



**TO-92 Encapsulate Adjustable Reference Source**

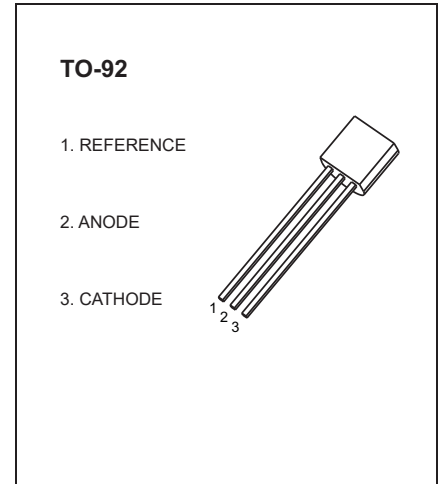
**CJ432** Adjustable Accurate Reference Source

**DEVICE DESCRIPTION**

The CJ432 is a three-terminal Shunt Voltage Reference providing a highly accuracy 1.24V. The CJ432 thermal stability and wide operating current, makes is sritable for all variety of applications that are looking for a low cost solution with high performance.

**FEATURES**

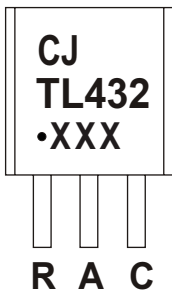
- Low dynamic output impedance
- The effective temperature compensation in the working range of full temperature
- Low output noise voltage
- Fast on -state response
- Sink current capability of 0.1mA to100mA



**APPLICATION**

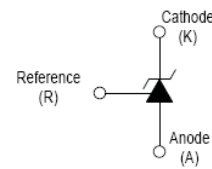
- Shunt Regulator
- High-Current Shunt Regulator
- Precision Current Limiter

**MARKING**



TL432=Device code  
 Solid dot=Green molding compound device, if none,the normal device  
 XXX=Code

**Equivalent Circuit**



**ORDERING INFORMATION**

Part Number	Package	Packing Method	Pack Quantity
CJ432	TO-92	Bulk	1000pcs/Bag
CJ432-TA	TO-92	Tape	2000pcs/Box

**ABSOLUTE MAXIMUM RATINGS (Operating temperature rangeapplies unless otherwise specified)**

Parameter	Symbol	Value	Unit
Cathode Voltage	$V_{KA}$	18	V
Cathode Current Range (continuous)	$I_{KA}$	100	mA
Reference Input Current Range	$I_{ref}$	6	$\mu A$
Power Dissipation	$P_D$	500	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	250	$^{\circ}C/W$
Operating Junction Temperature Range	$T_J$	-40~+125	$^{\circ}C$
Storage Temperature Range	$T_{stg}$	-65~+150	$^{\circ}C$

# ELECTRICAL CHARACTERISTICS

$T_a=25^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Reference input voltage (Fig 1)	$V_{\text{ref}}$	$V_{\text{KA}}=V_{\text{REF}}, I_{\text{KA}}=10\text{mA}$	1.2214		1.2586	V
Deviation of reference voltage over full temperature range (Fig 1)	$\Delta V_{\text{ref(DEV)}}$	$V_{\text{KA}}=V_{\text{REF}}, I_{\text{KA}}=10\text{mA}$ $0^\circ\text{C}\leq T_a\leq 70^\circ\text{C}$			16	mV
Ratio of change in reference input voltage to the change in cathode voltage (Fig 2)	$\Delta V_{\text{ref}}/\Delta V_{\text{KA}}$	$I_{\text{KA}}=10\text{mA}$ , $\Delta V_{\text{KA}}=1.25\text{V}\sim 15\text{V}$			2.4	mV/V
Deviation of reference input current over full temperature range (Fig 2)	$\Delta I_{\text{ref}}/\Delta T$	$I_{\text{KA}}=10\text{mA}$ , $R_1=10\text{K}\Omega$ , $R_2=\infty$ , $0^\circ\text{C}\leq T_a\leq 70^\circ\text{C}$			0.6	$\mu\text{A}$
Minimum cathode current for regulation (Fig 1)	$I_{\text{KA(min)}}$	$V_{\text{KA}}=V_{\text{REF}}$			0.1	mA
Off-state cathode current (Fig 3)	$I_{\text{off}}$	$V_{\text{KA}}=15\text{V}, V_{\text{REF}}=0$			0.5	$\mu\text{A}$
Dynamic impedance	$Z_{\text{KA}}$	$V_{\text{KA}}=V_{\text{REF}}, I_{\text{KA}}=0.1\sim 20\text{mA}$ , $f\leq 1.0\text{kHz}$			0.5	$\Omega$

