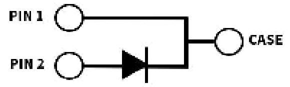
C3D02060A

3rd Generation 600 V, 2 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.



Package Types: TO-220-2
Marking: C3D02060A

Features

- Low Forward Voltage (V_F) Drop with Positive Temperature Coefficient
- Zero Reverse Recovery Current / Forward Recovery Voltage
- Temperature-Independent Switching Behavior

Applications

- Industrial Switched Mode Power Supplies
- Uninterruptible & AUX Power Supplies
- Boost for PFC & DC-DC Stages
- Solar Inverters

Maximum Ratings ($T_C = 25°C$ Unless Otherwise Specified)

Parameter	Symbol	Value	Unit	Test Conditions	Notes
Repetitive Peak Reverse Voltage	V_{RRM}	600	V		
DC Blocking Voltage	V_{DC}	600			
Continuous Forward Current	I_F	8	A	$T_J = 25$ °C	Fig. 3
		4		$T_J = 135$ °C	
		2		$T_J = 161$ °C	
Repetitive Peak Forward Surge Current	I_{FRM}	11		$T_C = 25$ °C, $t_p = 10$ ms, Half Sine Wave	
		7.5		$T_C = 110$ °C, $t_p = 10$ ms, Half Sine Wave	
Non-Repetitive Forward Surge Current	I_{FSM}	16.5		$T_C = 25$ °C, $t_p = 10$ ms, Half Sine Wave	Fig. 8
		15		$T_C = 110$ °C,$t_p = 10$ ms, Half Sine Wave	
Non-Repetitive Peak Forward Surge Current	$I_{F,Max}$	120		$T_C = 25$ °C, $t_p = 10$ µs, Pulse	
		110		$T_C = 110$°C, $t_p = 10$ µs, Pulse	
Power Dissipation	P_{tot}	39.5	W	$T_J = 25$ °C	Fig. 4
		17		$T_J = 110$ °C	
i^2t value	i^2dt	1.35	A^2s	$T_C = 25$ °C, $t_p = 10$ ms	
		1.12		$T_C = 110$ °C, $t_p = 10$ ms	

Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Notes
Forward Voltage	V_F	1.5	1.7	V	$I_F = 2$ A, $T_j = 25$ °C	Fig. 1
		1.8	2.4		$I_F = 2$ A, $T_j = 175$ °C	
Reverse Current	I_R	3	15	µA	$V_R = 600$ V, $T_j = 25$ °C	Fig. 2
		6	55		$V_R = 600$ V, $T_j = 175$ °C	
Total Capacitive Charge	Q_C	5.8		nC	$V_R = 400$ V, $T_j = 25$ °C	Fig. 5
Total Capacitance	C	175		pF	$V_R = 0$ V, $T_j = 25$ °C, f = 1 MHzj = 25 °C, f = 1 MHzCR	

