

#### FEATURES

- 0.6V to 6V in 100mV increments Voltages Available
- Active High On/Off Control
- Output Current of 150mA
- Quiescent Current of <math><1\mu\text{A}</math> when in Shutdown
- Low Dropout Voltage of 250mV at 150mA
- Wide Supply Voltage Range 1.5V to 15V
- Short Circuit and Thermal Protection
- Power Good function option
- Ceramic Output Capacitor OK
- Reference bypass for lower noise

#### APPLICATIONS

- Battery Powered Systems
- Cellular Phones
- Cordless Telephones
- Portable (Notebook) Computers
- Portable Instrumentation
- Portable Consumer Equipment
- Personal Communication Equipment
- Radio Control Systems
- Low Voltage Systems
- MP3 Player

#### GENERAL DESCRIPTION

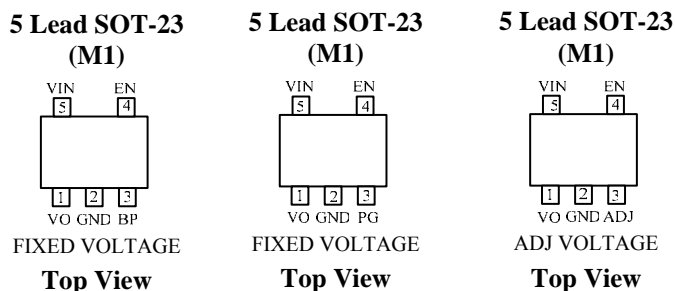
The AMS3101 is a 150mA low dropout fixed voltage regulator, featuring an internal electronic switch controlled by TTL or CMOS logic levels. When the Enable pin is pulled to a logic high level, the device is in the ON state. Designed specifically for battery powered applications where low quiescent current, low dropout and low standby current are required, the AMS3101 is ideal to use in standby power systems. Like other regulators the AMS3101 series also includes internal current limiting and thermal shutdown. A high precision 0.6V voltage reference enables the device to provide very low output voltages. A key feature includes a reference bypass pin to improve its low-noise performance for fixed output versions.

Ideal for space critical applications, the AMS3101 is available in the 5-pin SOT-23 surface mount package and requires only a 10 $\mu$ F capacitor on the output for a minimum amount of external components. The Power Good option is used when the Output Voltage drop must be detected. If the Output Voltage drops by approximately 15% of its nominal value, the open collector on PG pin will pull down to Low state.

#### ORDERING INFORMATION

PACKAGE TYPE	OPERATING TEMP. RANGE
5L SOT-23	
AMS3101AM1-XXBP	IND
AMS3101M1-XXBP	IND
AMS3101AM1-XXPG	IND
AMS3101M1-XXPG	IND
AMS3101AM1-ADJ	IND
AMS3101M1-ADJ	IND

#### PIN CONNECTIONS



XX =specify the output voltage required  
 PG=Power Good Open Collector pin  
 BP=Reference bypass pin for lower noise

## ABSOLUTE MAXIMUM RATINGS (Note 1)

Input Voltage	16V	Maximum Junction Temperature	+150°C
Power Dissipation	Internally limited	Storage Temperature	-65°C to +150°C
Thermal Resistance	410°C/W	Lead Temperature (Soldering 25 sec)	265°C
Operating Temperature Range	-40°C to +125°C	ESD Rating	2kV

## ELECTRICAL CHARACTERISTICS

Electrical Characteristics at  $V_{IN} = V_{OUT} + 1V$ ,  $I_O = 1mA$ ,  $C_{IN} = 10\mu F$ ,  $C_{OUT} = 22\mu F$ ,  $V_{ON/OFF} = 2V$  unless otherwise specified.

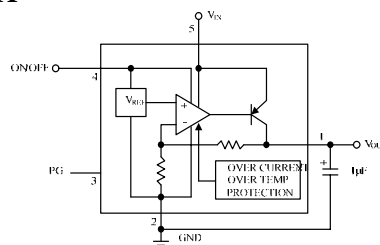
PARAMETER	CONDITIONS	AMS3101A-X			AMS3101-X			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Reference Voltage	Adjustable device option	0.594	0.600	0.606	0.488	0.600	0.612	V
Output Voltage		-1		1	-2		2	%
(Fixed Output Version)	$1mA \leq I_O \leq 150mA$	-2		2	-3.5		3.5	%
Line Regulation	$V_{OUT} + 1V \leq V_{IN} \leq 15V$		0.6	1		0.6	1	mV/V
				2			2	
Load Regulation	$I_L = 0.1mA$ to 150mA		0.1	0.4		0.1	0.4	mV/mA
				0.8			0.8	
Ground Pin Current	$I_O = 0mA$		70	100		70	100	$\mu A$
	$I_O = 150mA$		1.2	1.5		1.2	1.5	mA
Dropout Voltage	$I_O = 150mA$		200	250		200	250	mV
Quiescent Current	$V_{EN} \leq 0.9V$ (shutdown)					0.01	1	$\mu A$
	$V_{EN} \leq 0.8V$ (shutdown)			5			5	$\mu A$
Ripple Rejection	$f = 1kHz$ , $C_{OUT} = 10\mu F$		75			75		dB
Output Noise Voltage	$300Hz < f < 50kHz$ , $C_O = 10\mu F$ ,		60			60		$\mu V$
Short Circuit Current	$R_L = 0\Omega$		140			140		mA
<b>Control Terminal Specifications (note 2)</b>								
On/Off Input Current	$V_{ON/OFF} = 0V$		0	-1		0	-1	$\mu A$
	$V_{ON/OFF} = 5V$		5	15		5	15	$\mu A$
On/Off Input Voltage	High = Output On	1.3	1.25		1.3	1.25		V
	Low = Output Off		0.9			0.9		V

