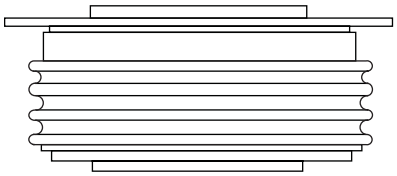
Fast Recovery Diodes (Hockey PUK Version), 375 A



DO-200AB (B-PUK)

FEATURES

- High power FAST recovery diode series
- 4.5 µs recovery time
- High voltage ratings up to 4500 V
- 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
- Lead (Pb)-free

Pb-free
RoHS COMPLIANT

PRODUCT SUMMARY	
$I_{F(AV)}$	375 A

TYPICAL APPLICATIONS

- Snubber diode for GTO
- High voltage freewheeling diode
- Fast recovery rectifier applications

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		375	A
	T_{hs}	55	°C
$I_{F(RMS)}$		408	A
I_{FSM}	50 Hz	5500	
	60 Hz	5760	
V_{RRM}	Range	3000 to 4500	V
t_{rr}		4.5	µs
	T_J	125	°C
T_J		- 40 to 125	

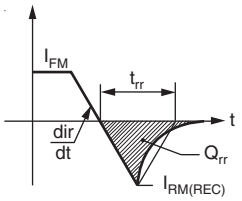
ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} MAXIMUM AT $T_J = T_J$ MAXIMUM mA
SD263C..S50L	30	3000	3100	50
	36	3600	3700	
	40	4000	4100	
	45	4500	4600	

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum average forward current at heatsink temperature	$I_{F(AV)}$	180° conduction, half sine wave Double side (single side) cooled			375 (150)	A
					55 (85)	°C
Maximum RMS forward current	$I_{F(RMS)}$	25 °C heatsink temperature double side cooled			725	A
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	5500	
		t = 8.3 ms			5760	
		t = 10 ms	50 % V_{RRM} reapplied		4630	
		t = 8.3 ms			4850	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		151	kA^2s
		t = 8.3 ms			138	
		t = 10 ms	50 % V_{RRM} reapplied		107	
		t = 8.3 ms			98	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			1510	$kA^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.56	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.71	
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.64	mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.53	
Maximum forward voltage drop	V_{FM}	I_{pk} = 1000 A, $T_J = T_J$ maximum, t_p = 10 ms sinusoidal wave			3.20	V

RECOVERY CHARACTERISTICS

CODE	MAXIMUM VALUE AT T_J = 25 °C	TEST CONDITIONS			TYPICAL VALUES AT T_J = 150 °C			
	t_{rr} AT 25 % I_{RRM} (µs)	I_{pk} SQUARE PULSE (A)	dI/dt (1) (A/µs)	V_r (V)	t_{rr} AT 25 % I_{RRM} (µs)	Q_{rr} (µC)	I_{rr} (A)	
S50	5.0	1000	100	- 50	4.5	680	240	

Note

(1) dI/dt = 25 A/µs, T_J = 25 °C

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating temperature range	T_J		- 40 to 125	°C
Maximum storage temperature range	T_{Stg}		- 40 to 150	
Maximum thermal resistance, junction to heatsink	$R_{thJ\text{-}hs}$	DC operation single side cooled	0.11	K/W
		DC operation double side cooled	0.05	
Mounting force, ± 10 %			9800 (1000)	N (kg)
Approximate weight			230	g
Case style		See dimensions - link at the end of datasheet	DO-200AB (B-PUK)	

$\Delta R_{thJ\text{-}hs}$ CONDUCTION						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.012	0.011	0.008	0.008	$T_J = T_J$ maximum	K/W
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		

Note

- The table above shows the increment of thermal resistance $R_{thJ\text{-}hs}$ when devices operate at different conduction angles than DC

