

Corporate Message

The year of 2009 is definitely a challenging year to everyone without exceptions. Nevertheless, pulling together of everyone's effort, Fujitsu Microelectronics Limited Asia has achieved expectant results. We make good preparation to weather the tough year ahead in 2009 and continued to work hard. With good perseverance, we, for sure, will survive in a better shape, achieve our desirable results and even shoot to a higher level of excellence.

Just before the end of 2008, Fujitsu Microelectronics Limited Asia has launched two new products as well as expanding its cooperation with universities, leading 2009 onto a promising note.

The two new industry-leading products are MB86H01, a SD multi-decoder LSI supporting MPEG-2 and H.264, and a CMOS logic-based high-voltage transistor for power amplifiers. Both products have captured many positive reviews.

Through joint effort with Xidian University in Xi'an, we have successfully set up the fourth MCU lab as further expansion of our Student Research Training Program (SRTP). Prior to this, there are three labs established with Shanxi University of Science and Technology, Southwest Jiaotong University and Beijing University of Aeronautics and Astronautics, respectively. Moving forward, Fujitsu Microelectronics has launched its "University Program Website" to facilitate the communication and cooperation with universities, as well as to further enhance our dedication to support higher education in China.

Next, Fujitsu Microelectronics has kick-start the year with participation in IIC China 2009, held in Shenzhen on February 26, 2009. At the exhibition, Fujitsu Microelectronics has presented five key categories of products including microcontroller, digital audio/video, foundry/COT, analog and storage. The latest solutions in area of automotive electronics, digital high-definition TV and foundry were put on showcase too. Through the event, we hope to strengthen the communication and cooperation with the local community of electronics industry.

To be a sustainable enterprise, we also started several programs on Quality and Environment protection enhancement, as part of our corporate culture, encouraging staffs to be more responsible to ourselves, our company and our world. Some related CSR projects will be introduced in this newsletter as well.



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

Read more about these events in the 24th issue of Fujitsu Microelectronics Limited Asia e-Newsletter – the first issue of 2009!



Fujitsu Microelectronics and Xidian University set up an MCU "Joint Lab"



Check out Fujitsu Microelectronics University Program Website



Fujitsu Microelectronics holds F²MC-8FX MB95200 MCU Online Seminar



Fujitsu Microelectronics shows its cutting-edge products on IIC-China 2009

- ▶ Fujitsu launches SD multi-decoder LSI supporting MPEG-2 & H.264
- ▶ Fujitsu develops CMOS logic-based high-voltage transistor for power amplifiers
- ▶ Activities: Fujitsu Microelectronics Shanghai University Program Website is now live
- ▶ Interview clipping from Electronic Products China: Electronics promotes automotive clean energy, upgrades security and recreation systems (II)
- ▶ Technical article from Electronic Design China: 32-bit Microcontrollers for digital consumer electronics FR family FR80S/T1 series MB91F639/F637/F647

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 (FML Asia), 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, FML Asia 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, FML Asia 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, FML Asia can readily delivers innovative and value-added solutions and varied range of products to its target markets in the Asia-Pacific region.

About Fujitsu Microelectronics Asia Pte Ltd (FMAL)

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).

▶ HOME ◀

Press Releases

Fujitsu Launches SD Multi-Decoder LSI Supporting MPEG-2 & H.264

Singapore, December 1, 2008— Fujitsu Microelectronics Asia Pte Ltd (FMAL) today announced the launch of multi-decoder LSI chips that support decoding of MPEG-2 and H.264 video compression formats for Standard Definition (SD) video, in particular for SD digital broadcasts in Russia, eastern Europe and China. Sample shipments of the new MB86H01 series also started from December 1, 2008.

For more information, please visit:

http://www.fujitsu.com/sg/news/pr/fmal_20081201.html

Fujitsu Develops CMOS Logic-Based High-Voltage Transistor for Power Amplifiers

Singapore, December 29, 2008 – Fujitsu Microelectronics Asia Pte Ltd (FMAL) today announced that Fujitsu Laboratories Limited and Fujitsu Microelectronics Limited have co-developed a CMOS logic process-based high-voltage transistor featuring high breakdown voltage, suitable for power amplifiers used in wireless devices. As a world's first, Fujitsu developed a 45 nanometer (45nm)-generation CMOS-based transistor capable of handling 10 V power output, thus enabling the transistor to handle high output requirements necessary for power amplifiers used in WiMAX and other high-frequency applications. The new technology makes it possible for power amplifiers to be formed on the same die as CMOS logic control circuitry to achieve single-chip integration, thereby making high-performance, low-cost power amplifiers feasible.

