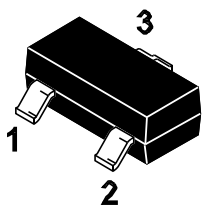
# Programmable Precision Reference

## Features

- Low dynamic output impedance.
- Sink current capability of 0.5 to 100mA.
- Low output noise voltage
- Fast turn on response

**SOT-23**

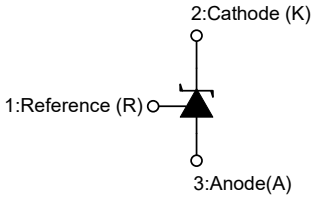



1. Reference 2.Cathode 3.Anode

## Application

- It provides very wide applications, including shunt regulator,series regulator,switching regulator,voltage reference and others.

**Marking Code:**
GN431A 0.5%: GN431A
GN431G 0.4%: GN431G




## Absolute Maximum Ratings (Ta=25℃unless otherwise specified)

| Parameter | Symbol | Value | Units |
|---|---|---|---|
| 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 |
| Maximum Power Dissipation | $P_D$ | 350 | mW |
| Operating Junction Temperature | $T_J$ | 150 | °C |
| Storage Temperature Range | $T_{STG}$ | -65 ~ +150 | °C |

## Recommended Operating Conditions

| Parameter | Symbol | Min. | Max. | Units |
|---|---|---|---|---|
| Cathode Voltage | $V_{KA}$ | $V_{REF}$ | 36 | V |
| Cathode Current | $I_{KA}$ | 1 | 100 | mA |
| Operating Ambient Temperature Range | $T_{OPR}$ | -40 | 85 | °C |

## Electrical Characteristics (Ta=25°C unless otherwise specified)

| Parameter | Symbol | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Reference Input Voltage Fig1 | $V_{REF}$ | $V_{KA}=V_{REF}$, $I_{KA}=10mA$ | GN431A 0.5% | 2.483 | 2.495 | 2.507 | V |
| | | | GN431G 0.4% | 2.485 | 2.495 | 2.505 | V |
| Deviation of Reference Input Voltage Over Temperature Fig1 | $\Delta V_{REF}$ | $V_{KA}=V_{REF}$, $I_{KA}=10mA$ $-40°C \le T_A \le +85°C$ | | -- | 4.5 | 17 | mV |
| Ratio of Change in Reference Input Voltage to The Change in Cathode Voltage Fig2 | $\frac{\Delta V_{REF}}{\Delta V_{KA}}$ | $I_{KA}=10mA$ | $\Delta V_{KA}=10V \sim V_{REF}$ | -- | -1.0 | -2.7 | mV/V |
| | | | $\Delta V_{KA}=36V \sim 10V$ | -- | -0.5 | -2.0 | |
| Reference Input Current Fig2 | $I_{REF}$ | $I_{KA}=10mA$, R1=10KΩ, R2=∞ | | -- | 1.5 | 4 | μA |
| Deviation of Reference Input Current Over Full Temperature Range Fig2 | $\Delta I_{REF}$ | $I_{KA}=10mA$, R1=10KΩ, R2=∞, $-20°C \le T_A \le +85°C$ | | -- | 0.4 | 1.2 | μA |
| Minimum Cathode Current for Regulation Fig1 | $I_{KA(MIN)}$ | $V_{KA}=V_{REF}$ | | -- | 0.45 | 1 | mA |
| Off-State Cathode Current Fig3 | $I_{KA(OFF)}$ | $V_{KA}=36V$, $V_{REF}=0$ | | -- | 0.05 | 1.0 | μA |
| Dynamic Impedance | $Z_{KA}$ | $V_{KA}=V_{REF}$, $I_{KA}=1 \sim 100mA$, f≤1.0KHz | | -- | 0.15 | 0.5 | Ω |

