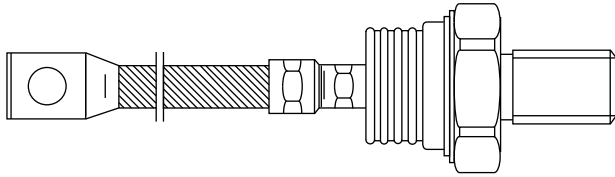


Standard Recovery Diodes (Stud Version), 600 A



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
- RoHS compliant
- Lead (Pb)-free
- Designed and qualified for industrial level



RoHS
COMPLIANT

TYPICAL APPLICATIONS

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

PRODUCT SUMMARY

$I_{F(AV)}$	600 A
-------------	-------

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	SD600N/R		UNITS
		04 to 20	22 to 32	
$I_{F(AV)}$		600		A
	T_C	92	54	°C
$I_{F(RMS)}$		940		A
I_{FSM}	50 Hz	13 000	10 500	
	60 Hz	13 600	11 000	
I^2t	50 Hz	845	551	kA ² 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
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	

FORWARD CONDUCTION							
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}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	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 ² 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 ² √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	mΩ	
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	

THERMAL AND MECHANICAL SPECIFICATIONS						
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 $\pm 10\%$		Not-lubricated threads		50		Nm
Approximate weight				454		g
Case style		See dimensions (link at the end of datasheet)		B-8		

