CREE

E3D08065G

Silicon Carbide Schottky Diode
E-Series Automotive

PPAP CAPABLE • AUTOMOTIVE QUALIFIED

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

Halogen-Free

RoHS
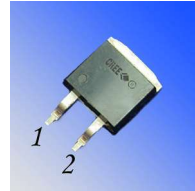
Part Number	Package	Marking
E3D08065G	TO-263-2	E3D08065G

Maximum Ratings (T_C = 25 °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°C T_C=135°C T_C=150°C	Fig. 3
P_{tot}	Power Dissipation	102 44	W	T_C=25°C T_C=110°C	Fig. 4
I_{FRM}	Repetitive Peak Forward Surge Current	31 18	A	T_C=25°C, t_P=10 ms, Half Sine Pulse T_C=110°C, t_P=10 ms, Half Sine Pulse	
dV/dt	Diode dV/dt ruggedness	200	V/ns	V_R=0-650V	
T_J , T_{stg}	Operating Junction and Storage Temperature	-55 to +175	°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 A, T_J=25°C I_F = 8 A, T_J=175°C	Fig. 1
I_R	Reverse Current	10 12	51 204	µA	V_R = 650 V, T_J=25°C V_R = 650 V, T_J=175°C	Fig. 2
Q_C	Total Capacitive Charge	21		nC	V_R = 400 V, I_F = 8A, T_J = 25°C	Fig. 5
C	Total Capacitance	369 39 36		pF	V_R = 0 V, T_J = 25°C, f = 1 MHz V_R = 200 V, T_J = 25°C, f = 1 MHz V_R = 400 V, T_J = 25°C, f = 1 MHz	Fig. 6
E_C	Capacitance Stored Energy	3.2		µJ	V_R = 400 V	

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

Thermal Characteristics

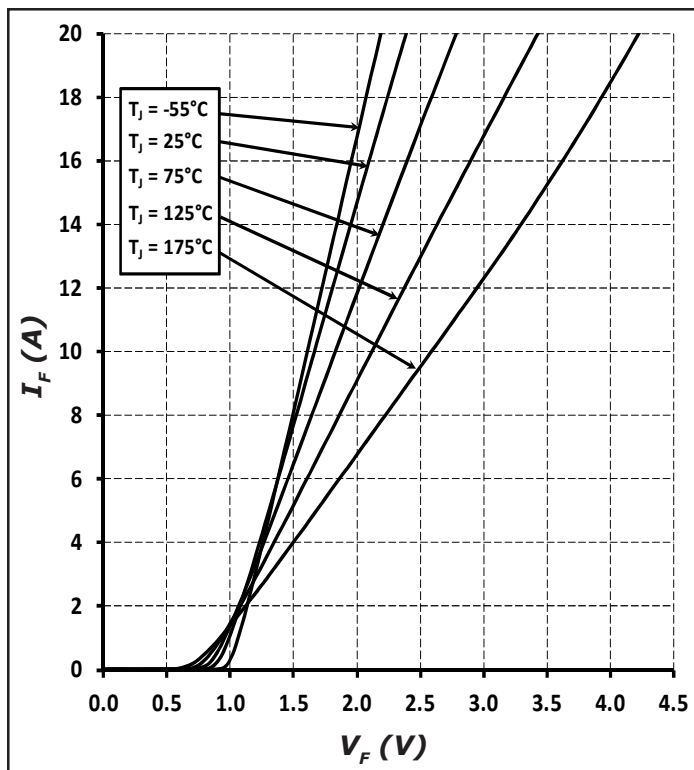| Symbol	Parameter	Typ.	Unit
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1.47	°C/W

