

## 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)**

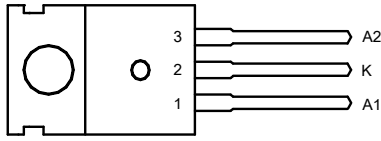
**TO-252-2 (1)**

**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](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.

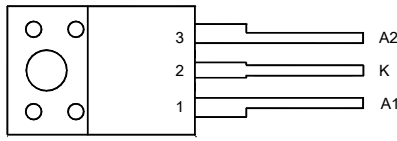
## Pin Assignments

(Front View)



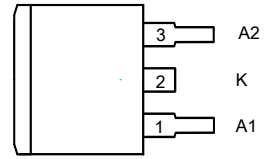
TO-220-3 (2)

(Front View)



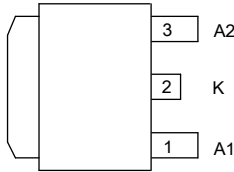
TO-220F-3 (Option 1)

(Top View)

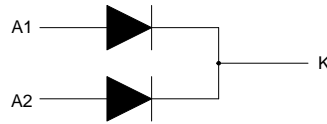


TO-263-2

(Top View)

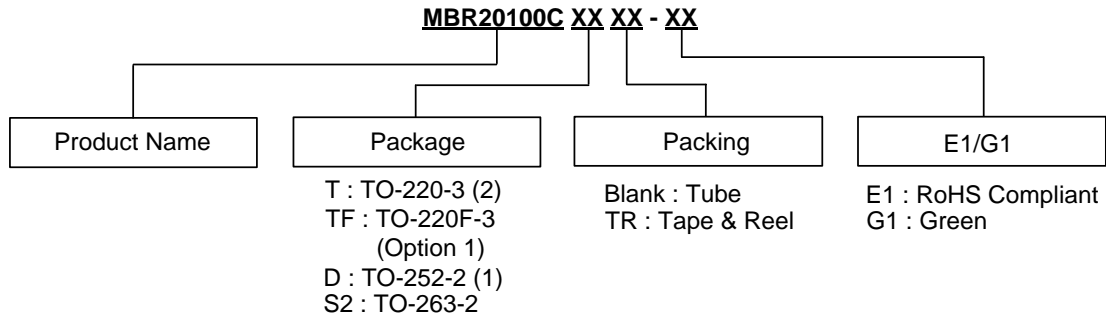


TO-252-2 (1)



Internal Structure of MBR20100C

## 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.)

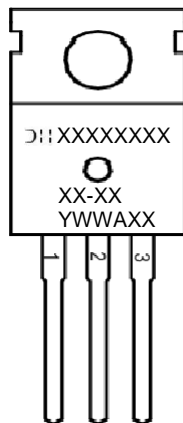


Package	Part Number	Marking ID	Packing
TO-252-2 (1)	MBR20100CD-E1	MBR20100CD-E1	80 Pieces/Tube
TO-252-2 (1)	MBR20100CD-G1	MBR20100CD-G1	80 Pieces/Tube
TO-252-2 (1)	MBR20100CDTR-E1	MBR20100CD-E1	2500 Pieces/Tape & Reel
TO-252-2 (1)	MBR20100CDTR-G1	MBR20100CD-G1	2500 Pieces/Tape & Reel
TO-263-2	MBR20100CS2-E1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

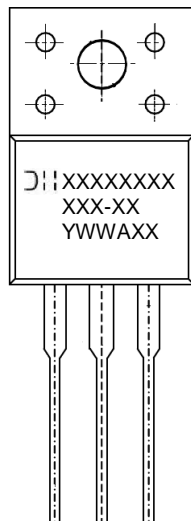
(Front View)



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)

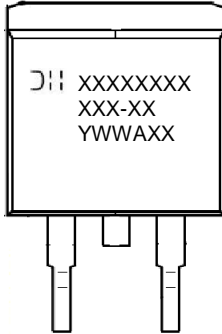


First and Second Lines: Logo and Marking ID  
 (See Ordering Information)  
 Third Line: Date Code  
 Y: Year  
 WW: Work Week of Molding  
 A: Assembly House Code  
 XX: 7th and 8th Digits of Batch Number

**Marking Information** (Cont.)

(3) TO-263-2

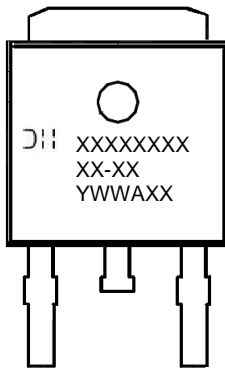
(Top View)



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%.

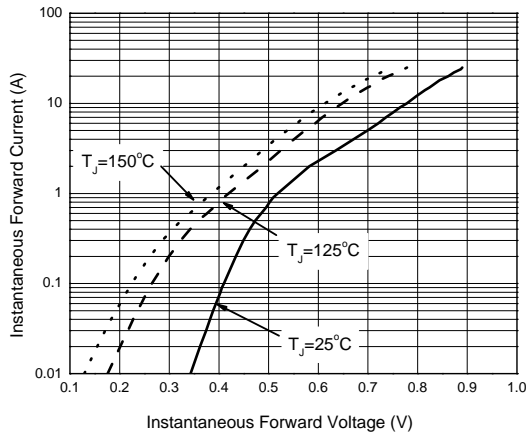


Figure 1. Typical Forward Voltage Per Diode

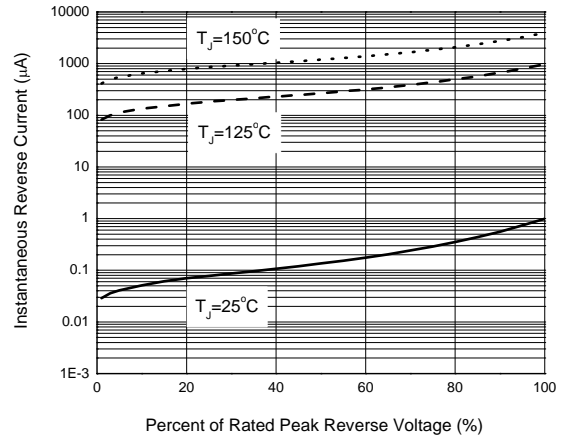


Figure 2. Typical Reverse Current Per Diode

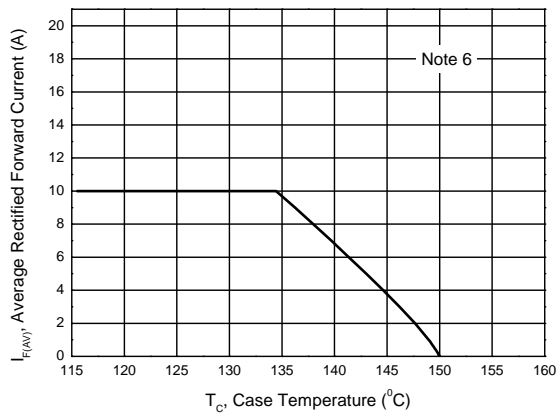
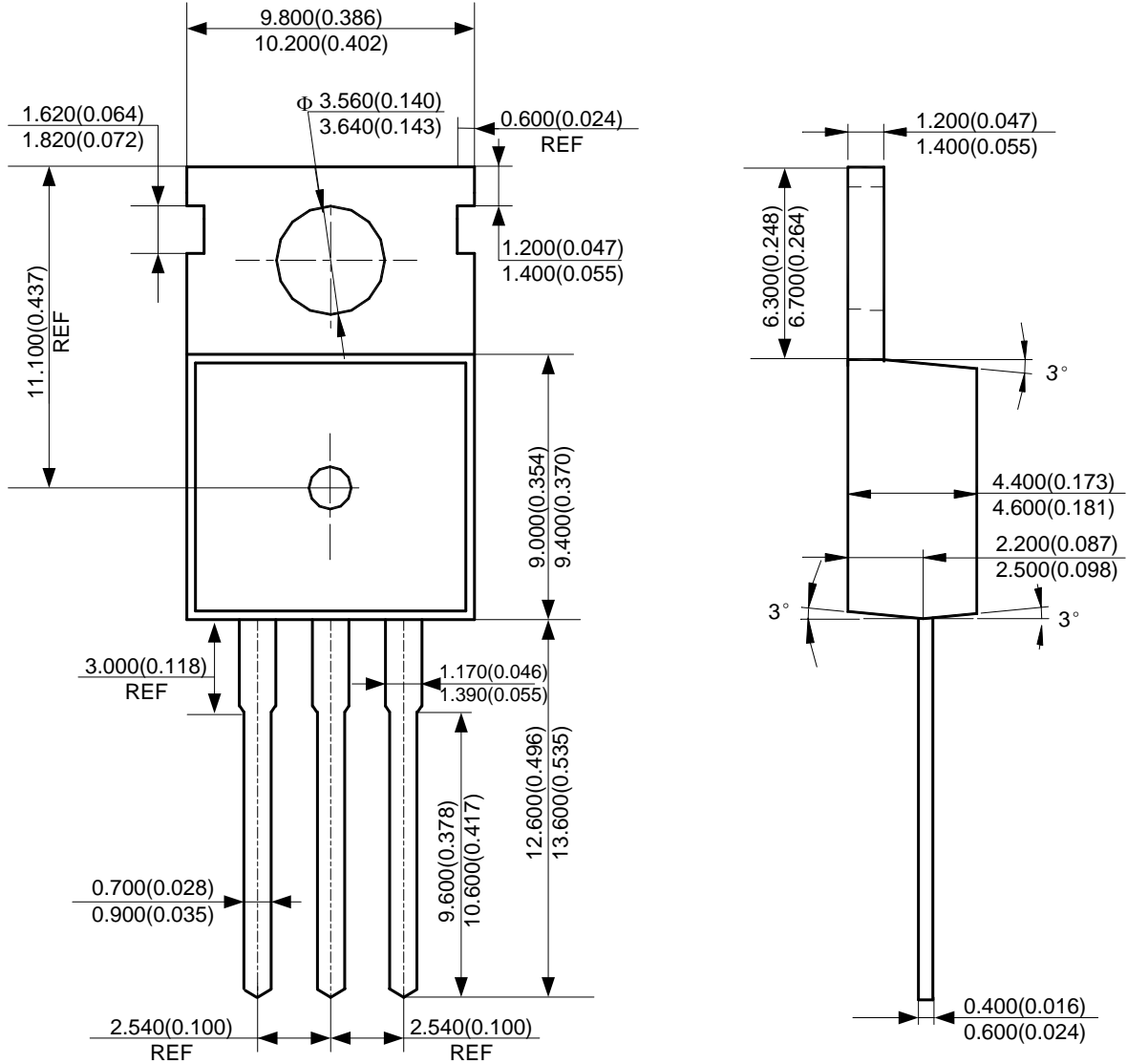


Figure 3. Average Rectified Forward Current vs. Case Temperature (Per Diode)

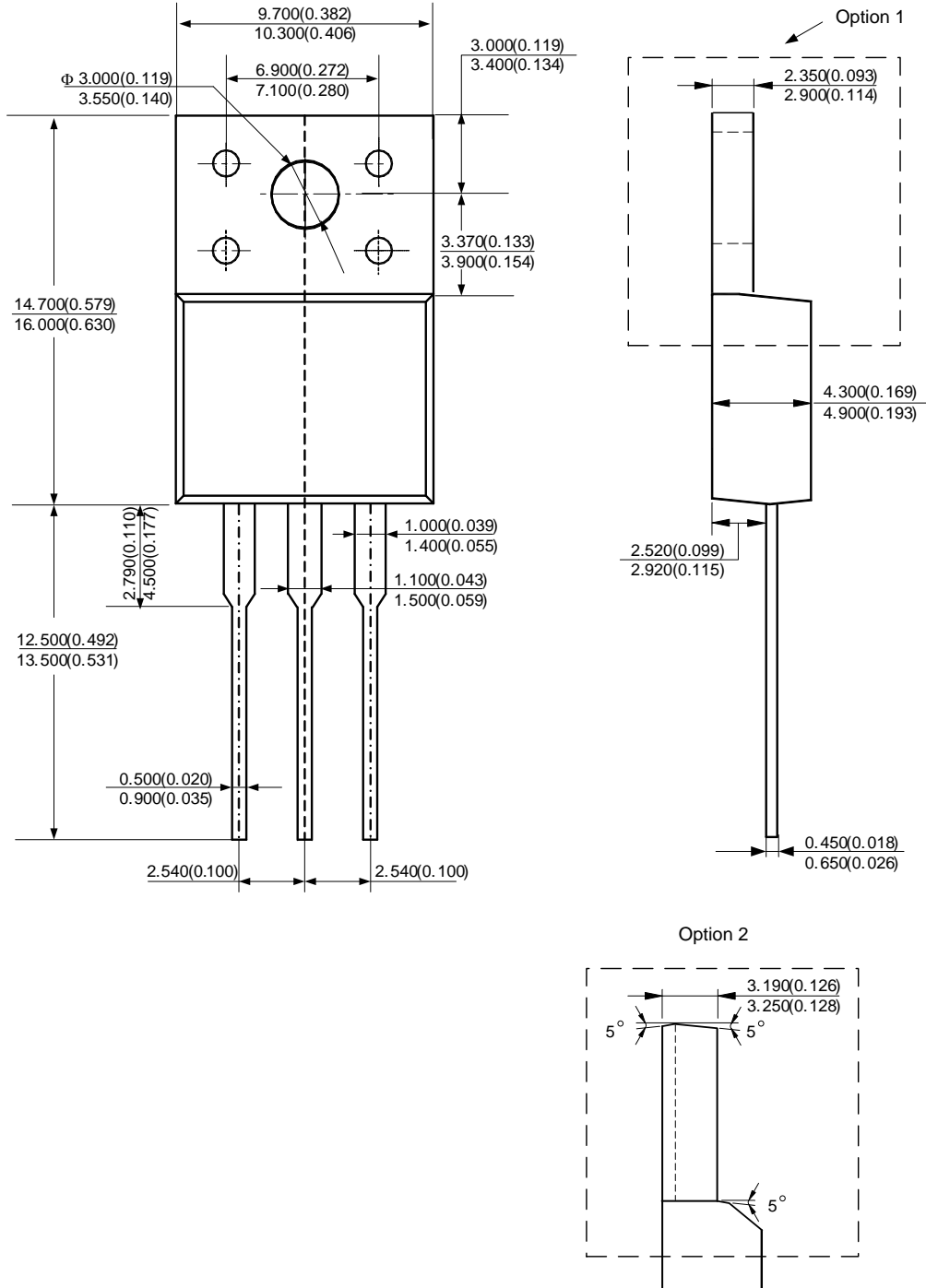
**Package Outline Dimensions** (All dimensions in mm(inch).)

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



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

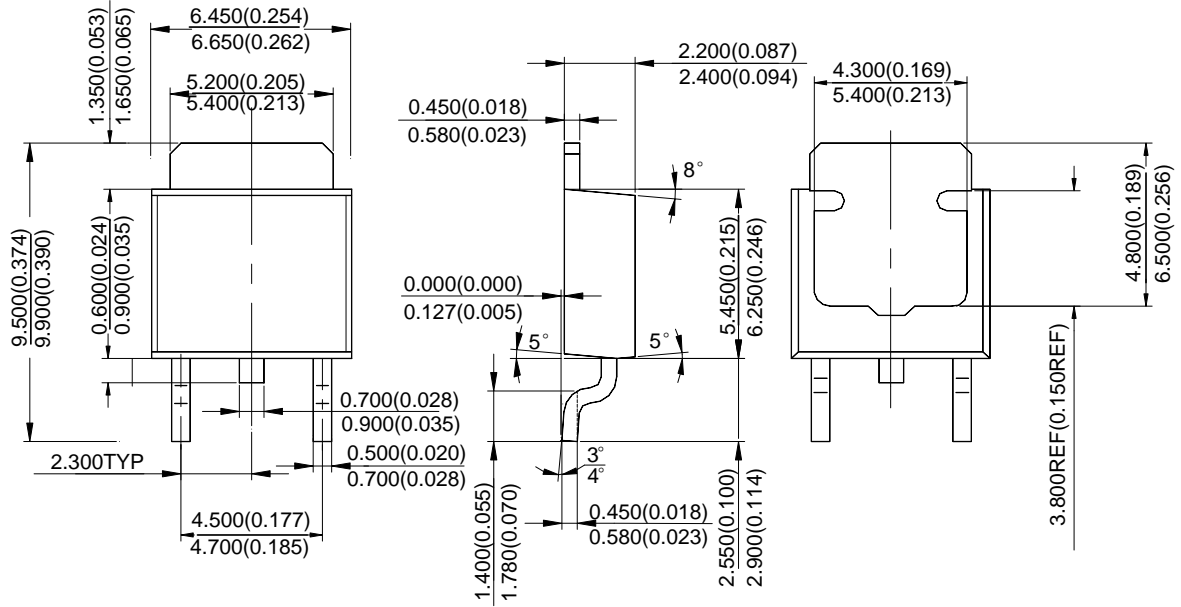
(2) Package Type: TO-220F-3





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

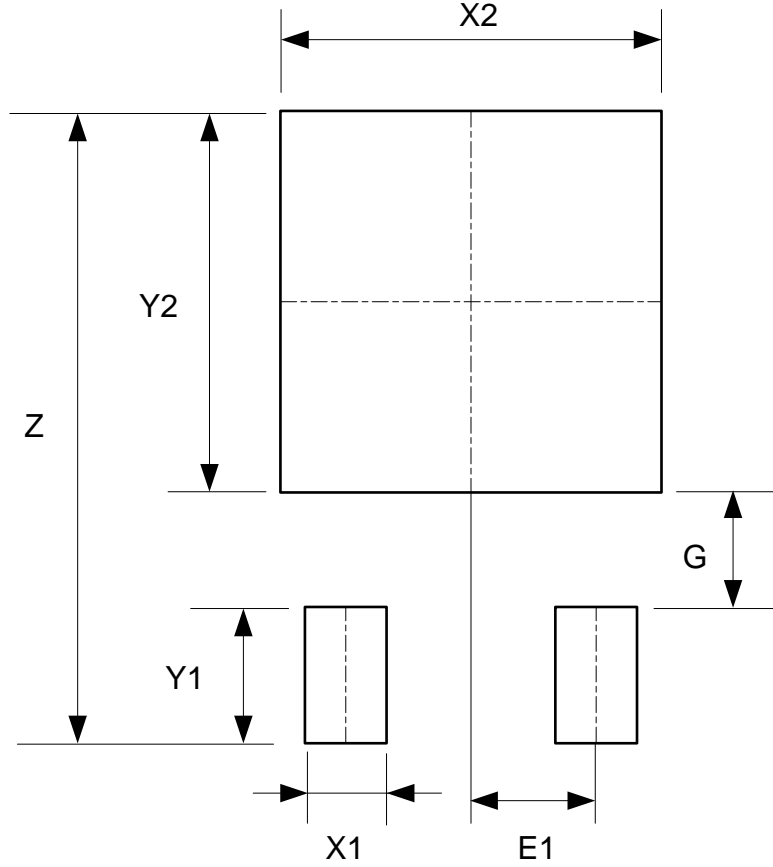
(3) Package Type: TO-252-2 (1)





**Suggested Pad Layout**

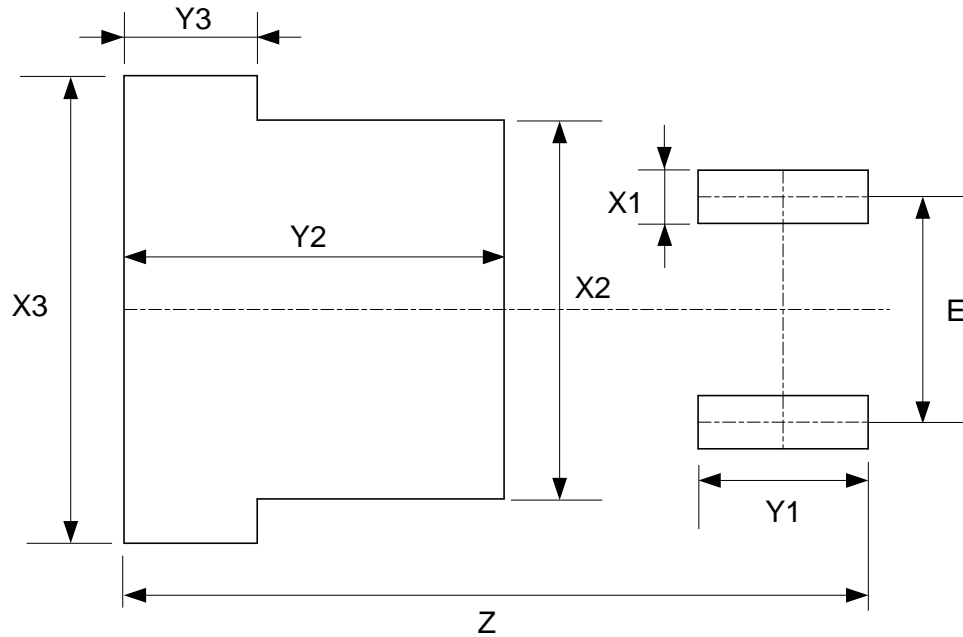
(1) Package Type: TO-252-2 (1)



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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