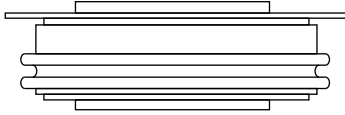


## Fast Recovery Diodes (Hockey PUK Version), 810/910 A



B-43

### FEATURES

- High power FAST recovery diode series
- 2.0 to 3.0  $\mu$ 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
- Hockey PUK version case style B-43
- Maximum junction temperature 150 °C
- Lead (Pb)-free
- Designed and qualified for industrial level



**RoHS**  
COMPLIANT

### PRODUCT SUMMARY

$I_{F(AV)}$	810/910 A
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### TYPICAL APPLICATIONS

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

### MAJOR RATINGS AND CHARACTERISTICS

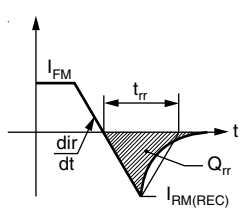
PARAMETER	TEST CONDITIONS	SD823C..C		UNITS
		S20	S30	
$I_{F(AV)}$		810	910	A
	$T_{hs}$	55	55	°C
$I_{F(RMS)}$		1500	1690	A
$I_{FSM}$	50 Hz	9300	9600	
	60 Hz	9730	10 050	
$V_{RRM}$	Range	1200 to 2500	1200 to 2500	V
$t_{rr}$		2.0	3.0	$\mu$ s
	$T_J$	25		°C
$T_J$	- 40 to 150			

### 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
SD823C..C	12	1200	1300	50
	16	1600	1700	
	20	2000	2100	
	25	2500	2600	

FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		SD823C..C		UNITS
				S20	S30	
Maximum average forward current at heatsink temperature	$I_{F(AV)}$	180° conduction, half sine wave Double side (single side) cooled		810 (425)	910 (470)	A
				55 (85)	55 (85)	°C
Maximum RMS forward current	$I_{F(RMS)}$	25 °C heatsink temperature double side cooled		1500	1690	A
Maximum peak, one-cycle forward, non-repetitive current	$I_{FSM}$	t = 10 ms	No voltage reappplied	9300	9600	
		t = 8.3 ms		9730	10 050	
		t = 10 ms	100 % $V_{RRM}$ reappplied	7820	8070	
		t = 8.3 ms		8190	8450	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied	432	460	kA <sup>2</sup> s
		t = 8.3 ms		395	420	
		t = 10 ms	100 % $V_{RRM}$ reappplied	306	326	
		t = 8.3 ms		279	297	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		4320	4600	kA <sup>2</sup> √s
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		1.00	0.95	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		1.11	1.06	
Low level value of forward slope resistance	$r_{f1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.80	0.60	mΩ
High level value of forward slope resistance	$r_{f2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.76	0.57	
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 $T_J = 125$ °C			
	$t_{rr}$ AT 25 % $I_{RRM}$ ( s )	$I_{pk}$ SQUARE PULSE (A)	di/dt (A/ s)	$V_r$ (V)	$t_{rr}$ AT 25 % $I_{RRM}$ ( s )	$Q_{rr}$ ( C )	$I_{rr}$ (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	0.076	K/W
		DC operation double side cooled	0.038	
Mounting force, $\pm 10$ %			9800 (1000)	N (kg)
Approximate weight			83	g
Case style		See dimensions - link at the end of datasheet	B-43	

$\Delta R_{thJ-hs}$ CONDUCTION						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.007	0.007	0.005	0.005	T <sub>J</sub> = T <sub>J</sub> maximum	K/W
120°	0.008	0.008	0.008	0.008		
90°	0.010	0.010	0.011	0.011		
60°	0.015	0.015	0.016	0.016		
30°	0.026	0.026	0.026	0.026		

