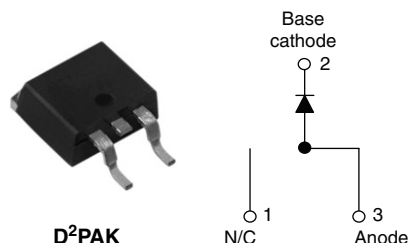


Schottky Rectifier, 16 A



FEATURES

- 150 °C T_J operation
- High frequency operation
- Low forward voltage drop
- 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 MBRB16.. 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

| | |
|-------------|-----------------|
| $I_{F(AV)}$ | 16 A |
| V_R | 35/45 V |
| I_{RM} | 40 mA at 125 °C |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|--------------------------------|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform | 16 | A |
| V_{RRM} | | 35/45 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 1800 | A |
| V_F | 16 Apk, $T_J = 125 \text{ °C}$ | 0.57 | V |
| T_J | | - 65 to 150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | MBRB1635 | MBRB1645 | UNITS |
|--------------------------------------|-----------|----------|----------|-------|
| Maximum DC reverse voltage | V_R | 35 | 45 | V |
| Maximum working peak reverse voltage | V_{RWM} | | | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
|-----------------------------------|-------------|---|---|--------|-------|
| Maximum average forward current | $I_{F(AV)}$ | $T_C = 134 \text{ °C}$, rated V_R | | 16 | A |
| Non-repetitive peak surge current | I_{FSM} | 5 μs sine or 3 μs rect. pulse | Following any rated load condition and with rated V_{RRM} applied | 1800 | |
| | | Surge applied at rated load condition halfwave single phase 60 Hz | | 150 | |
| Non-repetitive avalanche energy | E_{AS} | $T_J = 25 \text{ °C}$, $I_{AS} = 3.6 \text{ A}$, $L = 3.7 \text{ mH}$ | | 24 | mJ |
| Repetitive avalanche current | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | | 3.6 | A |

| ELECTRICAL SPECIFICATIONS | | | | | |
|---------------------------------------|----------------|---|-------------------------------------|--------|------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop | $V_{FM}^{(1)}$ | 16 A | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.63 | V |
| | | | $T_J = 125\text{ }^{\circ}\text{C}$ | 0.57 | |
| Maximum instantaneous reverse current | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^{\circ}\text{C}$ | Rated DC voltage | 0.2 | mA |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | | 40 | |
| Maximum junction capacitance | C_T | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$ | | 1400 | 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 | °C |
| Maximum storage temperature range | | T _{Stg} | | - 65 to 175 | |
| Maximum thermal resistance, junction to case | | R _{thJC} | DC operation | 1.50 | °C/W |
| Typical thermal resistance, case to heatsink | | R _{thCS} | Mounting surface, smooth and greased | 0.50 | |
| Approximate weight | | | | 2 | g |
| | | | | 0.07 | oz. |
| Mounting torque | minimum | | | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | | 12 (10) | |
| Marking device | | | Case style D ² PAK | MBRB1635 | |
| | | | | MBRB1645 | |

