

Fast Recovery Diodes (Hockey PUK Version), 700 A, 790 A



B-PUK (DO-200AB)

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	700 A, 790 A
Package	B-PUK (DO-200AB)
Circuit configuration	Single

FEATURES

- High power fast recovery diode series
- 2.0 μ s to 3.0 μ s recovery time
- High voltage ratings up to 2500 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® B-PUK (DO-200AB)
- Maximum junction temperature 150 °C
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

TYPICAL APPLICATIONS

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

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	SD703C..L		UNITS
		S20	S30	
$I_{F(AV)}$		700	790	A
	T_{hs}	55	55	°C
$I_{F(RMS)}$		1320	1470	A
I_{FSM}	50 Hz	9300	9600	
	60 Hz	9730	10 050	
V_{RRM}	Range	1200 to 2500	1200 to 2500	V
t_{rr}		2.0	3.0	μ s
	T_J	25	25	°C
T_J		-40 to +150	-40 to +150	

ELECTRICAL SPECIFICATIONS

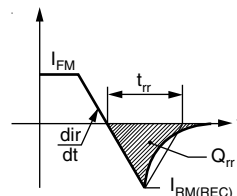
VOLTAGE RATINGS

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
VS-SD703C..L	12	1200	1300	50
	16	1600	1700	
	20	2000	2100	
	25	2500	2600	



FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS		SD703C..L		UNITS	
				s20	s30		
Maximum average forward current at heatsink temperature	I _{F(AV)}	180° conduction, half sine wave Double side (single side) cooled		700 (365)	790 (400)	A	
Maximum RMS forward current	I _{F(RMS)}	25 °C heatsink temperature double side cooled		55 (85)	55 (85)	°C	
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	9300	9600	A
		t = 8.3 ms			9730	10 050	
		t = 10 ms	100 % V _{RRM} reapplied		7820	8070	
		t = 8.3 ms			8190	8450	
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		432	460	kA ² s
		t = 8.3 ms			395	420	
		t = 10 ms	100 % V _{RRM} reapplied		306	326	
		t = 8.3 ms			279	297	
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied		4320	4600	kA ² √s	
Low level value of threshold voltage	V _{F(TO)1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J maximum		1.00	0.95	V	
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)}), T _J = T _J maximum		1.11	1.05		
Low level value of forward slope resistance	r _{f1}	(16.7 % × π × I _{T(AV)} < I < π × I _{T(AV)}), T _J = T _J maximum		0.80	0.60	mW	
High level value of forward slope resistance	r _{f2}	(I > π × I _{T(AV)}), T _J = T _J maximum		0.76	0.56		
Maximum forward voltage drop	V _{FM}	I _{pk} = 1500 A, T _J = T _J maximum, t _p = 10 ms sinusoidal wave		2.20	1.85	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 (A/μs)	V_r (V)	t_{rr} AT 25 % I_{RRM} (μs)	Q_{rr} (μC)	I_{rr} (A)
S20	2.0	1000	50	-50	3.5	240	110
S30	3.0				5.0	380	130



THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating and storage temperature range	T_J, T_{Stg}		-40 to 150	°C
Maximum thermal resistance, case junction to heatsink	R_{thJ-hs}	DC operation single side cooled	0.092	K/W
		DC operation double side cooled	0.046	
Mounting force, ± 10 %			9800 (1000)	N (kg)
Approximate weight			250	g
Case style		See dimensions - link at the end of datasheet	B-PUK (DO-200AB)	

ΔR_{thJ-hs} CONDUCTION					
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE	
180°	0.011	0.011	0.008	0.008	$T_J = T_J$ maximum
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	