ΔR_{thJC} CONDUCTION				
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

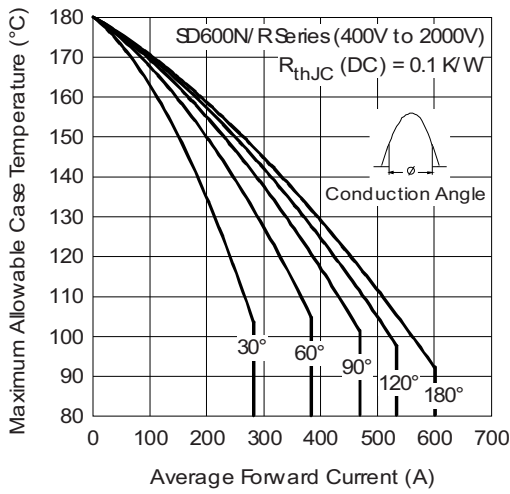


Fig. 1 - Current Ratings Characteristics

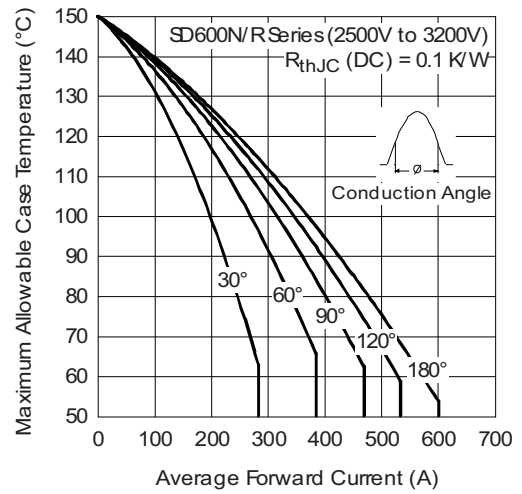


Fig. 3 - Current Ratings Characteristics

