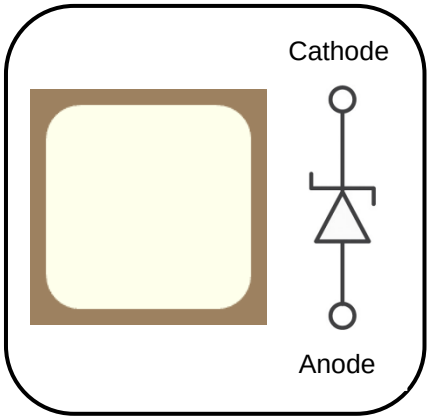
3rd Generation 1200V/50A SiC Schottky Barrier Diode

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℃ to 175℃
- RoHS compliant



Applications

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

AEC-Q101

RoHS

Description

The ADS120J050B3 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℃)	V_F (25℃)	Q_C
ADS120J050B3	**1200V**	**69A**	**1.35V**	**304nC**

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Table 1. Maximum Ratings

(Tc = 25℃, unless otherwise specified)

Parameter	Symbol	Value	Unit	Test conditions
Repetitive peak reverse voltage	V_{RRM}	1200	V	T_C = 25℃
Surge peak reverse voltage	V_{RSM}	1200		T_C = 25℃
DC reverse voltage	V_{DC}	1200		T_C = 25℃
Continuous forward current	I_F	145	A	T_C = 25℃
		68		T_C = 135℃
		50		T_C = 153℃
Surge non-repetitive forward current	I_{FSM}	504	A	T_C = 25℃, t_p = 10ms, half sine pulse
Repetitive peak forward current	I_{FRM}	202	A	T_C = 25℃, t_p = 10ms, half sine wave D = 0.1
i^2t value	$\int i^2dt$	1270	A^2s	T_C = 25℃, t_p = 10ms
Operating junction temperature	T_j	-55~175	℃	
Storage temperature	T_{stg}	-55~175	℃	

Table 2. Thermal Resistance

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Thermal resistance from junction to case	$R_{th(j-c)}$	/	0.27	/	℃/W	

*Thermal Resistance is collected in TO-247-2L

Table 3. Static Electrical Characteristics

(T_j = 25℃, 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 = 50A, T_j = 25℃
		/	1.75	2.20		I_F = 50A, T_j = 175℃
Reverse current	I_R	/	5	120	μA	V_R = 1200V, T_j = 25℃
		/	40	800		V_R = 1200V, T_j = 175℃

Table 4. Dynamic Electrical Characteristics

(T_j = 25℃, unless otherwise specified)

