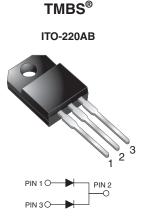
# MBRF1090CT-M3, MBRF10100CT-M3

Vishay General Semiconductor

# **Dual High Voltage Trench MOS Barrier Schottky Rectifier**



| PRIMARY CHARACTERISTICS |                |  |  |  |
|-------------------------|----------------|--|--|--|
| I <sub>F(AV)</sub>      | 2 x 5.0 A      |  |  |  |
| V <sub>RRM</sub>        | 90 V, 100 V    |  |  |  |
| I <sub>FSM</sub>        | 120 A          |  |  |  |
| V <sub>F</sub>          | 0.75 V         |  |  |  |
| T <sub>J</sub> max.     | 150 °C         |  |  |  |
| Package                 | ITO-220AB      |  |  |  |
| Circuit configuration   | Common cathode |  |  |  |

## **FEATURES**

- Trench MOS Schottky technology
- Lower power losses, high efficiency
- Low forward voltage drop
- · High forward surge capability
- High frequency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- · Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

## **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: ITO-220AB

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

M3 suffix meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs max.

| <b>MAXIMUM RATINGS</b> ( $T_c = 25$ °C unless otherwise noted)                                     |              |                                   |             |             |      |  |
|--|--------------|-----------------------------------|-------------|-------------|------|--|
| PARAMETER  |              | SYMBOL                            | MBRF1090CT  | MBRF10100CT | UNIT |  |
| Max. repetitive peak reverse voltage   |              | V <sub>RRM</sub>                  | 90          | 100         | V    |  |
| Working peak reverse voltage   |              | V <sub>RWM</sub>                  | 90          | 100         | V    |  |
| Max. DC blocking voltage   |              | V <sub>DC</sub>                   | 90          | 100         | V    |  |
| Max. average forward rectified current at $T_C$ = 105 °C   | total device | 1                                 | 10          |             | А    |  |
|  | per diode    | I <sub>F(AV)</sub>                | 5.0         |             |      |  |
| Peak forward surge current 8.3 ms single half sine-wave<br>superimposed on rated load per diode    |              | I <sub>FSM</sub>                  | 120         |             | А    |  |
| Non-repetitive avalanche energy at $T_J = 25 \text{ °C}$ , L = 60 mH per diode                     |              | E <sub>AS</sub>                   | 60          |             | mJ   |  |
| Peak repetitive reverse current at $t_p$ = 2 µs, 1 kHz,<br>T <sub>J</sub> = 38 °C ± 2 °C per diode |              | I <sub>RRM</sub>                  | 0.5         |             | А    |  |
| 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> , T <sub>STG</sub> | -65 to +150 |             | °C   |  |
| Isolation voltage from terminal to heatsink with t = 1 min   |              | V <sub>AC</sub>                   | 1500        |             | V    |  |

RoHS

COMPLIANT HALOGEN FREE

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| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25 \text{ °C}$ unless otherwise noted) |                         |                         |        |            |             |      |
|---|-------------------------|-------------------------|--------|------------|-------------|------|
| PARAMETER   | TEST CONDITIONS         |                         | SYMBOL | MBRF1090CT | MBRF10100CT | UNIT |
| Maximum instantaneous forward voltage per diode <sup>(1)</sup>                    | I <sub>F</sub> = 5.0 A  | T <sub>C</sub> = 125 °C | 0.75   |            | V           |      |
|   | $I_{F} = 5.0 \text{ A}$ | T <sub>C</sub> = 25 °C  | ۷F     | 0.85       |             | v    |
| Maximum reverse current per diode at working peak reverse voltage <sup>(2)</sup>  |                         | T <sub>J</sub> = 25 °C  | 100    |            | 00          | μA   |
|   |                         | T <sub>J</sub> = 100 °C | IR     | 6          | .0          | mA   |

Notes

 $^{(1)}\,$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: Pulse width  $\leq$  40 ms

| <b>THERMAL CHARACTERISTICS</b> ( $T_c = 25$ °C unless otherwise noted) |                                  |     |             |      |  |  |
|--|----------------------------------|-----|-------------|------|--|--|
| PARAMETER  | ER SYMBOL MBRF1090CT MBRF10100CT |     | MBRF10100CT | UNIT |  |  |
| Typical thermal resistance per diode                                   | $R_{	ext{	heta}JC}$              | 6.8 |             | °C/W |  |  |

| ORDERING INFORMATION (EXAMPLE) |                   |                 |              |               |               |  |  |
|--------------------------------|-------------------|-----------------|--------------|---------------|---------------|--|--|
| PACKAGE                        | PREFERRED P/N     | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |  |  |
| ITO-220AB                      | MBRF10100CT-M3/4W | 1.75            | 4W           | 50/tube       | Tube          |  |  |

## RATINGS AND CHARACTERISTICS CURVES (T<sub>C</sub> = 25 °C unless otherwise noted)

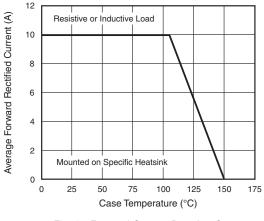


Fig. 1 - Forward Current Derating Curve

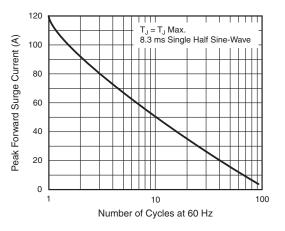


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode



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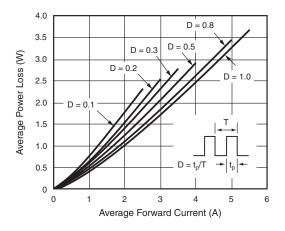


Fig. 3 - Forward Power Loss Characteristics Per Diode

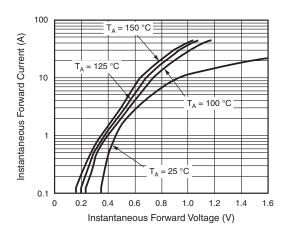


Fig. 4 - Typical Instantaneous Forward Characteristics Per Diode

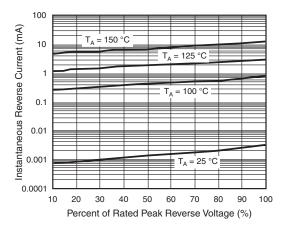


Fig. 5 - Typical Reverse Characteristics Per Diode

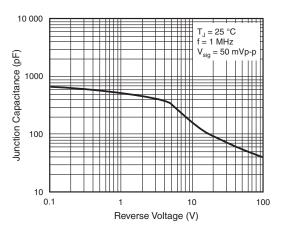


Fig. 6 - Typical Junction Capacitance Per Diode

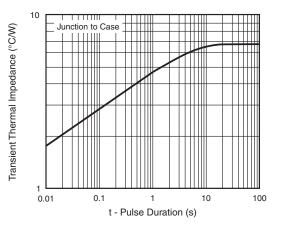


Fig. 7 - Typical Transient Thermal Impedance Per Diode

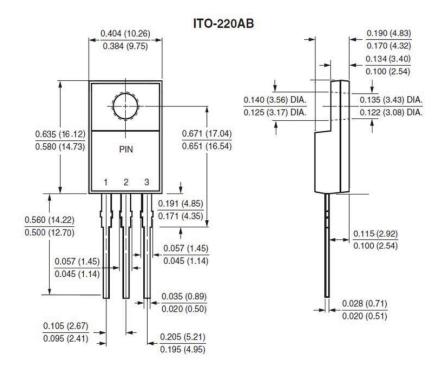
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## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





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