FUJITSU MICROELECTRONICS LIMITED
ASIA E-newsletter
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THE POSSIBILITIES ARE INFINITE FUJITSU

Corporate Message

Throughout summer, Beijing was full of excitement and celebration on the success of 29th Olympic Games. With such inspirational energy, Fujitsu Microelectronics Limited Asia has actively participated in several tradeshows and further enhanced its cooperation with universities.

It has also marked the establishment of Fujitsu Global Mobile Platform Inc. (FMPI), a joint venture between Fujitsu Microelectronics Limited (FML) and the Institute for Information Industry of Taiwan (III). Commencing its operations in August, FMPI will develop reference designs for improving design efficiencies of WiMAX-related products for Taiwan-based ODM vendors. It will also provide technical support to these customers.....

Fujitsu Microelectronics Set Up Another Joint Lab With SWJU.

Fujitsu Microelectronics Participates in Thailand Electronics Technology 2008

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About Fujitsu Microelectronics Limited Asia

Collaborating collectively on its distinct strengths and expertise, Fujitsu Microelectronics (Shanghai) Co Ltd, Fujitsu Microelectronics Asia Pte Ltd and Fujitsu Microelectronics Pacific Asia Ltd collectively form Fujitsu Microelectronics Limited Asia (FMLA), to provide a one-stop center for its semiconductor products to all customers in the Asia-Pacific region. Apart from sales and marketing of semiconductor products, FMLA also offers flexible business and system solutions for the digital AV, automotive, consumer electronics, and mobile and wireless markets, as well as design and technical support for customers, locally and regionally.

With technology resource centers and ASIC design support centers strategically located in Shanghai, Hong Kong and ChengDu, FMLA can speedily and competitively meet customers' stringent design-in requirements on ASSP, MCU and ASIC products. With heavy investments in design and engineering capabilities and application support resources, complemented by a regional network of design partners, suppliers and distributors, FMLA can readily delivers innovative and value-added solutions and varied range of products to its target markets in the Asia-Pacific region.

Fujitsu Microelectronics Asia Pte Ltd (FMAL) was established in 1986 to provide semiconductor sales and support solutions to customers in Southeast Asia, India and Oceania. FMAL offers a diverse array of application-oriented semiconductor products and solutions such as ASIC, ASSPs, microcontrollers/microprocessors (FR-V), System Memory (Flash Memory/FRAM/FCRAM) and System LSIs (DVD MPEG Source Decoders/MPEG –2 Encoders).

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Simultaneously, Fujitsu Microelectronics has launched new devices including low-power consumption 256Mbit FCRAM for digital consumer electronics, low pin count series of 8-bit Microcontrollers, AUTOSAR 2.1 - compatible driver for automotive onboard microcontrollers, and digital HDTV SoC for superior picture quality digital HDTV.

In progressive effort of universities tie-ups, Fujitsu Microelectronics (Shanghai) Co., Ltd. announces the collaboration with Southwest Jiaotong University to establish a joint laboratory after the founding of its Joint Lab with the Shanxi University of Science and Technology. It will also develop Students Research Training (SRT) to offer opportunity to students to be involved in scientific research training.

Sunny Chan,Senior Director of Corporate Development,Fujitsu Microelectronics Asia

Fujitsu Microelectronics Asia Pte Ltd (FMAL) has displayed its leading 8-bit microcontrollers' evaluation board, commodity MCU starter kit and power management ICs in Thailand Electronics Technology Exhibition, held from 10th to 13th October, 2008.

In India, Fujitsu Microelectronics Asia has shown up with its latest MCU product information in "EDN Asia Embedded System Seminar" which comprises of presentations and exhibits from leading companies in the embedded field, from test & debug to software and chip design.

Fujitsu Microelectronics (Shanghai) Co., Ltd. has also participated in China Digital TV Forum 2008, a session that gathered leading enterprises and industry experts to discuss the development of China's digital TV. Another participation is in the 6th China International IC Exhibitions & Summit, held from Sept 17 to 19 at the Suzhou International Expo Centre.

Read on the e-newsletter for more details on these activities!

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Press Releases

Fujitsu Microelectronics Launches Low-Power Consumption 256Mbit FCRAM for Digital Consumer Electronics

Shanghai, July 8, 2008 - Fujitsu Microelectronics (Shanghai) Co., LTd. announced the development of a 256Mbit Consumer FCRAM product for digital consumer electronics, the MB81EDS256545. The new FCRAM product runs on low power consumption and is ideal for system-in-package (SiP) designs. Key product features include a 64-bit I/O, low power DDR SDRAM interface that enables data transfer capabilities equivalent to two DDR2 SDRAMs(3) with 16-bit I/O, while reducing power consumption by a maximum of approximately 1 watt (1W) (equivalent to approximately 70%), thus contributing to power savings for digital consumer electronics. The new product is ideal for consumer electronics products that require low power consumption, such as digital televisions and camcorders.

For more information, please visit:
http://www.fujitsu.com/cn/fmc/en/news/archives/2008/0710.html

Fujitsu Microelectronics Launches AUTOSAR 2.1 - Compatible Driver for Automotive Onboard Microcontrollers

Shanghai, July 21, 2008 — Fujitsu Microelectronics (Shanghai) Co., Ltd. today announced the development and launch of a new microcontroller driver for its MB91460 Series of high-performance 32-bit automotive microcontrollers, jointly developed with Elektrobit Corporation of Finland and compatible with Release 2.1 of AUTOSAR, the open software architecture for automobiles from the AUTOSAR automotive software standards consortium. The new microcontroller driver is available from Fujitsu Microelectronics and Elektrobit from July 18, 2008. When used with Fujitsu Microelectronics' microcontrollers, this new driver will offer customers a greater degree of code reusability for automotive onboard applications already developed, and greater efficiency when developing automotive software.

For more information, please visit:
http://www.fujitsu.com/sg/news/pr/fmal_20080723.html

Fujitsu Global Mobile Platform Inc. Commences Operations

Shanghai, Aug 4, 2008 — Fujitsu Microelectronics (Shanghai) Co., Ltd. announced the commencement of operations of Fujitsu Global Mobile Platform Inc. ("FMPI"), a joint venture established based on a memorandum of understanding (MOU) tied between Fujitsu Limited's former LSI business divisions (currently a separate entity, Fujitsu Microelectronics Limited, "FML") and the Institute for Information Industry ("III") of Taiwan. FMPI will develop reference designs - designs which improve design efficiencies - for WiMAX-related products for Taiwan-based ODM vendors, in addition to providing technical support.

For more information, please visit:
http://www.fujitsu.com/sg/news/pr/fmal_20080804.html

Fujitsu Adds Low Pin Count Series to Line of High-Performance 8-bit Microcontrollers for Consumer Appliances

Shanghai, Sep 9, 2008 — Fujitsu Microelectronics (Shanghai) Co., Ltd. announced the addition of three series featuring low pin count (LPC), with 20 pins or less, to its F2MC-8FX family of high-performance 8-bit microcontrollers with embedded flash memory. Sample shipments of the new microcontrollers known as the MB95200H series, MB95210H series, and MB95220H series, are phased in starting on September 9, 2008. The three series have been added to the existing product line in response to the rapid rise in demand for LPC microcontrollers for use in home appliances and other consumer electronics in the Asian market.

For more information, please visit:
http://www.fujitsu.com/sg/news/pr/fmal_20080909.html

Fujitsu Launches Digital HDTV SoC for Superior Picture Quality Digital HDTV

Shanghai, Sep 11, 2008 — Fujitsu Microelectronics (Shanghai) Co., Ltd. announced that it has developed a digital HDTV system-on-chip (SoC) that integrates a video processing engine for superior picture quality, and a full high-definition (full HD, 1920 dots x 1080 lines) multi-decoder that decodes both MPEG-2 and H.264 video compression formats. The chip is an application specific standard product (ASSP), which features a proprietary video processing engine based on an algorithm by Fujitsu Laboratories Limited. By also including a proprietary picture quality adjustment tool that enables easy optimization of parameters by using a mouse, the new LSI enables TV set makers to dramatically improve their design efficiencies with regard to picture quality settings.

For more information, please visit:
http://www.fujitsu.com/sg/news/pr/fmal_20080912.html

Fujitsu Microelectronics and Leica Camera Co-develop Image Processing System Solution for High-end Digital SLR Cameras

Shanghai, Sep 26, 2008 — Fujitsu Microelectronics (Shanghai) Co., Ltd. announced that Fujitsu Microelectronics Limited ('FML') and Leica Camera AG ('Leica') have co-developed an image processing system solution for high-end digital single-lens reflex (SLR) cameras, to be featured in Leica's next-generation cameras.

For more information, please visit:
http://www.fujitsu.com/sg/news/pr/fmal_20080926-1.html

E-Shuttle and Hong Kong Science and Technology Parks Collaborate to Provide Silicon Shuttle Services for Asian Start-ups

Hong Kong and Tokyo, Sep 26, 2008 — Hong Kong Science and Technology Parks Corporation (HKSTP), and Fujitsu Microelectronics Limited's (FML) subsidiary e-Shuttle Inc. (ESI) in Japan have signed an agreement to provide silicon shuttle services for start-up integrated circuit (IC) design houses in Asia. The initiative, boosting Asia's semiconductor industry, provides first-of-a-kind Electron Beam Direct Writing (EBDW) technology at low cost. The proprietary EBDW technology developed by e-Shuttle significantly lowers the cost of prototyping ICs and reduces turnaround time. Under the new initiative, HKSTP will provide development support, including design tools and evaluation systems and secured remote access design environment to design houses, which then send timing, power and other data to ESI for prototyping using the EBDW technology.

For more information, please visit:
http://www.fujitsu.com/sg/news/pr/fmal_20080926.html

Activities

Fujitsu Microelectronics Establishes MCU "Joint Laboratory" With University Again

Fujitsu Microelectronics (Shanghai), Co., Ltd. announced that it will cooperate with Southwest Jiaotong University (SWJU) to establish a joint laboratory, which will become a platform for students to develop innovation experiments. In such manner, Fujitsu Microelectronics will continue to develop its Students Research Training (SRT) projects so as to provide university students with opportunities to be involved in the scientific research training.

SWJU is one of the oldest and prestigious universities in China. It offers one key state laboratory and 27 provincial laboratories that have very profound impact on the national transportation system. Fujitsu Microelectronics' cooperation with SWJU will further boost the development of SRT plan in China. The activity of "joint laboratory" will support universities to launch a variety of education innovation projects, consolidate the professional knowledge of university students and stimulate their innovation spirit so as to make them well-prepared for stepping into society and for making success in their future career.

Signature Ceremony

Unveiling Ceremony

Left: Fujitsu Microelectronics Asia Vice board chairman Fujitsu Kiminori
Right: The Vice-president of XiNan JiaoTong University Ge Fu Jiang

Fujitsu Microelectronics Participates in China Digital TV Forum 2008

Fujitsu Microelectronics attended the China Digital TV Forum 2008 from Sept 25 to 26, discussing with present experts on the achievements made during the past five years on DTV and forecasting the future development. At the event, Cedric Huang – Marketing Manager of Fujitsu Microelectronics (Shanghai), gave a speech on the application of digital TV STB.

Cedric Huang, Marketing Manager at Fujitsu Microelectronics (right photo) delivered a speech on "Application of Digital TV STB in Post-transform Era"

Mr Lee Ka Lok also gave a speech on "Power Solutions for Small Package Low Noise Portable Consumer Products"

Mr. Hui Wai Leung delivered a speech "Highly Efficient LCD Panel Power Solution" at the summit

Fujitsu Microelectronics Showcases at IC China 2008

From Sept 17 to 19, Fujitsu Microelectronics participated in the 6th China International IC Exhibition & Summit held in the Suzhou International Expo Centre. At the exhibition, Fujitsu Microelectronics showcases its 256-Mbit Consumer FCRAM product for digital consumer electronics, new 8-bit microcontrollers MB95200 as well as PLL products.

Fujitsu Microelectronics' booth

Fujitsu Microelectronics Participates in Thailand Electronics Technology 2008

Thailand Electronics Technology Exhibition was held from 10th to 13th October, 2008. Fujitsu's distributor in Thailand, Electronics Source Co. Ltd participated in the booth exhibition with displays of Fujitsu's leading 8-bit microcontrollers' evaluation board, commodity MCU starter kit and power management ICs.

Exhibition booth

Power Management IC Display Section

Microcontrollers (8-Bit Series) Display Section

Fujitsu Microelectronics Joins EDN Asia Embedded System Seminar 2008

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Fujitsu's Information Desk

Fujitsu's MB2146-410-01-E starter kit, MB95200's product development evaluation kit & software

The seminar has explored the issues encountered by the embedded design industry in line with its rapid evolution, and served as a networking platform for design engineers in Penang to not only bring forth their ideas, but also learn from each others' technologies and experiences.

Peter Tay, Assistant Marketing Manager, MCU & Automotive, delivered a presentation on "Cost Effective Microcontrollers – Simple instruction, Seamless Migration, Best-Choice Solution"

Special Press Reports

Media Interview

Electronic Engineering & Product World, July issue, 2008

Cedric Huang, Marketing Manager at Fujitsu Microelectronics, was interviewed by EEPW. He expressed his opinions on the development of the video transcoding technology.

Eng version

The Future Video Market Depends on Transcoding Technology

Cui Peng, Staff Reporter

Abstract:	Content is what really counts in today's video entertainment market, and the video content that can be converted into any desired format in real time represents an overwhelming trend of the market. Though it may not be well known by the public, the video transcoding technology is destined to be widely used. Video transcoding means the process of converting one video format into another, in which the video is first decoded and then re-encoded into desired format and data rate.
Key Words:	Video transcoding, MEPG-2, H.264, DSP

Content is what really counts in today's video entertainment market, and the video content that can be converted into any desired format in real time represents an overwhelming trend of the market. Though it may not be well known by the public, the video transcoding technology is destined to be widely used. Video transcoding means the process of converting one video format into another, in which the video is first decoded and then re-encoded into desired format and data rate.

According to analysis made by IDC, transcoding is required by three main applications:
conversion between different video formats: such as converting from MPEG-2 or MPEG-4 into H.264;

content transmission: changing bitrate in order to be aligned with bandwidth requirements of different networks or playback rate of different devices;

resolution: high definition video is first downscaled into standard definition video or even much lower definition video, and then converted back into high definition video.

A typical application is transmitting video from a video camera to a PC, so that the video can be edited and then uploaded to

a website, e.g., YouTube. Transcoding is carried out in the process of video transmission, such as from a video camera (AV1 format) to a PC (MPEG-2 for edit or MPEG-4 for storage), and then to a website (H.263/H.264/Flash/etc.). In order that files on websites can be viewed through a PC, another transcoding is required, so that the video can be played by a RealPlayer or Windows Media Player.

Demands of Transcoding Market

Development of and ever increasing demand for video transcoding technology correlates with the digital process of the digital TV broadcast, because the major applications of transcoding technology are now TV broadcast and front end processing of digital media. "As a matter of fact, multi-decoder chips, which enable devices to support various types of signal sources, are only applied in 'watching' program.", said Mr. Huang Zili, Marketing Manager of Fujitsu, "Sometimes, however, only one type of signal source is required for some applications. For example, it would be better to play back programs with the same format on the front-end of cable TV, where there is a need to convert the format of some programs."

