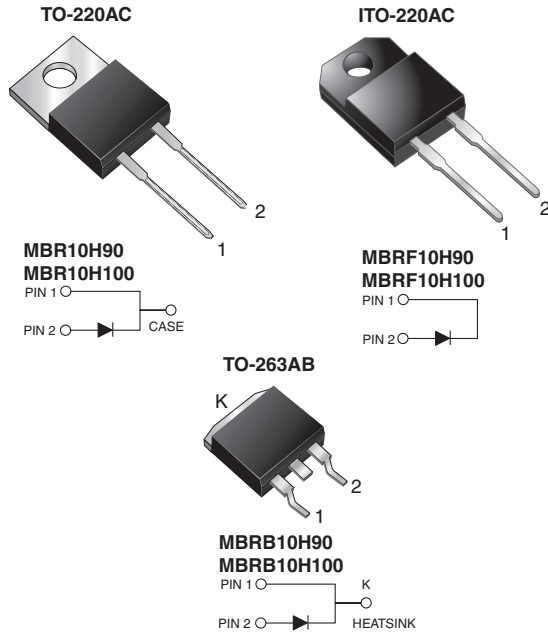


# High Voltage Schottky Rectifier

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
- 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 high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, or polarity protection application.

## PRIMARY CHARACTERISTICS

|                  |                               |
|------------------|-------------------------------|
| $I_{F(AV)}$      | 10 A                          |
| $V_{RRM}$        | 90 V to 100 V                 |
| $I_{FSM}$        | 250 A                         |
| $V_F$            | 0.64 V                        |
| $I_R$            | 4.5 $\mu$ A                   |
| $T_J$ max.       | 175 °C                        |
| Package          | TO-220AC, ITO-220AC, TO-263AB |
| Diode variations | Single                        |

## 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

**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

## MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)

| PARAMETER  | SYMBOL         | MBR10H90    | MBR10H100 | UNIT       |
|--|----------------|-------------|-----------|------------|
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      | 90          | 100       | V          |
| Working peak reverse voltage   | $V_{RWM}$      | 90          | 100       |            |
| Maximum DC blocking voltage  | $V_{DC}$       | 90          | 100       |            |
| Maximum average forward rectified current  | $I_{F(AV)}$    | 10          |           | A          |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 250         |           |            |
| Peak repetitive reverse current at $t_p = 2.0$ $\mu$ s, 1 kHz                      | $I_{RRM}$      | 0.5         |           |            |
| Voltage rate of change (rated $V_F$ )  | dV/dt          | 10 000      |           | V/ $\mu$ 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 <sub>C</sub> = 25 °C unless otherwise noted) |                               |                       |                         |       |      |
|--|-------------------------------|-----------------------|-------------------------|-------|------|
| PARAMETER  | SYMBOL                        | TEST CONDITIONS       |                         | VALUE | UNIT |
| Maximum instantaneous forward voltage                                      | V <sub>F</sub> <sup>(1)</sup> | I <sub>F</sub> = 10 A | T <sub>C</sub> = 25 °C  | 0.77  | V    |
|  |                               | I <sub>F</sub> = 10 A | T <sub>C</sub> = 125 °C | 0.64  |      |
|  |                               | I <sub>F</sub> = 20 A | T <sub>C</sub> = 25 °C  | 0.88  |      |
|  |                               | I <sub>F</sub> = 20 A | T <sub>C</sub> = 125 °C | 0.73  |      |
| Maximum reverse current  | I <sub>R</sub> <sup>(2)</sup> | Rated V <sub>R</sub>  | T <sub>J</sub> = 25 °C  | 4.5   | μA   |
|  |                               |                       | T <sub>J</sub> = 125 °C | 6.0   | mA   |

Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted) |                  |     |      |      |      |
|---|------------------|-----|------|------|------|
| PARAMETER   | SYMBOL           | MBR | MBRF | MBRB | UNIT |
| Typical thermal resistance  | R <sub>θJC</sub> | 2.7 | 5.8  | 2.7  | °C/W |

| ORDERING INFORMATION (Example) |                                 |                 |              |               |               |
|--------------------------------|---------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N                   | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC                       | MBR10H100-E3/45                 | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                      | MBRF10H100-E3/45                | 1.94            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB10H100-E3/45                | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB10H100-E3/81                | 1.33            | 81           | 800/reel      | Tape and reel |
| TO-220AC                       | MBR10H100HE3/45 <sup>(1)</sup>  | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                      | MBRF10H100HE3/45 <sup>(1)</sup> | 1.94            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB10H100HE3/45 <sup>(1)</sup> | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB10H100HE3/81 <sup>(1)</sup> | 1.33            | 81           | 800/reel      | Tape and reel |

