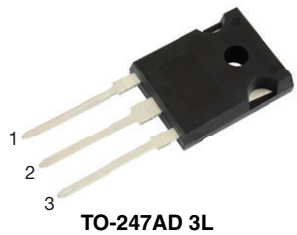
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# Dual High Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F$ = 0.44 V at $I_F$ = 10 A




TO-247AD 3L




## 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

AUTOMOTIVE GRADE Available

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

**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 A ($T_J$ = 125 °C) | 0.66 V |
| $T_J$ max. | 175 °C |
| Package | TO-247AD 3L |
| Circuit configuration | Common cathode |

**MAXIMUM RATINGS** ($T_A$ = 25 °C unless otherwise noted)

| PARAMETER | | SYMBOL | VX80M100PW | UNIT |
|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 100 | V |
| Maximum average forward rectified current (fig. 1) | per device | $I_{F(AV)}$ | 80 | A |
| | 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: $dP_D/dT_J < 1/R_{\theta JA}$



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| ELECTRICAL CHARACTERISTICS ($T_J$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **TYP.** | **MAX.** | **UNIT** |
| Instantaneous forward voltage per diode | $I_F$ = 10 A | $T_J$ = 25 °C | $V_F$ (1) | 0.52 | - | V |
| | $I_F$ = 20 A | | | 0.61 | - | |
| | $I_F$ = 40 A | | | 0.77 | 0.84 | |
| | $I_F$ = 10 A | $T_J$ = 125 °C | | 0.44 | - | |
| | $I_F$ = 20 A | | | 0.55 | - | |
| | $I_F$ = 40 A | | | 0.66 | 0.74 | |
| Reverse current at rated $V_R$ per diode | $V_R$ = 70 V | $T_J$ = 25 °C | $I_R$ (2) | 0.0055 | - | mA |
| | | $T_J$ = 125 °C | | 5 | - | |
| | $V_R$ = 100 V | $T_J$ = 25 °C | | - | 0.6 | |
| | | $T_J$ = 125 °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 ≤ 5 ms

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



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**RATINGS AND CHARACTERISTICS CURVES** ($T_A$ = 25 °C, unless otherwise noted)

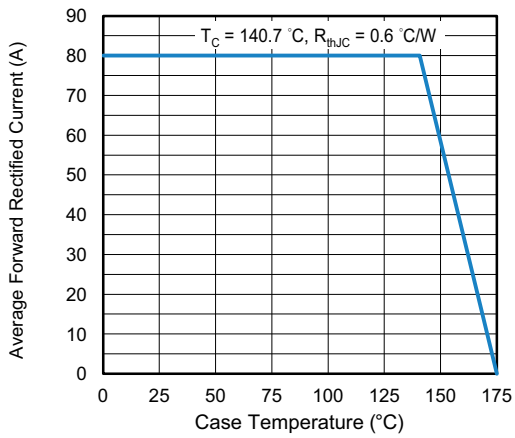



Fig. 1 - Maximum Forward Current Derating Curve

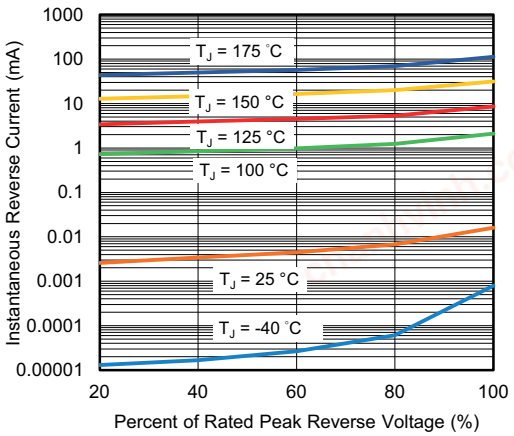



Fig. 4 - Typical Reverse Leakage Characteristics

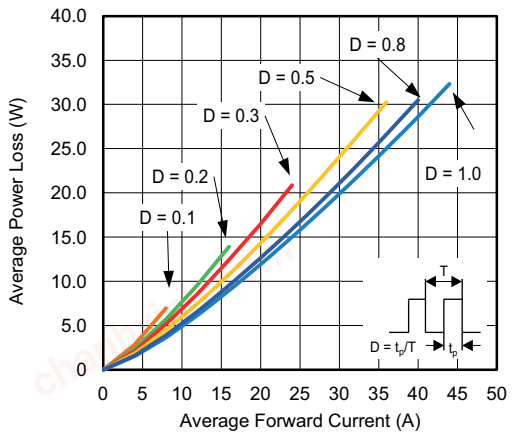



Fig. 2 - Average Power Loss Characteristics

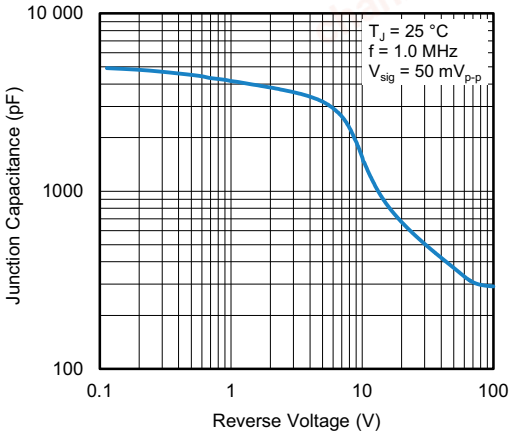



Fig. 5 - Typical Junction Capacitance

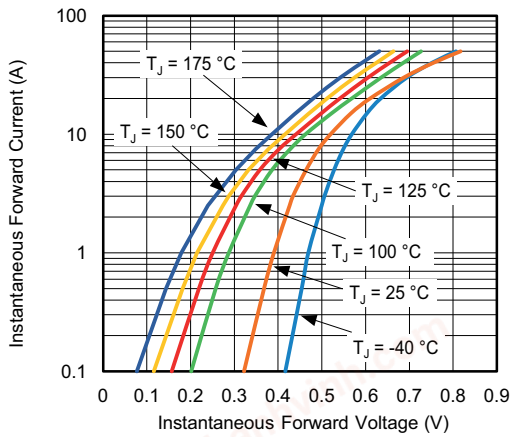



Fig. 3 - Typical Instantaneous Forward Characteristics

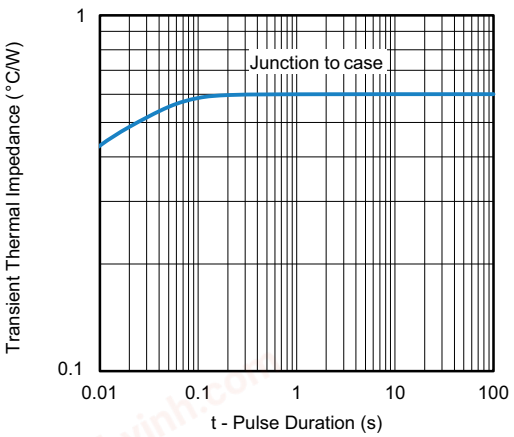


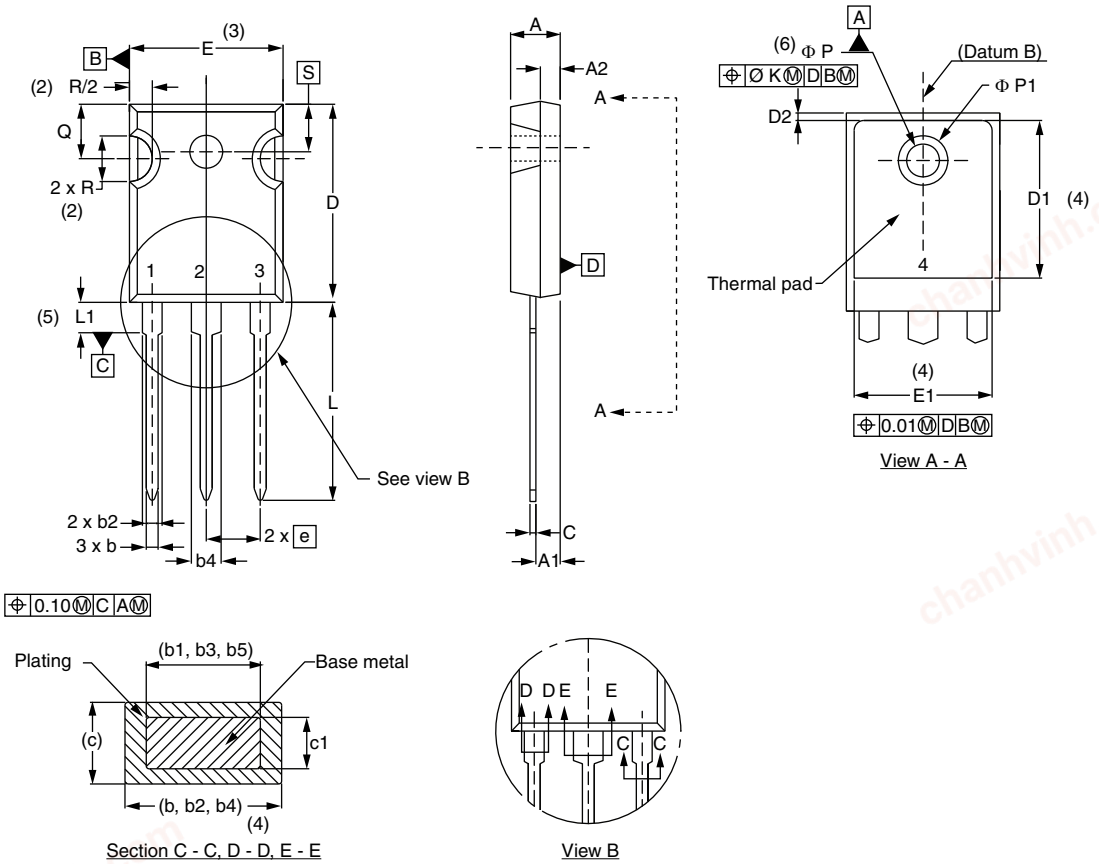

Fig. 6 - Typical Transient Thermal Impedance


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




| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|---|---|---|---|---|---|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.65 | 5.31 | 0.183 | 0.209 | |
| A1 | 2.21 | 2.59 | 0.087 | 0.102 | |
| A2 | 1.50 | 2.49 | 0.059 | 0.098 | |
| b | 0.99 | 1.40 | 0.039 | 0.055 | |
| b1 | 0.99 | 1.35 | 0.039 | 0.053 | |
| b2 | 1.65 | 2.39 | 0.065 | 0.094 | |
| b3 | 1.65 | 2.34 | 0.065 | 0.092 | |
| b4 | 2.59 | 3.43 | 0.102 | 0.135 | |
| b5 | 2.59 | 3.38 | 0.102 | 0.133 | |
| c | 0.38 | 0.89 | 0.015 | 0.035 | |
| c1 | 0.38 | 0.84 | 0.015 | 0.033 | |
| D | 19.71 | 20.70 | 0.776 | 0.815 | 3 |
| D1 | 13.08 | - | 0.515 | - | 4 |

| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|---|---|---|---|---|---|
| | MIN. | MAX. | MIN. | MAX. | |
| D2 | 0.51 | 1.30 | 0.020 | 0.051 | |
| E | 15.29 | 15.87 | 0.602 | 0.625 | 3 |
| E1 | 13.46 | - | 0.53 | - | |
| e | 5.46 BSC | | 0.215 BSC | | |
| Ø K | 0.254 | | 0.010 | | |
| L | 19.81 | 20.32 | 0.780 | 0.800 | |
| L1 | 3.71 | 4.29 | 0.146 | 0.169 | |
| Ø P | 3.56 | 3.66 | 0.14 | 0.144 | |
| Ø P1 | - | 6.98 | - | 0.275 | |
| Q | 5.31 | 5.69 | 0.209 | 0.224 | |
| R | 4.52 | 5.49 | 0.178 | 0.216 | |
| S | 5.51 BSC | | 0.217 BSC | | |

**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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