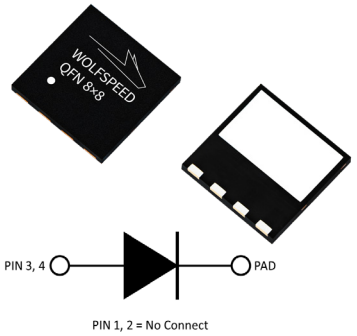
C6D10065Q

6th Generation 650 V, 10 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: QFN 8x8
Marking: C6D10065Q

Features

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

Applications

- Enterprise Power, Server, & Telecom Power Supplies
- Switched Mode Power Supplies
- Industrial Power Supplies
- Boost Power Factor Correction
- Bootstrap Diode
- LLC Clamping

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

Parameter	Symbol	Value	Unit	Test Conditions	Notes
Repetitive Peak Reverse Voltage	V_{RRM}	650	V		
DC Blocking Voltage	V_{DC}	650			
Continuous Forward Current	I_F	39	A	T_J = 25 °C	Fig. 3
		20		T_J = 125 °C	
		11		T_J = 155 °C	
Non-Repetitive Peak Forward Surge Current	I_{FSM}	61		T_C = 25 °C, t_p = 10 ms, Half Sine Wave	
		54		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	
Power Dissipation	P_{tot}	119	W	T_J = 25 °C	Fig. 4
		52		T_J = 110 °C	
i^2t Value	$\int i^2t$	19	A^2s	T_C = 25 °C, t_p = 10 ms	
		15		T_C = 110 °C, t_p = 10 ms	

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Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Notes
Forward Voltage	V_F	1.27	1.5	V	I_F = 10 A, T_j = 25 °C	Fig. 1
		1.37	1.6		I_F = 10 A, T_j = 175 °C	
Reverse Current	I_R	2	50	µA	V_R = 650 V, T_j = 25 °C	Fig. 2
		15	200		V_R = 650 V, T_j = 175 °C	
Total Capacitive Charge	Q_C	34		nC	V_R = 400 V, T_j = 25 °C	Fig. 5
Total Capacitance	C	611		pF	V_R = 0 V, T_j = 25 °C, f = 1 MHz	Fig. 6
		67			V_R = 200 V, T_j = 25 °C, f = 1 MHz	
		53			V_R = 400 V, T_j = 25 °C, f = 1 MHz	
Capacitance Stored Energy	E_c	5.2		µJ	V_R = 400 V	Fig. 7

Notes:
SiC Schottky Diodes are majority carrier devices, so there is no reverse recovery charge.

Thermal & Mechanical Characteristics

Parameter	Symbol	Value	Unit	Notes
Thermal Resistance, Junction to Case (Typ.)	$R_{\theta, JC}$	1.4	°C / W	
Junction Temperature	T_j	-55 to +175	°C	
Case & Storage Temperature	T_c	-55 to +150		
Maximum Processing Temperature	T_{PROC}	325		10 min max.

