August 2016

FFSP08120A

Silicon Carbide Schottky Diode

1200 V, 8 A

Features

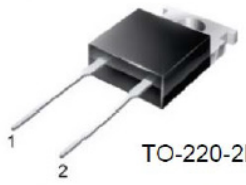
- Max Junction Temperature 175 °C
- Avalanche Rated 80 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery

Applications

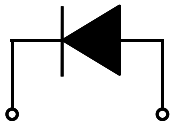
- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

Description

SiC Schottky Diode has no switching loss, provides improved system efficiency against Si diodes by utilizing new semiconductor material - Silicon Carbide, enables higher operating frequency, and helps increasing power density and reduction of system size/cost. Its high reliability ensures robust operation during surge or over-voltage conditions



1. Cathode 2. Anode



1,3 Cathode 2. Anode

Absolute Maximum Ratings T_C = 25 °C unless otherwise noted.

Symbol	Parameter		FFSP08120A	Unit
V_{RRM}	Peak Repetitive Reverse Voltage		1200	V
E_{AS}	Single Pulse Avalanche Energy (Note 1)		80	mJ
I_F	Continuous Rectified Forward Current @ T_C < 148 °C		8	A
$I_{F, Max}$	Non-Repetitive Peak Forward Surge Current	T_C = 25 °C, 10 µs	530	A
		T_C = 150 °C, 10 µs	480	A
$I_{F,SM}$	Non-Repetitive Forward Surge Current	Half-Sine Pulse, t_p = 8.3 ms	68	A
$I_{F,RM}$	Repetitive Forward Surge Current	Half-Sine Pulse, t_p = 8.3 ms	32	A
Ptot	Power Dissipation	T_C = 25 °C	166	W
		T_C = 150 °C	27	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	°C

Thermal Characteristic

Symbol	Parameter	FFSP08120A	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max	0.9	°C/W

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Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFSP08120A	FFSP08120A	TO-220-2L	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 = 8 A, T_C = 25 °C	-	1.45	1.75	V
		I_F = 8 A, T_C = 125 °C	-	1.7	2	
		I_F = 8 A, T_C = 175 °C	-	2	2.4	
I_R	Reverse Current	V_R = 1200 V, T_C = 25 °C	-	-	200	μA
		V_R = 1200 V, T_C = 125 °C	-	-	300	
		V_R = 1200 V, T_C = 175 °C	-	-	400	
Q_C	Total Capacitive Charge	V = 800 V	-	55	-	nC
C	Total Capacitance	V_R = 1 V, f = 100 kHz	-	538	-	pF
		V_R = 400 V, f = 100 kHz	-	50	-	
		V_R = 800 V, f = 100 kHz	-	40	-	

Notes:
1: EAS of 80 mJ is based on starting T_J = 25 °C, L = 0.5 mH, I_{AS} = 18 A, V = 150 V.

Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 1. Forward Characteristics

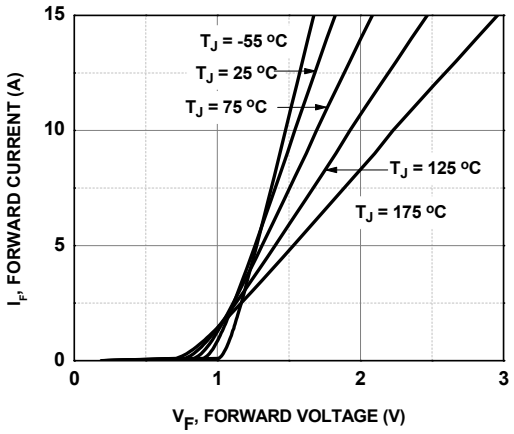


Figure 2. Reverse Characteristics

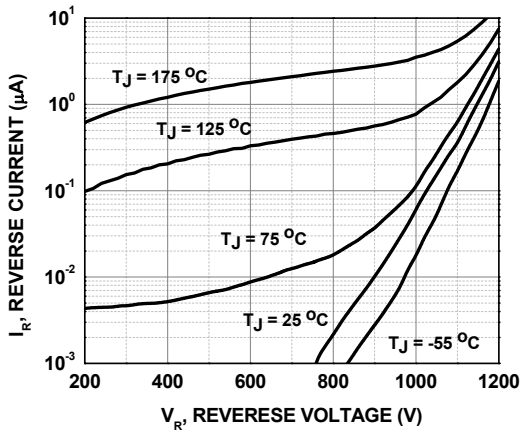


Figure 3. Reverse Characteristics

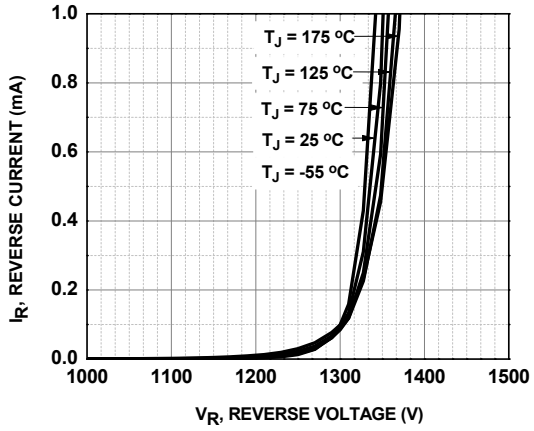
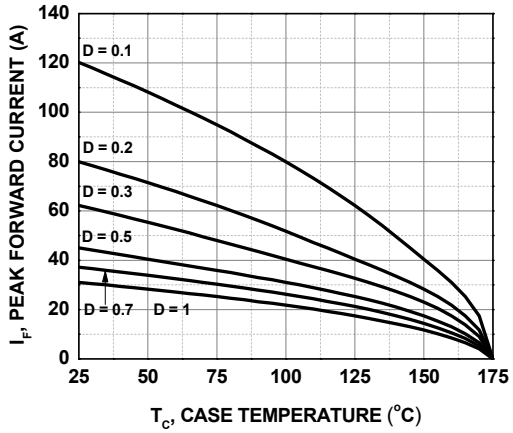


