

FEATURES

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

TL431

SOT-23
1. REFERENCE
2. CATHODE
3. ANODE



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

Parameter	Symbol	Value	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	300	mW
Operating temperature	T_{opr}	0-70	°C
Storage temperature Range	T_{stg}	-65~+150°C	°C

ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}C$ unless otherwise specified)

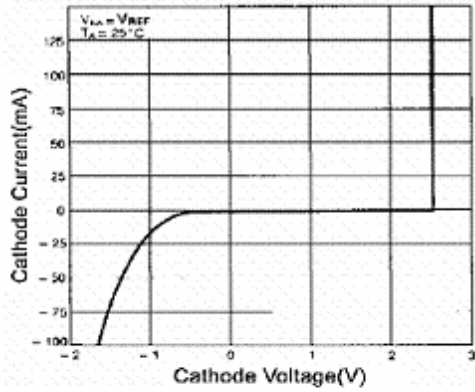
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Reference Input Voltage	V_{ref}	$V_{KA}=V_{REF}, I_{KA}=10mA$	2.4875	2.5	2.5125	V
Deviation of reference input Voltage Over temperature (note)	V_{ref} / T	$V_{KA} = V_{REF}, I_{KA} = 10mA$ $T_{min} \quad T_a \quad T_{max}$		4.5	17	mV
Ratio Of Change in Reference Input Voltage to the change in Cathode Voltage	V_{ref} / V_{KA}	$I_{KA}=10mA$ $V_{KA} = 10V \sim V_{REF}$		-1.0	-2.7	m V/V
		$V_{KA} = 36V \sim 10V$		-0.5	-2.0	m V/V
Reference Input Current	I_{ref}	$I_{KA} = 10mA, R_1=10K$ $R_2 =$		1.5	4	μA
Deviation Of Reference Input Current Over Full Temperature Range	I_{ref} / T	$I_{KA}=10mA, R_1=10K$ $R_2 =$ $T_A=full \text{ Temperature}$		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}	$V_{KA}=V_{REF}, I_{KA}=1 \text{ to } 100mA$ $f \text{ 1.0KHz}$		0.15	0.5	

Note: $T_{MIN}=0^{\circ}C$, $T_{MAX}=+70^{\circ}C$

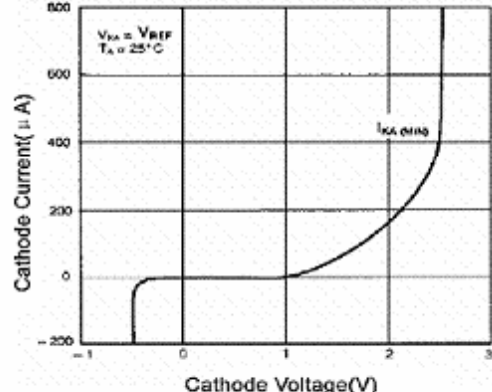
CLASSIFICATION OF V_{ref}

Rank	0.5%
Range	2.4875-2.5125

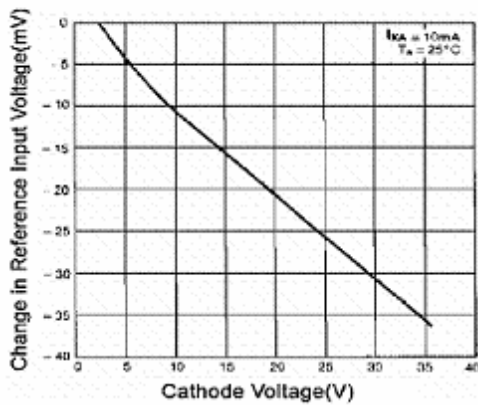
TL431 Typical Characteristics



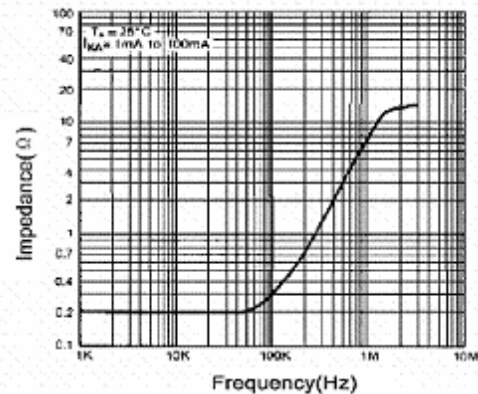
Cathode Current vs. Cathode Voltage



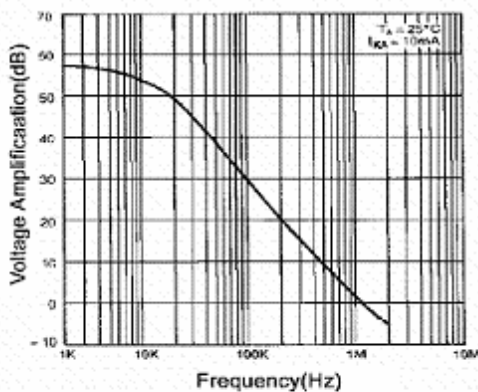
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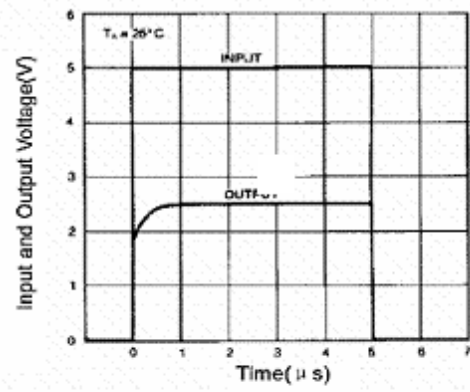
Change in Reference Input Voltage vs. Cathode Voltage



Dynamic Impedance Frequency



Small Signal Voltage Amplification vs. Frequency



Pulse Response