Currently, large amounts of digital video programs are in MPEG-2 format, while more and more playback devices adopt advanced digital encoding/decoding formats, such as MPEG-4\H.264\Real\VC-1\AVS, to improve transmission and storage efficiencies. Therefore, transcoding technology based on MPEG-2 has been widely used, which results in requirements of higher performance of high-definition transcoding, especially real-time transcoding technology and its realization strategies.

In addition, in hard-disk video recorder applications, MPEG-2 format video occupies too much hard-disk space: sometimes one high-definition movie will occupy about 8GBytes space on HD. Because H.264 format features higher compression ratio, transcoding from Mpeg2 to H.264 is required to reduce data size, and thus to reduce hard-disk costs as well as weight and footprint of the whole device. For example, the Fujitsu MB86H52 achieves up to 5X capacity expansion without deteriorating quality of the programs.

In some applications, such as transmitting programs over network, MPEG-2 requires more bandwidth. If there is only limited bandwidth, video signal may be converted from MPEG-2 format into H.264 format to save bandwidth for transmission. The data rate of H.264 signal can be further reduced by video transcode in order to meet requirements of network transmission.

Transcoding technology will be used in more and more applications which require for multi-format conversion of digital video, including not only commercial products such as video broadcasting, media gateways, multi-point control units,, medical imaging and video security, but also consumer products such as digital media adaptors, HD video conference terminals, advanced digital set-top boxes, IP video telephony and HD network cameras. As illustrated in Figure 1, commercial products are more concerned with high definition video quality, while high cost effective transcoding chips are more important to consumer products.

"There is a large application market for transcoding products, and more and more new applications will continue to be developed." said Mr. Huang Zili.

Realization of Transcoding Technology

The development of video transcoding market has attracted attention of more and more digital device manufacturers and semiconductor companies. The former, out of consideration of actual demands of the market, usually develops their own ASIC transcoding chips for conversion of MPEG-2 into H.264, and integrates them into their products. For example, Panasonic adopts self-developed UniPhier chips in its DIGA series of HDD video recorders, which, during content recording, converts 17Mbps MPEG-2 based digital video signal into 5.7Mbps H.264 format, significantly increasing the quantity of programs recorded on the device. Other Japanese companies, including Sony and Hitachi, also launched their respective products with transcoding functionalities based on independently developed transcoding chips, in 2007.

As the semiconductor companies are getting more and more interested in transcoding technology, new products supporting conversion between various formats, such as MPEG-2, H. 264 and VC-1, were launched one after another last year. However, these new products adopt different strategies. Transcoding can now be realized by either software or hardware. The former is usually realized with high speed computers or high performance DSPs, while the latter is generally realized with dedicated ASIC or FPGA. "In the digital video encoding/decoding and transcoding applications, high-end DSPs are always the main

platform for real-time processing. In basic media processing platform applications, features of ASIC chips cannot be changed once fab is out. Though FPGA is programmable device, it is difficult to make big modifications after completion of hardware design and PCB layout. The reason that DSP attracts extensive attention is that, as an embedded programmable software platform, it supports multiple video formats and even finished product can be upgraded by software updating.", said Mr. Zheng Xiaolong, Manager of Generic DSP Business Development of TI, when talking about the differences between these solutions.

Figure.1: Most Consumer Electronics & Commercial Video Products Will Adopt Transcoding Technology

Source: Texas Instruments, Inc.

Figure.2: TI's HD Multi-Media Processor Which Supports Multi-Format Video Transcoding, DM6467

TI's DM6467 is a HD multi-media processor which supports multi-format video transcoding. It's a SoC (system-on-chip) with multi-core processors, instead of simply putting several processing units in parallel. The core processing unit of DM6467 consists of high speed High-Definition Video/Imaging Co-Processors (HD-VICP), high speed DSP and video data conversion engine. The HD-VICP offers more than 3 GHz of DSP processing power through dedicated accelerators for HD 1080i H.264 high profile transcoding. The high speed DSP adopts 600 MHz C64+ core. Less than 300 MHz of the DSP core is used to support high-definition encoding/decoding and transcoding. The DSP is quite flexible, accommodating not only previous generations of video processing algorithms, but also new generation of algorithms as well as proprietary algorithms. The downscaling functionality of the video data conversion engine helps reduce DSP load. In addition, the video data conversion engine carries out chroma sampling with hardware and also delivers menu overlay functionality. DM6467 also integrates an ARM core, supporting multiple built-in real-time operating systems and performing various master control and management functionalities.

Figure.3: The Process of Hard Transcoding

Broadcom Corporation announced its 65 nanometer (nm) single-chip high definition (HD) transcoder solution, BCM7043, last year. The key built-in modules of BCM7043 include:

Video Compression Engine: uncompressed video input is delivered to this encoder engine and converts the sequence of uncompressed video pictures into H.264, AVC, MPEG-2 or MPEG-4 compressed video streams.

Advanced Video Decoder (AVD): the AVD module decodes compressed video for re-encoding using the video compression subsystem.

Advanced Audio Module: the advanced audio module contains a programmable audio processor that supports real-time decode of MPEG-1, Layer-II, Dolby? Digital and Dolby Digital Plus Stereo, DTS, DTS-HD, MP-3 and PCM; and real-time encode of MPEG-1, Layer-II, Dolby Digital, MP-3 and PCM audio formats.

Video Input Processor (VIP): the VIP module prepares uncompressed video for encoding and, in conjunction with the video pre-processor, motion compensated temporal filtering (MCTF) and digital noise reduction produces excellent video quality and excellent compression efficiency.

Transcoders are differentiated by the types and numbers of formats that they can support, especially when being extended to the market of portable devices. The transcoder XCode3290, developed by the Canadian company ViXS Systems Inc., performs a mirror transcode, which converts HDTV video content into two different output streams of different resolutions and bit-rates. For example, while converting MPEG-2 HDTV video into H. 264 format, the chip also downscales the video to QVGA resolution of 320x240, facilitating its playback on a portable device such as iPod.

Potential Challenges

Video transcoding is a process involving heavy processing load, including complete decoding, video filtering and image treatment of the input data stream, as well as complete decoding of the output format. The simplest transcoding process (Figure. 3) involves two steps, i.e., decoding only a single bitstream and then re-encoding the data with a different Codec. Though this kind of hard transcoding looks very simple, involving only one decoder and one encoder, the resulting display is not ideal, because decoding and re-encoding of video data deteriorates image quality.

Hard transcoding is not flexible. Compared to solutions with smart transcoding algorithms, hard transcoding requires higher processor performance and causing more power losses. If the whole process of transcoding is realized by software, a 2 GHz processor will be needed. The processing capacity of the CPUs of current PCs will, while running other programs, not be able to support real time HD video transcoding, not to mention such consumer products as set-top boxes.

Dedicated transcoder will be helpful to devices such as set-top boxes and digital video recorders, because it can offload the core processor. High-definition transcoding represents a bigger challenge than standard definition transcoding, because far more data need to be processed in the former case than in the latter. As a matter of fact, even the high-end PC processors available now are unable to decode 1080i stream media without help of a hardware accelerator, because even a non-real-time transcoding consumes a lot of system resources.

The prevailing method of improving the image quality deteriorated by transcoding is to perform software analysis of encoded video data before transcoding, and apply the outcome of such analysis to re-encoding. Specifically, DSP core is used to perform analysis of motion vector during decoding of the original video. The motion vector information of the source data is applied to encoding if it is correct. If the motion vector information of the source data is found to be incorrect, the encoder will inspect the motion vectors again and then analyze the information obtained from such inspection.

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国际电子商情

Electronics Supply & Manufacturing China, July 1, 2008

Mr Lu Biao, Marketing Manager of Fujitsu Microelectronics, accepted an interview with ESMC and discussed the development of WiMAX.


Wave 2认证即将开始，WiMAX大规模部署能否抢先于LTE?


满足您的无线需求

Eng version

Wave 2 Certification is going to start, can WiMAX's Large-Scaled Deployment Be Ahead of LTE?

Alice Sun

The unsuccessful cases of WiMAX's trial runs in Korea and Australia make a lot of people doubting the WiMAX technology. Is WiMAX progressing or has it stopped development now?

"Why Korea hasn't achieved great success till now is mainly because it is too anxious to introduce this service by utilizing Wave 1 WiBro. However, Wave 1 WiBro is not a mature product and KT's launching plan is either not well in place," said Bernard Aboussouan, VP of Marketing and Business Development, Sequans. "Some of the 16e Mobile WiMAX deployed earlier is based on Wave 1. In our eyes, Wave 1 may have disappointed the carriers that promised to conduct early deployment as the performance of the Wave 1 products are not the best-in-class. However, we firmly believe that solutions that fully meet the requirements of Wave 2, including MIMO and beamforming technology, will present great features and widely accepted by the market. "

"The complete functions of Wave 2 are very important for carriers to provide successful mobile WiMAX experience for the customers." Added Vijay Dube, Executive VP and COO, Wavesat.

According to Aboussouan, the major WiMAX markets are some developing countries, which focus on fixed and mobile applications, such as telecom carrier Reliance, VSNL/Tata and BSNL of India, Mobilink and Wateen of Pakistan. Russia also has great potential and M-Taiwan of China's Taiwan is also active in promoting WiMAX. In short and middle-term, Korea's KT, America's Sprint/Clearwire as well as Japan's UQ/KDDI all have the opportunity to realize true mobility. All of the deployments are in the early stage except that of India, Korea's KT and America's Clearwire. What's more, they can start large-scaled commercial deployment in 2009. Aboussouan points out that before WiMAX realizes successful deployment in commercial networks, very likely it will only be niche technology targeting at mobile applications. However, he is very positive towards the development of WiMAX.

Revealed by Intel's speaker, the Australian government has withdrawn its investment in OPEL's WiMAX network, which is supposed to provide broadband services for areas with lower telecom service level in Australia. The investment is made by the former Australia government, while the current government no longer supports this project due to various reasons. However, we don't think that the Australia government has once announced that they don't support WiMAX. The speaker said: "We are still waiting for the detailed plan about how the current government will provide broadband services to the rural areas."

Waiting, carriers are waiting, and all of the companies that deal with WiMAX are waiting. "We are closely working with base station companies, system integrators and ODM/OEM manufacturers to complete stable, high-performance end-to-end solutions, so that carriers interested in WiMAX can boldly invest in the fundamental construction of WiMAX," said Mr. Lu Biao, Marketing Manager, Fujitsu Microelectronics. "All of the OIT testing, field testing, volume production testing are becoming mature. At the same time, we are also cooperating with partners to develop different kinds of mobile WiMAX-related and innovative handheld devices. For us, everything is in order. We are only waiting for the opportunities." This is also what the majority of others think.

Aboussouan said: "The biggest challenge of WiMAX is whether we can ensure a wide and successful deployment in the next two years, ahead of the LTE." While the most important of this is when Wave 2 certification will start, and when there will be true Wave 2 product in the market and how to complete interoperability testing between base stations and CPE solutions. "Certification is a long-term process. The testing equipment and testing examples are not ready, the certification can not be successfully finished as a result."

Batch Wave 2 products is expected to be launched in Q4

Good news from Intel: the first Wave 1 product got certified in Apr of 2008, while Wave 2 certification will start from end of

3Q. And it is expected that WiMAX Forum will certify the first Wave 2 product's interoperability in Q4. The company also forecasts that with the deployment of the "new Clearwire" network, manufacturers will introduce Wave 2 products late this year. Intel emphasizes that different from WiMAX Forum's certified lab, Sprint and Clearwire are both conducting their own interoperability system certification. Sprint has announced in its recent press release that SAMSUNG has reached its strict business standards, including overall performance, network handover performance and network handover delay. Certification of carriers plays an important role on promoting WiMAX.

Sequans hopes that its products can become the first batch of products that pass the Wave 2 certification. The company's base station and customer station reference design passed the Wave 2 certification two months ago. Aboussouan said: "We expect that around five base stations and five mobile station products will get certification recently, followed up by more products later. Products for the early certification include fixed CPE and home gateway, PC card and USB dongle. During the early stage, it is expected that there will be no MID and cell phones. However, several MID/cell phone manufacturers are developing relative products, such ah Nokia and HTC."

Fujitsu Microelectronics also reveals that it will be leading company in getting Wave 2 certification and will launch Wave 2 products late this year or early next year. Intel forecasts that the Centrino 2 system adopting Intel's Echo Peak WiMAX solution will be launched late this year in America. The company says the product to be launched may be in the same size with MiniCard or half of that size, in order to make it applicable to mobile products with different sizes. However, MID or cell phones will not be launched so quickly.

WiMAX cell phone is under development, will be introduced end of this year at the earliest time
Dube pointed out that in short to middle term, the main opportunities lay in fixed access point and data card for portable and mobile applications. Except single mode devices, ODM companies are also developing dual mode USB devices (WiMAX + 3G) for special markets like Korea. Odyssey 8500 chipset from Wavesat can fully support MIH function, allowing changing WiMAX network to 3G network. This chipset has unique and flexible multi-mode 4G architecture, supporting WiMAX Wave 2, WiFi, XG-PHS, and can seamlessly transfer to 4G technologies like LTE. Such features are important to provide excellent user experience to customers. We have already noted that some companies are planning to integrate WiMAX into cell phones or other handheld devices, mainly targeting at dual mode applications. He said: "Though there are some prototype products in the market, we still expect that WiMAX cell phones will not swarm into the market until the second half of 2009."

The Odyssey 8500 chipset adopts a unique 4G multi-core architecture with several low power consumption DSPs and multi-voltage management IC. It uses advanced embedded DRAM technology and no need for external memory devices, saving floor space, cost and power consumption for customers. It is ideal for wireless USB dongle, cell phones and other portable and mobile applications within the consumer electronics market.

"Currently, the mainstream manufacturers in the market are focusing on peripheral products of PC, such as PC card, USB dongle, Express card, indoor and outdoor routers, but have not seen real MID or handheld products," said Lu Biao, Fujitsu Microelectronics. He also reveals that Fujitsu is now working with manufacturers to develop WiMAX MID and MWD (Mobile WiMAX Device), which will be showcased late this year. He said: "Our advantages are the leading technologies for very low power consumption, high performance, stability and micro-nano process. We have introduced single chip that integrates MAC and physical layer. We will not only integrate RF, but also our own power management chipset in order to develop industry's smallest products that are most suitable for handheld devices."

Sequans fully agrees on the trends of single chip for WiMAX. Aboussouan said: "Actually, Sequans' recently-launched SQN1170 has brought base band, RF and memory together in a single CMOS chip. Sequans is planning to continue to reduce footprint, cost and power consumption by utilizing optimization arithmetic, 65 nm and even less line width, as well as integrate more functions."

It is expected that low power consumption WiMAX or MID products will be launched next year.

China Electronics News, July 1, 2008

Steven Sui, Senior Marketing Manager of Fujitsu Microelectronics, conducted an interview with China Electronics News. He mainly discussed the development of satellite high definition TV.


卫星高清数字电视普及加快　产业链洗牌在即

Eng version

Sui Jun: Senior Manager of Micro-Electronics Marketing Dept of Fujitsu

Enhance the Investment in the Satellite Digital TV market

Nowadays, there's a "black market" of 15 million set-top boxes in China each year. These set-top boxes aimed at the rural market and based on the DVB-S technology. But as China adopts the direct satellite broadcasting technology of its own and together with the government purchasing, every village will have an access to satellite broadcasting .Therefore this "black market" will come to an end. We believe that the urban market of direct satellite broadcasting will also be opened in the end, so there will be a market of over 100 million customers in China, and possibly, the largest market in the world.

