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

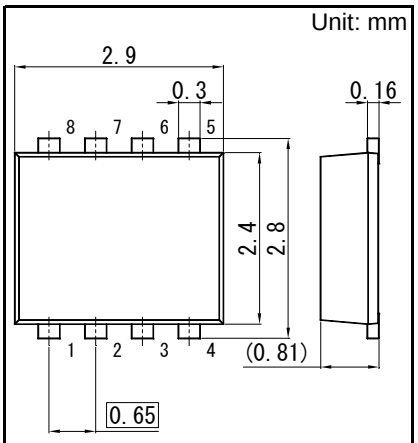
MOS FET

Panasonic FC8V22290L

FC8V22290L

Gate resistor installed Dual N-channel MOS FET

For lithium-ion secondary battery protection circuits



1. Source(FET1) 5. Darin(FET1,2)
2. Gate(FET1) 6. Darin(FET1,2)
3. Source(FET2) 7. Darin(FET1,2)
4. Gate(FET2) 8. Darin(FET1,2)

Panasonic	WMini8-F1
JEITA	SC-115
Code	-

■ Features

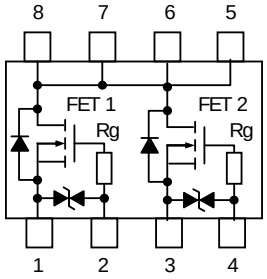
- Source-source ON Resistance:Rss(on) typ. = 11.5 mΩ（VGS = 4.5 V)
- Built-in gate resistor
- Halogen-free / RoHS compliant
  (EU RoHS / UL-94 V-0 / MSL:Level 1 compliant)

■ Marking Symbol: 4H

■ Packaging

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

Internal Connection



1. Source(FET1) 5. Darin(FET1,2)
2. Gate(FET1) 6. Darin(FET1,2)
3. Source(FET2) 7. Darin(FET1,2)
4. Gate(FET2) 8. Darin(FET1,2)

■ Absolute Maximum Ratings Ta = 25 °C

Parameter		Symbol	Rating	Unit
Drain-source Voltage		VDS	20	V
Gate-source Voltage		VGS	±12	V
Source Current	DC *1	IS1	7.5	A
	DC *2	IS2	11	A
	Pulse *3	ISp	75	A
Total Power Dissipation	Ta = 25 °C, DC *1	PD1	1.0	W
	Ta = 25 °C, DC *2	PD2	2.0	
	Ta = 25 °C, t = 10 s *1	PD3	1.2	
Channel Temperature		Tch	150	°C
Storage Temperature Range		Tstg	-55 to +150	°C
Thermal Resistance (ch-a)		Rth(ch-a)	125	°C/W

Note *1 Mounted on FR4 board (25.4 mm × 25.4 mm × t0.8 mm)
using the minimum recommended pad size (36μm Copper).
*2 Mounted on Ceramic substrate (70 mm × 70 mm × t1.0 mm).
*3 t = 10 μs, Duty Cycle ≤ 1 %

