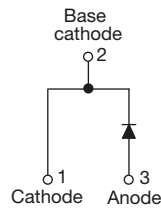


High Performance Schottky Rectifier, 16 A



2L TO-220AC



FEATURES

- 150 °C T_J operation
- 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 according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

DESCRIPTION

The VS-MBR16... 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.

| PRIMARY CHARACTERISTICS | |
|----------------------------------|-----------------|
| I _{F(AV)} | 16 A |
| V _R | 35 V, 45 V |
| V _F at I _F | 0.57 V |
| I _{RM} max. | 40 mA at 125 °C |
| T _J max. | 150 °C |
| E _{AS} | 24 mJ |
| Package | 2L TO-220AC |
| Circuit configuration | Single |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|-----------------------------------|--|-------------|-------|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| I _{F(AV)} | Rectangular waveform | 16 | A |
| V _{R(RM)} | | 35, 45 | V |
| I _{FSM} | t _p = 5 μs sine | 1800 | A |
| V _F | 16 A _{pk} , T _J = 125 °C | 0.57 | V |
| T _J | Range | -65 to +150 | °C |

| VOLTAGE RATINGS | | | | |
|--------------------------------------|--------------------|---------------|---------------|-------|
| PARAMETER | SYMBOL | VS-MBR1635-M3 | VS-MBR1645-M3 | UNITS |
| Maximum DC reverse voltage | V _R | 35 | 45 | V |
| Maximum working peak reverse voltage | V _{R(WM)} | | | |

| ABSOLUTE MAXIMUM RATINGS | | | | | |
|-----------------------------------|--------------------|--|--|--------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum average forward current | I _{F(AV)} | T _C = 134 °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 _{R(RM)} applied | 1800 | A |
| | | Surge applied at rated load condition half wave single phase, 60 Hz | | 150 | |
| Non-repetitive avalanche energy | E _{AS} | T _J = 25 °C, I _{AS} = 3.6 A, L = 3.7 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 x 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 °C | 0.63 | V |
| | | | T _J = 125 °C | 0.57 | |
| Maximum instantaneous reverse current | I _{RM} ⁽¹⁾ | T _J = 25 °C | Rated DC voltage | 0.2 | mA |
| | | T _J = 125 °C | | 40 | |
| Maximum junction capacitance | C _T | V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °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/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 | °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 maximum | | | 6 (5) | kgf · cm (lbf · in) |
| | | | | 12 (10) | |
| Marking device | | Case style 2L TO-220AC (JEDEC) | | MBR1635 | |
| | | | | MBR1645 | |

