650V/20A, SiC Schottky Barrier Diode

H3D020065

Part Number	Die Size
H3D020065	2.604mm x 2.604mm

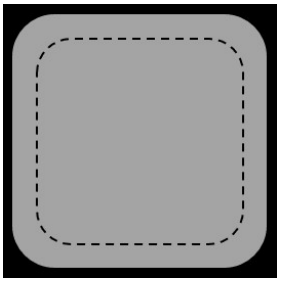
Product Summary

V_R	650V
$I_{F(135/144^\circ C)}$	23.5A/20A*
Q_C	55nC

Features

- Low Conduction and Switching Loss
- Zero Reverse Recovery
- Temperature Independent Switching Behavior
- Positive Temperature Coefficient Device
- High Surge Current Capability
- RoHS Compliant and Halogen Free
- Optimized for High Power Application
- AEC-Q101 Qualified

Chip Outline



Benefits

- Higher System Efficiency
- Increase Parallel Device Convenience
- Enable High Temperature Application
- Allow High Frequency Operation
- Realize Compact and Lightweight Systems
- High Reliability

Applications

- Switching Mode Power Supply
- PFC
- UPS
- Motor Drives
- Flywheel diode in Power Inverters
- Solar/Wind Renewable Energy

Absolute Maximum Ratings (T_c = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	T_J = 25°C	650	V
Peak Reverse Surge Voltage	V_{RSM}	T_J = 25°C	650	V
DC Blocking Voltage	V_R	T_J = 25°C	650	V
Continuous Forward Current (Per Leg/Per Device)	I_F	T_C= 25°C	53*	A
		T_C= 135°C	23.5*	
		T_C= 144°C	20*	
Non-Repetitive Peak Forward Surge Current	I_{FSM}	T_C = 25°C, T_P = 10 ms, Half Sine Wave	179*	A
		T_C = 125°C, T_P = 10 ms, Half Sine Wave	157*	
Repetitive Peak Forward Surge Current	I_{FRM}	T_C = 25°C, T_P = 10 ms Half Sine Wave, D = 0.1	117*	A
		T_C = 125°C, T_P = 10 ms Half Sine Wave, D = 0.1	110*	
I^2t value	$\int i^2dt$	T_C = 25°C, T_P = 10 ms	160*	A^2s
Junction & Storage Temperature	T_j , T_{stg}		-55 to 175	°C
Soldering Temperature	T_L		260	

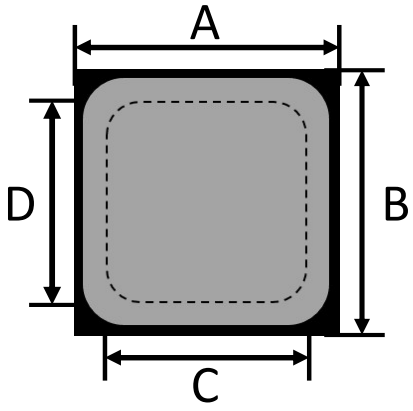
*Assume $R_{\theta,JC}$ Thermal Resistance of 1.0 °C/W or less

Electrical Characteristics (T_c = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
DC Blocking Voltage	V_{DC}	I_R = 100 µA, T_J = 25°C	> 650			V
Forward Voltage	V_F	I_F = 20A, T_J = 25°C		1.4	1.7	V
		I_F = 20A, T_J = 175°C		1.55	1.9	V
Reverse Current	I_R	V_R = 650V, T_J = 25°C		3	150	µA
		V_R = 650V, T_J = 175°C		40	600	µA
Total Capacitive Charge	Q_C	I_F = 20A, dI/dt = 300A/µs, V_R = 400V, T_J = 25°C		55		nC
Total Capacitance	C_j	V_R = 0.1V, T_J=25°C, f =1 MHz V_R = 200V, T_J=25°C, f =1 MHz V_R = 400V, T_J=25°C, f =1 MHz		1544 134 104		pF
Capacitance Stored Energy	E_C	V_R = 400V		11		µJ

Mechanical Parameters

Parameter	Typical Value (µm)
Die Size	**2604 x 2604 (A, B)**
Anode Pad Size	**2331 x 2335**
Anode Pad Opening	**1925 x 1925 (C, D)**
Anode Metallization	**4 (Al)**
Cathode Metallization	**2.5 (Ti/Ni/Ag)**
Die Thickness	**370 ± 10%**
Front Side Passivation	**Polyimide**



Notes

- The information provided herein is subject to change without notice.
- For other information that does not show on this datasheet, please contact us for inquiry.