For more information, please visit:

http://www.fujitsu.com/sg/news/pr/fmal_20081229.html

▶ HOME ◀

Activities

Fujitsu Microelectronics and Xidian University set up MCU "Joint Lab", the fourth of such labs set up with China's universities

Fujitsu Microelectronics (Shanghai) Co., Ltd. has jointly set up an MCU laboratory with Xidian University, the fourth one set up to date under the Student Research Training Program (SRTTP) with China's universities. The cooperation between Fujitsu Microelectronics Shanghai and Xidian University will advance the technology innovation capability of both parties as well as to develop more excellent industry talents for the semiconductor industry.

Xidian University in Xi'an is among the elite class of institutes for higher education selected nationally as part of China's State educational development project called "211". (Chinese government's endeavor aimed at strengthening about 100 institutions of higher education and key disciplinary areas as a national priority for the 21st century). A key national university, Xidian is dedicated primarily to electronics technology and information but a wide range of academic subjects including engineering, physical science, social science, foreign languages and business management are also integrated into the university's courses offered.

The university's School of Electronic Engineering has a tradition of excellence in both teaching and research and ranks first in China in the field of signal and information management, and circuitry and system.



Edwin Kwong, Senior Vice President of Fujitsu Microelectronics Limited Asia (right), unveiling a plaque with Zeng Xingwen, Director of Academic Affairs Office of Xidian University, to mark the set up of the MCU lab

Fujitsu Microelectronics University Program Website

The Fujitsu Microelectronics University Program Website, intended for the special community of the University Program of Fujitsu Microelectronics, is now available. The website is located at Eefocus.com, a portal that is well-known for creating special online spaces for major semiconductor players. The website is available at <http://www.edufujitsu.org/>

Fujitsu Microelectronics aims to establish the website as a dedicated platform to introduce the program and as documentation of its achievements in this area. It also serves as an official platform of communication between teachers and students. All universities partnering with Fujitsu Microelectronics will use the website for submission of their research projects, communication tool among the community, as well as technical assistance support from Fujitsu Microelectronics.

Fujitsu Microelectronics will also promote its joint-lab projects, design competitions, on-campus lectures, textbooks, and its products on the website.



Cover Page of Fujitsu Microelectronics University Program Website at <http://www.edufujitsu.org/>

Fujitsu Microelectronics Holds F²MC-8FX MB95200 MCU Online Seminar

Recent years have witnessed a rapidly growing demand for 8-bit microcontrollers (MCU) in industrial control, home appliances and consumer electronic products such as water heater, electric cooker, dehumidifier and hair dryer for Asian market. Responding to such needs, Fujitsu Microelectronics organized a F²MC-8FX MB95200 MCU online seminar on www.elenchina.com website. Held on Feb 24th, it has explained the various the performance and applications of this new products. After the presentation, there was a Q&A sessions where Mr. Lu Huiqiang, Product Manager of Fujitsu Microelectronics (Shanghai) Co. Ltd and other technical experts have helped to clarify queries regarding the new products and technology.



Cover Page of F²MC-8FX MB95200 MCU Online Seminar at <http://www.elenchina.com/topic/hotNews/2009/MCU/index.jsp#a1>

Fujitsu Microelectronics Shows its Cutting-edge Products on IIC-China 2009

The 14th International IC-China Conference & Exhibition (IIC-China) was held at Shenzhen Convention and Exhibition Center on February 26, 2009. Fujitsu Microelectronics (Shanghai) Co., Ltd. exhibited its microcontrollers, digital audios/videos, Foundry/COTs, analog and memory, and demonstrated the latest solutions for automotive electronics, digital high-definition TV and wafer foundry. In addition, Mr. Edwin Kwong, Senior Vice President of Fujitsu Microelectronics Limited Asia., delivered a keynote speech on "Composition of Competitive Edge for Commercial Semiconductor" – the presentation will take place in the morning of February 26, 2009. Please visit Fujitsu Microelectronics at Booth 2D01.

