

## Description

The AZ2085 series is low dropout positive voltage regulators with a maximum dropout of 1.5V at 3A of load current.

The device features on-chip thermal shutdown. It also includes a bandgap reference and a current limiting circuit.

The AZ2085 is available in adjustable version. The adjustable version can set the output voltage with two external resistors.

The AZ2085 series is available in standard packages of TO252-2 (3) and TO252-2 (5).

## Applications

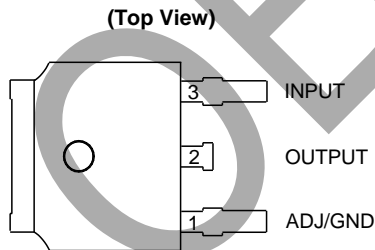
- High Efficiency Linear Regulators
- Battery Charger
- Digital Video/Camcorder
- Post Regulation for Switching Supplies
- Microprocessor Supply
- Mother Board Power Supplies
- DVD-video Player
- Telecom Equipment
- Set Top Boxes and Web Boxes Modules' Supply

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  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.

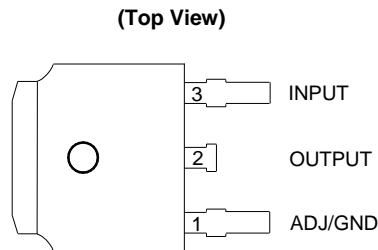
## Features

- Low Dropout Voltage: Typical 1.2V at 3A
- Current Limiting and Thermal Protection
- Output Current: 3A
- Current Limit: 4.5A
- Operating Junction Temperature: 0 to +125°C
- Line Regulation: 0.015% (Typ)
- Load Regulation: 0.1% (Typ)
- Adjust Pin Current: 6µA (Typ)
- Minimum Load Current: 0.3mA (Typ)
- Compatible with Low ESR Ceramic Capacitor
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

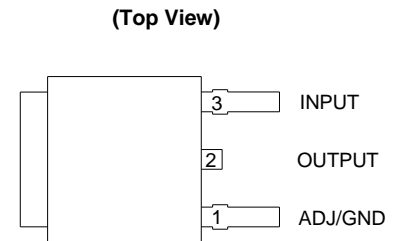
## Pin Assignments



(TO252-2 (3) Option 1/ D Package)

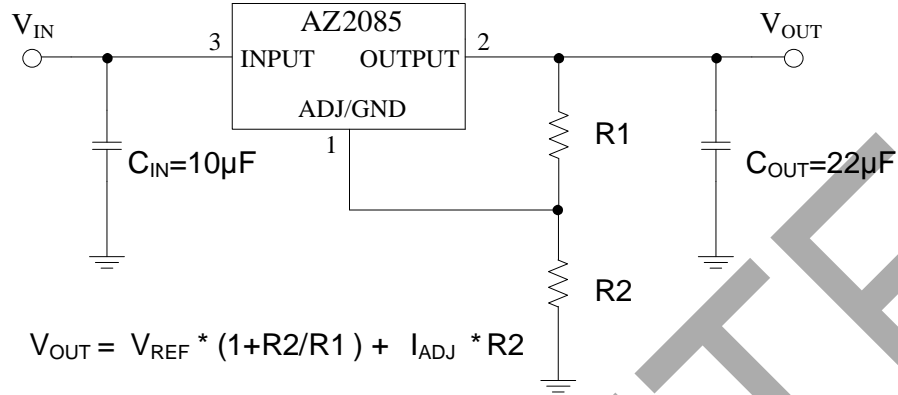


(TO252-2 (3) Option 2/ D Package)



(TO252-2 (5)/ D Package)

