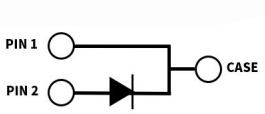
C4D30120H

4th Generation 1200 V, 30 A Silicon Carbide Schottky Diode



Package Types: TO-247-2
Marking: C4D30120

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.

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

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

Parameter	Symbol	Value	Unit	Test Conditions	Notes
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V		
DC Blocking Voltage	V_{DC}	1200			
Continuous Forward Current	I_F	94	A	T_C = 25 °C	Fig. 3
		45		T_C = 135 °C	
		30		T_C = 155 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	121		T_C = 25 °C, t_p = 10 ms, Half Sine Wave	
		68		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	
Non-Repetitive Forward Surge Current	I_{FSM}	233		T_C = 25 °C, t_p = 10 ms, Half Sine Wave	Fig. 8
		209		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	
i^2t Value	$\int i^2t$	271		T_C = 25 °C, t_p = 10 ms	
		218		T_C = 110 °C, t_p = 10 ms	
Power Dissipation	P_{tot}	441	W	T_C = 25 °C	Fig. 4
		191		T_C = 110 °C	

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Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Notes
Forward Voltage	V_F	1.5	1.8	V	I_F = 30 A, T_j = 25 °C	Fig. 1
		2.2	3		I_F = 30 A, T_j = 175 °C	
Reverse Current	I_R	40	250	µA	V_R = 1200 V, T_j = 25 °C	Fig. 2
		70	450		V_R = 1200 V, T_j = 175 °C	
Total Capacitive Charge	Q_C	152		nC	V_R = 800 V, T_j = 25 °C	Fig. 5
Total Capacitance	C	2177		pF	V_R = 0 V, T_j = 25 °C, f = 1 MHz	Fig. 6
		136			V_R = 400 V, T_j = 25 °C, f = 1 MHz	
		100			V_R = 800 V, T_j = 25 °C, f = 1 MHz	
Capacitance Stored Energy	E_c	44		µJ	V_R = 800 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)	$R_{\theta, JC (TYP)}$	0.34	°C / W	
Junction Temperature	T_j	-55 to +175	°C	
Case & Storage Temperature	T_c	-55 to +150		
TO-247 Mounting Torque	-	1	Nm	M3 Screw
		8.8	lbf-in	6-32 Screw

Typical Performance

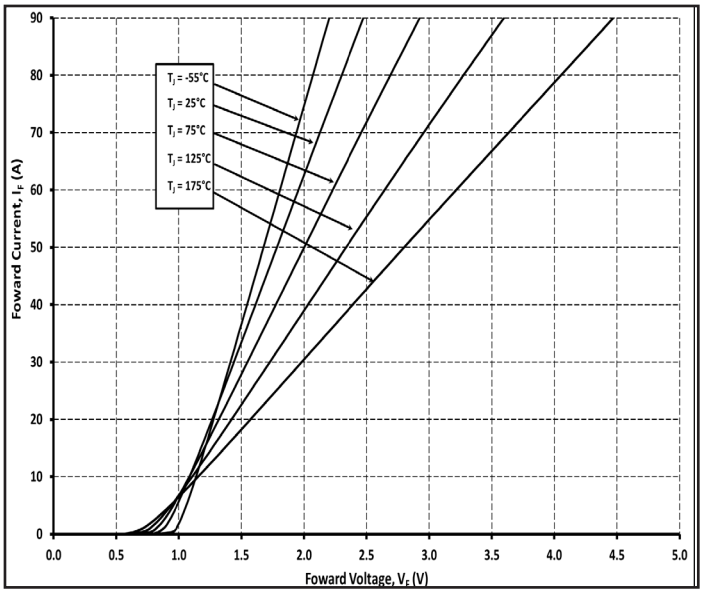


Figure 1. Forward Characteristics

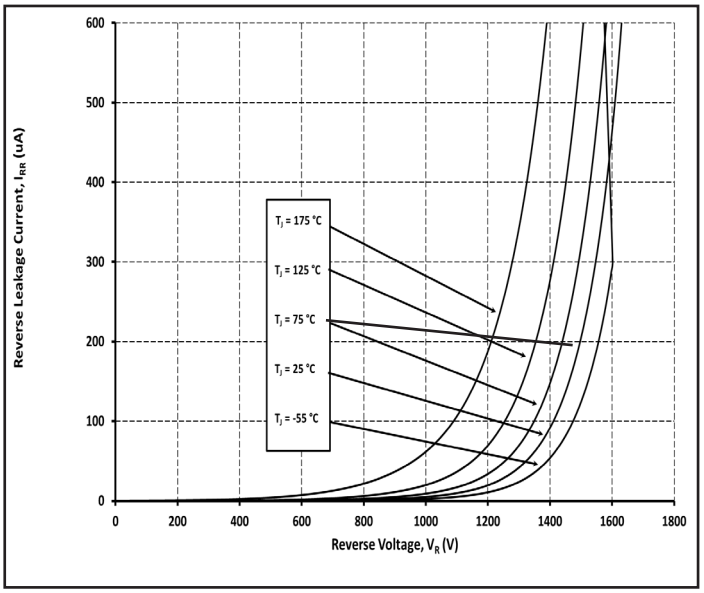


Figure 2. Reverse Characteristics

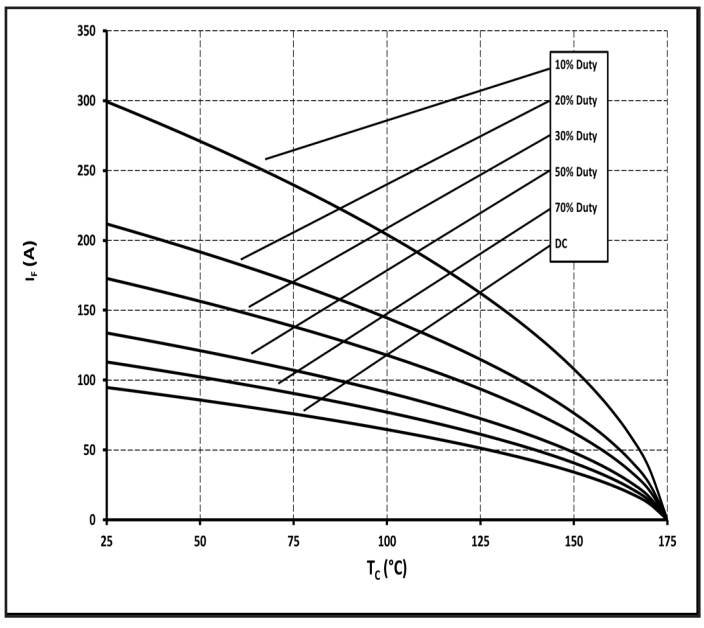


Figure 3. Current Derating

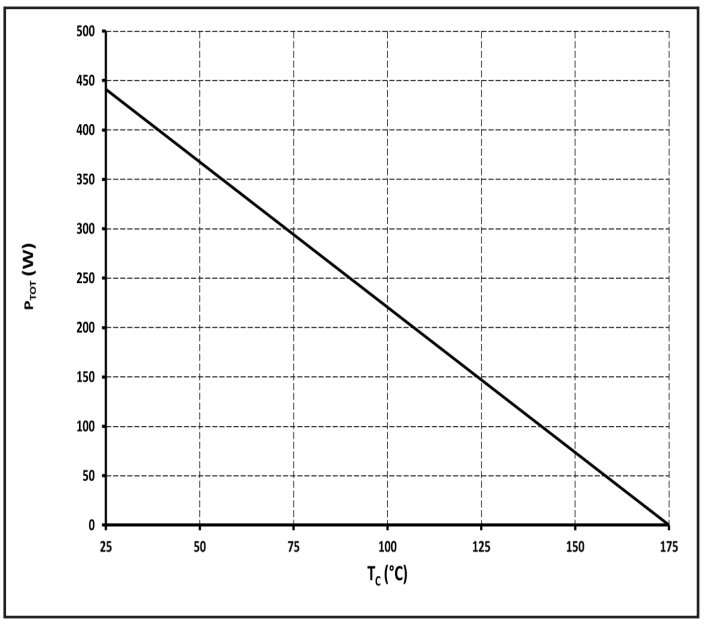


Figure 4. Power Derating

Typical Performance

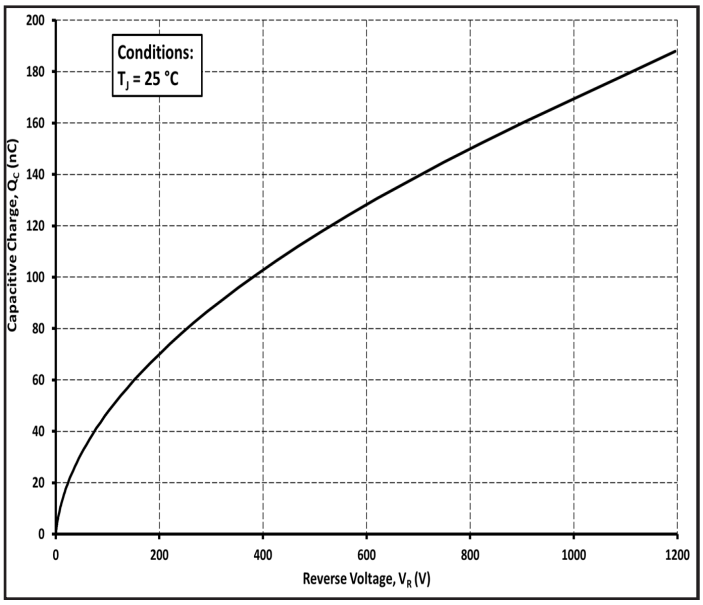


Figure 5.
Total Capacitance Charge vs. Reverse Voltage

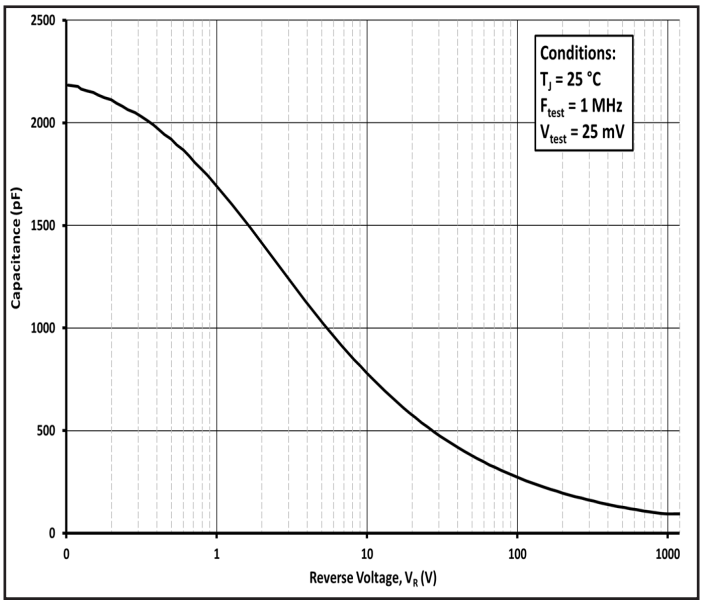


