

FC4B22690L

Gate resistor installed Dual N-channel MOS FET
For lithium-ion secondary battery protection circuits

■ Features

- Source-source On-state Resistance : $R_{SS(on)}$ typ. = 30 mΩ (VGS = 4.0 V)
- CSP (Chip Size Package)
- Halogen-free / RoHS compliant (EU RoHS / UL-94 V-0 / MSL : Level 1)

■ Marking Symbol : 6K

■ Packaging

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

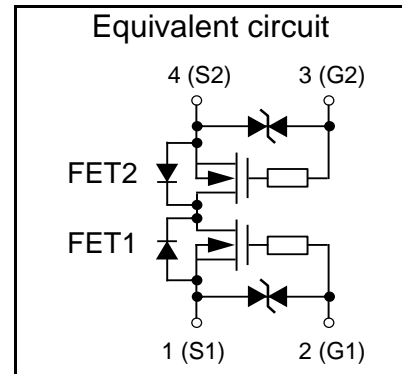
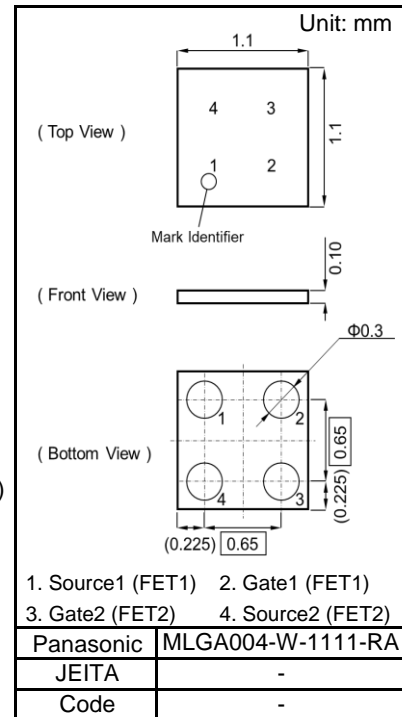
■ Absolute Maximum Ratings Ta = 25 °C

Parameter	Symbol	Rating	Unit	
Source-source Voltage	VSS	20	V	
Gate-source Voltage	VGS	±12	V	
Source Current	DC	IS1 ^{*1}	3.4	A
		IS2 ^{*2}	5.6	
		IS3 ^{*3}	7.3	
	Pulsed ^{*4}	ISp	34	
Total Power Dissipation	DC	PD1 ^{*1}	0.42	W
		PD2 ^{*2}	1.1	
		PD3 ^{*3}	1.9	
Channel Temperature	Tch	150	°C	
Storage Temperature Range	Tstg	-55 to +150	°C	

■ Thermal Characteristics Ta = 25 °C

Parameter	Symbol	Rating	Unit
Thermal Resistance (ch-a)	Rth1 ^{*1}	292	°C / W
	Rth2 ^{*2}	113	
	Rth3 ^{*3}	66	

- Note
- *1 Mounted on FR4 board (25.4 mm × 25.4 mm × t1.0 mm).
FR4 board partially covered with copper pad (18 mm² area, 36 μm thickness).
 - *2 Mounted on FR4 board (25.4 mm × 25.4 mm × t1.0 mm).
FR4 board fully covered with copper pad (608 mm² area, 36 μm thickness).
 - *3 Mounted on ceramic board (70 mm × 70 mm × t1.0 mm).
 - *4 t = 10 μs, Duty Cycle ≤ 1 %.



