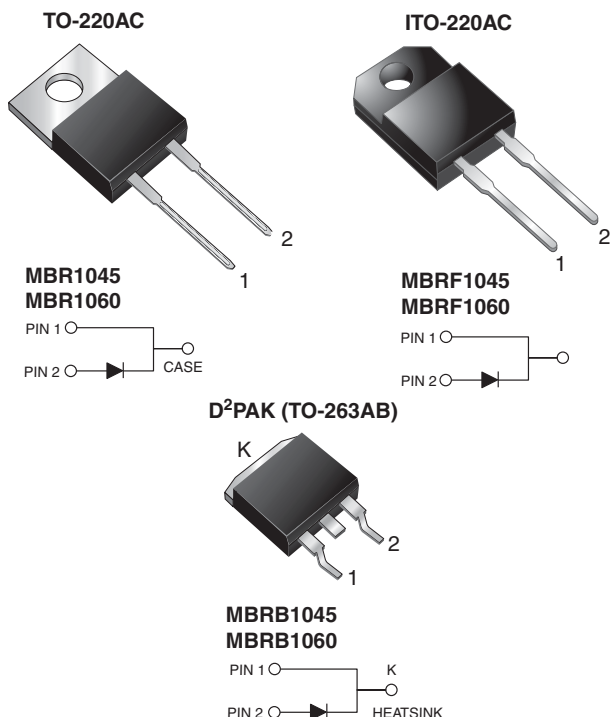


## Schottky Barrier Rectifier


**RoHS**  
COMPLIANT

### FEATURES

- Power pack
- Low power loss, high efficiency
- Low forward voltage drop
- 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 (for ITO-220AC and D²PAK (TO-263AB) package)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### 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, D²PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant, commercial grade  
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

### DESIGN SUPPORT TOOLS

[click logo to get started](#)

**3D**  
Models  
Available

### PRIMARY CHARACTERISTICS

|                       |                                       |
|-----------------------|---------------------------------------|
| $I_{F(AV)}$           | 10 A                                  |
| $V_{RRM}$             | 45 V, 60 V                            |
| $I_{FSM}$             | 150 A                                 |
| $V_F$                 | 0.57 V, 0.70 V                        |
| $T_J \text{ max.}$    | 150 °C                                |
| Package               | TO-220AC, ITO-220AC, D²PAK (TO-263AB) |
| Circuit configuration | Single                                |

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

| PARAMETER                                                                          | SYMBOL             | MBR1045     | MBR1060 | UNIT |
|------------------------------------------------------------------------------------|--------------------|-------------|---------|------|
| Maximum repetitive peak reverse voltage                                            | V <sub>RRM</sub>   | 45          | 60      | V    |
| Maximum average forward rectified current (fig. 1)                                 | I <sub>F(AV)</sub> | 10          |         | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I <sub>FSM</sub>   | 150         |         | A    |
| Peak repetitive reverse current at t <sub>p</sub> = 2.0 μs, 1 kHz                  | I <sub>RRM</sub>   | 1.0         | 0.5     |      |
| Voltage rate of change (rated V <sub>R</sub> )                                     | dV/dt              | 10 000      |         | V/μs |
| Operating junction and storage temperature range                                   | T <sub>J</sub>     | -65 to +150 |         | °C   |
|                                                                                    | T <sub>STG</sub>   | -65 to +175 |         |      |
| Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min             | V <sub>AC</sub>    | 1500        |         | V    |



| ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted) |                               |                       |                         |         |         |      |
|----------------------------------------------------------------------------|-------------------------------|-----------------------|-------------------------|---------|---------|------|
| PARAMETER                                                                  | SYMBOL                        | TEST CONDITIONS       |                         | MBR1045 | MBR1060 | UNIT |
| Maximum instantaneous forward voltage                                      | V <sub>F</sub> <sup>(1)</sup> | I <sub>F</sub> = 10 A | T <sub>J</sub> = 25 °C  | -       | 0.80    | V    |
|                                                                            |                               | I <sub>F</sub> = 10 A | T <sub>J</sub> = 125 °C | 0.57    | 0.70    |      |
|                                                                            |                               | I <sub>F</sub> = 20 A | T <sub>J</sub> = 25 °C  | 0.84    | 0.95    |      |
|                                                                            |                               | I <sub>F</sub> = 20 A | T <sub>J</sub> = 125 °C | 0.72    | 0.85    |      |
| Maximum instantaneous reverse current at DC blocking voltage               | I <sub>R</sub> <sup>(2)</sup> | Rated V <sub>R</sub>  | T <sub>J</sub> = 25 °C  | 0.10    |         | mA   |
|                                                                            |                               |                       | T <sub>J</sub> = 125 °C | 15      |         |      |

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

| <b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |     |      |      |                      |
|---------------------------------------------------------------------------------------------|-----------------|-----|------|------|----------------------|
| PARAMETER                                                                                   | SYMBOL          | MBR | MBRF | MBRB | UNIT                 |
| Typical thermal resistance from junction to case                                            | $R_{\theta JC}$ | 2.0 | 4.0  | 2.0  | $^{\circ}\text{C/W}$ |

| <b>ORDERING INFORMATION</b> (Example) |                                |                 |              |               |               |
|---------------------------------------|--------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N                  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC                              | MBR1045-E3/45                  | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                             | MBRF1045-E3/45                 | 1.94            | 45           | 50/tube       | Tube          |
| TO-263AB                              | MBRB1045-E3/45                 | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                              | MBRB1045-E3/81                 | 1.33            | 81           | 800/reel      | Tape and reel |
| ITO-220AC                             | MBRF1045HE3_A/P <sup>(1)</sup> | 1.94            | P            | 50/tube       | Tube          |
| TO-263AB                              | MBRB1045HE3_B/P <sup>(1)</sup> | 1.33            | P            | 50/tube       | Tube          |
| TO-263AB                              | MBRB1045HE3_B/I <sup>(1)</sup> | 1.33            | I            | 800/reel      | Tape and reel |

