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”

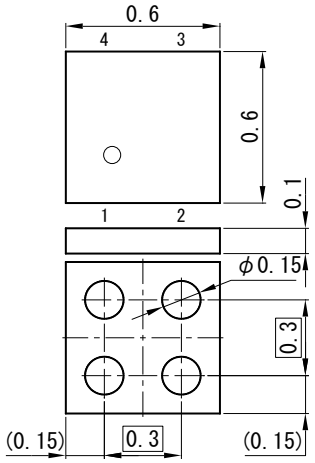
Nuvoton Technology Corporation Japan

FC4B21300L

Gate resistor installed Dual N-channel MOS FET

For lithium-ion secondary battery protection circuits

Unit: mm



1. Source1 (FET1) 3. Gate2 (FET2)
2. Gate1 (FET1) 4. Source2 (FET2)

Panasonic	ALGA004-W-0606-RA
JEITA	—
Code	—

■ Features

- Source-source ON resistance:Rss(on) typ. = 70 mΩ（VGS = 4.5 V)
- CSP(Chip Size Package)
- RoHS compliant (EU RoHS / MSL:Level 1 compliant)

■ Marking Symbol: 29

■ Packaging

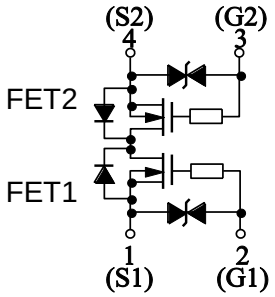
Embossed type (Thermo-compression sealing) : 20 000 pcs / reel (standard)

■ Absolute Maximum Ratings Ta = 25 °C

Parameter	Symbol	Rating	Unit
Source-source Voltage	VSS	12	V
Gate-source Voltage	VGS	±8	V
Source Current (DC)	IS *1	1.5	A
	IS *2	2	A
Source Current (Pulsed)	ISp *3	15	A
Total Power Dissipation	PD *1	0.32	W
	PD *2	0.6	W
Channel Temperature	Tch	150	°C
Storage Temperature Range	Tstg	-55 to +150	°C
Thermal Resistance (ch-a)	Rth *1	390	°C/W
	Rth *2	208	°C/W

Note *1 Mounted on FR4 board (25.4 mm × 25.4 mm × t1.0 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 %

Equivalent circuit



Established : 2014-12-15
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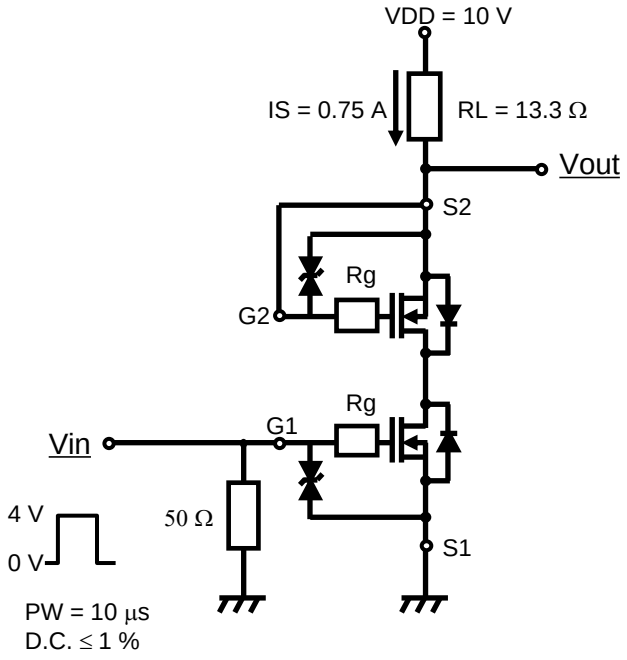
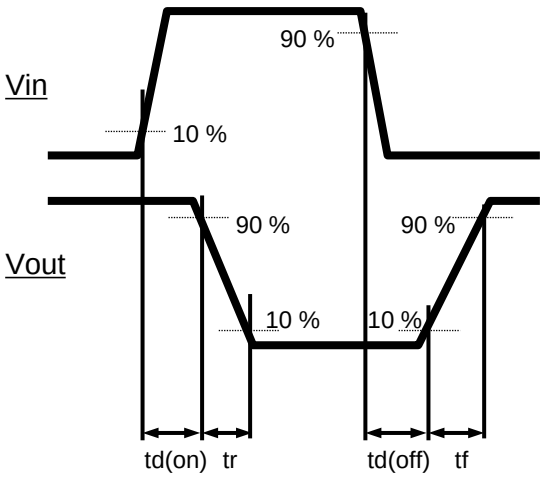
■ Electrical Characteristics Ta = 25 °C ± 3 °C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-source Breakdown Voltage	VSSS	IS = 1 mA, VGS = 0 V	12			V
Zero Gate Voltage Source Current	ISSS	VSS = 12 V, VGS = 0 V			1.0	μA
Gate-source Leakage Current	IGSS	VGS = ±8 V, VSS = 0 V			±10	μA
		VGS = ±5 V, VSS = 0 V			±1.0	
Gate-source Threshold Voltage	Vth	IS = 0.03 mA, VSS = 10 V	0.35	0.90	1.4	V
Source-source On-state Resistance	RSS(on)1	IS = 0.75 A, VGS = 4.5 V	55	70	95	mΩ
	RSS(on)2	IS = 0.75 A, VGS = 3.8 V	60	80	110	
	RSS(on)3	IS = 0.75 A, VGS = 3.1 V	65	90	150	
	RSS(on)4	IS = 0.75 A, VGS = 2.5 V	70	115	225	
Body Diode Forward Voltage	VF(s-s)	IF = 0.75 A, VGS = 0 V		0.6	1.2	V
Input Capacitance *1	Ciss	VSS = 10 V, VGS = 0 V, f = 1 MHz		115		pF
Output Capacitance *1	Coss			25		
Reverse Transfer Capacitance *1	Crss			18		
Turn-on delay Time *1,*2	td(on)	VDD = 10 V, VGS = 0 to 4.0 V		0.10		μs
Rise Time *1,*2	tr	IS = 0.75 A		0.20		
Turn-off delay Time *1,*2	td(off)	VDD = 10 V, VGS = 4.0 to 0 V		0.27		μs
Fall Time *1,*2	tf	IS = 0.75 A		0.22		
Total Gate Charge *1	Qg	VDD = 10 V		1.7		nC
Gate-source Charge *1	Qgs	VGS = 0 to 4.0 V,		0.5		
Gate-drain Charge *1	Qgd	IS = 0.75 A		0.45		

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





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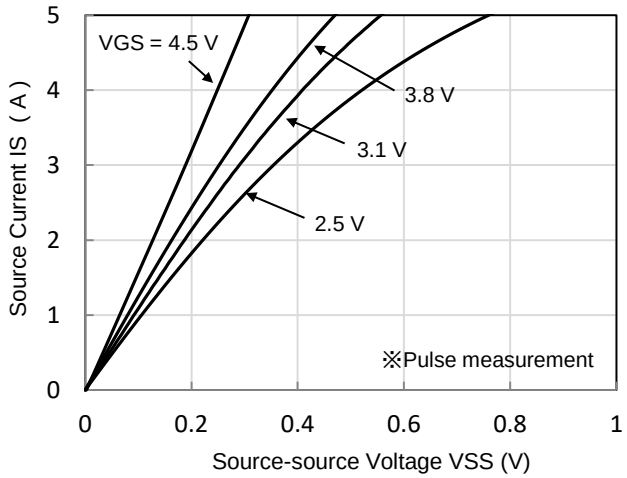
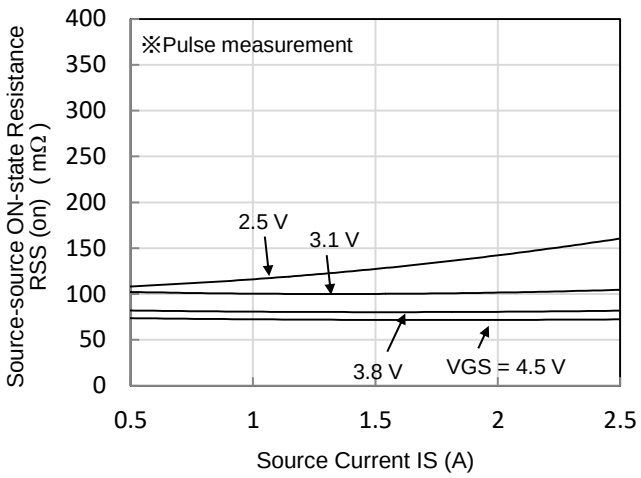
Technical Data (reference)

