

Adjustable Accurate Reference Source

DEVICE DESCRIPTION:

The UMW TL432 is a three-terminal adjustable shunt regulator highly accurate 1.25V band gap reference with 0.5%, 1% tolerance. The device offers thermal stability, wide operating current (50mA) and an extended temperature range of -40°C to 105°C for operation in power supply applications. The UMW TL432 offers a wide operating voltage range of up to 12V and is an excellent choice for voltage reference requirements in an isolated feedback circuit for 3.0V ~ 3.3V switching mode power supplies. The tight tolerance guarantees a lower design cost for the power supply manufacturer by virtually eliminating the need for an extra power supply manufacturing process of the power supply

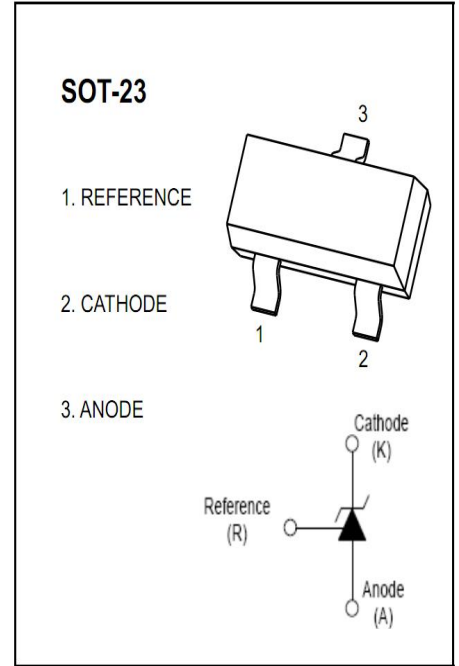
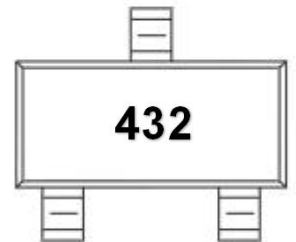
FEATURES:

- Low dynamic output impedance
- The effective temperature compensation in the working range of full temperature
- Low output noise voltage
- Fast on-state response
- Sink current capability of 0.1mA to 100mA

APPLICATION:

- Shunt Regulator
- High-Current Shunt Regulator
- Precision Current Limiter

MARKING:



ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|--------|----------|------|
| Cathode Voltage | VKA | 18 | V |
| Cathode Current Range (Continuous) | IKA | 100 | mA |
| Reference Input Current Range | Iref | 6 | mA |
| Power Dissipation | PD | 350 | mW |
| Thermal Resistance from Junction to Ambient | RθJA | 350 | °C/W |
| Operating Junction Temperature | Tj | 125 | °C |
| Operating Ambient Temperature Range | Topr | -40-105 | °C |
| Storage temperature Range | Tstg | -40~+150 | °C |

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ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|----------------------------------|---|------|------|------|------|
| Reference input voltage (Fig.1) | Vref | VKA=VREF, IKA=10mA | 1.22 | 1.25 | 1.26 | V |
| Deviation of reference voltage over full temperature range (Fig 1) | $\Delta V_{ref} / \Delta T$ | VKA =VREF, IKA =10mA 0°C≤Ta≤70°C | | 4.5 | 16 | mV |
| Ratio of change in reference input voltage to the change in cathode voltage (Fig.2) | $\Delta V_{ref} / \Delta V_{KA}$ | IKA=10mA $\Delta V_{KA}=1.25V\sim 15V$ | | 1 | 2.5 | mV/V |
| Reference input current (Fig.2) | Iref | IKA=10mA, R1=10kΩ R2=∞ | | 1.5 | 4 | μA |
| Deviation Of reference input current over full temperature range (Fig.2) | $\Delta I_{ref} / \Delta T$ | IKA=10mA, R1=10kΩ R2=∞ 0°C≤Ta≤70°C | | 0.2 | 0.6 | μA |
| Minimum cathode current for regulation (Fig.1) | IKA(min) | VKA=VREF, IKA=10mA | | | 0.1 | mA |
| Off-state cathode Current (Fig.3) | IKA(OFF) | VKA=36V, VREF=0 | | 0.05 | 0.5 | μA |
| Dynamic impedance | ZKA | VKA=VREF, IKA=1 to100mA f≤1.0kHz | | 0.15 | 0.5 | Ω |

Note: TMIN=-25°C ,TMAX=+85°C

CLASSIFICATION of Vref

| Rank | 0.5% | 1.00% |
|-------|-------------|-------------|
| Range | 1.234-1.246 | 1.228-1.252 |

Figure 1. Test Circuit for VKA = Vref

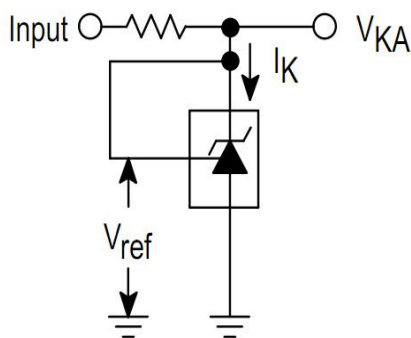
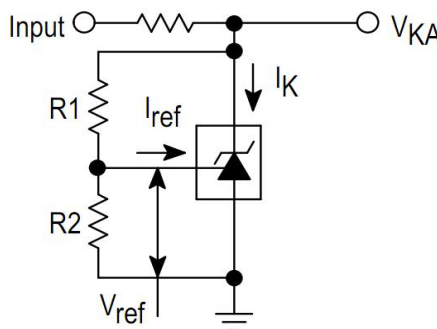
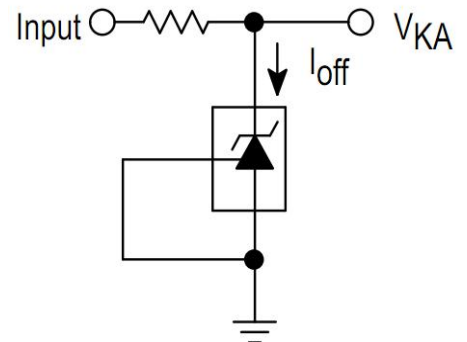


Figure 2. Test Circuit for VKA > Vref

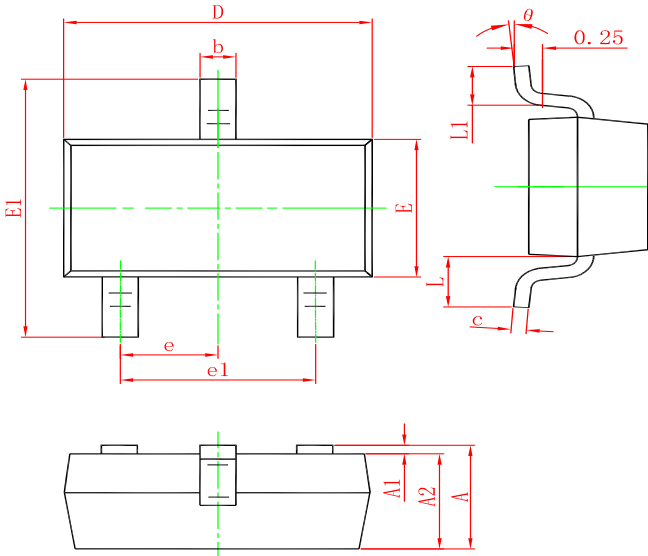


$$V_{KA} = V_{ref} \left(1 + \frac{R1}{R2} \right) + I_{ref} \cdot R1$$

Figure 3. Test Circuit for Ioff



SOT-23 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP. | | 0.037 TYP. | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF. | | 0.022 REF. | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |