

Notification about the transfer of the semiconductor business

The semiconductor business of Panasonic Corporation was transferred on September 1, 2020 to Nuvoton Technology Corporation (hereinafter referred to as "Nuvoton"). Accordingly, Panasonic Semiconductor Solutions Co., Ltd. became under the umbrella of the Nuvoton Group, with the new name of Nuvoton Technology Corporation Japan (hereinafter referred to as "NTCJ").

In accordance with this transfer, semiconductor products will be handled as NTCJ-made products after September 1, 2020. However, such products will be continuously sold through Panasonic Corporation.

Publisher of this Document is NTCJ.

If you would find description "Panasonic" or "Panasonic semiconductor solutions", please replace it with NTCJ.

※ Except below description page

"Request for your special attention and precautions in using the technical information and semiconductors described in this book"

Nuvoton Technology Corporation Japan

FC8V22040L

Gate Resistor installed Dual N-Channel MOS Type

For lithium-ion secondary battery protection circuit

■ Features

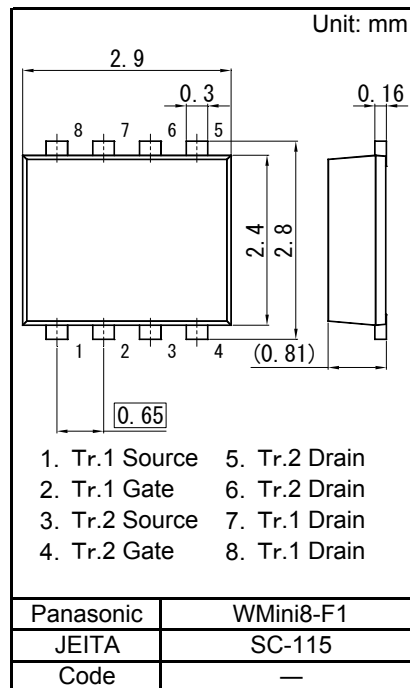
- Low drain-source On-state Resistance:
 $R_{DS(on)typ.} = 10.5\text{ m}\Omega$ ($V_{GS} = 4.5\text{ V}$)
- Halogen-free / RoHS compliant
 (EU RoHS / UL-94 V-0 / MSL:Level 1 compliant)

■ Marking Symbol: 4C

■ Basic Part Number : Dual Nch MOS 24V (Drain Common type)

■ Packaging

Embossed type (Thermo-compression sealing) : 3 000 pcs / reel (standard)



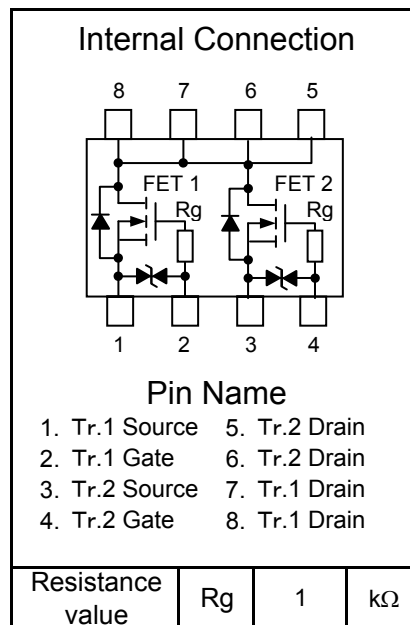
■ Absolute Maximum Ratings $T_a = 25\text{ }^\circ\text{C}$ Tr.1,Tr.2

Parameter		Symbol	Rating	Unit
FET1	Drain-source Voltage	V_{DS}	24	V
	Gate-source Voltage	V_{GS}	± 12	V
FET2	Drain Current	I_D	8	A
	Drain Current (Pulsed)	I_{Dp}	48	A
Overall	Power Dissipation	$PD1^{*1}$	1.0	W
		$PD2^{*1,2}$	1.2	
		$PD3^{*3}$	0.4	
	Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Operating Ambient Temperature	T_{opr}	-40 to + 85	$^\circ\text{C}$	
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$	

