



## DESCRIPTION

PT2399 is an echo audio processor IC utilizing CMOS Technology which is equipped with ADC and DAC, high sampling frequency and an internal memory of 44K. Digital processing is used to generate the delay time, it also features an internal VCO circuit in the system clock, thereby, making the frequency easily adjustable. PT2399 boasts of very low distortion (THD<0.5%) and very low noise (No<-90dBV), thus producing high quality audio output. The pin assignments and application circuit are optimized for easy PCB layout and cost saving advantage.

## FEATURES

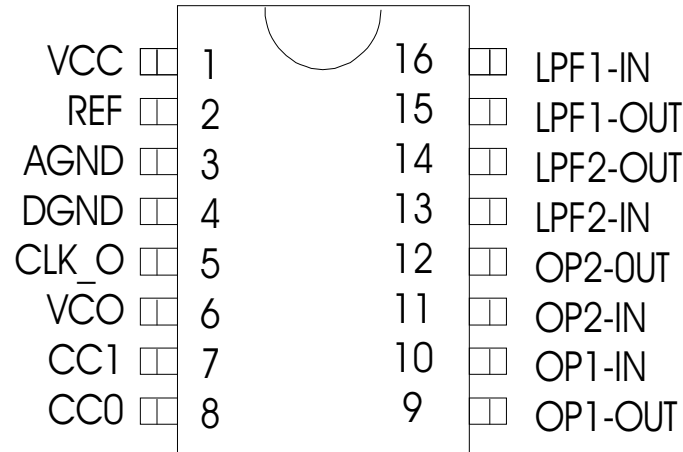
- CMOS Technology
- Least External Components
- Auto Reset Function
- Low Noise, No<-90dBV Typical
- Low Distortion, THD<0.5% Typical
- External Adjustable VCO
- Available in 16 pins, DIP or SO package

## APPLICATIONS

- Video Tape Recorder
- Video Compact Disk
- Television
- CD Player
- Car Stereo
- KARAOKE Mixer
- Electronic Musical Instrument
- Audio Equipment with Echo Processor



## PIN CONFIGURATION



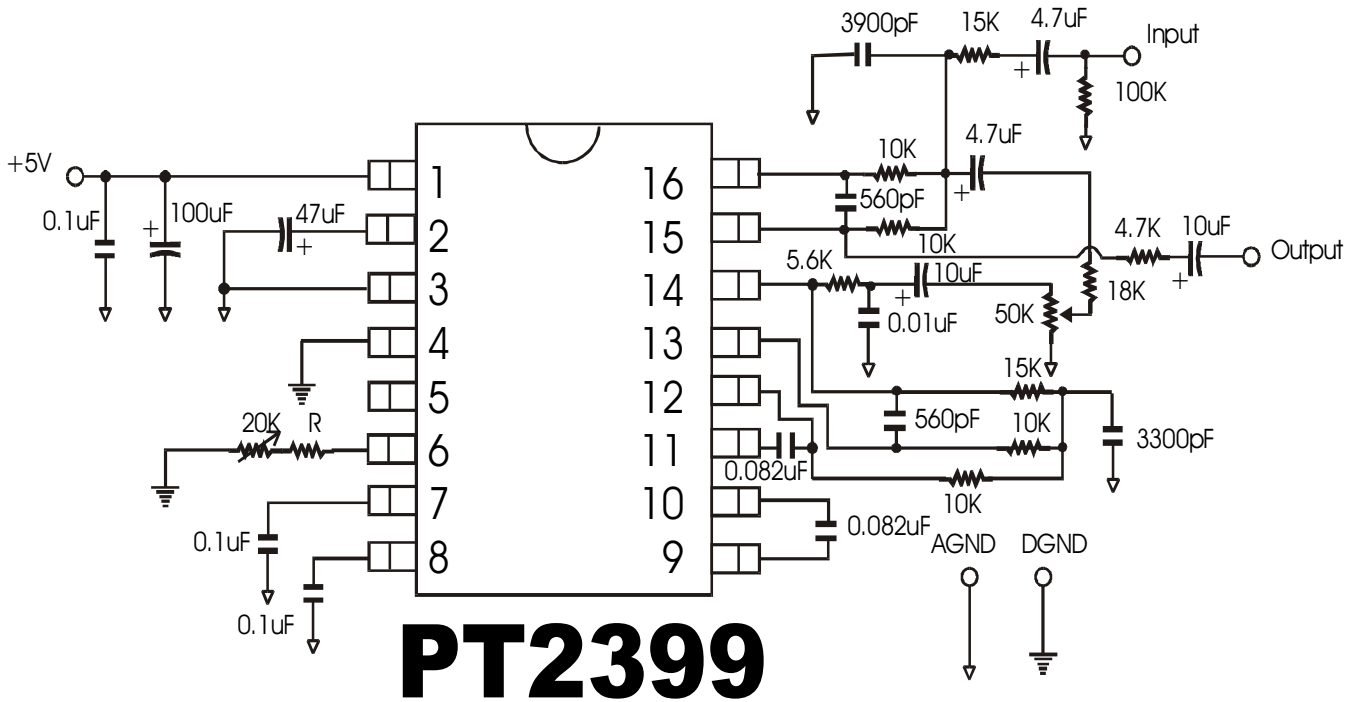
## PT2399

## ORDER INFORMATION

| Part Number | Package                        |
|-------------|--------------------------------|
| PT2399      | 16 Pins, DIP Package (300 mil) |
| PT2399S     | 16 Pins, SO Package (300 mil)  |



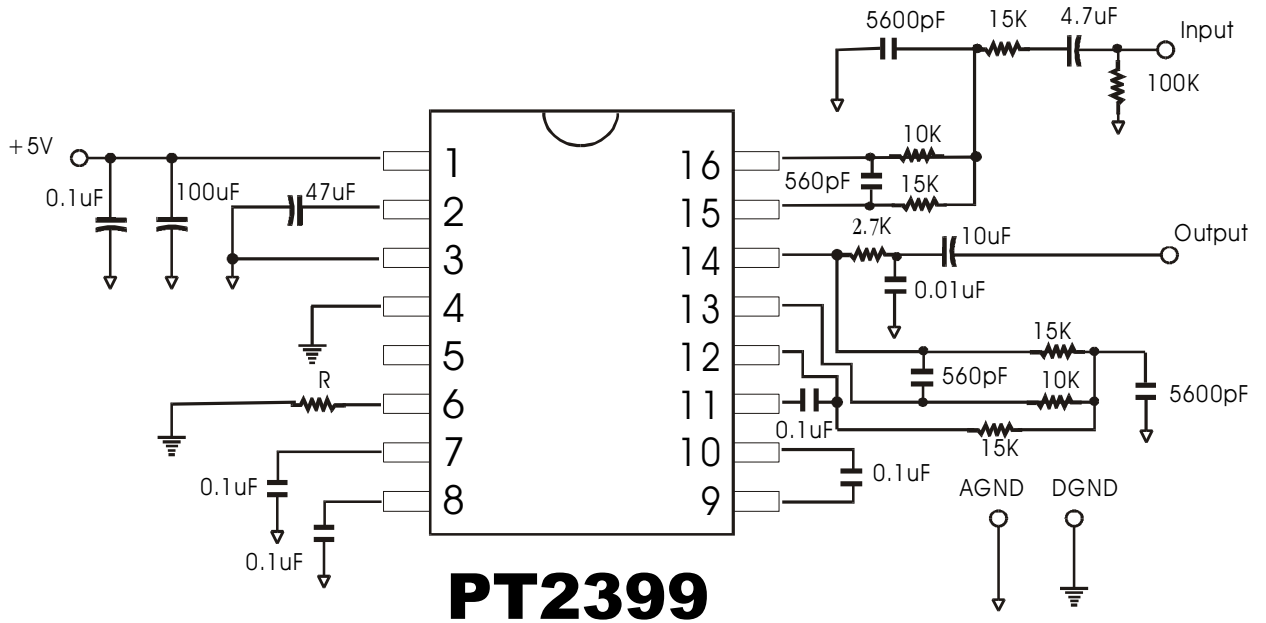
# PT2399 ECHO APPLICATION CIRCUIT



Note: External Resistor having a value of 10 K Ohms to 50 K Ohms may be used. The recommended Resistor Value ( R ) is 10 K Ohms. When the value of the Resistor ( R ) increases, the range of the Delay Time also increases.



## PT2399 SURROUND/DELAY APPLICATION CIRCUIT



Note: Please refer to Table 1 for the Resistor/Delay Time values



**TABLE 1: RESISTOR/DELAY TIME VALUES**

|     |       |       |       |       |       |       |         |         |
|-----|-------|-------|-------|-------|-------|-------|---------|---------|
| R   | 27.6K | 21.3K | 17.2K | 14.3K | 12.1K | 10.5K | 9.2K    | 8.2K    |
| fck | 2.0M  | 2.5M  | 3.0M  | 3.5M  | 4.0M  | 4.5M  | 5.0M    | 5.5M    |
| td  | 342ms | 273ms | 228ms | 196ms | 171ms | 151ms | 136.6ms | 124.1ms |
| THD | 1.0%  | 0.8%  | 0.63% | 0.53% | 0.46% | 0.41% | 0.36%   | 0.33%   |

|     |         |         |        |        |        |       |        |        |
|-----|---------|---------|--------|--------|--------|-------|--------|--------|
| R   | 7.2K    | 6.4K    | 5.8K   | 5.4K   | 4.9K   | 4.5K  | 4K     | 3.4K   |
| fck | 6.0M    | 6.5M    | 7.0M   | 7.5M   | 8.0M   | 8.5M  | 9.0M   | 10M    |
| td  | 113.7ms | 104.3ms | 97.1ms | 92.2ms | 86.3ms | 81ms  | 75.9ms | 68.1ms |
| THD | 0.29%   | 0.27%   | 0.25%  | 0.25%  | 0.23%  | 0.22% | 0.21%  | 0.19%  |

|     |        |        |        |        |        |       |        |        |
|-----|--------|--------|--------|--------|--------|-------|--------|--------|
| R   | 2.8K   | 2.4K   | 2K     | 1.67K  | 1.47K  | 1.28K | 1.08K  | 894    |
| fck | 11M    | 12M    | 13M    | 14M    | 15M    | 16M   | 17M    | 18M    |
| td  | 61.6ms | 56.6ms | 52.3ms | 48.1ms | 45.8ms | 43ms  | 40.6ms | 38.5ms |
| THD | 0.18%  | 0.16%  | 0.15%  | 0.15%  | 0.15%  | 0.15% | 0.14%  | 0.14%  |

|     |        |        |        |        |
|-----|--------|--------|--------|--------|
| R   | 723    | 519    | 288    | 0.5    |
| fck | 19M    | 20M    | 21M    | 22M    |
| td  | 36.6ms | 34.4ms | 32.6ms | 31.3ms |
| THD | 0.14%  | 0.13%  | 0.13%  | 0.13%  |

Note: R = External Resistor (Ohms), please refer to PT2399 Surround/Delay Time Application Circuit  
 fck = Clock Frequency (Hz)  
 td = Delay Time  
 THD = Total Harmonic Distortion