

# HK723

## AUDIO CONTROLLER IC

## AUDIO ECHO PROCESSOR ( II )

### Features

- \* Built-in adjustable OSC.
- \* Adjustable delay time setting: 30 ms ~ 700 ms
- \* Built-in power on reset circuit.
- \* Built-in 45KBits RAM for delay control.
- \* Low operating current.

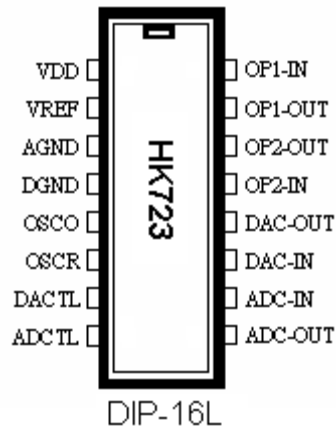
### General Description

HK723 is an Audio Echo Processor using CMOS Technology. It has built-in AD/DA and 45KBits RAM for time delay. External Resister adjust large range oscillation frequency and control delay time. Many combination to fit your applications.

### Application

- \* VCD
- \* Karaoke
- \* TV
- \* Audio System
- \* Car Stereo
- \* VCR

### PinOut Diagram



### Pin Description

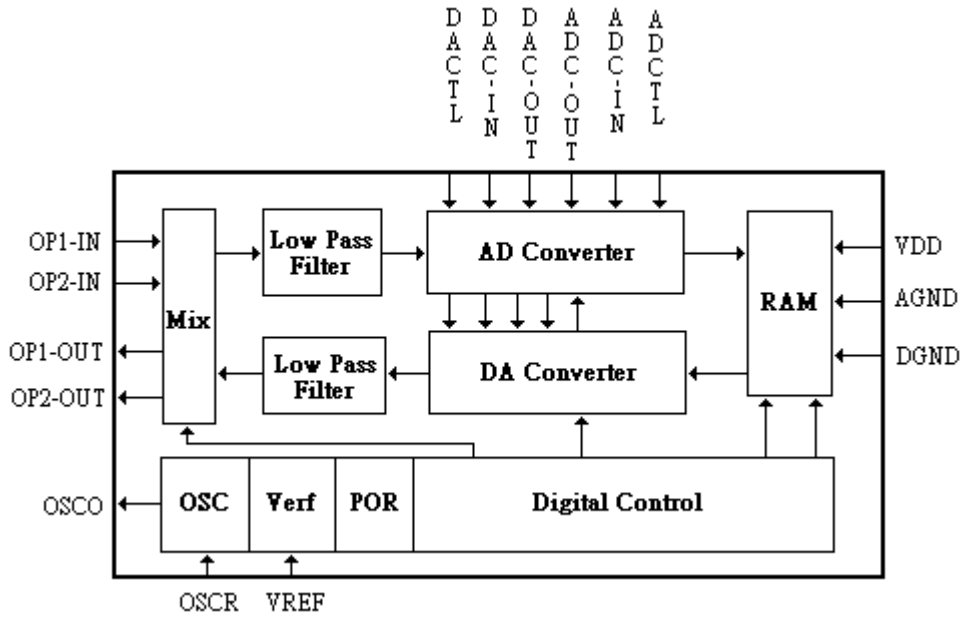
PIN NO	PIN NAME	DESCRIPTION	I/O
1	VDD	Positive power supply	Power
2	VREF	Analog reference voltage	A/I/O
3	AGND	Analog negative power supply	Power
4	DGND	Digital negative power supply	Power
5	OSCO	System clock output	OSC
6	OSCR	Add resistor to modify internal OSC	OSC
7	DACTL	DAC control	AIN
8	ADCTL	ADC control	AIN
9	ADC-OUT	ADC OP output	AOUT
10	ADC-IN	ADC OP input	AIN
11	DAC-IN	DAC OP input	AIN
12	DAC-OUT	DAC OP output	AOUT
13	OP2-IN	OP2 input	AIN
14	OP2-OUT	OP2 output	AOUT
15	OP1-OUT	OP1 output	AOUT
16	OP1-IN	OP1 input	AIN

