

Precision adjustable reference source

Features

Wide Programmable Precise Output Voltage from 1.25V to 18V
High Stability under Capacitive Load
Low Temperature Deviation: 3mV Typical
Low Equivalent Full-Range Temperature Coefficient: 20PPM/°C Typical
Low Dynamic Output Resistance: 0.05Ω Typical
High Sink Current Capacity from 0.1mA to 100mA
Low Output Noise
Wide Operating Range of -40 to +125°C

Applications

Graphic Card
PC Motherboard
Voltage Adapter
Switching Power Supply
Charger

Package



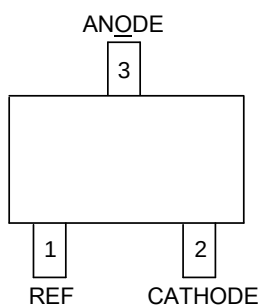
SOT23



TO92

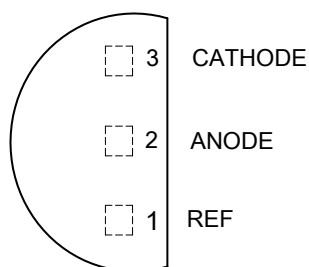
Pin Configurations

(Top View)



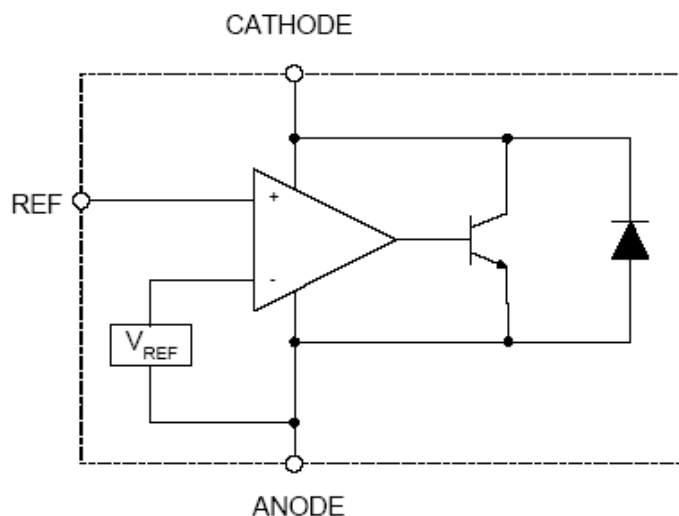
SOT-23

(Top View)



TO-92

Functional Block Diagram



Absolute Maximum Ratings (Note 2)

Symbol	Parameter	Rating		Unit
V_{KA}	Cathode Voltage	20		V
I_{KA}	Cathode Current Range (Continuous)	-100 to 100		mA
I_{REF}	Reference Input Current Range	10		mA
P_D	Power Dissipation	S Package	770	mW
		P Package	370	
T_J	Junction Temperature	+150		°C
T_{STG}	Storage Temperature Range	-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.

