

## FCAB21490L1

### Gate resistor installed Dual N-channel MOS FET

For lithium-ion secondary battery protection circuits

#### ■ Features

- Source-source ON resistance:RSS(on) typ. = 2.2 mΩ (VGS = 3.8 V)
- CSP(Chip Size Package)
- Halogen-free / RoHS compliant (EU RoHS / UL-94 V-0 / MSL : Level 1)

#### ■ Marking Symbol: 7F

#### ■ Packaging

Embossed type (Thermo-compression sealing) : 1 000 pcs / reel (standard)

#### ■ Absolute Maximum Ratings Ta = 25 °C

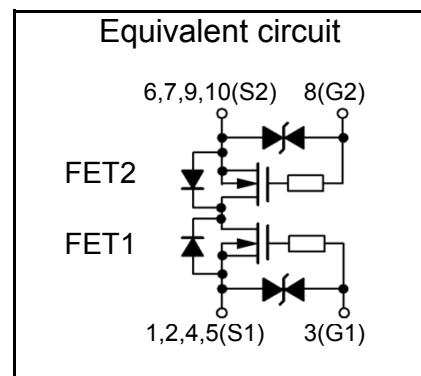
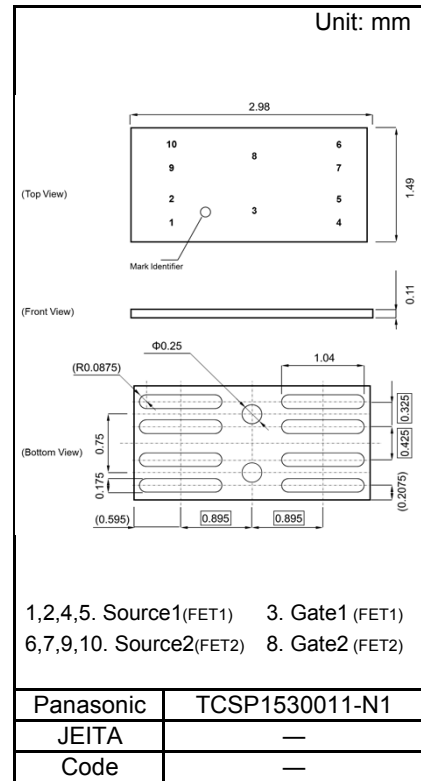
Parameter	Symbol	Rating	Unit
Source-source Voltage	VSS	12	V
Gate-source Voltage	VGS	±8	V
Source Current	DC <sup>*1</sup>	IS1	13.5
	DC <sup>*2</sup>	IS2	29
	Pulse <sup>*3</sup>	ISp	135
Total Power Dissipation	DC <sup>*1</sup>	PD1	0.54
	DC <sup>*2</sup>	PD2	3.5
Channel Temperature	Tch	150	°C
Storage Temperature Range	Tstg	-55 to +150	°C

