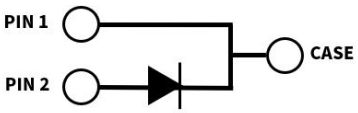
E3D08065G

650 V, 8 A Silicon Carbide Schottky Diode

Features

- 650-Volt Schottky rectifier
- Zero reverse recovery current
- Zero forward recovery voltage
- High-frequency operation
- Temperature-independent switching behavior
- Extremely fast switching
- Positive temperature coefficient on V_F

TO-263-2



Package Types: TO-263-2
PN: E3D08065G

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Applications

- Automotive battery chargers
- Boost diodes in PFC or DC/DC stages
- Free wheeling diodes in inverter stages
- AC/DC converters
- PV inverters

Benefits

- Higher system level efficiency
- Increase system power density
- Reduction of heat sink requirements
- Parallel devices without thermal runaway

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 Peak Reverse Voltage	V_R	650			
Continuous Forward Current	I_F	22	A	T_C = 25 °C	Fig. 3
		10		T_C = 135 °C	
		8		T_C = 150 °C	
Power Dissipation	P_{tot}	102	W	T_C = 25 °C	Fig. 4
		44		T_C = 110 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	31	A	T_C = 25 °C, t_P = 10 ms, Half Sine Pulse	
		18		T_C = 110 °C, t_P = 10 ms, Half Sine Pulse	
Diode dV/dt Ruggedness	dV/dt	200	V/ns	V_R = 0-650 V	
Operating Junction and Storage Temperature	T_J, T_{stg}	-55 to +175	°C		

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Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Note
Forward Voltage	V_F	1.5	1.8	V	I_F = 8 A, T_J = 25 °C	Fig. 1
		2.2	2.4		I_F = 8 A, T_J = 175 °C	
Reverse Current	I_R	10	51	µA	V_R = 650 V, T_J = 25 °C	Fig. 2
		12	204		V_R = 650 V, T_J = 175 °C	
Total Capacitive Charge	Q_C	21		nC	V_R = 400 V, I_F = 8 A, T_J = 25 °C	Fig. 5
Total Capacitance	C	369		pF	V_R = 0 V, T_J = 25 °C, f = 1 MHz	Fig. 6
		39			V_R = 200 V, T_J = 25 °C, f = 1 MHz	
		36			V_R = 400 V, T_J = 25 °C, f = 1 MHz	
Capacitance Stored Energy	E_C	3.2		µJ	V_R = 400 V	

Note: This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

Parameter	Symbol	Typ.	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.47	°C/W

