

FC4A22050L

Gate Resistor installed Dual N-Channel MOS Type

For lithium-ion secondary battery protection circuit

- Features
 - Low source-source ON resistance:Rss(on)typ . = 19.5 mΩ (VGS = 4.5V)
 - CSP package:smallest & thinnest size
 - Halogen-free / RoHS compliant
(EU RoHS / UL-94 V-0 / MSL:Level 1 compliant)

■ Marking Symbol: 11

■ Packaging
FC4A22050L Embossed type (Thermo-compression sealing):
5 000 pcs / reel (standard)

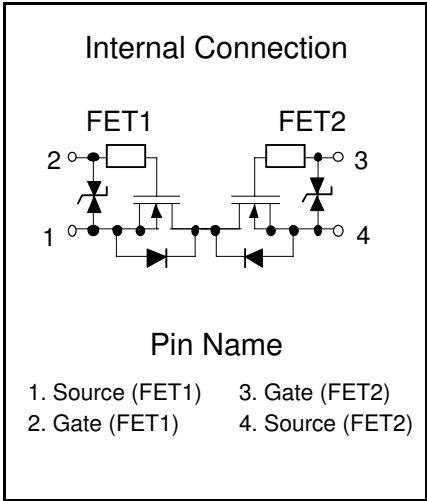
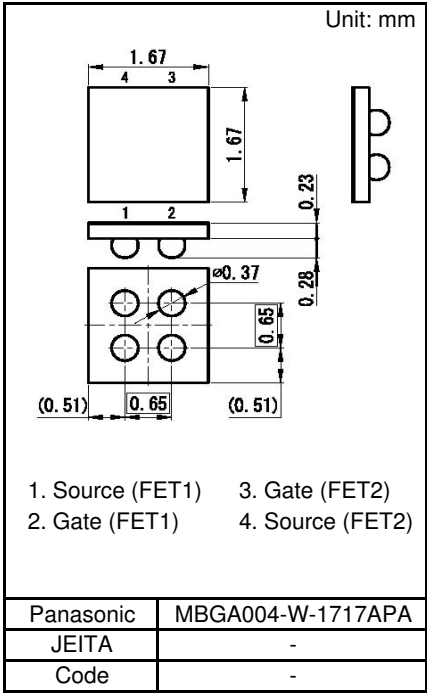
■ Absolute Maximum Ratings Ta = 25 °C

Parameter		Symbol	Rating	Unit
FET1 FET2	Source-source Voltage	VSS	24	V
	Gate-source Voltage	VGS	±12	V
	Source Current (DC) ^{*1}	IS	3.5	A
	Source Current (Pulsed) ^{*1,*2}	ISp	35	A
Overall	Total Power Dissipation ^{*1}	PD	0.4	W
	Channel Temperature	Tch	150	°C
	Storage Temperature Range	Tstg	-55 to +150	°C

■ Thermal Characteristics

Parameter		Symbol	Rating	Unit
Thermal Resistance,Channel to Ambient		Rth (ch-a)	312	°C/W

Note *1 Mounted on FR4 board (25.4 mm × 25.4 mm × t1.0 mm).
 Surface Mounted on FR4 Board using the minimum recommended
 pad size(Cu area = 47 mm² including traces).
 *2 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	24			V
Zero Gate Voltage source Current	ISSS	VSS = 24 V, VGS = 0 V			1.0	μA
Gate-source Leakage Current	IGSS	VGS = ±8 V, VSS = 0 V			±10	μA
Gate-source Threshold Voltage	Vth	IS = 1.0 mA, VSS = 10 V	0.4	0.85	1.5	V
Source-source On-State Resistance	RSS(on)1	IS = 3.0 A, VGS = 4.5 V	14	19.5	28	mΩ
	RSS(on)2	IS = 3.0 A, VGS = 3.1 V	15	23	32	
	RSS(on)3	IS = 3.0 A, VGS = 2.5 V	18	27	37	
Input Capacitance ^{*1}	Ciss	VSS = 10 V, VGS = 0 V, f = 1 MHz		1 780		pF
Output Capacitance ^{*1}	Coss			410		
Reverse Transfer Capacitance ^{*1}	Crss			407		
Turn-on Delay Time ^{*1,2}	td(on)	VDD = 10 V, VGS = 0 to 4.0 V		0.8		μs
Rise Time ^{*1,2}	tr	IS = 3 A		1.5		
Turn-off Delay Time ^{*1,2}	td(off)	VDD = 10 V, VGS = 4.0 to 0 V		6		μs
Fall Time ^{*1,2}	tf	IS = 3 A		3		
Total Gate Charge ^{*1}	Qg	VDD = 10 V, VGS = 0 to 4.0 V, IS = 3.5 A		15		nC
Gate-Source Charge ^{*1}	Qgs			4.1		
Gate-Drain Charge ^{*1}	Qgd			3.8		

