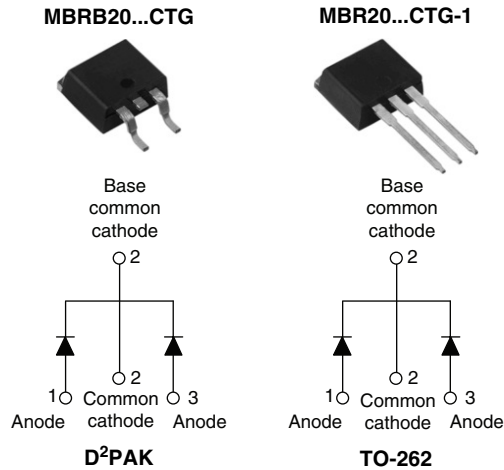


## Schottky Rectifier, 2 x 10 A



### FEATURES

- 150 °C  $T_J$  operation
- Center tap D²PAK and TO-262 packages
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring enhanced ruggedness and long term reliability
- Designed and qualified for AEC 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 |
|-----------|-----------------------------------|-------------|-------|
| $I_{FRM}$ | $T_C = 133\text{ °C}$ (per leg)   | 20          | A     |
| $V_{RRM}$ |                                   | 80 to 100   | V     |
| $I_{FSM}$ | $t_p = 5\text{ }\mu\text{s}$ 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    | MBRB2080CTG<br>MBR2080CTG-1 | MBRB2090CTG<br>MBR2090CTG-1 | MBRB20100CTG<br>MBR20100CTG-1 | UNITS |
|--------------------------------------|-----------|-----------------------------|-----------------------------|-------------------------------|-------|
| Maximum DC reverse voltage           | $V_R$     | 80                          | 90                          | 100                           | V     |
| Maximum working peak reverse voltage | $V_{RWM}$ |                             |                             |                               |       |

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| ABSOLUTE MAXIMUM RATINGS                                                    |                    |                                                                       |                                                                            |        |       |
|-----------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------|--------|-------|
| PARAMETER                                                                   | SYMBOL             | TEST CONDITIONS                                                       |                                                                            | VALUES | UNITS |
| Maximum average forward current<br><div>per leg</div> <div>per device</div> | I <sub>F(AV)</sub> | T <sub>C</sub> = 133 °C, rated V <sub>R</sub>                         |                                                                            | 10     | A     |
|                                                                             |                    |                                                                       |                                                                            | 20     |       |
| Peak repetitive forward current per leg                                     | I <sub>FRM</sub>   | Rated V <sub>R</sub> , square wave, 20 kHz<br>T <sub>C</sub> = 133 °C |                                                                            | 20     |       |
| Non-repetitive peak surge current                                           | I <sub>FSM</sub>   | 5 μs sine or 3 μs rect. pulse                                         | Following any rated load condition and with rated V <sub>RRM</sub> applied | 850    |       |
|                                                                             |                    | Surge applied at rated load conditions half wave, single phase, 60 Hz |                                                                            | 150    |       |
| Peak repetitive reverse surge current                                       | I <sub>RRM</sub>   | 2.0 μs, 1.0 kHz                                                       |                                                                            | 0.5    |       |
| Non-repetitive avalanche energy per leg                                     | E <sub>AS</sub>    | T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 2 A, L = 12 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   |                        | 0.85 |
|                                       |                | 20 A                                                                                      |                                     |        |                        |      |
| 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   | $\text{m}\Omega$       |      |
| Maximum junction capacitance          | $C_T$          | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$ |                                     | 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 | $\text{V}/\mu\text{s}$ |      |

## Note

<sup>(1)</sup> Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %



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| THERMAL - MECHANICAL SPECIFICATIONS                  |         |                               |                        |               |                        |
|------------------------------------------------------|---------|-------------------------------|------------------------|---------------|------------------------|
| PARAMETER                                            |         | SYMBOL                        | TEST CONDITIONS        | VALUES        | UNITS                  |
| Maximum junction temperature range                   |         | T <sub>J</sub>                |                        | - 65 to 150   | °C                     |
| Maximum storage temperature range                    |         | T <sub>Stg</sub>              |                        | - 65 to 175   |                        |
| Maximum thermal resistance, junction to case per leg |         | R <sub>thJC</sub>             | DC operation           | 2.0           | °C/W                   |
| Maximum thermal resistance, junction to ambient      |         | R <sub>thJA</sub>             |                        | 50            |                        |
| Approximate weight                                   |         |                               |                        | 2             | g                      |
|                                                      |         |                               |                        | 0.07          | oz.                    |
| Mounting torque                                      | minimum |                               | Non-lubricated threads | 6 (5)         | kgf · cm<br>(lbf · in) |
|                                                      | maximum |                               |                        | 12 (10)       |                        |
| Marking device                                       |         | Case style D <sup>2</sup> PAK |                        | MBRB2080CTG   |                        |
|                                                      |         |                               |                        | MBRB2090CTG   |                        |
|                                                      |         |                               |                        | MBRB20100CTG  |                        |
|                                                      |         | Case style TO-262             |                        | MBR2080CTG-1  |                        |
|                                                      |         |                               |                        | MBR2090CTG-1  |                        |
|                                                      |         |                               |                        | MBR20100CTG-1 |                        |

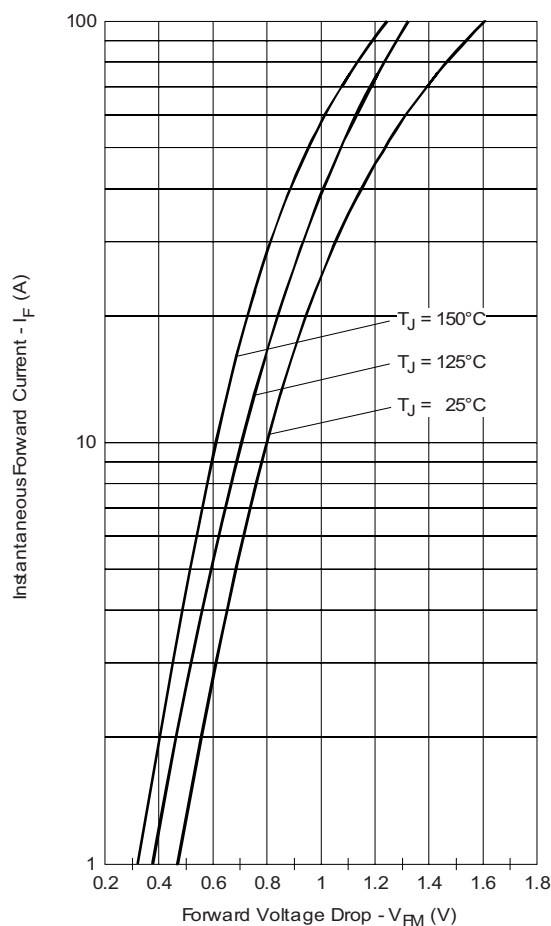


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

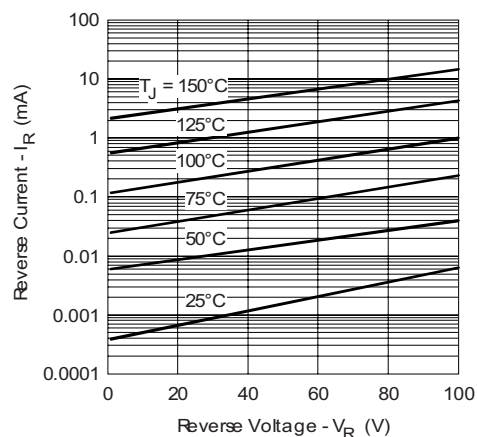


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

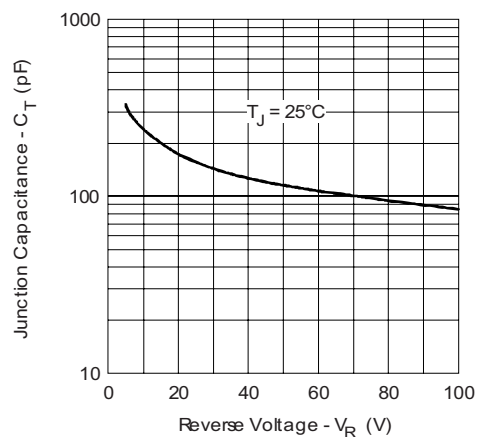


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

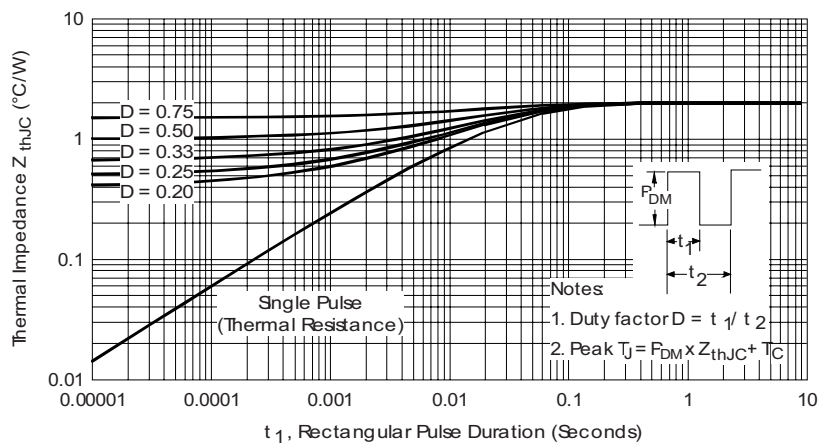


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)



