ON Semiconductor®

November 2016

FFSP08120A

Silicon Carbide Schottky Diode

1200 V, 8 A

Features

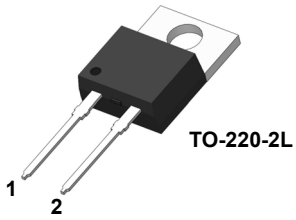
- Max Junction Temperature 175 °C
- Avalanche Rated 80 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery

Applications

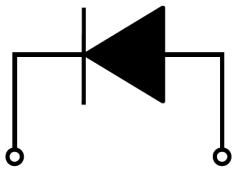
- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

Description

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 & cost.



1. Cathode 2. Anode



1. 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

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

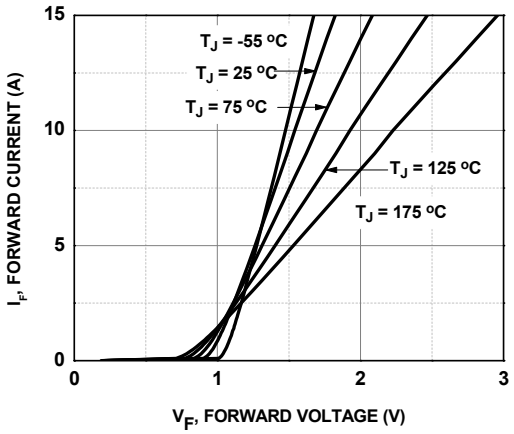


Figure 2. Reverse Characteristics

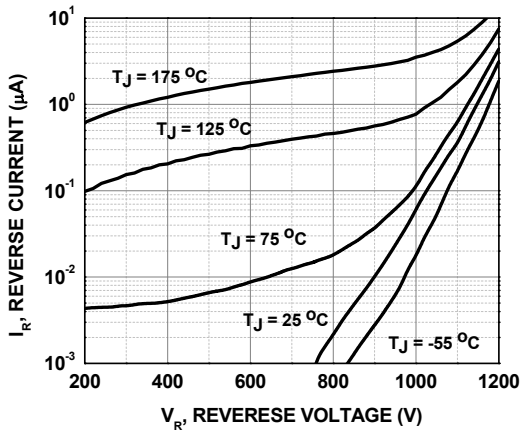


Figure 3. Reverse Characteristics

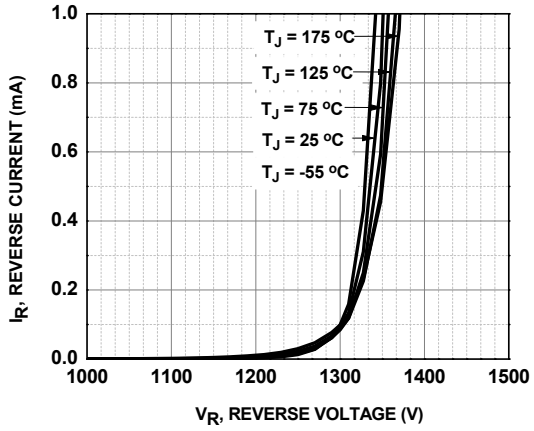
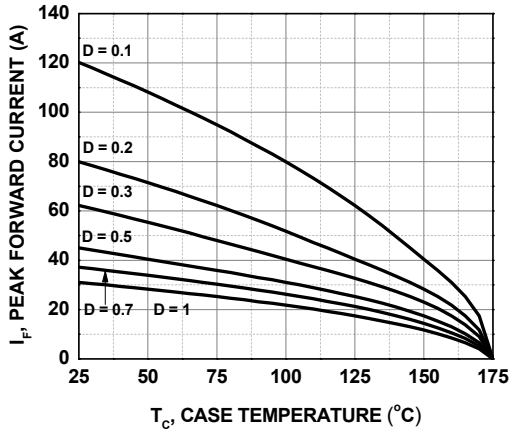


