Silicon Carbide (SiC) Schottky Diode – EliteSiC, 6 A, 650 V, D2, D2PAK-2L

FFSB0665B-F085

V_{RRM}	I_F
650 V	6.0 A

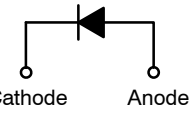
Silicon Carbide (SiC) Schottky Diodes use a completely new technology that provides superior switching performance and higher reliability compared to Silicon. No reverse recovery current, temperature independent switching characteristics, and excellent thermal performance sets Silicon Carbide as the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

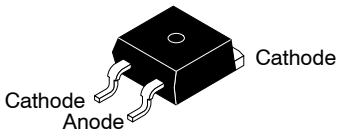
- Max Junction Temperature 175°C
- Avalanche Rated 24.5 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery
- AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- Automotive HEV−EV Onboard Chargers
- Automotive HEV−EV DC−DC Converters

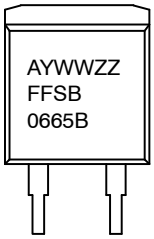


Schottky Diode



D²PAK2 (TO−263−2L)
CASE 418BK

MARKING DIAGRAM



A	= Assembly Plant Code
YWW	= Date Code (Year & Week)
ZZ	= Lot Code
FFSB0665B	= Specific Device Code

ORDERING INFORMATION

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

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, $I_{L(pk)}$ = 9.9 A, L = 0.5 mH, V = 50 V)		E_{AS}	24.5	mJ
Continuous Rectified Forward Current	@ T_C < 150	I_F	6.0	A
	@ T_C < 135		8.0	
Non−Repetitive Peak Forward Surge Current	T_C = 25°C, t_P = 10 µs	I_{FM}	523	A
	T_C = 150°C, t_P = 10 µs		467	
Non−Repetitive Forward Surge Current (Half−Sine Pulse)	T_C = 25°C, t_P = 8.3 ms	I_{FSM}	45	A
Power Dissipation	T_C = 25°C	P_{tot}	61	W
	T_C = 150°C		10	
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.

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THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction−to−Case, Max.	$R_{\theta JC}$	2.46	°C/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON CHARACTERISTICS						
Forward Voltage	V_F	I_F = 6.0 A, T_J = 25°C		1.38	1.7	V
		I_F = 6.0 A, T_J = 125°C		1.53	2.0	
		I_F = 6.0 A, T_J = 175°C		1.67	2.4	
Reverse Current	I_R	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						
Total Capacitive Charge	Q_C	V_C = 400 V		16		nC
	C_{tot}	V_R = 1 V, f = 100 kHz		259		pF
		V_R = 200 V, f = 100 kHz		29		
		V_R = 400 V, f = 100 kHz		22		

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.

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Top Marking	Package	Packing Method	Reel Size	Tape Width	Quantity
FFSB0665B−F085	FFSB0665B	D^2PAK2 (TO−263−2L)	Tape & Reel†	330 mm	24 mm	800 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

