

# MBR3045ST, MBRB3045CT-1

## Switch-mode Power Rectifier

### Features and Benefits

- Dual Diode Construction – Terminals 1 and 3 May Be Connected for Parallel Operation at Full Rating
- 45 V Blocking Voltage
- Low Forward Voltage Drop
- 175°C Operating Junction Temperature
- These are Pb-Free Devices

### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight (Approximately): 1.9 Grams (TO-220)  
1.5 Grams (TO-262)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Epoxy Meets UL 94 V-0 @ 0.125 in

### MAXIMUM RATINGS

| Rating                                                                                                          | Symbol                          | Value          | 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 Current<br>( $T_C = 130^\circ\text{C}$ )                                                      | $I_{F(AV)}$                     | 30<br>15       | A<br>Per Device<br>Per Diode |
| Peak Repetitive Forward Current, per Diode<br>(Square Wave, $V_R = 45\text{ V}$ , 20 kHz)                       | $I_{FRM}$                       | 30             | A                            |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions,<br>Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 150            | A                            |
| Peak Repetitive Reverse Current, per Diode<br>(2.0 $\mu\text{s}$ , 1.0 kHz)                                     | $I_{RRM}$                       | 2.0            | A                            |
| Storage Temperature Range                                                                                       | $T_{stg}$                       | -65 to<br>+175 | $^\circ\text{C}$             |
| Operating Junction Temperature (Note 1)                                                                         | $T_J$                           | -65 to<br>+175 | $^\circ\text{C}$             |
| Peak Surge Junction Temperature<br>(Forward Current Applied)                                                    | $T_{J(pk)}$                     | 175            | $^\circ\text{C}$             |
| Voltage Rate of Change (Rated $V_R$ )                                                                           | $dv/dt$                         | 10,000         | V/ $\mu\text{s}$             |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

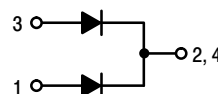
1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .



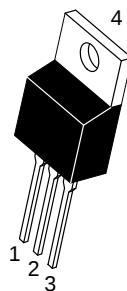
ON Semiconductor™

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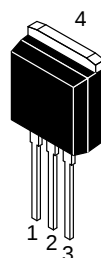
## SCHOTTKY BARRIER RECTIFIER 30 AMPERES 45 VOLTS



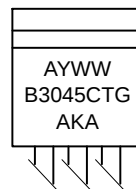
### MARKING DIAGRAMS



TO-220  
CASE 221A  
STYLE 6



I<sup>2</sup>PAK (TO-262)  
CASE 418D  
STYLE 3



A = Assembly Location  
Y = Year  
WW = Work Week  
AKA = Polarity Designator  
G = Pb-Free Device

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

# MBR3045ST, MBRB3045CT-1

## THERMAL CHARACTERISTICS (Per Diode)

| Characteristic                       | Symbol          | Value | Unit                        |
|--------------------------------------|-----------------|-------|-----------------------------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 1.5   | $^{\circ}\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS (Per Diode)

| Characteristic                                                                                                                                                                                                                                                                       | Symbol | Value                        | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|------|
| Instantaneous Forward Voltage (Note 2)<br>( $I_F = 15 \text{ Amp}$ , $T_C = 25^{\circ}\text{C}$ )<br>( $I_F = 15 \text{ Amp}$ , $T_C = 125^{\circ}\text{C}$ )<br>( $I_F = 30 \text{ Amp}$ , $T_C = 25^{\circ}\text{C}$ )<br>( $I_F = 30 \text{ Amp}$ , $T_C = 125^{\circ}\text{C}$ ) | $V_F$  | 0.62<br>0.57<br>0.76<br>0.72 | V    |
| Instantaneous Reverse Current (Note 2)<br>( $V_R = 45 \text{ Volts}$ , $T_C = 25^{\circ}\text{C}$ )<br>( $V_R = 45 \text{ Volts}$ , $T_C = 125^{\circ}\text{C}$ )                                                                                                                    | $I_R$  | 0.2<br>40                    | mA   |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

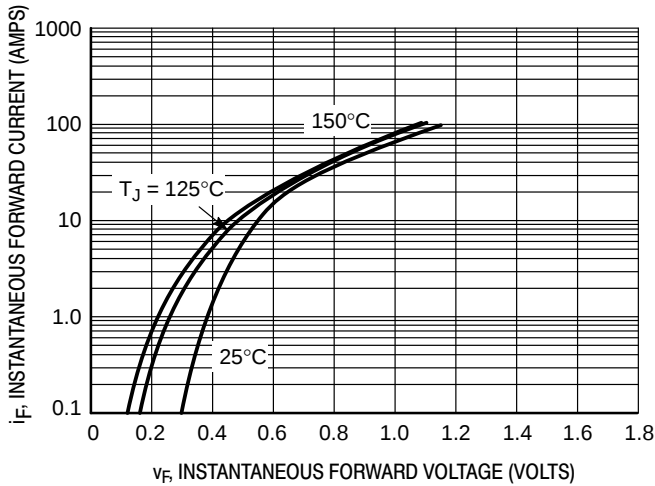


Figure 1. Typical Forward Voltage

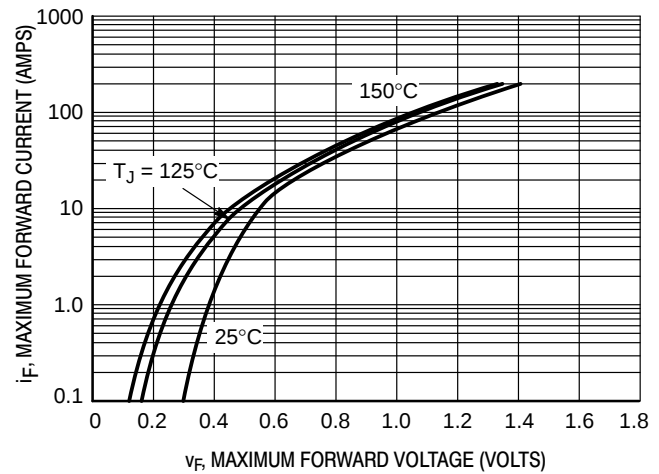


Figure 2. Maximum Reverse Current

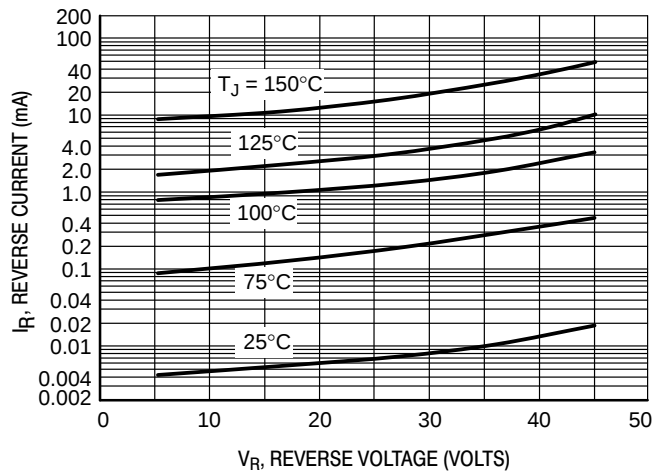


Figure 3. Typical Reverse Current

# MBR3045ST, MBRB3045CT-1

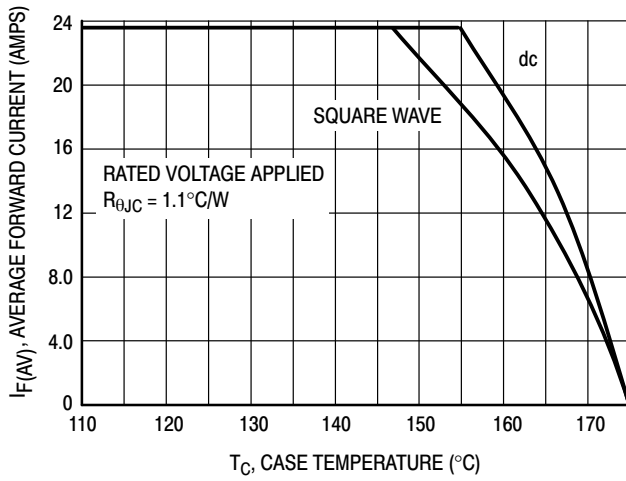


Figure 4. Current Derating, Case

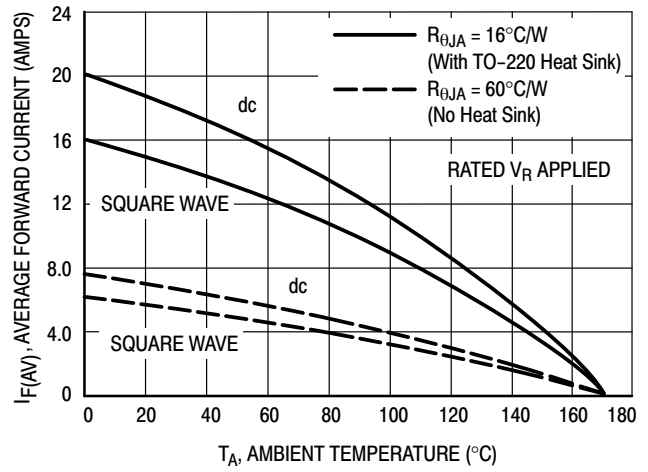


Figure 5. Current Derating, Ambient

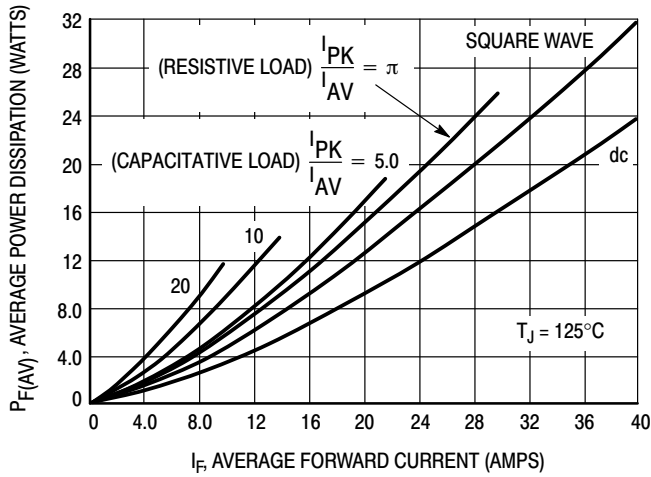


Figure 6. Forward Power Dissipation

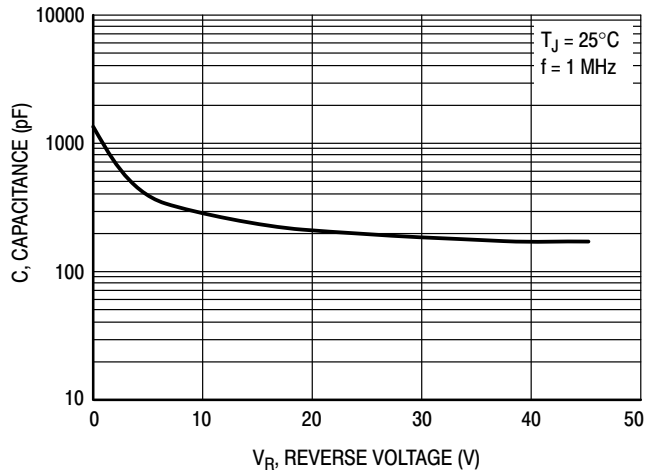
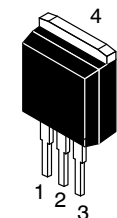


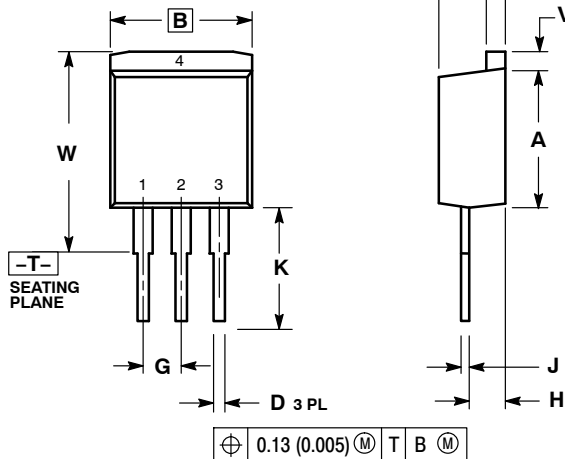
Figure 7. Capacitance

## ORDERING INFORMATION

| Device        | Package             | Shipping      |
|---------------|---------------------|---------------|
| MBR3045STG    | TO-220<br>(Pb-Free) | 50 Units/Rail |
| MBRB3045CT-1G | TO-262<br>(Pb-Free) | 50 Units/Rail |



SCALE 1:1


**STYLE 1:**

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

**STYLE 2:**

PIN 1. GATE  
2. DRAIN  
3. SOURCE  
4. DRAIN

**STYLE 3:**

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

