

STANDARD RECOVERY DIODES

Hockey Puk Version

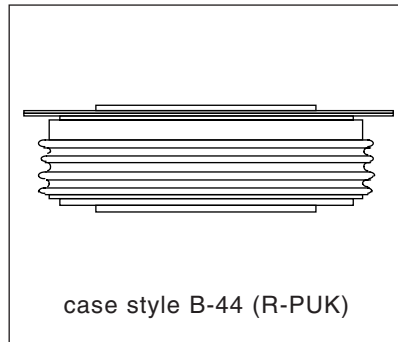
Features

- Wide current range
- High voltage ratings up to 4000V
- 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

4450A



Major Ratings and Characteristics

Parameters	SD4000C..R	Units	
$I_{F(AV)}$	4450	A	
@ T_{hs}	55	°C	
$I_{F(RMS)}$	7700	A	
@ T_{hs}	25	°C	
I_{FSM}	@ 50Hz	57300	A
	@ 60Hz	60000	A
I^2t	@ 50Hz	16430	KA ² s
	@ 60Hz	15000	KA ² s
V_{RRM} range	3000 to 4000	V	
T_J	- 40 to 150	°C	

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. @ $T_J = 150^\circ\text{C}$ mA
SD4000C..R	30	3000	3100	100
	34	3400	3500	
	38	3800	3900	
	40	4000	4100	

Forward Conduction

Parameter	SD4000C..R	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Heatsink temperature	4450 (2200)	A	180° conduction, half sine wave
	55 (85)	°C	Double side (single side) cooled
$I_{F(RMS)}$ Max. RMS forward current	7700	A	@ 25°C heatsink temperature double side cooled
I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current	57300	A	t = 10ms No voltage reappplied
	60000		t = 8.3ms reappplied
	48200		t = 10ms 100% V_{RRM} reappplied
	50470		t = 8.3ms reappplied
I^2t Maximum I^2t for fusing	16430	KA ² s	t = 10ms No voltage reappplied
	15000		t = 8.3ms reappplied
	11615		t = 10ms 100% V_{RRM} reappplied
	10605		t = 8.3ms reappplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	164300	KA ² √s	t = 0.1 to 10ms, no voltage reappplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.830	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ max.
$V_{F(TO)2}$ High level value of threshold voltage	1.112		$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ max.
r_{f1} Low level value of forward slope resistance	0.101	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ max.
r_{f2} High level value of forward slope resistance	0.071		$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ max.
V_{FM} Max. forward voltage drop	1.44	V	$I_{pk} = 6000A$, $T_J = T_J$ max, $t_p = 10ms$ sinusoidal wave

Thermal and Mechanical Specifications

Parameter	SD400C..R	Units	Conditions
T _J Max. junction operating temperature range	-40 to 150	°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	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">SD</td> <td style="padding: 5px;">400</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">C</td> <td style="padding: 5px;">40</td> <td style="padding: 5px;">R</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> </tr> </table>	SD	400	0	C	40	R	①	②	③	④	⑤	⑥						
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<table style="border-collapse: collapse;"> <tr><td style="background-color: black; color: white; padding: 2px 5px;">1</td><td style="padding: 2px 5px;">-</td><td style="padding: 2px 5px;">Diode</td></tr> <tr><td style="background-color: black; color: white; padding: 2px 5px;">2</td><td style="padding: 2px 5px;">-</td><td style="padding: 2px 5px;">Essential part number</td></tr> <tr><td style="background-color: black; color: white; padding: 2px 5px;">3</td><td style="padding: 2px 5px;">-</td><td style="padding: 2px 5px;">0 = Standard recovery</td></tr> <tr><td style="background-color: black; color: white; padding: 2px 5px;">4</td><td style="padding: 2px 5px;">-</td><td style="padding: 2px 5px;">C = Ceramic Puk</td></tr> <tr><td style="background-color: black; color: white; padding: 2px 5px;">5</td><td style="padding: 2px 5px;">-</td><td style="padding: 2px 5px;">Voltage code: code x 100 = V_{RRM} (see Voltage Ratings Table)</td></tr> <tr><td style="background-color: black; color: white; padding: 2px 5px;">6</td><td style="padding: 2px 5px;">-</td><td style="padding: 2px 5px;">R = Puk Case B-44 (R-PUK)</td></tr> </table>	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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SD4000C..R Series

Bulletin I2033 rev.B 04/00

International
IRF Rectifier

Outline Table

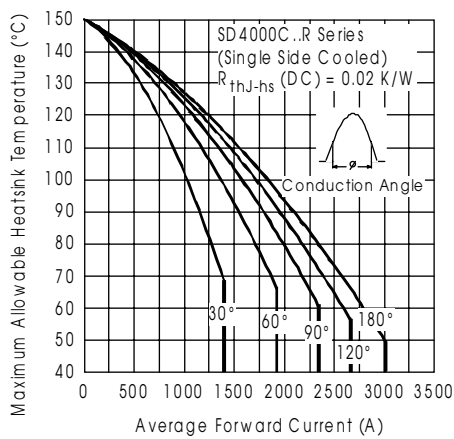
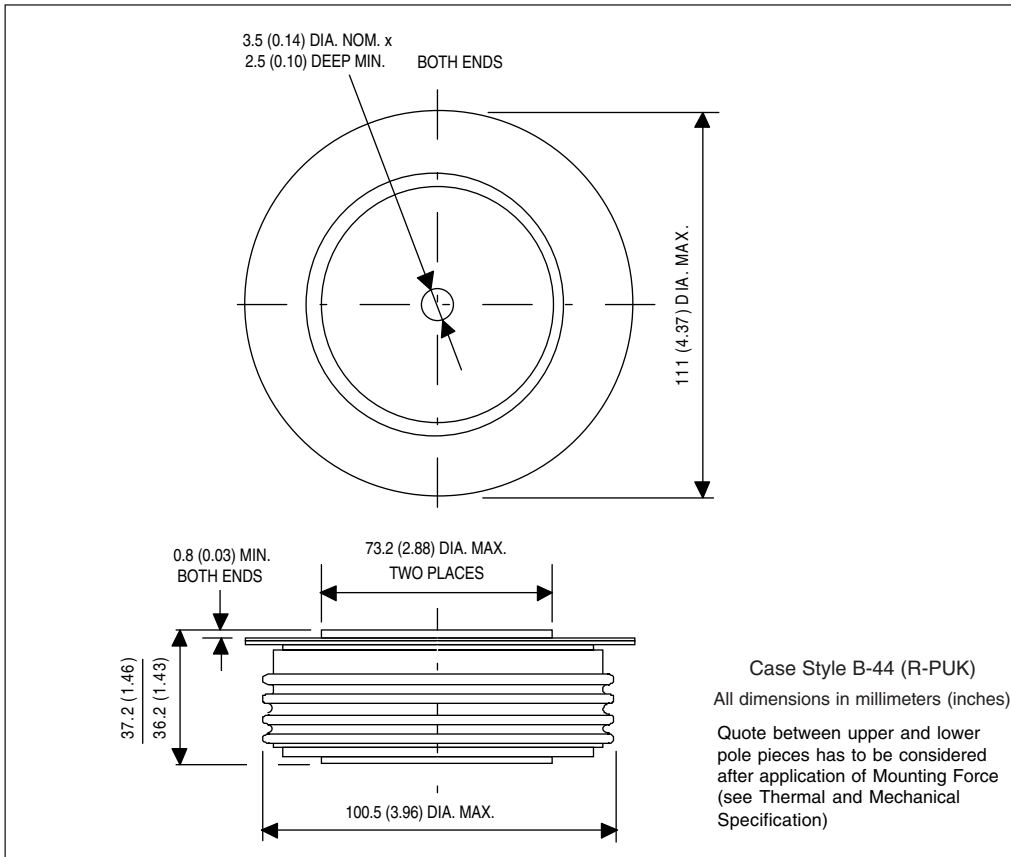


