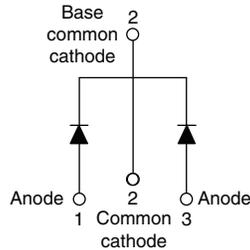


Schottky Rectifier, 2 x 10 A



TO-220AB



FEATURES

- 150 °C T_J operation
- Center tap package
- Low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


RoHS*
COMPLIANT

PRODUCT SUMMARY

| | |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 10 A |
| V_R | 100 V |

DESCRIPTION

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|-----------------------------------|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform (per device) | 20 | A |
| V_{RRM} | | 100 | V |
| I_{FRM} | $T_C = 133\text{ °C}$ (per leg) | 20 | A |
| I_{FSM} | $t_p = 5\ \mu\text{s}$ sine | 850 | A |
| V_F | 10 Apk, $T_J = 125\text{ °C}$ | 0.65 | V |
| T_J | Range | - 65 to 150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | MBR20100CTKPbF | UNITS |
|--------------------------------------|-----------|----------------|-------|
| Maximum DC reverse voltage | V_R | 100 | V |
| Maximum working peak reverse voltage | V_{RWM} | | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|-------------|---|--------|-------|
| Maximum average forward current | $I_{F(AV)}$ | $T_C = 133\text{ °C}$, rated V_R | 10 | A |
| | | | 20 | |
| Peak repetitive forward current per leg | I_{FRM} | Rated V_R , square wave, 20 kHz, $T_C = 133\text{ °C}$ | 20 | |
| Non-repetitive peak surge current | I_{FSM} | 5 μs sine or 3 μs rect. pulse | 850 | |
| | | Surge applied at rated load conditions half wave, single phase, 60 Hz | 150 | |
| Peak repetitive reverse surge current | I_{RRM} | 2.0 μs , 1.0 kHz | 0.5 | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25\text{ °C}$, $I_{AS} = 2\text{ A}$, $L = 12\text{ mH}$ | 24 | mJ |

* Pb containing terminations are not RoHS compliant, exemptions may apply

| ELECTRICAL SPECIFICATIONS | | | | | |
|---------------------------------------|----------------|--|-----------------------------------|--------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop | $V_{FM}^{(1)}$ | 10 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.80 | V |
| | | 20 A | | 0.95 | |
| | | 10 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.65 | |
| | | 20 A | | 0.80 | |
| Maximum instantaneous reverse current | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | Rated DC voltage | 0.10 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 6 | |
| Threshold voltage | $V_{F(TO)}$ | $T_J = T_J \text{ maximum}$ | | 0.433 | V |
| Forward slope resistance | r_t | | | 15.8 | m Ω |
| Maximum junction capacitance | C_T | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) 25 $^\circ\text{C}$ | | 400 | pF |
| Typical series inductance | L_S | Measured from top of terminal to mounting plane | | 8.0 | nH |
| Maximum voltage rate of change | dV/dt | Rated V_R | | 10 000 | V/ μs |

Note

(1) Pulse width < 300 μs , duty cycle < 2 %

| THERMAL - MECHANICAL SPECIFICATIONS | | | | | |
|--|--------------------|--|------------------------|-------------|------------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum junction temperature range | T_J | | | - 65 to 150 | $^\circ\text{C}$ |
| Maximum storage temperature range | T_{Stg} | | | - 65 to 175 | |
| Maximum thermal resistance, junction to case per leg | R_{thJC} | DC operation | | 2.0 | $^\circ\text{C/W}$ |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased (Only for TO-220) | | 0.50 | |
| Maximum thermal resistance, junction to ambient | R_{thJA} | DC operation (For D ² PAK and TO-262) | | 50 | |
| Approximate weight | | | | 2 | g |
| | | | | 0.07 | oz. |
| Mounting torque | minimum maximum | | Non-lubricated threads | 6 (5) | kgf · cm (lbf · in) |
| | | | | 12 (10) | |
| Marking device | | Case style TO-220AB | | MBR20100CTK | |

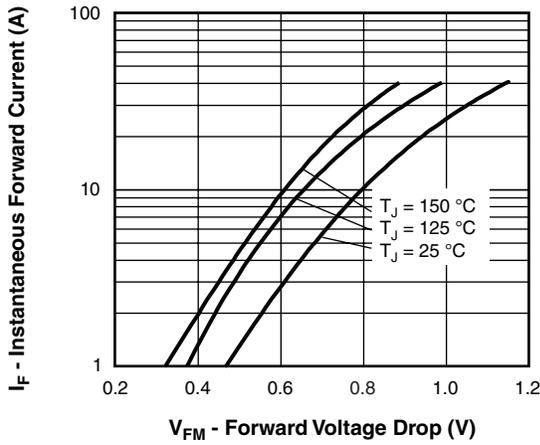


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

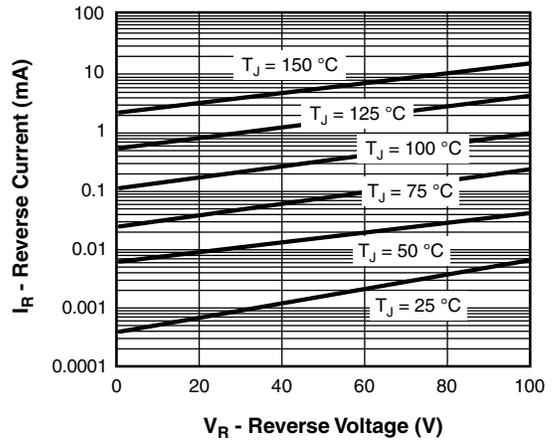


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

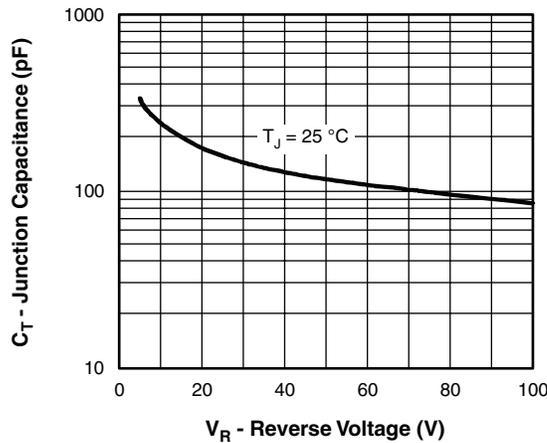


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

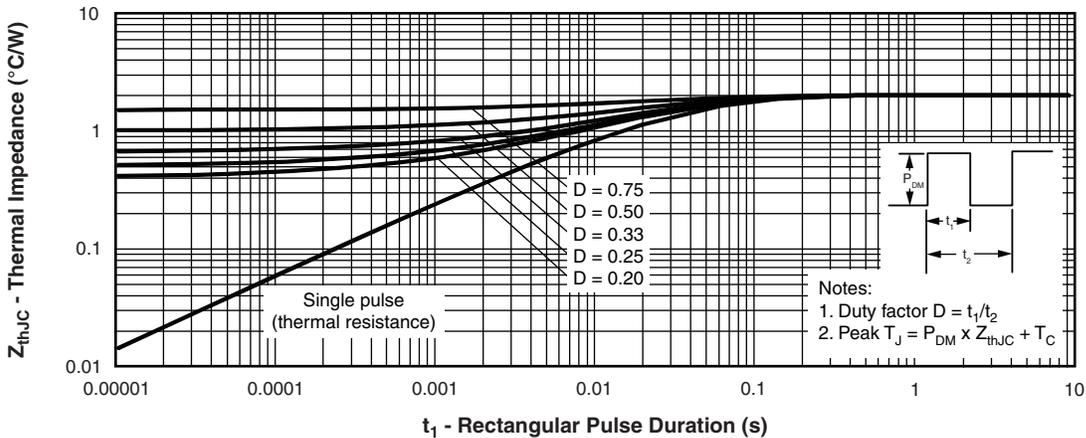


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

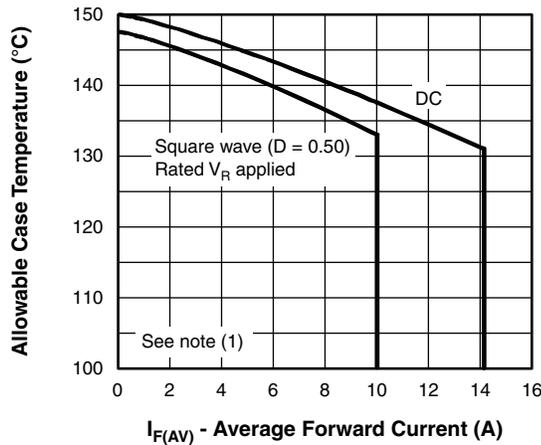


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

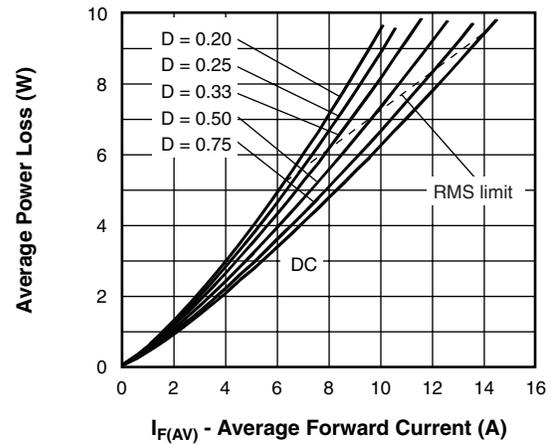


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

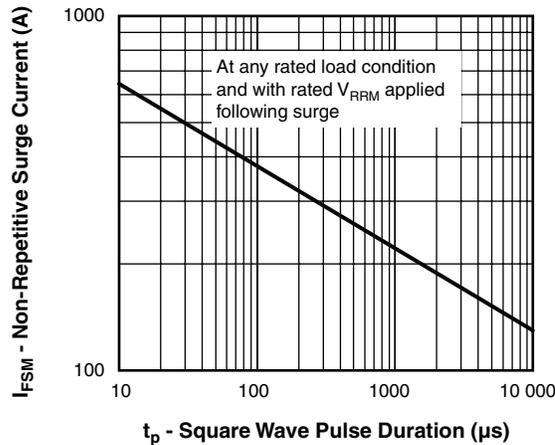


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{d_{REV}}$ = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R



ORDERING INFORMATION TABLE

| | | | | | | |
|-------------|------------|-----------|------------|-----------|----------|------------|
| Device code | MBR | 20 | 100 | CT | K | PbF |
| | ① | ② | ③ | ④ | ⑤ | ⑥ |

- 1** - MBR series
- 2** - Current rating (20 = 20 A)
- 3** - Voltage rating (100 = 100 V)
- 4** - CT = Center tap (dual)
- 5** - K = Schottky generation
- 6** - PbF = Lead (Pb)-free

Tube standard pack quantity: 50 pieces

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95222 |
| Part marking information | http://www.vishay.com/doc?95225 |



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