



# FC4B22180L1

## 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. = 10 m $\Omega$  (VGS = 3.8 V)
- CSP (Chip Size Package)
- RoHS compliant (EU RoHS / MSL: Level 1 compliant)

■ Marking Symbol: 17

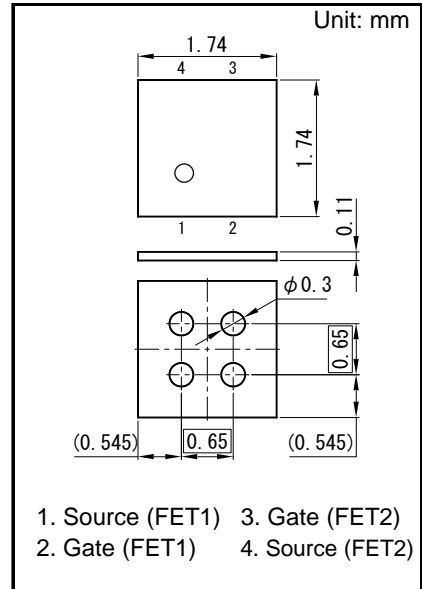
■ Packaging

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

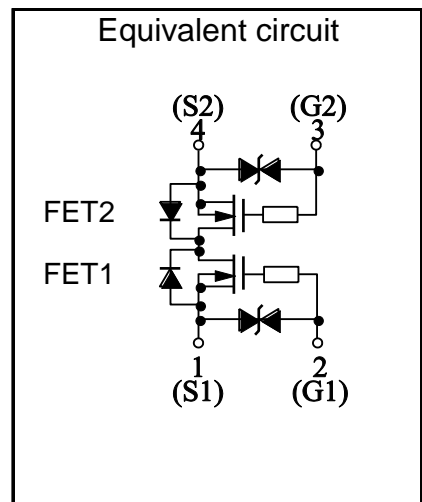
■ Absolute Maximum Ratings Ta = 25 °C

Parameter	Symbol	Rating	Unit	
Source-source Voltage	VSS	20	V	
Gate-source Voltage	VGS	±8	V	
Source Current	DC <sup>*1</sup>	IS1	5	A
	DC <sup>*2</sup>	IS2	10	A
	Pulse <sup>*3</sup>	ISp	50	A
Total Power Dissipation	DC <sup>*1</sup>	PD1	0.4	W
	DC <sup>*2</sup>	PD2	1.5	W
Channel Temperature	Tch	150	°C	
Storage Temperature Range	Tstg	-55 to +150	°C	
Thermal Resistance (ch-a)	DC <sup>*1</sup>	Rth1	312	°C/W
	DC <sup>*2</sup>	Rth2	83	°C/W

- Note \*1 Mounted on FR4 board  
 (25.4mm × 25.4mm × t1.0mm, 36 $\mu$ m Copper)  
 \*2 Mounted on Ceramic substrate  
 (70 mm × 70 mm × t1.0 mm).  
 \*3 t = 10  $\mu$ s, Duty Cycle ≤ 1 %



Panasonic	MLGA004-W-1717-RB
JEITA	—
Code	—



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

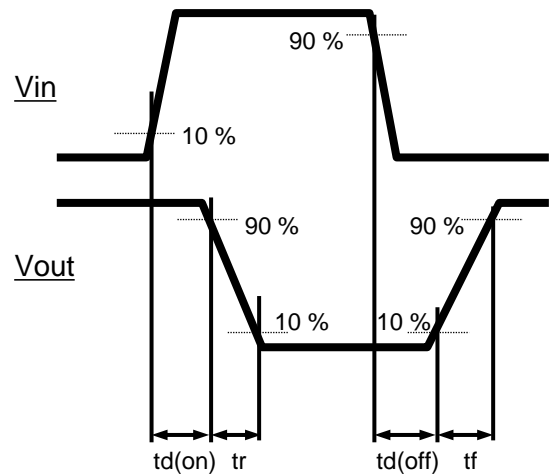
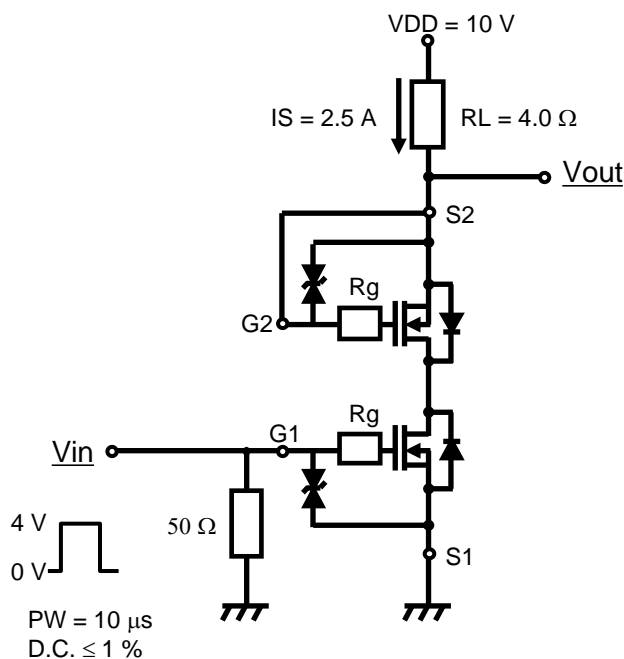
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-source Breakdown Voltage	VSSS	IS = 1 mA, VGS = 0 V	20			V
Zero Gate Voltage Source Current	ISSS	VSS = 20 V, VGS = 0 V			1.0	μA
Gate-source Leakage Current	IGSS	VGS = ±8 V, VSS = 0 V			±10	μA
		VGS = ±5 V, VSS = 0 V			±1.0	
Gate-source Threshold Voltage	Vth	IS = 0.64 mA, VSS = 10 V	0.35	0.90	1.4	V
Source-source On-state Resistance	RSS(on)1	IS = 2.5 A, VGS = 4.5 V	7	9.4	11.9	mΩ
	RSS(on)2	IS = 2.5 A, VGS = 3.8 V	7.3	10	12.9	
	RSS(on)3	IS = 2.5 A, VGS = 3.1 V	8.1	11.1	15.8	
	RSS(on)4	IS = 2.5 A, VGS = 2.5 V	8.6	13.4	22.6	
Body Diode Forward Voltage	VF(s-s)	IF = 2.5 A, VGS = 0 V		0.8	1.2	V
Input Capacitance <sup>*1</sup>	Ciss	VSS = 10 V, VGS = 0 V, f = 1 MHz		2440		pF
Output Capacitance <sup>*1</sup>	Coss			200		
Reverse Transfer Capacitance <sup>*1</sup>	Crss			160		
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 = 2.5 A		1.6		
Turn-off delay Time <sup>*1,*2</sup>	td(off)	VDD = 10 V, VGS = 4.0 to 0 V		5		μs
Fall Time <sup>*1,*2</sup>	tf	IS = 2.5 A		2.4		
Total Gate Charge <sup>*1</sup>	Qg	VDD = 10 V		23		nC
Gate-source Charge <sup>*1</sup>	Qgs	VGS = 0 to 4.0 V,		6		
Gate-drain Charge <sup>*1</sup>	Qgd	IS = 2.5 A		5		

