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”

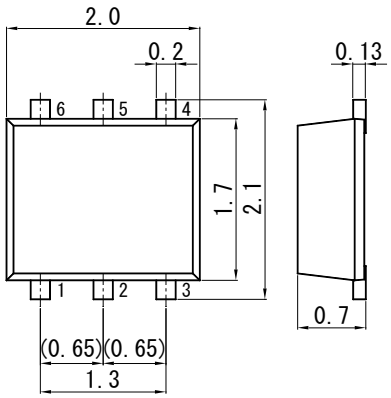
Nuvoton Technology Corporation Japan

FC6K3339ZL

Resistors, Zener Diode installed separate type dual N-channel MOS FET

For passive cell balancing circuits

Unit : mm



1. Source1
2. Gate1
3. Drain2
4. Source2
5. Gate2
6. Drain1

Panasonic	WSMini6-F2-B
JEITA	SC-113DA
Code	—

■ Features

- Build in Gate Resistor, Gate-source Resistor and Zener Diode
- Drain-source ON-state Resistance : RDS(on) typ. = 200 mΩ (VGS = 4.5 V)
- AEC-Q101 qualified
- Halogen-free / RoHS compliant
  (EU RoHS / UL-94 V-0 / MSL : Level 1 compliant)

■ Marking Symbol : 6J

■ Packaging

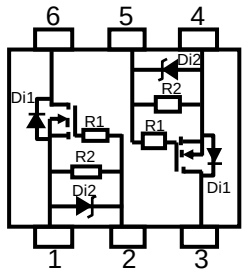
Embossed type (Thermo-compression sealing) : 3 000 pcs / reel (standard)

■ Absolute Maximum Ratings Ta = 25°C

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	VDS	30	V
Gate to Source Voltage	VGS	+5 , -0.5	V
Drain Current *1	ID	1.5	A
Drain Current (Pulsed) *2	IDp	15	A
Total Power Dissipation *1	PD	700	mW
Channel Temperature	Tch	150	°C
Storage Temperature Range	Tstg	-55 to +150	°C

Note *1 Mounted on FR4 board (25.4mm × 25.4mm × t1.0mm)
*2 Pulse width = 10 µs, Duty cycle ≤ 1 %

Internal Connection



*Di1 : Body Diode contained in MOSFET structure

Established : 2015-10-26
Revised : 2016-07-14

■ Electrical Characteristics Ta = 25 ℃ ± 3 ℃

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Drain-source Breakdown Voltage		VDSS	ID = 1 mA , VGS = 0 V	30			V
Zero Gate Voltage Drain Current		IDSS	VDS = 30 V , VGS = 0 V			1	μA
Gate-source Leakage Current		IGSS	VGS = 4.5 V , VDS = 0 V			30	μA
Gate-source Threshold Voltage		Vth	ID = 59 μA , VDS = 10 V	0.35		0.9	V
Drain-source ON-state Resistance		RDS(on)1	ID = 0.75 A , VGS = 4.5 V		200	280	mΩ
		RDS(on)2	ID = 0.75 A , VGS = 2.5 V		220	310	
		RDS(on)3	ID = 0.2 A , VGS = 1.5 V		300	900	
Di1	Body Diode Forward Voltage	VSD	ID = 0.75 A , VGS = 0 V		0.8	1.2	V
Di2	Zener Diode Forward Voltage	VF	IF = 100 μA			0.8	V
	Zener Diode Reverse Voltage	VZ	IZ = 1 mA	5.0			V
R1	Gate Resistance *3	Rg	-	1.0	1.5	3.0	kΩ
R2	Gate-source Resistance *3	Rgs	-	200	300	400	kΩ
Input Capacitance *3		Ciss	VDS = 15 V VGS = 0 V f = 1 kHz		95.0		pF
Output Capacitance *3		Coss			17.5		
Reverse Transfer Capacitance *3		Crss			10.5		
Turn-on Delay Time *3 *4		td(on)	VDD = 15 V VGS = 0 to 4 V ID = 0.75 A		50		ns
Rise Time *3 *4		tr			110		
Turn-off Delay Time *3 *4		td(off)			480		
Fall Time *3 *4		tf			210		
Total Gate Charge *3		Qg	VDD = 15 V VGS = 4 V ID = 0.75 A		1.8		nC
Gate to Source Charge *3		Qgs			0.3		
Gate to Drain Miller Charge *3		Qgd			0.4		

