AUK Semiconductor

AF431xSF

Programmable Voltage Reference

Features

- Programmable output voltage to 20 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

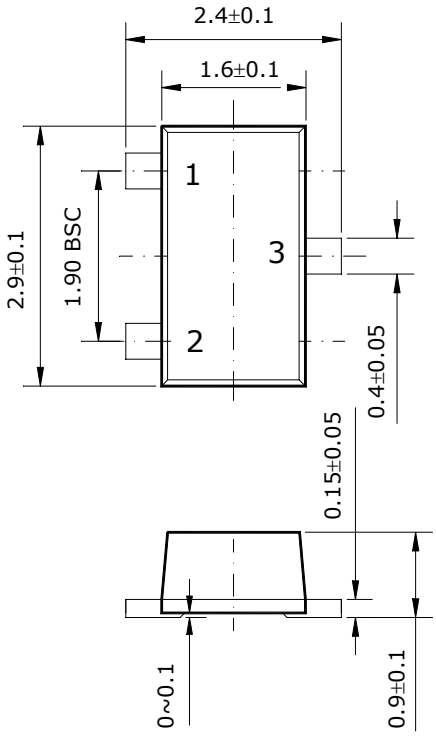
Ordering Information

Type NO.	Marking	Package Code
AF431xSF	□41	SOT-23F

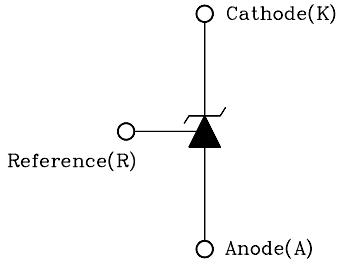
□: Grade => B : ±0.5%, A : ±1.0%

Outline Dimensions

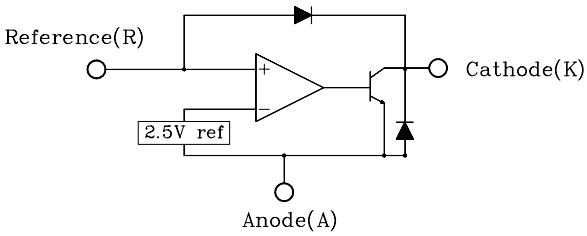
unit : mm



Symbol



Functional block diagram



PIN Connections

1. Reference
2. Cathode
3. Anode

Absolute maximum ratings

(Operating ambient temperature range applies unless other specified)

Parameter	Symbol	Ratings	Unit
Cathode to Anode voltage	V_{KA}	20	V
Cathode current range	I_{KA}	-100 ~+150	mA
Reference input current range	I_{ref}	-0.05~+10	mA
Power dissipation	P_D*	300	mW
Operating temperature range	T_{opr}	-40~+85	°C
Storage temperature range	T_{stg}	-65~+150	°C

* With PCB(8×8mm copper area) at glass epoxy board (t=1.7mm, area: 20×20mm)

Recommended operating conditions

Parameter	Symbol	Ratings		Unit
		Min.	Max.	
Cathode to Anode voltage	V_{KA}	V_{ref}	18	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	AF431BSF	2.482	2.495	2.508	V
			AF431ASF	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 @Ta=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 ΔV_{KA}=10V-V_{ref}		-	1.2	2.7	mV/V
		ΔV_{KA}=20V-10V		-	0.7	2.0	
Reference input current(Fig. 2)	I_{ref}	I_{KA}=10mA R1=10KΩ, R2=∞		-	1.8	4.0	μA
Deviation of reference input current over temperature(Fig. 2)	ΔI_{ref}	I_{KA}=10mA R1=10KΩ, R2=∞		-	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}=20V, V_{ref}=0V		-	2.7	1000	nA
Dynamic impedance(Fig. 1, Note 3)	Z_{KA}	$V_{KA}=V_{ref}$, f≤1.0KHz I_{KA}=1.0mA-100mA		-	0.14	0.5	Ω

Fig. 1

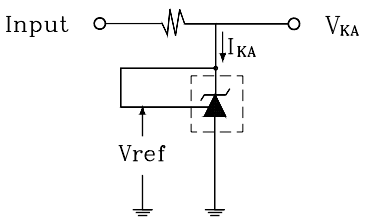


Fig. 2

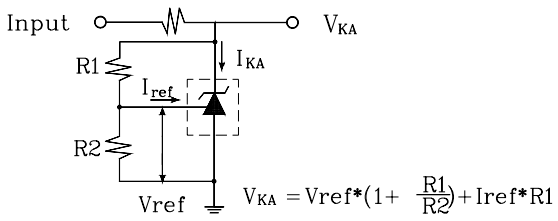
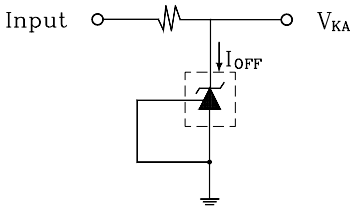