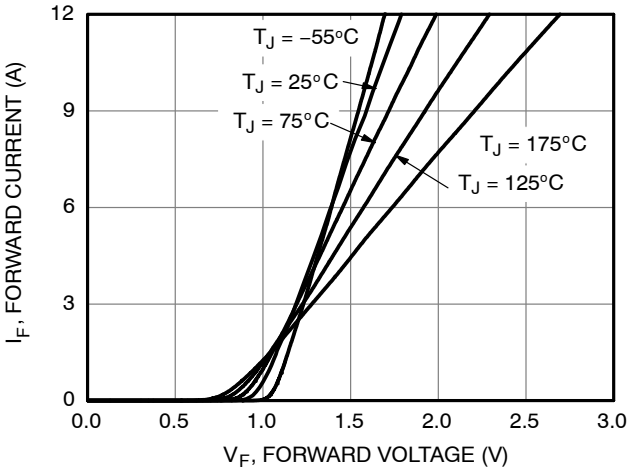


Figure 1. Forward Characteristics

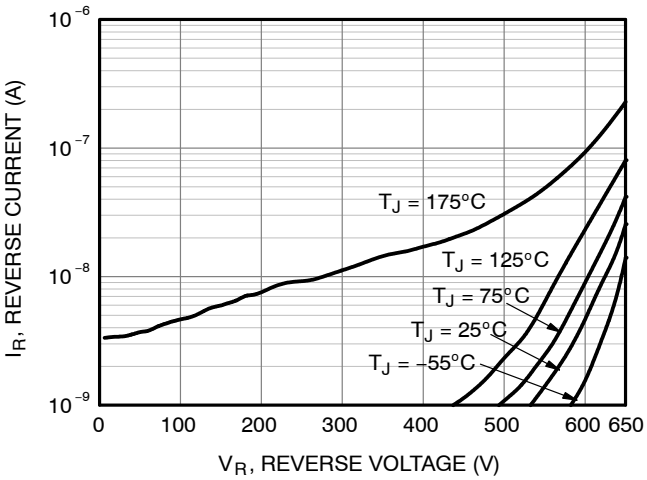


Figure 2. Reverse Characteristics

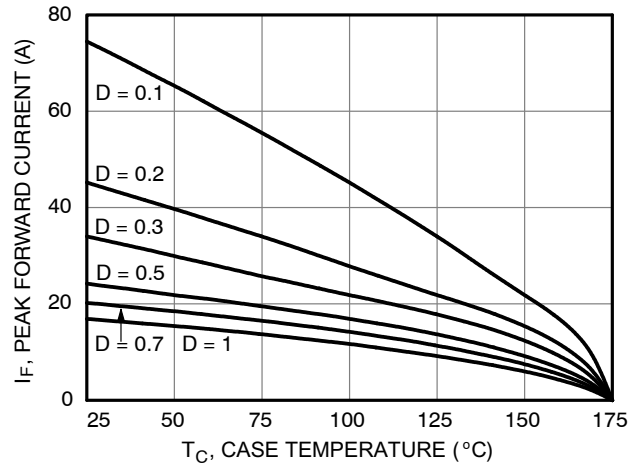


Figure 3. Current Derating

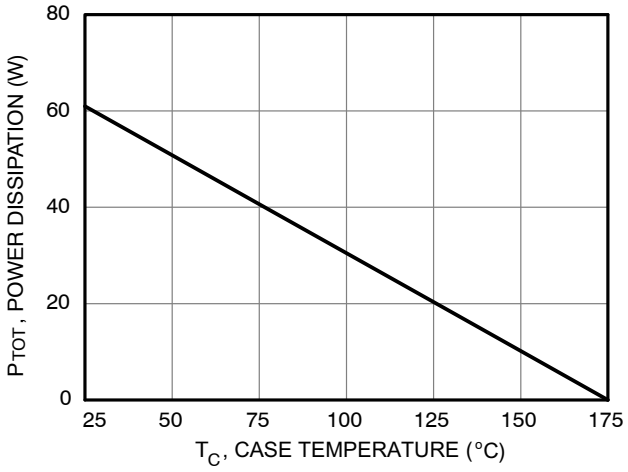


Figure 4. Power Derating

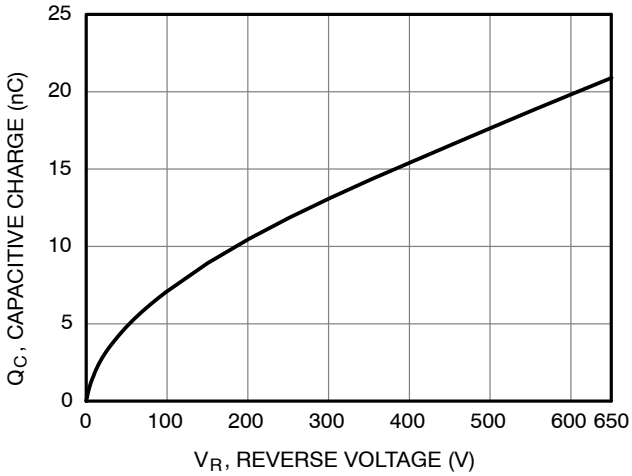