## CLASSIFICATION of $V_{\text{ref}}$

Rank	1%	1.5%
Range	1.2276~1.2524	1.2214~1.2586

Figure 1. Test Circuit for  $V_{\text{KA}} = V_{\text{ref}}$

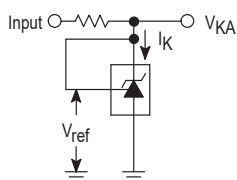


Figure 2. Test Circuit for  $V_{\text{KA}} > V_{\text{ref}}$

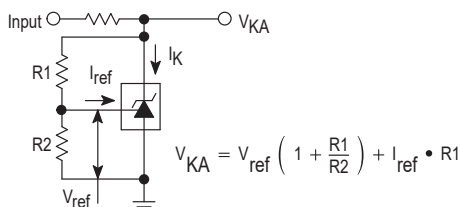
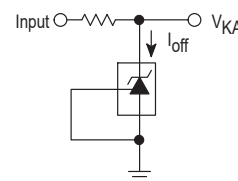
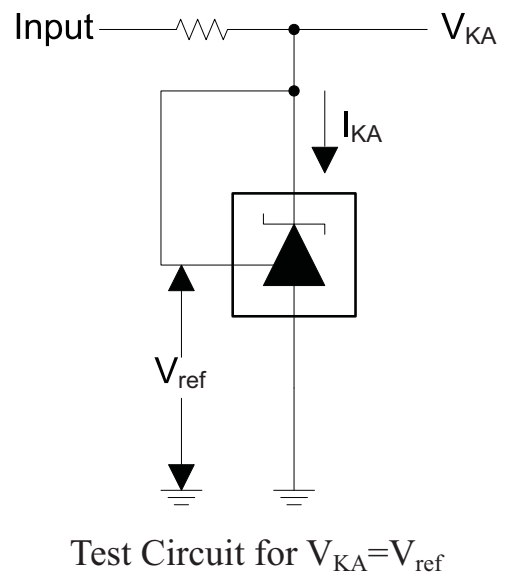
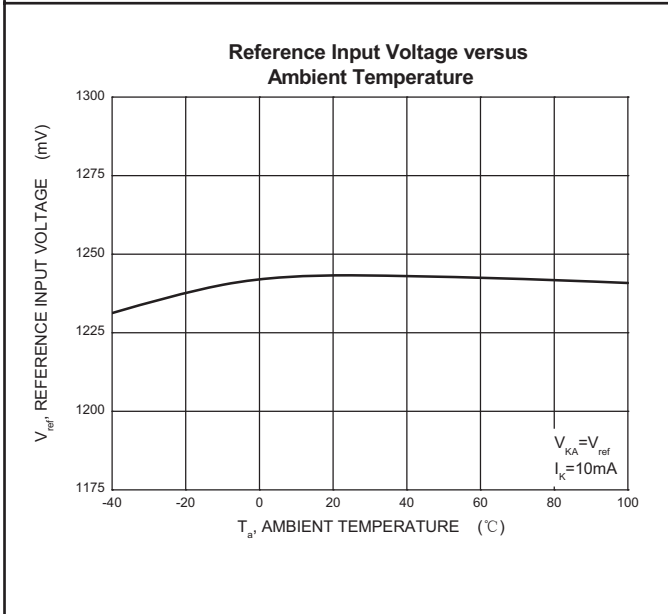
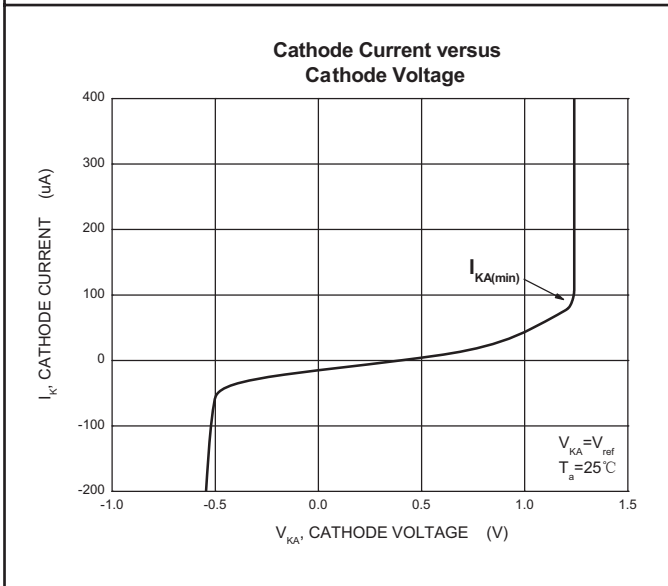
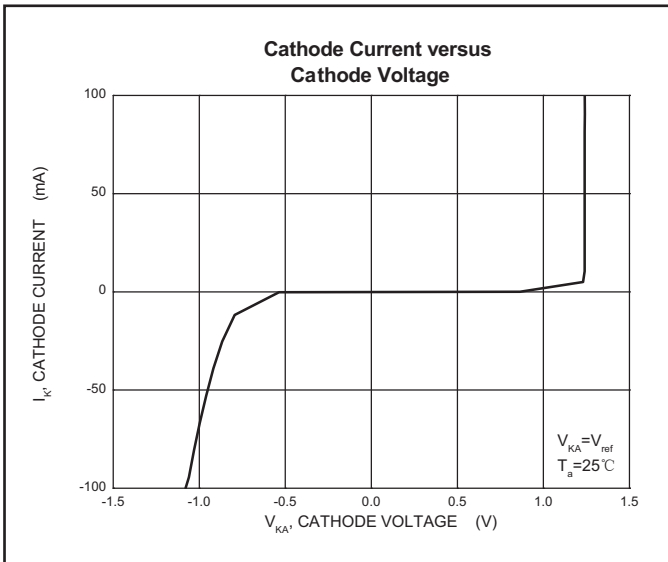


