Panasonic

2N7002E

Silicon N-channel MOSFET

For switching circuits
Panasonic parts No. FK360602

■ Features

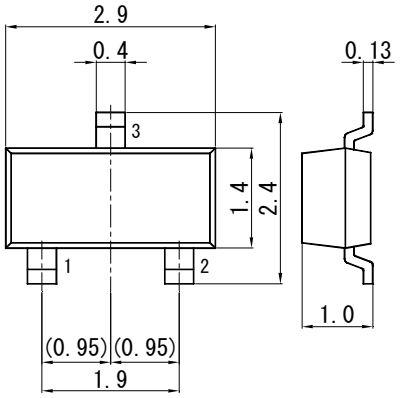
- Low Drain-source On-state Resistance : RDS(on) typ = 1 Ω (VGS = 4.5 V)
- Halogen-free / RoHS compliant
  (EU RoHS / UL-94 V-0 / MSL : Level 1 compliant)

■ Marking Symbol : GV

■ Packaging

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

Unit : mm



1. Gate
2. Source
3. Drain

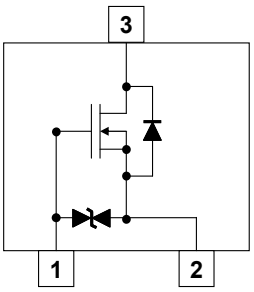
Panasonic	NMini3-R1-B
JEITA	SC-59A
Code	TO-236AA/SOT-23

■ Absolute Maximum Ratings Ta = 25 °C

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	VDS	60	V
Gate to Source Voltage	VGS	±20	V
Drain Current	ID	300	mA
Drain Current (Pulsed) *1	IDp	600	mA
Total Power Dissipation *2	PD	350	mW
Channel Temperature	Tch	150	°C
Storage Temperature Range	Tstg	-55 to +150	°C

Note *1 Pulse test: Ensure that the channel temperature does not exceed 150 °C
*2 Mounted on FR4 board (25.4mm×25.4mm×t0.8mm,Cu area >300mm^2)

Internal Connection



Pin Name

1. Gate
2. Source
3. Drain

Established : 2013-04-19
Revised : 2013-10-10

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source Breakdown Voltage	VDSS	ID = 250 μA, VGS = 0 V	60			V
Zero Gate Voltage Drain Current	IDSS	VDS = 60 V, VGS = 0 V			1	μA
Gate-source Leakage Current	IGSS	VGS = ±20 V, VDS = 0 V			±10	μA
Gate-source Threshold Voltage	Vth	ID = 250 μA, VDS = 10 V	1		3	V
Drain-source On-state Resistance	RDS(on)1	ID = 100 mA, VGS = 10 V		0.8	3	Ω
	RDS(on)2	ID = 100 mA, VGS = 4.5 V		1	4	
Input Capacitance	Ciss	VDS = 10 V, VGS = 0 V f = 1 MHz		40		pF
Output Capacitance	Coss			7		
Reverse Transfer Capacitance	Crss			4.5		
Total Gate Charge	Qg	VDS = 10 V, VGS = 0 to 4.5 V ID = 200 mA		0.8		nC
Gate to Source Charge	Qgs			0.2		
Gate to Drain Charge	Qgd			0.4		

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

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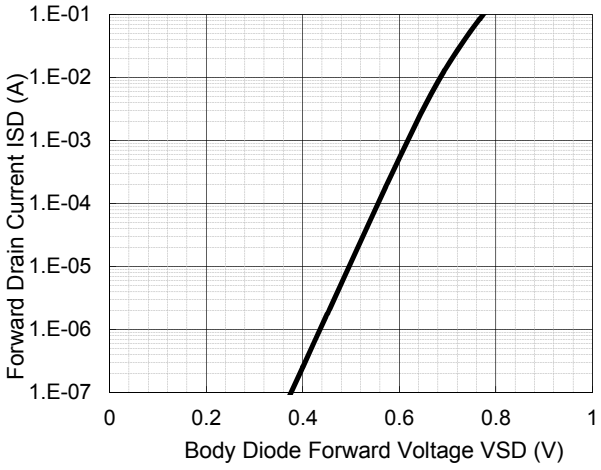
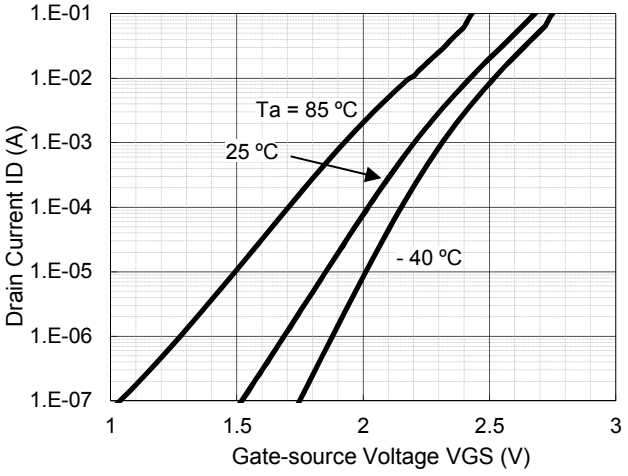
Technical Data (reference)

