FEATURES

- High accuracy output voltage
- Guaranteed 100 mA output
- Very low quiescent current
- Extremely tight load and line regulation
- Very low temperature coefficient
- Current and thermal limiting
- Low dropout voltage
- Need only 1uF for stability
- Error flag warns of output dropout
- Logi-control electronic shutdown
- Output programmable from 1.24 to 29V
- Moisture Sensitivity Level 3

TO- 92 PKG Pin 1 : Output Pin 2 : Ground Pin 3 : Input PSOP- 8 PKG Pin : 1. Output 2. Sense 3. Shutdown 4. Ground 5. Error 6. Tap 7. Feedback 8. Input

Applications

- High-efficiency linear regulator, voltage reference
- Battery powered systems
- Portable consumer equipment
- Portable / Parm, Desktop / Notebook computers
- Portable Instrumentation, cordless telephones
- Automotive Electronics, Radio control systems
- SMPS Post-Regulator, Avionics

ORDERING INFORMATION

	<u> </u>						
	DEVICE	PKG					
L	_M2950-XX	TO-92 (Bulk)					
LN	//2950TA-XX	TO-92 (Tape)					
L	M2951D-XX	SOP-8					

(XX= 1.5, 1.8, 2.8, 2.85, 3.0, 3.3, 5.0V, Adjustable)

DESCRIPTION

The LM2950/1 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.

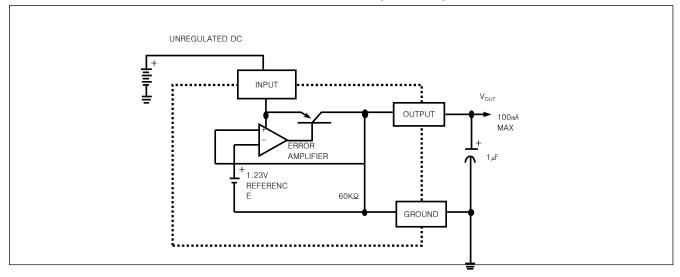
The LM2950/1 features very low quiescent current (75 \(\mu \) A Typ.) and very low drop output voltage (Typ. 400 \(\mu \) A t light load and 380 \(\mu \) at 100 \(\mu \) A.

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 LM2950/1 useful as a low-power voltage reference.

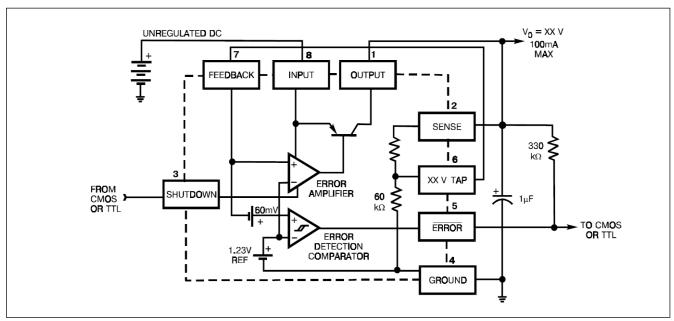
The error flag output feature is used as power-on reset for warn of a low output voltage, due to following batteries on input. Other feature is the logic-compatible shutdown input which enable the regulator to be switched on and off. The LM2950/1 is available in 8-pin plastic packages.

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 LM2950/1 is offered in 3-pin to-92 package compatible with other fixed regulator.

BLOCK DIAGRAM AND TYPICAL APPLICATIONS (LM2950)



BLOCK DIAGRAM AND TYPICAL APPLICATIONS (LM2951)



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		

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100mA LOW DROPOUT VOLTAGE REGULATORS

ELECTRICAL CHARACTERISTICS (at T_a =25 $^{\circ}$ C, 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
Output voltage	Full Operating Temperature	0.980 V ₀		1.020 V ₀	
Output Voltage	100μ A \leq I _L \leq 100 mA, T _J \leq T _{JMAX}	0.976 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)	100#A≤I _L ≤100mA		0.1	0.3	%
Dropout Voltage (Note 4)	I _L =100#A		50	80	mV
Diopout Voltage (Note 4)	I _L =100 ^{mA}		380	450	IIIV

ELECTRICAL CHARACTERISTICS (at T_a =25 $^{\circ}$ C, V_{IN} =15V, unles otherwise specified)

	(a	,			
Ground Current	I _L =100#		75	120	μA
Olouna Guileni	I _L =100mA		8	12	mA
Dropout Ground Current	$V_{IN}=V_0-0.5V$, $I_L=100\mu$		110	170	μA
Current Limit	V _{OUT} =0		160	250	mA
Thermal Regulation			0.05	0.2	%/W
	C _L =1 <i>µ</i> F		430		
	C _L =200 <i>µ</i> F		160		
Output Noise, 10Hz to 100kHz	C _L =3.3 <i>µ</i> F		100		μVrms
	(Bypass=0.01 ⊭ pins 7 to 1				
	(LP2951-XX))				
Error Comparator		•			!
Output Leakage Current	V _{OH} =30V		0.01	1.0	μA
Output Low Voltage	V _{IN} =4.5V, I _{OL} =400 \(\mu^{A} \)		150	250	mV
Upper Threshold Voltage	(Note 5)	40	60		
Lower Threshold Voltage	(Note 5)		75	95	
Hysteresis	(Note 5)		15		
Shutdown Input		•			•
lancit I ania Valtana	Low (Regulator ON)		1.3	0.7	V
Input Logic Voltage	High (Regulator OFF)	2			
Charteleura Die laguet Correct	V _S =2.4V		30	50	
Shutdown Pin Input Current	V _S =30V		450	600	
	(Note 6)				1
Domilator Outrot Compant Chatalana	V _{OUT} =5.0V		3	10	- <i>μ</i> Α -
Regulator Output Current Shutdown	3.3V≤V _{OUT} <5.0V			20	
	2.0V≤V _{OUT} <3.3V			30	
	•	•			

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100mA LOW DROPOUT VOLTAGE REGULATORS

8-pin Versions only					
Reference Voltage		1.21	1.235	1.26	V
Reference Voltage	Over Temperature(Note 7)	1.185		1.285	V
Feedback Pin Bias Current			20	40	nA
Reference Voltage Temperature Coefficient	(Note 8)		50		ppm/℃
Feedback Pin Bias Current Temperature Coefficient			0.1		nA/℃

- 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 $_J = 25\,^{\circ}\text{C}$, $V_{IN} = V_0 + 1\text{V}$, $I_L = 100\,^{\mu\!\text{A}}$ and $C_L = 1\,^{\mu\!\text{F}}$. Additional condition for the 8-pin versions are feedback tied to -XX V tap and output tied to output Sense (Vout=XX V) and Vshoutbown $\leq 0.8\text{V}$
- 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 mV 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 : Comparator thresholds are expressed in terms of a voltage differential at the feedback terminal below the nominal reference voltage measured at Vout+1V input. To express these thresholds in terms of output voltage changed, multiply by the error amplifier gain = V out/VREF = (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 mV x 5V / 1.235V = 384 mV. Thresholds remain constant as a percent V out as Vout is varied, with the dropout warning occurring at typically 5% below nominal, 7.5% guaranteed.
- Note 6 : Vshutdown \ge 2V, Vin \le 30V, Vout=0, Feed-back pin tied to -XX V Tap.
- Note 7 : $Vref \le Vout \le (Vin-1V)$, $2.3V \le Vin \le 30V$, $100uA \le IL \le 100mA$, $TJ \le TJMAX$
- Note 8: Output or reference voltage temperature coefficient is defined as the worst case voltage change divided by the total temperature range.