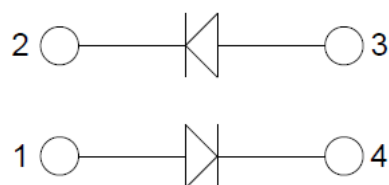


MSC2X51_50DC70J SiC Diode Power Module

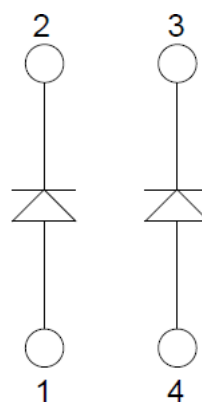
1 Product Overview

This section shows the product overview of the MSC2X51_50DC70J device.



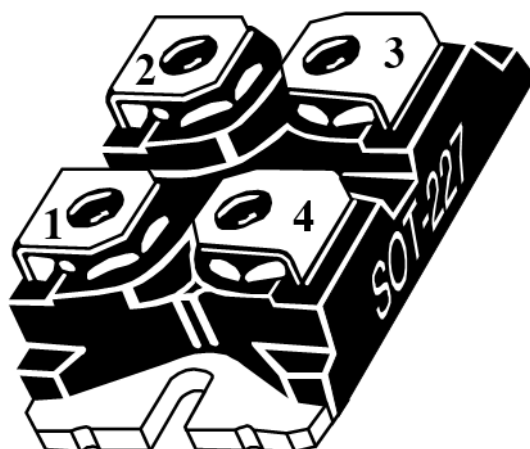
Anti-Parallel

MSC2X50DC70J



Parallel

MSC2X51DC70J



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 the key features of the MSC2X51_50DC70J device:

- Silicon carbide (SiC) Schottky diode
 - Zero reverse recovery
 - Zero forward recovery
 - Temperature-independent switching behavior
 - Positive temperature coefficient on VF
- Very low stray inductance

1.2 Benefits

The following are the benefits of the MSC2X51_50DC70J device:

- Outstanding performance at high-frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction-to-case thermal resistance
- RoHS compliant

1.3 Applications

The MSC2X51_50DC70J device is designed for the following applications:

- Uninterruptible power supplies
- Induction heating
- Welding equipment
- High-speed rectifiers

2 Electrical Specifications

This section shows the electrical specifications of the MSC2X51_50DC70J device.

2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per SiC diode of the MSC2X51_50DC70J device.

Table 1 • Absolute Maximum Ratings

Symbol	Parameter	Maximum Ratings	Unit
V_{RRM}	Repetitive peak reverse voltage	700	V
I_F	DC forward current	$T_C = 80\text{ }^{\circ}\text{C}$ 50	A

The following table shows the thermal and package characteristics of the MSC2X51_50DC70J.

Table 2 • Thermal and Package Characteristics

Symbol	Characteristic	Min	Typ	Max	Unit
V_{ISOL}	RMS isolation voltage, any terminal to case $t = 1$ minute, 50 Hz/60 Hz	2500			V
T_J, T_{STG}	Storage temperature range	-55		175	$^{\circ}\text{C}$
T_{JOP}	Recommended junction temperature under switching conditions	-55		$T_{Jmax} - 25$	
Torque	Terminals and mounting screws			1.1	N.m
Wt	Package weight		29.2		g

2.2 Electrical Performance

The following table shows the electrical characteristics per SiC diode of the MSC2X51_50DC70J.

Table 3 • Electrical Characteristics

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 1.9	1.8	V
I_{RM}	Reverse leakage current	$V_R = 700\text{ V}$ $T_J = 25\text{ }^{\circ}\text{C}$ $T_J = 175\text{ }^{\circ}\text{C}$		15 250	200	μA
Q_C	Total capacitive charge	$V_R = 400\text{ V}$		133		nC
C	Total capacitance	$f = 1\text{ MHz}, V_R = 200\text{ V}$ $f = 1\text{ MHz}, V_R = 400\text{ V}$		248 216		pF
R_{thJC}	Junction-to-case thermal resistance				0.86	$^{\circ}\text{C/W}$

2.3 Performance Curves

This section shows the typical performance curves of the MSC2X51_50DC70J device.

