

MBR3045ST, MBRB3045CT-1

SWITCHMODE™ 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
- Pb-Free Packages are Available

Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

Mechanical Characteristics

- Case: Epoxy, Molded
- Weight (Approximately): 1.9 Grams (TO-220AB)
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 Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 45 | V |
| Average Rectified Current ($T_C = 130^\circ\text{C}$) | Per Device $I_{F(AV)}$ Per Diode | 30 15 | A |
| Peak Repetitive Forward Current, per Diode (Square Wave, $V_R = 45\text{ V}$, 20 kHz) | I_{FRM} | 30 | A |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions, Halfwave, Single Phase, 60 Hz) | I_{FSM} | 150 | A |
| Peak Repetitive Reverse Current, per Diode (2.0 μs , 1.0 kHz) | 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 (Forward Current Applied) | $T_{J(pk)}$ | 175 | °C |
| Voltage Rate of Change (Rated V_R) | dv/dt | 10,000 | V/ μs |

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.

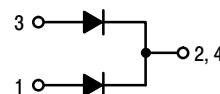
1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.



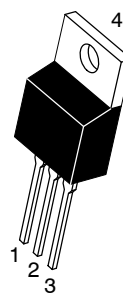
ON Semiconductor™

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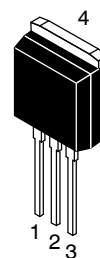
SCHOTTKY BARRIER RECTIFIER 30 AMPERES 45 VOLTS



MARKING DIAGRAMS



TO-220AB
CASE 221A
STYLE 6



I²PAK (TO-262)
CASE 418D
PLASTIC



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.

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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)

| | | | | |
|--|---|-------|------|-------|
| Instantaneous Forward Voltage (Note 2) | $(i_F = 15 \text{ Amp}, T_C = 25^{\circ}\text{C})$ | v_F | 0.62 | Volts |
| | $(i_F = 15 \text{ Amp}, T_C = 125^{\circ}\text{C})$ | | 0.57 | |
| | $(i_F = 30 \text{ Amp}, T_C = 25^{\circ}\text{C})$ | | 0.76 | |
| | $(i_F = 30 \text{ Amp}, T_C = 125^{\circ}\text{C})$ | | 0.72 | |
| Instantaneous Reverse Current (Note 2) | $(V_R = 45 \text{ Volts}, T_C = 25^{\circ}\text{C})$ | I_R | 0.2 | mA |
| | $(V_R = 45 \text{ Volts}, T_C = 125^{\circ}\text{C})$ | | 40 | |

2 Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$

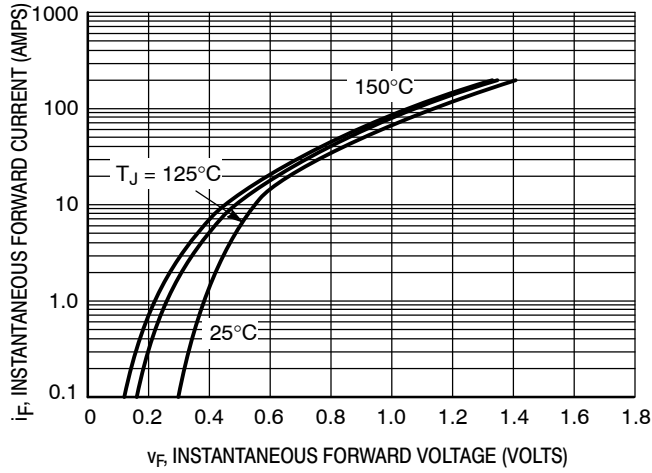


Figure 1. Typical Forward Voltage

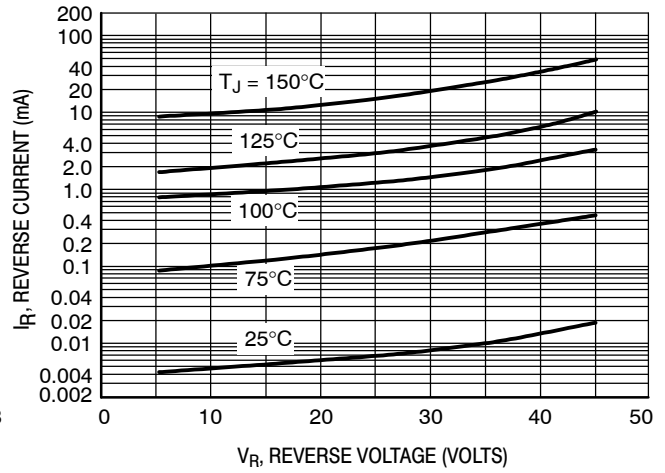


Figure 2. Typical Reverse Current

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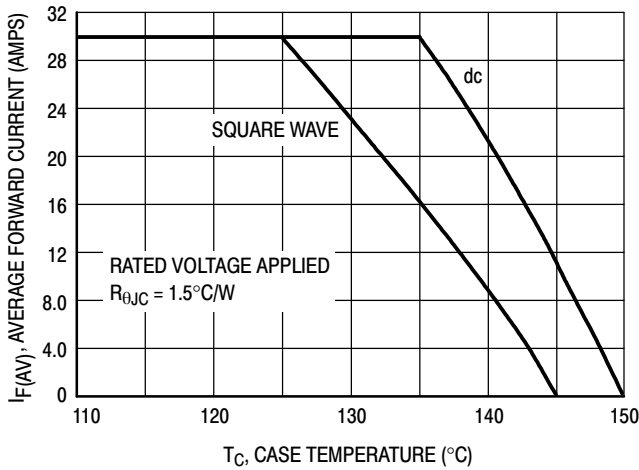


Figure 3. Current Derating, Case

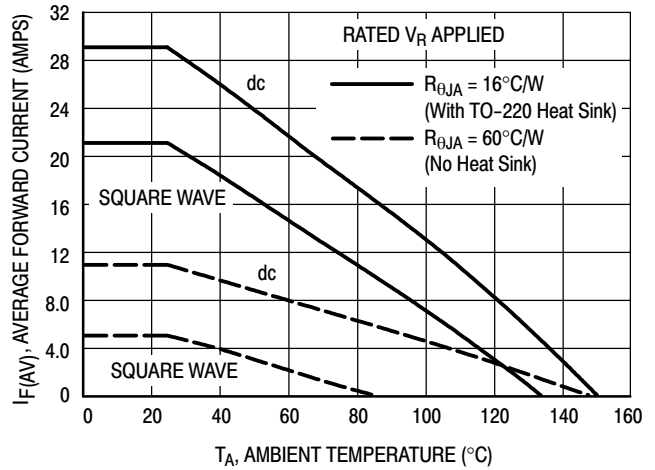


Figure 4. Current Derating, Ambient

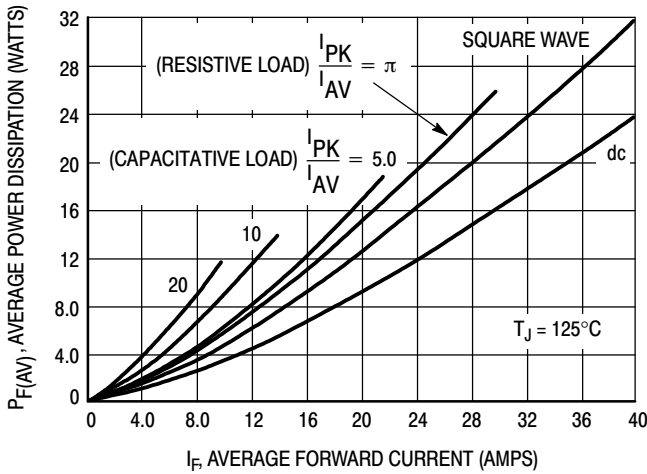


Figure 5. Forward Power Dissipation

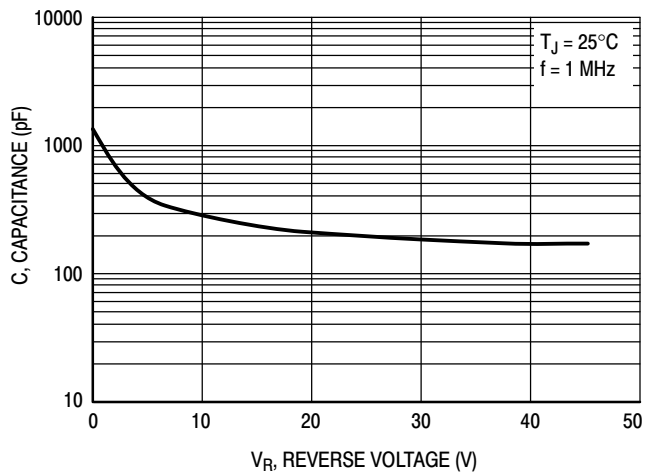


Figure 6. Capacitance

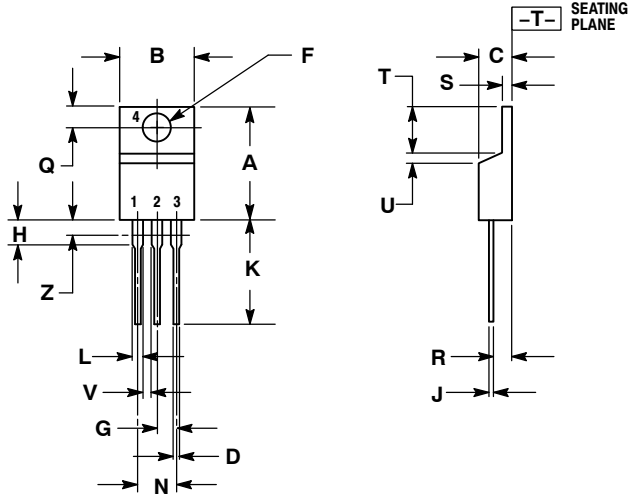
ORDERING INFORMATION

| Device | Package | Shipping |
|---------------|---------------------|---------------|
| MBR3045ST | TO-220 | 50 Units/Rail |
| MBR3045STG | TO-220 (Pb-Free) | 50 Units/Rail |
| MBRB3045CT-1 | TO-262 | 50 Units/Rail |
| MBRB3045CT-1G | TO-262 (Pb-Free) | 50 Units/Rail |

MBR3045ST, MBRB3045CT-1

PACKAGE DIMENSIONS

TO-220
CASE 221A-09
ISSUE AF



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.405 | 9.66 | 10.28 |
| C | 0.160 | 0.190 | 4.07 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.88 |
| F | 0.142 | 0.161 | 3.61 | 4.09 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.155 | 2.80 | 3.93 |
| J | 0.014 | 0.025 | 0.36 | 0.64 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.060 | 1.15 | 1.52 |
| N | 0.190 | 0.210 | 4.83 | 5.33 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.045 | 0.055 | 1.15 | 1.39 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | --- | 1.15 | --- |
| Z | --- | 0.080 | --- | 2.04 |

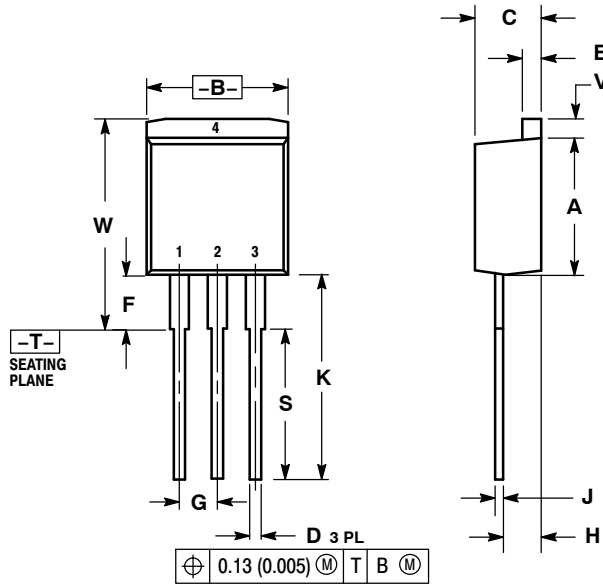
STYLE 6:

- PIN 1. ANODE
- CATHODE
- ANODE
- CATHODE

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PACKAGE DIMENSIONS


I²PAK (TO-262)
CASE 418D-01
ISSUE D



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

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.335 | 0.380 | 8.51 | 9.65 |
| B | 0.380 | 0.406 | 9.65 | 10.31 |
| C | 0.160 | 0.185 | 4.06 | 4.70 |
| D | 0.026 | 0.035 | 0.66 | 0.89 |
| E | 0.045 | 0.055 | 1.14 | 1.40 |
| F | 0.122 REF | | 3.10 REF | |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.094 | 0.110 | 2.39 | 2.79 |
| J | 0.013 | 0.025 | 0.33 | 0.64 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| S | 0.390 REF | | 9.90 REF | |
| V | 0.045 | 0.070 | 1.14 | 1.78 |
| W | 0.522 | 0.551 | 13.25 | 14.00 |

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