**Note**(1) AEC-Q101 qualified, available in ITO-220AC and D<sup>2</sup>PAK (TO-263AB) package



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

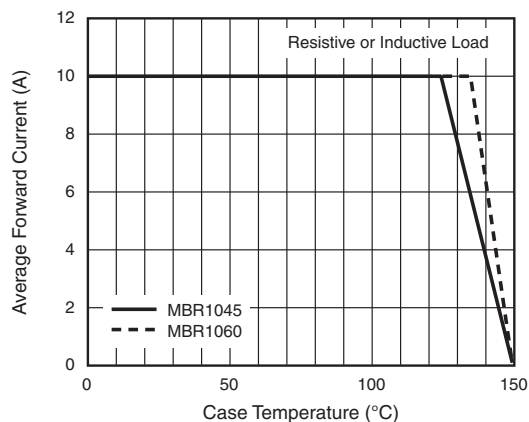


Fig. 1 - Forward Current Derating Curve

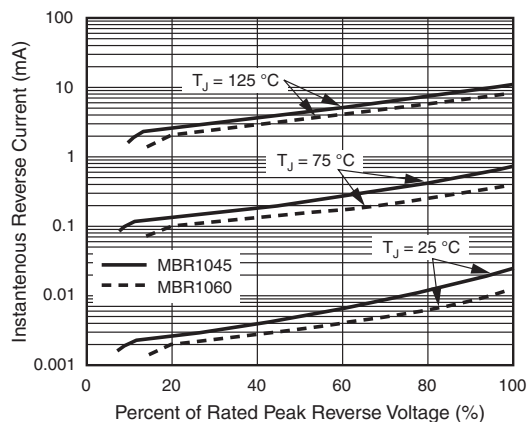


Fig. 4 - Typical Reverse Characteristics

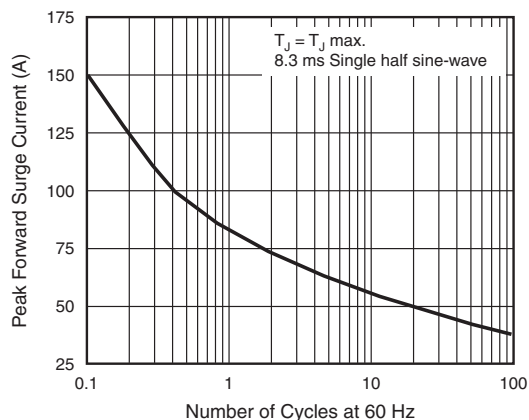


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

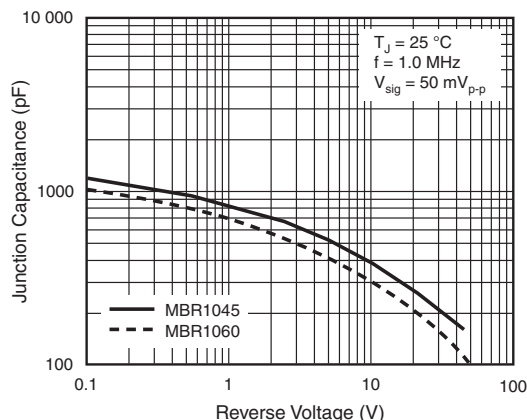


Fig. 5 - Typical Junction Capacitance

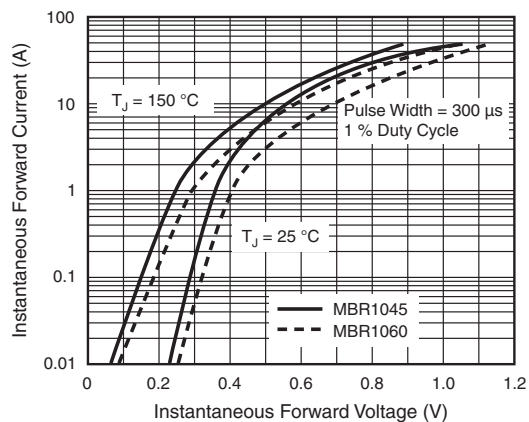


Fig. 3 - Typical Instantaneous Forward Characteristics

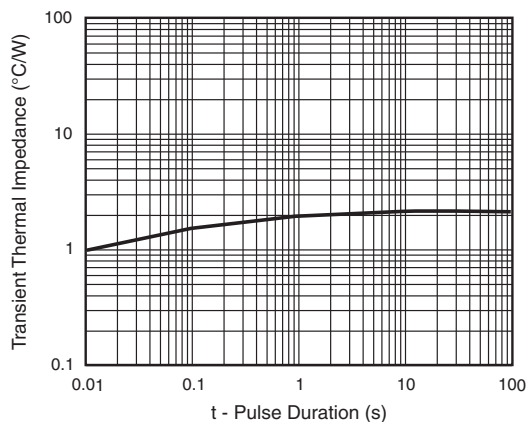
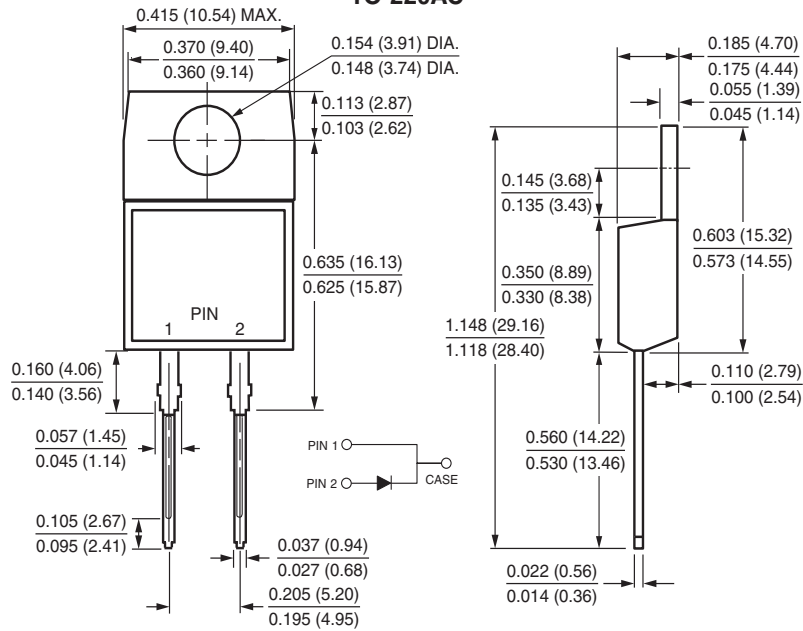


