# **OMRON**

# MOS FET Relay General Catalog G3VM Series

A wide range of contact forms and functions Over 180 different models available



#### What's NEW!

The Very small package "S-VSON series" is now available Expansion of the package "DIP/SOP" with High-current and Low-ON-resistance Type Expansion of the Package "SOP" with General-purpose Type

#### To the customer who buys Omron products

#### Warranty and Limited Warranty

#### (As of September, 2015. Please check Omron Corporation's homepage for the latest version of Terms and Conditions.)

Thank you for using Omron Corporation ("Omron") products. The Terms and Conditions hereunder are applied to Omron products regardless of where they are purchased. When you place an order, you are expected to agree to the Terms and Conditions described below.

#### 1 Definition

The definition of terms used in these Terms and Conditions are as follows:

- (1) Omron products: FA system equipment, general-purpose control devices, sensors, and electronic/mechanism components under Omron brand
- (2) Catalogues: Omron general catalogue, FA system equipment general catalogue, safety component general catalogue, electronic/mechanism components general catalogue and other catalogues, specifications, instructions and manuals of Omron products, including electronically provided information available on the Omron electronic components information website, etc.
- (3) Usage conditions: Usage conditions, rating, performance, operating environment, handling instructions, cautions, prohibited use, etc. of Omron products described in catalogues.
- (4) Customer application: Application of Omron products by customers which include embedding and/or using Omron products in their parts/components, electronic substrates, devices, equipment or systems manufactured by customers.
- (5) Fitness: (a) fitness, (b) performance, (c) non-infringement of third-party intellectual property, (d) compliance with laws and regulations and (e) conformity to standards.

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Attention is required to the following points on descriptions in catalogues.

- (1) Rated values and performance values are the product of tests performed for separate single conditions, including but not limited to temperature and humidity. It is not intended to warrant rated values and performance values for multiple combined conditions.
- (2) Reference data are provided for reference only. Omron does NOT warrant that Omron products work properly at all time in the range of reference data.
- (3) Application examples are provided for reference only. Omron does NOT warrant the fitness of Omron products under such application.
- (4) Omron may discontinue the production of Omron products or change the specifications of them for the purpose of improving such products or other reasons entirely at its own discretion.

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Please be aware of and accept the following when you introduce or use Omron products:

- (1) Please use Omron products in compliance with usage conditions including rating and performance.
- (2) Please confirm fitness of Omron products in your application and use your own judgment to determine the appropriateness of using them in such application. Omron shall not warrant the fitness of Omron products in customer application.
- (3) Please confirm that Omron products are properly wired and installed for their intended use in your overall system.
- (4) When using Omron products, please make sure to (i) maintain a margin of safety vis-à-vis the published rated and performance values, (ii) design to minimize risks to customer application in case of failure of Omron products, such as introducing redundancy, (iii) introduce system-wide safety measures to notify risks to users, and (iv) conduct regular maintenance on Omron products and customer application.
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  - (a) Applications with stringent safety requirements, including but not limited to nuclear power control equipment, combustion equipment, aerospace equipment, railway equipment, elevator/lift equipment, amusement park equipment, medical equipment, safety devices and other applications that could cause danger/farm to people's body and life.
  - (b) Applications that require high reliability, including but not limited to supply systems for gas, water and electricity, etc., 24 hour continuous operating systems, financial settlement systems and other applications that handle rights and property.
  - (c) Applications under severe conditions or in severe environment, including but not limited to outdoor equipment, equipment exposed to chemical contamination, equipment exposed to electromagnetic interference and equipment exposed to vibration and shocks.
  - (d) Applications under conditions and environment not described in catalogues
- (6) In addition to the applications listed from (a) to (d) above, Omron products are not intended for use in automotive applications (including two wheel vehicles). Please do NOT use Omron products for automotive applications. Please contact Omron sales staff for products for automotive use.

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The terms and conditions for warranty of *Omron products* are as follows:

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  - (a) Free repair of malfunctioning Omron products at an Omron maintenance service location (Repair service is not available for electronic/mechanism parts.), or
  - (b) Free replacement of the malfunctioning *Omron products* with the same number of replacement/alternative products.
- (3) Exceptions: Omron will not cover Omron products under its warranty if the cause of the malfunction falls under any of the following:
  - (a) Usage in a manner other than the original intended use for the Omron products.
  - (b) Usage outside of the usage conditions.
  - (c) Modification or repair made to the Omron products by other than Omron personnel.
  - (d) Software program embedded by other than Omron or usage of such software.
  - (e) Causes which could not have been foreseen with the level of science and technology at the time of shipping from *Omron*.
  - (f) Causes originating from other than Omron or Omron products (including force majeure such as but not limited to natural disasters).

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(EC300E)

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# **Using this Catalog**



There are the following three ways to search for products in this catalog.

Searching by Application

Recommended products are listed by typical industries and applications, such as security or communications, or by typical functions.

You can select products based on applications or functions.

MOS EST IN SEA Application 1 Control (1997) And Sea Application 1 Control (1997) And

Searching by Product Feature
Products are classified by features, such as

Products are classified by features, such as general purpose or small with high dielectric strength.

You can select products for each application based on product features.



Searching by Product Model Number

The products are listed in a product index.

You can select products by model number while checking specifications, such as the rated voltage or continuous load current.

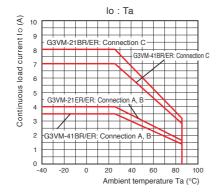


# **Improved Features of the MOS FET Relay General Catalog**

Similar models are grouped together so that you can select models while comparing detailed performances.

# Examples

●Continuous load current vs.
Ambient temperature
G3VM-21BR/21ER/41BR/41ER

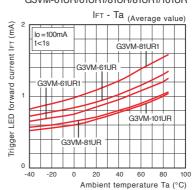


# ●Trigger LED forward current vs. Ambient temperature

P.8

P.10

G3VM-61UR/61UR1/81UR/81UR1/101UR



# **OMRON Electronic Components Website**

**Website** 

#### www.omron.com/ecb/





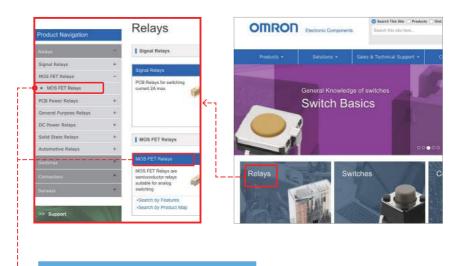
**OMRON Electronic Components** 



This website is dedicated to OMRON electronic components.

You can search for products based on model numbers, specifications, or product category.

The convenient interface also lets you view new product information and all of our services. Note: The contents of this website are subject to change.



## MOS FET Relay Select from Product Table

Please select MOSFET relay by checking the necessary items.



# **MOS FET Relays: G3VM Features**

G3VM Relays will help you downsize and reduce the energy consumption of a wide range of equipment.

#### **Ultra Small Size and Weight**

In addition to the SSOP and USOP, we have introduced the ultra-compact VSON and S-VSON packages, contributing to downsizing of equipment.

#### Low driving current

Realizing energy saving with standard driving current of 2 to 15mA Ultrasensitive models are also available featuring Drive Currents as low as 0.2 mA (max)

#### Long operating life

MOS FET Relays use light signal instead of moveable contacts; avoiding reduction of life caused by contact wear, substantially increasing operational

### Small leakage current

Can withstand external surge current without addition of snubber circuit. Under normal conditions, the typical leakage current is about 1 nA or below.

#### **Excellent shock resistance**

All the internal parts use casting method, and there is no movable parts in it. so it has excellent shock and vibration resistance.

#### **High Insulation**

MOS FET relays offer great I/O isolation due to its operational principle. It turns the voltage into the light and transfers by the light signal; Therefore input and output are isolated. The standard models offer 2,500 Vrms between input and output. Superior 5,000 VAC products are also available. 3,750 VAC products have also been added to the SOP package series.

#### Silent operation

As MOS FET Relays do not have mechanical contacts, by using a MOS FET instead of an electromechanical relay, it is possible to eliminate switching noise in your applications.

#### **High-speed switching**

Comparing with the switching time of 3 to 5 ms of a mechanical relay, its switching time is shortened to 0.2 ms(SSOP, USOP, VSON). Achieving quick response performance.

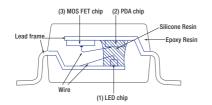
#### Control the micro analog signal correctly

Comparing with the triac, MOS FET greatly reduces the dead zone. The input waveform of micro analog signal does not suffer distortion as it does with a triac and is basically converted into output waveform without distortion.



# Structure and operational principle of MOS FET relays

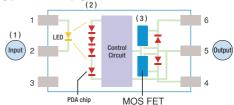
#### [Internal structure]



MOS FET relay consists of the following three components:

- (1) LED (light emitting diode)
- (2) Photodiode dome array (PDA)
- (3) MOS FET

#### [Operational Principle]



- (1) The LED lights up when the current is connected at the input side.
- (2) The light sent by the LED will be converted into voltage when it is received by the Photodiode dome array.
- (3) This voltage will be the gate voltage to drive the MOS FET via control circuit.

# **Application Examples**

#### MOS FET Relay Application Examples

### **Security Equipment**

 Smoke detector/Home security panel/PIR/ Video intercom systems



Function	Features / R	ecommended products	Page
	General purpose	G3VM-61VY3 G3VM-351VY	68 82
Status output Signal output	Ultrasensitive	G3VM-61G2	68
2.3	1b (SPST-NC)	G3VM-63G G3VM-353G	68 82
Switching power supply of small solenoid valve, small light	High curren	G3VM-61VR G3VM-61CR1/FR1 G3VM-201CR/FR G3VM-601CR/FR	127 121 121 121
External output	High dielectric strength	G3VM-61AY1/DY1 G3VM-351AY1/DY1	147

## FA/Industrial Equipment

 Machine tool/Customized power supply/Factory automation (PLC/Thermostat/Timer)



Function	Features / R	ecommended products	Page
Status output Signal output	General purpose	G3VM-61VY3 G3VM-61A1/D1 G3VM-351VY G3VM-351A/D	68 62 82 62
Switching power supply of small solenoid valve, small motor	High current	G3VM-61VR G3VM-61CR1/FR1 G3VM-201CR/FR G3VM-601CR/FR	127 121 121 121
External output	High dielectric strength	G3VM-61AY1/DY1 G3VM-351AY1/DY1	147

# **Test & Measurement Equipment**

Semi-conductor test equipment(ATE)/
 Semi-conductor test equipment Interface board/
 Tester for cars/PXI module/Data logger/ I/O board



### **Communication Equipment**

 Modems, Fax machines, network devices, and PBX transfer devices



Function	Features / Re	ecommended products	Page
Short-circuit line switching	General purpose	G3VM-61VY3 G3VM-351VY	68 82
Line switching	1b (SPST-NC)	G3VM-63G G3VM-353G	68 82

## **Energy-related Equipment**

 BMS's (business management systems), power meters, smart meters, secondary power supplies, and photovoltaic systems



Function	Features / Re	ecommended products	Page
External communications Charge voltage monitoring	High dielectric strength	G3VM-61AY1/DY1 G3VM-351AY1/DY1 G3VM-601AY1/DY1	147
	General purpose	G3VM-61VY3 G3VM-351VY	68 82
Storage battery charging	High current	G3VM-61CR1/FR1	121

#### Amusement Equipment

Currency Sensing Modules
 Coin dispenser / Information system



Function	Features / Ro	ecommended products	Page
Status output	General purpose	G3VM-61VY3 G3VM-351VY	68 82
Signal output	1b (SPST-NC)	G3VM-63G G3VM-353G	68 82

**Medical Equipment** 

Office automation/AV Equipment

**Broadcasting Equipment** 

# **Features by Product Type**

# Product Lineup by MOS FET Relay Type

#### **General-purpose Type**

Best-selling products suitable for various applications Ideal for AC/DC load, Micro analog signal.

DIP Relay Series	P.62
SOP 4-pin Relay Series with Load Voltage of 60 V	P.68
SOP 4-pin Relay Series with Load Voltage of 80 V	P.73
SOP 4-pin Relay Series with Load Voltage of 200 V	P.77
SOP 4-pin Relay Series with Load Voltage of 350 and 40	00 V P.82
SOP 6 -pin Relay Series	P.88

#### **High-dielectric-strength Type**

These MOS FET Relays come in DIP 6-pin packages and achieve a dielectric strength of 5,000 VAC between I/O.



Relay Series with Load Voltage of 400/600 V	P.155
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#### **High-load-voltage Type**

These MOS FET Relays come in SOP 4-pin packages and are for high load voltages.



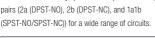
#### **Current-limiting Type**

These MOS FET Relays protect themselves from overcurrents with a current-limiting protection function.



### Multi-contact-pair Type (2a, 2b, and 1a1b)

These MOS FET Relays provide multiple contact pairs (2a (DPST-NO), 2b (DPST-NC), and 1a1b



DIP 8-pin Relay Series	P.98
SOP 8-pin Relay Series	P.104

#### Low-output-capacitance and Low-ON-resistance Type (with Low $C \times R$ )

Ideal for semi-conductor test equipment. low C (capacitance between terminals) × R (output on-resistance) type.



Models are also available that give priority to a low C or a low R.

SOP 4-pin Relay Series	P.165
SSOP Relay Series with Load Voltage of 20 V	P.170
SSOP Relay Series with Load Voltage of 40 V	P.175
USOP Relay Series with Load Voltage of 20 V	P.180
USOP Relay Series with Load Voltage of 40, 50 V	P.185
VSON Relay Series with Load Voltage of 20 V	P.190
VSON Relay Series with Load Voltage of 50 V	P.195
S-VSON Relay Series (New small package)	P.200

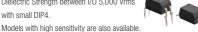
#### **High-current and Low-ON-resistance Type**

These MOS FET Relays achieve the low ON resistance and high switching capacity of a mechanical relay.



#### Small and High-dielectric-strength Type

Dielectric Strength between I/O 5,000 Vrms



DIP 4-pin Relay Series P.147
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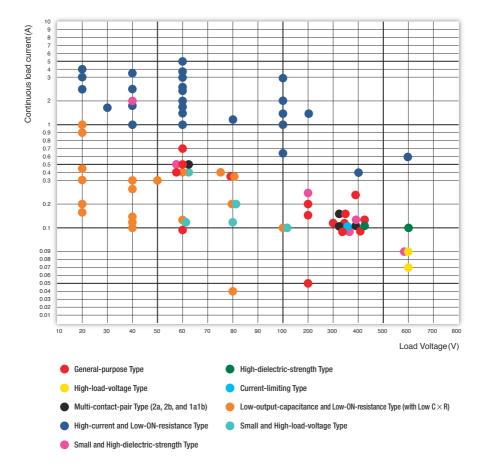
#### Small and High-load-voltage Type

These ultra-compact MOS FET Relays are for high load voltages.



SSOP Relay Series with Load Voltage of 60, 80, and 100 V	P.204
USOP Relay Series with Load Voltage of 60, 75, 80, and 100 V	
VSON Relay Series with Load Voltage of 60, 80, 100V	P.213

# **Product Map by features**



# **Product Index**

■DIP (Dual Inline Package)

Load Voltage (V) Max.	Model	Number of terminals	Contact form	Continuous load current (mA) Max.	Maximum resistance with output ON (Ohm) Typ.	Current leakage when the relay is open (nA) Max.	Capacitance between terminals (pF) Typ.	Turn-ON time (ms) Max.	Turn-OFF time (ms) Max.	Dielectric strength between I/O (Vrms)	Page
20	G3VM-21AR/DR	4	1a	3000	0.04	1000	300	5	1	2500	110
20	G3VM-21BR/ER	6	1a	4000 (8000) *1	0.02	1000	1000	5	1	2500	115
40	G3VM-41AY/DY	4	1a	2000	0.09	1000	300	5	1	5000	147
40	G3VM-41AY1/DY1	4	1a	2000	0.09	1000	300	5	1	5000	147
40	G3VM-41AR/DR	4	1a	2500	0.05	1000	300	5	1	2500	110
40	G3VM-41BR/ER	6	1a	3500 (7000) *1	0.03	1000	1000	5	1	2500	115
60	G3VM-61A1/D1	4	1a	500	1	1000	130	2	0.5	2500	62
60	G3VM-61AY/DY	4	1a	500	0.6	1000	130	1	1	5000	147
60	G3VM-61AY1/DY1	4	1a	500	0.6	1000	130	3	1	5000	147
60	G3VM-61AR/DR	4	1a	2000	0.08	1000	250	5	1	2500	110
60	G3VM-61B1/E1	6	1a	500 (1000) *1	1	1000	130	2	0.5	2500	62
60	G3VM-61BR/ER	6	1a	2500	0.065	10	400	1.5	0.4	2500	115
60	G3VM-61BR1/ER1	6	1a	3000 (6000) *1	0.04	1000	1000	5	1	2500	115
60	G3VM-61CR1/FR1 <u>NEW</u>	8	1a	5000(10000)*1	0.022	10000	850	5	1	2500	121
60	G3VM-62C1/F1	8	2a	500	1	1000	130	2	0.5	2500	98
100	G3VM-101AR/DR	4	1a	1000	0.25	1000	200	5	1	2500	110
100	G3VM-101BR/ER	6	1a	2000 (4000) *1	0.1	1000	1000	5	1	2500	115
100	G3VM-101CR/FR <u>NEW</u>	8	1a	3000(6000)*1	0.06	1000	720	5	1	2500	121
200	G3VM-201AY/DY	4	1a	250	5	1000	90	1	1	5000	147
200	G3VM-201AY1/DY1	4	1a	250	5	1000	90	3	1	5000	147
200	G3VM-201CR/FR NEW	8	1a	1500(3000)*1	0.25	1000	400	5	1	2500	121
350	G3VM-351AY/DY	4	1a	100	35	1000	30	1	1	5000	147
350	G3VM-351AY1/DY1	4	1a	100	35	1000	30	2	1	5000	147
350	G3VM-2L/2FL	4	1a	120 *2	22	1000	40	1	1	2500	159
350	G3VM-351A/D	4	1a	120	35	1000	30	1	1	2500	62
350 350	G3VM-353A/D	4	1b	150	15 35	1000	85 30	1	3	2500 2500	62
	G3VM-351B/E		1a	120 (240) *1		1000					62
350 350	G3VM-353B/E G3VM-355CR/FR	6 8	1b 1a1b	150 (300) *1 120	15 15	1000	85 65	1	3	2500 2500	62 98
350	G3VM-355CH/FH G3VM-352C/F	8	2a	120	35	1000	30	1	1	2500	98
350	G3VM-932C/F	8	2a 2a	120 *2	22	1000	40	1	1	2500	159
350	G3VM-354C/F	8	2b	150	15	1000	85	1	3	2500	98
400	G3VM-401A/D	4	1a	120	18	1000	40	1	1	2500	62
400	G3VM-401AY/DY	4	1a	120	22	1000	80	1	1	5000	147
400	G3VM-401AY1/DY1	4	1a	120	22	1000	80	2	1	5000	147
400	G3VM-401B/E	6	1a	120 (240) *1	17	1000	40	1	1	2500	62
400	G3VM-401BY/EY	6	1a	120 (240) *1	17	1000	40	1	1	5000	155
400	G3VM-401CR/FR NEW	8	1a	400(800)*1	3	1000	410	1	1	2500	121
400	G3VM-402C/F	8	2a	120	18	1000	40	1	1	2500	98
600	G3VM-601AY/DY	4	1a	90	45	1000	75	1	1	5000	147
600	G3VM-601AY1/DY1	4	1a	90	45	1000	75	2	1	5000	147
600	G3VM-601BY/EY	6	1a	100 (200) *1	30	1000	120	1.5	1	5000	155
600	G3VM-601CR/FR NEW	8	1a	600(1200)*1	1.3	10000	4300	3	1	2500	121

\*1 Load current in case of connection C is shown in parentheses (DC load only) \*2 Current-Limiting function (Limit current 150 mA Min. 300 mA Max.)

■SOP (Small Outline Package)

Load Voltage (V) Max.	Model		Number of terminals	Contact form	Continuous load current (mA) Max.	Maximum resistance with output ON (Ohm) Typ.	Current leakage when the relay is open (nA) Max.	Capacitance between terminals (pF) Typ.	Turn-ON time (ms) Max.	Turn-OFF time (ms) Max.	Dielectric strength between I/O (Vrms)	Page
20	G3VM-21GR		4	1a	160	5	1	1	0.5	0.5	1500	165
20	G3VM-21GR1		4	1a	300	1	1	5	0.5	0.5	1500	165
20	G3VM-21HR		6	1a	2500 (5000) *1	0.02	10	1000	5	1	1500	131
30	G3VM-31HR <u>J</u>	NEW	6	1a	4000(8000)*1	0.02	1000	1100	5	1	1500	131
40	G3VM-41GR6		4	1a	120	10	1	1	0.5	0.5	1500	165
40	G3VM-41GR4		4	1a	250	2	1	5	0.5	0.5	1500	165
40	G3VM-41GR5		4	1a	300	1	1	10	0.5	0.5	1500	165
40	G3VM-41GR8		4	1a	1000	0.1	1	300	3	0.5	1500	127
40	G3VM-41HR		6	1a	2500 (5000) *1	0.03	10	1000	5	1	1500	131
60	G3VM-61VY1		4	1a	100	25	1000	10	5	5	3750	68
60	G3VM-61G1		4	1a	400	1	1000	130	2	0.5	1500	68
60	G3VM-61G2		4	1a	400	1	1000	130	8	3	1500	68
60	G3VM-61G3		4	1a	400	1	1000	130	10	5	1500	68
60	G3VM-61VY2 <u>I</u>	NEW	4	1a	500	1	1000	20	2	0.5	3750	68
60	G3VM-61VY3 <u>I</u>	NEW	4	1a	700	0.15	1000	100	3	0.5	3750	68
60	G3VM-61GR1		4	1a	1000	0.25	100	90	3	1	1500	127
60	G3VM-61GR2 <u>J</u>	NEW	4	1a	1700	0.08	10	250	3	0.5	1500	127
60	G3VM-61VR <u>J</u>	NEW	4	1a	1400	0.13	1000	100	3	1	3750	127
60	G3VM-63G <u>I</u>	NEW	4	1b	500	1	1000	100	1	3	1500	68
60	G3VM-61H1		6	1a	400 (800) *1	1	1000	130	2	0.5	1500	88
60	G3VM-61HR		6	1a	2300 (4600) *1	0.04	10	1000	5	1	1500	131
60	G3VM-61HR1 <u>J</u>	NEW	6	1a	3300 (6600)*1	0.03	20	700	5	1	1500	131

<sup>\*1</sup> Load current in case of connection C is shown in parentheses (DC load only) 
\*2 Current-Limiting function (Limit current 150 mA Min. 300 mA Max.)

# **Product Index**

■SOP (Small Outline Package)

Load Voltage (V) Max.	Model	Number of terminals	Contact form	Continuous load current (mA) Max.	Maximum resistance with output ON (Ohm) Typ.	Current leakage when the relay is open (nA) Max.	Capacitance between terminals (pF) Typ.	Turn-ON time (ms) Max.	Turn-OFF time (ms) Max.	Dielectric strength between I/O (Vrms)	Page
60	G3VM-62J1	8	2a	400	1	1000	130	2	0.5	1500	104
80	G3VM-81GR	4	1a	40	16	1	2.5	0.5	0.5	1500	165
80	G3VM-81GR1	4	1a	200	5	1	6.5	0.5	0.5	1500	165
80	G3VM-81G1	4	1a	350	1	1	30	0.5	0.5	1500	73
80	G3VM-81HR	6	1a	1250 (2500) *1	0.11	1.5	460	3	1	1500	137
100	G3VM-101HR	6	1a	1400 (2800) *1	0.1	10	1000	5	1	1500	137
100	G3VM-101HR1 <u>NE</u> I	6	1a	2000 (4000)*1	0.045	1000	500	5	1	1500	137
200	G3VM-201G	4	1a	50	40	1	15	0.5	0.2	1500	77
200	G3VM-201G1	4	1a	200	5	1000	90	8	3	1500	77
200	G3VM-201G2	4	1a	200	5	1000	90	10	5	1500	77
200	G3VM-S5	4	1a	200	5	1000	100	1.5	1	1500	77
200	G3VM-201H1	6	1a	200 (400) *1	5	1000	100	1.5	1	1500	88
200	G3VM-202J1	8	2a	200	5	1000	100	1.5	1	1500	104
350	G3VM-351G1	4	1a	100	35	1000	35	5	3	1500	82
350	G3VM-351G	4	1a	110	35	1000	30	1	1	1500	82
350	G3VM-351VY <u>NE</u> I	4	1a	110	35	1000	60	1	0.5	3750	82
350	G3VM-351GL	4	1a	120 *2	15	1000	70	1	1	1500	159
350	G3VM-353G	4	1b	120	15	1000	65	1	3	1500	82
350	G3VM-351H	6	1a	110 (220) *1	35	1000	30	1	1	1500	88
350	G3VM-353H	6	1b	120 (240) *1	15	1000	65	1	3	1500	88
350	G3VM-355JR	8	1a1b	120	15	1000	65	1	3	1500	104
350	G3VM-352J	8	2a	110	35	1000	30	1	1	1500	104
350	G3VM-354J	8	2b	120	15	1000	65	1	3	1500	104
400	G3VM-401G1	4	1a	100	18	1000	70	10	5	1500	82
400	G3VM-401G	4	1a	120	17	1000	70	1	1	1500	82
400	G3VM-401H	6	1a	120 (240) *1	17	1000	70	1	1	1500	88
400	G3VM-402J	8	2a	120	17	1000	70	1	1	1500	104
600	G3VM-601G1	4	1a	70	35	1000	75	10	5	1500	94
600	G3VM-601G	4	1a	90	45	1000	75	8	3	1500	94

<sup>\*1</sup> Load current in case of connection C is shown in parentheses (DC load only) 

\*2 Current-Limiting function (Limit current 150 mA Min. 300 mA Max.)

## ■SSOP (Shrink Small Outline Package)

	(Sililik Siliali	Outiliii	c i uc	rage)							
Load Voltage (V) Max.	Model	Number of terminals		Continuous load current (mA) Max.	resistance with	Current leakage when the relay is open (nA) Max.	Capacitance between terminals (pF) Typ.	Turn-ON time (ms) Max.	Turn-OFF time (ms) Max.	Dielectric strength between I/O (Vrms)	Page
20	G3VM-21LR	4	1a	160	5	1	1	0.5	0.5	1500	170
20	G3VM-21LR10	4	1a	200	3	0.2	0.8	0.2	0.2	1500	170
20	G3VM-21LR1	4	1a	450	0.8	1	5	0.5	0.5	1500	170
20	G3VM-21LR11	4	1a	900	0.18	1	40	2	1	1500	170
40	G3VM-41LR10	4	1a	120	12	0.2	0.45	0.2	0.3	1500	175
40	G3VM-41LR6	4	1a	120	10	1	1	0.5	0.5	1500	175
40	G3VM-41LR11	4	1a	140	7	0.2	0.7	0.2	0.2	1500	175
40	G3VM-41LR4	4	1a	250	2	1	5	0.5	0.5	1500	175
40	G3VM-41LR5	4	1a	300	1	1	10	0.5	0.5	1500	175
60	G3VM-61LR	4	1a	400	1	1000	20	1	1	1500	204
80	G3VM-81LR	4	1a	120	7.5	0.2	5	0.25	0.2	1500	204
100	G3VM-101LR	4	1a	80	8	0.2	6	0.3	0.3	1500	204

### ■USOP (Ultra Small Outline Package)

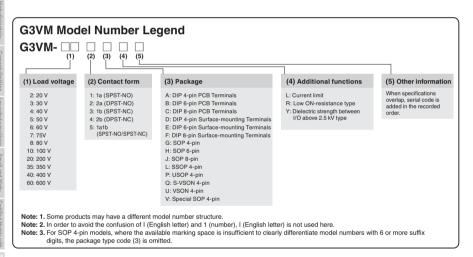
Load Voltage (V) Max.	Model	Number of terminals	Contact	Continuous load current (mA) Max.	Maximum resistance with output ON (Ohm) Typ.	Current leakage when the relay is open (nA) Max.	Capacitance between terminals (pF) Typ.	Turn-ON time (ms) Max.	Turn-OFF time (ms) Max.	Dielectric strength between I/O (Vrms)	Page
20	G3VM-21PR10	4	1a	200	3	1	0.8	0.2	0.2	500	180
20	G3VM-21PR1	4	1a	450	0.6	1	5	0.5	0.5	500	180
20	G3VM-21PR11	4	1a	900	0.18	1	40	2	1	500	180
40	G3VM-41PR12	4	1a	100	15	1	0.3	0.2	0.2	500	185
40	G3VM-41PR6	4	1a	120	10	0.2	1	0.2	0.3	500	185
40	G3VM-41PR10	4	1a	120	12	1	0.45	0.2	0.3	500	185
40	G3VM-41PR11	4	1a	140	7	1	0.7	0.2	0.2	500	185
40	G3VM-41PR5	4	1a	300	1	1	10	0.5	0.3	500	185
50	G3VM-51PR	4	1a	300	1	1	12	0.5	0.4	500	185
60	G3VM-61PR1	4	1a	120	10	1	0.7	0.2	0.2	500	208
60	G3VM-61PR	4	1a	400	1	1	20	0.5	0.5	500	208
75	G3VM-71PR	4	1a	400	1	1	30	2	1	500	208
80	G3VM-81PR	4	1a	120	7	0.02	5	0.5	0.2	500	208
100	G3VM-101PR	4	1a	100	8	0.2	6	0.3	0.3	500	208

# ■VSON (Very Small Outline Package Non-leaded)

Load Voltage (V) Max.	Model	Number of terminals		Continuous load current (mA) Max.	resistance with	Current leakage when the relay is open (nA) Max.		Turn-ON time (ms) Max.	Turn-OFF time (ms) Max.	Dielectric strength between I/O (Vrms)	Page
20	G3VM-21UR10	4	1a	200	3	1	0.8	0.2	0.2	500	190
20	G3VM-21UR1	4	1a	450	0.8	1	5	0.4	0.4	500	190
20	G3VM-21UR11	4	1a	1000	0.18	1	40	2	1	500	190
40	G3VM-41UR12	4	1a	100	15	1	0.3	0.2	0.2	500	195
40	G3VM-41UR10	4	1a	120	12	1	0.45	0.2	0.3	500	195
40	G3VM-41UR11	4	1a	140	7	1	0.7	0.2	0.2	500	195
50	G3VM-51UR	4	1a	300	1	1	12	0.5	0.4	500	195
60	G3VM-61UR1	4	1a	120	10	1	0.7	0.2	0.2	500	213
60	G3VM-61UR	4	1a	400	1	1	20	0.5	0.5	500	213
80	G3VM-81UR	4	1a	120	7	0.02	5	0.5	0.2	500	213
80	G3VM-81UR1	4	1a	200	6	1	6.5	0.4	0.4	500	213
100	G3VM-101UR	4	1a	100	8	0.2	6	0.3	0.3	500	213

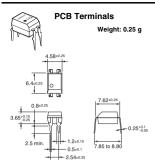
#### ■S-VSON (Super-Very Small Outline Package Non-leaded)

	oon (oupoi				nio i aonag	o mon ioa						
Load Voltage (V) Max.	Model		Number of terminals		Continuous load current (mA) Max.	resistance with	Current leakage when the relay is open (nA) Max.	Capacitance between terminals (pF) Typ.	Turn-ON time (ms) Max.	Turn-OFF time (ms) Max.	Dielectric strength between I/O (Vrms)	Page
30	G3VM-31QR	NEW	4	1a	1500	0.1	1	120	2	1	500	143
40	G3VM-41QR10	NEW	4	1a	120	11	1	0.45	0.2	0.3	500	200
60	G3VM-61QR	NEW	4	1a	400	1.1	1	12	0.5	0.3	500	200
60	G3VM-61QR2	NEW	4	1a	1000	0.2	1	80	2	0.3	500	143
100	G3VM-101QR1	NEW	4	1a	650	0.4	1	50	2	0.3	500	143



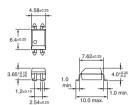
# **Dimensions and Appearance Examples**

**■DIP4** (Unit: mm)

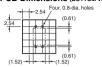




## **Surface-mounting Terminals** Weight: 0.25 g



### PCB Dimensions (BOTTOM VIEW)



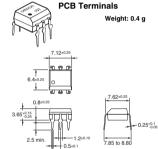
#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)



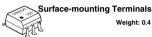
Weight: 0.4 g

### **■**DIP6

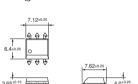
(Unit: mm)



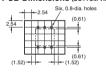
- 2.54±0.25



2 54



### PCB Dimensions (BOTTOM VIEW)

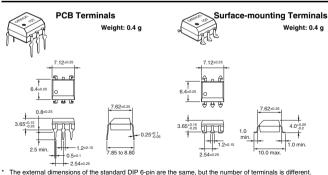


#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)

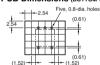


# ■Special DIP6 \* (G3VM-61BR/ER)

(Unit: mm)



#### PCB Dimensions (BOTTOM VIEW)



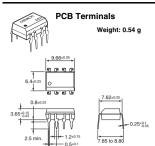
#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)



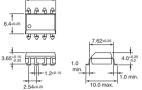
Note: The actual product is marked differently from the image shown here.

# **Dimensions and Appearance Examples**

■DIP8 (Unit: mm)







### PCB Dimensions (BOTTOM VIEW)



#### Actual Mounting Pad Dimensions (Recommended Value, Top View)

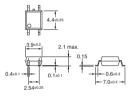


#### ■SOP4

(Unit: mm)



Surface-mounting Terminals
Weight: 0.1 g



### **Actual Mounting Pad Dimensions**



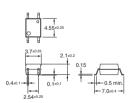
## ■Special SOP6 \* (G3VM-61VY1)

(Unit: mm)



Surface-mounting Terminals

Weight: 0.1 g



#### Actual Mounting Pad Dimensions (Recommended Value, Top View)

(Recommended value, 10

\* The external dimensions are different from those of the standard SOP 4-pin, but the mounting pad dimensions are the same.

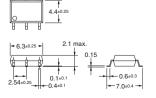
# ■SOP6

(Unit: mm)



# Surface-mounting Terminals

Weight: 0.13 g



# Actual Mounting Pad Dimensions (Recommended Value, Top View)



Note: The actual product is marked differently from the image shown here.

(Unit: mm)

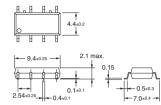
# **Dimensions and Appearance Examples**



**■SOP8** 

#### **Surface-mounting Terminals**

Weight: 0.2 g



#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)



#### SSOP4

(Unit: mm)



#### **Surface-mounting Terminals**

Weight: 0.03 a



tolerance is ± 0.1 mm.

#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)



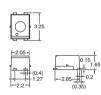
#### **■USOP4**

(Unit: mm)



#### **Surface-mounting Terminals**

Weight: 0.03 g



Unless otherwise specified, the dimensional tolerance is ± 0.2 mm.

#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)

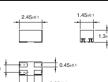


■VSON4

(Unit: mm)



#### **Surface-mounting Terminals** Weight: 0.01 g



#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)



Note: The actual product is marked differently from the image shown here.

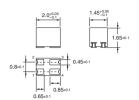
# Dimensions and Appearance Examples

■S-VSON4 (Unit: mm)



Surface-mounting Terminals

Weight: 0.01 g



#### **Actual Mounting Pad Dimensions**

#### (Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is + 0.1 mm.

#### ■S-VSON(L)\*4

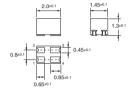
(L): Low profile type

(Unit: mm)



# Surface-mounting Terminals

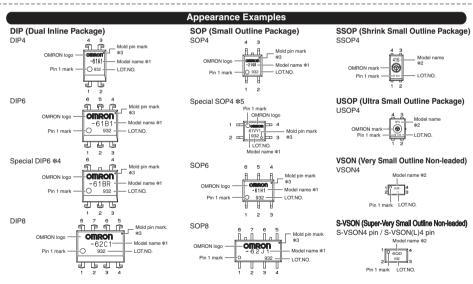
Weight: 0.01 g



#### Actual Mounting Pad Dimensions (Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is  $\pm$  0.1 mm.



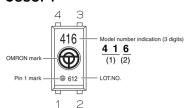
- \*1. "G3VM" does not appear in the model numbers on DIP or SOP Relays.
- \*2. Model numbers are given on SSOP4, USOP4, and VSON4 Relays according to the Model Number Indication Standards.
- \*3. The indentation may appear in the corner diagonally opposite from the pin 1 mark due to extrusion by metal casting.
- \*4. The external dimensions of the standard DIP 6-pin are the same, but the number of terminals is different.
- \*5. The external dimensions are different from those of the standard SOP 4-pin, but the mounting pad dimensions are the same.

# ■Model Number Indication Standards for SSOP4, USOP4 and VSON4 Relays

Only three digits are given for the model number due to the small package size.

**Dimensions and Appearance Examples** 

### ●SSOP4



# (1) Load voltage

21: 20 V 41: 40 V 51: 50 V 61: 60 V 81: 80 V 10: 100 V

# . . .

(2) Characters for Serial Numbers at the Ends of Model Numbers

0: Indicates no number at the end of the model number.

1 to 9: Indicate the given number. Numbers 10 and higher indicate letters of the alphabet (A, B, C, etc.).

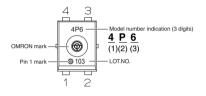
However, "101" is given for the G3VM-101LR

#### Examples

416: G3VM-41LR6 21B: G3VM-21LR11

## ●USOP4,VSON4,S-VSON4

#### USOP4



#### VSON4



#### USOP4,VSON4,S-VSON4 Relay

	, -	-
(1) Load	volta	age
2: 20 V		
3: 30 V		
4: 40 V		
5: 50 V		
6: 60 V		
7: 75 V		
8: 80 V		
A: 100	V	

P: USOP4
U: VSON4
Q: S-VSON4 4 pin
S-VSON(L)\* 4 pin
\* (L): Low profile type

(2) Package

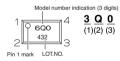
# (3) Characters for Serial Numbers at the Ends of Model Numbers

Indicates no number at the end of the model number.
 1 to 9: Indicate the given number.
 Numbers 10 and higher indicate letters of the alphabet (A, B, C, etc.).

#### Examples

4P6: G3VM-41PR6 2UB: G3VM-21UR11

#### S-VSON 4/S-VSON(L) 4



<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

	A   Section   A   Section	Application				
					Model	
		1a (SP:	ST-NO)		Contact form	
	4.58	7.12	4.58	4.58	Parkana	
	4.58	7.12	4.58	4.58	(Unit : mm, Average	:)
	DIP4	A 58				
	resistance Type  • Load voltage: 40 V  • Continuous load current	resistance Type  • Load voltage: 40 V  • Continuous load current: 3.5 A (7 A) max. *  • Values in parentheses are for connection C.	Load voltage: 60 V	strength Type  • Load voltage: 60 V  • Dielectric strength between I/O: 5,000 VAC  • Trigger LED forward current		
		Photodioo	de coupler			_
	40	V	60	V		
	· 2,500 mA ·	7,000 mA	500 mA	500 mA	9,000 - 8,000 - 7,000 - 6,000 - 5,000 - 4,000 - 2,000 - 1,000	Output Absolute maximum ratings
	30		50 mA			Input
			195°€	5,000 VAC 50/60 Hz for 1 min.		U
	0.15 Ω	Connection B: 0.015 Ω (typical)	2	Ω		tput
	1 μA (at		1 μA (at	60 VDC)	Maximum OFF leakage current	Output
				Surface-mounting termina	inal si	
		•	•		PCB terminals	Terminal
2,500 VAC 50/60 Hz for 1 min. 5,000 VAC 5  -40 to +85°C (with no icing or condensation)  Connection 8: 0.015 Ω (typical) Connection C: 0.008 Ω (typical)  1 μA (at 40 VDC)  1 μA (at 60 VDC)  PCB mounting or Surface mounting		Mounting method				
		U			Applicable standard	
		Com			RoHS compliance	
	Approx. 0.25 g	Approx. 0.4 g	* * * * * * * * * * * * * * * * * * * *	i. 0.25 g	Weight	
	110	115	62	147	Page	

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.
 Refer to pages 218 to 220 for detailed information on models certified for standards.

Terminal structure

Maximum OFF leakage

current

Surface-mounting terminals

PCB terminals

Mounting method

Applicable standards

RoHS compliance

Weight

Page

٥r	0	duct	t Ta	ble					
		Applica	ition			For I	PCBs		
		Mod			G3VM-61AY1 G3VM-61DY1	G3VM-61AR G3VM-61DR	G3VM-61B1 G3VM-61E1	G3VM-61BR G3VM-61ER	
		Contact	form				ST-NO)		
		Packa	ina.		4.58	4.58	7.12	7.12	
	(U	nit : mm,		e)	4.58 3.85 6.4	4.58	7.12	7.12	
					DIP4	DIP4	DIP6	Special DIP6	
		Featu	res		Small and High-dielectric- strength Type     Load voltage: 60 V     Dielectric strength between I/O: 5,000 VAC	High-current and Low-ON-resistance Type     Load voltage: 60 V     Continuous load current: 2 A max.	General-purpose Type     Load voltage: 60 V	High-current and Low-ON-resistance Type     Load voltage: 60 V     Continuous load current: 2.5 A max.	_
	-	Isolation r	nethod			Photodio	de coupler		
		Load		peak		60	) V		
		voltage		oc					
				10,000					
				9,000					
				8,000 7,000					
				6,000					
				5,000					
				4,000					
Absolute maximum ratings	=	Continu		3,000			<sub>-</sub> <u>-</u>	2,500 mA	
	Output	load cui		2,000		2,000 IIIA	* Connection C 1,000 mA		
	0	* 6-pin ty	ре	1,000					
		connect	tion C:	900 800		<del> </del>		<del>   </del>	
		50		700		[	[	[	
				600		<del></del>		<b></b>	
				500	500 mA	<del> </del>	500 mA		
				400		<del> </del> <del></del>			
				300				<del> </del>	
				200 100	<b> </b>				
	Input	LED for	rward c	urrent	30	mA	50 mA	30 mA	
	Die	lectric stre	-		5,000 VAC 50/60 Hz for 1 min.		2,500 VAC 50/60 Hz for 1 min.		
		Ambient temp	t operat erature	ting			+85°C r condensation)		
cteristics	utput	Maximu re:	ım outp sistanc		2 Ω	0.2 Ω	Connection A: 2 $\Omega$ Connection B: 1 $\Omega$ Connection C: 0.25 $\Omega$ (typical)	0.1 Ω	
ž	=					I .			

110

Approx. 0.25 g

1 μA (at 60 VDC)

PCB mounting or

Surface mounting

UL

Compliant

10 nA (at 60 VDC)

115

Approx. 0.4 g

62

147

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

	Application	А	For PCBs										
	Model		G3VM-101AR G3VM-101DR	G3VM-62C1 G3VM-62F1	G3VM-61CR1 G3VM-61FR1	G3VM-61BR1 G3VM-61ER1							
	Contact form	Co	1a (SPST-NO)	2a (DPST-NO)	ST-NO)	1a (SP							
	Package		4.58	9.66	9.66 3.65 6.4 3.65	7.12							
•	: mm, Average	(Unit :	4.58	9.66	9.66 9.66 NEW 6.4	7.12							
			DIP4	DIP8	DIP8	DIP6							
Features			High-current and Low-ON-resistance Type     Load voltage: 100 V     Continuous load current: 1 A max.	Multi-contact-pair Type     Load voltage: 60 V     Contact form: 2a (DPST-NO)	High-current and Low-ON-resistance Type     Load voltage: 60 V     Continuous load current: 5 A (10 A) max.*     Values in parentheses are for connection C.	High-current and Low-ON-resistance Type Load voltage: 60 V Continuous load current: 3 A (6 A) max.* Values in parentheses are for connection C.							
Isolation method				de coupler	Photodio								
	Load voltage	AC peak DC	100 V		60 V								
		10,000			*Connection C 10,000 mA								
		9,000			<del> </del>		ļ						
		8,000				* Connection C							
		7,000		+	<del> </del>	6,000 mA							
		6,000 5,000			5,000 mA		į.						
		4,000					1						
	Continuous					3,000 mA	[ ]						
india o	oad current	2.000 lo			<b>. </b>								
6	AC peak/ DC 6-pin type	1 000 AC	1,000 mA		<b>. </b>								
1	connection C:	900 c											
	DC												
		700			<del> </del>								
		600		500 mA									
:		500		<del> </del>			į.						
		400 300	<del></del>	† <b></b>			١.						
				† <del></del> :			į.						
		200 100		† <del></del> :			į.						
		100		† <del></del>	† <b></b>		į.						
1	ard current	LED forwa	30 mA	50 mA	mA	30							
0	ength between I				2,500 VAC 50/								
	nt operating perature	Ambient temp		+85°C r condensation)									
Flactrical		Maximum o	0.7 Ω	2 Ω	Connection A: $0.05 \Omega$ Connection B: $0.025 \Omega$ Connection C: $0.013 \Omega$	Connection A: $0.07 \Omega$ Connection B: $0.02 \Omega$ (typical) Connection C: $0.01 \Omega$ (typical)							
Flac	OFF leakage (		1 μA (at 100 VDC)	1 μA (at 60 VDC)	10 μA (at 60 VDC)	1 μA (at 60 VDC)							
Terminal	unting termina	Surface-mou			•								
Tern	terminals	PCB to											
Mounting method				unting or mounting	Surface								
š	cable standard			IL .									
	HS compliance	RoH		pliant									
	Weight		Approx. 0.25 g	. 0.54 g	Approx	Approx. 0.4 g							
_	Page		110	98	121	115							

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.
 Refer to pages 218 to 220 for detailed information on models certified for standards.

		Application	For PCBs							
		Model	G3VM-101BR G3VM-101ER	G3VM-101CR G3VM-101FR	G3VM-201AY G3VM-201DY	G3VM-201AY1 G3VM-201DY1				
		Contact form		1a (SP	ST-NO)					
		Package	7.12	9,66	4.58	4.58				
	(U	nit : mm, Äverage)	7.12	9.66 3.55 NEW	4.58					
			DIP6	DIP8	DIP4	DIP4				
Features			High-current and Low-ON-resistance Type     Load voltage: 100 V     Continuous load current: 2 A (4 A) max.*     Values in parentheses are for connection C.	High-current and Low-ON-resistance Type     Load voltage: 100 V     Continuous load current: 3 A (6 A) max.*     Values in parentheses are for connection C.	Small and High-dielectric- strength Type     Load voltage: 200 V     Dielectric strength between I/O: 5,000 VAC     Trigger LED forward current: 2 mA max.	Small and High-dielectric- strength Type     Load voltage: 200 V     Dielectric strength between I/O: 5,000 VAC				
	_ !	solation method		Photodio	de coupler					
Load AC peak voltage DC			10	0 V	20	0 V				
		10,000								
	9,000									
	8,000			*Connection C						
	7,000 6,000			6,000 mA						
		5,000	* Connection C		[					
		4,000	4,000 mA							
ngs	¥	Continuous 3,000		3,000 mA						
rati	Output	load current 2,000 AC peak/ DC	2,000 mA							
돌	0	* 6-nin tyne 1,000								
xim		connection C: 900								
E		DC 800 700								
Absolute maximum ratings		600								
psq		500								
⋖		400								
		300			250 mA	250 mA				
		200								
		100				<del> </del> <del> </del>				
	nput	LED forward current		30	mA					
	_	ectric strength between I/O	2,500 VAC 50/	60 Hz for 1 min.	5,000 VAC 50/6	60 Hz for 1 min.				
		Ambient operating	-40 to +85°C	-40 to +110°C		+85°C				
		temperature	(with no icing or condensation)	(with no icing or condensation)	(with no icing o	r condensation)				
ical ristics	ont	Maximum output ON resistance	Connection A: $0.2 \Omega$ Connection B: $0.05 \Omega$ (typical) Connection C: $0.025 \Omega$ (typical)	Connection A: $0.15 \Omega$ Connection B: $0.075 \Omega$ Connection C: $0.075 \Omega$	8	Ω				
Electrical characterist	Maximum output ON resistance  Maximum OFF leakage current			100 VDC)	1 μA (at 2	200 VDC)				
				•	)					
Terminal structure		PCB terminals			•					
	ı	Nounting method			unting or mounting					
	Ap	plicable standards			JL					
		IoHS compliance		Com	pliant					
		Weight	Approx. 0.4 g	Approx. 0.54 g		. 0.25 g				
		Page	115	121	147	147				

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

			Application					
	G3VM-201CR G3VM-201FR	G3VM-351AY G3VM-351DY	G3VM-351AY1 G3VM-351DY1	G3VM-2L G3VM-2FL		Model		
	'	1a (SPS	ST-NO)		Cor	tact form		
	9.66	4.58	4.58	4.58	P	ackage		
<u> </u>	9.66 3.85 NEW 6.4	4.58	4.58	4.58	(Unit : r	mm, Average	e)	
	DIP8	DIP4	DIP4	DIP4				
:	High-current and Low-ON-resistance Type     Load voltage: 200 V     Continuous load current: 1.5 A (3 A) max.* Values in parentheses are for connection C.	Small and High-dielectric- strength Type     Load voltage: 350 V     Dielectric strength between I/O: 5,000 VAC     Trigger LED forward current: 2 mA max.	Small and High-dielectric- strength Type     Load voltage: 350 V     Dielectric strength between I/O: 5,000 VAC	Current-limiting Type     Load voltage: 350 V     Current limit: 150 to 300 mA				
		Photodiod	le coupler			ion method		
	200 V		350 V		AC peak DC	Load voltage		
	*Connection C 3,000 mA	100 mA	100 mA	Current limiting (Current limit: 150 to 300 mA) 120 mA	2,000 loa 1,000 AC	in type nnection C:	nput	Absolute maximum ratings
	2,500 VAC 50/60 Hz for 1 min.	30 mA 5,000 VAC 50/6	O Hz for 1 min	2,500 VAC 50/60 Hz for 1 min.	Dielectric streng	-	- 1	
	E,000 TAO 00/00 FIZ IOI T HIIII.	-40 to -		2,000 YAO 00/00 HZ 101 HIIIII.	Ambient		-	
		(with no icing or			tempe	rature		
	Connection A: $0.5 \Omega$ Connection B: $0.25 \Omega$ Connection C: $0.25 \Omega$	50	Ω	35 Ω	Maximum ou resista		Output	Electrical characteristics
	1 μA (at 200 VDC) 1 μA (at 350 VDC)					F leakage nt	3	Elec
		Surface-moun	ting termina	ls	Terminal structure			
		PCB ter			Str			
		Mounting method						
		Applicable standards RoHS compliance						
	Approx. 0.54 g			compliance Veight				
	Approx. 0.54 g	159	Page					
		147	147	159		rage		

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

			Application		For	PCBs		
			Model	G3VM-351A	G3VM-353A	G3VM-351B	G3VM-353B	
				G3VM-351D	G3VM-353D	G3VM-351E	G3VM-353E	
			Contact form	1a (SPST-NO)	1b (SPST-NC)	1a (SPST-NO)	1b (SPST-NC)	
			Package	4.58	3.65	7.12	7.12	
	(Unit : mm, Äverage)			4.58	4.58	7.12	7.12	
				DIP4	DIP4	DIP6	DIP6	
	Features		Features	General-purpose Type     Load voltage: 350 V	General-purpose Type General-purpose Type Contact form: 1b (SPST-NC)  Ontact form: 1b (SPST-NC)	General-purpose Type     Load voltage: 350 V	General-purpose Type General-purpose Type Contact form: 1b (SPST-NC)  Ontact form: 1b (SPST-NC)	
		l	solation method		Photodioo	de coupler		
			Load AC peak		35	0 V		
	voltage DC							
			10,000 9,000					
			8,000					
			7,000					
			6,000 5,000					
			4,000					
Absolute maximum ratings	í	Ħ	Continuous 3,000					
n ra		Output	load current 2,000 AC peak/ DC 1,000					
i.			* 6-pin type connection C: 900					
max			DC 800					
lute			700 600					
Abso			500					
1	•		400	_ = = = = = = = = = =		* Connection C	* Connection C 300 mA	
			300 200			240 mA		
			100	120 mA		120 mA	- 130111A	
	ŀ	=						
		Input	LED forward current			mA		
	ļ	Diel	ectric strength between I/O			60 Hz for 1 min.		
			Ambient operating temperature			+85°C r condensation)		
rical	eristics	but	Maximum output ON resistance	50 Ω	25 Ω	Connection A: $50 \Omega$ Connection B: $40 \Omega$ Connection C: $20 \Omega$	Connection A: 25 $\Omega$ Connection B: 14 $\Omega$ Connection C: 7 $\Omega$	
Electrical	charact	Output	Maximum OFF leakage current		1 μA (at 3	350 VDC)		
Terminal		Sur	face-mounting terminals			•		
Tei	str		PCB terminals		•			
			lounting method			unting or mounting		
			plicable standards	UL and BSI (EN 60950)		UL		
		R	oHS compliance Weight	Annrox	. 0.25 g	pliant Approx	x. 0.4 g	
			Page	62	62	62	62	
_			-	1	1	1	1	

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

<sup>\*</sup> Refer to pages 218 to 220 for detailed information on models certified for standards.

		Application						
G3VM-355CR G3VM-355FR	G3VM-352C G3VM-352F	G3VM-WL G3VM-WFL	G3VM-354C G3VM-354F	Model				
1a1b (SPST-NO/SPST-NC)	2a (DP	ST-NO)		Contact form				
9.66 6.4 3.85 9.66	9.66 33.355 6.4 3 3.55	9.66 6.4 9.60 9.60 9.60 9.60	9.66 6.4 9.60 9.60 9.60 9.60 9.60 9.60	Package (Unit : mm, Averaç	je)			
DIP8	DIP8	DIP8	DIP8					
DIP8	DIP8	DIP8	DIP8					
Multi-contact-pair Type     Load voltage: 350 V     Contact form: 1a1b (SPST-NO/SPST-NC)	Multi-contact-pair Type     Load voltage: 350 V     Contact form: 2a (DPST-NO)	Current-limiting Type Load voltage: 350 V Current limit: 150 to 300 mA de coupler	Multi-contact-pair Type     Load voltage: 350 V     Contact form: 2b (DPST-NC)					
	Isolation method	1						
		AC peak Load voltage						
				10,000				
				9,000				
				- 8,000 - 7,000				
				6,000				
				5,000				
				4,000		s		
				3,000 Continuous 2,000 load current	Output	Absolute maximum ratings		
[				1,000 AC peak/ DC	Out	E		
				900 connection C:		Ē		
				800 DC		m a		
				- 700 - 600		l te		
				500		pso		
				400		٩		
		Current limiting (Current limit: 150 to 300 mA)		300				
120 mA	120 mA	120 mA	150 mA	200				
				100				
		mA		LED forward current	Input			
	2,500 VAC 50/6			Dielectric strength between	1/0			
		+85°C or condensation)	I	Ambient operating temperature				
25 Ω	50 Ω	35 Ω	25 Ω	Maximum output ON resistance	Output	trical		
	Maximum OFF leakage current	Ont	Electrical characteristics					
	Surface-mounting termin	als	Terminal					
	PCB terminals		Terr					
		Mounting method						
	IL	Applicable standards						
		pliant :. 0.54 g		RoHS complianc Weight	е			
98	98	159	98	Page				
			1 22	. 250		_		

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

Replication   G3VM-401A   G3VM-401D   G3VM-401D   G3VM-401B   G3VM-401B   G3VM-401D   G3	
Package (Unit : mm, Average)	
Package (Unit : mm, Average)	
Continuous   3,000   10,000	
Semantan	
Solution   Features   Peatures	
Load voltage   DC	
Voltage   DC	
10,000	
Source   S	
September   Sept	-
Continuous   1,000	1
South   Sout	-
Second   100   1	_
Solution   Continuous   3,000   1,00	j
400	]
400	-
400	-
400	]
400	
400	-
300 200 120 mA	1
100 - 120 IIIA 120 II	]
100	4
Dielectric strength between I/O         2,500 VAC 50/60 Hz for 1 min.         5,000 VAC 50/60 Hz for 1 min.         2,500 VAC 50/60 Hz for 1 min.	1
Ambient operating -40 to +85°C	
temperature (with no icing or condensation)	
Maximum output ON resistance   35 Ω   Connection X: 35 Ω   Connection B: 20 Ω   Connection C: 10 Ω	
Surface-mounting terminals  PCB terminals  •	
PCB terminals	
Mounting method PCB mounting or Surface mounting	
Applicable standards UL	
RoHS compliance         Compliant           Weight         Approx. 0.25 g         Approx. 0.4 g	
weight         Approx. 0.25 g         Approx. 0.4 g           Page         62         147         147         62	

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

		Ap	plication					
G3VM-401BY G3VM-401EY	G3VM-401CR G3VM-401FR	G3VM-402C G3VM-402F	G3VM-601AY G3VM-601DY		Model			
1a (SP:	ST-NO)	2a (DPST-NO)	1a (SPST-NO)	Co	ntact form			
7.12	9.66	9.66	4.58		Package			
7.12	9.66 33.65 NEW 6.4	9.66	4.58		mm, Averag	e)		
DIP6	DIP8	DIP8	DIP4					
High-dielectric-strength     Type     Load voltage: 400 V     Dielectric strength between     I/O: 5,000 VAC	High-current and Low-ON-resistance Type Load voltage: 400 V Continuous load current: 0.4 A (0.8 A) max.* Values in parentheses are for connection C. Photodioc	Multi-contact-pair Type     Load voltage: 400 V     Contact form: 2a (DPST-NO)	Small and High-dielectric- strength Type     Load voltage :600 V     Dielectric strength between I/O: 5,000 VAC     Trigger LED forward current : 2 mA max.		-eatures			
	I		tion method					
	400 V		600 V	AC peak DC	Load voltage			
**Confiection C** 240 mA** 120 mA	* Connection C 800 mA	120 mA	90 mA	2,000 loa 1,000 AC	pin type onnection C: C	Output	Absolute maximum ratings	
50 mA 5,000 VAC 50/60 Hz for 1 min.	30 mA 2,500 VAC 50/6	50 mA	30 mA 5,000 VAC 50/60 Hz for 1 min.	LED forward		lubut		
0,000 VAO 30/00 112 IOI 1 IIIIII.		+85°C	5,000 VAC 30/00 112 101 1 111111.		operating	,0		
	(with no icing or			tempe	erature			
Connection A: $35 \Omega$ Connection B: $20 \Omega$ Connection C: $10 \Omega$	Connection A: $5 \Omega$ Connection B: $2.5 \Omega$ Connection C: $1.3 \Omega$	35 Ω	65 Ω	Maximum o resista		Output	Electrical	
	1 μA (at 400 VDC)		1 μA (at 600 VDC)	Maximum OF curre	F leakage	ō	Elec	
		•		Surface-mour	nting termina		Terminal	
	PCB terminals			Terr				
	Mounting method							
		Applicable standards  RoHS compliance						
Approx. 0.4 g	Comp Approx		Approx. 0.25 g		S compliance Weight			

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

<sup>\*</sup> Refer to pages 218 to 220 for detailed information on models certified for standards.

