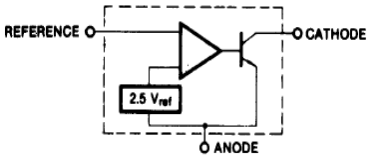
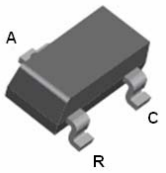
Programmable Shunt Regulator BL431A

FEATURES

Lead-free

- Programmable output voltage to 36 volts
- Low dynamic output impedance 0.20 typical
- Sink current capability of 1.0 to 100mA
- Equivalent full-range temperature coefficient of 50ppm/℃ typical
- Temperature compensated for operation over full rated Operating temperature range
- Low output noise voltage
- Fast turn-on response





SOT-23

ORDERING INFORMATION

Type No.	Marking	Package Code
BL431A	431	SOT-23

MAXIMUM RATING @ Ta=25℃ unless otherwise specified

Parameter	symbol	limits	unit
Cathode Voltage	V_{KA}	37	V
Cathode current Range(Continuous)	I_{KA}	-100 to +150	mA
Reference Input Current Range	I_{REF}	0.05 to -10	mA
Power dissipation	P_D	350	mW
Operating temperature Range	T_{OPR}	-25 to +85	℃
Storage temperature Range	T_{STG}	-65 to +150	℃

Recommended Operating Conditions

Parameter	symbol	Min	Typ	Max	Unit
Cathode Voltage	V_{KA}	V_{REF}	-	36	V
Cathode Current	I_{KA}	1.0	-	100	mA

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ELECTRICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

Parameter	symbol	conditions		Min.	Typ.	Max.	unit
Reference Input voltage	V_{REF}	$V_{KA}=V_{REF}, I_{KA}=10mA$		2.44	2.495	2.55	V
Deviation of Reference Input Voltage Over-Temperature (Note1)	$\Delta V_{REF}/\Delta T$	$V_{KA}=V_{REF}, I_{KA}=10mA,$ $T_{MIN}\leq T_A\leq T_{MAX}$			4.5	17	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\Delta V_{REF}/\Delta V_{KA}$	$I_{KA}=$ 10mA	$\Delta V_{KA}=10V-V_{REF}$		-1.0	-2.7	mV/V
			$\Delta V_{KA}=36V-10V$		-0.5	-2.0	
Reverse Input current	I_{REF}	$I_{KA}=10mA,$ $R_1=10K\Omega, R_2=\infty$			1.5	4	μA
Deviation of Reference Input Currrent Over Full Temperature Range	$\Delta I_{REF}/\Delta T$	$I_{KA}=10mA,$ $R_1=10K\Omega, R_2=\infty$ T_A=Full Range			0.4	1.2	μA
Minimun Cathode Current for Regulation	$I_{KA(MIN}$	$V_{KA}= V_{REF}$			0.45	1.0	mA
Off-Stage Cathode Current	$I_{KA(OFF)}$	$V_{KA}=36V,$ $V_{REF}=0$			0.05	1.0	μA
Dynamic Impedance(Note2)	Z_{ZA}	$V_{KA}= V_{REF},$ I_{KA}=1 to 100mA f≥1.0KHz			0.15	0.5	Ω

•T_{MIN}=-25℃, T_{MAX}=+85℃

CLASSIFICATION OF V_{ref}

Rank	0.5%	1%	2%
Range	2.483-2.507	2.470-2.520	2.440-2.550

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TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

