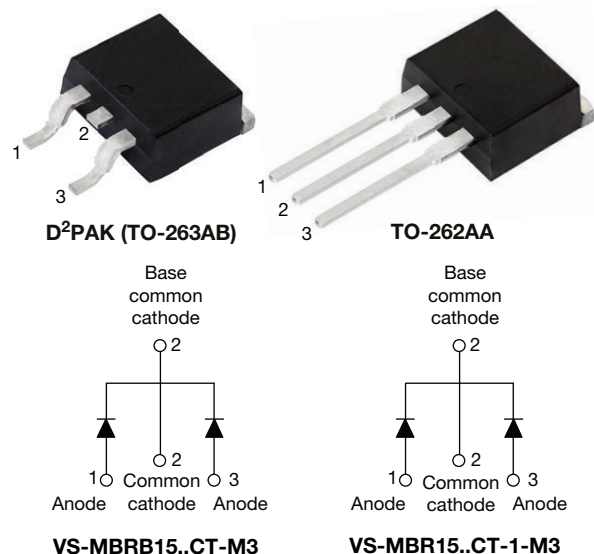


High Performance Schottky Rectifier, 2 x 7.5 A



FEATURES

- 150 °C T_J operation
- Center tap TO-220 package
- 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 245 °C
- 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-MBR(B)15... 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.

PRIMARY CHARACTERISTICS

| | |
|----------------------------------|---|
| I _{F(AV)} | 2 x 7.5 A |
| V _R | 35 V, 45 V |
| V _F at I _F | 0.57 V |
| I _{RM} max. | 15 mA at 125 °C |
| T _J max. | 150 °C |
| E _{AS} | 7 mJ |
| Package | D ² PAK (TO-263AB), TO-262AA |
| Circuit configuration | Common cathode |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|--------------------|---|-------------|-------|
| I _{F(AV)} | Rectangular waveform | 15 | A |
| V _{RRM} | | 35/45 | V |
| I _{FSM} | t _p = 5 μs sine | 690 | A |
| V _F | 7.5 A _{pk} , T _J = 125 °C | 0.57 | V |
| T _J | | -65 to +150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | VS-MBRB1535CT-M3 VS-MBR1535CT-1-M3 | VS-MBRB1545CT-M3 VS-MBR1545CT-1-M3 | 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 | $I_{F(AV)}$ | $T_C = 131\text{ }^{\circ}\text{C}$, rated V_R | 7.5 | A |
| per leg | | | 15 | |
| Maximum peak one cycle non-repetitive surge | I_{FSM} | 5 μs sine or 3 μs rect. pulse | 690 | |
| | | Following any rated load condition and with rated V_{RRM} applied | 150 | |
| Non-repetitive avalanche energy per leg | E_{AS} | Surge applied at rated load conditions halfwave, single phase, 60 Hz | 7 | mJ |
| Repetitive avalanche current per leg | I_{AR} | $T_J = 25\text{ }^{\circ}\text{C}$, $I_{AS} = 2\text{ A}$, $L = 3.5\text{ mH}$ | 2 | A |
| | | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | | |

ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---------------------------------------|----------------|--|--------|------------------|
| Maximum forward voltage drop | $V_{FM}^{(1)}$ | 15 A | 0.84 | V |
| | | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.57 | |
| | | 7.5 A | 0.72 | |
| Maximum instantaneous reverse current | $I_{RM}^{(1)}$ | 15 A | 0.1 | mA |
| | | $T_J = 25\text{ }^{\circ}\text{C}$ | 15 | |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | | |
| Maximum junction capacitance | C_T | Rated DC voltage | 400 | pF |
| Typical series inductance | L_S | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$ | 8.0 | nH |
| Maximum voltage rate of change | dV/dt | Measured from top of terminal to mounting plane | 10 000 | V/ μs |
| | | Rated V_R | | |

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 per leg | R _{thJC} | DC operation | 3.0 | °C/W |
| Typical thermal resistance, case to heatsink | R _{thCS} | Mounting surface, smooth and greased | 0.50 | |
| Maximum thermal resistance, junction to ambient | R _{thJA} | DC operation | 60 | |
| 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 (TO-263AB) | MBRB1545CT | |
| | | Case style TO-262AA | MBR1545CT-1 | |