Because direct satellite broadcasting technology and DVB-S technology are different in modulation, their modems are different. At the same time, the National Broadcasting Bureau will have a higher data standard for the set-top box used in direct satellite broadcasting, and all these factors call for a reworking on the original DVB-S solution.

At present, Fujitsu has a MB86H25B solution for FTI, and a MB86H20B solution for encryption application. Both of the solutions have passed the related tests. We are also working on the chips that support advanced encryption, in this way we can provide the optimized solutions promptly when ever the market is there. The high definition decoding, PVR products and more have been put into schedule to support the various applications of the satellite broadcasting market.

Currently, Fujitsu adopts the modulating chips made by Availink, and in the future, we may use other chips as well. So far, most of the manufacturers of the satellite broadcasting set-top box are our customers for many years, we have a close contact with them. We will make a quick response to any market feedbacks. Fujitsu takes the satellite broadcasting market as the most important strategic market in the years to come, and willing to share our experiences and technology with other market players and ready to help to build up a healthy mature satellite broadcasting market.

国际电子商情

Electronics Supply & Manufacturing China, Sep issue, 2008

Andy Chang, Deputy Marketing Director of Fujitsu Microelectronics Asia-Pacific, was interviewed by ESMC and expressed his opinions on wireless vehicular communications.

Eng version

Wireless Automotive Communication, Unlimited Market Potential

Wireless communication technology will play a more and more important role in the future automotive electronics market with development of technology as well as increasing demands of drivers. The momentum of such development comes not only from application of consumer electronics to vehicles, but also from the pursuit of a more environment friendly, more convenient and much safer driving environment. The former includes well-known technologies such as Bluetooth, GPS, mobile phone and so on, while the latter is still in the phase of market cultivation and standards formulation. Thanks to concerted efforts of the

electronics and automotive industries, new technologies and concepts for vehicle and road & communication infrastructure, such as DSRC, ETS, WAVE, ITS, are emerging and working together to eliminate the obstacles on the way to future success.

It Is Not Just a Remote Keyless Entry (RKE)

People come to remote keyless entry (RKE) when talking about automotive wireless communication technology. As a matter of fact, RKE does be one of the first wireless technologies applied onboard. USA and Japan use the frequency band of 315 MHz in RKE, while Europe uses ISM band. However, wireless communication technologies employing higher bands (such as Bluetooth and other wireless communication technologies related to mobile phone) are now knocking at the door of automotive electronics with development of the consumer electronics industry. For example, the Bluetooth, which is in 2.4GHz band, has been standard on mobile phones. This ten-year old technology is striding into information and navigation system.

In the opinion of Mr. Su Guoliang, Director of the Asia/Pacific and Japan Region of the Bluetooth Special Interest Group, in addition to Bluetooth headsets and hand-free Bluetooth kits, which can be used to help drivers make/answer a phone call with speech commands, some other systems can also be used to align automotive systems with address books, including caller's ID, call waiting, conference calling and even display of signal strength and battery capacity of the mobile phone. "The low power consumption Bluetooth technology to be launched in the middle 2009 is also expected to be used in automotive industry, for applications such as Tire Pressure Monitoring System (TPMS) and RKE.", said Su.

However, the principle for sound development of the automotive industry is to ensure safety driving and to minimize traffic accidents. In addition to improving passive and active safety systems onboard the vehicles, it has become consensus of all countries that in order to decrease traffic accidents, we should find solutions to connect vehicles with road and communication infrastructure, and thus to ensure safe driving through interaction between them. This is just the field where automotive wireless technology can make great contribution. According to Mr. Yang Zhengrong, Vice General Manager of Automotive Electronics Market Center, Renesas Technology (China) Co., Ltd., after the passive and active safety systems have reduced the death rate in traffic accidents by 40%, such interactive systems may further reduce the death rate by 20%.

Then which wireless communication technologies will have the best opportunities to develop together with such interactive systems? We believe DSRC ranks the first. DSRC has already been applied in Electronic Toll Collection (ETC) and will be possibly employed to provide traffic information about relevant roads to drivers when they are approaching junction points of branch roads and trunk roads, road junctions and T-shaped road junctions. In Japan, in addition to DSRC, light Beacon with a communication distance of 3.5 m is also used to provide drivers with traffic information about the road ahead; and a Radio Wave Beacon of 2.5GHz with a communication distance of 70m is adopted for expressway driving (capable of providing traffic information about the ramps and roads invisible ahead). Further, Japan is now exploring the possibility of realizing inter-vehicle communications as well as communications between vehicles and facilities along roads by setting up DSRC relay stations.

Hotspot, Ad Hoc, WAVE (IEEE802.11p) and WiMAX (IEEE802.16e) are all hot technologies for automotive communication & communication of traffic information, in which areas Europe, USA and Japan have taken lead because they have been studying applications of these technologies for quite some time. Mr. Yang Zhengrong believes that each of these technologies has its respective advantages. "Ad Hoc can build a communication network among a group of vehicles at any time and any place; while WAVE and WiMAX gain more attention in Europe and USA as technologies that may be realized in the near future." he said.

ITS, WAVE and WiMAX

If only one fashionable word could be used to describe the above-mentioned road infrastructure, that word could be no other but Intelligent Transportation Systems (ITS). In fact, ITS has attracted extensive attention in China as a result of the 14th World ITS Conference held in Beijing last October. It should be pointed out that this technology, which integrates computer, electronics and communication technologies all together, has been widely deployed in Europe, USA and Japan, since it was firstly launched in the early 1990s. The VII in USA as well as AHS and ASV in Japan are all typical applications of this technology. Take the ASV as an example. Japan has carried out three Five-Year Plans to promote this application since 1991. As a result, ASV has been playing an active and decisive role in reducing traffic accident, relieving traffic congestion and protecting the environment.

ITS is a technology that effectively connects vehicles with facilities along roads through wireless communication. It provides real-time traffic information to traffic administrators and other stakeholders (drivers, pedestrians and people who will be on road), so that the former can implement proper traffic control in a timely manner, and the latter can plan their routes of trip in advance. "With the traffic information provided by ITS, drivers can learn in advance whether there are obstacles ahead or whether there are other vehicles or pedestrians which may collide with themselves at road junctions (especially the ones without traffic lights), so that they can take precautious measures to prevent rear-end collision and reduce speed before entering a curve," Yang said, "ITS can not only significantly enhance driving safety, but also smooth the traffic by timing and proper control, contributing to energy saving and environment protection."

As to WAVE and WiMAX, it seems that two Japanese semiconductor companies have determined to be pioneers in this field. Discussions on standards in WAVE communication (IEEE802.11p) are now underway in USA and Europe. Germany even announced a plan aiming at making WAVE onboard all vehicles by 2012. It is claimed that Renesas has presented its WAVE communication terminal equipment to the Europe Vehicle Wireless Communication Standard Group C2CCC, which was set up in 2004, to take tests in accordance with international standards in WAVE regarding automotive wireless communication. Fujitsu Electronic is more optimistic about WiMAX. "WiMAX will provide rapid, extensive, optimal and low cost network infrastructure to various automotive communication networks.", said Mr. Zheng Guowei, Marketing Director of Asia-Pacific Region of Fujitsu Electronics.

"The sales of China's automobiles reached a new record of 8.79 million units in 2007, up 21.8%, while the sales of automotive information & communication devices increased by nearly 30% compared to 2006.", Zheng pointed out, "With the fast growth of the automotive consumption, automotive wireless communication electronics market also demonstrates a strong momentum. The market volume of Telematics and automotive entertainment system is expected to hit $4 billion by 2013." Automotive wireless communication technologies are categorized by applications and protocols adopted. By applications, there are interior vehicle (CAN), vehicle to vehicle, vehicle to outside facilities (such as traffic signs) and vehicle to outside networks (such as Internet); while for the protocols, "WiMAX will be the most important network based protocol for automotive communication technology."

But in Yang Zhengrong's opinion, combination of WAVE and WiMAX will make a preferable solution. He said that WAVE, with its speed of tens million bits per second, can provide both text and graphical information about road junctions, ramps, gas stations and parking lots within a radius of hundreds of meters. The technology can also be applied to vehicle to vehicle communication. WiMAX has a communication radius of up to 50 Km with a speed of up to 75 Mbps (20MHz bandwidth). It can used not only for communication between fixed spots, but also on objects moving at high speed of over 120 Km/h. WiMAX, which is easy to upgrade, offers better spectral efficiency and system capability in longer distance. Further, its outstanding systemic gain provides stronger long distance penetration and high-speed mobility, which makes it a good complement to 3G in the future. The combination of WiMAX and WAVE can cover areas out of the latter's reach, and thus to constitute a high-speed, seamless and wireless mobile communication network for vehicle and traffic information transmission.

Contribution to Automotive Entertainment System

The time is coming for automotive wireless communication technology. Considering the attractive prospects that the technology can bring to both drivers and passengers, every semiconductor manufacturer is trying their best to get ready to serve the consumers and the market as early as possible. However, it should still be pointed out that, though we do have many options, there is no ready market and applicable standards for automotive wireless technology up to now, and there is a long way to cover before such technology can be put into commercial application. Just as what Mr. Kang Xiaodun, Manager of Automotive Electronics Engineering of Freescale Semiconductor, said, at present, except for some short distance communication for wireless remote control, most automotive wireless communications are realized with civil consumer technologies, such as Bluetooth and cellular communication technology. In this context, it may be more practical for automotive electronics manufacturers to explore how to bring automotive communication technologies into full play in automotive entertainment systems.

It is no doubt that automotive entertainment system has gained strong momentum in recent years, due to the increasing demands of the users and the quick development of the software and hardware technologies of automotive electronics. Compared with the poor systems consisting of only one set of audio system in the past, automotive entertainment systems nowadays not only include CD/DVD/VCD/MP3, but also embrace various wireless technologies, such as television receiving, GPS, GSM/GPRS phony, Bluetooth headset and internet.

Kang expected that the future automotive entertainment system could be a system which "copies" all home entertainment functionalities onto vehicles. He also pointed out that, "It may be more practical to migrate consumer wireless technologies onto automobiles, because it seems that no more advanced technology could be developed in the near future, due to technical reasons."

However, migrating consumer technologies onto automobiles doesn't mean just mounting these technologies on automobiles, because the automotive application environment is quite tough. "All the technologies must be adapted to automotive requirements." said Kang. He emphasized that high quality third-party service, such as real time news and movies on demand via high-speed wireless internet, is quite important to take full advantages of these technologies. Further, independency of auto entertainment system is gradually influenced by development of technology—"besides hardware (advanced audio, DVD, multi-location LCD and navigation), future entertainment system will be connected to automotive communication and control systems through various networks, to provide automatic control functionality such as voice control, and diagnostic functionality."

GPS shouldn't be forgotten when talking about connection between wireless entertainment and control system. The process of integrating GPS into other on-board entertainment technologies is now underway. By sharing the same LCD with on-board DVD, drivers only become aware of its existence when they are using GPS. Although navigation is still its most important application for the time being, it is also very important for GPS, as an integral part of the future entertainment system, to provide real-time traffic information to drivers to help with their driving, in addition to continuously improving precision of location. In addition, this technology will hopefully combine with others to realize automatic driving.

Many people imagined contacting friends and family members with on-board video telephone or working on the wheels. Now development of Bluetooth has been able to make this dream come true. Some members of Bluetooth Special Interest Group have manufactured onboard voice Bluetooth devices especially for drivers and automotive Bluetooth kits for car makers. "These products can replace cables and infrared ray technology required by present rear seat entertainment system such as game players, DVD, stereo headset, thus to avoid existing problems such as intertwining of cables or negative influence of sunshine on infrared ray." said Mr. Su Guoliang, "They can also support automotive wireless communication, such as opening doors with remote control key or exchanging data with onboard test system.".

Captions:

1.Su Guoliang: Bluetooth technology can help eliminate the need for cables required by present rear seat entertainment system.

2.Zheng Guowei: WiMAX will provide rapid, extensive, optimal and low cost network infrastructure to various automotive communication networks.

国际电子商情

Electronics Supply & Manufacturing China, Sep issue, 2008

Welch Ding, Product Manager of Fujitsu Microelectronics, accepted an interview from ESMC and he discussed the development of Japan's MCU companies in China.


日系MCU厂商决战中国市场，多策略齐头并进

Eng version

Japanese MCU Manufacturers Fight for Chinese Market with Various Strategies

A newly released market report by iSppli shows that the Japanese company, Renesas, ranks the top on the list, and is the largest MCU supplier in China in 2007. Among the top 10 companies, another two Japanese companies are NEC and Toshiba. Compared with Taiwan and mainland companies who are still in the 8 bit market, Japanese companies have an obvious advantage over them and are strong enough to compete with US and Europe with their own different strategies.

Renesas: Fight for Chinese Market, RX Core Will Unify Multi-Platforms

Hideharu Takebe, the president of Renesas and the head of MCU department, declared 4 strategies on a meeting held at the beginning this year, in hope that their market share in China will be doubled by 2010. He said "to realize the above target, we'll put forward the following strategies: Further explore the product lines (high/medium/low end); Make a good achievement in high-end market in China through Super H; Put RX into action in medium-end products; Maintain the good momentum through Tiny series in low-end market".

The most noticeable project is Renesas's new "RX" series with CPU core. Renesas started to develop it's new generation of CISC CPU core architecture in May last year and announced the complete of the design on RX structure in November. According to the report, this new generation of RX will unify all the existing CISC MCU in 16-bit and 32-bit MCU. Renesas said when Renesas took over the semi-conduct business from Toshiba and Mitsubishi 5 years ago, there were several MCU platforms under development. With the complete of RX Serious, M16C, H8S, R32C and H8SX series will be unified. RX is compliant with the existing 16-bit and 32-bit CPU, and optimizes the coding efficiency□power consumption and processing. The maximum frequency is up to 200MHz the processing ability is above 1.25MIPS/MHz(Dhrystone2:1). Besides, it reduced the code length by 30% and the power consumption is under 0.03mA/MHz. The new RX CPU structure product, RX600 series

32 bit-MCU, features integrated 4MB flash on chip, 256KB SRAM and highly integrated peripherals. The samples of these products are expected for delivery in the second quarter of 2009.

Yasushi Akao, board director and executive general manager said: "RX series is bound to be the mainstream of MCU in Renesas." Apart from RX600 series, RX series also includes 16-bit RX200, aims at the applications that require both low power consumption and high speed. With the debut of the RX series, Renesas hopes to provide extensible CISC architectures and fulfills their advantages in 32 bit application.

Besides putting the next generation of RX product into schedule, Renesas enhanced the expansion in the market of flash MCU as well. Kamimura Shoichi, the general manager of Renesas (Beijing) MCU marketing center, said clearly: "Renesas will use flash in all the new developing MCU products. There's an increasing demand for flash MCU, not only in PC and handset market but also in the digital home appliances."

NEC□Features Both All Flash and Low Power Consumption

As one of the top 10 MCU suppliers, NEC puts forward the concept of "All Flash and low power consumption". Matsui, the senior manager of MCU marketing of Grand China Area, pointed out that NEC has two primary strategies, one is expanding power efficient MCU products and specific products, and the other is developing all flash product series. At present, NEC's all flash MCU has a variety of more than 300 which covers all round products from 8-bit to 32-bit. Within this year, it is expected that NEC will add 'power efficiency' concept into their product list and extend this concept to the 8-bit, 16-bit and 32-bit products.