Established : 2015-04-01
Revised : 2015-05-19

■ Electrical Characteristics Ta = 25 °C ± 3 °C

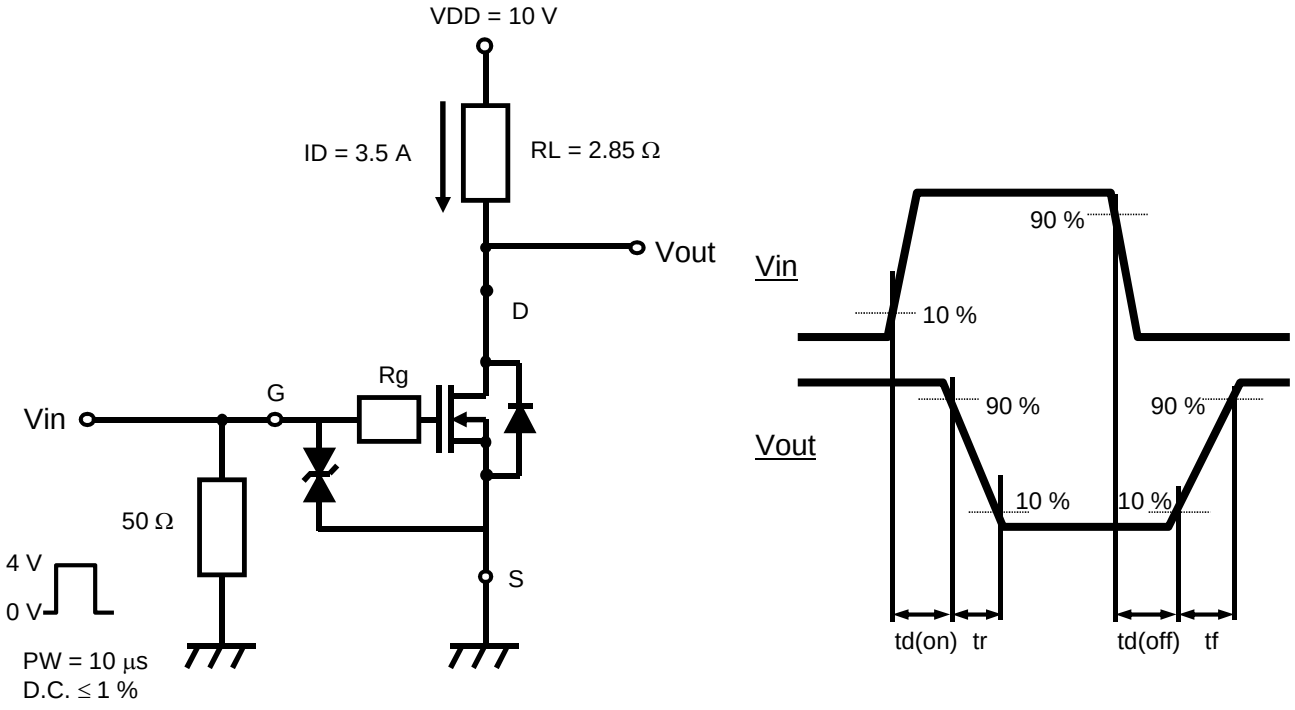
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source Breakdown Voltage	VDSS	ID = 1 mA, VGS = 0 V	20			V
Zero Gate Voltage Drain Current	IDSS	VDS = 20 V, VGS = 0 V			1.0	μA
Gate-source Leakage Current	IGSS	VGS = ±8 V, VSS = 0 V			±1.0	μA
Gate-source Threshold Voltage	Vth	ID = 0.44 mA, VDS = 10 V	0.35	0.9	1.4	V
Source-source On-state Resistance	RSS(on)1	IS = 3.5 A, VGS = 4.5 V	8.2	11.5	15.5	mΩ
	RSS(on)2	IS = 3.5 A, VGS = 3.8 V	8.5	12.5	16.5	
	RSS(on)3	IS = 3.5 A, VGS = 3.1 V	9	13.5	22.5	
	RSS(on)4	IS = 3.5 A, VGS = 2.5 V	9.5	16.5	32.5	
Body Diode Forward Voltage	VSD	IF = 3.5 A, VGS = 0 V		0.8	1.2	V
Input Capacitance *1	Ciss	VDS = 10 V, VGS = 0 V, f = 1 KHz		1250		pF
Output Capacitance *1	Coss			140		
Reverse Transfer Capacitance *1	Crss			115		
Turn-on delay Time *1,*2	td(on)	VDD = 10 V, VGS = 0 to 4.0 V		0.25		μs
Rise Time *1,*2	tr	ID = 3.5 A		0.65		
Turn-off delay Time *1,*2	td(off)	VDD = 10 V, VGS = 4.0 to 0 V		2.3		μs
Fall Time *1,*2	tf	ID = 3.5 A		1.4		
Total Gate Charge *1	Qg	VDD = 10 V		10.5		nC
Gate-source Charge *1	Qgs	VGS = 0 to 4.0 V,		4		
Gate-drain Charge *1	Qgd	ID = 3.5 A		4		

Note Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.

