C6D06065G

6th Generation 650 V, 6 A Silicon Carbide Schottky Diode

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.

Halogen-Free

RoHS

Package Type: TO-263-2
Marking: C6D06065

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)

Applications

- Industrial Power Supplies
- Switch Mode Power Supplies
- Server / Telecom Power Supplies
- Power Factor Correction
- Solar Inverter
- Uninterruptible Power Supply

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	23	A	T_J = 25 °C	Fig. 3
		12		T_J = 125 °C	
		6		T_J = 155 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	25		T_c = 25 °C, t_p = 10 ms, Half Sine Wave	
		14		T_c = 110 °C, t_p = 10 ms, Half Sine Wave	
Non-Repetitive Peak Forward Surge Current	I_{FSM}	45		T_c = 25 °C, t_p = 10 ms, Half Sine Wave	Fig. 8
		33		T_c = 110 °C, t_p = 10 ms, Half Sine Wave	
	$I_{F, Max}$	620		T_c = 25 °C, t_p = 10 µs, Pulse	
		570		T_c = 110 °C, t_p = 10 µs, Pulse	
Power Dissipation	P_{tot}	73	W	T_J = 25 °C	Fig. 4
		31		T_J = 110 °C	

Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Units	Test Conditions	Note
Drain-Source Voltage	V_F	1.27	1.40	V	I_F = 6 A, T_J = 25 °C	Fig. 1
		1.37	1.50		I_F = 6 A, T_J = 175 °C	
Reverse Current	I_R	2	20	µA	V_R = 650 V, T_J = 25 °C	Fig. 2
		25	200		V_R = 650 V, T_J = 175 °C	
Total Capacitive Charge	Q_C	22		nC	V_R = 400 V, T_J = 25 °C	Fig. 5
Total Capacitance	C	393		pF	V_R = 0 V, T_J = 25 °C, f = 1 MHz	Fig. 6
		44			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	3.5		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.	Units	Note
Thermal Resistance, Junction to Case	$R_{\theta, JC}$	2.05	°C / W	
Operating Junction & Storage Temperature	T_J, T_{stg}	-55 to +175	°C	Fig. 9

