DATA SHEET

LinearDimensions
SEMICONDUCTOR

LND2931

100mA Low Dropout Voltage Regulator

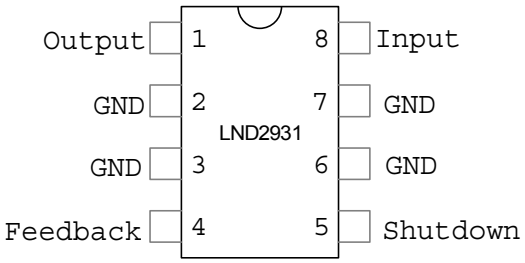
GENERAL DESCRIPTION

This series of fixed-voltage and adjustable 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 (Typ. 60mV at light load and 300mV at 100mV) 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 and adjustable regulators is offered in 3-pin TO-92 package (TO-220-5, SO-8 for LND2931) compatible with other fixed-voltage regulators.

FEATURES

- 3- terminal regulators (To-220-5, SO-8 for LND2931)
- 100mA output within 2% over temperature
- Very low quiescent current
- Low dropout voltage (300mV 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 National LM2931 fixed series, but has lower ground current, higher accuracy of output voltage and extremely tight load and line regulation. For adjust model LND2931 see typical applications on figure 2.

PIN CONFIGURATION



APPLICATIONS

- High-efficiency linear regulators
- Battery powered systems
- Portable/Palm top/ Notebook Computers
- Portable consumer equipment
- Portable instrumentation
- Automotive Electronics
- SMPS Post Regulator

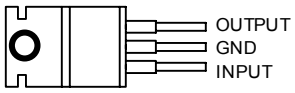
ABSOLUTE MAXIMUM RATINGS

Power Dissipation	Internally Limited
Lead Temperature(Soldering, 5 seconds)	260ºC
Storage Temperature Range	-65ºC to +150ºC
Operating Junction Temperature Range	-55ºC to +150ºC
Input Supply Voltage	-20V to +35V

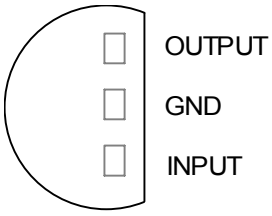
DEVICE SELECTION GUIDE

Vout , VOLTS	Device
3.3V*	LND2931-3.3
5.0V	LND2931-5.0
8.0V	LND2931-8.0
8.5V	LND2931-8.5
9.0V	LND2931-9.0
10.0V	LND2931-10
12.0V	LND2931-12
15.0V	LND2931-15
3.0v to 24V	LND2931

* Other fixed versions are also available, V_{OUT} =2.0V to 5.0V. Please consult for more information.



TO-220
(Top View)



TO-92
(Bottom View)

