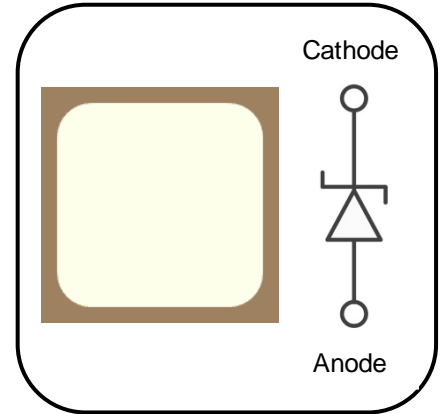


# 3<sup>rd</sup> Generation 1200V/50A SiC Schottky Barrier Diode

## Features

- AEC-Q101 qualified
- Revolutionary semiconductor material - Silicon Carbide (SiC)
- No reverse recovery
- High-speed switching performance
- Temperature-independent switching behavior
- System cost / size savings due to reduced cooling requirements
- Junction temperature range from -55°C to 175°C
- RoHS compliant



## Applications

- Industrial power supplies: Industrial UPS
- Battery chargers
- Solar inverters
- Switch mode power supplies



## Description

The ADS120J050B3 SiC Schottky Barrier Diode (SBD) has been developed using Sanan’s advanced 3<sup>rd</sup> generation SiC SBD technology with the highest performance and reliability. It registers higher efficiency, higher operation temperature and lower loss and can be operated at higher frequency than Si-based solutions. As to the Schottky structure, it shows no recovery at turn-off and allows a low leakage current with reverse voltage up to 1200V. It can contribute to system miniaturization and achieve lightweight system design. Using RoHS compliant components and being AEC-Q101 qualified, it is qualified for use in automotive application.

## Product Specifications

Device	V <sub>RRM</sub>	I <sub>F</sub> (135°C)	V <sub>F</sub> (25°C)	Q <sub>c</sub>
ADS120J050B3	1200V	69A	1.35V	304nC

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**Table 1. Maximum Ratings**

(T<sub>c</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit	Test conditions
Repetitive peak reverse voltage	V <sub>RRM</sub>	1200	V	T <sub>c</sub> = 25°C
Surge peak reverse voltage	V <sub>RSM</sub>	1200		T <sub>c</sub> = 25°C
DC reverse voltage	V <sub>DC</sub>	1200		T <sub>c</sub> = 25°C
Continuous forward current	I <sub>F</sub>	134	A	T <sub>c</sub> = 25°C
		69		T <sub>c</sub> = 135°C
		50		T <sub>c</sub> = 155°C
Surge non-repetitive forward current	I <sub>FSM</sub>	511	A	T <sub>c</sub> = 25°C, t <sub>p</sub> = 10ms, half sine pulse
Repetitive peak forward current	I <sub>FRM</sub>	202	A	T <sub>c</sub> = 25°C, t <sub>p</sub> = 10ms, half sine wave D = 0.1
i <sup>2</sup> t value	∫i <sup>2</sup> dt	1270	A <sup>2</sup> s	T <sub>c</sub> = 25°C, t <sub>p</sub> = 10ms
Operating junction temperature	T <sub>j</sub>	-55~175	°C	
Storage temperature	T <sub>stg</sub>	-55~175	°C	

**Table 2. Thermal Resistance**

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Thermal resistance from junction to case	R <sub>th(j-c)</sub>	/	0.24	/	°C/W	

\*Thermal Resistance is collected in TO247-2L

**Table 3. Static Electrical Characteristics**

(T<sub>j</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
DC blocking voltage	V <sub>DC</sub>	1200	/	/	V	I <sub>R</sub> = 200 μA
Forward voltage	V <sub>F</sub>	/	1.35	1.50	V	I <sub>F</sub> = 50A, T <sub>j</sub> = 25°C
		/	1.75	2.20		I <sub>F</sub> = 50A, T <sub>j</sub> = 175°C
Reverse current	I <sub>R</sub>	/	5	120	μA	V <sub>R</sub> = 1200V, T <sub>j</sub> = 25°C
		/	40	800		V <sub>R</sub> = 1200V, T <sub>j</sub> = 175°C

