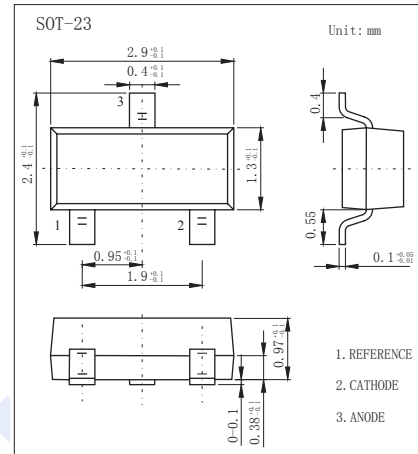
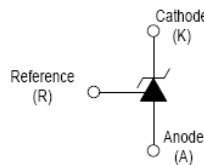


## Adjustable Accurate Reference Source TL431K (KL431K)

### ■ 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
- Low output noise voltage
- Fast on -state response



### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Cathode Voltage	$V_{KA}$	37	V
Cathode Current Range(Continuous)	$I_{KA}$	-100~+150	mA
Reference Input Current Range	$I_{ref}$	0.05~+10	
Maximum Power Dissipation	$P_D$	300	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Operating Junction Temperature	$T_j$	150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_{opr}$	0 ~ 70	
Storage Temperature Range	$T_{stg}$	-65 ~ 150	

### ■ Electrical Characteristics $T_a = 25^\circ\text{C}$ (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Reference Input Voltage(Fig.1)	$V_{ref}$	$V_{KA}=V_{REF}, I_{KA}=10\text{mA}$	2.445	2.495	2.545	V	
		Rank	0.5%		2.482		2.508
			1%		2.47		2.52
Deviation of Reference Input Voltage Over Temperature(Fig.1) $T_{min}=0^\circ\text{C}, T_{max}=+70^\circ\text{C}$	$\Delta V_{ref}/\Delta T$	$V_{KA}=V_{REF}, I_{KA}=10\text{mA}$ $T_{min} \leq T_a \leq T_{max}$		4.5	17	mV	
Ratio Of Change in Reference Input Voltage to the Change in Cathode Voltage (Fig.2)	$\Delta V_{ref}/\Delta V_{KA}$	$I_{KA}=10\text{mA}$	$\Delta V_{KA}=V_{REF} \sim 10\text{V}$		-1.0	-2.7	mV/V
			$\Delta V_{KA}=10\text{V} \sim 36\text{V}$		-0.5	-2.0	
Reference Input Current	$I_{ref}$	$I_{KA}=10\text{mA}, R_1=10\text{k}\Omega, R_2=\infty$		1.5	4	uA	
Deviation Of Reference Input Current Over Full Temperature Range(Fig.2)	$I_{ref}/\Delta T$	$I_{KA}=10\text{mA}, R_1=10\text{k}\Omega, R_2=\infty$ $T_a=\text{full Temperature}$		0.4	1.2		
Minimum Cathode Current for Regulation(Fig.1)	$I_{KA(min)}$	$V_{KA}=V_{REF}$		0.45	1.0	mA	
Off-state Cathode Current(Fig.3)	$I_{KA(OFF)}$	$V_{KA}=40\text{V}, V_{REF}=0$		0.05	0.5	uA	
Dynamic Impedance	$Z_{KA}$	$V_{KA}=V_{REF}, I_{KA}=1\text{ to }100\text{mA}, f \leq 1.0\text{KHz}$		0.15	0.5	$\Omega$	

### ■ Marking

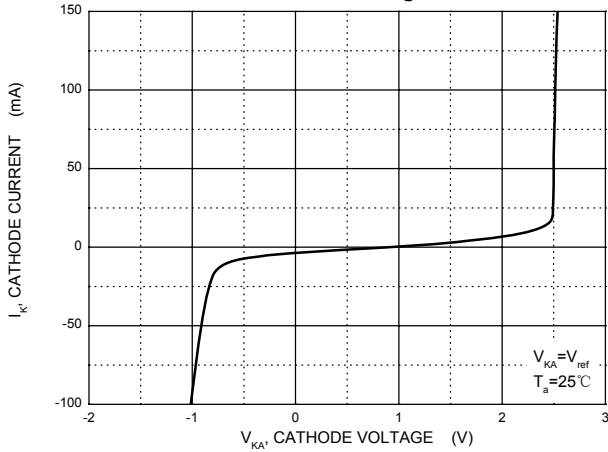
Marking	431
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# Adjustable Accurate Reference Source

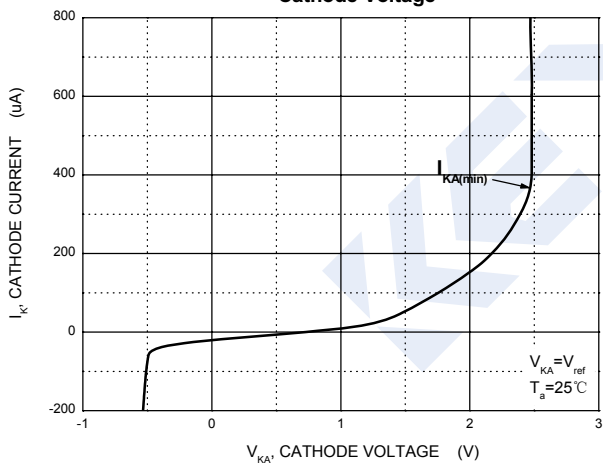
## TL431K (KL431K)

### ■ Typical Characteristics

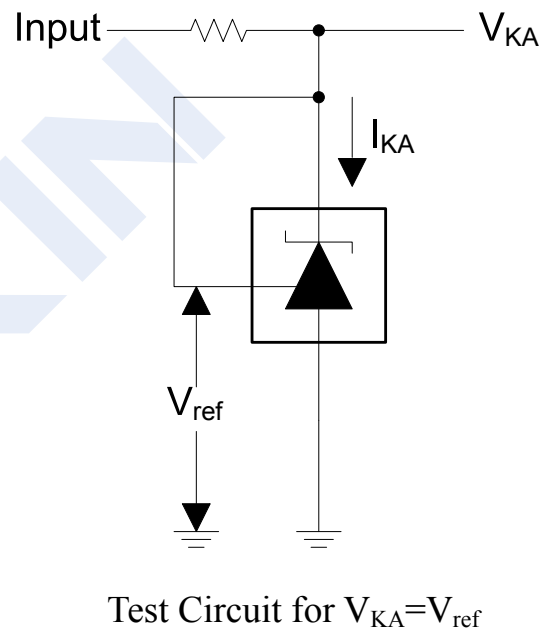
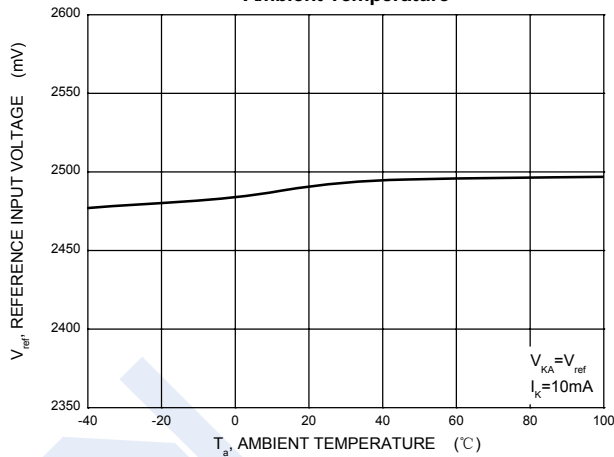
Cathode Current versus Cathode Voltage



Cathode Current versus Cathode Voltage



Reference Input Voltage versus Ambient Temperature



# Adjustable Accurate Reference Source

## TL431K (KL431K)

### Typical Characteristics

