

## Product Overview

### NCP431: Voltage Reference, Low Cathode Current, Programmable, Shunt Regulator

For complete documentation, see the data sheet.

The NCP431 integrated circuits are three-terminal programmable shunt regulator diodes. They are a direct upgrade to the industry standard TL431A. These monolithic IC voltage references operate as a low temperature coefficient zener which is programmable from  $V_{ref}$  to 36 V using two external resistors. These devices exhibit a wide operating current range of 40  $\mu$ A to 100 mA with a typical dynamic impedance of 0.22 $\Omega$ . The characteristics of these references make them excellent replacements for zener diodes in many applications such as digital voltmeters, power supplies, and op amp circuitry. The 2.5 V reference makes it convenient to obtain a stable reference from 5.0 V logic supplies, and since the NCP431 operates as a shunt regulator, it can be used as either a positive or negative voltage reference. Low minimum operating current makes this device an ideal choice for secondary regulators in SMPS adapters with extremely low no-load consumption. The NCP432 has exactly the same functionality and electrical specifications as the NCP431, but has an alternate pin configuration.

#### Features

- Low Minimum Operating Current: 40  $\mu$ A, Typ @ 25C
- Voltage Reference Tolerance: 1%, Typ @ 25C
- Programmable Output Voltage to 36 V
- Low Dynamic Output Impedance, 0.22ohm Typical
- Temperature Compensated for Operation over Full Rated Operating Temperature Range
- Equivalent Full Range Temperature Coefficient of 50 ppm/CTypical
- NCP431 is pin compatible to the TL432
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#### Applications

- Switchmode Power Supplies
- Instrumentation

#### Benefits

- Reduced power consumption
- Accurate Reference Voltage
- Allows for use in a broad range of applications
- High and stable gain even at very low cathode current operation
- Accurate and reliable operation over the temperature range
- Accurate reference across temperature
- Easily upgrade performance with no board level change
- Alternate pin configuration

#### End Products

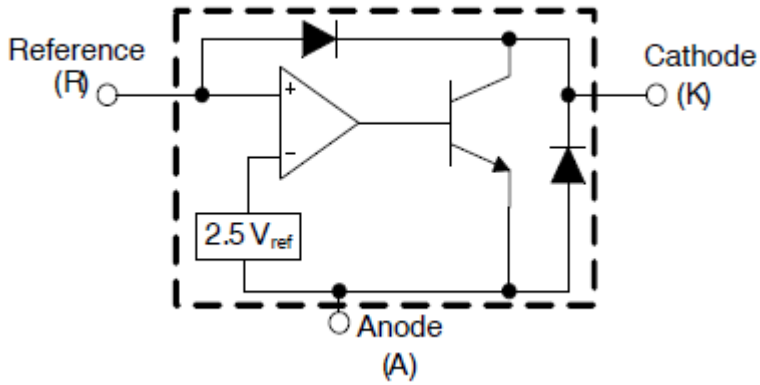
- Adapters
- Flat TVs

## Part Electrical Specifications

Product	Pricing (\$/Unit)	Compliance	Status	Type	V <sub>(BR)</sub> Typ (V)	Toleranc e (%)	I <sub>Q</sub> Typ (mA)	I <sub>R</sub> Min (mA)	V <sub>F</sub> Max (V)	T <sub>A</sub> Min (°C)	T <sub>A</sub> Max (°C)	Package Type
NCP431ACDR2G	0.1479	Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	0	70	SOIC-8
		Halide free non AEC-Q and PPAP										
NCP431ACLPRAG		Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	0	70	TO-92
		Halide free non AEC-Q and PPAP										
NCP431ACSNT1G	0.0933	Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	0	70	SOT-23-3
		Halide free non AEC-Q and PPAP										
NCP431AIDR2G		Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	-40	85	SOIC-8
		Halide free non AEC-Q and PPAP										
NCP431AILPRAG	0.154	Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	-40	85	TO-92
		Halide free non AEC-Q and PPAP										
NCP431AISNT1G	0.0933	Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	-40	85	SOT-23-3
		Halide free non AEC-Q and PPAP										
NCP431AVDR2G		Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	-40	125	SOIC-8
		Halide free non AEC-Q and PPAP										
NCP431AVLPRAG		Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	-40	125	TO-92
		Halide free non AEC-Q and PPAP										
NCP431AVSNT1G	0.0933	Pb-free	Active	Adjustabl e	2.5	1	0.04	0.04	36	-40	125	SOT-23-3
		Halide free non AEC-Q and PPAP										
NCP431BCSNT1G		Pb-free	Active	Adjustabl e	2.5	0.5	0.04	0.04	36	0	70	SOT-23-3
		Halide free non AEC-Q and PPAP										
NCP431BISNT1G	0.104	Pb-free	Active	Adjustabl e	2.5	0.5	0.04	0.04	36	-40	85	SOT-23-3
		Halide free non AEC-Q and PPAP										
NCP431BVSNT1G		Pb-free	Active	Adjustabl e	2.5	0.5	0.04	0.04	36	-40	125	SOT-23-3
		Halide free non AEC-Q and PPAP										
NCP432BCSNT1G	0.08	Pb-free	Active	Adjustabl e	2.5	0.5	0.04	0.04	36	0	70	SOT-23-3
		Halide free non AEC-Q and PPAP										
NCP432BISNT1G	0.1067	Pb-free	Active	Adjustabl e	2.5	0.5	0.04	0.04	36	-40	85	SOT-23-3
		Halide free non AEC-Q and PPAP										
NCP432BVSNT1G	0.1067	Pb-free	Active	Adjustabl e	2.5	0.5	0.04	0.04	36	-40	125	SOT-23-3
		Halide free non AEC-Q and PPAP										
SC431AVSNT1G	0.1867	AEC Qualified PPAP Capable Pb-free Halide free	Active	Adjustabl e	2.5	1	0.04	0.04	36	-40	125	SOT-23-3

SC431BVSNT1G	0.2	AEC Qualified PPAP Capable Pb-free Halide free	Active	Adjustable	2.5	0.5	0.04	0.04	36	-40	125	SOT-23-3
SC432BVSNT1G	0.2	AEC Qualified PPAP Capable Pb-free Halide free	Active	Adjustable	2.5	0.5	0.04	0.04	36	-40	125	SOT-23-3

## Application Diagram



For more information please contact your local sales support at [www.onsemi.com](http://www.onsemi.com).  
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