



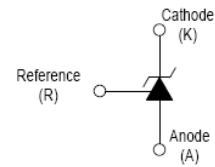
**CJ431K Adjustable Reference Source**

**CJ431K** Adjustable Accurate Reference Source

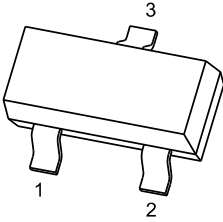
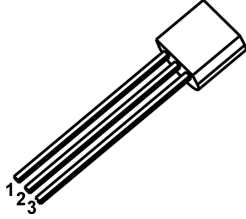
**FEATURES**

- The output voltage can be adjusted to 36V
- Low dynamic output impedance ,its typical value is 0.2Ω
- Trapping current capability is 1 to 100mA
- The typical value of the equivalent temperature factor in the whole temperature scope is 50 ppm/°C
- The effective temperature compensation in the working range of full temperature
- Low output noise voltage
- Fast on-state response
- ESD protected up to 2KV

**Equivalent Circuit**



**PIN CONNENCTIONS and MARKING**

<p><b>CJ431K</b></p> 	<p><b>SOT -23</b></p> <p>1.REFERENCE 2.CATHODE 3. ANODE</p>
<p><b>CJ431K</b></p> 	<p><b>TO-92</b></p> <p>1.REFERENCE 2.ANODE 3.CATHODE</p>

## ORDERING INFORMATION

Part Number	MARKING <sup>(1)</sup>	Package	Packing Method	Pack Quantity
CJ431K	431K •	SOT-23	Reel	3000pcs/Reel
CJ431K	CJ <sup>(2)</sup> TL431K • XXX	TO-92	Bulk	1000pcs/Bag
CJ431K-TA	CJ <sup>(2)</sup> TL431K • XXX	TO-92	Tape	2000pcs/Box

Notes:(1).Solid dot=Green molding compound device,if none,the normal device.

(2).XXX=Code

## ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

Parameter	Symbol	Value	Units
Cathode Voltage	$V_{KA}$	37	V
Cathode Current Range (Continuous)	$I_{KA}$	-100~+150	mA
Reference Input Current Range	$I_{ref}$	0.05~+10	mA
Power Dissipation	$P_D$	770	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	162	°C/W
Operating temperature	$T_{opr}$	-25~+125	°C
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{stg}$	-65~+150	°C

## ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Reference input voltage	$V_{ref}$	$V_{KA}=V_{REF}, I_{KA}=10mA$	2.470		2.520	V
Deviation of reference input voltage over temperature (note)	$\Delta V_{ref}/\Delta T$	$V_{KA}=V_{REF}, I_{KA}=10mA$ $T_{min} \leq T_a \leq T_{max}$		4.5	17	mV
Ratio of change in reference Input voltage to the change in cathode voltage	$\Delta V_{ref}/\Delta V_{KA}$	$I_{KA}=10mA$	$\Delta V_{KA}=10V \sim V_{REF}$	-1.0	-2.7	mV/V
			$\Delta V_{KA}=36V \sim 10V$	-0.5	-2.0	mV/V
Reference input current	$I_{ref}$	$I_{KA}=10mA, R_1=10k\Omega$ $R_2=\infty$		1.5	4	$\mu A$
Deviation of reference input current over full temperature range	$\Delta I_{ref}/\Delta T$	$I_{KA}=10mA, R_1=10k\Omega$ $R_2=\infty$ $T_A=-25$ to $125^\circ C$		0.4	1.2	$\mu A$
Minimum cathode current for regulation	$I_{KA(min)}$	$V_{KA}=V_{REF}$		0.45	1.0	mA
Off-state cathode current	$I_{KA(OFF)}$	$V_{KA}=40V, V_{REF}=0$		0.05	0.5	$\mu A$
Dynamic impedance	$Z_{KA}$	$V_{KA}=V_{REF}, I_{KA}=1$ to $100mA$ $f \leq 1.0kHz$		0.15	0.5	$\Omega$

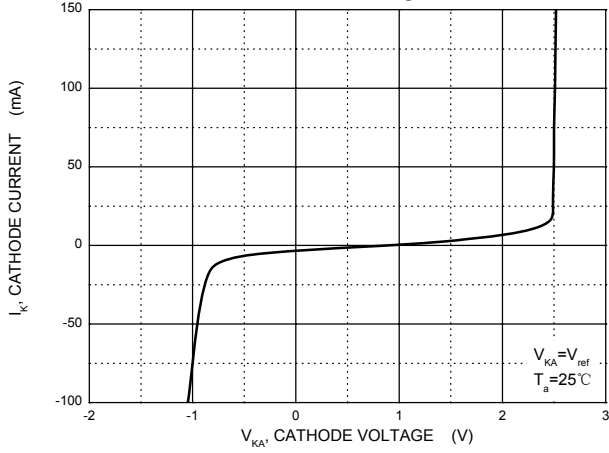
Note:  $T_{MIN}=-25^\circ C, T_{MAX}=+125^\circ C$

## CLASSIFICATION OF $V_{ref}$

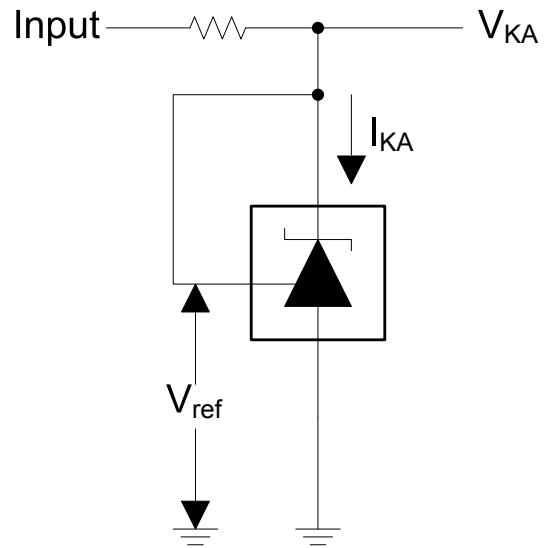
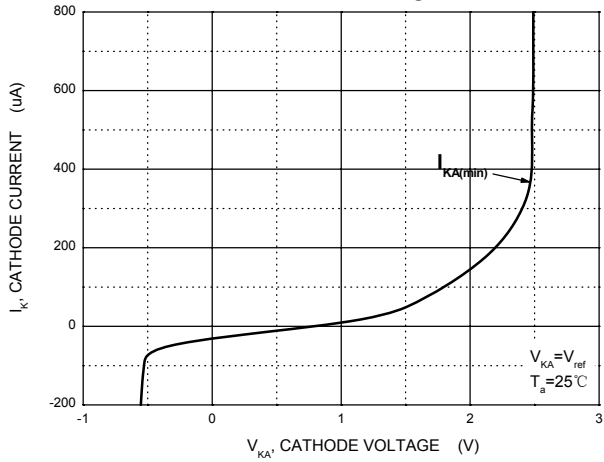
Rank	0.5%	1%
Range	2.482-2.508	2.47-2.52

# Typical Characteristics

**Cathode Current versus Cathode Voltage**

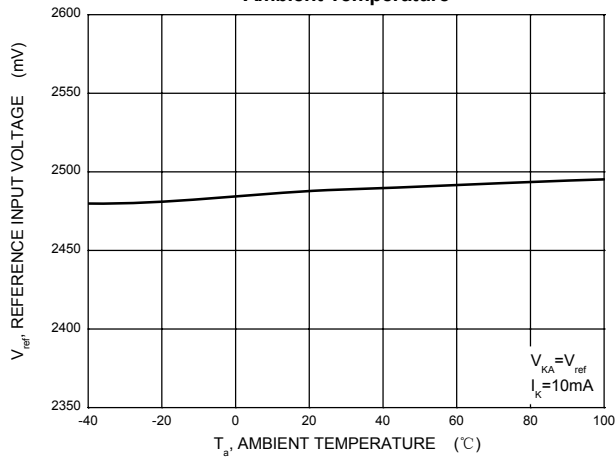


**Cathode Current versus Cathode Voltage**

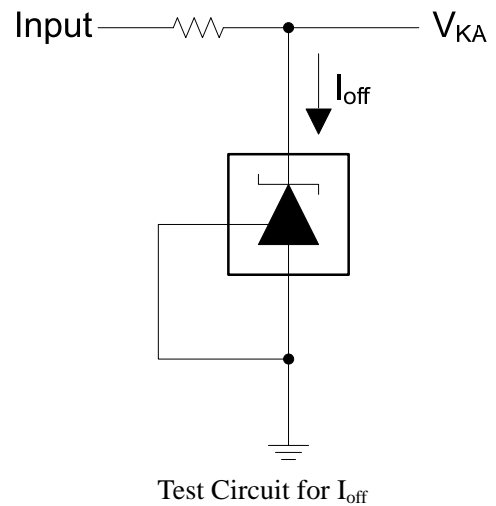
