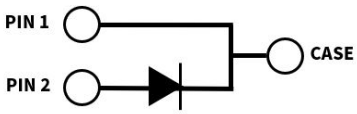
C6D10065G

650 V, 10 A Silicon Carbide Schottky Diode

TO-263-2



Package Types: TO-263-2
PN: C6D10065G

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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.

Typical Applications

- Industrial power supplies
- Switch mode power supplies
- Server/telecom power supplies
- Power factor correction
- Solar inverter
- Uninterruptible power supply

Features

- Low forward voltage (V_F) drop with positive temperature coefficient
- Zero reverse recovery current/forward recovery voltage
- Temperature-independent switching behavior
- Low leakage current (I_R)

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

Parameter	Symbol	Value	Unit	Test Conditions	Note
Repetitive Peak Reverse Voltage	V_{RRM}	650	V		
DC Blocking Voltage	V_{DC}	650			
Continuous Forward Current	I_F	36	A	T_C = 25 °C	Fig. 3
		18		T_C = 125 °C	
		10		T_C = 155 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	39		T_C = 25 °C, t_P = 10 ms, Half Sine Wave	
		22		T_C = 110 °C, t_P = 10 ms, Half Sine Wave	
Non-Repetitive Peak Forward Surge Current	I_{FSM}	80		T_C = 25 °C, t_P = 10 ms, Half Sine Wave	Fig. 8
		68		T_C = 110 °C, t_P = 10 ms, Half Sine Wave	
	$I_{F, Max}$	1020		T_C = 25 °C, t_P = 10 µs, Pulse	
		960		T_C = 110 °C, t_P = 10 µs, Pulse	
Power Dissipation	P_{tot}	108	W	T_C = 25 °C	Fig. 4
		47		T_C = 110 °C	

Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Note
Forward Voltage	V_F	1.27	1.40	V	I_F = 10 A, T_J = 25 °C	Fig. 1
		1.37	1.50		I_F = 10 A, T_J = 175 °C	
Reverse Current	I_R	2	20	µA	V_R = 650 V, T_J = 25 °C	Fig. 2
		12	200		V_R = 650 V, T_J = 175 °C	
Total Capacitive Charge	Q_C	34		nC	V_R = 400 V, T_J = 25 °C	Fig. 5
Total Capacitance	C	611		pF	V_R = 0 V, T_J = 25 °C, f = 1 MHz	Fig. 6
		67			V_R = 200 V, T_J = 25 °C, f = 1 MHz	
		53			V_R = 400 V, T_J = 25 °C, f = 1 MHz	
Capacitance Stored Energy	E_C	5.2		µJ	V_R = 400 V	Fig. 7

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

Thermal & Mechanical Characteristics

Parameter	Symbol	Typ.	Unit	Note
Thermal Resistance, Junction to Case	$R_{\theta, JC}$	1.38	°C/W	
Operating Junction & Storage Temperature	T_J, T_{stg}	-55 to +175	°C	Fig. 9