Electrostatic Discharge (ESD) Classifications

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

Typical Performance

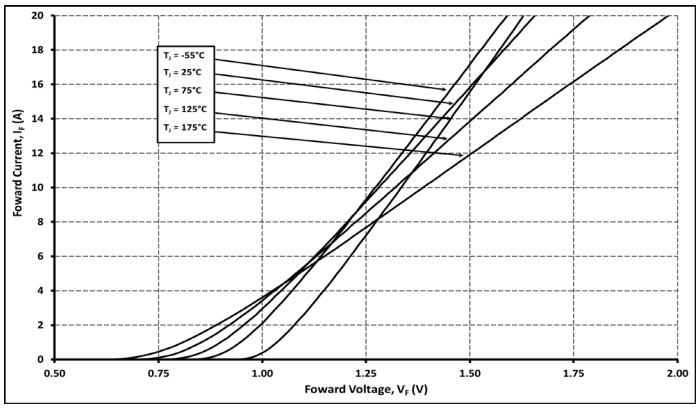


Figure 1
Forward Characteristics

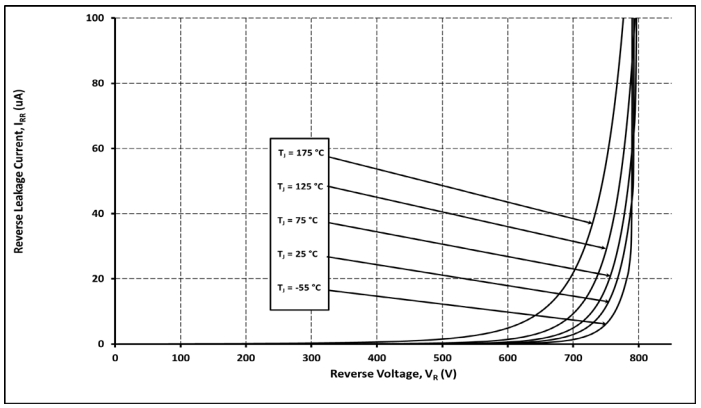


Figure 2
Reverse Characteristics

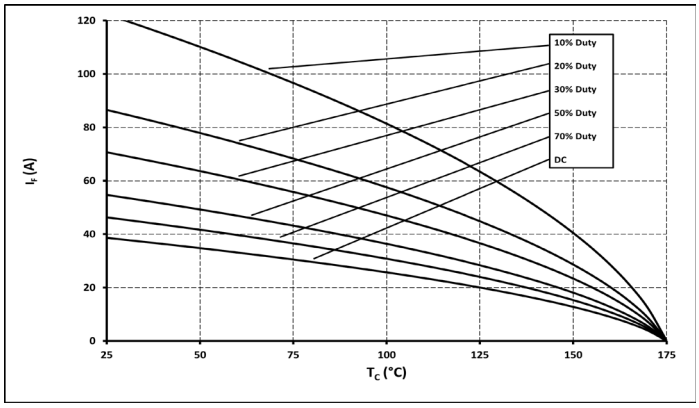


Figure 3
Current Derating

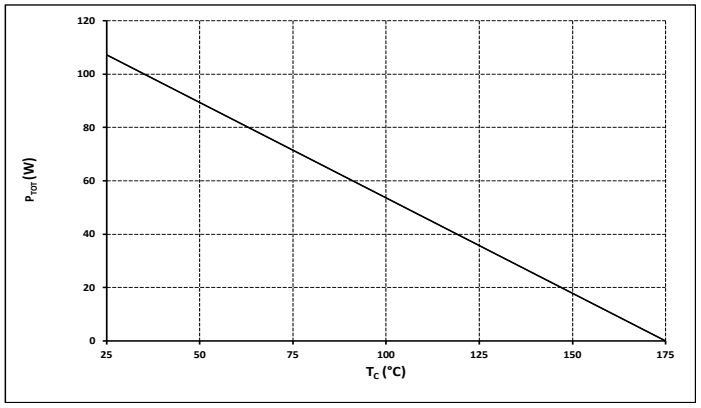


Figure 4
Power Derating

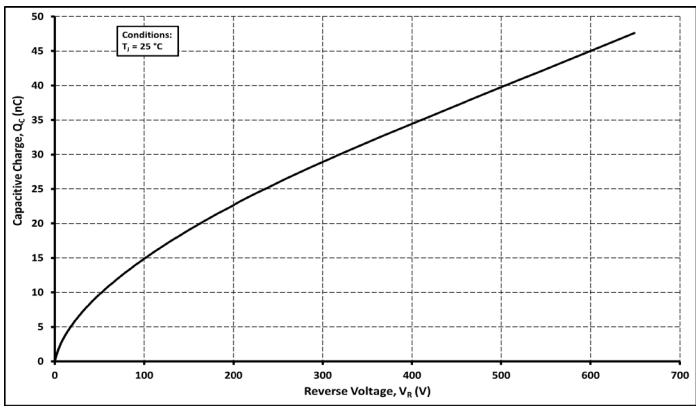


Figure 5
Total Capacitance Charge vs. Reverse Voltage

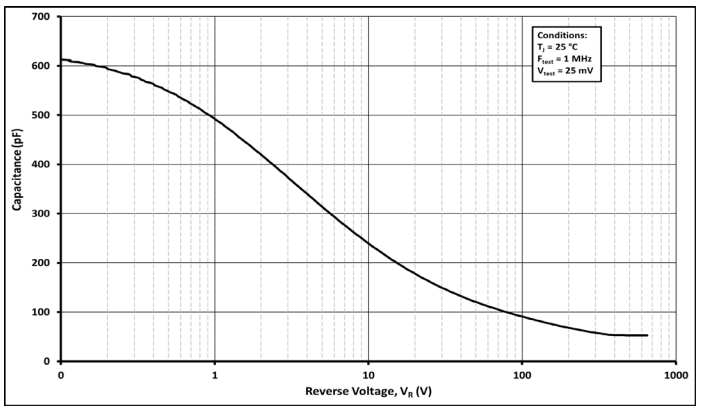


Figure 6
Capacitance vs. Reverse Voltage

Typical Performance

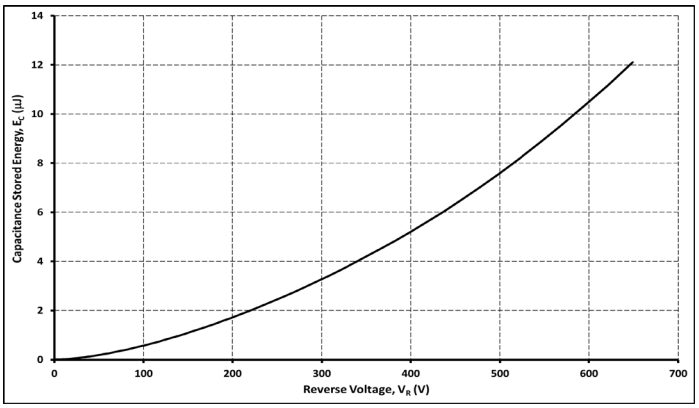
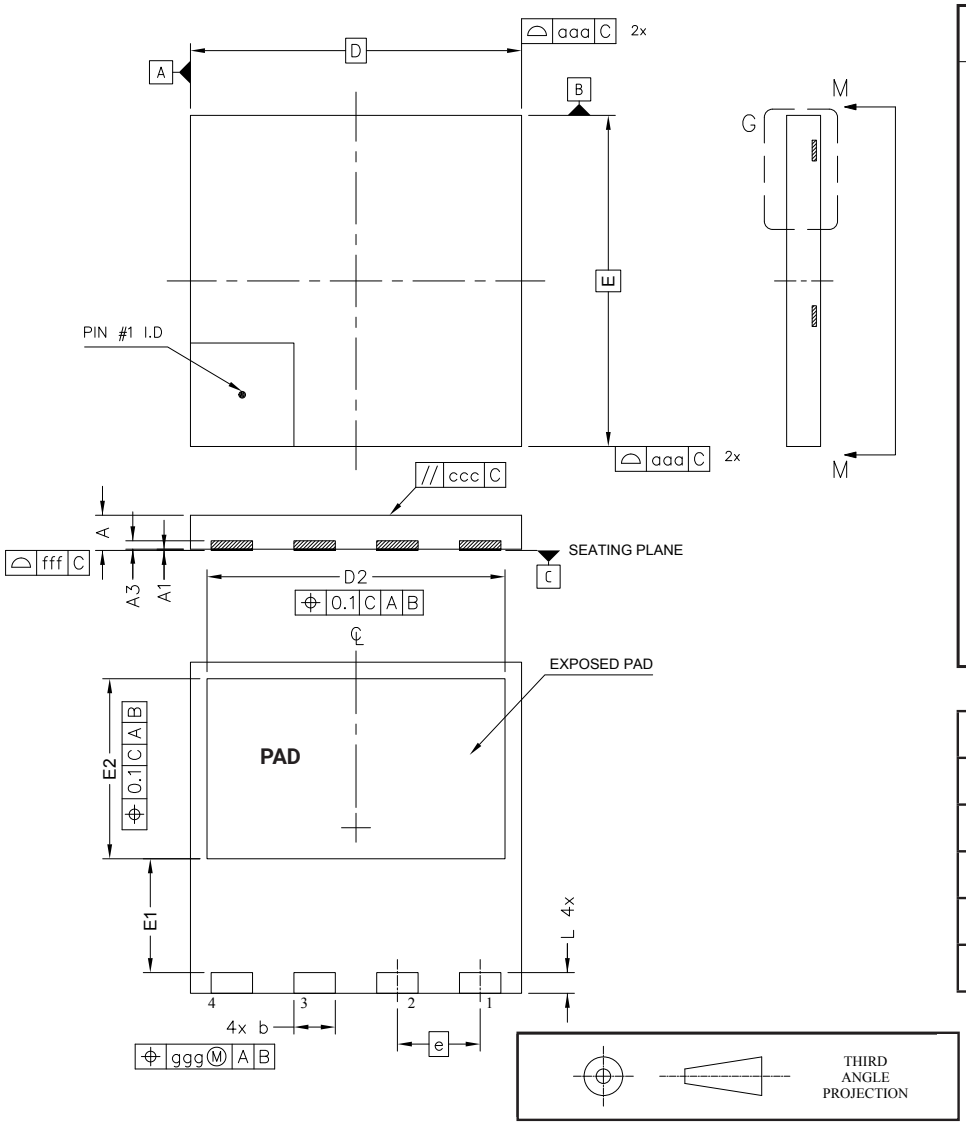