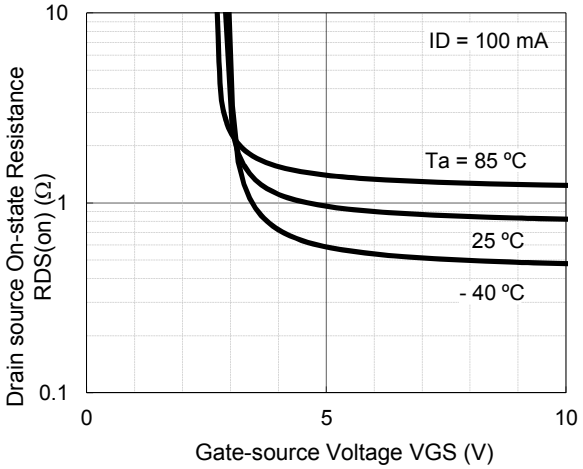
ISD - VSD



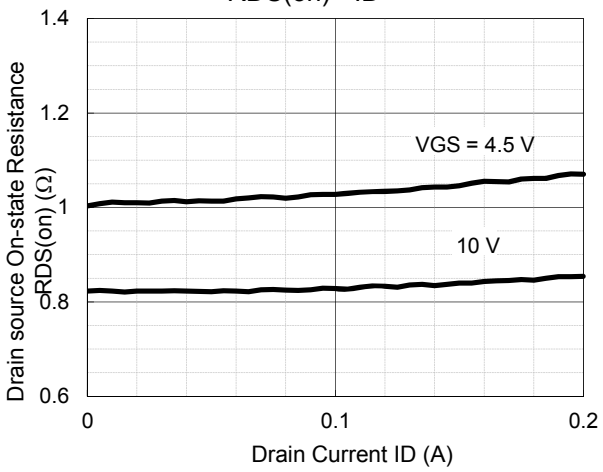
ID - VGS



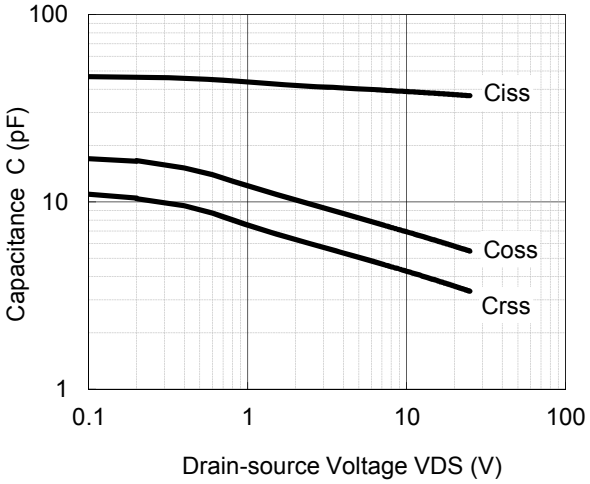
RDS(on) - VGS



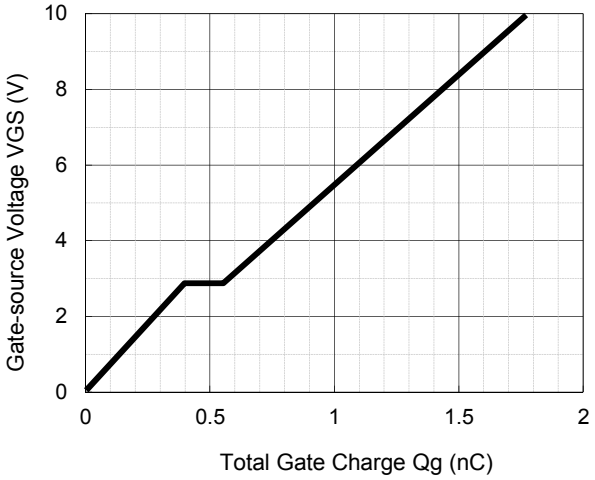
RDS(on) - ID



Capacitance - VDS



Dynamic Input/Output Characteristics



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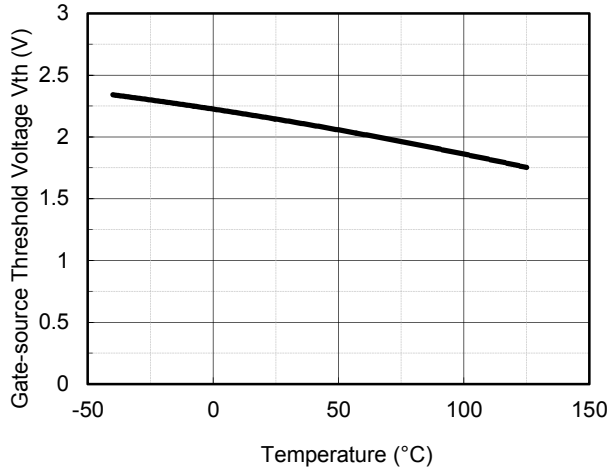
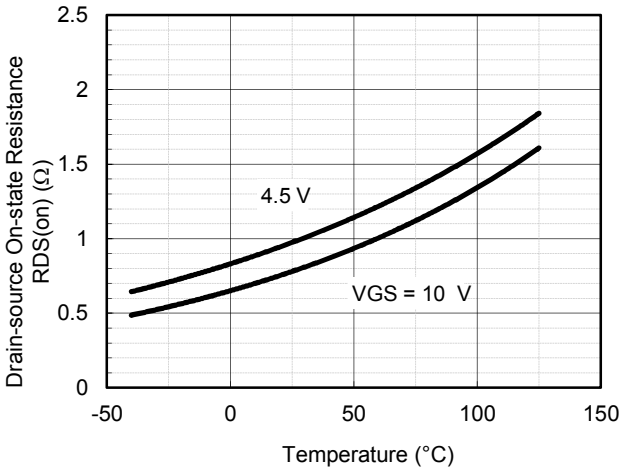
Technical Data (reference)

