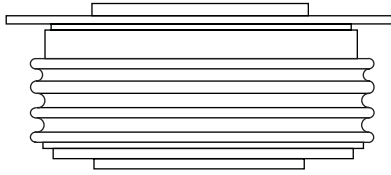


## Fast Recovery Diodes (Hockey PUK Version), 560 A



DO-200AB (B-PUK)

**FEATURES**

- High power FAST recovery diode series
- 6.0  $\mu$ s 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


**RoHS  
COMPLIANT**
**PRODUCT SUMMARY**

$I_{F(AV)}$	560 A
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**TYPICAL APPLICATIONS**

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

**MAJOR RATINGS AND CHARACTERISTICS**

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		560	A
	$T_{hs}$	55	°C
$I_{F(RMS)}$		1120	A
	$T_{hs}$	25	°C
$I_{FSM}$	50 Hz	12 000	A
	60 Hz	12 570	
$I^2t$	50 Hz	721	kA <sup>2</sup> s
	60 Hz	658	
$V_{RRM}$	Range	3000 to 4500	V
$t_{rr}$		6.0	$\mu$ s
	$T_J$	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 $T_J = 125$ °C mA
SD553C..S50L	30	3000	3100	75
	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		560 (210)	A	
				55 (85)	°C	
Maximum RMS forward current	$I_{F(RMS)}$	25 °C heatsink temperature double side cooled		1120	A	
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reappplied	12 000		
		t = 8.3 ms		12 570		
		t = 10 ms	50 % $V_{RRM}$ reappplied	10 100		
		t = 8.3 ms		10 570		
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied	721		kA <sup>2</sup> s
		t = 8.3 ms		658		
		t = 10 ms	50 % $V_{RRM}$ reappplied	510		
		t = 8.3 ms		466		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		7210	kA <sup>2</sup> √s	
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x $\pi$ x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$ ), $T_J = T_J$ maximum		1.77	V	
High level value of threshold voltage	$V_{F(TO)2}$	(I > $\pi$ x $I_{F(AV)}$ ), $T_J = T_J$ maximum		1.95		
Low level value of forward slope resistance	$r_{f1}$	(16.7 % x $\pi$ x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$ ), $T_J = T_J$ maximum		0.98	mΩ	
High level value of forward slope resistance	$r_{f2}$	(I > $\pi$ x $I_{F(AV)}$ ), $T_J = T_J$ maximum		0.89		
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 1500$ A, $T_J = 125$ °C, $t_p = 10$ ms sinusoidal wave		3.24	V	

RECOVERY CHARACTERISTICS								
CODE	MAXIMUM VALUE AT $T_J = 25$ °C	TEST CONDITIONS			TYPICAL VALUES AT $T_J = 125$ °C			
	$t_{rr}$ AT 25 % $I_{RRM}$ (μs)	$I_{pk}$ SQUARE PULSE (A)	di/dt (A/μs)	$V_r$ (V)	$t_{rr}$ AT 25 % $I_{RRM}$ (μs)	$Q_{rr}$ (μC)	$I_{rr}$ (A)	
S50	5.0	1000	100	- 50	6.0	900	250	

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	$R_{thJ-hs}$	DC operation single side cooled	0.073	K/W
		DC operation double side cooled	0.031	
Mounting force, ± 10 %			14 700 (1500)	N (kg)
Approximate weight			255	g
Case style		Conforms to JEDEC	DO-200AB (B-PUK)	



<b><math>\Delta R_{thJ-hs}</math> CONDUCTION</b>						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.009	0.009	0.006	0.006	T <sub>J</sub> = T <sub>J</sub> maximum	K/W
120°	0.011	0.011	0.011	0.011		
90°	0.014	0.014	0.015	0.015		
60°	0.020	0.020	0.021	0.021		
30°	0.036	0.036	0.036	0.036		

