E6D30065G

E-Series Automotive
650 V, 30 A Silicon Carbide Schottky Diode

Description

With the performance advantages of a Silicon Carbide (SiC) Schottky Barrier diode, power electronics systems can expect to meet higher efficiency standards than Si-based solutions, while also reaching higher frequencies and power densities. SiC diodes can be easily paralleled to meet various application demands, without concern of thermal runaway. In combination with the reduced cooling requirements and improved thermal performance of SiC products, SiC diodes are able to provide lower overall system costs in a variety of diverse applications.

Part Number	Package	Marking
E6D30065G	TO-263-2	E6D30065G

Features

- Low Forward Voltage (V_F) Drop with Positive Temperature Coefficient
- Zero Reverse Recovery Current / Forward Recovery Voltage
- Temperature-Independent Switching Behavior
- Automotive Qualified (AEC Q101) and PPAP Capable

Applications

- Interleaved or Bridgless PFC
- DC/DC On Board Battery Chargers
- Boost for PFC & DC-DC Stages
- AC/DC On Board Chargers
- PFC Output Rectification

Maximum Ratings (T_C = 25°C Unless Otherwise Specified)

Parameter	Symbol	Value	Unit	Test Conditions	Notes
Repetitive Peak Reverse Voltage	V_{RRM}	650	V		
Surge Peak Reverse Voltage	V_{RSM}	650			
DC Blocking Voltage	V_{DC}	650			
Continuous Forward Current	I_F	95	A	T_C = 25 °C	Fig. 3
		49		T_C = 125 °C	
		31		T_C = 150 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	111		T_C = 25 °C, t_p = 10 ms, Half Sine Wave	
		64		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	
Non-Repetitive Forward Surge Current	I_{FSM}	194	A	T_C = 25 °C, t_p = 10 ms, Half Sine Wave	
		164		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	
Power Dissipation	P_{tot}	306	W	T_C = 25 °C	Fig. 4
		133		T_C = 110 °C	
i^2t value	$\int i^2dt$	188	A^2s	T_C = 25 °C, t_p = 10 ms	
		135		T_C = 110 °C, t_p = 10 ms	

4600 Silicon Drive | Durham, NC 27703 | Tel: +1.919.313.5300 | wolfspeed.com/power

Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Notes
Forward Voltage	V_F	1.35	1.5	V	I_F = 30 A, T_j = 25 °C	Fig. 1
		1.5	1.6		I_F = 30 A, T_j = 175 °C	
Reverse Current	I_R	10	100	µA	V_R = 650 V, T_j = 25 °C	Fig. 2
		22	350		V_R = 650 V, T_j = 175 °C	
Total Capacitive Charge	Q_C	98		nC	V_R = 400 V, T_j = 25 °C	Fig. 5
Total Capacitance	C	1841		pF	V_R = 0 V, T_j = 25 °C, f = 1 MHz	Fig. 6
		187			V_R = 200 V, T_j = 25 °C, f = 1 MHz	
		143			V_R = 400 V, T_j = 25 °C, f = 1 MHz	
Capacitance Stored Energy	E_C	14.6		µJ	V_R = 400 V	Fig. 7

Notes:
SiC Schottky Diodes are majority carrier devices, so there is no reverse recovery charge.

Thermal & Mechanical Characteristics

Parameter	Symbol	Value	Unit	Notes
Thermal Resistance, Junction to Case (Typical)	$R_{\theta, JC (TYP)}$	0.38	°C / W	
Thermal Resistance, Junction to Case (Max)	$R_{\theta, JC (MAX)}$	0.49	°C / W	
Junction Temperature	T_j	-55 to +175	°C	
Case & Storage Temperature	T_c	-55 to +175		