Figure 3. Test Circuit for  $I_{\text{off}}$



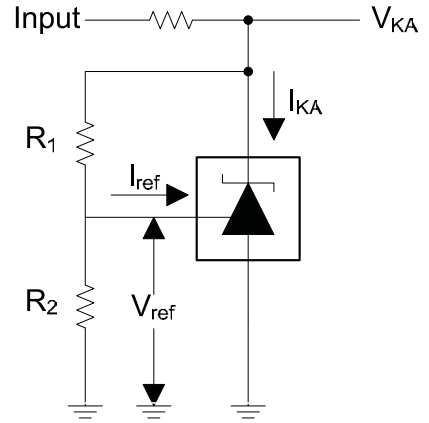
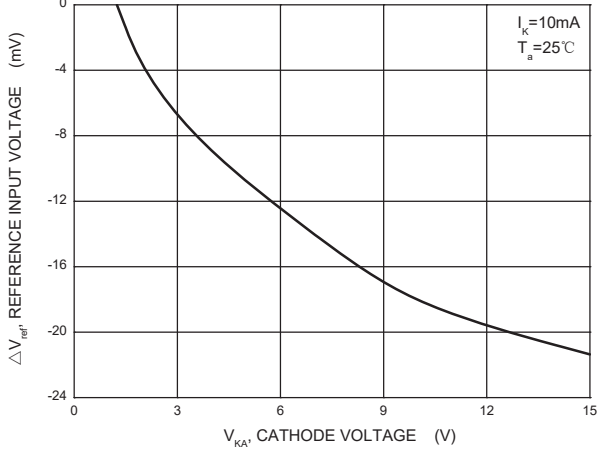
**NOTE:** It is strongly recommended to connect a capacitor (value more than  $0.1\mu\text{F}$ ) at the output pin to smooth the output. The capacitor should be placed as close as possible to the output pin, with the shortest path to GND.

