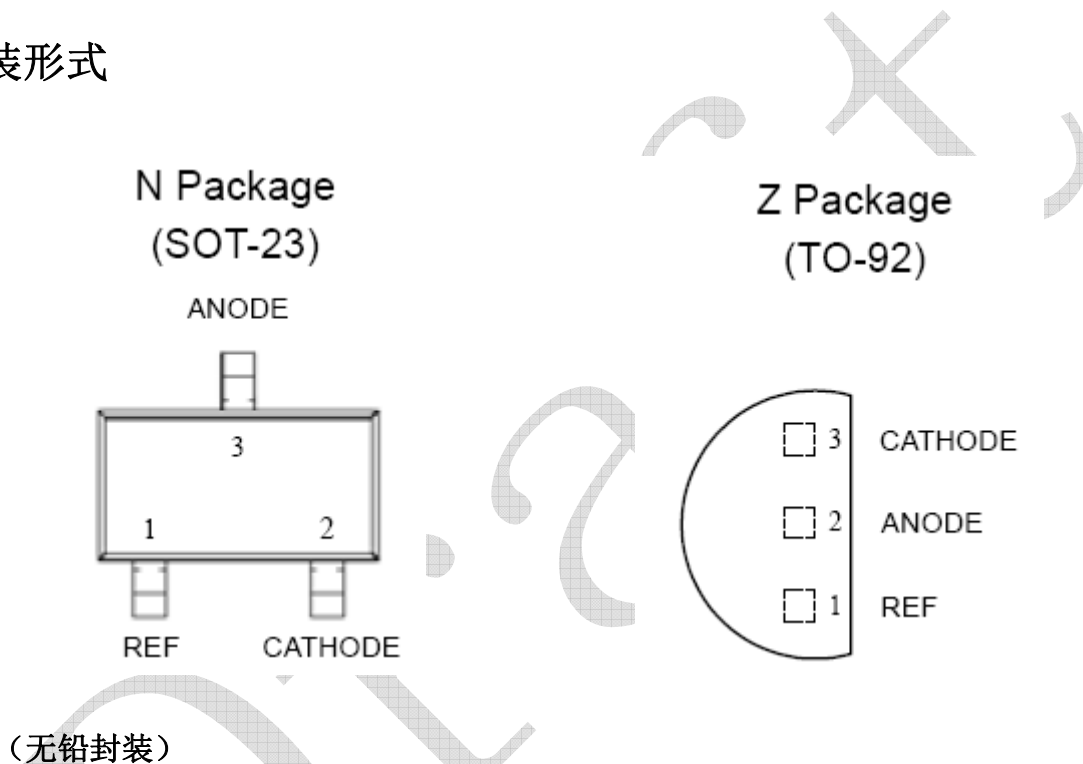


PR431 技术特点

- ◆ 工作电压可到 40V;
- ◆ 基准电压 2.5V, 可提供 0.5%, 1%和 1.5%三种精度;
- ◆ 动态阻抗低 (典型值 0.15 欧姆), 可有效降低电源纹波;
- ◆ 全温度范围内, 温度系数低至万分之 0.2/度 (20PPM/度);
- ◆ 较宽的工作范围 (-40 摄氏度至 125 摄氏度);
- ◆ 工作电流: 1mA 至 100mA;
- ◆ 可以高稳定性的工作于电容负载。

封装形式



封装	温度范围	电压精度	产品型号	丝印号	包装形式
SOT-23	-40 to 125oC	0.5%	PR431ANTR-E1	P1AN	编带
		1%	PR431BNTR-E1	P1BN	编带
		1.5%	PR431CNTR-E1	P1CN	编带
TO-92	-40 to 125oC	0.5%	PR431AZ-E1	P1AZ	散装
		0.5%	PR431AZTR-E1	P1AZ	编带
		1%	PR431BZ-E1	P1BZ	散装
		1%	PR431BZTR-E1	P1BZ	编带
		1.5%	PR431CZ-E1	P1CZ	散装
		1.5%	PR431CZTR-E1	P1CZ	编带

型号说明

PR431 □ □ □ - □

Voltage Tolerance:

(电压精度)

A: 0.5%

B: 1%

C: 1.5%

Package Type:

(封装类型)

Z: TO-92

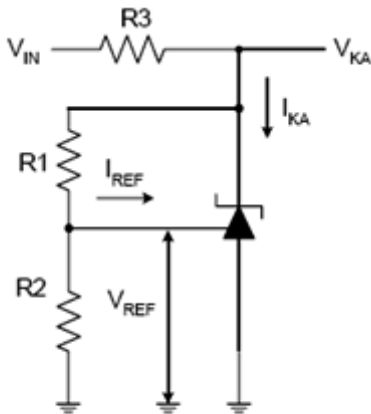
N: SOT-23

E1: Lead Free
(无铅)

TR: Tape & Reel
(编带)

Blank: Bulk
(空缺: 散装)

老化测试



$$V_{KA} = V_{REF} (1 + R1/R2) + I_{REF} * R1$$

参数	设置值	说明
V _{in}	45V	电源电压
V _{ka}	40V	PR431 工作在 40V 耐压下
R1	150K	调节 R1 的阻值, 可改变 V _{KA}
R2	10K	R1,R2 建议用 1%精度
R3	1.2K	可用 5%精度
I _{ka}	4mA	改变 R3 可以调节此电流
V _{ref}	2.5V	基准电压

- ◆ 每张老化板有 77 颗 PR431;
- ◆ PR431 已经通过 1000 小时不间断老化测试, 77 颗无一失效;
- ◆ PROSOO 可以提供老化板供客户测试。

General Description

The PR431 is a three-terminal adjustable shunt regulator with guaranteed thermal stability over a full operation range. It features sharp turn-on characteristics, low temperature coefficient and low output impedance, which make it ideal substitute for Zener diode in applications such as switching power supply, charger and other adjustable regulators.

The output voltage of PR431 can be set to any value between VREF (2.5V) and the corresponding maximum cathode voltage (40V).

The PR431 precision reference is offered in two voltage tolerance: 0.5%, 1.0% and 1.5%. This IC is available in 2 packages: TO-92 (bulk or ammo packing), SOT-23.

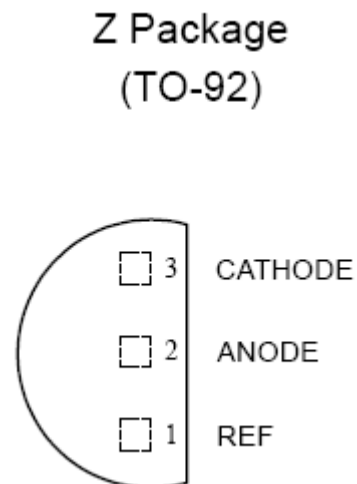
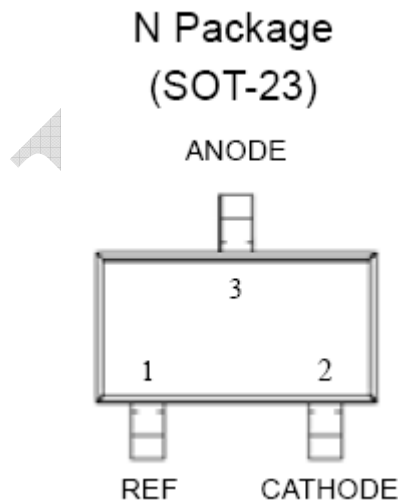
Features

- Programmable Precise Output Voltage from 2.5V to 40V
- High Stability under Capacitive Load
- Low Temperature Deviation: 4.5mV Typical
- Low Equivalent Full-range Temperature Coefficient with 20PPM/oC Typical
- Sink Current Capacity from 1mA to 100mA
- Low Output Noise
- Wide Operating Range of -40 to 125 oC