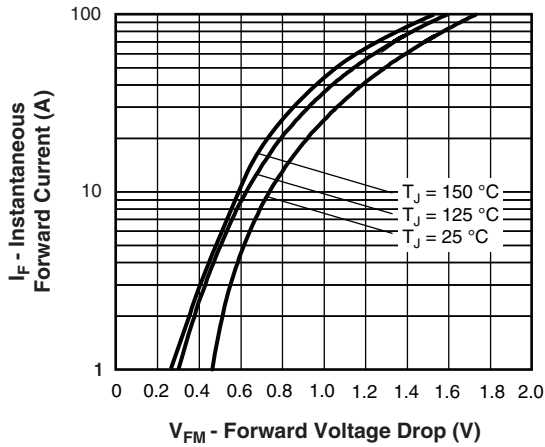


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

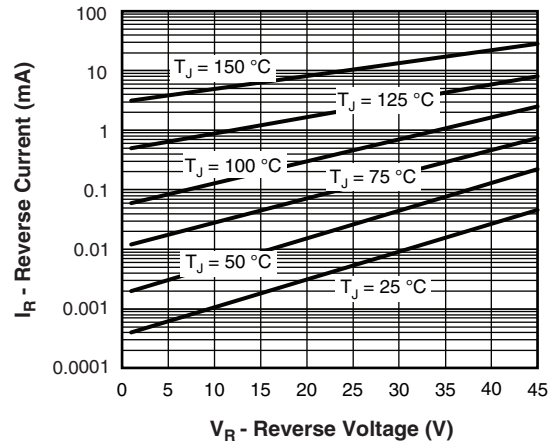


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

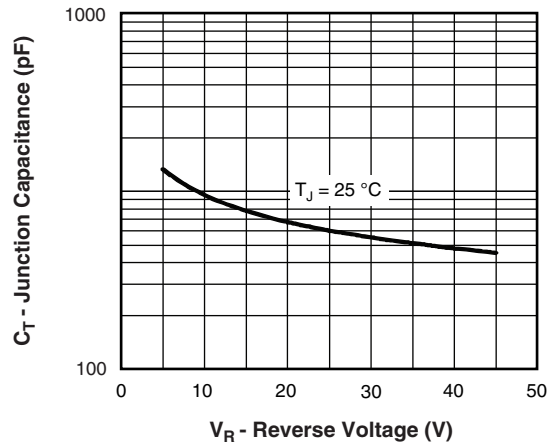


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

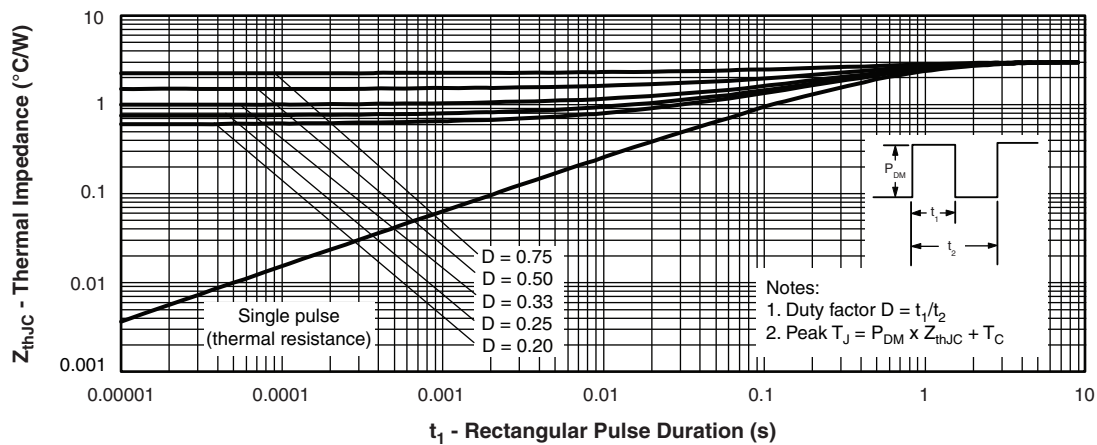


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

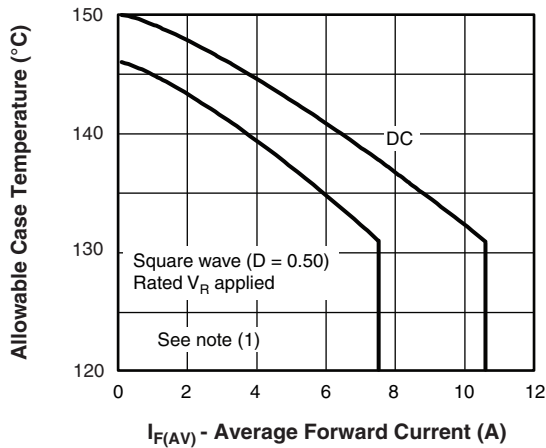


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

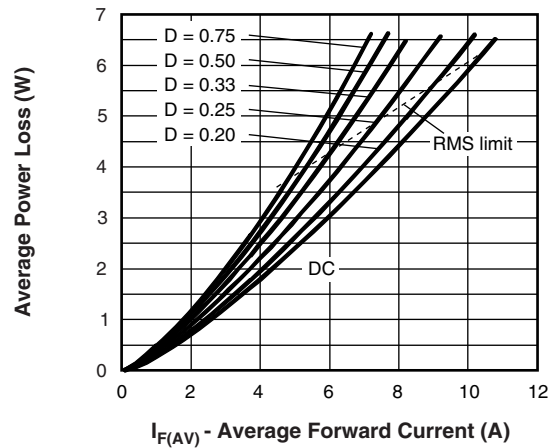


Fig. 6 - Forward Power Loss Characteristics

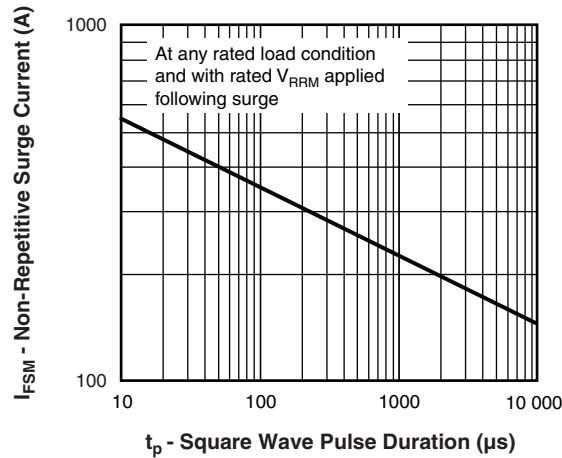


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

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



ORDERING INFORMATION TABLE

| | | | | | | | | | |
|-------------|-----|-----|---|----|----|----|----|---|-----|
| Device code | VS- | MBR | B | 15 | 45 | CT | -1 | L | -M3 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

- | | | | |
|----------|---|--|--------------------------------|
| 1 | - | Vishay Semiconductors product | |
| 2 | - | Essential part number | |
| 3 | - | <ul style="list-style-type: none"> B = D²PAK (TO-263AB) None = TO-262AA | 7 None 7 = -1 |
| 4 | - | Current rating (15 = 15 A) | |
| 5 | - | Voltage ratings | 35 = 35 V 45 = 45 V |
| 6 | - | CT = essential part number | |
| 7 | - | <ul style="list-style-type: none"> None = D²PAK -1 = TO-262AA | 3 = B 3 None |
