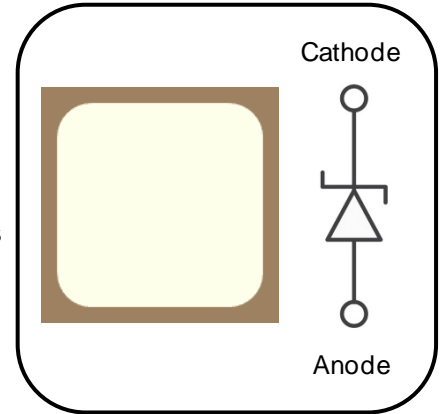


5th Generation 2000V/40A SiC Schottky Barrier Diode

Features

- 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

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



Description

The SDS200J040B5 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. As to the Schottky structure, it shows no recovery at turn-off and allows a low leakage current with reverse voltage up to 2000V. It can contribute to system miniaturization and achieve lightweight system design. 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
SDS200J040B5	2000V	54A	1.36V	403nC

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Table 1. Maximum Ratings

Parameter	Symbol	Value	Unit	Test conditions
Repetitive peak reverse voltage	V_{RRM}	2000	V	$T_c = 25^\circ\text{C}$
Surge peak reverse voltage	V_{RSM}	2000		$T_c = 25^\circ\text{C}$
DC reverse voltage	V_{DC}	2000		$T_c = 25^\circ\text{C}$
Continuous forward current	I_F	118	A	$T_c = 25^\circ\text{C}$
		54		$T_c = 135^\circ\text{C}$
		40		$T_c = 145^\circ\text{C}$
Surge non-repetitive forward current	I_{FSM}	520	A	$T_c = 25^\circ\text{C}$, $t_p = 10\text{ms}$, half sine pulse
Repetitive peak forward current	I_{FRM}	243	A	$T_c = 25^\circ\text{C}$, $t_p = 10\text{ms}$, half sine wave $D = 0.1$
i^2t value	$\int i^2 dt$	1352	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	$R_{th(j-c)}$	/	0.21	/	$^\circ\text{C}/\text{W}$	

*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}	2000	/	/	V	I _R = 100 μA
Forward voltage	V _F	/	1.36	1.60	V	I _F = 40A, T _j = 25°C
		/	2.10	2.75		I _F = 40A, T _j = 175°C
Reverse current	I _R	/	10	160	μA	V _R = 2000V, T _j = 25°C
		/	80	640		V _R = 2000V, T _j = 175°C

Table 4. Dynamic Electrical Characteristics

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
Total capacitance	C	/	5782	/	pF	V _R = 0V, f = 1MHz
		/	213	/		V _R = 800V, f = 1MHz
		/	178	/		V _R = 1200V, f = 1MHz
Total capacitive charge	Q _C	/	403	/	nC	V _R = 1200V
Capacitance stored energy	E _C	/	169	/	μJ	V _R = 1200V

