

5th 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



Package Type: TO-247-2L

Potential Applications

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



Description

The SDS170J050H5 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 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°C)	V _F (25°C)	Q _c	Marking
SDS170J050H5	1700V	51A	1.40V	360nC	DS170050H5

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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}	1700	V	T _C = 25°C
Surge peak reverse voltage	V _{RSM}	1700		T _C = 25°C
DC reverse voltage	V _{DC}	1700		T _C = 25°C
Continuous forward current	I _F	111	A	T _C = 25°C
		51		T _C = 135°C
		50		T _C = 136°C
Surge non-repetitive forward current	I _{FSM}	457	A	T _C = 25°C, t _p = 10ms, half sine pulse
Surge repetitive forward current	I _{FRM}	198	A	T _C = 25°C, t _p = 10ms, half sine wave D = 0.1
Power dissipation	P _{tot}	536	W	T _C = 25°C
i ² t value	∫i ² dt	1044	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	
Mounting torque	M	1	Nm	M3 screw

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	/	°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}	1700	/	/	V	I _R = 200 μA
Forward voltage	V _F	/	1.40	1.60	V	I _F = 50A, T _j = 25°C
		/	2.15	2.60		I _F = 50A, T _j = 175°C
Reverse current	I _R	/	15	150	μA	V _R = 1700V, T _j = 25°C
		/	75	1000		V _R = 1700V, 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	/	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	/	μJ	V _R = 1200V

