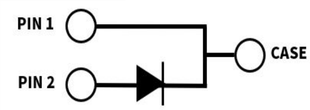
C6D30065H

6th Generation 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.



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Part Number	Package	Marking
C6D30065H	TO-247-2	C6D30065H

Features

- Low Forward Voltage (V_F) Drop with Positive Temperature Coefficient
- Zero Reverse Recovery Current / Forward Recovery Voltage
- Temperature-Independent Switching Behavior

Typical Applications

- Industrial Switched Mode Power Supplies
- Uninterruptible & AUX Power Supplies
- Boost for PFC & DC-DC Stages
- Solar Inverters

Key Parameters (T_C = 25°C Unless Otherwise Specified)

Parameter	Symbol	Value	Unit	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	88	A	T_C = 25 °C	Fig. 3
		44		T_C = 125 °C	
		27		T_C = 150 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	112		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}	207		T_C = 25 °C, t_p = 10 ms, Half Sine Wave	Fig. 8
		187		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	
i^2t Value	$\int i^2t$	214		T_C = 25 °C, t_p = 10 ms	
		175		T_C = 110 °C, t_p = 10 ms	
Power Dissipation	P_{tot}	227	W	T_C = 25 °C	Fig. 4
		99		T_C = 110 °C	

Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Notes
Forward Voltage	V_F	1.35	1.5	V	I_F = 30A, T_j = 25 °C	Fig. 1
		1.5	1.6		I_F = 30A, T_j = 175 °C	
Reverse Current	I_R	6.9	45	µA	V_R = 650V, T_j = 25 °C	Fig. 2
		46	350		V_R = 650V, T_j = 175 °C	
Total Capacitive Charge	Q_C	98		nC	V_R = 400V, T_j = 25 °C	Fig. 5
Total Capacitance	C	1851		pF	V_R = 0V, T_j = 25 °C, f = 1 MHz	Fig. 6
		187			V_R = 200V, T_j = 25 °C, f = 1 MHz	
		143			V_R = 400V, T_j = 25 °C, f = 1 MHz	
Capacitance Stored Energy	E_c	14.6		µJ	V_R = 400V	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)	$R_{\theta, JC (TYP)}$	0.55	°C / W	
Thermal Resistance, Junction to Case (Max)	$R_{\theta, JC (Max)}$	0.66	°C / W	
Junction Temperature	T_j	-55 to +175	°C	
Case & Storage Temperature	T_c	-55 to +175		
TO-247 Mounting Torque	-	1	Nm	M3 Screw
		8.8	lbf-in	6-32 Screw