Note

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

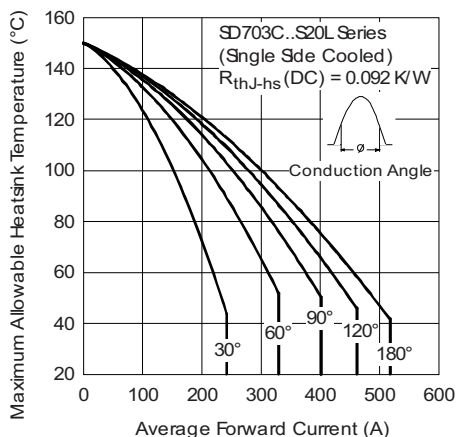


Fig. 1 - Current Ratings Characteristics

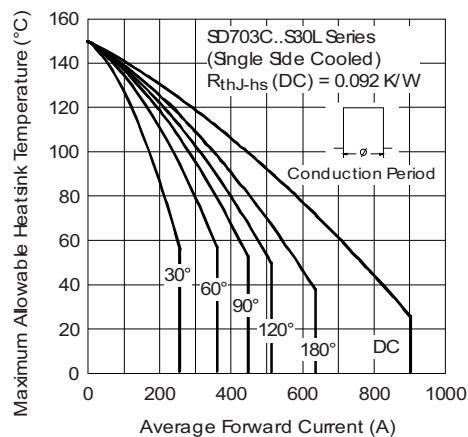


Fig. 4 - Current Ratings Characteristics

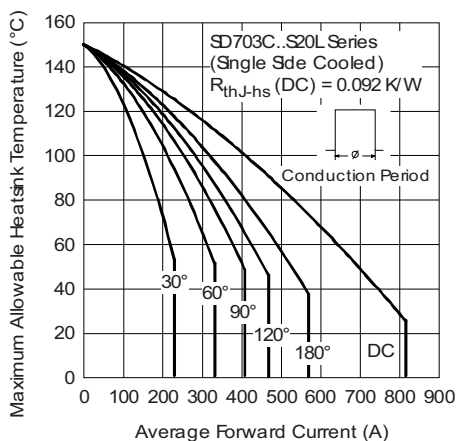


Fig. 2 - Current Ratings Characteristics

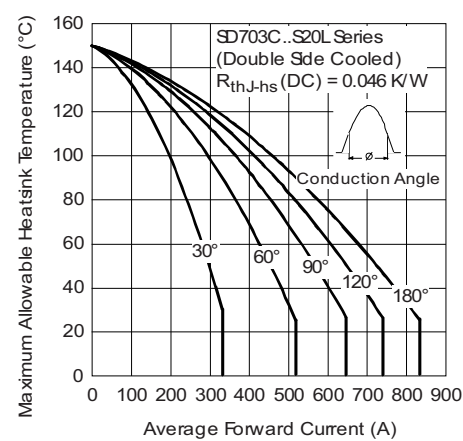


Fig. 5 - Current Ratings Characteristics

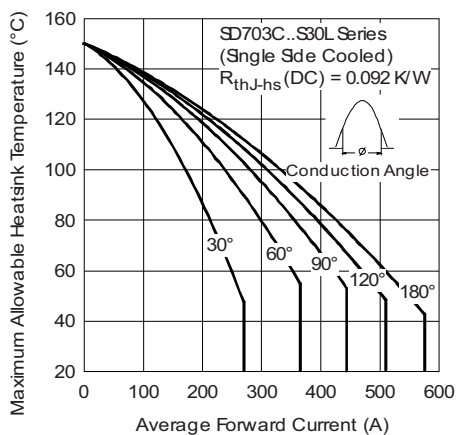


Fig. 3 - Current Ratings Characteristics

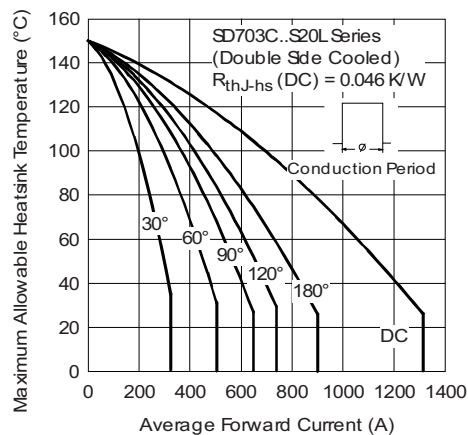


Fig. 6 - Current Ratings Characteristics

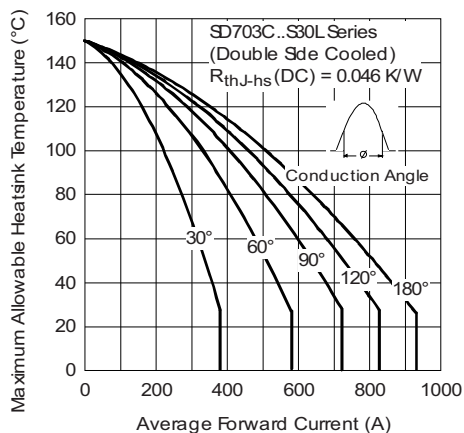


