ALPHA
SEMICONDUCTOR
Excellence in Analog Power Products

AS385-1.23

Micropower Voltage Reference

FEATURES

- Low output voltage ..... 1.23 Volt
- Dynamic impedance..... 1Ω Max
- Low temperature coefficient..... 30ppm/°CTyp
- Operating current..... 10µA to 20mA
- Initial tolerance .....1% & 2%
- Direct Pin Compatible to LM185/285/385, 1.23 Volt

APPLICATIONS

- Portable Meter Reference
- Portable Test Instruments
- Battery Operated Systems
- Panel Meter

PRODUCT DESCRIPTION

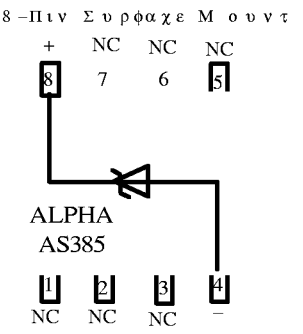
The ALPHA Semiconductor AS385-1.23 is a micropower 2-terminal band-gap voltage reference with a very wide operating current range from 10µA to 20mA that provides a stable voltage. The high stability of this device is primarily the result of the low temperature coefficient Thin Film Resistor process and Laser Trimming of the Output Voltage at the wafer level.

The AS385-1.23 is available in a TO-46 package with an operating temperature range of -55°C to +125°C, and TO-92, SO-8 and SOT-89 packages with an operating temperature range of -40°C to 85°C. The ALPHA Semiconductor 2.5 volt device is also available in an AS385-2.5.

ORDERING INFORMATION

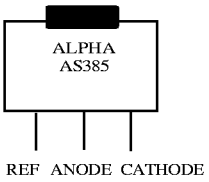
Part Number	Max. Tempco ppm/C	Temp. Range	Package Type
AS385AT-1.2	50	MIL	TO-46
AS385BT-1.2	100	MIL	TO-46
AS385AN-1.2	50	IND	TO-92
AS385BN-1.2	50	IND	TO-92
AS385AS-1.2	50	IND	SO-8
AS385BS-1.2	50	IND	SO-8
AS385AM-1.2	50	IND	SOT-89
AS385BM-1.2	50	IND	SOT-89

PIN CONNECTIONS



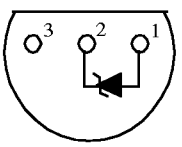
Top View

SOT-89



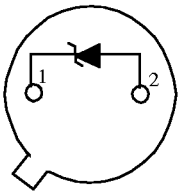
Front View

TO-92
Plastic Package



Bottom View

TO-46
Metal Can Package



Bottom View

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Rev.11/16/98

ABSOLUTE MAXIMUM RATINGS

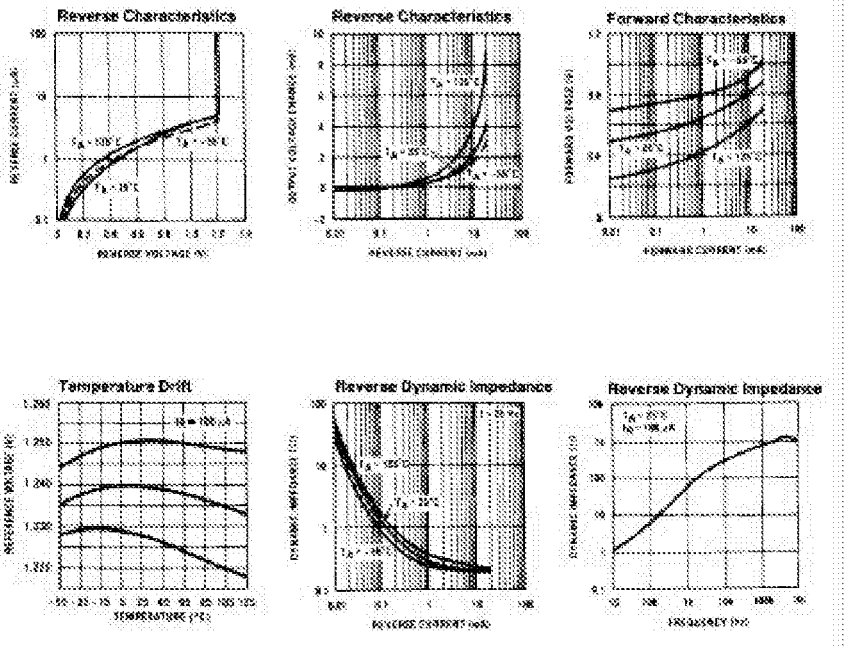
Reverse Current.....30 mA
Forward Current.....10mA
Operating Temperature Range
TO-46 Package.....-55 °Cto +125°C
SO-8, SOT-89 and TO-92 Packages .....-40 °C to +85°C
Storage Temperature .....-55°C to +150°C

ELECTRICAL CHARACTERISTICS at Iin=100μA, Ta=25°C, unless otherwise specified.

