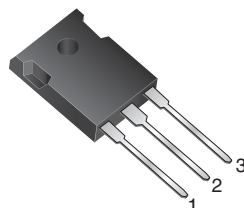




## Dual Common Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



TO-247AD (TO-3P)



### 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               |
| Diode variations   | 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](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT

### 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 (TO-3P)

Epoxy meets UL 94 V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, 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 <sub>RRM</sub>   | 35          | 45         | 50         | 60         | V    |
| Maximum working peak reverse voltage                                                          | V <sub>RWM</sub>   | 35          | 45         | 50         | 60         | V    |
| Maximum DC blocking voltage                                                                   | V <sub>DC</sub>    | 35          | 45         | 50         | 60         | V    |
| Maximum average forward rectified current (fig. 1)                                            | I <sub>F(AV)</sub> | 40          |            |            |            | A    |
| Non-repetitive avalanche energy per diode at 25 °C, I <sub>AS</sub> = 4 A, L = 10 mH          | E <sub>AS</sub>    | 80          |            |            |            | mJ   |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode | I <sub>FSM</sub>   | 400         |            |            |            | A    |
| Peak repetitive reverse surge current per diode (1)                                           | I <sub>RRM</sub>   | 2.0         |            | 1.0        |            | A    |
| Peak non-repetitive reverse energy (8/20 μs waveform)                                         | E <sub>RSM</sub>   | 30          |            | 25         |            | mJ   |
| Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ            | V <sub>C</sub>     | 25          |            |            |            | kV   |
| Voltage rate of change at (rated V <sub>R</sub> )                                             | dV/dt              | 10 000      |            |            |            | V/μs |
| Operating junction temperature range                                                          | T <sub>J</sub>     | -65 to +175 |            |            |            | °C   |
| Storage temperature range                                                                     | T <sub>STG</sub>   | -65 to +175 |            |            |            | °C   |

#### Note

<sup>(1)</sup> 2.0  $\mu\text{s}$  pulse width,  $f = 1.0\text{ kHz}$

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

| PARAMETER                                                       | TEST CONDITIONS     |                                                                           | SYMBOL | MBR40H35PT<br>MBR40H45PT |           | MBR40H50PT<br>MBR40H60PT |           | UNIT                |
|-----------------------------------------------------------------|---------------------|---------------------------------------------------------------------------|--------|--------------------------|-----------|--------------------------|-----------|---------------------|
|                                                                 |                     |                                                                           |        | TYP.                     | MAX.      | TYP.                     | MAX.      |                     |
| Maximum instantaneous forward voltage per diode <sup>(1)</sup>  | $I_F = 20\text{ A}$ | $T_J = 25\text{ }^{\circ}\text{C}$                                        | $V_F$  | -                        | 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 <sup>(2)</sup> |                     | $T_J = 25\text{ }^{\circ}\text{C}$<br>$T_J = 125\text{ }^{\circ}\text{C}$ | $I_R$  | -<br>9.0                 | 150<br>25 | -<br>6.0                 | 150<br>25 | $\mu\text{A}$<br>mA |

**Notes**<sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle<sup>(2)</sup> 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 | MBR40H45PT-E3/45 | 6.13            | 45           | 30/tube       | Tube          |

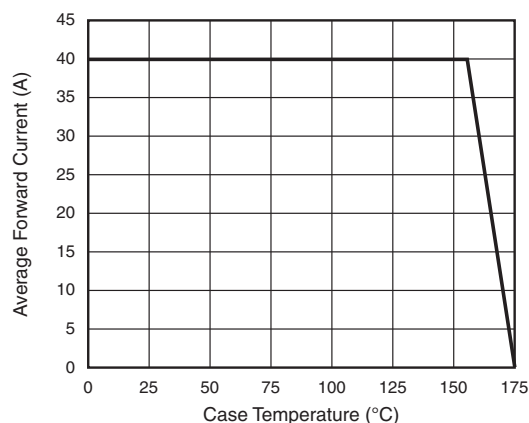
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

