

**3A LOW DROPOUT LINEAR REGULATOR**
**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).

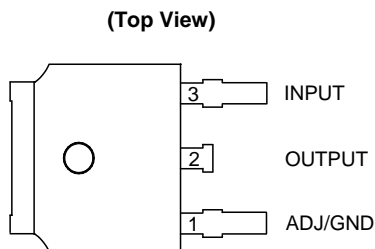
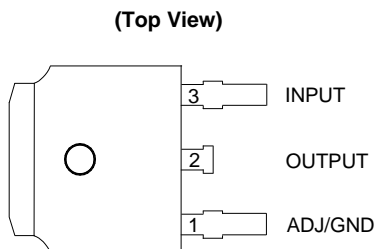
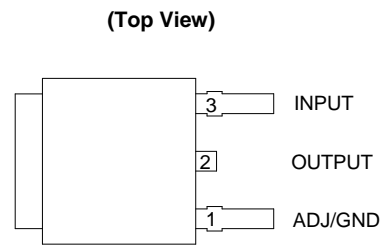
**Applications**

- 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

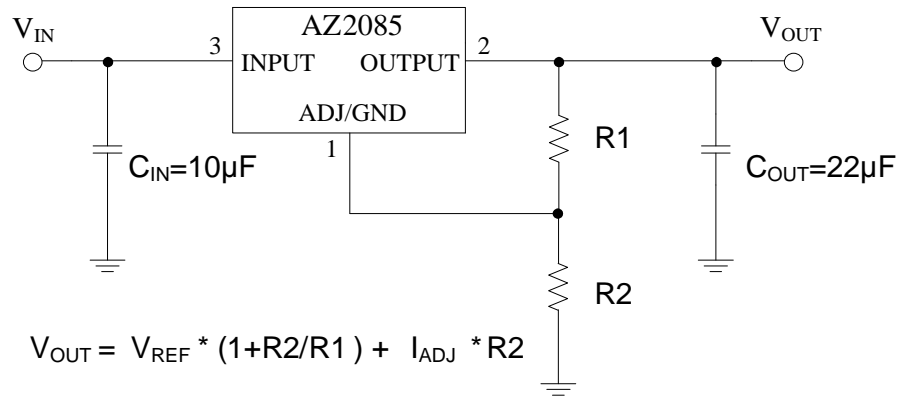
**Features**

- 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)**

- 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.

**Pin Assignments**

**TO252-2 (3) Option 1**

**TO252-2 (3) Option 2**

**TO252-2 (5)**

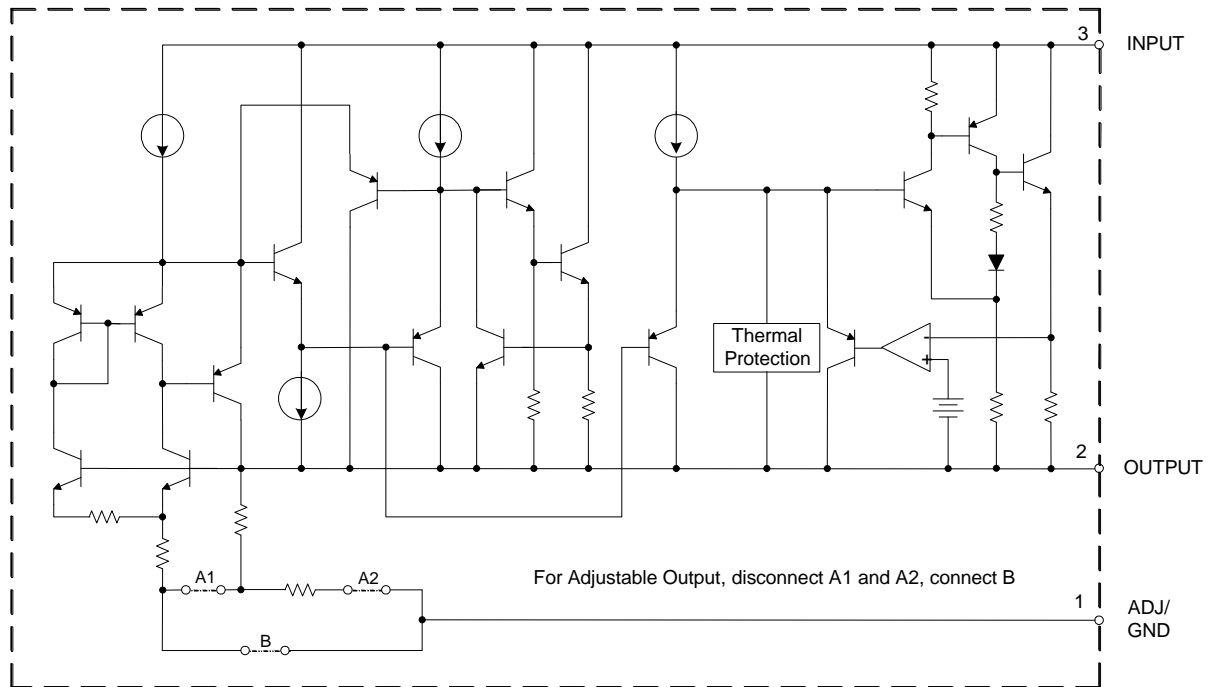
## Typical Applications Circuit



## Pin Descriptions

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

## Functional Block Diagram



## 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.

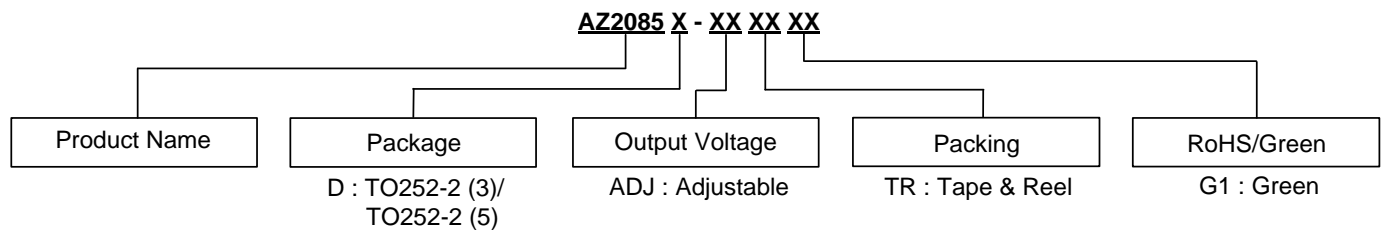
## Recommended Operating Conditions

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

**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	—	$^\circ\text{C/W}$

## Ordering Information



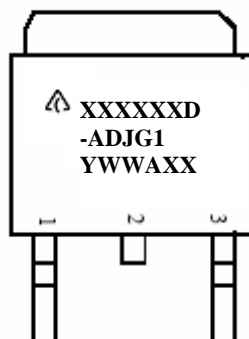
Diodes IC's Pb-free products with "G1" suffix in the part number, are RoHS compliant and green.

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

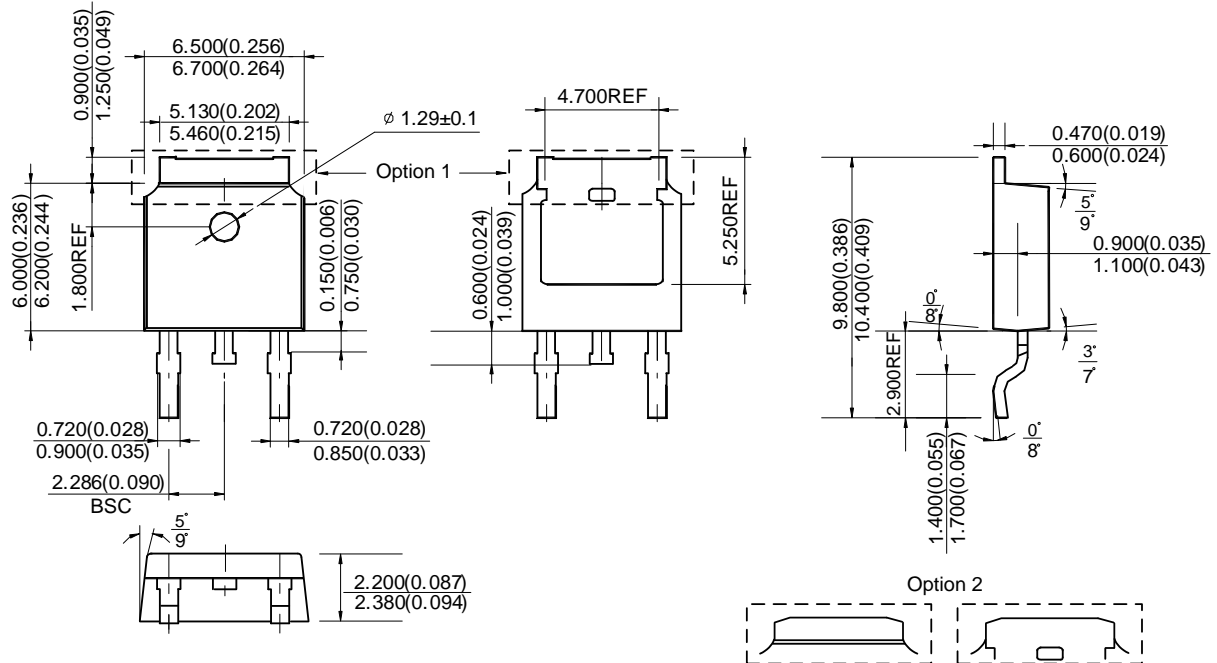
(Top View)



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.

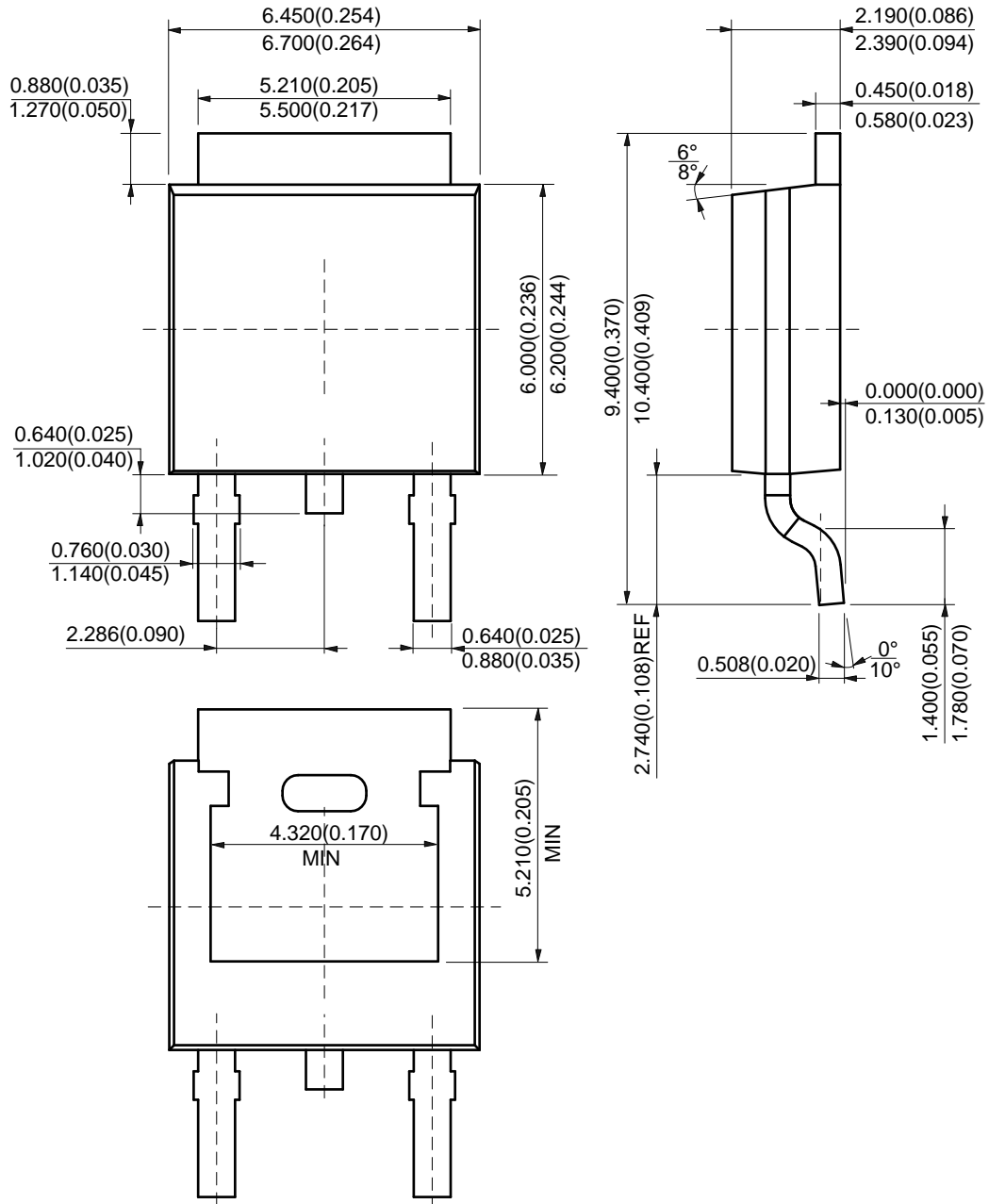
**Package Outline Dimensions** (All dimensions in mm(inch).)

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



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

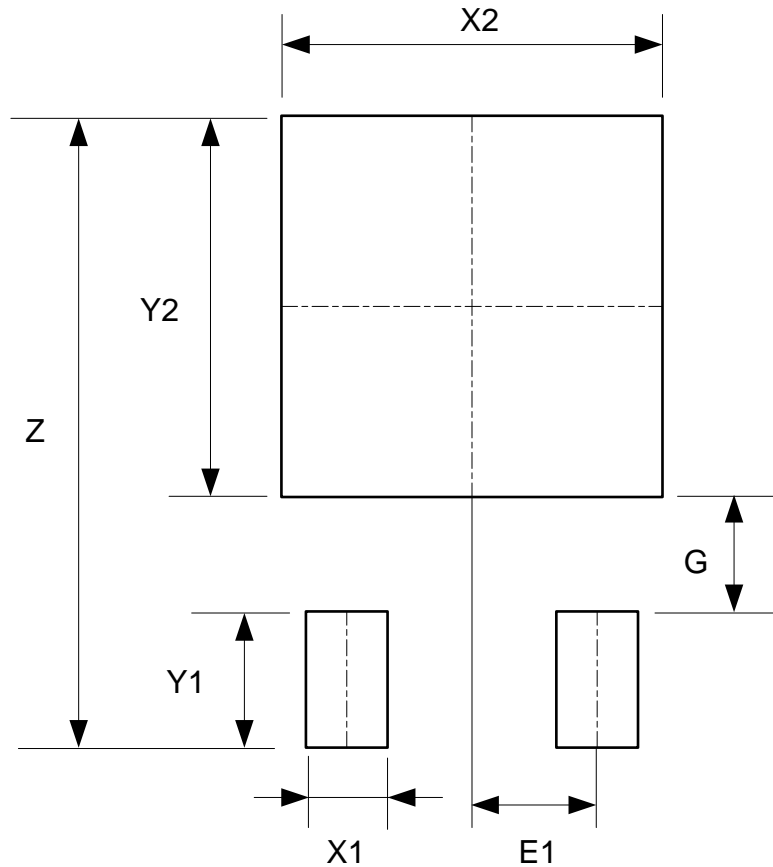
(2) Package Type: TO252-2 (5)





## Suggested Pad Layout

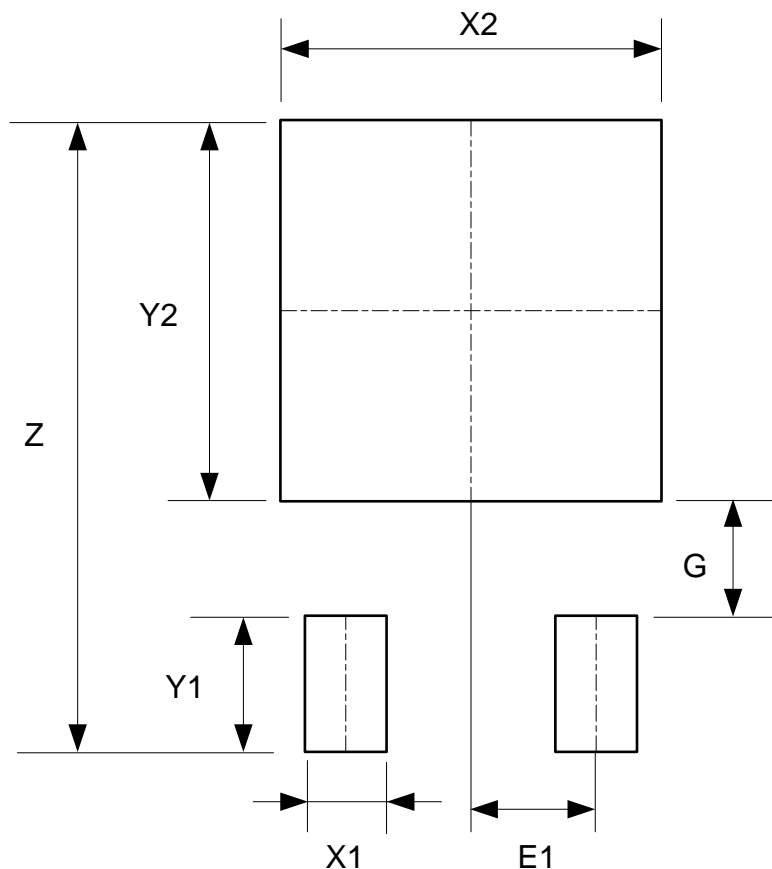
(1) Package Type: TO252-2 (3)



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

## 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

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