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GEC PLESSEY
SEMICONDUCTORS

REF25Z/REF25D

2.5V MICROPOWER PRECISION REFERENCE

The REF25Z and REF25D are integrated circuits using the bandgap principle to provide a precise stable reference voltage of 2.5V without the need for an external shaping capacitor. There are two package options available: REF25Z in a plastic 3-pin TO-92 and REF25D in a miniature surface mount package (MP8).

These references feature a recommended operating current of 60μA to 5mA which make them ideal for all low power and battery applications.

FEATURES

- Low Knee Current - typically 40 microamps
- Ideal for Battery Operation - 150 microwatts
- Internally Shaped
- REF25Z - 3 lead TO-92 Plastic Package
- REF25D - 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

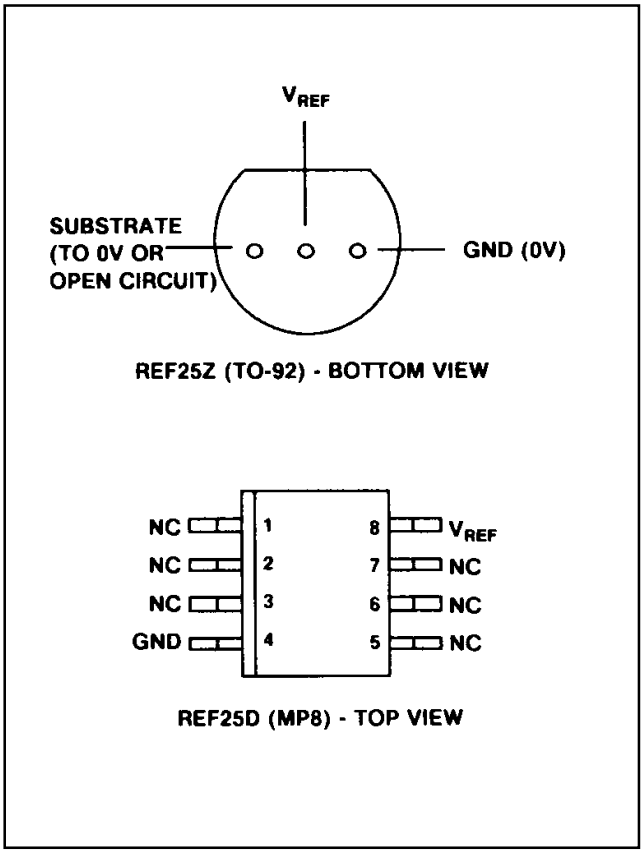

Fig.1 Pin connection

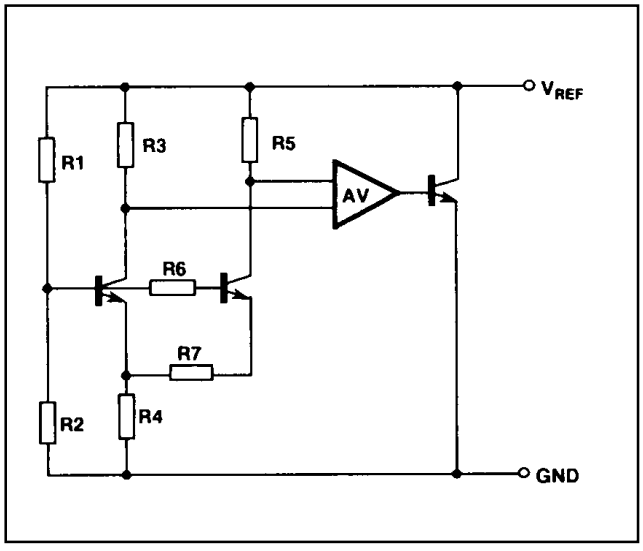

Fig.2 Internal connections

ORDERING INFORMATION

Device Type	Operating Temperature	Package
REF25Z	-40°C to +85°C	TO-92
REF25D	-40°C to +85°C	MP8

ABSOLUTE MAXIMUM RATINGS

Reference current	5mA
Operating temperature range:	
REF25Z	-40 to +85°C
REF25D	-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

ELECTRICAL CHARACTERISTICS

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

T_{amb} = 25°C, I_{REF} = 150µA

Characteristic	Symbol	Value			Units	Conditions
		Min.	Typ.	Max.		
Output voltage	V_{REF}	2.475	2.500	2.525	V	
Slope resistance (Note 1)	R_{REF}		1.2	2.0	Ω	REF25Z } I_{REF} = 150µA to 5mA
			1.2	2.0	Ω	REF25D }
Turn-on (knee) current	I_{ON}		40		µA	
Recommended operating current range	I_{REF}	0.06		5.0	mA	
Temperature coefficient (Note 2)	TC V_{REF}		35	110	ppm/°C	REF25Z } Note 2
			35	80	ppm/°C	REF25D }
RMS noise voltage	E_N		13		µV	1kHz to 10kHz
Turn-on time	T_{ON}		80		µs	
Turn-off time	T_{OFF}		7		µs	
Turn-on time	T_{ON}		65		µs	} I_{REF} = 500µA
Turn-off time	T_{OFF}		2		µs	}

