

3rd 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



Potential Applications

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

Package Type: SMBF



Description

The ADS16B3 SiC Schottky Barrier Diode (SBD) has been developed using Sanan’s advanced 3rd 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 industrial application.

Product Specifications

Device	V _{RRM}	I _F (135°C)	V _F (25°C)	Q _c	Marking
ADS16B3	650V	1.2A	1.30V	3.2nC	16B3

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Table 1. Maximum Ratings

(T_c = 25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit	Test conditions
Repetitive peak reverse voltage	V _{RRM}	650	V	T _c = 25°C
Surge peak reverse voltage	V _{RSM}	650		T _c = 25°C
DC reverse voltage	V _{DC}	650		T _c = 25°C
Continuous forward current	I _F	2.4	A	T _c = 25°C
		1.2		T _c = 135°C
		1.0		T _c = 147°C
Surge non-repetitive forward current	I _{FSM}	12	A	T _c = 25°C, t _p = 10ms, half sine pulse
Surge repetitive forward current	I _{FRM}	7	A	T _c = 25°C, t _p = 10ms, half sine wave D = 0.1
Power dissipation	P _{tot}	7.7	W	T _c = 25°C
i ² t value	∫j ² dt	0.72	A ² s	T _c = 25°C, t _p = 10ms
Operating junction temperature	T _j	-55~175	°C	
Storage temperature	T _{stg}	-55~175	°C	

Table 2. Thermal Resistance

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Thermal resistance from junction to case	R _{th(j-c)}	/	19.5	/	°C/W	

Table 3. Static Electrical Characteristics

(T_j = 25°C, unless otherwise specified)

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
DC blocking voltage	V _{DC}	650	/	/	V	I _R = 100 μA
Forward voltage	V _F	/	1.30	1.50	V	I _F = 1A, T _j = 25°C
		/	1.55	1.80		I _F = 1A, T _j = 175°C
Reverse current	I _R	/	1	8	μA	V _R = 650V, T _j = 25°C
		/	2	16		V _R = 650V, T _j = 175°C

Table 4. Dynamic Electrical Characteristics

(T_j = 25°C, unless otherwise specified)