Typical Performance
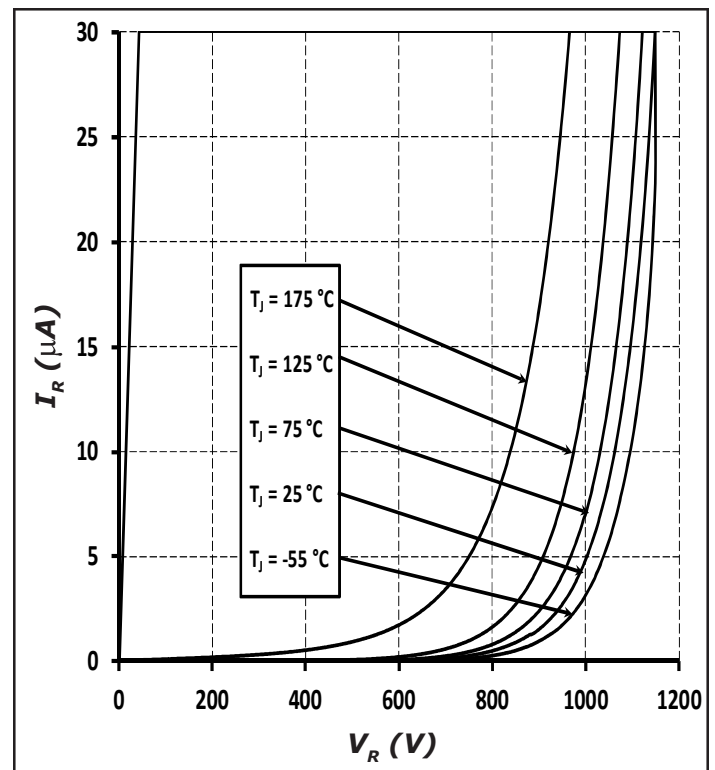

Figure 1. Forward Characteristics

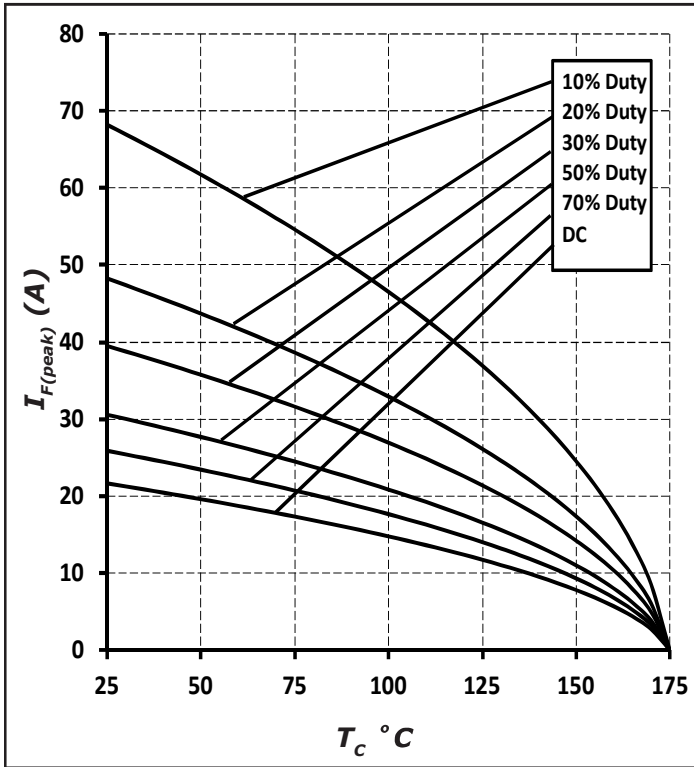Figure 2. Reverse Characteristics

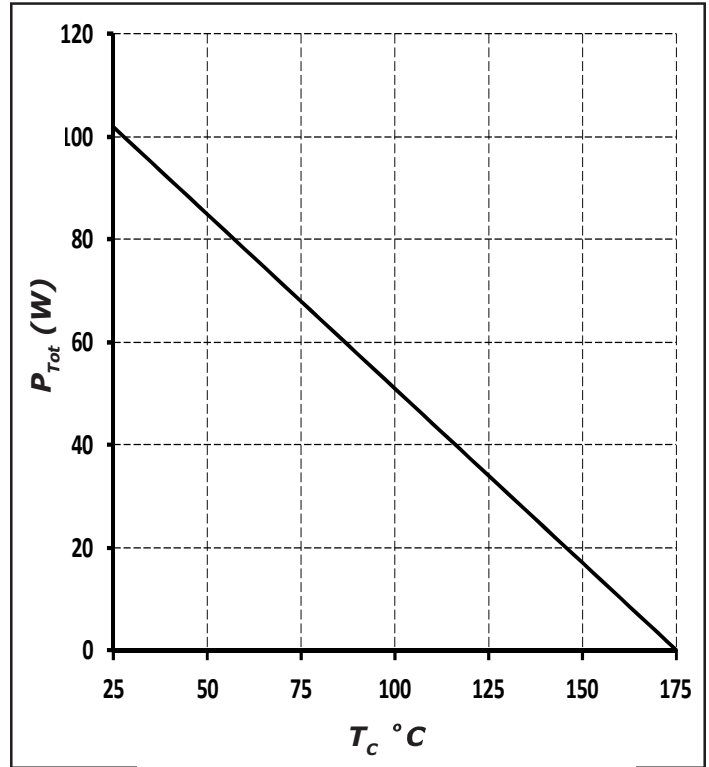**Typical Performance**

