Descriptions

The TL431M is Precision adjustable shunt regulator in a SOT-23 Plastic Package.

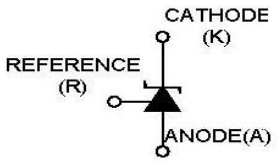
Features

- Precise reference voltage to 2.495V
- Guaranteed 0.5%,1% or 2% reference voltage tolerance
- Sink current capability,1.0mA～100mA;quick turn-on
- Adjustable Output voltage,VO=Vref～36V
- Low operational cathode current,50 μA typical
- 0.15Ω typical output impedance. HF Product

Applications

- Linear regulators
- adjustable power supply
- switching power supply

Equivalent Circuit



Pinning

PIN1：R　　PIN 2：K　　PIN 3：A

Marking

Marking	H431

Absolute Maximum Ratings(Ta=25℃)

Parameter	Symbol	Rating	Unit
Cathode to Anode Voltage	V_{KA}	37	V
Cathode Current Range, Continuous	I_K	-100～+100	mA
Reference Input Current Range, Continuous	I_{REF}	0.05～+10	mA
Power Dissipation	P_D	370	mW
Operating Ambient Temperature	T_{amb}	-40～125	℃
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-65～150	℃

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reference Input Voltage	V_{REF}	$V_{KA}=V_{REF}$ I_K=10mA(A=0.5%)	2.483	2.495	2.507	V
		$V_{KA}=V_{REF}$ I_K=10mA(B=1%)	2.470	2.495	2.520	V
		$V_{KA}=V_{REF}$ I_K=10mA(2%)	2.445	2.495	2.545	V
Deviation of Reference Input Voltage Over-Temperature	$\triangle V_{REF}$ /$\triangle$T	$V_{KA}=V_{REF}$ I_K=10mA T_A=-40～125℃		4.5	25	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\triangle V_{REF}$ /$\triangle V_{KA}$	I_K=10mA, $\triangle V_{KA}$ =10V to V_{REF}		-1	-2.7	mV/V
		I_K=10mA, $\triangle V_{KA}$ =36V to 10V		-0.5	-2.0	mV/V
Reference Input Current	I_{REF}	I_K=10mA R_1=10KΩ R_2=open		0.8	1.0	μA
Deviation of Reference Input Current Over Full Temperature Range	$\triangle I_{REF}/\triangle$T	I_K=10mA R_1=10KΩ R_2=open T_A=-40～125℃		0.4	1.2	μA
Minimum Cathode Current for Regulation	$I_{K(min)}$	$V_{KA}=V_{REF}$		0.05	0.08	mA
Off-state cathode current	$I_{K(off)}$	V_{KA}=36V V_{REF}=0V		0.05	1.0	μA
Dynamic Impedance	$\|Z_{KA}\|$	$V_{KA}=V_{REF}$ f≤1.0KHz I_K=1mA to 100mA		0.15	0.5	Ω

