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**FK8V03060L**

**Silicon N-channel MOS FET**

For lithium-ion secondary battery protection circuit  
 For DC-DC Converter

■ Features

- Low drain-source On-state Resistance  
 RDS(on) typ. = 22 mΩ (VGS = 4.5 V)
- High-speed switching : Qg = 3.8 nC
- Halogen-free / RoHS compliant  
 (EU RoHS / UL-94 V-0 / MSL:Level 1 compliant)

■ Marking Symbol: 3F

■ Packaging

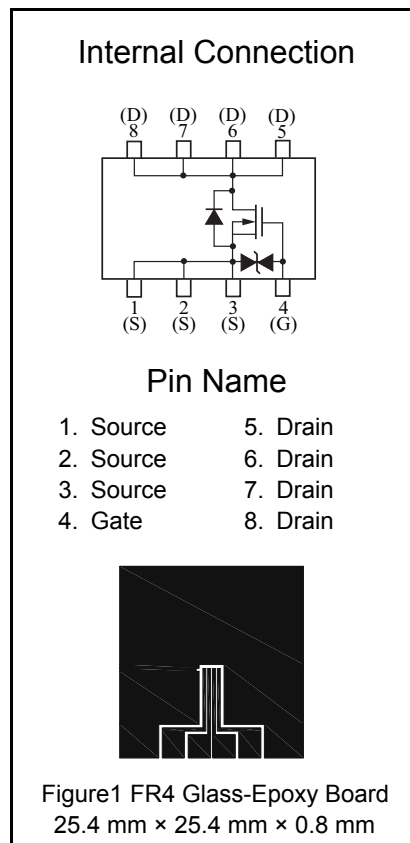
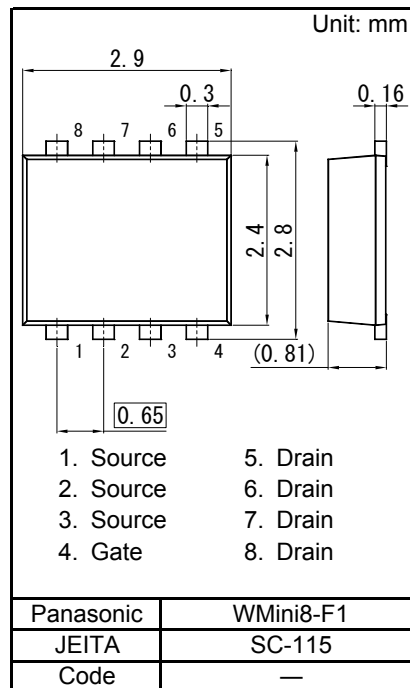
Embossed type (Thermo-compression sealing) : 3 000 pcs / reel (standard)

■ Absolute Maximum Ratings Ta = 25 °C

Parameter	Symbol	Rating	Unit
Drain-source Voltage	VDS	33	V
Gate-source Voltage	VGS	±20	V
Drain Current (Steady State) <sup>*1</sup>	ID	6.5	A
Drain Current (t = 10 s) <sup>*1</sup>		8	
Drain Current (Pulsed) <sup>*1,*2</sup>		26	
Source Current (Pulsed) (Body Diode) <sup>*1,*2</sup>	ISp (BD)	6.5	
Total Power Dissipation (Steady State) <sup>*1</sup>	PD	1	W
Total Power Dissipation (t = 10 s) <sup>*1</sup>		1.5	
Channel Temperature	Tch	150	°C
Operating Ambient Temperature	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-55 to +150	°C

Note) <sup>\*1</sup> Device mounted on a glass-epoxy board (See Figure 1)

<sup>\*2</sup> Pulse test: Ensure that the channel temperature does not exceed 150°C



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

Static Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source Breakdown Voltage	VDSS	ID = 1 mA, VGS = 0 V	33			V
Zero Gate Voltage Drain Current	IDSS	VDS = 33 V, VGS = 0 V			10	μA
Gate-source Leakage Current	IGSS	VGS = ±16 V, VDS = 0 V			±10	μA
Gate-source Threshold Voltage	Vth	ID = 0.48 mA, VDS = 10 V	1		2.5	V
Drain-source On-state Resistance *1	RDS(on)1	ID = 3.3 A, VGS = 10 V		15	20	mΩ
	RDS(on)2	ID = 3.3 A, VGS = 4.5 V		22	35	

