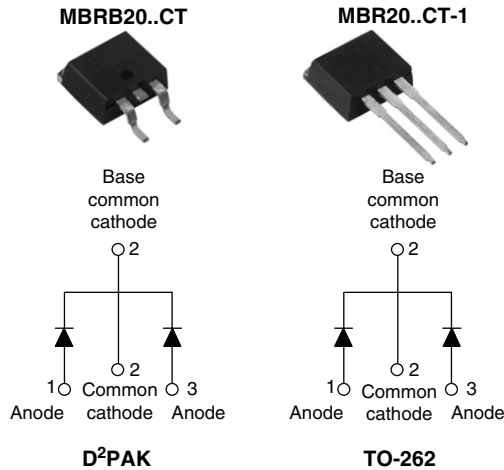


Schottky Rectifier, 2 x 10 A



FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Center tap D²PAK and TO-262 packages
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified for Q101 level

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.

PRODUCT SUMMARY

| | |
|-------------|-------------|
| $I_{F(AV)}$ | 2 x 10 A |
| V_R | 80 to 100 V |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|-----------------------------------|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform (per device) | 20 | A |
| I_{FRM} | $T_C = 133\text{ °C}$ (per leg) | 20 | |
| V_{RRM} | | 80 to 100 | V |
| I_{FSM} | $t_p = 5\ \mu\text{s}$ sine | 850 | A |
| V_F | 10 Apk, $T_J = 125\text{ °C}$ | 0.70 | V |
| T_J | Range | - 65 to 150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | MBRB2080CT MBR2080CT-1 | MBRB2090CT MBR2090CT-1 | MBRB20100CT MBR20100CT-1 | UNITS |
|--------------------------------------|-----------|---------------------------|---------------------------|-----------------------------|-------|
| Maximum DC reverse voltage | V_R | 80 | 90 | 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 halfwave, 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 |

| 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 | $T_J = 125\text{ }^\circ\text{C}$ | 0.70 | |
| | | 20 A | | 0.85 | |
| 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 | $V_{F(TO)}$ | $T_J = T_J$ maximum | | 0.433 | V |
| Forward slope resistance | r_t | | | 15.8 | m Ω |
| Maximum junction capacitance | C_T | $V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °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/ μ s |

Note

(1) Pulse width < 300 μ s, 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 | | 0.50 | |
| Maximum thermal resistance, junction to ambient | R_{thJA} | DC operation | | 50 | |
| Approximate weight | | | | 2 | g |
| | | | | 0.07 | oz. |
| Mounting torque | minimum | Non-lubricated threads | | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | | 12 (10) | |
| Marking device | | Case style D ² PAK | | MBRB20100CT | |
| | | Case style TO-262 | | MBR20100CT-1 | |