Note Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.
*3 Assured by design.
*4 Refer to Figure1, measurement circuit for Turn-on Delay Time / Rise Time / Turn-off Delay Time / Fall Time

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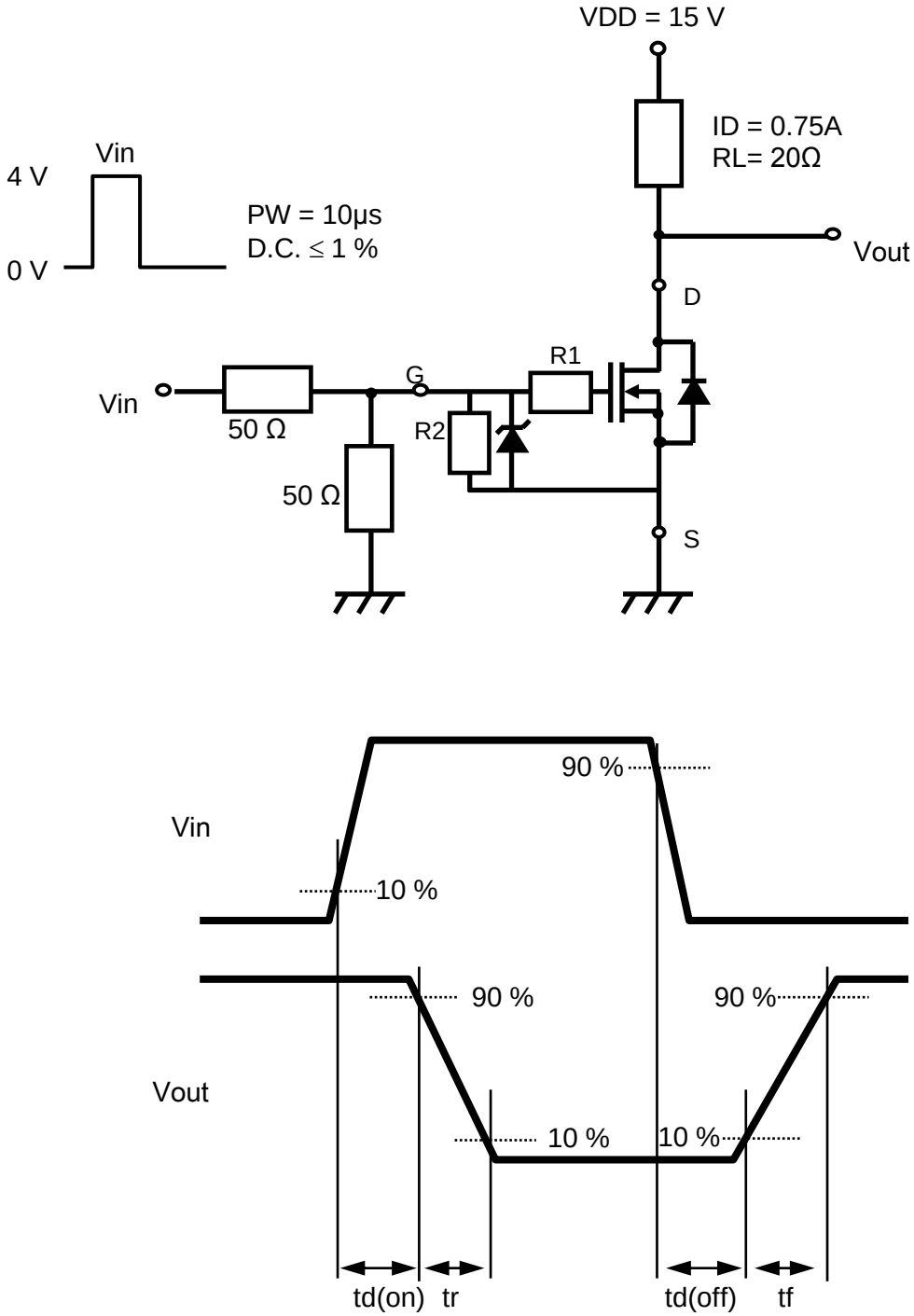
Figure1: Measurement circuit for Turn-on Delay Time / Rise Time / Turn-off Delay Time / Fall Time