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 %



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

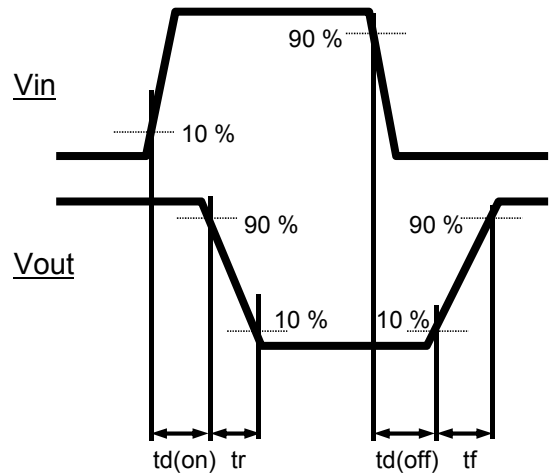
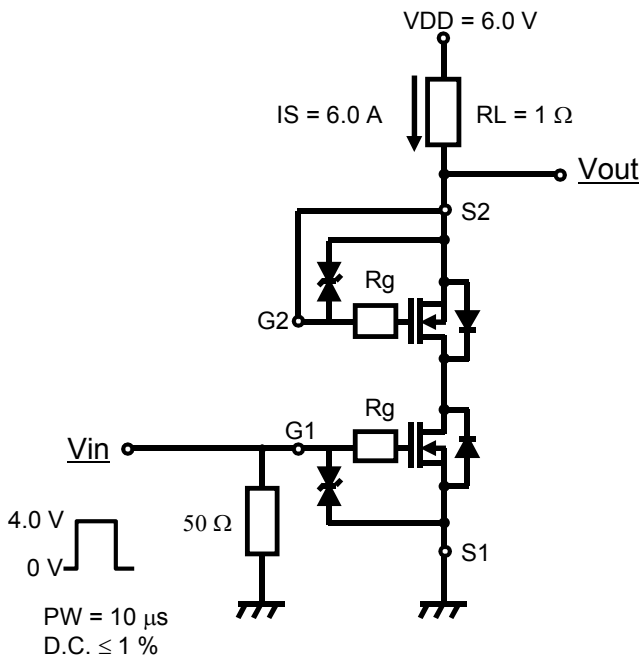
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-source Breakdown Voltage	VSSS	IS = 1.0 mA, VGS = 0 V	12			V
Zero Gate Voltage Source Current	ISSS	VSS = 12 V, VGS = 0 V			1.0	μA
Gate-source Leakage Current	IGSS	VGS = ±8 V, VSS = 0 V			±10	μA
		VGS = ±5 V, VSS = 0 V			±1.0	
Gate-source Threshold Voltage	Vth	IS = 1.11 mA, VSS = 10 V	0.35	0.90	1.4	V
Source-source On-state Resistance	RSS(on)1	IS = 6.0 A, VGS = 4.5 V	1.55	2.1	2.75	mΩ
	RSS(on)2	IS = 6.0 A, VGS = 3.8 V	1.6	2.2	2.85	
	RSS(on)3	IS = 6.0 A, VGS = 3.1 V	1.65	2.4	3.95	
	RSS(on)4	IS = 6.0 A, VGS = 2.5 V	1.9	3.1	6.1	
Body Diode Forward Voltage	VF(s-s)	IF = 6.0 A, VGS = 0 V		0.6	1.2	V
Input Capacitance <sup>*1</sup>	Ciss	VSS = 10 V, VGS = 0 V, f = 1 kHz		3570		pF
Output Capacitance <sup>*1</sup>	Coss			460		
Reverse Transfer Capacitance <sup>*1</sup>	Crss			410		
Turn-on delay Time <sup>*1,*2</sup>	td(on)	VDD = 6.0 V, VGS = 0 to 4.0 V		0.7		μs
Rise Time <sup>*1,*2</sup>	tr	IS = 6.0 A		1.5		
Turn-off delay Time <sup>*1,*2</sup>	td(off)	VDD = 6.0 V, VGS = 4.0 to 0 V		6.7		μs
Fall Time <sup>*1,*2</sup>	tf	IS = 6.0 A		4.1		
Total Gate Charge <sup>*1</sup>	Qg	VDD = 6.0 V		25		nC
Gate-source Charge <sup>*1</sup>	Qgs	VGS = 0 to 4.0 V,		12		
Gate-drain Charge <sup>*1</sup>	Qgd	IS = 6.0 A		6		