ELECTRICAL CHARACTERISTICS

(T_J =25ºC, I_O =100µA, V_{IN} =14V (for 2931-15, V_{IN} =16V), C_O =100µF; unless otherwise noted)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage (Fixed Model)	-25º C≤T_J≤ 85ºC Full Operating Temperature	0.985 |V_O| 0.98 |V_O|	V_O	1.015|V_O| 1.02 |V_O|	V
Output Voltage (Fixed Model)	100µA≤I_L≤ 100mA, T_J≤Tjmax	0.975 |V_O|	V_O	1.025 |V_O|	
Input Supply Voltage				26	
Output Voltage Temperature Coefficient	(Note 1)		50	150	ppm/ºC
Line Regulation (Note 2)	13V ≤ Vin ≤ 26V (Note 3)		0.1	0.4	%
Load Regulation(Note 2)	1mA≤ I_L ≤ 100mA		0.1	0.3	%
Dropout Voltage(Note 4)	I_L =10mA I_L =100mA		60 300	200 600	mV
Ground Current (Note 5)	I_L =100µA I_L =10mA I_L =100mA		100 0.9 8	150 1.5 12	µA mA mA
Dropout Ground Current (Note 5)	V_{in}=V_{out} -0.5V , I_L =100µA		110	170	µA
Current Limit	V_{out}=0		160	200	mA
Thermal Regulation(Note6)			0.05	0.2	% / W
Output Noise, 10Hz to 100KHz I_L = 100mA	C_L=2.2µF C_L=3.3µF C_L=33µF		500 350 120		µV RMS
Ripple Rejection Ratio	I_O =10mA,f=120Hz,C_o=100µF, Vin=V_o+3V+2Vpp	60			dB
TO-220-5, SO-8 Versions Only					
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/ºC
Feedback Pin Bias Current Temperature Coefficient			0.1		nA/ºC
Shutdown Input					
Input Logic Voltage	Low(Regulator ON) High (Regulator OFF)	 2	1.3	0.7	V
Shutdown Pin Input Current	V_S = 2.4V V_S = 26V		30 450	50 600	µA
Regulator Output Current in Shutdown	(Note 8)				
	5.0V ≤V_{out} <15.0V			10	
	3.3V ≤V_{out} <5.0 V			20	
	2.0V ≤V_{out} <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 150ºC for I_L = 1mA, for I_L=100µA and T_J =125ºC, line regulation is guaranteed by design to 0.2%. For LND2931-15 16V<= Vin <=26V.
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: Ground 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 output voltage at a time T after a change in power dissipation, excluding load or line regulation effects. Specifications are for a 50mA load pulse (1.25W pulse) for T=10ms.
Note7: Vref ≤ V_{out} ≤ (Vin-1V), 2.3V≤Vin ≤ 26V, 100µA ≤I_L ≤ 100mA, T_J ≤ $T_{jmax.}$
Note 8: Vshutdown ≥ 2V, V_{IN} ≤ 26V, Vout =0V.

BLOCK DIAGRAM AND TYPICAL APPLICATIONS

Figure 1: Fixed Regulator

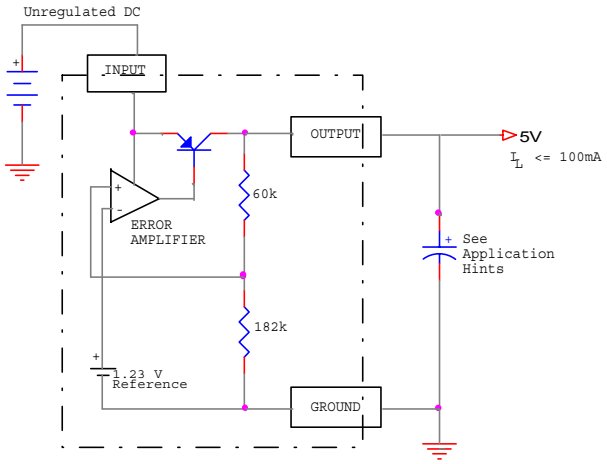
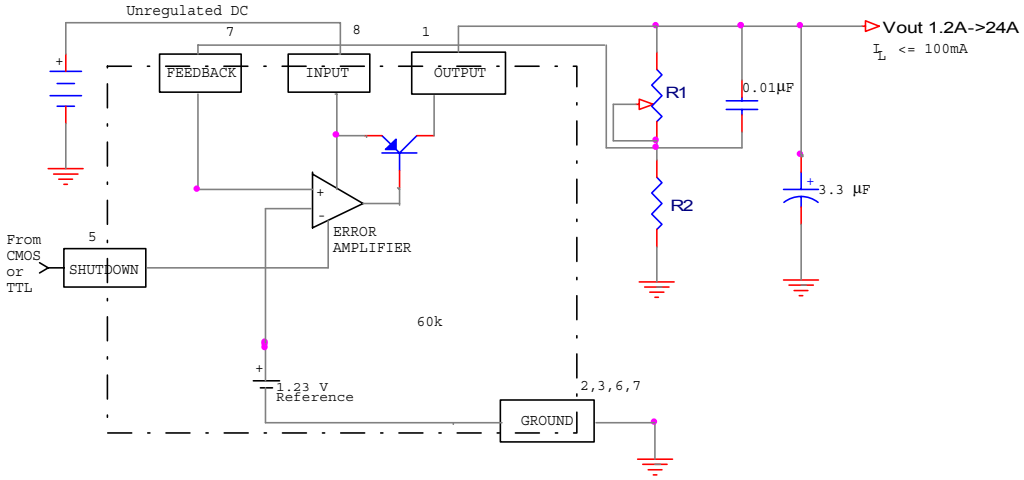
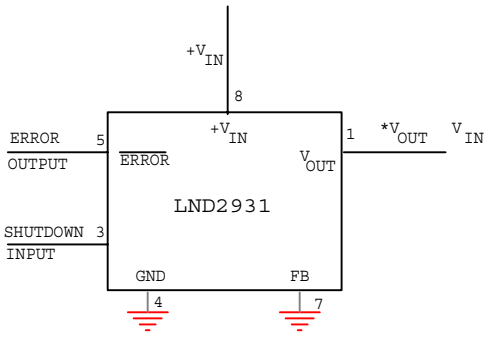


Figure 2:Adjustable Regulator

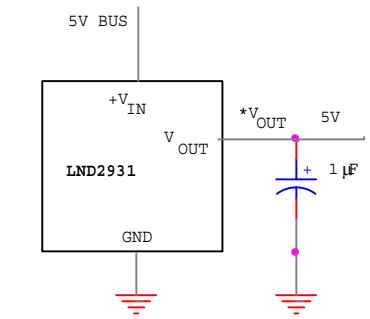


TYPICAL APPLICATIONS



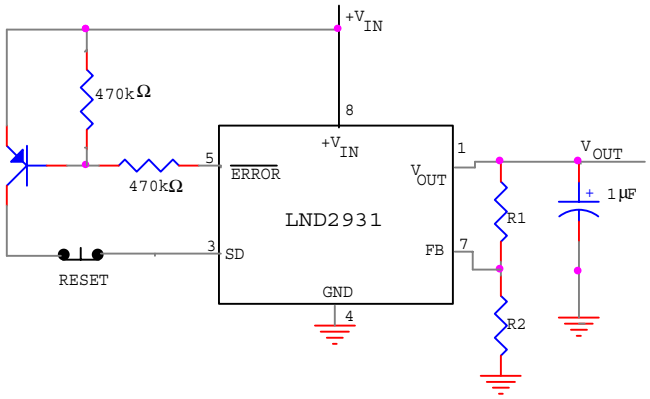
*Minimum input-output voltage ranges from 40mV to 400mV, depending on load current. Current limit is typically 160mA.

Wide Input Voltage Range Current Limiter

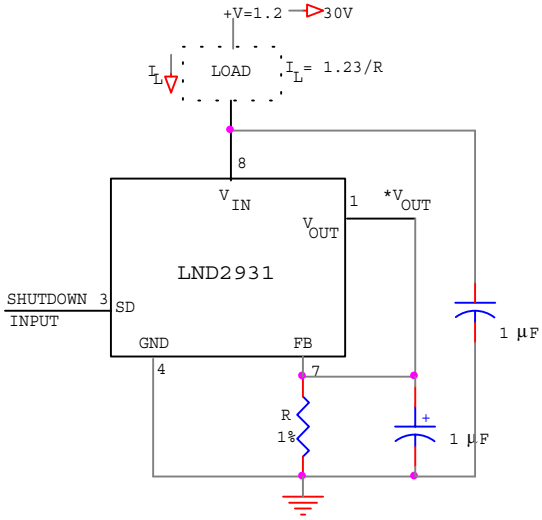


*Minimum input-output voltage ranges from 40mV to 400mV, depending on load current. Current limit is typically 160mA.

5V Current Limiter



Latch Off When Error Flag Occurs



Low Drift Current Source