Figure 1 • Maximum Transient Thermal Impedance

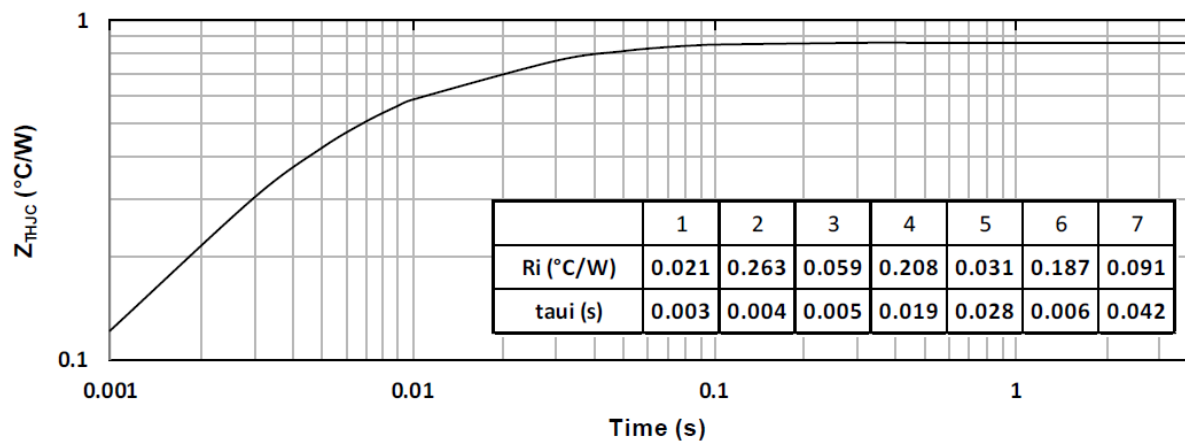


Figure 2 • Forward Current vs. Forward Voltage

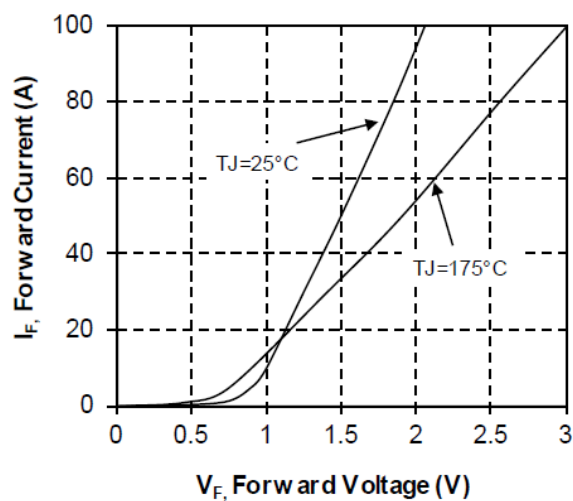
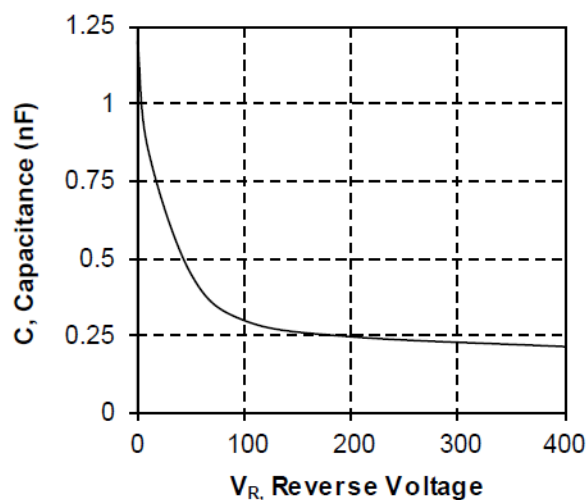


Figure 3 • Capacitance vs. Reverse Voltage



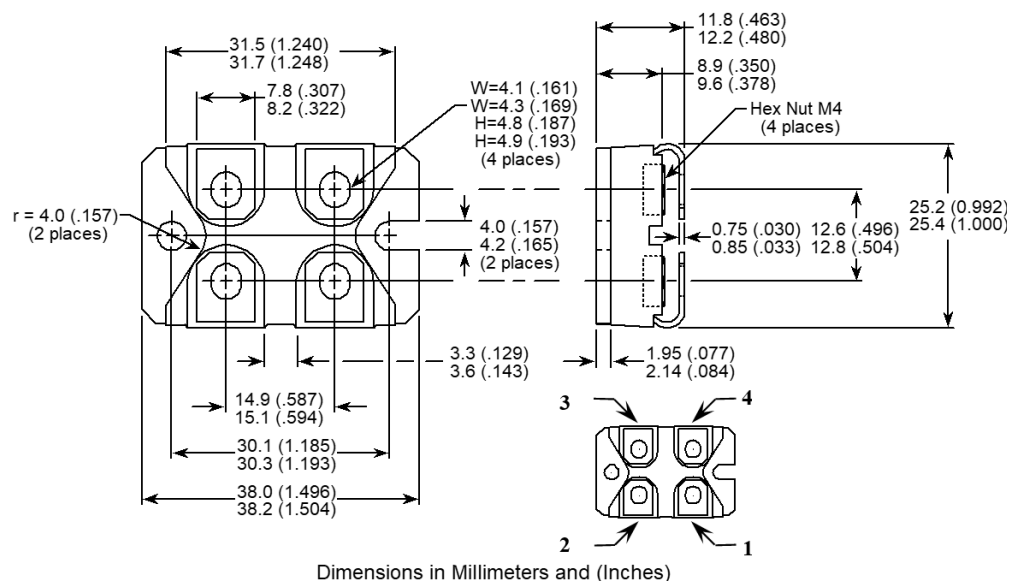
3 Package Specification

This section shows the package specification of the MSC2X51_50DC70J device.

3.1 Package Outline Drawing

The package outline of the MSC2X51_50DC70J device is illustrated in this section.

Figure 4 • Package Outline Drawing



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MSCC-0344-DS-01027-1.0-0619 | June 2019 | Final

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