Typical Performance

Figure 1. Forward Characteristics

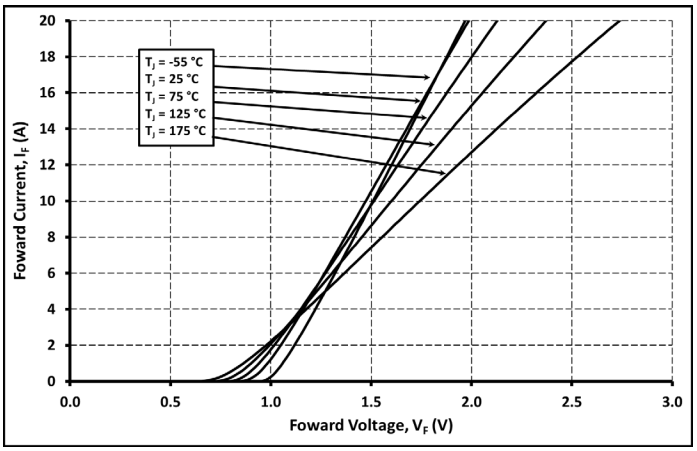


Figure 2. Reverse Characteristics

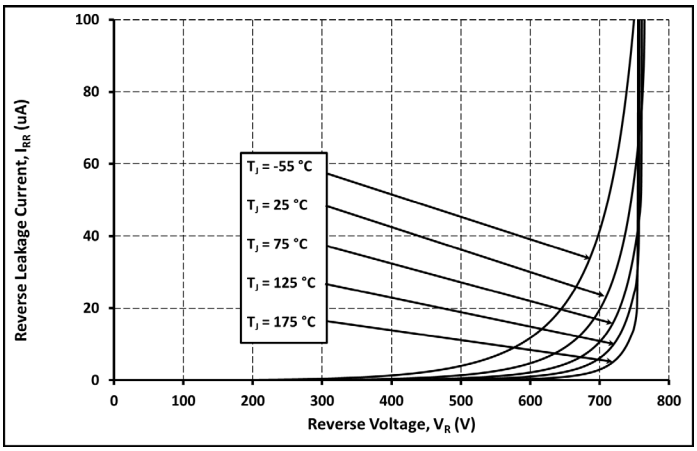


Figure 3. Current Derating

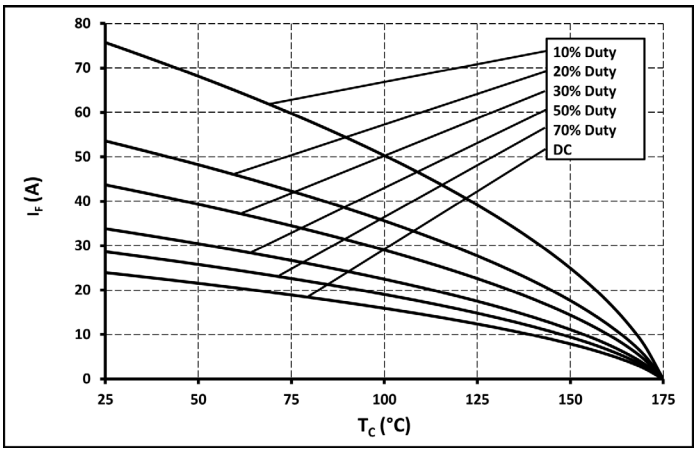


Figure 4. Power Derating

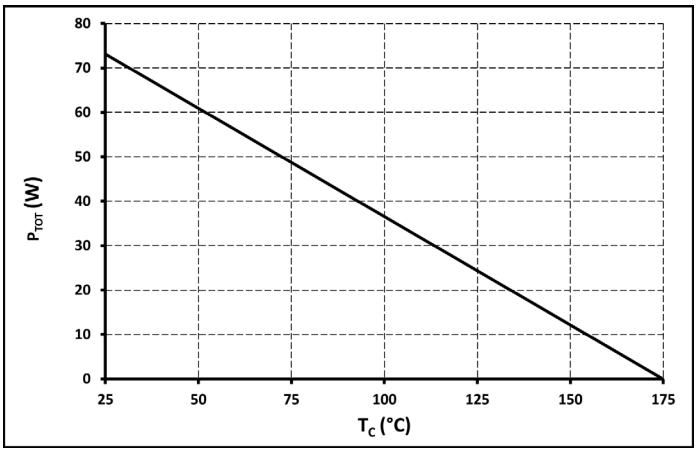


Figure 5. Total Capacitance Charge vs. Reverse Voltage

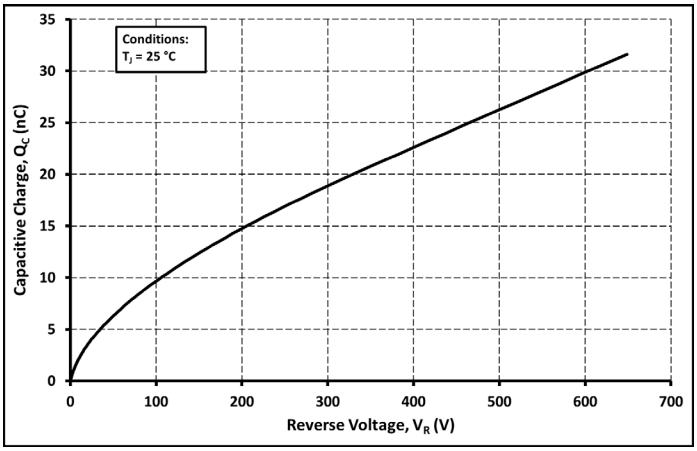
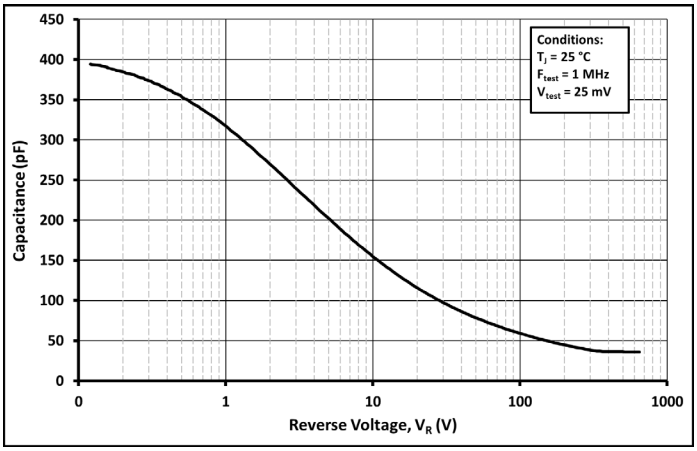


Figure 6. Capacitance vs. Reverse Voltage



Typical Performance

Figure 7. Capacitance Stored Energy

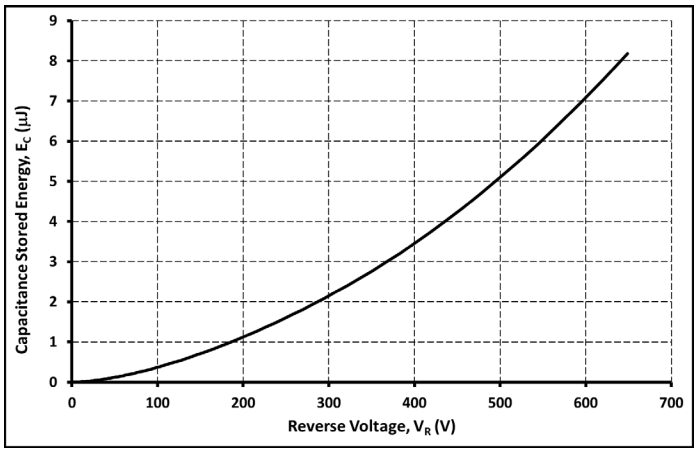


Figure 8. Non-Repetitive Peak Forward Surge Current (Sine Wave)

