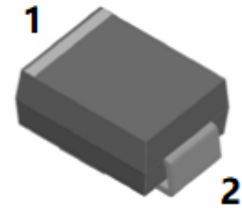


3rd Generation 1200V/1A SiC Schottky Barrier Diode

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



Package Type: SMB

Potential Applications

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



Description

The ADS12E3 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 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_{RRM}	I_F (135°C)	V_F (25°C)	Q_C	Marking
ADS12E3	1200V	1.4A	1.35V	7.0nC	12E3

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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}	1200	V	T _C = 25°C
Surge peak reverse voltage	V _{RSM}	1200		T _C = 25°C
DC reverse voltage	V _{DC}	1200		T _C = 25°C
Continuous forward current	I _F	2.7	A	T _C = 25°C
		1.4		T _C = 135°C
		1.0		T _C = 150°C
Surge non-repetitive forward current	I _{FSM}	19	A	T _C = 25°C, t _p = 10ms, half sine pulse
Surge repetitive forward current	I _{FRM}	16	A	T _C = 25°C, t _p = 10ms, half sine wave D = 0.1
Power dissipation	P _{tot}	12.9	W	T _C = 25°C
i ² t value	∫i ² dt	1.75	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)}	/	11.6	/	°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}	1200	/	/	V	I _R = 100 μA
Forward voltage	V _F	/	1.35	1.50	V	I _F = 1A, T _j = 25°C
		/	1.80	2.20		I _F = 1A, T _j = 175°C
Reverse current	I _R	/	1	8	μA	V _R = 1200V, T _j = 25°C
		/	2	16		V _R = 1200V, 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	/	84	/	pF	V _R = 0V, f = 1MHz
		/	6.9	/		V _R = 400V, f = 1MHz
		/	5.3	/		V _R = 800V, f = 1MHz
Total capacitive charge	Q _C	/	7.0	/	nC	V _R = 800V
Capacitance stored energy	E _C	/	2.1	/	μJ	V _R = 800V

Electrical Characteristic Diagrams

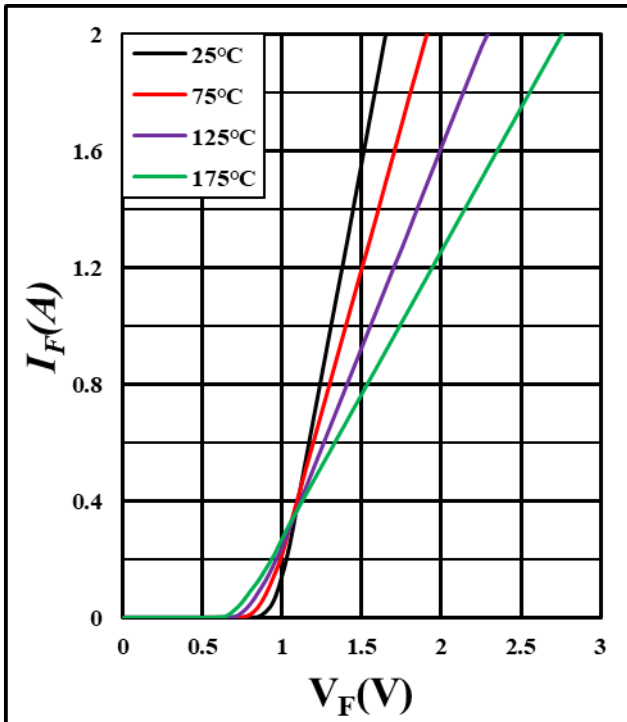


Figure 1. Forward characteristics

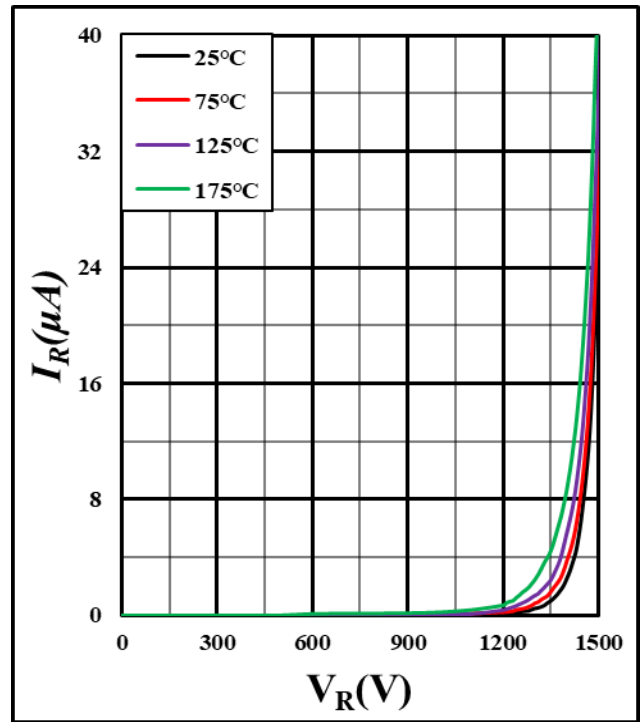


Figure 2. Reverse characteristics

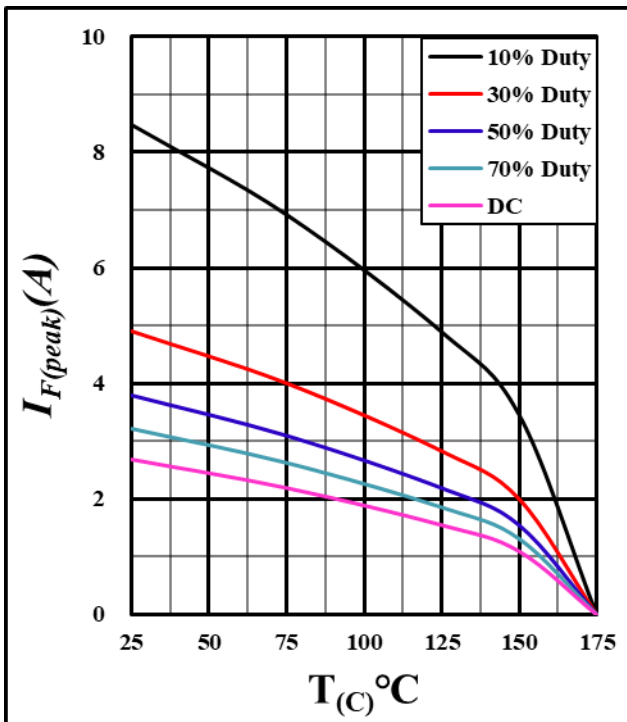


Figure 3. Current derating

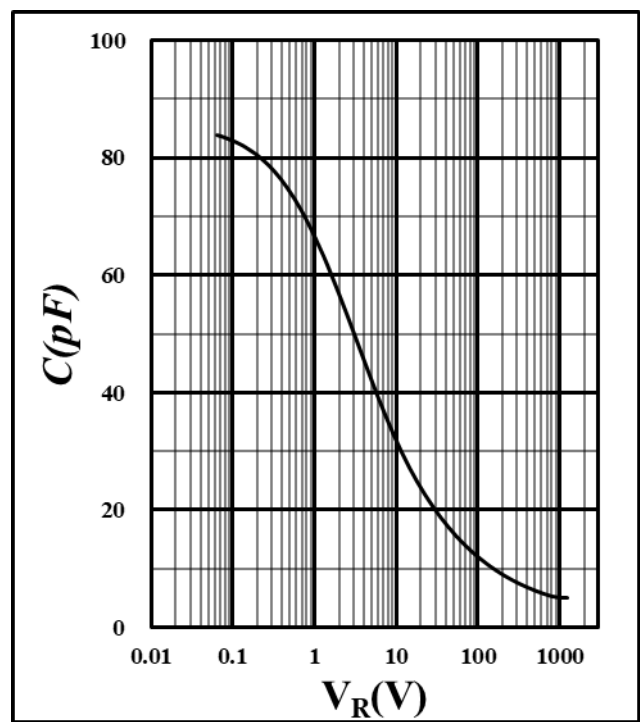


Figure 4. Capacitance vs. reverse voltage

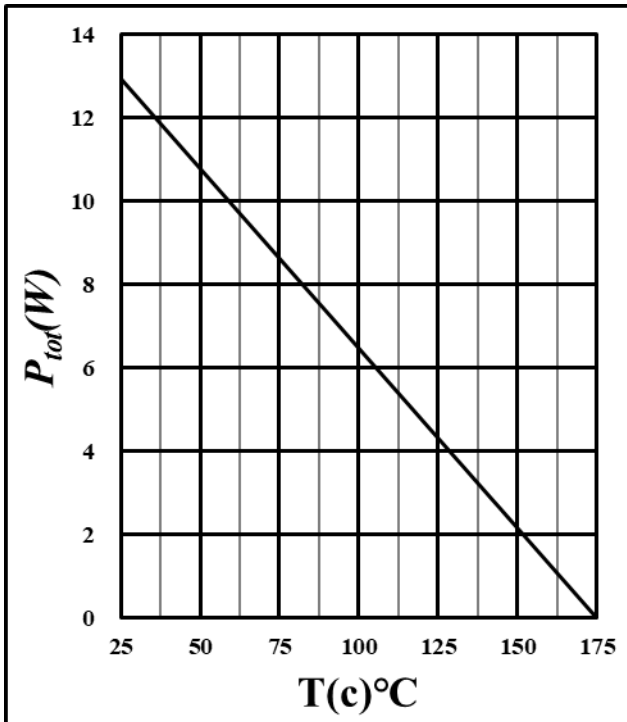


Figure 5. Power derating

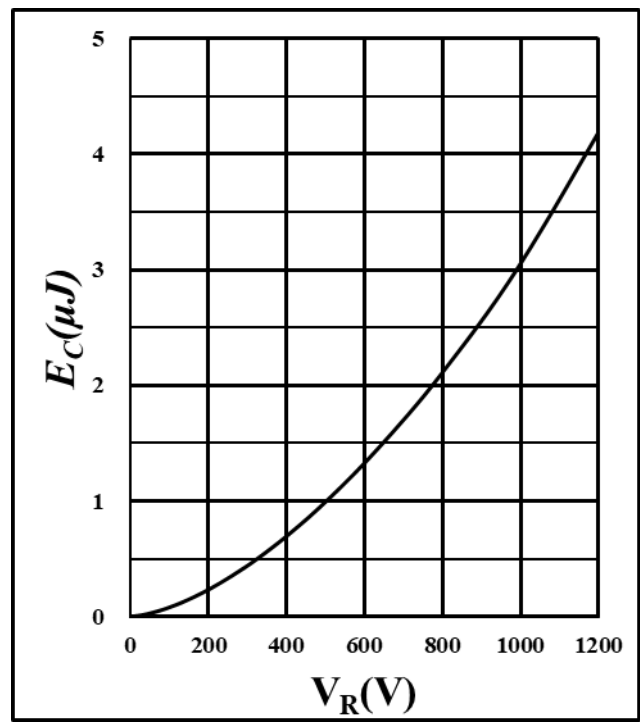


Figure 6. Capacitance stored energy

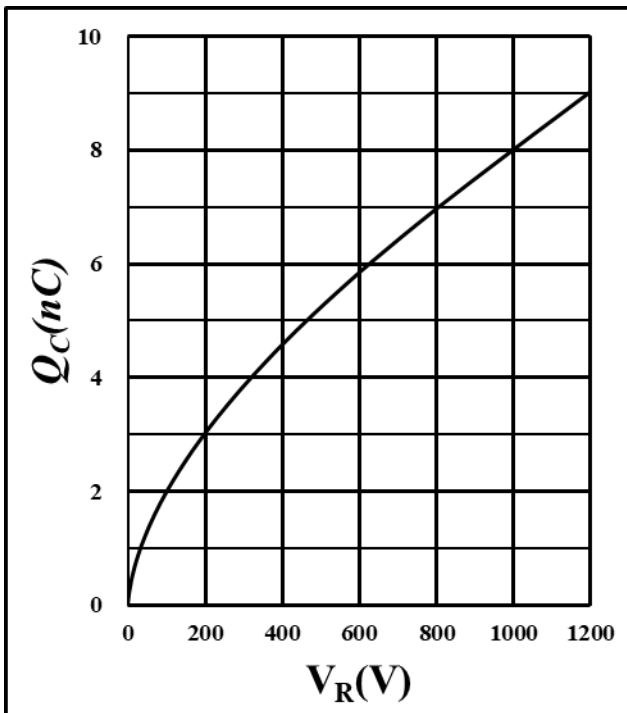
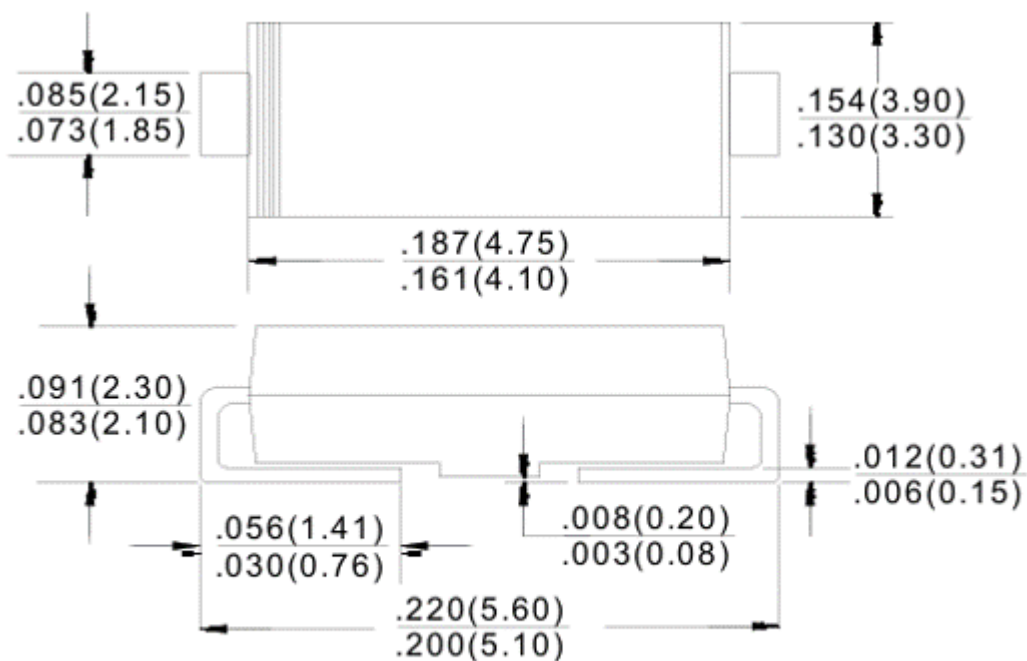


Figure 7. Total capacitance charge vs. reverse voltage

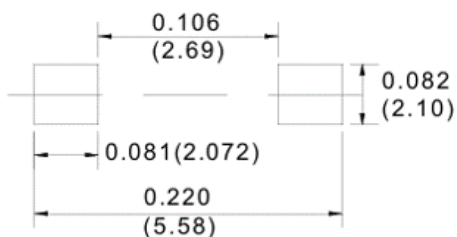
Package Information



Dimensions in inches and (millimeters)

Recommended Solder Pad Layout

(SMB) Mounting Pad Layout



Dimensions in inches and (millimeters)

Ordering Information

Part number	ADS12E3-ASARH
Package	SMB
Unit quantity	3000 EA
Packing type	Reel

Important Notices – Read Carefully

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