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

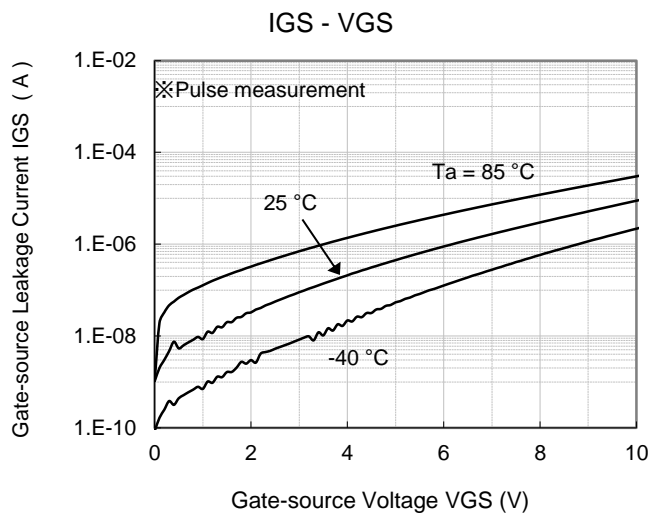
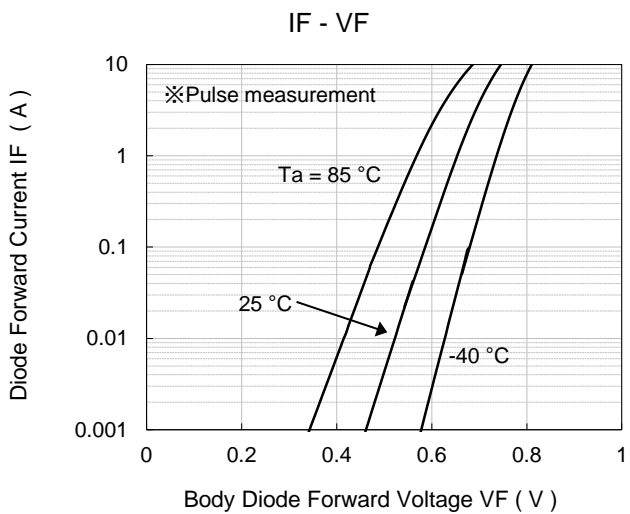
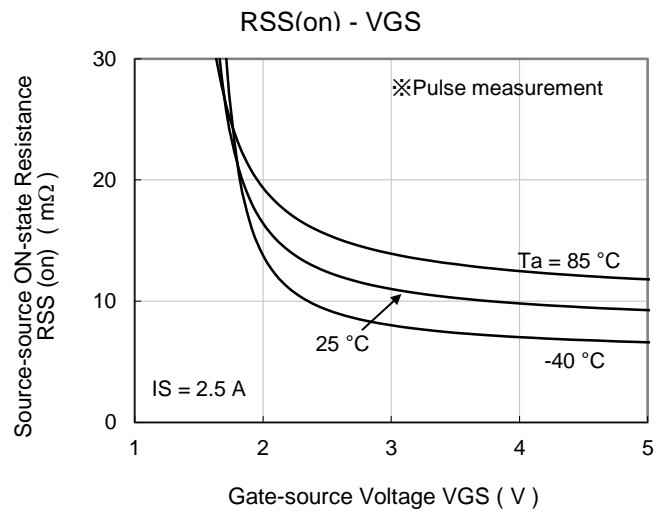
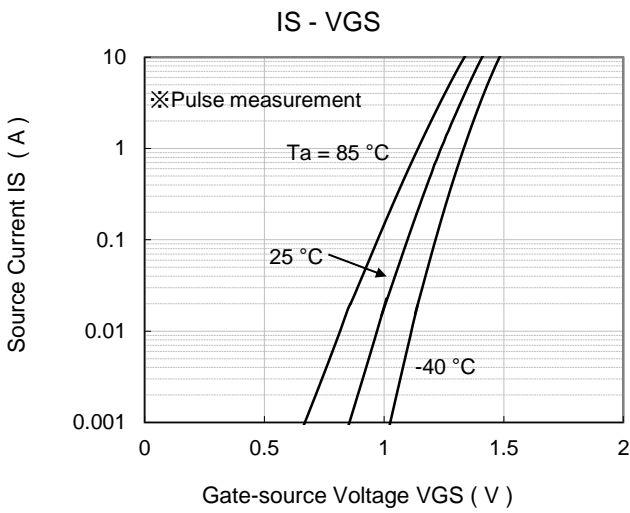
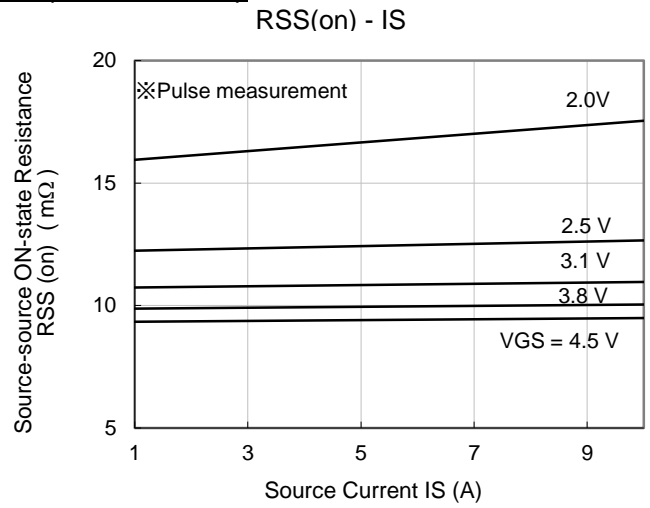
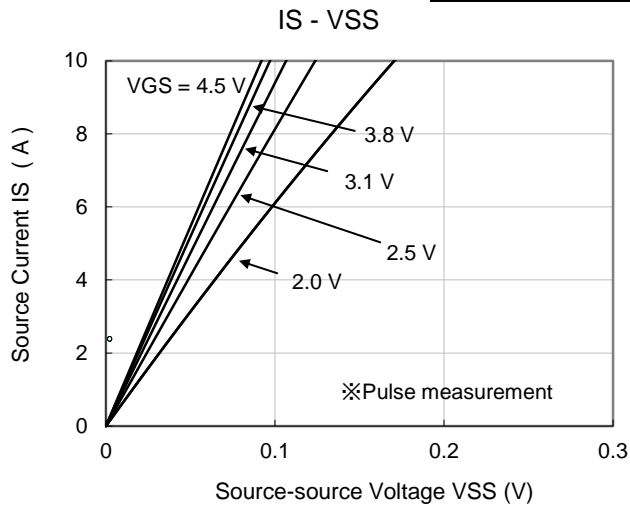
\*1 Guaranteed by design, not subject to production testing

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

Note2 : Measurement circuit

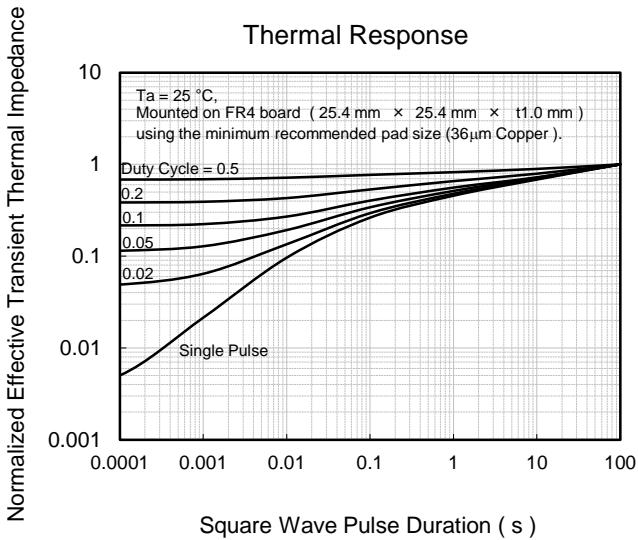
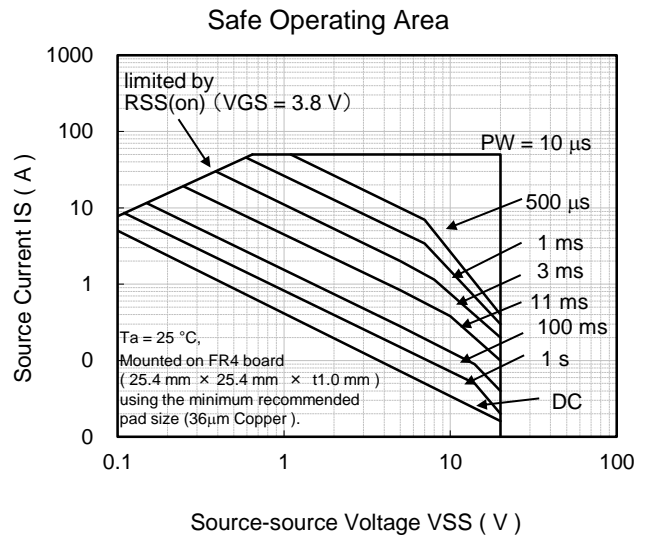
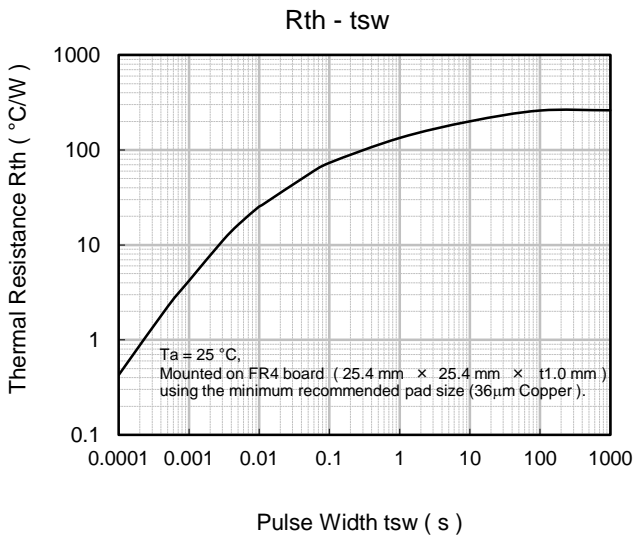
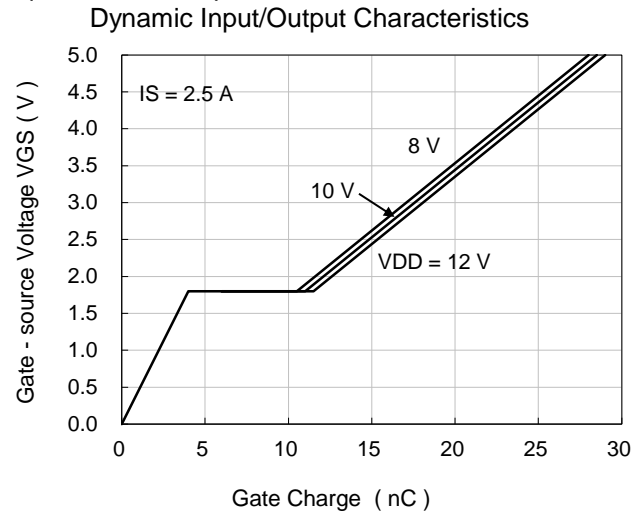
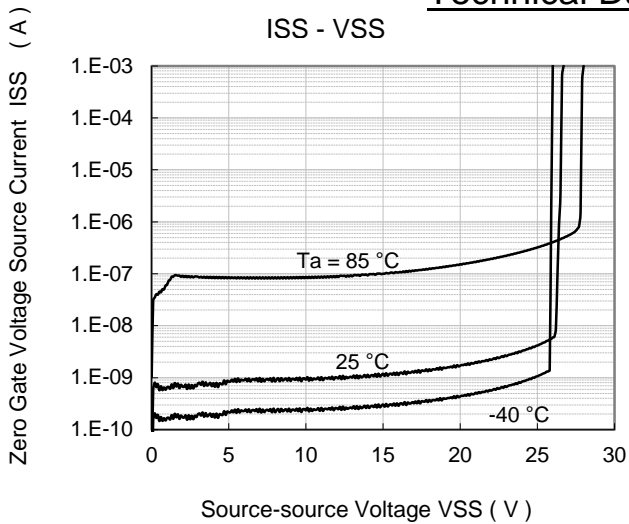


Technical Data ( reference )



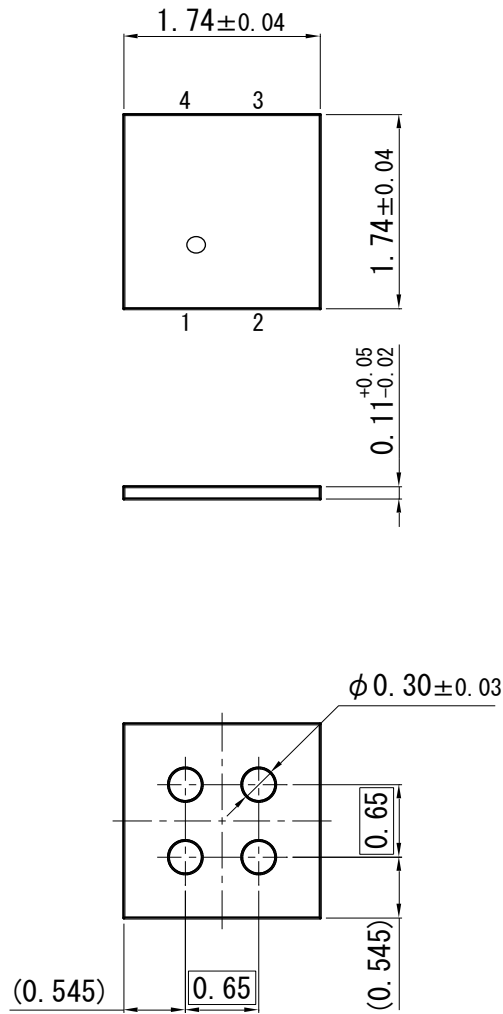


Technical Data ( reference )



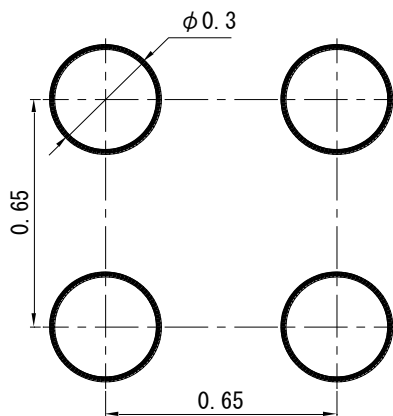
■ Outline (MLGA004-W-1717-RB)

Unit: mm



■ Land Pattern (Reference)

Unit: mm



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