**Note**

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

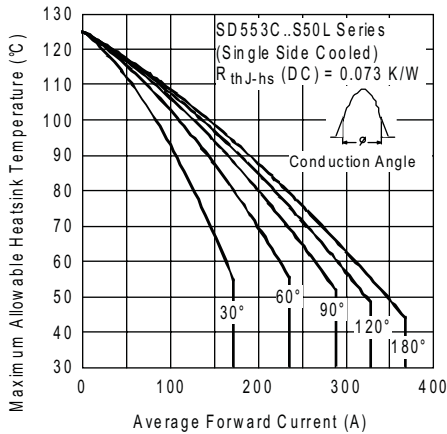


Fig. 1 - Current Ratings Characteristics

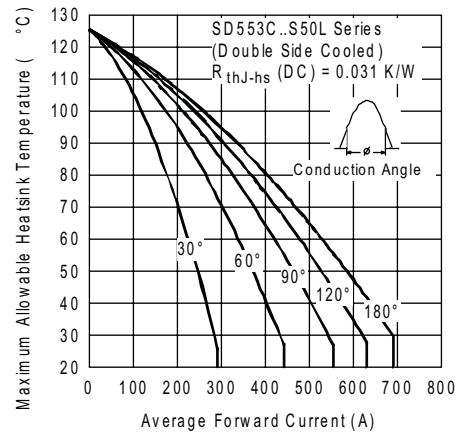


Fig. 3 - Current Ratings Characteristics

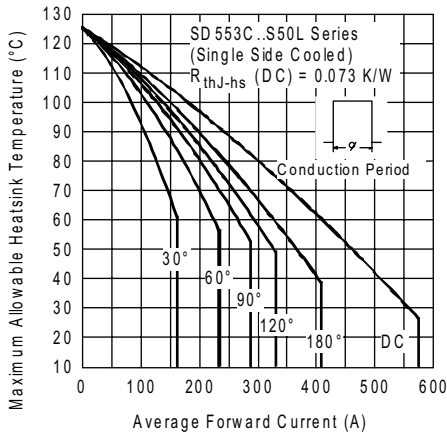


Fig. 2 - Current Ratings Characteristics

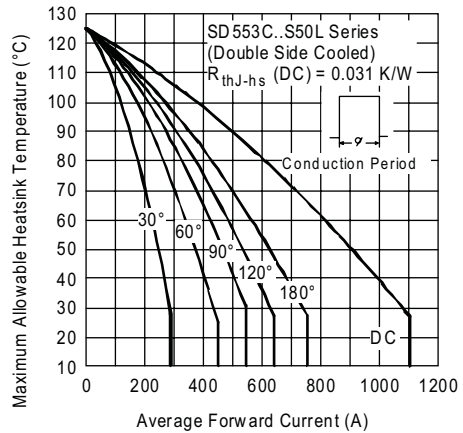


Fig. 4 - Current Ratings Characteristics

# SD553C..S50L Series



Vishay High Power Products Fast Recovery Diodes  
(Hockey PUK Version), 560 A

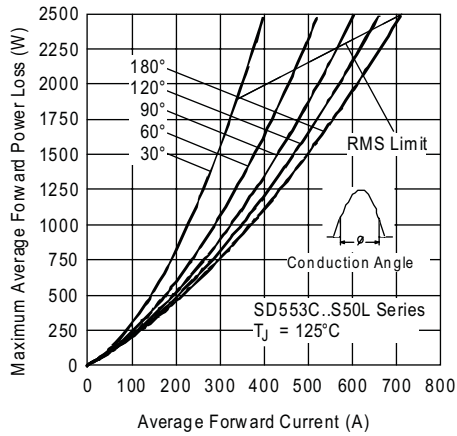


