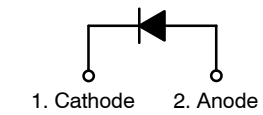
chanhvinh.com

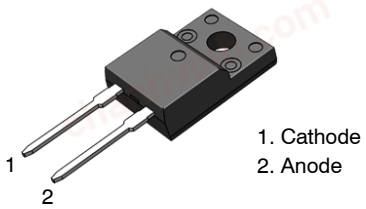
DATA SHEET
www.onsemi.com

Silicon Carbide (SiC) Schottky Diode – EliteSiC, 10 A, 650 V, D1, TO-220F-2L

FFSPF1065A



Schottky Diode



TO−220 FP / TO−220F−2FS
CASE 221AS

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.

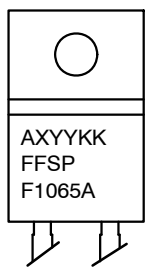
Features

- Max Junction Temperature 175°C
- Avalanche Rated 64 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery
- This Device is Pb−Free and is RoHS Compliant

Applications

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

MARKING DIAGRAM



A	= Assembly Plant Code
XYY	= Date Code (Year & Week)
KK	= Lot Traceability Code
FFSPF1065A	= Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

© Semiconductor Components Industries, LLC, 2017

chanhvinh.com

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, Unless otherwise specified)

Symbol	Parameter		FFSPF1065A	Unit
V_{RRM}	Peak Repetitive Reverse Voltage		650	V
E_{AS}	Single Pulse Avalanche Energy (Note 1)		64	mJ
I_F	Continuous Rectified Forward Current	@Tc < 110°C	10	A
		@ Tc < 135°C	7.2	
$I_{F, Max}$	Non−Repetitive Peak Forward Surge Current	Tc = 25°C, 10 μs	720	A
		Tc = 150°C, 10 μs	680	A
$I_{F, SM}$	Non−Repetitive Forward Surge Current	Half−Sine Pulse, t_P = 8.3 ms	56	A
$I_{F, RM}$	Repetitive Forward Surge Current	Half−Sine Pulse, t_P = 8.3 ms	28	A
P_{tot}	Power Dissipation	Tc = 25°C	38	W
		Tc = 150°C	6.4	W
T_J, T_{STG}	Operating and Storage Temperature Range		−55 to +175	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. E_{AS} of 64 mJ is based on starting T_J = 25°C, L = 0.5 mH, I_{AS} = 16 A, V = 50 V.

THERMAL CHARACTERISTICS

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	3.9	°C/W

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Top Marking	Package	Packing Method	Reel Size	Tape Width	Quantity
FFSPF1065A	FFSPF1065A	TO−220 FP / TO−220F−2FS	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, Tc = 25°C	–	1.50	1.75	V
		I_F = 10 A, Tc = 125°C	–	1.60	2.0	
		I_F = 10 A, Tc = 175°C	–	1.72	2.4	
I_R	Reverse Current	V_R = 650 V, Tc = 25°C	–	–	200	μA
		V_R = 650 V, Tc = 125°C	–	–	400	
		V_R = 650 V, Tc = 175°C	–	–	600	
Q_C	Total Capacitance Charge	V = 400 V	–	34	–	nC
C	Total Capacitance	V_R = 1 V, f = 100 kHz	–	575	–	pF
		V_R = 200 V, f = 100 kHz	–	62	–	
		V_R = 400 V, f = 100 kHz	–	47	–	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

chanhvinh.com

TYPICAL CHARACTERISTICS

(T_J = 25°C UNLESS OTHERWISE NOTED)

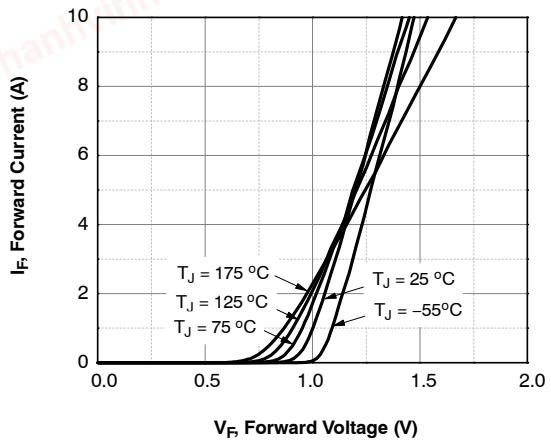


Figure 1. Forward Characteristics

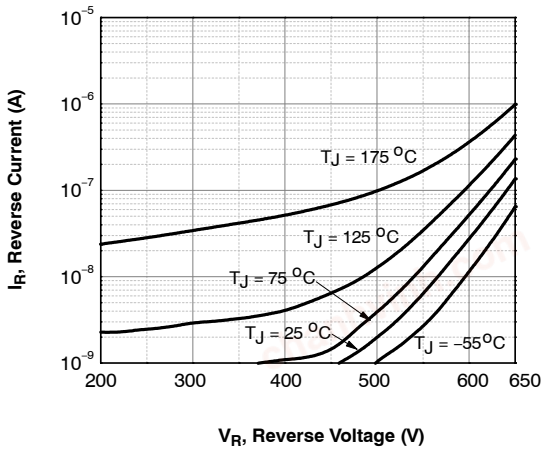


Figure 2. Reverse Characteristics

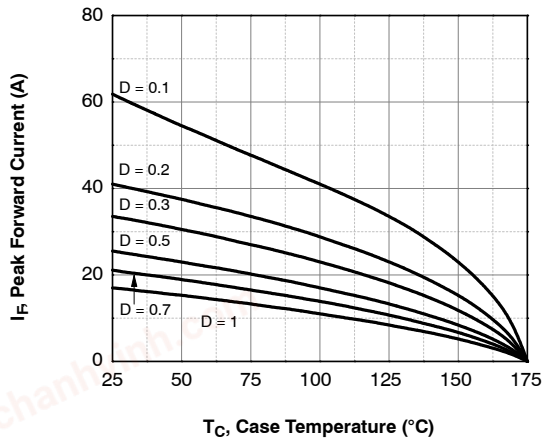


Figure 3. Current Derating

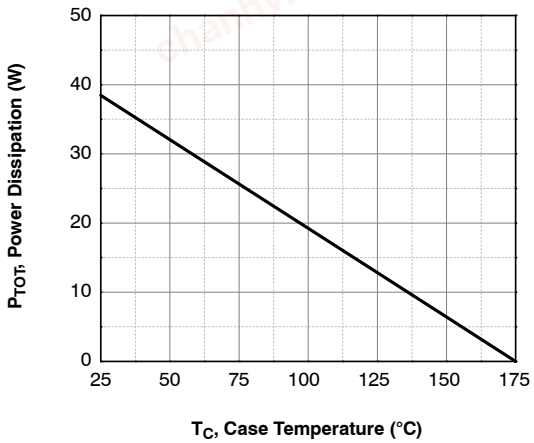


Figure 4. Power Derating

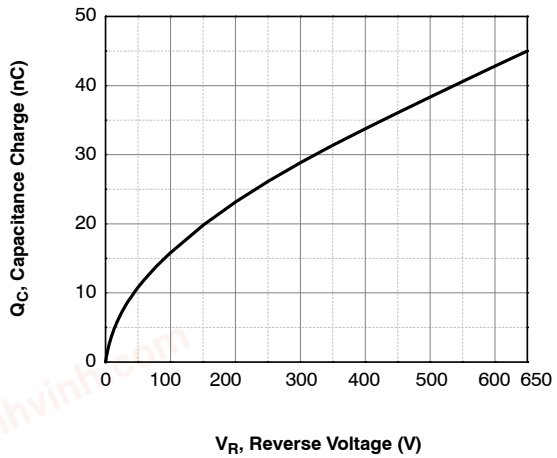


Figure 5. Capacitive Charge vs. Reverse Voltage

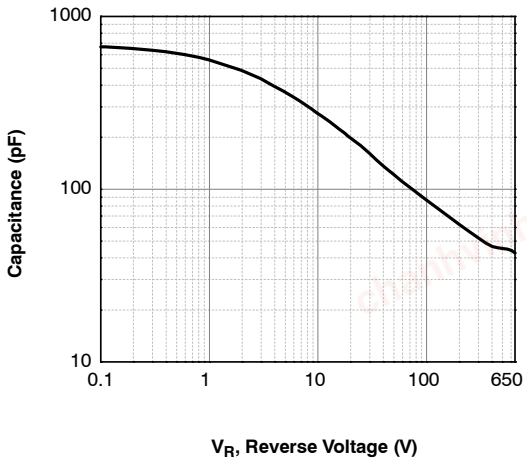


Figure 6. Capacitance vs. Reverse Voltage

chanhvinh.com

TYPICAL CHARACTERISTICS (CONTINUED)

(T_J = 25°C UNLESS OTHERWISE NOTED)

