

**Features**

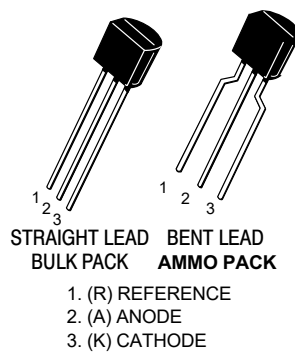
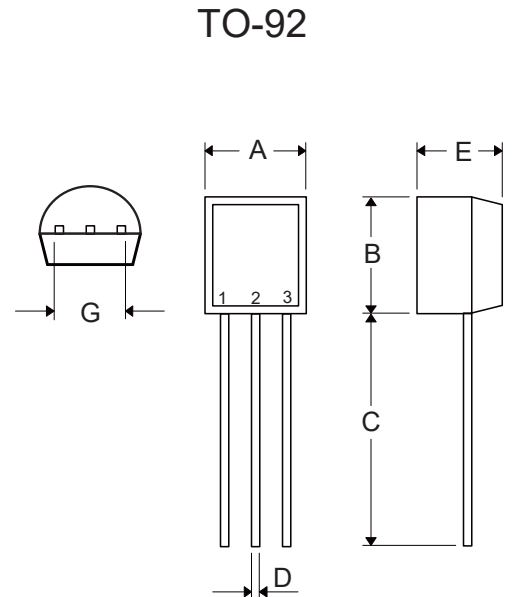
- Output Voltage can be Adjusted to 36V
- Trapping Current Capability is 1 to 100 mA
- The Effective Temperature Compensation In the Working Range of Full Temperature
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Input Voltage (Vo=5.8V)	V <sub>1</sub>	37	V
Cathode Current Range(Continuous)	I <sub>KA</sub>	-100~150	mA
Reference Input Current Range	I <sub>REF</sub>	0.05~10	mA
Power Dissipation	P <sub>D</sub>	0.77	W
Thermal Resistance junction to ambient	R <sub>θJA</sub>	162	°C/W
Operating Junction Temperature	T <sub>opr</sub>	0~70	°C
Storage Temperature Range	T <sub>STG</sub>	-55~150	°C

**Programmable Precision Shunt Regulator**

**Marking Code: TL431**



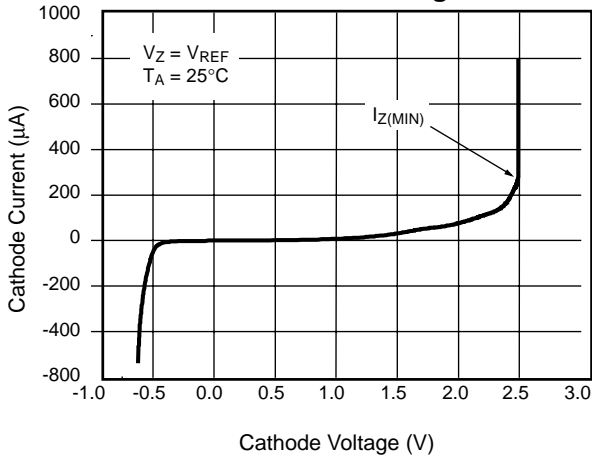
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.169	0.185	4.30	4.70	
B	0.169	0.185	4.30	4.70	
C	0.500	-----	12.70	-----	
D	0.015	0.022	0.38	0.55	
E	0.130	0.146	3.30	3.70	
G	0.095	0.105	2.42	2.67	Straight Lead
	0.173	0.220	4.40	5.60	Bent

**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

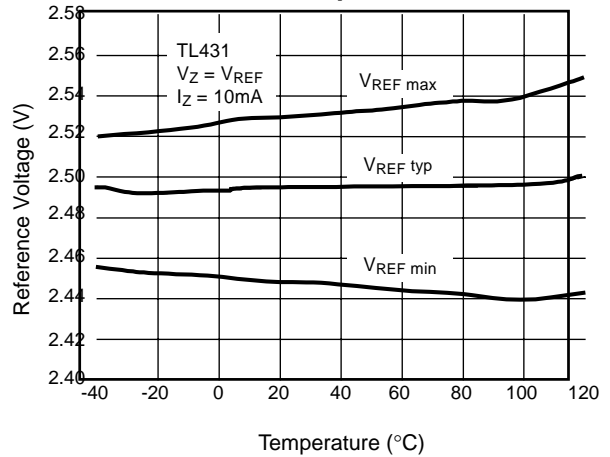
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reference Input Voltage	$V_{ref}$	$V_{KA}=V_{REF}, I_{KA}=10mA$	2.44	2.50	2.55	V
Deviation of Reference Input Voltage	$\frac{\Delta V_{ref}}{\Delta T}$	$V_{KA}=V_{REF}, I_{KA}=10mA$ $T_{min} \leq T_a \leq T_{max}$		4.5	17	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\frac{\Delta V_{ref}}{\Delta V_{KA}}$	$\Delta V_{KA}=10V \sim V_{ref}, I_{KA}=10mA$		-1.0	-2.7	
		$\Delta V_{KA}=36V \sim 10V, I_{KA}=10mA$		-0.5	-2.0	
Reference Input Current	$I_{ref}$	$I_{KA}=10mA,$ $R_1=10K\Omega, R_2=\infty$		1.5	4.0	$\mu A$
Deviation of Reference Input Current Over Full Temperature Range	$\frac{\Delta I_{ref}}{\Delta T}$	$I_{KA}=10mA,$ $R_1=10K\Omega, R_2=\infty$ $T_A=full\ Temperature$		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	$I_{KA(off)}$	$V_{KA}=36V, V_{REF}=0V$		0.05	1.0	$\mu A$
Dynamic Impedance	$Z_{KA}$	$V_{KA}=V_{REF}, I_{KA}=1\ to\ 100mA,$ $f \leq 1.0KHz$		0.15	0.5	$\Omega$

