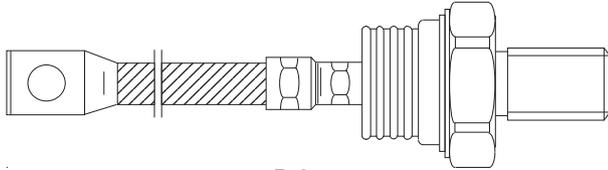


Standard Recovery Diodes, (Stud Version), 475 A



B-8


**RoHS
COMPLIANT**

FEATURES

- Wide current range
- High voltage ratings up to 3600 V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC® types
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

PRIMARY CHARACTERISTICS

| | |
|-----------------------|--------|
| $I_{F(AV)}$ | 475 A |
| Package | B-8 |
| Circuit configuration | Single |

TYPICAL APPLICATIONS

- Converters
- Power supplies
- High power drives
- Auxiliary system supplies for traction applications

MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER | TEST CONDITIONS | VALUES | UNITS |
|--------------|-----------------|-------------|-------------------|
| $I_{F(AV)}$ | | 475 | A |
| | T_C | 55 | °C |
| $I_{F(RMS)}$ | | 745 | A |
| I_{FSM} | 50 Hz | 7500 | A |
| | 60 Hz | 7850 | |
| I^2t | 50 Hz | 281 | kA ² s |
| | 60 Hz | 257 | |
| V_{RRM} | Range | 3600 | V |
| T_J | | -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 $T_J = T_J$ MAX. mA |
|----------------|--------------|--|--|---|
| SD500N, SD500R | 36 | 3600 | 3700 | 50 |



| FORWARD CONDUCTION | | | | | |
|---|---------------|--|--|---------------------------|--------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | 475 | A |
| | | | | 55 | °C |
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | 300 | A |
| | | | | 100 | °C |
| Maximum RMS forward current | $I_{F(RMS)}$ | DC at 40 °C case temperature | | 745 | |
| Maximum peak, one cycle forward, non-repetitive surge current | I_{FSM} | t = 10 ms | No voltage reappplied | 7500 | A |
| | | t = 8.3 ms | | 50 % V_{RRM} reappplied | |
| | | t = 10 ms | Sinusoidal half wave, initial $T_J = T_J \text{ max.}$ | | |
| | | t = 8.3 ms | | 6600 | |
| Maximum I^2t for fusing | I^2t | t = 10 ms | No voltage reappplied | 281 | kA ² s |
| | | t = 8.3 ms | | 50 % V_{RRM} reappplied | |
| | | t = 10 ms | 199 | | |
| | | t = 8.3 ms | 182 | | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reappplied | | 2810 | kA ² √s |
| Low level value of threshold voltage | $V_{F(TO)1}$ | (16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$), $T_J = T_J \text{ max.}$ | | 0.88 | V |
| High level value of threshold voltage | $V_{F(TO)2}$ | (I > $\pi \times I_{F(AV)}$), $T_J = T_J \text{ max.}$ | | 0.97 | |
| Low level value of forward slope resistance | r_{f1} | (16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$), $T_J = T_J \text{ max.}$ | | 0.78 | mΩ |
| High level value of forward slope resistance | r_{f2} | (I > $\pi \times I_{F(AV)}$), $T_J = T_J \text{ max.}$ | | 0.72 | |
| Maximum forward voltage drop | V_{FM} | $I_{pk} = 1000 \text{ A}$, $T_J = T_J \text{ max.}$ $t_p = 10 \text{ ms}$ sinusoidal wave | | 1.66 | V |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | |
|--|------------|---|--|-------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum junction operating temperature range | T_J | | | -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 | |
| Max. allowed mounting torque ± 10 % | | Not lubricated threads | | 50 | Nm |
| Approximate weight | | | | 454 | g |
| SD500N, SD500R | | 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 | $T_J = T_J \text{ max.}$ | 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