			Application		For PCBs								
			Model		G3VM-601AY1 G3VM-601DY1	G3VM-601BY G3VM-601EY	G3VM-601CR G3VM-601FR	G3VM-21GR					
			Contact form			1a (SP	ST-NO)						
	Package (Unit : mm, Average)		4.58	7.12	9.66	39 21							
					3,65	3.65	9,66 3,65 NEW 6.4	***					
					DIP4	DIP6	DIP8	SOP4					
	Features				Small and High-dielectric- strength Type     Load voltage: 600 V     Dielectric strength between I/O: 5,000 VAC	High-dielectric-strength Type     Load voltage: 600 V     Dielectric strength between I/O: 5,000 VAC	High-current and Low-ON-resistance Type     Load voltage: 600 V     Continuous load current     : 0.6 A (1.2 A) max. *     Values in parentheses are for connection C.	Low-output-capacitance and Low-ON-resistance Type (with Low C × R) Load voltage: 20 V Low C × R = 5 pF · Ω Coff (typical) = 1 pF					
		ls	solation method			Photodio	de coupler						
			Load AC per voltage DC	ak		600 V		20 V					
		-		0,000									
				9,000		<del>-</del>							
	8,000												
			7,000 6,000 5,000 4,000 Continuous 3,000 load current 2,000										
"													
tings	١.	Ħ											
n ra		Output	AC peak/ DC	1,000			* Connection C						
ii.			* 6-pin type connection C:	900			1,200 mA						
max			DC	800									
Absolute maximum ratings				700 600			- 600 mA						
Abso				500									
٩				400									
				300 200		* Connection C _ 200 mA		160 mA					
				100	90 mA	100 mA							
	ŀ	5	LED forward curr		30 mA	50 mA	30 mA	50 mA					
		ndul :-											
	1	uel	ectric strength between Ambient operating		5,000 VAC 50/	60 Hz for 1 min. -40 to +85°C	2,500 VAC 50/60 Hz for 1 min.	1,500 VAC 50/60 Hz for 1 min. -20 to +85°C					
			temperature	,		(with no icing or condensation)		(with no icing or condensation)					
Electrical	teristics	Output	Maximum output resistance	ON	60 Ω	Connection A: $45 \Omega$ Connection B: $35 \Omega$ Connection C: $18 \Omega$	Connection A: $2 \Omega$ Connection B: $1 \Omega$ Connection C: $0.5 \Omega$	8 Ω					
Elec	cnarac	ō	Maximum OFF leal current	kage	1 μA (at (	600 VDC)	10 μA (at 600 VDC)	1 nA (at 20 VDC)					
inal	Surface-mounting terminals PCB terminals			•		● (SOP)							
Term	struc		PCB terminals			•							
			lounting method			PCB mounting or Surface mounting		Surface mounting					
			plicable standards				JL .						
		R	oHS compliance		Approx 0.05 a		pliant Approx 0.54 g	Approx 0.1 a					
			Weight Page		Approx. 0.25 g 147	Approx. 0.4 g 155	Approx. 0.54 g	Approx. 0.1 g 165					
			-9-		<u> </u>								

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

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		Application					
G3VM-21GR1	G3VM-21HR	G3VM-31HR	G3VM-41GR6		Model		
	1a (SP:	ST-NO)		Cor	ntact form		
33 <sup>3</sup> 2.1	6.3 2 1 2 1 4.4 1 COPC	6.3 2 1 2 1 4.4 1 2 1 1	3.9 2.1 2.1 SOP4		Package (Unit : mm, Average		
SOP4	SOP6  • High-current and Low-ON-	SOP6  • High-current and Low-ON-					
Low-output-capacitance and Low-ON-resistance Type (with Low C × R) Load voltage: 20 V Low C × R = 5 pF · Ω Ron (typical) = 1 Ω	resistance Type  Load voltage: 20 V  Continuous load current : 2.5 A (5 A) max.*  Values in parentheses are for connection C.  Photodioc	resistance Type  • Load voltage: 30 V  • Continuous load current: 4 A (8 A) max. *  * Values in parentheses are for connection C.	Low-output-capacitance and Low-ON-resistance Type (with Low C × R) Load voltage: 40 V Low C × R = 10 pF · Ω COFF (typical) = 1 pF	Features			
		-		AC peak	Load	1	
20	V	30 V	40 V	DC	voltage		
		* Connection C 8,000 mA		10,000 9,000 8,000			
·	* Connection C 5,000 mA			7,000 6,000 5,000			
	_ 2,500 mA			4,000 3,000 Continuous 2,000 load curreni 1,000 * 6-pin type 900 connection		Output	Absolute maximum ratings
300 mA				800 D0 700 600 500 400			Absolutem
			120 mA	300 200 100			
50 mA	30		50 mA	LED forward		Input	
	1,500 VAC 50/6			Dielectric stren		/0	
-20 to +85°C (with no icing or condensation)	-40 to (with no icing o	+85°C r condensation)	-20 to +85°C (with no icing or condensation)		operating erature		
1.5 Ω	$\begin{array}{c} \text{Connection A: } 0.05 \ \Omega \\ \text{Connection B: } 0.025 \ \Omega \\ \text{Connection C: } 0.005 \ \Omega \ \text{(typical)} \end{array}$	$\begin{array}{c} \text{Connection A: } 0.02 \ \Omega \\ \text{Connection B: } 0.008 \ \Omega \\ \text{Connection C: } 0.004 \ \Omega \ \text{(typical)} \end{array}$	15 Ω	Maximum o resista		Output	Electrical
1 nA (at 20 VDC)	10 nA (at 20 VDC)	1 μA (at 30 VDC)	1 nA (at 30 VDC)	Maximum OF curre	F leakage ent	อี เ	Elec
	● (S	SOP)		Surface-mour	nting termina	ls	Terminal
	Surface i	mounting			rminals ting method	1	<u> </u>
	U	I.		Applica	ble standard	is	
	Com				compliance		
Approx. 0.1 g	Approx	. 0.13 g	Approx. 0.1 g	Weight			
165	131	131	165		Page		
i i							-

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

			Application	For PCBs					
			Model	G3VM-41GR4	G3VM-41GR5	G3VM-41GR8	G3VM-41HR		
			Contact form		1a (SP	ST-NO)			
	Package (Unit : mm, Average)			$\begin{array}{c} 39 \\ 44 \\ 44 \\ \end{array}$		6.3			
				SOP4	SOP4	SOP4	SOP6		
	Features			$ \begin{tabular}{ll} \bullet Low-output-capacitance\\ and Low-ON-resistance\\ Type (with Low C \times R)\\ \bullet Load voltage: 40 V\\ \bullet Low C \times R = 10 \ pF \cdot \Omega\\ \bullet \ Ron \ (typical) = 2 \ \Omega \\ \end{tabular} $	• Low-output-capacitance and Low-ON-resistance Type (with Low C × R) • Load voltage: 40 V • Low C × R = 10 pF $\cdot$ $\Omega$ • Ron (typical) = 1 $\Omega$	High-current and Low-ON-resistance Type     Load voltage: 40 V     Continuous load current:     1 A max.	High-current and Low-ON- resistance Type     Load voltage: 40 V     Continuous load current     : 2.5 A (5 A) max.*     Values in parentheses are for connection C.		
	Isolation method				Photodioo	de coupler			
	Load AC peak voltage DC			1	40	V			
A ho of the section made and in sec	Absolute maximum ramigs	Output	10,000   9,000   8,000   7,000   6,000   5,000   4,000   Continuous   3,000   40,000   Continuous   2,000   A6-pin type   2,000   Connection C: DC   800   700   600   600 	250 mA	300 mA	1,000 mA	*Connection C 5,000 mA		
	=	Input	LED forward current	50	mA	30	mA		
			ectric strength between I/0			60 Hz for 1 min.			
			Ambient operating temperature	-20 to	+85°C or condensation)	-40 to	+85°C r condensation)		
Electrical	teristics	Output	Maximum output ON resistance	3 Ω	1.5 Ω	0.13 Ω	Connection A: $0.06~\Omega$ Connection B: $0.03~\Omega$ Connection C: $0.008~\Omega$ (typical)		
Elec	charac	O	Maximum OFF leakage current		1 nA (at 30 VDC)		10 nA (at 40 VDC)		
Terminal	ructure	Sur	face-mounting terminal	5	• (5	SOP)			
Te	st		PCB terminals						
			Nounting method			mounting			
		_	plicable standards			JL pliant			
		В	toHS compliance Weight		Approx. 0.1 g	pliant	Approx. 0.13 g		
			Page	165	165	127	131		
_						I .	-		

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

		Applic	cation					
G3VM-61VY1	G3VM-61G1	G3VM-61G2	G3VM-61G3	G3VM-61VY2	Мо	del		
		1a (SPST-NO)			Contac	t form		
3,7 2.1 4.55 2.1 Special SOP4	3.9 2.1 4.4 2.1 SOP4	39 21 21 SOP4	39 221 21 SOP4	3.7 2.1  NEW  Special SOP4	Pack (Unit : mm	kage , Average	е)	
-	30F4			General-purpose Type				
General-purpose Type     Load voltage: 60 V     Dielectric strength between I/O: 3,750 VAC	General-purpose     Type     Load voltage: 60 V	General-purpose Type     Load voltage: 60 V     Trigger LED forward current : 1 mA max.  Photodiode coupler	General-purpose Type     Load voltage: 60 V     Trigger LED forward current : 0.2 mA max.	Continuous load current:     0.5A max.     Dielectric strength between I/O: 3,750 VAC     High Ambient operating temperature: -40 to +110°C	Feat			
	Isolation method AC peak Load							
		60 V				Load roltage		
100 mA	400 mA	400 mA	400 mA	500 mA	800 DC 700 600 500 400 300 200	urrent , ak/ DC , yppe , ction C:	ontput Output	Absolute maximum ratings
30 mA	50			30 mA	LED forward cu		Indu	
3,750 VAC 50/60 Hz for 1 min.	1,5 -40 to +	00 VAC 50/60 Hz for 1 n	nin.	3,750 VAC 50/60 Hz for 1 min. -40 to +110°C	Dielectric strength  Ambient ope		/0	
	-40 to + (with no icing or			-40 to +110°C (with no icing or condensation)	temperate	ure		
50 Ω 2 Ω						ut ON	Output	Electrical
1 μA (at 60 VDC)							o	Elec
● (SOP)							als	Terminal
								Tern
Surface mounting						Mounting method		
		UL	·		Applicable			
		Compliant Approx. 0.1 g			RoHS co	•		
68	68	68	68	68	Pa	-		
1	1					•		

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

			Application			For PCBs			
			Model	G3VM-61VY3	G3VM-61GR1	G3VM-61GR2	G3VM-61VR	G3VM-63G	
			Contact form		1a (SP:	ST-NO)	I	1b (SPST-NC)	
	Package (Unit : mm, Average)			2.1 4.55	239 221	2.1 NEW	3.77 2.1 4.55 72 12.1	2.1 4.4 NEW	
	Features			Special SOP4	SOP4	SOP4	Special SOP4	SOP4	
				General-purpose Type Continuous load current: 0.7A max. Dielectric strength between I/O: 3,750 VAC High Ambient operating temperature: -40 to +110°C	High-current and Low-ON-resistance Type     Load voltage: 60 V     Continuous load current     : 1 A max.	High-current and Low-ON- resistance Type     Load voltage: 60 V     Continuous load current     : 1.7 A max.	High-current and Low-ON-resistance Type     Continuous load current: 1.4 A max.     Dielectric strength between I/O: 3,750 VAC     High Ambient operating temperature: -40 to +110°C	General-purpose     Type     Load voltage: 60 V     Contact form: 1b     (SPST-NC)	
			solation method  Load AC peak			Photodiode coupler			
			voltage AC peak			60 V			
A L	Absolute maximum ratings	Output	10,000   9,000   8,000   7,000   6,000   5,000   4,000   2,000   1,000   5,000   1,000   6,0	700 mA	1,000 mA	1,700 mA	- 1,400 mA	500 mA	
		Input	LED forward current	30 mA	50 mA	30 mA	50 mA		
			ectric strength between I/O	3,750 VAC 50/60 Hz for 1 min.	1,500 VAC 50/6	60 Hz for 1 min.	3,750 VAC 50/60 Hz for 1 min.	1,500 VAC 50/60 Hz for 1 min.	
			Ambient operating temperature	-40 to +110°C (with no icing or condensation)	-20 to +85°C (with no icing or condensation)	-40 to +85°C (with no icing or condensation)	-40 to +110°C (with no icing or condensation)	-40 to +85°C (with no icing or condensation)	
trical	characteristics	Output	Maximum output ON resistance	2 Ω	0.7 Ω	0.13 Ω	0.25 Ω	2.5 Ω	
Elec	charac	On	Maximum OFF leakage current	1 μA (at 60 VDC)	0.1 μA (at 60 VDC)	0.01 μA (at 60 VDC)	1 μA (at 60	VDC)	
		Sur	face-mounting terminals			● (SOP)			
Termi	structure		PCB terminals						
		N	Nounting method			Surface mounting			
			plicable standards			UL			
		F	toHS compliance			Compliant			
			Weight	Approx. 0.1 g	Approx. 0.13 g		Approx. 0.1 g		
			Page	68	127	127	127	68	
			·						

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

	For PCBs				Application				
	G3VM-61H1	G3VM-61HR	G3VM-61HR1	G3VM-62J1	Model				
		1a (SPST-NO)		2a (DPST-NO)	Contact form				
	6.3	6.3	6.3 2.1 A.4. 1. 2.1	9.4	Package (Unit : mm, Average)		age)		
	SOP6	SOP6	SOP6	SOP8					
	General-purpose Type     Load voltage: 60 V	High-current and Low-ON-resistance Type     Load voltage: 60 V     Continuous load current:     2.3 A (4.6 A) max.*     Values in parentheses are for connection C.	High-current and Low-ON-resistance Type     Load voltage: 60 V     Continuous load current:     3.3 A (6.6 A) max.*     Values in parentheses are for connection C.	General-purpose Type     Load voltage: 60 V	Features				
		Photodioo	le coupler		Isolation method				
		60	V		AC peak Load voltage				
	*Connection C 800 mA	* Connection C 4,600 mA	- Connection C 6,600 mA - 3,300 mA	400 mA	10,000 9,000 8,000 7,000 6,000 5,000 4,000 3,000 Continuous load current AC pealy DC 6-pin type connection C DC  700 400 300 200 100	nput Output	Absolute maximum ratings		
	50 mA	30		50 mA	LED forward current				
	1,500 VAC 50/60 Hz for 1 min. -40 to +85°C				Dielectric strength between	n I/O			
			Ambient operating temperature						
	Connection A: 2 $\Omega$ Connection B: 1 $\Omega$ Connection C: 0.25 $\Omega$ (typical)	$\begin{array}{c} \text{(with no icing of }\\ \text{Connection A: } 0.07~\Omega\\ \text{Connection B: } 0.04~\Omega\\ \text{Connection C: } 0.01~\Omega \text{ (typical)} \end{array}$	Connection A: $0.06~\Omega$ Connection B: $0.015~\Omega$ (typical) Connection C: $0.008~\Omega$ (typical	2 Ω	Maximum output ON resistance		Electrical characteristics		
	1 μA (at 60 VDC)	10 nA (at 60 VDC)	0.02 μA (at 60 VDC)	1 μA (at 60 VDC)	Maximum OFF leakage current		Elec		
	● (SOP)				Surface-mounting terminals		Terminal structure		
					PCB terminals		Terr		
	Surface mounting				Mounting method				
	UL				Applicable standa				
,	Compliant				RoHS compliance				
	Approx. 0.1 g	Approx	-	Approx. 0.2 g	Weight				
	88	131	131	104	104 Page				

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

Application		tion	For PCBs						
		Mode	el	G3VM-81GR	G3VM-81GR1	G3VM-81G1	G3VM-81HR		
	Contact form				1a (SP	ST-NO)			
Package (Unit : mm, Average)				3.9	3.9 2.1	39 21	6.3		
Features			es	Low-output-capacitance and Low-ON-resistance Type (with Low C × R)     Load voltage: 80 V	SOP4  • Low-output-capacitance and Low-ON-resistance Type (with Low C × R) • Load voltage: 80 V	• General-purpose Type • Load voltage: 80 V	SOP6  • High-current and Low-ON-resistance Type • Load voltage: 80 V • Continuous load current: 1.25 A (2.5 A) max.*  * Values in parentheses are for connection C.		
		Isolation m			Photodio	de coupler			
		Load voltage	AC peak DC		80	o V			
Absolute maximum ratings	Input		rent 2,000 / DC 1,000	40 mA		mA 60 Hz for 1 min.	* Connection C		
	Ambient operating			-20 to +85°C					
aristics	Output	Maximu	m output ON sistance	25 Ω	(with no icing o 8 $\Omega$	r condensation) 1.2 Ω	Connection A: $0.15~\Omega$ Connection B: $0.08~\Omega$ Connection C: $0.04~\Omega$		
characteristics			n OFF leakage urrent	1 nA (at	80 VDC)	1 nA (at 30 VDC)	1.5 nA (at 20 VDC)		
structure	Su	eurface-mounting terminals  ● (SOP)  PCB terminals							
Mounting method		method	Surface mounting						
Applicable standards		tandards	UL						
RoHS compliance				Compliant					
Weight			165	Approx 165	x. 0.1 g	137			
		Page		100	100	13	131		

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

	Application						
G3VM-101HR	G3VM-101HR1	G3VM-201G	G3VM-201G1	Model			
	1a (SP:	ST-NO)		Contact form			
6.3	6.3 2 1 4.4 2 2 1	3.3	3.9		Package mm, Average	е)	
SOP6	SOP6	SOP4	SOP4				
High-current and Low-ON-resistance Type Load voltage: 100 V Continuous load current: 1.4 A (2.8 A) max.* Values in parentheses are for connection C.	High-current and Low-ON-resistance Type Load voltage: 100 V Continuous load current: 2 A (4 A) max.* Values in parentheses are for connection C.	General-purpose Type     Load voltage: 200 V	General-purpose Type Load voltage: 200 V Trigger LED forward current: 1 mA max.				
	Photodioo	de coupier		Isolation method			
100	) V	20	0 V	AC peak DC	Load voltage		
- *Connection C	*Connection C 4,000 mA	50 mA	200 mA	2,000 AC	on type nnection C: C	Output	Absolute maximum ratings
30 mA 50 mA 1,500 VAC 50/60 Hz for 1 min.				LED forwar		Input	
		+85°C		Dielectric strength between I/O  Ambient operating			
	(with no icing o				erature		
Connection A: $0.2 \Omega$ Connection B: $0.1 \Omega$ Connection C: $0.025 \Omega$ (typical)	Connection A: $0.045 \Omega$ Connection B: $0.022 \Omega$ Connection C: $0.011 \Omega$ (typical)	50 Ω	8 Ω	Maximum o resista		Output	Electrical characteristics
10 nA (at 100 VDC)	1 μA (at 100 VDC)	1 nA (at 160 VDC)	1 μA (at 200 VDC)	Maximum OF curre	F leakage o	On	Elec
● (SOP)				Surface-mounting terminal			Terminal
				PCB terminals			Teri
Surface mounting				Mounting method			
UL					ble standard		
Compliant Approx. 0.13 g Approx. 0.1 g				RoHS compliance			
Approx.	. 0.13 g 137				Weight		
13/	13/	77	77		Page		

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

8Ω

Approx. 0.1 g

77

200121
SOP
SON
Product Table

Dielectric strength between I/O

Ambient operating

temperature

Maximum output ON

resistance

Maximum OFF leakage

current
Surface-mounting terminals

PCB terminals

Mounting method

Applicable standards

RoHS compliance

Weight

Page

*	Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.
*	Refer to pages 218 to 220 for detailed information on models certified for standards.

77

1,500 VAC 50/60 Hz for 1 min.

-40 to +85°C

(with no icing or condensation)

1 µA (at 200 VDC)

● (SOP)

Surface mounting

Ш

Compliant

Connection A: 8 Ω

Connection B: 5  $\Omega$ 

Connection C: 1.5 Ω (typical)

Approx. 0.13 g

88

8Ω

Approx. 0.2 g

	For !	PCBs		Applicati	on	
G3VM-351G1	G3VM-351G	G3VM-351VY	G3VM-351GL	Model		
	1a (SP	PST-NO)		Contact for	rm	
39 21	39 2.1	2.1 NEW	39 × 21	Packag (Unit : mm, Av		
SOP4  • General-purpose Type • Load voltage: 350 V • Trigger LED forward current : 1 mA max.	• General-purpose Type • Load voltage: 350 V	Special SOP4  General-purpose Type Load voltage: 350 V  Dielectric strength between I/O: 3,750 VAC  High Ambient operating temperature: -40 to +110°C	SOP4  • Current-limiting Type • Load voltage: 350 V • Current limit: 150 to 300 mA	Feature		
	Photodiod	de coupler		Isolation me	thod	
	35	60 V		AC peak Los volts	ad	
100 mA	110 mA	110 mA	Current limiting (Current limit: 150 to 300 mA)	10,000 9,000 8,000 7,000 6,000 5,000 4,000 2,000 1,000 1,000 900 800 DC 700 600 600 500 400 300 200 1100	us indirection of the control of the	Absolute maximum ratings
50	mA	30 mA	50 mA	LED forward curre	nt d	
-40 to	60 Hz for 1 min. +85°C or condensation)	3,750 VAC 50/60 Hz for 1 min. -40 to +110°C (with no icing or condensation)	1,500 VAC 50/60 Hz for 1 min. -40 to +85°C (with no icing or condensation)	Dielectric strength bet Ambient operati temperature		)
	50 Ω		35 Ω	Maximum output 0 resistance	Ontput	Electrical characteristics
	1 μA (at :	350 VDC)		Maximum OFF leaks current	age Ö	Elec
	• (\$	SOP)		Surface-mounting te		Terminal structure
Surface mounting				PCB terminals		Te
Surface mounting				Mounting me		
	UL			Applicable sta		
		npliant	A 0.1	RoHS compl		
Approx 82	x. 0.1 g	Approx. 0.03 g 82	Approx. 0.1 g 159	Weight		
02	02	02	199	Page		

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

3	
5	

		Applica	tion		For I	PCBs		
Model				G3VM-353G	G3VM-351H	G3VM-353H	G3VM-355JR	
		Contact	form	1b (SPST-NC)	1a (SPST-NO)	1b (SPST-NC)	1a1b (SPST-NO/SPST-NC)	
Package (Unit : mm, Average)		ge Average)	3.9	6.3	63 21	94-121		
		F		SOP4  • General-purpose Type • Load voltage: 350 V	SOP6  • General-purpose Type	SOP6  • General-purpose Type • Load voltage: 350 V	SOP8  • Multi-contact-pair Type • Load voltage: 350 V	
		Featu		Contact form: 1b (SPST-NC)	Load voltage: 350 V	Contact form: 1b (SPST-NC)	Contact form: 1a1b (SPST- NO/SPST-NC)	
		Isolation r			Photodio	de coupler		
		Load voltage	AC peak DC		35	0 V		
Absolute maximum ratings	Input Output	Continu load cur AC peak * 6-pin tyr connect DC	10,000 9,000 8,000 7,000 6,000 5,000 4,000 1,000 1,000 1,000 1,000	120 mA	*Connection C 220 mA	*Connection C 240 mA	120 mA	
			ngth between I/O			60 Hz for 1 min.		
	5.6	Ambient	operating		-40 to	+85°C		
characteristics	Output	temp	erature Im output ON sistance	25 Ω	(with no icing of Connection A: 50 $\Omega$ Connection B: 40 $\Omega$ Connection C: 20 $\Omega$	r condensation)  Connection A: $25 \Omega$ Connection B: $14 \Omega$ Connection C: $4 \Omega$ (typical)	25 Ω	
	+	C	n OFF leakage current			350 VDC)		
Surface-mounting terminals			• (5	SOP)				
Surface-mounting terminals PCB terminals								
Mounting method Surface mounting								
Applicable standards UL								
RoHS compliance         Compliant           Weight         Approx. 0.1 g         Approx. 0.13 g         Approx. 0.2 g				Approx. 0.2 g				
Page 82 88 88 104								

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

	Application				
G3VM-352J	G3VM-354J	G3VM-401G1	G3VM-401G	Model	
2a (DPST-NO)	2b (DPST-NC)	1a (SP	ST-NO)	Contact form	
9.4	9.4	3.9 2.1	2.1	Package (Unit : mm, Average)	
SOP8	SOP8	SOP4	SOP4		
Multi-contact-pair Type     Load voltage: 350 V     Contact form: 2a (DPST-NO)	Multi-contact-pair Type     Load voltage: 350 V     Contact form: 2b (DPST-NC)	General-purpose Type     Load voltage: 400 V     Trigger LED forward current: 0.2 mA max.	General-purpose Type     Load voltage: 400 V	Features	
	Photodio	de coupler		Isolation method	
25.	0 V		0 V	AC peak Load	
33	0 V	40	0 V	DC voltage	
110 mA	mA	100 mA	120 mA	10,000 9,000 8,000 7,000 6,000 5,000 4,000 2,000 10,000 6-pin type 900 6-pin type 900 6-pin type 900 1000 1000 1000 1000 1000 1000 1000	Absolute maximum ratings
50			50 MA	_	
		60 Hz for 1 min. +85°C		Dielectric strength between I/O  Ambient operating	4
50 Ω		r condensation)	σΩ	temperature  Maximum output ON	
55 12	2312	35	, <b></b>	resistance 50 Maximum OFF leakage O	ctrica
1 μA (at 3	350 VDC)	1 μA (at 4	400 VDC)	Maximum OFF leakage current	Electrical
	• (5	SOP)		Surface-mounting terminals	Terminal
				PCB terminals	Ţ
		mounting		Mounting method	
U		UL certification is pending	UL and BSI (EN 60950)	Applicable standards	
		pliant	. 0.1 -	RoHS compliance	
104	x. 0.2 g	Approx 82	k. 0.1 g	Weight Page	
107	107	- V-	02	i uyc	

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

<sup>\*</sup> Refer to pages 218 to 220 for detailed information on models certified for standards.

Approx. 0.2 g

Compliant

Approx. 0.1 g

94

94

\* Refer to pages 218 to 220 for detailed information on models certified for standards.

Approx. 0.13 g

88

RoHS compliance

Weight

Page

	Applic	ation				
G3VM-21LR	G3VM-21LR10	G3VM-21LR1	G3VM-21LR11	Mod	del	
	1a (SP:	ST-NO)		Contac	t form	
2.04	2.04	2.04	2.04	Pack (Unit : mm,		
SSOP4  • Low-output-capacitance	SSOP4  • Low-output-capacitance	SSOP4  • Low-output-capacitance	SSOP4  • Low-output-capacitance			
and Low-ON-resistance Type (with Low C × R)  • Load voltage: 20 V  • Low C × R = 5 pF · Ω  • CoFF (typical) = 1 pF	and Low-ON-resistance Type (with Low C $\times$ R) • Load voltage: 20 V • Low C $\times$ R = 2.4 pF $\cdot$ $\Omega$ • Coff (typical) = 0.8 pF	and Low-ON-resistance Type (with Low C $\times$ R)  • Load voltage: 20 V  • Low C $\times$ R = 4 pF $\cdot$ $\Omega$ • Ron (typical) = 0.8 $\Omega$	and Low-ON-resistance Type (with Low C $\times$ R) • Load voltage: 20 V • Low C $\times$ R = 7.2 pF $\cdot$ $\Omega$ • Ron (typical) = 0.18 $\Omega$	Featu		
	Photodioc	de coupler		Isolation		
	20	o v			Load oltage	
160 mA	200 mA	450 mA	900 mA	800 DC 700 600 500 400 300 2200 100	urrent ak/ DC ype ction C:	Absolute maximum ratings
50 mA	30 mA		mA	LED forward cu	느	
	-20 to	60 Hz for 1 min. +85°C or condensation)		Dielectric strength  Ambient ope temperate	rating	
8 Ω	5 Ω	1.2 Ω	0.22 Ω	Maximum outpu resistance		Electrical characteristics
1 nA (at 20 VDC)	0.2 nA (at 20 VDC)	1 nA (at	20 VDC)	Maximum OFF le current	akage Ö	Elec
	• (SS	SOP)		Surface-mounting		Terminal structure
				PCB termin		Str
Surface mounting				Mounting		
	Comp	JL pliant		Applicable RoHS cor	mpliance	
170	Approx 170	c. 0.03 g		Wei	gnt	

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

Application

Model			G3VM-41LR10	G3VM-41LR6	G3VM-41LR11	G3VM-41LR4	
	Contact form			1a (SP	ST-NO)		
	Package (Unit : mm, Average)		2.04 3.8 SSOP4	2.04 1.8 SSOP4	2.04 1.8 SSOP4	2.04 1.8 SSOP4	
	Features		Low-output-capacitance and Low-ON-resistance Type (with Low C × R)  Load voltage: 40 V  Low C × R = 5.4 pF · Ω  Core (typical) = 0.45 pF	Low-output-capacitance and Low-ON-resistance Type (with Low C × R)  Load voltage: 40 V  Low C × R = 10 pF · Ω  Core (typical) = 1 pF	• Low-output-capacitance and Low-ON-resistance Type (with Low C × R) • Load voltage: 40 V • Low C × R = 4.9 pF · Ω • Core (typical) = 0.7 pF	• Low-output-capacitance and Low-ON-resistance Type (with Low C $\times$ R) • Load voltage: 40 V • Low C $\times$ R = 10 pF $\cdot$ $\Omega$ · Row (typical) = 2 $\Omega$	
		Isolation method		Photodioo	de coupler		
	Г	Load AC peak					
		voltage DC		40	) V		
Absolute maximum ratings	Output	10,000 9,000 8,000 7,000 6,000 5,000 4,000 Continuous load current AC peak/ DC 4-6-pin type connection C: DC 900 800 700 600 500 400 3000 200 100	120 mA	120 mA	140 mA	250 mA	
	Input	LED forward current	30 mA	50 mA	30 mA	50 mA	
		lectric strength between I/O		1,500 VAC 50/6	60 Hz for 1 min.	<u> </u>	
		Ambient operating temperature		-20 to	+85°C r condensation)		
ical	ont	Maximum output ON resistance	14 Ω	15 Ω	10 Ω	3 Ω	
Electrical characteristics	Output	Maximum OFF leakage current	0.2 nA (at 35 VDC)	1 nA (at 30 VDC)	0.2 nA (at 35 VDC)	1 nA (at 30 VDC)	
				• (S	SOP)	,	
Terminal structure	PCB terminals						
		Mounting method			mounting		
		pplicable standards			IL		
	-	RoHS compliance Weight			pliant :. 0.03 q		
		Weight Page	175	Approx 175	. 0.03 g	175	
		raye	173	1/3	173	173	

For PCBs

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

300 200

100

LED forward current

Dielectric strength between I/O

Ambient operating

temperature

Maximum output ON

resistance Maximum OFF leakage

current

Surface-mounting terminals **PCB** terminals

Mounting method

80 mA

14 Ω

Electrical characteristics

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roduct
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	Application				
G3VM-41LR5	G3VM-61LR	G3VM-81LR	G3VM-101LR	Model	
	1a (SP	ST-NO)		Contact form	
2.04	1.8	1.8	2.04	Package (Unit : mm, Average	e)
SSOP4	SSOP4	SSOP4	SSOP4		
• Low-output-capacitance and Low-ON-resistance Type (with Low C $\times$ R) • Load voltage: 40 V • Low C $\times$ R = 10 pF $\cdot$ $\Omega$ • Ron (typical) = 1 $\Omega$	Small and High-load-voltage Type Load voltage: 60 V Ron (typical) = 1 Ω	Small and High-load- voltage Type     Load voltage: 80 V	Small and High-load- voltage Type     Load voltage: 100 V	Features	
	Photodio	de coupler		Isolation method	
40 V	60 V	80 V	100 V	AC peak Load voltage	
300 mA	400 mA			10,000 9,000 8,000 7,000 6,000 5,000 4,000 2,000 1,000 1,000 6,000 1,000	Output Absolute maximum ratings

	Applicable standards			
	RoHS compliance			
	Approx	. 0.03 g		Weight
175	Page			

120 mA

12  $\Omega$ 

0.2 nA (at 80 VDC)

50 mA

1,500 VAC 50/60 Hz for 1 min.

-20 to +85°C

(with no icing or condensation)

● (SSOP)

Surface mounting

1 μA (at 60 VDC)

 $1.5\,\Omega$ 

1 nA (at 30 VDC)

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

		Applicat	ion		For	PCBs		
	Model			G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	G3VM-41PR12	
		Contact f	orm		1a (SP	ST-NO)		
	Package (Unit : mm, Average)			1.65	1.65	1.65	1 65	
				USOP4	USOP4	USOP4	USOP4	
		Feature		Low-output-capacitance and Low-ON-resistance Type (with Low C × R) Load voltage: 20 V Low C × R = 2.4 pF · Ω Corr (typical) = 0.8 pF	• Low-output-capacitance and Low-ON-resistance Type (with Low C $\times$ R) • Load voltage: 20 V • Low C $\times$ R = 3 pF $\cdot$ $\Omega$ • Ron (typical) = 0.6 $\Omega$	Low-output-capacitance and Low-ON-resistance Type (with Low C × R) Load voltage: 20 V Low C × R = 7.2 pF · Ω Ron (typical) = 0.18 Ω	Low-output-capacitance and Low-ON-resistance Type (with Low C × R) Load voltage: 40 V Low C × R = 4.5 pF · Ω Coff (typical) = 0.3 pF	
	1	Isolation m			Photodio	de coupler		
		Load voltage	AC peak DC		20 V		40 V	
			10,000					
		Continuous load current AC peak/ DC 6-pin type	9,000			<del> </del>		
			8,000 7,000			<del> </del>		
			6,000					
			5,000					
gs			4,000 ous 3.000			<del> </del>		
Absolute maximum ratings	Output		ent 2,000					
를	ō		e 1,000			900 mA		
axim		connection	on C: 900 800			<del> </del> <del></del>		
te m		50	700					
nos			600			+		
Ą			500 400		450 mA	† <b></b>		
			300					
			200	200 mA			100 mA	
			100		<del></del>	<del> </del>	<del></del>	
	Input	LED forv	ward current		50	mA		
			gth between I/O			0 Hz for 1 min.		
			operating erature			+85°C or condensation)		
ical	out		m output ON istance	5 Ω	1.2 Ω	0.22 Ω	20 Ω	
Electrical characteristics	Output		OFF leakage urrent		1 nA (at 20 VDC)		1 nA (at 40 VDC)	
Terminal		rface-moun	nting terminals		● (U	ISOP)		
Tem	PCB terminals		rminals					
	-	Mounting m	nethod		Surface	mounting		
		plicable st				JL		
		RoHS comp				pliant		-
		Weigh Page		180	Approx 180	c. 0.03 g	185	
		rage		100	100	100	100	

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

<sup>\*</sup> Refer to pages 218 to 220 for detailed information on models certified for standards.

	Application				
G3VM-41PR10	G3VM-41PR6	G3VM-41PR11	G3VM-41PR5	Model	
	Contact form				
1 65	1 65	1.65	1.65	Package (Unit : mm, Average	<b>»</b> )
USOP4  • Low-output-capacitance	USOP4  • Low-output-capacitance	USOP4  • Low-output-capacitance	USOP4  • Low-output-capacitance		
and Low-ON-resistance Type (with Low C × R)  Load voltage: 40 V  Low C × R = 5.4 pF · Ω  Coff (typical) = 0.45 pF	and Low-ON-resistance Type (with Low C $\times$ R) • Load voltage: 40 V • Low C $\times$ R = 4 pF $\cdot$ $\Omega$ • Ron (typical) = 0.8 $\Omega$	and Low-ON-resistance Type (with Low C × R)  • Load voltage: 40 V  • Low C × R = 4.9 pF · Ω  • CoFF (typical) = 0.7 pF	and Low-ON-resistance Type (with Low C $\times$ R)  • Load voltage: 40 V  • Low C $\times$ R = 10 pF $\cdot$ $\Omega$ • Row (typical) = 1 $\Omega$	Features	
	Photodio	de coupler		Isolation method	
	40	V		AC peak Load voltage	
120 mA	120 mA	140 mA	300 mA	900 connection C: 800 DC 700 DC 400 300 200 100	Output
		mA			ındu
		0 Hz for 1 min.		Dielectric strength between la	/0
		+85°C r condensation)		Ambient operating temperature	
14 Ω	15 Ω	10 Ω	1.5 Ω	Maximum output ON resistance	Curput
1 nA (at 40 VDC)	0.2 nA (at 40 VDC)	1 nA (at	40 VDC)	Maximum OFF leakage current	Output
	● (U	SOP)		Surface-mounting termina	Terminal
				PCB terminals	Tem
	Mounting method				
	Applicable standard	ls			
		pliant :. 0.03 g		RoHS compliance Weight	
185	185	. 0.03 g	185	Page	
.55	.50	.55	.00	i ugc	

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

<sup>\*</sup> Refer to pages 218 to 220 for detailed information on models certified for standards.

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Table	
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_		A 11: - 1	i		For PCBs		
		Applicat					
		Mode		G3VM-51PR	G3VM-61PR1	G3VM-61PR	
Contact form		orm		1a (SPST-NO)			
	(U	Packaç nit : mm, A	je verage)	1.65	1.65	165	
				USOP4	USOP4	USOP4	
		Feature	es	• Low-output-capacitance and Low-ON-resistance Type (with Low C x R) • Load voltage: 50 V • Low C x R = 12 pF · $\Omega$ • Ron (typical) = 1 $\Omega$	• Small and High-load-voltage Type • Load voltage: 60 V • Low C $\times$ R = 7 pF $\cdot$ $\Omega$ • Corr (typical) = 0.7 pF	Small and High-load-voltage Type     Load voltage: 60 V	
	ı	solation m	ethod		Photodiode coupler		
		Load voltage	AC peak	50 V	60	) V	
		voitage	DC				
			10,000 9,000 8,000 7,000 6,000				
m ratings	Output	Continuo load curr AC peak/	ent 2,000 DC 1,000				
Absolute maximum ratings		* 6-pin type connection DC	900 800 700 600				
Ab			500 400 300 200 100	300 mA	120 mA	400 mA	
	Input	LED forv	vard current		50 mA		
			gth between I/O		500 VAC 50/60 Hz for 1 min.		
			operating		-40 to +85°C (with no icing or condensation)		
rical eristics	Output		n output ON istance	1.5 Ω	15 Ω	1.5 Ω	
Electrical characteristics	Out		OFF leakage urrent	1 nA (at 50 VDC)	1 nA (at	60 VDC)	
Terminal structure	Sur		iting terminals		● (USOP)		
str		PCB te	rminals				
	٨	Mounting m	nethod		Surface mounting		
			Applicable standards		UL		
	Ар						
	Ар	plicable st RoHS comp Weigh	liance		Compliant Approx. 0.03 g		

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

	Application				
G3VM-71PR G3VM-81PR G3VM-101PR			Model		
	Contact form	1			
1.65	2.85	1.65	Package (Unit : mm, Aver	age)	
USOP4	USOP4	USOP4			
Small and High-load-voltage Type     Load voltage: 75 V	Small and High-load-voltage Type     Load voltage: 80 V     Maximum OFF leakage current     : 0.02 nA	Small and High-load-voltage Type     Load voltage: 100 V	Features		
	Photodiode coupler	T.	Isolation meth	od	
75 V	80 V	100 V	AC peak Load DC voltag		
400 mA	120 mA	100 mA	- 10,000 - 9,000 - 8,000 - 7,000 - 6,000 - 5,000 - 4,000 - 2,000 - 1,000 - 1,000 - 2,000 - 1,000 - 2,000 - 600 - 700 - 600 - 500 - 400 - 300 - 200 - 10,000 - 2,000 - 5,000 - 5,010 - 5,01	ndtnO	Absolute maximum ratings
	50 mA		LED forward current	므	
	500 VAC 50/60 Hz for 1 min.		Dielectric strength betwe		,
	-40 to +85°C (with no icing or condensation)		Ambient operating temperature	,	
1.5 Ω	12 Ω	14 Ω	Maximum output ON resistance	Output	Electrical
1 nA (at 75 VDC)	0.02 nA (at 80 VDC)	0.2 nA (at 100 VDC)	Maximum OFF leakag current	no	Elect
	● (USOP)		Surface-mounting term	inals	Terminal
			PCB terminals		Terl
	Mounting meth				
	Applicable stand				
	RoHS complian	ıce			
208	Weight Page				
	208	208			

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

<sup>\*</sup> Refer to pages 218 to 220 for detailed information on models certified for standards.

Prod	luct T	abl	e
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Application			A !! #!	T	Foot	oon-		
Package   Unit::mm, Average)				00/// 04//040			00/04 441/040	
Package (Unit : mm, Average)				G3VM-21UR10			G3VM-41UH12	
1.45		Contact form			1a (SP:	ST-NO)		
Converged Capacitance and Low-ON-resistance Type (with Low C x R) and Low-ON-resistance Type (with Low C x		(U		2.45	2.45	2.45	2.45 1.45	
Teature   Tea								
Load vollage   DC				and Low-ON-resistance Type (with Low C × R)  • Load voltage: 20 V  • Low C × R = 2.4 pF · Ω	and Low-ON-resistance Type (with Low C $\times$ R) • Load voltage: 20 V • Low C $\times$ R = 4 pF $\cdot$ $\Omega$ • Ron (typical) = 0.8 $\Omega$	and Low-ON-resistance Type (with Low C $\times$ R) • Load voltage: 20 V • Low C $\times$ R = 7.2 pF $\cdot$ $\Omega$ • Ron (typical) = 0.18 $\Omega$	and Low-ON-resistance Type (with Low C × R)  • Load voltage: 40 V  • Low C × R = 4.5 pF · Ω	
Voltage   DC		1			Priotodioc	de coupier		
Section   Se					20 V		40 V	
Section   Se			10,000					
Popular   Po			9,000					
Page								
Section   Page   Pa								
Page								
Maximum output ON resistance   1 nA (at 20 VDC)   1 nA (at 40 VDC)	8							
Maximum output ON resistance   1 nA (at 20 VDC)   1 nA (at 40 VDC)	ating	put						
Maximum output ON resistance   1 nA (at 20 VDC)   1 nA (at 40 VDC)	트	O	AC peak/ DC			1,000 mA		
Maximum output ON resistance   1 nA (at 20 VDC)   1 nA (at 40 VDC)	Ë		o-pin type					
Maximum output ON resistance   1 nA (at 20 VDC)   1 nA (at 40 VDC)	max							
Maximum output ON resistance   1 nA (at 20 VDC)   1 nA (at 40 VDC)	Inte					<del> </del>		
Maximum output ON resistance   1 nA (at 20 VDC)   1 nA (at 40 VDC)	psq				450 mA	[		
LED forward current   30 mA	⋖						 	
LED forward current   30 mA				200 mA				
Dielectric strength between I/O   300 VAC 50/60 Hz for 1 min.							100 mA	
Dielectric strength between I/O   300 VAC 50/60 Hz for 1 min.			100					
Ambient operating temperature    Ambient operating temperature   (with no icing or condensation)								
Temperature   (with no icing or condensation)		Die						
Surface-mounting terminals								
Surface-mounting terminals	rical	brt		5 Ω	1.2 Ω	0.22 Ω	20 Ω	
Surface-mounting terminals	Elect charact	Out			1 nA (at 20 VDC)		1 nA (at 40 VDC)	
Mounting method  Surface mounting  Applicable standards  UL certification is pending  RoHS compliance  Compliant  Weight  Approx. 0.01 g			rface-mounting terminals		• (V:	SON)		
Applicable standards  RoHS compliance  Compliant  Weight  Approx. 0.01 g	Terr		PCB terminals					
RoHS compliance Compliant Weight Approx. 0.01 g		ı	Mounting method		Surface	mounting		
Weight Approx. 0.01 g		•	•					
		F						
100 100 100				190			105	
			i-aye	190	130	190	133	

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.
 Refer to pages 218 to 220 for detailed information on models certified for standards.

For PCBs					Application		
G3VM-41UR10	G3VM-41UR11	G3VM-51UR	G3VM-61UR1	м	lodel		
	1a (SP	ST-NO)		Conta	act form		
2.45	2.45 1.45	2.45	2.45		ckage m, Averag	е)	
VSON4	VSON4	VSON4	VSON4				
Low-output-capacitance and Low-ON-resistance Type (with Low C × R) Load voltage: 40 V Low C × R = 5.4 pF · Ω Coff (typical) = 0.45 pF	Low-output-capacitance and Low-ON-resistance Type (with Low C × R)  Load voltage: 40 V  Low C × R = 4.9 pF · Ω  Coff (typical) = 0.7 pF	Low-output-capacitance and Low-ON-resistance Type (with Low C × R)  Load voltage: 50 V  Low C × R = 12 pF · Ω  Row (typical) =1 Ω	Low-output-capacitance and Low-ON-resistance Type (with Low C × R)  Load voltage: 60 V  Low C × R = 7 pF · Ω  Coff (typical) = 0.7 pF		atures		
	Photodio	de coupler			n method		
40	V	50 V	60 V	AC peak DC	Load voltage		
120 mA	140 mA	300 mA	120 mA	2,000 load 1,000 AC p 6-pir	n type nection C:	Output	Absolute maximum ratings
	30			LED forward		Input	
	300 VAC 50/6	+85°C		Dielectric strengt Ambient or		,0	
		r condensation)		tempera			
14 Ω	10 Ω	1.5 Ω	15 Ω	Maximum out resistance	put ON	Output	Electrical characteristics
1 nA (at 40 VDC) 1 nA (at 50 VDC) 1 nA (at 60 VDC)					leakage t	Omi	Elect
● (VSON)						als	Terminal structure
					ninals		Ter
Surface mounting					ng method		
UL certification is pending					le standard		
Compliant					ompliance		
Approx. 0.01 g  195 195 195 213					eight Page		
190	190	190	213		aye		

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

Refer to pages 218 to 220 for detailed information on models certified for standards.

		Application			PCBs		
		Model	G3VM-61UR	G3VM-81UR	G3VM-81UR1	G3VM-101UR	
	Contact form			1a (SP	ST-NO)		
Package (Unit : mm, Average)			2.45	2.45	2.45	2.45	
			VSON4	VSON4	VSON4	VSON4	
		Features	Small and High-load-voltage Type Load voltage: 60 V Ron (typical) =1 Ω	Small and High-load-voltage Type     Load voltage: 80 V     Maximum OFF leakage current: 0.02 nA	Small and High-load- voltage Type     Load voltage: 80 V	Small and High-load-voltage Type     Load voltage: 100 V	
		Isolation method		Photodioo	de coupler		
		Load AC peak voltage DC	60 V	80	) V	100 V	
Absolute maximum ratings	Output	DC 8	00	120 mA	200 mA	100 mA	
	Input	LED forward currer	t	30	mA		
		lectric strength between		300 VAC 50/6			
		Ambient operating temperature		-40 to	+85°C r condensation)		
cal	=	Maximum output O	1.5 Ω	12 Ω	8 Ω	14 Ω	
Electrical characteristics	Output	Maximum OFF leaka	ge 1 nA (at 60 VDC)	0.02 nA (at 80 VDC)	1 nA (at 80 VDC)	0.2 nA (at 100 VDC)	
Terminal structure		rface-mounting termin	als	• (V:	SON)	1	
Tern		PCB terminals					
		Mounting method			mounting		
	-	plicable standards			on is pending		
	F	RoHS compliance Weight			pliant : 0.01 g		
		Page	213	213	213	213	
		9-	2.0	0			

<sup>\*</sup> Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

<sup>\*</sup> Refer to pages 218 to 220 for detailed information on models certified for standards.

	Application						
G3VM-31QR	G3VM-41QR10	G3VM-61QR	G3VM-61QR2	G3VM-101QR1	Model		
		1a (SPST-NO)			Contact form		
2.0 1.65 1.46	2.0 1.3 1.45	1.65 NEW	2.0 1.65 1.45 NEW	1.65 1.65 NEW	Package (Unit : mm, Averag	ıe)	
S-VSON4 • New small S-VSON	S-VSON(L)4  • New small S-VSON	S-VSON4  • New small S-VSON	S-VSON4  • New small S-VSON	S-VSON4  • New small S-VSON			
package • Load voltage: 30 V • Continuous load current: 1.5 A max. • High Ambient operating temperature: -40 to +110°C	package (Low profile type)  • Load voltage: $40 \text{ V}$ • Low $C \times R = 4.95 \text{ pF} \cdot \Omega$ • High Ambient operating temperature: $-40 \text{ to} + 110^{\circ}\text{C}$	package • Load voltage: 60 V • Low C × R = 13.2 pF · Ω • High Ambient operating temperature: -40 to +110°C	package • Load voltage: 60 V • Continuous load current: 1A max. • High Ambient operating temperature: -40 to +110°C	package • Load voltage: 100 V • Continuous load current: 0.65A max. • High Ambient operating temperature: -40 to +110°C	Features		
		Photodiode coupler			Isolation method		
30 V	40 V	60	V	100 V	AC peak Load voltage		
1,500 mA	400 mA	400 mA	- 1,000 mA	650 mA	10,000 9,000 8,000 7,000 6,000 5,000 4,000 2,000 1,000 800 60-pin type connection C: DC 700 600 500 400 300 200 1100	rt Output	Absolute maximum ratings
		30 mA			LED forward current	lubn	
	5	00 VAC 50/60 Hz for 1 min -40 to +110°C	l.		Dielectric strength between  Ambient operating	1/0	
		(with no icing or condensation)			temperature		
0.2 Ω	14 Ω	1.5 Ω	0.3 Ω	0.6 Ω	Maximum output ON resistance	'n	ical
1 nA (at 30 VDC)	1 nA (at 40 VDC)	1,000 nA (a	at 60 VDC)	1,000 nA (at 100 VDC)	Maximum OFF leakage current	Output	Electrical
		● (S-VSON)			Surface-mounting termin		
					PCB terminals		Terminal
Surface mounting					Mounting method		
						ds	
Compliant					RoHS compliance	е	
143	200	Approx. 0.01 g	143	143	Weight		
143	200	200	143	143	Page		

Only basic specifications are given in this table. Refer to the reference page given in the table for detailed specifications and precautions before you attempt to use a Relay.

<sup>\*</sup> Refer to pages 218 to 220 for detailed information on models certified for standards.

IFC

IFT

RON

Coff

Інм

CLO

R<sub>I</sub>-o

toss

ERT

good characteristics. ERT =  $\sqrt{(\text{trout}^2 - \text{trin}^2)}$ 

Maximum resistance with output

when the relay is open
Capacitance be-

tween terminals

Capacitance between I/O

Insulation resistance be-

tween I/O terminals

Turn-ON time

Turn-OFF time

Equivalent rise time

ON Current leakage

#### **MOS FET Relay Glossary** Symbol Description Absolute maximum rat-Maximum values that must never be exceeded even instantaneously ings Unless otherwise specified, these values are given at Ta = 25°C. LED forward current le Bated current that can flow continuously in the LED forward direction Renetitive neak LED IFP Rated current that can flow momentarily in the LED forward direction forward current LED forward current ΔIε/°C Reduction rate for current that can flow in the LED forward direction in relation to the ambient temperature LED reverse voltage Vo Bated reverse voltage that can be applied between the cathode and the anode Connection temper-Tj Rated temperature that can be allowed at the LED junction Rated voltage that can be applied between the relay output terminals when switching the load or in the OFF I nad voltage (AC peak/ DC) The peak voltage for AC Continuous load Rated current that can flow between the relay output terminals in the ON state under the specified temperature lο current conditions (AC peak/ DC) The neak current for AC ON current reduc-Reduction rate for current that can flow between the relay output terminals in the ON state in relation to the Alo/°C ambient temperature Pulse ON current lop Bated current that can flow instantaneously between the relay output terminals in the ON state Connection temper-Ti Rated temperature that can be allowed at the light-receiving circuit junction Dielectric strength be-V<sub>I-O</sub> Voltage that the isolation between the input and output can withstand for a specified time tween I/O Ambient operating tem-Та Ambient temperature range in which the relay may be operated without impairment perature Ambient storage temper-Tsta Ambient temperature range in the relay may be stored while not operating ature Soldering temperature Bated temperature at which the terminals can be soldered without impairment of the relay LED forward voltage ٧/-Voltage drop between the LED anode and cathode at a certain forward current Reverse current Leakage current flowing in the LED reverse direction (between cathode and anode) lκ Capacitance be Ст Electrostatic capacitance between the LED anode and the cathode terminals tween terminals Minimum input current required to change the relay output state. To ensure operation of the relay, a current that is equal to or greater than the maximum specified value must Trigger LED forward let Minimum value of input current IF that is required to change an MOS FET with a NO output to the ON state Minimum value of input current IF that is required to change an MOS FET with a NC output to the OFF state IFC Maximum input current required to release the relay output state. To ensure release of the relay, a current that is equal to or less than the minimum specified value must be Release LED forward current

Maximum value of input current I⊧ that must flow to change an MOS FET with a NO output to the OFF state

Maximum value of input current IF that must flow to change an MOS FET with a NC output to the ON state

Leakage current flowing between the relay output terminals when the specified voltage is applied in the OFF

Resistance between the relay output terminals in the specified ON state

Electrostatic capacitance between the relay output terminals in the OFF state

Resistance between the input and output terminals at the specified voltage value

Indicator of the output transition characteristics for fast signals or pulse signals

Time required for the output waveform to change after the specified input LED current is applied

NO relay: Time required for the output waveform to change from 100% to 10% after the input changes from OFF to ON NC relay: Time required for the output waveform to change from 100% to 10% after the input changes from ON to OFF Time required for the output waveform to change after the specified input LED current is interrupted.