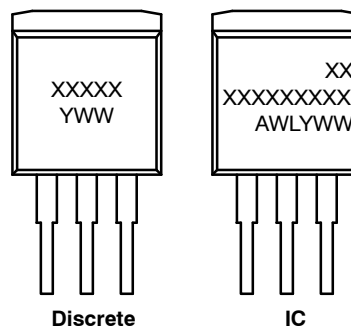
**STYLE 4:**

PIN 1. GATE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 418-01 THRU -04 OBSOLETE, NEW STANDARD 418-05.

| DIM | INCHES    |       | MILLIMETERS |        |
|-----|-----------|-------|-------------|--------|
|     | MIN       | MAX   | MIN         | MAX    |
| A   | 0.340     | 0.380 | 8.64        | 9.65   |
| B   | 0.380     | 0.405 | 9.65        | 10.29  |
| C   | 0.160     | 0.190 | 4.06        | 4.83   |
| D   | 0.020     | 0.035 | 0.51        | 0.89   |
| E   | 0.045     | 0.055 | 1.14        | 1.40   |
| G   | 0.100 BSC |       | 2.54 BSC    |        |
| H   | 0.080     | 0.110 | 2.03        | 2.79   |
| J   | 0.018     | 0.025 | 0.46        | 0.64   |
| K   | 0.285     | 0.305 | 7.493       | 7.747  |
| V   | 0.045     | 0.055 | 1.14        | 1.40   |
| W   | 0.525     | 0.545 | 13.335      | 13.843 |

**GENERIC MARKING DIAGRAMS\***

XXXX = Specific Device Code  
A = Assembly Location  
WL = Wafer Lot  
Y = Year  
WW = Work Week

\*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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