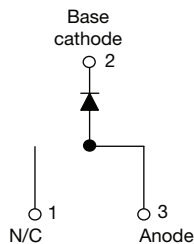


## Schottky Rectifier, 10 A



D<sup>2</sup>PAK



### FEATURES

- 150 °C T<sub>J</sub> operation
- TO-220 and D<sup>2</sup>PAK packages
- 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
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Halogen-free according to IEC 61249-2-21 definition
- Compliant to RoHS directive 2002/95/EC
- AEC-Q101 qualified



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### PRODUCT SUMMARY

|                    |                 |
|--------------------|-----------------|
| I <sub>F(AV)</sub> | 10 A            |
| V <sub>R</sub>     | 35 V/45 V       |
| I <sub>RM</sub>    | 15 mA at 125 °C |

### DESCRIPTION

This 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.

### MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL             | CHARACTERISTICS                 | VALUES      | UNITS |
|--------------------|---------------------------------|-------------|-------|
| I <sub>F(AV)</sub> | Rectangular waveform            | 10          | A     |
| I <sub>FRM</sub>   | T <sub>C</sub> = 135 °C         | 20          |       |
| V <sub>RRM</sub>   |                                 | 35/45       | V     |
| I <sub>FSM</sub>   | t <sub>p</sub> = 5 μs sine      | 1060        | A     |
| V <sub>F</sub>     | 10 Apk, T <sub>J</sub> = 125 °C | 0.57        | V     |
| T <sub>J</sub>     | Range                           | - 65 to 150 | °C    |

### VOLTAGE RATINGS

| PARAMETER                            | SYMBOL           | VS-MBRB1035PbF | VS-MBRB1045PbF | UNITS |
|--------------------------------------|------------------|----------------|----------------|-------|
| Maximum DC reverse voltage           | V <sub>R</sub>   | 35             | 45             | V     |
| Maximum working peak reverse voltage | V <sub>RWM</sub> |                |                |       |

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                       | SYMBOL             | TEST CONDITIONS                                                                                                                        |                                                                            | VALUES | UNITS |
|---------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------|-------|
| Maximum average forward current | I <sub>F(AV)</sub> | T <sub>C</sub> = 135 °C, rated V <sub>R</sub>                                                                                          |                                                                            | 10     | A     |
| Peak repetitive forward current | I <sub>FRM</sub>   | Rated V <sub>R</sub> , square wave, 20 kHz, T <sub>C</sub> = 135 °C                                                                    |                                                                            | 20     |       |
| Non-repetitive 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 | 1060   |       |
|                                 |                    | Surge applied at rated load conditions halfwave, single phase, 60 Hz                                                                   |                                                                            | 150    |       |
| Non-repetitive avalanche energy | E <sub>AS</sub>    | T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 2 A, L = 4 mH                                                                                |                                                                            | 8      | mJ    |
| Repetitive avalanche current    | I <sub>AR</sub>    | Current decaying linearly to zero in 1 μs<br>Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical |                                                                            | 2      | A     |

| ELECTRICAL SPECIFICATIONS             |                |                                                                                            |                                     |        |       |
|---------------------------------------|----------------|--------------------------------------------------------------------------------------------|-------------------------------------|--------|-------|
| PARAMETER                             | SYMBOL         | TEST CONDITIONS                                                                            |                                     | VALUES | UNITS |
| Maximum forward voltage drop          | $V_{FM}^{(1)}$ | 20 A                                                                                       | $T_J = 25\text{ }^{\circ}\text{C}$  | 0.84   | V     |
|                                       |                | 10 A                                                                                       | $T_J = 125\text{ }^{\circ}\text{C}$ | 0.57   |       |
|                                       |                | 20 A                                                                                       |                                     | 0.72   |       |
| Maximum instantaneous reverse current | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^{\circ}\text{C}$                                                         | Rated DC voltage                    | 0.1    | mA    |
|                                       |                | $T_J = 125\text{ }^{\circ}\text{C}$                                                        |                                     | 15     |       |
| Threshold voltage                     | $V_{F(TO)}$    | $T_J = T_J \text{ maximum}$                                                                |                                     | 0.354  | V     |
| Forward slope resistance              | $r_t$          |                                                                                            |                                     | 17.6   | mΩ    |
| Maximum junction capacitance          | $C_T$          | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$ |                                     | 600    | 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  $\mu$ s, duty cycle < 2 %

| 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 |         | R <sub>thJC</sub> | DC operation                                           | 2.0         | °C/W                   |
| Typical thermal resistance, case to heatsink |         | R <sub>thCS</sub> | Mounting surface, smooth and greased (Only for TO-220) | 0.50        |                        |
| Approximate weight                           |         |                   |                                                        | 2           | g                      |
|                                              |         |                   |                                                        | 0.07        | oz.                    |
| Mounting torque                              | minimum |                   |                                                        | 6 (5)       | kgf · cm<br>(lbf · in) |
|                                              | maximum |                   |                                                        | 12 (10)     |                        |
| Marking device                               |         |                   | Case style D <sup>2</sup> PAK                          | MBRB1035    |                        |
|                                              |         |                   |                                                        | MBRB1045    |                        |