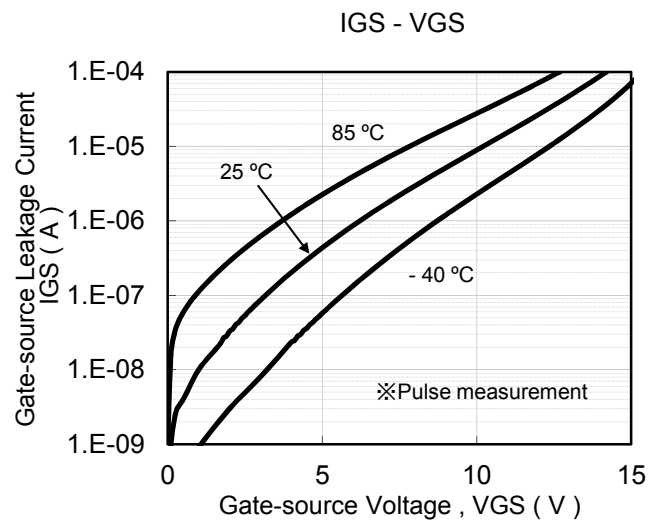
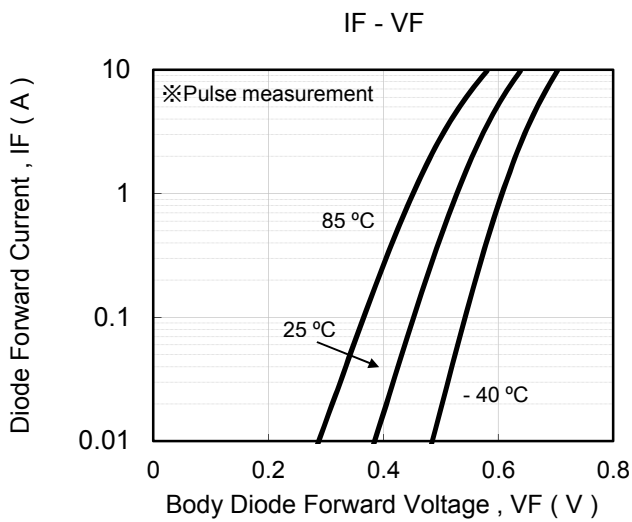
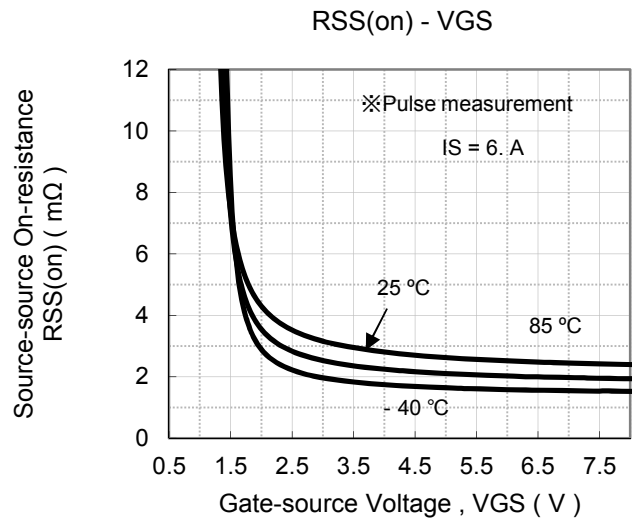
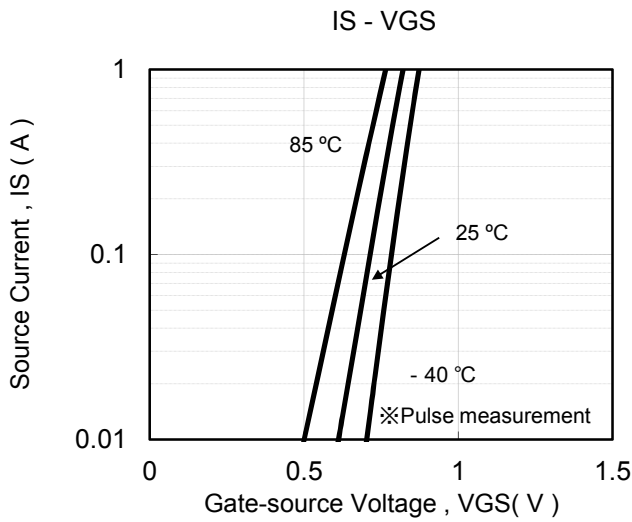
