

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

FJ4B01120L

Single P-channel MOS FET

■ Features

- Drain-source On-state Resistance : $R_{DS(on)}$ typ. = $40 \text{ m}\Omega$ ($V_{GS} = -2.5 \text{ V}$)
- CSP(Chip Size Package)
- Halogen-free / RoHS compliant (EU RoHS / UL-94 V-0 / MSL : Level 1)

■ Marking Symbol : 1F

■ Packaging

Embossed type (Thermo-compression sealing) : 20 000 pcs / reel (standard)

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

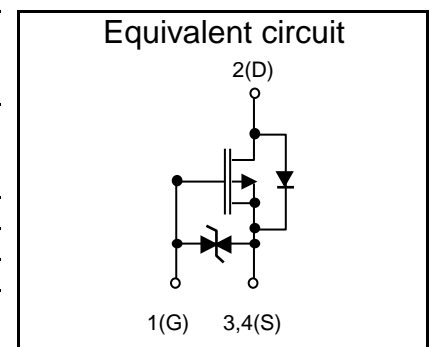
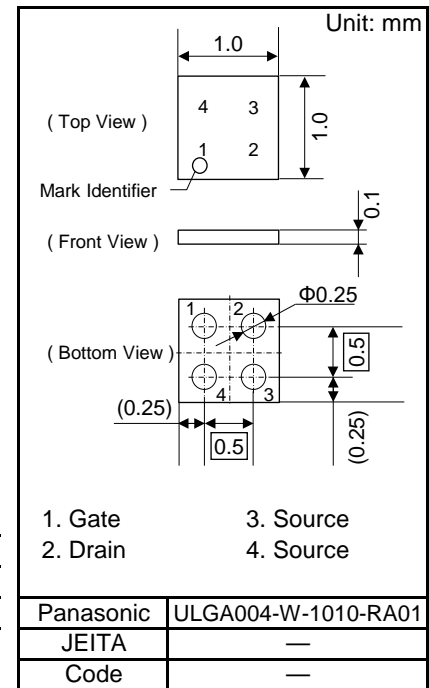
Parameter		Symbol	Rating	Unit
Drain-source Voltage		VDS	-12	V
Gate-source Voltage		VGS	±8	V
Drain Current	DC	ID1 ^{*1}	-2.6	A
		ID2 ^{*2}	-4.2	A
		ID3 ^{*3}	-5.4	A
	Pulsed ^{*4}	IDp1	-20	A
		IDp2	-33	A
		IDp3	-43	A
Total Power Dissipation		PD1 ^{*1}	0.37	W
		PD2 ^{*2}	0.94	W
		PD3 ^{*3}	1.5	W
Channel Temperature		Tch	150	°C
Operating Ambient Temperature		Topr	-40 to +85	°C
Storage Temperature Range		Tstg	-55 to +150	°C

Note *1 FR4 board (25.4mm×25.4mm×1.0mm), Min Cu 36mm² Copper.

*2 FR4 board (25.4mm×25.4mm×1.0mm), Full Cu.

*3 Ceramic substrate (70mm×70mm×1.0mm).