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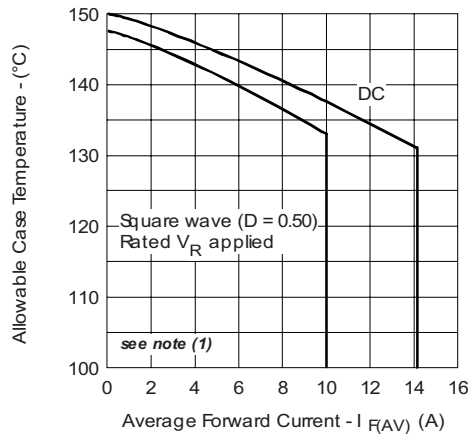


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

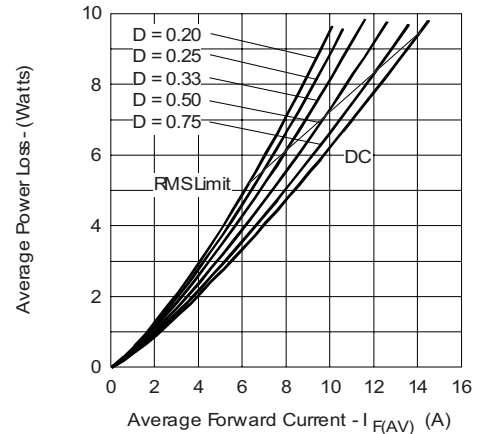


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

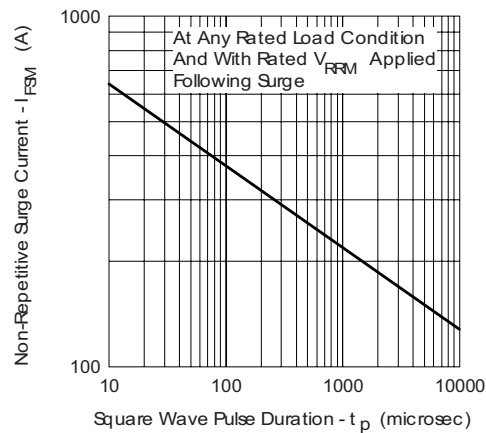


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

## Note

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

# MBRB20...CTG, MBR20...CTG-1

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## ORDERING INFORMATION TABLE

|             |     |   |    |     |    |   |    |     |   |
|-------------|-----|---|----|-----|----|---|----|-----|---|
| Device code | MBR | B | 20 | 100 | CT | G | -1 | TRL | - |
|             | 1   | 2 | 3  | 4   | 5  | 6 | 7  | 8   | 9 |

- |          |   |                                                                       |             |
|----------|---|-----------------------------------------------------------------------|-------------|
| <b>1</b> | - | Essential part number                                                 |             |
| <b>2</b> | - | • B = D <sup>2</sup> PAK                                              |             |
|          |   | • None = TO-262                                                       |             |
| <b>3</b> | - | Current rating (20 = 20 A)                                            | 80 = 80 V   |
| <b>4</b> | - | Voltage ratings                                                       | 90 = 90 V   |
|          |   |                                                                       | 100 = 100 V |
| <b>5</b> | - | CT = Essential part number                                            |             |
| <b>6</b> | - | G = Schottky generation                                               |             |
| <b>7</b> | - | • None = D <sup>2</sup> PAK                                           |             |
|          |   | • -1 = TO-262                                                         |             |
| <b>8</b> | - | • None = Tube (50 pieces)                                             |             |
|          |   | • TRL = Tape and reel (left oriented - for D <sup>2</sup> PAK only)   |             |
|          |   | • TRR = Tape and reel (right oriented - for D <sup>2</sup> PAK only)  |             |
| <b>9</b> | - | • None = Standard production                                          |             |
|          |   | • PbF = Lead (Pb)-free (D <sup>2</sup> PAK tube)                      |             |
|          |   | • P = Lead (Pb)-free (for D <sup>2</sup> PAK TRR and TRL, and TO-262) |             |

| LINKS TO RELATED DOCUMENTS |                                                                               |
|----------------------------|-------------------------------------------------------------------------------|
| Dimensions                 | <a href="http://www.vishay.com/doc?95014">http://www.vishay.com/doc?95014</a> |
| Part marking information   | <a href="http://www.vishay.com/doc?95057">http://www.vishay.com/doc?95057</a> |
| Packaging information      | <a href="http://www.vishay.com/doc?95032">http://www.vishay.com/doc?95032</a> |



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