

### FEATURES

- 3.3V, 5.0V and 6.2V Output Voltage Available\*
- Output Voltage Tolerance of  $\pm 5\%$  Over Temperature
- Output Current in excess of 100mA
- Internal Thermal Overload Protection
- Overvoltage Protection
- Short Circuit protection
- TO-92, SO-8 and SOT-89 Packages Available

### APPLICATIONS

- Battery Powered Systems
- Portable Consumer Equipment
- Cordless Telephones
- Portable (Notebook) Computers
- Portable Instrumentation
- Radio Control Systems
- Logic Systems

### GENERAL DESCRIPTION

The AMS78LXX series consists of positive fixed voltage regulators ideally suited for use in battery-powered systems. These devices feature very low quiescent current of 1mA or less when supplying 10mA loads. This unique characteristic and the low input -output differential of less than 1V required for proper regulation, make the AMS78LXX ideal to use for standby power systems and portable equipment.

The AMS78LXX series also includes internal current limiting, over voltage protection, thermal shutdown, and is able to withstand temporary power-up with mirror-image insertion.

The AMS78LXX series is offered in the 3-pin TO-92 package, 8-pin plastic SOIC and SOT-89 packages.

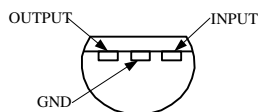
### ORDERING INFORMATION

OUTPUT VOLTAGE*	PACKAGE TYPE			OPER. TEMP RANGE
	TO-92	8 LEAD SOIC	SOT-89	
3.3V	AMS78L033N	AMS78L033S	AMS78L033L	-40°C to +85 °C
5.0V	AMS78L5N	AMS78L5S	AMS78L5L	-40°C to +85 °C
6.2V	AMS78L62N	AMS78L62S	AMS78L062L	-40°C to +85 °C

\* For other fixed voltages consult factory.

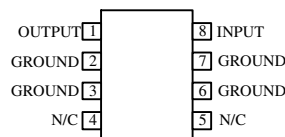
### PIN CONNECTION

**TO-92  
Plastic Package (N)**



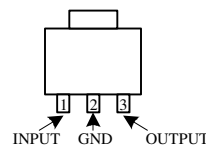
**Bottom View**

**8L SOIC  
SO-Package (S)**



**Top View**

**SOT-89 Package  
(L)**



**Front View**

## ABSOLUTE MAXIMUM RATINGS (Note 1)

Overvoltage Protection	24V to 40V
Power Dissipation (Note 4)	Internally Limited
Storage Temperature	-65°C to +150°C
ESD	1000V

## OPERATING RATINGS (Note 1)

Maximum Operating Input Voltage	4V to 22V
Operating Junction Temperature	0°C to +125°C
Lead Temperature (Soldering 25 sec)	265°C

## ELECTRICAL CHARACTERISTICS

### AMS78L033

Electrical Characteristics at  $V_{IN}=10V$ ,  $I_O=10mA$ ,  $T_J=25^\circ C$ ,  $C_1=0.33\mu F$ ,  $C_O=10\mu F$  unless otherwise specified.

PARAMETER	CONDITIONS (Note 2)	Min.	Typ.	Max.	Units
Output Voltage		3.168	3.3	3.432	V
	$5V \leq V_{IN} \leq 20V$ , $I_O=100mA$ $-40^\circ C \leq T_J \leq 125^\circ C$	<b>3.135</b>		<b>3.465</b>	V
Line Regulation	$5V \leq V_{IN} \leq 20V$		18	50	mV
	$5V \leq V_{IN} \leq 12V$		10	35	
Load Regulation	$1mA \leq I_O \leq 100mA$		20	60	mV
	$1mA \leq I_O \leq 40mA$		5	30	
Quiescent Current			0.6	1.0	mA
Output Noise Voltage	10Hz-100kHz		40		$\mu V$
Peak Output Current			200		mA
Average Output Voltage Tempco	$I_O = 5mA$		-0.65		mV/°C
Ripple Rejection	$f_O = 120Hz$ $8V \leq V_{IN} \leq 16V$	47	62		dB
Minimum Value of Input Voltage Required to Maintain Line Regulation			3.7	4.0	V

### AMS78L62

Electrical Characteristics at  $V_{IN}=12V$ ,  $I_O=10mA$ ,  $T_J=25^\circ C$ ,  $C_1=0.33\mu F$ ,  $C_O=10\mu F$  unless otherwise specified.

PARAMETER	CONDITIONS (Note 2)	Min.	Typ.	Max.	Units
Output Voltage		5.95	6.2	6.45	V
	$8.5V \leq V_{IN} \leq 20V$ , $I_O=100mA$ $-40^\circ C \leq T_J \leq 125^\circ C$	<b>5.9</b>		<b>6.5</b>	V
Line Regulation	$8.5V \leq V_{IN} \leq 20V$		65	175	mV
	$8.5V \leq V_{IN} \leq 12V$		55	125	
Load Regulation	$1mA \leq I_O \leq 100mA$		13	80	mV
	$1mA \leq I_O \leq 40mA$		6	40	
Quiescent Current			0.6	1.0	mA
Output Noise Voltage	10Hz-100kHz		50		$\mu V$
Peak Output Current			200		mA
Average Output Voltage Tempco	$I_O = 5mA$		-0.75		mV/°C

## ELECTRICAL CHARACTERISTICS (Continued)

### AMS78L62

Electrical Characteristics at  $V_{IN}=12V$ ,  $I_O=10mA$ ,  $T_J=25^\circ C$ ,  $C_1=0.33\mu F$ ,  $C_O=10\mu F$  unless otherwise specified.

PARAMETER	CONDITIONS (Note 2)	Min.	Typ.	Max.	Units
Ripple Rejection	$f_O = 120Hz$ $10V \leq V_{IN} \leq 20V$	40	46		dB
Minimum Value of Input Voltage Required to Maintain Line Regulation			6.8	7.0	V

### AMS78L05

Electrical Characteristics at  $V_{IN}=12V$ ,  $I_O=10mA$ ,  $T_J=25^\circ C$ ,  $C_1=0.33\mu F$ ,  $C_O=10\mu F$  unless otherwise specified.

PARAMETER	CONDITIONS (Note 2)	Min.	Typ.	Max.	Units
Output Voltage		4.80	5.0	5.2	V
	$7V \leq V_{IN} \leq 20V$ , $I_O=100mA$ $-40^\circ C \leq T_J \leq 125^\circ C$	<b>4.75</b>		<b>5.25</b>	V
Line Regulation	$7V \leq V_{IN} \leq 20V$		18	75	mV
	$7V \leq V_{IN} \leq 12V$		10	54	
Load Regulation	$1mA \leq I_O \leq 100mA$		20	60	mV
	$1mA \leq I_O \leq 40mA$		5	30	
Quiescent Current			0.6	1.0	mA
Output Noise Voltage	10Hz-100kHz		40		$\mu V$
Peak Output Current			200		mA
Average Output Voltage Tempco	$I_O = 5mA$		-0.65		mV/ $^\circ C$
Ripple Rejection	$f_O = 120Hz$ $8V \leq V_{IN} \leq 16V$	47	62		dB
Minimum Value of Input Voltage Required to Maintain Line Regulation			5.6	6.0	V

