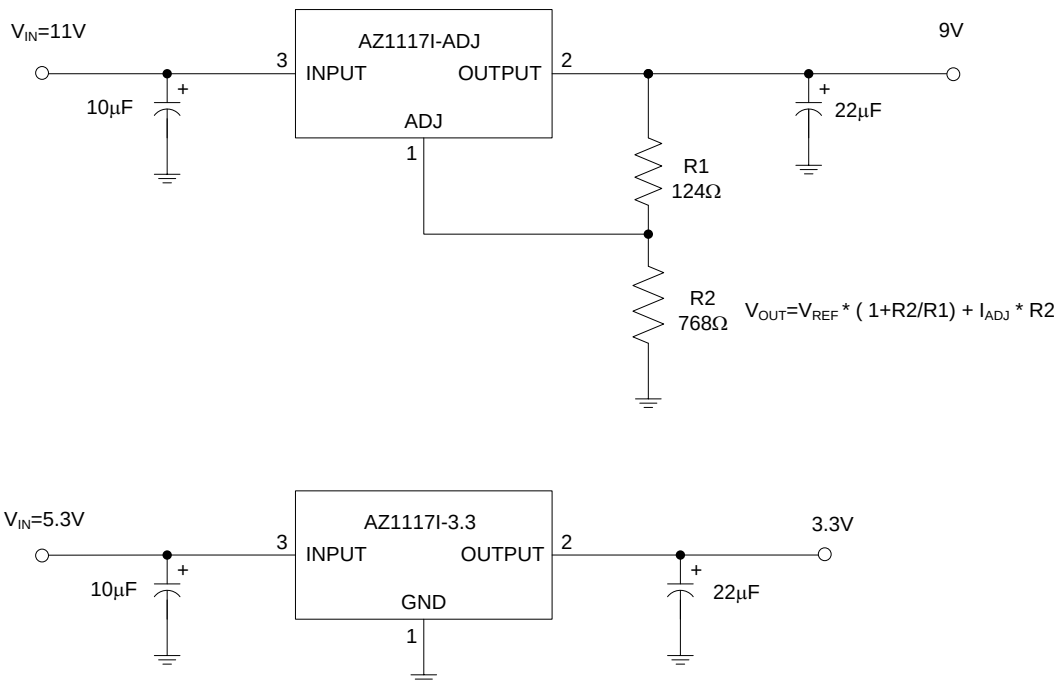
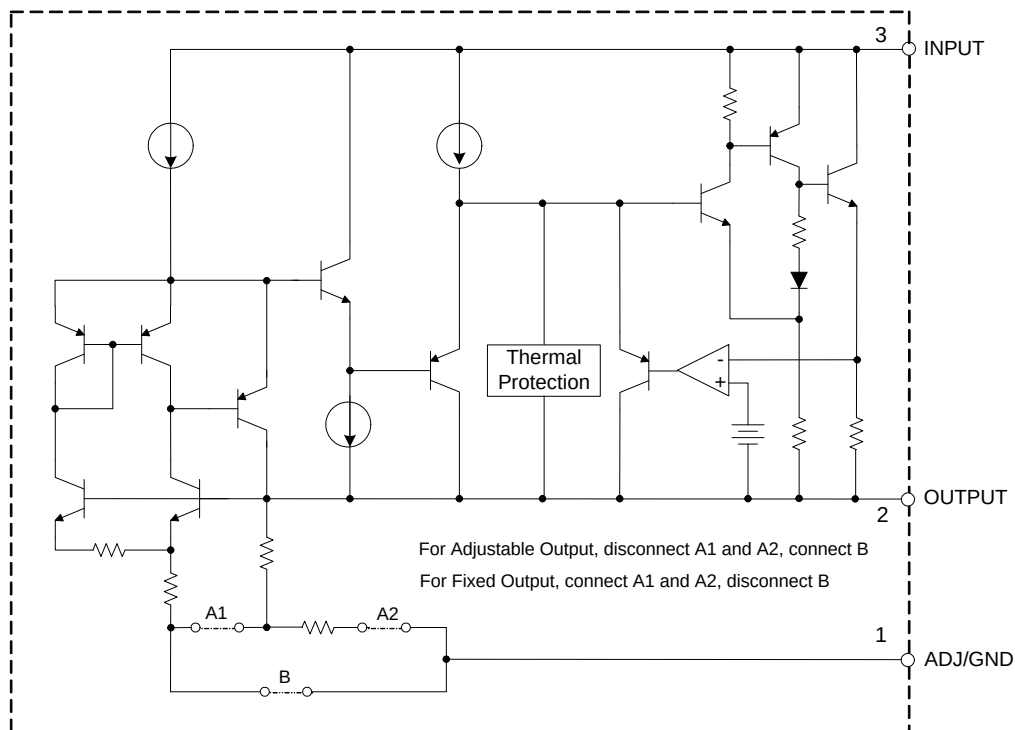


Typical Applications Circuit (Note 4)



Note 4: The AZ1117I 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



Absolute Maximum Ratings (Note 5) (@T_A = +25°C, unless otherwise specified.)