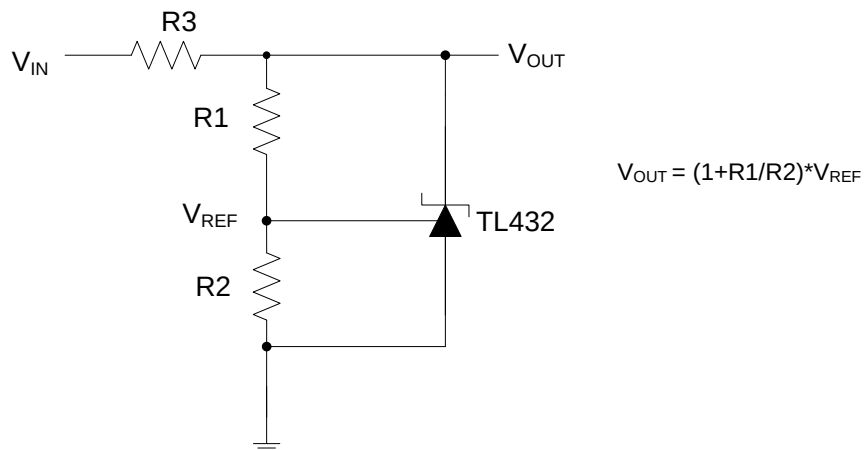
Recommended Operating Conditions

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

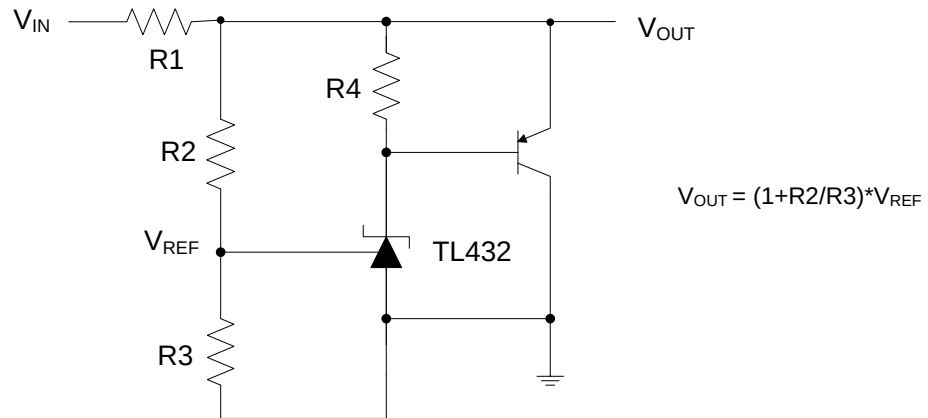
Electrical Characteristics (Typical and limits apply for $T_A = +25^\circ\text{C}$, unless otherwise noted.)

Symbol	Parameter		Test Circuit	Conditions		Min	Typ	Max	Unit
V _{REF}	Reference Voltage	0.5%	4	V _{KA} = V _{REF} , I _{KA} = 10mA		1.244	1.250	1.256	V
		1.0%				1.238	1.250	1.262	
ΔV _{REF}	Deviation of Reference Voltage Over Full Temperature Range		4	V _{KA} = V _{REF} , I _{KA} = 10mA	0 to +70°C	—	2	10	mV
					-40 to +85°C	—	3	10	
					-40 to +125°C	—	4	15	
$\frac{\Delta V_{REF}}{\Delta V_{KA}}$	Ratio of Change in V _{REF} to the Change in Cathode Voltage		5	I _{KA} = 10mA, ΔV _{KA} : V _{REF} to 16V		—	-0.5	-1.5	mV/V
I _{REF}	Reference Input Current		5	I _{KA} = 10mA, R1 = 10kΩ, R2 = ∞		—	0.15	0.4	μA
ΔI _{REF}	Deviation of Reference Current Over Full Temperature Range		5	I _{KA} = 10mA, R1 = 10kΩ, R2 = ∞, T _A = -40 to +125°C		—	0.1	0.4	μA
I _{KA} (Min)	Minimum Cathode Current for Regulation		4	V _{KA} = V _{REF}		—	55	80	μA
I _{KA} (Off)	Off-state Cathode Current		6	V _{REF} = 0, V _{KA} = 18V		—	0.04	0.10	μA
				V _{KA} = 6V, V _{REF} = 0		—	0.01	0.05	
Z _{KA}	Dynamic Impedance		4	V _{KA} = V _{REF} , I _{KA} = 1 to 100mA, f ≤ 1.0kHz		—	0.05	0.15	Ω
θ _{JC}	Thermal Resistance (Junction to Case)		—	SOT-23		—	84.84	—	°C/W
						—		—	
				TO-92		—	140.80	—	
						—		—	

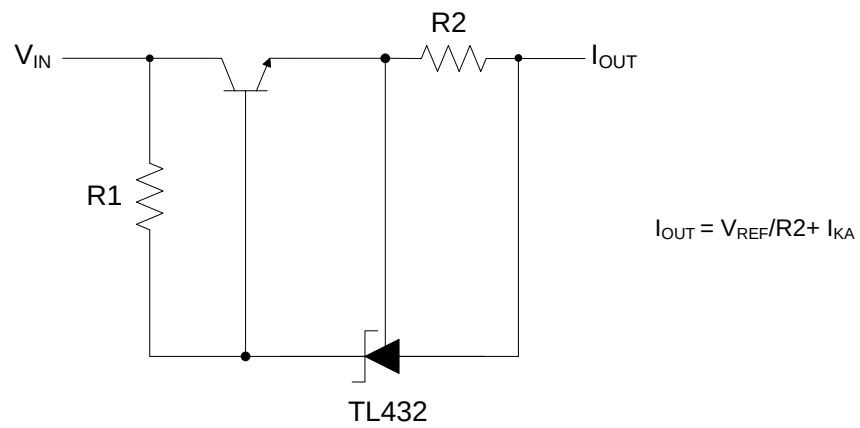
Typical Applications Circuit



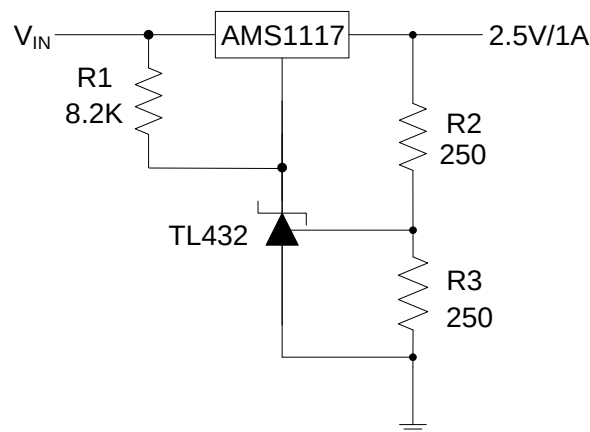
Shunt Regulator



High Current Shunt Regulator



Current Source or Current Limit

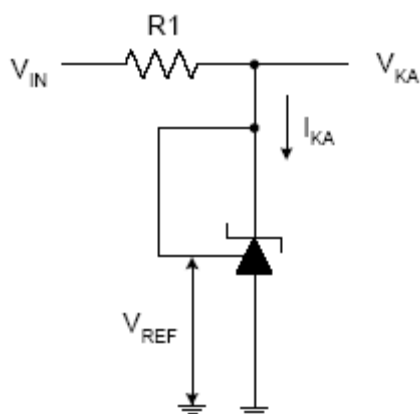


Precision 2.5V/1A Regulator

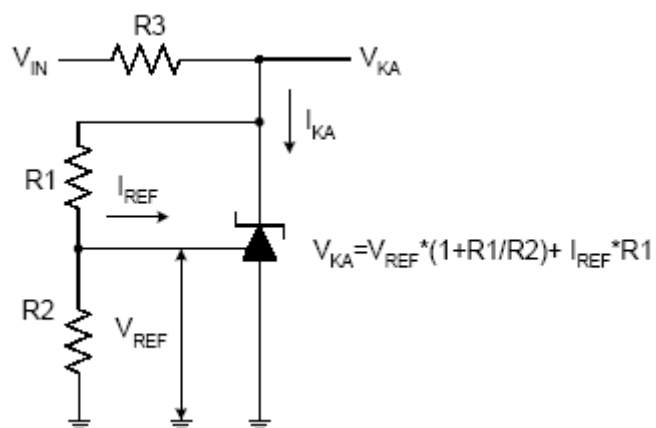
Ordering Information

Package	Temperature Range	Voltage Tolerance	Part Number		Marking ID		Packing
			RoHS Compliant	RoHS Compliant and Green	RoHS Compliant	RoHS Compliant and Green	
TO-92	-40 to +125°C	0.5%	TL432AZ-E1	TL432AZ-G1	TL432AZ-E1	TL432AZ-G1	Bulk
		0.5%	TL432AZTR-E1	TL432AZTR-G1	TL432AZ-E1	TL432AZ-G1	Ammo
		1.0%	TL432BZ-E1	TL432BZ-G1	TL432BZ-E1	TL432BZ-G1	Bulk
		1.0%	TL432BZTR-E1	TL432BZTR-G1	TL432BZ-E1	TL432BZ-G1	Ammo
SOT-23	-40 to +125°C	0.5%	TL432AIDBZR	TL432AIDBZ	432	GA8	Tape & Reel
		1.0%	TL432BNTR-E1	TL432BNTR-G1	EA9	GA9	Tape & Reel

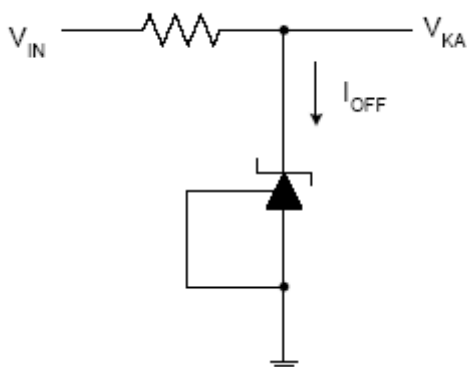
Electrical Characteristics (Cont.)



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



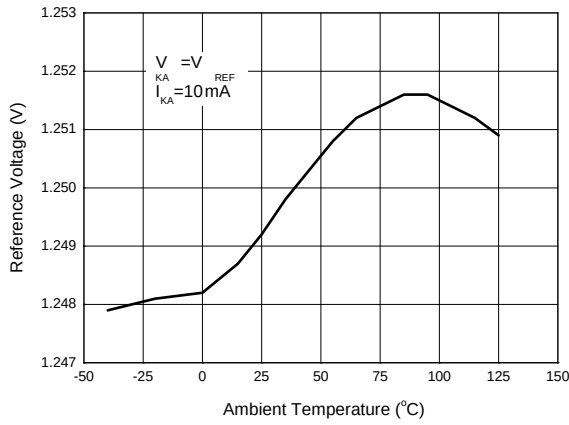
Test Circuit 5 for $V_{KA} > V_{REF}$



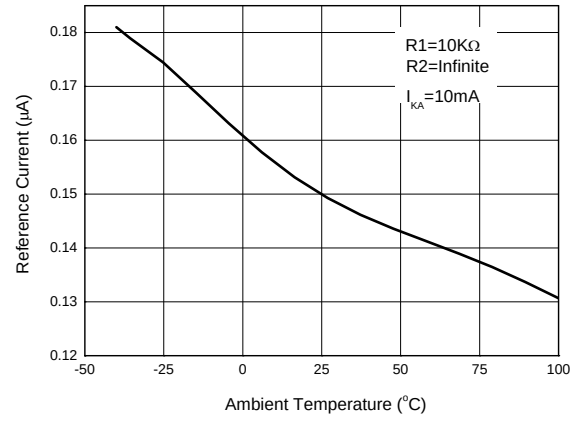
Test Circuit 6 for I_{OFF}

Performance Characteristics

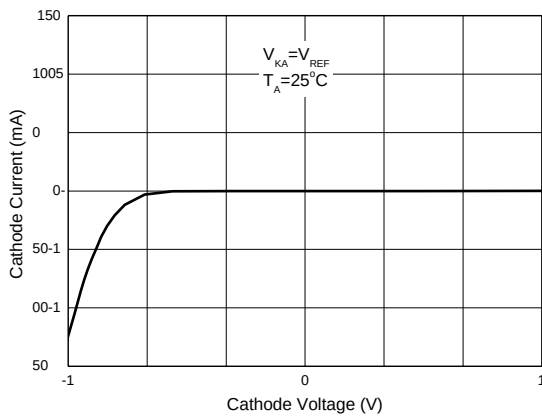
Reference Voltage vs. Ambient Temperature



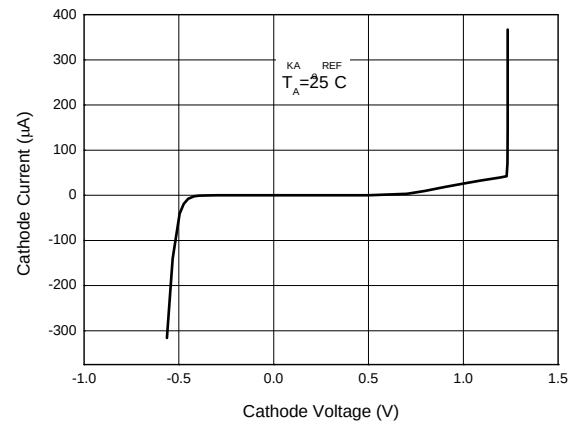
Reference Current vs. Ambient Temperature



