

**FK8V03020L**

**Silicon N-channel MOS FET**

For lithium-ion secondary battery protection circuit

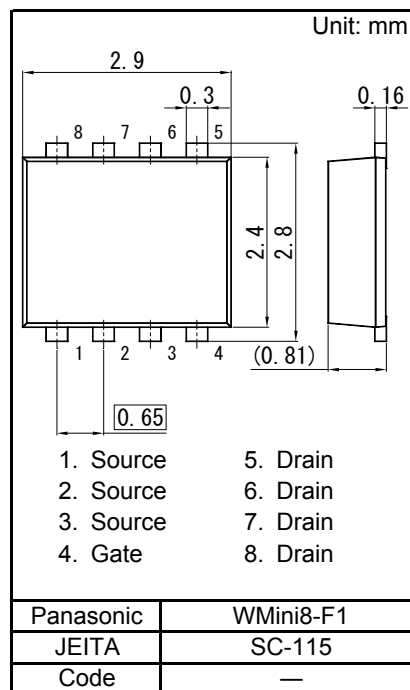
■ Features

- Low drain-source On-state Resistance  
 $R_{DS(on)}$  typ = 5.4 m $\Omega$  (VGS = 4.5 V)
- Halogen-free / RoHS compliant  
 (EU RoHS / UL-94 V-0 / MSL:Level 1 compliant)

■ Marking Symbol: 3B

■ Packaging

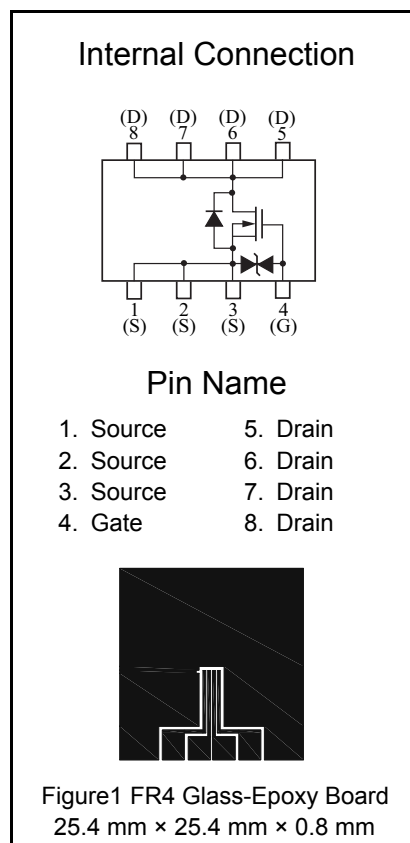
Embossed type (Thermo-compression sealing) : 3 000 pcs / reel (standard)



■ 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	14	A
Drain Current (t = 10 s) <sup>*1</sup>		18	
Drain Current (Pulsed) <sup>*1,*2</sup>		56	
Source Current (Pulsed) (Body Diode) <sup>*1,*2</sup>	ISp (BD)	14	
Total Power Dissipation (Steady State) <sup>*1</sup>	PD	1	W
Total Power Dissipation (t = 10 s) <sup>*1</sup>		1.6	
Channel Temperature	Tch	150	°C
Operating Ambient Temperature	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-55 to +150	°C
Avalanche Current <sup>*3</sup>	Iar	60	A

Note: \*1 Device mounted on a glass-epoxy board (See Figure 1)  
 \*2 Pulse test: Ensure that the channel temperature does not exceed 150°C  
 \*3 Conditions: VDS = 24 V, VGS = 10 V, L = 10  $\mu$ H



■ 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			1	μA
Gate-source Leakage Current	IGSS	VGS = ±16 V, VDS = 0 V			±10	μA
Gate-source Threshold Voltage	Vth	ID = 2.2 mA, VDS = 10 V	1.0		3.0	V
Drain-source On-state Resistance *1	RDS(on)1	ID = 7A, VGS = 10 V		3.6	4.6	mΩ
	RDS(on)2	ID = 7A, VGS = 4.5 V		5.4	9.8	

Dynamic Characteristics

Input Capacitance	Ciss	VDS = 10 V, VGS = 0 V f = 1 MHz		1500		pF
Output Capacitance	Coss			300		
Reverse Transfer Capacitance	Crss			200		
Turn-on Delay Time *2	td(on)	VDD = 15 V, VGS = 0 to 10 V		10		ns
Rise Time *2	tr	ID = 7 A		5		
Turn-off Delay Time *2	td(off)	VDD = 15 V, VGS = 10 to 0 V		200		
Fall Time *2	tf	ID = 7 A		150		
Total Gate Charge	Qg	VDD = 15 V, VGS = 0 to 4.5 V, ID = 14 A		14		nC
Gate-source Charge	Qgs			4		
Gate-drain Charge	Qgd			6		

Body Diode Characteristic

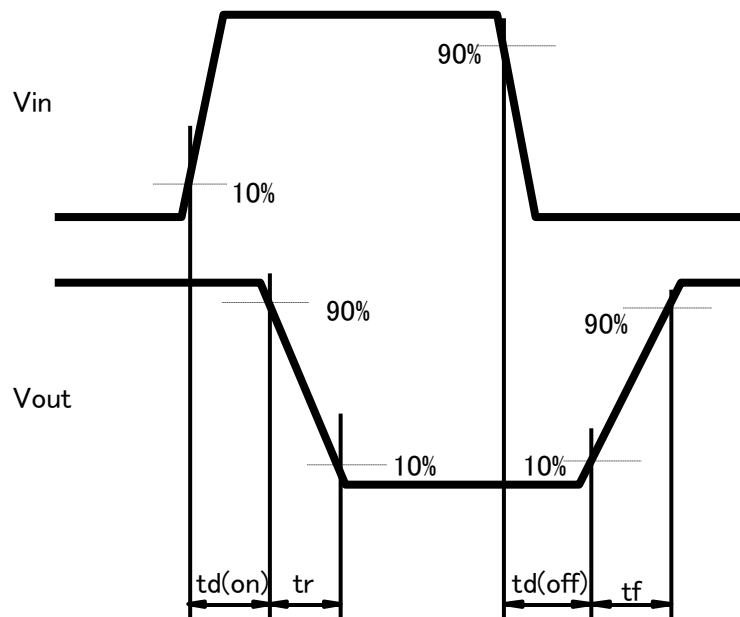
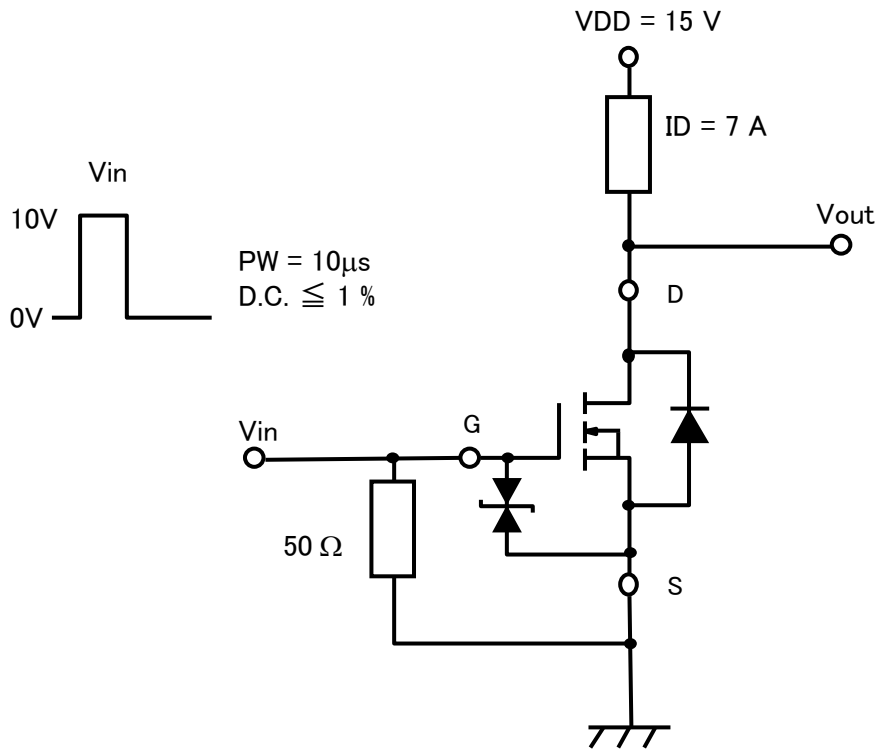
Diode Forward Voltage *1	VSD	IS = 7 A, VGS = 0 V		0.8	1.2	V
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Note: 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.

