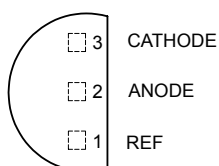


LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR

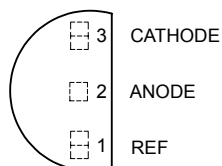
AZ432

Pin Configuration

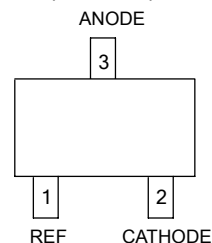
Z Package
(TO-92(Bulk Packing))



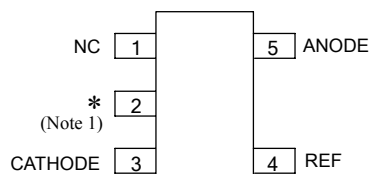
Z Package
(TO-92(Ammo Packing))



N Package
(SOT-23)



K Package
(SOT-23-5)



Note 1: * Pin 2 is attached to substrate and must be connected to ANODE or open

R Package
(SOT-89)

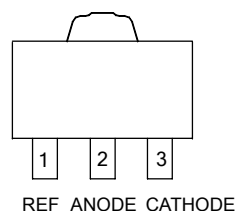


Figure 2. Pin Configuration of AZ432 (Top View)

Functional Block Diagram

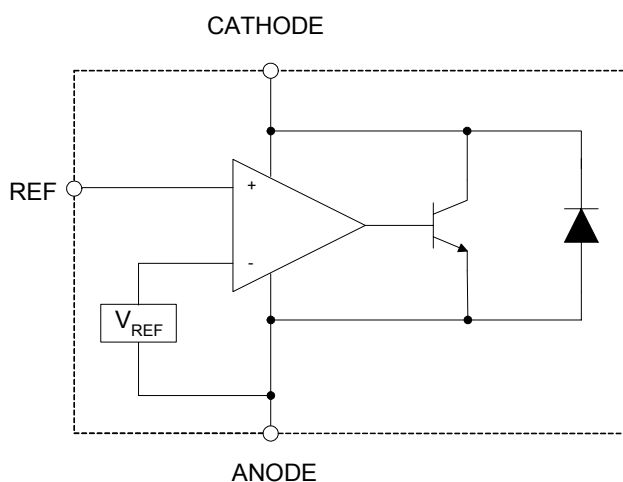
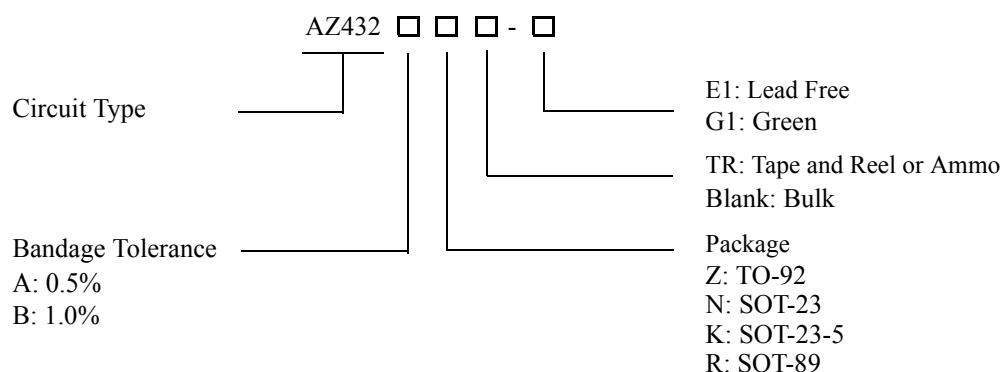


Figure 3. Functional Block Diagram of AZ432

**LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR****AZ432****Ordering Information**

Package	Temperature Range	Voltage Tolerance	Part Number		Marking ID		Packing Type
			Lead Free	Green	Lead Free	Green	
TO-92	-40 to 125°C	0.5%	AZ432AZ-E1	AZ432AZ-G1	AZ432AZ-E1	AZ432AZ-G1	Bulk
		0.5%	AZ432AZTR-E1	AZ432AZTR-G1	AZ432AZ-E1	AZ432AZ-G1	Ammo
		1.0%	AZ432BZ-E1	AZ432BZ-G1	AZ432BZ-E1	AZ432BZ-G1	Bulk
		1.0%	AZ432BZTR-E1	AZ432BZTR-G1	AZ432BZ-E1	AZ432BZ-G1	Ammo
SOT-23	-40 to 125°C	0.5%	AZ432ANTR-E1	AZ432ANTR-G1	EA8	GA8	Tape & Reel
		1.0%	AZ432BNTR-E1	AZ432BNTR-G1	EA9	GA9	Tape & Reel
SOT-23-5	-40 to 125°C	0.5%	AZ432AKTR-E1	AZ432AKTR-G1	E7A	G7A	Tape & Reel
		1.0%	AZ432BKTR-E1	AZ432BKTR-G1	E8A	G8A	Tape & Reel
SOT-89	-40 to 125°C	0.5%	AZ432ARTR-E1	AZ432ARTR-G1	E42A	G42A	Tape & Reel
		1.0%	AZ432BRTR-E1	AZ432BRTR-G1	E42B	G42B	Tape & Reel

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green packages.

**LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR****AZ432****Absolute Maximum Ratings (Note 2)**

Parameter	Symbol	Value		Unit
Cathode Voltage	V_{KA}	20		V
Cathode Current Range (Continuous)	I_{KA}	-100 to 100		mA
Reference Input Current Range	I_{REF}	10		mA
Power Dissipation	P_D	Z, R Package	770	mW
		N, K Package	370	
Junction Temperature	T_J	150		°C
Storage Temperature Range	T_{STG}	-65 to 150		°C

Note 2: 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 Operation Ratings

Parameter	Symbol	Min	Max	Unit
Cathode Voltage	V_{KA}	V_{REF}	18	V
Cathode Current	I_{KA}	0.1	100	mA
Operating Ambient Temperature Range		-40	125	°C



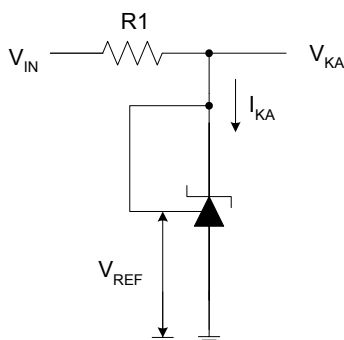
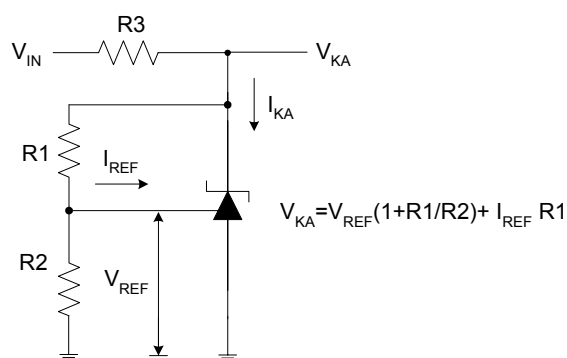
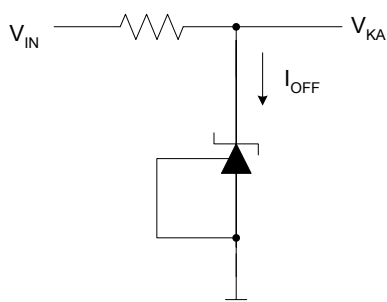
LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR

AZ432

Electrical Characteristics

(Typical and limits apply for $T_A=25^{\circ}\text{C}$, unless otherwise noted.)

Parameter	Test Circuit	Symbol	Conditions	Min	Typ	Max	Unit
Reference Voltage	0.5%	4	$V_{KA}=V_{REF}$, $I_{KA}=10\text{mA}$	1.244	1.250	1.256	V
	1.0%			1.238	1.250	1.262	
Deviation of Reference Voltage Over Full Temperature Range	4	ΔV_{REF}	$V_{KA}=V_{REF}$, $I_{KA}=10\text{mA}$	0 to 70°C	2	10	mV
				-40 to 85°C	3	10	
				-40 to 125°C	4	15	
Ratio of Change in V_{REF} to the Change in Cathode Voltage	5	$\frac{\Delta V_{REF}}{\Delta V_{KA}}$	$I_{KA}=10\text{mA}$, ΔV_{KA} : V_{REF} to 16V		-0.5	-1.5	mV/V
Reference Input Current	5	I_{REF}	$I_{KA}=10\text{mA}$, $R1=10\text{K}\Omega$, $R2=\infty$		0.15	0.4	μA
Deviation of Reference Current Over Full Temperature Range	5	ΔI_{REF}	$I_{KA}=10\text{mA}$, $R1=10\text{K}\Omega$, $R2=\infty$ $T_A=-40$ to 125°C		0.1	0.4	μA
Minimum Cathode Current for Regulation	4	I_{KA} (MIN)	$V_{KA}=V_{REF}$		55	80	μA
Off-state Cathode Current	6	I_{KA} (OFF)	$V_{REF}=0$, $V_{KA}=18\text{V}$		0.04	0.10	μA
			$V_{KA}=6\text{V}$, $V_{REF}=0$		0.01	0.05	
Dynamic Impedance	4	Z_{KA}	$V_{KA}=V_{REF}$, $I_{KA}=1$ to 100mA $f \leq 1.0\text{kHz}$		0.05	0.15	Ω
Thermal Resistance (Junction to Case)		θ_{JC}	SOT-23		84.84		$^{\circ}\text{C/W}$
			SOT-23-5		84.84		
			TO-92		140.80		
			SOT-89		88.00		

Electrical Characteristics (Continued)

Figure 4. Test Circuit 4 for $V_{KA} = V_{REF}$

Figure 5. Test Circuit 5 for $V_{KA} > V_{REF}$

Figure 6. Test Circuit 6 for I_{OFF}

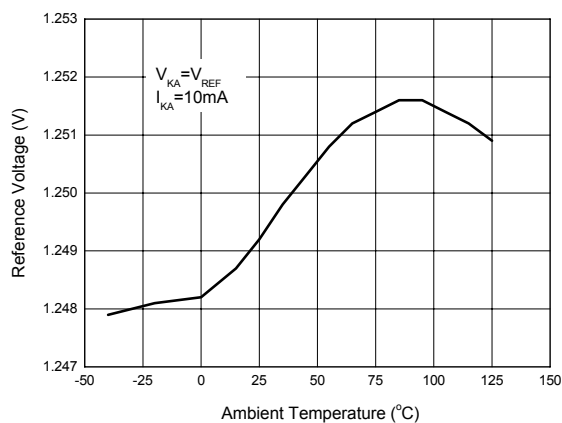
**LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR****AZ432****Typical Performance Characteristics**

