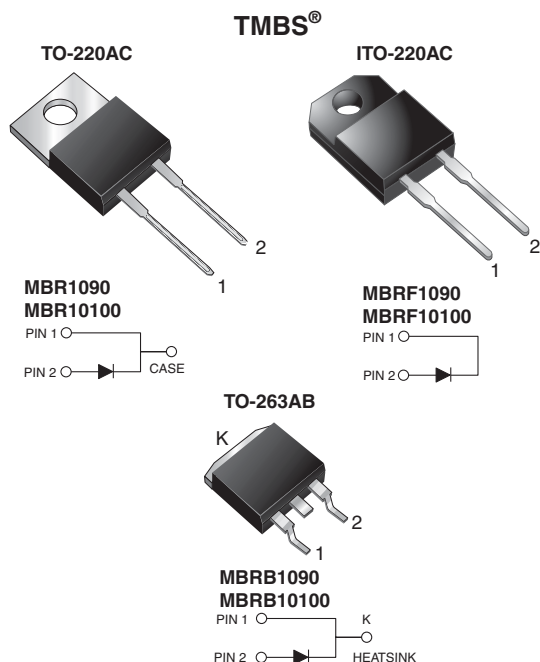




## High Voltage Trench MOS Barrier Schottky Rectifier



## PRIMARY CHARACTERISTICS

|                    |                                  |
|--------------------|----------------------------------|
| $I_{F(AV)}$        | 10 A                             |
| $V_{RRM}$          | 90 V, 100 V                      |
| $I_{FSM}$          | 150 A                            |
| $V_F$              | 0.65 V                           |
| $T_J \text{ max.}$ | 150 °C                           |
| Package            | TO-220AC, ITO-220AC,<br>TO-263AB |
| Diode variations   | Single die                       |

## FEATURES

- Trench MOS Schottky technology
- Lower power losses, 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)
- 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.

## 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

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

E3 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         | MBR1090     | MBR10100 | UNIT             |
|-------------------------------------------------------------------------------------------------------------------------|----------------|-------------|----------|------------------|
| Maximum repetitive peak reverse voltage                                                                                 | $V_{RRM}$      | 90          | 100      | V                |
| Working peak reverse voltage                                                                                            | $V_{RWM}$      | 90          | 100      | V                |
| Maximum DC blocking voltage                                                                                             | $V_{DC}$       | 90          | 100      | V                |
| Maximum average forward rectified current at $T_C = 133\text{ °C}$                                                      | $I_{F(AV)}$    | 10          |          | A                |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load                                      | $I_{FSM}$      | 150         |          | A                |
| Non-repetitive avalanche energy at $T_J = 25\text{ °C}$ , $L = 60\text{ mH}$                                            | $E_{AS}$       | 130         |          | mJ               |
| Peak repetitive reverse current at $t_p = 2\text{ }\mu\text{s}$ , 1 kHz, $T_J = 38\text{ °C} \pm 2\text{ °C}$ per diode | $I_{RRM}$      | 0.5         |          | A                |
| Voltage rate of change (rated $V_F$ )                                                                                   | $dV/dt$        | 10 000      |          | V/ $\mu\text{s}$ |
| Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1\text{ min}$                                         | $V_{AC}$       | 1500        |          | V                |
| Operating junction and storage temperature range                                                                        | $T_J, T_{STG}$ | -65 to +150 |          | °C               |

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

| PARAMETER                                                   | TEST CONDITIONS     |                                     | SYMBOL      | MAX. | UNIT          |
|-------------------------------------------------------------|---------------------|-------------------------------------|-------------|------|---------------|
| Maximum instantaneous forward voltage                       | $I_F = 10\text{ A}$ | $T_C = 25\text{ }^{\circ}\text{C}$  | $V_F^{(1)}$ | 0.80 | V             |
|                                                             | $I_F = 10\text{ A}$ | $T_C = 125\text{ }^{\circ}\text{C}$ |             | 0.65 |               |
|                                                             | $I_F = 20\text{ A}$ | $T_C = 125\text{ }^{\circ}\text{C}$ |             | 0.75 |               |
| Maximum reverse current per at working peak reverse voltage |                     | $T_J = 25\text{ }^{\circ}\text{C}$  | $I_R^{(2)}$ | 100  | $\mu\text{A}$ |
|                                                             |                     | $T_J = 125\text{ }^{\circ}\text{C}$ |             | 6.0  | mA            |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  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 | $R_{\theta JA}$ | 60  | -    | 60   | $^{\circ}\text{C/W}$ |
|                            | $R_{\theta JC}$ | 2.0 | 3.5  | 2.0  |                      |

**ORDERING INFORMATION** (Example)

| PACKAGE   | PREFERRED P/N     | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|-----------|-------------------|-----------------|--------------|---------------|---------------|
| TO-220AC  | MBR10100CT-E3/4W  | 1.845           | 4W           | 50/tube       | Tube          |
| ITO-220AC | MBRF10100CT-E3/4W | 1.661           | 4W           | 50/tube       | Tube          |
| TO-263AB  | MBRB10100CT-E3/4W | 1.384           | 4W           | 50/tube       | Tube          |
| TO-263AB  | MBRB10100CT-E3/8W | 1.384           | 8W           | 800/reel      | Tape and reel |