Electrical Characteristic Diagrams

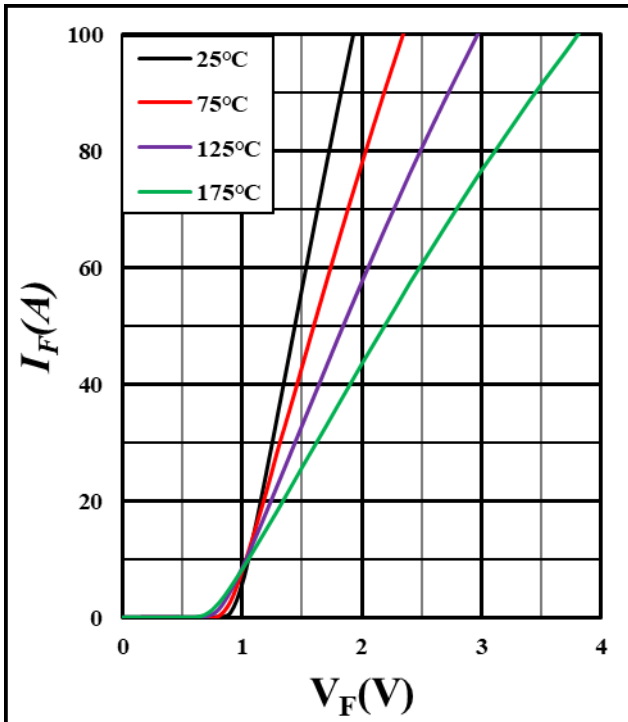


Figure 1. Forward characteristics

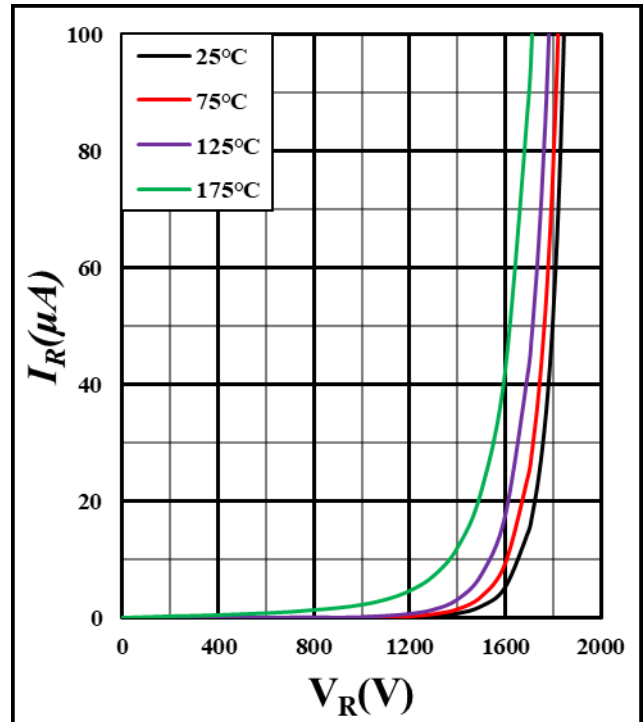


Figure 2. Reverse characteristics

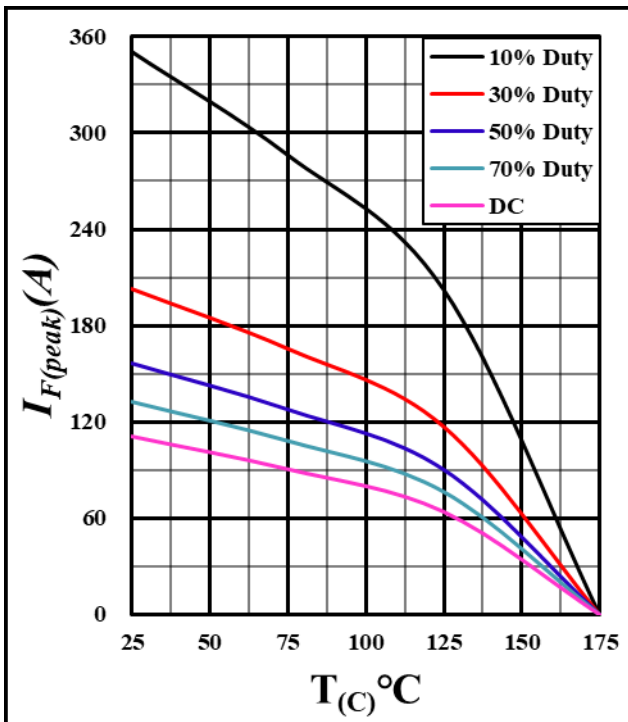


Figure 3. Current derating

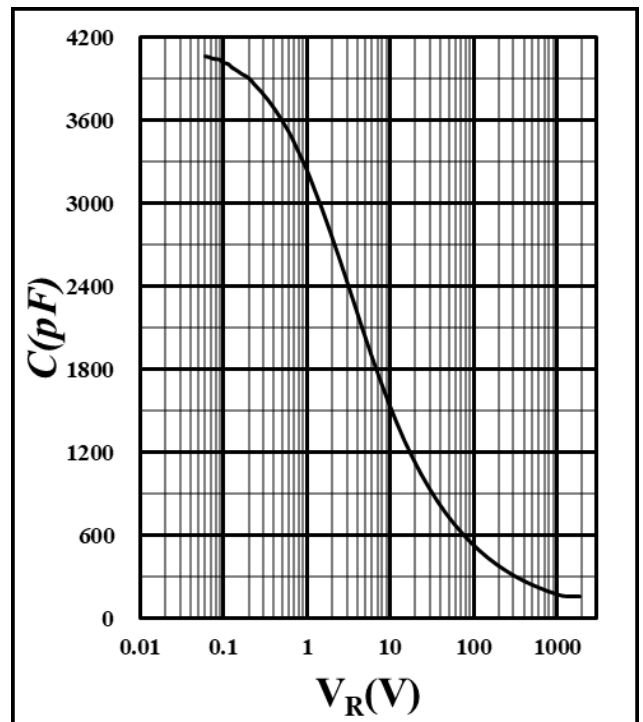


Figure 4. Capacitance vs. reverse voltage

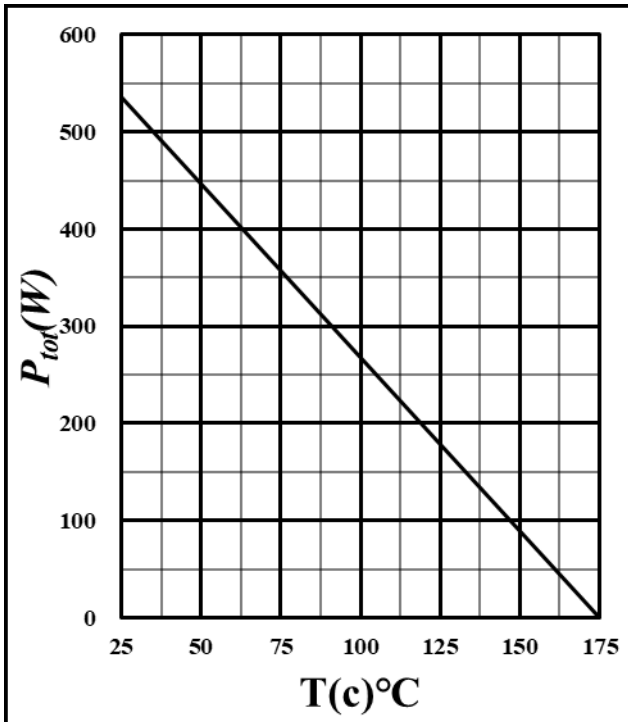


Figure 5. Power derating

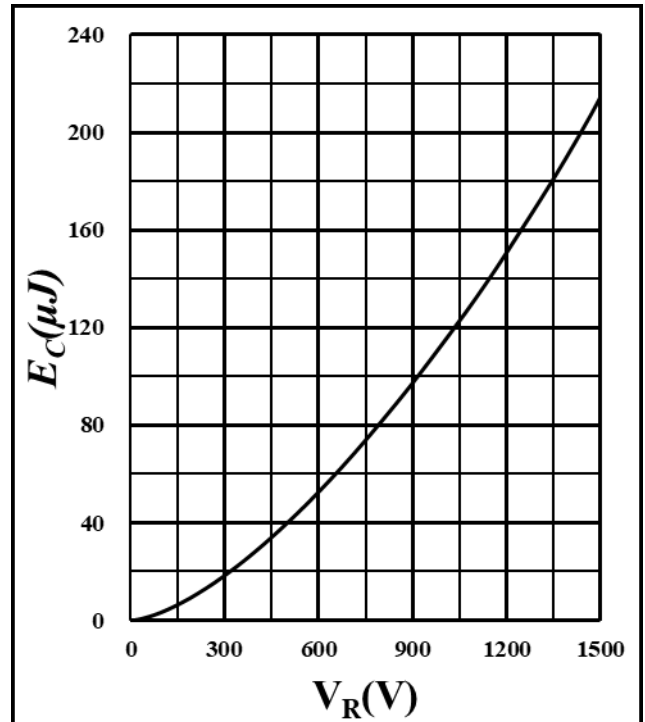


Figure 6. Capacitance stored energy

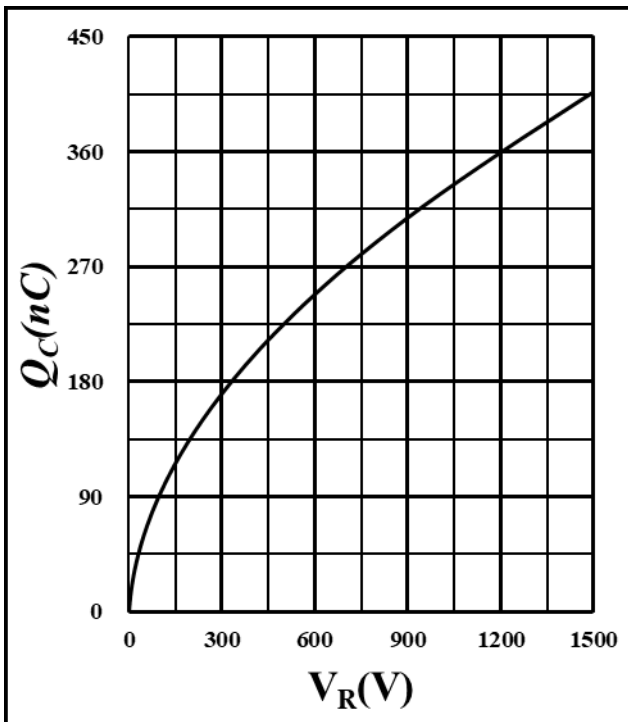
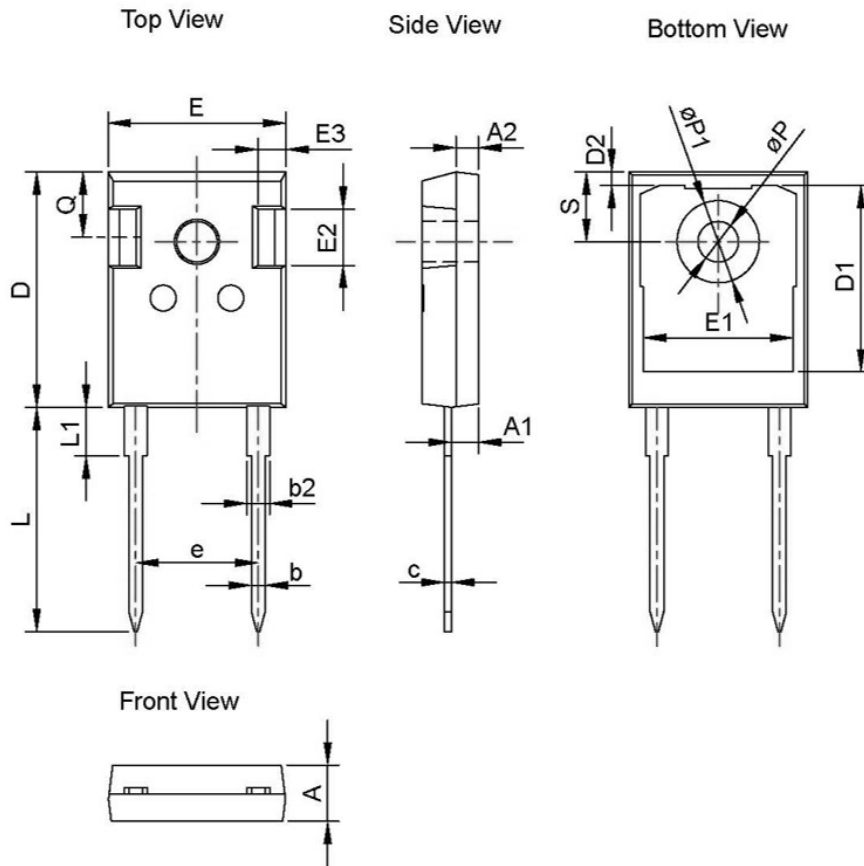


Figure 7. Total capacitance charge vs. reverse voltage

Package Information



Dimension unit: [mm]			
Symbol	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
c	0.51	0.60	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
D2	1.00	1.20	1.35
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	10.88 BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
ϕP	3.40	3.60	3.80
$\phi P1$	-	-	7.30
Q	5.40	5.80	6.20
S	6.20 BSC		

Recommended Solder Pad Layout

Note: All dimensions are in mm



TO-247-2L

Ordering Information

Part number	SDS170J050H5-ISATH
Package	TO-247-2L
Unit quantity	300 EA
Packing type	Tube

Important Notices – Read Carefully

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