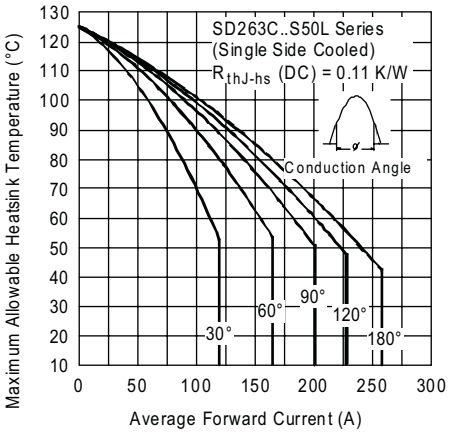


Fig. 1 - Current Ratings Characteristics

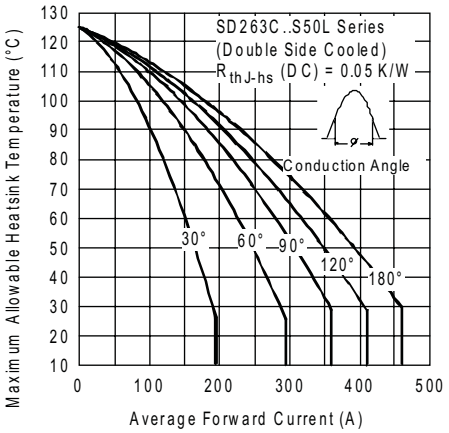


Fig. 3 - Current Ratings Characteristics

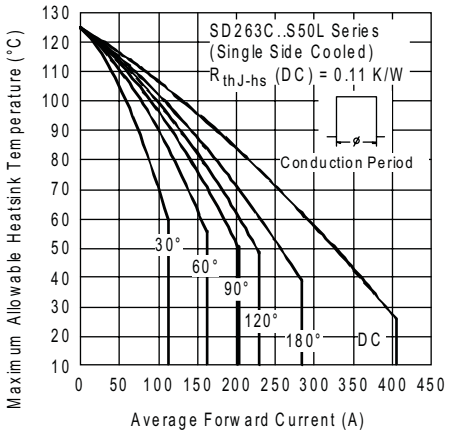


Fig. 2 - Current Ratings Characteristics

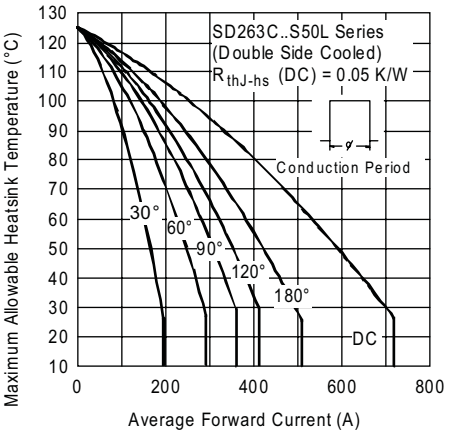


Fig. 4 - Current Ratings Characteristics

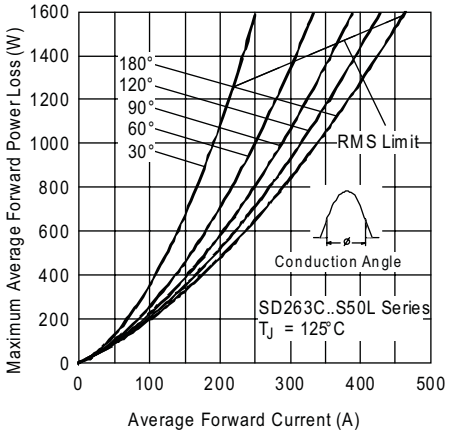


Fig. 5 - Forward Power Loss Characteristics

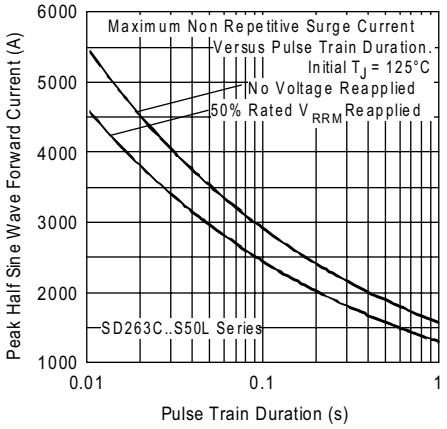


Fig. 8 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

