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***DISCRETE POWER DIODES and THYRISTORS***  
***DATA BOOK***

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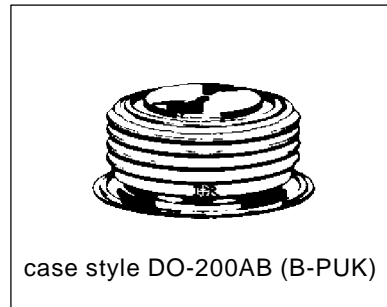
**FAST RECOVERY DIODES**
**Hockey Puk Version**
**Features**

- High power FAST recovery diode series
- 2.0 to 3.0  $\mu$ s recovery time
- High voltage ratings up to 2500V
- High current capability
- Optimized turn on and turn off characteristics
- Low forward recovery
- Fast and soft reverse recovery
- Press-puk encapsulation
- Case style conform to JEDEC DO-200AB (B-PUK)
- Maximum junction temperature 150°C

700A  
790A

**Typical Applications**

- Snubber diode for GTO
- High voltage free-wheeling diode
- Fast recovery rectifier applications


**Major Ratings and Characteristics**

Parameters	SD703C..L		Units
	S20	S30	
$I_{F(AV)}$	700	790	A
@ $T_{hs}$	55	55	°C
$I_{F(RMS)}$	1320	1470	A
$I_{FSM}$ @ 50Hz	9300	9600	A
@ 60Hz	9730	10050	A
$V_{RRM}$ range	1200 to 2500	1200 to 2500	V
$t_{rr}$	2.0	3.0	$\mu$ s
@ $T_J$	25	25	°C
$T_J$	- 40 to 150		°C

## SD703C..L Series

### ELECTRICAL SPECIFICATIONS

#### Voltage Ratings

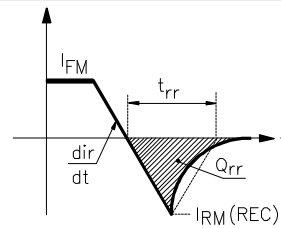
Type number	Voltage Code	$V_{RRM}$ , maximum repetitive peak reverse voltage V	$V_{RSM}$ , maximum non-repetitive peak rev. voltage V	$I_{RRM}$ max. @ $T_J = T_J$ max. mA
SD703C..L	12	1200	1300	50
	16	1600	1700	
	20	2000	2100	
	25	2500	2600	

#### Forward Conduction

Parameter	SD703C..L		Units	Conditions
	S20	S30		
$I_{F(AV)}$ Max. average forward current @ case temperature	700 (365) 55 (85)	790 (400) 55 (85)	A °C	180° conduction, half sine wave Double side (single side) cooled
$I_{F(RMS)}$ Max. RMS forward current	1320	1470	A	@ 25°C heatsink temperature double side cooled
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	9300	9600	A	t = 10ms No voltage
	9730	10050		t = 8.3ms reapplied
	7820	8070		t = 10ms 100% $V_{RRM}$
	8190	8450		t = 8.3ms reapplied
$I^2t$ Maximum $I^2t$ for fusing	432	460	KA <sup>2</sup> s	t = 10ms No voltage
	395	420		t = 8.3ms reapplied
	306	326		t = 10ms 100% $V_{RRM}$
	279	297		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	4320	4600	KA <sup>2</sup> $\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)1}$ Low level value of threshold voltage	1.00	0.95	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	1.11	1.05		( $I > \pi \times I_{F(AV)}$ ), $T_J = T_J$ max.
$r_{f1}$ Low level value of forward slope resistance	0.80	0.60	m $\Omega$	( $16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ max.
$r_{f2}$ High level value of forward slope resistance	0.76	0.56		( $I > \pi \times I_{F(AV)}$ ), $T_J = T_J$ max.
$V_{FM}$ Max. forward voltage drop	2.20	1.85	V	$I_{pk} = 1500A$ , $T_J = T_J$ max, $t_p = 10ms$ sinusoidal wave