Fig. 7 - Current Ratings Characteristics

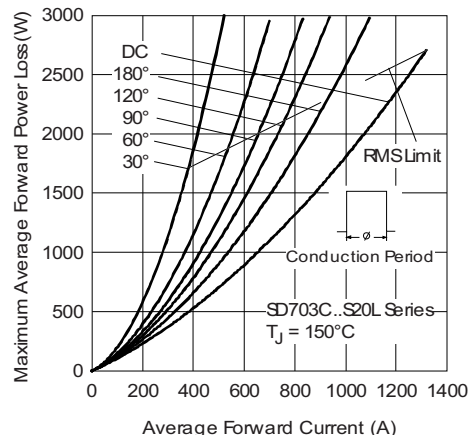


Fig. 10 - Forward Power Loss Characteristics

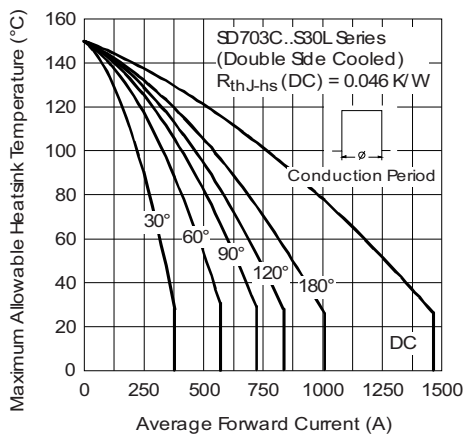


Fig. 8 - Current Ratings Characteristics

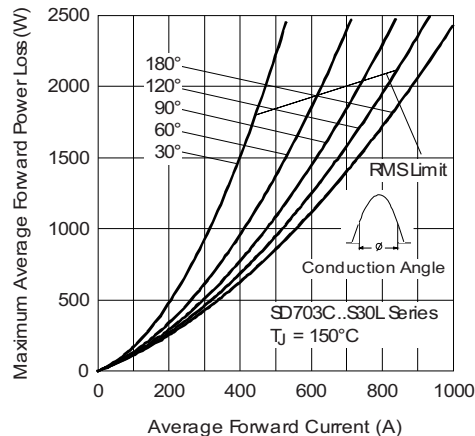


Fig. 11 - Forward Power Loss Characteristics

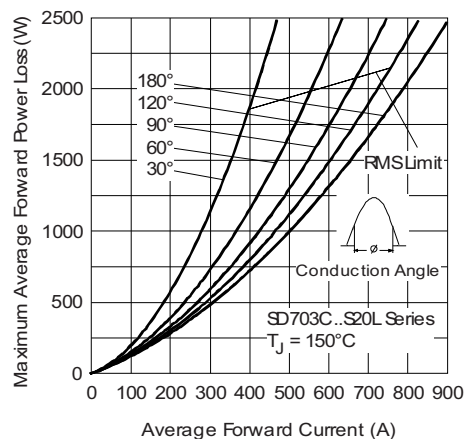


Fig. 9 - Forward Power Loss Characteristics

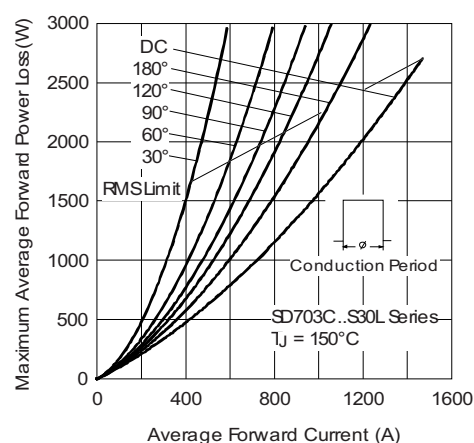


Fig. 12 - Forward Power Loss Characteristics

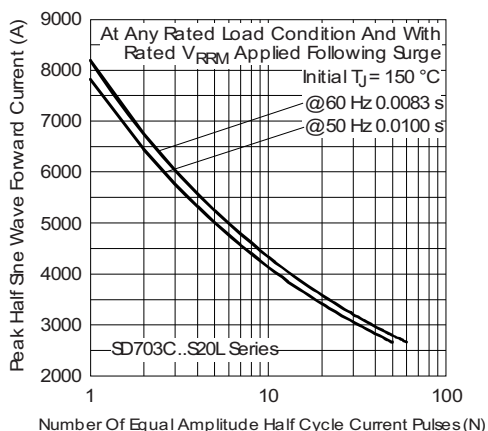


Fig. 13 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

