



UC723

LINEAR INTEGRATED CIRCUIT

ADJUSTABLE VOLTAGE REGULATOR

DESCRIPTION

The UTC **UC723** is a silicon monolithic integrated circuit, designed for service as voltage regulator at output voltages, ranging from 2V ~ 37V at current up to 150mA. It includes a temperature-compensated reference amplifier, an error amplifier, a power series pass transistor, and a current-limiting circuit.

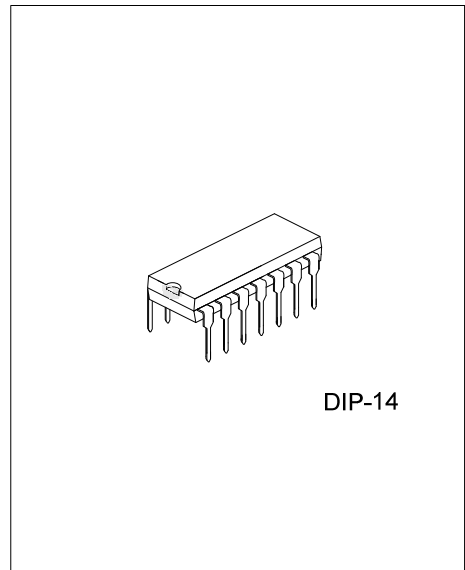
FEATURES

- *Up to 150mA Output Current
- *Adjustable Output Voltage (From 2V ~ 37V)
- *Positive and Negative Voltage Regulation
- *Regulation in Excess of 10A with Suitable Pass Transistors
- *Input and Output Short-Circuit Protection
- *Load and Line Regulation < 0.03%

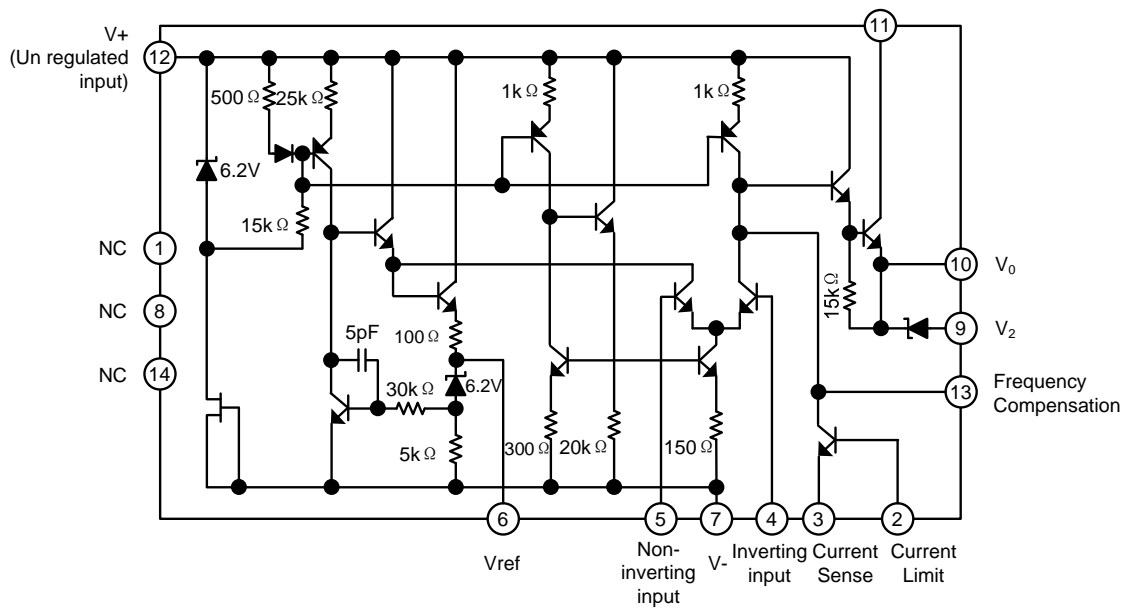
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead free	Halogen Free		
UC723L-D14-T	UC723G-D14-T	DIP-14	Tube

<p>UC723L-D14-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) T: Tube (2) D14 : DIP-14 (3) G: Halogen Free, L: Lead Free</p>
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■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage(between V+ and V-)	V _{CC}	40	V
Pulse Voltage for 50ms	V _{PULSE}	50	V
Differential Input-Output Voltage	V _D	40	V
Different Input Voltage (Between inverting and non-inverting inputs)	V _{ID}	±5	V
Different Input Voltage (Between Non-inverting Input and V-)	V _{ID}	8	V
Current from Zener Diode Terminal	I _Z	25	mA
Power Dissipation	P _D	900	mW
Operating Temperature	T _{OPR}	0 ~ 70	°C
Storage Temperature	T _{STG}	-40 ~ 150	°C
Junction Temperature	T _J	125	°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

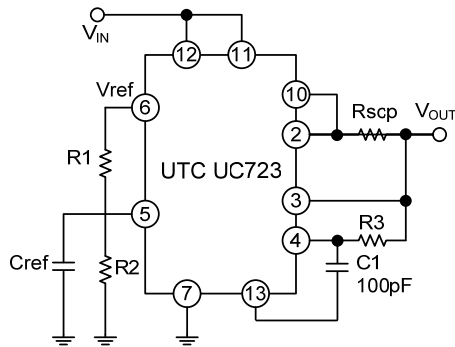
(T_A=25°C, V₊=V_C=V_{IN}=12V, V_{OUT}=5V, I_L=1mA, C₁=100Pf, C_{REF}=0, R_{SCP}=0, unless otherwise specified, divider impedance R₁*R₂ / (R₁+R₂) at non-inverting input, terminal 5=10KΩ)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Regulator Current	I _{CCQ}	I _L =0, V _{IN} =30V		2.3	3.5	mA
Input Voltage Range	V _{IN}		9.5		40	V
Output Voltage Range	V _{OUT}		2		37	V
Differential Input-Output Voltage	V _{IN} -V _{OUT}		3		38	V
Reference Voltage	V _{REF}		6.95	7.15	7.35	V
Line Regulation (Note 1)	ΔV _{OUT}	V _{IN} =12V ~ 40V		0.6	1	%V _O
		V _{IN} =12V ~ 15V		0.01	0.1	
		V _{IN} =12V ~ 15V, T _A =-55~125°C				
Load Regulation (Note 1)	ΔV _{OUT}	I _L =1mA ~ 50mA		0.03	0.15	%V _O
		I _L =1mA ~ 50mA, T _A =-55 ~ 125°C			0.6	
Output Voltage Temperature Coefficient	ΔV _{OUT}	T _A =-55~125°C		0.002	0.015	%/°C
Ripple Rejection (Note 2)	RR	f=50Hz ~ 10KHz		74		dB
		f=50Hz ~ 10KHz, C _{REF} =5μF		86		
		T _{MIN} <T _{TYP} <T _{MAX}		2.5		
Short Circuit Limiting Current	I _{LIM}	R _{SCP} =10Ω, V _{OUT} =0		65		mA
Equivalent Noise RMS output Voltage (Note 2)	V _N	BW=100Hz ~ 10KHz, C _{REF} =0		-20		μV
		BW=100Hz ~ 10KHz, C _{REF} =5μF		2.5		

Note 1: Line and load regulation specifications are given for conditions of a constant chip temperature. For high dissipation condition, temperature drifts must be separately taken in account.

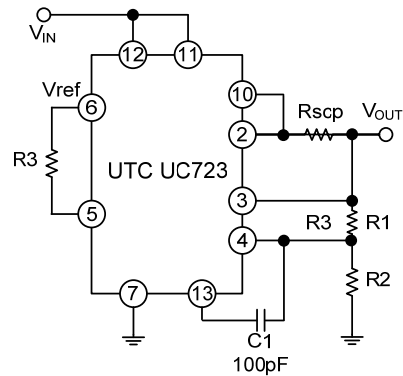
2: For C_{REF}, see Fig. 1

APPLICATION CIRCUIT



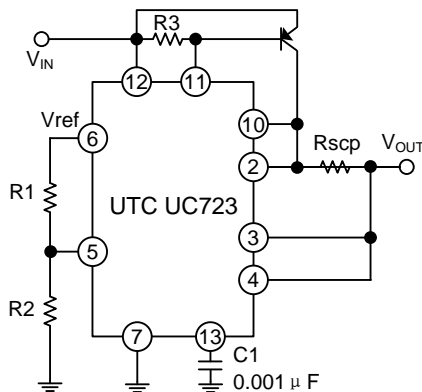
Regulator Output Voltage=5V
 Line Regulation ($\Delta V_{IN}=3V$)=0.5mV
 Load Regulation ($\Delta I_L=50mA$)=1.5mA
 Note $R3=R1 \cdot R2 / (R1+R2)$ for Minimum temperature drift

Fig. 1 Low Voltage Regulator circuit ($V_{OUT} = 2V \sim 7V$)



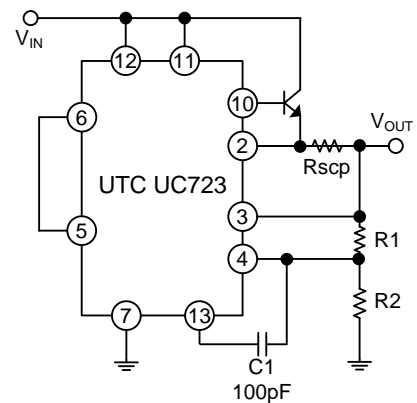
Regulator Output Voltage=5V
 Line Regulation ($\Delta V_{IN}=3V$)=1.5mV
 Load Regulation ($\Delta I_L=50mA$)=4.5mA
 Note $R3=R1 \cdot R2 / (R1+R2)$ for Minimum temperature drift

Fig. 2 High Voltage Regulator circuit ($V_{OUT} = 7V \sim 37V$)



Regulator Output Voltage=5V
 Line Regulation ($\Delta V_{IN}=3V$)=0.5mV
 Load Regulation ($\Delta I_L=1A$)=5mA

Fig. 3 Positive Voltage Regulator circuit (with external p-n-p pass transistor)



Regulator Output Voltage=15V
 Line Regulation ($\Delta V_{IN}=3V$)=1.5mV
 Load Regulation ($\Delta I_L=1A$)=15mA

Fig. 4 Positive Voltage Regulator circuit (with external n-p-n pass transistor)

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