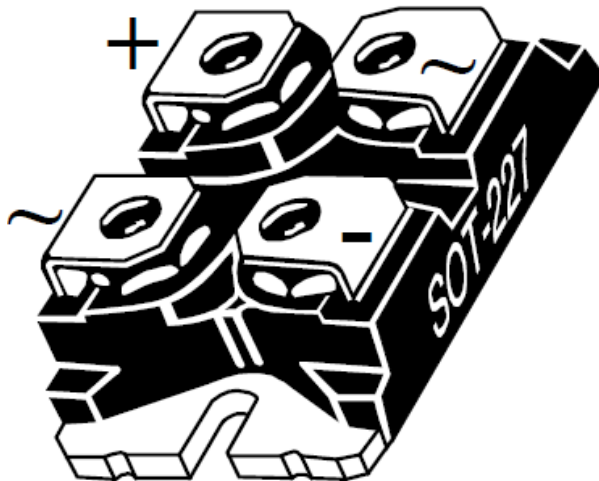
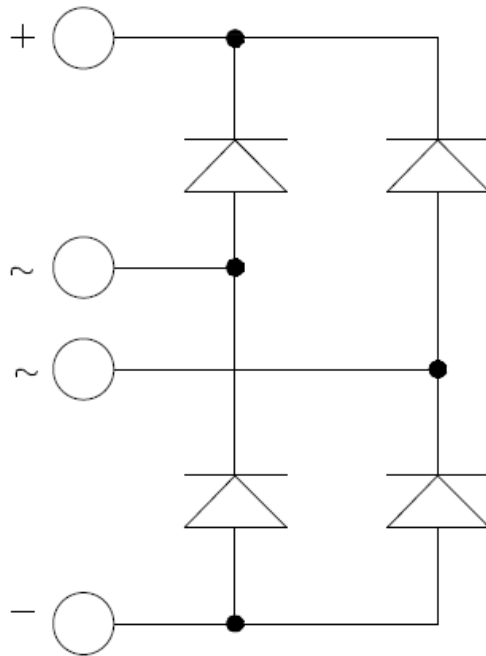


# MSC50DC70HJ SiC Diode Full Bridge Power Module

## 1 Product Overview

This section shows the product overview of the MSC50DC70HJ 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 MSC50DC70HJ 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
- High level of integration

## 1.2 Benefits

The following are benefits of the MSC50DC70HJ 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 MSC50DC70HJ device is designed for the following applications:

- Switch-mode power supplies rectifier
- Induction heating
- Welding equipment
- High-speed rectifiers

## 2 Electrical Specifications

This section shows the electrical specifications of the MSC50DC70HJ device.

### 2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per SiC diode of the MSC50DC70HJ device.

**Table 1 • Absolute Maximum Ratings**

Symbol	Parameter	Maximum Ratings	Unit
$V_{RRM}$	Repetitive peak reverse voltage	700	V
$I_F$	DC forward current	$T_C = 25\text{ }^\circ\text{C}$ 50	A

The following table shows the thermal and package characteristics of the MSC50DC70HJ.

**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 MSC50DC70HJ.

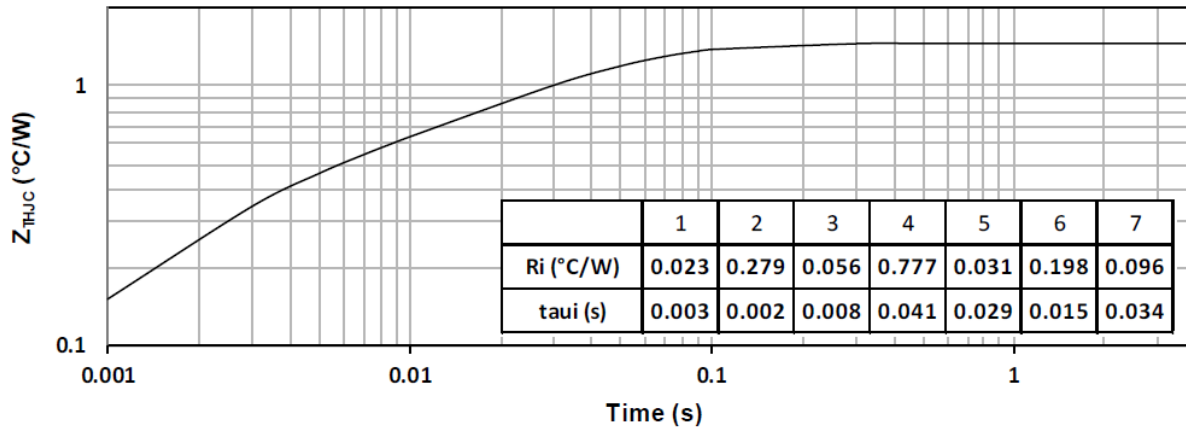
**Table 3 • Electrical Characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode forward voltage	$I_F = 50\text{ A}$ $T_J = 25\text{ }^\circ\text{C}$		1.5	1.8	V
		$T_J = 175\text{ }^\circ\text{C}$		1.9		
$I_{RM}$	Reverse leakage current	$V_R = 700\text{ V}$ $T_J = 25\text{ }^\circ\text{C}$		15	200	$\mu\text{A}$
		$T_J = 175\text{ }^\circ\text{C}$		250		
$Q_C$	Total capacitive charge	$V_R = 400\text{ V}$		133		nC
$C$	Total capacitance	$f = 1\text{ MHz}, V_R = 200\text{ V}$		248		pF
		$f = 1\text{ MHz}, V_R = 400\text{ V}$		216		
$R_{thJC}$	Junction-to-case thermal resistance				1.46	$^\circ\text{C/W}$

