BORN SEMICONDUCTOR

BX431B

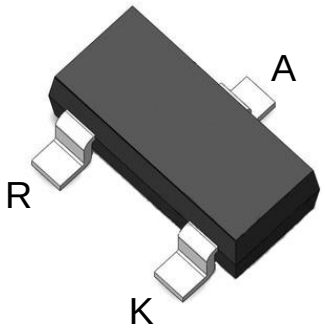
Linear integrated Circuit

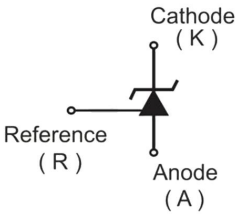
Features

- Programmable output Voltage to 36V
- Low dynamic output impedance 0.15Ω
- Sink current capability of 0.5 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
- Fast turn on response

Package

SOT-23

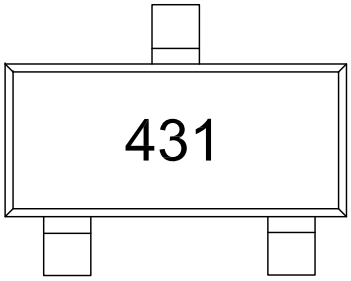




Description

The BX431B is three-terminal adjustable regulator with a guaranteed thermal stability over applicable temperature ranges. The output Voltage may be set to any value between Vref(approximately 2.5V) and 36V with two external resistors.These devices have provides a very sharp turn-on characteristic , making these devices excellent replacement for zener diodes in many applications.

Marking



Ordering information

Order code	Package	Base qty	Delivery mode
BX431B	SOT-23	3k	Tape and reel

Absolute Maximum Ratings (Operating temperature range applies unless otherwise specified)

Symbol	Characteristics	Value	Units
V_{KA}	Cathode Voltage	37	V
I_K	Cathode Current Range(Continuous)	-100 to 150	mA
I_{ref}	Reference Input Current Range	-0.05 to 10	
T_{opr}	Operating Junction temperature	-40 to 125	°C
T_{stg}	Storage temperature Temperature	-65 to 150	

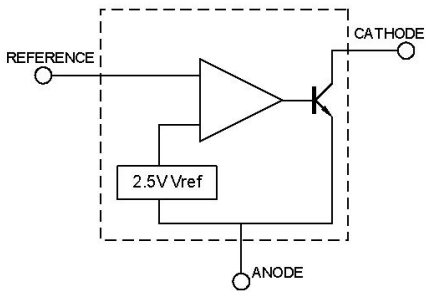
Recommended Operating Conditions

Characteristics	Symbol	Min.	Max.	Units
V_{KA}	Cathode Voltage	V_{REF}	36	V
I_K	Cathode Current	0.5	100	mA

Electrical Characteristics (T_A=25°C free-air temperature, unless otherwise noted)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Units
Reference Input Voltage	0.5%	V_{ref}	V_{kA}= V_{ref},I_{KA}=10mA	2.488	2.50	2.512	V
	1%			2.475	2.50	2.525	
Deviation of reference Input Voltage Over temperature		ΔV_{ref}	V_{kA}= V_{REF},I_{KA}=10mA , $T_{MIN} \leq T_A \leq T_{MAX}$	–	4.5	25	mV
Ratio of Change in Reference Input Voltageto the Change in Cathode Voltage		$\Delta V_{ref}/\Delta V_{KA}$	I_{KA}=10mA , ΔV_{KA}= 10V∼V_{REF}	–	-1.0	-2.7	mV/V
			I_{KA}=10mA , ΔV_{kA}= 36V∼10V	–	-0.5	-2.0	
Reference Input Current		I_{ref}	I_{KA}=10mA,R1=10kΩ,R2=∞	–	1	2	μA
Deviation of the REF input current over full temperature range		ΔI_{ref} /ΔT	I_{KA}=10mA,R1=10kΩ, R2=∞,T_A = full Temperature	–	0.2	0.4	μA
Minimum cathode current for regulation		$I_{KA(min)}$	V_{kA}= V_{REF}	–	50	85	μA
Off-state cathode current		$I_{KA(OFF)}$	V_{kA}=36V, V_{ref}=0V	–	0.05	0.5	μA
Dynamic impedance		Z_{kA}	V_{kA}= V_{REF},f≤1KHZ, I_{KA}=1mA to 100mA	–	0.15	0.5	Ω