Figure 6.
Capacitance vs. Reverse Voltage

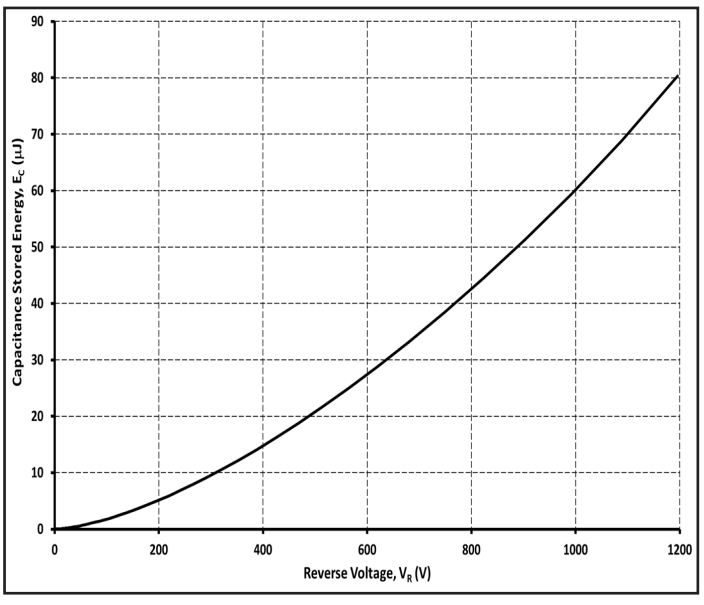


Figure 7.
Typical Capacitance Stored Energy

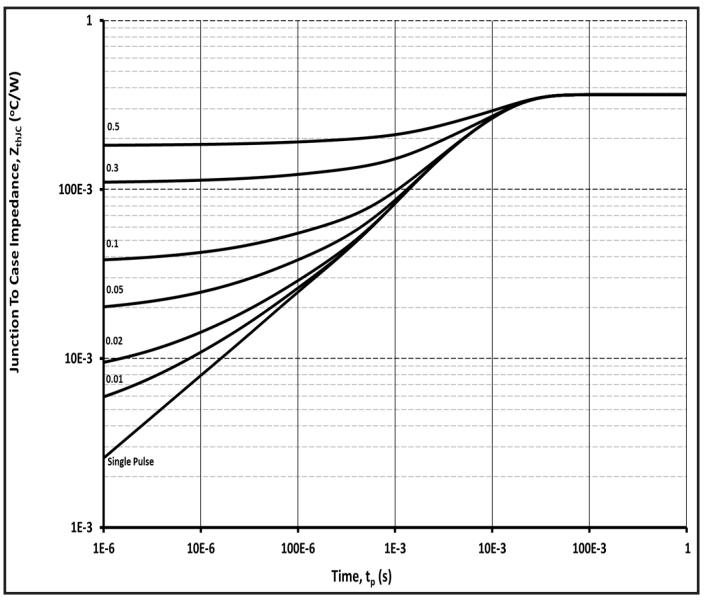
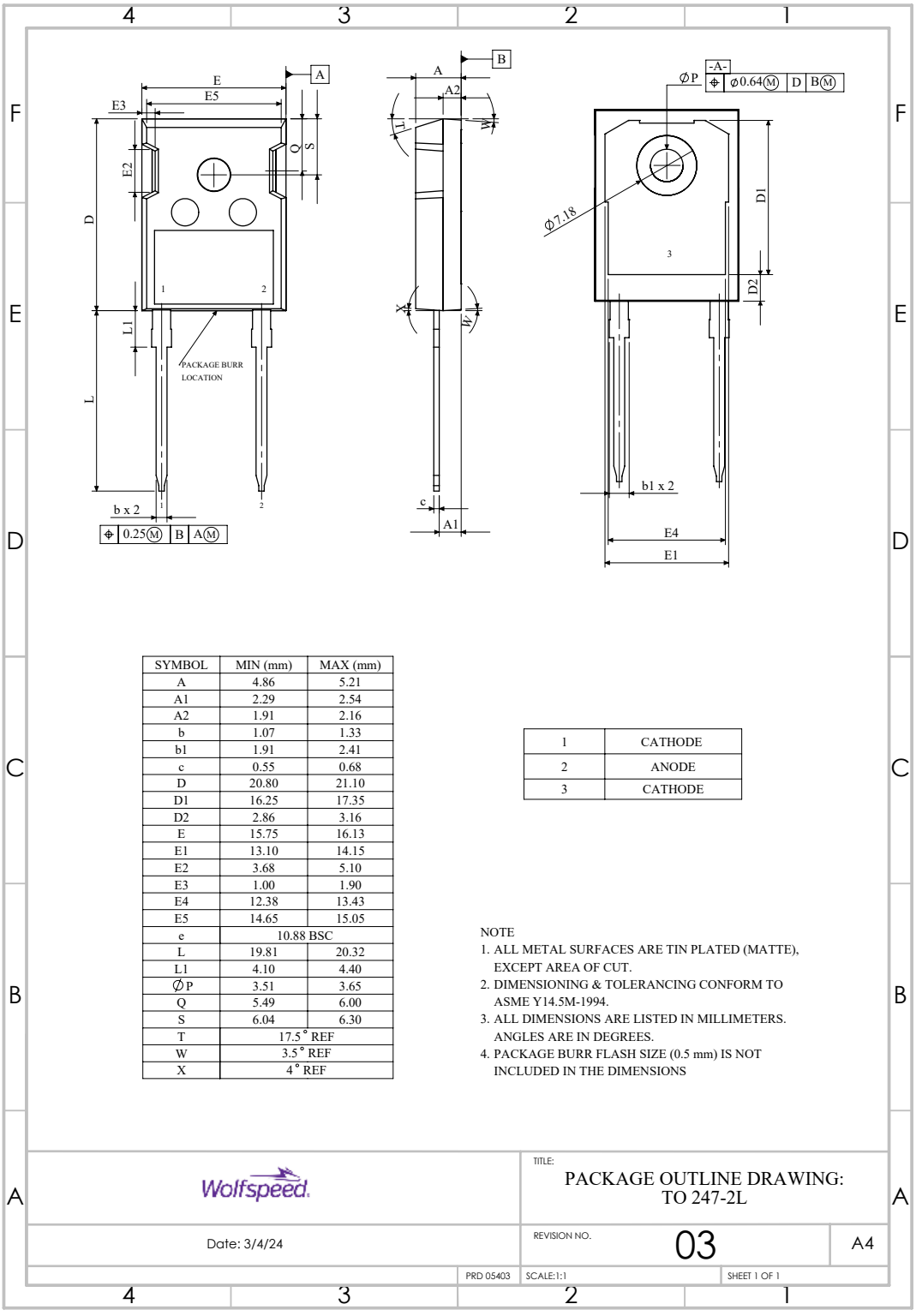