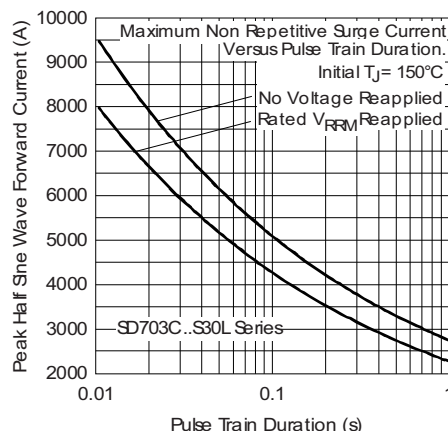


Fig. 16 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

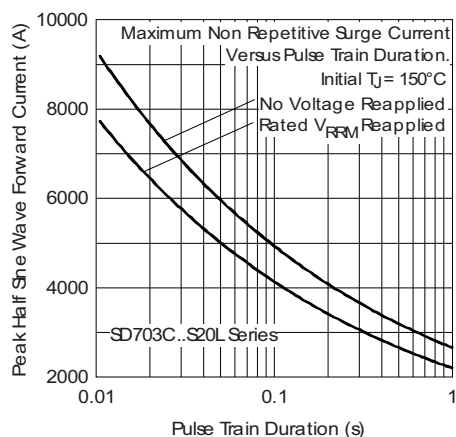


Fig. 14 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

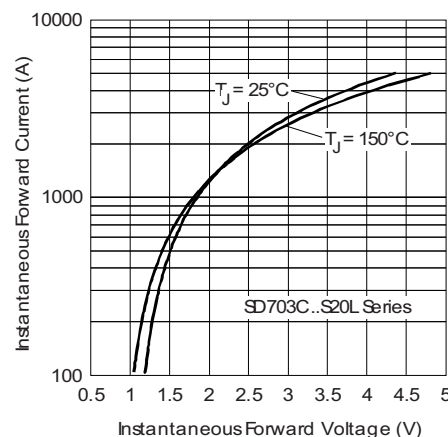


Fig. 17 - Forward Voltage Drop Characteristics

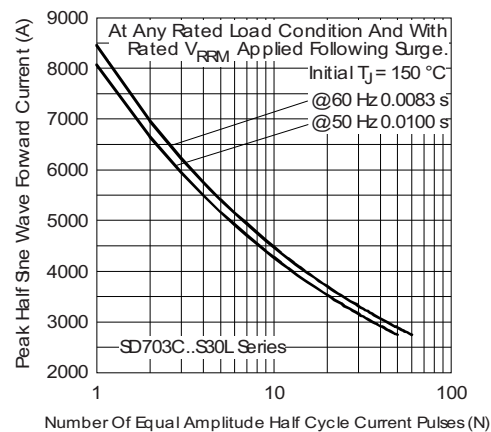


Fig. 15 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

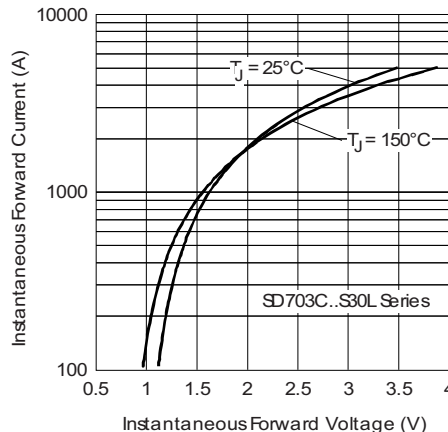


Fig. 18 - Forward Voltage Drop Characteristics

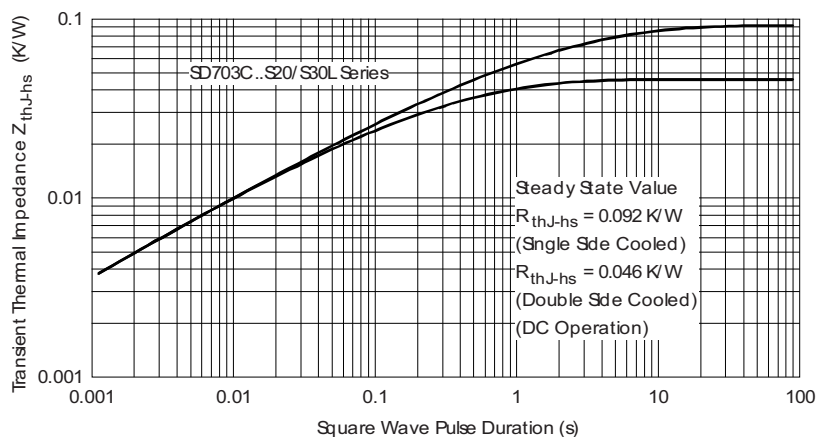
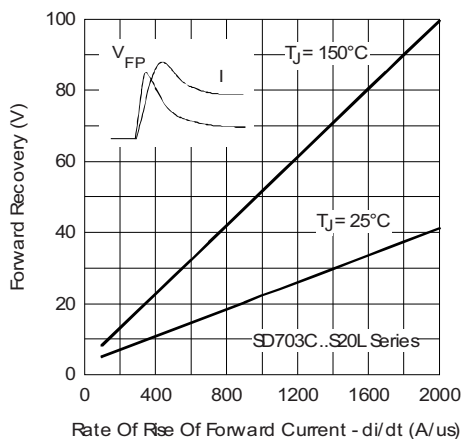

