

Bulletin I2035 rev.B 04/00

International
IR Rectifier

SD6000C..R SERIES

STANDARD RECOVERY DIODES

Hockey Puk Version

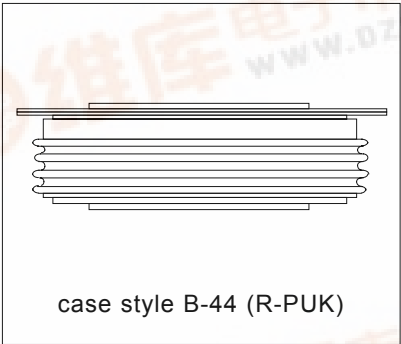
Features

- Wide current range
- High voltage ratings up to 2400V
- High surge current capabilities
- Diffused junction
- Hockey Puk version
- Case style B-44 (R-PUK)

Typical Applications

- Converters
- Power supplies
- High power drives
- Auxiliary system supplies for traction applications

6690A



Major Ratings and Characteristics

Parameters	SD6000C..R	Units
I _{F(AV)}	6690	A
@ T _{hs}	55	°C
I _{F(RMS)}	11150	A
@ T _{hs}	25	°C
I _{FSM}	@ 50Hz	76400
	@ 60Hz	80000
I ² t	@ 50Hz	KA ² s
	@ 60Hz	26650
V _{RRM} range	1200 to 2400	V
T _J	- 40 to 175	°C



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ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM} : maximum repetitive peak reverse voltage V	V_{RSM} : maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ $T_J = 175^\circ\text{C}$ mA
SD6000C..R	12	1200	1300	100
	16	1600	1700	
	20	2000	2100	
	24	2400	2500	

Forward Conduction

Parameter	SD6000C..R	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Heatsink temperature	6690 (3520)	A	180° conduction, half sine wave
	55 (85)	°C	Double side (single side) cooled
$I_{F(RMS)}$ Max. RMS forward current	11150	A	@ 25°C heatsink temperature double side cooled
I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current	76400	A	t = 10ms No voltage
	80000		t = 8.3ms reapplied
	64250		t = 10ms 100% V_{RRM}
	67280		t = 8.3ms reapplied
I^2t Maximum I^2t for fusing	29200	KA ² s	t = 10ms No voltage
	26650		t = 8.3ms reapplied
	20640		t = 10ms 100% V_{RRM}
	18850		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	292000	KA ² /s	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.727	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
$V_{F(TO)2}$ High level value of threshold voltage	1.350		$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
r_{f1} Low level value of forward slope resistance	0.055	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
r_{f2} High level value of forward slope resistance	0.027		$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
V_{FM} Max. forward voltage drop	1.22	V	$I_{pk} = 9000\text{A}, T_J = T_J \text{ max.}, t_p = 10\text{ms}$ sinusoidal wave

Thermal and Mechanical Specifications

Parameter	SD6000C..R	Units	Conditions
T _J Max. junction operating temperature range	-40 to 175	°C	
T _{stg} Max. storage temperature range	-55 to 200		
R _{thJ-hs} Max. thermal resistance, junction to heatsink	0.02 0.01	K/W	DC operation single side cooled DC operation double side cooled
F Mounting force, ± 10%	39200 (4000)	N (Kg)	
wt Approximate weight	1590	g	
Case style	B-44 (R-PUK)		See Outline Table

ΔR_{thJ-hs} Conduction

(The following table shows the increment of thermal resistance R_{thJ-hs} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction		Rectangular conduction		Units	Conditions
	Single Side	Double Side	Single Side	Double Side		
180°	0.0009	0.0010	0.0006	0.0006	K/W	T _J = T _J max.
120°	0.0010	0.0011	0.0010	0.0010		
90°	0.0013	0.0013	0.0014	0.0014		
60°	0.0019	0.0019	0.0020	0.0020		
30°	0.0033	0.0033	0.0034	0.0034		

Ordering Information Table

Device Code					
SD	600	0	C	24	R
①	②	③	④	⑤	⑥
1	- Diode				
2	- Essential part number				
3	- 0 = Standard recovery				
4	- C = Ceramic Puk				
5	- Voltage code: code x 100 = V _{RRM} (see Voltage Ratings Table)				
6	- R = Puk Case B-44 (R-PUK)				

