

## Description

The SL432 series are 3-terminal precision shunt regulators that are programmable over a wide voltage range of 1.24V to 16V with 1.0%, 2.0% tolerance. The SL432 series have a low dynamic impedance of  $0.25\Omega$ . These features make the SL432 series an excellent replacement for zener diodes in numerous applications circuits that require a precision reference voltage.

## Features

- Low voltage operation 1.24V
- Programmable output voltage from 1.24V to 16 V
- Voltage reference tolerance 1.0%, 2.0%
- Wide operating current range of 60uA to 30mA

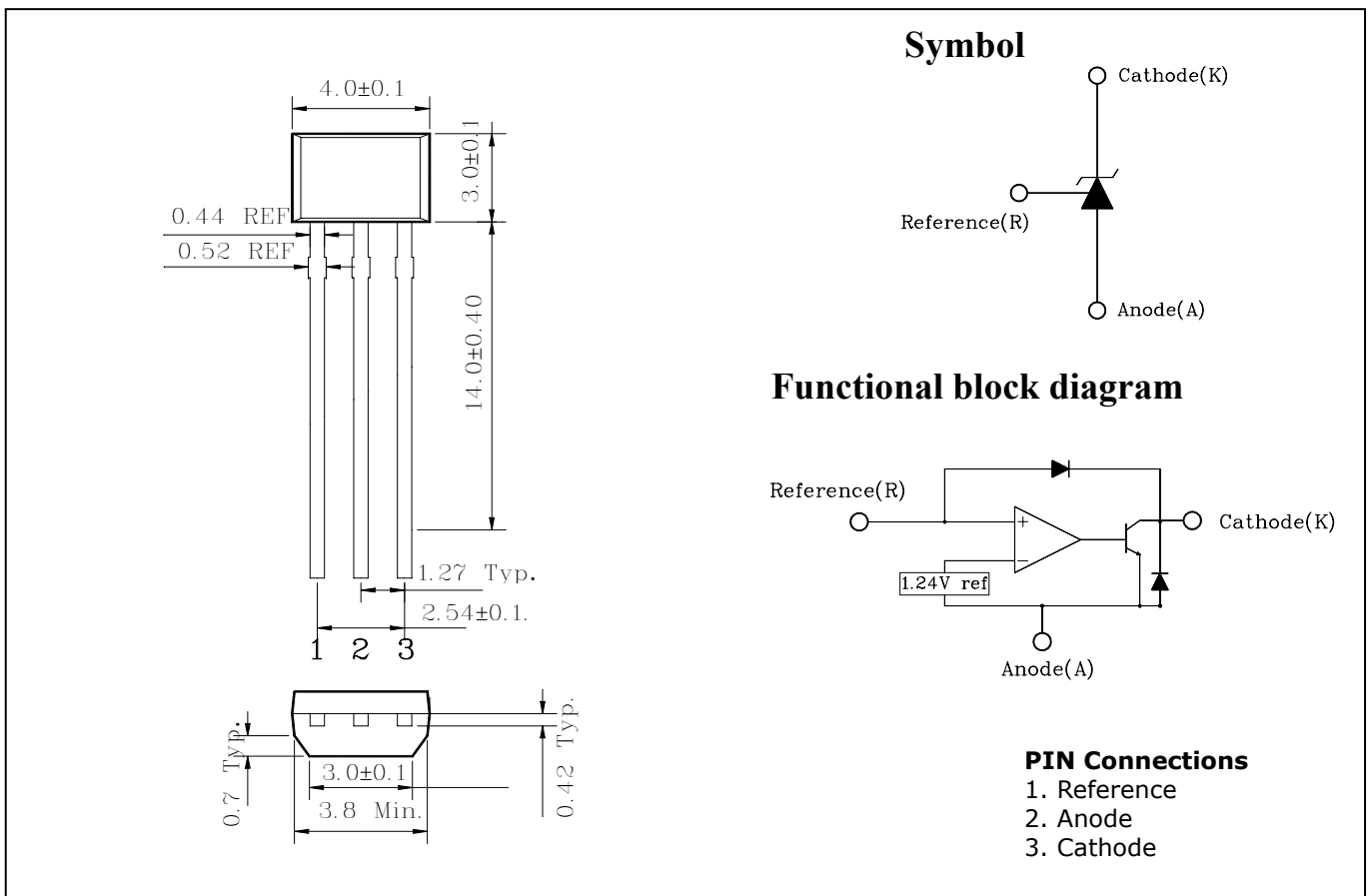
## Ordering Information

Type NO.	Marking	Package Code
SL432xM	SL432□	TO-92M

□: Grade => None:±2% , A:±1%

## Outline Dimensions

unit : mm



## Absolute maximum ratings

(Operating ambient temperature range applies unless other specified)

Parameter	Symbol	Ratings	Unit
Cathode to Anode voltage	$V_{KA}$	18	V
Cathode current range	$I_{KA}$	-20 ~ +30	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	$V_{KA}$	$V_{ref}$	16	V
Cathode current range	$I_{KA}$	0.1	30	mA

## Electrical Characteristics

(Ambient temperature at 25°C,  $C_L=0.1\mu F$ , unless otherwise noted.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	
