

## LOW DROPOUT LINEAR REGULATOR

### Description

The AZ1117C is a low dropout three-terminal regulator.

The AZ1117C has been optimized for low voltage where transient response and minimum input voltage are critical. It provides current limit and thermal shutdown. Its circuit includes a trimmed bandgap reference to assure output voltage accuracy to be within  $\pm 1\%$ . On-chip thermal shutdown provides protection against a combination of high current and ambient temperature that would create excessive junction temperature.

The AZ1117C is available in 1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5.0V fixed output voltage versions and ADJ output voltage version. The fixed versions integrate the adjust resistors. It is also available in an adjustable version which can set the output voltage with two external resistors.

The AZ1117C is available in the **industry-standard** TO252-2 Series (including TO252-2 (3), TO252-2 (4), and TO252-2 (5)), SOT89 and SOT223 power packages.

### Features

- Current Limit: 1.35A (Typ)
- **Output Noise from 10Hz to 10KHz: 0.003% of  $V_{OUT}$**
- **PSRR at  $I_{OUT} = 300mA$  and  $f = 120Hz$ : 70dB**
- **Output Voltage Accuracy:  $\pm 1\%$  (Except 1.2V Version)**
- On-chip Thermal Shutdown
- Maximum Quiescent Current:  $I_{QMAX} = 6mA$
- Compatible with Low ESR Ceramic Capacitor
- **Operation Junction Temperature:  $-20^{\circ}C$  to  $+125^{\circ}C$**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

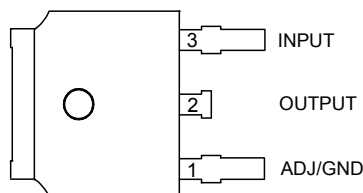
### Applications

- USB Device
- Add-on Card
- DVD Player
- PC Motherboard

- 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.

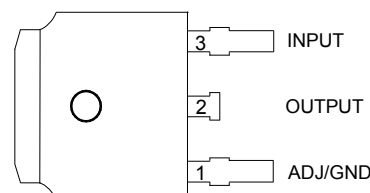
### Pin Assignments

(Top View)



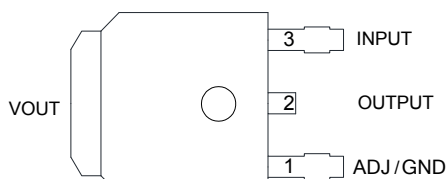
TO252-2 (3) Option 1

(Top View)



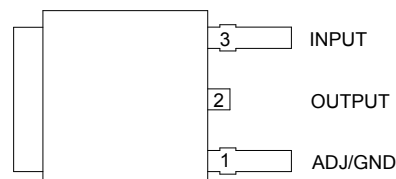
TO252-2 (3) Option 2

(Top View)



TO252-2 (4)

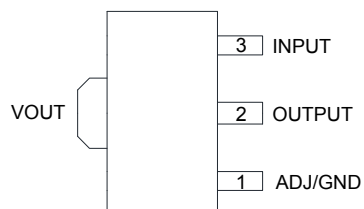
(Top View)



TO252-2 (5)

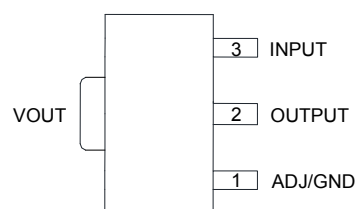
## Pin Assignments (Cont.)

(Top View)



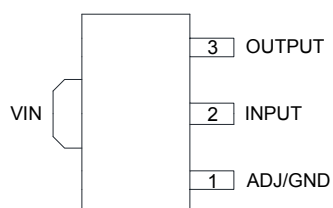
**SOT89 Option 1/ R Package**

(Top View)



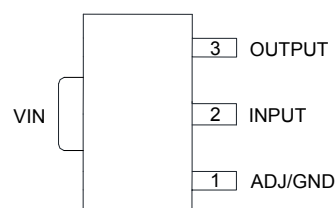
**SOT89 Option 2/ R Package**

(Top View)



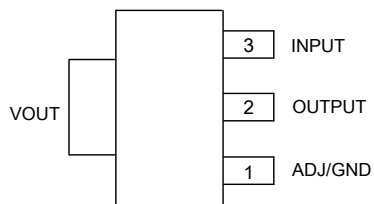
**SOT89 Option 1/ R2 Package**

(Top View)



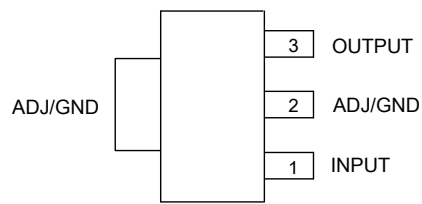
**SOT89 Option 2/ R2 Package**

(Top View)



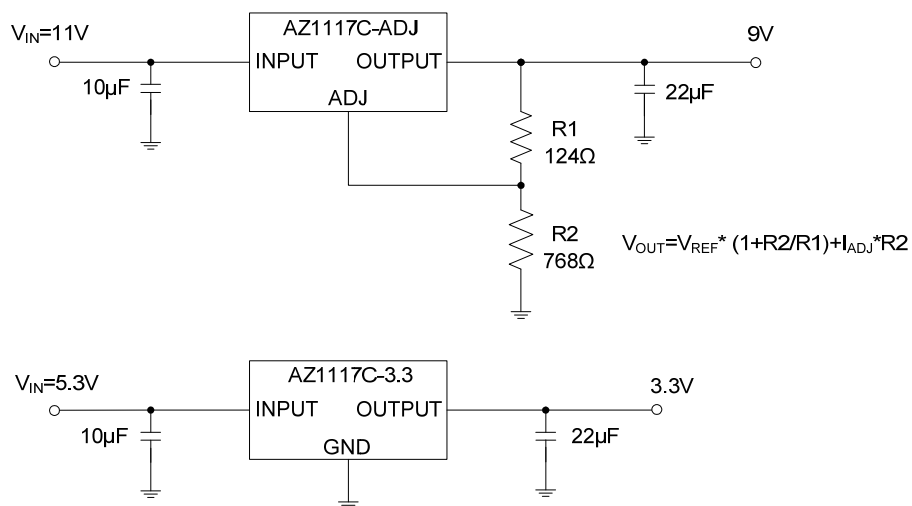
**SOT223/ H Package**

(Top View)



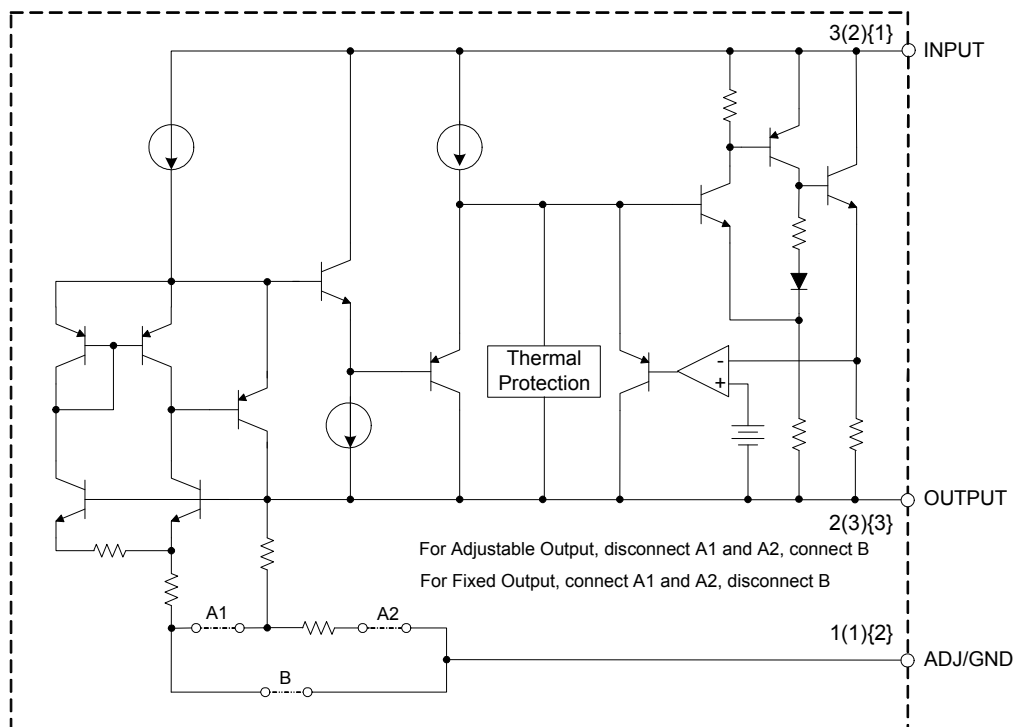
**SOT223/ H2 Package**

## Typical Applications Circuit (Note 4)



Note 4: The AZ1117C is compatible with low ESR ceramic capacitor. The ESR of the output capacitors must be less than 20Ω. A minimum of 10µF output capacitor is required.