Figure 7. Reference Voltage vs. Ambient Temperature

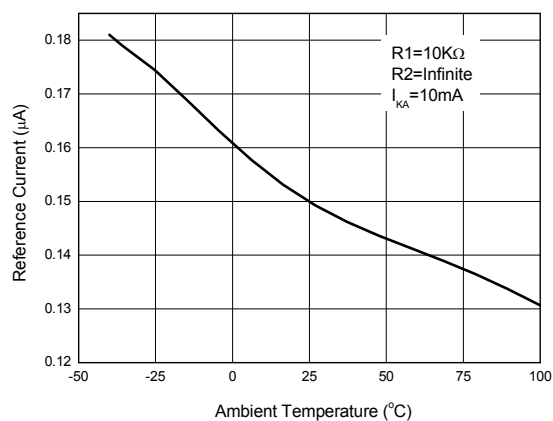


Figure 8. Reference Current vs. Ambient Temperature

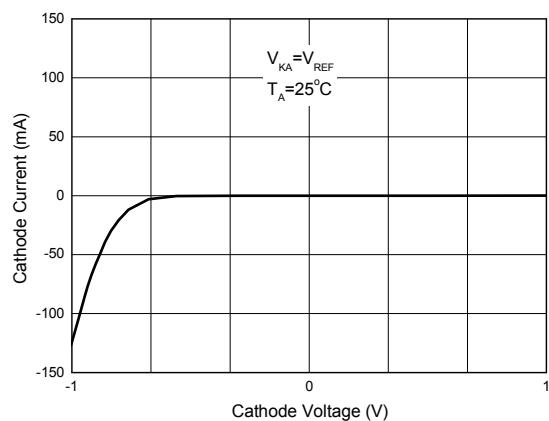


Figure 9. Cathode Current vs. Cathode Voltage

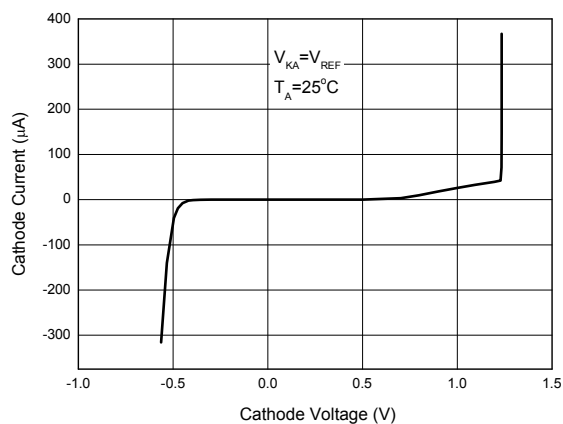


Figure 10. Cathode Current vs. Cathode Voltage

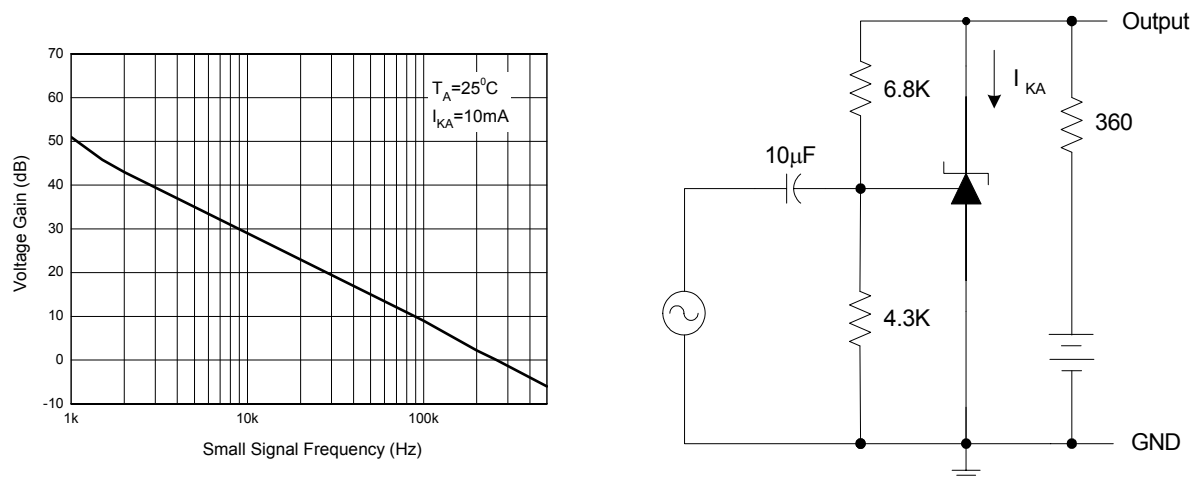
**LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR****AZ432****Typical Performance Characteristics (Continued)**

Figure 11. Small Signal Voltage Gain vs. Frequency

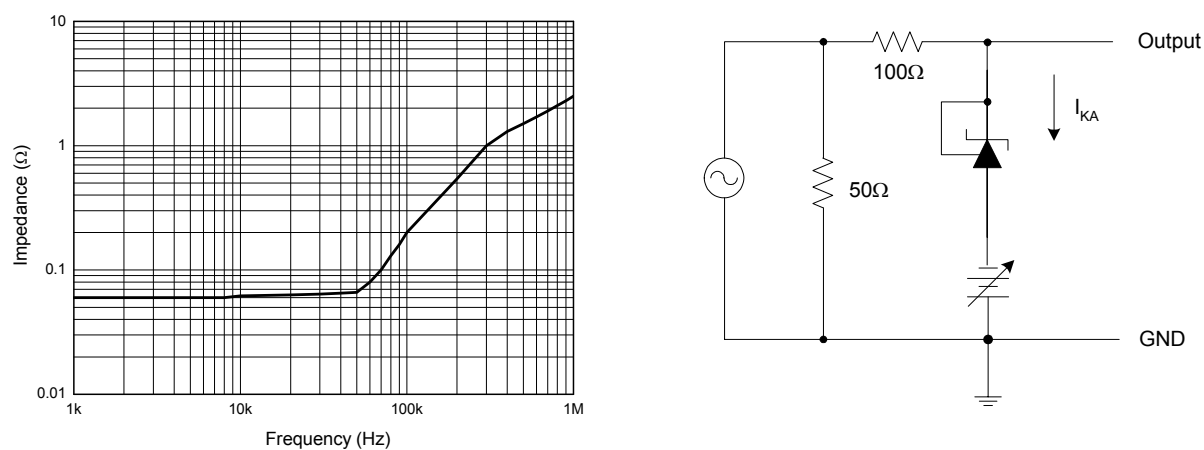


Figure 12. Dynamic Impedance vs. Frequency

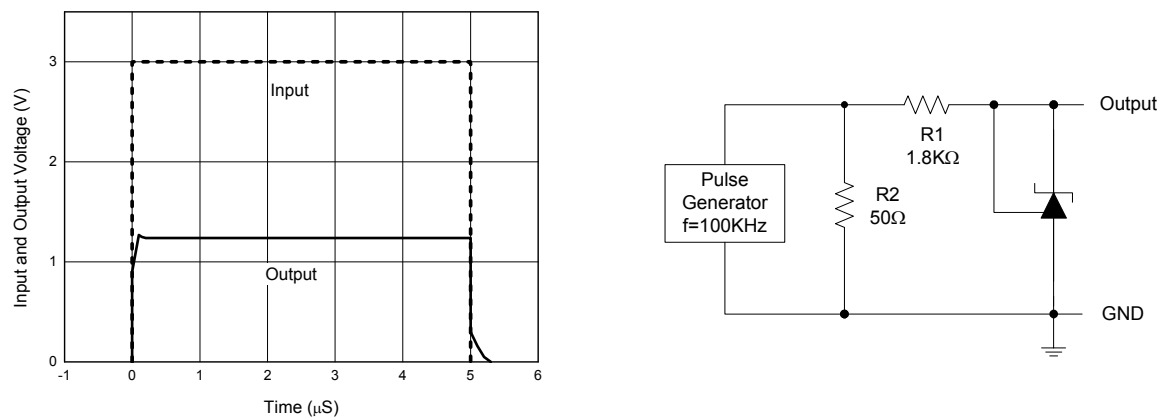
Typical Performance Characteristics (Continued)


Figure 13. Pulse Response of Input and Output Voltage

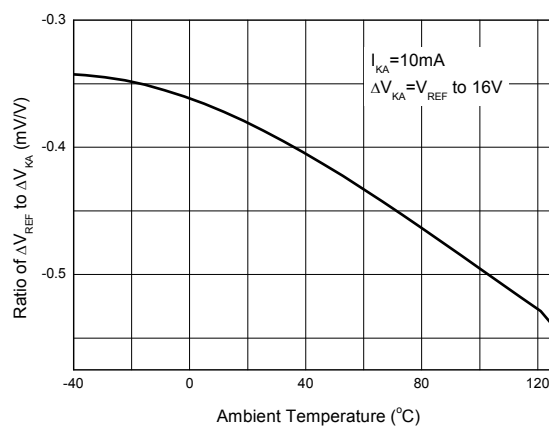


Figure 14. Ratio of Delta Reference Voltage to the Ratio of Delta Cathode Voltage vs. Ambient Temperature