NO relay: Time required for the output waveform to change from 0% to 90% after the input changes from ON to OFF

NC relay: Time required for the output waveform to change from 0% to 90% after the input changes from OFF to ON

The ERT is expressed by the following formula, where trin is the input waveform rise time and trout is the output

waveform rise time after relay transition. The lower the value, the less change there is in the signal, making for

Load current that is maintained when current limiting is activated

Electrostatic capacitance between the input and output terminals

## **MOS FET Relay Glossary**

	Item	Symbol	Description
tions	Recommended operating conditions		Indicators of the maximum ratings and electrical performances that consider derating to ensure high reliability Each item is an independent condition. Meeting compound conditions simultaneously is not considered.
condi	Load voltage (AC peak/ DC)	V <sub>DD</sub>	Recommended load voltage that considers derating The peak voltage for AC
erating	Operating LED forward current	lF	Recommended LED forward current that considers derating
ed ope	Continuous load current (AC peak/ DC)	lo	Recommended load current that considers derating The peak current for AC
Recommended operating conditions	Ambient operating temperature		Recommended ambient operating temperature that considers derating
ata	ON-state voltage Von		Voltage drop between the output terminals when the output MOS FET is in the ON state
Engineering data	Output terminal capacitance	Coff/Coff(0V)	Relative ratio based on the capacitance between output terminals when the voltage between the output terminals is 0 V
	Current limiting		When an overcurrent exceeds a certain value, this function maintains the load current between the minimum and maximum values of the limit current characteristic. Suppressing the current to a fixed value protects the relay and the circuit components connected after the relay.
Other terms	Low CxR		Indicator of output characteristics in applications that handle high-frequency signals, fast signals, etc. C indicates the capacitance between the output terminals in the OFF state, COFF, and R indicates the resistance between the output terminals, RON, in the ON state, If COFF is large, signal transition even when the relay is OFF (signal leakage or isolation reduction) and the delay in the signal rise time for signal transition when the relay is ON (waveform rounding) are affected. If RON is large, signal transition loss (voltage drop and insertion reduction) is affected. In these applications, a small COFF and RON, i.e., a low C × R characteristic, are important.

#### WARNING

Always turn OFF the power supply before wiring a Relav.

Not doing so may cause electrical shock.



Do not touch the current-carrying parts of the pin section of a MOS FET Relay while the power is being supplied.



An electrical shock may occur.

#### Precautions for Safe Use

1. Do not apply overvoltages or overcurrents to the input or output circuit of the MOS FET Relay.

The MOS FET Relay may fail or ignite.

2. Perform soldering and wiring correctly according to specified soldering conditions.

Using a MOS FET Relay with incomplete soldering may cause overheating when power is applied, possibly resulting in burning.

#### Precautions for Correct Use

#### ●Derating

You must consider derating to achieve the required system reliability.

To use a MOS FET Relay with high reliability, consider derating the maximum ratings and recommended operating conditions, and allow sufficient leeway in designs based on testing operation in the actual application under the actual operating conditions whenever possible.

(1) Maximum Ratings

The maximum ratings must never be exceeded even instantaneously. This applies individually to each of the ratings. If any of the maximum ratings is exceeded, the internal parts of the MOS FET Relay may deteriorate or the chip may be destroyed. To ensure high reliability in using a MOS FET Relay, sufficiently derate the maximum voltage, current, and temperature ratings when designing the application.

(2) Recommended Operating Conditions The recommended operating conditions are to ensure that the MOS FET Relay turns ON and OFF reliably. To ensure high reliability in using a MOS FET Relay, consider the recommended operating conditions when you design the application.

(3) Fail-safe Design

We recommend that you implement fail-safe measures in the design of the application if the failure of, deterioration of characteristics in, or functional errors in the MOS FET Relay will have a serious affect on the safe operation of the system.

#### Countermeasures for static electricity

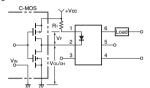
There is a risk of damage to internal elements and impairment of functionality if static electricity is discharged to the pins due to product handling or otherwise.

Reduce the generation of static electricity as much as possible, and implement appropriate measures to prevent charge accumulation near the product.

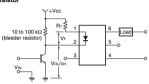
#### ●Typical MOS FET Relay Driving Circuit Examples

The LED input side of the MOS FET is driven by current. If applying a Voltage, add resistance in series with the circuit, so the specified current is applied.

This resistance is referred as "LED current limiting resistance".



#### Transisto



. To ensure that the MOSFET relay operates correctly, use the following formula to calculate the limiting resistance, and design the circuit accordingly.

$$R_1 = \frac{V_{CC} - V_{OL} - V_{F(ON)}}{I_{CO}}$$

Note: To set the value of IF(ON), check the trigger LED current and recommended operation LED forward current indicated in the catalogue for each model, and set a high value with leeway.

• To ensure that the MOSFET relay resets reliably, calculate the reset voltage using the formula below, and control so that the voltage is lower than this value.

$$V_{F(OFF)}=V_{CC}-I_FR_1-V_{OH}$$

Note: For the IF(OFF) value, set a value that is lower with leeway than the reset LED forward current indicated for each model in the catalogue.

 If the drive transistor has a large leakage current that may cause malfunctioning, add a bleeder resistance.

#### Protection from Surge Voltage on the Input Pins

· If any reversed surge voltage is imposed on the input pins, insert a diode in parallel with the input pins as shown in the following circuit diagram and do not impose a reversed voltage of 3 V or higher.

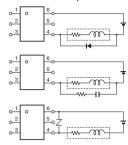
#### Surge Voltage Protection Circuit Example



#### ●Protection from Spike Voltage on the Output Pins

 If there is an inductive load or other condition that will cause overvoltage that exceeds the absolute maximum rating between the output pins, connect a protective circuit to limit the overvoltage.

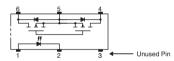
#### Spike Voltage Protection Circuit Example



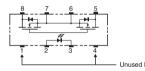
#### ●Unused Pin

The unused pins of each MOSFET relay are used in the internal circuitry. Do not connect to an external circuit.

#### (Example for 6-pin Relay)

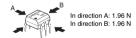


#### (Example of 8-pin high-capacity type



#### ●Pin Strength for Automatic Mounting

 In order to maintain the characteristics of the MOS FET Relay, the force imposed on any pin of the MOS FET Relay for automatic mounting must not exceed the following limits.



#### ●Load Connection

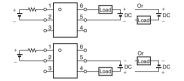
• Do not short-circuit the input and output pins while the MOS FET Relay is operating or it may malfunction.

#### Example of correct connection

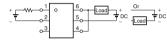
#### AC/DC connection (A connection)



#### DC Single Connection (B connection)



#### DC Parallel Connection (C connection)



#### ●Estimated Life

OMRON MOS FET Relays use mainly two types of LEDs. The service life is estimated separately for each type of LED.

The following tables show the LEDs that are used in each MOS FET Relay. Estimated life data is given on pages **3 and 4**. Ask your OMRON representative for any models that are not listed in the table.

This data is the results of estimating the service life from long-term data on a single lot. Use it only as reference data.

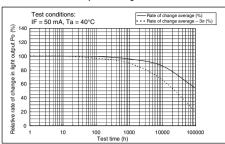
#### MOS FET Relays That Use GaAs LEDs

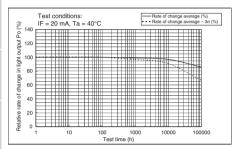
DIP	S	OP	SSOP
G3VM-61A1/D1	G3VM-21GR	G3VM-S5	G3VM-21LR
G3VM-61B1/E1	G3VM-21GR1	G3VM-201H1	G3VM-21LR1
G3VM-62C1/F1	G3VM-41GR4	G3VM-202J1	G3VM-41LR4
G3VM-2L/2FL	G3VM-41GR5	G3VM-351G	G3VM-41LR5
G3VM-351A/D	G3VM-41GR6	G3VM-351G1	G3VM-41LR6
G3VM-351B/E	G3VM-41GR8	G3VM-351GL	G3VM-61LR
G3VM-352C/F	G3VM-61G1	G3VM-351H	G3VM-81LR
G3VM-353A/D	G3VM-61G2	G3VM-352J	G3VM-101LR
G3VM-353B/E	G3VM-61GR1	G3VM-353G	USOP
G3VM-354C/F	G3VM-61H1	G3VM-353H	G3VM-21PR10
G3VM-355CR/FR	G3VM-62J1	G3VM-354J	G3VM-21PR11
G3VM-WL/WFL	G3VM-81G1	G3VM-355JR	G3VM-41PR10
G3VM-401A/D	G3VM-81GR	G3VM-401G	G3VM-41PR11
G3VM-401B/E	G3VM-81GR1	G3VM-401H	G3VM-41PR12
G3VM-401BY/EY	G3VM-81HR	G3VM-402J	G3VM-51PR
G3VM-402C/F	G3VM-201G	G3VM-601G	G3VM-61PR
G3VM-601BY/EY	G3VM-201G1		G3VM-61PR1

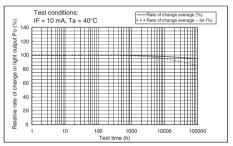
#### MOS FET Relays That Use GaAlAs LEDs

DIP	SOP	SSOP	SSOP
G3VM-21AR/DR	G3VM-61BR/ER	G3VM-21HR	G3VM-21LR10
G3VM-21BR/ER	G3VM-61BR1/ER1	G3VM-41HR	G3VM-41LR10
G3VM-41AR/DR	G3VM-101AR/DR	G3VM-61HR	G3VM-41LR11
G3VM-41BR/ER	G3VM-101BR/ER	G3VM-101HR	
G3VM-61AR/DR			

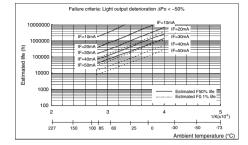
#### Data on Estimated Temporal Changes in GaAs LEDs

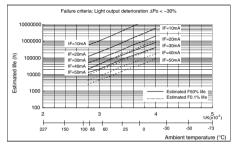






#### Estimated Life Data for GaAs LEDs





The above estimated life data is reference data that was based on LED long-term appraisal for a single lot.

Operating conditions that exceed the ratings for some models are included, but this in no way implies any warranty for operation that exceeds the ratings.

#### F50% Life

For the life to a 50% cumulative failure rate, this is the time that is required for the AVG average line in the data on estimated temporal changes to reach the failure criteria.

#### F0.1% Life:

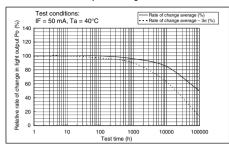
For the life to a 0.1% cumulative failure rate, this is the time that is required for the AVG-3 $\alpha$  line in the data on estimated temporal changes to reach the failure criteria.

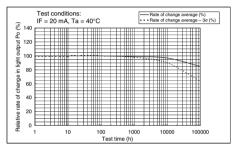
Whether to use estimated F50% life or F0.1% life should be determined based on the reliability required in the actual equipment, however, estimated F0.1% life is normally recommended.

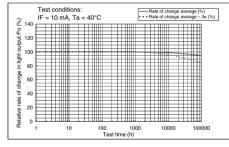
"Optical output deterioration  $\Delta$ po" is the amount of LED optical output deterioration compared to the initial LED output. When "Optical output deterioration failure criterion  $\Delta$ po < - 50%", a failure is detected when optical output has deteriorated 50% from the initial output.

Whether to use optical output deterioration  $\Delta po <$  - 50% or  $\Delta po <$  - 30% should be determined based on the amount of leeway to be provided in the LED forward current (IFT). However, the  $\Delta po <$  - 30% graph is normally recommended.

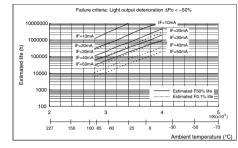
#### Data on Estimated Temporal Changes in GaAlAs LEDs

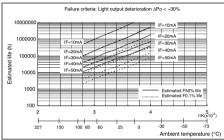






#### Estimated Life Data for GaAIAs LEDs





The above estimated life data is reference data that was based on LED long-term appraisal for a single lot.

Operating conditions that exceed the ratings for some models are included, but this in no way implies any warranty for operation that exceeds the ratings.

#### F50% Life:

For the life to a 50% cumulative failure rate, this is the time that is required for the AVG average line in the data on estimated temporal changes to reach the failure criteria.

#### F0.1% Life:

For the life to a 0.1% cumulative failure rate, this is the time that is required for the AVG-3 $\alpha$  line in the data on estimated temporal changes to reach the failure criteria.

Whether to use estimated F50% life or F0.1% life should be determined based on the reliability required in the actual equipment, however, estimated F0.1% life is normally recommended.

"Optical output deterioration  $\Delta$ po" is the amount of LED optical output deterioration compared to the initial LED output. When "Optical output deterioration failure criterion  $\Delta$ po < - 50%", a failure is detected when optical output has deteriorated 50% from the initial output.

Whether to use optical output deterioration  $\Delta po <$  - 50% or  $\Delta po <$  - 30% should be determined based on the amount of leeway to be provided in the LED forward current (IFT). However, the  $\Delta po <$  - 30% graph is normally recommended.

#### ●Cleaning Flux from the MOS FET Relavs

- (1) Clean flux from the MOS FET Relay so that there will be no residue of reactive ions, such as sodium or chlorine. Some organic solvents will react with water to produce hydrogen chloride or other corrosive gases, which may cause deterioration of the MOS FET Relays.
- (2) When washing off the flux with water, make sure that there will be no residue of reactive ions, particularly sodium or chloring.
- (3) During water washing, do not scrub the marks on the surface of the MOS FET Relay with a brush or your hand while there is cleaning liquid on the MOS FET Relay. The marks may come off.
- (4) Clean the flux from the MOS FET Relays with the chemical action of the solvent for submersed cleaning, shower cleaning, or steam cleaning. To minimize the effect on the MOS FET Relays, do not place the MOS FET Relay in the solvent or steam for more than 1 minute at a temperature of 50°C.
- (5) If you use ultrasonic cleaning, keep the time short. If the cleaning time is too long, the sealing characteristics of the molded resin and frame materials may deteriorate. The recommended basic conditions are given below. Recommended Conditions for Ultrasonic Cleaning: Frequency: 27 to 29 kHz

Ultrasonic wave output: 300 W max. (0.25 W/cm² max.) Cleaning time: 30 s max.

Also, suspend the MOS FET Relays in the cleaning solution so that the MOS FET Relay and PCB do not come into direct contact with the ultrasonic transducer.

#### Solder Mounting

Perform solder mounting under the following recommended conditions to prevent the temperature of the MOS FET Relays from rising.

#### <Flow Soldering>

#### PCB Terminals

#### (Set Temperature of Flow Bath)

Solder type	Preheating	Soldering	Count
(Lead solder)	150°C	260°C	Once only
SnPb	60 to 120 s	10 s max.	
(Lead-free solder)	150°C	260°C	Once only
SnAgCu	60 to 120 s	10 s max.	

Note: We recommend that you verify the suitability of solder mounting under actual conditions.

#### Surface-mount Terminals

If you are considering mounting a surface mount pin type by flow soldering, please consult us.

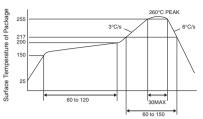
#### <Reflow Soldering>

#### **Surface-mount Terminals**

#### (Surface Temperature of Package)

Solder type	Preheating	Solo	dering	Count
(Lead solder) SnPb	140 to 160°C 60 to 120 s	210°C 30 s max.	Peak: 240°C max.	Up to twice

#### (Lead-free solder) SnAgCu recommended profile



Reflow repetitions : Up to twice Time (s)

Note: 1. We recommend that you verify the suitability of solder mounting under actual conditions.

2. When SSOP, USOP, VSON, or S-VSON products are ordered with (TR), tape package product is delivered in moisture-proof packaging. If ordered without (TR), tape-cut product is delivered in non moistureproof packaging. Mount a tape cut product by manual soldering. Tape cut products absorb moisture because a non moisture-proof package is used. Risk of package cracking or other damage due to thermal stress if reflow soldering is performed.

#### Manual Soldering (Once Only)

Perform manual soldering at 350°C for 3 s or less or at 260°C for 10 s or less

Note: Please consult us for manual soldering conditions for S-VSON products.

#### Storage Conditions

- Store the MOS FET Relay where they will not be subjected to water leaks or direct sunlight.
- (2) When transporting or storing the MOS FET Relays, observe all precautions on the packaging boxes.
- (3) Keep the storage location at normal temperature, normal humidity, and normal pressure. Guidelines for the temperature and humidity are 5 to 35°C and a relative humidity of 45% to 75%.
- (4) Do not store the MOS FET Relay in locations that are subject to corrosive gases, such as hydrogen sulfide gas, or to salt spray, and do not store them where there is visually apparent dust or dirt.
- (5) Store the MOS FET Relay in a location that has a relatively stable temperature. Radical changes in temperature during storage will cause condensation, which may oxidize or corrode the leads and interfere with solder wetting.
- (6) If you remove MOS FET Relays from the packages and then store them again, use storage containers that have measures to prevent static electricity.
- (7) Do not under any circumstances apply any force to the MOS FET Relays that would deform or alter them in any way.
- (8) This product is warranted for one year from the date of purchase or the date of delivery to the specified location. If the MOS FET Relays are stored for more than about one year under normal conditions, we recommend that you confirm solderability before you use the MOS FET Relays.

#### ●Usage Conditions

#### <Temperature>

The electrical characteristics of the MOS FET Relays are limited by the application temperature.

If you use them at temperatures outside of the operating temperature range, the electrical characteristics of the MOS FET Belays will not be achieved and the MOS FET Belays may deteriorate. For that reason, you must determine the temperature characteristics in advance and apply derating\* to the design of the application. (\*Derating reduces stress.) Consider derating in the operating temperature conditions and apply the recommended operating temperature as a guideline. <Humiditv>

If the MOS FET Relays are used for a long period of time at high humidity, humidity will penetrate the Relays and the internal chips may deteriorate or fail. In systems with high signal source impedance, leaks in the board or leaks between the leads of the MOS FET Relays can cause malfunctions. If these are issues, consider applying humidity-resistant processing to the surfaces of the MOS FET Relays. On the other hand, at low humidity. damage from the discharge of static electricity becomes a problem. Low humidity may cause damage due to electrostatic discharge. Unless moisture proofing is implemented, use within a relative humidity range of 40 to 60%.

#### Considerations when handling SSOP, USOP, VSON, and S-VSON products

<Moisture proof package, MSL3> (Other packages are MSL1) Surface mount products may have a crack when thermal stress is applied during surface mount assembly after they absorb atmospheric moisture. Therefore, please observe the following

- (1) This moisture proof bag may be stored unopened within 12 months at the following conditions. Temperature: 5°C to 30°C Humidity: 90% (Max.)
- (2) After opening the moisture proof bag, the devices should be assembled within 168 hours in an environment of 5°C to 30°C / 70%RH or below.
- (3) If upon opening, the moisture indicator card shows humidity 30% or above (Color of indication changes to pink) or the expiration date has passed, the devices should be baked in taping with reel. After baking, use the baked devices within 72 hours, but perform baking only once. Baking conditions: 60±5°C. For 64 to 72 hours. Expiration date: 12 months from sealing date, which is imprinted on the label affixed.
- (4) Repeated baking can cause the peeling strength of the taping to change, then leads to trouble in mounting. Furthermore, prevent the devices from being destructed against static electricity for baking of it.
- (5) If the packing material of laminate would be broken the hermeticity would deteriorate. Therefore, do not throw or drop the packed devices.
- (6) Tape-cut SSOPs, USOPs, VSONs, or S-VSON are packaged without humidity resistance. Use manual soldering to mount them. (MSL not supported)

## ●Tape Packaging

<Tape Form and Dimensions>

Unit: mm 20 + 01

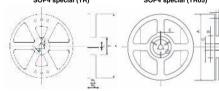
Unit: mm

Туре	of pa	ckage	DIP4	DIP6	DIP8	Special SOP4	SOP4
	Α			10.4±0.1		4.0±0.1	4.3±0.1
e.	В		5.1±0.1	7.6±0.1	10.1±0.1	7.6±0.1	7.5±0.1
igir	С			16±0.3		12±	:0.3
Dimension symbol (See figure.)	D			7.5±0.1		5.5:	±0.1
S)	E	Dimensions			1.75±0.1		
g	F	ensi		12.0±0.1		8.0:	±0.1
s	G	Ji m			4.0±0.1		
sion	J				1.5+0.1/-0		
neu	k			4.55±0.2		2.9±0.2	2.6±0.2
흐	ko			4.1±0.1		2.6±0.1	2.4±0.1
	t			0.4±0.05		0.3±	0.05

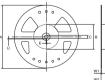
Туре	of pa	ckage	SOP6	SOP8	SSOP4	USOP4	VSON4	S-VSON4
	Α		7.5	±0.1	2.35±0.2	2.6±0.1	1.6:	±0.1
e-)	В		6.7±0.1	10.5±0.1	4.5±0.1	3.55±0.1	3.0±0.1	2.25±0.1
gar	С		16:	:0.3	12:	:0.3	8.0:	±0.3
symbol (See figure.)	D		7.5:	±0.1	5.5:	±0.1	3.5	±0.1
S)	E	Dimensions			1.75	±0.1		
ğ	F	ensi	12.0	±0.1		4.0:	±0.1	
Sy	G	Dim			4.0:	±0.1		
sior	J				1.5+	0.1-0		
Dimension	k		2.5±0.2	2.4±0.2	2.4±0.1	2.25±0.1	,	-
ă	ko		2.3±0.1	2.2±0.1	2.1±0.1	1.95±0.1	1.5±0.1	1.85±0.1
	t			0.3±0.05		0.3±0.1	0.2±	0.05

#### <Reel Form and Dimensions> DIP/SOP SOP4 special (TR)

#### SSOP/USOP/VSON/S-VSON SOP4 special (TR05)







nit: mm

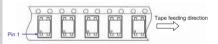
						Onit: mm								
		DIP4		DIP6	DIP8	Special SOP4	SOP4	SOP6	SOP8					
Тар	oe na	me	(TR05)				(TR)							
re.)	Α		254±2 dia.	38	30±2 di	ia.		330±2	dia.					
figure.)	В		100±1 dia.											
See (See	С	suc	13±0.2 dia.		13±0.5 dia.									
oqu.	E	Dimensions	2.0±0.5		2.0±0.5									
on sy	U	Dim	4.0				4.0±0.5							
Dimension symbol	W1		17.4±1.0	1	7.5±0.	5	13.5±0.5		17.5	±0.5				
Din	W2		21.4±1.0	21.5±1.0 17.				1.0	21.5	±1.0				

	ype o		Special SOP4	SSOP4	USOP4	VSON4	S-VSON4	
Тар	e na	me			(TR05)			
re.)	Α		180±2.0 dia.	180+0	/-4 dia.	180±	3 dia.	
figu	В		60±1.0 dia.	60	dia.	60±1 dia.		
es) I	С	suc	13±0.5 dia.	13	dia.	13±0.	.5 dia.	
oqu	E	Dimensions		:	2.0±0.5			
on sy	U	Din	4.0±0.5 dia.	-	<b></b>	4.0:	±0.5	
Dimension symbol (See figure.)	W1		13.5±0.5 dia.	13±	:0.3	9.0:	±0.3	
Din	W2		17.5±1.0 dia.	15.4	±1.0	11.4±1.0		

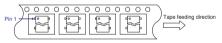
#### <Taping Direction>

The orientations of the MOS FET Relays in the depressions in the carrier tapes are shown below.

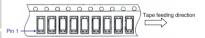
(1) SOP4 Pins



(2) SOP6, SOP8, DIP4, DIP6, or DIP8 Pins



(3) SSOP4, USOP4, VSON4, S-VSON4 pin types



#### <Number of Relays Per Reel>

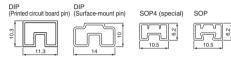
Type of pa	ckage	DIP4	DIP6	DIP8	Special SOP4	SOP4	SOP6	SOP8
Number of	TR		1,500		3,000		2,500	
Relays	TR05	500	-	-	500		-	

Type of pa	ckage	SSOP4	USOP4	VSON4	S-VSON4
Number of	TR		-	-	
Relays	TR05		50	00	

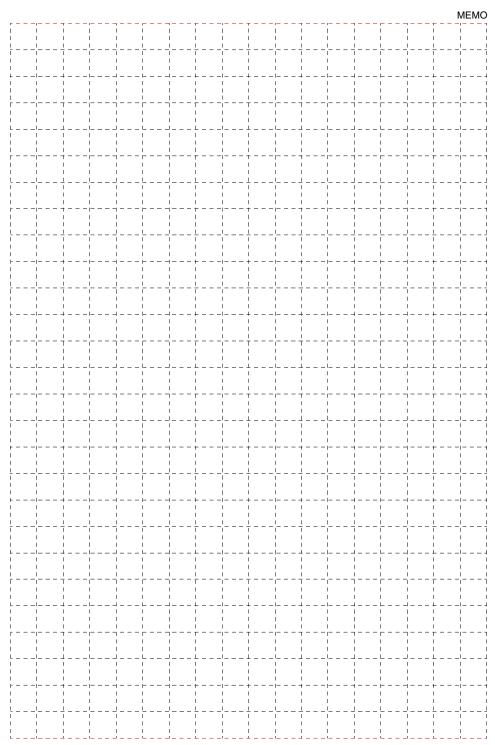
#### Stick packaging

#### <Stick shape and dimensions>

Unit: mm



Type of package	DIP4	DIP6	DIP8	DIP4	DIP6	DIP8	Special	SOD4	SOBE	SOP8	
Pin type		ited cir		Surf	ace-m pin	ount	SOP4	3014	3010	00.0	
Number of Relays	100	50	50	100	50	50	125	100	75	50	
Height (mm)		10.3			10		6.2				
Width (mm)		11.3			14		10.5				
Length (mm)		525			525			5	55		



MOS FET Relays DIP, General-purpose Type

## General-purpose MOS FET Relays in DIP packages for a wide range of applications

• Package: DIP 4-pin or DIP 6-pin

• Contact form: 1a (SPST-NO) or 1b (SPST-NC)

• Load voltage: 60 V, 350 V, or 400 V



Note: The actual product is marked differently from the image shown here.

#### RoHS Compliant

#### **■**Application Examples

- Communication equipment • Test & Measurement equipment
- · Security equipment

• Industrial equipment

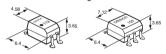
Power circuit

#### ■Package

(Unit: mm, Average)

DIP 4-pin DIP 6-pin **PCB** Terminals

Surface-mounting Terminals



Note: The actual product is marked differently from the image shown here.

#### ■Model Number Legend

## G3VM-

- 1. Load Voltage
- 6:60 V
- 35:350 V
- 40:400 V
- 2. Contact form
- 1:1a (SPST-NO) 3:1b (SPST-NC)
- 3. Package
- A: DIP 4-pin with PCB terminals
- B: DIP 6-pin with PCB terminals
- D: DIP 4-pin with surface-mounting terminals
- E: DIP 6-pin with surface-mounting terminals

#### 4. Other informations

When specifications overlap, serial code is added recorded order.

## **■**Ordering Information

					Stick packaging		Tape packag	ing	
Package	Contact form	Load voltage	Continuous load current		Model	Minimum	Model	Minimum	
. uonago	ge Contact form Load (peak	(peak value) *	(peak value) *	PCB Terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity	
	1a	60 V	500 mA	G3VM-61A1	G3VM-61D1		G3VM-61D1(TR)		
	(SPST-NO)		120 mA	G3VM-351A	G3VM-351D		G3VM-351D(TR)		
DIP4	1b (SPST-NC)	350 V	150 mA	G3VM-353A	G3VM-353D	100 pcs.	G3VM-353D(TR)	1,500 pcs.	
	1a (SPST-NO) 40	400 V	120 mA	G3VM-401A	G3VM-401D		G3VM-401D(TR)		

				Continuous	load current		Stick packaging		Tape packag	ing		
Pack	age	Contact form	Load voltage		alue) *		Model	Minimum	Model	Minimum		
ı ucı	ago (	001111101	(peak value) *	Connection A, B	Connection C	PCB Terminals	Surface-mounting Terminals			package quantity		
		1a	60 V	500 mA	1000 mA	G3VM-61B1	G3VM-61E1		G3VM-61E1(TR)			
		(SPST-NO)		120 mA	240 mA	G3VM-351B	G3VM-351E		G3VM-351E(TR)			
DII	P6	1b (SPST-NC)	350 V	150 mA	300 mA	G3VM-353B	G3VM-353E	50 pcs.	G3VM-353E(TR)	1,500 pcs.		
		1a (SPST-NO)	1a	1a	400 V	120 mA	240 mA	G3VM-401B	G3VM-401E		G3VM-401E(TR)	

\* The AC peak and DC value are given for the load voltage and continuous load current.

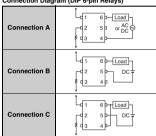
Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

## ■Absolute Maximum Ratings (Ta = 25°C)

	Item		Symbol	G3VM-61A1 G3VM-61D1	G3VM-61B1 G3VM-61E1	G3VM-351A G3VM-351D	G3VM-351B G3VM-351E	G3VM-353A G3VM-353D	G3VM-353B G3VM-353E	G3VM-401A G3VM-401D	G3VM-401B G3VM-401E	Unit	Measurement conditions
	LED forward curr	ent	lF				5	0				mA	
+	Repetitive peak L current	.ED forward	IFP					1				А	100 μs pulses, 100 pps
Input	LED forward curre rate	ent reduction	ΔIF/°C				-0	.5				mA/°C	Ta≥25°C
	LED reverse volta	age	VR					5				V	
	Connection temp	erature	TJ				1:	25				°C	
	Load voltage (AC	peak/DC)	Voff	60		350		50	0		00	V	
	Continuous load Connection A			50	500		120		150		120		Connection A:
	current Connection B		lo		500		120		150		120	mA	AC peak/DC Connection B and C:
Ħ	(AC peak/DC)	Connection C		_	1000	_	240	_	300	_	240		DC
Output	en .	Connection A		7	5	-1.2		-1.5		5 -1			
U	ON current reduction rate	Connection B	Δlo/°C		-5		-1.2		-1.5		-1.2	mA/°C	Ta ≥ 25°C
	reduction rate	Connection C		_	-10	_	-2.4	_	-3	_	-2.4		
	Pulse ON current		lop	1.	.5	0.	36	0.	45	0.3	36	Α	t=100 ms, Duty=1/10
	Connection temp	erature	TJ			•	13	25		•		°C	
Di	electric strength be	etween I/O *	VI-0				2,5	500				Vrms	AC for 1 min
Ar	nbient operating te	mperature	Ta				-40 t	+85				°C	With no icing or
Ar	nbient storage tem	perature	Tstg				-55 to	+125				°C	condensation
Sc	Idering temperatur	re	-				2	30				°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

#### Connection Diagram (DIP 6-pin Relays)



## ■Electrical Characteristics (Ta = 25°C)

	Item	Symbol			G3VM-61A1 G3VM-61D1	G3VM-61B1 G3VM-61E1	G3VM-351A G3VM-351D	G3VM-351B G3VM-351E	G3VM-353A G3VM-353D	G3VM-353B G3VM-353E	G3VM-401A G3VM-401D	G3VM-401B G3VM-401E	Unit	Measurement conditions
	LED forward voltage	VF	T	nimum ypical ximum				1.	.0 15 .3				v	I==10 mA
	Reverse current	IR	Ma	ıximum				1	0				μА	VR=5 V
	Capacitance between terminals	Ст	T	ypical				3	10				pF	V=0, f=1 MHz
Input	Trigger LED forward current	IFT (IFC) *2		ypical	1	.6		;	3	1			mA	G3VM-353A/353D/ 353B/353E: loff=10 µA Others: lo=Continuous load current ratings
	Release LED forward current	IFC (IFT) *2	Mil	nimum				0	.1				mA	G3VM-353A/353D/ 353B/353E: Io=150 mA Others: IoFF=100 μA
			Typical	Connection A				35 25)	1	5	18	17 11		G3VM-61A1/61D1/61B1/ 61E1/351A/351D/351B/ 351E/401A/401D/401B/
			,,	Connection B Connection C	-	0.5 0.25	-	28 14	-	8	-	6	ł	401E: IF=5 mA,
	Maximum resistance	Bon		Connection A	2	2		i0 i5)	2	5	3	15	Ω	lo=Continuous load current ratings
	with output ON	HON		Connection B	1	1	(0	40		14		20	5.2	Values in parentheses are for t < 1 s.
Output			Maximum	Connection C	-	-	-	20	-	7	-	10		G3VM-353A/353D/ 353B/353E: lo=Continuous load current ratings
	Current leakage when the relay is open	ILEAK	Ma	ıximum					1				μА	G3VM-353A/353D/ 353B/353E: IF=5mA, Voff=Load voltage ratings Others: Voff=Load voltage ratings
	Capacitance between terminals	Coff	T	ypical	13	30	3	80	8	5	4	10	pF	V=0, f=1 MHz
be	apacitance etween I/O rminals	CI-O	T	ypical			•	0	.8		,		pF	f=1 MHz, Vs=0 V
	sulation sistance		Mi	nimum				10	100					Vi-o=500 VDC,
be	sistance etween I/O rminals	Ri-o		ypical					08				ΜΩ	RoH≤60%
Tu	ırn-ON time	ton		ypical ximum		.8	0	.3	0	.1 1	-	0.3		I= 5 = A D: 000 O
				ypical	2		.1			1	_	0.1	ms	IF=5 mA, RL=200 Ω, VDD=10 V <b>*1</b>
Tu	ırn-OFF time	toff		ıximum	0	.5		1		3		1	t	

\*1. Turn-ON and Turn-OFF Times

\*2. These values are for Relays with NC contacts



#### ■Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol	·	G3VM-61A1 G3VM-61D1								Unit
Load voltage (AC peak/DC)	VDD	Maximum	48	3		28	30		32	20	٧
Operating LED		Minimum				į	5				
Operating LED forward current	lF	Typical		7.5		10	-	-	7.	5	
ioiwaia cariciit		Maximum				2	5				mΑ
Continuous load current (AC peak/DC)	lo	Maximum	50	10	10	00	15	50	100	120	
Ambient operating	Ta	Minimum			•	-2	20				°C
temperature	ı a	Maximum		65							C

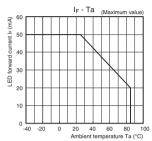
## ■Spacing and Insulation

Item	Minimum	Unit
Creepage distances	7.0	
Clearance distances	7.0	mm
Internal isolation thickness	0.4	

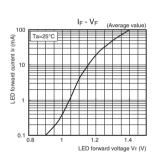
G3VM-□A□/□D□/□BI

#### **■**Engineering Data

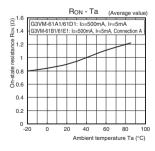
#### LED forward current vs. Ambient temperature



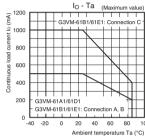
#### LED forward current vs. LED forward voltage



On-state resistance vs. Ambient temperature G3VM-61A1/61D1/61B1/61E1

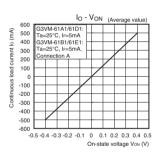


#### Continuous load current vs. Ambient temperature G3VM-61A1/61D1/61B1/61E1

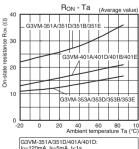


 Continuous load current vs. On-state voltage



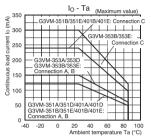


#### G3VM-351A/351D/351B/351E G3VM-353A/353D/353B/353E G3VM-401A/401D/401B/401E

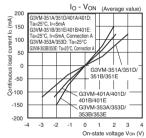


G3VM-351A/351D/401A/401D: lo=120mA, lr=5mA, t<1s G3VM-351B/351E/401B/401E: lo=120mA, Ir=5mA, t<1s, Connection A G3VM-353A/353D: lo=150mA, t<1s G3VM-353B/353E: lo=150mA, t<1s, Connection A

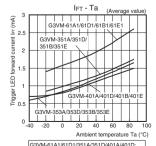
#### G3VM-351A/351D/351B/351E G3VM-353A/353D/353B/353E G3VM-401A/401D/401B/401E



#### G3VM-351A/351D/351B/351E G3VM-353A/353D/353B/353E G3VM-401A/401D/401B/401E



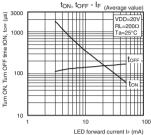
#### Trigger LED forward current vs. Ambient temperature



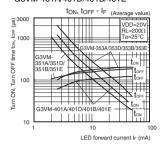
Io=Continuous Load Current Ratings, t<1s G3VM-61B1/61E1/351B/351E/401B/401E G3VM-91B1/91E1/391B351E/401B21 ID=Continuous Load Current Ratings, t<1s, Connection A G3VM-353A/353D: IoFF=10µA, G3VM-353B/353E: IoFF=10µA, Connection A

#### **■**Engineering Data

# Turn ON, Turn OFF time vs. LED forward current G3VM-61A1/61D1/61B1/61E1

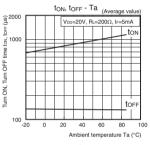


G3VM-351A/351D/351B/351E G3VM-353A/353D/353B/353E G3VM-401A/401D/401B/401E

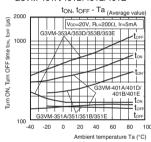


Current leakage vs.
 Ambient temperature

● Turn ON, Turn OFF time vs. Ambient temperature G3VM-61A1/61D1/61B1/61E1



G3VM-351A/351D/351B/351E G3VM-353A/353D/353B/353E G3VM-401A/401D/401B/401E



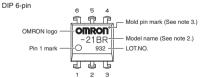
# | LEAK - Ta (Average value) | GSVM-SSAVSSDXSSB3SSE | Vors=SSVV, Is=SSVV, Is=SimA | Ib deter live 1-lad value grape | Ib deter live 1-lad value

## ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

#### DIP (Dual Inline Package)

OMRON logo



#### Terminal Arrangement/Internal Connections (Top View)





Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

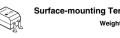
Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

## **■Dimensions** (Unit: mm)



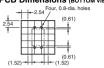








## PCB Dimensions (BOTTOM VIEW)



#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)



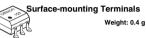
Note: The actual product is marked differently from the image shown here.

DIP6

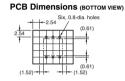


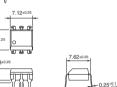
2 5/1-0 25

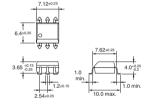




10.0 may







#### **Actual Mounting Pad Dimensions** (Recommended Value, Top View)



7.85 to 8.80 Note: The actual product is marked differently from the image shown here.

## **■**Approved Standards

0.5±0.1 - 2.54±0.25

UL recognized

Ü						
	Мо	del		Approved Standards	Contact form	File No.
G3VM-61A1 G3VM-351A G3VM-401A	G3VM-61D1 G3VM-351D G3VM-401D	G3VM-61B1 G3VM-351B G3VM-401B	G3VM-61E1 G3VM-351E G3VM-401E	UL (recognized)	1a (SPST-NO)	E80555
G3VM-353A	G3VM-353D	G3VM-353B	G3VM-353E		1b (SPST-NC)	

Models Certified by BSI for EN/IEC Standards

Model	Approved Standards	Contact form	File No.
G3VM-351A G3VM-351D	EN 60950/EN 60065 (BSI certified)	1a (SPST-NO)	8816 8817

#### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays SOP 4-pin, General-purpose Type

## General-purpose MOS FET Relays in SOP 4-pin packages for a wide range of applications

- Contact form: 1a (SPST-NO) or 1b (SPST-NC)
- Load voltage: 60 V

RoHS Compliant

SOP 4-pin





Note: The actual product is marked differently from the image shown here.

#### ■Application Examples

- Semiconductor test equipment
- Test & Measurement equipment Communication equipment

■Package (Unit: mm, Average)

Special

SOP 4-pin

- · Security equipment · Industrial equipment

  - Power circuit
- Amusement equipment

#### **■**Model Number Legend

G3VM-1 2 3 4 5

1. Load voltage 6: 60 V

2. Contact form 1: 1a (SPST-NO) 3: 1b (SPST-NC)

4. Additional functions None: Dielectric strength between I/O 1500 V Dielectric strength between I/O 3750 V

## 3. Package

G: SOP 4-pin V: Special SOP 4-pin

#### 5. Other informations

When specifications overlap, serial code is added in the recorded order.

#### Note: The actual product is marked differently from the image shown here. ■Ordering Information

			Load voltage	Continuous			Tape packaging								
Package	Contact form	Terminals	(peak value) *	load current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity							
				400 mA	G3VM-61G1		G3VM-61G1(TR)								
SOP4					G3VM-61G2	100 pcs.	G3VM-61G2(TR)	2500 pcs.							
					G3VM-61G3		G3VM-61G3(TR)								
	1a (SPST-NO)			100 mA	G3VM-61VY1		G3VM-61VY1(TR)	3000 pcs.							
	1a (SFS1-NO)	Surface-mounting Terminals	60 V	F00 A	F00 A	E00 mA	E00 mA	E00 mA	500 mA	E00 mA	E00 mA	G3VM-61VY2		G3VM-61VY2(TR05)	500 pcs.
Special SOP 4-pin		reminais		500 IIIA	G3VIVI-61V12	125 pcs.	G3VM-61VY2(TR)	3000 pcs.							
001 + piii				700 mA <b>G3VM-61VY3</b>	700 4	700 4	00//14 04///0	00/41 04/0/0		G3VM-61VY3(TR05)	500 pcs.				
						G3VM-61VY3(TR)	3000 pcs.								
SOP4	1b (SPST-NC)			500 mA	G3VM-63G	100 pcs.	G3VM-63G(TR05)	500 pcs.							

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" or "(TR05)" to the end of the model number.

#### ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-61G1G	3VM-61G2	G3VM-61G3	G3VM-61VY1	G3VM-61VY2	G3VM-61VY3	G3VM-63G	Unit	Measurement conditions
	LED forward current	lF	50			3	0		50	mA	
Input	LED forward current reduction rate	ΔIF/°C	-0.5	5		-0	1.3		-0.5	mA/°C	Ta ≥ 25°C
ŭ	LED reverse voltage	VR		į	5			3	5	٧	
	Connection temperature	TJ				125				°C	
	Load voltage (AC peak/DC)	Voff				60				٧	
=	Continuous load current (AC peak/DC)	lo	400			100	500	700	500	mA	
Output	ON current reduction rate	Δlo/°C		-4.0		-1.0	-5.0	-7.0	-5.0	mA/°C	Ta ≥ 25°C
0	Pulse ON current	lop	1200		1200 300		1500	2100	1500	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ			125					°C	
D	ielectric strength between I/O *	V <sub>I</sub> -O		1500			3750		1500	Vrms	AC for 1 min
Α	mbient operating temperature	Ta	-40 to +85 -40 to +110 -40 to +10				-40 to +105	°C	With no icing or		
Α	Ambient storage temperature Tstg			-55 to +125							condensation
	oldering temperature	-				260				°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

## $G3VM-6\square G\square/61VY$

#### **■Electrical Characteristics** (Ta = 25°C)

	Item	Symbol		G3VM-61G1	G3VM-61G2	G3VM-61G3	G3VM-61VY1	G3VM-61VY2	G3VM-61VY3	G3VM-63G	Unit	Measurement conditions						
	LED forward		Minimum	1	.0			.1		1.0								
	voltage	VF	Typical	1.15			1.	1.27 1.15			٧	IF=10 mA						
			Maximum	1	.3			.4		1.3								
	Reverse current	IR	Maximum				10				μΑ	VR=5 V						
	Capacitance between terminals	Ст	Typical		30		50		30		pF	V=0, f=1 MHz						
Input	Trigger LED forward current	IFT (IFC)	Typical	1.6	0.4	-	0.2		1	0.6	mA	G3VM-61G1/61G2/61G3: lo=400 mA G3VM-61VY1: lo=100 mA G3VM-61VY2: lo=500 mA						
	forward current	*2	Maximum	3	1	0.2	1		3			G3VM-61VY3: Io=700 mA G3VM-63G : IoFF=10 μA						
	Release LED	IFC	Minimum	0	.1	-	0.01		0.1		mA	G3VM-61G1/61G2/61G3/61VY1/						
	forward current	(IFT) *2	Typical		_	0.001	-	0.5		-	mA	61VY2/61VY3: loFF=100 μA G3VM-63G: lo=500 mA						
			Typical		1		25	1	0.15	1		G3VM-61G1:IF=5 mA, Io=400 mA G3VM-61G2:IF=2 mA, Io=400 mA						
Output	Maximum resistance with output ON Maximum		Maximum	2			50	2 2.5		2.5	Ω	G3VM-61G3 :I=0.5 mA, Io=400 mA, t<1s G3VM-61VV1 :I=2 mA, Io=100 mA, t<1s G3VM-61VY2 :IF=5 mA, Io=500 mA G3VM-61VY3 :IF=5 mA, Io=700 mA G3VM-63G: Io=500 mA						
	Current leakage		Typical	- 1		1		-	2 -				2 -		2 –			.,
	when the relay is open	İLEAK	Maximum				1000				nA	Voff=60 V						
	Capacitance between terminals	Coff	Typical		130		10	20	100		pF	G3VM-61G1/61G2/61G3/61VY1/ 61VY2/61VY3: V=0, f=1 MHz G3VM-63G: V=0, f=1 MHz, IF=5 mA						
	pacitance between terminals	Cı-o	Typical				8.0				pF	f=1 MHz, Vs=0 V						
	ulation resistance ween I/O terminals	Ri-o	Minimum				1000 108				МΩ	Vi-o=500 VDC, RoH≤60%						
			Typical Typical	0.8	3	3.5	10°	0.6	2	0.3		G3VM-61G1/63G:IF=5 mA, RL=200 Ω, VDD=20 V *1						
Tu	rn-ON time	ton	Maximum	2	8	10	5	2	3	1	1	G3VM-61G2 :IF=2 mA, RL=200 Ω, VDD=20 V *1 G3VM-61G3 :IF=0.5 mA.						
Tu	rn-OFF time	toff	Typical	0.1	0.1 1			0.1 0.7			ms	RL=200 Ω, VDD=20 V *1 G3VM-61VY1:IF=2 mA, RL=200 Ω, VDD=10 V *1						
	2770	ne toff Maximum		0.5	3	į	5	0.5		3		G3VM-61VY2/61VY3:IF=5 mA, RL=200 Ω, VDD=20 V *1						

\*1. Turn-ON and Turn-OFF Times







\*2. These values are for Relays with NC contacts

## **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-61G1	G3VM-61G2	G3VM-61G3	G3VM-61VY1	G3VM-61VY2	G3VM-61VY3	G3VM-63G	Unit
Load voltage (AC peak/DC)	VDD	Maximum	n 48					V		
		Minimum	5		=	2		5		
Operating LED forward current	lF	Typical	7.5	2	0.5	5	7.	.5	-	mA
		Maximum	25		15		25		шА	
Continuous load current (AC peak/DC)	lo	Maximum	400	400 320		80	500	700	500	
Ambient operating temperature	Ta	Minimum	-20				°C			
Ambient operating temperature	ı a	Maximum	65			10	00	85		

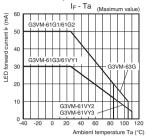
## **■**Spacing and Insulation

Item	G3VM-6□G□	G3VM-61VY□	Unit	
item	Mini	Ollit		
Creepage distances	4.0	5.0		
Clearance distances	4.0	5.0	mm	
Internal isolation thickness	0.1	0.2	1	

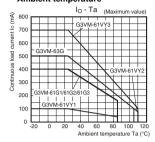
SOP

#### ■Engineering Data

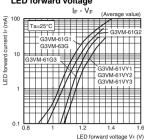
## LED forward current vs. Ambient temperature



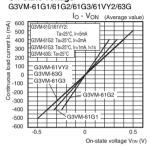
## Continuous load current vs. Ambient temperature

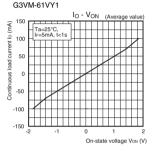


#### LED forward current vs. LED forward voltage

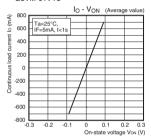


## Continuous load current vs. On-state voltage

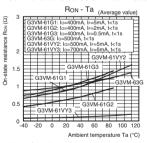




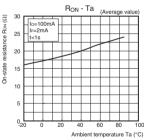
G3VM-61VY3



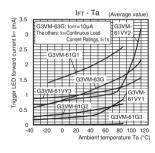
# On-state resistance vs. Ambient temperature G3VM-61G1/61G2/61G3/61VY2/61VY3/63G



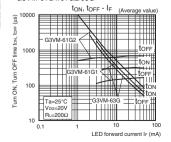
#### G3VM-61VY1



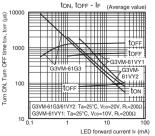
 Trigger LED forward current vs. Ambient temperature



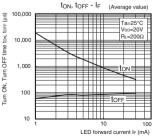
#### Turn ON, Turn OFF time vs. LED forward current G3VM-61G1/61G2/63G



#### G3VM-61G3/61VY1/61VY2



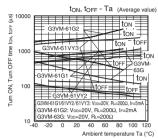
G3VM-61VY3



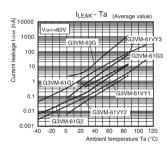
#### ■Engineering Data

# Turn ON, Turn OFF time vs. Ambient temperature G3VM-61G1/61G2/63G/61VY2/61VY3

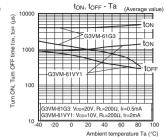
 $G3VM-6\square G\square/61VY$ 



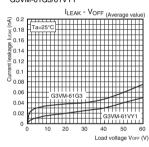
## Current leakage vs. Ambient temperature



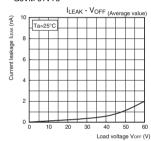
#### G3VM-61G3/61VY1



#### Current leakage vs. Load voltage G3VM-61G3/61VY1



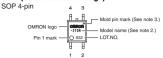
#### G3VM-61VY3



#### ■Appearance/Terminal Arrangement/Internal Connections

#### Appearance

#### SOP (Small Outline Package)



Special SOP 4-pin (G3VM-61VY1/61VY2/61VY3)



Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 2. "G3VM" does not appear in the model number on the Helay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

■Dimensions (Unit: mm)

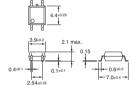
SOP (Small Outline Package)

SOP 4-pin



#### **Surface-mounting Terminals**

Weight: 0.1 g



# ●Terminal Arrangement/Internal Connections (Top View)

G3VM-61G1/61G2/61G3/61VY1/61VY2/61VY3



G3VM-63G



#### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



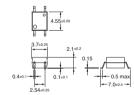
Note: The actual product is marked differently from the image shown here.

Special SOP 4-pin \*(G3VM-61VY1/61VY2/61VY3)



#### **Surface-mounting Terminals**

Weight: 0.1 g



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



\* The external dimensions are different from those of the standard SOP 4-pin, but the mounting pad dimensions are the same. **Note:** The actual product is marked differently from the image shown here.

## ■Approved Standards

UL recognized

Model	Approved Standards	Contact form	File No.
G3VM-61G1 G3VM-61G2 G3VM-61G3 G3VM-61VY1 G3VM-61VY2 G3VM-61VY3	UL recognized	1a (SPST-NO)	E80555
G3VM-63G		1b (SPST-NC)	

#### ■Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays SOP 4-pin, General-purpose Type

# **General-purpose MOS FET Relays** in SOP 4-pin packages for a wide range of applications

• Load voltage: 80 V

RoHS Compliant



Note: The actual product is marked differently from the image shown here.

# ■Application Examples

- · Semiconductor test equipment
- Test & Measurement equipment
- Communication equipment
- Security equipment
- Industrial equipment
- Power circuit
- Amusement equipment

# ■Package (Unit:mm, Average)

SOP 4-pin



Note: The actual product is marked differently from the image shown here.

## **■**Model Number Legend

G3VM-1 2 3 4

1. Load Voltage 2. Contact form

3. Package 8: 80 V 1: 1a (SPST-NO) G: SOP 4-pin

4. Other informations

When specifications overlap, serial code is added in the recorded order.

# **■**Ordering Information

				Continuous	Stick pa	ckaging	Tape packaging		
Package	Contact form	Terminals	Load voltage (peak value) *	load current	Model	Minimum package quantity	Model	Minimum package quantity	
SOP4	1a (SPST-NO)	Surface-mounting Terminals	80 V	350 mA	G3VM-81G1	100 pcs.	G3VM-81G1(TR)	2,500 pcs.	

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

## ■Absolute Maximum Ratings (Ta = 25°C)

	<u> </u>			
Item	Symbol	G3VM-81G1	Unit	Measurement conditions
LED forward current	lF	50	mA	
5 LED forward current reduction rate	Δlr/°C	-0.5	mA/°C	Ta ≥ 25°C
LED forward current reduction rate  LED reverse voltage	VR	5	V	
Connection temperature	TJ	125	°C	
Load voltage (AC peak/DC)	Voff	80	V	
Continuous load current (AC peak/DC)	lo	350	mA	
ON current reduction rate	Δlo/°C	-3.5	mA/°C	Ta ≥ 25°C
O Pulse ON current	lop	1.05	mA	t=100 ms, Duty=1/10
Connection temperature	TJ	125	°C	
Dielectric strength between I/O ★	V <sub>I-O</sub>	1500	Vrms	AC for 1 min
Ambient operating temperature	Ta	-20 to +85	°C	\A/:4b i-i
Ambient storage temperature	Tstg	-40 to +125	°C	With no icing or condensation
Soldering temperature	_	260	°C	10 s

<sup>★</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

	Item	Symbol		G3VM-81G1	Unit	Measurement conditions
			Minimum	1.0		
	LED forward voltage	VF	Typical	1.15	V	IF=10 mA
			Maximum	1.3		
Input	Reverse current	lr	Maximum	10	μА	VR=5 V
트	Capacitance between terminals	Ст	Typical	15	pF	V=0, f=1 MHz
	Trigger I ED forward current	IFT	Typical	1	mA	lo=350 mA
	Trigger LED forward current	IFI	Maximum	4	IIIA	10=350 IIIA
	Release LED forward current	IFC	Minimum	0.2	mA	Ioff=10 μA
	Maximum resistance with output	Ron	Typical	1	Ω	IF=5 mA, Io=350 mA
	ON	TION	Maximum	1.2	22	11 =3 111A, 10=330 111A
Output	Current leakage when the relay is	ILEAK	Typical	0.2	nA	Voff=30 V, Ta=50°C
ō	open	ILEAN	Maximum	1	IIA	VOFF=30 V, 1a=30 C
	Capacitance between terminals	Coff	Typical	30	pF	V=0, f=100 MHz
	Capacitance between terminals	COFF	Maximum	40	pi	V=0, 1=100 WH 12
Ca	pacitance between I/O terminals	Cı-o	Typical	0.8	pF	f=1 MHz, Vs=0V
Ins	sulation resistance between I/O	R <sub>I-O</sub>	Minimum	1000	MO.	Vi-o=500 VDC, RoH≤60%
ter	minals	ni-u	Typical	108	IVISZ	VI-0=500 VDC, NOH≤60%
т.,	rn-ON time	ton	Typical	0.3		
Tu	III-ON UIIIE	ION	Maximum	0.5	ms	IF=5 mA, RL=200 $\Omega$ ,
т.,	rn-OFF time	toff	Typical	0.3	1115	VDD=20 V *
Tu	in-Oi i uine	time		0.5		

#### \* Turn-ON and Turn-OFF Times



# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

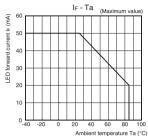
Item	Symbol		G3VM-81G1	Unit
Load voltage (AC peak/DC)	VDD	Maximum	64	V
Operating LED forward current	lF	Minimum	5	
Operating LED forward current	IF.	Maximum	30	mA
Continuous load current (AC peak/DC)	lo	Maximum	350	
Ambient operating temperature	Ta	Minimum	-20	°C
Ambient operating temperature	1a	Maximum	60	

# **■**Spacing and Insulation

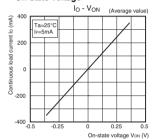
Item	Minimum	Unit
Creepage distances	4.0	
Clearance distances	4.0	mm
Internal isolation thickness	0.1	

G3VM-81G

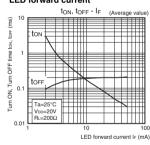
# LED forward current vs. Ambient temperature



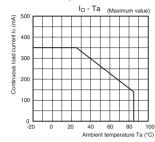
# Continuous load current vs. On-state voltage



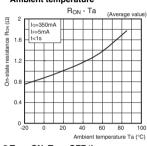
Turn ON, Turn OFF time vs. LED forward current



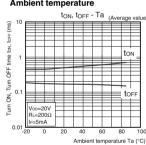
#### Continuous load current vs. Ambient temperature



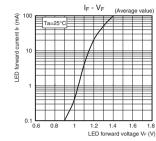
#### On-state resistance vs. Ambient temperature



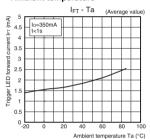
# Turn ON, Turn OFF time vs. Ambient temperature



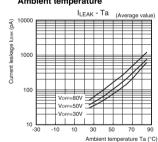
# LED forward current vs. LED forward voltage



#### Trigger LED forward current vs. Ambient temperature



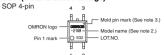
# Current leakage vs. Ambient temperature



# ■Appearance / Terminal Arrangement / Internal Connections

## Appearance

#### SOP (Small Outline Package)



Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

### Terminal Arrangement/Internal Connections (Top View)

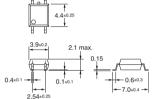


## ■Dimensions (Unit: mm)



## **Surface-mounting Terminals**

Weight: 0.1 g



#### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



Note: The actual product is marked differently from the image shown here.