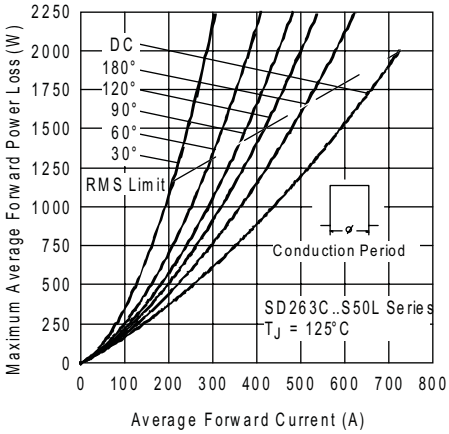


Fig. 6 - Forward Power Loss Characteristics

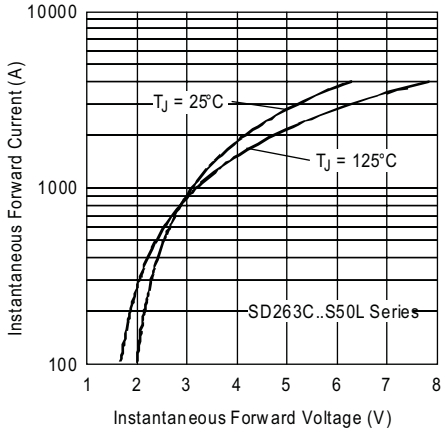


Fig. 9 - Forward Voltage Drop Characteristics

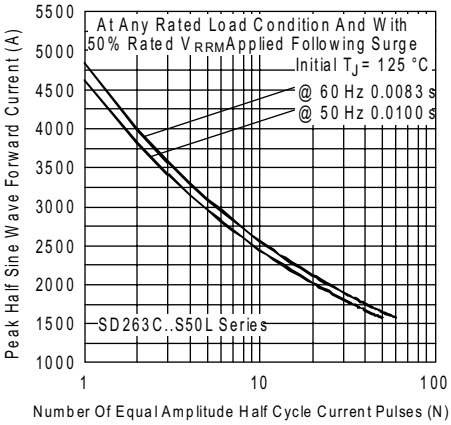


Fig. 7 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

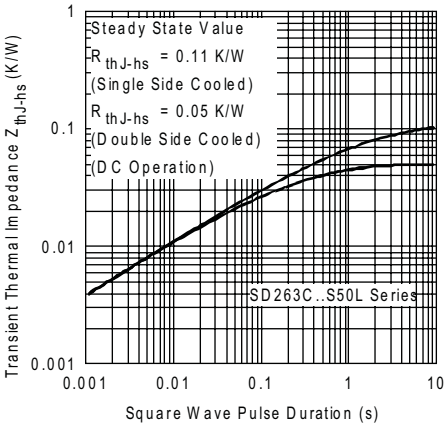


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristic

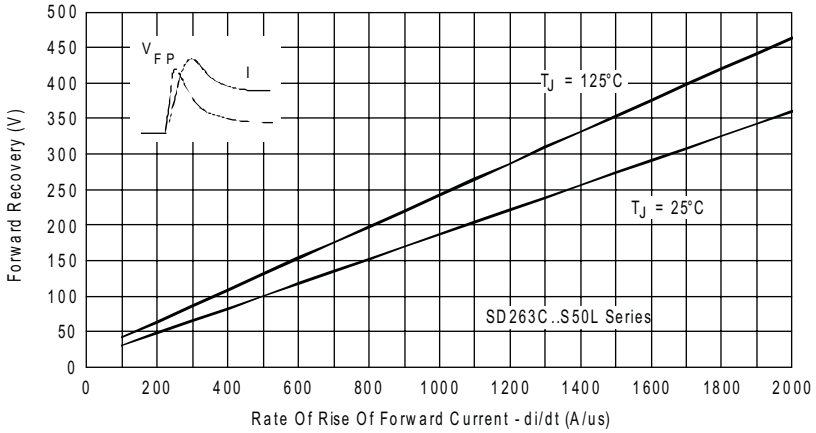


Fig. 11 - Typical Forward Recovery Characteristics

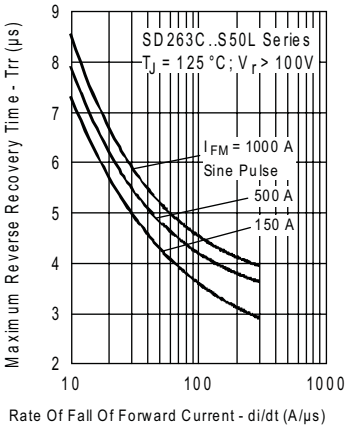