Applications

- Charger
- Voltage Adapter
- Switching Power Supply
- Graphic Card
- Precision Voltage Reference

Package Types of PR431



Ordering Information

PR431 □ □ □ - □

Voltage Tolerance:

(电压精度)

A: 0.5%

B: 1%

C: 1.5%

Package Type:

(封装类型)

Z: TO-92

N: SOT-23

E1: Lead Free

(无铅)

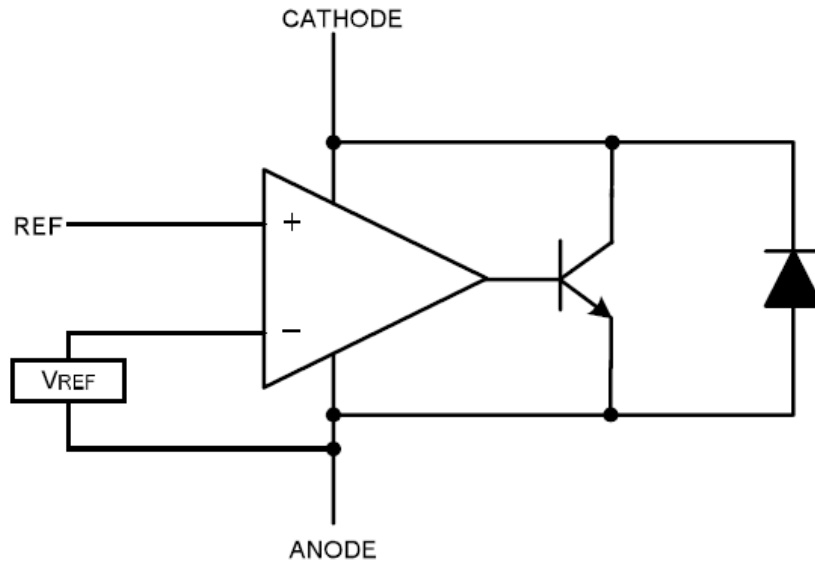
TR: Tape & Reel

(编带)

Blank: Bulk

(空缺: 散装)

Foundation Block Diagram



Package	Temperature Range	Voltage Tolerance	Part Number	Marking ID	Packing Type
SOT-23	-40 to 125oC	0.5%	PR431ANTR-E1	P1AN	Tape & Reel
		1%	PR431BNTR-E1	P1BN	Tape & Reel
		1.5%	PR431CNTR-E1	P1CN	Tape & Reel
TO-92	-40 to 125oC	0.5%	PR431AZ-E1	P1AZ	Bulk
		0.5%	PR431AZTR-E1	P1AZ	Ammo
		1%	PR431BZ-E1	P1BZ	Bulk
		1%	PR431BZTR-E1	P1BZ	Ammo
		1.5%	PR431CZ-E1	P1CZ	Bulk
		1.5%	PR431CZTR-E1	P1CZ	Ammo

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Cathode Voltage	VKA	40	V
Cathode Current Range (Continuous)	IKA	-100 to 150	mA
Reference Input Current Range	IREF	10	mA
Power Dissipation	PD	Z, Package: 770	mW
		N Package: 370	
Junction Temperature	TJ	150	oC
Storage Temperature Range	TSTG	-65 to 150	oC
ESD (Human Body Model)	ESD	2000	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

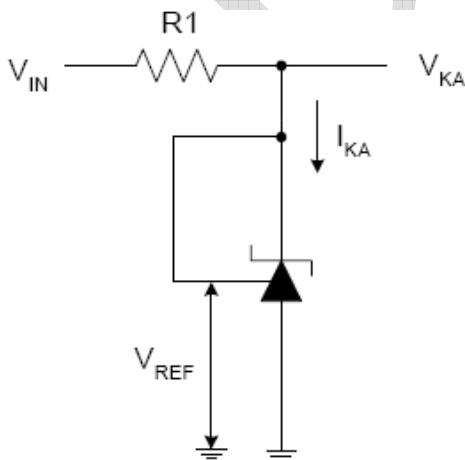
Parameter	Symbol	Min	Max	Unit
Cathode Voltage	VKA	VREF	40	V
Cathode Current	IKA	1.0	100	mA
Operating Ambient Temperature Range	TA	-40	125	oC

Electrical Characteristics

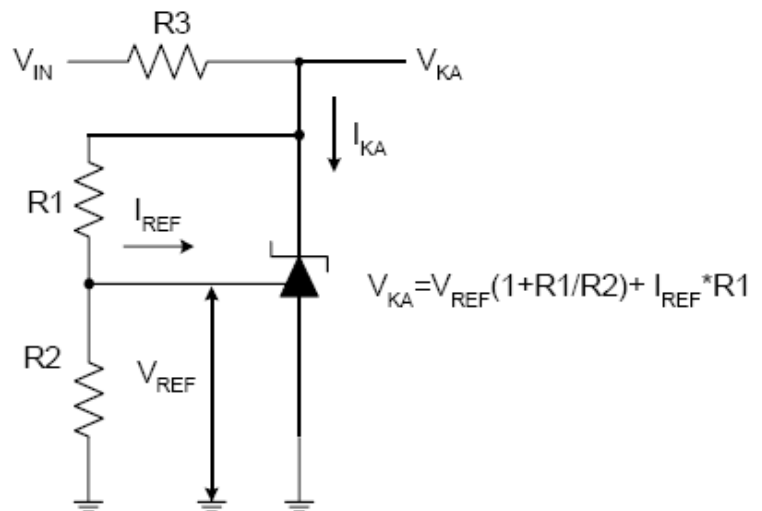
Operating Conditions: $T_A=25^{\circ}\text{C}$, unless otherwise specified.

Parameter	Test Circuit	Symbol	Conditions	Min	Typ	Max	Unit	
Reference Voltage	0.5%	4	VREF	VKA=VREF, IKA=10mA	2.487	2.500	2.512	V
	1.0%				2.475	2.500	2.525	
Deviation of Reference Voltage Over Full Temperature Range	4	ΔVREF	VKA=VREF IKA=10mA	0 to 70°C	4.5	8	mV	
				-40 to 85°C	4.5	10		
				-40 to 125°C	4.5	16		
Ratio of Change in Reference Voltage to the Change in Cathode Voltage	5	ΔVREF ΔVKA	IKA=10mA	$\Delta\text{VKA}=10\text{V}$ to VREF	-1.0	-2.7	mV/V	
				$\Delta\text{VKA}=36\text{V}$ to 10V	-0.5	-2.0		
Reference Current	5	IREF	IKA=10mA, R1=10K Ω , R2= ∞		0.7	4	μA	
Deviation of Reference Current Over Full Temperature Range	5	ΔIREF	IKA=10mA, R1=10K Ω , R2= ∞ , $T_A=-40$ to 125°C		0.4	1.2	μA	
Minimum Cathode Current for Regulation	4	IKA (Min)	VKA=VREF		0.4	1.0	mA	
Off-state Cathode Current	6	IKA (Off)	VKA=36V, VREF=0		0.05	1.0	μA	
Dynamic Impedance	4	ZKA	VKA=VREF, IKA=1 to 100mA, $f \leq 1.0\text{KHz}$		0.15	0.5	Ω	

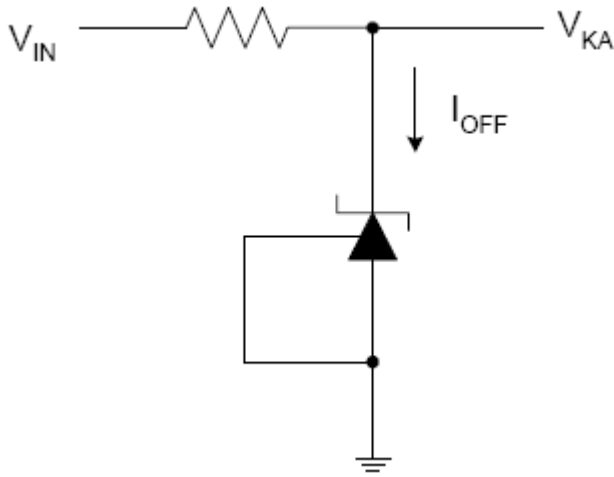
Electrical Characteristics



Test Circuit 1: $V_{KA}=V_{REF}$



Test Circuit 2: $V_{KA}>V_{REF}$

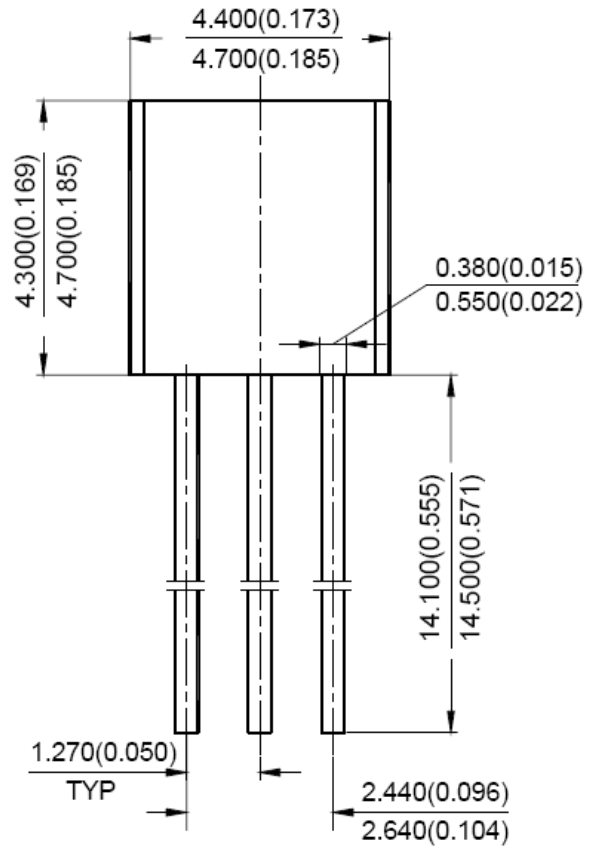
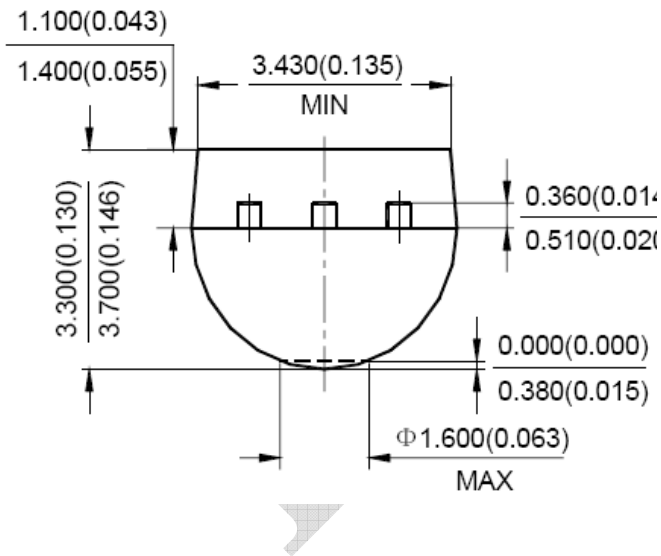


Test Circuit 3: Test IOFF

Mechanical Dimensions

TO-92

Unit: mm(inch)



Mechanical Dimensions

SOT-23

Unit: mm(inch)