Typical Performance

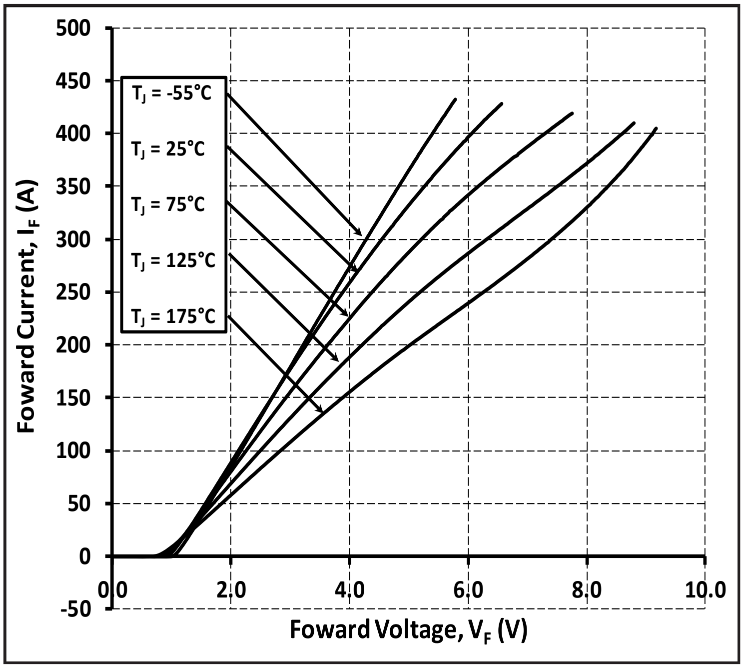


Figure 1. Forward Characteristics

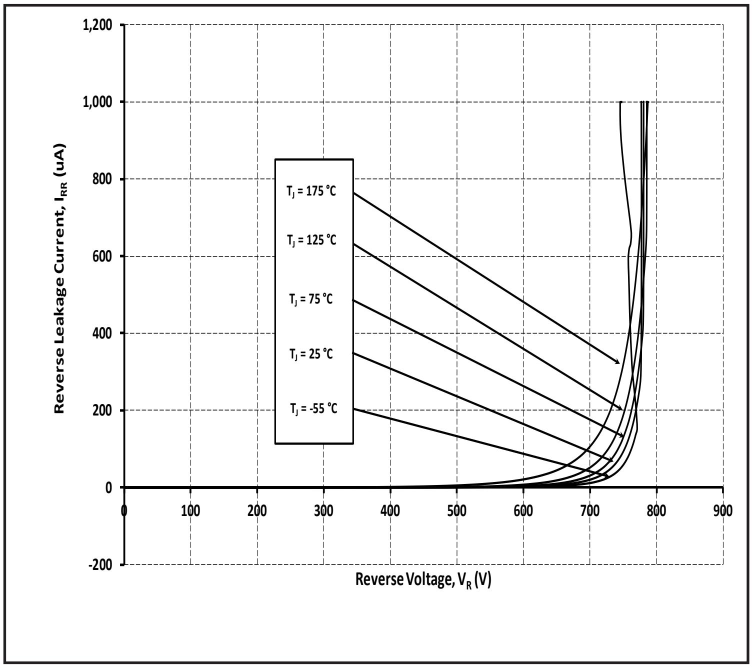


Figure 2. Reverse Characteristics

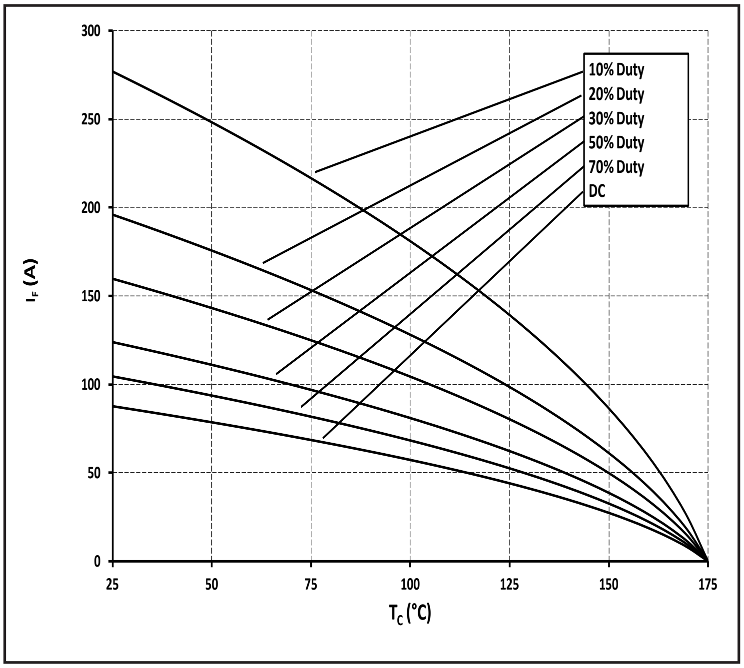