#### Recovery Characteristics

Code	$T_J = 25^\circ\text{C}$ typical $t_{rr}$ @ 25% $I_{RRM}$ ( $\mu\text{s}$ )	Test conditions			Max. values @ $T_J = 150^\circ\text{C}$		
		$I_{pk}$ Square Pulse (A)	$di/dt$ (A/ $\mu\text{s}$ )	$V_r$ (V)	$t_{rr}$ @ 25% $I_{RRM}$ ( $\mu\text{s}$ )	$Q_{rr}$ ( $\mu\text{C}$ )	$I_{rr}$ (A)
S20	2.0	1000	50	-50	3.5	240	110
S30	3.0	1000	50	-50	5.0	380	130



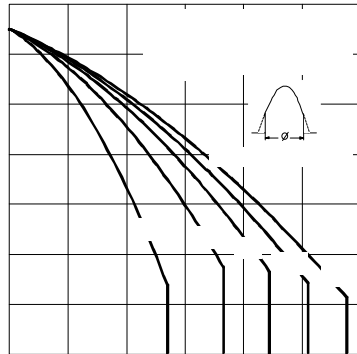


Fig. 3 - Current Ratings Characteristics

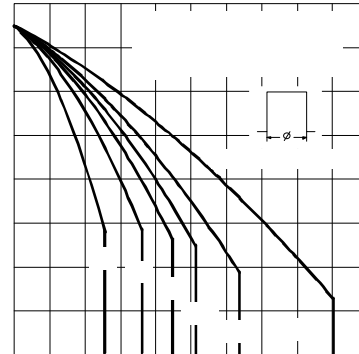


Fig. 4 - Current Ratings Characteristics

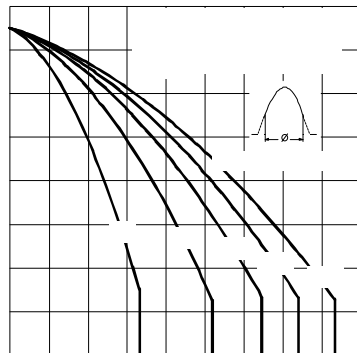


Fig. 5 - Current Ratings Characteristics

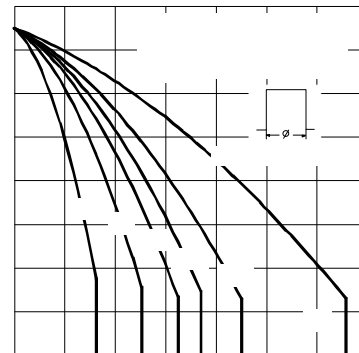


Fig. 6 - Current Ratings Characteristics

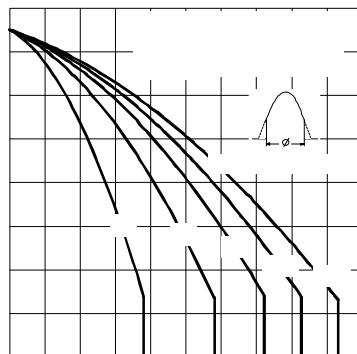


Fig. 7 - Current Ratings Characteristics

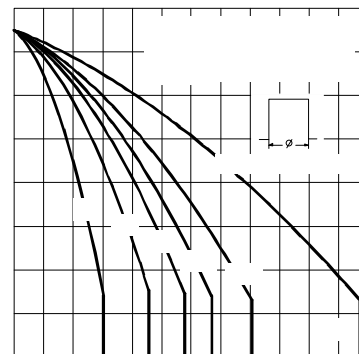


Fig. 8 - Current Ratings Characteristics

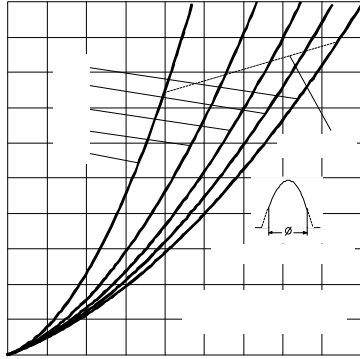


Fig. 9 - Forward Power Loss Characteristics

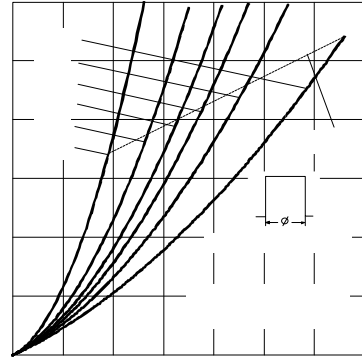


Fig. 10 - Forward Power Loss Characteristics