Note) *1 Glass epoxy board: 25.4 mm × 25.4 mm × 0.8 mm Copper foil of the drain portion should have a area of 300 mm² or more
 PD absolute maximum rating without a heat sink: 400 mW

*2 $t = 10\text{ s}$

*3 Stand-alone (without the board)

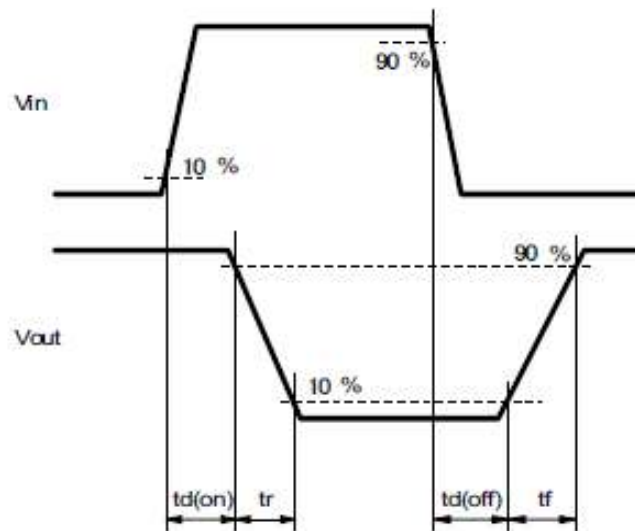
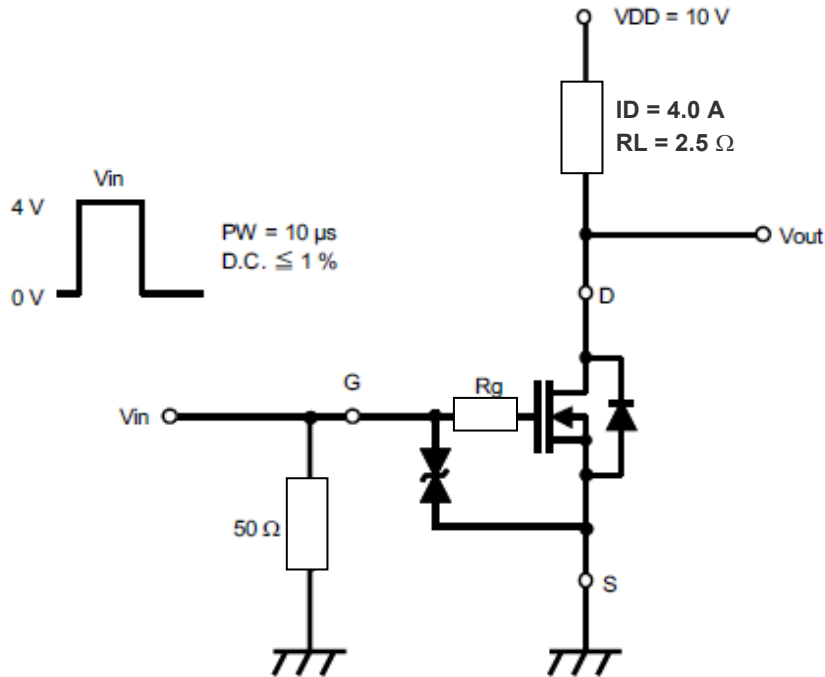


