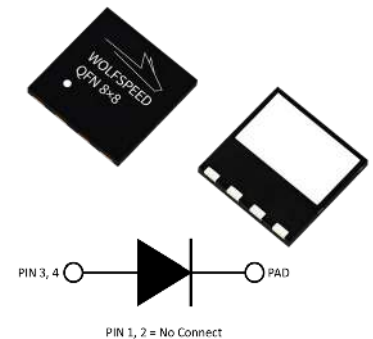


# C6D06065Q

## 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.



Package Types: QFN 8x8  
Marking: C6D06065Q

### 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 ( $T_c = 25^\circ\text{C}$ 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	$I_F$	21	A	$T_J = 25^\circ\text{C}$	Fig. 3
		11		$T_J = 125^\circ\text{C}$	
		6		$T_J = 155^\circ\text{C}$	
Non-Repetitive Peak Forward Surge Current	$I_{FSM}$	48		$T_c = 25^\circ\text{C}, t_p = 10\text{ ms}, \text{Half Sine Wave}$	
		42		$T_c = 110^\circ\text{C}, t_p = 10\text{ ms}, \text{Half Sine Wave}$	
Power Dissipation	$P_{tot}$	62	W	$T_J = 25^\circ\text{C}$	Fig. 4
		27		$T_J = 110^\circ\text{C}$	
$i^2t$ Value	$\int i^2t$	11	$\text{A}^2\text{s}$	$T_c = 25^\circ\text{C}, t_p = 10\text{ ms}$	
		8		$T_c = 110^\circ\text{C}, t_p = 10\text{ ms}$	



## Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Notes
Forward Voltage	$V_F$	1.27	1.5	V	$I_F = 6\text{ A}, T_j = 25\text{ }^\circ\text{C}$	Fig. 1
		1.37	1.6		$I_F = 6\text{ A}, T_j = 175\text{ }^\circ\text{C}$	
Reverse Current	$I_R$	2	20	$\mu\text{A}$	$V_R = 650\text{ V}, T_j = 25\text{ }^\circ\text{C}$	Fig. 2
		25	200		$V_R = 650\text{ V}, T_j = 175\text{ }^\circ\text{C}$	
Total Capacitive Charge	$Q_C$	22		nC	$V_R = 400\text{ V}, T_j = 25\text{ }^\circ\text{C}$	Fig. 5
Total Capacitance	C	393		pF	$V_R = 0\text{ V}, T_j = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	Fig. 6
		44			$V_R = 200\text{ V}, T_j = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	
		36			$V_R = 400\text{ V}, T_j = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	
Capacitance Stored Energy	$E_C$	3.5		$\mu\text{J}$	$V_R = 400\text{ V}$	Fig. 7

### Notes:

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

## Thermal & Mechanical Characteristics

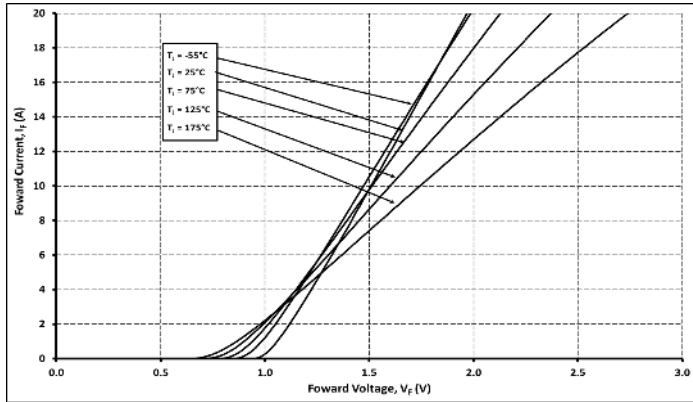
Parameter	Symbol	Value	Unit	Notes
Thermal Resistance, Junction to Case (Typ.)	$R_{\theta,JC}$	2.4	$^\circ\text{C} / \text{W}$	
Junction Temperature	$T_j$	-55 to +175	$^\circ\text{C}$	
Case & Storage Temperature	$T_c$	-55 to +150		
Maximum Processing Temperature	$T_{PROC}$	325		10 min max.

## Electrostatic Discharge (ESD) Classifications

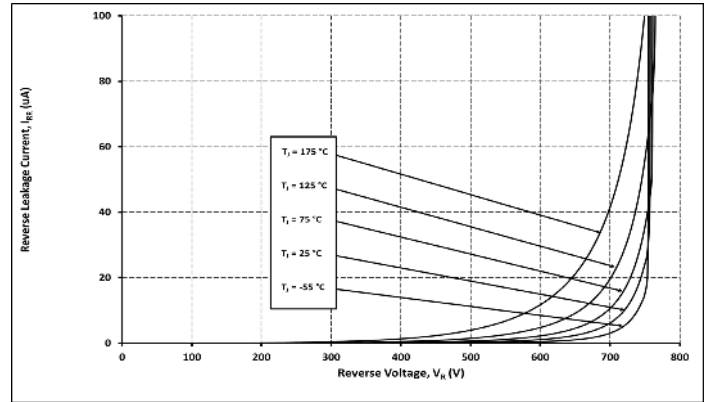
Parameter	Symbol	Notes
Human Body Model	HBM	Class 3B ( $\geq 8000\text{ V}$ )
Charge Device Model	CDM	Class C3 ( $\geq 1000\text{ V}$ )



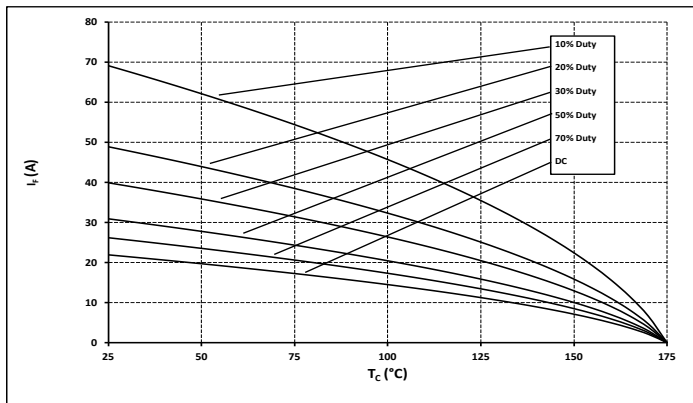
Typical Performance



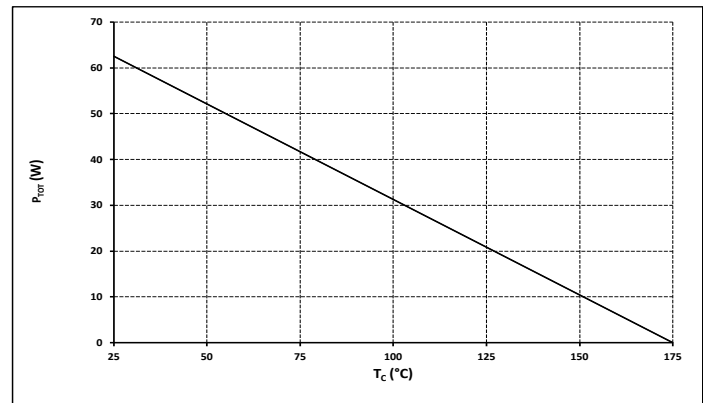
**Figure 1**  
Forward Characteristics



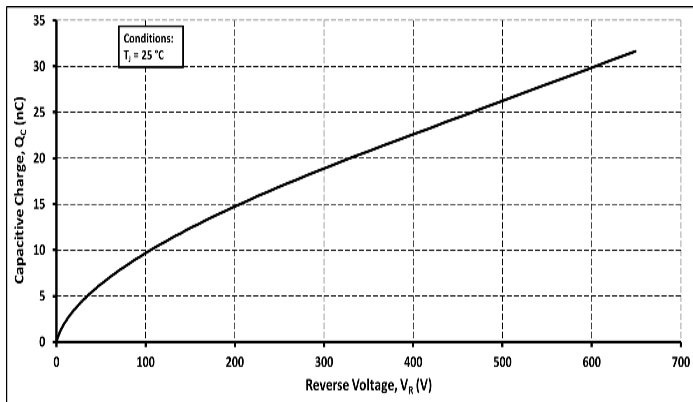
**Figure 2**  
Reverse Characteristics



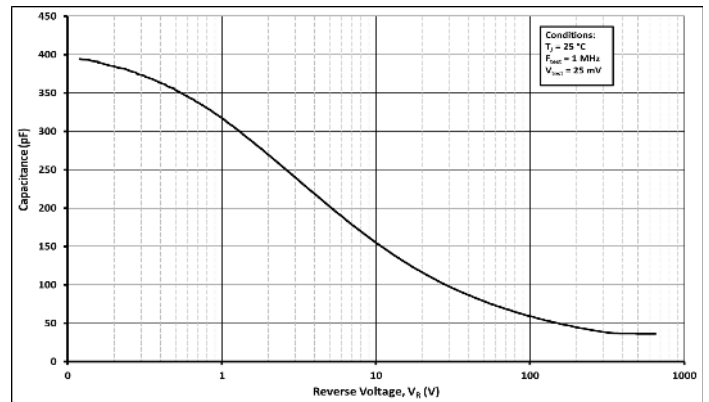