Figure 3. Current Derating
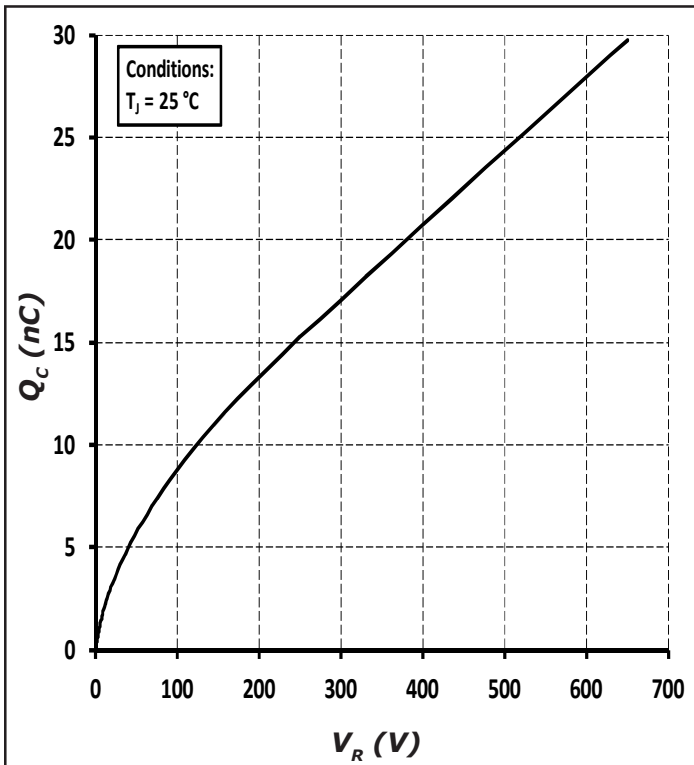

Figure 4. Power Derating

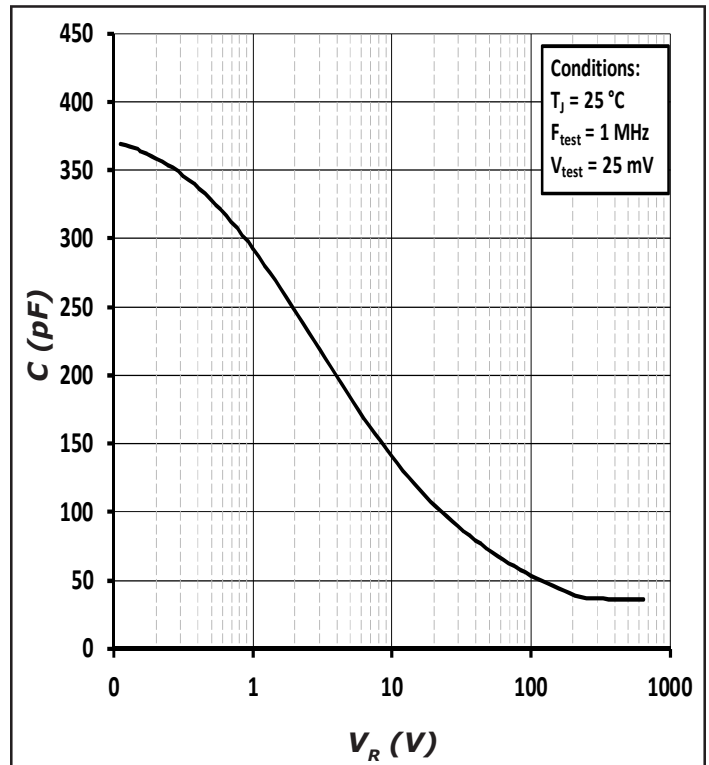Figure 5. Total Capacitance Charge vs. Reverse Voltage