**Note**

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

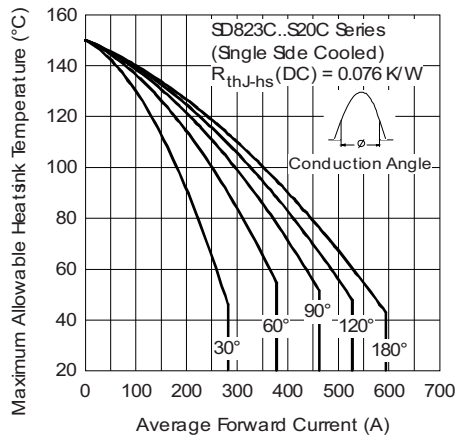


Fig. 1 - Current Ratings Characteristics

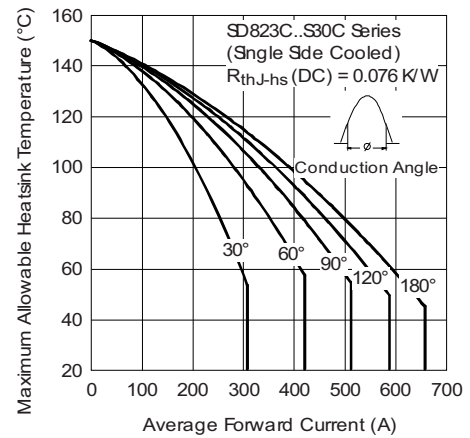


Fig. 3 - Current Ratings Characteristics

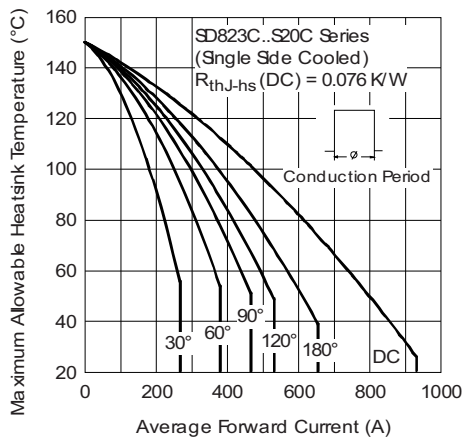


Fig. 2 - Current Ratings Characteristics

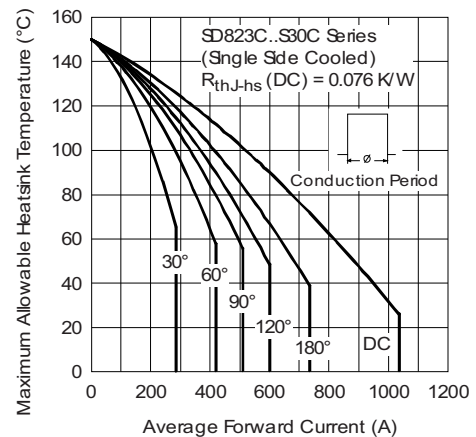


Fig. 4 - Current Ratings Characteristics

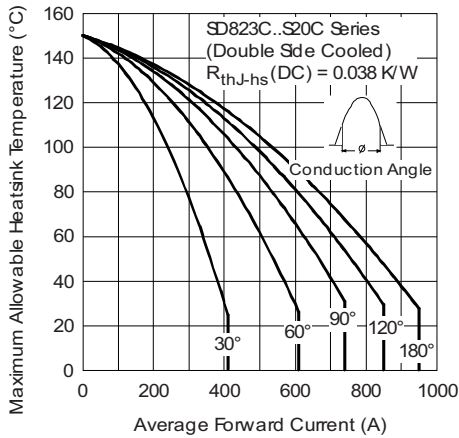


Fig. 5 - Current Ratings Characteristics

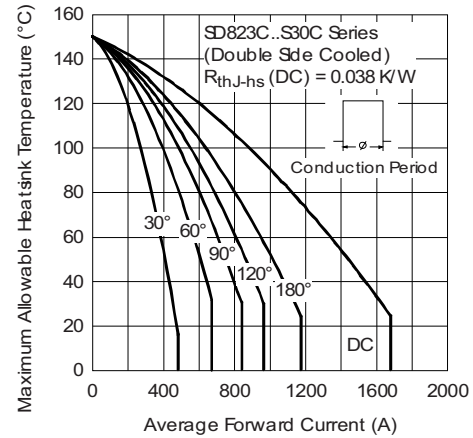


Fig. 8 - Current Ratings Characteristics