NOTES

1. Slope resistance (R_{REF})

   Slope resistance is defined as

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

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

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

   ΔT = temperature change in °C

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

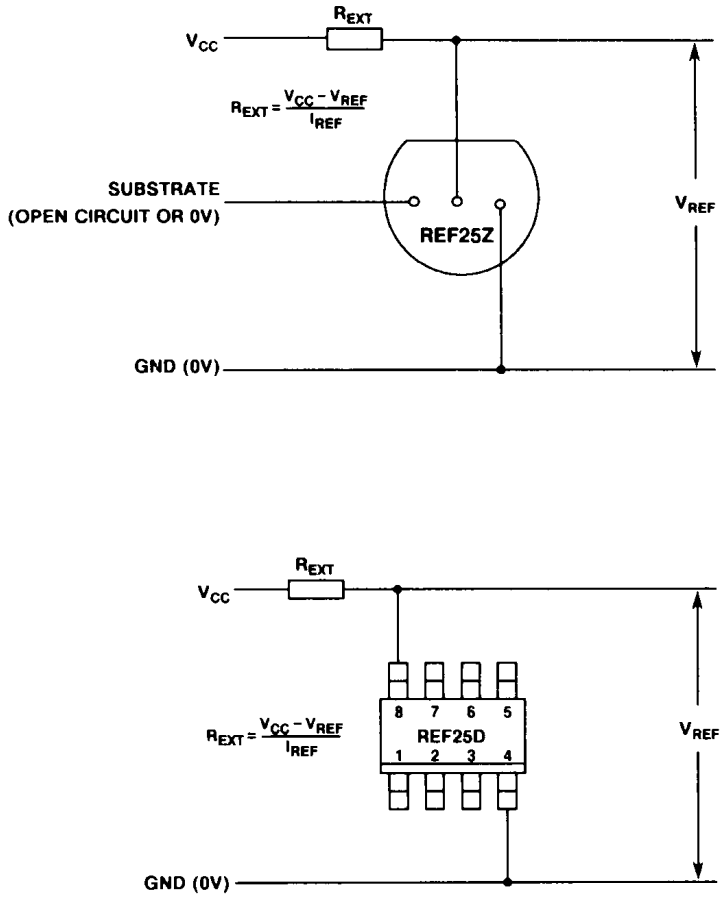

Fig.3 Connection diagram

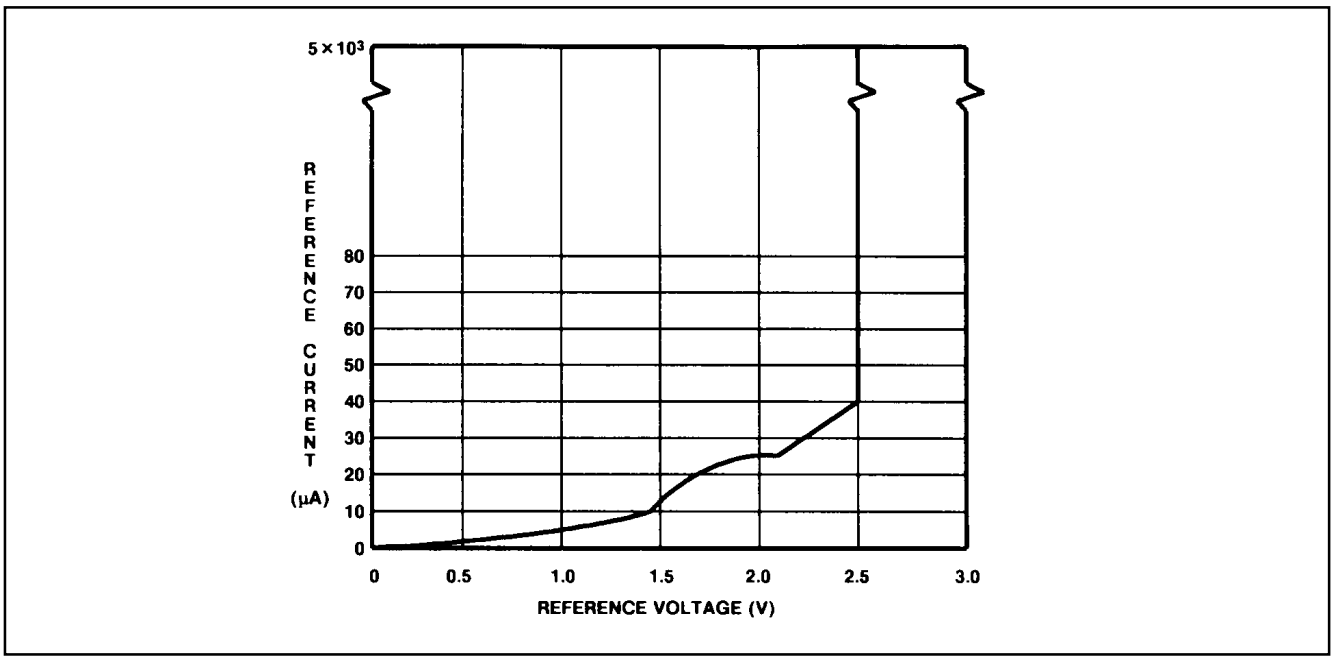