In fact, NEC has always been active in developing power efficient MCU. Previously, NEC has already put forward 8 products in two series of 32-bit MCU, and this was the first step of their all flash MCU products. These two series are V850ES/JG3-L and V850ES/JF3-L, and both of them feature the newly developed circuits. During the operation, the power can be cut off without the necessity of flash, in this way the power consumption of MCU is reduced.

According to a report, as the application of the new technology, the power consumption of this series product is about as half as their previous products which is less half than the average 1MIPS power consumption of 16-bit MCU. Matsui said "Although the power consumption and the price of 32-bit MCU is reduced, there's still a gap compared to 8-bit product. The 8-bit MCU is confined by its performance and memory size. Therefore, in many applications, the more advanced MCU has to be used based on the software of 8-bit MCU. At the same time, the stand-by power consumption is not allowed to increase much. In such a case, the 16-bit product is well suited to such applications. For instances, the 16-bit MCU can be used in the areas of acoustic equipments, production equipments and gymnasium equipments to facilitate the added functions of communication and data process. Today, NEC is actively expanding our cooperation with our customers in such areas.

Matsui disclosed that the power efficiency of the new MCU is 1.5mW/MIPS, and the power efficient 32-bit MCU, V850E/Jx3-L, is already in volume production with a power efficiency of only 0.9mW/MIPS.

Fujitsu: Seeking More Opportunities in the 16-bit Market

MCU suppliers take the power efficiency as the prime factor in their consideration, Ding Jiezao, the manager of micro electronics of Fujitsu, said"We are adopting the advanced low-leak technique, such as 0.18μm and 90nm, and low power consumption designs in the architecture of MCU." For instance, in order to maximize the process speed with optimized power consumption, MB96300 series adopts internal PLL, and uses external 4MHz resonator to provide internal 56MHz operating frequency for CPU. Therefore it reduced the minimum instruction circle to 17.8ns. The 16FX product, MB96340, adopting 0.18μm low leak technique, its power consumption is less than 20% of 16LX product and MB90340 is based on the 0.35μm techniques.
At the same time, the design of the 16FX product reduced the clock circle of instruction by 60%therefore, reduced the operating current of MCU.

Apart from low power MCU products, Fujitsu has made different strategies according to MCU bit difference. Ding Jiezao said"In the 8-bit market, we mainly push the 8FX product series which covers 8-pin to 100-pin. The advantage of 8FX product is more timers, and can have more flexible control. In the 16-bit market, we focus on auto electronics and industrial control application, while in the 32-bit market, such as DC frequency conversion control, Auto DVD control and Auto instrument, we will devote more developing source."

He also indicated the development opportunity of 16-bit MCU lies in the areas of auto electronics and industrial control. The study report from CCID shows, that the average growth rate of the 16-bit MCU will be 31.4% in the 5 coming years which is lower than the 40.5% growth rate of 32-bit MCU, but much higher than the 13.3% growth rate of 8-bit MCU. Dingjiezao said" Fujitsu will continuously expand our 16FX production lines, as for the 8-bit MCU market, we'll put forward a series of low pin 8-bit MCU standard products in the third quarter this year.

无线设计技术
Wireless
Design & Development asia

Wireless Design & Development Asia, Sep issue, 2008

Makoto Awaga, General Manager, Mobile Solution Business Division of FML, discussed with Wireless Design and Development Asia the latest issues and trends in WiMAX chip development during an interview.

WiMAX Chip Development Focuses on Functionality Convergence

BY STEPHEN LAS MARIAS, EDITOR

Fujitsu Microelectronics Ltd (FML) recently announced a mobile WiMAX chipset optimized for mobile devices smart phones, PDAs and MIDs (Mobile Internet Devices). The device, which integrates a baseband, an RF, and a power management LSI, was designed so that the size of the WiMAX module will be 12x12mm. The chipset also features mature software stacks, and the power management schemes have been optimized at the system level.

Makoto Awaga, General Manager, Mobile Solution Business Division, FML, discusses with *Wireless Design and Development Asia* some of the latest issues and trends in WiMAX chip development. Excerpts:

What were the major changes that have occurred in the WiMAX industry during the past 12 months?

One key change is the entry of key role players in the market. Fujitsu is a silicon manufacturer. We directly work with module manufacturers and test vendors—that is our incumbent business model—to focus on those hardware manufacturers who, in turn, talk to the operators. So we do not directly deal with the operators—we do not know their preferences or attitude, etc.

Now we have MVNOs who deal directly with the consumers—they know what kind of new services the consumers desire to have, for instance WiMAX. Delivering such new services also may require very dedicated terminals, which definitely features integrated chipsets, not just for the wireless communications front, but even including specific applications processor or dedicated IO controllers or software schemes to protect the content or data, etc.

Considering now those consumers' attitude in relation to what MVNOs will introduce as new services, it is becoming more important for us to discuss with those MVNOs and define our target chipsets dedicated for those new services. In that sense, this new channel is now the most important in our understanding. In this sense, WiMAX is totally different from other kinds of past business models.

Speaking of Asia, what is the impact of emerging markets in this region on device strategy? What will be the key differentiators across the developed and emerging markets in terms of WiMAX devices?

The point is, the operators' attitudes and expectations are so different between emerging countries and all those leading-edge or developed countries. In Japan, for example, 3.5G deployment is already finished. The industry is now focusing on the next generation, the Super-3G or LTE.

But in the case of emerging countries in Asia, there are most likely just 2G deployments—not 3G. In such countries, if we can deliver WiMAX at an extremely lower deployment cost than that of 3G, then it can be complementary to the high-speed data access capability of their current networks—2G, GSM, and GPRS.

Operators' attitudes are different, so according to such operator's preference, we may need to deliver specific, dedicated chipsets to the India market, or the China market, but they will be different from what we are delivering to developed markets.

What challenges are Fujitsu designers experiencing in their design activities, and how are they coping up?

We have already announced 90nm and 65nm at volume production. For the next generation, low-power low-leakage-current process technology, that will be ready to go sometime in the next couple of years. When that technology is ready, of course we will get right on to that and start delivering our new generation chips. At present, however, we have already started the sample delivery process of the 45nm.

Our RF chips and baseband chips are both manufactured using our current process technology; sooner or later we will shift to manufacturing using the 45nm process node. By that time, other than RF and baseband, we will also go into volume production of the CMOS power amplifier. Also we will be able to combine the PA, RF baseband and also power management controller together into the single silicon to optimize functionality, as well as minimize the form factor, deliver minimum footprint, and in effect deliver a minimum-cost solution.

One challenge is how to reduce the initial cost of such highly integrated new generation process, because the finer the process technology goes, the heavier the investment for such kind of manufacturing facility goes. But the key is getting the volume production at once and delivering that to the market. In that sense, WiMAX and mobile communications are the target markets where we can expect a pretty big volume up front.

MAKOTO AWAGA

You mentioned the Super 3G (LTE). How do you see it competing with WiMAX?

I do not have the right answer to that question yet. We are still struggling how to differentiate the two, and to make WiMAX uniquely established from Super 3G. Let us just see what will happen.

How do you see the newly opened 700MHz spectrum in the United States affecting WiMAX chip development?

The 700MHz would be a newly included profile for WiMAX. It will have the same WiMAX specifications, and the baseband processor will not change. It will just be a matter of the RF front ends. We have already started some kind of preliminary study of the 700MHz capability for our solutions.

What do you think are the most important challenges facing WiMAX chip providers in the months to come?

One thing is how to reduce power dissipation so that chipsets can be put into the small form-factor devices such as SD cards or other plug-and-play accessories. By introducing our state of the art architecture for the CMOS PA, and eliminate the PA power dissipation, and also at the same time integrating the RF and baseband all together into the next generation process technology and minimize power dissipation.

Another important thing is the flexibility of the software framework. The WiMAX solution which we are introducing and promoting is just for the wireless front end side. It still has to be controlled by the host processor, in laptop computers, MIDs or UMPCs, with Windows OS. For other kinds of embedded equipment, it can be Windows Mobile, Linux, or even Android.

Considering those types of operating systems, how to flexibly deliver all dedicated software framework, and make the combination as easily as possible will be the biggest challenge.

Technical Article

世界电子元器件
GLOBAL ELECTRONICS CHINA

Global Electronics China, July issue, 2008

Makoto Awaga, General Manager, Mobile Solution Business Division of FML, discussed with Wireless Design and Development Asia the latest issues and trends in WiMAX chip development during an interview.

Eng version

32-bit Microcontroller for Integration of Automotive CAN Bus Network

FR Family MB91F467BA
Integrating a 6-channel CAN controller in the 100MHz CPU core with a maximum operation frequency at the top speed in the industry, this highly versatile microcontroller addresses automotive network integration that requires high basic performance and is expected to increase in the future. This product is positioned as a concentrated version of the"MB91460 Series," our core series of 32-bit automotive microcontrollers.

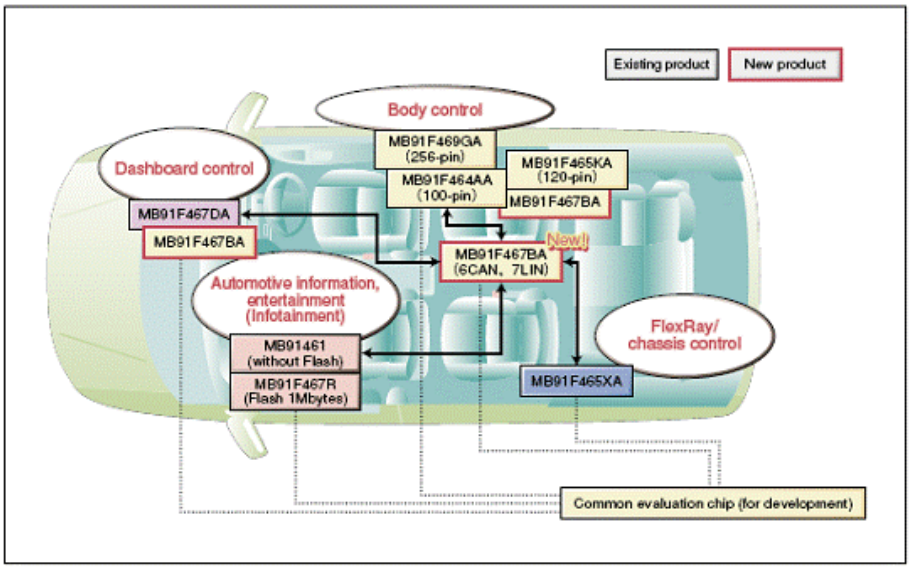
Overview
In recent years, CAN-application systems have been popularized for controlling automobile bodies and driving, resulting in automotive network speedup and the diversification of connected devices. Among the ECUs that control these devices, demand is increasing for an ECU that, in addition to being in charge of controlling the body, also controls the entire automotive network.

The newly developed 32-bit microcontroller"MB91F467BA"takes into consideration this need for the integration of the automotive network—a need that is expected to increase —and has a built-in 6-channel CAN controller, which is the greatest number in the industry, to enable the connection of CAN bus networks with different speeds and mutual connection between CAN and FlexRay (gateway function). This built-in 6-channel CAN controller enables the integration of the information CAN, power train CAN, failure diagnosis CAN, and so forth, centering at the body CAN on 1 chip, which had hitherto been difficult in conventional systems.

Its on-chip FR core, a 32-bit RISC, realizes a maximum operation frequency of 100MHz, which is the fastest in the industry. In addition to its high basic performance, this product has rich built-in peripheral functions including 1Mbytes large density Flash memory and 32-channel A/D converter for use in various applications such as dashboard control with graphic display and integrated control of the body system.

In this microcontroller product, "highly expandable automotive network functions" and "high basic performance/peripheral functions" coexist. Its development environment has the same common specifications of peripheral function circuits and development chip as the MB91460 Series, allowing compatibility of the application software and the succeeding of development assets from the existing products of the same series.

Fig.1: Lineup of the MB91460 Series.

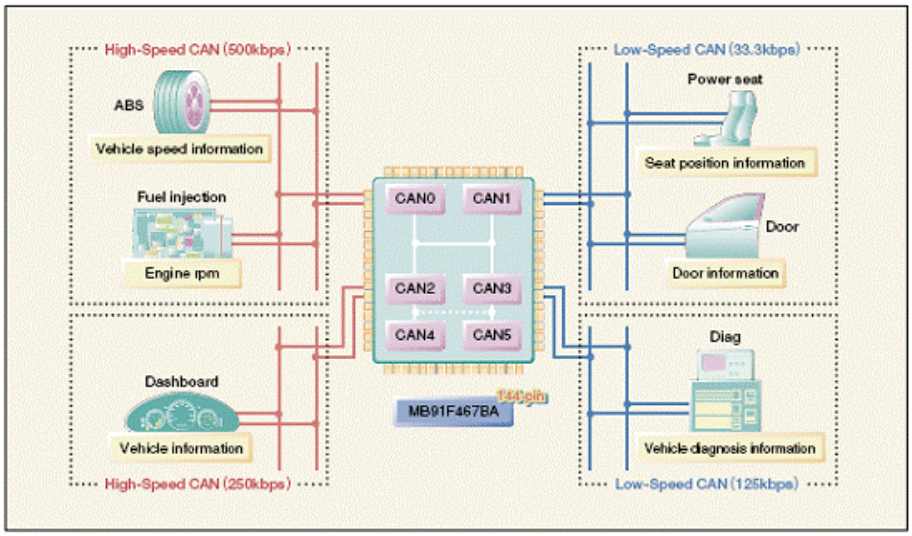


Proposed Application Scenes

Integration of multiple CAN bus networks

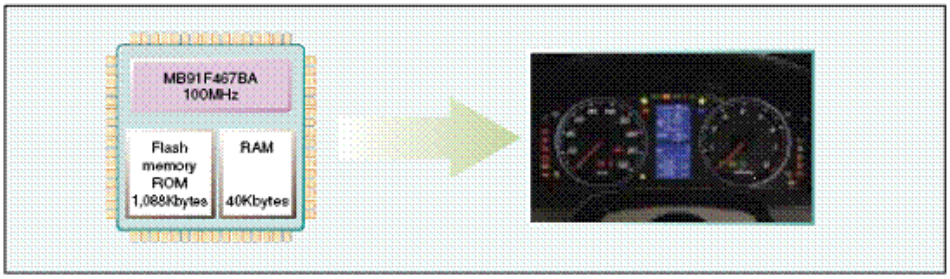
Integration of the information CAN, power train CAN, failure diagnosis CAN, and so forth with the body CAN at the center can be addressed on 1 chip. An integrated network system of the automotive devices utilizing the multiple integrated CAN bus networks can be constructed

(Fig.2 Integration of Multiple CAN Bus network).



Built-in large-density Flash memory (1Mbytes) and SRAM (40Kbytes) will realize dashboard control in which various display data will be required.

(Fig.3 Application in dashboard with large-density Flash Memory)



Main Specifications

The on-chip resources of this product deliver the following features:

■ FR60 core

The FR60 core, which is instruction compatible with the FR Series, has been adopted. The FR60 core is FUJITSU's 32-bit RISC CPU core. It has a maximum operation frequency of 100MHz and offers high performance and low power consumption.