Block Diagram



Test Circuits

Fig 1: Test Circuit for $V_{KA}=V_{ref}$

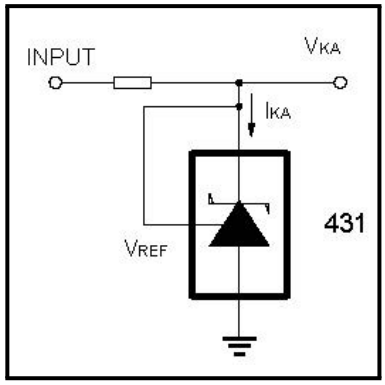


Fig 2: Test Circuit for $V_{KA}>V_{REF}$

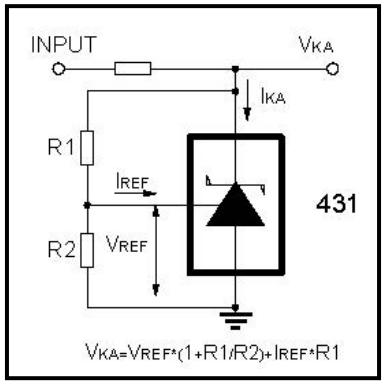
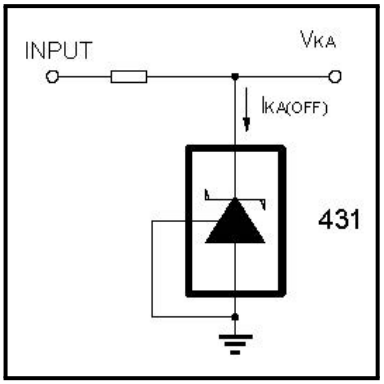


Fig 3:Test Circuit for $I_{KA(off)}$



Typical Characteristics

Fig 4: Shutdown Regulator

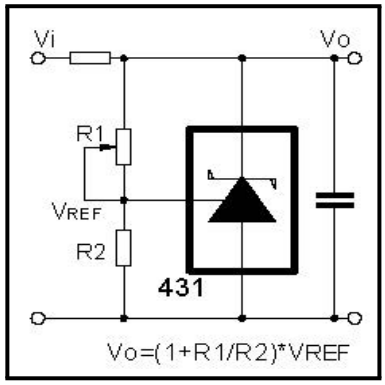


Fig 5: Output Control of a Three Terminal Fixed Regulator

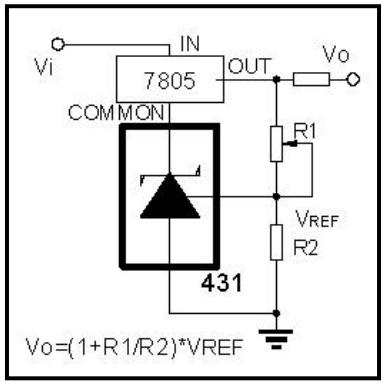


Fig 6:Higher-current Shunt Regulator

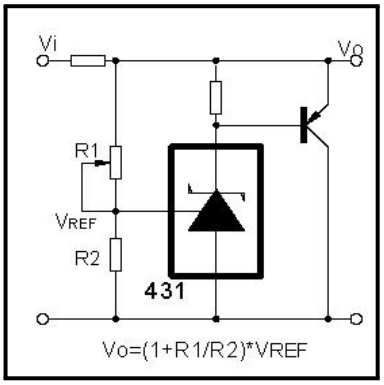


Fig 7: Constant-current Sink

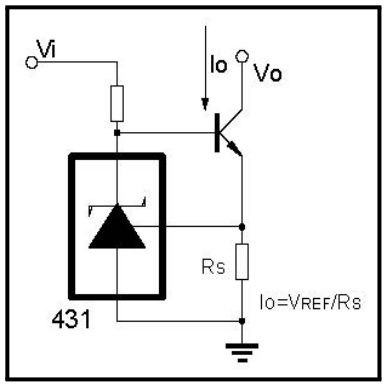
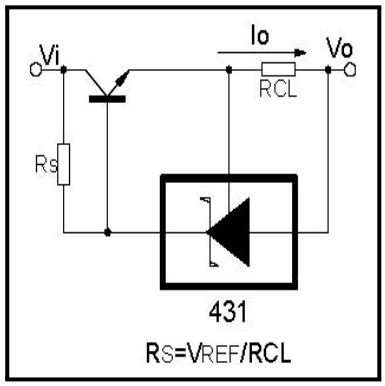