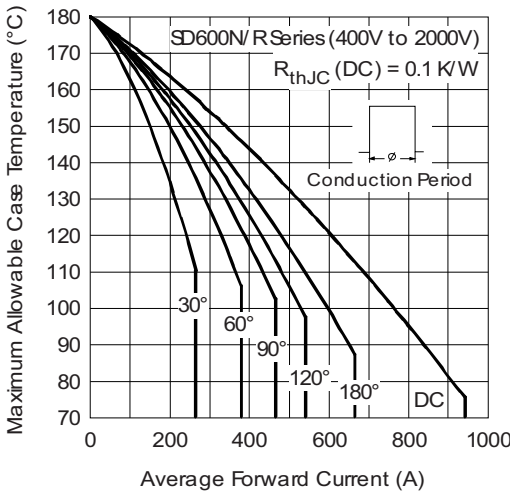


Fig. 2 - Current Ratings Characteristics

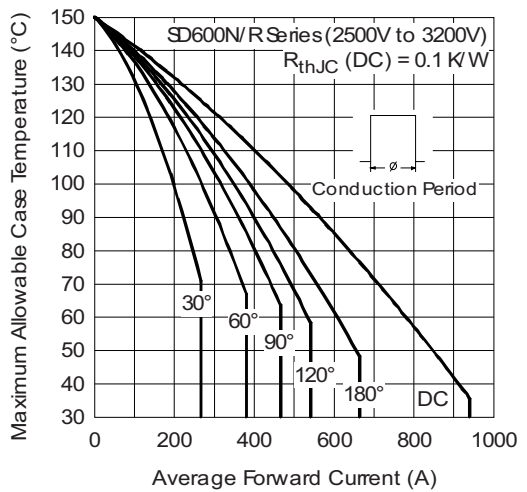
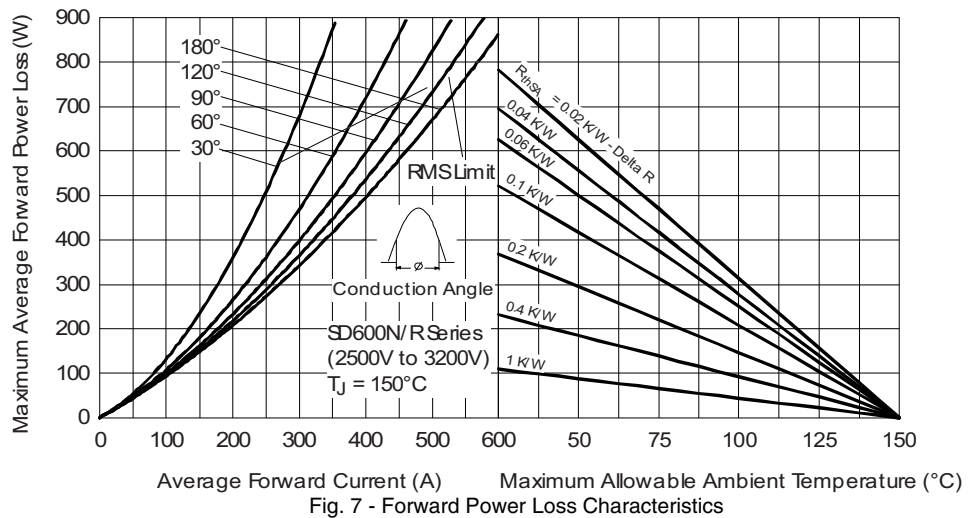
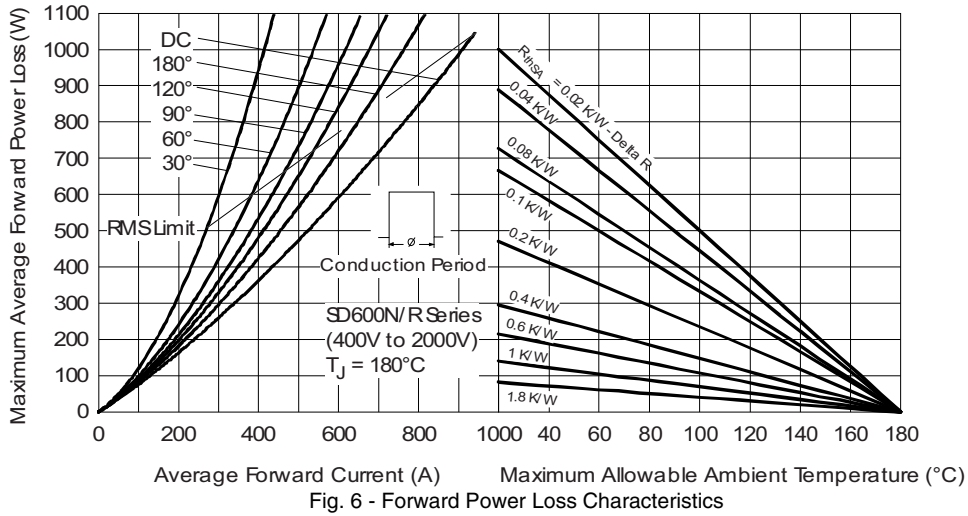
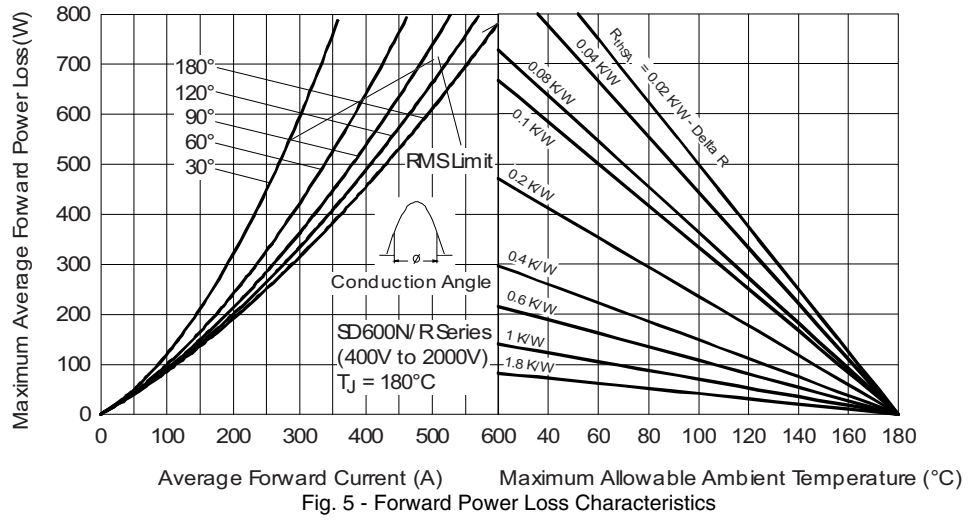


