THIS DOCUMENT IS FOR MAINTENANCE PURPOSES ONLY AND IS NOT RECOMMENDED FOR NEW DESIGNS





REF12Z/REF12D

1.26V MICROPOWER PRECISION REFERENCE

The REF12Z and REF12D are integrated circuits using the bandgap principle to provide a precise stable reference voltage of 1.26V. There are two package options available: REF12Z in a plastic 3-pin TO-92 and REF12D in a miniature surface mount package (MP8).

These references feature a recommended operating current of $90\mu\text{A}$ to 2.5mA which make them ideal for all low power and battery applications.

FEATURES

- Low Knee Current typically 80 microamps
- Ideal for Battery Operation 113 microwatts
- REF12Z 3 lead TO-92 Plastic Package
- REF12D Miniature Plastic Surface Mount Package (MP8)
- Tight Initial V_{REF} Tolerance ±1%
- Low Temperature Coefficient
- Low Slope Resistance
- Low Cost
- Operation over Industrial Temperature Range

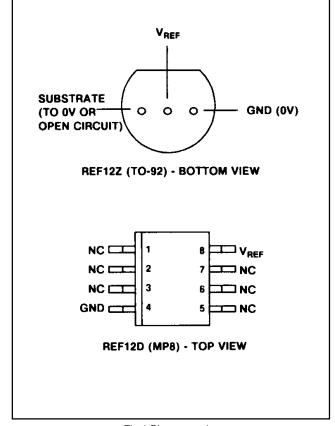


Fig.1 Pin connection

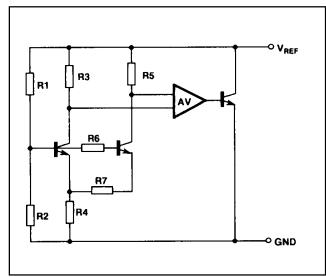


Fig.2 Internal connections

ORDERING INFORMATION

Device Type	Operating Temperature	Package
REF12Z	-40°C to +85°C	TO-92
REF12D	-40°C to +85°C	MP8

ABSOLUTE MAXIMUM RATINGS

Reference current 2.5mA

Operating temperature range:

REF12Z -40 to +85°C REF12D -40 to +85°C Storage temperature -55 to +125°C

Storage temperature for a max. time of 10ns: within 1.59mm of the seating plane 300°C within 0.80mm of the seating plane 265°C

REF12Z/12D

ELECTRICAL CHARACTERISTICS

These characteristics are guaranteed over the following conditions (unless otherwise stated)

 $T_{amb} = 25$ °C, $C_{s} = 470$ nF (see Fig.3)

Characteristic	Symbol	Value			Units	Conditions
		Min.	Тур.	Max.		
Output voltage Slope resistance (Note 1)	V _{REF} R _{REF}	1.247	1.26 2.5	1.273 4.0	V Ω	I _{REF} = 150μA to 2.5mA Note 1
Turn-on (knee) current Recommended operating	l _{on} I _{REF}	0.09	80	90 2.5	μA mA	
current range Temperature coefficient (Note 2) RMS noise voltage	TC V _{REF}		40 30 1.0	80 80	ppm/°C ppm/°C μV/√Hz	REF12Z Note 2 REF12D Note 2 0.1Hz to 25kHz
Turn-on time Turn-off time Turn-on time Turn-off time	T _{ON} T _{OFF} T _{ON} T _{OFF}		0.4 15 5 110		ms ms ms ms	$\begin{cases} I_{REF} = 1.5 \text{mA} \\ I_{REF} = 1.5 \text{mA} \end{cases}$

NOTES

1. Slope resistance (R_{REF})

Slope resistance is defined as

$$R_{\text{REF}} = \frac{\text{Change in V}_{\text{REF}} \text{ over a specified current range}}{\text{The change in reference current}}$$

2. Reference voltage temperature coefficient (TC V_{REF})

This is the normalised reference voltage change over temperature, divided by the change in temperature. It is expressed in ppm/°C