*1 Guaranteed by design, not subject to production testing

*2 Measurement circuit for Turn-on Delay Time / Rise Time / Turn-off Delay Time / Fall Time

Note2:Measurement circuit



Established : 2015-04-01
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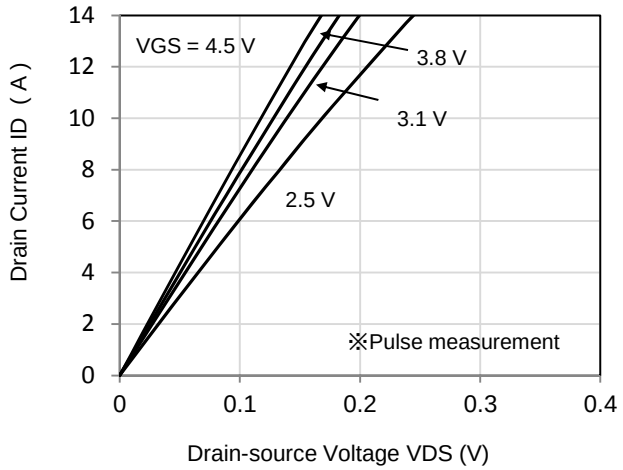
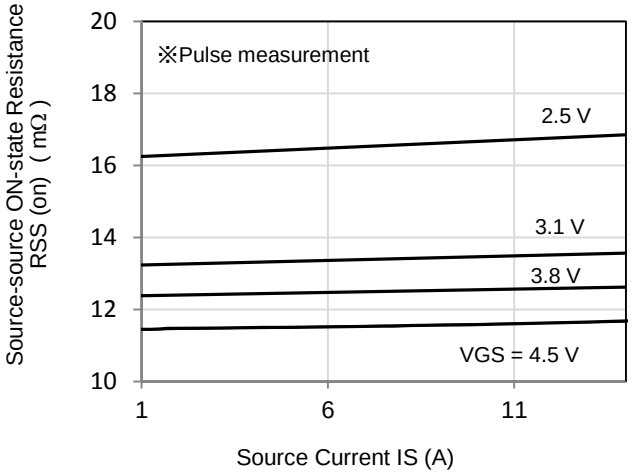
Technical Data (reference)

