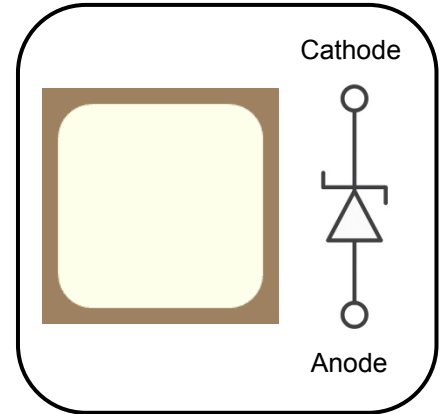


5th Generation 1700V/25A SiC Schottky Barrier Diode

Features

- Revolutionary semiconductor material - Silicon Carbide (SiC)
- Super high IFSM (Forward surge current)
- No reverse recovery
- High-speed switching performance
- System cost / size savings due to reduced cooling requirements
- Junction temperature range from -55°C to 175°C
- RoHS compliant



Potential Applications

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



Description

The SDS170J025B5 SiC Schottky Barrier Diode (SBD) has been developed using Sanan’s advanced 5th 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. Compared with the 3rd product which got comprehensive performance, the 5th product mainly promotes the IFSM performance. Diode got higher IFSM performance could effectively absorb bursts of huge energy, So it's less susceptible to damage. Using RoHS compliant components, it is qualified for use in industrial application.

Product Specifications

Device	V_{RRM}	$I_F (135^\circ C)$	$V_F (25^\circ C)$	Q_C
SDS170J025B5	1700V	40A	1.4V	152nC

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Table 1. Maximum Ratings

Parameter	Symbol	Value	Unit	Test conditions
Repetitive peak reverse voltage	V_{RRM}	1700	V	$T_C = 25^\circ\text{C}$
Surge peak reverse voltage	V_{RSM}	1700		$T_C = 25^\circ\text{C}$
DC reverse voltage	V_{DC}	1700		$T_C = 25^\circ\text{C}$
Continuous forward current	I_F	87	A	$T_C = 25^\circ\text{C}$
		39		$T_C = 135^\circ\text{C}$
		25		$T_C = 155^\circ\text{C}$
Surge non-repetitive forward current	I_{FSM}	432	A	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ms}$, half sine pulse
Repetitive peak forward current	I_{FRM}	214	A	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ms}$, half sine wave $D = 0.1$
Power dissipation	P_{tot}	428	W	$T_C = 25^\circ\text{C}$
i^2t value	$\int i^2 dt$	933	A^2s	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ms}$
Operating junction temperature	T_j	-55~175	$^\circ\text{C}$	
Storage temperature	T_{stg}	-55~175	$^\circ\text{C}$	

Table 2. Thermal Resistance

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Thermal resistance from junction to case	$R_{th(j-c)}$	/	0.35	/	$^\circ\text{C/W}$	

*Thermal Resistance is collected in TO247-2L

Table 3. Static Electrical Characteristics

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
DC blocking voltage	V_{DC}	1700	/	/	V	$I_R = 100 \mu\text{A}$
Forward voltage	V_F	/	1.40	1.60	V	$I_F = 25\text{A}$, $T_j = 25^\circ\text{C}$
		/	2.15	2.70		$I_F = 25\text{A}$, $T_j = 175^\circ\text{C}$
Reverse current	I_R	/	3	75	μA	$V_R = 1700\text{V}$, $T_j = 25^\circ\text{C}$

		/	30	400		$V_R = 1700V, T_j = 175^\circ C$
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Table 4. Dynamic Electrical Characteristics

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
Total capacitance	C	/	2940	/	pF	$V_R = 0V, f = 1MHz$
		/	102	/		$V_R = 800V, f = 1MHz$
		/	90	/		$V_R = 1700V, f = 1MHz$
Total capacitive charge	Q_C	/	152	/	nC	$V_R = 1700V$
Capacitance stored energy	E_C	/	129	/	μJ	$V_R = 1700V$

Table 5. Mechanical Parameters

Parameter	Type	Unit
Die Thickness	$150 \pm 10\%$	μm
Topside Anode Metallization (Al)	$4 \pm 10\%$	μm
Backside Cathode Metallization (Ag)	$1.2 \pm 10\%$	μm
Frontside Passivation (polyimide)	6.5 ± 0.6	μm