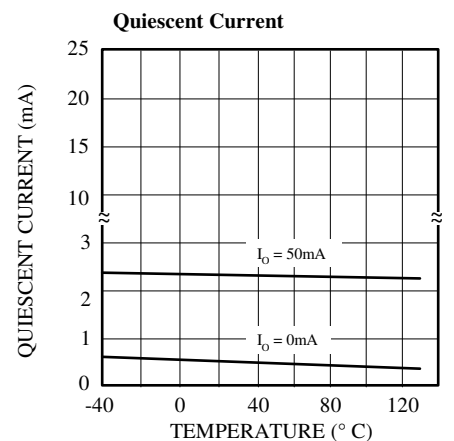
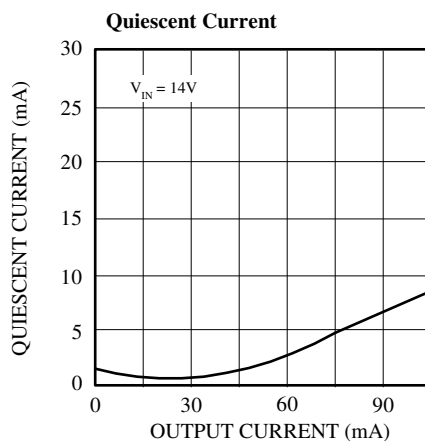
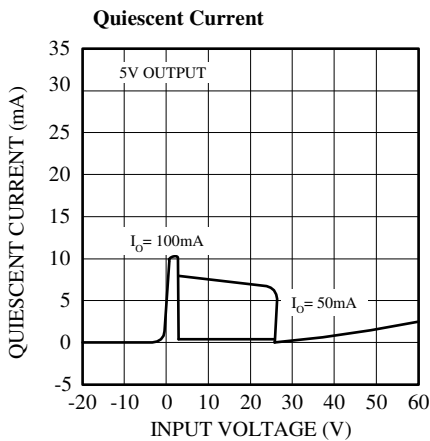
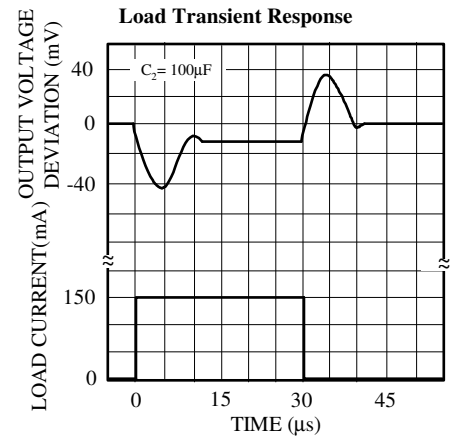
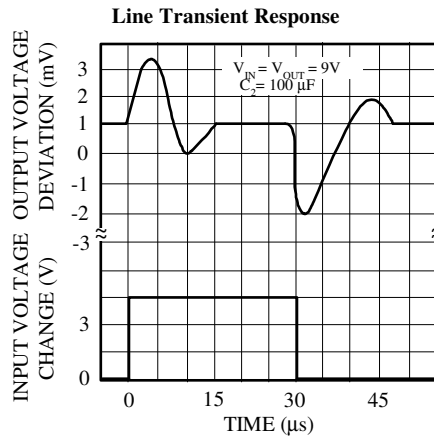
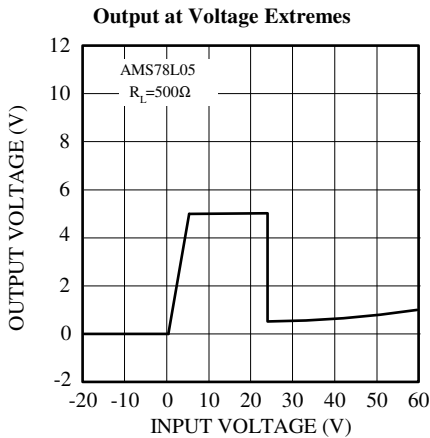
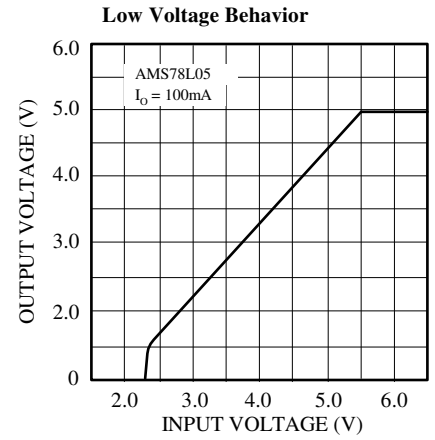
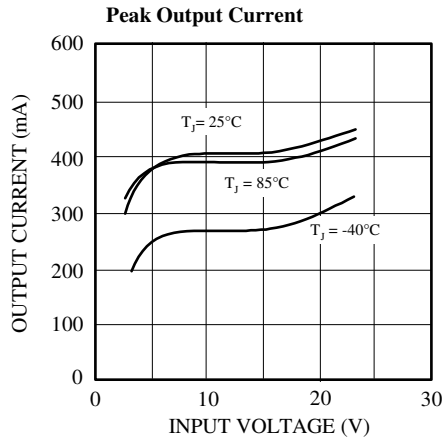
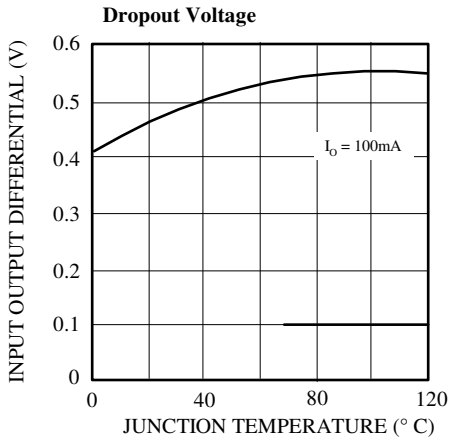
**Note 1:** Absolute Maximum Ratings are limits beyond which damage to the device may occur. For guaranteed performance limits and associated test conditions, see the Electrical Characteristics tables.

