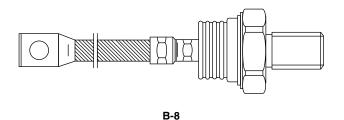


# Standard Recovery Diodes, (Stud Version), 600 A



PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	600 A			
Package	B-8			
Circuit configuration	Single			

#### **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 <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **TYPICAL APPLICATIONS**

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

MAJOR RATINGS AND CHARACTERISTICS					
PARAMETER	TEST CONDITIONS	SD60	LINUTO		
	TEST CONDITIONS	04 to 20	22 to 32	UNITS	
I <sub>F(AV)</sub>		600	600	A	
	T <sub>C</sub>	92	54	°C	
I <sub>F(RMS)</sub>		940	940		
1	50 Hz	13 000	10 500	Α	
I <sub>FSM</sub>	60 Hz	13 600	11 000		
l <sup>2</sup> t	50 Hz	845	551	kA <sup>2</sup> s	
	60 Hz	772	503	KA-S	
V <sub>RRM</sub>	Range	400 to 2000	2200 to 3200	V	
T <sub>J</sub>		-40 to +180	-40 to +150	°C	

#### **ELECTRICAL SPECIFICATIONS**

VOLTAGE RATINGS						
TYPE NUMBER	VOLTAGE CODE	V <sub>RRM</sub> , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V <sub>RSM</sub> , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$\begin{aligned} & I_{RRM} \text{ MAXIMUM} \\ \text{AT T}_{J} &= T_{J} \text{ MAXIMUM} \\ & \text{mA} \end{aligned}$		
	04	400	500			
	08	800	900			
	12	1200	1300			
VS-SD600N/R	16	1600	1700	35		
V3-3D000IV/N	20	2000	2100	33		
	22	2200	2300			
	28	2800	2900			
	32	3200	3300			



FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS		SD600N/R		0N/R	
PARAMETER	STINIBUL		TEST CONDITIONS		04 to 20	22 to 32	UNITS
					600		Α
Maximum average forward current		180° conduction, half sine wave		92	54	°C	
at case temperature	I <sub>F(AV)</sub>	160 Condi	uction, nan sine	e wave	570	375	Α
			100		°C		
Maximum RMS forward current	I <sub>F(RMS)</sub>	DC at T <sub>C</sub> =	75 °C (04 to 2	0), T <sub>C</sub> = 36 °C (25 to 32)	94	10	
		t = 10 ms	No voltage		13 000	10 500	A
Maximum peak, one-cycle forward,	l-ou	t = 8.3  ms	reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	13 600	11 000	
non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	100 % V <sub>RRM</sub>		10 900	8830	
		t = 8.3 ms	reapplied		11 450	9250	
	l <sup>2</sup> t	t = 10 ms	No voltage		845	551	kA <sup>2</sup> s
Maximum I <sup>2</sup> t for fusing		t = 8.3 ms	reapplied		772	503	
Waxiindiii i cioi idaiiig		t = 10 ms	100 % V <sub>RRM</sub>		598	390	
		t = 8.3  ms	reapplied		546	356	
Maximum $I^2\sqrt{t}$ for fusing	I²√t	t = 0.1 to 10 ms, no voltage reapplied		8450	5510	kA²√s	
Low level value of threshold voltage	V <sub>F(TO)1</sub>	(16.7 % x $\pi$ x $I_{F(AV)}$ < $I$ < $\pi$ x $I_{F(AV)}$ ), $I_J = I_J$ maximum		0.78	0.84	V	
High level value of threshold voltage	V <sub>F(TO)2</sub>	$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ maximum}$		0.87	0.88		
Low level value of forward slope resistance	r <sub>f1</sub>	(16.7 % x $\pi$ x $I_{F(AV)}$ < $I$ < $\pi$ x $I_{F(AV)}$ ), $I_{J} = I_{J}$ maximum		0.35	0.40	mW	
High level value of forward slope resistance	r <sub>f2</sub>	$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ maximum}$		0.31	0.38	IIIVV	
Maximum forward voltage drop	V <sub>FM</sub>	$I_{pk} = 1500 \text{ A}, T_J = T_J \text{ maximum},$ $t_p = 10 \text{ ms sinusoidal wave}$		1.31	1.44	V	

