

# ALPHA SEMICONDUCTOR

Excellence in Analog Power Products

## AS385-2.5

### Micropower Voltage Reference

#### FEATURES

- Low output voltage ..... 2.500 Volt
- Dynamic impedance..... 1Ω Max
- Low temperature coefficient..... 30ppm/°C Typ
- Operating current..... 20μA to 20mA
- Initial tolerance ..... 1% & 2%
- Direct pin compatible to LM185/285/385, 2.5 Volt

#### APPLICATIONS

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

#### PRODUCT DESCRIPTION

The ALPHA Semiconductor's AS385-2.5 is a micropower 2-terminal band-gap voltage reference with a very wide operating current range from 20μA 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.

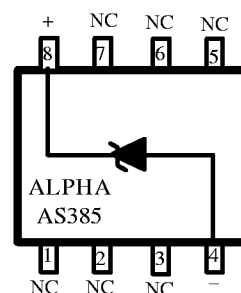
The AS385-2.5 is available in a TO-46 package with an operating temperature range of -55°C to +125°C, and TO-92, SO-8 and SOT-89 packages with an operating temperature range of -40°C to 85°C. The ALPHA Semiconductor 1.2 volt device is also available in an AS385-1.2.

#### ORDERING INFORMATION

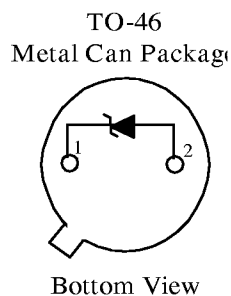
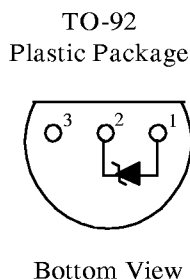
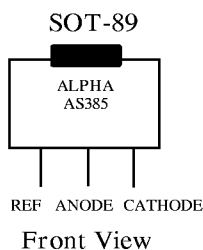
Part Number	MAX. TEMPCO PPM/°C	Package Type	Oper. Temp. Range
AS385AT-2.5	50	TO-46	MIL.
AS385BT-2.5	100	TO-46	MIL.
AS385AN-2.5	50	TO-92	IND.
AS385BN-2.5	100	TO-92	IND.
AS385AS-2.5	50	SO-8	IND.
AS385BS-2.5	100	SO-8	IND.
AS385AM-2.5	50	SOT-89	IND.
AS385BM-2.5	100	SOT-89	IND.

#### PIN CONNECTIONS

8-Pin Surface Mount



Top View



## ABSOLUTE MAXIMUM RATINGS

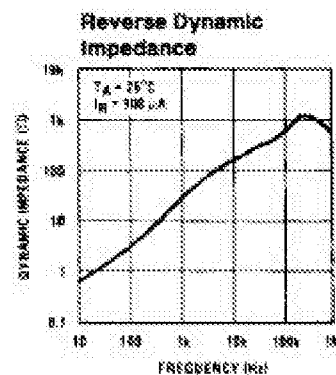
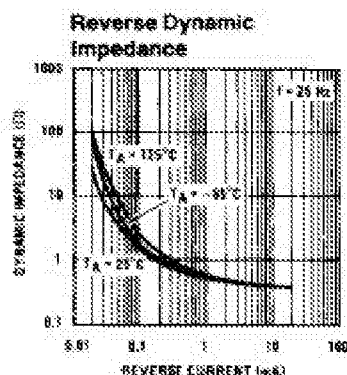
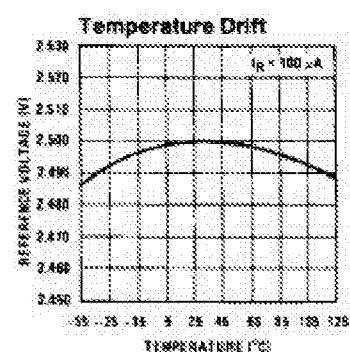
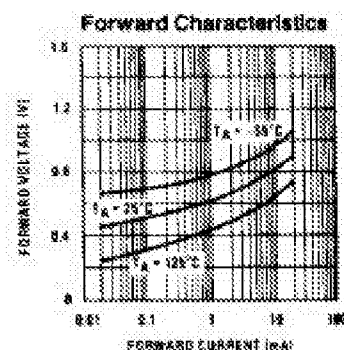
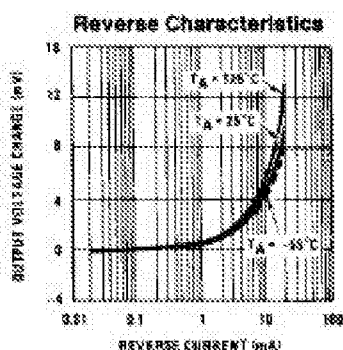
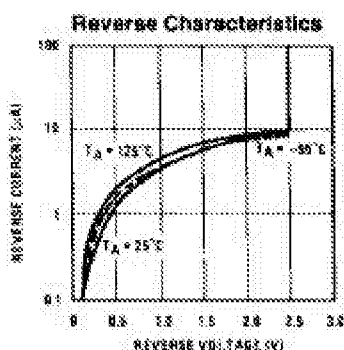
Reverse Current.....	30 mA
Forward Current.....	10mA
Operating Temperature Range	
TO-46 Package.....	-55 °C to +125°C
SO-8 , SOT-89 and TO-92 Packages .....	-40 °C to +85°C
Storage Temperature .....	-55°C to +150°C

ELECTRICAL CHARACTERISTICS at  $I_{in}=100\mu A$ ,  $T_a=25^\circ C$ , unless otherwise specified.