Fig.4 Typical reference characteristic

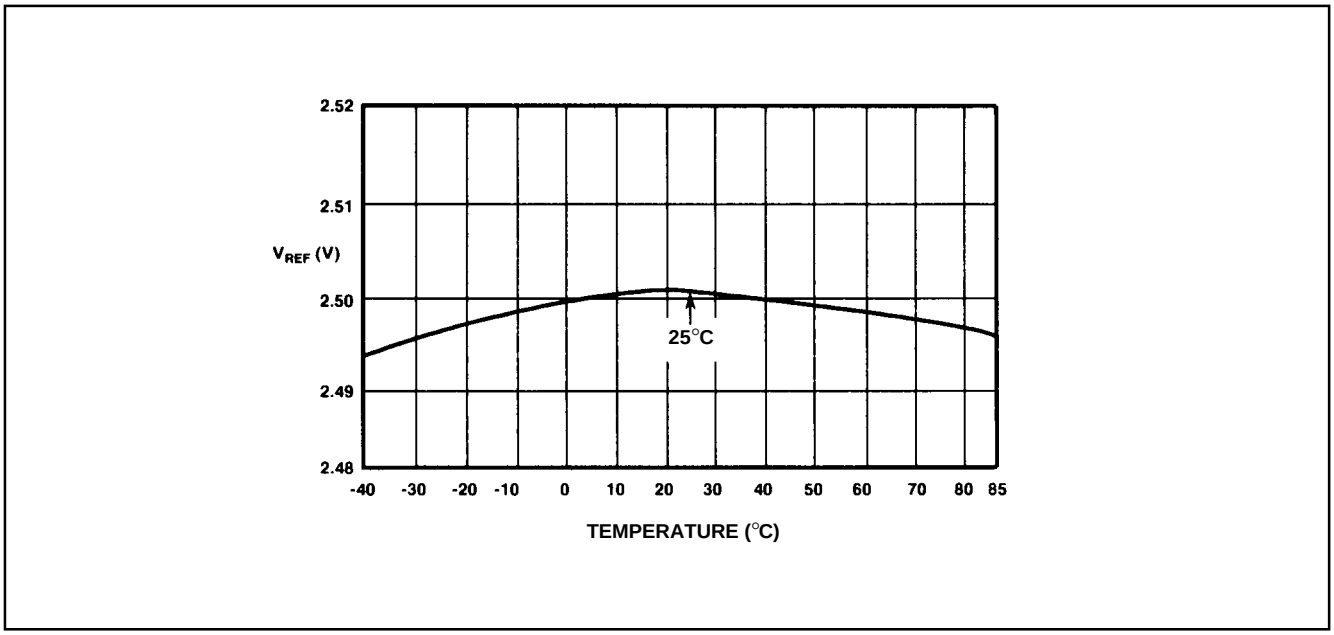

Fig.5 Typical temperature characteristics at I_{REF} = 150μA

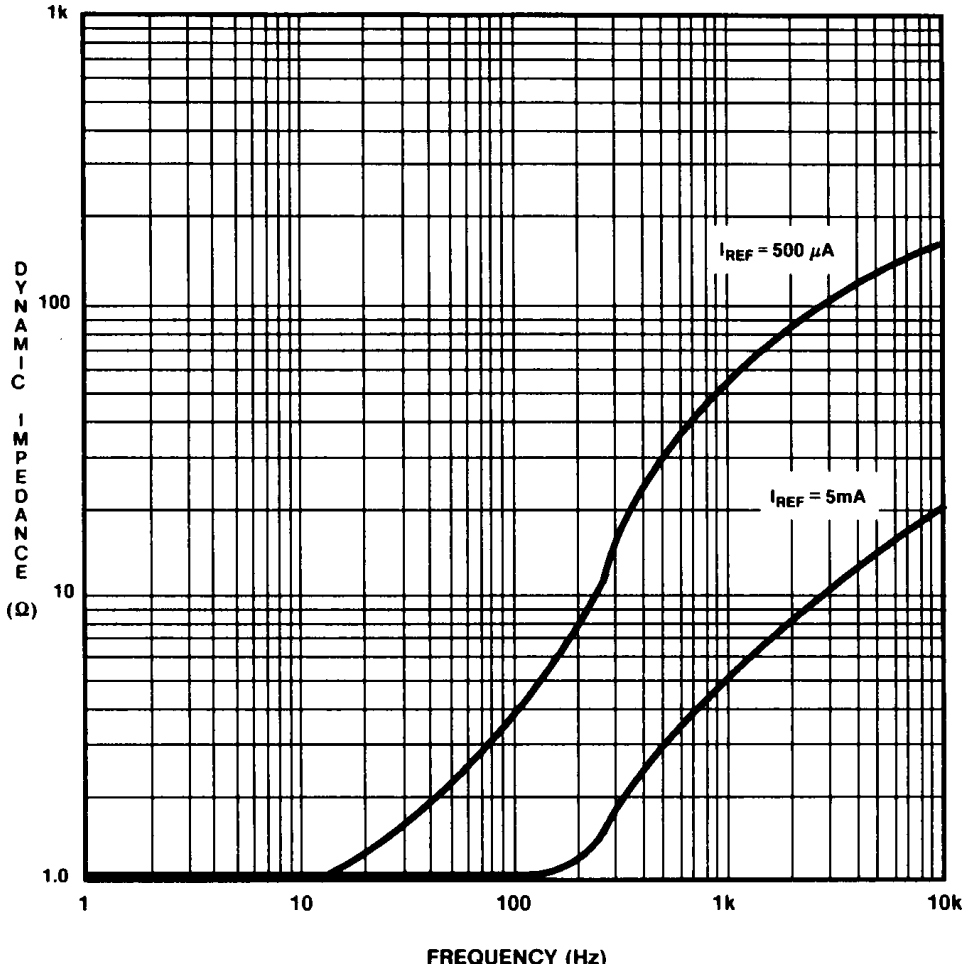

Fig.6 Typical dynamic impedance