Typical Performance

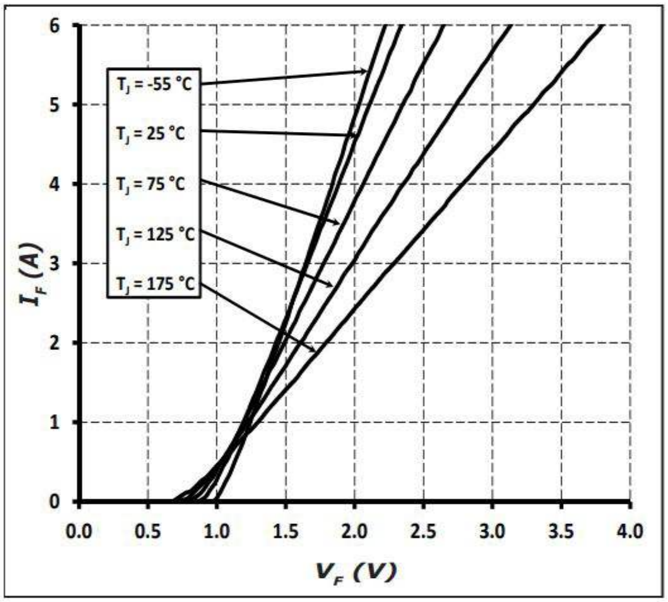


Figure 1
Forward Characteristics

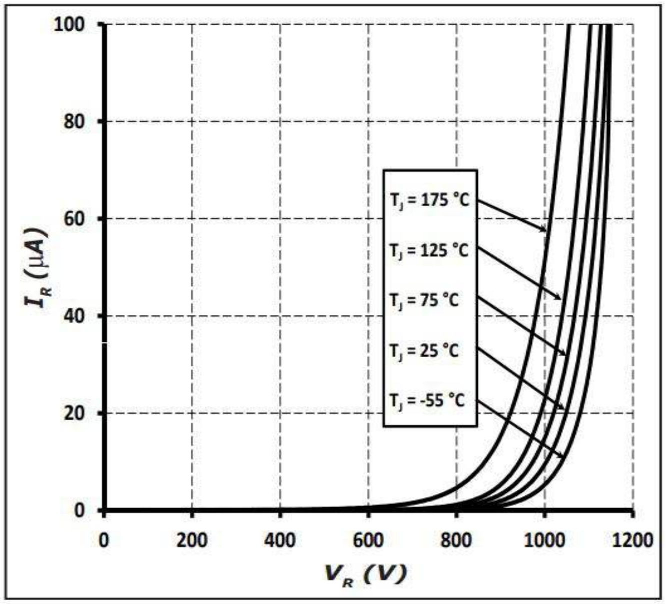


Figure 2
Reverse Characteristics

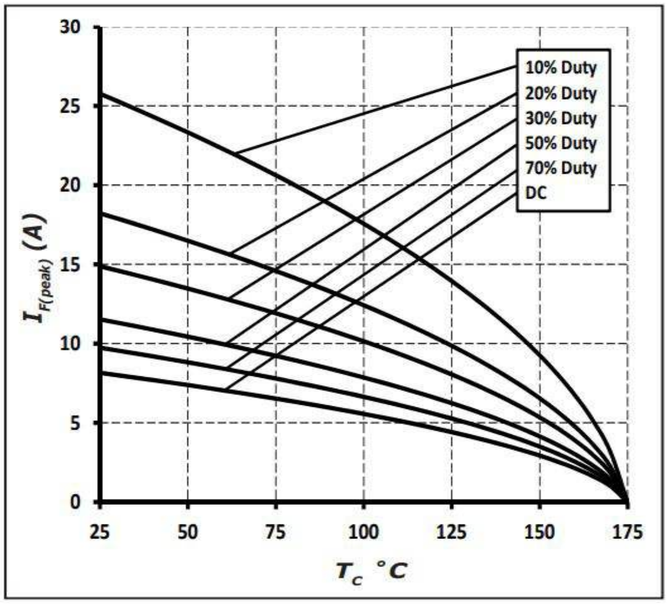


Figure 3
Current Derating

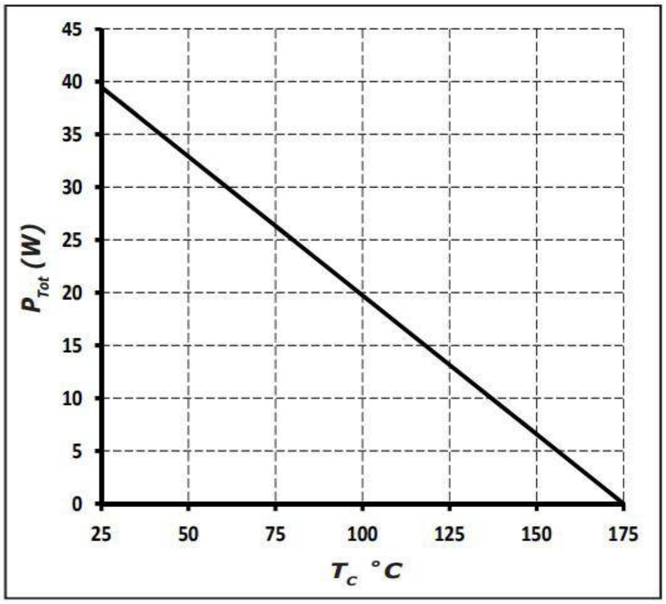


Figure 4
Power Derating

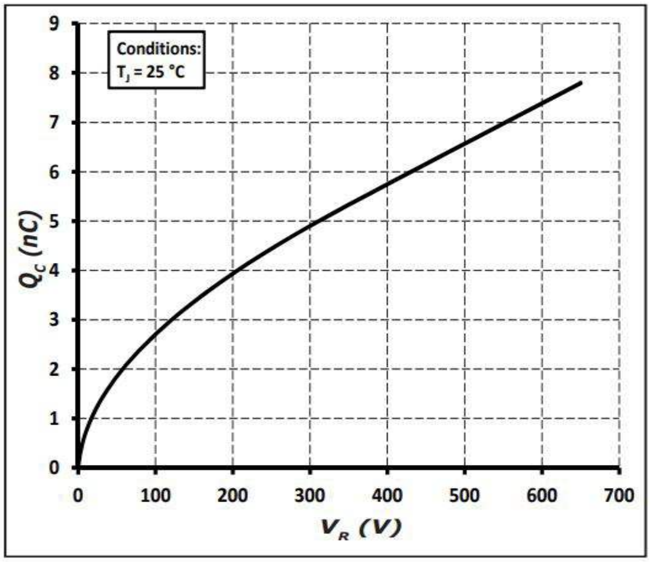