Typical Performance

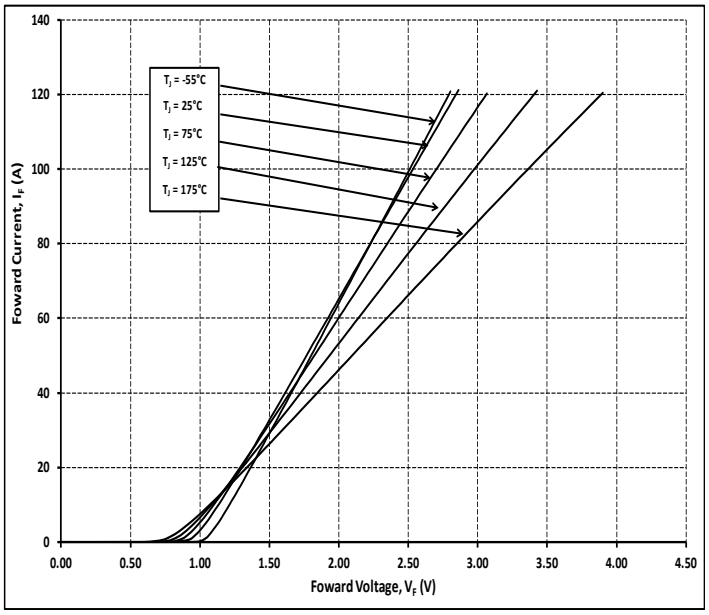


Figure 1
Forward Characteristics

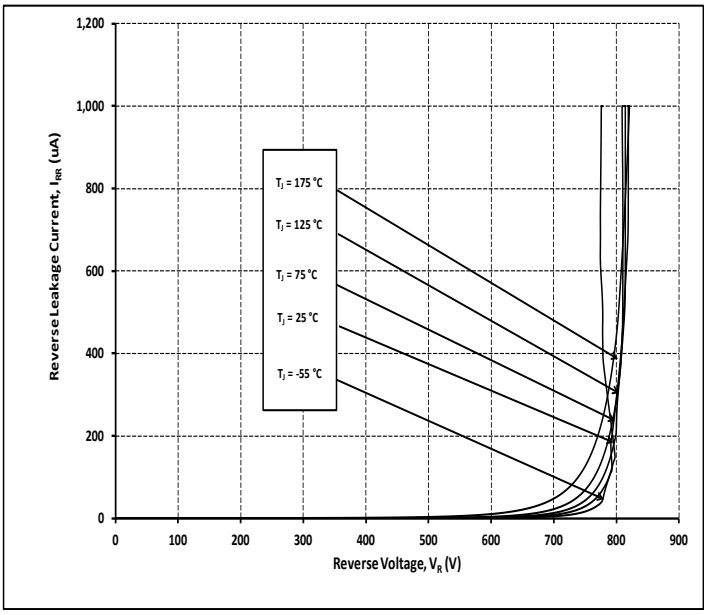


Figure 2
Reverse Characteristics

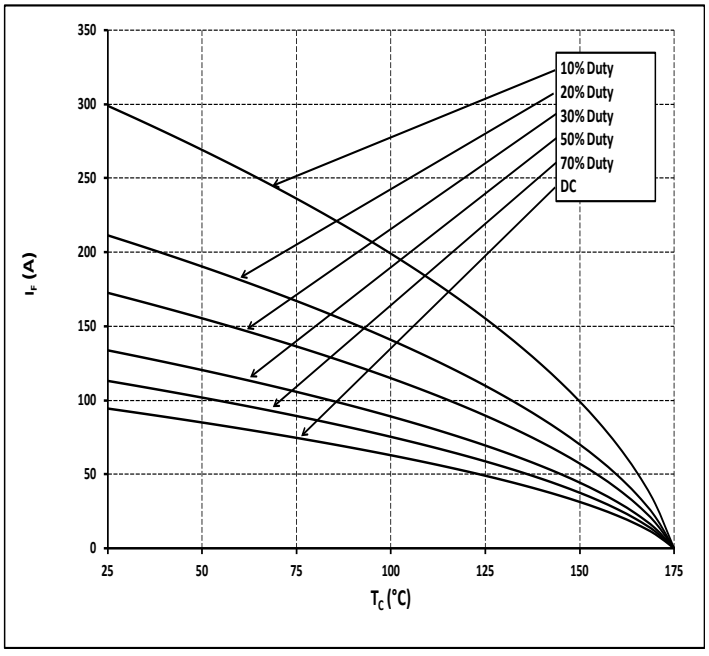


