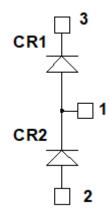
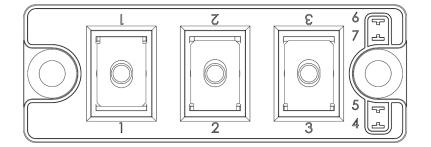


# MSCDC150A120D1PAG Phase leg SiC diodes Power Module

## **1 Product Overview**

This section shows the product overview for the MSCDC150A120D1PAG device.





All ratings at T<sub>j</sub> = 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 key features of the MSCDC150A120D1PAG device:

- Silicon Carbide (SiC) Schottky Diode
  - Zero reverse recovery
  - Zero forward recovery
  - Temperature independent switching behavior
  - Positive temperature coefficient on VF
- M5 power connectors
- Aluminum nitride (AIN) substrate for improved thermal performance

### 1.2 Benefits

The following are benefits of the MSCDC150A120D1PAG device:

- Stable temperature behavior
- Low losses
- Direct mounting to heatsink (isolated package)
- Low junction-to-case thermal resistance
- RoHS compliant

### **1.3** Applications

The MSCDC150A120D1PAG device is designed for the following applications:

- Uninterruptible power supply (UPS)
- Switched mode power supply
- Welding converters
- Motor control



## 2 Electrical Specifications

This section shows the electrical specifications for the MSCDC150A120D1PAG device.

#### 2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per SiC diode for the MSCDC150A120D1PAG device.

#### Table 1 • Absolute Maximum Ratings

Symbol	Parameter		Maximum Ratings	Unit
Vrrm	Repetitive peak reverse voltage		1200	V
IF	DC forward current	Tc = 95 °C	150	А

The following table shows the thermal and package characteristics of the MSCDC150A120D1PAG.

#### Table 2 • Thermal and Package Characteristics

Symbol	Characteristic			Min	Max	Unit
VISOL	RMS isolation voltage, any terminal to case t =1 minute, 50 Hz/60 Hz					V
Τ	Operating junction temperature range			-40	175	°C
POL	Recommended junction temperature under switching conditions			-40	T <sub>Jmax</sub> –25	
Tstg	Storage temperature range			-40	125	
Tc	Operating case temperature			-40	125	
Torque	Mounting torque	To heatsink	M6	3	5	N.m
		For terminals	M5	2	3.5	
Wt	Package weight				160	g

### 2.2 Electrical Performance

The following table shows the electrical characteristics per SiC diode of the MSCDC150A120D1PAG.

Symbol	Characteristic	Test Conditions		Min	Тур	Max	Unit
VF	Diode forward voltage	IF = 150 A	T <sub>j</sub> = 25 °C		1.5	1.8	V
			T <sub>j</sub> = 175 °C		2.1		-
Irm	Reverse leakage current	V <sub>R</sub> = 1200 V	T <sub>j</sub> = 25 °C		45	600	μΑ
			T <sub>j</sub> = 175 °C		750		-
Qc	Total capacitive charge	V <sub>R</sub> = 600 V			672		nC
С	Total capacitance	f = 1 MHz, V <sub>R</sub> = 400 V			738		pF
		f = 1 MHz, V <sub>R</sub> = 8	800 V		546		-
RthJC	Junction-to-case thermal resis	tance				0.212	°C/V

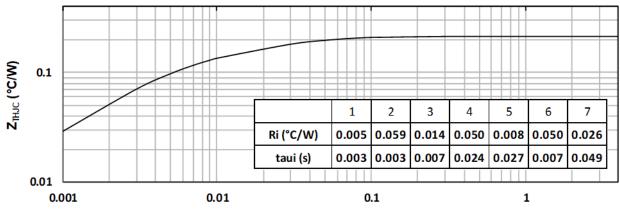
#### Table 3 • Electrical Characteristics Per Diode



### 2.3 Performance Curves

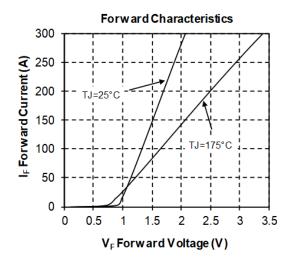
This section shows the typical performance curves for the MSCDC150A120D1PAG device.

Maximum thermal impedance

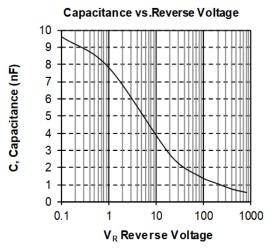


#### Figure 1 • Maximum Transient Thermal Impedance





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







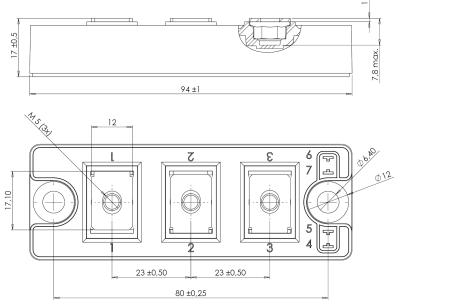
## 3 Package Specifications

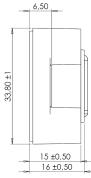
This section shows the package specifications for the MSCDC150A120D1PAG device.

### 3.1 Package Outline Drawing

This section shows the package outline drawing of the MSCDC150A120D1PAG device. The dimensions in the following figure are in millimeters.

#### Figure 4 • Package Outline Drawing









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