FFSP1065B-F085

Silicon Carbide Schottky Diode

650 V, 10 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 49 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

ABSOLUTE MAXIMUM RATINGS

(T_C = 25°C, Unless otherwise specified)

Symbol	Parameter		FF-SP1065B−F085	Unit
V_{RRM}	Peak Repetitive Reverse Voltage		650	V
E_{AS}	Single Pulse Avalanche Energy (Note 1)		49	mJ
I_F	Continuous Rectified Forward Current @ T_C < 139°C		10	A
	Continuous Rectified Forward Current @ T_C < 135°C		11	
$I_{F, Max}$	Non−Repetitive Peak Forward Surge Current	T_C = 25°C, 10 μs	650	A
		T_C = 150°C, 10 μs	570	
$I_{F, SM}$	Non−Repetitive Forward Surge Current	Half−Sine Pulse, t_p = 8.3 ms	45	A
P_{tot}	Power Dissipation	T_C = 25°C	75	W
		T_C = 150°C	12.5	
T_J, T_{STG}	Operating and Storage Temperature Range		−55 to +175	°C

1. E_{AS} of 49 mJ is based on starting T_J = 25°C, L = 0.5 mH, I_{AS} = 14 A, V = 50 V.

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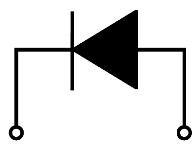
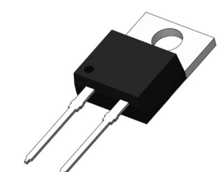
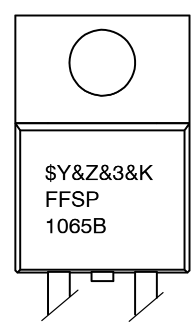
ELECTRICAL CONNECTION





TO−220−2LD
CASE 340BB

MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z	= Assembly Plant Code
&3	= Numeric Date Code
&K	= Lot Code
FFSP1065B−F085	= Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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THERMAL CHARACTERISTICS

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	2.0	°C/W

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFSP1065B−F085	FFSP1065B	TO220	Tube	N/A	N/A	50 Units

ELECTRICAL CHARACTERISTICS T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F = 10 A, T_C = 25°C	–	1.38	1.7	V
		I_F = 10 A, T_C = 125°C	–	1.6	2.0	
		I_F = 10 A, T_C = 175°C	–	1.72	2.4	
I_R	Reverse Current	V_R = 650 V, T_C = 25°C	–	0.5	40	μA
		V_R = 650 V, T_C = 125°C	–	1.0	80	
		V_R = 650 V, T_C = 175°C	–	2.0	160	
Q_C	Total Capacitive Charge	V = 400 V	–	25	–	nC
C	Total Capacitance	V_R = 1 V, f = 100 kHz	–	421	–	pF
		V_R = 200 V, f = 100 kHz	–	46	–	
		V_R = 400 V, f = 100 kHz	–	35	–	

