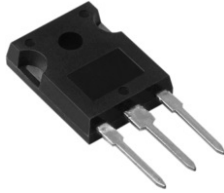
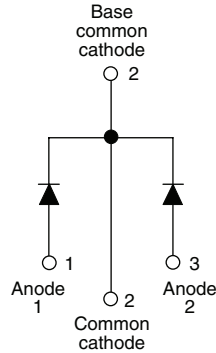


Schottky Rectifier, 2 x 20 A


TO-247AC


FEATURES

- 150 °C T_J operation
- Center tap TO-247 package
- Very 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
- Designed and qualified for industrial level

DESCRIPTION

The MBR4060WT center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. 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 20 A |
| V_R | 60 V |
| I_{RM} | 100 mA at 125 °C |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|--|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform | 40 | A |
| V_{RRM} | | 60 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 1020 | A |
| V_F | 20 Apk, $T_J = 125 \text{ °C}$ (per leg) | 0.62 | V |
| T_J | Range | - 55 to 150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | MBR4060WT | UNITS |
|--------------------------------------|-----------|-----------|-------|
| Maximum DC reverse voltage | V_R | 60 | V |
| Maximum working peak reverse voltage | V_{RWM} | | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|-------------|---|---|-------|
| Maximum average forward current per leg per device | $I_{F(AV)}$ | $T_C = 108 \text{ °C}$, 50 % duty cycle, rectangular waveform | 20 | A |
| | | | 40 | |
| Maximum peak one cycle non-repetitive surge current per leg | I_{FSM} | 5 μs sine or 3 μs rect. pulse | Following any rated load condition and with rated V_{RRM} applied | 1020 |
| | | 10 ms sine or 6 ms rect. pulse | | 265 |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25 \text{ °C}$, $I_{AS} = 1.5 \text{ A}$, $L = 11.5 \text{ mH}$ | 13 | mJ |
| Repetitive avalanche current per leg | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | 1.5 | A |

| ELECTRICAL SPECIFICATIONS | | | | | |
|---------------------------------------|----------------|---|-----------------------------------|--------|------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop | $V_{FM}^{(1)}$ | 20 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.72 | V |
| | | | $T_J = 125\text{ }^\circ\text{C}$ | 0.62 | |
| Maximum instantaneous reverse current | I_{RM} | $T_J = 25\text{ }^\circ\text{C}$ | Rated DC voltage | 1.0 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 100 | |
| Maximum junction capacitance | C_T | $V_R = 5\text{ }V_{DC}$, (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$ | | 720 | pF |
| Typical series inductance | L_S | Measured from top of terminal to mounting plane | | 7.5 | 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 and storage temperature range | T_J, T_{Stg} | | | - 55 to 150 | $^\circ\text{C}$ |
| Maximum thermal resistance, junction to case per package | R_{thJC} | DC operation | | 2.20 | $^\circ\text{C/W}$ |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased | | 1.10 | |
| Maximum thermal resistance, junction to ambient | R_{thJA} | DC operation | | 50 | |
| Approximate weight | | | | 6 | g |
| | | | | 0.21 | oz. |
| Mounting torque | minimum | | | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | | 12 (10) | |
| Marking device | | Case style TO-247AC | | MBR4060WT | |