## Functional Block Diagram



A(B){C}  
A for TO252-2 Series/SOT223 (H)/SOT89 (R)  
B for SOT89 (R2)  
C for SOT223 (H2)

## Absolute Maximum Ratings (Note 5)

Symbol	Parameter	Rating	Unit
$V_{IN}$	Input Voltage	18	V
$T_J$	Operating Junction Temperature Range	+150	°C
$T_{STG}$	Storage Temperature Range	-65 to +150	°C
$\theta_{JA}$	Thermal Resistance (Without Heatsink)	SOT89	170
		SOT223	125
		TO252-2 Series	100
$\theta_{JA}$	Thermal Resistance (With Heatsink) (Note 6)	SOT89	150
		SOT223	100
		TO252-2 Series	70
$T_{LEAD}$	Lead Temperature (Soldering, 10sec)	+260	°C

Notes: 5. 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.  
6. Chip is soldered to 100mm<sup>2</sup>(10mm\*10mm) copper (top side solder mask) on 2oz.2 layers FR-4 PCB with 8\*0.5mm vias.

## Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
$V_{IN}$	Input Voltage	—	15	V
$T_J$	Operating Junction Temperature Range	-20	+125	°C

## Electrical Characteristics AZ1117C-ADJ

(Operating Conditions:  $V_{IN} = V_{OUT} + 2V$ ,  $I_{OUT} = 10mA$ ,  $T_J = +25^{\circ}C$ , unless otherwise specified. (P ≤ maximum power dissipation). Limits appearing in **Boldface** type apply over the entire junction temperature range for operation, -20°C to +125°C.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{REF}$	Reference Voltage	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	1.238	1.250	1.262	V
			<b>1.225</b>	1.250	<b>1.270</b>	
$V_{RLINE}$	Line Regulation	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	—	0.001	0.1	%
			—	—	<b>0.2</b>	
$V_{RLOAD}$	Load Regulation	—	—	0.4	1.0	%
$V_{DROP}$	Dropout Voltage	$\Delta V_{REF} = 1\%$ , SOT223	—	1.2	1.3	V
		$I_{OUT} = 0.8A$ , TO252-2 Series	—	1.3	1.4	V
$I_{LIMIT}$	Current Limit	—	1	1.35	—	A
—	Adjust Pin Current	—	—	60	<b>120</b>	μA
—	Adjust Pin Current Change	$1.5 \leq (V_{IN} - V_{OUT}) \leq 10V$	—	0.2	<b>5</b>	μA
—	Minimum Load Current	$1.5 \leq (V_{IN} - V_{OUT}) \leq 10V$	—	1.7	<b>5</b>	mA
PSRR	Ripple Rejection	$f = 120Hz$ , $C_{OUT} = 22\mu F$ $(V_{IN} - V_{OUT}) = 3V$ , $I_{OUT} = 300mA$	—	70	—	dB
—	Temperature Stability	—	—	0.5	—	%
—	RMS Output Noise (% of $V_{OUT}$ )	$T_A = +25^{\circ}C$ , $10Hz \leq f \leq 10KHz$	—	0.003	—	%
—	Thermal Shutdown	Junction Temperature	—	+160	—	°C
—	Thermal Shutdown Hysteresis	—	—	+16	—	°C
$\theta_{JC}$	Thermal Resistance (Junction to Case)	SOT89	—	30	—	°C/W
		SOT223	—	15	—	
		TO252-2 Series	—	10	—	

## Electrical Characteristics AZ1117C-1.2 (Cont.)

(Operating Conditions:  $V_{IN} \leq 10V$ ,  $I_{OUT} = 10mA$ ,  $T_J = +25^\circ C$ , unless otherwise specified. ( $P \leq$  maximum power dissipation). Limits appearing in **Boldface** type apply over the entire junction temperature range for operation,  $-20^\circ C$  to  $+125^\circ C$ .)

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V <sub>OUT</sub>	Output Voltage	1.5V ≤ V <sub>IN</sub> -V <sub>OUT</sub> ≤ 10V		1.176	1.2	1.224	V
				<b>1.152</b>	1.2	<b>1.228</b>	
V <sub>RLINE</sub>	Line Regulation	1.5V ≤ V <sub>IN</sub> -V <sub>OUT</sub> ≤ 10V		—	0.5	6	mV
				—	—	<b>10</b>	
V <sub>RLOAD</sub>	Load Regulation	—		—	2	15	mV
V <sub>DROP</sub>	Dropout Voltage	ΔV <sub>OUT</sub> = 1%, I <sub>OUT</sub> = 0.8A	SOT223	—	<b>1.2</b>	<b>1.3</b>	V
			TO252-2 Series	—	1.3	1.4	V
I <sub>LIMIT</sub>	Current Limit	—		1	1.35	—	A
I <sub>Q</sub>	Quiescent Current	I <sub>OUT</sub> = 0		—	4	<b>6</b>	mA
PSRR	Ripple Rejection	f = 120Hz, C <sub>OUT</sub> = 22μF (V <sub>IN</sub> -V <sub>OUT</sub> ) = 3V, I <sub>OUT</sub> = 300mA		—	70	—	dB
—	Temperature Stability	—		—	0.5	—	%
—	RMS Output Noise (% of V <sub>OUT</sub> )	T <sub>A</sub> = +25°C, 10Hz ≤ f ≤ 10KHz		—	0.003	—	%
—	Thermal Shutdown	Junction Temperature		—	+160	—	°C
—	Thermal Shutdown Hysteresis	—		—	+16	—	°C
θ <sub>JC</sub>	Thermal Resistance (Junction to Case)	SOT89		—	30	—	°C/W
		SOT223		—	15	—	
		TO252-2 Series		—	10	—	

## Electrical Characteristics AZ1117C-1.5 (Cont.)

(Operating Conditions:  $V_{IN} \leq 10V$ ,  $I_{OUT} = 10mA$ ,  $T_J = +25^\circ C$ , unless otherwise specified. ( $P \leq$  maximum power dissipation). Limits appearing in **Boldface** type apply over the entire junction temperature range for operation,  $-20^\circ C$  to  $+125^\circ C$ .)

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V <sub>OUT</sub>	Output Voltage	1.5V ≤ V <sub>IN</sub> -V <sub>OUT</sub> ≤ 10V		1.485	1.5	1.515	V
				<b>1.470</b>	1.5	<b>1.530</b>	
V <sub>RLINE</sub>	Line Regulation	1.5V ≤ V <sub>IN</sub> -V <sub>OUT</sub> ≤ 10V		—	0.5	6	mV
				—	—	<b>10</b>	
V <sub>RLOAD</sub>	Load Regulation	—		—	2	15	mV
V <sub>DROP</sub>	Dropout Voltage	ΔV <sub>OUT</sub> = 1%, I <sub>OUT</sub> = 0.8A	SOT223	—	1.2	1.3	V
			TO252-2 Series	—	1.3	1.4	V
I <sub>LIMIT</sub>	Current Limit	—		1	1.35	—	A
I <sub>Q</sub>	Quiescent Current	I <sub>OUT</sub> = 0		—	4	<b>6</b>	mA
PSRR	Ripple Rejection	f = 120Hz, C <sub>OUT</sub> = 22μF (V <sub>IN</sub> -V <sub>OUT</sub> ) = 3V, I <sub>OUT</sub> = 300mA		—	70	—	dB
—	Temperature Stability	—		—	0.5	—	%
—	RMS Output Noise (% of V <sub>OUT</sub> )	T <sub>A</sub> = +25°C, 10Hz ≤ f ≤ 10KHz		—	0.003	—	%
—	Thermal Shutdown	Junction Temperature		—	+160	—	°C
—	Thermal Shutdown Hysteresis	—		—	+16	—	°C
θ <sub>JC</sub>	Thermal Resistance (Junction to Case)	SOT89		—	30	—	°C/W
		SOT223		—	15	—	
		TO252-2 Series		—	10	—	

