

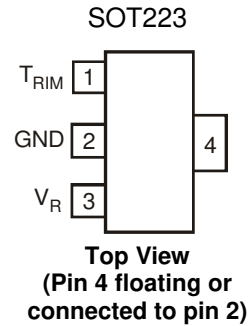
Description

The ZRT025 is a monolithic integrated circuit providing a precise stable reference voltage of 2.5V at 500µA.

The circuit features a knee current of 150µA and operation over a wide range of temperatures and currents.

The ZRT025 is available for surface mount applications. This product offers a trim facility whereby the output voltage can be adjusted as shown in the schematic diagram. This facility is used when compensating for system errors or setting the reference output to a particular value. When the trim facility is not used, the pin should be left open circuit.

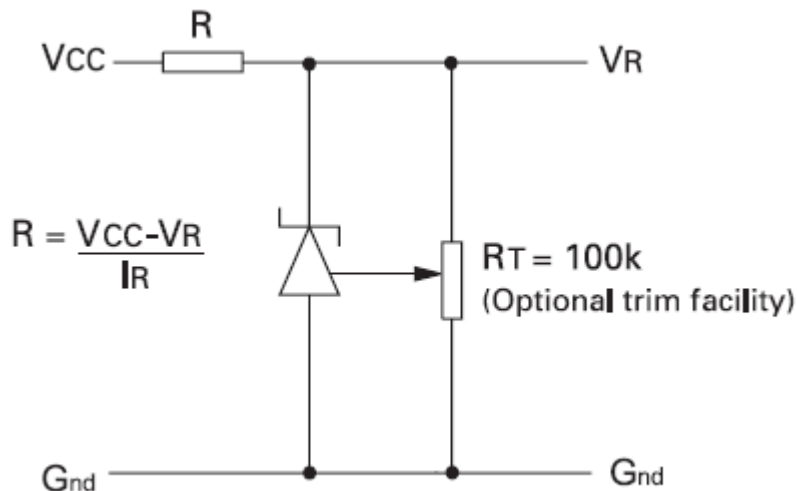
Pin Assignments



Features

- Trimmable output
- Excellent temperature stability
- Low output noise figure
- -40 to 85°C operating temperature range
- 1% initial voltage tolerance
- No external stabilizing capacitor required in most cases
- Low slope resistance
- No derating required at low temperatures
- SOT223 package

Schematic Diagram



This circuit will allow the reference to be trimmed over a wide range. The device is specified over a ±5% trim range.

Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|--------------------------------|------------------|-------------|------|
| Reverse Current (Note 1) | | 75 | mA |
| Operating Temperature: C grade | T _{OMP} | -40 to +85 | °C |
| Storage Temperature | T _{STG} | -55 to +150 | °C |

Notes: 1. Above 72°C this figure should be linearly derated to 25mA @ 125°C

Power Dissipation (@T_{amb} = 25°C unless otherwise stated)

| Package | Value | Unit |
|---------|-------|------|
| SOT223 | 2 | W |

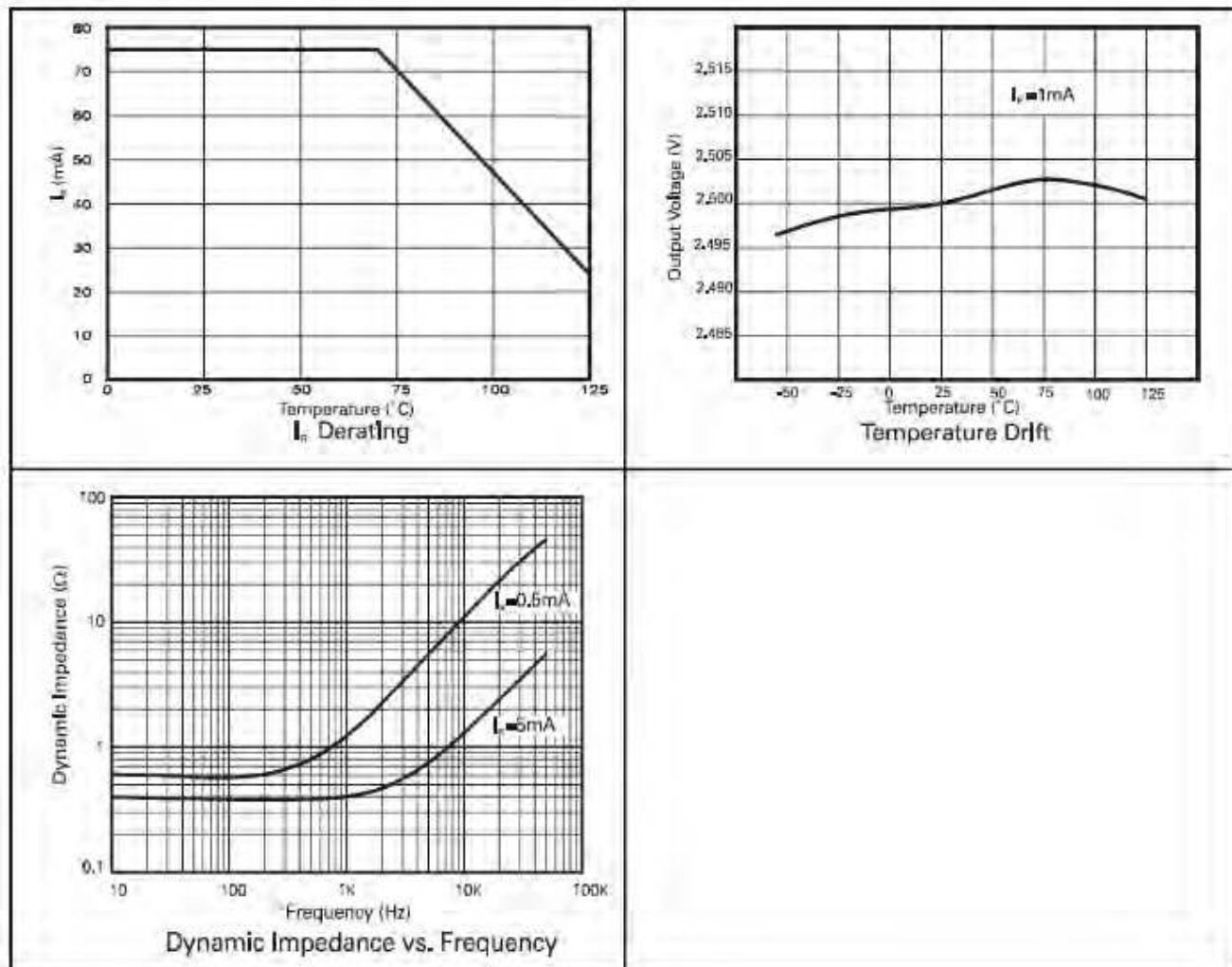
Temperature Dependent Electrical Characteristics

