

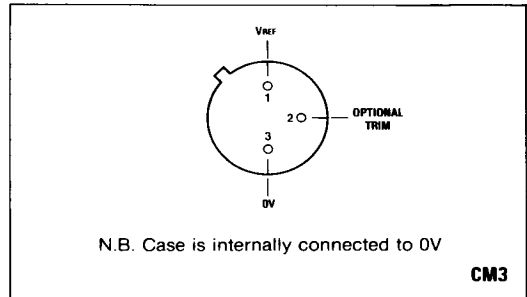
ZNREF025

2.5V LOW POWER PRECISION REFERENCE SOURCE

The ZNREF025 is a monolithic integrated circuit providing a precise stable reference voltage of 2.50V at 500µA.

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

The ZNREF025 is available in a 3-pin metal can package with pin 2 offering 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, pin 2 should be left open circuit.



Pin connections (bottom view)

FEATURES

- Trimable Output
- Excellent Temperature Stability
- Low Output Noise Figure
- Available in Two Temperature Ranges
- 1 and 2% Initial Voltage Tolerance Versions Available
- No External Stabilising Capacitor required in most cases
- Low Slope Resistance

ABSOLUTE MAXIMUM RATINGS

Reference current	10mA*
Power dissipation	300mW
Operating temperature range	See ordering information
Storage temperature range	-55°C to +175°C
Soldering temperature for a maximum time of 10s	
Within 1/16 in of the seating plane	300°C
Within 1/32 in of the seating plane	265°C

* Below -25°C this figure should be linearly derated to 1.5mA maximum at -55°C.

ORDERING INFORMATION

Device type	Tol. (%)	Temperature Range
ZNREF025 A1	1	-55°C to +125°C
ZNREF025 C1	1	0°C to +70°C
ZNREF025 C2	2	0°C to +70°C

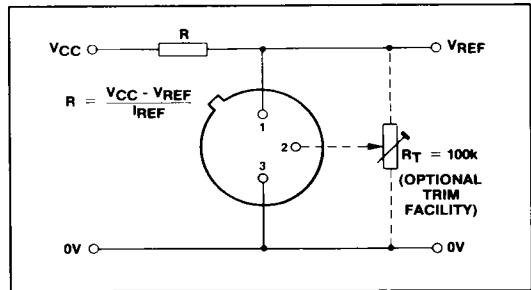


Fig.1 ZNREF025 application circuit

TEMPERATURE DEPENDENT ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Initial voltage tolerance %	Grade A - 55 to 125°C		Grade C 0 to 70°C		Units
			Typ.	Max.	Typ.	Max.	
Output voltage change over relevant temperature range (See note (a))	ΔV_{REF}	1 & 2	16.0	22.5	2.7	8.8	mV
Output voltage temperature coefficient (See note (b))	TCV_{REF}	1 & 2	35	50	15	50	ppm/°C

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$ and Pin 2 o/c unless otherwise specified).
(LOAD CAPACITANCE should be less than 220pF or greater than 22nF).

Parameter	Symbol	Min.	Typ.	Max.	Units	Comments
Output voltage 1% tolerance (A1 C1) 2% tolerance (C2)	V_{REF}	2.475 2.450	2.500 2.500	2.525 2.550	V	$I_{REF} = 500\mu\text{A}$
Output voltage adjustment range	ΔV_{TRIM}	-	± 5	-	%	$R_T = 100\text{k}\Omega$
Change in TCV_{REF} with output adjustment	$TC\Delta V_{TRIM}$	-	0.8	-	ppm/°C/%	
Operating current range	I_{REF}	0.15	-	10	mA	See note (c)
Turn-on time	t_{on}	-	40	-	μS	$R_L = 1\text{k}\Omega$
Turn-off time	t_{off}	-	0.3	-	μS	
Output voltage noise (over the range 0.1 to 10Hz)	e_{np-p}	-	50	-	μV	Peak to peak measurement
Slope resistance	R_{REF}	-	1.5	2.0	Ω	$I_{REF} 0.5\text{mA}$ to 5mA See note (d)

NOTES

(a) Output change with temperature (ΔV_{REF})
 The absolute maximum difference between the maximum output voltage and the minimum output voltage over the specified temperature range

$$\Delta V_{REF} = V_{max} - V_{min}$$

(b) Output temperature coefficient (TCV_{REF})
 The ratio of the output change with temperature to the specified temperature range expressed in ppm/°C.

$$TCV_{REF} = \frac{\Delta V_{REF} \times 10^6}{V_{REF} \times \Delta T} \text{ ppm/}^\circ\text{C}$$

ΔT = Full temperature change.