Typical Performance

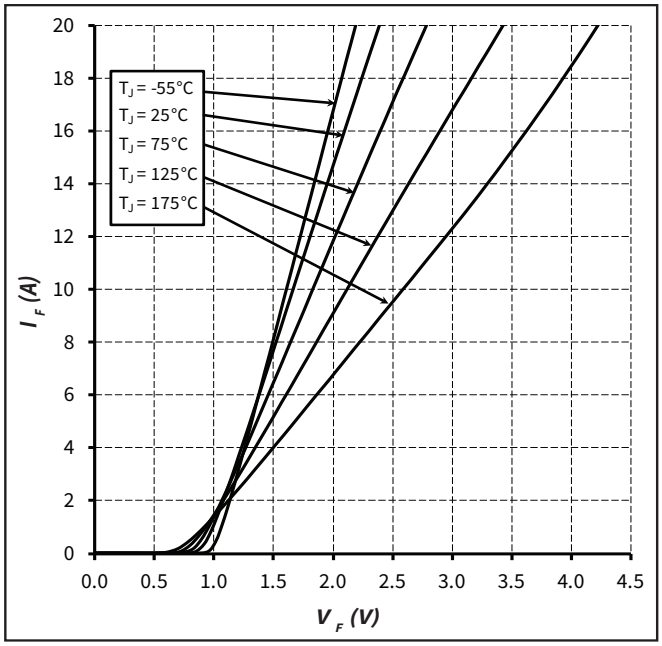


Figure 1. Forward Characteristics

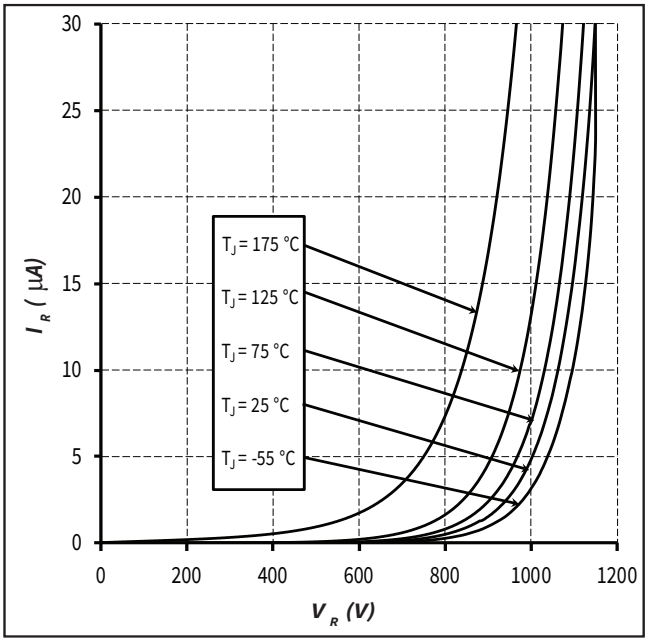


Figure 2. Reverse Characteristics

Typical Performance

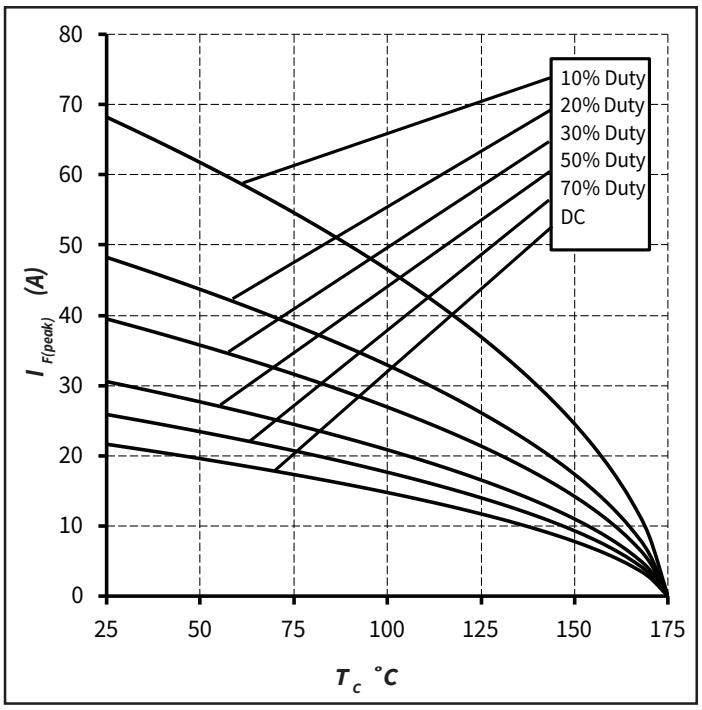