**Typical Applications Circuit**



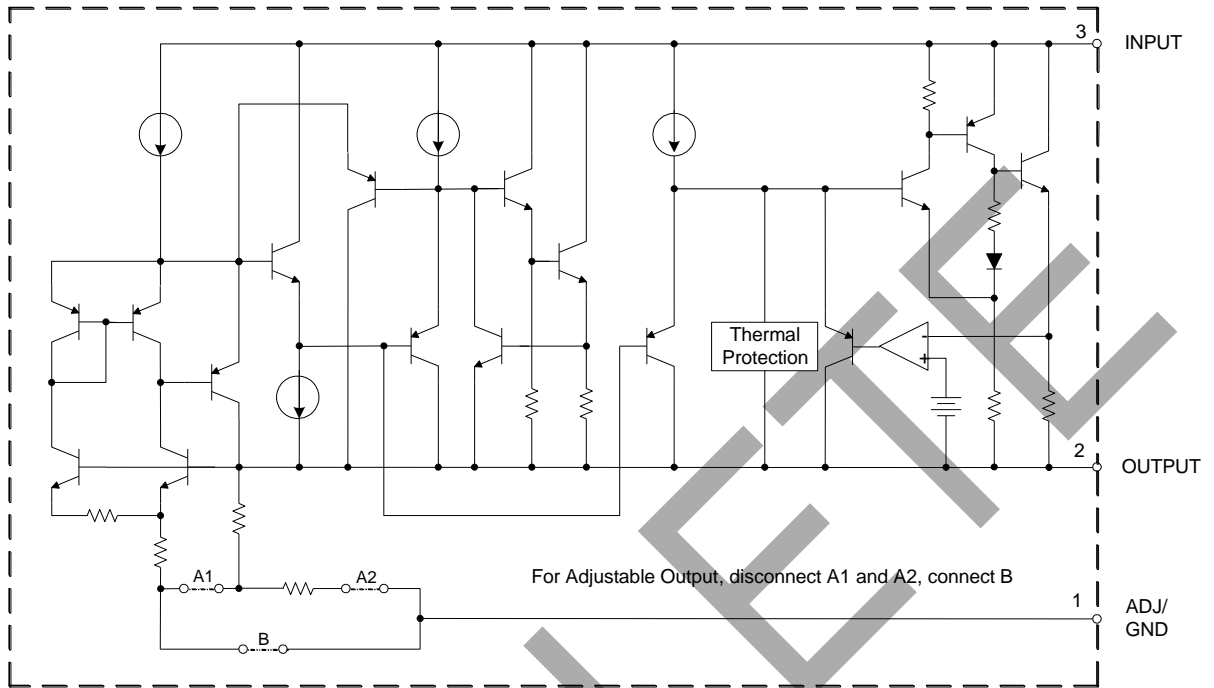
**Pin Descriptions**

Pin Number	Pin Name	Function
1	ADJ/GND	Adjust pin/Ground
2	OUTPUT	Output voltage
3	INPUT	Input voltage

OBSOLETE - PART DISCONTINUED

OBSOLETE

**Functional Block Diagram**



OBSOLETE - PART DISCONTINUED

OBSOLETE

OBsolete - PART DISCONTINUED

**Absolute Maximum Ratings** (Note 4)

Symbol	Parameter	Rating	Unit
$V_{IN}$	Input Voltage	18	V
$T_J$	Operating Junction Temperature	+150	°C
$T_{STG}$	Storage Temperature Range	-65 to +150	°C
$T_{LEAD}$	Lead Temperature (Soldering, 10sec)	+260	°C
$\theta_{JA}$	Thermal Resistance (Junction to Ambient)	100	°C/W
—	ESD (Human Body Model)	2000	V

Note 4: 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.

**Recommended Operating Conditions**

Symbol	Parameter	Min	Max	Unit
$V_{IN}$	Input Voltage	—	12	V
$T_J$	Operating Junction Temperature	0	+125	°C

