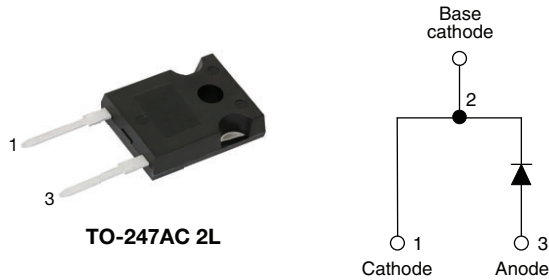


High Voltage Input Rectifier Diode, 60 A



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
Available

LINKS TO ADDITIONAL RESOURCES



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).

MECHANICAL DATA

Case: TO-247AC 2L, TO-247AC 3L

Molding compound meets UL 94 V-0 flammability rating

Terminal: matte tin plated leads, solderable per J-STD-002

| PRIMARY CHARACTERISTICS | |
|-------------------------|--------------------------|
| $I_{F(AV)}$ | 60 A |
| V_R | 1600 V |
| V_F at I_F | 1.15 V |
| I_{FSM} | 950 A |
| T_J max. | 150 °C |
| Package | TO-247AC 2L, TO-247AC 3L |
| Circuit configuration | Single |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|-----------------------------------|---------------------|-------------|-------|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Sinusoidal waveform | 60 | A |
| V_{RRM} | | 1600 | V |
| I_{FSM} | | 950 | A |
| V_F | 60 A, $T_J = 25$ °C | 1.15 | 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-60EPS16-M3 | 1600 | 1700 | 1 |

| ABSOLUTE MAXIMUM RATINGS | | | | |
|---|---------------|--|--------|-------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum average forward current | $I_{F(AV)}$ | $T_C = 118$ °C, 180° conduction half sine wave | 60 | A |
| Maximum peak one cycle non-repetitive surge current | I_{FSM} | 10 ms sine pulse, rated V_{RRM} applied | 800 | |
| | | 10 ms sine pulse, no voltage reapplied | 950 | |
| Maximum I^2t for fusing | I^2t | 10 ms sine pulse, rated V_{RRM} applied | 3200 | A ² s |
| | | 10 ms sine pulse, no voltage reapplied | 4525 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | $t = 0.1$ ms to 10 ms, no voltage reapplied | 45 250 | A ² √s |

| ELECTRICAL SPECIFICATIONS | | | | | |
|---------------------------------|-------------|--|-------------------------------|--------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop | V_{FM} | 30 A, $T_J = 25\text{ }^\circ\text{C}$ | | 1.0 | V |
| | | 60 A, $T_J = 25\text{ }^\circ\text{C}$ | | 1.15 | |
| Forward slope resistance | r_t | $T_J = 150\text{ }^\circ\text{C}$ | | 3.96 | $\text{m}\Omega$ |
| Threshold voltage | $V_{F(TO)}$ | | | 0.74 | V |
| Maximum reverse leakage current | I_{RM} | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_{RRM}$ | 0.1 | mA |
| | | $T_J = 150\text{ }^\circ\text{C}$ | | 1.0 | |

| 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 | | 0.35 | $^\circ\text{C}/\text{W}$ |
| Maximum thermal resistance, junction to ambient | R_{thJA} | | | 40 | |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased | | 0.2 | |
| Approximate weight | | | | 6 | g |
| Mounting torque | minimum | | | 6.0 (5) | $\text{kgf} \cdot \text{cm}$ $(\text{lbf} \cdot \text{in})$ |
| | maximum | | | 12 (10) | |
| Marking device | | Case style TO-247AC 2L, TO-247AC 3L | | 60EPS16 | |