(c) Operating current (I_{REF})
 Maximum operating current must be derated as indicated in maximum ratings.

(d) Slope resistance (R_{REF})
 The slope resistance is defined as $R_{REF} =$ change in V_{REF} overspecified current range
 $\Delta I_{REF} = 5 - 0.5 = 4.5\text{mA}$ (typically)

(e) Line regulation
 The ratio of change in output voltage to the change in input voltage producing it.

$$\frac{R_{REF} \times 100}{V_{REF} \times R_S} \% / \text{V} \quad R_S = \text{Source resistance}$$

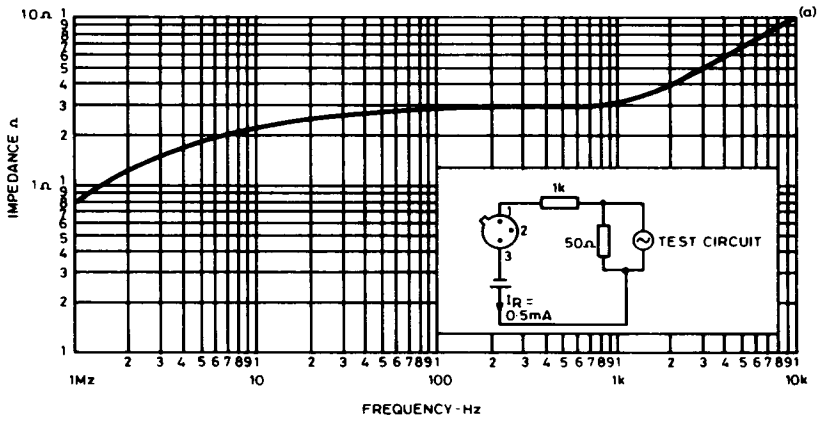


Fig.2 Dynamic impedance (typical)

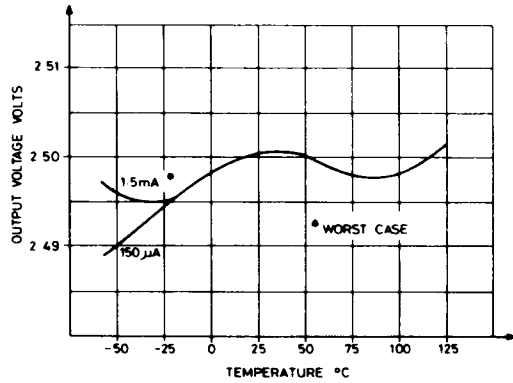


Fig.3 Typical temperature characteristics

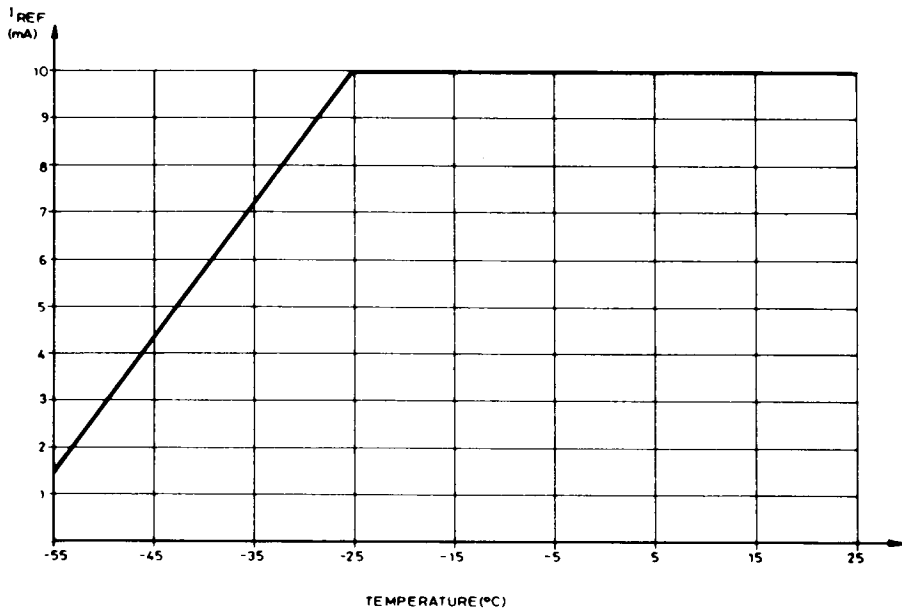


Fig.4 I_{REF} derating for ZNREF025