

# International IOR Rectifier

## MBR2545CT MBRB2545CT MBR2545CT-1

### SCHOTTKY RECTIFIER

30 Amp

#### Major Ratings and Characteristics

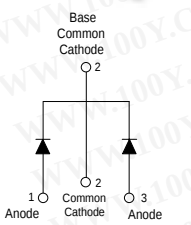
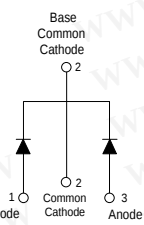
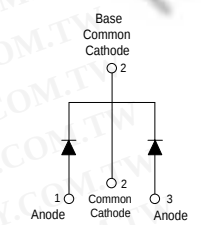
| Characteristics                                    | Values     | Units            |
|----------------------------------------------------|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform<br>(Per Device)   | 30         | A                |
| $I_{FRM}$ @ $T_C = 130^\circ\text{C}$<br>(Per Leg) | 30         | A                |
| $V_{RRM}$                                          | 35/45      | V                |
| $I_{FSM}$ @ $t_p = 5\mu\text{s}$ sine              | 1060       | A                |
| $V_F$ @ 30 Apk, $T_J = 125^\circ\text{C}$          | 0.73       | V                |
| $T_J$ range                                        | -65 to 150 | $^\circ\text{C}$ |

#### Description/ Features

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  $150^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $150^\circ\text{C}$   $T_J$  operation
- Center tap TO-220 and D<sup>2</sup>Pak packages
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

#### Case Styles

| MBR25..CT                                                                                                                                                                            | MBRB25..CT                                                                                                                                                                                       | MBR25..CT-1                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><br>TO-220 | <br><br>D <sup>2</sup> PAK | <br><br>TO-262 |

# MBR2545CT, MBRB2545CT, MBR2545CT-1

Bulletin PD-2.322 rev.C 01/03

International  
**IR** Rectifier

## Voltage Ratings

| Parameters                                      | MBR2535CT<br>MBRB2535CT<br>MBR2535CT-1 | MBR2545CT<br>MBRB2545CT<br>MBR2545CT-1 |
|-------------------------------------------------|----------------------------------------|----------------------------------------|
| $V_R$ Max. DC Reverse Voltage (V)               | 35                                     | 45                                     |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |                                        |                                        |

## Absolute Maximum Ratings

| Parameters                                                         | Values | Units | Conditions                                                                                                                                                                                        |
|--------------------------------------------------------------------|--------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_{F(AV)}$ Max. Average Forward Current (Per Leg)<br>(Per Device) | 15     | A     | @ $T_C = 130^\circ\text{C}$ , (Rated $V_R$ )                                                                                                                                                      |
|                                                                    | 30     |       |                                                                                                                                                                                                   |
| $I_{FRM}$ Peak Repetitive Forward Current (Per Leg)                | 30     | A     | Rated $V_R$ , square wave, 20kHz<br>$T_C = 130^\circ\text{C}$                                                                                                                                     |
| $I_{FSM}$ Non Repetitive Peak Surge Current                        | 1060   | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse<br>Following any rated load condition and with rated $V_{RWM}$ applied<br>Surge applied at rated load conditions halfwave, single phase, 60Hz |
|                                                                    | 150    |       |                                                                                                                                                                                                   |
| $E_{AS}$ Non-Repetitive Avalanche Energy                           | 16     | mJ    | (Per Leg) $T_J = 25^\circ\text{C}$ , $I_{AS} = 2\text{Amps}$ , $L = 8\text{mH}$                                                                                                                   |
| $I_{AR}$ Repetitive Avalanche Current (Per Leg)                    | 2      | A     | Current decaying linearly to zero in 1 $\mu\text{sec}$<br>Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical                                                                          |

## Electrical Specifications

| Parameters                                         | Values                                             | Units            | Conditions                                                              |
|----------------------------------------------------|----------------------------------------------------|------------------|-------------------------------------------------------------------------|
| $V_{FM}$ Max. Forward Voltage Drop (1)             | 0.82                                               | V                | @ 30A $T_J = 25^\circ\text{C}$                                          |
|                                                    | 0.73                                               | V                | @ 30A $T_J = 125^\circ\text{C}$                                         |
| $I_{RM}$ Max. Instantaneous Reverse Current (1)    | 0.2                                                | mA               | $T_J = 25^\circ\text{C}$                                                |
|                                                    | 40                                                 | mA               | $T_J = 125^\circ\text{C}$<br>Rated DC voltage                           |
| $V_{F(TO)}$ Threshold Voltage                      | 0.355                                              | V                | $T_J = T_J \text{ max.}$                                                |
| $r_f$ Forward Slope Resistance                     | 12.3                                               | m $\Omega$       |                                                                         |
| $C_T$ Max. Junction Capacitance                    | 700                                                | pF               | $V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance 8.0                | nH Measured from top of terminal to mounting plane |                  |                                                                         |
| $dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ ) | 10000                                              | V/ $\mu\text{s}$ |                                                                         |

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## Thermal-Mechanical Specifications

| Parameters                                                    | Values       | Units              | Conditions                                              |
|---------------------------------------------------------------|--------------|--------------------|---------------------------------------------------------|
| $T_J$ Max. Junction Temperature Range                         | -65 to 150   | $^\circ\text{C}$   |                                                         |
| $T_{stg}$ Max. Storage Temperature Range                      | -65 to 175   | $^\circ\text{C}$   |                                                         |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Leg) | 1.5          | $^\circ\text{C/W}$ | DC operation                                            |
| $R_{thCS}$ Typical Thermal Resistance Case to Heatsink        | 0.50         | $^\circ\text{C/W}$ | Mounting surface, smooth and greased<br>Only for TO-220 |
| wt Approximate Weight                                         | 2 (0.07)     | g (oz.)            |                                                         |
| T Mounting Torque                                             | Min. 6 (5)   | Kg-cm<br>(lbf-in)  | Non-lubricated threads                                  |
|                                                               | Max. 12 (10) |                    |                                                         |