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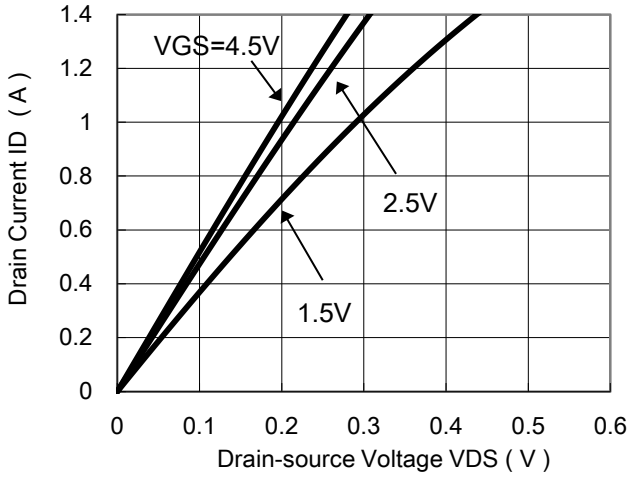
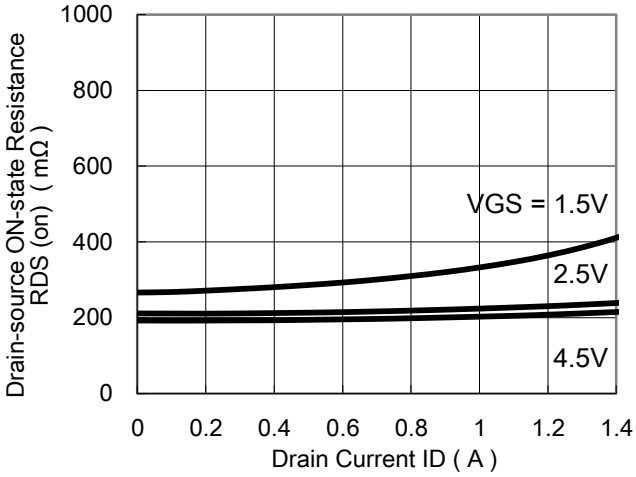
Technical Data (reference)