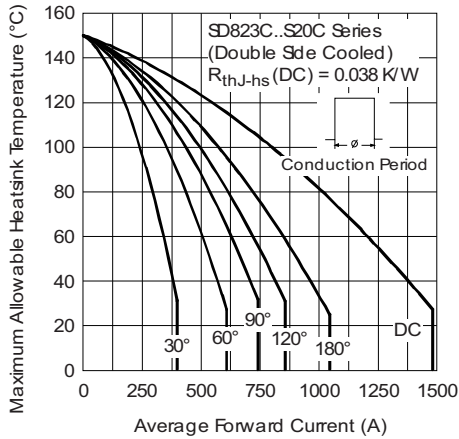


Fig. 6 - Current Ratings Characteristics

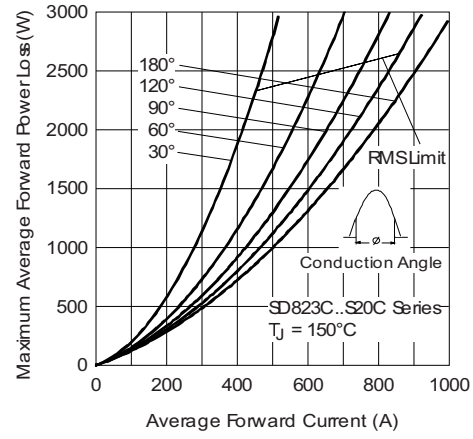


Fig. 9 - Forward Power Loss Characteristics

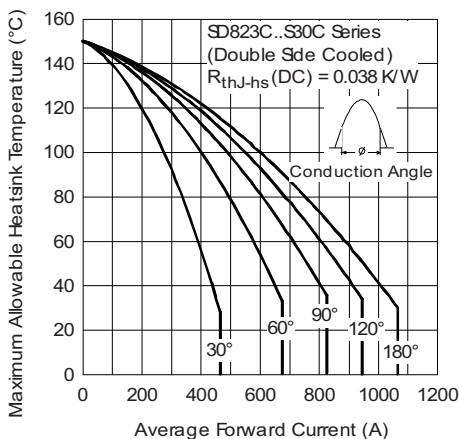


Fig. 7 - Current Ratings Characteristics

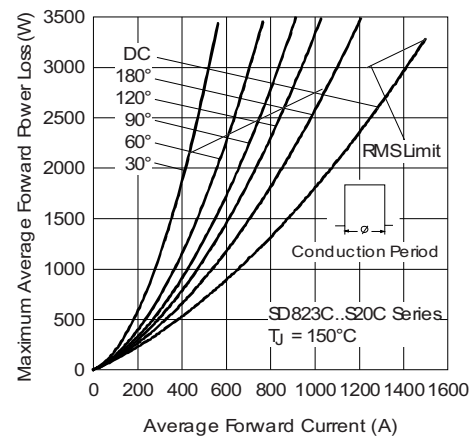


Fig. 10 - Forward Power Loss Characteristics

## Fast Recovery Diodes (Hockey PUK Version), 810/910 A

Vishay Semiconductors

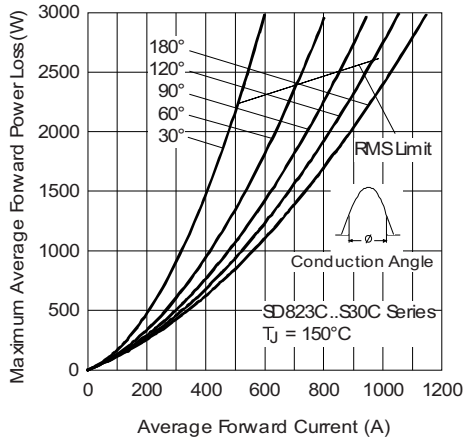


Fig. 11 - Forward Power Loss Characteristics

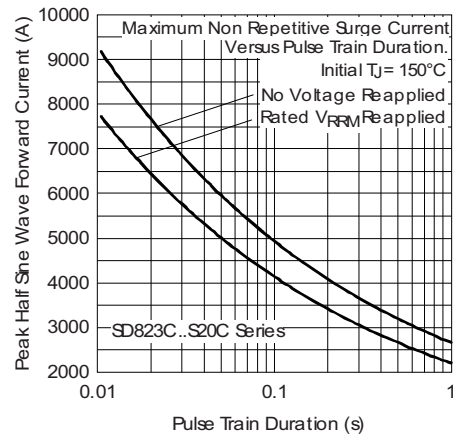


Fig. 14 - Maximum Non-Repetitive Surge Current