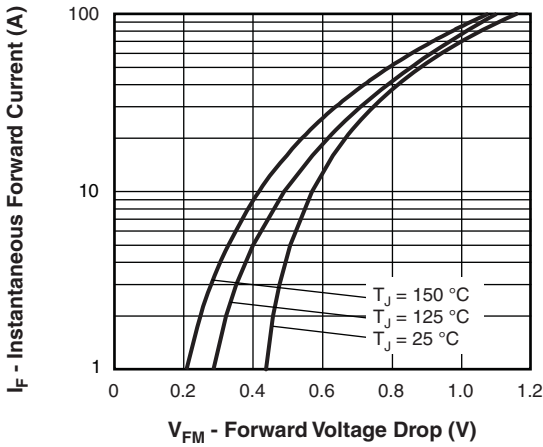


Fig. 1 - Maximum Forward Voltage Drop Characteristics

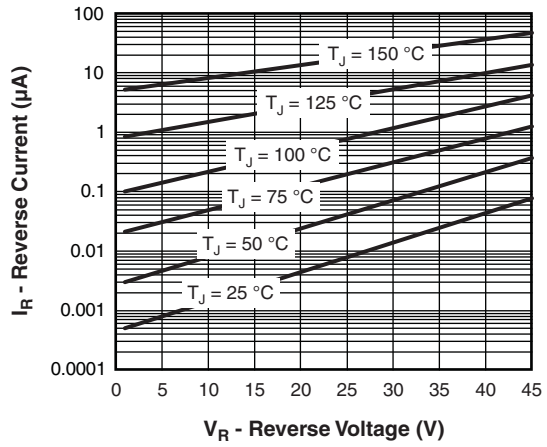


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

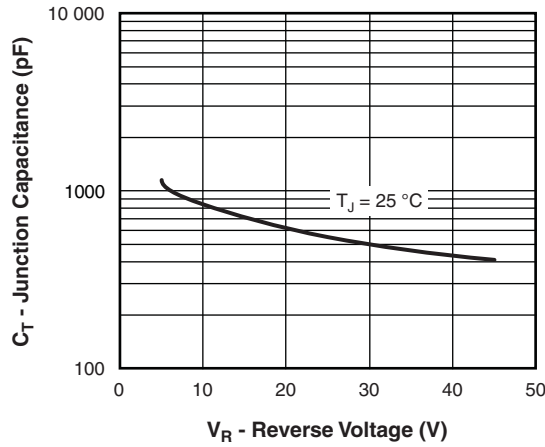


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

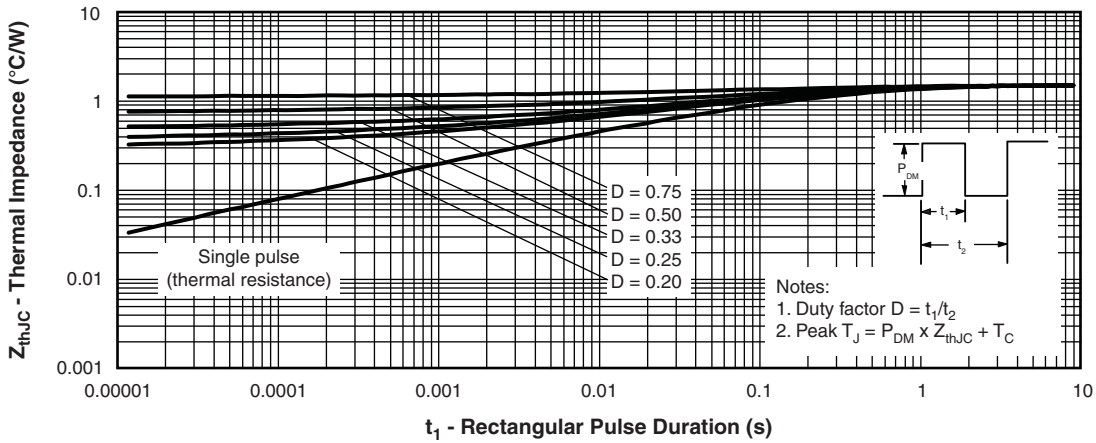


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

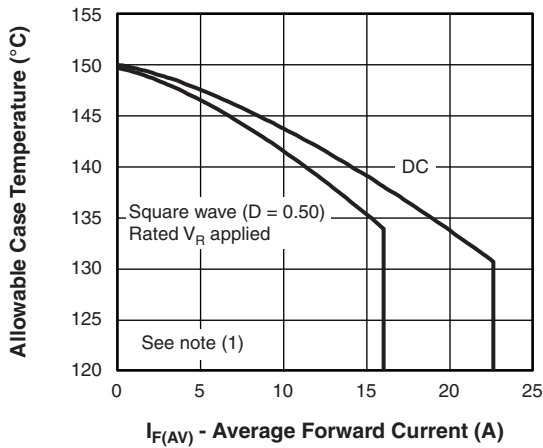


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

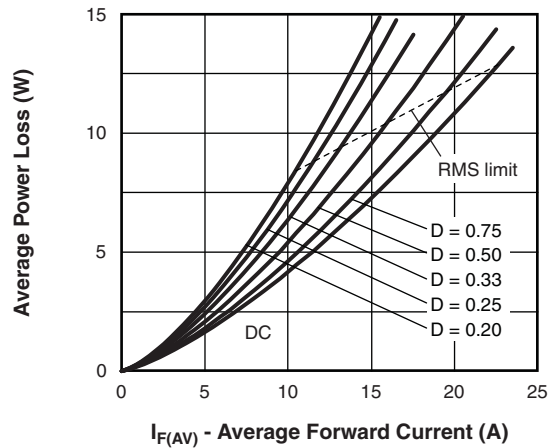


Fig. 6 - Forward Power Loss Characteristics

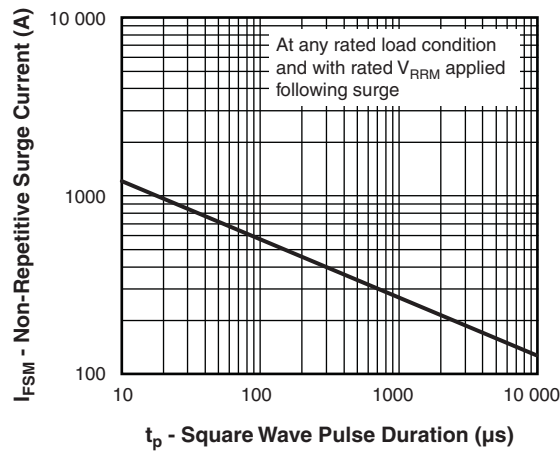


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

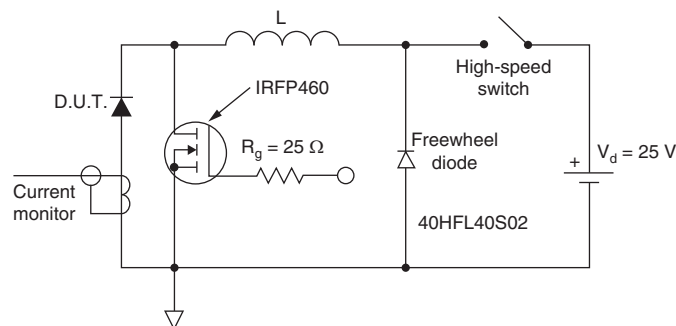


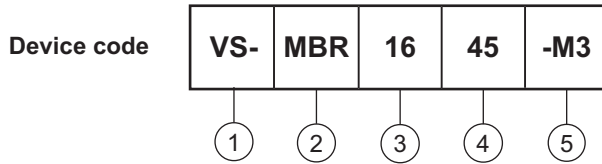
Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 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 applied



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
 - 2** - Schottky MBR series
 - 3** - Current rating (16 = 16 A)
 - 4** - Voltage ratings 35 = 35 V
45 = 45 V
 - 5** - Environmental digit
- M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

| ORDERING INFORMATION (Example) | | | |
|--------------------------------|------------------|------------------------|-------------------------|
| PREFERRED P/N | QUANTITY PER T/R | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION |
| VS-MBR1635-M3 | 50 | 1000 | Antistatic plastic tube |
| VS-MBR1645-M3 | 50 | 1000 | Antistatic plastic tube |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?96156 |
| Part marking information | www.vishay.com/doc?95391 |



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