Typical Applications

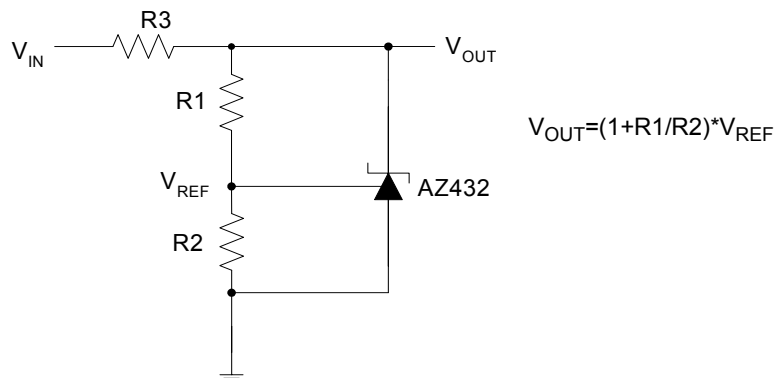


Figure 15. Shunt Regulator

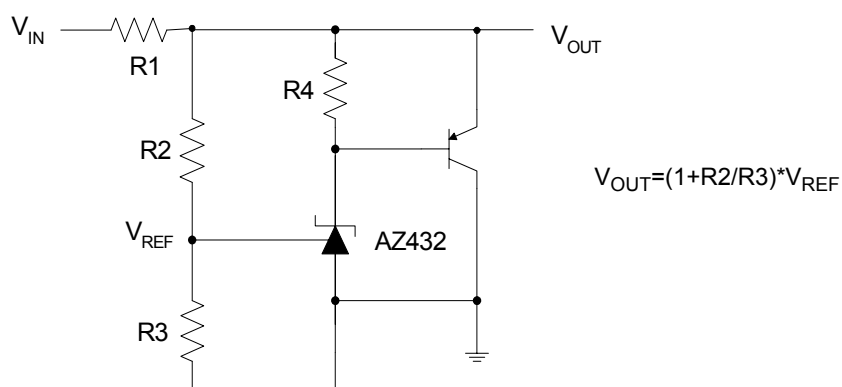


Figure 16. High Current Shunt Regulator

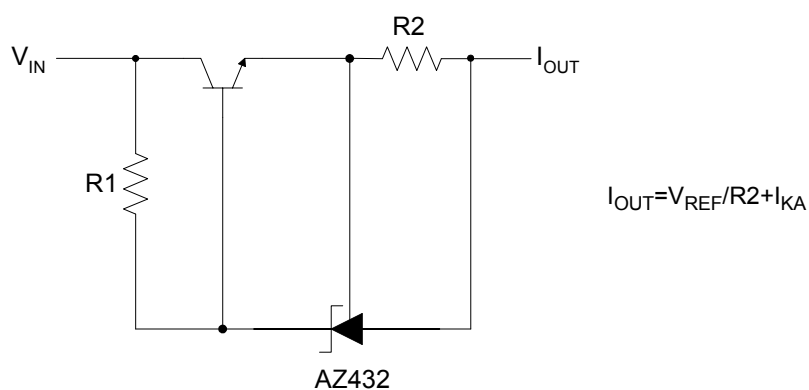


Figure 17. Current Source or Current Limit

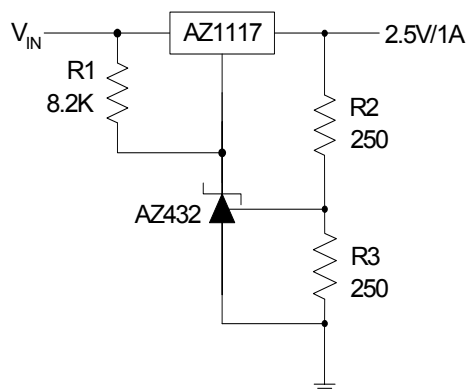
Typical Application (Continued)


Figure18. Precision 2.5V/1A Regulator

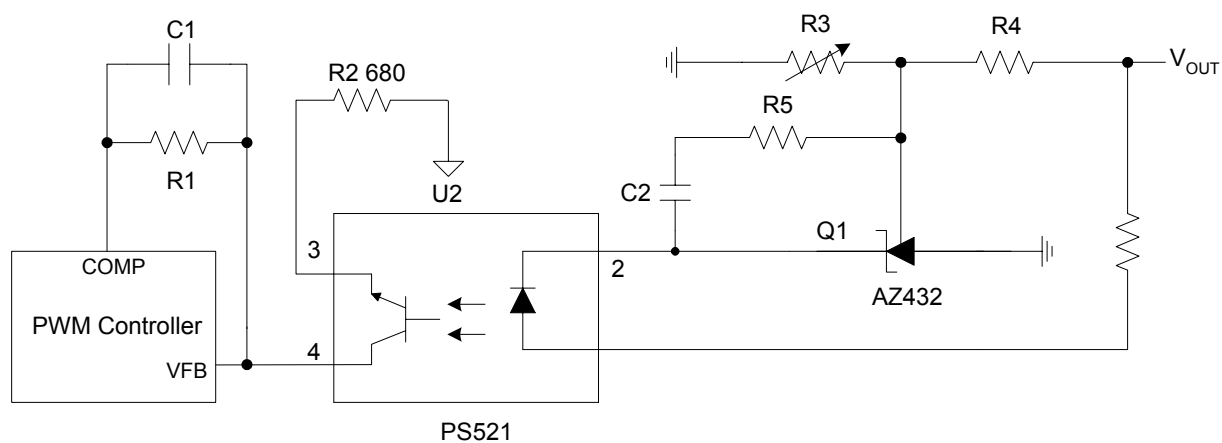


Figure 19. PWM Converter with Reference

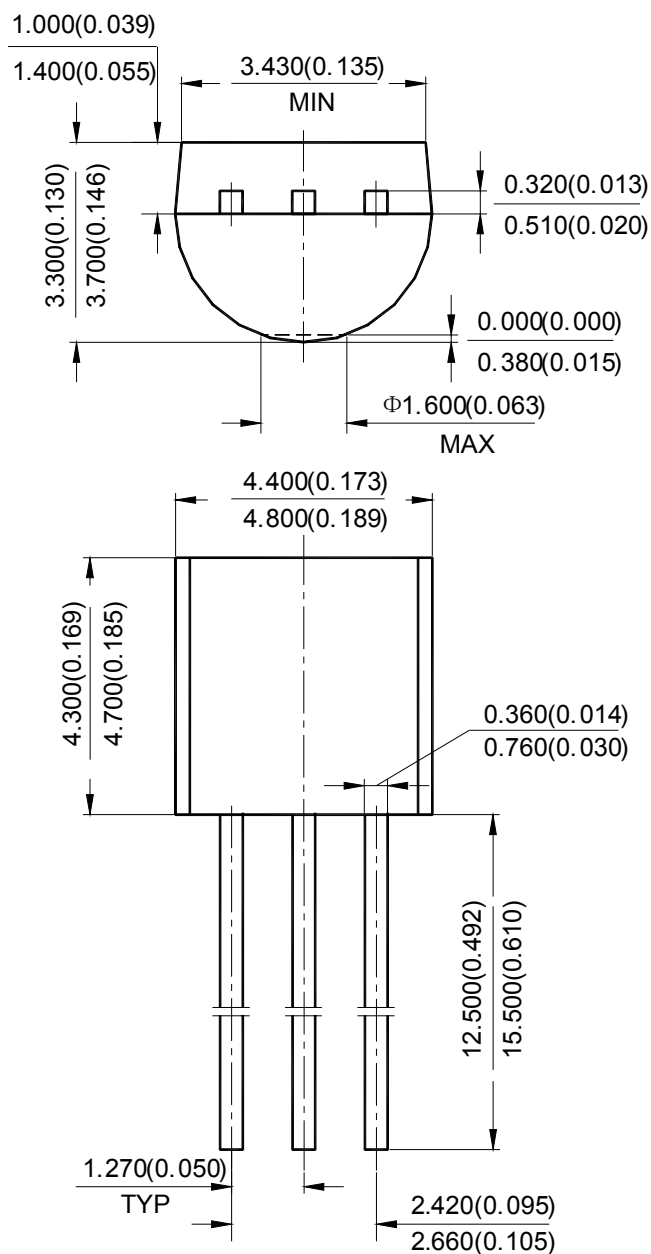
LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR

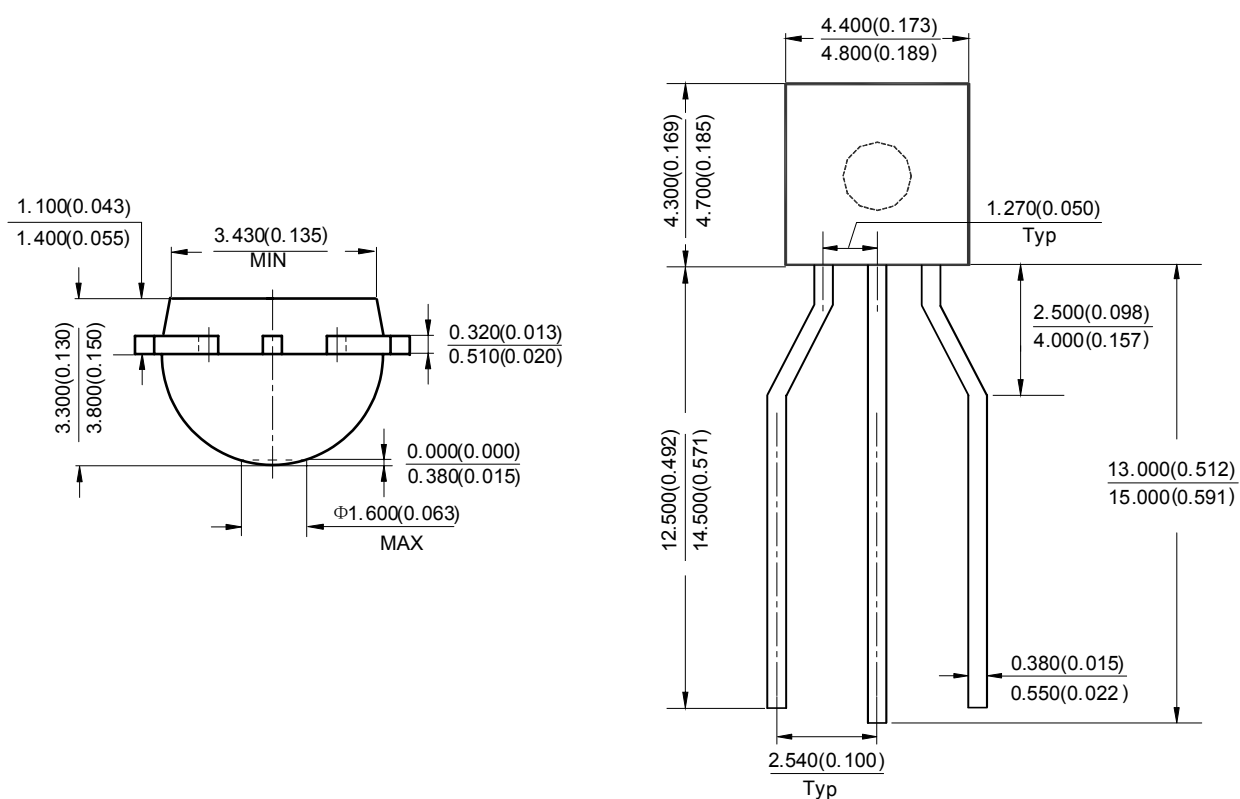
AZ432

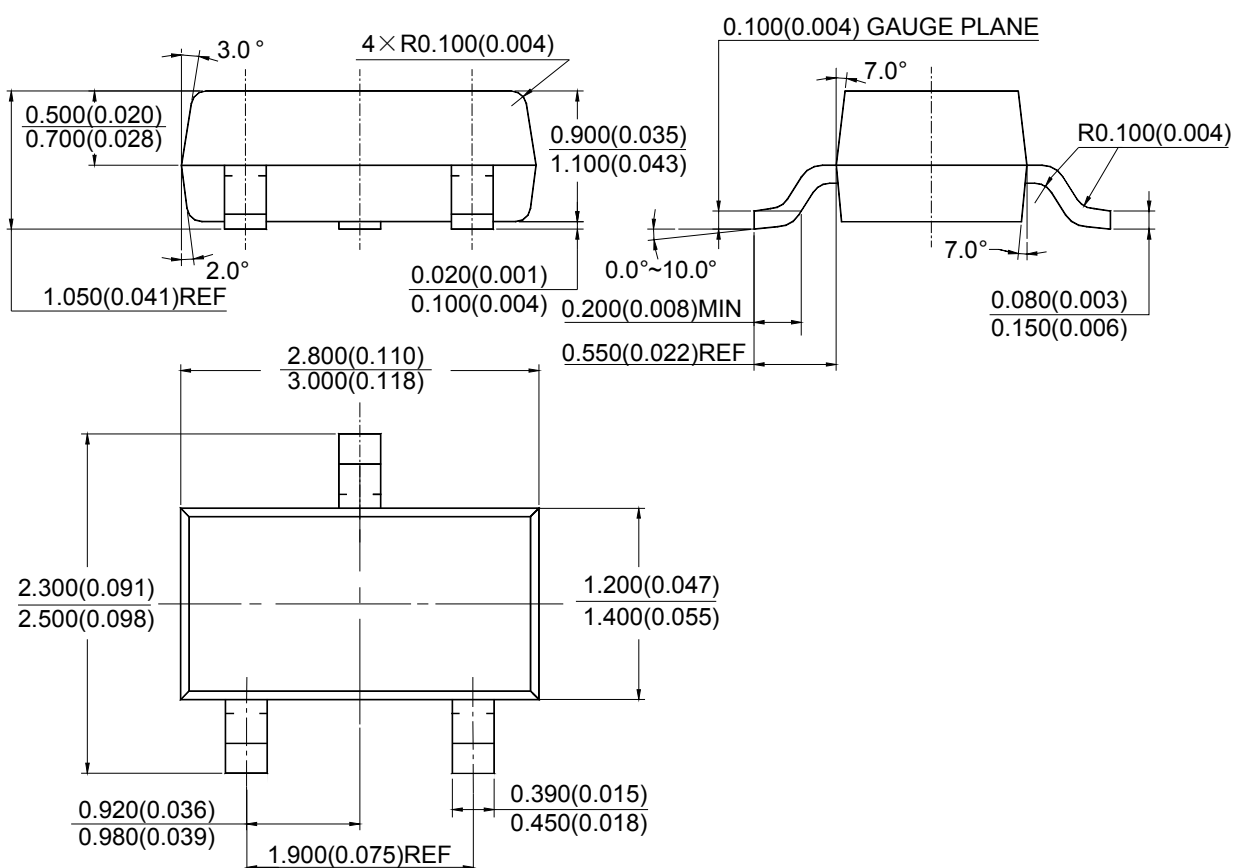
Mechanical Dimensions

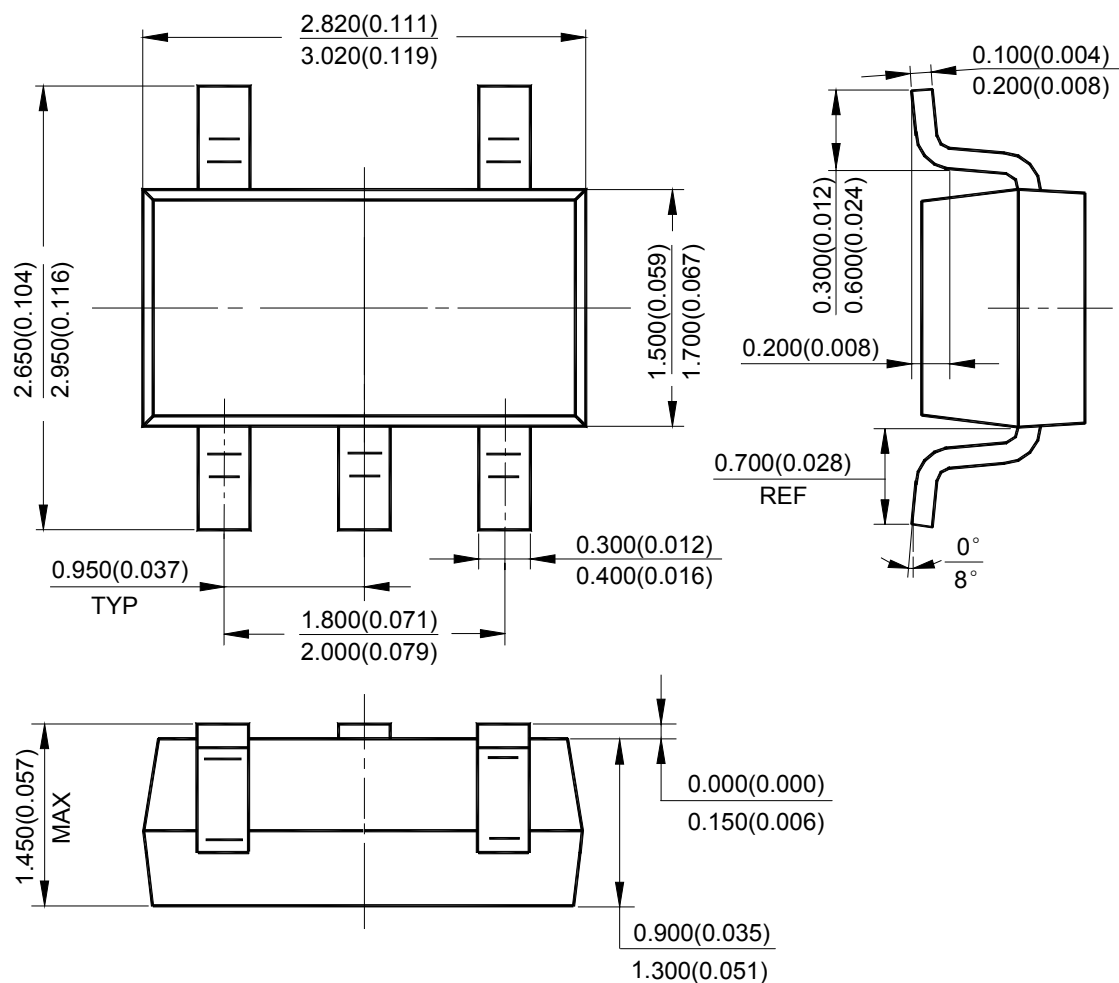
TO-92(Bulk Packing)

