

## Features

- It includes an internal VCO ( Voltage-controlled oscillator ) for the system clock and can be adjusted to the suitable frequency by using the external resistor and capacitor.
- It includes an A/D , D/A converter ( adaptive delta modulation ) , two low pass filters and a 32k bits SRAM .

## Description

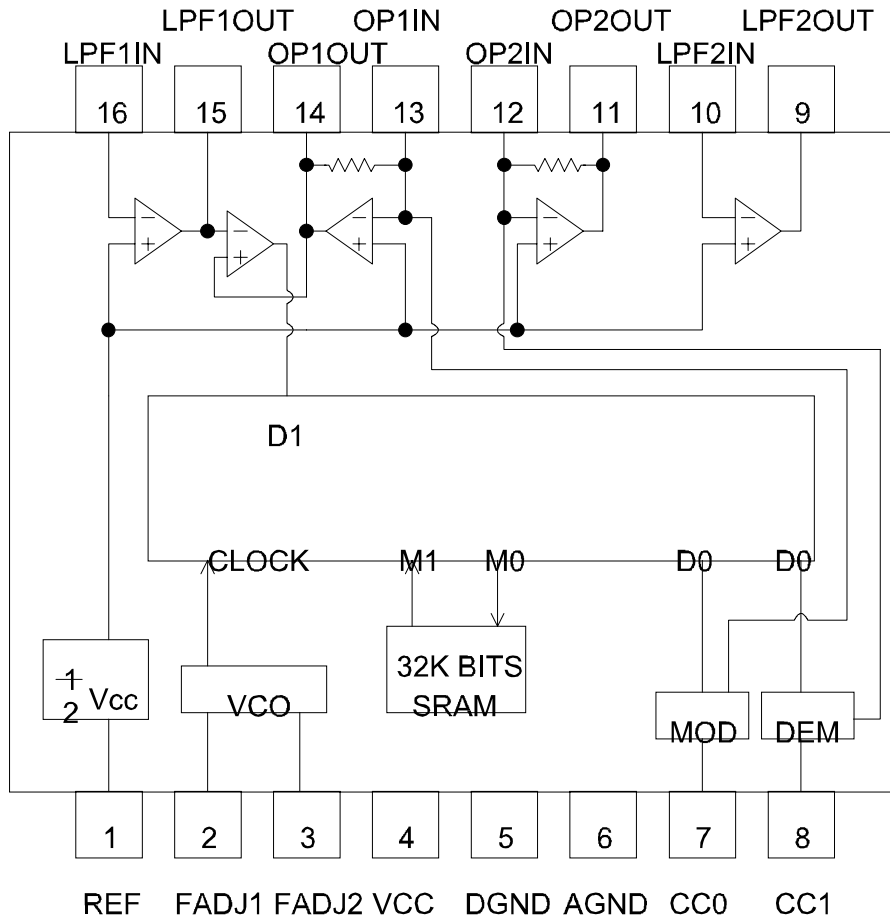
ES56033 is an echo effect generator IC . It has an internal VCO circuit to provide the system clock , and it is easily to adjust the suitable frequency with external variable resistor . It has an ADC , DAC and uses digital processing audio signal for the delay time .

ES56033 can be easily used in the karaoke , T.V. and other electronic instruments .

## Application

- KARAOKE
- TV
- Video disc player

## Function Block Diagram



Pad assignment



### Pin description

Pin	Name	Type	Function
1	REF	I	Reference voltage ( = 1/2 VCC ) .
2	FADJ1		Frequency_adjust 1 .
3	FADJ2		Frequency_adjust 2 .
4	VCC	I	Supply voltage input .
5	DGND		Digital ground .
6	AGND		Analog ground .
7	CC0		Current control 0 .
8	CC1		Current control 1 .
9	LPF2OUT	O	Low pass filter 2 output .
10	LPF2IN	I	Low pass filter 2 input .
11	OP2OUT	O	It can be used as demodulated integrator by connected capacitor .
12	OP2IN	I	It can be used as demodulated integrator by connected capacitor .
13	OP1IN	I	It can be used as modulated integrator by connected capacitor .
14	OP1OUT	O	It can be used as modulated integrator by connected capacitor .
15	LPF1OUT	O	Low pass filter 1 output .
16	LPF1IN	I	Low pass filter 1 input .