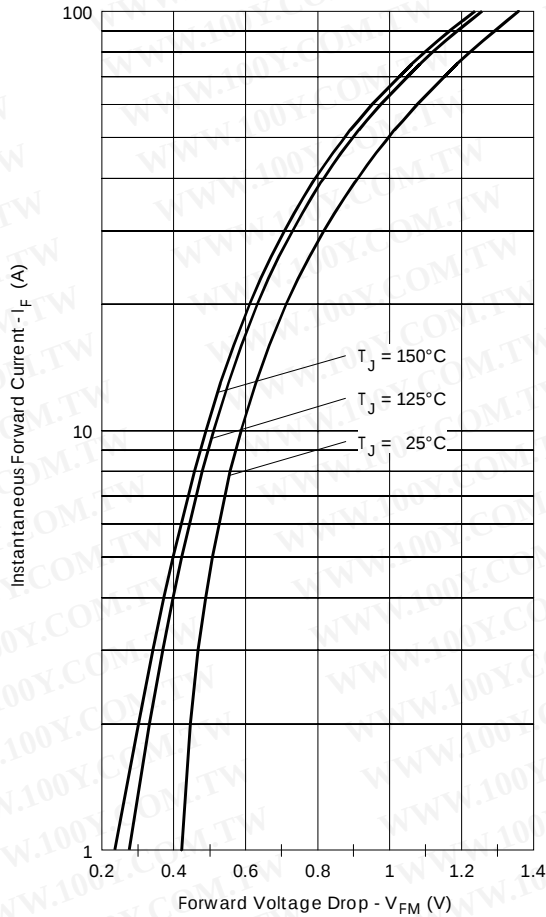


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

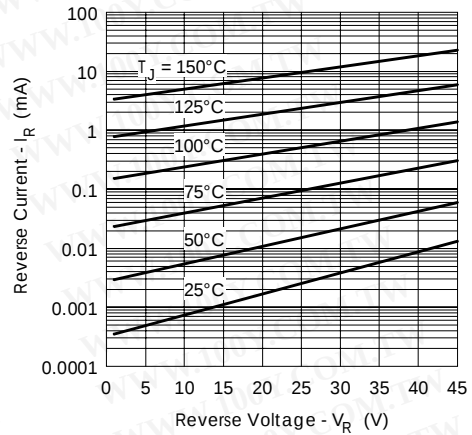


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

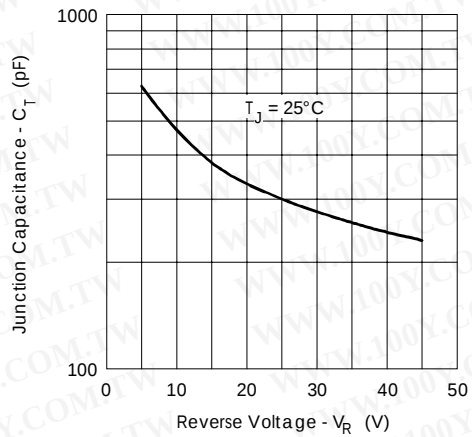


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

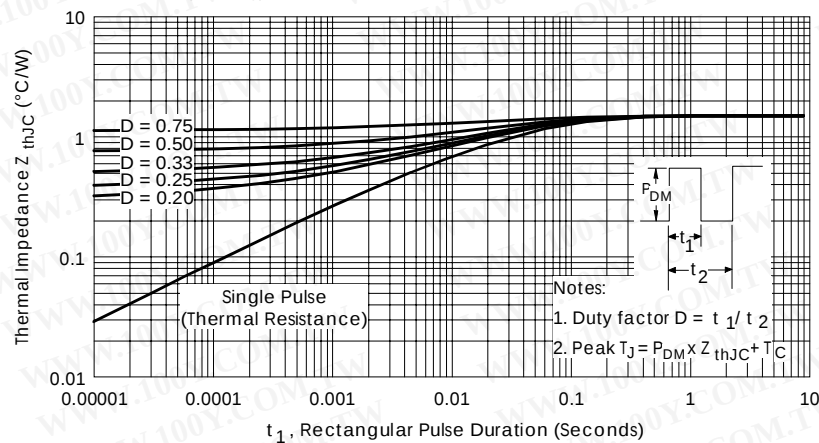


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

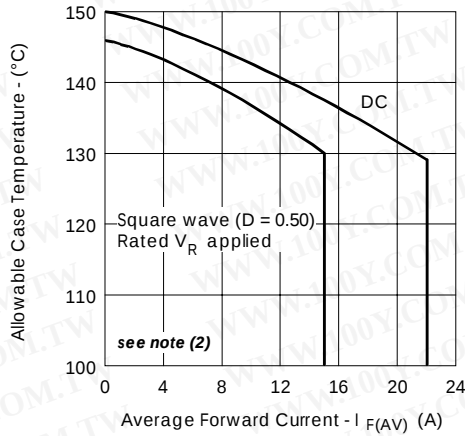


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

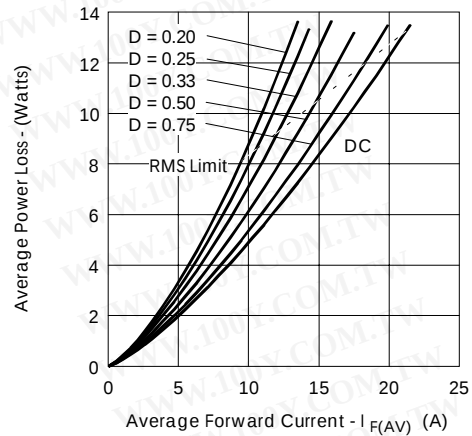


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

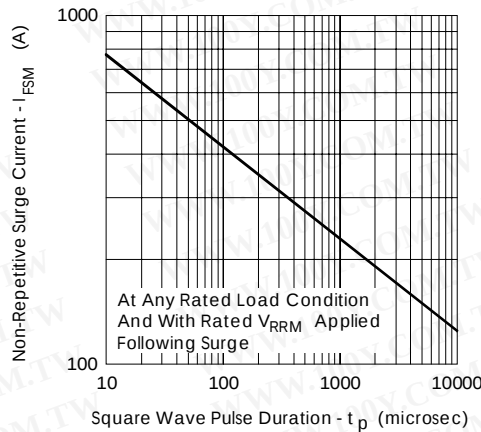


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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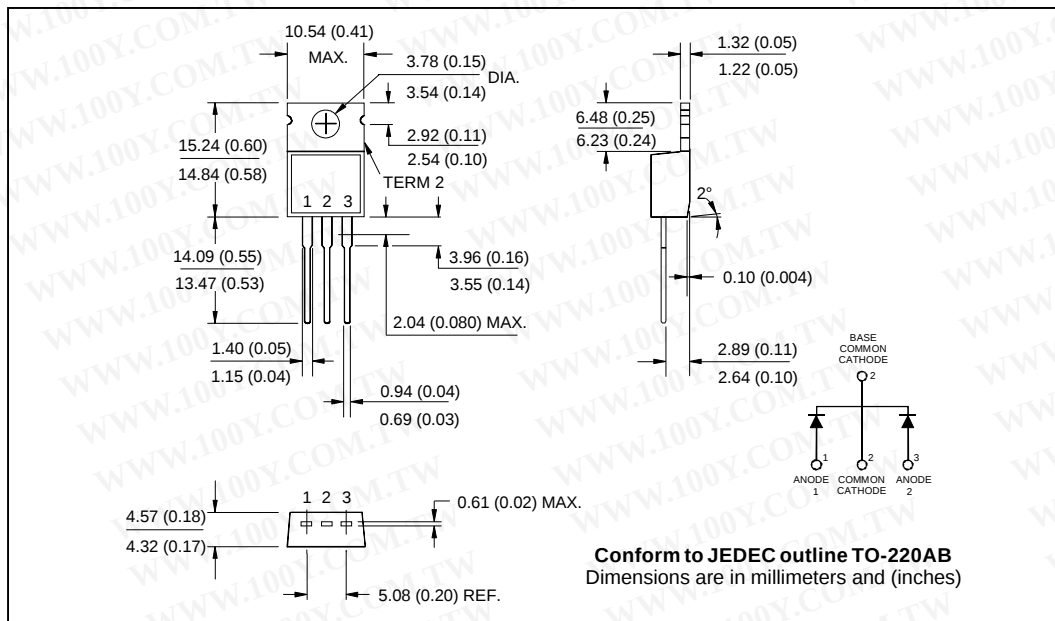
(2) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);  
 $P_{d_{REV}}$  = Inverse Power Loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1}$  = rated  $V_R$

## Ordering Information Table

| Device Code |                                      |    |    |    |    |
|-------------|--------------------------------------|----|----|----|----|
| 1           | 2                                    | 3  | 4  | 5  | 6  |
| MBR         | B                                    | 25 | 45 | CT | -1 |
| 1           | 2                                    | 3  | 4  | 5  | 6  |
| 1           | - Essential Part Number              |    |    |    |    |
| 2           | - B = Surface Mount<br>None = TO-220 |    |    |    |    |
| 3           | - Current Rating                     |    |    |    |    |
| 4           | - Voltage code: Code = $V_{RRM}$     |    |    |    |    |
| 5           | - CT = Essential Part Number         |    |    |    |    |
| 6           | - -1 = TO-262<br>None = TO-220       |    |    |    |    |

