

JPEG 2000 Video Codec Solution



Analog Devices' video compression technology enables Motion Picture Industry to adopt JPEG 2000 as Digital Cinema Standard

Analog Devices Inc., a global leader in high-performance semiconductors for signal processing applications, announced that its JPEG 2000 video compression technology has led a major breakthrough for the emerging digital cinema market. ADI's real-time integrated JPEG 2000 compression technology has proven to be the catalyst for Digital Cinema Initiatives (DCI), a consortium of seven major Hollywood movie studios, to formally adopt JPEG 2000 as the standard format for digital delivery of all motion pictures to theaters. Analog Devices is

the only company offering a high-performance JPEG 2000 video compression chip that meets the rigorous technical performance requirements of the motion picture industry.

The ADV202 JPEG 2000 video compression chip achieves high-definition image quality in real-time, while offering unprecedented flexibility and scalability in image delivery. With DCI's adoption of JPEG 2000 as the standard digital compression format, the motion picture industry can benefit from the same proven high performance capabilities that JPEG 2000

has been providing to applications in the consumer, surveillance, professional broadcast, and industrial markets.

"After extensive testing and evaluation of digital delivery system technologies, JPEG 2000 proved to deliver the flexibility and scalability that the industry's sophisticated creative environments demand," said Walt Ordway, chief technology officer for DCI. "The fact that JPEG 2000 is an international standard, its growing acceptance in several other markets, as well as its support by companies such as Analog Devices further reinforces our decision to move forward with JPEG 2000."

First JPEG 2000 Chip Ushers in New Era for Digital Cinema

Used in digital cinema applications in many stages of theatrical production, including high-definition theatrical projectors, video servers, and file storage, the ADV202 enables cinema equipment manufacturers to provide interoperable digital delivery systems based on the JPEG 2000 standard.

"Within a year, movie-goers will be able to see pictures that live up to the full potential of digital cinema including noise- and scratch-free images and quicker releases - due in part to the ADV202," said Bill Bucklen, product line director for high speed converters at Analog Devices. "By adopting the worldwide JPEG 2000 standard, the movie industry will benefit from ADI's continuing investment in this core technology."

About ADI's JPEG 2000 Development

Since 1996, Analog Devices has been a pioneer in the development of wavelet-based video compression, the technological basis of JPEG 2000. ADI's ADV202 solution features its patented SURF (Spatial Ultra-efficient Recursive Filtering) wavelet technology that enables real-time compression and decompression of high-quality moving and still digital images. With a flexible interface, the ADV202 can be used with multiple types of video and still image formats and comes in a compact 12mm x 12mm or 13mm x 13mm BGA (ball grid-array) pack-

age. In addition to digital cinema, ADV202 is enabling JPEG 2000 performance capabilities in surveillance, broadcast, and professional systems. For more information, please visit www.analog.com/ADV202.

About the JPEG 2000 Standard

JPEG 2000, which was established as an international standard in January 2001, is a still image and video compression standard based on wavelet technology. In addition to compressing images 20% more efficiently than standard JPEG, JPEG 2000 supports lossless compression, which allows images to be recovered without any loss or distortion. JPEG 2000 provides for the extraction of video images from a signal stream with varying resolutions, frame rates, and image layers from a signal stream without further signal processing.

About Digital Cinema Initiatives

Digital Cinema Initiatives, LLC (DCI) was created in March 2002 as a joint venture among Disney, Fox, MGM, Paramount, Sony Pictures Entertainment, Universal and Warner Bros. Studios. DCI's primary purpose is to establish and document voluntary specifications for an open architecture for digital cinema that ensures a uniform and high level of technical performance, reliability, and quality control. DCI will also facilitate the development of business plans and strategies to help spur deployment of digital cinema systems in movies theatres.

About Analog Devices

Analog Devices, Inc. is a leading manufacturer of precision high-performance integrated circuits used in analog and digital signal processing applications. ADI is headquartered in Norwood, Massachusetts, and employs approximately 9,000 people worldwide. It has manufacturing facilities in Massachusetts, California, North Carolina, Ireland, and the Philippines. Analog Devices' common stock is listed on the New York Stock Exchange and ADI is included in the S&P 500 Index.

ADV202 - JPEG 2000 Video CODEC

The ADV202 is a single-chip JPEG2000 codec targeted for video and high bandwidth image compression applications that can benefit from the enhanced quality and feature set provided by the JPEG2000 (J2K) – ISO/IEC15444-1 image compression standard. The part implements the computationally intensive operations of the JPEG2000 image compression standard as well as providing fully compliant code-stream generation for most applications.

The ADV202's dedicated video port provides glueless connection to common digital video standards such as ITU.R-BT656, SMPTE125M, SMPTE293M [525p], ITU.R-BT1358 [625p], SMPTE274M[1080i], or SMPTE296M[720p]. A variety of other high speed synchronous pixel and video formats can also be supported using the programmable framing and validation signals.

Applications

- Networked video and image distribution systems
- Wireless video and image distribution
- Image archival/retrieval
- Digital CCTV and surveillance systems
- Digital cinema systems
- Professional video editing and recording
- Digital still cameras
- Digital camcorders

Complete single-chip JPEG2000 compression and decompression solution for video and still images

- Patented SURF™ (spatial ultraefficient recursive filtering) technology enables low power and low cost wavelet based compression
- Supports both 9/7 and 5/3 wavelet transforms with up to 6 levels of transform
- Programmable tile/image size with widths up to 2048 pixels in 3-component 4:2:2 interleaved mode, and up to 4096 pixels in single-component mode
- Maximum tile/image height: 4096 pixels
- Video interface directly supporting ITU.R-BT656, SMPTE125M PAL/ NTSC, SMPTE274M, SMPTE293M (525p), ITU.R-BT1358 (625p) or any video format with a maximum input rate of 65 MSPS for irreversible mode or 40 MSPS for reversible mode
- Two or more ADV202s can be combined to support full-frame SMPTE274M HDTV (1080i) or SMPTE296M (720p)
- Interlaces temporally coherent frame-based SD video sources for improved performance
- Flexible asynchronous SRAM-style host interface allows glueless connection to most 16-/32-bit micro controllers and ASICs
- 2.5 V to 3.3 V I/O and 1.5 V core supply
- 12 mm × 12 mm 121-lead CSPBGA, speed grade 115 MHz, or 13 mm × 13 mm 144-lead CSPBGA, speed grade 150 MHz

Specifications

Bits per Component	16
Compression Format	JPEG2000
Microcontroller Interface	16 or 32-bits
External Memory Necessary	No - Internal
On-board Rate Control	Yes
HD Encode Capability	Yes
Pixel interface	10, 12, 14, 16, 8
Max. Tile Width	4096 Pixels
Target Applications	CCTV, Consumer, Industrial , Professional
Temp Range (°C)	0 to 70
Package	121-pin BGA, 144-pin BGA