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Outline Table

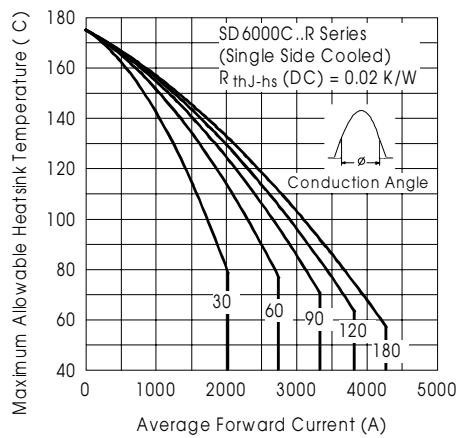
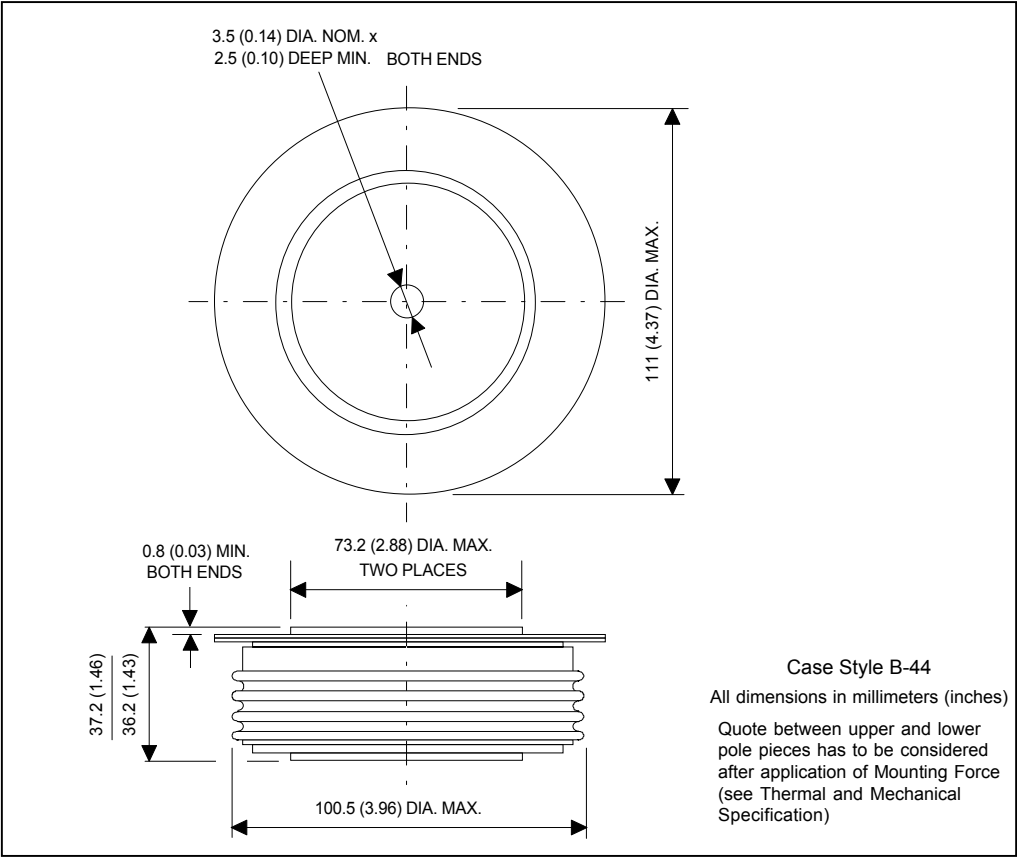