Fig. 19 - Thermal Impedance Z_{thJ-hs} Characteristic


Fig. 20 - Typical Forward Recovery Characteristics

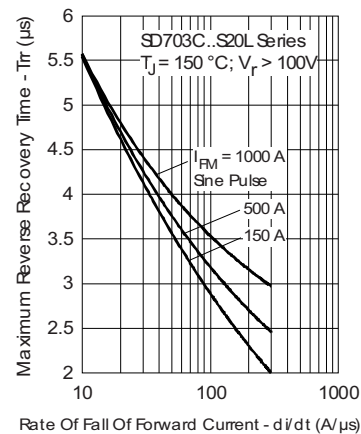


Fig. 22 - Recovery Time Characteristics

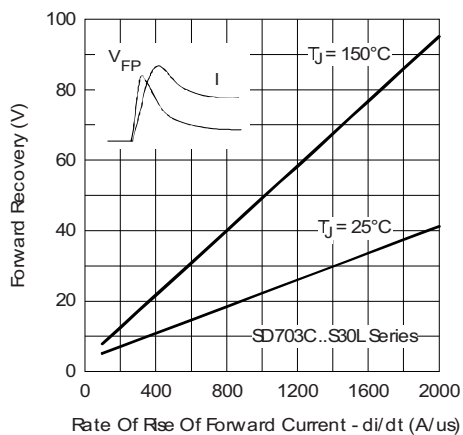


Fig. 21 - Typical Forward Recovery Characteristics

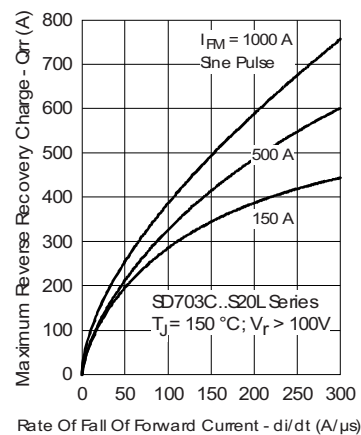


Fig. 23 - Recovery Charge Characteristics

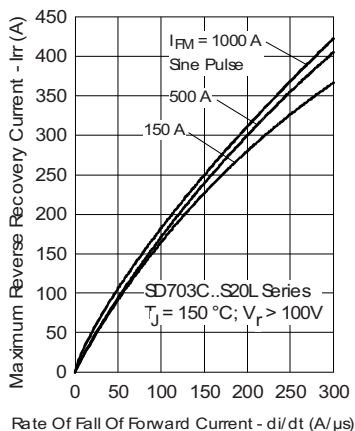


Fig. 24 - Recovery Current Characteristics

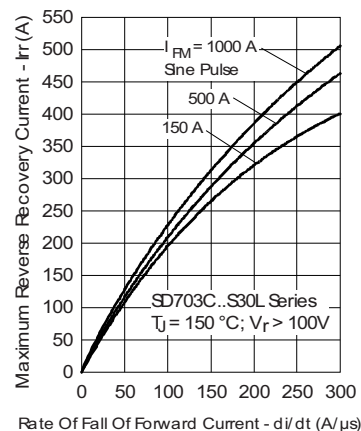


Fig. 27 - Recovery Current Characteristics

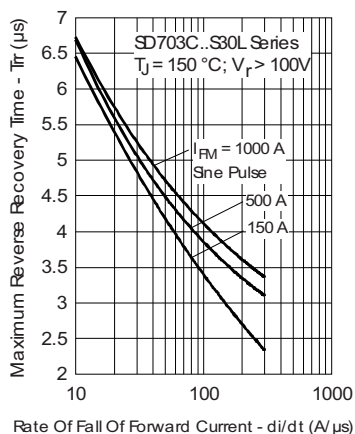


Fig. 25 - Recovery Time Characteristics

