

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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Typical 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 ($T_C = 25^\circ\text{C}$ 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	$T_C = 25^\circ\text{C}$	Fig. 3
		10		$T_C = 135^\circ\text{C}$	
		8		$T_C = 150^\circ\text{C}$	
Power Dissipation	P_{tot}	102	W	$T_C = 25^\circ\text{C}$	Fig. 4
		44		$T_C = 110^\circ\text{C}$	
Repetitive Peak Forward Surge Current	I_{FRM}	31	A	$T_C = 25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Pulse	
		18		$T_C = 110^\circ\text{C}$, $t_p = 10$ 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	$^\circ\text{C}$		



Electrical Characteristics

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

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	$^\circ\text{C/W}$

Typical Performance

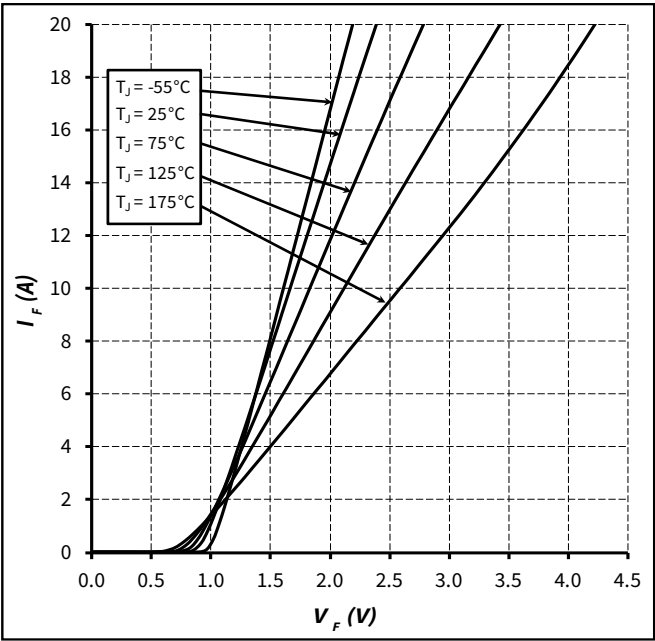


Figure 1. Forward Characteristics

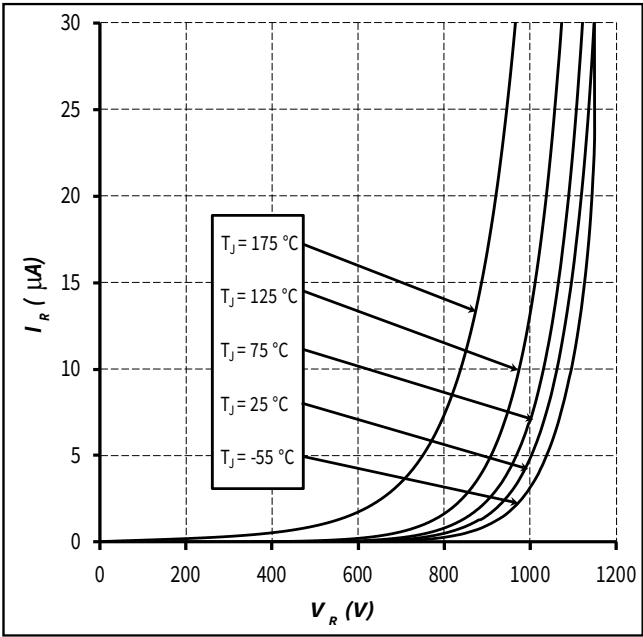


Figure 2. Reverse Characteristics



Typical Performance

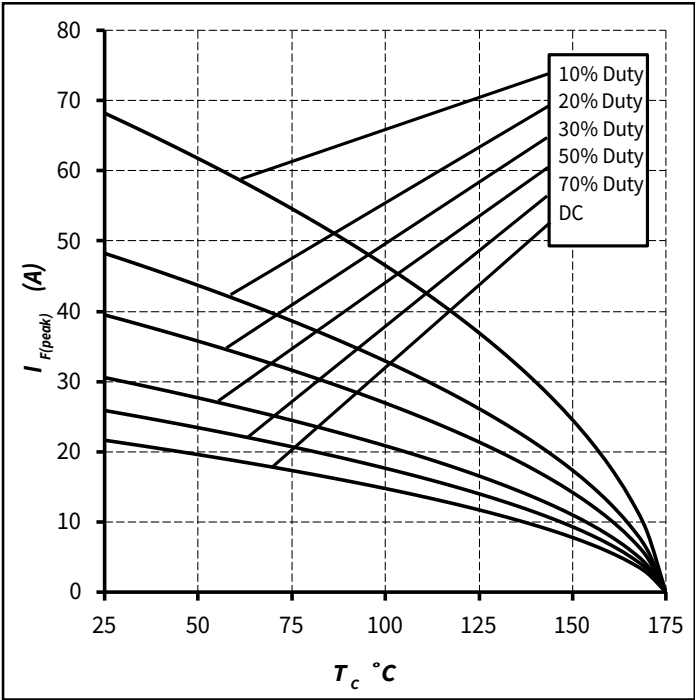


Figure 3. Current Derating

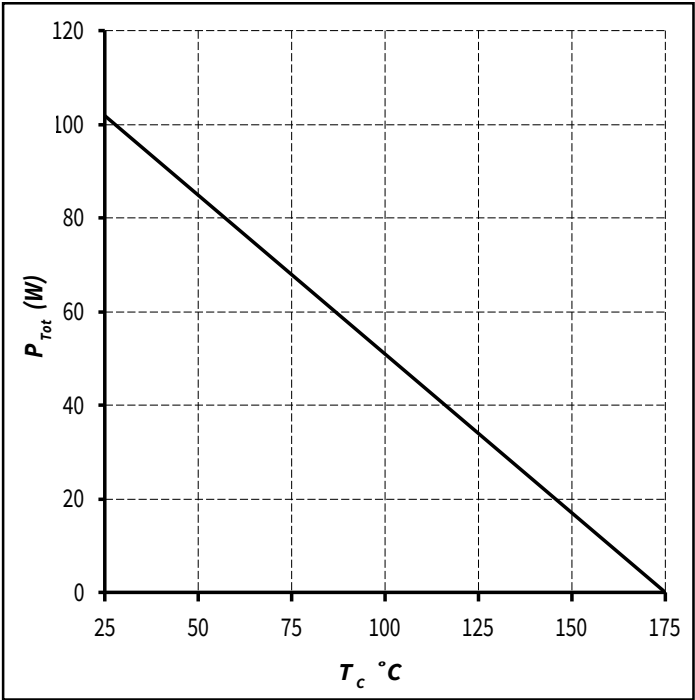


Figure 4. Power Derating

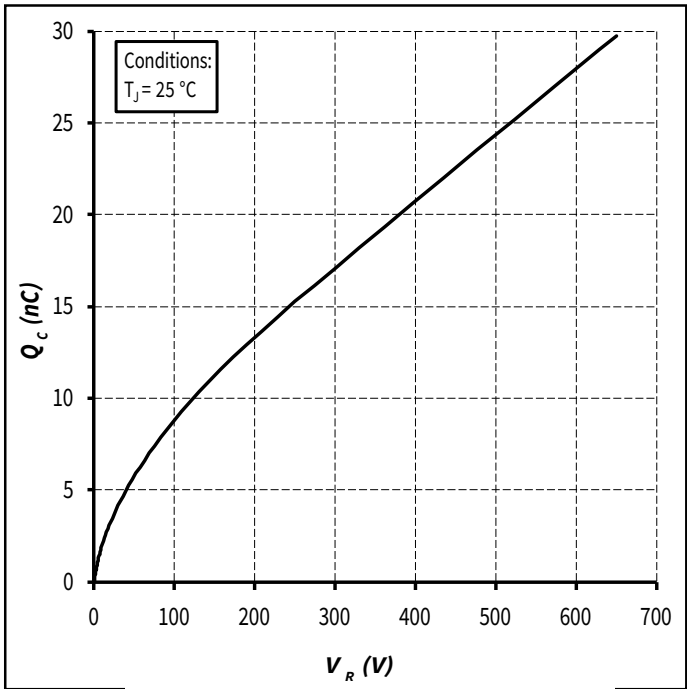


Figure 5. Total Capacitance Charge vs. Reverse Voltage

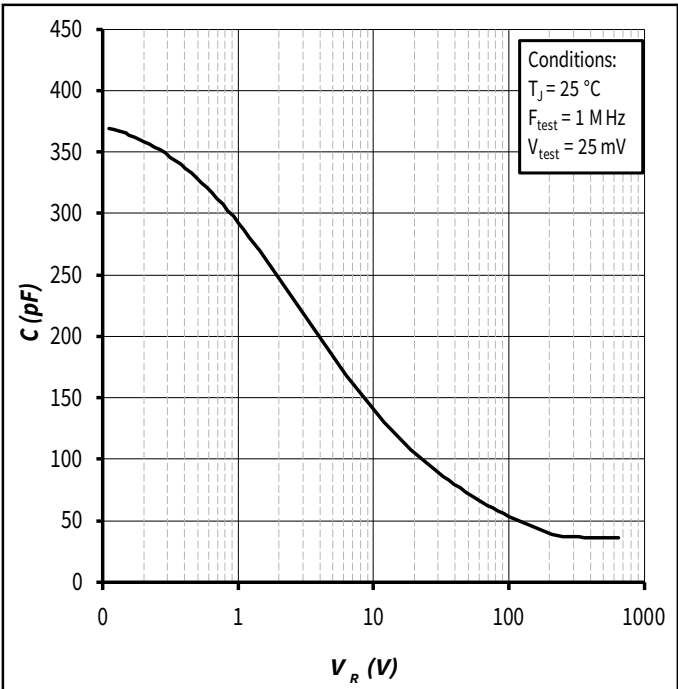


Figure 6. Capacitance vs. Reverse Voltage



Typical Performance

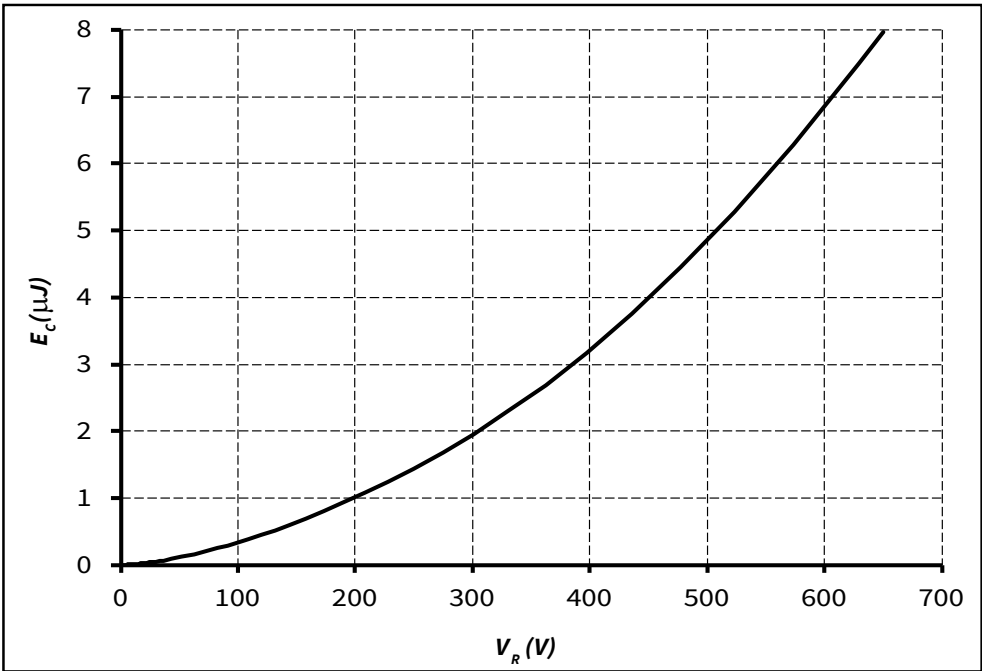


Figure 7. Typical Capacitance Stored Energy

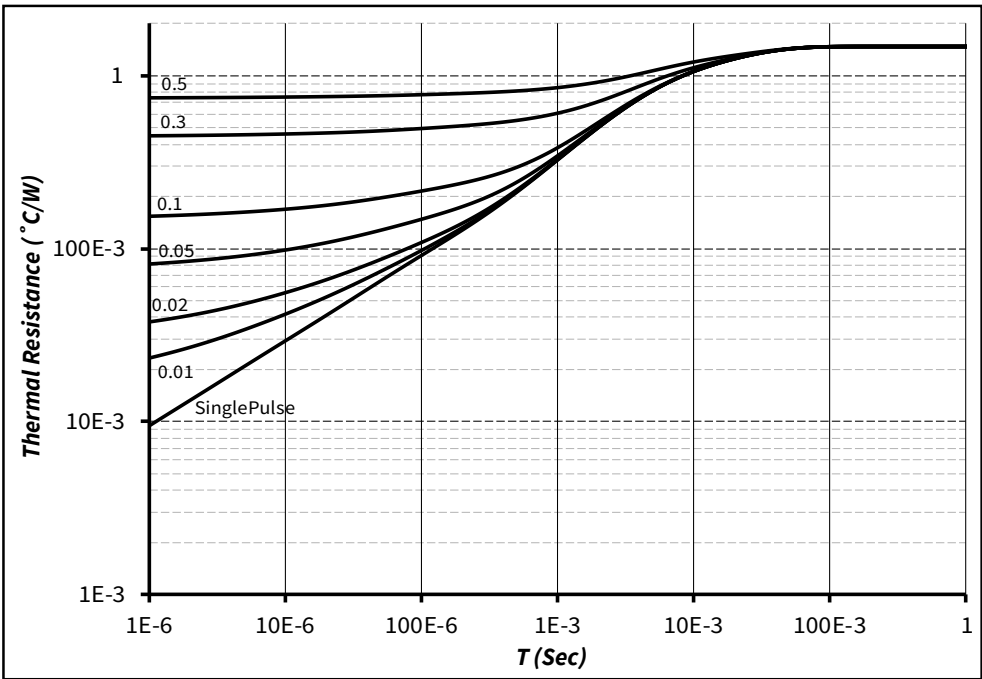
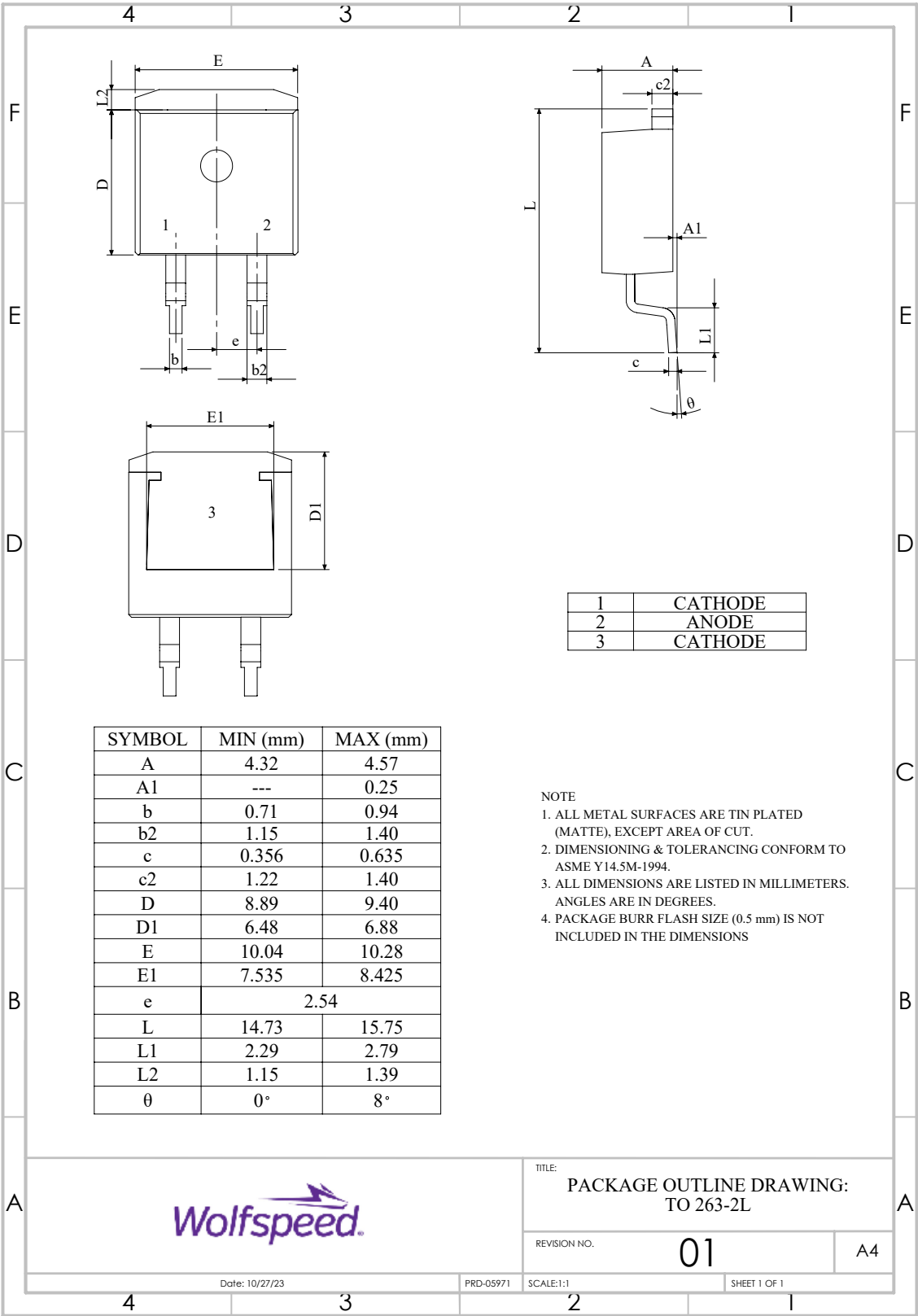