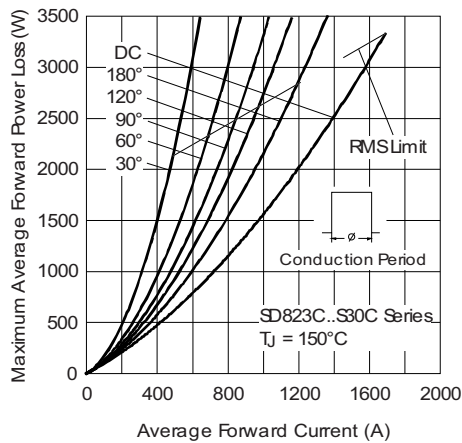


Fig. 12 - Forward Power Loss Characteristics

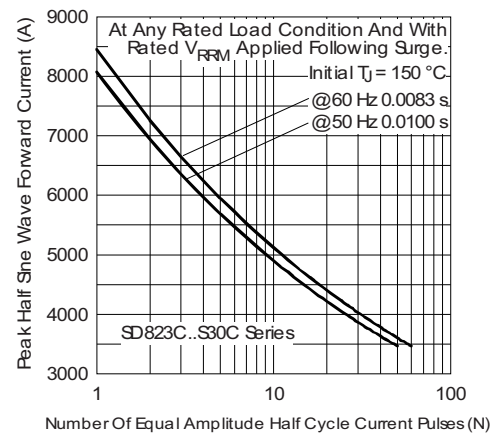


Fig. 15 - Maximum Non-Repetitive Surge Current

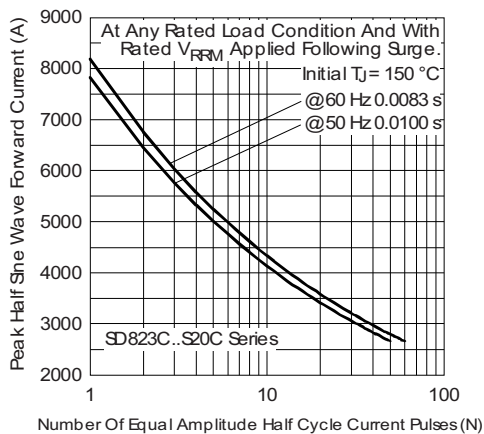


Fig. 13 - Maximum Non-Repetitive Surge Current

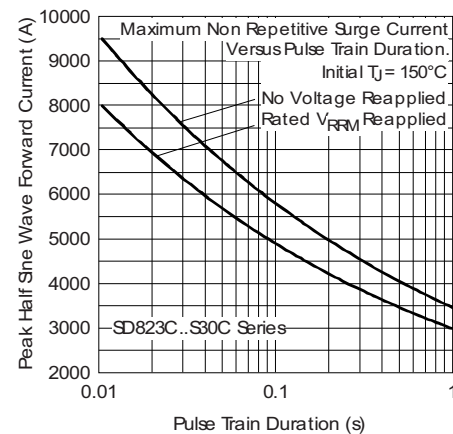


Fig. 16 - Maximum Non-Repetitive Surge Current

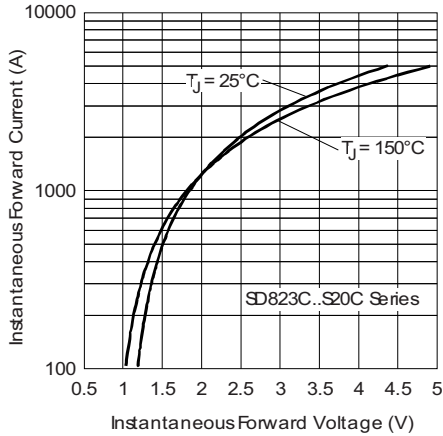


Fig. 17 - Forward Voltage Drop Characteristics

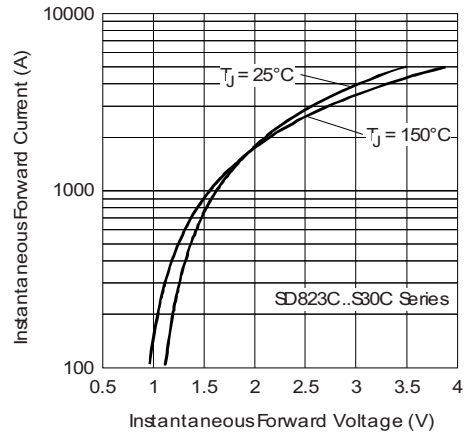


Fig. 18 - Forward Voltage Drop Characteristics

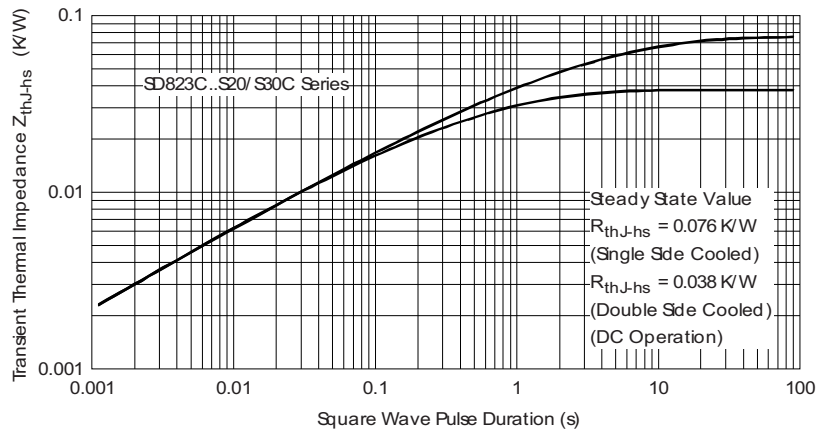


