# 0.1A LOW DROPOUT VOLTAGE REGULATORS   LM2931

Features
- 3-Terminal regulators
- 0.1A output within 2% over temperature
- Very low quiescent current
- Low dropout voltage (300mv Type)
- Extermely tight load and line regulation
- Very low temperature coeffecient
- Current and thermal limiting
- Unregulated DC input canwithstand -20V
  revers battery and +60V positive
transients

Applications
- High-efficiency linear regulator
- Battery powerd system
- Portable/Palm top/Notebook
computer
- Portable consumer equipment
- Portable Instrumentation
- Avionics
- Automotive Electronics
- SMPS Post-Regulator

TO-92

1. Vout 2. Gnd 3. Vin
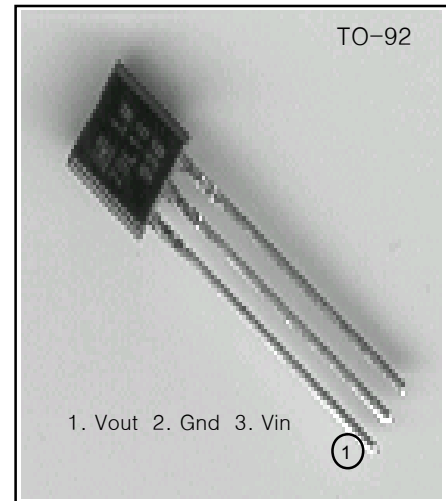
ORDERING INFORMATION

DEVICE	PKG
LM2931L-XX	TO-92

(XX= Output Voltage=3.3, 5.0, 8.0, 8.5 9.0
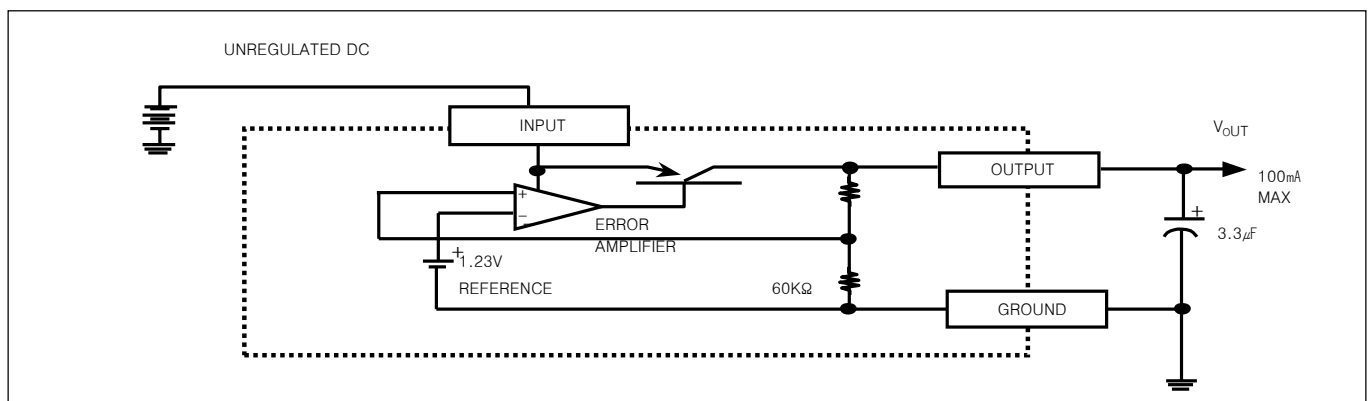10.0, 12.0,15.0V, Adjustable=AD)

PRODUCT DESCRIPTION
The LM2931 is a low power voltage regulator. This device excellent choice for use in battery powered.
Furthermore, the quiescent current increases only slightly at dropout, which prolongs battery life.
The LM2931 features very low quiescent current (100μA Typ.) and very low drop output voltage
(Typ. 60㎷ at light load and 300㎷ at 100㎃).
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.
The LM2931 fixed-voltage and andjustable regulators is offered in 3-pin TO-92 package compatible with
other fixed regulator.

BLOCK DIAGRAM AND TYPICAL APPLICATIONS

UNREGULATED DC

INPUT

ERROR
AMPLIFIER

1.23V

REFERENCE

60KΩ

OUTPUT

GROUND

V$_{oUT}$

100㎃
MAX

3.3μF

HTC

0.1A LOW DROPOUT VOLTAGE REGULATORS

ABSOLUTE MAXIMUM RATINGS

POWER DISSIPATION	INTERNALLY LIMITED
Lead Temperature (Soldering, 5 seconds)	260℃
Storage Temperature Range	−65℃ to +150℃
Operating Junction Temperature Range	−55℃ to +150℃
Input Supply Voltage	−20 to +30V

ELECTRICAL CHARACTERISTICS(at Tj=25℃, Io=100μA, Vin=14V, Co=100μF ; unless otherwise noted)

PARAMETER	CONDITIONS (Note 2)	MIN	TYP	MAX	UNITS
Output Voltage (Fixed Model)	−25℃ ≤T_J ≤85℃	0.985 | V_0 |	V_0	1.015 | V_0 |	V
	Full Operating Temperature	0.980 | V_0 |		1.020 | V_0 |	
Output Voltage (Fixed Model)	100μA≤I_L≤100mA,T_J≤T_{JMAX}	0.975 | V_0 |	V_0	1.025 | V_0 |	
Input Supply Voltage				26	
Output Voltage Temperature Coefficient	(Note 1)		50	150	ppm/℃
Line Regulation (Note 2)	13V≤V_{IN}≤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		60	200	mV
	I_L=100mA		300	600	
Ground Current (Note 5)	I_L=100μA		100	150	μA
	I_L=10mA		0.9	1.5	mA
	I_L=100mA		8	12	
Dropout Ground Current (Note 5)	V_{IN}=V_0−0.5V, I_L=100μA		110	170	μA
Current Limit	V_{OUT}=0		160	200	mA
Thermal Regulation (Note 6)			0.05	0.2	%/W
Output Noise, 10Hz to 100kHz I_L = 10 mA	C_L=2.2μF		500		μVrms
	C_L=3.3μF		350		
	C_L=33μF		120		
Shutdown Input					
Input Logic Voltage	Low (Regulator ON)		1.3	0.7	V
	High (Regulator OFF)	2			
Shutdown Pin Input Current	V_S=2.4V		30	50	μA
	V_S=26V		450	600	
Regulator Output Current Shutdown	(Note 8)				μA
	5.0V≤V_{OUT}< 15.0V			10	
	3.3V≤V_{OUT}< 5.0V			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 is 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℃ for IL = 1mA. For IL = 100μA and TJ = 125℃, line regulation is guaranteed by value measured at 1V differential.

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 puls (1.25W) for T = 10ms

Note 7 : V_{REF}≤V_{OUT}≤(V_{IN}−1V), 2.3V≤V_{IN}≤26V, 100μA≤I_L≤100mA, T_J≤T_{JMAX}

Note 8 : Vshutdown≥2V, V_{IN}≤26V, Vout≤0V