Fig. 5 - Forward Power Loss Characteristics

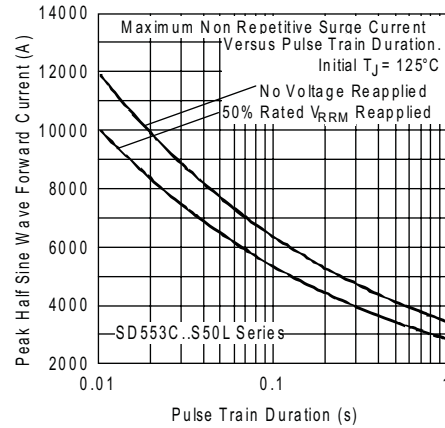


Fig. 8 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

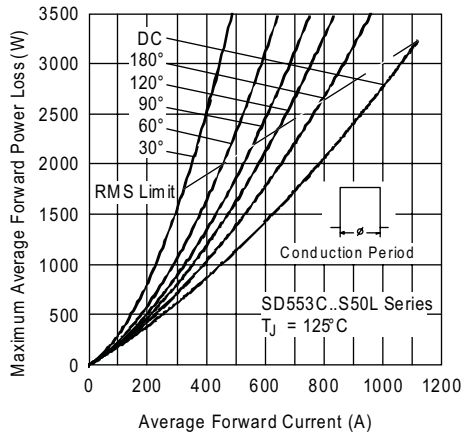


Fig. 6 - Forward Power Loss Characteristics

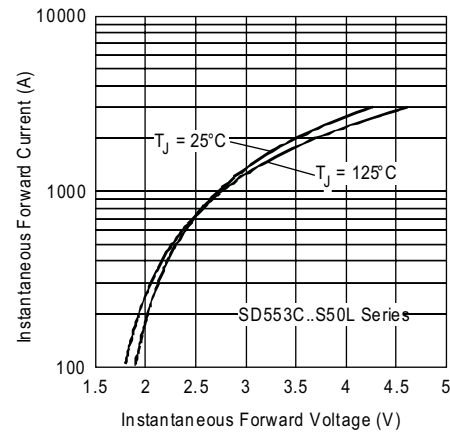


Fig. 9 - Forward Voltage Drop Characteristics

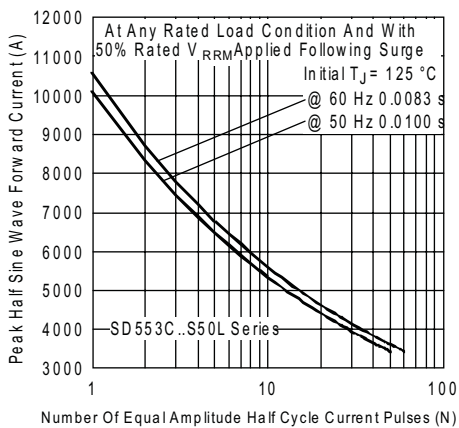


Fig. 7 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

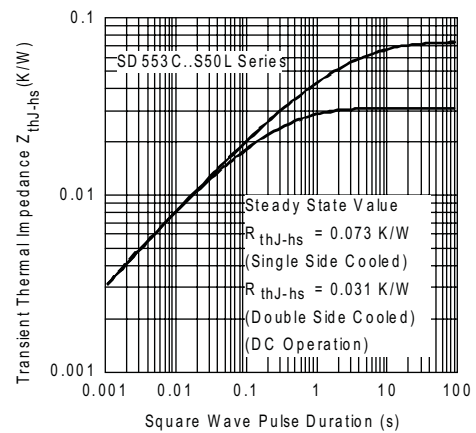


Fig. 10 - Thermal Impedance  $Z_{thJ-hs}$  Characteristic

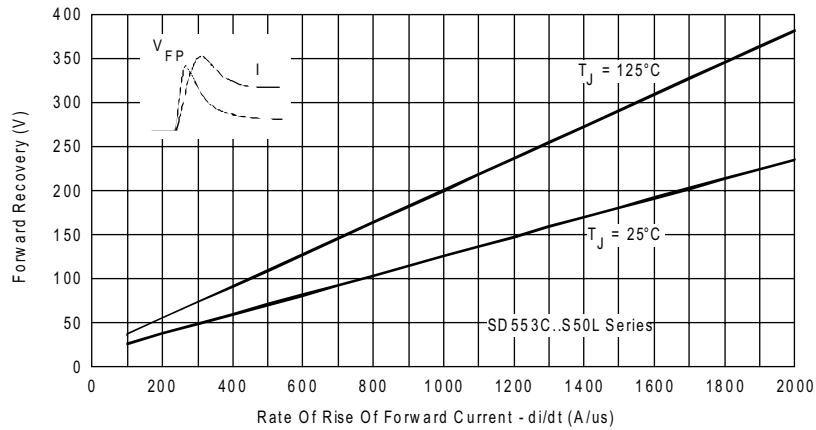


