UTC LP2950/2951   LINEAR INTEGRATED CIRCUIT

100 mA LOW-DROPOUT VOLTAGE REGULATOR

DESCRIPTION

The UTC LP2950/2951 is a monolithic integrated voltage regulator with low dropout voltage, and low quiescent current. It includes many features that suitable for different applications. Available in 3-pin TO-92, DIP-8 and SOP-8 packages.

FEATURES

*High accuracy 2.5, 3.0, 3.3, 3.6 or 5V fixed output for TO-92, SOP-8 package.
*Extremely low quiescent current and dropout voltage.
*Extremely tight load and line regulation.
*Current and thermal limiting.
*Very low temperature coefficient.
*Logic controlled shutdown and error flag available for DIP and SOP package.
*Output voltage programmable for DIP and SOP package.
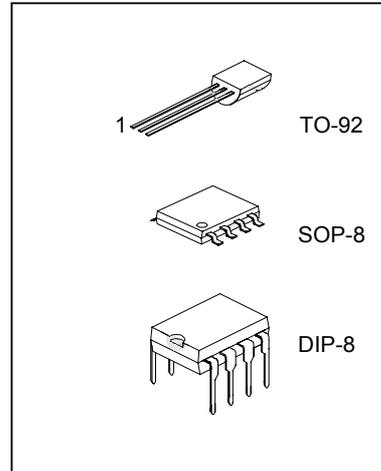
APPLICATIONS

*Battery powered equipment.
*High efficient linear regulator down to 1.24V.
*Cellular phones.

ORDERING INFORMATION

PART NUMBER	TEMPERATURE RANGE	PACKAGE	ACCURACY
UTC LP2950-5.0	-40 ~ +125°C	3-Pin TO-92 plastic	2.0%
UTC LP2950-3.0	-40 ~ +125°C	3-Pin TO-92 plastic	1.0%
UTC LP2950-3.3	-40 ~ +125°C	3-Pin TO-92 plastic	1.0%
UTC LP2950-3.6	-40 ~ +125°C	3-Pin TO-92 plastic	2.0%
UTC LP2950-2.5	-40 ~ +125°C	3-Pin TO-92 plastic	1.0%
UTC LP2950-5.0	-40 ~ +125°C	8-Pin SOP-8 plastic	2.0%
UTC LP2950-3.0	-40 ~ +125°C	8-Pin SOP-8 plastic	1.0%
UTC LP2950-3.3	-40 ~ +125°C	8-Pin SOP-8 plastic	1.0%
UTC LP2951	-40 ~ +125°C	8-Pin SOP-8 plastic	2.0%
UTC LP2951	-40 ~ +125°C	8-Pin DIP-8 plastic	2.0%

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UTC LP2950/2951   LINEAR INTEGRATED CIRCUIT

PIN CONFIGURATIONS

UTC LP2950

1   2   3

OUTPUT   INPUT

GND
TO-92 Plastic Package
Bottom View

OUTPUT (1)   (8) INPUT

SENSE (2)   (7) FEEDBACK

            UTC
            LP2951

SHUTDOWN (3)   (6) 5V TAP

GND (4)   (5) $\overline{\text{ERROR}}$

SOP-8 OR DIP-8 PACKAGE
FOR UTC LP2951

OUTPUT (1)   (8) INPUT

NC (2)   (7) NC

            UTC
            LP2950

SHUTDOWN (3)   (6) NC

GND (4)   (5) $\overline{\text{ERROR}}$

SOP-8 OR DIP-8 PACKAGE
FOR UTC LP2950

Fig.1

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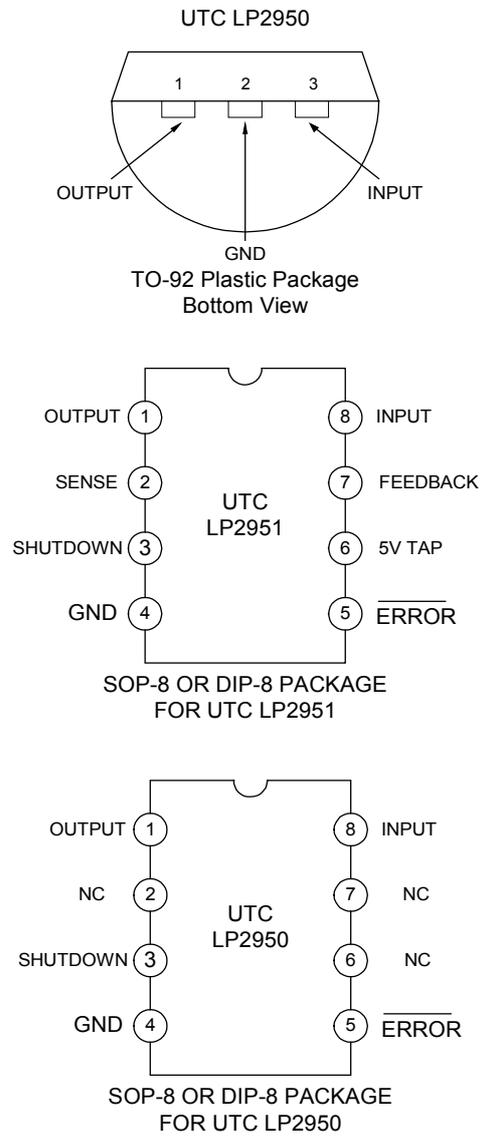
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BLOCK DIAGRAM

