



## CS24 Digital Audio/Video Decoders



Figure 1: IBM's single-chip digital audio/video decoders integrate advanced features for high-performance solutions.

### Highlights

- **Single-chip decoders for audio/video editing, broadcast, and emerging applications**
- **Family of professional audio/video decoders provides advanced technology to satisfy diverse decoding requirements**
- **High levels of integration help enable robust designs**
- **World-class technical support helps make system design, test, and deployment more efficient**

### Enabling cost-effective, value-added products

The IBM MPEG-2 digital audio/video decoders, CS24, CS24E, CS24D, and CS24DE, are advanced, high-performance chips designed to satisfy the needs of customers developing professional audio/video products. These single-chip decoders are intended for professional audio/video editing, broadcast, and a range of emerging applications.

The IBM family of CS24 decoders can decode MPEG-2 4:2:2 Profile at Main Level video, Main Profile at Main Level (MP @ ML) video, and MPEG-2 stereo Layers I & II (CD-quality) audio. The CS24D and CS24DE also offer the ability to decode Dolby® Digital audio.\* The new members of the CS24 decoder family, the CS24E and CS24DE, provide all of the features of their counterparts (the CS24 and CS24D, respectively) with enhancements such as encoded Dolby Digital pass-through. Together, these four CS24 decoders give our customers a broad selection of functionality for designing value-added products quickly and affordably.

### A flexible, single-chip solution for high-performance systems

IBM's family of CS24 decoders features an integrated transport stream demultiplexer, MPEG-2 video decoder, dual audio decoders, and an SDRAM interface. By integrating these features on a single chip, the decoders enable more complex designs while helping to reduce design time and effort.

### Integrated transport stream demultiplexer

The integrated transport stream demultiplexer accepts continuous input at a rate of up to 160 Mb/sec in parallel format or 60 Mb/sec in serial format. Compliant with the ISO/IEC 13818-1 system layer standard, it incorporates a range of capabilities. These include data error reporting and concealment, programmable PID and table filtering, and flexible packet-data routing. These features assist in the design of very-high-performance, complex systems using fewer external components.

### MPEG-2 video decoder

The integrated video decoder is compliant with the ISO/IEC 13818-2 standards for 4:2:2 Profile at Main Level video and MP @ ML video decoding. In addition, the video decoder is capable of decoding both elementary streams and packetized elementary streams at rates of up to 50 Mb/sec. This capability enables high-bandwidth broadcast and studio-quality applications.

The video decoder offers features that provide design flexibility for emerging, high-performance applications. Horizontal and vertical filtering,

pan and scan, on-screen display support, 3:2 pulldown support, VBI output support, and audio and video synchronization are all incorporated into these decoders. An on-chip SDRAM memory interface, supporting 4-MB and 8-MB memory configurations, helps enable more flexible, affordable designs.

### Dual audio decoders

The dual audio decoders, which can operate simultaneously, support robust designs like multi-language applications requiring multiple audio streams. The decoders can be configured to decode MPEG-1 and

MPEG-2 Layers I & II audio in compliance with the ISO/IEC 13818-3 standard and can also decode Dolby Digital audio, thereby providing the latest technology for digital and audio systems. The entire family of CS24 decoders offers a built-in phase-locked loop for audio/video synchronization and the flexibility to support multiple audio sampling rates and outputs.

### Tools for simplified design

To assist customers in their product development efforts, IBM offers design tools, including an evaluation card and card schematics.

