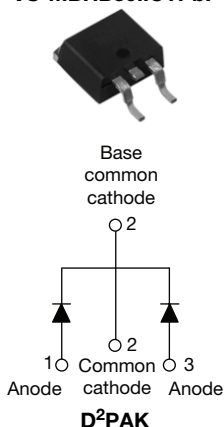
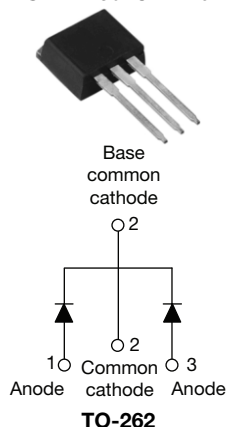


Schottky Rectifier, 2 x 15 A

VS-MBRB30..CTPbF



VS-MBR30..CT-1PbF



FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Center tap D²PAK and TO-262 packages
- 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 _{F(AV)} | 2 x 15 A |
| V _R | 35 V/45 V |
| I _{RM} | 100 mA at 125 °C |

DESCRIPTION

This 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.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|--------------------|-----------------------------------|-------------|-------|
| I _{F(AV)} | Rectangular waveform (per device) | 30 | A |
| I _{FRM} | T _C = 123 °C (per leg) | 30 | |
| V _{RRM} | | 35/45 | V |
| I _{FSM} | t _p = 5 μs sine | 1020 | A |
| V _F | 20 Apk, T _J = 125 °C | 0.6 | V |
| T _J | Range | - 65 to 150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | VS-MBRB3035CTPbF VS-MBR3035CT-1PbF | VS-MBRB3045CTPbF VS-MBR3045CT-1PbF | 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 = 123 °C, rated V _R | 15 | A |
| per leg | | | 30 | |
| Peak repetitive forward current per leg | I _{FRM} | Rated V _R , square wave, 20 kHz, T _C = 123 °C | 30 | |
| Non-repetitive peak surge current | I _{FSM} | 5 μs sine or 3 μs rect. pulse | 1020 | |
| | | Following any rated load condition and with rated V _{RRM} applied | 200 | |
| Non-repetitive peak surge current | | Surge applied at rated load conditions halfwave, single phase, 60 Hz | | |
| Non-repetitive avalanche energy per leg | E _{AS} | T _J = 25 °C, I _{AS} = 2 A, L = 5 mH | 10 | 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 x V _R typical | 2 | A |

VS-MBRB30..CTPbF, VS-MBR30..CT-1PbF Series



Vishay High Power Products Schottky Rectifier, 2 x 15 A

| ELECTRICAL SPECIFICATIONS | | | | | |
|---------------------------------------|--------------------------------|--|-------------------------|--------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop | V _{FM} ⁽¹⁾ | 30 A | T _J = 25 °C | 0.76 | V |
| | | 20 A | T _J = 125 °C | 0.6 | |
| | | 30 A | | 0.72 | |
| Maximum instantaneous reverse current | I _{RM} ⁽¹⁾ | T _J = 25 °C | Rated DC voltage | 1 | mA |
| | | T _J = 125 °C | | 100 | |
| Threshold voltage | V _{F(TO)} | T _J = T _J maximum | | 0.29 | V |
| Forward slope resistance | r _t | | | 13.6 | mΩ |
| Maximum junction capacitance | C _T | V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz), 25 °C | | 800 | 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 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 per leg | R _{thJC} | DC operation | 1.5 | °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 | 50 | |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Mounting torque | minimum | Non-lubricated threads | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | 12 (10) | |
| Marking device | | Case style D ² PAK | MBRB3045CT | |
| | | Case style TO-262 | MBR3045CT-1 | |



