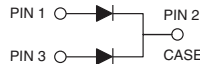
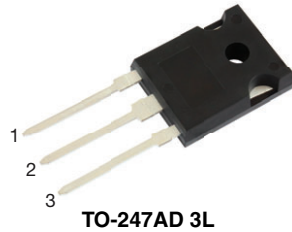


Dual High Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

 Ultra Low $V_F = 0.44 \text{ V}$ at $I_F = 10 \text{ A}$


FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder bath temperature 275 °C maximum, 10 s per JESD 22-B106
- AEC-Q101 qualified available:
 - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection in commercial, industrial, and automotive application.

MECHANICAL DATA

Case: TO-247AD 3L

Molding compound meets UL 94 V-0 flammability rating
 Base P/N-M3 - halogen-free, RoHS-compliant
 Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

Mounting torque: 10 in-lbs maximum

| PRIMARY CHARACTERISTICS | |
|--|----------------|
| $I_{F(AV)}$ | 2 x 40 A |
| V_{RRM} | 100 V |
| I_{FSM} | 550 A |
| V_F at $I_F = 40 \text{ A}$ ($T_J = 125 \text{ °C}$) | 0.66 V |
| T_J max. | 175 °C |
| Package | TO-247AD 3L |
| Circuit configuration | Common cathode |

| MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | |
|--|----------------------|-------------|------|
| PARAMETER | SYMBOL | VX80M100PW | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | per device | 80 |
| | | per diode | 40 |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 550 | A |
| Operating junction temperature range | T_J ⁽¹⁾ | -40 to +175 | °C |
| Storage temperature range | T_{STG} | -40 to +175 | |

Note

⁽¹⁾ The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$



| ELECTRICAL CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|----------------------|-----------------------------------|-------------|--------|------|----|
| PARAMETER | TEST CONDITIONS | SYMBOL | TYP. | MAX. | UNIT | |
| Instantaneous forward voltage per diode | $I_F = 10\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.52 | - | V |
| | $I_F = 20\text{ A}$ | | | 0.61 | - | |
| | $I_F = 40\text{ A}$ | | | 0.77 | 0.84 | |
| | $I_F = 10\text{ A}$ | $T_J = 125\text{ }^\circ\text{C}$ | | 0.44 | - | |
| | $I_F = 20\text{ A}$ | | | 0.55 | - | |
| | $I_F = 40\text{ A}$ | | | 0.66 | 0.74 | |
| Reverse current at rated V_R per diode | $V_R = 70\text{ V}$ | $T_J = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 0.0055 | - | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 5 | - | |
| | $V_R = 100\text{ V}$ | $T_J = 25\text{ }^\circ\text{C}$ | | - | 0.6 | |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 9 | 35 | |
| Typical junction capacitance | 4.0 V, 1 MHz | C_J | 3400 | - | pF | |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 5\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | |
|---|-----------------------|------------|--------------------|
| PARAMETER | SYMBOL | VX80M100PW | UNIT |
| Typical thermal resistance per device | $R_{\theta JC}^{(1)}$ | 0.6 | $^\circ\text{C/W}$ |

Note

- (1) Thermal resistance junction-to-case to follow JEDEC[®] 51-14 transient dual interface test method (TDIM)

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|--------------|---------------|---------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| VX80M100PW-M3/P | 5.64 | P | 25/tube | Tube |
| VX80M100PWHM3/P ⁽¹⁾ | 5.64 | P | 25/tube | Tube |

Note

- (1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)