# ■Approved Standards

UL recognized 🔧

Approved Standards	Contact form	File No.
UL (recognized)	1a (SPST-NO)	E80555

# **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

# G3VM-201G<sup>-</sup>/S5

MOS FET Relays SOP 4-pin, General-purpose Type

# General-purpose MOS FET Relays in SOP 4-pin packages for a wide range of applications

Load voltage: 200 V

RoHS Compliant





Note: The actual product is marked differently from the image shown here

## ■Application Examples

- · Semiconductor test equipment
- Test & Measurement equipment Communication equipment
- Security equipment Industrial equipment
- Power circuit
- Amusement equipment

### ■Package

(Unit: mm, Average)

SOP 4-pin



Note: The actual product is marked differently from the image shown here.

## ■Model Number Legend

G3VM-1 2 3 4

1. Load Voltage 2. Contact form 20:200 V

1:1a (SPST-NO)

3. Package G: SOP 4-pin

4. Other informations

When specifications overlap, serial code is added in the recorded order.

Note: The model number legend for the G3VM-S5 is different from the above legend.

# **■**Ordering Information

					Stick packa	ging	Tape packa	ging						
Package	Contact form	Terminals	Load voltage (peak value) *	Continuous load current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity						
			200 V	50 mA	G3VM-201G		G3VM-201G(TR)							
SOP4	1a	Surface-mounting		200.14	000 1/	000.1/	000.1/	000 1/	000 1/		G3VM-201G1	100 pcs.	G3VM-201G1(TR)	2,500 pcs.
30F4	(SPST-NO)	Terminals		200 mA	G3VM-201G2	100 pcs.	G3VM-201G2(TR)	2,500 pcs.						
					G3VM-S5		G3VM-S5(TR)							

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-201G	G3VM-201G1	G3VM-201G2	G3VM-S5	Unit	Measurement conditions
	LED forward current	lF	5	0	30	50	mA	
Ħ	Repetitive peak LED forward current	IFP			1		Α	100 μs pulses, 100 pps
Input	LED forward current reduction rate	ΔIF/°C	-0	.5	-0.3	-0.5	mA/°C	Ta ≥ 25°C
	LED reverse voltage	VR			5		V	
	Connection temperature	TJ	125				°C	
	Load voltage (AC peak/DC)	Voff		20	00		V	
Ħ	Continuous load current (AC peak/DC)	lo	50		200		mA	
Output	ON current reduction rate	Δlo/°C	-0.5		-2		mA/°C	Ta ≥ 25°C
0	Pulse ON current	lop	150		600		mA	t=100 ms, Duty=1/10
	Connection temperature	TJ		12	25		°C	
Die	electric strength between I/O *	VI-O	1500			Vrms	AC for 1 min	
An	nbient operating temperature	Ta	-40 to +85			°C	With no icing or	
An	nbient storage temperature	Tstg	-55 to +125			°C	condensation	
So	Idering temperature	-		26	60		°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

	Item	Symbol		G3VM-201G	G3VM-201G1	G3VM-201G2	G3VM-S5	Unit	Measurement conditions
	LED forward		Minimum	1	.0	1.1	1.0		
	voltage	VF	Typical	1.	15	1.27	1.15	V	IF=10 mA
	voltage		Maximum	1	.3	1.4	1.3		
	Reverse current	IR	Maximum		1	0		μА	V <sub>R</sub> =5 V
nbnt	Capacitance between terminals	Ст	Typical		3	0		pF	V=0, f=1 MHz
	Trigger LED forward	let	Typical	1	0.4	1	1	mA	G3VM-201G : Io=50 mA
	current	IF1	Maximum	3	1	0.2	3	IIIA	G3VM-201G1/201G2/S5 : Io=200 mA
	Release LED	IFC	Minimum	0	.1	ı	0.1	mA	Ioff=100 μA
	forward current		Typical		-	0.001	-		ιοπ - 100 μπ
	Maximum		Typical	40		5			G3VM-201G/S5: IF=5 mA,
=	resistance with output ON	Ron	Maximum	50		8		Ω	lo=Continuous load current ratings G3VM-201G1 : IF=2 mA, lo=200 mA G3VM-201G2 : IF=0.5 mA, lo=200 mA, t < 1s
Output	Current leakage		Typical	=		1	-		G3VM-201G : Voff=160 V G3VM-201G1/201G2/S5 : Voff=200 V
õ	when the relay is open	ILEAK	Maximum	1		1,000		nA	
	Capacitance	COFF	Typical	15	9	0	100	ρF	G3VM-201G : V=0, f=1 MHz, t < 10s
	between terminals	COFF	Maximum	20		-		þΓ	G3VM-201G1/201G2/S5 : V=0, f=1 MHz
	pacitance between I/ terminals	Cı-o	Typical		0	.8		pF	f=1 MHz, Vs=0 V
Ins	sulation resistance	Ri-o	Minimum		10	00		МΩ	Vi-o=500 VDC, RoH≤60%
be	tween I/O terminals	ni-0	Typical		1	D <sub>8</sub>		IVISZ	VI-0=500 VDC, ROH≤60%
Tu	rn-ON time	ton	Typical	ı	3	3.5	0.6		G3VM-201G/S5 : IF=5 mA, RL=200 Ω, Vpp=20 V *
		LOIV	Maximum	0.5	8	10	1.5	ms	G3VM-201G1 : IF=2 mA, RL=200 Ω,
Tu	rn-OFF time	torr	Typical	-	0.6	1	0.1	IIIS	V <sub>DD</sub> =20 V * G3VM-201G2 : I <sub>F</sub> =0.5 mA, R <sub>L</sub> =200 Ω,
lu	III-OI I IIIIIB	IUFF	Maximum	0.2	3	5	1		VDD=20 V *

#### \* Turn-ON and Turn-OFF Times



# ■Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

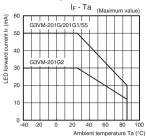
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-201G	G3VM-201G1	G3VM-201G2	G3VM-S5	Unit
Load voltage (AC peak/DC)	VDD	Maximum	160			200	٧
Operating LED forward		Minimum	5	-	-	5	
current	lF	Typical	7.5	2	0.5	7.5	
Garrona		Maximum	15		25		mA
Continuous load current (AC peak/DC)	lo	Maximum	40	16	60	130	
Ambient operating	Ta	Minimum		-2	20		ô
temperature	ıd	Maximum		65			

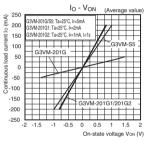
# **■**Spacing and Insulation

Item	Minimum	Unit
Creepage distances	4.0	
Clearance distances	4.0	mm
Internal isolation thickness	0.1	

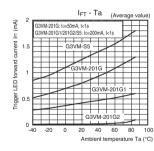
# LED forward current vs. Ambient temperature



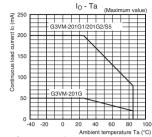
Continuous load current vs.
 On-state voltage



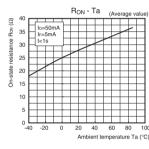
# Trigger LED forward current vs. Ambient temperature



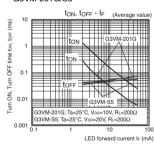
# Continuous load current vs. Ambient temperature



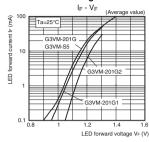
# On-state resistance vs. Ambient temperature G3VM-201G



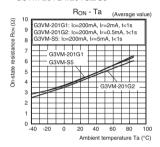
#### ● Turn ON, Turn OFF time vs. LED forward current G3VM-201G/S5



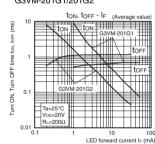
# LED forward current vs. LED forward voltage



#### G3VM-201G1/201G2/S5



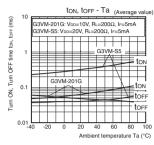
## G3VM-201G1/201G2



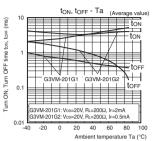
# G3VM-201G□,

# **■**Engineering Data

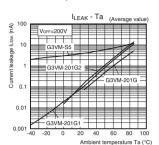
#### ● Turn ON, Turn OFF time vs. Ambient temperature G3VM-201G/S5



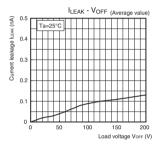
#### G3VM-201G1/201G2



# Current leakage vs. Ambient temperature



#### Current leakage vs. Load voltage G3VM-201G2



# ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

#### SOP (Small Outline Package)

SOP 4-pin OMBON Inco Model name (See note 2.) LOTNO

G3VM-201G□/S5

Note: 1. The actual product is marked differently from the image shown here. Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

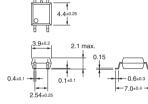
### ●Terminal Arrangement/Internal Connections (Top View)



### ■Dimensions (Unit: mm)

#### **Surface-mounting Terminals**

Weight: 0.1 a



## **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



Note: The actual product is marked differently from the image shown here

# **■**Approved Standards

UL recognized

Approved Standards	Contact form	File No.		
UL (recognized)	1a (SPST-NO)	E80555		

#### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

# G3VM-35 G /351VY/401 MOS FET Relays SOP 4-pin, General-purpose Type

# **General-purpose MOS FET Relays** in SOP 4-pin packages for a wide range of applications

- Contact form: 1a (SPST-NO) or 1b (SPST-NC)
- . Load voltage: 350 V or 400 V

RoHS Compliant





Note: The actual product is marked differently from the image shown here.

# ■Application Examples

- · Semiconductor test equipment
- Test & Measurement equipment
- Communication equipment
- · Various battery-driven devices
- Security equipment
- Industrial equipment
- Power circuit
- Amusement equipment

#### ■Package

(Unit: mm, Average)

SOP 4-pin

Special SOP 4-pin





Note: The actual product is marked differently from the image shown here.

# ■Model Number Legend

G3VM----1 2 3 4 5

1. Load Voltage

2. Contact form 35:350 V

1:1a (SPST-NO) 40:400 V 3:1b (SPST-NC)

#### 4. Additional functions

None: Dielectric strength between I/O 1500 V Dielectric strength between I/O 3750 V

#### 3. Package

G: SOP 4-pin

V : Special SOP 4-pin

#### 5. Other informations

When specifications overlap, serial code is added in the recorded order

# ■Ordering Information

			Load voltage	Continuous	Stick p	ackaging	Tape pac	kaging	
Package	Contact form	Terminals	(peak value) *	load current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity	
SOP4				100 mA	G3VM-351G1	100 pcs.	G3VM-351G1(TR)	2,500 pcs.	
30F4	1a				G3VM-351G	100 pcs.	G3VM-351G(TR)	2,500 pcs.	
Special SOP	(SPST-NO)	Surface-	350 V	110 mA	G3VM-351VY	125 pcs.	G3VM-351VY(TR05)	500 pcs.	
4-PIN		mounting			G3VW-351V1	125 pcs.	G3VM-351VY(TR)	3,000 pcs.	
	1b (SPST-NC)	Terminals		120 mA	G3VM-353G		G3VM-353G(TR)		
SOP4	1a		400 V	100 mA	G3VM-401G1	100 pcs.	G3VM-401G1(TR)	2,500 pcs.	
	(SPST-NO)		400 V	120 mA	G3VM-401G		G3VM-401G(TR)	1	

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)", "(TR05)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-351G1	G3VM-351G	G3VM-351VY	G3VM-353G	G3VM-401G1	G3VM-401G	Unit	Measurement conditions
	LED forward current	lF	50		30	50	30	50	mA	
put	LED forward current reduction rate	ΔIF/°C	-0.5		-0.3	-0.5	-0.3	-0.5	mA/°C	Ta ≥ 25°C
트	LED reverse voltage	VR	ţ	5	6		5		٧	
	Connection temperature	TJ			12	25			ç	
	Load voltage (AC peak/DC)	Voff	350		50	40		00	٧	
Ħ	Continuous load current (AC peak/DC)	lo	100	100 1		120	100	120	mA	
Output	ON current reduction rate	Δlo/°C	-1.0 -		1.1	-1.2	-1.0	-1.2	mA/°C	Ta ≥ 25°C
0	Pulse ON current	lop	300 3		330 3		300	360	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ			12	25	•	•	ç	
Di	electric strength between I/O *	VI-O	15	00	3750		1500		Vrms	AC for 1 min
Ar	Ambient operating temperature		-40 to +85 -40 to		-40 to +110		-40 to +85		°C	With no icing or
Αı	mbient storage temperature	Tstg	-55 to +125					ç	condensation	
S	oldering temperature	-			26	60			°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

 $G3VM-35\Box G\Box/351VY/401G\Box$ 

	Item	Symbol		G3VM- 351G1	G3VM- 351G	G3VM- 351VY	G3VM- 353G	G3VM- 401G1	G3VM- 401G	Unit	Measurement conditions
			Minimum		.0	1.1	1.0	1.1	1.0		
	LED forward voltage	VF	Typical	1.	15	1.27	1.15	1.27	1.15	V	IF=10 mA
	voitage		Maximum	1	.3	1.4	1.3	1.4	1.3		
	Reverse current	IR	In Maximum 10	•	•	μΑ	VR=5 V				
+	Capacitance between terminals	Ст	Typical			3	10			pF	V=0, f=1 MHz
Input	Trigger LED	IFT (IFC)	Typical	0.4	1	0.8	1	-	1	mA	G3VM-351G1/351G/401G1 : lo=100 mA G3VM-351VY : lo=110 mA
	forward current	*2	Maximum	1		3		0.2	3	IIIA	G3VM-353G : IoFF=10 μA G3VM-401G : Io=120 mA
	Release LED	IFC (IFT)	Minimum		0	.1		-	0.1	mA	G3VM-351G1/351VY/351G/401G1/401G:
	forward current	*2	Typical	-	=	0.4	-	0.001	-		G3VM-353G : lo=120 mA
			Typical	35	(25)	35 (22)	15	18	17		G3VM-351G1 : IF=2 mA, Io=100 mA Values in parentheses are for t < 1 s. G3VM-351G : IF=5 mA, Io=110 mA
Output	Maximum resistance with output ON	Ron	Maximum		50 (35)		25	3	5	Ω	Values in parentheses are for $t < 1$ s. G3VM-351VY: IF=5 mA, Io=110 mA Values in parentheses are for $t < 1$ s. G3VM-353G: Io=120 mA G3VM-401G1: IF=0.5 mA, Io=100 mA, $t < 1$ s G3VM-401G1: IF=0.5 mA, Io=120 mA
	Current leakage when the relay is	li fak	Typical	1	-	1	-	1	-	nA	G3VM-351G1/351VY/351G: Voff=350 V G3VM-353G: Voff=350 V. If=5 mA
	open	ILEAN	Maximum			1,0	000			IIA	G3VM-401G1/401G: Voff=400 V
	Capacitance between terminals	Coff	Typical	35	30	30	65	7	0	pF	G3VM-351G1/351VY/351G/401G1/401G : V=0, f=1 MHz G3VM-353G : V=0, f=1 MHz, IF=5 mA
	pacitance between terminals	Ci-o	Typical			0	.8			pF	f=1 MHz, Vs=0 V
	sulation resistance						00			МΩ	Vi-o=500 VDC, RoH≤60%
be	tween I/O terminals	0	Typical		,	1	08	,	,		1.0-000 120, 1.0.120070
To	rn-ON time	ton	Typical	1	0.3	0.5	-	2	0.3		G3VM-351G1:
10	III OII IIIII	LON	Maximum	5		1		10	1	ms	IF=2 mA, RL=200 Ω, VDD=20 V G3VM-401G1 :
_	OFF #:		Typical	1	0	.1	-	1	0.1	ms	IF=0.5 mA, RL=200 Ω, VDD=20 V
Tu	rn-OFF time	toff	Maximum	3	1	0.5	3	5	1	1	Others : IF=5 mA, RL=200 $\Omega$ , VDD=20 V <b>*1</b>

\*1. Turn-ON and Turn-OFF Times





G3VM-351G1/G/VY



G3VM-353G

\*2. These values are for Relays with NC contacts

# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-351G1	G3VM-351G	G3VM-351VY	G3VM-353G	G3VM-401G1	G3VM-401G	Unit	
Load voltage (AC peak/DC)	VDD	Maximum		280				320		
		Minimum	-		5		-	5		
Operating LED forward current	IF	Typical	2	7	.5	-	0.5	7.5	mA	
		Maximum			2	5	•		111/4	
Continuous load current (AC peak/DC)	lo	Maximum	80	100	110	120	80	120		
Ambient operating temperature	Ta	Minimum			-2	20			°C	
Ambient operating temperature	ı a	Maximum	6	5	100	6	i5		Ü	

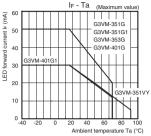
# **■**Spacing and Insulation

Item	G3VM-35 G /401G	Unit		
item	Minii	Uillt		
Creepage distances	4.0	5.0		
Clearance distances	4.0	5.0	mm	
Internal isolation thickness	0.1	0.2		

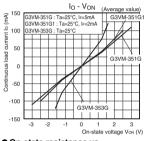
SOP

# **■**Engineering Data

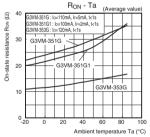
# LED forward current vs. Ambient temperature



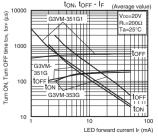
# Continuous load current vs. On-state voltage G3VM-351G/351G1/353G



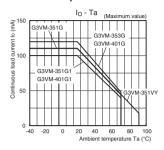
# On-state resistance vs. Ambient temperature G3VM-351G/351G1/353G



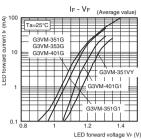
#### Turn ON, Turn OFF time vs. LED forward current G3VM-351G/351G1/353G



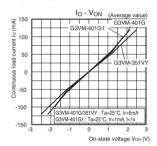
# Continuous load current vs. Ambient temperature



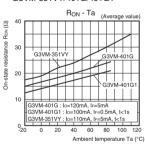
# LED forward current vs. LED forward voltage



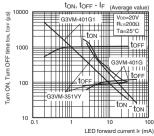
#### G3VM-351VY/401G/401G1



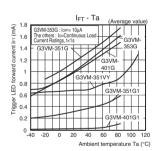
#### G3VM-351VY/401G/401G1



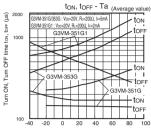
#### G3VM-351VY/401G/401G1



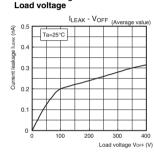
#### Trigger LED forward current vs. Ambient temperature



# Turn ON, Turn OFF time vs. Ambient temperature G3VM-351G/351G1/353G

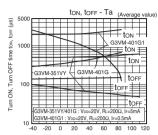


# 100 -40 -20 0 20 40 60 80 100 Ambient temperature Ta (°C) • Current leakage vs.



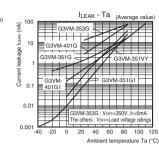
#### G3VM-351VY/401G/401G1

 $G3VM-35\square G\square/351VY/401G\square$ 



#### Ambient temperature Ta (°C)

#### Current leakage vs. Ambient temperature

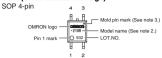


SOP

# ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

### SOP (Small Outline Package)



Special SOP 4-pin (G3VM-351VY)

Pin 1 mark
OMRON logo

1 Mold pin mark
2 Mold pin mark
2 LOT.NO.
Model name (See note 2.)

Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

### Terminal Arrangement/Internal Connections (Top View)

G3VM-351G1/G/VY G3VM-401G1/G



G3VM-353G



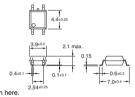
## ■Dimensions (Unit: mm)

#### SOP (Small Outline Package) SOP 4-pin



#### **Surface-mounting Terminals**

Weight: 0.1 g



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



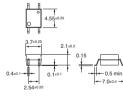
Note: The actual product is marked differently from the image shown here

Special SOP 4-pin \* (G3VM-351VY)



### Surface-mounting Terminals

Weight: 0.1 g



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



\* The external dimensions are different from those of the standard SOP 4-pin, but the mounting pad dimensions are the same.

Note: The actual product is marked differently from the image shown here.

## ■Approved Standards

## UL recognized 💫

Model	Approved Standards	Contact form	File No.
G3VM-351G1 G3VM-351G G3VM-401G G3VM-351VY	UL (recognized)	1a (SPST-NO)	E80555
G3VM-353G		1b (SPST-NC)	
G3VM-401G1		UL certification is pending.	

Models Certified by BSI for EN/IEC Standards

Model	Approved Standards	Contact form	File No.
G3VM-401G	EN62368-1 (BSI certified)	1a (SPST-NO)	VC669262

# **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

G3VM-35 G / 351VY / 401G



MOS FET Relays SOP 6-pin, General-purpose Type

# General-purpose MOS FET Relays in SOP 6-pin packages for a wide range of applications

- Contact form: 1a (SPST-NO) or 1b (SPST-NC)
- Load voltage: 60 V, 200 V, 350 V, or 400 V



Note: The actual product is marked differently from the image shown here.

3. Package

H: SOP 6-pin

#### RoHS Compliant

■Package

SOP 6-pin

# ■Application Examples

- · Semiconductor test equipment
- Communication equipment
- Test & Measurement equipment

(Unit: mm, Average)

- · Security equipment
- Industrial equipment
- Power circuit

## **■**Model Number Legend

1 2 3 4

# G3VM-

1. Load Voltage

6:60 V

2. Contact form 1:1a (SPST-NO)

20:200 V 3:1b (SPST-NC) 35:350 V

40:400 V

#### 4. Other informations

When specifications overlap, serial code is added in the recorded order.

· Amusement equipment

# **■**Ordering Information

Note: The actual product is marked differently

from the image shown here.

			Load voltage	Continuous (peak v	load current alue) *	Stick pac	kaging	Tape packa	ging							
Package	Contact form		(peak value) *	Connection A, B	Connection C	Model	Minimum package quantity	Model	Minimum package quantity							
			60 V	400 mA	800 mA	G3VM-61H1		G3VM-61H1(TR)								
	1a (SPST-NO)	- /	Surface mounting	Surface-mounting	Surface mounting	Surface-mounting	Surface-mounting			200 V	200 mA	400 mA	G3VM-201H1		G3VM-201H1(TR)	
	(6. 6. 116)								110 mA	220 mA	G3VM-351H		G3VM-351H(TR)			
SOP6	1b (SPST-NC)	Terminals	350 V	120 mA	240 mA	G3VM-353H	75 pcs.	G3VM-353H(TR)	2,500 pcs.							
	1a (SPST-NO)		400 V	120 IIIA	240 IIIA	G3VM-401H		G3VM-401H(TR)								

\* The AC peak and DC value are given for the load voltage and continuous load current.

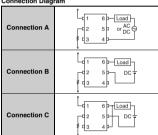
Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item		Symbol	G3VM-61H1	G3VM-201H1	G3VM-351H	G3VM-353H	G3VM-401H	Unit	Measurement conditions
	LED forward curre	ent	lF		•	50			mA	
Input	LED forward current reduction rate		ΔIF/°C			mA/°C	Ta ≥ 25°C			
=	LED reverse volta	ge	VR			5			V	
	Connection tempe	erature	TJ			125			°C	
	Load voltage (AC	peak/DC)	Voff	60	200	35	50	400	V	
		Connection A		400	200	110	1/	20		Connection A:
	Continuous load current	Connection B	lo	400	200	110	12	120		AC peak/DC
Ħ		Connection C		800	400	220	24	10		Connection B and C: DC
Output	ON current	Connection A		-4.0	-2.0	-1.1	-1	.2		
_	reduction rate	Connection B	Δlo/°C						mA/°C	Ta ≥ 25°C
		Connection C		-8.0	-4.0	-2.2	-2	.4		
	Pulse ON current		lop	1200	600	330	36	60	mA	t=100 ms, Duty=1/10
	Connection tempe	erature	TJ			125			°C	
Di	lectric strength between I/O * Vi-o 1500		Vrms	AC for 1 min						
Ar	umbient operating temperature Ta -40 to +85						°C	With no icing or		
Ar	nbient storage temp	Tstg			-55 to +125			°C	condensation	
Sc	Idering temperature	9	-			260			°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

#### Connection Diagram



Г	Item		Symbol		G3VM-61H1	G3VM-201H1	G3VM-351H	G3VM-353H	G3VM-401H	Unit	Measurement conditions
Ī				Minimum			1.0				
	LED forward	voltage	VF	Typical			1.15			٧	IF=10 mA
				Maximum			1.3				
	Reverse curr	ent	IR	Maximum			10			μА	V <sub>R</sub> =5 V
	Capacitance b terminals	etween	Ст	Typical			30			pF	V=0, f=1 MHz
to so of	Trigger LED	forward	IFT (IFC)	Typical	1.6		1	I		mA	G3VM-61H1/201H1/351H/401H: lo=Continuous load current
	current		*2	Maximum			3				ratings G3VM-353H : Ioff=10 μA
	Release LED current	forward	IFC (IFT) *2	Minimum			0.1			mA	G3VM-61H1/201H1/351H/401H : IoFF=100 μA G3VM-353H : Io=120 mA
		Connection A		Typical	1	5	35 (25)	15	17		G3VM-61H1/201H1/351H/401H : IF=5 mA.
	Maximum	Connection B		i ypicai	0.5	3	28	8	11		lo=Continuous load current
	resistance	Connection C	Bon		0.25	1.5	14	4	6	Ω	ratings
	with output ON	Connection A	HON		2	8	50 (35)	25	35	32	Values in parentheses are for t < 1 s. G3VM-353H:
١,		Connection B		Maximum	1	5	40	14	20		Io=Continuous load current ratings
1	<u> </u>	Connection C				_	20	-	-		raungs
Č	Current leaka relay is open		İLEAK	Maximum			1			μА	G3VM-61H1/201H1/351H/401H : Voff=Load voltage ratings G3VM-353H : Voff=350 V, If=5 mA
	Capacitance terminals	between	Coff	Typical	130	100	30	65	70	pF	G3VM-61H1/201H1/351H/401H : V=0, f=1 MHz G3VM-353H : V=0, f=1 MHz, IF=5 mA
	Capacitance betwee erminals	een I/O	Cı-o	Typical			0.8			pF	f=1 MHz, Vs=0 V
I	nsulation resista	nce	Ri-o	Minimum			1000			МΩ	Vi-o=500 VDC, RoH≤60%
Ł	etween I/O term	ninals	ni-0	Typical	108			IVISZ	VI-0=500 VDC, n0H560%		
Γ.	urn-ON time		ton	Typical	0.8 0.6 0.3 - 0.3						
	uni-ON unie		ION	Maximum			ms	IF=5 mA, RL=200 Ω, VDD=20 V <b>*1</b>			
-	urn-OFF time		toff	Typical		0.1		-	0.1	1115	IF-3 IIIA, ITE-200 12, VDD=20 V 41
	a Or i tilile		1011	Maximum	0.5	1		3	1		

- \*1. Turn-ON and Turn-OFF Times
- \*2. These values are for Relays with NC contacts



# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

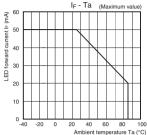
Item	Symbol		G3VM-61H1	G3VM-201H1	G3VM-351H	G3VM-353H	G3VM-401H	Unit
Load voltage (AC peak/DC)	VDD	Maximum	48	160 280		30	320	V
		Minimum			5			
Operating LED forward current	lF	Typical	7	.5	10	-	7.5	mA
		Maximum			25		•	IIIA
Continuous load current (AC peak/DC)	lo	Maximum	400	130	100	12	20	
Ambient operating temperature	Ta	Minimum			-20			ာ့
Ambient operating temperature	l a	Maximum	65	60		65		C

# **■**Spacing and Insulation

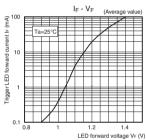
Item	Minimum	Unit
Creepage distances	4.0	
Clearance distances	4.0	mm
Internal isolation thickness	0.1	

# G3VM H ■Engineering Data

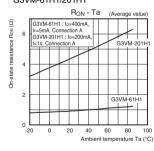
#### LED forward current vs. Ambient temperature



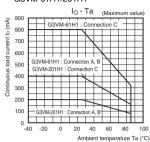
 LED forward current vs. LED forward voltage



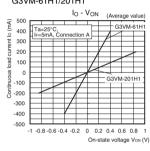
On-state resistance vs. Ambient temperature G3VM-61H1/201H1



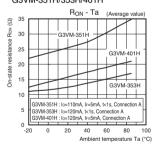
#### Continuous load current vs. Ambient temperature G3VM-61H1/201H1



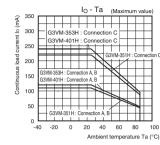
#### Continuous load current vs. On-state voltage G3VM-61H1/201H1



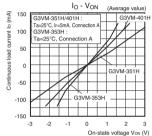
# G3VM-351H/353H/401H



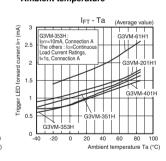
#### G3VM-351H/353H/401H



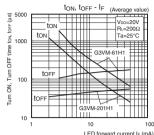
#### G3VM-351H/353H/401H



#### Trigger LED forward current vs. Ambient temperature

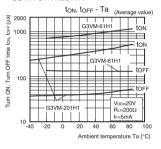


#### ● Turn ON, Turn OFF time vs. LED forward current G3VM-61H1/201H1

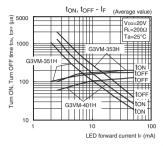


LED forward current IF (mA)

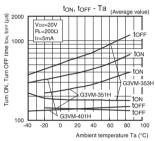
#### ● Turn ON, Turn OFF time vs. Ambient temperature G3VM-61H1/201H1



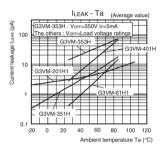
#### G3VM-351H/353H/401H



## G3VM-351H/353H/401H



#### Current leakage vs. Ambient temperature



# ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

#### SOP (Small Outline Package)

Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

# ●Terminal Arrangement/Internal Connections (Top View)

G3VM-61H1/201H1/351H/401H



G3VM-353H

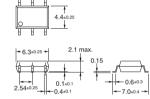


## ■Dimensions (Unit: mm)



## **Surface-mounting Terminals**

Weight: 0.13 g



#### Actual Mounting Pad Dimensions

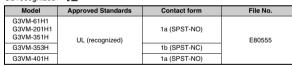
(Recommended Value, Top View)



Note: The actual product is marked differently from the image shown here.

# ■Approved Standards

UL recognized 🔊



Models Certified by BSI for EN/IEC Standards

Model	Approved Standards	Contact form	File No.
G3VM-401H	EN 60950/EN 60065 (BSI certified)	1a (SPST-NO)	8884 8885

# **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

# MOS FET Relays in SOP 4-pin packages for high load voltages

• Load voltage: 600 V



Note: The actual product is marked differently from the image shown here.

## RoHS Compliant

### **■**Application Examples

- Semiconductor test equipment
- Test & Measurement equipment
- Communication equipment
- Various battery-driven devices
- Security equipment
- Industrial equipment
- Power circuit
- · Amusement equipment

## ■Package (Unit: mm, Average)

SOP 4-pin



Note: The actual product is marked differently from the image shown here.

## **■**Model Number Legend

G3VM-

1. Load Voltage 60:600 V 2. Contact form 1:1a (SPST-NO) 3. Package G: SOP 4-pin

4. Other informations

When specifications overlap, serial code is added in the recorded order.

# **■**Ordering Information

				Stick packa	ging	Tape packaging		
Package	Contact form	Terminals	Load voltage (peak value) *	Continuous load current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity
SOP4	1a	Surface-mounting	600 V	70 mA	G3VM-601G1	100 pcs.	G3VM-601G1(TR)	2.500 pcs.
3014	(SPST-NO)	Terminals	000 V	90 mA	G3VM-601G	100 pcs.	G3VM-601G(TR)	2,300 pcs.

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

## ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-601G1	G3VM-601G	Unit	Measurement conditions
	LED forward current	lF	30	50	mA	
nbut	Repetitive peak LED forward current			1	А	100 μs pulses, 100 pps
qu	LED forward current reduction rate	ΔIF/°C	-0.3	-0.5	mA/°C	Ta ≥ 25°C
	LED reverse voltage	VR		5		
	Connection temperature	TJ	125			
	Load voltage (AC peak/DC)	Voff	OFF 600			
=	Continuous load current (AC peak/DC)	lo	70	90	mA	
Output	ON current reduction rate	Δlo/°C	-0.7	-0.9	mA/°C	Ta ≥ 25°C
0	Pulse ON current	lop	210	270	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ	1:	25	°C	
D	ielectric strength between I/O *	VI-O	15	00	Vrms	AC for 1 min
Α	Ambient operating temperature		-40 to +85			With no icing or
Α	Ambient storage temperature		-55 to +125			condensation
S	oldering temperature	-	260			10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

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G3VM-601G

	Item	Symbol		G3VM-601G1	G3VM-601G	Unit	Measurement conditions	
			Minimum	1.1	1.0			
	LED forward voltage	VF	Typical	1.27	1.15	V	IF=10 mA	
			Maximum	1.4	1.3			
	Reverse current	ln	Maximum	1	0	μΑ	V <sub>R</sub> =5 V	
Input	Capacitance between terminals	Ст	Typical	3	0	pF	V=0, f=1 MHz	
-	Trigger LED forward	let	Typical	=	0.4	mA	G3VM-601G1 : lo=70 mA	
	current	IFI	Maximum	0.2	1	IIIA	G3VM-601G : Io=90 mA	
	Release LED forward	IEC	Minimum	-	0.1	mA	Ioff=100 μA	
	current		Typical	0.001	-		16.11–166 μ.1	
	Maximum resistance with	Ron	Typical	35	45	Ω	G3VM-601G1 : IF=0.5 mA, Io=70 mA, t < 1 s	
١	output ON	HON	Maximum	6	0	12	G3VM-601G : IF=2 mA, Io=90 mA	
Output	Current leakage when the	ILEAK	Typical	1	=	nA	Voff=600 V	
õ	relay is open	ILEAN	Maximum	1,0	000	11/4	VOFF=000 V	
	Capacitance between terminals	Coff	Typical	7	5	pF	V=0, f=1 MHz	
	apacitance between I/O	Ci-o	Typical	0	.8	pF	f=1 MHz, Vs=0 V	
In	sulation resistance	R <sub>I-O</sub>	Minimum	10	00	МО	Vi-o=500 VDC, RoH≤60%	
be	tween I/O terminals	HI-O	Typical	1	O <sup>8</sup>	MΩ	VI-0=500 VDC, R0H≤60%	
т.	ırn-ON time	ton	Typical	:	2		G3VM-601G1 : IF=0.5 mA, RL=200 Ω,	
11	IIII-ON IIIIE	ION	Maximum	10	8		VDD=10 V *	
т.	urn-OFF time	tore	Typical	1	0.5	ms	G3VM-601G : IF=2 mA,	
11	IIII-OFF IIIIIE	LOFF	Maximum	5	3		RL=200 Ω, VDD=10 V *	

\* Turn-ON and Turn-OFF Times



# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

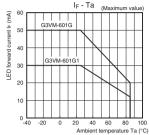
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-601G1	G3VM-601G	Unit
Load voltage (AC peak/DC)	VDD	Maximum	48	80	V
Operating LED forward	le .	Typical	0.5	2	
current	-	Maximum	2	5	mA
Continuous load current (AC peak/DC)	lo	Maximum	60	70	III.
Ambient operating	Ta	Minimum	-2	20	°C
temperature	I I d	Maximum	6	5	

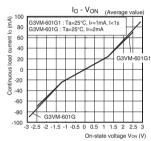
# **■**Spacing and Insulation

Item	Minimum	Unit
Creepage distances	4.0	
Clearance distances	4.0	mm
Internal isolation thickness	0.1	

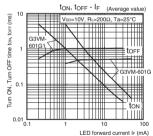
# LED forward current vs. Ambient temperature



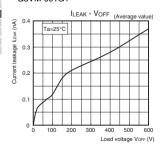
# Continuous load current vs. On-state voltage



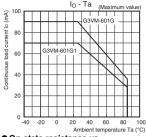
 Turn ON, Turn OFF time vs. LED forward current



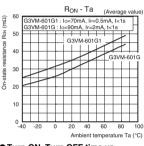
● Current leakage vs. Load voltage G3VM-601G1



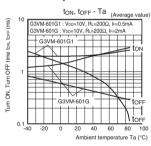
# Continuous load current vs. Ambient temperature



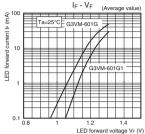
On-state resistance vs.
 Ambient temperature



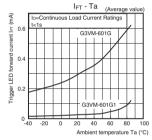
#### Turn ON, Turn OFF time vs. Ambient temperature



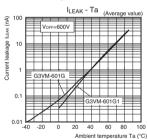
# LED forward current vs. LED forward voltage



#### Trigger LED forward current vs. Ambient temperature



# Current leakage vs. Ambient temperature



# ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

#### SOP (Small Outline Package)

SOP 4-pin Model name (See note 2.) LOT.NO.

Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

## ●Terminal Arrangement/Internal Connections (Top View)

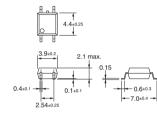


# ■Dimensions (Unit: mm)



#### **Surface-mounting Terminals**

Weight: 0.1 g



## **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



Note: The actual product is marked differently from the image shown here

# **■**Approved Standards

UL recognized

Approved Standards	Contact form	File No.		
UL (recognized)	1a (SPST-NO)	E80555		

## **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays DIP 8-pin, Multi-contact-pair Type

# MOS FET Relays in DIP 8-pin packages with multiple contact pairs for a wide range of circuits

- Contact form: 2a (DPST-NO), 2b (DPST-NC), 1a1b (SPST-NO/SPST-NC)
- Load voltage: 60 V, 350 V, or 400 V



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Note: The actual product is marked differently from the image shown here.

# RoHS Compliant

## ■Application Examples

- Communication equipment
- Test & Measurement equipment

#### ■Package (Unit: mm, Average)

DIP 8-pin PCB Terminals



Surface-mounting Terminals



Note: The actual product is marked differently from the image shown here.

# ■Model Number Legend

#### G3VM-1 2 3 4 5

- 1. Load Voltage
- 6: 60 V
- 2:2a (DPST-NO) 35: 350 V 4: 2b (DPST-NC)
- 40: 400 V 5:1a1b
- 3. Package
  - C: DIP 8-pin with PCB terminals F: DIP 8-pin with surface-mounting terminals
- (SPST-NO/SPST-NC)

2. Contact form

#### 4. Additional functions R: Low ON resistance

#### 5. Other informations

When specifications overlap, serial code is added in the recorded order.

# ■Ordering Information

						Stick packaging		Tape packag	jing
2	Package		Load voltage (peak value)	Continuous load current		Model	Minimum	Model	Minimum
	rackage	form	*	(peak value) *	PCB Terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity
		2a	60 V	500 mA	G3VM-62C1	G3VM-62F1		G3VM-62F1(TR)	
ł	2b (DPST-NC)	(DPST-NO)		120 mA	G3VM-352C	G3VM-352F		G3VM-352F(TR)	
		2b (DPST-NC)	350 V	150 mA	G3VM-354C	G3VM-354F		G3VM-354F(TR)	
	DIP8	1a1b (SPST-NO/ SPST-NC)	. 350 V	G3VM-355CR	G3VM-355FR	50 pcs.	G3VM-355FR(TR)	1,500 pcs.	
		2a (DPST-NO)	400 V		G3VM-402C	G3VM-402F		G3VM-402F(TR)	

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-62C1 G3VM-62F1	G3VM-352C G3VM-352F	G3VM-354C G3VM-354F	G3VM-355CR G3VM-355FR	G3VM-402C G3VM-402F	Unit	Measurement conditions
	LED forward current	lF		50		mA			
+	Repetitive peak LED forward current	e peak LED forward I <sub>FP</sub> 1			Α	100 μs pulses, 100 pps			
Input	LED forward current reduction rate	ΔIF/°C		-0.5				mA/°C	Ta ≥ 25°C
	LED reverse voltage	VR		5		V			
	Connection temperature	Connection temperature T <sub>J</sub> 125			°C				
	Load voltage (AC peak/DC)	Voff	60		350		400	V	
ont	Continuous load current (AC peak/DC)	lo	500	120	150	12	20	mA	
Output	ON current reduction rate	Δlo/°C	-5	-1.2	-1.5	-1	.2	mA/°C	Ta≥25°C
	Pulse ON current	lop	1,500	360	450	36	30	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ		•	125			°C	
Di	electric strength between I/O *	VI-O			2,500			Vrms	AC for 1 min
An	Ambient operating temperature Ta -40 to +85				-40 to +85		°C	With no icing or	
An	nbient storage temperature	Tstg	-55 to +125					°C	condensation
Sc	Idering temperature	-			260			°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

	Item	Symbol		G3VM-62C1 G3VM-62F1	G3VM-352C G3VM-352F	G3VM-354C G3VM-354F	G3VM-355CR G3VM-355FR	G3VM-402C G3VM-402F	Unit	Measurement conditions	
	LED forward		Minimum			1.0					
	voltage	VF	Typical		1.15				V	Ir=10 mA	
	Tonago		Maximum			1.3					
	Reverse current	IR	Maximum			10			μΑ	V <sub>R</sub> =5 V	
	Capacitance between terminals	Ст	Typical			30			pF	V=0, f=1 MHz	
Input	Trigger LED	IFT (IFC)	Typical	1.6			1		mA	G3VM-62C1/62F1/352C/352F/ 402C/402F : Io=Continuous load current ratings	
	forward current	*2	Maximum			3			mA	G3VM-354C/354F: IoFF=10 μA G3VM-355CR/355FR: 1a: Io=120 mA, 1b: IoFF=10 μA	
	Release LED forward current	IFC (IFT) *2	Minimum		0.1			mA	G3VM-62C1/62F1/352C/352F/ 402C/402F: loFF=100 μA G3VM-354C/354F: lo=150 mA G3VM-355CR/355FR: 1a: loFF=10 μA, 1b: lo=120 mA		
	Maximum resistance with	Bon	Typical	1	35 (25)	1	5	18	Ω	G3VM-62C1/62F1/402C/402F/ 352C/352F: I==5 mA, Io=Continuous load current ratings Values in parentheses are for t < 1 s.	
ont	output ON	11011	Maximum	2	50 (35)	2	!5	35	32	G3VM-354C/354F : Io=150 mA G3VM-355CR/355FR : 1a : IF=5 mA, Io=120 mA, 1b : IF=0 mA, Io=120 mA	
Output	Current leakage when the relay is open	ILEAK	Maximum			1	·	1		G3VM-354C/354F: V=0, f=1 MHz, I==5 mA G3VM-355CP/355FR: 1a: V=0, f=1 MHz 1b: V=0, f=1 MHz, I==5 mA Others: V=0, f=1 MHz	
	Capacitance between terminals	Coff	Typical	130	30	85	65	40	pF	V=0, f=1 MHz	
	Capacitance between I/O terminals		Typical			0.8			pF	f=1 MHz, Vs=0 V	
	sulation resistance	RI-O	Minimum			1000			МΩ	Vi-o=500 VDC, RoH≤60%	
be	etween I/O terminals	en I/O terminals Typical 108			10122	VI-0=300 VDO, 110H≤00%					
т	urn-ON time	ton	Typical	0.8	0.3	0.1	-	-			
	uni Ora unie	ION	Maximum	2		1	1a:1,1b:1	1	ms	ns Ir=5 mA, Rι=200 Ω, Vpp=20 V <b>*1</b>	
Т	urn-OFF time	tore	Typical	0.1	0.1	1	-	-	1113	5, TIL=200 32, VDD=20 V #1	
Ι''	a Of Fullio	Maximum Maximum		0.5	1	3	1a:1,1b:3	1			

\*1. Turn-ON and Turn-OFF Times





# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

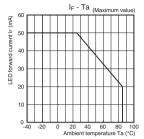
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-62C1 G3VM-62F1	G3VM-352C G3VM-352F	G3VM-354C G3VM-354F	G3VM-355CR G3VM-355FR	G3VM-402C G3VM-402F	Unit
Load voltage (AC peak/DC)	VDD	Maximum	48 280		320	V		
		Minimum			5			
Operating LED forward current	lF	Typical	7.5			7.5	mA	
		Maximum			25		•	IIIA
Continuous load current (AC peak/DC)	lo	Maximum	500	100	150	120	100	
Ambient operating temperature	Ta	Minimum	-20					°C
Ambient operating temperature	1a	Maximum	65				Č	

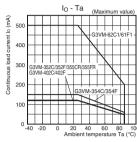
# **■**Spacing and Insulation

Item	Minimum	Unit
Creepage distances	7.0	
Clearance distances	7.0	mm
Internal isolation thickness	0.4	

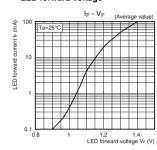
#### LED forward current vs. Ambient temperature



#### Continuous load current vs. Ambient temperature



#### LED forward current vs. LED forward voltage



Continuous load current vs. On-state voltage

I<sub>O</sub> - V<sub>ON (Average value)</sub>

 $G3VM-\Box C\Box/\Box F\Box/\Box CR/\Box FR$ 

G3VM-62C1/62F1

600

500

400

300

200

100 0

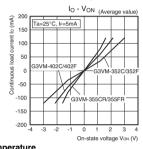
-100

-200 -300

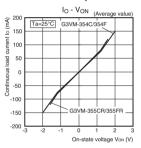
-400

load current lo (mA)

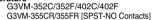


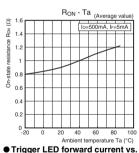


G3VM-354C/354F G3VM-355CR/355FR [SPST-NC Contacts]

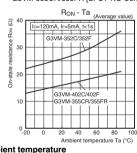


#### On-state voltage Von (V) On-state resistance vs. Ambient temperature G3VM-62C1/62F1

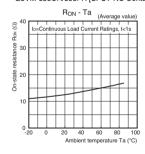




-600 -0.5 -0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4 0.5

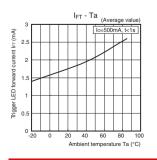


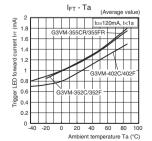
#### G3VM-354C/354F G3VM-355CR/355FR [SPST-NC Contacts]



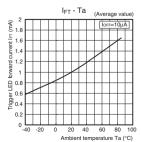
#### ● Trigger LED forward current vs. Ambient temperature G3VM-62C1/62F1

#### G3VM-352C/352F/402C/402F G3VM-355CR/355FR [SPST-NO Contacts]

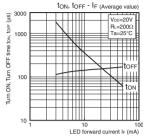




#### G3VM-354C/354F G3VM-355CR/355FR [SPST-NC Contacts]



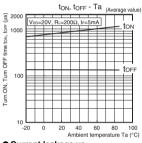
#### Turn ON, Turn OFF time vs. LED forward current G3VM-62C1/62F1



● Turn ON, Turn OFF time vs.

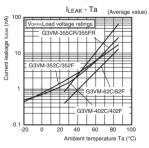
Ambient temperature

G3VM-62C1/62F1

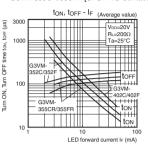


# Current leakage vs. Ambient temperature

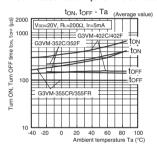
G3VM-62C1/62F1/352C/352F/402C/402F G3VM-355CR/355FR [SPST-NO Contacts]



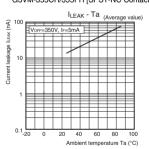
#### G3VM-352C/352F/402C/402F G3VM-355CR/355FR [SPST-NO Contacts]



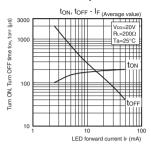
G3VM-352C/352F/402C/402F G3VM-355CR/355FR [SPST-NO Contacts]



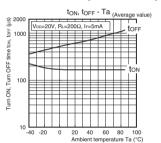
G3VM-354C/354F G3VM-355CR/355FR [SPST-NC Contacts]



#### G3VM-354C/354F G3VM-355CR/355FR [SPST-NC Contacts]



#### G3VM-354C/354F G3VM-355CR/355FR [SPST-NC Contacts]



# ■Appearance / Terminal Arrangement / Internal Connections

 $\Box \mathsf{C} \Box / \Box \mathsf{F} \Box / \Box \mathsf{CR} / \Box \mathsf{FR}$ 

#### Appearance

# DIP (Dual Inline Package)

DIP 8-pin Mold pin mark (See note 3.) OMRON logo OMRON Model name (See note 2.) -62C1 Pin 1 mark LOTNO 932 回 J

G3VM-62C1/62F1/352C/352F/402C/402F

●Terminal Arrangement/Internal Connections (Top View)

G3VM-354C/354F

G3VM-355CR/355FR (1b)

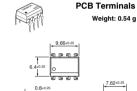
Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

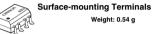
## ■Dimensions (Unit: mm)

#### DIP 8-pin





41 [4, 44] [4





# PCB Dimensions (BOTTOM VIEW)



#### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



Note: The actual product is marked differently from the image shown here.

# **■**Approved Standards

- 0.5±0.1 - 2.54±0.29

#### UL recognized

25 n

Model	Approved Standards	Contact form	File No.
G3VM-62C1 G3VM-62F1 G3VM-352C G3VM-352F G3VM-402C G3VM-402F	UL (recognized)	2a (DPST-NO)	E80555
G3VM-354C G3VM-354F		2b (DPST-NC)	
G3VM-355CR G3VM-355FR		1a1b (SPST-NO/SPST-NC)	

#### Models Certified by BSI for EN/IEC Standards

Model	Approved Standards	Contact form	File No.
G3VM-352C G3VM-352F	EN 60950/EN 60065 (BSI certified)	2a (DPST-NO)	8816 8817
	(==:===================================		•••

# **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

• Contact form: 2a (DPST-NO), 2b (DPST-NC), 1a1b (SPST-NO/SPST-NC)

Load voltage: 60 V, 200 V, 350 V, or 400 V



Note: The actual product is marked differently from the image shown here.

RoHS Compliant

# ■Application Examples

- · Semiconductor test equipment
- Test & Measurement equipment
- Communication equipment
- Security equipment
- Industrial equipment

Power circuit

· Amusement equipment

#### ■Package (Unit: mm, Average)

SOP 8-pin



Note: The actual product is marked differently from the image shown here.

# **■**Model Number Legend

#### G3VM----1 2 3 4 5

1. Load Voltage

2. Contact form 6: 60 V 2:2a (DPST-NO)

20:20 V 4:2b (DPST-NC)

35: 350 V 5: 1a1b (SPST-NO/SPST-NC)

40: 400 V

4. Additional functions R: Low ON resistance

5. Other informations

When specifications overlap, serial code is added in the recorded order.

3. Package

J: SOP 8-pin

# **■**Ordering Information

					Stick packa	ging	Tape packa	ging
Package	Contact form	Terminals	Load voltage (peak value) *	Continuous load current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity
	2a		60 V	400 mA	G3VM-62J1		G3VM-62J1(TR)	
	(DPST-NO)		200 V	200 mA	G3VM-202J1		G3VM-202J1(TR)	2,500 pcs.
	1a1b (SPST-NO/ SPST-NC)	T-NO/ T-NC) Surface- pa mounting		120 mA	G3VM-355JR		G3VM-355JR(TR)	
SOP8	2a (DPST-NO)		350 V	110 mA	G3VM-352J	50 pcs.	G3VM-352J(TR)	
	2b (DPST-NC)			120 mA	G3VM-354J		G3VM-354J(TR)	
	2a (DPST-NO)		400 V	120 IIIA	G3VM-402J	1	G3VM-402J(TR)	

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

	Item	Symbol	G3VM-62J1	G3VM-202J1	G3VM-355JR	G3VM-352J	G3VM-354J	G3VM-402J	Unit	Measurement conditions
	LED forward current	lF			mA					
Input	LED forward current reduction rate	ΔIF/°C			mA/°C	Ta ≥ 25°C				
=	LED reverse voltage	VR			V					
	Connection temperature	TJ			12	25			°C	
	Load voltage (AC peak/DC)	Voff	60	200		350		400	V	
ont	Continuous load current (AC peak/DC)	lo	400	200	120	110	110 120		mA	
Output	ON current reduction rate	Δlo/°C	-4.0	-2.0	-1.2	-1.1	-1	.2	mA/°C	Ta ≥ 25°C
	Pulse ON current	lop	1,200	600	360	330	30	60	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ			12	25			°C	
Di	electric strength between I/O *	Vi-o	1500							AC for 1 min
Ar	Ambient operating temperature		-40 to +85							With no icing or
Ar	Ambient storage temperature				-55 to	+125			°C	condensation
Sc	oldering temperature	-			26	60			ç	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

	Item Symbol		G3VM- 62J1	G3VM- 202J1	G3VM- 355JR	G3VM- 352J	G3VM- 354J	G3VM- 402J	Unit	Measurement conditions	
	LED forward		Minimum	1.0						v	
	voltage		Typical	1.15							IF=10 mA
			Maximum				.3			цΑ	
	Reverse current	IR	Maximum		10						VR=5 V
	Capacitance between terminals	Ст	Typical		30						V=0, f=1 MHz
Input			Typical	1.6			1				G3VM-62J1/202J1/352J/402J:
Ţ	Trigger LED forward current	IFT (IFC) *2	Maximum	3						mA	lo=Continuous load current ratings G3VM-355JR: 1a: lo=120 mA, 1b: loFF=10 μA G3VM-354J: loFF=10 μA
	Release LED forward current	IFC (IFT) *2	Minimum	0.1				mA	G3VM-62J1/202J1/352J/402J : IoFF=100 μA G3VM-355JR : 1a : IoFF=10 μA, 1b : Io=120 mA G3VM-354J : Io=120 mA		
	Maximum resistance with output ON	Bou	Typical	1	5	15	35 (25)	15	17	Ω	G3VM-62J1/202J1/352J/402J: IF=5 mA, lo=Continuous load current ratings G3VM-355JR: 1a: IF=5 mA, lo=120 mA,
		HON	Maximum	2	8	25	50 (35)	25	35	52	1b : IF=0, Io=120 mA G3VM-352J : IF=5 mA, Io=110 mA, Values in parentheses are for t < 1 s. G3VM-354J : Io=120 mA
Output	Current leakage when the relay is open	ILEAK	Maximum		1						G3VM-62J1/202J1/352J1/402J: VoFF=Load voltage ratings G3VM-355JR: 1a: VoFF=350 V, 1b: VoFF=350 V, IF=5 mA G3VM-354J: VoFF=350 V, IF=5 mA
	Capacitance between terminals	Coff	Typical	130	100	65	30	65	70	pF	G3VM-62J1/202J1/352J/402J: V=0, f=1 MHz G3VM-355JR: 1a: V=0, f=1 MHz, 1b: V=0, f=1 MHz, F=5 mA G3VM-354J: V=0, f=1 MHz, IF=5 mA
	apacitance between I/ terminals	CI-O	Typical			0	.8			pF	f=1 MHz, Vs=0 V
	sulation resistance	Ri-o	Minimum				00			MΩ	Vi-o=500 VDC, RoH≤60%
be	etween I/O terminals	111-0	Typical			1	D <sup>8</sup>			IVISE	VPG=500 VBG; 1161136076
			Typical	0.8	0.6	-	0.3	-	0.3		
Τι	urn-ON time	ton	Maximum	2	1.5	1a:1 1b:1		1		ms	IF=0.5 mA, RL=200 $\Omega$ ,
			Typical	0	.1	-	0.1	-	0.1	1115	VDD=20 V *1
Τι	urn-OFF time tops		Maximum	0.5	1	1a:1 1b:3	1	3	1		

\*1. Turn-ON and Turn-OFF Times



 $\*2$ . These values are for Relays with NC contacts

# ■Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-62J1	G3VM-202J1	G3VM-355JR	G3VM-352J	G3VM-354J	G3VM-402J	Unit	
Load voltage (AC peak/DC)	VDD	Maximum	48 200		280			320	٧	
Operating LED forward current	lF	Minimum		5						
		Typical	7.	.5	-	10	_	7.5		
Current		Maximum	25						mA	
Continuous load current (AC peak/DC)	lo	Maximum	400	130	120	100	12	20		
Ambient operating temperature	Ta	Minimum	-20							
	ıa.	Maximum			6	5			°C	

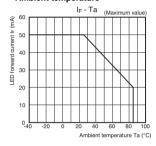
# ■Spacing and Insulation

G3VM-\J

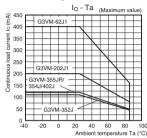
Item	Minimum	Unit
Creepage distances	4.0	
Clearance distances	4.0	mm
Internal isolation thickness	0.1	

# **■**Engineering Data

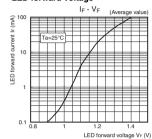
#### LED forward current vs. Ambient temperature



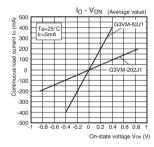
#### Continuous load current vs. Ambient temperature



#### LED forward current vs. LED forward voltage



#### Continuous load current vs. On-state voltage G3VM-62J1/202J1



 On-state resistance vs. Ambient temperature

lo=Continuou Load Current

Ratings Ir=5mA,

G3VM-62J1/202J1

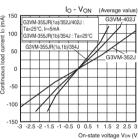
ĝ

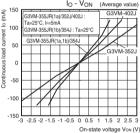
8 S

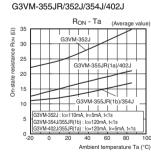
On-state resistance

2

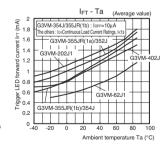
#### G3VM-355JR/352J/354J/402J







#### Trigger LED forward current vs. Ambient temperature



#### 20 60 80 Ambient temperature Ta (°C)

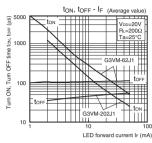
Ron - Ta

(Average value)

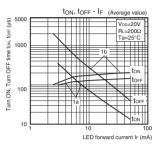
G3VM-202J1

G3VM-62J1

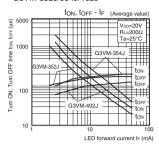
#### Turn ON, Turn OFF time vs. LED forward current G3VM-62J1/202J1



#### G3VM-355JR

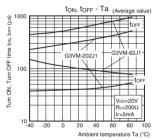


#### G3VM-352J/354J/402J

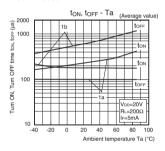


#### Turn ON, Turn OFF time vs. Ambient temperature

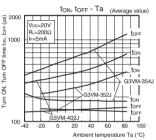
G3VM-62J1/202J1



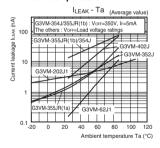
#### G3VM-355JR



#### G3VM-352J/354J/402J



# Current leakage vs. Ambient temperature



# ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

#### SOP (Small Outline Package)

G3VM-□J□

SOP 8-pin Mold pin mark (See note 3.) OMRON OMBON Iono Model name (See note 2.) LOTNO

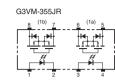
G3VM-62J1/202J1/352J/402J Note: 1. The actual product is marked differently from the image shown here.