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

Electrical Characteristic Diagrams

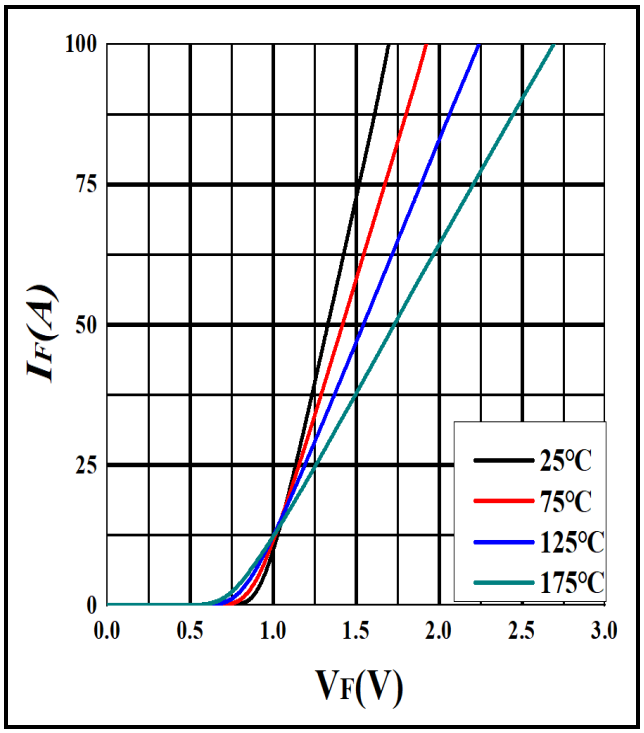

Figure 1. Forward characteristics

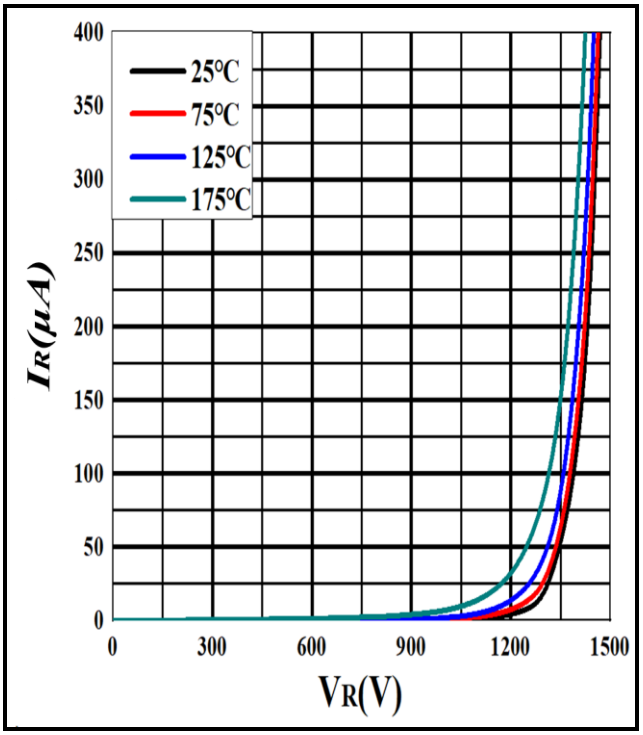

Figure 2. Reverse characteristics

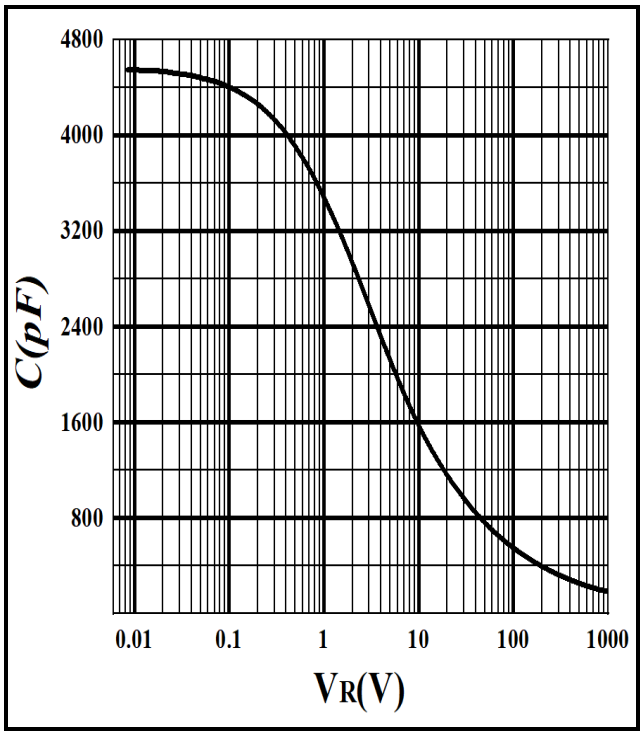

Figure 3. Capacitance vs. reverse voltage

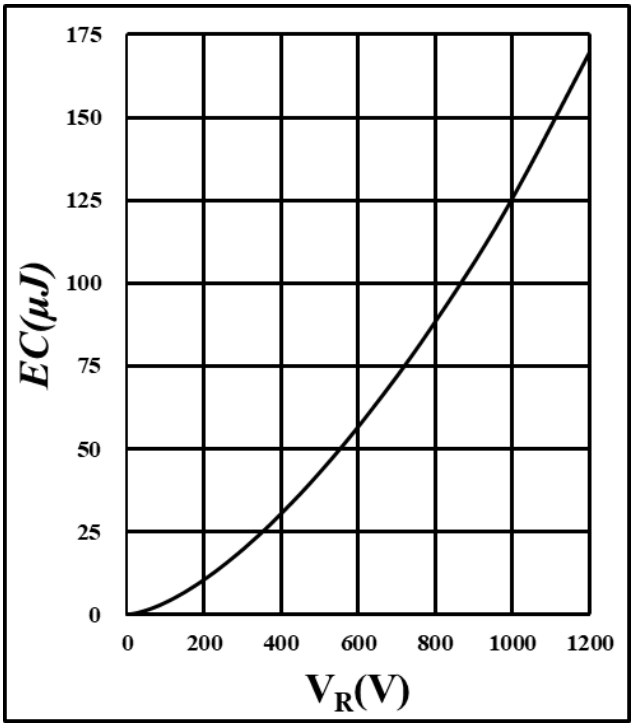

Figure 4. Capacitance stored energy

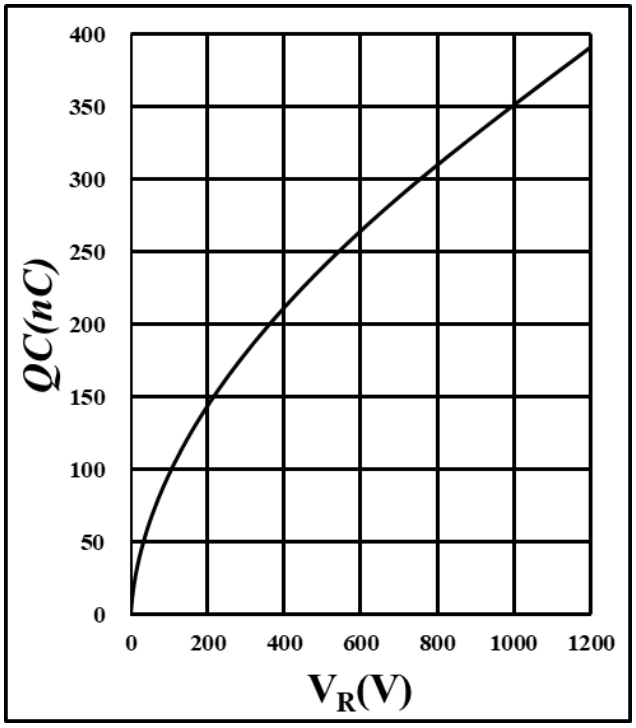

Figure 5. Total capacitance charge vs. reverse voltage

Ordering Information

Part number	ADS120J050B3
Package	Bare Die
Packing type	Wafer
RoHS	Yes

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