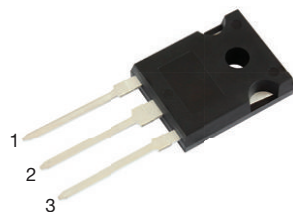




Dual Common Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



TO-247AD 3L

PIN 1 PIN 2
PIN 3 CASE

PRIMARY CHARACTERISTICS

| | |
|-----------------------|------------------------|
| $I_{F(AV)}$ | 40 A |
| V_{RRM} | 35 V, 45 V, 50 V, 60 V |
| I_{FSM} | 400 A |
| V_F | 0.55 V, 0.60 V |
| $T_J \text{ max.}$ | 175 °C |
| Package | TO-247AD 3L |
| Circuit configuration | Common cathode |

FEATURES

- Power pack
- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, or polarity protection application.

MECHANICAL DATA

Case: TO-247AD 3L

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - RoHS-compliant, halogen-free, commercial grade

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

M3 suffix meets JESD 201 class 1A whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER | SYMBOL | MBR40H35PT | MBR40H45PT | MBR40H50PT | MBR40H60PT | UNIT |
|---|--------------------|-------------|------------|------------|------------|------|
| Maximum repetitive peak reverse voltage | V _{RRM} | 35 | 45 | 50 | 60 | V |
| Maximum working peak reverse voltage | V _{RWM} | 35 | 45 | 50 | 60 | V |
| Maximum DC blocking voltage | V _{DC} | 35 | 45 | 50 | 60 | V |
| Maximum average forward rectified current (fig. 1) | I _{F(AV)} | 40 | | | | A |
| Non-repetitive avalanche energy per diode at 25 °C, I _{AS} = 4 A, L = 10 mH | E _{AS} | 80 | | | | mJ |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode | I _{FSM} | 400 | | | | A |
| Peak repetitive reverse surge current per diode (1) | I _{RRM} | 2.0 | | 1.0 | | A |
| Peak non-repetitive reverse energy (8/20 μs waveform) | E _{RSM} | 30 | | 25 | | mJ |
| Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ | V _C | 25 | | | | kV |
| Voltage rate of change at (rated V _R) | dV/dt | 10 000 | | | | V/μs |
| Operating junction temperature range | T _J | -65 to +175 | | | | °C |
| Storage temperature range | T _{STG} | -65 to +175 | | | | °C |

Note

⁽¹⁾ 2.0 μs pulse width, $f = 1.0\text{ kHz}$

**ELECTRICAL CHARACTERISTICS** ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | SYMBOL | MBR40H35PT MBR40H45PT | | MBR40H50PT MBR40H60PT | | UNIT |
|---|---------------------|---|--------|--------------------------|-----------|--------------------------|-----------|---------------------|
| | | | | TYP. | MAX. | TYP. | MAX. | |
| Maximum instantaneous forward voltage per diode ⁽¹⁾ | $I_F = 20\text{ A}$ | $T_J = 25\text{ }^{\circ}\text{C}$ | V_F | - | 0.63 | - | 0.69 | V |
| | $I_F = 20\text{ A}$ | $T_J = 125\text{ }^{\circ}\text{C}$ | | 0.49 | 0.55 | 0.56 | 0.60 | |
| | $I_F = 40\text{ A}$ | $T_J = 25\text{ }^{\circ}\text{C}$ | | - | 0.73 | - | 0.83 | |
| | $I_F = 40\text{ A}$ | $T_J = 125\text{ }^{\circ}\text{C}$ | | 0.62 | 0.66 | 0.68 | 0.72 | |
| Maximum reverse current at rated V_R per diode ⁽²⁾ | | $T_J = 25\text{ }^{\circ}\text{C}$ $T_J = 125\text{ }^{\circ}\text{C}$ | I_R | - 9.0 | 150 25 | - 6.0 | 150 25 | μA mA |

Notes⁽¹⁾ Pulse test: 300 μs pulse width, 1 % duty cycle⁽²⁾ Pulse test: Pulse width $\leq 40\text{ ms}$ **THERMAL CHARACTERISTICS**

| PARAMETER | SYMBOL | MBR40H35PT | MBR40H45PT | MBR40H50PT | MBR40H60PT | UNIT |
|--|-----------------|------------|------------|------------|------------|----------------------|
| Thermal resistance, junction to case per diode | $R_{\theta JC}$ | 1.2 | | | | $^{\circ}\text{C/W}$ |

ORDERING INFORMATION (Example)

| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|-------------|-----------------|-----------------|--------------|---------------|---------------|
| TO-247AD 3L | MBR40H45PT-M3/P | 5.83 | P | 25/tube | Tube |



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

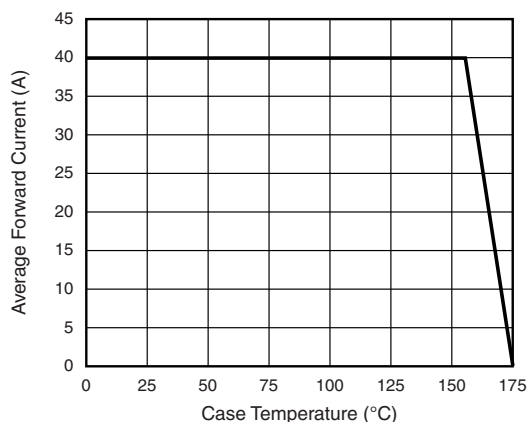


Fig. 1 - Forward Current Derating Curve

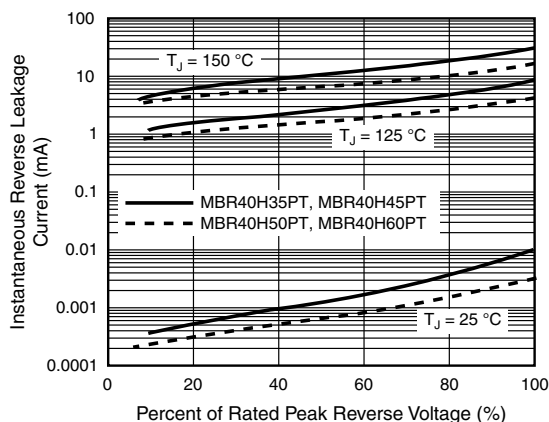


Fig. 4 - Typical Reverse Characteristics Per Diode

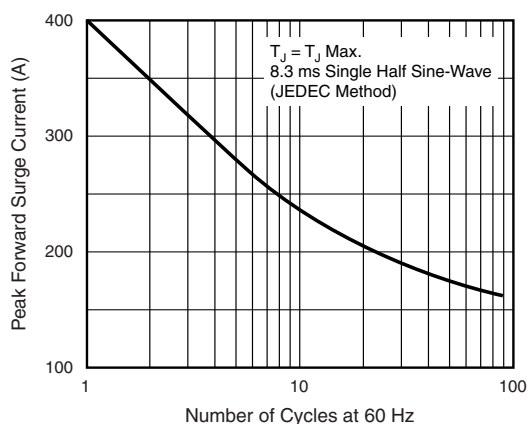


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode

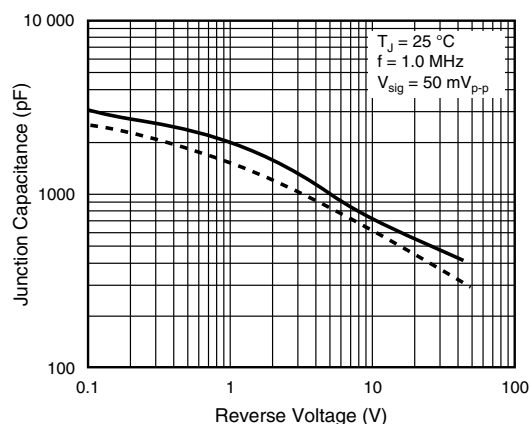


Fig. 5 - Typical Junction Capacitance Per Diode

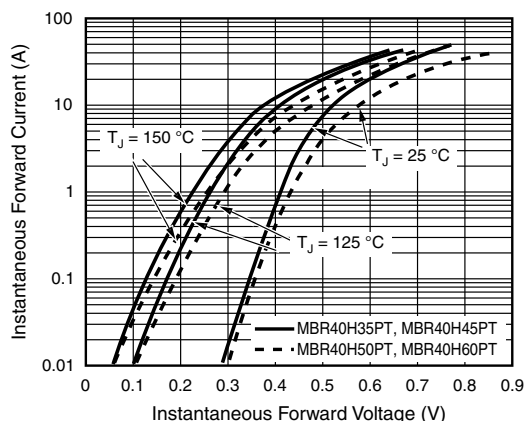


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

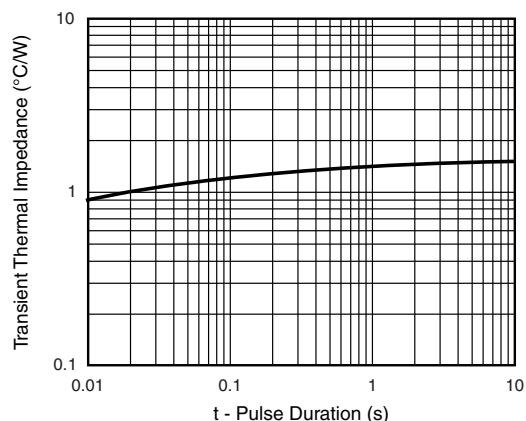
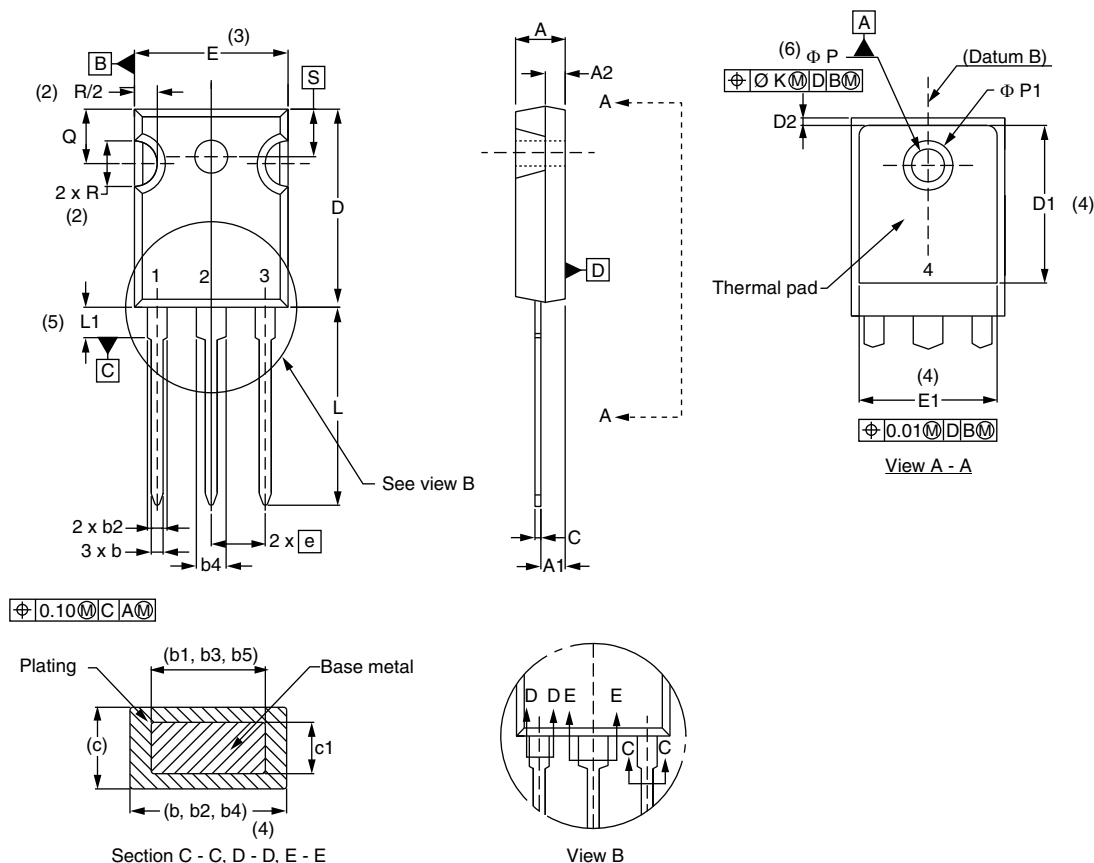


Fig. 6 - Typical Transient Thermal Impedance Per Diode



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

- Dimensioning and tolerancing per ASME Y14.5M-1994
- Contour of slot optional
- Dimension D and E do not include mold flash. These dimensions are measured at the outermost extremes of the plastic body
- Thermal pad contour optional with dimensions D1 and E1
- Lead finish uncontrolled in L1
- 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")
- 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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