Note: ^{*1} Assured by design

^{*2} See Test circuit

DESTRUCTION CURRENT

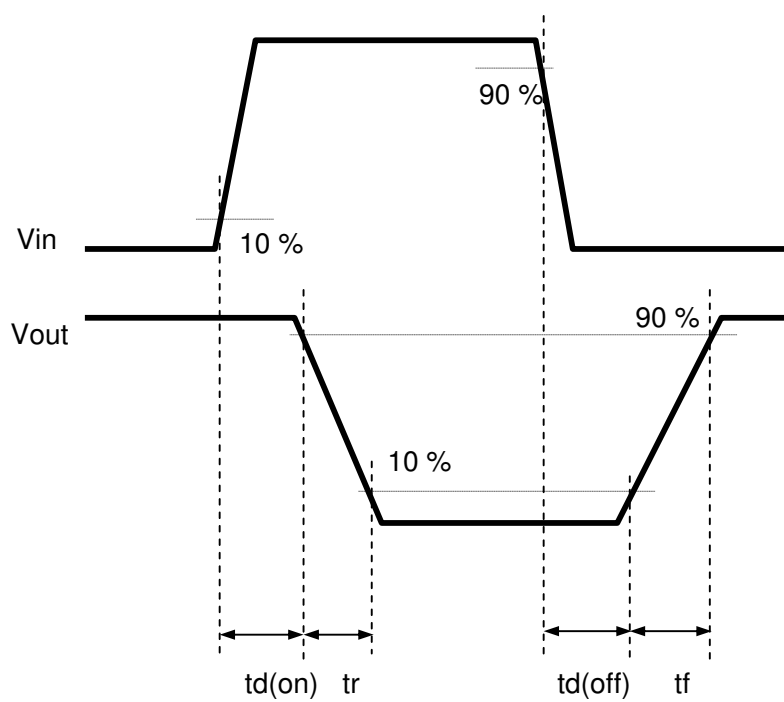
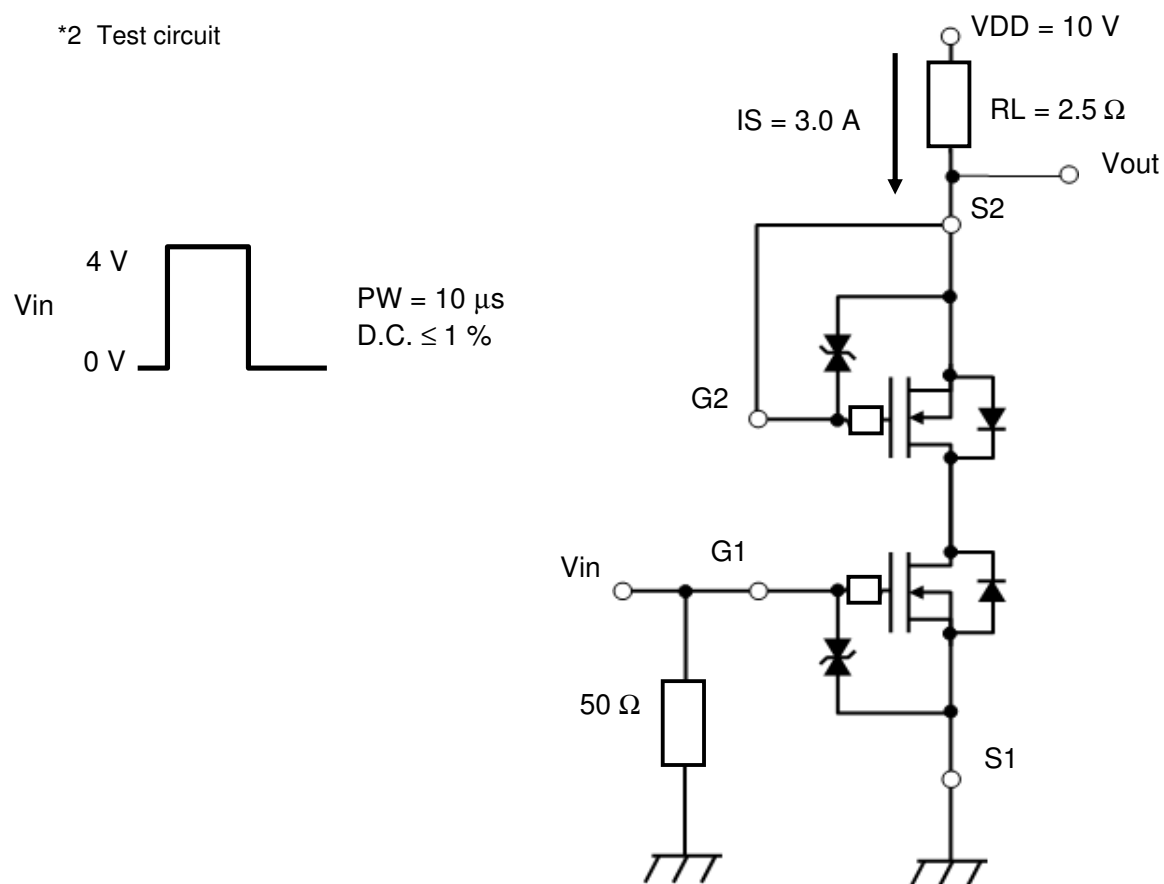
	Condition	Result
Operation test	VGS = 3.8 V t = 3 ms, IS = 40 A	PASS
	VGS = 3.8 V t = 11 ms, IS = 15 A	PASS
Destruction current	VGS = 3.8 V t = 3 ms	55 A
	VGS = 3.8 V t = 11 ms	35 A

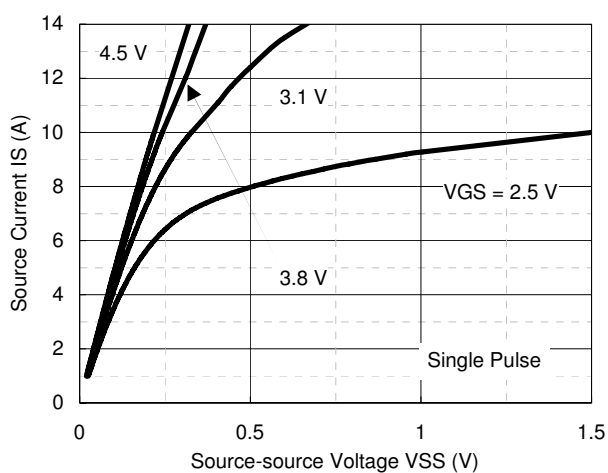
Ta = 25 °C,

Mounted on FR4 board (25.4 × 25.4 × t1.0 mm).

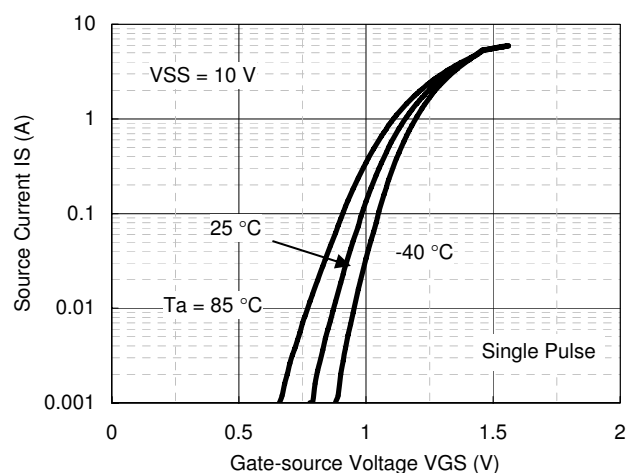
Surface Mounted on FR4 Board using the minimum recommended pad size(Cu area = 47 mm² including traces).

*2 Test circuit

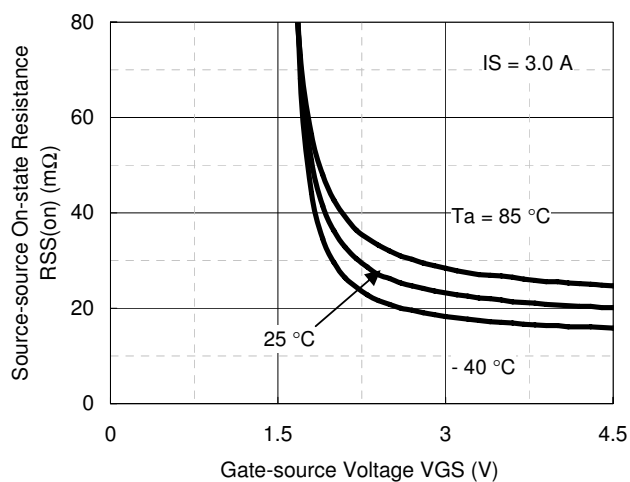




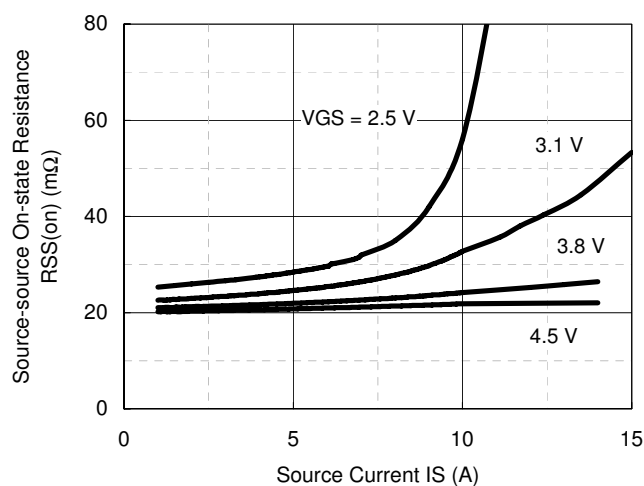
IS - VSS



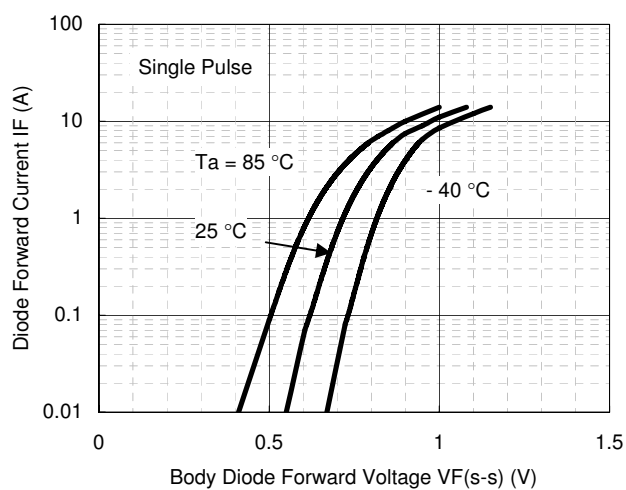
IS - VGS



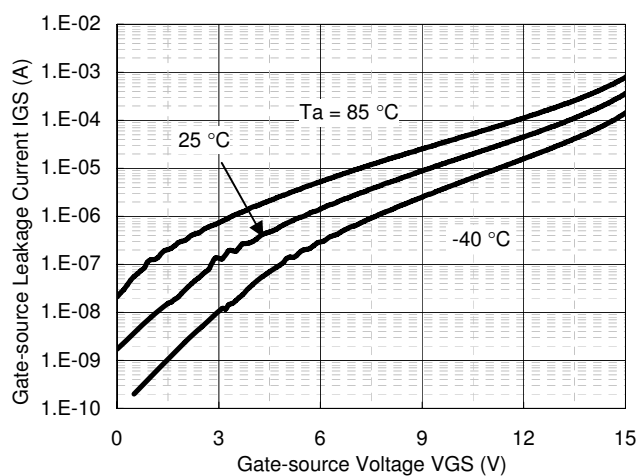
RSS(on) - VGS



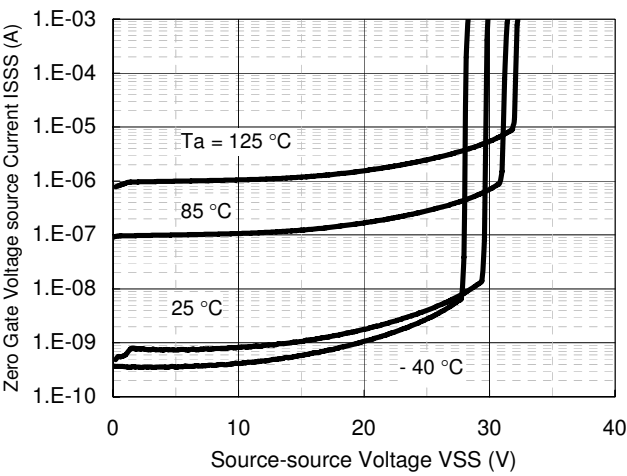
RSS(on) - IS



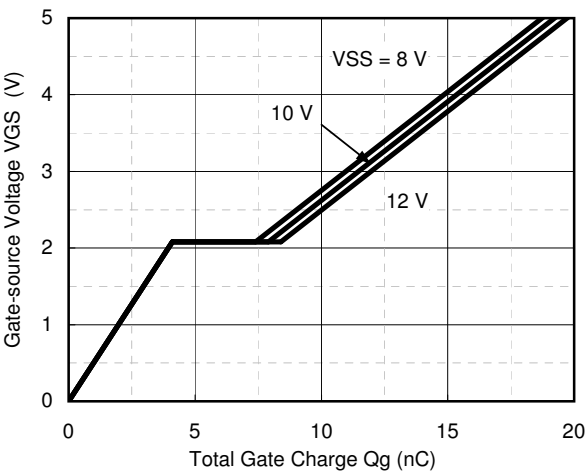
IF - VF(s-s)



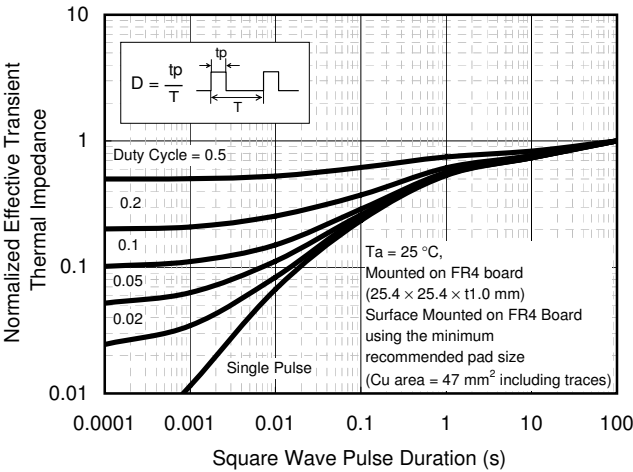
IGS - VGS



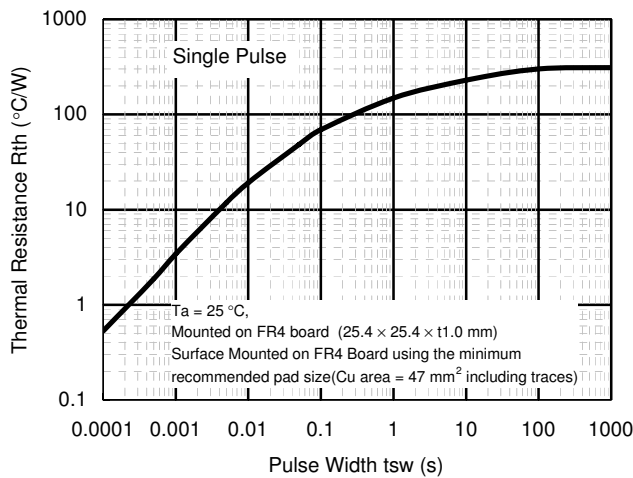
ISSS - VSS



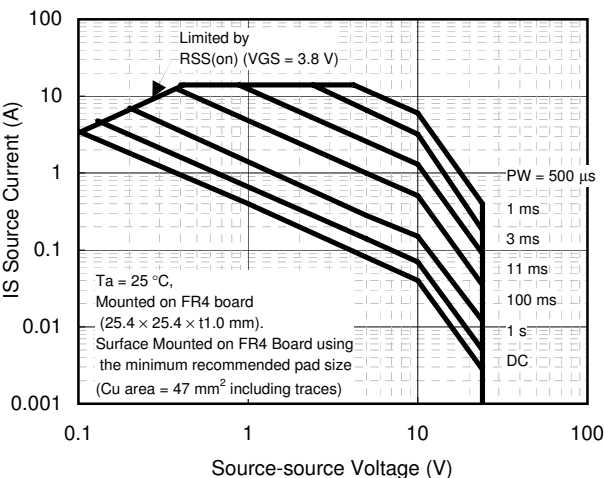
Dynamic Input/Output Characteristics



Thermal Response



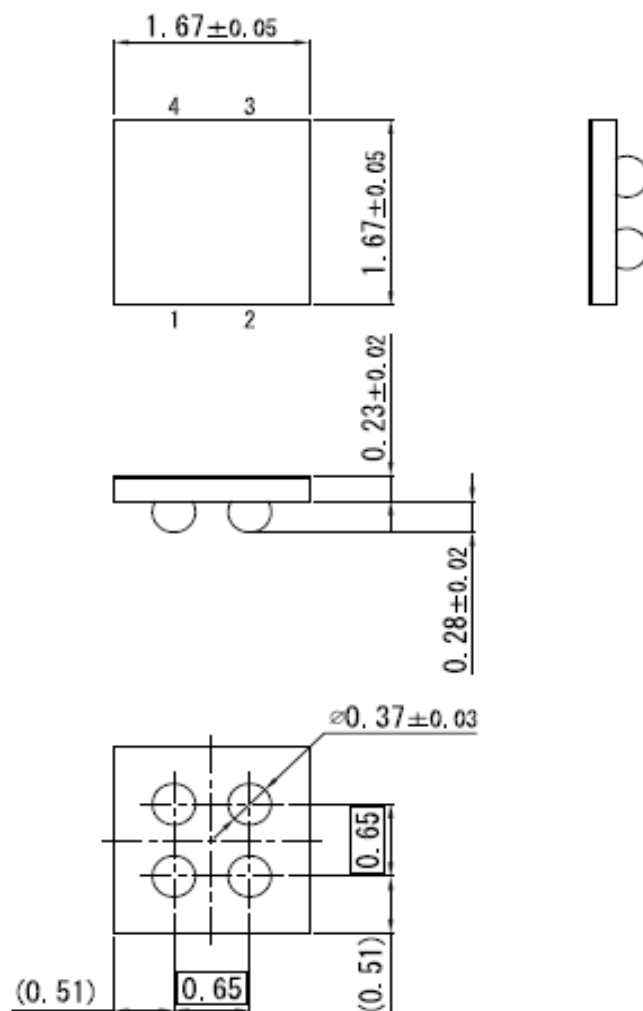
R_{th} - t_{sw}



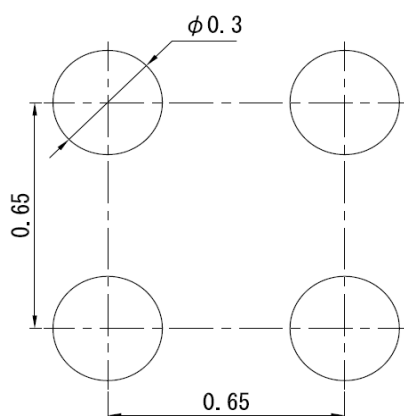
Safe Operating Area

MBGA004-W-1717APA

Unit: mm



■ Land Pattern (Reference) (Unit: mm)



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