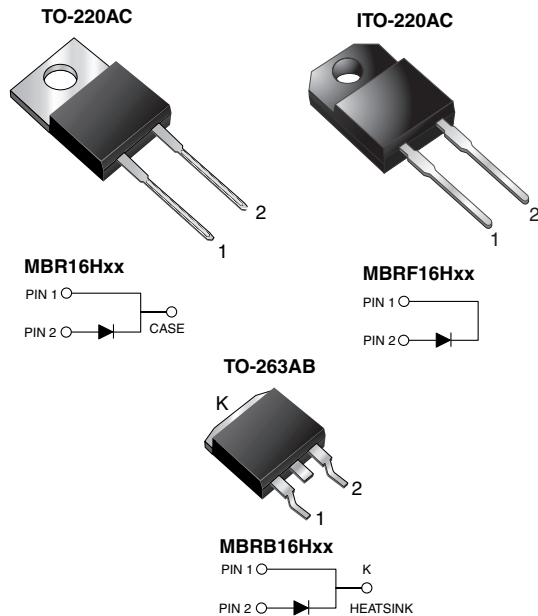


Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Power pack
- Guardring for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AC and ITO-220AC package)
- AEC-Q101 qualified available
 - Automotive ordering code: base P/NHE3_A
- Material categorization: for definitions of compliance please see 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, and polarity protection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Molding compound meets UL 94 V-0 flammability rating
 Base P/N-E3 - RoHS-compliant, commercial grade
 Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified
 Base P/NHE3_X - RoHS-compliant, AEC-Q101 qualified
 ("X" denotes revision code, e.g. A, B, ...)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
 E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

| PRIMARY CHARACTERISTICS | |
|-------------------------|-------------------------------|
| $I_{F(AV)}$ | 16 A |
| V_{RRM} | 35 V to 60 V |
| I_{FSM} | 150 A |
| V_F | 0.56 V, 0.62 V |
| I_R | 100 μ A |
| T_J max. | 175 °C |
| Package | TO-220AC, ITO-220AC, TO-263AB |
| Diode variations | Single die |

| MAXIMUM RATINGS ($T_C = 25$ °C unless otherwise noted) | | | | | |
|---|----------------|-------------|----------|----------|------------|
| PARAMETER | SYMBOL | MBR16H35 | MBR16H45 | MBR16H60 | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 35 | 45 | 60 | V |
| Working peak reverse voltage | V_{RWM} | 35 | 45 | 60 | |
| Maximum DC blocking voltage | V_{DC} | 35 | 45 | 60 | |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 16 | | | A |
| Non-repetitive avalanche energy 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 | I_{FSM} | 150 | | | A |
| Peak repetitive reverse surge current at $t_p = 2.0$ μ s, 1 kHz | I_{RRM} | 1.0 | 0.5 | | |
| Peak non-repetitive reverse energy (8/20 μ s waveform) | E_{RSM} | 20 | | | mJ |
| Electrostatic discharge capacitor voltage Human body model: $C = 100$ pF, $R = 1.5$ k Ω | V_C | 25 | | | kV |
| Voltage rate of change (rated V_R) | dV/dt | 10 000 | | | V/ μ s |
| Operating junction and storage temperature range | T_J, T_{STG} | -65 to +175 | | | °C |
| Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1$ min | V_{AC} | 1500 | | | V |



| ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | | | |
|--|----------------------|---------------------|-----------------------------------|----------------------|------|----------|------|---------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | MBR16H35 MBR16H45 | | MBR16H60 | | UNIT |
| | | | | TYP. | MAX. | TYP. | MAX. | |
| Maximum instantaneous forward voltage | V_F ⁽¹⁾ | $I_F = 16\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | - | 0.66 | - | 0.73 | V |
| | | $I_F = 16\text{ A}$ | $T_J = 125\text{ }^\circ\text{C}$ | 0.52 | 0.56 | 0.58 | 0.62 | |
| Maximum reverse current | I_R ⁽²⁾ | Rated V_R | $T_J = 25\text{ }^\circ\text{C}$ | - | 100 | - | 100 | μA |
| | | | $T_J = 125\text{ }^\circ\text{C}$ | 6.0 | 20 | 4.0 | 20 | mA |