Fig. 1 - Current Ratings Characteristics

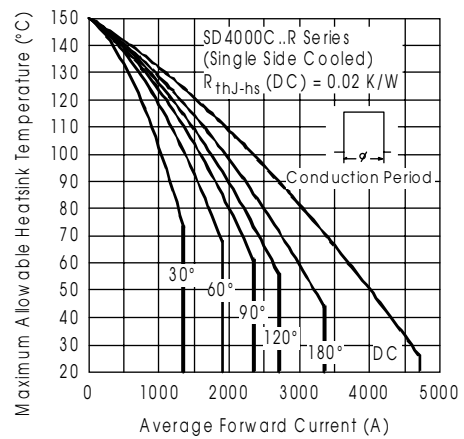


Fig. 2 - Current Ratings Characteristics

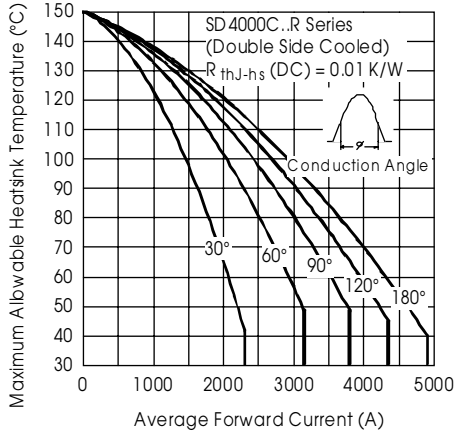


Fig. 3 - Current Ratings Characteristics

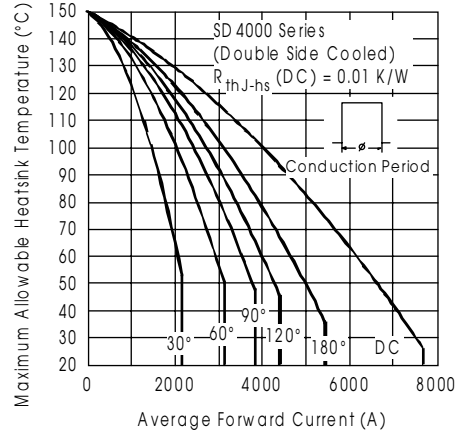


Fig. 4 - Current Ratings Characteristics

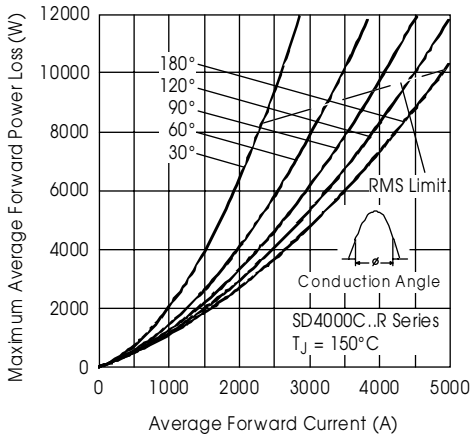


Fig. 5 - Forward Power Loss Characteristics

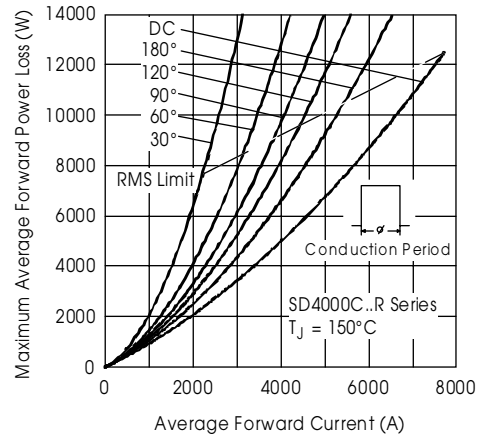


Fig. 6 - Forward Power Loss Characteristics

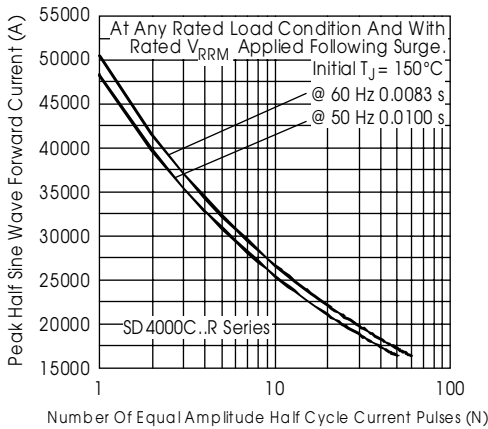


Fig. 7 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

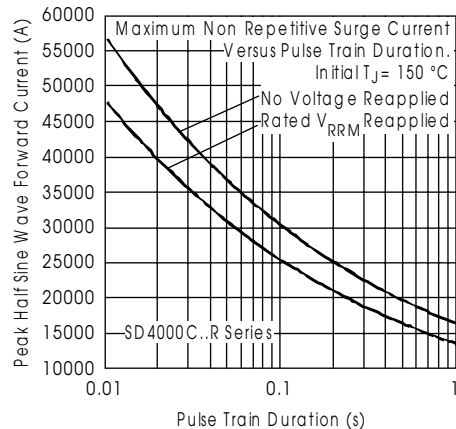


Fig. 8 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

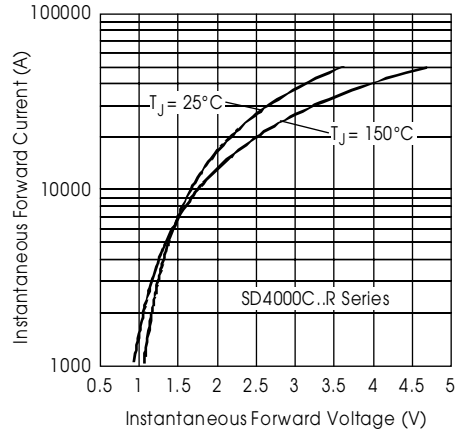


Fig. 9 - Forward Voltage Drop Characteristics

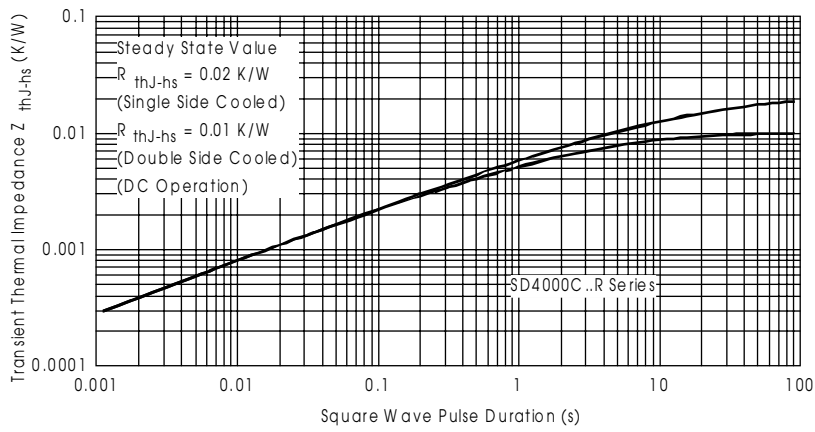


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics