Silicon Carbide Schottky Diode

650 V, 8 A

FFSD0865B

Silicon Carbide (SiC) Schottky Diodes use a completely new technology that provides superior switching performance and higher reliability compared to Silicon. No reverse recovery current, temperature independent switching characteristics, and excellent thermal performance sets Silicon Carbide as the next generation of power semiconductor. System benefits include highest efficiency, faster operating frequency, increased power density, reduced EMI, and reduced system size and cost.

Features

- Max Junction Temperature 175°C
- Avalanche Rated 33 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery/No Forward Recovery
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Peak Repetitive Reverse Voltage		V_{RRM}	650	V
Single Pulse Avalanche Energy (T_J = 25°C, $I_{L(pk)}$ = 11.5 A, L = 0.5 mH, V = 50 V)		E_{AS}	33	mJ
Continuous Rectified Forward Current	$T_C < 153$	I_F	8.0	A
	$T_C < 135$		11.6	
Non−Repetitive Peak Forward Surge Current	T_C = 25°C, t_P = 10 μs	I_{FM}	577	A
	T_C = 150°C, t_P = 10 μs		538	
Non−Repetitive Forward Surge Current (Half−Sine Pulse)	T_C = 25°C t_P = 8.3 ms	I_{FSM}	42	A
Power Dissipation	T_C = 25°C	P_{tot}	91	W
	T_C = 150°C		15	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to +175	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ON Semiconductor®

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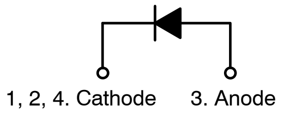
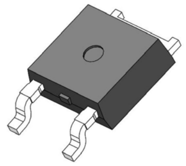


Schottky Diode



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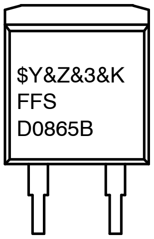
MARKING DIAGRAM



$Y = ON Semiconductor Logo
&Z = Assembly Plant Code
&3 = Numeric Date Code
&K = Lot Code
FFSD0865B = Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

THERMAL RESISTANCE

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	1.64	°C/W

ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
ON CHARACTERISTICS						
V_F	Forward Voltage	I_F = 8.0 A, T_J = 25°C		1.39	1.7	V
		I_F = 8.0 A, T_J = 125°C		1.55	2.0	
		I_F = 8.0 A, T_J = 175°C		1.71	2.4	
I_R	Reverse Current	V_R = 650 V, T_J = 25°C		0.5	40	μA
		V_R = 650 V, T_J = 125°C		1.0	80	
		V_R = 650 V, T_J = 175°C		2.0	160	
CHARGES, CAPACITANCES & GATE RESISTANCE						
Q_C	Total Capacitive Charge	V_C = 400 V		22		nC
C_{tot}		V_R = 1 V, f = 100 kHz		336		pF
		V_R = 200 V, f = 100 kHz		39		
		V_R = 400 V, f = 100 kHz		30		

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

PART MARKING AND ORDERING INFORMATION

Part Number	Top Mark	Package	Packing Method†	Reel Size	Tape Width	Quantity
FFSD0865B	FFSD0865B	DPAK3	Tape & Reel	330 mm	16 mm	2500 units

