

### Features

- Adjustable output voltage range: 1.25V~18V
- Stable capacitive load
- Low temperature float 16mV
- Low working current of 35 $\mu$  A (typ)
- Current capacity range 0.1-100 mA
- accuracy:  $\pm 0.5\%$
- Package appearance SOT23
- Low output noise voltage

### Applications

- Adjustable voltage and current reference
- Zener diode replacement products
- Voltage monitoring
- A comparator with an integrated benchmark
- Precision current limiter

### TP432BS3

#### Precision adjustable reference source

TP432BS3 is a three terminal adjustable parallel regulator that can Set the output voltage through

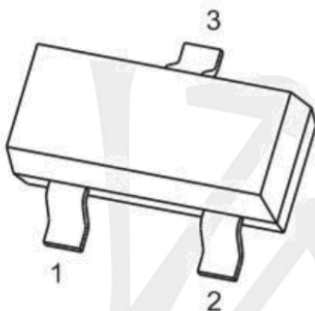
two external resistors Between Vref

(approximately 1.25V) and 18V Any value.

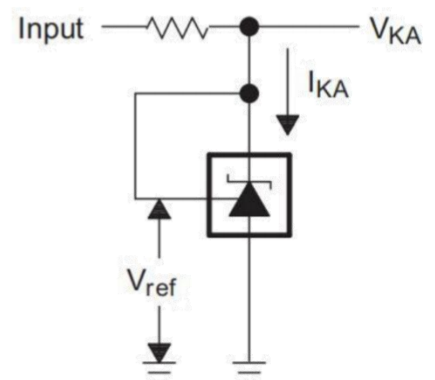
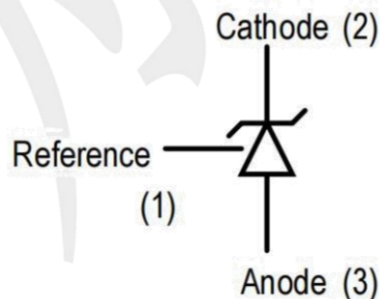
Active output circuits can provide very sharp The conductivity characteristics of these devices enable them to be used in many applications Becoming an excellent substitute for Zener diodes in use, this

Some applications include onboard voltage regulation, adjustable power supply, and power on/off Power off.

### Circuit diagram and pin information



**SOT23**



## Absolute Maximum Ratings

Within the range of  $T_A=25^\circ\text{C}$  (unless otherwise specified)

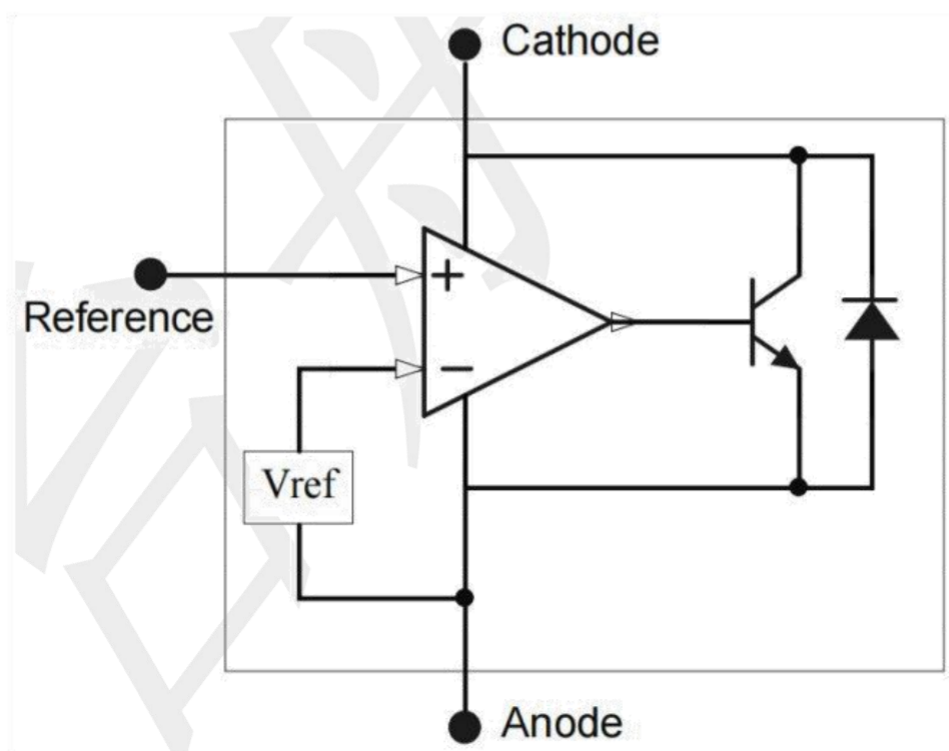
| Parameter    |                                        | Value           | UNIT             |
|--------------|----------------------------------------|-----------------|------------------|
| $P_M$        | Power Rating                           | 0.35            | W                |
| $V_{KA}$     | Cathode voltage                        | 18              | V                |
| $I_{KA}$     | Continuous cathode current range       | 100             | mA               |
| $I_{I(ref)}$ | Reference input current range          | 1               | uA               |
| $T_{OA}$     | Operating Ambient Temperature Range    | $-25 \sim +125$ | $^\circ\text{C}$ |
| $T_J$        | Operating virtual junction temperature | +150            | $^\circ\text{C}$ |
| $T_{stg}$    | Storage temperature range              | $-55 \sim +150$ | $^\circ\text{C}$ |
| ESD          | Human Body Model                       | 6               | KV               |
| ESD          | Machine Model                          | 0.4             | KV               |