Figure 5

Total Capacitance vs. Reverse Voltage

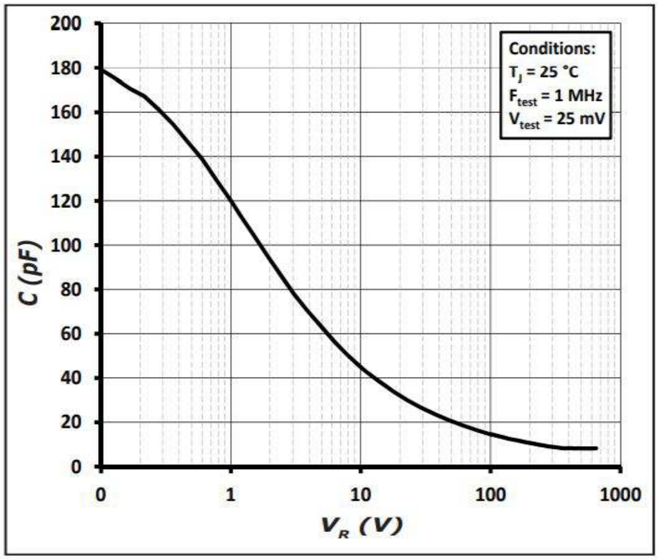


Figure 6

Capacitace vs. Reverse Voltage

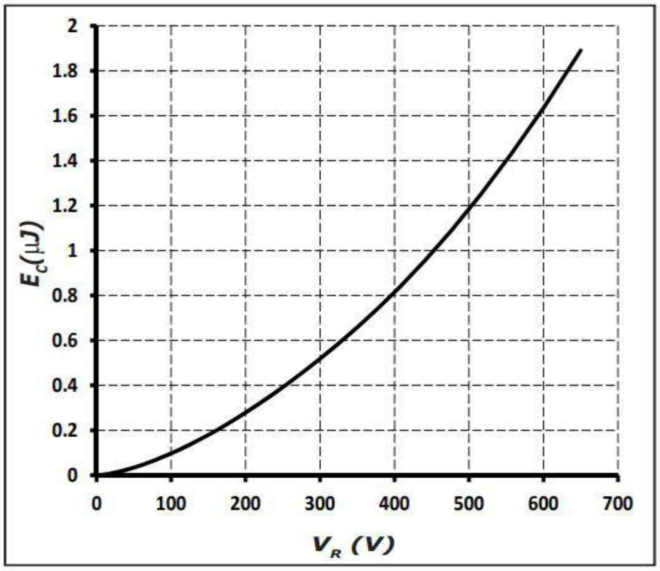


Figure 7

Capacitance Stored Energy

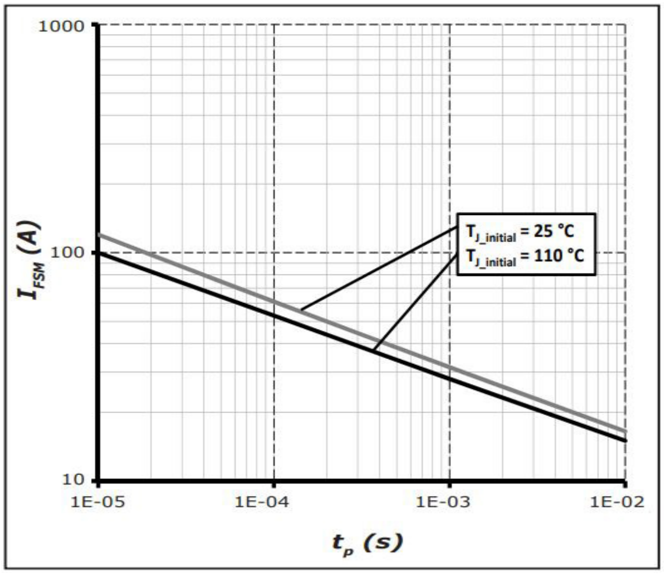


Figure 8

Non-Repetitive Peak Forward Surge Current versus Pulse Duration (sinusoidal waveform)