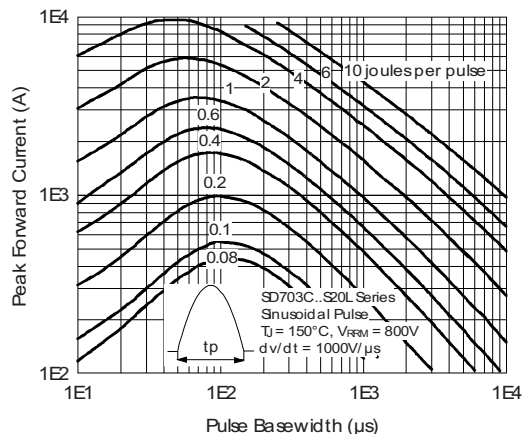


Fig. 28 - Maximum Total Energy Loss Per Pulse Characteristics

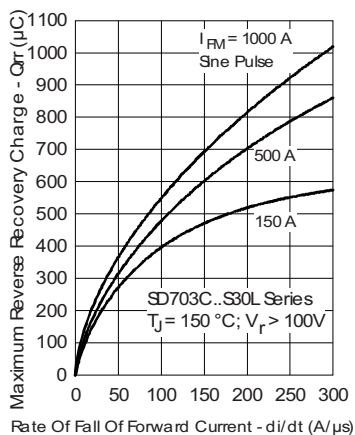


Fig. 26 - Recovery Charge Characteristics

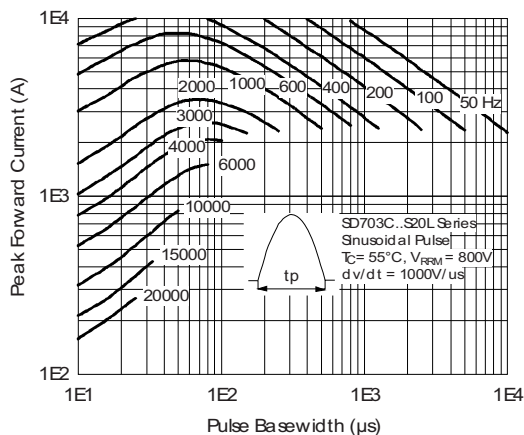


Fig. 29 - Frequency Characteristics

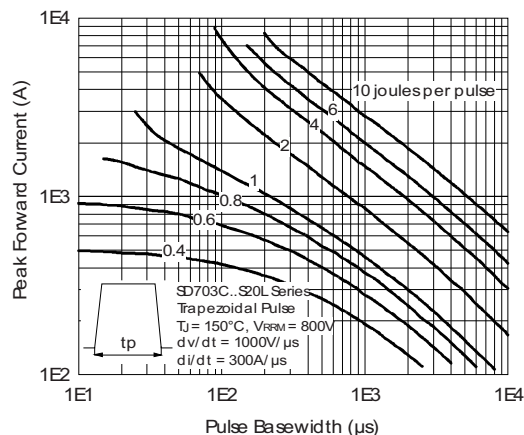


Fig. 30 - Maximum Total Energy Loss Per Pulse Characteristics

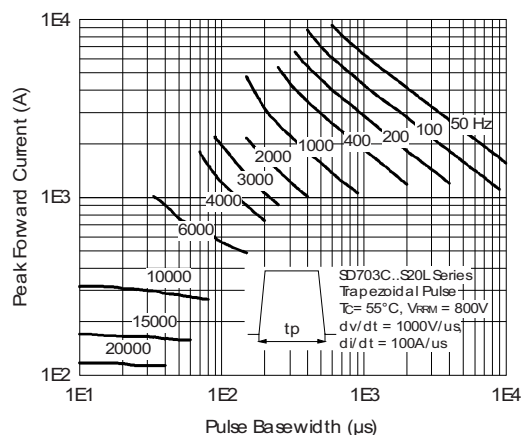


Fig. 33 - Frequency Characteristics

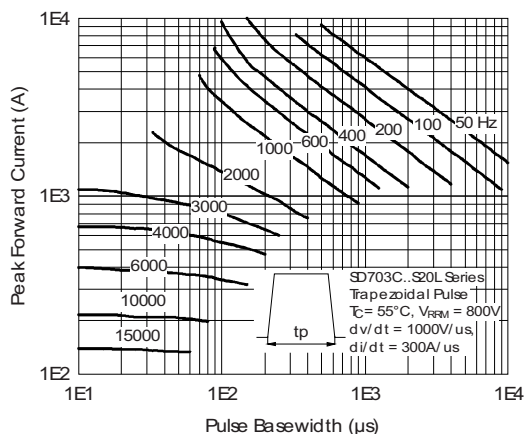


Fig. 31 - Frequency Characteristics

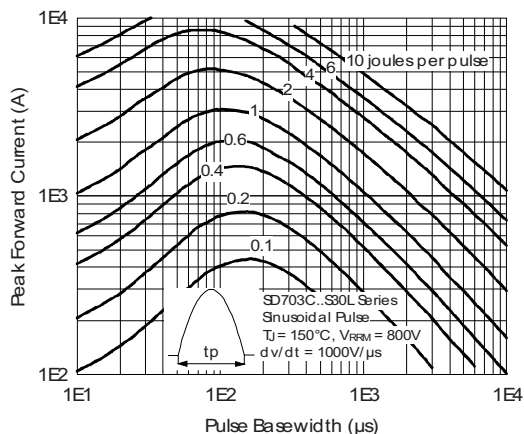


Fig. 34 - Maximum Total Energy Loss Per Pulse Characteristics