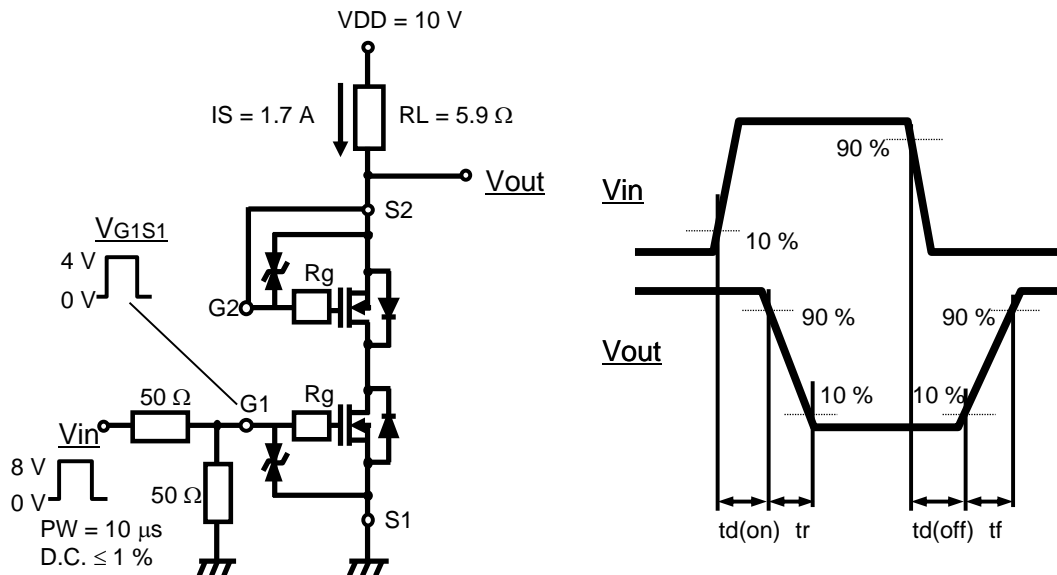
■ Electrical Characteristics Ta = 25 °C ± 3 °C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-source Breakdown Voltage	VSSS	IS = 1 mA, VGS = 0 V	20			V
Zero Gate Voltage Source Current	ISSS	VSS = 20 V, VGS = 0 V			1.0	μA
Gate-source Leakage Current	IGSS1	VGS = ±8 V, VSS = 0 V			±1.0	μA
	IGSS2	VGS = ±3.8 V, VSS = 0 V			±0.1	
Gate-source Threshold Voltage	Vth	IS = 0.16 mA, VSS = 10 V	0.35	0.9	1.4	V
Source-source On-state Resistance	RSS(on)1	IS = 1.7 A, VGS = 4.5 V	23	28	32	mΩ
	RSS(on)2	IS = 1.7 A, VGS = 4.1 V	23.5	29.5	34	
	RSS(on)3	IS = 1.7 A, VGS = 4.0 V	24	30	35	
	RSS(on)4	IS = 1.7 A, VGS = 3.8 V	24	30.5	36	
	RSS(on)5	IS = 1.7 A, VGS = 3.7 V	24.5	31	37	
	RSS(on)6	IS = 1.7 A, VGS = 3.1 V	25	33	40	
	RSS(on)7	IS = 1.7 A, VGS = 2.5 V	26	36	50	
Body Diode Forward Voltage	VF(s-s)	IF = 1.7 A, VGS = 0 V		0.8	1.2	V
Input Capacitance *1	Ciss	VSS = 10 V, VGS = 0 V, f = 1 kHz		426		pF
Output Capacitance *1	Coss			84		
Reverse Transfer Capacitance *1	Crss			71		
Turn-on Delay Time *1,*2	td(on)	VDD = 10 V, VGS = 0 to 4 V IS = 1.7 A		0.11		μs
Rise Time *1,*2	tr			0.28		
Turn-off Delay Time *1,*2	td(off)	VDD = 10 V, VGS = 4 to 0 V IS = 1.7 A		0.66		μs
Fall Time *1,*2	tf			0.46		
Total Gate Charge *1	Qg	VDD = 10 V		4.5		nC
Gate-source Charge *1	Qgs	VGS = 0 to 4 V		1.1		
Gate-drain Charge *1	Qgd	IS = 3.4 A		1.2		