■ Built-in Flash memory capacity

● Main Flash memory: 1Mbytes

● Flash memory security realized

■ Built-in RAM density

●40Kbytes

●Instruction cache: 8Kbytes

■ CAN controller

Conforms to CAN Specification Version 2.0 Part A and Part B. There are 32 built-in message buffers with priorities for data and ID. Supports communication speeds up to 1Mbps.

■ Various timers

● 16-bit free-run timer (8 channels)

● 16-bit input capture (8 channels)

● 16-bit output compare (8 channels)

● 16-bit PPG (16 channels): Selection of one-shot output/PWM output possible

● 16-bit reload timer (8 channels)

■ Various interfaces

● LIN-supporting USART (7 channels, with 16bytes FIFO)

● I2C interface (2 channels)

■ High-speed A/D converter

Sequential transformation-type A/D converter realizing 10-bit resolution (32 channels)

(Minimum conversion time 3µs, overall error ±3LSB: VccAvcc3.0V to 5.5V)

■ Lower power consumption mode: Sleep/stop function

The low power consumption modes of this product are sleep mode (program stops) and stop mode (device stops). Standby current consumption can be minimized by utilizing these low power consumption modes.

■ I/O port

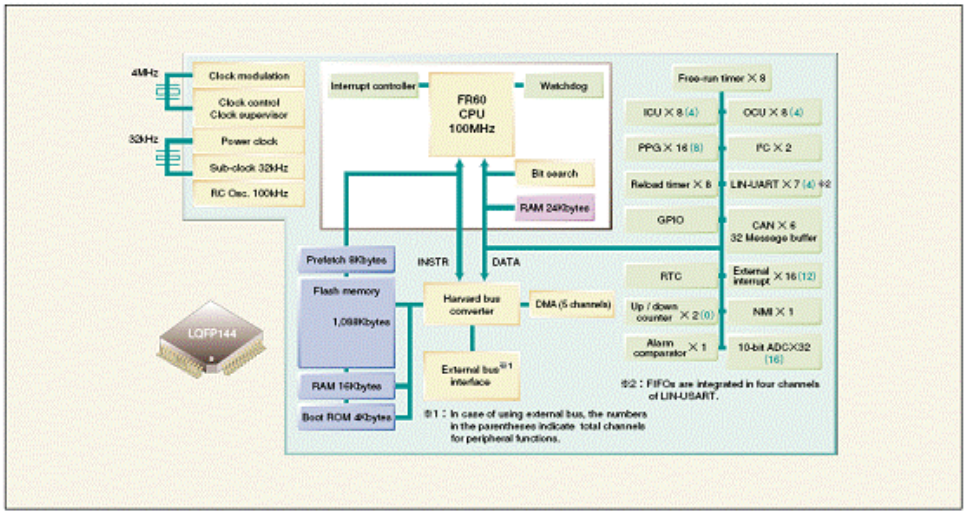
● Input permission setting: Setting possible for each port
● Input level setting: Selection from 4 input levels (CMOS (0307)/CMOS (0208)/Automotive/TTL) possible

Item	VIL (V)	VIH (V)	Input level
Input voltage	0.3Vcc	0.7Vcc	CMOS input (0307)
	0.2Vcc	0.8Vcc	CMOS input (0208)
	0.5Vcc	0.8Vcc	Automotive
	0.8	2.1	TTL

● Pull-up resistance setting: Setting possible for each port (50kΩ Typ.)

Table 1 Input level Setting and Input Voltage

■ Other peripheral functions
● External interrupt (16 channels)
● DMAC (5 channels)
● Watchdog timer
● Real-time clock
● Alarm comparator
● Sound generator



● Low voltage detection circuit
● Power-supply voltage: 3.0V to 5.5V

Fig.4 Block Diagram

Development Environment

This product is supported by SOFTUNE V6, a FUJITSU's integrated development environment. SOFTUNE V6 application software is designed to simplify programming tasks in order to meet the diverse needs of program designers.

Table 2 Development tools.?

Hardware	Emulator main unit	MB2198-01
	Adapter board	MB2198-600
	Evaluation chip	MB91V460
	Header board	MB2198-604B (for external bus mode without level shifter) MB2198-634B (for external bus mode with level shifter) MB2198-664 (for single chip mode)
Software	SOFTUNE V6 Workbench	
	SOFTUNE V6 C compiler	
	SOFTUNE V6 assembler	
	SOFTUNE V6 C/C++ analyzer	
	SOFTUNE V6 C checker	

NOTES

* FlexRay is a trademark of DaimlerChrysler AG.

* Other company names and brand names are the trademarks or registered trademarks of their respective owners.

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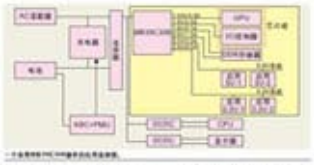
global sources
电子系统设计
Electronic Design – China

Electronics Design China, July issue, 2008

亚洲技术

面向UMPC的6通道同步整流降压型DC/DC转换器IC



Eng version

Six-channel Synchronous Rectification Down-conversion DC/DC Converter IC

6-channel Synchronous Rectification Down-conversion DC/DC Converter IC for UMPCs Supporting LPIA **MB39C308**

MB39C308 is a 6-channel DC/DC converter IC utilized to supply power in ultra-mobile devices such as UMPCs. It is the first one-chip power supply IC in the industry that conforms to the next version of LPIA (Low-Power Intel Architecture), which Intel Corporation is proposing as a low power consumption platform for UMPCs. MB39C308 is capable of supplying power to the chipset, memory, and external systems (for various applications such as wireless LAN) except for the processor as a single chip and thereby contributes to the miniaturization of the power supply system and long battery life.

* UMPC: Ultra-Mobile PC

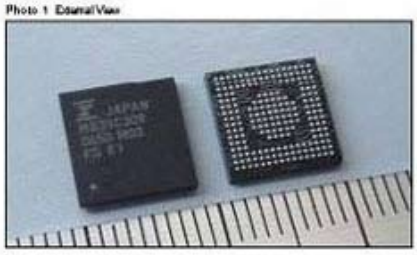
Overview

UMPCs were first released in 2006 as miniature mobile PCs that could use the same OS as normal PCs. The market for UMPCs is expected to expand globally in the future.

It is necessary to supply differing voltages to the processor, chipset, memory, and other parts for UMPCs. To extend the operating time of the battery, a reduction in the power consumed by the processor and high efficiency of power management LSIs are required. As such, there is a need for power management LSIs that can enable size reduction of the overall power supply system, including control circuits that can supply a large current with high efficiency from the lithium ion battery.

This product is a 6-channel synchronous rectification down-conversion DC/DC converter IC developed in consideration of these needs. By improving the efficiency and adopting the current mode type, it realizes high-speed load response

Photo 1 External View



properties compared to conventional voltage mode products.

Fig.1 presents the conversion efficiency properties and **Fig.2** the load response properties.

CH1 and CH2 can flexibly support efficiency optimization depending on the system application by using external FETs. In addition, CH3 to CH6 have built-in switching FET for large currents and contribute to the reduction in total area including external parts. The power supply system package area of 56.5mm², including external parts, is one of the smallest in the world (see **Fig.6**).

Product Features

- Conforms to Intel's LPIA
- Current mode type: Nch/Nch synchronous rectification

Figure 1 Conversion Efficiency Properties

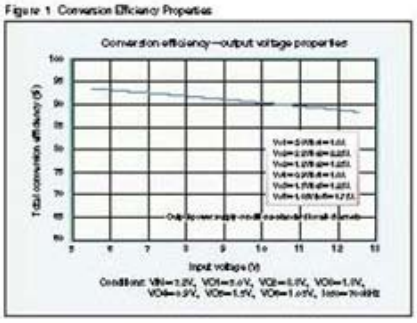
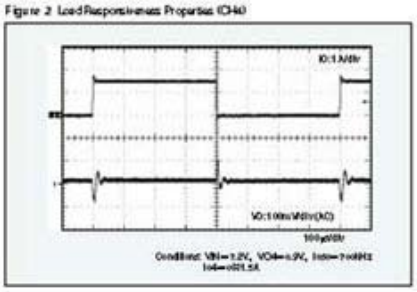


Figure 2 Load Responsiveness Properties (CH4)



- Input power supply voltage range: 5.5V to 12.6V
- Total efficiency: Max. 93%
- Operating frequency: 0.7MHz
  (CH1/CH2/CH3/CH5/CH6), 0.7MHz/0.35MHz (CH4)
- Preset output voltage
  System: CH1 (5.0V), CH2 (3.3V)
  Memory: CH3 (1.8V/1.5V), CH4 (0.9V/0.75V)
  Chipset: CH5 (1.5V), CH6 (1.05V/1.10V)
- Built-in operation circuit for external FET (2 channels), built-in switching FET (4 channels)
- Built-in POWERGOOD function
- Built-in soft-start/soft-stop functions with no load dependency
- Substantial protective functions
  Overcurrent protection, undervoltage lockout, input/output overvoltage protection, output short-circuit protection, and over-temperature protection
- Compact package: FPBGA-208-pin (9mm×9mm×1.3mm)
- Lead-free/conforms to the RoHS Directive

Description of Functions

Main control type

This product adopts the High-side FET sense-type current mode type on the Nch/Nch synchronous rectification. It detects the coil current (IL) and output voltage (VO) and controls on-duty in current mode.

POWERGOOD function

This product has a built-in POWERGOOD function. When it detects that the DC/DC converter output voltage of each channel enters the ±7% range of the preset voltage, it determines that the set value has been reached and outputs "H" to the PG terminal output (PG1 to PG6 terminals) and then outputs "L" to the PG terminal output (PG1 to PG6 terminals) when it exceeds ±10% of the preset voltage.

Furthermore, it outputs "H" to the ALLPG terminal when the output voltage values for CH3 to CH6 reach the set value (all PG3 to PG6 terminal outputs are "H").

The ALLPG output and PG1 to PG6 outputs adopt the open-drain output type. This function is useful for monitoring the output voltage status for each channel simply.

Fig.3 presents the timing chart for the POWERGOOD function.

Soft-start/soft-stop functions with no load dependency

The soft-start function prevents the inrush current and overshooting of output voltage. It also controls startup independent of the load. The output voltage startup time is set by connecting the SS1/2

terminal to AGND, VREF, and VB terminals. When CTL is OFF, output is controlled to be stopped independent of the load using the soft-stop function.

Table 1 presents the soft-start/soft-stop time setting in this product, and **Figs.4** and **5** the examples of soft-start/soft-stop timing chart.

Overcurrent protection circuit (OCP function)

When the drain-source current of CH1, CH2 High-side FET, and the input 2 current at the PVDD terminal of each channel (PVDD3 to PVDD6) exceeds the set value, it is considered to be in an overcurrent condition and the product will turn OFF the High-side FET of the corresponding channel and restrict the input current. This function prohibits abnormal overcurrent conditions.

Undervoltage lockout circuit (UVLO function)

When AVDD drops to 5V or lower, the undervoltage lockout circuit will turn OFF the switching FETs of all channels and stops the output. UVLO operation will be released when AVDD rises to 5.1V or higher. This function prevents malfunctions under low voltage.

Output overvoltage protection circuit (OVP function)

When the output voltage for a channel exceeds 120% of its set voltage, it is considered to be in an output overvoltage condition and the switching FET of the corresponding channel is turned OFF. OVP is cancelled when the output voltage drops to 105% or lower of the set voltage. This function protects devices, which are connected the each channel, from overvoltage.

Input overvoltage protection circuit (IVP function)

When the input voltage at the AVDD terminal exceeds 13V, it is considered to be in an input overvoltage condition and the FETs of all channels are turned OFF and output voltage is stopped. IVP is cancelled when the input voltage drops to 12.85V or lower.

Short-circuit protection circuit (SCP function)

When the load condition changes rapidly due to short-circuiting in the load, etc., the DC/DC converter output voltage drops, the internal short-circuit protection comparator output is set to "H" level, and SCP counting is started. The latch is set when SCP is detected for 1.4ms and all FETs are turned OFF.

Over-temperature protection circuit (OTP function)

The FETs of all channels are turned OFF and voltage output is stopped when the junction temperature reaches 150℃. OTP is released and voltage output is resumed with the soft-start function when the junction temperature drops to 125℃. This function protects the IC when it heats up.

Table 2 presents the truth table for protective functions in the output circuit block.

Application Examples and Block Diagrams

Fig.6 presents the block diagram and **Fig.7** the application examples of this product.

Figure 3 POWERGOOD Functions Timing Chart

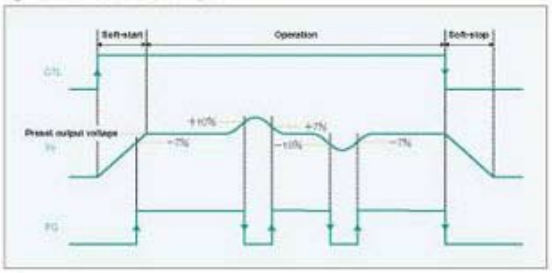


Table 1 Soft Start/Soft Stop Time Setting

SS1 pin	SS2 pin	Soft-start time (tson)(Typ.)*	Soft-stop time (tsoff)(Typ.)*	Unit
AGND terminal connection	AGND terminal connection	1.4	1.4	msec
	VREF terminal connection	2.2	2.2	
	VB terminal connection	2.9	2.9	
VREF terminal connection	AGND terminal connection	3.5	3.5	
	VREF terminal connection	4.1	4.1	
	VB terminal connection	5.1	5.1	
VB terminal connection	AGND terminal connection	5.9	5.9	
	VREF terminal connection	7.3	7.3	
	VB terminal connection	8.2	8.2	

* Accuracy Typ. ±15%

Evaluation Board

We offer a single unit evaluation board for this product. **Fig.8** depicts the evaluation board.

Future Development

We will expand the lineup of power supply ICs for UMPCs and mobile devices to meet the demands of the growing UMPC and mobile device markets.