**Figure 3**  
Current Derating



**Figure 4**  
Power Derating

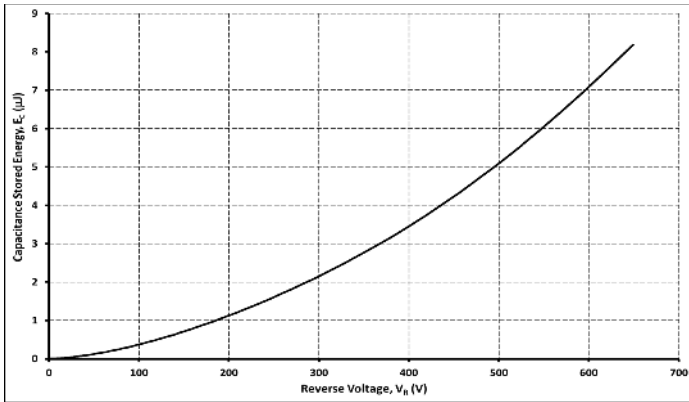


**Figure 5**  
Total Capacitance Charge vs. Reverse Voltage



**Figure 6**  
Capacitance vs. Reverse Voltage

## Typical Performance



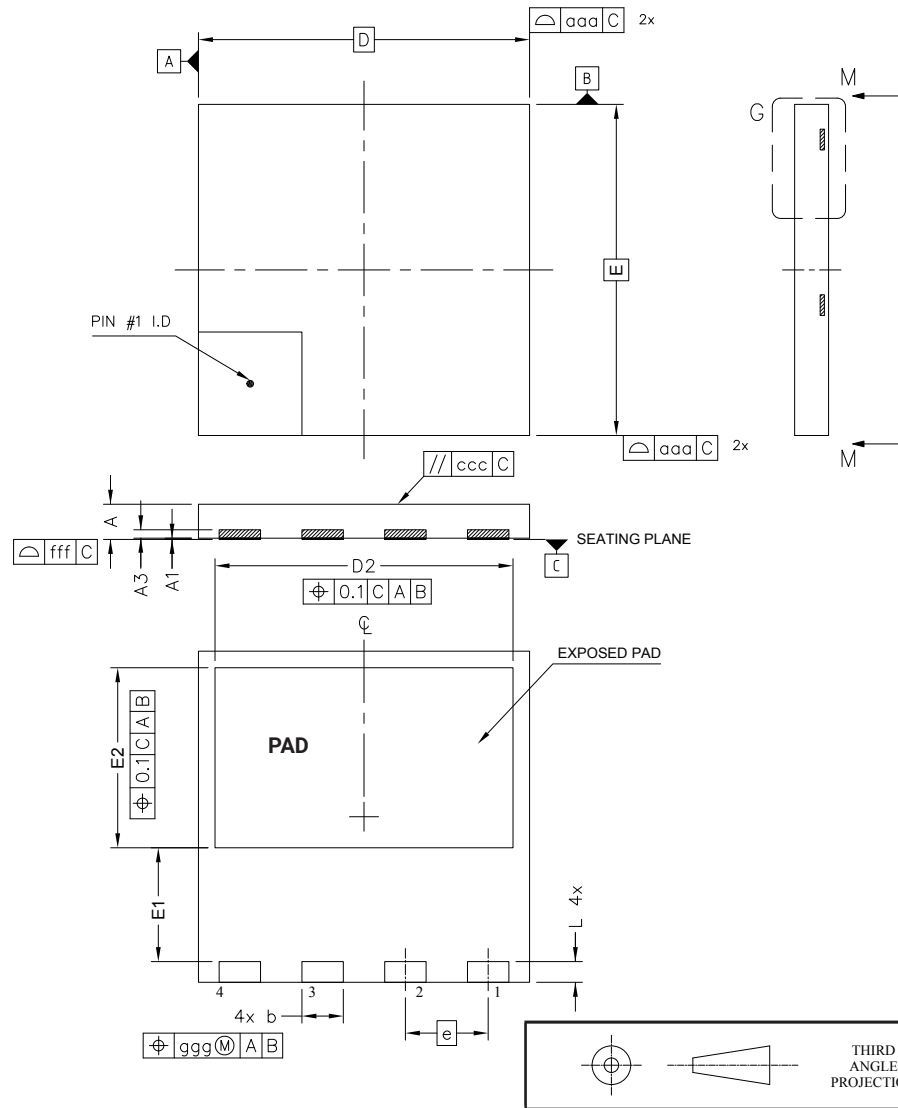
**Figure 7**  
Capacitance Stored Energy



### Package Dimensions & Pin-Out

Package: QFN 8x8

All dimensions are in mm.



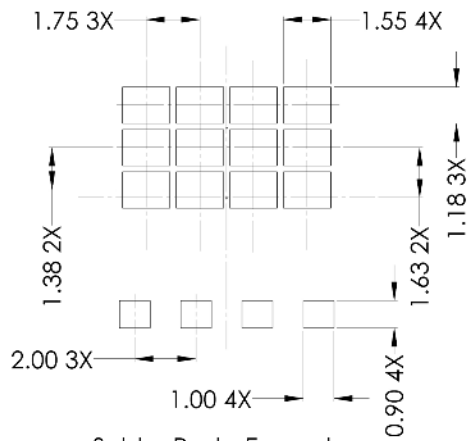
DIM	MIN	NOM	MAX
A	0.75	0.85	0.95
A1	0.00		0.05
A3	0.10	0.20	0.30
b	0.90	1.00	1.10
D	7.90	8.00	8.10
E	7.90	8.00	8.10
D2	7.10	7.20	7.30
E1	2.65	2.75	2.85
E2	4.25	4.35	4.45
e	2.00 BSC		
L	0.40	0.50	0.60
aaa	0.10		
ggg	0.05		
ccc	0.05		
fff	0.05		

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

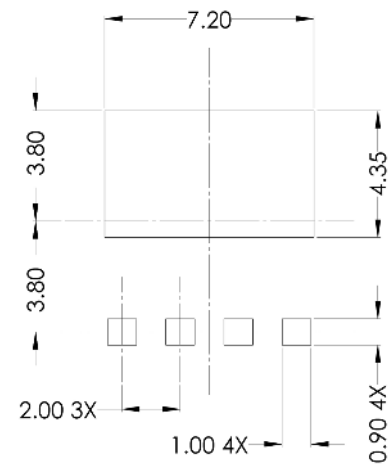


## Recommended Solder Pad Layout

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
C6D06065Q-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.



## Notes & Disclaimer

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