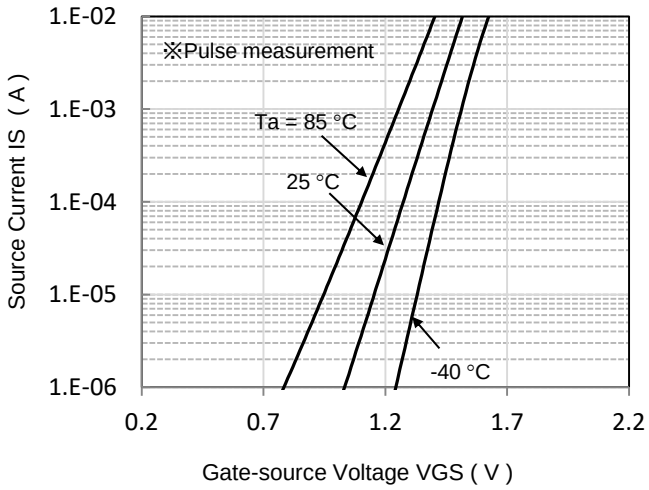
IS - VSS



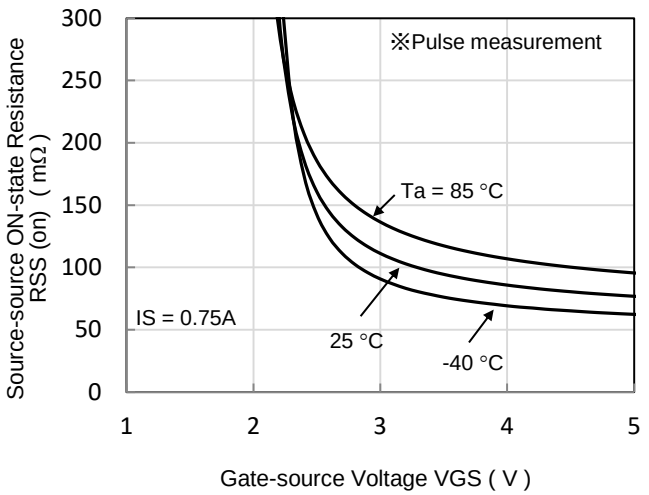
RSS(on) - IS



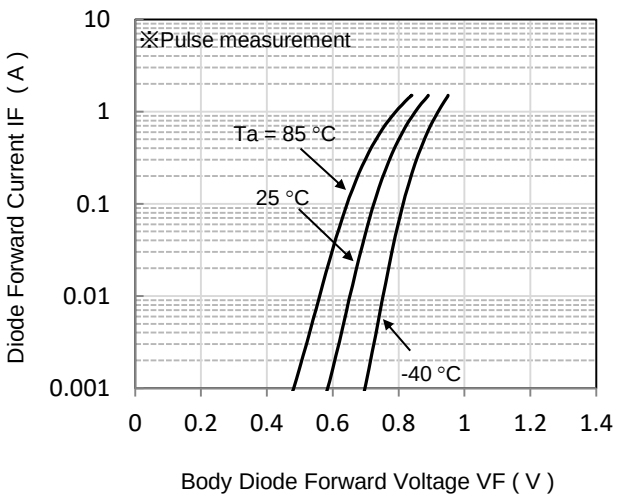
IS - VGS



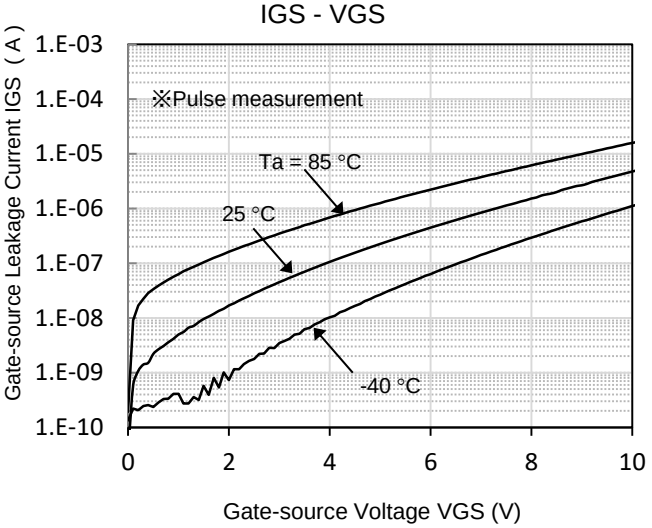
