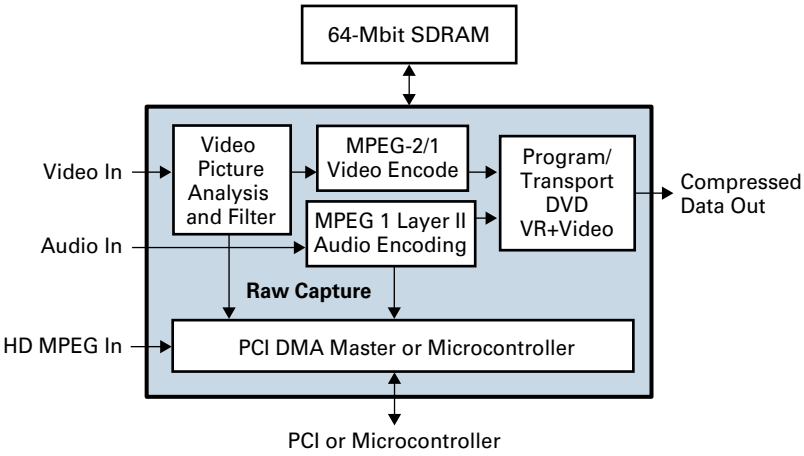
CONEXANT

# MPEG-2 Encoder

CX23416

## The CX23416 is a low-cost, low-power MPEG-2 video and audio encoder that integrates the functionality of several ICs in a single device

Conexant's broadband communications portfolio includes a comprehensive suite of semiconductor solutions that enable the digital home and information network. The CX23416 is a highly integrated MPEG-2 audio/video encoder. The versatile CX23416 actually incorporates the functionality of up to three different chips, allowing Conexant to deliver this device at a price point that will enable consumer electronics and personal computer companies to dramatically reduce the cost of designing and manufacturing their next-generation digital video products. Pre-filtering improvements in the CX23416 include built-in noise filters that dynamically improve images in the pre-processing stage. As a result, end-users obtain the best possible picture, even as the data rate is reduced and the recording time is lengthened. Other video quality improvements include an increased motion search range, the de-coupling of motion estimation from encoding, and an adaptive quantization scheme. To reduce the overall cost of the CX23416 and achieve the highest video quality, Conexant devoted significant engineering resources to determining the optimal balance between hardware and software implementation of these processing improvements.




**CX23416 Block Diagram**

## Distinguishing Features

- Video Encoding
  - High-quality real-time encoding
  - Supports MPEG-2 (MP@ML, SP@ML) and MPEG-1
  - HDTV MPEG Capture
- Audio Encoding
  - MPEG 1 Layer II
  - Sampling rates of 32 kHz, 44.1 kHz, and 48 kHz
  - Compressed bit rates up to 448 kbit/sec

**Part Number** CX23416
**Description** MPEG-2 audio/video Encoder

## CX23416 Features

### 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
- HDTV MPEG capture
- Variable and constant bit rate up to 15-Mbit/sec
- Programmable GOP lengths
- Adaptive field/frame (motion compensation type 8 DCT)
- Field/frame motion estimation
  - B-frame: ±296(H) x ±184(V)
  - P-frame: ±326(H) x ±202(V)
  - Half-pel accuracy
- 4:2:2 to 4:2:0 conversion
- Speckle noise reduction
- Sharpness control
- Recursive noise reduction
- Inverse telecine (3:2 pulldown)
- Scene change detection
- Adaptive quantization
- Supports elementary program, and transport streams
- Automatic VBI extraction

### Audio Encoding

- MPEG-1 Layer II
- Sampling rates of 32 kHz, 44.1 kHz, and 48 kHz
- Compressed bit rates up to 448 kbit/sec

### Interfaces

- Video input: 4:2:2 YUV CCIR-656
- Audio input: Stereo Sony $I^2S$
- MPEG input and output supports one of the following
  - PCI DMA master or PCI slave
  - 8-bit parallel program data
  - 8-bit parallel SPI transport data
  - 1-bit serial transport data
- One 64 Mbit SDRAM
- Host interface supports one of the following
  - 32-bit, 33 MHz PCI
  - 8-bit microcontroller
- General-purpose input/output with 16 programmable pins

### Package

- 233 BGA

Conexant provides complete software support for the CX23416, including an on-chip API function call layer and binary and source code examples. Evaluation boards are also available for the CX23416 encoder. Please contact Conexant for more details on these reference designs.

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