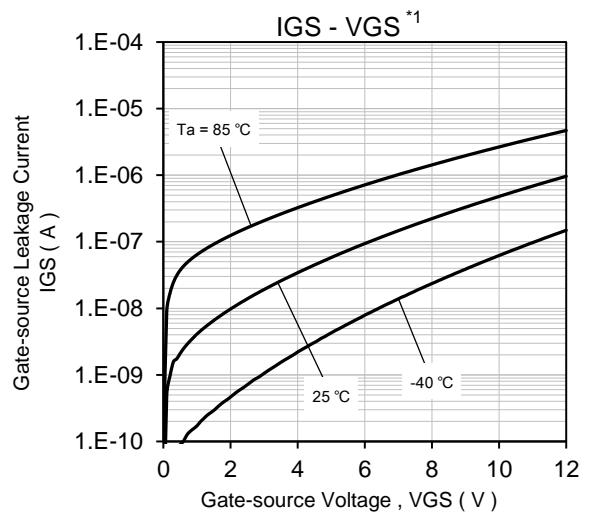
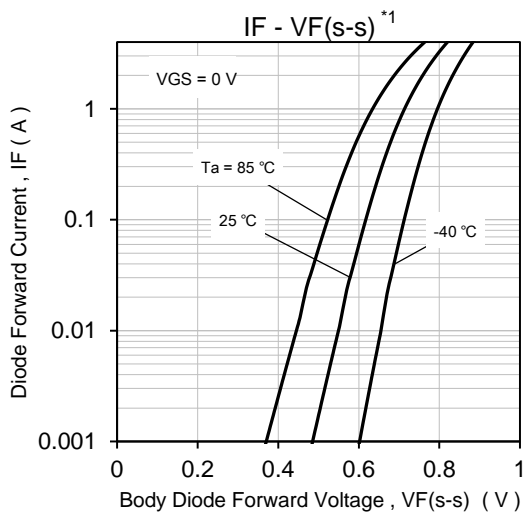
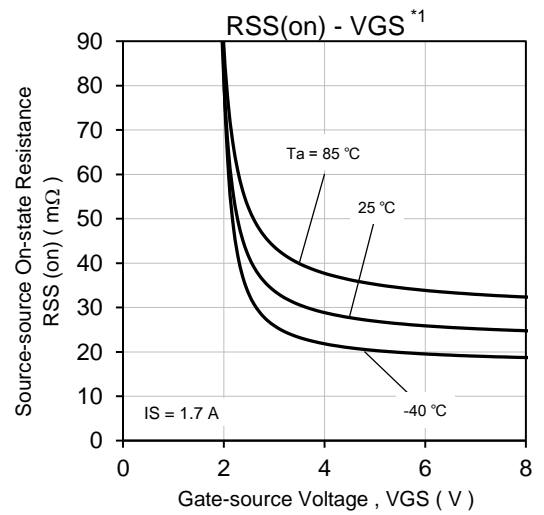
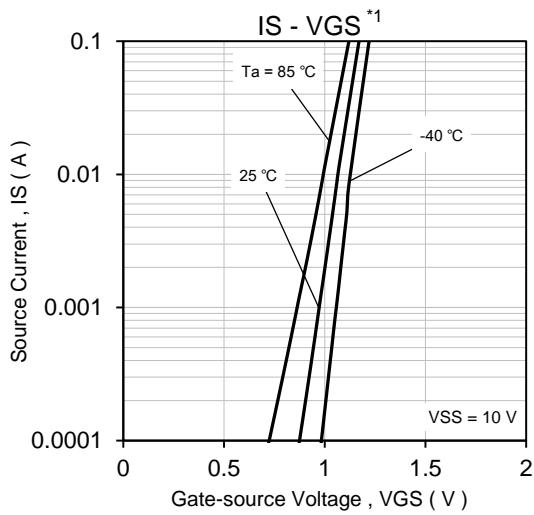
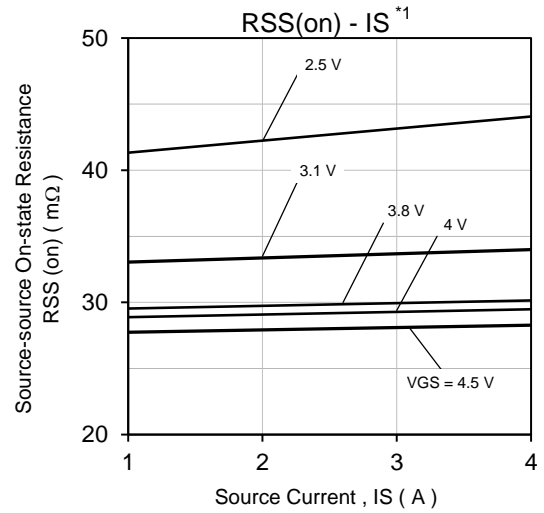
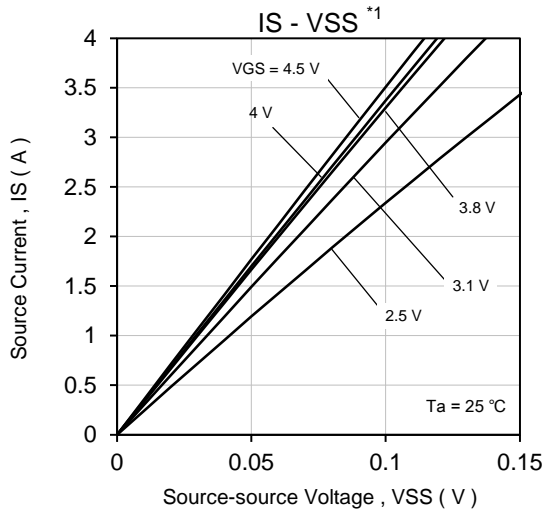
Note Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.