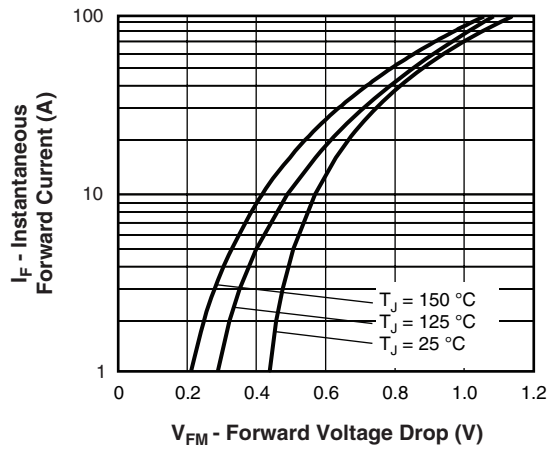


Fig. 1 - Maximum Forward Voltage Drop Characteristics

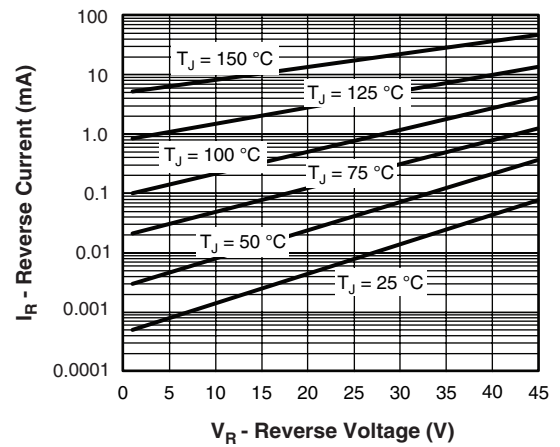


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

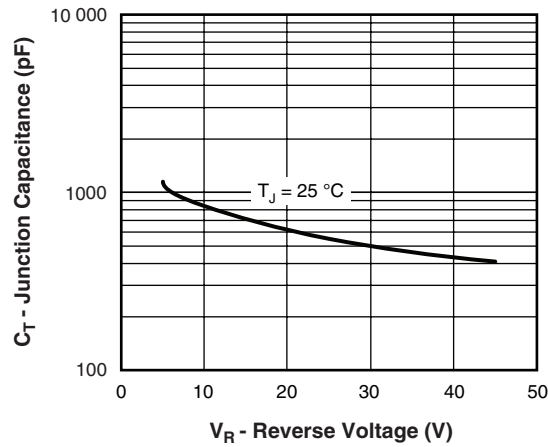
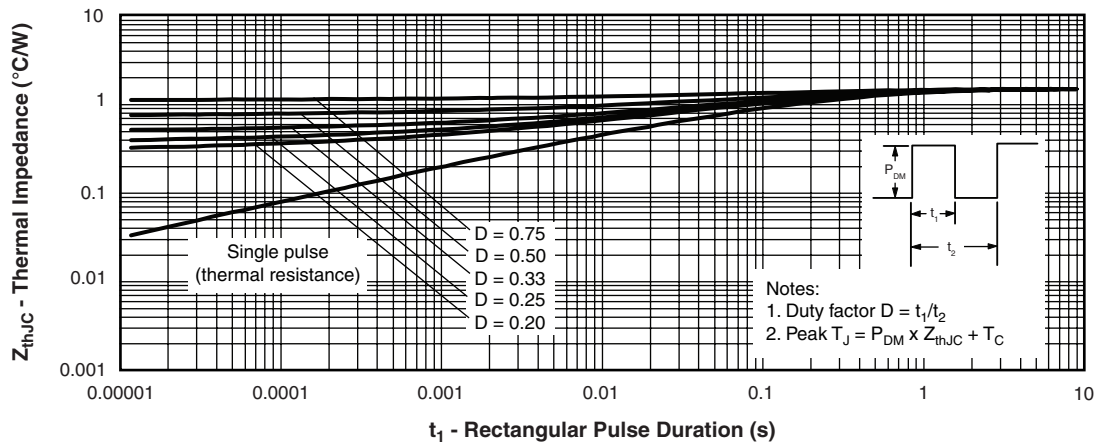