Typical Performance

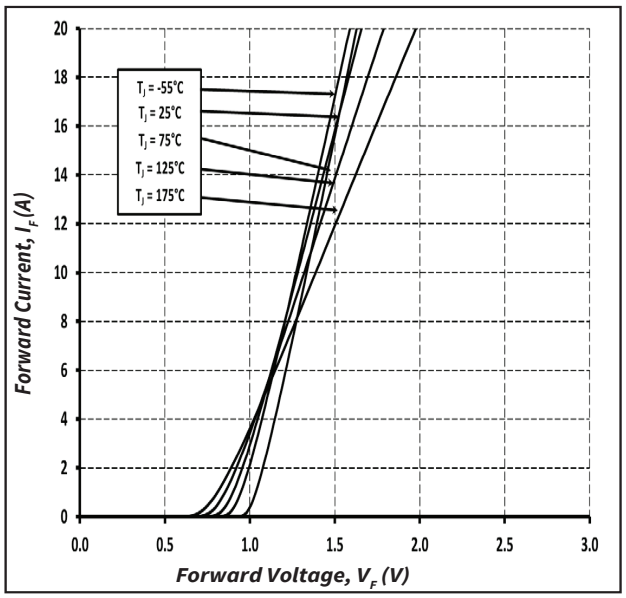


Figure 1. Forward Characteristics

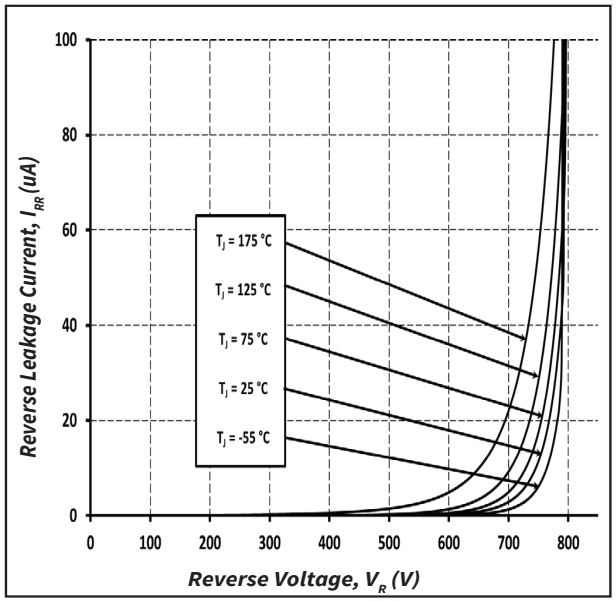


Figure 2. Reverse Characteristics

Typical Performance

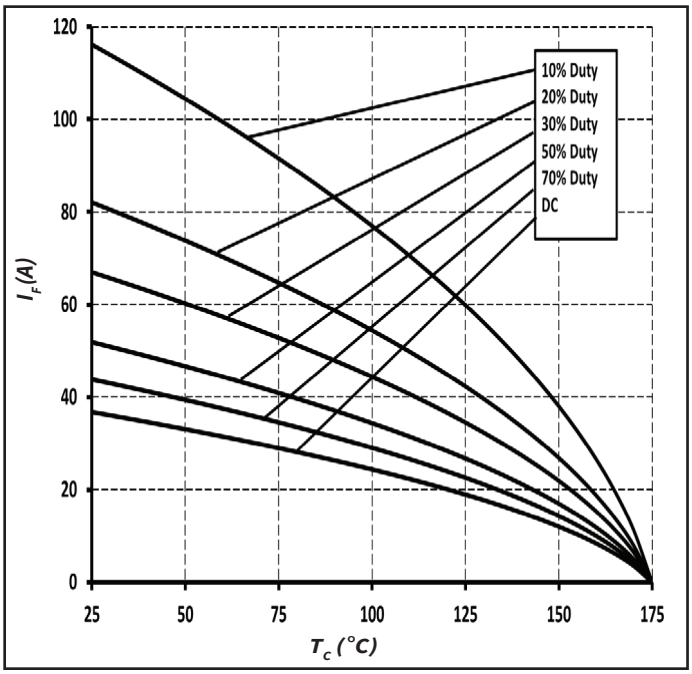


Figure 3. Current Derating

