

International IOR Rectifier

SD4000C..R SERIES

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



case style B-44 (R-PUK)

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

SD4000C..R Series

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
	60000		t = 8.3ms reapplied
	48200		t = 10ms 100% V_{RRM}
	50470		t = 8.3ms reapplied
I^2t Maximum I^2t for fusing	16430	KA ² s	t = 10ms No voltage
	15000		t = 8.3ms reapplied
	11615		t = 10ms 100% V_{RRM}
	10605		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	164300	KA ² √s	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.830	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
$V_{F(TO)2}$ High level value of threshold voltage	1.112		$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
r_{f1} Low level value of forward slope resistance	0.101	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
r_{f2} High level value of forward slope resistance	0.071		$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
V_{FM} Max. forward voltage drop	1.44	V	$I_{pk} = 6000\text{A}, T_J = T_J \text{ max.}, t_p = 10\text{ms}$ sinusoidal wave

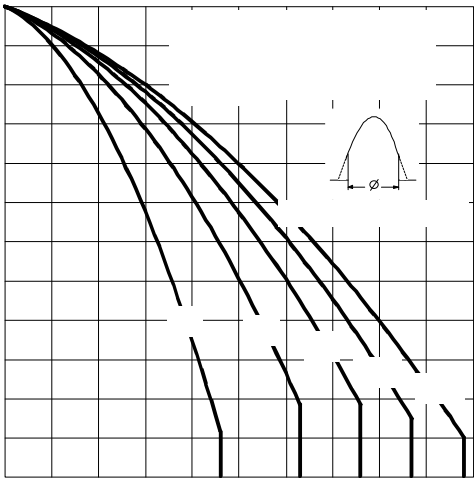


Fig. 3 - Current Ratings Characteristics

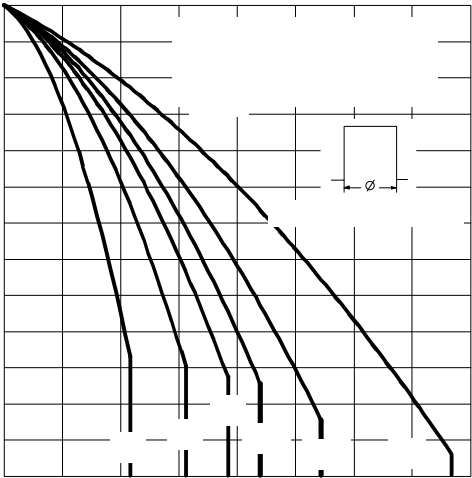


Fig. 4 - Current Ratings Characteristics

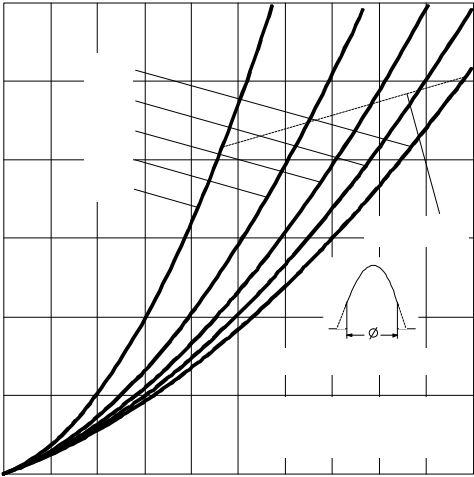


Fig. 5 - Forward Power Loss Characteristics

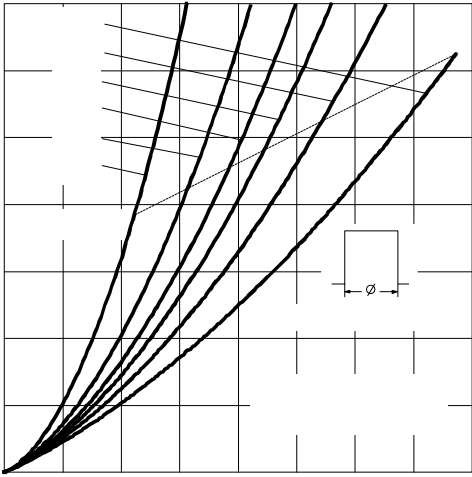
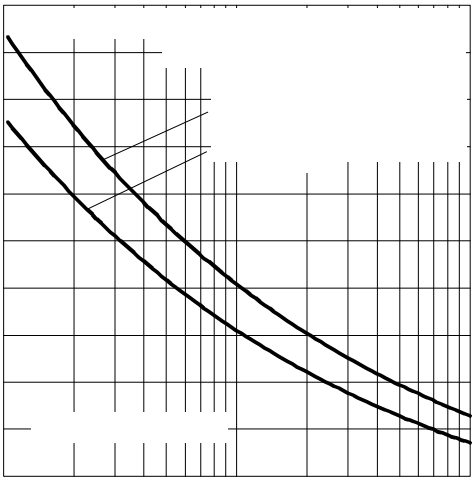
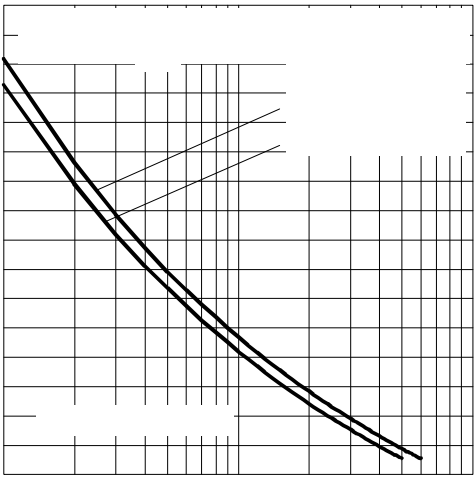