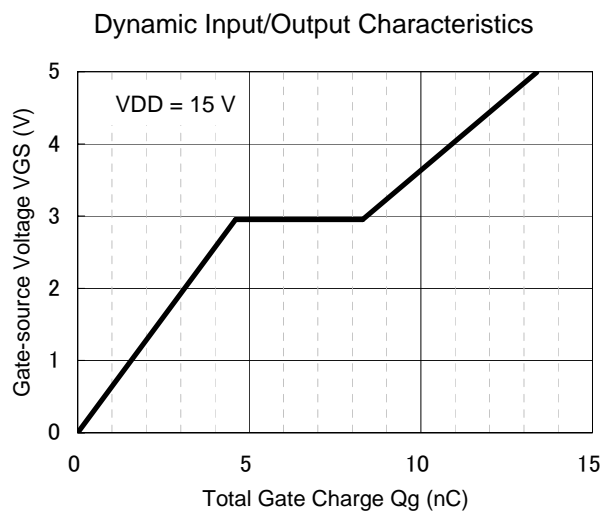
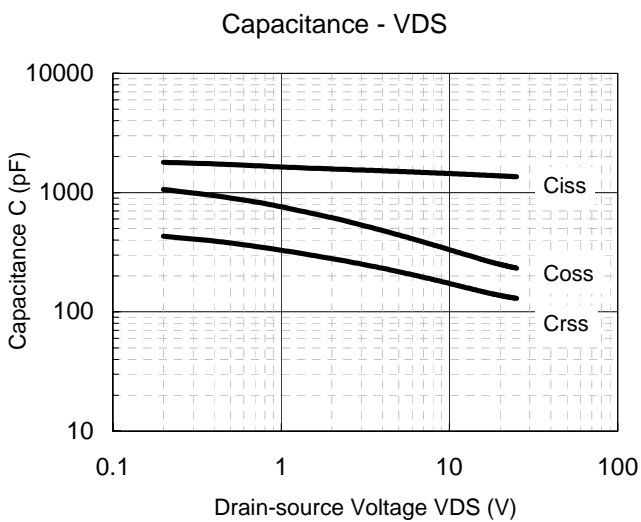
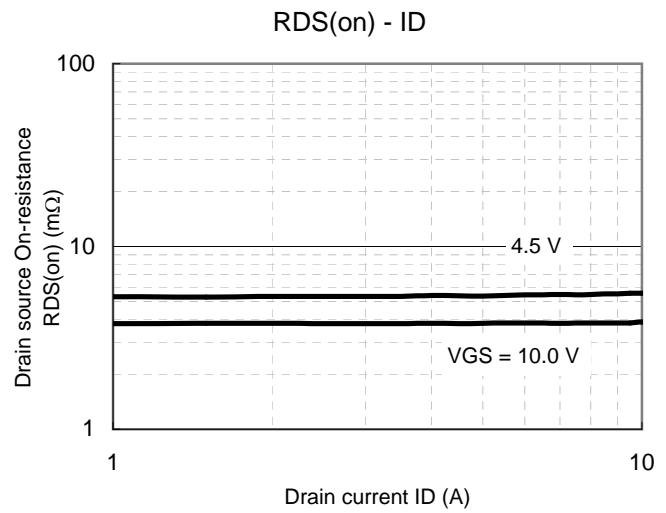
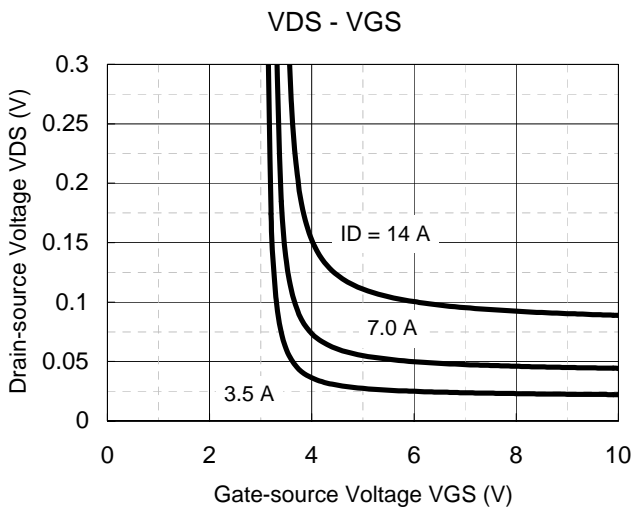
