

## Adjustable Shunt Voltage Regulator

### Description

The YJ431A is a three-terminal adjustable shunt voltage 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 YJ431A can be set to any value between  $V_{REF}$  (2.5V) and the maximum cathode voltage  $V_{KA}$  (40V).

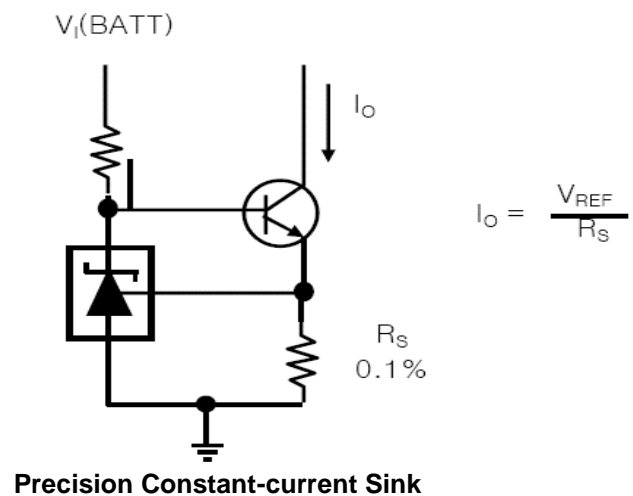
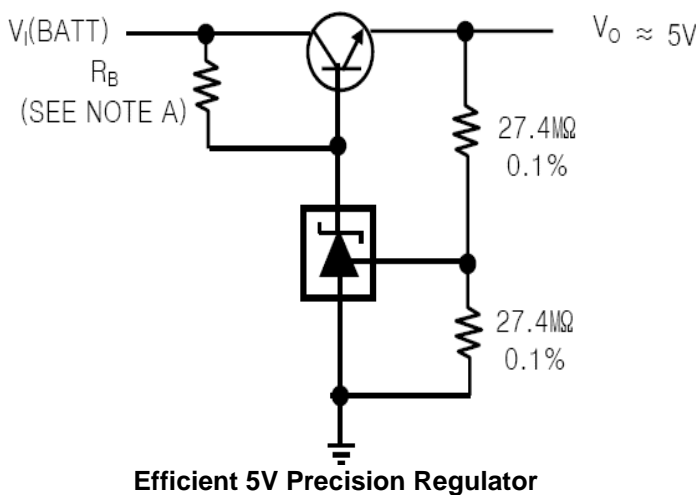
### Features

- Tolerance of Reference Voltage at  $\pm 1\%$
- Programmable Output Voltage up to 40V
- High Stability under Capacitive Loads
- Sink Current Capacity at 0.1 ~ 100mA
- Temperature Compensated for Stable Operation
- Wide Operating Temperature Range at  $-40 \sim 125^{\circ}\text{C}$
- Low Output Noise Voltage
- Fast Turn-ON Response

### Applications

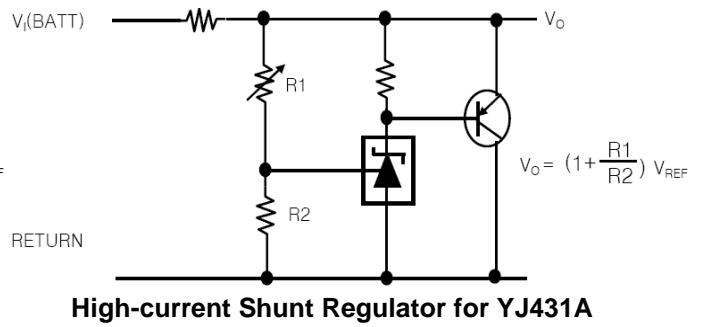
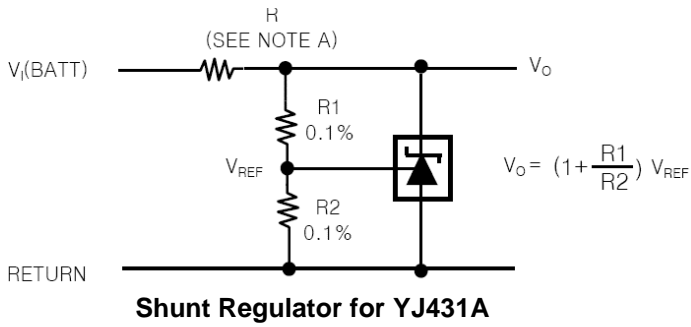
- Mobile Charger
- Wall AC-Adapter
- Switched Mode Power Supply
- PCI-E Add-IN/ON Peripherals
- Precision Voltage Reference