Figure 3
Current Derating

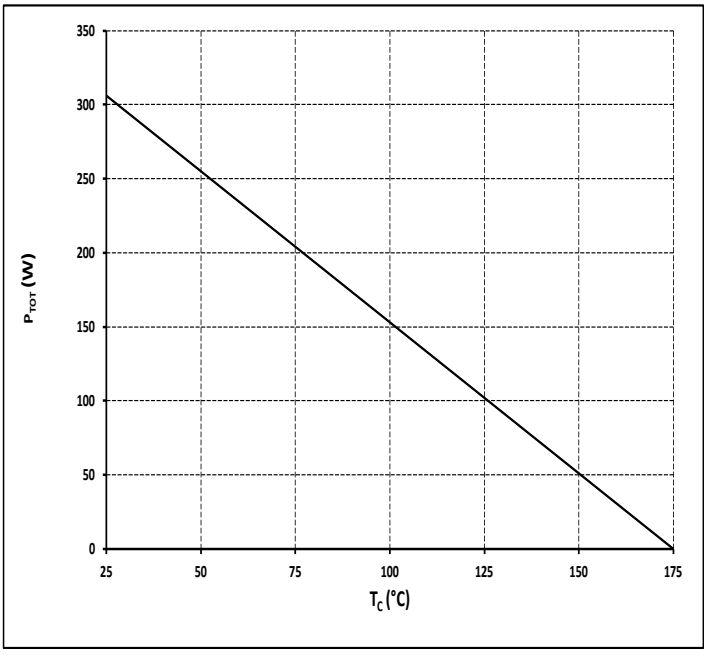


Figure 4
Power Derating

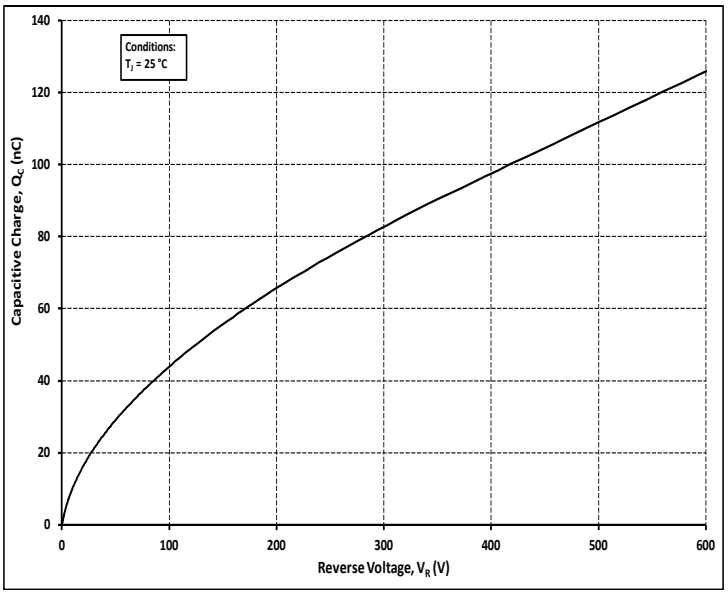


Figure 5
Total Capacitance vs. Reverse Voltage

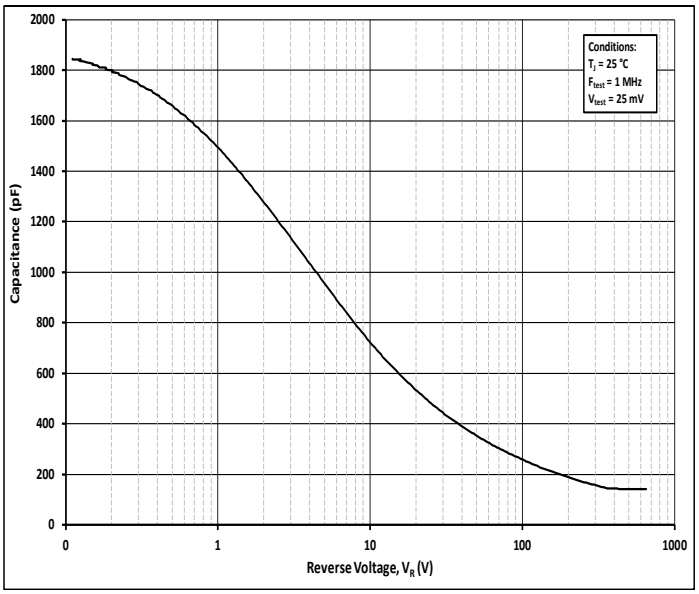


