

S1D020120G



TriQSiC™ 1200V Silicon Carbide Schottky Diode

Features

- 1.2kv schottky Rectifier
- Zero Reverse Recovery Current / Zero forward recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Low forward voltage
- Positive Temperature Coefficient on V_F
- Increased Creepage/Clearance Distance



TO-263-2L



Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- High Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway



Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives
- AC/DC converters

Table 1 Key performance and package parameters

Type	V_{RRM}	$I_F(T_C = 135^\circ\text{C})$	Q_C	Marking	Package
S1D020120G	1200V	32A	110nC	S1D020120G	TO-263-2L

S1D0200G

1200V SiC Schottky Diode

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1 Maximum ratings

Table 2 Maximum rating (Tc = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V	-	
V_{RSM}	Surge Peak Reverse Voltage	1300	V	-	
V_R	DC Peak Reverse Voltage	1200	V	-	
I_F	Continuous Forward Current	67 32 20	A	Tc = 25°C Tc = 135°C Tc = 156°C	Fig.7
I_{FSM}	Non-Repetitive Peak Forward Surge Current	180	A	Tc = 25 tp = 10ms Half Sine Pulse	
P_{tot}	Power Dissipation	312 135	W	Tc = 25°C Tc = 110°C	Fig.6
$\int i^2 dt$	$\int i^2 dt$	160	A ² S	Tc = 25 tp = 10ms	
T_{stg}, T_J	Operating Junction Range	-55 to +175		-	

2 Thermal characteristics

Table 3 Thermal characteristics

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
$R_{th(j-c)}$	Thermal resistance from junction to case	0.48	°C/W	-	Fig.8

3 Electrical characteristics

Table 4 Electrical characteristics (T_c = 25°C unless otherwise specified)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V _F	Forward Voltage	1.38 1.85	1.6 2.2	V	I _F = 20A T _J = 25 I _F = 20A T _J = 175	Fig.1
I _R	Reverse Current	1 10	100 200	μA	V _R = 1200V T _J = 25 V _R = 1200V T _J = 175	Fig.2
Q _c	Total Capacitive Charge	110	-	nC	V _R = 800V I _F = 20A di/dt = 200A/μs T _J = 25	Fig.4
C	Total Capacitance	2120 104 76	-	pF	V _R = 0V T _J = 25 f = 1MHz V _R = 400V T _J = 25 f = 1MHz V _R = 800V T _J = 25 f = 1MHz	Fig.3
E _C	Capacitance Stored Energy	60	-	μJ	V _R = 800V	Fig.5

