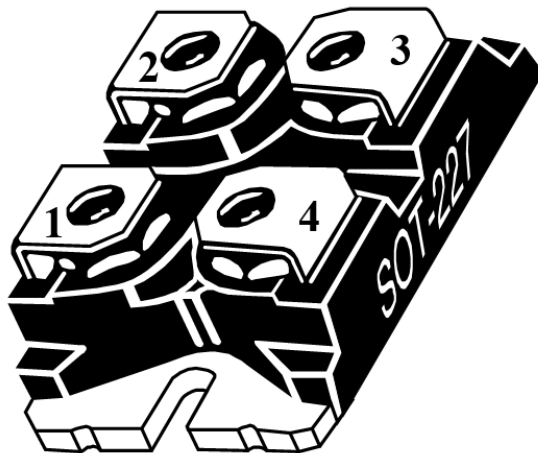
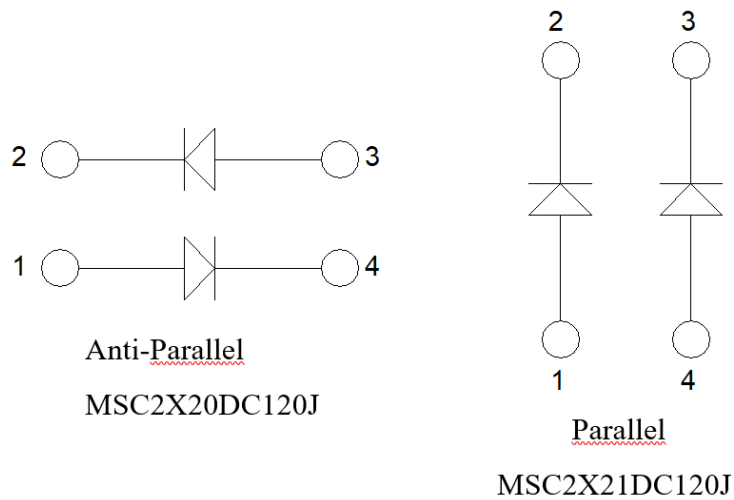


## MSC2X21-20DC120J SiC Diode Power Module

### 1 Product Overview

This section shows the product overview for the MSC2X21-20DC120J 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 MSC2X21-20DC120J 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 benefits of the MSC2X21-20DC120J 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 MSC2X21-20DC120J device is designed for the following applications:

- Uninterruptible power supply (UPS)
- Induction heating
- Welding equipment
- High-speed rectifiers

## 2 Electrical Specifications

This section shows the electrical specifications for the MSC2X21-20DC120J device.

### 2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per SiC diode for the MSC2X21-20DC120J device.

**Table 1 • Absolute Maximum Ratings**

Symbol	Parameter	Maximum Ratings	Unit
$V_{RRM}$	Repetitive peak reverse voltage	1200	V
$I_F$	DC forward current	$T_C = 125\text{ }^\circ\text{C}$ 20	A

The following table shows the thermal and package characteristics of the MSC2X21-20DC120J.

**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
$T_i, T_{STG}$	Storage temperature range	-55		175	$^\circ\text{C}$
$T_{JOP}$	Recommended junction temperature under switching conditions	-55		$T_{Jmax} - 25$	
Torque	Mounting torque			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 MSC2X21-20DC120J.

**Table 3 • Electrical Characteristics Per Diode**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode forward voltage	$I_F = 30\text{ A}$ $T_j = 25\text{ }^\circ\text{C}$ $T_j = 175\text{ }^\circ\text{C}$		1.5 2	1.8	V
$I_{RM}$	Reverse leakage current	$V_R = 1200\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ $T_j = 175\text{ }^\circ\text{C}$		20 300	600	$\mu\text{A}$
$Q_C$	Total capacitive charge	$V_R = 600\text{ V}$		146		nC
C	Total capacitance	$f = 1\text{ MHz}, V_R = 400\text{ V}$ $f = 1\text{ MHz}, V_R = 800\text{ V}$		160 118		pF
$R_{thJC}$	Junction-to-case thermal resistance				0.82	$^\circ\text{C/W}$

## 2.3 Performance Curves

This section shows the typical performance curves for the MSC2X21-20DC120J device.

Figure 1 • Maximum Transient Thermal Impedance

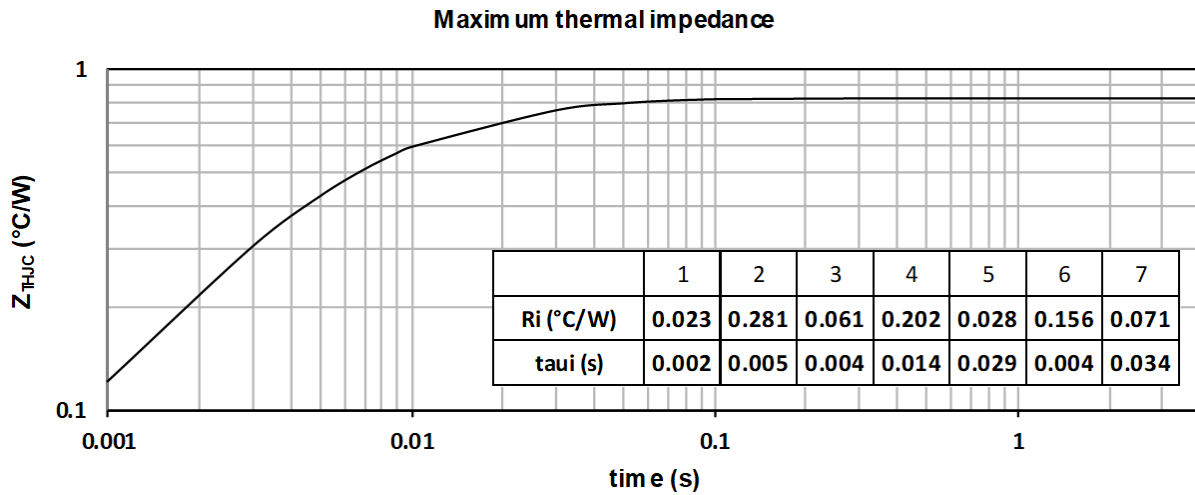


Figure 2 • Forward Current vs. Forward Voltage

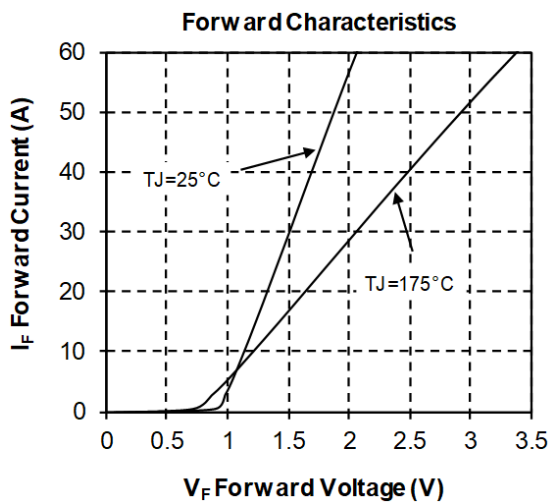
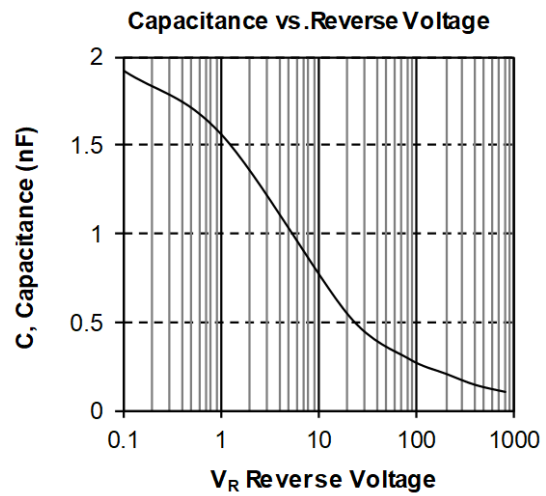


Figure 3 • Capacitance vs. Reverse Voltage



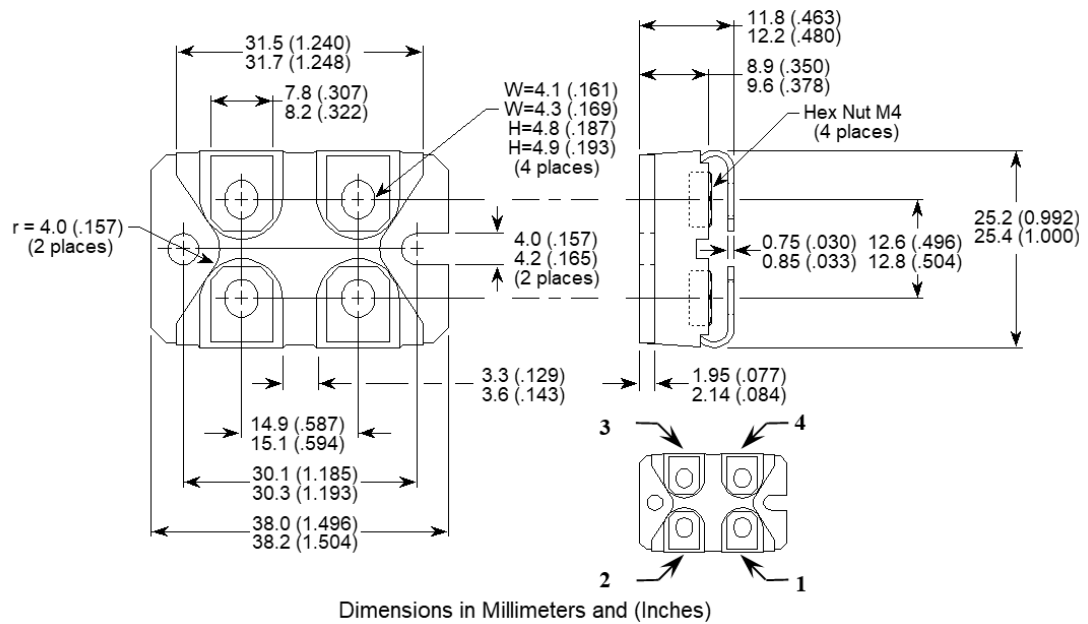
### 3 Package Specifications

This section shows the package specifications for the MSC2X21-20DC120J device.

#### 3.1 Package Outline Drawing

This section shows the package outline drawing of the MSC2X21-20DC120J device. The dimensions in the following figure are in millimeters.

Figure 4 • Package Outline Drawing





**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](mailto:sales.support@microsemi.com)  
[www.microsemi.com](http://www.microsemi.com)

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