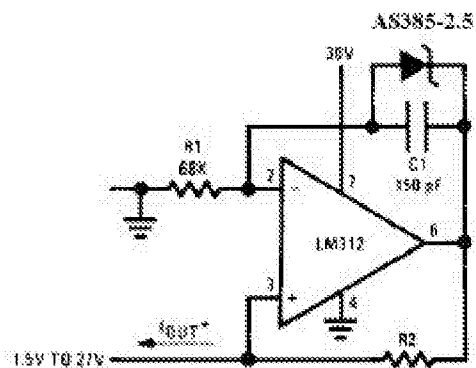
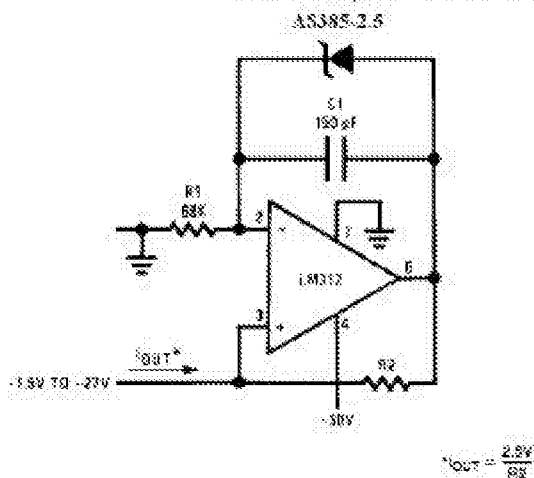
PARAMETER	CONDITIONS	AS385AT-2.5			AS385BT-2.5			AS385AN/AS-2.5			AS385BN/BS-2.5			UNITS
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Reference Voltage		2.475	2.50	2.525	2.450	2.50	2.55	2.475	2.50	2.525	2.45	2.50	2.55	V
Dynamic Output Impedance	$f=20\text{Hz}$ $I_R = 100\mu A$		0.6	1.0		0.6	1.0		0.6	1.0		0.6	1.0	$\Omega$
Reference Voltage Change With $I_R$	$20\mu A \leq I_R \leq 20\text{mA}$		10	20		10	20		10	20		10	20	mV
Temperature Coeff.	Note 1		30	50		60	100		30	50		60	100	ppm/°C
Minimum Operating Current			15	20		15	20		15	20		15	20	$\mu A$
Output Wideband Noise	$10\text{Hz} \leq f \leq 10\text{kHz}$		120			120			120			120		$\mu V_{rms}$
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.

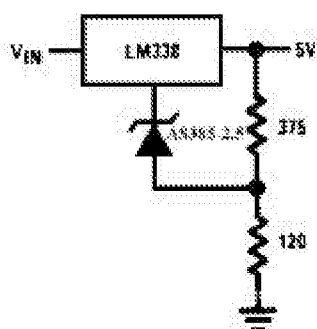
## TYPICAL PERFORMANCE CHARACTERISTICS



## AS385-2.5 APPLICATIONS

Precision 1  $\mu$ A to 1 mA Current Sources

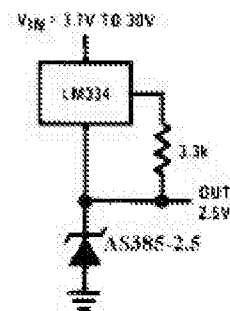
Improving Regulation of Adjustable Regulators



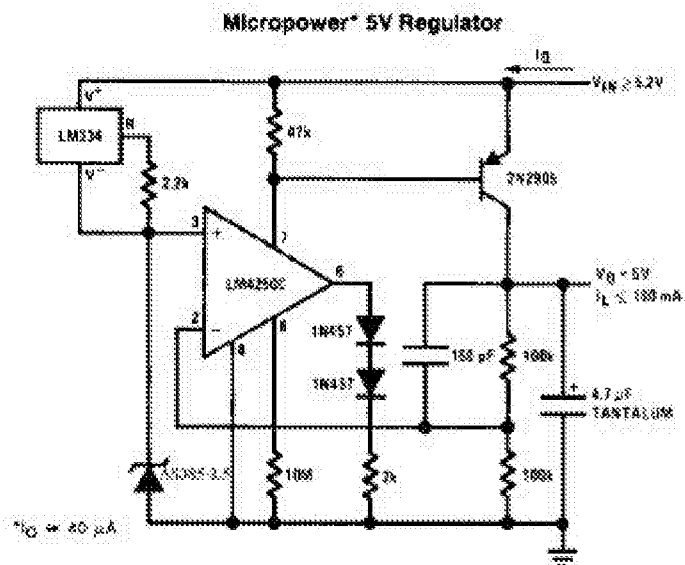
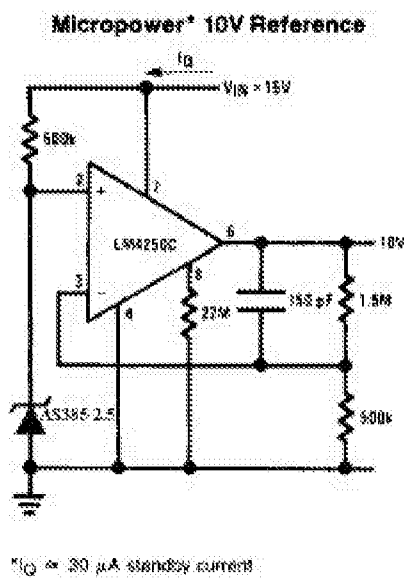
Micropower Reference from 9V Battery



Wide Input Range Reference



## AS385-2.5 APPLICATIONS (Continued)



## SCHEMATIC DIAGRAM

