



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.

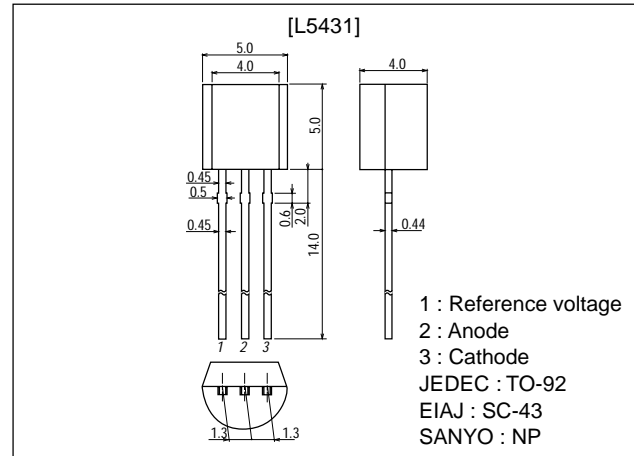
Features

- Excellent temperature characteristic of V_{ref} : 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 $T_a = 25^\circ\text{C}$

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	I_{ref}		-0.05 to +10	mA
Allowable Power Dissipation	P_d max	$T_a \leq 25^\circ\text{C}$	750	mW
Operating Temperature	T_{opr}		-20 to +85	°C
Storage Temperature	T_{stg}		-65 to +150	°C

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

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

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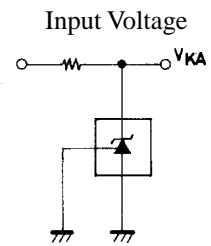
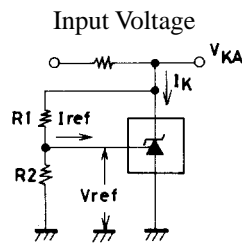
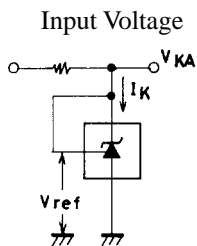
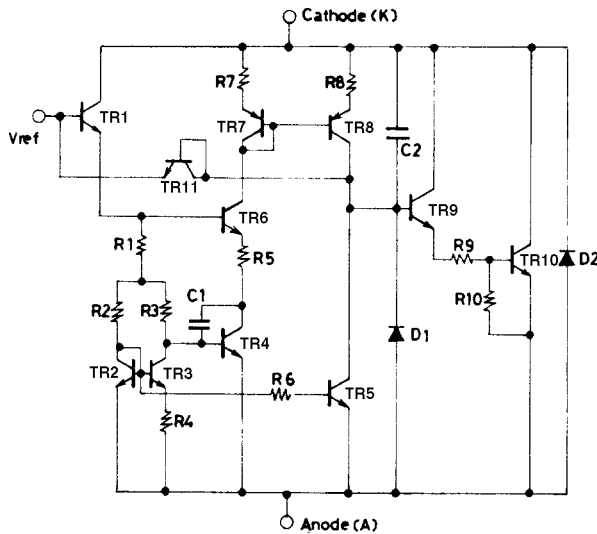
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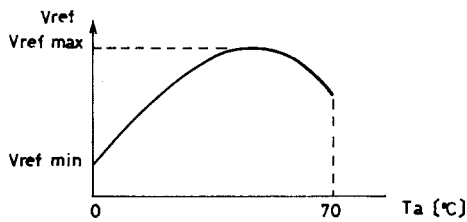
Electrical Characteristics at Ta = 25°C

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

Equivalent Circuit Diagram

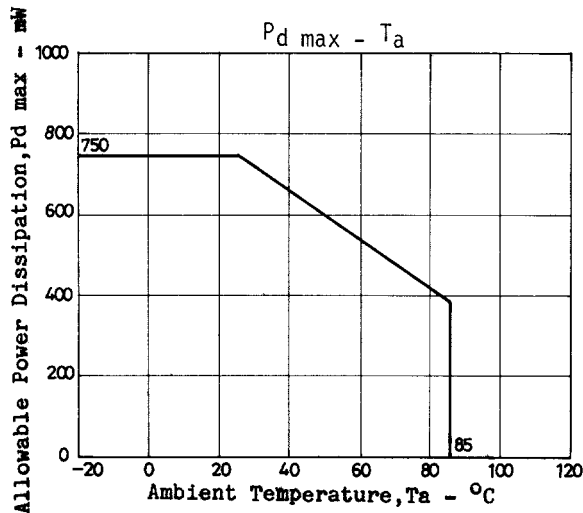


Note1 : ΔVref (Ta) is defined by using Vref max and Vref min as follows :
 $\Delta V_{ref} (Ta) = V_{ref \max} - V_{ref \min}$



Note2 : The dynamic resistance is defined as follows :

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



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