Ordering number:ENN2173B

Monolithic Linear IC

L5431

High-Precision Variable Shunt Voltage Regulator

Overview

The L5431 is a high-precision variable shunt voltage regulator IC whose output voltage can be set to a value from approximately 2.5V to 36V by using external resistors. Because of low output resistance and fast pulse response, the L5431 can be most suitably used as high-precision voltage reference, high-speed comparator, or zener diode.

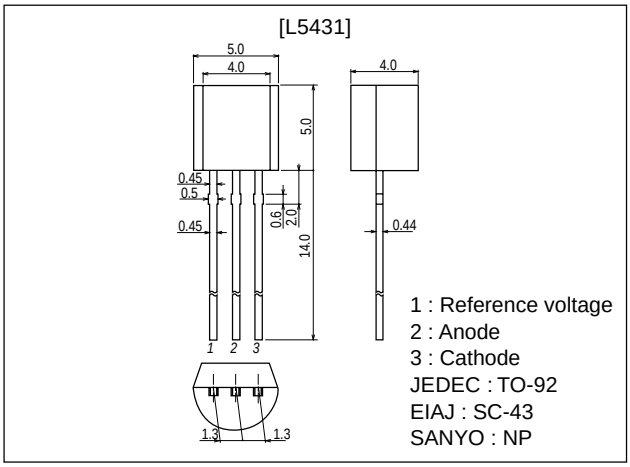
Features

- Excellent temperature characteristic of Vref : 50ppm/°C (typ)
- Output voltage settable : Approximately 2.5V to 36V.
- Output flow-in current range : 1mA to 100mA
- Low dynamic resistance : 0.15Ω (typ)
- Fast response.
- Low output noise voltage.
- Small-sized TO-92.

Package Dimensions

unit:mm

3101



Specifications

Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Voltage Applied across Cathode and Anode	V_{KA} max	Referenced to anode	37	V
Cathode Current	I_K max		–100 to +150	mA
Reference Voltage Pin Input Current	Iref		–0.05 to +10	mA
Allowable Power Dissipation	Pd max	Ta≤25˚C	750	mW
Operating Temperature	Topr		–20 to +85	˚C
Storage Temperature	Tstg		–65 to +150	˚C

Recommended Operating Conditions at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Voltage Applied across Cathode and Anode	V_{KA}		Vref to 36	V
Cathode Current	I_K	Stabilized state	1 to 100	mA

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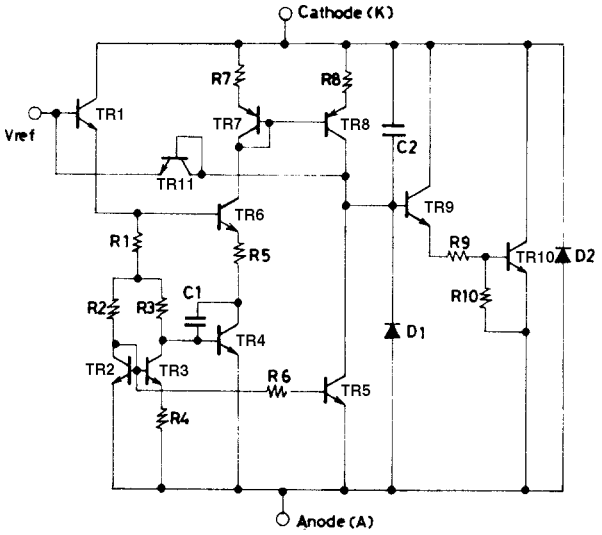
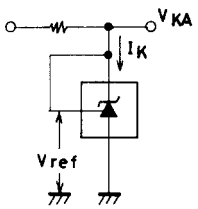
Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Reference Voltage	Vref	V_{KA}=Vref, I_K=10mA : Fig.1	2440	2495	2550	mV
Reference Voltage Change with Temperature (Note1)	ΔVref (Ta)	V_{KA}=Vref, I_K=10mA, Ta=0 to +70°C : Fig.1		8	17	mV
Vref Change Ratio to V_{KA}	$\frac{\Delta Vref}{\Delta V_{KA}}$	I_K=10mA, ΔV_{KA}=10V to Vref : Fig.2		–1.4	–2.7	mV/V
		I_K=10mA, ΔV_{KA}=36V to 10V : Fig.2		–1.0	–2.0	mV/V
Reference Voltage Pin Input Current Change with Temperature (Note1)	ΔIref (Ta)	I_{KA}=10mA, R1=10kΩ, R2=∞, Ta=0 to +70°C : Fig.2		2	4	μA
Minimum Cathode Current	I_{KMIN}	V_{KA}=Vref, regulation availabe : Fig1		0.4	1	mA
OFF-Stage Cathode Current	I_{Koff}	V_{KA}=36V, Vref=0 : Fig.3		0.1	1	μA
Dynamic Resistance (Note2)	$\lvert Z_{KA} \rvert$	V_{KA}=Vref, f≤1kHz, I_K=1 to 100mA : Fig.1		0.15	0.5	Ω

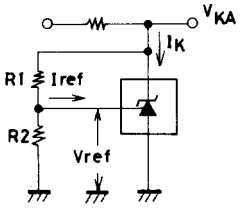
Equivalent Circuit Diagram



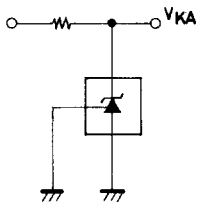
Input Voltage



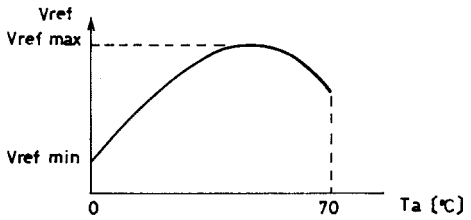
Input Voltage



Input Voltage



Note1 : ΔVref (Ta) is defined by using Vref max and Vref min as follows :
ΔVref (Ta)=Vref max – Vref min



Note2 : The dynamic resistance is defined as follows :

$$|\Delta Z_{KA}| = \frac{\Delta V_{KA}}{\Delta I_K}$$