Fig. 19 - Thermal Impedance  $Z_{thJ-hs}$  Characteristic

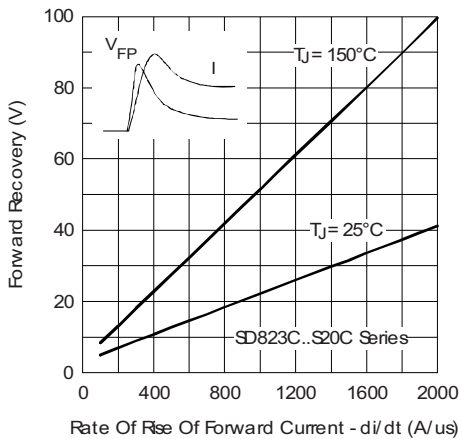


Fig. 20 - Typical Forward Recovery Characteristics

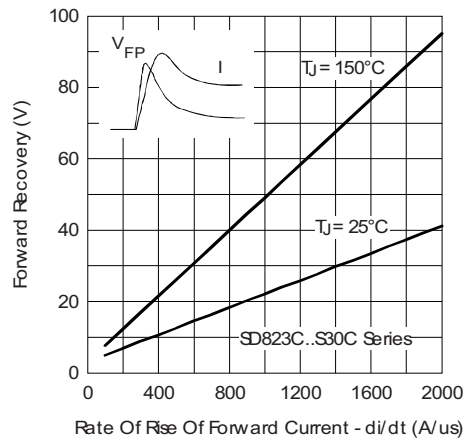


Fig. 21 - Typical Forward Recovery Characteristics

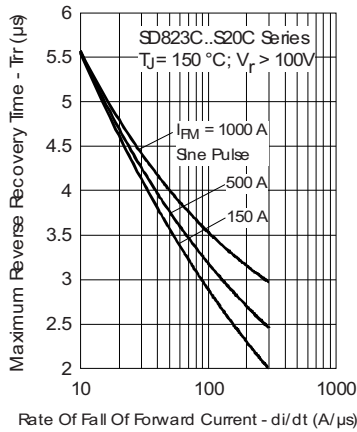


Fig. 22 - Recovery Time Characteristics

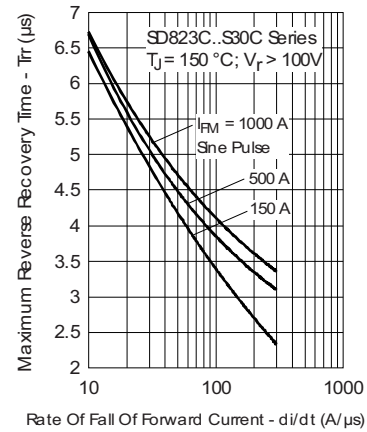


Fig. 25 - Recovery Time Characteristics

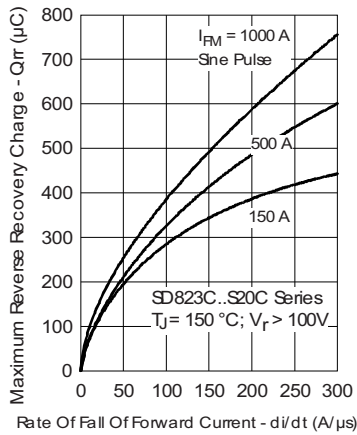


Fig. 23 - Recovery Charge Characteristics

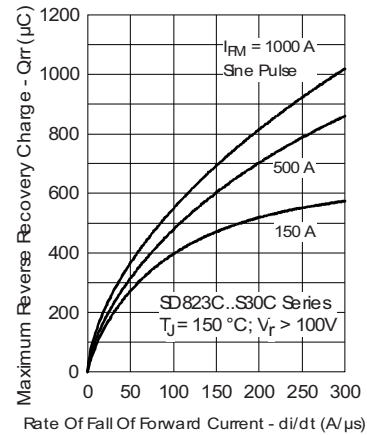


Fig. 26 - Recovery Charge Characteristics

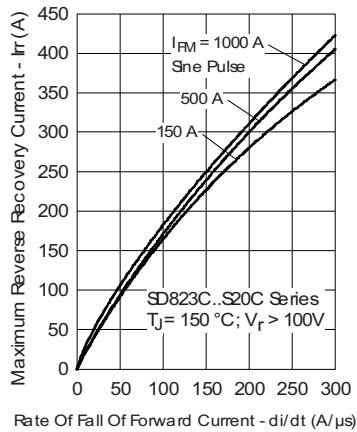


Fig. 24 - Recovery Current Characteristics

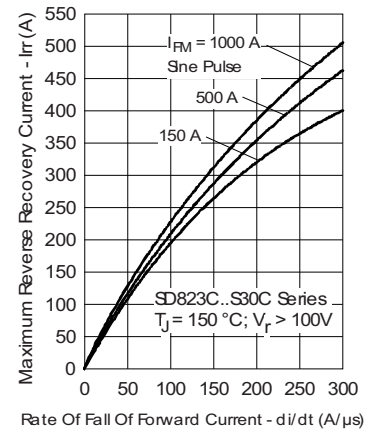


Fig. 27 - Recovery Current Characteristics

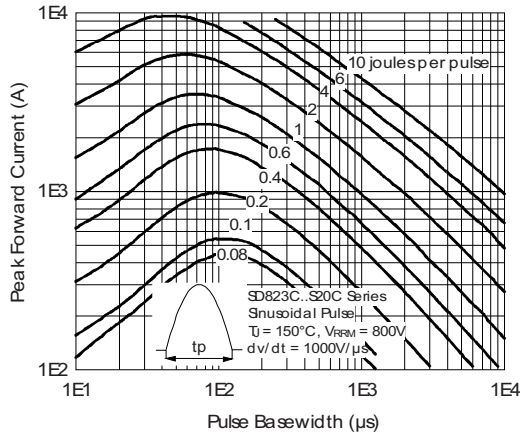


Fig. 28 - Maximum Total Energy Loss Per Pulse Characteristics

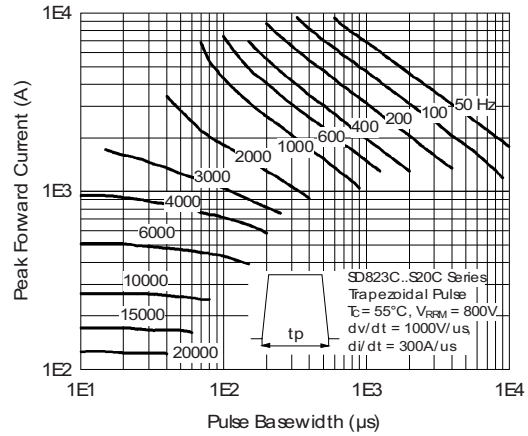


Fig. 31 - Frequency Characteristics

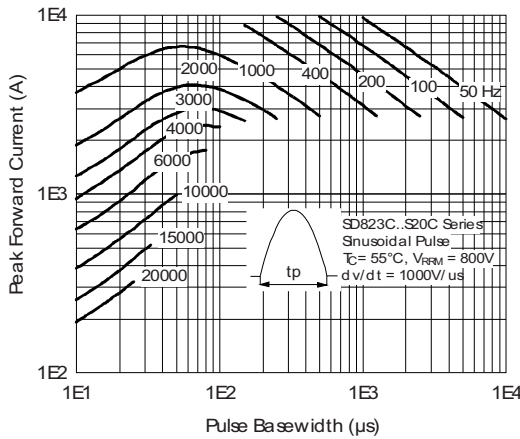


Fig. 29 - Frequency Characteristics

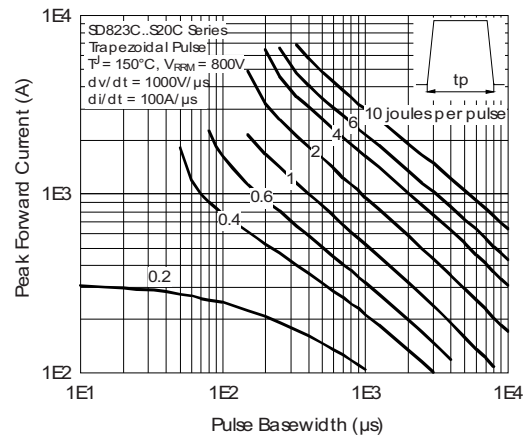


Fig. 32 - Maximum Total Energy Loss Per Pulse Characteristics

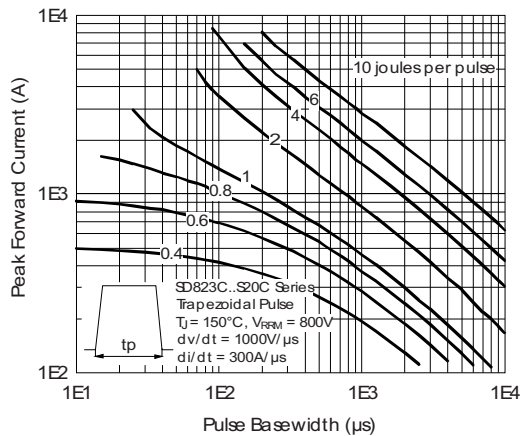