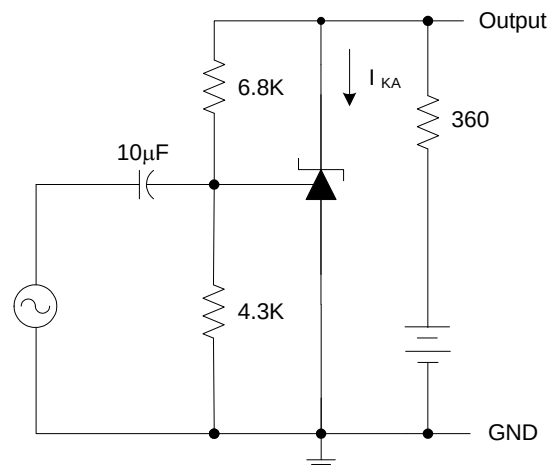
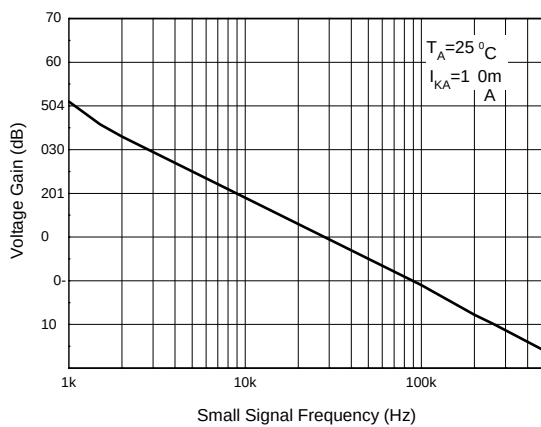
Cathode Current vs. Cathode Voltage



Cathode Current vs. Cathode Voltage

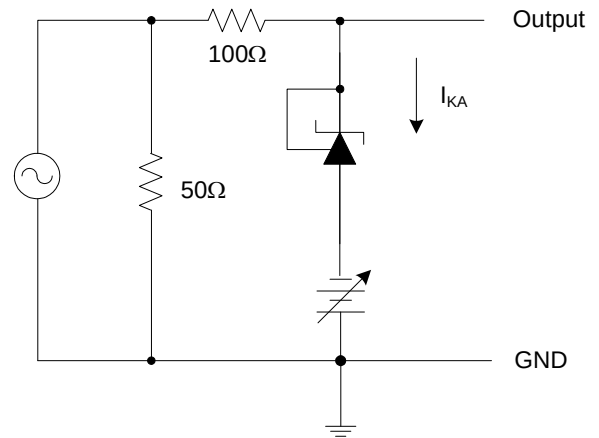
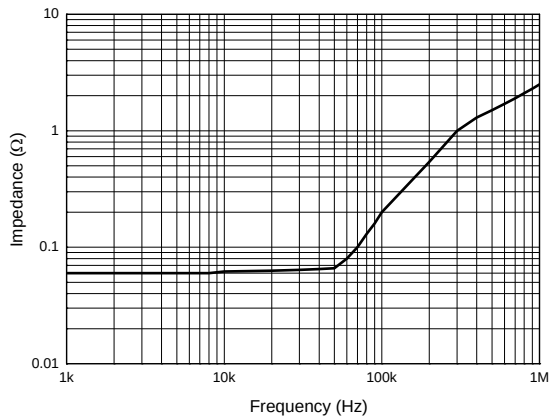


Small Signal Voltage Gain vs. Frequency

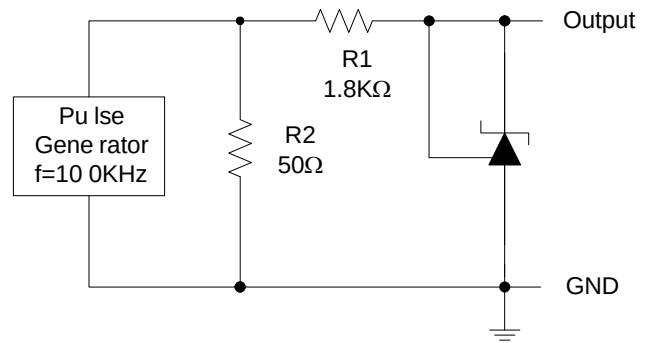
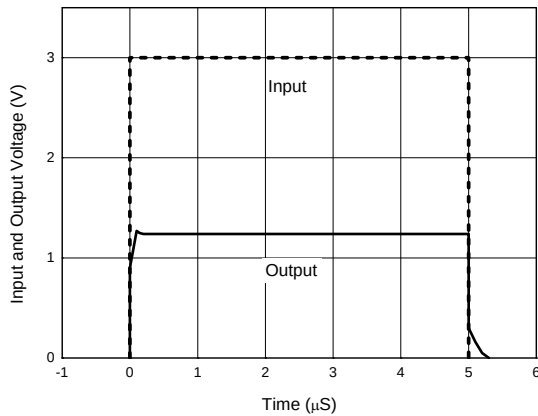


Performance Characteristics (Cont.)

