

Features

- Programmable output voltage to 36 volts
- Sink current capability of 1.0mA to 100mA
- Low dynamic impedance 0.15Ω typical
- Temperature compensated for operation over full rated operating temperature
- Equivalent full-range temperature coefficient of 50ppm/°C (Typical)
- Low output Noise voltage
- Voltage reference tolerance : ±1.0% (Ta=25°C)

Ordering Information

Type NO.	Marking	Package Code
SL431xM	SL431□	TO-92M

□: Grade => B : ±0.5%, A : ±1.0%

Outline Dimensions

unit : mm

Symbol

Functional block diagram

PIN Connections

1. Reference
2. Anode
3. Cathode

Absolute maximum ratings

(Operating ambient temperature range applies unless other specified)

Parameter	Symbol	Ratings	Unit
Cathode to Anode voltage	V_{KA}	37	V
Cathode current range	I_{KA}	-100 ~ +150	mA
Reference input current range	I_{ref}	-0.05 ~ +10	mA
Power dissipation	P_D	500	mW
Operating temperature range	T_{opr}	-40 ~ +85	°C
Storage temperature range	T_{stg}	-65 ~ +150	°C

Recommended operating conditions

Parameter	Symbol	Ratings		Unit
		Min.	Max.	
Cathode to Anode voltage	V_{KA}	V_{ref}	36	V
Cathode current range	I_{KA}	1.0	100	mA

Electrical Characteristics

(Ambient temperature at 25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	
Reference input voltage (Fig. 1, Note 1)	V_{ref}	$V_{KA}=V_{ref}, I_{KA}=10mA$	SL431BM	2.482	2.495	2.508	V
			SL431AM	2.470		2.520	
Deviation of reference input voltage Over temperature(Fig. 1, Note 1,2)	ΔV_{ref}	$V_{KA}=V_{ref}, I_{KA}=10mA$ @ $T_a=T_{LOW}$ to T_{HIGH}	-	7.0	30	mV	
Ratio of change in reference input Voltage to the change in cathode Voltage(Fig. 2)	$\frac{\Delta V_{ref}}{\Delta V_{KA}}$	$I_{KA}=10mA$ $\Delta V_{KA}=10V-V_{ref}$ $\Delta V_{KA}=36V-10V$	-	1.2	2.7	mV/V	
			-	0.7	2.0		
Reference input current(Fig. 2)	I_{ref}	$I_{KA}=10mA$ $R1=10K\Omega, R2=\infty$	-	1.8	4.0	μA	
Deviation of reference input current over temperature(Fig. 2)	ΔI_{ref}	$I_{KA}=10mA$ $R1=10K\Omega, R2=\infty$	-	0.4	2.5	μA	
Minimum cathode current for Regulation(Fig. 1)	I_{MIN}	$V_{KA}=V_{ref}$	-	0.35	1.0	mA	
Off-state cathode current(Fig. 3)	I_{OFF}	$V_{KA}=36V, V_{ref}=0V$	-	2.7	1000	nA	
Dynamic impedance(Fig. 1, Note 3)	Z_{KA}	$V_{KA}=V_{ref}, f \leq 1.0KHz$ $I_{KA}=1.0mA-100mA$	-	0.14	0.5	Ω	

Fig. 1

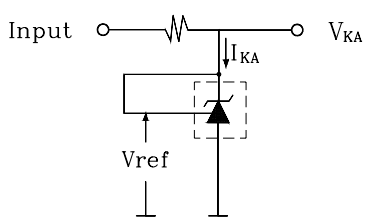


Fig. 2

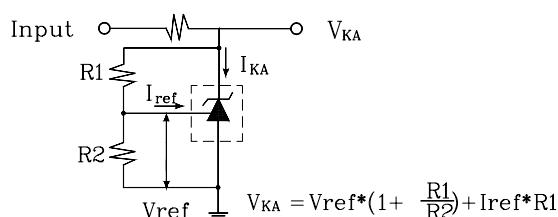
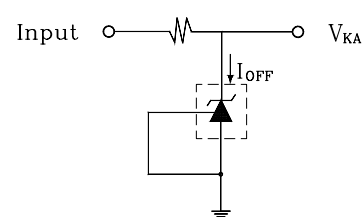


Fig. 3



<Note 1> : $T_{LOW}=-40^{\circ}C, T_{HIGH}=+85^{\circ}C$, <Note 2> : $\Delta V_{ref}=V_{ref} Max. - V_{ref} Min.$, <Note 3> : $Z_{KA}=\Delta V_{KA}/\Delta I_{KA}$