TYPICAL CHARACTERISTICS T_J = 25°C Unless Otherwise Noted

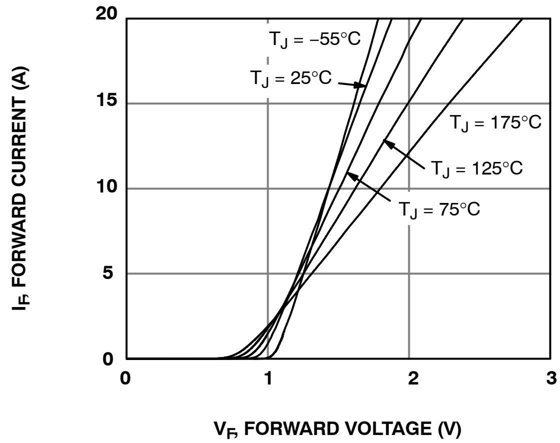


Figure 1. Forward Characteristics

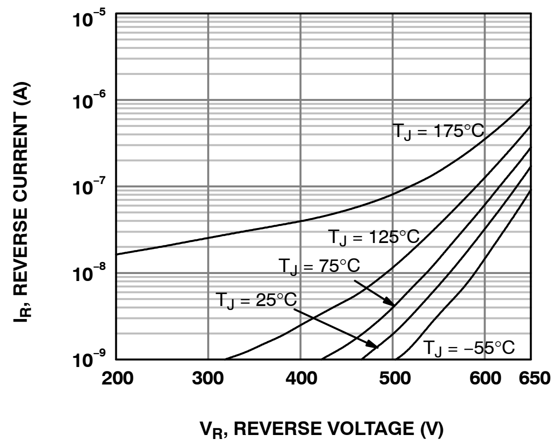


Figure 2. Reverse Characteristics

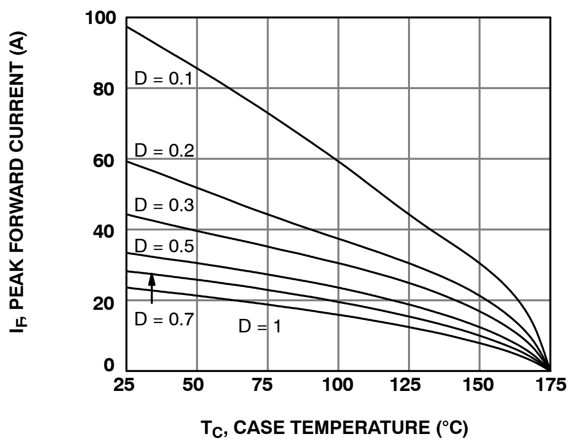


Figure 3. Current Derating

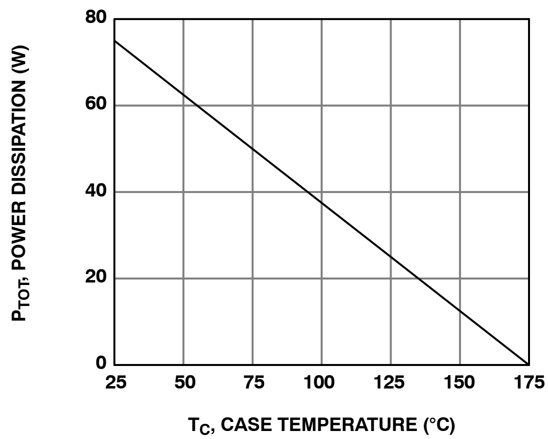


Figure 4. Power Dissipation

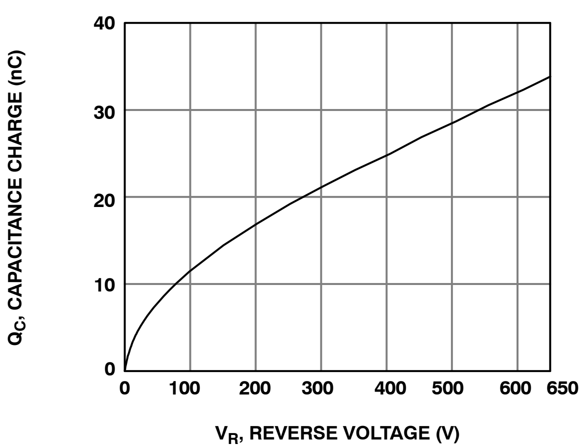


Figure 5. Capacitance Charge vs. Reverse Voltage

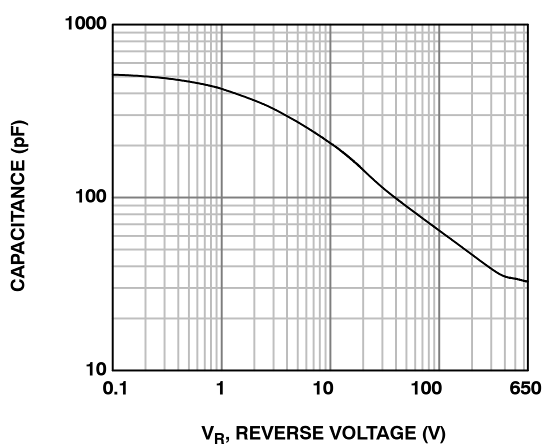


Figure 6. Capacitance vs. Reverse Voltage

TYPICAL CHARACTERISTICS T_J = 25°C Unless Otherwise Noted (continued)

