



HT5XX

产品规格手册

QN431

低压差线性稳压器

QN431

Adjustable shunt voltage reference IC

General Description:

The QN431series ICs are three-terminal shunt regulators with guaranteed thermal stability over a full operation range. These ICs feature very sharp turn-on characteristics, low temperature adjustable coefficient and low output impedance, which make them ideal substitutes for Zener diodes in applications such as switching power supply, charger, and other adjustable regulators.

The QN431is especially suitable for industry applications types.

The

QN431are characterized foroperation from –gap tolerance: : 0.3%-1%.

The QN431precision reference is offered in band40°C to 1

25°C.

Features:

- Reference Voltage Tolerance at 25°C – 0.3%~1.0% Voltage tolerance.
- Adjustable Output Voltage: V_{REF} to 36 V
- Operation From –40°C to 125°C
- Typical Temperature Drift
 - 10mV (-40 to 85°C)
 - 20mV (-40 to 125°C)
- Low Output Noise
- Sink-Current Capability: 0.15 mA to 100 mA

Applications:

- Precision Voltage Reference
- Switching Power Supply
- Charger
- Voltage Adapter
- Adjusted Power Supply

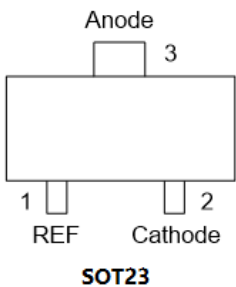


Figure 1. Package types of QN431

Ordering Information

Device Name	Package Types	Accuracy	Mark ID	Operating Free-Air Temperature (TA)
QN431	SOT23	0.3%-1%	431	-40°C to 125°C

Functional Block Diagram:

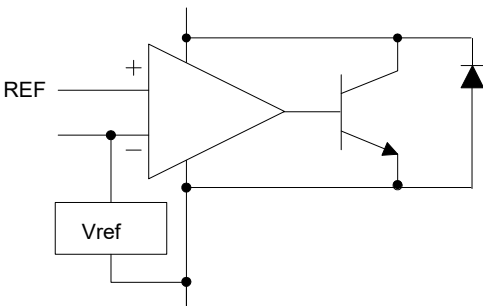


Figure 2. Functional Block Diagram of QN431

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Absolute Maximum Ratings:

(Operation temperature range applies unless otherwise specified.)

Parameter	Symbol	Range	Unit
Cathode voltage	V_{KA}	36	V
Continuous cathode current	I_{KA}	-100 to 100	mA
Reference input current range	I_{REF}	-0.05 to 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	θ_{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}	36	V
Cathode Current	I_{KA}	0.4	80	mA
Operating Ambient Temperature Range		-40	125	°C

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Electrical Characteristics:(Typical and limits appearing in normal tape apply for $T_J=25^{\circ}\text{C}$ unless otherwise noted.)

Parameter		Test Circuit	Symbol	Conditions		QN431			Unit
						Min.	Typ.	Max.	
Reference Voltage	0.3%	Fig.3	V_{REF}	$V_{\text{KA}}=V_{\text{REF}}, I_{\text{KA}}=10\text{mA}$		2.487	2.495	2.503	V
	0.5%					2.482	2.495	2.508	
	1.0%					2.470	2.495	2.520	
Deviation of Reference Voltage Over-Temperature		Fig.3	ΔV_{REF}	$V_{\text{KA}}=V_{\text{REF}}$ $I_{\text{KA}}=10\text{mA}$	-40 to 85°C	-	10	15	mV
					-40 to 125°C	-	10	25	
Ratio of Change in Reference Voltage to the Change in Cathode Voltage		Fig.4	$\frac{\Delta V_{\text{REF}}}{\Delta V_{\text{KA}}}$	$I_{\text{KA}}=10\text{mA}$	$\Delta V_{\text{KA}}=10\text{V to } V_{\text{REF}}$	-	-1.0	-2.7	mV/V
					$\Delta V_{\text{KA}}=36\text{V o } 10\text{V}$	-	-0.5	-2.0	
Reference Current		Fig.4	I_{REF}	$I_{\text{KA}}=10\text{mA}, R1=10\text{k}\Omega, R2=\infty$		-	0.7	4	μA
Deviation of Reference Current Over Full Temperature Range		Fig.4	ΔI_{REF}	$I_{\text{KA}}=10\text{mA}, R1=0\text{K}\Omega, R2=\infty$ $T_A=-40 \text{ to } 105^{\circ}\text{C}$		-	0.4	1.2	μA
Minimum Cathode Current for Regulation		Fig.4	I_{KA} (MIN)	$V_{\text{KA}}=V_{\text{REF}}$		-	0.15	0.5	mA
Off-State Cathode Current		Fig.5	I_{KA} (OFF)	$V_{\text{KA}}=36\text{V}, V_{\text{REF}}=0$			0.1	0.5	μA
Dynamic Impedance		Fig.3	$ Z_{\text{KA}} $	$V_{\text{KA}}=V_{\text{REF}}, I_{\text{KA}}=1 \text{ to } 80\text{mA}$ $f \leq 1.0\text{kHz}$		-	0.2	0.5	Ω

