

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

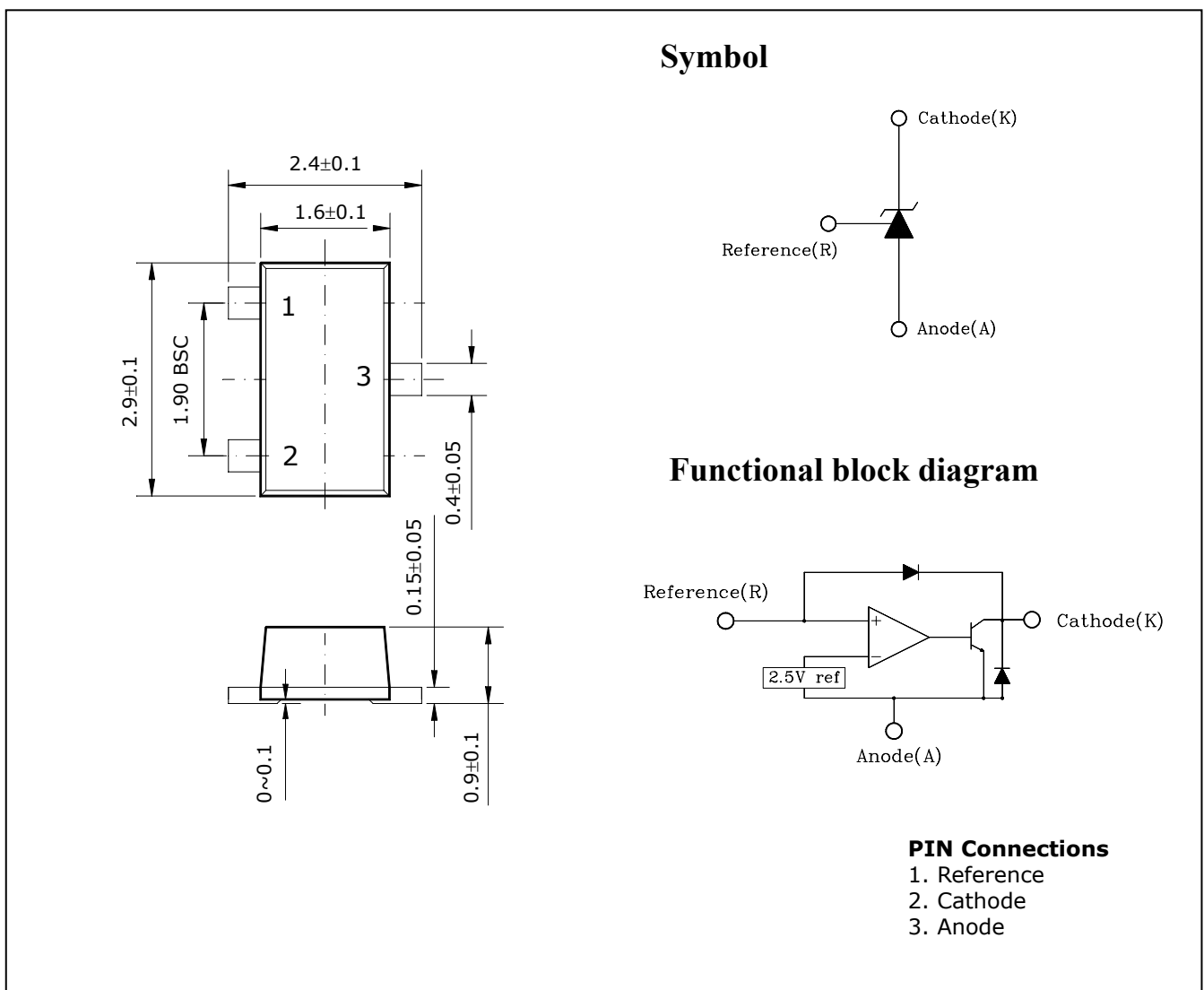
Ordering Information

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

□: Grade => B : ±0.5%, A : ±1.0%

Outline Dimensions

unit : mm



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	AF431ASF 2.508	V
			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)	$\frac{\Delta V_{ref}}{\Delta V_{KA}}$	$I_{KA}=10mA$ $\Delta V_{KA}=10V-V_{ref}$ $\Delta V_{KA}=20V-10V$	-	1.2 0.7	2.7 2.0	mV/V
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}	$V_{KA}=20V$, $V_{ref}=0V$	-	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