Fig. 6 - Typical Transient Thermal Impedance

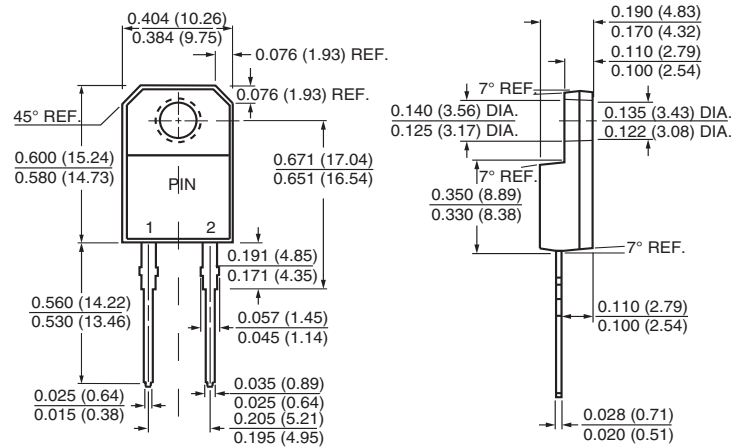


## PACKAGE OUTLINE DIMENSIONS in inches (millimeter)

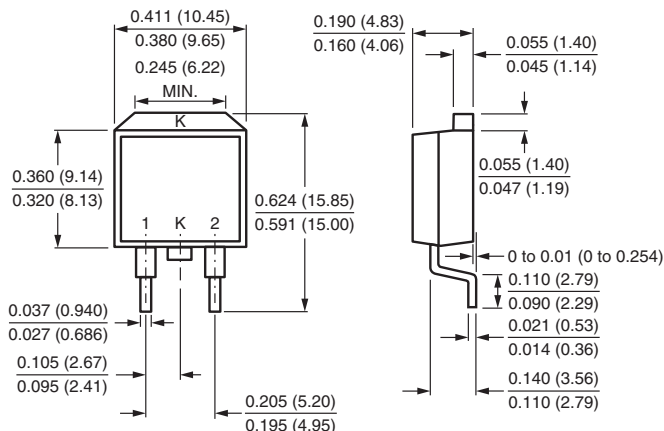
### TO-220AC



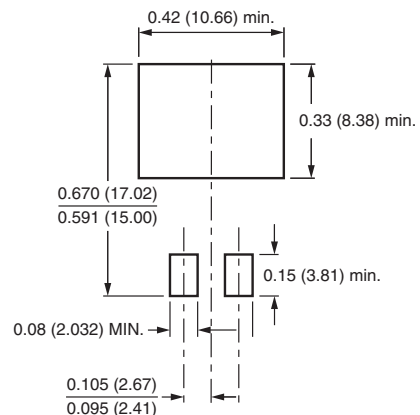
### ITO-220AC



### D<sup>2</sup>PAK (TO-263AB)



### Mounting Pad Layout





## Disclaimer

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