Fig. 1 - Current Ratings Characteristics

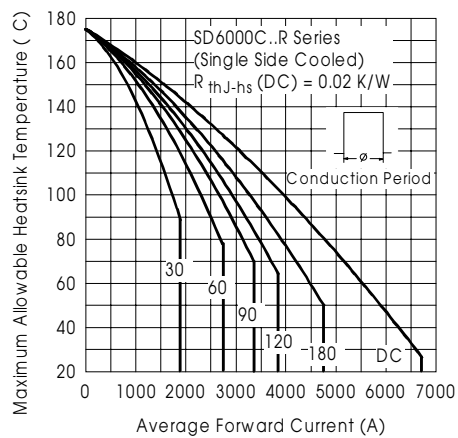


Fig. 2 - Current Ratings Characteristics

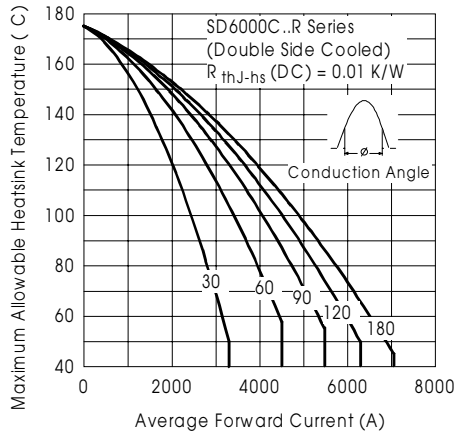


Fig. 3 - Current Ratings Characteristics

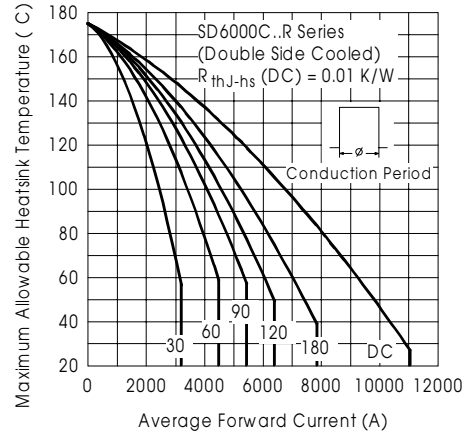


Fig. 4 - Current Ratings Characteristics

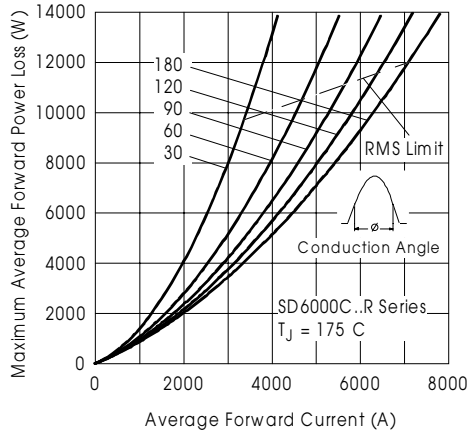


Fig. 5 - Forward Power Loss Characteristics

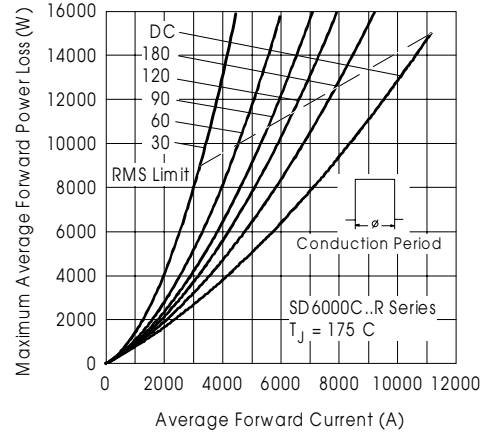


Fig. 6 - Forward Power Loss Characteristics

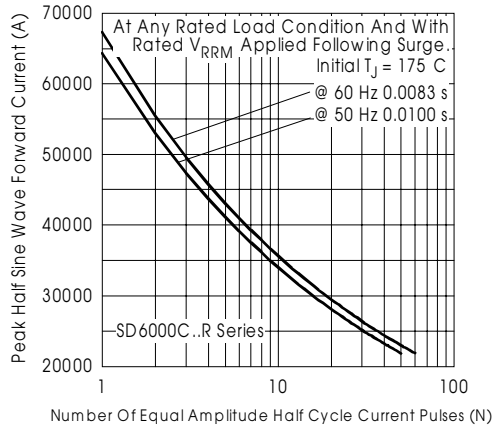


Fig. 7 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

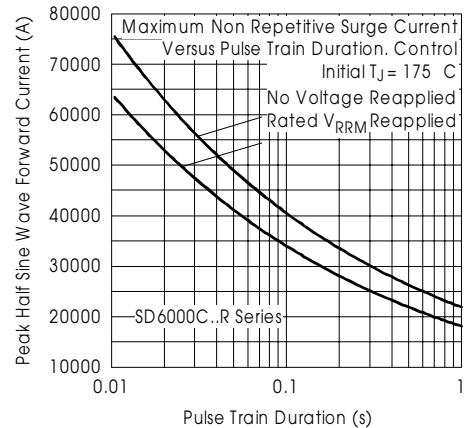


Fig. 8 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

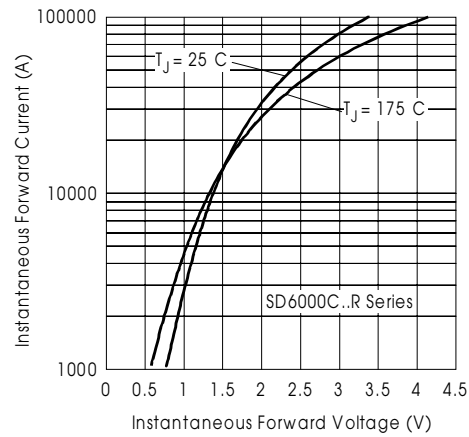


Fig. 9 - Forward Voltage Drop Characteristics

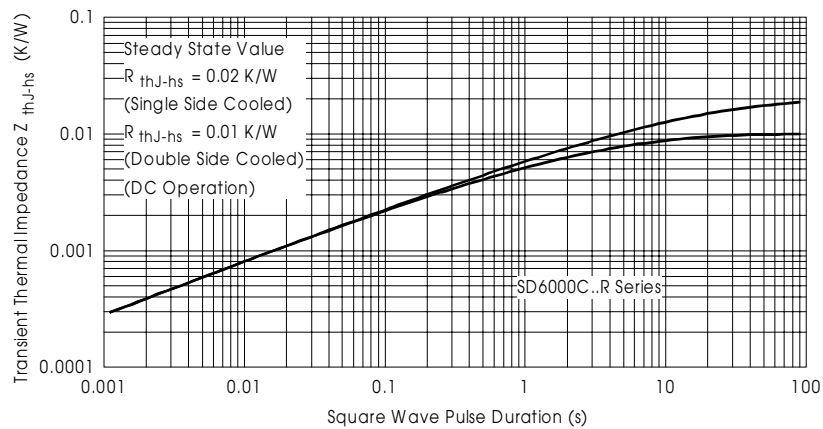


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics