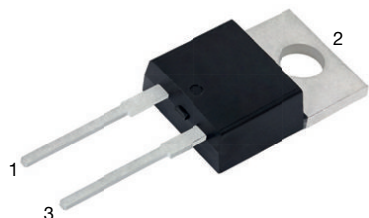
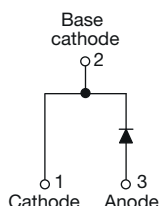


High Voltage, Input Rectifier Diode, 10 A


TO-220AC 2L


FEATURES

- Very low forward voltage drop
- 150 °C max. operating junction temperature
- Glass passivated pellet chip junction
- Designed and qualified according to JEDEC®-JESD 47
- 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

High voltage rectifiers optimized for very low forward voltage drop with moderate leakage.

These devices are intended for use in main rectification (single or three phase bridge).

PRIMARY CHARACTERISTICS

| | |
|-----------------------|-----------------|
| $I_{F(AV)}$ | 10 A |
| V_R | 800 V to 1200 V |
| V_F at I_F | 1.1 V |
| I_{FSM} | 160 A |
| T_J max. | 150 °C |
| Package | TO-220AC 2L |
| Circuit configuration | Single |

OUTPUT CURRENT IN TYPICAL APPLICATIONS

| APPLICATIONS | SINGLE-PHASE BRIDGE | THREE-PHASE BRIDGE | UNITS |
|--|---------------------|--------------------|-------|
| Capacitive input filter $T_A = 55$ °C, $T_J = 125$ °C common heatsink of 1 °C/W | 12.0 | 16.0 | A |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|---------------------|-------------|-------|
| $I_{F(AV)}$ | Sinusoidal waveform | 10 | A |
| V_{RRM} | | 800/1200 | V |
| I_{FSM} | | 160 | A |
| V_F | 10 A, $T_J = 25$ °C | 1.1 | 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-10ETS08-M3 | 800 | 900 | 0.5 |
| VS-10ETS12-M3 | 1200 | 1300 | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|--|---------------|--|--------|-------------------|
| Maximum average forward current | $I_{F(AV)}$ | $T_C = 105$ °C, 180° conduction half sine wave | 10 | A |
| Maximum peak one cycle non-repetitive surge current | I_{FSM} | 10 ms sine pulse, rated V_{RRM} applied | 135 | |
| | | 10 ms sine pulse, no voltage reapplied | 160 | |
| Maximum I^2t for fusing | I^2t | 10 ms sine pulse, rated V_{RRM} applied | 91 | A ² s |
| | | 10 ms sine pulse, no voltage reapplied | 130 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | $t = 0.1$ ms to 10 ms, no voltage reapplied | 1300 | A ² √s |



ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---------------------------------|-------------|--|--------|------------------|
| Maximum forward voltage drop | V_{FM} | 10 A, $T_J = 25\text{ }^{\circ}\text{C}$ | 1.1 | V |
| Forward slope resistance | r_t | $T_J = 150\text{ }^{\circ}\text{C}$ | 20 | $\text{m}\Omega$ |
| Threshold voltage | $V_{F(TO)}$ | | 0.82 | V |
| Maximum reverse leakage current | I_{RM} | $T_J = 25\text{ }^{\circ}\text{C}$ | 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 | $^{\circ}\text{C}$ |
| Maximum thermal resistance, junction to case | R_{thJC} | DC operation | 2.5 | $^{\circ}\text{C}/\text{W}$ |
| Maximum thermal resistance, junction to ambient (PCB mount) | R_{thJA} | | 62 | |
| Soldering temperature | T_S | | 240 | $^{\circ}\text{C}$ |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Marking device | | Case style TO-220AC 2L | 10ETS08 | |
| | | | 10ETS12 | |

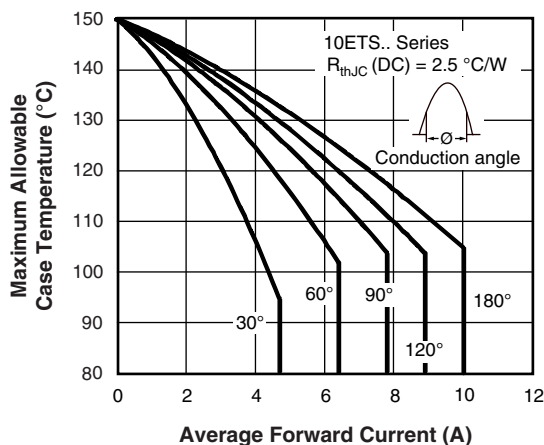


Fig. 1 - Current Rating Characteristics

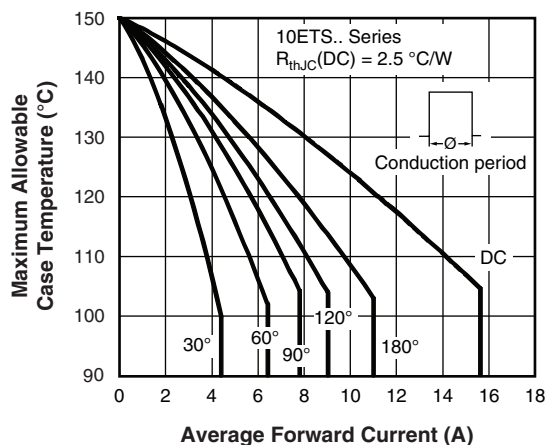


Fig. 2 - Current Rating Characteristics

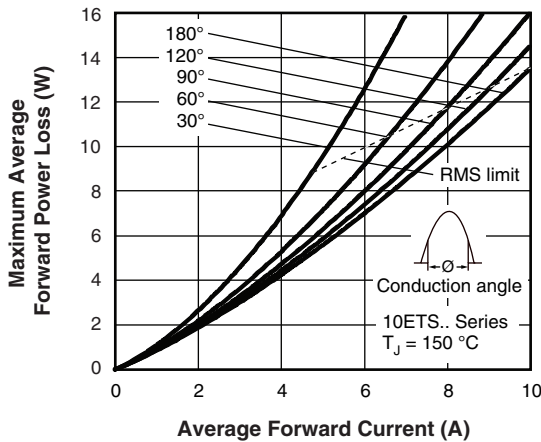


Fig. 3 - Forward Power Loss Characteristics

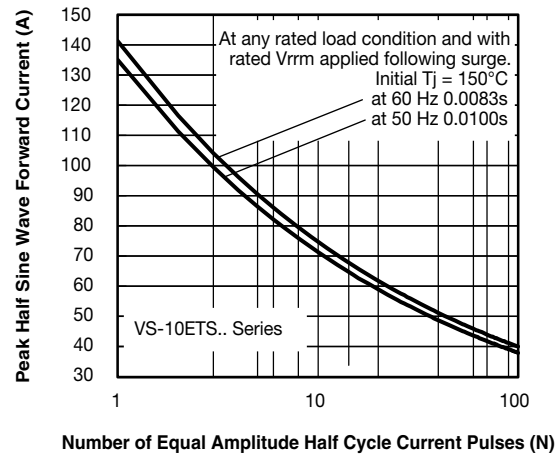


Fig. 5 - Maximum Non-Repetitive Surge Current

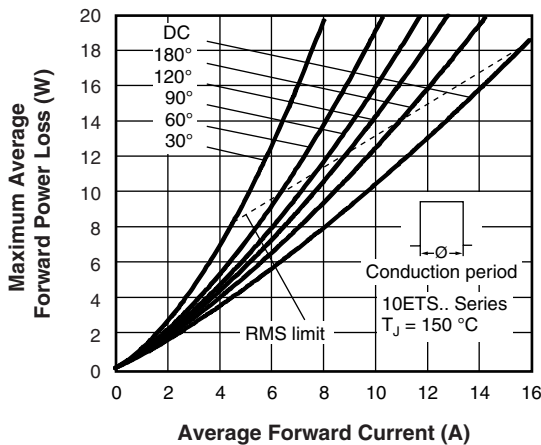


Fig. 4 - Forward Power Loss Characteristics

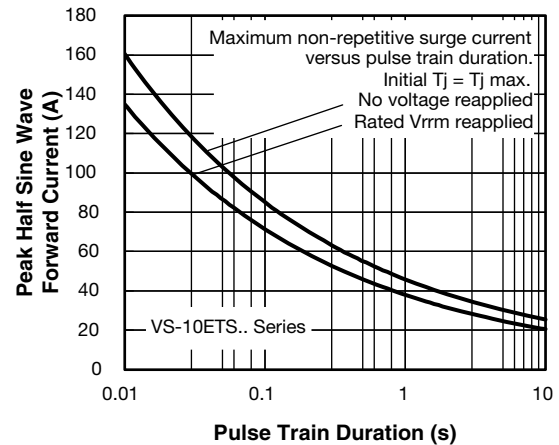


Fig. 6 - Maximum Non-Repetitive Surge Current

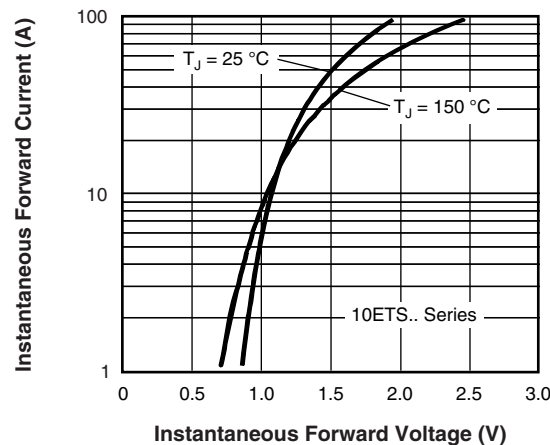


Fig. 7 - Forward Voltage Drop Characteristics

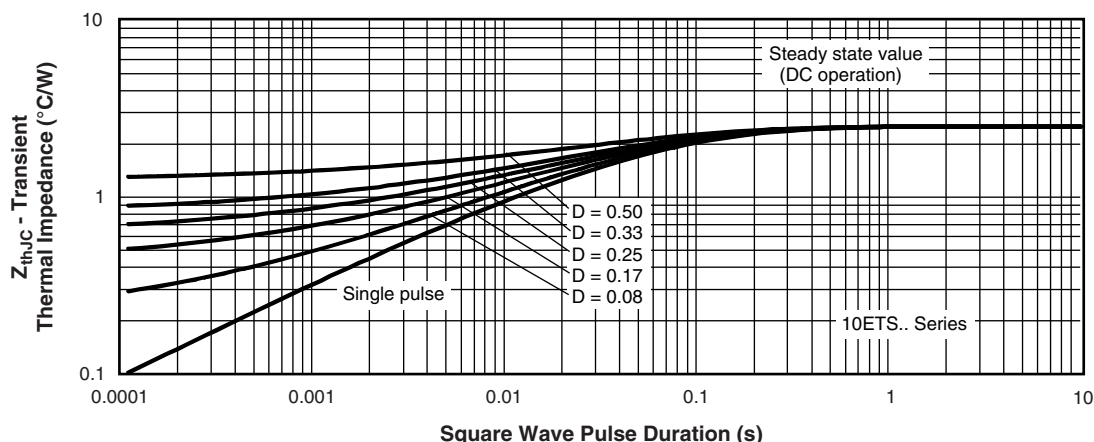


Fig. 8 - Thermal Impedance $Z_{th,JC}$ Characteristics

ORDERING INFORMATION TABLE

Device code

| | | | | | | |
|------------|-----------|----------|----------|----------|-----------|------------|
| VS- | 10 | E | T | S | 12 | -M3 |
|------------|-----------|----------|----------|----------|-----------|------------|

1 2 3 4 5 6 7

- 1 - Vishay Semiconductors product
- 2 - Current rating (10 = 10 A)
- 3 - Circuit configuration:
E = single
- 4 - Package:
T = 2L TO-220AC
- 5 - Type of silicon:
S = standard recovery rectifier
- 6 - Voltage code $x 100 = V_{RRM}$