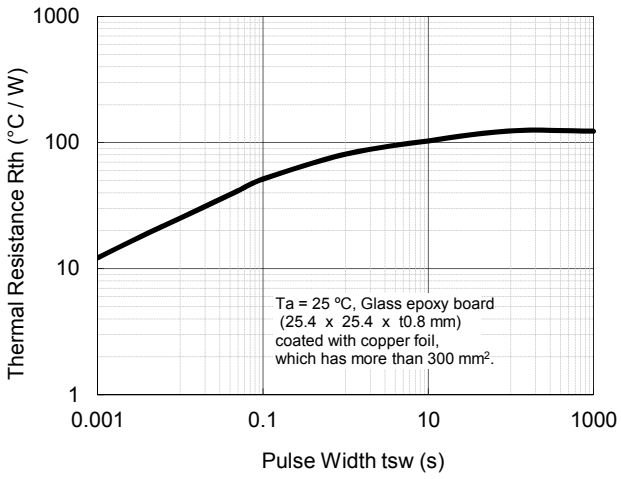
Vth - Ta



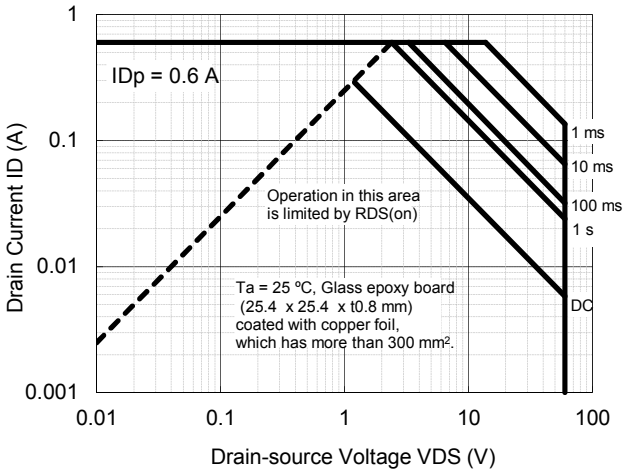
RDS(on) - Ta



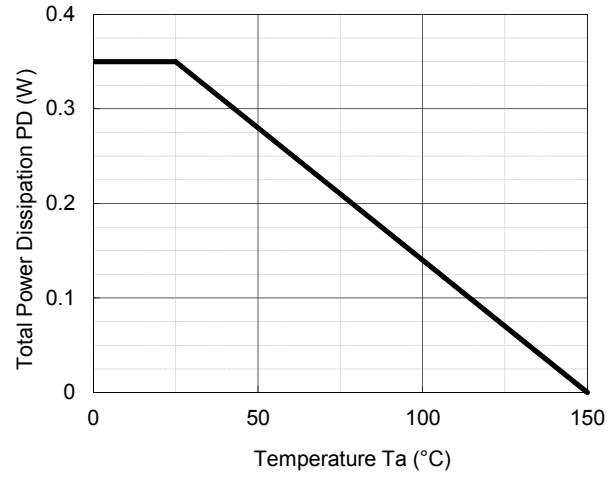
Rth - tsw



Safe Operating Area



PD - Ta



