



**THE DATASHEET OF
MBR2020CTF-E1**



Product Summary

| V_{RRM} (V) | I_O (A) | V_F (MAX) (V) @ +25°C | I_R (MAX) (mA) @ +25°C |
|---------------|-----------|----------------------------|-----------------------------|
| 200 | 2x10 | 0.90 | 0.05 |

Description

High voltage dual Schottky rectifier suited for switch mode power supplies and other power converters. This device is intended for use in medium voltage operation, and particularly, in high frequency circuits where low switching losses and low noise are required.

The MBR20200C is available in TO-220-3 (2) and TO-220F-3 (Option 1) packages.

Applications

- Power Supply Output Rectification
- Power Management
- Instrumentation



TO-220F-3 (Option 1)



TO-220-3 (2)

- 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 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.

Features

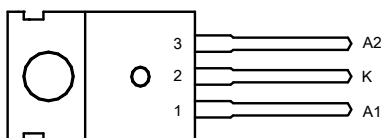
- Low Forward Voltage: 0.9V @ +25°C
- High Surge Capacity
- +150°C Operating Junction Temperature
- 20A Total (10A Per Diode Leg)
- Guard-Ring for Stress Protection
- Pb-free Package
- TO-220-3 (2) and TO-220F-3 (Option 1)
 - **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Available in "Green" Packages: TO-220-3 (2) and TO-220F-3 (Option 1)
 - **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
 - **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: TO-220-3 (2), TO-220F-3 (Option 1)
- 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-220-3 (2) – 1.95 Grams (Approximate)
 - TO-220F-3 (Option 1) – 1.69 Grams (Approximate)

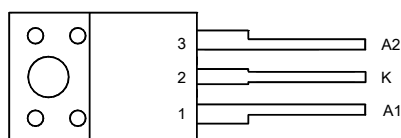
Pin Assignments

(Front View)

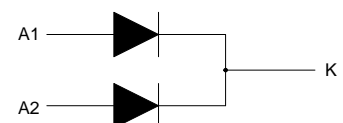


TO-220-3 (2)

(Front View)

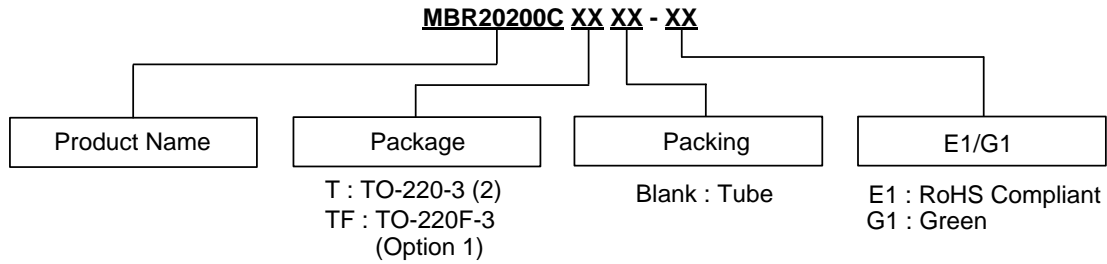


TO-220F-3 (Option 1)



Internal Structure of MBR20200C

Ordering Information (Note 4)



- Notes:
- 4. Diodes IC's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green packages.
 - 5. Not recommended for new design.
 - 6. Recommended MBR(F)20200CT-LJ for new design, MBR(F)20200CT-LJ can replace the "G1" products.

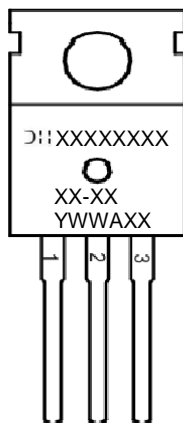


| Package | Part Number | Marking ID | Packing |
|----------------------|-------------------------|----------------|----------------|
| TO-220-3 (2) | MBR20200CT-E1 (Note 5) | MBR20200CT-E1 | 50 Pieces/Tube |
| TO-220-3 (2) | MBR20200CT-G1 (Note 6) | MBR20200CT-G1 | 50 Pieces/Tube |
| TO-220F-3 (Option 1) | MBR20200CTF-E1 (Note 5) | MBR20200CTF-E1 | 50 Pieces/Tube |
| TO-220F-3 (Option 1) | MBR20200CTF-G1 (Note 6) | MBR20200CTF-G1 | 50 Pieces/Tube |

Marking Information

(1) TO-220-3 (2)

(Front View)

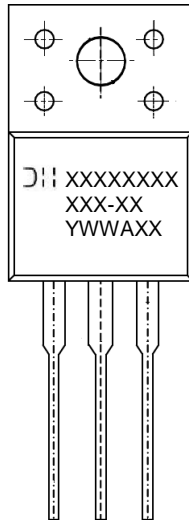


First and Second Lines: Logo and Marking ID
(See Ordering Information)
Third Line: Date Code
Y: Year
WW: Work Week of Molding
A: Assembly House Code
XX: 7th and 8th Digits of Batch Number

Marking Information (Cont.)

(2) TO-220F-3 (Option 1)

(Front View)



First and Second Lines: Logo and Marking ID
 (See Ordering Information)
 Third Line: Date Code
 Y: Year
 WW: Work Week of Molding
 A: Assembly House Code
 XX: 7th and 8th Digits of Batch Number

Maximum Ratings (Each Diode Leg) (Note 7)

| Characteristic | Symbol | Rating | Unit |
|---|-------------|-------------|------------------|
| Peak Repetitive Reverse Voltage | V_{RRM} | 200 | V |
| Working Peak Reverse Voltage | V_{RWM} | | |
| DC Blocking Voltage | V_R | | |
| Average Rectified Forward Current (Rated V_R) $T_C = +133^\circ\text{C}$ | $I_{F(AV)}$ | 10 | A |
| Peak Repetitive Forward Current (Rated V_R , Square Wave, 20kHz) $T_C = +130^\circ\text{C}$ | I_{FRM} | 20 | A |
| Non Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Half Wave, Single Phase, 60Hz) | I_{FSM} | 150 | A |
| Operating Junction Temperature Range (Note 8) | T_J | +150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | -65 to +150 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R) | dv/dt | 10000 | V/ μs |
| ESD (Machine Model = C) | – | >400 | V |
| ESD (Human Body Model = 3B) | – | >8000 | V |

Notes: 7. Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

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

Thermal Characteristics

| Characteristic | Symbol | Rating | | Unit |
|--|-----------------|----------------------|-----|------|
| Maximum Thermal Resistance (Junction to Case) (Note 9) | $R_{\theta JC}$ | TO-220-3 (2) | 2.0 | °C/W |
| | | TO-220F-3 (Option 1) | 2.5 | |
| Maximum Thermal Resistance (Junction to Ambient) (Note 9) | $R_{\theta JA}$ | TO-220-3 (2) | 60 | |
| | | TO-220F-3 (Option 1) | 60 | |

Note 9: Device mounted on heat sink, with minimum recommended pad layout per <http://www.diodes.com>

Electrical Characteristics

| Characteristic | Symbol | Rating | Unit | Test Condition |
|---|--------|--------|------|--|
| Maximum Instantaneous Forward Voltage Drop (Note 10) | V_F | 0.9 | V | $I_F = 10A, T_C = +25^\circ C$ |
| Maximum Instantaneous Reverse Current (Note 10) | I_R | 6.0 | mA | Rated DC Voltage, $T_C = +125^\circ C$ |
| | | 0.05 | | Rated DC Voltage, $T_C = +25^\circ C$ |

Note 10: Short duration pulse test used to minimize self-heating effect, Pulse Test Width = 300µs, Duty Cycle < 2.0%.

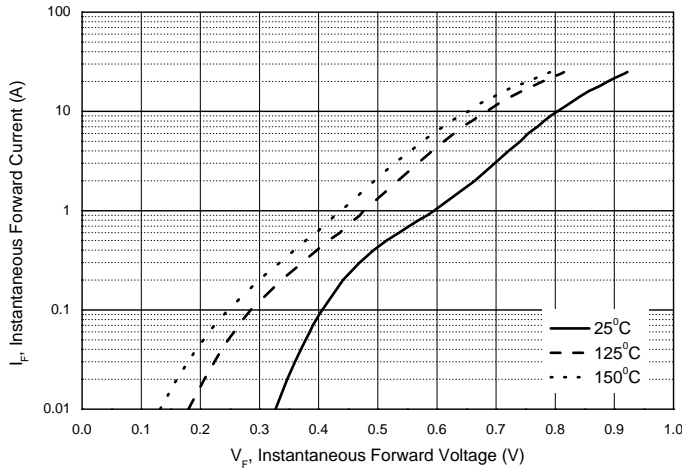


Figure 1. Typical Forward Voltage Per Diode

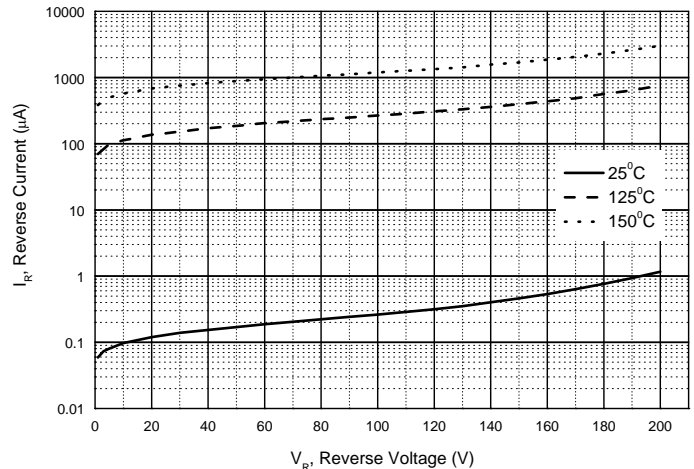


Figure 2. Typical Reverse Current Per Diode

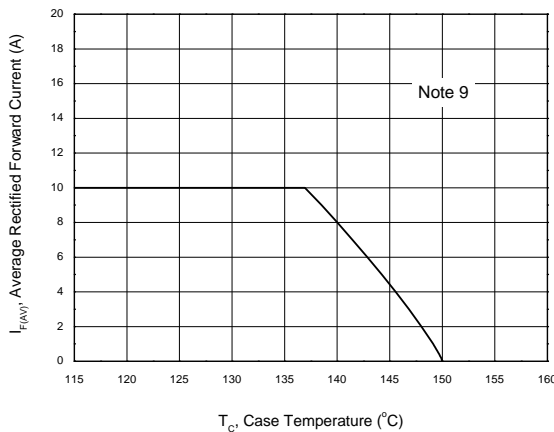
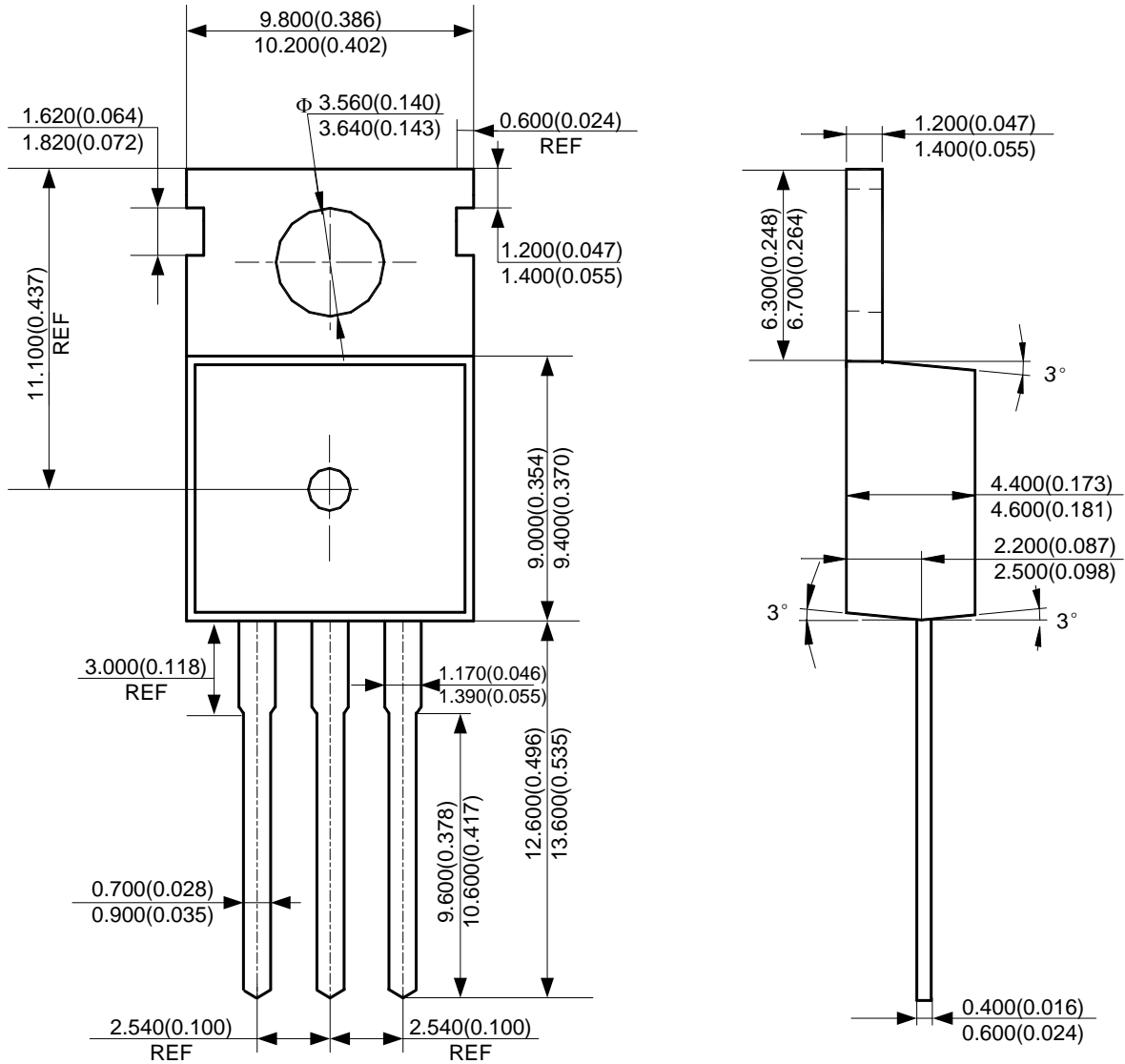


Figure 3. Average Rectified Forward Current vs. Case Temperature (Per Diode)

Package Outline Dimensions (All dimensions in mm(inch).)

(1) Package Type: TO-220-3 (2)



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