Dynamic Characteristics

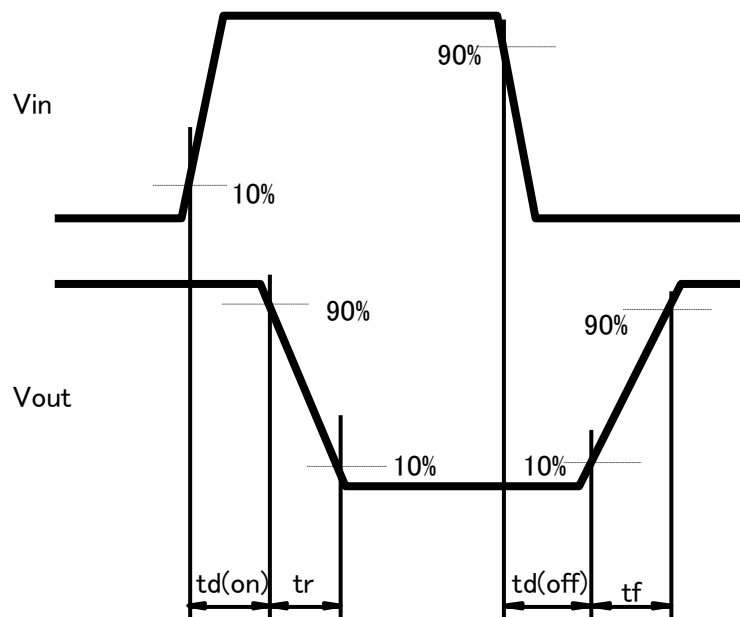
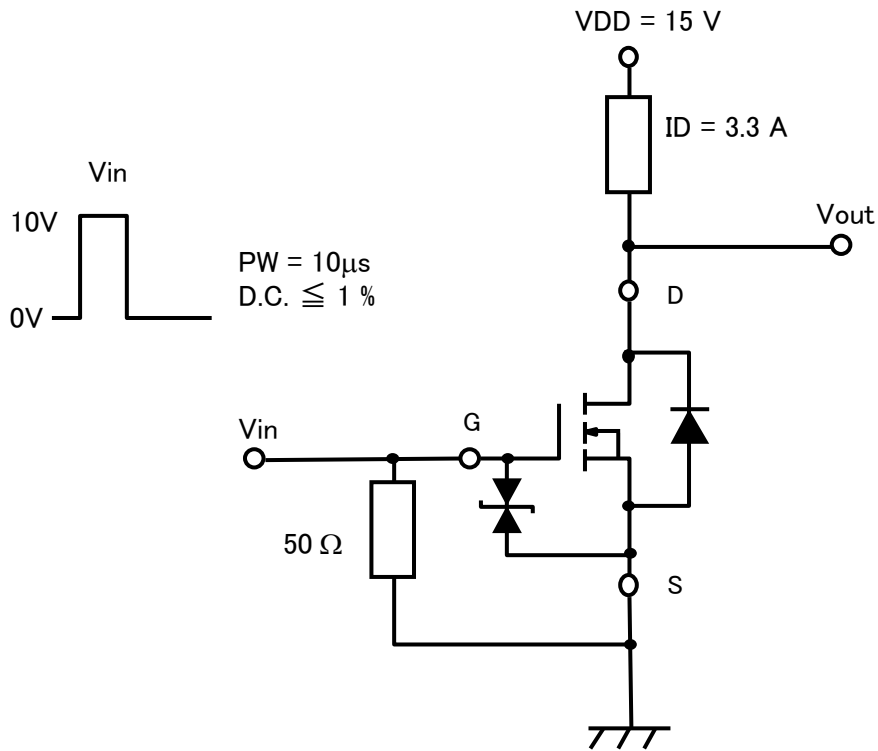
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Capacitance	Ciss	VDS = 10 V, VGS = 0 V f = 1 MHz		360		pF
Output Capacitance	Coss			70		
Reverse Transfer Capacitance	Crss			50		
Turn-on Delay Time *2	td(on)	VDD = 15 V, VGS = 0 to 10 V		8		ns
Rise Time *2	tr	ID = 3.3 A		3		
Turn-off Delay Time *2	td(off)	VDD = 15 V, VGS = 10 to 0 V		24		
Fall Time *2	tf	ID = 3.3 A		9		
Total Gate Charge	Qg	VDD = 15 V, VGS = 0 to 4.5 V, ID = 6.5 A		3.8		nC
Gate-source Charge	Qgs			1.4		
Gate-drain Charge	Qgd			1.6		