RSS(on) - VGS



IF - VF



IGS - VGS



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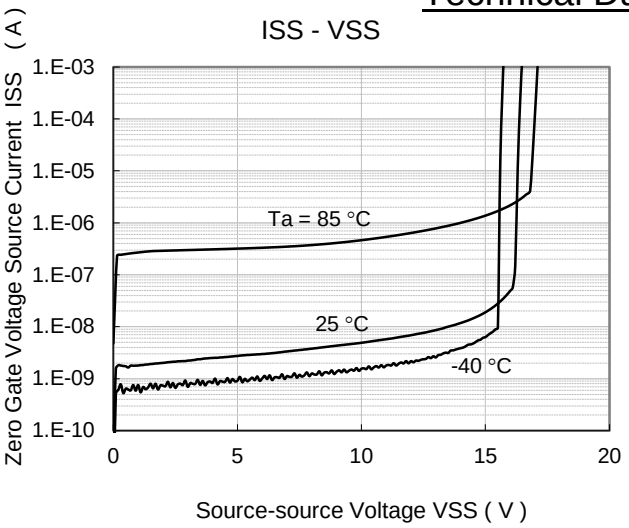
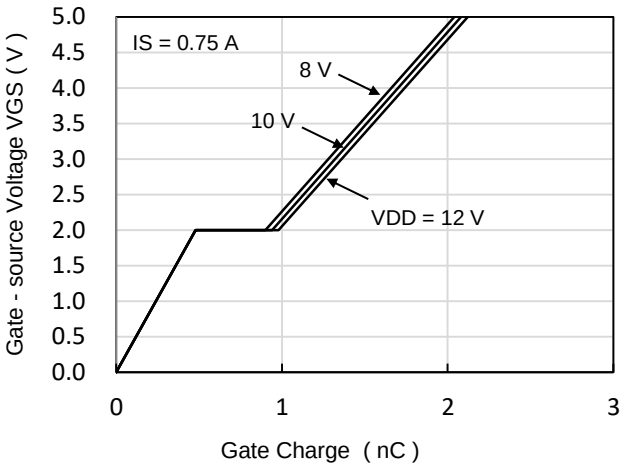
Technical Data (reference)

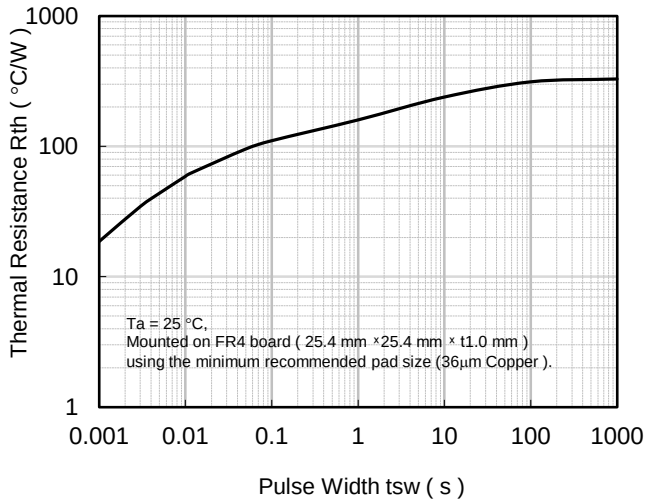
ISS - VSS



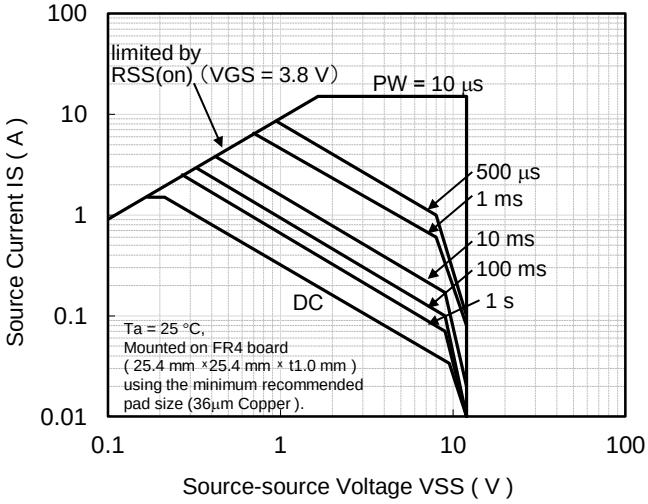
Dynamic Input/Output Characteristics



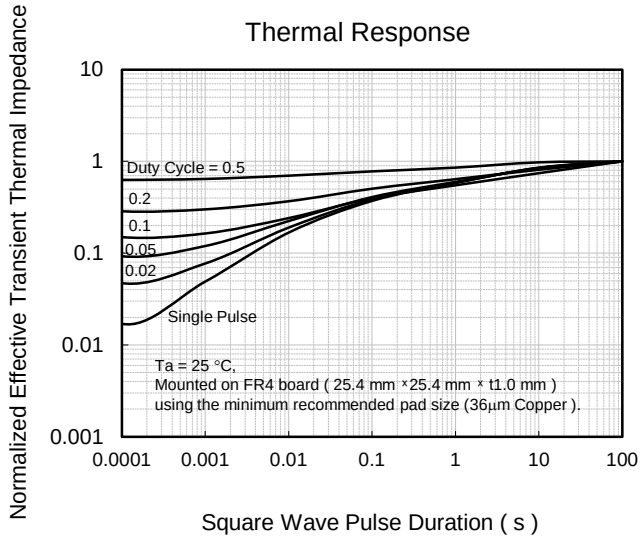
Rth - tsw



Safe Operating Area



Thermal Response



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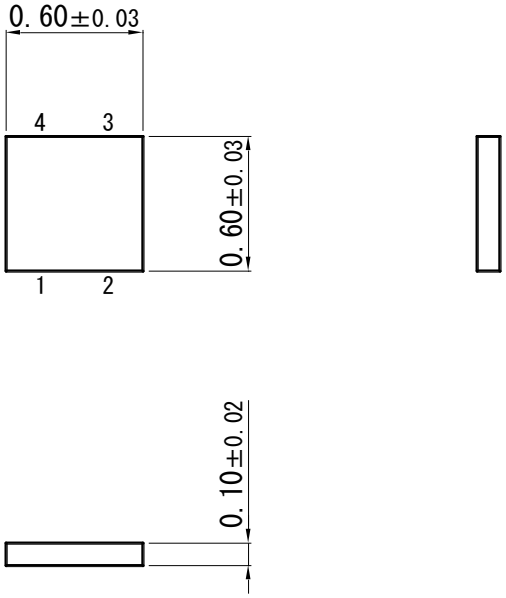
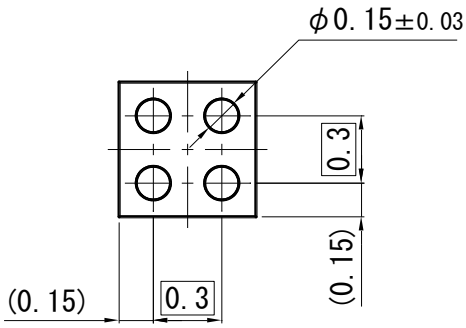
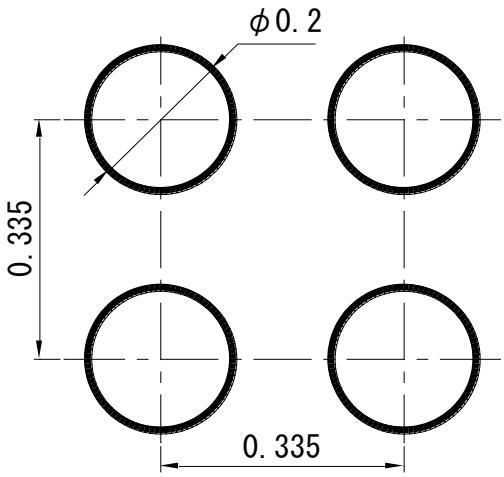
ALGA004-W-0606-RA

Unit: mm





■ Land Pattern (Reference) (Unit: mm)



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