Figure 4. Current Derating



Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 5. Power Derating

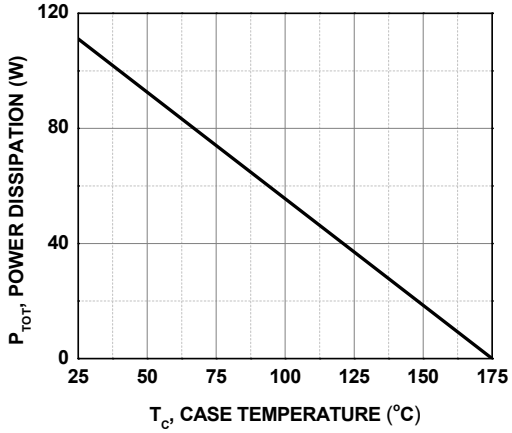


Figure 6. Capacitive Charge vs. Reverse Voltage

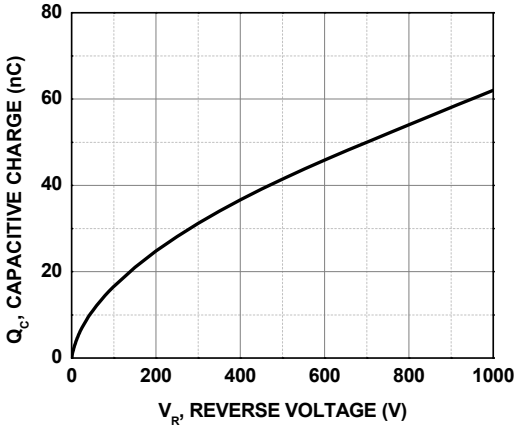


Figure 7. Capacitance vs. Reverse Voltage

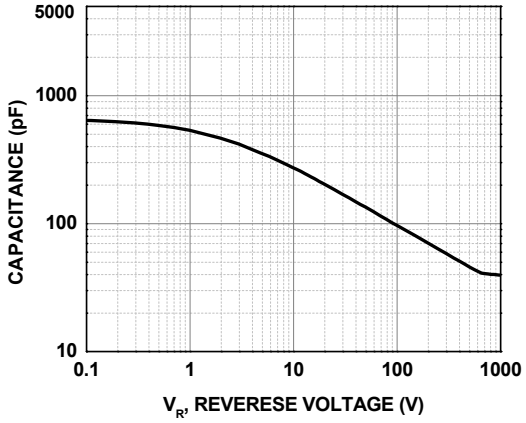


Figure 8. Capacitance Stored Energy

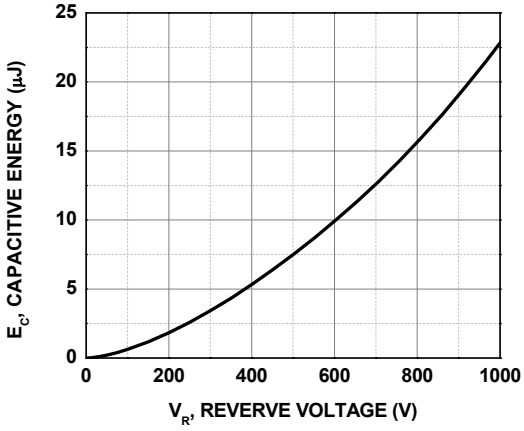
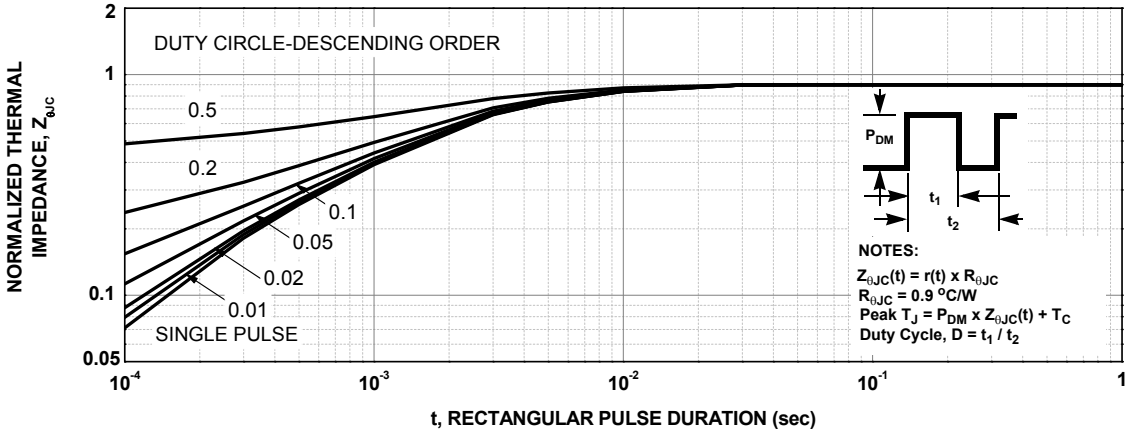
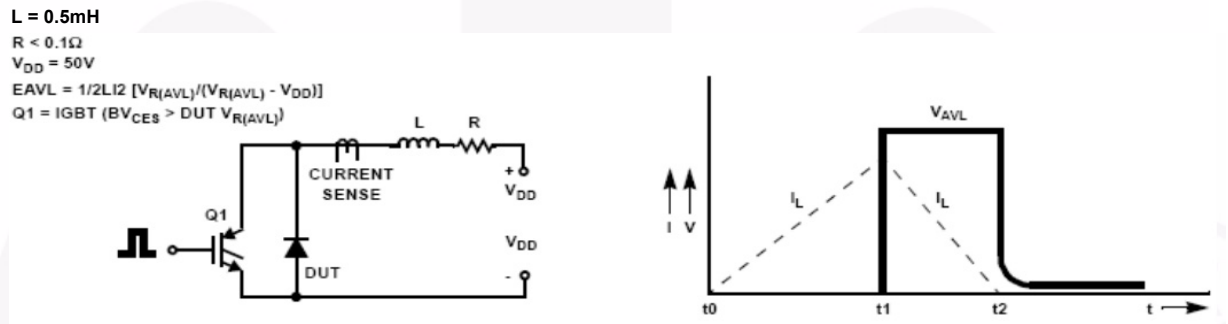


