OMRON

Middle Power PCB Relay for Automotive and DC 12 V/24 V Applications

# G8G Relay

## Middle Load Relay for Motor/Heater Control Applications

- Can replace Micro ISO Plug-in type relay
- Small size & High heat resistance enable for usage in engine room
- Can support 40 A Fuse
- PIP reflow compliant
- Temperature range -40°C to +125°C
- DC24V Model for the applications of commercial vehicle also avaiable

## ■Model Number Legend

G8G-□□□□
1 2 3 4

**1. Number of Contact Poles/Structure**
1A: SPST (1 Form A)
1 : SPDT (1 Form C)

**2. Protective structure**
Blank or 4: Plastic sealed (RT III IEC61810)
7 : Flux tight (Open vent hole) (RT II IEC61810)

**3. Characteristics**
Blank: Standard
S : Low operating voltage

**4. Special function**
R: Pin in paste compliant type
V: DC24V Model

## ■Application Examples

- DC motor/resistive application control
- Automotive DC applications (Smart Junction Box, Blower fan, PTC heater, Seat heater, Power for accessory, A/C magnet clutch, Motor control for Commercial vehicle, etc.)

## ■Ordering Information

| Classification | Contact form | Protective structure | Rated coil voltage (V) | Model | Minimum Packing unit (Tube packing) |
|---|---|---|---|---|---|
| Standard | SPST 1 Form A | Flux tight (open vent hole) (RT II IEC61810) | DC12 | **G8G-1A7R DC12** | 1920 pcs. / box (64 pcs. × 30 tubes) |
| | SPDT 1 Form C | | | **G8G-17R DC12** | |
| Low operation voltage | SPST 1 Form A | | | **G8G-1A7SR DC12** | |
| | SPDT 1 Form C | | | **G8G-17SR DC12** | |
| DC24V Model | SPDT 1 Form C | Plastic sealed (RT III IEC61810) | DC24 | **G8G-1SV DC24** | |

**Note.** Above models are not certificated for the safety standards of UL or CSA, etc.

## ■Ratings

**●Coil**

| Rated voltage (V) | Rated current (mA) | Coil resistance (Ω) | Must-operate voltage (V) | Must-release voltage (V) | Permissible voltage Range (V) | Rated Power consumption (mW) | Model |
|---|---|---|---|---|---|---|---|
| DC12 | 40.0 | 300 | 6.5 Max. | 0.5 Min. | 10 to 16 | 480 | **G8G-1A7R DC12** |
| | | | | | | | **G8G-17R DC12** |
| | 53.3 | 225 | 5.5 Max. | | | 640 | **G8G-1A7SR DC12** |
| | | | | | | | **G8G-17SR DC12** |
| DC24 | 106.7 | 225 | 14.4 Max. | 1 Min. | 18.2 to 32 | 2560 | **G8G-1SV DC24** |

**Note 1.** The rated current and coil resistance are measured at a coil temperature of 20°C with a tolerance of ±10%.
**Note 2.** The operating characteristics are measured at a coil temperature of 20°C.

### ●Contacts

| Item / Classification / Model | | Standard<br>**G8G-1A7R DC12<br>G8G-17R DC12** | Low operating voltage<br>**G8G-1A7SR DC12<br>G8G-17SR DC12** | DC24V Model<br>**G8G-1SV DC24** |
|---|---|---|---|---|
| Contact material | | Silver-alloy | | |
| | at 85°C | - | - | 5 A |
| | at 110°C | 20 A | 15 A | - |
| | at 125°C | 15 A | 10 A | - |
| Max. switching current | | 84 A Inrush / 35 A Break (N.O.) | | 20 A Inrush / 14 A Break (N.O.) |
| Max. carrying current *1 | 20 A fuse 200% | - | - | 40 A at DC28V for 10 mins |
| | 30 A slow fuse 135% | 40.5 A at DC14V for 60 mins | | - |
| | 40 A blade fuse 135% | 54 A at DC14V for 2 mins | | - |
| Min. switching current | | DC12V, 1 A | | |

*1. The value is applicable at an ambient temerature 20°C. This does not guarantee repeated condition. Also depends on the connecting conditions. Please contact our sales representative if you have specific conditions.

