Suntac ELECTRONIC CORP

STC431

Programmable Voltage Reference

Features

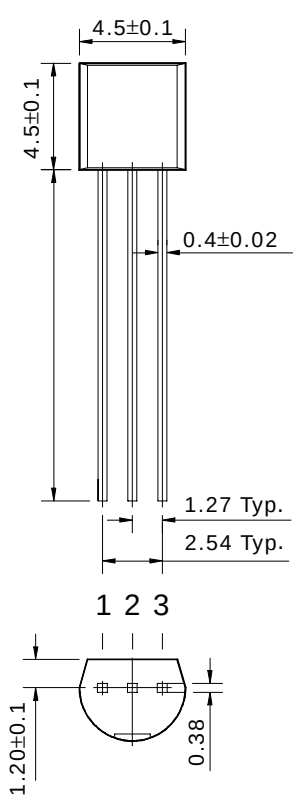
- Programmable output voltage to 36 volts
- Sink current capability of 1.0mA to 100mA
- Low dynamic impedance 0.15Ω typical
- Temperature compensated for operation over full rated operating temperature
- Equivalent full-range temperature coefficient of 50ppm/℃ (Typical)
- Low output Noise voltage
- Voltage reference tolerance : ±1.0% (Ta=25℃)

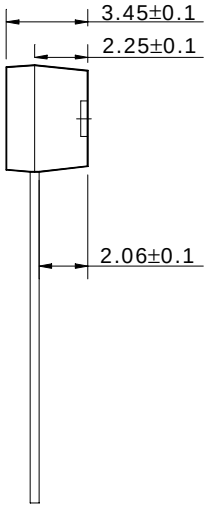
Ordering Information

Type NO.	Marking	Package Code
STC431	STC431	TO-92

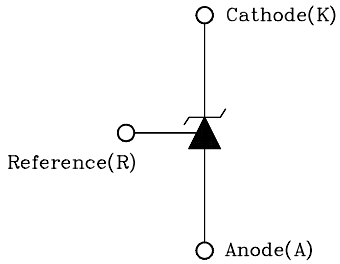
Outline Dimensions

unit : mm

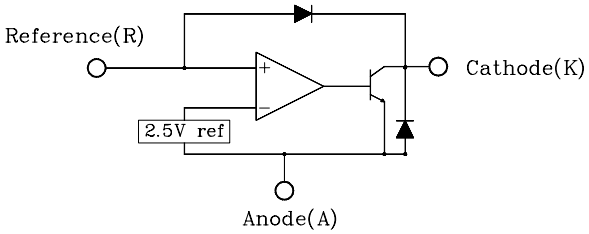




Symbol



Functional block diagram



PIN Connections

1. Reference
2. Anode
3. Cathode

Absolute maximum ratings

(Operating ambient temperature range applies unless other specified)

Parameter	Symbol	Ratings	Unit
Cathode to anode voltage	V_{KA}	37	V
Cathode current range(Continuous)	I_K	-100 ~+150	mA
Reference input current range(Continuous)	I_{ref}	-0.05~+10	mA
Power dissipation	P_D^*	700	mW
Operating temperature range	T_{opr}	-40~+85	°C
Storage temperature range	T_{stg}	-65~+150	°C

Recommended operating conditions

Parameter	Symbol	Ratings		Unit
		Min.	Max.	
Cathode to Anode voltage	V_{KA}	V_{ref}	36	V
Cathode current range(Continuous)	I_K	1.0	100	mA

Electrical Characteristics

(Ambient temperature at 25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reference input voltage (Fig. 1, Note 1)	V_{ref}	$V_{KA}=V_{ref}$, I_K=10mA	2.47	2.495	2.52	V
Deviation of reference input voltage Over temperature(Fig. 1, Note 1,2)	ΔV_{ref}	$V_{KA}=V_{ref}$, I_K=10mA @Ta=T_{LOW} to T_{HIGH}	-	7.0	30	mV
Ratio of change in reference input Voltage to the change in cathode Voltage(Fig. 2)	$\frac{\Delta V_{ref}}{\Delta V_{KA}}$	I_K=10mA ΔV_{KA}=10V-V_{ref} ΔV_{KA}=36V-10V	- -	1.2 0.7	2.7 2.0	mV/V
Reference input current(Fig. 2)	I_{ref}	I_K=10mA R1=10KΩ, R2=∞	-	1.8	4.0	μA
Deviation of reference input voltage over temperature(Fig. 2)	ΔI_{ref}	I_K=10mA R1=10KΩ, R2=∞	-	0.4	2.5	μA
Minimum cathode current for Regulation(Fig. 1)	I_{MIN}	$V_{KA}=V_{ref}$	-	0.35	1.0	mA
Off-state cathode current(Fig. 3)	I_{OFF}	V_{KA}=36V, V_{ref}=0V	-	2.7	1000	nA
Dynamic impedance(Fig. 1, Note 3)	Z_{KA}	$V_{KA}=V_{ref}$, f≤1.0KHz I_{KA}=1.0mA-100mA	-	0.14	0.5	Ω