## Electrical Characteristics AZ1117C-1.8 (Cont.)

(Operating Conditions:  $V_{IN} \leq 10V$ ,  $I_{OUT} = 10mA$ ,  $T_J = +25^\circ C$ , unless otherwise specified. ( $P \leq$  maximum power dissipation). Limits appearing in **Boldface** type apply over the entire junction temperature range for operation,  $-20^\circ C$  to  $+125^\circ C$ .)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{OUT}$	Output Voltage	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	1.782 <b>1.764</b>	1.8 <b>1.8</b>	1.818 <b>1.836</b>	V
$V_{RLINE}$	Line Regulation	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	—	0.5	6	mV
$V_{RLOAD}$	Load Regulation	—	—	2	15	mV
$V_{DROP}$	Dropout Voltage	$\Delta V_{OUT} = 1\%$ , $I_{OUT} = 0.8A$	—	1.2	1.3	V
		SOT223	—	1.3	1.4	V
		TO252-2 Series	—	1.3	1.4	V
$I_{LIMIT}$	Current Limit	—	1	1.35	—	A
$I_Q$	Quiescent Current	$I_{OUT} = 0$	—	4	6	mA
PSRR	Ripple Rejection	$f = 120Hz$ , $C_{OUT} = 22\mu F$ ( $V_{IN}-V_{OUT}$ ) = 3V, $I_{OUT} = 300mA$	—	70	—	dB
—	Temperature Stability	—	—	0.5	—	%
—	RMS Output Noise (% of $V_{OUT}$ )	$T_A = +25^\circ C$ , $10Hz \leq f \leq 10KHz$	—	0.003	—	%
—	Thermal Shutdown	Junction Temperature	—	+160	—	$^\circ C$
—	Thermal Shutdown Hysteresis	—	—	+16	—	$^\circ C$
$\theta_{JC}$	Thermal Resistance (Junction to Case)	SOT89	—	30	—	$^\circ C/W$
		SOT223	—	15	—	
		TO252-2 Series	—	10	—	

## Electrical Characteristics AZ1117C-2.5 (Cont.)

(Operating Conditions:  $V_{IN} \leq 10V$ ,  $I_{OUT} = 10mA$ ,  $T_J = +25^\circ C$ , unless otherwise specified. ( $P \leq$  maximum power dissipation). Limits appearing in **Boldface** type apply over the entire junction temperature range for operation,  $-20^\circ C$  to  $+125^\circ C$ .)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{OUT}$	Output Voltage	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	2.475 <b>2.455</b>	2.5 <b>2.5</b>	2.525 <b>2.545</b>	V
$V_{RLINE}$	Line Regulation	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	—	0.5	6	mV
$V_{RLOAD}$	Load Regulation	—	—	2	15	mV
$V_{DROP}$	Dropout Voltage	$\Delta V_{OUT} = 1\%$ , $I_{OUT} = 0.8A$	—	1.2	1.3	V
		SOT223	—	1.3	1.4	V
		TO252-2 Series	—	1.3	1.4	V
$I_{LIMIT}$	Current Limit	—	1	1.35	—	A
$I_Q$	Quiescent Current	$I_{OUT} = 0$	—	4	6	mA
PSRR	Ripple Rejection	$f = 120Hz$ , $C_{OUT} = 22\mu F$ ( $V_{IN}-V_{OUT}$ ) = 3V, $I_{OUT} = 300mA$	—	70	—	dB
—	Temperature Stability	—	—	0.5	—	%
—	RMS Output Noise (% of $V_{OUT}$ )	$T_A = +25^\circ C$ , $10Hz \leq f \leq 10KHz$	—	0.003	—	%
—	Thermal Shutdown	Junction Temperature	—	+160	—	$^\circ C$
—	Thermal Shutdown Hysteresis	—	—	+16	—	$^\circ C$
$\theta_{JC}$	Thermal Resistance (Junction to Case)	SOT89	—	30	—	$^\circ C/W$
		SOT223	—	15	—	
		TO252-2 Series	—	10	—	

### Electrical Characteristics AZ1117C-3.3 (Cont.)

(Operating Conditions:  $V_{IN} \leq 10V$ ,  $I_{OUT} = 10mA$ ,  $T_J = +25^\circ C$ , unless otherwise specified. ( $P \leq$  maximum power dissipation). Limits appearing in **Boldface** type apply over the entire junction temperature range for operation,  $-20^\circ C$  to  $+125^\circ C$ .)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{OUT}$	Output Voltage	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	3.267	3.3	3.333	V
			<b>3.235</b>	3.3	<b>3.365</b>	
$V_{RLINE}$	Line Regulation	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	—	0.5	6	mV
			—	—	<b>10</b>	
$V_{RLOAD}$	Load Regulation	—	—	2	15	mV
$V_{DROP}$	Dropout Voltage	$\Delta V_{OUT} = 1\%$ , SOT223	—	1.2	1.3	V
		$I_{OUT} = 0.8A$ , TO252-2 Series	—	1.3	1.4	V
$I_{LIMIT}$	Current Limit	—	1	1.35	—	A
$I_Q$	Quiescent Current	$I_{OUT} = 0$	—	4	<b>6</b>	mA
PSRR	Ripple Rejection	$f = 120Hz$ , $C_{OUT} = 22\mu F$ ( $V_{IN}-V_{OUT}$ ) = 3V, $I_{OUT} = 300mA$	—	70	—	dB
—	Temperature Stability	—	—	0.5	—	%
—	RMS Output Noise (% of $V_{OUT}$ )	$T_A = +25^\circ C$ , $10Hz \leq f \leq 10KHz$	—	0.003	—	%
—	Thermal Shutdown	Junction Temperature	—	+160	—	$^\circ C$
—	Thermal Shutdown Hysteresis	—	—	+16	—	$^\circ C$
$\theta_{JC}$	Thermal Resistance (Junction to Case)	SOT89	—	30	—	$^\circ C/W$
		SOT223	—	15	—	
		TO252-2 Series	—	10	—	

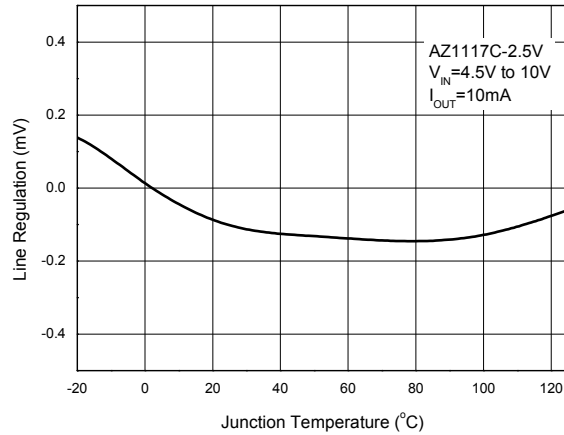
### Electrical Characteristics AZ1117C-5.0 (Cont.)

(Operating Conditions:  $V_{IN} \leq 10V$ ,  $I_{OUT} = 10mA$ ,  $T_J = +25^\circ C$ , unless otherwise specified. ( $P \leq$  maximum power dissipation). Limits appearing in **Boldface** type apply over the entire junction temperature range for operation,  $-20^\circ C$  to  $+125^\circ C$ .)

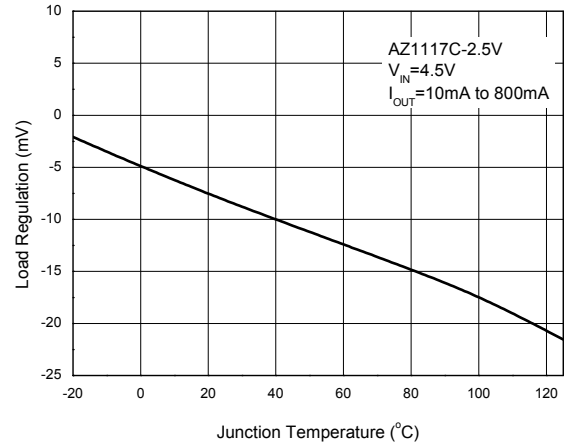
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{OUT}$	Output Voltage	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	4.950	5.0	5.050	V
			<b>4.900</b>	5.0	<b>5.100</b>	
$V_{RLINE}$	Line Regulation	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	—	0.5	6	mV
			—	—	<b>10</b>	
$V_{RLOAD}$	Load Regulation	—	—	2	15	mV
$V_{DROP}$	Dropout Voltage	$\Delta V_{OUT} = 1\%$ , SOT223	—	1.2	1.3	V
		$I_{OUT} = 0.8A$ , TO252-2 Series	—	1.3	1.4	V
$I_{LIMIT}$	Current Limit	—	1	1.35	—	A
$I_Q$	Quiescent Current	$I_{OUT} = 0$	—	4	<b>6</b>	mA
PSRR	Ripple Rejection	$f = 120Hz$ , $C_{OUT} = 22\mu F$ ( $V_{IN}-V_{OUT}$ ) = 3V, $I_{OUT} = 300mA$	—	70	—	dB
—	Temperature Stability	—	—	0.5	—	%
—	RMS Output Noise (% of $V_{OUT}$ )	$T_A = +25^\circ C$ , $10Hz \leq f \leq 10KHz$	—	0.003	—	%
—	Thermal Shutdown	Junction Temperature	—	+160	—	$^\circ C$
—	Thermal Shutdown Hysteresis	—	—	+16	—	$^\circ C$
$\theta_{JC}$	Thermal Resistance (Junction to Case)	SOT89	—	30	—	$^\circ C/W$
		SOT223	—	15	—	
		TO252-2 Series	—	10	—	

## Performance Characteristics

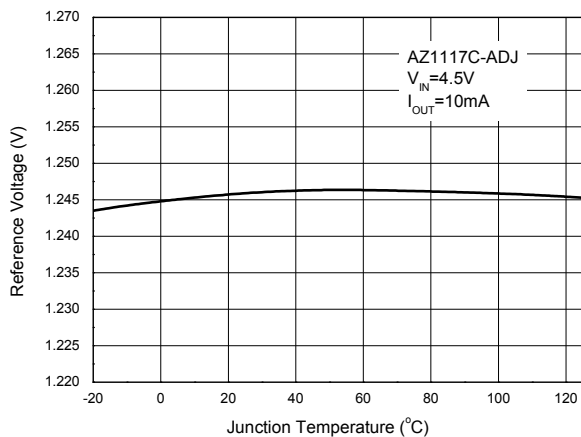
**Line Regulation vs. Junction Temperature**



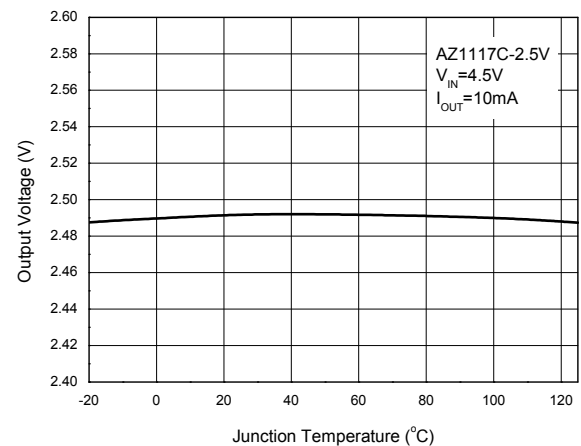
**Load Regulation vs. Junction Temperature**



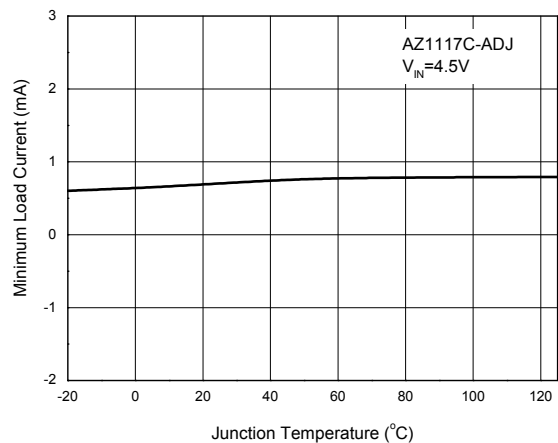
**Reference Voltage vs. Junction Temperature**



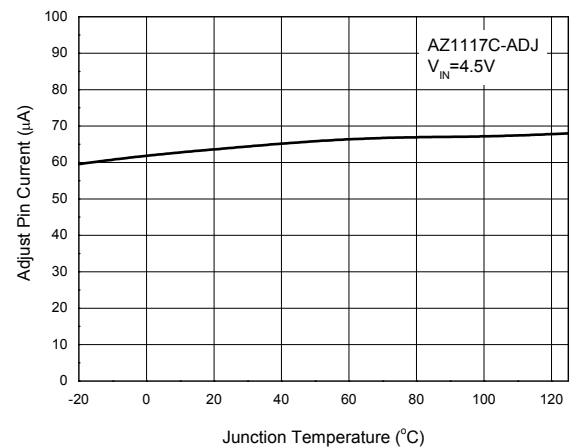
**Output Voltage vs. Junction Temperature**



**Minimum Load Current vs. Junction Temperature**



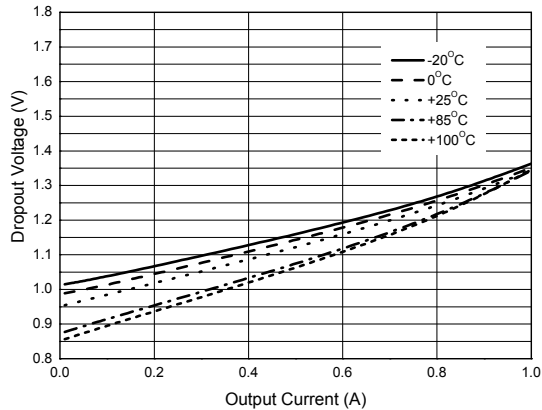
**Adjust Pin Current vs. Junction Temperature**



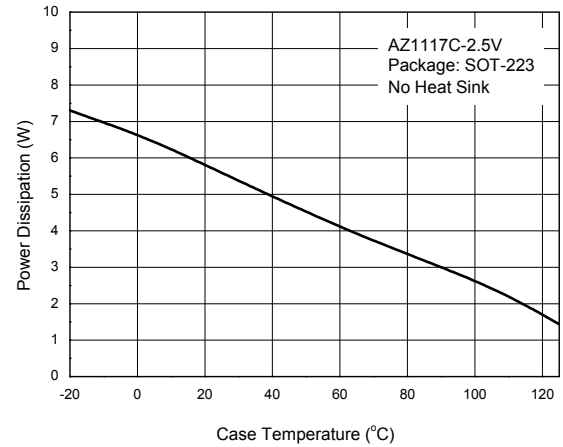


## Performance Characteristics (Cont.)

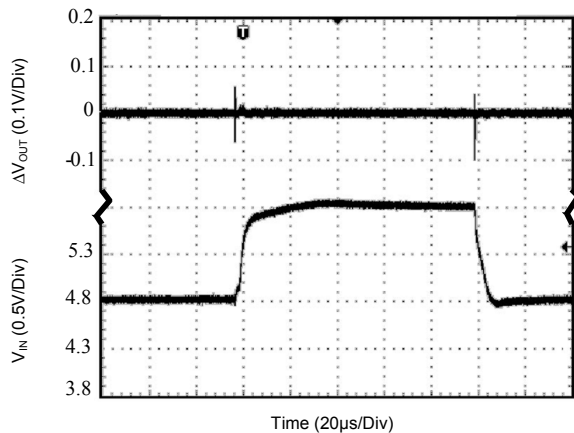
**Dropout Voltage vs. Output Current**



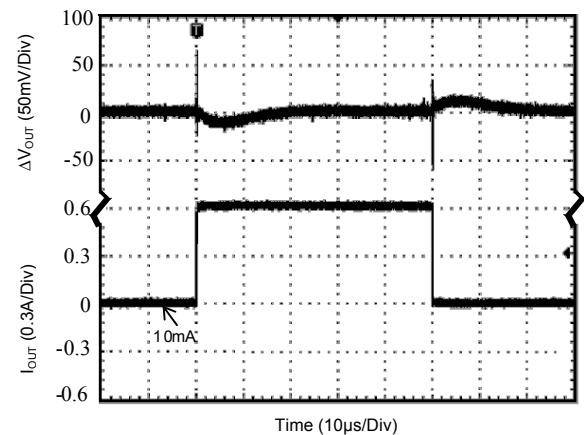
**Power Dissipation vs. Case Temperature**



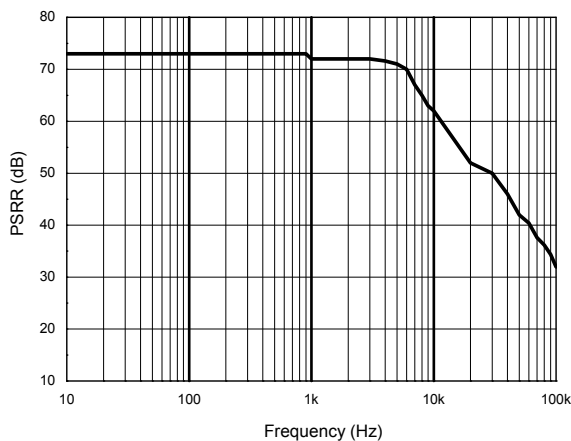
**Line Transient Response**



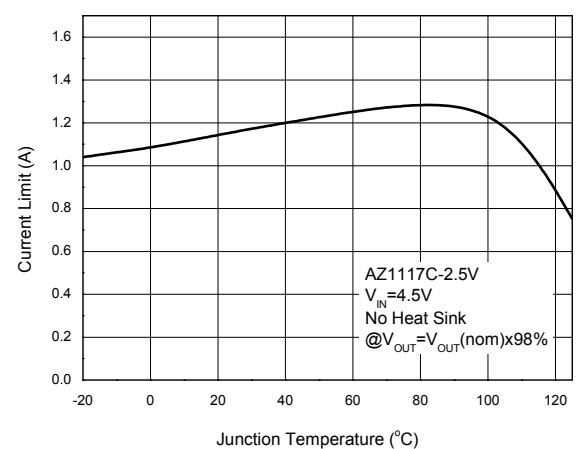
**Load Transient Response**



**PSRR vs. Frequency**

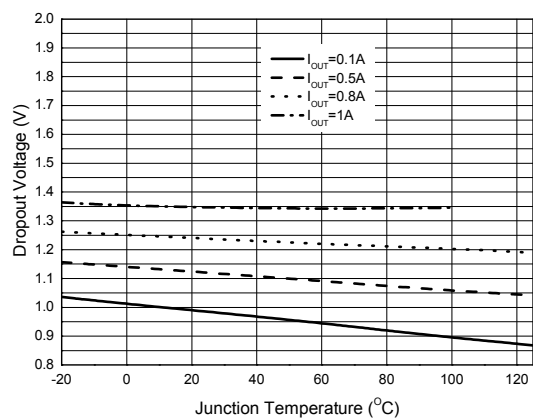


**Current Limit vs. Junction Temperature**

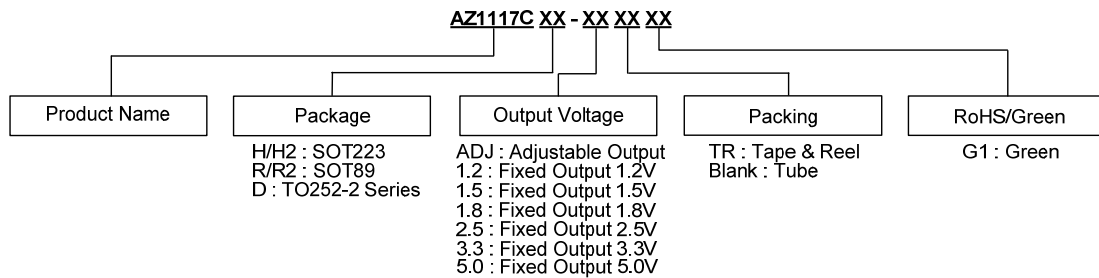


## Performance Characteristics (Cont.)

### Dropout Voltage vs. Junction Temperature



## Ordering Information



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

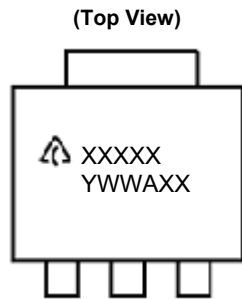
Package	Temperature Range	Part Number	Marking ID	Packing
SOT223	-20°C to +125°C	AZ1117CH-ADJTRG1	GH15B	4000/Tape & Reel
		AZ1117CH-1.2TRG1	GH16B	4000/Tape & Reel
		AZ1117CH-1.5TRG1	GH15C	4000/Tape & Reel
		AZ1117CH-1.8TRG1	GH16C	4000/Tape & Reel
		AZ1117CH-2.5TRG1	GH15D	4000/Tape & Reel
		AZ1117CH-3.3TRG1	GH16D	4000/Tape & Reel
		AZ1117CH-5.0TRG1	GH15E	4000/Tape & Reel
SOT223		AZ1117CH2-ADJTRG1	GH14H	4000/Tape & Reel
		AZ1117CH2-1.2TRG1	GH15H	4000/Tape & Reel
		AZ1117CH2-1.5TRG1	GH17H	4000/Tape & Reel
		AZ1117CH2-1.8TRG1	GH27H	4000/Tape & Reel
		AZ1117CH2-2.5TRG1	GH28H	4000/Tape & Reel
		AZ1117CH2-3.3TRG1	GH38H	4000/Tape & Reel
		AZ1117CH2-5.0TRG1	GH13H	4000/Tape & Reel
SOT89	-20°C to +125°C	AZ1117CR-ADJTRG1	G27N	1000/Tape & Reel
		AZ1117CR-1.2TRG1	G28J	1000/Tape & Reel
		AZ1117CR-1.5TRG1	G28K	1000/Tape & Reel
		AZ1117CR-1.8TRG1	G28L	1000/Tape & Reel
		AZ1117CR-2.5TRG1	G28M	1000/Tape & Reel
		AZ1117CR-3.3TRG1	G28N	1000/Tape & Reel
		AZ1117CR-5.0TRG1	G27M	1000/Tape & Reel
SOT89		AZ1117CR2-ADJTRG1	G42O	1000/Tape & Reel
		AZ1117CR2-1.2TRG1	G43M	1000/Tape & Reel
		AZ1117CR2-1.5TRG1	G43N	1000/Tape & Reel
		AZ1117CR2-1.8TRG1	G43O	1000/Tape & Reel
		AZ1117CR2-2.5TRG1	G70M	1000/Tape & Reel
		AZ1117CR2-3.3TRG1	G70N	1000/Tape & Reel
		AZ1117CR2-5.0TRG1	G33N	1000/Tape & Reel

## Ordering Information (Cont.)

Package	Temperature Range	Part Number	Marking ID	Packing
TO252-2 Series	-20°C to +125°C	AZ1117CD-ADJG1	AZ1117CD-ADJG1	80/Tube
		AZ1117CD-ADJTRG1	AZ1117CD-ADJG1	2500/Tape & Reel
		AZ1117CD-1.2G1	AZ1117CD-1.2G1	80/Tube
		AZ1117CD-1.2TRG1	AZ1117CD-1.2G1	2500/Tape & Reel
		AZ1117CD-1.5G1	AZ1117CD-1.5G1	80/Tube
		AZ1117CD-1.5TRG1	AZ1117CD-1.5G1	2500/Tape & Reel
		AZ1117CD-1.8G1	AZ1117CD-1.8G1	80/Tube
		AZ1117CD-1.8TRG1	AZ1117CD-1.8G1	2500/Tape & Reel
		AZ1117CD-2.5G1	AZ1117CD-2.5G1	80/Tube
		AZ1117CD-2.5TRG1	AZ1117CD-2.5G1	2500/Tape & Reel
		AZ1117CD-3.3G1	AZ1117CD-3.3G1	80/Tube
		AZ1117CD-3.3TRG1	AZ1117CD-3.3G1	2500/Tape & Reel
		AZ1117CD-5.0G1	AZ1117CD-5.0G1	80/Tube
		AZ1117CD-5.0TRG1	AZ1117CD-5.0G1	2500/Tape & Reel

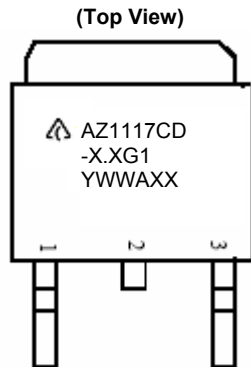
## Marking Information

### (1) SOT223 Series



First Line: Logo and Marking ID  
(See Ordering Information)  
Second 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 Number

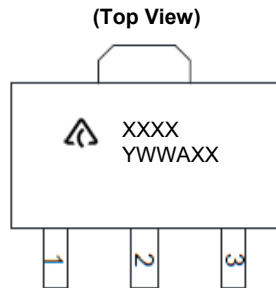
### (2) TO252-2 Series



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 Number

## Marking Information (Cont.)

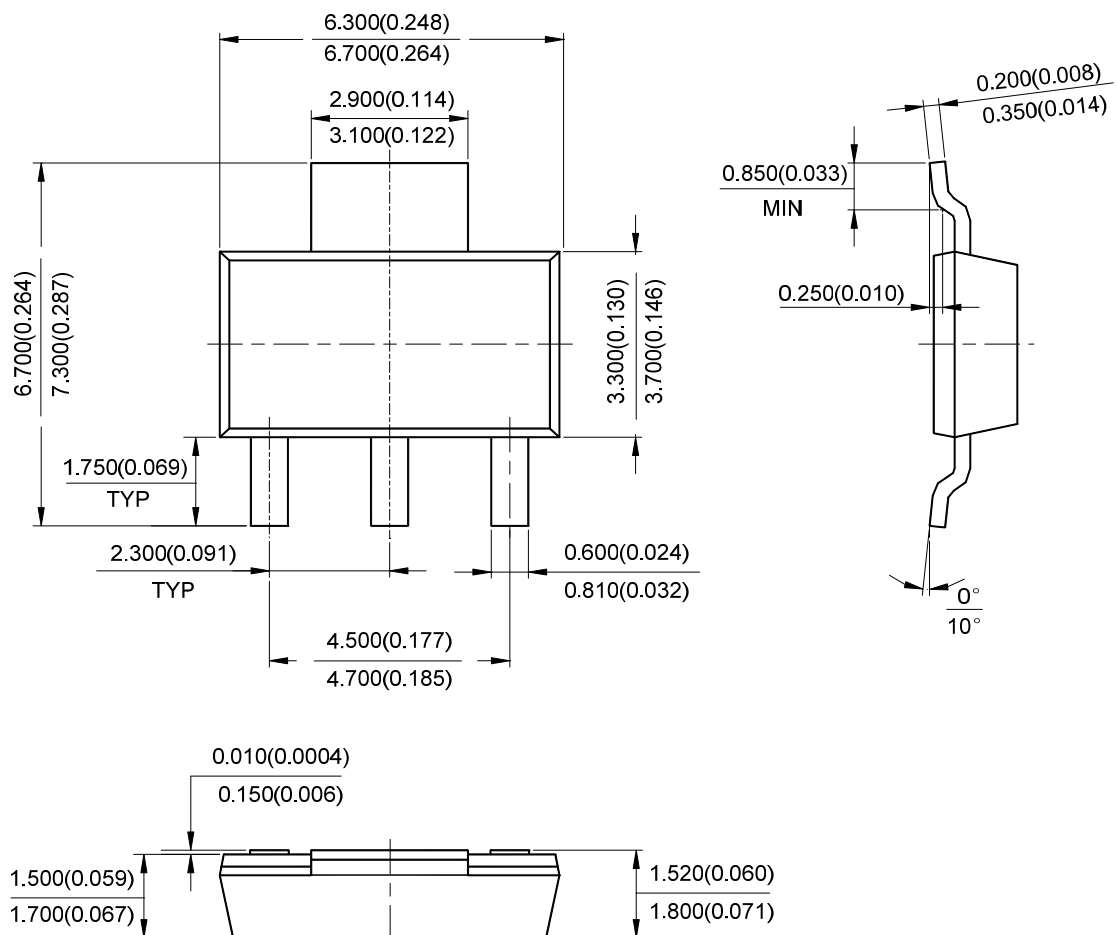
### (3) SOT89 Series



First Line: Logo and Marking ID  
(See Ordering Information)  
Second 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 Number

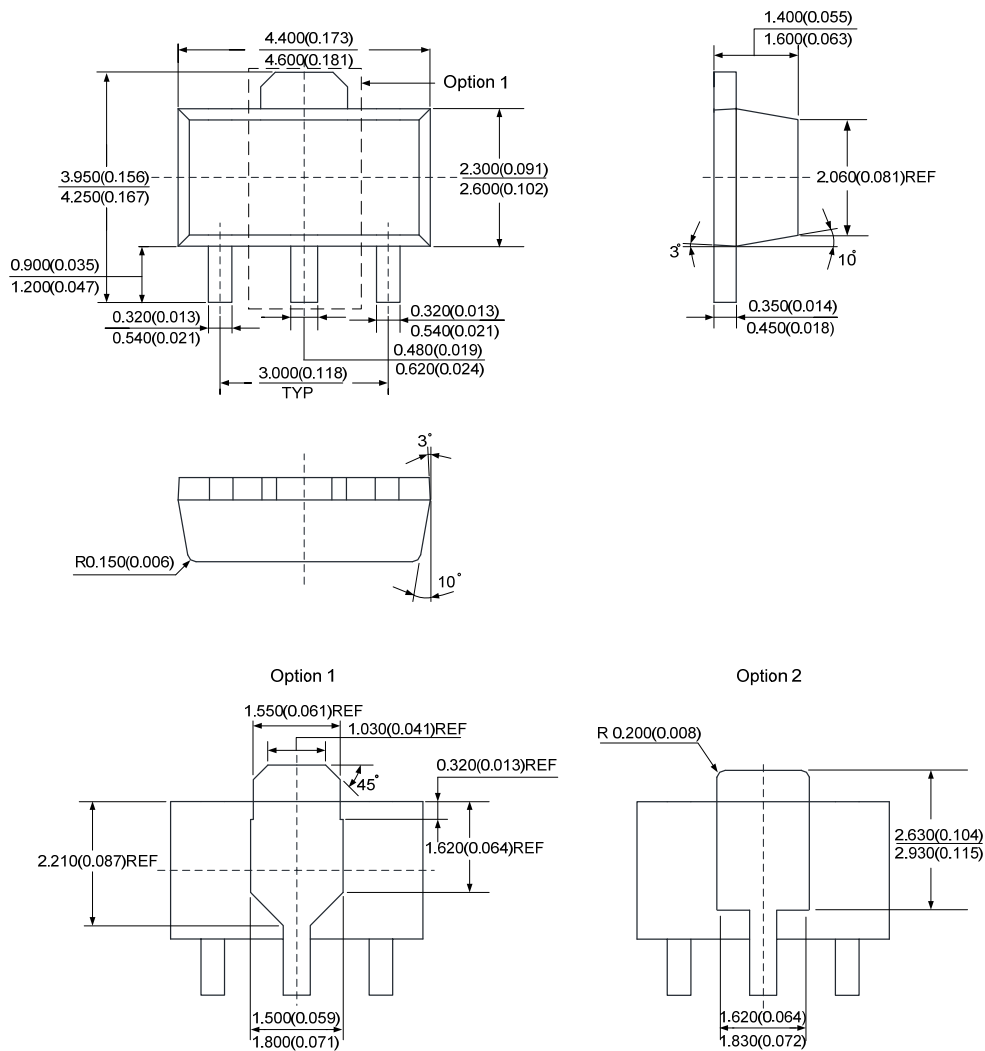
## Package Outline Dimensions (All dimensions in mm (inch).)

### (1) Package Type: SOT223



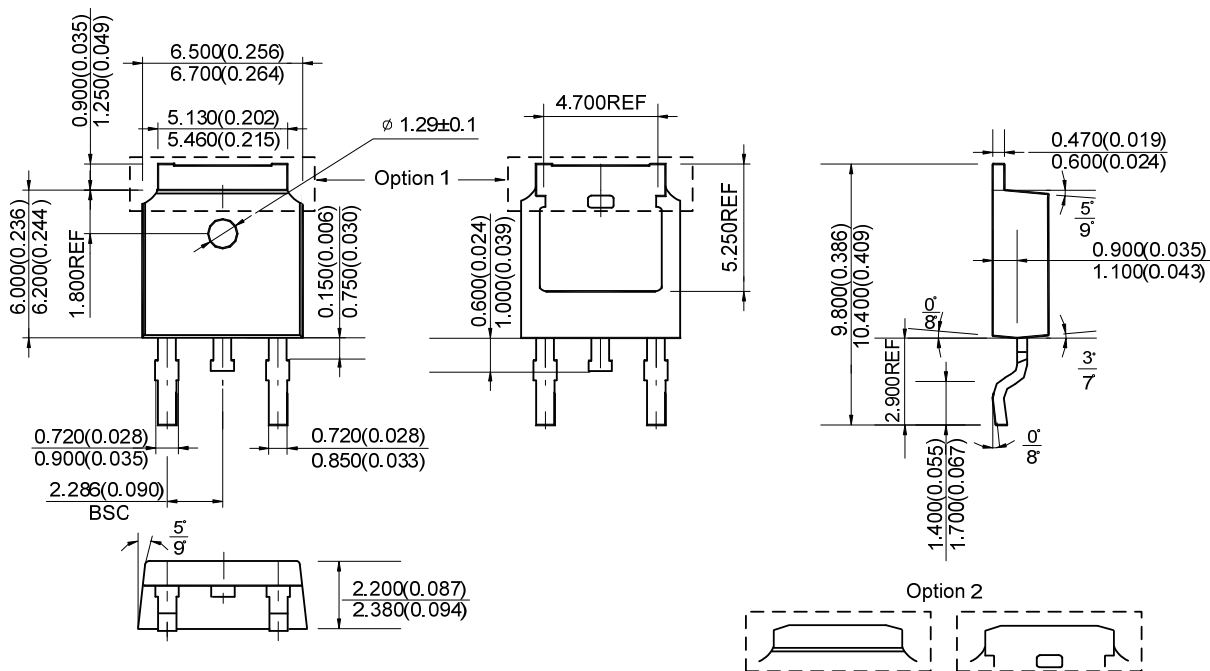
**Package Outline Dimensions** (Cont.) (All dimensions in mm (inch).)

(2) Package Type: SOT89



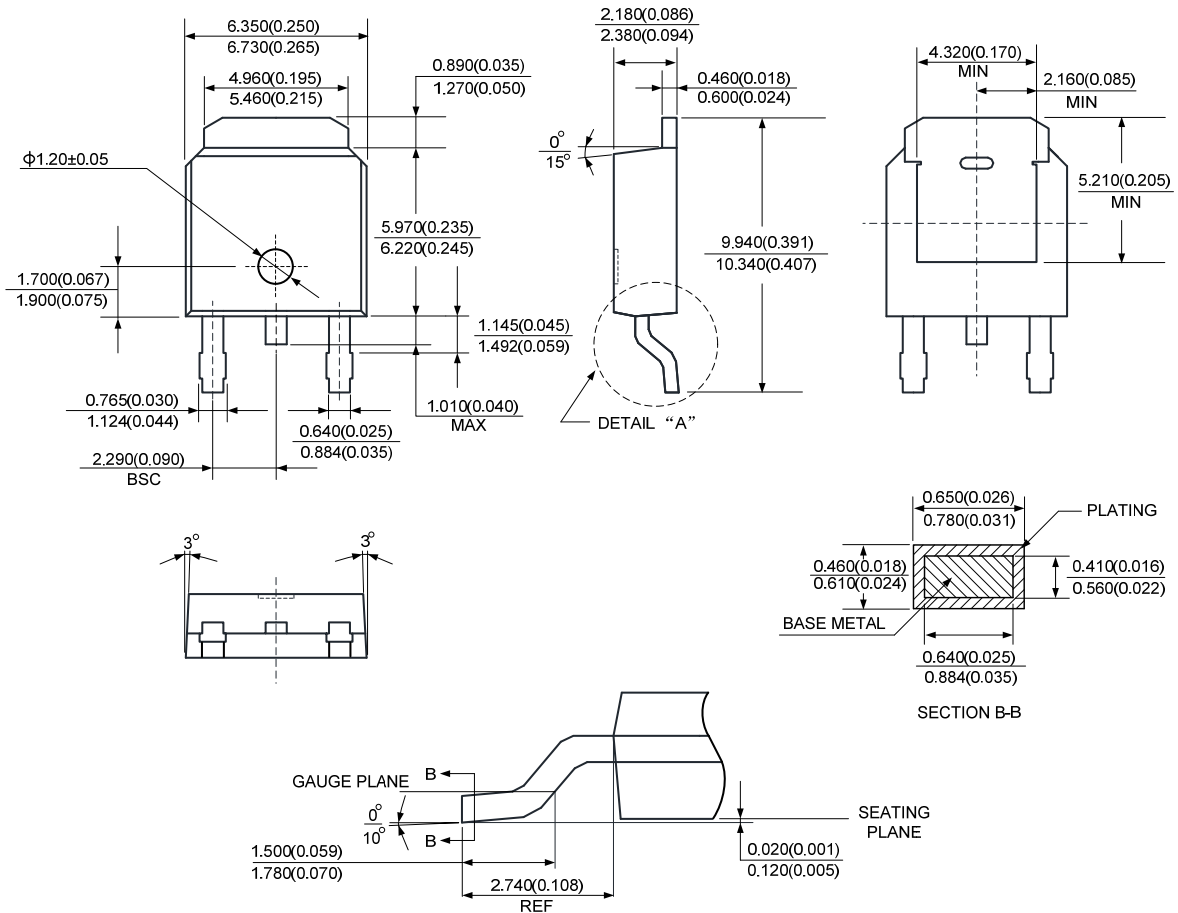
**Package Outline Dimensions** (Cont.) (All dimensions in mm (inch).)

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



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

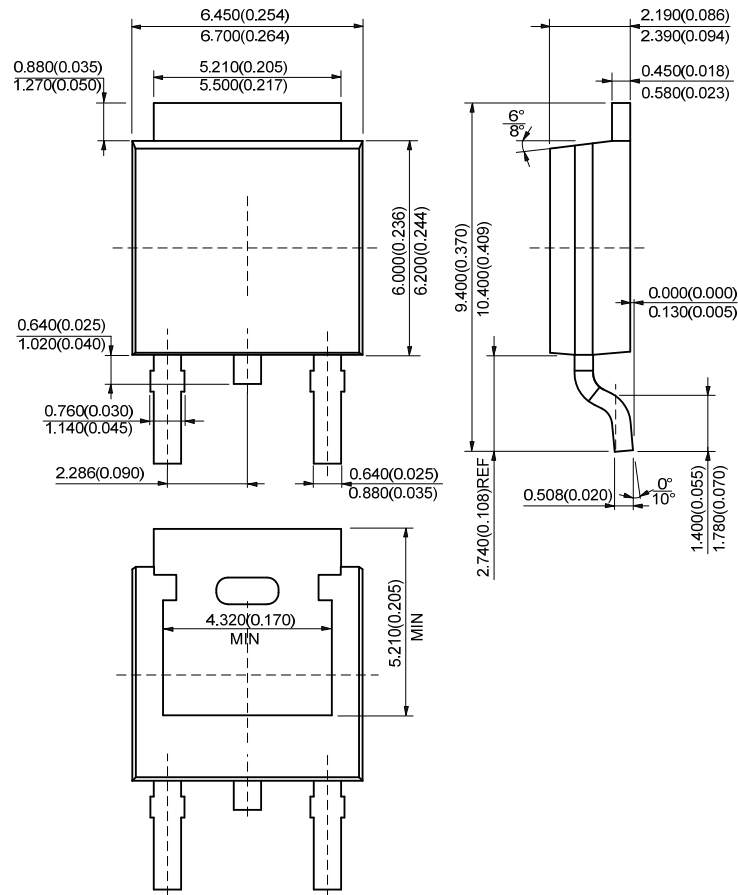
**(4) Package Type: TO252-2 (4)**





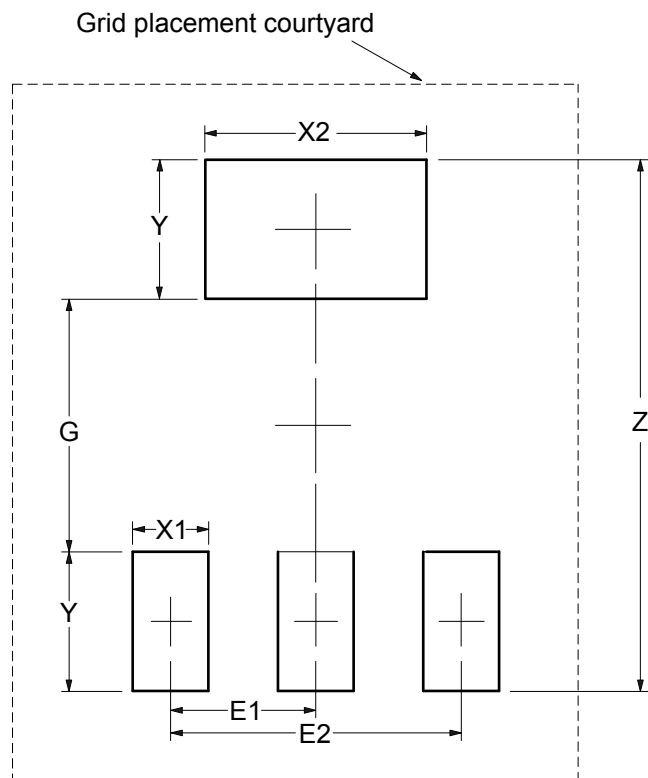
**Package Outline Dimensions** (Cont.) (All dimensions in mm (inch).)

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



## Suggested Pad Layout

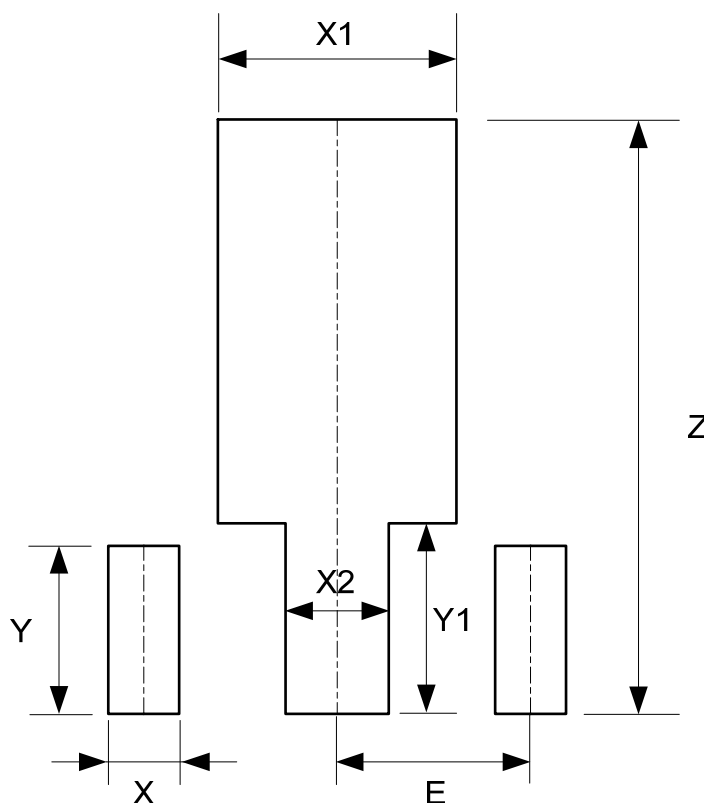
(1) Package Type: SOT223



Dimensions	Z (mm)/(inch)	G (mm)/(inch)	X1 (mm)/(inch)	X2 (mm)/(inch)	Y (mm)/(inch)	E1 (mm)/(inch)	E2 (mm)/(inch)
Value	8.400/0.331	4.000/0.157	1.200/0.047	3.500/0.138	2.200/0.087	2.300/0.091	4.600/0.181

## Suggested Pad Layout (Cont.)

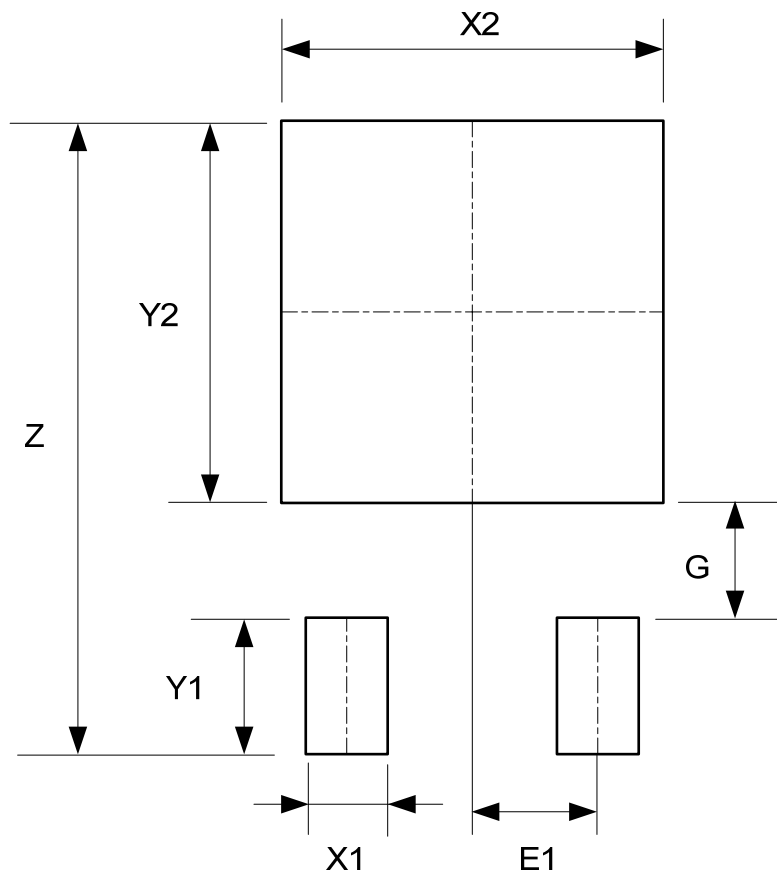
(2) Package Type: SOT89



Dimensions	Z (mm)/(inch)	X (mm)/(inch)	X1 (mm)/(inch)	X2 (mm)/(inch)	Y (mm)/(inch)	Y1 (mm)/(inch)	E (mm)/(inch)
Value	4.600/0.181	0.550/0.022	1.850/0.073	0.800/0.031	1.300/0.051	1.475/0.058	1.500/0.059

## Suggested Pad Layout (Cont.)

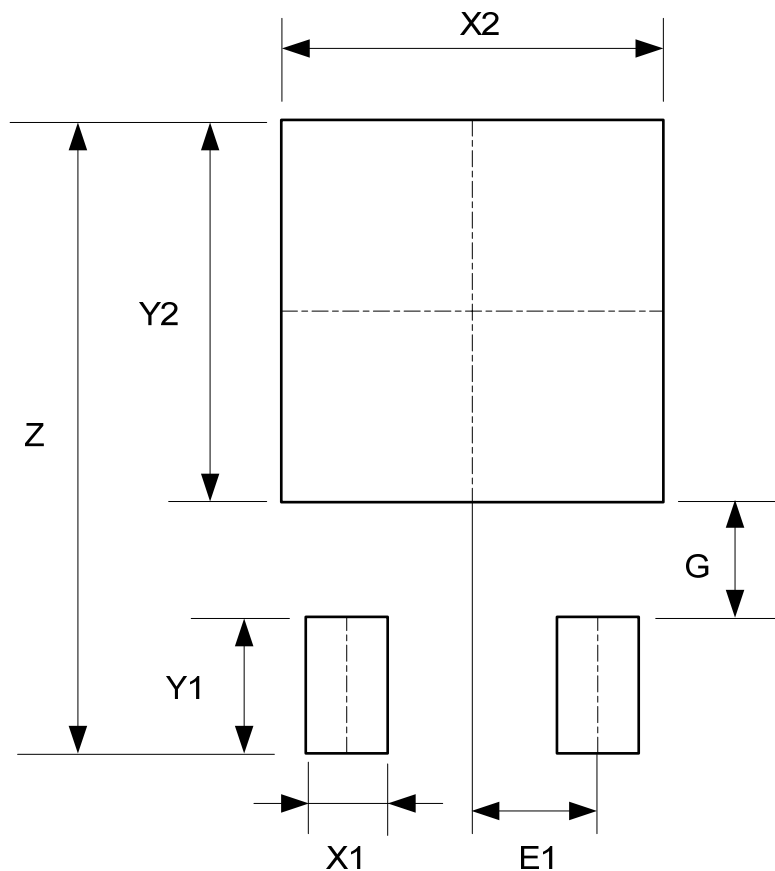
(3) Package Type: TO252-2 (3)



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.)

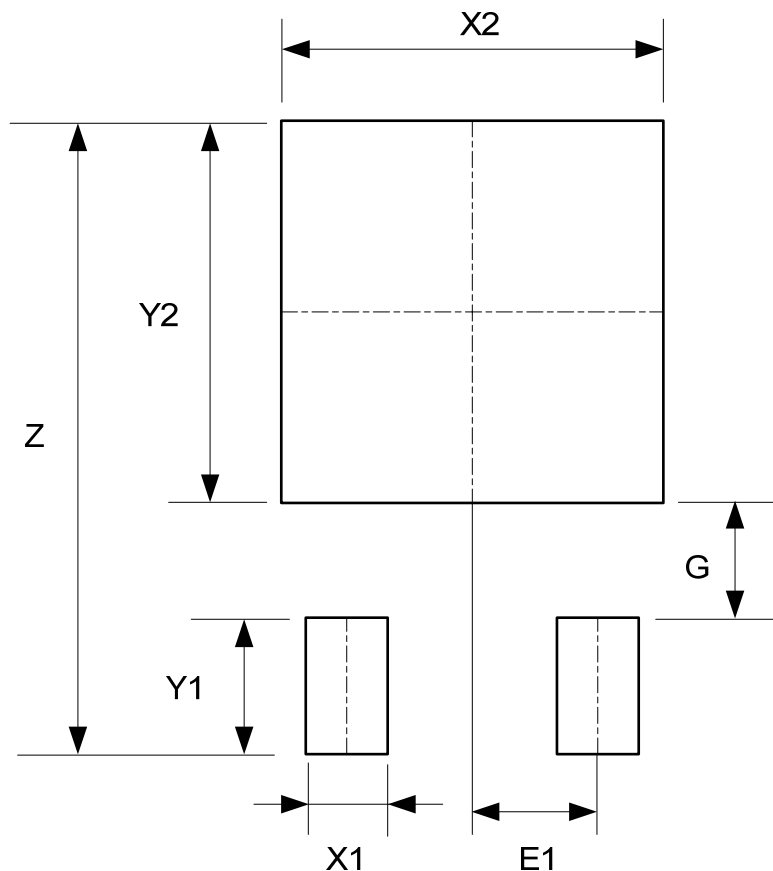
(4) Package Type: TO252-2 (4)



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.)

(5) 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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