# Typical Characteristics



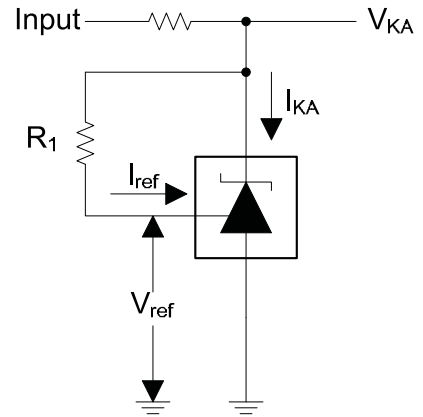
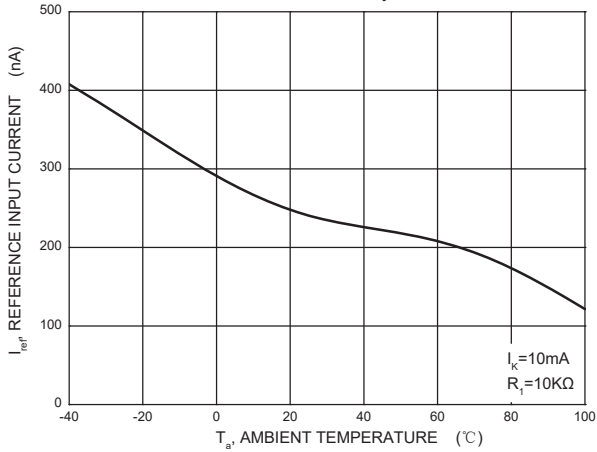
# Typical Characteristics

**Change in Reference Input Voltage versus Cathode Voltage**



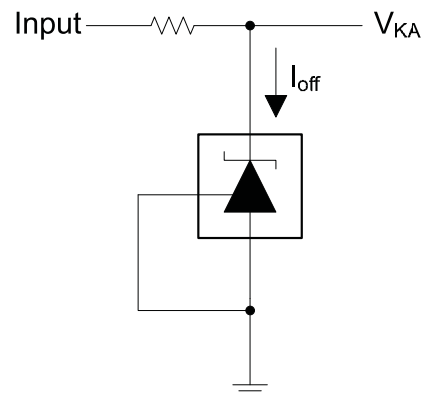
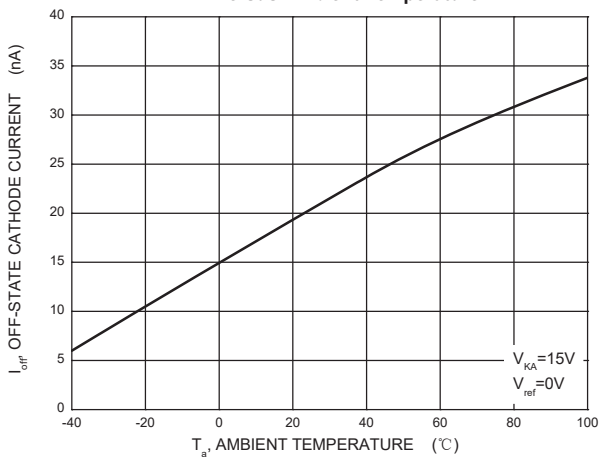
Test Circuit for  $V_{KA} = V_{ref}(1 + R_1/R_2) + R_1 \cdot I_{ref}$

**Reference Input Current versus Ambient Temperature**



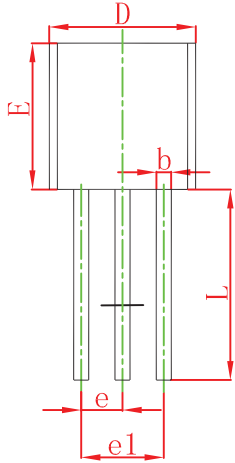
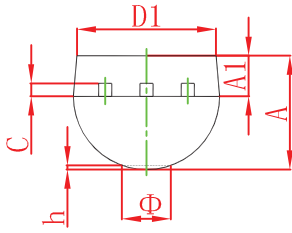
Test Circuit for I<sub>ref</sub>

**Off-State Cathode Current versus Ambient Temperature**



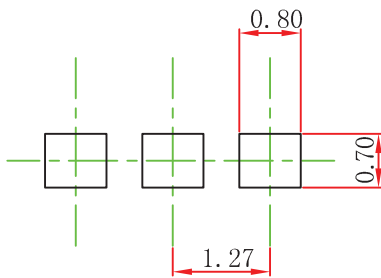
Test Circuit for I<sub>off</sub>

## TO-92 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
r		1.600		0.063
h	0.000	0.380	0.000	0.015

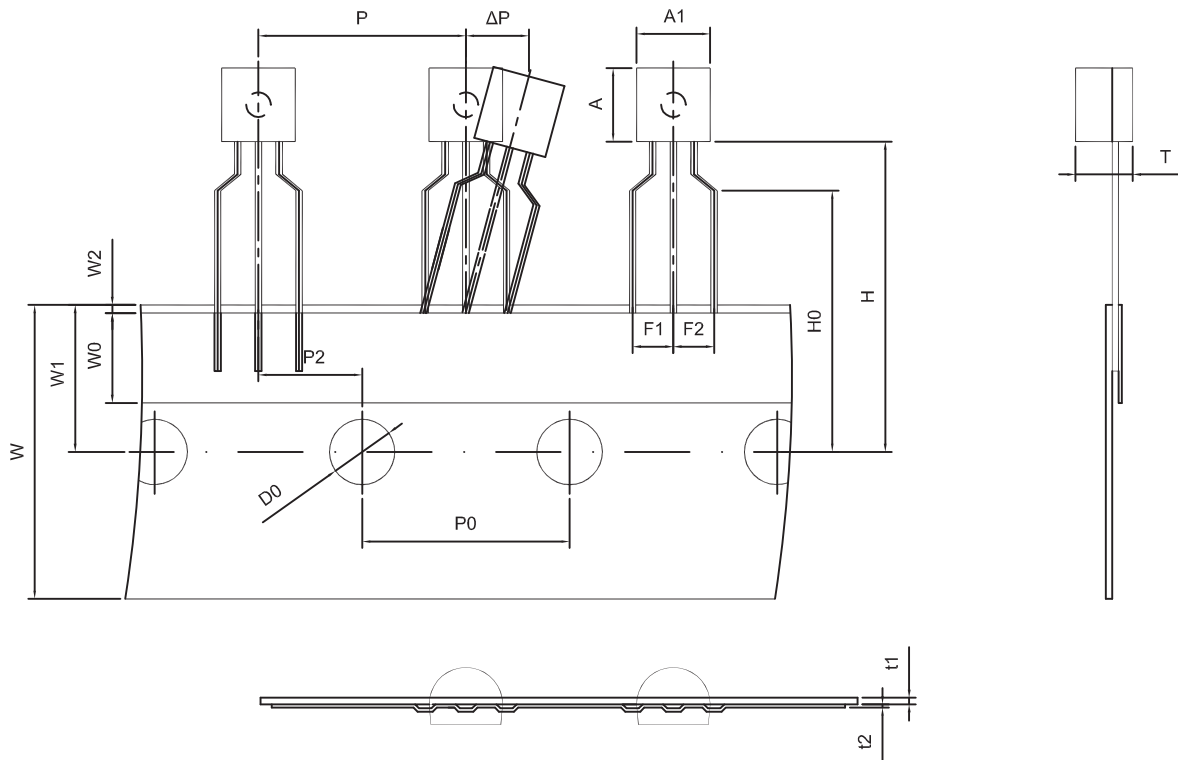
## TO-92 Suggested Pad Layout



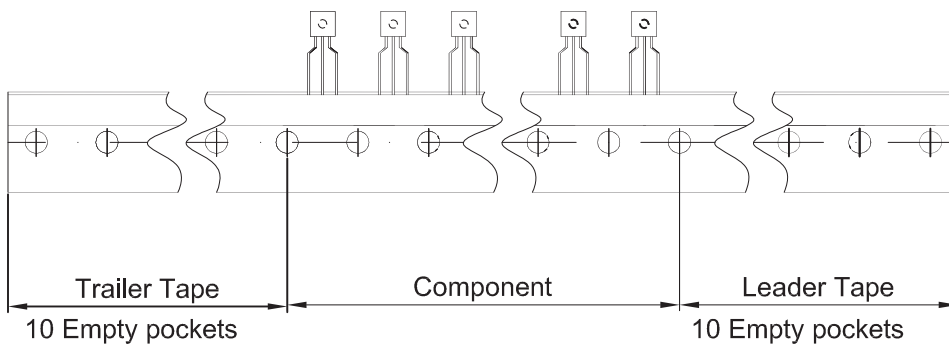
### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

TO-92 PACKAGE TAPEING DIMENSION



Dimiensions are in millimeter								
A1	A	T	P	P0	P2	F1	F2	W
4.5	4.5	3.5	12.7	12.7	6.35	2.5	2.5	18.0
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0	9.0	1.0 MAX.	19.0	16.0	4.0	0.4	0.2	0



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000 pcs	333×162×43	20,000 pcs	350×340×250

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