VS-MBRB30..CTPbF, VS-MBR30..CT-1PbF Series

Schottky Rectifier, 2 x 15 A Vishay High Power Products

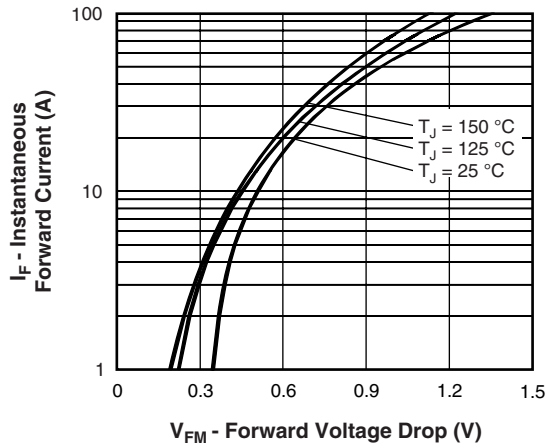


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

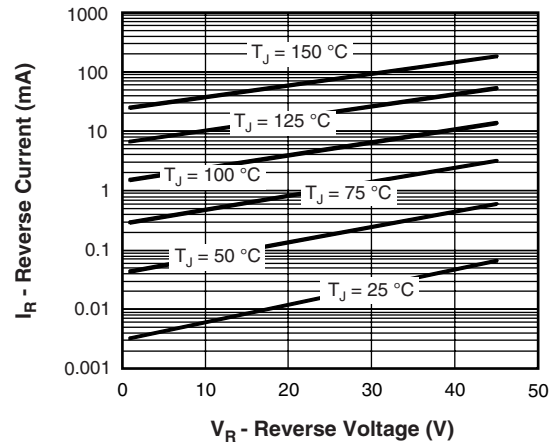


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

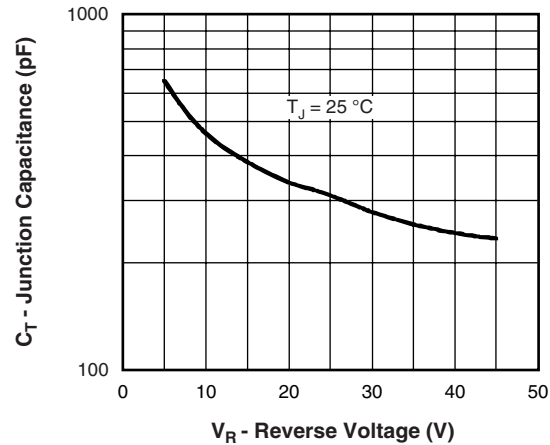


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

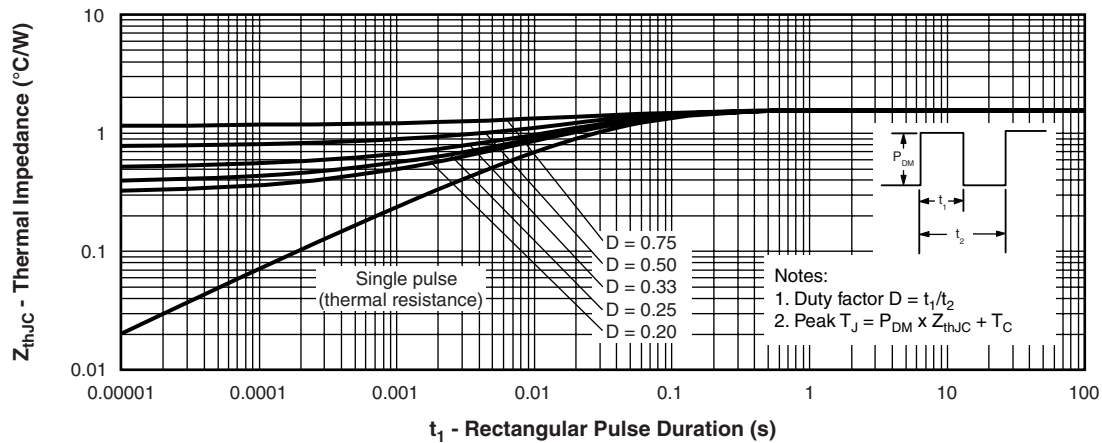


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

VS-MBRB30..CTPbF, VS-MBR30..CT-1PbF Series

Vishay High Power Products Schottky Rectifier, 2 x 15 A

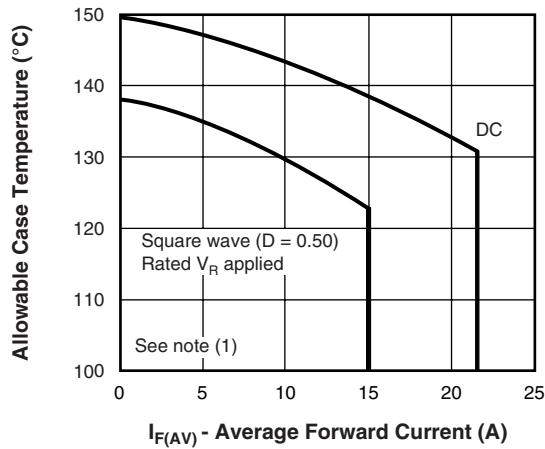


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

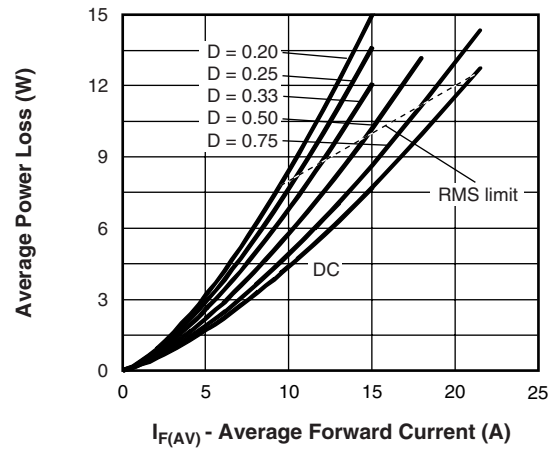


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

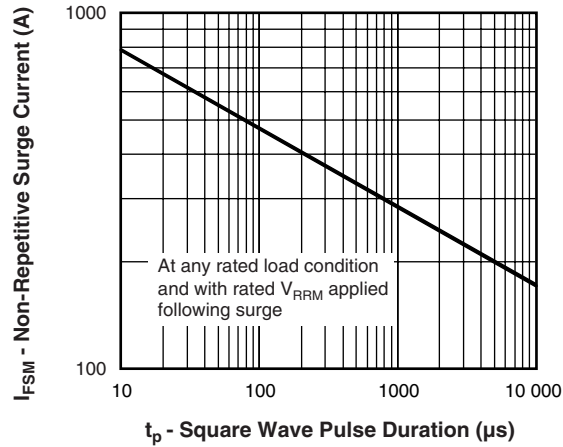


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

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



VS-MBRB30..CTPbF, VS-MBR30..CT-1PbF Series

Schottky Rectifier, 2 x 15 A Vishay High Power Products

ORDERING INFORMATION TABLE

| Device code | VS- | MBR | B | 30 | 45 | CT | -1 | TRL | PbF |
|-------------|-----|-----|---|----|----|----|----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

- | | | | |
|----------|---|--|------------------------|
| 1 | - | HPP product suffix | |
| 2 | - | Essential part number | |
| 3 | - | • B = D ² PAK 7 None | |
| | | • None = TO-262 7 = -1 | |
| 4 | - | Current rating (30 = 30 A) | |