Figure 5. Capacitive Charge vs. Reverse Voltage

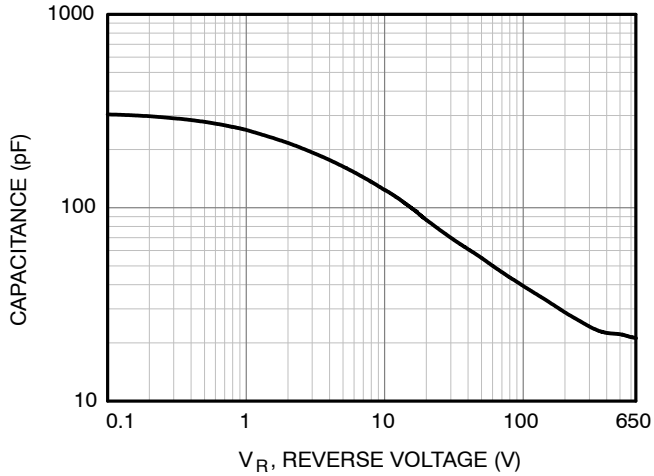


Figure 6. Capacitance vs. Reverse Voltage

TYPICAL CHARACTERISTICS

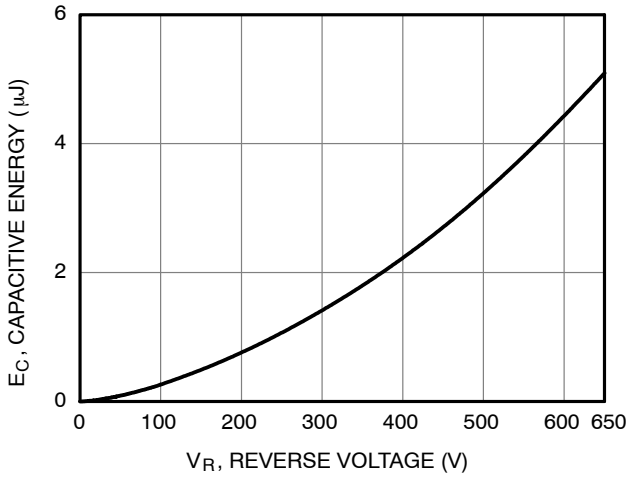


Figure 7. Capacitance Stored Energy

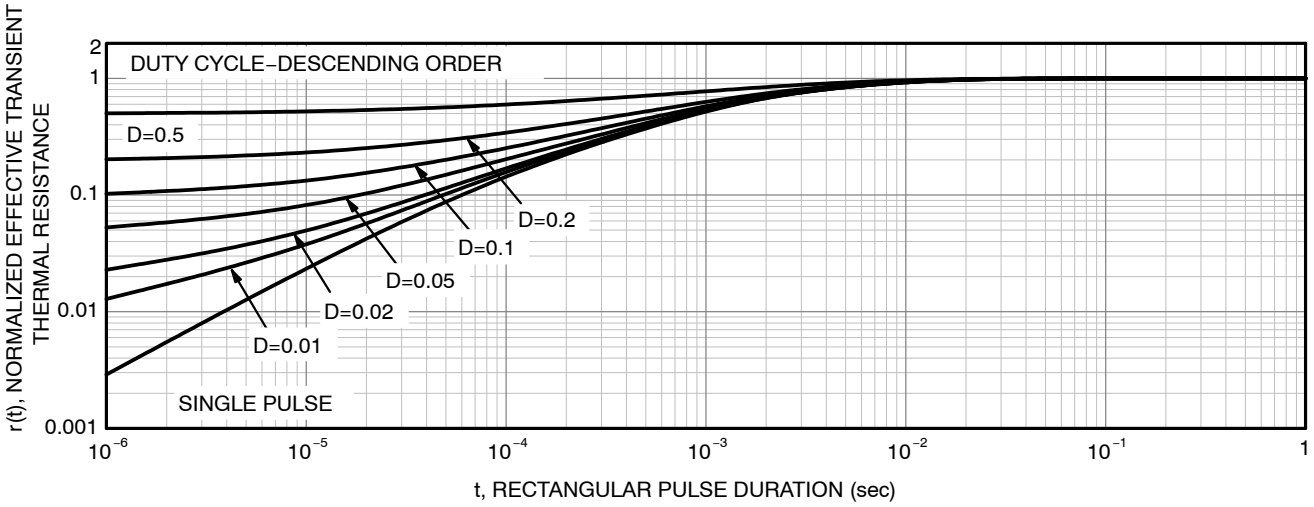
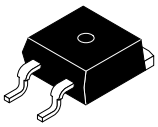