Typical Device Performance

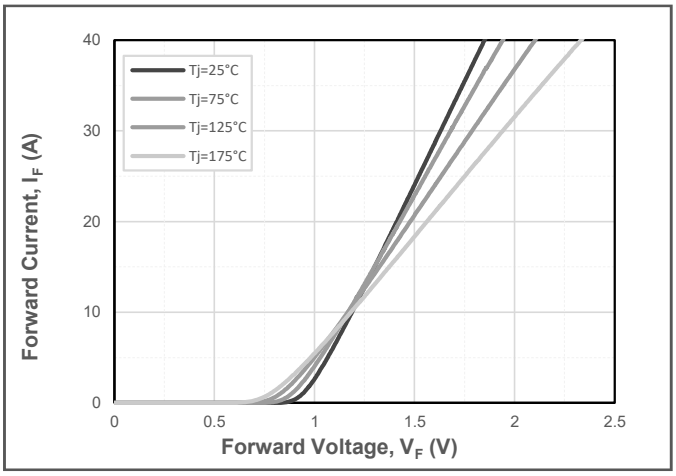


Fig.1 Forward Characteristics

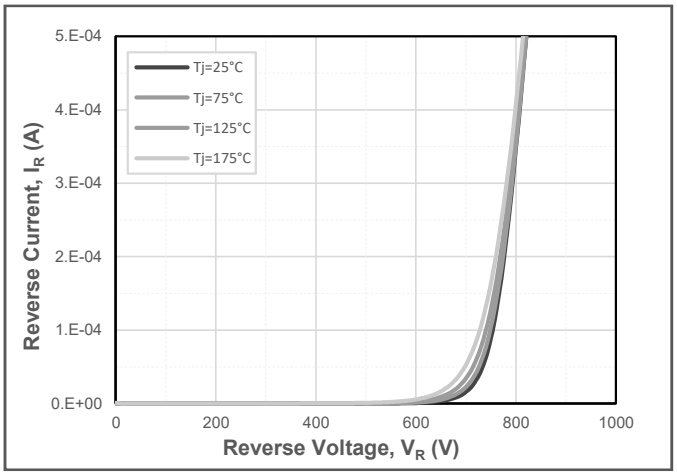


Fig.2 Reverse Characteristics

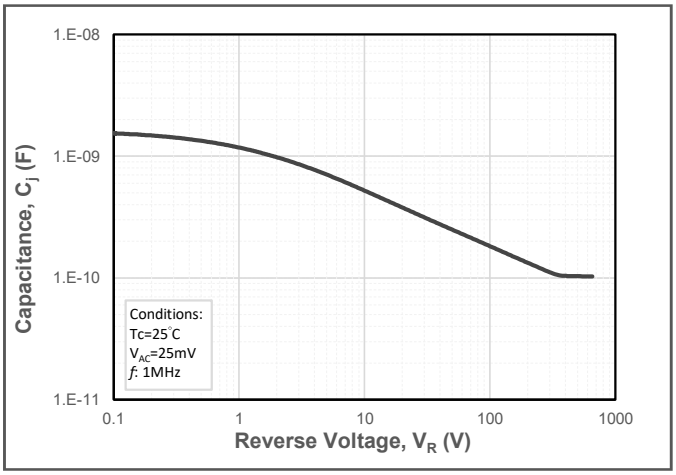


Fig.3 Junction Capacitance vs. Reverse Voltage

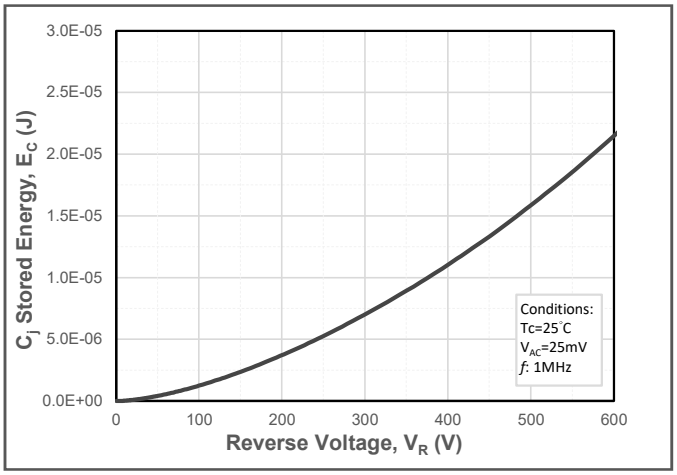


Fig.4 Capacitance Stored Energy

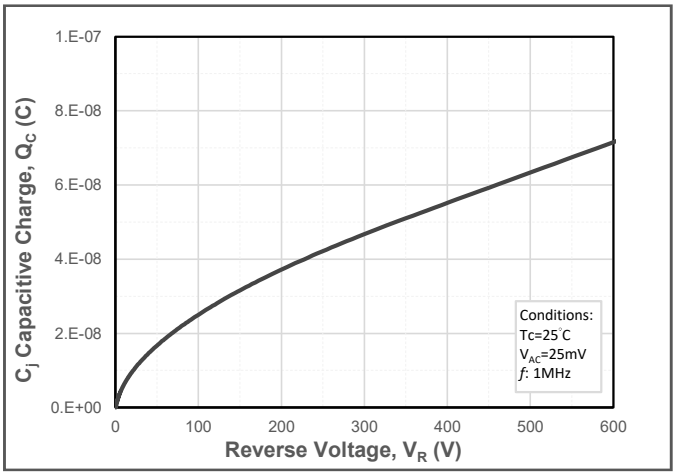


Fig.5 Recovery Charge vs. Reverse Voltage