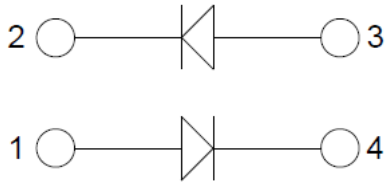
MSC2X51_50DC70J SiC Diode Power Module

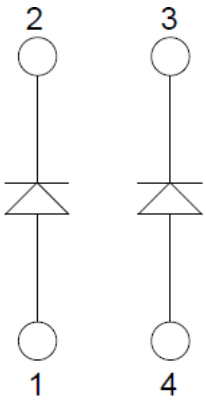
1 Product Overview

This section shows the product overview of the MSC2X51_50DC70J device.



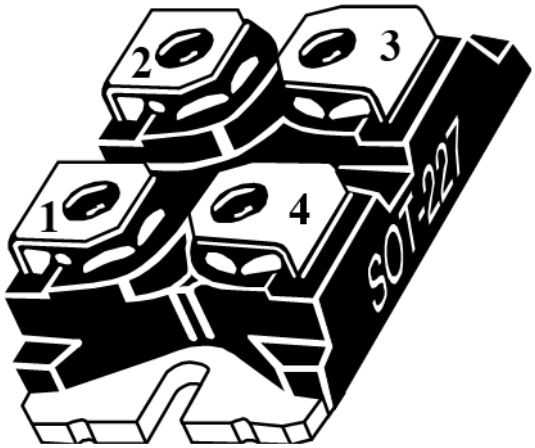
Anti-Parallel

MSC2X50DC70J



Parallel

MSC2X51DC70J



All ratings at T_j = 25°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 °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
TJ, T_{STG}	Storage temperature range	–55		175	°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.

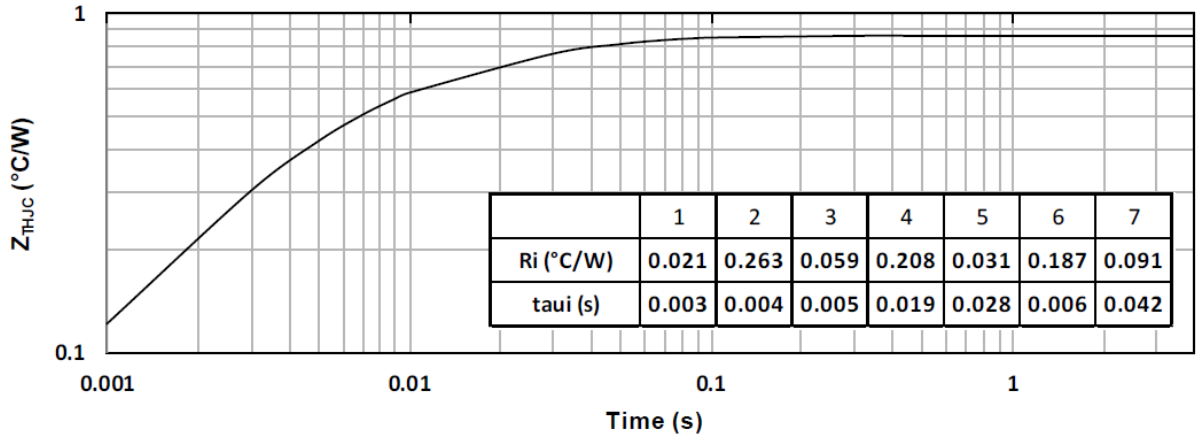
Table 3 • Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V_F	Diode forward voltage	I_F = 50 A	T_j = 25 °C		1.5	1.8	V
			T_j = 175 °C		1.9		
I_{RM}	Reverse leakage current	V_R = 700 V	T_j = 25 °C		15	200	µA
			T_j = 175 °C		250		
Q_C	Total capacitive charge	V_R = 400 V			133		nC
C	Total capacitance	f = 1 MHz, V_R = 200 V			248		pF
		f = 1 MHz, V_R = 400 V			216		
R_{thJC}	Junction-to-case thermal resistance					0.86	°C/W

2.3 Performance Curves

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

Figure 1 • Maximum Transient Thermal Impedance



	1	2	3	4	5	6	7
Ri (°C/W)	0.021	0.263	0.059	0.208	0.031	0.187	0.091
taui (s)	0.003	0.004	0.005	0.019	0.028	0.006	0.042

