



Anywhere, Anytime Video Using the H.264 Specification

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for better quality of experience

Video is everywhere, available to users of handheld devices with Internet broadband access virtually any time, any place, and in many formats. In fact, one of the major challenges that the consumer electronics industry has faced in recent years has been to conveniently, seamlessly, and consistently deliver video across a broad range of formats and platforms.

The solution is “placeshifting,” which allows consumers to watch live or DVR-recorded content on any wireless device. Placeshifting enables viewing and listening to live, recorded, or pre-stored media on a remote device (computer, tablet, mobile phone or TV) over the Internet or over a data network.

Socionext’s transcoders enable the development of PC accessories, home electronics equipment, smart phones, and other mobile devices.

To stream full HD-resolution content to mobile devices requires the use of transcoding technology, because mobile devices cannot handle MPEG-2. Transcoding adjusts the bit rate required to send the stream over a low-bandwidth network.

The H.264 Standard: Benefits and Advantages

Since its inception almost 10 years ago, the H.264/MPEG-4 Part 10 standard or AVC (Advanced Video Coding) has become one of the most commonly used formats for recording, compressing, and distributing high-definition video. This block-oriented, motion-compensation-based codec standard has been successful worldwide because it can record for long periods without needing extra disk space. The H.264 specification lowers costs, significantly increases the amount of video that can be archived, and reduces the amount of redundant recording.

H.264 supports the HTML5 video tag, and is supported on every Blu-ray digital video disc (DVD) player, plus most Flash and Silverlight players. The format’s efficient hardware-acceleration capability delivers excellent, high-definition video even on inexpensive mobile and handheld products. The decoding takes place inside the processor; no additional software support is required.

H.264 lowers costs, increases the amount of video that can be archived, and reduces redundant recording.

H.264 can use video taken directly from a camera on the web with no need to encode it. This is significant because the same video with different encoding typically needs additional software support, consuming power and slowing the process.

Earlier compression methods let users record excellent picture quality at real-time frame rates, but these methods required large hard-drive capacity, with wasted disk space. H.264 uses predictive technology, which reduces redundant video recording.

For example, instead of constantly recording a room under surveillance where there is no motion, H.264 uses prior recordings and images that remain in place until some action or motion changes the scene or setting. For example, if someone walks into an empty room that is being monitored, H.264 systems will record the change in the room, and use the previously recorded background where applicable.

There are other benefits to H.264. Its sampling rates run up to 32 frames of video to ensure complete accuracy and quality, compared with previous compression methods that typically apply only one or two frames as a reference.

Along with conserving hard disk space, products using the standard bring together high-quality video and low memory sizes for seamless presentations of video when transmitted. The video image is extremely stable, and the audio is always synchronized.

As a result, broadcast companies around the globe have rapidly adopted the H.264 standard, and its flexibility makes it likely it will be used for a long time. Recently, some leaders in mobile device hardware and software development raised issues about the viability of this standard, especially when Google announced its plan to promote own, open WebM video codec via Flash-like plugins for Internet Explorer and Safari users. That program has now been abandoned, and H.264 continues its significant contributions across a broad platform of systems and equipment.

MB86M01/M02/M03 Transcoders

The Socionext MB86M01/M02/M03 transcoders make “placeshifting” possible. The ICs use the proven H.264 standard to distribute high-definition video to virtually any mobile device. (See sidebar on H.264.)

These compact, low-power ICs allow widespread deployment of products capable of playing H.264/AVC video at standard definition and with HD TV resolutions. The Socionext H.264-compliant devices provide robust and reliable bidirectional H.264/MPEG transcoding, as well as audio transcoding, for multiple formats. Transrating adds the ability to convert H.264 video data into H.264 formats of various video resolutions and bit rates.

The Socionext ICs can fit the different formats, resolutions and bit rates in use throughout the world. For example, Japan and the United States use MPEG-2 for broadcasting, while Europe, South America and most of continental Asia use the H.264 specification.

The Socionext MB86M01/M02/M03 series brings all the benefits of H.264 to mobile products.

Another benefit of the Socionext transcoders is their low power requirements. The company’s proprietary transcoding technology delivers industry-leading levels of low power consumption, and integrates 1GB of Fast Cycle RAM (FCRAM). The built-in memory and miniaturization process technology hold power consumption to 1.2W (when using the H.264 transrating function in full, high-definition mode). Besides lowering power consumption, the built-in memory architecture helps overcome thermal effects, enables small form-factor product design, and minimizes the BOM cost.

Because of its ultra-small package and low power requirements, Socionext’s transcoders enable the development of various PC accessories, as well as home electronics equipment, smart phones, and other mobile and portable equipment.

For example, transcoding solutions can be integrated into accessories as simple and flexible as a USB dongle. Video streaming to mobile devices can be achieved using a Wi-Fi router with a TV tuner for standalone or mobile devices, or a PVR with a built-in HDD and Blu-ray/HDD recorder. The technology also can be applied in a PCTV with a mini-card for notebook PCs and in a USB/PCI-e TV tuner accessory.

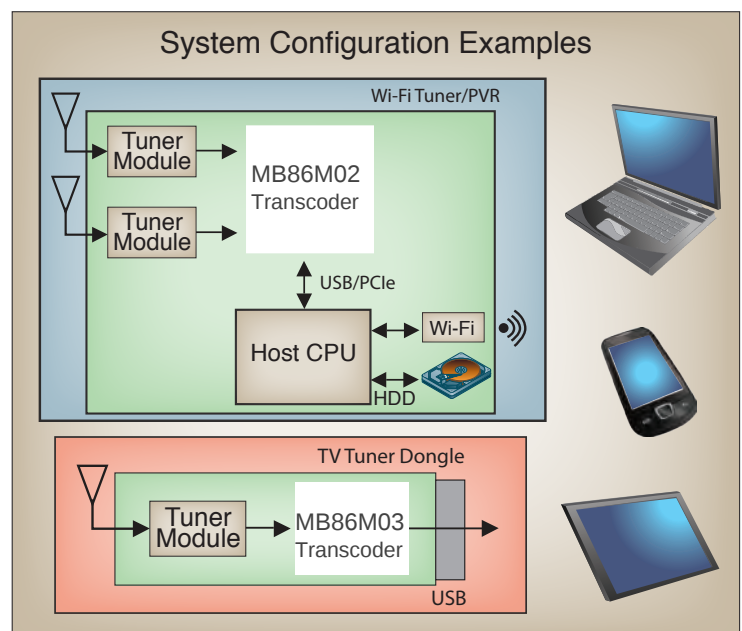
In addition to full HD transcoding functionality, the MB86M01/M02/M03 series features H.264 transrating functionality for converting H.264 video data into highly compressed data. These devices can also transcode audio data for any format, meeting the specifications of the playback equipment.

The MB86M01/M02/M03 series also reduces the latency required during transcoding (to less than 80ms), which speeds distribution over a network. This represents a significant improvement over Socionext’s first-generation transcoding products.

Connecting two tuner modules to two tuner input terminals enables simultaneous control of a program as it is being viewed and of another program as it is being recorded. Two streams for recording to HDD and mobile flash drives can be created simultaneously.

Socionext’s first-generation products, the MB86H57 and MB86H58, have been widely used in home electronics equipment, gaming and mobile products to deal with format-conversion issues while maintaining good video quality. With the increased demand for wireless distribution of HD content to mobile devices, Socionext designed the new series to meet the specific requirements of multiple regions and bandwidth constraints.

The combination of low power requirements, compact footprint, embedded memory and transcoding functionality in the MB86M01/M02/M03 series enables the placeshifting and other capabilities required to bring all the benefits of H.264 to mobile products.



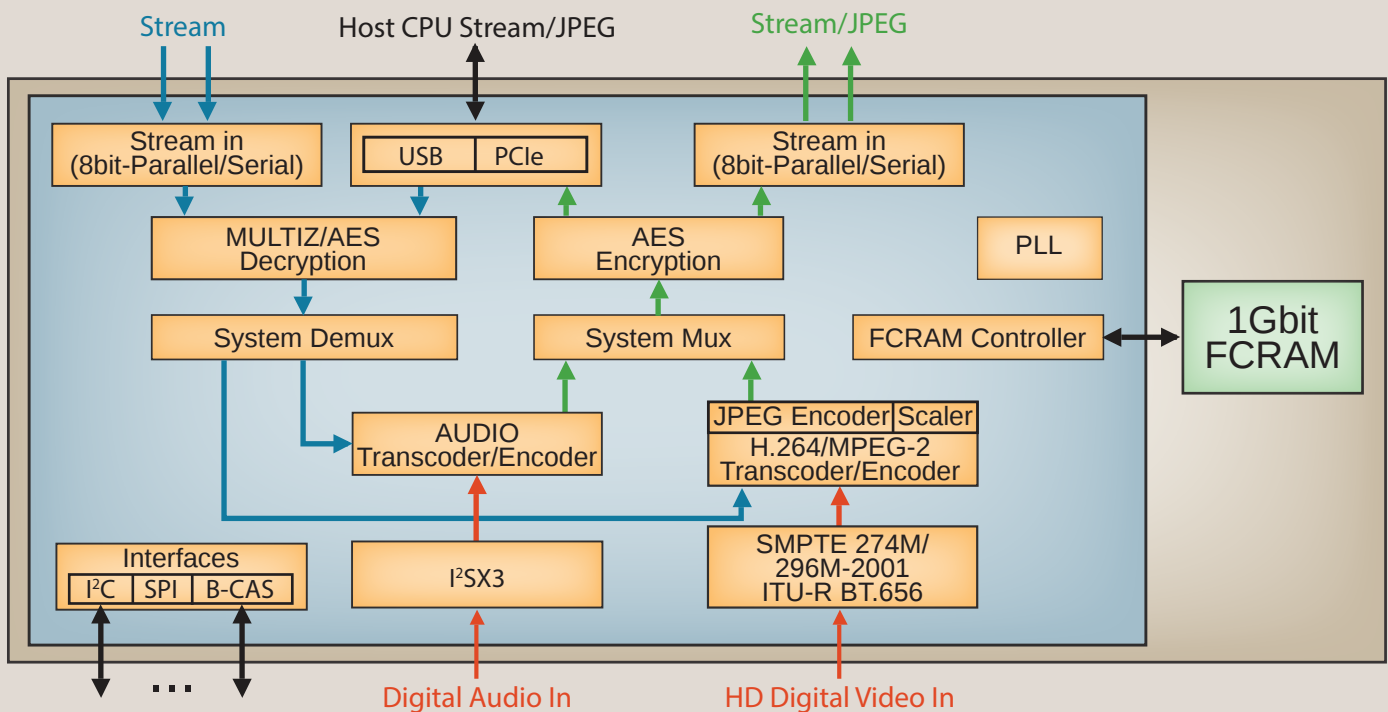
MB86M01/M02/M03 Series: Low-Power, Bi-Directional H.264/MPEG-2 HD Transcoders

The MB86M01/M02/M03 Transcoder LSIs enable conversion between Full HD (1920 dots x 1080 lines) H.264 video data and MPEG-2 video data. The bi-directional LSIs, which can also transcode between any audio format, offer industry-leading low power consumption and built-in memory.

A transrating function enables H.264 video data to be converted into even higher-compression H.264 video data, making the transcoders ideal for products for H.264 broadcast markets such as Europe, South America, and Asia. The transcoder LSIs combine Fujitsu's low-power-consumption technology with a proprietary algorithm that enables higher image quality while reducing the processing burden. Even with built-in memory, they deliver industry-leading levels of low power consumption.

Features

- Built-in H.264 transcoding, transrating and audio-transcoding functions
- Industry-leading low power consumption
- Small form factors for compact products
- Control functions for simultaneously viewing and recording programs
- Short delay time when transcoding
- Single-chip solution



MB86E631 Bridge IC: 10-Interface Controller for Video Processors and Advanced Wi-Fi TV Tuner Designs

The MB86E631 bridge IC enables advanced Wi-Fi television tuner applications to control various interfaces among different equipment. The device is an ideal controller for video/graphic processors, such as the MB86M01/02/03 transcoder series.

The new SoC combines a high-performance, dual-core ARM® Cortex™-A9 processor and more interfaces than any other single device: USB 2.0, USB 3.0, Serial ATA, PCI Express, Gigabit Ethernet MAC, transport stream (TS), UART, I²C, and two memory interfaces (DDR3 and Quad Serial Flash Controller).

The combination of this powerful processor (~500MHz operation) and multiple interfaces provides the performance and interoperability that transcoder ICs and other products – such as video-recording devices and TVs with built-in recording capabilities – need to control a wide range of interfaces.

The SoC manages the Wi-Fi TV tuner, which wirelessly sends transcoded H.264 / MPEG-2 streams to smartphones, tablets, other mobile products and storage devices. This enables users to view programming on the device of their choice, increasing flexibility and convenience.

Features

- 10 interfaces, more than any other single device: USB 2.0, USB 3.0, Serial TA, PCI Express, Gigabit Ethernet MAC, transport stream (TS), UART, I²C, and two memory interfaces (DDR3 and Quad Serial Flash Controller)
- High-performance CPU – dual-core ARM Cortex-A9 processor
- Single-chip solution
- Ideal for use with MB86M01/02/03 transcoder series

Applications

- Wi-Fi television tuners
- Video-recording devices
- Game-capture devices
- Network-attached storage (NAS)
- TVs with built-in recording capabilities
- Other products that need to control a wide range of interfaces