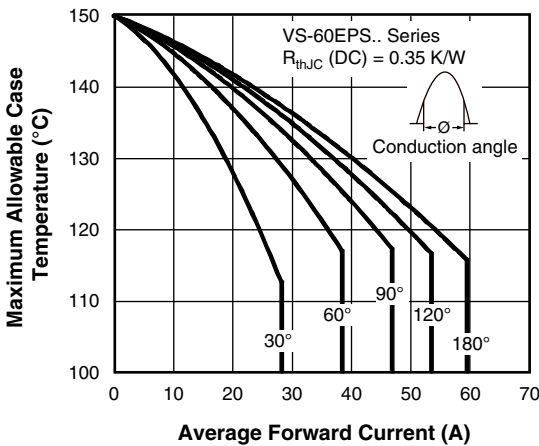


Fig. 1 - Current Rating Characteristics

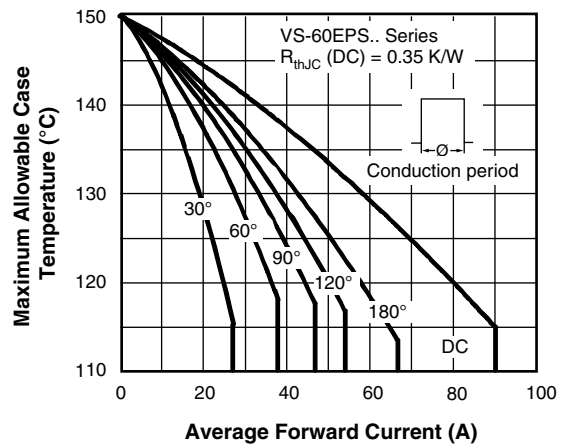


Fig. 2 - Current Rating Characteristics

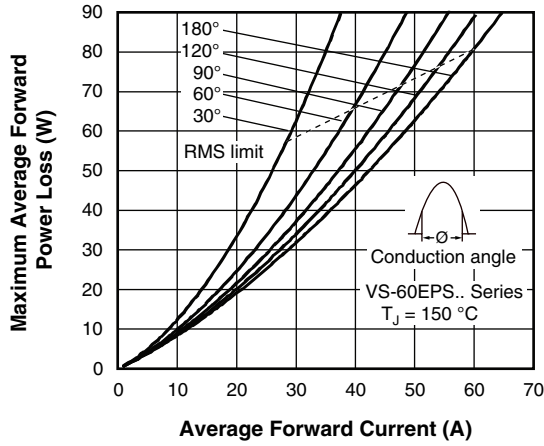


Fig. 3 - Forward Power Loss Characteristics

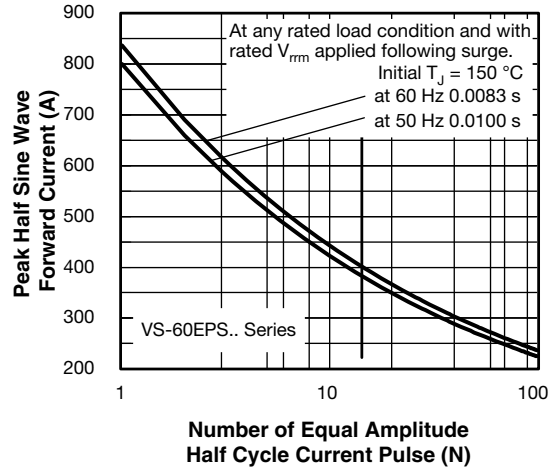


Fig. 5 - Maximum Non-Repetitive Surge Current

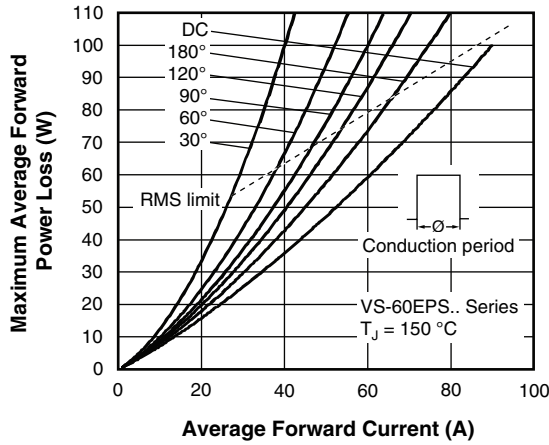


Fig. 4 - Forward Power Loss Characteristics

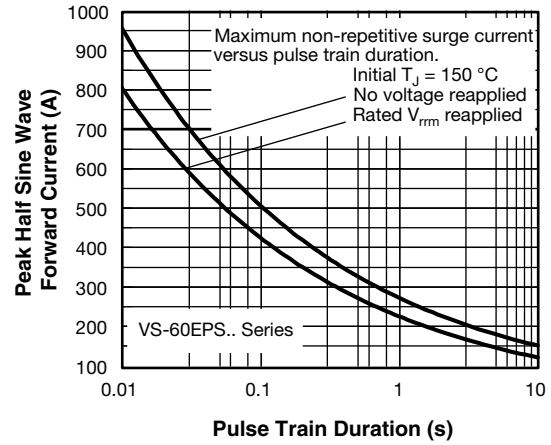


Fig. 6 - Maximum Non-Repetitive Surge Current

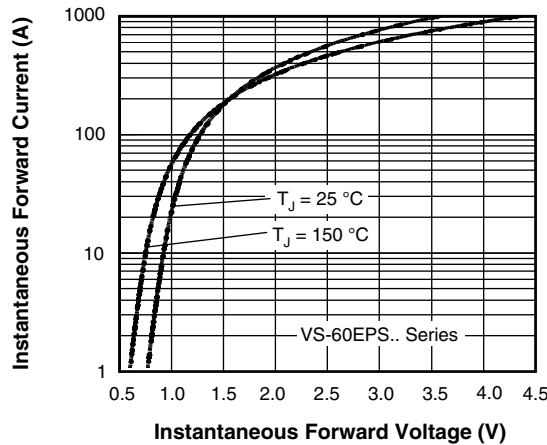
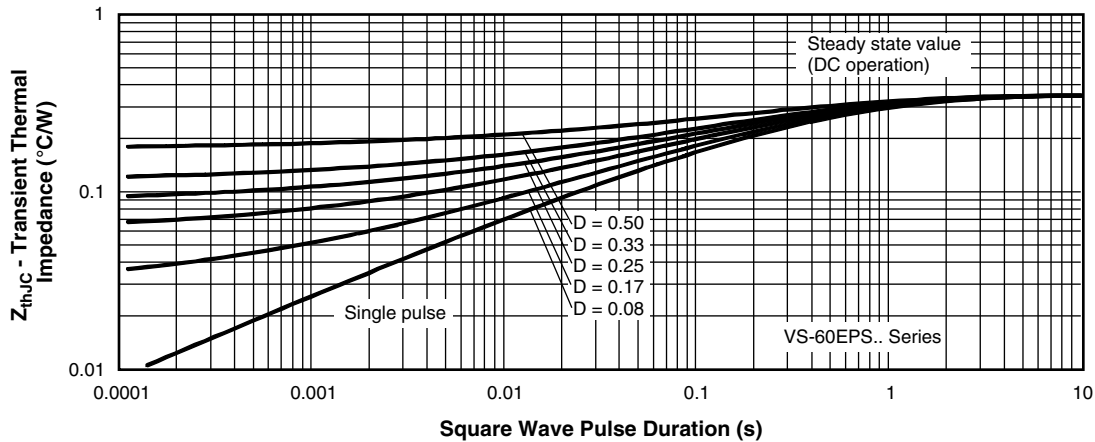


Fig. 7 - Forward Voltage Drop Characteristics


 Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

| | | | | | | | |
|-------------|------------|-----------|----------|----------|----------|-----------|------------|
| Device code | VS- | 60 | E | P | S | 16 | -M3 |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

- 1** - Vishay Semiconductors product
- 2** - Current rating (60 = 60 A)
- 3** - Circuit configuration:
E = single diode
- 4** - Package:
P = TO-247AC 2L
- 5** - Type of silicon:
S = standard recovery rectifier
- 6** - Voltage rating (16 = 1600 V)
- 7** - 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-60EPS16-M3 | 25 | 500 | Antistatic plastic tubes |

