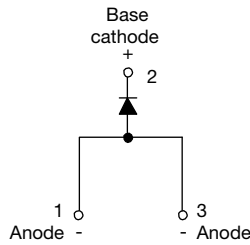
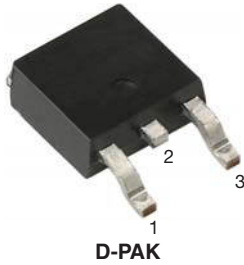




High Voltage Surface Mount Input Rectifier Diode, 8 A



FEATURES

- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS COMPLIANT HALOGEN FREE

APPLICATIONS

- Input rectification
- Vishay Semiconductors switches and output rectifiers which are available in identical package outlines

DESCRIPTION

The VS-8EWS16S-M3 rectifier high voltage series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150 °C junction temperature.

The **high reverse voltage** range available allows design of input stage primary rectification with **outstanding voltage surge** capability.

| PRODUCT SUMMARY | |
|-----------------|------------------|
| Package | D-PAK (TO-252AA) |
| $I_{F(AV)}$ | 8 A |
| V_R | 1600 V |
| V_F at I_F | 1.1 V |
| I_{FSM} | 150 A |
| T_J max. | 150 °C |
| Diode variation | Single die |

| OUTPUT CURRENT IN TYPICAL APPLICATIONS | | | |
|--|---------------------|--------------------|-------|
| APPLICATIONS | SINGLE-PHASE BRIDGE | THREE-PHASE BRIDGE | UNITS |
| NEMA FR-4 or G10 glass fabric-based epoxy with 4 oz. (140 μm) copper | 1.2 | 1.6 | A |
| Aluminum IMS, $R_{thCA} = 15$ °C/W | 2.5 | 2.8 | |
| Aluminum IMS with heatsink, $R_{thCA} = 5$ °C/W | 5.5 | 6.5 | |

Note

- $T_A = 55$ °C, $T_J = 125$ °C, footprint 300 mm²

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|-----------------------------------|---------------------|------------|-------|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Sinusoidal waveform | 8 | A |
| V_{RRM} | | 1600 | V |
| I_{FSM} | | 150 | A |
| V_F | 8 A, $T_J = 25$ °C | 1.10 | V |
| T_J | | -40 to 150 | °C |

| VOLTAGE RATINGS | | | |
|-----------------|---|--|---------------------------|
| PART NUMBER | V_{RRM} , MAXIMUM PEAK REVERSE VOLTAGE V | V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | I_{RRM} AT 150 °C mA |
| VS-8EWS16S-M3 | 1600 | 1700 | 0.5 |



| ABSOLUTE MAXIMUM RATINGS | | | | |
|---|---------------|---|--------|---------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum average forward current | $I_{F(AV)}$ | $T_C = 96\text{ }^\circ\text{C}$, 180° conduction half sine wave | 8 | A |
| Maximum peak one cycle non-repetitive surge current | I_{FSM} | 10 ms sine pulse, rated V_{RRM} applied | 125 | |
| | | 10 ms sine pulse, no voltage reapplied | 150 | |
| Maximum I^2t for fusing | I^2t | 10 ms sine pulse, rated V_{RRM} applied | 78 | A^2s |
| | | 10 ms sine pulse, no voltage reapplied | 110 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | $t = 0.1\text{ ms to }10\text{ ms}$, no voltage reapplied | 1100 | $A^2\sqrt{s}$ |

| ELECTRICAL SPECIFICATIONS | | | | | |
|---------------------------------|-------------|---------------------------------------|-----------------------------------|-----------|----|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS | |
| Maximum forward voltage drop | V_{FM} | 8 A, $T_J = 25\text{ }^\circ\text{C}$ | 1.1 | V | |
| Forward slope resistance | r_t | $T_J = 150\text{ }^\circ\text{C}$ | 20 | $m\Omega$ | |
| Threshold voltage | $V_{F(TO)}$ | | 0.82 | V | |
| Maximum reverse leakage current | I_{RM} | $V_R = \text{Rated } V_{RRM}$ | $T_J = 25\text{ }^\circ\text{C}$ | 0.05 | mA |
| | | | $T_J = 150\text{ }^\circ\text{C}$ | 0.50 | |

| THERMAL - MECHANICAL SPECIFICATIONS | | | | |
|---|------------------|-----------------------------|-----------------------|--------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum junction and storage temperature range | T_J, T_{Stg} | | -40 to 150 | $^\circ\text{C}$ |
| | | | Soldering temperature | |
| Maximum thermal resistance, junction to case | R_{thJC} | DC operation | 2.5 | $^\circ\text{C/W}$ |
| Typical thermal resistance, junction to ambient (PCB mount) | $R_{thJA}^{(1)}$ | | 62 | |
| Approximate weight | | | 1 | g |
| | | | 0.03 | oz. |
| Marking device | | Case style TO-252AA (D-PAK) | 8EWS16S | |

Note

⁽¹⁾ When mounted on 1" square (650 mm²) PCB of FR-4 or G-10 material 4 oz. (140 μm) copper 40 $^\circ\text{C/W}$
For recommended footprint and soldering techniques refer to application note #AN-994

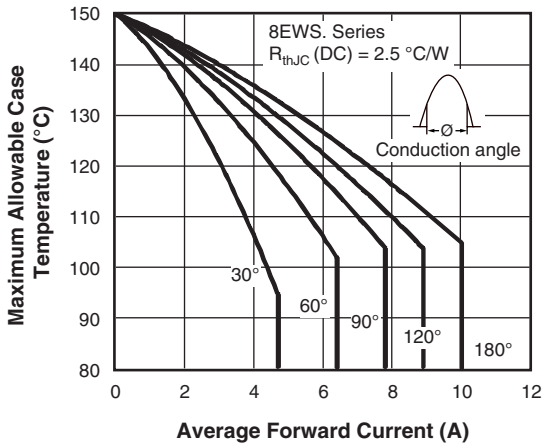


Fig. 1 - Current Rating Characteristics

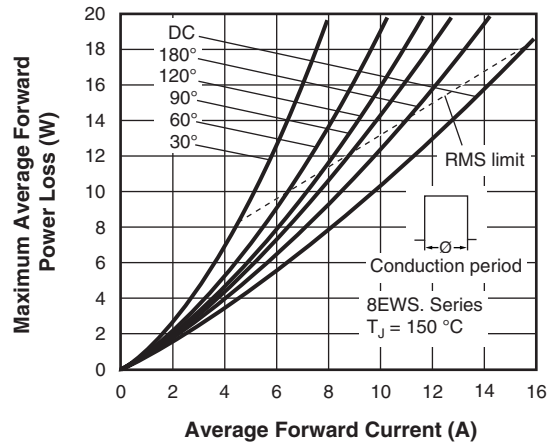


Fig. 4 - Forward Power Loss Characteristics

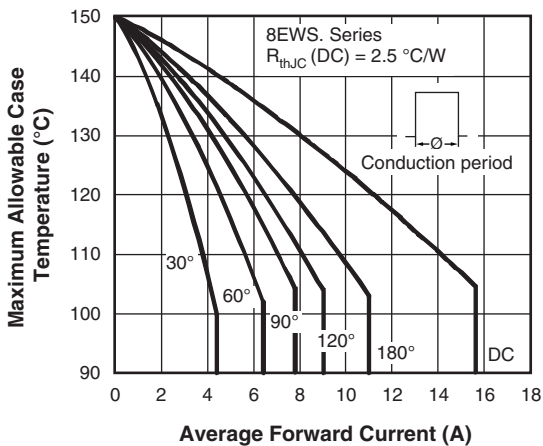


Fig. 2 - Current Rating Characteristics

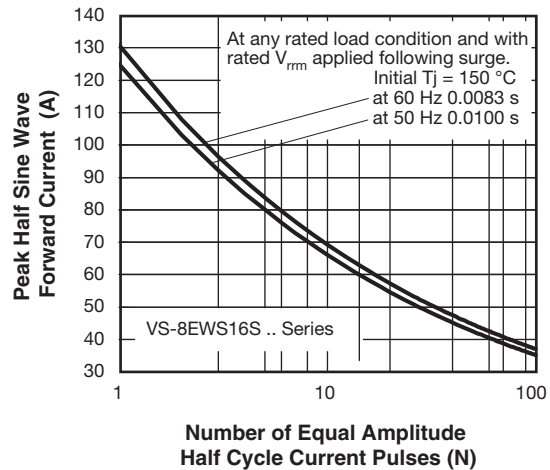


Fig. 5 - Maximum Non-Repetitive Surge Current

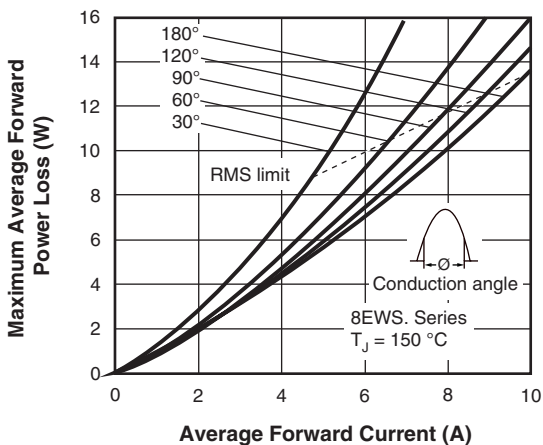


Fig. 3 - Forward Power Loss Characteristics

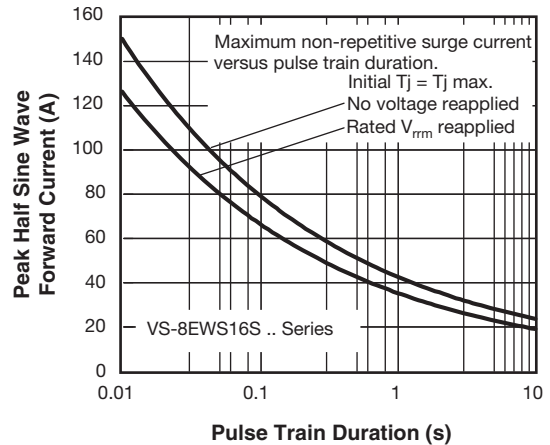


Fig. 6 - Maximum Non-Repetitive Surge Current

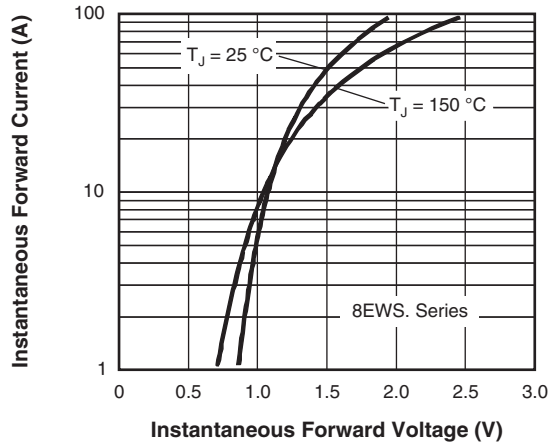


Fig. 7 - Forward Voltage Drop Characteristics

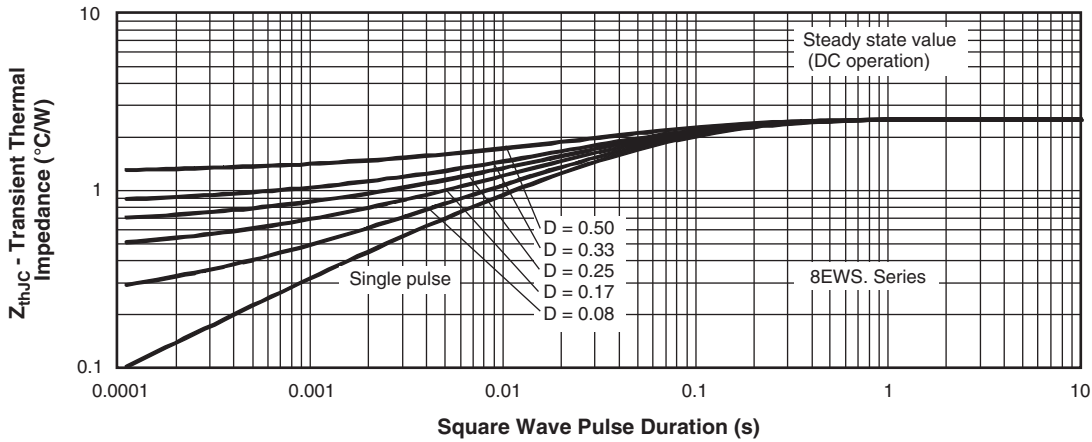
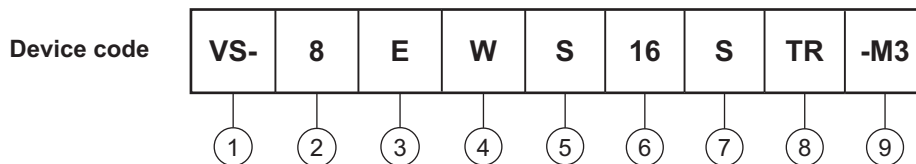


