

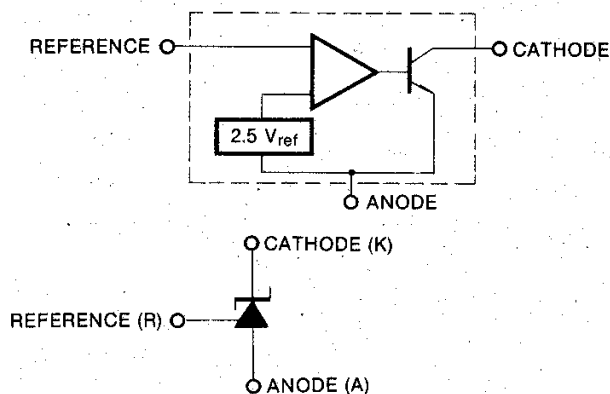
PROGRAMMABLE PRECISION REFERENCES

The KA431 is a three-terminal adjustable regulator series with guaranteed thermal stability over applicable temperature ranges. The output voltage may be set to any value between V_{ref} (approximately 2.5 volts) and 36 volts with two external resistors. These devices have a typical dynamic output impedance of 0.2Ω . Active output circuitry provides a very sharp turn-on characteristic, making these devices excellent replacement for zener diodes in many applications.

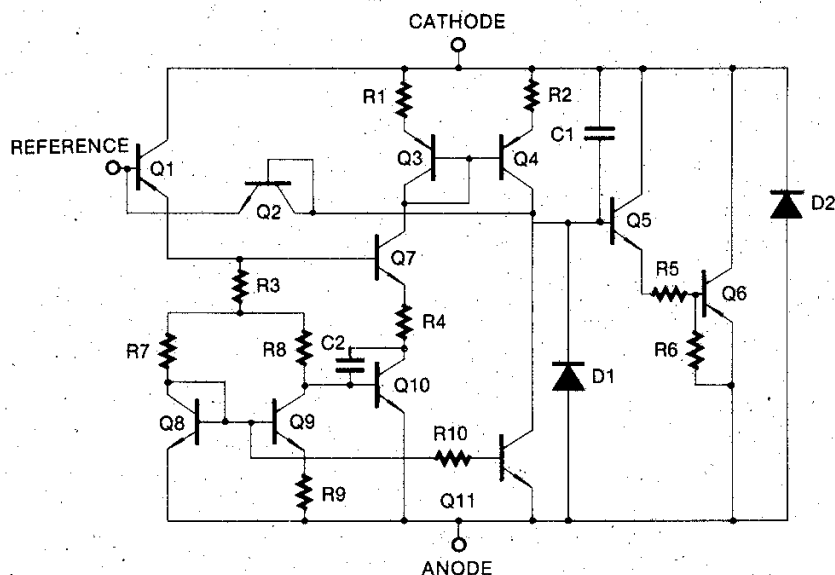
FEATURES

- Programmable output voltage to 36 volts
- Low dynamic output impedance 0.2Ω typical
- Sink current capability of 1.0 to 100mA
- Equivalent full-range temperature coefficient of 50ppm/°C typical
- Temperature compensated for operation over full rated operating temperature range
- Low output noise voltage

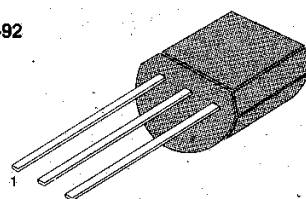
BLOCK DIAGRAM



SCHEMATIC DIAGRAM

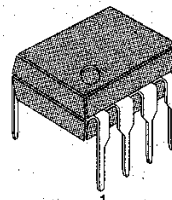


TO-92

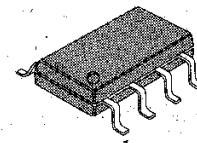


1: Ref. 2: Anode 3: Cathode

8 DIP

1: Cathode 6: Anode 8: Ref.
2, 3, 4, 7: N.C.

8 SOP

1: Cathode 2, 3, 6, 7: Anode 8: Ref.
4, 5: N.C.

ORDERING INFORMATION

Device	Operating Temperature	Package
KA431CZ	0 ~ +70°C	TO-92
**KA431CN	0 ~ +70°C	8 DIP
KA431CD	0 ~ +70°C	8 SOP
**KA431IZ	-40 ~ +85°C	TO-92
**KA431IN	-40 ~ +85°C	8 DIP

** Under Development.

ABSOLUTE MAXIMUM RATINGS

(Operating temperature range applies unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Cathode Voltage	V_{KA}	37	V
Cathode Current Range (Continuous)	I_K	-100 ~ +150	mA
Reference Input Current Range	I_{ref}	0.05 ~ +10	mA
Power Dissipation	P_D	770	mW
D, Z Suffix Package		1000	mW
N Suffix Package			
Operating Temperature	T_{opr}	0 ~ +70	°C
KA431CZ, KA431CN, KA431CD		-40 ~ +85	°C
KA431IZ, KA431IN			
Operating Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{stg}	-65 ~ +150	°C

RECOMMENDED OPERATING CONDITIONS

Characteristic	Symbol	Min	Typ	Max	Unit
Cathode Voltage	V_{KA}	V_{ref}		36	V
Cathode Current	I_K	1.0		100	mA

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Test Conditions		Min	Typ	Max	Unit	*T/C
Reference Input Voltage	V_{ref}	$V_{KA} = V_{ref}$ $I_K = 10\text{mA}$	$T_a = 25^\circ\text{C}$	2.440	2.495	2.550	V	1
			$T_a = 0^\circ\text{C}$ to 70°C	2.423		2.567		
Deviation of Reference Input Voltage Over Temperature 1	$V_{ref(dev)}$	$V_{KA} = V_{ref}$, $I_K = 10\text{mA}$ $T_a = 0^\circ\text{C}$ to 70°C			8	17	mV	1
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\frac{V_{ref}}{V_{KA}}$	$I_K = 10\text{mA}$	$V_{KA} = V_{ref}$ to 10V		-1.4	-2.7	mV/V	2
			$V_{KA} = 10\text{V}$ to 36V		-1.0	-2.0		
Reference Input Current	I_{ref}	$I_K = 10\text{mA}$ $R1 = 10\text{K}\Omega$ $R2 = \infty$	$T_a = 25^\circ\text{C}$		1.8	4.0	μA	2
			$T_a = 0^\circ\text{C}$ to 70°C			5.2		
Reference Input Current Deviation Over Temperature Range	I_{ref}	$I_K = 10\text{mA}$, $R1 = 10\text{K}\Omega$ $R2 = \infty$ $T_a = 0^\circ\text{C}$ to 70°C			0.4	1.2	μA	2
Minimum Cathode Current for Regulation	I_{Kmin}	$V_{KA} = V_{ref}$			0.5	1.0	mA	1
Off-State Cathode Current	I_{Koff}	$V_{KA} = 36\text{V}$, $V_{ref} = 0\text{V}$			2.6	1000	nA	3
Dynamic Impedance 2	Z_{KA}	$V_{KA} = V_{ref}$ $I_K = 1.0$ to 100mA $f \leq 1.0\text{KHz}$			0.22	0.5	Ω	1

* Test Circuit