Fig. 11 - Typical Forward Recovery Characteristics

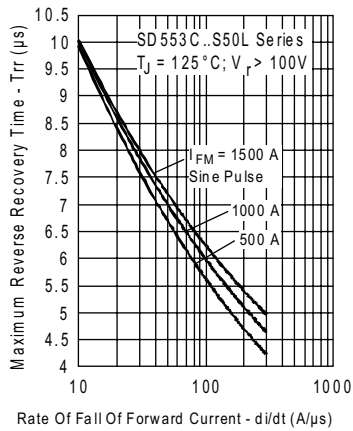


Fig. 12 - Recovery Time Characteristics

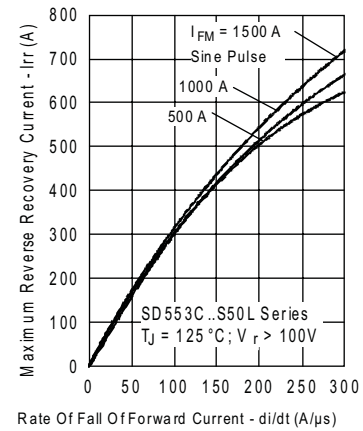


Fig. 14 - Recovery Current Characteristics

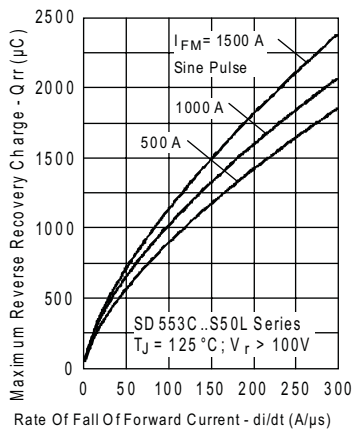


Fig. 13 - Recovery Charge Characteristics

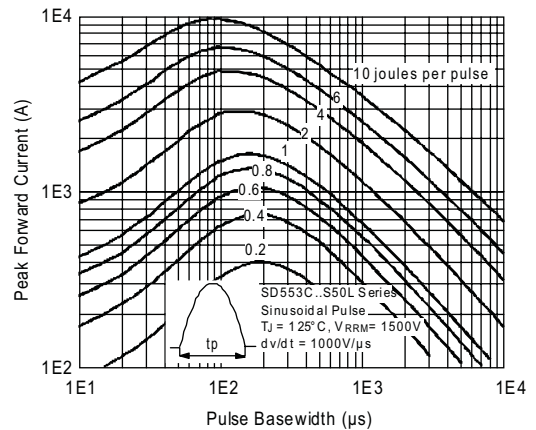


Fig. 15 - Maximum Total Energy Loss Per Pulse Characteristics

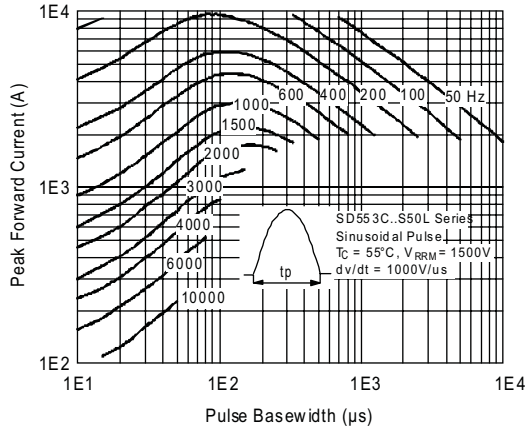


Fig. 16 - Frequency Characteristics

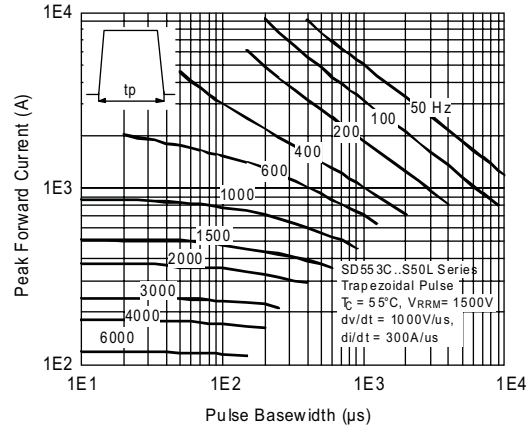


Fig. 18 - Frequency Characteristics