Figure 9. Junction-to-Case Transient Thermal Response Curve

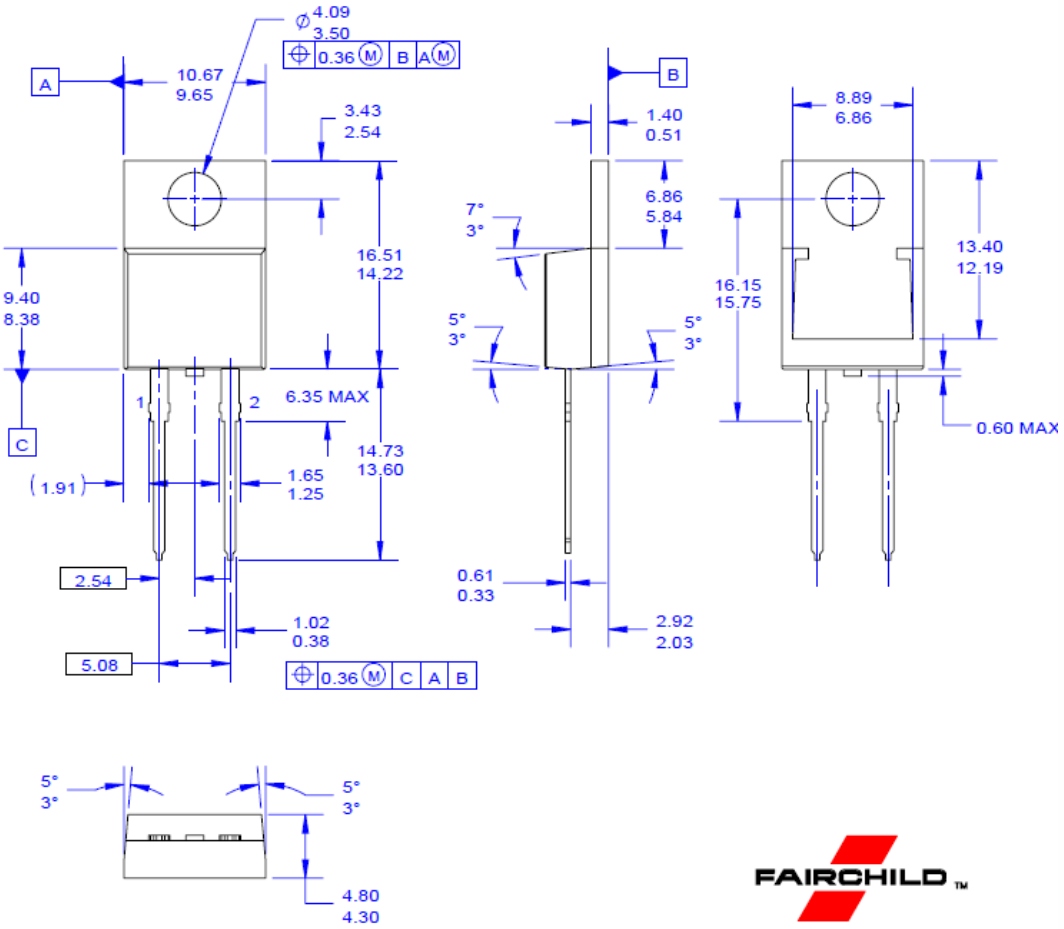


Test Circuit and Waveforms

Figure 10. Unclamped Inductive Switching Test Circuit & Waveform



Mechanical Dimensions



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.
E. DRAWING FILE NAME: TO220A02REV5

Figure 11. TO-220 2L - TO-220, MOLDED, 2LD

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