

## FK8V03040L

### Silicon N-channel MOSFET

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

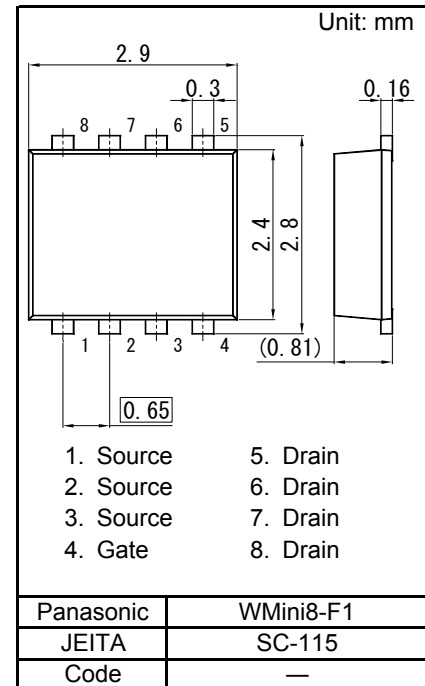
#### ■ Features

- Low drain-source On-state Resistance  
RDS(on) typ = 11 mΩ (VGS = 4.5 V)
- High-speed switching : Qg = 7.2 nC
- Halogen-free / RoHS compliant  
(EU RoHS / UL-94 V-0 / MSL:Level 1 compliant)

#### ■ Marking Symbol: 3D

#### ■ Packaging

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



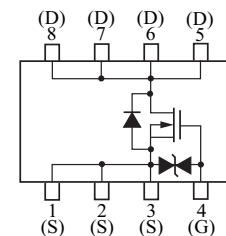
#### ■ Absolute Maximum Ratings Ta = 25 °C

Parameter	Symbol	Rating	Unit
Drain-source Voltage	VDS	33	V
Gate-source Voltage	VGS	±20	V
Drain Current (Steady State) <sup>*1</sup>	ID	10	A
Drain Current (t = 10 s) <sup>*1</sup>		12	
Drain Current (Pulsed) <sup>*1,*2</sup>		40	
Source Current (Pulsed) (Body Diode) <sup>*1,*2</sup>	ISp (BD)	10	W
Total Power Dissipation (Steady State) <sup>*1</sup>	PD	1	
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.

#### Internal Connection



#### Pin Name

- |           |          |
|-----------|----------|
| 1. Source | 5. Drain |
| 2. Source | 6. Drain |
| 3. Source | 7. Drain |
| 4. Gate   | 8. Drain |

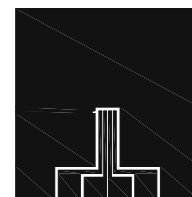


Figure1 FR4 Glass-Epoxy Board  
25.4 mm × 25.4 mm × 0.8 mm

■ 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 = 1.12 mA, VDS = 10 V	1		2.5	V
Drain-source On-state Resistance *1	RDS(on)1	ID = 5A, VGS = 10 V		7	10	mΩ
	RDS(on)2	ID = 5A, VGS = 4.5 V		11	19	

Dynamic Characteristics

Input Capacitance	Ciss	VDS = 10 V, VGS = 0 V f = 1 MHz		750		pF
Output Capacitance	Coss			170		
Reverse Transfer Capacitance	Crss			100		
Turn-on Delay Time *2	td(on)	VDD = 15 V, VGS = 0 to 10 V ID = 5 A		9		ns
Rise Time *2	tr			6		
Turn-off Delay Time *2	td(off)	VDD = 15 V, VGS = 10 to 0 V ID = 5 A		46		
Fall Time *2	tf			18		
Total Gate Charge	Qg	VDD = 15 V, VGS = 0 to 4.5 V, ID = 10 A		7.2		nC
Gate-source Charge	Qgs			2.3		
Gate-drain Charge	Qgd			3.3		

