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1 Revision History

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

1.1 Revision 1.0

Revision 1.0 was published in December 2019. It is the first publication of this document.
2 Product Overview

This section shows the product overview of the MSCDC50X1701AG device.

All multiple inputs and outputs must be shorted together

1/2; 7/8; 9/10; 12/13; 15/16

All ratings at Tj = 25 °C, unless otherwise specified.

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

2.1 Features

The following are key features of the MSCDC50X1701AG 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
2.2 Benefits

The following are benefits of the MSCDC50X1701AG device:

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

2.3 Applications

The MSCDC50X701AG device is designed for the following applications:

- Welding converters
- Switched-mode power supplies
- Uninterruptible power supplies
- Battery DC power supply
3 Electrical Specifications

This section shows the electrical specifications of the MSCDC50X1701AG device.

3.1 Absolute Maximum Ratings

The following tables show the absolute maximum ratings per SiC diode and thermal and package characteristics of the MSCDC50X1701AG device.

**Table 1 • Absolute Maximum Ratings**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Max Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{RRM}$</td>
<td>Repetitive peak reverse voltage</td>
<td>1700</td>
<td>V</td>
</tr>
<tr>
<td>$I_F$</td>
<td>DC forward current</td>
<td>$T_C = 125 , ^\circ C$</td>
<td>50</td>
</tr>
</tbody>
</table>

**Table 2 • Thermal and Package Characteristics**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristics</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{ISOL}$</td>
<td>RMS isolation voltage, any terminal to case $t = 1$ minute, 50 Hz/60 Hz</td>
<td>4000</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$T_J$</td>
<td>Operating junction temperature range</td>
<td>$-40$</td>
<td>175</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{JOP}$</td>
<td>Recommended junction temperature under switching conditions</td>
<td>$-40$</td>
<td>$T_{Jmax}=25$</td>
<td></td>
</tr>
<tr>
<td>$T_{STG}$</td>
<td>Storage temperature range</td>
<td>$-40$</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>$T_C$</td>
<td>Operating case temperature</td>
<td>$-40$</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>Torque</td>
<td>Mounting torque</td>
<td>M4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Wt</td>
<td>Package weight</td>
<td></td>
<td>80</td>
<td>g</td>
</tr>
</tbody>
</table>

3.2 Electrical Performance

The following table shows the electrical characteristics per SiC diode of the MSCDC50X1701AG device.

**Table 3 • Electrical Characteristics**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristics</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_F$</td>
<td>Diode forward voltage</td>
<td>$I_F = 50 , A$</td>
<td>$T_J = 25 , ^\circ C$</td>
<td>1.5</td>
<td>1.8</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$T_J = 175 , ^\circ C$</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{RM}$</td>
<td>Reverse leakage current</td>
<td>$V_R = 1700 , V$</td>
<td>$T_J = 25 , ^\circ C$</td>
<td>50</td>
<td>200</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$T_J = 175 , ^\circ C$</td>
<td>250</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 3.3 Typical Performance Curves

This section shows the typical performance curves of the MSCDC50X1701AG device.

**Figure 1 • Maximum Transient Thermal Impedance**

![Maximum thermal impedance graph]

**Figure 2 • Forward Current vs. Forward Voltage**

![Forward Current vs. Forward Voltage graph]

**Figure 3 • Capacitance vs. Reverse Voltage**

![Capacitance vs. Reverse Voltage graph]
4 Package Specifications

This section shows the package specifications for the MSCDC50X1701AG device.

4.1 Package Outline Drawing

The following image illustrates the package outline of MSCDC50X1701AG device. The dimensions in the following figure are in millimeters.

Figure 4 • Package Outline Drawing
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