Electrical Characteristic Diagrams

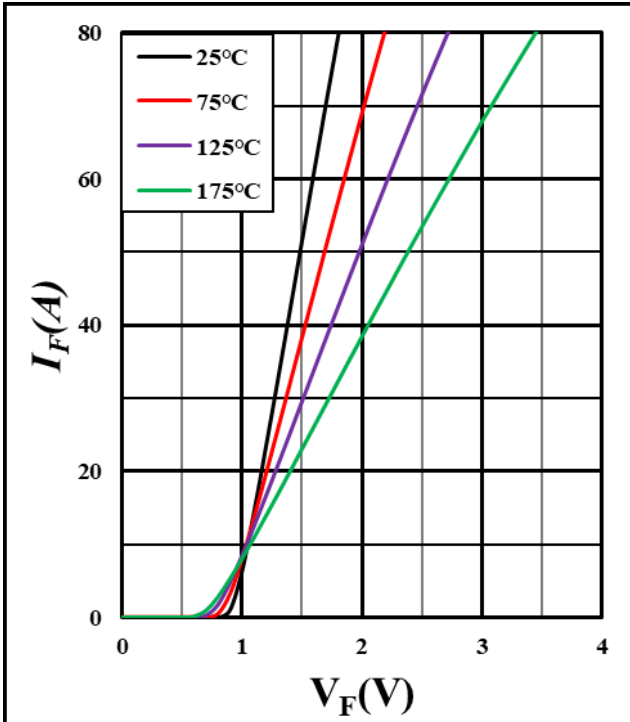


Figure 1. Forward characteristics

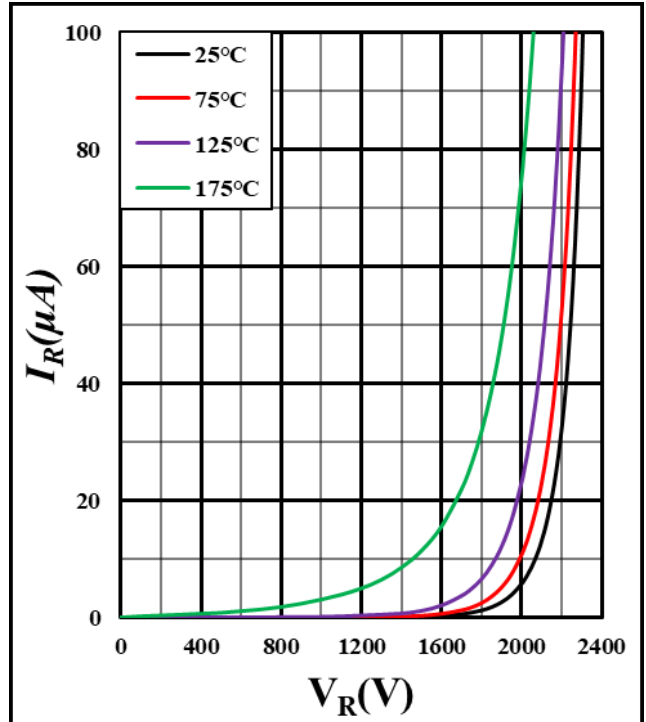


Figure 2. Reverse characteristics

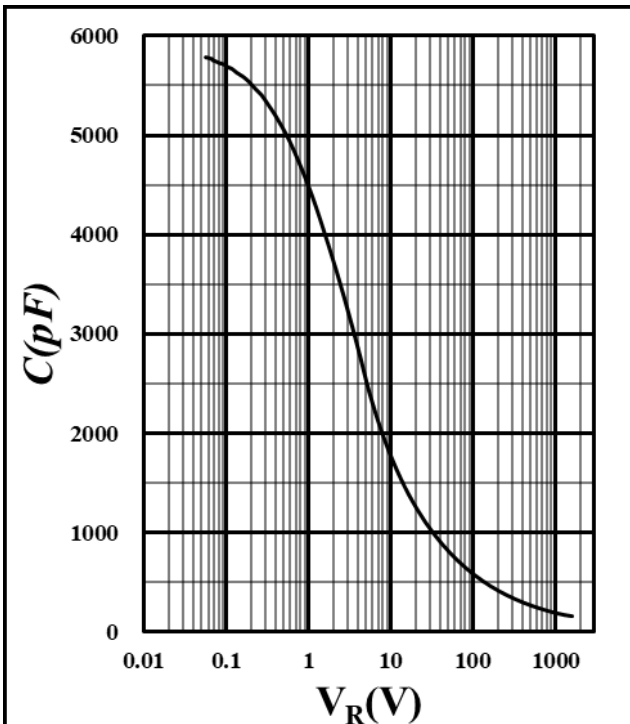


Figure 3. Capacitance vs. reverse voltage

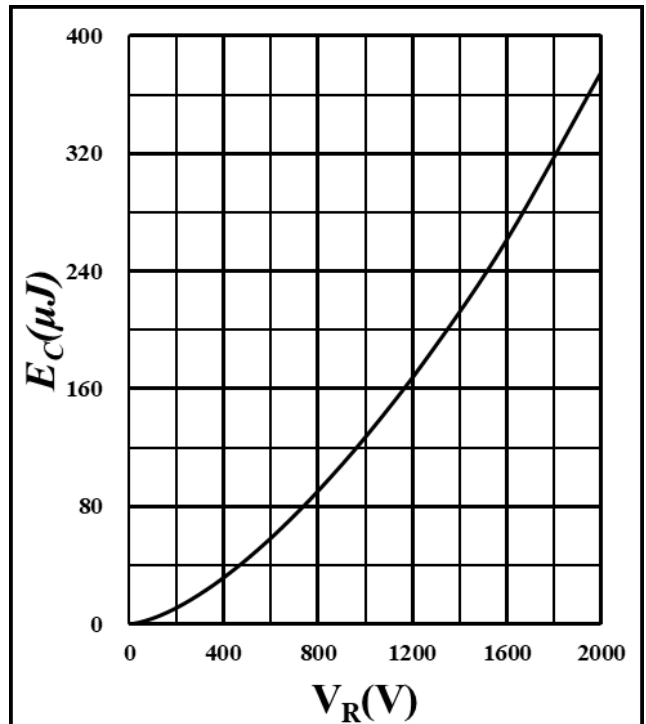


Figure 4. Capacitance stored energy

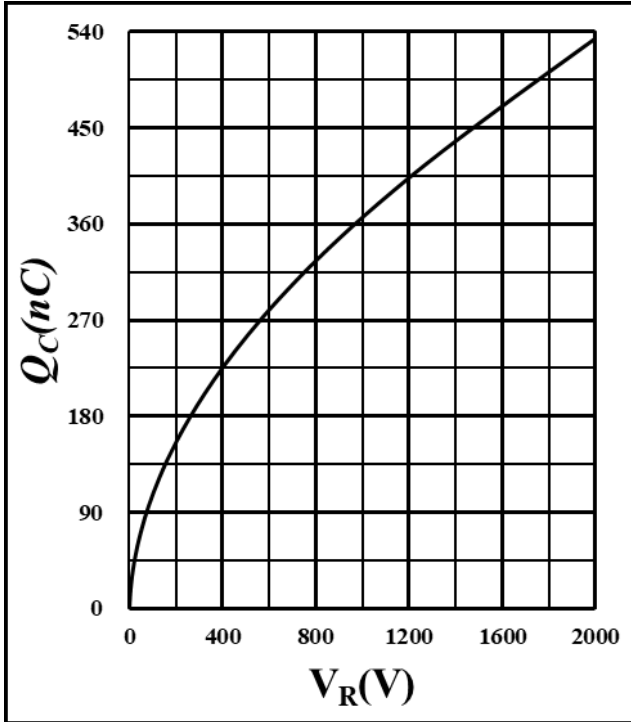


Figure 5. Total capacitance charge vs. reverse voltage

Ordering Information

Part Number	SDS200J040B5
Package	Bare Die
Packing Method	Wafer
RoHS	Yes

Important Notices – Read Carefully

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