FOR UTC LP2951
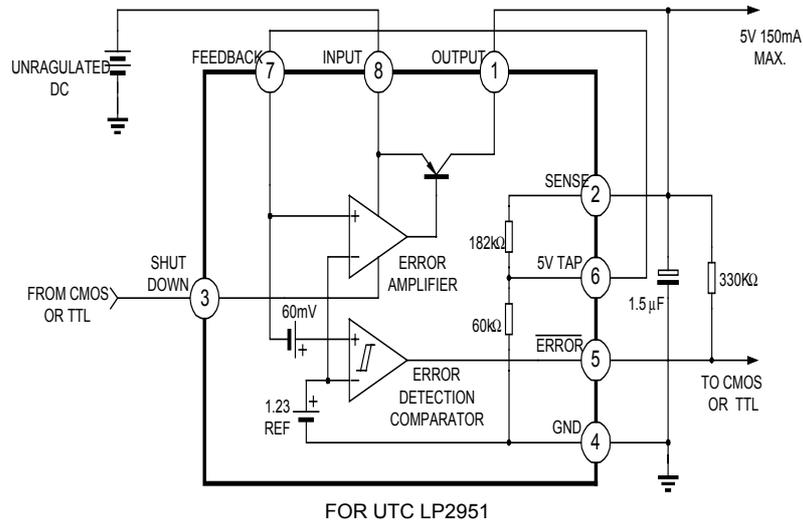
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	-0.3~+18	V
Feedback Voltage	Vfeedback	-1.5~+18	V
Shutdown Voltage	Vshutdown	-0.3~+18	V
Comparator Output Voltage	Vco	-0.3~+18	V
Storage Temperature	Tstr	-65~+150	°C
Operating Junction Temperature	Tj	-40~+125	°C

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ELECTRICAL CHARACTERISTICS
(Tested at Tj=25°C,VIN=6V,IL=100μA and CL=1μF, unless otherwise specified)

PARAMETER	PART NUMBER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	UTC LP2950-2.5	TJ=25°C	2.47	2.5	2.53	V
	UTC LP2950-3.0		2.97	3.0	3.03	
	UTC LP2950-3.3		3.27	3.3	3.33	
	UTC LP2950-3.6		3.53	3.6	3.67	
	UTC LP2950-5.0		4.90	5.0	5.10	
	UTC LP2951	(note 1)				
	UTC LP2950-2.5	-25°C<=TJ<=<=+85°C	2.47	2.5	2.53	V
	UTC LP2950-3.0		2.97	3.0	3.03	
	UTC LP2950-3.3		3.27	3.3	3.33	
	UTC LP2950-3.6		3.53	3.6	3.67	
	UTC LP2950-5.0		4.90	5.0	5.10	
	UTC LP2951	(note 1)				
Output Voltage	UTC LP2950-2.5	100μA<=IL<=100 mA	2.47	2.5	2.53	V
	UTC LP2950-3.0	Tj<=Tj(max)	2.97	3.0	3.03	
	UTC LP2950-3.3		3.27	3.3	3.33	
	UTC LP2950-3.6		3.53	3.6	3.67	
	UTC LP2950-5.0		4.90	5.0	5.10	
	UTC LP2951	(note 1)				
Output Voltage Temperature Coefficient			20		100	ppm/°C
Line Regulation		6V<=VIN<=18V	0.03	0.1	0.2	%
Load Regulation		100μA<=IL<=100 mA	0.04	0.1	0.2	%
Dropout Voltage		IL=100μA	50	80	150	mV
		IL=100mA (note 2)	380	450	600	
Ground Current		IL=100μA	75	120	140	μA
		IL=100mA	8	12	14	mA
Dropout Ground Current		VIN=4.5V,IL=100μA	110	170	200	μA
Current Limit		Vout=0	160	200	220	mA
Output Noise 10Hz to 100KHz		CL=1μF			430	μV
		CL=200μF			160	
		CL=3.3μF			100	
		(Bypass=0.01μF pins 7 to (utc2951))				
For LP2951 8-Pin version only						
Reference Voltage			1.22	1.235	1.25	V
Reference Voltage		(Note 4)	1.19		1.27	V
Feedback pin Bias Current				20	40	nA
Reference Voltage Temperature Coefficient				50		ppm/°C
Feedback Bias Current temperature Coefficient				0.1		nA/°C