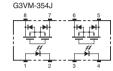
(Top View)

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark

●Terminal Arrangement/Internal Connections



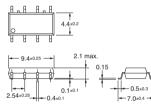


# ■Dimensions (Unit: mm)

is from a pin on the mold.

#### Surface-mounting Terminals

Weight: 0.2 g



#### **Actual Mounting Pad Dimensions**



Note: The actual product is marked differently from the image shown here.

## **■**Approved Standards

UL recognized

Model	Approved Standards	Contact form	File No.		
G3VM-62J1		2a (DPST-NO)			
G3VM-202J1		2a (DF31-NO)			
G3VM-355JR	UL (recognized)	1a1b (SPST-NO/SPST-NC)	E80555		
G3VM-352J		2a (DPST-NO)			
G3VM-354J		2b (DPST-NC)			
G3VM-402J		2a (DPST-NO)			

Models Certified by BSI for EN/IEC Standards

Model	Approved Standards	Contact form	File No.
G3VM-402J	EN 60950/EN 60065 (BSI certified)	2a (DPST-NO)	8884 8885

## **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays DIP 4-pin, High-current and Low-ON-resistance Type

# MOS FET Relays in DIP 4-pin packages that achieve the low ON resistance and high switching capacity of a mechanical relay

Load voltage: 20 V, 40 V, 60 V, or 100 V

• 20-V Relay: Continuous load current of 3 A max. • 40-V Relay: Continuous load current of 2.5 A max.

• 60-V Relay: Continuous load current of 2 A max.

• 100-V Relay: Continuous load current of 1 A max.



Note: The actual product is marked differently from the image shown here.

#### RoHS Compliant

# **■**Application Examples

- Communication equipment
- Test & Measurement equipment
- · Security equipment Industrial equipment
- Power circuit

2. Contact form

1:1a (SPST-NO)

#### ■Package (Unit: mm, Average)

DIP 4-pin PCB Terminals



Surface-mounting Terminals



Note: The actual product is marked differently from the image shown here.

### ■Model Number Legend

# G3VM-

1. Load Voltage

2: 20 V

40 V

6: 60 V 10: 100 V

4. Additional functions

R: Low ON resistance

3. Package

A: DIP 4-pin with PCB terminals

D: DIP 4-pin with surface-mounting

terminals

#### 5. Other informations

When specifications overlap, serial code is added in the recorded order.

# ■Ordering Information

			Load voltage (peak value) *	Continuous load current		Stick packaging	Tape packaging		
,	Package					Model	Minimum	Model	Minimum
		form			PCB Terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity
Г			20 V	3 A	G3VM-21AR	G3VM-21DR		G3VM-21DR(TR)	
	DIP4	1a	40 V	2.5 A	G3VM-41AR	G3VM-41DR	100 pcs.	G3VM-41DR(TR)	1.500 pcs.
	DIP4 (S	(SPST-NO)	60 V	2 A	G3VM-61AR	G3VM-61DR	100 pcs.	G3VM-61DR(TR)	1,500 pcs.
			100 V	1 A	G3VM-101AR	G3VM-101DR		G3VM-101DR(TR)	

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

 $G3VM-\square AR/\square DR$ 

	Item	Symbol	G3VM-21AR G3VM-21DR	G3VM-41AR G3VM-41DR	G3VM-61AR G3VM-61DR	G3VM-101AR G3VM-101DR	Unit	Measurement conditions
	LED forward current	lF		3	30			
+	Repetitive peak LED forward current	IFP			1		Α	100 μs pulses, 100 pps
Input	LED forward current reduction rate	ΔIF/°C		-0.3				Ta ≥ 25°C
	LED reverse voltage	VR			5		٧	
	Connection temperature T <sub>J</sub> 125						°C	
	Load voltage (AC peak/DC)	ak/DC) Voff 20		40	60	100	V	
nt	Continuous load current (AC peak/DC)	lo	3	3 2.5 2		1	Α	
Output	ON current reduction rate	Δlo/°C	-30	-25	-20	-10	mA/°C	Ta ≥ 25°C
	Pulse ON current	lop	9	7.5	6	3	Α	t=100 ms, Duty=1/10
	Connection temperature	TJ		12	25		°C	
Di	electric strength between I/O *	Vi-o		2,5	600		Vrms	AC for 1 min
Ar	nbient operating temperature	Ta		-40 to	+85		ô	With no icing or condensation
Ar	nbient storage temperature	Tstg		-55 to	+125		°C	Willi no long or condensation
So	oldering temperature	-		26	60		°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

# ■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-21AR G3VM-21DR	G3VM-41AR G3VM-41DR	G3VM-61AR G3VM-61DR	G3VM-101AR G3VM-101DR	Unit	Measurement conditions
Г			Minimum		1.	18			
	LED forward voltage	VF	Typical			33		V	IF=10 mA
			Maximum		1.4	48			
	Reverse current	IR	Maximum		1	0		μΑ	VR=5 V
	Capacitance between terminals	Ст	Typical		7	0		pF	V=0, f=1 MHz
friend	Trigger LED forward	lfT	Typical	0.7		0.5			Io=1 A
	current	(IFC)	Maximum		3	3		mA	
	Release LED forward current	IFC (IFT)	Minimum		0.	.1		mA	IOFF=10 μA
	Maximum resistance	Bon	Typical	40	50	80	250	mΩ	G3VM-21AR/21DR/41AR/41DR/61AR/61DR : IF=5 mA, t < 1s, lo=2 A
+10410	with output ON		Maximum	80	150	200	700	11152	G3VM-101AR/DR : IF=5 mA, t < 1s, lo=1 A
	Current leakage when the relay is open	ILEAK	Maximum			1		μА	Voff=Load voltage ratings
	Capacitance between terminals	Coff	Typical	30	00	250	200	pF	V=0, f=1 MHz
	Capacitance between I/ O terminals				pF	f=1 MHz, Vs=0 V			
	nsulation resistance	Ri-o	Minimum		10	00		ΜΩ	Vi-o=500 VDC, RoH≤60%
t	etween I/O terminals	111-0	Typical		10	-		10122	VF0=300 VD0, 11011200%
	urn-ON time	ton	Typical	1		0.8			
	uni Ort unio	ION	Maximum			5		ms	IF=5 mA, RL=200 Ω, VDD=20 V *
-	urn-OFF time	toff	Typical		0	.3			
	un on anie	LOFF	Maximum			1		1	

\* Turn-ON and Turn-OFF Times



# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

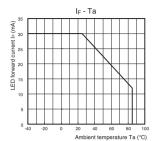
Each term of this list is an independent containent, so it is not simultaneously statisty several containents.												
Item		G3VM-21AR G3VM-21DR	G3VM-41AR G3VM-41DR	G3VM-61AR G3VM-61DR	G3VM-101AR G3VM-101DR	Unit						
Load voltage (AC peak/DC)	VDD	Maximum	16	32	48	80	٧					
		Minimum			5							
Operating LED forward current	IF	Typical	10									
		Maximum	25									
Continuous load current (AC peak/DC)	lo	Maximum	3	2.5	2	1	Α					
Ambient operating temperature Ta Minimum -20												
Ambient operating temperature	1 a	Maximum		65								

# ■Spacing and Insulation

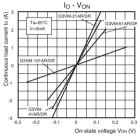
Item	Minimum	Unit
Creepage distances	7.0	
Clearance distances	7.0	mm
Internal isolation thickness	0.4	

 $G3VM-\square AR/\square DR$ 

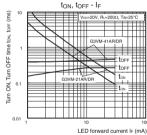
#### LED forward current vs. Ambient temperature



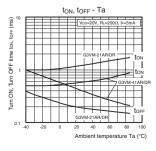
#### Continuous load current vs. On-state voltage



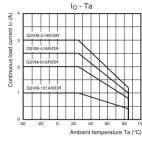
#### ● Turn ON, Turn OFF time vs. LED forward current G3VM-21AR/21DR/41AR/41DR



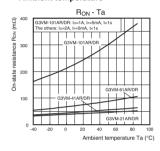
● Turn ON, Turn OFF time vs. Ambient temperature G3VM-21AR/21DR/41AR/41DR



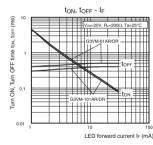
#### Continuous load current vs. Ambient temperature



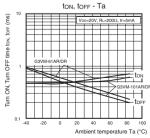
#### On-state resistance vs. Ambient temperature



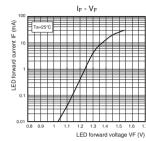
#### G3VM-61AR/61DR/101AR/101DR



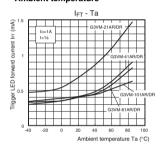
#### G3VM-61AR/61DR/101AR/101DR



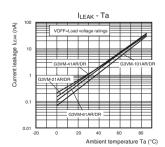
#### LED forward current vs. LED forward voltage



#### Trigger LED forward current vs. Ambient temperature



#### Current leakage vs. Ambient temperature



# ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

DIP (Dual Inline Package)

DIP 4-pin

4 3

OMRON logo

OM

#### Terminal Arrangement/Internal Connections (Top View)

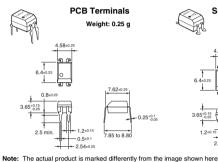


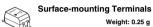
Note: 1. The actual product is marked differently from the image shown here.

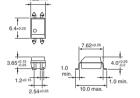
Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

### ■Dimensions (Unit: mm)







### PCB Dimensions (BOTTOM VIEW)



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



# ■Approved Standards

### UL recognized

Approved Standards	Contact form	File No.
UL (recognized)	1a (SPST-NO)	E80555

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

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MOS FET Relays DIP 6-pin, High-current and Low-ON-resistance Type

# MOS FET Relays in DIP 6-pin packages that achieve the low ON resistance and high switching capacity of a mechanical relav

- Load voltage: 20 V, 40 V, 60 V, or 100 V
- 20-V Relay: Continuous load current of 4 A (8 A) max. \*
- 40-V Relay: Continuous load current of 3.5 A (7 A) max. \*
- 60-V G3VM-61BR/ER Relay: Continuous load current of 2.5 A max.
- 60-V G3VM-61BR1/ER1 Relay: Continuous load current of 3 A (6 A) max. \*
- 100-V Relay: Continuous load current of 2 A (4 A) max. \*
- \* Values in parentheses are for connection C.



Note: The actual product is marked differently from the image shown here.

## RoHS Compliant

## ■Application Examples

- Communication equipment
- · Security equipment
- Power circuit
- Test & Measurement equipment
- · Industrial equipment

#### ■Package (Unit: mm, Average)

# DIP 6-pin PCB Terminals

Surface-mounting Terminals



Note: The actual product is marked differently from the image shown here.

## **■**Model Number Legend

# G3VM-

1. Load Voltage 2. Contact form 1:1a (SPST-NO)

2: 20 V 4: 40 V 6: 60 V

10: 100 V

# 4. Additional functions

R: Low ON resistance

B: DIP 6-pin with PCB terminals E: DIP 6-pin with surface-mounting terminals

3. Package

#### 5. Other informations

When specifications overlap, serial code is added in the recorded order.

# ■Ordering Information

			Continuous	load current		Stick packaging		Tape packaging										
Package	Contact form	Load voltage				Model		Model	Minimum									
· uonago		(peak value) 1	Connection A, B	Connection C	PCB Terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity									
	1a (SPST-NO)	20 V	4 A	8 A	G3VM-21BR	G3VM-21ER		G3VM-21ER(TR)										
		40 V	3.5 A	7 A	G3VM-41BR	G3VM-41ER		G3VM-41ER(TR)										
DIP6											60 V	2.5 A	-	G3VM-61BR	G3VM-61ER	50 pcs.	G3VM-61ER(TR)	1,500 pcs.
		60 V	3 A	6 A	G3VM-61BR1	G3VM-61ER1		G3VM-61ER1(TR)										
		100 V	2 A	4 A	G3VM-101BR	G3VM-101ER		G3VM-101ER(TR)										

\* The AC peak and DC value are given for the load voltage and continuous load current.

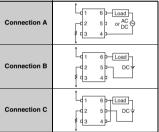
Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item		Symbol	G3VM-21BR G3VM-21ER	G3VM-41BR G3VM-41ER	G3VM-61BR G3VM-61ER	G3VM-61BR1 G3VM-61ER1	G3VM-101BR G3VM-101ER	Unit	Measurement conditions
	LED forward cur	rent	lF			30	•		mA	
+-	Repetitive peak current	LED forward	IFP				Α	100 μs pulses, 100 pps		
Input	LED forward cur rate	rent reduction	ΔIF/°C			mA/°C	Ta ≥ 25°C			
	LED reverse vol	tage	VR			5			V	
	Connection tem	perature	TJ			125	°C			
	Load voltage (A	C peak/DC)	Voff	20	40	6	0	100	V	
	Connection				0.5	2.5				Connection A:
	Continuous load current	Connection B	lo	4	3.5		3	2	Α	AC peak/DC
Ħ		Connection C		8	7	_	6	4		Connection B and C: DC
Output	au .	Connection A		-40	-35	-22	-30	-20		
U	ON current reduction rate	Connection B	∆lo/°C	-40	-33		-30	-20	mA/°C	Ta ≥ 25°C
	reduction rate	Connection C		-80	-70	_	-60	-40		
	Pulse ON currer	it	lop	12	10.5	7.5	9	6	Α	t=100 ms, Duty=1/10
	Connection temperature		TJ			125			°C	
D	electric strength b	VI-O			2,500			Vrms	AC for 1 min	
A	Ambient operating temperature			-40 to +85 -20 to +85 -40 to +85					°C	With no icing or
A	mbient storage ten	nperature	Tstg	-55 to	+125	-40 to +125	-55 to	+125	°C	condensation
S	oldering temperatu	ire	-			260			°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

#### Connection Diagram



Note: Only connection A can be used for the G3VM-61BR/ER.

# G3VM-□BR□/

## ■Electrical Characteristics (Ta = 25°C)

	Ite	m	Symbol				G3VM-61BR G3VM-61ER				Measurement conditions	
				Minimum			1.18					
	LED forward	i voltage	VF	Typical			1.33			٧	IF=10 mA	
				Maximum			1.48					
	Reverse cui	rent	IR	Maximum	10						V <sub>R</sub> =5 V	
Input	Capacitance terminals	Capacitance between erminals CT		Typical			70			pF	V=0, f=1 MHz	
드	Trigger LED	forward	let	Typical	0.5 1 0.5			mA	Io=1 A			
	current		IFI	Maximum			3			IIIA	10-1 A	
	Release LE current	D forward	IFC	Minimum			0.1			mA	Ioff=10 μA	
		Connection A		Typical	20	30	65	40	100		G3VM-21BR/21ER/41BR/41ER/	
	Maximum	Connection A		Maximum	50	60	100	70	200		61BR1/61ER1/101BR/101ER:	
	resistance	Connection B	Ron	Typical	10	15		20	50	mO	Ir=5 mA, Io=2 A (Connection A and B),	
Output	with output ON	Connection C	HON	Typical	5	8	-	10			Io=4 A (Connection C), t<1 s G3VM-61BR/ER : IF=10 mA, t=10 ms, Io=2 A	
		leakage when the ILEAK Typical		Typical	- 0.001 -			цΑ	Vorr=Load voltage ratings			
	relay is oper	1	ILLAK	Maximum	1		0.01		1	μΑ	Voi 1 = Edad Voitage Tallings	
	Capacitance terminals	between	Coff	Typical	10	00	400	10	00	pF	V=0, f=1 MHz	
	pacitance betv minals	veen I/O	Cı-o	Typical			0.8			pF	f=1 MHz, Vs=0 V	
Ins	sulation resist	ance between	Ri-o	Minimum			1000			МΩ	Vi-o=500 VDC, RoH≤60%	
I/C	terminals		ri-o	Typical		10 <sup>8</sup>				IVISZ	VI-0=300 VDC, NOH≤60%	
Tu	rn-ON time		ton	Typical	2.5 2 1 2			G3VM-21BR/21ER/41BR/41ER/ 61BR1/61ER1/101BR/101ER:				
				Maximum	5	5	1.5		5	ms	IF=5 mA, RL=200 $\Omega$ ,	
Tu	Turn-OFF time		torr	Typical	0.	1	0.2	0	.1	0	S VDD=20 V * G3VM-61BR/ER :	
- 10	0		1011	Maximum	1	l	0.4		1		IF=10 mA, RL=200 Ω, VDD=20 V *	

\* Turn-ON and Turn-OFF Times



## **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

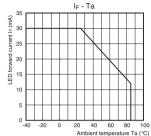
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item Symbol			G3VM-21BR G3VM-21ER	G3VM-41BR G3VM-41ER	G3VM-61BR G3VM-61ER	G3VM-61BR1 G3VM-61ER1	G3VM-101BR G3VM-101ER	Unit	
Load voltage (AC peak/DC)	VDD	Maximum	16 32 48 80			80	V		
		Minimum		5	10		5		
Operating LED forward current	IF	Typical	10		-	1	0	mA	
		Maximum	25		20		.5		
Continuous load current (AC peak/DC)	lo	Maximum	4	3.5	2.5	3	2	Α	
Ambient operating temperature	bient operating temperature Ta			-20					
Ambient operating temperature	l la	Maximum	6	i5	60	6	5	°C	

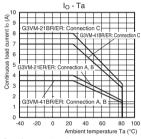
# **■**Spacing and Insulation

Item	Minimum	Unit
Creepage distances	7.0	
Clearance distances	7.0	mm
Internal isolation thickness	0.4	

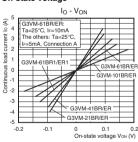
# ● LED forward current vs. Ambient temperature G3VM-21BR/21ER/41BR/41ER/ 61BR1/61ER1/101BR/101ER



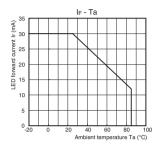
# Continuous load current vs. Ambient temperature G3VM-21BR/21ER/41BR/41ER



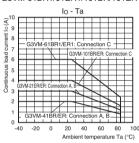
# Continuous load current vs. On-state voltage



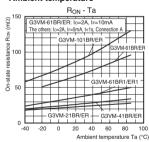
#### G3VM-61BR/61ER



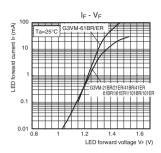
#### G3VM-61BR1/61ER1/101BR/101ER



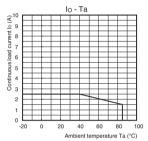
#### On-state resistance vs. Ambient temperature



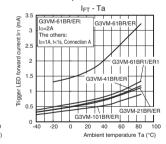
#### LED forward current vs. LED forward voltage



#### G3VM-61BR/61ER

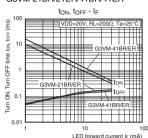


# Trigger LED forward current vs. Ambient temperature

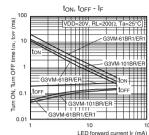


#### ● Turn ON, Turn OFF time vs. LED forward current G3VM-21BR/21ER/41BR/41ER

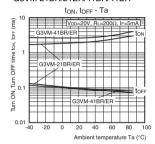
G3VM−□BR□/□ER



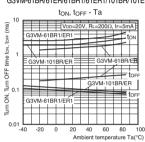
#### G3VM-61BB/61EB/61BB1/61EB1/101BB/101EB



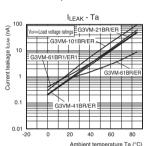
#### ● Turn ON, Turn OFF time vs. Ambient temperature G3VM-21BR/21ER/41BR/41ER



#### G3VM-61BR/61ER/61BR1/61ER1/101BR/101ER



#### Current leakage vs. Ambient temperature



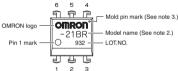
# ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

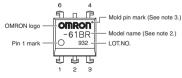
#### DIP (Dual Inline Package)

DIP 6-pin

G3VM-21BR/ER, -41BR/ER, -61BR1/ER1, -101BR/ER



Special DIP 6-pin \* G3VM-61BR/ER



#### ●Terminal Arrangement/Internal Connections (Top View)

G3VM-21BR/ER. -41BR/ER. -61BR1/ER1. -101BR/ER



#### G3VM-61BR/ER



Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

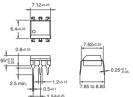
\* The external dimensions of the standard DIP 6-pin are the same, but the number of terminals is different.

# ■Dimensions (Unit: mm)

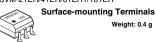
# G3VM-21BR/41BR/61BR1/101BR

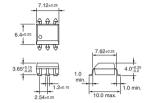
# SVM-21BH/41BH/

PCB Terminals Weight: 0.4 g



#### G3VM-21ER/41ER/61ER1/101ER





# PCB Dimensions (BOTTOM VIEW)



#### Actual Mounting Pad Dimensions (Recommended Value, Top View)

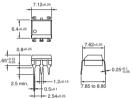


Note: The actual product is marked differently from the image shown here.

#### 00/44 04 05



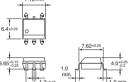
PCB Terminals
Weight: 0.4 g



G3VM-61ER



Surface-mounting Terminals
Weight: 0.4 g



PCB Dimensions (BOTTOM VIEW)



#### Actual Mounting Pad Dimensions (Recommended Value, Top View)



Note: The actual product is marked differently from the image shown here.

# ■Approved Standards

UL recognized 🔊

Approved Standards	Contact form	File No.		
UL (recognized)	1a (SPST-NO)	E80555		

# ■Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays DIP 8-pin, High-Current and Low-ON-resistance Type

# The highest class load current of MOS FET Relays realized with DIP8 package

- Contact form: 1a (SPST-NO)
- Load voltage: 60 V, 100 V, 200 V, 400 V, or 600 V
- 60-V Relay: Continuous load current of 5 A (10 A) max. \*
- 100-V Relay: Continuous load current of 3 A (6 A) max. \*
- 200-V Relay: Continuous load current of 1.5 A (3 A) max. \*
- 400-V Relay: Continuous load current of 0.4 A (0.8 A) max. \*
- 600-V Relay: Continuous load current of 0.6 A (1.2 A) max. \*
- \* Values in parentheses are for connection C.



Note: The actual product is marked differently from the image shown here.

#### RoHS Compliant

# **■**Application Examples

Communication equipment

· Industrial equipment

- Test & Measurement equipment
- Power circuit

#### ■Package (Unit: mm, Average)

DIP 8-pin PCB Terminals



Surface-mounting Terminals



Note: The actual product is marked differently from the image shown here.

### **■**Model Number Legend

#### G3VM-1 2 3 4 5

- 1. Load Voltage 2. Contact form 1:1a (SPST-NO)
- 6: 60 V
- 10:100 V 20:200 V
- 40:400 V
- 60:600 V
- 4. Additional functions
- R: Low ON resistance

3. Package

Security equipment

- C: DIP 8-pin with PCB terminals
- F: DIP 8-pin with surface-mounting terminals
- 5. Other informations
- When specifications overlap, serial code is added in the recorded order.

# ■Ordering Information

					Stick packaging	Tape packaging			
Package	Contact	Load voltage (peak value)	Continuous load current		Model	Minimum	Model	Minimum	
rackage	form	*	(peak value) *	PCB Terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity	
		60 V	5 A	G3VM-61CR1	G3VM-61FR1		G3VM-61FR1(TR05)	500 pcs.	
		100 V	3 A	G3VM-101CR	G3VM-101FR		G3VM-101FR(TR05)		
DIP8	1a (SPST-NO)	200 V	1.5 A	G3VM-201CR	G3VM-201FR	50 pcs.	G3VM-201FR(TR05)		
	(3. 31 140)	400 V	0.4 A	G3VM-401CR	G3VM-401FR		G3VM-401FR(TR05)		
		600 V	0.6.4	G2VM-601CD	G2\/M_601ED	1	G2VM_601ED/TD05\		

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item		Symbol	G3VM-61CR1 G3VM-61FR1	G3VM-101CR G3VM-101FR	G3VM-201CR G3VM-201FR	G3VM-401CR G3VM-401FR	G3VM-601CR G3VM-601FR	Unit	Measurement conditions	
	LED forward curre	ent	lF			mA					
	Repetitive peak LED	forward current	IFP			1			Α	100 μs pulses, 100 pps	
Input	LED forward current	reduction rate	ΔIF/°C			-0.3			mA/°C	Ta ≥ 25°C	
-	LED reverse volta	ge	VR			5			V		
	Connection tempe	erature	TJ			125			°C		
	Load voltage (AC	peak/DC)	Voff	60	100	200	400	600	V		
	Continuous load current	Connection A		5	3	1.5	0.4	0.6		Connection A:	
		Connection B	lo	5	3	1.5	0.4	0.6	Α	AC peak/DC	
=		Connection C		10	6	3	0.8	1.2		Connection B and C: DC	
Jutput		Connection A		-50	-30	-15	-4	-6		Ta ≥ 25°C	
õ	ON current reduction rate	Connection B	∆lo/°C	-50	-30	-15	-4	-6	mA/°C		
	reduction rate	Connection C		-100	-60	-30	-8	-12			
	Pulse ON current		lop	15	9	4.5	1.2	1.8	Α	t=100 ms, Duty=1/10	
	Connection tempe	erature	TJ			125			°C		
Di	electric strength bet	tween I/O *	VI-O			2,500			Vrms	AC for 1 min	
Ar	nbient operating ter	nperature	Ta	-40 to +85 -40 to +110 -40 to +85					°C	With no icing or	
Ar	nbient storage temp	erature	Tstg			-55 to +125			°C	condensation	
Sc	Soldering temperature					260			°C	10 s	

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

#### Connection Diagram

Connection A	1 8 LOAD 2 7 D 3 6 AC or DC
Connection B	1 8 LOAD 1 2 7 1 3 6 DC
Connection C	1 8 LOAD DC DC 3 6 DC 4 5

## ■Electrical Characteristics (Ta = 25°C)

	Ite	n	Symbol				G3VM-201CR G3VM-201FR			Unit	Measurement conditions		
				Minimum	G3VW-011 H1	GOVINFIOTEN	1.5	G3VWP4011 H	GJVM-0011 H				
	LED forwar	rd voltage	VF	Typical			1.64			V	IF=10 mA		
		-		Maximum			1.8						
	Reverse cu	ırrent	IR	Maximum	10						V <sub>R</sub> =5 V		
	Capacitano terminals	e between	Ст	Typical	70					pF	V=0, f=1MHz		
Input	Trigger LE	D forward	lfT	Typical	0.28	0.3	0.3	0.2	0.23	mA	G3VM-61CR1/FR1 : Io=1 A G3VM-101CR/FR : Io=1 A G3VM-201CR/FR : Io=1 A		
	current			Maximum	5	5	5	1	5		G3VM-401CR/FR : lo=0.4 A G3VM-601CR/FR : lo=0.6 A		
	Release LE	ED forward	IFC	Minimum	0.01					mA	G3VM-61CR1/FR1 : loff=1 μA G3VM-101CR/FR : loff=1 μA G3VM-201CR/FR : loff=1 μA		
	current			Typical	0.19		-	0.19	0.17		G3VM-401CR/FR : loFF=10 μA G3VM-601CR/FR : loFF=1 μA		
		Connection		Typical	0.022	0.06	0.25	3	1.3		G3VM-61CR1/FR1: lo=1 A, IF=5 mA, t < 1 s G3VM-101CR/FR: lo=1 A, IF=5 mA, t < 1 s G3VM-201CR/FR: lo=1 A, IF=5 mA, t < 1 s		
		Α		Maximum	0.05	0.15	0.5	5	2		G3VM-401CR/FR: lo=0.4 A, IF=2 mA, t < 1 s G3VM-601CR/FR: lo=0.6 A, IF=5 mA, t < 1 s		
Output		Connection B	Ron	Maximum	0.025	0.075	0.25	2.5	1	Ω	G3VM-61CR1/FR1 : lo=1 A, IF=2 mA, t < 1 s G3VM-101CR/FR : lo=1 A, IF=5 mA, t < 1 s G3VM-201CR/FR : lo=1 A, IF=5 mA, t < 1 s G3VM-401CR/FR : IO=0.4 A, IF=2 mA, t < 1 s G3VM-601CR/FR : IO=0.6 A, IF=2 mA, t < 1 s		
O		Connection C		Maximum	0.013	0.075	0.25	1.3	0.5		G3VM-61CR1/FR1 : IO=1 A, IF=2 mA, t < 1 s G3VM-101CR/FR : Io=1 A, IF=5 mA, t < 1 s G3VM-201CR/FR : Io=1 A, IF=5 mA, t < 1 s G3VM-401CR/FR : IO=0.8 A, IF=2 mA, t < 1 s G3VM-601CR/FR : IO=1.2 A, IF=2 mA, t < 1 s		
		kage when	ILEAK	Typical	0.01	0.02	0.1	0.001	0.05	μА	Vorr=Load Voltage Ratings		
	the relay is		ILLAN	Maximum	10	1	1	1	10	μΑ	Voit = Load Voitage Hairings		
	Capacitano terminals	e between	Coff	Typical	850	720	400	410	4,300	pF	V=0, f=1 MHz		
	pacitance b minals	etween I/O	CI-O	Typical			0.8			pF	f=1 MHz, Vs=0 V		
	sulation resist tween I/O te		Ri-o	Minimum Typical			1,000 108			МΩ	Vi-o=500 VDC, RoH≤60%		
_	ONLE			Typical	2.5	1.5	0.25	0.22	0.8				
Tu	rn-ON time		ton	Maximum		5	•	1	3	ma	In F mA D: -200 O Ven-20 V *		
т	rn-OFF time		torr	Typical	0.1 0.08 0.07				ms	IF =5 mA, RL =200 Ω, VDD=20 V *			
10	Turn-OFF time		IOFF	Maximum			1			l			

\* Turn-ON and Turn-OFF Times





## **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

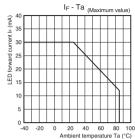
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-61CR1 G3VM-61FR1	G3VM-101CR G3VM-101FR	G3VM-201CR G3VM-201FR	G3VM-401CR G3VM-401FR	G3VM-601CR G3VM-601FR	Unit		
Load voltage (AC peak/DC)	VDD	Maximum	48	80	160	320	480	V		
Operating LED forward current	le	Typical	5	5	5	2	5	mA		
Operating LED forward current	"	Maximum	25							
Continuous load current (AC peak/DC)	lo	Maximum	5	3	1.5	0.4	0.6	Α		
Ambient operating temperature	Ta	Minimum	-40							
Ambient operating temperature	l la	Maximum			85			°C		

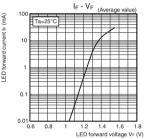
# **■**Spacing and Insulation

Item	Minimum	Unit
Creepage distances	7.0	
Clearance distances	7.0	mm
Internal isolation thickness	0.4	

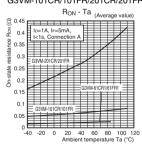
# LED forward current vs. Ambient temperature



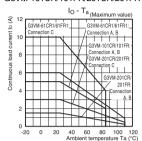
#### ● LED forward current vs. LED forward voltage



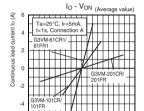
On-state resistance vs.
 Ambient temperature
 G3VM-61CR1/61FR1
 G3VM-101CR/101FR/201CR/201FR



# Continuous load current vs. Ambient temperature G3VM-61CR1/61FR1 G3VM-101CR/101FR/201CR/201FR



# Continuous load current vs. On-state voltage G3VM-61CR1/61FR1



G3VM-101CR/101FR/201CR/201FR

#### G3VM-401CR/401FR/601CR/601FR

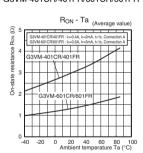
0.25

On-state voltage Von (V)

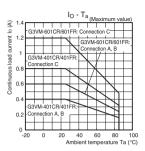
0.5

-0.25

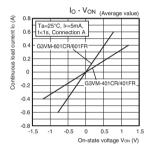
-0.5



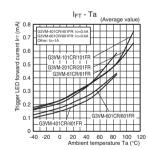
#### G3VM-401CR/401FR/601CR/601FR



#### G3VM-401CR/401FR/601CR/601FR



#### Trigger LED forward current vs. Ambient temperature

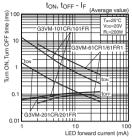


# ● Turn ON, Turn OFF time vs. LED forward current

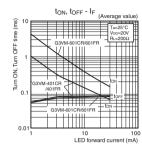
G3VM-61CR1/61FR1

G3VM-□CR□/[

G3VM-101CR/101FR/201CR/201FR

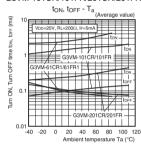


G3VM-401CR/401FR/601CR/601FR

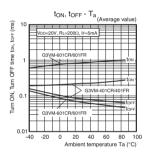


#### ● Turn ON, Turn OFF time vs. Ambient temperature

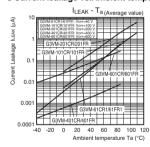
G3VM-61CR1/61FR1 G3VM-101CR/101FR/201CR/201FR



#### G3VM-401CR/401FR/601CR/601FR



#### ● Current leakage vs.Ambient temperature

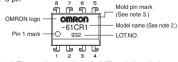


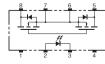
# ■Appearance / Terminal Arrangement / Internal Connections

# Appearance

#### ●Terminal Arrangement/Internal Connections (Top View)

#### DIP (Dual Inline Package) DIP 8-pin





Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

**■Dimensions** (Unit: mm)

### PCB Terminals Weight: 0.54 g



9.66±0.25

#### Surface-mounting Terminals Weight: 0.54 g

4.0+0.2

# PCB Dimensions (BOTTOM VIEW)



### **Actual Mounting Pad Dimensions**





3.65<sup>-0.15</sup>
2.5 min 1.200.15

-2.54±0.25

Note: The actual product is marked differently from the image shown here.

# ■Approved Standards

UL recognized

Model	Approved Standards	Contact form	File No.
G3VM-61CR1 G3VM-61FR1			
G3VM-101CR G3VM-101FR			
G3VM-201CR G3VM-201FR	UL (recognized)	1a (SPST-NO)	E80555
G3VM-401CR G3VM-401FR			
G3VM-601CR G3VM-601FR			

# **■**Safety Precautions

Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

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# G3VM-41GR8/61GR\_/61

MOS FET Relays SOP 4-pin, High-current and Low-ON-resistance Type

# MOS FET Relays in SOP4-pin that featuring the low ON resistance and high switching capacity as a mechanical relay.

. Load voltage: 40 V or 60 V

• 40-V Relay: Continuous load current of 1 A max.

• 60-V Relay: Continuous load current of 1.7 A max.



Note: The actual product is marked differently from the image shown here.

RoHS Compliant

## ■Application Examples

- · Semiconductor test equipment
- Test & Measurement equipment
- Communication equipment
- Security equipment Amusement equipment Industrial equipment
- Power circuit

#### ■Package

#### (Unit: mm, Average)





Note: The actual product is marked differently from the image shown here.

# ■Model Number Legend

G3VM-1 2 3 4 5

- 1. Load Voltage 2. Contact form
- 4:40 V 1:1a (SPST-NO)
- 6:60 V

- 3. Package G: SOP 4-pin V: Special SOP 4-pin
- 4. Additional function

#### 5. Other informations R: Low ON resistance

When specifications overlap, serial code is added in the recorded order.

# **■**Ordering Information

	Contact	Terminals	Load voltage	Continuous load	Stick pack	kaging	Tape packaging		
Package	form		(peak value) *	current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity	
			40 V	1000 mA	G3VM-41GR8	100 pcs.	G3VM-41GR8(TR)	2,500 pcs.	
			60 V	1000111A	G3VM-61GR1	100 pcs.	G3VM-61GR1(TR)	2,500 pcs.	
SOP4	1a (SPST-NO)	Surface-mounting Terminals		1400 mA	G3VM-61VR	125 pcs.	G3VM-61VR(TR05)	500 pcs.	
	(01 01 110)	Terrimas			G3 VIVI-0 I V N	125 pcs.	G3VM-61VR(TR)	3,000 pcs.	
				1700 mA	G3VM-61GR2	100 pcs.	G3VM-61GR2(TR05)	2,500 pcs.	

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" or "(TR05)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-41GR8	G3VM-61GR1	G3VM-61VR	G3VM-61GR2	Unit	Measurement conditions
	LED forward current	lF	30	5	0 30		mA	
Input	LED forward current reduction rate	ΔIF/°C	-0.3 -0		).5	-0.3	mA/°C	Ta ≥ 25°C
ᆸ	LED reverse voltage	VR	į	5	6	5	V	
	Connection temperature	TJ	125					
	Load voltage (AC peak/DC)	Voff	40		60		V	
¥	Continuous load current (AC peak/DC)	lo	10	1000		1700	mA	
Output	ON current reduction rate	Δlo/°C	-10	3.3	-14	-17	mA/°C	G3VM-41GR8/61GR1: Ta ≥ 50°C G3VM-61VR/61GR2: Ta ≥ 25°C
	Pulse ON current	lop	2	3	4.2	5	Α	t=100 ms, Duty=1/10
	Connection temperature	TJ		1:	25		°C	
Die	electric strength between I/O *	VI-O	15	00	3750	1500	Vrms	AC for 1 min
An	nbient operating temperature	Ta	-40 to +85	-20 to +85	-40 to +110	-40 to +85	°C	With no icing or condensation
An	nbient storage temperature	Tstg	-55 to +125 -40 to		+125 -55 to +125		°C	with no long of condensation
So	Idering temperature	-	260					10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

# ■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-41GR8	G3VM-61GR1	G3VM-61VR	G3VM-61GR2	Unit	Measurement conditions
			Minimum	1.18	1.0	1.1	1.18		
	LED forward voltage	VF	Typical	1.33	1.15	1.27	1.33	٧	IF=10 mA
			Maximum	1.48	1.3	1.4	1.48		
=	Reverse current	lR	Maximum		1	0		μА	VR=5 V
Input	Capacitance between terminals	Ст	Typical	70	15	7	0	pF	V=0, f=1 MHz
			Typical	1 0.6					G3VM-41GR8/61GR1/61GR2:
	Trigger LED forward current	IFT	Maximum		3	mA	lo=100 mA G3VM-61VR: lo=1400 mA		
	Release LED forward current	IFC	Minimum		0.	.1		mA	Ioff=100 μA
	Maximum resistance with output	Ron	Typical	0.1	0.25	0.13	0.08	Ω	G3VM-61GR2/61VR: IF=5mA, Io= Continuous load current ratings, t<1s
Output	ON		Maximum	0.13	0.7	0.25	0.13	12	G3VM-41GR8/61GR1: IF=5mA, Io= Continuous load current ratings
	Current leakage when the relay is		Typical	-	0.2	2	1		G3VM-41GR8: Voff=30 V
	open	ILEAK	Maximum	1	100	1000	10	nA	G3VM-61GR1/61VR/61GR2: Voff=60 V
	Capacitance between terminals	Coff	Typical	300	90	100	250	pF	V=0, f=1 MHz
C	apacitance between I/O terminals	Cı-o	Typical		0.	.8	•	pF	f=1 MHz, Vs=0 V
In	sulation resistance between I/O	Ri-o	Minimum		10	00		MΩ	Vi-o=500 VDC, RoH≤60%
te	rminals	111-0	Typical		10	08		10122	VI-0=300 VDC, 11011500 /6
Т	ırn-ON time	ton	Typical	1.2	1.4	2	0.7		
		LON	Maximum	3					IF=5 mA, RL=200 $\Omega$ ,
Т	ırn-OFF time	tore	Typical	0.2	0.6	0.1	0.1	ms	VDD=20 V *
1.0	Turn-OFF time		Maximum	0.5	1	1	0.5		i

#### \* Turn-ON and Turn-OFF Times



# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

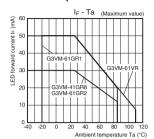
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-41GR8	G3VM-61GR1	G3VM-61VR	G3VM-61GR2	Unit	
Load voltage (AC peak/DC)	VDD	Maximum	32		48	V		
0 " 150" 1		Maximum		5				
Operating LED forward current	lF	Typical	10		7.5	10		
curion		Maximum	20		2	mA		
Continuous load current (AC peak/DC)	lo	Maximum	1000		1400	1300		
Ambient operating	Ta	Minimum	-20					
temperature	1d	Maximum	6	0	100	65	°C	

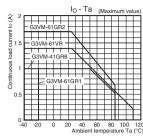
# **■**Spacing and Insulation

Item	G3VM-□GR□ G3VM-61VR		Unit	
item	Mini	Unit		
Creepage distances	4.0	5.0		
Clearance distances	4.0	5.0	mm	
Internal isolation thickness	0.1	0.2		

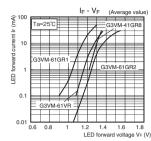
#### LED forward current vs. Ambient temperature



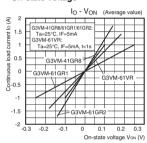
# Continuous load current vs. Ambient temperature



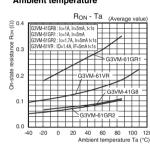
#### LED forward current vs. LED forward voltage



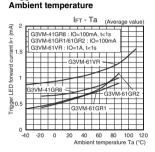
#### Continuous load current vs. On-state voltage



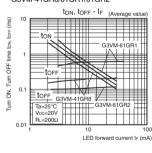
#### On-state resistance vs. Ambient temperature



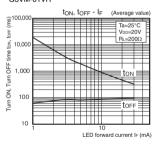
Trigger LED forward current vs.



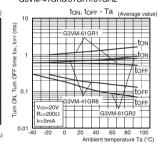
#### Turn ON. Turn OFF time vs. LED forward current G3VM-41GR8/61GR1/61GR2



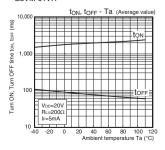
G3VM-61VR



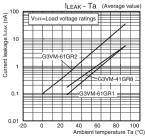
● Turn ON, Turn OFF time vs. Ambient temperature G3VM-41GR8/61GR1/61GR2



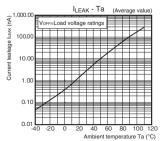
#### G3VM-61VR



#### Current leakage vs. Ambient temperature G3VM-41GR8/61GR1/61GR2



### G3VM-61VR



### Appearance

#### SOP (Small Outline Package)

SOP 4-pin 4 3
OMFON logo OMFON logo LOTINO.

Pin 1 mark Description Model name (See note 2.)

1 1 1 mark Description Company (See note 2.)

Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark

# ●Terminal Arrangement/Internal Connections (Top View)



### ■Dimensions (Unit: mm)

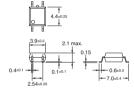
is from a pin on the mold.

SOP (Small Outline Package) SOP 4-pin



#### **Surface-mounting Terminals**

Weight: 0.1 g



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



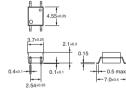
Note: The actual product is marked differently from the image shown here.

Special SOP 4-pin \* (G3VM-61VR)



#### Surface-mounting Terminals

Weight: 0.1 g



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



\* The external dimensions are different from those of the standard SOP 4-pin, but the mounting pad dimensions are the same **Note:** The actual product is marked differently from the image shown here.

# **■**Approved Standards

UL recognized

Model	Approved Standards	Contact form	File No.
G3VM-41GR8 G3VM-61GR1 G3VM-61GR2 G3VM-61VR	UL (recognized)	1a (SPST-NO)	E80555

# **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

# /M-21HR/31HR/41HR/61HR/61HR1

MOS FET Relays SOP 6-pin, High-current and Low-ON-resistance Type

# MOS FET Relays in SOP 6-pin packages that achieve the low ON resistance and high switching capacitance of a mechanical relav

Load voltage: 20 V, 30 V, 40 V, or 60 V

• 20-V Relay: Continuous load current of 2.5 A (5 A) max. \*

• 30-V Relay: Continuous load current of 4 A (8 A) max. \*

• 40-V Relay: Continuous load current of 2.5 A (5 A) max. \*

• 60-V Relay: Continuous load current of 3.3 A (6.6 A) max. \*

\* Values in parentheses are for connection C.



Note: The actual product is marked differently from the image shown here.

# RoHS Compliant

## ■Application Examples

- Semiconductor test equipment
- Communication equipment
- Test & Measurement equipment
- Security equipment
- Industrial equipment Power circuit

· Amusement equipment

# ■Package

### (Unit: mm, Average)

SOP 6-pin



Note: The actual product is marked differently from the image shown here.

# **■**Model Number Legend

G3VM-

1 2 3 4 5

1. Load Voltage 2. Contact form

1: 1a (SPST-NO) 2 · 20 V

3:30 V

4. Additional functions 5. Other informations 4:40 V R: Low ON resistance 6:60 V

H: SOP 6-pin

3. Package

When specifications overlap, serial code is added in the recorded order.

# ■Ordering Information

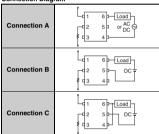
	Contact		Load voltage	Continuous load current (peak value) *		Stick packaging		Tape packaging	
Package form		Terminals	(peak value) *	Connection A, B	Connection C	Model	Minimum package quantity	Model	Minimum package quantity
		Surface-mounting Terminals	20 V	2.5 A	5 A	G3VM-21HR		G3VM-21HR(TR)	2,500
			30 V	4 A	8 A	G3VM-31HR		G3VM-31HR(TR05)	500
SOP6	1a (SPST-NO)		40 V	2.5 A	5 A	G3VM-41HR	75	G3VM-41HR(TR)	2,500
	(2. 2. 110)		60 V	2.3 A	4.6 A	G3VM-61HR		G3VM-61HR(TR)	2,500
				3.3 A	6.6 A	G3VM-61HR1		G3VM-61HR1(TR05)	500

\* The AC peak and DC value are given for the load voltage and continuous load current. Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

	Iten	n	Symbol	G3VM-21HR	G3VM-31HR	G3VM-41HR	G3VM-61HR	G3VM-61HR1	Unit	Measurement conditions		
	LED forward cu	ırrent	lF			30	•		mA			
Input	LED forward current reduction rate		ΔIF/°C				mA/°C	Ta ≥ 25°C				
=	LED reverse vo	ltage	VR			5			V			
	Connection ten	nperature	TJ			125			°C			
	Load voltage (A	AC peak/DC)	Voff	20	30	40	6	i0	V			
		Connection A		2500	4000	2500	2300	3300		Connection A:		
	Continuous load current	Connection B	lo	2500	4000	2500	2300	3300	mA	AC peak/DC Connection B and C:		
Ħ		Connection C		5000	8000	5000	4600	6600		DC		
Output	ON current	Connection A	Δlo/°C			-33.3	-40	-33.3	-30.7	-33		G3VM-31HR/61HR1:
U	reduction rate	Connection B		-55.5	-40	-33.3	50.7	00	mA/°C	Ta ≥ 25°C		
	Toddollori rato	Connection C		-66.7	-80	-66.7	-61.3	-66		Others: Ta ≥ 50°C		
	Pulse ON curre	ent	lop	7.5	12	7.5	7	10	Α	t=100 ms, Duty=1/10		
	Connection ten	nperature	TJ			125			°C			
D	electric strength	between I/O *	V <sub>I-O</sub>			1500			Vrms	AC for 1 min		
Aı	Ambient operating temperature			-40 to +85						With no icing or		
A	Ambient storage temperature					-55 to +125			°C	condensation		
S	oldering temperat	-			260			°C	10 s			

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

#### Connection Diagram



Low-ON-resistance die

strength

g Low-output-capacitand and Low-ON-resistanc

#### G3VM-21HR/31HR/41HR/61HR/61HR1 **MOS FET Relays**

## ■Electrical Characteristics (Ta = 25°C)

	Ite	m	Symbol		G3VM-21HR	G3VM-31HR	G3VM-41HR	G3VM-61HR	G3VM-61HR1	Unit	Measurement conditions	
				Minimum			1.18					
	LED forward	/oltage	VF	Typical			1.33			V	IF=10 mA	
				Maximum			1.48					
Ħ	Reverse current		lr	Maximum	10					μА	VR=5 V	
Input	Capacitance between terminals	Ст	Typical		70				pF	V=0, f=1 MHz		
	Trigger I ED f	orward current	IFT	Typical	-	0.3	0.	4	0.2	mA	G3VM-61HR1 : Io=2000 mA	
	Trigger LLD I	orward current		Maximum	3					IIIA	Others : Io=100 mA	
Release LED forward current		forward current	IFC	Minimum	0.1					mA	Ioff=10 μA	
	Connection A			0.02	0.02	0.03	0.04	0.03		G3VM-31HR:		
	Maximum	Connection B		Typical	0.01	0.008	0.015	0.02	0.015	1	I <sub>F</sub> =5 mA I <sub>O</sub> =4 A (Connection A, B)	
	resistance	Connection C	Ron		0.005	0.004	0.008	0.01	0.008	Ω	Io=8 A (C connections), t<1s	
	with output ON	Connection A	HON		0.05	0.04	0.06	0.07	0.06	32	Others: I==5 mA	
Output	. ON	Connection B		Maximum	0.025	0.02	0.03	0.04	-		In=5 mA Io=2 A (Connection A. B)	
ō		Connection C			-	0.01		-			Io=4 A (C connections), t<1s	
	Current leaka	ge when the	ILEAK	Typical	,	=				nA	Vorr= Load voltage ratings	
	relay is open		ILEAK	Maximum	10	1000	11	0	20	IIA	Voff= Load voltage ratings	
	Capacitance I	etween	Coff	Typical	1000	1100	10	00	700	pF	V=0, f=1 MHz	
	terminals		COFF	Maximum		-			1500	рі	V-0, I-1 WII IZ	
	pacitance betv minals	veen I/O	CI-O	Typical			0.8			pF	f=1 MHz, Vs=0 V	
		nce between I/O	Ri-o	Minimum			1000			МΩ	Vi-o=500 VDC, RoH≤60%	
ter	minals		111-0	Typical			10 <sup>8</sup>			10122	VI-0=300 VDO, 1101120076	
т.,	ON #:		4	Typical	1.5	1.1	1.	1.0 0.			G3VM-21HR:	
10	Turn-ON time		ton	Maximum	5						I <sub>F</sub> =5 mA, R <sub>L</sub> =200 Ω, V <sub>DD</sub> =10 V *	
Tu	Turn-OFF time		toff	Typical	0.1	0.1 0.1 0.15 0.2			0.2	ms	Others : I <sub>F</sub> =5 mA, R <sub>L</sub> =200 Ω.	
10			1011	Maximum			1				V <sub>DD</sub> =20 V *	

\* Turn-ON and Turn-OFF Times



# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

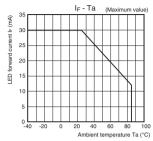
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-21HR	G3VM-31HR	G3VM-41HR	G3VM-61HR	G3VM-61HR1	Unit
Load voltage (AC peak/DC)	VDD	Maximum	20	24	40	60	48	V
		Minimum		*	5		,	
Operating LED forward current	lF	Typical	1	0	7	.5	10	mA
		Maximum	20	25	20		25	IIIA
Continuous load current (AC peak/DC)	lo	Maximum	2000	4000	2000	1800	3300	
Ambient operating temperature	Та	Minimum	-20					
Ambient operating temperature	1 d	Maximum			65			°C

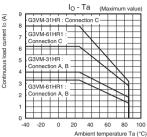
# **■**Spacing and Insulation

Item	Minimum	Unit
Creepage distances	4.0	
Clearance distances	4.0	mm
Internal isolation thickness	0.1	

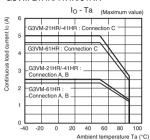
#### ● LED forward current vs. Ambient temperature



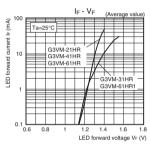
#### Continuous load current vs. Ambient temperature G3VM-31HR/61HR1



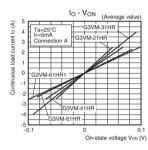
#### G3VM-21HR/41HR/61HR



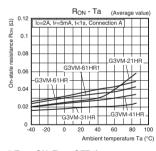
### LED forward current vs. LED forward voltage



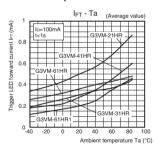
#### Continuous load current vs. On-state voltage



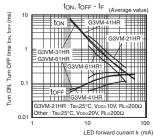
#### On-state resistance vs. Ambient temperature



#### Trigger LED forward current vs. Ambient temperature



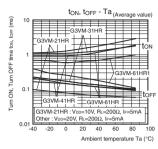
#### Turn ON, Turn OFF time vs. LED forward current



SOP

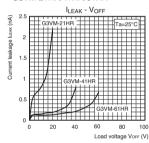
G3VM-21HR/31HR/41HR/61HR/61HR

#### ● Turn ON, Turn OFF time vs. Ambient temperature



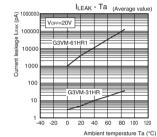
### Current leakage vs. Load voltage

#### G3VM-21HR/41HR/61HR



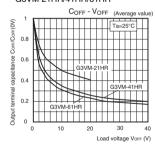
#### Current leakage vs. Ambient temperature G3VM-31HR/61HR1

G3VM-21HR/31HR/41HR/61HR/61HR1



#### Output terminal capacitance vs. Load voltage

G3VM-21HR/41HR/61HR



■Appearance / Terminal Arrangement / Internal Connections

# Appearance

### SOP (Small Outline Package)

SOP 6-pin 6 5 4

OMRON logo ORRON logo ORRON logo ORRON logo ORRON logo ORRON LOTNO.

Pin 1 mark 3 932 LOTNO.

Note: 1. The actual product is marked differently from the image shown here. Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

#### Terminal Arrangement/Internal Connections (Top View)

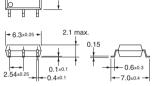


### ■Dimensions (Unit: mm)



#### **Surface-mounting Terminals**

Weight: 0.13 g



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)

Note: The actual product is marked differently from the image shown here.

