

## Product Summary

MBR2045CT / MBRF2045CT (Per Leg)

| $V_{RRM}$ (V) | $I_O$ (A) | $V_F$ (MAX) (V)<br>@ +25°C | $I_R$ (MAX) (mA)<br>@ +25°C |
|---------------|-----------|----------------------------|-----------------------------|
| 45            | 10        | 0.64                       | 0.1                         |

MBR2060CT / MBRF2060CT (Per Leg)

| $V_{RRM}$ (V) | $I_O$ (A) | $V_F$ (MAX) (V)<br>@ +25°C | $I_R$ (MAX) (mA)<br>@ +25°C |
|---------------|-----------|----------------------------|-----------------------------|
| 60            | 10        | 0.81                       | 0.1                         |

## Features and Benefits

- Guard Ring Die Construction for Transient Protection.
- High Surge Current Capability.
- Low Forward Voltage Drop.
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

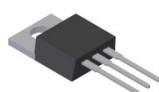
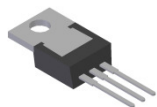
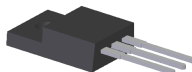
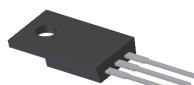
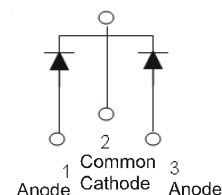
## Description and Applications

This Schottky Barrier Rectifier is designed to meet the general requirements of commercial applications. It is ideally suited for use as:

- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode

## Mechanical Data

- Case: TO-220AB, ITO-220AB
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe.  
Solderable per MIL-STD-202, Method 208 (E3)
- Polarity: See Below
- Weight: TO-220AB – 1.95 grams (Approximate)  
ITO-220AB – 1.69 grams (Approximate)

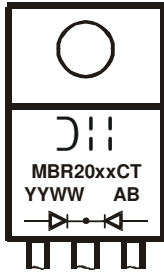

 TO-220AB  
Top View

 TO-220AB  
Bottom View

 ITO-220AB  
Top View

 ITO-220AB  
Bottom View

 Package Pin Out  
Configuration

## Ordering Information (Note 4)

| Part Number   | Case                 | Packaging      |
|---------------|----------------------|----------------|
| MBR2045CT-LJ  | TO-220AB (Type C)    | 50 pieces/tube |
| MBRF2045CT-LJ | ITO-220AB (TO220F-3) | 50 pieces/tube |
| MBR2060CT-LJ  | TO-220AB (Type C)    | 50 pieces/tube |
| MBRF2060CT-LJ | ITO-220AB (TO220F-3) | 50 pieces/tube |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



MBR20xxCT = Product Type Marking Code  
 AB = Foundry and Assembly Code  
 YYWW = Date Code Marking  
 YY = Last two Digits of Year (ex: 13 = 2013)  
 WW = Week (01 - 53)



MBRF20xxCT = Product Type Marking Code  
 AB = Foundry and Assembly Code  
 YYWW = Date Code Marking  
 YY = Last two Digits of Year (ex: 13 = 2013)  
 WW = Week (01 - 53)

## Maximum Ratings (Per Leg) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.  
 For capacitance load, derate current by 20%.

| Characteristic                                                                                      | Symbol           | Value    | Unit |
|-----------------------------------------------------------------------------------------------------|------------------|----------|------|
| Peak Repetitive Reverse Voltage                                                                     | V <sub>RRM</sub> |          |      |
| Working Peak Reverse Voltage                                                                        | V <sub>RWM</sub> | 45       | V    |
| DC Blocking Voltage                                                                                 | V <sub>RM</sub>  | 60       |      |
| MBR2045CT / MBRF2045CT                                                                              |                  |          |      |
| MBR2060CT / MBRF2060CT                                                                              |                  |          |      |
| Average Rectified Output Current (Per Leg)<br>(Total)                                               | I <sub>O</sub>   | 10<br>20 | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | I <sub>FSM</sub> | 180      | A    |

## Thermal Characteristics (Per Leg)

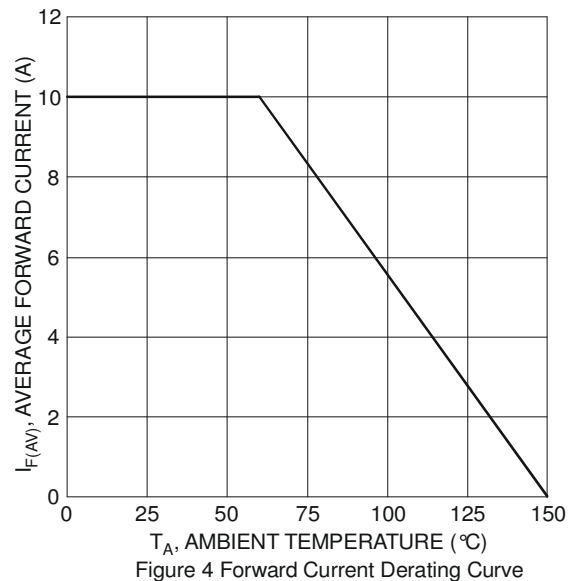
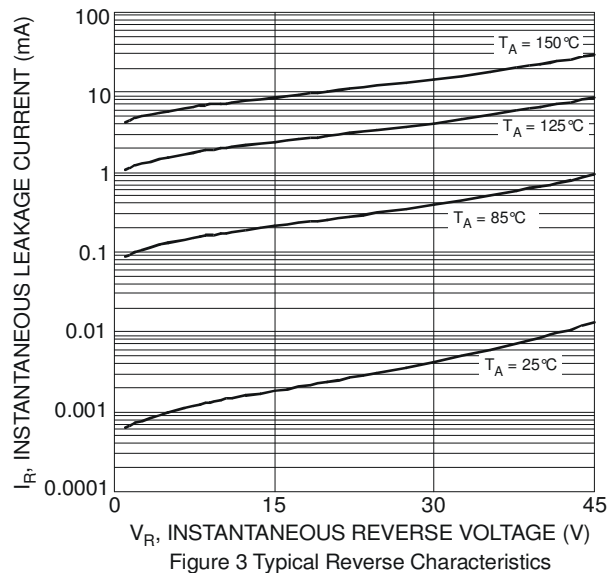
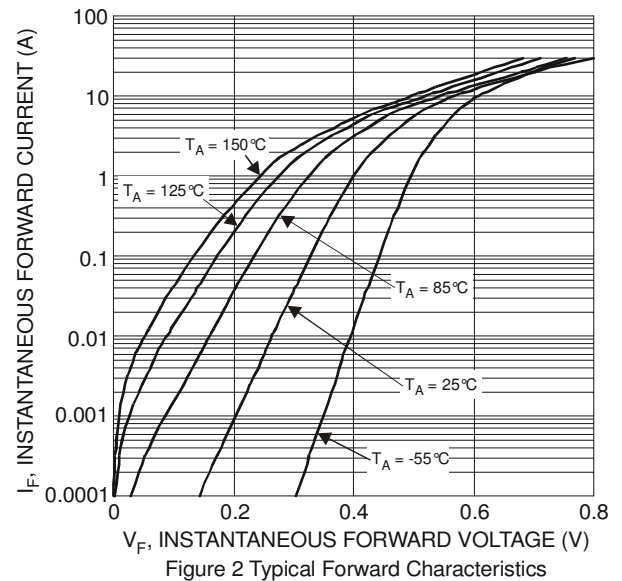
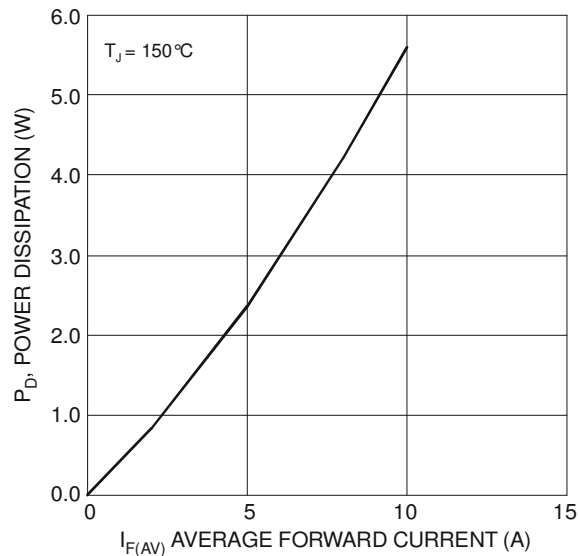
| Characteristic                                           | Symbol                            | Value       | Unit |
|----------------------------------------------------------|-----------------------------------|-------------|------|
| Typical Thermal Resistance, Junction to Case (Note 5)    |                                   |             |      |
| Package = TO-220AB                                       | R <sub>θJC</sub>                  | 2           | °C/W |
| Package = ITO-220AB                                      |                                   | 4           |      |
| Typical Thermal Resistance, Junction to Ambient (Note 5) |                                   |             |      |
| Package = TO-220AB                                       | R <sub>θJA</sub>                  | 15          | °C/W |
| Package = ITO-220AB                                      |                                   | 25          |      |
| Operating and Storage Temperature Range                  | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

## Electrical Characteristics (Per Leg) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                           | Symbol         | Min | Typ  | Max       | Unit | Test Condition                                                                                        |
|----------------------------------------------------------|----------------|-----|------|-----------|------|-------------------------------------------------------------------------------------------------------|
| MBR2045CT / MBRF2045CT                                   |                |     |      |           |      |                                                                                                       |
| Forward Voltage Drop                                     | V <sub>F</sub> | —   | 0.58 | 0.64      | V    | I <sub>F</sub> = 10A, T <sub>J</sub> = +25°C                                                          |
|                                                          |                | —   | —    | 0.57      |      | I <sub>F</sub> = 10A, T <sub>J</sub> = +125°C                                                         |
| MBR2060CT / MBRF2060CT                                   |                |     |      |           |      |                                                                                                       |
| Forward Voltage Drop                                     | V <sub>F</sub> | —   | 0.75 | 0.81      | V    | I <sub>F</sub> = 10A, T <sub>J</sub> = +25°C                                                          |
|                                                          |                | —   | —    | 0.69      |      | I <sub>F</sub> = 10A, T <sub>J</sub> = +125°C                                                         |
| Leakage Current (Note 6)<br>at Rated DC Blocking Voltage | I <sub>R</sub> | —   | —    | 0.1<br>15 | mA   | V <sub>R</sub> = Rated V, T <sub>J</sub> = +25°C<br>V <sub>R</sub> = Rated V, T <sub>J</sub> = +125°C |

Notes: 5. Device mounted on heat sink (45mm x 20mm x 12mm), with minimum recommended pad layout per <http://www.diodes.com>.  
 6. Short duration pulse test used to minimize self-heating effect.

**MBR2045CT / MBRF2045CT**



**MBR2060CT / MBRF2060CT**

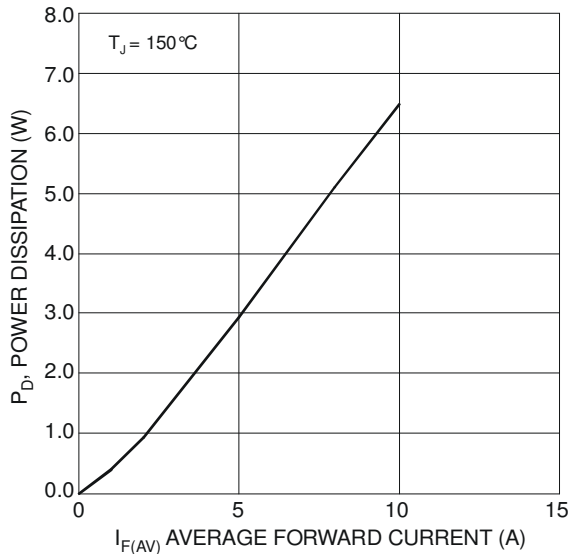


Figure 1 Forward Power Dissipation

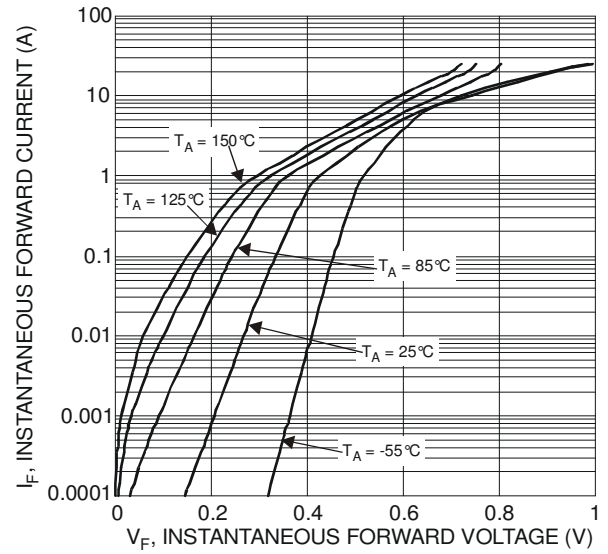


Figure 2 Typical Forward Characteristics

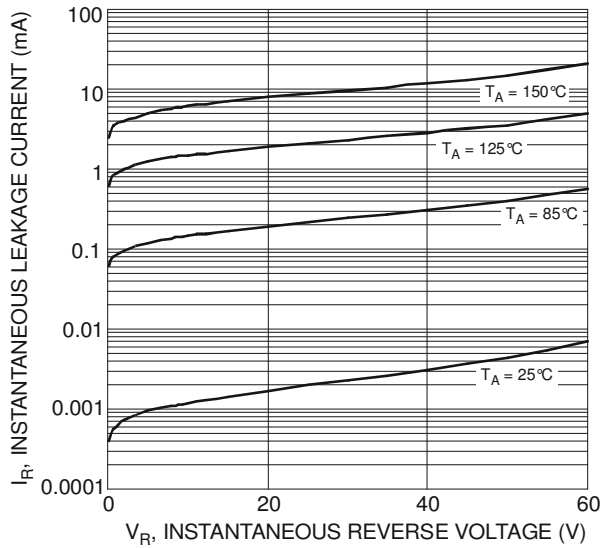


Figure 3 Typical Reverse Characteristics

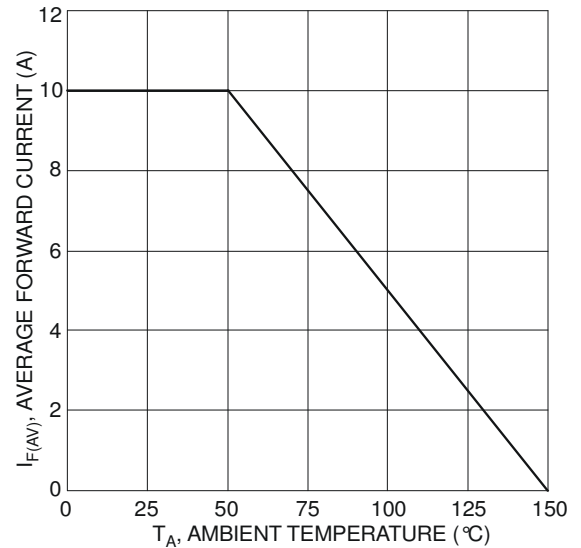
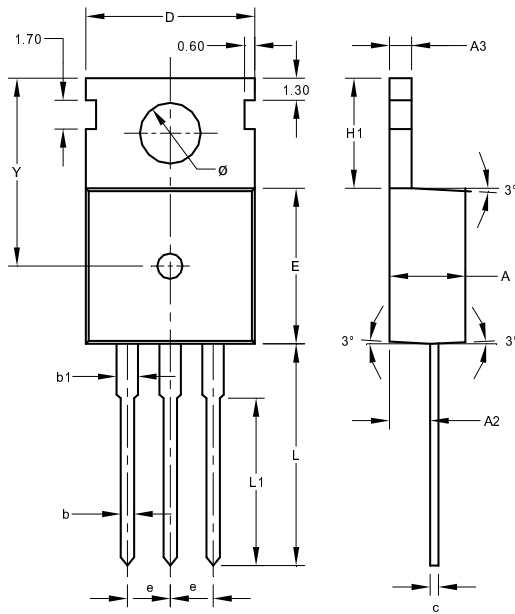


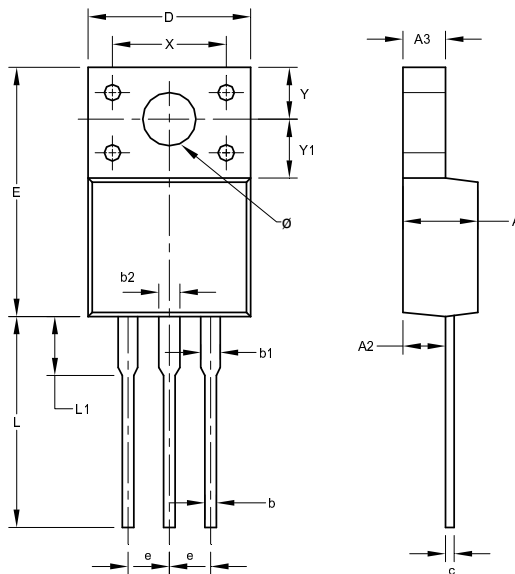
Figure 4 Forward Current Derating Curve

## Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| TO220AB<br>(Type C)  |        |        |        |
|----------------------|--------|--------|--------|
| Dim                  | Min    | Max    | Typ    |
| A                    | 4.40   | 4.60   | 4.500  |
| A2                   | 2.20   | 2.50   | 2.400  |
| A3                   | 1.20   | 1.40   | 1.300  |
| b                    | 0.700  | 0.900  | -      |
| b1                   | 1.170  | 1.390  | 1.270  |
| c                    | 0.400  | 0.600  | -      |
| D                    | 9.800  | 10.200 | -      |
| E                    | 9.000  | 9.400  | -      |
| e                    | -      | -      | 2.54   |
| H1                   | 6.300  | 6.700  | -      |
| L                    | 12.600 | 13.600 | -      |
| L1                   | 9.600  | 10.600 | -      |
| Y                    | -      | -      | 11.100 |
| Ø                    | 3.560  | 3.640  | -      |
| All Dimensions in mm |        |        |        |



| ITO220AB (TO220F-3)  |       |       |      |
|----------------------|-------|-------|------|
| Dim                  | Min   | Max   | Typ  |
| A                    | 4.30  | 4.90  | -    |
| A2                   | 2.52  | 2.92  | -    |
| A3                   | 2.35  | 2.90  | -    |
| b                    | 0.55  | 0.90  | -    |
| b1                   | 1.00  | 1.40  | -    |
| b2                   | 1.10  | 1.50  | -    |
| c                    | 0.45  | 0.60  | -    |
| D                    | 9.70  | 10.30 | -    |
| E                    | 14.70 | 16.00 | -    |
| e                    | -     | -     | 2.54 |
| L                    | 12.50 | 13.50 | -    |
| L1                   | 2.79  | 4.50  | -    |
| X                    | 6.90  | 7.10  | -    |
| Y                    | 3.00  | 3.40  | -    |
| Y1                   | 3.37  | 3.90  | -    |
| Ø                    | 3.00  | 3.55  | -    |
| All Dimensions in mm |       |       |      |

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