Notes

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

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | |
|---|-----------------|-----|------|------|--------------------|
| PARAMETER | SYMBOL | MBR | MBRF | MBRB | UNIT |
| Typical thermal resistance, junction to case | $R_{\theta JC}$ | 1.5 | 3.0 | 1.5 | $^\circ\text{C/W}$ |

| ORDERING INFORMATION (Example) | | | | | |
|---------------------------------------|---------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC | MBR16H45-E3/45 | 1.80 | 45 | 50/tube | Tube |
| ITO-220AC | MBRF16H45-E3/45 | 1.94 | 45 | 50/tube | Tube |
| TO-263AB | MBRB16H45-E3/45 | 1.33 | 45 | 50/tube | Tube |
| TO-263AB | MBRB16H45-E3/81 | 1.33 | 81 | 800/reel | Tape and reel |
| TO-220AC | MBR16H45HE3/45 ⁽¹⁾ | 1.80 | 45 | 50/tube | Tube |
| ITO-220AC | MBRF16H45HE3/45 ⁽¹⁾ | 1.94 | 45 | 50/tube | Tube |
| TO-263AB | MBRB16H45HE3/45 ⁽¹⁾ | 1.33 | 45 | 50/tube | Tube |
| TO-263AB | MBRB16H45HE3/81 ⁽¹⁾ | 1.33 | 81 | 800/reel | Tape and reel |
| TO-263AB | MBRB16H45HE3_A/P ⁽¹⁾ | 1.33 | P | 50/tube | Tube |
| TO-263AB | MBRB16H45HE3_A/I ⁽¹⁾ | 1.33 | I | 800/reel | Tape and reel |

Note

- (1) AEC-Q101 qualified



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

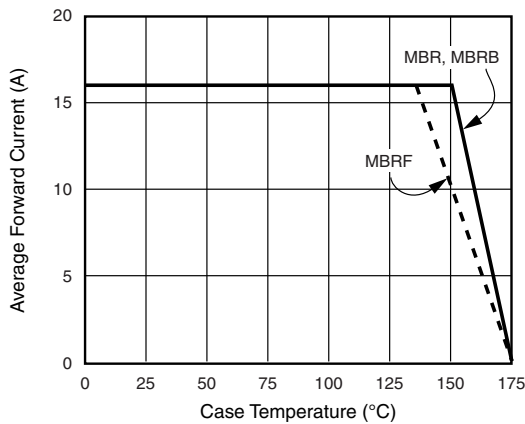


Fig. 1 - Forward Current Derating Curve

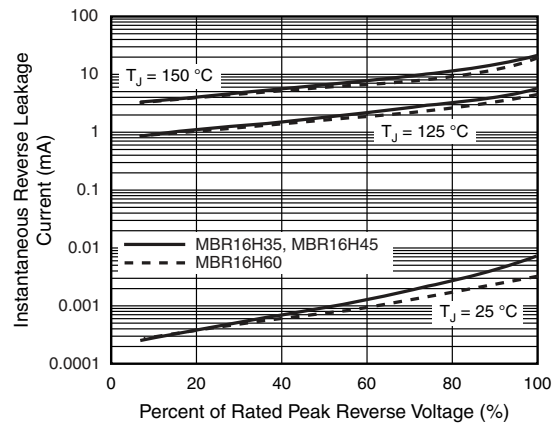


Fig. 4 - Typical Reverse Characteristics

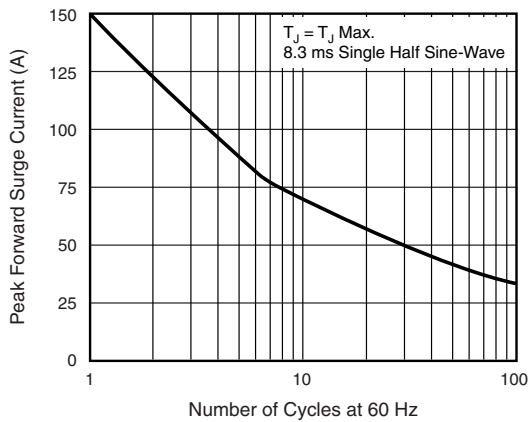


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

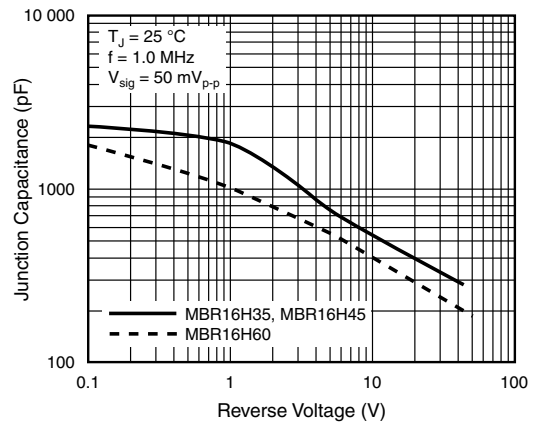


Fig. 5 - Typical Junction Capacitance

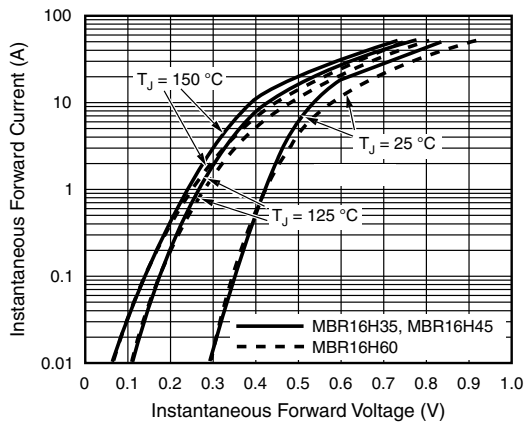


Fig. 3 - Typical Instantaneous Forward Characteristics

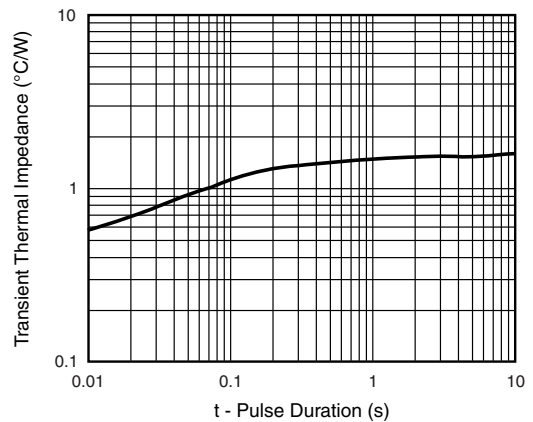
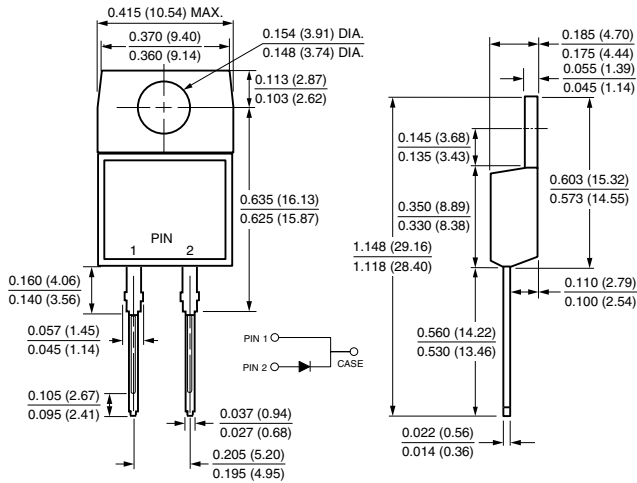


Fig. 6 - Typical Transient Thermal Impedance

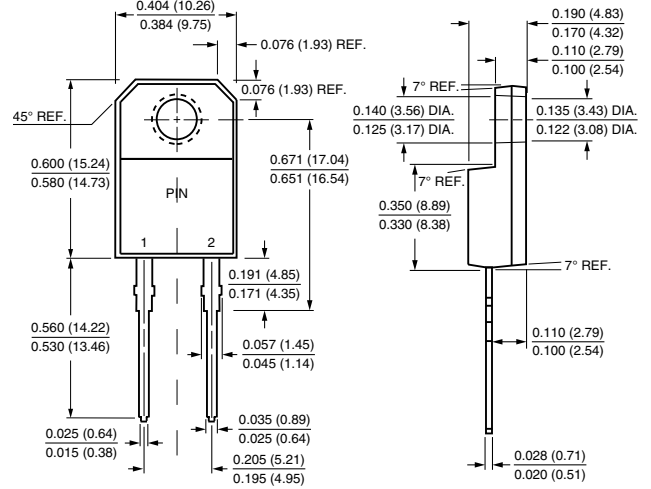
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



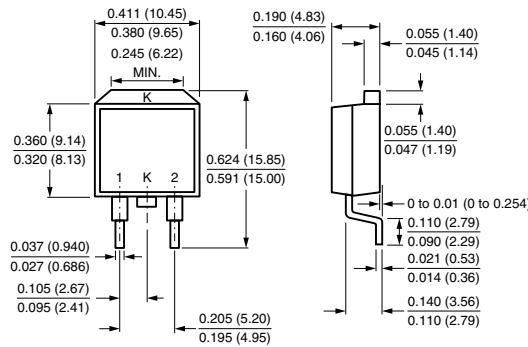
TO-220AC



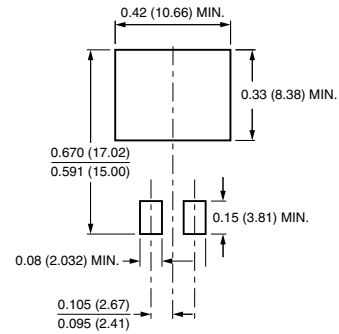
ITO-220AC



TO-263AB



Mounting Pad Layout





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