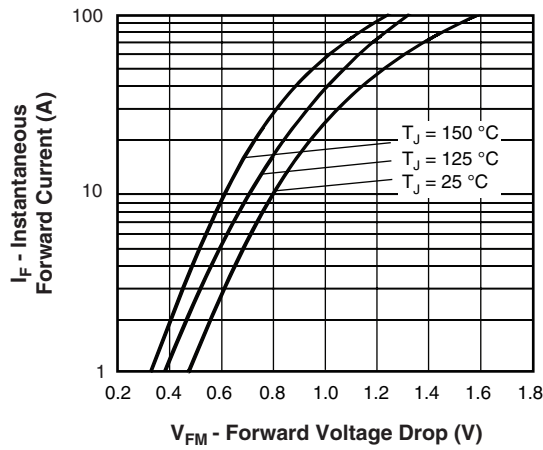


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

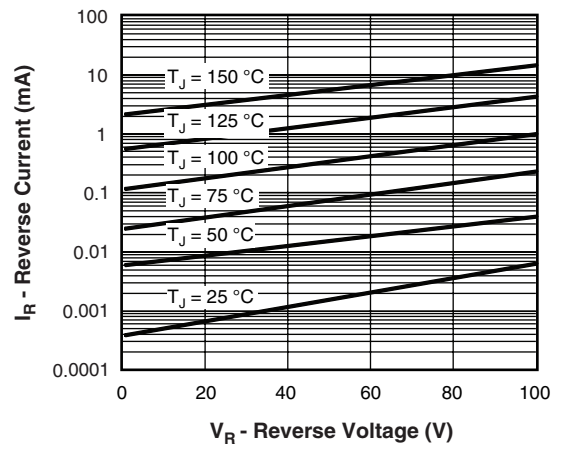


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

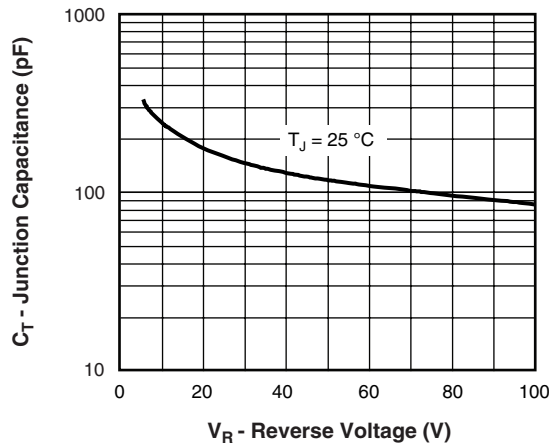


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

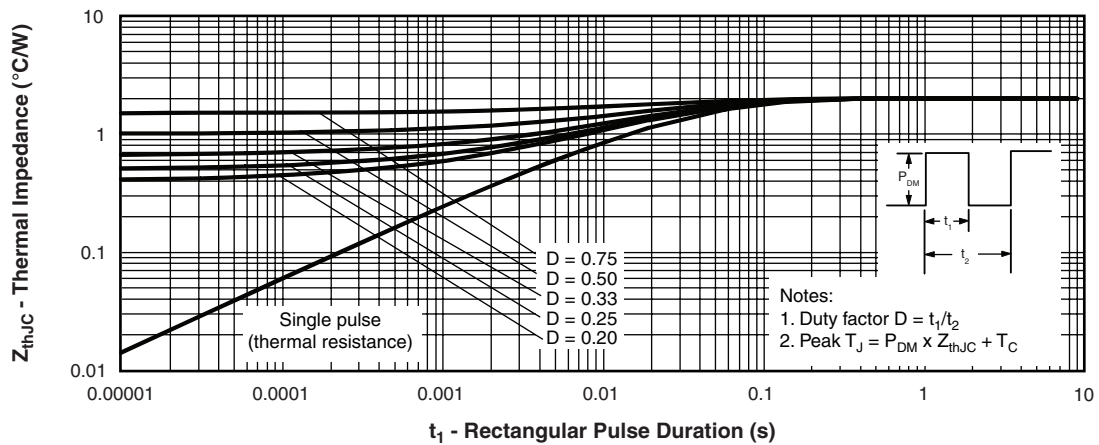


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

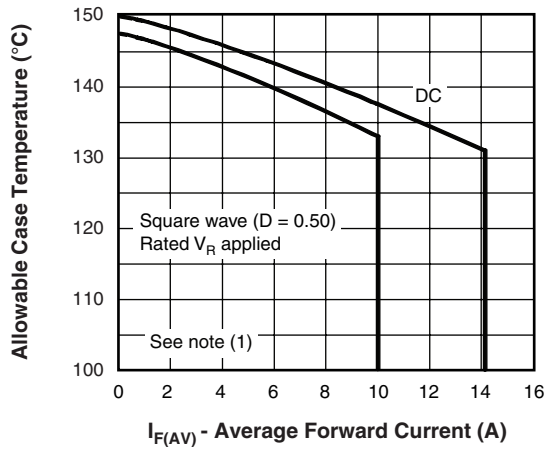


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

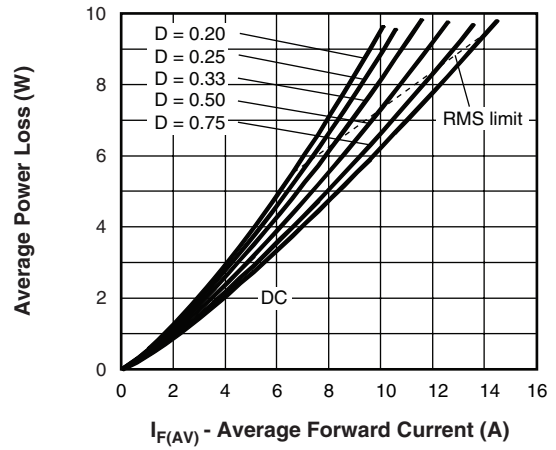


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

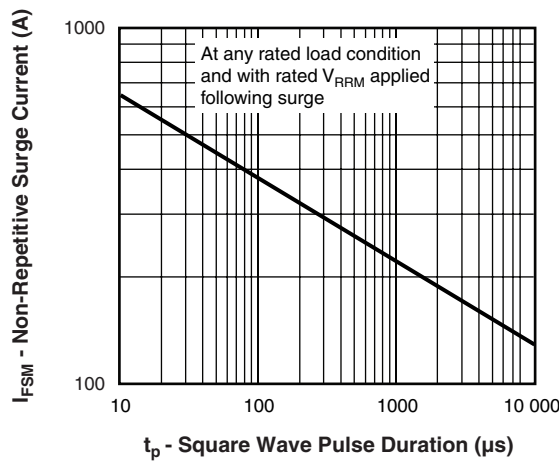


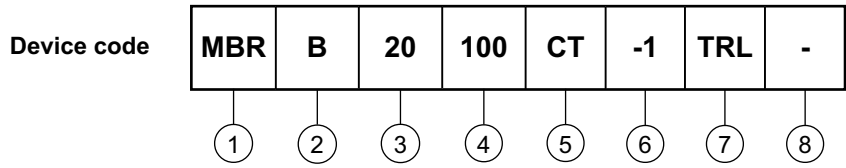
Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

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



- 1** - Essential part number
- 2** -
 - B = D²PAK **6** None
 - None = TO-262 **6** = -1
- 3** - Current rating (20 = 20 A)
- 4** - Voltage ratings
- 5** - CT = Essential part number
- 6**
 - None = D²PAK **2** = B
 - -1 = TO-262 **2** None
- 7** -
 - None = Tube (50 pieces)
 - TRL = Tape and reel (left oriented - for D²PAK only)
 - TRR = Tape and reel (right oriented - for D²PAK only)
- 8** -
 - None = Standard production
 - PbF = Lead (Pb)-free (for TO-262 and D²PAK tube)
 - P = Lead (Pb)-free (for D²PAK TRR and TRL)

| |
|-------------|
| 80 = 80 V |
| 90 = 90 V |
| 100 = 100 V |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95014 |
| Part marking information | http://www.vishay.com/doc?95008 |
| Packaging information | http://www.vishay.com/doc?95032 |



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