Reference input voltage (Fig. 1, Note 1)	$V_{ref}$	$V_{KA}=V_{ref}, I_{KA}=10mA$	SL432AM	1.228	1.240	1.252	V
			SL432M	1.215		1.265	
Deviation of reference input voltage Over temperature(Fig. 1, Note 1,2)	$\Delta V_{ref}$	$V_{KA}=V_{ref}, I_{KA}=10mA$ @ $T_A=T_{LOW}$ to $T_{HIGH}$	-	10	20	mV	
Ratio of change in reference input Voltage to the change in cathode Voltage(Fig. 2)	$\frac{\Delta V_{ref}}{\Delta V_{KA}}$	$I_{KA}=10mA$ $\Delta V_{KA}=V_{ref}-16V$	-	1.0	2.7	mV/V	
Reference input current(Fig. 2)	$I_{ref}$	$I_{KA}=10mA$ $R1=10K\Omega, R2=\infty$	-	0.7	1.0	$\mu A$	
Deviation of reference input current over temperature(Fig. 2)	$\Delta I_{ref}$	$I_{KA}=10mA$ $R1=10K\Omega, R2=\infty$	-	0.04	0.08	$\mu A$	
Minimum cathode current for Regulation(Fig. 1)	$I_{MIN}$	$V_{KA}=V_{ref}$	-	55	80	$\mu A$	
Off-state cathode current(Fig. 3)	$I_{OFF}$	$V_{KA}=16V, V_{ref}=0V$	-	5	50	nA	
Dynamic impedance(Fig. 1, Note 3)	$Z_{KA}$	$V_{KA}=V_{ref}, f \leq 1.0KHz$ $I_{KA}=0.1mA-30mA$	-	0.25	0.4	$\Omega$	

Fig. 1

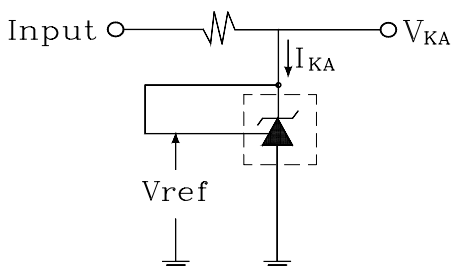


Fig. 2

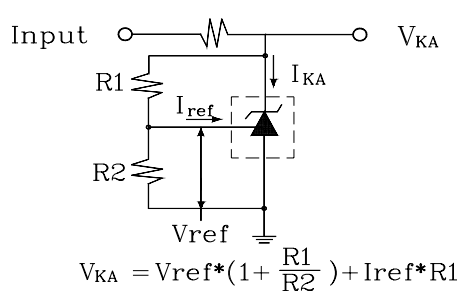
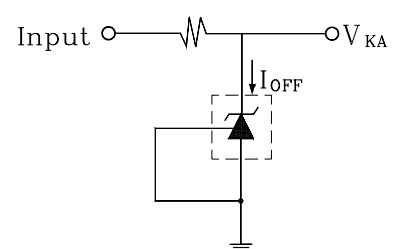


