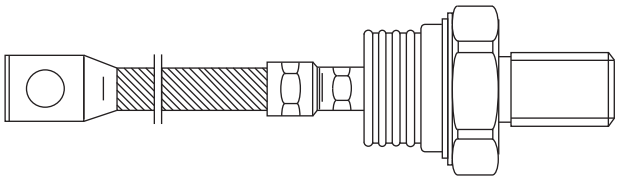
Standard Recovery Diodes (Stud Version), 600 A



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

Pb-free

RoHS COMPLIANT

TYPICAL APPLICATIONS

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

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

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^2s
	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	

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			SD600N/R 04 to 20	SD600N/R 22 to 32	UNITS
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 °C (04 to 20), T_C = 36 °C (25 to 32)			940		A
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	
		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^2s
		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	$kA^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.78	0.84	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.87	0.88	
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.35	0.40	mW
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.31	0.38	
Maximum forward voltage drop	V_{FM}	I_{pk} = 1500 A, $T_J = T_J$ maximum, t_p = 10 ms sinusoidal wave			1.31	1.44	V

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	SD600N/R 04 to 20	SD600N/R 22 to 32	UNITS
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		

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

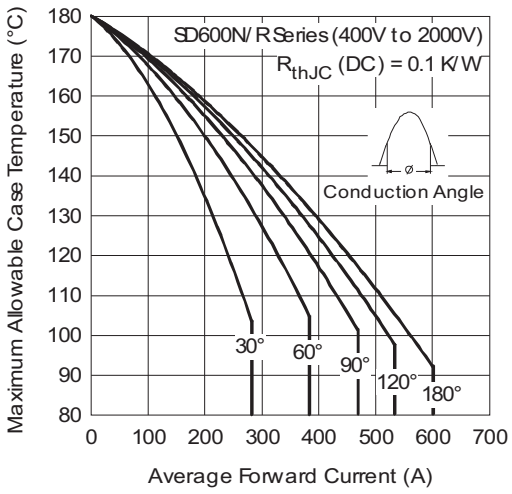


Fig. 1 - Current Ratings Characteristics

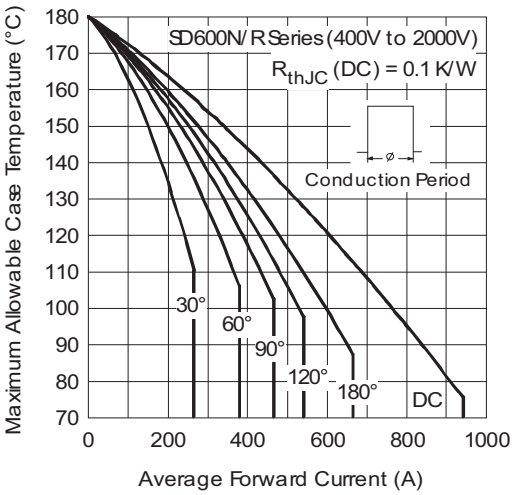


Fig. 2 - Current Ratings Characteristics

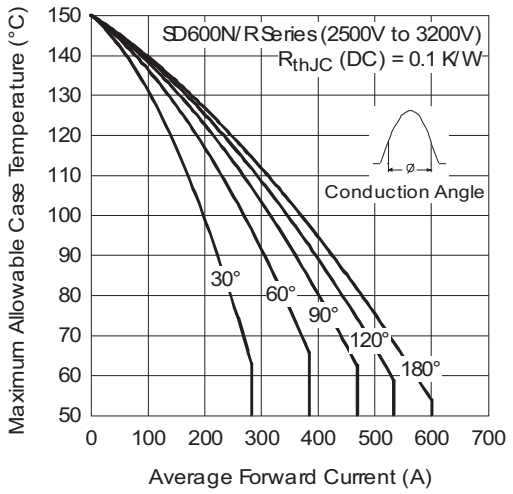


Fig. 3 - Current Ratings Characteristics

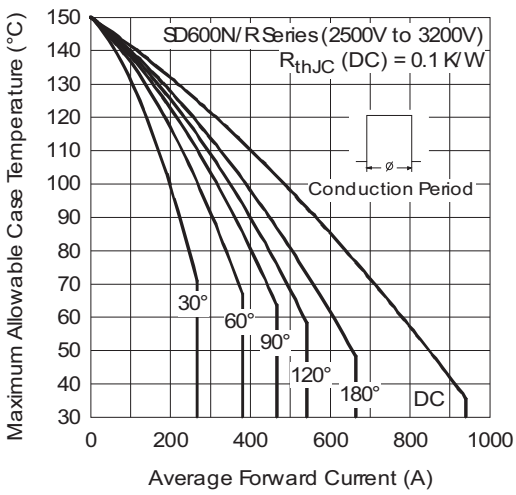


Fig. 4 - Current Ratings Characteristics

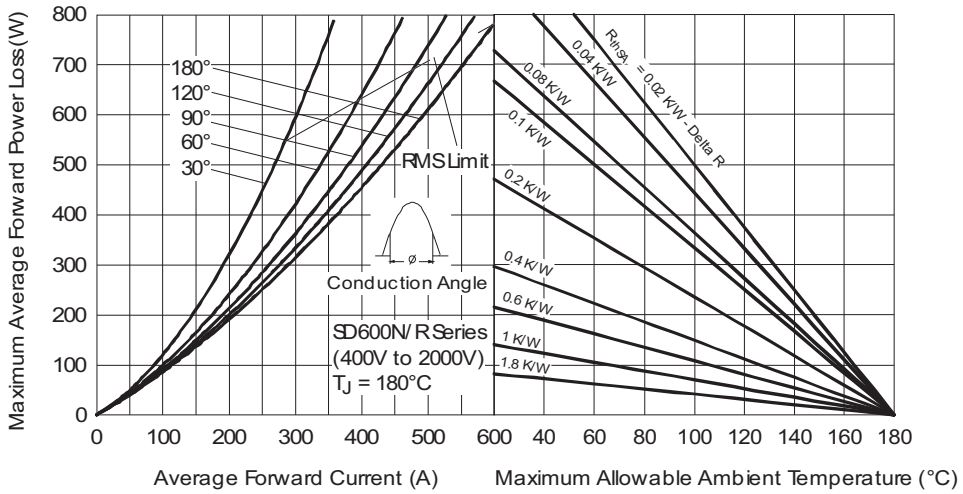


Fig. 5 - Forward Power Loss Characteristics

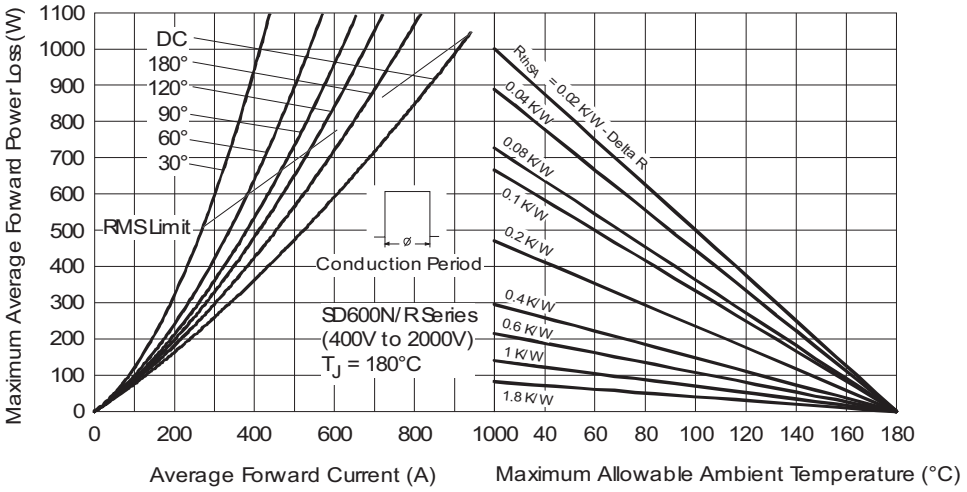


Fig. 6 - Forward Power Loss Characteristics

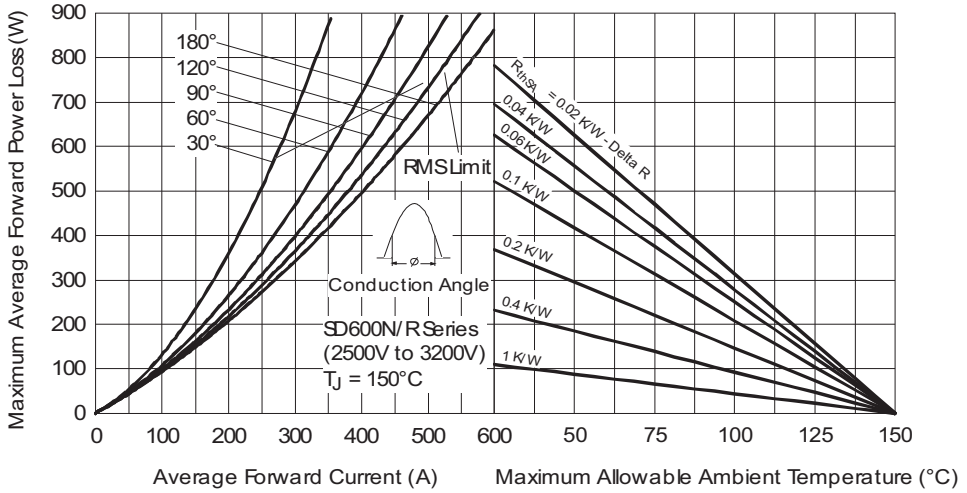


Fig. 7 - Forward Power Loss Characteristics

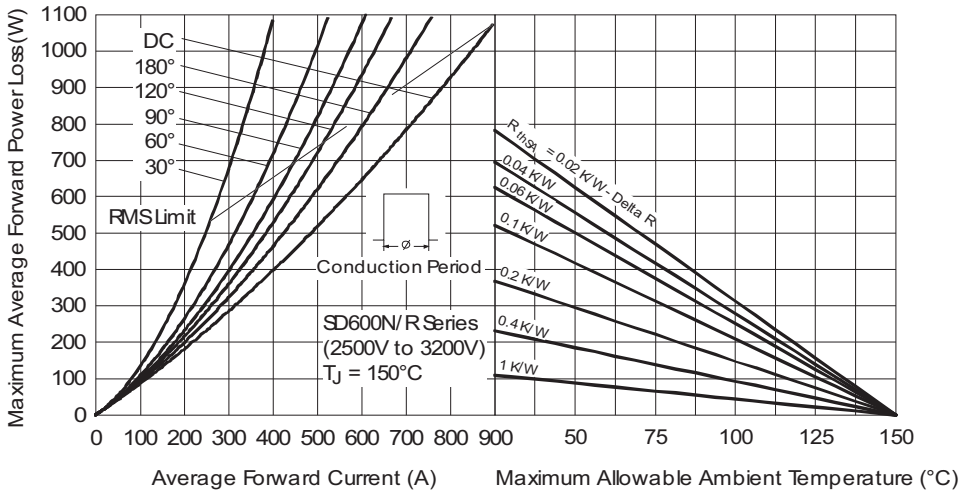


Fig. 8 - Forward Power Loss Characteristics

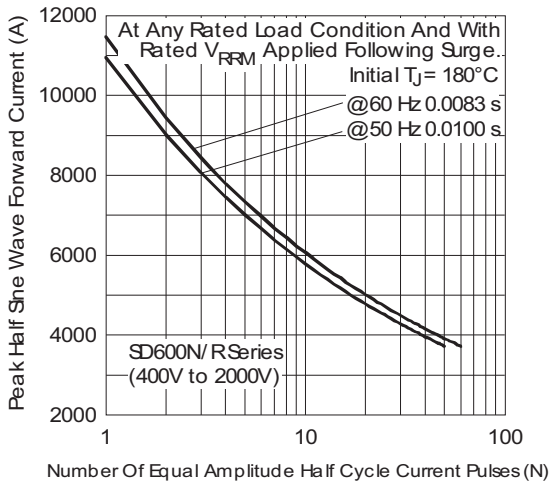


Fig. 9 - Maximum Non-Repetitive Surge Current

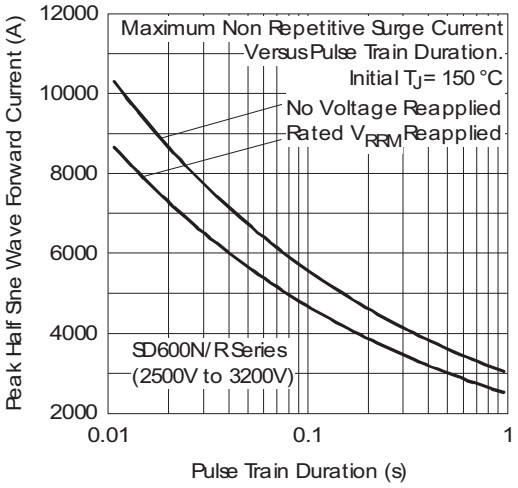


Fig. 12 - Maximum Non-Repetitive Surge Current

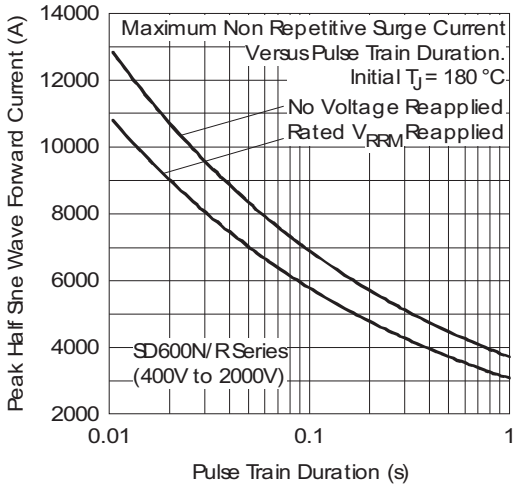


Fig. 10 - Maximum Non-Repetitive Surge Current

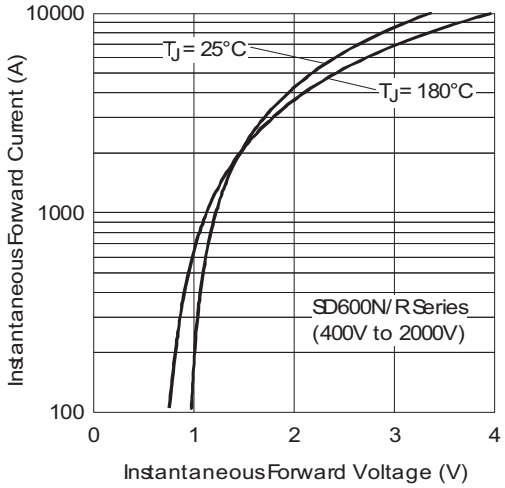


Fig. 13 - Forward Voltage Drop Characteristics

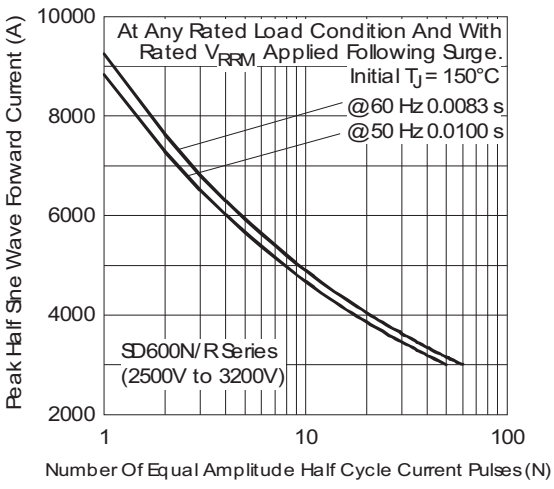


Fig. 11 - Maximum Non-Repetitive Surge Current

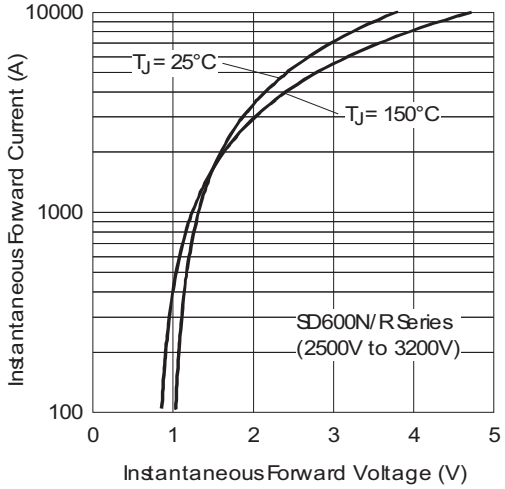


Fig. 14 - Forward Voltage Drop Characteristics

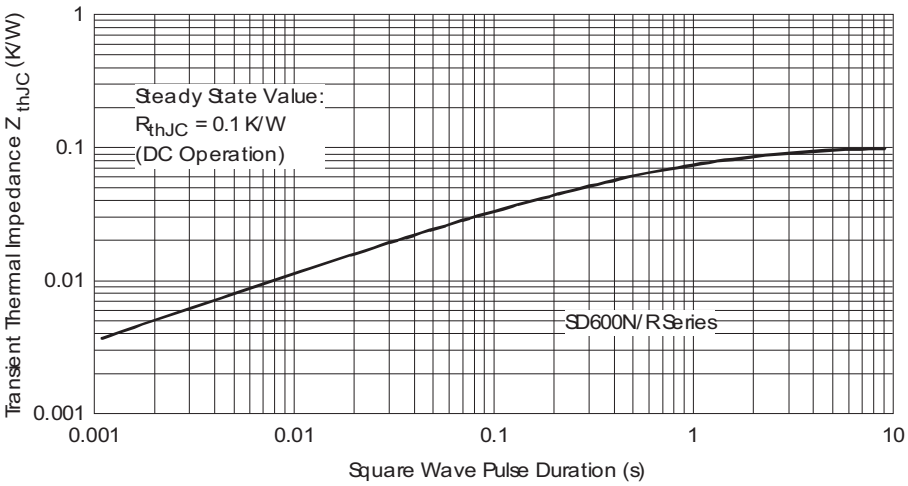


Fig. 15 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

VS-	SD	60	0	N	32	P	C
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	www.vishay.com/doc?95303

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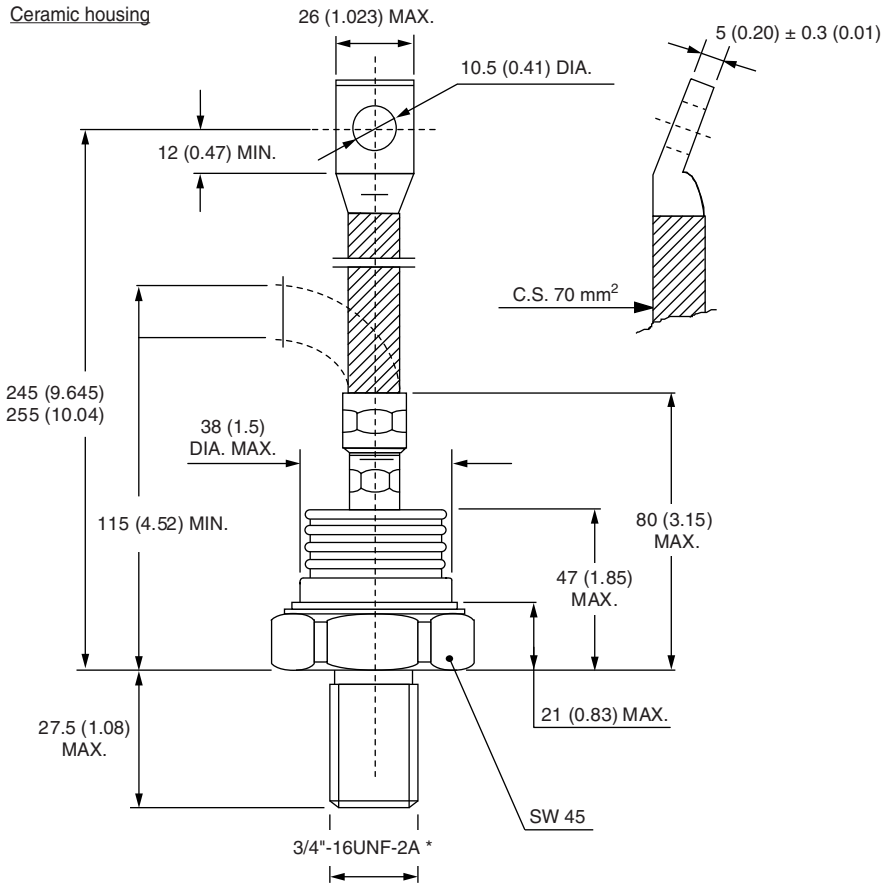
DIMENSIONS in millimeters (inches)



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

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