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
θ _{JA}	Thermal Resistance (Without Heatsink)	SOT223	125	°C/W
		TO252-2	100	
θ _{JA}	Thermal Resistance (With Heatsink) (Note 6)	SOT223	100	°C/W
		TO252-2	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 100mm² (10mm*10mm) copper (top side solder mask) on 2oz.2 layers FR-4 PCB with 8*0.5mm vias.

Recommended Operating Conditions (@T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Min	Max	Unit
V _{IN}	Input Voltage	—	15	V
T _J	Operating Junction Temperature Range	-40	+125	°C

Electrical Characteristics AZ1117I-ADJ

(Operating Conditions: V_{IN} = V_{OUT}+2V, I_{OUT} = 10mA, T_J = +25°C, unless otherwise specified. (P ≤ maximum power dissipation). Limits appearing in **Boldface** type apply over the entire junction temperature range for operation, -40°C to +125°C.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{REF}	Reference Voltage	1.5V ≤ V _{IN} -V _{OUT} ≤ 10V	1.238 1.225	1.250 1.250	1.262 1.275	V
V _{RLINE}	Line Regulation	1.5V ≤ V _{IN} -V _{OUT} ≤ 10V	— —	0.001 —	0.1 0.2	%
V _{RLOAD}	Load Regulation	V _{IN} = V _{OUT} +2V 1mA ≤ I _{OUT} ≤ 1A	—	0.4	1.0	%
V _{DROP}	Dropout Voltage	ΔV _{REF} = 1%, I _{OUT} = 0.8A	—	1.2	1.3	V
		SOT223 TO252-2	—	1.3	1.4	V
I _{LIMIT}	Current Limit	—	1	1.35	—	A
—	Adjust Pin Current	—	—	60	120	μA
—	Adjust Pin Current Change	1.5 ≤ (V _{IN} -V _{OUT}) ≤ 10V	—	0.2	5	μA
—	Minimum Load Current	1.5 ≤ (V _{IN} -V _{OUT}) ≤ 10V	—	1.7	5	mA
PSRR	Ripple Rejection	f = 120Hz, C _{OUT} = 22μF (V _{IN} -V _{OUT}) = 3V, I _{OUT} = 300mA	—	70	—	dB
—	Temperature Stability	—	—	0.5	—	%
—	RMS Output Noise (% of V _{OUT})	T _A = +25°C, 10Hz ≤ f ≤ 10KHz	—	0.003	—	%
—	Thermal Shutdown	Junction Temperature	—	+160	—	°C
—	Thermal Shutdown Hysteresis	—	—	+16	—	°C
θ _{JC}	Thermal Resistance (Junction to Case)	SOT223	— —	15	—	°C/W
		TO252-2	—	10	—	

Electrical Characteristics AZ1117I-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, $-40^\circ C$ to $+125^\circ C$.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	1.176 1.152	1.2	1.224 1.248	V
V_{RLINE}	Line Regulation	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	— —	0.5 —	6 10	mV
V_{RLOAD}	Load Regulation	$V_{IN} = V_{OUT} + 2V$ $1mA \leq I_{OUT} \leq 1A$	—	2	15	mV
V_{DROP}	Dropout Voltage	$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.8A$	—	1.2	1.3	V
		SOT223 TO252-2	—	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	—	$^\circ C$
θ_{JC}	Thermal Resistance (Junction to Case)	SOT223	— —	15	—	$^\circ C/W$
		TO252-2	—	10	—	

Electrical Characteristics AZ1117I-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, $-40^\circ C$ to $+125^\circ C$.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	1.485 1.47	1.5	1.515 1.53	V
V_{RLINE}	Line Regulation	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	— —	0.5 —	6 10	mV
V_{RLOAD}	Load Regulation	$V_{IN} = V_{OUT} + 2V$ $1mA \leq I_{OUT} \leq 1A$	—	2	15	mV
V_{DROP}	Dropout Voltage	$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.8A$	—	1.2	1.3	V
		SOT223 TO252-2	—	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	—	$^\circ C$
θ_{JC}	Thermal Resistance (Junction to Case)	SOT223	— —	15	—	$^\circ C/W$
		TO252-2	—	10	—	

Electrical Characteristics AZ1117I-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, $-40^\circ C$ 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	1.8	1.818	V
			1.764	1.8	1.836	
V_{RLINE}	Line Regulation	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	—	0.5	6	mV
			—	—	10	
V_{RLOAD}	Load Regulation	$V_{IN} = V_{OUT} + 2V$ $1mA \leq I_{OUT} \leq 1A$	—	2	15	mV
V_{DROP}	Dropout Voltage	$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.8A$	—	1.2	1.3	V
		SOT223 TO252-2	—	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	—	$^\circ C$
θ_{JC}	Thermal Resistance (Junction to Case)	SOT223	—	15	—	$^\circ C/W$
		—	—	—	—	
		TO252-2	—	10	—	