35 = 35V  
45 = 45V

## Outline Table

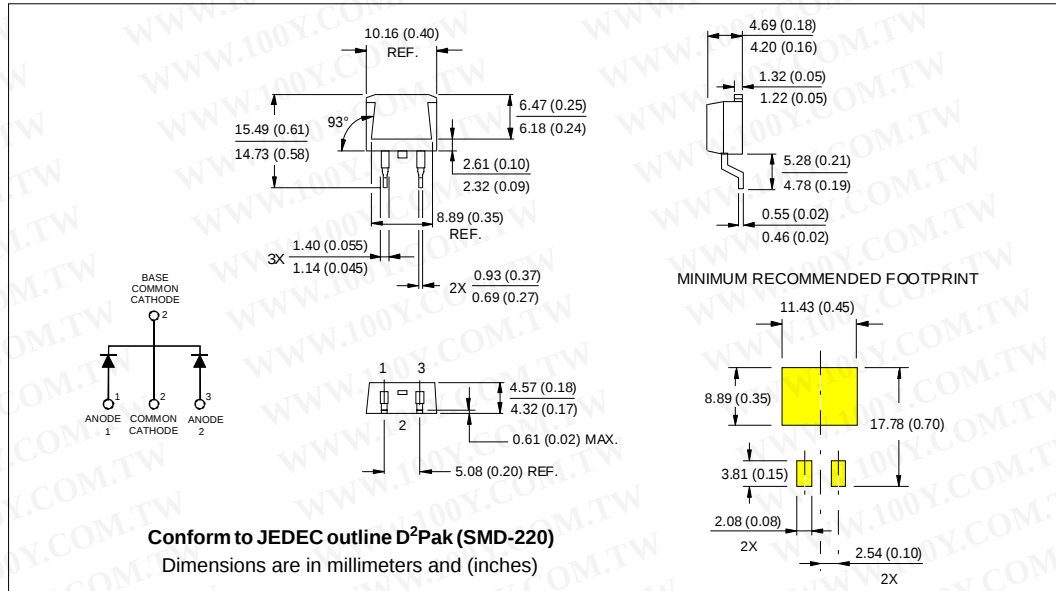


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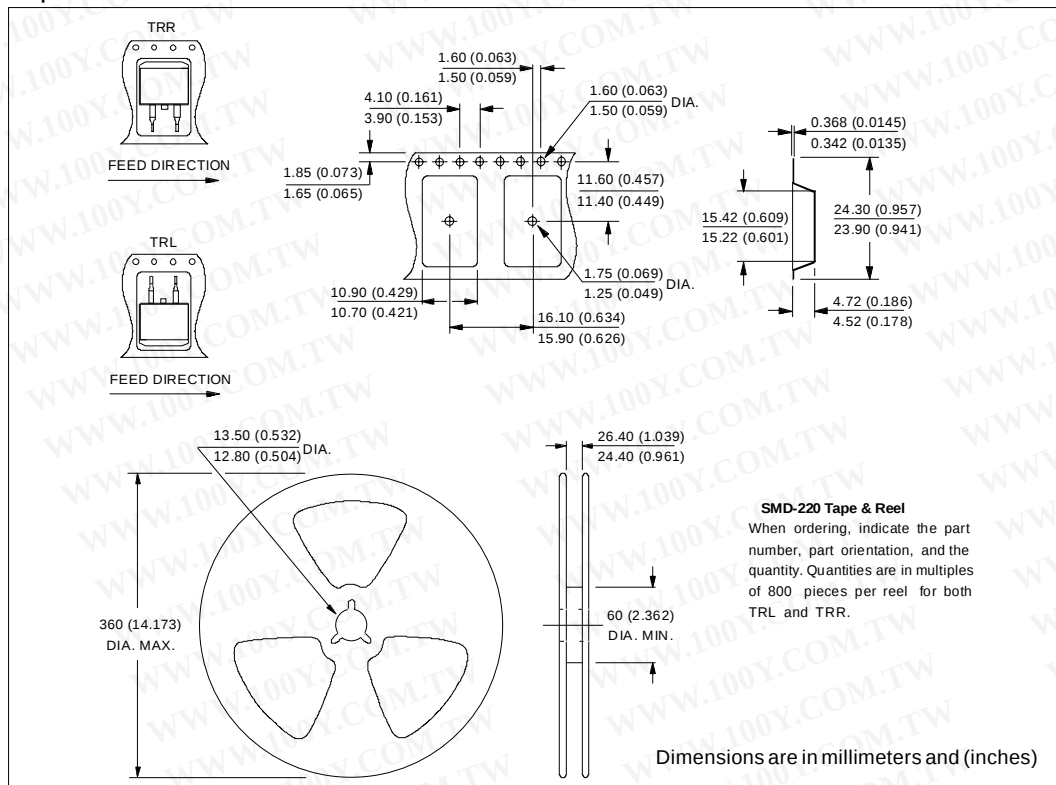
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## Tape & Reel Information



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