Electrical Characteristic Diagrams

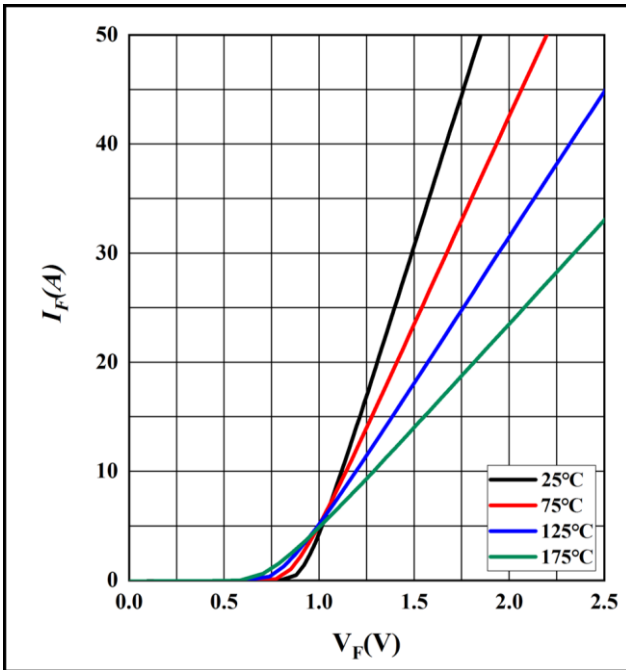


Figure 1. Forward characteristics

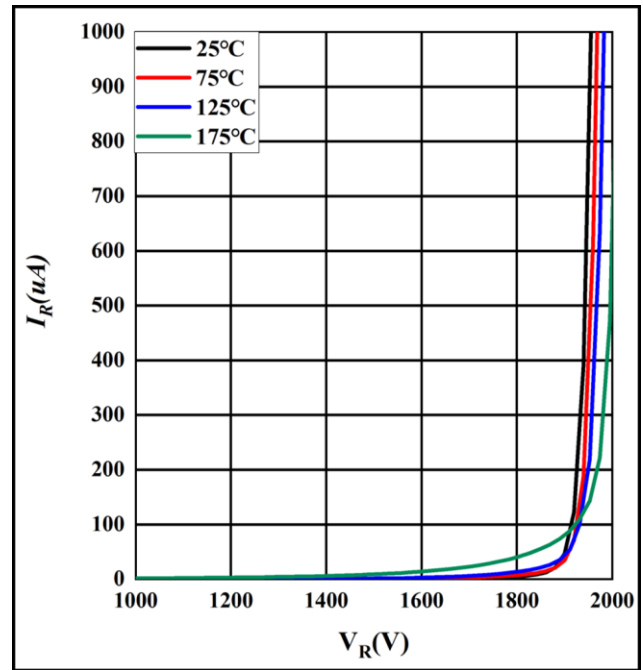


Figure 2. Reverse characteristics

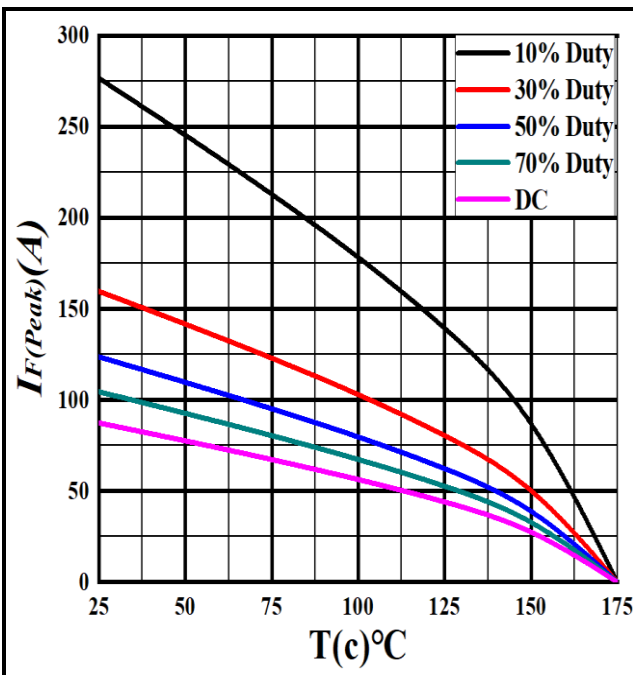


Figure 3. Current derating

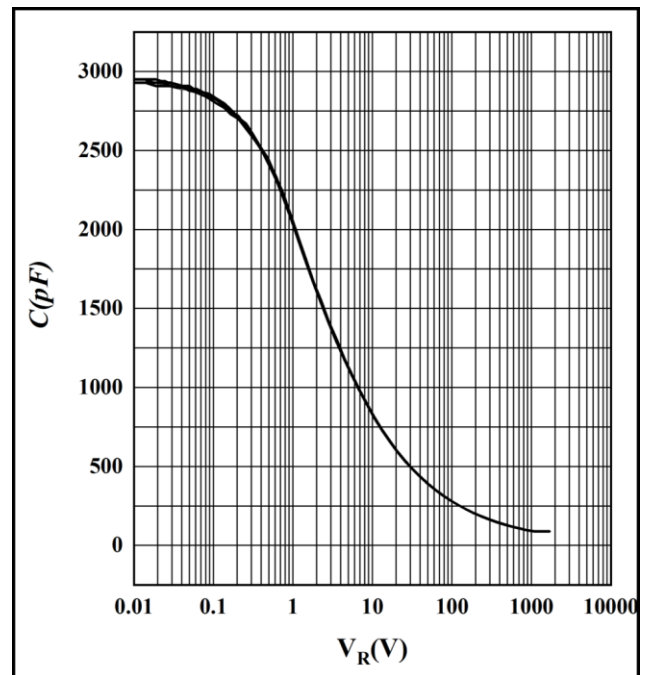


Figure 4. Capacitance vs. reverse voltage

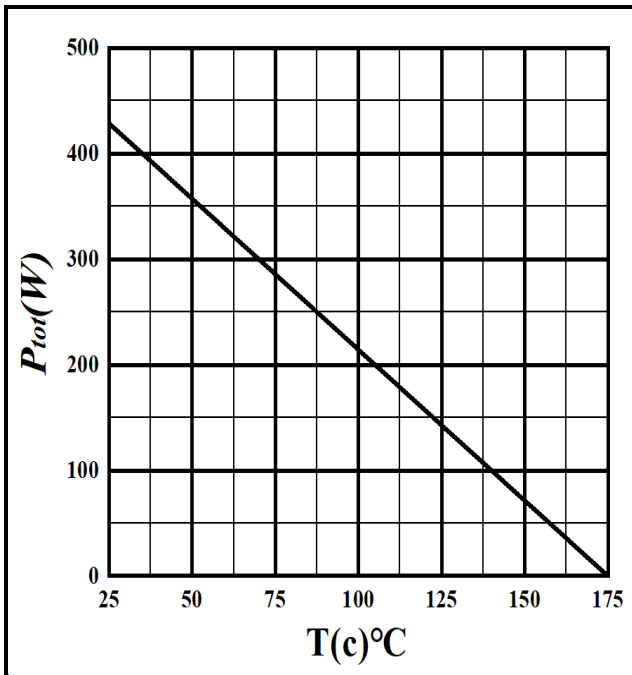


