Press Release

Fujitsu Microelectronics Limited

Fujitsu Releases New Full HD H.264/MPEG-2 Transcoder ICs

- Industry-leading low power to drive video in mobile products -

Tokyo, May 8, 2009 - Fujitsu Microelectronics Limited today announced 2 new transcoder ICs that can convert between Full HD (1920dots x 1080lines) MPEG-2[(1)] video data and H.264[(2)] video data, as well as transcoding between audio formats while featuring a low power consumption of only 1.0Watt(W) including the in-package memory. These new ICs are targeted to support the growing number of electronic equipment that can record digital broadcasts. By employing Fujitsu's proprietary transcode technology, Fujitsu Microelectronics realized industry-leading low power consumption. Combined with the small form-factor packaging, these ICs can be used not only for non-mobile fixed electronic equipment – such as digital video recorders (DVRs) - but also in such mobile products such as notebook PCs. In addition to the transcode function, security functions are included on a single chip to make it easy for customers to create their systems. Sample shipment of the new transcoder ICs, the MB86H57 and MB86H58, will begin from late July, 2009.

Digital TV broadcasts - including HD - are increasing worldwide, while demand for HD video recorders is also increasing. As many broadcasts still use MPEG-2 format, many such HD video recorders have a transcode function to convert the MPEG-2 data to the higher compression H.264 format, so that more data can be recorded onto certain media (hard-disk, DVD disc) and thus offer longer recording times. At the same time, there are increasing needs to record digital broadcasts on mobile products such as notebook PCs, as well as the increasing demands to create electronic appliances that use less energy. To meet these demands for low power consumption and small form-factors, Fujitsu Microelectronics developed these two transcoder ICs.

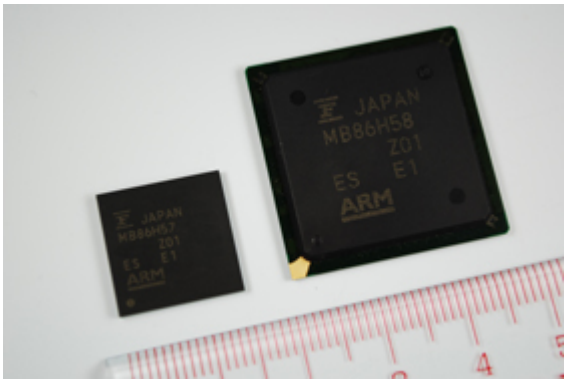

Figure 1 Chip photo of transcoders, MB86H57(left) and MB86H58(right) (unit: cm)

These new transcoder products use Fujitsu Microelectronics' low power consumption technologies that have been used in its previously announced H.264 Full HD CODEC ICs, including utilizing proprietary video algorithms developed by Fujitsu Laboratories, that maintain high video quality while reducing the processing load. Thus, when transcoding, an industry-leading low power consumption of 1.0W - including the power consumption of the in-package memory - was realized.

These transcoders also include audio transcode functionality, security functions for digital rights management of content, and a demodulator interface all integrated on one chip as well as in-package memory. The MB86H57 trancoder has a small 15mm x 15mm package ideal for adding video recording capability to compact electronic equipment. Therefore, these ICs can be used not only in non-mobile fixed electronic equipment, but they also enable expansion of the new recording functionality to such mobile products such as notebook PCs.

Leveraging Fujitsu's highly regarded expertise in image and video processing-related technologies and products, Fujitsu Microelectronics will continue to strengthen its video processing ICs for the recorder and set-top-box markets, focusing on video-processing ASSPs.

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Sample Shipment

MB86H01 Series

Product	Package	Sample Availability
MB86H57	FBGA 650 pin	From end of July 2009
MB86H58	PBGA 496 pin	From end of July 2009

Sales Target

200,000 units/month in the first year for both products

Key Features

1. **Industry-leading low power consumption and small form-factor**
   Utilizing Fujitsu Microelectronics' proprietary transcode technologies, a Full HD H.264/MPEG-2 transcoder with industry-leading low power consumption was realized. In addition, utilizing one 512M bit memory (FCRAM[3]) in-package, as well as the usage of 65nm process technology, the power consumption during Full HD transcoding, is kept down to 1.0W, including the in-package memory power consumption. Also, it is provided in a small form-factor, 15mm x 15mm package, so it can be used not only in fixed electronic equipment, but also in such mobile products such as notebook PCs.

2. **1-chip integration of necessary functions for recording digital broadcasts**
   In addition to the transcode and encode functions, security functions, and demodulator interface are all integrated on one chip, thus providing the necessary functions for creating systems for recording digital broadcasts and thereby making it easy for customers to create their systems.