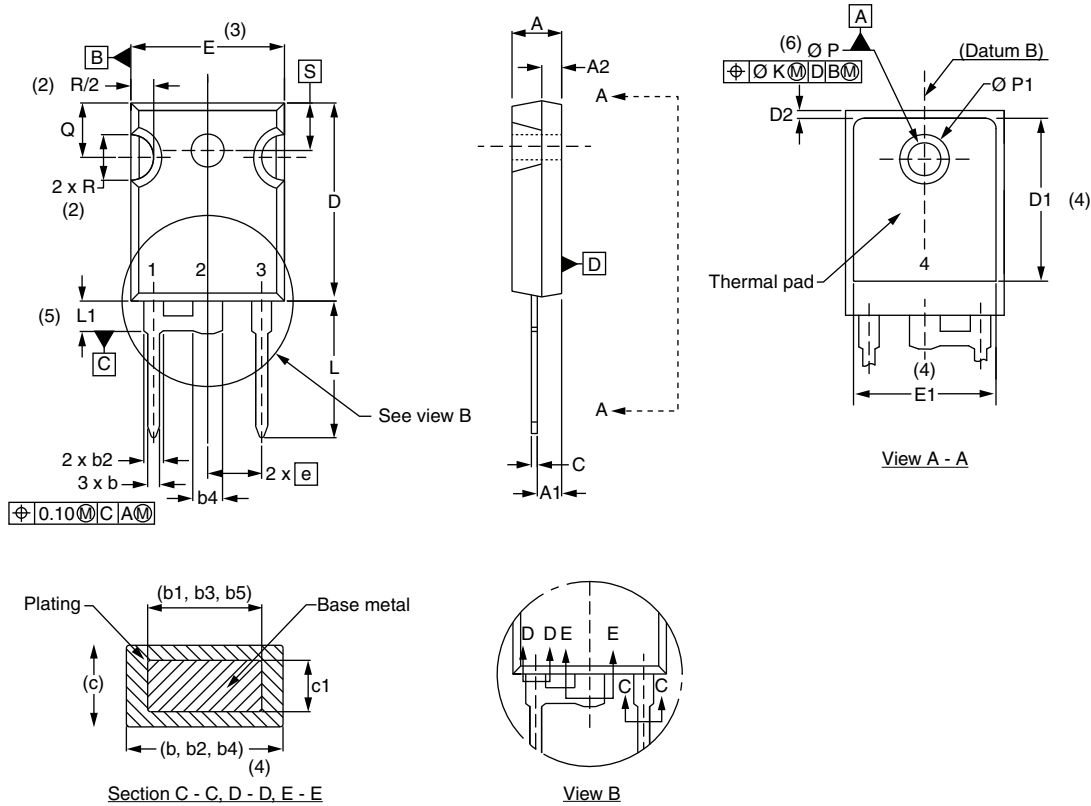
LINKS TO RELATED DOCUMENTS

| | | |
|--------------------------|-------------|--|
| Dimensions | TO-247AC 2L | www.vishay.com/doc?96144 |
| | TO-247AC 3L | www.vishay.com/doc?96138 |
| Part marking information | TO-247AC 2L | www.vishay.com/doc?95648 |
| | TO-247AC 3L | www.vishay.com/doc?95007 |
| SPIICE model | | www.vishay.com/doc?96047 |



TO-247AC modified - 50 mils L/F

DIMENSIONS in millimeters and inches



| SYMBOL | MILLIMETERS | | INCHES | | NOTES | SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|-----------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | | | MIN. | MAX. | MIN. | MAX. | |
| A | 4.65 | 5.31 | 0.183 | 0.209 | | D2 | 0.51 | 1.35 | 0.020 | 0.053 | |
| A1 | 2.21 | 2.59 | 0.087 | 0.102 | | E | 15.29 | 15.87 | 0.602 | 0.625 | 3 |
| A2 | 1.17 | 1.37 | 0.046 | 0.054 | | E1 | 13.46 | - | 0.53 | - | |
| b | 0.99 | 1.40 | 0.039 | 0.055 | | e | 5.46 BSC | | 0.215 BSC | | |
| b1 | 0.99 | 1.35 | 0.039 | 0.053 | | ΦK | 0.254 | | 0.010 | | |
| b2 | 1.65 | 2.39 | 0.065 | 0.094 | | L | 14.20 | 16.10 | 0.559 | 0.634 | |
| b3 | 1.65 | 2.34 | 0.065 | 0.092 | | L1 | 3.71 | 4.29 | 0.146 | 0.169 | |
| b4 | 2.59 | 3.43 | 0.102 | 0.135 | | ΦP | 3.56 | 3.66 | 0.14 | 0.144 | |
| b5 | 2.59 | 3.38 | 0.102 | 0.133 | | $\Phi P1$ | - | 7.39 | - | 0.291 | |
| c | 0.38 | 0.89 | 0.015 | 0.035 | | Q | 5.31 | 5.69 | 0.209 | 0.224 | |
| c1 | 0.38 | 0.84 | 0.015 | 0.033 | | R | 4.52 | 5.49 | 0.178 | 0.216 | |
| D | 19.71 | 20.70 | 0.776 | 0.815 | 3 | S | 5.51 BSC | | 0.217 BSC | | |
| D1 | 13.08 | - | 0.515 | - | 4 | | | | | | |