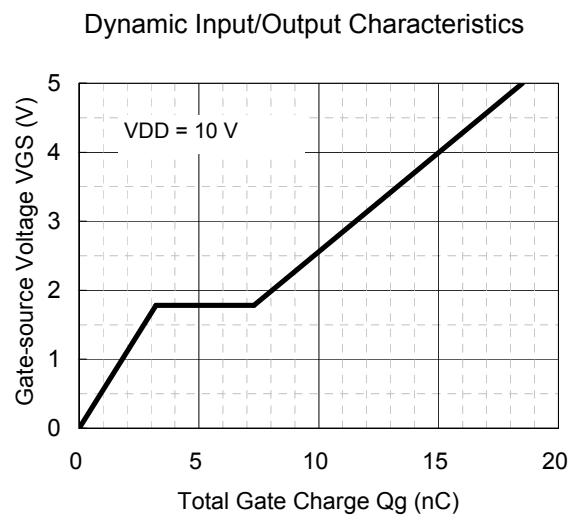
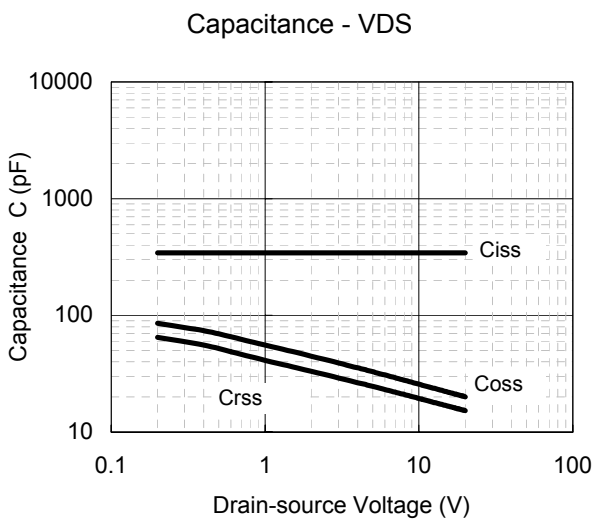
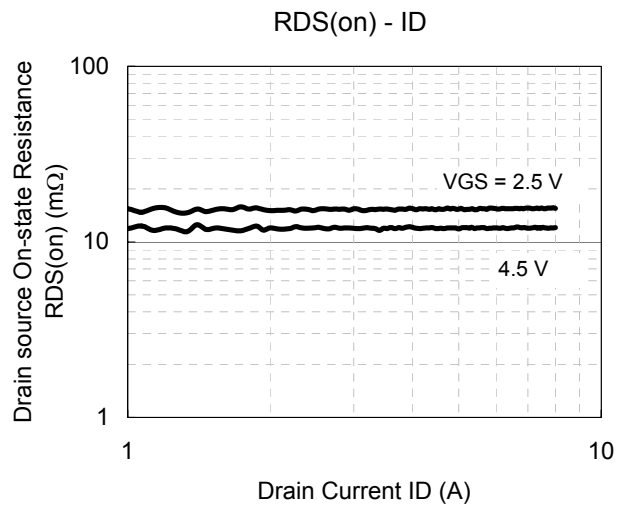
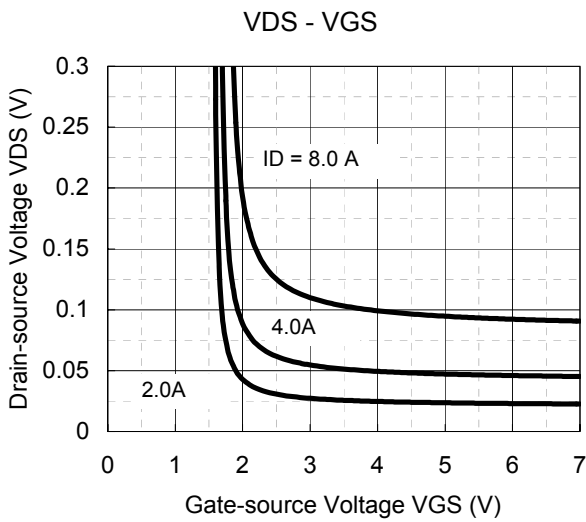
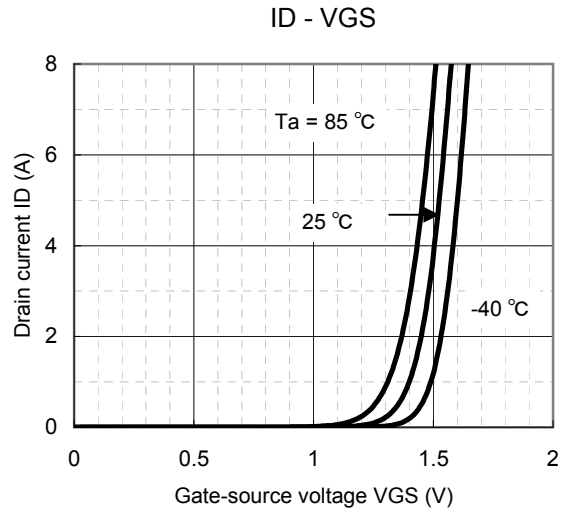
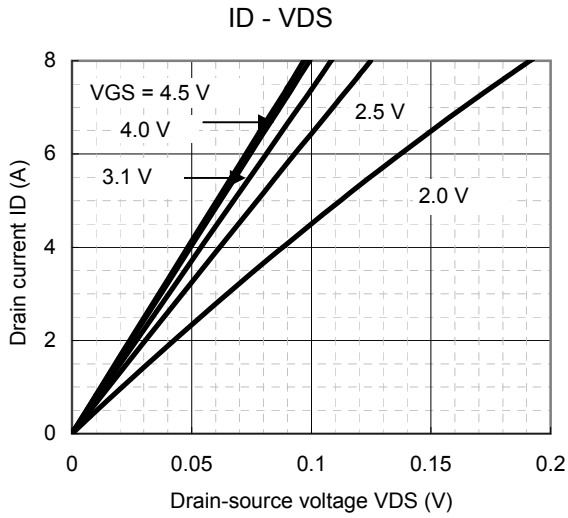
■ Electrical Characteristics Ta = 25°C ± 3°C Tr.1,Tr.2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source surrender voltage	VDSS	ID = 1.0 mA, VGS = 0	24			V
Drain-source cutoff current	IDSS	VDS = 24 V, VGS = 0			1.0	μA
Gate-source cutoff current	IGSS	VGS = ±8.0 V, VDS = 0			±10	μA
Gate threshold voltage	Vth	ID = 1.0 mA, VDS = 10 V	0.40	0.85	1.50	V
Drain-source ON resistance	RDS(ON)1	ID = 4.0 A, VGS = 4.5 V	7.0	10.5	15	mΩ
	RDS(ON)2	ID = 4.0 A, VGS = 4.0 V	7.2	11.0	16	mΩ
	RDS(ON)3	ID = 4.0 A, VGS = 3.1 V	7.5	12.0	18	mΩ
	RDS(ON)4	ID = 4.0 A, VGS = 2.5 V	8.0	13.5	20	mΩ
Turn-on delay time *1	td(on)	VDD = 10 V, VGS = 0 V to 4 V		0.6		μs
Rise time *1	tr	ID = 4.0 A		1.5		μs
Turn-off delay time *1	td(off)	VDD = 10 V, VGS = 4 V to 0 V		4.4		μs
Fall time *1	tf	ID = 4.0 A		2.8		μs
Source to Drain Diode Forward Voltage	VSD	IS = 4.0 A, VGS = 0 V		0.8	1.2	V

