

## Standard Recovery Diodes (Stud Version), 600 A


**B-8**

### FEATURES

- Wide current range
- High voltage ratings up to 3200 V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC® types
- Compression bonded encapsulations
- Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS  
COMPLIANT**

### PRODUCT SUMMARY

$I_{F(AV)}$	600 A
Package	B-8
Circuit configuration	Single Diode

### TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	SD600N/R		UNITS
		04 to 20	22 to 32	
$I_{F(AV)}$		600	600	A
	$T_C$	92	54	°C
$I_{F(RMS)}$		940	940	A
$I_{FSM}$	50 Hz	13 000	10 500	
	60 Hz	13 600	11 000	
$I^2t$	50 Hz	845	551	kA <sup>2</sup> s
	60 Hz	772	503	
$V_{RRM}$	Range	400 to 2000	2200 to 3200	V
$T_J$		- 40 to 180	- 40 to 150	°C

### 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-SD600N/R	04	400	500	35
	08	800	900	
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	
	22	2200	2300	
	28	2800	2900	
	32	3200	3300	



<b>FORWARD CONDUCTION</b>							
PARAMETER	SYMBOL	TEST CONDITIONS	SD600N/R		UNITS		
			04 to 20	22 to 32			
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave	600		A		
			92	54	°C		
			570	375	A		
			100		°C		
Maximum RMS forward current	$I_{F(RMS)}$	DC at $T_C = 75\text{ °C}$ (04 to 20), $T_C = 36\text{ °C}$ (25 to 32)	940				
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	Sinusoidal half wave, initial $T_J = T_J$ maximum	t = 10 ms	No voltage reapplied	13 000	10 500	A
			t = 8.3 ms		13 600	11 000	
			t = 10 ms	100 % $V_{RRM}$ reapplied	10 900	8830	
			t = 8.3 ms		11 450	9250	
Maximum $I^2t$ for fusing	$I^2t$		t = 10 ms	No voltage reapplied	845	551	kA <sup>2</sup> s
			t = 8.3 ms		772	503	
			t = 10 ms	100 % $V_{RRM}$ reapplied	598	390	
			t = 8.3 ms		546	356	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied	8450	5510	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	0.78	0.84	V		
High level value of threshold voltage	$V_{F(TO)2}$	( $I > \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum	0.87	0.88			
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	0.35	0.40	mW		
High level value of forward slope resistance	$r_{f2}$	( $I > \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum	0.31	0.38			
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 1500\text{ A}$ , $T_J = T_J$ maximum, $t_p = 10\text{ ms}$ sinusoidal wave	1.31	1.44	V		

<b>THERMAL AND MECHANICAL SPECIFICATIONS</b>					
PARAMETER	SYMBOL	TEST CONDITIONS	SD600N/R		UNITS
			04 to 20	22 to 32	
Maximum junction operating temperature range	$T_J$		- 40 to 180	- 40 to 150	°C
Maximum storage temperature range	$T_{Stg}$		- 55 to 200		
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	0.1		K/W
Maximum thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth, flat and greased	0.04		
Maximum allowed mounting torque ± 10 %		Not-lubricated threads	50		Nm
Approximate weight			454		g
Case style		See dimensions (link at the end of datasheet)	B-8		

<b><math>\Delta R_{thJC}</math> CONDUCTION</b>				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.012	0.008	$T_J = T_J$ maximum	K/W
120°	0.014	0.014		
90°	0.017	0.019		
60°	0.025	0.026		
30°	0.042	0.042		