THERMAL AND MECHANICAL SPECIFICATIONS					
DADAMETER	SYMBOL	TEST CONDITIONS	SD60	UNITS	
PARAMETER	STIVIBUL		04 to 20	22 to 32	UNITS
Maximum junction operating temperature range	TJ		-40 to 180	-40 to 150	°C
Maximum storage temperature range	T <sub>Stg</sub>		-55 to 200		
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	0.1		K/W
Maximum thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth, flat and greased	0.	04	<b>r</b> √ vv
Maximum allowed mounting torque ± 10 %		Not-lubricated threads	5	0	Nm
Approximate weight			45	54	g
Case style		See dimensions (link at the end of datasheet)		B-8	

△R <sub>thJC</sub> CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.012	0.008		
120°	0.014	0.014		
90°	0.017	0.019	$T_J = T_J$ maximum	K/W
60°	0.025	0.026		
30°	0.042	0.042		

#### Note

• The table above shows the increment of thermal resistance R<sub>thJC</sub> when devices operate at different conduction angles than DC

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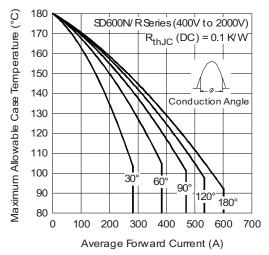


Fig. 1 - Current Ratings Characteristics

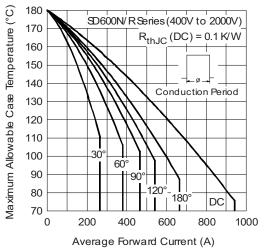


Fig. 2 - Current Ratings Characteristics

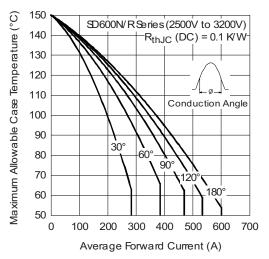


Fig. 3 - Current Ratings Characteristics

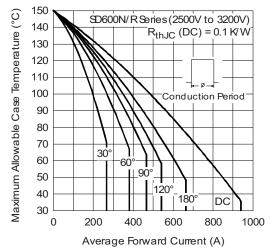


Fig. 4 - Current Ratings Characteristics

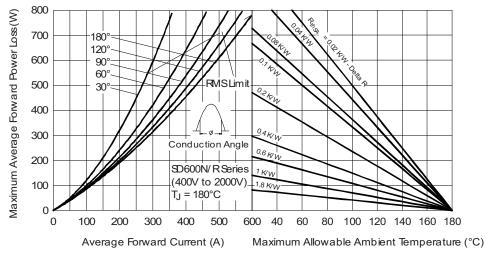


Fig. 5 - Forward Power Loss Characteristics



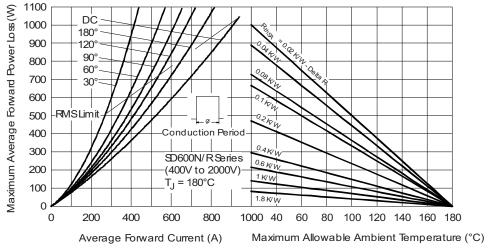


Fig. 6 - Forward Power Loss Characteristics

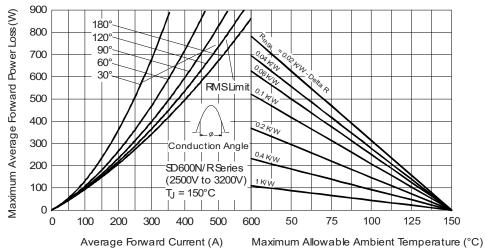


Fig. 7 - Forward Power Loss Characteristics

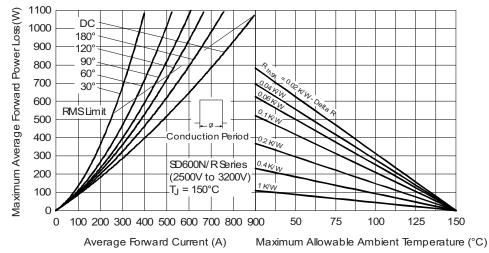


Fig. 8 - Forward Power Loss Characteristics

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Number Of Equal Amplitude Half Cycle Current Pulses (N)