Figure 5. Power derating

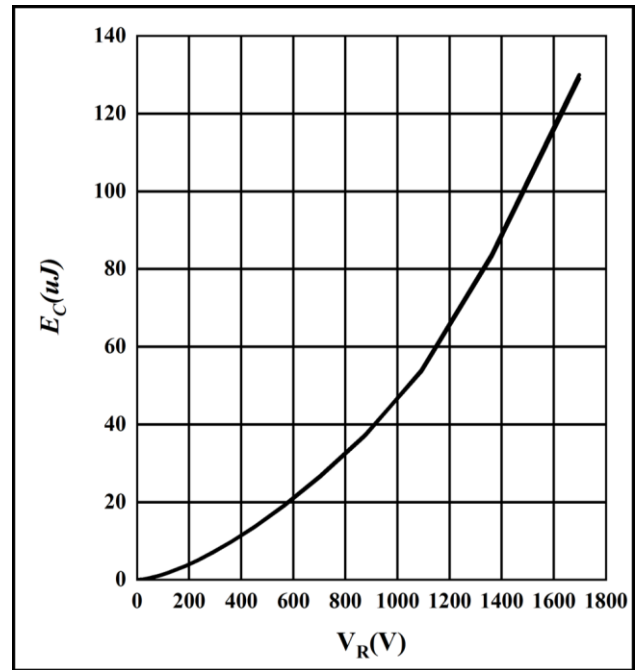


Figure 6. Capacitance stored energy

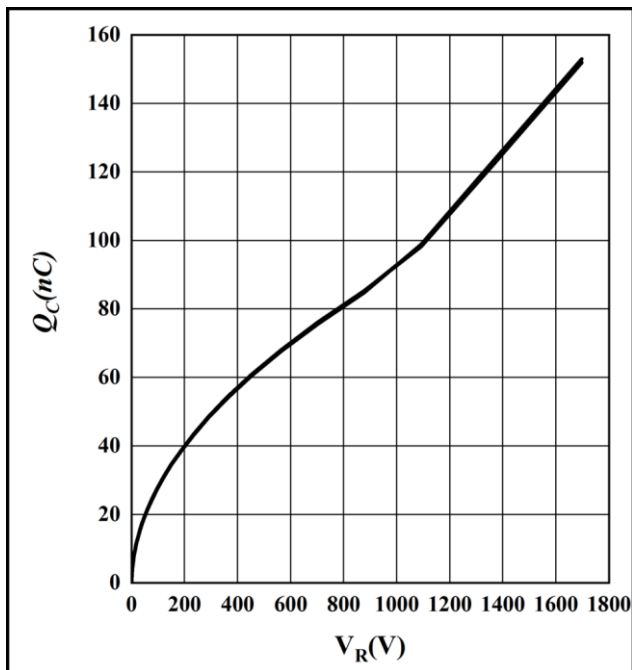


Figure 7. Total capacitance charge vs. reverse voltage

Ordering Information

Part Number	SDS170J025B5
Package	Bare Die
Packing Method	Wafer
RoHS	Yes

Important Notices – Read Carefully

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