# HK723

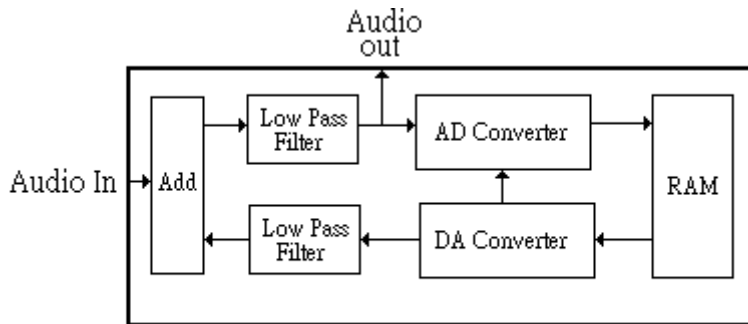
## AUDIO CONTROLLER IC

## AUDIO ECHO PROCESSOR ( II )

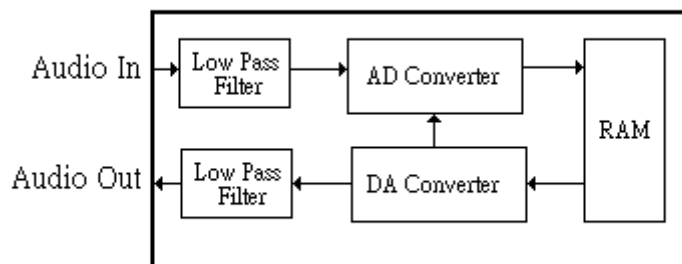
### Block Diagram



### Echo Mode & Surround Mode



Echo Mode



Surround Mode

# HK723

## AUDIO CONTROLLER IC

## AUDIO ECHO PROCESSOR ( II )

### Delay Time Table

OSCR	Fosc (MHz)	Delay Time ms
160 K $\Omega$	1.047	737.28
75 K $\Omega$	1.989	368.64
33 K $\Omega$	3.935	184.32
24 K $\Omega$	4.893	160.00
18 K $\Omega$	5.974	122.88
11 K $\Omega$	7.977	92.16
6.8 K $\Omega$	9.99	73.73
4.7 K $\Omega$	11.84	61.44
3.3 K $\Omega$	13.72	52.66
2.4 K $\Omega$	15.94	46.08
1.8 K $\Omega$	18.18	40.96
1.5 K $\Omega$	19.68	36.86
1.1 K $\Omega$	22.05	33.51
820 $\Omega$	23.87	30.72

### AC Characteristics

(Vcc = 5.0V, f<sub>in</sub> = 1KHz, Vi = 100mVrms, f<sub>ck</sub> = 4.608MHz, Ta = 25°C , unless otherwise noted)

Symbol	Parameter	Test condition	Min	Typ	Max	Unit
Icco	Supply current			10	20	mA
Gv	Voltage gain	RL = 47K $\Omega$		-0.5	2.5	dB
Vomax	Maximum output voltage	THD = 10%	0.8	1.4		Vrms
THD	Output distortion			0.38	0.9	%
No	Output noise voltage			-85	-70	dBV
PSRR	Power supply rejection ratio	$\Delta$ Vcc = -20 dBV f = 100 Hz		-40	-25	dB
Tmute	Mute time		560	600	640	msec

### DC Characteristics

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
Vcc	Supply voltage	4.5	5	5.5	V
Icc	Supply current		10	20	mA
V <sub>IH</sub>	"H" input voltage	0.7V			V
V <sub>IL</sub>	"L" input voltage			0.3V	V

# HK723

## AUDIO CONTROLLER IC

## AUDIO ECHO PROCESSOR ( II )

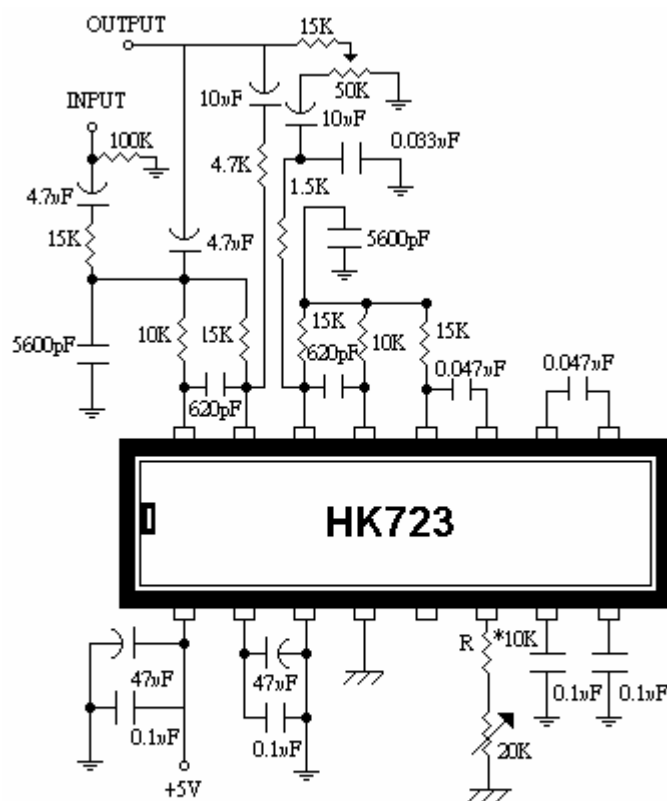
### Absolute Maximum Ratings

( Ta = 25°C , unless otherwise noted )

