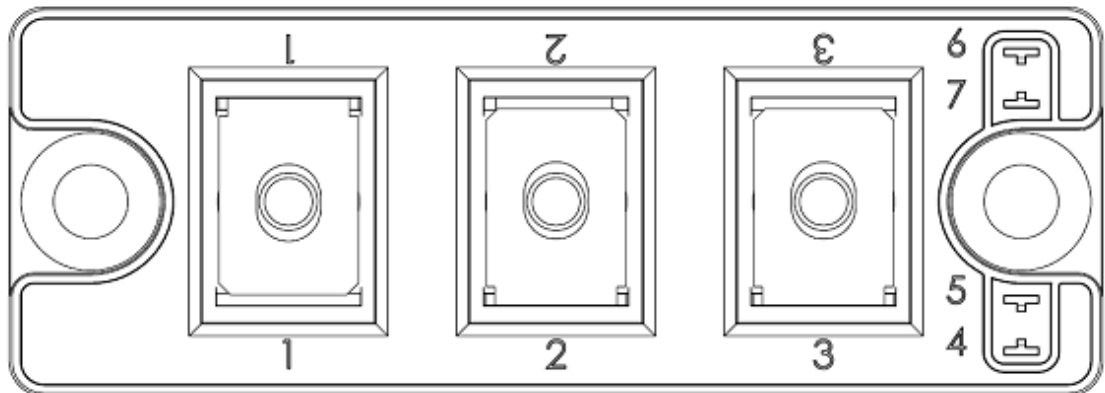
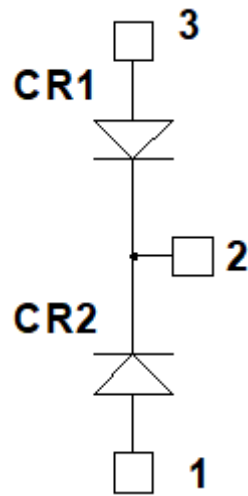


# MSCDC100KK120D1PAG Dual Common Cathode SiC Diodes Power Module

## 1 Product Overview

This section shows the product overview of the MSCDC100KK120D1PAG 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 MSCDC100KK120D1PAG 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 (AlN) substrate for improved thermal performance

## 1.2 Benefits

The following are benefits of the MSCDC100KK120D1PAG device:

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

## 1.3 Applications

The MSCDC100KK120D1PAG device is designed for the following applications:

- Welding converters
- Switched mode power supplies
- Uninterrupted power supplies
- Motor control

## 2 Electrical Specifications

This section shows the electrical specifications of the MSCDC100KK120D1PAG device.

### 2.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings per SiC diode of the MSCDC100KK120D1PAG device.

**Table 1 • Absolute Maximum Ratings**

Symbol	Parameter	Maximum Ratings	Unit
$V_{RRM}$	Repetitive peak reverse voltage	1200	V
$I_F$	DC forward current	$T_c = 100\text{ }^\circ\text{C}$ 100	A

The following table shows the thermal and package characteristics of the MSCDC100KK120D1PAG.

**Table 2 • Thermal and Package Characteristics**

Symbol	Characteristic	Min	Max	Unit	
$V_{ISOL}$	RMS isolation voltage, any terminal to case $t = 1$ minute, 50 Hz/60 Hz	4000		V	
$T_J$	Operating junction temperature range	-40	175	$^\circ\text{C}$	
$T_{JOP}$	Recommended junction temperature under switching conditions	-40	$T_{Jmax} - 25$		
$T_{STG}$	Storage temperature range	-40	125		
$T_c$	Operating case temperature	-40	125		
Torque	Mounting torque	For terminals	M5 2	3.5	N.m
		To Heatsink	M6 3	5	
Wt	Package weight		160	g	

### 2.2 Electrical Performance

The following table shows the electrical characteristics per SiC diode of the MSCDC100KK120D1PAG.

**Table 3 • Electrical Characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode forward voltage	$I_F = 100\text{ A}$ $T_J = 25\text{ }^\circ\text{C}$		1.5	1.8	V
		$T_J = 175\text{ }^\circ\text{C}$		2.1		
$I_{RM}$	Reverse leakage current	$V_R = 1200\text{ V}$ $T_J = 25\text{ }^\circ\text{C}$		30	400	$\mu\text{A}$
		$T_J = 175\text{ }^\circ\text{C}$		500		
$Q_C$	Total capacitive charge	$V_R = 600\text{ V}$		448		nC
C	Total capacitance	$f = 1\text{ MHz}, V_R = 400\text{ V}$		492		pF
		$f = 1\text{ MHz}, V_R = 800\text{ V}$		364		
$R_{thJC}$	Junction-to-case thermal resistance				0.304	$^\circ\text{C/W}$

## 2.3 Performance Curves

This section shows the typical performance curves of the MSCDC100KK120D1PAG device.