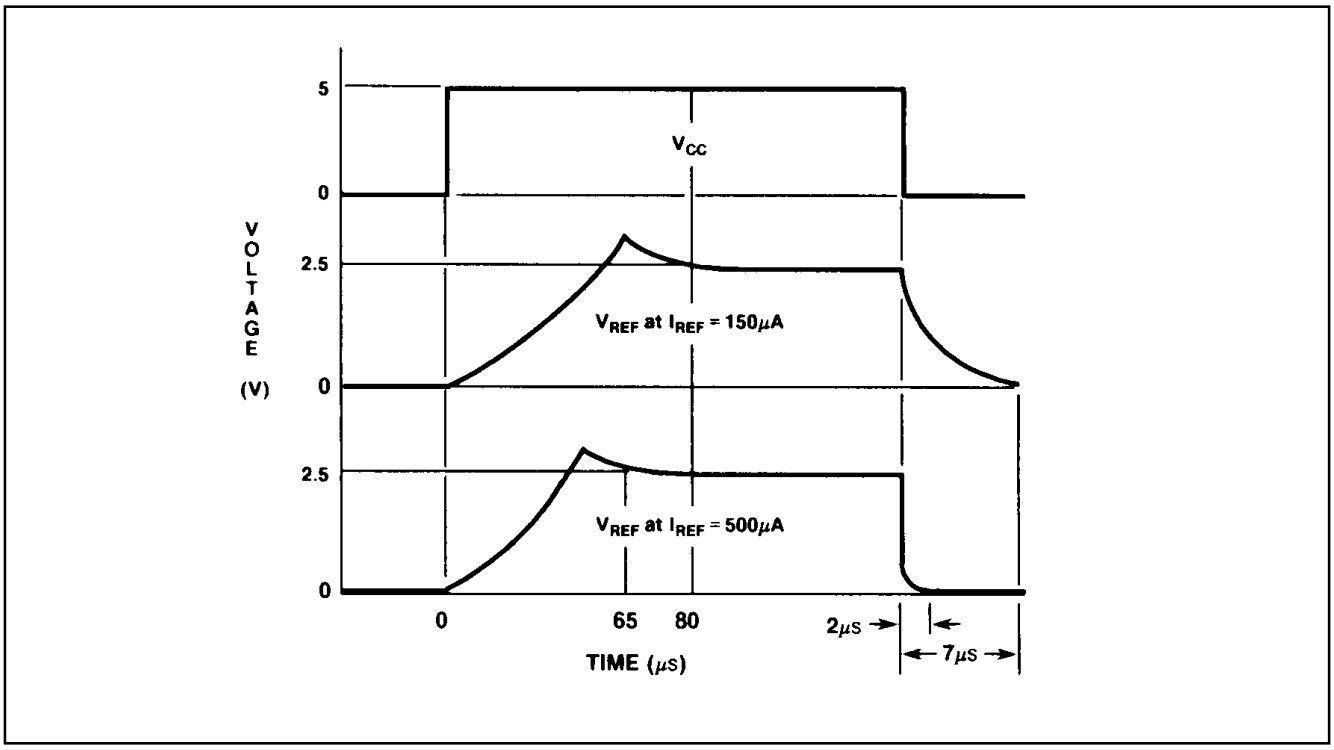

Fig.7 Typical response time

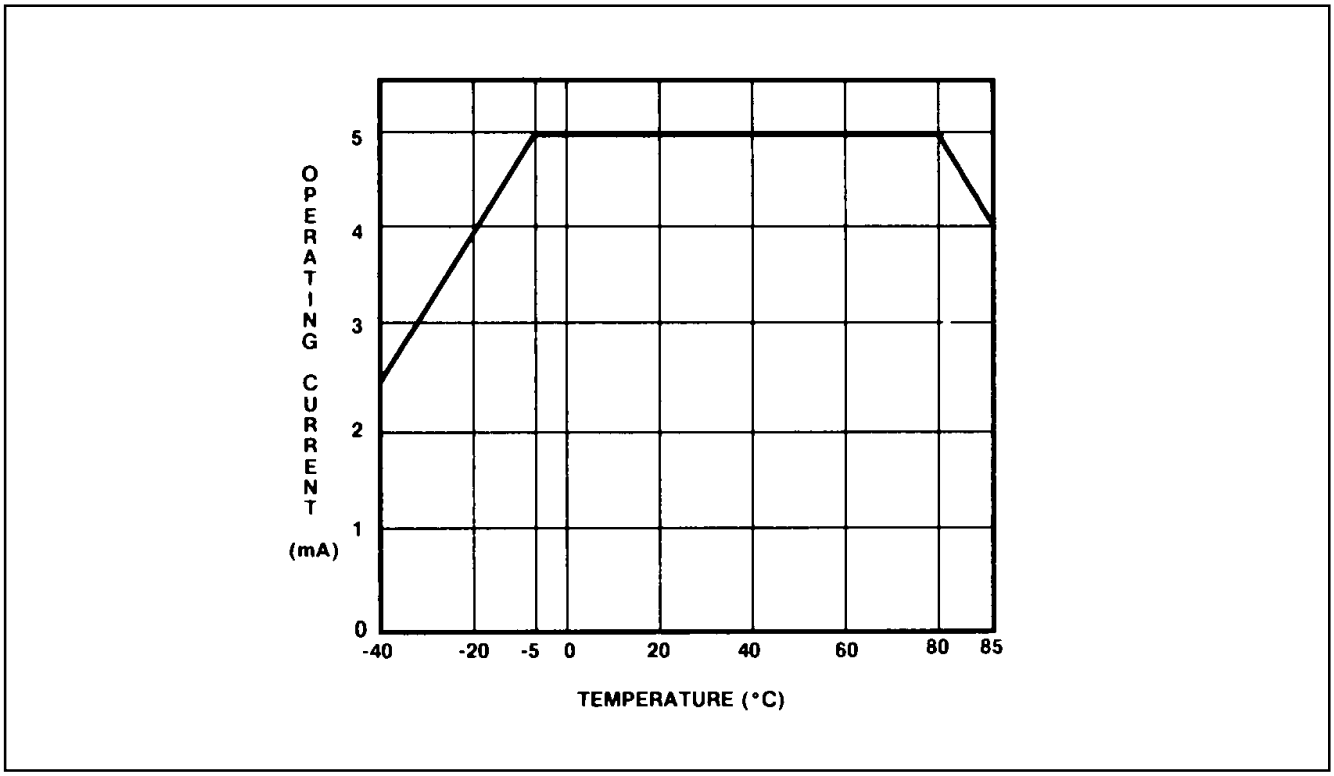

Fig.8 Derating curve REF25Z/25D

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