Electrical Characteristics AZ1117I-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, $-40^\circ C$ 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	2.5	2.525	V
			2.455	2.5	2.545	
V_{RLINE}	Line Regulation	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	—	0.5	6	mV
			—	—	10	
V_{RLOAD}	Load Regulation	$V_{IN} = V_{OUT} + 2V$ $1mA \leq I_{OUT} \leq 1A$	—	2	15	mV
V_{DROP}	Dropout Voltage	$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.8A$	—	1.2	1.3	V
		SOT223 TO252-2	—	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	—	$^\circ C$
θ_{JC}	Thermal Resistance (Junction to Case)	SOT223	—	15	—	$^\circ C/W$
		—	—	—	—	
		TO252-2	—	10	—	

Electrical Characteristics AZ1117I-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, $-40^\circ C$ 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 3.235	3.3 3.3	3.333 3.365	V
V_{RLINE}	Line Regulation	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	— —	0.5 —	6 10	mV
V_{RLOAD}	Load Regulation	$V_{IN} = V_{OUT}+2V$ $1mA \leq I_{OUT} \leq 1A$	—	2	15	mV
V_{DROP}	Dropout Voltage	$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.8A$	SOT223 TO252-2	1.2 1.3	1.3 1.4	V 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	—	$^\circ C$
θ_{JC}	Thermal Resistance (Junction to Case)	SOT223 TO252-2	— —	15 10	— —	$^\circ C/W$

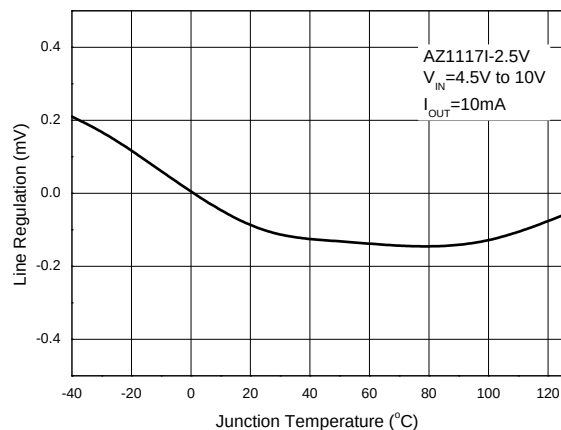
Electrical Characteristics AZ1117I-5.0 (Cont.)

(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, $-40^\circ C$ to $+125^\circ C$.)

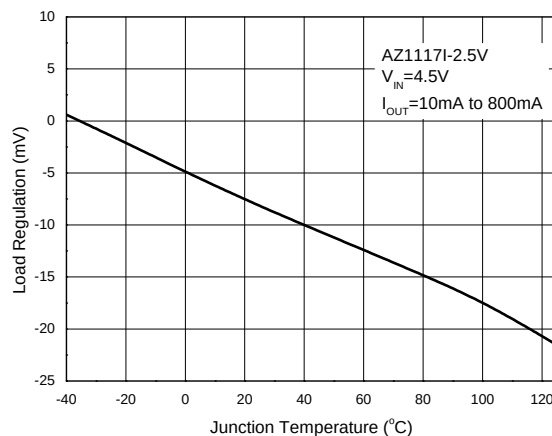
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT}	Output Voltage	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	4.950 4.900	5.0 5.0	5.050 5.100	V
V_{RLINE}	Line Regulation	$1.5V \leq V_{IN}-V_{OUT} \leq 10V$	— —	0.5 —	6 10	mV
V_{RLOAD}	Load Regulation	$V_{IN} = V_{OUT}+2V$ $1mA \leq I_{OUT} \leq 1A$	—	2	15	mV
V_{DROP}	Dropout Voltage	$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.8A$	SOT223 TO252-2	1.2 1.3	1.3 1.4	V 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	—	$^\circ C$
θ_{JC}	Thermal Resistance (Junction to Case)	SOT223 TO252-2	— —	15 10	— —	$^\circ C/W$