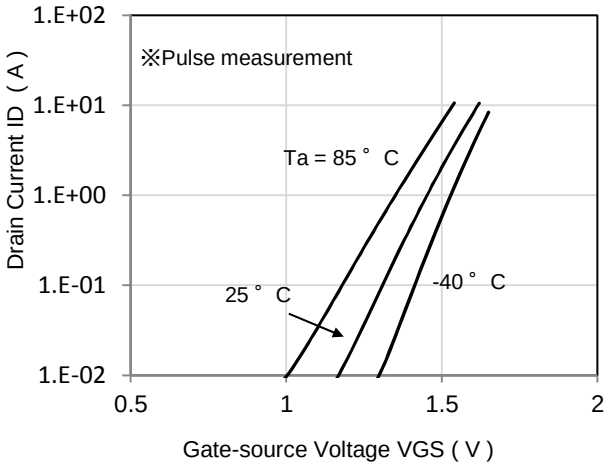
ID - VDS



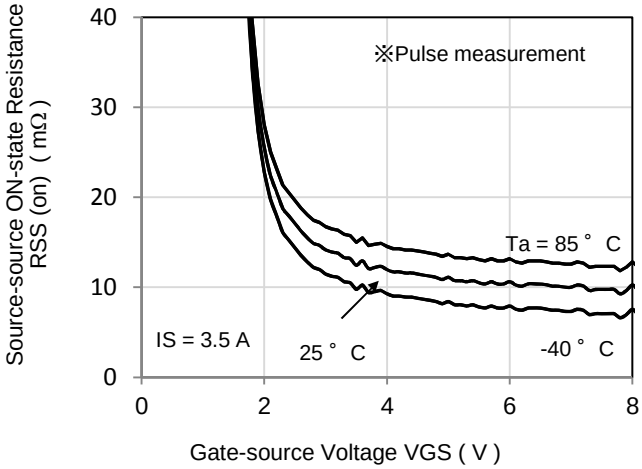
RSS(on) - IS



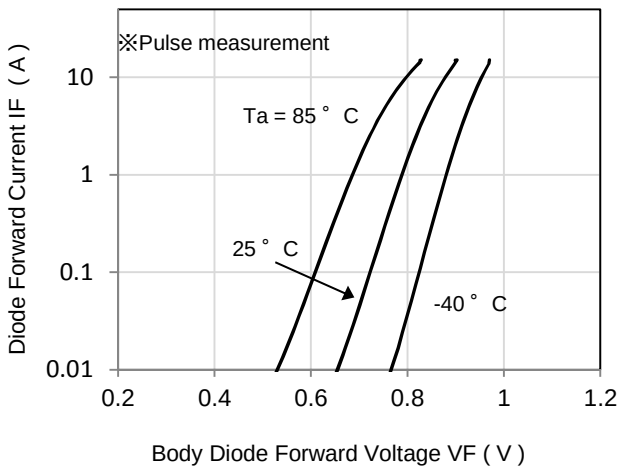
ID - VGS



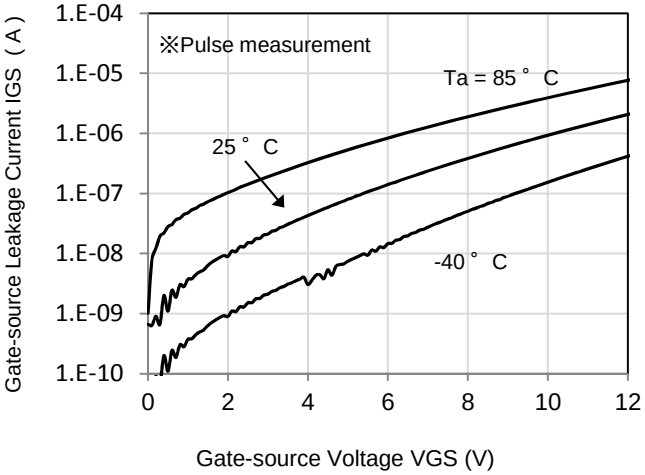
RSS(on) - VGS



IF - VF



IGS - VGS



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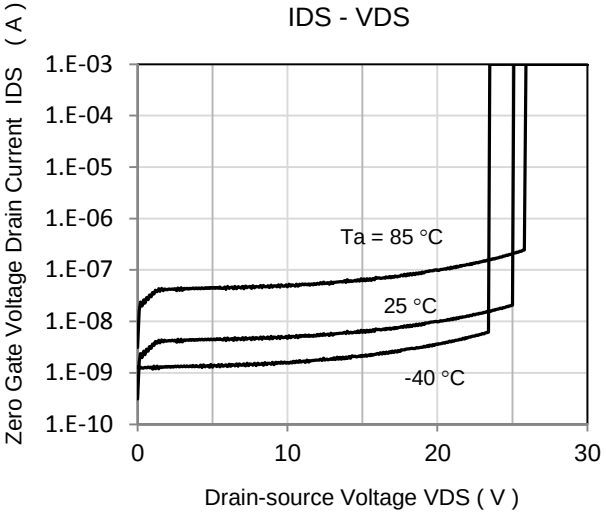
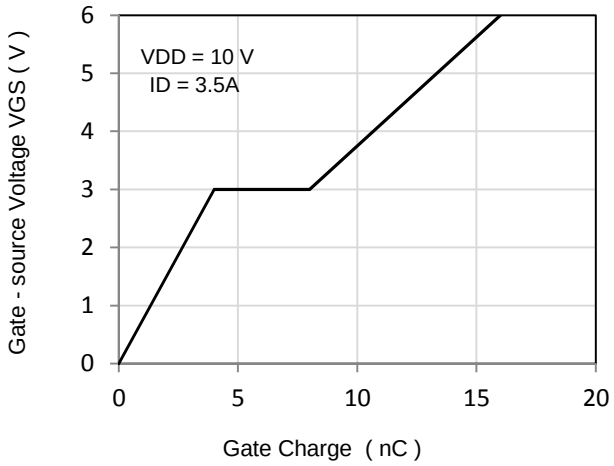
Revised : 2015-05-19

