

Description

The ZRT050 is a monolithic integrated circuit providing a precise stable reference voltage of 4.9V at 500μ A.

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

The ZRT050 is available in a SOT223 package for surface mount applications. This device 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 small outline 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.

Pin Assignments





Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Reverse Current (Note 1)		60	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 15mA @ 125°C

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

Package	Value	Unit		
SOT223	2	W		

Temperature Dependent Electrical Characteristics

Symbol	Parameter		de C 985°C	Unit	
		Тур.	Max.		
ΔV_R	Output voltage change over operating temperature range	5.4	17.2	mV	
T _C V _R	Output voltage temperature coefficient (see Note B)	15.0	50.0	ppm/°C	

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

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
V _R	Output voltage: 1% tolerance	I _R = 500 μA	4.85	4.90	4.95	V
V _{TRIM}	Output voltage adjustment range	$R_T = 100k\Omega$		±5		%
T _C V _{TRIM}	Change in T_CV_R with output adjustment			2.5		ppm/°C
I _R	Operating current range	(See Note C)	0.15		60	mA
t _{on} t _{off}	Turn-on time Turn-off time	$R_L = 1k\Omega$		100 0.3		μs
e _{np-p}	Output voltage noise (over the range 0.1 to 10Hz)	Peak to peak measurement		50		μV
Rs	Slope resistance (see Note D)	$I_R = 0.5 mA$ to 5mA		1.25	2.0	Ω



ZRT050

4.9V 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_CV_R)

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

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

 ΔT = Full temperature range

(c) Operating current (I_R)

Maximum operating current must be derated as indicated in maximum ratings.

(d) Slope resistance (RS)

The slope resistance is defined as:

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

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

(e) 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	Tol %	Operating Temperature	Part Mark	Reel Size	Tape Width	Quantity Per Reel	
ZRT050GC1	1	-40 to +85°C	ZRT050C1	7"	12mm	1000	

Package Outline Dimensions (All Dimensions in mm)

SOT223



Conforms to JEDEC TO-261 AA Issue B

DIM	Millin	Millimeters		Inches		Millimeters		Inches	
DIN	Min	Max	Min	Max	DIM	Min	Max	Min	Max
А	-	1.80	-	0.071	е	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	Е	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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