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# FCAB22370L1

## Gate resistor installed Dual N-channel MOS FET

For lithium-ion secondary battery protection circuits

### ■ Features

- Low source-source ON resistance:  $R_{ss(on)}$  typ. = 3.3 mΩ (VGS = 3.8 V)
- CSP (Chip Size Package)
- RoHS compliant (EU RoHS / MSL: Level 1 compliant)

### ■ Marking Symbol: 3P

### ■ Packaging

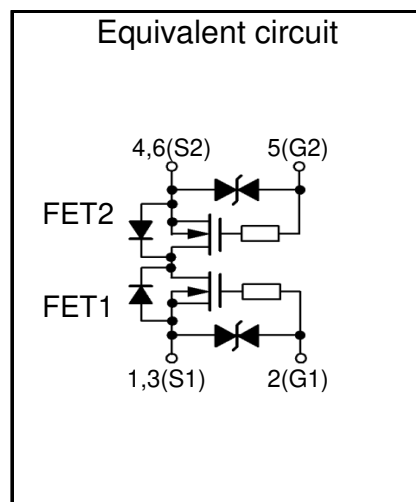
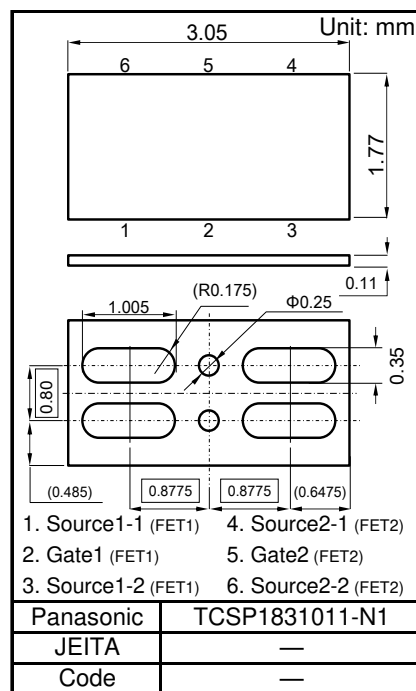
Embossed type (Thermo-compression sealing) : 1 000 pcs / reel (standard)

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

Parameter	Symbol	Rating	Unit
Source-source Voltage	VSS	20	V
Gate-source Voltage	VGS	±12	V
Source Current (DC) <sup>*1</sup>	IS	10	A
Source Current (Pulsed) <sup>*1,*2</sup>	ISp	100	A
Total Power Dissipation <sup>*1</sup>	PD	0.45	W
Channel Temperature	Tch	150	°C
Storage Temperature Range	Tstg	-55 to +150	°C
Thermal Resistance (ch-a)	Rth(ch-a)	278	°C/W

Note <sup>\*1</sup> Mounted on FR4 board ( 25.4 mm × 25.4 mm × 1.0 mm )  
 using the minimum recommended pad size (36μm Copper).

<sup>\*2</sup> t = 10 μs, Duty Cycle ≤ 1 %



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

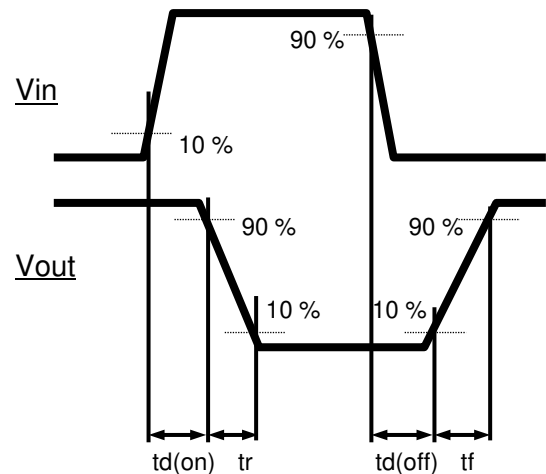
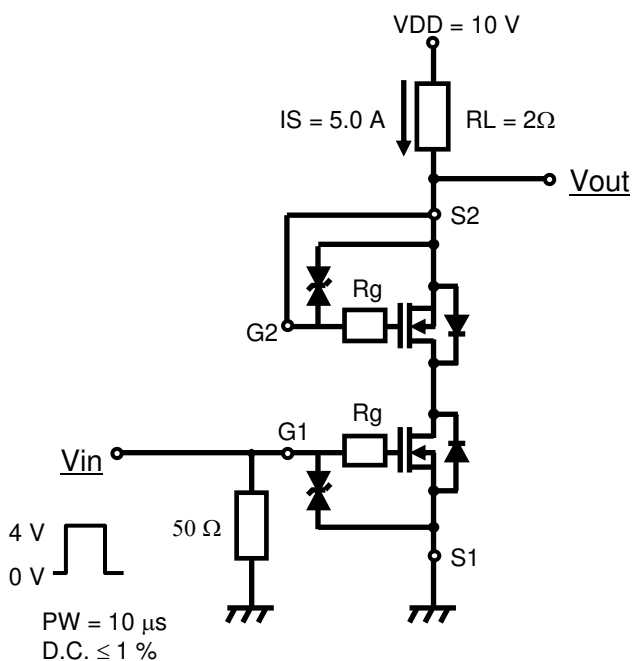
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-source Breakdown Voltage	VSSS	IS = 1 mA, VGS = 0 V	20			V
Zero Gate Voltage Source Current	ISSS	VSS = 20 V, VGS = 0 V			1.0	μA
Gate-source Leakage Current	IGSS	VGS = ±8 V, VSS = 0 V			±10	μA
		VGS = ±5 V, VSS = 0 V			±1.0	
Gate-source Threshold Voltage	Vth	IS = 1.41 mA, VSS = 10 V	0.35	0.90	1.4	V
Source-source On-state Resistance	RSS(on)1	IS = 5.0 A, VGS = 4.5 V	2.1	3.1	4.2	mΩ
	RSS(on)2	IS = 5.0 A, VGS = 3.8 V	2.2	3.3	4.3	
	RSS(on)3	IS = 5.0 A, VGS = 3.1 V	2.4	3.8	6.0	
	RSS(on)4	IS = 5.0 A, VGS = 2.5 V	2.6	4.6	9.0	
Body Diode Forward Voltage	VF(s-s)	IF = 5.0 A, VGS = 0 V		0.8	1.2	V
Input Capacitance <sup>*1</sup>	Ciss	VSS = 10 V, VGS = 0 V, f = 1 kHz		3700		pF
Output Capacitance <sup>*1</sup>	Coss			380		
Reverse Transfer Capacitance <sup>*1</sup>	Crss			340		
Turn-on delay Time <sup>*1,2</sup>	td(on)	VDD = 10 V, VGS = 0 to 4.0 V		0.9		μs
Rise Time <sup>*1,2</sup>	tr	IS = 5.0 A		2.0		
Turn-off delay Time <sup>*1,2</sup>	td(off)	VDD = 10 V, VGS = 4.0 to 0 V		6		μs
Fall Time <sup>*1,2</sup>	tf	IS = 5.0 A		3.7		
Total Gate Charge <sup>*1</sup>	Qg	VDD = 10 V		33		nC
Gate-source Charge <sup>*1</sup>	Qgs	VGS = 0 to 4.0 V,		11		
Gate-drain Charge <sup>*1</sup>	Qgd	IS = 5.0 A		9		
Gate Resistance <sup>*1</sup>	Rg	f = 1 kHz	400	700	1000	Ω

