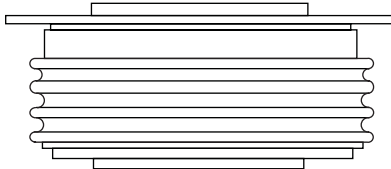




### Fast Recovery Diodes (Hockey PUK Version), 920/1050 A



DO-200AB (B-PUK)

#### FEATURES

- High power FAST recovery diode series
- 2.0 to 3.0  $\mu$ s recovery time
- High voltage ratings up to 3000 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 150 °C
- RoHS compliant
- Lead (Pb)-free
- Designed and qualified for industrial level



RoHS  
COMPLIANT

#### PRODUCT SUMMARY

$I_{F(AV)}$	920/1050 A
-------------	------------

#### TYPICAL APPLICATIONS

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

#### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	SD1053C..L		UNITS
		S20	S30	
$I_{F(AV)}$		1050	920	A
	$T_{hs}$	55	55	°C
$I_{F(RMS)}$		1940	1700	A
$I_{FSM}$	50 Hz	15 000	13 000	
	60 Hz	15 700	13 610	
$V_{RRM}$	Range	1800 to 2500	1800 to 3000	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
SD1053C..S20L	18	1800	1900	50
	22	2200	2300	
	25	2500	2600	
SD1053C..S30L	18	1800	1900	
	22	2200	2300	
	25	2500	2600	
	28	2800	2900	
	30	3000	3100	

# SD1053C..L Series



Vishay High Power Products Fast Recovery Diodes  
(Hockey PUK Version),  
920/1050 A

FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		SD1053C..L		UNITS
				S20	S30	
Maximum average forward current at heatsink temperature	$I_{F(AV)}$	180° conduction, half sine wave Double side (single side) cooled		1050 (450)	920 (390)	A
				55 (85)	55 (85)	°C
Maximum RMS forward current	$I_{F(RMS)}$	25 °C heatsink temperature double side cooled		1940	1700	A
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reappplied	15 000	13 000	
		t = 8.3 ms	No voltage reappplied	15 700	13 610	
		t = 10 ms	100 % $V_{RRM}$ reappplied	12 620	10 930	
		t = 8.3 ms	100 % $V_{RRM}$ reappplied	13 210	11 450	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied	1125	845	kA <sup>2</sup> s
		t = 8.3 ms	No voltage reappplied	1027	772	
		t = 10 ms	100 % $V_{RRM}$ reappplied	796	598	
		t = 8.3 ms	100 % $V_{RRM}$ reappplied	727	546	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		11 250	8450	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		1.34	1.51	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		1.48	1.67	
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		0.37	0.50	mΩ
High level value of forward slope resistance	$r_{f2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.33	0.45	
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 1500$ A, $T_J = T_J$ maximum, $t_p = 10$ ms sinusoidal wave		1.90	2.26	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	100	- 50	4.0	400	180	
S30	3.0				4.5	550	230	

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	0.073	K/W
		DC operation double side cooled	0.031	
Mounting force, ± 10 %			14 700 (1500)	N (kg)
Approximate weight			255	g
Case style		See dimensions - link at the end of datasheet	DO-200AB (B-PUK)	



# SD1053C..L Series

Fast Recovery Diodes  
(Hockey PUK Version),  
920/1050 A

Vishay High Power Products

$\Delta R_{thJ-hs}$ CONDUCTION						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.009	0.008	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	0.021	0.021	0.022		
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