**Note 1:** Absolute Maximum Ratings are limits beyond which damage to the device may occur. For guaranteed performance limits and associated test conditions, see the Electrical Characteristics tables.

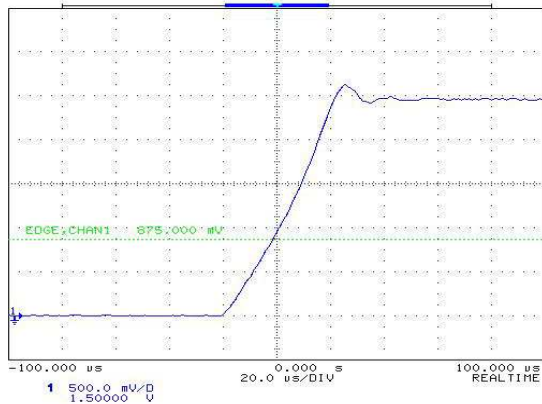
**Note 2:** The ON/OFF inputs must be properly driven to prevent possible misoperation.

**Note 3:** Limits appearing in **boldface** type apply over the entire junction temperature range for operation. Limits appearing in normal type apply for  $T_A = T_J = 25^\circ C$ .

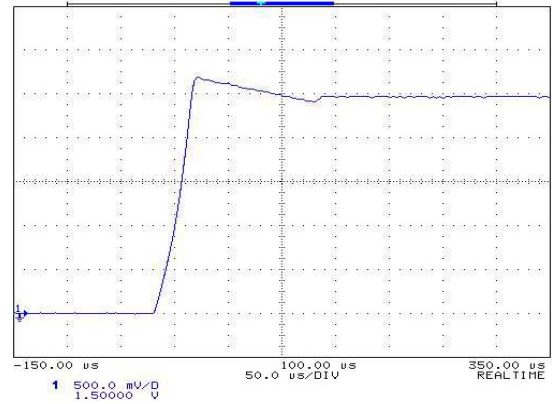
## TYPICAL APPLICATION CIRCUIT



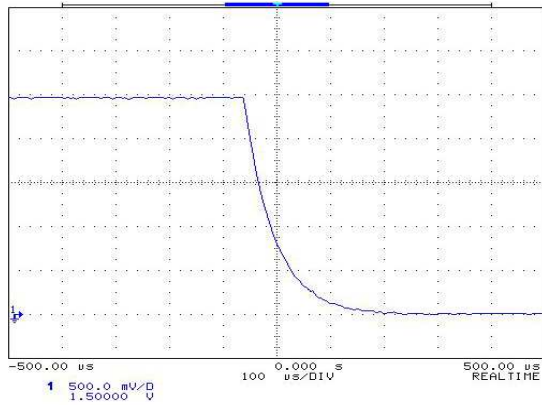
## TYPICAL PERFORMANCE



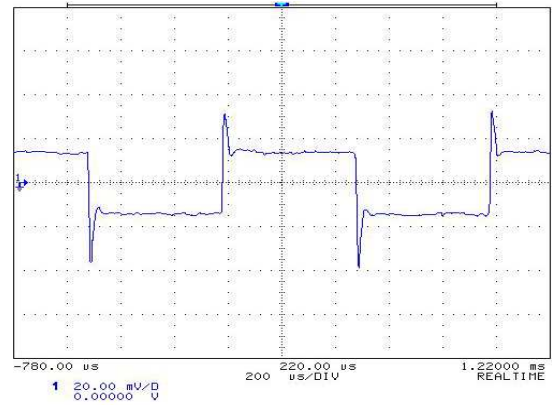
25  $\Omega$  Load Start up from enable with  
VIN = 4.5V output C = 2.2u, Ref C=0pf.