Fig. 30 - Maximum Total Energy Loss Per Pulse Characteristics

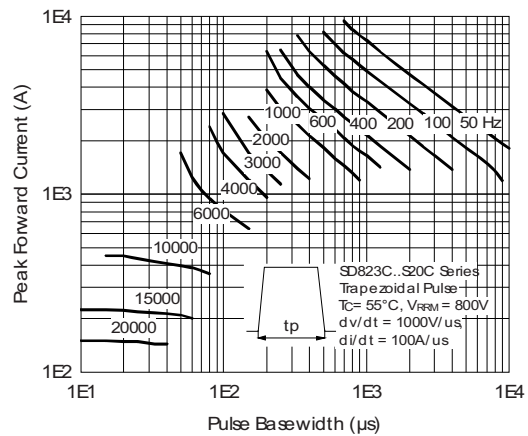


Fig. 33 - Frequency Characteristics

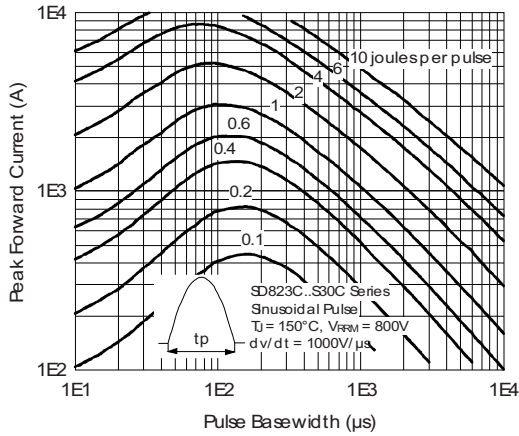


Fig. 34 - Maximum Total Energy Loss Per Pulse Characteristics

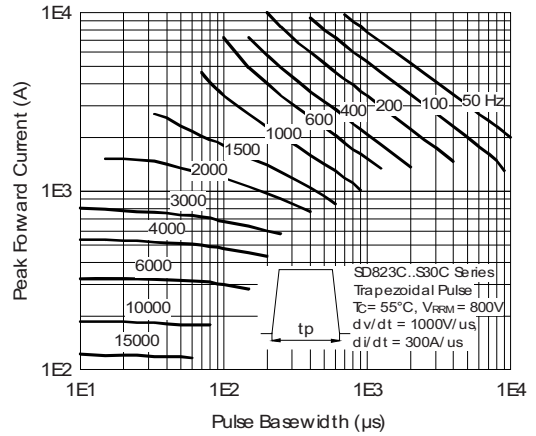


Fig. 37 - Frequency Characteristics

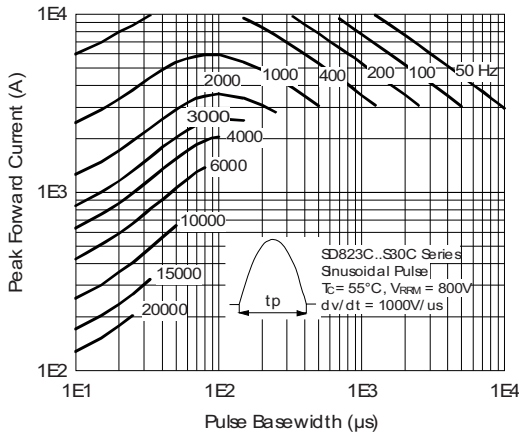


Fig. 35 - Frequency Characteristics

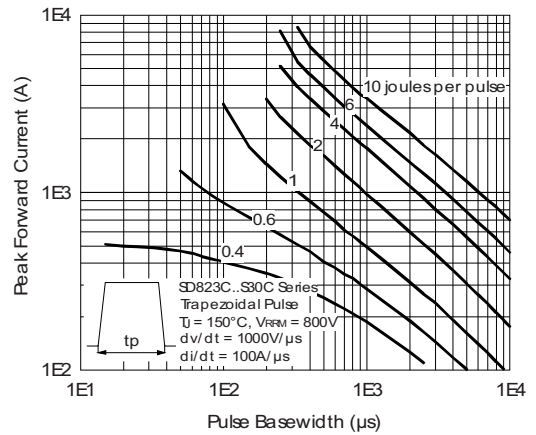


Fig. 38 - Maximum Total Energy Loss Per Pulse Characteristics

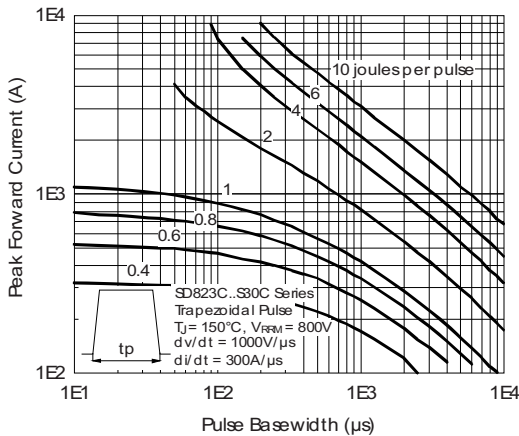


Fig. 36 - Maximum Total Energy Loss Per Pulse Characteristics