Figure 3. Current Derating

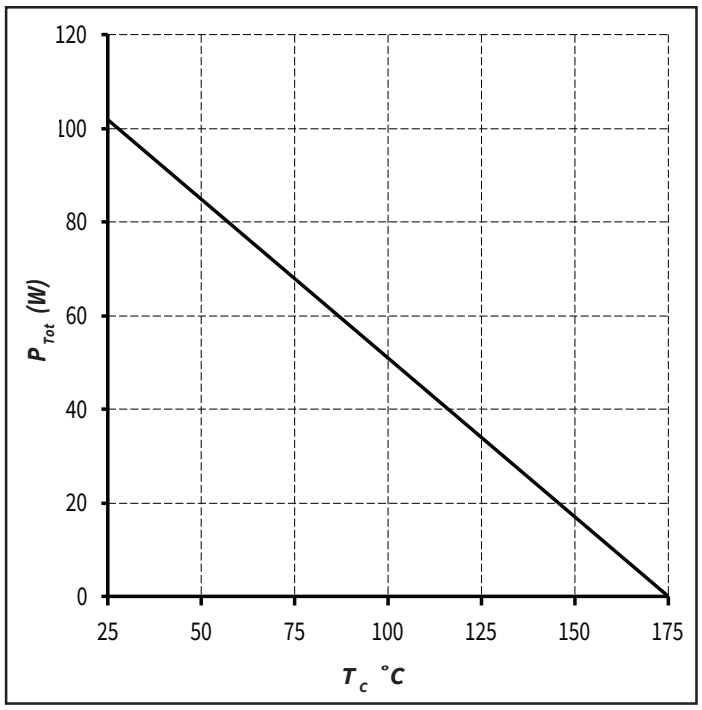


Figure 4. Power Derating

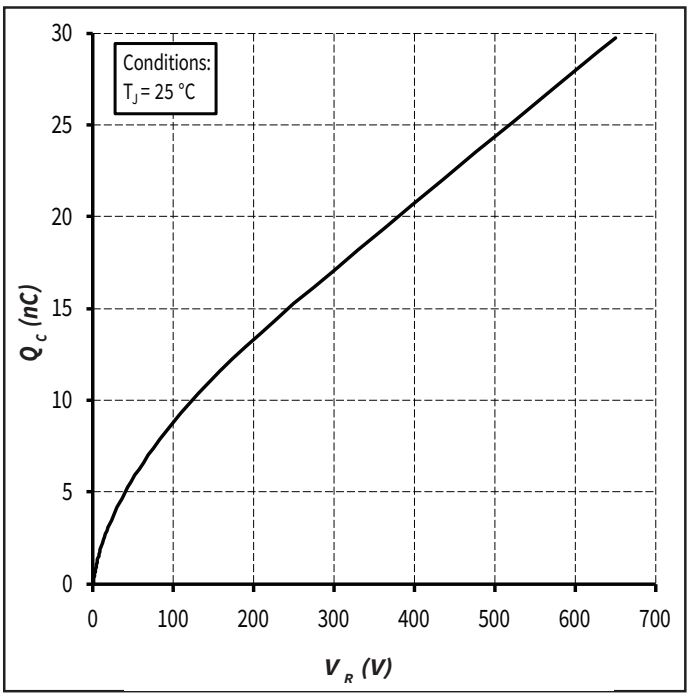


Figure 5. Total Capacitance Charge vs. Reverse Voltage

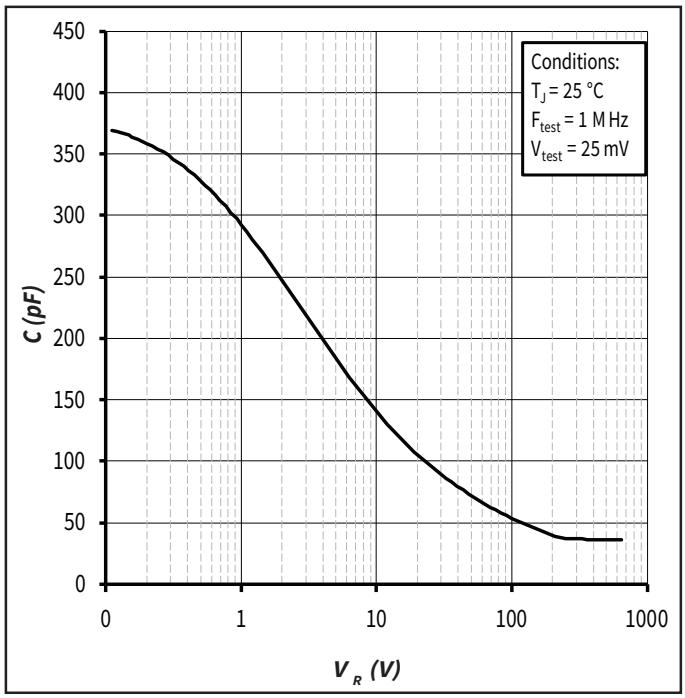