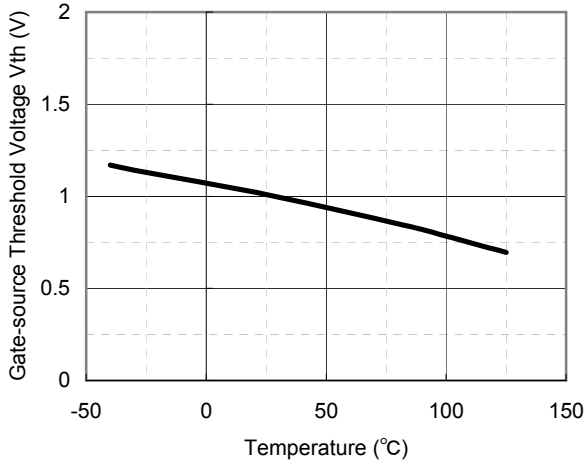
- Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.
2. *1 Measurement circuit for Turn-on Delay Time/Rise Time/Turn-off Delay Time/Fall Time

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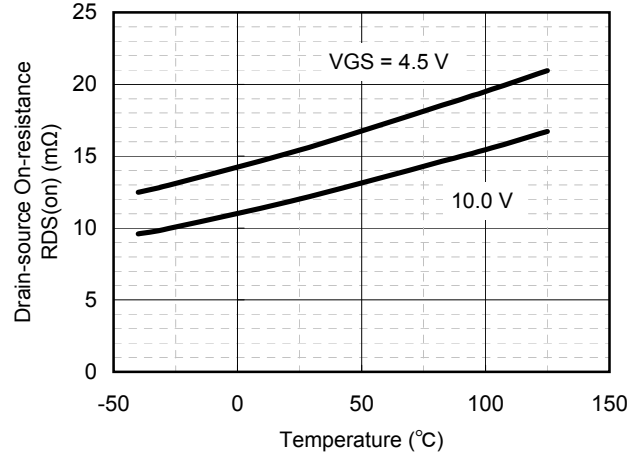