Technical Data (reference)

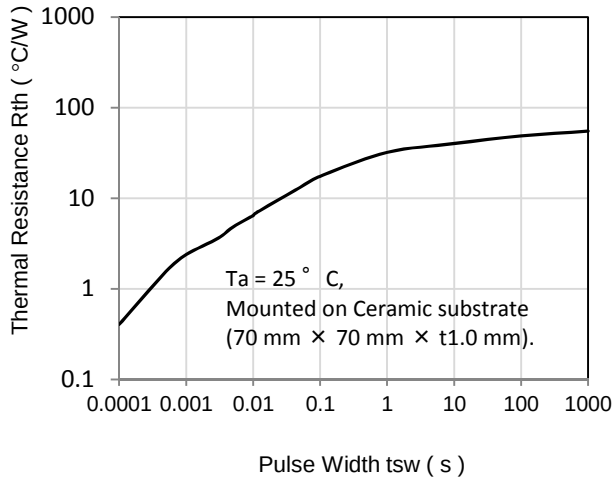
IDS - VDS



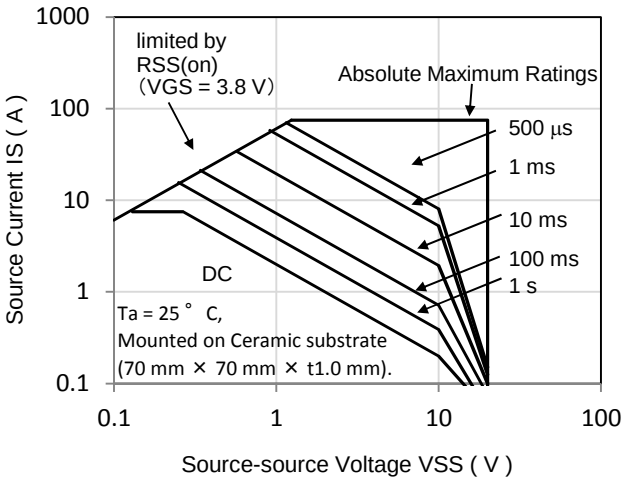
Dynamic Input/Output Characteristics



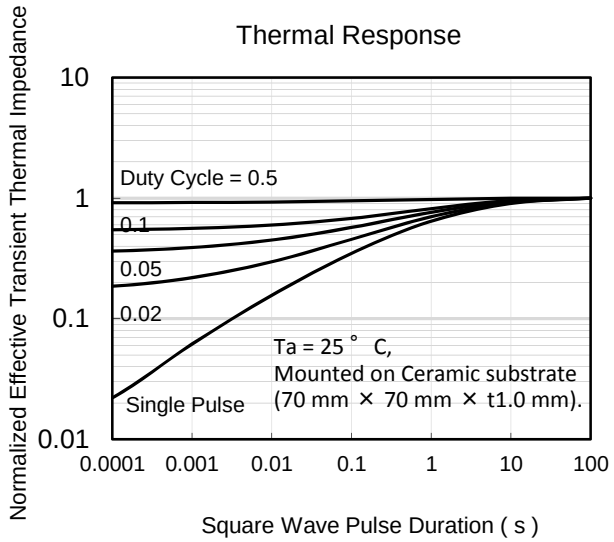
Rth - tsw



Safe Operating Area



Thermal Response