Fig. 12 - Recovery Time Characteristics

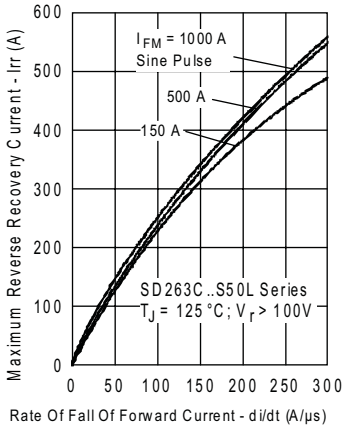


Fig. 14 - Recovery Current Characteristics

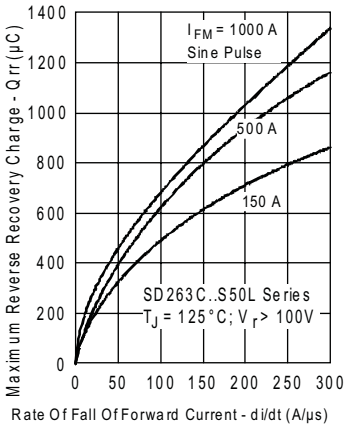


Fig. 13 - Recovery Charge Characteristics

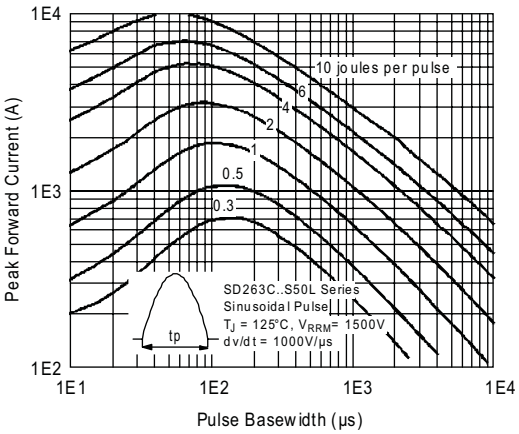


Fig. 15 - Maximum Total Energy Loss Per Pulse Characteristics

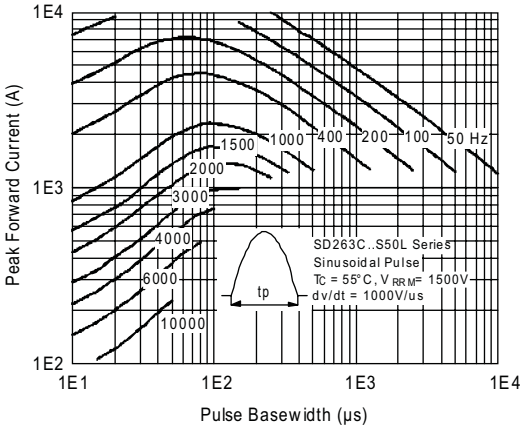


Fig. 16 - Frequency Characteristics

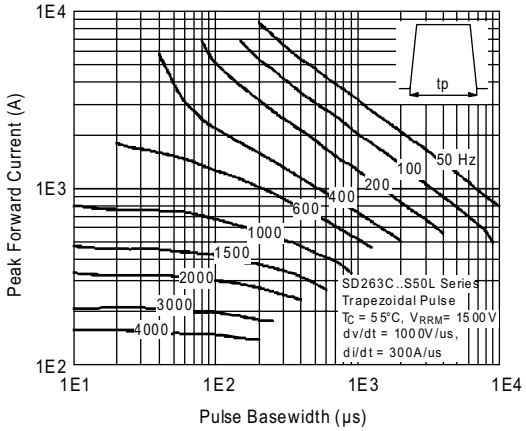


Fig. 18 - Frequency Characteristics

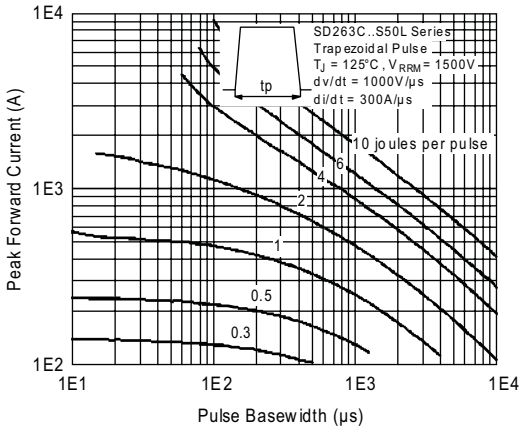