PARAMETER	CONDITIONS	AS385AT-1.2			AS385BT-1.2			AS385AN-1.2 AS385AS-1.2			AS385BN-1.2 AS385BS-1.2			UNIT
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Reference Voltage		1.237	1.23	1.263	1.225	1.23	1.275	1.223	1.23	1.247	1.205	1.23	1.260	V
Dynamic Output Impedance	f=20Hz I_R = 100 μA		0.6	1.0		0.6	1.0		0.6	1.0		0.6	1.0	Ω
Reference Voltage Change With Ir.	10μA≤I_R≤20mA		10	20		10	20		10	20		10	20	mV
Temperature Coeff.	Note 1 Design Limits		30	50 150		30	50 150		30	50 150		30	50 150	ppm/°C ppm/°C
Minimum Operating Current			8	10		8	10		8	10		8	10	μA
Output Wideband Noise	10Hz ≤f≤10kHz		60			60			60			60		μVrms
Operating Temperature		-55		+125	-55		+125	-40		+85	-40		+85	°C

Note 1: Three point measurement guarantees the error band over the specified temperature range.

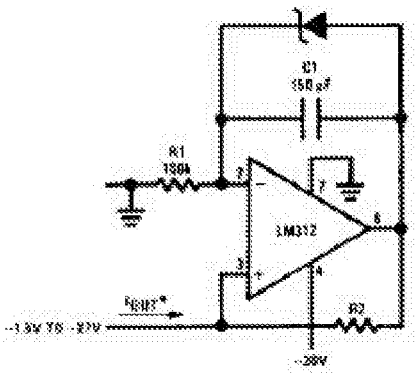
TYPICAL PERFORMANCE CHARACTERISTICS



APPLICATIONS

Precision 1 μA to 1 mA Current Sources

AS385



$$*I_{OUT} = \frac{1.23V}{R2}$$

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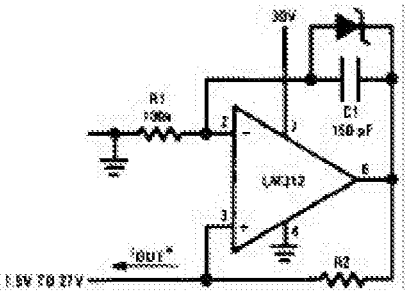

Reference from 1.5V Battery

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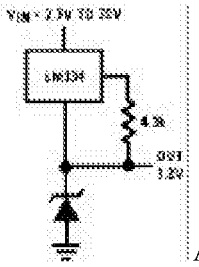
Micropower Reference from 9V Battery

AS385

Wide Input Range Reference



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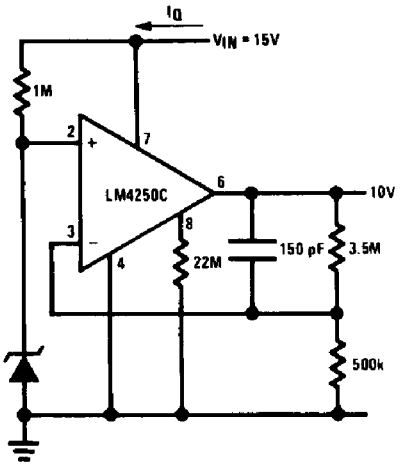
APPLICATIONS (continued)

Micropower* 10V Reference



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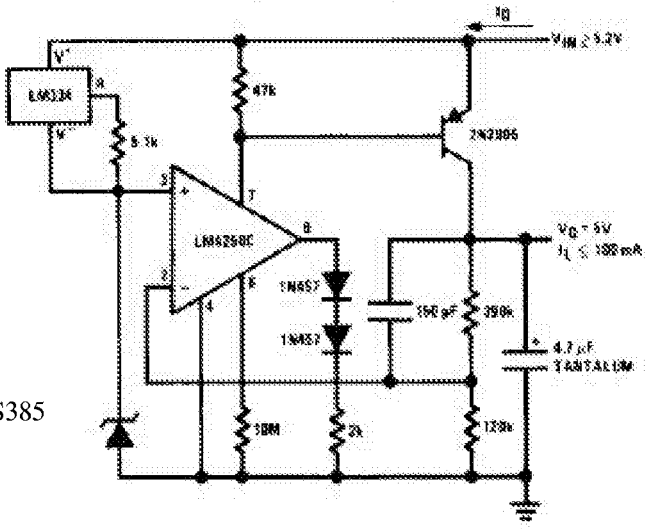
*I_Q = 20 µA standby current

Micropower* 5V Regulator



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*I_Q = 30 µA

SCHEMATIC DIAGRAM