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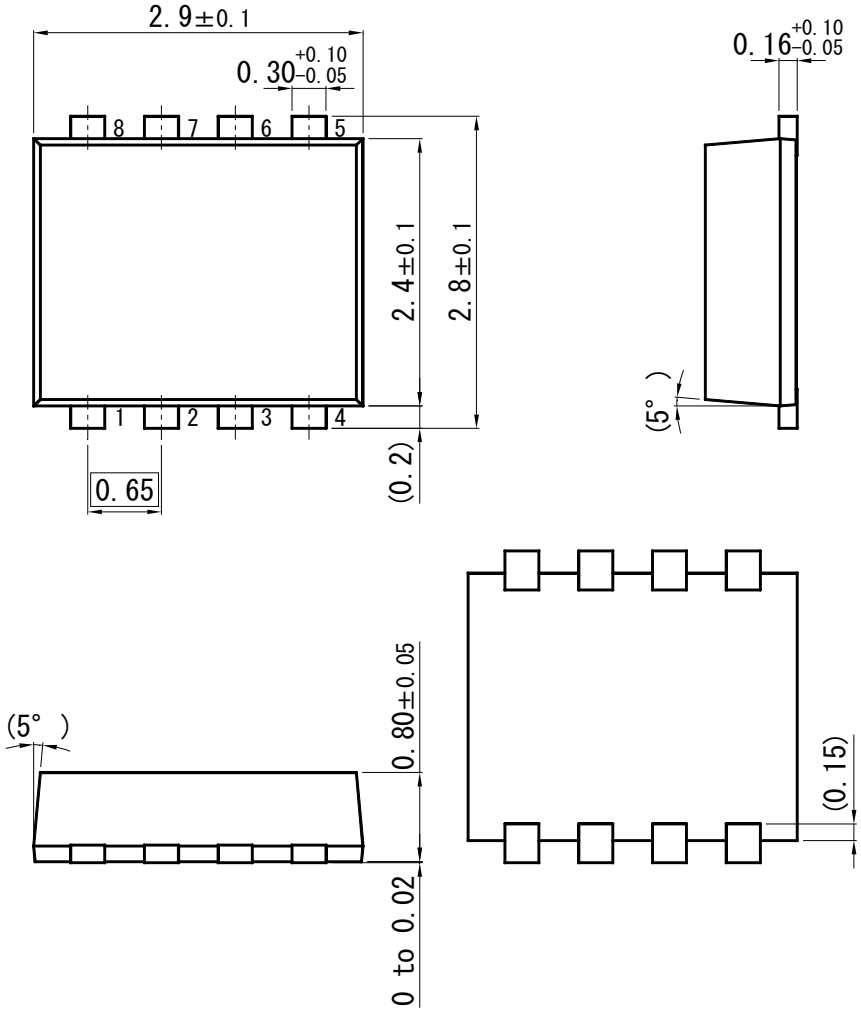
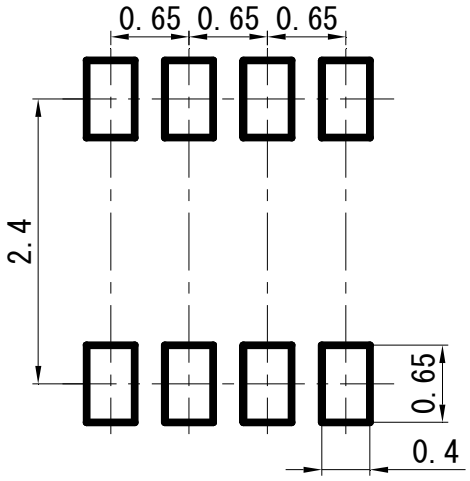
WMini8-F1

Unit: mm



■ Land Pattern (Reference) (Unit: mm)



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