Silicon Carbide (SiC) Schottky Diode – EliteSiC, 8 A, 650 V, D2, Power88

FFSM0865B

V_{RRM}	I_F
650 V	8.0 A

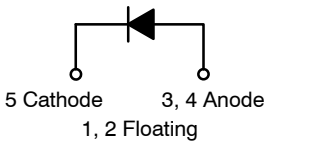
Silicon Carbide (SiC) Schottky Diodes use a completely new technology that provides superior switching performance and higher reliability compared to Silicon. No reverse recovery current, temperature independent switching characteristics, and excellent thermal performance sets Silicon Carbide as the 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

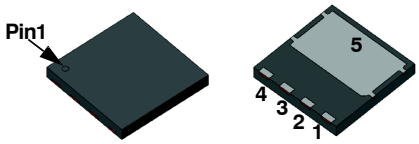
- Max Junction Temperature 175°C
- Avalanche Rated 33 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

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

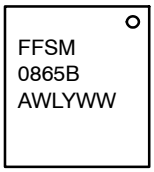


Schottky Diode



PQFN4 8×8, 2P
(Power88)
CASE 483AP

MARKING DIAGRAM



FFSM0865B	= Specific Device Code
A	= Assembly Site
WL	= Wafer Lot Number
Y	= Year
WW	= Work Week

ORDERING INFORMATION

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

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

Parameter		Symbol	Value	Unit
Peak Repetitive Reverse Voltage		V_{RRM}	650	V
Single Pulse Avalanche Energy (starting T_C = 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_P = 10 μs)	T_C = 25°C	I_{FM}	490	A
	T_C = 150°C		434	
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.

THERMAL RESISTANCE

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

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ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

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		
		I_F = 8.0 A, T_J = 150°C		1.67		
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†	Quantity
FFSM0865B	FFSM0865B	PQFN4 8X8, 2P (Power88) (Halogen Free)	Tape & Reel	3000 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 (T_J = 25°C UNLESS OTHERWISE NOTED)