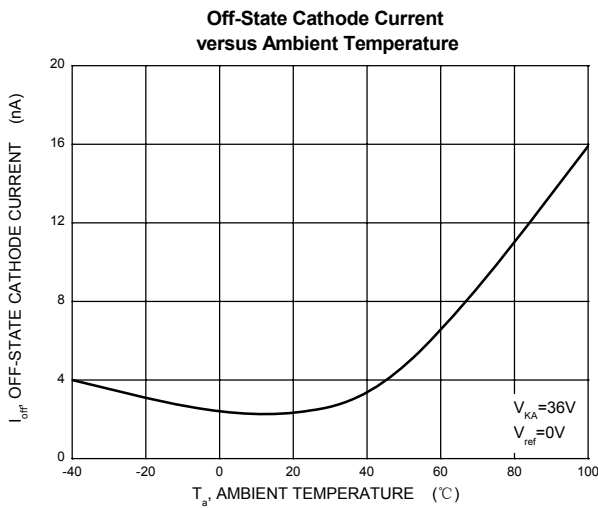
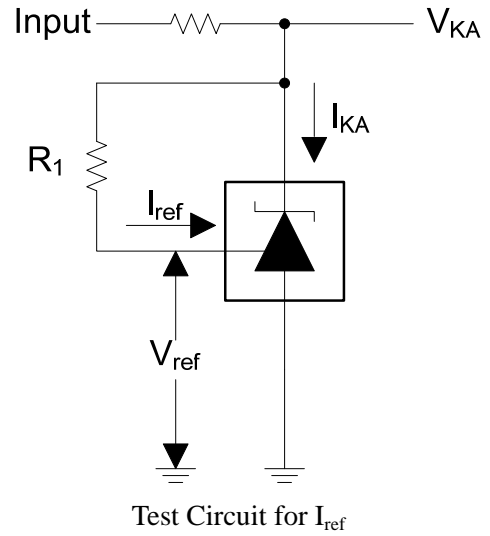
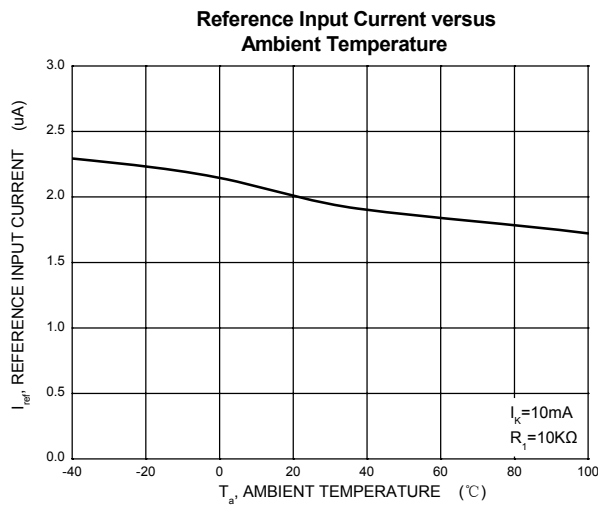
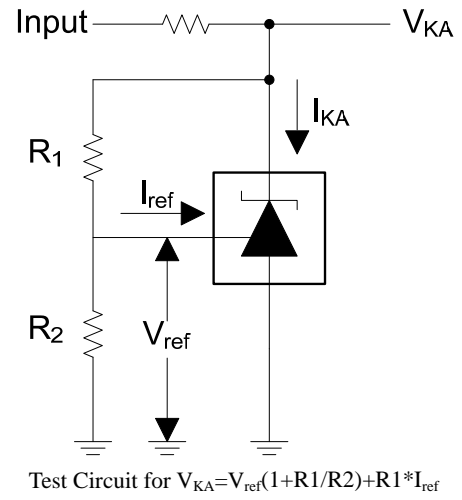
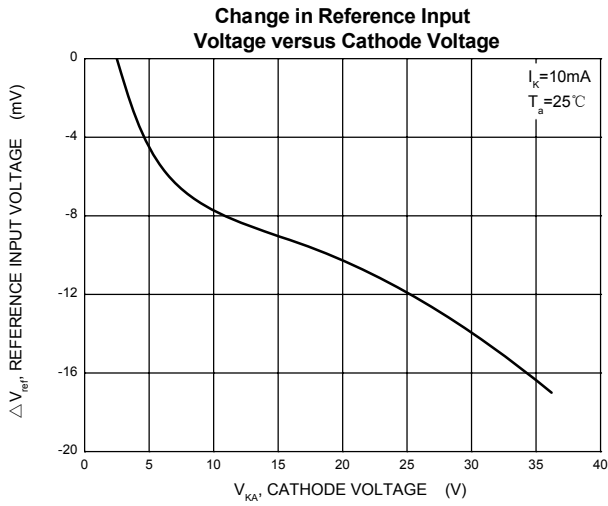