Figure 8. Transiant Thermal Impedence

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

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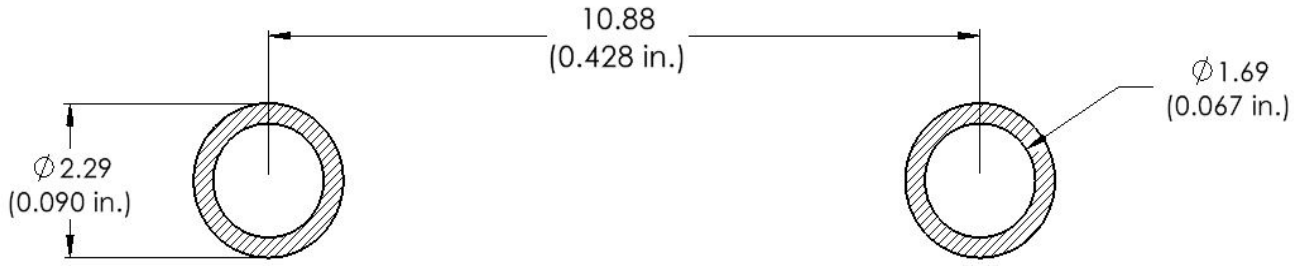
Recommended Solder Pad Layout

(All dimensions are in mm)



Product Ordering Information

Order Number	Packing Type
C4D30120H	Tube

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

Revision History

Document Version	Date of Release	Description of changes
0	January - 2019	Initial Release
1	January - 2023	Updated POD and Landing Pad
2	August - 2024	Notes and dislaimers, added ROHS and Halogen Free Symbols

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