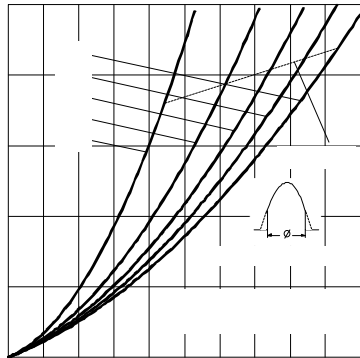


Fig. 11 - Forward Power Loss Characteristics

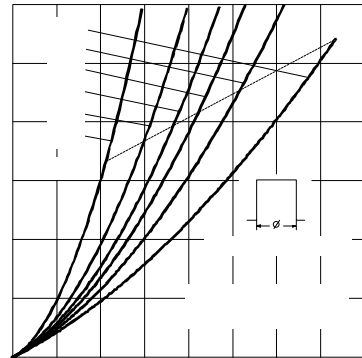


Fig. 12 - Forward Power Loss Characteristics

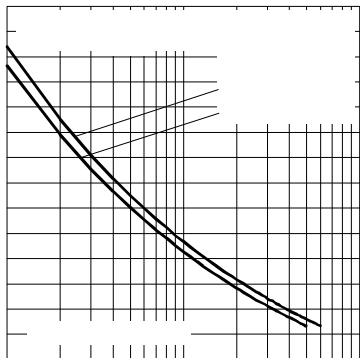


Fig. 13 - Maximum Non-repetitive Surge Current  
Single and Double Side Cooled

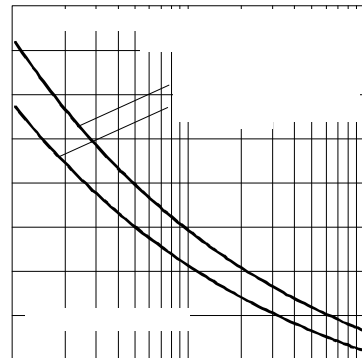


Fig. 14 - Maximum Non-repetitive Surge Current  
Single and Double Side Cooled

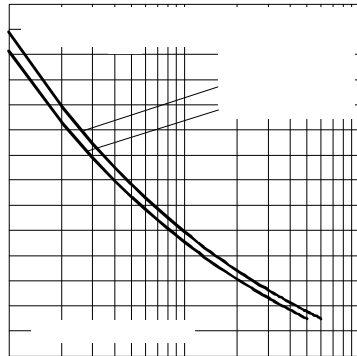


Fig. 15 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

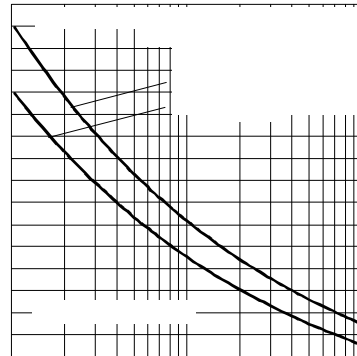


Fig. 16 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

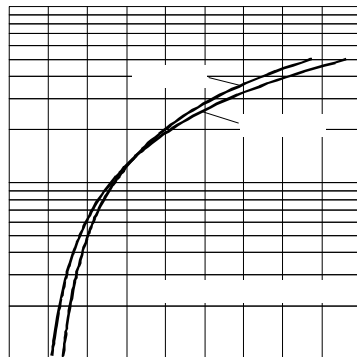


Fig. 17 - Forward Voltage Drop Characteristics

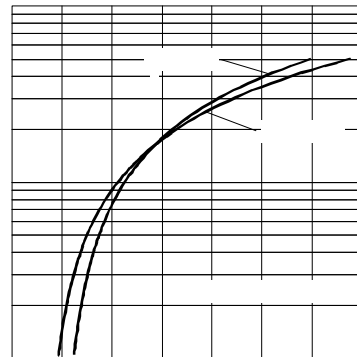


Fig. 18 - Forward Voltage Drop Characteristics

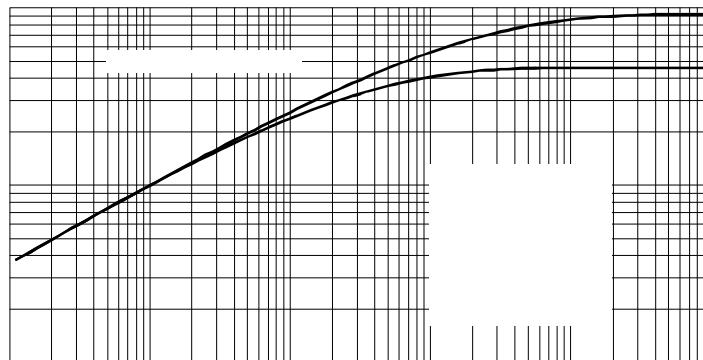


Fig. 19 - Thermal Impedance  $Z_{th(j-hs)}$  Characteristic

SD703C..L Series

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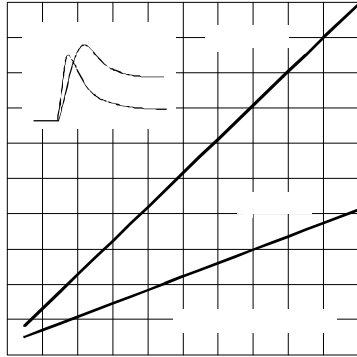


Fig. 20 - Typical Forward Recovery Characteristics

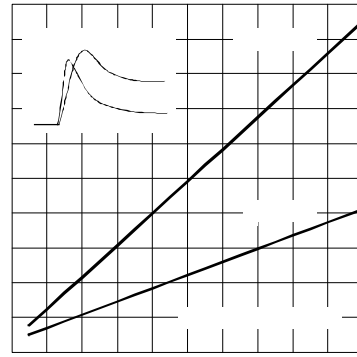


Fig. 21 - Typical Forward Recovery Characteristics

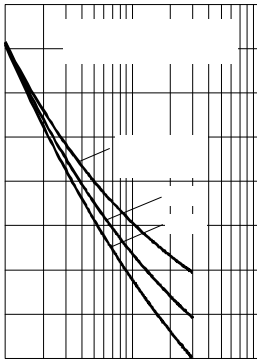


Fig. 22 - Recovery Time Characteristics

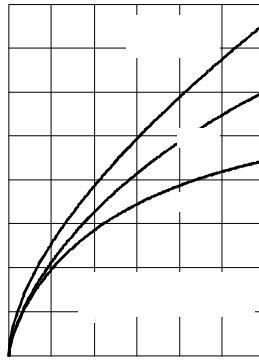


Fig. 23 - Recovery Charge Characteristics

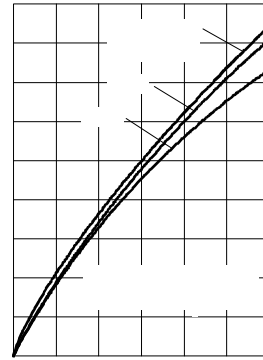


Fig. 24 - Recovery Current Characteristics

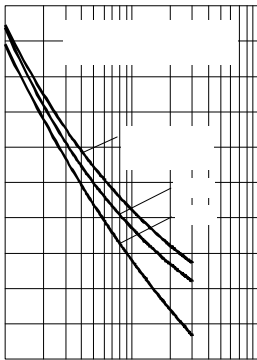


Fig. 25 - Recovery Time Characteristics

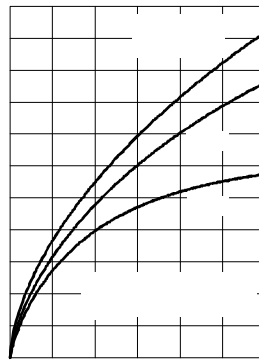


Fig. 26 - Recovery Charge Characteristics

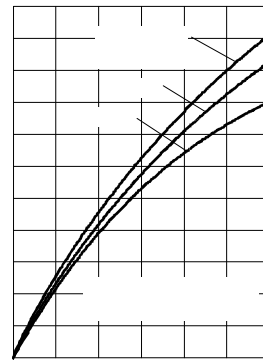


Fig. 27 - Recovery Current Characteristics

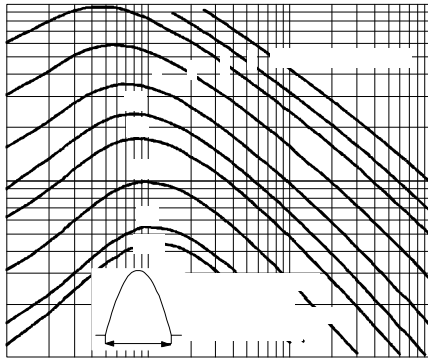


Fig. 28 - Maximum Total Energy Loss Per Pulse Characteristics

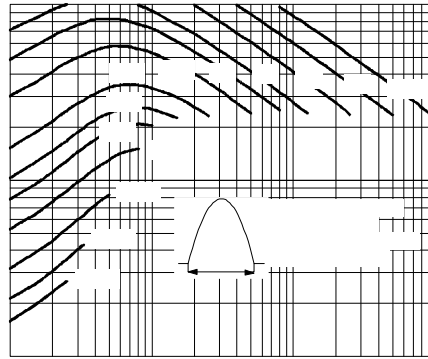


