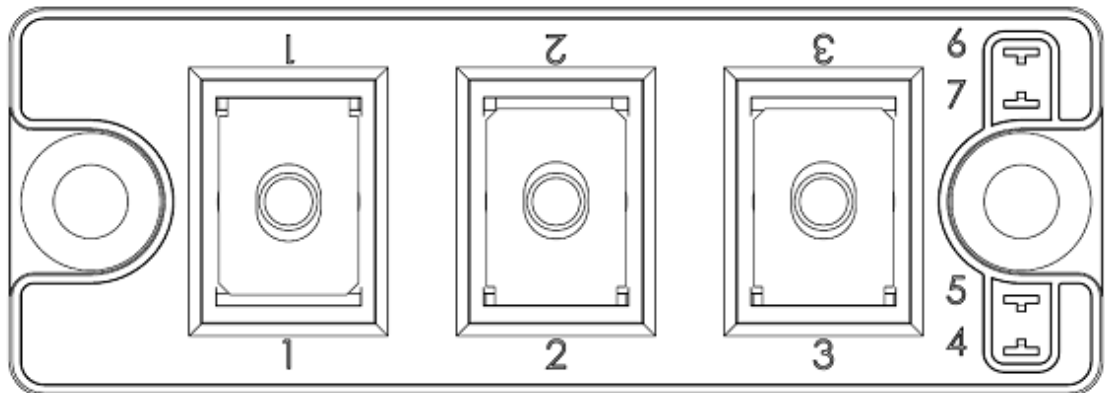
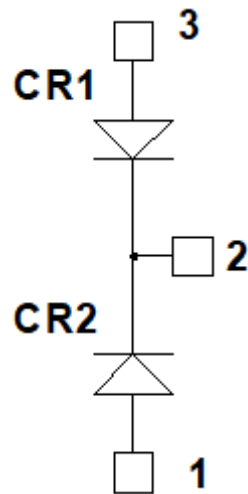


MSCDC100KK120D1PAG Dual Common Cathode SiC Diodes Power Module

1 Product Overview

This section shows the product overview of the MSCDC100KK120D1PAG device.



All ratings at $T_j = 25^\circ\text{C}$, unless otherwise specified.

Caution: These devices are sensitive to electrostatic discharge. Proper handling procedures should be followed.

1.1 Features

The following are key features of the MSCDC100KK120D1PAG device:

- Silicon carbide (SiC) Schottky diode
 - Zero reverse recovery
 - Zero forward recovery
 - Temperature-independent switching behavior
 - Positive temperature coefficient on VF
- M5 power connectors
- Aluminum nitride (AlN) substrate for improved thermal performance

1.2 Benefits

The following are benefits of the MSCDC100KK120D1PAG device:

- Stable temperature behavior
- Low losses
- Direct mounting to heatsink (isolated package)
- Low junction-to-case thermal resistance
- RoHS compliant

1.3 Applications

The MSCDC100KK120D1PAG device is designed for the following applications:

- Welding converters
- Switched mode power supplies
- Uninterrupted power supplies
- Motor control

2 Electrical Specifications

This section shows the electrical specifications of the MSCDC100KK120D1PAG device.

2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per SiC diode of the MSCDC100KK120D1PAG device.

Table 1 • Absolute Maximum Ratings

| Symbol | Parameter | Maximum Ratings | Unit |
|-----------|---------------------------------|--|------|
| V_{RRM} | Repetitive peak reverse voltage | 1200 | V |
| I_F | DC forward current | $T_c = 100\text{ }^\circ\text{C}$ 100 | A |

The following table shows the thermal and package characteristics of the MSCDC100KK120D1PAG.

Table 2 • Thermal and Package Characteristics

| Symbol | Characteristic | Min | Max | Unit | |
|------------|---|---------------|-----------------|------------------|-----|
| V_{ISOL} | RMS isolation voltage, any terminal to case $t = 1$ minute, 50 Hz/60 Hz | 4000 | | V | |
| T_J | Operating junction temperature range | -40 | 175 | $^\circ\text{C}$ | |
| T_{JOP} | Recommended junction temperature under switching conditions | -40 | $T_{Jmax} - 25$ | | |
| T_{STG} | Storage temperature range | -40 | 125 | | |
| T_c | Operating case temperature | -40 | 125 | | |
| Torque | Mounting torque | For terminals | M5 2 | 3.5 | N.m |
| | | To Heatsink | M6 3 | 5 | |
| Wt | Package weight | | 160 | g | |

2.2 Electrical Performance

The following table shows the electrical characteristics per SiC diode of the MSCDC100KK120D1PAG.

Table 3 • Electrical Characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|------------|-------------------------------------|---|-----|-----|-------|--------------------|
| V_F | Diode forward voltage | $I_F = 100\text{ A}$ $T_J = 25\text{ }^\circ\text{C}$ | | 1.5 | 1.8 | V |
| | | $T_J = 175\text{ }^\circ\text{C}$ | | 2.1 | | |
| I_{RM} | Reverse leakage current | $V_R = 1200\text{ V}$ $T_J = 25\text{ }^\circ\text{C}$ | | 30 | 400 | μA |
| | | $T_J = 175\text{ }^\circ\text{C}$ | | 500 | | |
| Q_C | Total capacitive charge | $V_R = 600\text{ V}$ | | 448 | | nC |
| C | Total capacitance | $f = 1\text{ MHz}, V_R = 400\text{ V}$ | | 492 | | pF |
| | | $f = 1\text{ MHz}, V_R = 800\text{ V}$ | | 364 | | |
| R_{thJC} | Junction-to-case thermal resistance | | | | 0.304 | $^\circ\text{C/W}$ |

2.3 Performance Curves

This section shows the typical performance curves of the MSCDC100KK120D1PAG device.

Figure 1 • Maximum Transient Thermal Impedance

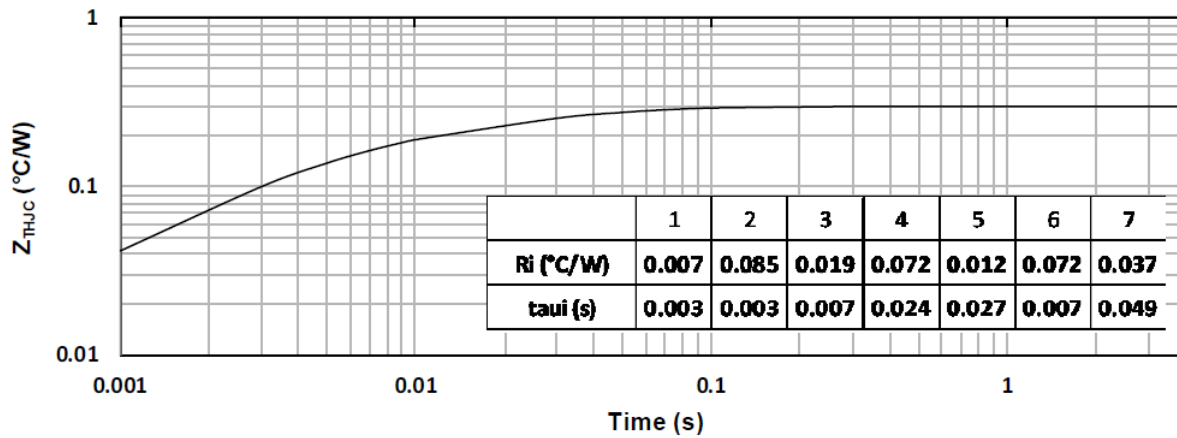


Figure 2 • Forward Current vs. Forward Voltage

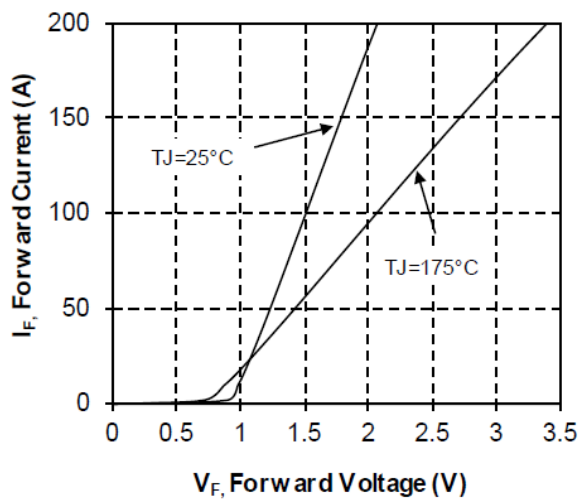
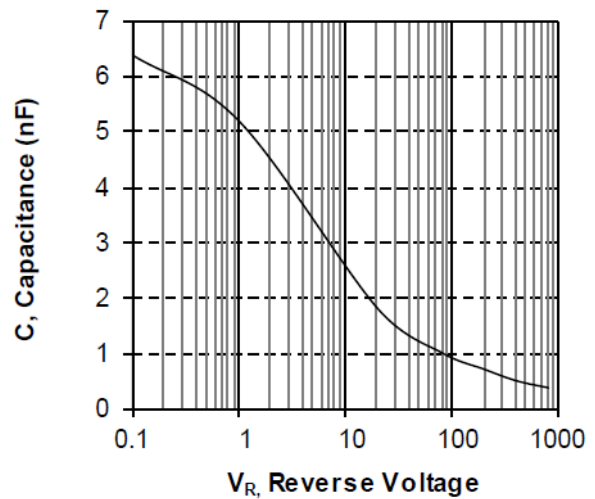


Figure 3 • Capacitance vs. Reverse Voltage



3 Package Specification

This section shows the package specification of the MSCDC100KK120D1PAG device.

3.1 Package Outline Drawing

The package outline of the MSCDC100KK120D1PAG device is illustrated in this section. The dimensions in the following figure are in millimeters.

Figure 4 • Package Outline Drawing