Fig. 3



<Note 1> : T_{LOW}=-40°C, T_{HIGH}=+85°C , <Note 2> : ΔV_{ref}= V_{ref} Max. - V_{ref} Min. , <Note 3> : Z_{KA}= ΔV_{KA}/ ΔI_{KA}

Characteristic diagrams

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

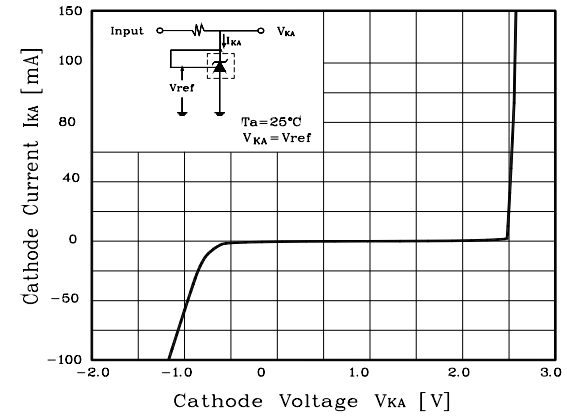


Fig. 5 I_{MIN} vs. V_{KA}

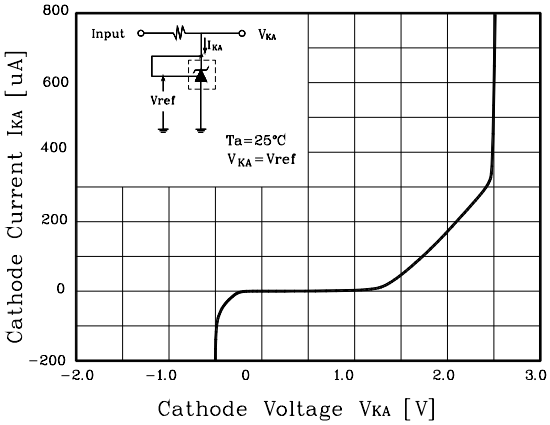


Fig. 6 ΔV_{ref} vs. T_a

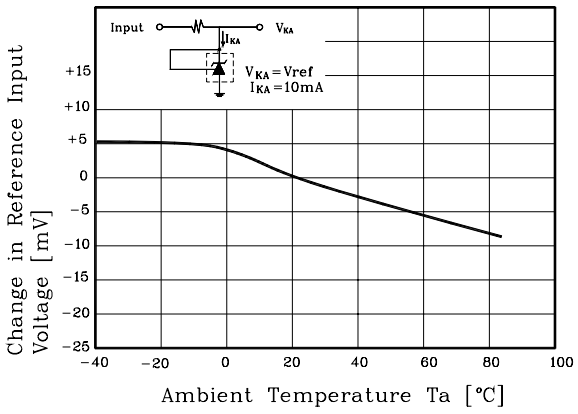


Fig. 7 Gv vs. frequency

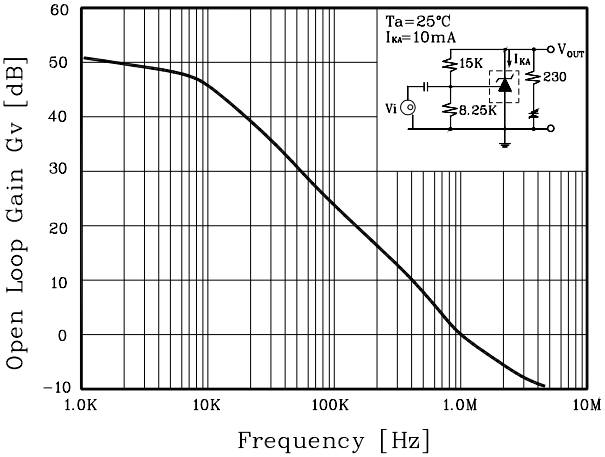
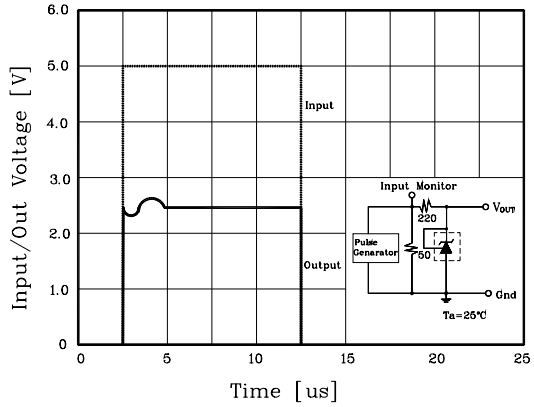


Fig. 8 Pulse response



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