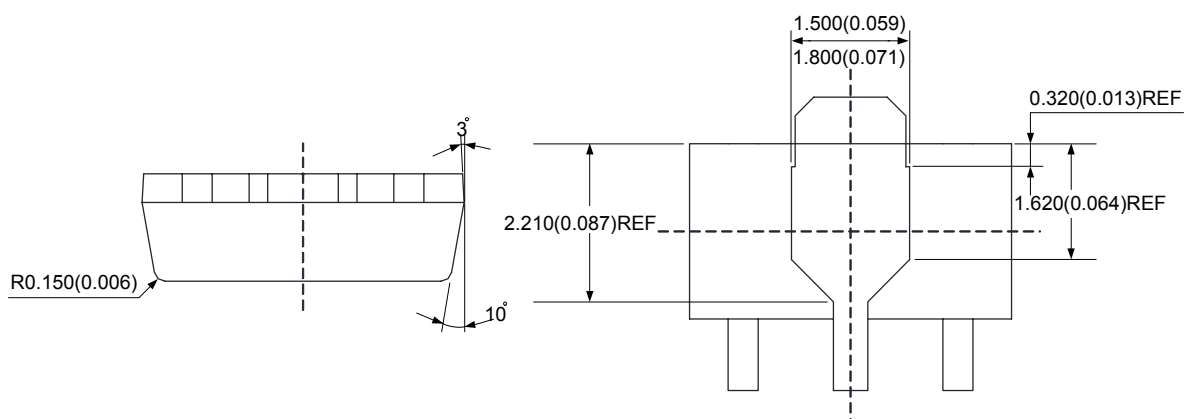
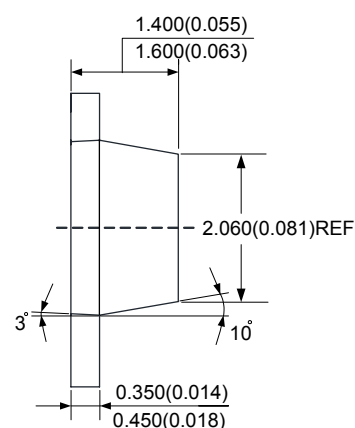
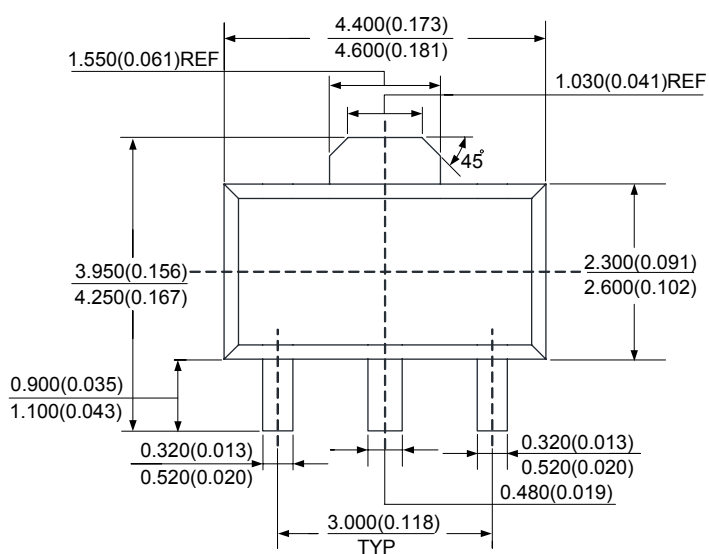
Unit: mm(inch)



**LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR****AZ432****Mechanical Dimensions (Continued)****TO-92(Ammo Packing)****Unit: mm(inch)**

**LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR****AZ432****Mechanical Dimensions (Continued)****SOT-23****Unit: mm(inch)**

**LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR****AZ432****Mechanical Dimensions (Continued)****SOT-23-5****Unit: mm(inch)**

**LOW VOLTAGE (1.25V) ADJUSTABLE PRECISION SHUNT REGULATOR****AZ432****Mechanical Dimensions (Continued)****SOT-89****Unit: mm(inch)**



BCD Semiconductor Manufacturing Limited

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