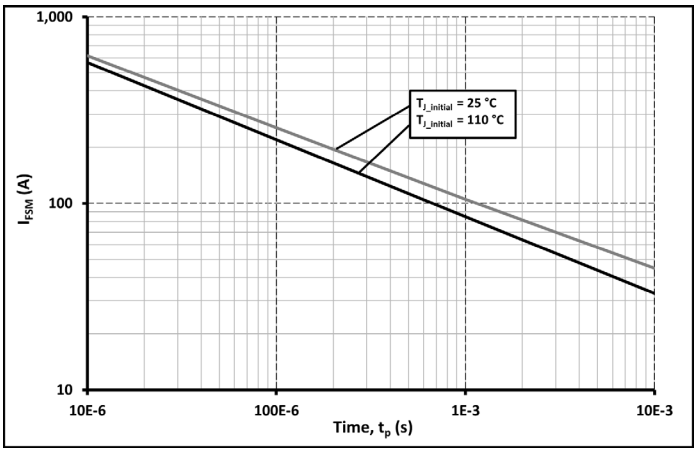
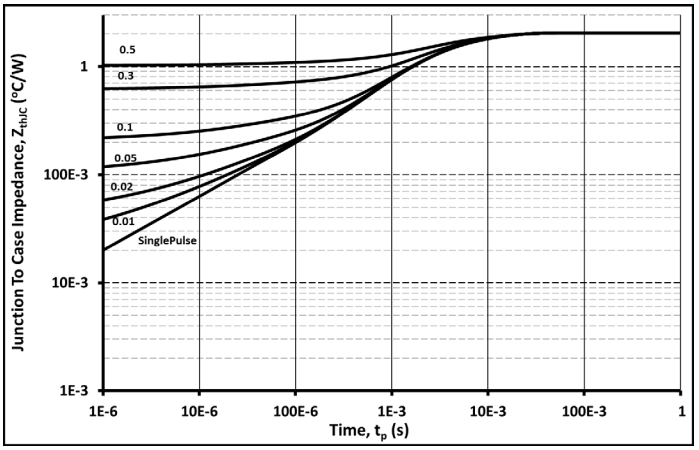


Figure 9. Transient Thermal Impedance



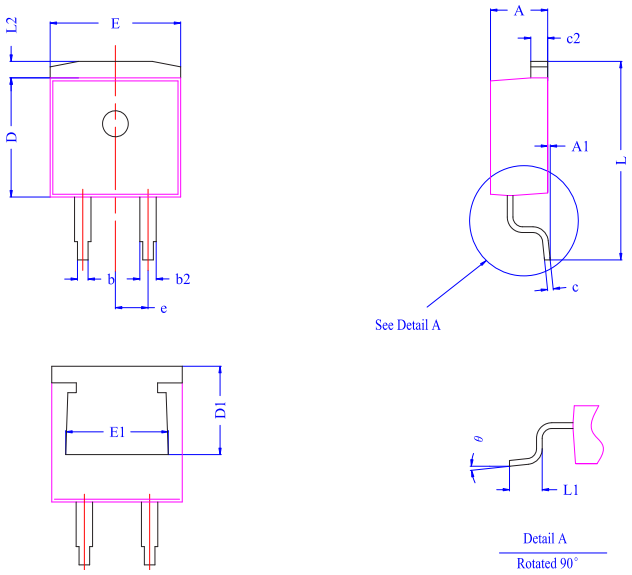
Electrostatic Discharge (ESD) Classifications

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

Package Dimensions

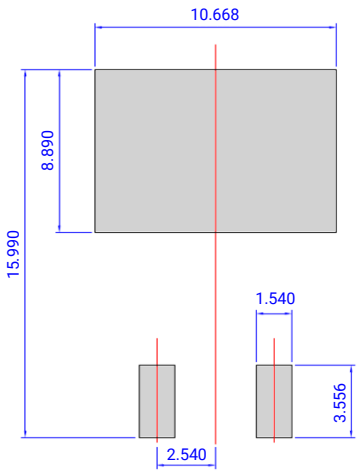
Package: TO-263-2

All dimensions in mm.



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



Learn more about recommended soldering profiles in this application note.

Notes

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