Figure 9. Transient Thermal Impedance

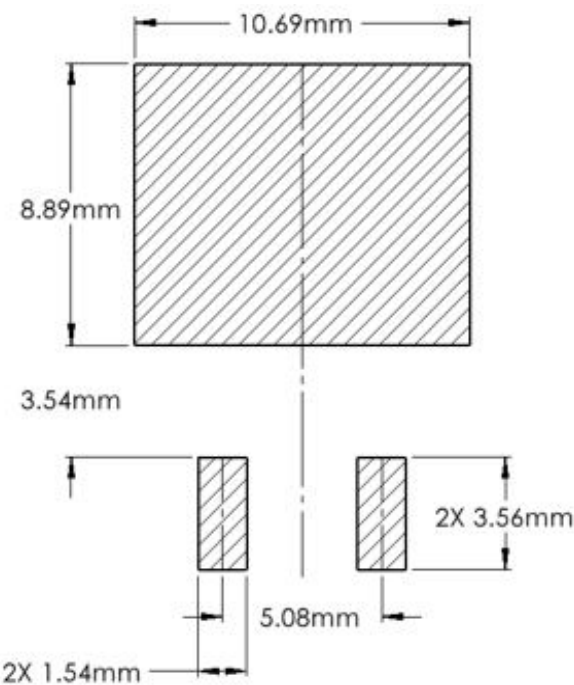
Package Dimensions

Package: TO-263-2





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	Initial Release
2	October-2023	Updated Wolfspeed branding, package drawing, and solder pad layout (Not Released)
3	November-2023	Corrected Package Drawing L and L1
4	February - 2025	Legal Disclaimer Updated



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