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

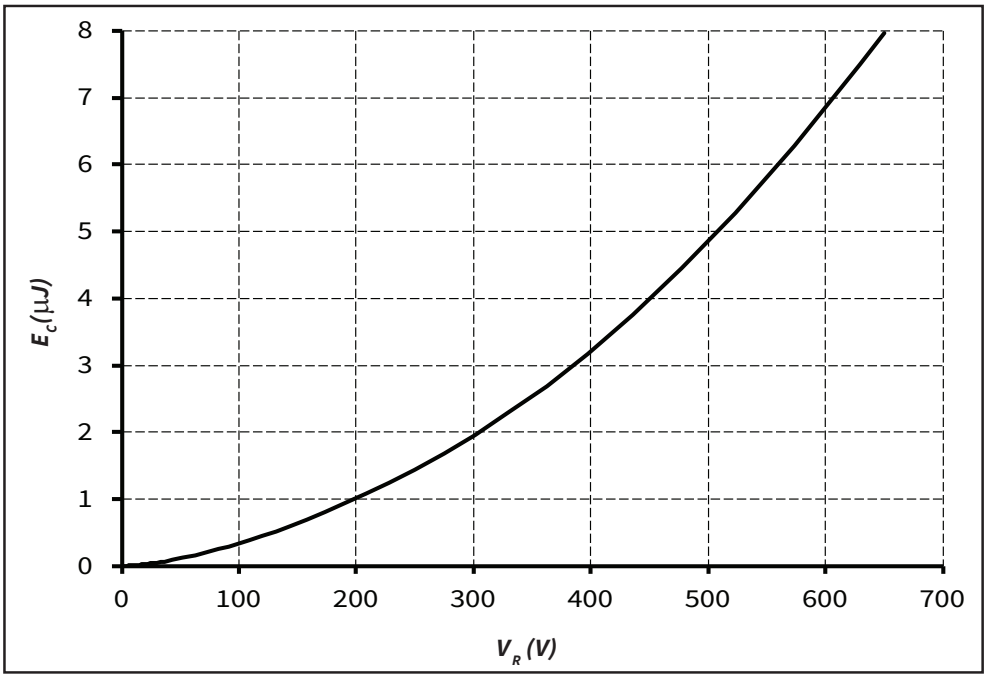


Figure 7. Typical Capacitance Stored Energy

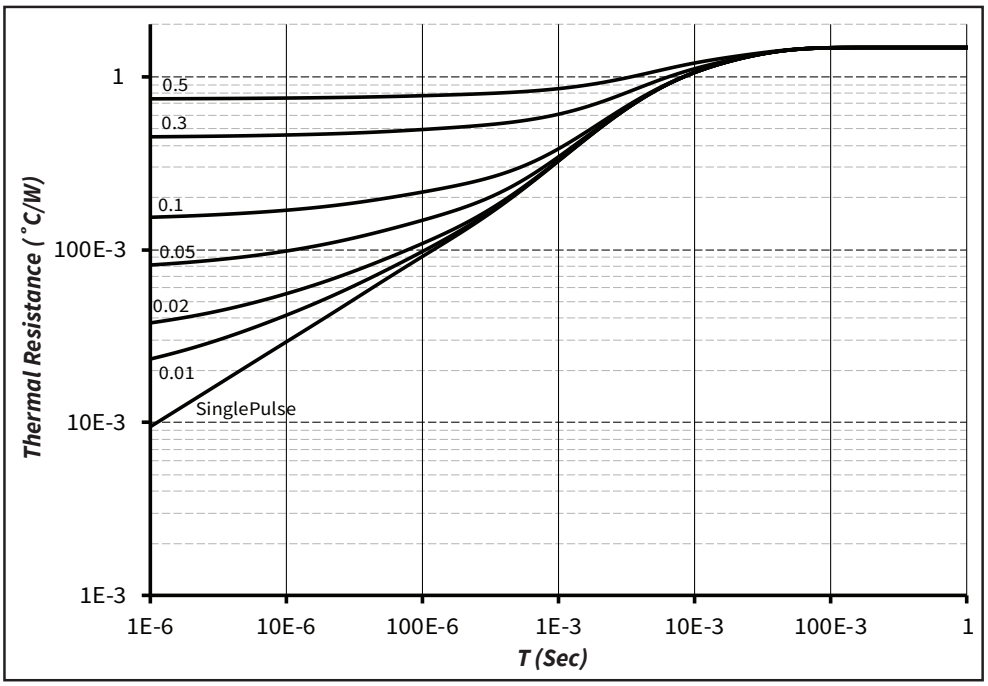
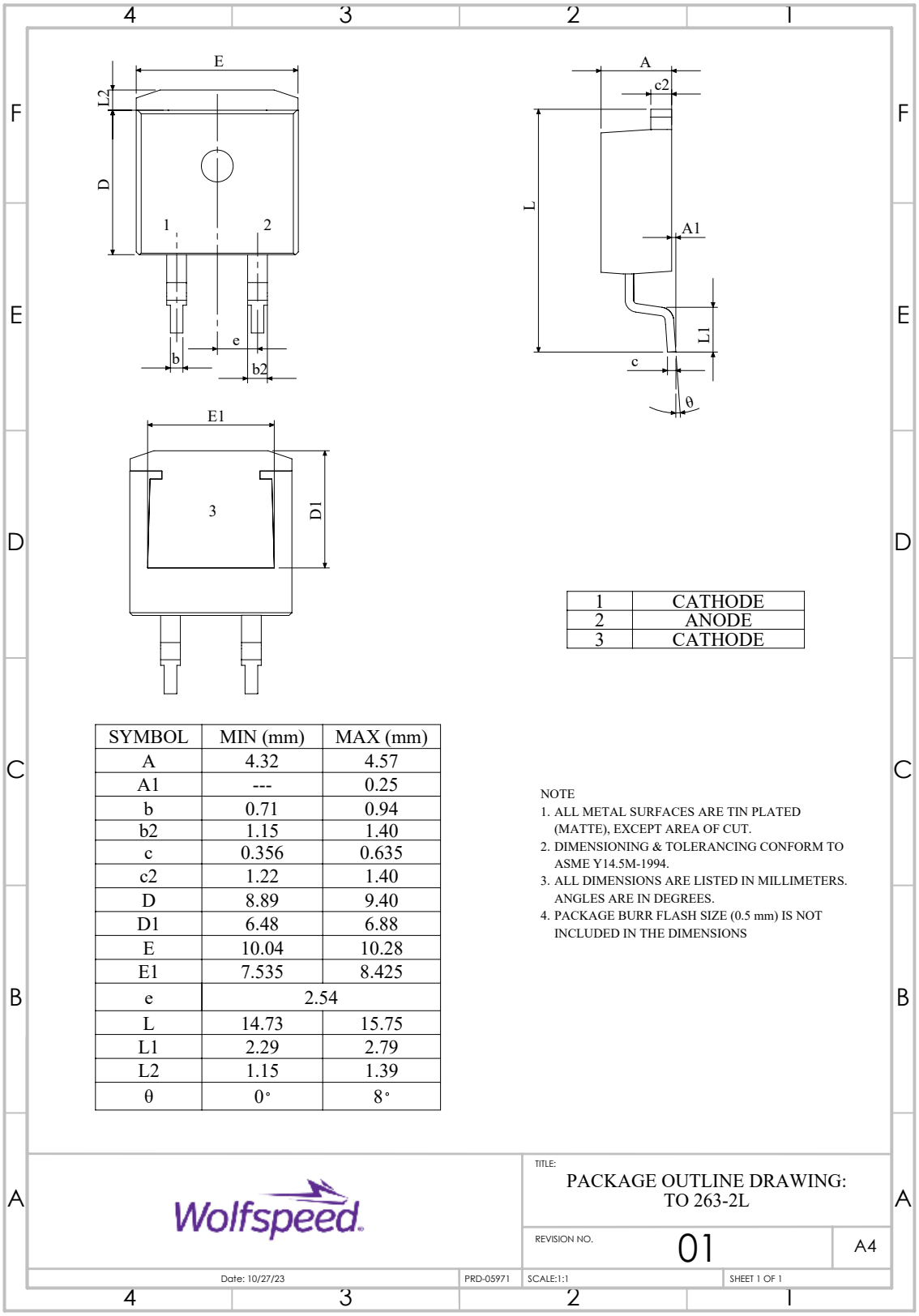