Body Diode Characteristic

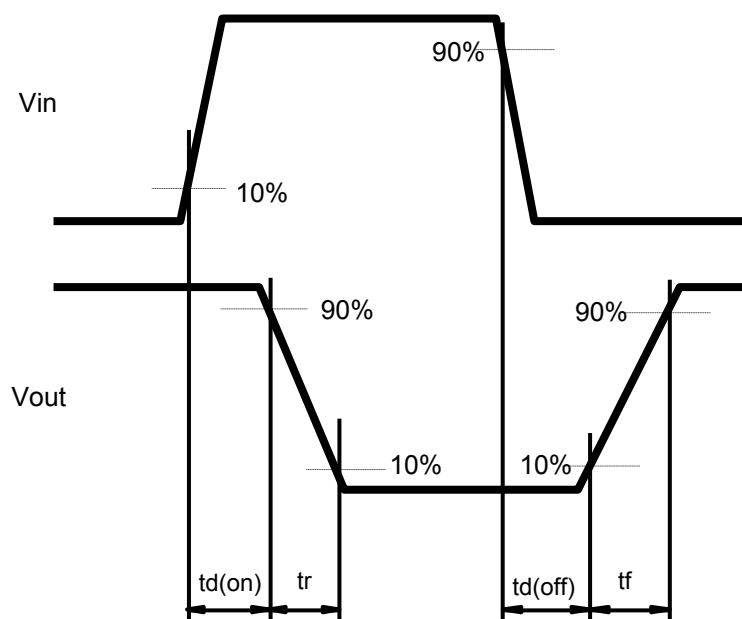
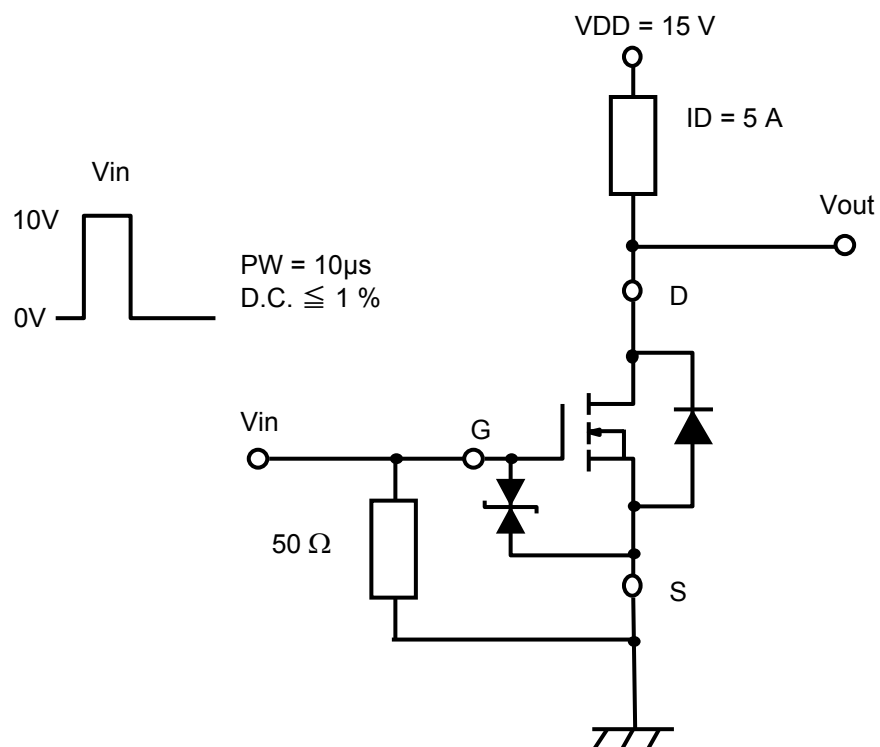
Diode Forward Voltage *1	VSD	IS = 5 A, VGS = 0 V		0.8	1.2	V
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Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 Measuring methods for transistors.

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

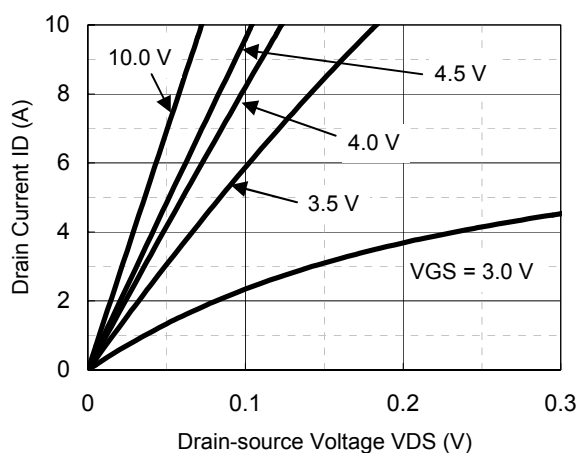
\*2 Measurement circuit for Turn-on Delay Time/Rise Time/Turn-off Delay Time/Fall Time