Fig. 29 - Frequency Characteristics

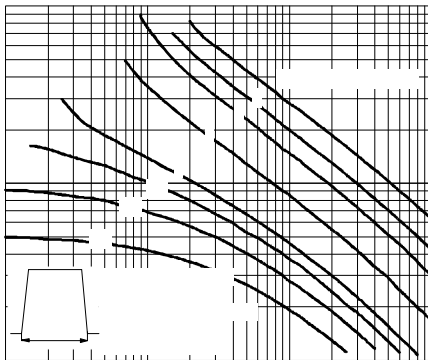


Fig. 30 - Maximum Total Energy Loss Per Pulse Characteristics

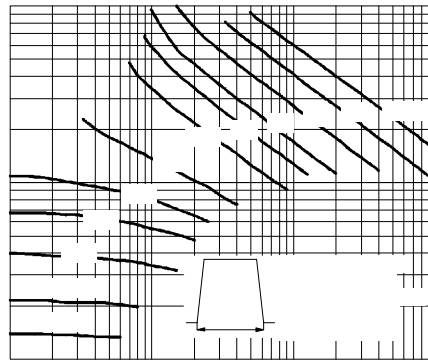


Fig. 31 - Frequency Characteristics

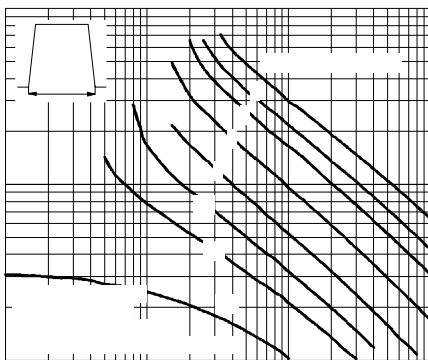


Fig. 32 - Maximum Total Energy Loss Per Pulse Characteristics

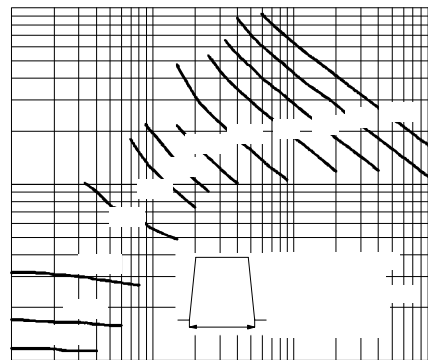


Fig. 33 - Frequency Characteristics



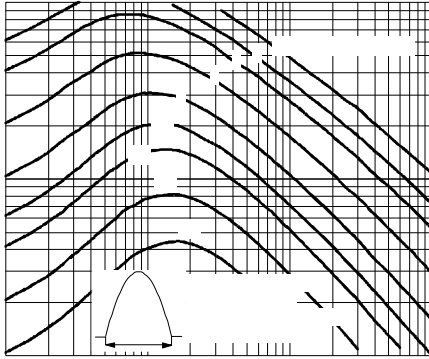


Fig. 34 - Maximum Total Energy Loss Per Pulse Characteristics

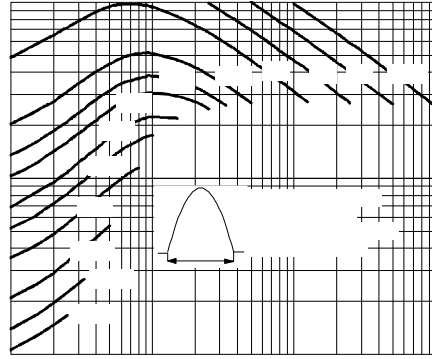


Fig. 35 - Frequency Characteristics

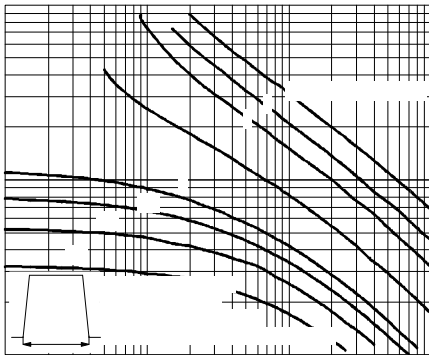


Fig. 36 - Maximum Total Energy Loss Per Pulse Characteristics

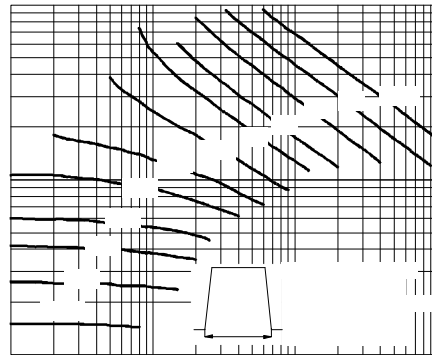


Fig. 37 - Frequency Characteristics

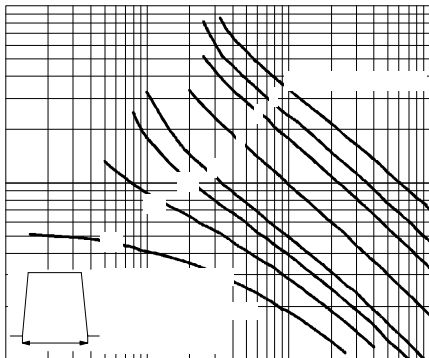