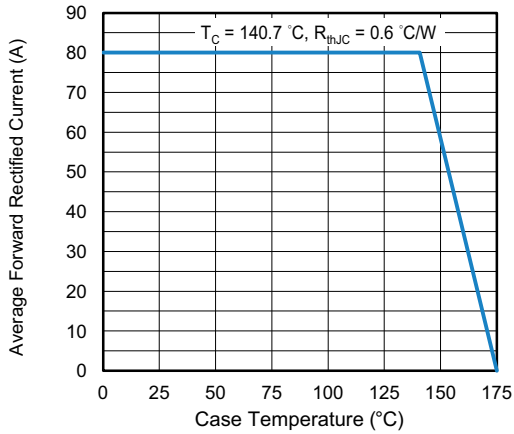


Fig. 1 - Maximum Forward Current Derating Curve

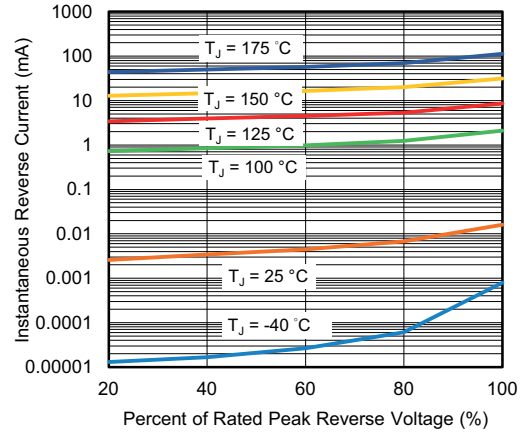


Fig. 4 - Typical Reverse Leakage Characteristics

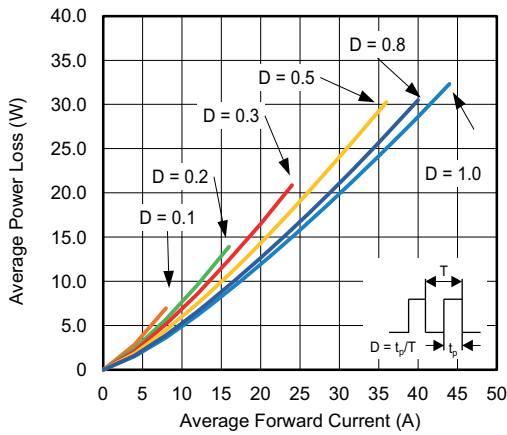


Fig. 2 - Average Power Loss Characteristics

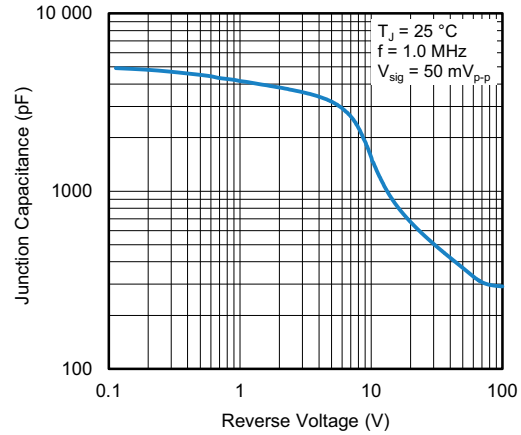


Fig. 5 - Typical Junction Capacitance

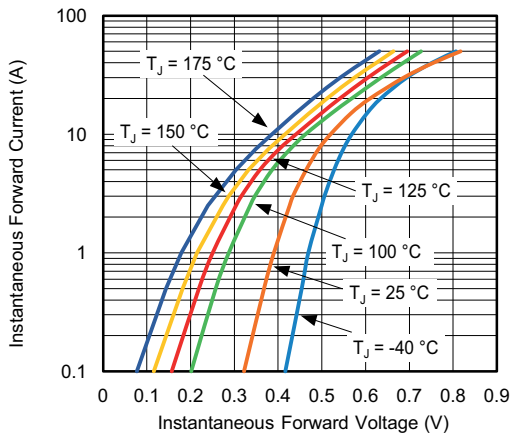


Fig. 3 - Typical Instantaneous Forward Characteristics

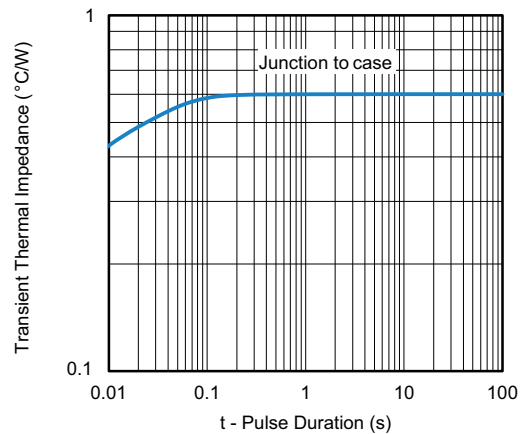
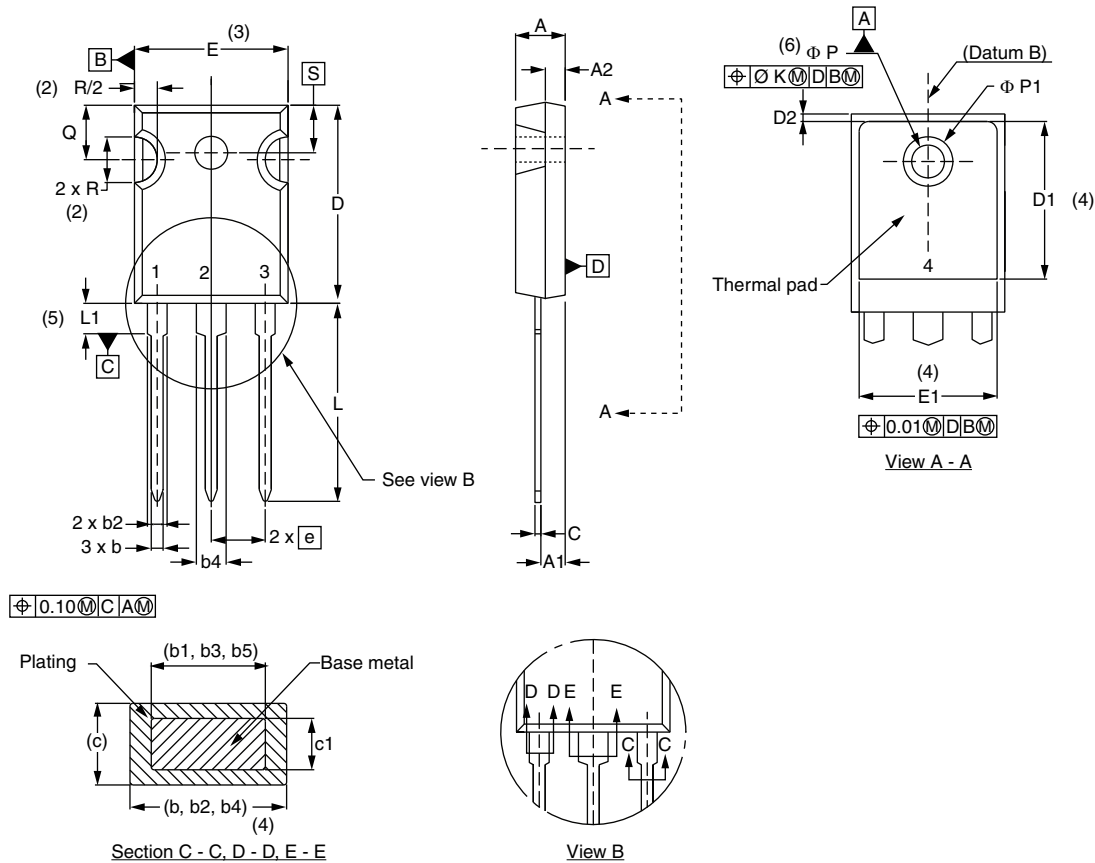


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters (inches) **TO-247AD 3L**


| 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 | 1.30 | 0.020 | 0.051 | |
| A1 | 2.21 | 2.59 | 0.087 | 0.102 | | E | 15.29 | 15.87 | 0.602 | 0.625 | 3 |
| A2 | 1.50 | 2.49 | 0.059 | 0.098 | | 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 | | Ø K | 0.254 | | 0.010 | | |
| b2 | 1.65 | 2.39 | 0.065 | 0.094 | | L | 19.81 | 20.32 | 0.780 | 0.800 | |
| 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 | | Ø P | 3.56 | 3.66 | 0.14 | 0.144 | |
| b5 | 2.59 | 3.38 | 0.102 | 0.133 | | Ø P1 | - | 6.98 | - | 0.275 | |
| 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 tolerancing per ASME Y14.5M-1994
- (2) Contour of slot optional
- (3) Dimension D and E do not include mold flash. 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) Ø P 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 A min., D, E min., Q min., S, and note 4



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