Figure 3. Current Derating

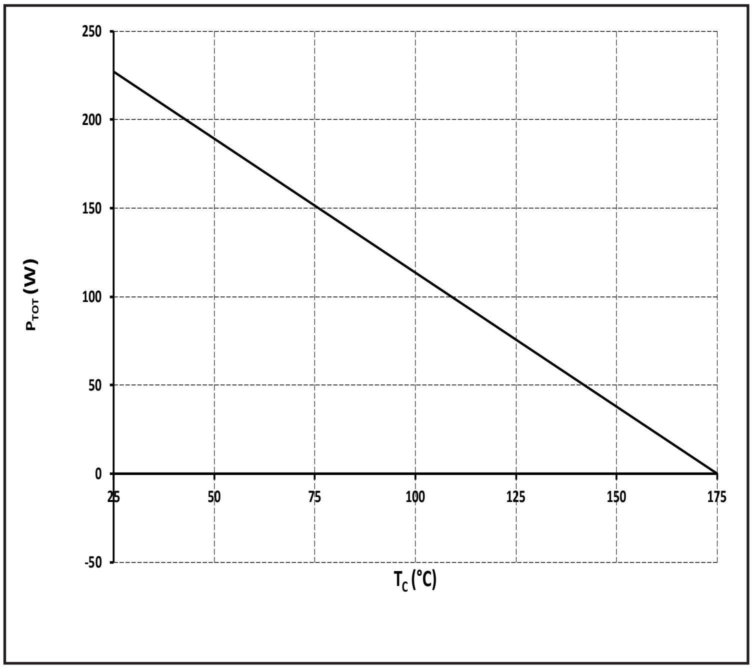


Figure 4. Power Derating

Typical Performance

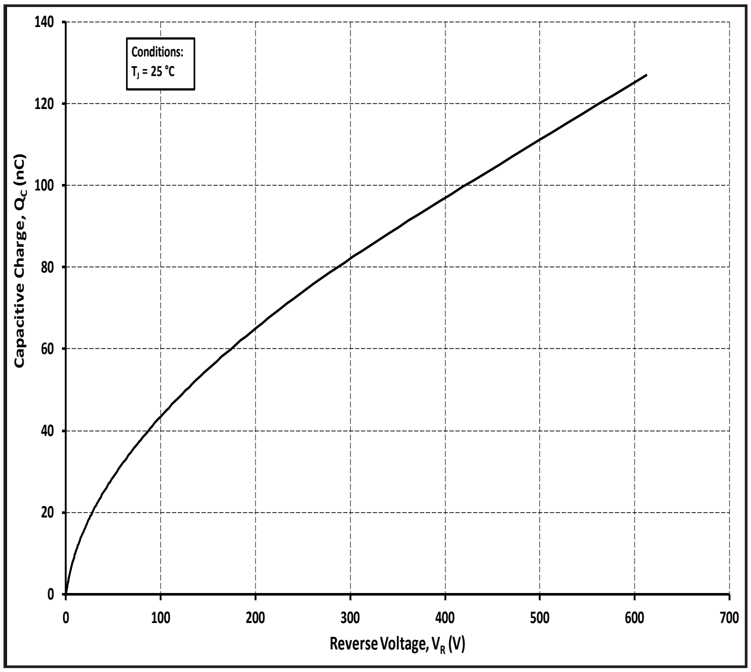


Figure 5.
Total Capacitance Charge vs. Reverse Voltage

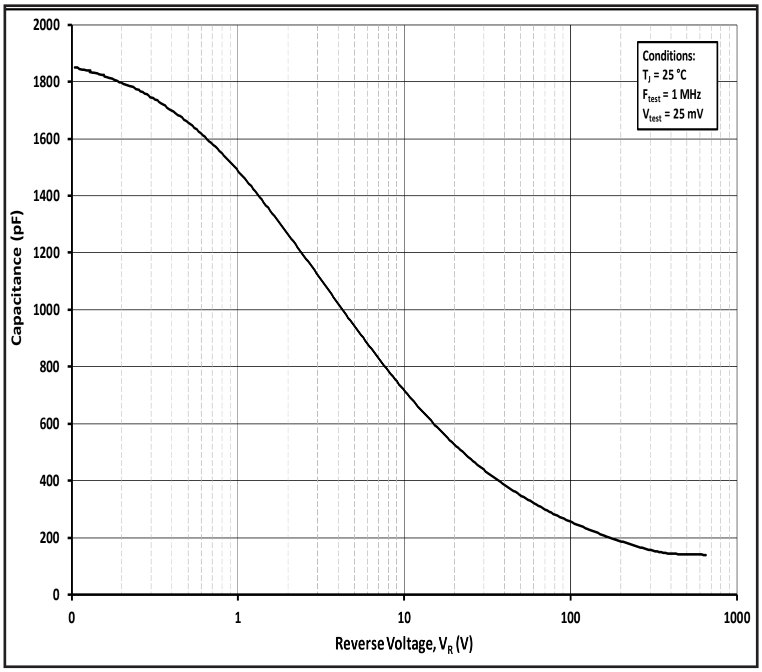