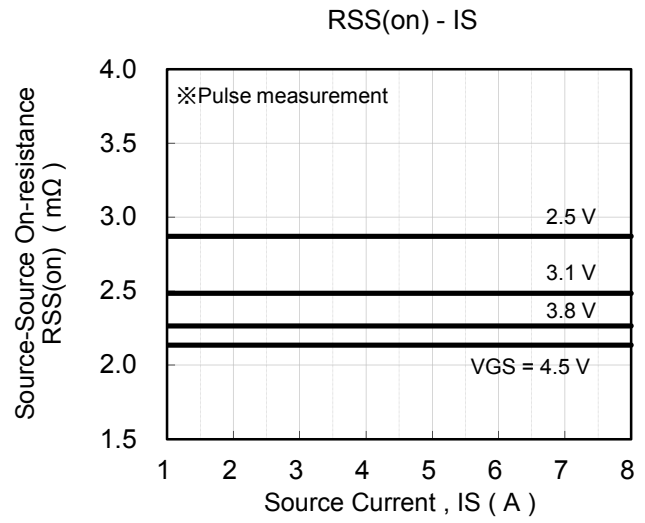
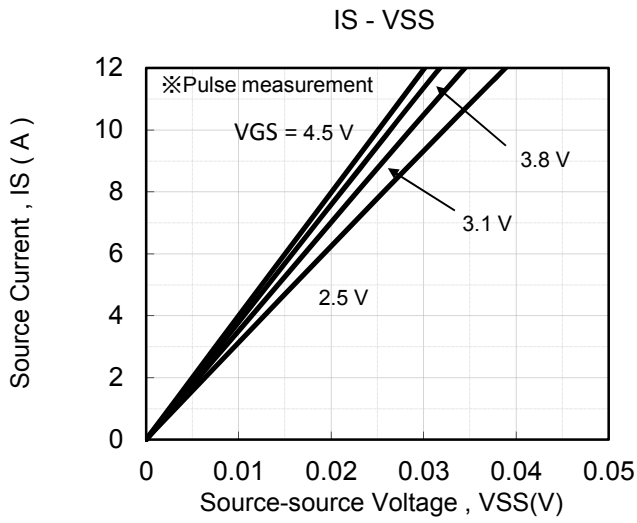
Note Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.

\*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

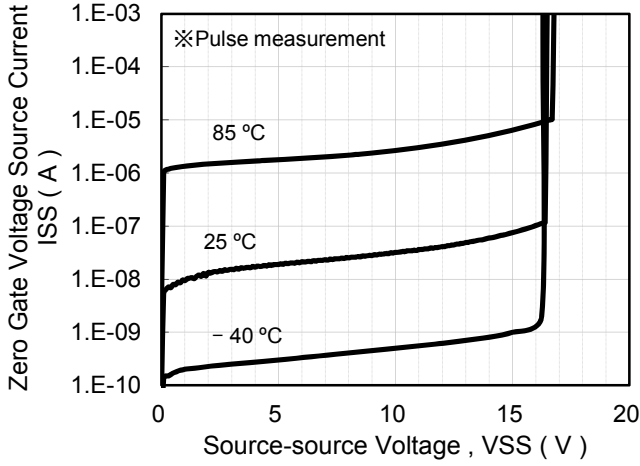
Note2: Measurement circuit



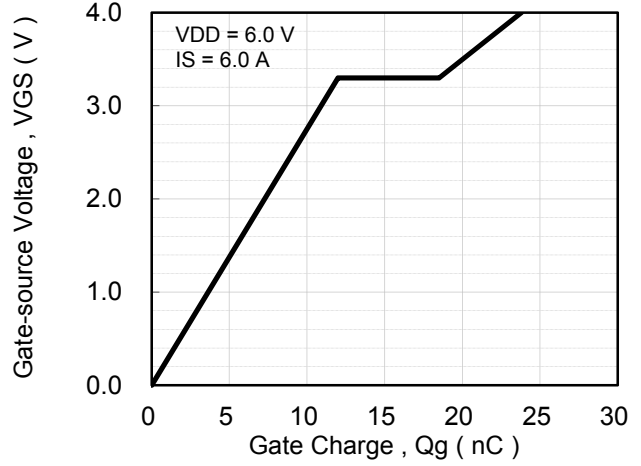




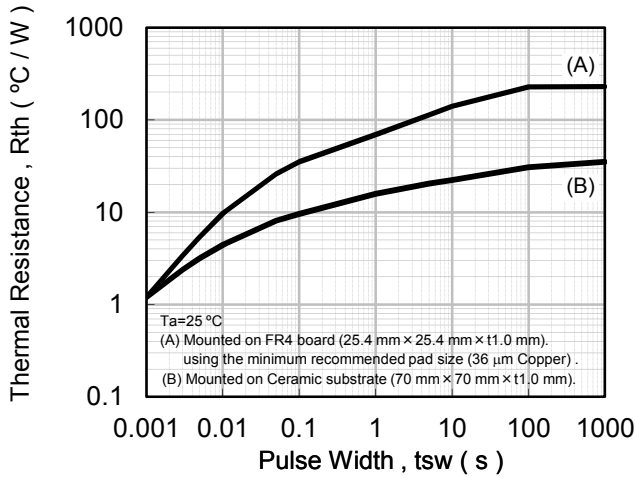
ISS - VSS



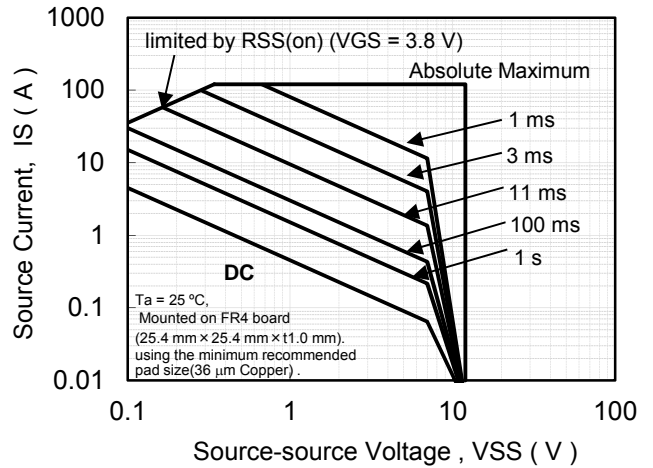
Dynamic Input / Output Characteristics