Fig 8:Current Limiting or Current Source



Typical Performance Characteristics

Fig 7: Cathode Current Vs Cathode Voltage

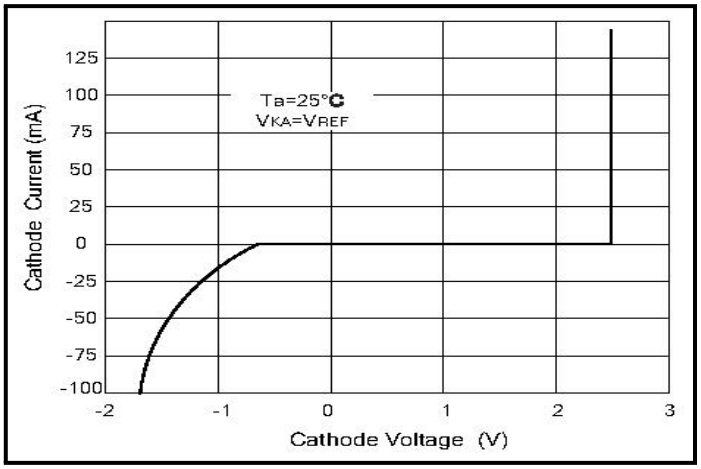


Fig 8:Cathode Current Vs Cahode Voltage

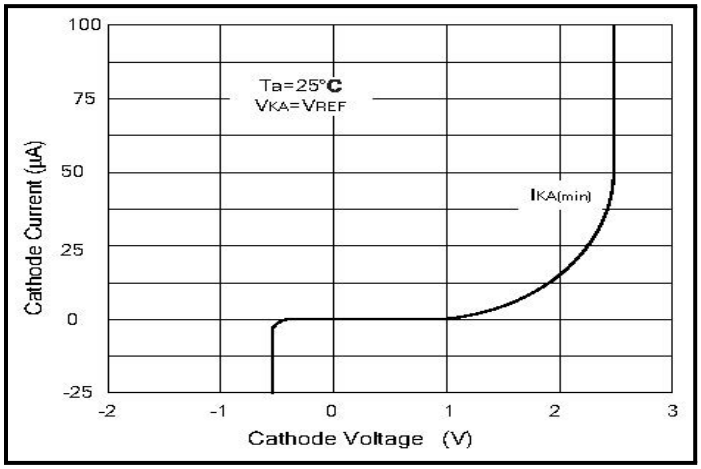


Fig 9: Change in Reference Input Voltage Vs Cathode