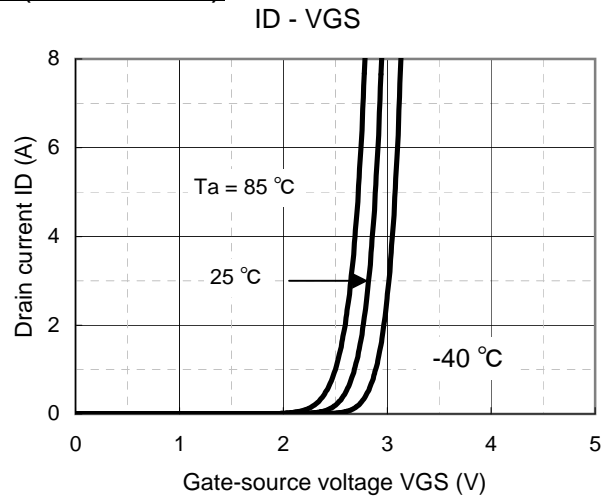
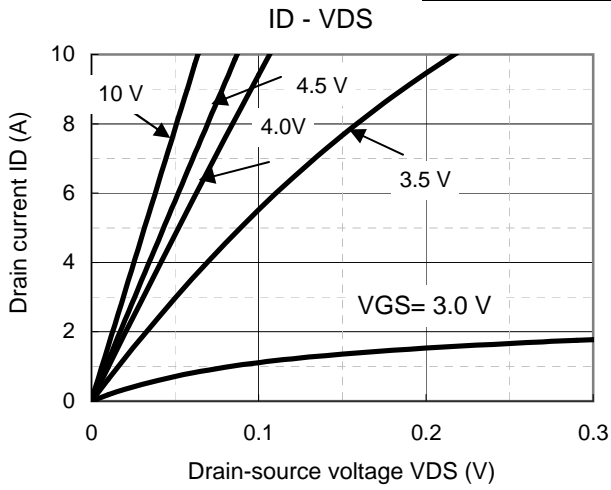
2. \*1 Pulse test: Ensure that the channel temperature does not exceed 150°C