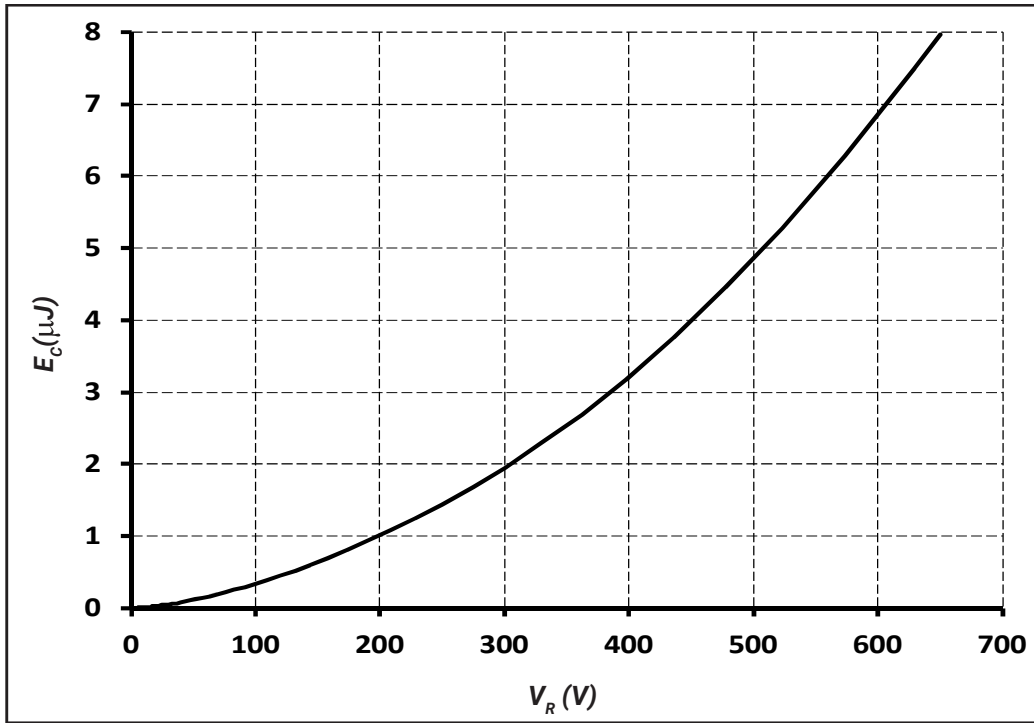Figure 6. Capacitance vs. Reverse Voltage
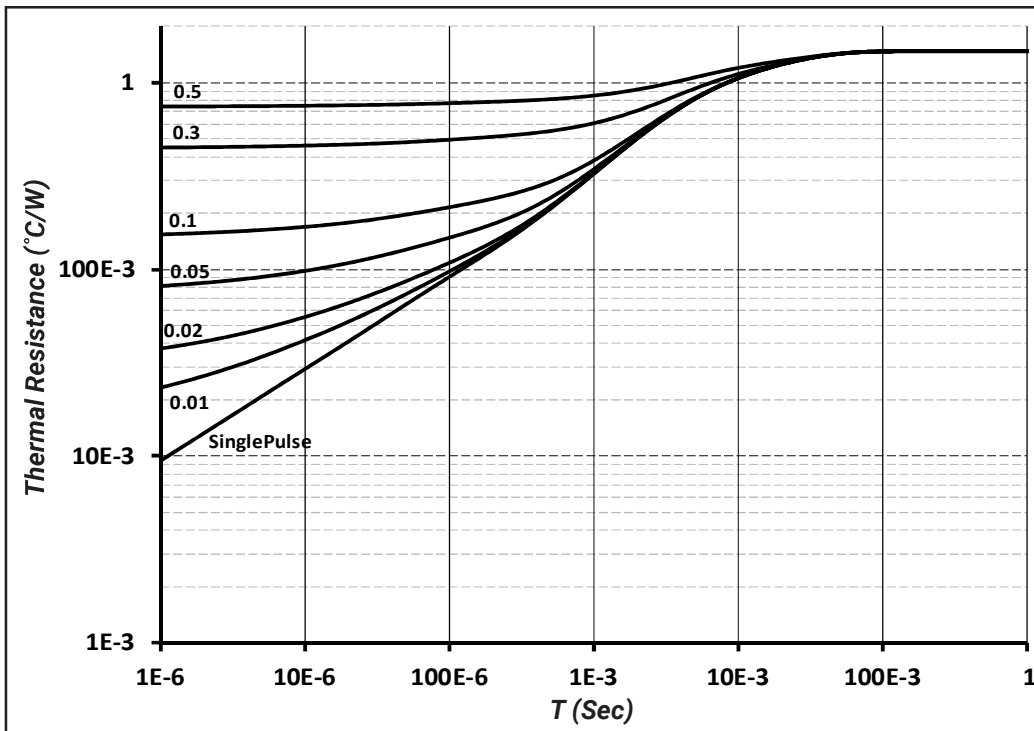
Figure 7. Typical Capacitance Stored Energy