Test Circuit for  $V_{KA} = V_{ref}$

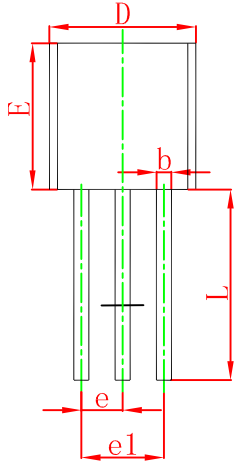
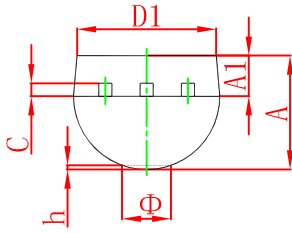
**Reference Input Voltage versus Ambient Temperature**



# Typical Characteristics

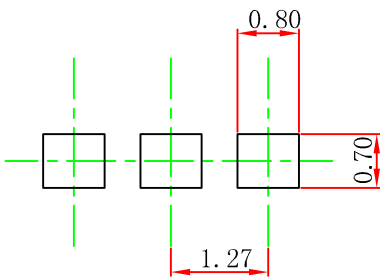


## TO-92 Package Outline Dimensions



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
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

## TO-92 Suggested Pad Layout



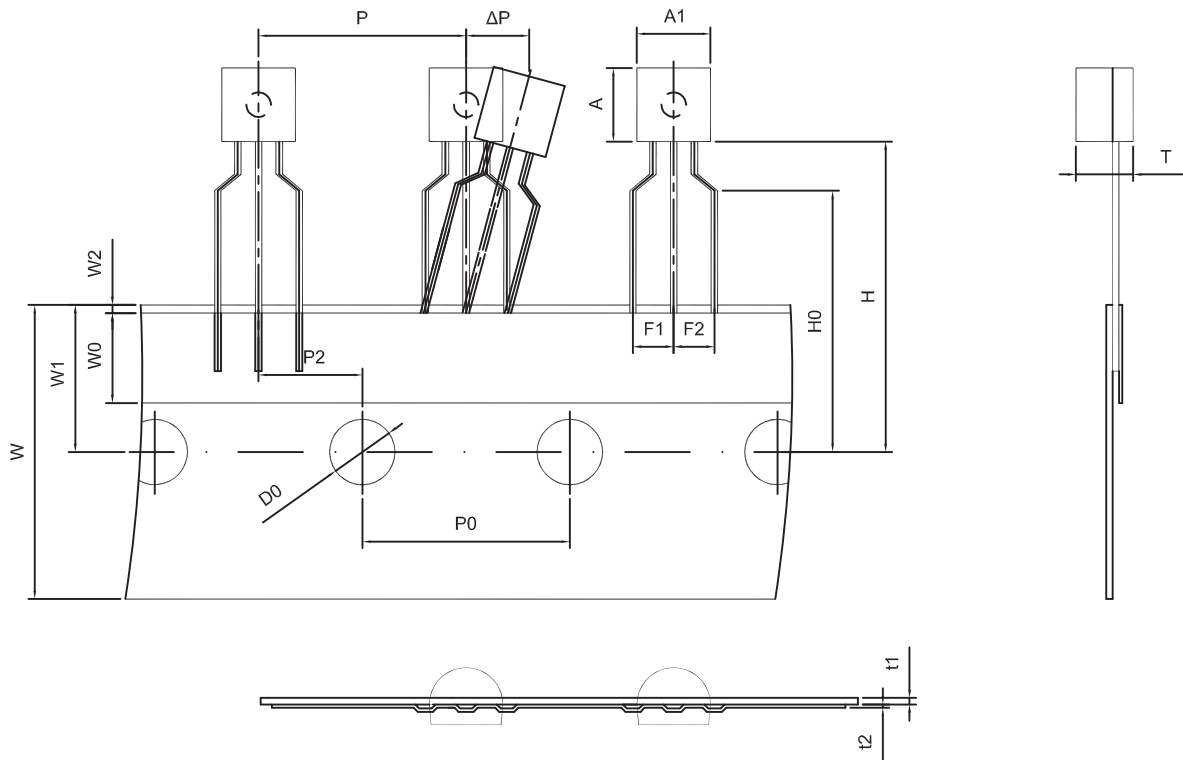
### Note:

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

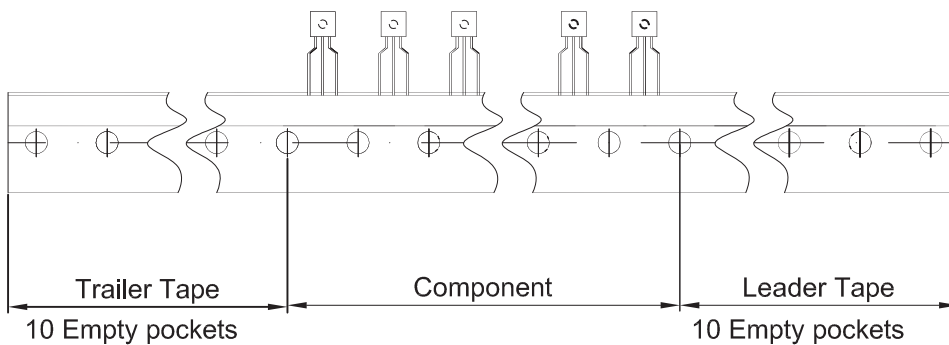
### NOTICE

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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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