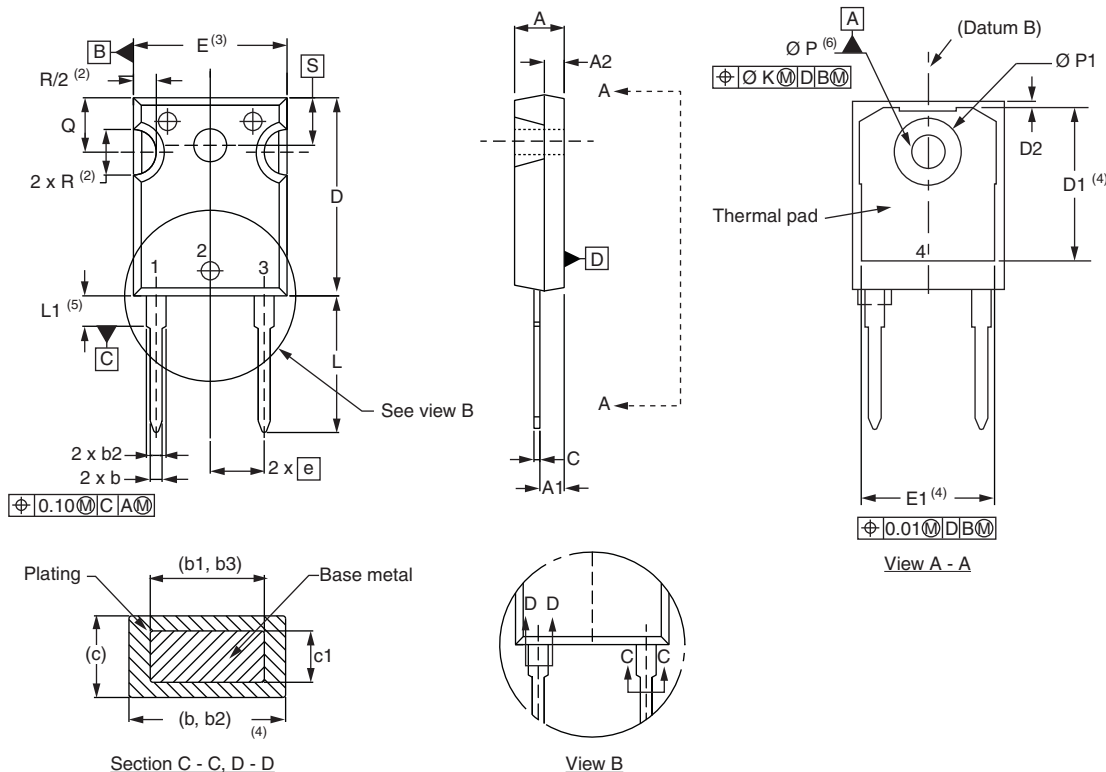
Notes

- (1) Dimensioning and tolerance per ASME Y14.5M-1994
- (2) Contour of slot optional
- (3) 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
- (4) Thermal pad contour optional with dimensions D1 and E1
- (5) Lead finish uncontrolled in L1
- (6) ΦP to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154")
- (7) Outline conforms to JEDEC® outline TO-247 with exception of dimension c and Q



TO-247AC 2L

DIMENSIONS in millimeters and inches



| SYMBOL | MILLIMETERS | | INCHES | | NOTES | SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|--------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | | | MIN. | MAX. | MIN. | MAX. | |
| A | 4.65 | 5.31 | 0.183 | 0.209 | | E | 15.29 | 15.87 | 0.602 | 0.625 | 3 |
| A1 | 2.21 | 2.59 | 0.087 | 0.102 | | E1 | 13.46 | - | 0.53 | - | |
| A2 | 1.17 | 1.37 | 0.046 | 0.054 | | e | 5.46 BSC | | 0.215 BSC | | |
| b | 0.99 | 1.40 | 0.039 | 0.055 | | Ø K | 0.254 | | 0.010 | | |
| b1 | 0.99 | 1.35 | 0.039 | 0.053 | | L | 14.20 | 16.10 | 0.559 | 0.634 | |
| b2 | 1.65 | 2.39 | 0.065 | 0.094 | | L1 | 3.71 | 4.29 | 0.146 | 0.169 | |
| b3 | 1.65 | 2.34 | 0.065 | 0.092 | | Ø P | 3.56 | 3.66 | 0.14 | 0.144 | |
| c | 0.38 | 0.89 | 0.015 | 0.035 | | Ø P1 | - | 7.39 | - | 0.291 | |
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| D1 | 13.08 | - | 0.515 | - | 4 | S | 5.51 BSC | | 0.217 BSC | | |
| D2 | 0.51 | 1.35 | 0.020 | 0.053 | | | | | | | |

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