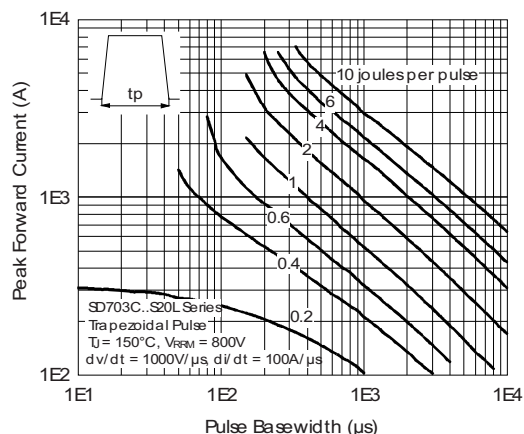


Fig. 32 - Maximum Total Energy Loss Per Pulse Characteristics

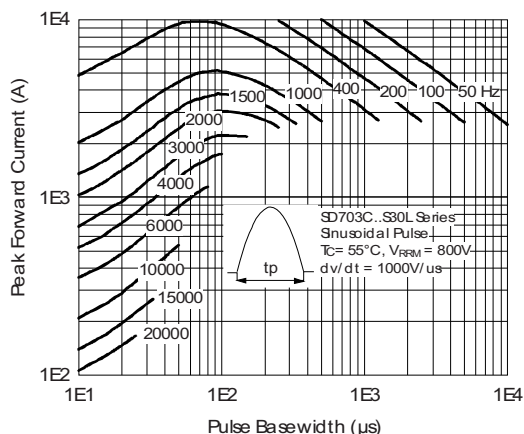


Fig. 35 - Frequency Characteristics

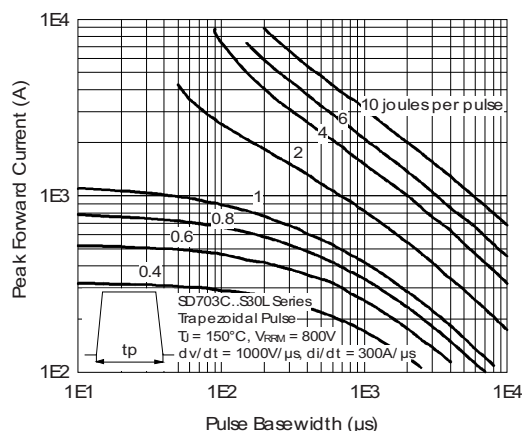


Fig. 36 - Maximum Total Energy Loss Per Pulse Characteristics

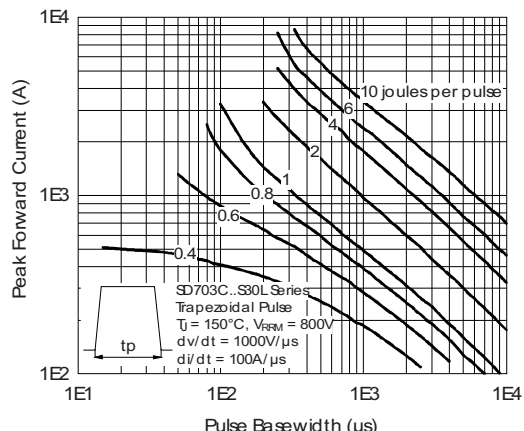


Fig. 38 - Maximum Total Energy Loss Per Pulse Characteristics

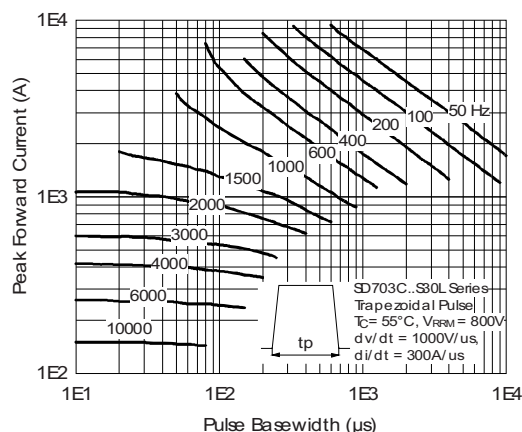


Fig. 37 - Frequency Characteristics

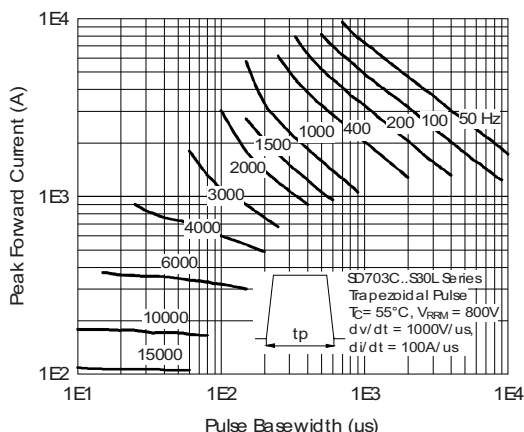


Fig. 39 - Frequency Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	SD	70	3	C	25	S20	L
	①	②	③	④	⑤	⑥	⑦	⑧
