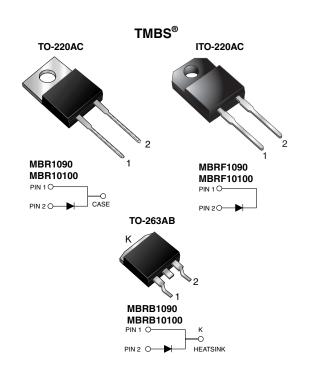


Vishay General Semiconductor

High-Voltage 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 max. | 150 °C | | | | |

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)
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-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 _C = 25 °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 $^{\circ}C$ | I _{F(AV)} | 10 | | Α | | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I _{FSM} | 150 | | А | | |
| Non-repetitive avalanche energy at $T_J = 25$ °C, $L = 60$ mH | E _{AS} | 130 | | mJ | | |
| Peak repetitive reverse current at t_p = 2 μ s, 1 kHz, T_J = 38 °C \pm 2 °C | I _{RRM} | 0.5 | | А | | |
| Voltage rate of change (rated V _R) | dV/dt | 10 000 | | V/µs | | |
| Isolation voltage (ITO-220AC only) From terminal to heatsink t = 1 min | V _{AC} | 1500 | | V | | |
| Operating junction and storage temperature range | T _J , T _{STG} | - 65 to + 150 | | °C | | |

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| ELECTRICAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted) | | | | | | | |
|---|---|---|-----------------|----------------------|----------|-------|------|
| PARAMETER | TEST CONDITIONS | | TEST CONDITIONS | | SYMBOL | VALUE | UNIT |
| Maximum instantaneous forward voltage (1) | I _F = 10 A I _F = 10 A I _F = 20 A | $T_{C} = 25 ^{\circ}\text{C}$ $T_{C} = 125 ^{\circ}\text{C}$ $T_{C} = 125 ^{\circ}\text{C}$ | V _F | 0.80 0.65 0.75 | > | | |
| Maximum reverse current at working peak reverse voltage (2) | | T _J = 25 °C T _J = 100 °C | I _R | 100 6.0 | μA mA | | |

Notes

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

 $^{(2)}$ Pulse test: Pulse width $\leq 40~\text{ms}$

| THERMAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted) | | | | | |
|---|-----------------------------|-----------|----------|-----------|------|
| PARAMETER | SYMBOL | MBR | MBRF | MBRB | UNIT |
| Typical thermal resistance | $R_{	hetaJA} \ R_{	hetaJC}$ | 60 2.0 | - 3.5 | 60 2.0 | °C/W |

| ORDERING INFORMATION (Example) | | | | | | | |
|--------------------------------|-----------------|-----------------|--------------|---------------|---------------|--|--|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE | | |
| TO-220AC | MBR10100-E3/4W | 1.845 | 4W | 50/tube | Tube | | |
| ITO-220AC | MBRF10100-E3/4W | 1.661 | 4W | 50/tube | Tube | | |
| TO-263AB | MBRB10100-E3/4W | 1.384 | 4W | 50/tube | Tube | | |
| TO-263AB | MBRB10100-E3/8W | 1.384 | 8W | 800/reel | Tape and reel | | |

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

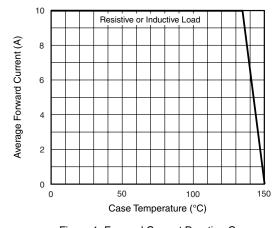


Figure 1. Forward Current Derating Curve

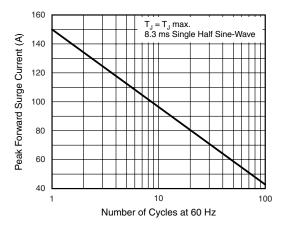


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current



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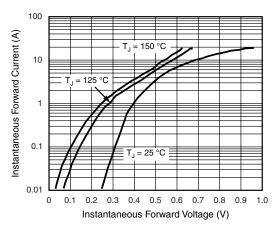


Figure 3. Typical Instantaneous Forward Characteristics

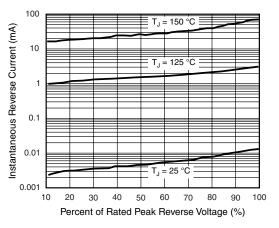


Figure 4. Typical Reverse Characteristics

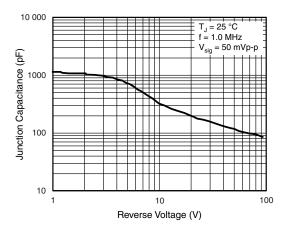


Figure 5. Typical Junction Capacitance

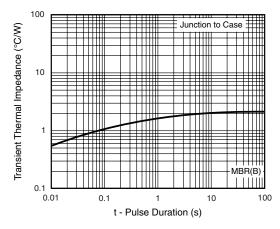


Figure 6. Typical Transient Thermal Impedance

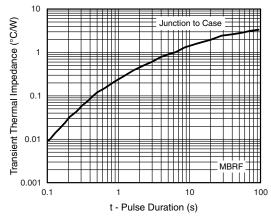
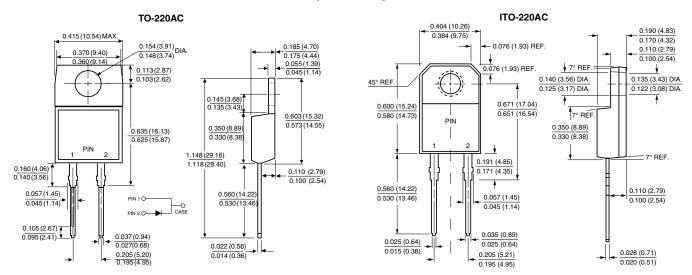


Figure 7. Typical Transient Thermal Impedance

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



TO-263AB 0.41 (10.45) 0.190 (4.83) **Mounting Pad Layout** 0.380 (9.65) 0.055 (1.40) 0.160 (4.06) 0.045 (1.14) 0.055 (1.40) 0.360 (9.14) 0.320 (8.13) 0.047 (1.19) 0.624 (15.85) 0.670 (17.02) - 0 to 0.01 (0 to 0.254) 0.591 (15.00) 0.110 (2.79) 0.090 (2.29) 0.021 (0.53) 0.014 (0.36) 0.037 (0.940) 0.027 (0.686) 0.08 0.105 (2.67) 0.205 (5.20) (0.095) (2.41)



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