DISCRETE POWER DIODES and THYRISTORS

DATA BOOK

Bulletin I2089/A

International
IOR Rectifier

SD2500C..K SERIES

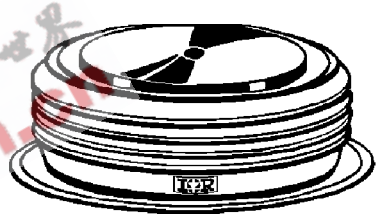
STANDARD RECOVERY DIODES

Hockey Puk Version

3000A

Features

- Wide current range
- High voltage ratings up to 2500V
- High surge current capabilities
- Diffused junction
- Hockey Puk version
- Case style DO-200AC (K-PUK)



case style DO-200AC (K-PUK)

Typical Applications

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications

Major Ratings and Characteristics

Parameters		SD2500C..K	Units
$I_{F(AV)}$		3000	A
	@ T_{hs}	55	°C
$I_{F(RMS)}$		5000	A
	@ T_{hs}	25	°C
I_{FSM}	@ 50Hz	31000	A
	@ 60Hz	32460	A
I^2t	@ 50Hz	4810	KA^2s
	@ 60Hz	4390	KA^2s
V_{RRM} range		1200 to 2500	V
T_J		- 40 to 180	°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 = 180°C mA
SD2500C..K	12	1200	1300	75
	16	1600	1700	
	20	2000	2100	
	25	2500	2600	

Forward Conduction

Parameter		SD2500C..K	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	3000 (1550)	A	180° conduction, half sine wave		
	@ Heatsink temperature	55 (85)	°C	Double side (single side) cooled		
$I_{F(RMS)}$	Max. RMS forward current	5000	A	@ 25°C heatsink temperature double side cooled		
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	31000	A	t = 10ms	No voltage reapplied	Sinusoidal halfwave, Initial T_J = T_J max.
		32460		t = 8.3ms		
		26050		t = 10ms	100% V_{RRM} reapplied	
		27300		t = 8.3ms		
I^2t	Maximum I^2t for fusing	4810	KA^2s	t = 10ms	No voltage reapplied	
		4390		t = 8.3ms		
		3400		t = 10ms	100% V_{RRM} reapplied	
		3100		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	48100	$KA^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.76	V	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J max.		
$V_{F(TO)2}$	High level value of threshold voltage	0.97		(I > π x $I_{F(AV)}$),T_J = T_J max.		
r_{f1}	Low level value of forward slope resistance	0.16	mΩ	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J max.		
r_{f2}	High level value of forward slope resistance	0.13		(I > π x $I_{F(AV)}$),T_J = T_J max.		
V_{FM}	Max. forward voltage drop	1.41	V	I_{pk}= 4000A, T_J = T_J max, t_p = 10ms sinusoidal wave		

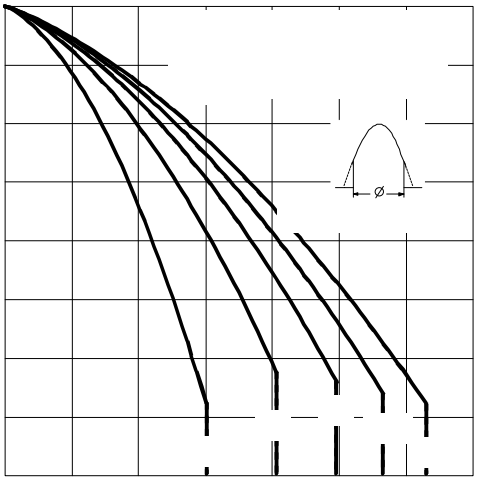


Fig. 3 - Current Ratings Characteristics

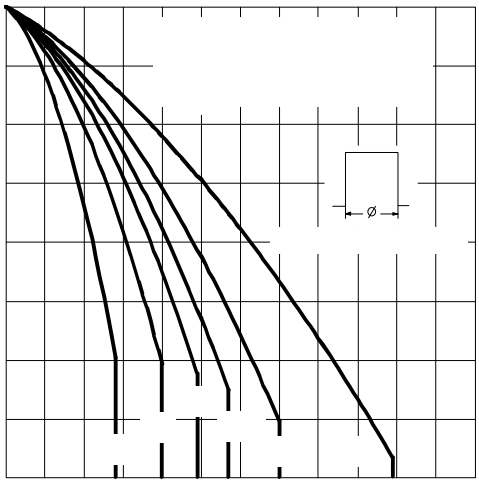


Fig. 4 - Current Ratings Characteristics

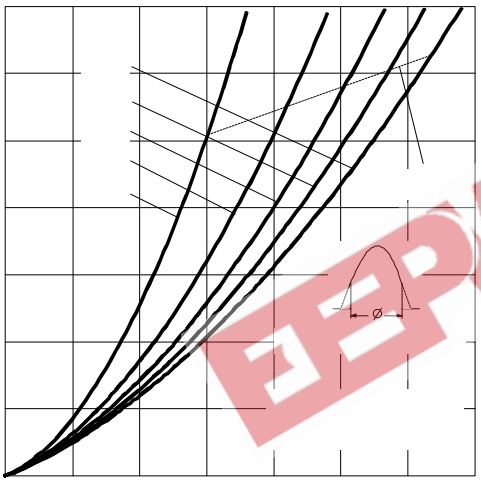


Fig. 5 - Forward Power Loss Characteristics

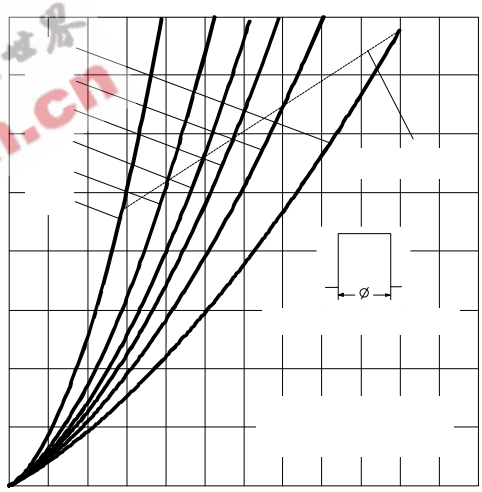


Fig. 6 - Forward Power Loss Characteristics

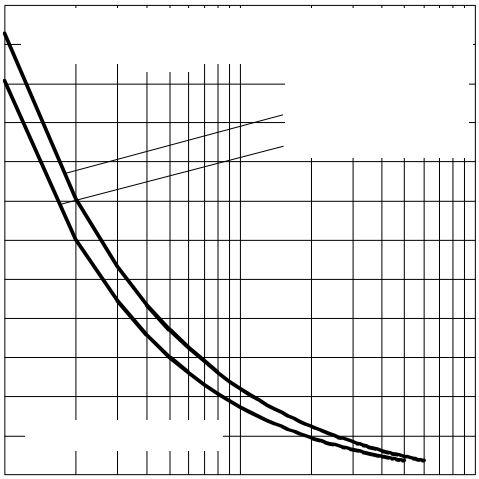


Fig. 7 - Maximum Non-Repetitive Surge Current

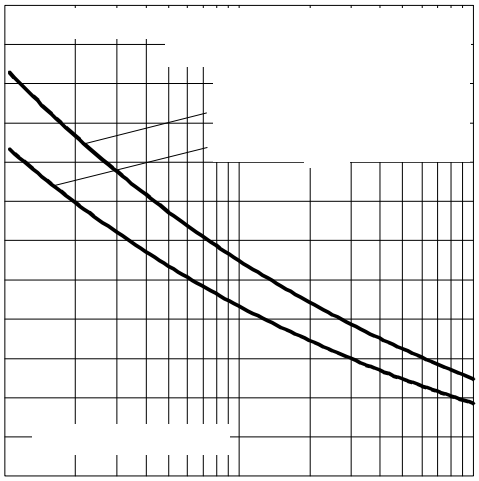


Fig. 8 - Maximum Non-Repetitive Surge Current

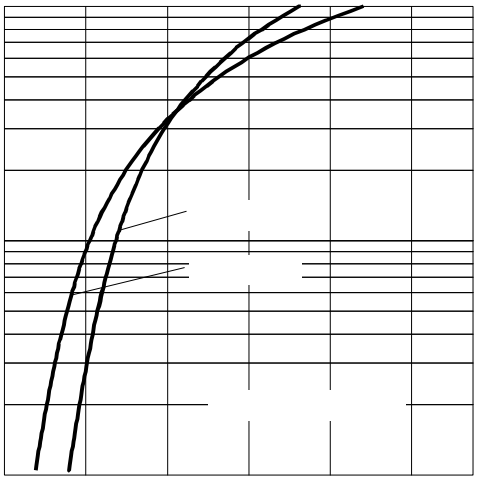


Fig. 9 - Forward Voltage Drop Characteristics

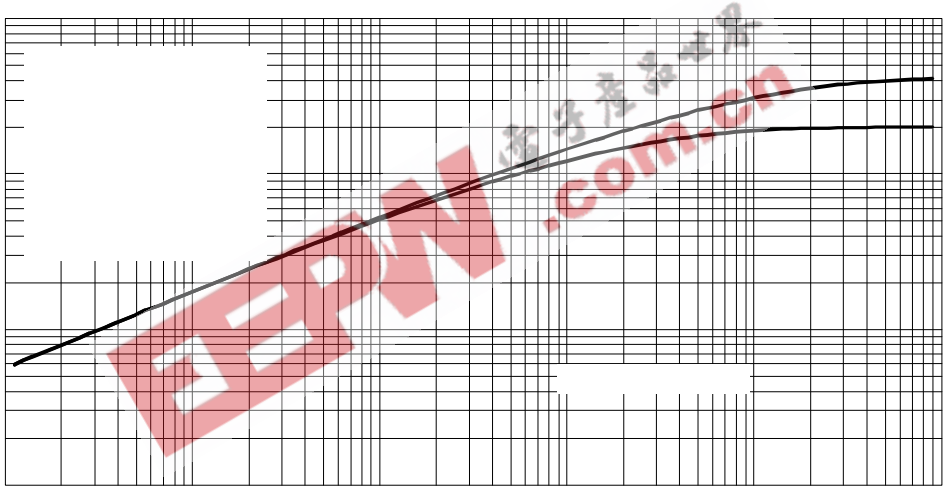


Fig. 10 - Thermal Impedance Z_{thJC} Characteristics

Thermal and Mechanical Specifications

	Parameter	SD2500C..K	Units	Conditions
T_J	Max. junction operating temperature range	-40 to 180	°C	
T_{stg}	Max. storage temperature range	-55 to 200		
R_{thJ-hs}	Max. thermal resistance, junction to heatsink	0.042 0.020	K/W	DC operation single side cooled DC operation double side cooled
F	Mounting force, ± 10%	22250 (2250)	N (Kg)	
wt	Approximate weight	425	g	
	Case style	DO-200AC(K-PUK)		See Outline Table

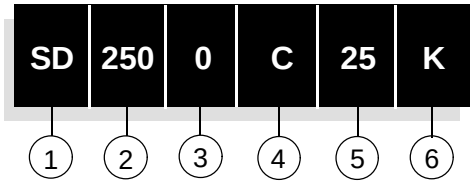
ΔR_{thJ-hs} Conduction

(The following table shows the increment of thermal resistence 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°	0.002	0.002	0.001	0.001	K/W	$T_J = T_J$ max.
120°	0.002	0.002	0.002	0.002		
90°	0.003	0.003	0.003	0.003		
60°	0.004	0.004	0.004	0.004		
30°	0.007	0.007	0.007	0.007		