Figure 2 • Forward Current vs. Forward Voltage

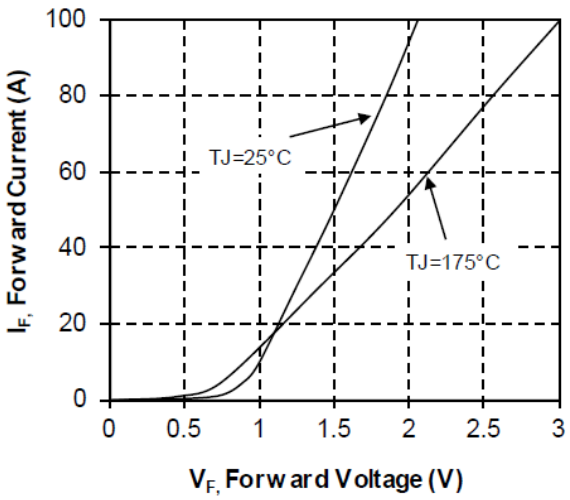
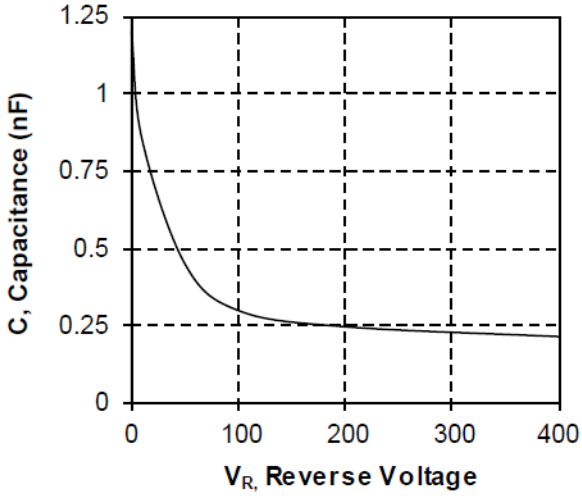


Figure 3 • Capacitance vs. Reverse Voltage



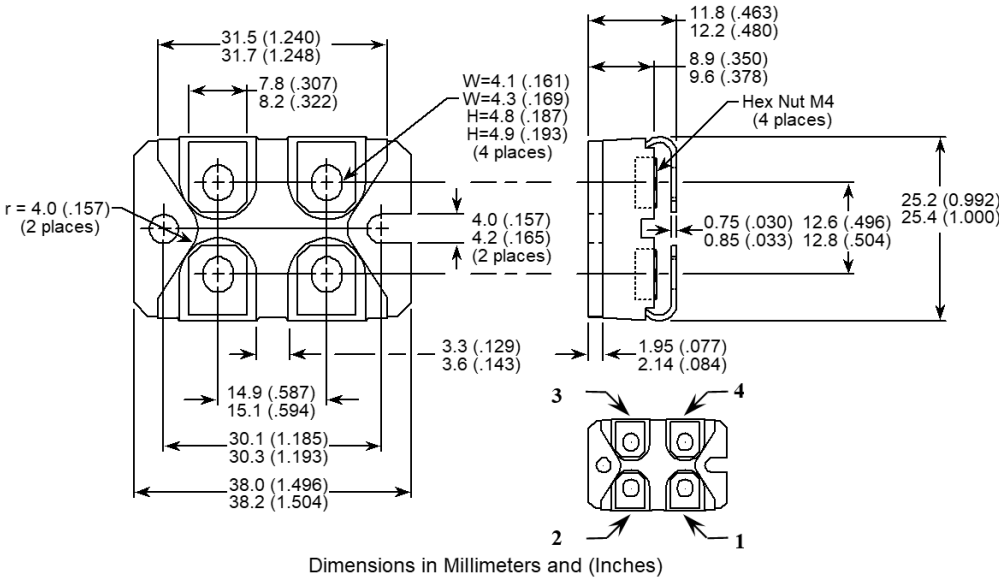
3 Package Specification

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



Dimensions in Millimeters and (Inches)

Microsemi Headquarters
One Enterprise, Aliso Viejo,
CA 92656 USA
Within the USA: +1 (800) 713-4113
Outside the USA: +1 (949) 380-6100
Sales: +1 (949) 380-6136
Fax: +1 (949) 215-4996
Email: sales.support@microsemi.com
www.microsemi.com

Microsemi, a wholly owned subsidiary of Microchip Technology Inc. (Nasdaq: MCHP), offers a comprehensive portfolio of semiconductor and system solutions for aerospace & defense, communications, data center and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions; security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, California, and has approximately 4,800 employees globally. Learn more at www.microsemi.com.

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

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Microchip:

MSC2X50DC70J MSC2X51DC70J