**Note 2:** See Circuit in Typical Applications. To ensure constant junction temperature, low duty cycle pulse testing is used.

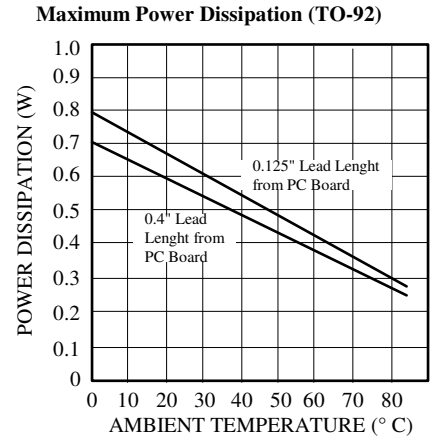
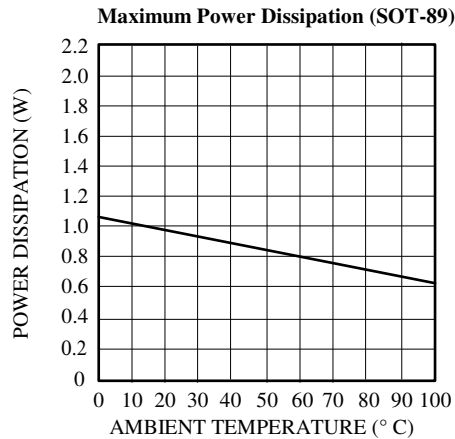
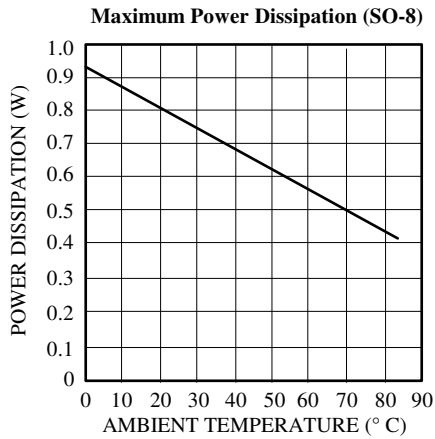
**Note 3:** Limits appearing in **boldface** type apply over the entire junction temperature range for operation. Limits appearing in normal type apply for  $T_A = T_J = 25^\circ C$ .

**Note 4:** The junction-to-ambient thermal resistance are as follows:  $195^\circ C/W$  for the TO-92 (N) package,  $160^\circ C/W$  for the molded plastic SO-8 (S),  $150^\circ C/W$  for the SOT-89 package.

## TYPICAL PERFORMANCE CHARACTERISTICS

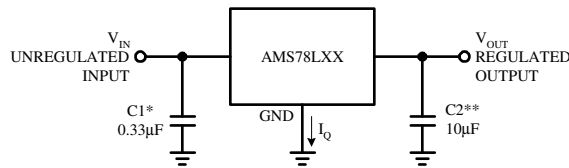


## TYPICAL PERFORMANCE CHARACTERISTICS (Continued)



## TYPICAL APPLICATIONS

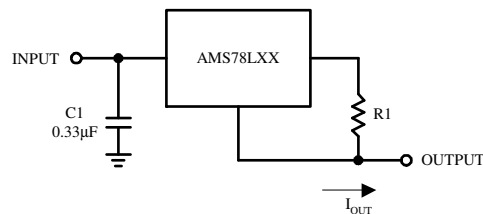
### Fixed Output Regulator



\*Required if regulator is located far from power supply filter.

\*\*C2 must be at least 10µF to maintain stability; it can be increased without bound to maintain regulation during transients and it should be located as close as possible to the regulator. This capacitor must be rated over the same operating temperature range like the regulator.

### Current Regulator

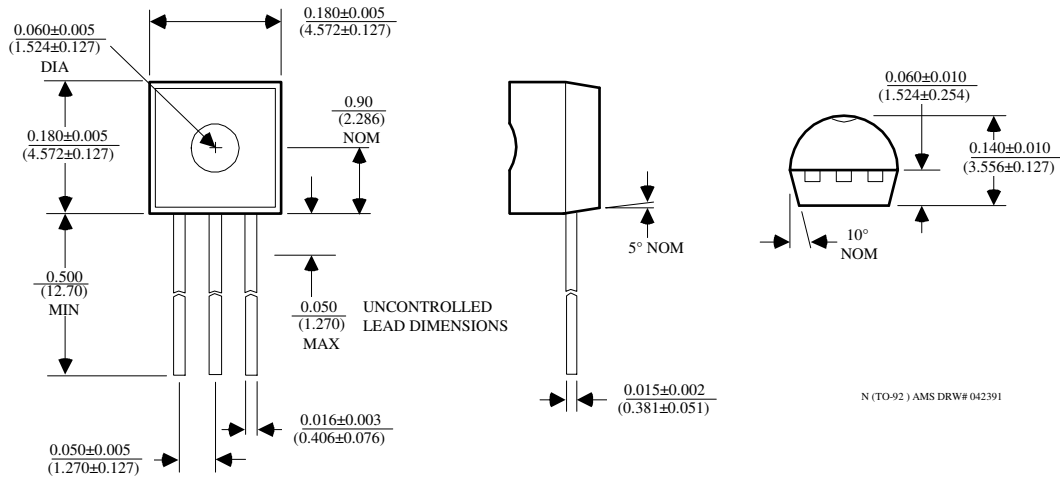


$$I_{OUT} = (V_{OUT}/R1) + I_Q$$

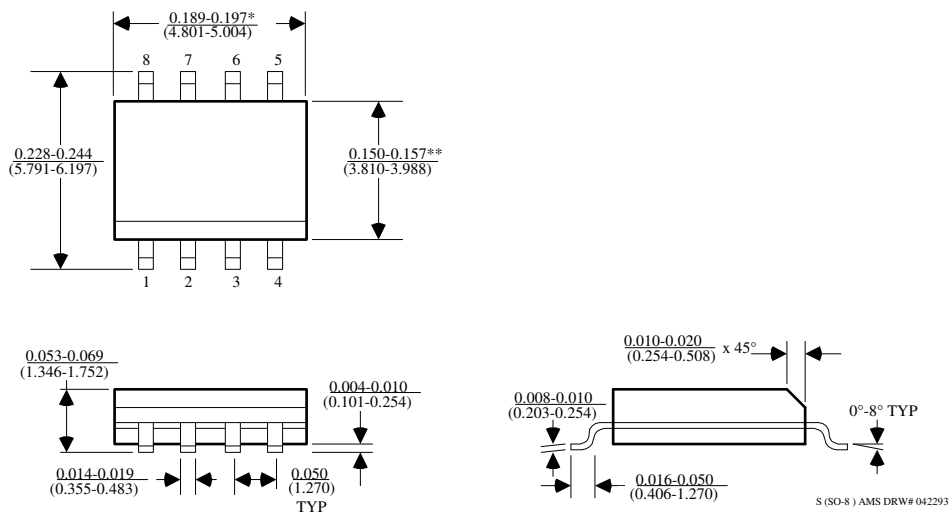
>I<sub>Q</sub> = 1.5mA over line and load changes

PACKAGE DIMENSIONS inches (millimeters) unless otherwise noted.

## 3 LEAD TO-92 PLASTIC PACKAGE (N)



## 8 LEAD SOIC PLASTIC PACKAGE (S)



\*DIMENSION DOES NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.006" (0.152mm) PER SIDE

\*\*DIMENSION DOES NOT INCLUDE INTERLEAD FLASH. INTERLEAD FLASH SHALL NOT EXCEED 0.010" (0.254mm) PER SIDE

PACKAGE DIMENSIONS inches (millimeters) unless otherwise noted (Continued).

## SOT-89 PLASTIC PACKAGE (L)