| Symbol | Parameter | Grade C -40 to 85°C | | Unit |
|-------------------------------|---|------------------------|------|--------|
| | | | | |
| ΔV _R | Output voltage change over relevant temperature range | 2.7 | 8.8 | mV |
| T _C V _R | Output voltage temperature coefficient | 15.0 | 50.0 | ppm/°C |

Electrical Characteristics (@T_{amb} = 25°C unless otherwise stated)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|--|-------------------------------|-------|-----------|-------|--------|
| V _R | Output voltage 1% tolerance | I _R = 500 μA | 2.475 | 2.500 | 2.525 | V |
| V _{TRIM} | Output voltage adjustment range | R _T = 100kΩ | | ±5 | | % |
| T _C V _{TRIM} | Change in T _C V _R with output adjustment | | | 2.5 | | ppm/°C |
| I _R | Operating current range | | 0.15 | | 75 | mA |
| t _{on} t _{off} | Turn-on time Turn-off time | R _L = 1kΩ | | 10 0.3 | | μs |
| e _{np-p} | Output voltage noise (over the range 0.1 to 10Hz) | Peak to peak measurement | | 50 | | μV |
| R _S | Slope resistance (see note C) | I _R = 0.5mA to 5mA | | 0.85 | 2.0 | Ω |

Typical Characteristics



(a) Output change with temperature

The absolute maximum difference between the maximum output voltage and the minimum output voltage over the specified temperature range

$$\Delta V_R = V_{MAX} - V_{MIN}$$

(b) Output temperature coefficient ($T_C V_R$)

The ratio of the output change with temperature to the specified temperature range expressed in ppm/°C

$$T_C V_R = \frac{\Delta V_R \times 10^6}{V_R \times \Delta T} \text{ ppm}^\circ C$$

ΔT = Full temperature range

(c) Slope resistance (RS)

The slope resistance is defined as :

$$RS = \frac{\text{change in } V_R}{\text{specific current range}}$$

$$\Delta I = 5 - 0.5 = 4.5 \text{ mA (typically)}$$

(d) Line regulation

The ratio of change in output voltage to the change in input voltage producing it.

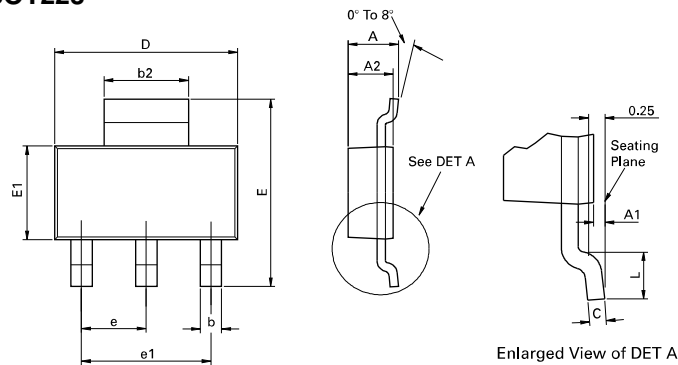
$$\frac{R_S \times 100}{V_R \times R_{SOURCE}} \% / V$$

Ordering Information

| Device | Tol % | Operating Temperature | Part Mark | Reel Size | Tape Width | Quantity Per Reel |
|-------------|-------|-----------------------|-----------|-----------|------------|-------------------|
| ZRT025GC1TA | 1 | -40 to +85 | ZRT025C1 | 7" | 12mm | 1000 |

Package Outline Dimensions (All Dimensions in mm)

SOT223



Conforms to JEDEC TO-261 AA Issue B

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|------|--------|-------|-----|-------------|------|------------|-------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| A | - | 1.80 | - | 0.071 | e | 2.30 BSC | | 0.0905 BSC | |
| A1 | 0.02 | 0.10 | 0.0008 | 0.004 | e1 | 4.60 BSC | | 0.181 BSC | |
| b | 0.66 | 0.84 | 0.026 | 0.033 | E | 6.70 | 7.30 | 0.264 | 0.287 |
| b2 | 2.90 | 3.10 | 0.114 | 0.122 | E1 | 3.30 | 3.70 | 0.130 | 0.146 |
| C | 0.23 | 0.33 | 0.009 | 0.013 | L | 0.90 | - | 0.355 | - |
| D | 6.30 | 6.70 | 0.248 | 0.264 | - | - | - | - | - |

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches.

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