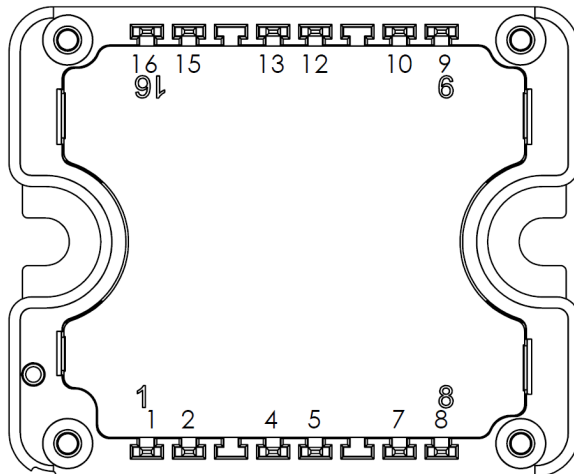
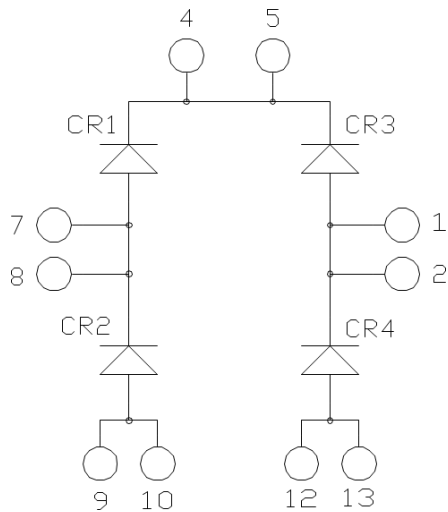


MSCDC50H1201AG SiC Diode Full Bridge Power Module

1 Product Overview

This section shows the product overview for the MSCDC50H1201AG 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 MSCDC50H1201AG device:

- Silicon Carbide (SiC) Schottky Diode
 - Zero reverse recovery
 - Zero forward recovery
 - Temperature independent switching behavior
 - Positive temperature coefficient on VF
- High blocking voltage
- Very low stray inductance
- Aluminum nitride (AlN) substrate for improved thermal performance

1.2 Benefits

The following are benefits of the MSCDC50H1201AG device:

- Outstanding performance at high frequency operation
- Solderable terminals for easy PCB mounting
- Direct mounting to heatsink (isolated package)
- Low profile
- RoHS compliant

1.3 Applications

The MSCDC50H1201AG device is designed for the following applications:

- Uninterruptible power supply (UPS)
- Induction heating
- Welding equipment
- High-speed rectifiers

2 Electrical Specifications

This section shows the electrical specifications for the MSCDC50H1201AG device.

2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per SiC diode for the MSCDC50H1201AG device.

Table 1 • Absolute Maximum Ratings

| Symbol | Parameter | Maximum Ratings | Unit |
|-----------|---------------------------------|-----------------------------------------|------|
| V_{RRM} | Repetitive peak reverse voltage | 1200 | V |
| I_F | DC forward current | $T_C = 100\text{ }^\circ\text{C}$ 50 | A |

The following table shows the thermal and package characteristics of the MSCDC50H1201AG.

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 | To heatsink | M4 | 2 | 3 | N.m |
| Wt | Package weight | | | | 80 | g |

2.2 Electrical Performance

The following table shows the electrical characteristics per SiC diode of the MSCDC50H1201AG.

Table 3 • Electrical Characteristics Per Diode

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|------------|-------------------------------------|------------------------------------------------------------------------------------------------|-----|------------|------|--------------------|
| V_F | Diode forward voltage | $I_F = 50\text{ A}$ $T_J = 25\text{ }^\circ\text{C}$ $T_J = 175\text{ }^\circ\text{C}$ | | 1.5 2.1 | 1.8 | V |
| I_{RM} | Reverse leakage current | $V_R = 1200\text{ V}$ $T_J = 25\text{ }^\circ\text{C}$ $T_J = 175\text{ }^\circ\text{C}$ | | 15 250 | 200 | μA |
| Q_C | Total capacitive charge | $V_R = 600\text{ V}$ | | 224 | | nC |
| C | Total capacitance | $f = 1\text{ MHz}, V_R = 400\text{ V}$ $f = 1\text{ MHz}, V_R = 800\text{ V}$ | | 246 182 | | pF |
| R_{thJC} | Junction-to-case thermal resistance | | | | 0.56 | $^\circ\text{C/W}$ |

2.3 Performance Curves

This section shows the typical performance curves for the MSCDC50H1201AG device.