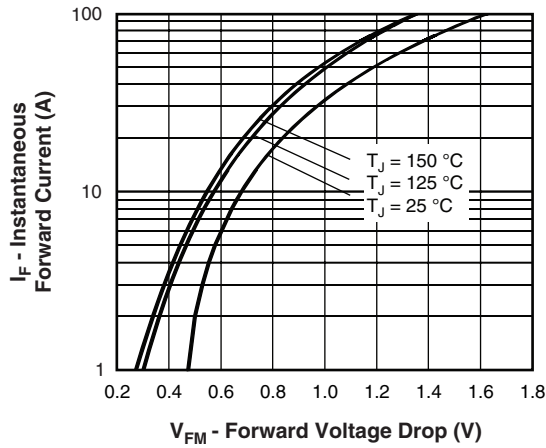


Fig. 1 - Maximum Forward Voltage Drop Characteristics

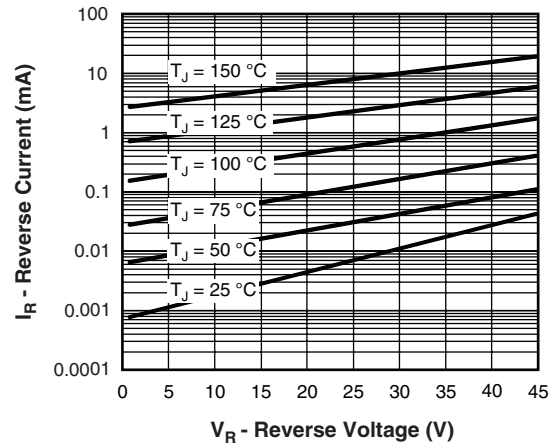


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

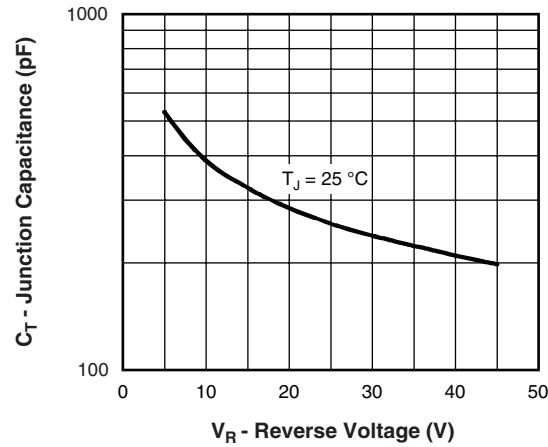


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

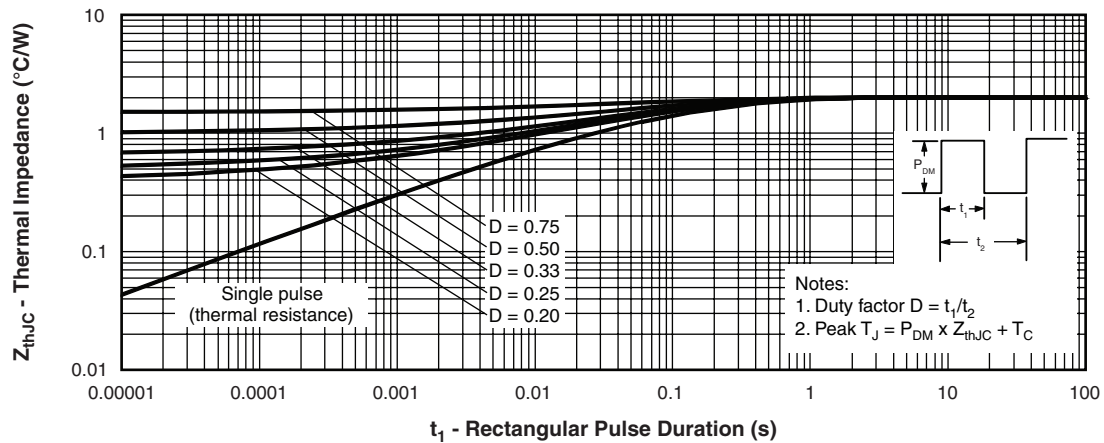


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

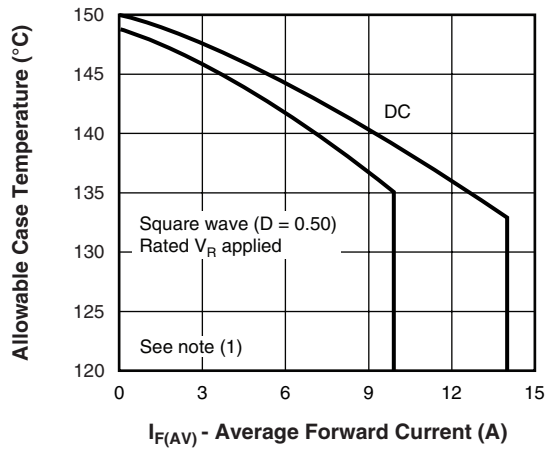


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

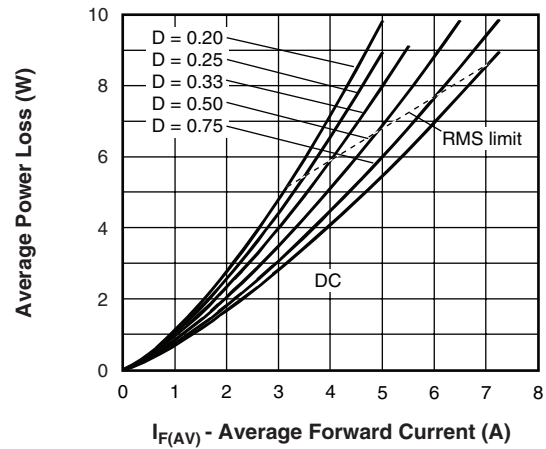


Fig. 6 - Forward Power Loss Characteristics

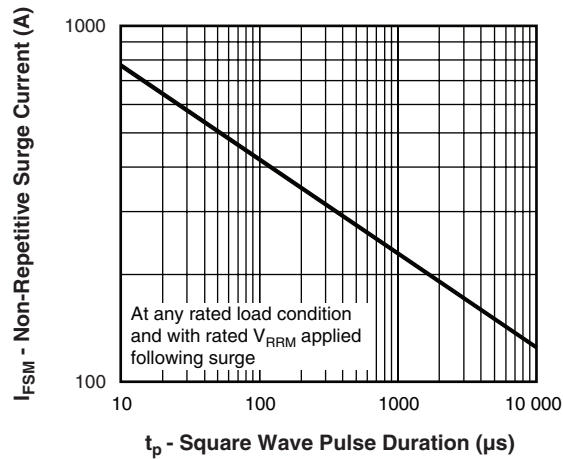


Fig. 7 - Maximum Non-Repetitive Surge Current

### 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  $V_R$



# VS-MBRB1035PbF, VS-MBRB1045PbF

Schottky Rectifier, 10 A Vishay High Power Products

## ORDERING INFORMATION TABLE

|             |     |     |   |    |    |     |     |
|-------------|-----|-----|---|----|----|-----|-----|
| Device code | VS- | MBR | B | 10 | 45 | TRL | PbF |
|             | 1   | 2   | 3 | 4  | 5  | 6   | 7   |

- |          |   |                                                                                                                                                                        |                        |
|----------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>1</b> | - | HPP product suffix                                                                                                                                                     |                        |
| <b>2</b> | - | Essential part number                                                                                                                                                  |                        |
