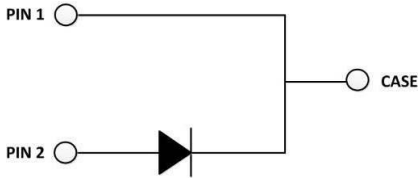


**5th Generation
1700V/25A SiC
Schottky Barrier Diode**

PDS025J170H5



Circuit diagram



Package Type: TO-247-2L



Description

The PDS025J170H5 SiC Schottky Barrier Diode (SBD) has been developed using Powerex’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.

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

Applications

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

Product Specifications

Device	V _{RRM}	I _F (135°C)	V _F (25°C)	Q _c	Marking
PDS025J170H5	1700V	40A	1.40V	191nC	PDS025J170H5



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Maximum Ratings ($T_c = 25^\circ\text{C}$, unless otherwise specified)

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}	388	A	$T_c = 25^\circ\text{C}$, $t_p = 10\text{ms}$, half sine pulse
Surge repetitive forward current	I_{FRM}	171	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	$\int i^2 dt$	752	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	$^\circ\text{C}$	
Mounting torque	M	1	Nm	M3 screw

Thermal Resistance

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

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Static Electrical Characteristics ($T_j = 25^\circ\text{C}$, unless otherwise specified)

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		$V_R = 1700\text{V}, T_j = 175^\circ\text{C}$

Dynamic Electrical Characteristics ($T_j = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
Total capacitance	C	/	2943	/	pF	$V_R = 0\text{V}, f = 1\text{MHz}$
		/	116	/		$V_R = 600\text{V}, f = 1\text{MHz}$
		/	90	/		$V_R = 1200\text{V}, f = 1\text{MHz}$
Total capacitive charge	Q_C	/	191	/	nC	$V_R = 1200\text{V}$
Capacitance stored energy	E_C	/	80	/	μJ	$V_R = 1200\text{V}$

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Electrical Characteristic Diagrams

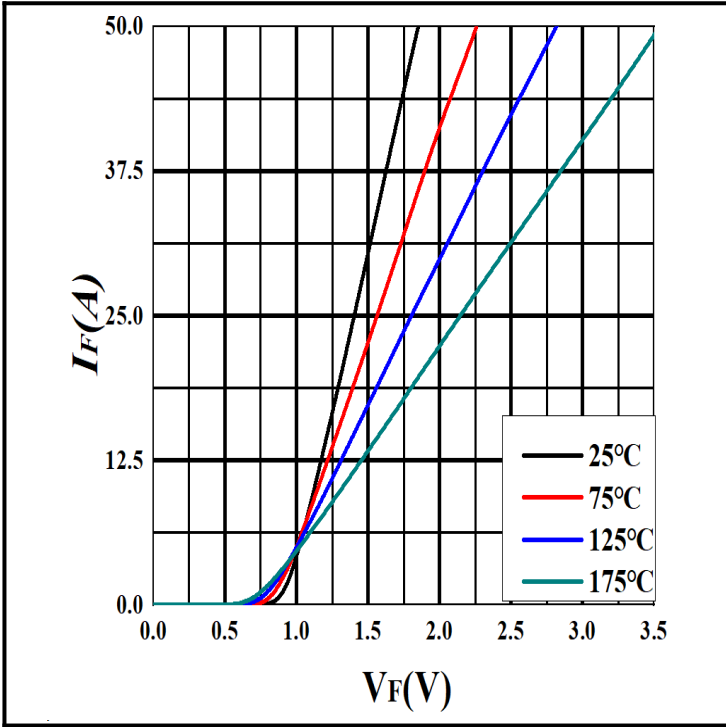


Figure 1. Forward characteristics

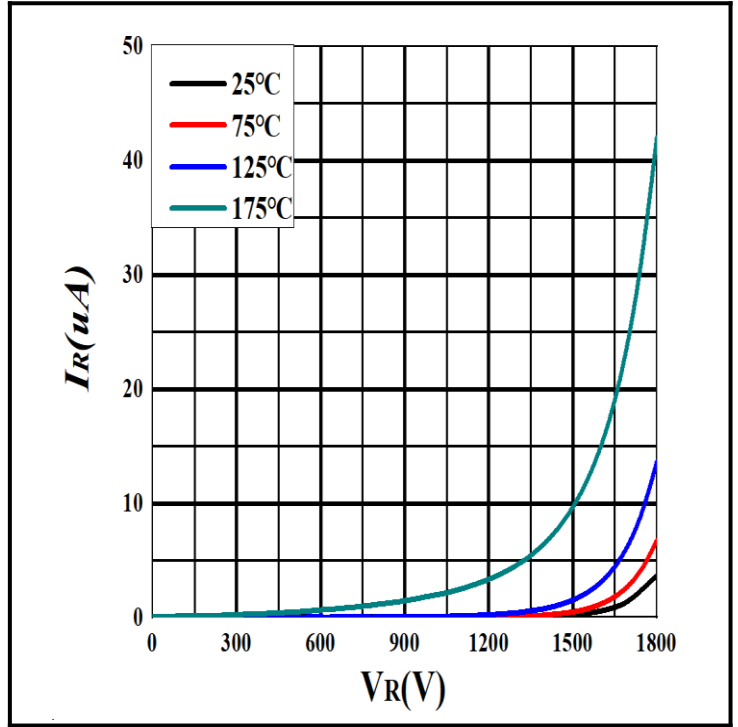


Figure 2. Reverse characteristics

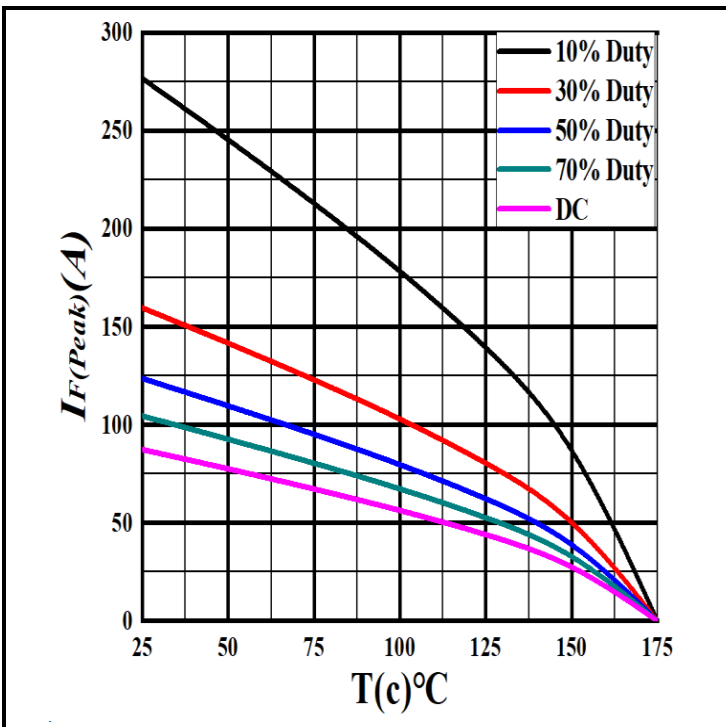


Figure 3. Current derating

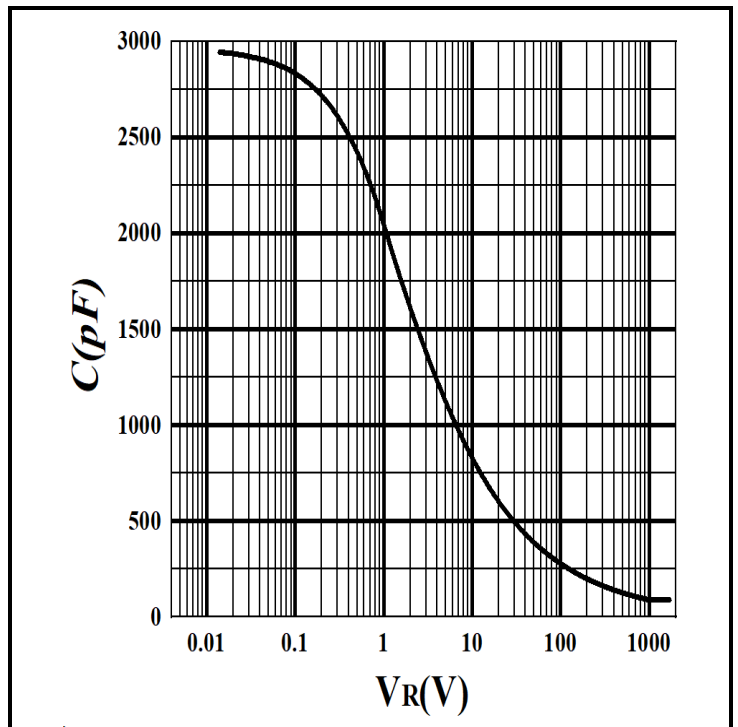


Figure 4. Capacitance vs. reverse voltage

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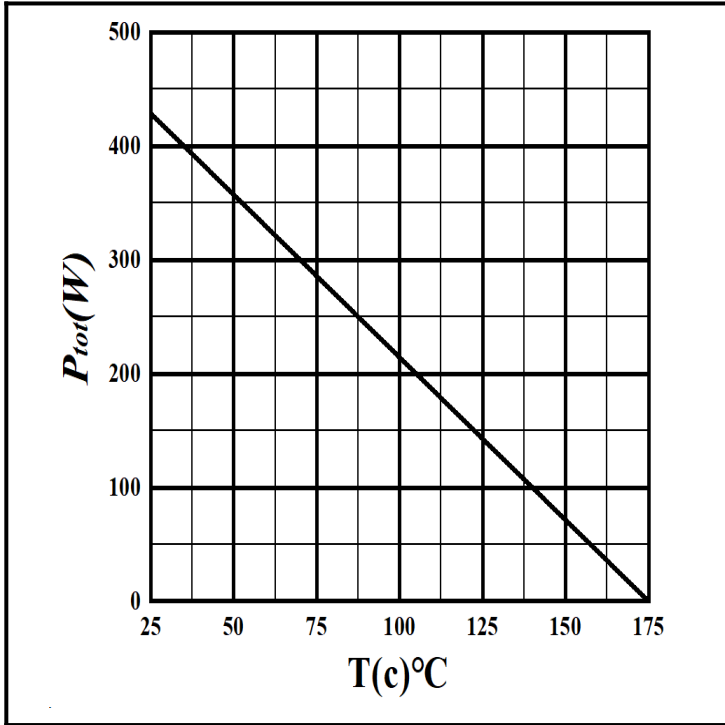


Figure 5. Power derating

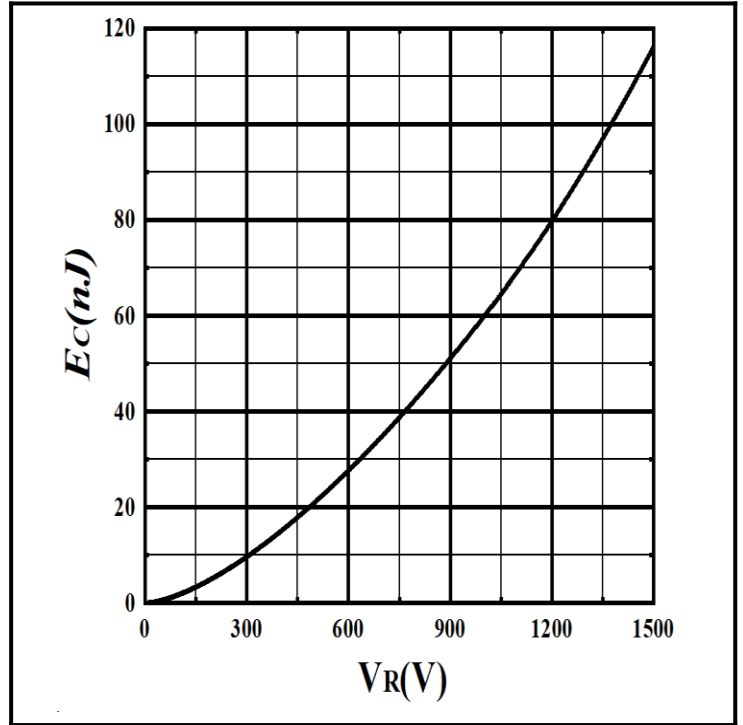


Figure 6. Capacitance stored energy

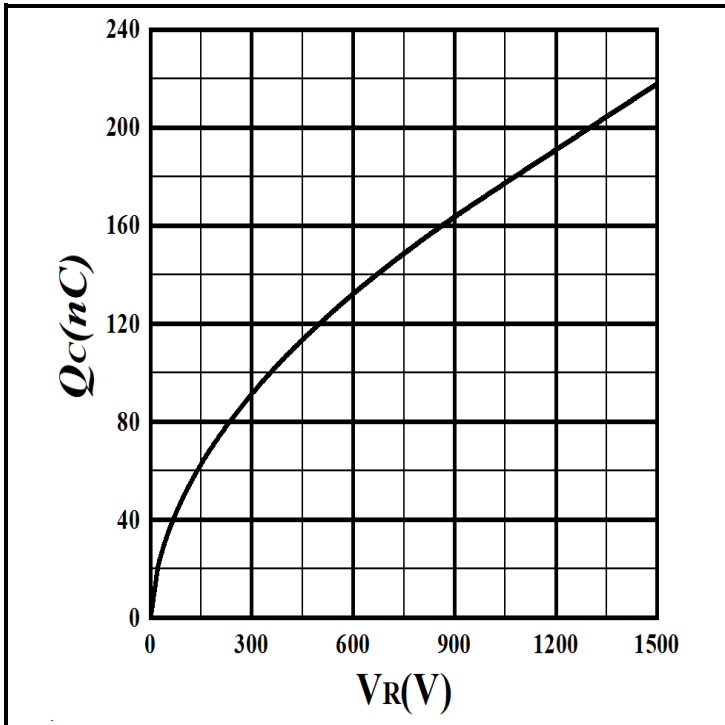
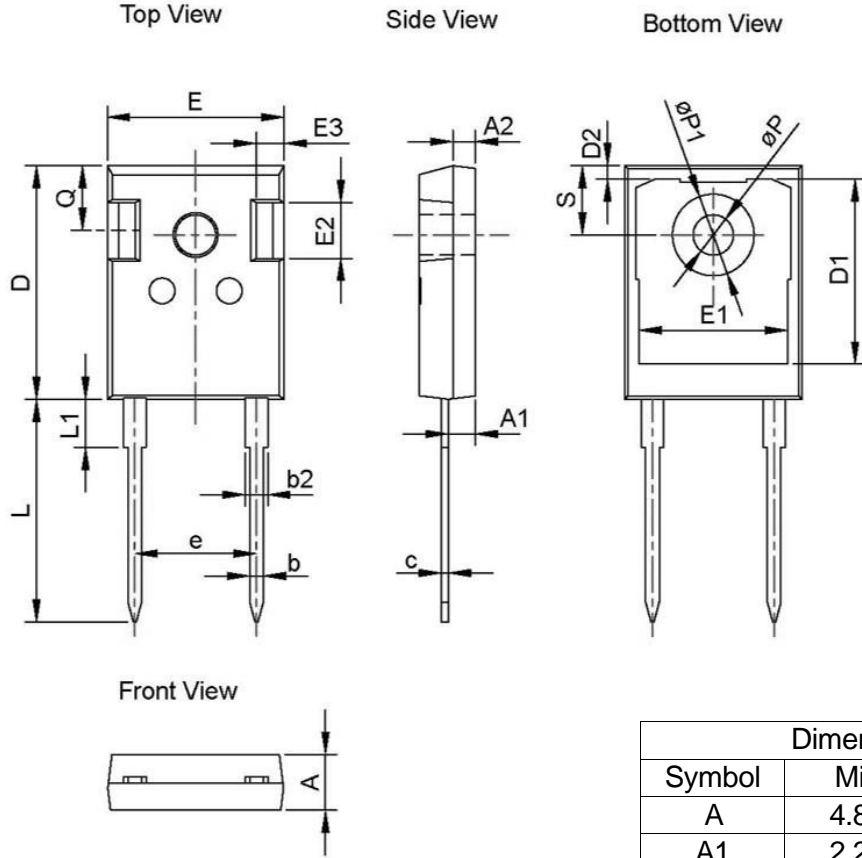


Figure 7. Total capacitance charge vs. reverse voltage

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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		

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Recommended Solder Pad Layout



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Note: All dimensions are in mm