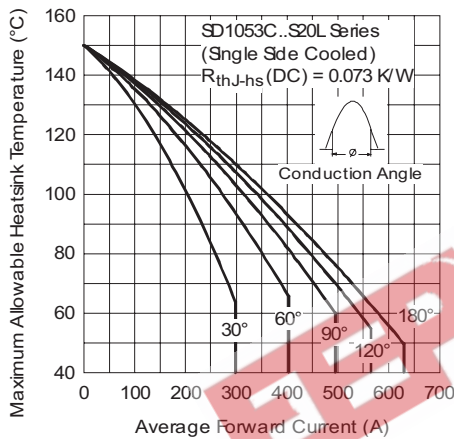


Fig. 1 - Current Ratings Characteristics

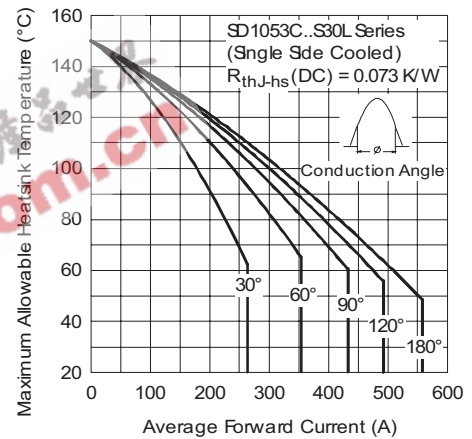


Fig. 3 - Current Ratings Characteristics

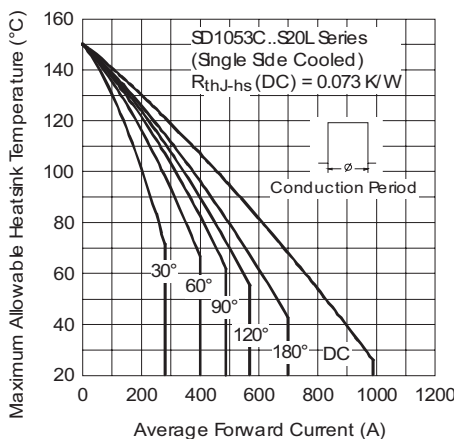


Fig. 2 - Current Ratings Characteristics

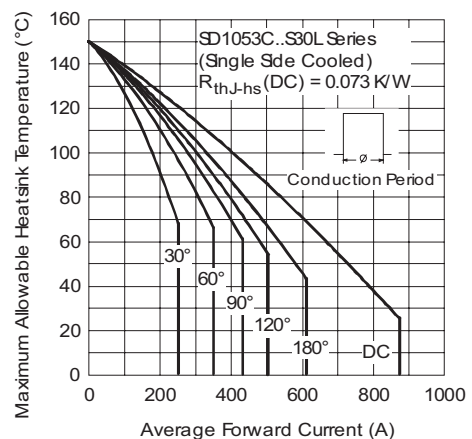


Fig. 4 - Current Ratings Characteristics

# SD1053C..L Series



Vishay High Power Products Fast Recovery Diodes (Hockey PUK Version), 920/1050 A

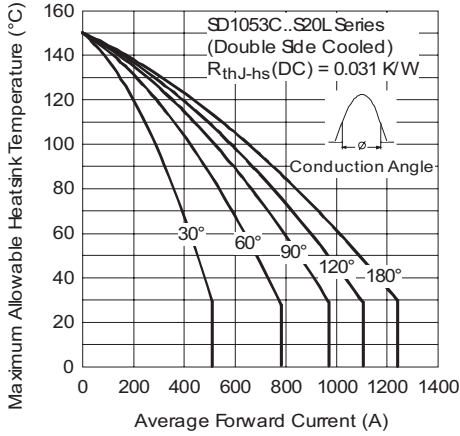


Fig. 5 - Current Ratings Characteristics

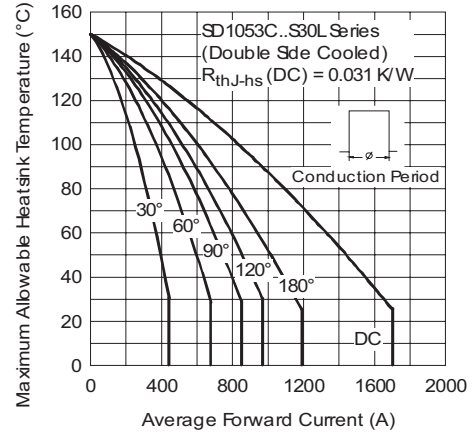


Fig. 8 - Current Ratings Characteristics

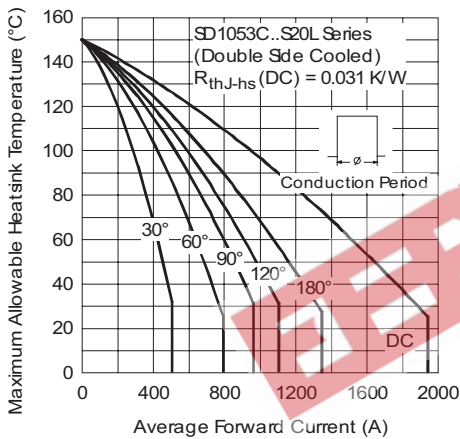


Fig. 6 - Current Ratings Characteristics

