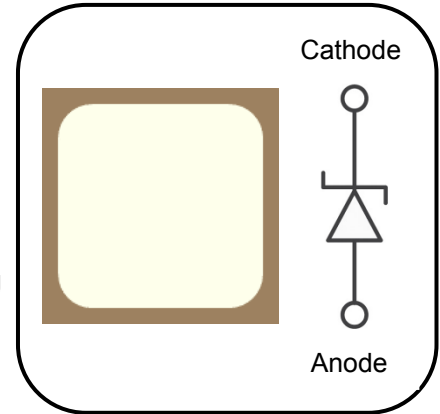


# 3<sup>rd</sup> Generation 650V/1A SiC Schottky Barrier Diode

## 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

- DC/DC converter for EV/HEV
- On board charger (OBC)



## Description

The ADS065J001B3 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 650V. 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>
ADS065J001B3	650V	1.2A	1.30V	3.2nC

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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>	650	V	T <sub>C</sub> = 25°C
Surge peak reverse voltage	V <sub>RSM</sub>	650		T <sub>C</sub> = 25°C
DC reverse voltage	V <sub>DC</sub>	650		T <sub>C</sub> = 25°C
Continuous forward current	I <sub>F</sub>	2.4	A	T <sub>C</sub> = 25°C
		1.2		T <sub>C</sub> = 135°C
		1.0		T <sub>C</sub> = 147°C
Surge non-repetitive forward current	I <sub>FSM</sub>	12	A	T <sub>C</sub> = 25°C, t <sub>p</sub> = 10ms, half sine pulse
Repetitive peak forward current	I <sub>FRM</sub>	7	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	0.72	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>	/	19.5	/	°C/W	

\*Thermal Resistance is collected in SMBF

**Table 3. Static Electrical Characteristics**

(Tc = 25°C, unless otherwise specified)

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
DC blocking voltage	V <sub>DC</sub>	650	/	/	V	I <sub>R</sub> = 100 μA
Forward voltage	V <sub>F</sub>	/	1.30	1.50	V	I <sub>F</sub> = 1A, T <sub>j</sub> = 25°C
		/	1.55	1.80		I <sub>F</sub> = 1A, T <sub>j</sub> = 175°C
Reverse current	I <sub>R</sub>	/	1	8	μA	V <sub>R</sub> = 650V, T <sub>j</sub> = 25°C
		/	2	16		V <sub>R</sub> = 650V, T <sub>j</sub> = 175°C

**Table 4. Dynamic Electrical Characteristics**

(Tc = 25°C, unless otherwise specified)

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
Total capacitance	C	/	61	/	pF	V <sub>R</sub> = 0V, f = 1MHz
		/	6.1	/		V <sub>R</sub> = 200V, f = 1MHz
		/	4.9	/		V <sub>R</sub> = 400V, f = 1MHz
Total capacitive charge	Q <sub>C</sub>	/	3.2	/	nC	V <sub>R</sub> = 400V
Capacitance stored energy	E <sub>C</sub>	/	0.5	/	μJ	V <sub>R</sub> = 400V

**Electrical Characteristic Diagrams**

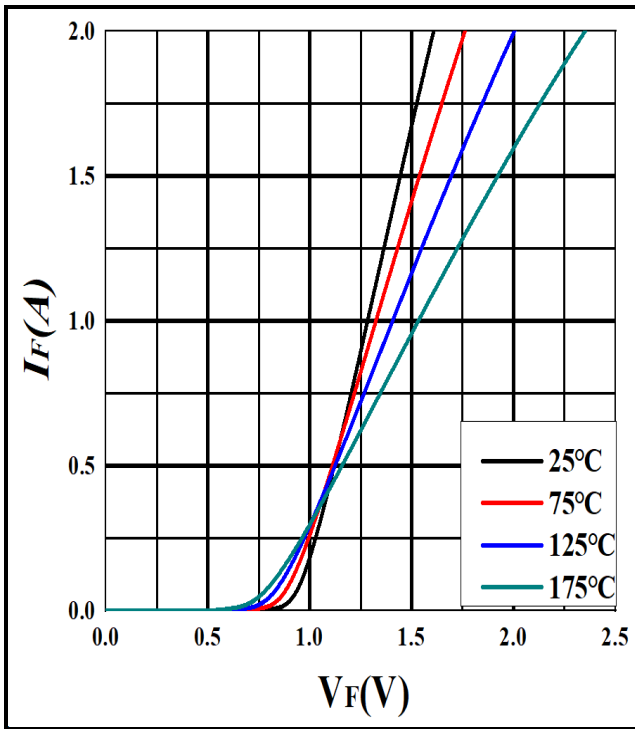


Figure 1. Forward characteristics

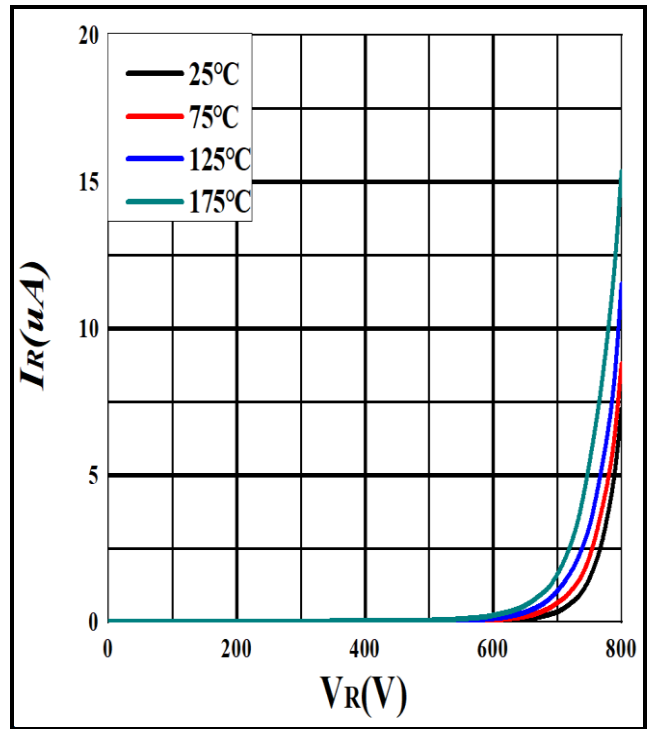


Figure 2. Reverse characteristics

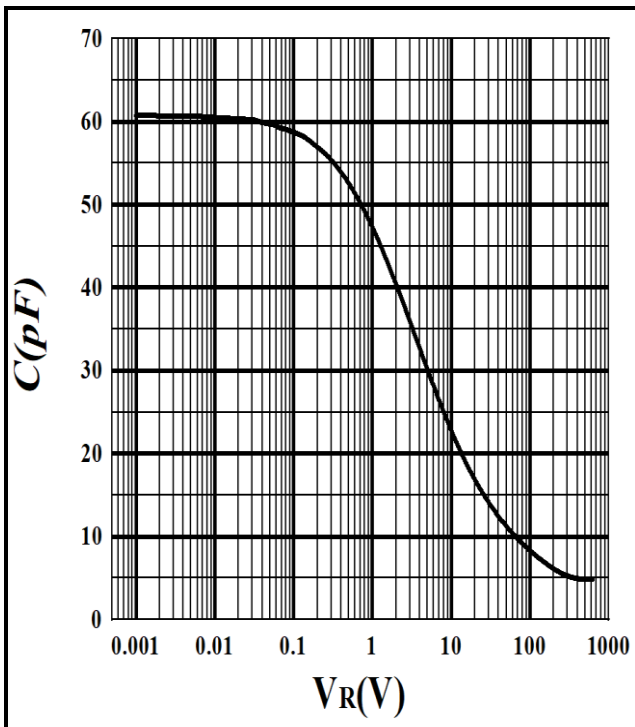


Figure 3. Capacitance vs. reverse voltage

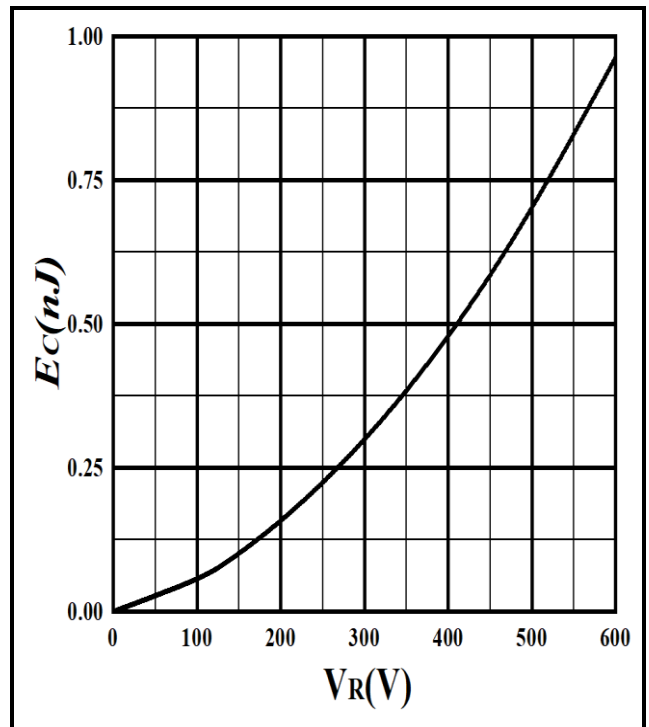


Figure 4. Capacitance stored energy

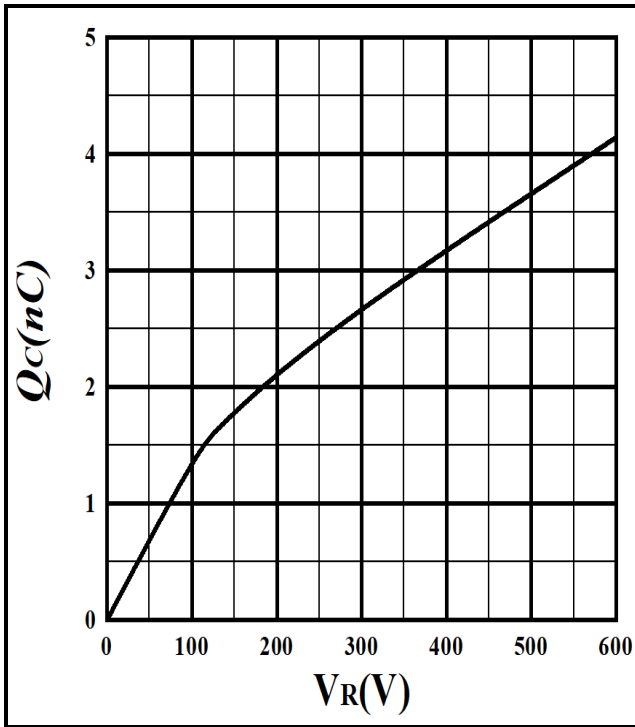


Figure 5. Total capacitance charge vs. reverse voltage

## Ordering Information

Part number	ADS065J001B3
Package	Bare Die
Packing type	Wafer
RoHS	Yes

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