Figure 6.
Capacitance vs. Reverse Voltage

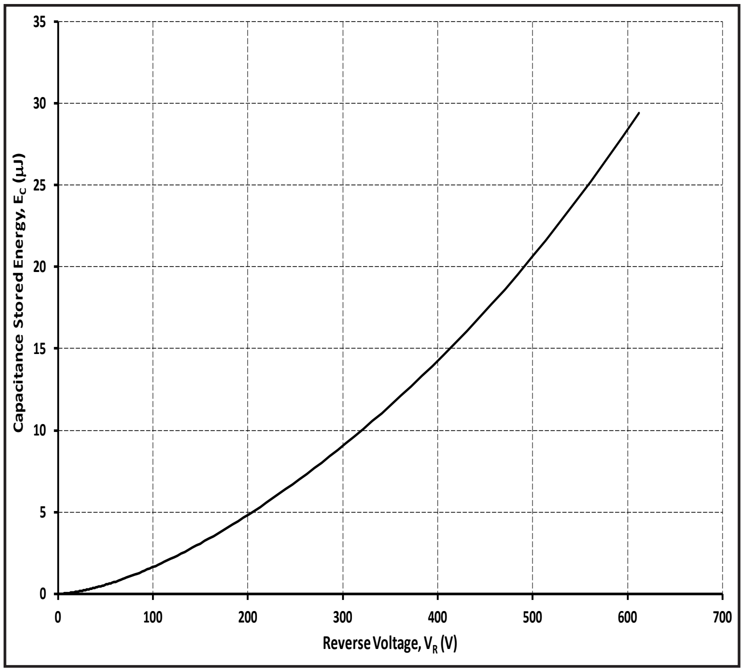


Figure 7.
Typical Capacitance Stored Energy

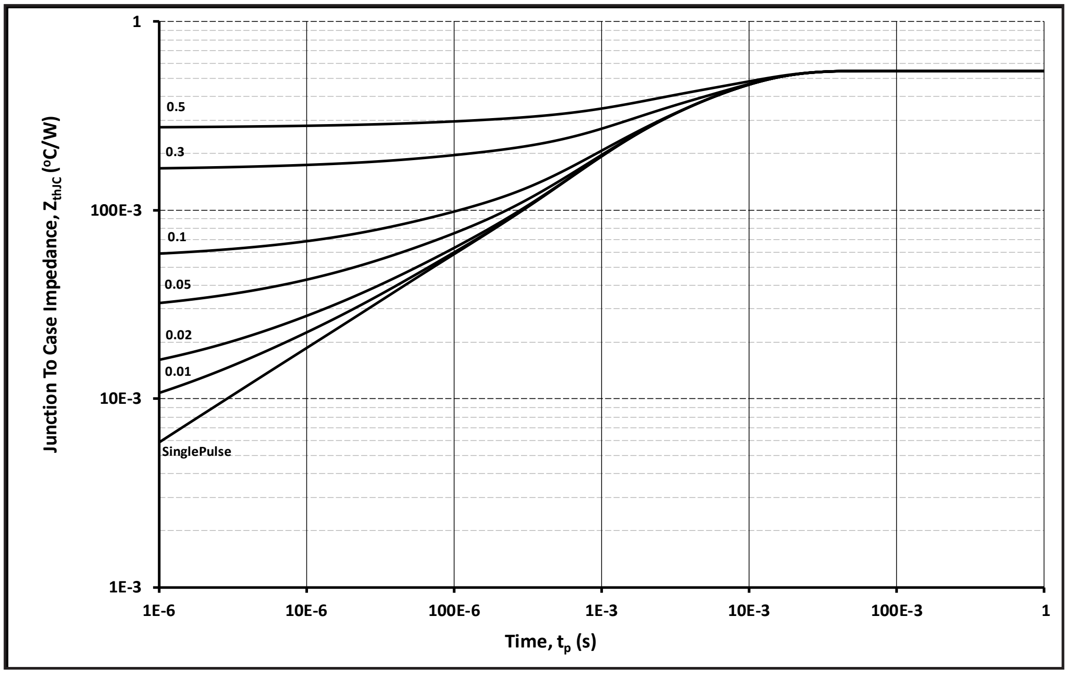
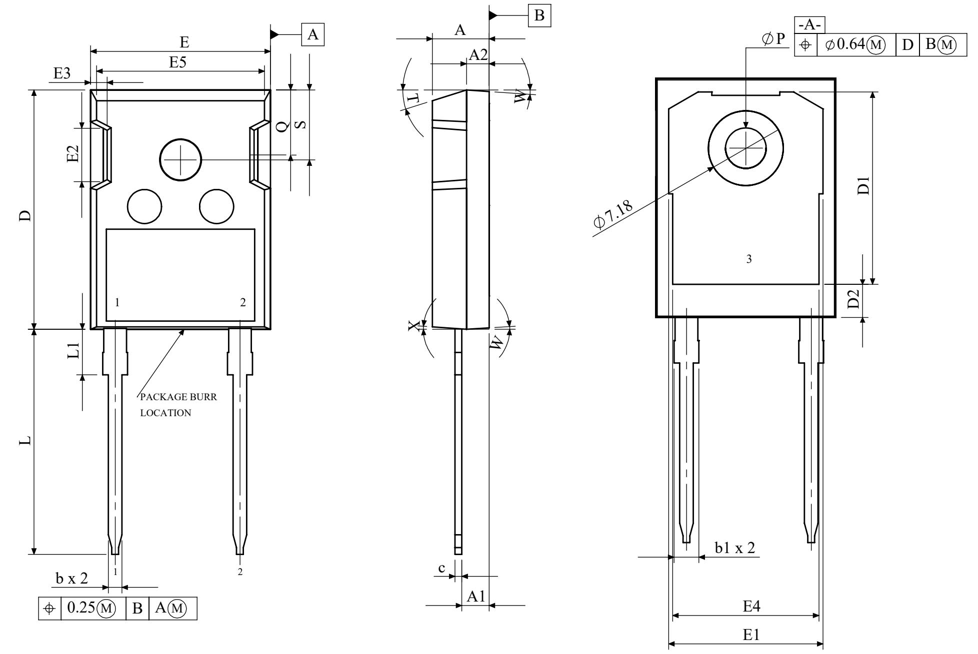