Parameter Measurement Information

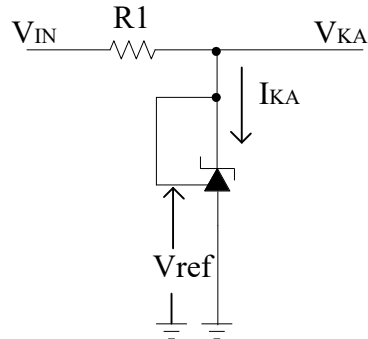


Figure 3. Test Circuit for $V_{KA}=V_{ref}$

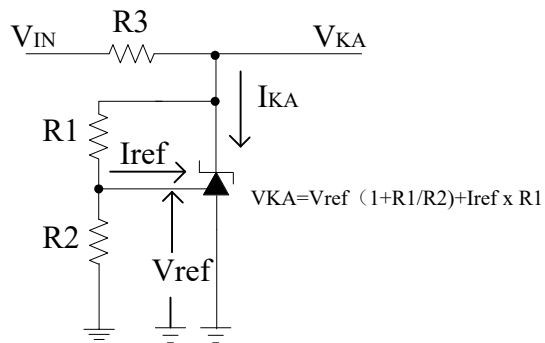


Figure 4. Test Circuit for $V_{KA}>V_{ref}$

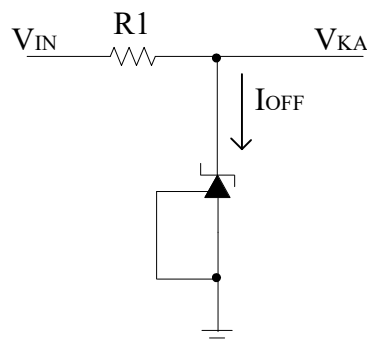
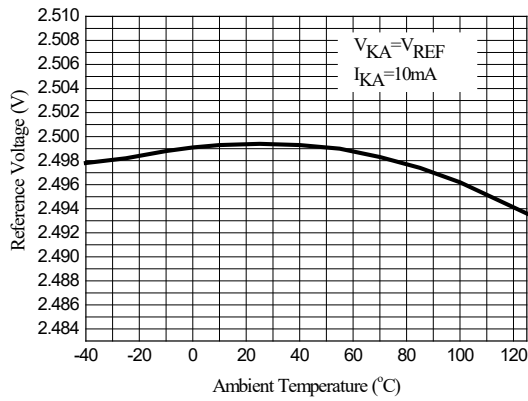