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (8 = 8 A)
- 3** - Circuit configuration:
E = Single diode
- 4** - Package:
W = D-PAK
- 5** - Type of silicon:
S = Standard recovery rectifier
- 6** - Voltage code x 100 = V_{RRM} (16 = 1600 V)
- 7** - S = Surface mountable
- 8** -
 - TR = Tape and reel
 - TRR = Tape and reel (right oriented)
 - TRL = Tape and reel (left oriented)
- 9** - Environmental digit:
-M3 = Halogen-free, RoHS compliant and terminations lead (Pb)-free

| ORDERING INFORMATION (Example) | | | |
|--------------------------------|------------------|------------------------|--------------------------|
| PREFERRED P/N | QUANTITY PER T/R | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION |
| VS-8EWS16S-M3 | 75 | 3000 | Antistatic plastic tubes |
| VS-8EWS16STR-M3 | 2000 | 2000 | 13" diameter reel |
| VS-8EWS16STRL-M3 | 3000 | 3000 | 13" diameter reel |
| VS-8EWS16STRR-M3 | 3000 | 3000 | 13" diameter reel |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?95016 |
| Part marking information | www.vishay.com/doc?95176 |
| Packaging information | www.vishay.com/doc?95033 |

D-PAK (TO-252AA)

DIMENSIONS in millimeters and inches



| SYMBOL | MILLIMETERS | | INCHES | | NOTES | SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|------|--------|-------|-------|--------|-------------|-------|------------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | | | MIN. | MAX. | MIN. | MAX. | |
| A | 2.18 | 2.39 | 0.086 | 0.094 | | e | 2.29 BSC | | 0.090 BSC | | |
| A1 | - | 0.13 | - | 0.005 | | H | 9.40 | 10.41 | 0.370 | 0.410 | |
| b | 0.64 | 0.89 | 0.025 | 0.035 | | L | 1.40 | 1.78 | 0.055 | 0.070 | |
| b2 | 0.76 | 1.14 | 0.030 | 0.045 | | L1 | 2.74 BSC | | 0.108 REF. | | |
| b3 | 4.95 | 5.46 | 0.195 | 0.215 | 3 | L2 | 0.51 BSC | | 0.020 BSC | | |
| c | 0.46 | 0.61 | 0.018 | 0.024 | | L3 | 0.89 | 1.27 | 0.035 | 0.050 | 3 |
| c2 | 0.46 | 0.89 | 0.018 | 0.035 | | L4 | - | 1.02 | - | 0.040 | |
| D | 5.97 | 6.22 | 0.235 | 0.245 | 5 | L5 | 1.14 | 1.52 | 0.045 | 0.060 | 2 |
| D1 | 5.21 | - | 0.205 | - | 3 | Ø | 0° | 10° | 0° | 10° | |
| E | 6.35 | 6.73 | 0.250 | 0.265 | 5 | Ø1 | 0° | 15° | 0° | 15° | |
| E1 | 4.32 | - | 0.170 | - | 3 | Ø2 | 25° | 35° | 25° | 35° | |

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension uncontrolled in L5
- (3) Dimension D1, E1, L3 and b3 establish a minimum mounting surface for thermal pad
- (4) Section C - C dimension apply to the flat section of the lead between 0.13 and 0.25 mm (0.005 and 0.10") from the lead tip
- (5) Dimension D, and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (6) Dimension b1 and c1 applied to base metal only
- (7) Datum A and B to be determined at datum plane H
- (8) Outline conforms to JEDEC outline TO-252AA



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