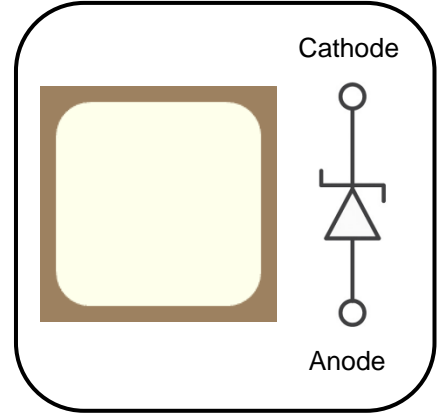


# 5<sup>th</sup> Generation 1700V/50A SiC Schottky Barrier Diode

## 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 SDS170J050B5 SiC Schottky Barrier Diode (SBD) has been developed using Sanan’s advanced 5<sup>th</sup> 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 1700V. 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	$V_{RRM}$	$I_F (135^\circ C)$	$V_F (25^\circ C)$	$Q_C$
SDS170J050B5	1700V	51A	1.40V	360nC

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**Table 1. Maximum Ratings**

Parameter	Symbol	Value	Unit	Test conditions
Repetitive peak reverse voltage	$V_{RRM}$	1700	V	$T_C = 25^\circ C$
Surge peak reverse voltage	$V_{RSM}$	1700		$T_C = 25^\circ C$
DC reverse voltage	$V_{DC}$	1700		$T_C = 25^\circ C$
Continuous forward current	$I_F$	111	A	$T_C = 25^\circ C$
		51		$T_C = 135^\circ C$
		50		$T_C = 136^\circ C$
Surge non-repetitive forward current	$I_{FSM}$	457	A	$T_C = 25^\circ C, t_p = 10ms,$ half sine pulse
Repetitive peak forward current	$I_{FRM}$	198	A	$T_C = 25^\circ C, t_p = 10ms,$ half sine wave $D = 0.1$
$i^2t$ value	$\int i^2 dt$	1044	$A^2s$	$T_C = 25^\circ C, t_p = 10ms$
Operating junction temperature	$T_j$	-55~175	$^\circ C$	
Storage temperature	$T_{stg}$	-55~175	$^\circ C$	

**Table 2. Thermal Resistance**

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Thermal resistance from junction to case	$R_{th(j-c)}$	/	0.28	/	$^\circ C/W$	

\*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	$I_R = 100 \mu A$
Forward voltage	$V_F$	/	1.40	1.60	V	$I_F = 50A, T_j = 25^\circ C$
		/	2.15	2.60		$I_F = 50A, T_j = 175^\circ C$
Reverse current	$I_R$	/	15	150	$\mu A$	$V_R = 1700V, T_j = 25^\circ C$
		/	75	1000		$V_R = 1700V, T_j = 175^\circ C$

**Table 4. Dynamic Electrical Characteristics**

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
Total capacitance	C	/	4065	/	pF	$V_R = 0V, f = 1MHz$
		/	221	/		$V_R = 600V, f = 1MHz$
		/	160	/		$V_R = 1200V, f = 1MHz$
Total capacitive charge	$Q_C$	/	360	/	nC	$V_R = 1200V$
Capacitance stored energy	$E_C$	/	151	/	$\mu J$	$V_R = 1200V$