Fig. 9 - Maximum Non-Repetitive Surge Current

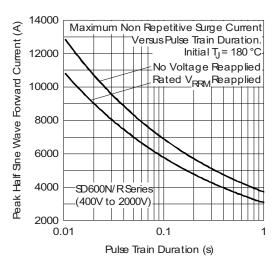


Fig. 10 - Maximum Non-Repetitive Surge Current

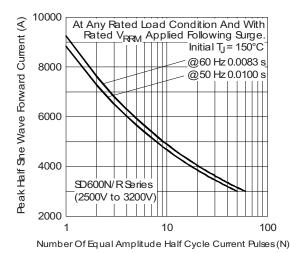


Fig. 11 - Maximum Non-Repetitive Surge Current

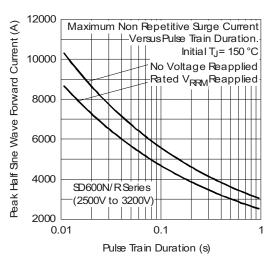


Fig. 12 - Maximum Non-Repetitive Surge Current

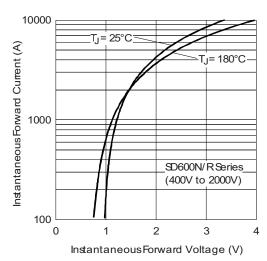


Fig. 13 - Forward Voltage Drop Characteristics

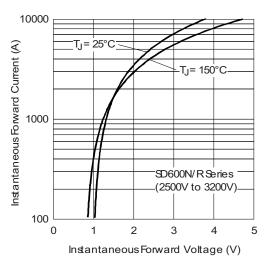


Fig. 14 - Forward Voltage Drop Characteristics

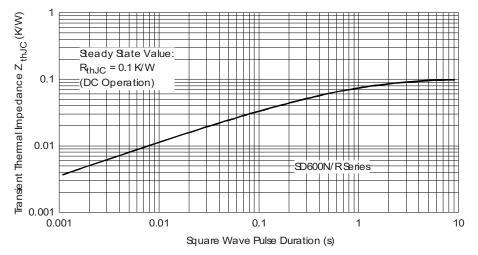
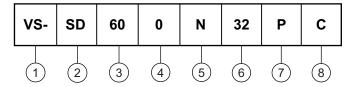


Fig. 15 - Thermal Impedance  $Z_{thJC}$  Characteristics

#### **ORDERING INFORMATION TABLE**

Device code



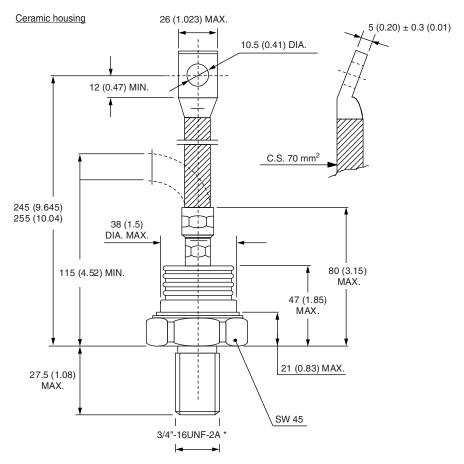
- 1 Vishay Semiconductors product
- 2 Diode
- 3 Essential part number
- 4 0 = standard recovery
- 5 • N = stud normal polarity (cathode to stud)
  - R = stud reverse polarity (anode to stud)
- 6 Voltage code x 100 = V<sub>RRM</sub> (see Voltage Ratings table)
- 7 P = stud base B-8 3/4" 16UNF-2A
- 8 C = ceramic cap

For metric device M24 x 1.5 contact factory

LINKS TO RELATED DOCUMENTS			
Dimensions	www.vishay.com/doc?95303		

## **B-8**

#### **DIMENSIONS** in millimeters (inches)



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

Document Number: 95303 Revision: 11-Apr-08

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