DISCRETE POWER DIODES and THYRISTORS

DATA BOOK

International
IOR Rectifier

SD263C..S50L SERIES

FAST RECOVERY DIODES

Hockey Puk Version

Features

- High power FAST recovery diode series
- 4.5 µs recovery time
- High voltage ratings up to 4500V
- 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 125°C

375A

case style DO-200AB (B-PUK)

Typical Applications

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

Major Ratings and Characteristics

Parameters		SD263C..S50L	Units
$I_{F(AV)}$		375	A
	@ T_{hs}	55	°C
$I_{F(RMS)}$		408	A
I_{FSM}	@ 50Hz	5500	A
	@ 60Hz	5760	A
V_{RRM} range		3000 to 4500	V
t_{rr}		4.5	µs
	@ T_J	125	°C
T_J		- 40 to 125	°C

ELECTRICAL SPECIFICATIONS

Voltage Ratings

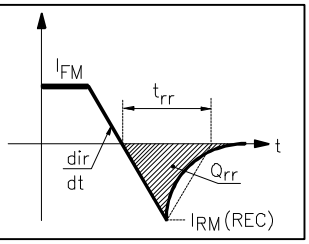
Type number	Voltage Code	V_{RRM}, maximum repetitive peak reverse voltage V	V_{RSM}, maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ $T_J = T_J$ max. mA
SD263C..S50L	30	3000	3100	50
	36	3600	3700	
	40	4000	4100	
	45	4500	4600	

Forward Conduction

Parameter		SD263C..S50L	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	375 (150)	A	180° conduction, half sine wave		
	@ Heatsink temperature	55 (85)	°C	Double side (single side) cooled		
$I_{F(RMS)}$	Max. RMS forward current	725	A	@ 25°C heatsink temperature double side cooled		
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	5500	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		5760		t = 8.3ms		
		4630		t = 10ms	50% V_{RRM} reapplied	
		4850		t = 8.3ms		
I^2t	Maximum I^2t for fusing	151	KA^2s	t = 10ms	No voltage reapplied	
		138		t = 8.3ms		
		107		t = 10ms	50% V_{RRM} reapplied	
		98		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	1510	$KA^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	1.56	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	1.71		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f1}	Low level value of forward slope resistance	1.64	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	1.53		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
V_{FM}	Max. forward voltage drop	3.20	V	I_{pk}= 1000A, $T_J = T_J$ max, t_p = 10ms sinusoidal wave		

Recovery Characteristics

Code	T_J = 25°C typical t_{rr} @ 25% I_{RRM} (µs)	Test conditions I_{pk} Square Pulse (A)	di/dt (*) (A/µs)	V_r (V)	Max. values @ T_J = 125°C t_{rr} @ 25% I_{RRM} (µs)	Q_{rr} (µC)	I_{rr} (A)
S50	5.0	1000	100	-50	4.5	680	240



(*) di/dt = 25A/us @ T_J = 25°C

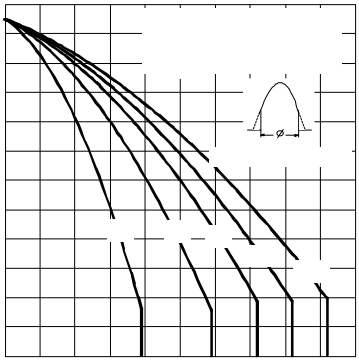


Fig. 3 - Current Ratings Characteristics

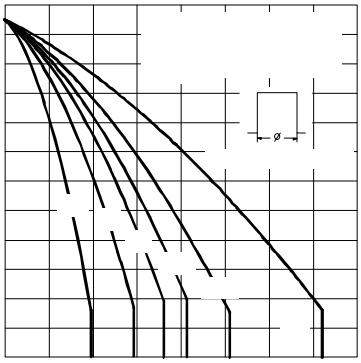


Fig. 4 - Current Ratings Characteristics

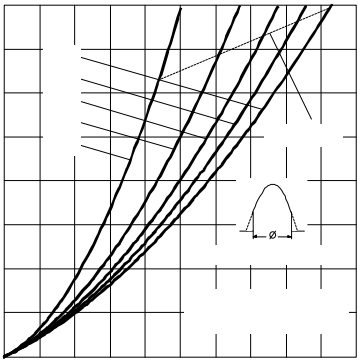


Fig. 5 - Forward Power Loss Characteristics

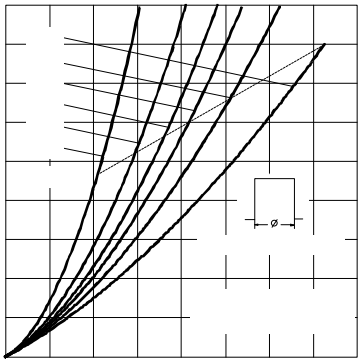


Fig. 6 - Forward Power Loss Characteristics

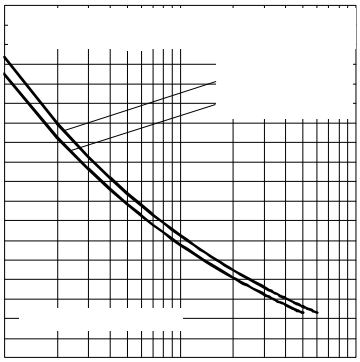


Fig. 7 - Maximum Non-repetitive Surge Current
Single and Double Side Cooled

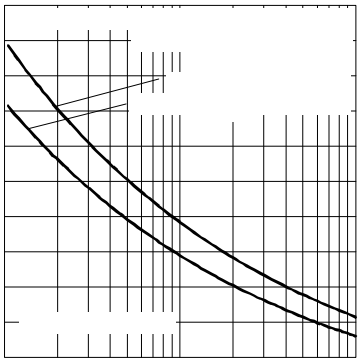


Fig. 8 - Maximum Non-repetitive Surge Current
Single and Double Side Cooled

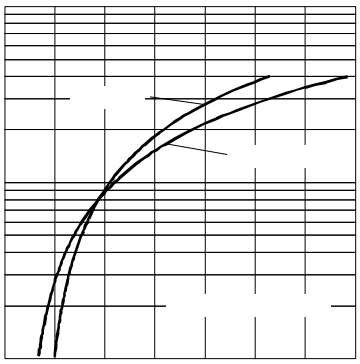


Fig. 9 - Forward Voltage Drop Characteristics

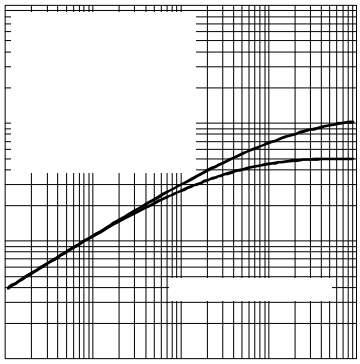


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristic

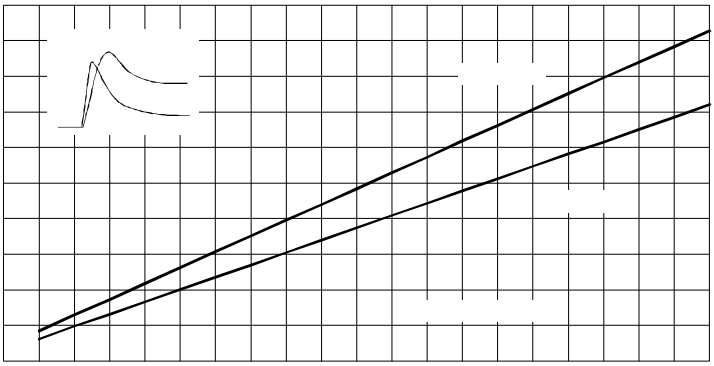


Fig. 11 - Typical Forward Recovery Characteristics

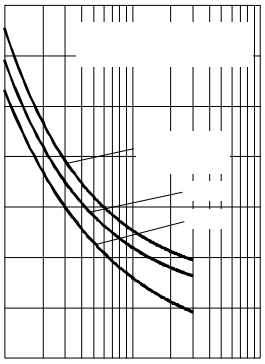


Fig. 12 - Recovery Time Characteristics

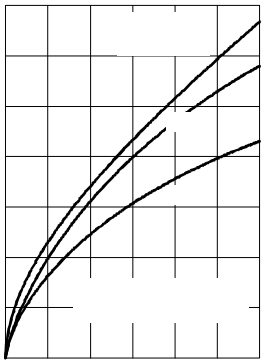


Fig. 13 - Recovery Charge Characteristics

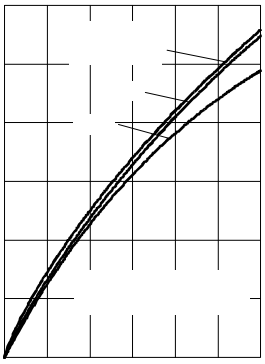


Fig. 14 - Recovery Current Characteristics

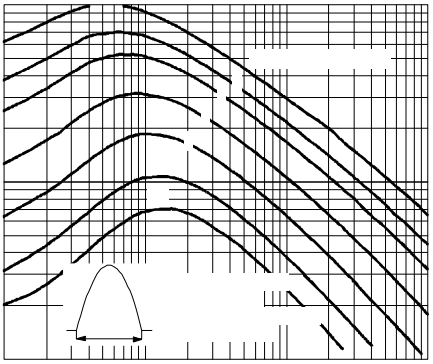


Fig. 15 - Maximum Total Energy Loss Per Pulse Characteristics

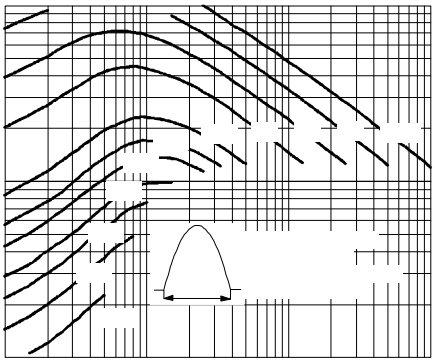


Fig. 16 - Frequency Characteristics

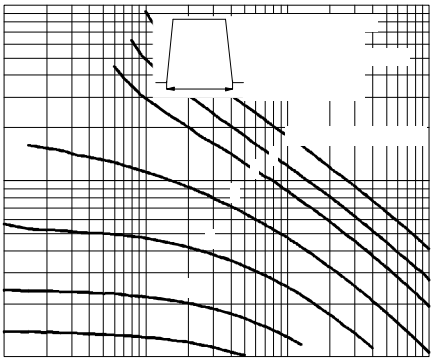


Fig. 17 - Maximum Total Energy Loss Per Pulse Characteristics

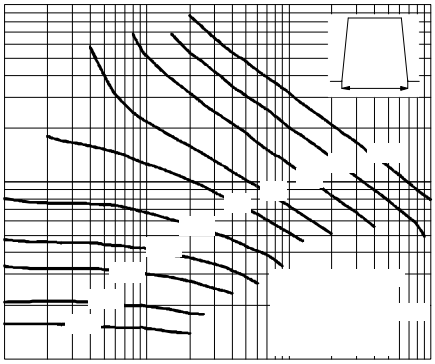


Fig. 18 - Frequency Characteristics

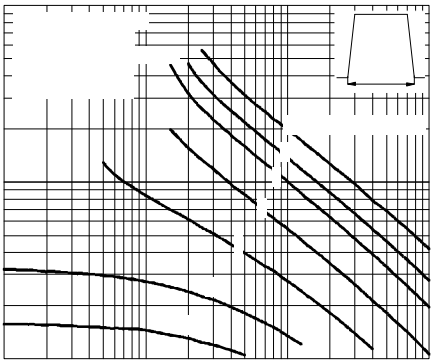


Fig. 19 - Maximum Total Energy Loss Per Pulse Characteristics

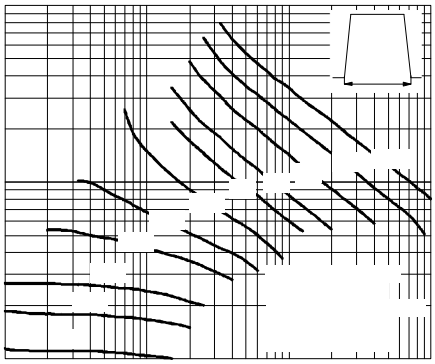


Fig. 20 - Frequency Characteristics

Thermal and Mechanical Specifications

	Parameter	SD263C..S50L	Units	Conditions
T_J	Max. junction operating temperature range	-40 to 125	°C	
T_{stg}	Max. storage temperature range	-40 to 150		
R_{thJ-hs}	Max. thermal resistance, junction to heatsink	0.11 0.05	K/W	DC operation single side cooled DC operation double side cooled
F	Mounting force, ± 10%	9800 (1000)	N (Kg)	
wt	Approximate weight	230	g	
	Case style	DO-200AB (B-PUK)		See outline table