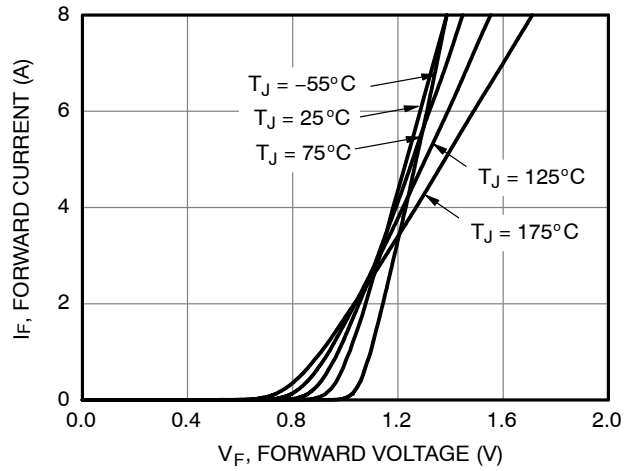


Figure 1. Forward Characteristics

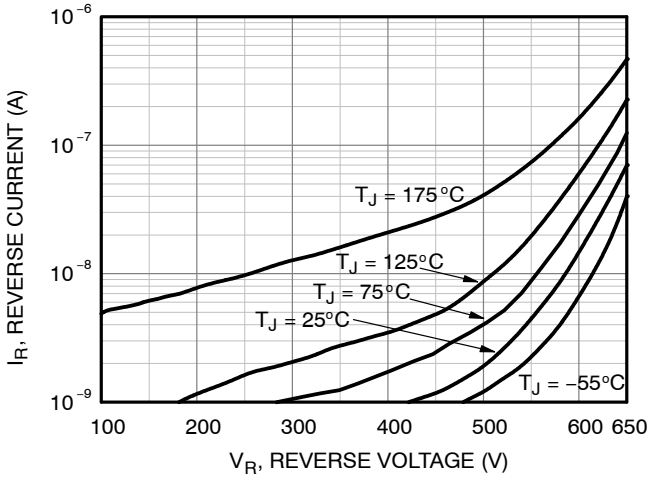


Figure 2. Reverse Characteristics

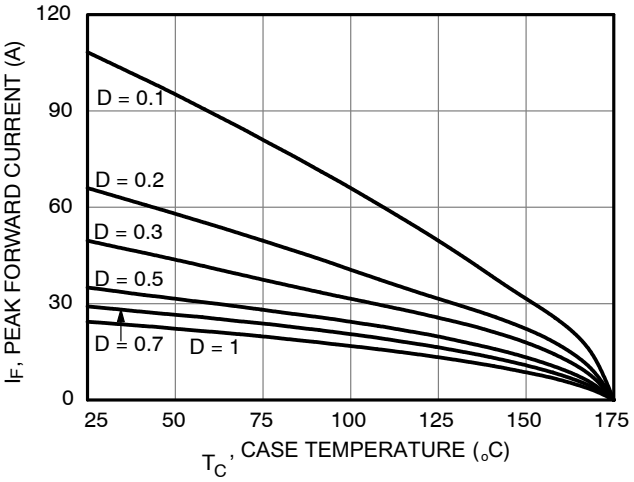


Figure 3. Current Derating

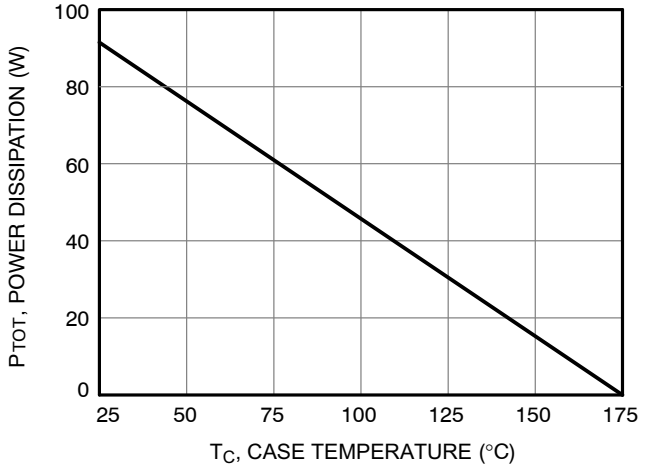


Figure 4. Power Derating

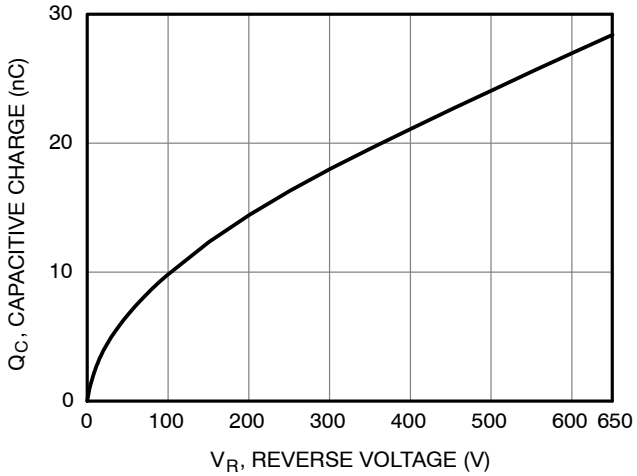


Figure 5. Capacitive Charge vs. Reverse Voltage

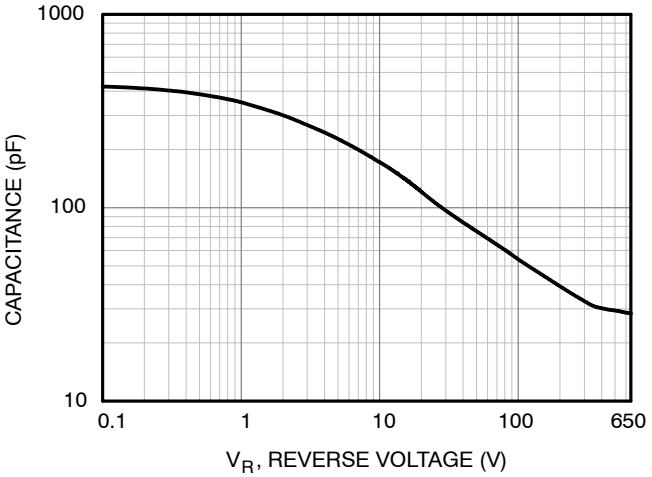


Figure 6. Capacitance vs. Reverse Voltage

TYPICAL CHARACTERISTICS (T_J = 25°C UNLESS OTHERWISE NOTED)