Figure 8. Transient Thermal Impedance

Package Dimensions

Package TO-263-2
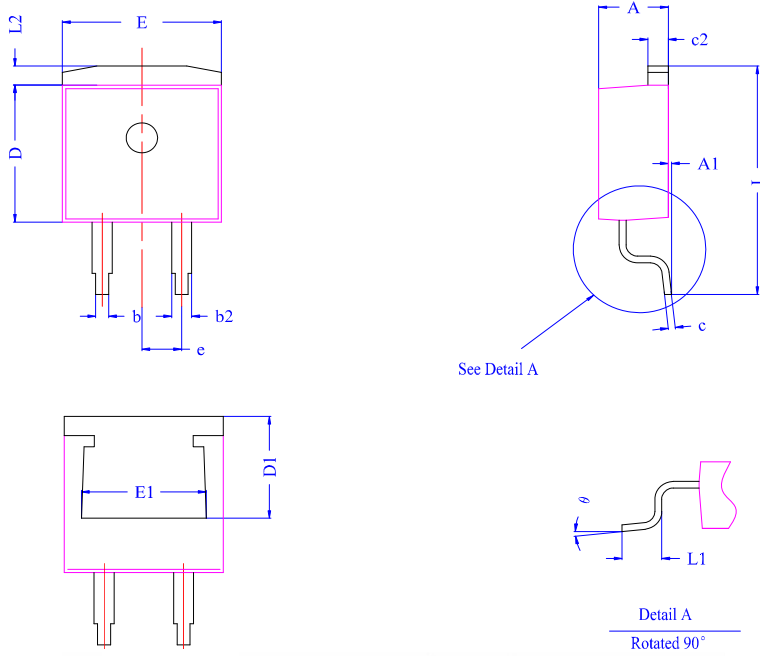
Dim	Min	Typ	Max
A	4.32	4.445	4.57
A1	--	0.20	0.25
b	0.71	0.825	0.94
b2	1.15	1.275	1.4
c	0.356	0.4955	0.635
c2	1.22	1.31	1.4
D	8.89	9.145	9.4
D1	6.48	6.78	6.88
E	10.04	10.16	10.28
E1	7.535	7.980	8.425
e		2.54	
L	14.73	15.24	15.75
L1	2.29	2.54	2.79
L2	1.15	1.27	1.39
θ	0°	4°	8°

See Detail A

Detail A
Rotated 90°

PIN 1   PIN 2   CASE

Recommended Solder Pad Layout
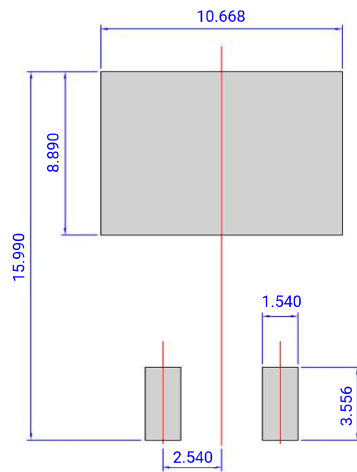
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Note: Recommended soldering profiles can be found in the applications note here:
http://www.wolfspeed.com/power_app_notes/soldering

Notes

- **RoHS Compliance**
  The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Wolfspeed representative or from the Product Ecology section of our website at http://www.wolfspeed.com/power/tools-and-support/product-ecology.

- **REACh Compliance**
  REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future,please contact a Cree representative to insure you get the most up-to-date REACh SVHC Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

- This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control systems.

Related Links

- Wolfspeed E-Series Family: http//wolfspeed.com/E-Series
- Wolfspeed SiC Schottky diode portfolio: http://www.wolfspeed.com/Power/Products#SiCSchottkyDiodes
- Schottky diode Spice models: http://www.wolfspeed.com/power/tools-and-support/DIODE-model-request2
- SiC MOSFET and diode reference designs: http://go.pardot.com/l/101562/2015-07-31/349i

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