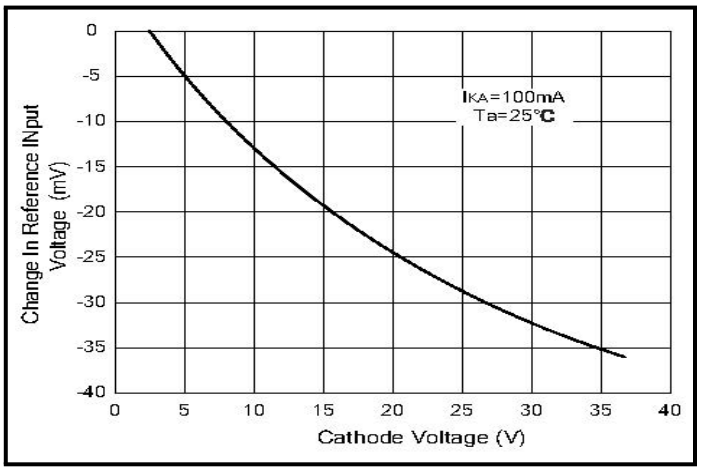


Fig 10:Pulse Response

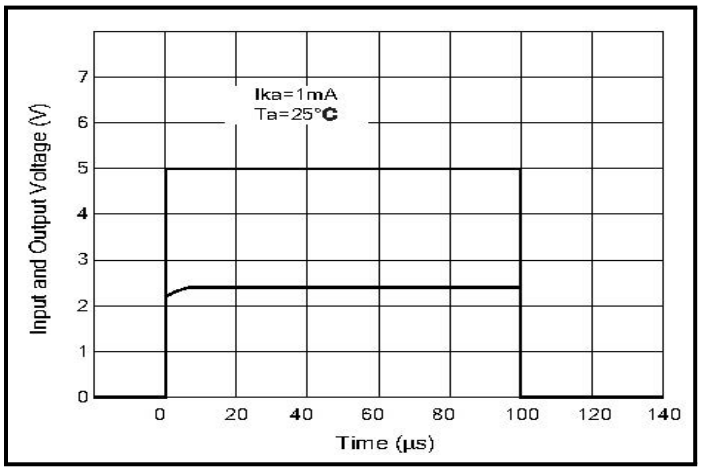


Fig 11: Dynamic Impedance Vs Frequency

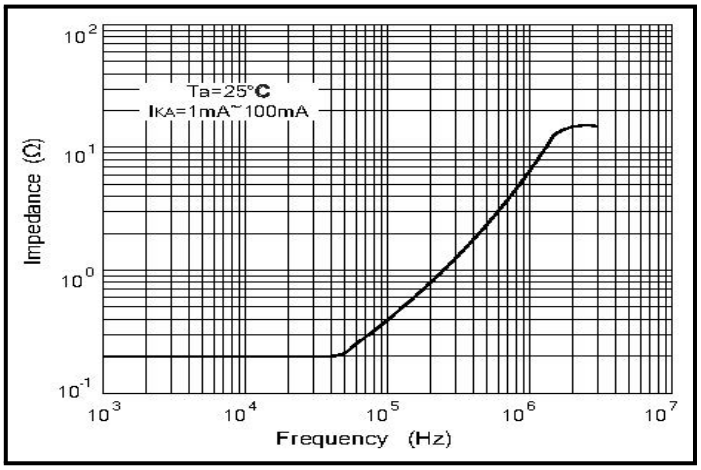
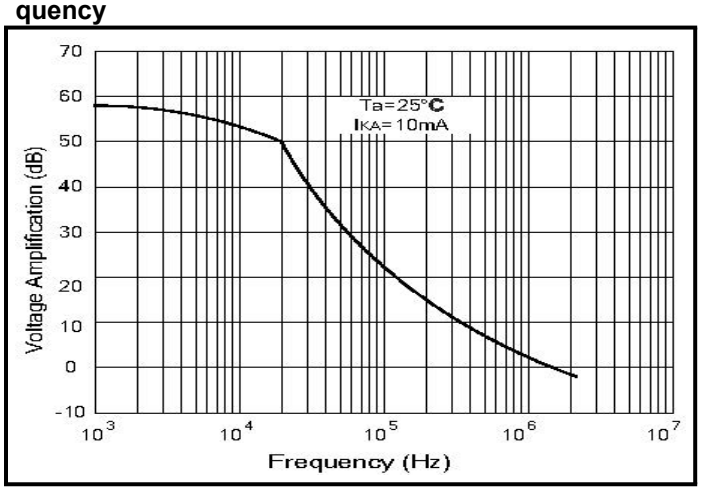
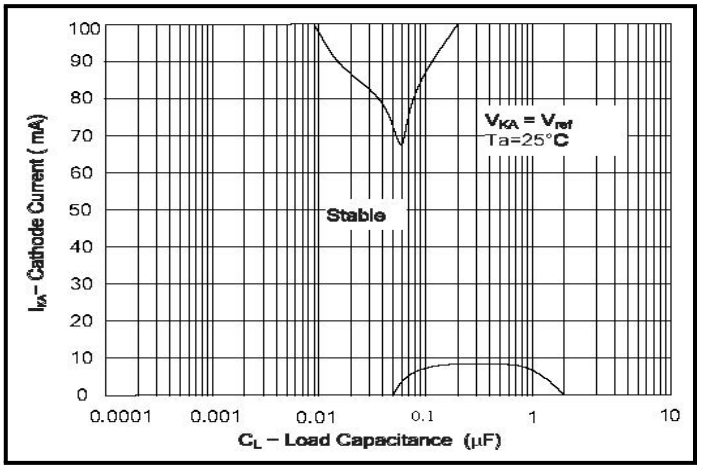