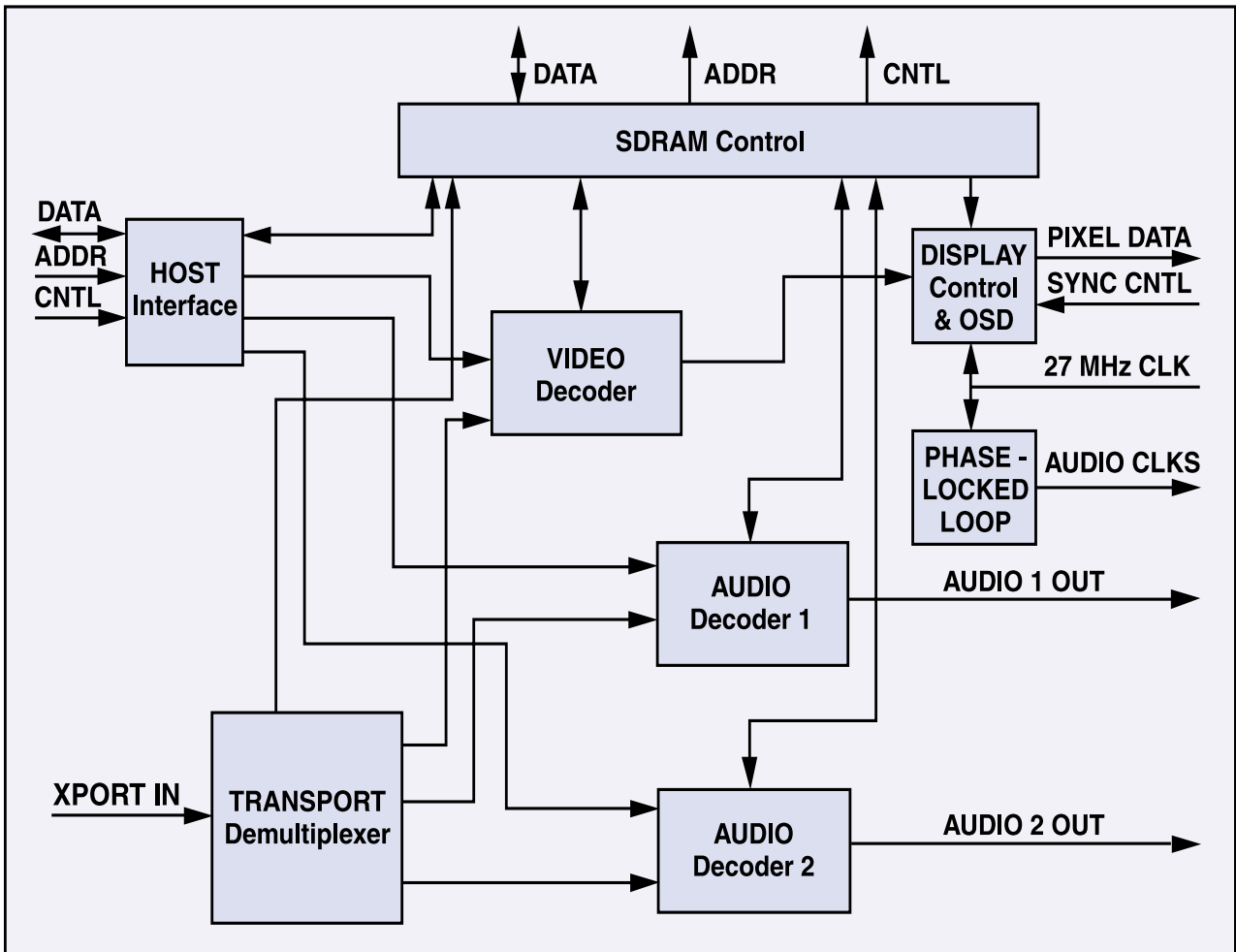


Figure 2: IBM CS24 block diagram

### CS24E and CS24DE enhancements

The new CS24 family of decoders, the CS24E and CS24DE, offer the functions and capabilities of their earlier counterparts with the following enhancements:

#### Encoded Dolby Digital Pass-Through

The CS24E chip can accept compressed Dolby AC/3 data and pass it, undecoded, through the SPDIF output port. This encoded Dolby stream can then be decoded by other external devices.

#### SMPTE 302M Support

The CS24E and CS24DE chips can accept SMPTE 302M audio data in the transport stream and play that data over the analog ports of the chip.

#### Enhanced Audio/Video Statistical Output

The CS24E and CS24DE decoders can provide expanded information about the audio and video streams

being decoded by the chips. This information includes data such as video bit rate, audio bit rate, audio sample rate, and a host of other statistics.

### Outstanding Technology and Technical Customer Support Help Make Design Integration Easier

When you use CS24 decoders, you get the IBM Blue Logic® CMOS and packaging technologies to help you incorporate more functionality into smaller, more economical products. You also get the benefit of the CS24 decoder support team's close ties to IBM Research — one of the most prominent research organizations in our industry. And with online access to technical support documentation, as well as access to application engineering support, you don't need to face your development challenges alone.

For more information, visit our Web site at [www.chips.ibm.com](http://www.chips.ibm.com).

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### Specifications

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Technology	0.25-micron process, 4 levels of metal
Ambient temperature	0° C to 70° C
Nominal supply voltage	3.3 volts +/- 5%, 2.5 volts +/- 5%
Power dissipation	1 watt (nominal)
Packaging	208-pin, 28-mm PQFP

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### Part numbers

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IBM39 MPEGCS24 PFA16C

IBM39 MPEGCS24E PFA16C

IBM39 MPEGCS24D PFA16C

IBM39 MPEGCS24DE PFA16C

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