Figure 1 • Maximum Transient Thermal Impedance

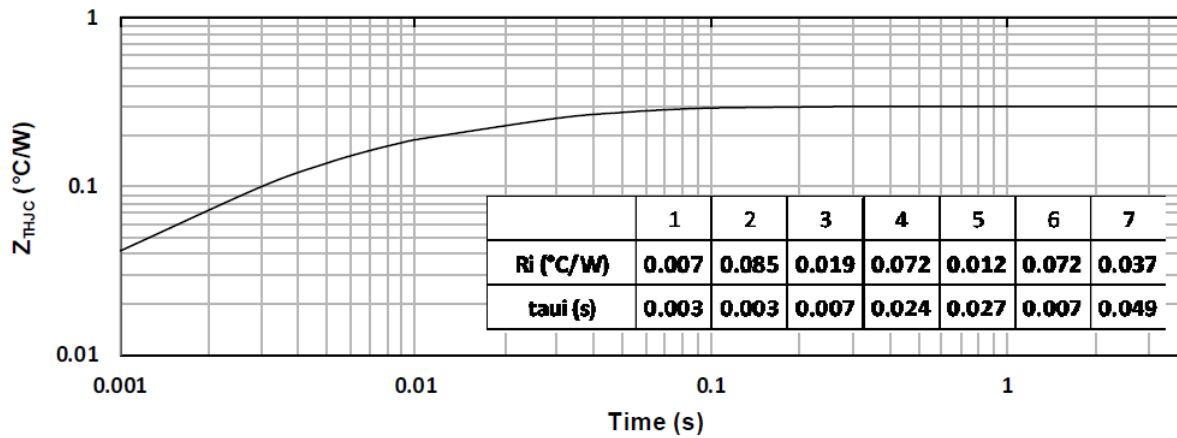


Figure 2 • Forward Current vs. Forward Voltage

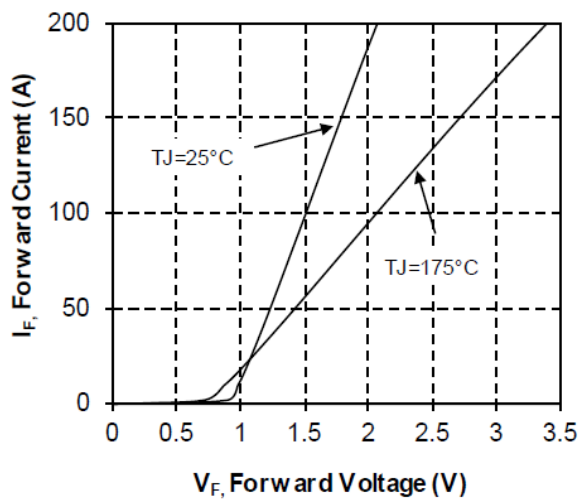
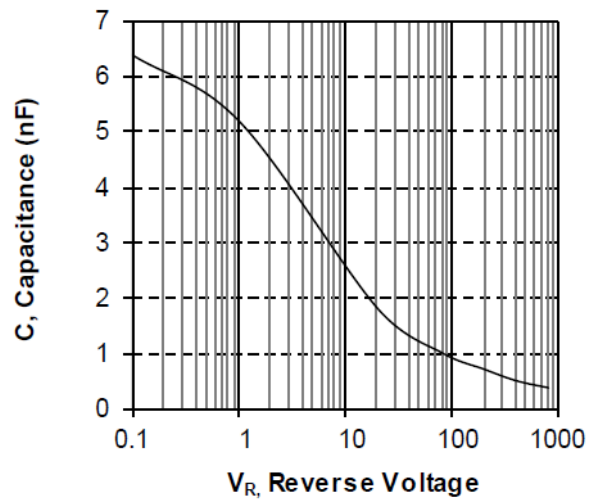


Figure 3 • Capacitance vs. Reverse Voltage



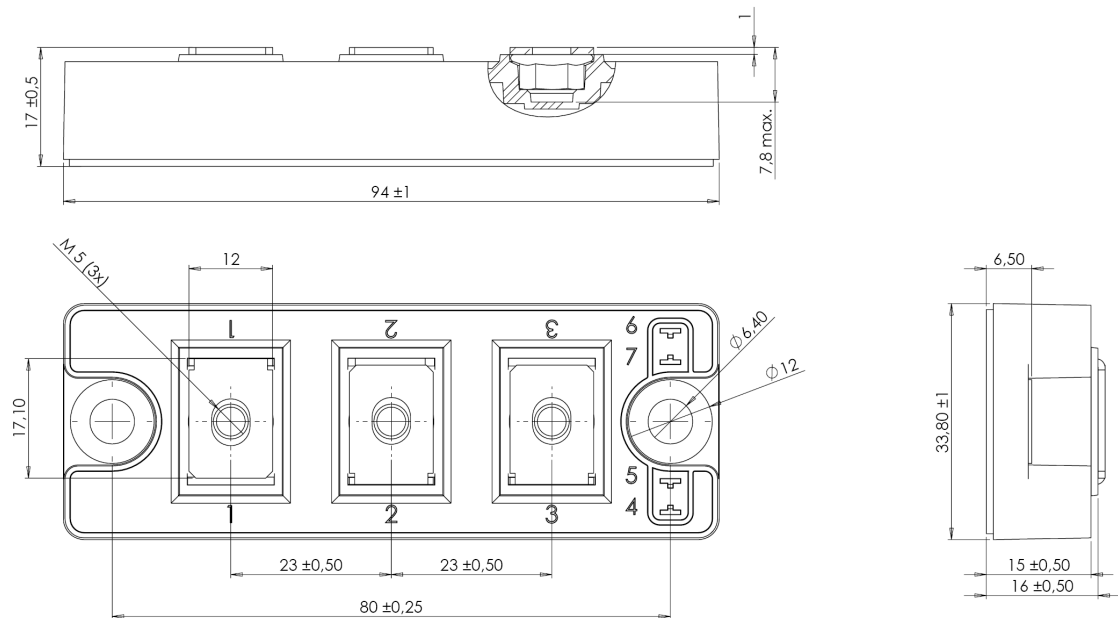
### 3 Package Specification

This section shows the package specification of the MSCDC100KK120D1PAG device.

#### 3.1 Package Outline Drawing

The package outline of the MSCDC100KK120D1PAG device is illustrated in this section. 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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