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Product Summary

| V_{RRM} (V) | I_o (A) | V_F (MAX) (V) @ +25°C | I_R (MAX) (mA) @ +25°C |
|---------------|-----------|----------------------------|-----------------------------|
| 100 | 2x10 | 0.85 | 0.1 |

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 MBR20100C is available in standard TO-220-3 (2), TO-220F-3 (Option 1), TO-252-2 (1) and TO-263-2 packages.


Applications

- Power Supply Output Rectification
- Power Management
- Instrumentation

Features

- Low Forward Voltage: 0.85V @ +25°C
- High Surge Current Capability
- +150°C Operating Junction Temperature
- 20A Total (10A Each Diode Leg)
- Guard-Ring for Stress Protection
- Pb-free Package
- TO-220-3 (2), TO-220F-3 (Option 1), TO-252-2 (1) and TO-263-2
 - **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Available in "Green" Packages: TO-220-3 (2), TO-220F-3 (Option 1), TO-252-2 (1) and TO-263-2
 - **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), TO-252-2 (1) and TO-263-2
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Polarity: See Below
- Weight
 - TO-220-3 (2), TO-220F-3 (Option 1) and TO-263-2 — 1.9 Grams (Approximate)
 - TO-252-2 (1) — 0.31Grams (Approximate)


TO-220F-3 (Option 1)

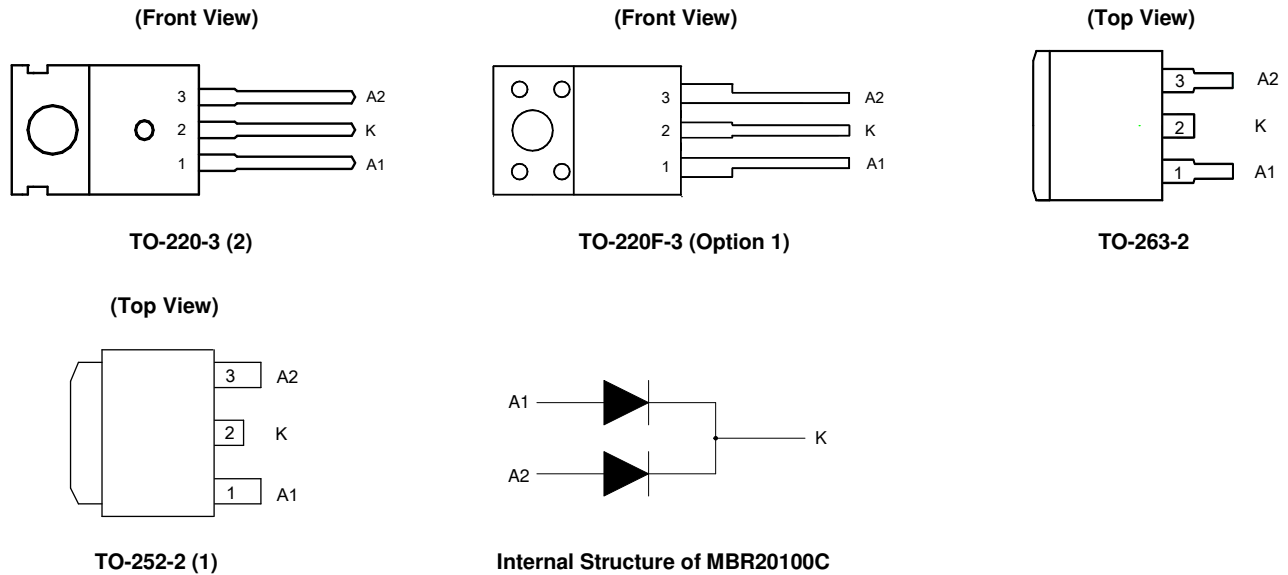
TO-220-3 (2)

TO-252-2 (1)

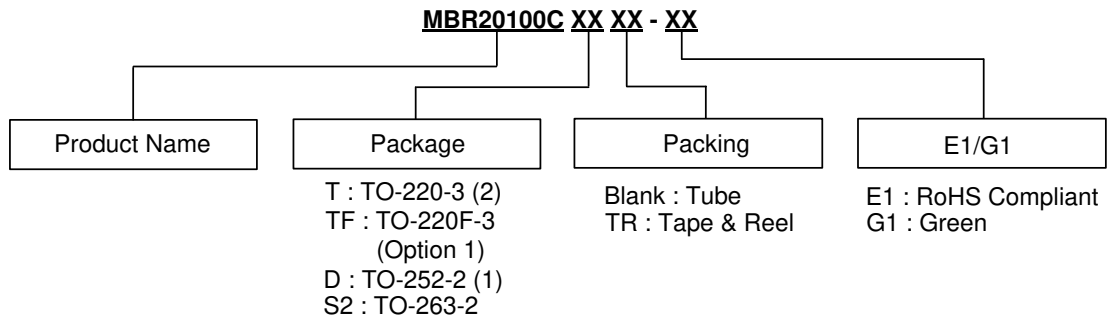
TO-263-2

- 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.

Pin Assignments



Ordering Information



| Package | Part Number | Marking ID | Packing |
|----------------------|----------------|----------------|----------------|
| TO-220-3 (2) | MBR20100CT-E1 | MBR20100CT-E1 | 50 Pieces/Tube |
| TO-220-3 (2) | MBR20100CT-G1 | MBR20100CT-G1 | 50 Pieces/Tube |
| TO-220F-3 (Option 1) | MBR20100CTF-E1 | MBR20100CTF-E1 | 50 Pieces/Tube |
| TO-220F-3 (Option 1) | MBR20100CTF-G1 | MBR20100CTF-G1 | 50 Pieces/Tube |

Ordering Information (Cont.)

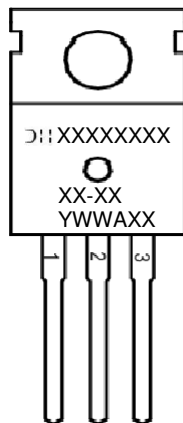


| Package | Part Number | Marking ID | Packing |
|--------------|------------------|----------------|-------------------------|
| TO-252-2 (1) | MBR20100CD-E1 | MBR20100CD-E1 | 80 Pieces/Tube |
| TO-252-2 (1) | MBR20100CD-G1 | MBR20100CD-G1 | 80 Pieces/Tube |
| TO-252-2 (1) | MBR20100CDTR-E1 | MBR20100CD-E1 | 2500 Pieces/Tape & Reel |
| TO-252-2 (1) | MBR20100CDTR-G1 | MBR20100CD-G1 | 2500 Pieces/Tape & Reel |
| TO-263-2 | MBR20100CS2-E1 | MBR20100CS2-E1 | 50 Pieces/Tube |
| TO-263-2 | MBR20100CS2-G1 | MBR20100CS2-G1 | 50 Pieces/Tube |
| TO-263-2 | MBR20100CS2TR-E1 | MBR20100CS2-E1 | 800 Pieces/Tape & Reel |
| TO-263-2 | MBR20100CS2TR-G1 | MBR20100CS2-G1 | 800 Pieces/Tape & Reel |

Marking Information

(1) TO-220-3 (2)

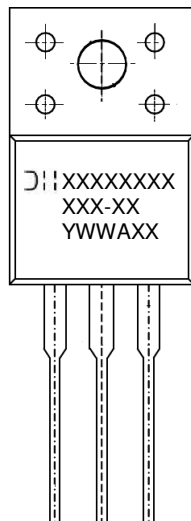
(Front View)



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

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

(Front View)

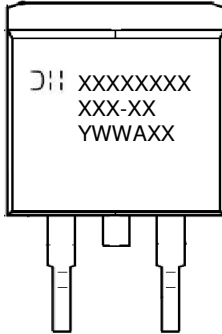


First and Second Lines: Logo and Marking ID
 (See Ordering Information)
 Third Line: Date Code
 Y: Year
 WW: Work Week of Molding
 A: Assembly House Code
 XX: 7th and 8th Digits of Batch Number

Marking Information (Cont.)