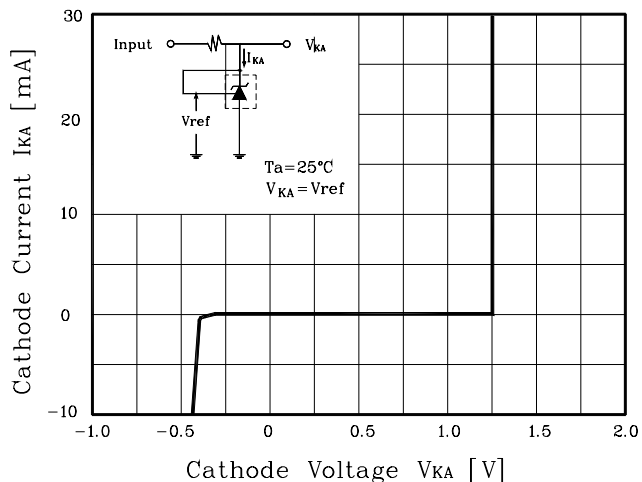
Fig. 3



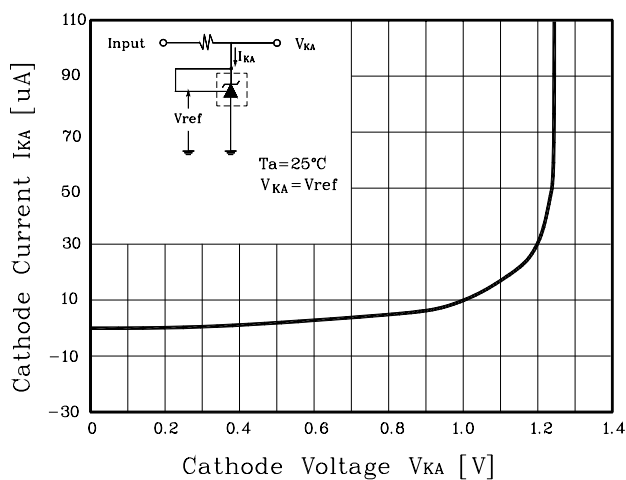
<Note 1> :  $T_{LOW}=-40^{\circ}C, T_{HIGH}=+85^{\circ}C$  , <Note 2> :  $\Delta V_{ref}= V_{ref} \text{ Max.} - V_{ref} \text{ Min.}$  , <Note 3> :  $Z_{KA}= \Delta V_{KA}/ \Delta I_{KA}$