Body Diode Characteristic

Diode Forward Voltage *1	VSD	IS = 3.3 A, VGS = 0 V	Min	Typ	Max	Unit
				0.8	1.2	V

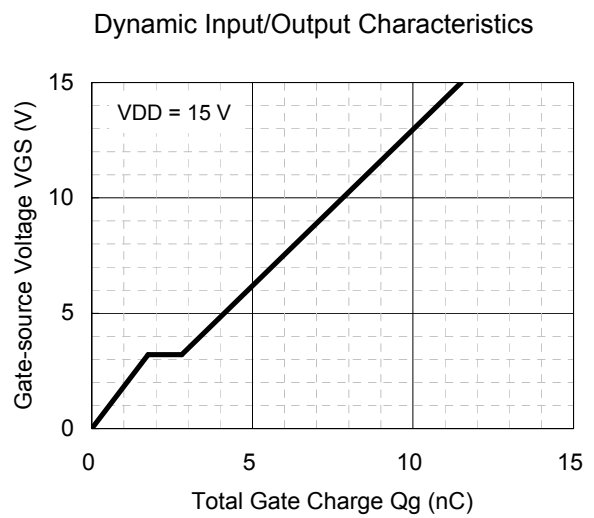
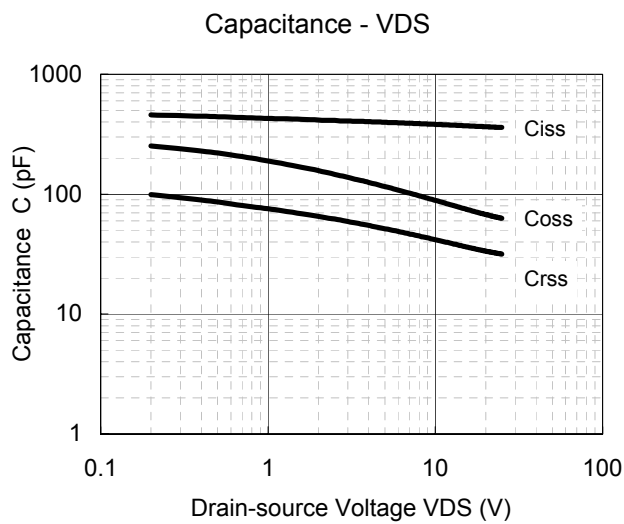
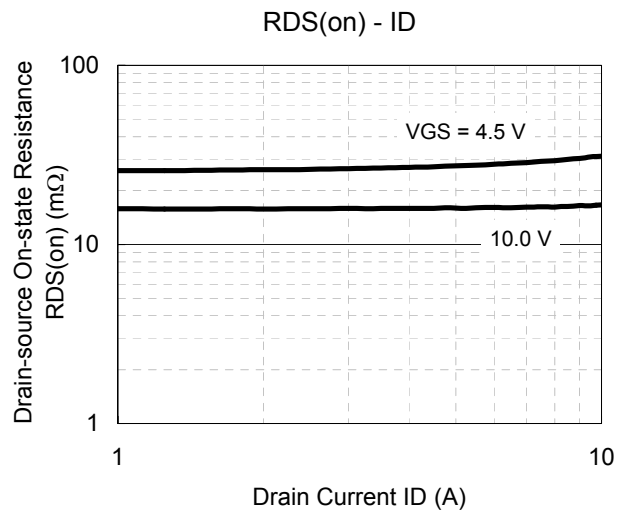
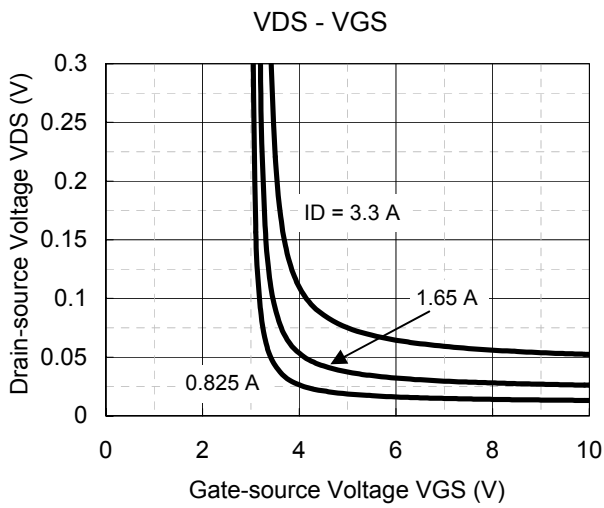
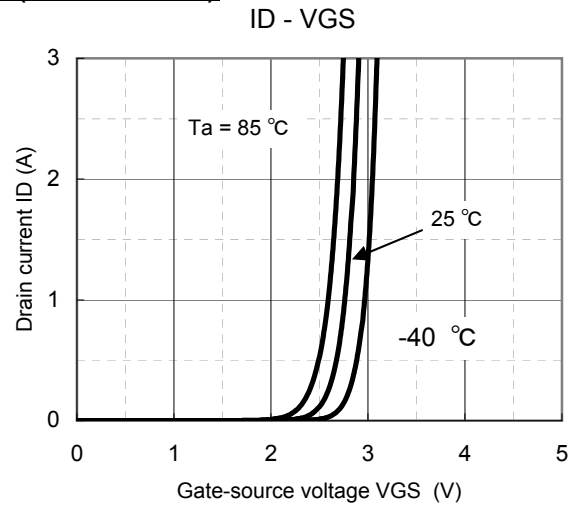
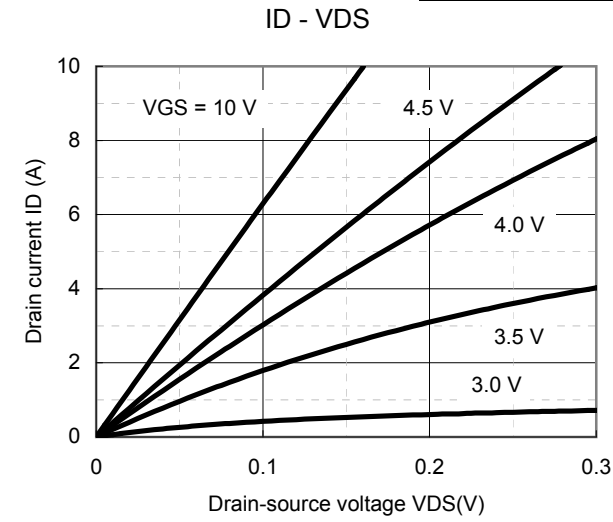
- Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.  
 2. \*1 Pulse test: Ensure that the channel temperature does not exceed 150°C  
 \*2 Measurement circuit for Turn-on Delay Time/Rise Time/Turn-off Delay Time/Fall Time

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



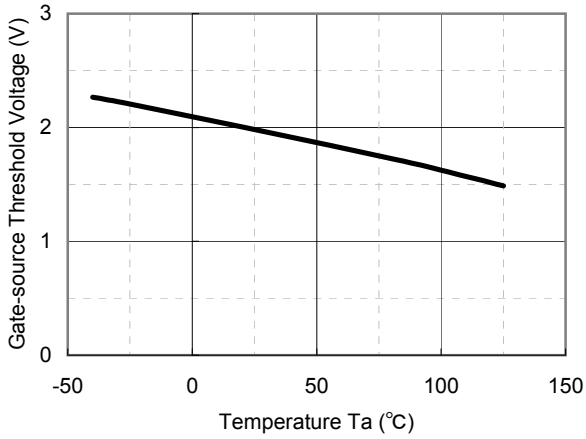


Technical Data ( reference )