| <b>3</b> | - | B = Surface mount                                                                                                                                                      |                        |
| <b>4</b> | - | Current rating (10 = 10 A)                                                                                                                                             |                        |
| <b>5</b> | - | Voltage ratings                                                                                                                                                        | 35 = 35 V<br>45 = 45 V |
| <b>6</b> | - | <ul style="list-style-type: none"><li>• None = Tube (50 pieces)</li><li>• TRL = Tape and reel (left oriented)</li><li>• TRR = Tape and reel (right oriented)</li></ul> |                        |
| <b>7</b> | - | PbF = Lead (Pb)-free                                                                                                                                                   |                        |

| LINKS TO RELATED DOCUMENTS |                                                                        |
|----------------------------|------------------------------------------------------------------------|
| Dimensions                 | <a href="http://www.vishay.com/doc?95046">www.vishay.com/doc?95046</a> |
| Part marking information   | <a href="http://www.vishay.com/doc?95054">www.vishay.com/doc?95054</a> |
| Packaging information      | <a href="http://www.vishay.com/doc?95032">www.vishay.com/doc?95032</a> |
| SPICE model                | <a href="http://www.vishay.com/doc?95293">www.vishay.com/doc?95293</a> |



### 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.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Vishay:](#)

[VS-MBRB1035PBF](#)