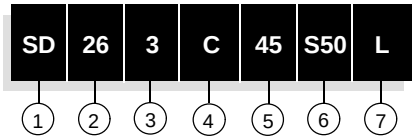
ΔR_{thJ-hs} Conduction

(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°	0.012	0.011	0.008	0.008	K/W	$T_J = T_J$ max.
120°	0.014	0.015	0.014	0.014		
90°	0.018	0.018	0.019	0.019		
60°	0.026	0.027	0.027	0.028		
30°	0.045	0.046	0.046	0.046		

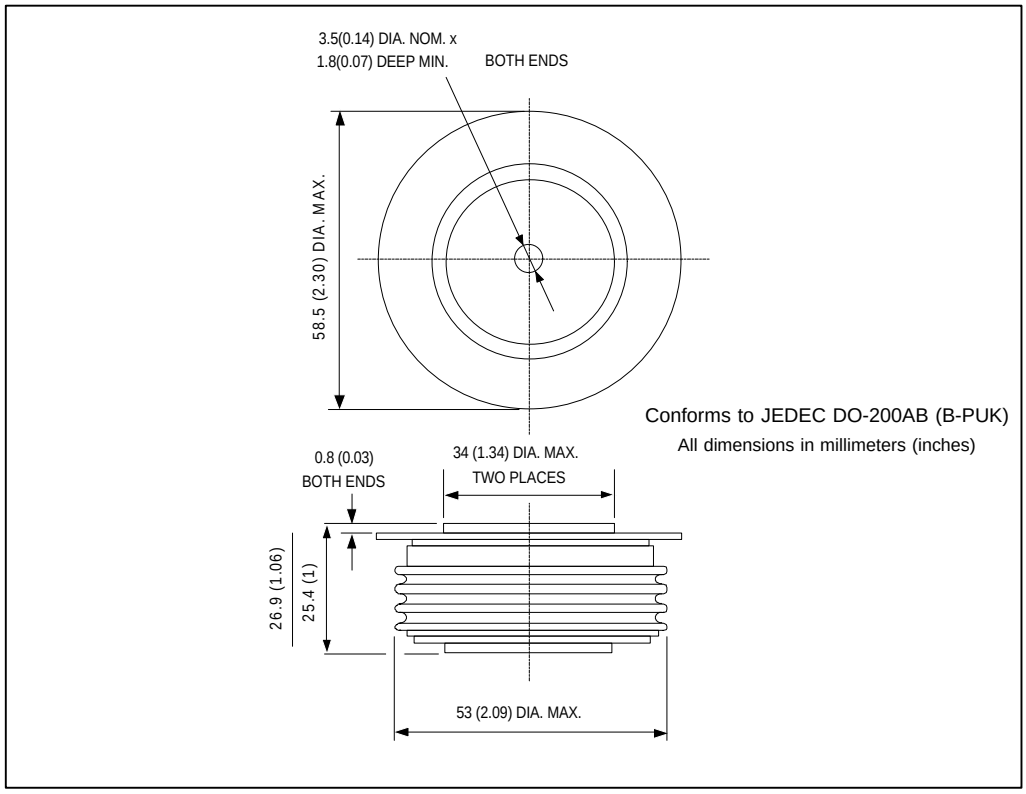
Ordering Information Table

Device Code



1 - Diode
2 - Essential part number
3 - 3 = Fast recovery
4 - C = Ceramic Puk
5 - Voltage code: Code x 100 = V_{RRM} (See Voltage Ratings table)
6 - t_{rr} code
7 - L = Puk Case DO-200AB (B-PUK)

Outline Table



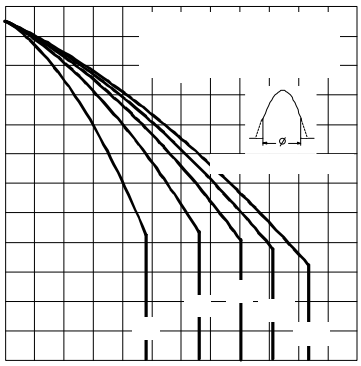


Fig. 1 - Current Ratings Characteristics

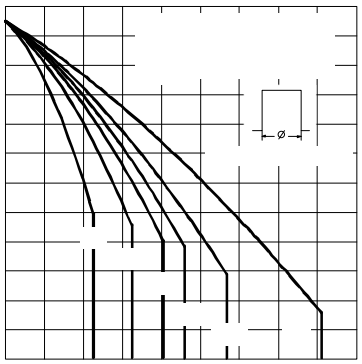


Fig. 2 - Current Ratings Characteristics