



LP2950/2951

LINEAR INTEGRATED CIRCUIT

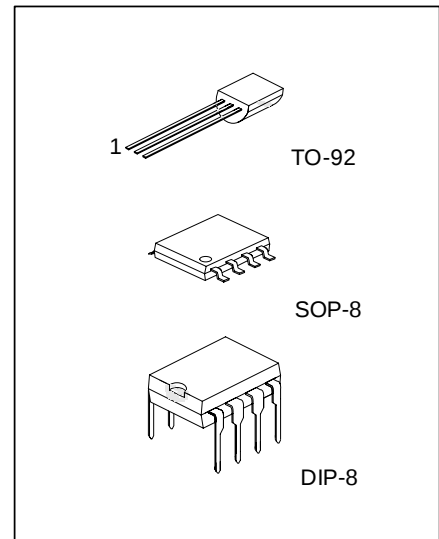
100 mA LOW-DROPOUT VOLTAGE REGULATOR

DESCRIPTION

The UTC **LP2950/2951** are monolithic integrated voltage regulators with low dropout voltage, and low quiescent current. It includes many features that suitable for different applications.

FEATURES

- * Fixed output versions, 2.5V, 3V, 3.3V, 3.6V and 5V, are available.
- * High accuracy output voltage.
- * 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 err flog available for 8 pin package.
- * Output voltage programmable for LP2951.



*Pb-free plating product number:
LP2950L-XX/LP2951L

ORDERING INFORMATION

Ordering Number		Package	Packing
Normal	Lead Free Plating		
LP2950-xx-D08-T	LP2950L-xx-D08-T	DIP-8	Tube
LP2950-xx-S08-T	LP2950L-xx-S08-T	SOP-8	Tube
LP2950-xx-S08-R	LP2950L-xx-S08-R	SOP-8	Tape Reel
LP2950-xx-T92-B	LP2950L-xx-T92-B	TO-92	Tape Box
LP2950-xx-T92-K	LP2950L-xx-T92-K	TO-92	Bulk
LP2951-D08-T	LP2951L-D08-T	DIP-8	Tube
LP2951-S08-T	LP2951L-S08-T	SOP-8	Tube
LP2951-S08-R	LP2951L-S08-R	SOP-8	Tape Reel

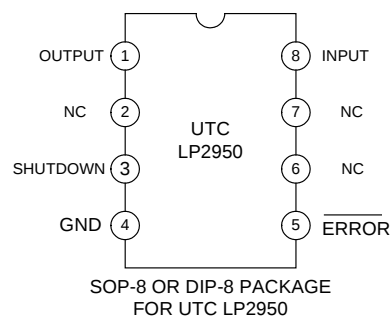
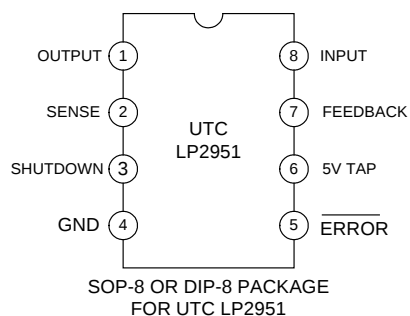
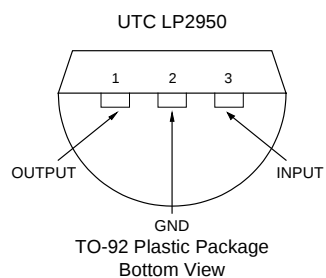
Note: xx: Output Voltage Code (For LP2950 only)

LP2950L-xx-S08-R (1)Packing Type (2)Package Type (3)Output Voltage Code (4)Lead Plating		(1) B: Tape Box, K: Bulk, R: Tape Reel, T: Tube (2) D08: DIP-8, S08: SOP-8, T92: TO-92 (3) xx: refer to Output Voltage Code (4) L: Lead Free Plating, Blank: Pb/Sn
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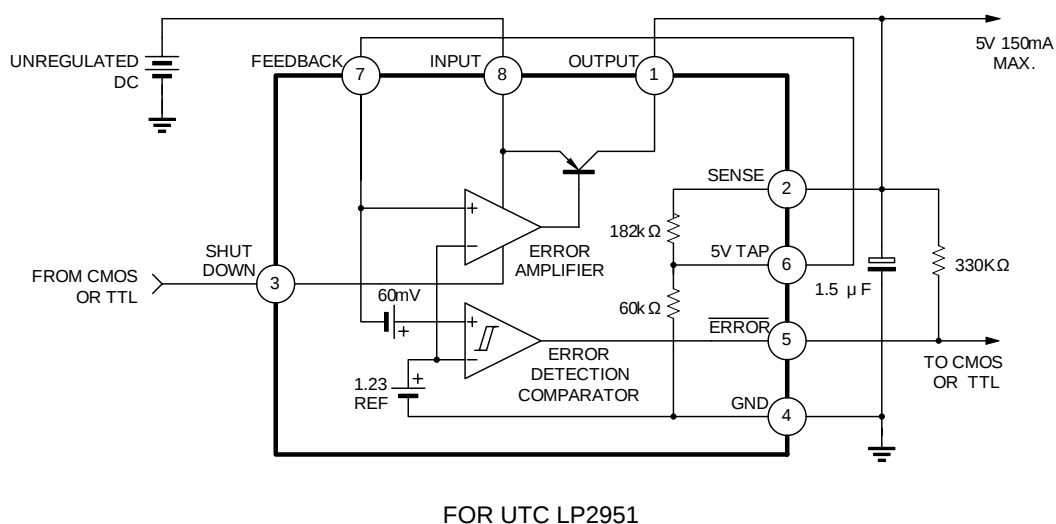
OUTPUT VOLTAGE CODE(For LP2950)

OUTPUT VOLTAGE	CODE
2.5V	25
3.0V	30
3.3V	33
3.6V	36
5.0V	50

PIN CONFIGURATIONS



BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.3 ~ +30	V
Feedback Voltage	V_{FB}	-1.5 ~ +30	V
Shutdown Voltage	V_{SHDN}	-0.3 ~ +30	V
Operation Junction Temperature	T_J	-40 ~ +125	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, $V_{IN}=6\text{V}$, $I_L=100\mu\text{A}$, $C_L=1\mu\text{F}$, unless otherwise specified.)

For All Version:

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}\text{C}$ (Note 1)	$V_{OUT}\times 0.98$	V_{OUT}	$V_{OUT}\times 1.02$	V
		-25°C T_J +85°C (Note 1)	$V_{OUT}\times 0.98$	V_{OUT}	$V_{OUT}\times 1.02$	V
Output Voltage	V_{OUT}	100μA I_L 100mA, T_J $T_J(\text{max})$	$V_{OUT}\times 0.98$	V_{OUT}	$V_{OUT}\times 1.02$	V
Output Voltage Temperature Coefficient	TcV_o		20		100	ppm/°C
Line Regulation	ΔV_{OUT}	6V V_{IN} 30V	0.03	0.1	0.2	%
Load Regulation	ΔV_{OUT}	100μA I_L 100 mA	0.04	0.1	0.2	%
Dropout Voltage	V_D	$I_L=100\mu\text{A}$	50	80	150	mV
		$I_L=100\text{mA}$ (Note 2)	380	450	600	
Ground Current	I_G	$I_L=100\mu\text{A}$	75	120	140	μA
		$I_L=100\text{mA}$	8	12	14	
Dropout Ground Current		$V_{IN}=4.5\text{V}$, $I_L=100\mu\text{A}$	110	170	200	μA
Current Limit	I_{LIMIT}	$V_{OUT}=0$	160	200	220	mA
Output Noise (10Hz ~ 100KHz) (Bypass=0.01μF pins 7 to 1 (LP2951))	eN	$C_L=1\mu\text{F}$			430	μV
		$C_L=200\mu\text{F}$			160	
		$C_L=3.3\mu\text{F}$			100	

For UTC LP2951 8-Pin Version Only

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Reference Voltage	V_{REF}		1.22	1.235	1.25	V
Reference Voltage	V_{REF}	Over temperature (Note 4)	1.19		1.27	V
Feedback pin Bias Current	I_{FB}			20	40	nA
Reference Voltage Temperature Coefficient	$V_{REF(TC)}$			50		ppm/°C
Feedback Bias Current Temperature Coefficient	$I_{FB(TC)}$			0.1		nA/°C
Error Comparator						
Output Leakage Current	$I_{O(LEAK)}$	$V_{OH}=30\text{V}$			1	μA
Output Low Voltage	V_{OL}	$V_{IN}=4.5\text{V}$, $I_{OL}=400\mu\text{A}$			250	mV
Threshold Voltage	Upper	V_{THU} (Note 3)	3.2			%VO
	Lower	V_{THL} (Note 3)			7.6	%VO
Hysteresis	V_{HYS}	(Note 3)		15		mV

■ ELECTRICAL CHARACTERISTICS(Cont.)

For UTC LP2951 8-Pin Version Only

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Shutdown Input						
Input Logic Voltage	Low	V_{IL}	Regulator ON	1.3	0.70	V
	High	V_{IH}	Regulator OFF	2.0		
Shutdown Pin Input Current	I_{SHDN}	$V_{SHDN}=2.4V$		30	50	μA
		$V_{SHDN}=30V$		450	600	μA
Regulator Output Current Shutdown	I_{DFF}	$V_{SHDN}=2V, V_{IN}=30V, V_{OUT}=0$ Feedback pin tied to 5V Tap.		3	10	μA

Note 1: Additional conditions for 8-pin versions are FB pin tied to 5V_{TAP}, Output tied to Sense($V_{OUT}=5V$) and $V_{SHDN} \leq 0.8V$.

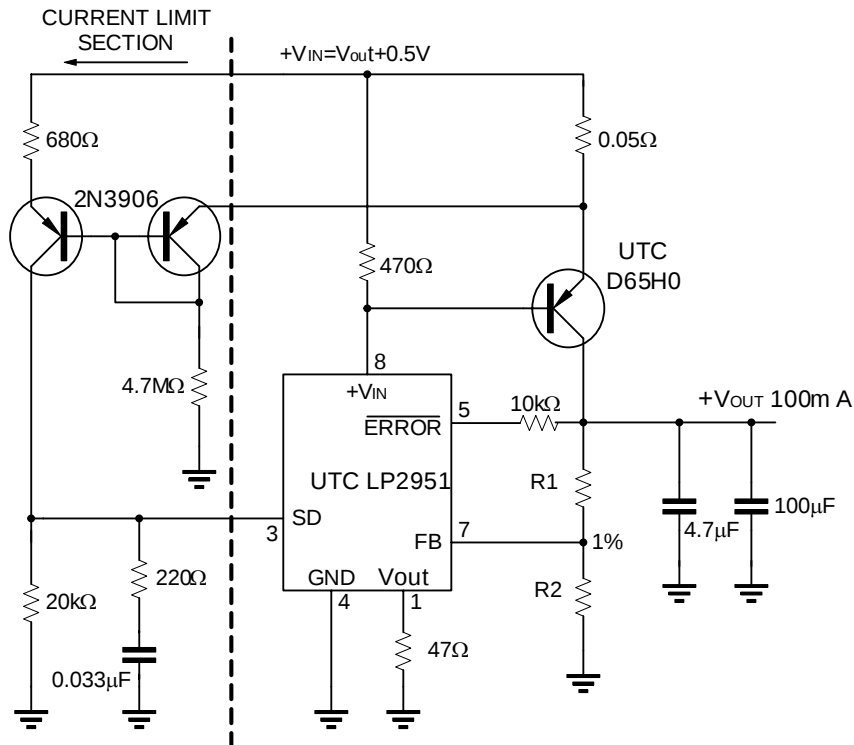
Note 2: Dropout Voltage is defined as the input to output differential at which the output voltage drops 100mV below its nominal value measured at 1V differential.

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

Note 4: $V_{REF} \leq V_{OUT} \leq (V_{IN}-1V)$, $2.3V \leq V_{IN} \leq 30V$, $100\mu A \leq I_L \leq 100mA$, $T_J \leq T_{J(MAX)}$

■ TYPICAL 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.1

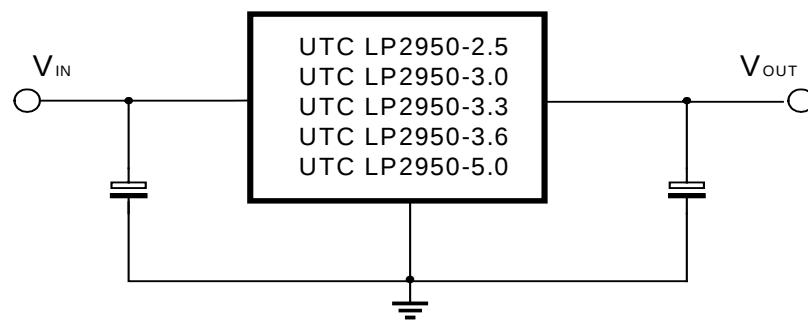
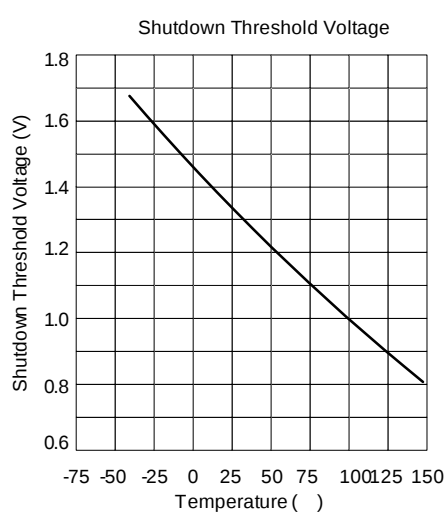
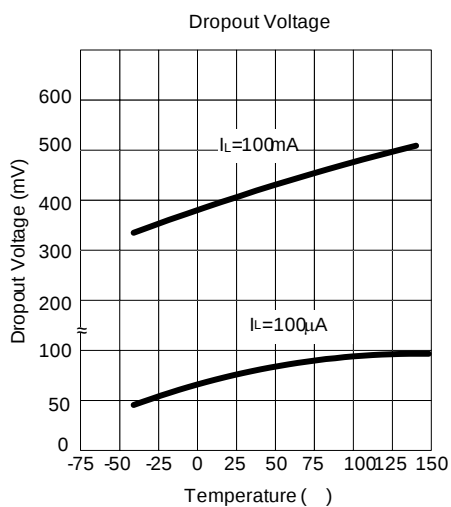
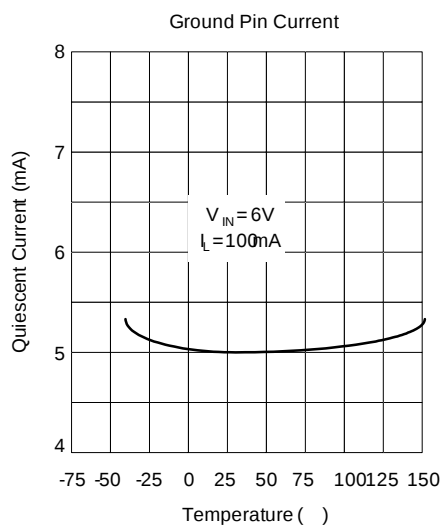
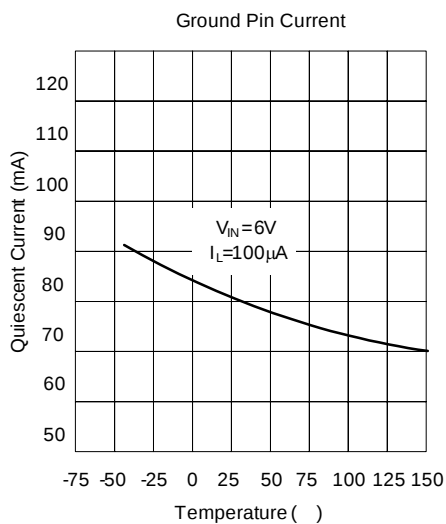
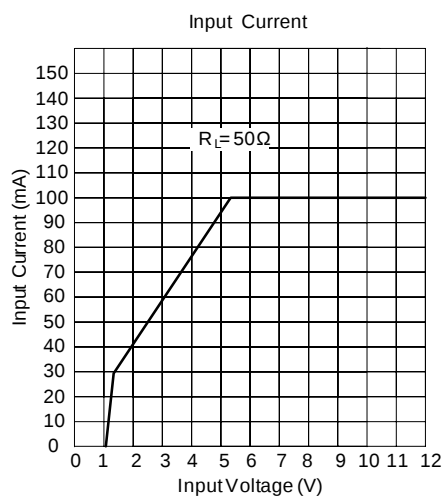
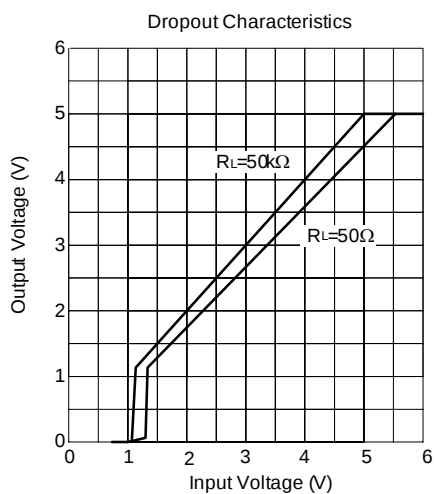
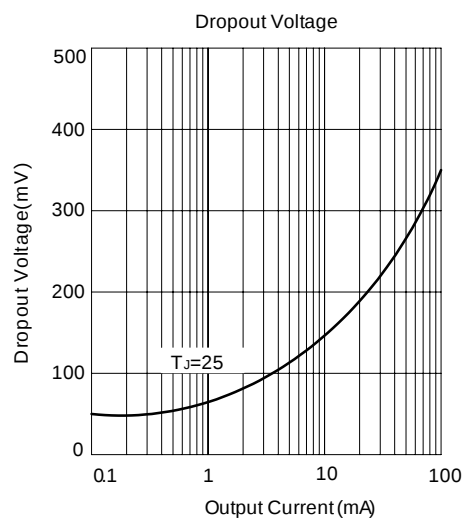
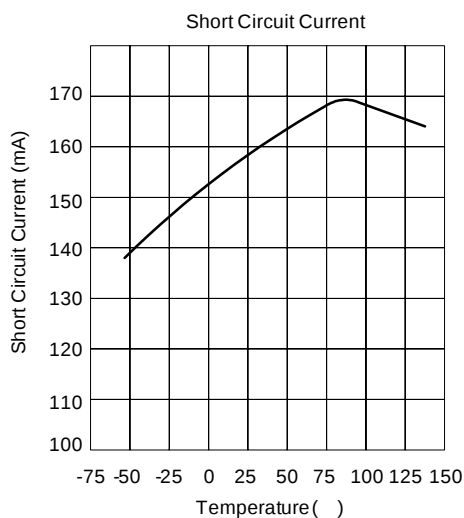


Fig.2

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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