①	- Vishay Semiconductors product							
②	- Diode							
③	- Essential part number							
④	- 3 = fast recovery							
⑤	- C = ceramic PUK							
⑥	- Voltage code x 100 = V_{RRM} (see Voltage Ratings table)							
⑦	- t_{rr} code							
⑧	- L = PUK case B-PUK (DO-200AB)							

LINKS TO RELATED DOCUMENTS

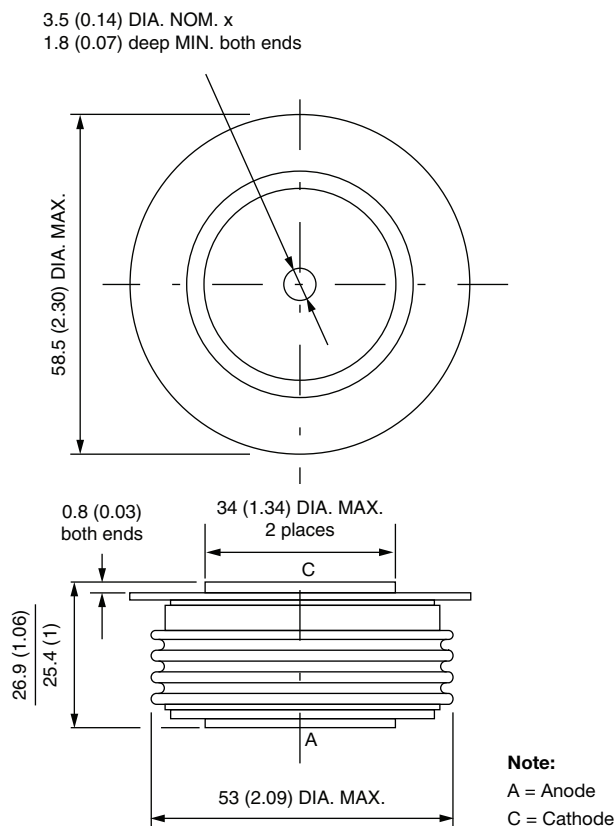
Dimensions

www.vishay.com/doc?95246



B-PUK (DO-200AB)

DIMENSIONS in millimeters (inches)



Quote between upper and lower pole pieces has to be considered after application of mounting force (see Thermal and Mechanical Specifications)



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