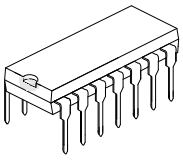
UC723

LINEAR INTEGRATED CIRCUIT

ADJUSTABLE VOLTAGE REGULATOR



DIP-14

■ 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

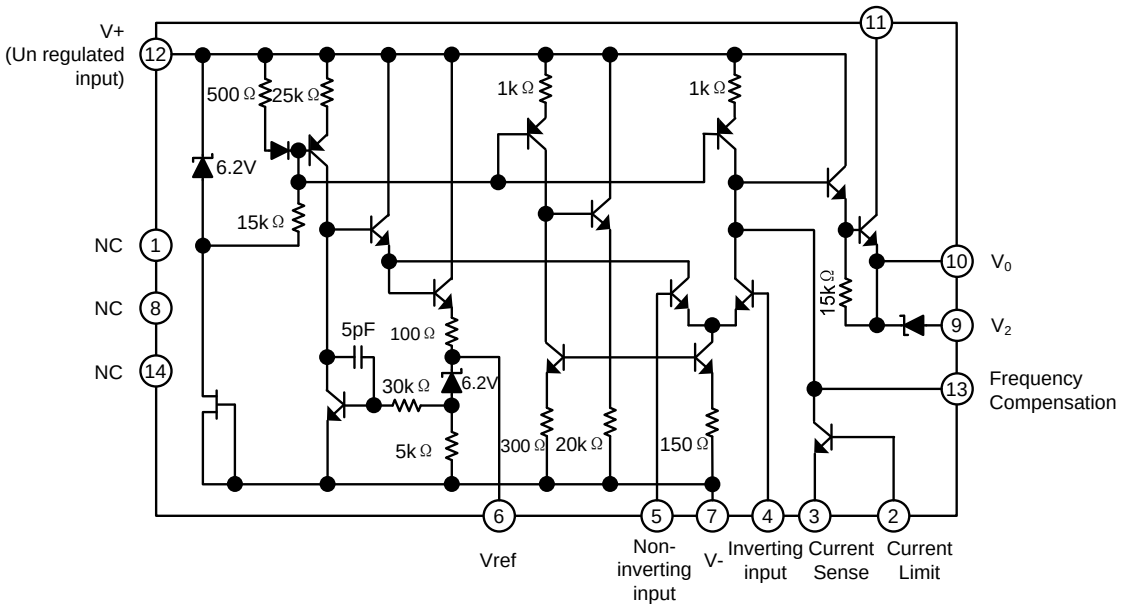
*Up to 150mA Output Current
*Adjustable Output Voltage (From 2V ~ 37V)
*Positive and Negative Voltage Regulation
*Regulation in Excess of 10A with Suitable Pass Transistors
*Input and Output Short-Circuit Protection
*Load and Line Regulation< 0.03%

■ ORDERING INFORMATION

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

UC723L-D14-T (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube (2) D14 : DIP-14 (3) G: Halogen Free, L: Lead Free

■ 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

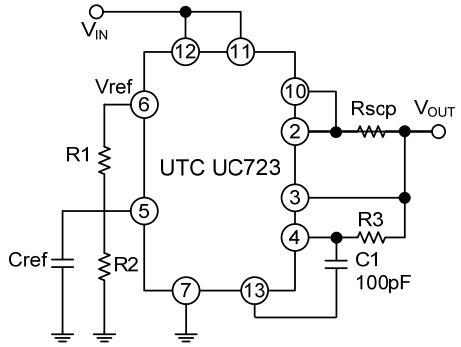
(T_A=25°C, V+=V_C=V_{IN}=12V, V_{OUT}=5V, I_L=1mA, C1=100Pf, C_{REF}=0, R_{SCP}=0, unless otherwise specified, divider impedance R1*R2 / (R1+R2) at non-inverting input, terminal 5=10KΩ)

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.

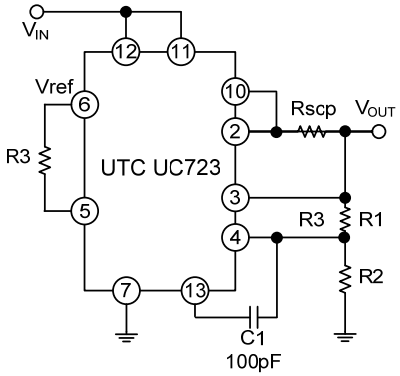
2: For C_{REF}, see Fig. 1

■ APPLICATION CIRCUIT



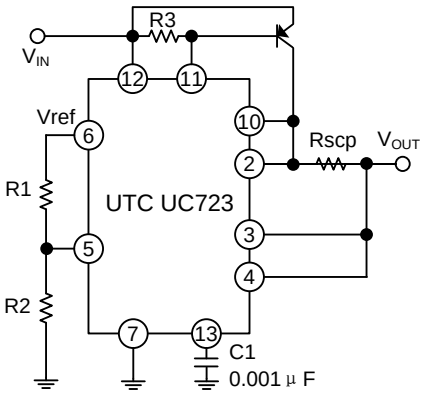
Regulator Output Voltage=5V
Line Regulation (ΔV_{IN}=3V)=0.5mV
Load Regulation (ΔI_L=50mA)=1.5mA
Note R3=R1*R2/(R1+R2)for Minmum temperature drift

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



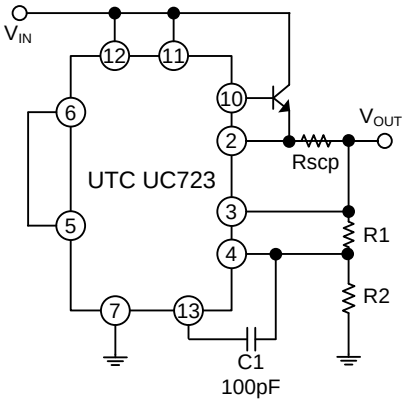
Regulator Output Voltage=5V
Line Regulation (ΔV_{IN}=3V)=1.5mV
Load Regulation (ΔI_L=50mA)=4.5mA
Note R3=R1*R2/(R1+R2)for Minmum temperature drift

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



Regulator Output Voltage=5V
Line Regulation (ΔV_{IN}=3V)=0.5mV
Load Regulation (ΔI_L=1A)=5mA

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



Regulator Output Voltage=15V
Line Regulation (ΔV_{IN}=3V)=1.5mV
Load Regulation (ΔI_L=1A)=15mA

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