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

TYPICAL CHARACTERISTICS

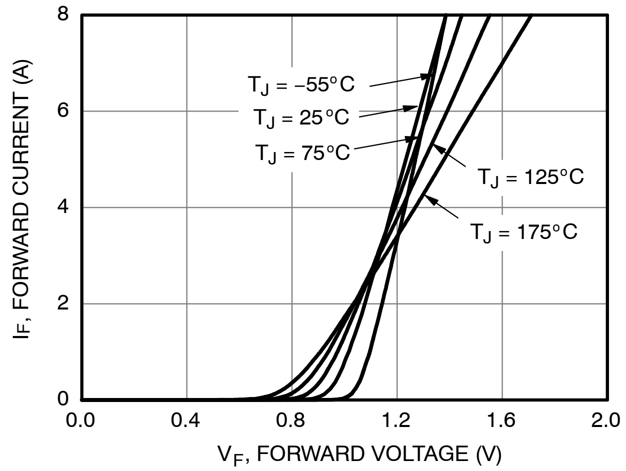


Figure 1. Forward Characteristics

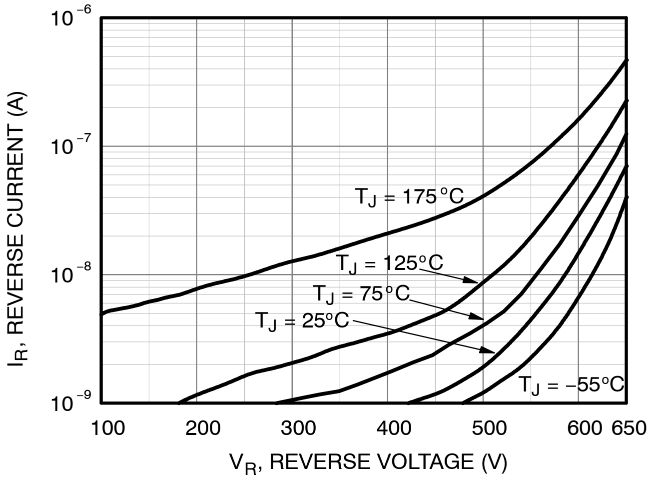


Figure 2. Reverse Characteristics

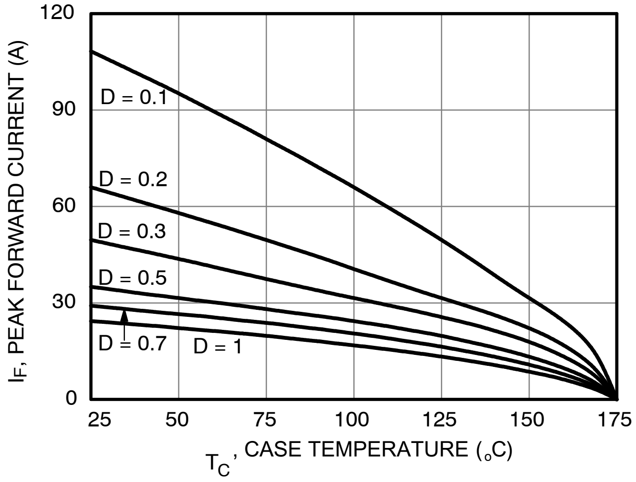


Figure 3. Current Derating

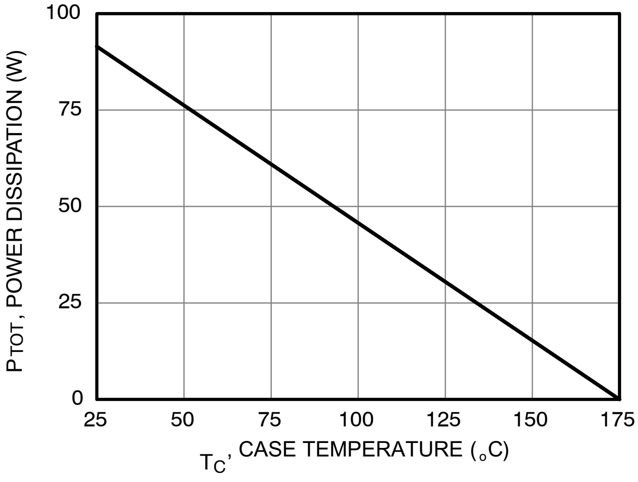


Figure 4. Power Derating

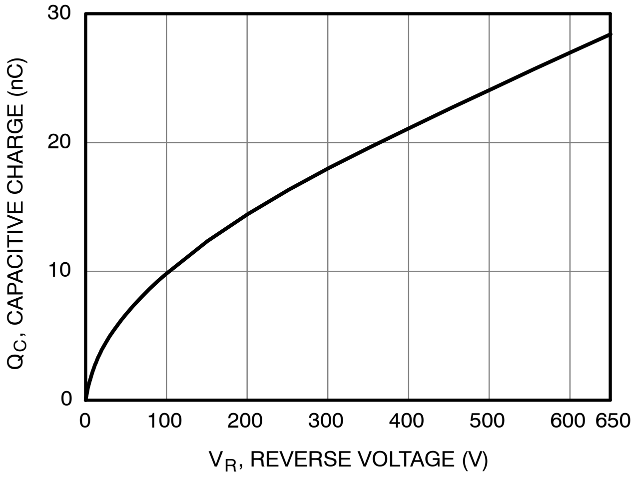


Figure 5. Capacitive Charge vs. Reverse Voltage

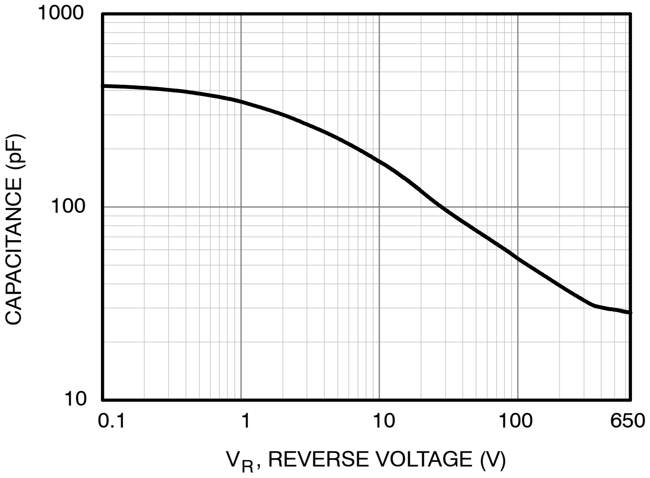


Figure 6. Capacitance vs. Reverse Voltage

TYPICAL CHARACTERISTICS (continued)

