

**General Description**

The uP432 series ICs are low voltage three-terminal adjustable regulators with guaranteed thermal stability over a full operation range. These ICs feature sharp turn-on characteristics, low temperature coefficient and low output impedance, which make them ideal substitutes for Zener diodes in applications such as switching power supply, charger, motherboard and other adjustable regulators.

The output voltage can be set to any value between 1.25V and 22V with two external resistors.

The uP432 precision reference is offered in two band-gap tolerance: 0.5% and 1%.

The main packages have low thermal impedance which allows operation over a wide range of -40°C to 125°C.

**Features**

- Wide programmable precise output voltage from 1.25V to 22V
- High stability under capacitive load
- Low temperature deviation: 3mV typical
- Low equivalent full-range temperature coefficient: 20PPM/°C typical
- Low dynamic output resistance: 0.05Ω typical
- High sink current capacity from 55μA to 100 mA
- Low output noise
- Available in SOT23-3 package

**Applications**

- Graphic Card
- PC Motherboard
- Voltage Adapter
- Switching Power Supply
- Quick Charger, PD

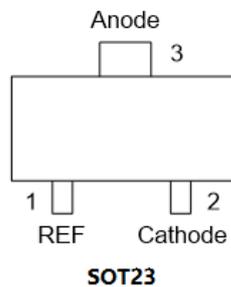


Figure 1. Package Types of uP432

**Ordering Information**

Device Name	Package Types	Accuracy	Mark ID	Operating Free-Air Temperature (TA)
uP432AN	SOT23	0.5%	GL3	-40°C to 125°C
uP432BN	SOT23	1%	GL6	

**Functional Block Diagram**

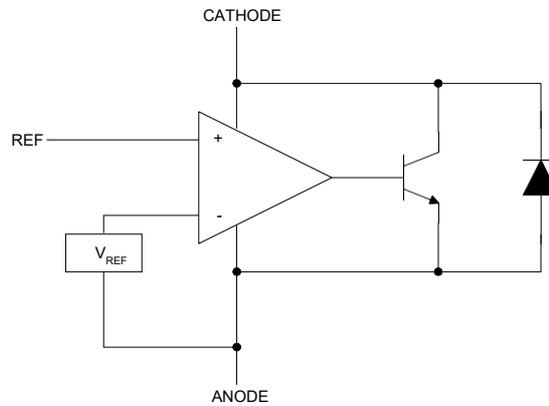


Figure 2. Functional Block Diagram of uP432

### Absolute Maximum Ratings

(Operation temperature range applies unless otherwise specified.)

Parameter	Symbol	Range	Unit
Cathode voltage	$V_{KA}$	22	V
Continuous cathode current	$I_{KA}$	-100 to 100	mA
Reference input current range	$I_{REF}$	10	mA
Maximum junction temperature	$T_{JMAX}$	150	°C
Maximum lead temperature	$T_{LEAD}$	260	°C
Storage temperature	$T_{STG}$	-65 to 150	°C
Thermal resistance SOT23	$\theta_{JC}$	76	°C/W
ESD rating	CDM	+/-1000	V

Note: 1. Absolute maximum ratings indicate stresses beyond which may cause permanent damage to the device.

## Recommended Operation Ratings

Parameter	Symbol	Min.	Max.	Unit
Cathode Voltage	$V_{KA}$	$V_{REF}$	20	V
Cathode Current	$I_{KA}$	0.1	100	mA
Operating Ambient Temperature Range		-40	125	°C

## Electrical Characteristics

(Typical and limits apply for  $T_J=25^{\circ}\text{C}$  unless otherwise noted.)

Parameter	Test Circuit	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reference Voltage	0.5%	$V_{REF}$	$V_{KA}=V_{REF}$ $I_{KA}=10\text{mA}$	1.244	1.250	1.256	V
	1%			1.238	1.250	1.263	
Deviation of Reference Voltage Over-Temperature	3	$\Delta V_{REF}$	$V_{KA}=V_{REF}$ $I_{KA}=10\text{mA}$	-40°C ~ 85°C	3	10	mV
				-40°C ~ 125°C	4	15	
Ratio of Change in $V_{REF}$ to the Change in Cathode Voltage	4	$\frac{\Delta V_{REF}}{\Delta V_{KA}}$	$I_{KA}=10\text{mA}$ $\Delta Vz: V_{REF}$ to 16V		-0.5	-1.5	mV/V
Reference Input Current	4	$I_{REF}$	$I_{KA}=10\text{mA}$ , $R1=10\text{K}\Omega$ , $R2=\infty$		0.15	0.4	$\mu\text{A}$
Deviation of Reference Current Over Full Temperature Range	4	$\Delta I_{REF}$	$I_{KA}=10\text{mA}$ , $R1=10\text{K}\Omega$ , $R2=\infty$ , $T_A=-40$ to $125^{\circ}\text{C}$		0.1	0.4	$\mu\text{A}$
Minimum Cathode Current for Regulation	3	$I_{KA}$ (MIN)	$V_{KA}=V_{REF}$		55	80	$\mu\text{A}$
Off-State Cathode Current	5	$I_{KA}$ (OFF)	$V_{REF}=0$ , $V_{KA}=18\text{V}$		0.04	0.10	$\mu\text{A}$
			$V_{KA}=6\text{V}$ , $V_{REF}=0$		0.01	0.05	
Dynamic Impedance	3	$Z_{KA}$	$V_{KA}=V_{REF}$ , $I_{KA}=1$ to $100\text{mA}$ , $f \leq 1.0\text{kHz}$		0.05	0.15	$\Omega$

Parameter Measurement Information

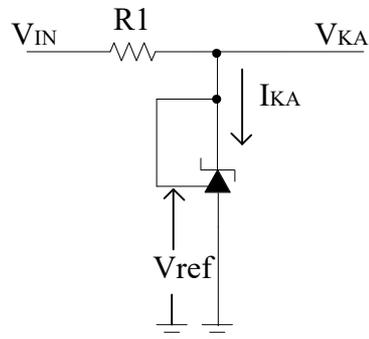


Figure 3. Test Circuit for  $V_{KA} = V_{ref}$

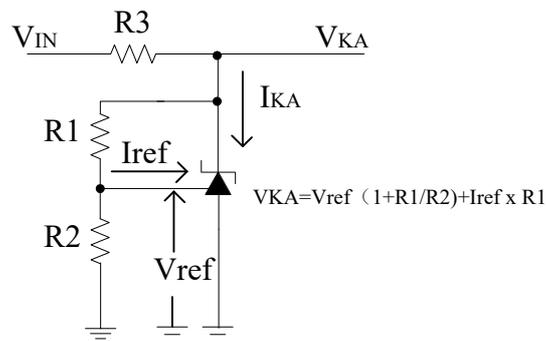


Figure 4. Test Circuit for  $V_{KA} > V_{ref}$

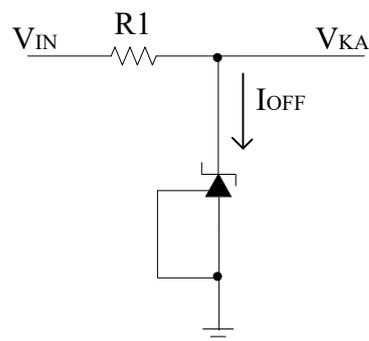


Figure 5. Test Circuit for  $I_{OFF}$

Typical Characteristics

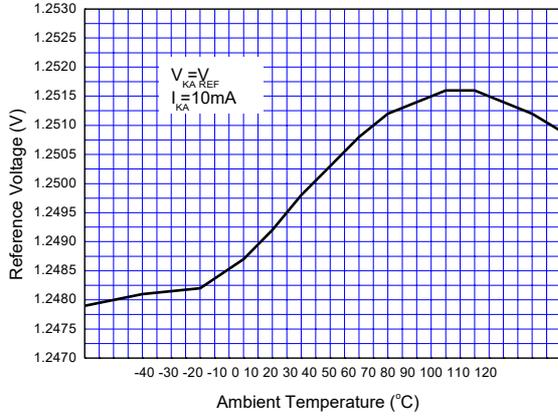


Figure 6. Reference Voltage vs. Ambient Temperature

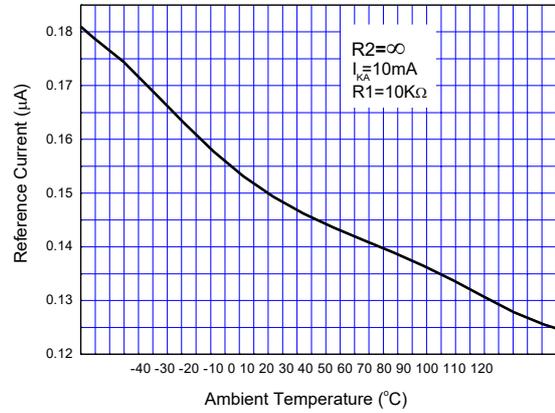


Figure 7. Reference Current vs. Ambient Temperature

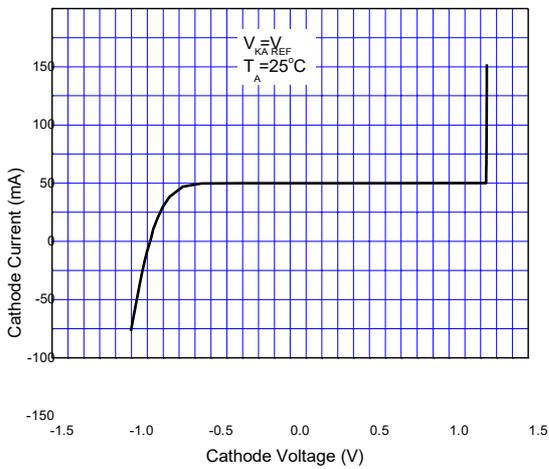


Figure 8. Cathode Current vs. Cathode Voltage

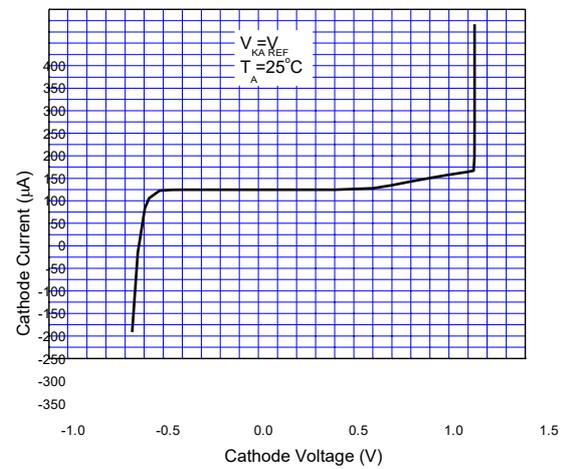


Figure 9. Cathode Current vs. cathode Voltage