Characteristic diagrams

Fig. 4 I_{KA} vs. V_{KA}

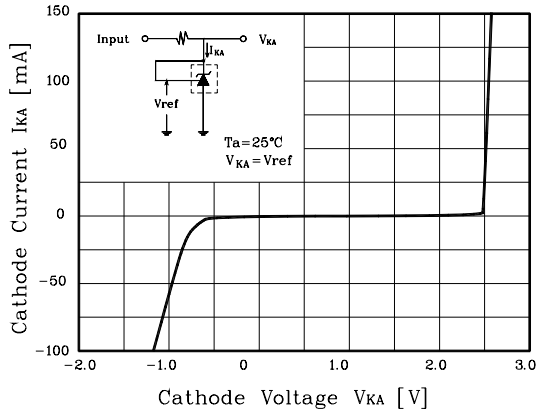


Fig. 5 I_{MIN} vs. V_{KA}

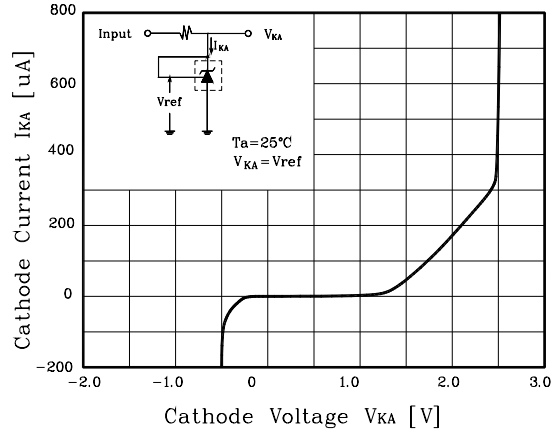


Fig. 6 ΔV_{ref} vs. T_a

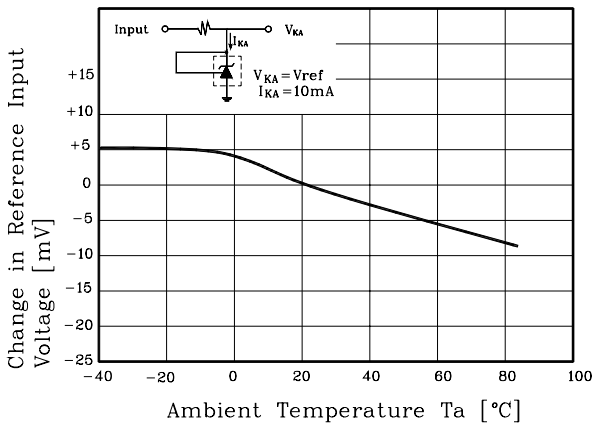


Fig. 7 ΔV_{ref} vs. V_{KA}

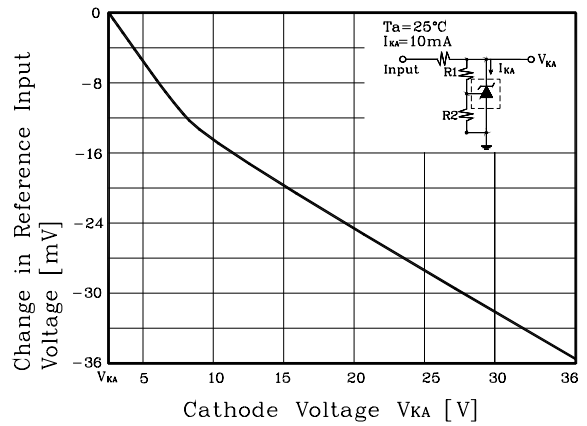


Fig. 8 G_v vs. frequency

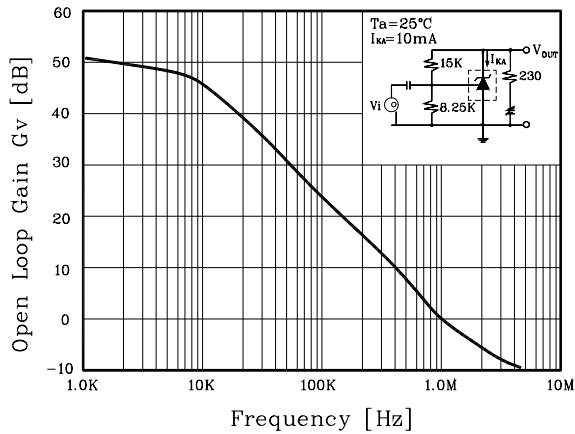
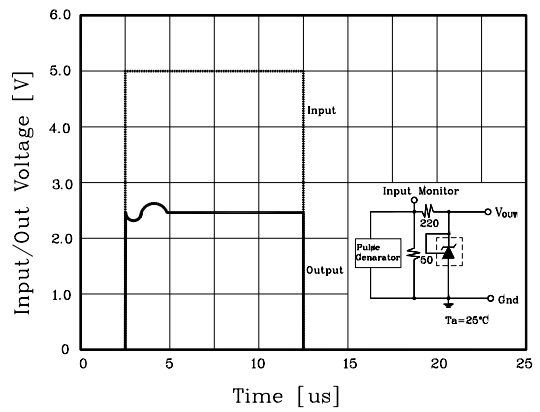


Fig. 9 Pulse response



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