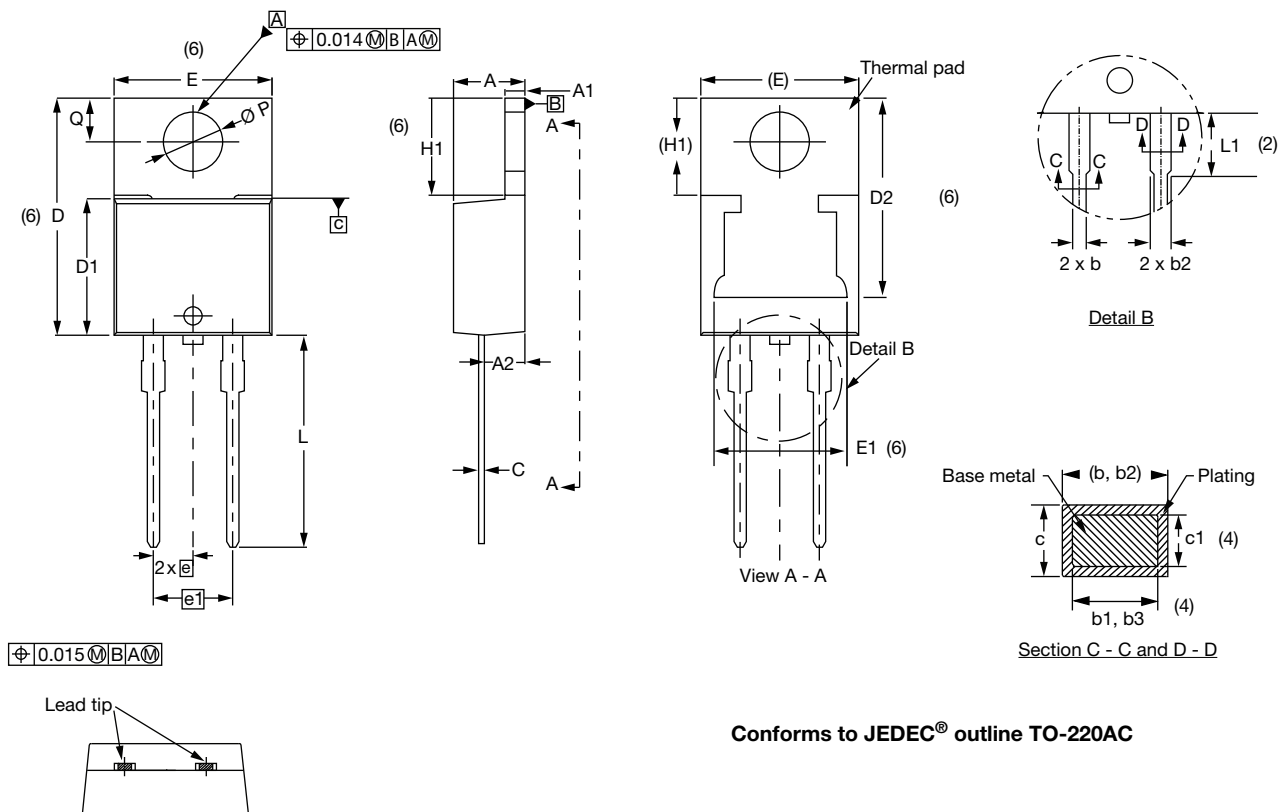
| |
|-------------|
| 08 = 800 V |
| 12 = 1200 V |
- 7 - Environmental digit:
-M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

| ORDERING INFORMATION (Example) | | |
|--------------------------------|---------------|--------------------------|
| PREFERRED P/N | BASE QUANTITY | PACKAGING DESCRIPTION |
| VS-10ETS08-M3 | 50 | Antistatic plastic tubes |
| VS-10ETS12-M3 | 50 | Antistatic plastic tubes |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?96156 |
| Part marking information | www.vishay.com/doc?95391 |

TO-220AC 2L

DIMENSIONS in millimeters and inches



Conforms to JEDEC® outline TO-220AC

| SYMBOL | MILLIMETERS | | INCHES | | NOTES | | SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|--|--------|-------------|-------|--------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | | | | MIN. | MAX. | | | |
| A | 4.25 | 4.65 | 0.167 | 0.183 | | | D2 | 11.68 | 13.30 | 0.460 | 0.524 | 6, 7 |
| A1 | 1.14 | 1.40 | 0.045 | 0.055 | | | E | 10.11 | 10.51 | 0.398 | 0.414 | 3, 6 |
| A2 | 2.50 | 2.92 | 0.098 | 0.115 | | | E1 | 6.86 | 8.89 | 0.270 | 0.350 | 6 |
| b | 0.69 | 1.01 | 0.027 | 0.040 | | | e | 2.41 | 2.67 | 0.095 | 0.105 | |
| b1 | 0.38 | 0.97 | 0.015 | 0.038 | 4 | | e1 | 4.88 | 5.28 | 0.192 | 0.208 | |
| b2 | 1.20 | 1.73 | 0.047 | 0.068 | | | H1 | 6.09 | 6.48 | 0.240 | 0.255 | 6 |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 | | L | 13.52 | 14.02 | 0.532 | 0.552 | |
| c | 0.36 | 0.61 | 0.014 | 0.024 | | | L1 | 3.32 | 3.82 | 0.131 | 0.150 | 2 |
| c1 | 0.36 | 0.56 | 0.014 | 0.022 | 4 | | Ø P | 3.54 | 3.91 | 0.139 | 0.154 | |
| D | 14.85 | 15.35 | 0.585 | 0.604 | 3 | | Q | 2.60 | 3.00 | 0.102 | 0.118 | |
| D1 | 8.38 | 9.02 | 0.330 | 0.355 | | | | | | | | |

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension and finish uncontrolled in L1
- (3) Dimension D, D1, 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
- (4) Dimension b1, b3, and c1 apply to base metal only
- (5) Controlling dimensions: inches
- (6) Thermal pad contour optional within dimensions E, H1, D2, and E1
- (7) Outline conforms to JEDEC® TO-220, except D2



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