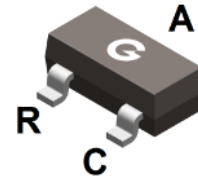
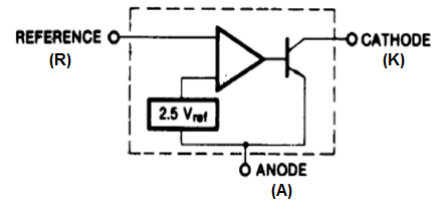


Features

- Programmable output voltage to 36 volts
- Low dynamic output impedance 0.15 typical
- Sink current capability of 0.03 to 100mA
- Equivalent full-range temperature coefficient of 36ppm/°C typical
- Temperature compensated for operation over full rated operating temperature range
- Low output noise voltage
- Fast turn-on response
- Minimum Cathode Current for Regulation 15uA typ.
- 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
BL431M	SOT-23	3000 pcs / Tape & Reel	431M
BL431M-A	SOT-23	3000 pcs / Tape & Reel	431M
BL431M-B	SOT-23	3000 pcs / Tape & Reel	431M

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}	37	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	$^{\circ}\text{C/W}$
Operating Temperature Range	T_{OPR}	-40 ~ +125	$^{\circ}\text{C}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

Recommended Operating Condition

Parameter	Symbol	Min.	Typ.	Max.	Unit
Cathode Voltage	V_{KA}	V_{REF}	-	36	V
Cathode Current	I_{KA}	0.03	-	100	mA

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Reference voltage	V_{REF}	$V_{KA} = V_{REF}$, $I_{KA} = 10\text{mA}$ BL431M-A (0.5%) BL431M (1%) BL431M-B (2%)	2.488 2.475 2.450	2.500 2.500 2.500	2.512 2.525 2.550	V
Deviation of Reference Voltage Over Full Temperature Range	$\Delta V_{REF}/\Delta V_T$	$V_{KA} = V_{REF}$, $I_{KA} = 10\text{mA}$, -40 $^{\circ}\text{C} \leq T_J \leq 125^{\circ}\text{C}$	-	15	25	mV
Ratio of Change in Reference Voltage to the Change in Cathode Voltage	$\Delta V_{REF}/\Delta V_{KA}$	$I_{KA} = 10\text{mA}$ $\Delta V_{KA} = 10\text{V} - V_{REF}$	-	-0.5	-2.7	mV/V
		$\Delta V_{KA} = 36\text{V} - 10\text{V}$	-	-0.2	-2.0	mV/V
Reference Current	I_{REF}	$I_{KA} = 10\text{mA}$, $R_1 = 10\text{K}\Omega$, $R_2 = \infty$	-	0.04	2	μA
Deviation of Reference Current Over Full Temperature Range	ΔI_{REF}	$I_{KA} = 10\text{mA}$, $R_1 = 10\text{K}\Omega$, $R_2 = \infty$, -40 $^{\circ}\text{C} \leq T_J \leq 125^{\circ}\text{C}$	-	0.2	0.4	μA
Minimum Cathode Current for Regulation	$I_{KA(MIN)}$	$V_{KA} = V_{REF}$	-	15	30	μA
Off-state Cathode Current	$I_{KA(OFF)}$	$V_{KA} = 36\text{V}$, $V_{REF} = 0$	-	0.05	0.5	μA
Dynamic Impedance	Z_{KA}	$V_{KA} = V_{REF}$, $f \leq 1\text{KHz}$ $I_{KA} = 1$ to 100mA	-	0.15	0.5	Ω

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

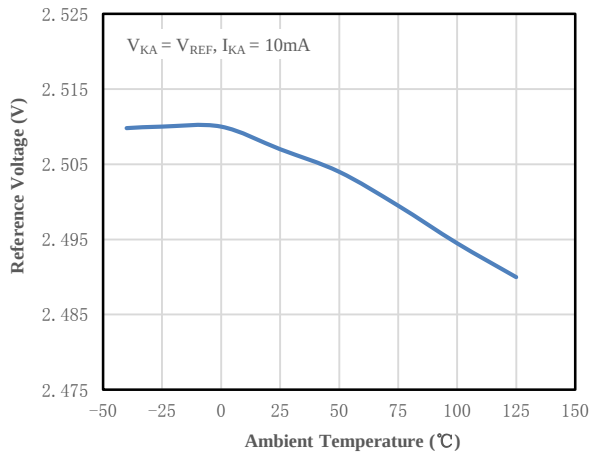


Fig 1 Reference Voltage vs. Temperature

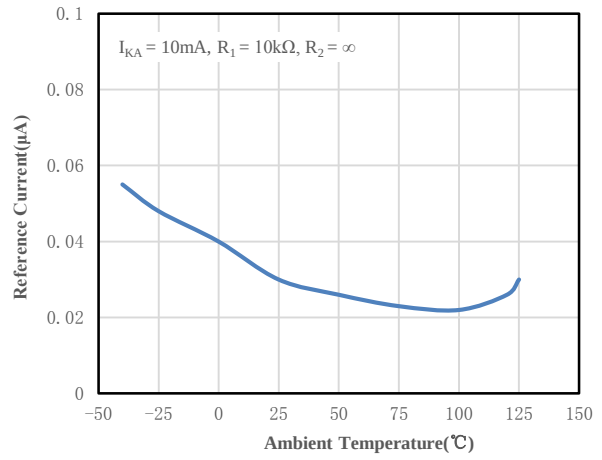


Fig 2 Reference Current vs. Temperature

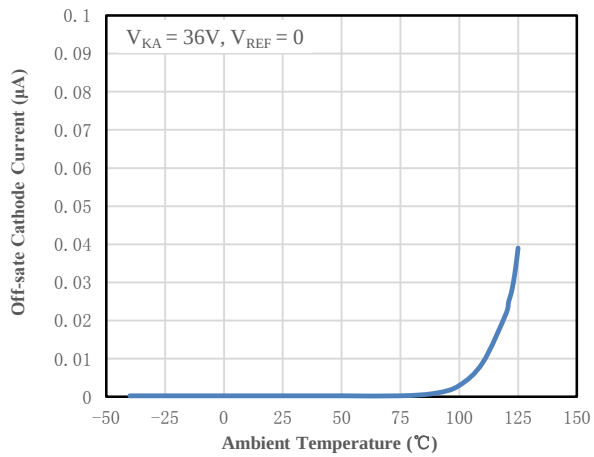
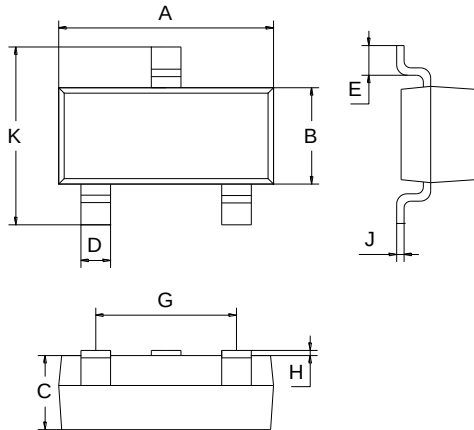


Fig 3 Off-state Cathode Current vs. Temperature

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