Fig. 4 - Current Ratings Characteristics



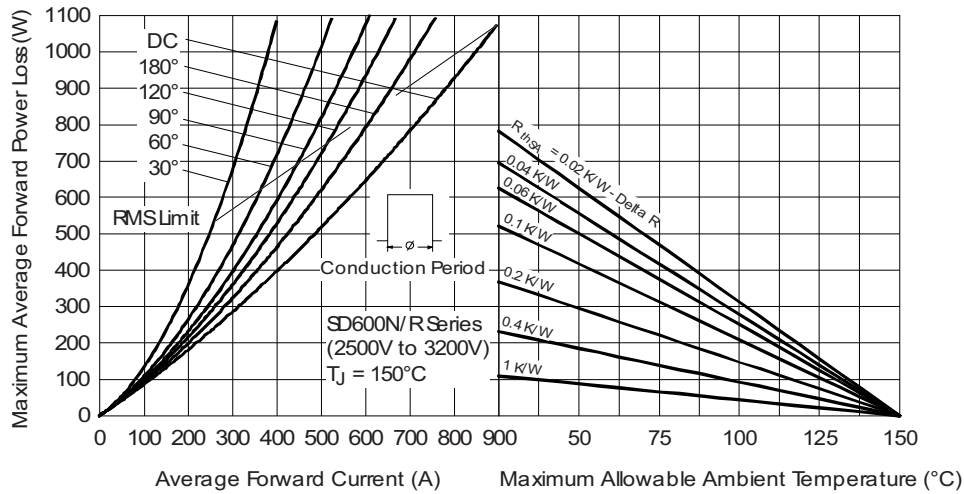


Fig. 8 - Forward Power Loss Characteristics

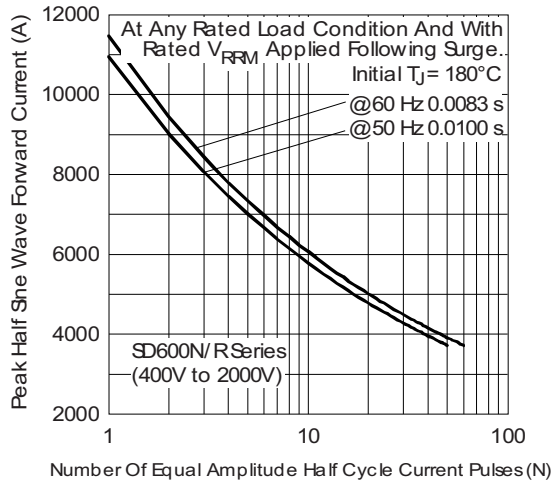


Fig. 9 - Maximum Non-Repetitive Surge Current

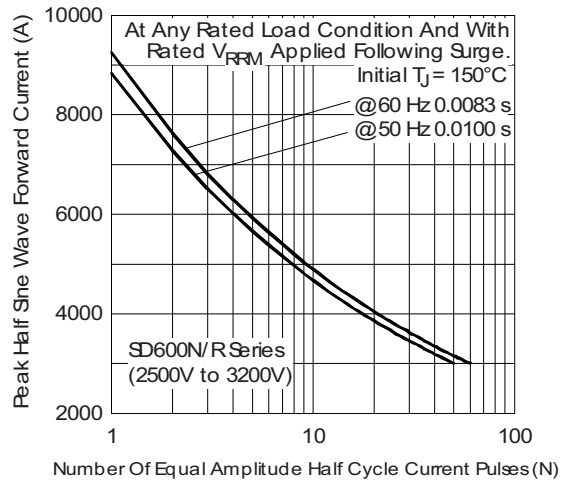


Fig. 11 - Maximum Non-Repetitive Surge Current

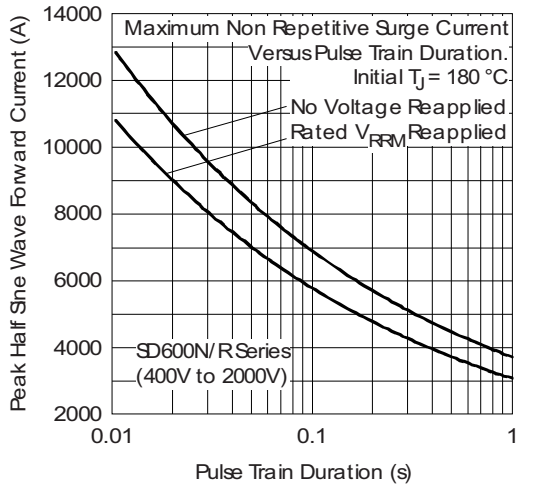


Fig. 10 - Maximum Non-Repetitive Surge Current

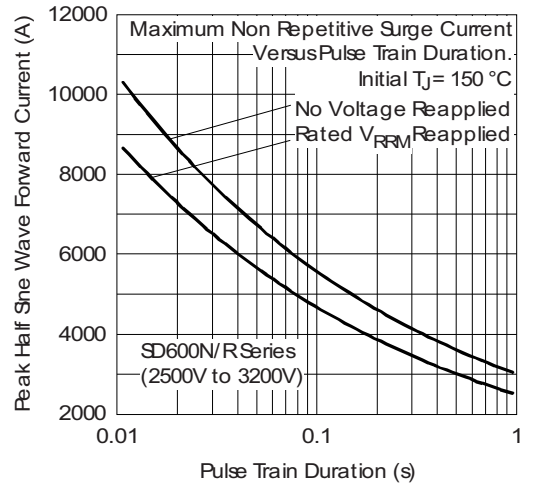


Fig. 12 - Maximum Non-Repetitive Surge Current

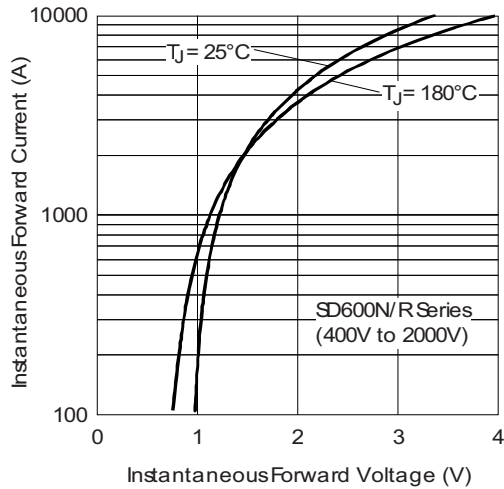


Fig. 13 - Forward Voltage Drop Characteristics

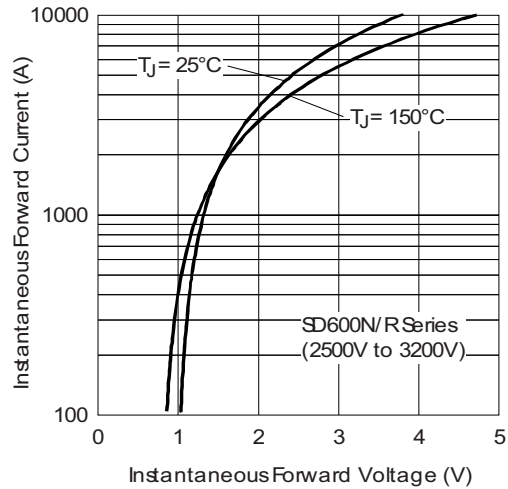


Fig. 14 - Forward Voltage Drop Characteristics

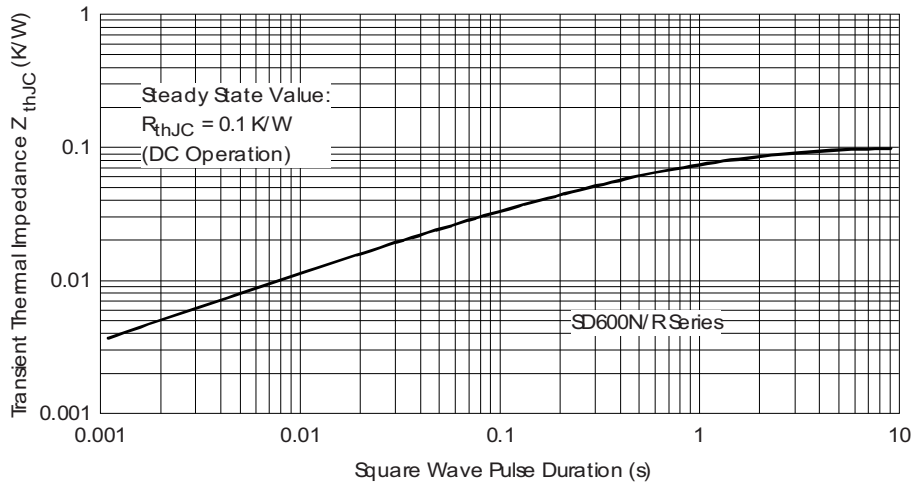