Figure 4. Current Derating



Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 5. Power Derating

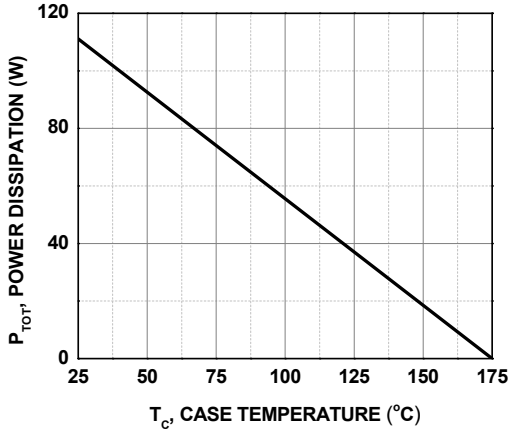


Figure 6. Capacitive Charge vs. Reverse Voltage

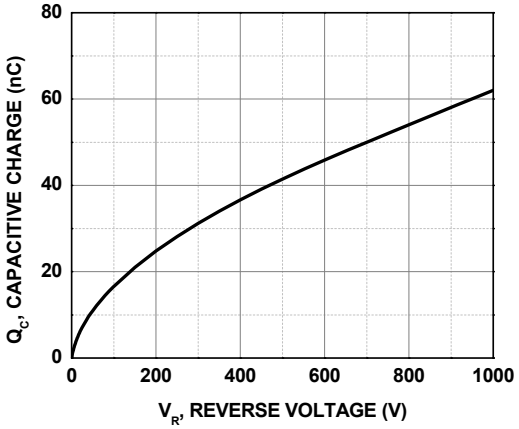


Figure 7. Capacitance vs. Reverse Voltage

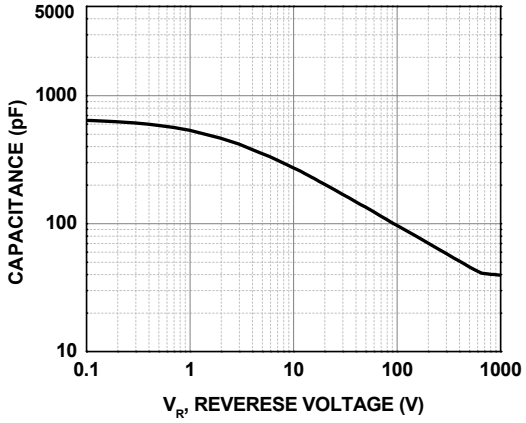


Figure 8. Capacitance Stored Energy

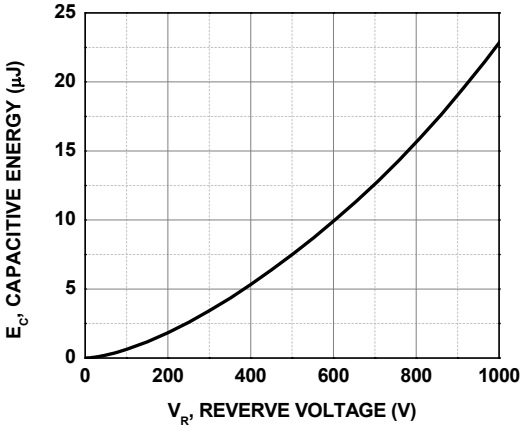
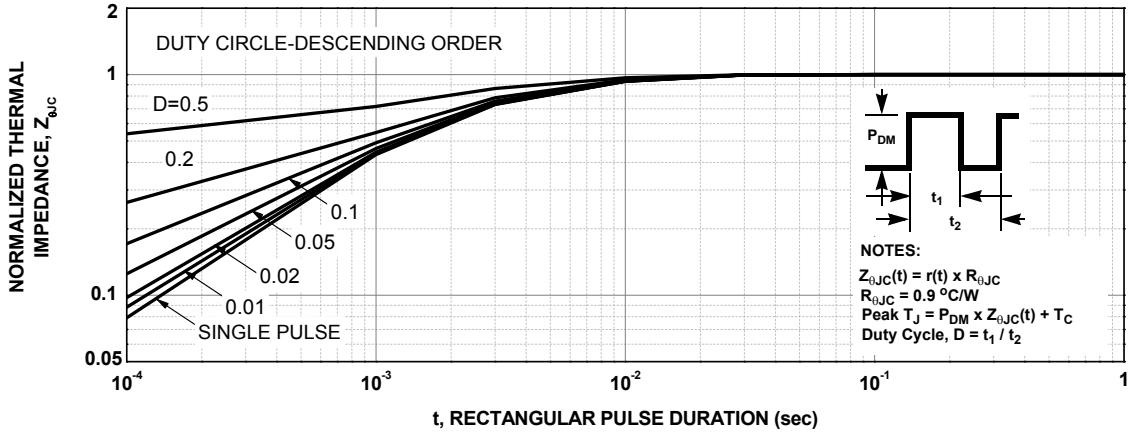
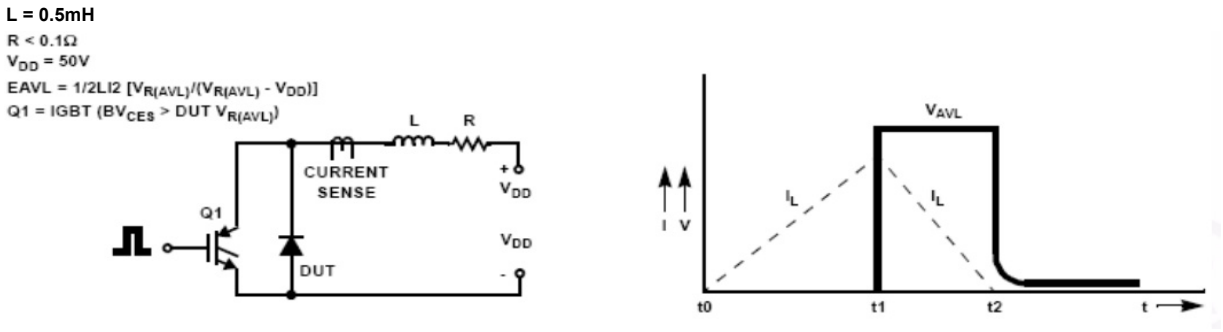