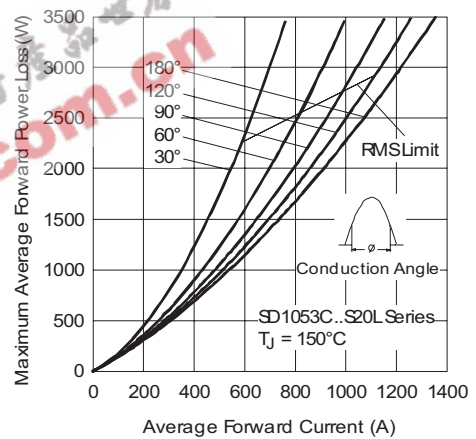


Fig. 9 - Forward Power Loss Characteristics

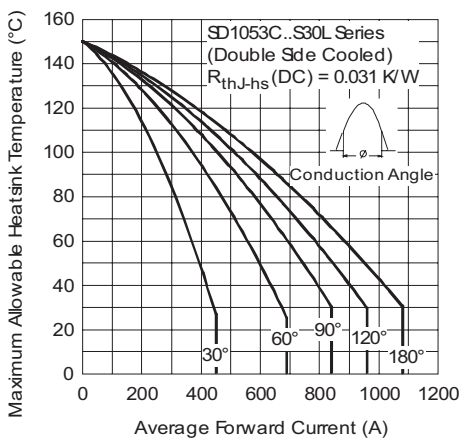


Fig. 7 - Current Ratings Characteristics

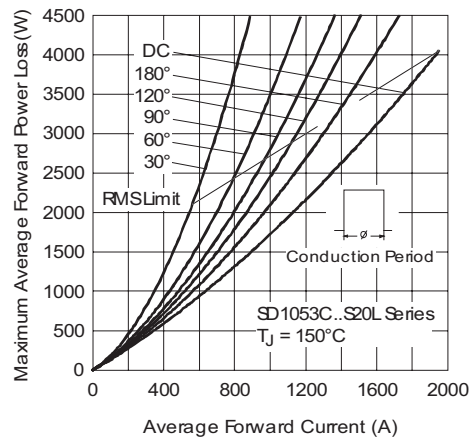


Fig. 10 - Forward Power Loss Characteristics



# SD1053C..L Series

## Fast Recovery Diodes (Hockey PUK Version), 920/1050 A

## Vishay High Power Products

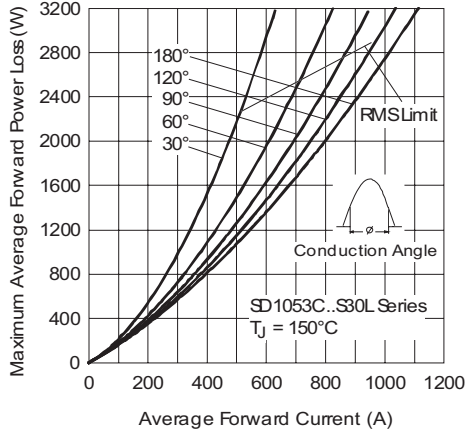


Fig. 11 - Forward Power Loss Characteristics

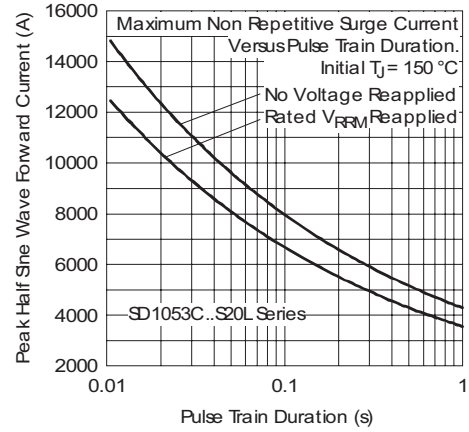


Fig. 14 - Maximum Non-Repetitive Surge Current

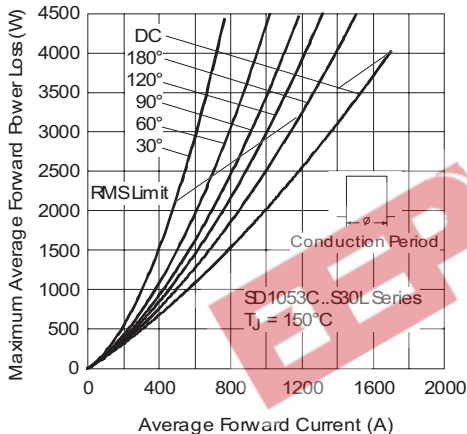


Fig. 12 - Forward Power Loss Characteristics