*1 Guaranteed by design, not subject to production testing.

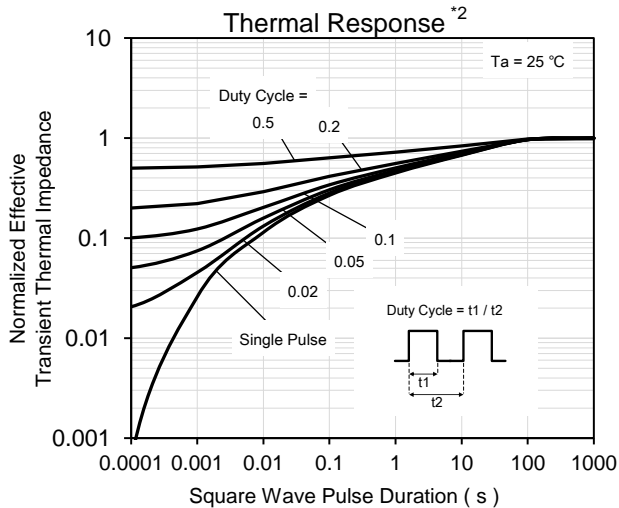
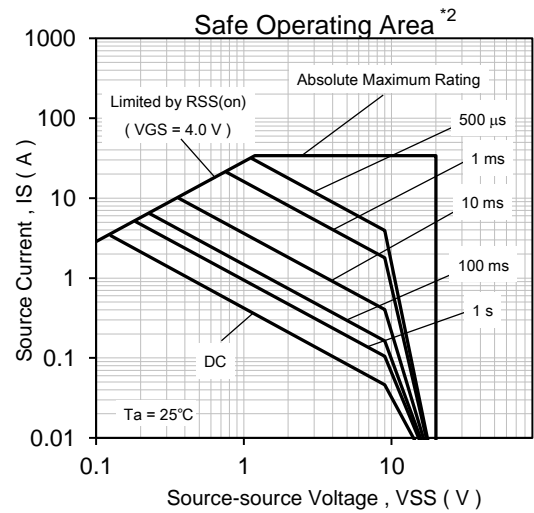
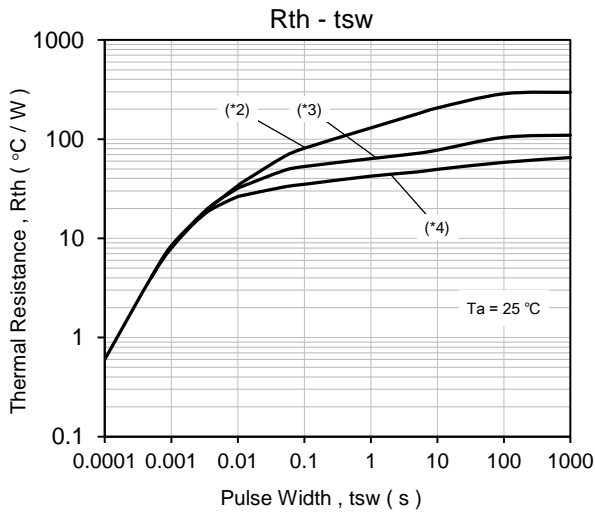
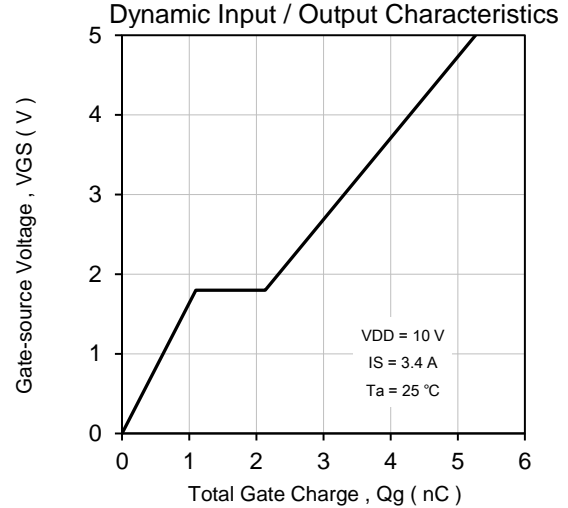
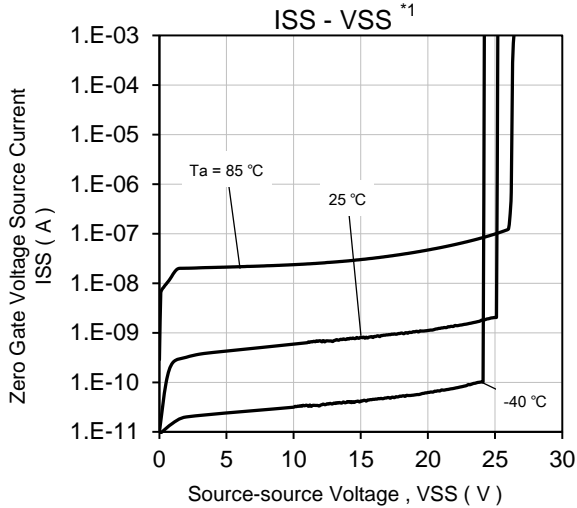
*2 Measurement circuit for Turn-on Delay Time / Rise Time / Turn-off Delay Time / Fall Time.