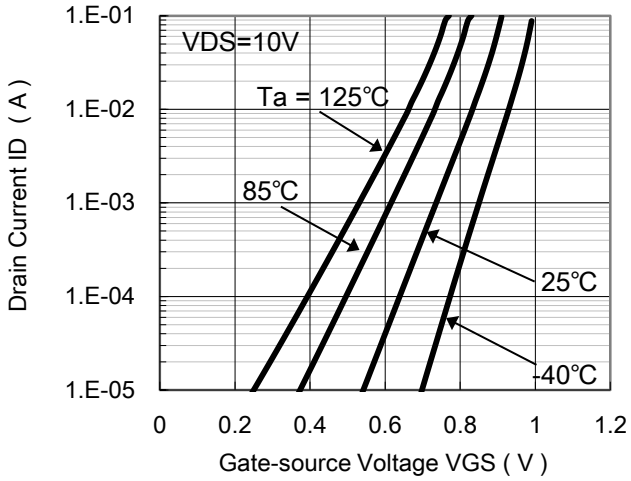
ID - VDS



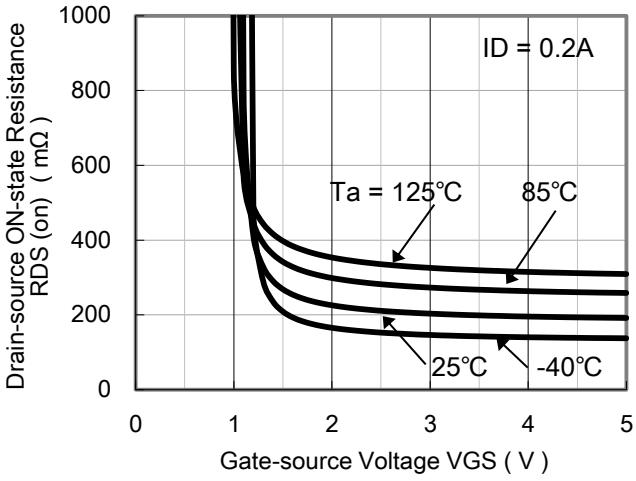
RDS(on) - ID



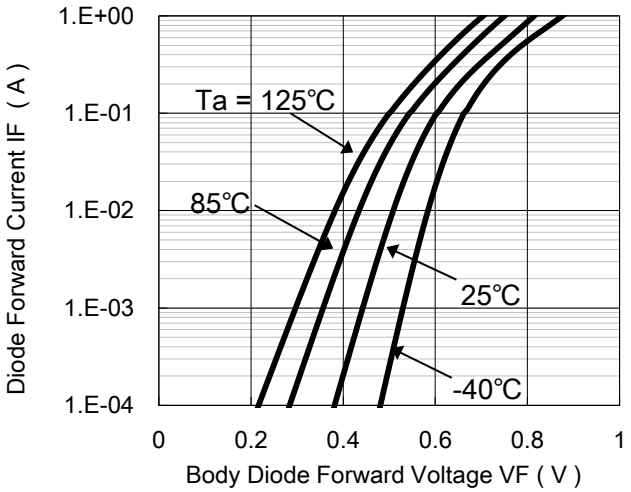
ID - VGS



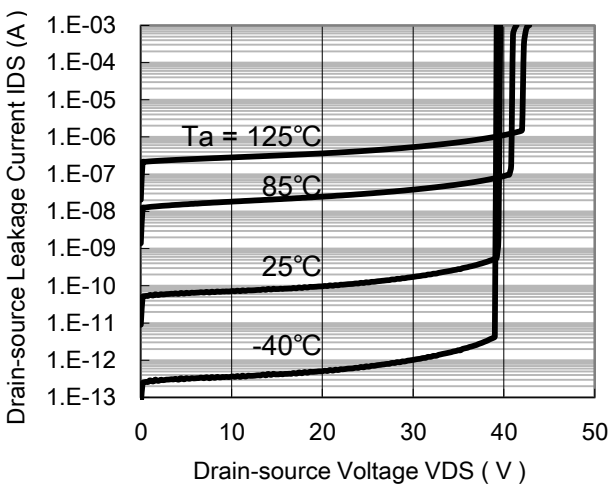
RDS(on) - VGS



IF - VF



IDS - VDS



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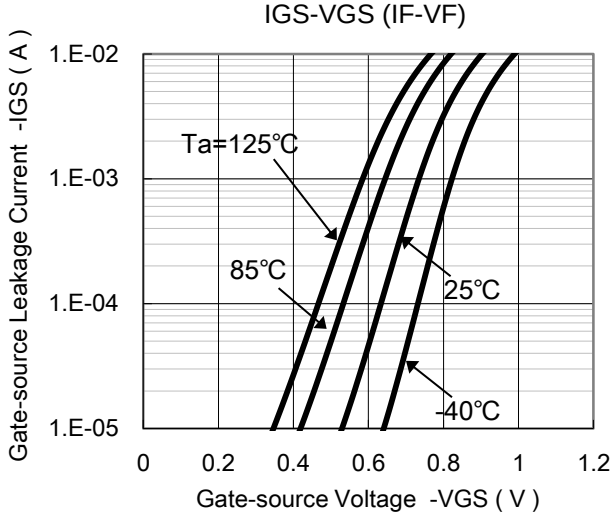
MOS FET

Panasonic

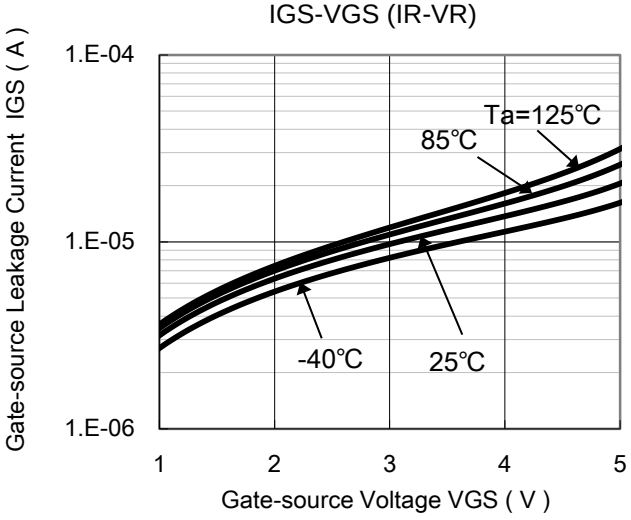
FC6K3339ZL

Technical Data (reference)

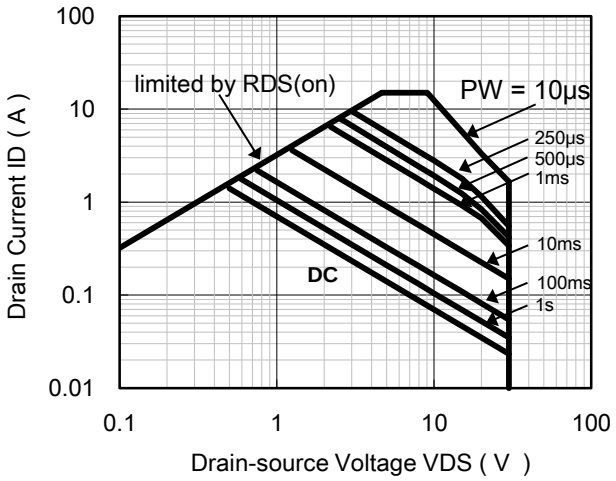
IGS-VGS (IF-VF)



