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)	Q_C	Marking	Package
S1D020120G	1200V	32A	110nC	S1D020120G	TO-263-2L

Table of contents

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
$\int i^2dt$	$\int i^2dt$	160	A^2S	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 (Tc = 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

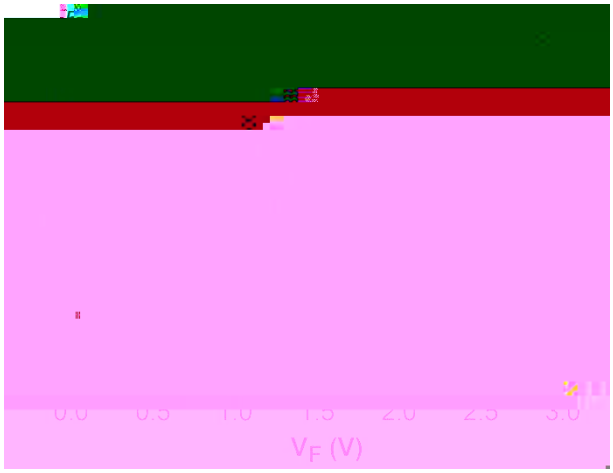

Figure 1. Forward Characteristics

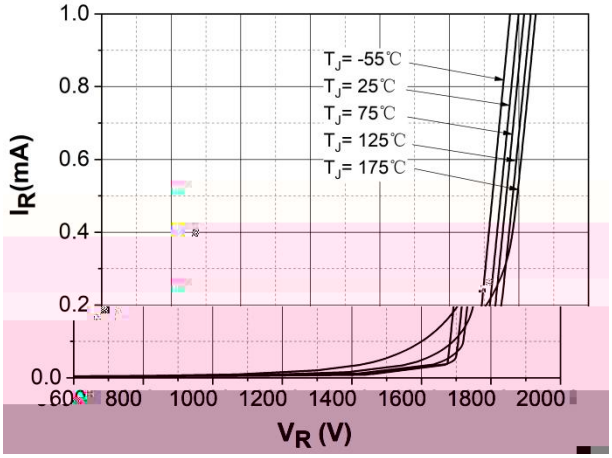

Figure 2. Reverse Characteristics

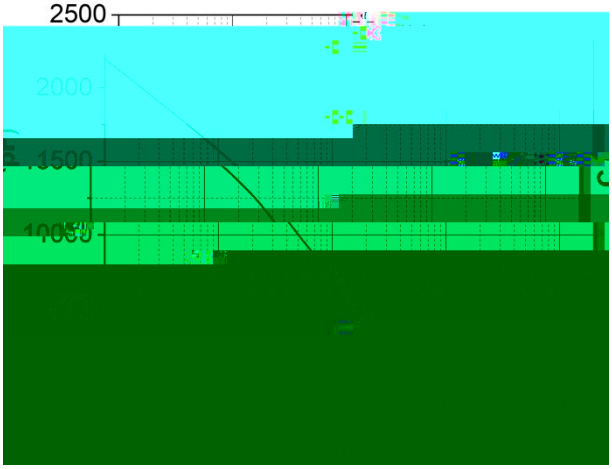

Figure 3. Capacitance vs. Reverse Voltage

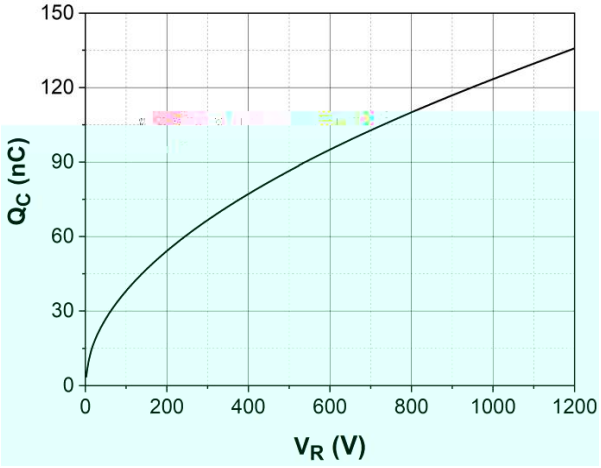

Figure 4. Recovery Charge vs. Reverse Voltage

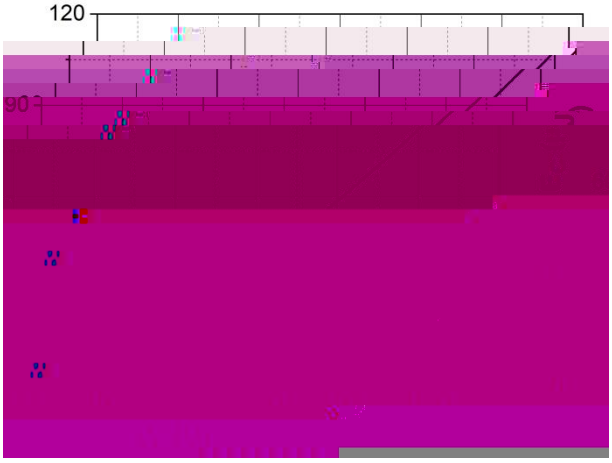

Figure 5. Typical Capacitance Stored Energy

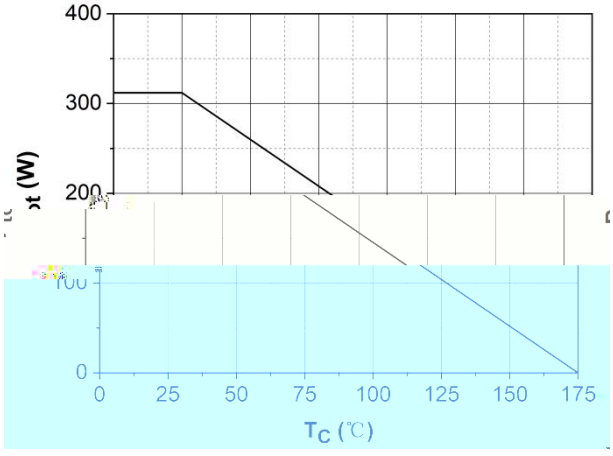

Figure 6. Power Derating

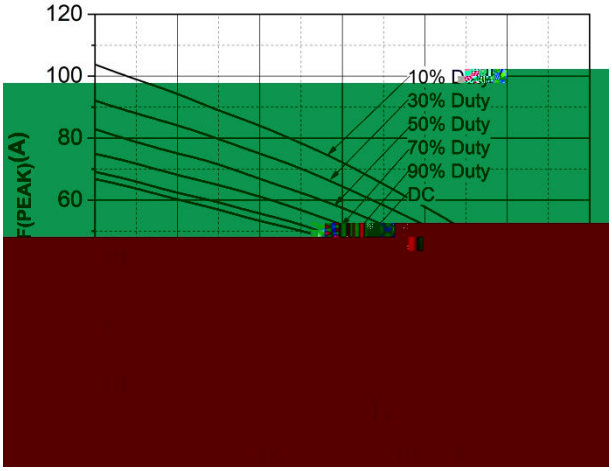

Figure 7. Current Derating

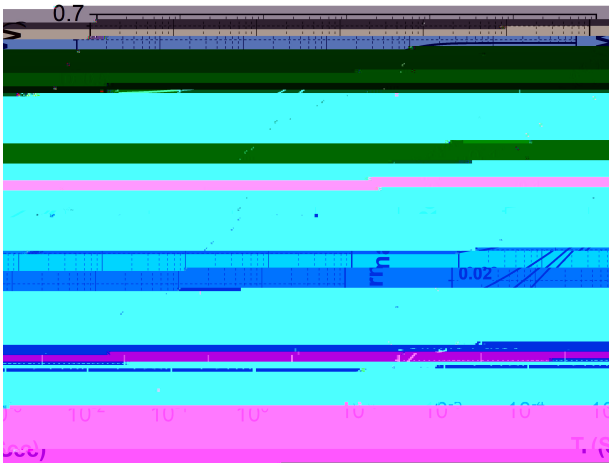

Figure 8. Transient Thermal Impedance

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.

3. With respect to information regarding the application of the product, Sichain hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

4. Any information given in this documents subject to customer's compliance with its obligations and any applicable legal requirements, norms and standards concerning any use of the product of Sichain in any customer's applications.

5. Specifications of any and all products described or contained herein stipulate the performance, characteristics, and

7. Except as otherwise explicitly approved by Sichain in a written document signed by authorized representatives of Sichain, Sichain' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.

8. For use of our products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a Sichain representatives, for example but not limited to: transportation equipment,primary communication equipment,traffic lights,fire/crime prevention, safety equipment, medical systems, and power transmission systems.