# 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 |

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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<br>32<br>20 | A | Tc = 25˚C<br>Tc = 135˚C<br>Tc = 156˚C | Fig.7 |
| $I_{FSM}$ | Non-Repetitive Peak Forward Surge Current | 180 | A | Tc = 25 tp = 10ms<br>Half Sine Pulse | |
| $P_{tot}$ | Power Dissipation | 312<br>135 | W | Tc = 25˚C<br>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<br>1.85 | 1.6<br>2.2 | V | $I_F$ = 20A $T_J$ = 25<br>$I_F$ = 20A $T_J$ = 175 | Fig.1 |
| $I_R$ | Reverse Current | 1<br>10 | 100<br>200 | μA | $V_R$ = 1200V $T_J$ = 25<br>$V_R$ = 1200V $T_J$ = 175 | |

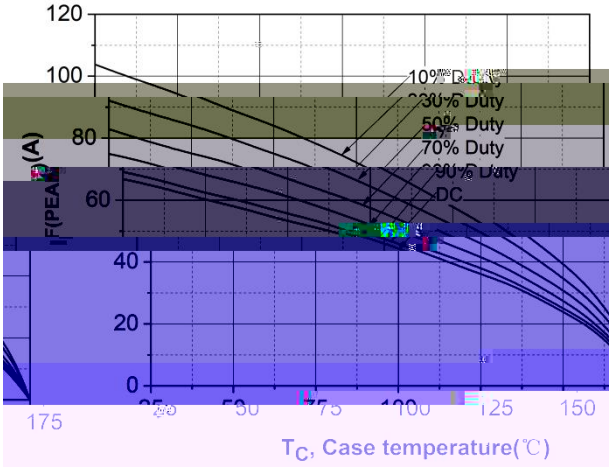



Figure 7. Current Derating

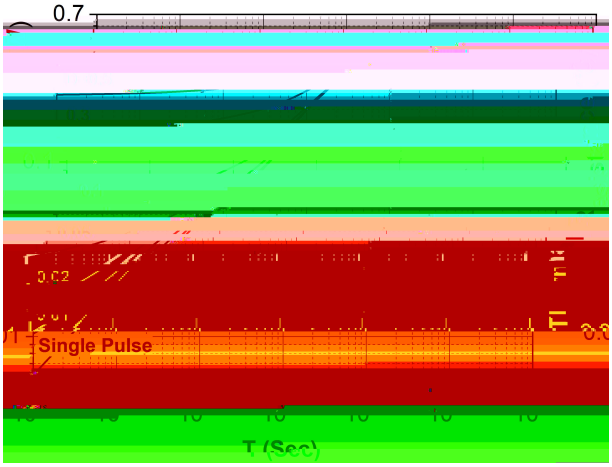



Figure 8. Transient Thermal Impedance

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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.