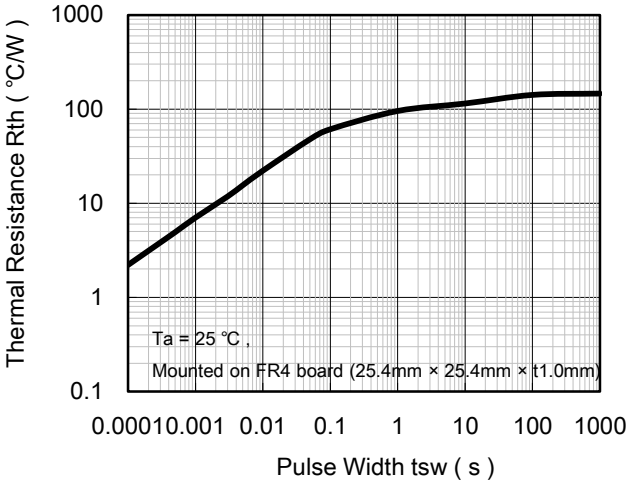
IGS-VGS (IR-VR)



Safe Operating Area



Rth - tsw



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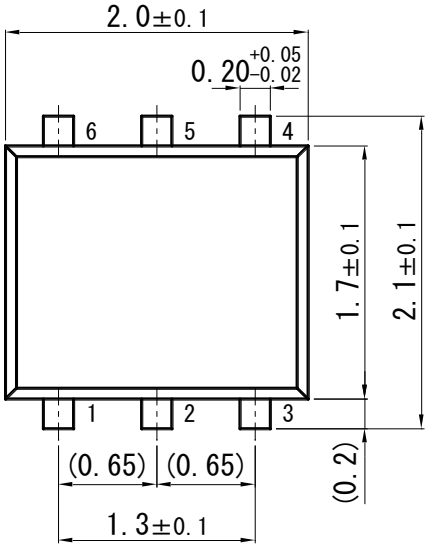
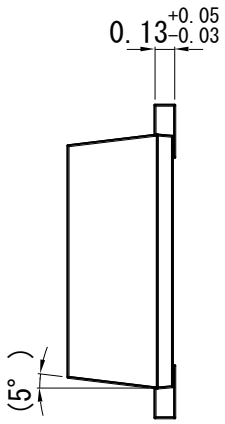
Unit: mm

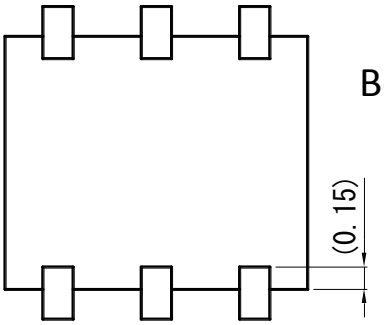
Top View



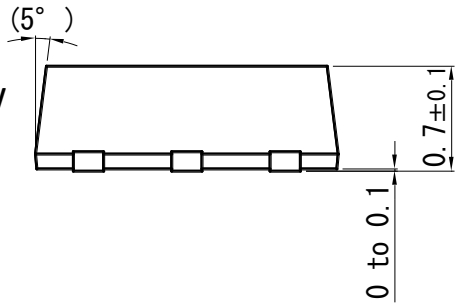
Side View



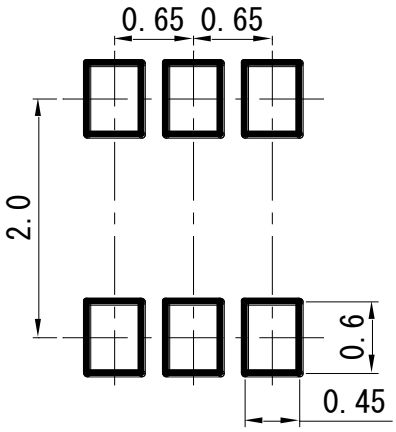
Bottom View



Front View



■ Land Pattern (Reference) (Unit: mm)



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