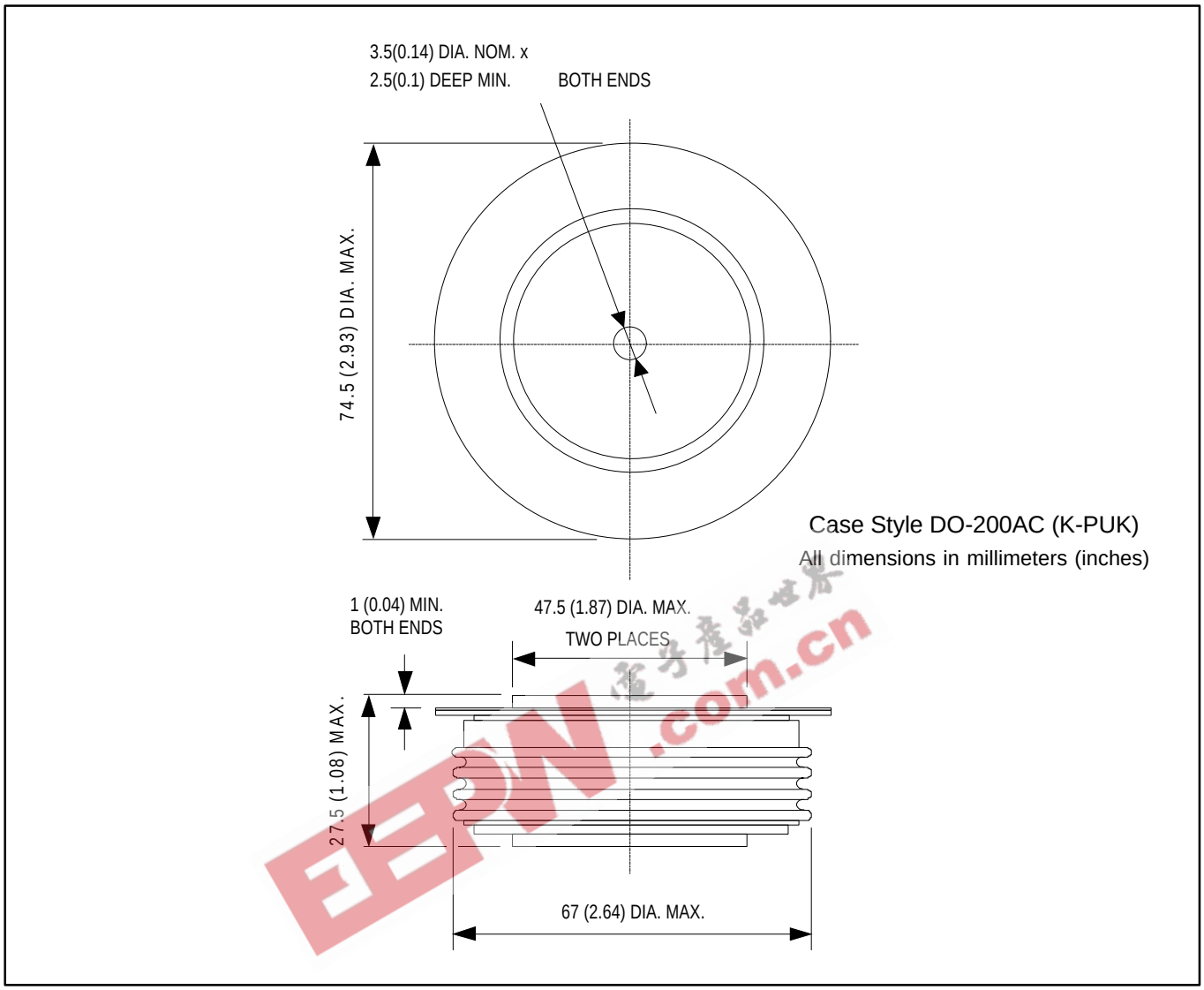
Ordering Information Table

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 - K = Puk Case DO-200AC (K-PUK)

Outline Table



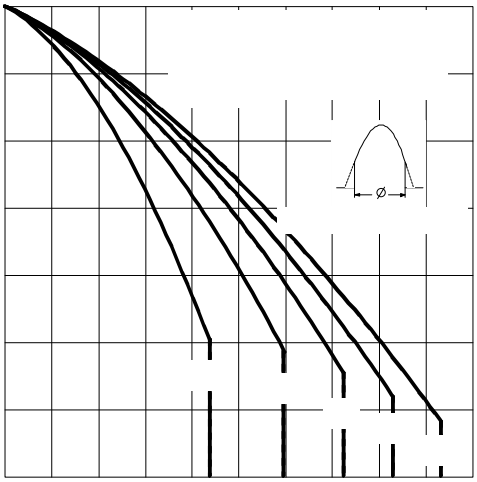


Fig. 1 - Current Ratings Characteristics

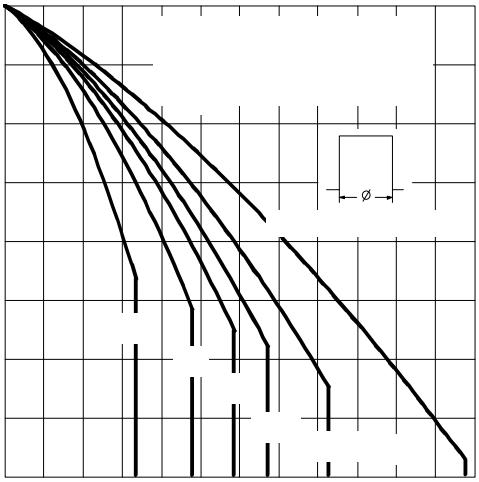


Fig. 2 - Current Ratings Characteristics