Figure 9. Transient Thermal Impedance

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°

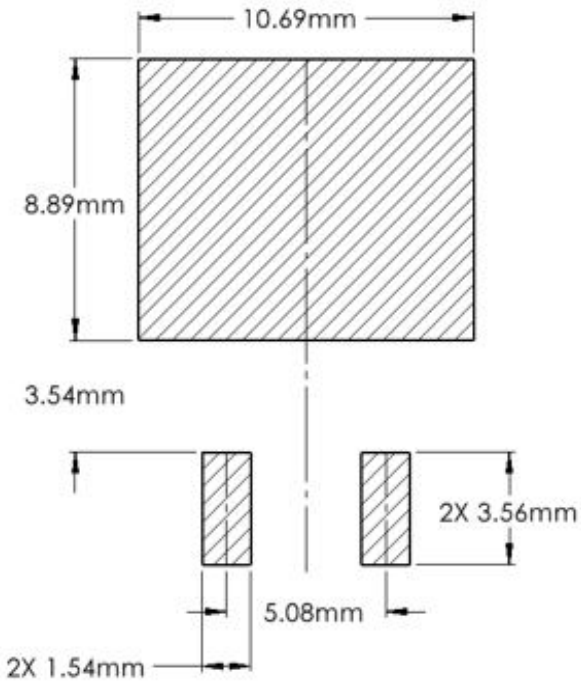
NOTE
1. ALL METAL SURFACES ARE TIN PLATED (MATTE), EXCEPT AREA OF CUT.
2. DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
3. ALL DIMENSIONS ARE LISTED IN MILLIMETERS. ANGLES ARE IN DEGREES.
4. PACKAGE BURR FLASH SIZE (0.5 mm) IS NOT INCLUDED IN THE DIMENSIONS

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
E3D08065G	TO-263-2	E3D08065

Revision History

Current Revision	Date of Release	Description of Changes
1	October-2020	Initital Release
2	October-2023	Updated Wolfspeed branding, package drawing, and solder pad layout (Not Released)
3	November-2023	Corrected Package Drawing L and L1

Notes & Disclaimer

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