Fig. 17 - Maximum Total Energy Loss Per Pulse Characteristics

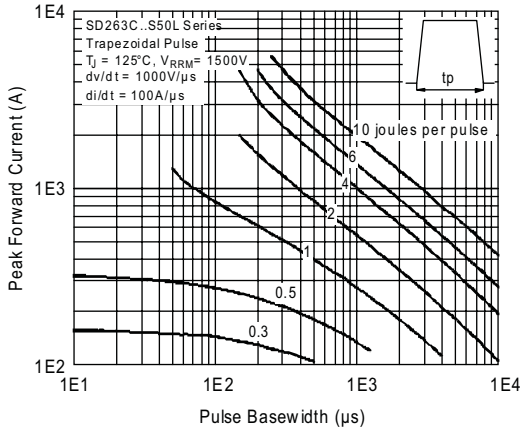


Fig. 19 - Maximum Total Energy Loss Per Pulse Characteristics

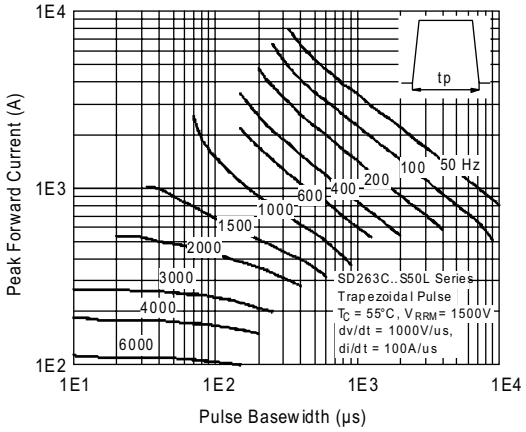
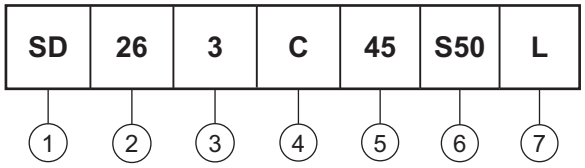


Fig. 20 - Frequency Characteristics

ORDERING INFORMATION TABLE

Device code



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

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95246

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