| 5 | - | Voltage ratings | 35 = 35 V 45 = 45 V |
| 6 | - | CT = Essential part number | |
| 7 | - | • None = D ² PAK 3 = B | |
| | | • -1 = TO-262 3 None | |
| 8 | - | • None = Tube (50 pieces) | |
| | | • TRL = Tape and reel (left oriented - for D ² PAK only) | |
| | | • TRR = Tape and reel (right oriented - for D ² PAK only) | |
| 9 | - | • PbF = Lead (Pb)-free (for TO-262 and D ² PAK tube) | |
| | | • P = Lead (Pb)-free (for D ² PAK TRR and TRL) | |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?95014 |
| Part marking information | www.vishay.com/doc?95008 |
| Packaging information | www.vishay.com/doc?95032 |

D²PAK, TO-262

DIMENSIONS FOR D²PAK 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 |

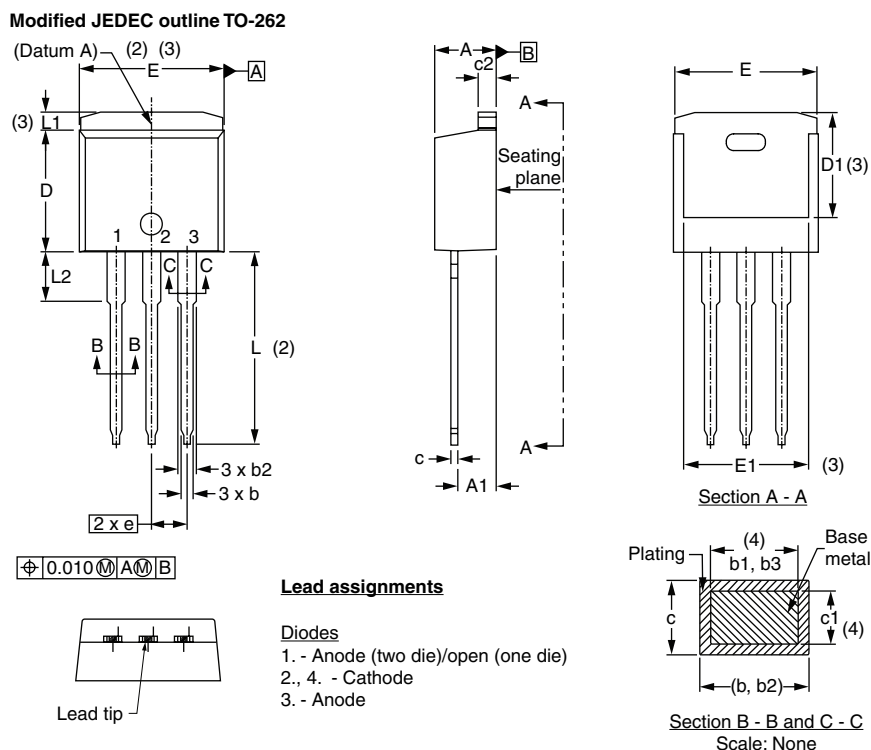
| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| D1 | 6.86 | 8.00 | 0.270 | 0.315 | 3 |
| E | 9.65 | 10.67 | 0.380 | 0.420 | 2, 3 |
| E1 | 7.90 | 8.80 | 0.311 | 0.346 | 3 |
| e | 2.54 BSC | | 0.100 BSC | | |
| 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

- (1) Dimensioning and tolerancing per ASME Y14.5 M-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) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inch

- (7) Outline conforms to JEDEC outline TO-263AB

DIMENSIONS FOR TO-262 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 (maximum), b (minimum) and D1 (minimum) where dimensions derived the actual package outline



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