Fig. 1

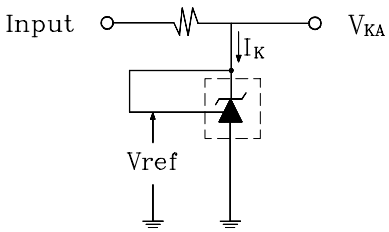


Fig. 2

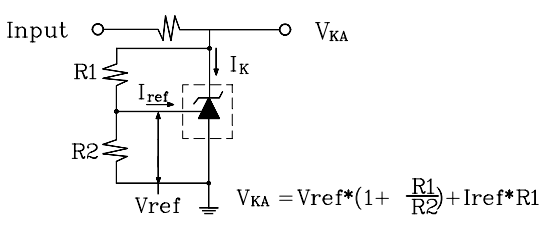
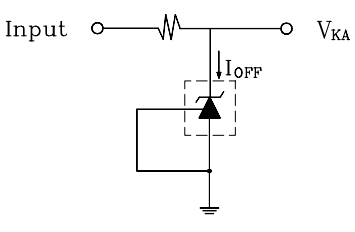


Fig. 3



<Note 1> : T_{LOW}=-40°C, T_{HIGH}=+85°C , <Note 2> : ΔV_{ref}= V_{ref} Max. - V_{ref} Min. , <Note 3> : Z_{KA}= ΔV_{KA}/ ΔI_K