# Electrical Characteristics Curves

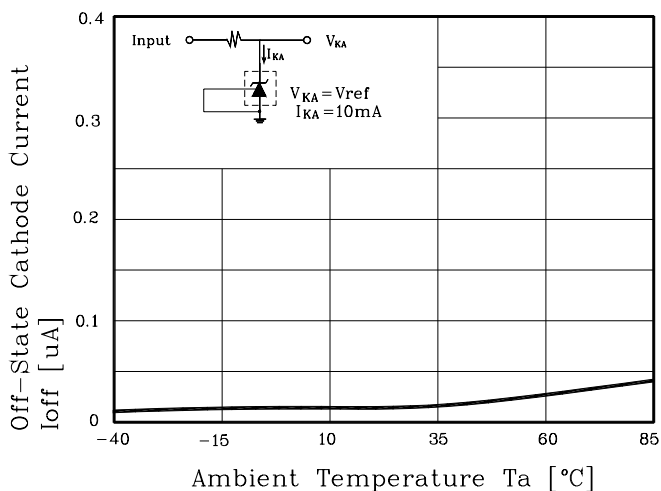
**Fig.1  $I_{KA}$  vs  $V_{KA}$**



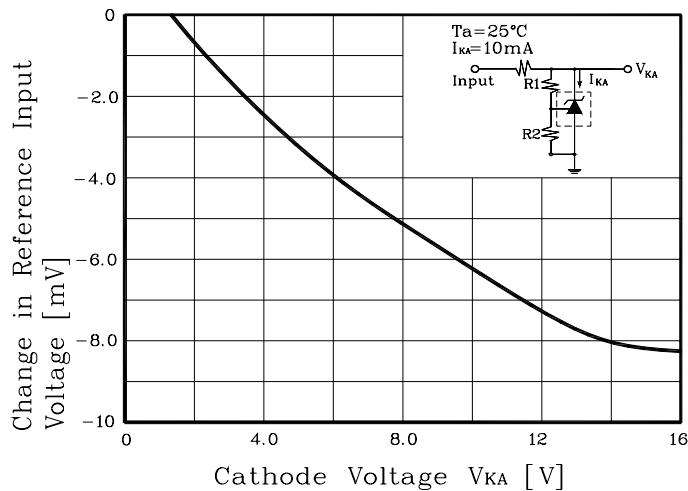
**Fig. 2  $I_{MIN}$  vs  $V_{KA}$**



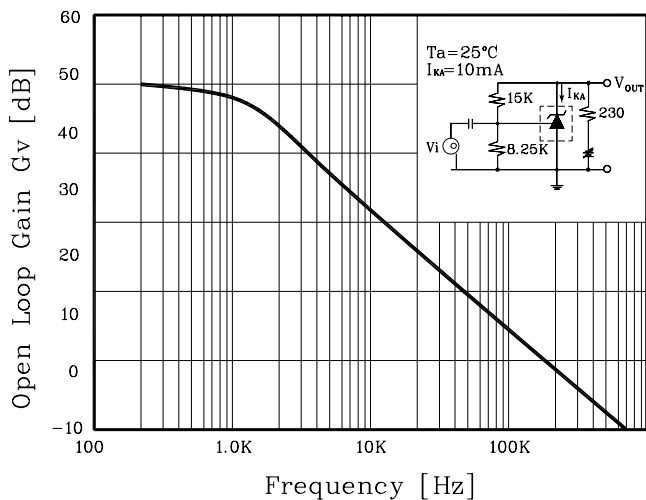
**Fig. 3  $\Delta I_{off}$  vs  $T_a$**



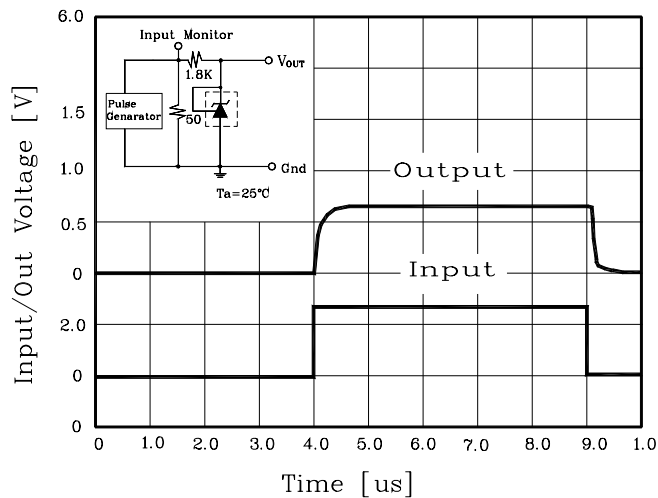
**Fig. 4  $\Delta V_{ref}$  vs  $T_a$**



**Fig. 5  $G_v$  vs. frequency**



**Fig. 6 Pulse Response**



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