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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

FFSH20120A

Silicon Carbide Schottky Diode

1200 V, 20 A

Features

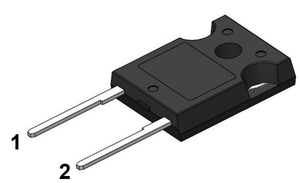
- Max Junction Temperature 175 °C
- Avalanche Rated 200 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery

Applications

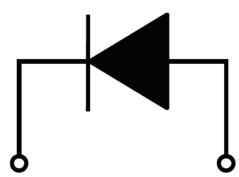
- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

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 and cost.



TO-247-2L



1. Cathode **2. Anode**

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

Symbol	Parameter		Ratings	Unit
V_{RRM}	Peak Repetitive Reverse Voltage		1200	V
E_{AS}	Single Pulse Avalanche Energy	(Note 1)	200	mJ
I_F	Continuous Rectified Forward Current @ T_C < 153 °C		20	A
	Continuous Rectified Forward Current @ T_C < 135 °C		30	
$I_{F,\ Max}$	Non-Repetitive Peak Forward Surge Current	T_C = 25 °C, 10 μs	1190	A
		T_C = 150 °C, 10 μs	990	A
$I_{F,SM}$	Non-RepetitiveForwardSurgeCurrent	Half-Sine Pulse, t_p = 8.3 ms	135	A
$I_{F,RM}$	Repetitive Forward Surge Current	Half-Sine Pulse, t_p = 8.3 ms	74	A
Ptot	Power Dissipation	T_C = 25 °C	273	W
		T_C = 150 °C	46	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	°C

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.55	°C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFSH20120A	FFSH20120A	TO-247-2L	Tube	N/A	N/A	30 units

Electrical Characteristics T_C = 25°C unless otherwise noted.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F = 20 A, T_C = 25 °C	-	1.45	1.75	V
		I_F = 20 A, T_C = 125 °C	-	1.7	2	
		I_F = 20 A, T_C = 175 °C	-	2	2.4	
I_R	Reverse Current	VR = 1200 V, T_C = 25 °C	-	-	200	μA
		VR = 1200 V, T_C = 125 °C	-	-	300	
		VR = 1200 V, T_C = 175 °C	-	-	400	
Q_C	Total Capacitive Charge	V = 800 V	-	120	-	nC
C	Total Capacitance	V_R = 1 V, f = 100 kHz	-	1220	-	pF
		V_R = 400 V, f = 100 kHz	-	111	-	
		V_R = 800 V, f = 100 kHz	-	88	-	

Notes:
1: EAS of 200 mJ is based on starting T_J = 25 °C, L = 0.5 mH, I_{AS} = 29 A, V = 150 V.

Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 1. Forward Characteristics

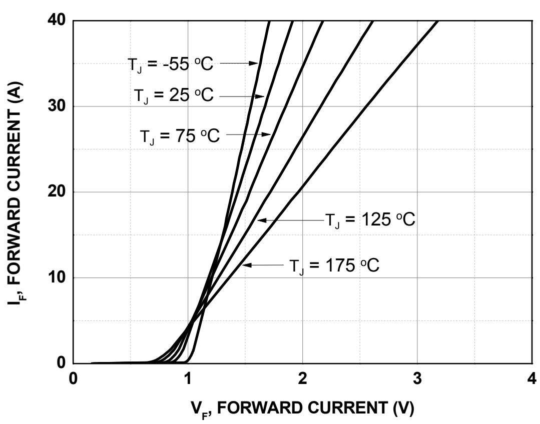


Figure 2. Reverse Characteristics

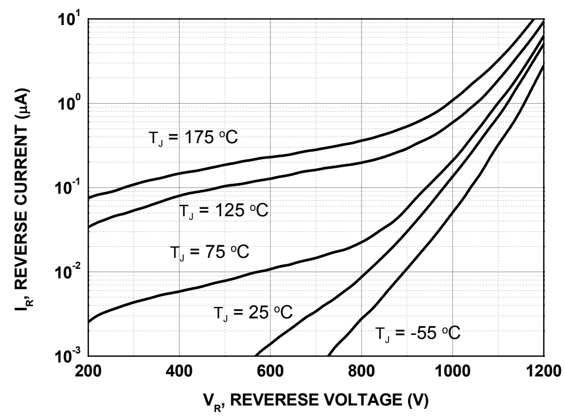


Figure 3. Reverse Characteristics

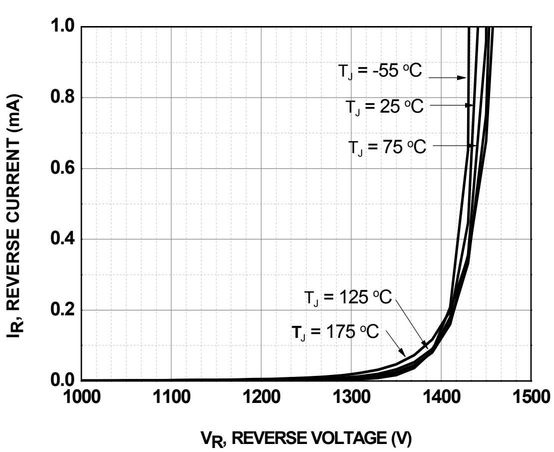
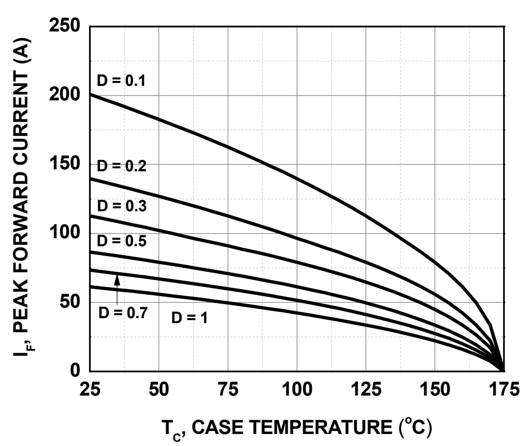