Symbol	Decription	Limits	Unit
Vcc	Supply voltage	6.5	V
Icc	Supply current	100	mA
Pd	Power dissipation	1.7	W
Topr	Operation temperature	-20 ~ 75	°C
Tstg	Storage temperature	-25 ~ 125	°C

### Application Circuit

#### Echo Mode



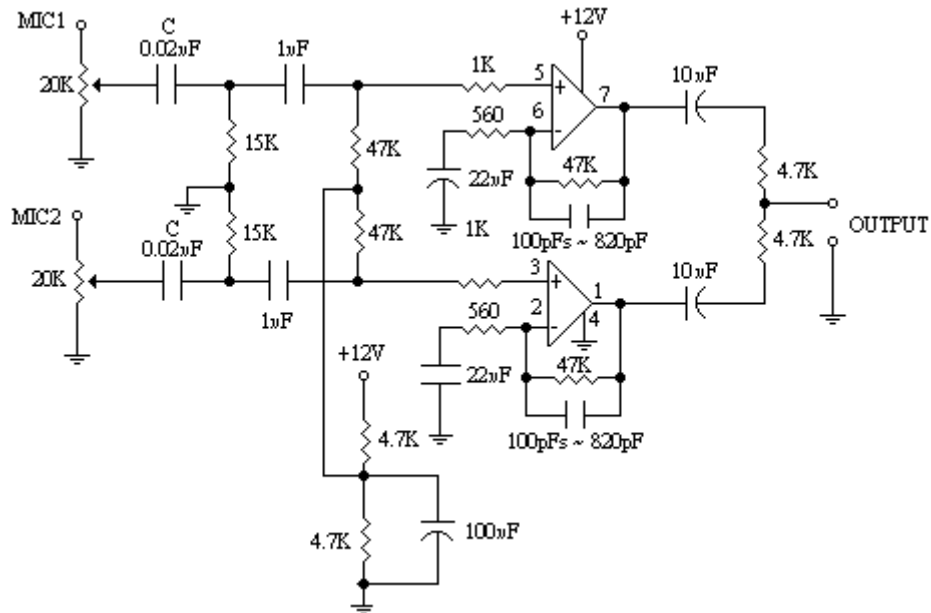
1. Pin 6, R is approximate 1K ~ 160K
2.  $\perp$  Represent Analog Ground
3.  $\text{///}$  Represent Digital Ground

# HK723

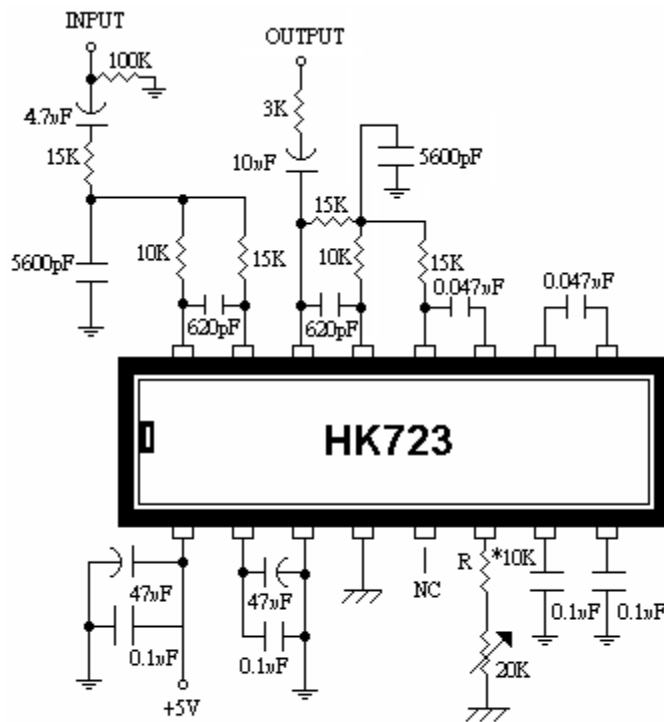
## AUDIO CONTROLLER IC

## AUDIO ECHO PROCESSOR (II)

### Mic Pre-Amp Circuit



### Surround Mode



1. Pin 6, R is approximate 1K ~ 160K
2.  $\perp$  Represent Analog Ground
3.  $\text{///}$  Represent Digital Ground