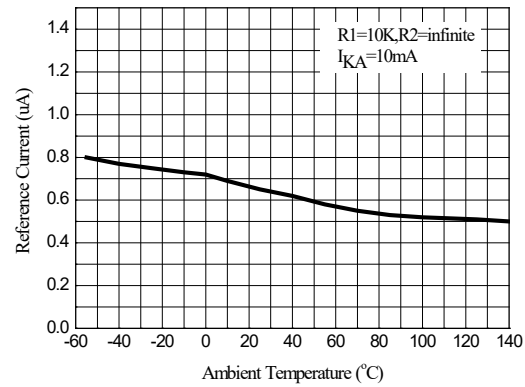
Figure 5. Test Circuit for I_{OFF}

Performance Characteristics

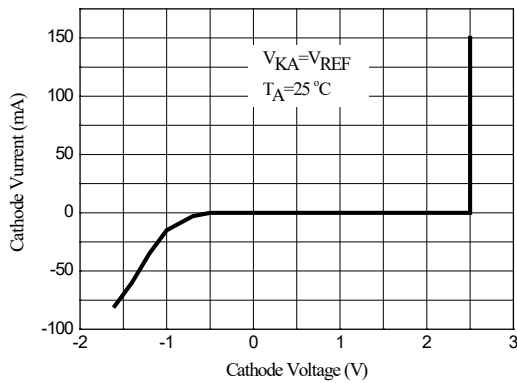
Reference Voltage vs. Ambient Temperature



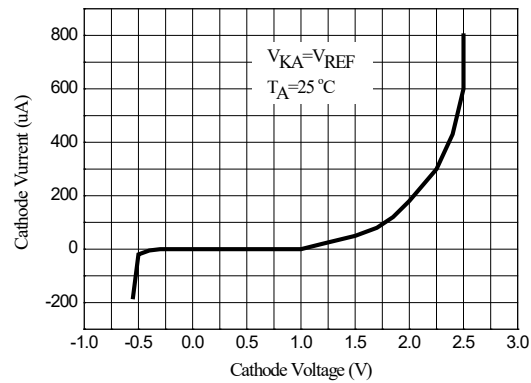
Reference Current vs. Ambient Temperature



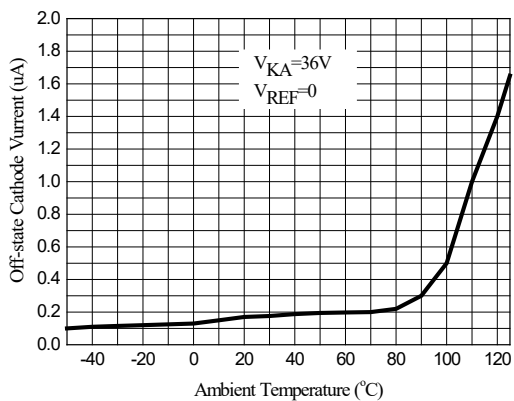
Cathode Current vs. Cathode voltage



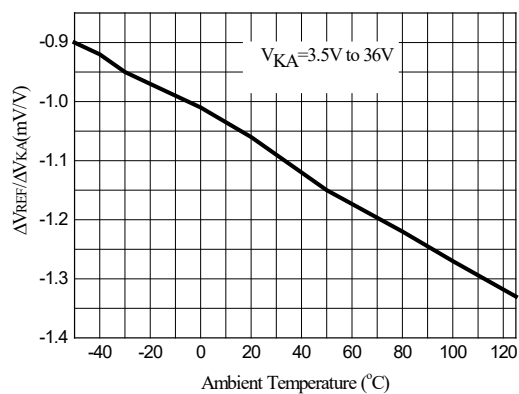
Cathode Current vs. Cathode voltage



Off-state Cathode Current vs. Ambient Temperature

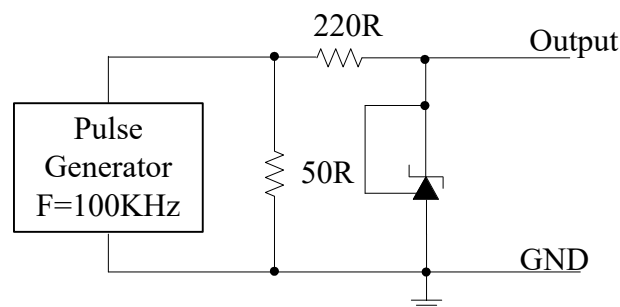
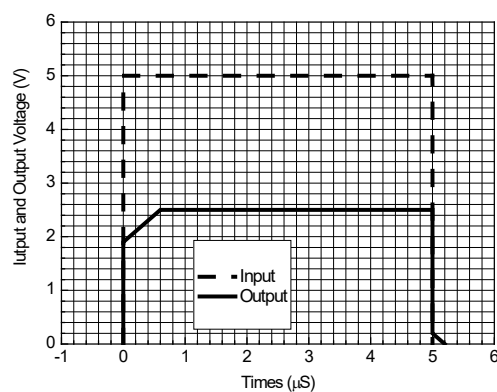
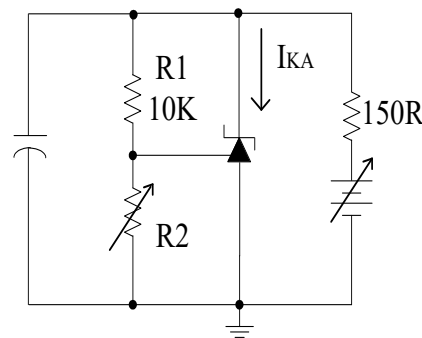
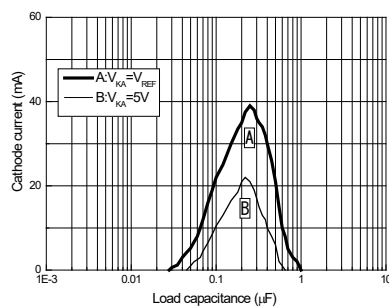
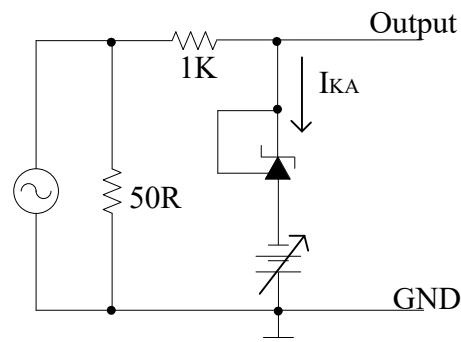
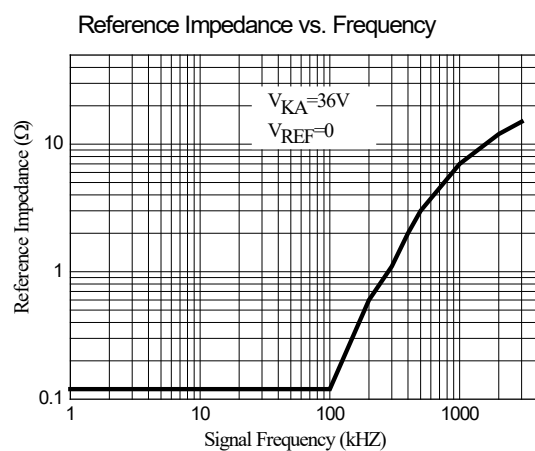
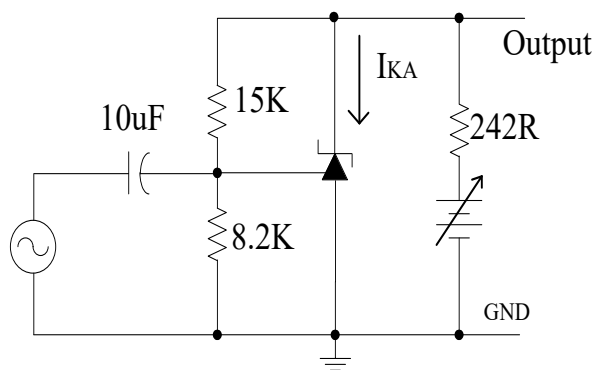
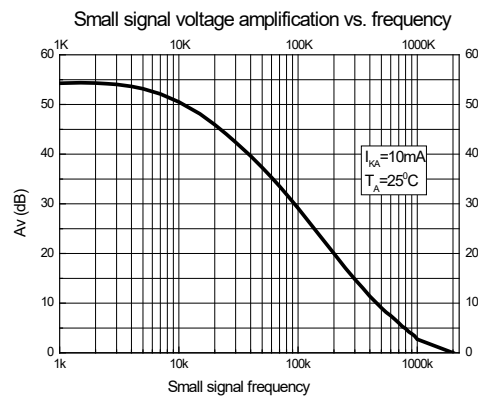


Ratio of delta reference voltage to the ratio of delta to the cathode voltage



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Typical Applications Circuit