Figure 4. Current Derating



Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 5. Power Derating

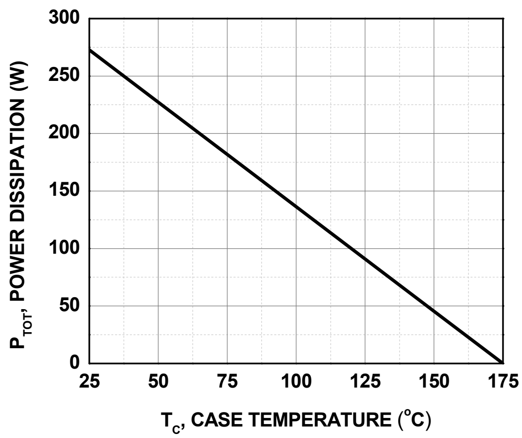


Figure 6. Capacitive Charge vs. Reverse Voltage

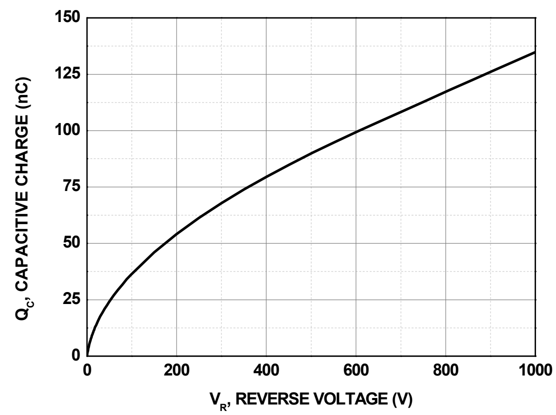


Figure 7. Capacitance vs. Reverse Voltage

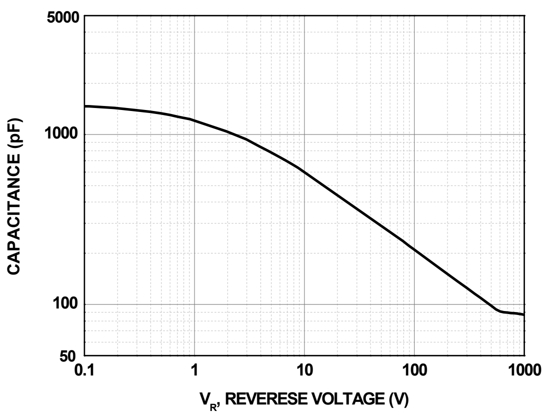


Figure 8. Capacitance Stored Energy

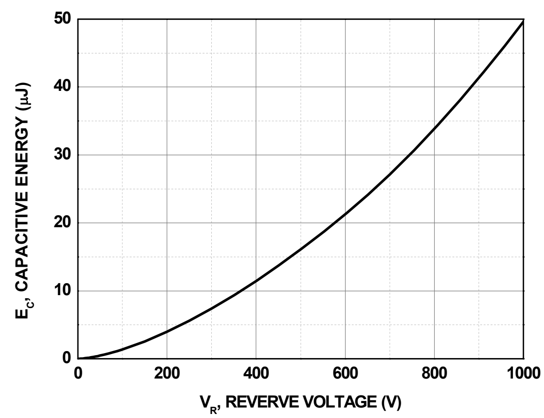
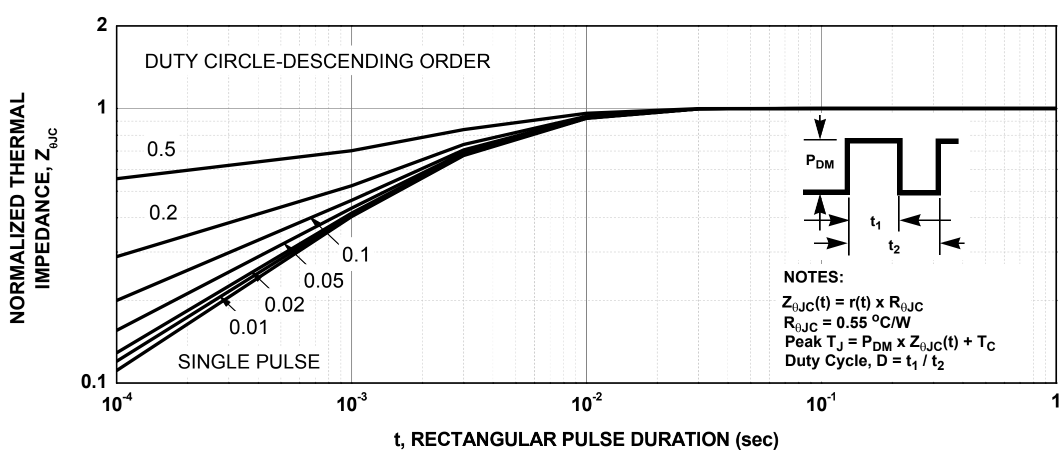
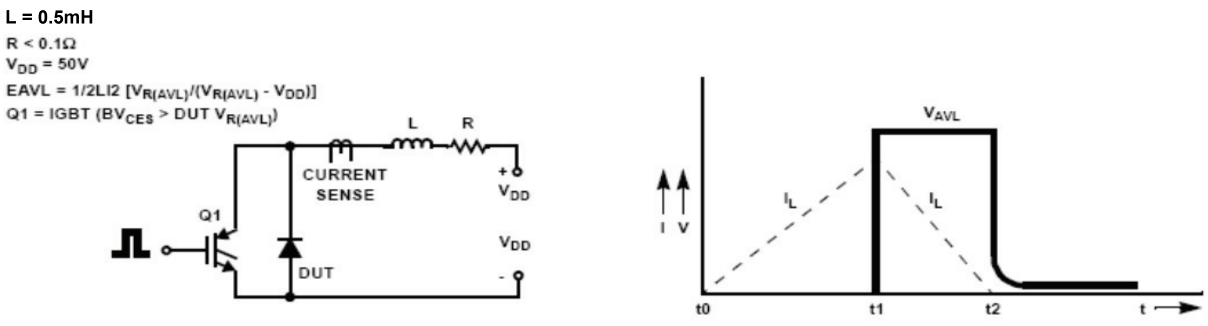


