100㎃ LOW DROPOUT VOLTAGE REGULATORS LM2950

Features

- High accuracy output voltage
- Guaranteed 100 mA output
- Very low guiescent current
- Low dropout voltage
- Extermely tight load and line regulation
- Very low temperature coefficent
- Need only 1uF for stability
- Error flag warns of output dropout
- Logi-control electronic shutdown
- Output programmable from 1.24 to 29V

TO-92 PKG

Pin : 1. Output
2. Ground
3. Input

Applications

- Battery powered systems
- Cordless telephones
- Radio control systems
- Portable/Palm top/Notebook computer
- Portable consumer equipment
- Portable Instrumentation
- Avionics
- Automotive Electronics
- SMPS Post-Regulator
- Voltage Reference

ORDERING INFORMATION

DEVICE	PKG
LM2950L-XX	TO-92

(XX= Output Voltage=2.85, 3.0, 3.3, 5.0V, Adjustable=AD)

PRODUCT DESCRIPTION

The LM2950 is a low power voltage regulator. This device excellent choice for use in battery powered application such as cordless telephone, radio control systems, and portable computers.

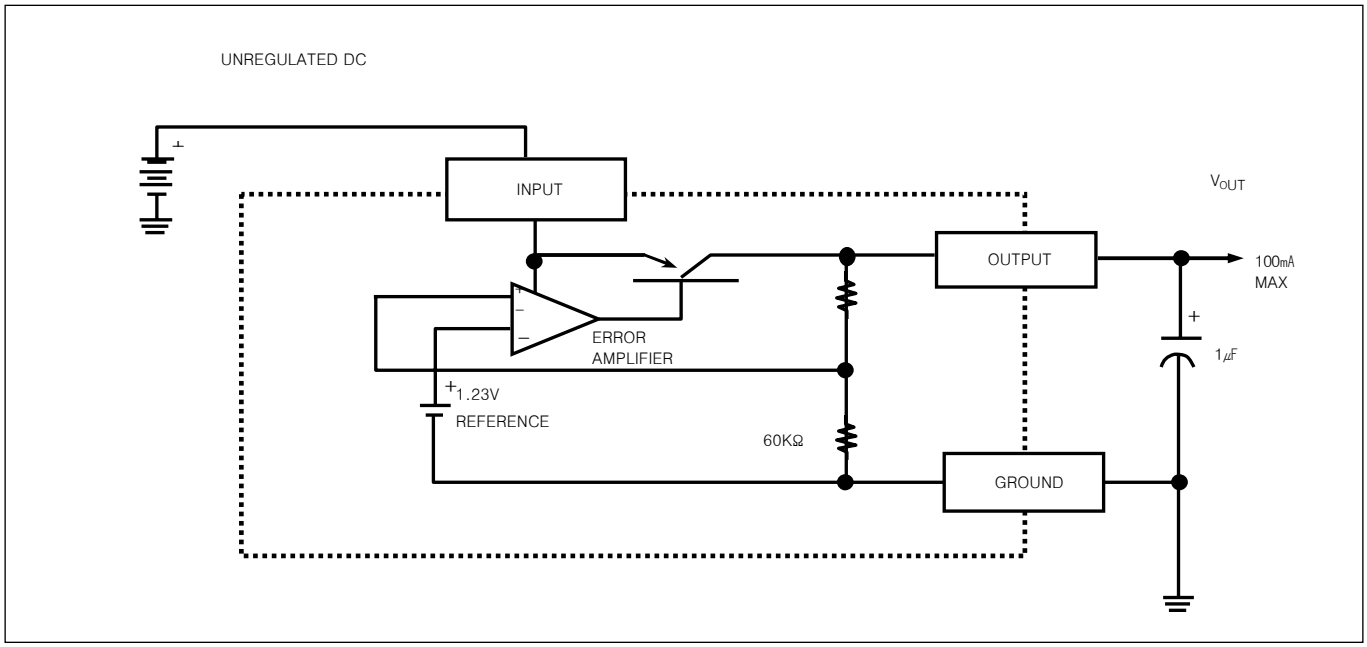
The LM2950 features very low quiescent current (75㎂ Typ.) and very low drop output voltage (Typ. 400㎷ at light load and 380㎷ at 100㎃).

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, making the LM2950 useful as a low-power voltage reference.

The error flag output feature is used as power-on reset for warn of a low output voltage, due to following batteries on input. Other feature is the logic-compatible shutdown input which enable the regulator to be switched on and off. The LM2950 is available in 8-pin plastic packages.

The regulator output voltage may be pin-strapped for a -XX volt or programmed from 1.24 volt to 29 volts with external pair of resistors. The LM2950 is offered in 3-pin to-92 package compatible with other fixed regulator.

BLOCK DIAGRAM AND TYPICAL APPLICATIONS



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	−0.3 to +30V
Feedback Input Voltage	−1.5 to +30V
Shutdown Input Voltage	−0.3 to +30V
Error Comparator Output	−0.3 to +30V

ELECTRICAL CHARACTERISTICS(at T_a=25℃, V_{IN}=15V, unles otherwise specified)

PARAMETER	CONDITIONS (Note 2)	MIN	TYP	MAX	UNITS
Output Voltage	−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	100μA≤I_L≤100㎃, T_J≤T_{JMAX}	0.976 | V_0 |	V_0	1.024 | V_0 |	
Output Voltage Temperature Coefficient	(Note 1)		50	150	ppm/℃
Line Regulation (Note 3)	V_0+1V≤V_{IN}≤30V		0.04	0.4	%
Load Regulation (Note 3)	100μA≤I_L≤100㎃		0.1	0.3	%
Dropout Voltage (Note 4)	I_L=100μA		50	80	㎷
	I_L=100㎃		380	450	

ELECTRICAL CHARACTERISTICS(at T_a=25℃, V_{IN}=15V, unles otherwise specified)

PARAMETER	CONDITIONS (Note 2)	MIN	TYP	MAX	UNITS
Ground Current	I_L=100㎂		75	120	㎂
	I_L=100㎃		8	12	㎃
Dropout Ground Current	V_{IN}=V_0-0.5V, I_L=100㎂		110	170	㎂
Current Limit	V_{OUT}=0		160	200	㎃
Thermal Regulation			0.05	0.2	%/W
Output Noise, 10Hz to 100kHz	C_L=1㎌		430		µVrms
	C_L=200㎌		160		
	C_L=3.3㎌		100		
	(Bypass=0.01㎌ pins 7 to 1				
Error Comparator					
Output Leakage Current	V_{OH}=30V		0.01	1.0	㎂
Output Low Voltage	V_{IN}=4.5V, I_{OL}=400㎂		150	250	㎷
Upper Threshold Voltage	(Note 6)	40	60		
Lower Threshold Voltage	(Note 6)		75	15	
Hysteresis	(Note 6)		15		
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	㎂
	V_S=30V		450	600	
Regulator Output Current Shutdown	(Note 7)				
	V_{OUT}=5.0V		3	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 : Unless otherwise specified all limits guaranteed for T_J=25℃, V_{IN}=V_0+1V, I_L=100㎂ and C_L=1㎌. Additional condition for the 8-pin versions are feedback tied to -XX V tap and output tied to output Sense (V_{OUT}=XX V) and $V_{SHOUTDOWN}$≤0.8V

Note 3 : 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 4 : Dropout voltage is defined as the input to output differential at which the output voltage drops 100㎷ below its nominal value measured at 1V differential. At very low values of programmed output voltage, the minimum input supply voltage(2.3V over temperature) must be taken into account.

Note 5 : $V_{REF} \leq V_{OUT} \leq (V_{IN}-1V)$, $2.3V \leq V_{IN} \leq 30V$, $100\mu A \leq I_L \leq 100mA$, $T_J \leq T_{JMAX}$

Note 6 : Comparator thresholds are expressed in terms of a voltage differential at the feedback terminal below the nominal reference voltage measured at V_0+1V input. To express these thresholds in terms of output voltage changed, multiply by the error amplifier gain=V_{OUT}/V_{REF}=(R1+R2)/R2. For example, at a programmed output voltage of 5V, the error output is guaranteed to go low when the output drops by 95㎷x5V/1.235V=384㎷. Thresholds remain constant as a percent V_{OUT} as V_{OUT} is varied, with the dropout warning occurring at typically 5% below nominal, 7.5% guaranteed.

Note 7 : $V_{SHUTDOWN} \geq 2V$, $V_{IN} \leq 30V$, V_{OUT}=0, Feed-back pin tied to -XX V Tap.