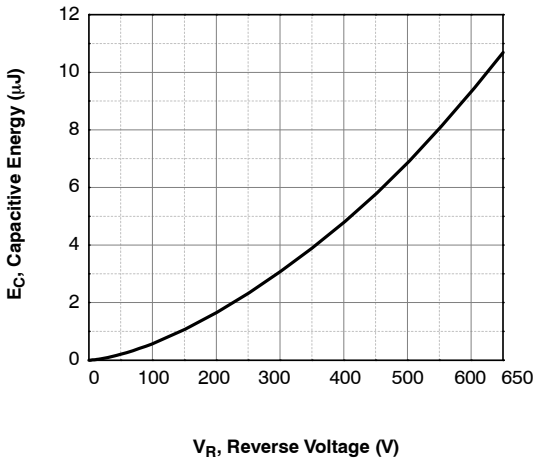


Figure 7. Capacitance Stored Energy

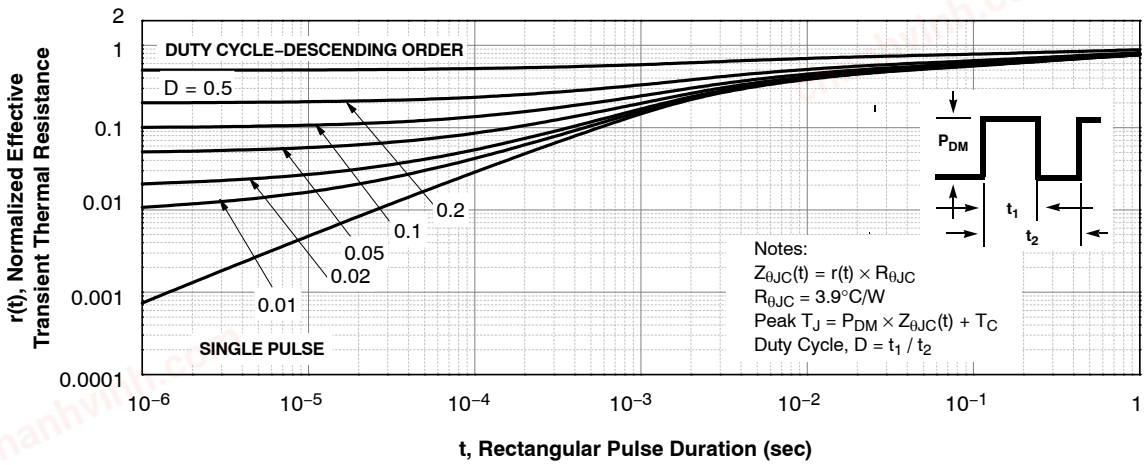


Figure 8. Junction−to−Case Transient Thermal Response Curve

chanhvinh.com

TEST CIRCUIT AND WAVEFORMS

L = 0.5 mH
R < 0.1 Ω
V_{DD} = 50 V
EAVL = 1/2LI2 [$V_{R(AVL)}$/($V_{R(AVL)}$ – V_{DD})]
Q1 = IGBT (BV_{CES} > DUT $V_{R(AVL)}$)

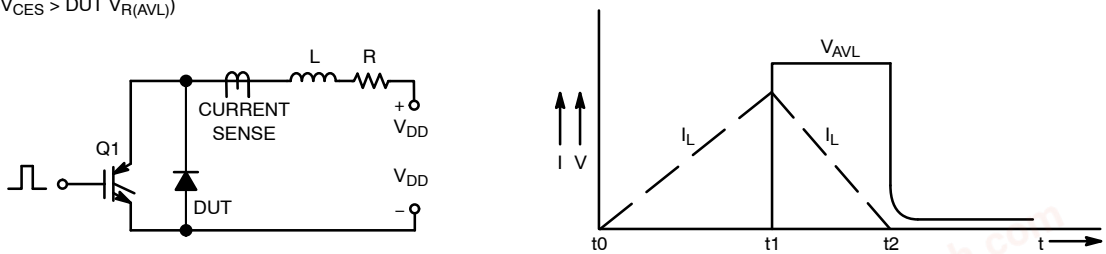


Figure 9. Unclamped Inductive Switching Test Circuit & Waveform

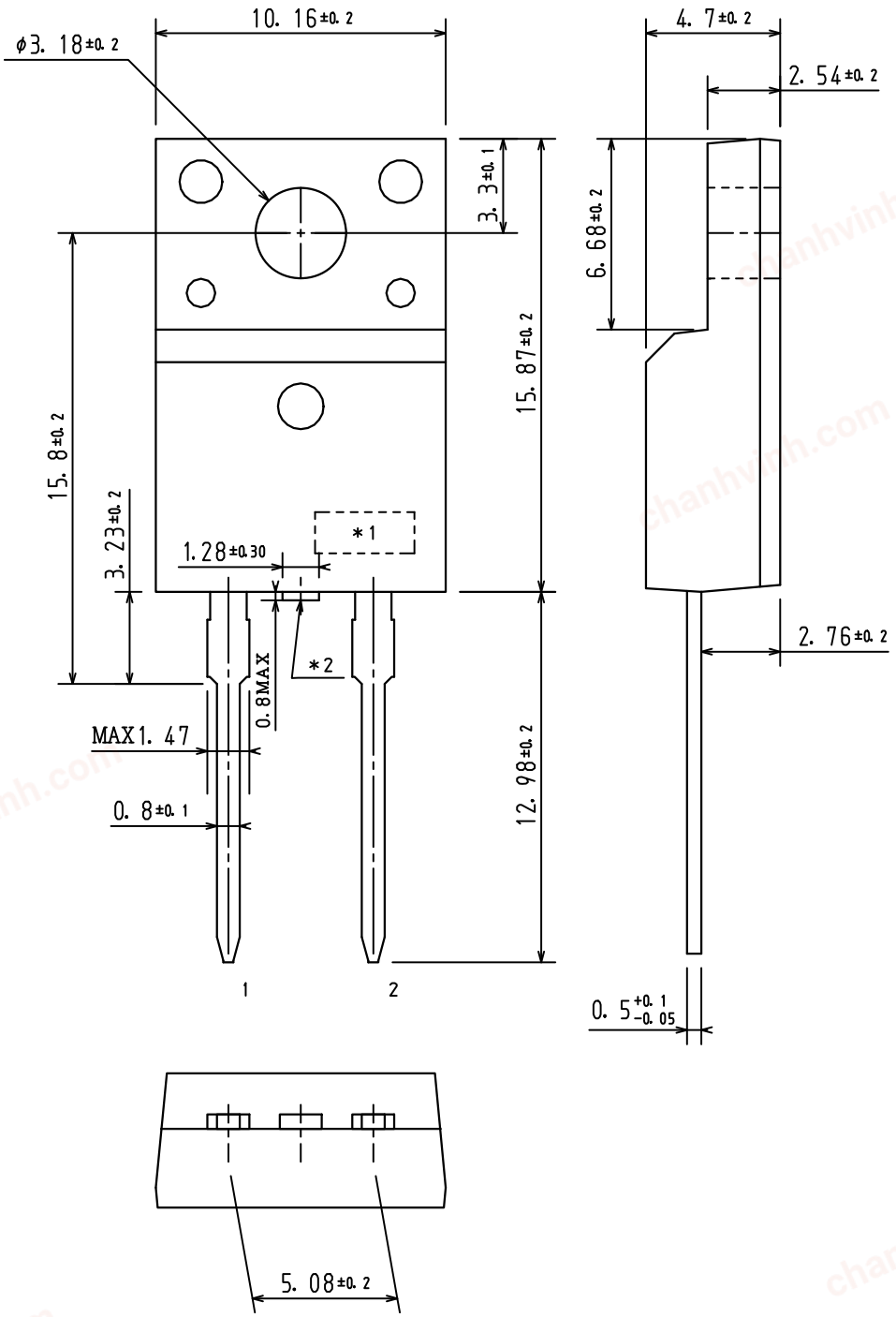
chanhvinh.com

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

ON Semiconductor®

TO−220 Fullpack, 2−Lead / TO−220F−2FS
CASE 221AS
ISSUE O

DATE 29 FEB 2012



DOCUMENT NUMBER:	**98AON67438E**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	**TO−220 FULLPACK, 2−LEAD / TO−220F−2FS**	**PAGE 1 OF 1**

ON Semiconductor and ON are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

© Semiconductor Components Industries, LLC, 2019

chanhvinh.com

onsemi, ONSEMI., and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as−is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Email Requests to: orderlit@onsemi.com

onsemi Website: www.onsemi.com

TECHNICAL SUPPORT
North American Technical Support:
Voice Mail: 1 800−282−9855 Toll Free USA/Canada
Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:
Phone: 00421 33 790 2910
For additional information, please contact your local Sales Representative

◊