

# MBRB2545CT

Preferred Device

## SWITCHMODE™ Power Rectifier

### D<sup>2</sup>PAK Surface Mount Power Package

The D<sup>2</sup>PAK Power Rectifier is a state-of-the-art device that employs the Schottky Barrier principle with a platinum barrier metal.

#### Features

- Center-Tap Configuration
- Guardring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Short Heat Sink Tab Manufactured – Not Sheared
- Similar in Size to the Industry Standard TO-220 Package
- Pb-Free Packages are Available

#### Mechanical Characteristics

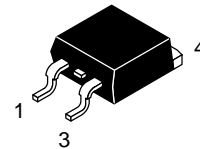
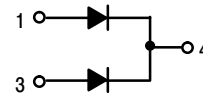
- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- Weight: 1.7 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL1 Requirements
- ESD Ratings: Machine Model, C (>400 V)  
Human Body Model, 3B (>8000 V)



**ON Semiconductor®**

<http://onsemi.com>

### SCHOTTKY BARRIER RECTIFIER 30 AMPERES, 45 VOLTS



**D<sup>2</sup>PAK  
CASE 418B  
STYLE 3**

#### MARKING DIAGRAM



|       |                     |
|-------|---------------------|
| A     | = Assembly Location |
| Y     | = Year              |
| WW    | = Work Week         |
| B2545 | = Device Code       |
| G     | = Pb-Free Package   |
| AKA   | = Diode Polarity    |

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

# MBRB2545CT

## MAXIMUM RATINGS (Per Leg)

| 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 Forward Current<br>(Rated $V_R$ , $T_C = 164^\circ\text{C}$ ) Total Device                | $I_{F(AV)}$                     | 15<br>30    | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave,<br>20 kHz, $T_C = 160^\circ\text{C}$ )       | $I_{FRM}$                       | 30          | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 150         | A                |
| Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0 kHz)   | $I_{RRM}$                       | 1.0         | A                |
| Storage Temperature Range   | $T_{stg}$                       | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature (Note 1)   | $T_J$                           | -65 to +175 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )   | $dv/dt$                         | 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.

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

## THERMAL CHARACTERISTICS (Per Leg)

| Characteristic   | Symbol                             | Value     | Unit               |
|--|------------------------------------|-----------|--------------------|
| Thermal Resistance, - Junction-to-Case<br>- Junction-to-Ambient (Note 2) | $R_{\theta JC}$<br>$R_{\theta JA}$ | 1.5<br>50 | $^\circ\text{C/W}$ |

2. When mounted using minimum recommended pad size on FR-4 board.

## ELECTRICAL CHARACTERISTICS (Per Diode)

| Symbol | Characteristic                            | Condition  | Min              | Typ                    | Max                          | Unit |
|--------|---|--|------------------|------------------------|------------------------------|------|
| $V_F$  | Instantaneous Forward Voltage<br>(Note 3) | $I_F = 15 \text{ Amp}$ , $T_J = 25^\circ\text{C}$<br>$I_F = 15 \text{ Amp}$ , $T_J = 125^\circ\text{C}$<br>$I_F = 30 \text{ Amp}$ , $T_J = 25^\circ\text{C}$<br>$I_F = 30 \text{ Amp}$ , $T_J = 125^\circ\text{C}$ | -<br>-<br>-<br>- | -<br>0.50<br>-<br>0.65 | 0.62<br>0.57<br>0.82<br>0.72 | V    |
| $I_R$  | Instantaneous Reverse Current<br>(Note 3) | $V_R = 45 \text{ Volts}$ , $T_J = 25^\circ\text{C}$<br>$V_R = 45 \text{ Volts}$ , $T_J = 125^\circ\text{C}$  | -<br>-           | -<br>9.0               | 0.2<br>25                    | mA   |

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

## ORDERING INFORMATION

| Device        | Package                         | Shipping <sup>†</sup>   |
|---------------|---------------------------------|-------------------------|
| MBRB2545CT    | D <sup>2</sup> PAK              | 50 Units / Rail         |
| MBRB2545CTG   | D <sup>2</sup> PAK<br>(Pb-Free) | 50 Units / Rail         |
| MBRB2545CTT4  | D <sup>2</sup> PAK              | 800 Units / Tape & Reel |
| MBRB2545CTT4G | D <sup>2</sup> PAK<br>(Pb-Free) | 800 Units / Tape & Reel |

<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.

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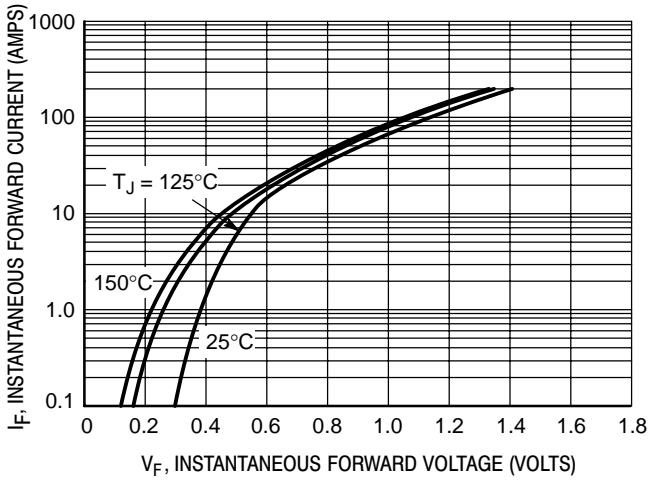


Figure 1. Typical Forward Voltage, Per Leg

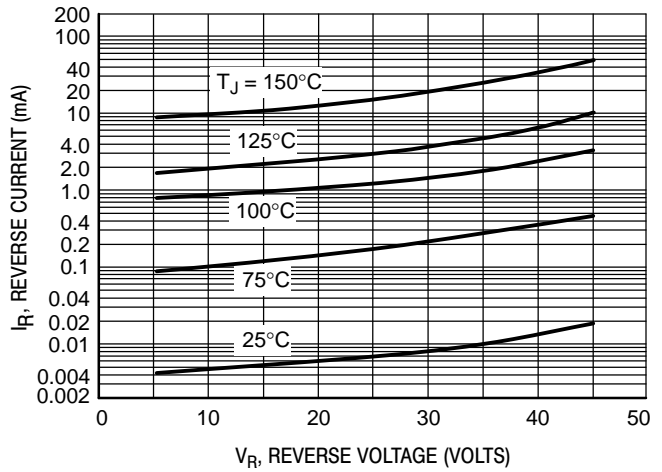


Figure 2. Typical Reverse Current, Per Leg

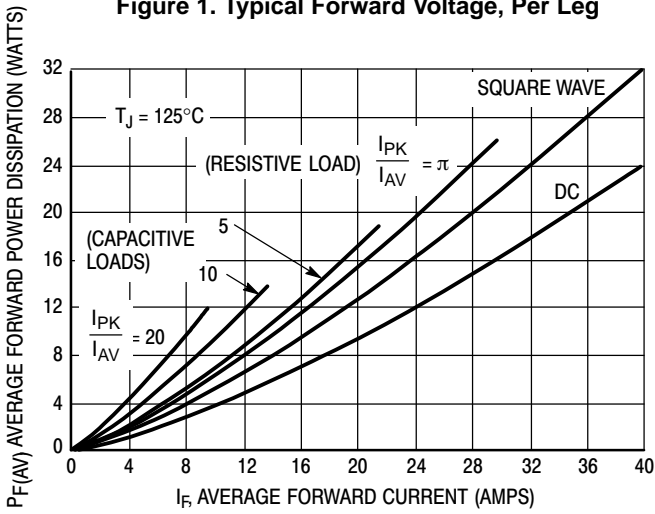


Figure 3. Typical Forward Power Dissipation

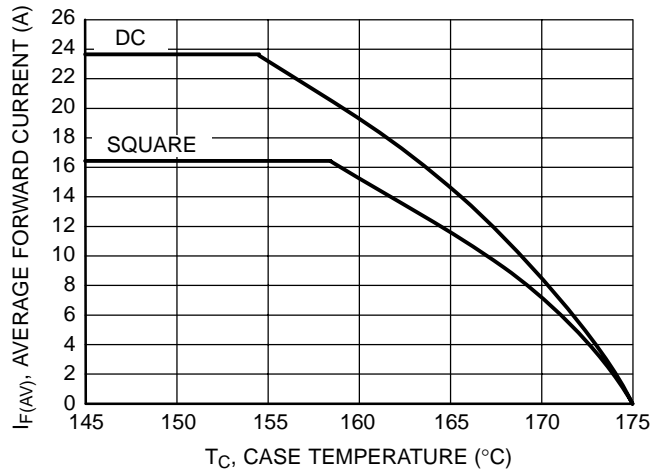
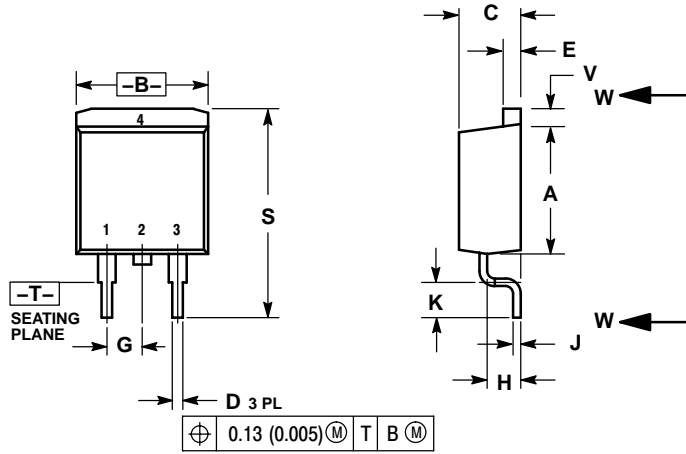


Figure 4. Current Derating, Case per Leg

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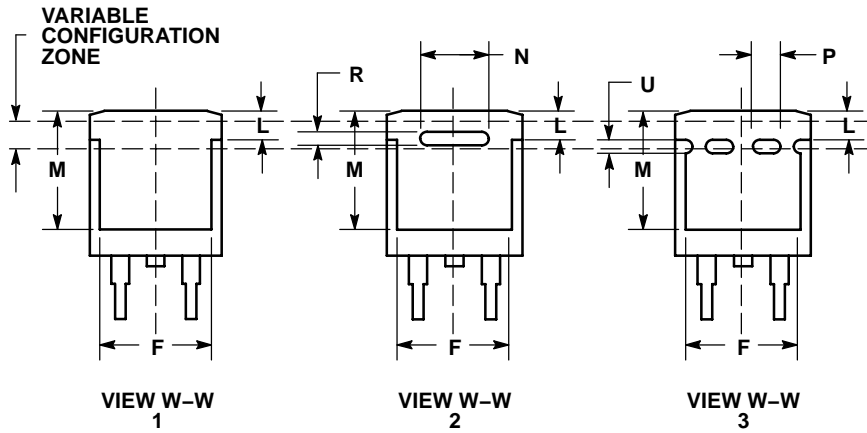
## PACKAGE DIMENSIONS

D<sup>2</sup>PAK 3  
CASE 418B-04  
ISSUE J



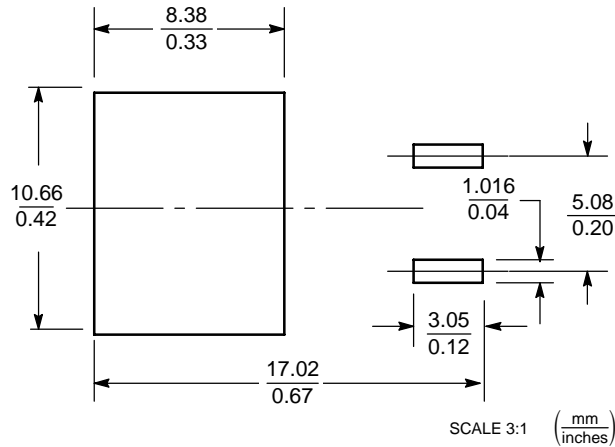
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

| 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  |
| F   | 0.310  | 0.350 | 7.87        | 8.89  |
| 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   | 0.090  | 0.110 | 2.29        | 2.79  |
| L   | 0.052  | 0.072 | 1.32        | 1.83  |
| M   | 0.280  | 0.320 | 7.11        | 8.13  |
| N   | 0.197  | REF   | 5.00        | REF   |
| P   | 0.079  | REF   | 2.00        | REF   |
| R   | 0.039  | REF   | 0.99        | REF   |
| S   | 0.575  | 0.625 | 14.60       | 15.88 |
| V   | 0.045  | 0.055 | 1.14        | 1.40  |



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


### SOLDERING FOOTPRINT\*



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

# MBRB2545CT

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**MBRB2545CT/D**