

SANYO	No.2173B	L5431
High-Precision Variable Shunt Voltage Regulator		

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

- (1) Excellent temperature characteristic of V_{ref} : 50ppm/°C(typ)
- (2) Output voltage settable: Approximately 2.5V to 36V
- (3) Output flow-in current range: 1mA to 100mA
- (4) Low dynamic resistance: 0.15ohm(typ)
- (5) Fast response
- (6) Low output noise voltage
- (7) Small-sized TO-92

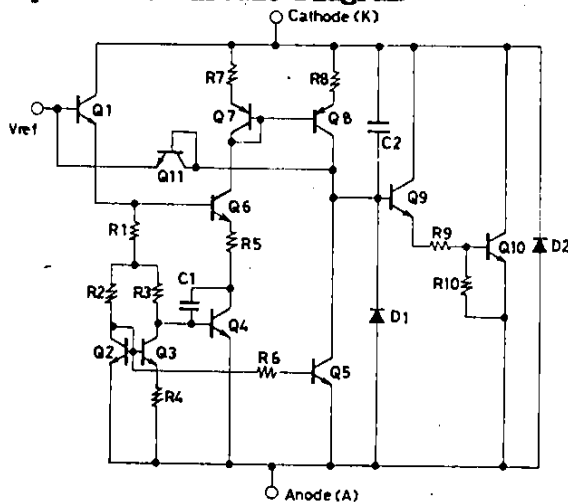
Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Value	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

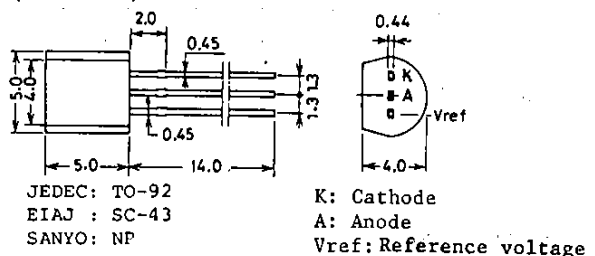
Recommended Operating Conditions at $T_a=25^\circ\text{C}$

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

Equivalent Circuit Diagram



Package Dimensions 3101 (unit: mm)



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Electrical Characteristics at Ta=25°C

			min	typ	max	unit	Test Circuit
Reference Voltage	Vref	V _{KA} =Vref, I _K =10mA	2440	2495	2550	mV	Fig.1
Reference Voltage Change with Temperature (Note1)	ΔVref(Ta)	V _{KA} =Vref, I _K =10mA, Ta=0 to +70°C		8	17	mV	Fig.1
Vref Change Ratio to V _{KA}	$\frac{\Delta V_{ref}}{\Delta V_{KA}}$	I _K =10mA, ΔV _{KA} =10V to Vref	-1.4	-2.7		mV/V	Fig.2
Reference Voltage Pin Input Current Change with Temperature (Note1)	ΔIref(Ta)	I _K =10mA, ΔV _{KA} =36V to 10V		2	4	uA	Fig.2
Minimum Cathode Current	I _{KMIN}	I _K =10mA, R1=10kohms R2=∞, Ta=0 to +70°C					
OFF-State Cathode Current	I _{Koff}	V _{KA} =Vref, regulation available	0.4	1		mA	Fig.1
Dynamic Resistance (Note2)	Z _{KA}	V _{KA} =36V, Vref=0	0.15	0.5		ohm	Fig.3
		V _{KA} =Vref, f ≤ 1kHz, I _K =1 to 100mA					

Input Voltage

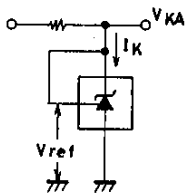


Fig.1

Input Voltage

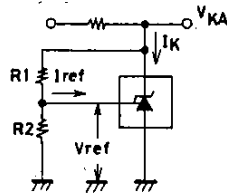


Fig.2

Input Voltage

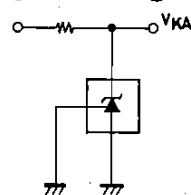
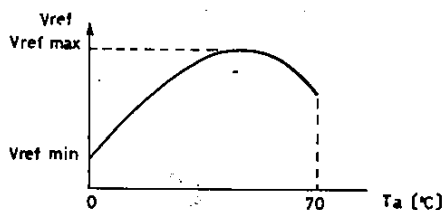


Fig.3

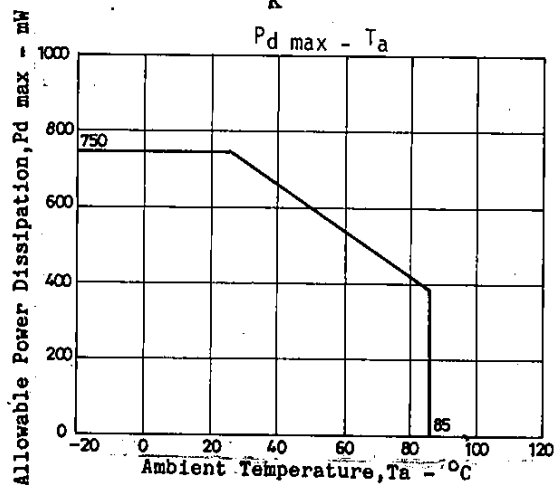
Note1: ΔVref(Ta) is defined by using Vref max and Vref min as follows:

$$\Delta V_{ref}(T_a) = V_{ref \max} - V_{ref \min}$$



Note2: The dynamic resistance is defined as follows:

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



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