

Single-Chip MPEG-2 Encoder with Integrated Analog Video/Broadcast Audio Decoder

CX23418

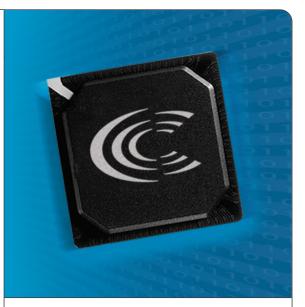
Combines Digital Compression and Analog Audio/Video Decoding into a Single Device

Conexant's portfolio includes a comprehensive suite of semiconductor solutions for broadband communications, enterprise networks and the digital home. The CX23418 increases upon the level of integration found in the CX23416 MPEG-2 encoder by adding a worldwide compatible broadcast audio/video decoder that supports NTSC/PAL/SECAM video standards and their associated stereo audio broadcast standards. By integrating the analog decoding functions that are typically spread across three chips into one chip, the CX23418 offers consumer electronics and personal computer companies a path to reduce the cost of designing and manufacturing their next-generation digital video products.

The CX23418 interfaces directly to analog video signals, sound intermediate frequency (IF)/audio frequency (AF) signals from television tuners, and audio ADCs to produce high-quality video and audio MPEG program or transport streams. High-performance video quality is accomplished by the integration of 10-bit video ADCs supporting composite, S-video, and component formats, 3-D adaptive comb filtering, dynamic MPEG noise filters time-based correction, an increased motion search range, the de-coupling of motion estimation from encoding, and an adaptive guantization scheme. In addition, 16-bit audio samples are preserved throughout the audio path to deliver high-fidelity compressed stereo audio. As a result, end-users obtain the best possible picture and sound, even as the data rate is reduced and the recording time is lengthened. The chip also supports AES, triple-DES and CPRM encryption technologies to protect content stored on either a hard disk or DVD recordable disk.

The new encoder includes several features to ensure high-fidelity audio and superior video. Special capabilities include the ability to cleanly process and convert low-quality video from old VCR tapes and similar sources to digital formats such as DVDs. This revolutionary new feature enables consumers to make the best possible copy of content from bad or unstable video sources.

The company's broad portfolio of semiconductor products also includes client-side DSL and cable modem solutions, home network processors, broadcast video encoders and decoders, digital set-top box components and systems solutions, and dial-up modems. In addition to its IEEE 802.11a/b/g-compliant WLAN chipsets, software, and reference designs, Conexant offers a suite of networking components that includes solutions for applications based on HomePlug[™] and HomePNA[™]. Additional products include a complete line of asymmetric and symmetric DSL central office solutions, which are used by service providers worldwide to deliver broadband data, voice, and video over copper telephone lines.



Distinguishing Features

- Supports MPEG-2 (MP@ML, SP@ML) and MPEG-1
- MPEG transport capture from digital TV demodulators
- Dolby Digital (AC-3) 2-channel
- Sampling rates of 32 kHz, 44.1 kHz, and 48 kHz with compressed bit rates up to 384 kb/sec
- · 3-D adaptive comb filter with timebased correction
- Supports interlaced YPbPr inputs along with composite video and S-video
- Vertical blanking interval (VBI) data slicer
- · Worldwide audio standards: BTSC, EIAJ, A2, NICAM, FM/AM Mono
- Two stereo audio processing blocks featuring three-band equalizer (EQ), volume, soft mute, auto volume control, and soft clipping functions
- AES, triple DES, and CPRM encryption

Part Number CX23418

Description Single-Chip MPEG-2 Encoder with Integrated Analog Video/Broadcast Audio Decoder

Features and Benefits

Video Encoding

- High-quality real-time encoding (I-, B-, and P-frames)
- Supports MPEG-2 (MP@ML, SP@ML) and MPEG-1
- 525/60 (NTSC) up to 720x480 @ 30 fps
- 625/50 (PAL) up to 720x576 @ 25 fps
- Variable and constant bit rate up to 15 Mb/sec
- Programmable group of pictures (GOP) lengths
- Adaptive field/frame (motion compensation type 8 discrete cosine transform [DCT])
- Field/frame motion estimation
 - B-frame: ± 100 horizontal x ± 64 vertical
 - P-frame: ± 100 horizontal x ± 64 vertical
 - Half-pel accuracy
- 4:2:2 to 4:2:0 conversion
- Time-based correction
- Speckle noise reduction
- Sharpness control
- Recursive noise reduction
- Inverse telecine (3:2 pulldown)
- Scene change detection
- Adaptive quantization
- Supports DVD-VR+Video, program, and transport streams
- AES, triple DES, and CPRM encryption
- Automatic VBI extraction

Analog Video Decoding

- Worldwide video standards support
- NTSC-M/J/4.43
- PAL-BDGHI/M/N/Nc/60
- SECAM
- Flexible video input multiplexer supporting composite, S-video, and component inputs with integrated anti-alias filtering
- 3-D adaptive comb filtering with time-based correction
- Full 10-bit ADCs and data path
- Macrovision, detection
- Programmable VBI data slicer for services such as closed caption, wide screen signaling (WSS), teletext, and program guides

Audio Encoding

- Dolby Digital (AC-3) 2-channel
- MPEG-1 layer II
- Sampling rates of 32 kHz, 44.1 kHz, and 48 kHz
- Compressed bit rates up to 384 kb/sec

Broadcast Audio Decoding

- Worldwide broadcast stereo audio standards support: - BTSC with and without dBx
 - EIAJ
- A2
- NICAM
- FM/AM Mono
- Auto-detection and configuration of broadcast standards
- Two stereo channels of 3-band EQ, volume, soft mute, auto volume control, and soft clipping
- Flexible sample rate conversion on all audio inputs and outputs

Interfaces

- Video input:
 - Eight analog video inputs supporting composite, s-video, and $\ensuremath{\mathsf{YPbPr}}$
 - Digital 8-bit 4:2:2 YCrCb ITU-R BT.656
- Audio input:
 - Sound IF from tunersSony or Philips style serial audio
- AC'97 Codec
- AC 97 COU - S/PDIF
- External MPEG transport stream capture interface
- MPEG input and output supports one of the following:
- PCI DMA master or PCI slave
 - 8-bit parallel program data
- 1-bit serial peripheral interface (SPI) transport data
- Optional advanced encryption standard (AES), triple-data encryption standard (DES) or CPRM encrypted output
- 32-bit wide DDR SDRAM
- Host interface supports one of the following
- 32-bit, 33 MHz PCI, revision 2.3
- 8-bit microcontroller
- · General-purpose input/output with 16 programmable pins

Package

Lead free 388-pin, 23 mm ball grid array (BGA)

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