| 8 | - | <ul style="list-style-type: none"> None = tube L = tape and reel (left oriented - for D²PAK (TO-263AB) only) R = tape and reel (right oriented - for D²PAK (TO-263AB) only) | |
| 9 | - | -M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free | |

ORDERING INFORMATION

| PREFERRED P/N | BASE QUANTITY | PACKAGING DESCRIPTION |
|-------------------|---------------|------------------------------------|
| VS-MBRB1535CTL-M3 | 800 | 13" diameter plastic tape and reel |
| VS-MBRB1535CT-M3 | 50 | Antistatic plastic tubes |
| VS-MBRB1535CTR-M3 | 800 | 13" diameter plastic tape and reel |
| VS-MBRB1545CTL-M3 | 800 | 13" diameter plastic tape and reel |
| VS-MBRB1545CT-M3 | 50 | Antistatic plastic tubes |
| VS-MBRB1545CTR-M3 | 800 | 13" diameter plastic tape and reel |
| VS-MBR1535CT-1-M3 | 50 | Antistatic plastic tubes |
| VS-MBR1545CT-1-M3 | 50 | Antistatic plastic tubes |

LINKS TO RELATED DOCUMENTS

| | | |
|--------------------------|-------------------------------|--|
| Dimensions | D ² PAK (TO-263AB) | www.vishay.com/doc?96164 |
| Dimensions | TO-262AA | www.vishay.com/doc?96165 |
| Part marking information | D ² PAK (TO-263AB) | www.vishay.com/doc?95444 |
| Part marking information | TO-262AA | www.vishay.com/doc?95443 |
| Packaging information | | www.vishay.com/doc?96424 |
| SPICE model | | www.vishay.com/doc?95294 |



D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)