3. **H.264/MPEG-2 bi-directional transcoder functionality**
   In addition to transcoding from MPEG-2 to H.264, as did the previous MB86H52 product, these new ICs also transcode from H.264 to SD MPEG-2, thus being able to handle the various formats likely encountered during use. Furthermore, with audio transcoding included, the high quality audio needs of discerning customers can be met.

4. **Abundant interfaces to connect peripheral ICs**
   Both products contain many interfaces for improved connectivity. As a host interface to connect to an external CPU, there is a 16 bit parallel interface and a TS interface as the video stream interface. In addition, there is a serial interface, PCI, PCI Express, and USB interface integrated. Connection to external ROM is also possible, thus realizing high-speed boot for products that feature this IC.

Glossary and Notes

1. **MPEG-2:**
   A video compression format (codec) that is part of the MPEG standard for video compression. MPEG-2 is widely used in DVDs and other video products.
2. **H.264:**
   Refers to MPEG4 AVC/H.264, a video-encoding format (codec) noted for offering more compression than MPEG-2 and other earlier formats. Jointly defined by the International Telecommunication Union,

Telecommunication Standardization Sector (ITU-T) and International Organization for Standardization/International Electrotechnical Commission (ISO/IEC), it is the most recent international standard for video compression.

3. **FCRAM (Fast Cycle RAM):**
   Fujitsu Microelectronics' proprietary RAM core architecture featuring high-speed and low power consumption.

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Inquiries

https://www-s.fujitsu.com/global/news/contacts/inquiries/index.html

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About Fujitsu Microelectronics (FML)
Fujitsu Microelectronics Limited designs and manufactures semiconductors, providing highly reliable, optimal solutions and support to meet the varying needs of its customers. Products and services include ASICs/COT, ASSPs, power management ICs, and flash microcontrollers, with wide-ranging expertise focusing on imaging, wireless, automotive and security applications. Fujitsu Microelectronics also drives power efficiency and environmental initiatives. Headquartered in Tokyo, Fujitsu Microelectronics Limited was established as a subsidiary of Fujitsu Limited on March 21, 2008. Through its global sales and development network, with sites in Japan and throughout Asia, Europe, and the Americas, Fujitsu Microelectronics offers semiconductor solutions to the global marketplace. For more information: http://jp.fujitsu.com/group/fml/en/

Attachment

Key specifications of the MB86H57 and MB86H58 transcoder ICs

Functions	Transcode	Video	TS(MPEG-2 HD/SD) ⇒ TS(H.264 HD/SD), MP4(H.264 QVGA) TS(MPEG-2 HD/SD) ⇒ TS/PS(MPEG-2 SD) TS(H.264 HD/SD) ⇒ TS/PS(MPEG-2 SD)
		Audio	Audio transcode, Time stamp re-allocation
		PSI / Private PES re-multiplexing	
	Encode	Video	VBS[*1] ⇒ TS(H.264 HD/SD), TS/PS(MPEG-2 SD)
		Audio	ABS[*2] ⇒ MPEG-1 Audio Layer2, etc.
	Thumbnails	JPEG Encode	
Video	Profile	H.264 High Profile /Level 4.0. H.264 Main Profile /Level 3.0. H.264 Baseline Profile /Level 3.1. MPEG-2 Video Main Profile / High-Level.	
	Interface	SMPTE274M/SMPTE296M-2001, ITU-R BT.656, external synchonous support	
Audio	Formats	Dolby® Digital(AC-3)[*3], MPEG-2/4 AAC-LC/HE-AAC, MPEG-1 Audio Layer2, Linear PCM	
	Channels	Max. 5.1ch[*4]	
	Interface	I^2S, S/PDIF	
JPEG	Resolution	320x240, 320x192	
Stream	Format	MPEG-2 TS/PS, MP4, Video/Audio ES output	
	Interface	Stream (8bit parallel, serial), General purpose 16-bit interface, PCI, PCI Express, USB	
Host Interface		General purpose 16-bit interface, Serial, PCI, PCI Express, USB	
Security		AES, 3DES, MULTI2 (decode only)	
Peripherals		I^2C, SPI, Card	
Input Clock Frequency		27 MHz	
Operating Frequency		216MHz (internal memory interface: 243MHz)	
Power Consumption(incl. memory)		1.0W (target) (typ., 1.2V, for MPEG-2 HD ⇒ H.264 HD transcode)	
Package		MB86H57：FBGA 650 pin, 15 sq.mm SiP(0.5 mm ball pitch) MB86H58：FBGA 496 pin, 27 sq.mm SiP(1.0 mm ball pitch)	
Memory		512Mbit FCRAM X 1	
Process Technology		65nm	

*1. VBS: Video Baseband. Refers to uncompressed video data.
*2. ABS: Audio Baseband. Refers to uncompressed audio data.
*3. Dolby: Dolby is a registered trademark of Dolby Laboratories.
*4 The number of channels differs depending on the audio format.