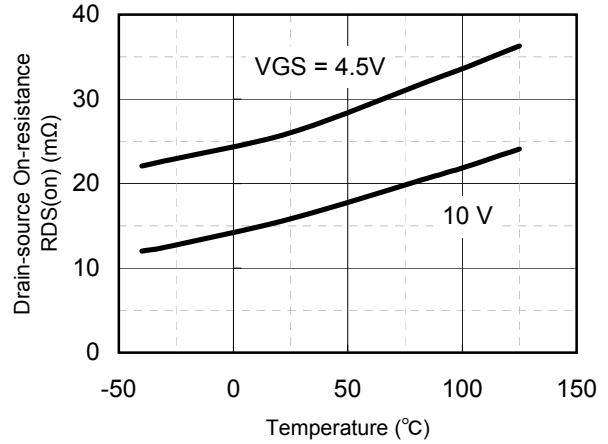


Technical Data ( reference )

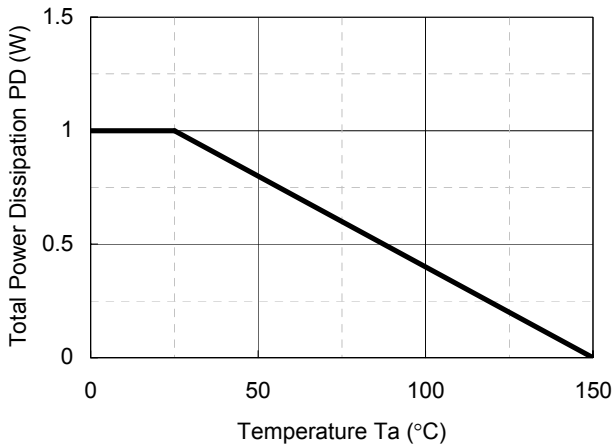
V<sub>th</sub> - T<sub>a</sub>



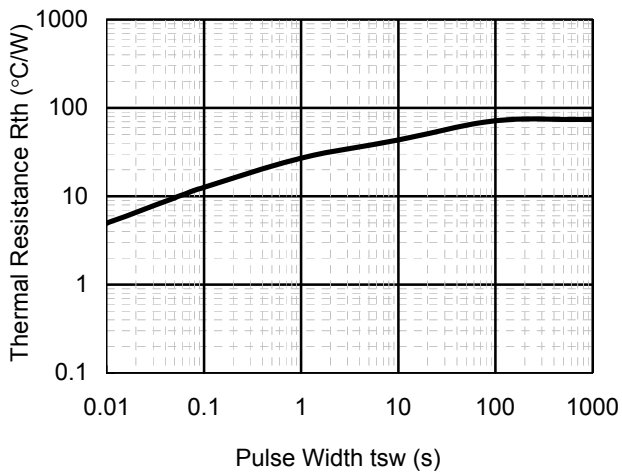
R<sub>DS(on)</sub> - T<sub>a</sub>



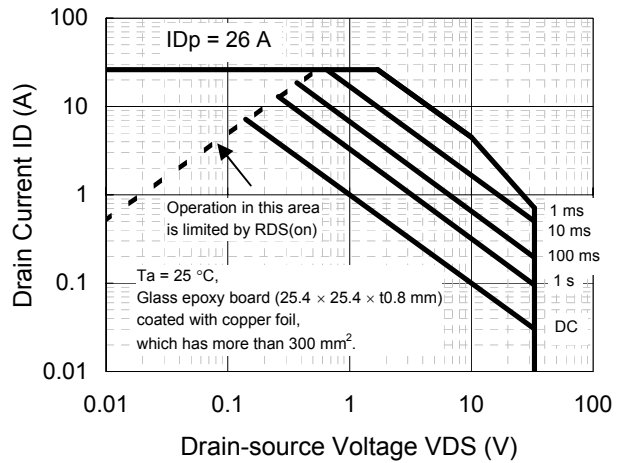
