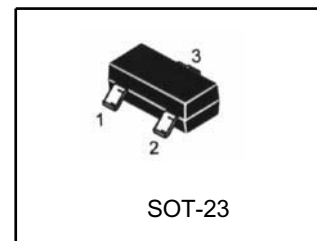


## Programmable Precision Reference

# LR431ATSLT1G

### DESCRIPTION

The LR431 is a three-terminal adjustable regulator with a guaranteed thermal stability over applicable temperature ranges. The output voltage may be set to any value between  $V_{ref}$  (approximately 2.5V) and 36V with two external resistors. It provides very wide applications, including shunt regulator, series regulator, switching regulator, voltage reference and others.



SOT-23 1: Ref; 2: Cathode; 3: Anode

### FEATURES

Programmable output Voltage to 36V.

Low dynamic output impedance  $0.2\Omega$

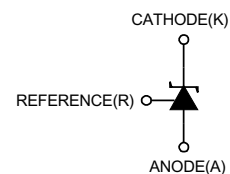
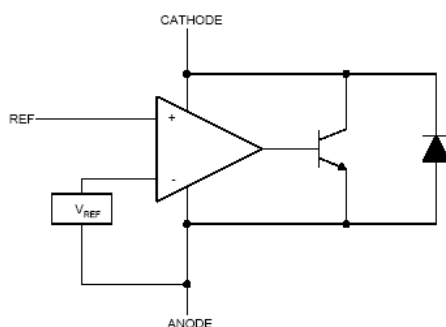
Sink current capability of 1 to 100mA.

Equivalent full-range temperature coefficient of  $50\text{ppm}/^\circ\text{C}$  typical for operation over full rated operating temperature range.

We declare that material of product compliance with ROHS requirements.

ESD: HBM 4000V

### BLOCK DIAGRAM



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

PARAMETER	SYMBOL	VALUE	UNIT
Cathode Voltage	V <sub>KA</sub>	36	V
Cathode Current Range(Continuous)	I <sub>KA</sub>	-100 ~ +150	mA
Reference Input Current Range	I <sub>ref</sub>	-0.05 ~ +10	mA
Operating Junction Temperature	T <sub>j</sub>	150	°C
Thermal Resistance	θ <sub>JA</sub>	206	°C/W
Operating Ambient Temperature	T <sub>opr</sub>	-40 ~ +125	°C
Storage Temperature	T <sub>stg</sub>	-65 ~ +150	°C

