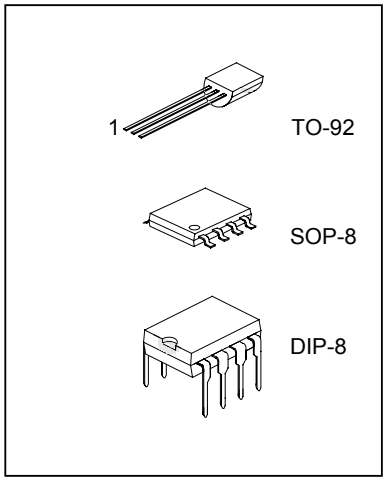
UTC M2950/2951 LINEAR INTEGRATED CIRCUIT

250 mA LOW-DROPOUT VOLTAGE REGULATOR



DESCRIPTION

The UTC M2950/2951 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.

PIN CONFIGURATIONS

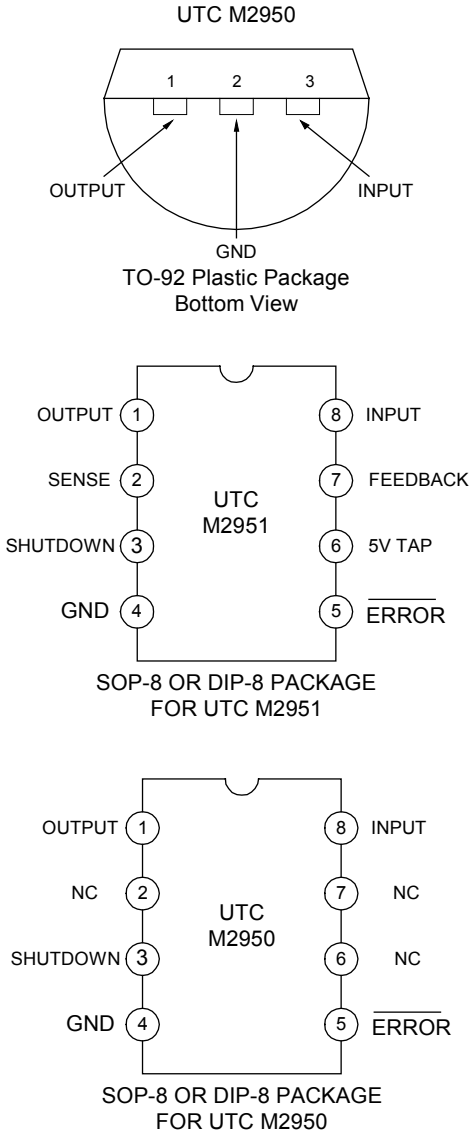
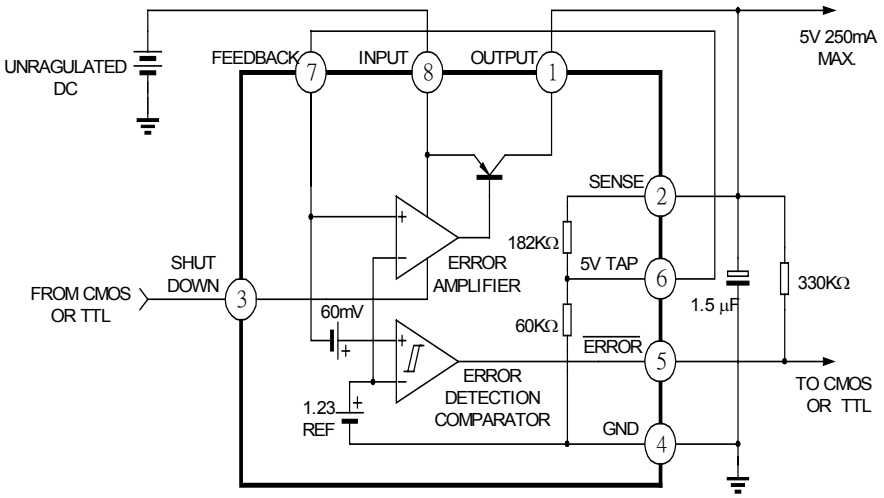


Fig. 1

BLOCK DIAGRAM



FOR UTC M2951

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

ELECTRICAL CHARACTERISTICS

(Tested at Tj=25°C, V_{IN}=6V, I_L=100μA and C_L=1μF, unless otherwise specified)

PARAMETER	PART NUMBER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	UTC M2950-2.5	T_J=25°C	2.45	2.5	2.55	V
	UTC M2950-3.0		2.94	3.0	3.06	
	UTC M2950-3.3		3.23	3.3	3.36	
	UTC M2950-3.6		3.53	3.6	3.67	
	UTC M2950-5.0		4.90	5.0	5.10	
	UTC M2951	(note 1)				
	UTC M2950-2.5	-25°C<=T_J<=<=+85°C	2.45	2.5	2.55	V
	UTC M2950-3.0		2.94	3.0	3.06	
	UTC M2950-3.3		3.23	3.3	3.36	
	UTC M2950-3.6		3.53	3.6	3.67	
	UTC M2950-5.0		4.90	5.0	5.10	
	UTC M2951	(note 1)				
Output Voltage	UTC M2950-2.5	100μA<=I_L<=250 mA	2.45	2.5	2.55	V
	UTC M2950-3.0	Tj<=Tj(max)	2.94	3.0	3.06	
	UTC M2950-3.3		3.23	3.3	3.36	
	UTC M2950-3.6		3.53	3.6	3.67	
	UTC M2950-5.0		4.90	5.0	5.10	
	UTC M2951	(note 1)				
Output Voltage Temperature Coefficient			20		100	ppm/°C
Line Regulation		6V<=V_{IN}<=18V	0.03	0.1	0.2	%
Load Regulation		100μA<=I_L<=250 mA	0.04	0.1	0.2	%
Dropout Voltage		I_L=100μA	50	80	150	
		I_L=250mA (note 2)	380	450	600	mV
Ground Current		I_L=100μA	75	120	140	μA
		I_L=250mA	8	12	22	mA
Dropout Ground Current		V_{IN}=4.5V,I_L=100μA	110	170	200	μA
Current Limit		Vout=0	160	200	300	mA
Output Noise 10Hz to 100KHz		C_L=1μF	260	280	430	μV
		C_L=200μF			160	
		C_L=3.3μF			100	
		(Bypass=0.01μF pins 7 to (UTC M2951))				
For M2951 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
Error Comparator						

PARAMETER	PART NUMBER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
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		Vshutdown>=2V,V_{IN}<=18V, V_{out}=0, Feedback pin tied to 5V Tap.		3	10	μA

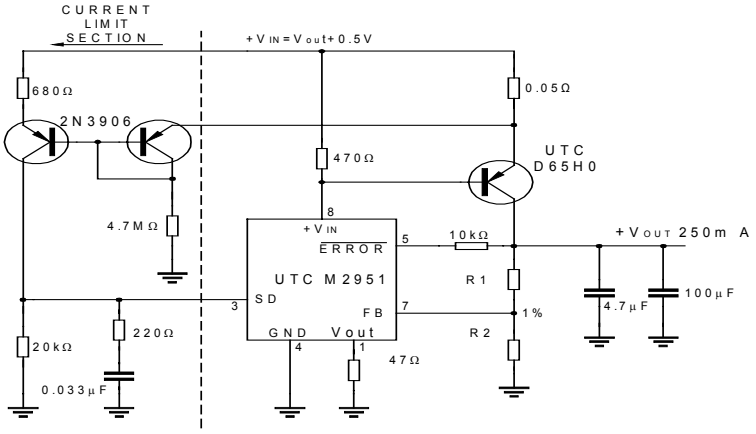
Note 1: Additional conditions for 8-pin versions are feedback tied to 5V Tap an Output tied to Output Sense (V_{out}=5V) and Vshutdown<=0.8V.

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≤250mA, T_J≤T_{JMAX}

APPLICATION CIRCUIT (10 Ampere Low Dropout Regulator)



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

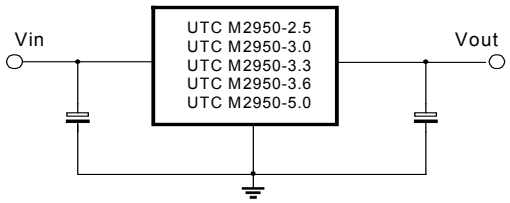


Fig.3

TYPICAL PERFORMANCE CHARACTERISTICS

Fig.4 Dropout Characteristics

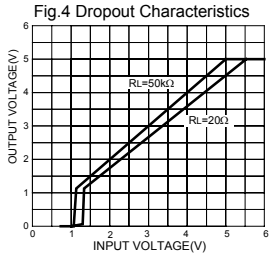


Fig.5 Input Current

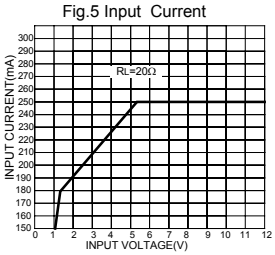


Fig. 6 Dropout Voltage

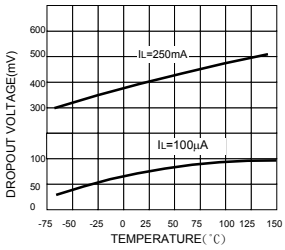


Fig. 7 Ground Pin Current

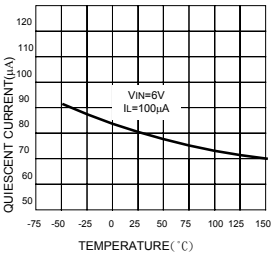


Fig. 8 Ground Pin Current

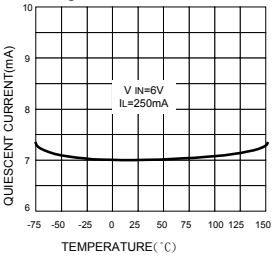


Fig. 9 Shutdown Threshold Voltage

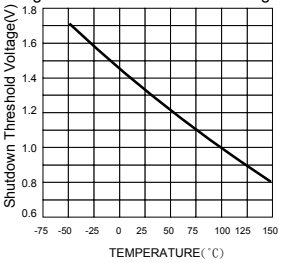


Fig. 10 Short Circuit Current

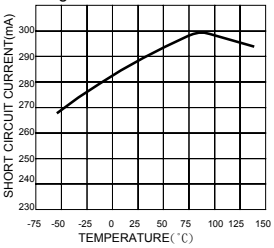
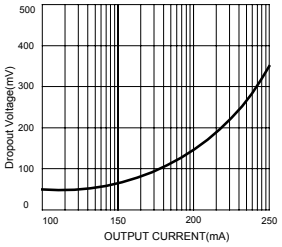


Fig. 11 Dropout Voltage



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