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

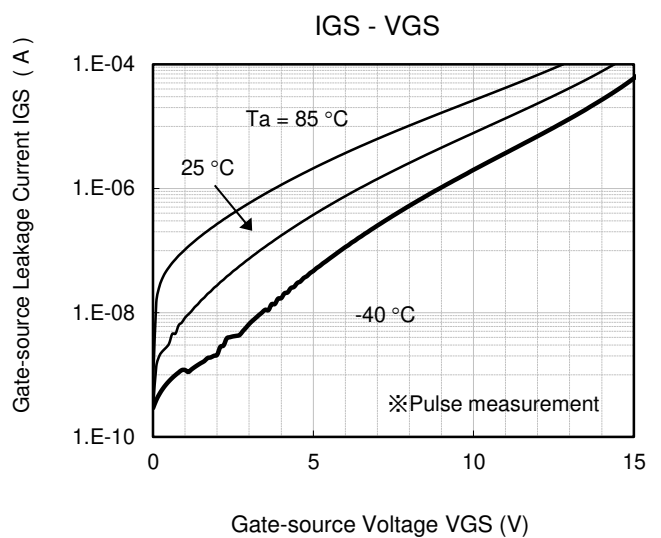
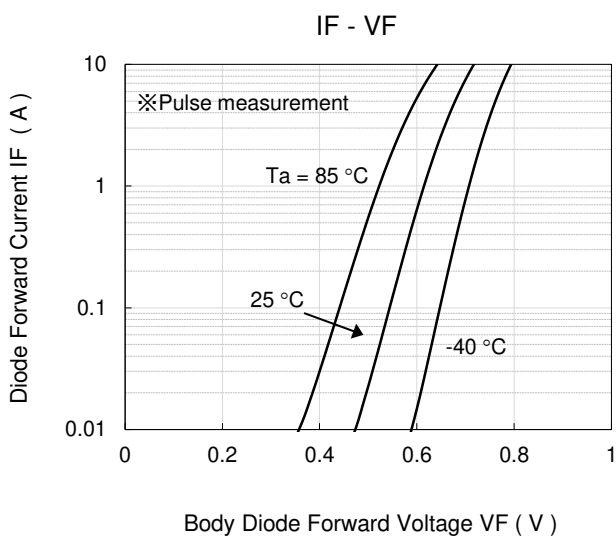
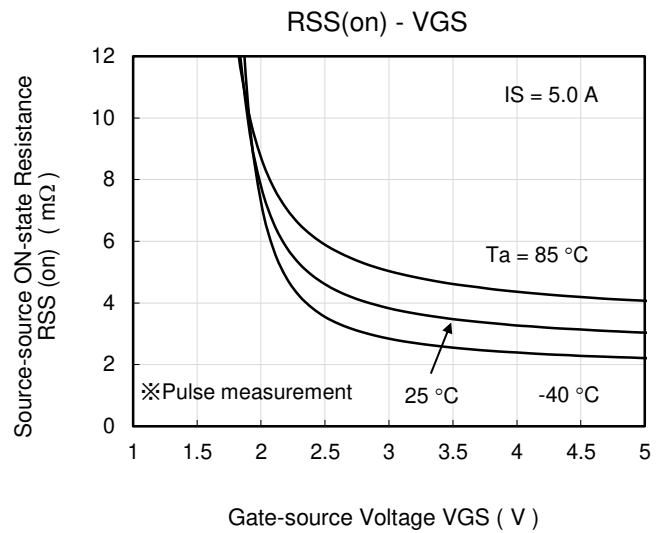
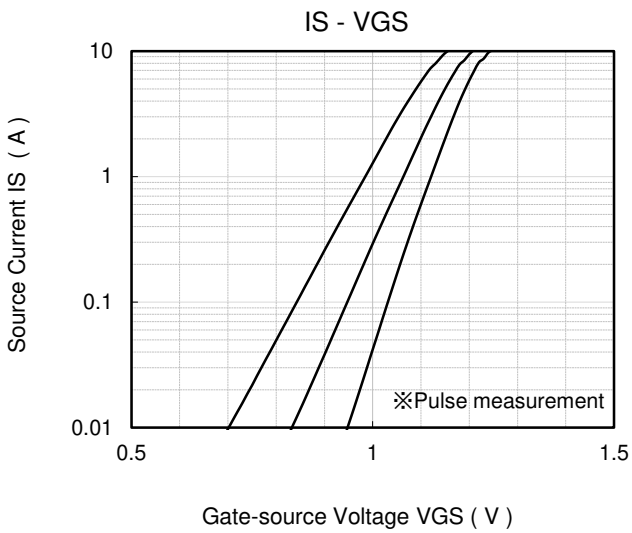
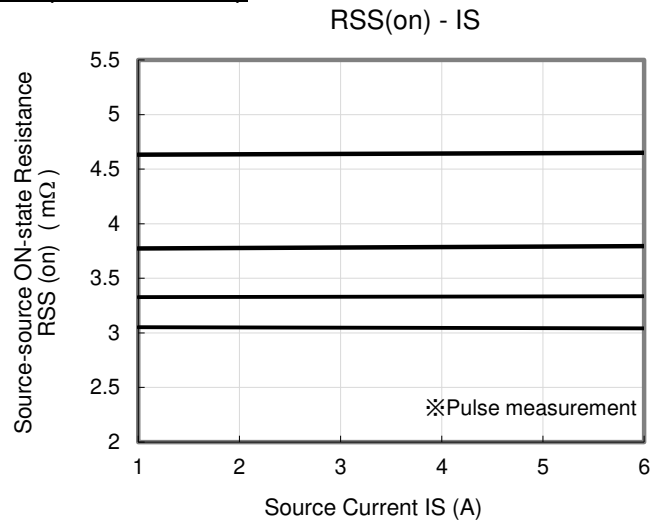
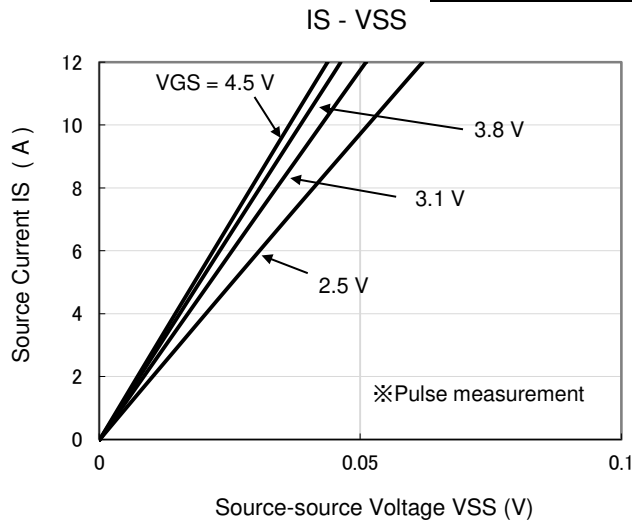
\*2 Measurement circuit for Turn-on Delay Time / Rise Time / Turn-off Delay Time / Fall Time

Note2 : Measurement circuit



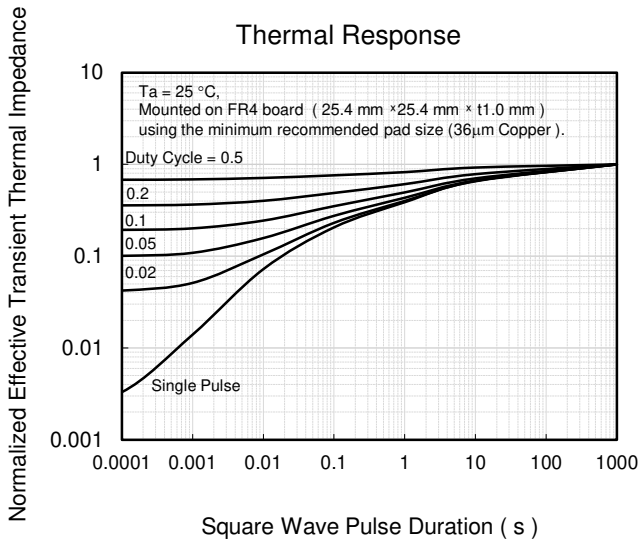
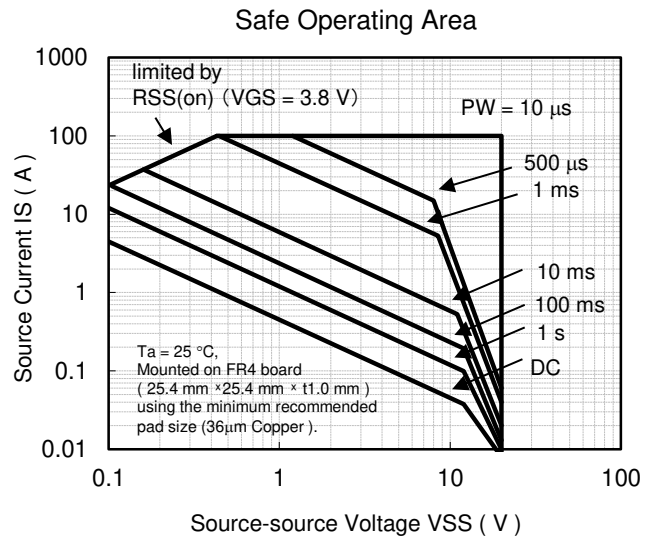
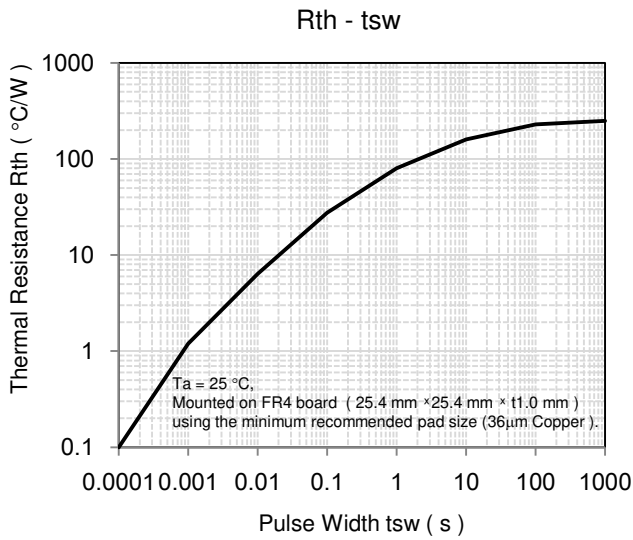
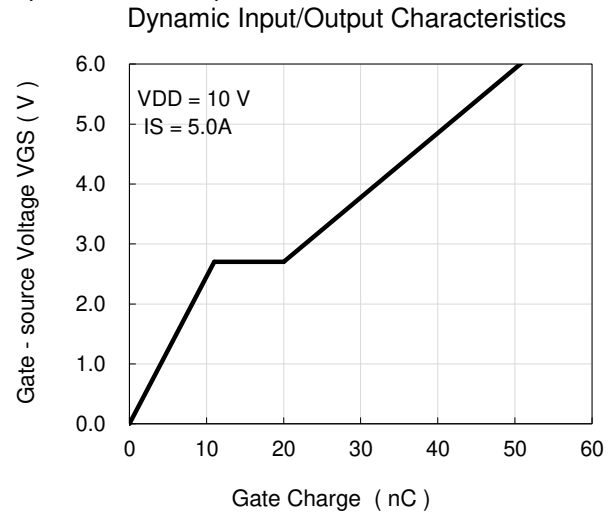
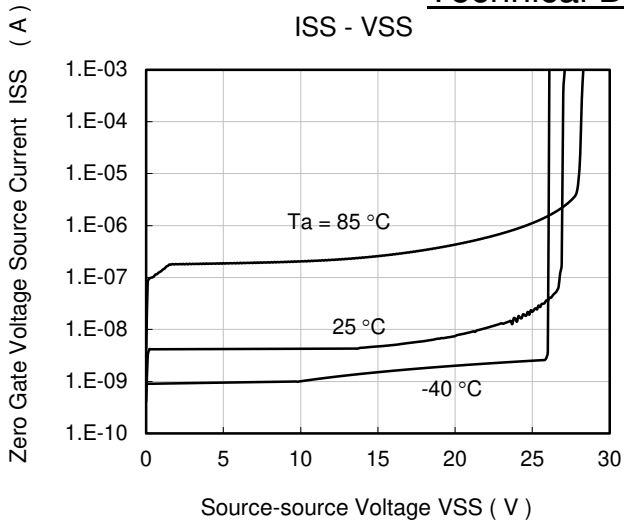