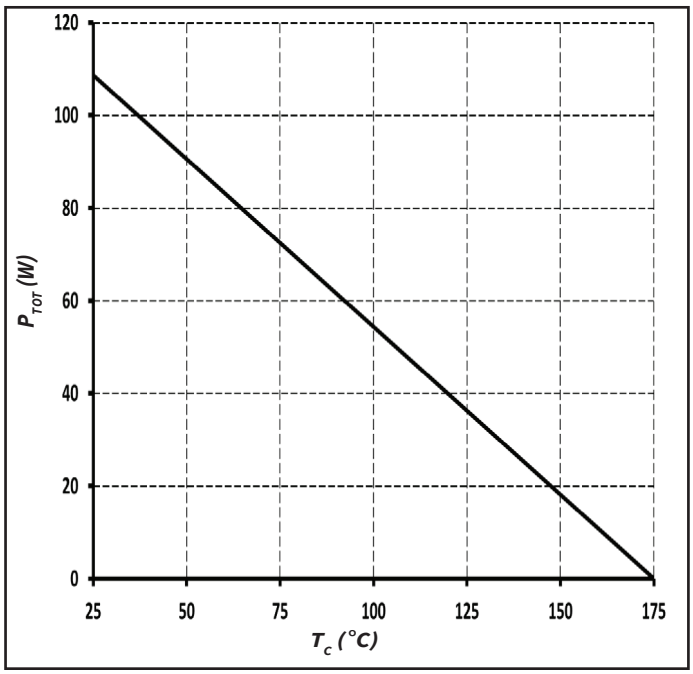


Figure 4. Power Derating

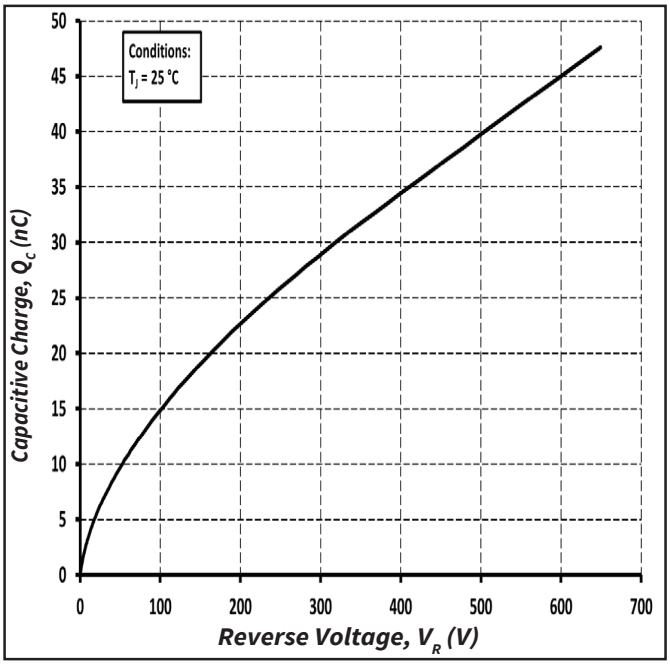


Figure 5. Total Capacitance Charge vs. Reverse Voltage

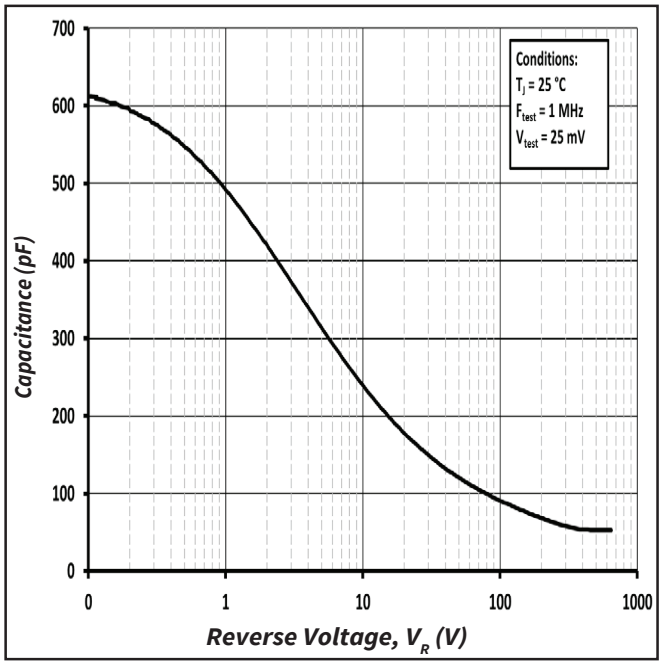


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

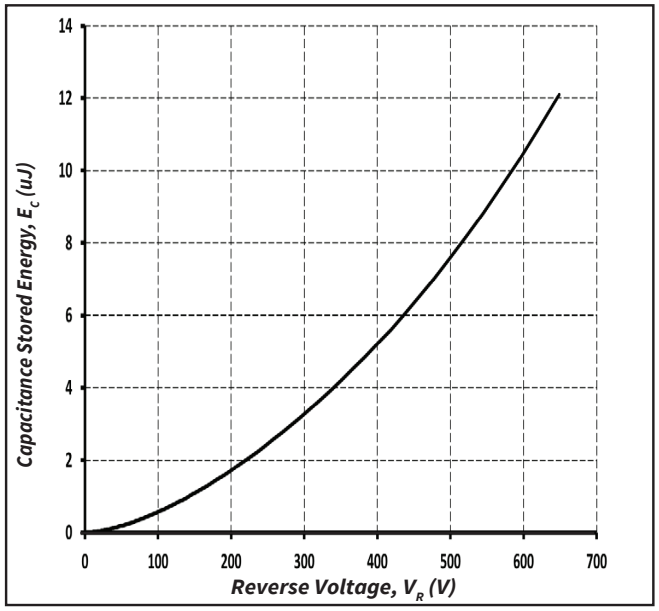


Figure 7. Capacitance Stored Energy

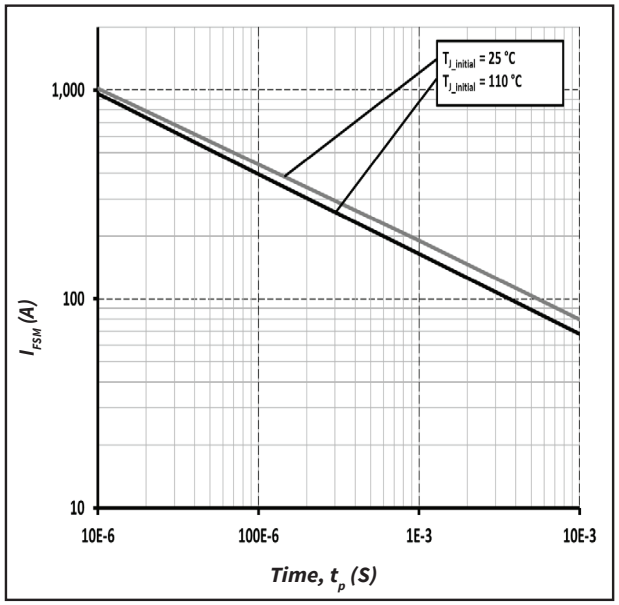


Figure 8. Non-Repetitive Peak Forward Surge Current (Sine Wave)

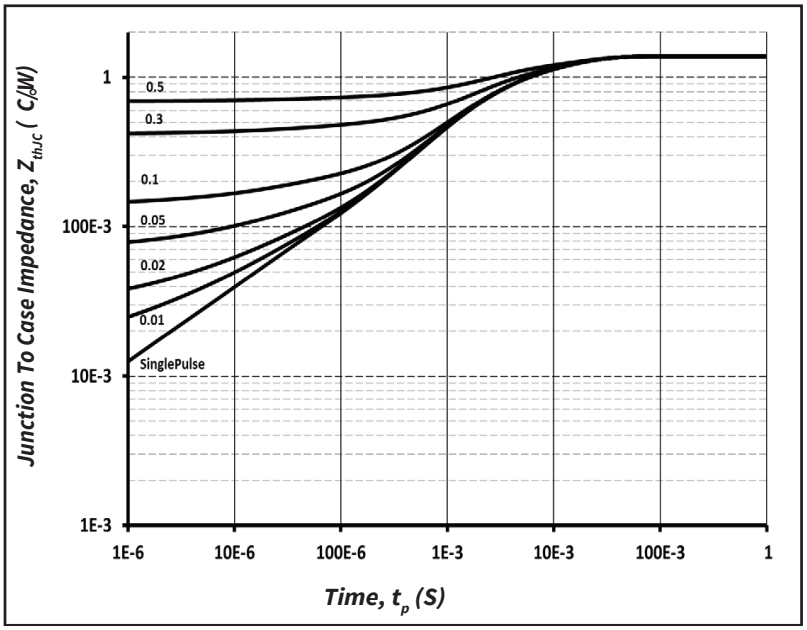
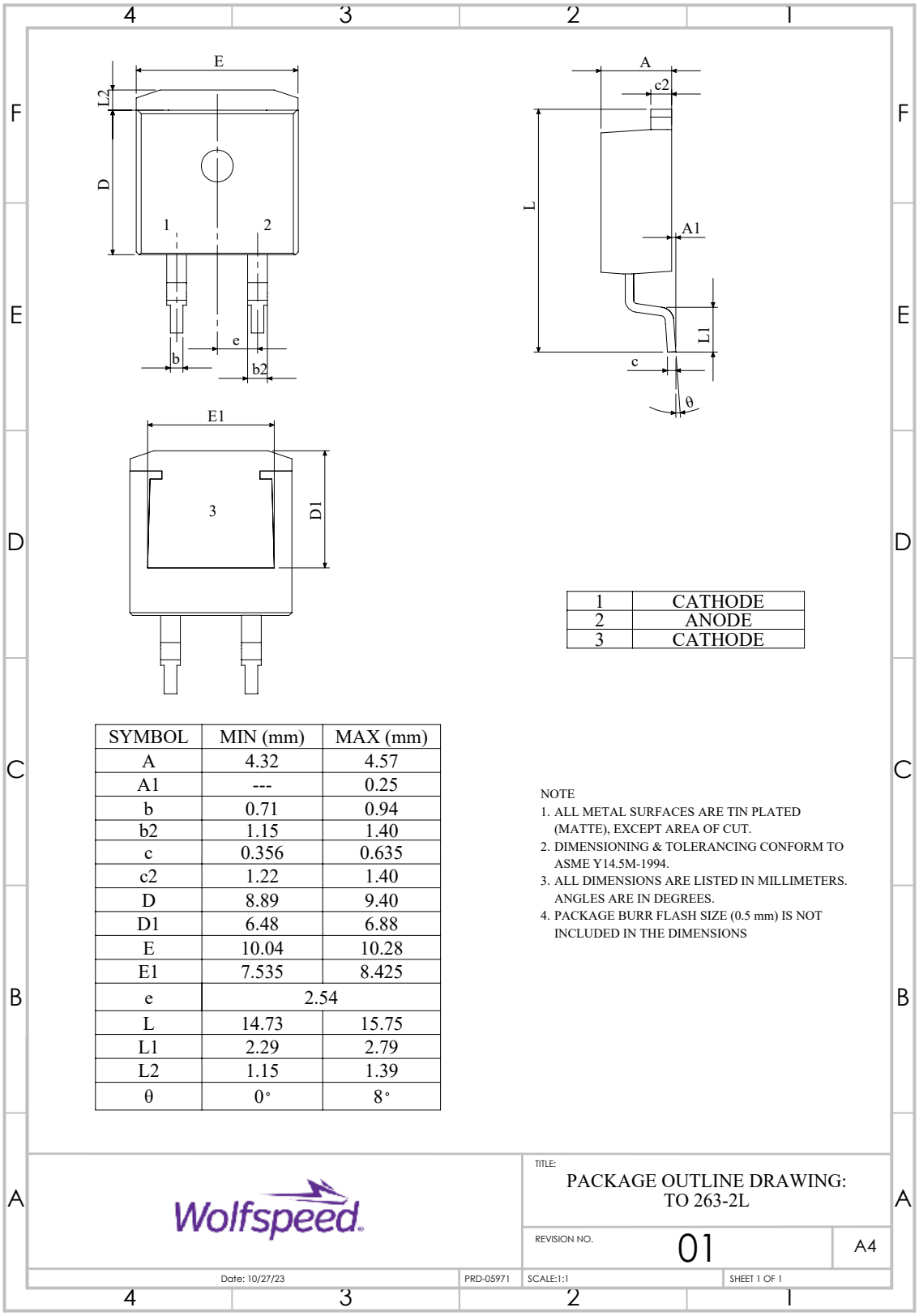


Figure 9. Transient Thermal Impedance

Package Dimensions

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°

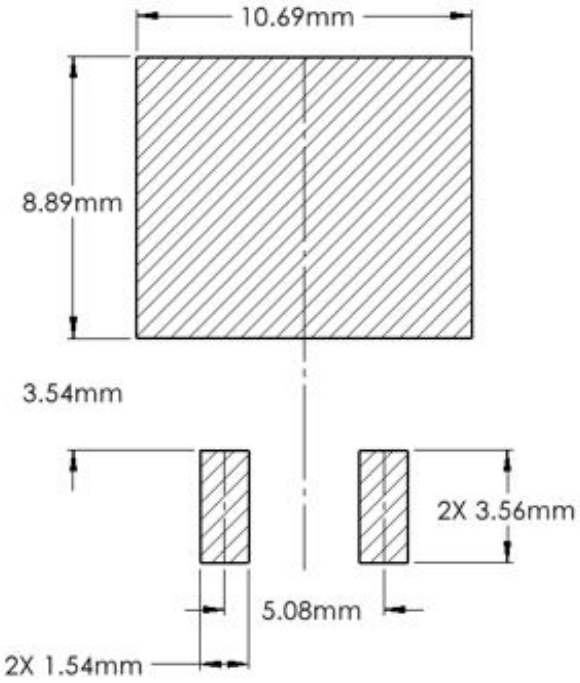
NOTE
1. ALL METAL SURFACES ARE TIN PLATED (MATTE), EXCEPT AREA OF CUT.
2. DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
3. ALL DIMENSIONS ARE LISTED IN MILLIMETERS. ANGLES ARE IN DEGREES.
4. PACKAGE BURR FLASH SIZE (0.5 mm) IS NOT INCLUDED IN THE DIMENSIONS

TITLE: PACKAGE OUTLINE DRAWING: TO 263-2L

REVISION NO. 01 | A4

Date: 10/27/23 | PRD-05971 | SCALE:1:1 | SHEET 1 OF 1

Recommended Solder Pad Layout



Part Number	Package	Marking
C6D10065G	TO-263-2	C6D10065

Electrostatic Discharge (ESD) Classifications

Parameter	Symbol	Class
Human Body Model	HBM	Class 3B (≥ 8000 V)
Charge Device Model	CDM	Class C3 (≥ 1000 V)

Revision History

Document Version	Date of Release	Description of Changes
0	July-2021	Initial Release
1	October-2023	Updated Wolfspeed branding, package drawing, and solder pad layout (Not Released)
2	November-2023	Corrected Package Drawing L and L1
3	November - 2024	Legal Disclaimer

Notes & Disclaimer

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