

CS4390

24-Bit, Stereo D/A Converter for Digital Audio

The following information is based on the technical datasheet:

CS4390 DS264PP1 MAY '97

Please contact Cirrus Logic : Crystal Semiconductor Products Division for further information.

CRYSTAL SEMICONDUCTOR PRODUCTS DIVISION PRODUCT INFORMATION

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PI264PP1 JAN '98

24-Bit, Stereo D/A Converter for Digital Audio

Features

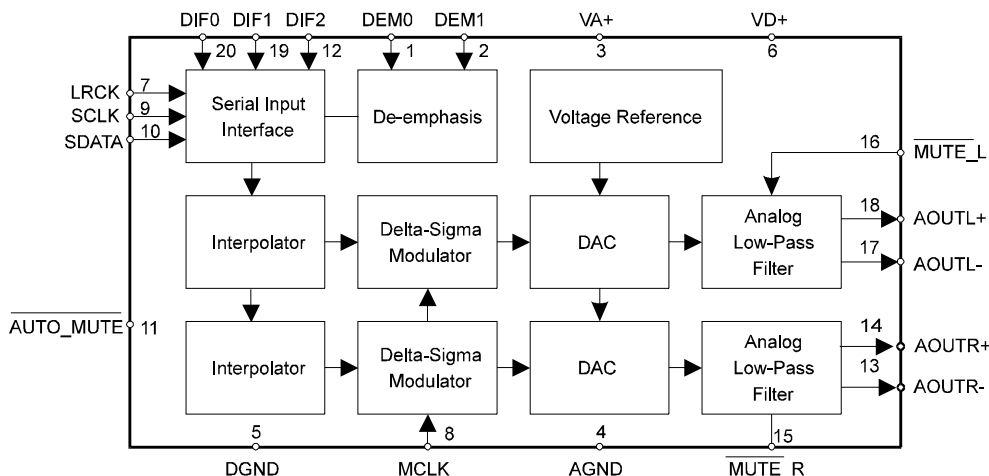
- 24-Bit Conversion
- 115 dB Signal-to-Noise-Ratio (EIAJ)
- 106 dB Dynamic Range
- -97 dB THD+N
- 128x Oversampling
- Low Clock Jitter Sensitivity
- Filtered Line-Level Outputs
 - Linear Phase Filtering
 - Zero Phase Error Between Channels
- Adjustable System Sampling Rates
 - including 32 kHz, 44.1 kHz & 48 kHz
- Digital De-emphasis for 32 kHz, 44.1 kHz & 48 kHz
- Pin Compatible with CS4329

Description

The CS4390 is a complete stereo digital-to-analog output system. In addition to the traditional D/A function, the CS4390 includes a digital interpolation filter followed by 128X oversampled delta-sigma modulator. The modulator output controls the reference voltage input to an ultra-linear analog low-pass filter. This architecture allows for infinite adjustment of sample rate between 1 and 50 kHz while maintaining linear phase response simply by changing the master clock frequency.

The CS4390 also includes an extremely flexible serial port utilizing mode select pins to support multiple interface formats.

The master clock can be either 256, 384, or 512 times the input sample rate, supporting various audio environments.



Overview

The CS4390 is a complete stereo digital-to-analog system including 128× digital interpolation, fourth-order delta-sigma digital-to-analog conversion, 128× oversampled one-bit delta-sigma modulator and analog filtering. This architecture provides a low sensitivity to clock jitter. The DAC converts digital data at any input sample rate between 1 and 50 kHz, including the standard audio rates of 48, 44.1 and 32 kHz.

The primary purpose of using delta-sigma modulation techniques is to avoid the limitations of laser trimmed resistive DAC architectures by using an inherently linear 1-bit DAC. The advantages of a 1-bit DAC include: ideal differential linearity, no distortion mechanisms due to resistor matching errors and no linearity drift over time and temperature due to variations in resistor values.

FAQs

- 1) What is the difference between the CS4329 and the CS4390?
A: Although the analog performance of the CS4329 and CS4390 is essentially the same, the CS4390 supports 24-bit conversion.

- 2) What would happen if you input 24-bit data into a 20-bit converter D/A converter like the CS4329?
A: A 20-bit D/A converter will provide poor distortion performance when presented 24-bit data. The 24-bit CS4390 however will be able to provide true high performance 24-bit conversion without any degradation in the distortion performance.

- 3) Is the CS4390 always a pin compatible replacement for the CS4329?
A: The CS4390 can replace the CS4329 in any socket without requiring any layout change by the customer. The only exception is if the customer is using the CS4329 in the right justified 18-bit mode(Format 1 in the CS4329 data sheet).

Ordering Information


| | | |
|---------------------------------|--------------|---------------------|
| CS4390-KP | -10 to 70 ×C | 20-pin Plastic DIP |
| CS4390-KS | -10 to 70 ×C | 20-pin Plastic SSOP |
| CDB4390 CS4390 Evaluation Board | | |

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