## Absolute Maximum Ratings

( Ta = 25 ° C , unless otherwise noted )

Symbol	Description	Limits	Unit
Vcc	Supply voltage	6.5	V
Topr	Operation temperature	-20~75	°C
Tstg	Storage temperature	-25~125	°C
Pd	Power dissipation	0.9	W

## Recommended Operating Conditions

Supply voltage range ..... 4.5 ~ 5.5 V

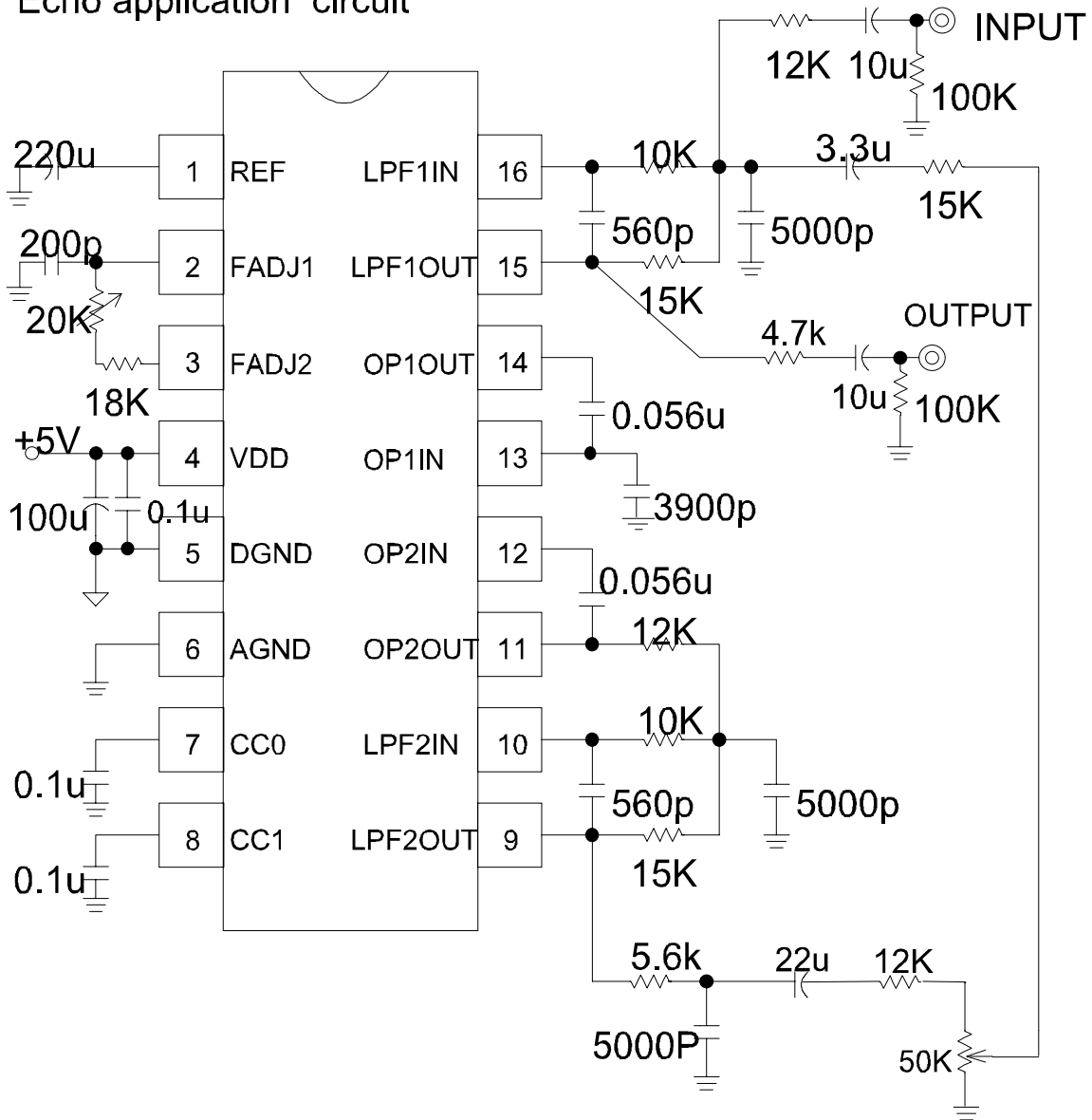
Rated supply voltage ..... 5 V

## Electrical Characteristics

(  $V_{CC} = 5.0\text{ V}$  ,  $f_{ck}=500\text{KHz}$ ,  $f_{in} = 1\text{ KHz}$  ,  $V_i = 100\text{ mVrms}$  ,  
 $T_a = 25\text{ }^\circ\text{C}$  , unless otherwise noted )

