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## Echo IC with Built-in Microphone Amplifier & Output Mixer

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**PT2390**

### DESCRIPTION

PT2390 is a digital echo IC utilizing CMOS Technology. Microphone Amplifier, Output Mixer, internal 44K RAM and Vocal Switch are all integrated in a single chip to provide a digital echo IC of the the highest standard. Very low distortion and high S/N Ratio qualities, not to mention the built-in VCO feature which eliminates the need for an external crystal oscillator are just some of the features of PT2390. Pin assignments and application circuit are optimized for easy PCB Layout and low cost effectiveness.

### FEATURES

- CMOS Technology
- Least External Component
- 5V Power Supply
- 2 Microphone Amplifier and KARAOKE Automatic Vocal Changer
- Built-in 44K RAM
- Built-in VCO, eliminating the need for a crystal oscillator
- Low Total Harmonic Distortion : Microphone Pre-Amplifier <0.09% (typ.)  
: Echo Processor < 0.5% (typ.)
- High S/N Ratio : Microphone Pre-Amplifier > 85 (no - weighting)  
: Echo Processor > 80 dB (no - weighting)
- Available in 28-pin, DIP or SO Package

### APPLICATIONS

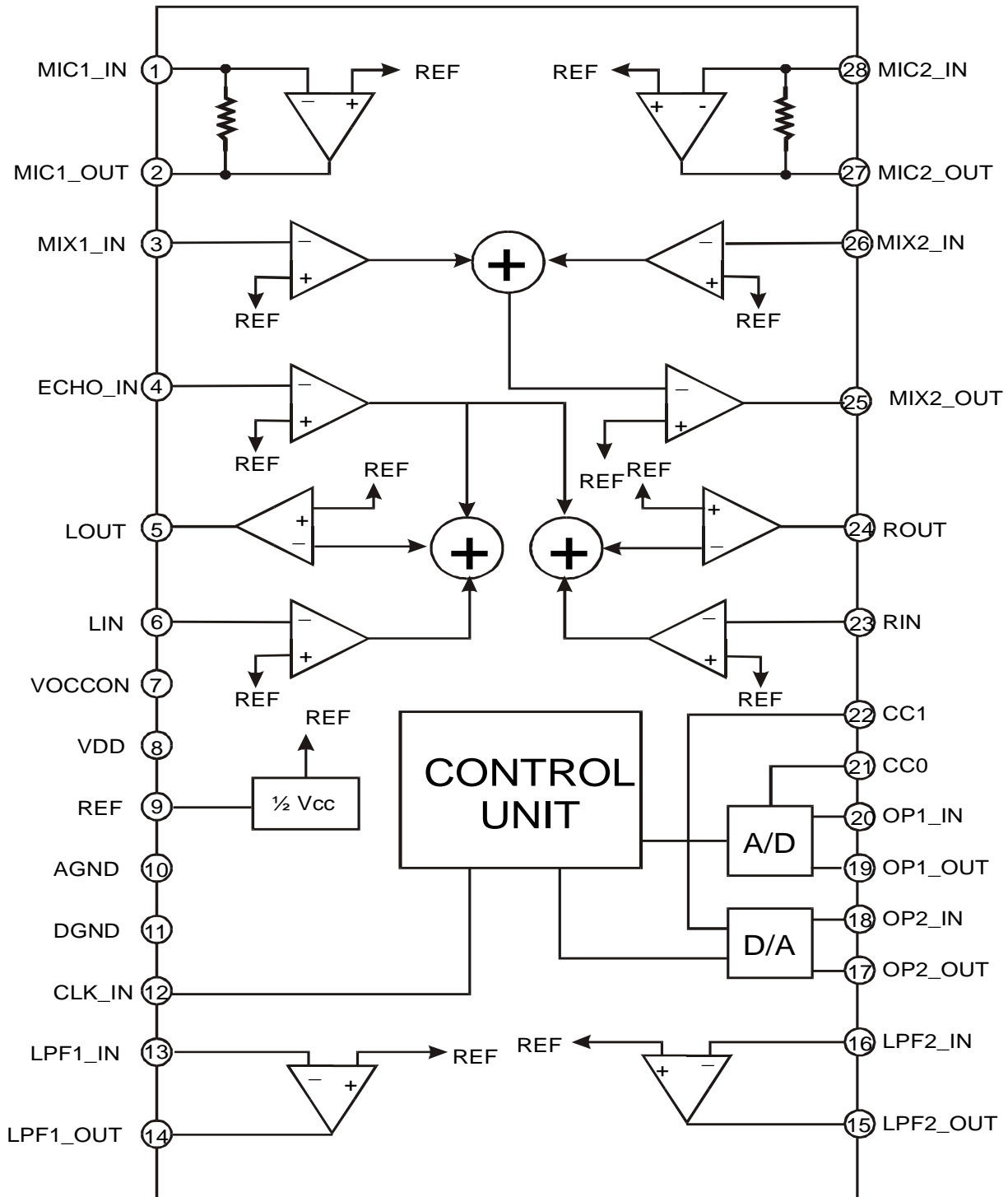
- DVD, VCD
- KARAOKE
- VCR
- Mini Compo
- Other Audio Equipments



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## BLOCK DIAGRAM





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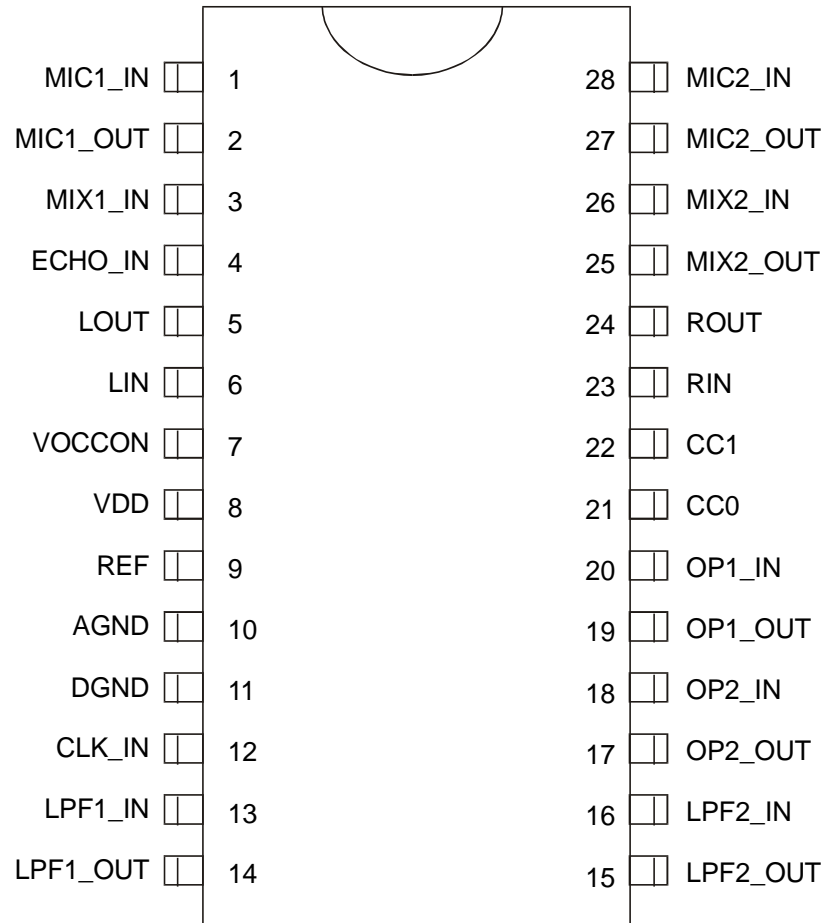
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**PIN CONFIGURATION**



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## Echo IC with Built-in Microphone Amplifier & Output Mixer

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### PIN DESCRIPTION

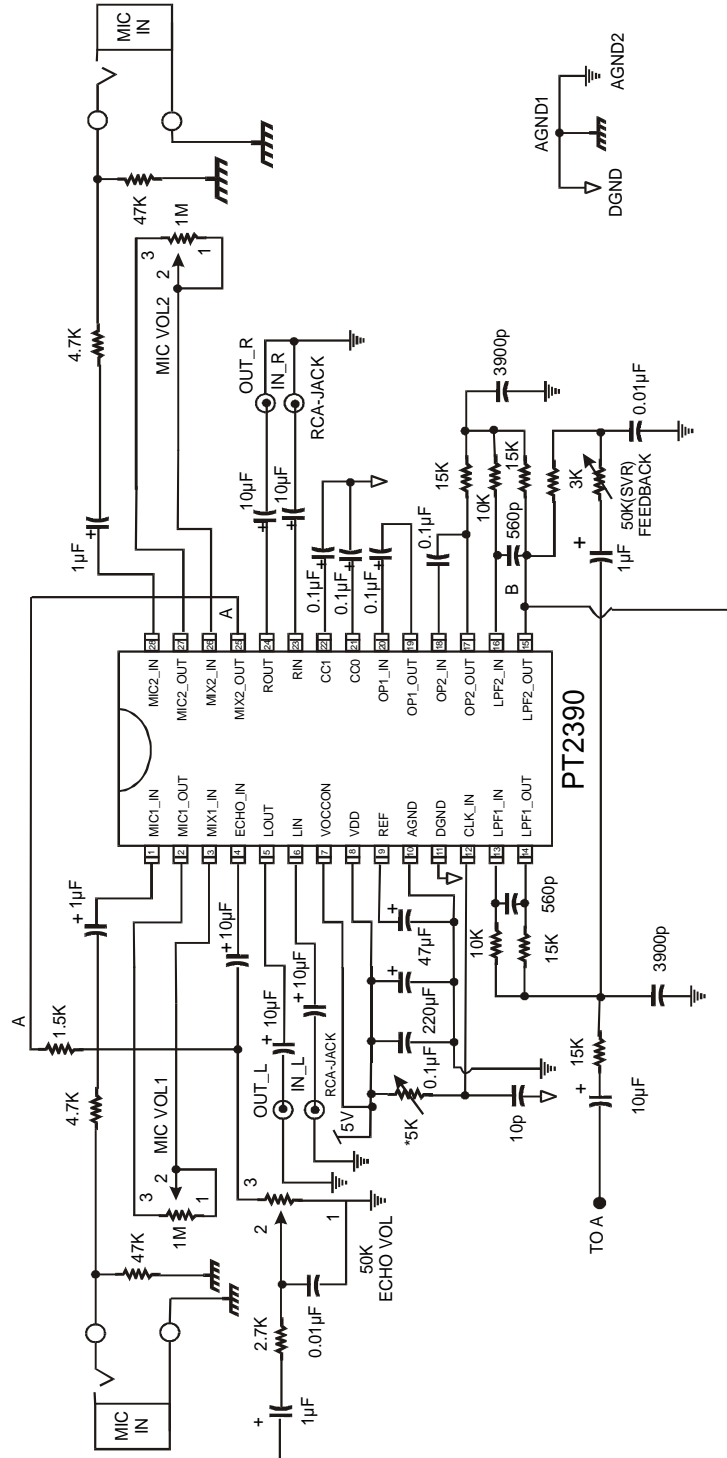
| Pin Name | I/O | Description  | Pin No. |
|----------|-----|--|---------|
| MIC1_IN  | I   | Microphone 1 Amplifier Input   | 1       |
| MIC2_OUT | O   | Microphone 1 Amplifier Output  | 2       |
| MIX1_IN  | I   | Mixer 1 Input  | 3       |
| ECHO_IN  | I   | Echo Input   | 4       |
| LOUT     | O   | Left Channel Output  | 5       |
| LIN      | I   | Left Channel Input   | 6       |
| VOCCON   | I   | Auto-Vocal Changer Control Terminal<br>When this pin is pulled "HIGH" (VDD), RIN is connected to ROUT and LIN is connected to LOUT.<br>When this pin is pulled "LOW" (GND), LIN is connected to ROUT and LOUT. | 7       |
| VDD      | -   | Power Supply   | 8       |
| REF      | -   | Reference Voltage<br>Connects to 47 $\mu$ f to GND   | 9       |
| AGND     | -   | Analog Ground  | 10      |
| DGND     | -   | Digital Ground   | 11      |
| CLK_IN   | I   | System Clock Input   | 12      |
| LPF1_IN  | I   | Low-Pass Filter 1 Input  | 13      |
| LPF1_OUT | O   | Low-Pass Filter 1 Output   | 14      |
| LPF2_IN  | I   | Low-Pass Filter 2 Input  | 15      |
| LPF2_OUT | O   | Low-Pass Filter 2 Output   | 16      |
| OP2_OUT  | O   | OP Amplifier 2 Output  | 17      |
| OP2_IN   | I   | OP Amplifier 2 Input   | 18      |
| OP1_OUT  | O   | OP Amplifier 1 Output  | 19      |
| OP1_IN   | I   | OP Amplifier 1 Input   | 20      |
| CC0      | -   | Current Control 0  | 21      |
| CC1      | -   | Current Control 1  | 22      |
| RIN      | I   | Right Channel Input  | 23      |
| ROUT     | O   | Right Channel Output   | 24      |
| MIX2_OUT | O   | Mixer 2 Output   | 25      |
| MIX2_IN  | I   | Mixer 2 Input  | 26      |
| MIC2_OUT | O   | Microphone 2 Amplifier Output  | 27      |
| MIC2_IN  | I   | Microphone 2 Amplifier Input   | 28      |



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### APPLICATION CIRCUIT



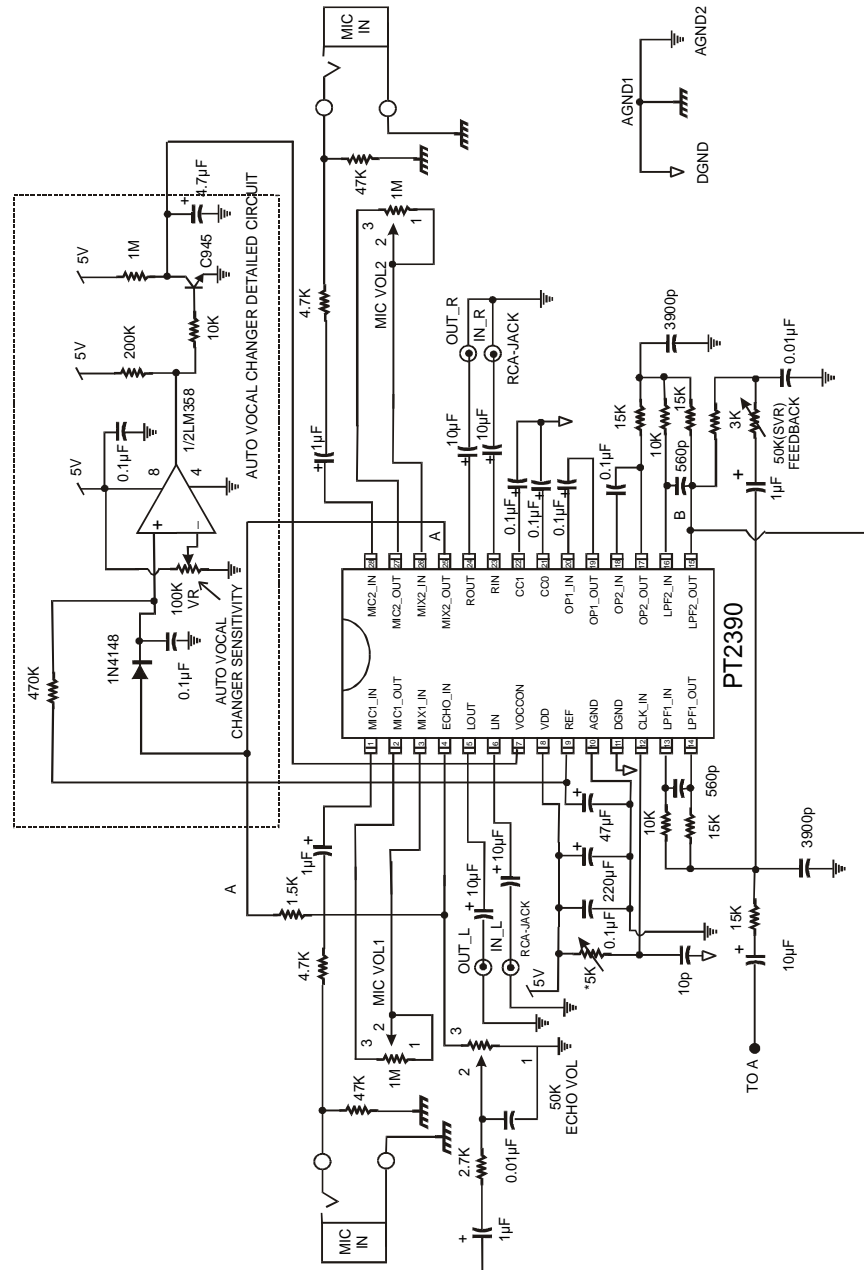
Note: \* = You can adjust the 5K Variable Resistor value in order to change the Oscillator Frequency. The Oscillator waveform can be measured from Pin No.12. It must be kept in mind that the probe's capacitor can cause erroneous oscillator waveform measurement.



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## AUTO-VOCAL CHANGER APPLICATION CIRCUIT



### Guidelines in using this Application Circuit:

1. IN\_R must be connected to Human Vocal Input.
2. IN\_L must be connected to KARAOKE Music

Note: \* = You can adjust the 5K Variable Resistor value in order to change the Oscillator Frequency. The Oscillator waveform can be measured from Pin No.12. It must be kept in mind that the probe's capacitor can cause erroneous oscillator waveform measurement.



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**PT2390**

**ORDER INFORMATION**

| Valid Part Number | Package                |
|-------------------|------------------------|
| PT2390            | 28 Pins, DIP (300 mil) |
| PT2390-S          | 28 Pins, SO (300 mil)  |