### Typical Applications





# YJ431A



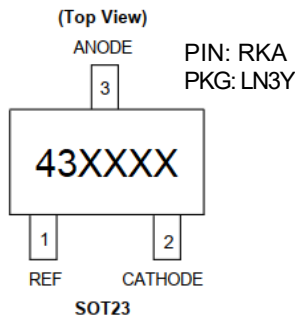
## Package and Ordering Information

Model	Product Name	Package Name	Junction Temperature	Voltage Tolerance	Ordering Number	Marking Information	Packing Option
	YJ431A	SOT-23	-40 ~ 125°C	± 1%	YJ431ALN3Y	43AXXX	Tape & Reel 3,000 pcs
		SOT-23	-40 ~ 125°C		YJ431ALNCY	4CAXXX	Tape & Reel 3,000 pcs

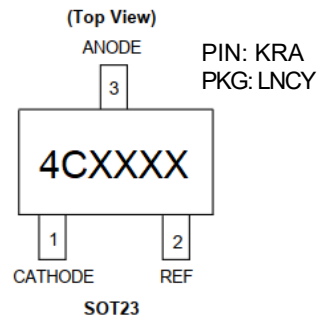
Notes:

1. XXX: Tracking Number

## Pin Configuration & Chip Marking

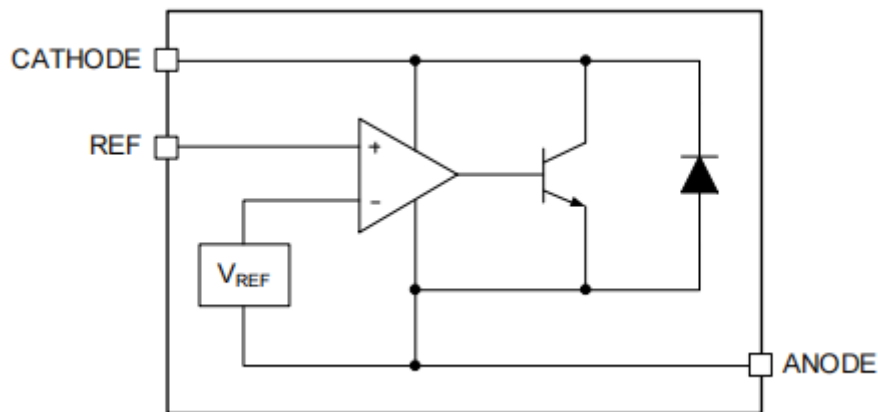


REF (R) : CATHODE (K) : ANODE (A)



CATHODE (K) : REF (R) : ANODE (A)

## Diagram of Functional Blocks





### ■ Absolute Maximum Ratings (Operating temperature range applies unless otherwise stated)

Parameter		Symbol	Ratings	Unit
Cathode Voltage		$V_{KA}$	40	V
Cathode Current Range (Continuous)		$I_{KA}$	-100 to 150	mA
Reference Input Current Range		$I_{REF}$	-0.05 to +10	mA
Thermal Resistance for Junction-to-Ambient	SOT-23	$R_{\theta JA}$	333	$^{\circ}\text{C}/\text{W}$
Power Dissipation at 25 $^{\circ}\text{C}$		$P_D$	0.3	W
Junction Temperature Range		$T_J$	-40 to +150	$^{\circ}\text{C}$
Storage Temperature Range		$T_{STG}$	-65 to +150	$^{\circ}\text{C}$

Notes:

1. Absolute maximum ratings are values beyond which the device could be permanently damaged.
2. While the absolute maximum ratings are to specify the stress which the device can bear without permanent damage, they are not recommended for standard device operation.
3. Because these conditions are guaranteed by design, they are not subjected to manufacturing tests in production.

