

### STANDARD RECOVERY DIODES

### Hockey Puk Version

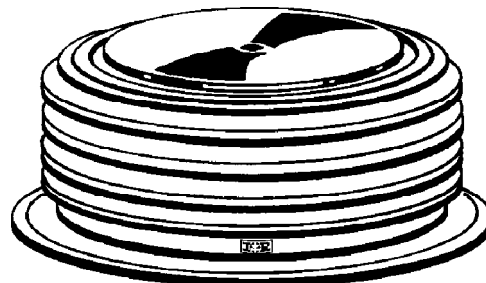
#### Features

- Wide current range
- High voltage ratings up to 3000V
- 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

5570A



case style B-44 (R-PUK)

#### Major Ratings and Characteristics

Parameters	SD5000C..R	Units
$I_{F(AV)}$	5570	A
@ $T_{hs}$	55	°C
$I_{F(RMS)}$	9400	A
@ $T_{hs}$	25	°C
$I_{FSM}$ @ 50Hz	67800	A
@ 60Hz	71000	A
$I^2t$ @ 50Hz	23000	KA <sup>2</sup> s
@ 60Hz	21000	KA <sup>2</sup> s
$V_{RRM}$ range	2000 to 3000	V
$T_J$	- 40 to 160	°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. @ $T_J = 160^\circ\text{C}$ mA
SD5000C..R	20	2000	2100	100
	24	2400	2500	
	26	2600	2700	
	30	3000	3100	

## Forward Conduction

Parameter	SD5000C..R	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Heatsink temperature	5570 (2850)	A	180° conduction, half sine wave
	55 (85)	°C	Double side (single side) cooled
$I_{F(RMS)}$ Max. RMS forward current	9400	A	@ 25°C heatsink temperature double side cooled
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	67800	A	t = 10ms No voltage
	71000		t = 8.3ms reapplied
	57000		t = 10ms 100% $V_{RRM}$
	59700		t = 8.3ms reapplied
$I^2t$ Maximum $I^2t$ for fusing	23000	KA <sup>2</sup> s	t = 10ms No voltage
	21000		t = 8.3ms reapplied
	16260		t = 10ms 100% $V_{RRM}$
	14845		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	230000	KA <sup>2</sup> /s	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.774	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	1.271		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ max.
$r_{f1}$ Low level value of forward slope resistance	0.068	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	0.037		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ max.
$V_{FM}$ Max. forward voltage drop	1.32	V	$I_{pk} = 8000\text{A}$ , $T_J = T_J$ max, $t_p = 10\text{ms}$ sinusoidal wave

