

## Description

The ZRT025 is a monolithic integrated circuit providing a precise stable reference voltage of 2.5V at  $500\mu$ A.

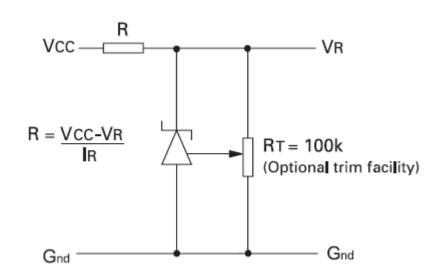
The circuit features a knee current of  $150\mu A$  and operation over a wide range of temperatures and currents.

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.

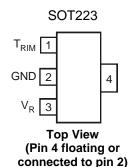
## Features

- 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 <sub>OMP</sub>	-40 to +85	°C
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C

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

### Power Dissipation (@T<sub>amb</sub> = 25°C unless otherwise stated)

Package	Value	Unit		
SOT223	2	W		

## **Temperature Dependent Electrical Characteristics**

Symbol	Parameter	Grade C -40 to 85°C		Unit	
$\Delta V_R$	Output voltage change over relevant temperature range	2.7	8.8	mV	
T <sub>C</sub> V <sub>R</sub>	Output voltage temperature coefficient	15.0	50.0	ppm/°C	

## Electrical Characteristics (@T<sub>amb</sub> = 25°C unless otherwise stated)

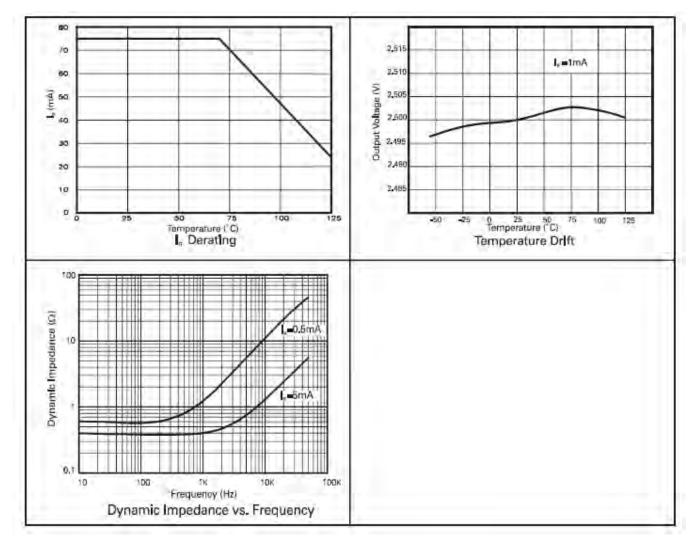
Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
V <sub>R</sub>	Output voltage 1% tolerance	I <sub>R</sub> = 500 μA	2.475	2.500	2.525	V
V <sub>TRIM</sub>	Output voltage adjustment range	$R_T = 100k\Omega$		±5		%
$T_{C}V_{TRIM}$	Change in $T_{C}V_{R}$ with output adjustment			2.5		ppm/°C
I <sub>R</sub>	Operating current range		0.15		75	mA
t <sub>on</sub> t <sub>off</sub>	Turn-on time Turn-off time	$R_L = 1k\Omega$		10 0.3		μs
e <sub>np-p</sub>	Output voltage noise (over the range 0.1 to 10Hz)	Peak to peak measurement		50		μV
Rs	Slope resistance (see note C)	$I_R = 0.5 \text{mA}$ to 5mA		0.85	2.0	Ω



# **ZRT025**

# 2.5V LOW POWER PRECISION REFERENCE SOURCE

# **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<sub>C</sub>V<sub>R</sub>)

The ratio of the output change with temperature to the specified temperature range expressed in  $ppm/^{\circ}C$ 

$$T_{c}V_{R} = \frac{\Delta V_{R} \times 10^{6}}{V_{R} \times \Delta T} ppm^{\circ}C$$

ΔT= Full temperature range

#### (c) Slope resistance (RS)

The slope resistance is defined as :

$$RS = \frac{changeinV_R}{specificcurrentrange}$$

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

#### (d) Line regulation

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

$$\frac{R_s x 100}{V_R x R_{source}} \% / V$$

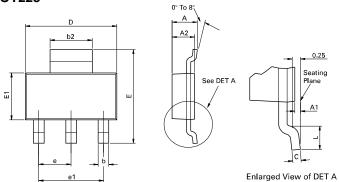


## **Ordering Information**

Device	ice 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	Millir	neters	Inches		DIM	Millimeters		Inches		
DIM	Min	Max	Min	Max	DIN	Min	Max	Min	Max	
Α	-	1.80	-	0.071	е	2.30	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	
С	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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