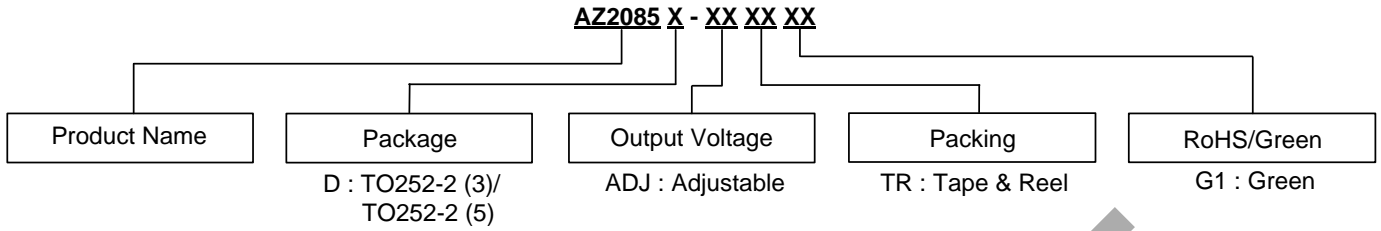
**OBSOLETE - PART DISCONTINUED**

**Electrical Characteristics** (Typicals and limits appearing in normal type apply for  $T_J = +25^\circ\text{C}$ . Limits appearing in **Boldface** type apply over the entire operating junction temperature range 0 to  $+125^\circ\text{C}$ .)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{REF}$	Reference Voltage	$I_{OUT} = 10\text{mA}$ , $V_{IN}-V_{OUT} = 3\text{V}$ , $T_J = +25^\circ\text{C}$ , $10\text{mA} \leq I_{OUT} \leq 3\text{A}$ , $1.5\text{V} \leq V_{IN}-V_{OUT} \leq 5\text{V}$	1.238 <b>1.225</b>	1.250 <b>1.250</b>	1.262 <b>1.275</b>	V
$\Delta V_{OUT}/V_{OUT}$	Load Regulation	$0\text{A} \leq I_{OUT} \leq 3\text{A}$ , $V_{IN}-V_{OUT} = 3\text{V}$	—	0.1 <b>0.2</b>	0.3 <b>0.4</b>	%
$\Delta V_{OUT}/\Delta V_{IN}$	Line Regulation	$I_{OUT} = 10\text{mA}$ , $2.85\text{V} \leq V_{IN} \leq 10\text{V}$	—	0.015 <b>0.035</b>	0.2 <b>0.2</b>	%
$V_{DROP}$	Dropout Voltage	$I_{OUT} = 3\text{A}$ , $\Delta V_{REF}$ , $\Delta V_{OUT} = 1\%$	—	<b>1.2</b>	<b>1.5</b>	V
$I_{LIMIT}$	Current Limit	$V_{IN}-V_{OUT} = 3\text{V}$	3.2	4.5	—	A
$I_{LOAD}$	Minimum Load Current	$V_{IN} = 10\text{V}$	—	0.3	1	mA
$I_{ADJ}$	Adjust Pin Current	$V_{IN} = 4.25\text{V}$ , $I_{OUT} = 10\text{mA}$	—	6	10	$\mu\text{A}$
$\Delta I_{ADJ}$	Adjust Pin Current Change	$10\text{mA} \leq I_{OUT} \leq 3\text{A}$ , $1.5\text{V} \leq V_{IN}-V_{OUT} \leq 6\text{V}$	—	0.3	2	$\mu\text{A}$
PSRR	Ripple Rejection	$f_{RIPPLE} = 120\text{Hz}$ , $C_{OUT} = 22\mu\text{F}$ , $I_{OUT} = 3\text{A}$ , $V_{IN}-V_{OUT} = 3\text{V}$	—	72	—	dB
—	Long Term Stability	$T_A = +125^\circ\text{C}$ , 1000Hrs	—	0.5	—	%
—	Temperature Stability	$I_{OUT} = 10\text{mA}$ , $V_{IN}-V_{OUT} = 1.5\text{V}$	—	0.5	—	%
—	RMS Noise (% of $V_{OUT}$ )	$T_A = +125^\circ\text{C}$ , $10\text{Hz} \leq f \leq 10\text{kHz}$	—	0.003	—	%
—	OTSD	—	+130	+150	+170	$^\circ\text{C}$
—	OTSD Hysteresis	—	—	+20	—	$^\circ\text{C}$
—	Pulse Current	Pulse Width $\leq 100\mu\text{s}$	—	7	12	A
$\theta_{JC}$	Thermal Resistance (Junction to Case)	—	—	7.36	—	$^\circ\text{C/W}$

OBSOLETE - PART DISCONTINUED

**Ordering Information**



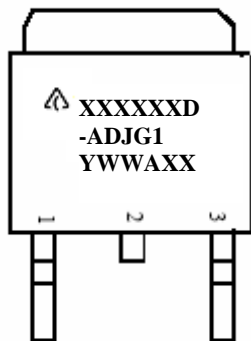
Diodes IC's Pb-free products with "G1" suffix in the part number, are RoHS compliant and green.

Package	Temperature Range	Part Number	Marking ID	Packing
TO252-2 (3)/ TO252-2 (5)	0 to +125°C	AZ2085D-ADJTRG1	AZ2085D-ADJG1	2500/Tape & Reel

**Marking Information**

(1) TO252-2 Series

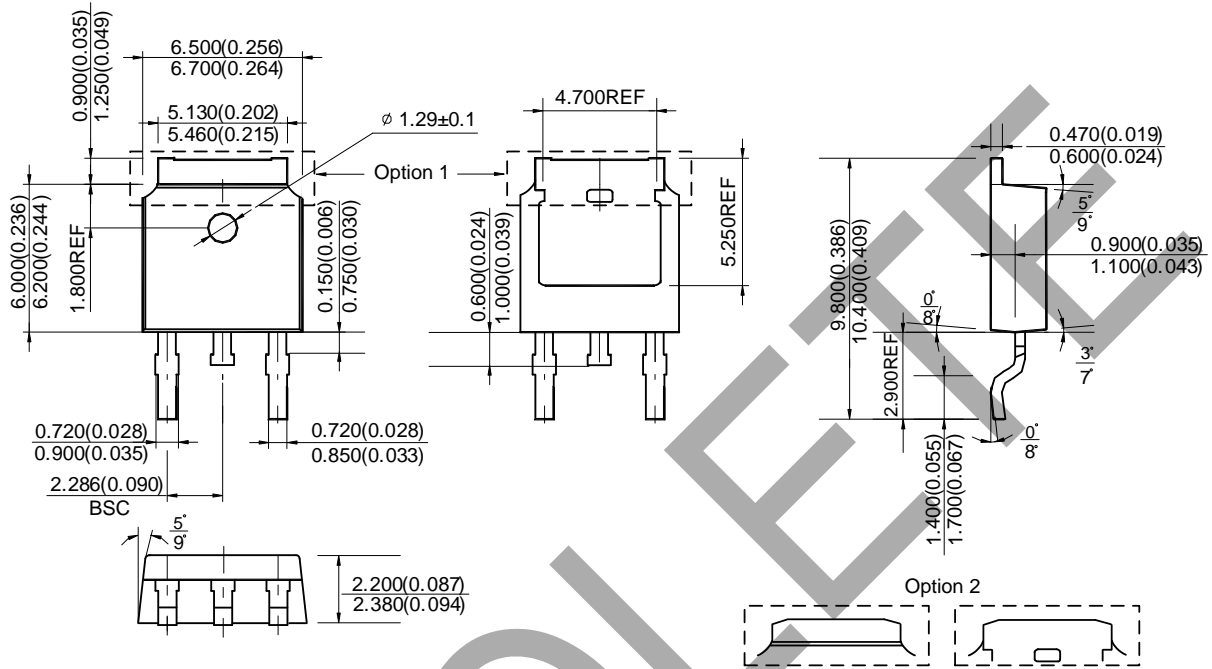
(Top View)



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: 7<sup>th</sup> and 8<sup>th</sup> Digits of Batch No.

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

(1) Type Package: TO252-2 (3)

