

<b>SANYO</b>	No.2173B	<b>L5431</b>
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 Vref: 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

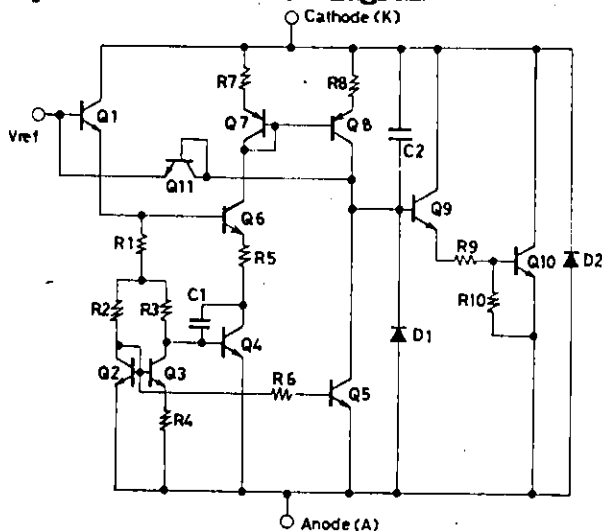
**Maximum Ratings at Ta=25°C**

			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	$T_a \leq 25^\circ C$	750 mW
Operating Temperature	$T_{opr}$		-20 to +85 °C
Storage Temperature	$T_{stg}$		-65 to +150 °C

**Recommended Operating Conditions at Ta=25°C**

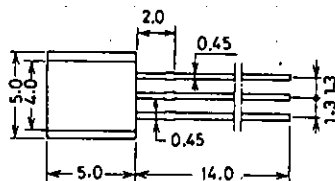
			unit
Voltage Applied across Cathode and Anode	$V_{KA}$		Vref to 36 V
Cathode Current	$I_K$	Stabilized state	1 to 100 mA

**Equivalent Circuit Diagram**

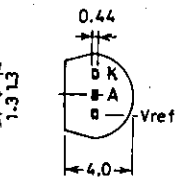


**Package Dimensions 3101**

(unit: mm)



JEDEC: TO-92  
EIAJ: SC-43  
SANYO: NP



K: Cathode  
A: Anode  
Vref: Reference voltage

Electrical Characteristics at Ta=25°C

			min	typ	max	unit	Test Circuit
Reference Voltage	Vref	V <sub>KA</sub> =Vref, I <sub>K</sub> =10mA	2440	2495	2550	mV	Fig.1
Reference Voltage Change with Temperature (Note1)	ΔVref(Ta)	V <sub>KA</sub> =Vref, I <sub>K</sub> =10mA, Ta=0 to +70°C		8	17	mV	Fig.1
Vref Change Ratio to V <sub>KA</sub>	$\frac{\Delta V_{ref}}{\Delta V_{KA}}$	I <sub>K</sub> =10mA, ΔV <sub>KA</sub> =10V to Vref I <sub>K</sub> =10mA, ΔV <sub>KA</sub> =36V to 10V		-1.4	-2.7	mV/V	Fig.2
Reference Voltage Pin Input Current Change with Temperature (Note1)	ΔIref(Ta)	I <sub>K</sub> =10mA, R1=10kohms R2=∞, Ta=0 to +70°C		2	4	μA	Fig.2
Minimum Cathode Current	I <sub>KMIN</sub>	V <sub>KA</sub> =Vref, regulation available		0.4	1	mA	Fig.1
OFF-State Cathode Current	I <sub>Koff</sub>	V <sub>KA</sub> =36V, Vref=0		0.1	1	μA	Fig.3
Dynamic Resistance (Note2)	Z <sub>KA</sub>	V <sub>KA</sub> =Vref, f ≤ 1kHz, I <sub>K</sub> =1 to 100mA		0.15	0.5	ohm	Fig.1

Input Voltage

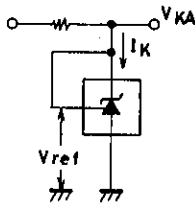


Fig.1

Input Voltage

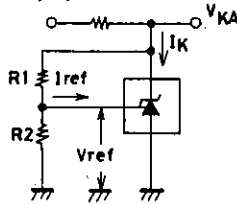


Fig.2

Input Voltage

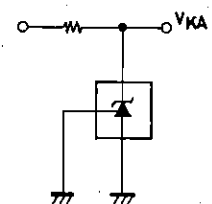
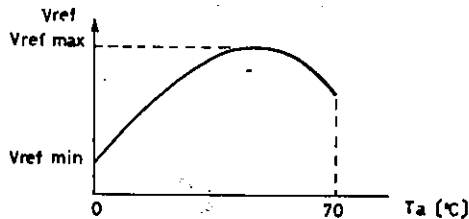


Fig.3

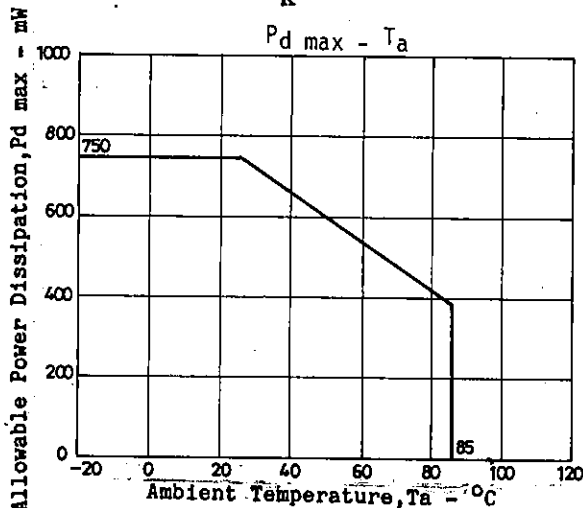
Note1: ΔVref(Ta) is defined by using Vref max and Vref min as follows:

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



Note2: The dynamic resistance is defined as follows:

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



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