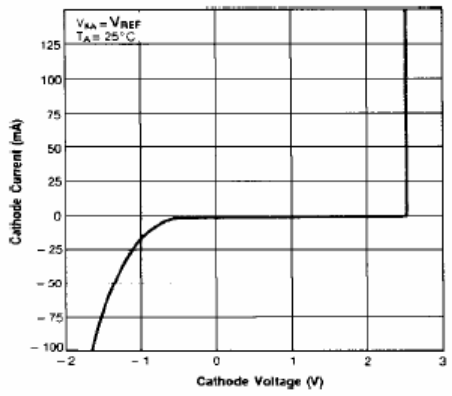


Figure 1. Cathode Current vs. Cathode Voltage

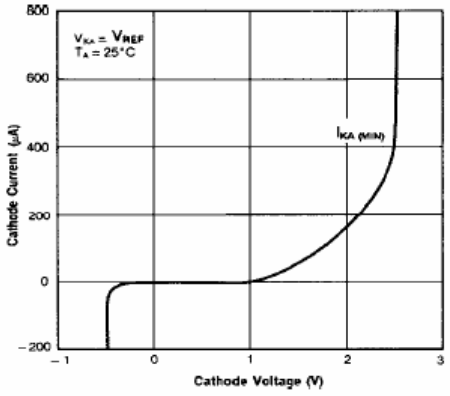


Figure 2. Cathode Current vs. Cathode Voltage

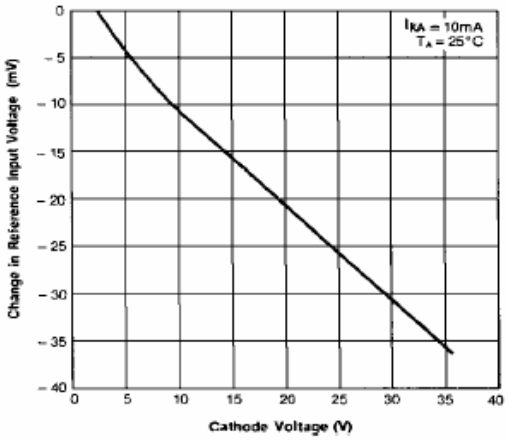


Figure 3. Change In Reference Input Voltage vs. Cathode Voltage

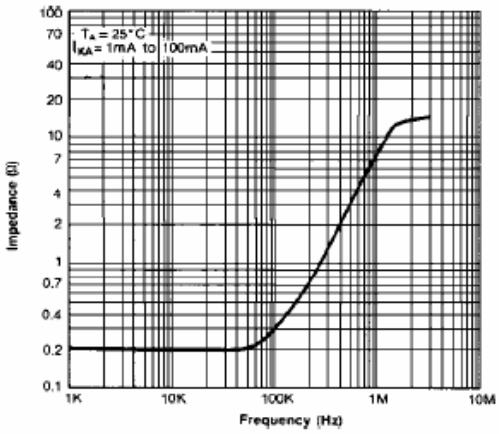


Figure 4. Dynamic Impedance Frequency

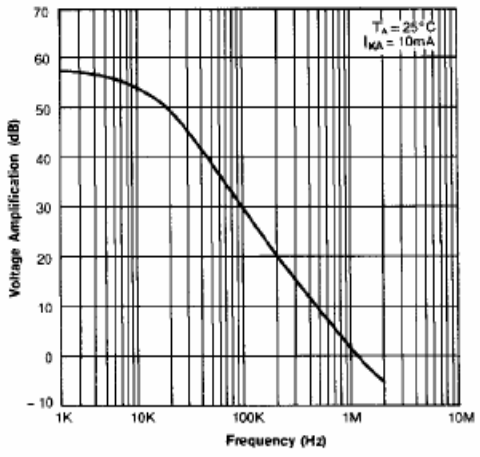


Figure 5. Small Signal Voltage Amplification vs. Frequency

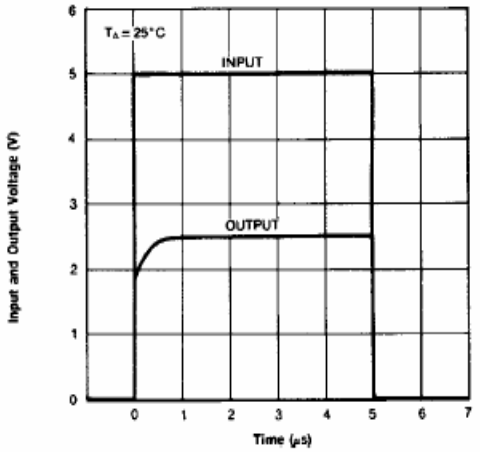
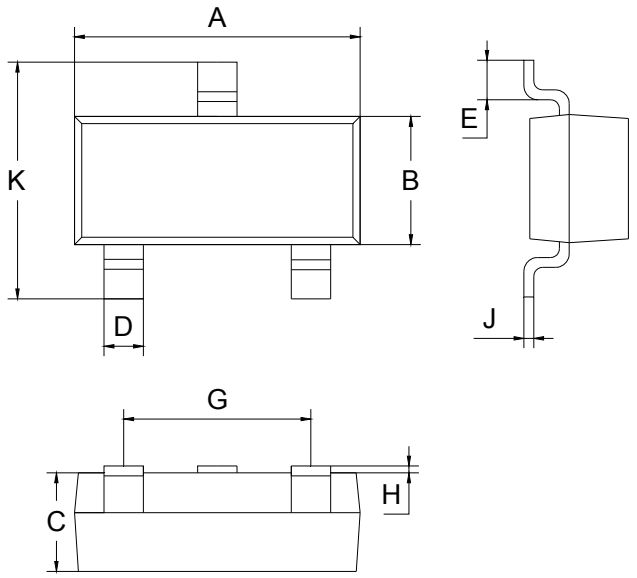


Figure 6. Pulse Response

Programmable Shunt Regulator — BL431A

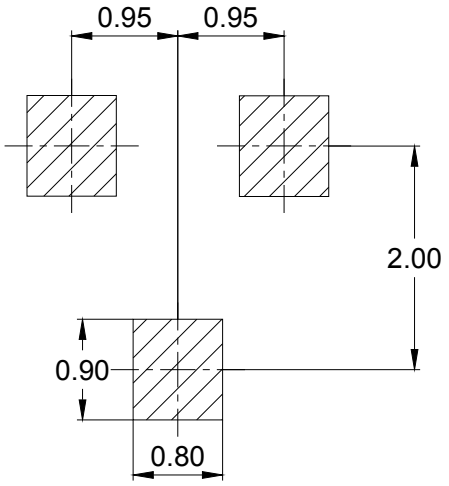
PACKAGE OUTLINE

Plastic surface mounted package — SOT-23



SOT-23		
Dim	Min	Max
A	2.70	3.10
B	1.10	1.50
C	1.0 Typical	
D	0.4 Typical	
E	0.35	0.48
G	1.80	2.00
H	0.02	0.1
J	0.1 Typical	
K	2.20	2.60
All Dimensions in mm		

SOLDERING FOOTPRINT



Unit : mm

PACKAGE INFORMATION

Device	Package	Shipping
BL431A	SOT-23	3000/Tape&Reel