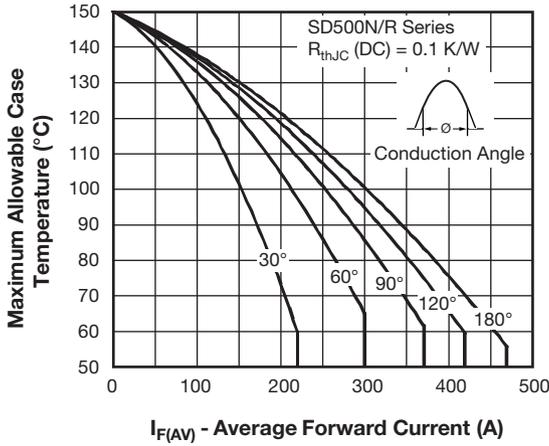


Fig. 1 - Current Ratings Characteristics

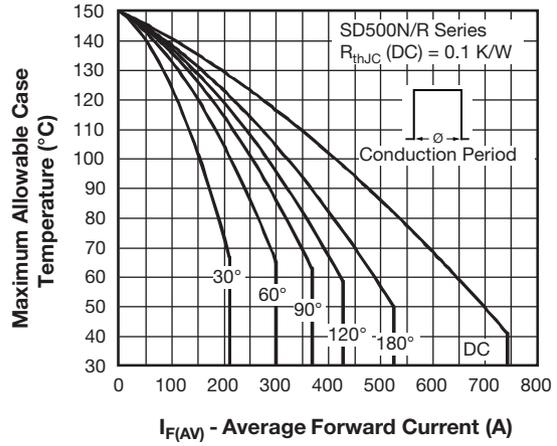


Fig. 2 - Current Ratings Characteristics

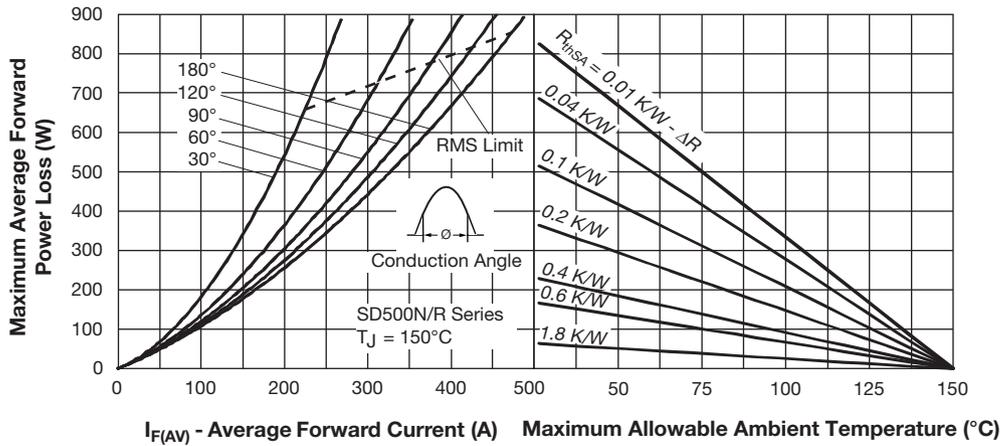


Fig. 3 - Forward Power Loss Characteristics

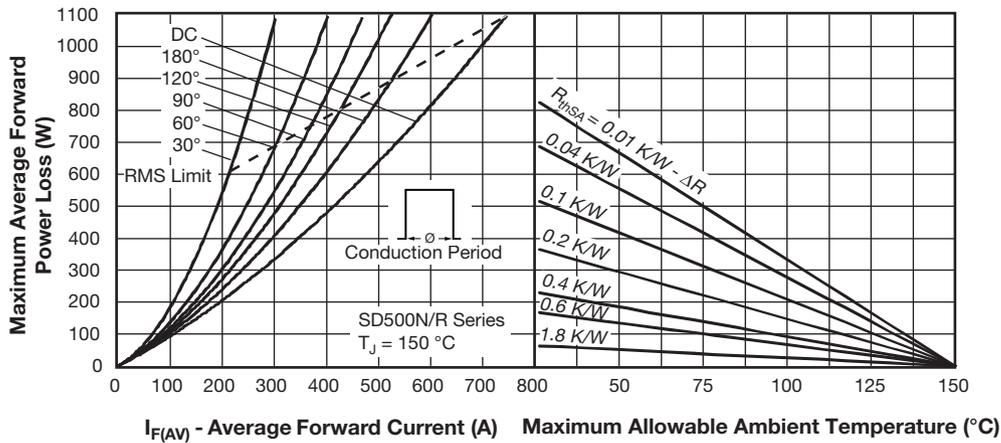


Fig. 4 - Forward Power Loss Characteristics

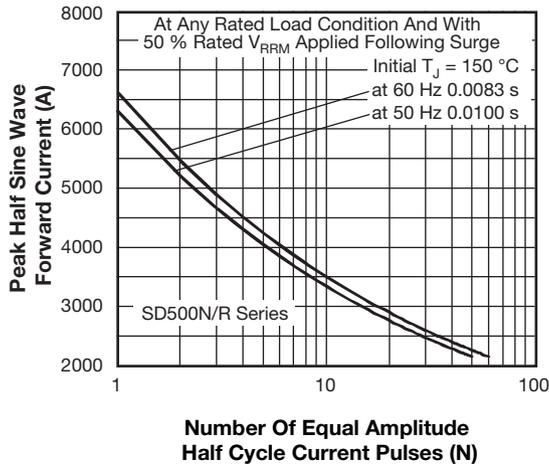


Fig. 5 - Maximum Non-Repetitive Surge Current

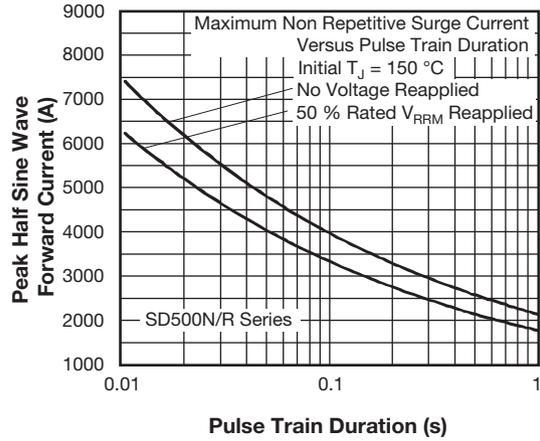