**Note**

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



Fig. 1 - Current Ratings Characteristics

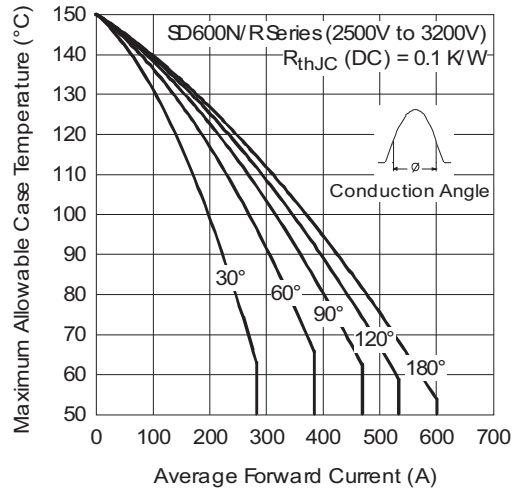


Fig. 3 - Current Ratings Characteristics

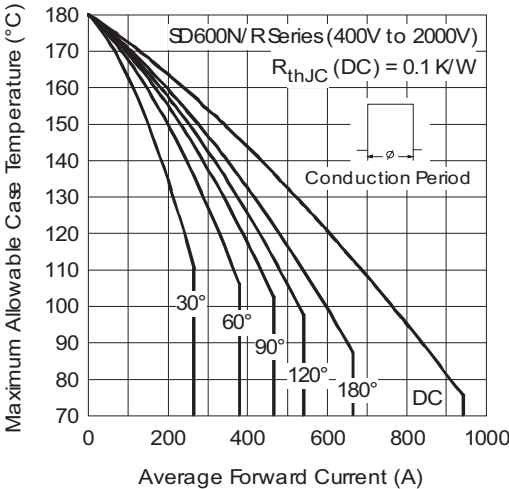


Fig. 2 - Current Ratings Characteristics

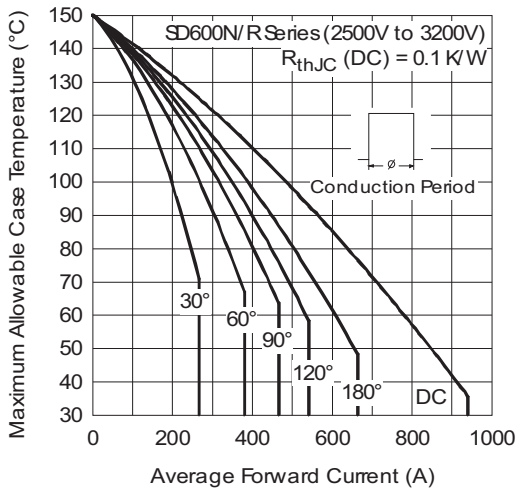


Fig. 4 - Current Ratings Characteristics



Fig. 5 - Forward Power Loss Characteristics



Fig. 6 - Forward Power Loss Characteristics



Fig. 7 - Forward Power Loss Characteristics



Fig. 8 - Forward Power Loss Characteristics



Fig. 9 - Maximum Non-Repetitive Surge Current

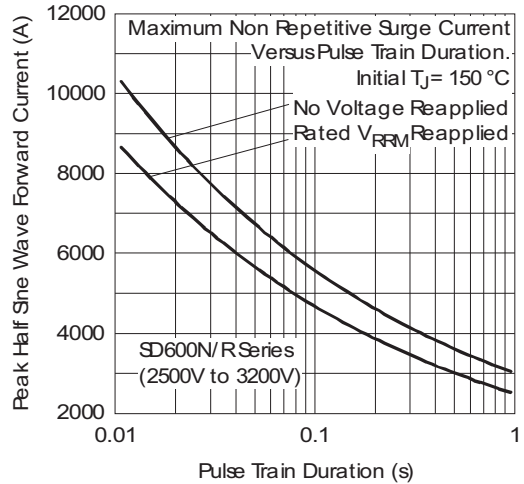


Fig. 12 - Maximum Non-Repetitive Surge Current



Fig. 10 - Maximum Non-Repetitive Surge Current

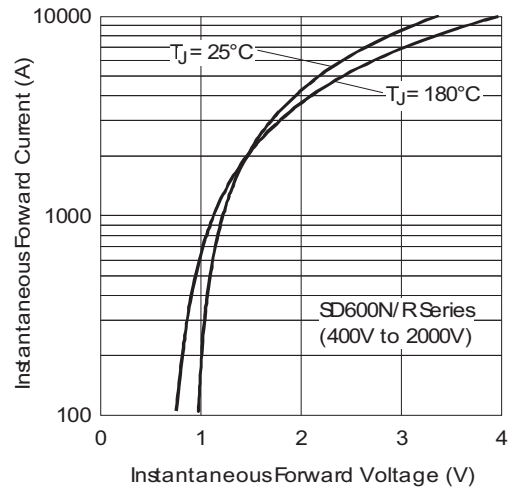


Fig. 13 - Forward Voltage Drop Characteristics



Fig. 11 - Maximum Non-Repetitive Surge Current

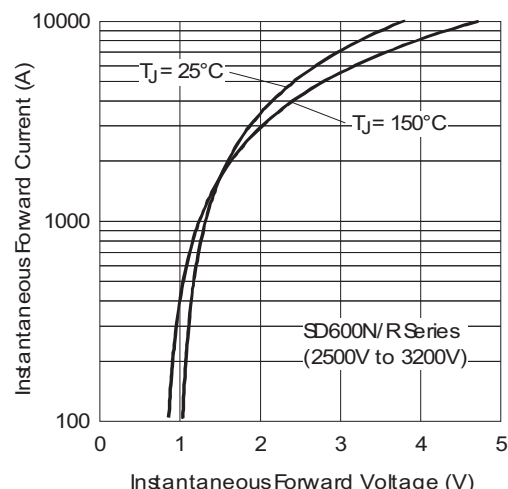


Fig. 14 - Forward Voltage Drop Characteristics



Fig. 15 - Thermal Impedance  $Z_{thJC}$  Characteristics

### ORDERING INFORMATION TABLE

Device code	<b>VS-</b>	<b>SD</b>	<b>60</b>	<b>0</b>	<b>N</b>	<b>32</b>	<b>P</b>	<b>C</b>
	①	②	③	④	⑤	⑥	⑦	⑧

- 1** - Vishay Semiconductors product
- 2** - Diode
- 3** - Essential part number
- 4** - 0 = Standard recovery
- 5** - • N = Stud normal polarity (cathode to stud)  
• R = Stud reverse polarity (anode to stud)
- 6** - Voltage code x 100 =  $V_{RRM}$  (see Voltage Ratings table)
- 7** - P = Stud base B-8 3/4" 16UNF-2A
- 8** - C = Ceramic cap

For metric device M24 x 1.5 contact factory

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95303">www.vishay.com/doc?95303</a>

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**DIMENSIONS** in millimeters (inches)



\*For metric device: M24 x 1.5 - length 21 (0.83) MAX.  
contact factory



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- Техническая поддержка проекта;
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