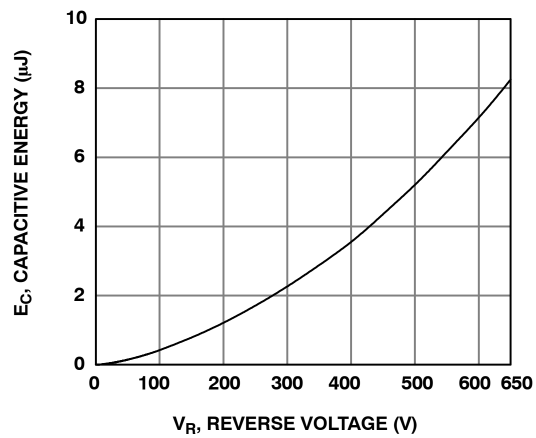


Figure 7. Capacitance Stored Energy

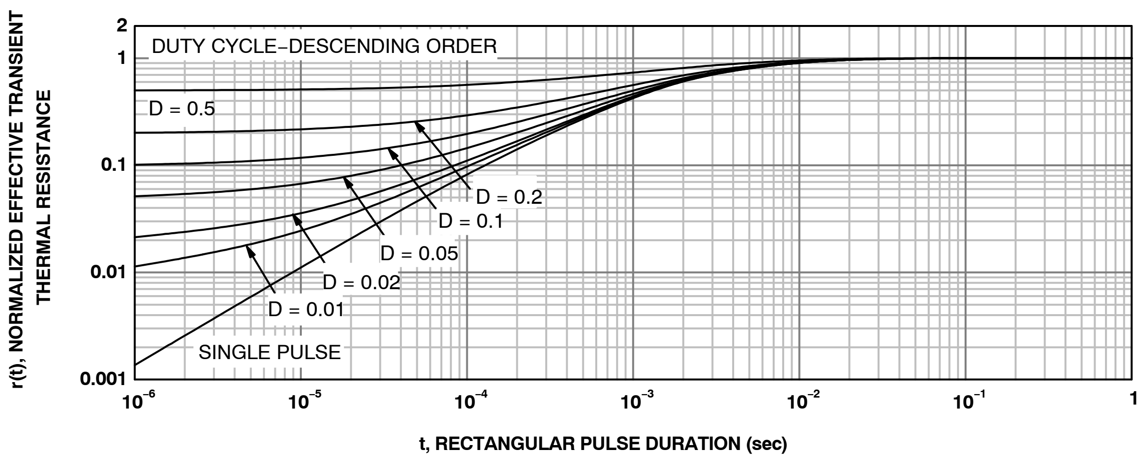


Figure 8. Junction−to−Case Transient Thermal Response Curve

TEST CIRCUIT AND WAVEFORMS

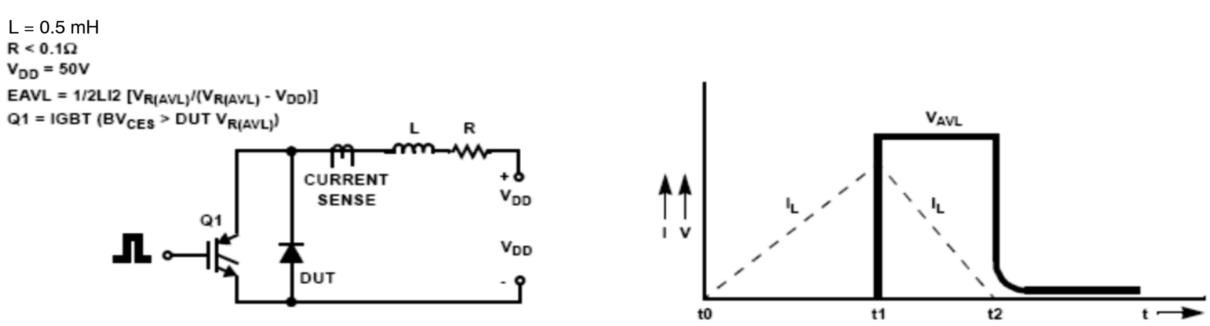
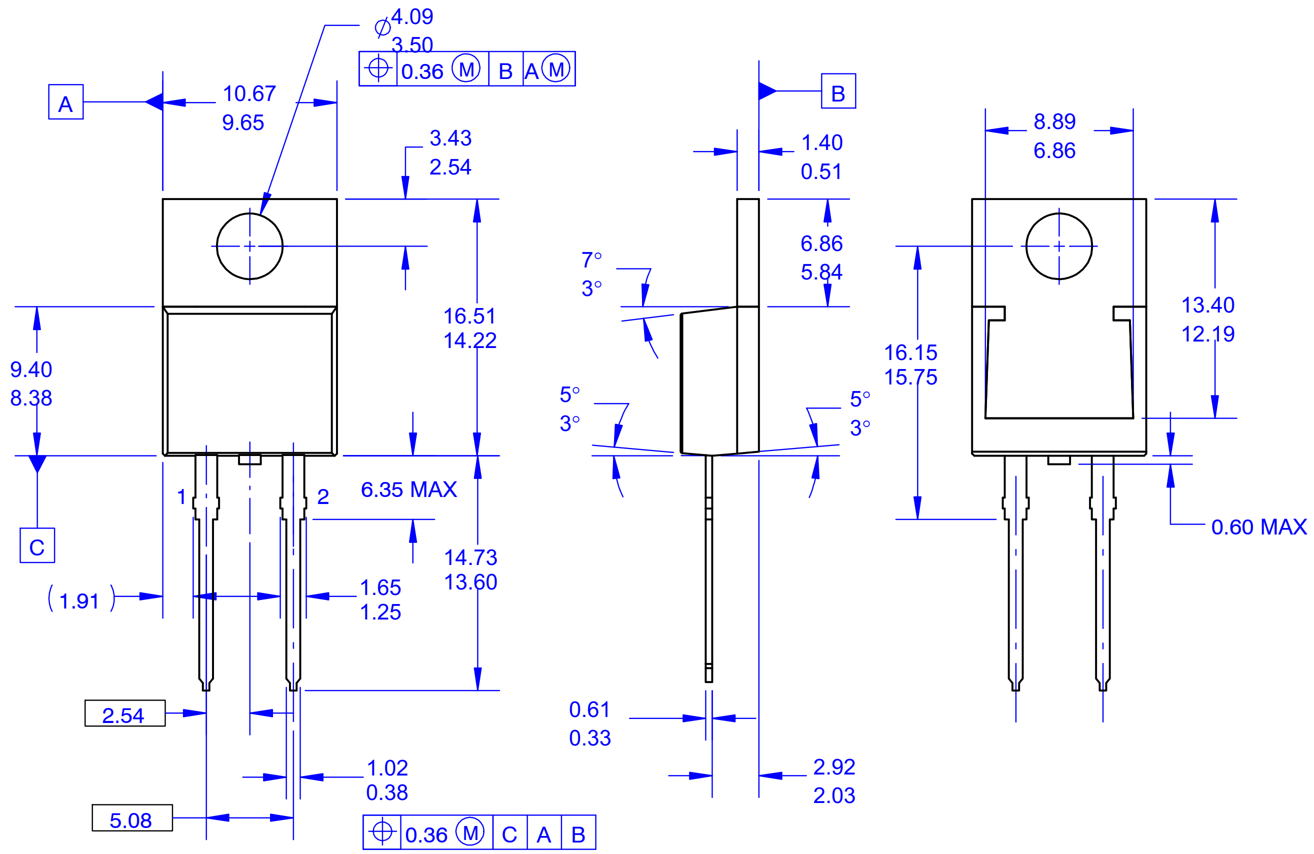
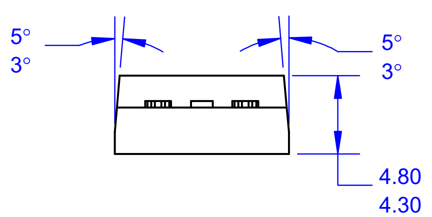


Figure 9. Unclamped Inductive Switching Test Circuit & Waveform

PACKAGE DIMENSIONS

TO−220−2LD
CASE 340BB
ISSUE O





NOTES:

A. PACKAGE REFERENCE: JEDEC TO220,ISSUE K, VARIATION AC,DATED APRIL 2002.
B. ALL DIMENSIONS ARE IN MILLIMETERS.
C. DIMENSION AND TOLERANCE AS PER ASME Y14.5−2009.
D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.

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