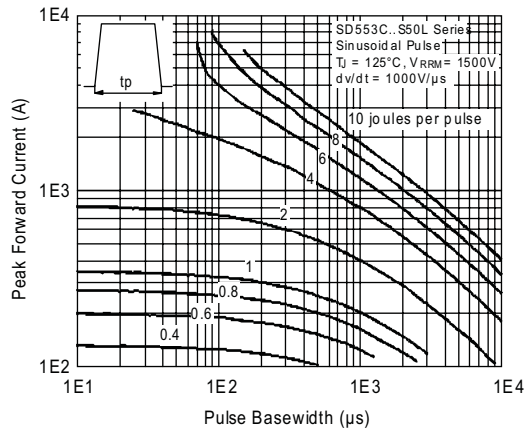


Fig. 17 - Maximum Total Energy Loss Per Pulse Characteristics

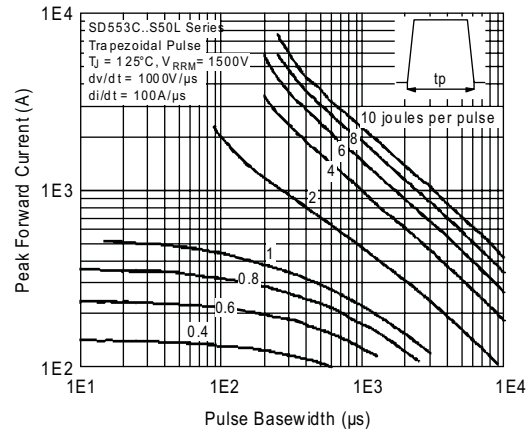


Fig. 19 - Maximum Total Energy Loss Per Pulse Characteristics

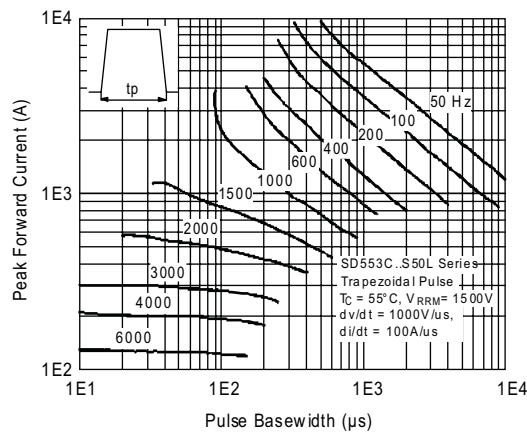


Fig. 20 - Frequency Characteristics



## ORDERING INFORMATION TABLE

Device code	SD	55	3	C	45	S50	L
	①	②	③	④	⑤	⑥	⑦

- 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	<a href="http://www.vishay.com/doc?95246">http://www.vishay.com/doc?95246</a>



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