### ■ Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		Min	Max	
Cathode Voltage	$V_{KA}$	$V_{REF}$	40	V
Cathode Current	$I_{KA}$	0.5	100	mA

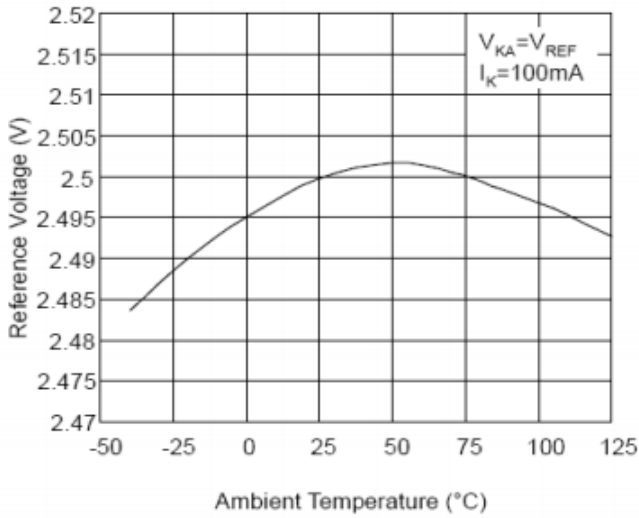
### ■ Electrical Characteristics ( $T_A = 25^{\circ}\text{C}$ , $V_{KA} = V_{REF}$ , $I_K = 10\text{mA}$ unless otherwise stated)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reference input voltage	$V_{REF}$   $\pm 1\%$	$V_{KA} = V_{REF}$ , $I_{KA} = 10\text{mA}$	2.470	2.495	2.520	V
Deviation of reference input voltage over full temperature range	$V_{REF(\text{dev})}$	$T_{\min} \leq T_A \leq T_{\max}$		3	17	mV
Ratio of change in reference input voltage to the change in cathode voltage	$\Delta V_{REF}/\Delta V_{KA}$	$\Delta V_{KA} = 10\text{V} - V_{REF}$		-0.5	-2.7	mV/V
		$\Delta V_{KA} = 36\text{V} - 10\text{V}$		-0.4	-2.0	
Reference input current	$I_{REF}$	$R_1 = 10\text{k}\Omega$ ; $R_2 = \infty\Omega$		1.8	4.0	$\mu\text{A}$
Deviation of reference input current over full temperature range	$I_{REF(\text{dev})}$	$R_1 = 10\text{k}\Omega$ ; $R_2 = \infty\Omega$		0.4	1.2	$\mu\text{A}$
Minimum cathode current for regulation	$I_{KA(\text{min})}$	-		0.25	0.50	mA
OFF-state Cathode current	$I_{KA(\text{off})}$	$V_{KA} = 40\text{V}$ ; $V_{REF} = 0\text{V}$		0.17	0.90	$\mu\text{A}$
Dynamic impedance	$Z_{KA}$	$I_{KA} = 1 \sim 100\text{mA}$ ; $f \leq 1.0\text{kHz}$		0.15	0.50	$\Omega$

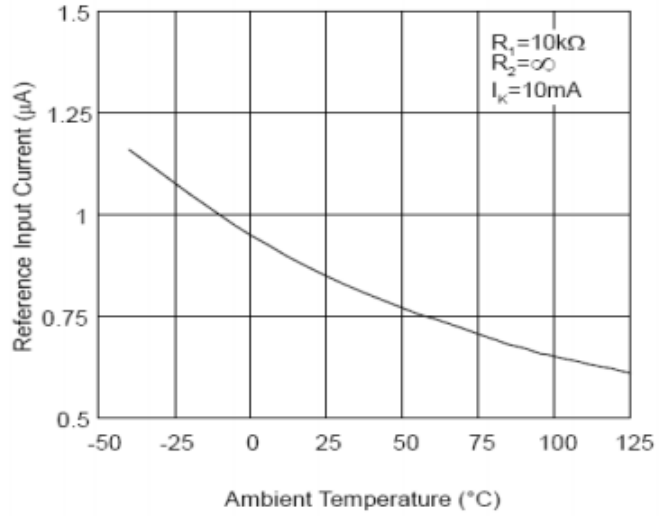


■ Performance Characteristics

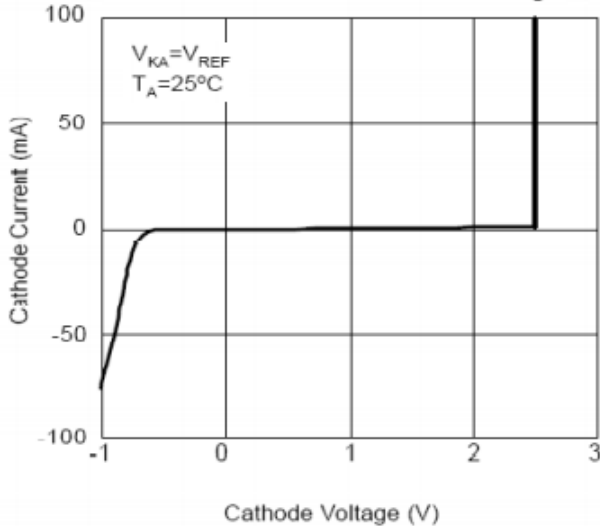
Reference Voltage vs. Ambient Temperature



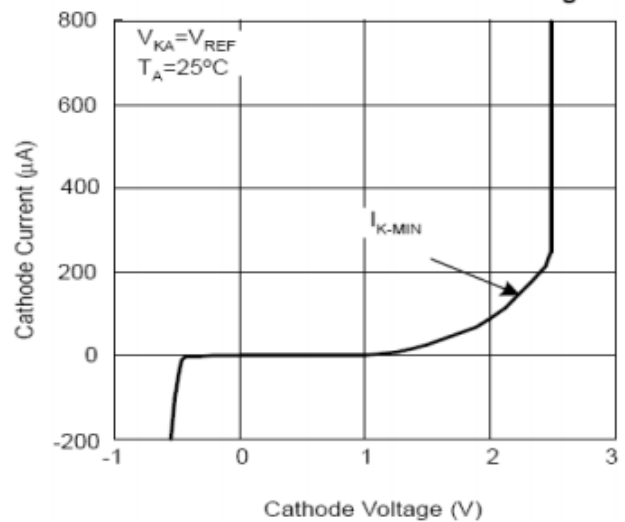
Reference Input Current vs. Ambient Temperature