Performance Characteristics

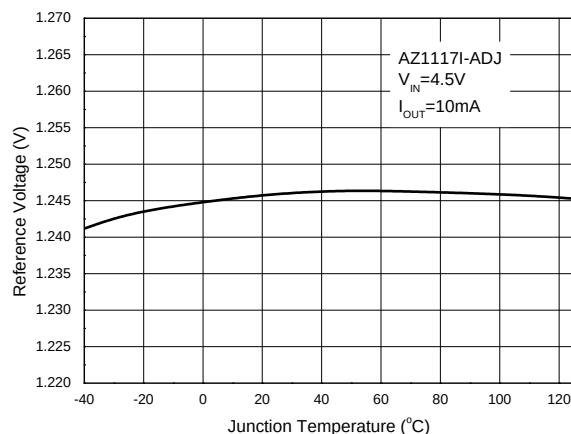
Line Regulation vs. Temperature



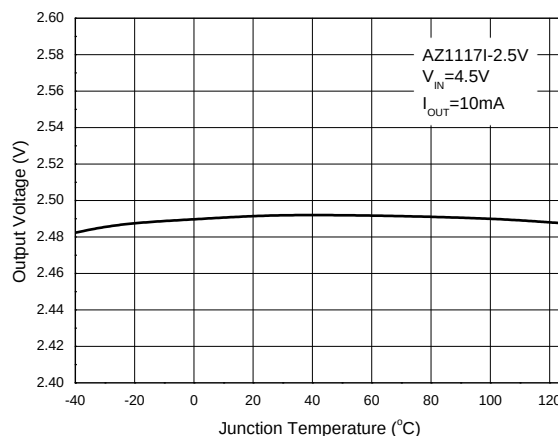
Load Regulation vs. Temperature



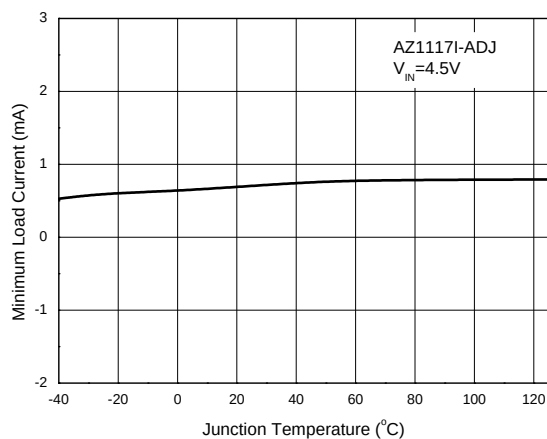
Reference Voltage vs. Temperature



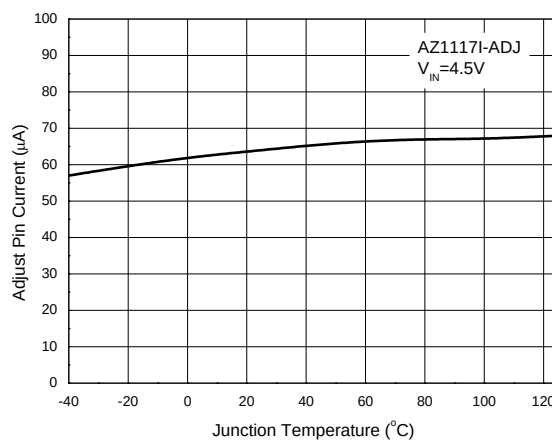
Output Voltage vs. Temperature



Minimum Load Current vs. Temperature

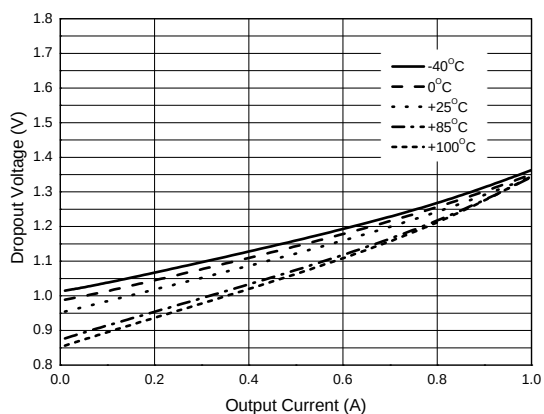


Adjust Pin Current vs. Temperature

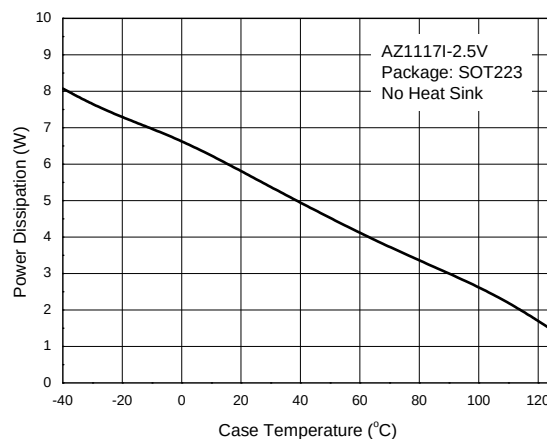


Performance Characteristics (Cont.)

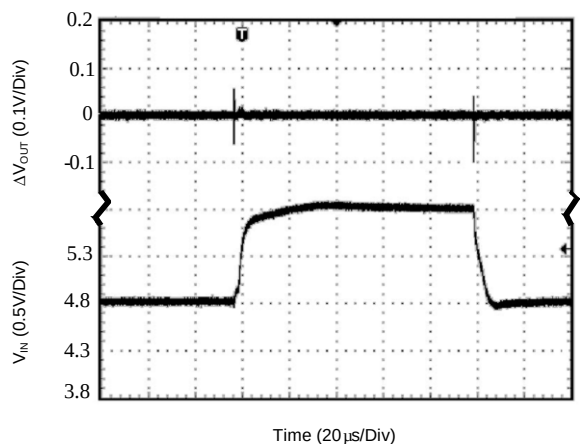
Dropout Voltage vs. Output Current



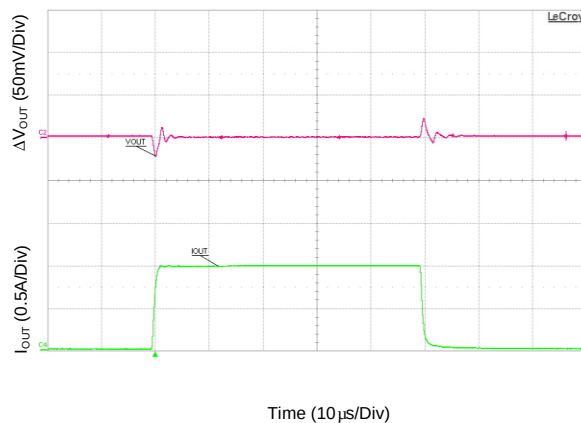
Power Dissipation vs. Temperature



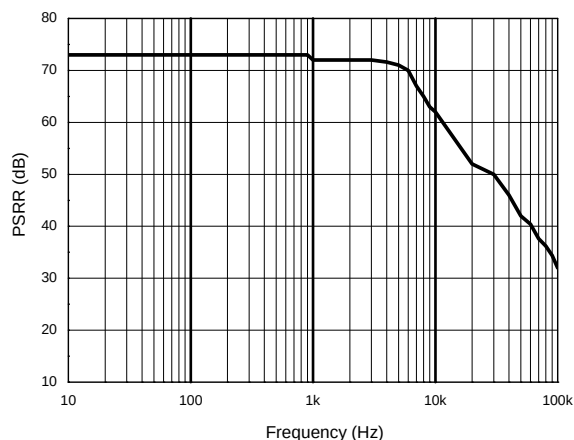
Line Transient Response



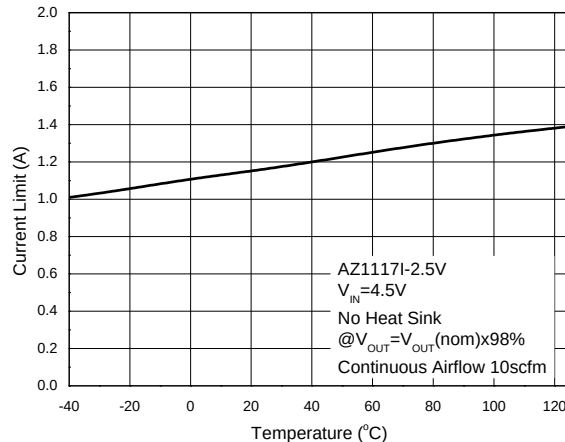
Load Transient Response



PSRR vs. Frequency

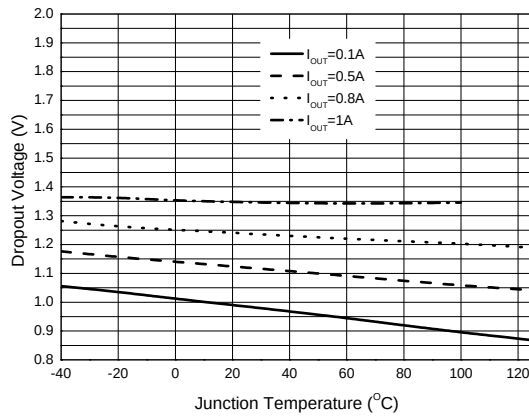


Current Limit vs. Temperature

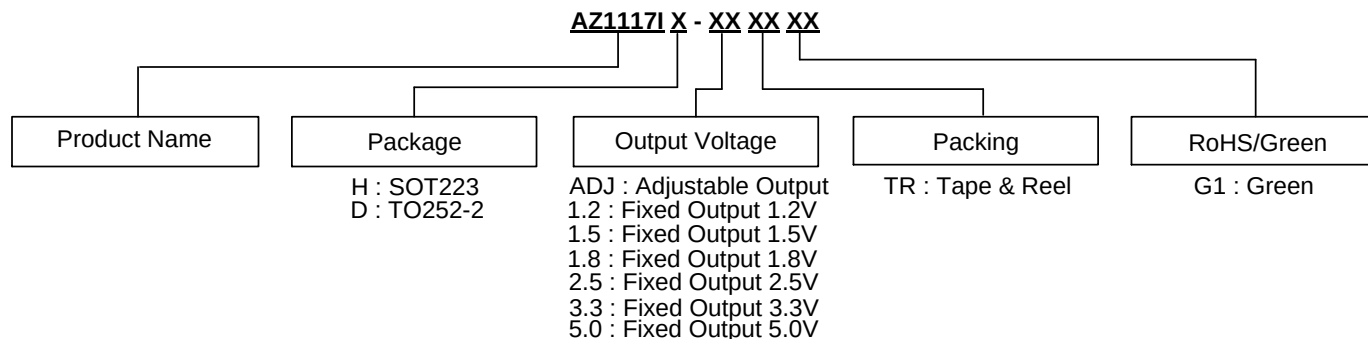


Performance Characteristics (Cont.)

Dropout Voltage vs. Temperature



Ordering Information

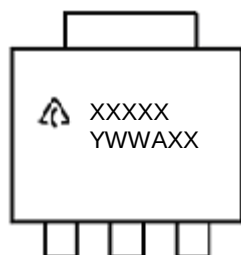


Package	Temperature Range	Part Number	Marking ID	Packing
SOT223	-40°C to +125°C	AZ1117IH-ADJTRG1	GH86J	4000/Tape & Reel
		AZ1117IH-1.2TRG1	GH86K	4000/Tape & Reel
		AZ1117IH-1.5TRG1	GH86L	4000/Tape & Reel
		AZ1117IH-1.8TRG1	GH86M	4000/Tape & Reel
		AZ1117IH-2.5TRG1	GH86N	4000/Tape & Reel
		AZ1117IH-3.3TRG1	GH86P	4000/Tape & Reel
		AZ1117IH-5.0TRG1	GH86Q	4000/Tape & Reel
TO252-2		AZ1117ID-ADJTRG1	AZ1117ID-ADJG1	2500/Tape & Reel
		AZ1117ID-1.2TRG1	AZ1117ID-1.2G1	2500/Tape & Reel
		AZ1117ID-1.5TRG1	AZ1117ID-1.5G1	2500/Tape & Reel
		AZ1117ID-1.8TRG1	AZ1117ID-1.8G1	2500/Tape & Reel
		AZ1117ID-2.5TRG1	AZ1117ID-2.5G1	2500/Tape & Reel
		AZ1117ID-3.3TRG1	AZ1117ID-3.3G1	2500/Tape & Reel
		AZ1117ID-5.0TRG1	AZ1117ID-5.0G1	2500/Tape & Reel

Marking Information

(1) SOT223

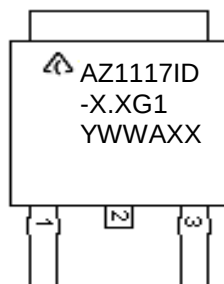
(Top View)



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: 7th and 8th Digits of Batch Number

(2) TO252-2

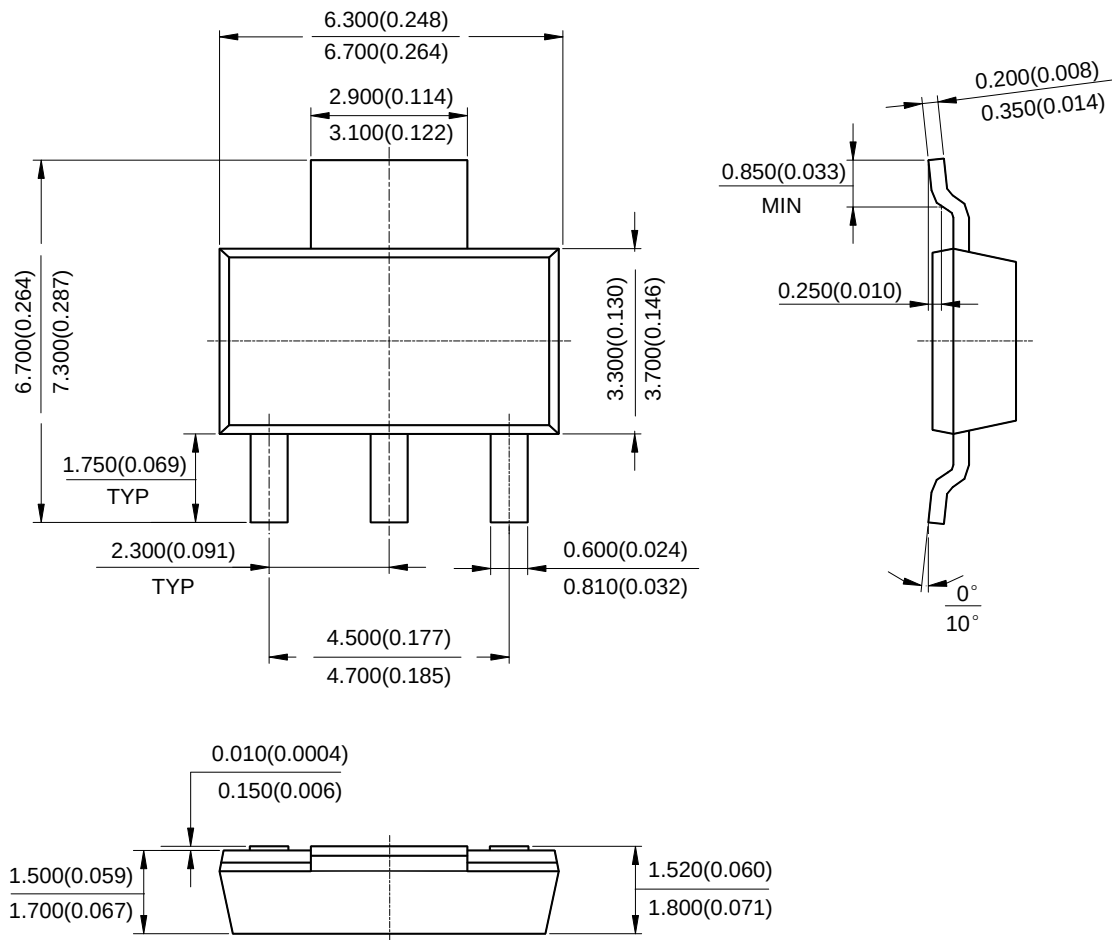
(Top View)



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

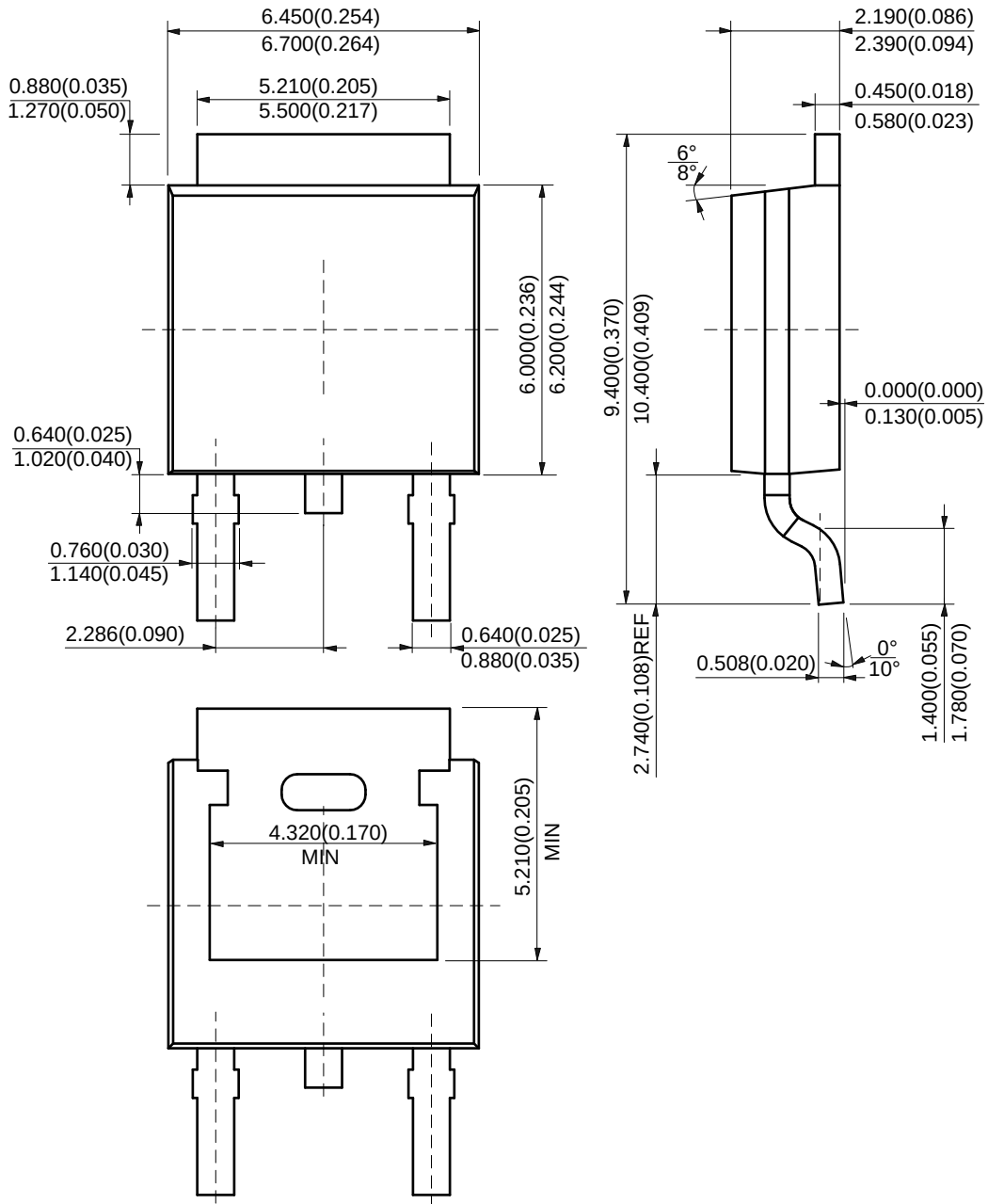
Package Outline Dimensions (All dimensions in mm.)