(1) Exceeding the absolute maximum rated pressure listed may result in permanent damage to the equipment. These are only rated stresses and do not imply any of them or any of them

The functional operation of the equipment under his conditions (beyond the conditions indicated under the 'recommended working conditions'). Long term exposure to absolute maximum rated conditions can It can affect the reliability of the equipment.

(2) Unless otherwise specified, all voltage values are related to the anode.

## BLOCK DIAGRAM



### Electrical Characteristics

Under recommended working conditions,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)

| PARAMETER                                                                           | SYMBOL                                 | TEST Conditions                                                                                                    | MIN   | TYP   | MAX   | UNIT               |
|-------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------------------|
| Reference voltage (Fig.1)                                                           | $V_{REF}$                              | $V_{KA} = V_{REF}$ , $I_K = 10\text{mA}$                                                                           | 1.238 | 1.250 | 1.262 | V                  |
| Deviation of reference input voltage over full temperature (1)(Fig.1)               | $V_{REF}$<br>(DEV)                     | $V_{KA} = V_{REF}$ , $I_K = 10\text{mA}$ ,<br>$T_A = 0^\circ\text{C} \sim 70^\circ\text{C}$                        | --    | --    | 16    | mV                 |
| Ratio of change in reference input voltage to the change in cathode voltage (Fig.2) | $\frac{\Delta V_{REF}}{\Delta V_{KA}}$ | $I_K = 10\text{mA}$ ,<br>$\Delta V_{KA} = 15\text{V} \sim V_{REF}$                                                 | --    | 0.6   | 2.4   | mV/V               |
| Reference input current (Fig.2)                                                     | $I_{REF}$                              | $I_K = 10\text{mA}$ , $R_1 = 10\text{K}\Omega$ ,<br>$R_2 = \infty$                                                 | --    | 0.4   | 1.0   | $\mu\text{A}$      |
| Deviation Of reference input current over full temperature range (Fig.2)            | $\Delta I_{REF}$                       | $I_K = 10\text{mA}$ , $R_1 = 10\text{K}\Omega$ ,<br>$R_2 = \infty$ , $T_A = 0^\circ\text{C} \sim 70^\circ\text{C}$ | --    | 0.1   | 0.2   | $\mu\text{A}$      |
| Minimum cathode current for regulation (Fig.1)                                      | $I_{KMIN}$                             | $V_{KA} = V_{REF}$                                                                                                 | --    | 30    | 100   | $\mu\text{A}$      |
| Off-state cathode current (Fig.3)                                                   | $I_{OFF}$                              | $V_{KA} = 15\text{V}$ , $V_{REF} = 0$                                                                              | --    | --    | 0.1   | $\mu\text{A}$      |
| Dynamic impedance                                                                   | $Z_{KA}$                               | $V_{KA} = V_{REF}$ ,<br>$I_K = 0.1\text{mA} \sim 20\text{mA}$ ,<br>$f \leq 1\text{KHz}$                            | --    | 0.15  | 0.5   | $\Omega$           |
| Thermal Resistance                                                                  | $\theta_{JC}$                          |                                                                                                                    | --    | 115   | --    | $^\circ\text{C/W}$ |

