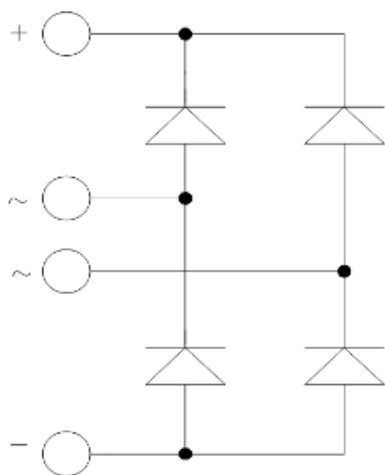


MSC50DC120HJ SiC Diode Full Bridge Power Module

1 Product Overview

This section provides the product overview for the MSC50DC120HJ device.



All ratings at $T_j = 25\text{ }^{\circ}\text{C}$, 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 MSC50DC120HJ 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 MSC50DC120HJ 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 MSC50DC120HJ device is designed for the following applications:

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

2 Electrical Specifications

This section provides the electrical specifications for the MSC50DC120HJ device.

2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per diode for the MSC50DC120HJ device.

Table 1 • Absolute Maximum Ratings

Symbol	Parameter	Maximum Ratings	Unit
V_{RRM}	Repetitive peak reverse voltage	1200	V
I_F	DC forward current	$T_C = 60\text{ }^{\circ}\text{C}$ 50	A

The following table shows the thermal and package characteristics of the MSC50DC120HJ.

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_{JSTG}	Storage temperature range	-55		175	$^{\circ}\text{C}$
T_{JOP}	Recommended junction temperature under switching conditions	-55		$T_{Jmax} - 25$	
Torque	Terminal 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 diode of the MSC50DC120HJ.

Table 3 • Electrical Characteristics Per Diode

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_F	Diode forward voltage	$I_F = 50\text{ A}$ $T_J = 25\text{ }^{\circ}\text{C}$		1.5	1.8	V
		$T_J = 175\text{ }^{\circ}\text{C}$		2.1		
I_{RM}	Reverse leakage current	$V_R = 1200\text{ V}$ $T_J = 25\text{ }^{\circ}\text{C}$		15	200	μA
		$T_J = 175\text{ }^{\circ}\text{C}$		250		
Q_C	Total capacitive charge	$V_R = 600\text{ V}$		224		nC
C	Total capacitance	$f = 1\text{ MHz}$, $V_R = 400\text{ V}$		246		pF
		$f = 1\text{ MHz}$, $V_R = 800\text{ V}$		182		
R_{thJC}	Junction-to-case thermal resistance				0.95	$^{\circ}\text{C/W}$

2.3 Performance Curves

This section shows the typical performance curves for the MSC50DC120HJ device.