Figure 1 • Maximum Transient Thermal Impedance

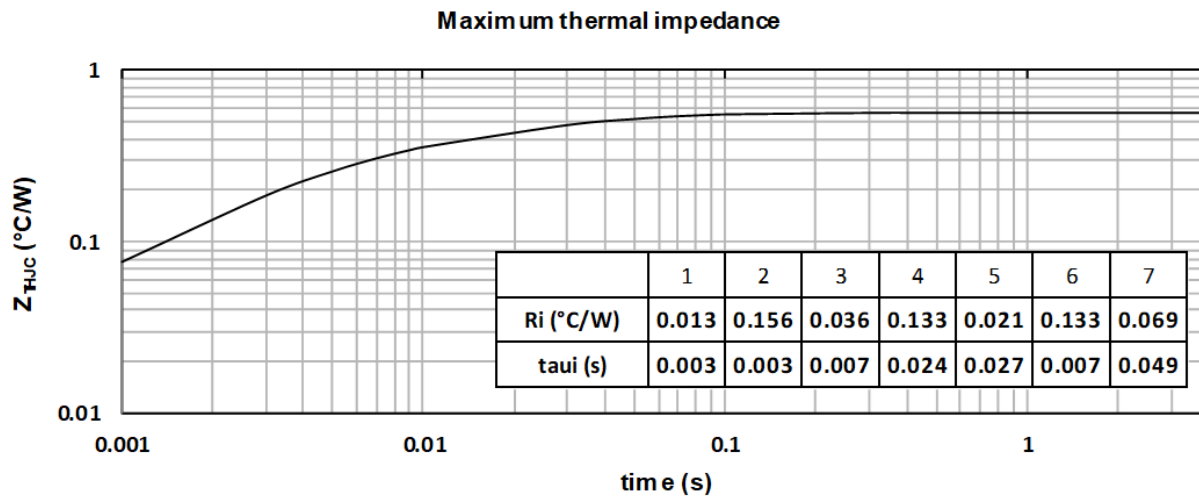


Figure 2 • Forward Current vs Forward Voltage

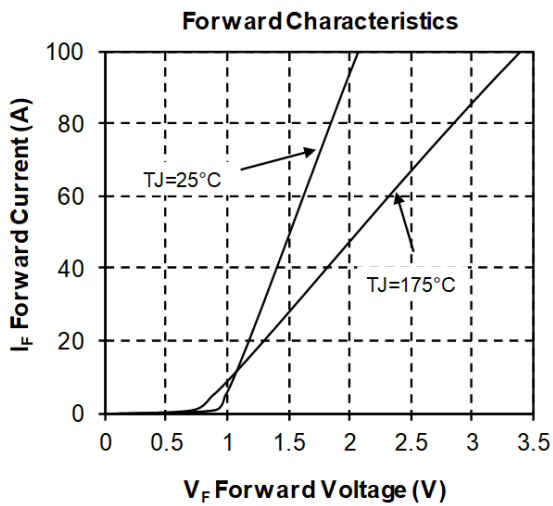
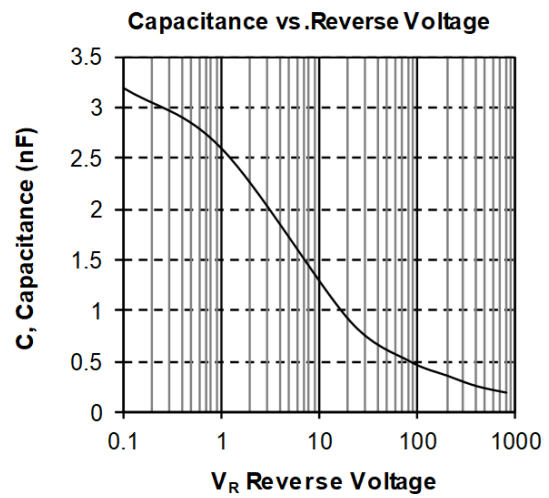


Figure 3 • Capacitance vs. Reverse Voltage



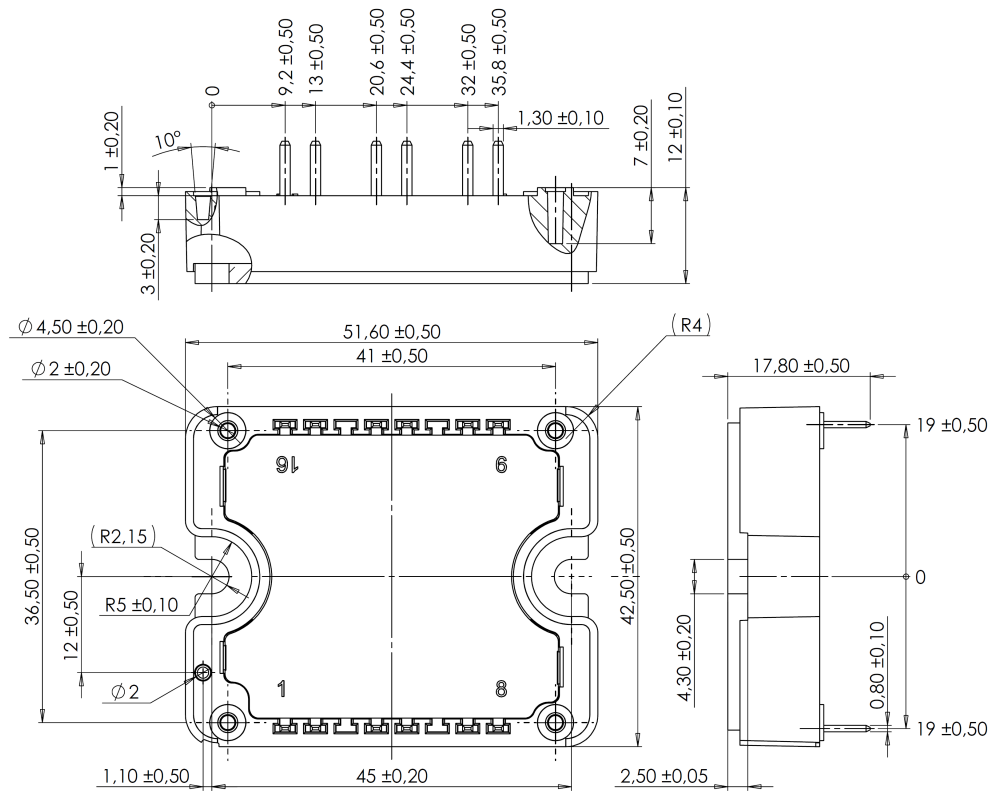
3 Package Specifications

This section shows the package specifications for the MSCDC50H1201AG device.

3.1 Package Outline Drawing

This section shows the package outline drawing of the MSCDC50H1201AG device. The dimensions in the following figure are in millimeters.

Figure 4 • Package Outline Drawing



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