(1) Package Type: SOT223



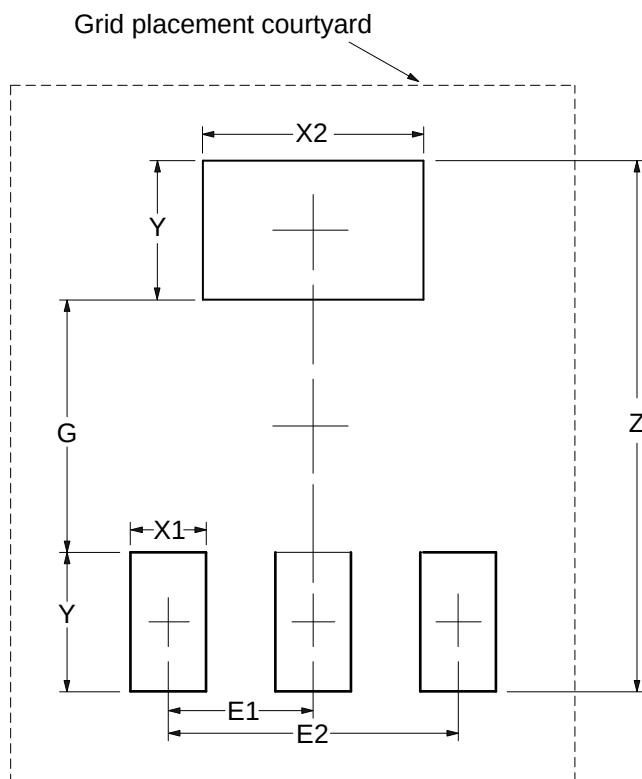
Package Outline Dimensions (All dimensions in mm.) (Cont.)

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



Suggested Pad Layout

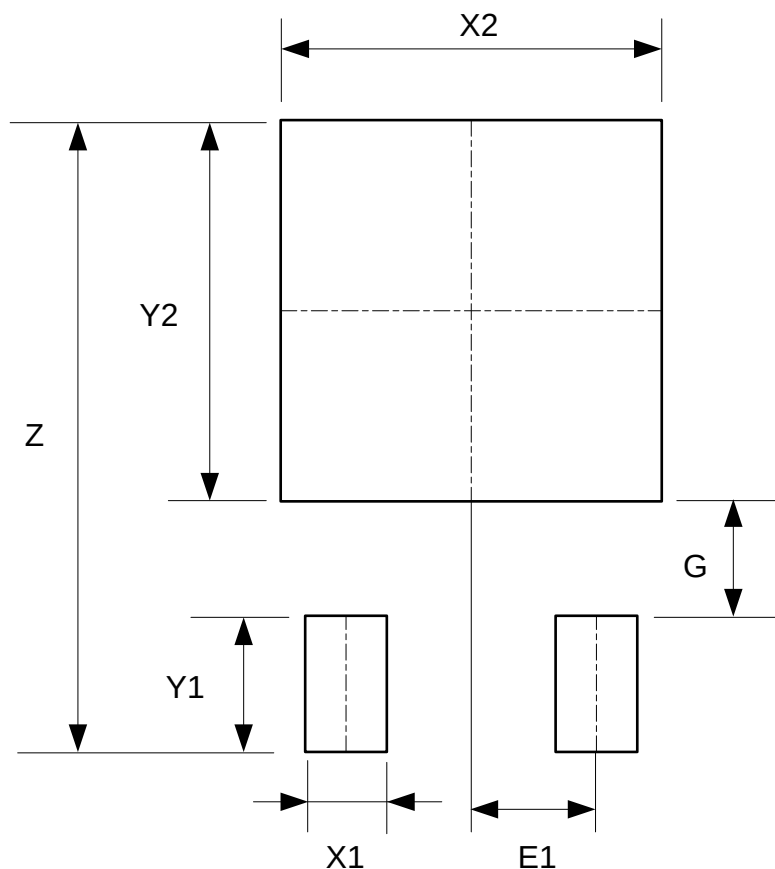
(1) Package Type: SOT223



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: 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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1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

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