Figure 7
Capacitance Stored Energy

Package Dimensions & Pin-Out

Package: QFN 8x8

All dimensions are in mm.

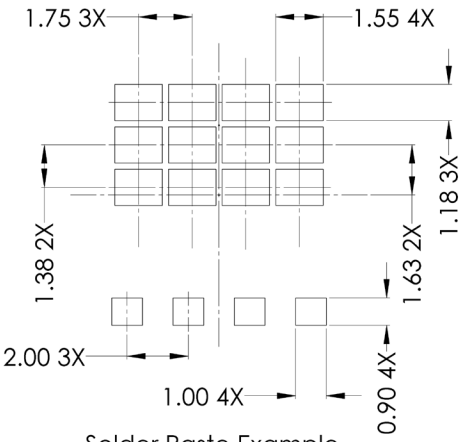


DIM	MIN	NOM	MAX
A	0.75	0.85	0.95
A1	0.00		0.05
A3	0.10	0.20	0.30
b	0.90	1.00	1.10
D	7.90	8.00	8.10
E	7.90	8.00	8.10
D2	7.10	7.20	7.30
E1	2.65	2.75	2.85
E2	4.25	4.35	4.45
e		2.00 BSC	
L	0.40	0.50	0.60
aaa		0.10	
ggg		0.05	
ccc		0.05	
fff		0.05	

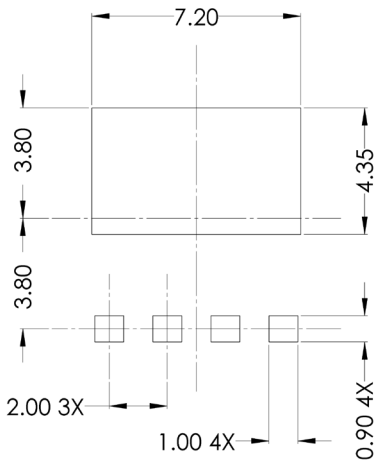
Pin	Definition
1	N/C
2	N/C
3	Anode
4	Anode
PAD	Cathode

Recommended Solder Pad Layout

Learn more about recommended soldering profiles in this application note.



Solder Paste Example
Based on 5mil thick stencil
70% printed solder coverage by thermal pad area



QFN 8X8 Land Pattern

Product Ordering Information

Order Number	Packing Type
C6D10065Q-TR	Tape & Reel

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

REACh, RoHS, and Halogen-Free compliance documentation available for this product.