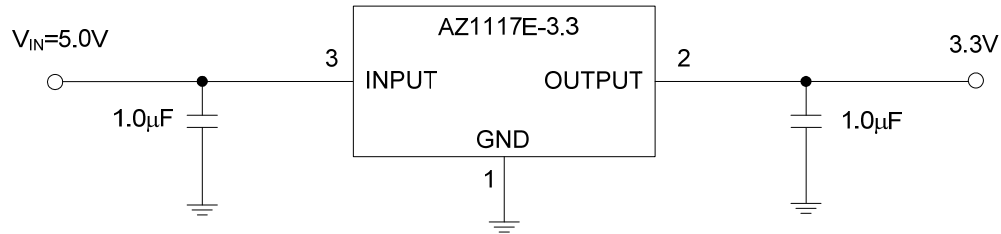


## Typical Applications Circuit (Cont. Note 4)



Note 4: The AZ1117E is compatible with Low ESR ceramic capacitor. A minimum of 1.0µF input and output capacitors are required. The ESR of the output capacitors must be less than 1.5Ω. Close to the OUTPUT pin, it is not recommended to use a capacitor smaller than 0.68µF in parallel with output capacitor. When the output capacitor parallels 0.1µF capacitor, the 0.1µF capacitor must be away from the OUTPUT pin, the distance is no less than 5mm.

## Pin Descriptions

Pin Number	Pin Name	Function
1	ADJ/GND	Adjustable pin or ground pin
2	OUTPUT	Regulator output pin
3	INPUT	Supply voltage pin

## Absolute Maximum Ratings (Note 5)

Symbol	Parameter	Rating	Unit
$V_{IN}$	Power Supply Voltage	16	V
$T_J$	Operating Junction Temperature Range	+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) (Note 6)	65	°C/W
—	ESD (Machine Model)	200	V
—	ESD (Human Body Model)	2000	V

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 200mm<sup>2</sup> (16mm\*12.5mm) copper (top side solder mask) on 2oz.2 layers FR-4 PCB with 8\*0.5mm vias.

## Recommended Operating Conditions

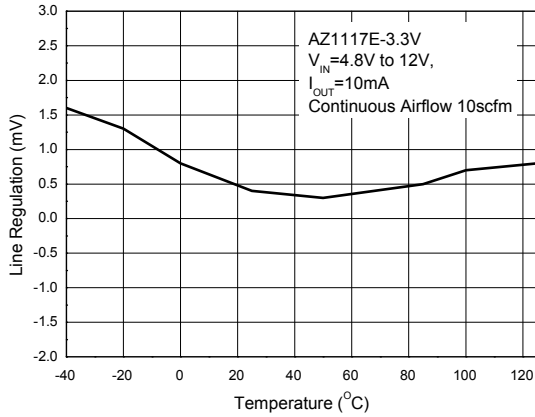
Symbol	Parameter	Min	Max	Unit
$V_{IN}$	Supply Voltage	—	13	V
$T_J$	Operating Junction Temperature Range	-40	+125	°C

**Electrical Characteristics** (@ $V_{IN} = V_{OUT} + 1.5V$ ,  $C_{IN} = 1.0\mu F$  (Ceramic),  $C_{OUT} = 1.0\mu F$  (Ceramic), Typical  $T_A = +25^\circ C$ , **Bold** typeface applies over  $-40^\circ C \leq T_J \leq +125^\circ C$  ranges, unless otherwise specified.)

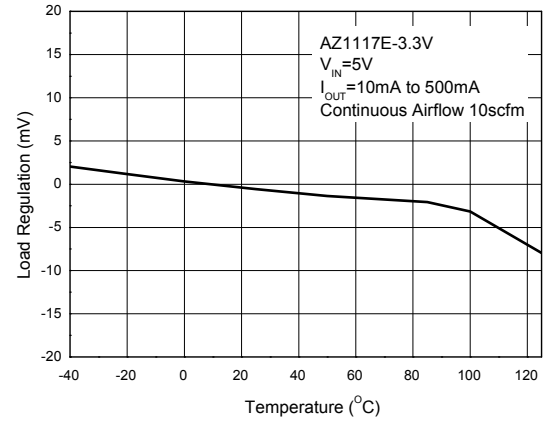
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{REF}$	Reference Voltage	$V_{OUT} + 1.5V \leq V_{IN} \leq 12V$ , $I_{OUT} = 10mA$	1.238	1.250	1.262	V
			<b>98%*<math>V_{OUT}</math></b>	$V_{OUT}$	<b>102%*<math>V_{OUT}</math></b>	V
$V_{OUT}$	Output Voltage (Fixed Versions)	For 1.2V, $V_{OUT} + 1.5V \leq V_{IN} \leq 12V$ , $I_{OUT} = 10mA$	98%* $V_{OUT}$	$V_{OUT}$	102%* $V_{OUT}$	V
			<b>96%*<math>V_{OUT}</math></b>	<b><math>V_{OUT}</math></b>	<b>104%*<math>V_{OUT}</math></b>	V
		For 1.5V to 5V, $V_{OUT} + 1.5V \leq V_{IN} \leq 12V$ , $I_{OUT} = 10mA$	99%* $V_{OUT}$	$V_{OUT}$	101%* $V_{OUT}$	V
			<b>98%*<math>V_{OUT}</math></b>	$V_{OUT}$	<b>102%*<math>V_{OUT}</math></b>	V
$V_{DROP}$	Dropout Voltage	$I_{OUT} = 1A$	—	1.1	1.3	V
$I_{OUT(MAX)}$	Maximum Output Current	$1.5V \leq V_{IN} - V_{OUT}$	1	1.3	—	A
$V_{RLOAD}$	Load Regulation	$V_{IN} = V_{OUT} + 1.5V$ $1mA \leq I_{OUT} \leq 1A$	—	0.2	0.6	%/A
$V_{RLINE}$	Line Regulation	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$ , $I_{OUT} = 30mA$	—	0.001	$\pm 0.04$	%/V
$I_Q$	Quiescent Current	For Fixed Voltage Version, $I_{OUT} = 0$	—	3.5	6	mA
—	Minimum Load Current	For ADJ Version, $1.5V \leq V_{IN} - V_{OUT} \leq 10V$	—	2	5	mA
$I_{ADJ}$	Adjustable Pin Current	—	—	45	90	$\mu A$
—	Adjustable Pin Current Change	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	—	0.2	5	$\mu A$
PSRR	Power Supply Rejection Ratio	Ripple 1.0 Vp-p $V_{IN} = V_{OUT} + 2V$ , $I_{OUT} = 100mA$	f = 120Hz	—	70	dB
			f = 1kHz	—	70	
$\frac{\Delta V_{OUT}}{V_{OUT}} / \Delta T$	Output Voltage Temperature Coefficient	$I_{OUT} = 30mA$	—	$\pm 30$	—	ppm/ $^\circ C$
$V_{NOISE}$	RMS Output Noise	$10Hz \leq f \leq 100kHz$ , No Load	—	0.003	—	%
$T_{OTSD}$	Thermal Shutdown Temperature	—	—	+170	—	$^\circ C$
$T_{HYOTSD}$	Thermal Shutdown Hysteresis	—	—	+20	—	$^\circ C$
$\theta_{JC}$	Thermal Resistance (Junction to Case)	SOT-223	—	40	—	$^\circ C/W$

## Performance Characteristics

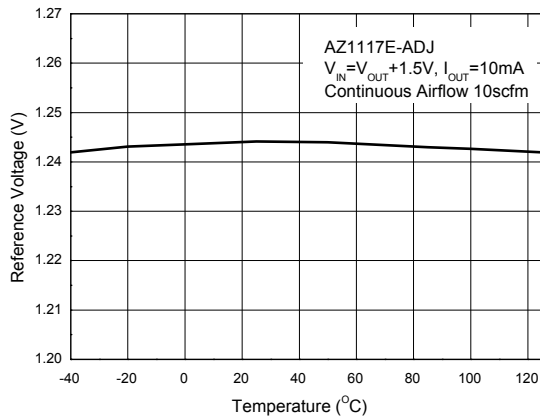
Line Regulation vs. Temperature



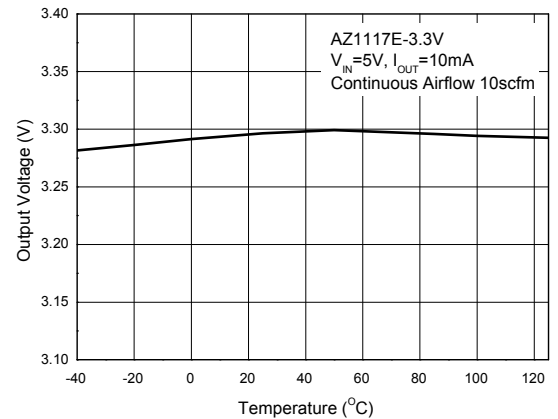
Load Regulation vs. Temperature



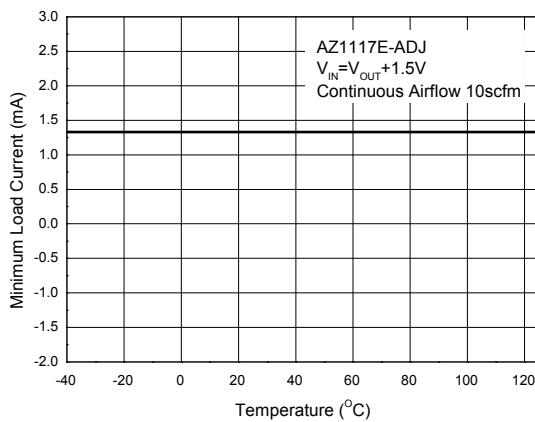
Reference Voltage vs. Temperature



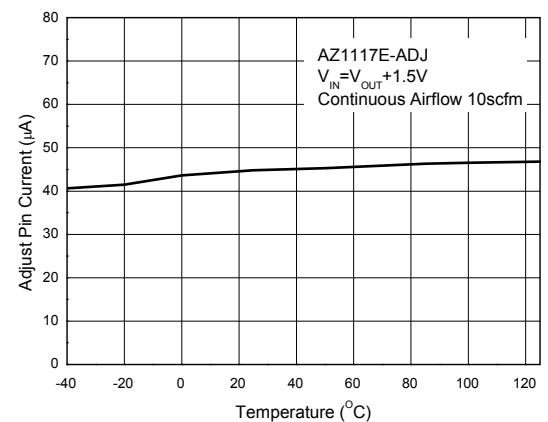
Output Voltage vs. Temperature



Minimum Load Current vs. Temperature

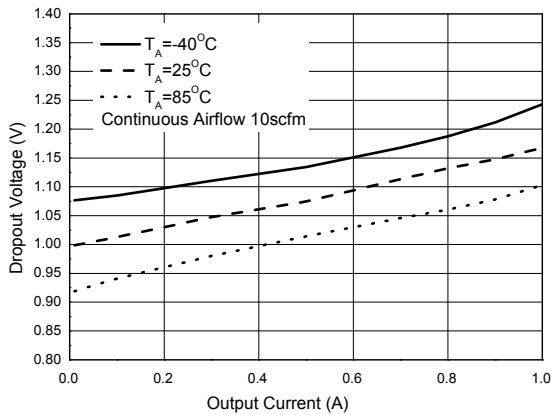


Adjust Pin Current vs. Temperature

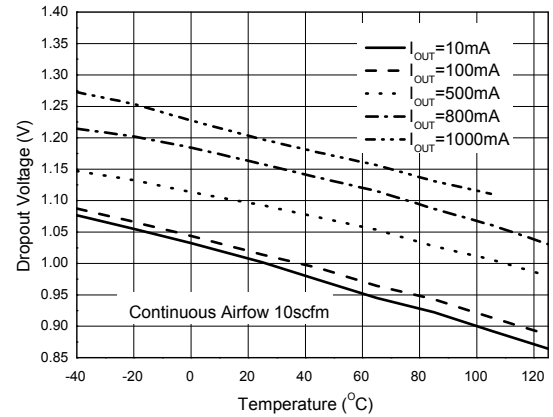


## Performance Characteristics (Cont.)

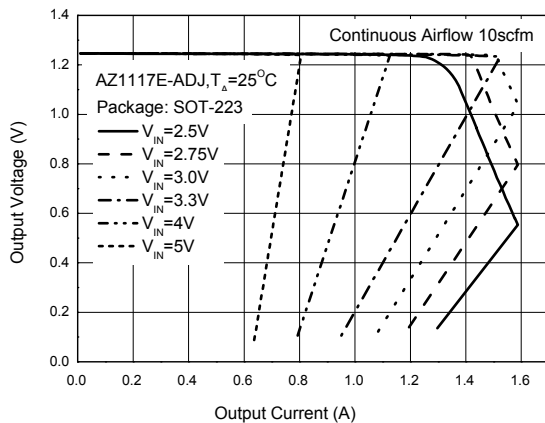
**Dropout Voltage vs. Output Current**



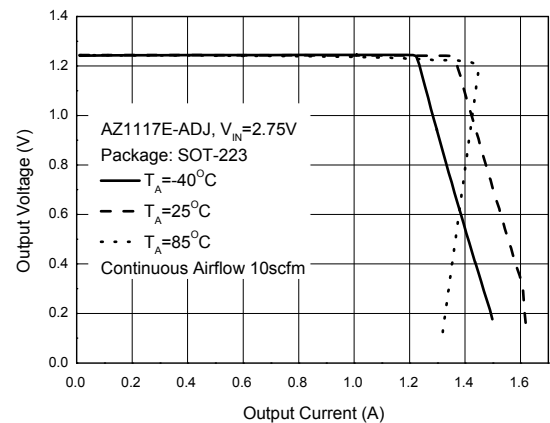
**Dropout Voltage vs. Temperature**



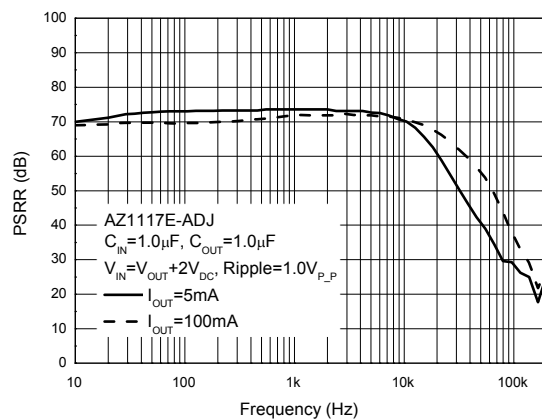
**Output Voltage vs. Output Current**



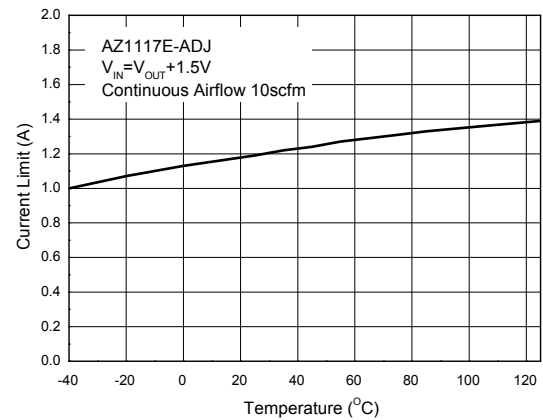
**Output Voltage vs. Output Current**



**PSRR vs. Frequency**



**Current Limit vs. Temperature**

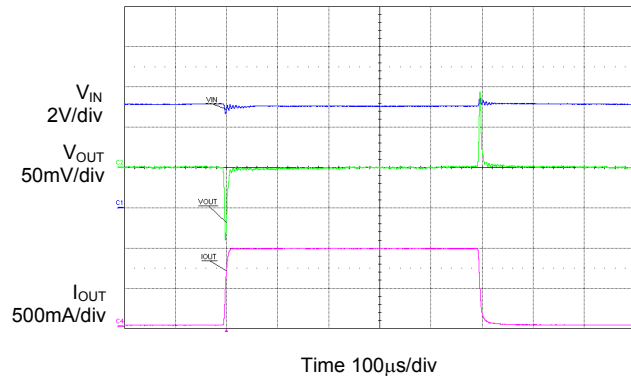


## Performance Characteristics (Cont.)

### Load Transient Response

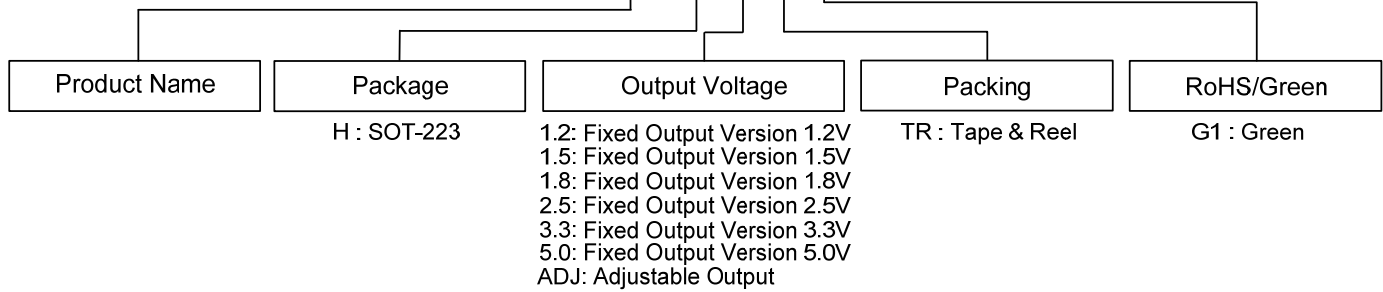
(AZ1117E-ADJ,  $V_{IN}=5V$ ,  $V_{OUT}=3.3V$ ,

$C_{IN}=1.0\mu F$ ,  $C_{OUT}=1.0\mu F$ )



## Ordering Information

### AZ1117E X - XX XX XX

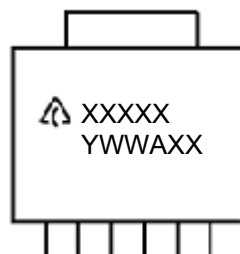


Package	Temperature Range	Part Number	Marking ID	Packing
SOT-223	-40 to +125°C	AZ1117EH-1.2TRG1	GH23F	4000/Tape & Reel
		AZ1117EH-1.5TRG1	GH27F	4000/Tape & Reel
		AZ1117EH-1.8TRG1	GH18G	4000/Tape & Reel
		AZ1117EH-2.5TRG1	GH23G	4000/Tape & Reel
		AZ1117EH-3.3TRG1	GH27G	4000/Tape & Reel
		AZ1117EH-5.0TRG1	GH18H	4000/Tape & Reel
		AZ1117EH-ADJTRG1	GH23H	4000/Tape & Reel

## Marking Information

### SOT-223 Series

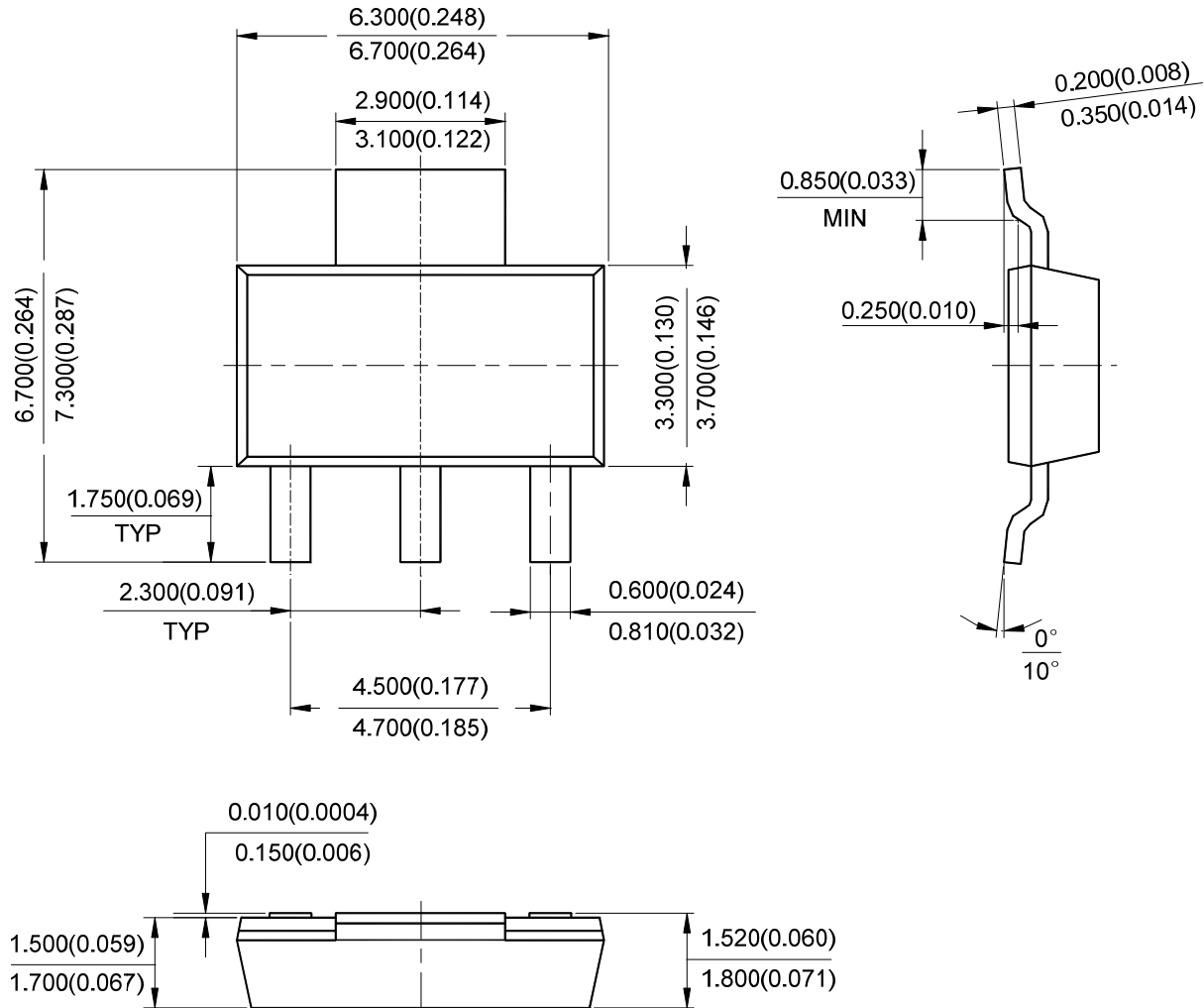
(Top View)



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

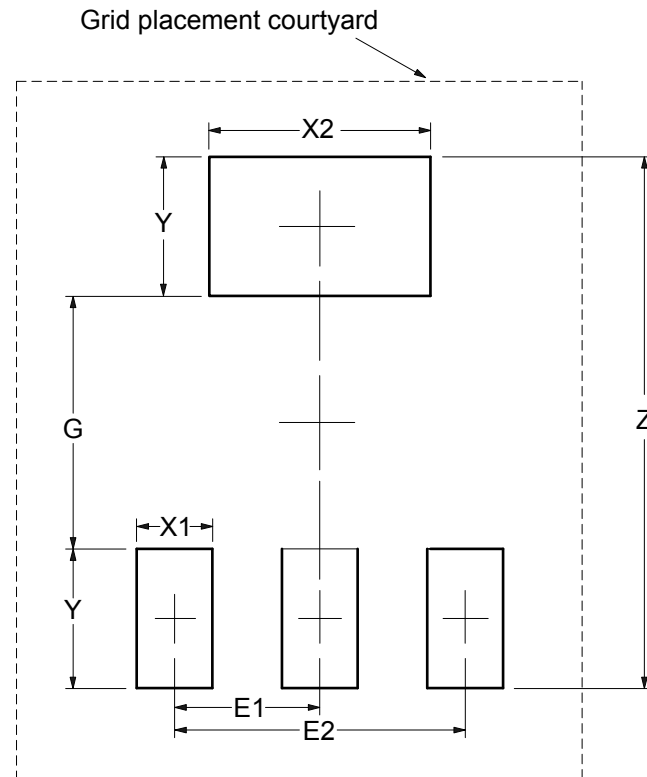
**Package Outline Dimensions** (All dimensions in mm(inch).)

(1) Package Type: SOT-223



## Suggested Pad Layout

(1) Package Type: SOT-223



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



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