Electrical Characteristic Curve

Fig 1 Cathode Current Vs Cathode Voltage

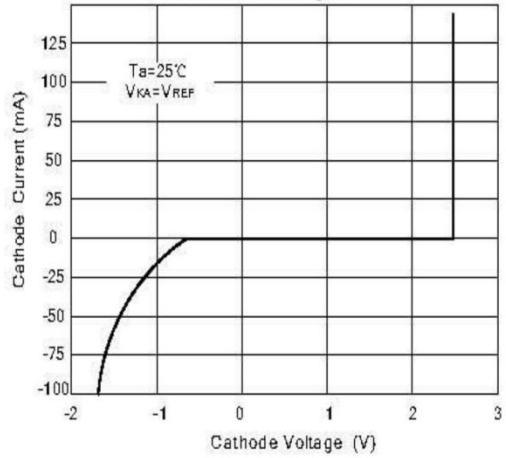


Fig 2 Cathode Current Vs Cahode Voltage

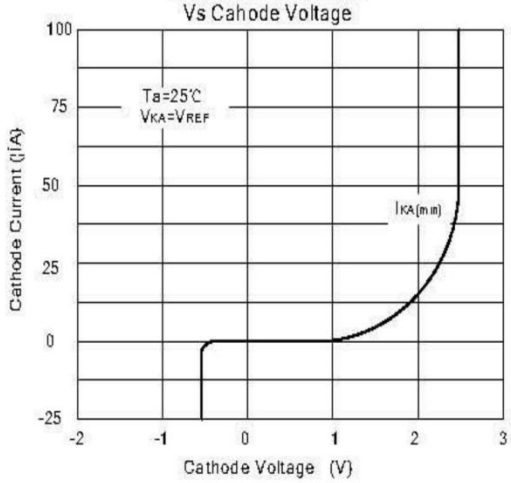


Fig 3 Change in Reference Input Voltage Vs Cathode voltage

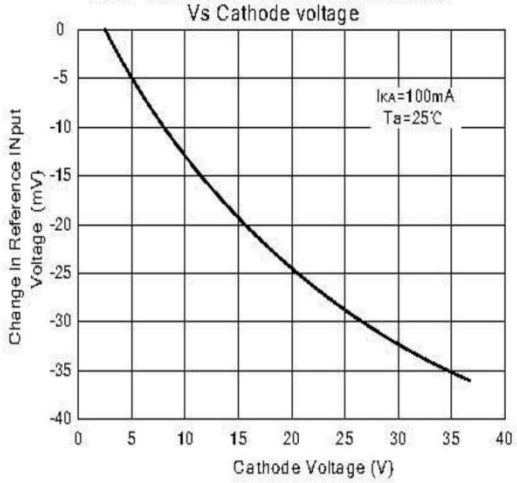


Fig 4 Pulse Response

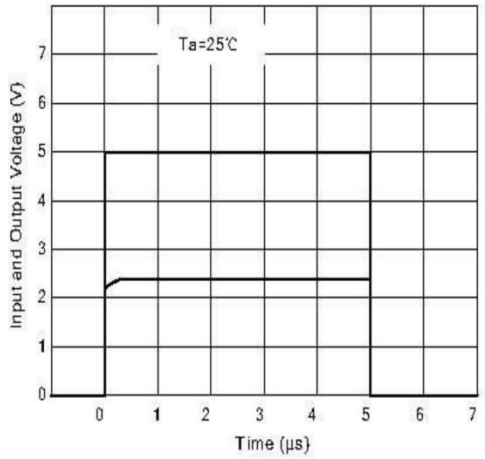


Fig 5 Dynamic Impedance Vs Frequency

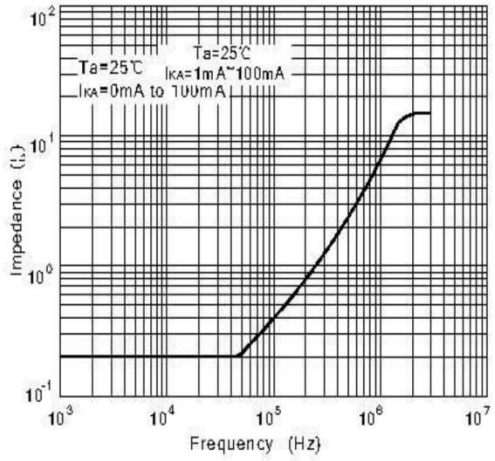
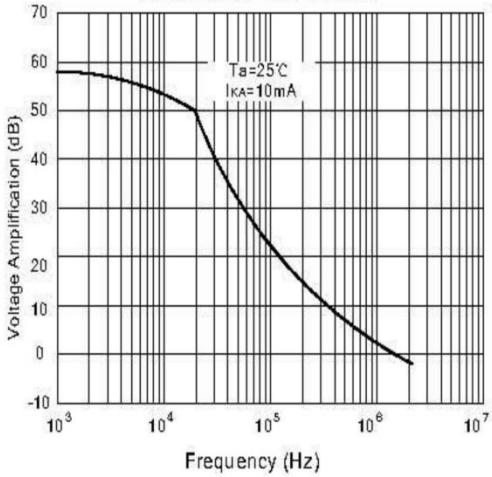
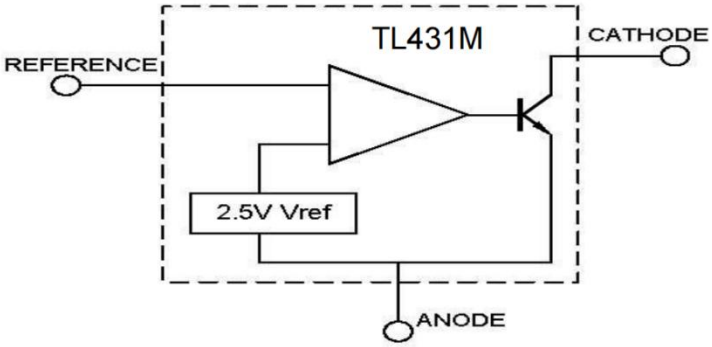


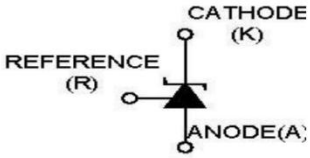
Fig 6 Small Signal Voltage Amplification Vs Frequency



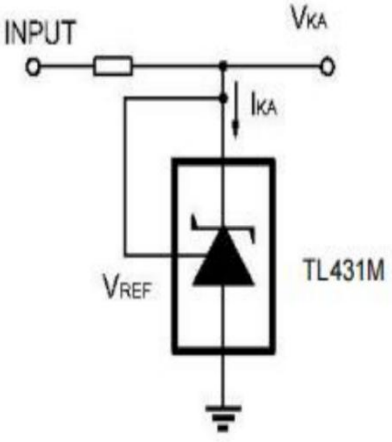
Typical Application Circuit

BLOCK DIAGRAM:

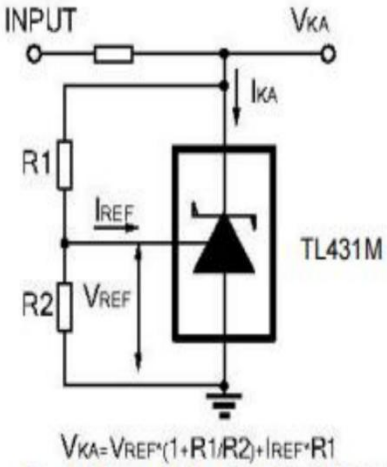




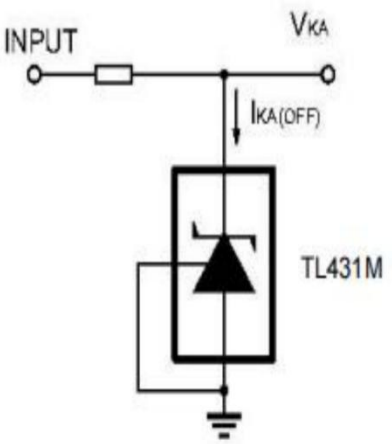
TEST CIRCUITS:



Test Circuit For VKA=VREF



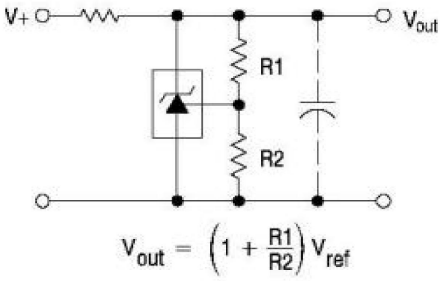
Test Circuit for VKA≥VREF



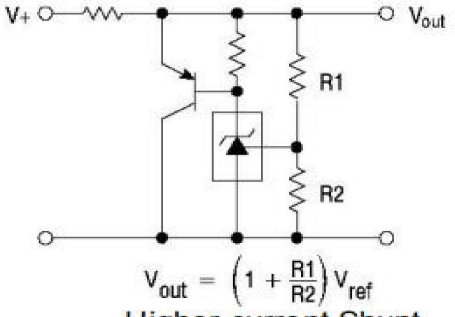
Test Circuit For IKA(OFF)

Typical Application Circuit

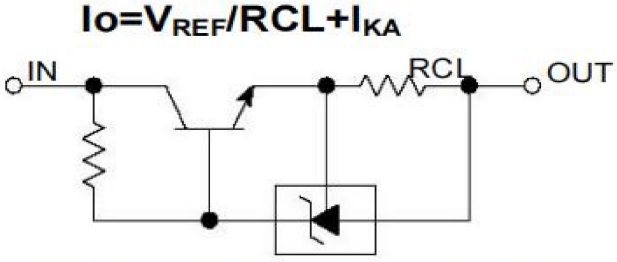
TYPICAL APPLICATION:



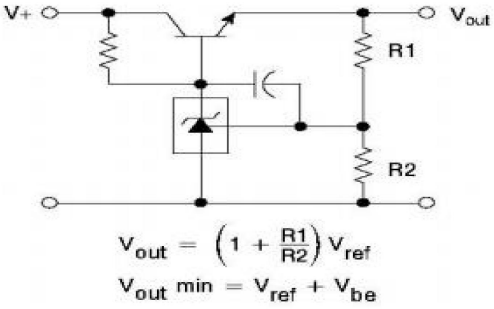
Shutdown Regulator



Higher-current Shunt

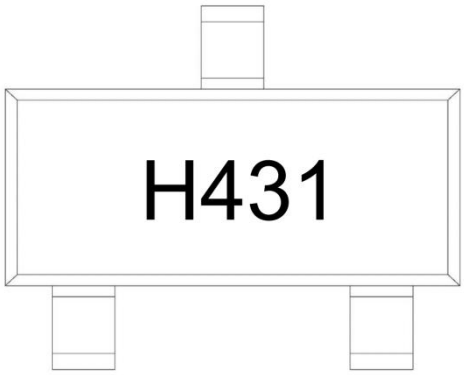


Constant Current Source TL431M



Series Pass Regulator

Marking Instructions



Note:

H: Company Code.

431: Product Type.

Packaging SPEC.

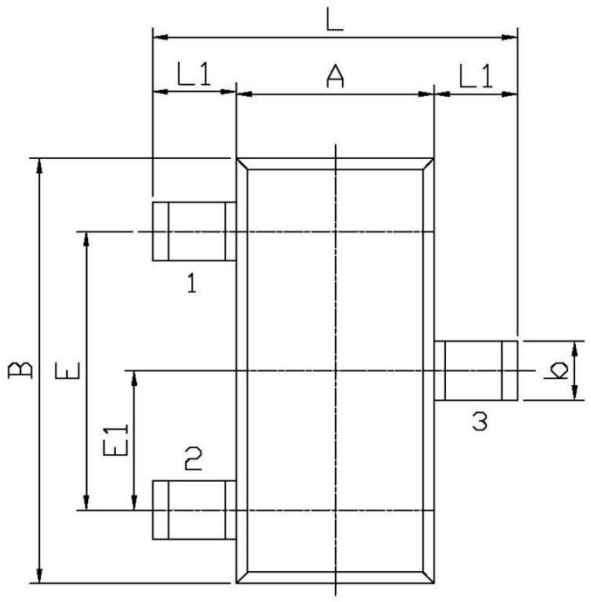
REEL

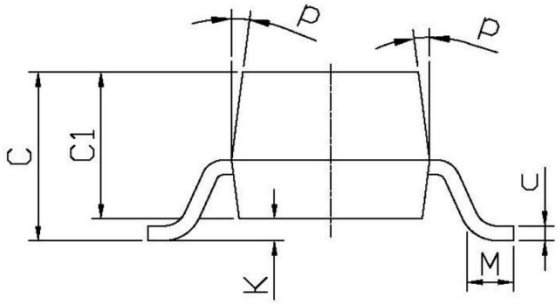
Package Type	Units					Dimension (unit：mm³)		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
SOT-23	3,000	10	30,000	6	180,000	7″ ×8	180×120×180	390×385×205

Package Outline Dimensions

SOT-23

单位：mm





Symbol	Dimensions In Millmeters		Symbol	Dimensions In Millmeters	
	Min	Max		Min	Max
L	2.2	2.7	C	1.30Max	
L1	0.45	0.65	C1	0.90	1.20
A	1.15	1.50	c	0.05	0.20
B	2.70	3.10	K	0	0.10
E	1.70	2.10	M	0.20MIN	
E1	0.85	1.05	P	7°	
b	0.35	0.55			