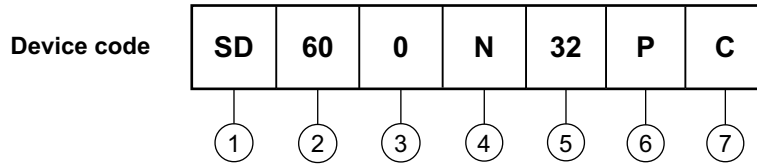


Fig. 15 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE



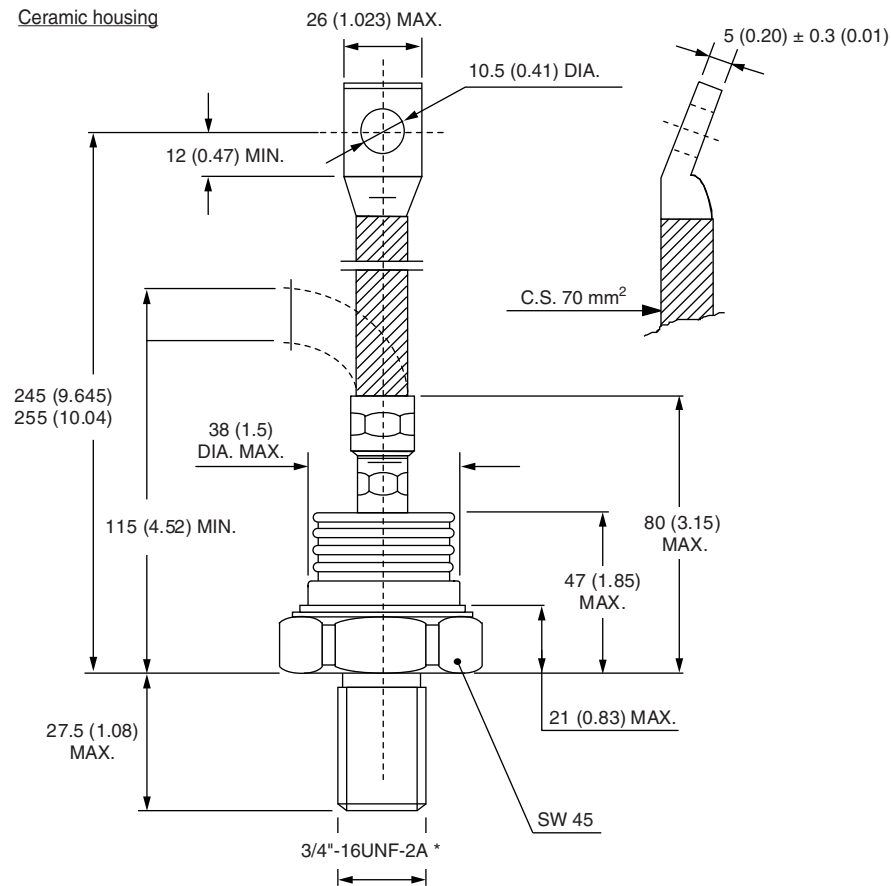
- 1** - Diode
- 2** - Essential part number
- 3** - 0 = Standard recovery
- 4** -
 - N = Stud normal polarity (cathode to stud)
 - R = Stud reverse polarity (anode to stud)
- 5** - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)
- 6** - P = Stud base B-8 3/4" 16UNF-2A
- 7** - C = Ceramic cap

For metric device M24 x 1.5 contact factory

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

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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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