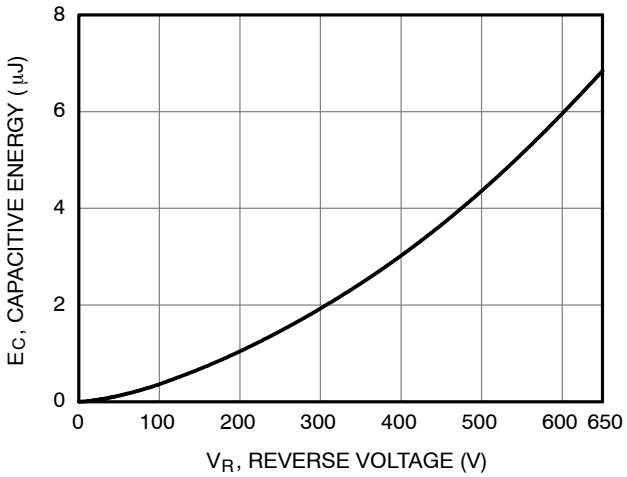


Figure 7. Capacitance Stored Energy

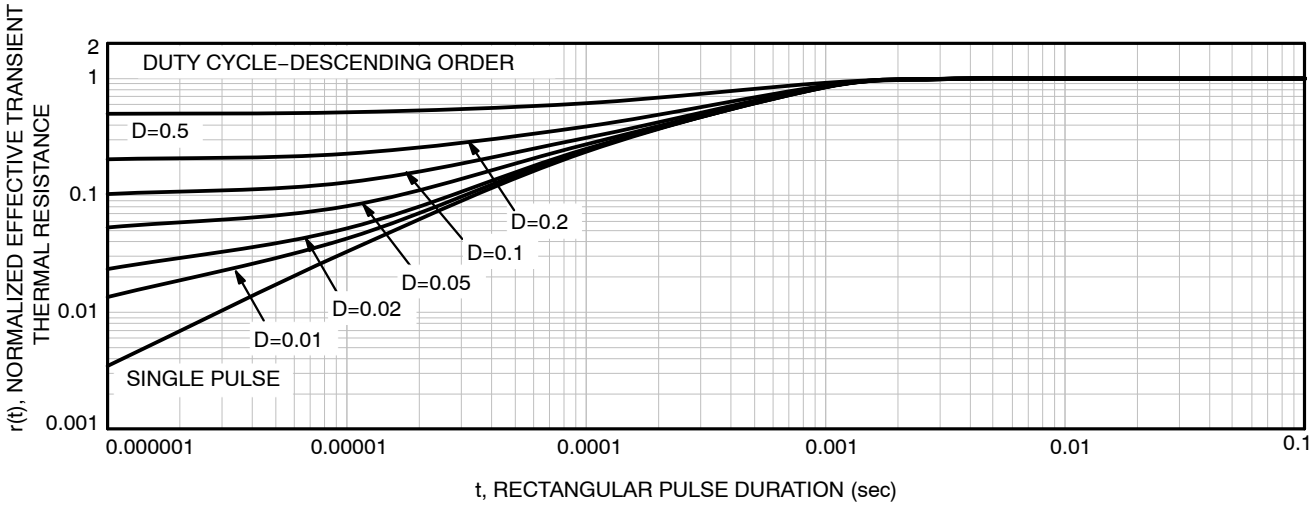
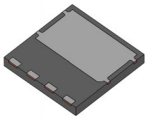