For more information, please visit:

<http://www.fujitsu.com/cn/fmc/en/news/archives/2009/0216.html>



Mr. Edwin Kwong, Senior Vice President of Fujitsu Microelectronics Limited Asia, is delivering a keynote speech on "A construct in the competitiveness in commodity semiconductors"

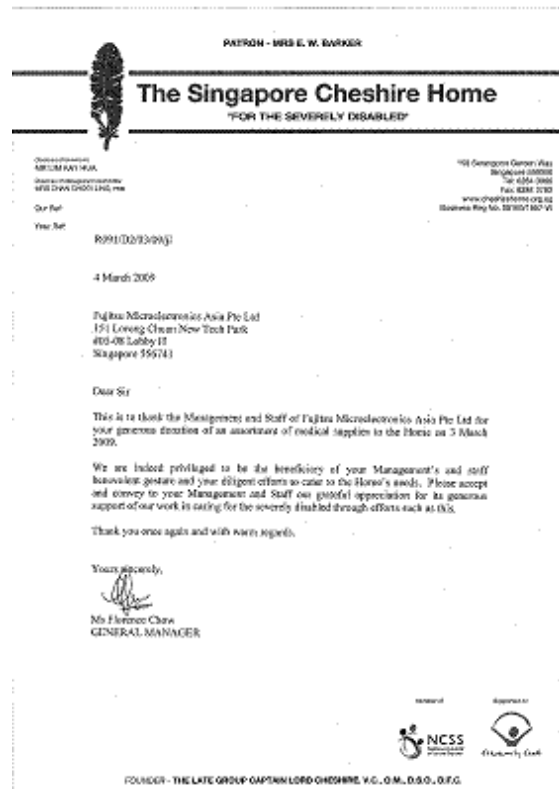


Visitors at Fujitsu Microelectronics booth

CSR ACTIVITIES UPDATES

We started a CSR program in Singapore with the intention to help the needy in the Singapore Cheshire Handicap Home. This activity allows colleagues to understand our social responsibilities to the society and it also allows us to learn from the handicaps when we converse with them at the Home. Most of them are shy and we need to spend some time to talk with them and for them to get to know to us. Besides chatting with them, we also do some handicraft work for the Home to sell to the public. Enclosed are some pictures of the handicraft work done by our volunteer staff for the Home. The time spent at the Home is every Sat from 10am to 12.30pm.

The charity fund is contributed by the staff in FMAL and it is voluntary for charity purpose. This fund is used to purchase medical supplies and sundries for the Home. Our colleagues find this activity meaningful as it allows them to see a different perspective in life when sharing their time and converse with them. It also increases the social awareness among the staff to the society. Therefore, we would like to encourage our colleagues to take up similar initiatives. Below is an Appreciation Letter from "The Singapore Cheshire Home" to our Management and Colleagues in FMAL.



BUILD A GREEN WALL PROGRAM

This activity actually was in end of 2007. Our Singapore Office participated a program to work with a primary school, Princess Elizabeth Primary School, to build a green wall. Our participation was not only to the money, but also involved the activities during the planning and the implementation as well. It was a successful program which also obtained an award (with cash) from Fujitsu Limited.

Media Interview



Micro-Electronics, Feb, 2009

Andy Chang, Marketing Director of Fujitsu Microelectronics Limited Asia was interviewed by Micro-Electronics. He reviewed the prospects and development of Chinese semiconductor industry.



Eng version

The curtain has fallen on the year 2008. In the "unpeaceful" year, although the whole industry has not been spared from unprecedented challenges due to global financial crisis, the Chinese semiconductor industry has achieved favorable development with over 10 percent growth rate.

2009 will be a year with more opportunities and challenges. The global semiconductor industry might be into a period of downturn, and the Chinese semiconductor industry will become the most powerful drive to the continuous depressing global semiconductor industry.

