

# MBR6045PT

## SWITCHMODE™ Power Rectifier

### Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 175°C Operating Junction Temperature
- 60 A Total (30 A Per Diode Leg)
- Pb-Free Packages are Available\*

### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

### Mechanical Characteristics

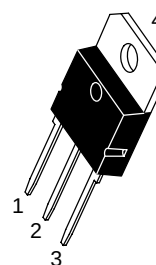
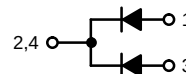
- Case: Epoxy, Molded
- Epoxy Meets UL 94, V-0 @ 0.125 in
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperatures for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Rating: Human Body Model 3B  
Machine Model C



**ON Semiconductor®**

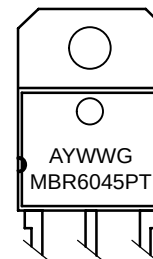
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIER 60 AMPERES 45 VOLTS



**SOT-93  
CASE 340D  
STYLE 2**

### MARKING DIAGRAM



MBR6045PT = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package

### ORDERING INFORMATION

| Device     | Package             | Shipping <sup>†</sup> |
|------------|---------------------|-----------------------|
| MBR6045PT  | SOT-93              | 30 Units/Rail         |
| MBR6045PTG | SOT-93<br>(Pb-Free) | 30 Units/Rail         |

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

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# MBR6045PT

## 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 $V_R$ , $T_C = 125^\circ\text{C}$ ) Per Diode<br>Per Device       | $I_{F(AV)}$                     | 30<br>60    | A                |
| Peak Repetitive Forward Current,<br>(Rated $V_R$ , Square Wave, 20 kHz @ $T_C = 90^\circ\text{C}$ ) Per Diode | $I_{FRM}$                       | 60          | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)   | $I_{FSM}$                       | 500         | A                |
| Peak Repetitive Reverse Current (2.0 $\mu\text{s}$ , 1.0 kHz)                                                 | $I_{RRM}$                       | 2.0         | A                |
| Storage Temperature Range                                                                                     | $T_{stg}$                       | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature (Note 1)                                                                       | $T_J$                           | -65 to +175 | $^\circ\text{C}$ |
| Peak Surge Junction Temperature (Forward Current Applied)                                                     | $T_{J(pk)}$                     | 175         | $^\circ\text{C}$ |
| Voltage Rate of Change                                                                                        | $dv/dt$                         | 10,000      | V/ $\mu\text{s}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

## THERMAL CHARACTERISTICS

| Characteristic                                  | Conditions | Symbol          | Max | Unit                      |
|-------------------------------------------------|------------|-----------------|-----|---------------------------|
| Maximum Thermal Resistance, Junction-to-Case    | Min. Pad   | $R_{\theta JC}$ | 1.0 | $^\circ\text{C}/\text{W}$ |
| Maximum Thermal Resistance, Junction-to-Ambient | Min. Pad   | $R_{\theta JA}$ | 60  |                           |

## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                                                                             | Symbol | Min | Typical              | Max                  | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|----------------------|----------------------|------|
| Instantaneous Forward Voltage (Note 2)<br>( $i_F = 30$ Amps, $T_J = 25^\circ\text{C}$ )<br>( $i_F = 30$ Amps, $T_J = 125^\circ\text{C}$ )<br>( $i_F = 60$ Amps, $T_J = 25^\circ\text{C}$ ) | $V_F$  | -   | 0.55<br>0.51<br>0.70 | 0.62<br>0.55<br>0.75 | V    |
| Instantaneous Reverse Current (Note 2)<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 125^\circ\text{C}$ )                                                  | $i_R$  | -   | 0.2<br>35            | 1.0<br>50            | mA   |

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

## TYPICAL ELECTRICAL CHARACTERISTICS

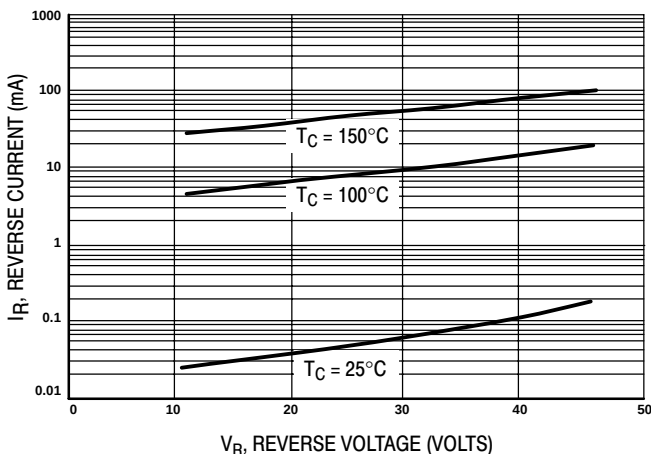


Figure 1. Typical Reverse Current

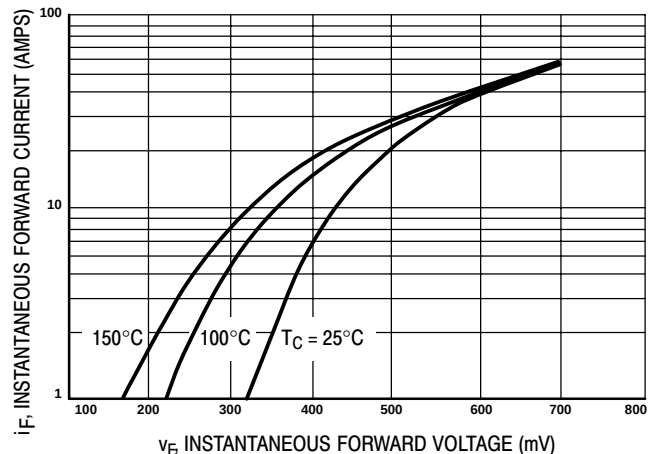
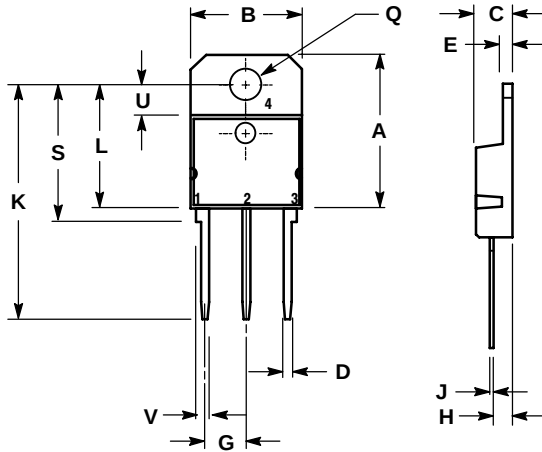


Figure 2. Typical Forward Voltage

# MBR6045PT

## PACKAGE DIMENSIONS

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



- 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  | ---   |

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

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