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

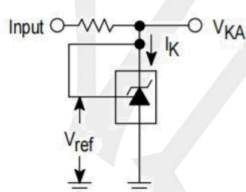


Figure 2. Test Circuit for  $V_{KA} > V_{ref}$

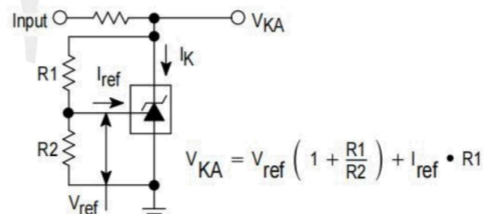
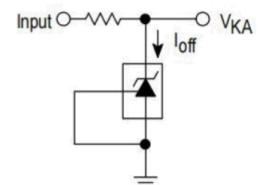


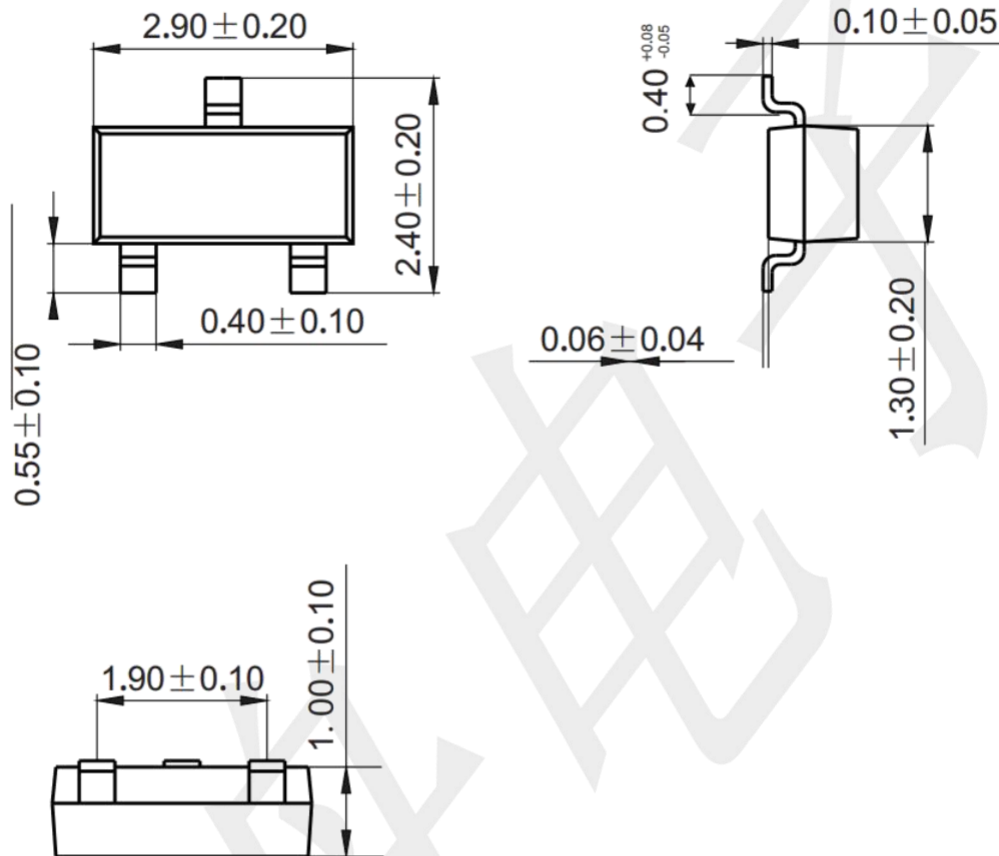
Figure 3. Test Circuit for  $I_{off}$



**Note:** It is recommended to connect a capacitor (with a value greater than  $0.1 \mu\text{F}$ ) to the output pin for smooth output. The capacitor should be placed as close as possible to the output pin and The shortest path connects to GND.

**Package Outline Dimensions (unit: mm)**

SOT23



**Mounting Pad Layout (unit: mm)**