Figure 9.

Transient Thermal Impedance

Package Dimensions & Pin-Out

Package: TO-247-2 (All dimensions are in mm)



SYMBOL	MIN (mm)	MAX (mm)
A	4.86	5.21
A1	2.29	2.54
A2	1.91	2.16
b	1.07	1.33
b1	1.91	2.41
c	0.55	0.68
D	20.80	21.10
D1	16.25	17.35
D2	2.86	3.16
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
E5	14.65	15.05
e	10.88 BSC	
L	19.81	20.32
L1	4.10	4.40
ØP	3.51	3.65
Q	5.49	6.00
S	6.04	6.30
T	17.5° REF	
W	3.5° REF	
X	4° REF	

1	CATHODE
2	ANODE
3	CATHODE

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

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TITLE: PACKAGE OUTLINE DRAWING: TO 247-2L

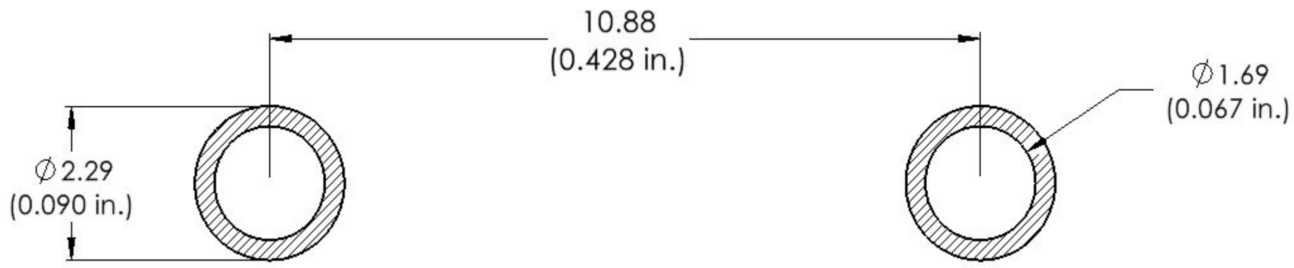
Date: 3/4/24

REVISION NO. 03 A4

PRD 05403 SCALE:1:1 SHEET 1 OF 1

Recommended Solder Pad Layout

(All dimensions are in mm)



Product Ordering Information

Order Number	Packing Type
C6D30065H	Tube

REACh, RoHS, and Halogen-Free compliance documentation available for this product.

Revision History

Document Version	Date of Release	Description of changes
1	November - 2023	Initial Release
2	August - 2024	Notes and Disclaimer Updated Updated POD

Notes & Disclaimer

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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.

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