A DIVISION OF CIRRUS LOGIC®

CS4334/5/6/7/8/9

8-Pin, 24-Bit, 96 kHz Stereo D/A Converter

The following information is based on the technical datasheet:

CS4334/5/6/7/8/9 DS248PP1 APR '98

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

CRYSTAL SEMICONDUCTOR PRODUCTS DIVISION PRODUCT INFORMATION

PI248PP1 APR '98

8-Pin, 24-Bit, 96 kHz Stereo D/A Converter

Features

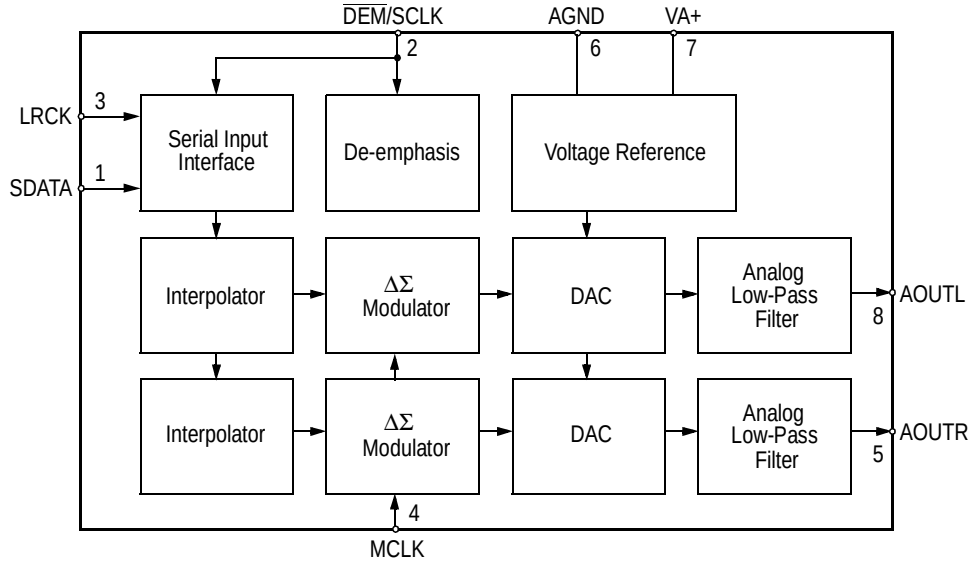
- Complete Stereo DAC System: Interpolation, D/A, Output Analog Filtering
- 24-Bit Conversion
- 96 dB Dynamic Range
- 0.003% THD
- Low Clock Jitter Sensitivity
- Single +5 V Power Supply
- Filtered Line Level Outputs
- On-Chip Digital De-emphasis
- Soft Ramp to Quiescent Output Voltage
- Functionally Compatibile with CS4330/31/33

Description

The CS4334 family members are complete, stereo digital-to-analog output systems including interpolation, 1-bit D/A conversion and output analog filtering in an 8-pin package. These devices differ in the serial interface format used for audio data input.

The CS4334 family is based on delta-sigma modulation, where 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 2 kHz and 100 kHz simply by changing the master clock frequency.

The CS4334 family contains on-chip digital de-emphasis, operates from a single +5 V power supply, and requires minimal support circuitry. These features are ideal for portable CD players and other portable playback systems.



Overview

The CS4334 family of devices offers a complete stereo digital-to-analog system including digital interpolation, fourth-order delta-sigma digital-to-analog conversion, digital de-emphasis and analog filtering. This architecture provides a high tolerance to clock jitter.

The primary purpose of using delta-sigma modulation techniques is to avoid the limitations of laser trimmed resistive digital-to-analog converter architectures by using an inherently linear 1-bit digital-to-analog converter. The advantages of a 1-bit digital-to-analog converter 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.

The CS4334 family of devices supports two modes of operation. The devices operate in Base Rate Mode (BRM) when MCLK/LRCK is 256, 384 or 512 and in High Rate Mode (HRM) when MCLK/LRCK is 128 or 192. High Rate Mode allows input sample rates up to 100 kHz.

FAQs

1) What competitive advantages do these D/A converters offer?

A: These DACs provide the smallest and most cost-effective solution for CD quality digital audio.

2) What is the difference between High Rate Mode (HRM) and Base Rate Mode (BRM)?

A: These DACs support two oversampling modes. 128× oversampling, BRM, is used for sample rates less than 50 kHz and 64× oversampling, HRM, is used for sample rates greater than 50 kHz. Therefore a 12.288 MHz MCLK can support both 48 kHz and 96 kHz sample rates.

3) Are the CS4334, CS4338, and CS4339 drop-in replacements for the CS4331, CS4333, and CS4330 respectively?

A: The CS4334, CS4338, and CS4339 are functionally compatible and have the same pin-out as the CS4331, CS4333, and CS4330 respectively, but are in a smaller package. The new DACs are in an 8-pin 150 mil wide Jedec SOIC package. The CS4330/1/3 are in an 8-pin, 208 mil wide EIAJ SOIC package.

Ordering Information

Model	Temperature	Package	Serial Interface
CS4334-KS	-10 to +70°C	8-pin Plastic SOIC	16 to 24-bit, I2S
CS4335-KS	-10 to +70°C	8-pin Plastic SOIC	16 to 24-bit, left justified
CS4336-KS	-10 to +70°C	8-pin Plastic SOIC	24-bit, right justified
CS4337-KS	-10 to +70°C	8-pin Plastic SOIC	20-bit, right justified
CS4338-KS	-10 to +70°C	8-pin Plastic SOIC	16-bit, right justified
CS4339-KS	-10 to +70°C	8-pin Plastic SOIC	18-bit, right justified, 32 F_S Internal SCLK mode

Functional Compatibility

CS4330-KS ⇒ CS4339-KS

CS4331-KS ⇒ CS4334-KS

CS4333-KS ⇒ CS4338-KS

For further information on Crystal products, please visit our website "www.crystal.com" or call our literature department (800) 888-5016 ext. 3594 or (512) 912-3594 for data sheets and application notes.

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