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

Electrical Characteristic Diagrams

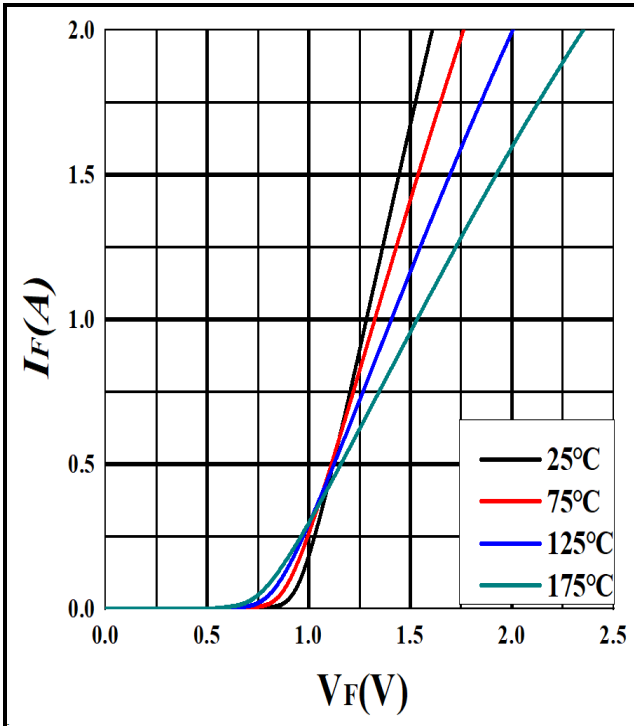


Figure 1. Forward characteristics

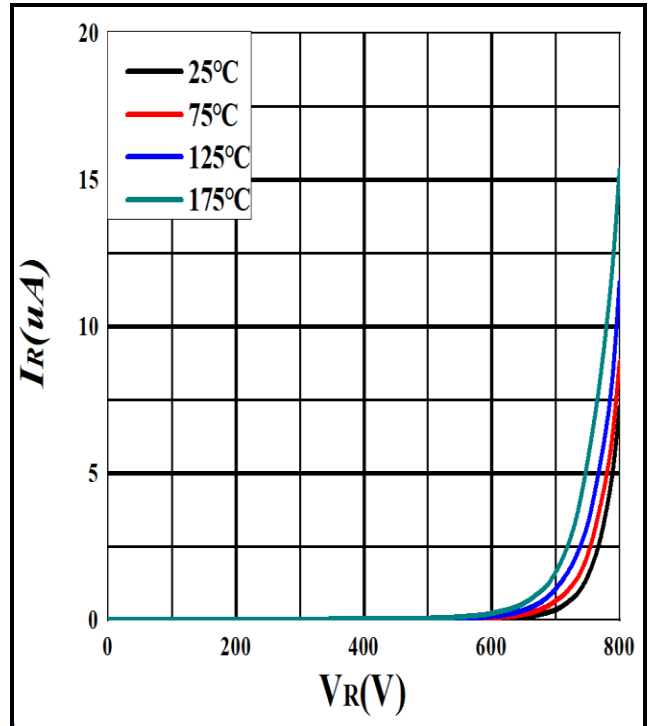


Figure 2. Reverse characteristics

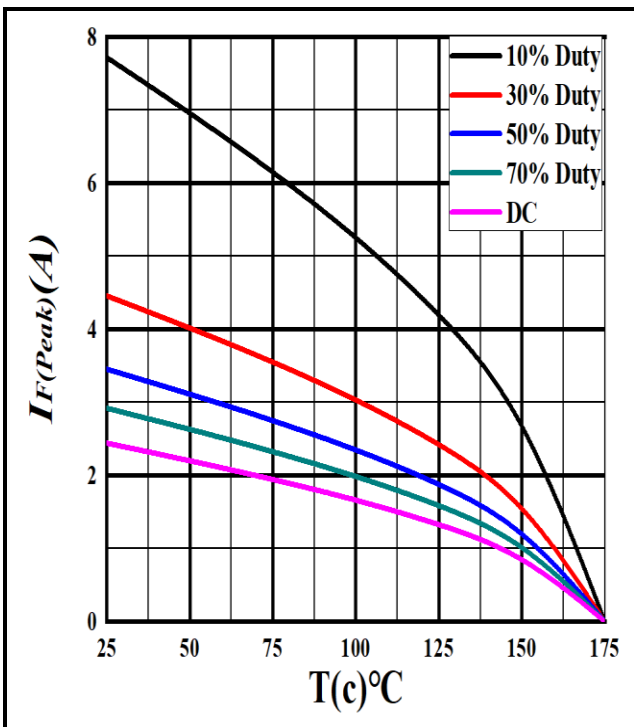


Figure 3. Current derating

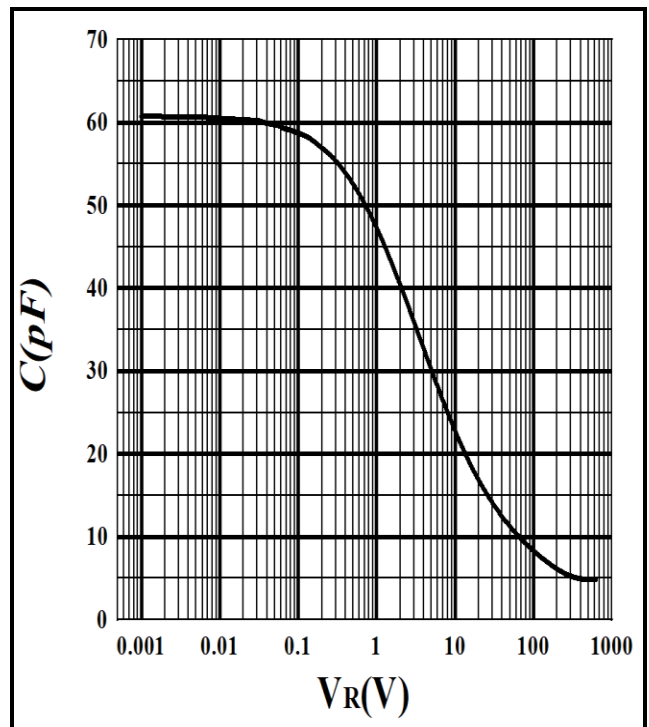


Figure 4. Capacitance vs. reverse voltage

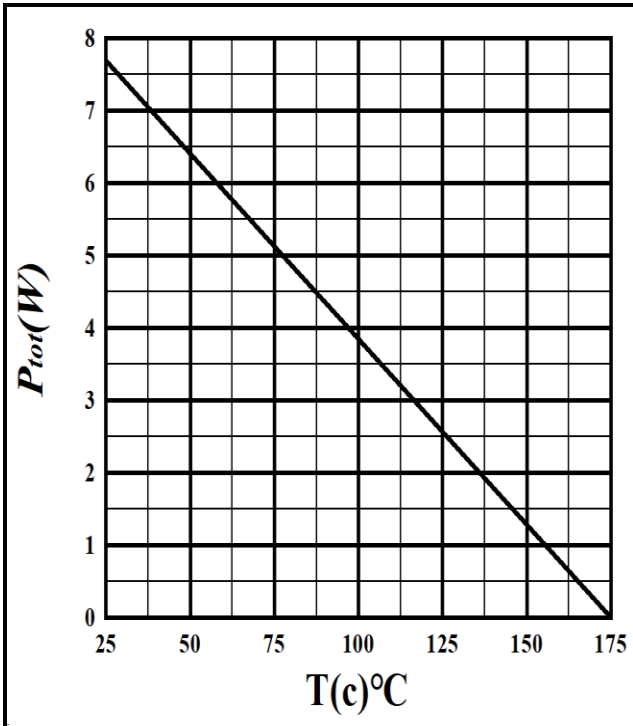


Figure 5. Power derating

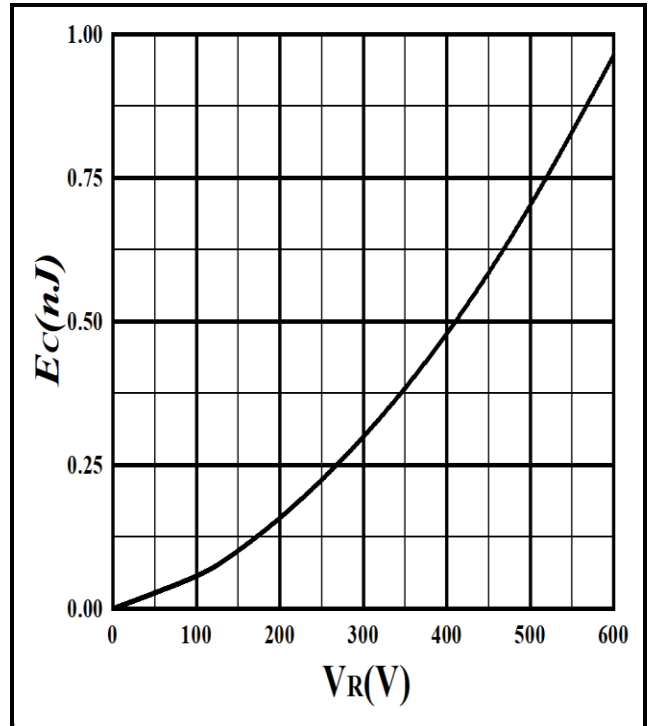


Figure 6. Capacitance stored energy

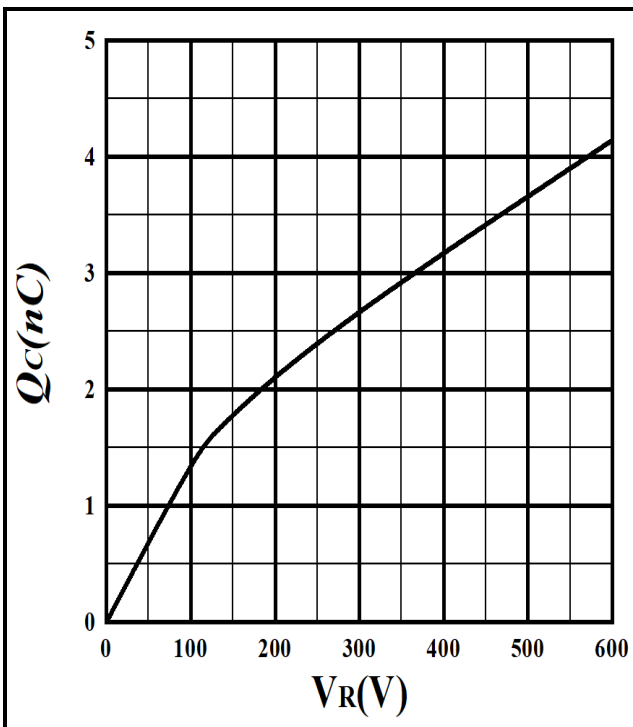
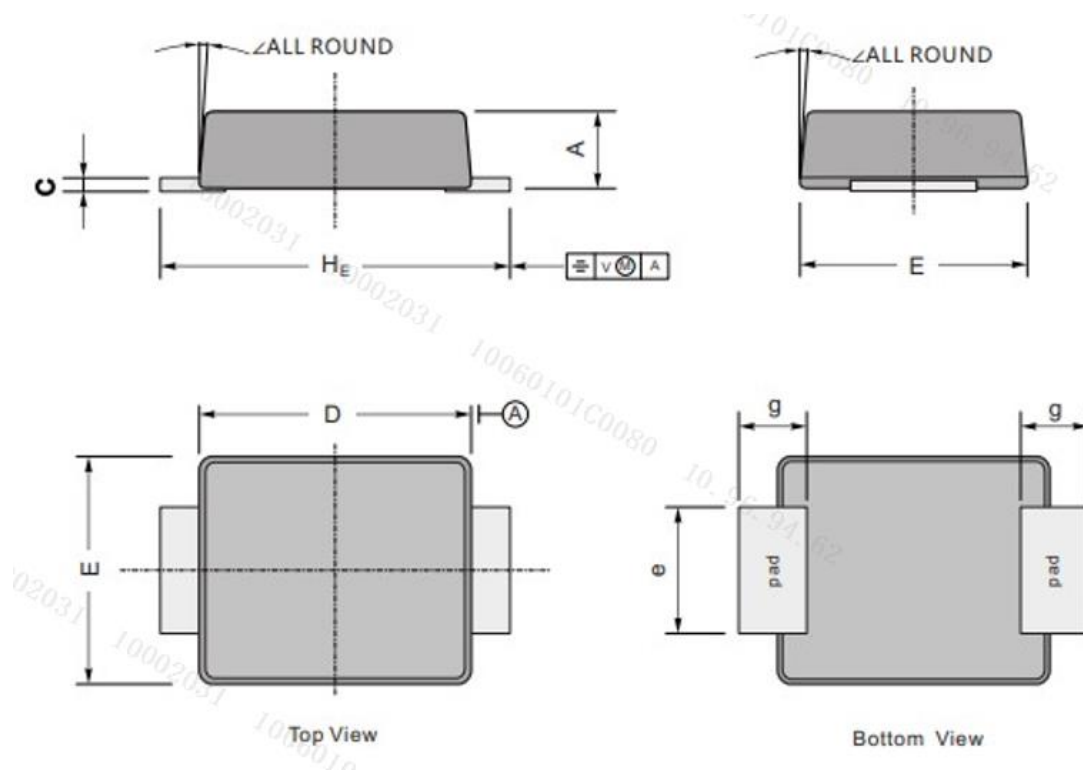


Figure 7. Total capacitance charge vs. reverse voltage

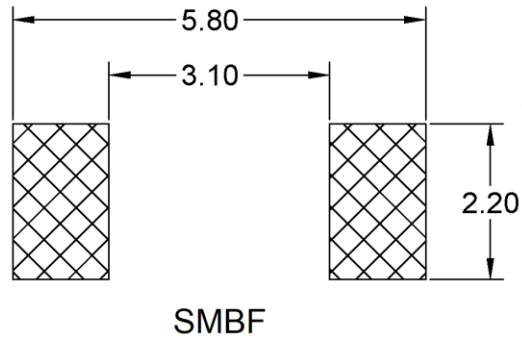
Package Information



Dimension unit: [mm]			
Symbol	Min	Nom	Max
A	1.1	1.2	1.3
C	0.18	0.22	0.26
D	4.2	4.3	4.4
E	3.5	3.6	3.7
H_E	5.1	5.3	5.5
e	1.9	-	2.2
g	1.0		
∠	9°		

Recommended Solder Pad Layout

Note: All dimensions are in mm



Ordering Information

Part number	ADS16B3-ASARH
Package	SMBF
Unit quantity	5000 EA
Packing type	Tape & Reel

Important Notices – Read Carefully

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