## Electrical Characteristic Diagrams

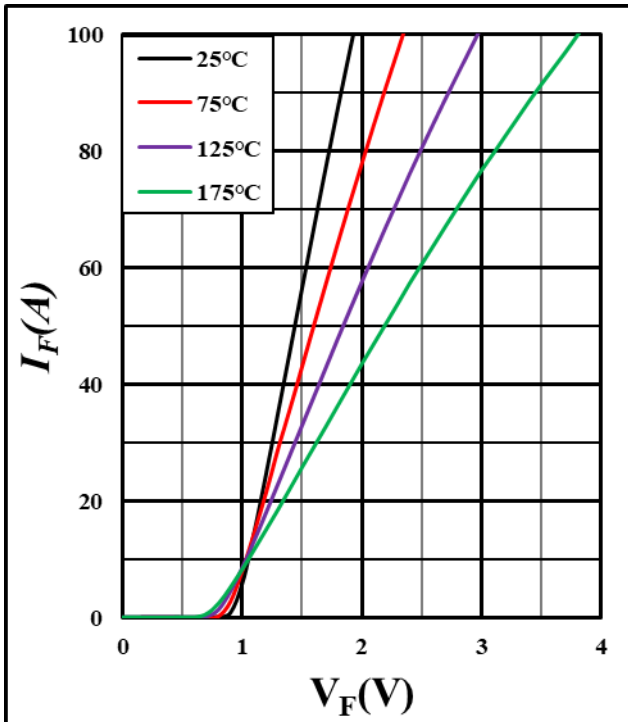


Figure 1. Forward characteristics

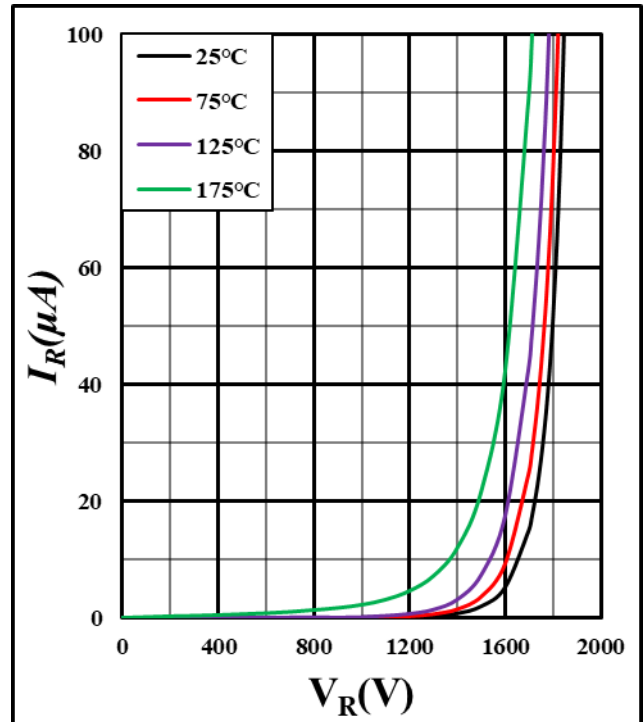


Figure 2. Reverse characteristics

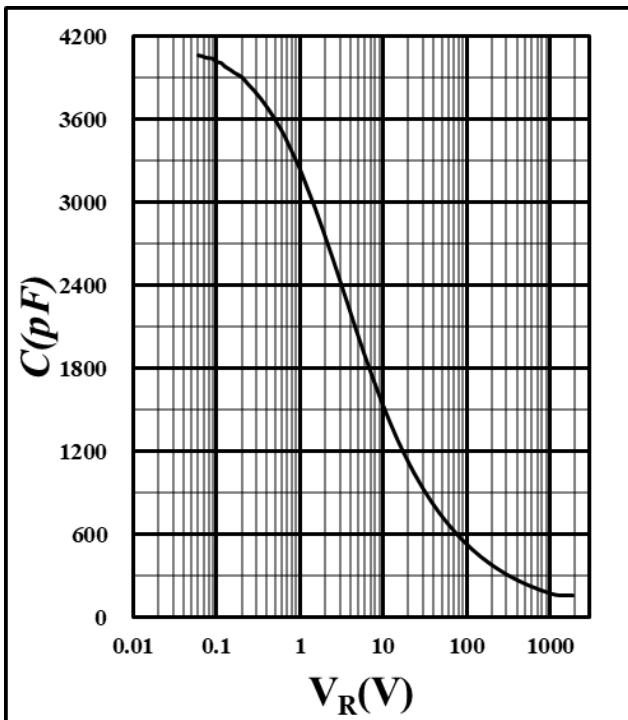


Figure 3. Capacitance vs. reverse voltage

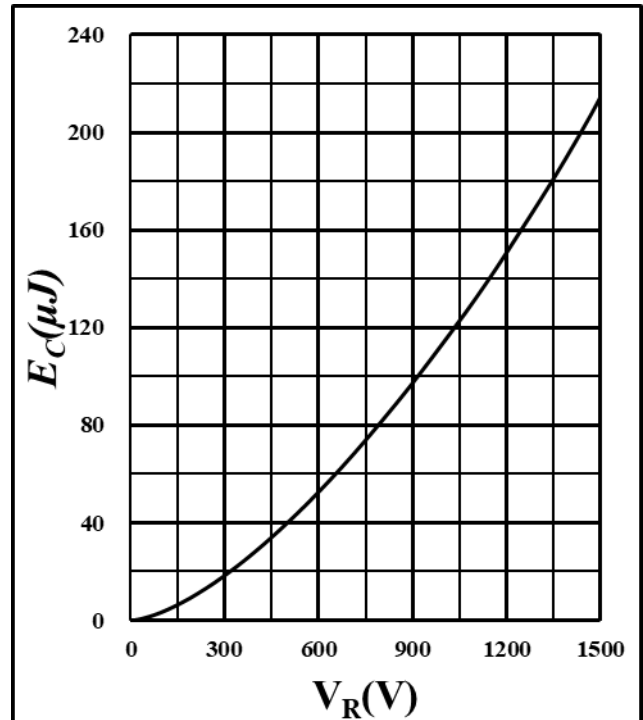


Figure 4. Capacitance stored energy

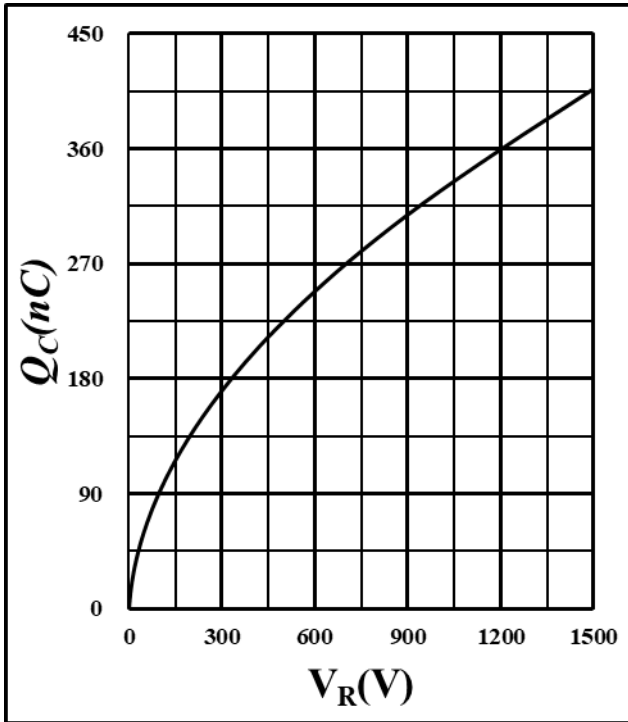


Figure 5. Total capacitance charge vs. reverse voltage

## Ordering Information

Part Number	SDS170J050B5
Package	Bare Die
Packing Method	Wafer
RoHS	Yes

## Important Notices – Read Carefully

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