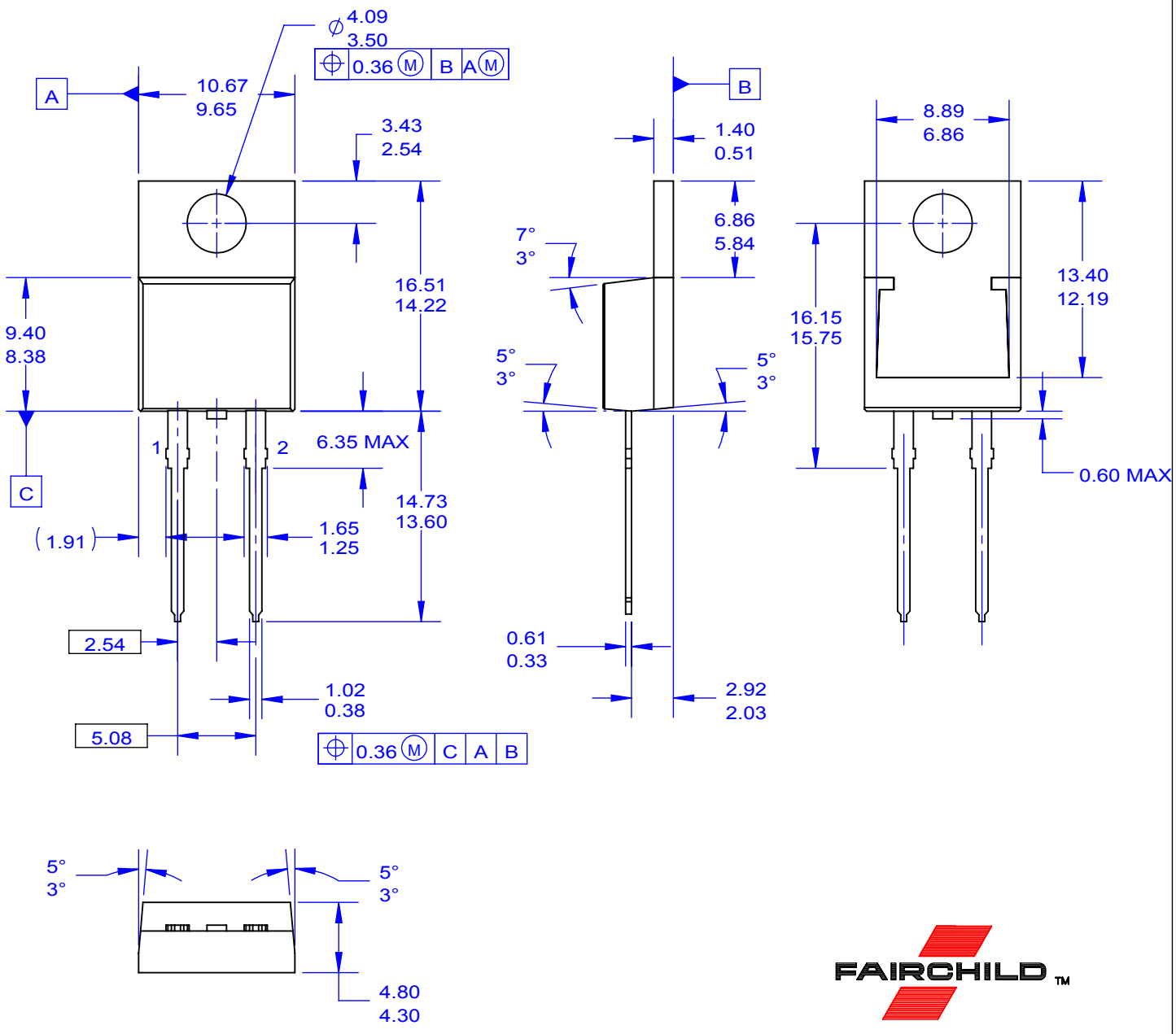
Figure 9. Junction-to-Case Transient Thermal Response Curve



Test Circuit and Waveforms

Figure 10. Unclamped Inductive Switching Test Circuit & Waveform





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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative