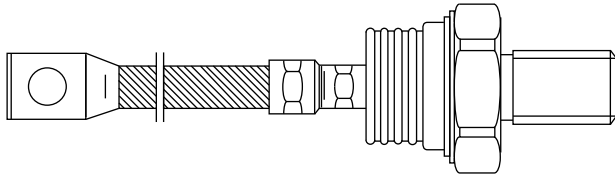




**THE DATASHEET OF
VS-SD600R12PC**



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


**RoHS
COMPLIANT**
PRIMARY CHARACTERISTICS

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

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 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 |
|-------------|--------------|--|--|--|
| 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 | | 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 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 | 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 | |

| 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

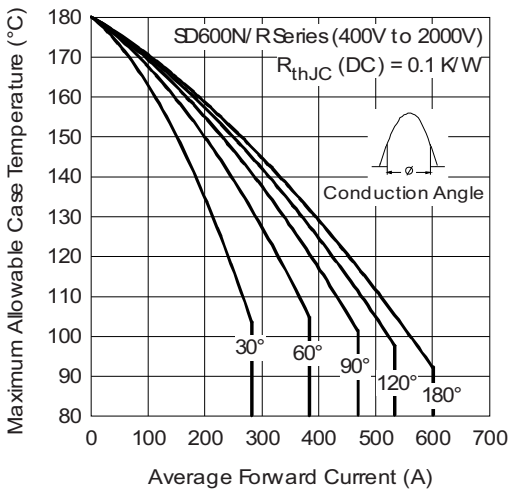


Fig. 1 - Current Ratings Characteristics

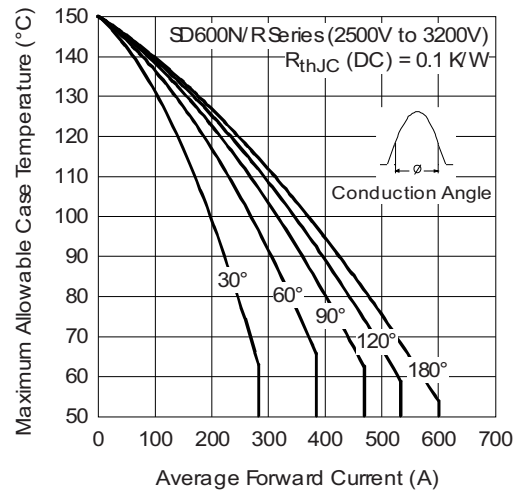


Fig. 3 - Current Ratings Characteristics

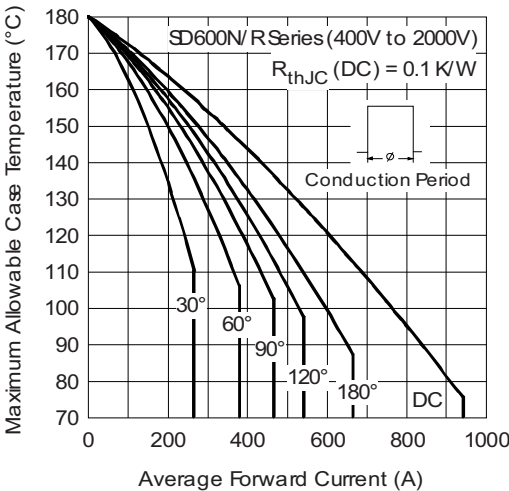


Fig. 2 - Current Ratings Characteristics

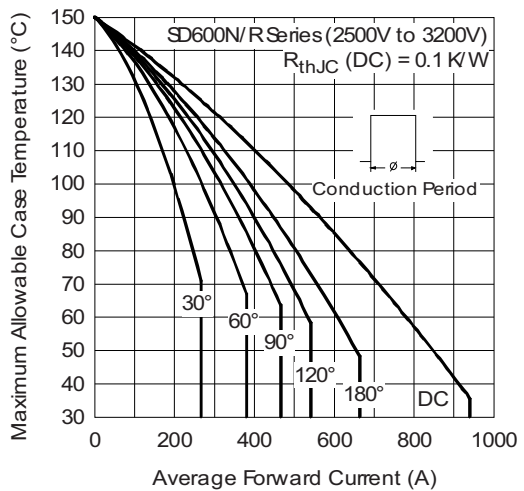


Fig. 4 - Current Ratings Characteristics

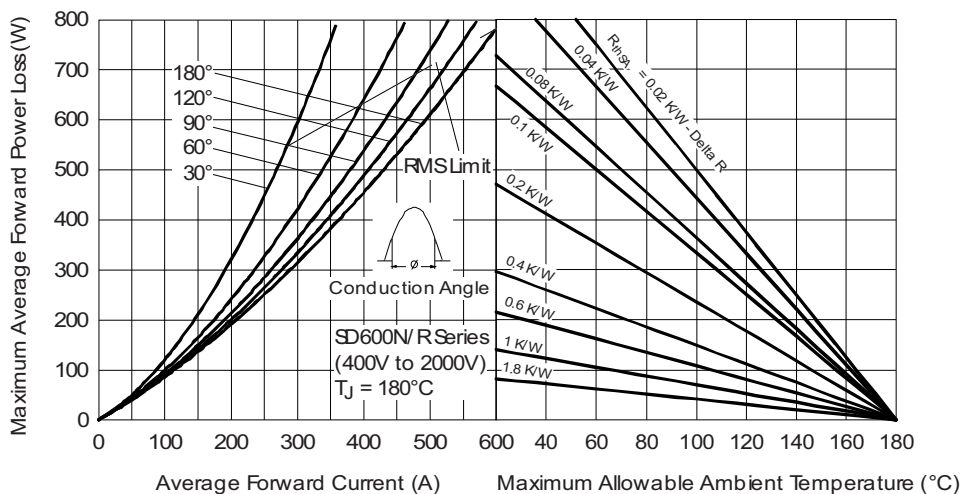


Fig. 5 - Forward Power Loss Characteristics

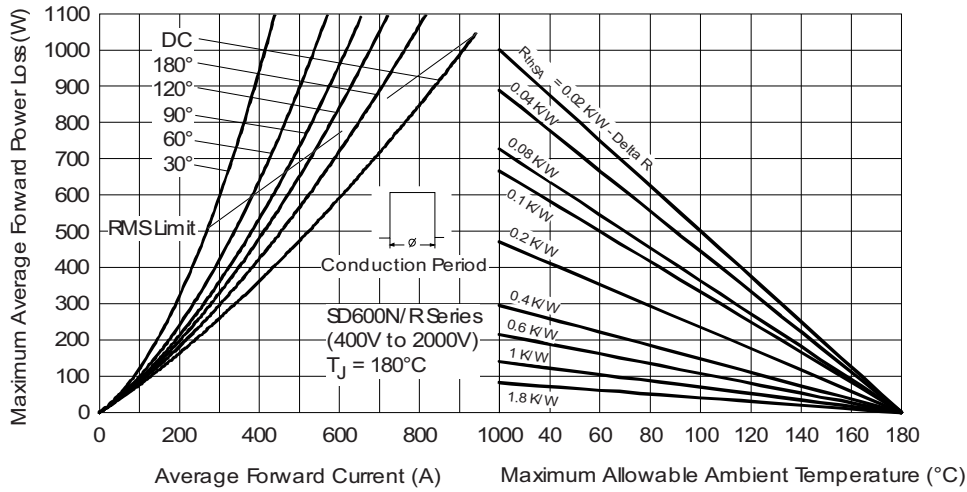


Fig. 6 - Forward Power Loss Characteristics

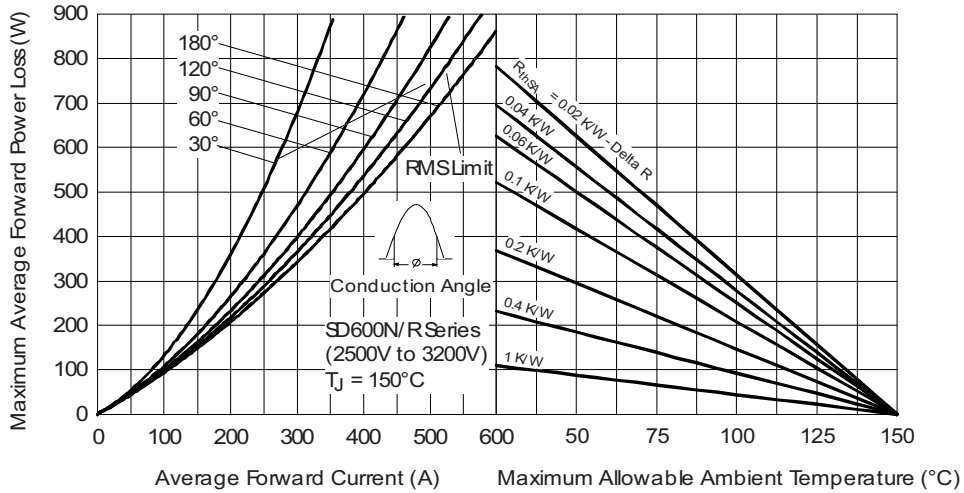


Fig. 7 - Forward Power Loss Characteristics

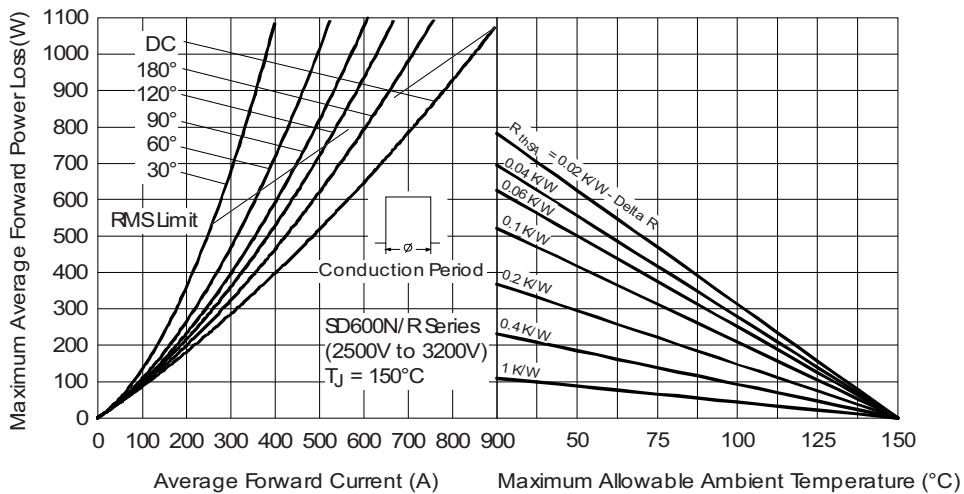


Fig. 8 - Forward Power Loss Characteristics

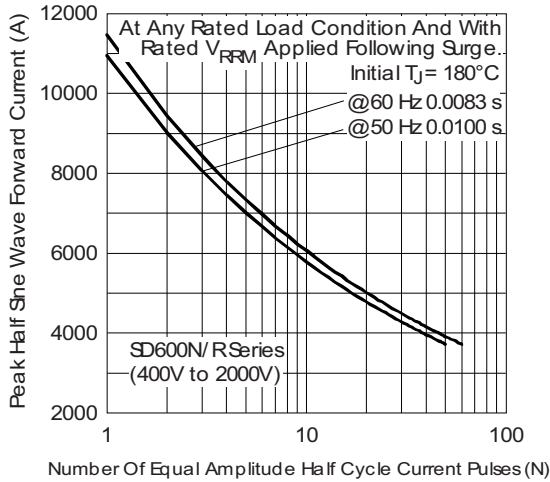


Fig. 9 - Maximum Non-Repetitive Surge Current

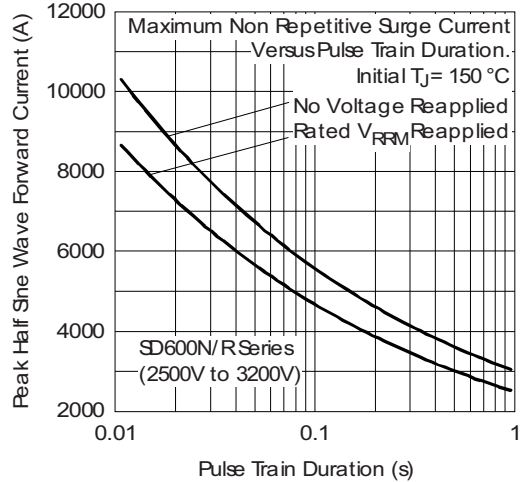


Fig. 12 - Maximum Non-Repetitive Surge Current

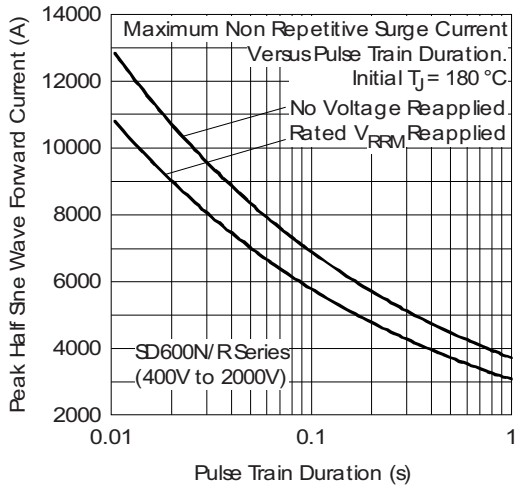


Fig. 10 - Maximum Non-Repetitive Surge Current

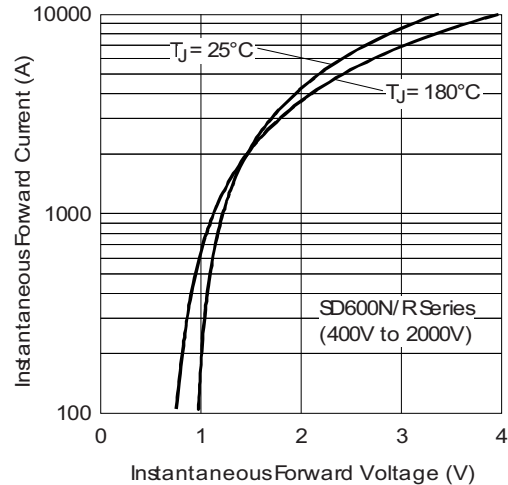


Fig. 13 - Forward Voltage Drop Characteristics

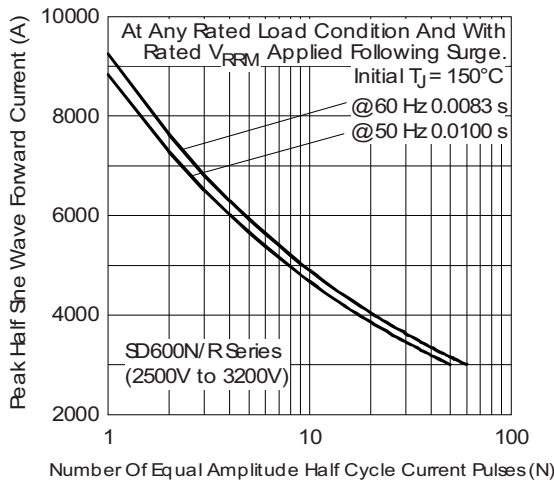


Fig. 11 - Maximum Non-Repetitive Surge Current

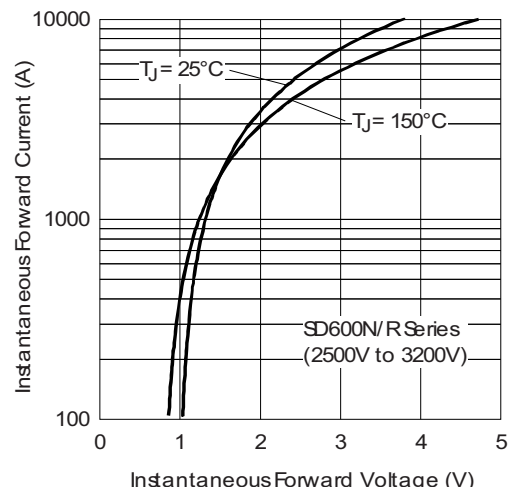


Fig. 14 - Forward Voltage Drop Characteristics

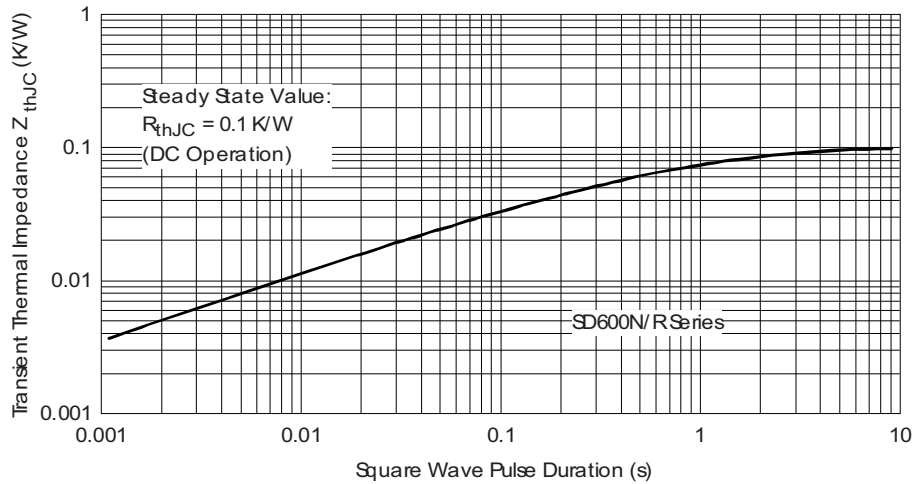


Fig. 15 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

| | | | | | | | | |
|-------------|------------|-----------|-----------|----------|----------|-----------|----------|----------|
| Device code | VS- | SD | 60 | 0 | N | 32 | P | C |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |

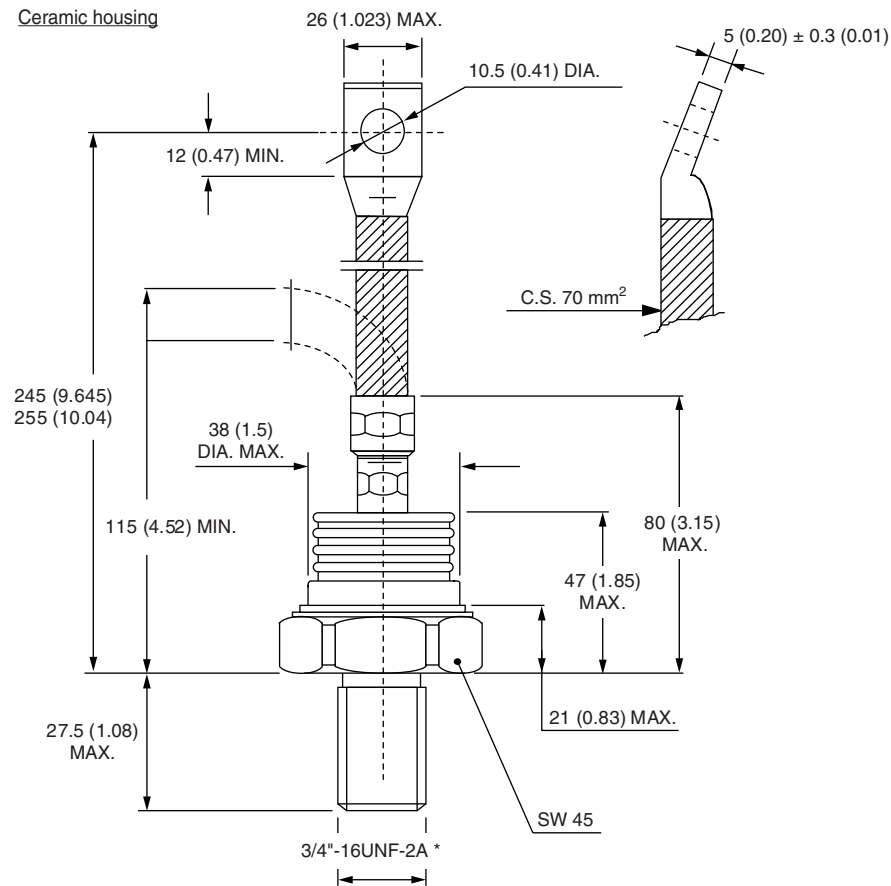
- 1** - Vishay Semiconductors product
- 2** - Diode
- 3** - Essential part number
- 4** - 0 = standard recovery
- 5** -
 - N = stud normal polarity (cathode to stud)
 - R = stud reverse polarity (anode to stud)
- 6** - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)
- 7** - P = stud base B-8 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 |

B-8

DIMENSIONS in millimeters (inches)



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



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