Figure 4 Example of Soft-Start/Soft Stop Functions
(Simultaneous Startup/Shutdown for All Channels)

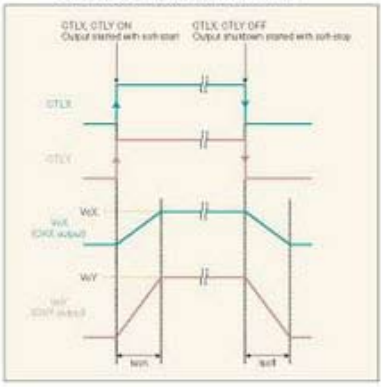


Figure 5 Example of Soft Start/Soft Stop Functions
(Individual Startup/Shutdown for Each Channel)

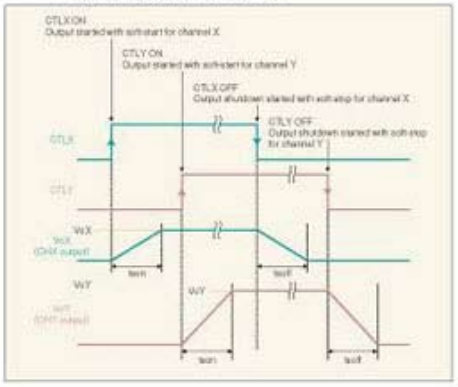


Figure 7 Application Examples

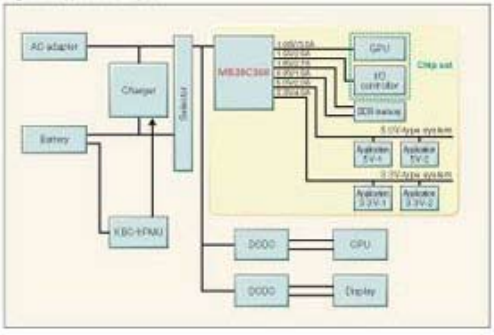


Figure 8 Evaluation Board (8.0cm×8.0cm)
Power supply system with a package area of 64 mm²

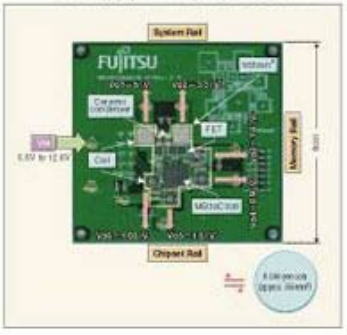


Figure 6 Block Diagram

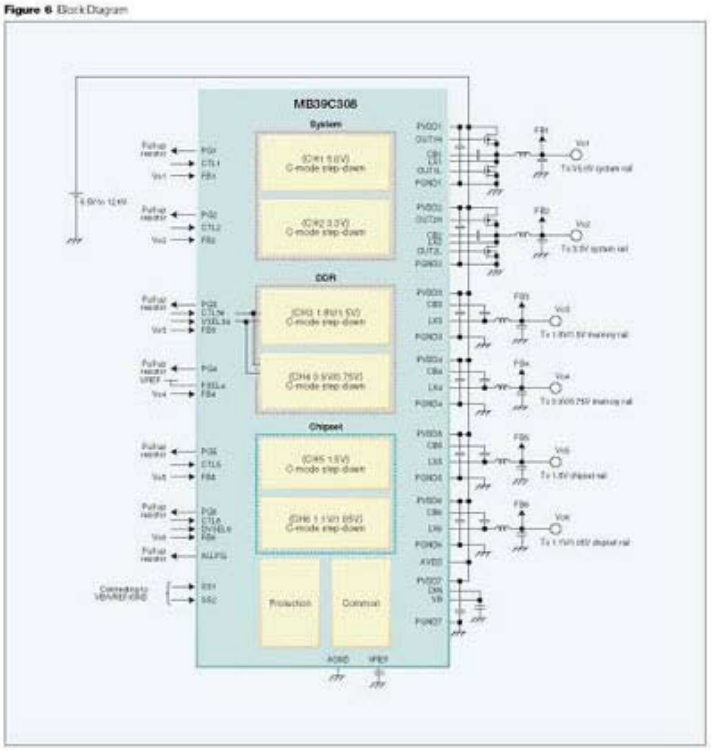


Table 2 Truth Table for Protective Functions in Output Circuit Block

Protection Function	CH1		CH2		CH3		CH4		CH5		CH6	
	OUT1H	OUT1L	OUT2H	OUT2L	High-side FET	Low-side FET	High-side FET	Low-side FET	High-side FET	Low-side FET	High-side FET	Low-side FET
OCP	L	H	L	H	OFF	ON	OFF	ON	OFF	ON	OFF	ON
UVLO	L	L	L	L	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
OVP	L	L	L	L	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
IVP	L	L	L	L	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
SCP	L	L	L	L	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
OTP	L	L	L	L	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

世界电子元器件
GLOBAL ELECTRONICS CHINA

Global Electronics China, Sept issue, 2008

MB86H60:全高清多标准解码器

MB86H60 功能框图

MB86H60 产品特性

硬件

软件

开发工具

Eng version

Full HD Multi-standard Decoder LSI MB86H60

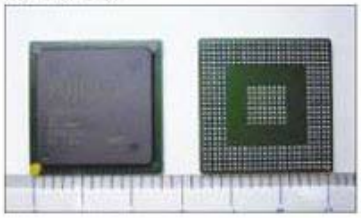
Full HD Multi-standard Decoder LSI Supporting Both MPEG-2 and H.264 MB86H60

A full HD (1920 dots×1080 lines) multi-standard decoder LSI capable of decoding both MPEG-2 and H.264 video compression types.

Overview

This product is a system LSI for TVs, set-top boxes, and portable receivers to be distributed in Europe. It not only conforms to the DVB standard, a digital broadcasting standard adopted in Europe, and is capable of decoding both full HD MPEG-2 and H.264, but also includes the necessary functions for HD broadcast reception on one chip. The total system construction cost can be reduced because set vendor customers can use these functions simply by connecting two 16-bit width memories to this product.

Photo 1 External View



Product Features

Table 1 presents the main specifications and **Figure 1** the block diagram of this product.

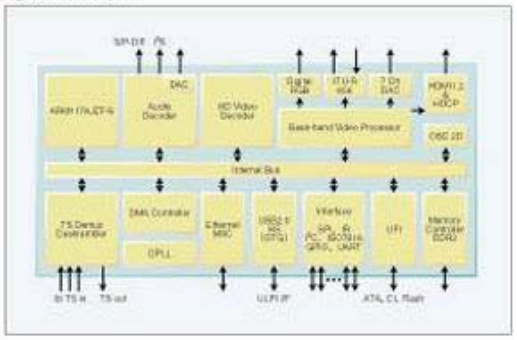
■ **Addressing both current and next-generation broadcasting in Europe with built-in full HD MPEG-2 and H.264 decoder functions**

With a built-in decoder addressing both full HD MPEG-2 and H.264, it enables both the current SD broadcasting by MPEG-2 and the next-generation HD broadcasting by H.264 in Europe.

■ **Integrating necessary functions for HD broadcast reception on one chip**

Adopting high-performance ARM1176JZF-S as the main CPU, it enables various applications

Figure 1 Block Diagram



including the system control required in TVs and set-top boxes, teletext, subtitles, and JPEG decoding. Since it integrates the necessary functions for HD broadcast reception such as sound and graphic processing on one chip, system construction becomes simple.

All functions can be used by connecting two 16-bit DDR2-SDRAMs

All product functions such as the system control by the CPU and the decoding of digital videos can be used by simply connecting two 16-bit width DDR2-SDRAM667s as external work memories. It is thus possible to reduce the total cost of system construction.

Coordination with various devices possible with four built-in TS transmission ports

With four TS transmission ports, it is capable of connecting to personal video recorders to record TV broadcasting and so forth on HDD, addressing the limited broadcasting reception card required for viewing some digital broadcasting in Europe, and a wide range of coordination with other external functions.

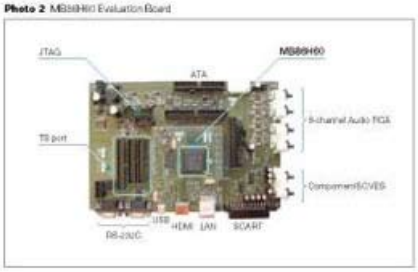
Table 1 Main Specifications

Built-in CPU		ARM 1176JZF-S CPU (324MHz)
Video	Profile	H.264 high-profile/Level 4.0 decoder MPEG-2 Video main-profile/High-level decoder
	Video encoder	PAL/NTSC/SECAM format supported, built-in 7-channel Video DAC, teletext /WSS/PDC/CC/VBID supported
	Interface	ITU-R BT.656 input/output, digital RGB888 output, YPrPb analog HD output
Audio	Type	MPEG-1/2 Layer I/II/III, MPEG-2/4 AAC LC, etc.
	Number of channels	5.1 channels
	Interface	L/R serial, S/P-DIF
TS processing	Format	Conforms to MPEG-2 TS
	Interface	Built-in 1 output line, 3 input lines, and DVB descrambler
	Coding process	3DES coding/decoding
DDR2 memory interface		2 systems×16-bit width DDR2-SDRAM667 256M-bit to 1G-bit density SDRAM support
Flash memory interface		Serial Flash, NOR Flash, and NAND Flash supported
Display		5 planes: BG (Back Ground), Video, Cursor, OSD ×2
USB		USB 2.0 High Speed OTG Controller
Ethernet		Ethernet 10/100 Base-T Mac
ATA		Multiword DMA ATA Interface (16M-bit)
HDMI		HDMI 1.2 Link and PHY with HDCP 1.1
UPI		NAND/NOR Flash, Common Interface
Peripheral		UART×2, Smart Card×2, I²C×2, GPIO, PWM, IR Rx/Tx, SPI output
Input clock frequency		27MHz
Operation frequency		Internal: 324MHz DDR2 memory interface: 324MHz
Power consumption		1.2W (standard)
Package		FBGA 484-pin 27mm² (1.0mm pitch)
Production technology		90nm
Power supply		Core: 1.2V, I/O: 3.3V (partial 5V tolerant), DDR2 memory interface: 1.8V

Development Environment

To evaluate this product and assist in software development, we offer the evaluation board MB86H60-DK (**Photo 2**). The MB86H60 evaluation board is a development kit that can be used to evaluate the "MB86H60" LSI's ability to decode MPEG-2 and H.264 videos.

Photo 2 MB86H60 Evaluation Board



Hardware (MB86H60-DK)

- TS input
- Video output
  - HD Video
    Component output (YPbPr): RCA connector
    Digital output: HDMI
  - SD Video
    RGB+CVBS: SCART connector
- **Sound output**:
  8-channel Audio: RCA connector
  S/P-DIF: RCA/Optical
- **2×512M-bit DDR2 SDRAM**
- **ATA interface**
- **Common interface (PC Card)**
- **USB/OTG connector**
- **IR receiver/transmitter (remote controller)**
- **2×DB9/RS-232C terminals**
- **Power supply: +12V used**

Software

- **Fujitsu RTOS (FAMOS)**
- **Device Driver (Fujitsu API)**
- **Download and Flasher tools (USB adapter used)**
- **Sample application**

Development tool

- **ARM® development tool**
  - **RealView™ Development Suite**
  - **RealView™ ICE**
- **GNU development tool (in planning)**

Future Development

FUJITSU develops high-performance, high-function decoder LSIs to realize MPEG-2 and H.264. In the future, we will further enhance the performance and functions to address a wider range of applications.

NOTES

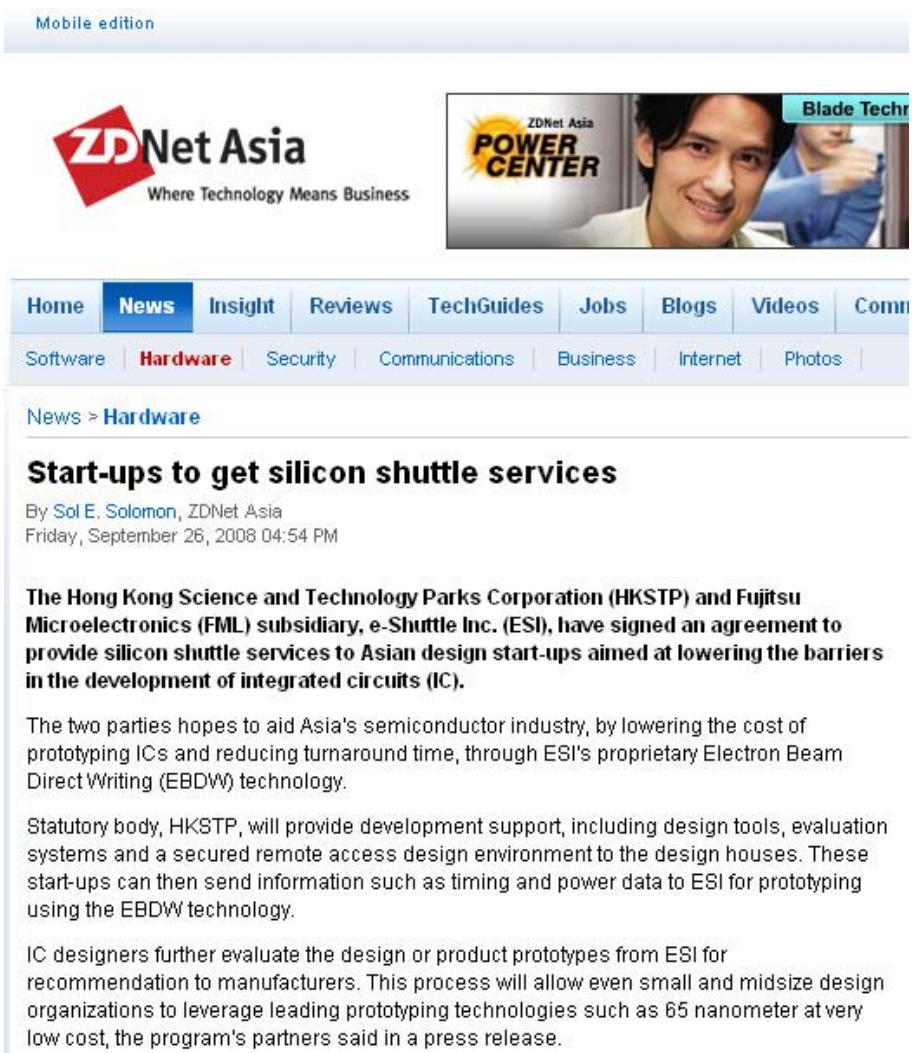
- ARM, ARM1176JZF-S, and RealView are trademarks or registered trademarks of ARM Limited. ARM
- Supply of this product or technology which implements in whole or in part MPEG-2 AAC technology does not include licenses to patents that are the subject of the Via Licensing MPEG-2 AAC Implementation Patent License Agreement. By way of example only, your purchase of this product conveys no right under those patents to sell or use this product or technology either alone or in connection with another product. An independent license for such rights is required.

Press Release Clippings

Zdnetasia

Sep 26, 2008

Start-ups to get silicon shuttle services



Mobile edition

ZDNet Asia
Where Technology Means Business

Start-ups to get silicon shuttle services

By Sol E. Solomon, ZDNet Asia
Friday, September 26, 2008 04:54 PM

The Hong Kong Science and Technology Parks Corporation (HKSTP) and Fujitsu Microelectronics (FML) subsidiary, e-Shuttle Inc. (ESI), have signed an agreement to provide silicon shuttle services to Asian design start-ups aimed at lowering the barriers in the development of integrated circuits (IC).

The two parties hopes to aid Asia's semiconductor industry, by lowering the cost of prototyping ICs and reducing turnaround time, through ESI's proprietary Electron Beam Direct Writing (EBDW) technology.

Statutory body, HKSTP, will provide development support, including design tools, evaluation systems and a secured remote access design environment to the design houses. These start-ups can then send information such as timing and power data to ESI for prototyping using the EBDW technology.

IC designers further evaluate the design or product prototypes from ESI for recommendation to manufacturers. This process will allow even small and midsize design organizations to leverage leading prototyping technologies such as 65 nanometer at very low cost, the program's partners said in a press release.

Hardwarezone

Sep 26, 2008

Fujitsu and Leica will co-develop image processing system for DSLRs

Fujitsu & Leica Co-Develop Image Processing System for DSLRs

Digital Cameras/Camcorders | 26th Sep 2008

Fujitsu Microelectronics and Leica Camera Co-develop Image Processing System Solution for High-end Digital SLR Cameras

- New image processing system to feature outstanding image quality, fast processing times, and low power consumption -

Fujitsu and Leica Camera have co-developed an image processing system solution for high-end digital single-lens reflex (SLR) cameras, to be featured in Leica' s next-generation cameras.

