



# LM385-2.5

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## Micropower Voltage Reference Diode

### General Description

The LM385-2.5 are micropower 2-terminal band-gap voltage regulator diodes. Operating over a 20  $\mu$ A to 20 mA current range, they feature exceptionally low dynamic impedance and good temperature stability. On-chip trimming is used to provide tight voltage tolerance.

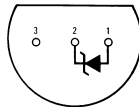
### Features

- $\pm 20$  mV ( $\pm 0.8\%$ ) max. initial tolerance (A grade)
- Operating current of 20  $\mu$ A to 20 mA
- 0.6 $\Omega$  dynamic impedance (A grade)
- Low temperature coefficient
- Low voltage reference — 2.5V

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### Connection Diagrams

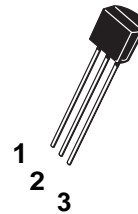
TO-92  
Plastic Package



Bottom View

LM385Z-2.5

### Ordering No: LM385Z-2.5



1: "-"

2: "+"

3: NC



# LM385-2.5

## Absolute Maximum Ratings

	Soldering Information	
	TO-92 Package (10 sec.)	260°C
Reverse Current	30 mA	
Forward Current	10 mA	
Operating Temperature Range (Note 3)		
LM385-2.5	0°C to 70°C	
Storage Temperature	-55°C to + 150°C	

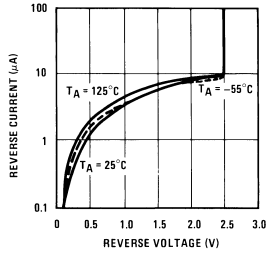
## Electrical Characteristics

(Note 4)

Parameter	Conditions	Typ	LM385-2.5		Units (Limits)
			Tested Limit	Design Limit	
Reverse Breakdown Voltage	$T_A = 25^\circ\text{C}$ $20\mu\text{A} < I_{R1} < 20\text{mA}$	2.500	2.425 2.575		V(Min) V(Max)
Minimum Operating Current		13	20	30	$\mu\text{A}$ (Max)
Reverse Breakdown Voltage Change with Current	$20\mu\text{A} \leq I_R \leq 1\text{mA}$		2.0	2.5	mV (Max)
	$1\text{mA} \leq I_R \leq 20\text{mA}$		20	25	mV (Max)
Reverse Dynamic Impedance	$I_R = 100\mu\text{A}$ $f = 20\text{Hz}$	1			$\Omega$
Wideband Noise (rms)	$I_R = 100\mu\text{A}$ $10\text{Hz} \leq f \leq 10\text{kHz}$	120			$\mu\text{V}$
Long Term Stability	$I_R = 100\mu\text{A}$ , $T = 1000\text{Hr}$ , $T_A = 25^\circ\text{C} \pm 0.1^\circ\text{C}$	20			ppm
Average Temperature	$I_{MIN} \leq I_R \leq 20\text{mA}$			150	ppm/°C (Max)

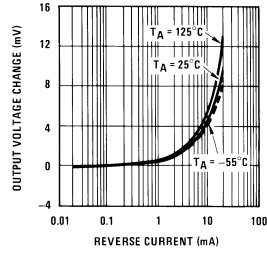
## Typical Performance Characteristics

Reverse Characteristics



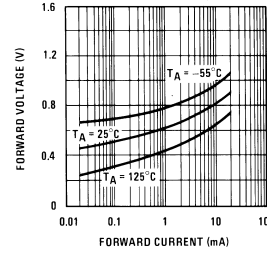
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Reverse Characteristics



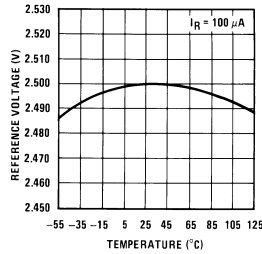
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Forward Characteristics



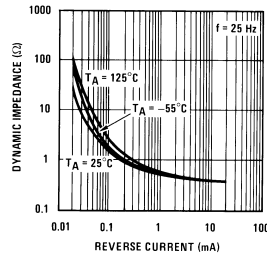
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Temperature Drift



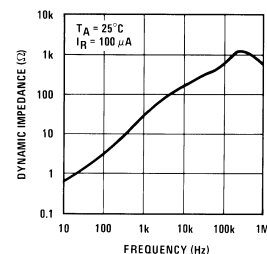
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Reverse Dynamic Impedance



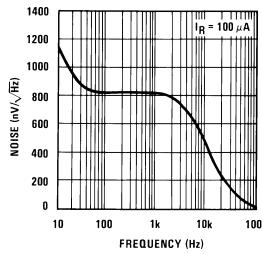
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Reverse Dynamic Impedance



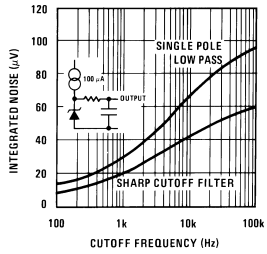
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Noise Voltage



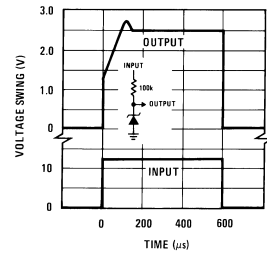
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Filtered Output Noise



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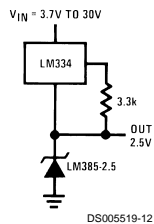
Response Time



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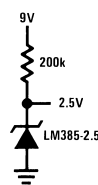
## Applications

Wide Input Range Reference



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Micropower Reference from 9V Battery



## LM385-2.5 Applications