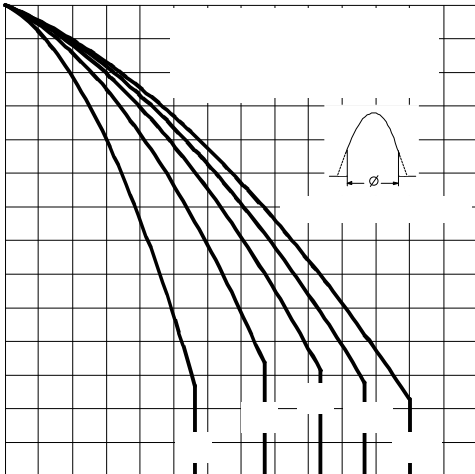


Fig. 3 - Current Ratings Characteristics

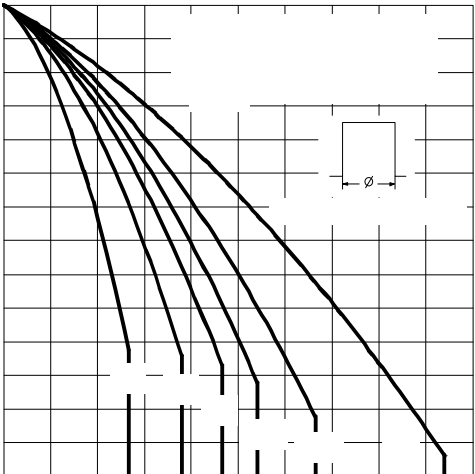


Fig. 4 - Current Ratings Characteristics

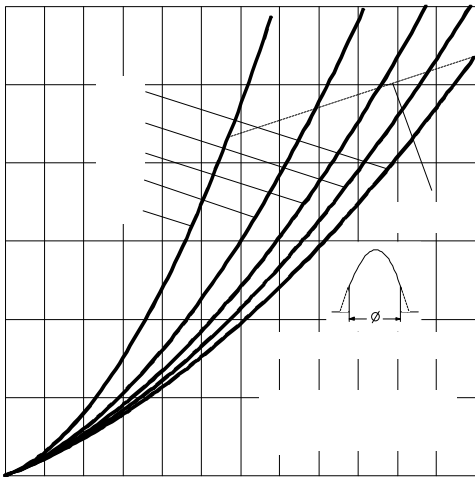


Fig. 5 - Forward Power Loss Characteristics

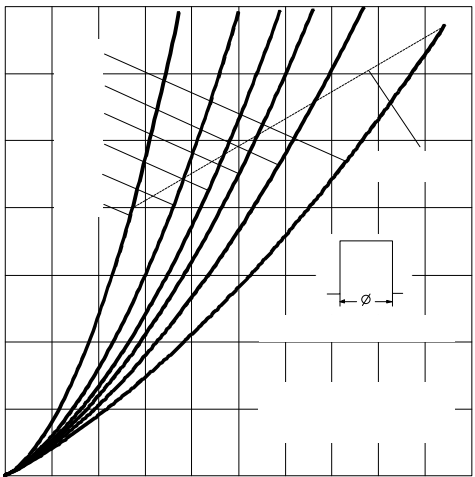


Fig. 6 - Forward Power Loss Characteristics

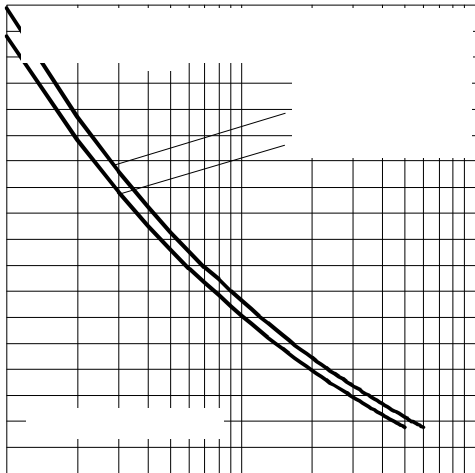


Fig. 7 - Maximum Non-Repetitive Surge Current

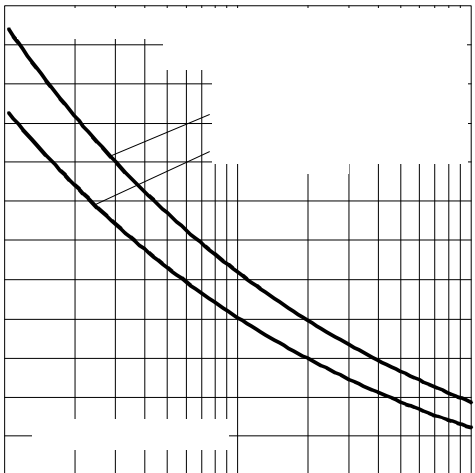


Fig. 8 - Maximum Non-Repetitive Surge Current

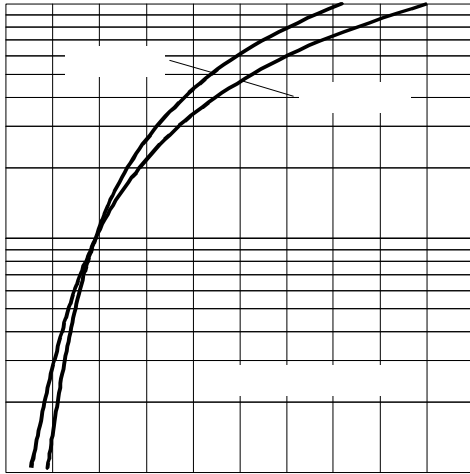


Fig. 9 - Forward Voltage Drop Characteristics

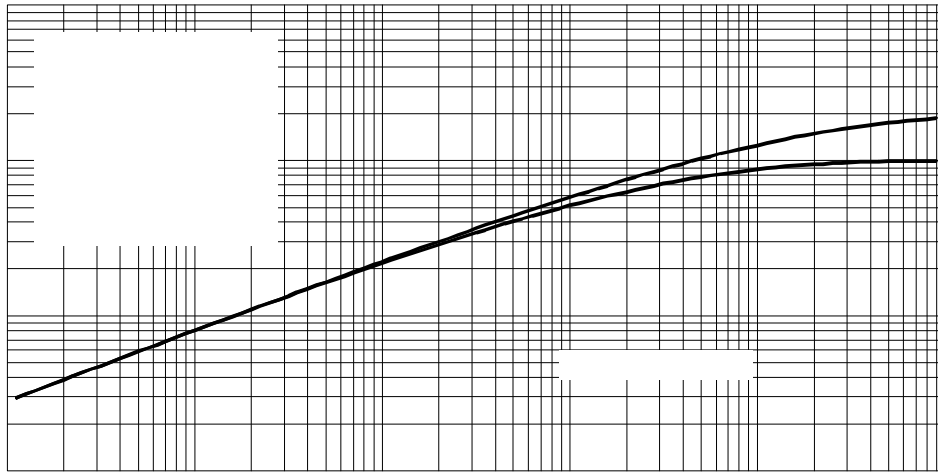


Fig. 10 - Thermal Impedance  $Z_{thJ-hs}$  Characteristics

## Thermal and Mechanical Specifications

Parameter	SD5000C..R	Units	Conditions
T <sub>J</sub> Max. junction operating temperature range	-40 to 160	°C	
T <sub>stg</sub> Max. storage temperature range	-55 to 200		
R <sub>thJ-hs</sub> 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

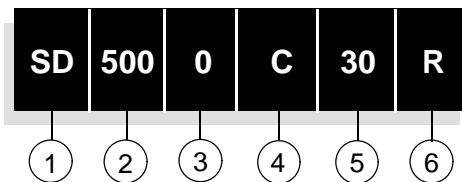
 $\Delta R_{thJ-hs}$  Conduction

(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 <sub>J</sub> = T <sub>J</sub> 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<sub>RRM</sub> (see Voltage Ratings Table)
- 6** - R = Puk Case B-44 (R-PUK)