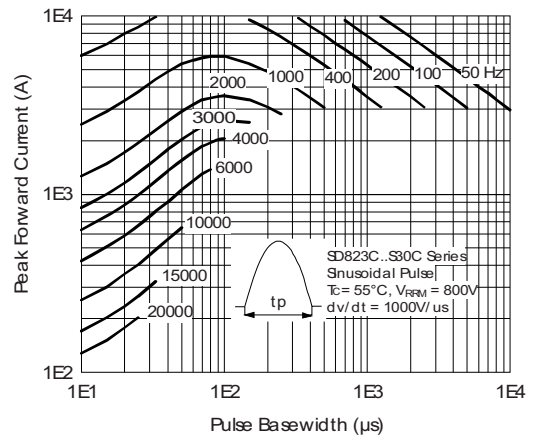


Fig. 39 - Frequency Characteristics

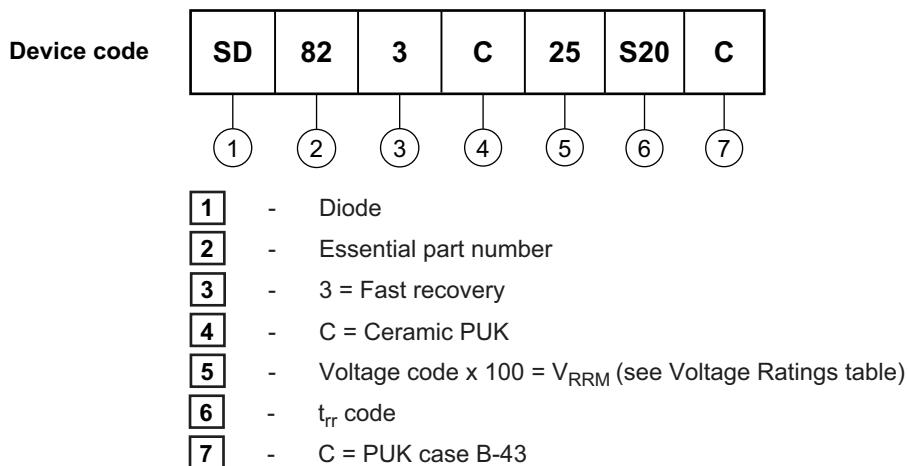
# SD823C..C Series

Vishay Semiconductors

Fast Recovery Diodes  
(Hockey PUK Version),  
810/910 A



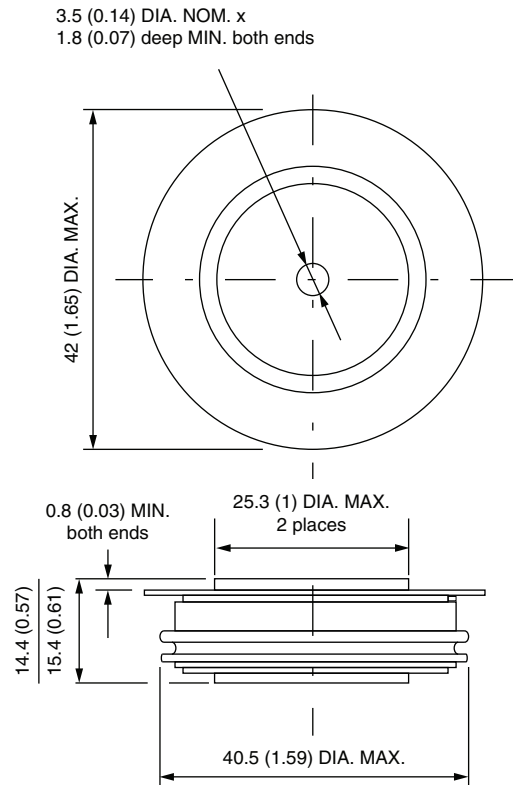
## ORDERING INFORMATION TABLE



LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95249">http://www.vishay.com/doc?95249</a>

## B-43

**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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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**