

Silicon Carbide Schottky Diode

QSD-HCS016X65

Features

- 650v schottky rectifier
- Zero reverse recovery current
- High-frequency operation
- Temperature-independent switching behavior
- Extremely fast switching

V _{rrm} =	650 V
I _f (T _c =150 °C)	16 A
Q _c =	51 nC

Benefits

- Replace bipolar with unipolar rectifiers
- Essentially no switching losses
- Higher efficiency
- Reduction of heat sink requirements
- Parallel devices without thermal runaway

Package



Applications

- Switch mode power supplies (SMPS)
- Power factor correction
- Motor drives

Part Number	Package	Marking
QSD-HCS016X65	Die Only	Q

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Maximum Rated Values (TC=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
Vrrm	Repetitive Peak Reverse Voltage	650	V		
If	Continuous Forward Current	47	A	Tc=25°C	Fig.3
		23		Tc=135°C	
		16		Tc=150°C	
Ifrm	Repetitive Peak Forward Surge Current	83	A	Tc=25°C, Tp=10ms, Half Sine Pulse	
		73		Tc=110°C, Tp=10ms, Half Sine Pulse	
Ifsm	Non-Repetitive Forward Surge Current	104	A	Tc=25°C, Tp=10ms, Half Sine Pulse	
		92		Tc=110°C, Tp=10ms, Half Sine Pulse	
Ptot	Power Dissipation	200	W	Tc=25°C	Fig.4
		87		Tc=110°C	
Tj	Operating Temperature	-55to +175	°C		
Tstg	Storage Temperature	-55to +175	°C		

Electrical Characteristics (Tj=25°C)

Symbol	Parameter	Value			Unit	TestConditions	Note
		Min.	Typ.	Max.			
Vf	Forward Voltage		1.4	1.8	V	If=16A, Tj=25°C	Fig.1
			1.5	2.0		If=16A, Tj=175°C	
Ir	ReverseCurrent		2	100	µA	Vr=650V, Tj=25°C	Fig.2
			13			Vr=650V, Tj=175°C	
Qc	TotalCapacitiveCharge		51		nC	Vr=400V, Tj=25°C	Fig.5
C	TotalCapacitance		1078		pF	Vr=0V, Tj=25°C, f=1MHz	Fig.6
			91			Vr=200V, Tj=25°C, f=1MHz	
			90			Vr=400V, Tj=25°C, f=1MHz	
Ec	CapacitanceStoredEnergy		14		µJ	Vr=400V	Fig.7

Thermal Characteristics

Symbol	Parameter	Value	Unit	Note
Rejc	Thermal Resistance (Junction to Case) ¹	0.75	°C/W	Fig.8

Note:
1Tested inTO-247 Package

Typical Performance

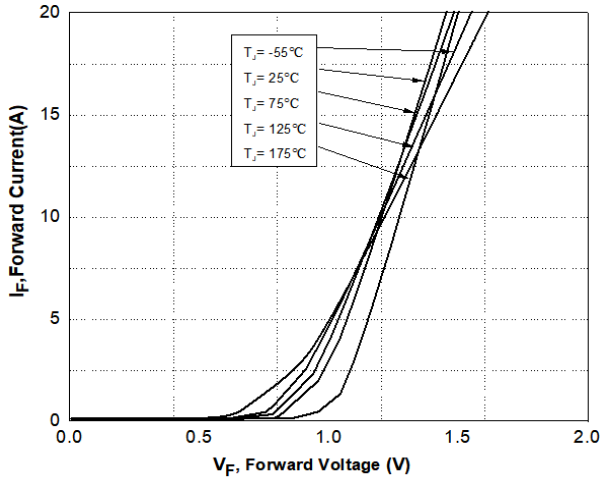


Figure 1. Forward Characteristics

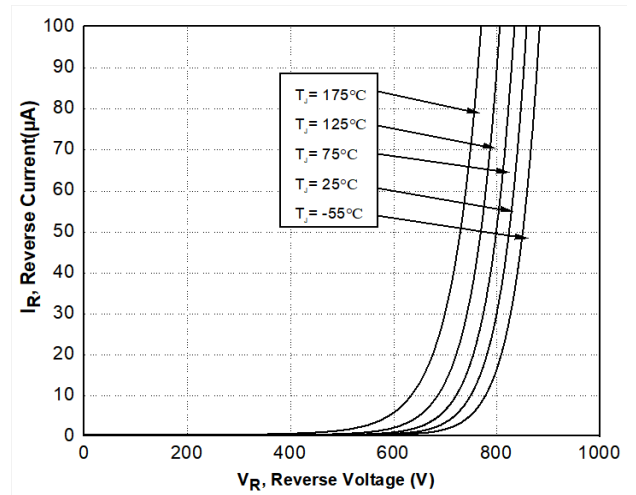


Figure 2. Reverse Characteristics

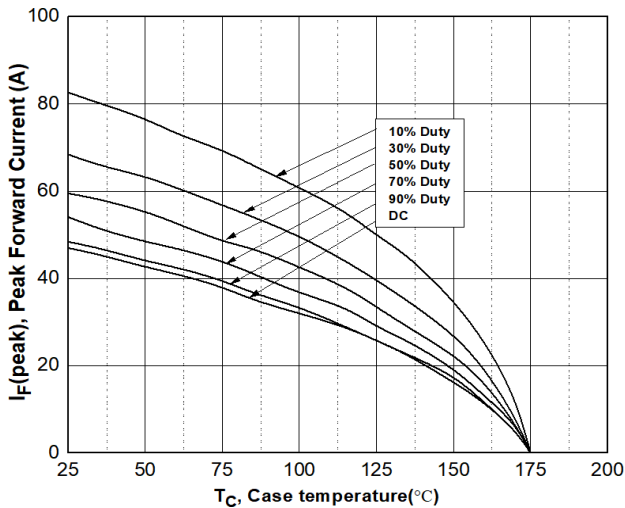


Figure 3. Current Derating

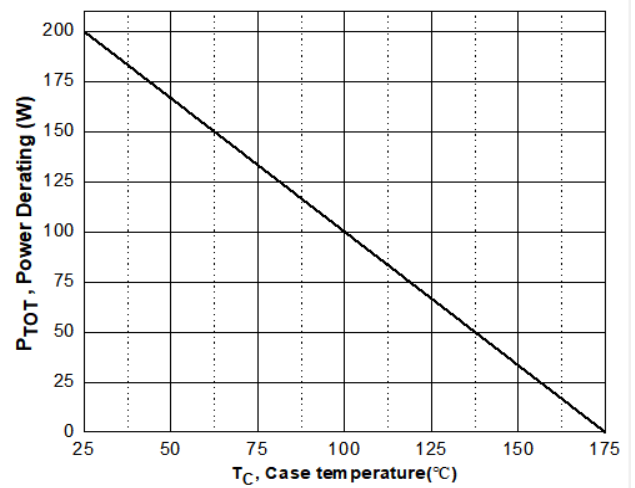


Figure 4. Power Derating

Typical Performance

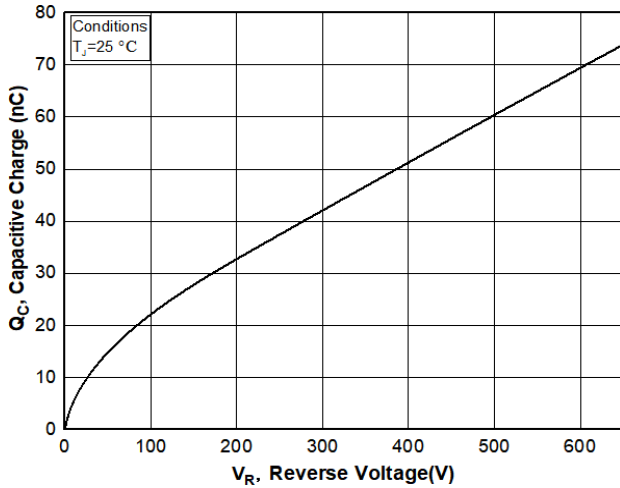


Figure 5. Capacitance Charge Vs. Reverse Voltage

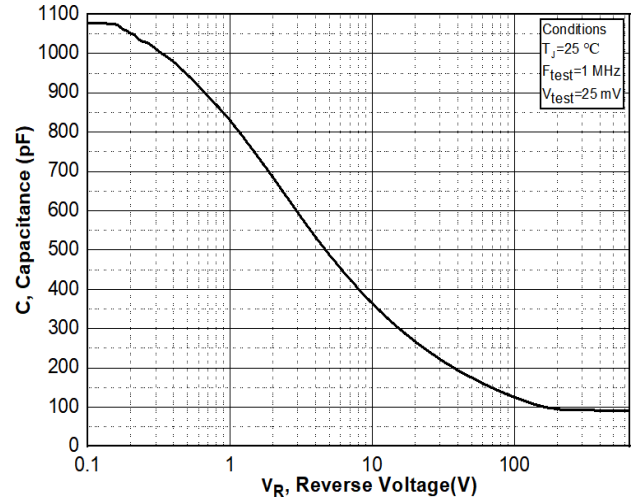


Figure 6. Capacitance Vs. Reverse Voltage

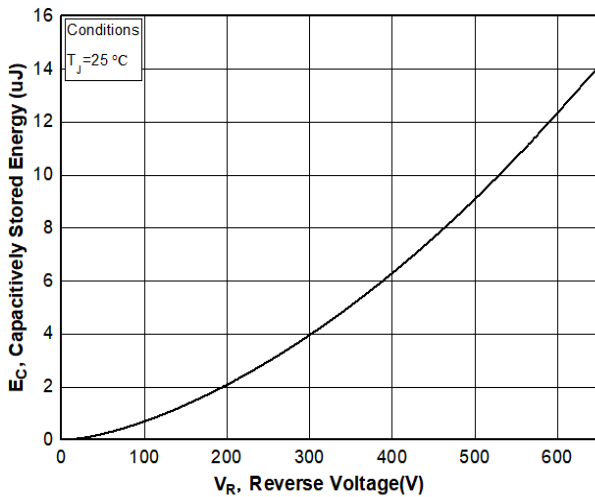


Figure 7. Capacitance Stored Energy

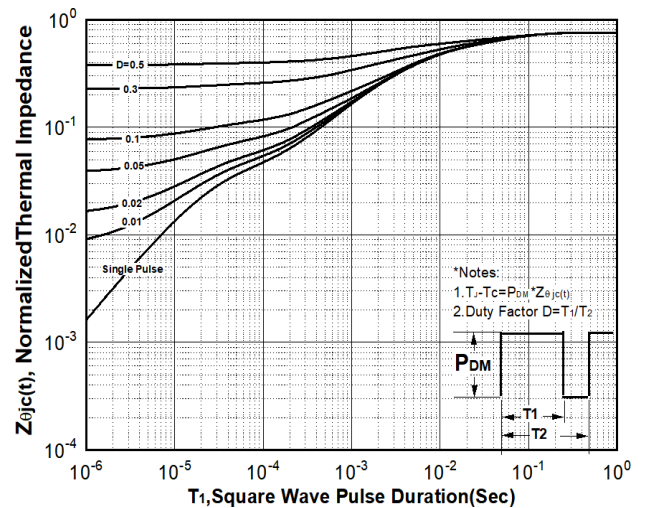
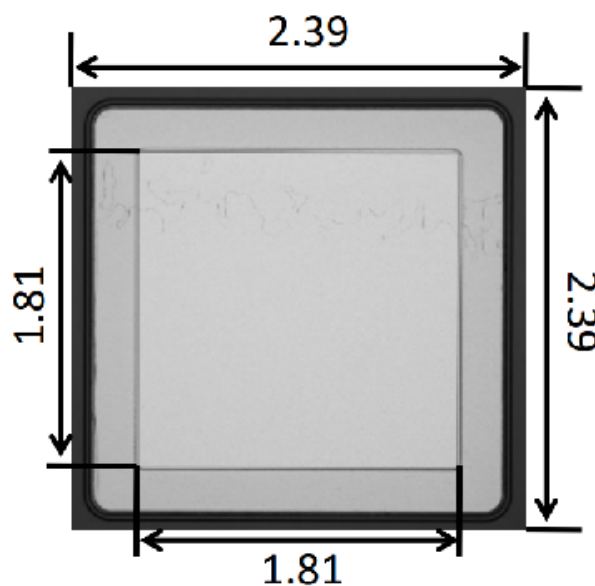


Figure 8. Transient Thermal Response Curve(Junction-to-Case)

Package Dimensions



Product Dimensions

Parameter	Typical	Units
Die Size (LxW)	2.39x2.39	mm
Anode Pad Opening	1.81x1.81	mm
Die Thickness ¹	364±10%	µm
Top side Anode Metalization (Al)	4	µm
Back side Cathode Metalization (Ti/Ni/Ag)	2.05	µm
Front side Passivation (polymide)	SiO ₂ Polyimide	

Attention

- Specifications of any and all products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
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