**Table 4. Dynamic Electrical Characteristics**

(T<sub>j</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
Total capacitance	C	/	4547	/	pF	V <sub>R</sub> = 0V, f = 1MHz
		/	285	/		V <sub>R</sub> = 400V, f = 1MHz
		/	202	/		V <sub>R</sub> = 800V, f = 1MHz
Total capacitive charge	Q <sub>C</sub>	/	304	/	nC	V <sub>R</sub> = 800V
Capacitance stored energy	E <sub>C</sub>	/	86	/	μJ	V <sub>R</sub> = 800V

**Electrical Characteristic Diagrams**

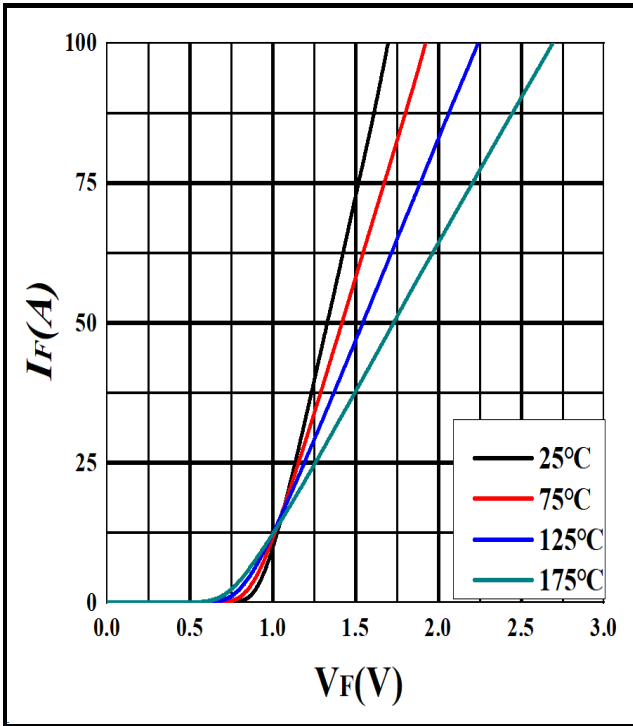


Figure 1. Forward characteristics