Outline Table

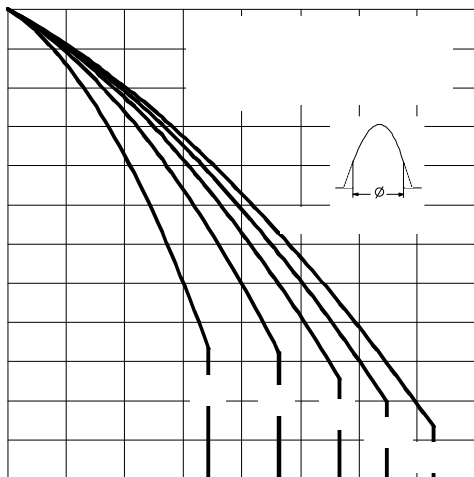
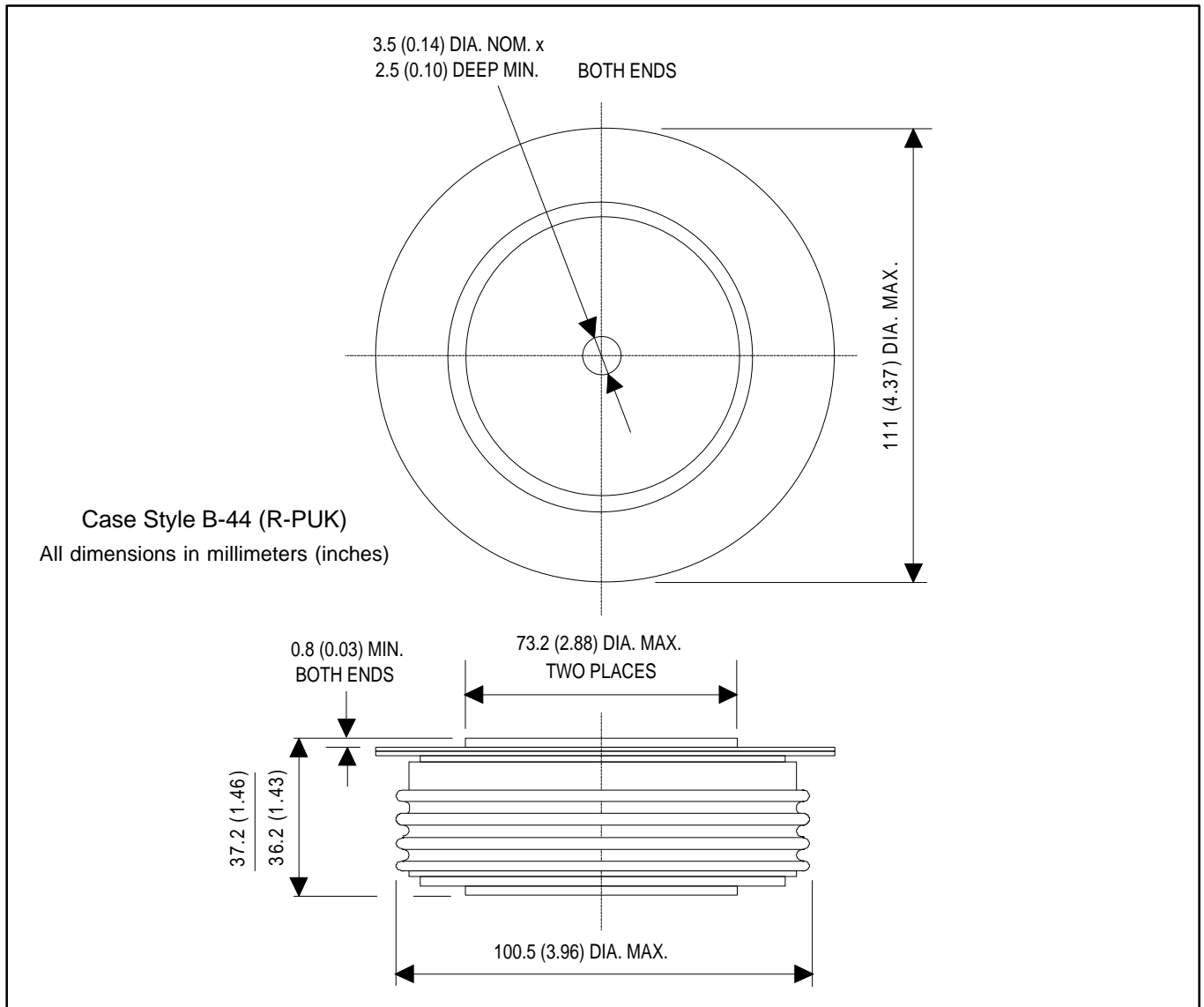


Fig. 1 - Current Ratings Characteristics

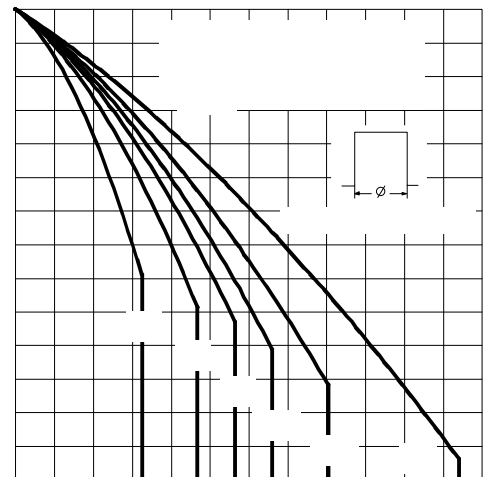


Fig. 2 - Current Ratings Characteristics