Fig. 6 - Forward Power Loss Characteristics



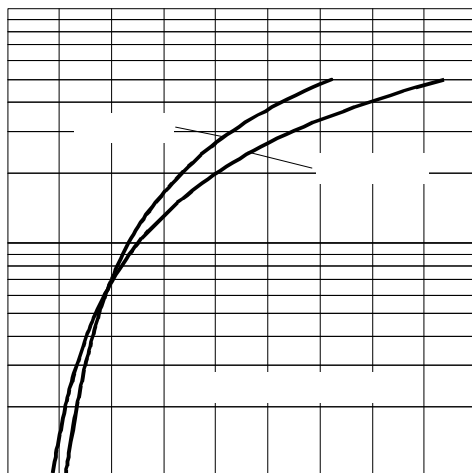


Fig. 9 - Forward Voltage Drop Characteristics

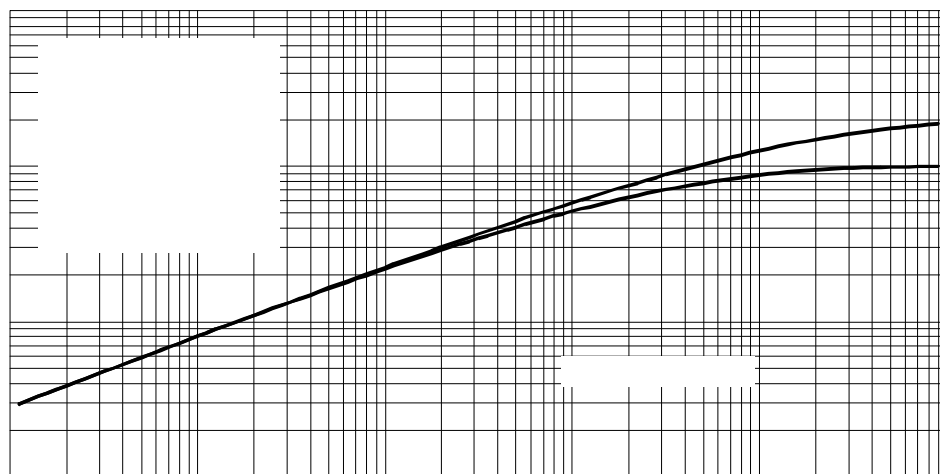


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics

Thermal and Mechanical Specifications

Parameter	SD4000C..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

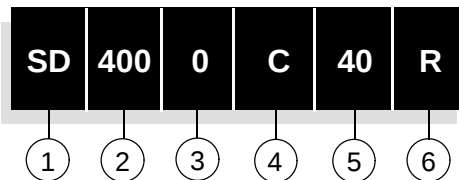
 ΔR_{thJ-hs} Conduction

(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



- 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)