(3) TO-263-2

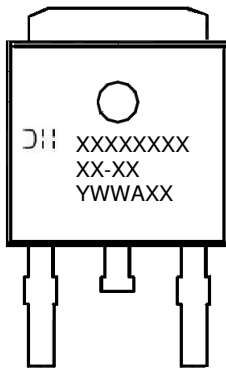
(Top View)



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

(4) TO-252-2 (1)

(Top 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 4)

| Characteristic | Symbol | Rating | Unit |
|---|-------------|-------------|------------------------|
| Peak Repetitive Reverse Voltage | V_{RRM} | 100 | V |
| Working Peak Reverse Voltage | V_{RWM} | | |
| DC Blocking Voltage | V_R | | |
| Average Rectified Forward Current (Rated V_R) $T_C = +122^\circ\text{C}$ | $I_{F(AV)}$ | 10 | A |
| Peak Repetitive Forward Current (Rated V_R , Square Wave, 20kHz) $T_C = +118^\circ\text{C}$ | I_{FRM} | 20 | A |
| Non Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Half Wave, Single Phase, 60Hz) | I_{FSM} | 150 | A |
| Non Repetitive Peak Reverse Current, $t_P = 3\mu\text{s}$ | I_{RSM} | 2 | A |
| Operating Junction Temperature Range (Note 5) | 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 | $\text{V}/\mu\text{s}$ |
| ESD (Machine Model = C) | – | >400 | V |
| ESD (Human Body Model = 3B) | – | >8000 | V |

- Notes:
- 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.
 - 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 6) | $R_{\theta JC}$ | TO-220-3 (2) | 2.5 | $^\circ\text{C}/\text{W}$ |
| | | TO-220F-3 (Option 1) | 4.5 | |
| | | TO-252-2 (1) | 2.0 | |
| | | TO-263-2 | 2.0 | |
| Maximum Thermal Resistance (Junction to Ambient) (Note 6) | $R_{\theta JA}$ | TO-220-3 (2) | 60 | $^\circ\text{C}/\text{W}$ |
| | | TO-220F-3 (Option 1) | 60 | |
| | | TO-252-2 (1) | 50 | |
| | | TO-263-2 | 50 | |

Note 6: 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 7) | V_F | 0.85 | V | $I_F = 10A, T_C = +25^\circ C$ |
| | | 0.75 | | $I_F = 10A, T_C = +125^\circ C$ |
| Maximum Instantaneous Reverse Current (Note 7) | I_R | 6.0 | mA | Rated DC Voltage, $T_C = +125^\circ C$ |
| | | 0.1 | | Rated DC Voltage, $T_C = +25^\circ C$ |

Note 7: Short duration pulse test used to minimize self-heating effect, Pulse Test Width = 300µs, Duty Cycle < 2.0%.

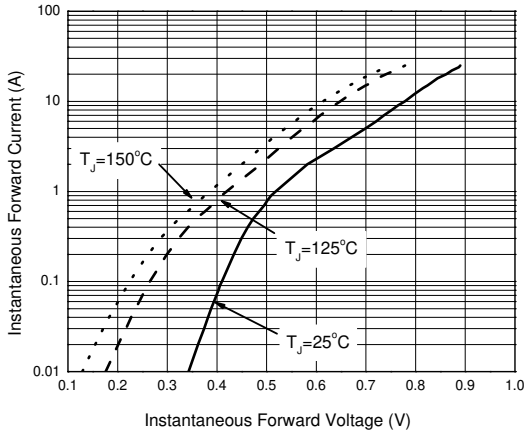


Figure 1. Typical Forward Voltage Per Diode

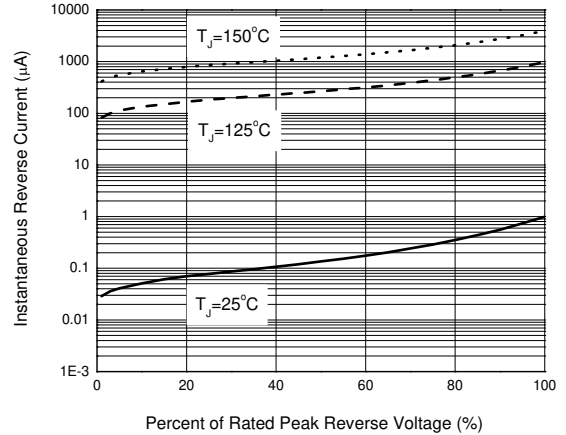


Figure 2. Typical Reverse Current Per Diode

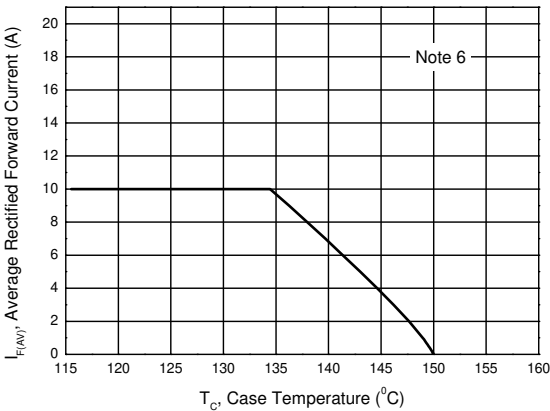
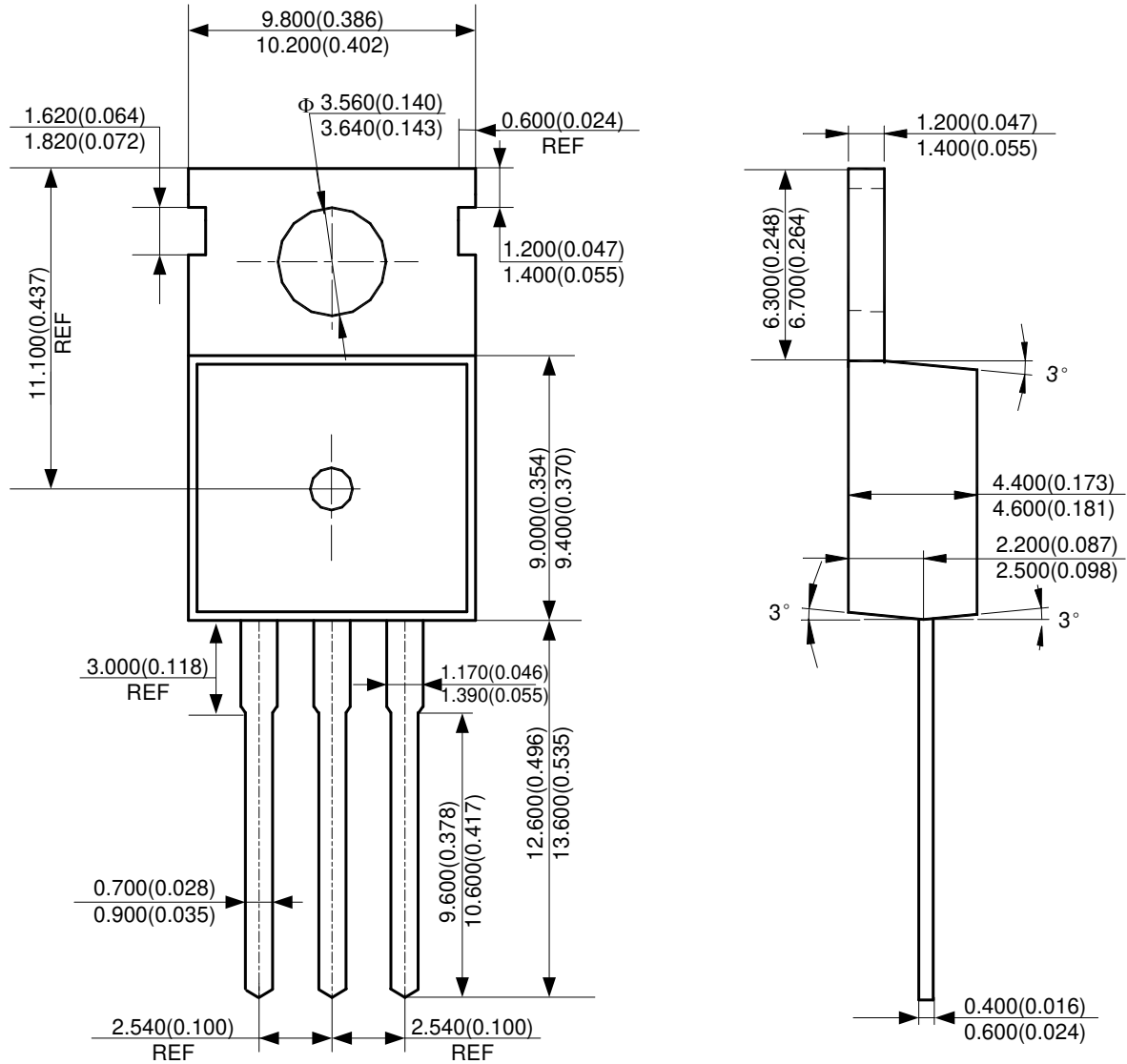


Figure 3. Average Rectified Forward Current vs. Case Temperature (Per Diode)

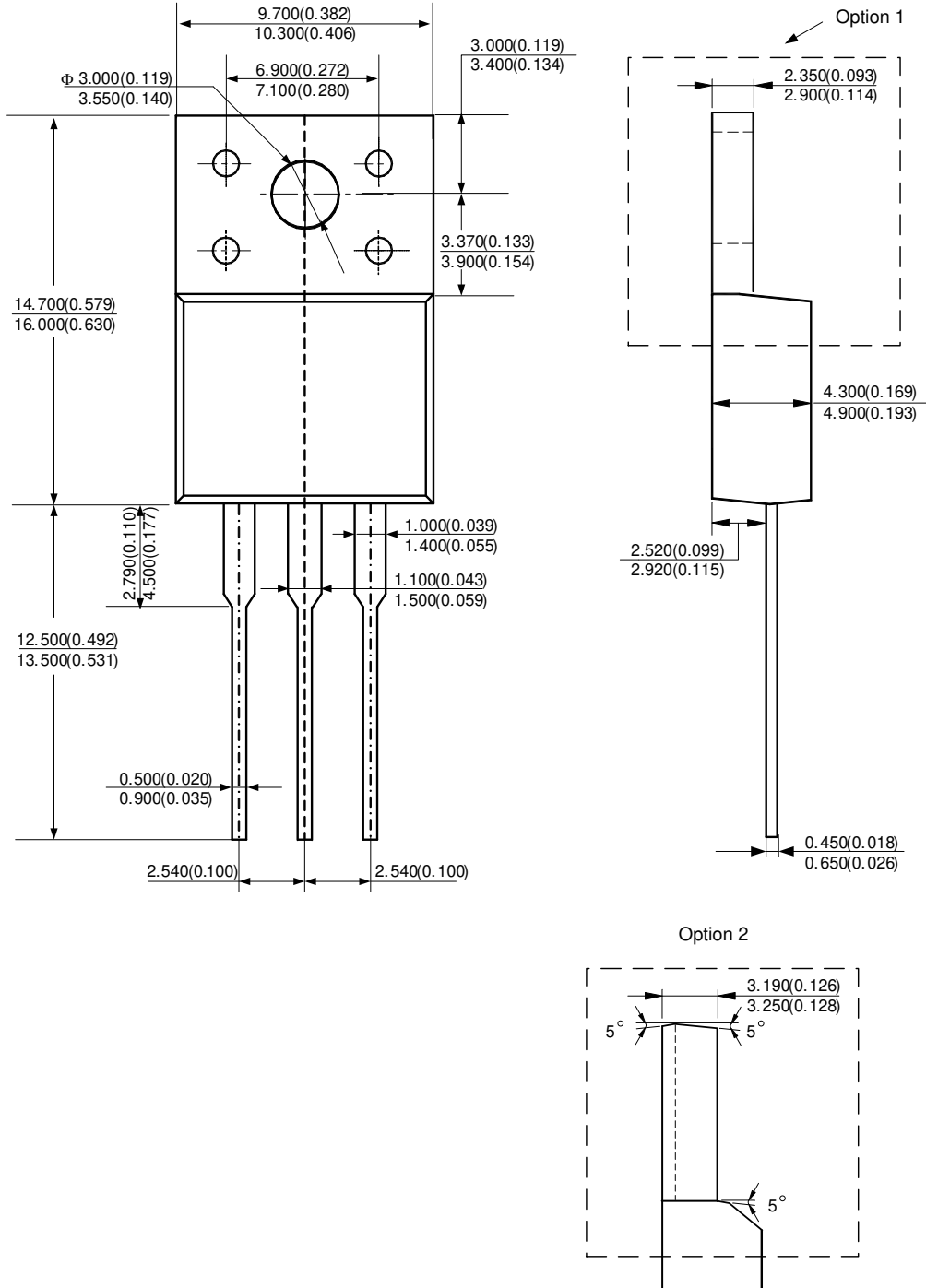
Package Outline Dimensions (All dimensions in mm(inch).)

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



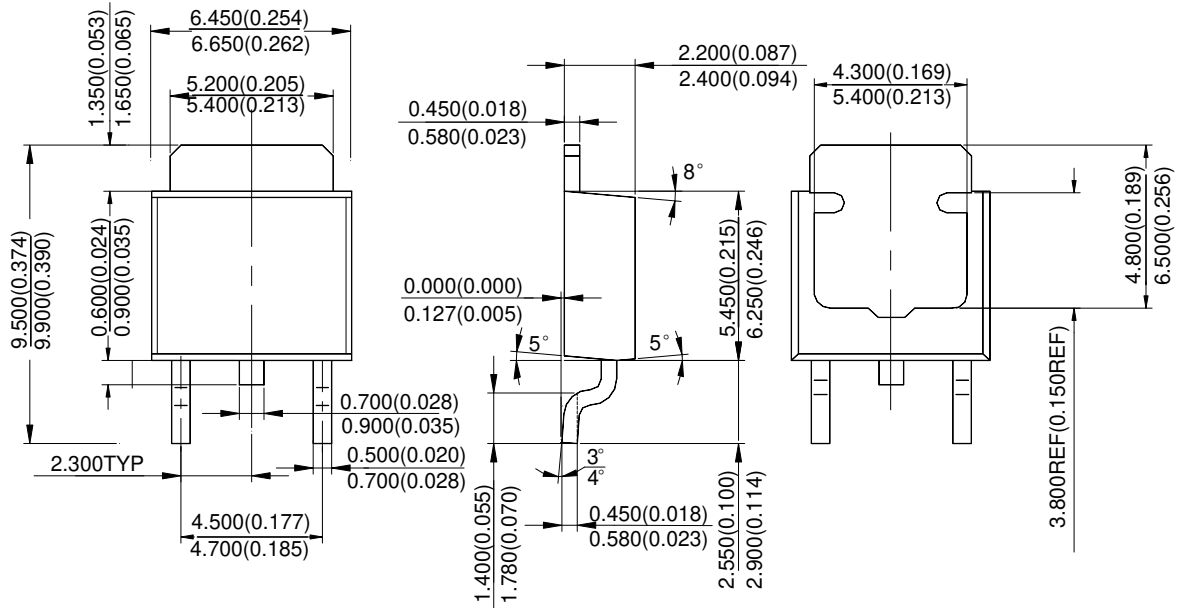
Package Outline Dimensions (Cont. All dimensions in mm(inch).)

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



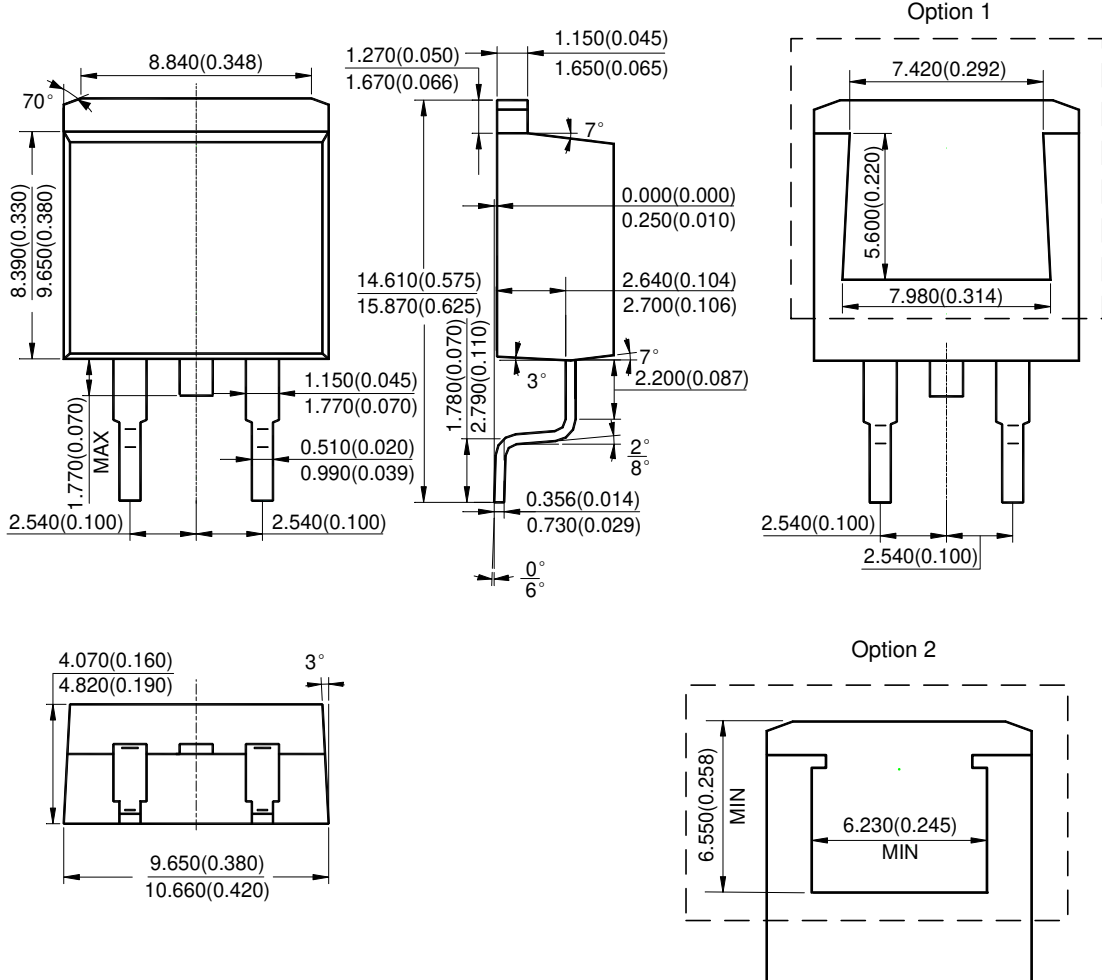
Package Outline Dimensions (Cont. All dimensions in mm(inch).)

(3) Package Type: TO-252-2 (1)



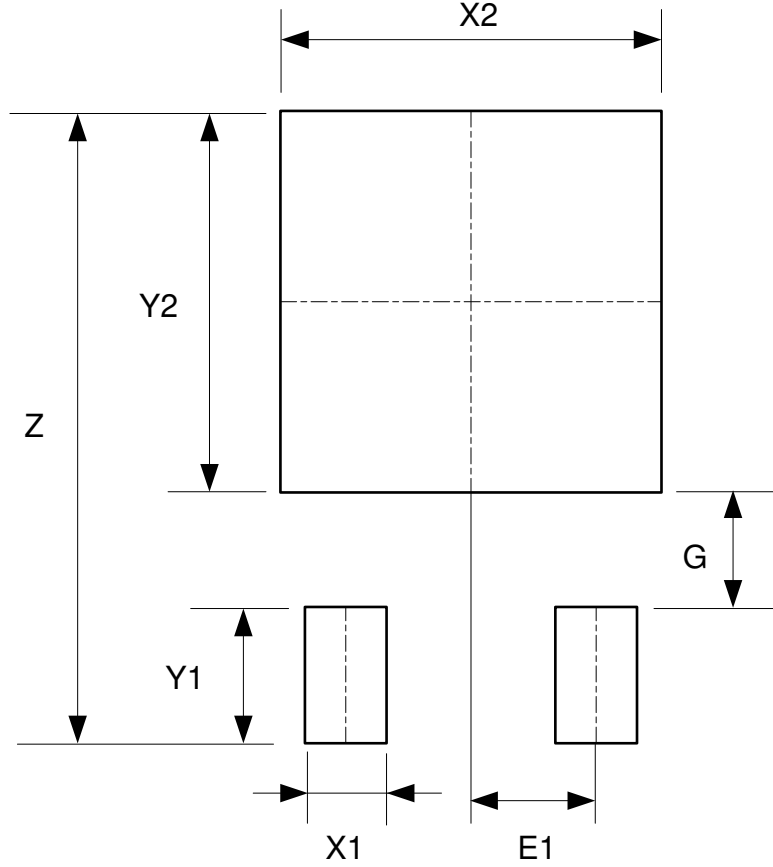
Package Outline Dimensions (Cont. All dimensions in mm(inch).)

(4) Package Type: TO-263-2



Suggested Pad Layout

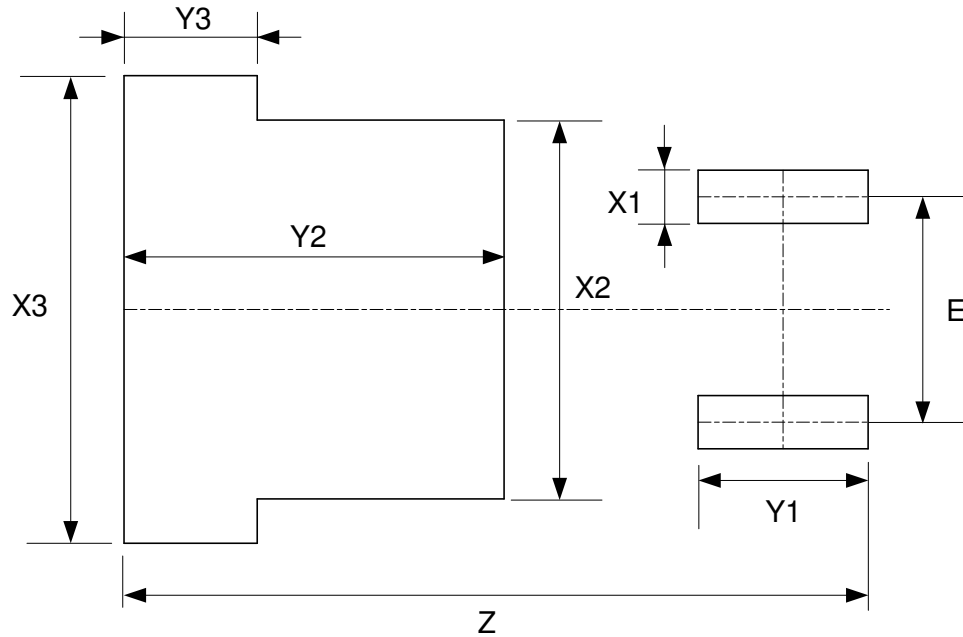
(1) Package Type: TO-252-2 (1)



| Dimensions | Z (mm)/(inch) | X1 (mm)/(inch) | X2=Y2 (mm)/(inch) | Y1 (mm)/(inch) | G (mm)/(inch) | E1 (mm)/(inch) |
|------------|------------------|-------------------|----------------------|-------------------|------------------|-------------------|
| Value | 11.600/0.457 | 1.500/0.059 | 7.000/0.276 | 2.500/0.098 | 2.100/0.083 | 2.300/0.091 |

Suggested Pad Layout (Cont.)

(2) Package Type: TO-263-2



| | | | | |
|------------|-------------------|-------------------|-------------------|-------------------|
| Dimensions | Z (mm)/(inch) | X1 (mm)/(inch) | X2 (mm)/(inch) | X3 (mm)/(inch) |
| Value | 16.760/0.660 | 1.200/0.047 | 8.540/0.336 | 10.540/0.415 |
| Dimensions | Y1 (mm)/(inch) | Y2 (mm)/(inch) | Y3 (mm)/(inch) | E (mm)/(inch) |
| Value | 3.830/0.151 | 8.560/0.337 | 3.000/0.118 | 5.080/0.200 |

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