



UC723

LINEAR INTEGRATED CIRCUIT

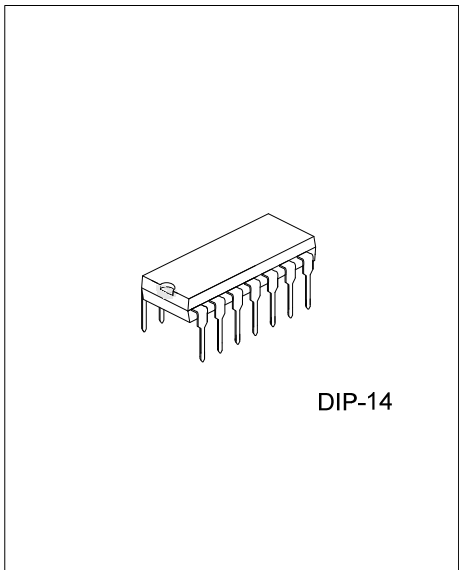
ADJUSTABLE VOLTAGE REGULATOR

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%



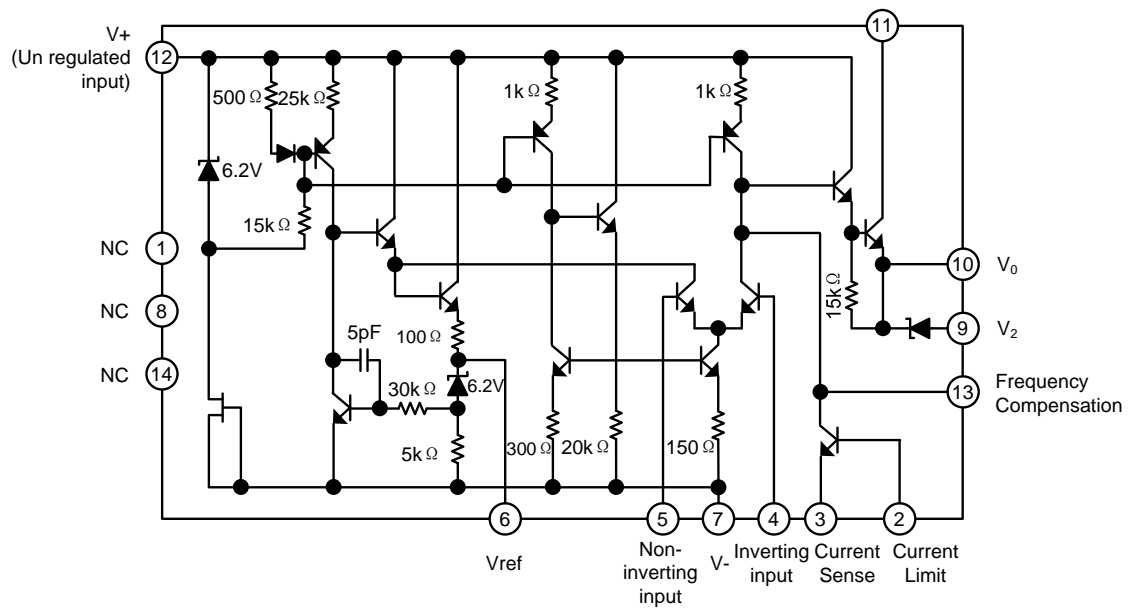
ORDERING INFORMATION

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



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■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$)

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	$^\circ\text{C}$
Storage Temperature	T_{STG}	-40 ~ 150	$^\circ\text{C}$
Junction Temperature	T_J	125	$^\circ\text{C}$

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

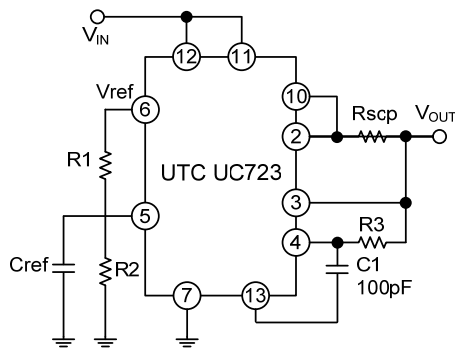
($T_A=25^\circ\text{C}$, $V_+=V_C=V_{IN}=12\text{V}$, $V_{OUT}=5\text{V}$, $I_L=1\text{mA}$, $C_1=100\text{pF}$, $C_{REF}=0$, $R_{SCP}=0$, unless otherwise specified, divider impedance $R_1 \cdot R_2 / (R_1 + R_2)$ at non-inverting input, terminal 5=10K Ω)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Regulator Current	I_{CCQ}	$I_L=0$, $V_{IN}=30\text{V}$		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}	$V_{IN}=12\text{V} \sim 40\text{V}$		0.6	1	% V_O
		$V_{IN}=12\text{V} \sim 15\text{V}$		0.01	0.1	
		$V_{IN}=12\text{V} \sim 15\text{V}$, $T_A=-55 \sim 125^\circ\text{C}$				
Load Regulation (Note 1)	ΔV_{OUT}	$I_L=1\text{mA} \sim 50\text{mA}$		0.03	0.15	% V_O
		$I_L=1\text{mA} \sim 50\text{mA}$, $T_A=-55 \sim 125^\circ\text{C}$			0.6	
Output Voltage Temperature Coefficient	ΔV_{OUT}	$T_A=-55 \sim 125^\circ\text{C}$		0.002	0.015	%/ $^\circ\text{C}$
Ripple Rejection (Note 2)	RR	$f=50\text{Hz} \sim 10\text{KHz}$		74		dB
		$f=50\text{Hz} \sim 10\text{KHz}$, $C_{REF}=5\mu\text{F}$		86		
		$T_{MIN} < T_{TYP} < T_{MAX}$		2.5		
Short Circuit Limiting Current	I_{LIM}	$R_{SCP}=10\Omega$, $V_{OUT}=0$		65		mA
Equivalent Noise RMS output Voltage (Note 2)	V_N	$BW=100\text{Hz} \sim 10\text{KHz}$, $C_{REF}=0$		-20		μV
		$BW=100\text{Hz} \sim 10\text{KHz}$, $C_{REF}=5\mu\text{F}$		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.

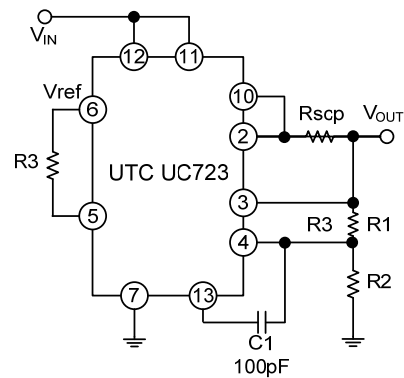
2: For C_{REF} , see Fig. 1

APPLICATION CIRCUIT



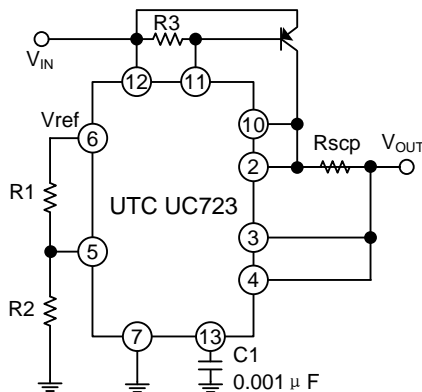
Regulator Output Voltage=5V
 Line Regulation ($\Delta V_{IN}=3V$)=0.5mV
 Load Regulation ($\Delta I_L=50mA$)=1.5mV
 Note $R3=R1 \cdot R2 / (R1+R2)$ for Minimum temperature drift

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



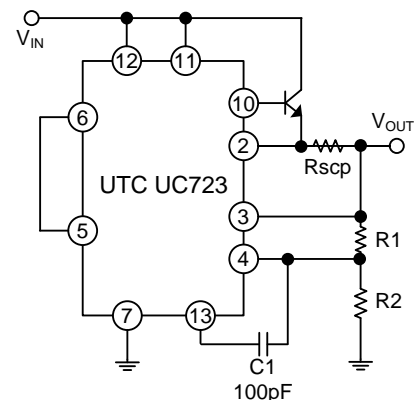
Regulator Output Voltage=5V
 Line Regulation ($\Delta V_{IN}=3V$)=1.5mV
 Load Regulation ($\Delta I_L=50mA$)=4.5mV
 Note $R3=R1 \cdot R2 / (R1+R2)$ for Minimum temperature drift

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 ($\Delta I_L=1A$)=5mV

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 ($\Delta I_L=1A$)=15mV

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

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