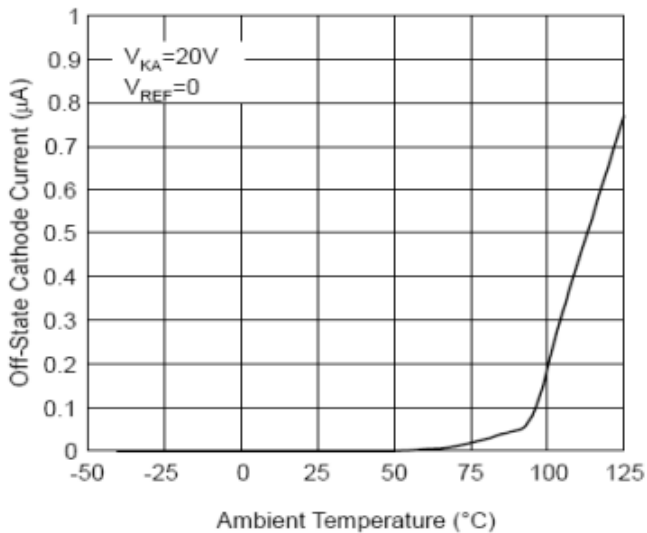
Cathode Current vs. Cathode Voltage



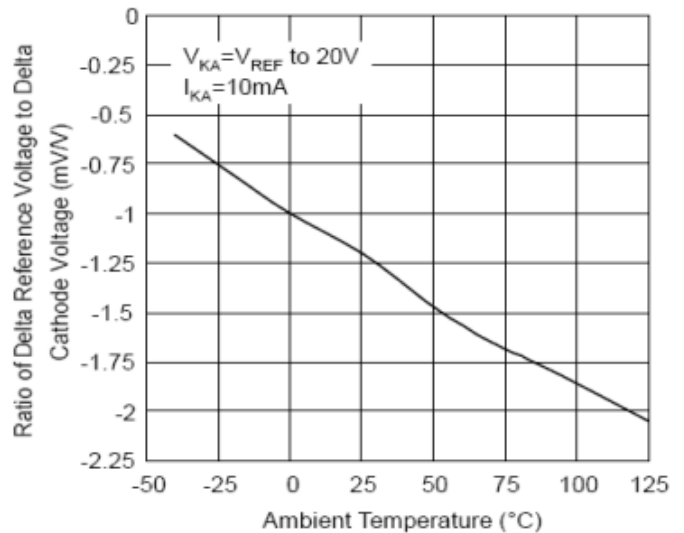
Cathode Current vs. Cathode Voltage



Off-State Cathode Current vs. Ambient Temperature



Ratio of Delta Reference Voltage to Delta Cathode Voltage vs. Ambient Temperature

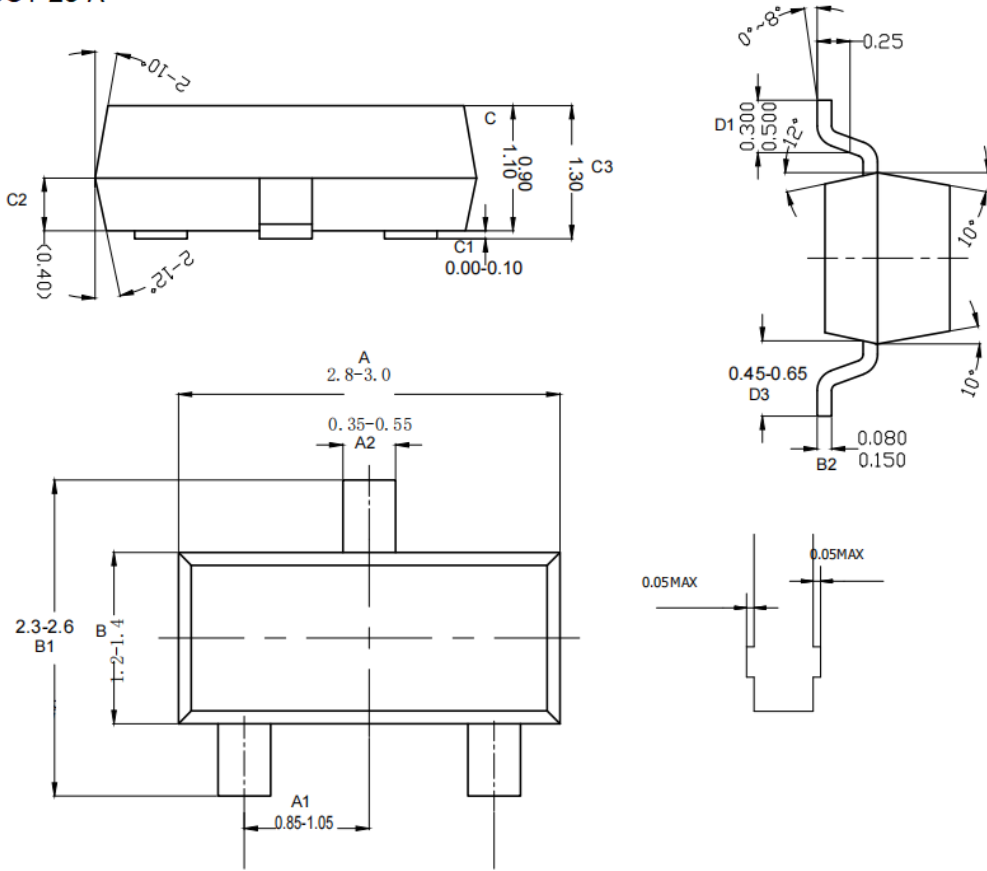




# YJ431A

## Package Outline Drawing

SOT-23-A



COMMON DIMENSIONS UNITS MEASURE=MILLIMETER			
SYMBOL	MIN	MID	MAX
A	2.80	2.90	3.0
A1	0.85	0.95	1.05
A2	0.35	0.45	0.55
B	1.20	1.3	1.4
B1	2.3	2.45	2.6
B2	0.08	0.115	0.15
C	0.90	1.0	1.10
C1	0.00	0.05	0.10
C2	0.35	0.4	0.45
C3	1.30MAX		
D1	0.3	0.4	0.5
D2	0.25TYP		
D3	0.45	0.55	0.65



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