4 Electrical characteristic diagrams

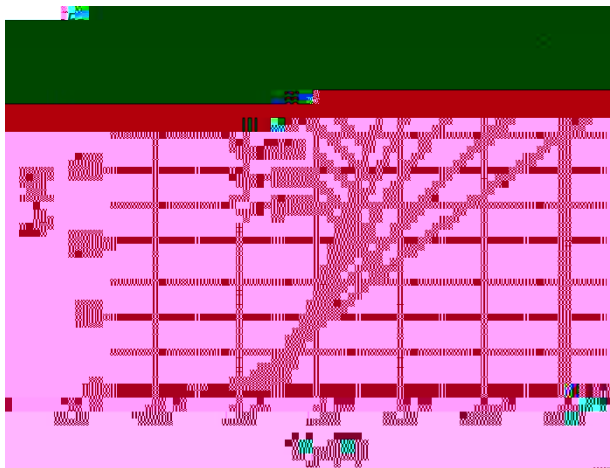


Figure 1. Forward Characteristics

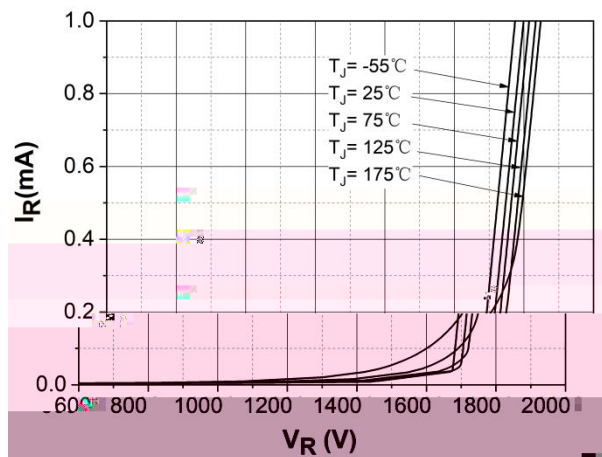


Figure 2. Reverse Characteristics

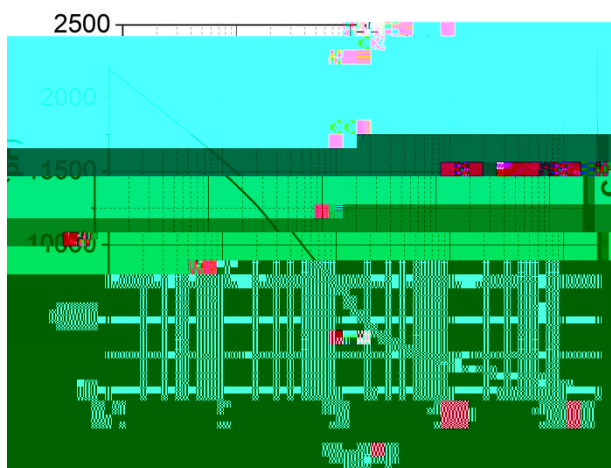


Figure 3. Capacitance vs. Reverse Voltage

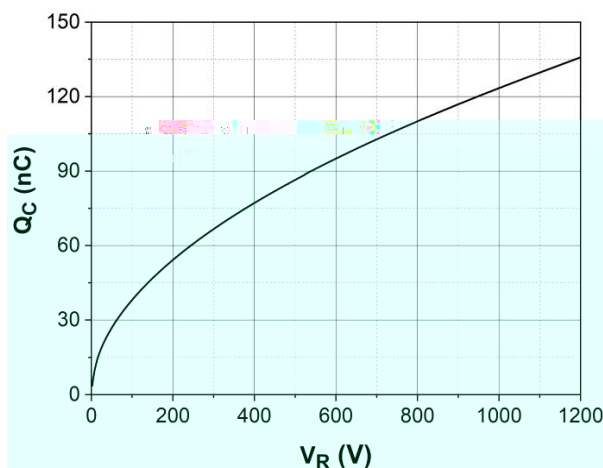


Figure 4. Recovery Charge vs. Reverse Voltage

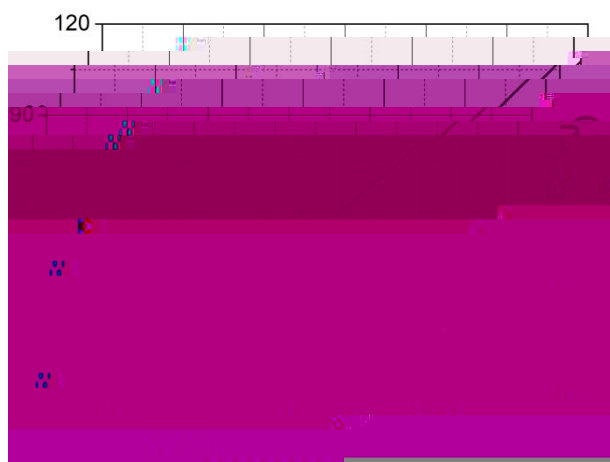


Figure 5. Typical Capacitance Stored Energy

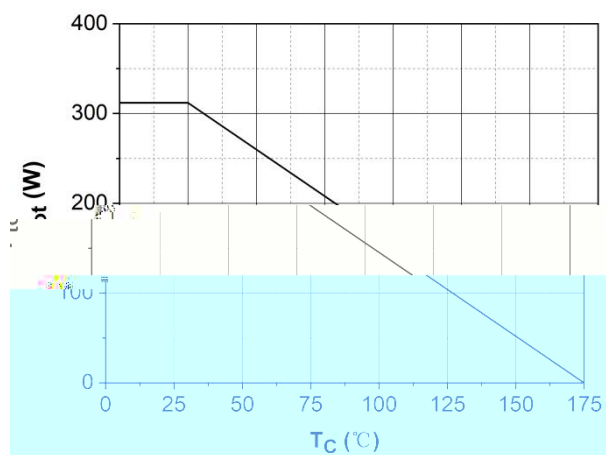


Figure 6. Power Derating

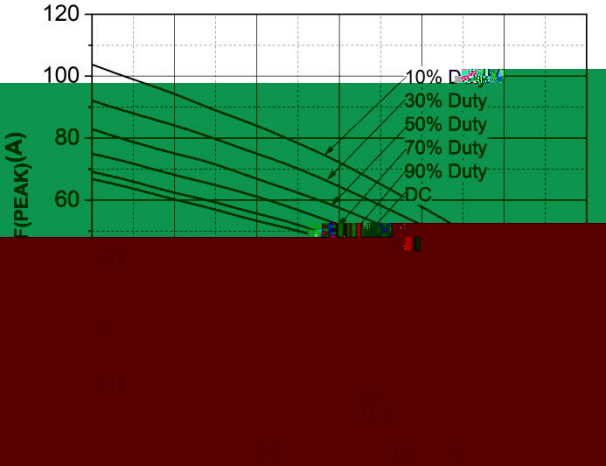


Figure 7. Current Derating

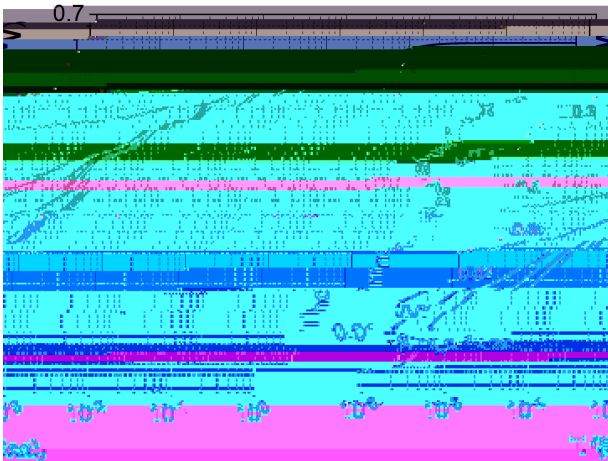


Figure 8. Transient Thermal Impedance

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1200V SiC Scccb 1 0



Revision history

Document version	Date of release	Description of changes
V01_00	2023-01-15	
V01_01	2023-09-15	
V02_00	2025-05-15	

Attention

1. RoHS compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/ EC (RoHS2), as implemented January 2, 2013.

2. REACH compliance

REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a Sichain representative to insure you get the most up-to-date REACH SVHC Declaration. REACH banned substance information (REACH Article 67) is also available upon request.

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