**Figure 1. Test Circuit for $V_{KA} = V_{REF}$**

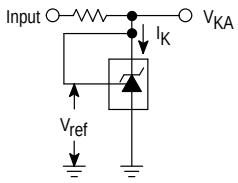



**Figure 2. Test Circuit for $V_{KA} > V_{REF}$**

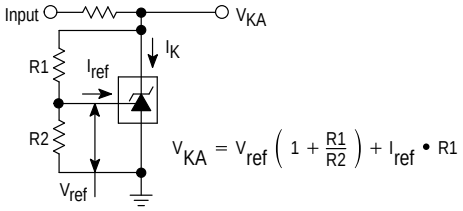
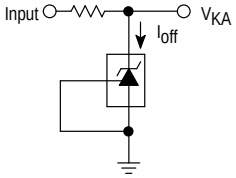
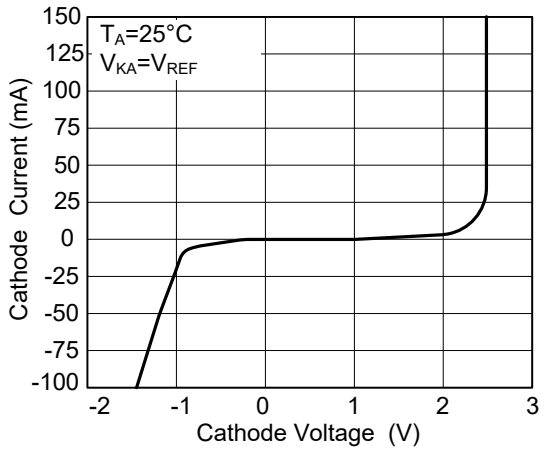
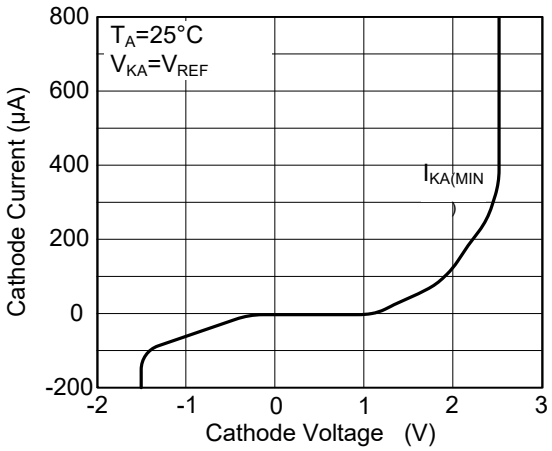


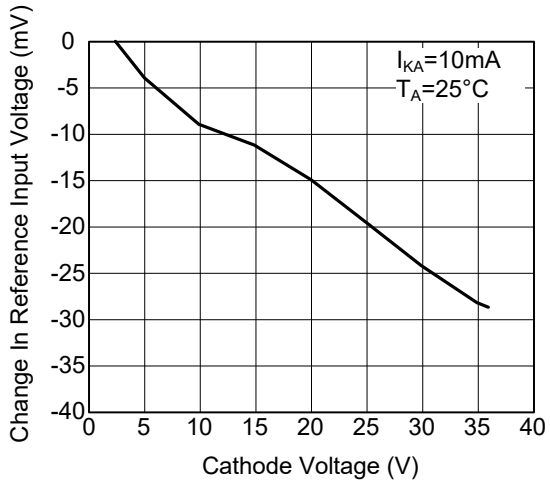

**Figure 3. Test Circuit for $I_{OFF}$**

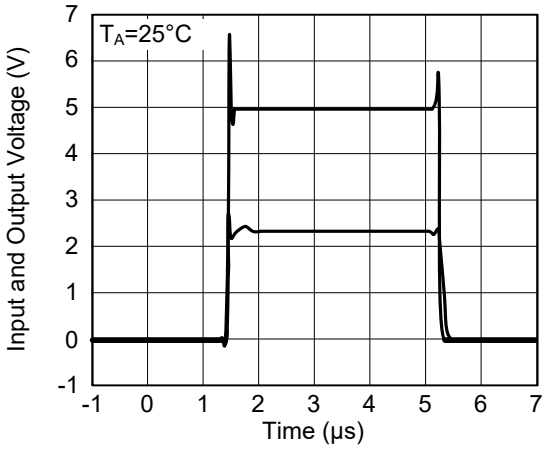


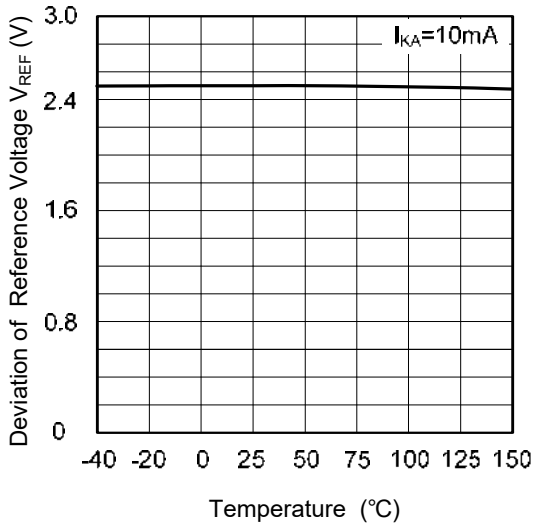
## Typical Characteristic Curves

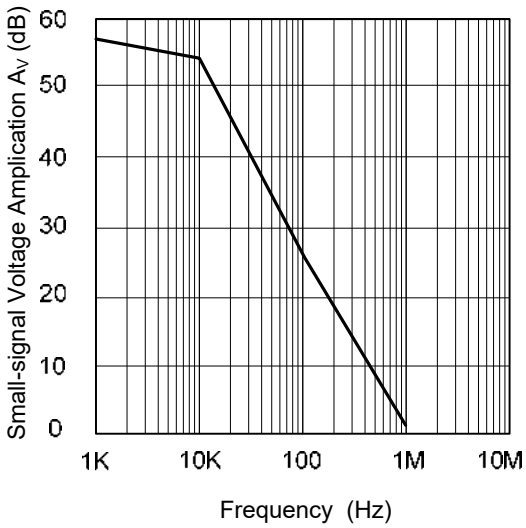


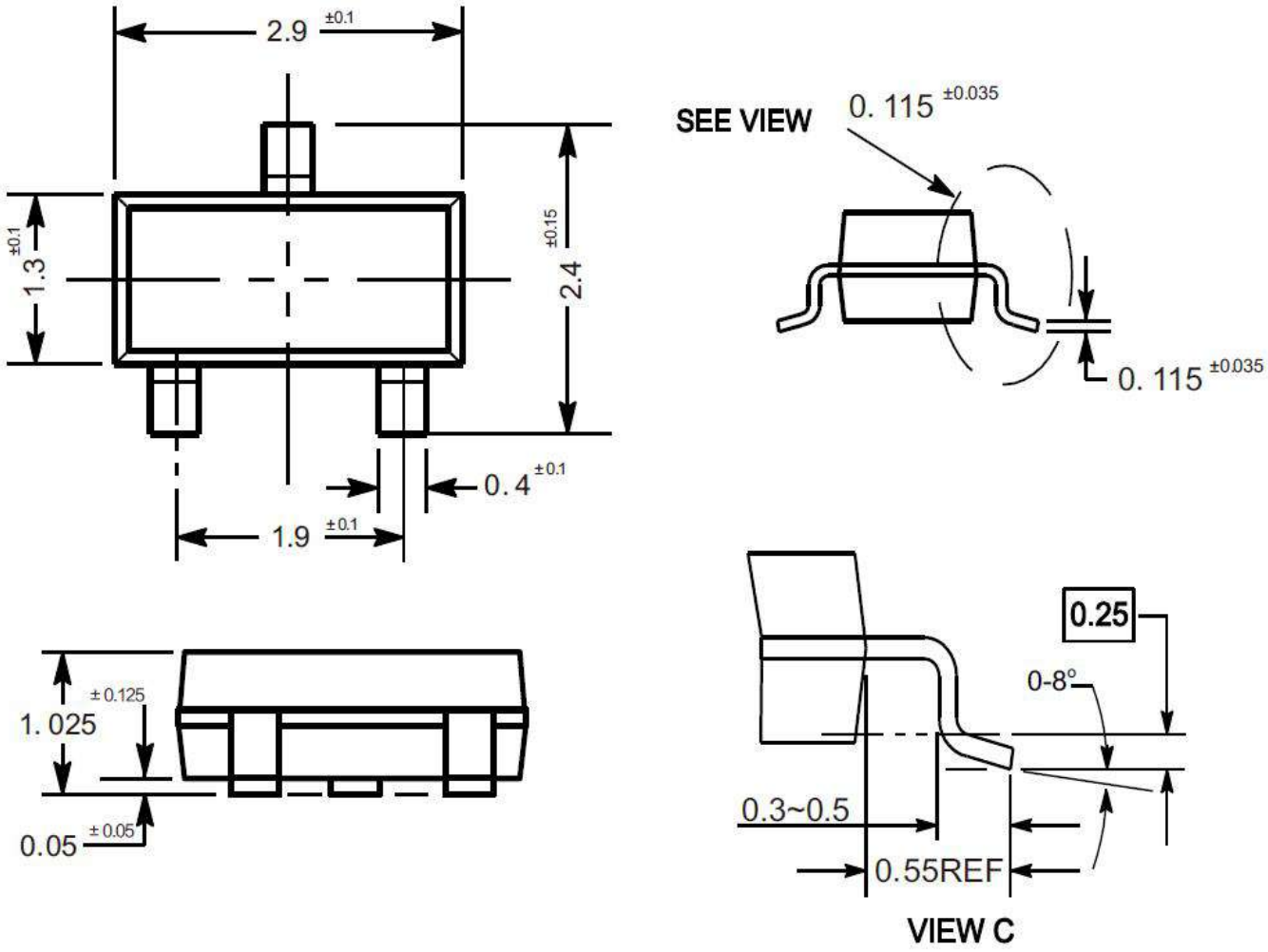



## Package Outline

SOT-23

Dimensions in mm




## Ordering Information

| Device | Package | Shipping |
|---|---|---|
| GN431 | SOT-23 | 3,000PCS/Reel&7inches |