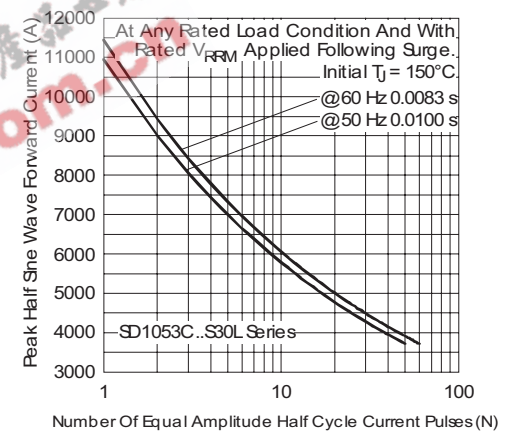


Fig. 15 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

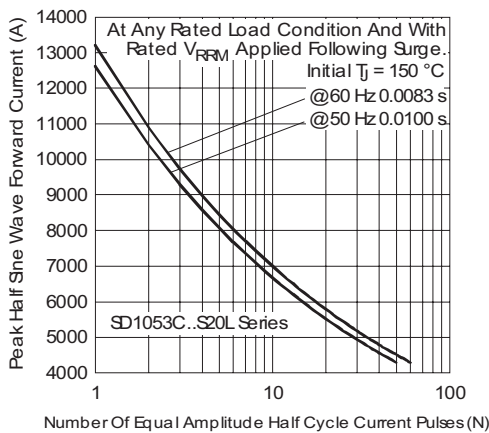


Fig. 13 - Maximum Non-Repetitive Surge Current

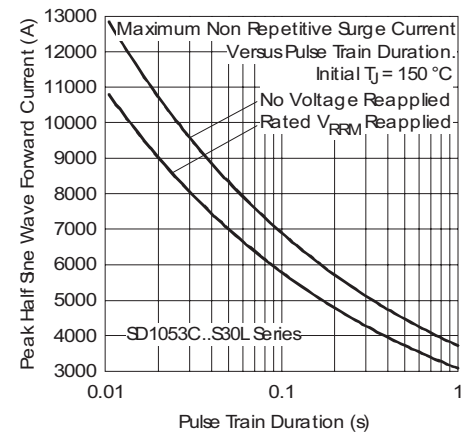


Fig. 16 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

# SD1053C..L Series



Vishay High Power Products Fast Recovery Diodes (Hockey PUK Version), 920/1050 A

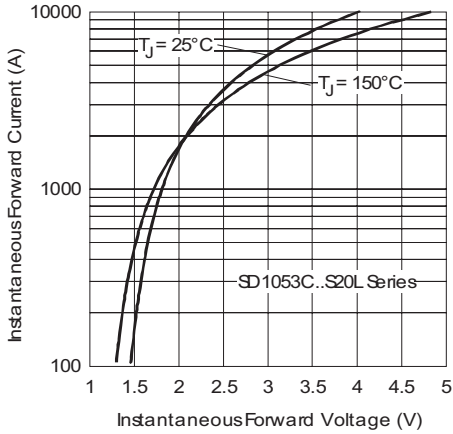


Fig. 17 - Forward Voltage Drop Characteristics

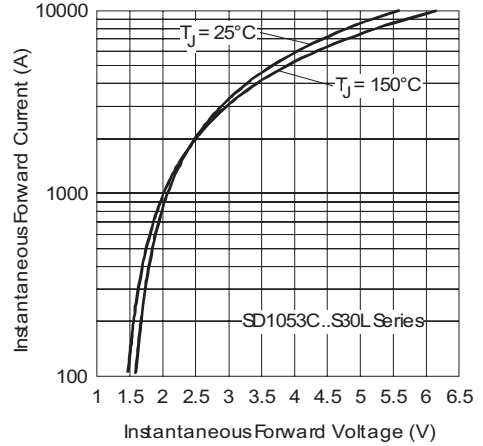


Fig. 18 - Forward Voltage Drop Characteristics

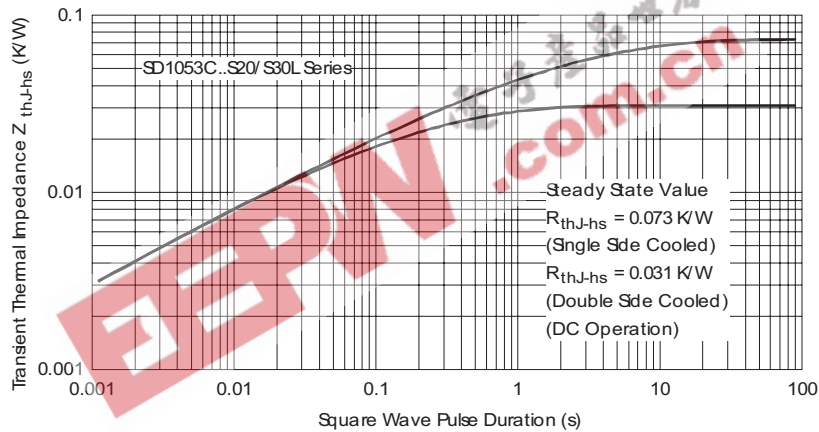


Fig. 19 - Thermal Impedance  $Z_{thJ-hs}$  Characteristic