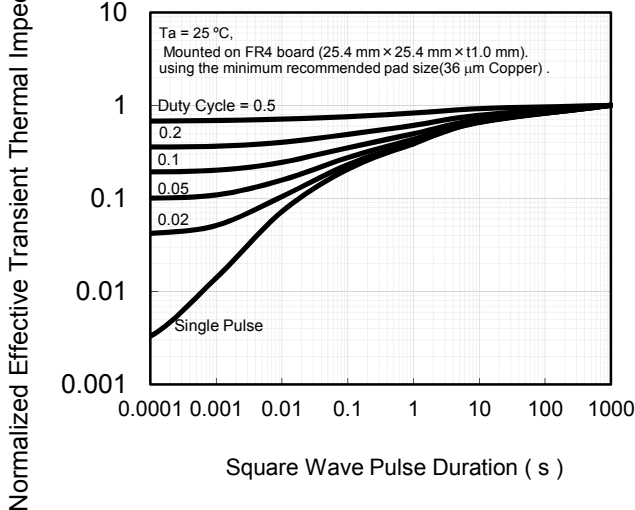
Rth - tsw



Safe Operating Area

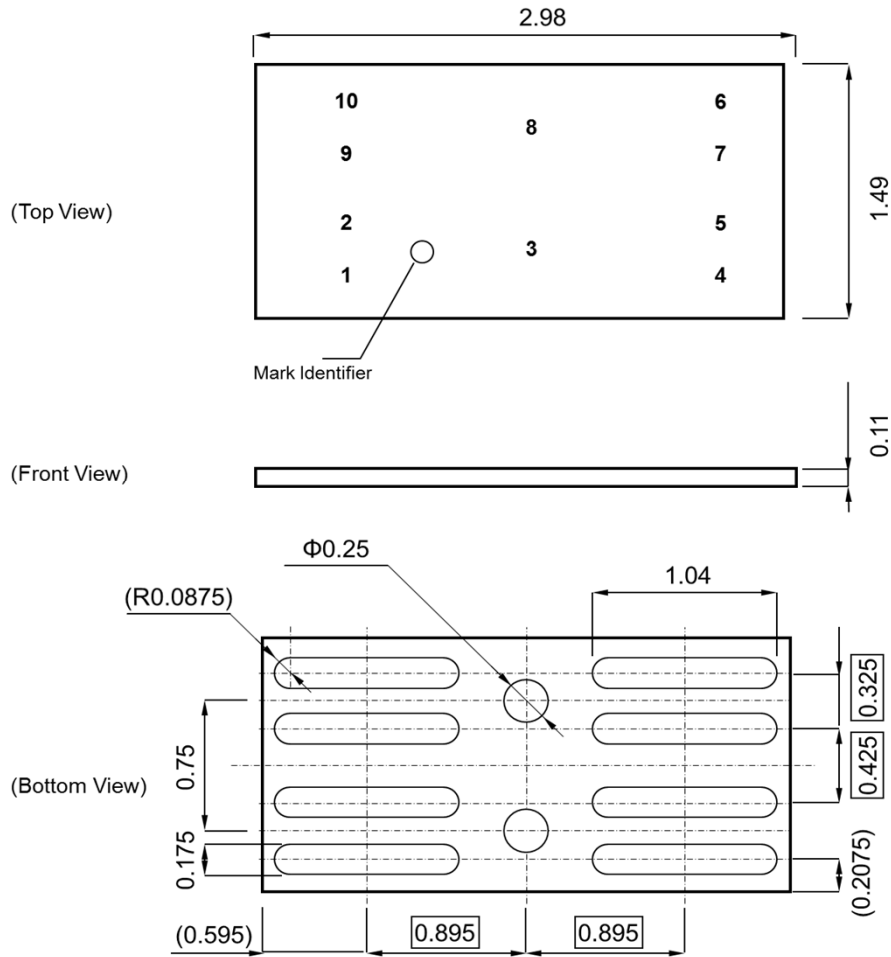


Thermal Response



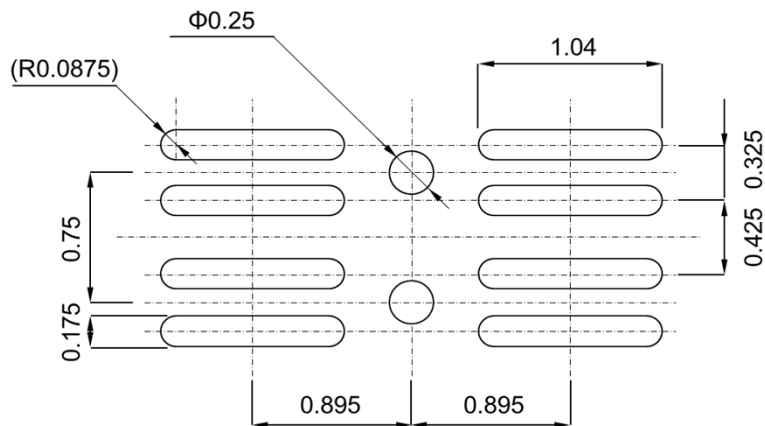
■ Outline

Unit: mm



■ Land Pattern (Reference)

Unit: mm



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