Figure 1 • Maximum Transient Thermal Impedance

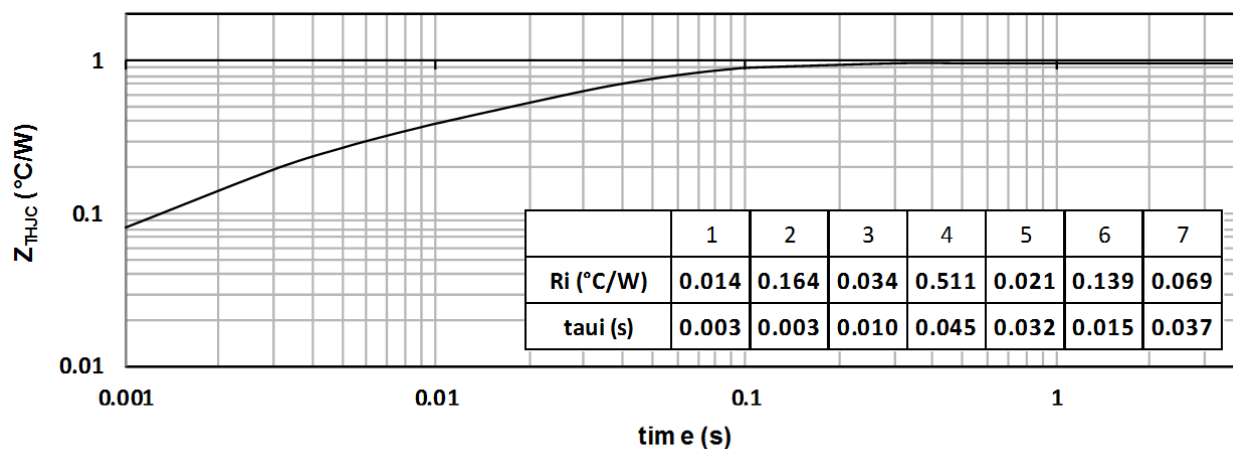


Figure 2 • Forward Current vs. Forward Voltage

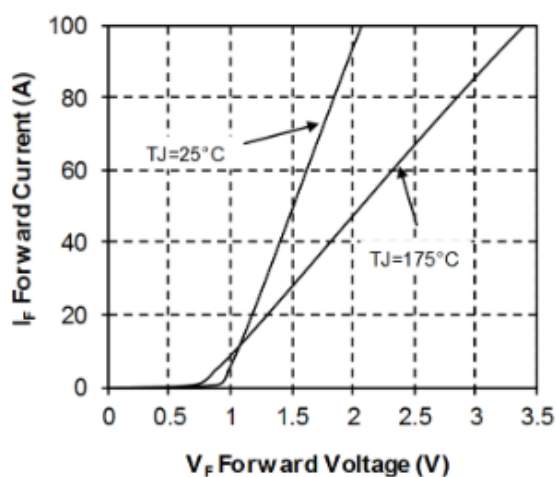
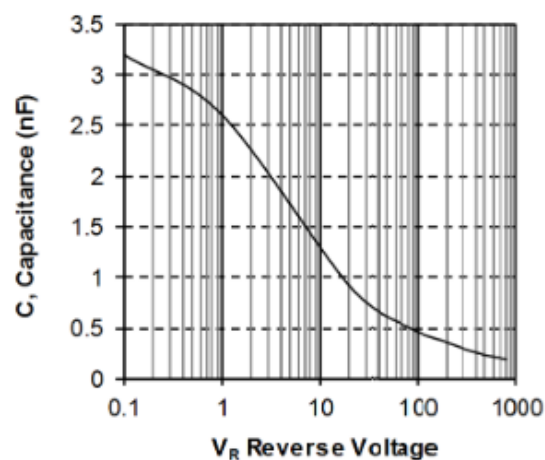


Figure 3 • Capacitance vs. Reverse Voltage



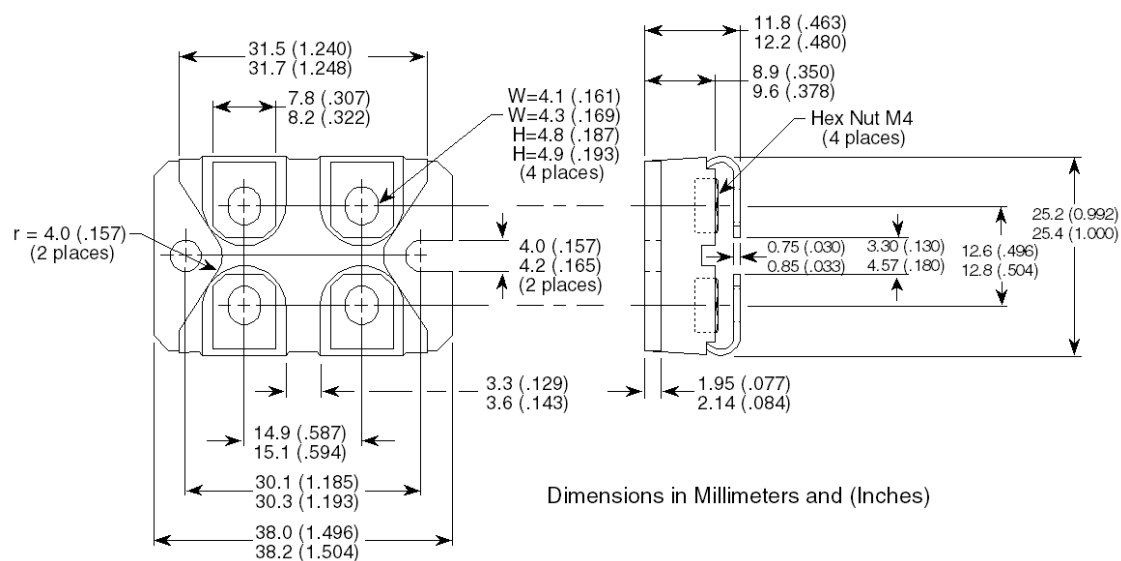
3 Package Specifications

This section shows the package specifications for the MSC50DC120HJ device.

3.1 Package Outline Drawing

The following drawing shows the package outline of the MSC50DC120HJ device. The dimensions in the following figure are in millimeters.

Figure 4 • Package Outline Drawing



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