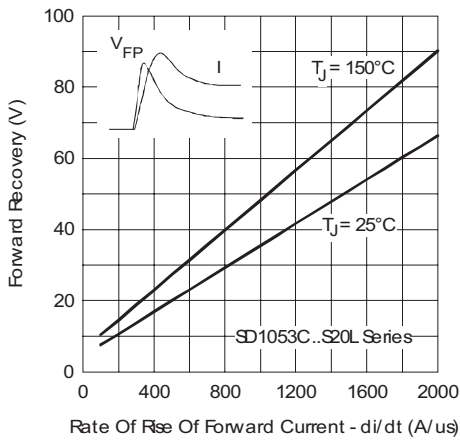


Fig. 20 - Typical Forward Recovery Characteristics

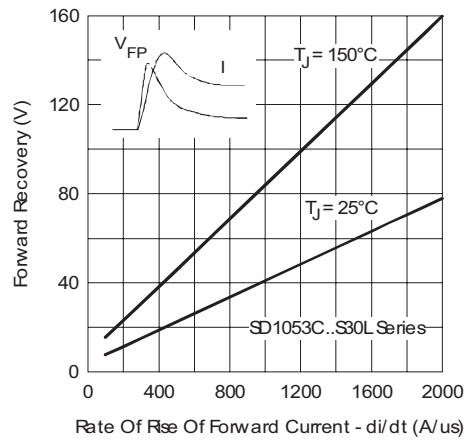


Fig. 21 - Typical Forward Recovery Characteristics



# SD1053C..L Series

## Fast Recovery Diodes (Hockey PUK Version), 920/1050 A

## Vishay High Power Products

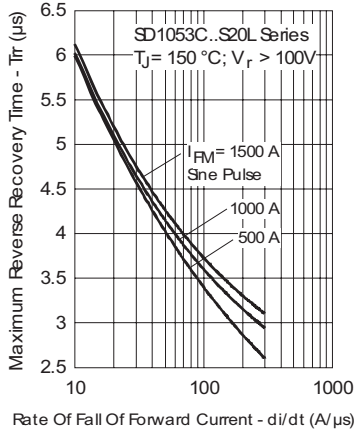


Fig. 22 - Recovery Time Characteristics

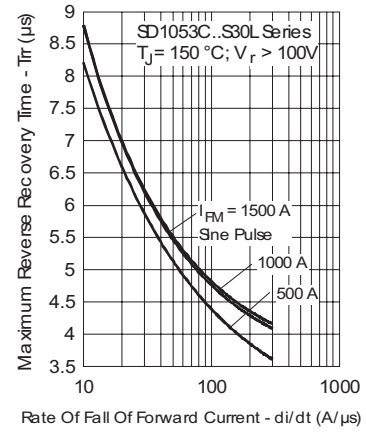


Fig. 25 - Recovery Time Characteristics

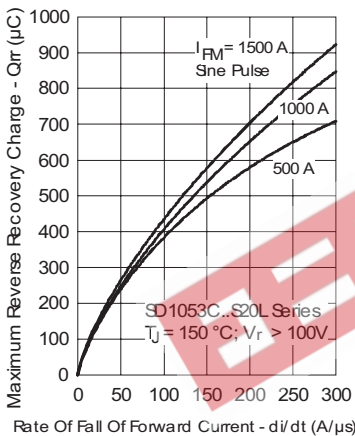


Fig. 23 - Recovery Charge Characteristics

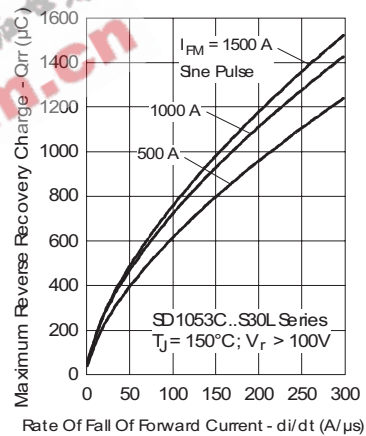


Fig. 26 - Recovery Charge Characteristics

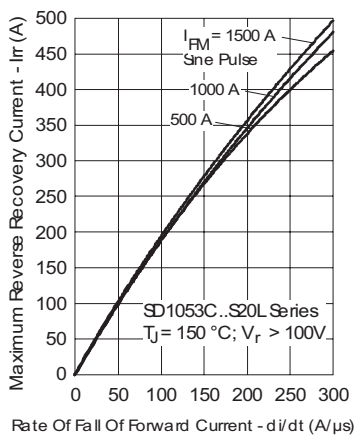


Fig. 24 - Recovery Current Characteristics

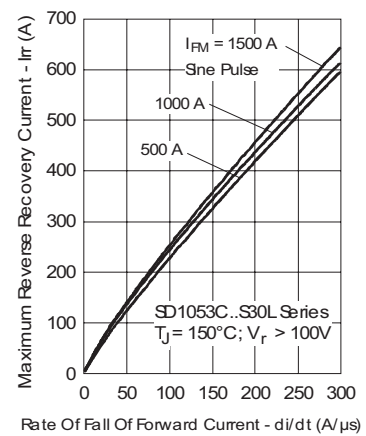


Fig. 27 - Recovery Current Characteristics

# SD1053C..L Series



Vishay High Power Products Fast Recovery Diodes (Hockey PUK Version), 920/1050 A

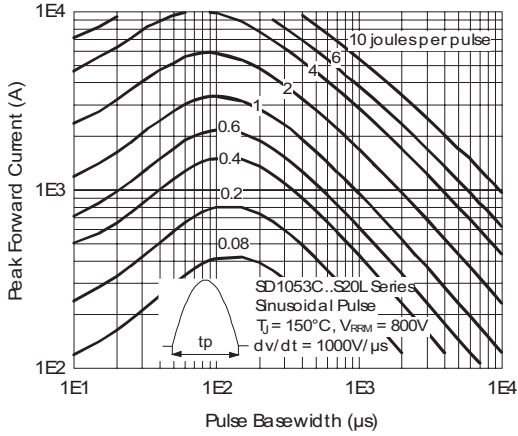


Fig. 28 - Maximum Total Energy Loss Per Pulse Characteristics

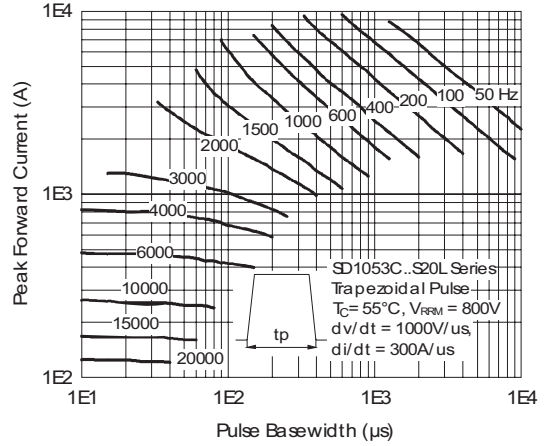


Fig. 31 - Frequency Characteristics

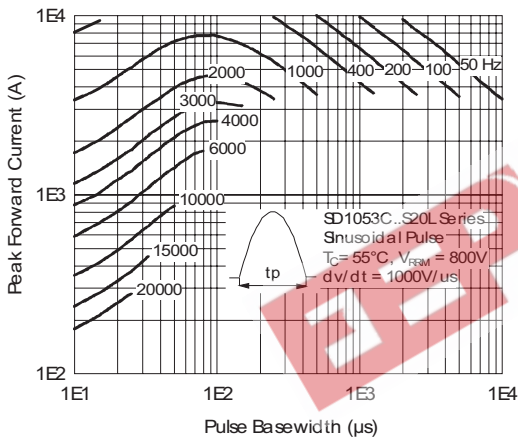


Fig. 29 - Frequency Characteristics

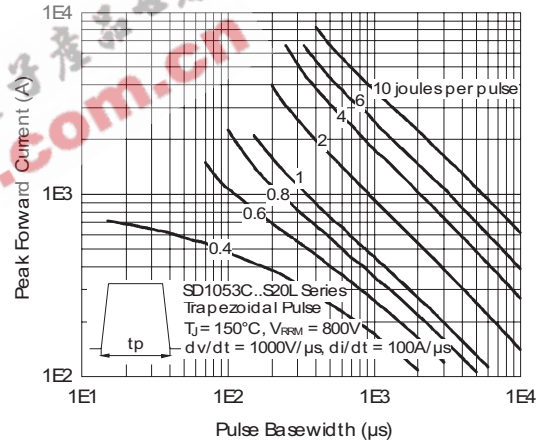


Fig. 32 - Maximum Total Energy Loss Per Pulse Characteristics

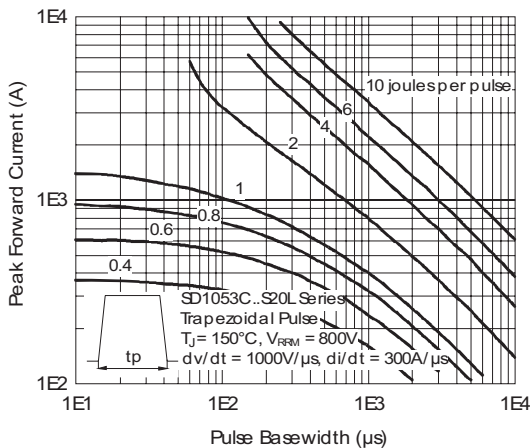


Fig. 30 - Maximum Total Energy Loss Per Pulse Characteristics

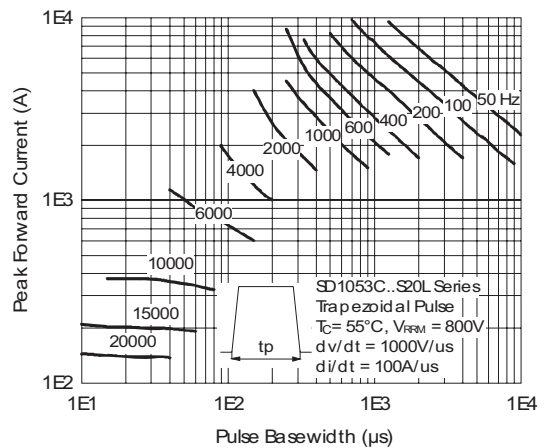


Fig. 33 - Frequency Characteristics





# SD1053C..L Series

## Fast Recovery Diodes (Hockey PUK Version), 920/1050 A

## Vishay High Power Products

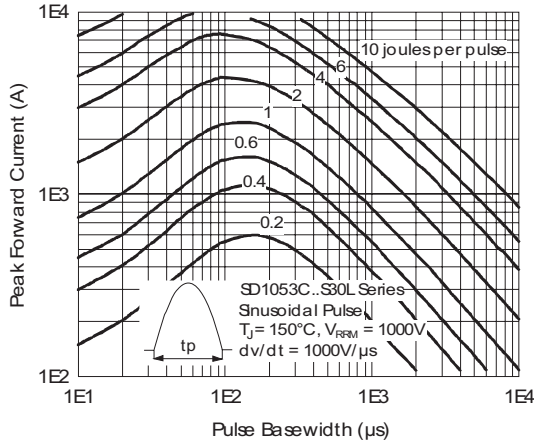


Fig. 34 - Maximum Total Energy Loss Per Pulse Characteristics

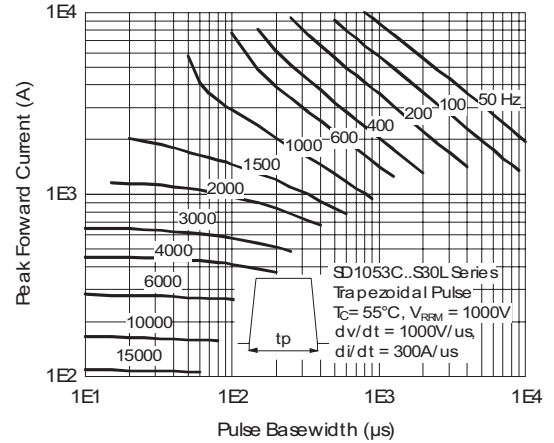


Fig. 37 - Frequency Characteristics

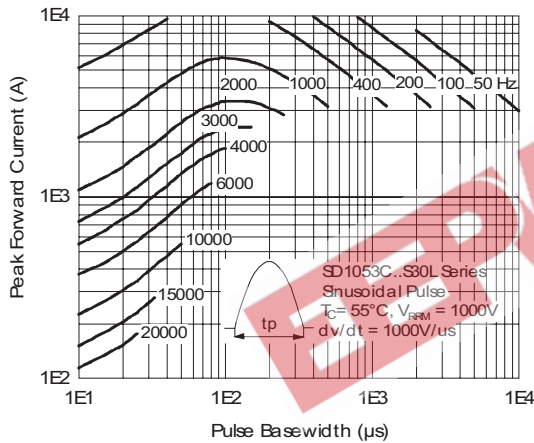


Fig. 35 - Frequency Characteristics

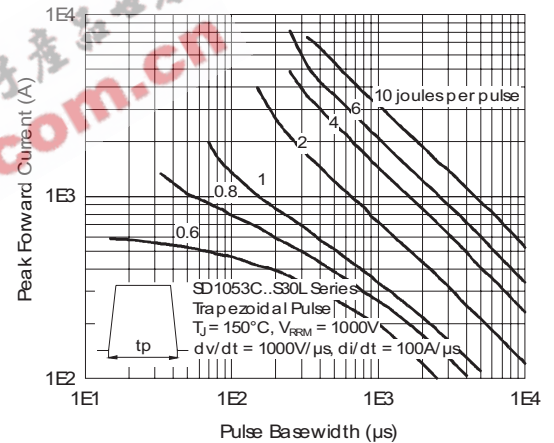


Fig. 38 - Maximum Total Energy Loss Per Pulse Characteristics

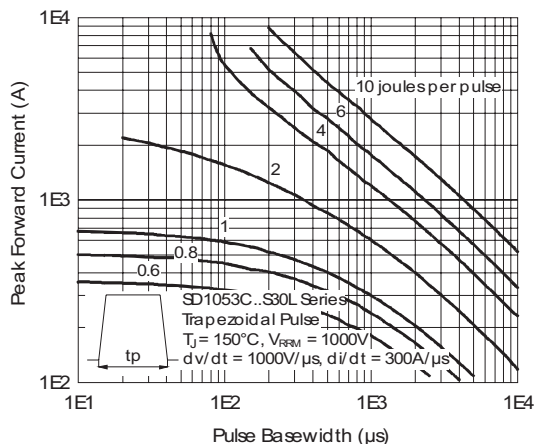


Fig. 36 - Maximum Total Energy Loss Per Pulse Characteristics

