



**LinearDimensions**  
SEMICONDUCTOR

**LND48XX**

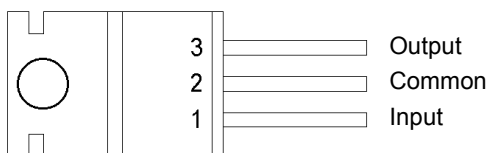
## 400mA Low Dropout Voltage Regulators

### GENERAL DESCRIPTION

This series of fixed-voltage monolithic micropower voltage regulators is designed for a wide range of applications. This device is an excellent choice for use in battery-powered application. Furthermore, the quiescent current increases only slightly at dropout, which prolongs battery life.

This series of fixed-voltage regulators features very low quiescent current (100mA Typ.) and very low drop output voltage (Typ. 60mV at light load and 420mV at 400mA). This includes a tight initial tolerance of 0.5% typ. Extremely good load and line regulation of 0.05% typ., and very low output temperature coefficient. This series of fixed-voltage regulators is offered in 3-pin TO-220 package compatible with other fixed voltage regulators. Adjust model is offered in 5-pin TO-220 package and fixed model with shutdown input is offered in 4-pin TO-220 package.

### PIN DIAGRAM



TO – 220 Package

### FEATURES

- 400mA output within 2% over temperature
- Very low quiescent current
- Low dropout voltage (420mV Typ)
- Extremely tight load and line regulation
- Very low temperature coefficient
- Current and thermal limiting
- Unregulated DC input can withstand – 20V reverse battery and +60V positive transients
- Direct replacement for SGS-Thomson-L48XX Series, but has lower ground current, higher accuracy of output voltage and extremely tight load and line regulation. The 5 pin version (adjust model) and 4 pin version (fixed model) have a shutdown input.

### APPLICATIONS

- High-efficiency linear regulator
- Battery powered systems
- Portable/palm top/ notebook Computers
- Portable consumer equipment
- Portable instrumentation
- Automotive Electronics
- SMPS Post Regulator



## **ABSOLUTE MAXIMUM RATINGS**

Power Dissipation	Internally Limited
Lead Temperature(Soldering, 5 seconds)	260°C
Storage Temperature Range	-65°C to +150°C
Operating Junction Temperature Range	-55°C to +150°C
Input Supply Voltage	-20V to +35V
Continuous total dissipation at 25° C free air temperature	2W
Continuous total dissipation at (or below) 25° C case temperature	15W

## **DEVICE SELECTION GUIDE**

Vout , VOLTS	Device
3.3V*	LND4833
5V	LND4805
8V	LND4808
8.5V	LND4885
9V	LND4809
10V	LND4810
12V	LND4812
15V	LND4815
Adj.	LND48-adj

\* Other fixed versions are also available Vout=2.0 V to 5.0V  
Please Consult Linear Dimensions for Information.



## ELECTRICAL CHARACTERISTICS

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	-25° C ≤ T <sub>J</sub> ≤ 85°C Full Operating Temperature	0.985  V <sub>O</sub>   0.98  V <sub>O</sub>	V <sub>O</sub>	1.015  V <sub>O</sub>   1.02  V <sub>O</sub>	V
Output Voltage	1mA ≤ I <sub>L</sub> ≤ 400mA, T <sub>J</sub> ≤ T <sub>Jmax</sub>	0.975  V <sub>O</sub>	V <sub>O</sub>	1.025  V <sub>O</sub>	
Input Supply Voltage				26	
Output Voltage Temperature Coefficient	(Note 1)		50	150	ppm/°C
Line Regulation (Note 2)	13V ≤ V <sub>in</sub> ≤ 26V (Note 3)		0.1	0.4	%
Load Regulation (Note 2)	1mA ≤ I <sub>L</sub> ≤ 400mA		0.1	0.3	%
Dropout Voltage (Note 4)	I <sub>L</sub> = 150mA		200	400	mV
	I <sub>L</sub> = 400mA		420	700	
Ground Current (Note 5)	I <sub>L</sub> = 100μA		100	200	μA
	I <sub>L</sub> = 150μA		12	20	mA
	I <sub>L</sub> = 400μA		30	50	mA
Dropout Ground Current (Note 5)	V <sub>in</sub> = V <sub>out</sub> - 0.5V I <sub>L</sub> = 100μA		110	220	μA
Current Limit	V <sub>out</sub> = 0		350	500	mA
Thermal Regulation (Note 6)			0.05	0.2	%/W
Output Noise, 10Hz to 100KHz I <sub>L</sub> = 100mA	C <sub>L</sub> = 2.2μF		500		μV RMS
	C <sub>L</sub> = 3.3μF		350		
	C <sub>L</sub> = 33μF		120		
Ripple Rejection Ratio	I <sub>O</sub> = 350mA, f = 120Hz, C <sub>O</sub> = 100μF, V <sub>IN</sub> = V <sub>O</sub> + 3V + 2V <sub>PP</sub>	60			dB
<b>Adjust model</b>					
Reference Voltage		1.21	1.235	1.26	V
Reference Voltage	Over Temperature (Note 7)	1.185		1.285	
Feedback Pin Bias Current			20	40	nA
Reference Voltage Temperature Coefficient	(Note 1)		50		ppm/°C
Feedback Pin Bias Current Temperature coefficient			0.1		nA/°C
<b>Shutdown Input</b>					
Input Logic Voltage	Low (Regulator ON) High (Regulator OFF)	2	1.3	0.7	V
Shutdown Pin Input Current	V <sub>S</sub> = 2.4V		30	50	μA
	V <sub>S</sub> = 26V		450	600	
Regulator Output Current in Shutdown	(Note 8)				
	5.0V ≤ V <sub>out</sub> < 15.0V			10	
	3.3V ≤ V <sub>out</sub> < 5.0 V			20	
	2.0V ≤ V <sub>out</sub> < 3.3V			30	



Note 1: Output or reference voltage temperature coefficients defined as the worst case voltage change divided by the total temperature range.

Note 2: Regulations are measured at constant junction temperature, using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specification for thermal regulation.

Note 3: Line regulation is tested at 150°C for  $I_L = 5\text{mA}$ . For  $I_L = 100\mu\text{A}$  and  $T_J = 125^\circ\text{C}$ , line regulation is guaranteed by design to 0.2%. For LND4815  $16\text{V} \leq V_{in} \leq 26\text{V}$ .

Note 4: Dropout voltage is defined as the input to output differential at which the output voltage drops 2% below its nominal value measured at 1V differential.

Note 5: Group pin current is the regulator quiescent current. The total current drawn from the source is the sum of the ground pin current and output load current.

Note 6: Thermal Regulation is the change in the output voltage at a time T after a change in power dissipation, excluding load or line regulation effects. Specifications are for a 200mA load pulse (3W pulse) for  $T = 10\text{ms}$ .

Note 7:  $V_{ref} \leq V_{out} \leq (V_{in} - 1\text{V})$ ,  $2.3\text{V} \leq V_{in} \leq 26\text{V}$ ,  $100\mu\text{A} \leq I_L \leq 400\text{mA}$ ,  $T_J \leq T_{Jmax}$ .

Note 8:  $V_{shutdown} \geq 2\text{V}$ ,  $V_{in} \leq 26\text{V}$ ,  $V_{out} = 0\text{V}$ .

## BLOCK DIAGRAM and TYPICAL APPLICATIONS

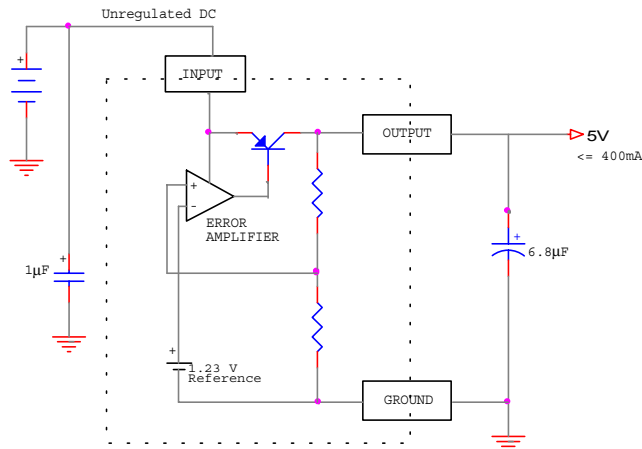


Fig 1 : Fixed Regulator

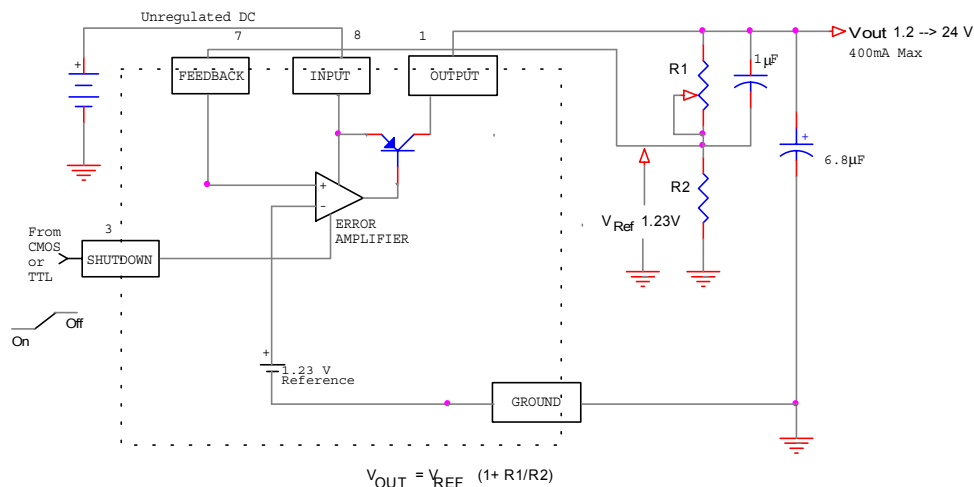


Fig 2 : Adjustable Regulator