Note

(1) AEC-Q101 qualified



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

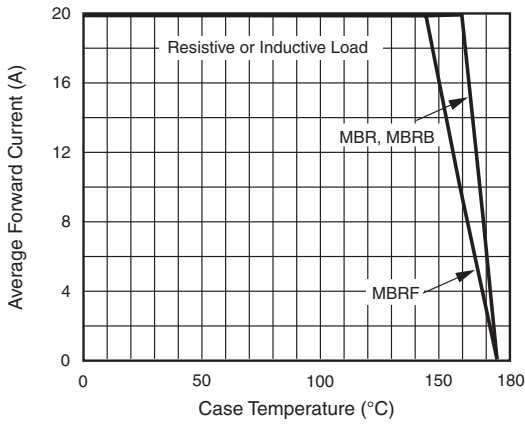


Fig. 1 - Forward Current Derating Curve

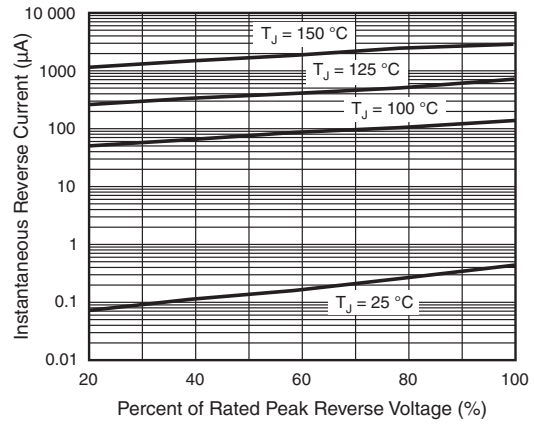


Fig. 4 - Typical Reverse Characteristics

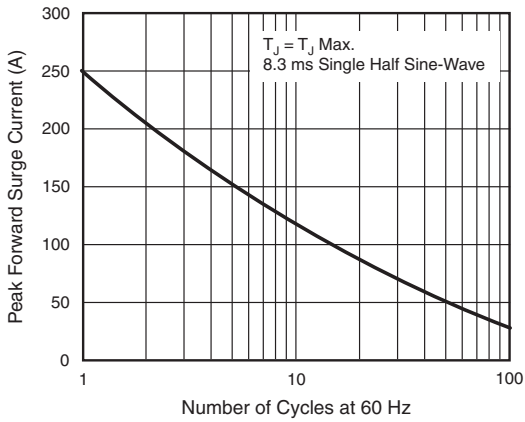


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

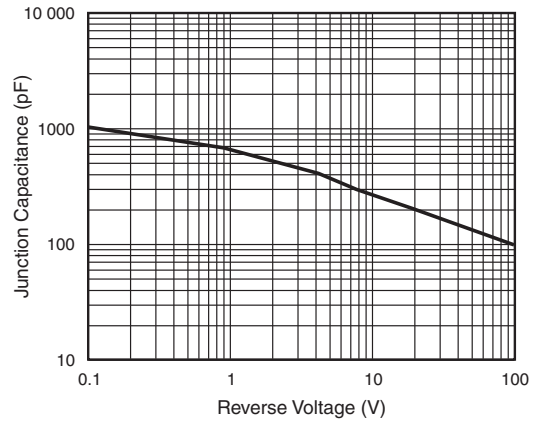


Fig. 5 - Typical Junction Capacitance

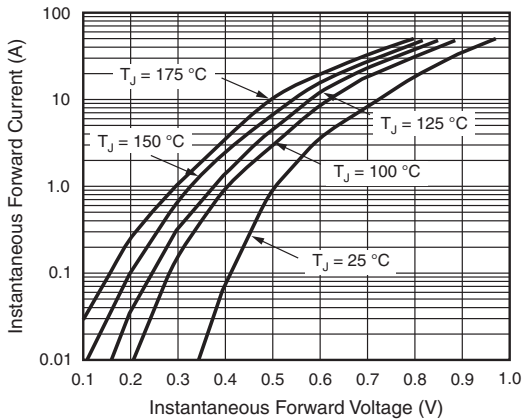


Fig. 3 - Typical Instantaneous Forward Characteristics

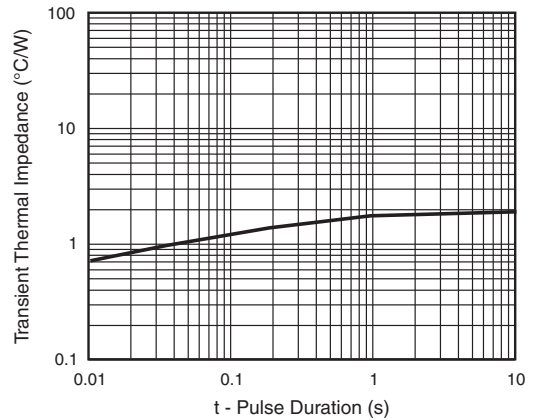
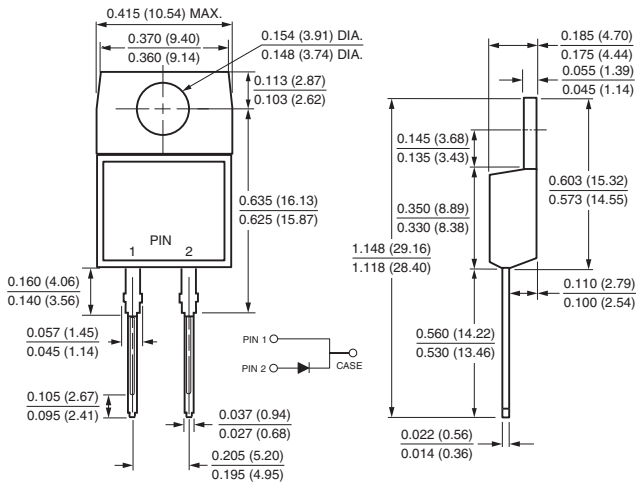


Fig. 6 - Typical Transient Thermal Impedance

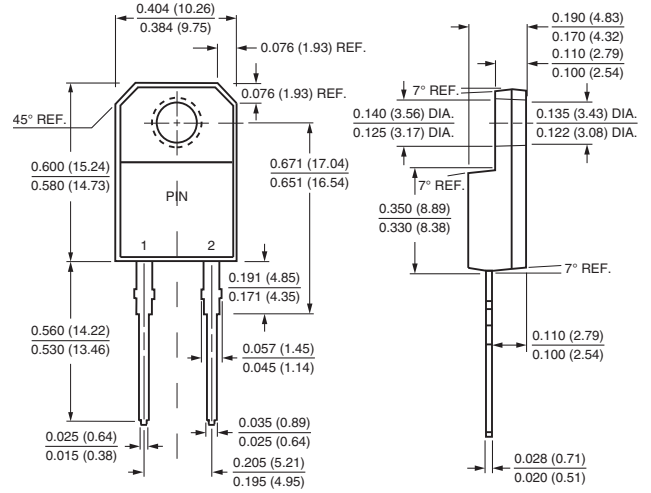


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

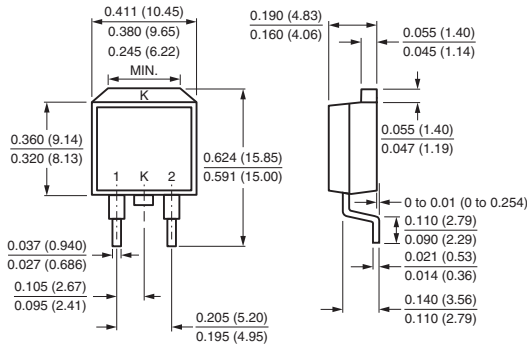
#### TO-220AC



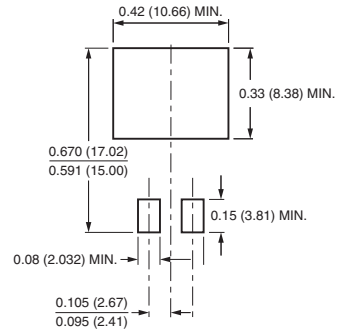
#### ITO-220AC



#### TO-263AB



#### Mounting Pad Layout





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