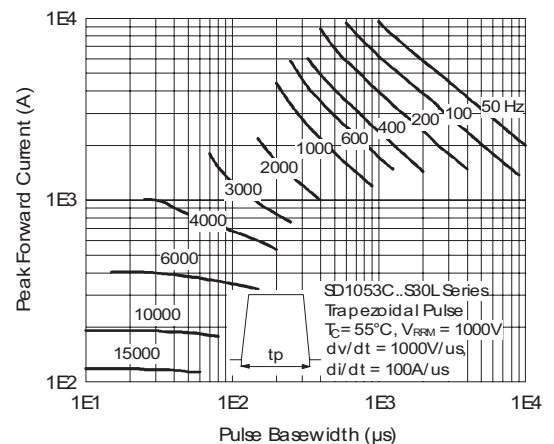


Fig. 39 - Frequency Characteristics

# SD1053C..L Series



Vishay High Power Products Fast Recovery Diodes  
(Hockey PUK Version),  
920/1050 A

## ORDERING INFORMATION TABLE

Device code	<b>SD</b>	<b>105</b>	<b>3</b>	<b>C</b>	<b>30</b>	<b>S30</b>	<b>L</b>
	①	②	③	④	⑤	⑥	⑦
<b>1</b>	-	Diode					
<b>2</b>	-	Essential part number					
<b>3</b>	-	3 = Fast recovery					
<b>4</b>	-	C = Ceramic PUK					
<b>5</b>	-	Voltage code x 100 = $V_{RRM}$ (see Voltage Ratings table)					
<b>6</b>	-	$t_r$ code					
<b>7</b>	-	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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