Figure 6
Capacitace vs. Reverse Voltage

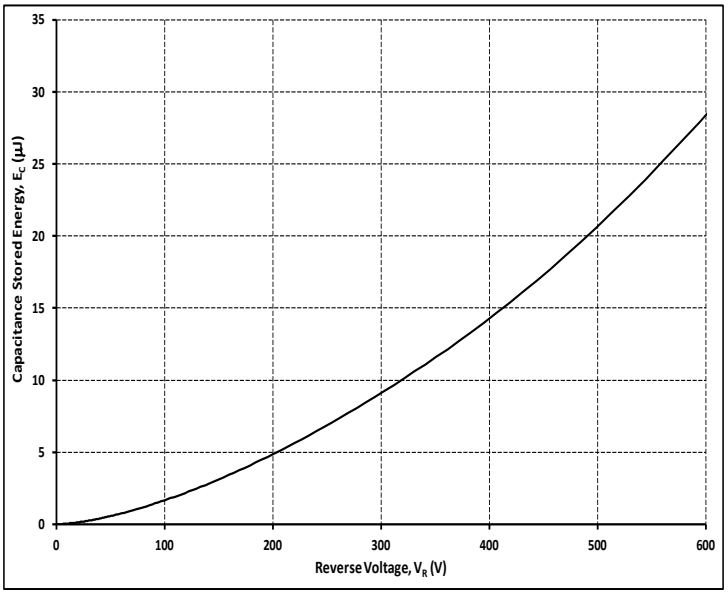


Figure 7
Capacitance Stored Energy

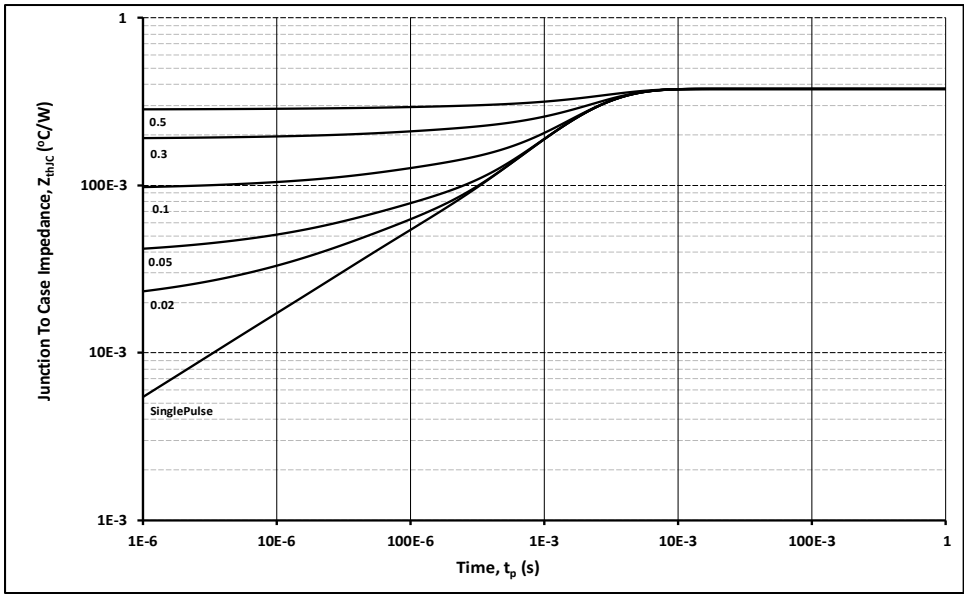
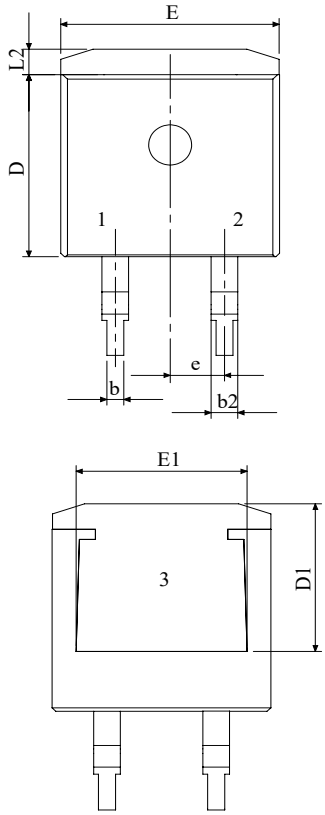