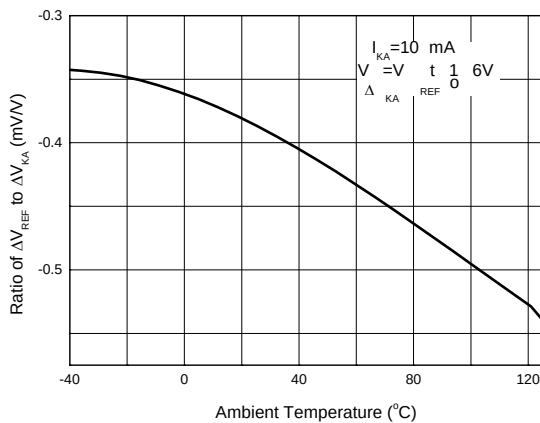
Dynamic Impedance vs. Frequency



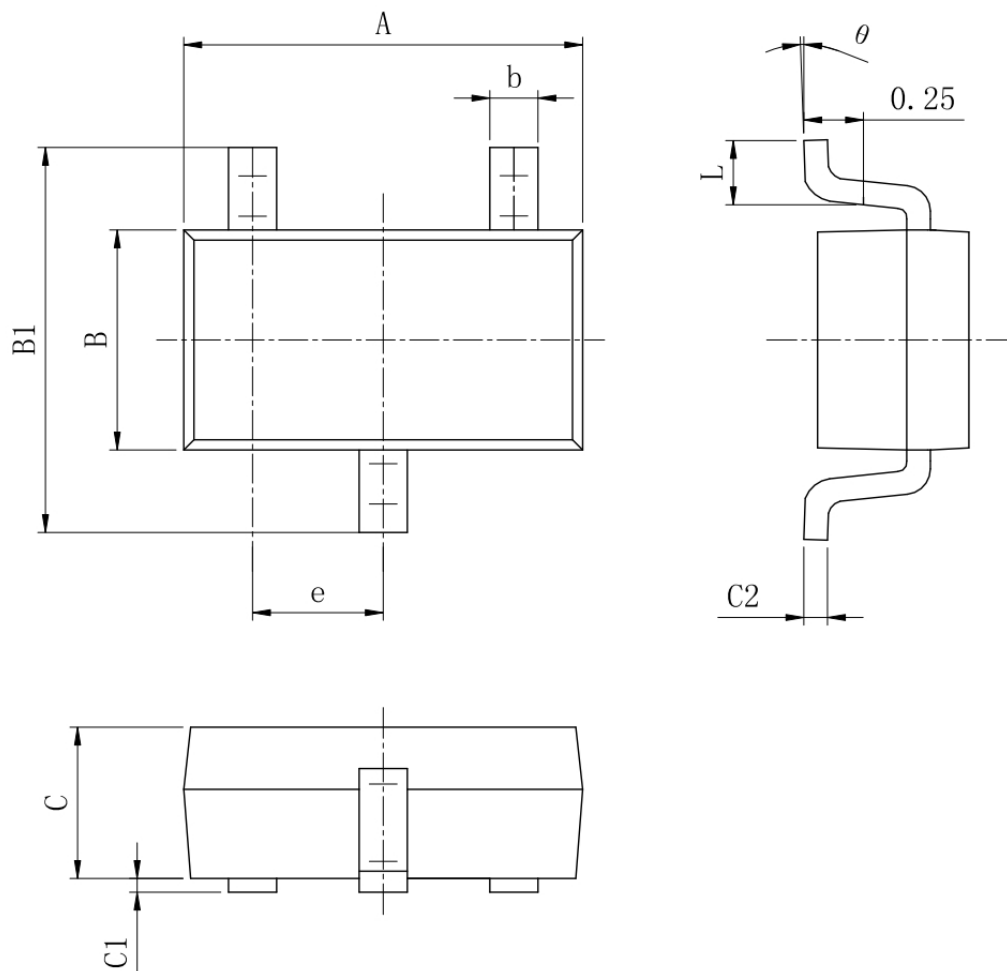
Pulse Response of Input and Output Voltage