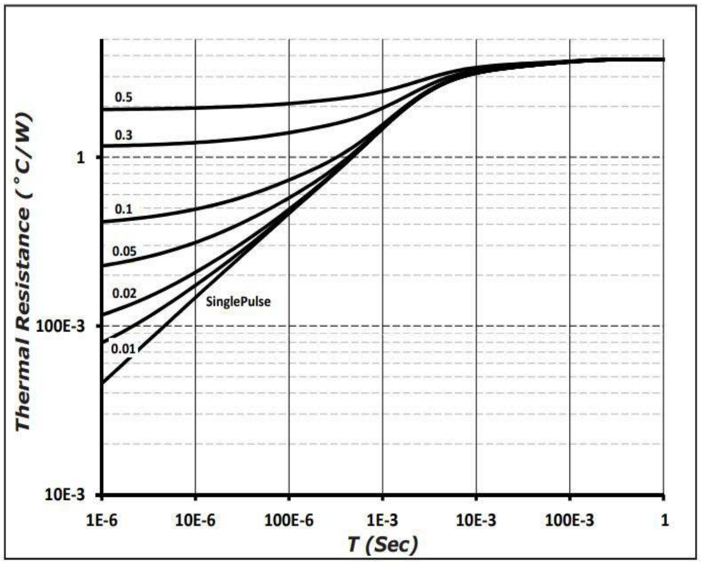
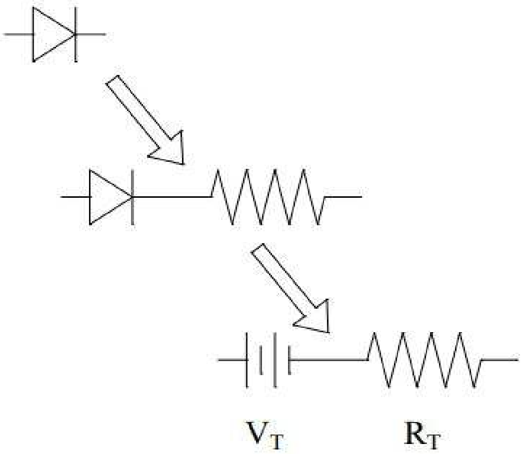


Figure 9

Transient Thermal Impedance

Diode Model



$$Vf_T = V_T + If*R_T$$

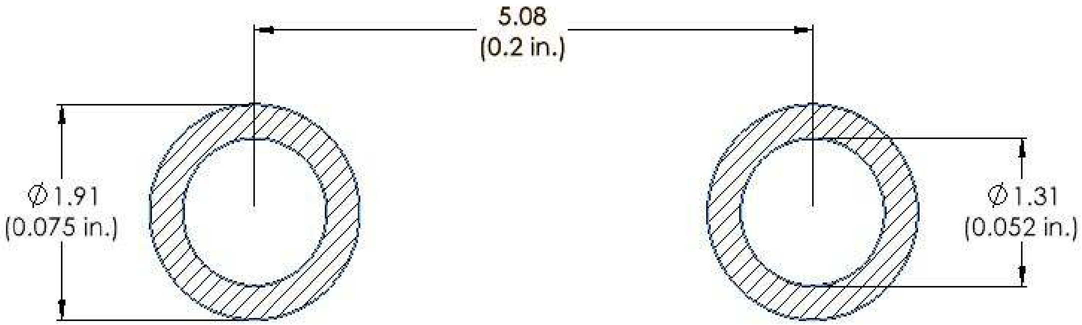
$$V_{T=} 0.94 + (T_j * -1.2*10^{-3})$$

$$R_{T=} 0.015 + (T_j * 6.4*10^{-3})$$

Note: T_j = Diode Junction Temperature In Degrees Celsius

Recommended Solder Pad Layout

Primary dimensions shown in mm.
Learn more about recommended soldering profiles in this application note.



Product Ordering Information

Order Number	Packing Type
C3D02060A	Tube

Learn more about power device packing & shipment information in this application note.

Revision History

Document Version	Date of Release	Description of Changes
1	October-2016	Initial Release
8	March-2023	Update Package Drawing Update Landing Pad

Notes & Disclaimer

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