## ■Approved Standards

UL recognized 🔊

Approved Standards	Contact form	File No.
UL (recognized)	1a (SPST-NO)	E80555

## **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

91

# VM-81HR/101HR/101

MOS FET Relays SOP 6-pin, High-current and Low-ON-resistance Type

# MOS FET Relays in SOP 6-pin packages that achieve the low ON resistance and high switching capacitance of a mechanical relay

- Load voltage: 80 V/100 V
- 80-V Relay: Continuous load current of 1.25 A (2.5 A) max. \*
- 100-V Relay: Continuous load current of 2 A (4 A) max. \*
- \* Values in parentheses are for connection C.



Note: The actual product is marked differently from the image shown here.

#### RoHS Compliant

# ■Application Examples

- · Semiconductor test equipment
- Communication equipment
- Test & Measurement equipment
- Security equipment
- Industrial equipment Power circuit
- Amusement equipment

#### ■Package (Unit: mm, Average)

SOP 6-pin



Note: The actual product is marked differently from the image shown here.

## **■**Model Number Legend

G3VM-

- 1 2 3 4 5
- 1. Load Voltage 2. Contact form 8:80 V 1: 1a (SPST-NO)
- 10:100 V
  - 4. Additional functions 5. Other informations
  - R: Low ON resistance When specifications overlap, serial code is added in the recorded order.

3. Package

H: SOP 6-pin

# **■**Ordering Information

	Contact			Load voltage		load current value) *	Stick pack	aging	Tape packagi	ng
Package	form	Terminals	(peak value) *	Connection A, B	Connection C	Model	Minimum package quantity	Model	Minimum package quantity	
		Surface- mounting Terminals	80 V	1.25 A	2.5 A	G3VM-81HR		G3VM-81HR(TR)	2,500	
SOP6	OP6 (SPST-NO)		100 V	1.4 A	2.8 A	G3VM-101HR	75	G3VM-101HR(TR)	2,500	
			100 V	2.0 A	4.0 A	G3VM-101HR1		G3VM-101HR1(TR05)	500	

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item	1	Symbol	G3VM-81HR	G3VM-101HR	G3VM-101HR1	Unit	Measurement conditions
	LED forward curre	ent	lF	50	3	30	mA	
Ħ	LED forward current reduction rate		ΔIF/°C	-0.5	-0	).3	mA/°C	Ta ≥ 25°C
Input	LED reverse volta	ge	VR		5		V	
	Connection tempe	erature	TJ		125		°C	
	Load voltage (AC peak/DC)		Voff	80	10	00	V	
		Connection A		1250 1400 2000 m				
	Continuous load current	Connection B	lo		1400	2000	mA	Connection A: AC peak/DC Connection B and C: DC
Ħ		Connection C	İ	2500	2800	4000		Commodition B and C. BC
Output	au .	Connection A		-12.5	-18.7	-20	mA/°C	000 #4 404 UP T + 5000
O	ON current reduction rate	Connection B	Δlo/°C	C -12.5	-10.7	-20		G3VM-101HR : Ta ≥ 50°C Others : Ta > 25°C
	reduction rate	Connection C	1	-25.0	-37.3	-40		Guicia. Ta 223 G
	Pulse ON current		lop	3.75	4	6	Α	t=100 ms, Duty=1/10
	Connection temper	erature	TJ		125		°C	
Di	electric strength bet	tween I/O *	V <sub>I</sub> -o		1500		Vrms	AC for 1 min
Ar	nbient operating ten	nperature	Ta	-20 to +85 -40 to +85			°C	With no icing or condensation
Ar	nbient storage temp	erature	Tstg	-40 to +125 -55 to +125			°C	with no long of condensation
Sc	oldering temperature	9	-		260		°C	10 s

The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

### Connection Diagram

Connection A	1 6 Load 1 2 5 0 or AC 2 5 0 or DC
Connection B	2 5 DC
Connection C	1 6 Load 2 5 DC

# ■Electrical Characteristics (Ta = 25°C)

G3VM-81HR/101HR/101HR1

	H	em	Symbol		G3VM-81HR	G3VM-101HR	G3VM-101HR1	Unit	Measurement conditions
		ieiii	Syllibol	Minimum	1.0		18	Ollic	weasurement conditions
	LED forward	LED forward voltage		Typical	1.15		1.33		I==10 mA
	LLD IOIWaid	voltage	VF	Maximum	1.3		48	V	II = 10 HZ
	Reverse curr	Reverse current		Maximum	1.5	10	40	μА	VR=5 V
Ħ	Capacitance between terminals		IR CT	Typical	15	70		pF	V=0. f=1 MHz
Input	Capacitarice	between terminals	- 01	,,				Pi	V=0, 1=1 WH12
				Typical	2	0	.4		G3VM-81HB : Io=1250 mA
	Trigger LED	orward current	IFT	Maximum	5			mA	Others : Io=100 mA
				Maximum	5	3			
	Release LED	forward current	IFC	Minimum	0.2	0	.1	mA	Ioff=10 μA
		Connection A			0.11	0.1	0.045		
	Maximum	Connection B		Typical	0.06	0.05	0.022	1	G3VM-81HR : IF=5 mA,
	resistance with output ON	Connection C	Ron		0.03	0.025	0.011	Ω	Io= Continuous load current ratings G3VM-101HR/101HR1 : IF=5 mA.
		Connection A		Maximum	0.15	0.2	0.07	52	lo= Continuous load current ratings,
		Connection B			0.08	0.1	0.035		t < 1 s
Ħ		Connection C			0.04	-	0.018		
Output	Current leakage when the relay is open		ILEAK	Typical	1.2	-	-	nA	G3VM-81HR : Voff=20 V, Ta=50°C
				Maximum	1.5	10	1000	IIA	Others : Voff= Load voltage ratings
				Typical	460	1000	500		G3VM-81HR : V=0, f=100 MHz
	Capacitance	between terminals	Coff	Maximum	1000	=	=	pF	Others : V=0, f=1 MHz
C	Capacitance between I/O terminals		Cı-o	Typical		8.0		pF	f=1 MHz, Vs=0 V
	Insulation resistance between I/O		Rı-o	Minimum		1000		МΩ	Vi-o=500 VDC, RoH≤60%
te	terminals		111-0	Typical		108		IVISE	VP0=500 VB0, NonE50076
т.	Turn-ON time		ton	Typical	2.0	1.0	1.1		
l''			LOIN	Maximum	3.0	5.0		ma	IE mA B:- 200 O V 20 V **
т.	Turn-OFF time			Typical	0.7	0.15	0.1	ms	I <sub>F</sub> =5 mA, R <sub>L</sub> =200 Ω, V <sub>DD</sub> =20 V *
11				Maximum		1.0			

Turn-ON and Turn-OFF Times



# **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

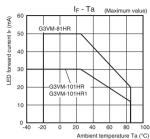
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-81HR	G3VM-101HR	G3VM-101HR1	Unit		
Load voltage (AC peak/DC)	VDD	Maximum	64	100	80	V		
		Minimum		5				
Operating LED forward current	lF	Typical	=	7.5	10	mA		
		Maximum	30	20	25	IIIA		
Continuous load current (AC peak/DC)	lo	Maximum	1250	1100	2000			
Ambient operating temperature	Ta	Minimum	25	-20		°C		
Ambient operating temperature	ı a	Maximum	60	6	5	·		

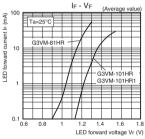
# **■**Spacing and Insulation

Item	Minimum	Unit
Creepage distances	4.0	
Clearance distances	4.0	mm
Internal isolation thickness	0.1	

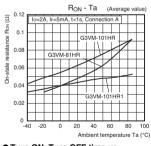
# LED forward current vs. Ambient temperature



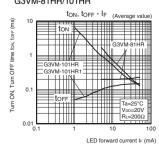
## ● LED forward current vs. LED forward voltage



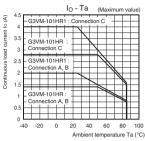
# On-state resistance vs. Ambient temperature



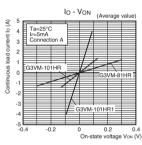
# Turn ON, Turn OFF time vs. LED forward current G3VM-81HR/101HR



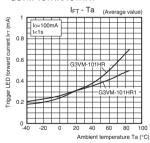
# Continuous load current vs. Ambient temperature G3VM-101HR/101HR1



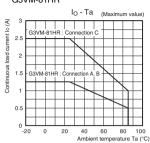
# Continuous load current vs. On-state voltage



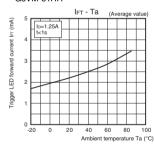
# Trigger LED forward current vs. Ambient temperature G3VM-101HR/101HR1



#### G3VM-81HR



### G3VM-81HR

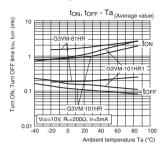


SOP

G3VM-81HR/101HR/101HR

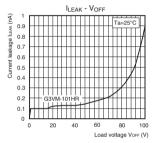
#### ● Turn ON, Turn OFF time vs. Ambient temperature

G3VM-81HR/101HR/101HR1

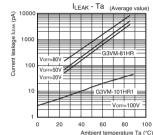


#### Current leakage vs. Load voltage

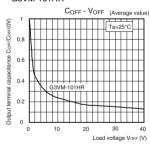
#### G3VM-101HR



#### Current leakage vs. Ambient temperature G3VM-81HR/101HR1



# Output terminal capacitance vs. Load voltage G3VM-101HR



■Appearance / Terminal Arrangement / Internal Connections

Note: 1. The actual product is marked differently from the image shown here. Note: 2. "G3VM" does not appear in the model number on the Relay. Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

### ●Terminal Arrangement/Internal Connections (Top View)

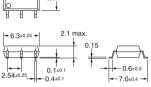


### ■Dimensions (Unit: mm)



#### Surface-mounting Terminals

Weight: 0.13 g



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)

Note: The actual product is marked differently from the image shown here.

### ■Approved Standards

UL recognized R

Approved Standards	Contact form	File No.
UL (recognized)	1a (SPST-NO)	E80555

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

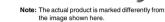
NEW

# G3VM-31QR/61QR2/101QR1

MOS FET Relays S-VSON 4-pin, High-current and Low-ON-resistance Type

# World's smallest \* class New S-VSON Package

- Load voltage 30 V/60 V/100 V.
- 30-V Relay: Continuous load current of 1.5 A max.
- 60-V Relay: Continuous load current of 1.0 A max.
- 100-V Relay: Continuous load current of 0.65 A max.
- High Ambient operating temperature: -40°C to +110°C



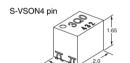
\* As of March 2018 Survey by OMBON.

RoHS Compliant

# **■**Application Examples

- Semiconductor test equipment
- Test & measurement equipment
- Communication equipment
- Data loggers
- ■Package (Unit:mm, Average)

### **■**Model Number Legend



Note: The actual product is marked differently from the image shown here.

1. Load Voltage 3: 30 V

6: 60 V 10: 100 V 4. Additional functions R: Low On-resistance 2. Contact form Package type
1: 1a (SPST-NO)
3. Package type
Q: S-VSON 4 pin

5. Other informations

When specifications overlap, serial code is added in the recorded order.

# **■**Ordering Information

				Continuous	Packing/Tape cut		Packing/Tape & reel	
Package type	Contact form	Terminals	Load voltage (peak value) *	load current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity
	ON4 1a Surface-moun (SPST-NO) Terminals	0 (	30 V	1,500 mA	G3VM-31QR		G3VM-31QR (TR05)	
S-VSON4			60 V	1,000 mA	G3VM-61QR2	1 pc.	G3VM-61QR2 (TR05)	500 pcs.
			100 V	650 mA	G3VM-101QR1		G3VM-101QR1 (TR05)	

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: When ordering tape packing, add "(TR05)" (500 pcs/reel) to the model number.

Ask your OMRON representative for orders under 500 pcs. We can supply products with the tape already cut.

Tape-cut S-VSON is packaged without humidity resistance. Use manual soldering to mount them.

Refer to common precautions.

# ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-31QR	G3VM-61QR2	G3VM-101QR1	Unit	Measurement conditions	
	LED forward current	lF	30					
Ħ	LED forward current reduction rate	ΔIF/°C	-0.3				Ta≥25°C	
Input	LED reverse voltage	VR		5	V			
	Connection temperature	TJ		125		°C		
	Load voltage (AC peak/DC)	Voff	30	60	100	V		
=	Continuous load current (AC peak/DC)	lo	1500	1000	650	mA		
Output	ON current reduction rate	Δlo/°C	-15	-10	-6.5	mA/°C	Ta≥25°C	
0	Pulse ON current	lop	4.5	3	2	Α	t=100 ms, Duty=1/10	
	Connection temperature	TJ	125			°C		
Di	electric strength between I/O *	V <sub>I-O</sub>	500			Vrms	AC for 1 min	
Ambient operating temperature		Ta	-40 to +110				Miss.	
Ambient storage temperature		Tstg	-40 to +125			°C	With no icing or condensation	
Sc	oldering temperature	-		260		°C	10 s	

The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

## **■Electrical Characteristics** (Ta = 25°C)

	Item	Syn	nbol	G3VM-31QR	G3VM-61QR2	G3VM-101QR1	Unit	Measurement conditions
		VF	Minimum		1.1			
	LED forward voltage		Typical		1.21		V	I <sub>F</sub> =10 mA
			Maximum	1.4				
Input	Reverse current	IR	Maximum		10		μА	V <sub>R</sub> =5 V
宣	Capacity between terminals	Ст	Typical		30		pF	V=0, f=1 MHz
	T: 150/		Typical	0.6	0	.7		lo=100 mA
	Trigger LED forward current	IFT	Maximum		3		mA	I0=100 MA
	Release LED forward current	IFC	Minimum		0.1		mA	Ioff=10 μA
			Typical	0.1	0.2	0.4		G3VM-31QR/61QR2,
	Maximum resistance with output ON	Ron	Maximum	0.2	0.3	0.6	Ω	lo=1000 mA, IF=5 mA, t<1 s G3VM-101QR1, lo=650 mA, IF=5 mA, t<1 s
Output	Current leakage when the relay is open	Ileak	I <sub>LEAK</sub> Maximum 1 1000 (1)				G3VM-31QR :VoFF= 20 V G3VM-61QR2 :VoFF= 60 V (VoFF=50 V) G3VM-101QR1 :VoFF= 100 V (VoFF=80 V)	
	Capacity between terminals	Coff	Typical	120	80	50	pF	V=0, f=100 MHz, t<1 s
	Capacity between terminals	Con	Maximum	-	150	-	þг	V=0, I=100 MHz, t<1 S
Ca	pacity between I/O terminals	Cı-o	Typical	1	0	.9	pF	f=1 MHz, Vs=0 V
	ulation resistance between I/O minals	Ri-o	Typical		10 <sup>8</sup>		МΩ	Vi-o=500 VDC, RoH≤60%
Turn-ON time		ton	Typical	0.8	0.75	0.6	ms	
Iu	III-ON UIIIE	LON	Maximum	imum 2		IIIS	I <sub>F</sub> =5 mA, R <sub>L</sub> =200 Ω,	
т	m-OFF time	torr	Typical	0.05	0.05 0.04		mo	VDD=20 V *
IU	III-OFF WITE	LOFF	Maximum	1	0	.3	ms	

#### \* Turn-ON and Turn-OFF Times





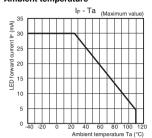
# **■**Recommended Operating Conditions

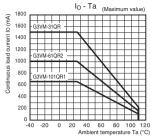
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-31QR	G3VM-61QR2	G3VM-101QR1	Unit
Load voltage (AC peak/DC)	V <sub>DD</sub>	Maximum	24	48	80	V
		Minimum		•		
Operating LED forward current	lF	Typical		mA		
		Maximum		IIIA		
Continuous load current (AC peak/DC)	lo	Maximum	1300	1000	650	
Ambient operating temperature	Ta	Minimum	-20			°C
Ambient operating temperature	Id	Maximum		100		C

#### ●LED forward current vs. Ambient temperature

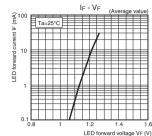




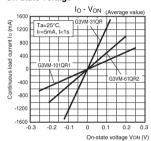
Continuous load current vs.

Ambient temperature

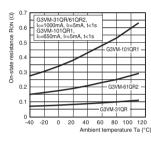
#### ●LED forward current vs. LED forward voltage



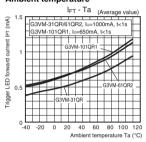
#### Continuous load current vs. On-state voltage



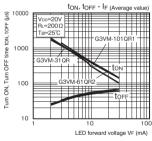
#### On-state resistance vs. Ambient temperature



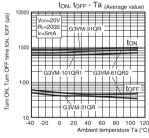
Trigger LED forward current vs. Ambient temperature



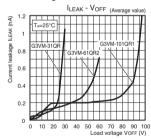
#### ●Turn ON, Turn OFF time vs. LED forward current



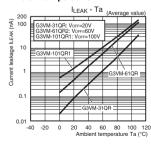
#### ●Turn ON, Turn OFF time vs. Ambient temperature



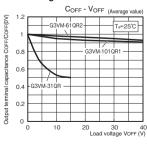
## Current leakage vs. Load voltage



#### Current leakage vs. Ambient temperature



## Load voltage



#### ■Appearance / Terminal Arrangement / Internal Connections

#### ■Appearance

#### S-VSON (Super-Very Small Outline Non-leaded) S-VSON4 pin

Model name \*

\* Actual model name marking for

each model	_
Model	Marking
G3VM-31QR	3Q0
G3VM-61QR2	6Q2
G3VM-101QR1	AQ1

## ■Terminal Arrangement/Internal Connections (Top View)

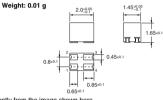


Note 1. The actual product is marked differently from the image shown here.

2. "G3VM" does not appear in the model number on the Relay.

#### ■Dimensions (Unit: mm)

#### **Surface-mounting Terminals**



**Actual Mounting Pad Dimensions** 

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is  $\pm 0.1$  mm.

#### Note: The actual product is marked differently from the image shown here.

#### **■**Safety Precautions

• Refer to "Common Precautions" for all G3VM models.

## Small DIP 4-pin package with Dielectric Strength of 5.000 VAC between I/O

- Load voltage: 40 V, 60 V, 200 V, 350 V, 400 V, or 600 V
- Standard type: Trigger LED forward current 3 mA (max.)
- High sensitive type: Trigger LED forward current 2 mA (max.)



Note: The actual product is marked differently from the image shown here.

#### RoHS Compliant

#### **■**Application Examples

- · Electrical power unit
- · Security equipment
- Medical equipment

- Test & measurement equipment
- · Industrial equipment

#### ■Package (Unit: mm, Average)

DIP 4-pin PCB Terminals



Surface-mounting Terminals



Note: The actual product is marked differently from the image shown here.

#### **■**Model Number Legend

#### G3VM- ... ... ... ... 1 2 3 4 5

- 1. Load Voltage 2. Contact form
- 4: 40 V 1: 1a (SPST-NO)
- 60 V
- 20: 200 V
- 35: 350 V 40: 400 V 60: 600 V
- - 4. Additional functions Y: Dielectric strength between I/O above 2,500 V type
- 3. Package
  - A: DIP4 pin PCB terminals D: DIP4 pin Surface
    - mounting Terminals

#### 5. Other informations

When specifications overlap, serial code is added in the recorded order.

#### **■**Ordering Information

#### Standard type

			Continuous		Stick packaging		Tape packaging		
Package	Contact	Load voltage	load current	Mo	del	Minimum	Model	Minimum	
	form	(peak value) *		PCB terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity	
		40 V	2000 mA	G3VM-41AY1	G3VM-41DY1		G3VM-41DY1(TR05)		
		60 V	500 mA	G3VM-61AY1	G3VM-61DY1		G3VM-61DY1(TR05)		
DIP4	1a	200 V	250 mA	G3VM-201AY1	G3VM-201DY1	100 pcs.	G3VM-201DY1(TR05)	500 pcs.	
DII 4	(SPST-NO)	350 V	100 mA	G3VM-351AY1	G3VM-351DY1	100 pcs.	G3VM-351DY1(TR05)	300 pcs.	
		400 V	120 mA	G3VM-401AY1	G3VM-401DY1		G3VM-401DY1(TR05)		
		600 V	90 mA	G3VM-601AY1	G3VM-601DY1		G3VM-601DY1(TR05)		

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.

#### High sensitive type

			Continuous	(	Stick packaging		Tape packaging		
Package	Contact	Load voltage (peak value) #	load current	Mo	del	Minimum	Model	Minimum	
Таскаде	form			PCB terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity	
		40 V	2000 mA	G3VM-41AY	G3VM-41DY		G3VM-41DY(TR)		
		60 V	500 mA	G3VM-61AY	G3VM-61DY		G3VM-61DY(TR)		
DIP4	1a	200 V	250 mA	G3VM-201AY	G3VM-201DY		G3VM-201DY(TR)	4.500	
DIP4	(SPST-NO)	350 V	100 mA	G3VM-351AY	G3VM-351DY	100 pcs.	G3VM-351DY(TR)	1,500 pcs.	
		400 V	120 mA	G3VM-401AY	G3VM-401DY		G3VM-401DY(TR)		
		600 V	90 mA	G3VM-601AY	G3VM-601DY		G3VM-601DY(TR)	İ	

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

#### ■Absolute Maximum Ratings (Ta = 25°C)

#### •Standard type, High senstive type

	Item				G3VM-201DY1 G3VM-201AY			G3VM-601AY1 G3VM-601DY1 G3VM-601AY G3VM-601DY	Unit	Measurement conditions
	LED forward current	lF			3	0			mA	
	Repetitive peak LED forward current	IFP				1			Α	100 μs pulses, 100 pps
nput	LED forward current reduction rate	ΔIF/°C	-0.3							Ta≥25°C
=	LED reverse voltage	VR	5							
	Connection temperature	TJ	125						°C	
	Load voltage (AC peak/DC)	Voff	40	60	200	350	400	600	٧	
Ħ	Continuous load current (AC peak/DC)	lo	2,000	500	250	100	120	90	mA	
th th	ON current reduction rate	Δlo/°C	-20	-5	-2.5	-1	-1.2	-0.9	mA/°C	Ta≥25°C
0	Pulse ON current	lop	6	1.5	0.75	0.3	0.36	0.27	Α	t=100 ms, Duty=1/10
	Connection temperature	TJ		•	12	25	•		°C	
Die	lectric strength between I/O *	VI-O			5,0	000			Vrms	AC for 1 min
Am	bient operating temperature	Ta			-40 to	+85			°C	With no icing or
Am	bient storage temperature	Tstg			-55 to	+125			°C	condensation
	dering temperature	-				60			°C	10 s

The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

## G3VM-\QAY\Q/\QDY\Q

#### ■Electrical Characteristics (Ta = 25°C)

#### ●Standard type

	Item	Symbol		G3VM-41AY1 G3VM-41DY1	G3VM-61AY1 G3VM-61DY1	G3VM-201AY1 G3VM-201DY1	G3VM-351AY1 G3VM-351DY1	G3VM-401AY1 G3VM-401DY1	G3VM-601AY1 G3VM-601DY1	Unit	Measurement conditions	
			Minimum				.1					
	LED forward voltage	VF	Typical				27			V	IF=10 mA	
			Maximum				.4					
Input	Reverse current	IR	Maximum		10 50			μА	VR=5 V			
q	Capacitance between terminals	Ст	Typical						pF	V=0, f=1 MHz		
	T: 150/	Ι.	Typical	0.5	0.5 0.6 0.5			G3VM-41AY1/DY1 : lo=1 A Others : lo=Continuous load				
	Trigger LED forward current	IFT	Maximum		3 0.1			mA	Others : Io=Continuous load current ratings			
	Release LED forward current	IFC	Minimum					mA	Ioff=10 μA			
	Maximum registance with output ON	Bon	Typical	0.09 (0.06)	0.6	5	35 (25)	22 (17)	45 (30)	Ω	I=5 mA, Io=Continuous load current	
Output	Maximum resistance with output ON		Maximum	0.15 (0.10)	2	8	50 (35)	35 (28)	60 (40)	12	ratings Values in parentheses are for t < 1 s.	
0	Current leakage when the relay is open	ILEAK	Maximum		1					μА	Voff=Load voltage ratings	
	Capacitance between terminals	Coff	Typical	300	130	90	30	80	75	pF	V=0, f=1 MHz	
Ca	pacitance between I/O terminals	CI-0	Typical			0	.8			pF	f=1 MHz, Vs=0 V	
	ulation resistance between I/O	Ri-o	Minimum			10	000			ΜΩ	Vi-o=500 VDC, RoH≤60%	
ten	minals	THO	Typical			1	08			10122	VIO=300 VBO, 110/130076	
Tu	Furn-ON time		Typical	2.8		1	0.3	0.6	0.5		G3VM-41AY1/DY1: RL=200 Ω, IF=10 mA, VDD=20 V	
rui	II OI4 uille	ton	Maximum	5	3			2	2		G3VM-601AY1/DY1 : RL=200 Ω, IF=5 mA, VDD=10 V	
Tui	urn-OFF time		Typical	0.3	0.2	0	.1	0.2		ms	Others: RL=200 Ω. IF=5 mA. VDD=20 V	
		toff	Maximum				1				#L=200 12, IF=5 MA, VDD=20 V	

#### \* Turn-ON and Turn-OFF Times





#### ●High sensitive type

	Item	Symbol		G3VM-41AY G3VM-41DY		G3VM-201AY G3VM-201DY		G3VM-401AY G3VM-401DY	G3VM-601AY G3VM-601DY	Unit	Measurement conditions	
			Minimum			1.	45					
	LED forward voltage	VF	Typical			1.0	63			V	IF=10 mA	
			Maximum			1.7	75					
Ħ	Reverse current	IR	Maximum			1	0			μА	V <sub>R</sub> =5 V	
Input	Capacitance between terminals	Ст	Typical			4	0			pF	V=0, f=1 MHz	
			Typical			0	.3				G3VM-41AY/DY : lo=1 A	
	Trigger LED forward current	İFT	Maximum			2	2			mA	Others : Io=Continuous load current ratings	
	Release LED forward current	IFC	Minimum			0	.1			mΑ	Ioff=10 μA	
	Maximum resistance with output ON	Ron	Typical	0.09 (0.06)	0.6	5	35 (25)	22 (17)	45 (30)	Ω	IF=5 mA, Io=Continuous load current	
Output		HON	Maximum	0.15 (0.10)	2	8	50 (35)	35 (28)	60 (40)	. 12	ratings Values in parentheses are for t < 1 s.	
ō	Current leakage when the relay is open	ILEAK	Maximum		1					μА	Voff=Load voltage ratings	
	Capacitance between terminals	Coff	Typical	300	130	90	30	80	75	рF	V=0, f=1 MHz	
Ca	pacitance between I/O terminals	CI-0	Typical			0	.8			pF	f=1 MHz, Vs=0 V	
	ulation resistance between I/O	Ri-o	Minimum			10	00			ΜΩ	Vi-o=500 VDC, RoH≤60%	
ten	ninals	ni-0	Typical			10	O <sup>8</sup>			IVISZ	VI-0=300 VDC, R0H≤60%	
т	urn-ON time		Typical	2	0	.5	0.1	0	.2		G3VM-601AY/DY:	
rui			Maximum	5 1						ms	RL=200 Ω, IF=5 mA, VDD=10 V Others:	
Tu	n-OFF time	torr	Typical	0.3			0.2			1115	RL=200 Ω, IF=5 mA, VDD=20 V	
Tui	n-Orr time	IOFF	Maximum				1				*	

#### \* Turn-ON and Turn-OFF Times





### **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Standard type

Item	Symbol							G3VM-601AY1 G3VM-601DY1			
Load voltage (AC peak/DC)	VDD	Maximum	32	48	160	280	320	480	٧		
		Minimum				5					
Operating LED forward current	lF	Typical		7.5							
		Maximum			2	!5			mA		
Continuous load current (AC peak/DC)	lo	Maximum	2000	500	250	100	120	90			
Ambient operating temperature	Ta	Minimum			-	20			ο̈́		
Ambient operating temperature	ıa	Maximum			6	5			Ü		

◆High sensitive type

Item	Symbol		G3VM-41AY G3VM-41DY	G3VM-61AY G3VM-61DY	G3VM-201AY G3VM-201DY		G3VM-401AY G3VM-401DY		Unit
Load voltage (AC peak/DC)	VDD	Maximum	32	48	160	280	320	480	٧
		Minimum				3			
Operating LED forward current	lF	Typical	al 5						mA
		Maximum	1	5			IIIA		
Continuous load current (AC peak/DC)	lo	Maximum	2000	500	250	100	120	90	
Ambient operating temperature	Ta	Minimum	m –20				•		
Ambient operating temperature	ı a	Maximum			6	5			°C

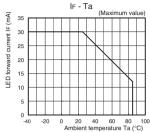
### ■Spacing and Insulation

Standard type and High sensitive type

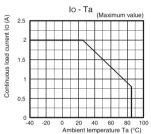
- Claridard type and riight content to type											
Item		Standard	Unit								
Creepage distances	Minimum	7.0									
Clearance distances	Minimum	7.0	mm								
Internal ignitation thickness	Minimum	0.4									

 $G3VM-\square AY\square/\square DY$ 

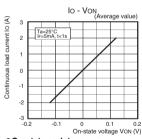
#### ●LED forward current vs. Ambient temperature



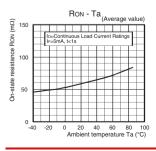
#### Continuous load current vs. Ambient temperature G3VM-41AY1/DY1/AY/DY



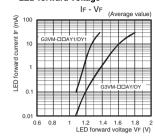
#### Continuous load current vs. On-state voltage G3VM-41AY1/DY1/AY/DY



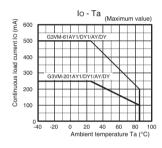
 On-state resistance vs. Ambient temperature G3VM-41AY1/DY1/AY/DY



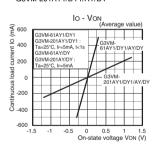
#### ●LED forward current vs. LED forward voltage



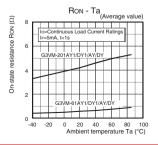
#### G3VM-61AY1/DY1/AY/DY G3VM-201AY1/DY1/AY/DY



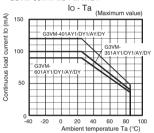
#### G3VM-61AY1/DY1/AY/DY G3VM-201AY1/DY1/AY/DY



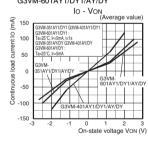
#### G3VM-61AY1/DY1/AY/DY G3VM-201AY1/DY1/AY/DY



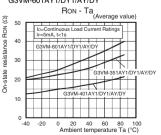
#### G3VM-351AY1/DY1/AY/DY G3VM-401AY1/DY1/AY/DY G3VM-601AY1/DY1/AY/DY



#### G3VM-351AY1/DY1/AY/DY G3VM-401AY1/DY1/AY/DY G3VM-601AY1/DY1/AY/DY

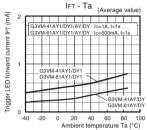


#### G3VM-351AY1/DY1/AY/DY G3VM-401AY1/DY1/AY/DY G3VM-601AY1/DY1/AY/DY



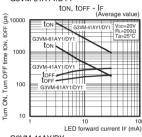
#### Trigger LED forward current vs. Ambient temperature

G3VM-41AY1/DY1/AY/DY G3VM-61AY1/DY1/AY/DY

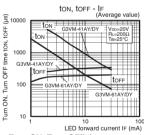


#### Turn ON. Turn OFF time vs. LED forward current

G3VM-41AY1/DY1 G3VM-61AY1/DY1

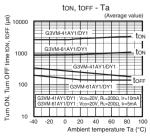


G3VM-41AY/DY G3VM-61AY/DY

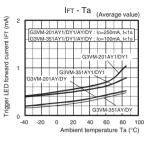


#### Turn ON. Turn OFF time vs. Ambient temperature

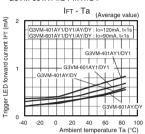
G3VM-41AY1/DY1 G3VM-61AY1/DY1



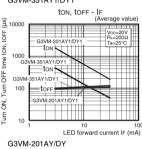
#### G3VM-201AY1/DY1/AY/DY G3VM-351AY1/DY1/AY/DY



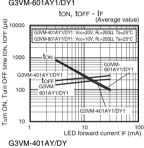
#### G3VM-401AY1/DY1/AY/DY G3VM-601AY1/DY1/AY/DY



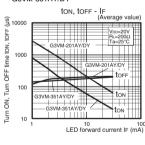
#### G3VM-201AY1/DY1 G3VM-351AY1/DY1



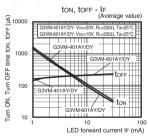
#### G3VM-401AY1/DY1 G3VM-601AY1/DY1



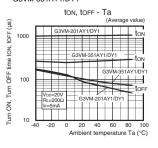
## G3VM-351AY/DY



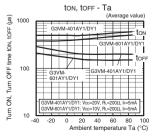
## G3VM-601AY/DY



#### G3VM-201AY1/DY1 G3VM-351AY1/DY1



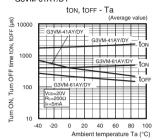
#### G3VM-401AY1/DY1 G3VM-601AY1/DY1



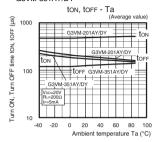
 $G3VM-\square AY\square/\square DY$ 

#### ●Turn ON, Turn OFF time vs. Ambient temperature

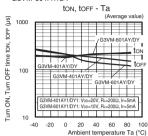
G3VM-41AY/DY G3VM-61AY/DY



#### G3VM-201AY/DY G3VM-351AY/DY

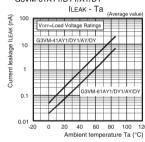


#### G3VM-401AY/DY G3VM-601AY/DY

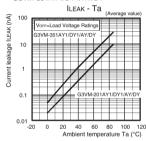


#### Current leakage vs. Ambient temperature

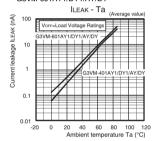
G3VM-41AY1/DY1/AY/DY G3VM-61AY1/DY1/AY/DY



#### G3VM-201AY1/DY1/AY/DY G3VM-351AY1/DY1/AY/DY



#### G3VM-401AY1/DY1/AY/DY G3VM-601AY1/DY1/AY/DY

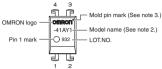


## ■Apperance Terminal Arrangement Internal Connections

#### ● Terminal Arrangement/Internal Connections

#### DIP (Dual Inline Package)

DIP 4-pin



Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

#### ■Dimensions (Unit: mm)





#### Surface-mounting Terminals Weight: 0.25 g

10.0 max





#### **Actual Mounting Pad Dimensions**

(Recommended Value, TOP VIEW)



#### Note: The actual product is marked differently from the image shown here.

#### **■**Approved Standards

UL recognized 31

•Standard type and High sensitive type

Approved Standards	Contact form	File No.
UL recognized	1a (SPST-NO)	E80555

#### **■**Safety Precautions

· Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays DIP 6-pin, High-dielectric-strength Type

## MOS FET Relays in DIP 6-pin packages that achieve a dielectric strength of 5.000 VAC between I/O

• Load voltage: 400 V or 600 V

RoHS Compliant

### **■**Application Examples

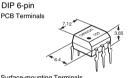
- · Electrical power unit
- Test & Measurement equipment
- Security equipment
- Industrial equipment
- Medical equipment



Note: The actual product is marked differently from the image shown here.

### ■Package

(Unit: mm, Average)



Surface-mounting Terminals



Note: The actual product is marked differently from the image shown here

### **■**Model Number Legend

G3VM-

- 1. Load Voltage
- 40:400 V
- 60:600 V
- 1:1a (SPST-NO)
- 2. Contact form
  - B: DIP 6-pin with PCB terminals
  - E: DIP 6-pin with surface-mounting terminals
- 4. Additional functions
- Y: Dielectric strength between I/O above 2.500 V type

#### 5. Other informations

3. Package

When specifications overlap, serial code is added in the recorded order.

### ■Ordering Information

	Continuous load current			Stick packaging		Tape packaging				
Package	Contact form	Load voltage	(1)			Minimum	Model	Minimum		
Package	Contact form	(peak value) *	Connection A, B	Connection C	PCB Terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity	
DIP6	1a	400 V	120 mA	240 mA	G3VM-401BY	G3VM-401EY	50 pcs.	G3VM-401EY(TR)	1.500 pcs.	
DIFO	(SPST-NO)	600 V	100 mA	200 mA	G3VM-601BY	G3VM-601EY	50 pcs.	G3VM-601EY(TR)	1,500 pcs.	

Fithe AC peak and DC value are given for the load voltage and continuous load current.

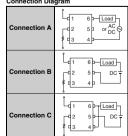
Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

#### ■Absolute Maximum Ratings (Ta = 25°C)

	Iten	n	Symbol	G3VM-401BY G3VM-401EY	G3VM-601BY G3VM-601EY	Unit	Measurement conditions	1
	LED forward curre	ent	lF	5	0	mA		ĺ
+	Repetitive peak Li	ED forward current	IFP	1	1	Α	100 μs pulses, 100 pps	ĺ
Input	LED forward curre	ent reduction rate	ΔIF/°C	-0.5		mA/°C	Ta ≥ 25°C	İ
=	LED reverse volta	ige	VR	5		V		İ
	Connection temper	erature	TJ	12	25	°C		İ
	Load voltage (AC	tage (AC peak/DC) VoFF 400 600		V		İ		
	Connection A Continuous load			120	100		Connection A:	
	current	Connection B	lo	120	100	mA	AC peak/DC Connection B and C:	l
Output		Connection C		240	200		DC	ĺ
õ		Connection A		-1.2	-1.0			i
	ON current reduction rate	Connection B	Δlo/°C	-2.4	-2.0	mA/°C	Ta ≥ 25°C	i
	reduction rate	Connection C		20	35			i
	Connection temper	erature	TJ	12	25	°C		i
Die	Dielectric strength between I/O ★		VI-O	50	00	Vrms	AC for 1 min	i
An	Ambient operating temperature		Ta	-40 to	0 +85	°C	With no icing or	i
An	mbient storage temp	Tstg	-55 to	+125	°C	condensation	i	
So	oldering temperatur	e	-	26	60	°C	10 s	ĺ

\* The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

Connection Diagram



#### **■Electrical Characteristics** (Ta = 25°C)

	Iten	n	Symbol		G3VM-401BY G3VM-401EY	G3VM-601BY G3VM-601EY	Unit	Measurement conditions
				Minimum		1		
	LED forward volt	age	VF	Typical	1.	15	V	IF=10 mA
١.				Maximum	1	.3		
t id	Reverse current		IR	Maximum	10		μА	VR=5 V
1-	Capacitance between terminals		Ст	Typical	3	0	pF	V=0, f=1 MHz
	Trigger I ED form	Trigger LED forward current		Typical	-	1.6	mA	Io=Continuous load current ratings
	ringger LED forward current		IFT	Maximum	3	5	IIIA	10=00mmaous load current laungs
		Connection A			17	30 (25)		G3VM-401BY/EY: IF= 5 mA, Io=120 mA G3VM-601BY/EY: IF=10 mA, Io=100 mA Values in parentheses are for t < 1 s.
		Connection B		Typical	11	23		G3VM-401BY/EY : IF= 5 mA, Io=120 mA G3VM-601BY/EY : IF=10 mA, Io=100 mA
	Maximum resistance with	Connection C	Ron		6	12	Ω	G3VM-401BY/EY : IF= 5 mA, Io=240 mA G3VM-601BY/EY : IF=10 mA, Io=200 mA
ti di io		Connection A	HON	Maximum	35	45 (35)	32	G3VM-401BY/EY: IF= 5 mA, Io=120 mA G3VM-601BY/EY: IF=10 mA, Io=100 mA Values in parentheses are for t < 1 s.
		Connection B			20	35		G3VM-401BY/EY : IF= 5 mA, Io=120 mA G3VM-601BY/EY : IF=10 mA, Io=100 mA
		Connection C			10	18		G3VM-401BY/EY : IF= 5 mA, Io=240 mA G3VM-601BY/EY : IF=10 mA, Io=200 mA
	Current leakage open	when the relay is	ILEAK	Maximum		1	μА	Voff=Load voltage ratings
	Capacitance bet		Coff	Typical	40	120	pF	V=0, f=1 MHz
C	apacitance betwee	n I/O terminals	Cı-o	Typical	0	.8	pF	f=1 MHz, Vs=0 V
100	Insulation resistance between I/O		Rı-o	Minimum		00	MΩ	V⊦o=500 VDC, RoH≤60%
te	erminals		111-0	Typical	11	08	10122	VF0=300 VB0, 110/120076
Ī	urn-ON time		ton	Typical	0.3	0.2		G3VM-401BY/EY : IF=5mA,
Ľ			LON	Maximum	1.0	1.5	ms	RL=200Ω, VDD=20V *
Т	urn-OFF time		toff	Typical	0.1	0.2		G3VM-601BY/EY : IF=10mA,
Ι.				Maximum	1.0			RL=200Ω, VDD=20V *

#### \* Turn-ON and Turn-OFF Times



## **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

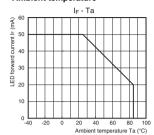
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-401BY G3VM-401EY	G3VM-601BY G3VM-601EY	Unit	
Load voltage (AC peak/DC)	VDD	Maximum	320	480	V	
		Minimum	5	7.5		
Operating LED forward current	lF	Typical	7.5	15	mA	
		Maximum	25		IIIA	
Continuous load current (AC peak/DC)	lo	Maximum	120	100		
Ambient operating temperature	Ta	Minimum	-20		- °C	
Ambient operating temperature	l 'a	Maximum	6			

## **■**Spacing and Insulation

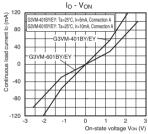
Item	Minimum	Unit		
Creepage distances	7.0			
Clearance distances	7.0	mm		
Internal isolation thickness	0.4			

#### LED forward current vs. Ambient temperature

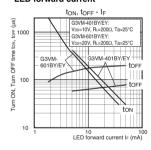


G3VM-\BY/\EY

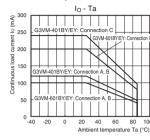
#### Continuous load current vs. On-state voltage



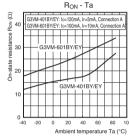
#### ● Turn ON, Turn OFF time vs. LED forward current



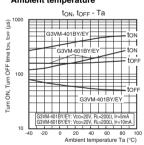
#### Continuous load current vs. Ambient temperature



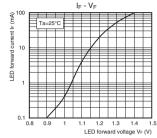
#### On-state resistance vs. Ambient temperature



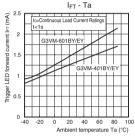
#### Turn ON, Turn OFF time vs. Ambient temperature



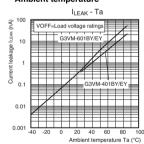
#### LED forward current vs. LED forward voltage



#### Trigger LED forward current vs. Ambient temperature



#### Current leakage vs. Ambient temperature

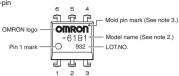


#### ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

#### DIP (Dual Inline Package)

DIP 6-pin



#### ●Terminal Arrangement/Internal Connections (Top View)

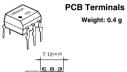


Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

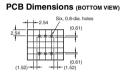
#### ■Dimensions (Unit: mm)



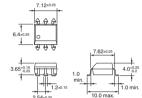


#### **Surface-mounting Terminals**

Weight: 0.4 g



# 0.25+0.1



#### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View) 8.3 to 8.8

7.85 to 8.80 Note: The actual product is marked differently from the image shown here.

#### **■**Approved Standards

0.5±0.1

UL recognized

Approved Standards	Contact form	File No.
UL (recognized)	1a (SPST-NO)	E80555

#### ■Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

## G3VM-UL/UFL/UGL

MOS FET Relays Current-limiting Type

## MOS FET Relays that protect themselves from overcurrents with a current-limiting protection function

Package: DIP 4-pin, DIP 8-pin or SOP 4-pin
Contact form: 1a (SPST-NO) or 2a (DPST-NO)

Load voltage: 350 V

• Current limit: 150 to 300 mA

Note: The actual product is marked differently from the

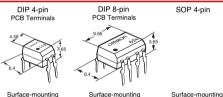
#### RoHS Compliant

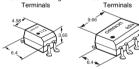
### ■Application Examples

- Communication equipment
- Industrial equipment
- Test & Measurement equipment

#### ■Package

#### (Unit : mm, Average)





Terminals

~

Note: The actual product is marked differently from the image shown here.

### ■Model Number Legend

G3VM- \_\_ \_ \_ \_ \_ \_ \_ \_

1. Load Voltage

35 : 350 V

3. Package

G: SOP 4-pin with

surface-mounting terminals

2. Contact form

1 : 1a (SPST-NO)

4. Additional functions

L: Current limiting

Note: The model number legend for the G3VM-2L/2FL/WL/WFL is different from the above legend.

## **■**Ordering Information

					Stick packaging		Tape packaging		
Package	Contact	Load voltage		Mo	del	Minimum	Model	Minimum	
	form	(peak value) *	(peak value) *	PCB Terminals	Surface-mounting Terminals	package quantity	Surface-mounting Terminals	package quantity	
DIP4	1a (SPST-NO)			G3VM-2L	G3VM-2FL	100 pcs.	G3VM-2FL(TR)	1,500 pcs.	
DIP8	2a (DPST-NO)	350 V	120 mA	G3VM-WL	G3VM-WFL	50 pcs.	G3VM-WFL(TR)	1,500 pcs.	
SOP4	1a (SPST-NO)			=	G3VM-351GL	100 pcs.	G3VM-351GL(TR)	2,500 pcs.	

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

## ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-2L G3VM-2FL	G3VM-WL G3VM-WFL	G3VM-351GL	Unit	Measurement conditions	
	LED forward current	lF		50		mA		
١.	Repetitive peak LED forward current	IFP		1		Α	100 μs pulses, 100 pps	
+	LED forward current reduction rate	ΔIF/°C	-0.5			mA/°C	Ta ≥ 25°C	
1-	LED reverse voltage	VR	6 5			V		
	Connection temperature	TJ	125					
	Load voltage (AC peak/DC)	Voff	350					
4	Continuous load current (AC peak/DC)	lo	120			mA		
ā	ON current reduction rate	∆lo/°C		-1.2			Ta ≥ 25°C	
	Connection temperature	TJ		125		°C		
С	ielectric strength between I/O *	Vi-o	25	00	1500	Vrms	AC for 1 min	
Α	mbient operating temperature	Ta	-40 to +85			°C	With no icing or	
Α	mbient storage temperature	Tstg		-55 to +125		°C	condensation	
Soldering temperature		-	260			°C	10 s	

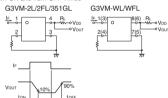
<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

## $G3VM-\Box L/\Box FL/$ ■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-2L G3VM-2FL	G3VM-WL G3VM-WFL	G3VM-351GL	Unit	Measurement conditions
			Minimum		1.0	•		
	LED forward voltage	VF	Typical		1.15		V	IF=10 mA
			Maximum		1.3		Ī	
Input	Reverse current	lR	Maximum	10			μА	G3VM-2L/2FL/WL/WFL : VR=6 V G3VM-351GL : VR=5 V
르	Capacitance between terminals	Ст	Typical	30			pF	V=0, f=1 MHz
	Triange I ED forward assert	let	Typical		1		4	lo=120 mA
	Trigger LED forward current	IFT	Maximum		3		mA	10=120 MA
	Release LED forward current	IFC	Minimum	0.1		mA	G3VM-2L/2FL/WL/WFL : IOFF=10 μA G3VM-351GL : IOFF=100 μA	
	Maximum resistance with output	Ron	Typical	2	22	15	_	I- 5 A I- 400 A
=	ON	HON	Maximum		35		Ω	Ir=5 mA, Io=120 mA
Output	Current leakage when the relay is open	ILEAK	Maximum		1.0		μА	Voff=350 V
	Capacitance between terminals	Coff	Typical	4	10	70	pF	V=0, f=1 MHz
Lie	nit current	Ішм	Minimum		150	•	mA	IF=5 mA, VDD=5 V, t=5 ms
LII	in curen	ILIM	Maximum		300		IIIA	IF-3 IIIA, VDD-3 V, t-3 IIIS
Ca	pacitance between I/O terminals	Ci-o	Typical		0.8		pF	f=1 MHz, Vs=0 V
Ins	sulation resistance between I/O	Ri-o	Minimum		1000		MΩ	Vi-o=500 VDC, RoH≤60%
terminals		111-0	Typical		10 <sup>8</sup>			VI-0=300 VDC, 1101120076
Turn-ON time		ton	Typical	Typical – 0.3				
٠	5.1 45	1314	Maximum	1.0		ms	IF=5 mA. RL=200 Ω. VDD=2 V *	
Turn-OFF time		torr	Typical		-	0.1	1113	11 -0 111A, 11E-200 32, VDD-2 V A
		LOFF	Maximum		1.0		1	

1.0

Turn-ON and Turn-OFF Times



#### **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

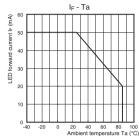
Maximum

ltem	Symbol		G3VM-2L G3VM-2FL	G3VM-WL G3VM-WFL	G3VM-351GL	Unit	
Load voltage (AC peak/DC)	VDD	Maximum		V			
		Minimum		5			
Operating LED forward current	lF	Typical	7.5				
		Maximum		25			
Continuous load current (AC peak/DC)	lo	Maximum		100		Α	
Ambient operating temperature	Ta	Minimum		-20		°C	
Ambient operating temperature	ıα	Maximum	65				

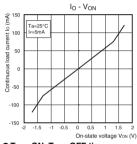
## **■**Spacing and Insulation

Item	Mini	mum	Unit
item	G3VM-□L/□FL	G3VM-□GL	Oilit
Creepage distances	7.0	2.5	
Clearance distances	7.0	2.5	mm
Internal isolation thickness	0.4	0.1	

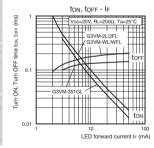
## LED forward current vs. Ambient temperature



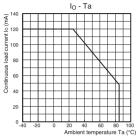
## Continuous load current vs. On-state voltage



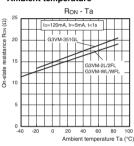
#### Turn ON, Turn OFF time vs. LED forward current



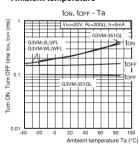
## Continuous load current vs. Ambient temperature



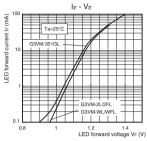
## On-state resistance vs. Ambient temperature



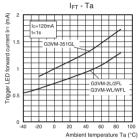
## Turn ON, Turn OFF time vs. Ambient temperature



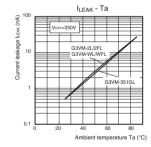
#### LED forward current vs. LED forward voltage



#### Trigger LED forward current vs. Ambient temperature



## Current leakage vs. Ambient temperature

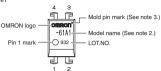


## ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

#### DIP (Dual Inline Package)

DIP 4-pin

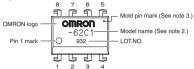


G3VM-\BL/\BFL/\BGL

#### ●Terminal Arrangement/Internal Connections (Top View)

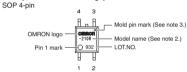








#### SOP (Small Outline Package)





4.0+0.2

1.0 min

Note: 1. The actual product is marked differently from the image shown here. Note: 2, "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

#### ■Dimensions (Unit: mm)

#### G3VM-2L





#### G3VM-2FL

## **Surface-mounting Terminals** Weight: 0.4 g

## PCB Dimensions (BOTTOM VIEW)



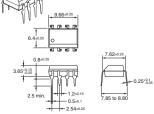
## **Actual Mounting Pad Dimensions** (Recommended Value, TOP VIEW) 2.54



#### Note: The actual product is marked differently from the image shown here.

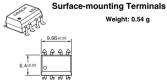
#### G3VM-WL

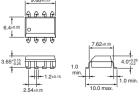
#### **PCB Terminals** Weight: 0.54 g



#### G3VM-WFL

3.65+0.15





#### PCB Dimensions (BOTTOM VIEW)



#### **Actual Mounting Pad Dimensions** (Recommended Value TOP VIFW)



Note: The actual product is marked differently from the image shown here.

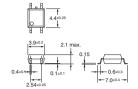
#### **■Dimensions** (Unit: mm)

G3VM-351GL



#### **Surface-mounting Terminals**

Weight: 0.1 g



#### Actual Mounting Pad Dimensions (Recommended Value, TOP VIEW)



Note: The actual product is marked differently from the image shown here.

## **■**Approved Standards

UL recognized

Model	Approved Standards	Contact form	File No.		
G3VM-2L G3VM-2FL	UL (recognized)	1a (SPST-NO)	EGOERE		
G3VM-WL G3VM-WFL	or (recognized)	2a (DPST-NO)	E80555		

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

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## G3VM-21GR=/41GR4/41GR5/41GR6/81GR=

MOS FET Relays SOP 4-pin, Low-output-capacitance and Low-ON-resistance Type (with Low C × 8)/M-21PR10

## MOS FET Relays in SOP 4-pin packages that achieve a low $\mathbf{C} \times \mathbf{R}$

(Unit: mm, Average)

- Load voltage: 20 V, 40 V, or 80 V
- G3VM-21GR: Low C  $\times$  R = 5 pF· $\Omega$ , Coff (standard) = 1 pF, Ron (standard) = 5  $\Omega$
- G3VM-21GR1: Low C  $\times$  R = 5 pF· $\Omega$ , Coff (standard) = 5 pF, Ron (standard) = 1  $\Omega$
- G3VM-41GR6: Low C × R = 10 pF· $\Omega$ , Coff (standard) = 1 pF, Ron (standard) = 10  $\Omega$
- G3VM-41GR4: Low C  $\times$  R = 10 pF· $\Omega$ , Coff (standard) = 5 pF, Ron (standard) = 2  $\Omega$
- G3VM-41GR5: Low C  $\times$  R = 10 pF $\cdot$  $\Omega$ , Coff (standard) = 10 pF, Ron (standard) = 1  $\Omega$



Note: The actual product is marked differently from the image shown here.

#### RoHS Compliant

■Package

SOP 4-pin

#### **■**Application Examples

- Semiconductor test equipment
- Test & Measurement equipment
- Communication equipment
- Security equipment
- Industrial equipment
   Power circuit

## ■Model Number Legend

G3VM-

1 2 3 4 5
1. Load Voltage 2. Contact form

1. Load Voltage

2.20 V

4 : 40 V

8:80 V

80 V R: Low ON resistance

1:1a (SPST-NO)

4. Additional functions

3. Package

G: SOP 4-pin

· Amusement equipment

5. Other informations

When specifications overlap, serial code is added in the recorded order.