Technical Data (reference)



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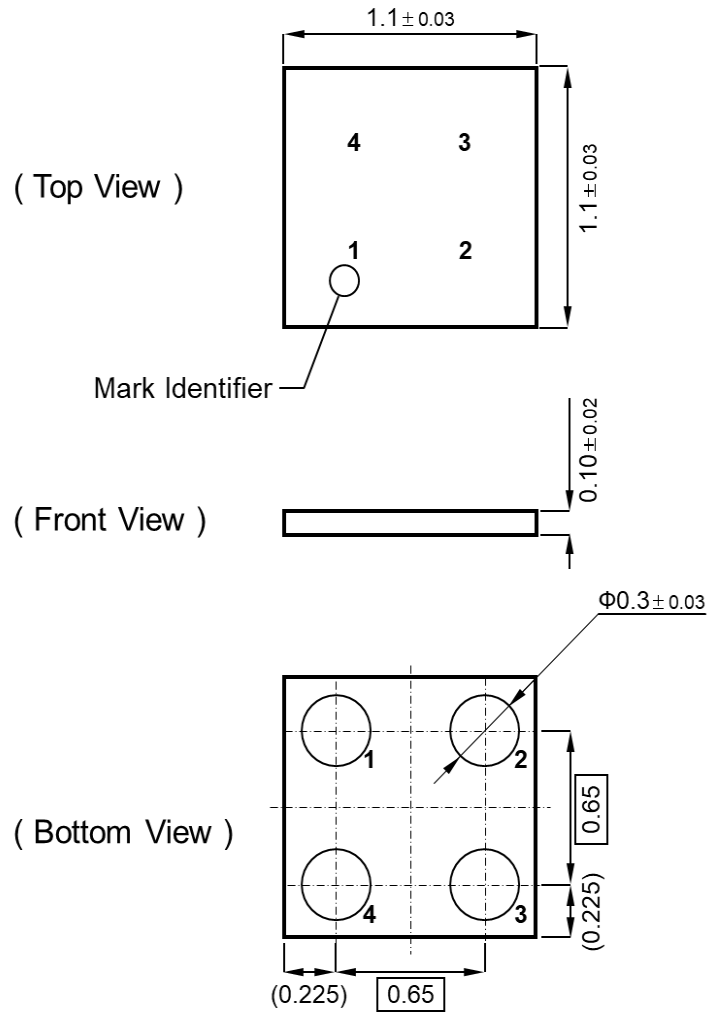


Note

- *1 Pulse measurement.
- *2 Mounted on FR4 board (25.4 mm \times 25.4 mm \times t1.0 mm).
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■ Outline

Unit: mm



■ Land & Stencil Pattern (reference)

Unit: mm

