

E3D08065G

Silicon Carbide Schottky Diode E-Series Automotive



Features

- 650V 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

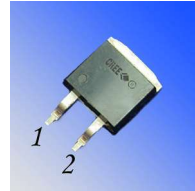
Benefits

- Higher System Level Efficiency
- Increase System Power Density
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Automotive Battery Chargers
- Boost diodes in PFC or DC/DC stages
- Free Wheeling Diodes in Inverter stages
- AC/DC Converters
- PV Inverters

Package



TO-263-2



Part Number	Package	Marking
E3D08065G	TO-263-2	E3D08065G

Maximum Ratings ($T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V		
V_R	DC Peak Reverse Voltage	650	V		
I_F	Continuous Forward Current	22 10 8	A	$T_C=25^\circ\text{C}$ $T_C=135^\circ\text{C}$ $T_C=150^\circ\text{C}$	Fig. 3
P_{tot}	Power Dissipation	102 44	W	$T_C=25^\circ\text{C}$ $T_C=110^\circ\text{C}$	Fig. 4
I_{FRM}	Repetitive Peak Forward Surge Current	31 18	A	$T_C=25^\circ\text{C}$, $t_p=10$ ms, Half Sine Pulse $T_C=110^\circ\text{C}$, $t_p=10$ ms, Half Sine Pulse	
dV/dt	Diode dV/dt ruggedness	200	V/ns	$V_R=0-650\text{V}$	
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$		

Electrical Characteristics

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

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

Thermal Characteristics

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

Typical Performance

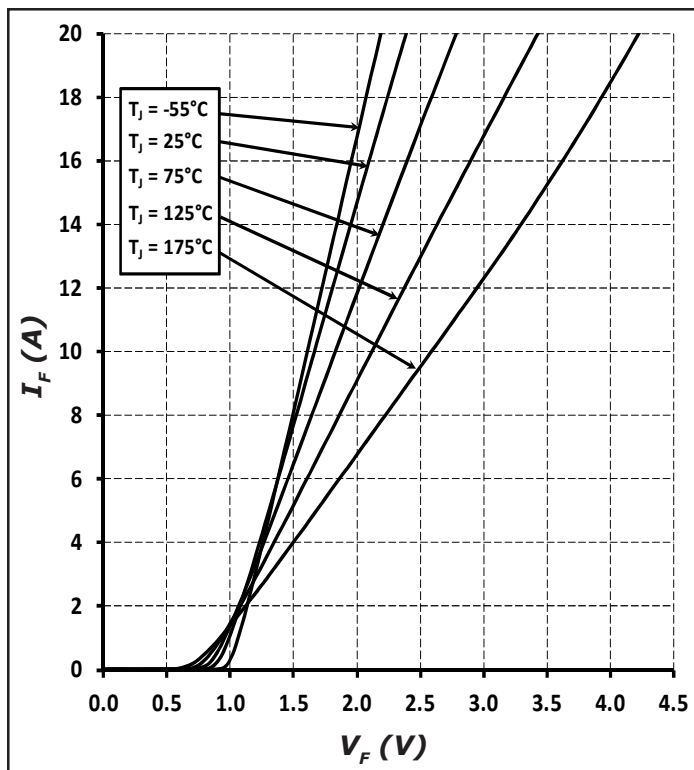


Figure 1. Forward Characteristics

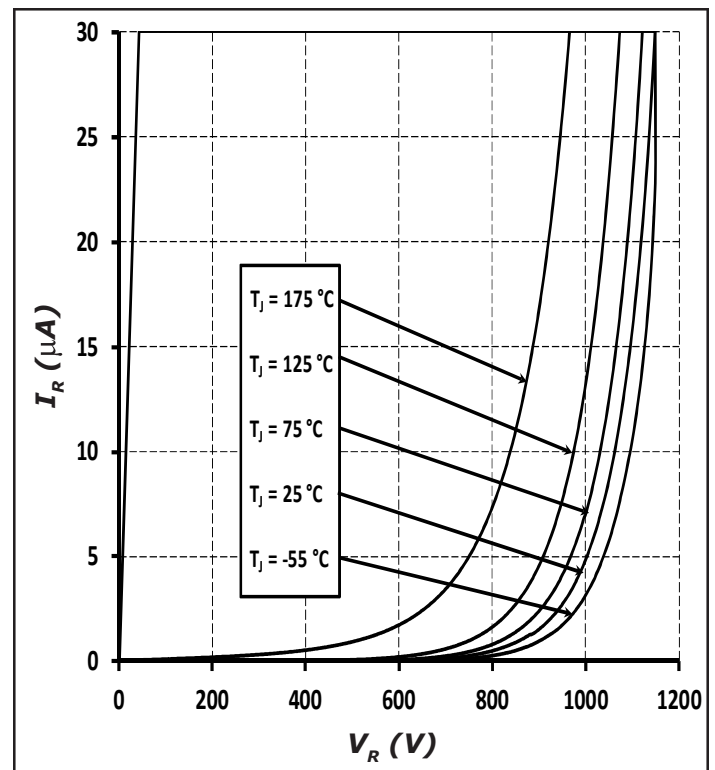


Figure 2. Reverse Characteristics

Typical Performance

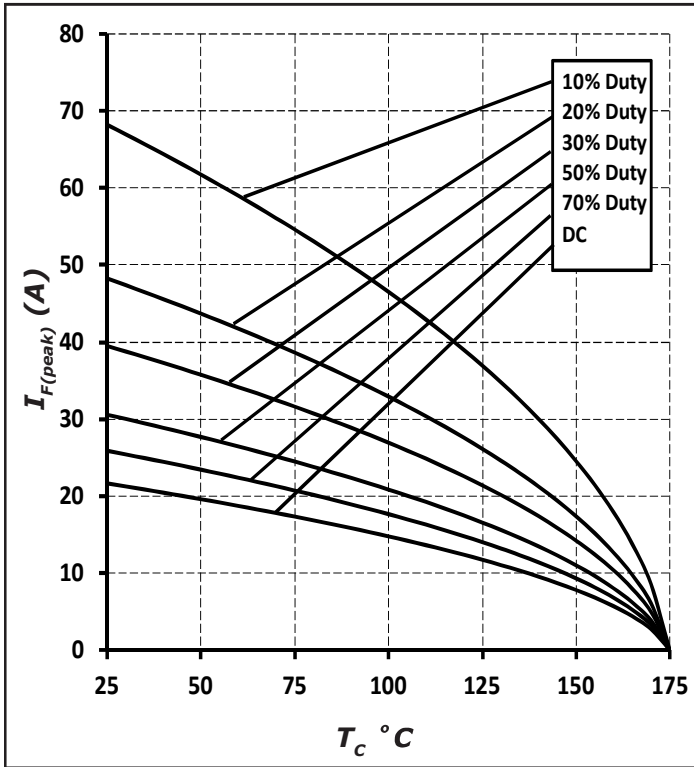


Figure 3. Current Derating

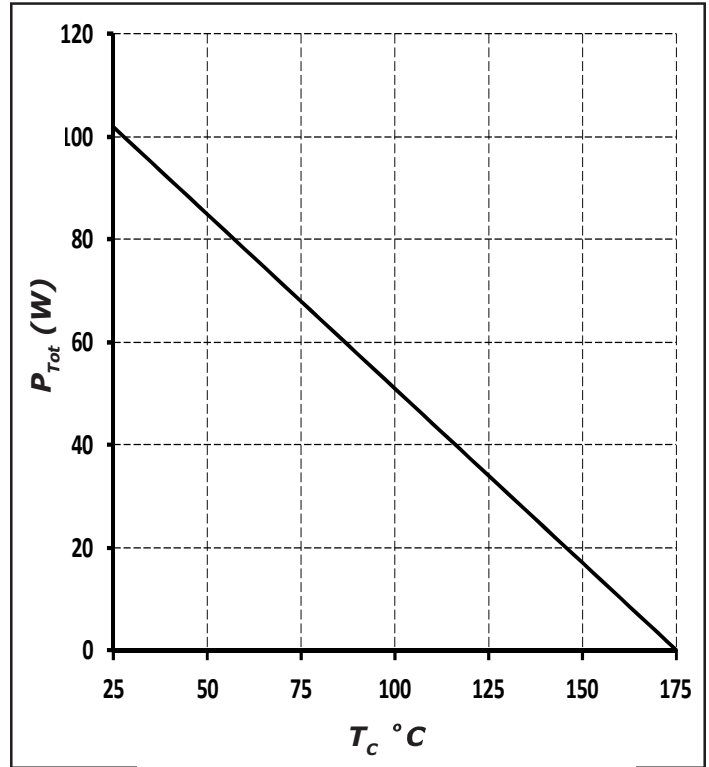


Figure 4. Power Derating

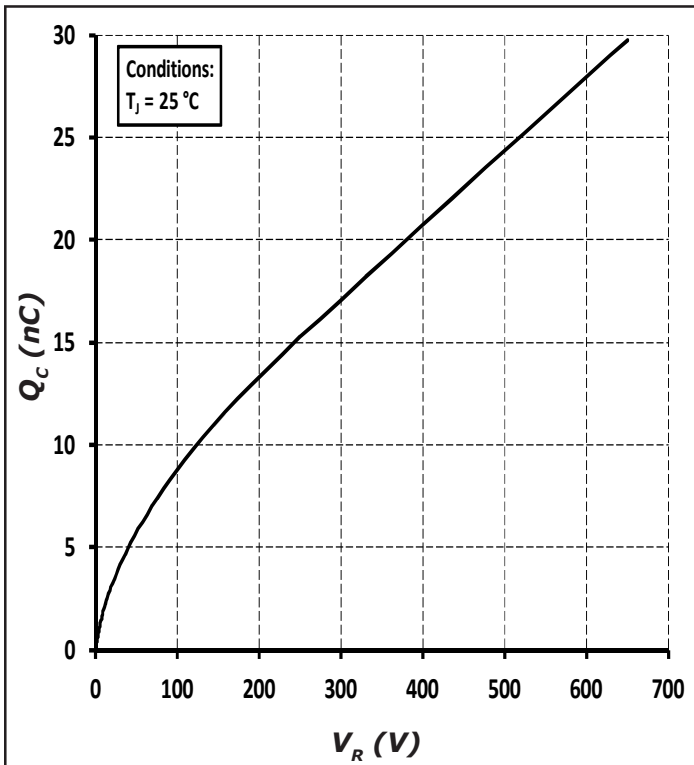


Figure 5. Total Capacitance Charge vs. Reverse Voltage

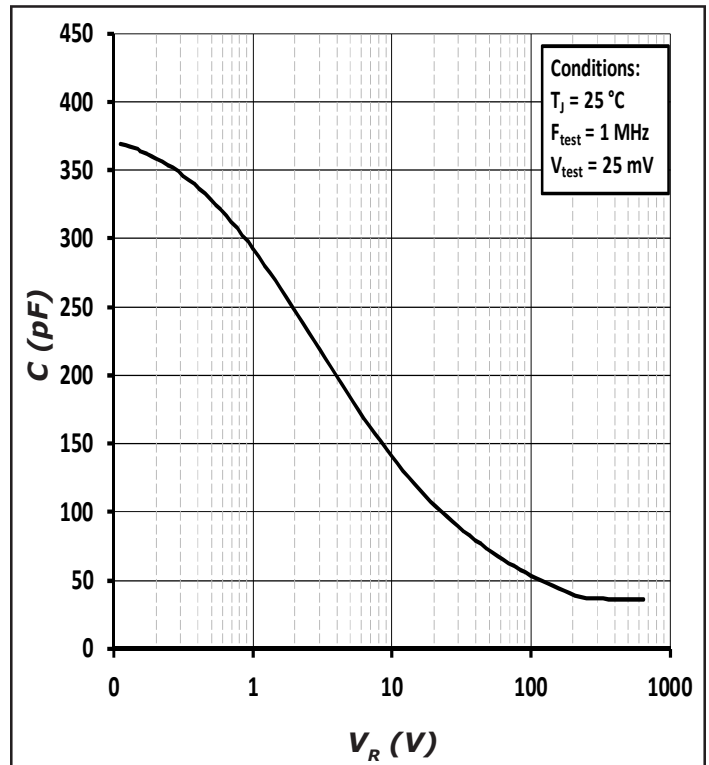


Figure 6. Capacitance vs. Reverse Voltage

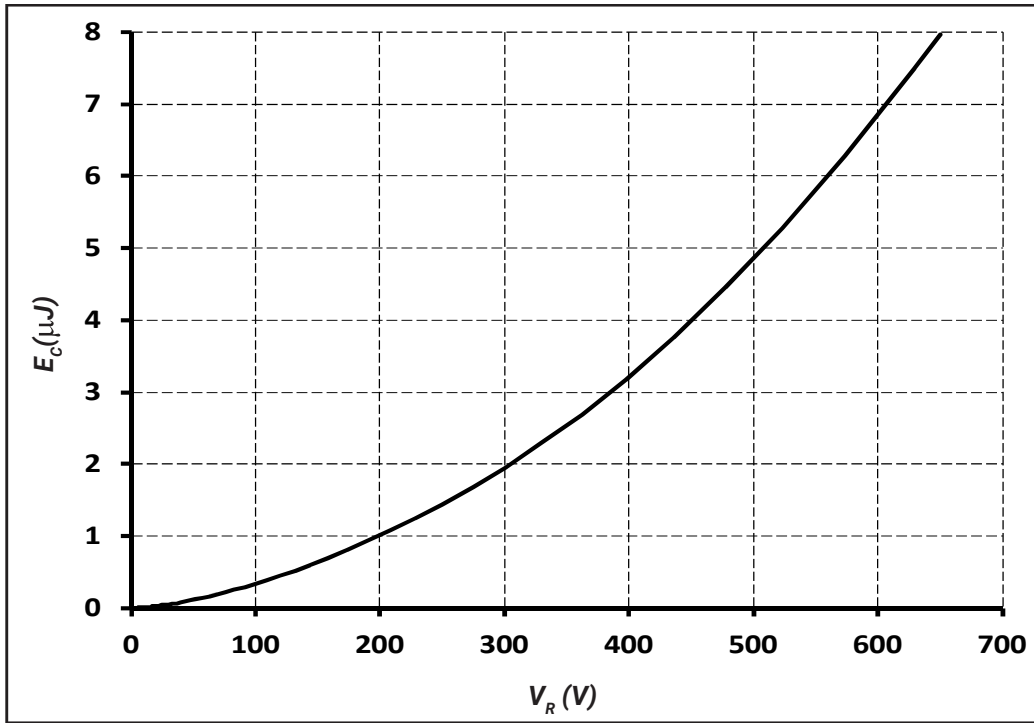