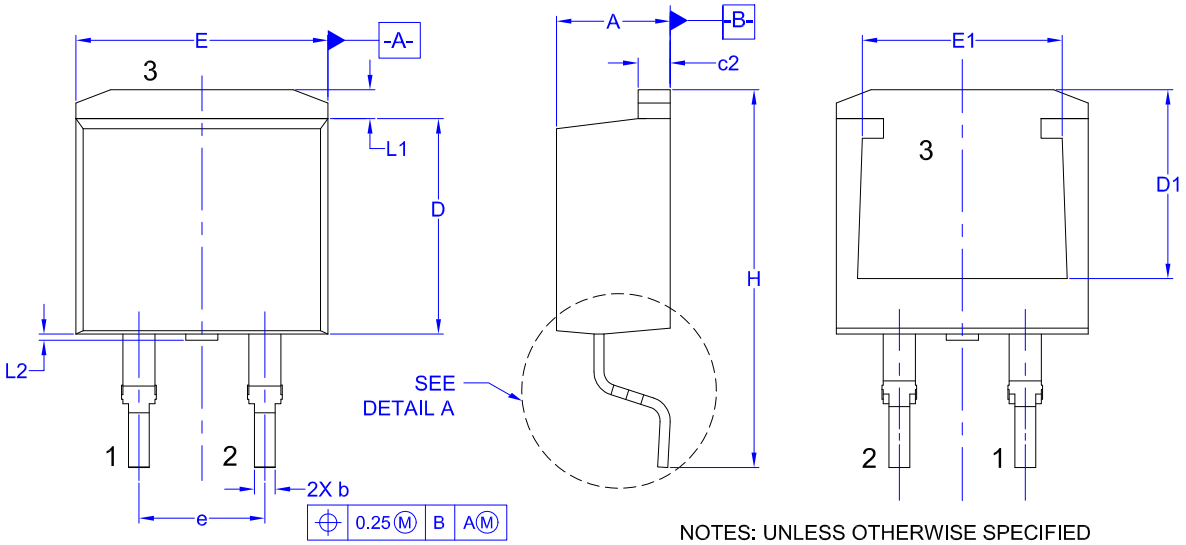
Figure 8. Junction−to−Case Transient Thermal Response

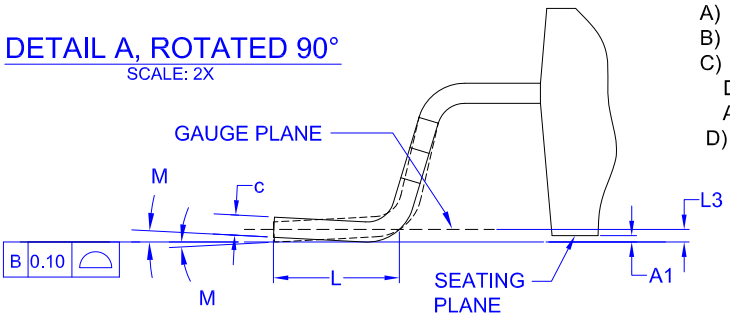
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS



D²PAK2 (TO−263−2L)
CASE 418BK
ISSUE O

DATE 02 AUG 2018

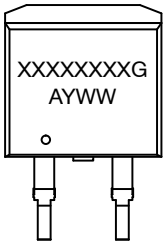




NOTES: UNLESS OTHERWISE SPECIFIED
A) ALL DIMENSIONS ARE IN MILLIMETERS.
B) REFERENCE JEDEC, TO-263, VARIATION AB.
C) DIMENSIONING AND TOLERANCING PER DIMENSIONING AND TOLERANCING PER ASME Y14.5 - 2009.
D) LANDPATTERN RECOMMENDATION PER IPC TO254P1524X482-3N

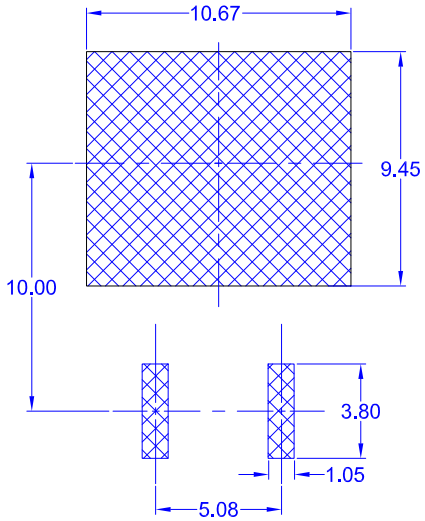
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.06	4.57	4.83
A1	0.00	0.10	0.25
b	0.51	0.81	0.99
c	0.30	0.407	0.74
c2	1.14	1.30	1.65
D	8.38	8.69	9.65
D1	7.30	7.80	8.30
E	9.65	10.16	10.67
E1	8.00	8.62	9.00
e	5.08 BSC		
H	14.60	15.35	15.88
L	1.78	2.54	2.79
L1	0.90	1.29	1.68
L2	0.00	0.15	0.25
L3	0.25 BSC		
M	0°	4°	8°

GENERIC MARKING DIAGRAM*



XXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present. Some products may not follow the Generic Marking.



LAND PATTERN RECOMMENDATION
UNLESS NOTED, ALL DIMS TYPICAL

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