*4 $t = 10 \mu\text{s}$, Duty Cycle $\leq 1\%$



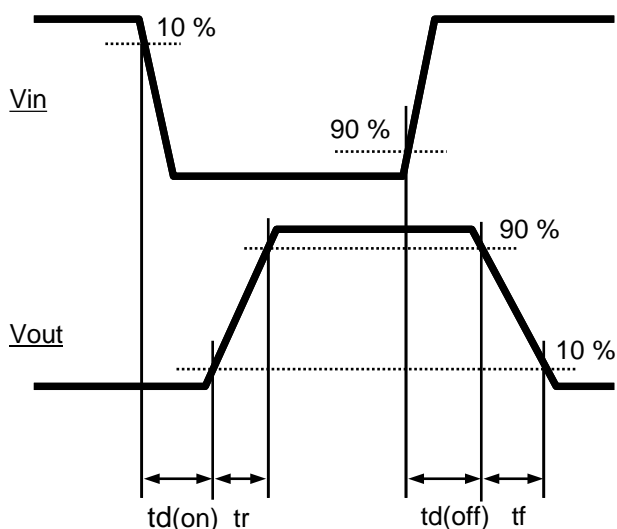
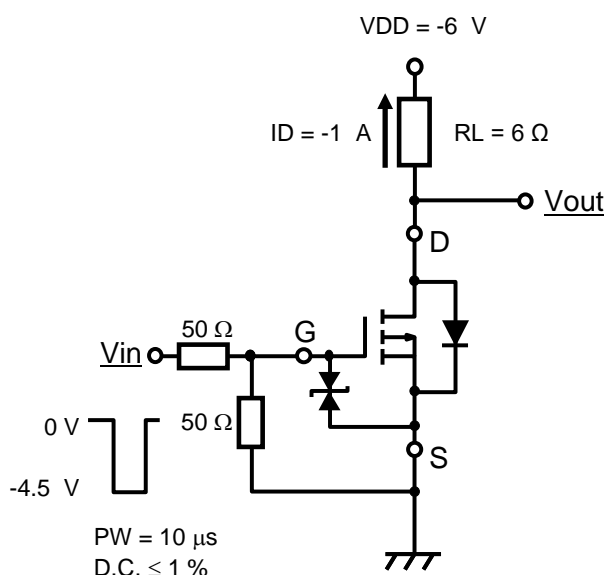
■ Electrical Characteristics Ta = 25 °C ± 3 °C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source Breakdown Voltage	VDSS	ID = -1 mA, VGS = 0	-12			V
Zero Gate Voltage Drain Current	IDSS	VDS = -12 V, VGS = 0			-1	μA
Gate-source Leakage Current	IGSS	VGS = ±8 V, VDS = 0 V			±10	μA
Gate-source Threshold Voltage	Vth	ID = -2 mA, VDS = -10 V	-0.3		-1.0	V
Drain-source On-state Resistance	RDS(on)1	ID = -2 A, VGS = -4.5 V		34	51	mΩ
	RDS(on)2	ID = -2 A, VGS = -2.5 V		40	61	
	RDS(on)3	ID = -0.2 A, VGS = -1.8 V		48	85	
	RDS(on)4	ID = -0.1 A, VGS = -1.5 V		57	170	
Body Diode Forward Voltage	VF(s-d)	IF = -0.2 A, VGS = 0 V		-0.7	-1.2	V
Input Capacitance ^{*1}	Ciss	VDS = -10 V, VGS = 0 V f = 1 MHz		814		pF
Output Capacitance ^{*1}	Coss			201		
Reverse Transfer Capacitance ^{*1}	Crss			187		
Turn-on Delay Time ^{*1,*2}	td(on)	VDD = -6 V, VGS = 0 to -4.5 V		6		ns
Rise Time ^{*1,*2}	tr	ID = -1 A		4		
Turn-off Delay Time ^{*1,*2}	td(off)	VDD = -6 V, VGS = -4.5 to 0 V		63		
Fall Time ^{*1,*2}	tf	ID = -1 A		46		
Total Gate Charge ^{*1}	Qg	VDD = -6 V, VGS = -4.5 V ID = -1 A		10.7		nC
Gate-source Charge ^{*1}	Qgs			1.4		
Gate-drain Charge ^{*1}	Qgd			2.1		

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.

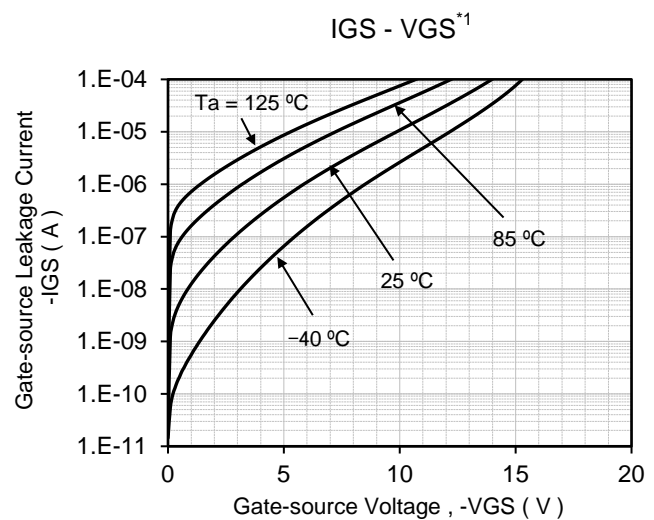
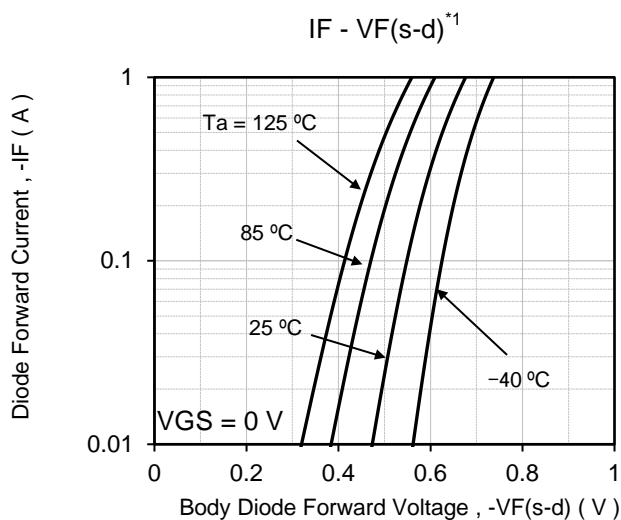
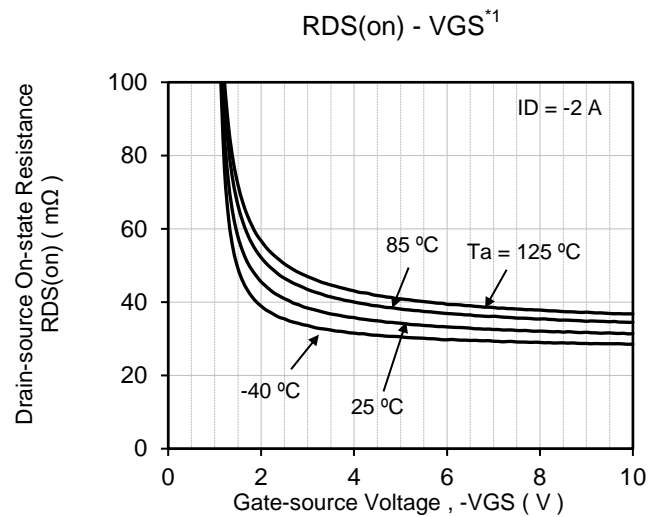
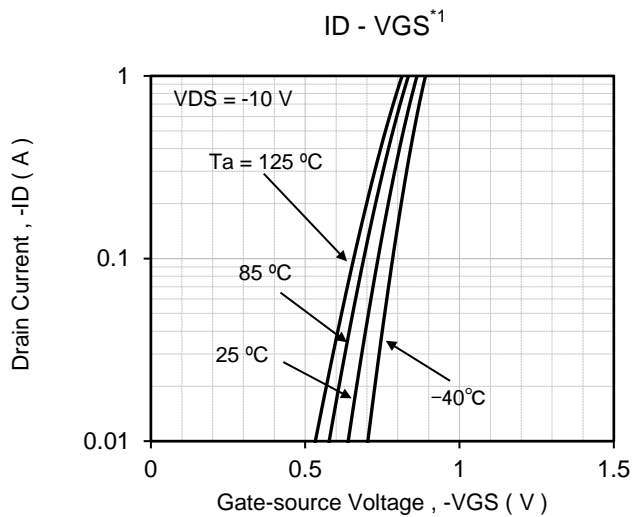
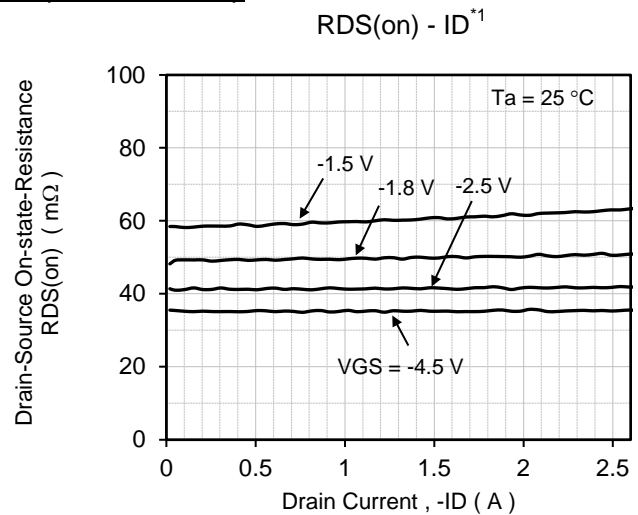
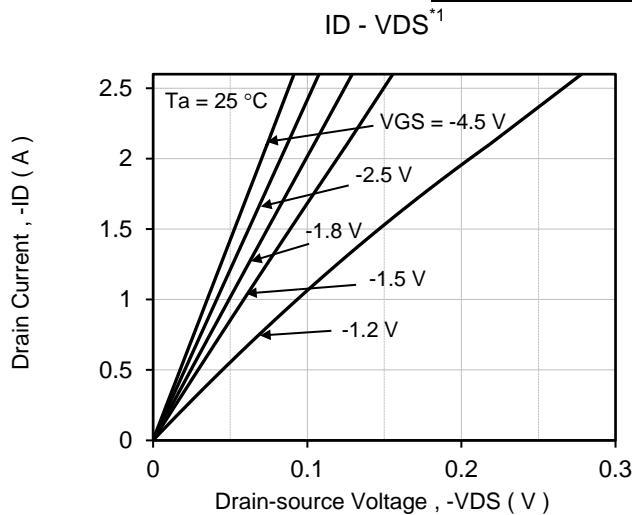
*2 Measurement circuit for Turn-on Delay Time / Rise Time / Turn-off Delay Time / Fall Time.



■ Electrical State Discharge Characteristics

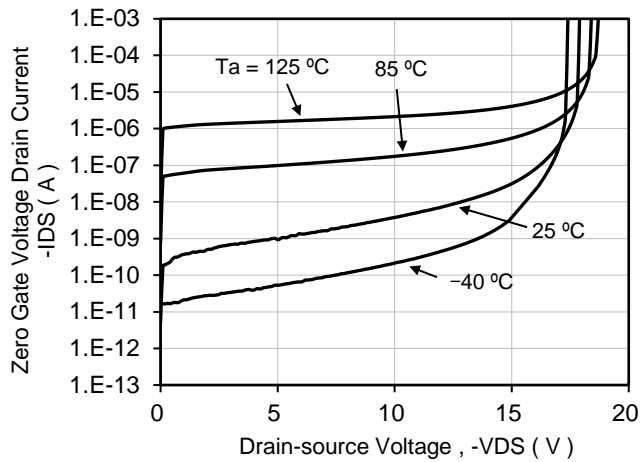
Standard	Test Type	Symbol	Conditions	Class	Value	Unit
AEC-Q101	Human Body Model	HBM	C = 100 pF, R = 1.5 kΩ	H1C	> 1k to ≤ 2k	V
	Machine Model	MM	C = 200 pF, R = 0 Ω	M2	> 100 to ≤ 200	V

Technical Data (reference)

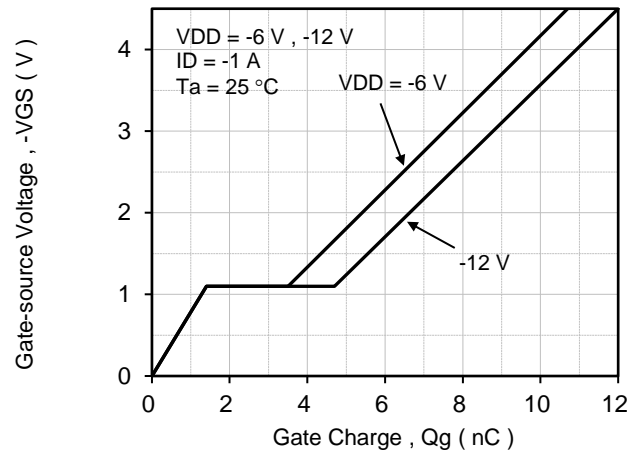


Technical Data (reference)

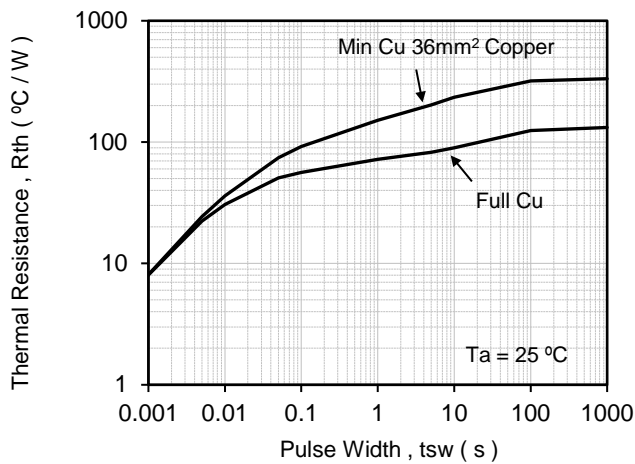
$I_{DS} - V_{DS}^{*1}$



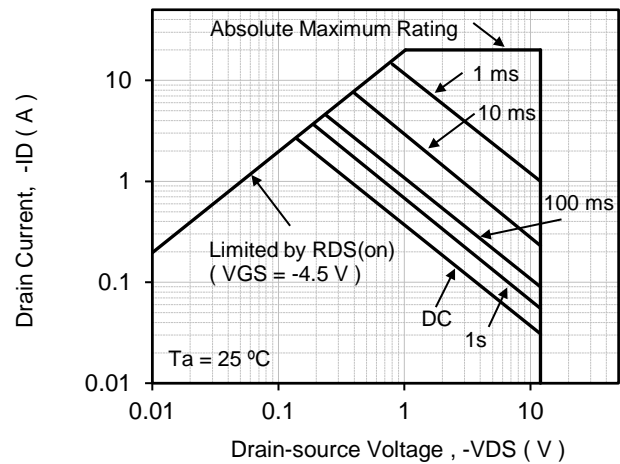
Dynamic Input / Output Characteristics



$R_{th} - t_{sw}^{*2*3}$



Safe Operating Area^{*2}



Note

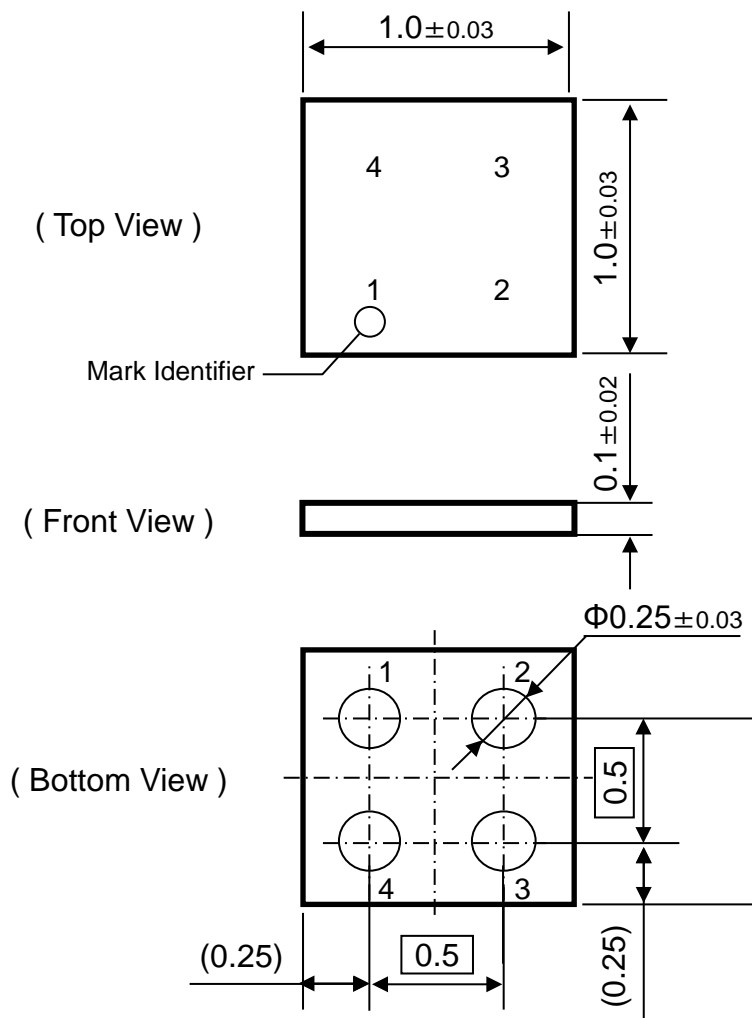
*1 Pulse measurement

*2 FR4 board (25.4mm×25.4mm×1.0mm), Min Cu 36mm² Copper.

*3 FR4 board (25.4mm×25.4mm×1.0mm), Full Cu.

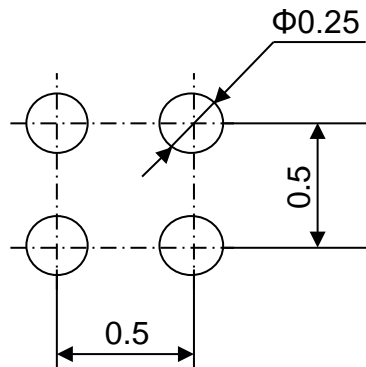
■ Outline

Unit: mm



■ Land & Stencil Pattern (Reference)

Unit: mm



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