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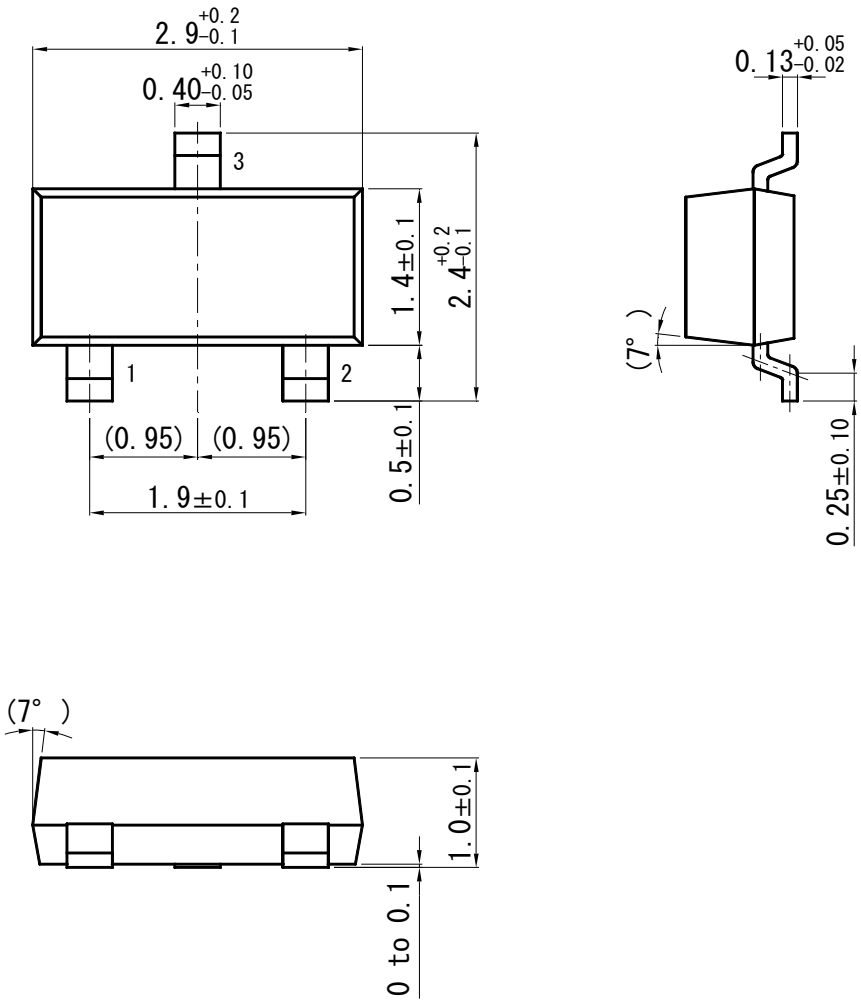
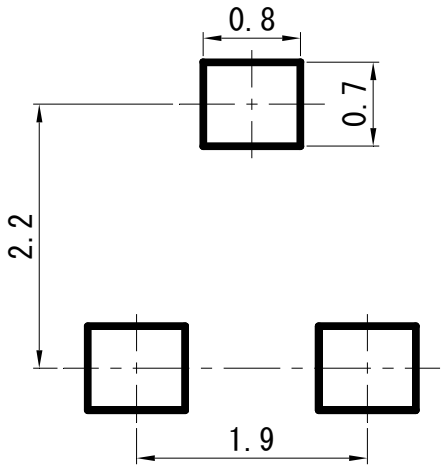
NMini3-R1-B

Unit : mm



■ Land Pattern (Reference) (Unit : mm)



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