PD - T<sub>a</sub>



R<sub>th</sub> - t<sub>sw</sub>

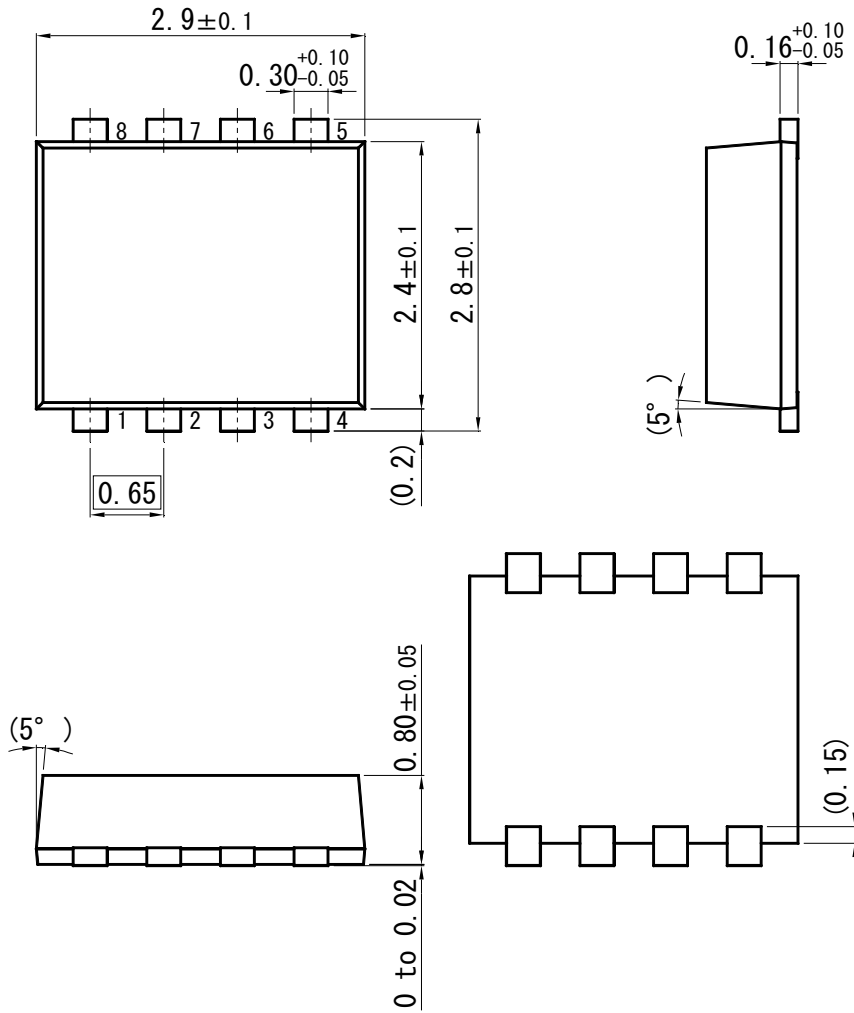


Safe Operating Area

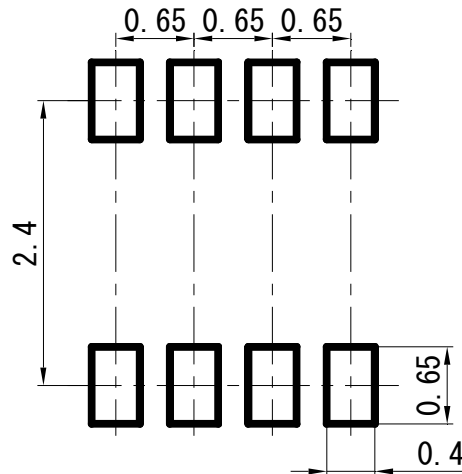


WMini8-F1

Unit : mm



■ Land Pattern (Reference) (Unit : mm)



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