## ■Ordering Information

Note: The actual product is marked differently

from the image shown here

	Contact		Load voltage (peak value) *	Continuous load	Stick pa	ckaging	Tape paci	kaging
Package	form	Terminals		current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity
			20 V	160 mA	G3VM-21GR	100 pcs.	G3VM-21GR(TR)	2,500 pcs.
		Surface-mounting Terminals	20 V	300 mA	G3VM-21GR1		G3VM-21GR1(TR)	
			40 V	120 mA	G3VM-41GR6		G3VM-41GR6(TR)	
SOP4	1a (SPST-NO)			250 mA	G3VM-41GR4		G3VM-41GR4(TR)	
	(01 01 140)			300 mA	G3VM-41GR5		G3VM-41GR5(TR)	
			80 V	40 mA	G3VM-81GR		G3VM-81GR(TR)	
				200 mA	G3VM-81GR1		G3VM-81GR1(TR)	

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

## ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM- 21GR	G3VM- 21GR1	G3VM- 41GR6	G3VM- 41GR4	G3VM- 41GR5	G3VM- 81GR	G3VM- 81GR1	Unit	Measurement conditions
	LED forward current	lF				50				mA	
nbnt	LED forward current reduction rate	ΔIF/°C		-0.5							Ta≥25°C
In	LED reverse voltage	VR		5							
	Connection temperature	TJ		125							
	Load voltage (AC peak/DC)	Voff	FF 20 40 80			0	V				
ont	Continuous load current (AC peak/ DC)	lo	160	300	120	250	300	40	200	mA	
Output	ON current reduction rate	Δlo/°C	-1.6	-3.0	-1.2	-2.5	-3.0	-0.4	-2.0	mA/°C	Ta≥25°C
	Pulse ON current	lop	480	900	360	750	900	120	600	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ				125			•	°C	
D	ielectric strength between I/O *	V <sub>I-O</sub>				1500				Vrms	AC for 1 min
Α	mbient operating temperature	Ta	-20 to +85							°C	With no icing or
Α	Ambient storage temperature		-40 to +125		-55 to +125			-40 to +125		°C	condensation
S	oldering temperature	-				260	•			°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

#### **■Electrical Characteristics** (Ta = 25°C)

	Item	Symbol		G3VM- 21GR	G3VM- 21GR1	G3VM- 41GR6	G3VM- 41GR4	G3VM- 41GR5	G3VM- 81GR	G3VM- 81GR1	Unit	Measurement conditions	
			Minimum				1.0						
	LED forward voltage	VF	Typical				1.15				٧	IF=10 mA	
			Maximum				1.3						
	Reverse current	IR	Maximum				10				μΑ	V <sub>R</sub> =5 V	
Input	Capacitance between terminals	Ст	Typical				15				pF	V=0, f=1 MHz	
=	Trigger LED forward current	lfT	Maximum					3 mA			G3VM-21GR/21GR1/41GR4/ 41GR5/41GR6 : lo=100 mA G3VM-81GR : lo=40 mA G3VM-81GR1 : lo=200 mA		
	Release LED forward current	IFC	Minimum				0	.1	mA	Ioff=10μA			
	Maximum resistance with output ON	Bon	Typical	5	1	10	2	1	16	5	Ω	G3VM-21GR/21GR1/41GR4/ 41GR5/41GR6: Ir=5 mA, Io=Continuous load current ratings,	
Output		TION	Maximum	8	1.5	15	3	1.5	25	8		t<1s G3VM-81GR/81GR1 : IF=5 mA, Io=Continuous load current ratings	
	Current leakage when the relay is open	ILEAK	Maximum		1						nA	G3VM-21GR/21GR1 : V0FF=20 V, Ta=50°C G3VM-41GR4/41GR5/41GR6 : V0FF=30 V, Ta=50°C G3VM-81GR1 : V0FF=80 V, Ta=60°C G3VM-81GR1 : V0FF=80 V, Ta=50°C	
	Capacitance between	Coff	Typical	1	5	1	5	10	2.5	6.5	pF	G3VM-21GR/21GR1/41GR4/ 41GR5/41GR6 :	
	terminals	COFF	Maximum	2.5	12	2	7	14	3.5	11		V=0, f=100 MHz, t<1 s G3VM-81GR/81GR1 : V=0, f=100 MHz, t<10 s	
	apacitance between I/O minals	Cı-o	Typical			0.8			0	.7	pF	f=1 MHz, Vs=0 V	
	sulation resistance	Ri-o	Minimum				1000				МΩ	Vi-o=500 VDC, RoH≤60%	
b	etween I/O terminals	111-0	Typical				108				IVISZ	•	
Т	urn-ON time	ton	Typical	- 0.07 0.13					0.13		G3VM-21GR/21GR1/41GR4/41GR5/		
			Maximum				0.5				ms	41GR6 : Ir=10 mA, RL=200 Ω, Vpp=20 V *	
Т	urn-OFF time	toff	Typical						0.07	0.17	0	G3VM-81GR/81GR1 :IF=5 mA,	
	10.		Maximum				0.5					RL=200 Ω, VDD=10 V *	

#### \* Turn-ON and Turn-OFF Times



## **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

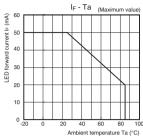
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

	Item	Symbol		G3VM- 21GR	G3VM- 21GR1	G3VM- 41GR6	G3VM- 41GR4	G3VM- 41GR5	G3VM- 81GR	G3VM- 81GR1	Unit
	Load voltage (AC peak/DC)	VDD	V <sub>DD</sub> Maximum		20		32			64	
ı,	Operating LED forward current	lF	Minimum		7 10 5			5			
	Operating LED forward current		Maximum		30						mA
	Continuous load current (AC peak/DC)	lo	Maximum	160	300	120	250	300	40	200	
	Ambient operating temperature	Ta	Minimum	-20							•°C
	Ambient operating temperature	ı a	Maximum	60							

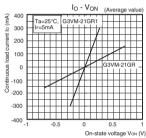
## **■**Spacing and Insulation

Item	Minimum	Unit		
Creepage distances	4.0			
Clearance distances	4.0	mm		
Internal isolation thickness	0.1			

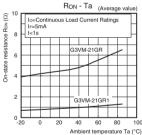
#### LED forward current vs. Ambient temperature



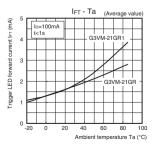
 Continuous load current vs. On-state voltage G3VM-21GR/21GR1



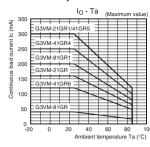
On-state resistance vs. Ambient temperature G3VM-21GR/21GR1



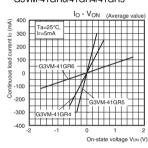
 Trigger LED forward current vs. Ambient temperature G3VM-21GR/21GR1



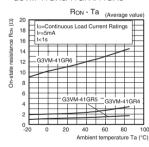
#### Continuous load current vs. Ambient temperature



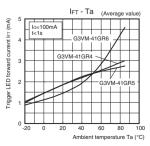
#### G3VM-41GR6/41GR4/41GR5



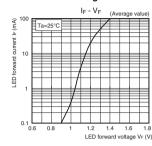
#### G3VM-41GR6/41GR4/41GR5



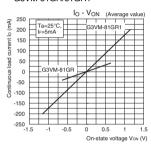
#### G3VM-41GR6/41GR4/41GR5



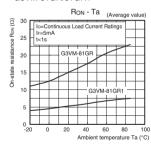
#### LED forward current vs. LED forward voltage



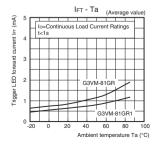
#### G3VM-81GR/81GR1



#### G3VM-81GR/81GR1

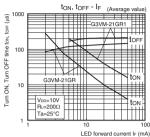


#### G3VM-81GR/81GR1



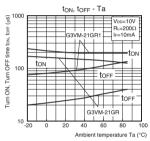


#### Turn ON, Turn OFF time vs. LED forward current G3VM-21GR/21GR1

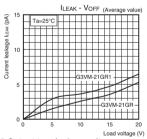


■ Turn ON, Turn OFF time vs.

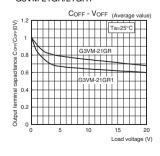
Ambient temperature
G3VM-21GR/21GR1



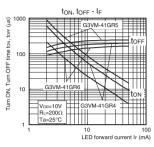
● Current leakage vs. Load voltage G3VM-21GR/21GR1



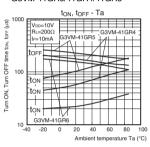
 Output terminal capacitance vs. Load voltage G3VM-21GR/21GR1



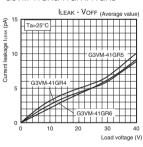
#### G3VM-41GR6/41GR4/41GR5



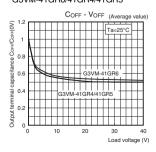
G3VM-41GR6/41GR4/41GR5



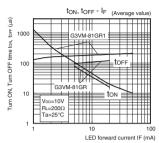
G3VM-41GR6/41GR4/41GR5



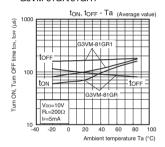
G3VM-41GR6/41GR4/41GR5



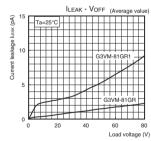
#### G3VM-81GR/81GR1



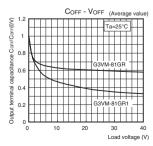
#### G3VM-81GR/81GR1



#### G3VM-81GR/81GR1



#### G3VM-81GR/81GR1



SOP

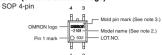
G3VM-21GR\_/41GR4/41GR5/41GR6/81GR

## ■Appearance / Terminal Arrangement / Internal Connections

G3VM-21GR\(\to\)/41GR4/41GR5/41GR6/81GR\(\text{L}\)

#### Appearance

#### SOP (Small Outline Package)



Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

#### ●Terminal Arrangement/Internal Connections (Top View)

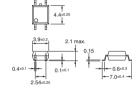


#### Dimensions (Unit: mm)



#### **Surface-mounting Terminals**

Weight: 0.1 g



#### **Actual Mounting Pad Dimensions** (Recommended Value, TOP VIEW)



Note: The actual product is marked differently from the image shown here.

#### **■**Approved Standards

UL recognized 🔊

Approved Standards	Contact form	File No.		
UL (recognized)	1a (SPST-NO)	E80555		

#### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays SSOP, Low-output-capacitance and Low-ON-resistance Type (with Low C x R)

## **MOS FET Relays in SSOP** packages that achieve a low C × R

- . Load voltage: 20 V
- G3VM-21LR: Low C  $\times$  R = 5 pF· $\Omega$ , Coff (standard) = 1 pF, Ron (standard) = 5  $\Omega$
- G3VM-21LR10: Low C  $\times$  R = 2.4 pF· $\Omega$ , Coff (standard) = 0.8 pF, Ron (standard) = 3  $\Omega$
- G3VM-21LR1: Low C  $\times$  R = 4 pF· $\Omega$ , Coff (standard) = 5 pF, Ron (standard) = 0.8  $\Omega$
- G3VM-21LR11: Low C  $\times$  R = 7.2 pF· $\Omega$ , Coff (standard) = 40 pF, Rox (standard) = 0.18  $\Omega$

#### RoHS Compliant

#### ■Application Examples

- Semiconductor test equipment
- Communication equipment
- Test & Measurement equipment
- Data loggers



Note: The actual product is marked differently from the image shown here.

#### ■Package

#### (Unit: mm, Average)

SSOP 4-pin



Note: The actual product is marked differently from the image shown here.

#### **■**Model Number Legend

G3VM-1 2 3 4 5

- 1. Load Voltage
- 2. Contact form
- 2:20 V
- 1:1a (SPST-NO)
- 3. Package L: SSOP 4-pin
- 4. Additional functions B: Low ON resistance
- 5. Other informations
- When specifications overlap, serial code is added in the recorded order.

#### **■**Ordering Information

	Contact		Load voltage	Continuous load	Tape cut	packaging	Tape packaging		
Package	form	Terminals	(peak value) *	current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity	
		Surface-mounting Terminals		160 mA	G3VM-21LR		G3VM-21LR(TR05)	500 pcs.	
SSOP4	1a		20 V	200 mA	G3VM-21LR10	1 pc.	G3VM-21LR10(TR05)		
33014	(SPST-NO)			450 mA	G3VM-21LR1		G3VM-21LR1(TR05)		
				900 mA	G3VM-21LR11		G3VM-21LR11(TR05)		

\* The AC peak and DC value are given for the load voltage and continuous load current

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.

Tape-cut SSOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

#### ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-21LR	G3VM-21LR10	G3VM-21LR1	G3VM-21LR11	Unit	Measurement conditions
	LED forward current	lF	50	30	50	50	mA	
Input	LED forward current reduction rate	ΔIF/°C	-0.5	-0.3	-0	-0.5		Ta ≥ 25°C
ᆸ	LED reverse voltage	VR		5	V			
	Connection temperature	TJ		125	i		°C	
	Load voltage (AC peak/DC)	Voff		20			V	
Ħ	Continuous load current (AC peak/DC)	lo	160	200	450	900	mA	
Output	ON current reduction rate	Δlo/°C	-1.6	-2.0	-4.5	-12	mA/°C	G3VM-21LR11 : Ta ≥ 50°C Others : Ta ≥25°C
	Pulse ON current	lop	480	600	1,350	2,700	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ		125	°C			
Di	ielectric strength between I/O *	VI-O		150	)		Vrms	AC for 1 min
Ar	mbient operating temperature	Ta		-20 to	+85		°C	With no icing or
Ar	mbient storage temperature	Tstg		-40 to +	°C	condensation		
S	oldering temperature	-		260	l		°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

## ■Electrical Characteristics (Ta = 25°C)

G3VM-21LR

	Item	Symbol		G3VM-21LR	G3VM-21LR10	G3VM-21LR1	G3VM-21LR11	Unit	Measurement conditions	
			Minimum	1.0	1.15	1	.0		G3VM-21LR10 : IF=5 mA	
	LED forward voltage	VF	Typical	1.15	1.35	1.	15	V	G3VM-21LR/21LR1/21LR11:	
			Maximum	1.3	1.45	1	.3		IF=10 mA	
	Reverse current	IR	Maximum		1	0		μА	V <sub>R</sub> =5 V	
Input	Capacitance between terminals	Ст	Typical	15	70	1	5	pF	V=0, f=1 MHz	
	Trigger LED forward current	lfT	Maximum	4	3	4	3	mA	Io=100 mA	
	Release LED forward current	IFC	Minimum	0.2	0.1	0.2	0.1	mA	Ioff=10 μA	
	Maximum resistance	Bon	Typical	5	3	0.8	0.18	Ω	G3VM-21LR/21LR1 : IF=5 mA, Io=Continuous load current ratings, t=10 ms	
Output	with output ON		Maximum	8	5	1.2	0.22	32	G3VM-21LR10/21LR11 : IF=5 mA, Io=Continuous load current ratings, t<1 s	
Out	Current leakage when		Typical	-	0.01	-			G3VM-21LR/21LR1:	
	the relay is open	ILEAK	Maximum	1	0.2	1		nA	Voff=20 V, Ta=50°C G3VM-21LR10/21LR11 : Voff=20 V	
	Capacitance between		Typical	1	0.8	5	40	_	G3VM-21LR10 : V=0, f=100 MHz	
	terminals	Coff	Maximum	2.5	1.1	12	=	pF	G3VM-21LR/21LR1/21LR11 : V=0, f=100 MHz, t<1 s	
	apacitance between I/O minals	Ci-o	Typical	0.8	0.3	0.8	0.3	pF	f=1 MHz, Vs=0 V	
In	sulation resistance	Ri-o	Minimum		10	00		МΩ	Vi-o=500 VDC, RoH≤60%	
be	tween I/O terminals	NI-U	Typical		10	) <sup>8</sup>		IVISZ	VI-0=300 VDC, R0H≤60%	
Т	rn-ON time	ton	Typical	0.06	-	0.2	0.3			
10		.514	Maximum	0.5	0.2	0.5	2	ms	IF=5 mA, RL=200 Ω, VDD=10 V *	
Τu	rn-OFF time	toff	Typical	0.12	-		.2	0		
		.5	Maximum	0.5	0.2	0.5	1			

#### \* Turn-ON and Turn-OFF Times



## **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

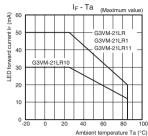
Item	Symbol		G3VM-21LR	G3VM-21LR10	G3VM-21LR1	G3VM-21LR11	Unit		
Load voltage (AC peak/DC)	VDD	Maximum		20					
Operating LED forward current	le	Minimum	10	-	10	-			
Operating LED forward current	IF	Maximum	30	20	30	20 mA			
Continuous load current (AC peak/DC)	lo	Maximum	160	200	450	900			
Ambient operating temperature	Ta	Minimum	-20						
Ambient operating temperature	Id	Maximum		60		65	°C		

## **■**Spacing and Insulation

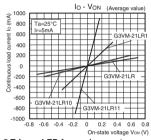
Item	Minimum	Unit		
Creepage distances	2.5			
Clearance distances	ance distances 2.5			
Internal isolation thickness	0.1			

## LED forward current vs. Ambient temperature

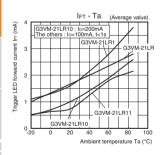
Multi-contact-pair (2a, 2b, and 1a1b)



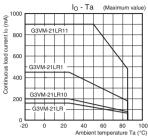
## Ambient temperature Continuous load current vs. On-state voltage



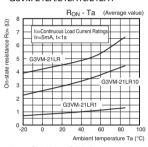
 Trigger LED forward current vs. Ambient temperature



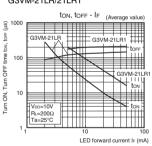
## Continuous load current vs. Ambient temperature



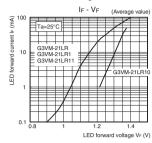
## On-state resistance vs. Ambient temperature G3VM-21LR/21LR10/21LR1



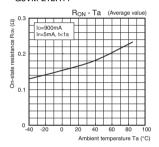
#### Turn ON, Turn OFF time vs. LED forward current G3VM-21LR/21LR1



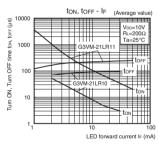
## LED forward current vs. LED forward voltage



#### G3VM-21LR11

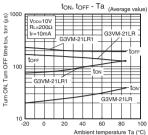


#### G3VM-21LR10/21LR11



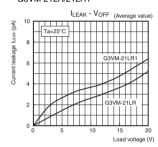
#### ● Turn ON, Turn OFF time vs. Ambient temperature G3VM-21LR/21LR1

G3VM-21LR

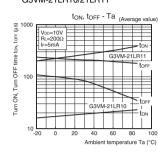


#### Current leakage vs. Load voltage

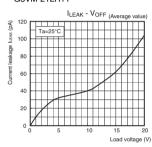
#### G3VM-21LR/21LR1



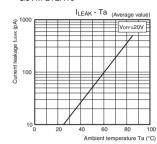
#### G3VM-21LR10/21LR11



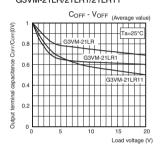
#### G3VM-21LR11



#### Current leakage vs. Ambient temperature G3VM-21LR10



#### Output terminal capacitance vs. Load voltage G3VM-21LR/21LR1/21LR11



## Appearance

## SSOP (Shrink Small Outline Package)

SSOP 4-pin LOT.NO.

for each model	
Model	Marking
G3VM-21LR	210
G3VM-21LR10	21A
G3VM-21LR1	211
G3VM-21LR11	21B

\* Actual model name marking

■Appearance / Terminal Arrangement / Internal Connections

Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

#### ●Terminal Arrangement/ Internal Connections (Top View)

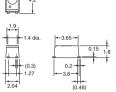


#### ■Dimensions (Unit: mm)



#### Surface-mounting Terminals

Weight: 0.03 g



Unless otherwise specified, the dimensional tolerance is  $\pm$  0.1 mm.

#### **Actual Mounting Pad Dimensions** (Recommended Value, TOP VIEW)



Note: The actual product is marked differently from the image shown here.

## **■**Approved Standards

UL recognized 🔊

Approved Standards	Contact form	File No.		
UL (recognized)	1a (SPST-NO)	E80555		

#### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

## G3VM-41LR

MOS FET Relays SSOP, Low-output-capacitance and Low-ON-resistance Type (with Low C x R)

## MOS FET Relays in SSOP packages that achieve a low $\mathbf{C} \times \mathbf{R}$

• Load voltage: 40 V

• G3VM-41LR10 : Low C  $\times$  R = 5.4 pF $\cdot\Omega$ , Coff (standard) = 0.45 pF, Ron (standard) = 12  $\Omega$ 

• G3VM-41LR6 : Low C  $\times$  R = 10 pF· $\Omega$ , Coff (standard) = 1 pF, Ron (standard) = 10  $\Omega$ 

• G3VM-41LR11 : Low C  $\times$  R = 4.9 pF $\cdot\Omega$ , Coff (standard) = 0.7 pF, Ron (standard) = 7  $\Omega$ 

• G3VM-41LR4 : Low C  $\times$  R = 10 pF· $\Omega$ , Coff (standard) = 5 pF, Rox (standard) = 2  $\Omega$ 

• G3VM-41LR5 : Low C  $\times$  R = 10 pF· $\Omega$ , Coff (standard) = 10 pF, Ron (standard) = 1  $\Omega$ 



Note: The actual product is marked differently from the image shown here.

## RoHS Compliant

#### **■**Application Examples

· Semiconductor test equipment

Communication equipment

• Test & Measurement equipment

Data loggers

## SSOP 4-pin

(Unit: mm, Average)

nit : mm, Average

## ■Model Number Legend

1. Load Voltage 4:40 V 2. Contact form 3. Package 1:1a (SPST-NO) L:SSOP 4-pin

4. Additional functions

5. Other informations

R: Low ON resistance

When specifications overlap, serial code is added in the recorded order.

## Note: The actual product is marked differently from the image shown here. Ordering Information

	Contact	Terminals	Load voltage (peak value) *	Continuous load	Tape cut	packaging	Tape packaging		
Package	form			current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity	
			40 V	120 mA	G3VM-41LR10		G3VM-41LR10(TR05)	500 pcs.	
					G3VM-41LR6	1 pc.	G3VM-41LR6(TR05)		
SSOP4	1a (SPST-NO)	Surface-mounting Terminals		140 mA	G3VM-41LR11		G3VM-41LR11(TR05)		
	(3F31-NO)	reminais		250 mA	G3VM-41LR4		G3VM-41LR4(TR05)		
				300 mA	G3VM-41LR5		G3VM-41LR5(TR05)		

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TRIO5)" to the end of the model number.

Tape-cut SSOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

#### ■Absolute Maximum Ratings (Ta = 25°C)

_									
	Item	Symbol	G3VM-41LR10	G3VM-41LR6	G3VM-41LR11	G3VM-41LR4	G3VM-41LR5	Unit	Measurement conditions
Input	LED forward current	lF	30	50	30	5	60	mA	
	LED forward current reduction rate	ΔIF/°C	-0.3 -0.5 -0.3 -0.5		mA/°C	Ta≥25°C			
=	LED reverse voltage	VR		•	V				
	Connection temperature	TJ	125						
ont	Load voltage (AC peak/DC)	Voff	40					V	
	Continuous load current (AC peak/DC)	lo	12	20	140	250	300	mA	
Output	ON current reduction rate	Δlo/°C	-1.2		-1.4	-2.5	-3.0	mA/°C	Ta ≥ 25°C
0	Pulse ON current	lop	360		420	750	900	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ	125						
D	ielectric strength between I/O *	VI-O	1500 -20 to +85				Vrms	AC for 1 min	
Α	mbient operating temperature	Ta					°C	With no icing or	
Α	mbient storage temperature	Tstg		-40 to +125					condensation
S	oldering temperature	-	260						10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

#### ■Electrical Characteristics (Ta = 25°C)

	Item Symbol		G3VM-41LR10	G3VM-41LR6	G3VM-41LR11	G3VM-41LR4	G3VM-41LR4 G3VM-41LR5		Measurement conditions			
	LED forward		Minimum	1.15	1.0	1.15	1	.0		G3VM-41LR4/41LR5/41LR6:		
			Typical	1.35	1.15	1.3	1.	1.15		IF=10 mA G3VM-41LB10/41LB11:		
	voltage		Maximum	1.45	1.3	1.45	1.3			IF=5 mA		
	Reverse current	IR	Maximum	10					μА	V <sub>R</sub> =5 V		
Input	Capacitance between terminals	Ст	Typical	70	15	70	1	5	pF	V=0, f=1 MHz		
	Trigger LED forward current	IFT	Maximum	3	4	3	4		mA	lo=100 mA		
	Release LED forward current	IFC	Minimum	0.1	0.2	0.1	0	.2	mA	G3VM-41LR4/41LR5/41LR6/41LR10 : ΙοFF=10 μΑ G3VM-41LR11 : ΙοFF=1 μΑ		
	Maximum resistance with output ON		Typical	12	10	7	2	1	Ω	G3VM-41LR4/41LR6 : IF=5 mA, Io=Continuous load current ratings, t=10 ms		
Output		Maximum	14	15	10	3	1.5	12	G3VM-41LR5/41LR10/41LR11 : IF=5 mA, Io=Continuous load current ratings, t<1 s			
_	Current leakage when the relay is open	Typical	0.01	-	0.01	-			G3VM-41LR4/41LR5/41LR6:			
		ILEAK	Maximum	0.2	1	0.2		nA		Voff=30 V, Ta=50°C G3VM-41LR10/41LR11 : Voff=35 V		
	Capacitance	Capacitance	Coff	Typical	0.45	1	0.7	5	10	ρF	V=0, f=100 MHz, t<1 s	
	between terminals	COFF	Maximum	0.8	2	1.3	7	14	pr	V=0, 1=100 MHz, t<1 S		
	apacitance between terminals	C <sub>I-O</sub>	Typical	0.3	0.8	0.3	0.8		0.8		pF	f=1 MHz, Vs=0 V
	sulation resistance	RI-O Minimur		1000					MΩ	Vi-o=500 VDC, RoH≤60%		
be	tween I/O terminals	111-0	Typical			10 <sup>8</sup>			IVISE	VI-0=300 VBO, 1101130070		
Τu	ırn-ON time	ton	Typical	-	0.05	-	0.12	0.2				
			Maximum	0.2	0.5	0.2	0		ms	IF=5 mA, RL=200 Ω, VDD=10 V *		
Τι	ırn-OFF time	toff	Typical	-	0.12	-	0.14	0.2		, , , , , , , , , , , , , , , , , , , ,		
			Maximum	0.3	0.5	0.2	0	.5		1		

#### \* Turn-ON and Turn-OFF Times



## **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

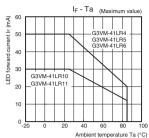
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-41LR10	G3VM-41LR6	G3VM-41LR11	G3VM-41LR4	G3VM-41LR5	Unit	
Load voltage (AC peak/DC)	VDD	Maximum	32						
Operating LED forward current	lF	Minimum	-	10	-	10			
		Maximum	20	30	20	3	mA		
Continuous load current (AC peak/DC)	lo	Maximum	12	20	140	250	300		
Ambient operating temperature	Ta	Minimum	-20						
Ambient operating temperature	ıa	Maximum	60						

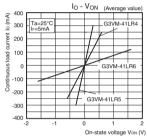
## ■Spacing and Insulation

Item	Minimum	Unit	
Creepage distances	2.5		
Clearance distances	2.5	mm	
Internal isolation thickness	0.1		

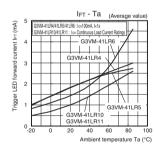
## LED forward current vs. Ambient temperature



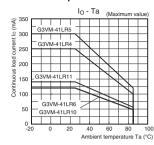
Continuous load current vs.
 On-state voltage
 G3VM-41LR6/41LR4/41LR5



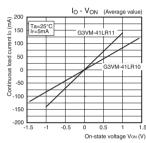
Trigger LED forward current vs.
 Ambient temperature



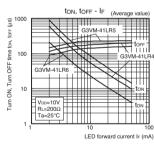
## Continuous load current vs. Ambient temperature



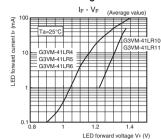
#### G3VM-41LR10/41LR11



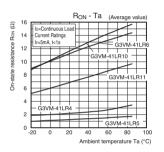
 Turn ON, Turn OFF time vs. LED forward current G3VM-41LR6/41LR4/41LR5



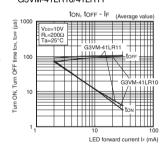
## LED forward current vs. LED forward voltage



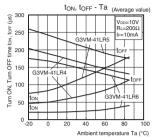
On-state resistance vs.
 Ambient temperature



#### G3VM-41LR10/41LR11

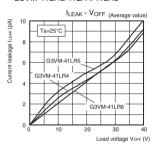


#### ● Turn ON, Turn OFF time vs. Ambient temperature G3VM-41LR6/41LR4/41LR5

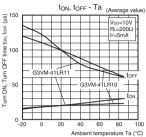


## Current leakage vs. Load voltage

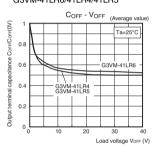
#### G3VM-41LR6/41LR4/41LR5



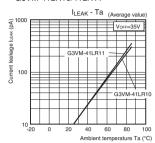
#### G3VM-41LR10/41LR11



#### Output terminal capacitance vs. Load voltage G3VM-41LR6/41LR4/41LR5



## ● Current leakage vs. Ambient temperature G3VM-41LR10/41LR11



and Low-ON-resi

Multi-contact-pair (2a, 2b, and 1a1b)

tance load-voltag

rtification

63VM-4ILE

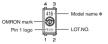
## ■Appearance / Terminal Arrangement / Internal Connections

#### Appearance

#### SSOP (Shrink Small Outline Package)

G3VM-41LR

SSOP 4-pin



Note: 1. The actual product is marked differently from

the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

#### ●Terminal Arrangement/ Internal Connections (Top View)

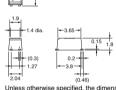


#### ■Dimensions (Unit: mm)



#### **Surface-mounting Terminals**

Weight: 0.03 g



\* Actual model name marking for each model

Marking

41Δ

416

41B

414

415

Model

G3VM-41LR10

G3VM-41LR6

G3VM-41LR11

G3VM-411 R4

G3VM-41LR5

Unless otherwise specified, the dimensional tolerance is ± 0.1 mm.

## **Actual Mounting Pad Dimensions**

(Recommended Value, TOP VIEW)



Note: The actual product is marked differently from the image shown here.

### ■Approved Standards

UL recognized

•		
Approved Standards	Contact form	File No.
UL (recognized)	1a (SPST-NO)	E80555

#### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays USOP, Low-output-capacitance and Low-ON-resistance Type (with Low C x R)

## **USOP Package with Low Output** Capacitance and ON Resistance

Load voltage: 20 V

• G3VM-21PR10: Low C  $\times$  R = 2.4 pF $\cdot \Omega$ , Coff (standard) = 0.8 pF,

Ron (standard) = 3  $\Omega$ 

• G3VM-21PR1: Low  $C \times R = 3 pF \cdot \Omega$ , Coff (standard) = 5 pF,

Ron (standard) = 0.6  $\Omega$ 

• G3VM-21PR11: Low C  $\times$  R = 7.2 pF· $\Omega$ , Coff (standard) = 40 pF,

Ron (standard) = 0.18  $\Omega$ 

RoHS Compliant



Note: The actual product is marked differently from the image shown here.

## ■Application Examples

- Semiconductor test equipment
- Communication equipment
- Test & measurement equipment
- Data loggers

#### ■Package (Unit: mm. Average)

## USOP 4-pin

Note: The actual product is marked differently from the image shown here.

#### ■Model Number Legend

G3VM- ... 1 2 3 4 5

1. Load Voltage

2: 20 V

4. Additional functions R: Low On-resistance

2. Contact form

3. Package 1: 1a (SPST-NO)

P: USOP 4 pin

5. Other informations

When specifications overlap, serial code is added in the recorded order.

## ■Ordering Information

		ntact form Terminals		Continuous Tape o		ackaging	Tape packaging	
Package	Contact form			load current	Model	Minimum package quantity	Model	Minimum package quantity
	1a (SPST-NO)	Surface-mounting Terminals	20 V	200 mA	G3VM-21PR10	1 pc.	G3VM-21PR10(TR05)	500 pcs.
USOP4				450 mA	G3VM-21PR1		G3VM-21PR1(TR05)	
				900 mA	G3VM-21PR11		G3VM-21PR11(TR05)	

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number. Tape-cut USOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

\* The AC peak and DC value are given for the load voltage and continuous load current.

### ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	Measurement conditions
	LED forward current	lF		50		mA	
Input	LED forward current reduction rate	ΔIF/°C		-0.5		mA/°C	Ta≥25°C
ī,	LED reverse voltage	VR		5		V	
	Connection temperature	TJ		125	°C		
	Load voltage (AC peak/DC)	Voff		20	V		
	Continuous load current (AC peak/DC)	lo	200	450	900	mA	
Output	ON current reduction rate	Δlo/°C	-2.0	-2.0 -4.5 -		mA/°C	G3VM-21PR10/21PR1 : Ta ≥ 25°C G3VM-21PR11 : Ta ≥ 50°C
	Pulse ON current	lop	600	1,300	2,700	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ	•	125		°C	
Die	electric strength between I/O *	VI-O		500		Vrms	AC for 1 min
Am	bient operating temperature	Ta		-40 to +85	°C	With no icing or condensation	
Am	Ambient storage temperature			-40 to +125	•	°C	TYTET TIO IOING OF CONDENSATION
So	dering temperature	-		260		°C	10 s

The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

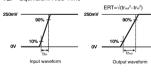
### ■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	Measurement conditions	
			Minimum		1.0				
	LED forward voltage	VF	Typical		1.15		V	IF=10 mA	
			Maximum		1.3				
Input	Reverse current	IR	Maximum		10		μА	V <sub>R</sub> =5 V	
直	Capacitance between terminals	Ст	Typical		15		pF	V=0, f=1 MHz	
	Trigger LED forward current	let	Typical	1	0	1.6	mA	lo=100 mA	
	riigger LLD loiward current	IFT	Maximum		3		IIIA	10-100 IIIA	
	Release LED forward current	IFC	Minimum	0.1			mA	Ioff=10 μA	
	Maximum resistance with	Bon	Typical	3	0.6	0.18	Ω	IF=5 mA, t<1 s	
۱	output ON	TION	Maximum	5	1.2	0.22	52	lo=Continuous load current ratings	
Output	Current leakage when the relay is open	ILEAK	Maximum	1			nA	Voff=20 V	
	Capacitance between terminals	COFF	Typical	0.8	5	40	pF	V=0, f=100 MHz, t<1 s	
	Capacitance between terminals	COFF	Maximum	1.1	12	-	pΓ	V=0, I=100 MHz, I<1 S	
Ca	pacitance between I/O terminals	C <sub>I-O</sub>	Typical		0.4		pF	f=1 MHz, Vs=0 V	
Ins	sulation resistance between I/O	Rı-o	Minimum		1000		МΩ	Vi-o=500VDC, RoH≤60%	
ten	minals	ni-u	Typical		108		IVISZ	VI-0=300 VDC, NOH≤00%	
т	rn-ON time	ton	Typical	0.04	0.2	0.5			
Tu	III-ON time	ION	Maximum	0.2	0.5	2	ms	IF=5 mA, RL=200 $\Omega$ ,	
т	rn-OFF time	toff	Typical	0.13	0.2	0.1 ms		VDD=10 V *1	
ru	III-OI I tillie	IOFF	Maximum	0.2	0.5	1			
Ea	uivalent rise time	FRT	Typical	-	40	-	ps	IF=5 mA, VDD=0.25 V, Tr(in)=25 ps	
Equivalent rise time		Lini	Maximum	_	90	-	μs	*2	

### Turn-ON and Turn-OFF Times



### Equivalent Rise Time



### **■**Recommended Operating Conditions

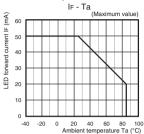
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

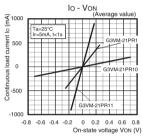
Item	Symbol		G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit			
Load voltage (AC peak/DC)	VDD	Maximum	Maximum 16						
		Minimum		5					
Operating LED forward current	lF	Typical		7.5					
		Maximum		20					
Continuous load current (AC peak/DC)	lo	Maximum	200	450	900				
Ambient operating temperature	Ta	Minimum		°C					
Ambient operating temperature	I d	Maximum		65					

### LED forward current vs. Ambient temperature

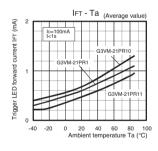
(2a, 2b, and 1a1b)



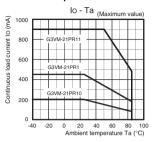
### Continuous load current vs. On-state voltage



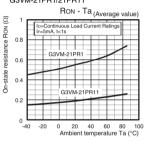
### •Trigger LED forward current vs. Ambient temperature



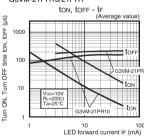
### Continuous load current vs. Ambient temperature



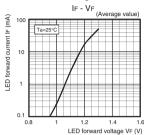
#### ●On-state resistance vs. Ambient temperature G3VM-21PR1/21PR11



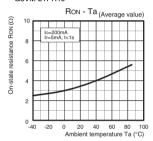
#### ●Turn ON, Turn OFF time vs. LED forward current G3VM-21PR10/21PR1



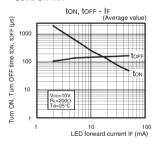
#### LED forward current vs. LED forward voltage



#### G3VM-21PR10



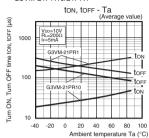
#### G3VM-21PR11



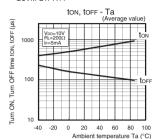
USOP

G3VM-21PR

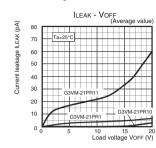
### ●Turn ON, Turn OFF time vs. Ambient temperature G3VM-21PR10/21PR1



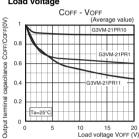
#### G3VM-21PR11



#### ●Current leakage vs. Load voltage



### Output terminal capacitance vs. Load voltage



### ■Appearance / Terminal Arrangement / Internal Connections ●Appearance ●Terminal Arrangement

### USOP (Ultra Small Outline Package)

USOP 4-pin

2P1 Model name :

OMRON mark 103 LOT NO.

\* Actual model name marking for each model

each model	
Model	Marking
G3VM-21PR10	2PA
G3VM-21PR1	2P1
G3VM-21PR11	2PB

### ●Terminal Arrangement/Internal Connections (Top View)



Note: 1. The actual product is marked differently from the image shown here.

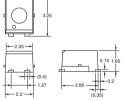
Note: 2. "G3VM" does not appear in the model number on the Relay.

### ■Dimensions (Unit: mm)

### **Surface-mounting Terminals**

Weight: 0.03 g





Unless otherwise specified, the dimensional tolerance is  $\pm \ 0.2 \ \text{mm}.$ 

### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is  $\pm$  0.2 mm.

Note: The actual product is marked differently from the image shown here.

### ■Approved Standards

UL recognized 🔊

Approved Standards	Contact form	File No.
UL recognized	1a (SPST-NO)	E80555

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

184

41

# G3VM−41PR□/51F

MOS FET Relays USOP, Low-output-capacitance and Low-ON-resistance Type (with Low C x R)

### **USOP Package with Low Output** Capacitance and ON Resistance

- Load voltage: 40 V or 50 V
- G3VM-41PR12: Low C  $\times$  R = 4.5 pF· $\Omega$ , Coff (standard) = 0.3 pF,

Ron (standard) = 15  $\Omega$ 

• G3VM-41PR6: Low C  $\times$  R = 10 pF $\cdot \Omega$ , Coff (standard) = 1 pF,

Ron (standard) = 10  $\Omega$ 

• G3VM-41PR10: Low C  $\times$  R = 5.4 pF· $\Omega$ , Coff (standard) = 0.45 pF,

Ron (standard) = 12  $\Omega$ 

• G3VM-41PR11: Low C  $\times$  R = 4.9 pF· $\Omega$ , Coff (standard) = 0.7 pF,

Ron (standard) = 7  $\Omega$ 

• G3VM-41PR5: Low C  $\times$  R = 10 pF $\cdot \Omega$ , Coff (standard) = 10 pF,

Ron (standard) = 1  $\Omega$ 

• G3VM-51PR: Low  $C \times R = 12 pF \cdot \Omega$ . Coff (standard) = 12 pF.

Ron (standard) = 1  $\Omega$ 

RoHS Compliant



Note: The actual product is marked differently from the image shown here.

### ■Application Examples

- · Semiconductor test equipment
- Communication equipment
- Test & measurement equipment
- Data loggers

### ■Package (Unit:mm, Average)

### **■**Model Number Legend

USOP 4-pin



Note: The actual product is marked differently from the image shown here.

G3VM- ... ... ... ... ... ... 1 2 3 4 5

1. Load Voltage 4: 40 V

5: 50 V

1: 1a (SPST-NO)

2. Contact form

3. Package

P: USOP 4-pin

4. Additional functions 5. Other informations

R: Low On-resistance

When specifications overlap, serial code is added in the recorded order.

### **■**Ordering Information

		Terminals		Continuous	Tape cut p	oackaging	Tape packa	ging
Package	Contact form		Load voltage (peak value) *	load current	Model	Minimum package quantity	Minimum package quantity	
		Surface-mounting Terminals	40 V 50 V	100 mA	G3VM-41PR12		G3VM-41PR12(TR05)	
				120 mA	G3VM-41PR6	1 pc.	G3VM-41PR6(TR05)	
USOP4	1a			120 IIIA	G3VM-41PR10		G3VM-41PR10(TR05)	F00
USUP4	(SPST-NO)			140 mA	G3VM-41PR11		G3VM-41PR11(TR05)	500 pcs.
				300 mA	G3VM-41PR5		G3VM-41PR5(TR05)	
				300 mA	G3VM-51PR		G3VM-51PR(TR05)	

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number. Tape-cut USOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

USOP

### ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-41PR12	G3VM-41PR6	G3VM-41PR10	G3VM-41PR11	G3VM-41PR5	G3VM-51PR	Unit	Measurement conditions
	LED forward current	lF			5	0			mA	
Ħ	LED forward current reduction rate	ΔIF/°C			-(	).5			mA/°C	Ta≥25°C
Input	LED reverse voltage	VR			ļ	5			V	
	Connection temperature	TJ		125						
	Load voltage (AC peak/DC)	Voff			40			50	٧	
=	Continuous load current (AC peak/DC)	lo	100	12	20	140	30	10	mA	
Output	ON current reduction rate	Δlo/°C	-1.0	-1	.2	-1.4		-3		Ta≥25°C
0	Pulse ON current	lop	300	36	60	420	90	0	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ		•	12	25	•		°C	
Die	electric strength between I/O (See note 1.)	Vi-o			50	00			Vrms	AC for 1 min
Am	bient operating temperature	Ta			-40 t	0 +85			°C	With no icing or condensation
Am	bient storage temperature	Tstg			-40 to	+125			°C	With no iding of condensation
So	Idering temperature	1			26	30			°C	10 s

Note: 1. The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

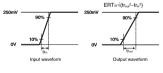
### **■Electrical Characteristics** (Ta = 25°C)

	Item	Symbol		G3VM-41PR12	G3VM-41PR6	G3VM-41PR10	G3VM-41PR11	G3VM-41PR5	G3VM-51PR	Unit	Measurement conditions	
			Minimum			1	.0					
	LED forward voltage	VF	Typical			1.	15			V	IF=10 mA	
			Maximum			1	.3					
Ħ	Reverse current	IR	Maximum			1	0			μΑ	V <sub>R</sub> =5 V	
Input	Capacitance between terminals	nce between terminals CT Typical 15				pF	V=0, f=1 MHz					
	Trigger LED forward current	let	Typical	1.0	0.6	0.5	1.0	0.6	0.5	mA	lo=100 mA	
	Trigger LED forward current	IFT	Maximum		•	;	3	•		IIIA	IO=100 IIIA	
	Release LED forward current	IFC	Minimum			0.1			0.2	mA	Ioff=10 μA	
	Maximum resistance with	Ron	Typical	15	10	12	7		1	Ω	IF=5 mA, t<1 s	
	output ON	HON	Maximum	20	15	14	10	1	.5	52	lo=Continuous load current ratings	
Output	Current leakage when the relay is open	ILEAK	Maximum	1	0.2	1				nA	Voff=Load voltage ratings	
	Capacitance between terminals	COFF	Typical	0.3	1	0.45	0.7	10	12	pF	V=0, f=100 MHz, t<1 s	
			Maximum	0.6	2	0.8	1.3	14	-	рF	V=0, I=100 IVII IZ, I<1 S	
Ca	pacitance between I/O terminals	CI-O	Typical		•	0	.4	•		pF	f=1 MHz, Vs=0 V	
Ins	ulation resistance between I/O	Ri-o	Minimum			10	00			ΜΩ	Vi-o=500 VDC, RoH≤60%	
ten	minals	111-0	Typical	108						10122	VI-0=300 VDC, 1101120076	
Tu	n-ON time	ton	Typical	0.04	0.05	0.03	0.04	0	.2			
	TO CONTRACTOR	1011	Maximum		0	.2		0	.5	ms	IF=5 mA, RL=200 Ω, VDD=20 V <b>*1</b>	
Tu	Turn-OFF time		Typical	0.12	0.16	0.2	0.14	0.2	0.1	1115	11 = 0 11/1, 11:=200 32, VDD=20 V <b>*1</b>	
Tu	II-OI I uille	toff	Maximum	0.2	0	.3	0.2	0.3	0.4			
Ea	uivalent rise time	FRT	Typical			-			40	nc	IF=5 mA, VDD=0.25 V,	
Equivalent rise time		Lai	Maximum			-			90	ps	Tr(in)=25 ps *2	

### \*1. Turn-ON and Turn-OFF Times



### \*2. Equivalent Rise Time



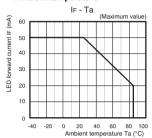
### **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

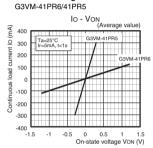
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-41PR12	G3VM-41PR6 G3	VM-41PR10	G3VM-41PR11	G3VM-41PR5	G3VM-51PR	Unit	
Load voltage (AC peak/DC)	VDD	Maximum	32 40							
		Minimum			5					
Operating LED forward current	lF	Typical	7.5							
		Maximum	20							
Continuous load current (AC peak/DC)	lo	Maximum	100	100 120 140 300				00		
Ambient operating temperature	Ta	Minimum	-20							
Ambient operating temperature	ıa	Maximum	65							

#### ●LED forward current vs. Ambient temperature

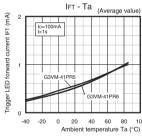


### Continuous load current vs. On-state voltage

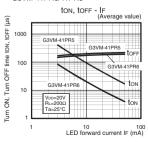


### •Trigger LED forward current vs. Ambient temperature

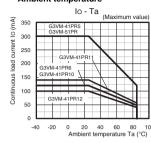
G3VM-41PR6/41PR5



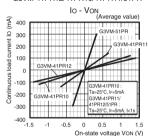
### ●Turn ON, Turn OFF time vs. LED forward current G3VM-41PR6/41PR5



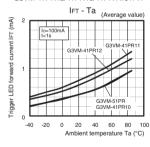
### Continuous load current vs. Ambient temperature



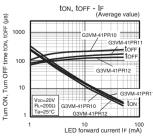
### G3VM-41PR12/41PR10/41PR11/51PR

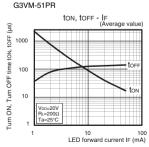


#### G3VM-41PR12/41PR10/41PR11/51PR

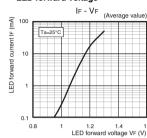


#### G3VM-41PR12/41PR10/41PR11

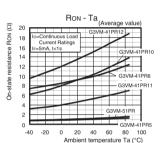




### LED forward current vs. LED forward voltage

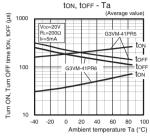


### On-state resistance vs. Ambient temperature



### ●Turn ON, Turn OFF time vs. Ambient temperature

G3VM-41PR6/41PR5



ON, Turn OFF time ton, toFF G3VM-41PR10 toff G3VM-41PR11 100 Ē 10

G3VM-41PR12/41PR10/41PR11

Vnn=20V

D: -2000

(kg)

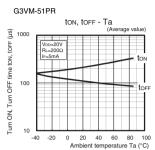
1000

ton, toff - Ta

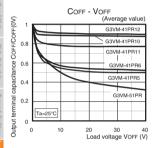
40 60 80 100

Ambient temperature Ta (°C)

(Average value)

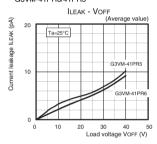


### Output terminal capacitance vs. Load voltage

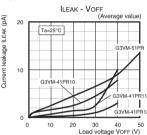


●Current leakage vs. Load voltage G3VM-41PR6/41PR5

-4n -20



### G3VM-41PR12/41PR10/41PR11/51PR



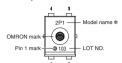
### ■Appearance / Terminal Arrangement / Internal Connections

### Appearance

### USOP (Ultra Small Outline Package)

G3VM-41PR\(\sigma/51PR\)

USOP 4-pin



\* Actual model name marking for

each model					
Model	Marking				
G3VM-41PR12	4PC				
G3VM-41PR6	4P6				
G3VM-41PR10	4PA				
G3VM-41PR11	4PB				
G3VM-41PR5	4P5				
G3VM-51PR	5P0				

●Terminal Arrangement/Internal Connections (Top View)



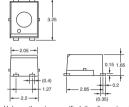
Note: 1. The actual product is marked differently from the image shown here. Note: 2, "G3VM" does not appear in the model number on the Relay.

### ■Dimensions (Unit: mm)

### **Surface-mounting Terminals**

Weight: 0.03 g





Unless otherwise specified, the dimensional tolerance is ± 0.2 mm.

### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ± 0.2 mm.

### ■Approved Standards

UL recognized 💫

Approved Standards	Contact form	File No.
UL recognized	1a (SPST-NO)	E80555

Note: The actual product is marked differently from the image shown here.

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

MOS FET Relays VSON, Low-output-capacitance and Low-ON-resistance Type (with Low C x R)

# World's smallest class New VSON Package with Low Output Capacitance and Low ON Resistance



• G3VM-21UR10: Low C  $\times$  R = 2.4 pF· $\Omega$ , Coff (standard) = 0.8 pF,

Ron (standard) = 3  $\Omega$ 

• G3VM-21UR1: Low C  $\times$  R = 4 pF· $\Omega$ , Coff (standard) = 5 pF,

Ron (standard) = 0.8  $\Omega$ 

• G3VM-21UR11: Low C  $\times$  R = 7.2 pF· $\Omega$ , Coff (standard) = 40 pF,

Ron (standard) = 0.18  $\Omega$ 



Note: The actual product is marked differently from the image shown here.

3. Package

U: VSON 4-pin

RoHS Compliant

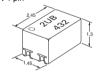
### ■Application Examples

· Semiconductor test equipment

- Communication equipment
- Test & measurement equipment
- Data loggers

### ■Package (Unit: mm, Average)

VSON 4-pin



Note: The actual product is marked differently from the image shown here.

### ■Model Number Legend

1. Load Voltage 2. Contact form

2: 20 V 1: 1a (SPST-NO)
4. Additional functions 5. Other informations

R: Low On-resistance When specifications overlap, serial code

is added in the recorded order.

### **■**Ordering Information

				Continuous	Tape cut p	oackaging	Tape packaging	
Package	Contact form	Terminals	Load voltage (peak value) *	load current	Model	Minimum package quantity	Model	Minimum package quantity
	1a (SPST-NO)	Surface-mounting Terminals	20 V	200 mA	G3VM-21UR10		G3VM-21UR10(TR05)	
VSON4				450 mA	G3VM-21UR1	1 pc.	G3VM-21UR1(TR05)	500 pcs.
	(0. 0. 110)			1,000 mA	G3VM-21UR11		G3VM-21UR11(TR05)	

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number. Tape-out VSONs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

\* The AC peak and DC value are given for the load voltage and continuous load current.

G3VM-21UR

### ■Absolute Maximum Ratings (Ta = 25°C)

G3VM-21UR

	Item	Symbol	G3VM-21UR10	G3VM-21UR1	G3VM-21UR11	Unit	Measurement conditions	
	LED forward current	lF.		30		mA		
Ħ	LED forward current reduction rate	ΔIF/°C		-0.3		mA/°C	Ta≥25°C	
Input	LED reverse voltage	VR		5		٧		
	Connection temperature	TJ		125		°C		
	Load voltage (AC peak/DC)	Voff	20			٧		
=	Continuous load current (AC peak/DC)	lo	200	450	1,000	mA		
Output	ON current reduction rate	Δlo/°C	-2	-4.5	-10	mA/°C	Ta≥25°C	
0	Pulse ON current	lop	0.6	1.3	3	Α	t=100 ms, Duty=1/10	
	Connection temperature	TJ		125		°C		
Di	electric strength between I/O *	Vi-o		300		Vrms	AC for 1 min	
An	Ambient operating temperature			-40 to +85		°C	With no icing or condensation	
An	Ambient storage temperature			-40 to +125		°C		
Sc	ldering temperature	-		260		°C	10 s	

The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the

### ■Electrvical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-21UR10	G3VM-21UR1	G3VM-21UR11	Unit	Measurement conditions	
			Minimum		1.1				
	LED forward voltage	VF	Typical		1.27		V	IF=10 mA	
			Maximum		1.4				
Ħ	Reverse current	lR	Maximum		10		μА	V <sub>R</sub> =5 V	
Input	Capacitance between terminals	Ст	Typical		30		pF	V=0, f=1 MHz	
	Triange I ED (annual annual	let	Typical	1	0.6	-	mA	Io=100 mA	
	Trigger LED forward current	IFT	Maximum		3		mA	10=100 mA	
	Release LED forward current	IFC	Minimum		0.1		mA	Ioff=10 μA	
	Maximum resistance with output ON	Bon	Typical	3	0.8	0.18	Ω	IF=5 mA, t<1 s,	
		HON	Maximum	5	1.2	0.22	22	lo=Continuous load current ratings	
Output	Current leakage when the relay is open	ILEAK	Maximum		1			Voff=20 V	
		_	Typical	0.8	5	40	-		
	Capacitance between terminals	Coff	Maximum	1.1	12	-	pF	V=0, f=100 MHz, t<1 s	
Ca	pacitance between I/O terminals	Cı-o	Typical		1	0.4	pF	f=1 MHz, Vs=0 V	
	sulation resistance between I/O minals	Ri-o	Typical		10 <sup>8</sup>	,	МΩ	V⊦o=500 VDC, RoH≤60%	
т	rn-ON time	ton	Typical	0.05	0.17	-			
Tu	III-ON time	ION	Maximum	0.2	0.4	2		IF=5 mA, RL=200 $\Omega$ , VDD=10 V *	
т	rn-OFF time	torr	Typical	0.	02	-	ms		
Iu	III-OFF LIIIE	IOFF	Maximum	0.2	0.4	1			

Turn-ON and Turn-OFF Times



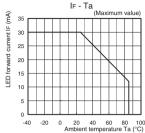
### **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

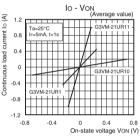
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-21UR10	G3VM-21UR1	G3VM-21UR11	Unit		
Load voltage (AC peak/DC)	VDD	Maximum	16			V		
		Minimum		5				
Operating LED forward current	lF	Typical		mA				
		Maximum		IIIA				
Continuous load current (AC peak/DC)	lo	Maximum	200 450 1,4		1,000			
Ambient operating temperature	Ta	Minimum	-20			°C		
Ambient operating temperature	I d	Maximum		65				

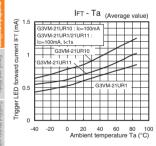
### LED forward current vs. Ambient temperature



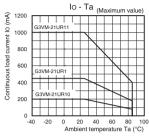
### Continuous load current vs. On-state voltage



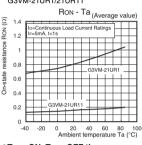
#### Trigger LED forward current vs. Ambient temperature



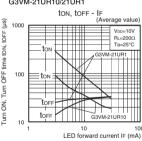
### Continuous load current vs. Ambient temperature



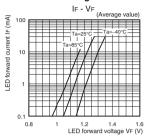
#### ●On-state resistance vs. Ambient temperature G3VM-21UR1/21UR11



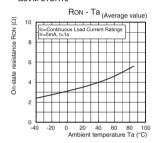
#### ●Turn ON, Turn OFF time vs. LED forward current G3VM-21UR10/21UR1



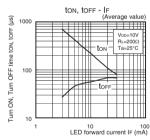
### LED forward current vs. LED forward voltage



#### G3VM-21UR10

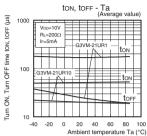


#### G3VM-21UR11

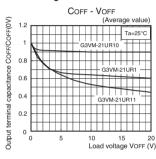


#### ●Turn ON, Turn OFF time vs. Ambient temperature G3VM-21UR10/21UR1

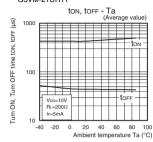
G3VM-21UR



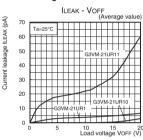
### Output terminal capacitance vs. Load voltage



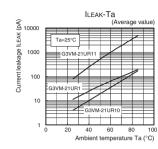
### G3VM-21UR11



### Current leakage vs. Load voltage



### Current leakage vs. Ambient temperature



■Appearance / Terminal Arrangement / Internal Connections

each model							
Model	Marking						
G3VM-21UR10	2UA						
G3VM-21UR1	2U1						
G3VM-21UR11	2UB						

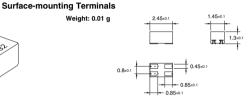
### ●Terminal Arrangement/Internal Connections (Top View)



Note: 1. The actual product is marked differently from the image shown here.

### Note: 2. "G3VM" does not appear in the model number on the Relay.

### ■Dimensions (Unit: mm)



### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ± 0.1 mm.

Note: The actual product is marked differently from the image shown here.

### **■**Approved Standards

Applying for UL recognition

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

## G3VM−41UR□/51**ι**

MOS FET Relays VSON, Low-output-capacitance and Low-ON-resistance Type (with Low C x R)

### World's smallest class New VSON Package with Low Output Capacitance and Low ON Resistance

- . Load voltage: 40 V or 50 V
- G3VM-41UR12: Low C  $\times$  R = 4.5 pF· $\Omega$ , Coff (standard) = 0.3 pF,

Ron (standard) = 15  $\Omega$ 

- G3VM-41UR10: Low C  $\times$  R = 5.4 pF· $\Omega$ , Coff (standard) = 0.45 pF, Ron (standard) = 12  $\Omega$
- G3VM-41UR11: Low C  $\times$  R = 4.9 pF· $\Omega$ , Coff (standard) = 0.7 pF,

Ron (standard) =  $7 \Omega$ 

• G3VM-51UR: Low  $C \times R = 12 pF \cdot \Omega$ , Coff (standard) = 12 pF,

Ron (standard) = 1  $\Omega$ 



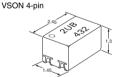
Note: The actual product is marked differently from the image shown here.

RoHS Compliant

### ■Application Examples

- Semiconductor test equipment
- Communication equipment
- Test & measurement equipment
- Data loggers

### ■Package (Unit: mm, Average)



Note: The actual product is marked differently from the image shown here.

### ■Model Number Legend

G3VM- ... ... ... ... ... 1 2 3 4 5

- 1. Load Voltage
- 4: 40 V 5: 50 V
- 4. Additional functions
- R: Low On-resistance
- 2. Contact form
  - 1: 1a (SPST-NO)
- 3. Package
- U: VSON 4-pin
- 5. Other informations
  - When specifications overlap, serial code is added in the recorded order.

### ■Ordering Information

				Continuous	Tape cut p	oackaging	Tape packa	Tape packaging	
Package	Contact form	Terminals	Load voltage (peak value) *	load current	Model	Minimum package quantity	Model	Minimum package quantity	
		Surface-mounting Terminals	40 V	100 mA	G3VM-41UR12	1 pc.	G3VM-41UR12(TR05)	500 pcs.	
VSON4	1a			120 mA	G3VM-41UR10		G3VM-41UR10(TR05)		
V301V4	(SPST-NO)			140 mA	G3VM-41UR11		G3VM-41UR11(TR05)		
			50 V	300 mA	G3VM-51UR		G3VM-51UR(TR05)		

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number. Tape-cut VSONs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

<sup>\*</sup> The AC peak and DC value are given for the load voltage and continuous load current.

### ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-51UR	Unit	Measurement conditions
	LED forward current	lF		3	0		mA	
Input	LED forward current reduction rate	ΔIF/°C		-(	).3		mA/°C	Ta≥25°C
u	LED reverse voltage	VR			5		V	
	Connection temperature	TJ		1:	°C			
	Load voltage (AC peak/DC)	Voff		40 50			V	
=	Continuous load current (AC peak/DC)	lo	100	120	140	300	mA	
Output	ON current reduction rate	∆lo/°C	-1.0	-1.2	-1.4	-3	mA/°C	Ta≥25°C
0	Pulse ON current	lop	300	360	420	900	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ		1:	25		°C	
D	electric strength between I/O *	V <sub>I</sub> -o		3	00		Vrms	AC for 1 min
Α	mbient operating temperature	Ta		−40 t	o +85		°C	With no icing or condensation
Α	mbient storage temperature	Tstg		-40 to	+125		°C	Will no icing or condensation
S	oldering temperature	-		2	60		°C	10 s

The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

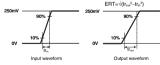
### ■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-51UR	Unit	Measurement conditions	
			Minimum		1	.1				
	LED forward voltage	VF	Typical		1.	27		٧	IF=10 mA	
			Maximum		1	.4				
Input	Reverse current	IR	Maximum		1	0		μΑ	VR=5 V	
п	Capacitance between terminals	Ст	Typical		3	10		pF	V=0, f=1 MHz	
	Trigger LED forward current	IFT	Typical	0.9	-	0.7	-	mA	lo=100 mA	
	Trigger LLD forward current	IF1	Maximum			3		IIIA	10=100 HIA	
	Release LED forward current	IFC	Minimum	0.1				mA	Ioff=10 μA	
	Maximum resistance with	Bon	Typical	15	12	7	1	Ω	IF=5 mA, t<1 s,	
	output ON	HON	Maximum	20	14	10	1.5	32	Io=Continuous load current ratings	
Output	Current leakage when the relay is open	ILEAK	Maximum			1	nA	Voff =Load voltage ratings		
O		0	Typical	0.3	0.45	0.7	12	pF	V=0, f=100 MHz, t<1 s	
	Capacitance between terminals	Coff	Maximum	0.6	0.8	1.3	20	pr	V=0, I=100 MHZ, t<1 S	
Ca	pacitance between I/O terminals	Cı-o	Typical			1		pF	f=1 MHz, Vs=0 V	
	ulation resistance between I/O minals	R⊩o	Typical		1	O8		МΩ	Vi-o=500 VDC, RoH≤60%	
т	rn-ON time	ton	Typical	0.05	-	0.06	-			
Tu	II-ON time	ION	Maximum		0.2		0.5		IF=5 mA, RL=200 Ω,	
To	n-OFF time	torr	Typical	0.03	-	0.03	-	ms	VDD=20 V *1	
Tu	II-OI I uille	IOFF	Maximum	0.2	0.3	0.2	0.4			
Ea	uivalant riaa tima	ERT	Typical	-			40		IF=5 mA, VDD=0.25 V,	
≥q	uivalent rise time	CHI	Maximum		=		90	ps	Tr(in)=25 ps <b>*2</b>	

\*1. Turn-ON and Turn-OFF Times



\*2. Equivalent Rise Time



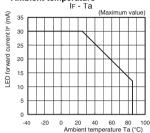
### ■Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

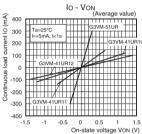
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-51UR	Unit			
Load voltage (AC peak/DC)	VDD	Maximum		32 40						
		Minimum		5						
Operating LED forward current	lF	Typical			mA					
		Maximum			IIIA					
Continuous load current (AC peak/DC)	lo	Maximum	100	120	140	300				
Ambient operating temperature	Ta	Minimum		°C						
Ambient operating temperature	ıa	Maximum		6	5		Ü			

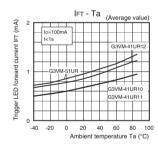
### LED forward current vs. Ambient temperature



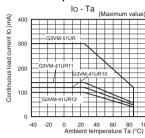
### Continuous load current vs. On-state voltage



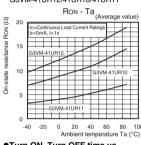
### Trigger LED forward current vs. Ambient temperature



### Continuous load current vs. Ambient temperature

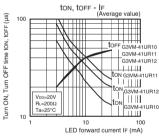


### On-state resistance vs. Ambient temperature G3VM-41UR12/41UR10/41UR11

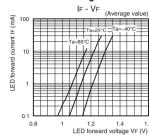


### Turn ON, Turn OFF time vs. LED forward current

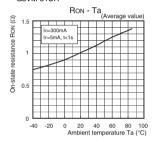
G3VM-41UR12/41UR10/41UR11



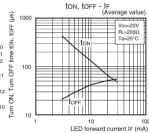
#### LED forward current vs. LED forward voltage



### G3VM-51UR



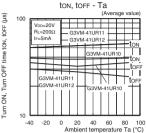
#### G3VM-51UR



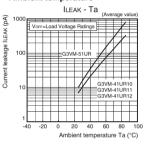
Ď, Turn OFF time 1

Furn ON,

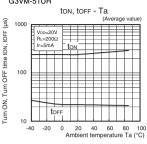
### Ambient temperature G3VM-41UR12/41UR10/41UR11



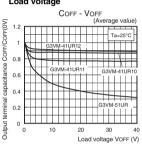
### Current leakage vs. Ambient temperature



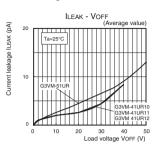
### G3VM-51UR



#### Output terminal capacitance vs. Load voltage



#### ●Current leakage vs. Load voltage



### ■Appearance / Terminal Arrangement / Internal Connections

### Appearance

### VSON (Very Small Outline Non-leaded)

VSON 4-pin



\* Actual model name marking for

each model	
Model	Marking
G3VM-41UR12	4UC
G3VM-41UR10	4UA
G3VM-41UR11	4UB
G3VM-51UR	5U0

### ●Terminal Arrangement/Internal Connections (Top View)



Note: 1. The actual product is marked differently from the image shown here. Note: 2. "G3VM" does not appear in the model number on the Relay.

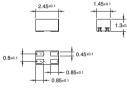
G3VM-41UR\(\sigmu/51UR\)

### ■Dimensions (Unit: mm)

#### **Surface-mounting Terminals**

Weight: 0.01 g





### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ± 0.1 mm.

Note: The actual product is marked differently from the image shown here.

### **■**Approved Standards

Applying for UL recognition

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

# G3VM-41QR10/61C

MOS FET Relays S-VSON 4-pin, Low-output-capacitance and Low-ON-resistance Type (with Low C x R)

### World's smallest class \* **New S-VSON Package** with Low Output Capacitance and Low ON Resistance

- . Load voltage: 40 V / 60 V.
- G3VM-41QR10: Low C  $\times$  R = 4.95 pF- $\Omega$ , Coff (standard) = 0.45 pF, Rox (standard) = 11  $\Omega$
- G3VM-61QR: Low C  $\times$  R = 13.2 pF· $\Omega$ , Coff (standard) = 12 pF, Rox (standard) = 1.1  $\Omega$
- High Ambient operating temperature: -40°C to +110°C

\* As of March 2018 Survey by OMRON.



Note: The actual product is marked differently from the image shown here.

#### RoHS Compliant

S-VSON4 pin

### ■Application Examples

- Semiconductor test equipment
- Test & measurement equipment
- Communication equipment
- Data loggers

#### ■Package (Unit: mm, Average)

S-VSON(L) 4 pin

Note: The actual product is marked differently from the image shown here

### ■Model Number Legend

G3VM-\_\_\_\_\_\_\_ 2 3 4 5

1. Load Voltage 6: 60 V

4: 40V

4. Additional functions R: Low On-resistance

2. Contact form Package type 3. Package type

1: 1a (SPST-NO)

Q: S-VSON 4 pin

S-VSON(L)\* 4 pin 5. Other informations \* (L): Low profile type

When specifications overlap. serial code is added in the recorded order.

### **■**Ordering Information

			Terminals	Load voltage (peak value) *	Continuous load current (peak value) #	Packing/	Tape cut	Packing/Tape & reel		
	Package type	Contact form				Model	Minimum package quantity	Model	Minimum package quantity	
ſ	S-VSON4(L)4	1a	Surface-mounting	40 V	120 mA	G3VM-41QR10	1 pc.	G3VM-41QR10 (TR05)	500 pcs.	
I	S-VSON4	(SPST-NO)	Terminals	60 V	400 mA	G3VM-61QR	i pc.	G3VM-61QR (TR05)		

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: When ordering tape packing, add "(TR05)" (500 pcs/reel) to the model number.

Ask your OMBON representative for orders under 500 pcs. We can supply products with the tape already cut. Tape-cut S-VSON is packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

### ■Absolute Maximum Ratings (Ta = 25°C)

=						
	Item	Symbol	G3VM-41QR10	G3VM-61QR	Unit	Measurement conditions
	LED forward current	lF	30		mA	
Input	LED forward current reduction rate	ΔI <sub>F</sub> /°C	-(	-0.3		Ta≥25°C
ᆸ	LED reverse voltage	VR	(	6	V	
	Connection temperature	TJ	125		°C	
	Load voltage (AC peak/DC)	Voff	40	60	V	
=	Continuous load current (AC peak/DC)	lo	120	400	mA	
Output	ON current reduction rate	∆lo/°C	-1.2	-4	mA/°C	Ta≥25°C
0	Pulse ON current	Іор	0.36	1.2	Α	t = 100 ms, Duty = 1/10
	Connection temperature	TJ	12	25	°C	
Die	electric strength between I/O *	V <sub>I-O</sub>	50	00	Vrms	AC for 1 min
An	Ambient operating temperature		-40 to	+110	°C	With no icing or condensation
An	nbient storage temperature	Tstg	-40 to	+125	°C	
So	Idering temperature	-	26	60	°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

### **■Electrical Characteristics** (Ta = 25°C)

	Item	Symbol		G3VM-41QR10	G3VM-61QR	Unit	Measurement conditions	
			Minimum	1.	1			
	LED forward voltage	VF	Typical	1.2	21	٧	IF = 10 mA	
			Maximum	1.	4	i		
Ħ	Reverse current	IR	Maximum	1	0	μА	V <sub>R</sub> = 5 V	
Input	Capacity between terminals	Ст	Typical	3	0	pF	V = 0, f = 1 MHz	
	Trigger LED forward current	let	Typical	0.8	_	mA	lo = 100 mA	
	Trigger LED forward current	IFT	Maximum	3	3	IIIA	10 = 100 HIA	
	Release LED forward current	IFC	Minimum	0.	1	mA	loff = 10 μA	
			Typical	11	1.1		G3VM-41QR10: IF = 5 mA,	
	Maximum resistance with output ON	Ron	Maximum	14	1.5	Ω	t<1s, lo = 120 mA G3VM-61QR: I <sub>F</sub> = 5 mA, t<1s,	
=			mon		••=		lo = 400 mA	
Output	Current leakage when the relay is open	ILEAK	Maximum	1	1000 (1)	nA	G3VM-41QR10: VoFF = 40 V G3VM-61QR: VoFF = 60 V (VoFF = 50 V)	
	Citbtil-	_	Typical	0.45	12	pF	V 0 ( 400 MH ) 4	
	Capacity between terminals	Coff	Maximum	0.8	20	pr	V = 0, f = 100 MHz, t<1s	
Ca	pacity between I/O terminals	CI-O	Typical	1	0.9	pF	f = 1 MHz, Vs = 0V	
	sulation resistance between I/O minals	Ri-o	Typical	10	)8	ΜΩ	Vi-o = 500 VDC, RoH≤60%	
			Typical	0.08	-			
Tu	rn-ON time	ton	Maximum	0.2	0.5 (0.25)	ms	I <sub>F</sub> = 5 mA, R <sub>L</sub> = 200 Ω, V <sub>DD</sub> = 20 V	
			Typical	0.04	-		(I <sub>F</sub> = 10 mA, R <sub>L</sub> = 200 Ω, V <sub>DD</sub> = 20 V) *	
Tu	rn-OFF time	toff	Maximum	0.3	0.3 (0.3)	ms	VDD - 20 V) ~	

### \* Turn-ON and Turn-OFF Times





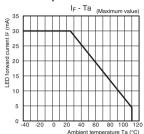
### **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

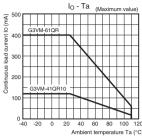
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

		,		.,	
Item	Symbol		G3VM-41QR10	G3VM-61QR	Unit
Load voltage (AC peak/DC)	VDD	Maximum	32	48	V
		Minimum		5	
Operating LED forward current	lF	Typical	7	mA	
		Maximum	2	IIIA	
Continuous load current (AC peak/DC)	lo	Maximum	120	400	
Ambient operating temperature	Ta	Minimum	-2	20	°C
Ambient operating temperature	I a	Maximum	85	100	

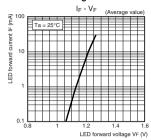
### LED forward current vs. Ambient temperature



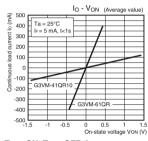
### Continuous load current vs. Ambient temperature



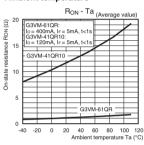
### LED forward current vs. LED forward voltage



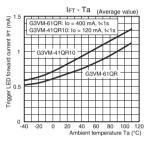
#### Continuous load current vs. On-state voltage



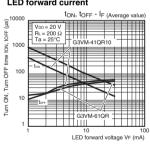
On-state resistance vs. Ambient temperature



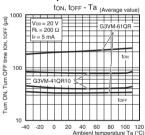
Trigger LED forward current vs.
 Ambient temperature



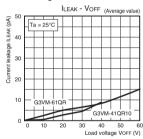
### ●Turn ON, Turn OFF time vs. LED forward current



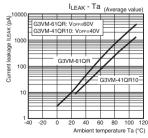
●Turn ON, Turn OFF time vs. Ambient temperature



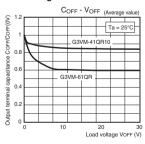
 Current leakage vs. Load voltage



### Current leakage vs. Ambient temperature



Output terminal capacitance vs. Load voltage



### ■Appearance / Terminal Arrangement / Internal Connections

### ■Appearance

### S-VSON (Super-Very Small Outline Non-leaded)

S-VSON4 pin / S-VSON(L)4 pin

Model name \*

Model name #

- \* Actual model name marking for

### ■Terminal Arrangement/Internal Connections (Top View)



Note 1. The actual product is marked differently from the image shown here.

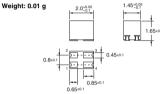
2. "G3VM" does not appear in the model number on the Relay.

### ■Dimensions (Unit: mm)

#### S-VSON (Super-Very Small Outline Non-leaded) S-VSON4 pin

### **Surface-mounting Terminals**

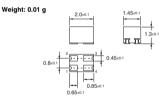




Note: The actual product is marked differently from the image shown here. S-VSON(L)4 pin

### **Surface-mounting Terminals**





Note: The actual product is marked differently from the image shown here.

### **■**Safety Precautions

• Refer to "Common Precautions" for all G3VM models.

### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is  $\pm$  0.1 mm.

### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ± 0.1 mm.

MOS FET Relays SSOP, Small and High-load-voltage Type

### **MOS FET Relays** in SSOP packages for high load voltages

Load voltage: 60 V, 80 V, or 100 V

RoHS Compliant

### **■**Application Examples

- Semiconductor test equipment
- Test & Measurement equipment
- Communication equipment
- Data loggers





Note: The actual product is marked differently from the image shown here

### ■Package

(Unit: mm, Average)

SSOP 4-pin



Note: The actual product is marked differently from the image shown here.

### ■Model Number Legend

G3VM-1 2 3 4

1. Load Voltage 2. Contact form

1:1a (SPST-NO)

3. Package L: SSOP 4-pin

8:80 V 10:100 V

4. Additional functions R: Low ON resistance

5. Other informations

When specifications overlap, serial code is added in the recorded order.

### **■**Ordering Information

	Contact		Load voltage	Continuous load	Tape cut	packaging	Tape packaging		
Package	form	Terminals	(peak value) *	current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity	
SSOP4 (S		Surface-mounting Terminals	60 V	400 mA	G3VM-61LR		G3VM-61LR(TR05)		
	1a (SPST-NO)		80 V	120 mA	G3VM-81LR	1 pc.	G3VM-81LR(TR05)	500 pcs.	
	(6/ 6/ 146)		100 V	80 mA	G3VM-101LR		G3VM-101LR(TR05)		

\* The AC peak and DC value are given for the load voltage and continuous load current

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.

Tape-cut SSOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

### ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-61LR	G3VM-81LR	G3VM-101LR	Unit	Measurement conditions
	LED forward current	lF		50		mA	
Ħ	LED forward current reduction rate	ΔIF/°C		-0.5		mA/°C	Ta ≥ 25°C
aul	LED reverse voltage	VR		5		٧	
	Connection temperature	TJ		125		°C	
	Load voltage (AC peak/DC)	Voff	60	80	100	V	
5	Continuous load current (AC peak/DC)	lo	400	120	80	mA	
Output	ON current reduction rate	Δlo/°C	-4	-1.2	-0.8	mA/°C	Ta ≥ 25°C
0	Pulse ON current	lop	1200	360	240	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ		125	•	°C	
D	ielectric strength between I/O *	V <sub>I</sub> -o		1500		Vrms	AC for 1 min
Α	mbient operating temperature	Ta		-20 to +85		°C	With no icing or condensation
Α	mbient storage temperature	Tstg		-40 to +125		°C	with no long or condensation
S	oldering temperature	-		260		°C	10 s

<sup>\*</sup> The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

### G3VM-61LR/81LR/101LR

### ■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-61LR	G3VM-81LR	G3VM-101LR	Unit	Measurement conditions
			Minimum		1.0			
	LED forward voltage	VF	Typical		1.15		٧	IF=10 mA
			Maximum		1.3			
	Reverse current	IR	Maximum		10		μА	VR=5 V
nbnt	Capacitance between terminals	Ст	Typical		15		pF	V=0, f=1 MHz
_	Trigger LED forward	Trigger LED forward		2	2 1			G3VM-61LR : lo=100 mA G3VM-81LR : lo=120 mA
	current		Maximum		5	*	mA	G3VM-101LR : lo=80 mA
	Release LED forward current	IFC	Minimum	0.2	0.1	0.2	mA	G3VM-61LR/81LR : Ioff=10 μA G3VM-101LR : Ioff=1 μA
	Maximum resistance with output ON	Bon	Typical	1	7.5	8	Ω	G3VM-61LR: IF=5 mA, Io=Continuous load current ratings G3VM-81LR/101LR: IF=10 mA.
Output		HON	Maximum	1.5	12	14		lo=Continuous load current ratings, t=10 ms
Out	Current leakage when the relay is open	İLEAK	Maximum	1,000	1,000 0.2		nA	G3VM-61LR : Voff=60 V G3VM-81LR : Voff=80 V, Ta=60°C G3VM-101LR : Voff=80 V
	Capacitance between	Coff	Typical	20	5	6	pF	V=0, f=100 MHz, t<1 s
	terminals	COFF	Maximum	30	7	8	PΓ	V=0, I=100 WH2, t<1 S
	pacitance between I/O minals	CI-O	Typical	0.3	0.8	0.6	pF	f=1 MHz, Vs=0 V
Ins	sulation resistance between	Ri-o	Minimum		1000		МΩ	Vi-o=500 VDC, RoH≤60%
I/C	terminals	ni-o	Typical		108		IVISZ	VI-0=300 VDC, R0H≤60%
Tu	rn-ON time	ton	Typical	0.3	0	.1		G3VM-81LR:
10	ini-Oiv unie	ION	Maximum 1 0.25 0.3		0.3	ms	I <sub>F</sub> =10 mA, R <sub>L</sub> =200 Ω, V <sub>DD</sub> =20 V	
Tu	rn-OFF time	torr	Typical	0.2	0.15	0.1	1115	G3VM-61LR/101LR:
10	in Or anie	LOFF	Maximum	1	0.2	0.3		IF=5 mA, RL=200 Ω, VDD=20 V *

### \* Turn-ON and Turn-OFF Times



### **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

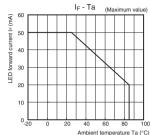
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

East Kom on the lot to an independen		,,		,					
Item	Symbol		G3VM-61LR	G3VM-81LR	G3VM-101LR	Unit			
Load voltage (AC peak/DC)	VDD	Maximum	48	64	80	V			
Operating LED forward current	le.	Minimum		10					
	IF.	Maximum	20	3	mA				
Continuous load current (AC peak/DC)	lo	Maximum	400	120	80				
Ambient operating temperature	Ta	Minimum	-20						
Ambient operating temperature	Id	Maximum	70 60						

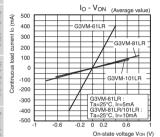
### **■**Spacing and Insulation

Item	Minimum	Unit
Creepage distances	2.5	
Clearance distances	2.5	mm
Internal isolation thickness	0.1	

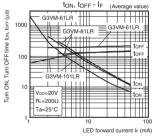
### LED forward current vs. Ambient temperature



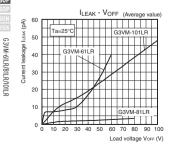
### Continuous load current vs. On-state voltage



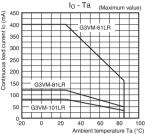
● Turn ON, Turn OFF time vs. LED forward current



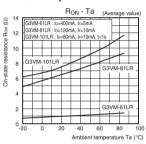
Current leakage vs.
 Ambient temperature



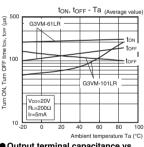
### Continuous load current vs. Ambient temperature



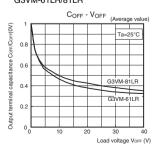
### On-state resistance vs. Ambient temperature



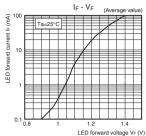
● Turn ON, Turn OFF time vs. Ambient temperature G3VM-61LR/101LR



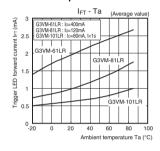
#### Output terminal capacitance vs. Load voltage G3VM-61LR/81LR



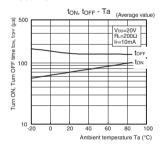
### LED forward current vs. LED forward voltage



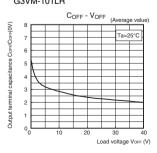
Trigger LED forward current vs.
 Ambient temperature



G3VM-81LR



G3VM-101LR



### ■Appearance / Terminal Arrangement / Internal Connections

G3VM-61LR/81LR/101LR

### Appearance

#### SSOP (Shrink Small Outline Package) SSOP 4-pin



\* Actual model name marking for each model

Model	Marking
G3VM-61LR	610
G3VM-81LR	810
G3VM-101LR	101

### ●Terminal Arrangement/ Internal Connections



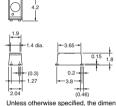
### ■Dimensions (Unit: mm)



### **Surface-mounting Terminals**

Note: 1. The actual product is marked differently from the image shown here. Note: 2. "G3VM" does not appear in the model number on the Relay.

Weight: 0.03 g



Unless otherwise specified, the dimensional tolerance is ± 0.1 mm.

# (Top View)



### **Actual Mounting Pad Dimensions** (Recommended Value, TOP VIEW)



Note: The actual product is marked differently from the image shown here.

### **■**Approved Standards

UL recognized 🔊



### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

# G3VM-61PR / /71PR / 81PR / 101PR

MOS FET Relays USOP, Small and High-load-voltage Type

### USOP Package with High Load voltage

- Load voltage: 60 V, 75 V, 80 V, or 100 V
- G3VM-61PR1: Low C  $\times$  R = 7 pF· $\Omega$ , Coff (standard) = 0.7 pF,

Ron (standard) = 10  $\Omega$ 

RoHS Compliant



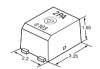
Note: The actual product is marked differently from the image shown here.

### **■**Application Examples

- · Semiconductor test equipment
- Communication equipment
- Test & measurement equipment
- Data loggers

### ■Package (Unit:mm, Average)

### USOP 4-pin



Note: The actual product is marked differently from the image shown here.

### ■Model Number Legend

### 

- 1. Load Voltage
  - 6: 60 V
  - 7: 75 V
  - 8: 80 V 10: 100 V
- 2. Contact form
  1: 1a (SPST-NO)
- 4. Additional functions
- R: Low On-resistance
- 3. Package
  - P: USOP 4-pin
- 5. Other informations

When specifications overlap, serial code is added in the recorded order.

### **■**Ordering Information

				Continuous	Tape cut p	ackaging	Tape packa	ging
Package	Contact form	Terminals	Load voltage (peak value) *	load current	Model	Minimum package quantity	Model	Minimum package quantity
			60 V	120 mA	G3VM-61PR1		G3VM-61PR1(TR05)	
			00 V	400 mA	G3VM-61PR		G3VM-61PR(TR05)	
USOP4	1a (SPST-NO)	Surface-mounting Terminals	75 V	400 IIIA	G3VM-71PR	1 pc.	G3VM-71PR(TR05)	500 pcs.
	(31-31-10)	reminais	80 V	120 mA	G3VM-81PR		G3VM-81PR(TR05)	
			100 V	100 mA	G3VM-101PR		G3VM-101PR(TR05)	

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.

Tape-cut USOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

\* The AC peak and DC value are given for the load voltage and continuous load current.

### ■Absolute Maximum Ratings (Ta = 25°C)

G3VM-61PR\(\to\$/71PR/81PR/101PR\)

	Item	Symbol	G3VM-61PR1	G3VM-61PR	G3VM-71PR	G3VM-81PR	G3VM-101PR	Unit	Measurement conditions
	LED forward current	lF			50			mA	
Input	LED forward current reduction rate	ΔIF/°C			-0.5			mA/°C	Ta≥25°C
luc	LED reverse voltage	VR			5				
	Connection temperature	TJ			125			°C	
	Load voltage (AC peak/DC)	Voff	60		75	80	100	٧	
=	Continuous load current (AC peak/DC)	lo	120	120 40		120	100	mA	
Output	ON current reduction rate	Δlo/°C	-1.2	-	4	-1.2	-1	mA/°C	Ta≥25°C
0	Pulse ON current	lop	360	1,2	00	360	300	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ		•	125			°C	
D	ielectric strength between I/O *	VI-O			500			Vrms	AC for 1 min
Α	mbient operating temperature	Ta			-40 to +85			°C	With no icing or condensation
Α	mbient storage temperature	Tstg			-40 to +125			°C	With no icing or condensation
S	oldering temperature	-			260			°C	10 s

The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

### **■Electrical Characteristics** (Ta = 25°C)

	Item	Symbol		G3VM-61PR1	G3VM-61PR	G3VM-71PR	G3VM-81PR	G3VM-101PR	Unit	Measurement conditions	
			Minimum			1.0					
	LED forward voltage	VF	Typical			1.15			V	IF=10 mA	
			Maximum			1.3					
Input	Reverse current	lR	Maximum			10			μΑ	VR=5 V	
'n	Capacitance between terminals	Ст	Typical			15	pF	V=0, f=1 MHz			
	Trigger I ED forward ourrent	lft	Typical	1.0	0.5		0.6	0.5	mA	lo=100 mA	
	Trigger LED forward current	IFI	Maximum			3			IIIA	10=100 IIIA	
	Release LED forward current	IFC	Minimum	0.1	0.2		0.1		mA	Ioff=10 μA	
			Typical	10		1	7	8		G3VM-61PR : IF=5 mA,	
Output	Maximum resistance with output ON	Ron	Maximum	15	1	.5	12	14	Ω	Io=400 mA Others : IF=5 mA, Io=Continuous load current ratings, t<1 s	
Jul	Current leakage when the relay is open	ILEAK	Maximum		1		0.02	0.2	nΑ	Voff=Load voltage ratings	
		Coff	Typical	0.7	20	30	5	6		G3VM-61PR : V=0,	
	Capacitance between terminals		Maximum	1.3	30	-	7	8	pF	f=1 MHz, t<1 s Others : V=0, f=100 MHz, t<1 s	
Ca	pacitance between I/O terminals	Cı-o	Typical	0.4	0.3		0.4		pF	f=1 MHz, Vs=0 V	
	ulation resistance between I/O terminals	Ri-o	Maximum		•	1000			МΩ	Vi-o=500 VDC, RoH≤60%	
ins	ulation resistance between I/O terminals	HI-O	Typical		108					VI-0=500 VDC, HOH≤60%	
т	n-ON time	ton	Typical	0.04	0.3	0.4	0.14	0.12			
ıuı	II-ON time	ION	Maximum	0.2	0.5	2	0.5	0.3	ms	IF=5 mA, RL=200 Ω,	
т	n OFF time	toff	Typical	0.12	0.3	0.2	0.16	0.18	IIIS	VDD=20 V *	
ıuı	Turn-OFF time								i I		

### Turn-ON and Turn-OFF Times



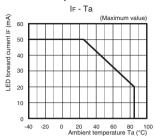
### **■**Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

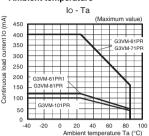
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-61PR1	G3VM-61PR	G3VM-71PR	G3VM-81PR	G3VM-101PR	Unit
Load voltage (AC peak/DC)	VDD	Maximum	4	8	60	64	80	V
		Minimum			5			
Operating LED forward current	IF Typical 7.5							mA
		Maximum	20					
Continuous load current (AC peak/DC)	lo	Maximum	120	400		120	100	
Ambient operating temperature	Ta	Minimum	-20					°C
Ambient operating temperature	ı a	Maximum			65			·

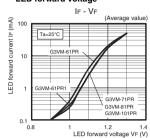
### ●LED forward current vs. Ambient temperature



#### Continuous load current vs. Ambient temperature

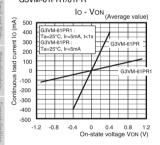


### LED forward current vs. LED forward voltage

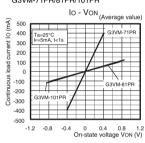


### •Continuous load current vs. On-state voltage

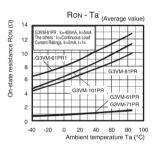
G3VM-61PR1/61PR



### G3VM-71PR/81PR/101PR

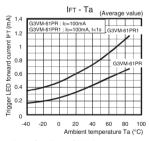


On-state resistance vs. Ambient temperature

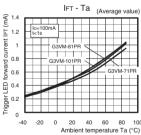


### Trigger LED forward current vs. Ambient temperature

G3VM-61PR1/61PR



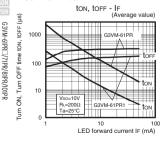
### G3VM-71PR/81PR/101PR



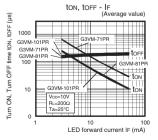
Turn ON, Turn OFF time vs. LED forward current

G3VM-61PR1/61PR

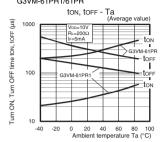
USOP



### G3VM-71PR/81PR/101PR

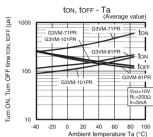


### ●Turn ON, Turn OFF time vs. Ambient temperature G3VM-61PR1/61PR

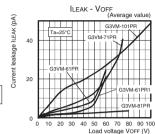


### G3VM-71PR/81PR/101PR

G3VM-61PR\(\to\$/71PR/81PR/101PR\)

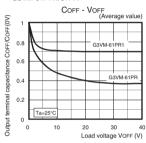


### Current leakage vs. Load voltage

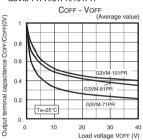


### Output terminal capacitance vs. Load voltage





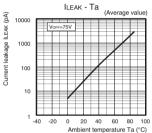
### G3VM-71PR/81PR/101PR



### ●Current leakage vs.



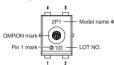




### ■Appearance / Terminal Arrangement / Internal Connections

### Appearance USOP (Ultra Small Outline Package)

USOP 4-pin



\* Actual model name marking for each model

Model	Marking
G3VM-61PR1	6P1
G3VM-61PR	6P0
G3VM-71PR	7P0
G3VM-81PR	8P0
G3VM-101PR	AP0



●Terminal Arrangement/Internal Connections (Top View)

Note: 1. The actual product is marked differently from the image shown here.

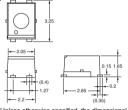
Note: 2. "G3VM" does not appear in the model number on the Relay.

### ■Dimensions (Unit: mm)

**Surface-mounting Terminals** 

Weight: 0.03 g





Unless otherwise specified, the dimensional tolerance is ±0.2 mm.

### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ±0.2 mm.

Note: The actual product is marked differently from the image shown here.

### **■**Approved Standards

UL recognized

Approved Standards	Contact form	File No.
UL recognized	1a (SPST-NO)	E80555

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

# G3VM-61UR□/81UR□/1

MOS FET Relays VSON, Small and High-load-voltage Type

### World's smallest class New VSON Package with High Load voltage

- Load voltage: 60 V, 80 V, or 100 V
- G3VM-61UR1: Low C  $\times$  R = 7 pF· $\Omega$ , Coff (standard) = 0.7 pF,

Ron (standard) = 10  $\Omega$ 

RoHS Compliant



Note: The actual product is marked differently from the image shown here.

### ■Application Examples

- · Semiconductor test equipment
- Communication equipment
- Test & measurement equipment
- Data loggers

### ■Package (Unit:mm, Average)

### **■**Model Number Legend

VSON 4-pin



G3VM- ... ... ... ... 1 2 3 4 5

1. Load Voltage

6: 60 V

8: 80 V

10: 100 V

2. Contact form

1: 1a (SPST-NO)

4. Additional functions R: Low On-resistance 3. Package U: VSON 4-pin

5. Other informations When specifications overlap.

serial code is added in the recorded order.

Note: The actual product is marked differently from the image shown here. **■**Ordering Information

				Continuous	Tape cut p	ackaging	Tape packa	iging						
Package	Contact form	Terminals	Load voltage (peak value) *	load current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity						
									60 V	120 mA	G3VM-61UR1		G3VM-61UR1(TR05)	
	_		60 V	400 mA	G3VM-61UR		G3VM-61UR(TR05)							
VSON4	1a (SPST-NO)	Surface-mounting Terminals	80 V	120 mA	G3VM-81UR	1 pc.	G3VM-81UR(TR05)	500 pcs.						
	(6. 6. 116)	Tommato	80 V	200 mA	G3VM-81UR1		G3VM-81UR1(TR05)							
			100 V	100 mA	G3VM-101UR		G3VM-101UR(TR05)							

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number. Tape-cut VSONs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

\* The AC peak and DC value are given for the load voltage and continuous load current.

# 63VM-61UR\( \)/81UR\( \)/101UR

### ■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-61UR1	G3VM-61UR	G3VM-81UR	G3VM-81UR1	G3VM-101UR	Unit	Measurement conditions	
	LED forward current	lF		30						
Ħ	LED forward current reduction rate	ΔIF/°C			-0.3			mA/°C	Ta≥25°C	
Input	LED reverse voltage	VR			5			V		
	Connection temperature	TJ			125			°C		
	Load voltage (AC peak/DC)	Voff	6	0	8	0	100	٧		
=	Continuous load current (AC peak/DC)	lo	120	400	120	200	100	mA		
Output	ON current reduction rate	Δlo/°C	-1.2	-4.0	-1.2	-2	-1	mA/°C	Ta≥25°C	
0	Pulse ON current	lop	360	1200	360	600	300	mA	t=100 ms, Duty=1/10	
	Connection temperature	TJ			125	•		°C		
D	electric strength between I/O *	V <sub>I</sub> -O			300			Vrms	AC for 1 min	
A	mbient operating temperature	Ta		-40 to +85					\A(i4b i-i d4i	
A	mbient storage temperature	Tstg			-40 to +125			°C	With no icing or condensation	
S	oldering temperature	-			260			°C	10 s	

The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

### ■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-61UR1	G3VM-61UR	G3VM-81UR	G3VM-81UR1	G3VM-101UR	Unit	Measurement conditions		
			Minimum									
	LED forward voltage	VF	Typical	1.27					V	IF=10 mA		
			Maximum			1.4						
Input	Reverse current	l <sub>R</sub>	Maximum			10			μА	VR=5 V		
'n	Capacitance between terminals	Ст	Typical			30			pF	V=0, f=1 MHz		
	Trigger LED forward current	IFT	Typical	1	-	=	1	-	mA	lo=100 mA		
	Trigger LLD forward current	IF1	Maximum			3			шА	10=100 IIIA		
	Release LED forward current	IFC	Minimum			0.1			mA	Ioff=10 μA		
	Maximum resistance with	_	Typical	10	1.0	7	6	8		IF=5 mA, t<1 s,		
=	output ON	Ron	Maximum	15	1.5	12	8	14	Ω	Io=Continuous load current ratings		
Output	Current leakage when the relay is open	ILEAK	Maximum	1	I	0.02	1	0.2	nA	Voff=Load voltage ratings		
	Capacitance between	Coff	Typical	0.7	20	5	6.5	6	рF	V=0, f=100 MHz, t<1 s		
	terminals	COFF	Maximum	1.3	-	7	11	8	ы	V=0, 1=100 Wil12, t<1 S		
Ca	pacitance between I/O terminals	CI-0	Typical			1			pF	f=1 MHz, Vs=0 V		
	ulation resistance between I/O minals	Ri-o	Typical		108				$M\Omega$	V⊦o=500 VDC, RoH≤60%		
Ton	n-ON time	ton	Typical	0.05			_					
rui	II-ON UIIIC	LON	Maximum	0.2	0	.5	0.4	0.3	ms	IF=5 mA, RL=200 $\Omega$ , VDD=20 V *		
Ton	n-OFF time	torr	Typical	0.015			_		1115			
rui	II-OI I uille	LOFF	Maximum	0.2	0.5	0.2	0.4	0.3				

### \* Turn-ON and Turn-OFF Times



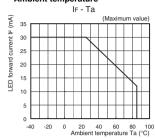
### **▼SON** ■Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

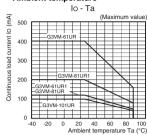
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

Item	Symbol		G3VM-61UR1	G3VM-61UR	G3VM-81UR	G3VM-81UR1	G3VM-101UR	Unit	
Load voltage (AC peak/DC)	VDD	Maximum	4	8	6	4	80	V	
	Minimum 5								
Operating LED forward current	lF	Typical		7.5					
		Maximum			20			mA	
Continuous load current (AC peak/DC)	lo	Maximum	120	400	120	200	100		
Ambient operating temperature	Ta	Minimum			-20			°C	
Ambient operating temperature	1a	Maximum			65			1.0	

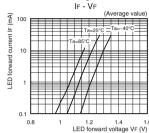
#### ●LED forward current vs. Ambient temperature



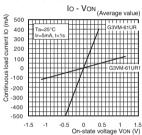
### Continuous load current vs. Ambient temperature



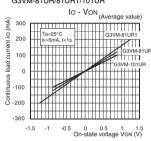
#### ●LED forward current vs. LED forward voltage



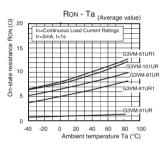
#### Continuous load current vs. On-state voltage G3VM-61UR1/61UR



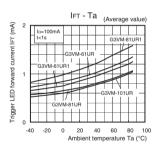
### G3VM-81UR/81UR1/101UR



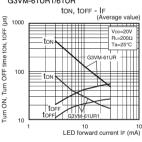
#### On-state resistance vs. Ambient temperature



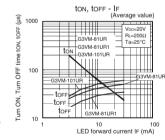
### Trigger LED forward current vs. Ambient temperature



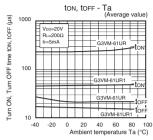
### ●Turn ON, Turn OFF time vs. LED forward current G3VM-61UR1/61UR



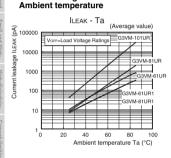
#### G3VM-81UR/81UR1/101UR



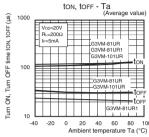
#### ●Turn ON, Turn OFF time vs. Ambient temperature G3VM-61UR1/61UR



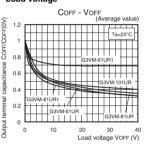
### •Current leakage vs.



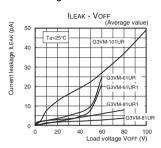
### G3VM-81UR/81UR1/101UR



#### Output terminal capacitance vs. Load voltage



#### Current leakage vs. Load voltage



### ■Appearance / Terminal Arrangement / Internal Connections

### Appearance

### VSON (Very Small Outline Non-leaded)

VSON 4-pin



\* Actual model name marking for each model

Model	Marking
G3VM-61UR1	6U1
G3VM-61UR	6U0
G3VM-81UR	8U0
G3VM-81UR1	8U1
G3VM-101UR	AU0

### ●Terminal Arrangement/Internal Connections

(Top View)



Note: 1. The actual product is marked differently from the image shown here.

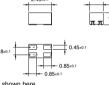
### Note: 2. "G3VM" does not appear in the model number on the Relay.

### Dimensions (Unit: mm)

### **Surface-mounting Terminals**

Weight: 0.01 a





### **Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ±0.1 mm

Note: The actual product is marked differently from the image shown here.

### **■**Approved Standards

Applying for UL recognition

### **■**Safety Precautions

• Refer to the Common Precautions for All MOS FET Relays for precautions that apply to all MOS FET Relays.

### **Models with Standards Certification**

Consult your OMRON sales representative for specific models with standard approvals.

### ●MOS FET Relay

IP (Dual Inline Package

Model	Standard	Contact	Standard No.	Coil ratings	Page
G3VM-21AR/DR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	3000 mA 20 V (AC peak/DC)	110
G3VM-21BR/ER	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	4000 mA 20 V (AC peak/DC)	115
G3VM-41AY/DY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2000 mA 40 V (AC peak/DC)	147
G3VM-41AY1/DY1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2000 mA 40 V (AC peak/DC)	147
G3VM-41AR/DR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2500 mA 40 V (AC peak/DC)	110
G3VM-41BR/ER	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	3500 mA 40 V (AC peak/DC)	115
G3VM-61A1/D1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	500 mA 60 V (AC peak/DC)	62
G3VM-61AY/DY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	500 mA 60 V (AC peak/DC)	147
G3VM-61AY1/DY1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	500 mA 60 V (AC peak/DC)	147
G3VM-61AR/DR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2000 mA 60 V (AC peak/DC)	110
G3VM-61B1/E1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	500 mA 60 V (AC peak/DC)	62
G3VM-61BR/ER	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2500 mA 60 V (AC peak/DC)	115
G3VM-61BR1/ER1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	3000 mA 60 V (AC peak/DC)	115
G3VM-61CR1/FR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	5000mA 60V (AC peak/DC)	121
G3VM-62C1/F1	UL Approved Models (Recognized)	2a (DPST-NO)	E80555	500 mA 60 V (AC peak/DC)	98
G3VM-101AR/DR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	1000 mA 100 V (AC peak/DC)	110
G3VM-101BR/ER	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2000 mA 100 V (AC peak/DC)	115
G3VM-101CR/FR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	3000mA 100V (AC peak/DC)	121
G3VM-201AY/DY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	250 mA 200 V (AC peak/DC)	147
G3VM-201AY1/DY1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	250 mA 200 V (AC peak/DC)	147
G3VM-201CR/FR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	1500mA 200V (AC peak/DC)	121
G3VM-351AY/DY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	100 mA 350 V (AC peak/DC)	147
G3VM-351AY1/DY1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	100 mA 350 V (AC peak/DC)	147
G3VM-2L/2FL	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 350 V (AC peak/DC)	159
00/44 054 4 /D	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 350 V (AC peak/DC)	
G3VM-351A/D	EN62368-1 Approved Models (BSI certified)	1a (SPST-NO)	VC669156		62
G3VM-353A/D	UL Approved Models (Recognized)	1b (SPST-NC)	E80555	150 mA 350 V (AC peak/DC)	62
G3VM-351B/E	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 350 V (AC peak/DC)	62
G3VM-353B/E	UL Approved Models (Recognized)	1b (SPST-NC)	E80555	150 mA 350 V (AC peak/DC)	62
00/44 0500/5	UL Approved Models (Recognized)	2a (DPST-NO)	E80555	120 mA 350 V (AC peak/DC)	
G3VM-352C/F	EN62368-1 Approved Models (BSI certified)	2a (DPST-NO)	VC669156		98
G3VM-WL/WFL	UL Approved Models (Recognized)	2a (DPST-NO)	E80555	120 mA 350 V (AC peak/DC)	159
G3VM-354C/F	UL Approved Models (Recognized)	2b (DPST-NC)	E80555	150 mA 350 V (AC peak/DC)	98
G3VM-401A/D	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 400 V (AC peak/DC)	62
G3VM-401AY/DY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 400 V (AC peak/DC)	147
G3VM-401AY1/DY1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 400 V (AC peak/DC)	147
G3VM-401B/E	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 400 V (AC peak/DC)	62
G3VM-401BY/EY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 400 V (AC peak/DC)	155
G3VM-401CR/FR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	400mA 400V (AC peak/DC)	121
G3VM-402C/F	UL Approved Models (Recognized)	2a (DPST-NO)	E80555	120 mA 400 V (AC peak/DC)	98
G3VM-601AY/DY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	90 mA 600 V (AC peak/DC)	147
G3VM-601AY1/DY1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	90 mA 600 V (AC peak/DC)	147
G3VM-601BY/EY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	100 mA 600 V (AC peak/DC)	155
G3VM-601CR/FR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	600mA 600V (AC peak/DC)	121

Consult your OMRON sales representative for specific models with standard approvals.

#### SOP (Small Outline Package)

Model	Standard	Contact	Standard No.	Coil ratings	Page
G3VM-21GR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	160 mA 20 V (AC peak/DC)	165
G3VM-21GR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	300 mA 20 V (AC peak/DC)	165
G3VM-21HR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2500 mA 20 V (AC peak/DC)	131
G3VM-31HR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	4000mA 30V (AC peak/DC)	131
G3VM-41GR6	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 40 V (AC peak/DC)	165
G3VM-41GR4	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	250 mA 40 V (AC peak/DC)	165
G3VM-41GR5	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	300 mA 40 V (AC peak/DC)	165
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G3VM-41GR8 G3VM-41HR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	1000 mA 40 V (AC peak/DC)	127
	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2500 mA 40 V (AC peak/DC)	131
G3VM-61VY1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	100 mA 60 V (AC peak/DC)	68
G3VM-61G1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	400 mA 60 V (AC peak/DC)	68
G3VM-61G2	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	400 mA 60 V (AC peak/DC)	68
G3VM-61G3	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	400 mA 60 V (AC peak/DC)	68
G3VM-61VY2	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	500mA 60V (AC peak/DC)	68
G3VM-61VY3	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	700mA 60V (AC peak/DC)	68
G3VM-61GR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	1000 mA 60 V (AC peak/DC)	127
G3VM-61GR2	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	1700mA 60V (AC peak/DC)	127
G3VM-61VR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	1400mA 60V (AC peak/DC)	127
G3VM-63G	UL Approved Models (Recognized)	1b (SPST-NC)	E80555	500mA 60V (AC peak/DC)	68
G3VM-61H1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	400 mA 60 V (AC peak/DC)	88
G3VM-61HR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2300 mA 60 V (AC peak/DC)	131
G3VM-61HR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	3300mA 60V (AC peak/DC)	131
G3VM-62J1	UL Approved Models (Recognized)	2a (DPST-NO)	E80555	400 mA 60 V (AC peak/DC)	104
G3VM-81GR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	40 mA 80 V (AC peak/DC)	165
G3VM-81GR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	200 mA 80 V (AC peak/DC)	165
G3VM-81G1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	350 mA 80 V (AC peak/DC)	73
G3VM-81HR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	1250 mA 80 V (AC peak/DC)	137
G3VM-101HR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	1400 mA 100 V (AC peak/DC)	137
G3VM-101HR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	2000mA 100V (AC peak/DC)	137
G3VM-201G	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	50 mA 200 V (AC peak/DC)	77
G3VM-201G1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	200 mA 200 V (AC peak/DC)	77
G3VM-201G2	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	200 mA 200 V (AC peak/DC)	77
G3VM-S5	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	200 mA 200 V (AC peak/DC)	77
G3VM-201H1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	200 mA 200 V (AC peak/DC)	88
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G3VM-202J1	UL Approved Models (Recognized)	2a (DPST-NO)	E80555	200 mA 200 V (AC peak/DC)	104
G3VM-351G1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	100 mA 350 V (AC peak/DC)	82
G3VM-351G	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	110 mA 350 V (AC peak/DC)	82
G3VM-351VY	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	110mA 350V (AC peak/DC)	82
G3VM-353G	UL Approved Models (Recognized)	1b (SPST-NC)	E80555	120 mA 350 V (AC peak/DC)	82
G3VM-351H	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	110 mA 350 V (AC peak/DC)	88
G3VM-353H	UL Approved Models (Recognized)	1b (SPST-NC)	E80555	120 mA 350 V (AC peak/DC)	88
G3VM-355JR	UL Approved Models (Recognized)	1a1b (SPST- NO/SPST-NC)	E80555	120 mA 350 V (AC peak/DC)	104
G3VM-352J	UL Approved Models (Recognized)	2a (DPST-NO)	E80555	110 mA 350 V (AC peak/DC)	104
G3VM-354J	UL Approved Models (Recognized)	2b (DPST-NC)	E80555	120 mA 350 V (AC peak/DC)	104
G3VM-401G1	UL certification pending.	1a (SPST-NO)	E80555	100 mA 400 V (AC peak/DC)	82
C3VM 401C	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 400 V (AC peak/DC)	82
G3VM-401G	EN62368-1 Approved Models (BSI certified)	1a (SPST-NO)	VC669262		82
00/44 40411	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 400 V (AC peak/DC)	
G3VM-401H	EN62368-1 Approved Models (BSI certified)	1a (SPST-NO)	VC669262		88
	UL Approved Models (Recognized)	2a (DPST-NO)	E80555	120 mA 400 V (AC peak/DC)	
G3VM-402J	EN62368-1 Approved Models (BSI certified)	2a (DPST-NO)	VC669262		104
G3VM-601G1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	70 mA 600 V (AC peak/DC)	94
G3VM-601G	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	90 mA 600 V (AC peak/DC)	94

Consult your OMRON sales representative for specific models with standard approvals.

Model	Standard	Contact	Standard No.	Coil ratings	Page
G3VM-21LR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	160 mA 20 V (AC peak/DC)	170
G3VM-21LR10	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	200 mA 20 V (AC peak/DC)	170
G3VM-21LR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	450 mA 20 V (AC peak/DC)	170
G3VM-21LR11	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	900 mA 20 V (AC peak/DC)	170
G3VM-41LR10	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 40 V (AC peak/DC)	175
G3VM-41LR6	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 40 V (AC peak/DC)	175
G3VM-41LR11	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	140 mA 40 V (AC peak/DC)	175
G3VM-41LR4	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	250 mA 40 V (AC peak/DC)	175
G3VM-41LR5	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	300 mA 40 V (AC peak/DC)	175
G3VM-61LR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	400 mA 60 V (AC peak/DC)	204
G3VM-81LR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 80 V (AC peak/DC)	204
G3VM-101LR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	80 mA 100 V (AC peak/DC)	204

### **USOP (Ultra Small Outline Package)**

Model	Standard	Contact	Standard No.	Coil ratings	Page
G3VM-21PR10	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	200 mA 20 V (AC peak/DC)	180
G3VM-21PR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	450 mA 20 V (AC peak/DC)	180
G3VM-21PR11	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	900 mA 20 V (AC peak/DC)	180
G3VM-41PR12	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	100 mA 40 V (AC peak/DC)	185
G3VM-41PR10	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 40 V (AC peak/DC)	185
G3VM-41PR6	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 40 V (AC peak/DC)	185
G3VM-41PR11	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	140 mA 40 V (AC peak/DC)	185
G3VM-41PR5	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	300 mA 40 V (AC peak/DC)	185
G3VM-51PR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	300 mA 50 V (AC peak/DC)	185
G3VM-61PR1	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 60 V (AC peak/DC)	208
G3VM-61PR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	400 mA 60 V (AC peak/DC)	208
G3VM-71PR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	400 mA 75V (AC peak/DC)	208
G3VM-81PR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	120 mA 80 V (AC peak/DC)	208
G3VM-101PR	UL Approved Models (Recognized)	1a (SPST-NO)	E80555	100 mA 100 V (AC peak/DC)	208

#### VSON (Very Small Outline Non-leaded)

Model	Standard	Contact	Standard No.	Coil ratings	Page
G3VM-21UR10	UL certification pending.	1a (SPST-NO)	E80555	200 mA 20 V (AC peak/DC)	190
G3VM-21UR1	UL certification pending.	1a (SPST-NO)	E80555	450 mA 20 V (AC peak/DC)	190
G3VM-21UR11	UL certification pending.	1a (SPST-NO)	E80555	1000 mA 20 V (AC peak/DC)	190
G3VM-41UR12	UL certification pending.	1a (SPST-NO)	E80555	100 mA 40 V (AC peak/DC)	195
G3VM-41UR10	UL certification pending.	1a (SPST-NO)	E80555	120 mA 40 V (AC peak/DC)	195
G3VM-41UR11	UL certification pending.	1a (SPST-NO)	E80555	140 mA 40 V (AC peak/DC)	195
G3VM-51UR	UL certification pending.	1a (SPST-NO)	E80555	300 mA 50 V (AC peak/DC)	195
G3VM-61UR1	UL certification pending.	1a (SPST-NO)	E80555	120 mA 60 V (AC peak/DC)	213
G3VM-61UR	UL certification pending.	1a (SPST-NO)	E80555	400 mA 60 V (AC peak/DC)	213
G3VM-81UR	UL certification pending.	1a (SPST-NO)	E80555	120 mA 80 V (AC peak/DC)	213
G3VM-81UR1	UL certification pending.	1a (SPST-NO)	E80555	200 mA 80 V (AC peak/DC)	213
G3VM-101UR	UL certification pending.	1a (SPST-NO)	E80555	100 mA 100 V (AC peak/DC)	213

# A Selection Guide is available in addition to this MOS FET Relay General Catalog.

- The Selection Guide allows you to easily search for products using tables of basic specifications.
- You can use simple searches in the Selection Guide and then check for details in this General Catalog.
- Basic information is summarized in the booklet so that you can easily take the Selection Guide with you wherever you might need it.

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