Figure 8. Junction−to−Case Transient Thermal Response



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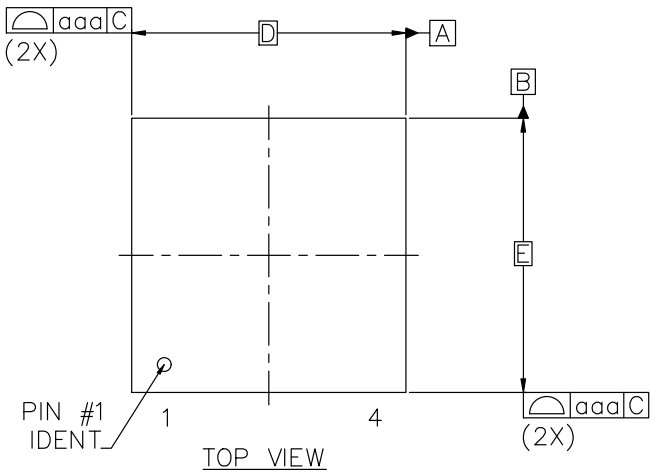
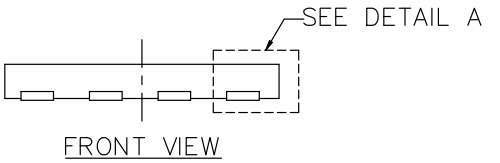
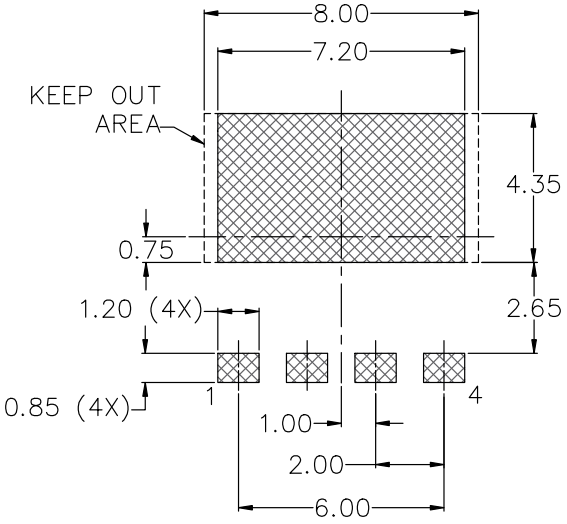
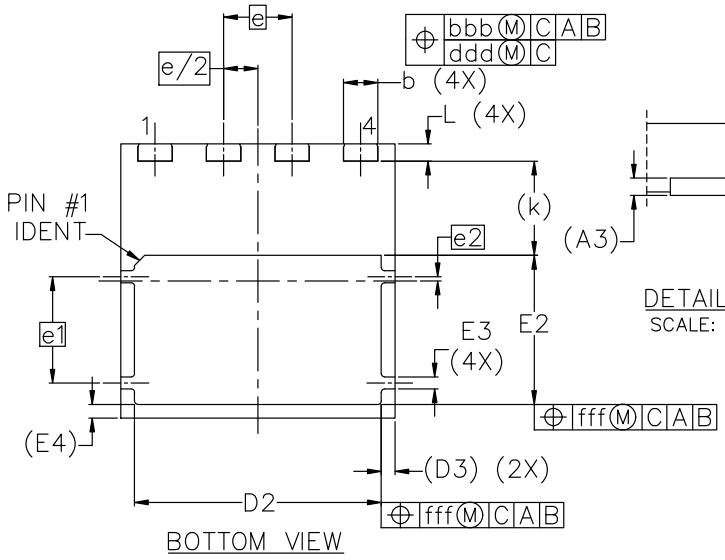
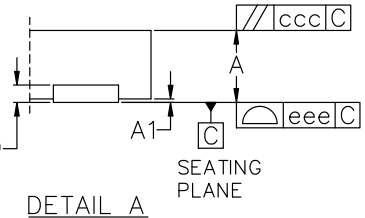






*FOR ADDITIONAL INFORMATION ON OUR PB−FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ONSEMI SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.





DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0.00	–	0.05
A3	0.20 REF		
b	0.90	1.00	1.10
D	8.00 BSC		
D2	7.10	7.20	7.30
D3	0.40 REF		
E	8.00 BSC		
E2	4.25	4.35	4.45
E3	0.25	0.35	0.45
E4	0.40 REF		
e	2.00 BSC		
e/2	1.00 BSC		
e1	3.10 BSC		
e2	0.125 BSC		
k	2.75 REF		
L	0.40	0.50	0.60
aaa	0.10		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		
fff	0.10		

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5−2018.
2. CONTROLLING DIMENSION: MILLIMETERS
3. COPLANARITY APPLIES TO THE EXPOSED PADS AS WELL AS THE TERMINALS.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
5. SEATING PLANE IS DEFINED BY THE TERMINALS. "A1" IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.
6. IT IS RECOMMENDED TO HAVE NO TRACES OR VIAS WITHIN THE KEEP OUT AREA.

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