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

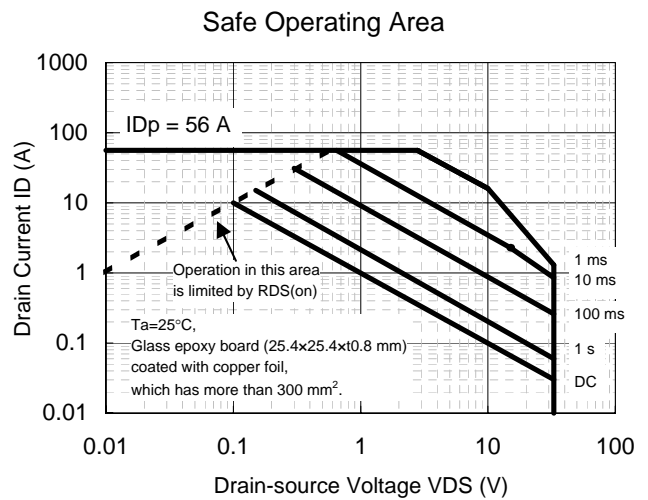
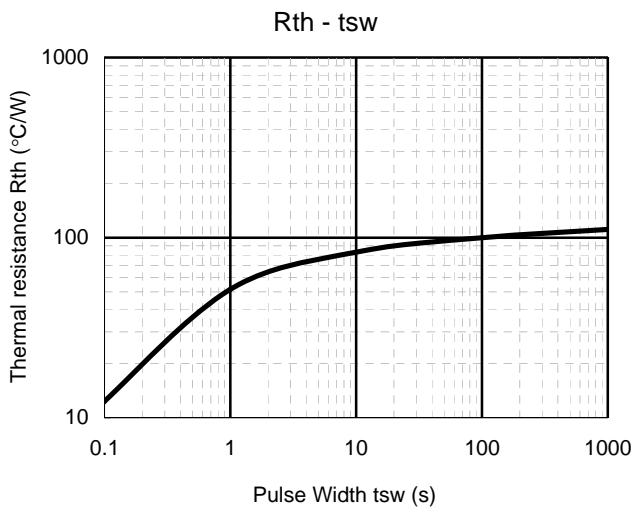
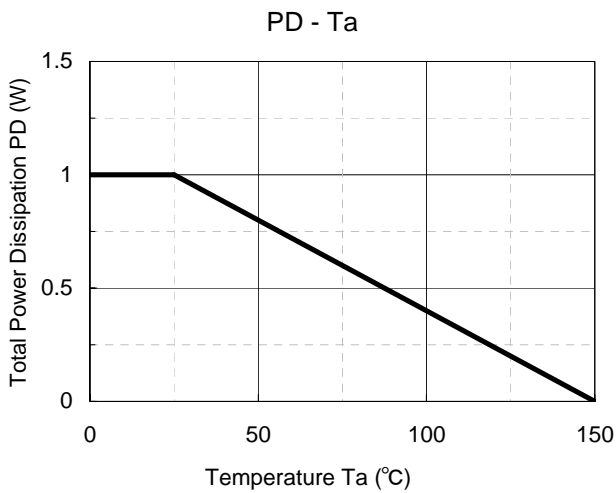
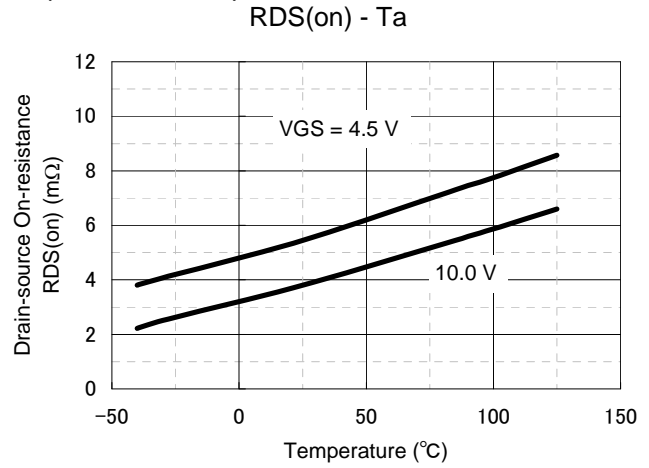
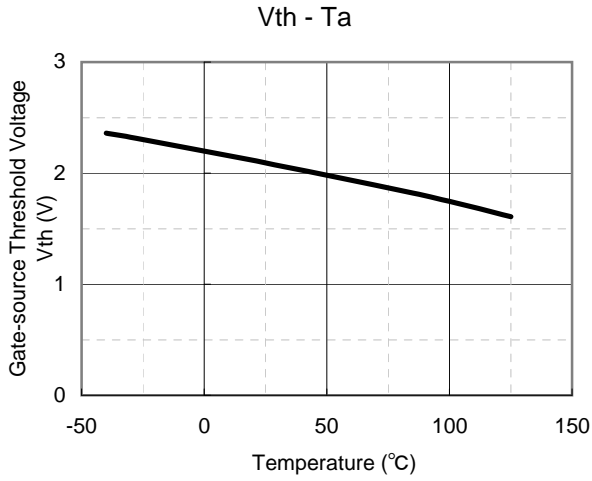
\*2 Measurement circuit for Turn-on Delay Time/Rise Time/Turn-off Delay Time/Fall Time