Fig. 38 - Maximum Total Energy Loss Per Pulse Characteristics

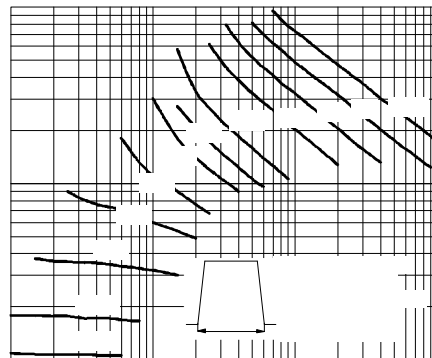


Fig. 39 - Frequency Characteristics

## Thermal and Mechanical Specifications

Parameter	SD703C..L		Units	Conditions
	S20	S30		
$T_J$ Max. junction operating temperature range	-40 to 150		°C	
$T_{stg}$ Max. storage temperature range	-40 to 150			
$R_{thJ-hs}$ Max. thermal resistance, case junction to heatsink	0.092 0.046		K/W	DCoperation single side cooled DCoperation double side cooled
F Mounting force, $\pm 10\%$	9800 (1000)		N (Kg)	
wt Approximate weight	250		g	
Case style	DO-200AB (B-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°	0.011	0.011	0.008	0.008	K/W	$T_J = T_J \text{ max.}$
120°	0.013	0.014	0.013	0.013		
90°	0.017	0.017	0.018	0.018		
60°	0.024	0.025	0.026	0.026		
30°	0.043	0.043	0.043	0.044		