Figure 7. Typical Capacitance Stored Energy

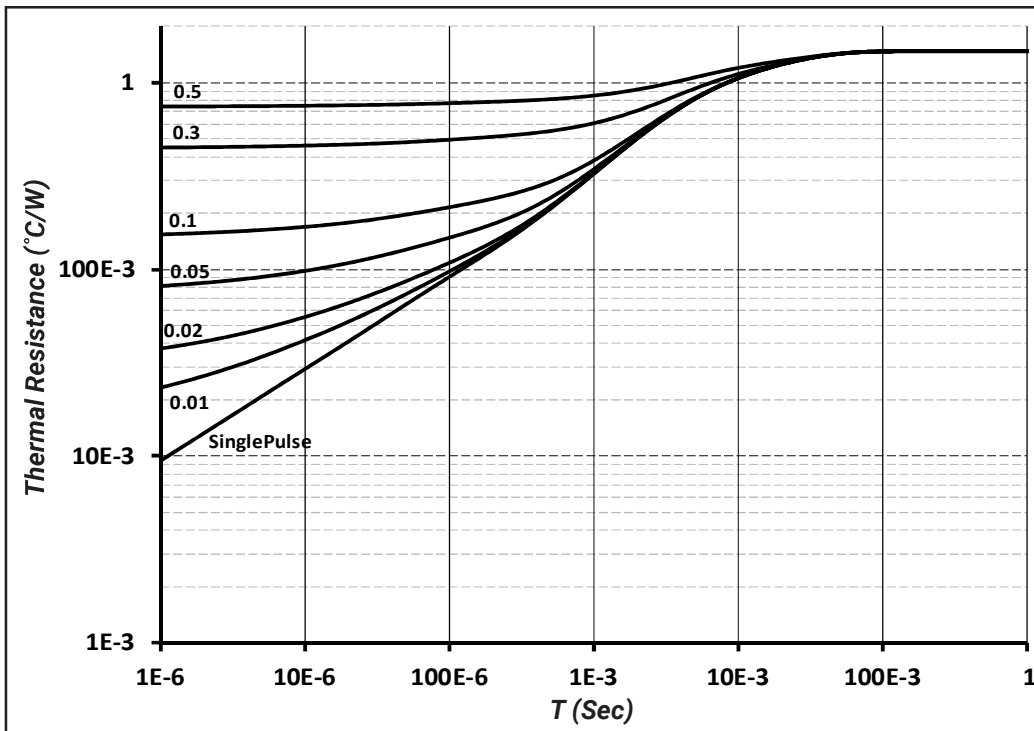
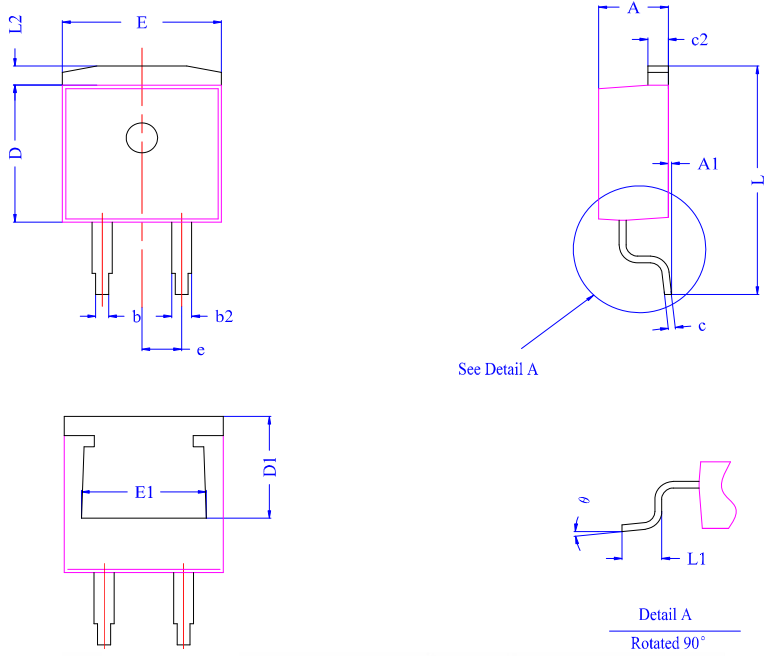


Figure 8. Transient Thermal Impedance

Package Dimensions

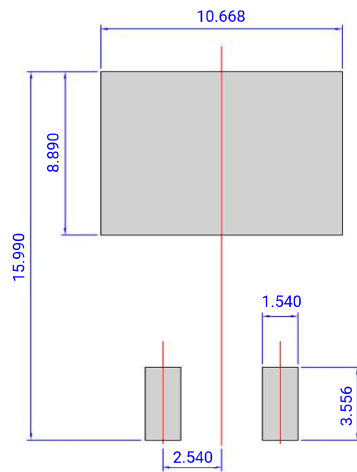
Package TO-263-2



Dim	Min	Typ	Max
A	4.32	4.445	4.57
A1	--	0.20	0.25
b	0.71	0.825	0.94
b2	1.15	1.275	1.4
c	0.356	0.4955	0.635
c2	1.22	1.31	1.4
D	8.89	9.145	9.4
D1	6.48	6.78	6.88
E	10.04	10.16	10.28
E1	7.535	7.980	8.425
e	2.54		
L	14.73	15.24	15.75
L1	2.29	2.54	2.79
L2	1.15	1.27	1.39
θ	0°	4°	8°



Recommended Solder Pad Layout



Part Number	Package	Marking
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Note: Recommended soldering profiles can be found in the applications note here:
http://www.wolfspeed.com/power_app_notes/soldering