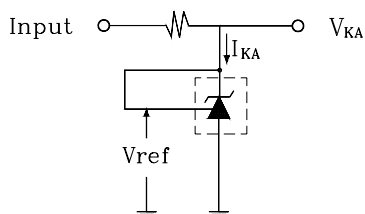


Fig. 2

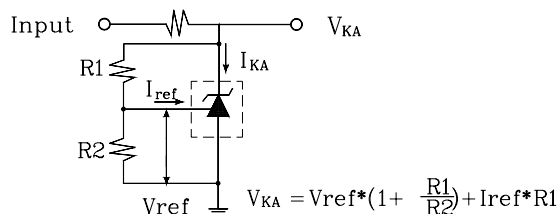
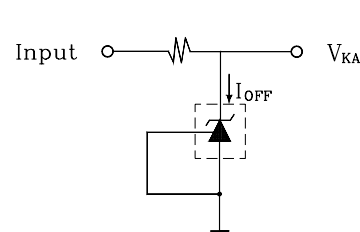


Fig. 3



<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}

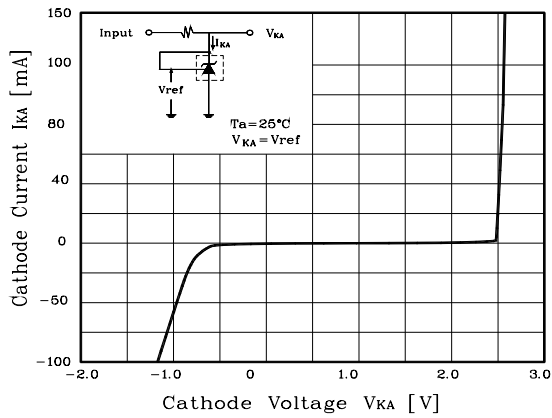


Fig. 5 I_{MIN} vs. V_{KA}

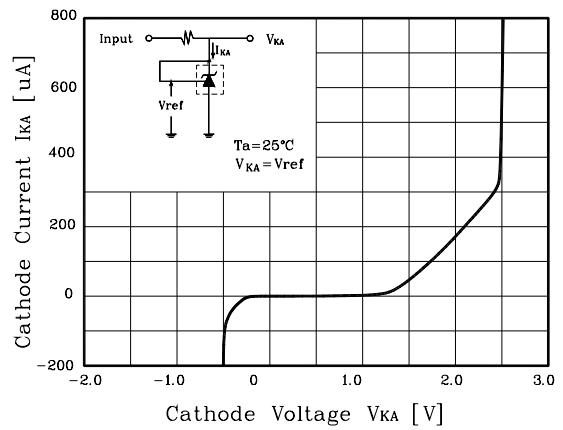


Fig. 6 ΔV_{ref} vs. T_a

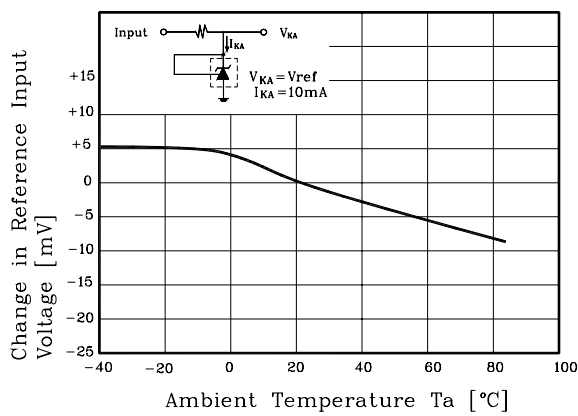


Fig. 7 G_v vs. frequency

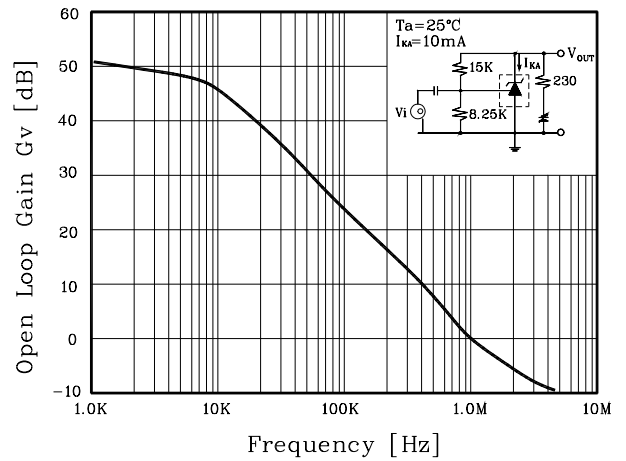
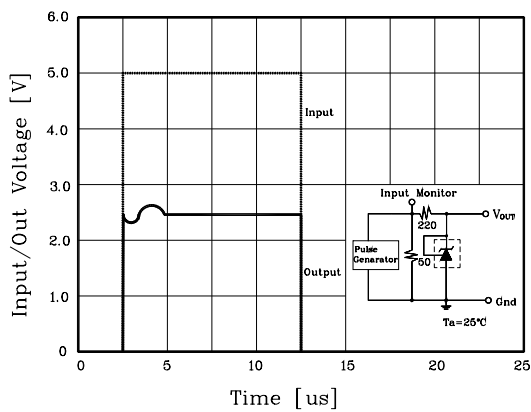


Fig. 8 Pulse response



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