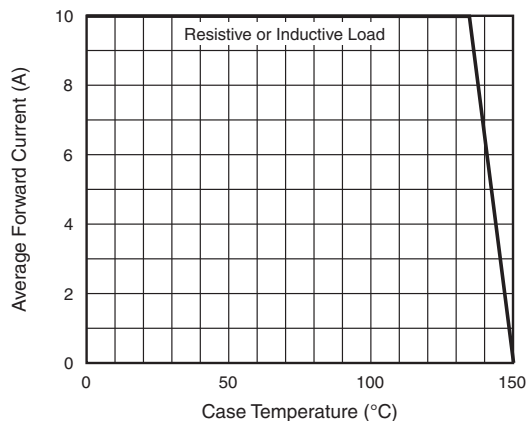
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

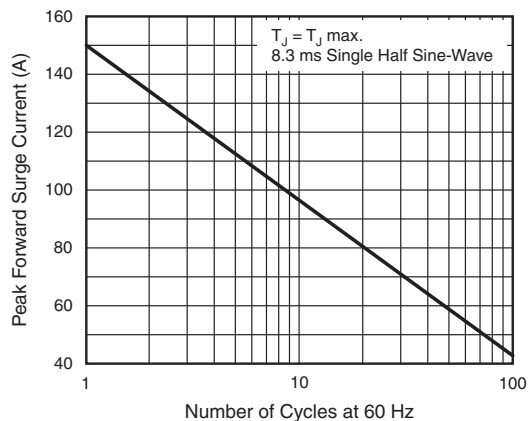


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

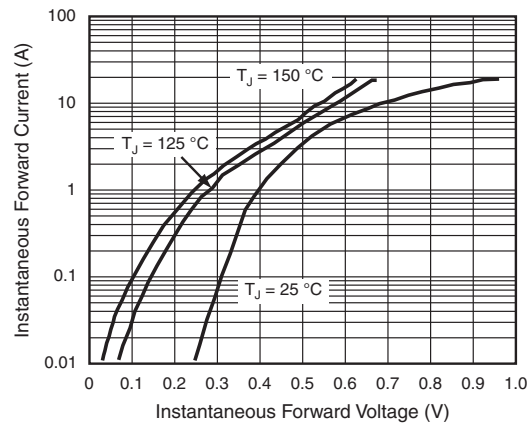


Fig. 3 - Typical Instantaneous Forward Characteristics

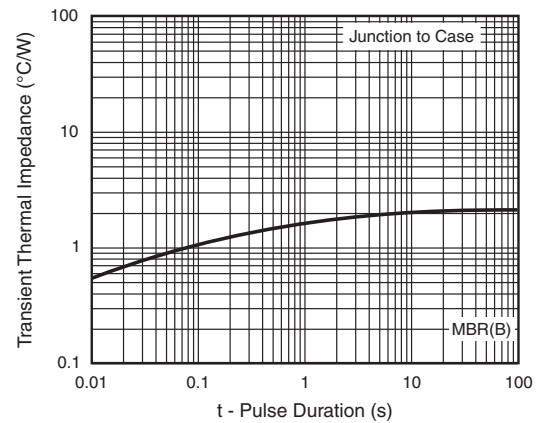


Fig. 6 - Typical Transient Thermal Impedance

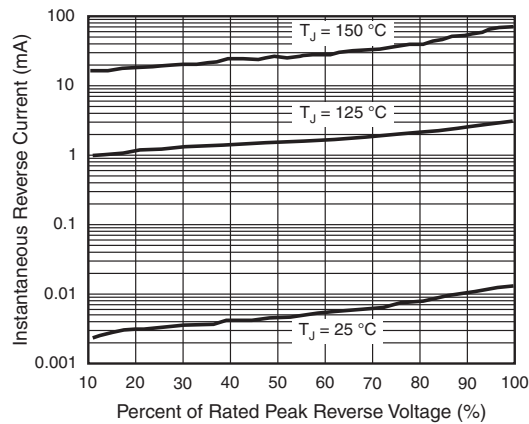


Fig. 4 - Typical Reverse Characteristics

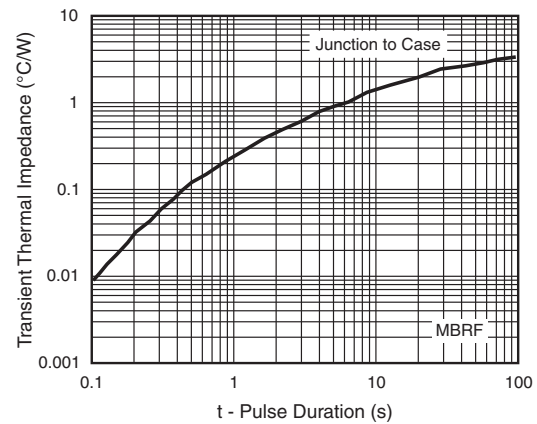


Fig. 7 - Typical Transient Thermal Impedance

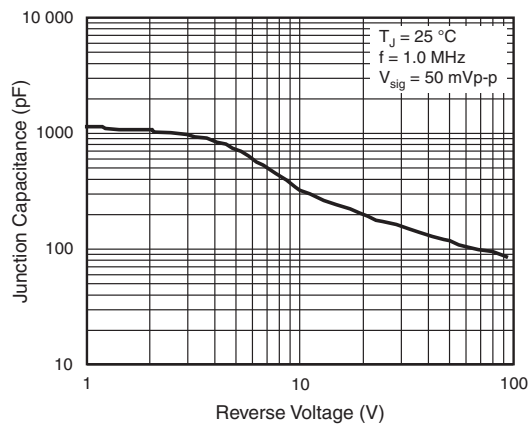
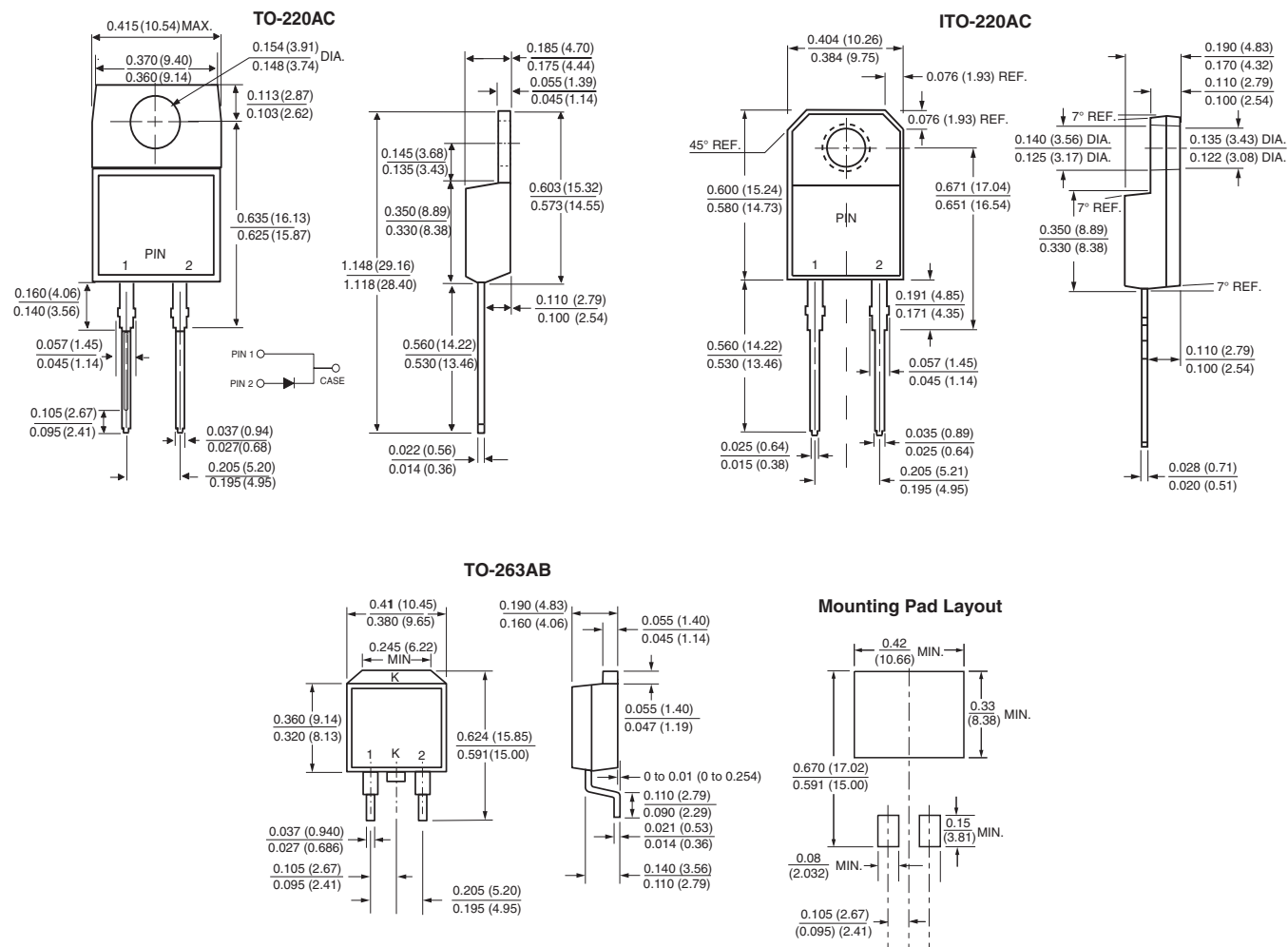


Fig. 5 - Typical Junction Capacitance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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