

# Switch-mode Power Rectifiers

## MBR2535CTG, MBR2545CTG

The MBR2535CTG/45CTG series uses the Schottky Barrier principle with a platinum barrier metal. These state-of-the-art devices have the following features:

### Features

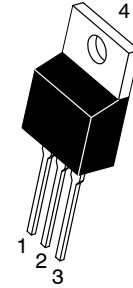
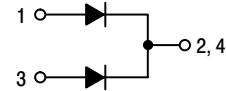
- Guardring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- These are Pb-Free Devices\*

### 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 Temperature for Soldering Purposes:  
260°C Max. for 10 Seconds

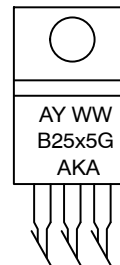
\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## SCHOTTKY BARRIER RECTIFIERS 30 AMPERES 35 and 45 VOLTS



TO-220  
CASE 221A  
STYLE 6

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
B25x5 = Device Code  
x = 3 or 4  
G = Pb-Free Package  
AKA = Diode Polarity

### ORDERING INFORMATION

| Device     | Package             | Shipping      |
|------------|---------------------|---------------|
| MBR2535CTG | TO-220<br>(Pb-Free) | 50 Units/Rail |
| MBR2545CTG | TO-220<br>(Pb-Free) | 50 Units/Rail |

# MBR2535CTG, MBR2545CTG

## MAXIMUM RATINGS

| Rating                                                                                                                     | Symbol                          | Value           | Unit             |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage<br>MBR2535CTG<br>MBR2545CTG         | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 35<br>45        | V                |
| Average Rectified Forward Current<br>(Rated $V_R$ , $T_C = 160^\circ\text{C}$ )<br>Per Device<br>Per Diode                 | $I_{F(AV)}$                     | 30<br>15        | A                |
| Peak Repetitive Forward Current<br>per Diode Leg (Rated $V_R$ , Square Wave, 20 kHz, $T_C = 150^\circ\text{C}$ )           | $I_{FRM}$                       | 30              | A                |
| Non-Repetitive Peak Surge Current per Diode Leg<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/ $\mu\text{s}$ |
| ESD Ratings:<br>Machine Model = C<br>Human Body Model = 3B                                                                 | ESD                             | > 400<br>> 8000 | V                |

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:  $dP_D/dT_J < 1/R_{\theta JA}$ .

## THERMAL CHARACTERISTICS (Per Leg)

| Characteristic                                                          | Symbol                             | Value     | Unit               |
|-------------------------------------------------------------------------|------------------------------------|-----------|--------------------|
| Thermal Resistance,<br>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) | $I_F = 15\text{ A}$ , $T_J = 25^\circ\text{C}$<br>$I_F = 15\text{ A}$ , $T_J = 125^\circ\text{C}$<br>$I_F = 30\text{ A}$ , $T_J = 25^\circ\text{C}$<br>$I_F = 30\text{ A}$ , $T_J = 125^\circ\text{C}$ | –<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) | Rated dc Voltage, $T_J = 25^\circ\text{C}$<br>Rated dc Voltage, $T_J = 125^\circ\text{C}$                                                                                                              | –<br>–           | –<br>9.0               | 0.2<br>25                    | 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.

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

# MBR2535CTG, MBR2545CTG

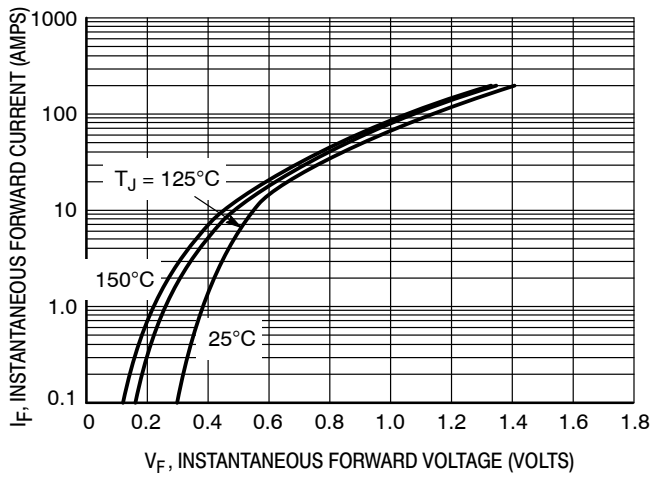


Figure 1. Typical Forward Voltage, Per Leg

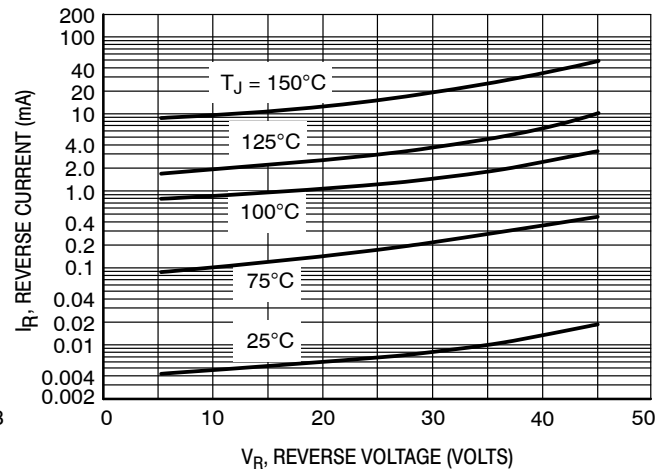


Figure 2. Typical Reverse Current, Per Leg

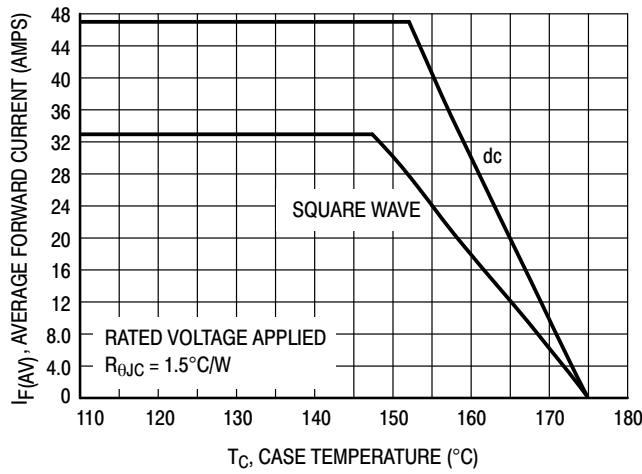


Figure 3. Current Derating, Per Device

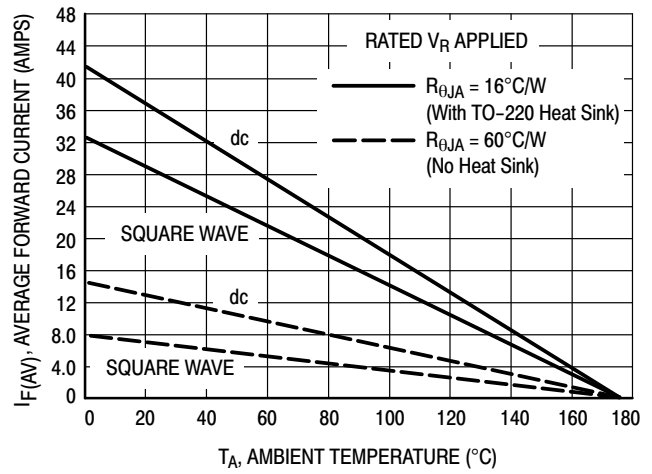


Figure 4. Current Derating, Per Device

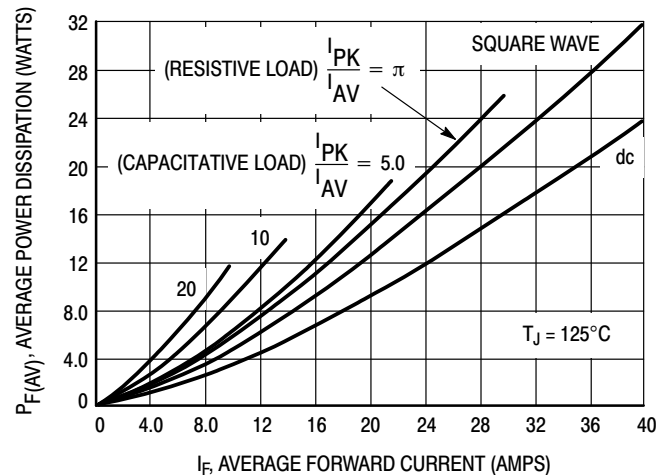
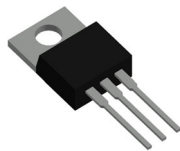


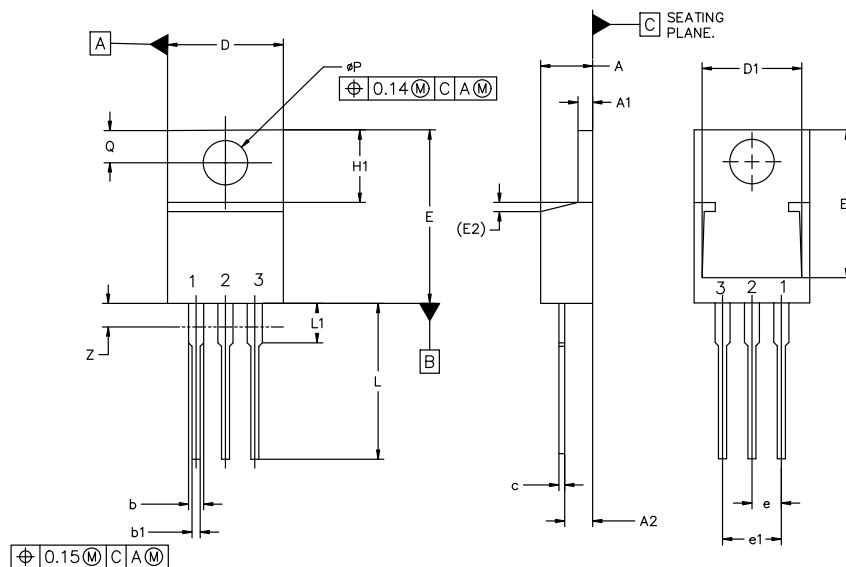
Figure 5. Forward Power Dissipation


**TO-220-3 10.10x15.12x4.45, 2.54P**

CASE 221A

ISSUE AL

DATE 05 FEB 2025



| MILLIMETERS |          |       |       |
|-------------|----------|-------|-------|
| DIM         | MIN      | NOM   | MAX   |
| A           | 4.07     | 4.45  | 4.83  |
| A1          | 1.15     | 1.28  | 1.41  |
| A2          | 2.04     | 2.42  | 2.79  |
| b           | 1.15     | 1.34  | 1.52  |
| b1          | 0.64     | 0.80  | 0.96  |
| c           | 0.36     | 0.49  | 0.61  |
| D           | 9.66     | 10.10 | 10.53 |
| D1          | 8.43     | 8.63  | 8.83  |
| E           | 14.48    | 15.12 | 15.75 |
| E1          | 12.58    | 12.78 | 12.98 |
| E2          | 1.27 REF |       |       |

| MILLIMETERS |       |       |       |
|-------------|-------|-------|-------|
| DIM         | MIN   | NOM   | MAX   |
| e           | 2.42  | 2.54  | 2.66  |
| e1          | 4.83  | 5.08  | 5.33  |
| H1          | 5.97  | 6.22  | 6.47  |
| L           | 12.70 | 13.49 | 14.27 |
| L1          | 2.80  | 3.45  | 4.10  |
| Q           | 2.54  | 2.79  | 3.04  |
| øP          | 3.60  | 3.85  | 4.09  |
| Z           | ---   | ---   | 3.48  |

## NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

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

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

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

STYLE 4:  
PIN 1. MAIN TERMINAL 1  
2. MAIN TERMINAL 2  
3. GATE  
4. MAIN TERMINAL 2

STYLE 5:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE  
4. DRAIN

STYLE 6:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

STYLE 7:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. ANODE

STYLE 8:  
PIN 1. CATHODE  
2. ANODE  
3. EXTERNAL TRIP/DELAY  
4. ANODE

STYLE 9:  
PIN 1. GATE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 10:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN  
4. SOURCE

STYLE 11:  
PIN 1. DRAIN  
2. SOURCE  
3. GATE  
4. SOURCE

STYLE 12:  
PIN 1. MAIN TERMINAL 1  
2. MAIN TERMINAL 2  
3. GATE  
4. NOT CONNECTED

**DOCUMENT NUMBER: 98ASB42148B**

Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.

**DESCRIPTION: TO-220-3 10.10x15.12x4.45, 2.54P**
**PAGE 1 OF 1**

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at  
[www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)

