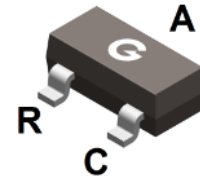
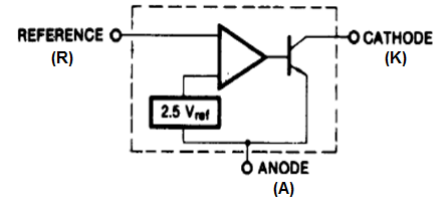


Features

- 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/°C typical
- Temperature compensated for operation over full rated operating temperature range
- Low output noise voltage
- Fast turn-on response
- RoHS compliant with Halogen-free

HF



SOT-23

Mechanical Data

- Case: SOT-23
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL431	SOT-23	3000 pcs / Tape & Reel	431
BL431-A	SOT-23	3000 pcs / Tape & Reel	431
BL431-B	SOT-23	3000 pcs / Tape & Reel	431

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Electrostatic discharge Human-body model(HBM),per ANSI/ESDA/JEDEC JS-001 *1	V _(ESD)	±2000	V
Electrostatic discharge Charged-device model(CDM), per JEDEC specification JESD22C101 *2		±1000	V
Cathode Voltage	V _{KA}	40	V
Cathode Current Range(Continuous)	I _{KA}	-100 ~ +150	mA
Reference Input Current Range	I _{REF}	-0.05 ~ +10	mA

Notes:

1. JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 500-V HBM is possible with the necessary precautions.
2. JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 250-V CDM is possible with the necessary precautions.

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation	P_D	350	mW
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	350	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	155	°C/W
Operating Temperature Range	T_{OPR}	-40 ~ +125	°C
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Recommended Operating Condition

Parameter	Symbol	Min.	Typ.	Max.	Unit
Cathode Voltage	V_{KA}	V_{REF}	-	36	V
Cathode Current	I_{KA}	1	-	100	mA

Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Reference voltage	V_{REF}	$V_{KA} = V_{REF}$, $I_{KA} = 10\text{mA}$ BL431-A (0.5%) BL431 (1%) BL431-B (2%)	2.488 2.475 2.450	2.5 2.5 2.5	2.512 2.525 2.550	V
Deviation of Reference Voltage Over Full Temperature Range	$\Delta V_{REF}/\Delta V_T$	$V_{KA} = V_{REF}$, $I_{KA} = 10\text{mA}$, $T_{MIN} \leq T_A \leq T_{MAX}$	-	4.5	17	mV
Ratio of Change in Reference Voltage to the Change in Cathode Voltage	$\Delta V_{REF}/\Delta V_{KA}$	$I_{KA} = 10\text{mA}$, $\Delta V_{KA} = 10\text{V} - V_{REF}$	-	-1.0	-2.7	mV/V
		$\Delta V_{KA} = 36\text{V} - 10\text{V}$	-	-0.5	-2.0	mV/V
Reference Current	I_{REF}	$I_{KA} = 10\text{mA}$, $R_1 = 10\text{K}\Omega$, $R_2 = \infty$	-	1.5	4	μA
Deviation of Reference Current Over Full Temperature Range	ΔI_{REF}	$I_{KA} = 10\text{mA}$, $R_1 = 10\text{K}\Omega$, $R_2 = \infty$, $T_{MIN} \leq T_A \leq T_{MAX}$	-	0.4	1.2	μA
Minimum Cathode Current for Regulation	$I_{KA(MIN)}$	$V_{KA} = V_{REF}$	-	0.3	0.5	mA
Off-state Cathode Current	$I_{KA(OFF)}$	$V_{KA} = 36\text{V}$, $V_{REF} = 0$	-	0.05	1.0	μA
Dynamic Impedance	Z_{KA}	$V_{KA} = V_{REF}$, $f \leq 1\text{kHz}$ $I_{KA} = 1$ to 100mA	-	0.15	0.5	Ω

• $T_{MIN} = -40^\circ\text{C}$, $T_{MAX} = +125^\circ\text{C}$

TYPICAL CHARACTERISTICS (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

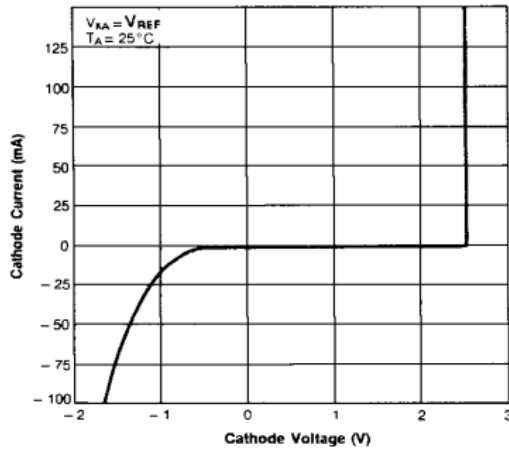


Figure 1. Cathode Current vs. Cathode Voltage

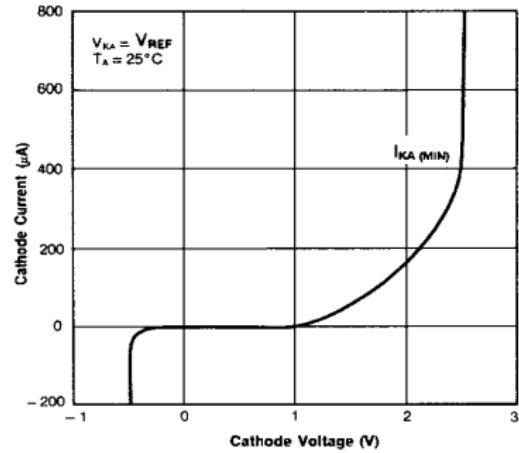


Figure 2. Cathode Current vs. Cathode Voltage

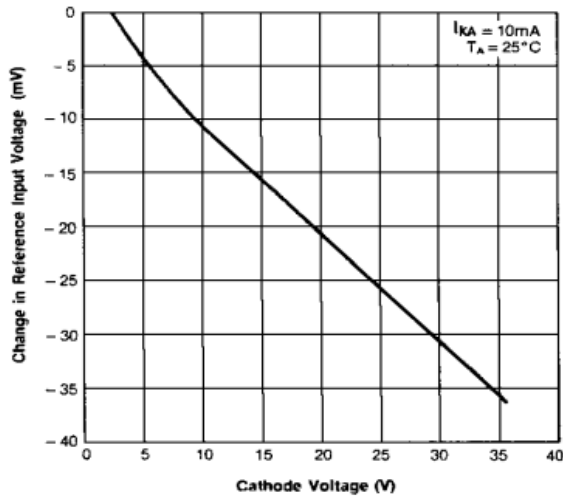


Figure 3. Change In Reference Input Voltage vs. Cathode Voltage

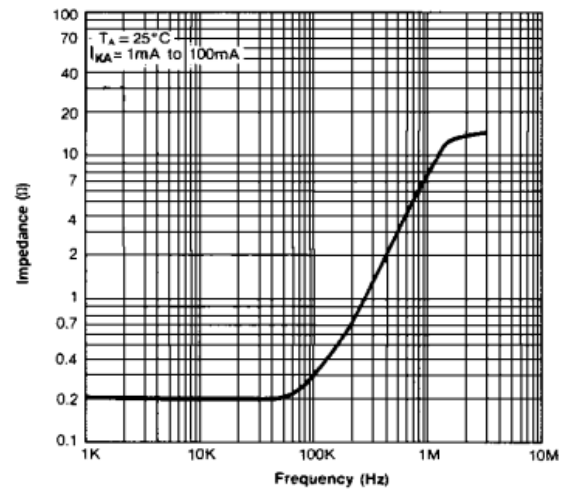


Figure 4. Dynamic Impedance Frequency

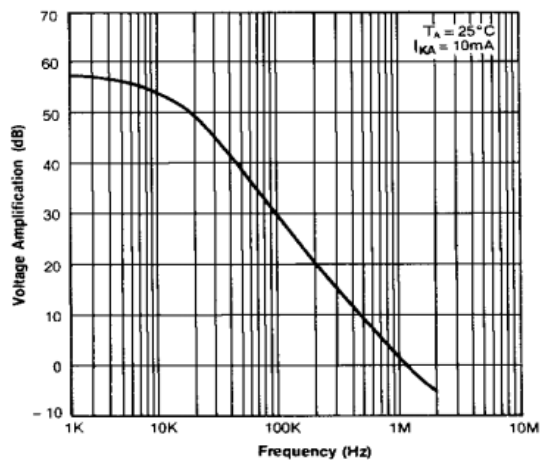


Figure 5. Small Signal Voltage Amplification vs. Frequency

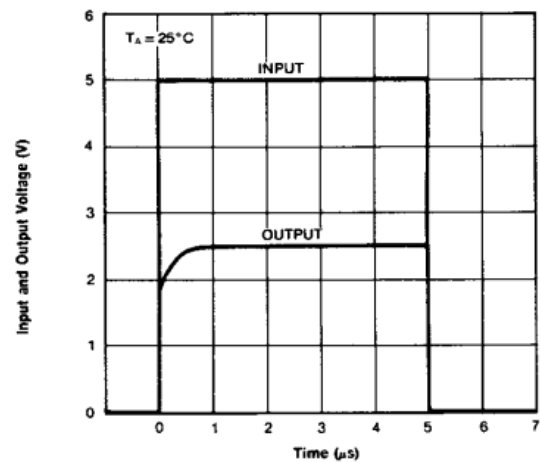
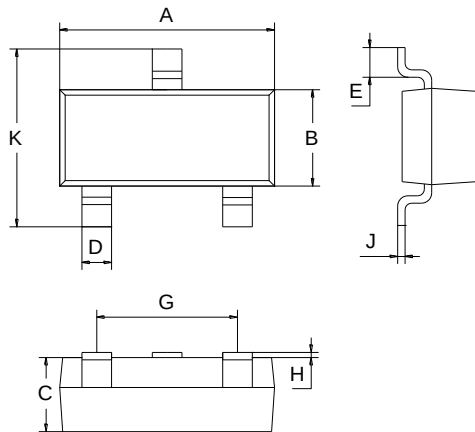


Figure 6. Pulse Response

Package Outline Dimensions (Unit: mm)



SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.9	1.1
D	0.3	0.5
E	0.35	0.48
G	1.80	2.00
H	0.02	0.1
J	0.05	0.15
K	2.20	2.60

Package Outline Dimensions (Unit: mm)

SOT-23

