431L

(SC431L) Adjustable Precision Shunt Regulators

December 2001

FEATURES

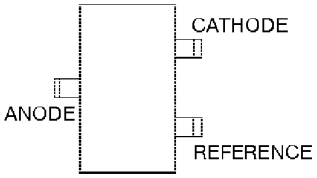
- Low voltage operation (down to 1.24V)
- Wide operating current range 80μA to 100mA
- Low Dynamic output impedance 0.05 Ω typ.
- Available in SOT-23-3, SOT-23-5 and TO-92 packages

DESCRIPTION

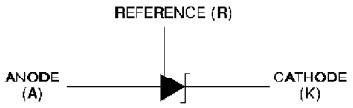
The AS431 are three-terminal adjustable shunt regulators with specified thermal stability. The output voltage may be set to any value between V_{ref} (approximately 1.24V) and 16 V with two external resistors. These devices have a typical output impedance of 0.05Ω. Active output circuitry provides a very sharp turn-on characteristic, making these devices excellent replacements for zener diodes in many applications.

Pin Configuration

(TOP VIEW)
SOT-23-3



SYMBOL



Absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Parameter	Value	Units
Cathode voltage (see Note 1)	20	V
Continuous cathode current range	100	mA
Reference input current range	3	
Operating free-air temperature rage	0 to 70	°C
Lead temperature 1.6mm from case for 10 seconds	260	

Note 1: Voltage values are with respect to the anode terminal unless otherwise noted

Recommended operating conditions

Parameter	MIN	MAX	UNIT
Cathode voltage, V_{KA}	V_{ref}	16	V
Cathode current, I_K	80μA	100	mA

Electrical characteristics at 25 °C free-air temperature (unless otherwise noted)

Parameter	Symbol	Test Circuit	Test Conditions	MIN	TYP	MAX	UNIT
Reference input voltage	V_{ref}	1	$V_{KA}=V_{ref}$, I_K=10mA	1228	1240	1252	mV
Deviation of reference input voltage over full temperature range	$V_{ref(dev)}$	1	$V_{KA}=V_{ref}$, I_K=10mA, T_A=full range		10	25	
Ratio of change in reference input voltage to the change in cathode voltage	$\Delta V_{ref}/\Delta V_{KA}$	2	I_K=10mA, ΔV_{KA}=16V to V_{ref}	-2.7	-1.0		mV/V
Reference input current	I_{ref}	2	I_K=10mA, R1=10KΩ, R2=∞		0.15	0.5	μA
Deviation of reference input current over full temperature range	$I_{ref(dev)}$	2	I_K=10mA, R1=10KΩ, R2=∞, T_A=full range		0.1	0.4	
Minimum cathode current for regulation	I_{min}	1	$V_{KA}=V_{ref}$		20	80	μA
Off-state cathode current	I_{off}	3	V_{KA}=16V, Vref=0		0.135	0.15	μA
Dynamic impedance	$\lvert Z_{KA} \rvert$	1	$V_{KA}=V_{ref}$, I_K=100μA to 100mA, f≤1KHz		0.05	0.15	Ω

PARAMETER MEASUREMENT INFORMATION

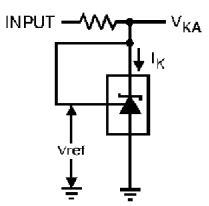


FIGURE 1. TEST CIRCUIT FOR V_{KA} = Vref

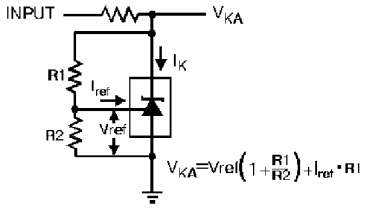


FIGURE 2. TEST CIRCUIT FOR V_{KA} > Vref

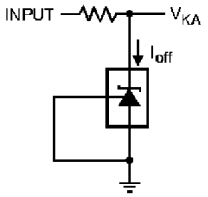


FIGURE 3. TEST CIRCUIT FOR I_{off}

TYPICAL CHARACTERISTICS

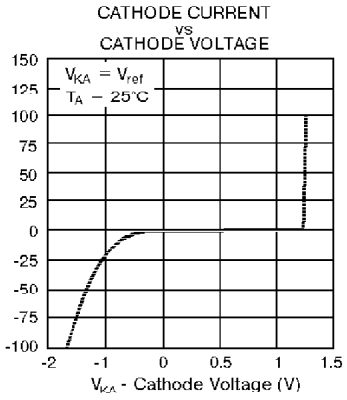


FIGURE 1

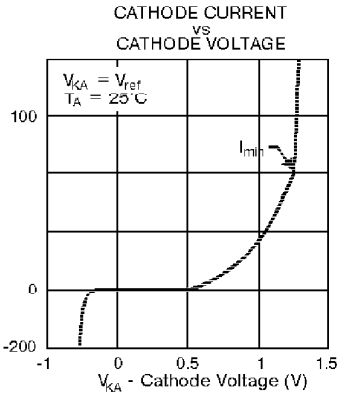


FIGURE 2

TYPICAL APPLICATIONS

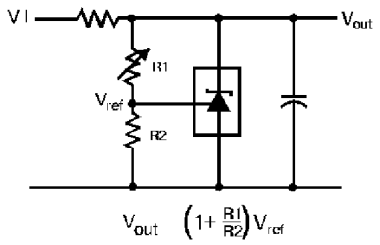


FIGURE 1. SHUNT REGULATOR

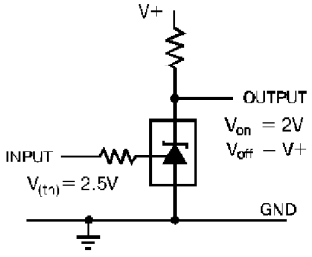
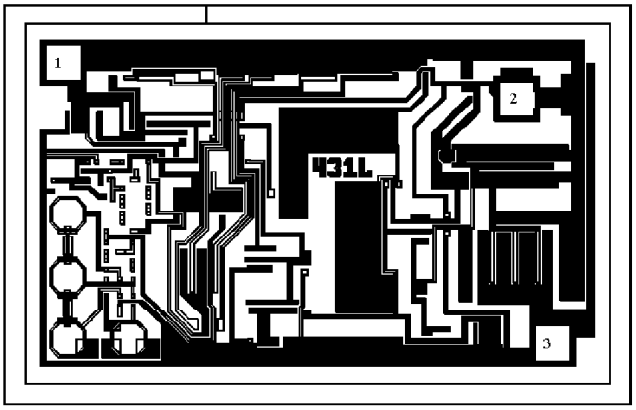


FIGURE 2. SINGLE-SUPPLY COMPARATOR WITH TEMPERATURE-COMPENSATED THRESHOLD

Pad Location SC431L



Chip size: 1.40 x 0.90 mm

Pad Location Coordinates

Pad N	Pad Name	Coordinates	
		X (□m)	Y (□m)
1	cathode	130	767
2	reference	1146	687
3	anode	1226	132