## ■Characteristics

| Item | | | **G8G-1A7R DC12<br>G8G-17R DC12** | **G8G-1A7SR DC12<br>G8G-17SR DC12** | **G8G-1SV DC24** |
|---|---|---|---|---|---|
| Contact resistance (See *1.) | | | Typ.3.0 mΩ max.20 mΩ | | |
| Operate time | | | 10 ms max.<br>(DC12V not including bounce time) | | 10 ms max.<br>(DC24V not including bounce time) |
| Release time | | | 5 ms max.<br>(DC12V not including bounce time) | | 5 ms max.<br>(DC24V not including bounce time) |
| Insulation resistance (See *2.) | Between coil and contacts | | 100 MΩ min. | | |
| | Between contacts of the same polarity | | 100 MΩ min. | | |
| Dielectric strength | Between coil and contacts | | AC500V 1 min | | |
| | Between contacts of the same polarity | | AC500V 1 min | | |
| Vibration resistance | Destruction | | 33 Hz, 45 m/s² | | |
| | Malfunction | | 10 to 200 Hz, 45 m/s² (detection time: 10 μs) | | |
| Shock resistance | Destruction | | 1,000 m/s² (pulse duration: 6 ms) | | |
| | Malfunction | | 100 m/s² (pulse duration: 11 ms detection time: 10 μs) | | |
| Mechanical endurance (See *3.) | | | 1,000,000 ops. min. | | |
| Electrical endurance (See *4.) | | Resistive Load | DC14V, N.O. 35 A / N.C. 15 A,<br>1.0 s ON/9.0 s OFF, 100,000 ops. | | DC28V, N.O. 14 A / N.C. 5 A,<br>1.0 s ON/1.0 s OFF, 100,000 ops. |
| | | Lamp Load | DC14V, 84 A Inrush / 12 A Break,<br>1.0 s ON/9.0 s OFF, 100,000 ops. | | DC28V, 20 A Inrush / 2 A Steady,<br>1.0 s ON/1.2 s OFF, 100,000 ops. |
| | | Motor Load | DC14V, 32 A, 0.25 mH, Motor locked,<br>0.25 s ON/9.75 s OFF, 100,000 ops. | | DC28V, 12 A, 3 mH, Motor locked,<br>0.25 s ON/4.75 s OFF, 100,000 ops. |
| Ambient operating temperature | | | -40 to 125°C<br>(without freezing or condensation) | | -40 to 85°C<br>(without freezing or condensation) |
| Ambient operating humidity | | | 35% to 85% RH | | |
| Weight | | | Approx. 5.2 g | | Approx. 6.0 g |

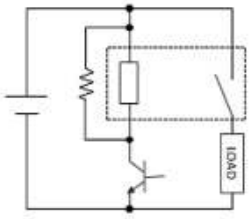
**Note.** The above values are initial values at an ambient temperature of +20°C unless otherwise specified.
*1. The contact resistance was measured with 1 A at DC5V using the voltage drop method.
*2. The insulation resistance was measured with a DC500V megohmmeter.
*3. The mechanical endurance was measured at a switching frequency of 18,000 operations/hr.
*4. Please connect N.O. terminal to the +BATT side on Electrical use and connect surge suppression element in parallel with between coil based on recommended circuit.

Recommended circuit: (a), (b), (c)

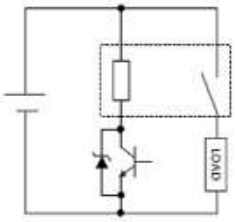
Not-recommended circuit: (d)

Note:
OMRON recommends coil driver circuit (b) and (c) for coil surge suppression. However the circuit (d) is not recommended because it may negatively affect the durability performance.