## Ordering Information Table

Device Code															
<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">SD</td> <td style="padding: 5px;">70</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">C</td> <td style="padding: 5px;">25</td> <td style="padding: 5px;">S20</td> <td style="padding: 5px;">L</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> <td style="text-align: center;">⑦</td> </tr> </table>	SD	70	3	C	25	S20	L	①	②	③	④	⑤	⑥	⑦	<ul style="list-style-type: none"> <li><b>1</b> - Diode</li> <li><b>2</b> - Essential part number</li> <li><b>3</b> - 3 = Fast recovery</li> <li><b>4</b> - C = Ceramic Puk</li> <li><b>5</b> - Voltage code: Code x 100 = <math>V_{RRM}</math> (See Voltage Ratings table)</li> <li><b>6</b> - <math>t_{rr}</math> code</li> <li><b>7</b> - L = Puk Case DO-200AB (B-PUK)</li> </ul>
SD	70	3	C	25	S20	L									
①	②	③	④	⑤	⑥	⑦									

SD703C..L Series

Outline Table

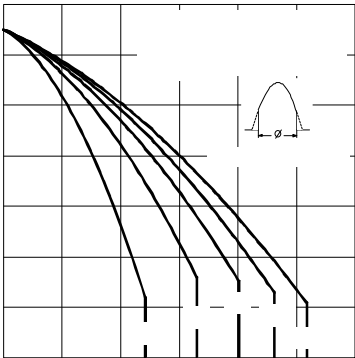
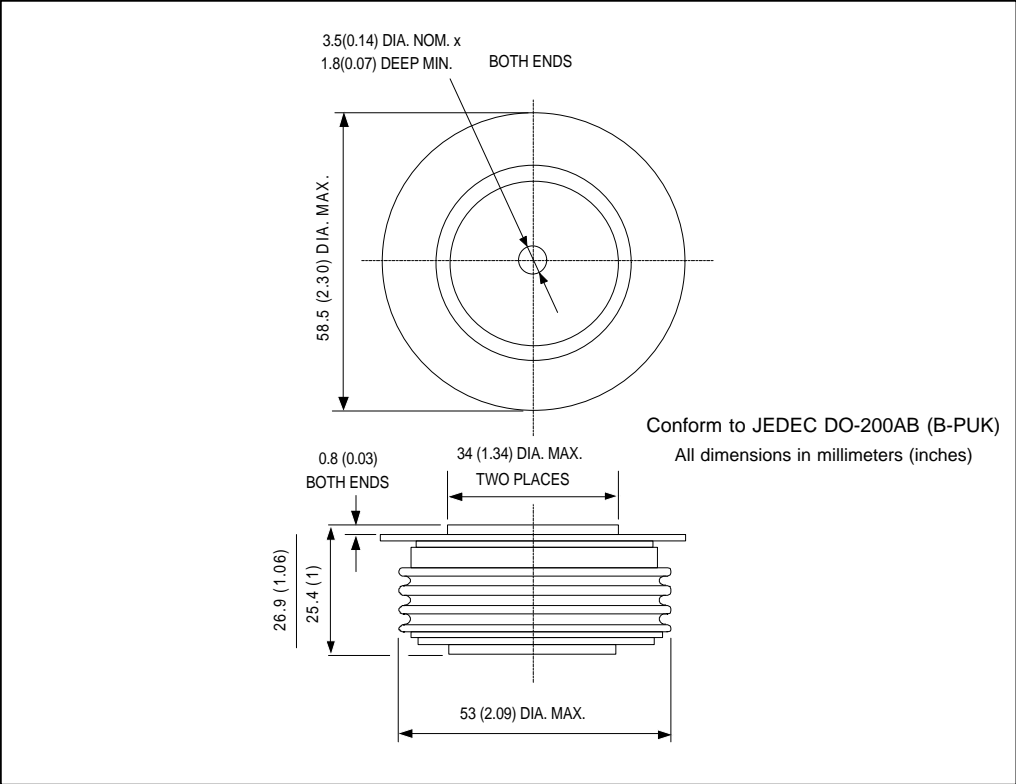


Fig. 1 - Current Ratings Characteristics

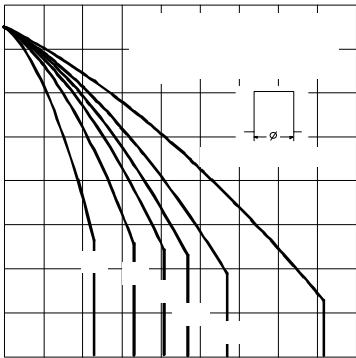


Fig. 2 - Current Ratings Characteristics