

# LP2950/2951

# LINEAR INTEGRATED CIRCUIT

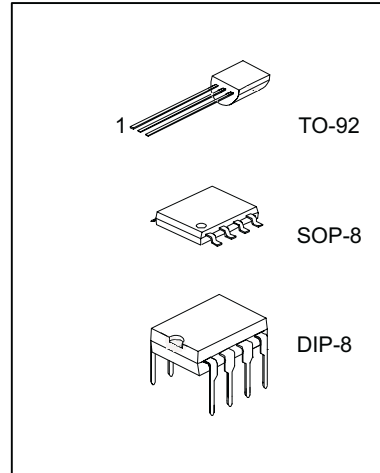
## 100 mA LOW-DROPOUT VOLTAGE REGULATOR

### DESCRIPTION

The Contek 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 3.0, 3.3, or 5V fixed output for TO-92 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
Contek LP2950-3.0	-40 ~ +125 C	3-Pin TO-92 plastic	1.0%
Contek LP2950-3.3	-40 ~ +125 C	3-Pin TO-92 plastic	2.0%
Contek LP2950	-40 ~ +125 C	3-Pin TO-92 plastic	1.0%
Contek LP2951F	-40 ~ +125 C	8-Pin SOP-8 plastic	2.0%
Contek LP2951P	-40 ~ +125 C	8-Pin DIP-8 plastic	2.0%



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## PIN CONFIGURATIONS

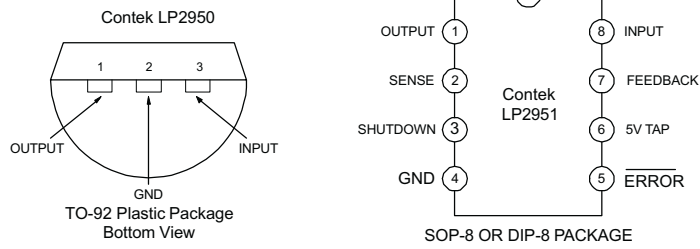
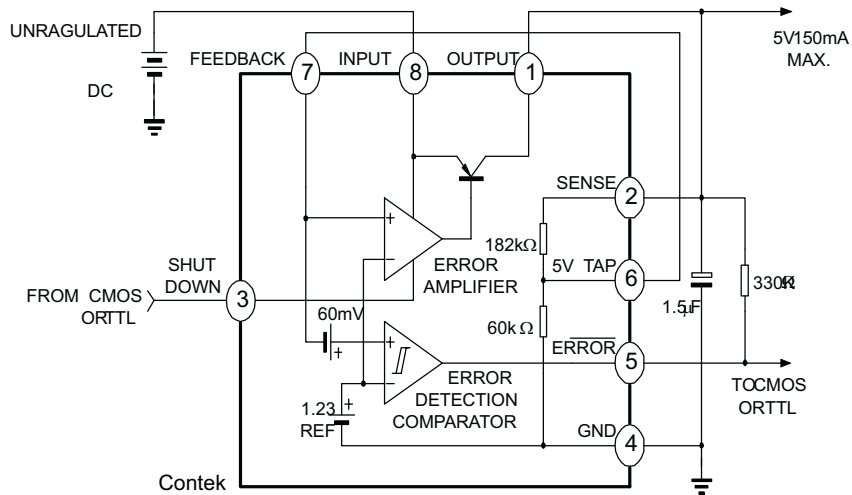


Fig. 1

## BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	V <sub>cc</sub>	-0.3~+30	V
Feedback Voltage	V <sub>feedback</sub>	-1.5~+30	V
Shutdown Voltage	V <sub>shutdown</sub>	-0.3~+30	V
Comparator Output Voltage	V <sub>co</sub>	-0.3~+30	V
Storage Temperature	T <sub>str</sub>	-65~+150	C
Operating Junction Temperature	T <sub>j</sub>	-40~+125	C



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## ELECTRICAL CHARACTERISTICS

( Tested at  $T_j=25^\circ\text{C}$ ,  $V_{IN}=6\text{V}$ ,  $I_L=100\text{mA}$  and  $C_L=1\text{F}$ , unless otherwise specified)

PARAMETER	PART NUMBER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Contek LP2950-3.0	$T_j=25^\circ\text{C}$	2.97	3.0	3.03	V
	Contek LP2950-3.3		3.26	3.3	3.37	
	Contek LP2950		4.90	5.0	5.10	
	Contek LP2951		(note 1)			
Output Voltage	Contek LP2950-3.0	$-25^\circ\text{C} \leq T_j \leq +85^\circ\text{C}$	2.97	3.0	3.03	V
	Contek LP2950-3.3		3.26	3.3	3.37	
	Contek LP2950		4.90	5.0	5.10	
	Contek LP2951		(note 1)			
Output Voltage	Contek LP2950-3.0	$100\mu\text{A} \leq I_L \leq 100\text{mA}$ $T_j \leq T_j(\text{max})$	2.97	3.0	3.03	V
	Contek LP2950-3.3		3.26	3.3	3.37	
	Contek LP2950		4.90	5.0	5.10	
	Contek LP2951		(note 1)			
Output Voltage Temperature Coefficient			20		100	ppm/ $^\circ\text{C}$
Line Regulation		$6\text{V} \leq V_{IN} \leq 30\text{V}$	0.03	0.1	0.2	%
Load Regulation		$100\mu\text{A} \leq I_L \leq 100\text{mA}$	0.04	0.1	0.2	%
Dropout Voltage		$I_L=100\mu\text{A}$	50	80	150	mV
		$I_L=100\text{mA}$ (note 2)	380	450	600	
Ground Current		$I_L=100\mu\text{A}$	75	120	140	$\mu\text{A}$
		$I_L=100\text{mA}$	8	12	14	mA
Dropout Ground Current		$V_{IN}=4.5\text{V}$ , $I_L=100\mu\text{A}$	110	170	200	$\mu\text{A}$
Current Limit		$V_{out}=0$	160	200	220	mA
Output Noise 10Hz to 100KHz		$C_L=1\mu\text{F}$			430	$\mu\text{V}$
		$C_L=200\mu\text{F}$			160	
		$C_L=3.3\mu\text{F}$			100	
		(Bypass=0.0F $\mu$ pins 7 to (Contek 2951)				
For 8-Pin version only						
Reference Voltage			1.22	1.235	1.25	V
Reference Voltage		(Note 7)	1.19		1.27	V
Feedback pin Bias Current				20	40	nA
Reference Voltage Temperature Coefficient				50		ppm/ $^\circ\text{C}$
Feedback Bias Current temperature Coefficient				0.1		nA/ $^\circ\text{C}$
Error Comparator						
Output Leakage Current		$V_{OH}=30\text{V}$			1	$\mu\text{A}$
Output Low Voltage		$V_{IN}=4.5\text{V}$ $I_{OL}=400\mu\text{A}$			250	mV
Upper Threshold Voltage		(Note 3)	3.2			% $V_O$



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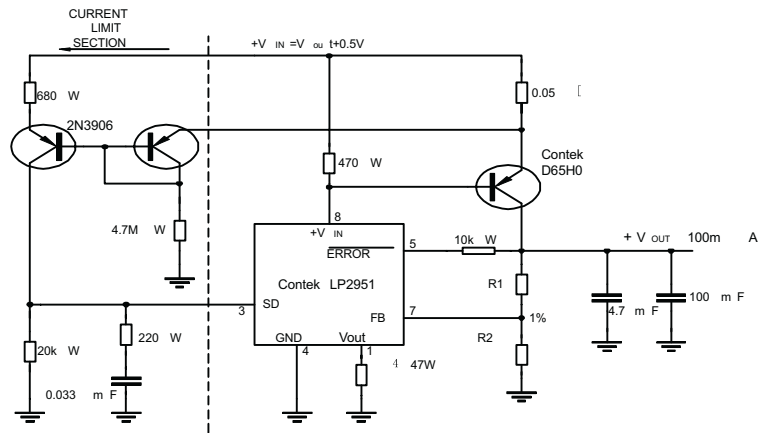
PARAMETER	PART NUMBER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Lower Threshold Voltage		(Note 3)			7.6	%Vo
Hysteresis		(Note 3)		15		mV
Shutdown Input						
Input Logic Voltage		Low(Regulator ON) High(Regulator OFF)	2.0	1.3	0.70	V
Shutdown Pin Input Current		Vshutdown=2.4V		30	50	μA
		Vshutdown=30V		450	600	μA
Regulator Output Current Shutdown		Vshutdown>=2V, V IN<=30V, Vout=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<sub>out</sub>=5V) and V<sub>shutdown</sub><=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.

## APPLICATION CIRCUIT (10 Ampere Low Dropout Regulator)



$$V_{out} = 1.23V * (1 + R1/R2)$$

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

Fig.2



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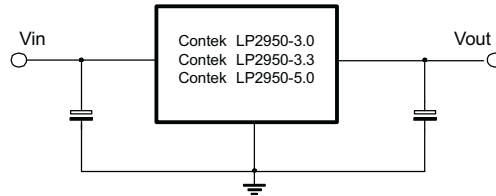


Fig. 3

TYPICAL PERFORMANCE CHARACTERISTICS

Fig.4 Dropout Characteristics

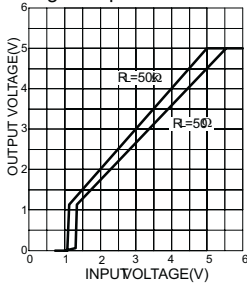


Fig.5 Input Current

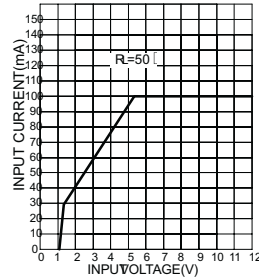


Fig.6 Dropout Voltage

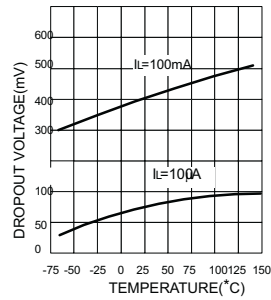


Fig.7 Ground Pin Current

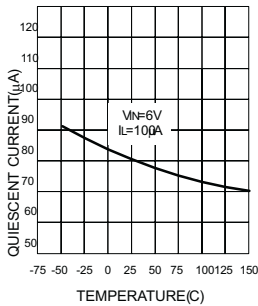


Fig.8 Ground Pin Current

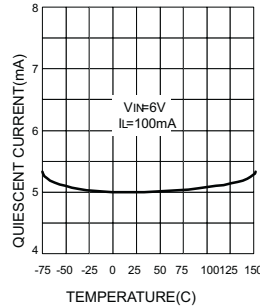


Fig.9 Shutdown Threshold Voltage

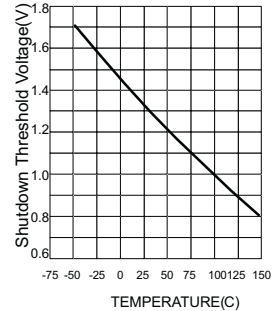


Fig.10 Short Circuit Current

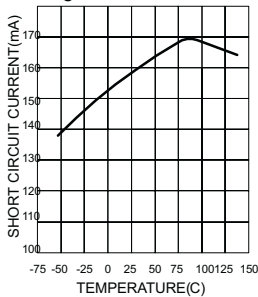


Fig.11 Dropout Voltage

