ZRT025

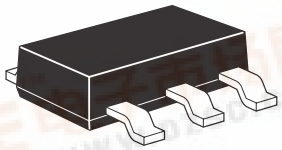
2.5V LOW POWERPRECISION REFERENCE SOURCE

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.

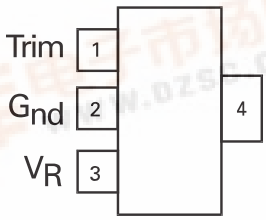
The ZRT025 is available for surface mount applications. This product offers a trim facility whereby the output voltage can be adjusted as shown in Fig.1. This facility is used when compensating for system errors or setting the reference output to a particular value. When the trim facility is not used, the pin should be left open circuit.



SOT223

FEATURES

- Trimmable output
- Excellent temperature stability
- Low output noise figure
- Available in two temperature ranges
- 1 and 2% initial voltage tolerance versions available
- No external stabilizing capacitor required in most cases
- Low slope resistance
- No derating required at low temperatures
- SOT223 package



SOT223
Package suffix G
Top view (pin 4 floating or connected to pin 2)

ORDERING INFORMATION

DEVICE	TOL%	OPERATING TEMP °C	PARTMARK	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZRT025GC2TA	2	-40 to 85	ZRT025C2	7”	12mm	1,000 units
ZRT025GC1TA	1	-40 to 85	ZRT025C1	7”	12mm	1,000 units
ZRT025GA1TA	1	-55 to 125	ZRT025A1	7”	12mm	1,000 units

A grade -55 to 125°C
C grade -40 to 85°C

ZRT025

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Reverse current (1)		75	mA
Operating temperature:	T_{OMP}		
A grade		-55 to 125	°C
C grade		-40 to 85	°C
Storage temperature	T_{STG}	-55 to 150	°C

(1) Above 72°C this figure should be linearly derated to 25mA at 125°C

POWER DISSIPATION (at T_{amb} = 25°C unless otherwise stated)

PACKAGE	VALUE	UNIT
SOT223	2	W

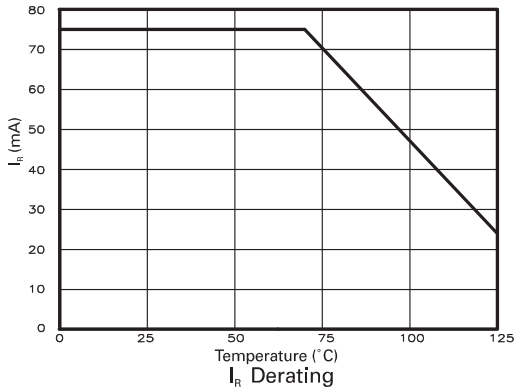
TEMPERATURE DEPENDENT ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	INITIAL VOLTAGE TOLERANCE %	GRADE A -55 TO 125°C		GRADE C -40 TO 85°C		UNIT
ΔV_R	Output voltage change over relevant temperature range(See note (a))	1 & 2	6.8	22.5	2.7	8.8	mV
$T_C V_R$	Output voltage temperature coefficient (See note (b))	1 & 2	15.0	50.0	15.0	50.0	ppm/°C

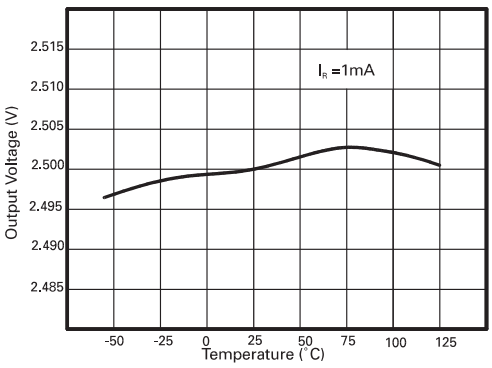
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated)

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_R	Output voltage					
	1% tolerance (A1,C1)	I_R=500μA	2.475	2.500	2.525	V
	2% tolerance (C2)		2.450	2.500	2.550	V
ΔV_{TRIM}	Output voltage adjustment range	R_T=100kΩ		±5		%
$T_C \Delta V_{TRIM}$	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 timeTurn-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	I_R= 0.5mA to 5mA (See note (c))		0.85	2.0	Ω

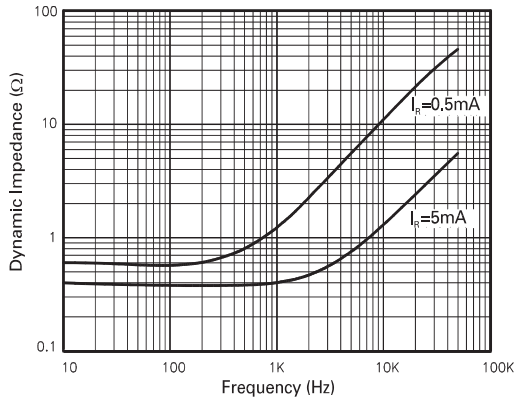
TYPICAL CHARACTERISTICS



I_R Derating



Temperature Drift



Dynamic Impedance vs. Frequency

NOTES:

(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

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

ΔT= Full temperature range

(c) Slope resistance (RS)

The slope resistance is defined as :

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

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

(d) Line regulation

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

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

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SCHEMATIC DIAGRAM

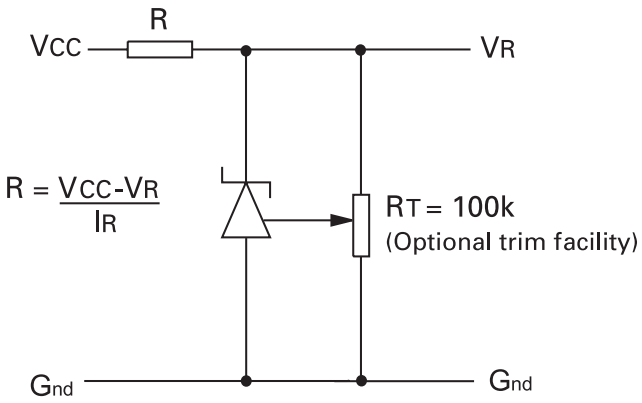
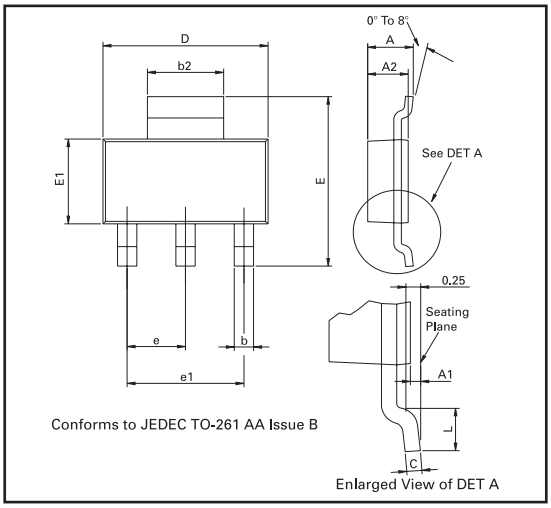


Figure 1:

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

PACKAGE OUTLINE



Controlling dimensions are in millimeters. Approximate conversions are given in inches

PACKAGE DIMENSIONS

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	–	0.0355	–
D	6.30	6.70	0.248	0.264		–	–	–	–

Europe

Zetex plc
Fields New Road
Chadderton
Oldham, OL9 8NP
United Kingdom
Telephone (44) 161 622 4444
Fax: (44) 161 622 4446
hq@zetex.com

Zetex GmbH
Streitfeldstraße 19
D-81673 München
Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49
europe.sales@zetex.com

Americas

Zetex Inc
700 Veterans Memorial Hwy
Hauppauge, NY 11788
USA
Telephone: (1) 631 360 2222
Fax: (1) 631 360 8222
usa.sales@zetex.com

Asia Pacific

Zetex (Asia) Ltd
3701-04 Metroplaza Tower 1
Hing Fong Road
Kwai Fong
Hong Kong
Telephone: (852) 26100 611
Fax: (852) 24250 494
asia.sales@zetex.com

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