Curve Characteristics

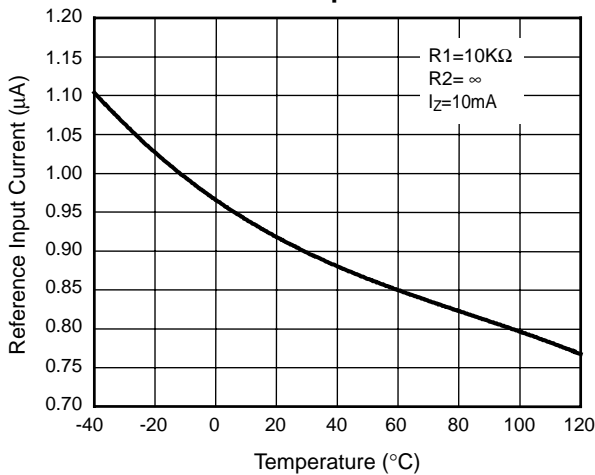
**Fig. 1 – Cathode Current vs. Cathode Voltage**



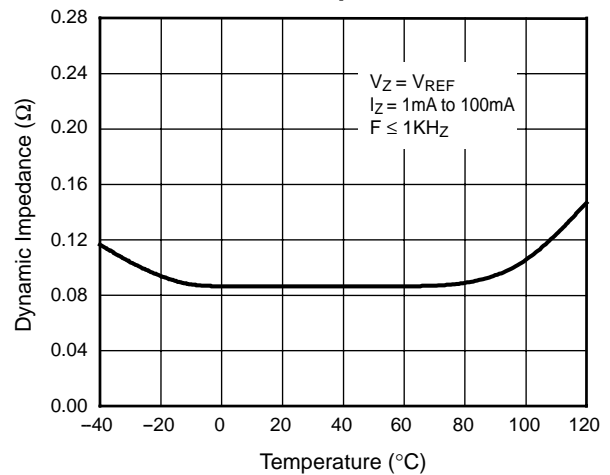
**Fig. 2 – Reference Voltage vs. Temperature**



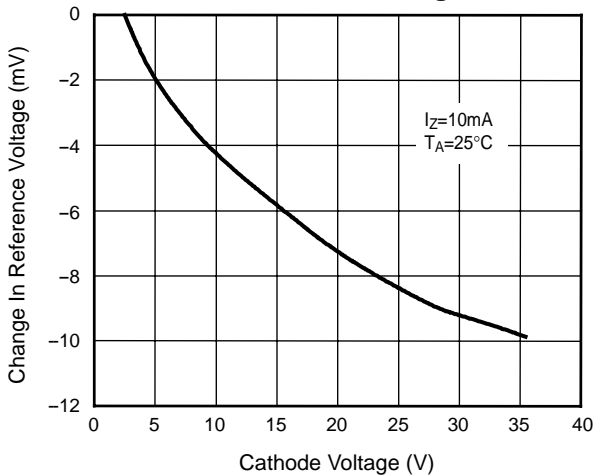
**Fig. 3 – Reference Input Current vs. Temperature**



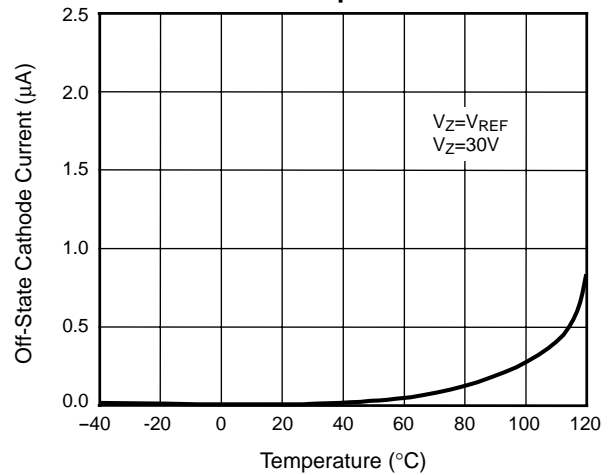
**Fig. 4 – Dynamic Impedance vs. Temperature**



**Fig. 5 – Change in Reference Voltage vs. Cathode Voltage**



**Fig. 6 – Off-State Cathode Current vs. Temperature**



## Ordering Information

Device	Packing
Part Number-AP	Ammo Packing: 20Kpcs/Carton
Part Number-BP	Bulk: 100Kpcs/Carton

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-BP-HF  
 Adding "-HF" Suffix for Halogen Free, eg. Part Number-AP-HF

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