SD4000C..R Series

Outline Table

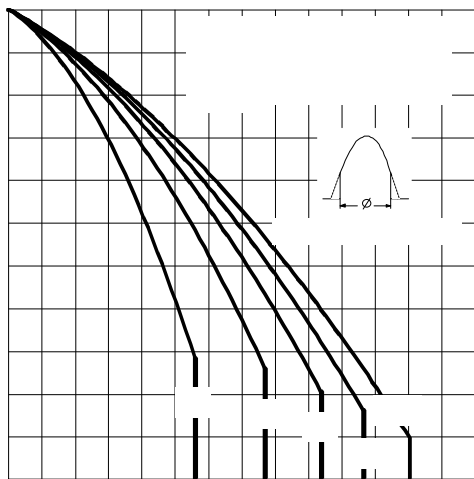
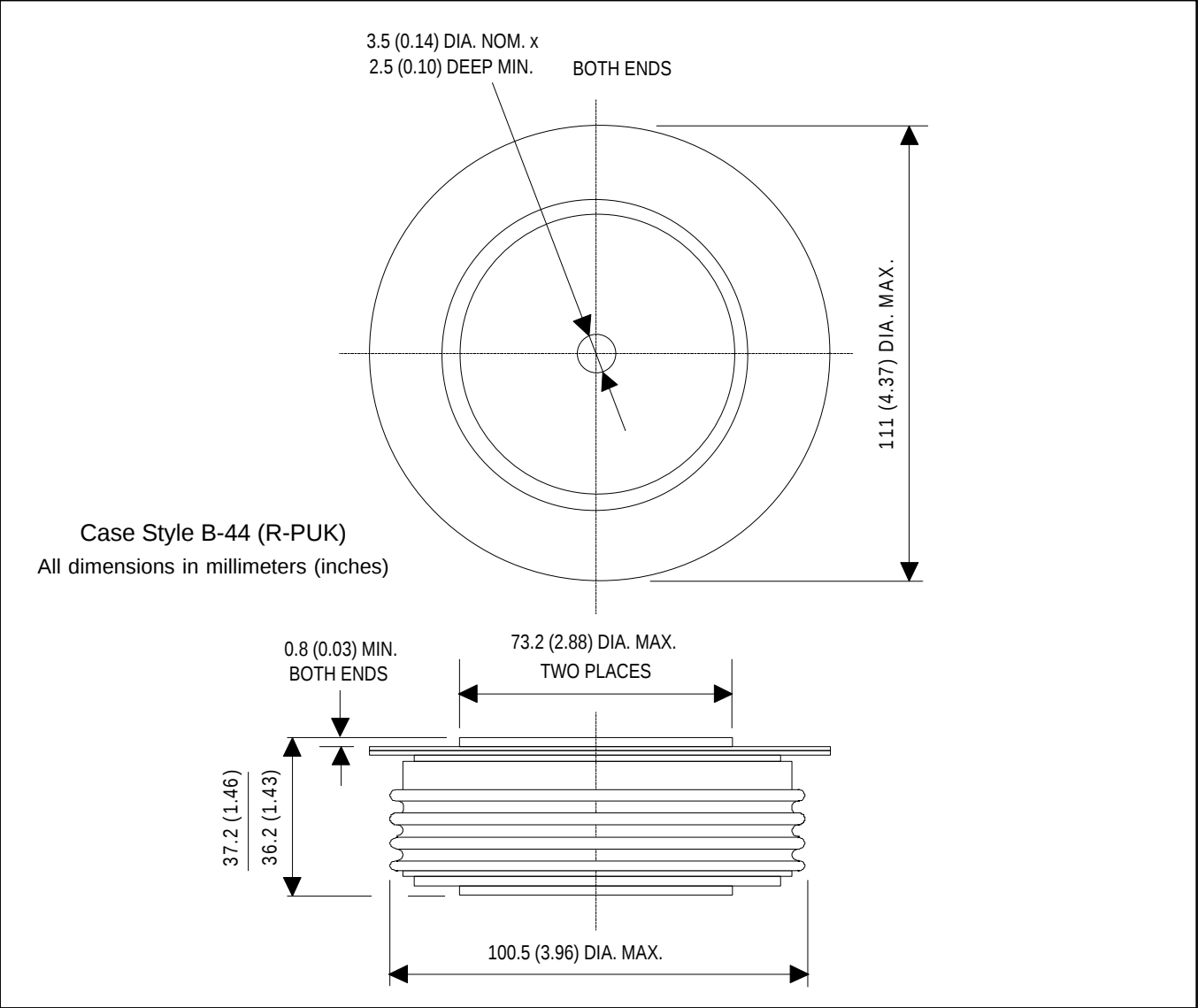


Fig. 1 - Current Ratings Characteristics

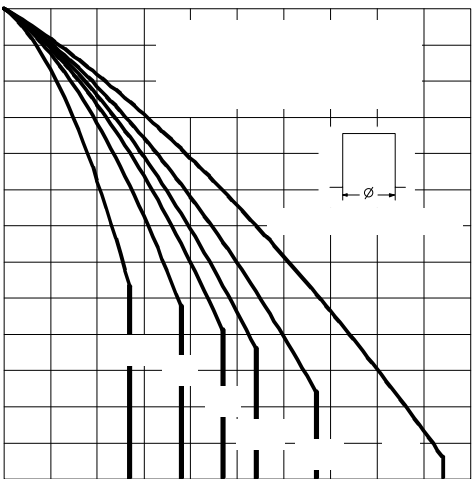


Fig. 2 - Current Ratings Characteristics