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PARAMETER	PART NUMBER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Error Comparator						
Output Leakage Current		V_{OH}=18V			1	μA
Output Low Voltage		V_{IN}=4.5V I_{OL}=400μA			250	mV
Upper Threshold Voltage		(Note 3)	3.2			%V_O
Lower Threshold Voltage		(Note 3)			7.6	%V_O
Hysteresis		(Note 3)		15		mV
Shutdown Input						
Input Logic Voltage		Low(Regulator ON) High(Regulator OFF)	2.0	1.3	0.70	V
Shutdown Pin Input Current		$V_{shutdown}$=2.4V		30	50	μA
		$V_{shutdown}$=18V		450	600	μA
Regulator Output Current Shutdown		$V_{shutdown}$>=2V,V_{IN}<=18V, V_{out}=0, Feedback pin tied to 5V Tap.		3	10	μA

Note 1: Additional conditions for 8-pin versions are feedback tied to 5V Tap an Output tied to Output Sense (V_{out}=5V) and Vshutdown<=0.8V.

Note 2:Dropout Voltage is defined as the input to output differential at which the output voltage drops 100mV below its nominal value measured at 1V differential.

Note 3:Comparator thresholds are expressed in terms of percentage value of voltage output.

Note 4:Vref≤Vout≤(Vin-1V), 2.3V≤Vin≤30V, 100μA≤I_L≤100mA, T_J≤T_{JMAX}

UTC LP2950/2951   LINEAR INTEGRATED CIRCUIT

APPLICATION CIRCUIT (10 Ampere Low Dropout Regulator)

CURRENT
LIMIT
SECTION

+VIN=Vout+0.5V

680Ω

2N3906

0.05Ω

UTC
D65H0

470Ω

4.7MΩ

8

+VIN

ERROR

5   10kΩ

R1

+VOUT 100m A

UTC LP2951

3   SD

FB   7   1%   4.7μF   100μF

GND   Vout

R2

20kΩ   220Ω   4   1

0.033μF   47Ω
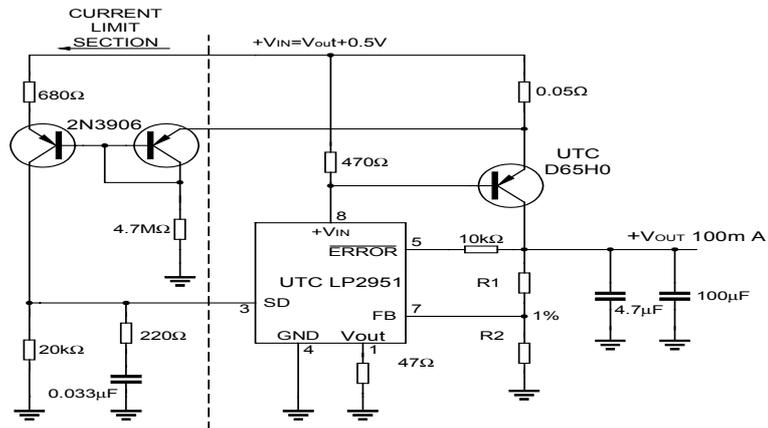
Vout=1.23V*(1+R1/R2)

**For 5V output use internal resistors.Wire pin 6 to 7
and wire pin 2 to +Vout**

Fig.2

Vin   UTC LP2950-2.5   Vout
       UTC LP2950-3.0
       UTC LP2950-3.3
       UTC LP2950-3.6
       UTC LP2950-5.0

Fig.3

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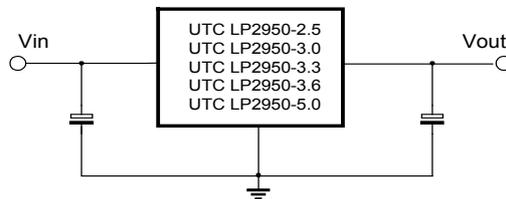
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TYPICAL PERFORMANCE CHARACTERISTICS

Fig.4 Dropout Characteristics

Fig.5 Input Current

Fig. 6 Dropout Voltage

Fig. 7 Ground Pin Current

Fig. 8 Ground Pin Current

Fig. 9 Shutdown Threshold Voltage

Fig. 10 Short Circuit Current

Fig. 11 Dropout Voltage

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