Fig 12:Small Signal Voltage Amplification Vs Frequency



Typical Performance Characteristics

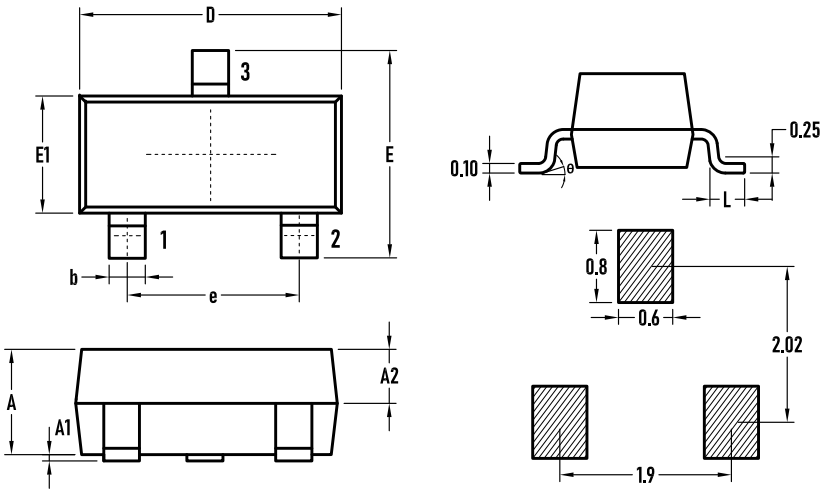
Fig 13: Cathode Current Vs Load Capacitance



BX431B

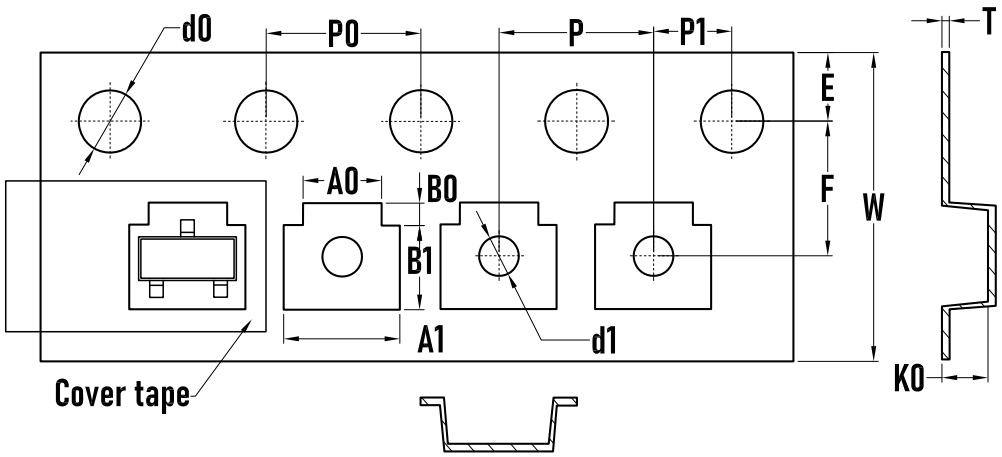
Linear integrated Circuit

Outline Drawing - SOT-23



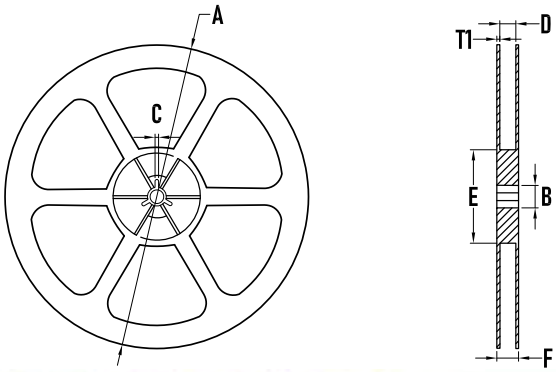
SYMBOL	MILLIMETER		
	MIN.	Typ	MAX
A	0.95	1.00	–
A1	0.02	0.06	0.10
A2	–	0.60	–
D	2.85	2.90	2.95
b	0.37	0.40	0.43
E	2.35	2.40	2.45
E1	1.25	1.30	1.35
e	1.85	1.90	1.95
L	0.35	0.40	0.48
θ	0	–	6°

Packaging Tape - SOT-23



SYMBOL	MILLIMETER
A0	2.10±0.10
A1	3.10±0.10
B0	0.65±0.10
B1	2.75±0.10
d0	1.55±0.10
d1	1.00±0.05
E	1.75±0.10
F	3.50±0.10
K0	1.10±0.10
P	4.00±0.10
P0	4.00±0.10
P1	2.00±0.10
W	8.00±0.30
T	0.20 ±0.05

Packaging Reel



SYMBOL	MILLIMETER
A	177.8±0.2
B	3.1
C	13.50
D	9.6±0.3
E	75±0.2
F	12.3±0.3
T1	1.0±0.2
Quantity	3000PCS