Background

The number of image pixels handled by digital still cameras, such as digital SLR cameras and those on mobile phones, is continually rising, with higher definition becoming a key selling feature. As a result, there has been a rise in demand for low power consumption and faster image processing systems. Satisfying these conflicting conditions is a challenge for design engineers.

ince 2001, Fujitsu Microelectronics has offered its Milbeaut series of image processing devices for cameras, delivering high-definition imagery, fast processing speeds, and low power consumption. Widely used in digital SLR, compact digital still, and mobile phone cameras, the Milbeaut series is meeting market requests in advance. Milbeaut technology offers various functions on a single chip as required by these cameras, including image compression/decompression (image codec), noise reduction and memory card processing.

For nearly a century, Leica Camera has worked to position itself as a globally-renowned and reputable camera manufacturer, recognized for its outstanding expertise in camera imagery-related technologies, which are testament to its refined high-quality product offerings. The company is actively engaged in the development of digital camera technologies, demonstrated by the release in 2006 of its first digital still camera, the LEICA M8, featuring the popular Leica M series body.

Newly Developed Solution

Given the aforementioned market requirements, the new image processing system solution for high-end SLR cameras uses Leica' s MAESTRO image processor based on Fujitsu' s Milbeaut technology, coupled with its control software.

The latest technology in Milbeaut series features improved power management, thereby achieving extremely low power consumption. High-speed operation is achieved by the employment of two embedded CPUs: Fujitsu' s FR-80 and FR-V (VLIW architecture) and additional accelerators. The combined faster operation of both software and hardware enables superior image processing performance.

For this joint development, Leica and FML created a team of dedicated hardware and software engineers to leverage the companies' expertise and know-how. By combining the strengths of Fujitsu' s image-processing Milbeaut technologies with Leica' s high-definition imaging technologies, the companies now offer an industry-leading image processing solution.

Stefan Trippe, COO of Leica Camera commented, "Leica' s philosophy is to deliver the very latest technology to its customers - as a result, this joint development with Fujitsu Microelectronics, will enable Leica to continue to lead the field in terms of picture quality."

"Fujitsu Microelectronics welcomes this opportunity for co-development with Leica. Leica' s expertise and reputation in the camera industry, combined with our Milbeaut imaging-processing LSI technology, will result in a truly outstanding high-end SLR digital camera," said Joji Murakami, Corporate Vice President at Fujitsu Microelectronics Limited.

Future Developments

The new solution platform resulting from this collaboration has been established for, and will hereon become a basis for the planning and development of new Leica products, as well as enabling easy implementation of FML' s next-generation devices. Furthermore, the newly created platform will enable the stable development of future image processing systems.

FUJITSU 富士通网络世界创意无限

Fujitsu's Website
Sep 12, 2008

Fujitsu Microelectronics established joint laboratory with Southwest Jiaotong University

2008-09-12
Fujitsu Microelectronics (Shanghai) Co. Ltd.

Establish MCU "Joint Laboratory" With University Again Fujitsu Devotes to Semiconductor Talents Training

Shanghai, Sep. 12th, 2008 — Fujitsu Microelectronics (Shanghai), Co., Ltd. announces today that it will cooperate with Southwest Jiaotong University (SWJU) to establish a joint laboratory, which will become a platform for students to develop innovation experiments. In this way, Fujitsu microelectronics will continue to develop its project of Students Research Training (SRT) so as to provide the university students an opportunity to be involved in the scientific research training.

The joint laboratory mentioned above is equipped with the latest Fujitsu 8-digit microcontroller F^2MC-8FX family MB95200 series microcontroller, which can assist teachers to direct their students to operate practically. This series adopts the verified embedded flash memory technology and owns very strong internet support capacity. In addition, this controller can not only provide a low-cost software development environment but also is capable of assessing to data sheet/ hardware manual, user's guide, sample software framework, SOFTUNE, C database and sample application, etc. so that it is very easy for the students to use and practice.

Kiminobu Fujisaki, vice-chairman of the board of Fujitsu Microelectronics, expresses his ideas in the opening ceremony as below, "As one of the oldest and prestigious universities in China, SWJU has nurtured lots of excellent talents for the development of various links of China. China started to establish and carried out SRT plan in 1996, and more universities began to be involved in the development of this project since them, and at present lots of universities have this project. We're so glad to cooperate with universities again to jointly boost the development of SRT plan in China. Universities are called the cradle for reserving semiconductor talents. We trust that we can strongly support the universities to launch a variety of education innovation projects through such platform of "joint laboratory", which will not only consolidate the professional knowledge of university students but also to stimulate their innovation spirit so as to make them well-prepared for stepping into society and for making success in their future career."

Mr. Pan Wei, dean of Information College of SWJU maintains that, "Fujitsu Microelectronics (Shanghai) Co., Ltd. plays a leading role in the field of MCU and owns lots of industry recognized MCU products. Therefore, it's a great honour for us to cooperate with such a company to build a joint laboratory, which will greatly assist our university to improve and perfect our teaching and academic research environment. This laboratory will provide a manual operating platform for our students, promote their independent thinking capacity and actively boost the training of semiconductor talents for our university. MB95200 series integrates the high-precise clock, and is equipped with fast processing capacity and low power consumption as well as the free software development environment. In consequence, it will provide a strong support for the students' practice and R&D. Meanwhile, the establishment of this laboratory will offer great assistance to the teaching and academic research of SWJU and will promote the technology level of SWJU more powerfully so as to make it all along stay at the frontline of industry development.

For such a long time, Fujitsu Microelectronics (Shanghai) Co., Ltd. is dedicated to supporting the Chinese education cause depending upon its world leading technology and capital advantage. It can be traced back to the year of 2003 that Fujitsu Microelectronics started to establish scholarship in the home key universities and institutes. Thereafter, Fujitsu Microelectronics constantly invests more in the domestic education field, including Fujitsu theme lecture, Fujitsu Microelectronics Cup Series Contest, Co-built laboratory, IC donation, innovation research project cooperation for university students. Thus, Fujitsu Microelectronics continually conveys advanced software, hardware and intellectual support for the Chinese education cause.

Hardwarezone

Sep 11, 2008

Fujitsu Microelectronics launches digital HDTV SoC for superior picture quality digital HDTV

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Fujitsu Launches Digital HDTV SoC

Corporate/Events | Just Announced
Thu 11 Sep 2008

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Fujitsu Launches Digital HDTV SoC for Superior Picture Quality Digital HDTV

TV engine integrated with multi-decoder reduces total cost

Fujitsu Microelectronics Asia Pte Ltd (FMAL) today announced that it has developed a digital HDTV system-on-chip (SoC) that integrates a video processing engine for superior picture quality, and a full high-definition (full HD, 1920 dots x 1080 lines) multi-decoder that decodes both MPEG-2(*1) and H.264(*2) video compression formats. The new chip, the MB86H70, is aimed for digital TVs receiving high-definition broadcasts that are ramping up in Europe.

The chip is an application specific standard product (ASSP) (*3), that features a video processing engine that was co-developed with Fujitsu Laboratories Limited. By also including a proprietary picture quality adjustment tool that makes it possible for picture adjustment parameters to be easily set simply by using a mouse, the new LSI enables TV set makers to dramatically improve their design efficiencies for picture quality settings. Furthermore, SoC integration of the video processing engine and multi-decoder allow common memory to be used, enabling use of the chip by simply adding two 16-bit external memories and thereby reducing TV set makers' costs and development cycles for both design development and manufacturing.

Sample shipment of this new SoC will start from mid-October 2008.

Background

Currently, in various regions such as Europe, digital TV broadcasting is offered in standard definition (SD) using the MPEG-2 video compression format. Next-generation broadcasts will be in HD, and it has been decided that H.264 will be the main format to be used. For example in France, HD digital TVs that are scheduled to be released to the market from the end of 2008 are required to be equipped with H.264 decoders. Thus, demand from the European TV market for high picture quality video processing engine chips with integrated H.264 decoders is expected to grow significantly.

Fujitsu Microelectronics already offers a full HD multi-decoder chip, the MB86H60, supporting MPEG-2 and H.264, to the European markets. In view of the ramp-up towards digital TVs for HD broadcasts in Europe, Fujitsu Microelectronics will offer this new ASSP that integrates as a SoC Fujitsu's proprietary superior picture quality video processing engine that was co-developed with Fujitsu Laboratories, with Fujitsu Microelectronics' already available full HD multi-decoder.

With digital TV, differing from analog TV, picture quality can be improved depending on the video processing engine. Up until now, Fujitsu Microelectronics has been providing to TV set makers its expertise through custom ASIC(*5) chip products. With this new digital HDTV SoC, Fujitsu Microelectronics' offerings for TV set makers expand to ASSPs, to improve the cost competitiveness of its customers.

Leveraging Fujitsu's highly regarded expertise in image processing-related technologies and products, Fujitsu Microelectronics has positioned its image processing ASSPs as a pillar for strategic growth for its ASSP business, providing world-class ASSPs for imaging, such as "Milbeaut™" LSIs for digital still cameras, as well as transcoder LSIs that convert MPEG-2 to H.264. Along with expanding its line-up of ASSPs for imaging through the new MB86H70, building on its video processing engine business, Fujitsu Microelectronics will continue to strengthen its product offerings for the TV market.

Key Features

1. Video processing engine for digital TV that realizes vivid colors and sharpness that are essential for HD broadcasts

- "Hybrid filter" automatically adjusts filter strength by separate areas in the picture.
  Distinguishes between contours of each object and other areas in the picture and distinctly enhances the contour to produce greater sharpness, while removing any noticeable noise from other areas. Such optimized filtering by area in the picture realizes a much smoother rendering of the picture.
- "Active tone curve control" automatically adjusts tone reproduction property in each scene
  Automatically selects optimized tone curve for various video scenes such as scenes where fine differences in brightness are required, or when there are large differences in brightness within a scene, thereby enabling a wide variety of images to be optimally displayed.
- Proprietary "Real 3-D color control" enables free selection of color range and control of desired level of color correction
  With standard color control methods, if a particular color is adjusted, it can change the color of the other colors of the entire picture. However, with Fujitsu's proprietary method that utilizes a 3-D color space, very precise color adjustment is possible without influencing other colors.
- Proprietary picture quality adjustment tool allows adjustment parameters to be easily set by using a mouse
  Each TV set maker has different picture quality requirements, which can be met simply and flexibly with Fujitsu's proprietary picture quality adjustment tool that is provided together with the new LSI. Using a graphical user interface (GUI), picture quality adjustment parameters can be easily set with a mouse while viewing the actual changes in picture quality. This allows TV set makers to dramatically improve their design efficiencies for picture quality settings.

In addition, other functions that are necessary to display HD video on a TV screen are included, such as motion adaptive de-interlacing that reduces jagged edges that can be caused by diagonal lines, as well as a scalar that enlarges and reduces HD images.

2. Includes full HD MPEG-2 and H.264 decoders, supporting current and next-generation European broadcasting standards
This chip includes full HD MPEG-2 and H.264 decoders and thus can be used for current SD MPEG-2 broadcasts used widely in Europe and other regions, and for next-generation HD broadcasts using H.264. Includes audio decoders necessary for HD broadcasts in Europe such as Dolby® Digital, Dolby® Digital Plus (*6), HE-AAC.

3. Integrates as a system-on-chip (SoC) key functions necessary for a TV
The CPU core in the chip is the ARM1176JZF-S™[1], which is supported by widely and easily available software in the market. Fujitsu also provides various software stacks for DVB(*7), such as for teletext(*8), subtitles, and JPEG decoding(*9), which make it possible for TV set makers to more easily design and construct their systems with the necessary functions to view HD broadcasts.

4. Complete functionality by adding two 16-bit wide DDR2-SDRAMs
By simply connecting two 16-bit wide DDR2 SDRAM667 external memory chips as working memory to this digital HDTV SoC, the chip becomes fully functional, including CPU-based system control and digital-video decoding. This allows TV set makers to reduce the overall cost of their systems.

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. ASSP: Application specific standard product. LSIs for specific applications, such as image processing and network-related processing, which are sold to a wide range of customers.

*4. Motion adaptive de-interlacing: Conversion of an interlaced signal, containing every second (2nd) scanning line of a frame, to a progressive signal, by introducing line data to give a full frame while taking into account motion between frames.

*5. ASIC: Application specific IC. Customized ICs for specific applications (customers).

*6: Dolby® Digital Plus: Fujitsu Microelectronics plans to support this audio format from around November, 2008.

*7. DVB: Digital Video Broadcasting. A set of internationally approved open standards for digital television broadcasts. DVB is used in many countries, especially in Europe.

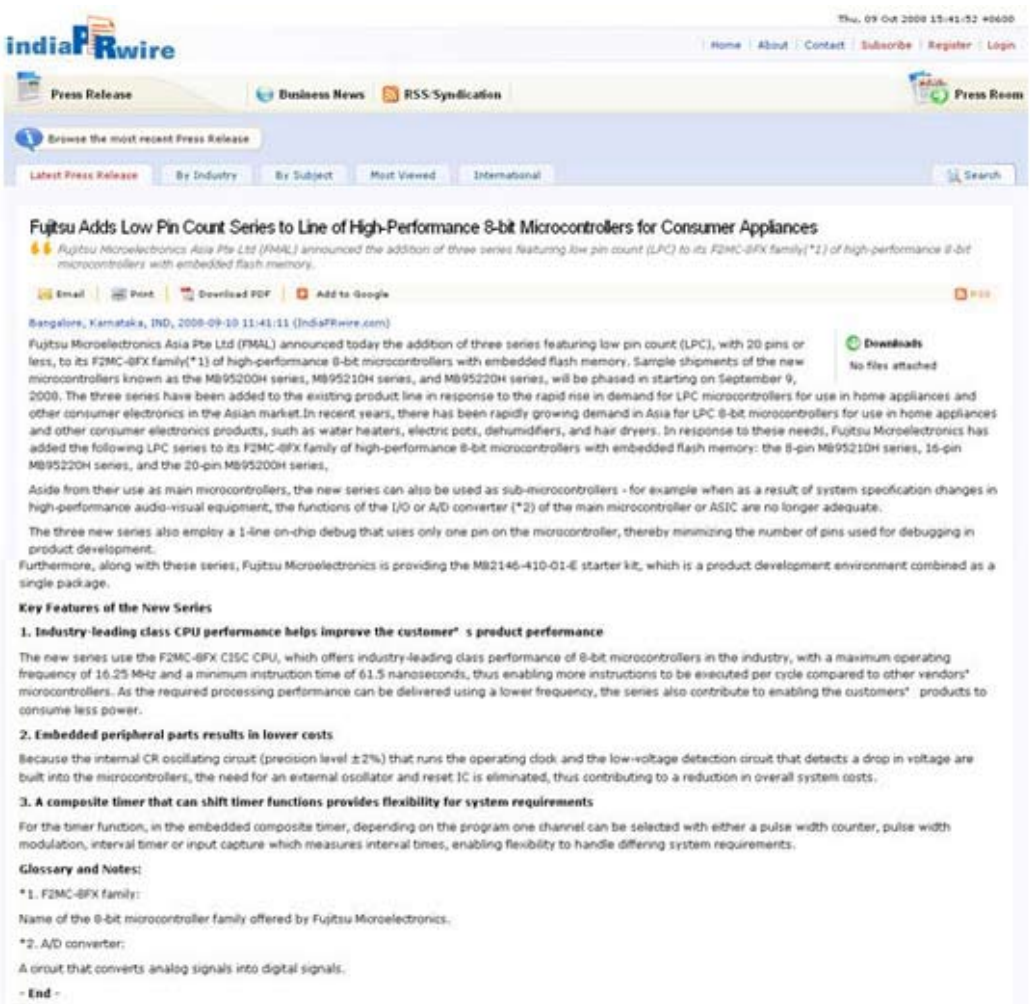
*8. Teletext: A TV broadcasting standard in which data such as text (e.g. subtitles, closed caption) or diagrams are transmitted within the TV broadcast signal.