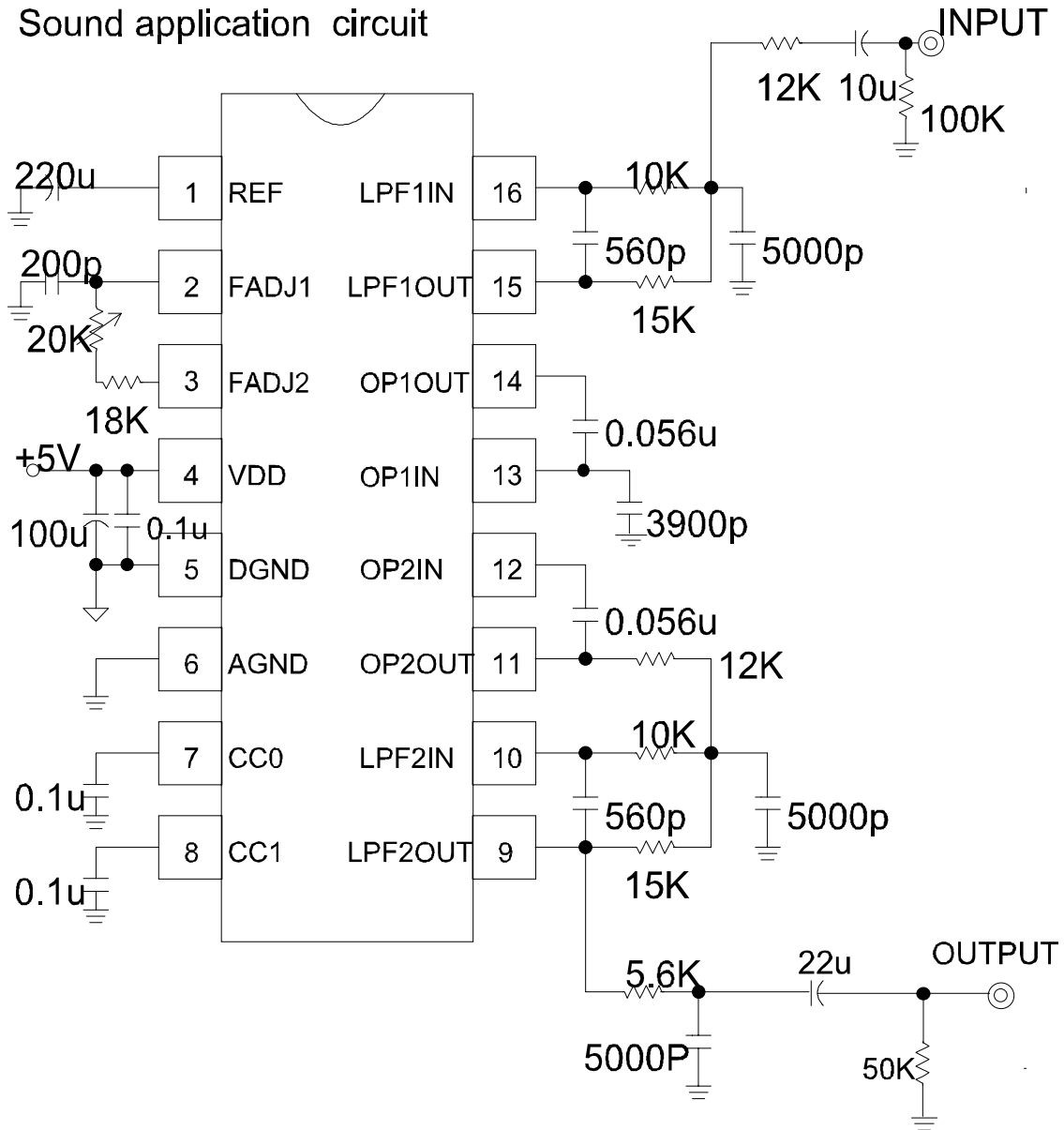
Symbol	Parameter	Test condition	Min	Typ	Max	Unit
I <sub>cc</sub>	Supply current			10	12	mA
G <sub>v</sub>	Gain	R <sub>load</sub> =50 K $\Omega$	-2.5	0	2.5	dB
THD	Total harmonic distortion			0.5	1.5	%
No	Noise			-75	-65	dBV

### Echo application circuit



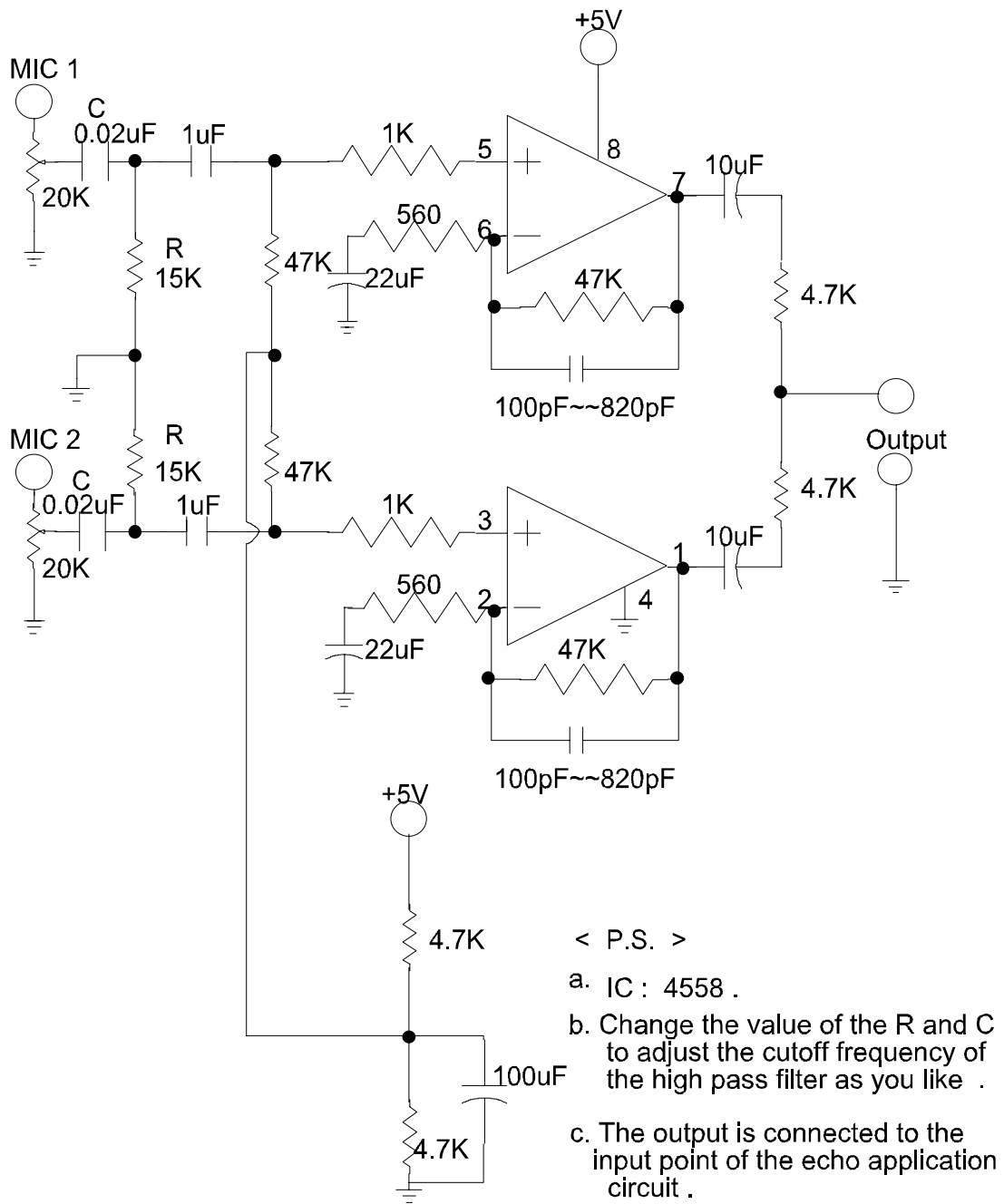
\*Note : ES56033's working frequency ( Fw ) can be measured from the Pin 3 .  
And advise ES56033's Fw from 230KHz to 400KHz .

### Sound application circuit



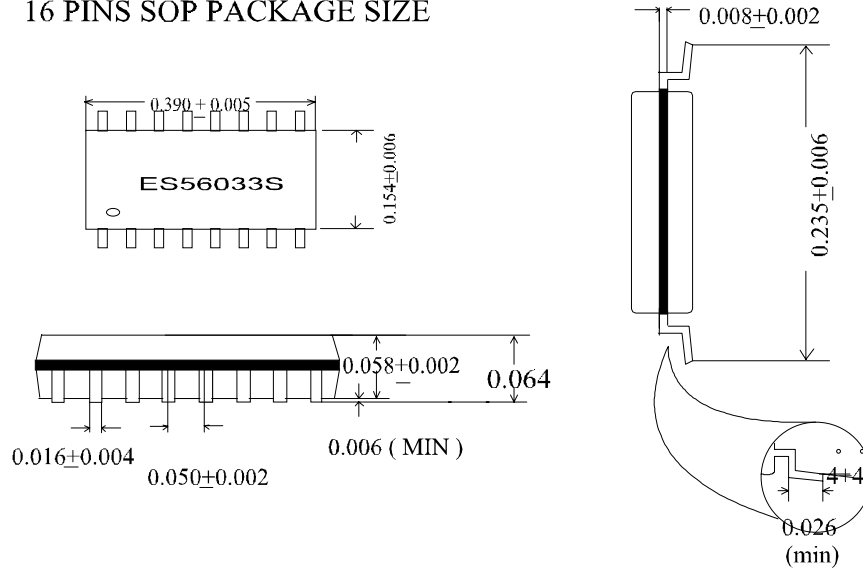
\* ECHO application circuit ( continued )

### MIC Pre-Amp Application circuit

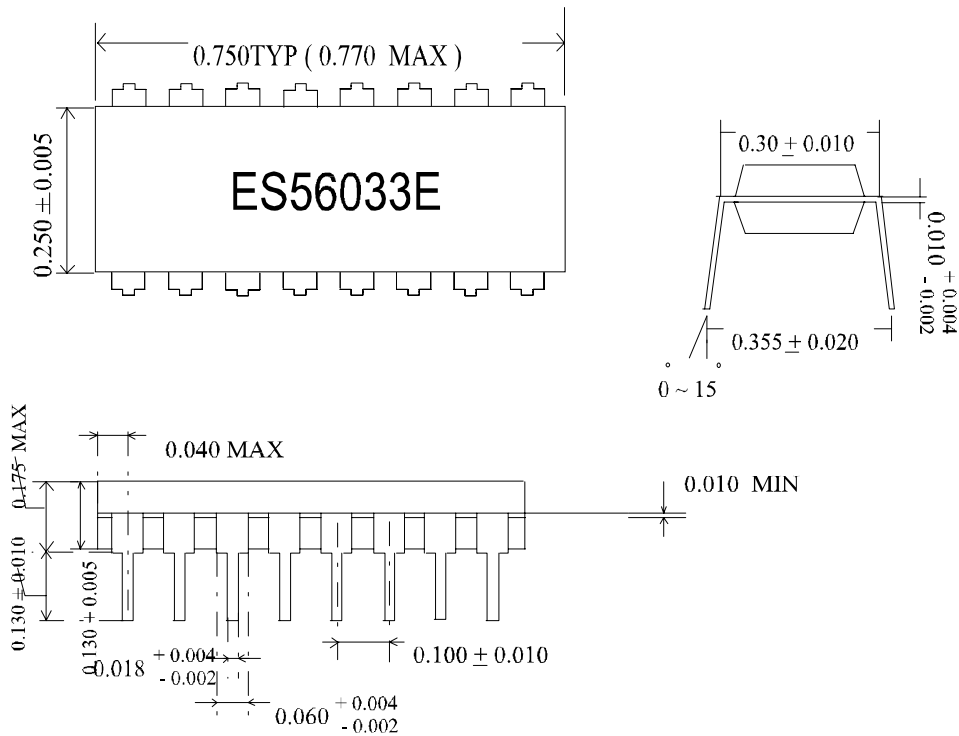




### 16 PINS SOP PACKAGE SIZE



### 16 PINS DIP PACKAGE SIZE



unit : inch