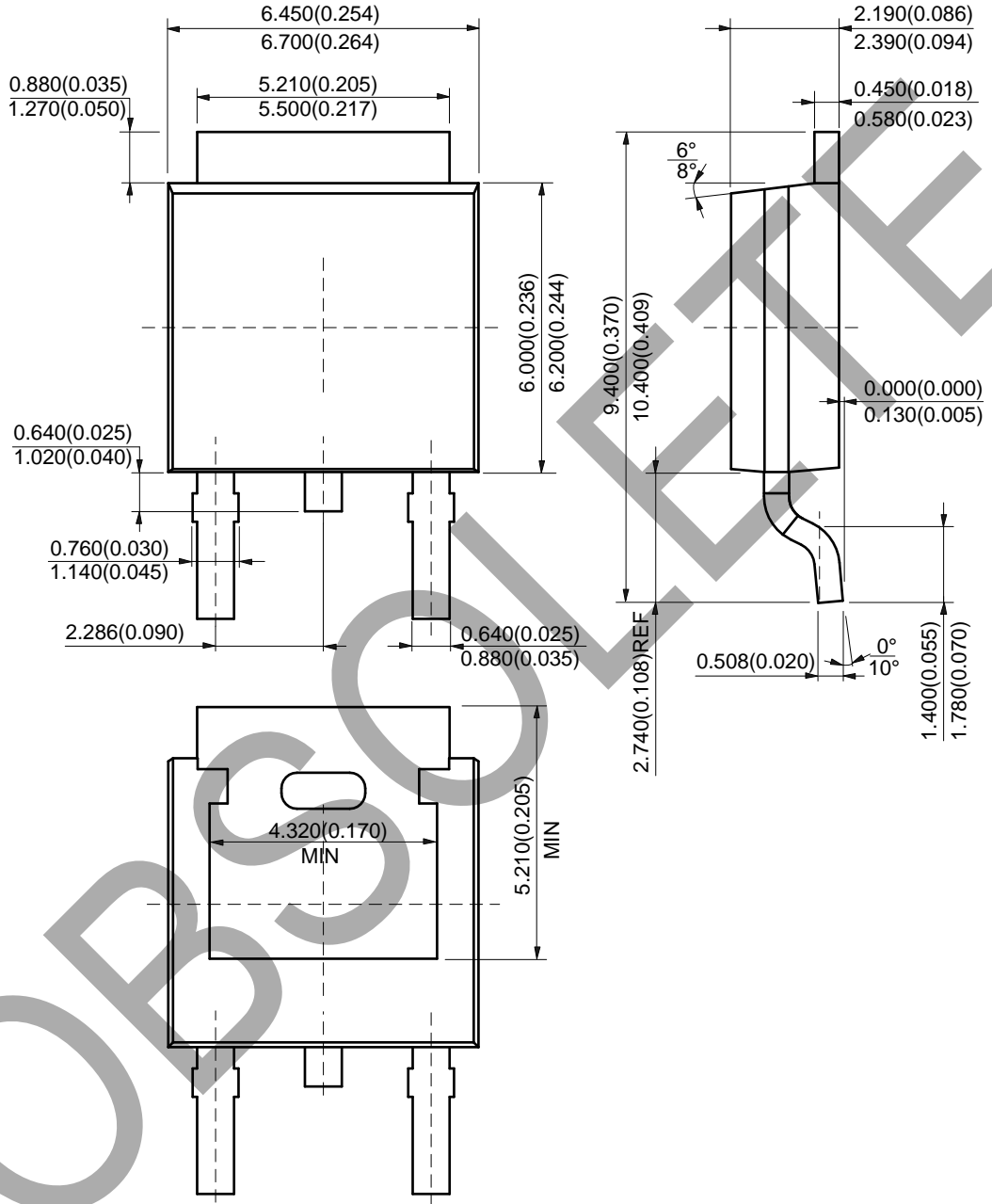


OBSOLETE - PART DISCONTINUED

OBSOLETE

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

(2) Package Type: TO252-2 (5)

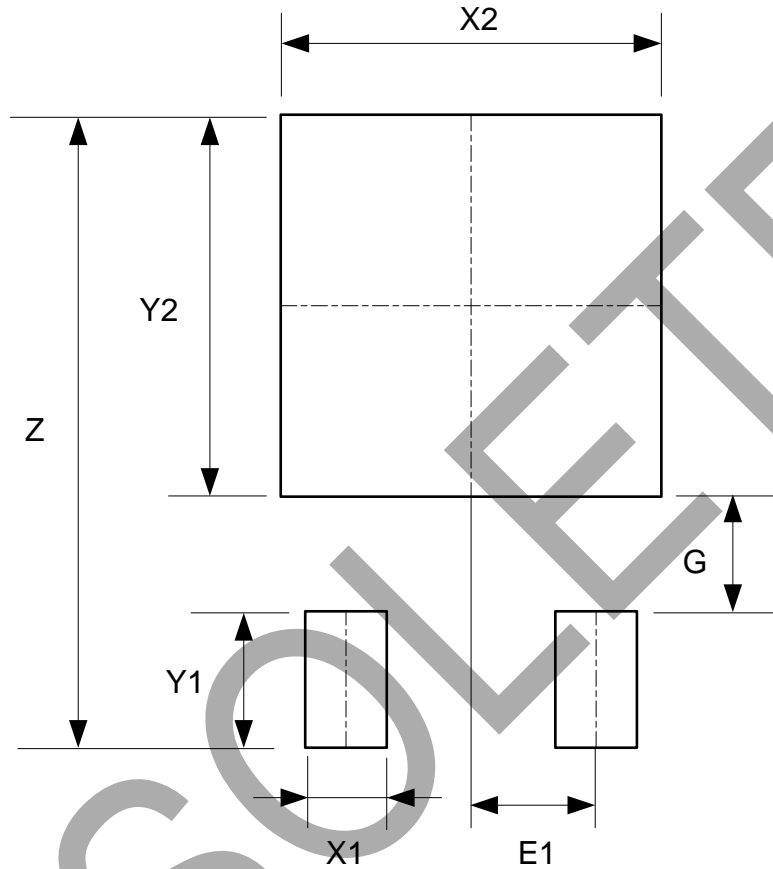


OBSOLETE - PART DISCONTINUED



**Suggested Pad Layout**

(1) Package Type: TO252-2 (3)

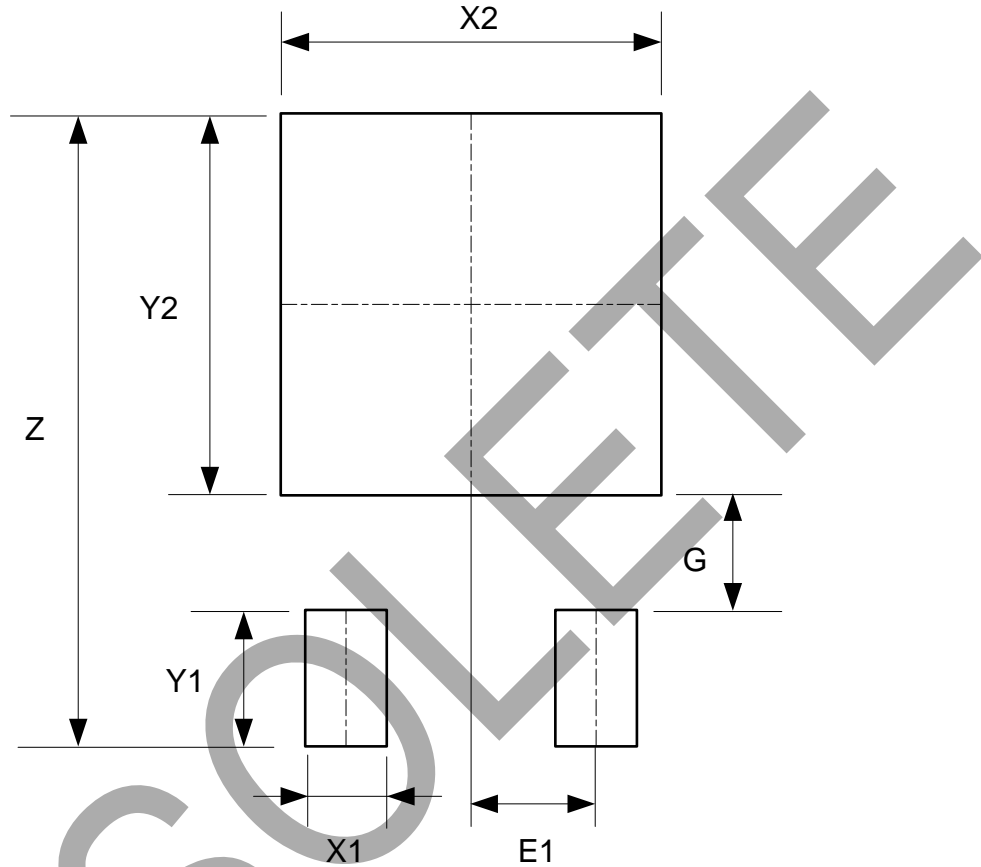


Dimensions	Z (mm)/(inch)	X1 (mm)/(inch)	X2=Y2 (mm)/(inch)	Y1 (mm)/(inch)	G (mm)/(inch)	E1 (mm)/(inch)
Value	11.600/0.457	1.500/0.059	7.000/0.276	2.500/0.098	2.100/0.083	2.300/0.091

OBSOLETE - PART DISCONTINUED

**Suggested Pad Layout** (Cont.)

(2) Package Type: TO252-2 (5)



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

OBSOLETE - PART DISCONTINUED

**IMPORTANT NOTICE**

1. DIODES INCORPORATED AND ITS SUBSIDIARIES ("DIODES") MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).
2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes products. Diodes products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of the Diodes products for their intended applications, (c) ensuring their applications, which incorporate Diodes products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.
3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.
4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.
5. Diodes products are provided subject to Diodes' Standard Terms and Conditions of Sale (<https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/>) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.
6. Diodes products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.
7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.
8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

Copyright © 2021 Diodes Incorporated

[www.diodes.com](http://www.diodes.com)