



**CIRRUS LOGIC®**

**CS4622/24**

# **CrystalClear™ SoundFusion™ PCI Audio Accelerator**

The following information is based on the technical datasheet:

*CS4622/24 DS293PP2 JUN '98  
Preliminary Product Bulletin*

Please contact Cirrus Logic, Multimedia  
Audio support for further information.

---

## **PC MULTIMEDIA AUDIO PRODUCT INFORMATION**

Copyright © Cirrus Logic, Inc. 1998  
(All Rights Reserved)

PI293PP1 JUL '98

---

***CrystalClear™ SoundFusion™ PCI Audio Accelerator***

---

**Features**

- 300/255 MIPs SLIMD™ DSP Architecture
- DirectX™ 5.0 3D Positional Audio
- Fat Labs Approved 64-Voice Wavetable Synthesis with Effects
- NetMeeting™ AEC Hardware Acceleration
- Dolby® Digital AC-3® (CS4622)
- High Quality Hardware Sample Rate Conversion (90+ dB Dynamic Range)
- PC/PCI Legacy Support
- DDMA Legacy Support
- CrystalClear Legacy Support (CCLS™)
- PCI 2.1 Compliant PCI Interface
- 96 Stream DMA Interface with Hardware Scatter/Gather Support
- PCI Power Management (D0 through D3 Hot), APM 1.2, and ACPI 1.0 Support
- AC '97 2.0 Link Codec Interface
- Secondary AC '97 1.0/2.0 Link Codec Interface for Multi-Channel and Digital Docking Support
- Asynchronous Digital Serial Interface (ZV Port)
- S/PDIF Digital Input and Output Interfaces supporting both PCM and Dolby Digital 5.1 Formats
- MPU-401 MIDI Input/Output Interface
- 3.3 V Power Supply (5 V tolerant I/O)

**Description**

The CS4622/24 is a high performance pin-compatible upgrade to the 128-pin CS4610C PCI audio accelerator. With the added legacy compatibility modes,

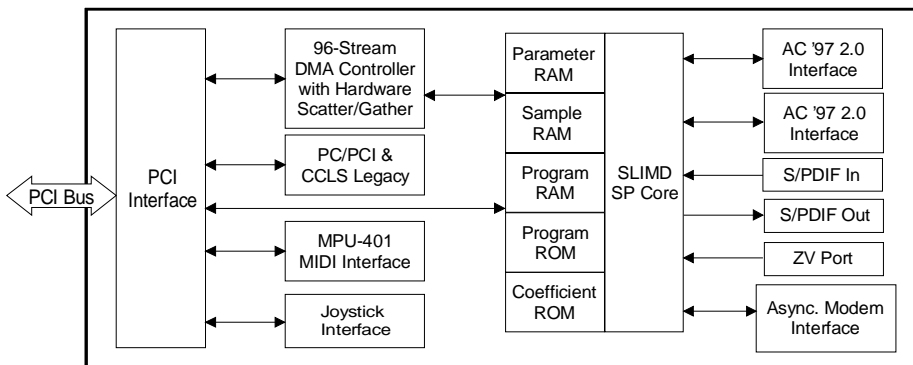
the CS4622/24 enables real mode DOS compatible PCI-only audio sub-systems. This device, combined with application and driver software, provides a complete system solution for hardware acceleration of Windows 95® DirectSound®, DirectSound3D®, DirectInput, and Wavetable Synthesis. WDM drivers provide support for both Windows 98 and Windows NT 5.0.

The CS4622/24 is based on the Cirrus Logic CrystalClear Stream Processor (SP) DSP core. The SP core is optimized for digital audio processing, and is powerful enough to handle complex signal processing tasks such as Dolby Digital AC-3 decoding (CS4622 only) with ease. The SP core is supported by a bus mastering PCI interface and a built-in dedicated DMA engine with hardware scatter-gather support. These support functions ensure extremely efficient transfer of audio data streams to and from host-based memory buffers, providing a system solution with maximum performance and minimal host CPU loading.

The all-digital CS4622/24 supports a variety of audio I/O configurations including direct connection to the CrystalClear CS4297 AC '97 Codec. A secondary AC '97 2.0 interface provides support for multi-channel and digital docking solutions. Added extended I/O supports DAA control for modem applications.

Consumer Digital input and output (S/PDIF) interfaces support both PCM and compressed 5.1 digital data formats.

PC/PCI, DDMA, and CrystalClear Legacy support provide PCI-only legacy games compatibility.



## Overview

The CS4622/24 is a high performance audio accelerator DSP for the PCI bus. This device, combined with application and driver software, provides a complete system solution for cost effective acceleration of Windows DirectSound, Direct-Sound3D, DirectInput, MIDI playback via Wavetable Synthesis with reverberation and chorus effects processing, and more. The CS4622/24 is compatible with the CS4610C with the following added features:

- Primary AC '97 Interface now 2.0 compatible
- 2<sup>nd</sup> AC '97 Interface (also 2.0 compliant)
- CrystalClear Legacy Support
- PC/PCI Legacy Support
- DDMA Legacy Support
- PCI Power Management Event Support
- ZV Port Asynchronous Serial Port
- 2nd Asynchronous Serial Port
- 9 Extended GPIO pins for Modem Support
- Consumer Digital (S/PDIF) Input and Output

The CS4622 is a high-performance, full-featured version of the SoundFusion audio accelerator. The CS4624 is a reduced-cost version of the CS4622. The CS4624 has a lower maximum clock speed and does not support AC-3. Please refer to the *OEM Software Reference Manual* for more details.

## FAQs

- 1) What is the difference between the two devices?  
A: The CS4622 offers the capability to decode Dolby Digital (AC3), and the CS4624 does not.
- 2) How is the Dolby License obtained?  
A: Cirrus Logic can only ship devices and software implementing Dolby

technology to Dolby certified customers. A Dolby System License certification can be obtained by faxing a written request to Dolby Licensing Corporation, at (415) 863-1373. This request should include a description of the intended application and should be marked "Request for Dolby License Application".

- 3) How are these devices different than the other Crystal PCI audio products (CS4280 and CS4614)?
- A: The CS4280 does not offer DSP acceleration for wavetable synthesis and 3D sound, using the host processor instead. The CS4614 offers DSP processing, but not digital I/O (SPDIF) or ZVPort support.
- 4) Which markets would the CS4622 and CS4624 serve?
- A: Manufacturers of PC motherboards, portables, and PCI audio cards would use the CS4622 and CS4624, where the performance advantages of DSP processing are desired along with the digital input/output to connect to high-end audio devices. The DSP processor is used for hardware wavetable synthesis and 3D audio acceleration for the games/multimedia market, and acoustic echo cancellation for speakerphone/ videoconferencing in the commercial market.

## Ordering Information

CS4622-CQ	128-pin TQFP	20x14x1.60 mm
CS4624-CQ	128-pin TQFP	20x14x1.60 mm

If you have any questions, please contact the undersigned by phone or by email. Also, visit our website "www.cirrus.com" or call our literature department (800) 888-5016 ext. 3594 or (512) 912-3594 for data sheets and application notes.



# Sales Office and Applications Support

## **UNITED STATES**

### **Sales Office and Applications Support:**

#### **WESTERN AREA**

Cirrus Logic, Inc.  
Headquarters, Sales  
3100 West Warren Ave.  
Fremont, CA 94538  
Ph: 510-623-8300  
FAX: 510-252-6020

Cirrus Logic, Inc.  
827 Wellesley Ave.  
Los Angeles, CA 90049  
Ph: 310-820-6489  
FAX: 310-820-6180

Cirrus Logic, Inc.  
Westlake Village  
The Townsgate Executive Bldg.  
2659 Townsgate Road, Ste. 238  
Westlake Village, CA 91361  
Ph: 805-371-5860  
FAX 805-371-5861

Cirrus Logic, Inc.  
6650 S.W. Redwood Lane,  
Ste. 105, First Floor Bldg. 16  
Portland, Oregon 97224  
Ph: 503-620-5547  
FAX: 503-620-5665

#### **CENTRAL AREA**

Cirrus Logic, Inc.  
14205 Burnet Rd., Ste. 400  
Austin, TX 78728  
Ph: 512-255-8893  
FAX: 512-255-0733

#### **SOUTHEASTERN AREA**

Cirrus Logic, Inc.  
5511 Capital Center Dr., Ste. 103  
Raleigh, NC 27606  
Ph: 919-859-5210  
FAX: 919-859-5334

Cirrus Logic International  
3998 NW 8th Avenue, Ste. 300  
Boca Raton, FL 33431  
Ph: 561-395-1613  
FAX: 561-395-1373

#### **NORTHEASTERN AREA**

Cirrus Logic, Inc.  
10 New England Business  
Center, Ste. 100  
Andover, MA 01810  
Ph: 978-794-9992  
FAX: 978-794-9998

Cirrus Logic, Inc.  
10440 Little Patuxent Pkwy., Ste. 300  
Columbia, MD 21044-3559  
Ph: 410-740-5654  
FAX: 410-740-6961

#### **U.S. Sales Distributors**

Insight Electronics, Inc.  
Corporate Headquarters  
9980 Huennekens  
San Diego, CA 92121  
1-800-677-7716  
Ph: 619-450-8500  
FAX: 619-450-8550

Nu Horizons Electronics  
Corporate Headquarters  
70 Maxess Rd.  
Melville, NY 11747  
1-888-747-6846  
Ph: 516-396-5000  
FAX: 516-396-5050

## **EUROPE**

### **Sales Office and Applications Support:**

Cirrus Logic International SARL  
Immeuble Andre Malraux  
1 rue de Rome  
F-93561 Rosny-sous-Bois  
CEDEX, France  
Ph: +33148122812  
FAX: +33148122810

Cirrus Logic (UK) Ltd.  
Anglers Court  
Spittal St.  
Marlow  
Bucks, England SL7 1DB  
Ph: +44(0)1628 472 211  
FAX: +44(0)1628 486 114

Cirrus Logic GmbH  
Muehlfelder-Strasse 2  
D-82211 Herrsching, Germany  
Ph: +49815292460  
FAX: +498152924699

## **FAR EAST**

### **Sales Office and Applications Support:**

#### **CHINA**

Cirrus Logic International Ltd.  
A-1403, Qiancun Commercial Man-  
sion  
Beijing, China 100029  
Ph: (8610)6443-0783  
FAX: (8610)6443-0786

#### **HONG KONG**

Cirrus Logic International Ltd.  
Hong Kong  
Ph: (852)2376-0801

#### **KOREA**

Cirrus Logic, Korea Co., Ltd.  
Seoul, Korea  
Ph: +82(2)565-8561

#### **SINGAPORE**

Cirrus Logic  
Crystal International Ltd.  
Singapore  
Ph: +65-743-4111

#### **TAIWAN**

Cirrus Logic International Ltd.  
Taiwan Branch  
10F, No. 214, Tun Hwa North Rd.  
Taipei, Taiwan R.O.C.  
Ph: +886(22)718-4533  
FAX: +886(22)718-4526

## **JAPAN**

### **Sales Office and Applications Support:**

Cirrus Logic K.K.  
Tokyo, Japan  
Ph: +81(03)3340-9111



PC MULTIMEDIA AUDIO  
PO BOX 17847  
4210 S. INDUSTRIAL DRIVE  
AUSTIN, TEXAS 78744  
512.445.7222 / 800.888.5016  
FAX: 512.445.7581

WORLDWIDE WEB:  
<http://www.cirrus.com>