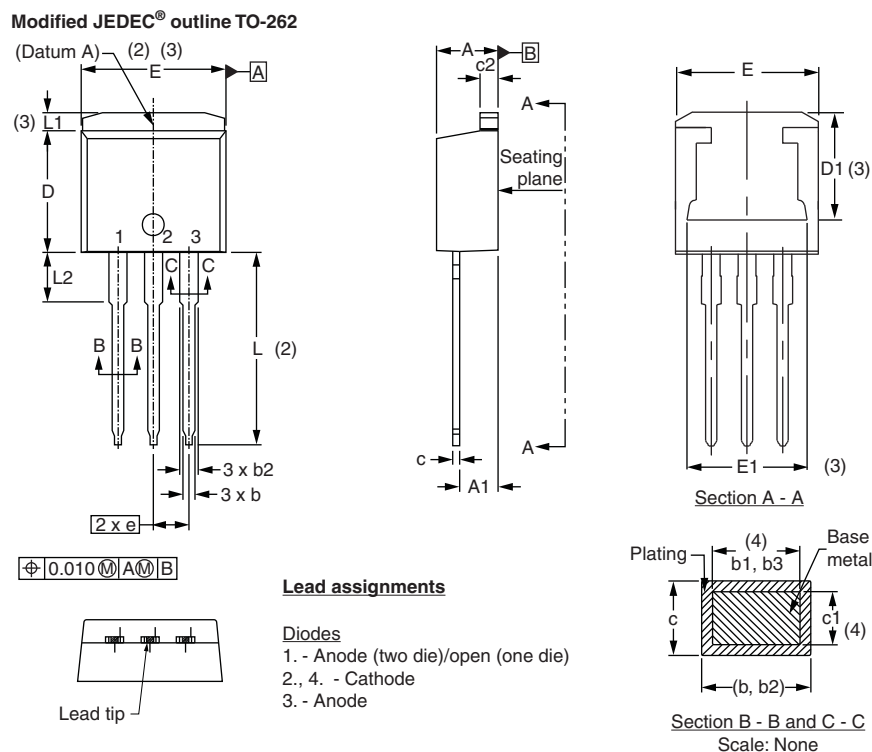

| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.06 | 4.83 | 0.160 | 0.190 | |
| A1 | 0.00 | 0.254 | 0.000 | 0.010 | |
| b | 0.51 | 0.99 | 0.020 | 0.039 | |
| b1 | 0.51 | 0.89 | 0.020 | 0.035 | 4 |
| b2 | 1.14 | 1.78 | 0.045 | 0.070 | |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 |
| c | 0.38 | 0.74 | 0.015 | 0.029 | |
| c1 | 0.38 | 0.58 | 0.015 | 0.023 | 4 |
| c2 | 1.14 | 1.65 | 0.045 | 0.065 | |
| D | 8.51 | 9.65 | 0.335 | 0.380 | 2 |
| D1 | 6.86 | 8.00 | 0.270 | 0.315 | 3 |
| E | 9.65 | 10.67 | 0.380 | 0.420 | 2, 3 |
| E1 | 7.90 | 8.80 | 0.311 | 0.346 | 3 |
| e | 2.54 BSC | | 0.100 BSC | | |
| H | 14.61 | 15.88 | 0.575 | 0.625 | |
| L | 1.78 | 2.79 | 0.070 | 0.110 | |
| L1 | - | 1.65 | - | 0.066 | 3 |
| L2 | 1.27 | 1.78 | 0.050 | 0.070 | |
| L3 | 0.25 BSC | | 0.010 BSC | | |
| L4 | 4.78 | 5.28 | 0.188 | 0.208 | |

Notes

- Dimensioning and tolerancing per ASME Y14.5 M-1994
- Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- Thermal pad contour optional within dimension E, L1, D1 and E1
- Dimension b1 and c1 apply to base metal only
- Datum A and B to be determined at datum plane H
- Controlling dimension: inches
- Outline conforms to JEDEC® outline TO-263AB

TO-262AA

DIMENSIONS in millimeters and inches



| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.06 | 4.83 | 0.160 | 0.190 | |
| A1 | 2.03 | 3.02 | 0.080 | 0.119 | |
| b | 0.51 | 0.99 | 0.020 | 0.039 | |
| b1 | 0.51 | 0.89 | 0.020 | 0.035 | 4 |
| b2 | 1.14 | 1.78 | 0.045 | 0.070 | |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 |
| c | 0.38 | 0.74 | 0.015 | 0.029 | |
| c1 | 0.38 | 0.58 | 0.015 | 0.023 | 4 |
| c2 | 1.14 | 1.65 | 0.045 | 0.065 | |
| D | 8.51 | 9.65 | 0.335 | 0.380 | 2 |
| D1 | 6.86 | 8.00 | 0.270 | 0.315 | 3 |
| E | 9.65 | 10.67 | 0.380 | 0.420 | 2, 3 |
| E1 | 7.90 | 8.80 | 0.311 | 0.346 | 3 |
| e | 2.54 BSC | | 0.100 BSC | | |
| L | 13.46 | 14.10 | 0.530 | 0.555 | |
| L1 | - | 1.65 | - | 0.065 | 3 |
| L2 | 3.56 | 3.71 | 0.140 | 0.146 | |

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Controlling dimension: inches
- (6) Outline conform to JEDEC® TO-262 except A1 (max.), b (min., max.), b1 (min.), b2 (max.), c (min.), c1(min.), c2 (max.), D (min.), E (max.), L1 (max.), L2 (min., max.)



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