

## Descriptions

The CT431M is Precision adjustable shunt regulator , SOT-23 Plastic Package.

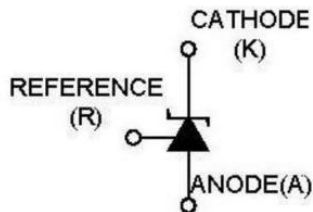
## Features

- Precise reference voltage to 2.500V
- Quaranteed 0.4%,0.8%reference voltage tolerance
- Sink current capability,1.0mA~100 mA
- Quick turn-on
- Adjustable Output voltage,  $V_O = V_{ref} \sim 37V$
- Low operational cathode current,400 $\mu$ A typical
- 0.15 $\Omega$  typical output impedance

## Applications

- Linear regulators
- Adjustable power supply
- Switching power supply

## Equivalent Circuit



## Pinning



PIN1: R

PIN 2: K

PIN 3: A

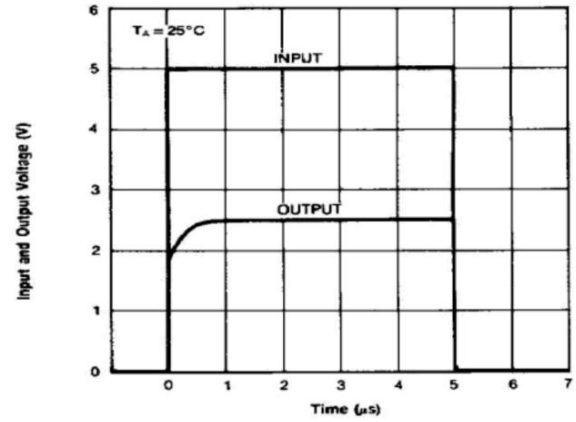
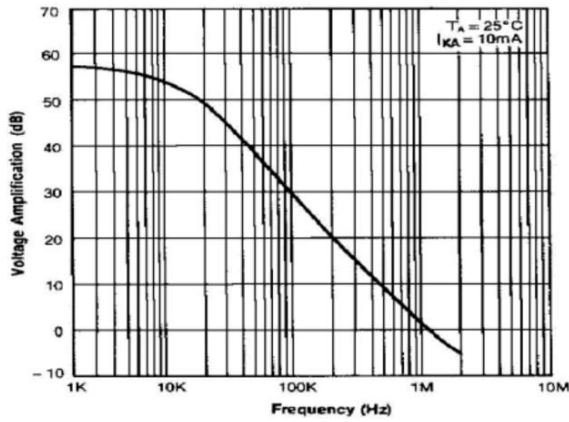
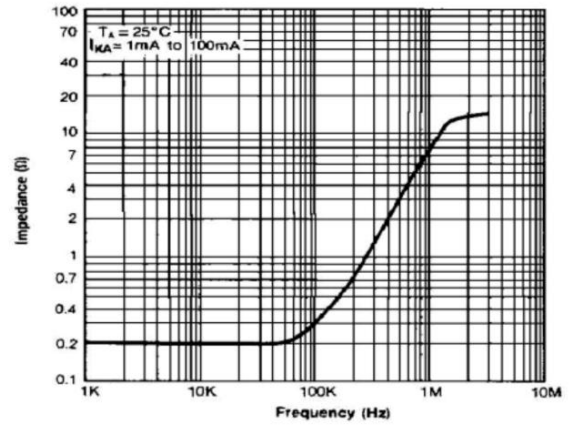
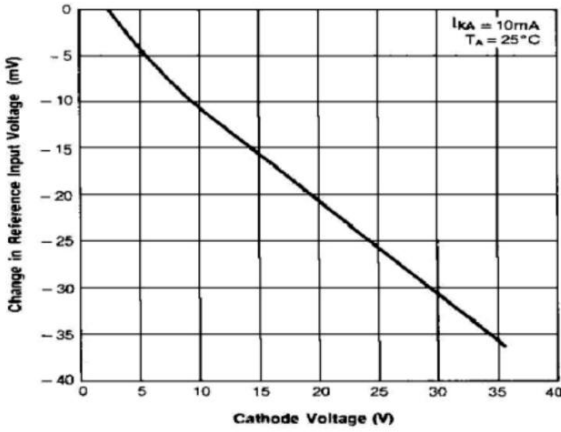
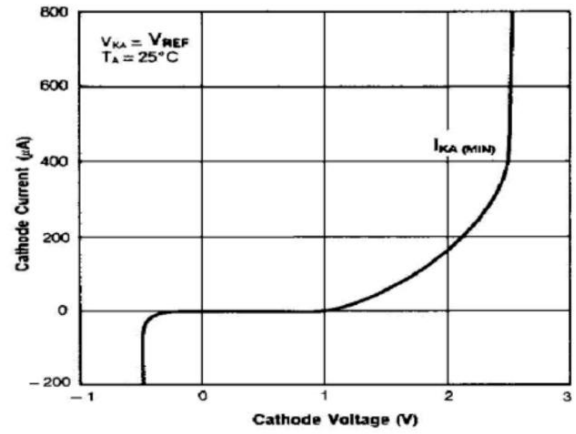
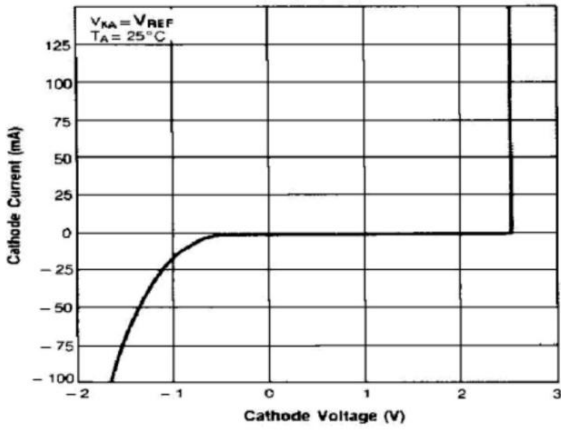
**Absolute Maximum Ratings(Ta=25°C)**

