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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.

July 2016

FFSP3065A

Silicon Carbide Schottky Diode

650 V, 30 A

Features

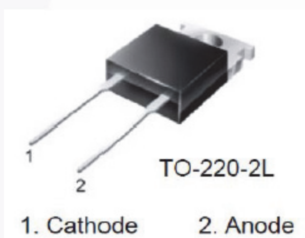
- Max Junction Temperature 175 ^{o}C
- Avalanche Rated 180 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery

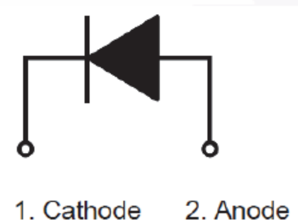
Applications

- 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





Absolute Maximum Ratings T_C = 25 ^{o}C unless otherwise noted.

Symbol	Parameter		FFSP3065A	Unit
V_{RRM}	Peak Repetitive Reverse Voltage		650	V
E_{AS}	Single Pulse Avalanche Energy (Note 1)		180	mJ
I_F	Continuous Rectified Forward Current @ T_C < 148 ^{o}C		30	A
$I_{F, Max}$	Non-Repetitive Peak Forward Surge Current	T_C = 25 ^{o}C, 10 μs	1125	A
		T_C = 150 ^{o}C, 10 μs	1040	A
$I_{F,SM}$	Non-RepetitiveForwardSurgeCurrent	Half-Sine Pulse, t_p = 8.3 ms	150	A
$I_{F,RM}$	Repetitive Forward Surge Current	Half-Sine Pulse, t_p = 8.3 ms	75	A
Ptot	Power Dissipation	T_C = 25 ^{o}C	240	W
		T_C = 150 ^{o}C	40	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	^{o}C

Thermal Characteristics

Symbol	Parameter	FFSP3065A	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.62	^{o}C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFSP3065A	FFSP3065A	TO-220-2L	Tube	N/A	N/A	50 units

Electrical Characteristics T_C = 25 ^oC unless otherwise noted.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F = 30 A, T_C = 25 ^oC	-	1.50	1.75	V
		I_F = 30 A, T_C = 125 ^oC	-	1.60	2.0	
		I_F = 30 A, T_C = 175 ^oC	-	1.72	2.4	
I_R	Reverse Current	VR = 650 V, T_C = 25 ^oC	-	-	200	μA
		VR = 650 V, T_C = 125 ^oC	-	-	400	
		VR = 650 V, T_C = 175 ^oC	-	-	600	
Q_C	Total Capacitive Charge	V = 400 V	-	100	-	nC
C	Total Capacitance	V_R = 1 V, f = 100 kHz	-	1705	-	pF
		V_R = 200 V, f = 100 kHz	-	180	-	
		V_R = 400 V, f = 100 kHz	-	130	-	

Notes:
1: EAS of 180 mJ is based on starting T_J = 25 °C, L = 0.5 mH, I_{AS} = 27 A, V = 50 V.

Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 1. Forward Characteristics

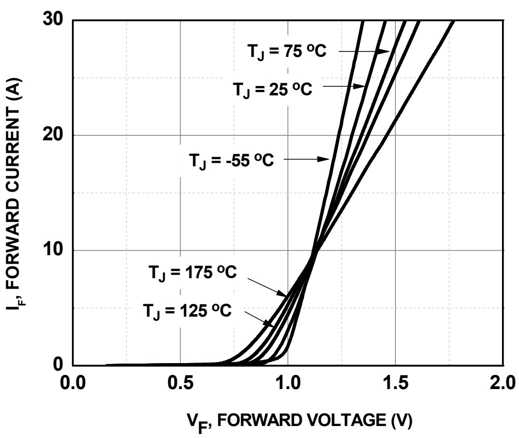


Figure 2. Reverse Characteristics

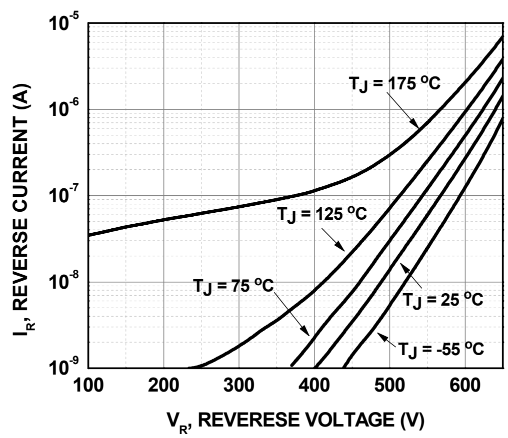


Figure 3. Current Derating

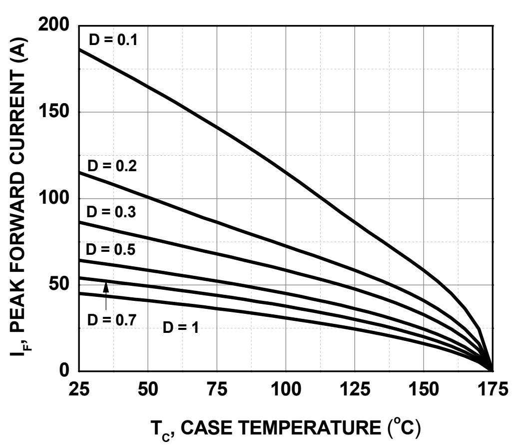
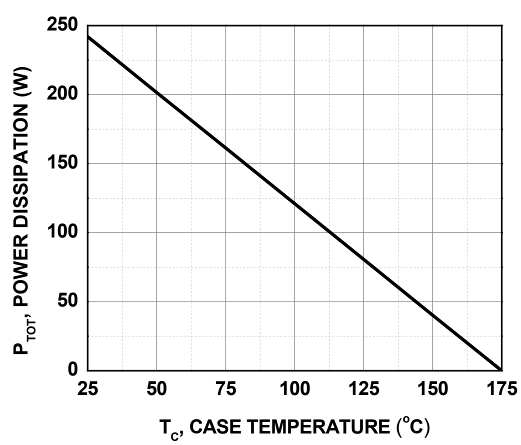


Figure 4. Power Derating



Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 5. Capacitive Charge vs. Reverse Voltage

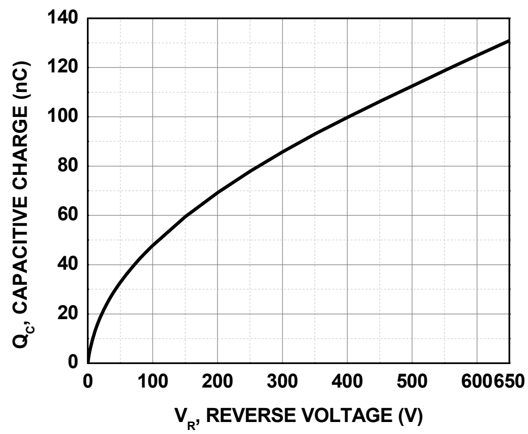


Figure 6. Capacitance vs. Reverse Voltage

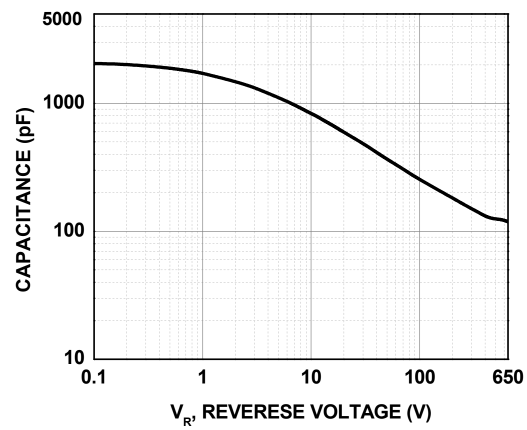


Figure 7. Capacitance Stored Energy

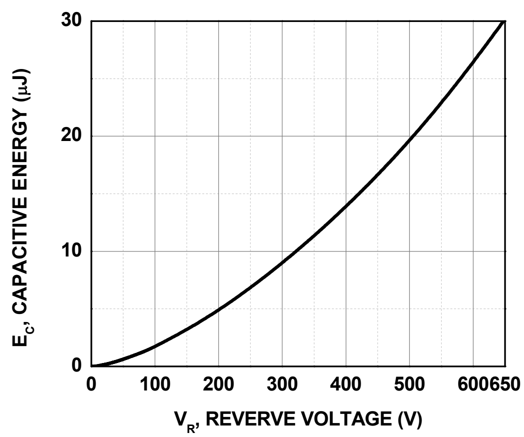
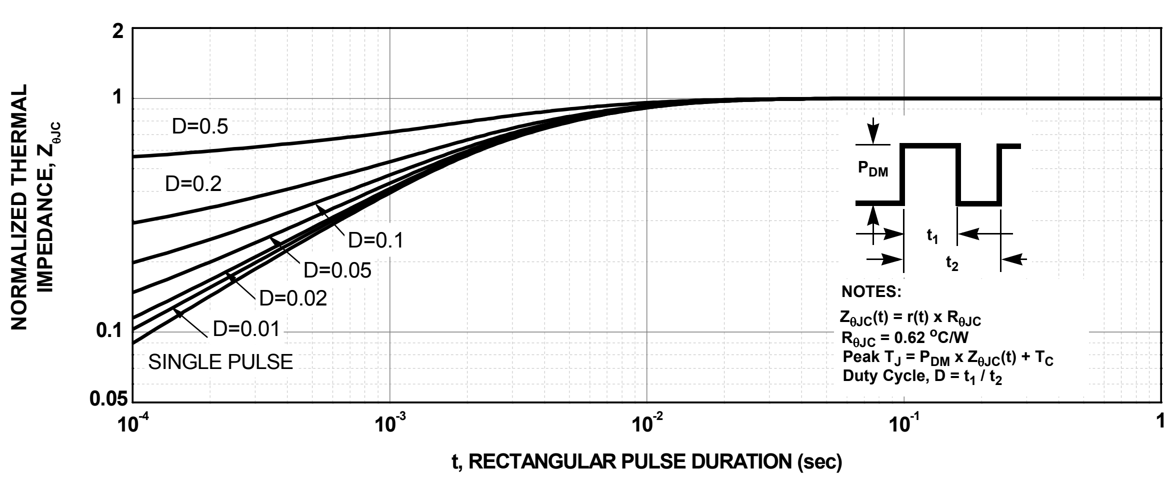
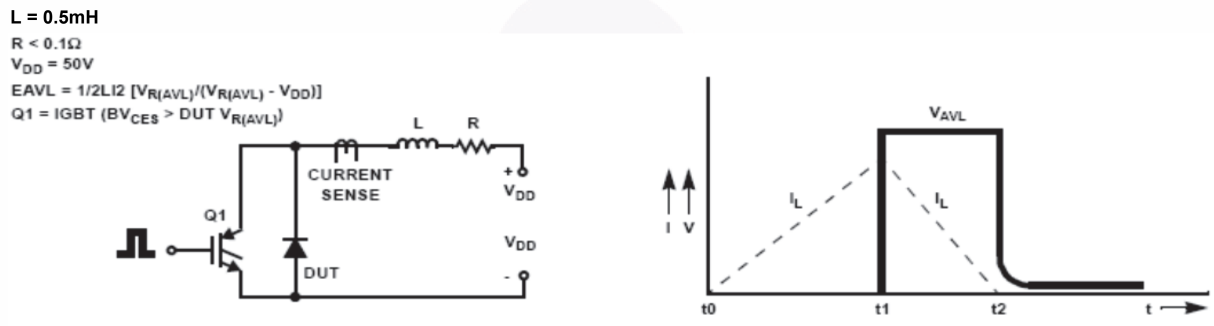


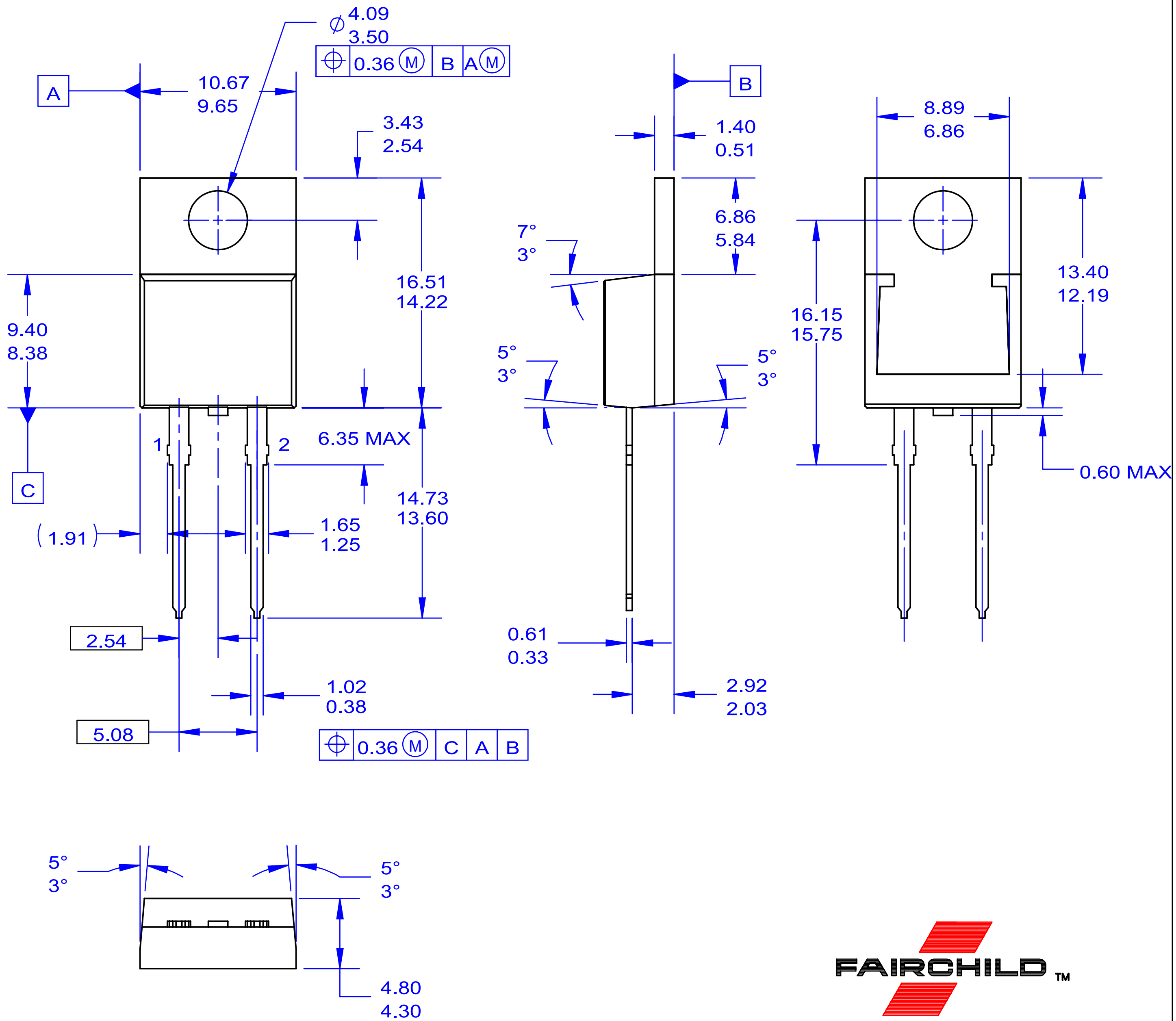
Figure 8. Junction-to-Case Transient Thermal Response Curve



Test Circuit and Waveforms

Figure 9. Unclamped Inductive Switching Test Circuit & Waveform





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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
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