CIRRUS LOGIC®

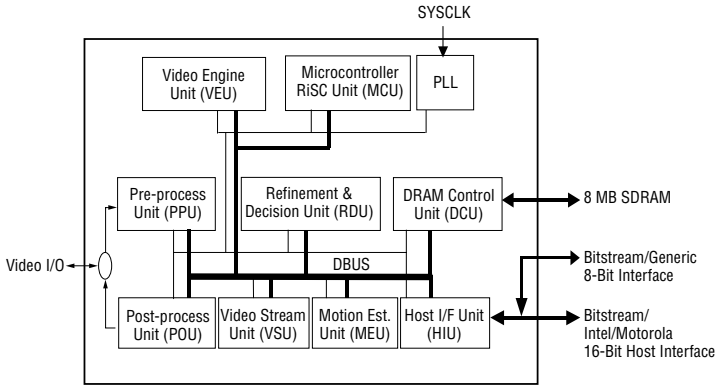
CS92210

PRODUCT BULLETIN

MPEG-2 VIDEO Encoder/Decoder

CS92210 Features

- Single chip MPEG-2 Video CODEC
- Supports real time MPEG-1 encoding and decoding
- Supports real time MPEG-2 MP@ML, SP@ML, and MP@LL encoding and decoding
- Support for constant and one-pass variable bit rate
  - IPB-pictures, CBR or VBR to 15 Mbps
  - I-pictures only to 30 Mbps
- Proprietary high performance motion estimation
- Low external memory
  - 8 Mbytes for full D1 (720) NTSC/PAL pictures
- Provides complete video encoding and decoding (half-duplex) when combined with system function and supporting commodity devices
- Direct interface to video modulator & demodulator
- Supports multiple resolutions & scan rates
  - NTSC: (720-D1, 704-D1, 640-VGA, 544, 480-2/3D1, 352-1/2D1) x 480, or 352 x 240 (CIF), 320 x 240 (MPEG-1) or 176 x 112 (QCIF) at 30 or 29.97 Hz
  - PAL: (720-D1, 704-D1, 640-VGA, 544, 480-2/3D1, 352-1/2D1) x 576, or 352 x 288 (CIS/SIF), or 176 x 144 (QCIF) at 25 Hz
- Intel/Motorola 16-bit host interface
- 5 V I/O tolerance, 3.3 V and 1.8 V power supplies
- 0.65 watts @ 87.75 MHz average power consumption
- 256-pin PQFP package



The CS92210 is a real time MPEG-2 video encoder and decoder (CODEC) that fully complies with the ISO/IEC-13818 Main Profile@Main Level (MP@ML) format, Simple Profile@ Main Level (SP@ML), and Main Profile @ Low Level (MP@LL).

In encode mode, the CS92210 accepts digital video in ITU-R BT.601 (CCIR-601) or ITU-R BT.656 (CCIR-656) format. The input is filtered and then encoded to produce compressed bitstreams in MPEG-2 MP@ML syntax. In decode mode, CS92210 accepts an MPEG bitstream, decodes it, and then filters the video output to produce either ITU-R BT.601 or ITU-R BT.656 format digital video. Designed for flexibility, the CS92210's video interface supports multiple video formats, resolutions, and frame rates including NTSC, PAL, and FILM.

The CS92210's versatile time-stamp feature enables flexible muxing of audio and video elementary bit streams. Also, the CS92210 can encode and decode bitstreams in both the VCD and SVCD formats.

The algorithmic and architectural innovations of the CS92210 enable a high degree of integration while still providing exceptional video quality over the widest range of bit rates. Also, the CS92210 provides ease of system design by interfacing to a wide variety of commodity components such as Philips video decoders and encoders, Flash and SDRAM memories.

Technical Overview

The CS92210 is organized as a process pipeline that implements the MPEG-2 encoding and decoding algorithms.

The CS92210 provides application program control over a large number of encoding parameters such as I, P, B-picture cadence, GOP structure and decoder buffer sizes.

For communications applications, the CS92210 can match its output bit rate to the channel rate. This feature allows the host controller to make bit rate changes as needed to demonstrate better bandwidth utilization across multiple channels.

Internal rate control provides a high degree of flexibility in relation to the output bit rate, including the ability to generate variable bitrate compressed video stream in one pass. This makes it suitable for storage sensitive applications such as digital camcorders and personal video recorders (PVRs).

The CS92210 also has features geared toward MPEG-2 publishing and authoring systems.

Pre- and post-processing supports includes pre- and post-filtering and up and down chroma conversions. Other features include:

- DMA in either 8-b or 16-b modes
- Encodes/decodes full D1 to QCIF video resolutions
- Bit rates up to 15 Mb/s in either CBR or VBR modes
- Debugging and DMA monitoring control
- Asynchronous video and system clocks
- Support for commodity video NTSC/PAL encoders and decoders

VCD, Super-VCD Support

The CS92210 supports MPEG-1 and MPEG-2 video encoding at 1/2 (VCD), 2/3 (SVCD), and full D1 resolutions. In addition, the CS92210's versatile pre-processing features allow the input video to be either scaled or cropped to the desired encode size.

Interfaces

The CS92210 includes a 64-bit SDRAM memory interface, a video interface, 16-bit Motorola/Intel host interface, a generic 8-bit interface, and a serial EPROM /Flash memory interface.

Applications

The CS92210 can be used in a variety of applications:

- VCD, Super-VCD player and recorder
- DVD-recordable products
- Advanced set-top boxes
- Personal video recorder (time shifting)
- PC-based content creation/editing boards
- USB-based products for video capture and display

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