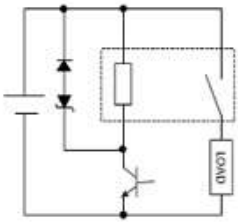
(a)



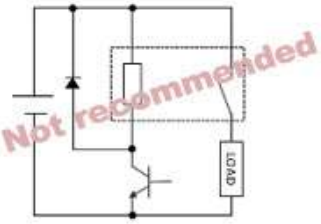

(b)




(c)




(d)

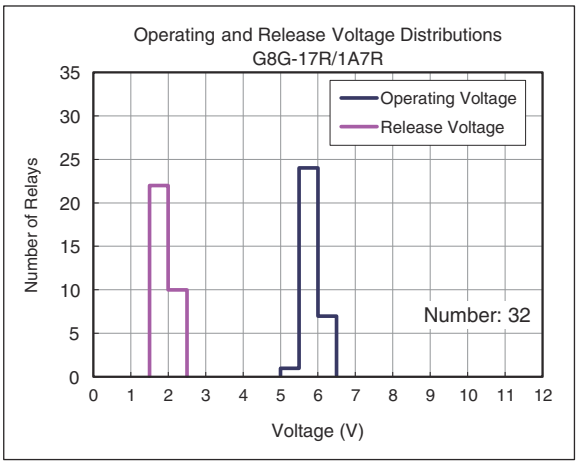


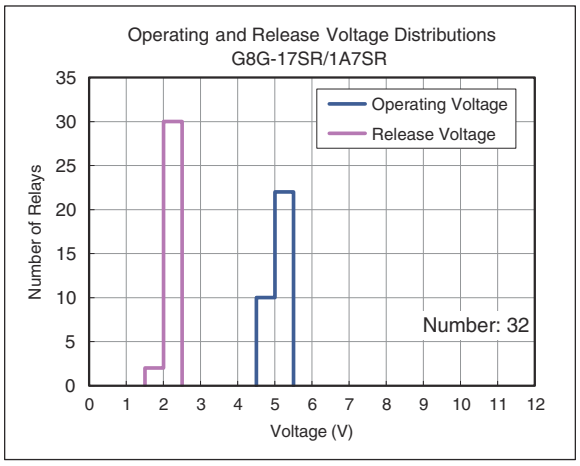
# ■Reference Technical Data

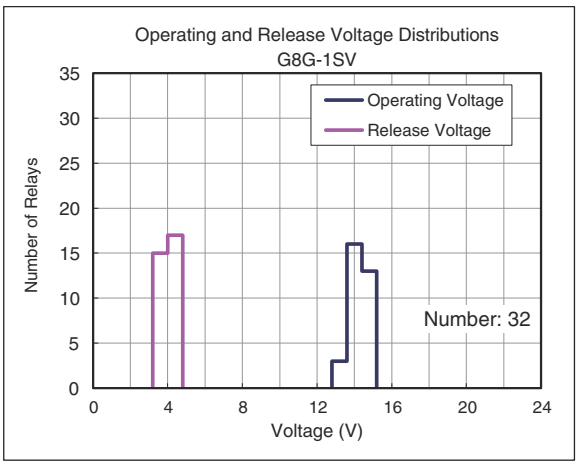
**●Actual Electrical performance (reference)**

| Model | Application | Load voltage | Inrush | Steady state | Switching off | Inductance | Ambient temperature | Switching frequency | | Required Cycles (min) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (V) | (A) | (A) | (A) | (mH) | (°C) | On (s) | Off (s) | Total |
| **G8G-17R DC12** | N.O. Inductive | 14 | 60 | 12 | | 0.5 | -40°C to +125°C | 3.0 | 5.0 | 250,000 |
| **G8G-17R DC12** | Wiper On Off | 14 | 32.4 | 4.33 | 22 | 1 | -40°C to +105°C | 2.0 | 2.0 | 700,000 |
| **G8G-1A7R DC12** | Blower Fan | 14 | 46.6 | 22 | | 0.5 | -40°C to +85°C | 3.0 | 5.0 | 150,000 |
| **G8G-1A7R DC12** | A/C clutch | 14 | 3.8 | 3.8 | | 14 | -40°C to +110°C | 1.0 | 1.0 | 2,000,000 |
| **G8G-1SV DC24** | Motor lock | 28 | | | 12 | 3 | 25 | 0.25 | 4.75 | 100,000 |
| **G8G-1SV DC24** | Motor free | 28 | 15 | 2.5 | | 0.25 | 25 | 1.0 | 4.0 | 100,000 |
| **G8G-1SV DC24** | N.O. Resistive | 28 | | 14 | | | 25 | 1.0 | 1.0 | 100,000 |
| **G8G-1SV DC24** | N.C. Resistive | 28 | | 5 | | | 25 | 1.0 | 1.0 | 100,000 |
| **G8G-1SV DC24** | N.O. Lamp | 28 | 20 | 2 | | | 25 | 1.0 | 1.2 | 100,000 |

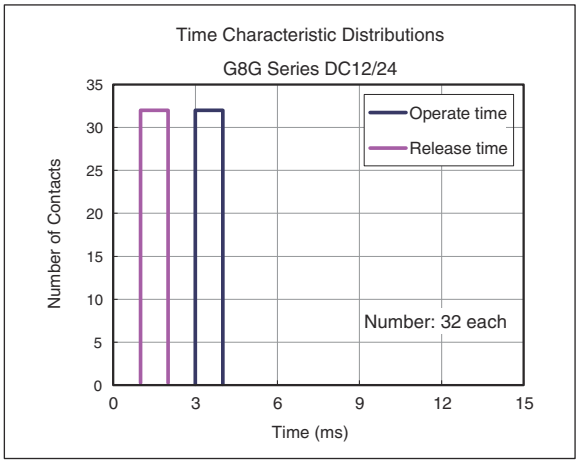
**●Operating Voltage and Release Voltage Distributions (Number of Relays × Percentage of Rated Voltage)**