Characteristic diagrams

Fig. 4 I_K vs. V_{KA}

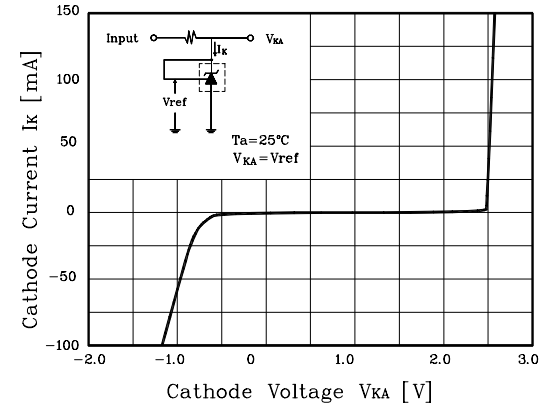


Fig. 5 I_{MIN} vs. V_{KA}

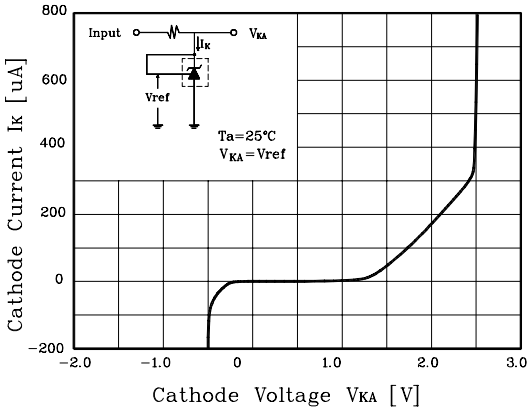


Fig. 6 ΔV_{ref} vs. T_a

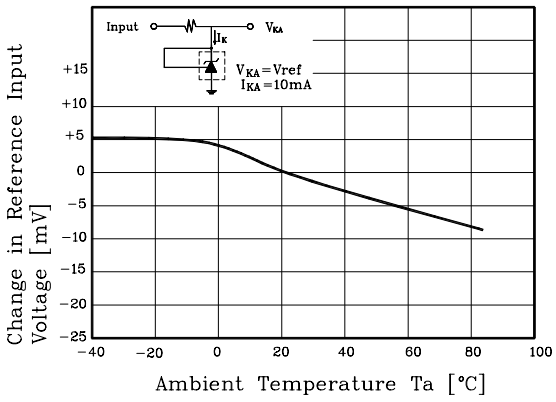


Fig. 7 ΔV_{ref} vs. V_{KA}

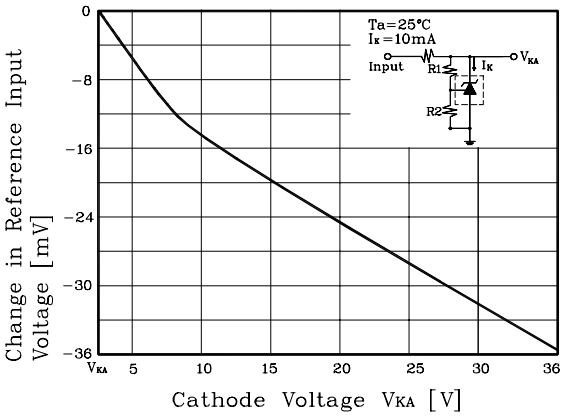


Fig. 8 Gv vs. frequency

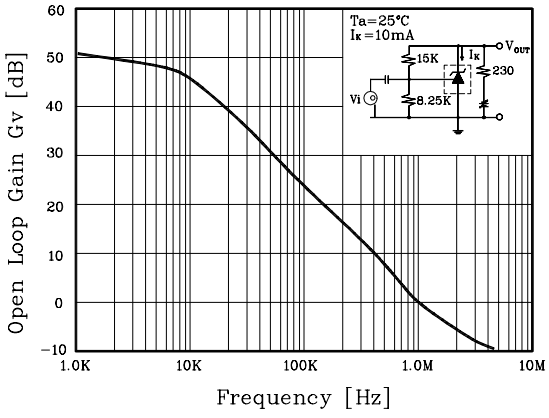
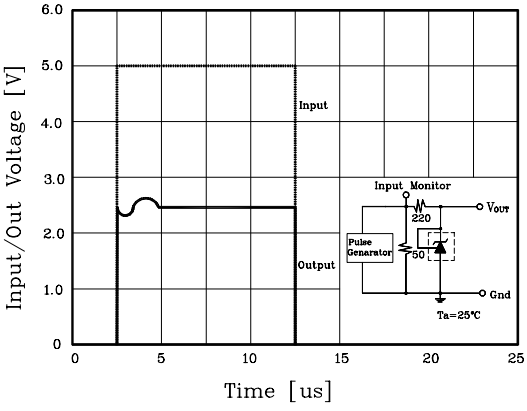