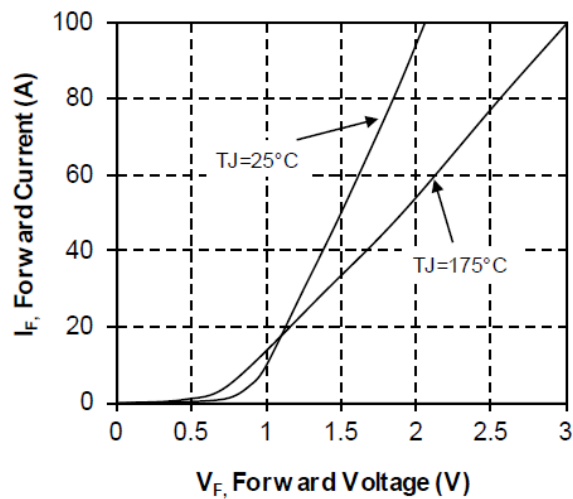
## 2.3 Performance Curves

This section shows the typical performance curves of the MSC50DC70HJ device.

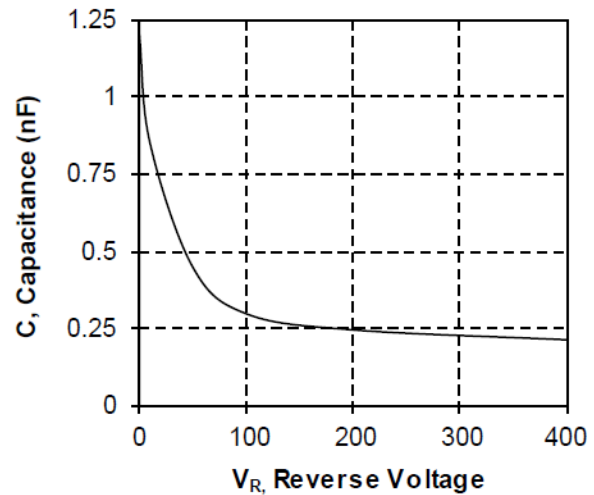
**Figure 1 • Maximum Transient Thermal Impedance**



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



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



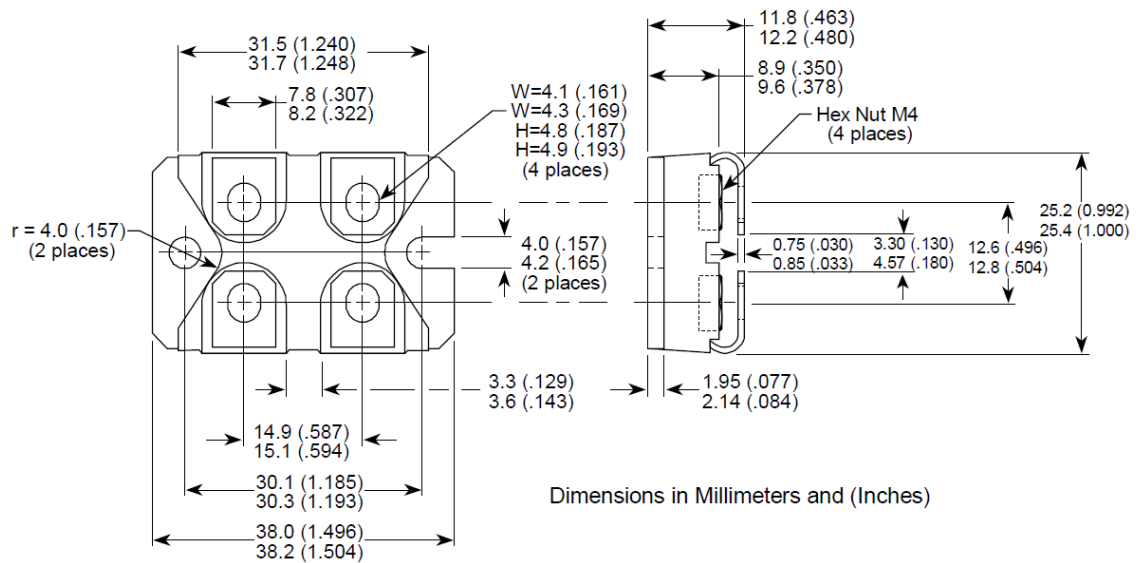
### 3 Package Specification

This section shows the package specification of the MSC50DC70HJ device.

#### 3.1 Package Outline Drawing

The package outline of the MSC50DC70HJ device is illustrated in this section.

**Figure 4 • Package Outline Drawing**





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