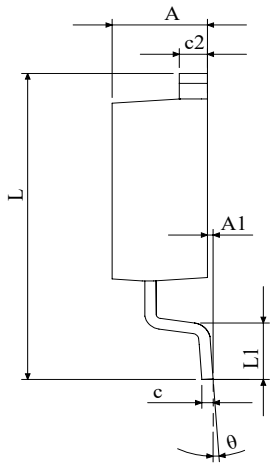
Figure 8

Transient Thermal Impedance

Package Dimensions & Pin-Out

Package: TO-263-2





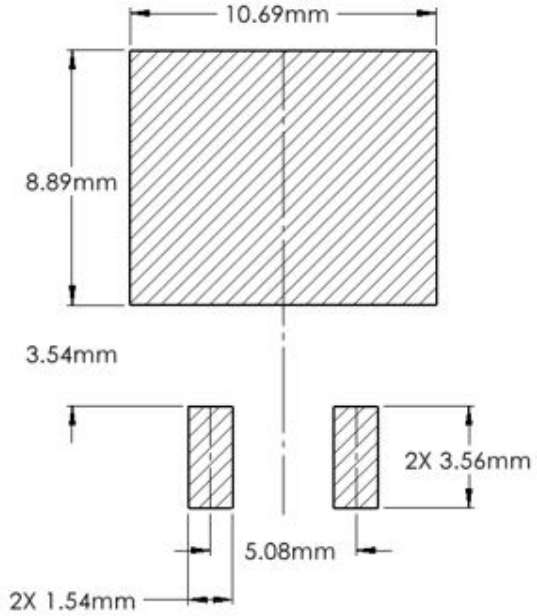
1	CATHODE
2	ANODE
3	CATHODE

SYMBOL	MIN (mm)	MAX (mm)
A	4.32	4.57
A1	---	0.25
b	0.71	0.94
b2	1.15	1.40
c	0.356	0.635
c2	1.22	1.40
D	8.89	9.40
D1	6.48	6.88
E	10.04	10.28
E1	7.535	8.425
e	2.54	
L	14.73	15.75
L1	2.29	2.79
L2	1.15	1.39
θ	0°	8°

NOTE
1. ALL METAL SURFACES ARE TIN PLATED (MATTE), EXCEPT AREA OF CUT.
2. DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
3. ALL DIMENSIONS ARE LISTED IN MILLIMETERS. ANGLES ARE IN DEGREES.
4. PACKAGE BURR FLASH SIZE (0.5 mm) IS NOT INCLUDED IN THE DIMENSIONS

Recommended Solder Pad Layout

Primary dimensions shown in mm.



Product Ordering Information

Order Number	Packing Type
E6D30065G-TR	Tape & Reel
E6D30065G	Tube

Revision History

Document Version	Date of Release	Description of Changes
1	February 2024	Initial Release

Notes & Disclaimer

This document and the information contained herein are subject to change without notice. Any such change shall be evidenced by the publication of an updated version of this document by Wolfspeed. No communication from any employee or agent of Wolfspeed or any third party shall effect an amendment or modification of this document. No responsibility is assumed by Wolfspeed for any infringement of patents or other rights of third parties which may result from use of the information contained herein. No license is granted by implication or otherwise under any patent or patent rights of Wolfspeed.

Notwithstanding any application-specific information, guidance, assistance, or support that Wolfspeed may provide, the buyer of this product is solely responsible for determining the suitability of this product for the buyer's purposes, including without limitation for use in the applications identified in the next bullet point, and for the compliance of the buyers' products, including those that incorporate this product, with all applicable legal, regulatory, and safety-related requirements.

This product has not been designed or tested for use in, and is not intended for use in, applications in which failure of the product would reasonably be expected to cause death, personal injury, or property damage, including but not limited to equipment implanted into the human body, life-support machines, cardiac defibrillators, and similar emergency medical equipment, aircraft navigation, communication, and control systems, aircraft power and propulsion systems, air traffic control systems, and equipment used in the planning, construction, maintenance, or operation of nuclear facilities.

RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Wolfspeed representative or from the Product Documentation sections of www.wolfspeed.com.

REACh Compliance

REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact your Wolfspeed representative to ensure you get the most up-to-date REACh SVHC Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

Contact info:

4600 Silicon Drive
Durham, NC 27703 USA
Tel: +1.919.313.5300
www.wolfspeed.com/power

© 2024 Wolfspeed, Inc. All rights reserved. Wolfspeed® and the Wolfstreak logo are registered trademarks and the Wolfspeed logo is a trademark of Wolfspeed, Inc.
The information in this document is subject to change without notice.