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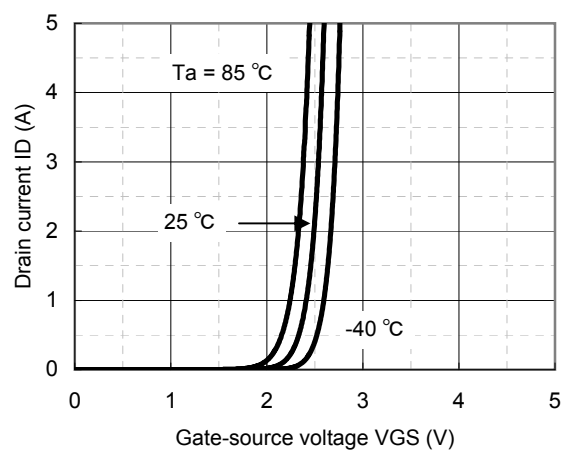


Technical Data ( reference )

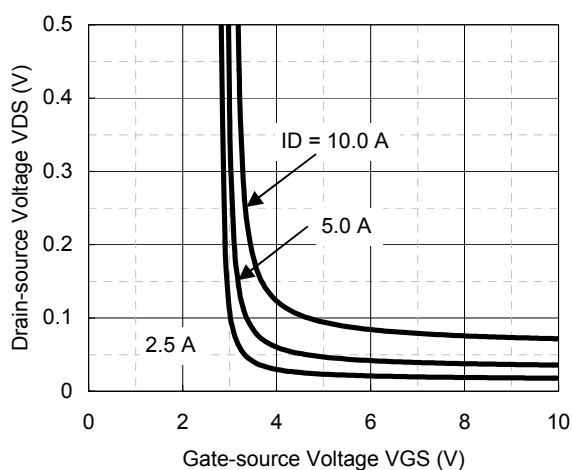
ID - VDS



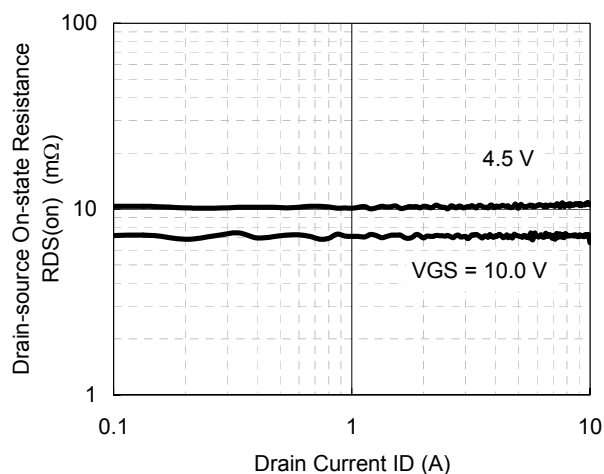
ID - VGS



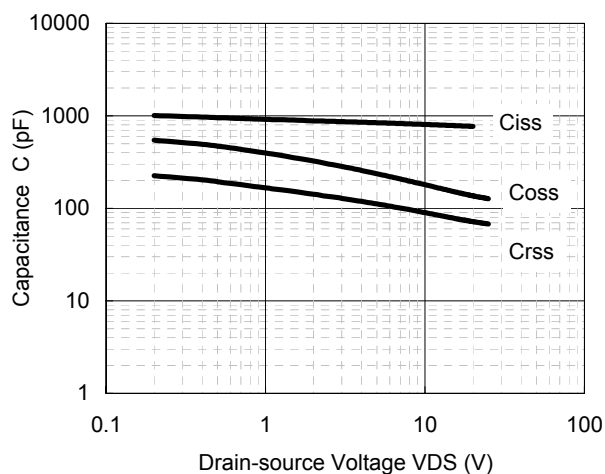
VDS - VGS



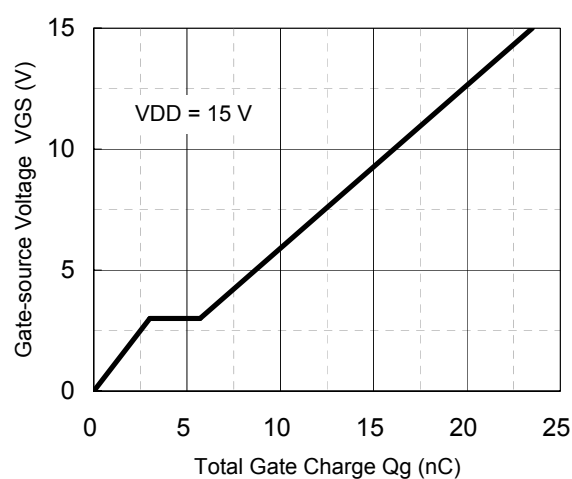
RDS(on) - ID



Capacitance - VDS

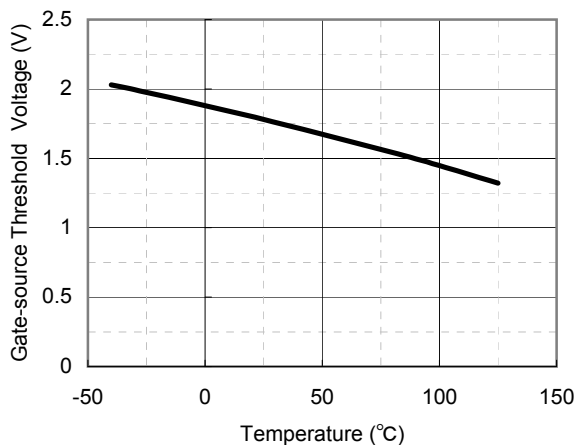


Dynamic Input/Output Characteristics

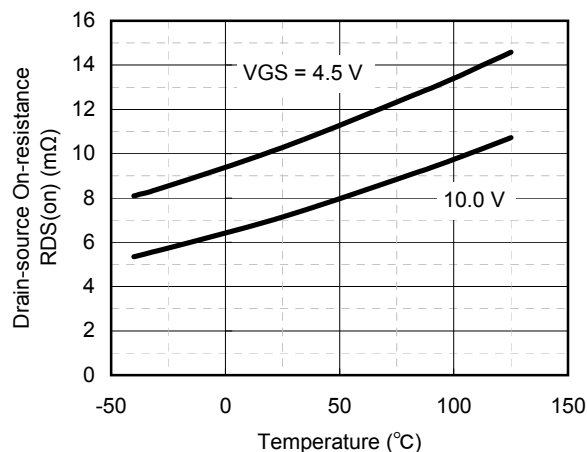


Technical Data ( reference )

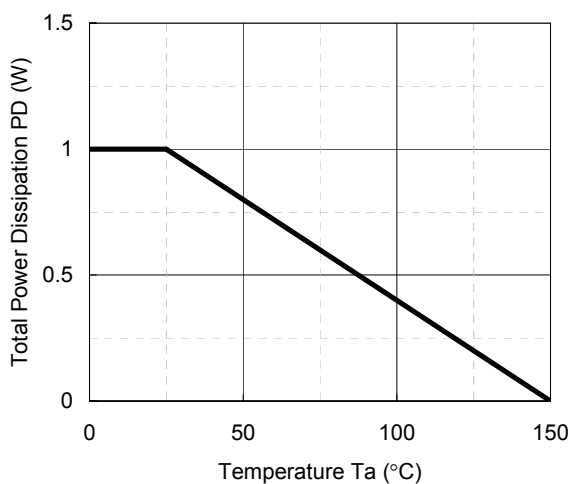
V<sub>th</sub> - T<sub>a</sub>



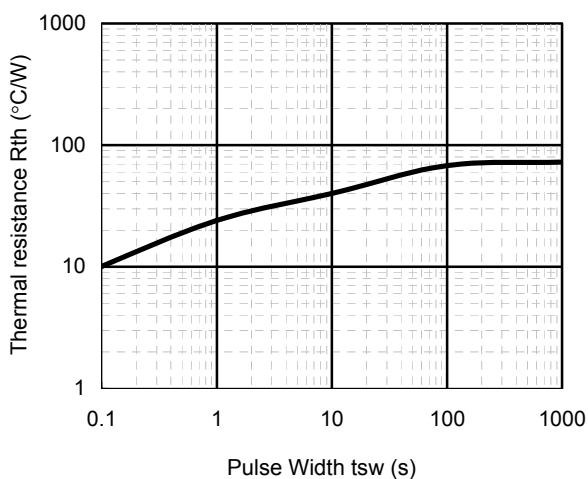
R<sub>DS(on)</sub> - T<sub>a</sub>



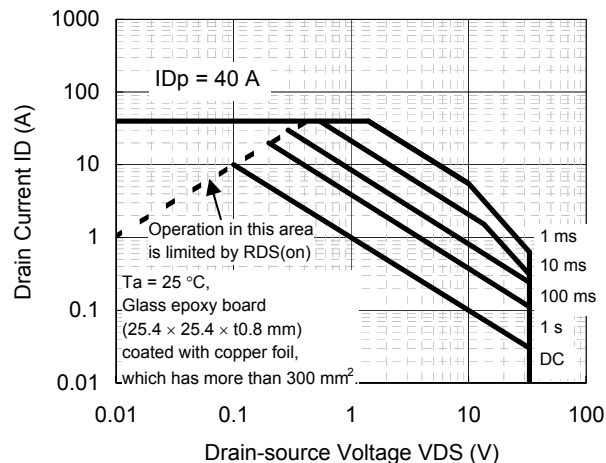
P<sub>D</sub> - T<sub>a</sub>



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

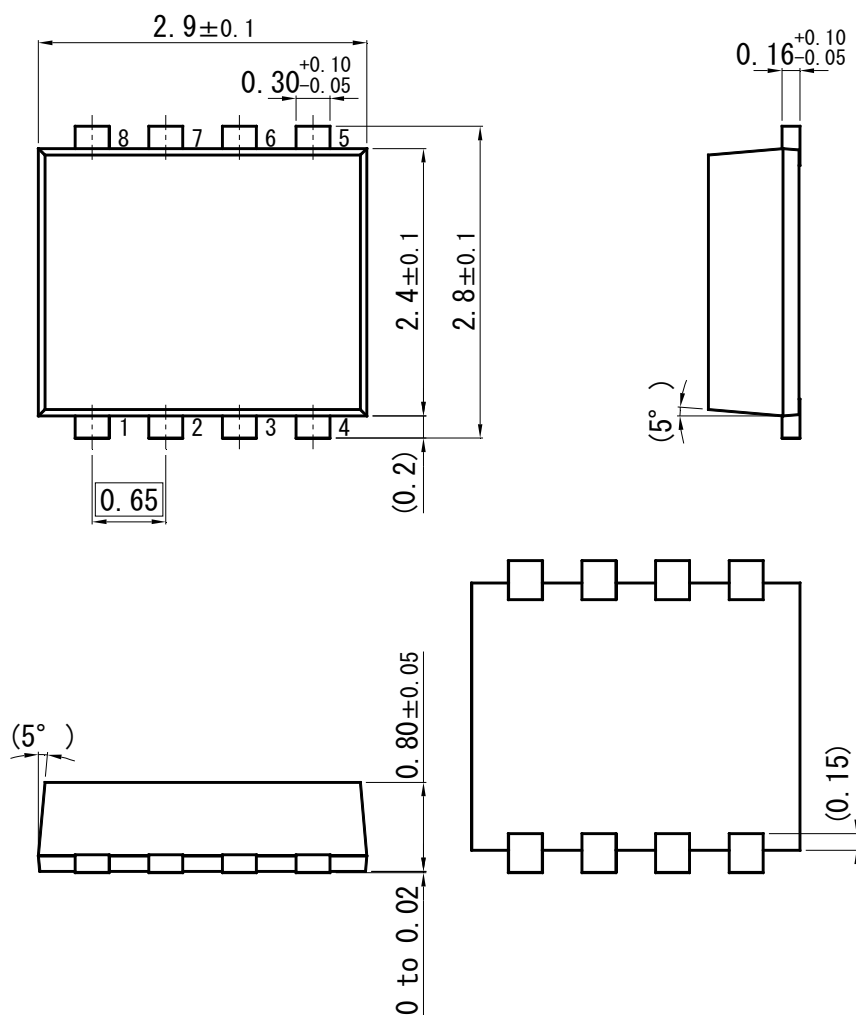


Safe Operating Area

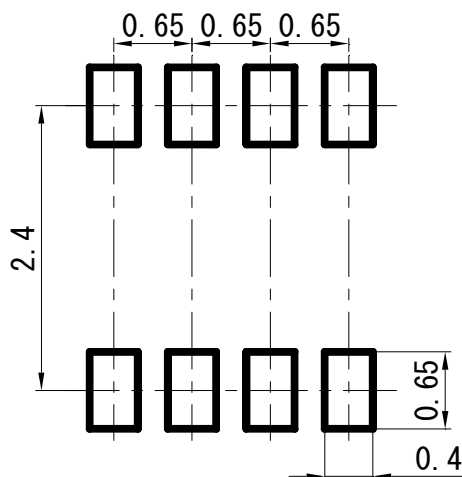


WMini8-F1

Unit : mm



■ Land Pattern (Reference) (Unit : mm)



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