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

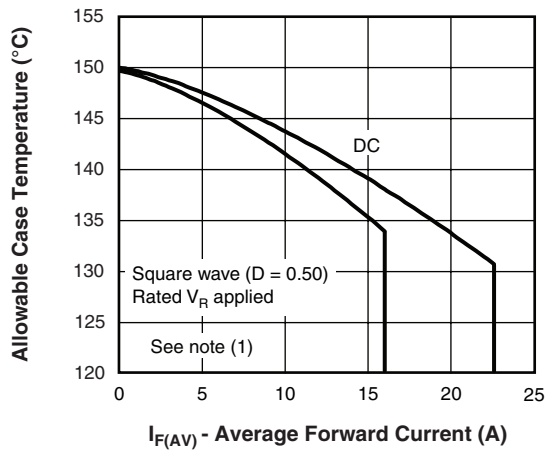


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

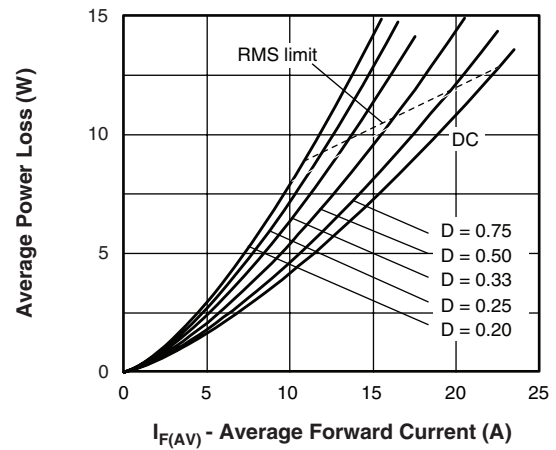


Fig. 6 - Forward Power Loss Characteristics

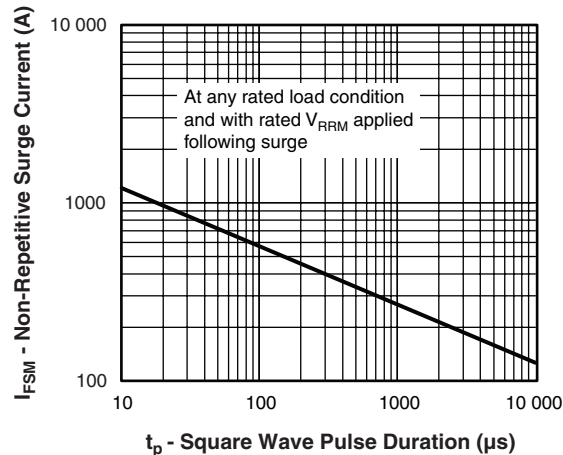


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

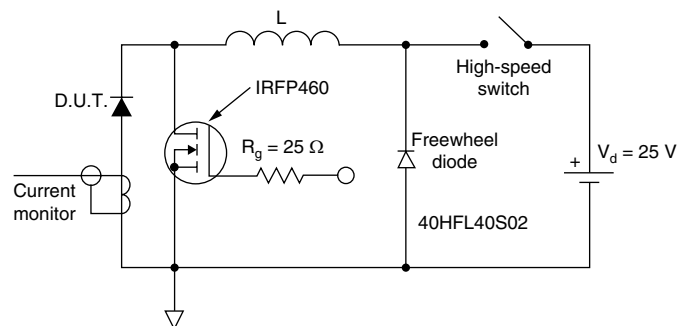


Fig. 8 - Unclamped Inductive Test Circuit

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 applied

**ORDERING INFORMATION TABLE**

| | | | | | | |
|-------------|--|----------|-----------|-----------|------------|----------|
| Device code | MBR | B | 16 | 45 | TRL | - |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | - Essential part number | | | | | |
| 2 | - B = D ² PAK | | | | | |
| 3 | - Current rating (16 = 16 A) | | | | | |
| 4 | - Voltage code = V _{RRM} | | | | | |
| 5 | - • None = Tube (50 pieces) • TRL = Tape and reel (left oriented) • TRR = Tape and reel (right oriented) | | | | | |
| 6 | - • None = Standard production • PbF = Lead (Pb)-free | | | | | |

| |
|------------------------|
| 35 = 35 V 45 = 45 V |
|------------------------|

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95046 |
| Part marking information | http://www.vishay.com/doc?95054 |
| Packaging information | http://www.vishay.com/doc?95032 |



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