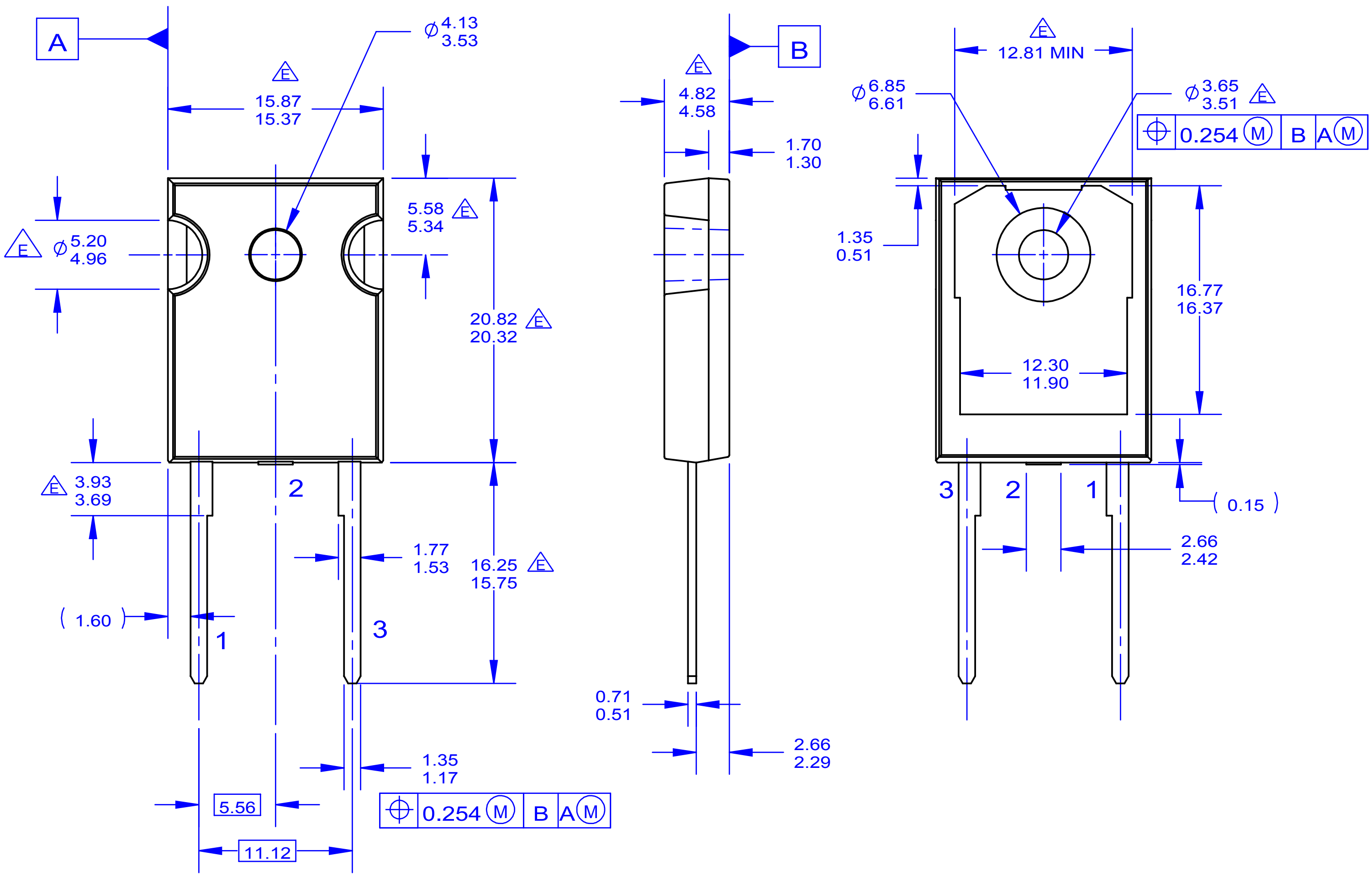
Figure 9. Junction-to-Case Transient Thermal Response Curve



Test Circuit and Waveforms

Figure 10. Unclamped Inductive Switching Test Circuit & Waveform





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NOTES: UNLESS OTHERWISE SPECIFIED.

A. PACKAGE REFERENCE: JEDEC TO-247, ISSUE E, VARIATION AB, DATED JUNE, 2004.
B. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
C. ALL DIMENSIONS ARE IN MILLIMETERS.
D. DRAWING CONFORMS TO ASME Y14.5 - 2009.

E DOES NOT COMPLY JEDEC STANDARD VALUE.
F. DRAWING FILENAME: MKT-TO247B02_REV04.
G. FAIRCHILD SEMICONDUCTOR.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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