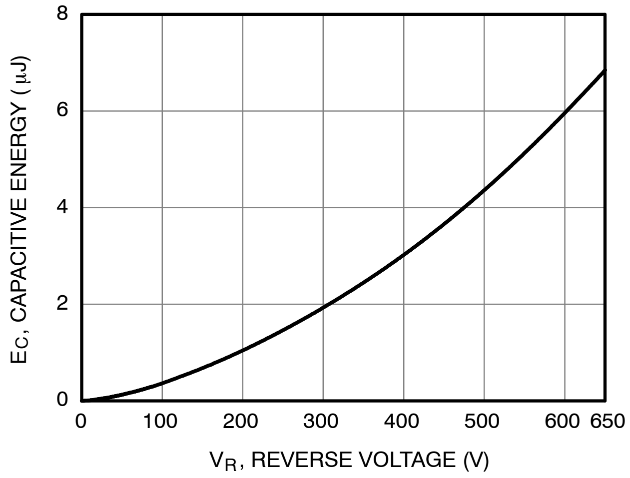


Figure 7. Capacitance Stored Energy

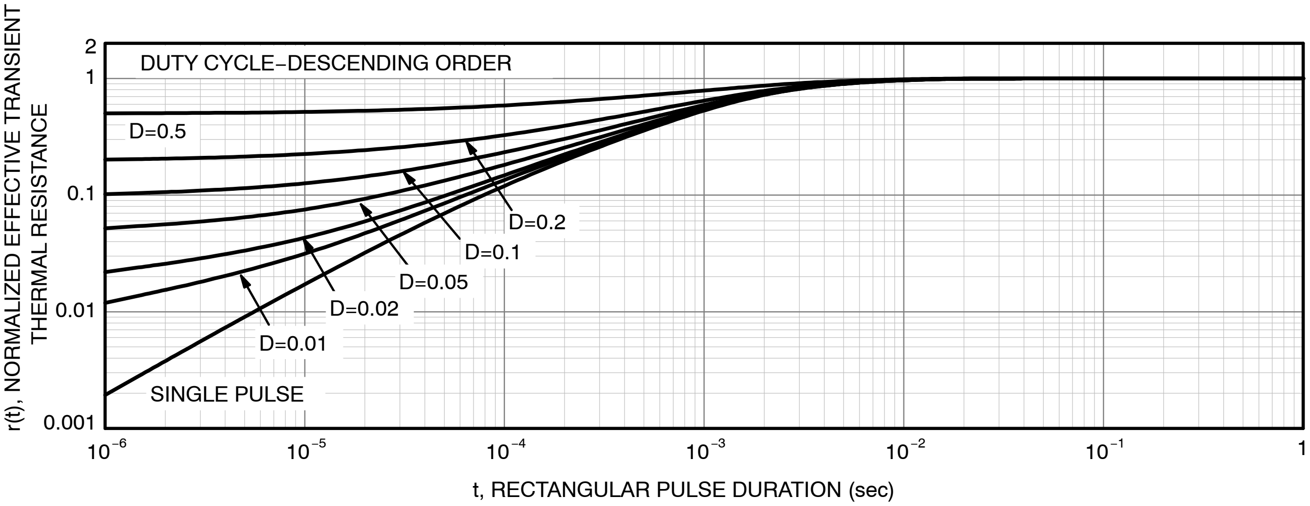


Figure 8. Junction−to−Case Transient Thermal Response

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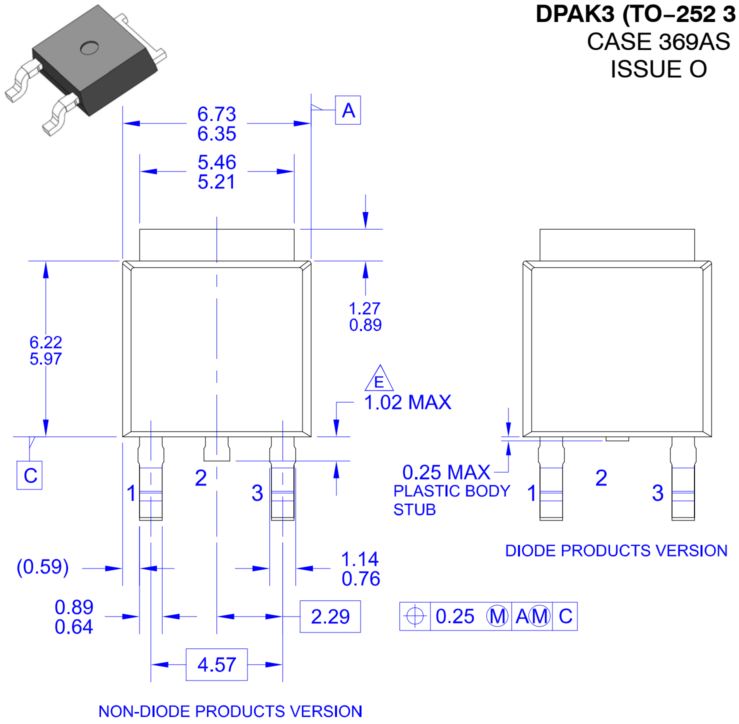
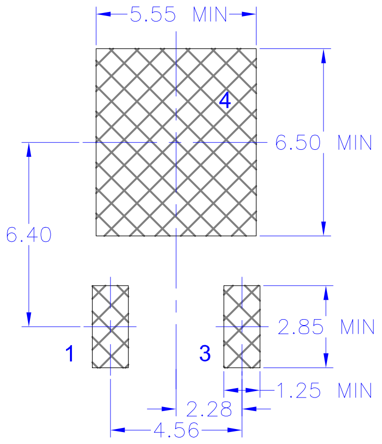
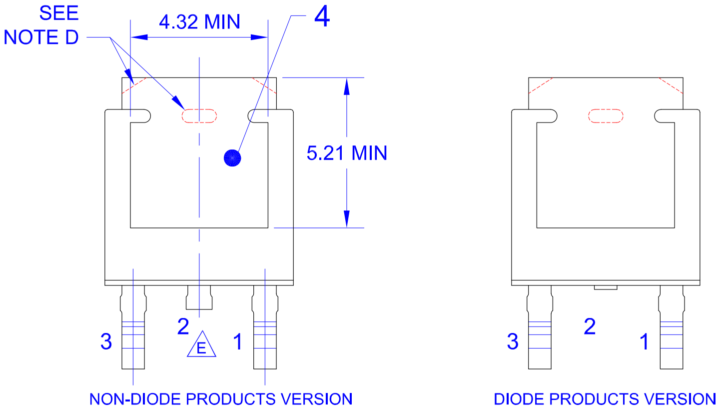
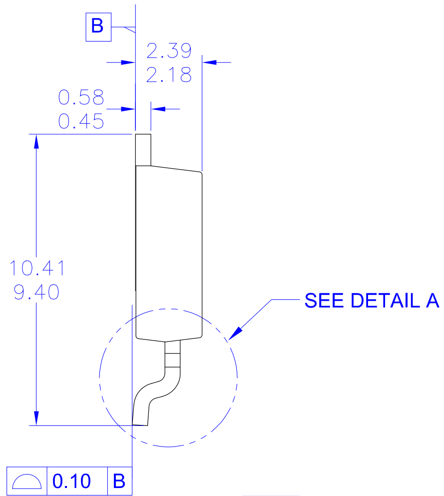
DATE 30 SEP 2016



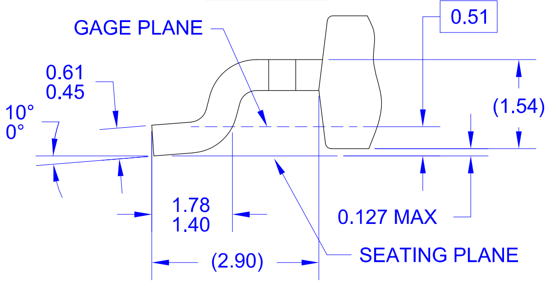


LAND PATTERN RECOMMENDATION





NOTES: UNLESS OTHERWISE SPECIFIED
A) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE C, VARIATION AA.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED CORNERS OR EDGE PROTRUSION.
E) TRIMMED CENTER LEAD IS PRESENT ONLY FOR DIODE PRODUCTS
F) DIMENSIONS ARE EXCLUSSIVE OF BURSS, MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.



DETAIL A
(ROTATED -90°)
SCALE: 12X

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