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

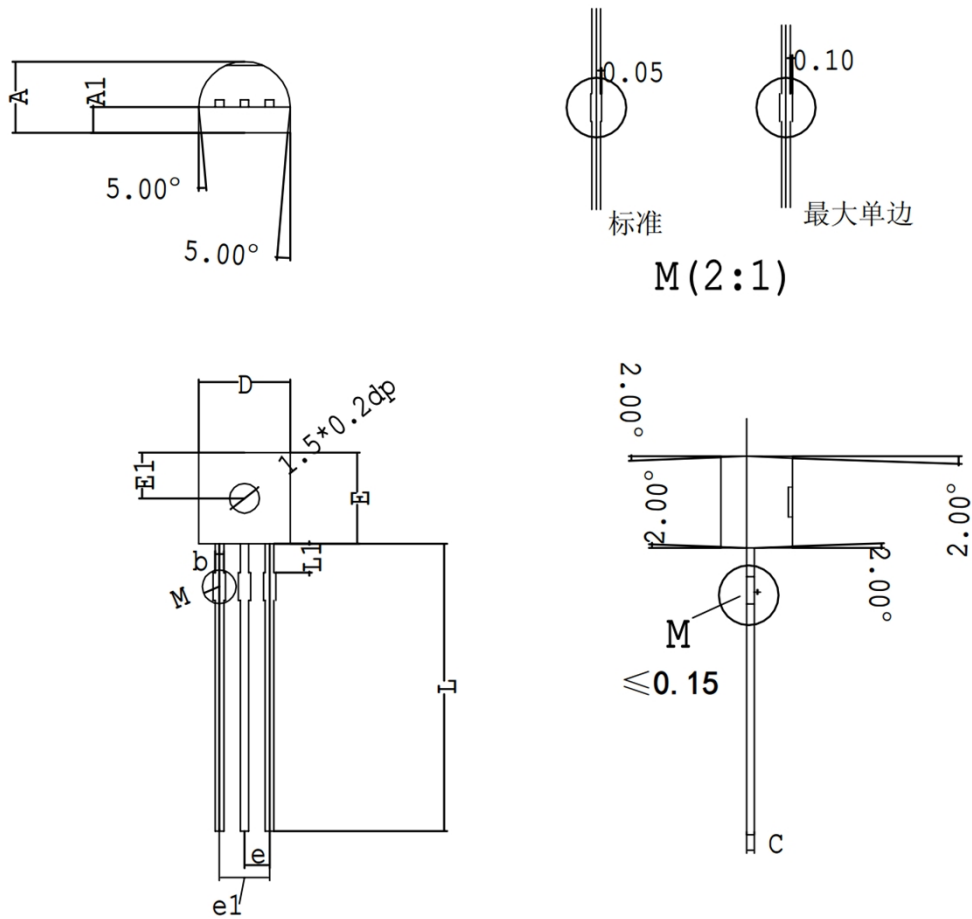


SOT23 Package Outline Dimensions



尺寸 标注	最小(mm)	最大(mm)	尺寸 标注	最小(mm)	最大(mm)
A	2.82	3.02	C	1.05	1.15
e	0.95 (BSC)		C1	0.03	0.15
b	0.28	0.45	C2	0.12	0.23
B	1.50	1.70	L	0.35	0.55
B1	2.60	3.00	θ	0°	8°

TO92 Package Outline Dimensions



COMMON DIMENSIONS UNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	3.40	3.50	3.60
A1	1.20	1.25	1.30
b	0.40	0.45	0.50
c	0.295	0.300	0.305
D	4.40	4.50	4.60
e	-	1.27TYP	-
e1	2.44	2.54	2.64
E	4.40	4.50	4.60
E1	2.20	2.30	2.40
L	14.0	14.5	15.0
L1	1.45	1.50	1.55