Technical Data ( reference )

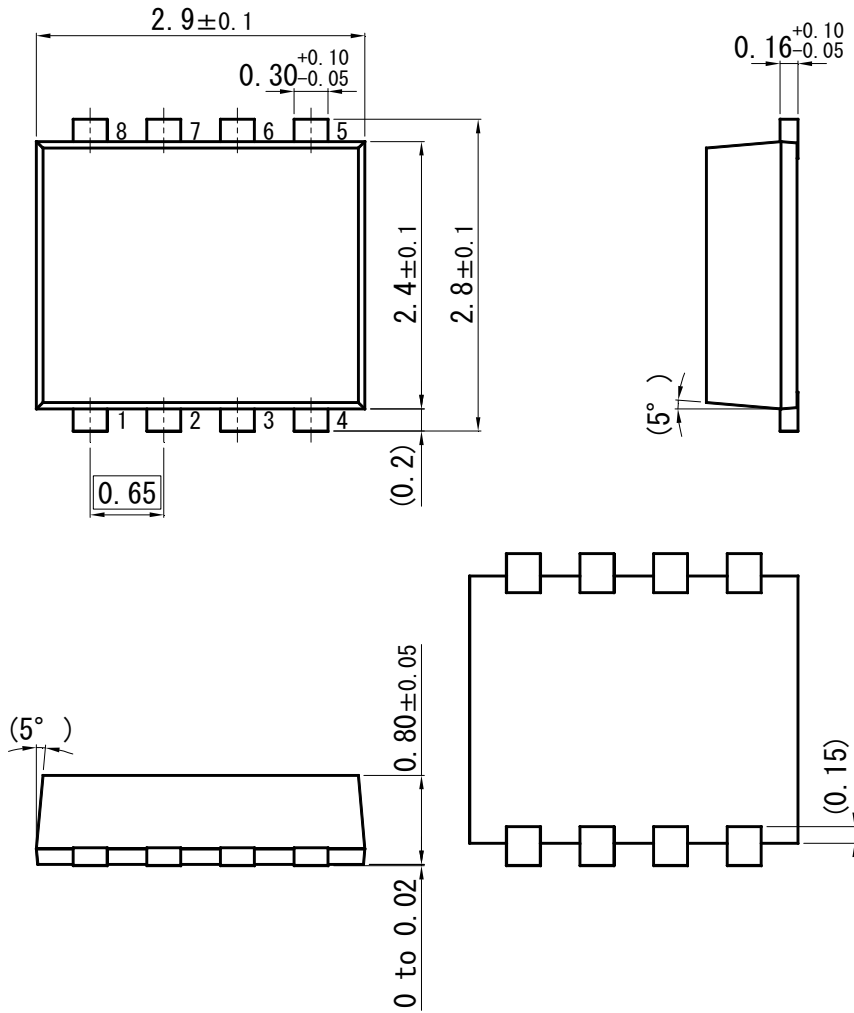


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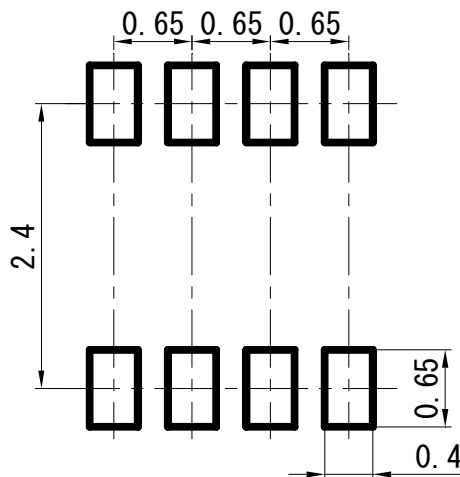


WMini8-F1

Unit : mm



■ Land Pattern (Reference) (Unit : mm)



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