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

 ΔT = temperature change in $^{\circ}C$

 ΔV_{REF} = change in reference voltage over temperature change ΔT

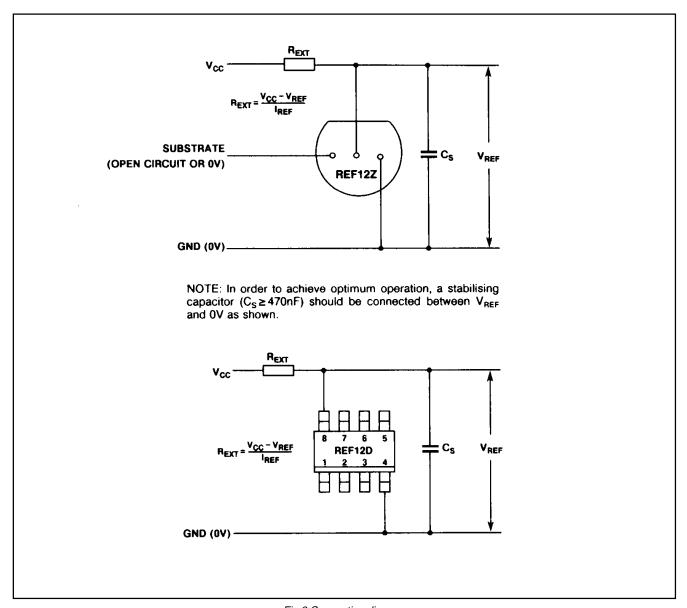


Fig.3 Connection diagram

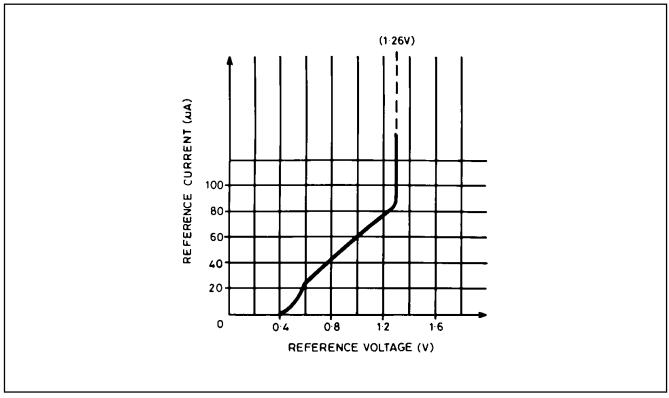


Fig.4 Typical reference characterics

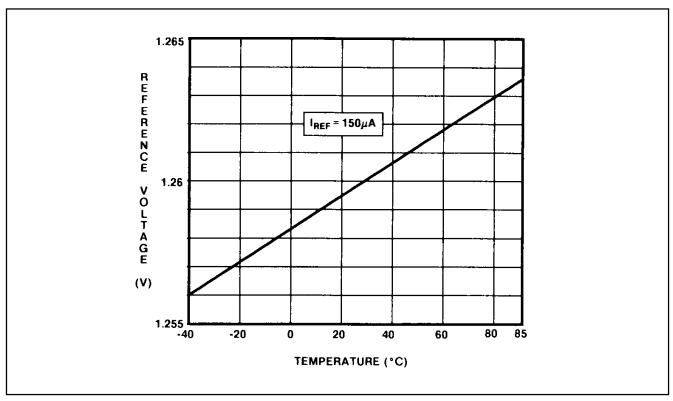


Fig.5 Typical temperature characteristic

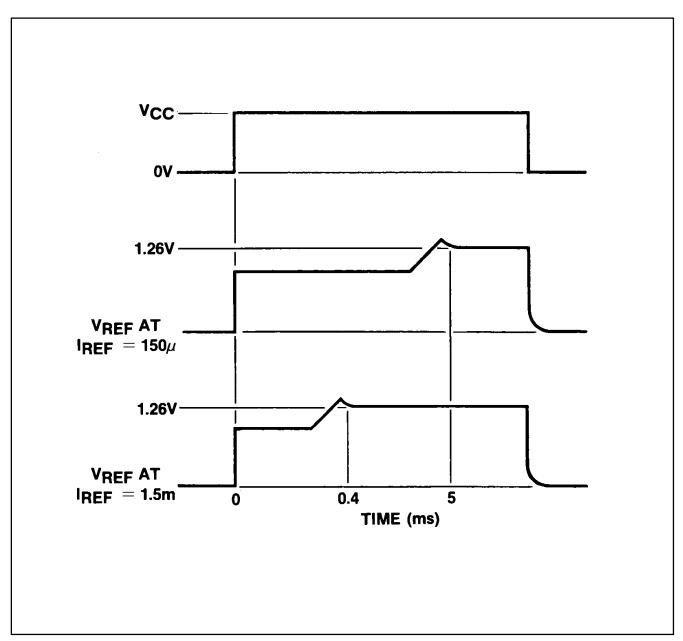


Fig.6 Typical response time

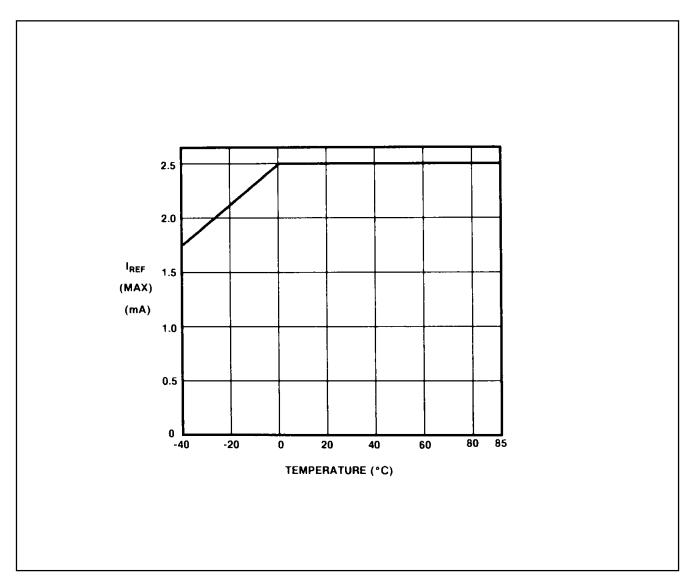


Fig.7 Typical derating curve



HEADQUARTERS OPERATIONS GEC PLESSEY SEMICONDUCTORS

Cheney Manor, Swindon, Wiltshire SN2 2QW, United Kingdom.

Tel: (0793) 518000 Fax: (0793) 518411

GEC PLESSEY SEMICONDUCTORS

Sequoia Research Park, 1500 Green Hills Road, Scotts Valley, California 95066, United States of America. Tel: (408) 438 2900 Fax: (408) 438 5576

CUSTOMER SERVICE CENTRES

- FRANCE & BENELUX Les Ulis Cedex Tel: (1) 64 46 23 45 Tx: 602858F Fax: (1) 64 46 06 07
- GERMANY Munich Tel: (089) 3609 06-0 Tx: 523980 Fax: (089) 3609 06-55
- ITALY Milan Tel: (02) 66040867 Fax: (02) 66040993
- JAPAN Tokyo Tel: (03) 3296-0281 Fax: (03) 3296-0228
- NORTH AMERICA Integrated Circuits and Microwave Products Scotts Valley, USA Tel (408) 438 2900 Fax: (408) 438 7023.

Hybrid Products, Farmingdale, USA Tel (516) 293 8686 Fax: (516) 293 0061.

- SOUTH EAST ASIA Singapore Tel: (65) 3827708 Fax: (65) 3828872
- SWEDEN Stockholm, Tel: 46 8 702 97 70 Fax: 46 8 640 47 36
- UNITED KINGDOM & SCANDINAVIA

Swindon Tel: (0793) 518510 Tx: 444410 Fax: (0793) 518582

These are supported by Agents and Distributors in major countries world-wide.

© GEC Plessey Semiconductors 1993 Publication No. DS2475 Issue No. 2.1 December 1993

This publication is issued to provide information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose nor form part of any order or contract nor to be regarded as a representation relating to the products or services concerned. No warranty or guarantee expresses or implied is made regarding the capability, performance or suitability of any product or service. The Company reserves the right to alter without prior knowledge the specification, design or price of any product or service. Information concerning possible methods of use is provided as a guide only and does not constitute any guarantee that such methods of use will be satisfactory in a specific piece of equipment. It is the user's responsibility to fully determine the performance and suitability of any equipment using such information and to ensure that any publication or data used is up to date and has not been superseded. These products are not suitable for use in any medical products whose failure to perform may result in significant injury or death to the user. All products and materials are sold and services provided subject to the Company's conditions of sale, which are available on request.