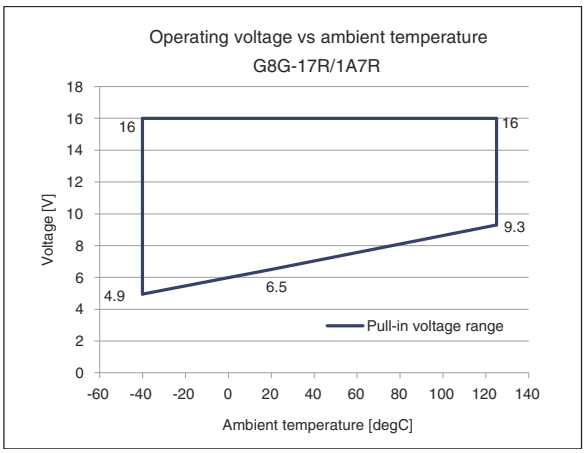



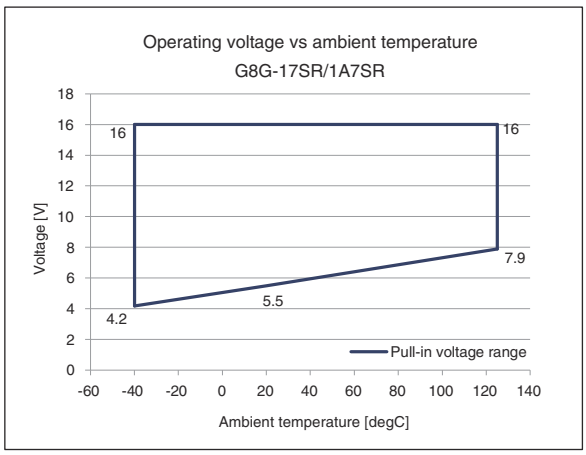



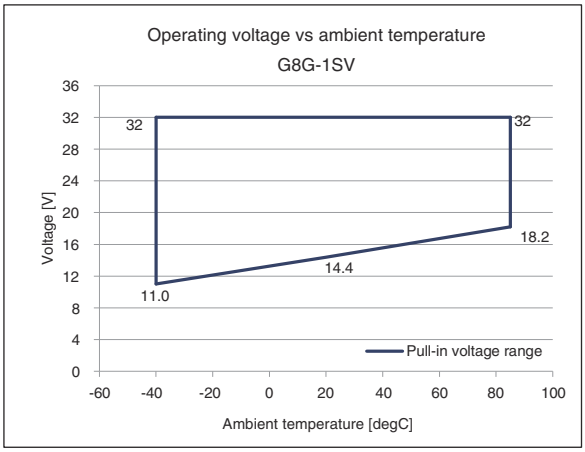
## ●Time Characteristic Distributions (Number of Contacts × Time (ms))




## ●Operating voltage vs ambient temperature (Cold start)

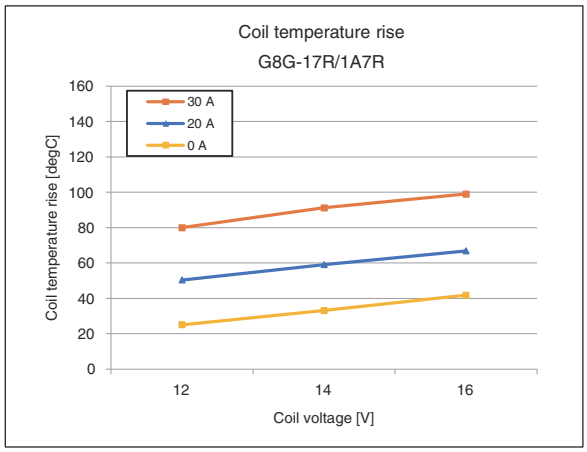


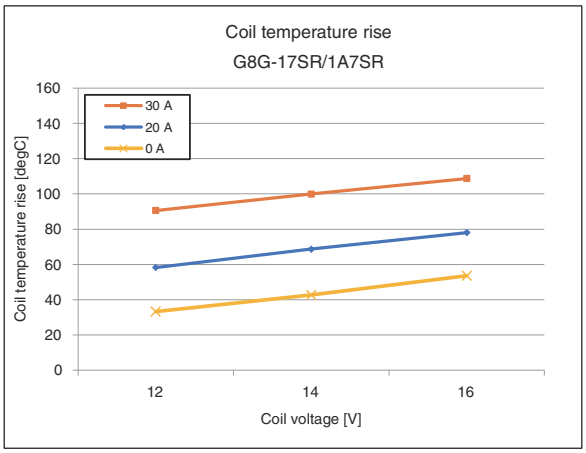



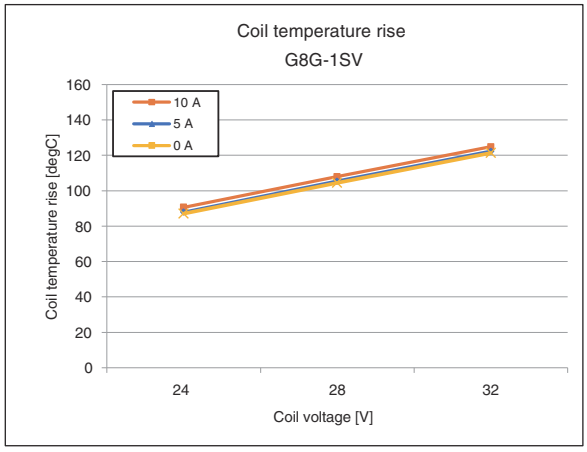



## ●Coil temperature rise [degC] at 20°C

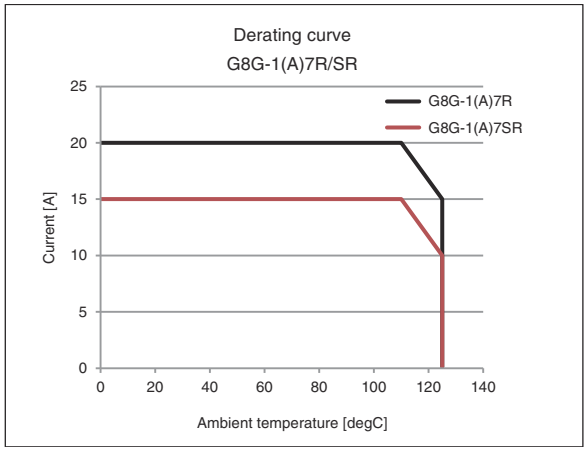
(For using under a higher ambient temperature, please select the proper current carrying condition to avoid a possible excessive temperature rising.)

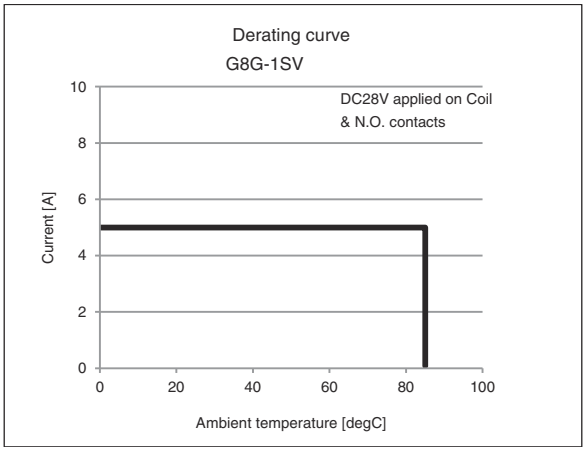



## ●Derating curve

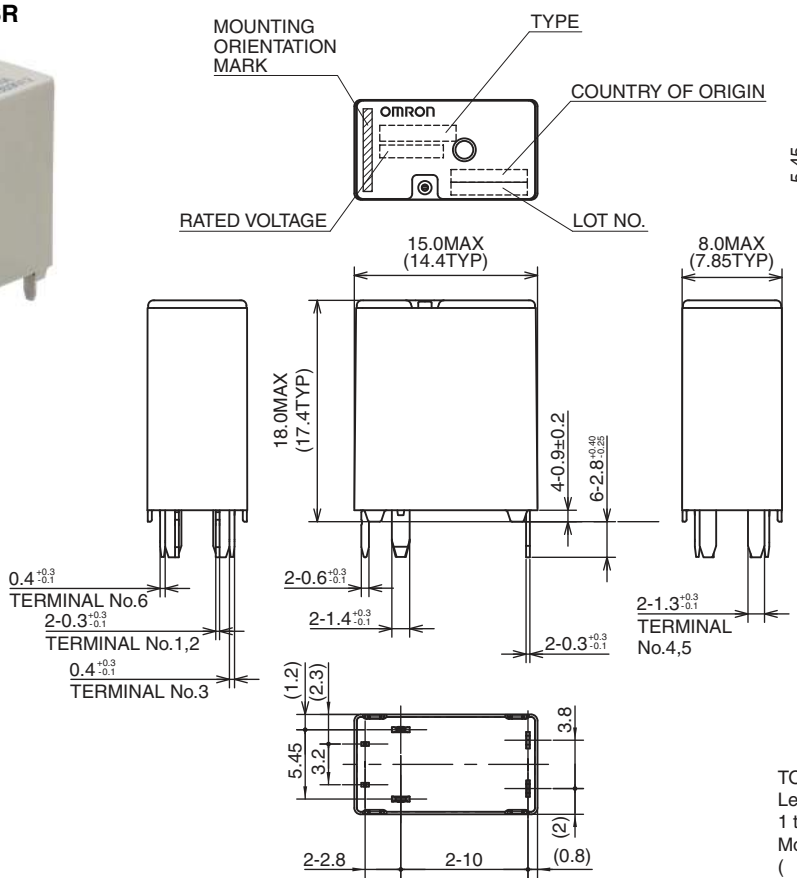


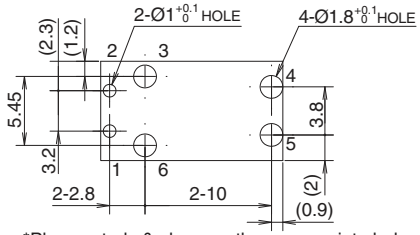
## ■Dimensions

CAD Data Please visit our website, which is noted on the last page. **(Unit: mm)**

### G8G-17R/17SR

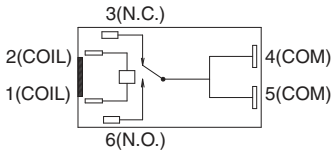



FOR REFERENCE : PCB MOUNTING HOLES (BOTTOM VIEW)




*Please study & choose other appropriate hole diameters if confirmed the diameter values recommended above don't work with the soldering process.

TERMINAL ARRANGEMENT/ INTERNAL CONNECTIONS (BOTTOM VIEW)

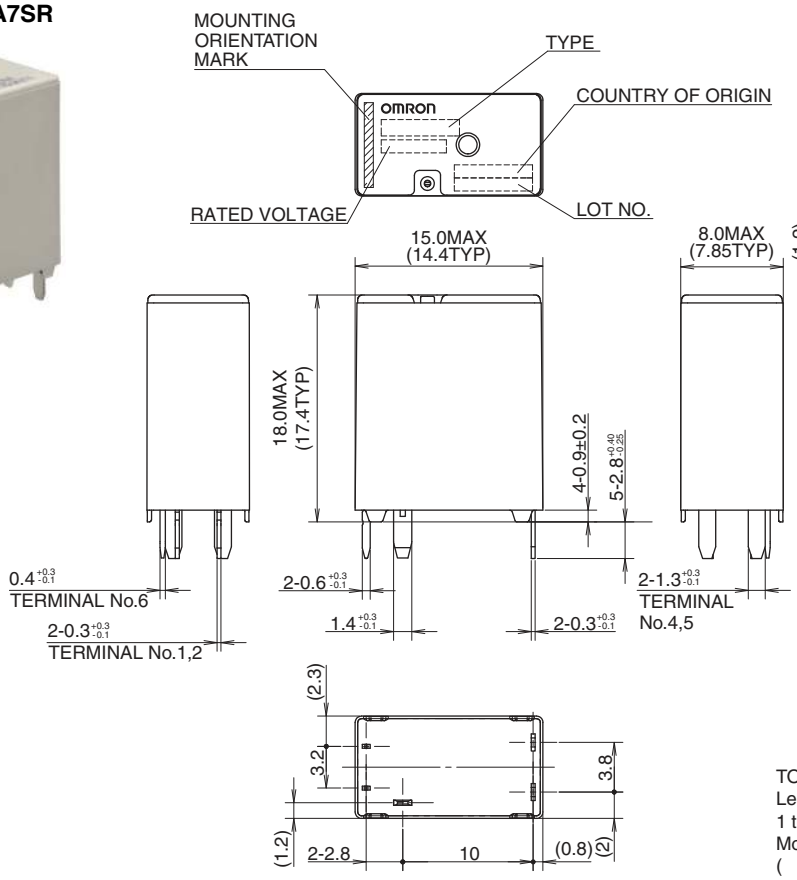



NOTE: *TERMINAL 6 CONNECTS TO +BATT.