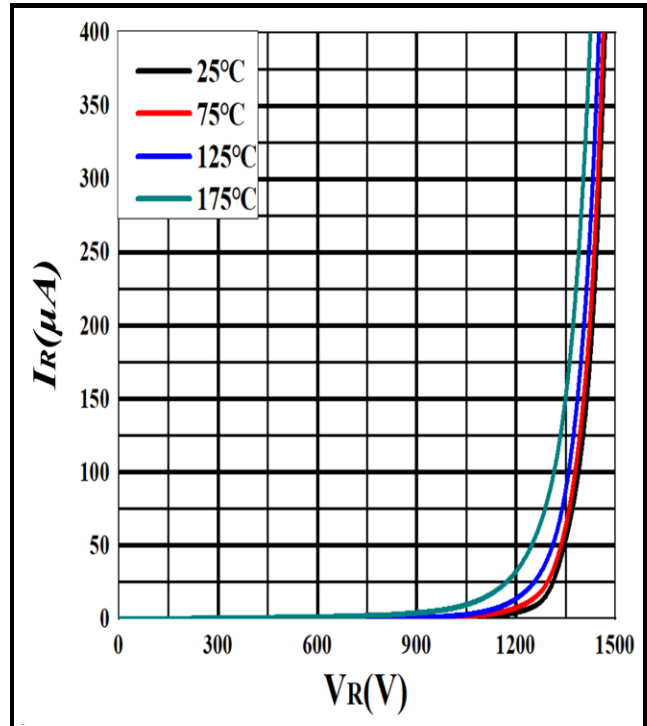


Figure 2. Reverse characteristics

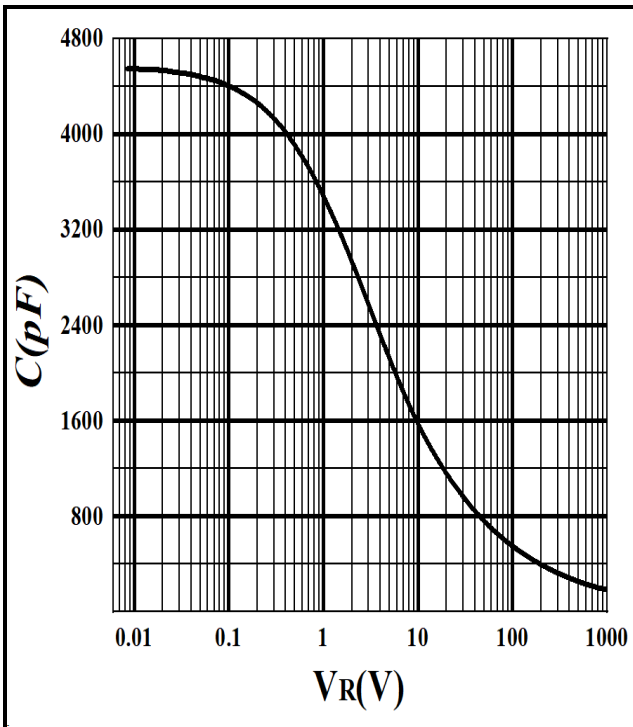


Figure 3. Capacitance vs. reverse voltage

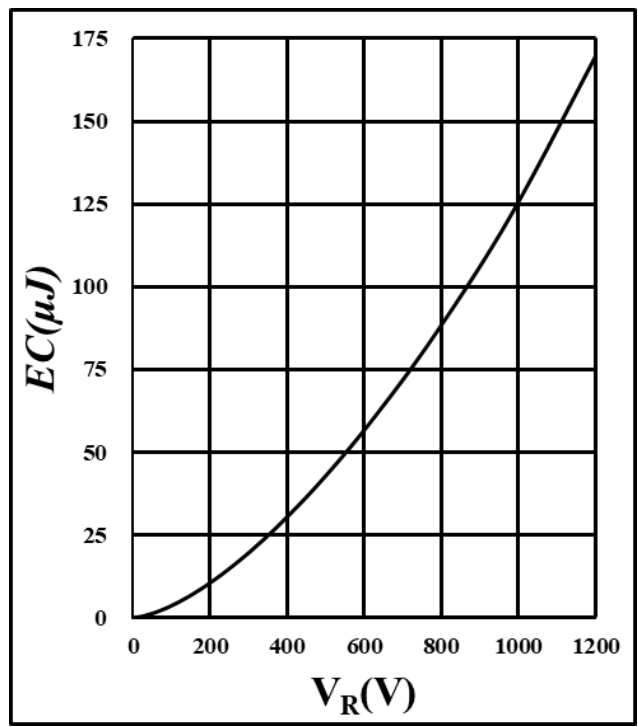


Figure 4. Capacitance stored energy

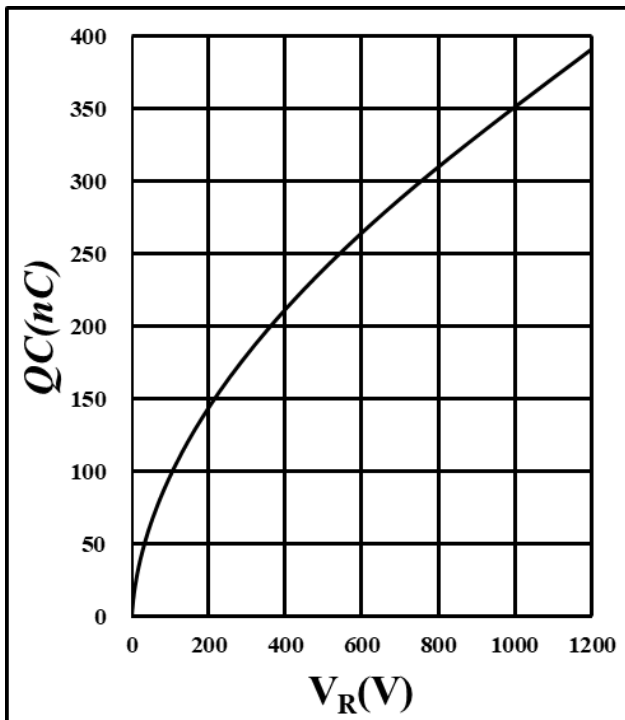


Figure 5. Total capacitance charge vs. reverse voltage

## Ordering Information

Part number	ADS120J050B3
Package	Bare Die
Packing type	Wafer
RoHS	Yes

## Important Notices – Read Carefully

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