Fig. 9 Pulse reponse



APPLICATION CIRCUIT

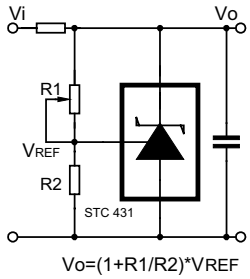


Fig 7 Shutdown Regulator

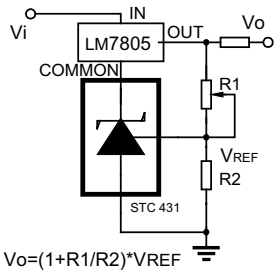


Fig 8 Output Control of a Three -Terminal Fixed Regulator

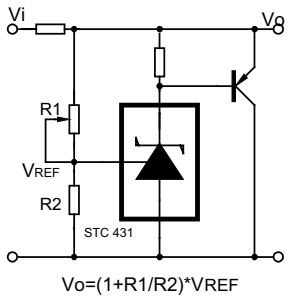


Fig 9 Higher-current Shunt Regulator

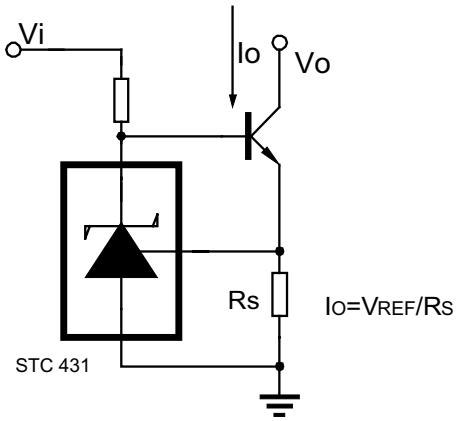


Fig 1 0 Constant-current Sink

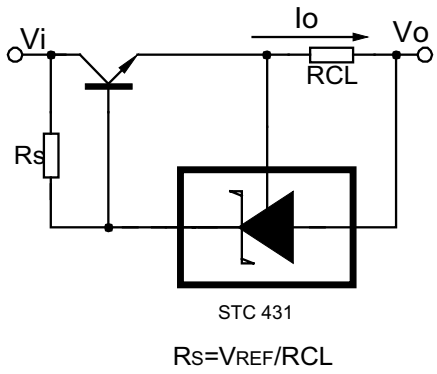


Fig 11 Current Limiting or Current Source

TEST CIRCUIT

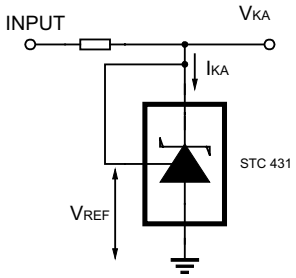


Fig 12 Test Circuit For VKA=VREF

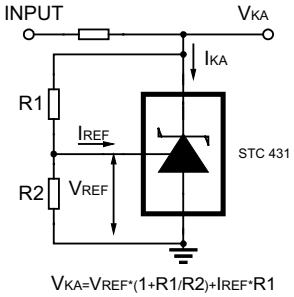


Fig 1 3 Test Circuit for VKA >= VREF

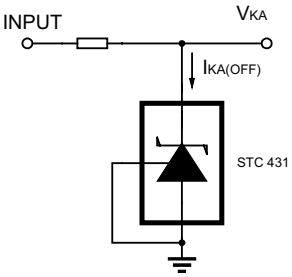


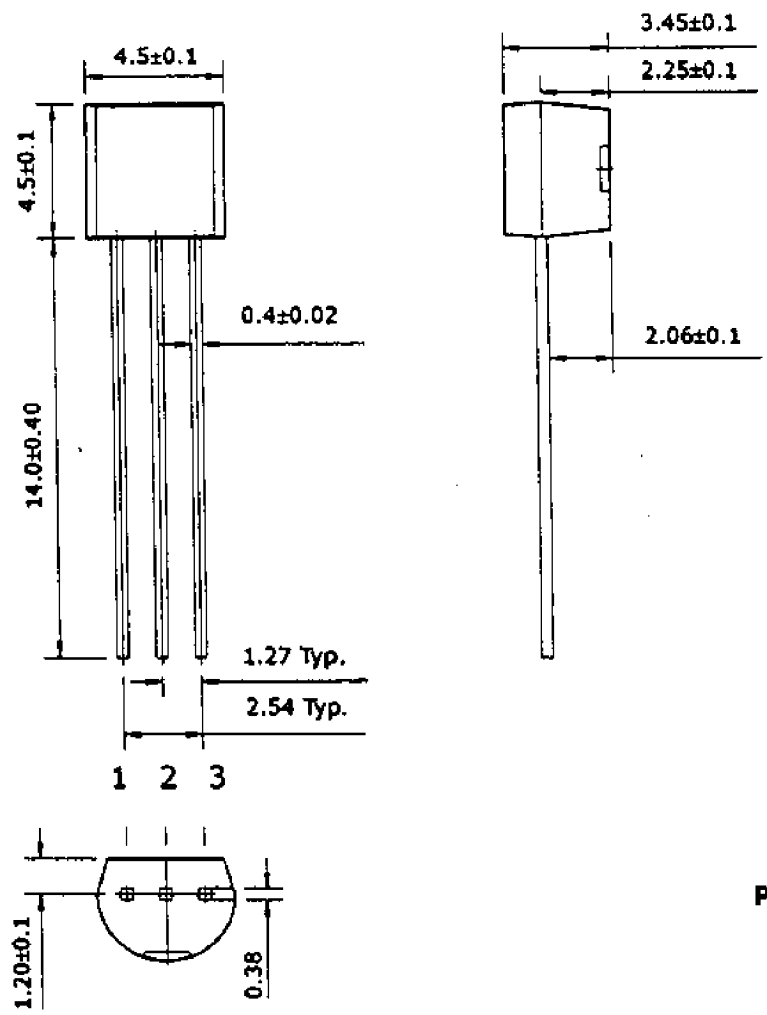
Fig 14Test Circuit For IKA(OFF)

Ordering Information

Type No.	Marking	Spec.	Package Code
STC431	Ⓢ431A	5/1000	TO-92
STC431	Ⓢ431B	1/100	TO-92

Outline Dimensions

unit : mm



PIN Connections

1. Ref
2. Anode
3. Cathode