

# MBR3045PT

Preferred Device

## Switch-mode Power Rectifier

These state-of-the-art devices use the Schottky Barrier principle with a platinum barrier metal.

### Features

- Dual Diode Construction; Terminals 1 and 3 may be Connected for Parallel Operation at Full Rating
- Guard-ring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- Pb-Free Package is Available\*

### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 4.3 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

### MAXIMUM RATINGS

| Rating                                                                                                         | Symbol                          | Max         | Unit             |
|----------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                         | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 45          | V                |
| Average Rectified Forward Current<br>(Rated $V_R$ , $T_C = 105^\circ\text{C}$ )<br>Per Device<br>Per Diode     | $I_{F(AV)}$                     | 30<br>15    | A                |
| Peak Repetitive Forward Current,<br>(Rated $V_R$ , Square Wave,<br>20 kHz) Per Diode                           | $I_{FRM}$                       | 30          | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions<br>Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 200         | A                |
| Peak Repetitive Reverse Current (2.0 $\mu\text{s}$ ,<br>1.0 kHz) Per Diode (See Figure 6)                      | $I_{RRM}$                       | 2.0         | A                |
| Storage Temperature Range                                                                                      | $T_{stg}$                       | -65 to +175 | °C               |
| Operating Junction Temperature (Note 1)                                                                        | $T_J$                           | -65 to +175 | °C               |
| Peak Surge Junction Temperature<br>(Forward Current Applied)                                                   | $T_{J(pk)}$                     | 175         | °C               |
| Voltage Rate of Change (Rated $V_R$ )                                                                          | $dv/dt$                         | 10,000      | V/ $\mu\text{s}$ |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .

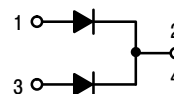
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



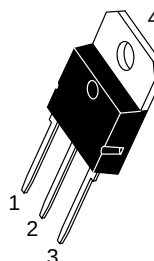
ON Semiconductor®

<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIER 30 AMPERES, 45 VOLTS



### MARKING DIAGRAM



SOT-93  
CASE 340D  
PLASTIC



A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package

### ORDERING INFORMATION

| Device     | Package             | Shipping        |
|------------|---------------------|-----------------|
| MBR3045PT  | SOT-93              | 30 Units / Rail |
| MBR3045PTG | SOT-93<br>(Pb-Free) | 30 Units / Rail |

Preferred devices are recommended choices for future use and best overall value.

# MBR3045PT

## THERMAL CHARACTERISTICS (Per Diode)

| Rating                                  | Symbol          | Max | Unit                        |
|-----------------------------------------|-----------------|-----|-----------------------------|
| Thermal Resistance, Junction-to-Case    | $R_{\theta JC}$ | 1.4 | $^{\circ}\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 40  | $^{\circ}\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS (Per Diode)

|                                                                                                                                                                                                   |       |                      |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------|----|
| Instantaneous Forward Voltage (Note 2)<br>( $i_F = 20$ Amps, $T_C = 125^{\circ}\text{C}$ )<br>( $i_F = 30$ Amps, $T_C = 125^{\circ}\text{C}$ )<br>( $i_F = 30$ Amps, $T_C = 25^{\circ}\text{C}$ ) | $V_F$ | 0.60<br>0.72<br>0.76 | V  |
| Instantaneous Reverse Current (Note 2)<br>(Rated dc Voltage, $T_C = 125^{\circ}\text{C}$ )<br>(Rated dc Voltage, $T_C = 25^{\circ}\text{C}$ )                                                     | $i_R$ | 100<br>1.0           | mA |

2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

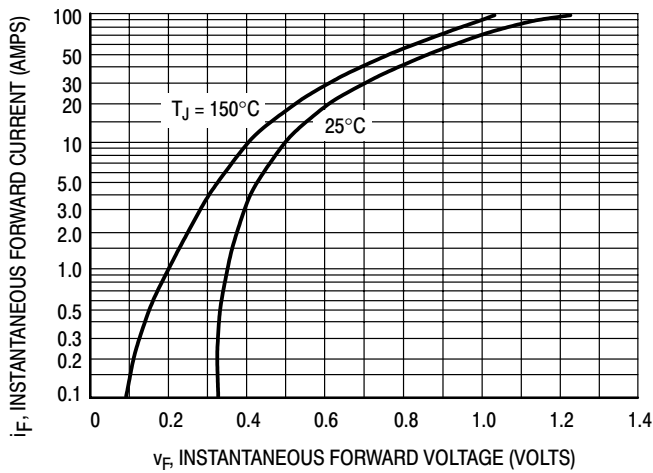


Figure 1. Typical Forward Voltage

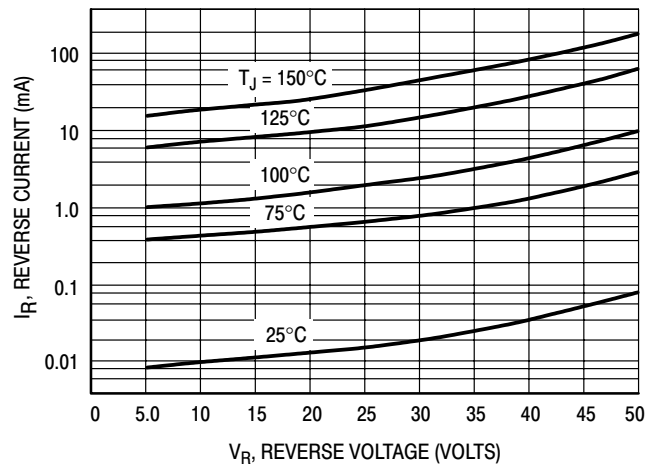


Figure 2. Typical Reverse Current

# MBR3045PT

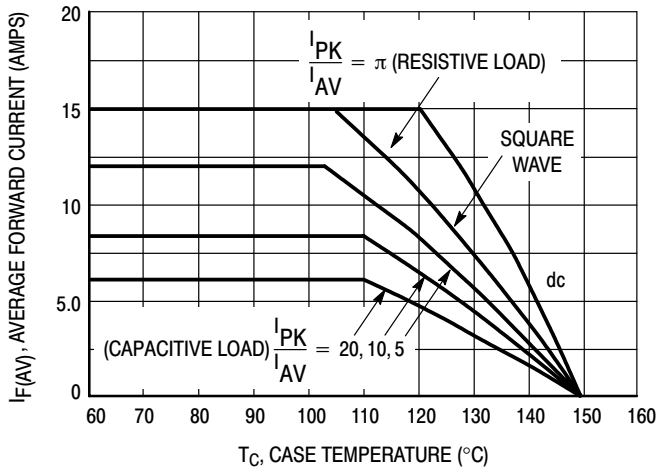


Figure 3. Current Derating (Per Leg)

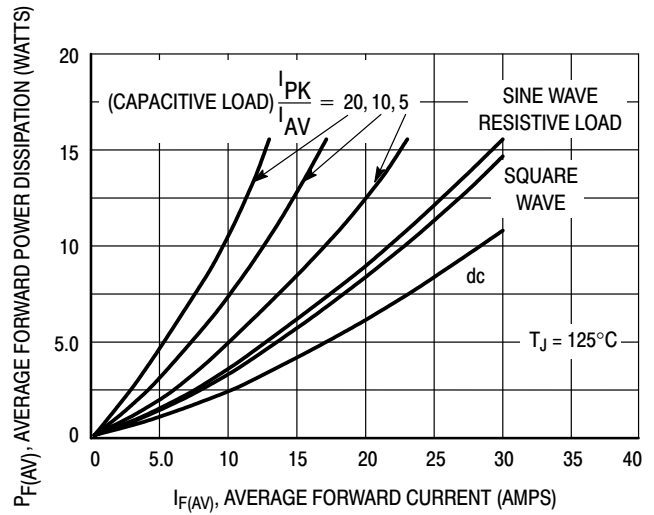


Figure 4. Forward Power Dissipation (Per Leg)

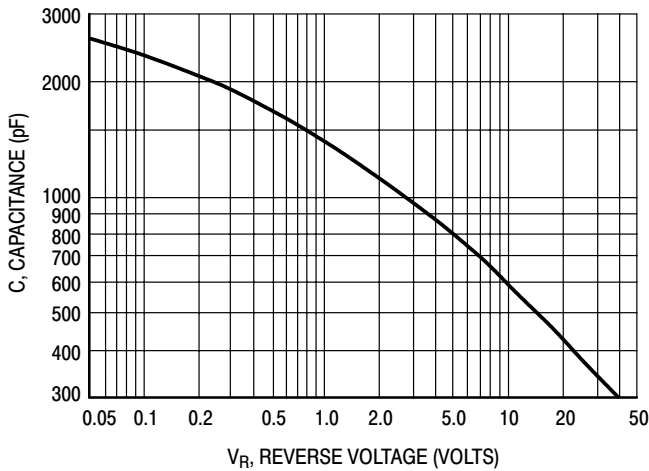


Figure 5. Capacitance

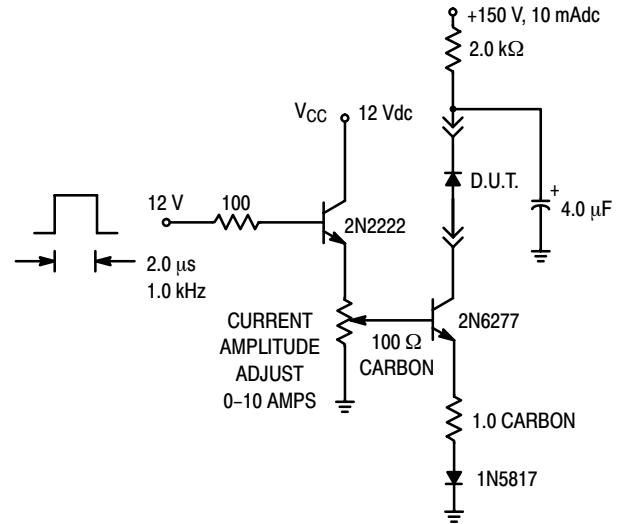
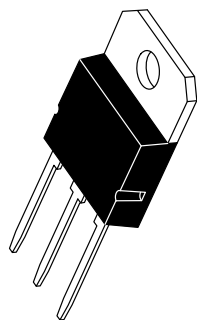


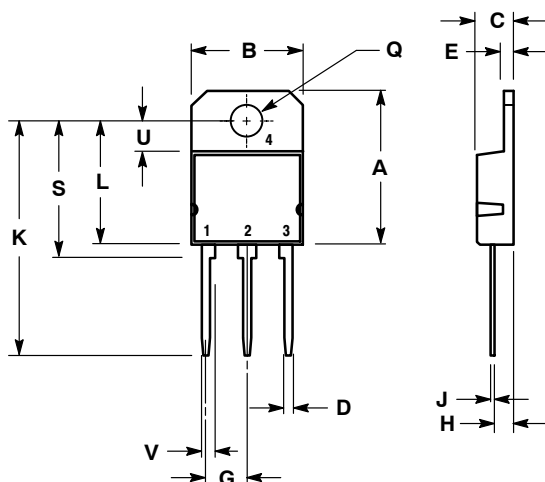
Figure 6. Test Circuit for Repetitive Reverse Current



SCALE 1:1

SOT-93 (TO-218)  
CASE 340D-02  
ISSUE E

DATE 03 JAN 2002



STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 2:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | ---         | 20.35 | ---       | 0.801 |
| B   | 14.70       | 15.20 | 0.579     | 0.598 |
| C   | 4.70        | 4.90  | 0.185     | 0.193 |
| D   | 1.10        | 1.30  | 0.043     | 0.051 |
| E   | 1.17        | 1.37  | 0.046     | 0.054 |
| G   | 5.40        | 5.55  | 0.213     | 0.219 |
| H   | 2.00        | 3.00  | 0.079     | 0.118 |
| J   | 0.50        | 0.78  | 0.020     | 0.031 |
| K   | 31.00 REF   |       | 1.220 REF |       |
| L   | ---         | 16.20 | ---       | 0.638 |
| Q   | 4.00        | 4.10  | 0.158     | 0.161 |
| S   | 17.80       | 18.20 | 0.701     | 0.717 |
| U   | 4.00 REF    |       | 0.157 REF |       |
| V   | 1.75 REF    |       | 0.069     |       |

GENERIC  
MARKING DIAGRAM\*



A = Assembly Location  
Y = Year  
WW = Work Week  
XXXXX = Device Code

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

|                  |                 |                                                                                                                                                                                     |
|------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | SOT-93 (TO-218) | PAGE 1 OF 1                                                                                                                                                                         |

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