Technical Data ( reference )



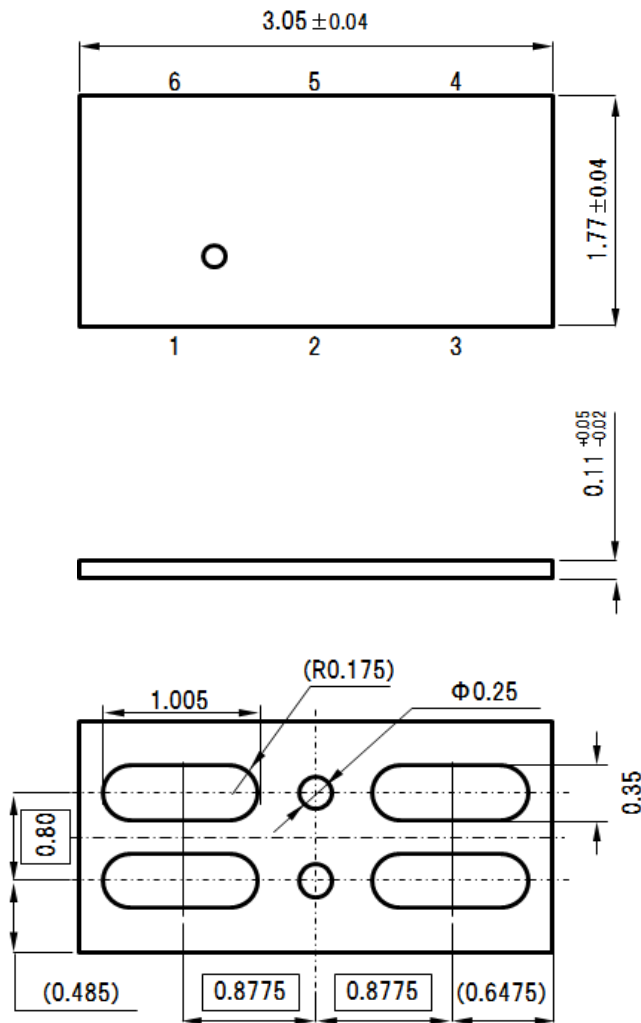


Technical Data ( reference )



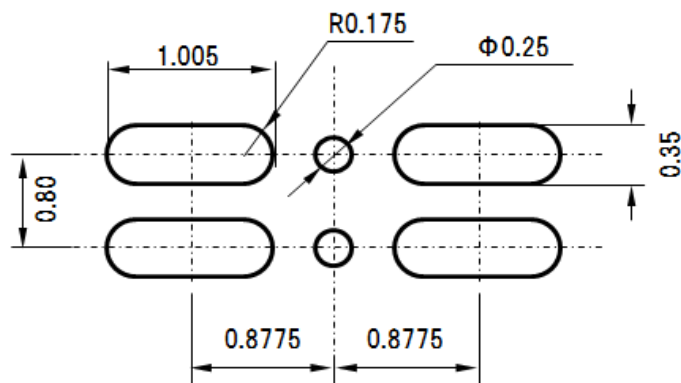
■ Outline (TCSP1831011-N1)

Unit: mm



■ Land Pattern (Reference)

Unit: mm



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