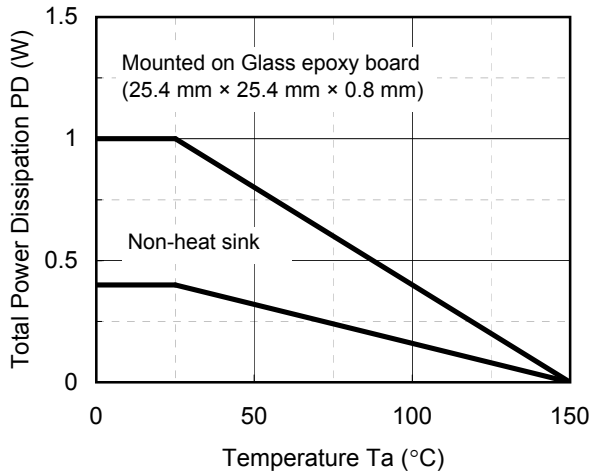
V_{th} - T_a



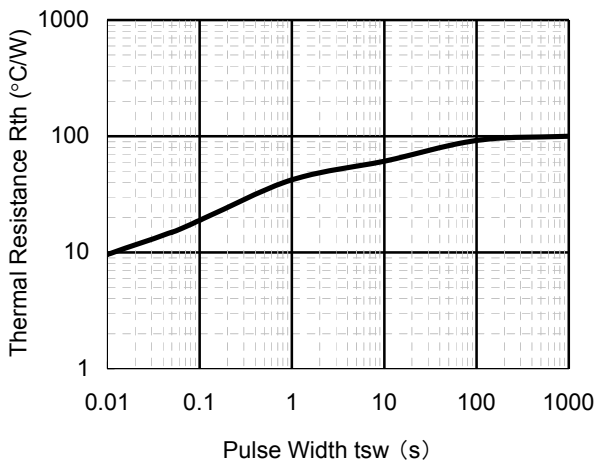
R_{DS(on)} - T_a



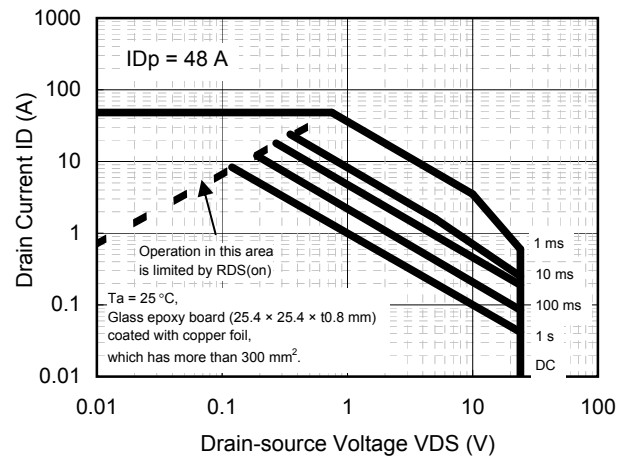
PD - T_a



R_{th} - t_{sw}

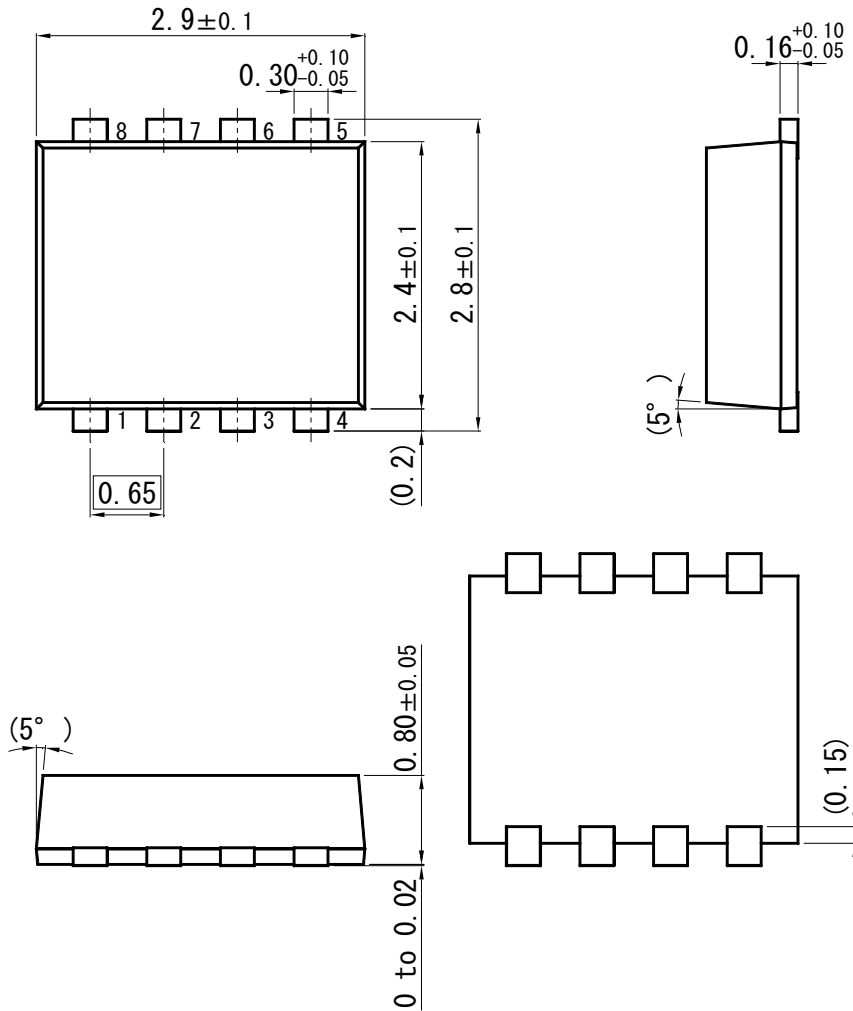


Safe Operating Area

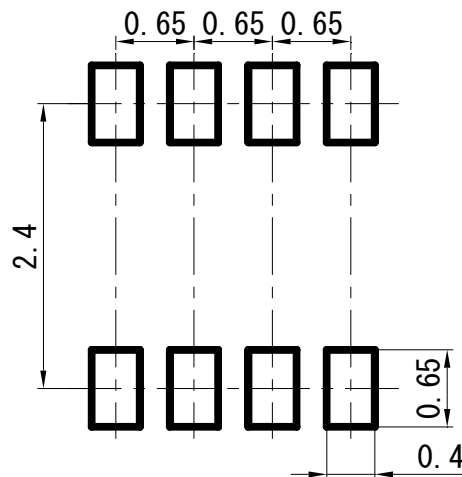


WMini8-F1

Unit : mm



■ Land Pattern (Reference) (Unit : mm)



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