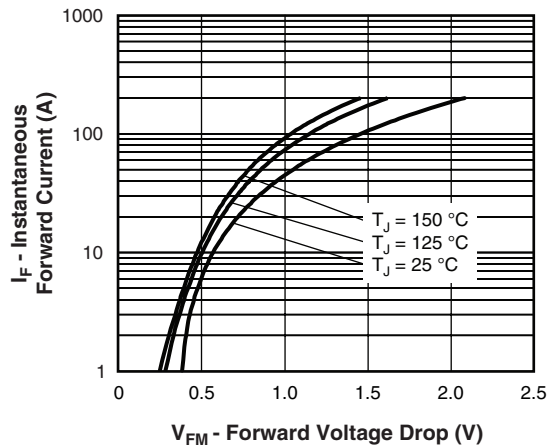


Fig. 1 - Maximum Forward Voltage Drop Characteristics

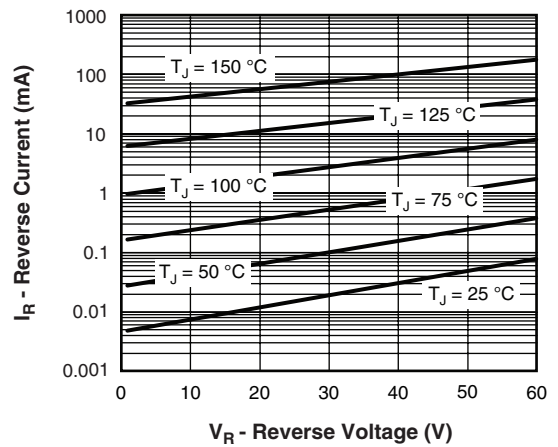


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

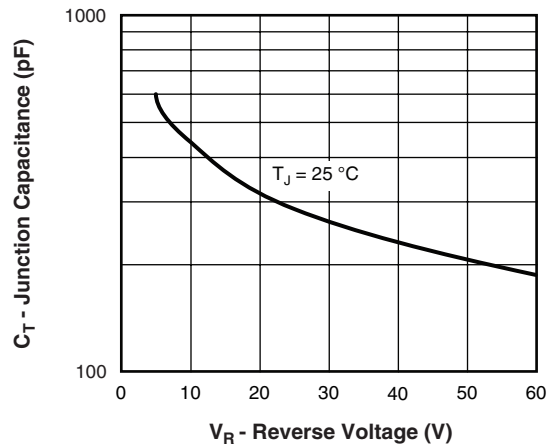
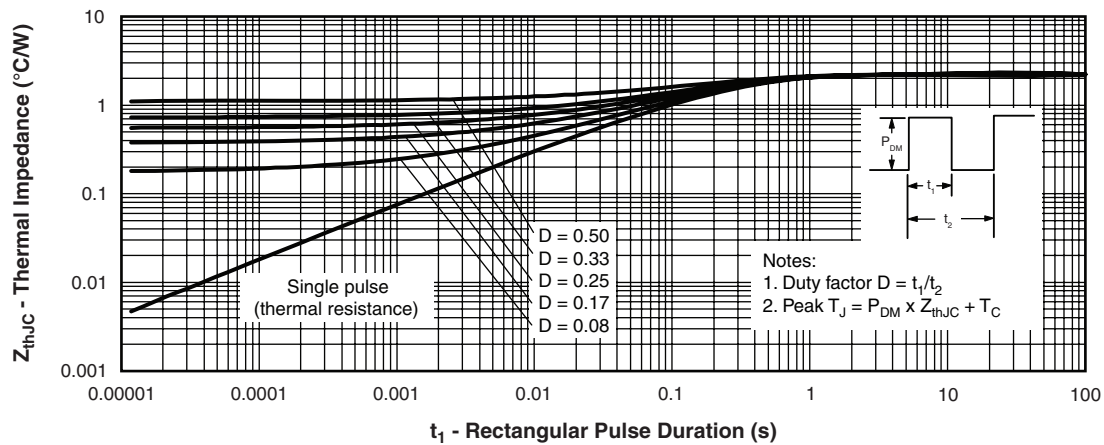


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

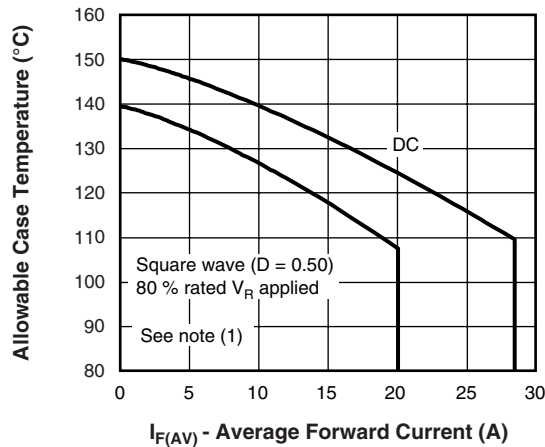


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

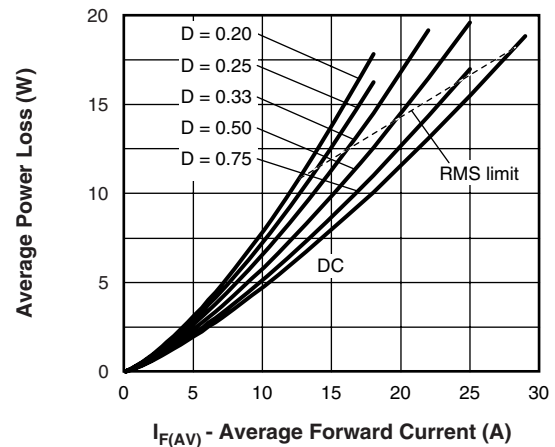


Fig. 6 - Forward Power Loss Characteristics

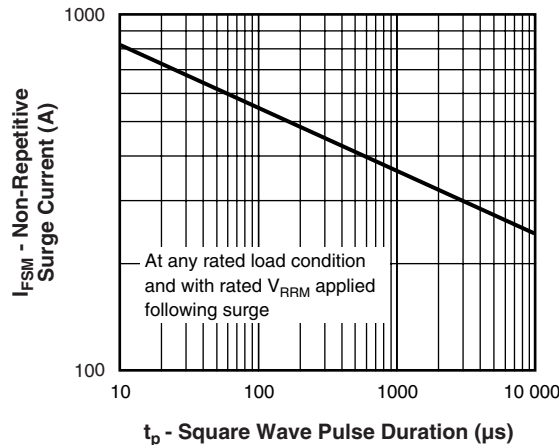


Fig. 7 - Maximum Non-Repetitive Surge Current

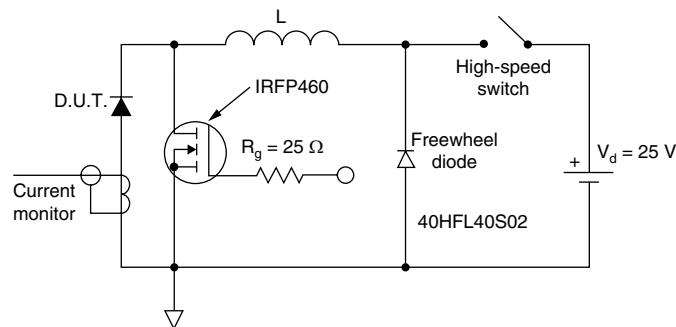


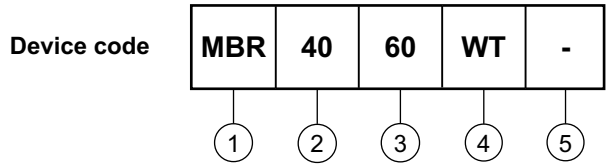
Fig. 8 - Unclamped Inductive Test Circuit

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 $V_{R1} = 80\%$ rated V_R



ORDERING INFORMATION TABLE



- 1** - Schottky MBR series
- 2** - Current rating (40 = 40 A)
- 3** - Voltage rating (60 = 60 V)
- 4** - Circuit configuration:
Center tap (dual) TO-247
- 5** -
 - None = Standard production
 - PbF = Lead (Pb)-free

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95223 |
| Part marking information | http://www.vishay.com/doc?95226 |



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.