TOLERANCE UNLESS OTHERWISE SPECIFIED
Less than 1 mm :±0.1 mm
1 to 3 mm :±0.2 mm
More than 3 mm :±0.3 mm
( ) is reference dimension

CAD Data

### G8G-1A7R/1A7SR

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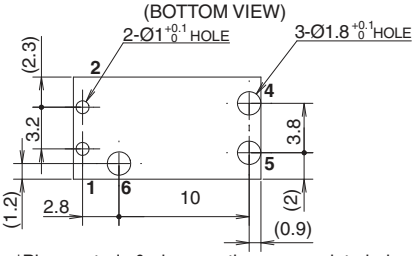


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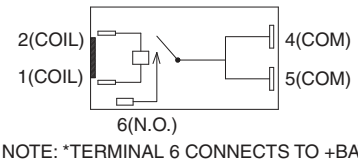


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CAD Data

## ■Dimensions

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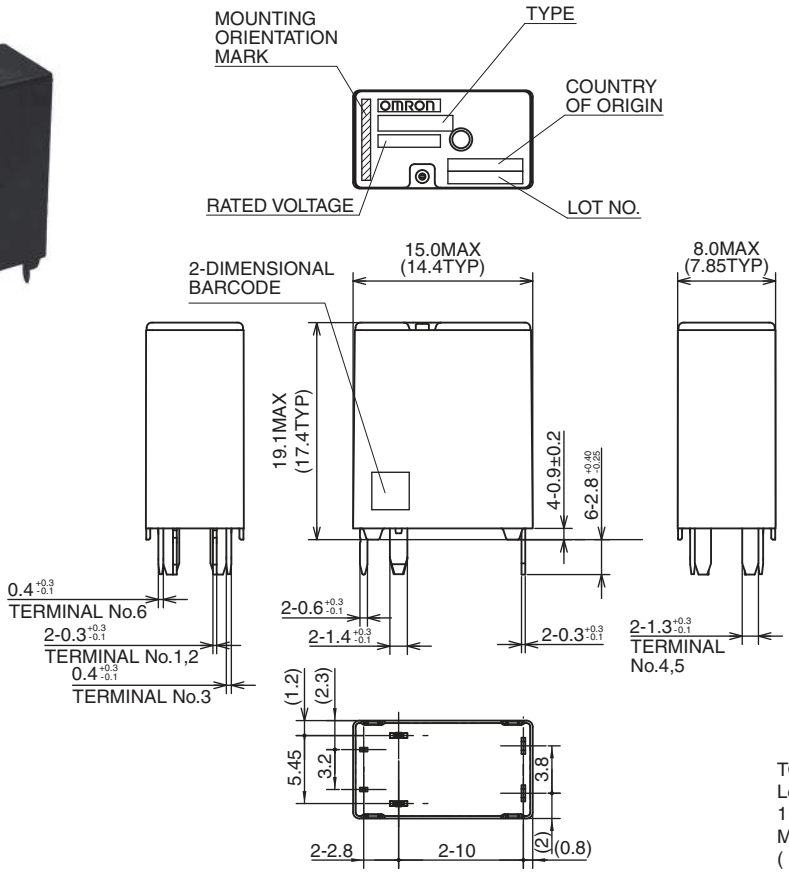
**(Unit: mm)**

**G8G-1SV**

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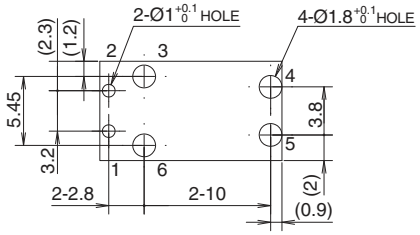
(BOTTOM VIEW)

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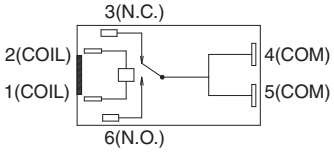
TERMINAL ARRANGEMENT/
INTERNAL CONNECTIONS
(BOTTOM VIEW)

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Less than 1 mm :±0.1 mm
1 to 3 mm :±0.2 mm
More than 3 mm :±0.3 mm
( ) is reference dimension

CAD Data

## ■Precautions

**●Please refer to “Safety Precautions for All Automotive Relays” for correct use.**



**OMRON Corporation**
**Device & Module Solutions Company**

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**Cat. No. J263-E1-02**
1122 (1221)