Fig. 6 - Maximum Non-Repetitive Surge Current

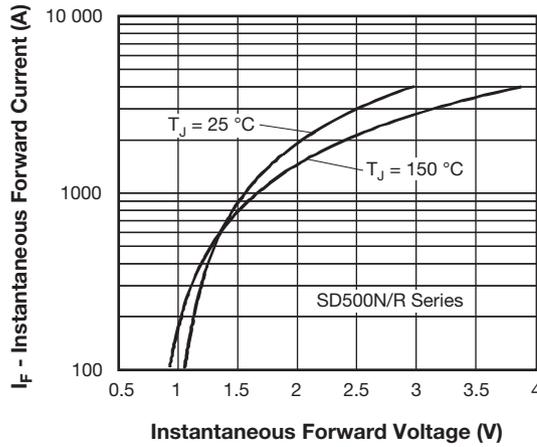


Fig. 7 - Forward Voltage Drop Characteristics

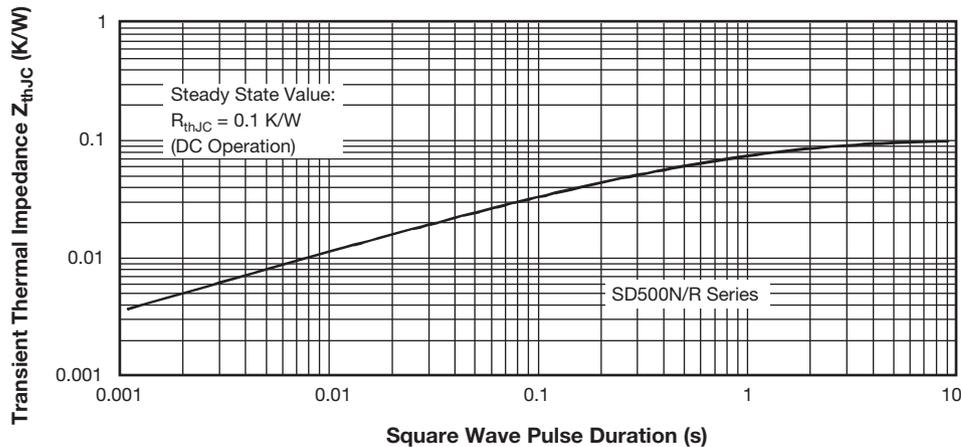


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE

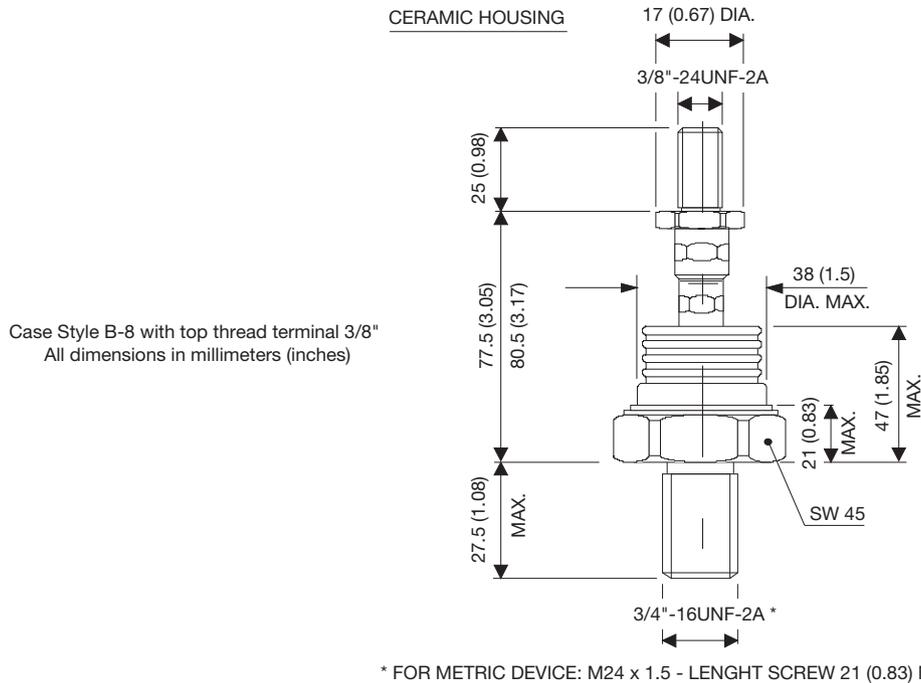
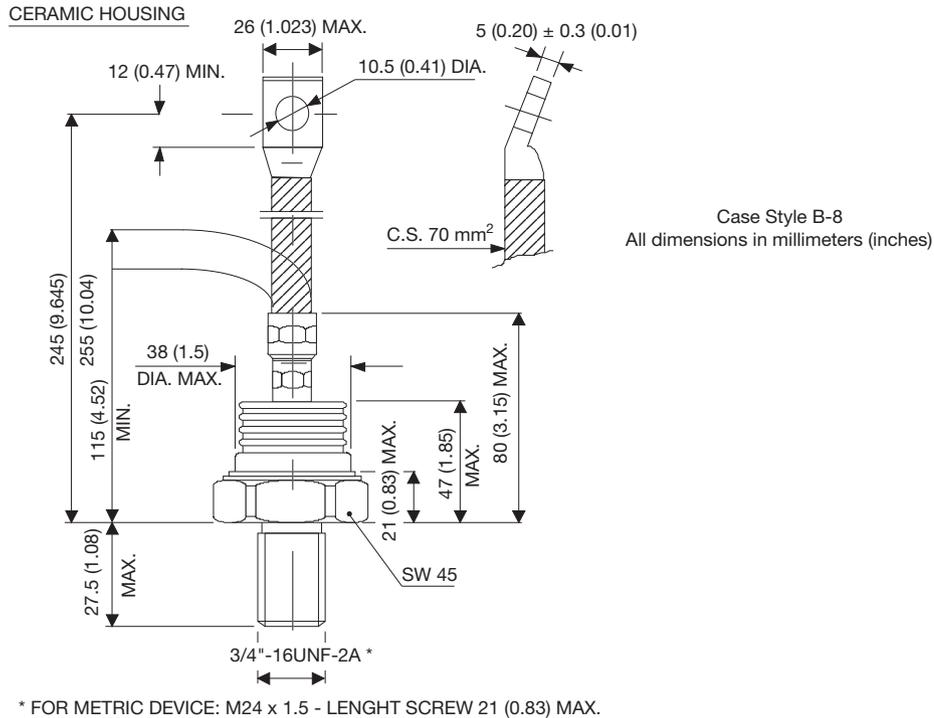
| | | | | | | | | | |
|-------------|------------|-----------|-----------|----------|----------|-----------|----------|----------|----------|
| Device code | VS- | SD | 50 | 0 | N | 36 | P | S | C |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ |

- 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
M = stud base B-8 M24 x 1.5
- 8** - S = isolated lead with silicone sleeve
(red = reverse polarity; blue = normal polarity)
T = threaded top terminal 3/8" 24UNF-2A
None = non isolated lead
- 9** - C = ceramic housing

Note: available for rotating applications (contact factory)



DIMENSIONS in millimeters (inches)





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