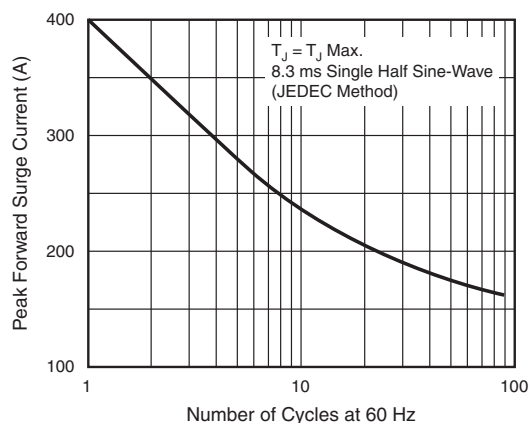


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode

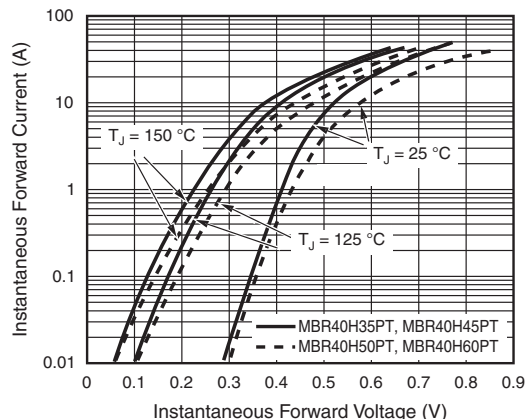


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

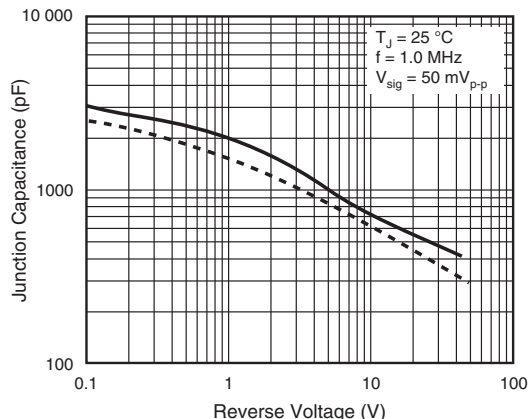


Fig. 5 - Typical Junction Capacitance Per Diode

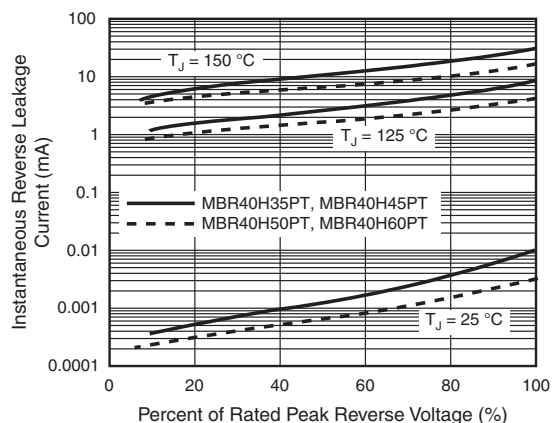


Fig. 4 - Typical Reverse Characteristics Per Diode

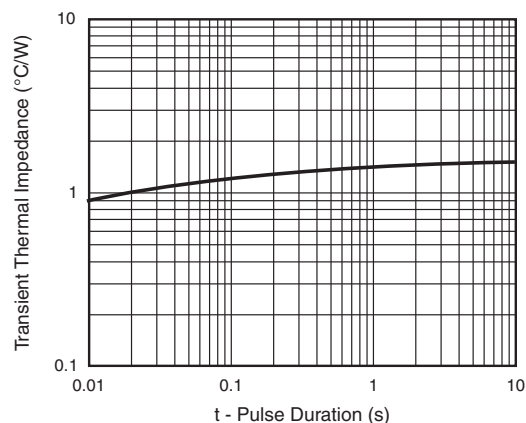
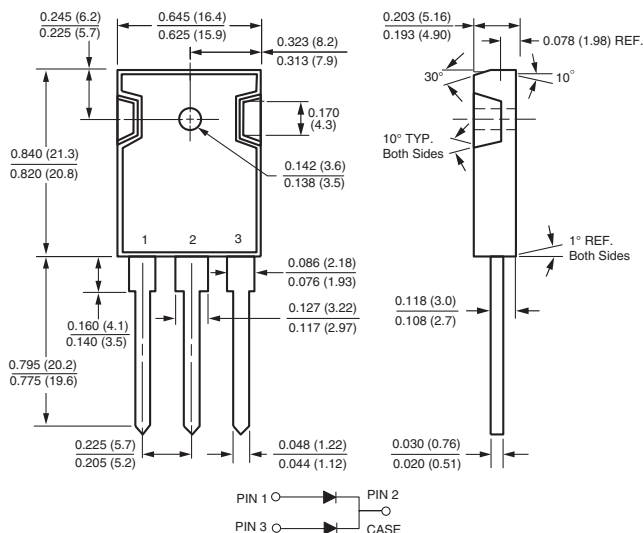


Fig. 6 - Typical Transient Thermal Impedance Per Diode

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-247AD (TO-3P)





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