



Adjustable Accurate Reference Source



TL431

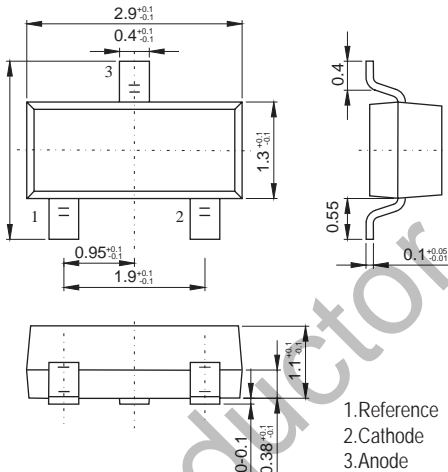
Features:

- The output voltage can be adjusted to 36V
- Low dynamic output impedance, its typical value is 0.2 Ω
- 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



SOT-23

Unit: mm



1.Reference
2.Cathode
3.Anode

■ Absolute Maximum Ratings (Operating temperature range applies unless otherwise specified)

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	mA
Power Dissipation	P _D	350	mW
Operating Temperature	T _{OPR}	0 ~ 70	°C
Storage Temperature Range	T _{STG}	-65 ~ +150	°C

■ Electrical Characteristics (T_a = 25°C unless otherwise specified)

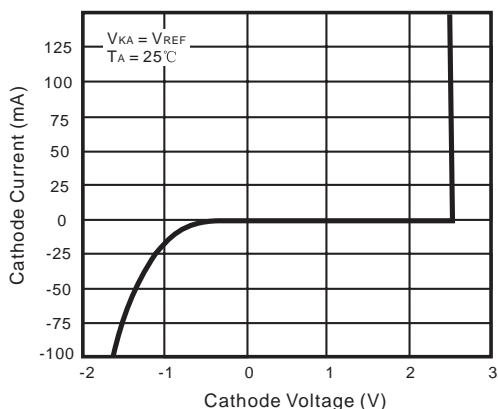
Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Reference Input Voltage	V _{REF}	V _{KA} = V _{REF} , I _{KA} = 10mA	2.45	2.5	2.55	V
Deviation of Reference Input Voltage Over Temperature *	ΔV _{REF} /ΔT	V _{KA} = V _{REF} , I _{KA} = 10mA T _{min} ≤ T _a ≤ T _{max}		4.5	17	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	ΔV _{REF} /ΔV _{KA}	I _{KA} = 10mA, ΔV _{KA} = 10V ~ V _{REF} I _{KA} = 10mA, ΔV _{KA} = 36V ~ 10V		-1.0	-2.7	mV/V
Reference Input Current	I _{REF}	I _{KA} = 10mA, R ₁ = 10KΩ, R ₂ = ∞		1.5	4	μA
Deviation of Reference Input Current Over Full Temperature Range	ΔI _{REF} /ΔT	I _{KA} = 10mA, R ₁ = 10KΩ, R ₂ = ∞ T _A = Full Temperature		0.4	1.2	μA
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} = 36V, V _{REF} = 0		0.05	1.0	μA
Dynamic Impedance	Z _{KA}	V _{KA} = V _{REF} , I _{KA} = 1 to 100mA, f ≤ 1.0KHz		0.15	0.5	Ω

* T_{MIN} = 0°C, T_{MAX} = +70°C

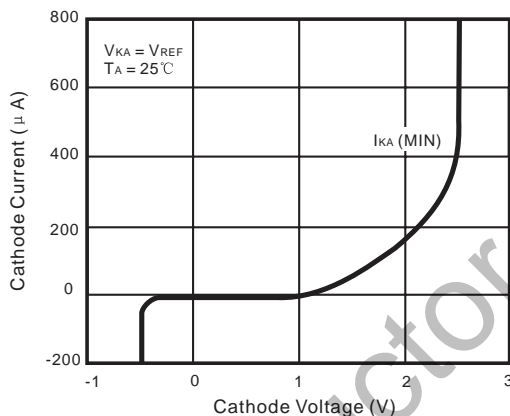
■ Classification Of V_{REF}

Rank	0.3%	0.5%	1%	2%
Range	2.493~2.508	2.487~2.512	2.475~2.525	2.450~2.550

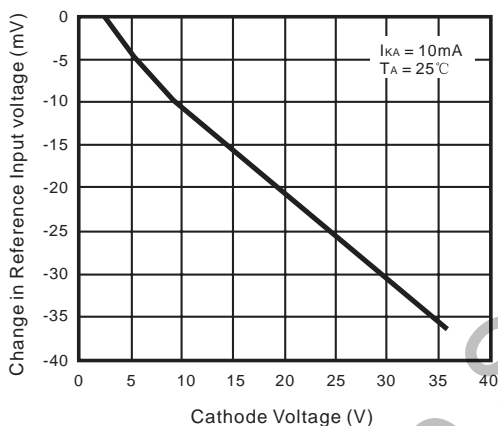
Typical Characteristics



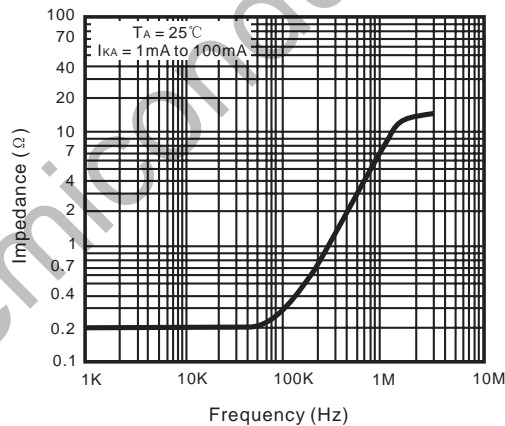
Cathode Current vs. Cathode Voltage



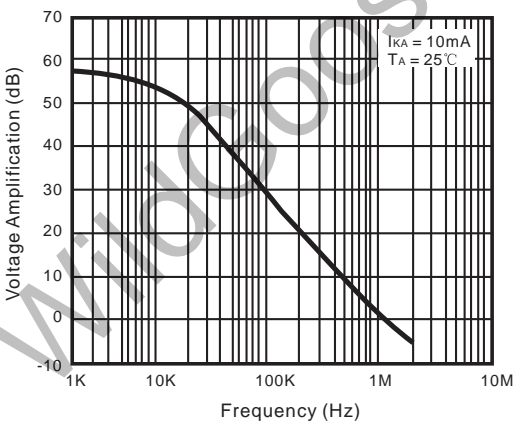
Cathode Current vs. Cathode Voltage



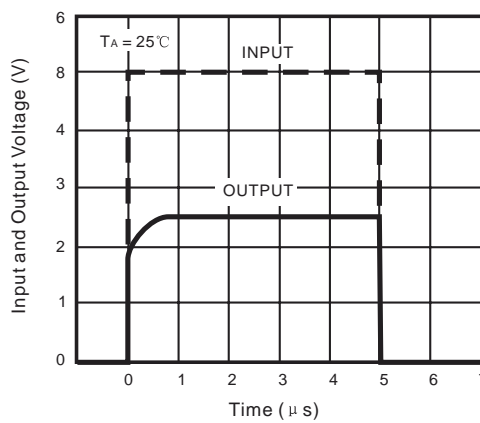
Change in Reference Input Voltage vs. Cathode Voltage



Dynamic Impedance Frequency



Small Signal Voltage Amplification vs. F



Pulse Response