**RECOMMENDED OPERATING CONDITIONS**

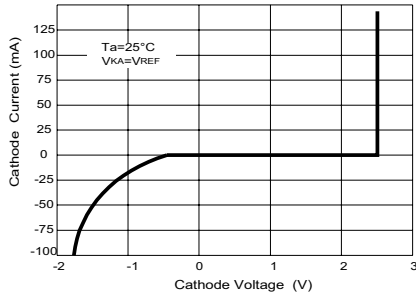
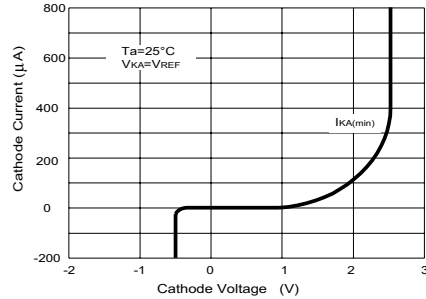
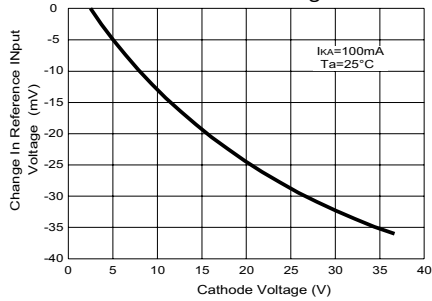
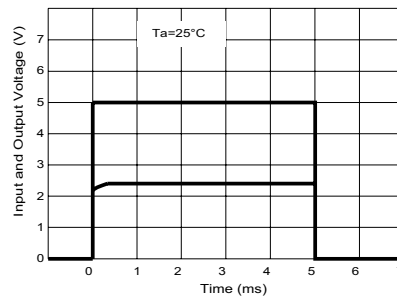
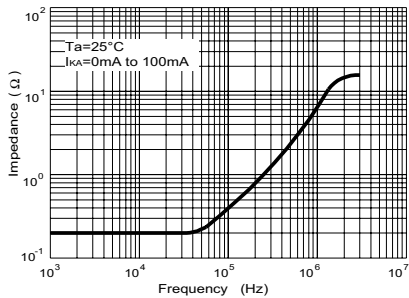
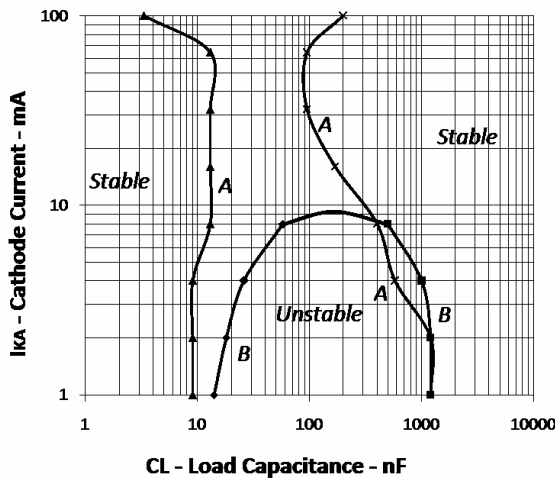
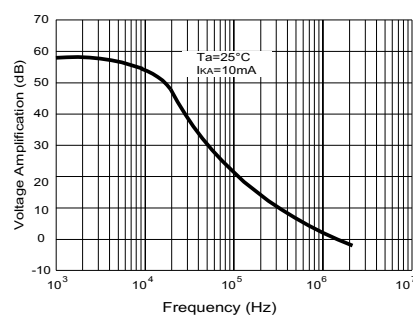
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Cathode Voltage	V <sub>KA</sub>	V <sub>REF</sub>		36	V
Cathode Current	I <sub>KA</sub>	0.5		100	mA

**ELECTRICAL CHARACTERISTICS**(T<sub>a</sub>=25°C, unless otherwise specified)

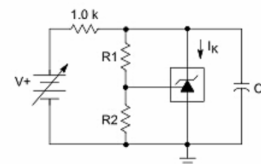
Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT	
Reference Input Voltage 1	V <sub>ref</sub>	V <sub>KA</sub> =V <sub>REF</sub> , I <sub>KA</sub> =10mA	2.488	2.50	2.512	V	
			2.475	2.50	2.525		
			2.450	2.50	2.550		
Reference Input Voltage 2*	V <sub>ref</sub>	V <sub>KA</sub> =V <sub>REF</sub> , I <sub>KA</sub> =10mA	2.483	2.495	2.507	V	
			2.470	2.495	2.520		
			2.445	2.495	2.545		
Deviation of reference Input Voltage Over temperature	ΔV <sub>ref</sub>	V <sub>KA</sub> =V <sub>REF</sub> , I <sub>KA</sub> =10mA T <sub>MIN</sub> ≤T <sub>A</sub> ≤T <sub>MAX</sub>		4.5	25	mV	
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	ΔV <sub>ref</sub> /ΔV <sub>KA</sub>	I <sub>KA</sub> =10mA	ΔV <sub>KA</sub> =10V~V <sub>REF</sub>		-1.0	-2.7	mV/V
			ΔV <sub>KA</sub> =36V~10V		-0.5	-2.0	
Reference Input Current	I <sub>ref</sub>	I <sub>KA</sub> =10mA, R <sub>1</sub> =10kΩ, R <sub>2</sub> =∞		1	2	μA	
Deviation of Reference Input Current Over Full Temperature Range	ΔI <sub>ref</sub> /ΔT	I <sub>KA</sub> =10mA, R <sub>1</sub> =10kΩ, R <sub>2</sub> =∞, T <sub>A</sub> =full Temperature		0.2	0.4	μA	
Minimum cathode current for regulation	I <sub>KA</sub> (min)	V <sub>KA</sub> =V <sub>REF</sub>		0.3	0.5	mA	
Off-state cathode Current	I <sub>KA</sub> (OFF)	V <sub>KA</sub> =36V, V <sub>REF</sub> =0		0.05	0.5	μA	
Dynamic Impedance	Z <sub>KA</sub>	V <sub>KA</sub> =V <sub>REF</sub> , I <sub>KA</sub> =1 to 100mA f≤1.0kHz		0.15	0.5	Ω	

**CLASSIFICATION OF V<sub>ref</sub> AND PACKAGE**

Type	RanK	Range(V)	Marking	Package	T <sub>opr</sub>
LR431ATSLT1G	0.5%	2.488~2.512	RAS	SOT-23	-40~+125 °C
LR431BTSLS1G	1%	2.475~2.525	RBS	SOT-23	-40~+125 °C
LR431APTSLS1G	0.5%	2.483~2.507	RCS	SOT-23	-40~+125 °C
LR431BPTSLS1G	1%	2.470~2.520	RDS	SOT-23	-40~+125 °C

**TYPICAL PERFORMANCE CHARACTERISTICS**
**Fig 1 Cathode Current Vs Cathode Voltage**

**Fig 2 Cathode Current Vs Cathode 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**

**Fig7.Stability Boundary Conditions(Ta=25 ° C)**

Note:The region C is not unstable when test current is above 1mA,


**Fig8.Test Circuit for Fig7**

Unstable region	VKA(V)	R1(KΩ)	R2(KΩ)
A	Vref	0	∞
B	5	10	10
C	10	30	10

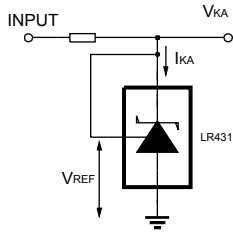
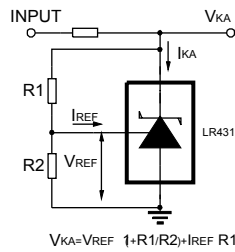
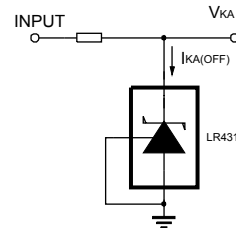
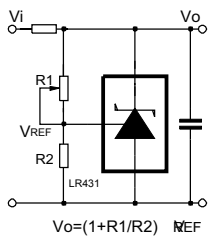
**TEST CIRCUIT**

 Fig9 Test Circuit For  $V_{KA} = V_{REF}$ 

 Fig10 Test Circuit for  $V_{KA} \geq V_{REF}$ 

 Fig11 Test Circuit For  $I_{KA(OFF)}$ 
**APPLICATION CIRCUIT**


Fig12 Shutdown Regulator

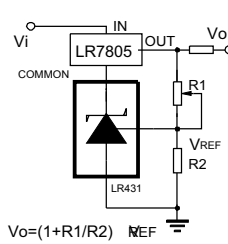


Fig13 Output Control of a Three-Terminal Fixed Regulator

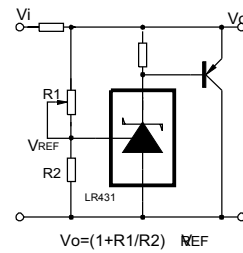


Fig14 Higher-current Shunt Regulator

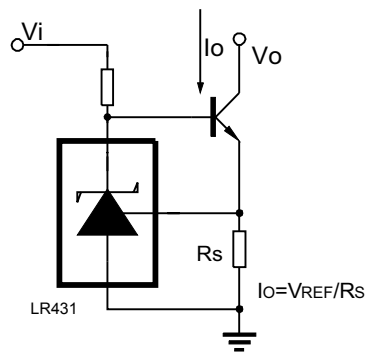


Fig15 Constant-current Sink

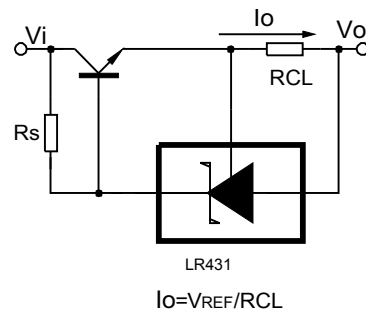
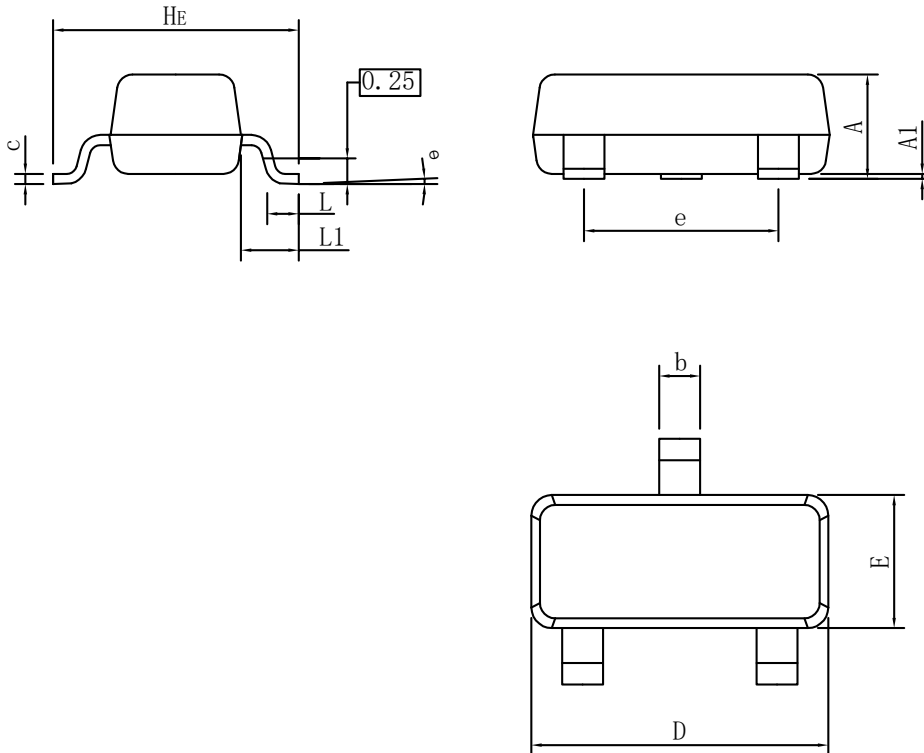


Fig16 Current Limiting or Current Source

**SOT-23 PACKAGE OUTLINE DIMENSIONS**


SOT23			
DIM	MIN	NOR	MAX
A	0.90	1.00	1.10
A1	0.01	0.06	0.10
b	0.30	0.40	0.50
c	0.10	0.17	0.20
D	2.80	2.90	3.00
E	1.20	1.30	1.40
e	1.80	1.90	2.00
L	0.20	0.40	0.60
L1	0.60REF		
HE	2.20	2.40	2.60
θ	0°	-	10°
All Dimensions in mm			

**GENERAL NOTES**

1. Top package surface finish Ra0.4±0.2um
2. Bottom package surface finish Ra0.7±0.2um
3. Side package surface finish Ra0.4±0.2um

单击下面可查看定价，库存，交付和生命周期等信息

[>>LRC\(乐山无线电\)](#)