| Parameter                                 | Symbol    | Rating    | Unit |
|---|-----------|-----------|------|
| Cathode to Anode Voltage                  | $V_{KA}$  | 37        | V    |
| Cathode Current Range, Continuous         | $I_K$     | -100~+100 | mA   |
| Reference Input Current Range, Continuous | $I_{REF}$ | 0.05~+10  | mA   |
| Power Dissipation                         | $P_D$     | 370       | mW   |
| Operating Ambient Temperature             | $T_{amb}$ | -40~125   | °C   |
| Junction Temperature                      | $T_j$     | 160       | °C   |
| Storage Temperature Range                 | $T_{stg}$ | -65~150   | °C   |

**Electrical Characteristics(Ta=25°C)**

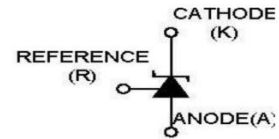
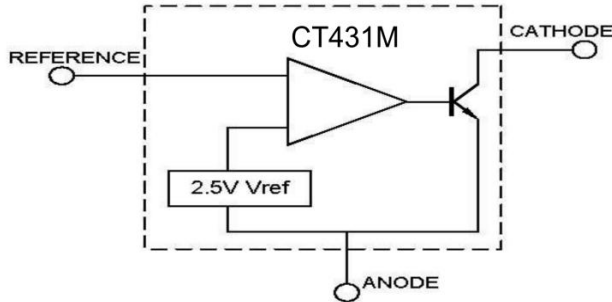
| Parameter   | Symbol                         | Test Conditions   | Min   | Typ   | Max   | Unit     |
|---|--------------------------------|---|-------|-------|-------|----------|
| Reference Input voltage   | $V_{REF}$                      | $V_{KA}=V_{REF}$<br>$I_K=10mA(A=0.4\%)$                                 | 2.490 | 2.500 | 2.510 | V        |
|   |                                | $V_{KA}=V_{REF}$<br>$I_K=10mA(B=0.8\%)$                                 | 2.480 | 2.500 | 2.520 | V        |
| Deviation of Reference Input Voltage Over-Temperature                       | $\Delta V_{REF}/T$             | $V_{KA}=V_{REF}$<br>$I_K=10mA$<br>$T_A=-25\sim 85^\circ C$              |       | 4.5   | 17    | mV       |
| Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage | $\Delta V_{REF}/\Delta V_{KA}$ | $I_K=10mA$<br>$\Delta V_{KA} =10V$ to $V_{REF}$                         |       | -1    | -2.7  | mV/V     |
|   |                                | $I_K=10mA$<br>$\Delta V_{KA} =36V$ to 10V                               |       | -0.45 | -2.0  | mV/V     |
| Reference Input current   | $I_{REF}$                      | $I_K=10mA$ $R_1=10\Omega$<br>$R_2=open$                                 |       | 1.0   | 4.0   | $\mu A$  |
| Deviation of Reference Input Current Over Full Temperature Range            | $\Delta I_{REF}/T$             | $I_K=10mA$ $R_1=10K\Omega$ ,<br>$R_2=open$<br>$T_A=-40\sim 125^\circ C$ |       | 0.4   | 1.2   | $\mu A$  |
| Minimum Cathode Current for Regulation                                      | $I_{K(min)}$                   | $V_{KA}=V_{REF}$  |       | 0.4   | 1     | mA       |
| Off-state cathode current   | $I_{K(off)}$                   | $V_{KA}=36V$<br>$V_{REF}=0V$  |       | 0.05  | 1.0   | $\mu A$  |
| Dynamic impedance   | $ Z_{KA} $                     | $V_{KA}=V_{REF}$<br>$I_K=1mA$ to 100mA<br>$f\leq 1.0KHz$                |       | 0.15  | 0.5   | $\Omega$ |

Electrical Characteristic Curve

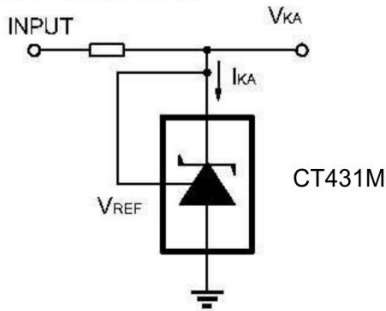


Typical Application Circuit

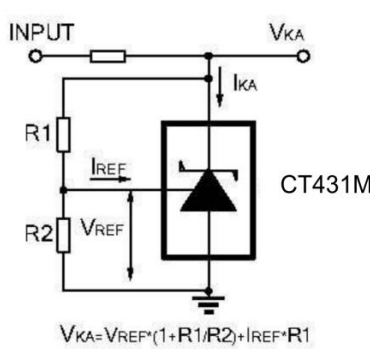
BLOCK DIAGRAM:



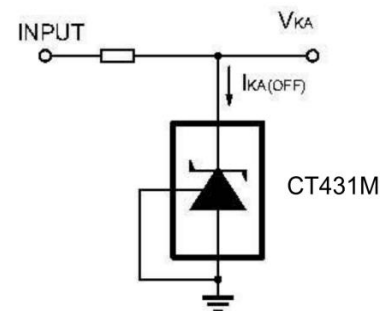
TEST CIRCUITS:



Test Circuit For  $V_{KA} = V_{REF}$

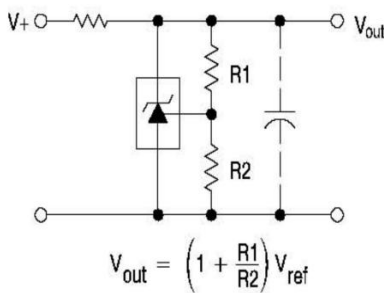


Test Circuit for  $V_{KA} \geq V_{REF}$

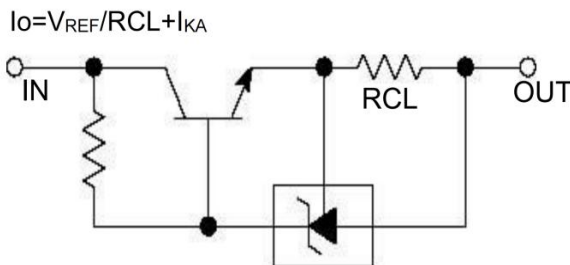


Test Circuit For  $I_{KA(OFF)}$

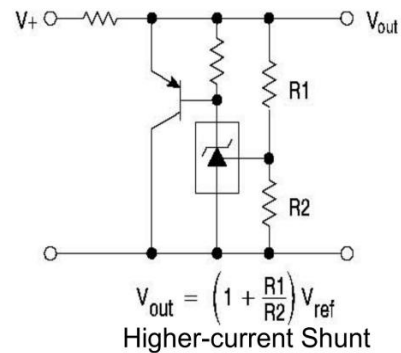
TYPICAL APPLICATION:



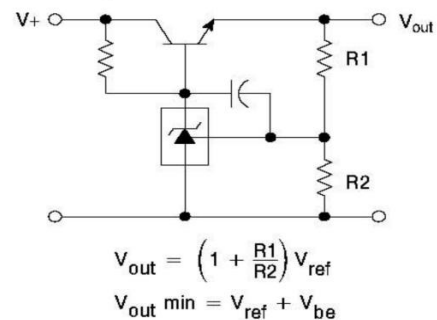
Shutdown Regulator



Constant Current Source CT431M

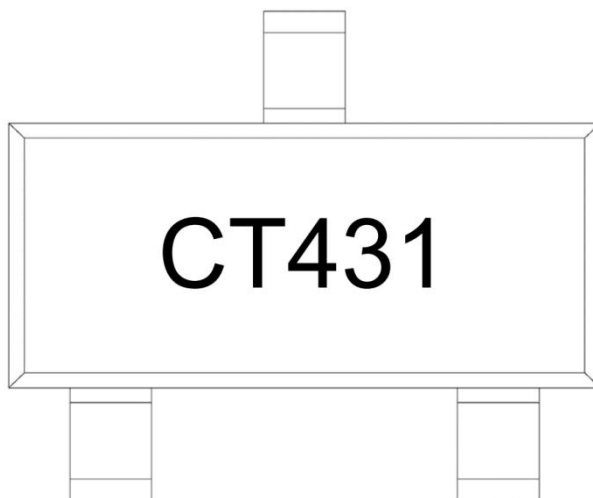


Higher-current Shunt



Series Pass Regulator

**Marking Instructions**



Note:

CT: Company Code.

431: Product Type.

**Packaging SPEC**

REEL

| Package Type | Units      |                 |                 |                       |                 | Dimension (unit: mm <sup>3</sup> ) |             |             |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|------------------------------------|-------------|-------------|
|              | Units/Reel | Reels/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Reel                               | Inner Box   | Outer Box   |
| SOT-23       | 3,000      | 10              | 30,000          | 6                     | 180,000         | 7" ×8                              | 180×120×180 | 390×385×205 |

**Package Outline Dimensions**

SOT-23

单位: mm