*9. JPEG decoding: Refers to decoding that enables JPEG photographic data to be viewed on devices such as TVs.

Indiaprwire

Sep 10, 2008

Fujitsu adds low pin count series to line of 8-bit microcontrollers for consumer appliances



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Fujitsu Adds Low Pin Count Series to Line of High-Performance 8-bit Microcontrollers for Consumer Appliances

*Fujitsu Microelectronics Asia Pte Ltd (FMAL) announced the addition of three series featuring low pin count (LPC) to its F2MC-8FX family(*1) of high-performance 8-bit microcontrollers with embedded flash memory.*

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Bangalore, Karnataka, IND, 2008-09-10 11:41:11 (IndiaPRwire.com)

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Fujitsu Microelectronics Asia Pte Ltd (FMAL) announced today the addition of three series featuring low pin count (LPC), with 20 pins or less, to its F2MC-8FX family(*1) of high-performance 8-bit microcontrollers with embedded flash memory. Sample shipments of the new microcontrollers known as the MB95200H series, MB95210H series, and MB95220H series, will be phased in starting on September 9, 2008. The three series have been added to the existing product line in response to the rapid rise in demand for LPC microcontrollers for use in home appliances and other consumer electronics in the Asian market.In recent years, there has been rapidly growing demand in Asia for LPC 8-bit microcontrollers for use in home appliances and other consumer electronics products, such as water heaters, electric pots, dehumidifiers, and hair dryers. In response to these needs, Fujitsu Microelectronics has added the following LPC series to its F2MC-8FX family of high-performance 8-bit microcontrollers with embedded flash memory: the 8-pin MB95210H series, 16-pin MB95220H series, and the 20-pin MB95200H series,

Aside from their use as main microcontrollers, the new series can also be used as sub-microcontrollers - for example when as a result of system specification changes in high-performance audio-visual equipment, the functions of the I/O or A/D converter (*2) of the main microcontroller or ASIC are no longer adequate.

The three new series also employ a 1-line on-chip debug that uses only one pin on the microcontroller, thereby minimizing the number of pins used for debugging in product development.

Furthermore, along with these series, Fujitsu Microelectronics is providing the MB2146-410-01-E starter kit, which is a product development environment combined as a single package.

Key Features of the New Series

1. Industry-leading class CPU performance helps improve the customer' s product performance

The new series use the F2MC-8FX CISC CPU, which offers industry-leading class performance of 8-bit microcontrollers in the industry, with a maximum operating frequency of 16.25 MHz and a minimum instruction time of 61.5 nanoseconds, thus enabling more instructions to be executed per cycle compared to other vendors' microcontrollers. As the required processing performance can be delivered using a lower frequency, the series also contribute to enabling the customers' products to consume less power.

2. Embedded peripheral parts results in lower costs

Because the internal CR oscillating circuit (precision level ±2%) that runs the operating clock and the low-voltage detection circuit that detects a drop in voltage are built into the microcontrollers, the need for an external oscillator and reset IC is eliminated, thus contributing to a reduction in overall system costs.

3. A composite timer that can shift timer functions provides flexibility for system requirements

For the timer function, in the embedded composite timer, depending on the program one channel can be selected with either a pulse width counter, pulse width modulation, interval timer or input capture which measures interval times, enabling flexibility to handle differing system requirements.

Glossary and Notes:

*1. F2MC-8FX family:

Name of the 8-bit microcontroller family offered by Fujitsu Microelectronics.

*2. A/D converter:

A circuit that converts analog signals into digital signals.

- **End** -

Resellernews

Resellernews
Aug 13, 2008

Fujitsu Global Mobile Platform commences operations

Fujitsu Global Mobile Platform commences operations

Joint venture established based on a memorandum of understanding (MOU) between Fujitsu's former LSI business divisions and the Institute for Information Industry (III) of Taiwan

By Channelworld staff, Bangalore | 星期三, 八月 13 2008

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Fujitsu Microelectronics Asia (FMAL) has announced the commencement of operations of Fujitsu Global Mobile Platform (FMPI), a joint venture established based on a memorandum of understanding (MOU) tied between Fujitsu's former LSI business divisions (currently a separate entity, Fujitsu Microelectronics, FML) and the Institute for Information Industry (III) of Taiwan.

FMPI will develop reference designs, which will improve design efficiencies for WiMAX-related products for Taiwan-based ODM vendors, in addition to providing technical support.

Background

FMPI was established in Taipei, Taiwan on July 2, 2008 by Fujitsu (of which its existing LSI business divisions were later split from the company on March 21, 2008 to form a separate entity, Fujitsu Microelectronics, (FML) and III, based on an MOU tied by Fujitsu and III. FMPI commences business operations today.

Mobile WiMAX commercial services are anticipated to begin in Taiwan, Japan, the U.S. and from around Europe in August 2009. Services for various aspects of design and manufacturing of WiMAX-related products, including mobile WiMAX devices and mobile WiMAX ultra-small base stations, will be conducted by numerous ODM vendors centered in Taiwan.

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Fujitsu Adds Low Pin Count Series to Line of High-Performance 8-bit Microcontrollers for Consumer Appliances

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Bangalore, Karnataka, IND, 2008-09-10 11:41:11 (IndiaPRwire.com)

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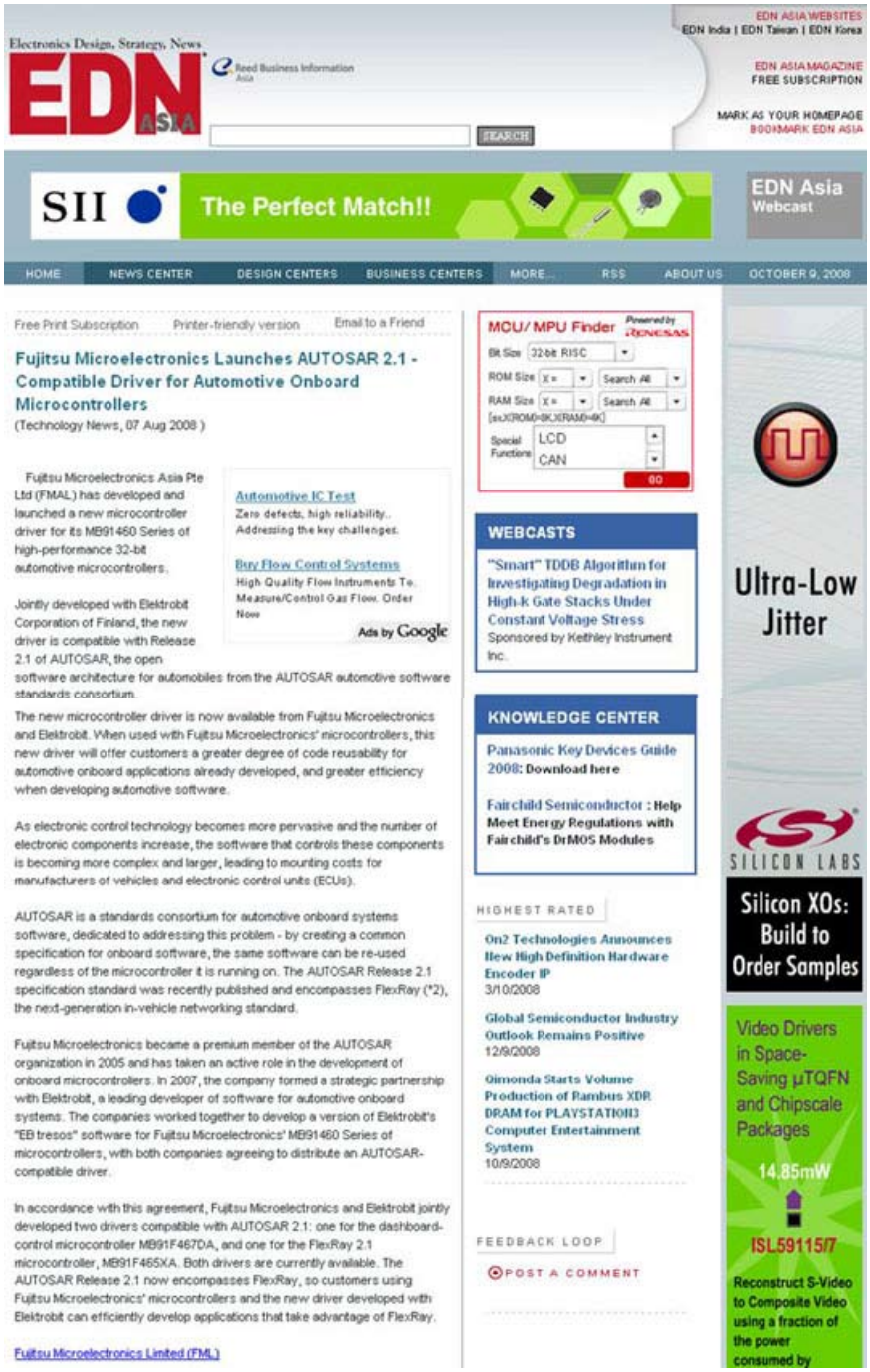

Fujitsu's STB Solution for Digital TV

Fujitsu Microelectronics' SmartMPEG digital TV decoder can address the market's various needs.

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数字电视机顶盒解决方案

SmartMPEG系列标清解码芯片，满足数字电视市场不同需求。

MB86H20B芯片，有线、卫星、地面市场基本型机顶盒、数字电视一体机解决方案。

MB86H20C芯片，有线市场PVR、交互等增强型机顶盒优选方案。

MB86H35芯片，手持便携设备市场解决方案，如PND、手机电视产品。

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MB86H20B	MB86H20C	MB86H35
基本型STB/IDTV解决方案	交互及增强STB解决方案	移动便携数字电视解决方案
○ 芯片主频130.5MHz ○ 独立MPEG-2硬件解码器，解码时不占用主芯片资源 ○ 低功耗：700mW(待机100mW) ○ 已集成主流CA、浏览器及中间件	○ 芯片主频202.5MHz ○ 2路独立MPEG-2硬件解码器，同时处理3路TS流 ○ 支持画中画和PVR功能 ○ 高速USB2.0 OTG ○ 已集成主流CA、浏览器及中间件 ○ Java虚拟机，CDC版本，通过SUN TCK认证 ○ 超低功耗：360mW	○ 高速USB2.0 OTG ○ PVR个人录像 ○ 超小封装，9mm x 9mm ○ 超低功耗：300mW ○ 高速移动应用，速度超过200km/h正常接收 ○ 独立LCD输出接口，无需LCD转换设备，可直接输出至LCD屏幕

应用场景：

有线 — 基本型、交互型 PVR/STB/IDTV

卫星 — 基本型、交互型 PVR/STB/IDTV

地面 — 基本型、交互型 PVR/STB/IDTV，便携设备如 GPS PND, 手机电视等

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Fujitsu's High-Definition Chips

Fujitsu Microelectronics' high-definition chips can help manufacturers produce high-definition solutions in the areas of STB, PVR and network monitoring.

富士通高清系列芯片

协助厂商打造机顶盒、PVR、网络监控等领域高清解决方案，为用户提供真正的全高清应用。

MB86H51芯片让高清视频在窄带宽网络中传输成为现实。可用于数字摄像机、硬盘录像机、安全监控设备、视频编码器、广播前端等设备。

MB86H52芯片将高清MPEG-2转码至H.264格式。独创的图像质量保真技术，保证转码后视频质量不变。内置H.264 Codec。可用于DVR、转码器等设备。

MB86H60高清解码芯片，有线、卫星、地面市场的高性价比高清STB/IDTV解决方案。

更多数字电视解决方案及介绍请联系富士通微电子，富士通期待与您共创未来！

MB86H51	MB86H52	MB86H60
高清摄像机、视频编码器解决方案	高清转码器、DVR/PVR解决方案	高清STB/IDTV解决方案
○ H.264 HP/ Level 4.0 ○ 分辨率：1080i/720p等 ○ 最大码率支持20Mbps ○ 专利算法可减少视频压缩噪声 ○ 超低功耗：600mW ○ 内置2/8/256Mbits FCRAM	○ MPEG2 HD/SD ⇒ H.264 HD/SD；VBS ⇒ H.264 HD/SD；H.264 HD/SD ⇒ VBS ○ 图像质量保真技术，转码后图像质量不变 ○ 高性能压缩比，可使录像时间延长2~5倍 ○ 内置H.264 Codec	○ MPEG2 MP/HL，H.264 HP/Level 4.0 ○ ARM11架构，主频 324MHz ○ 高速USB2.0 OTG ○ 4路TS流解优/解复用，PVR个人录像 ○ 支持HDMI，Dolby，MP3 ○ 支持DDR2内存和串行Flash ○ 内嵌Ethernet MAC，10/100 Base-T
应用场景： 有线 — 单向、交互 PVR/STB/IDTV，编码器/转码器 卫星 — 单向、交互 PVR/STB/IDTV，编码器/转码器 地面 — 单向、交互 PVR/STB/IDTV，编码器/转码器 其他 — 高清摄像机、网络监控		

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THE POSSIBILITIES ARE INFINITE FUJITSU

Fujitsu's SmartMPEG Chipsets

Fujitsu Microelectronics' SmartMPEG chipsets can successfully address the demand for STBs and iDTV.

The digital TV revolution is growing, and Fujitsu Microelectronics is meeting the demand for STBs and iDTV with its innovative range of **SmartMPEG** chipsets. The MB86H20B, for example, is an integrated MPEG-2 decoder which includes hardware extensions to support a low Bill of Material for STBs and iDTVs.

The MB86H20C takes it further with advanced support for PVR applications, which includes two MPEG decoders, USB 2.0 OTG and 3TS interfaces.

Not surprisingly, Fujitsu Microelectronics is at the heart of the digital TV revolution, working with a variety of partners to bring great advances in television services.

For the right decoder to fit your needs, you can find all the right answers at Fujitsu Microelectronics — **The Future of Digital TV**.

MB86H20B	MB86H20C
Basic Pay TV, STB Includes hardware extensions required to support a low Bill of Material for STB & iDTV	**Interactive STB** Advanced digital TV decoder to meet the needs of tomorrow's STB and iDTV market
• ARC Tangent A4 @ 130.5MHz • 1x MPEG-2 MP@ML video decoder • 1x MPEG-1 Layer 1/2 audio decoder • 2x TS interface • 24bit true color OSD menu • ITU656 input/output • Support 1xCI and 2x CAS SmartCard • PAL/NTSC/Secam Video Encoder • Supports both Nor/NAND flash • 7-segment LED supported	• Includes all the features of MB86H20B **Other key enhancements** • Improved ARC CPU @ 202MHz • 2x MPEG-2 MP@ML Video Decoder • 3x TS input • Support personal video recorder (PVR) with advanced Time Shifting feature • USB 2.0 OTG • JPEG & MP3 decoding • Low power consumption of 360mW
Applications: Cable – DVB-C basic and advanced interactive PVR payTV STB Satellite – DVB-S basic and advanced interactive PVR payTV STB Terrestrial – DVB-T basic and advanced interactive payTV STB, iDTV and portable devices like GPS PND, mobile phone and portable TV	

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