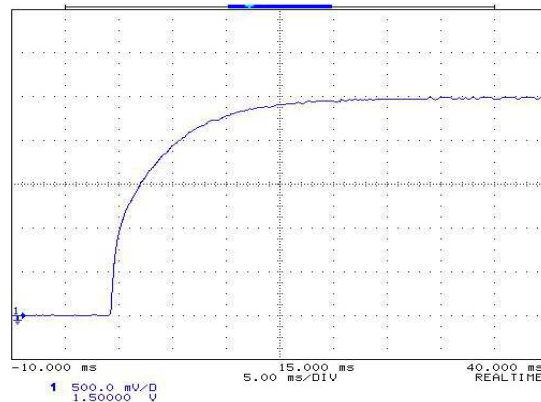
500  $\Omega$  Load Start up from Enable with  
VIN= 4.5V, output C = 2.2u, Ref C=0pf.



Stop with 25 $\Omega$  load using enable Output C =2.2Uf

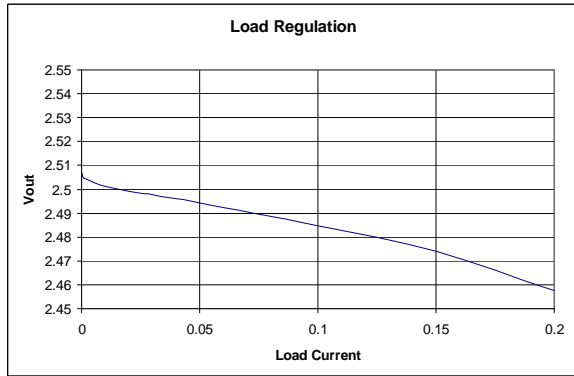


10mA/150mA load transient VIN = 4.5V, VOUT = 2.5V

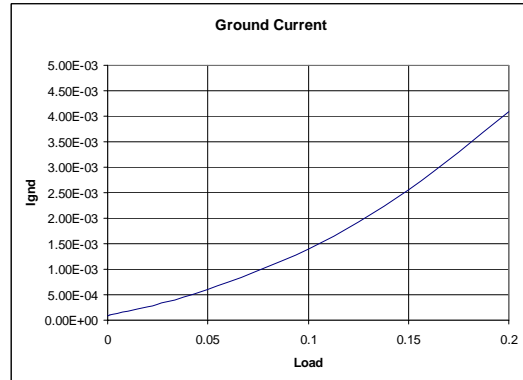


Soft Start with enable, 100nF on Ref pin, output C = 2.2uF, VIN = 4.5, Load = 1mA

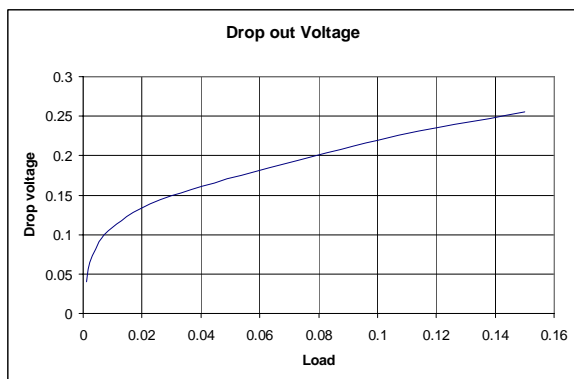
## TYPICAL PERFORMANCE



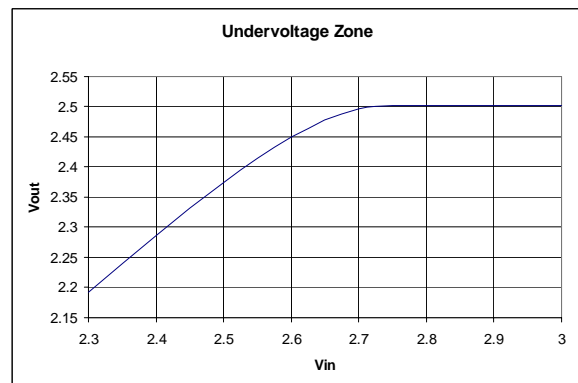
Load Regulation for 4.5v input 2.5v set point



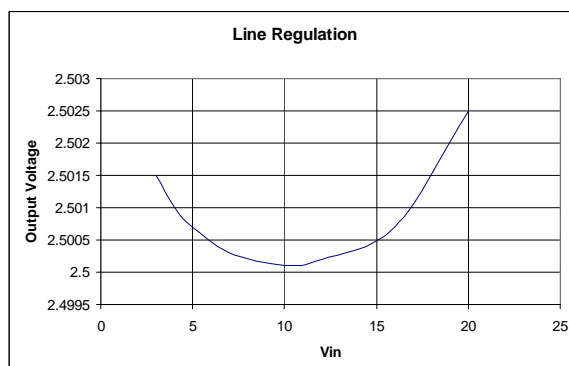
Ground current VS load for VIN = 4.5V and output = 2.5V



Dropout Vs Load for VIN = 2.3V



2.5V regulator with 10mA load showing under-voltage dropout



PACKAGE DIMENSIONS inches (millimeters) unless otherwise noted.

## 5 LEAD SOT-23 PLASTIC PACKAGE (M1)