Being a key player in the semiconductor industry with long history, Fujitsu has experienced and successfully weathered several difficult economic conditions and has the power to make greater achievements. We planned to focus on local design and turn China into an innovation base. In accordance, we have launched products especially for the Chinese policy of Home Appliances, going into countryside, and ventured into market of digital television integer conversion. Hence, we have made good preparation to weather the tough year ahead in 2009. With good perseverance, we will achieve our desirable results.

Cold winter will someday pass and spring will not be far behind. Let us encourage each other in our endeavors.

China Electronics News, Jan 20, 2009

Mr. Cedric Huang, Marketing Manager, Fujitsu Microelectronics (Shanghai) Co. Ltd, was interviewed by China Electronics News. He discussed the development of the Direct Broadcast Satellite (DBS) market.



Eng version

Cedric Huang: Reducing Cost Through Localization

China's satellite digital TV (DTV) industry has experienced moderate growth in 2008. Live broadcasting satellite TV, cabled TV as well as terrestrial TV have become the three main areas of China's broadcasting TV industry.

Key elements in the industry chain are under smooth development. Companies like Availink and NationalChip have introduced channel demodulation chips; Fujitsu and Haier have unveiled STB decode chips, while Changhong, Coship, Hisense, Jiuzhou and so on have launched different live satellite STBs. What's worth mentioning was the open tender for live satellite STB in the second half year of 2008, which got STB manufacturers and the entire industry excited.

Historically, the domestic market, especially the rural areas still has many unqualified satellite STBs. According to incomplete statistics, more than 20 million terminals are DVB-S standard-based. With the launch of the live satellite market and under the direction of governmental policies, these DVB-S users will gradually be transferring to China's own standard-based platforms. Where there are demands, there will be cottage industry products. Hopefully, the government can do well in managing these products.

With the fast development of live satellite and international terrestrial digital TV, the domination of the cabled digital TV will be ending.

We think end-STBs have two developing trends: the first is to ensure basic functions while reducing cost while the STBs have stable performance and are reliable; the second is to improve functions and add new ones such as two-way interaction and high definition.

Fujitsu is also planning product development based on these two trends. The company aims to provide customers with complete solutions and timely technical support, addressing their changing application needs. In addition to moving its chip R&D center to Shanghai, Fujitsu is also helping customer to improve efficiency and to reduce overall cost through localized support.

Fujitsu has many partners worldwide and its satellite receiver solutions are available across China, Southeast Asia, Europe and America. Customers can purchase Fujitsu's high-end, middle-end and low-end satellite receivers in the large home appliance markets in Europe. Europe has world's strictest standards and patents. So it is reasonable to conclude that if the products can be used in Europe, it can be applied in Asia or in other regions. Most of these products are manufactured in mainland China or Taiwan.

global sources

国际电子商情

China Electronics News, Jan 20, 2009

Mr. Cedric Huang, Marketing Manager, Fujitsu Microelectronics (Shanghai) Co. Ltd, was interviewed by China Electronics News. He discussed the development of the Direct Broadcast Satellite (DBS) market.

工控市场抗寒性强，MCU需求持续走高



随着全球经济的持续低迷，消费电子市场陷入寒冬，但工业控制领域的 MCU 需求却持续走高。据行业人士分析，工业控制领域的 MCU 需求主要来自于汽车、工业自动化、医疗设备等领域。这些领域对 MCU 的需求具有较高的稳定性和可靠性，因此即使在经济不景气的情况下，这些领域的 MCU 需求依然保持强劲。

工控市场抗寒性强，MCU需求持续走高



丁浩：2009 年工业控制领域的 MCU 需求将持续走高。随着全球经济的持续低迷，消费电子市场陷入寒冬，但工业控制领域的 MCU 需求却持续走高。据行业人士分析，工业控制领域的 MCU 需求主要来自于汽车、工业自动化、医疗设备等领域。这些领域对 MCU 的需求具有较高的稳定性和可靠性，因此即使在经济不景气的情况下，这些领域的 MCU 需求依然保持强劲。



松井敬之：工业控制领域的 MCU 需求在持续走高。随着全球经济的持续低迷，消费电子市场陷入寒冬，但工业控制领域的 MCU 需求却持续走高。据行业人士分析，工业控制领域的 MCU 需求主要来自于汽车、工业自动化、医疗设备等领域。这些领域对 MCU 的需求具有较高的稳定性和可靠性，因此即使在经济不景气的情况下，这些领域的 MCU 需求依然保持强劲。

Eng version

MCU Demand Is Still On The Rise

Industrial Control Area Shows Better Immunity Against Depression

If we look at the areas of communication infrastructure, portable consumer electronics, home appliance and auto industry, we will find that MCU is ubiquitous. MCU is applicable for data processing systems and control systems of multiple functions and is being widely used increasingly in the industrial control systems. It boosts the industrial transformation from mechanicals to electronics and raises efficiency of the systems with lower costs.

Fujitsu is a major MCU supplier. Mr. Welch Ding, the product manager of Fujitsu Microelectronics (Shanghai) Co.,Ltd., indicated that the shipment of MCU by Fujitsu in 2008 is over 7 million. He also said: "because of the financial crisis, the price dropped considerably. At present, the major users demand over 5% price cut, in order to tide over the difficulties together with Fujitsu." Mr. Welch Ding is cautious about the perspective of the industrial application market in 2009. He thinks that, at least, the market scale will be the same as 2008, maybe a slight better.

However, NEC is optimistic about the industrial market. Mr. Matsui, the senior marketing manager of NEC Grand China area anticipated that the company's target is over 100% MCU increase in the industrial control sector in 2009. His confidence comes from the performance/cost ratio of NEC products. "The price of MCU from NEC is relatively stable, despite the sharp competition." According to sources, NEC benefited a lot in the industrial control sector in 2008, its shipment increased by over 50% from 2007.

Match with CAN and Flash to meet the application of industrial control

Mr. Matsui believes that because of cost pressure, more and more factories from US, Europe and Japan will be moved to China where the labor cost is lower. As the Chinese design ability is improved, many entrusted design works from overseas will be shifted to China. On the other hand, the MCU growth on the side of NEC is boosted by the strategy of "all flash". A programme can be written during the development stage with all flash MCU, or be rewritten after the MCU is mounted on PCB, which greatly reduced the risk in the system development. During the economic depression, the market is of uncertain factor. Whereas the flexible all flash MCU can rewrite the programme timely according to the changing market. It helps the system integrators to shorten the D&R cycles and further reduce the D&R cost.

As the control function diversified, the control of the industrial system spread around. Mr. Matsui pointed out: "There is an obvious tendency that the industrial control sector is moving towards high-end functionalized, graphics interface and networked port, so the demand for MCU is ever increasing". This tendency also posed a further requirement for MCU power consumption; peripheral integration and interface back up and therefore raised the value of MCU itself.

At the same time, as the bus standard of the industry has not been unified, this allows the bus application in the industrial sector to expand freely. CAN bus is designed for the auto industry, but because of its excellent performance its application is already beyond the limits of auto industry. Its short-haul high speed, high reliability and multi-host-bus are ideal features for the connections between industrial control units. Mr. Welch Ding noted that many customers used CAN bus to cut down the wiring harness count and reduced the cost of the entire system. This requires a stable CAN bus interface on the MCU. Facing up to this situation, Fujitsu put forward a MCU series, part numbered 16FX. This series bears many improvements compared to its predecessor, 16LX series. It has 1-3 CAN buses, the operating frequency is up to 56MHz compared to the 24MHz of its predecessor, and it is built around 0.18um technology. The 16FX greatly reduced power consumption compared to 16LX. These products can be used in industrial sewing machines, inverters, equipment controllers and UPS.

Industrial control system architecture calls for function rather than formation

MCU in the industrial control system improved the system performance remarkably. However, modern electronic systems involve more and more complicated functions from the control systems. Besides controlling, MCU has to process data and signals etc, so, NSP+MCU control architecture come into being to share the works with MCU. In this architecture, MCU is enhanced by DSP, the controlling task which took a lot of energy from MCU, now is being done by DSP.

的应用经验，我们开发了不同的产品来很好地应对各种的车内应用要求，如车身应用、车内网络连接、汽车安全控制和车内多媒体系统。我们都可以为客户提供成熟的解决方案。从需求上来说，我们的挑战在于，不断的开发更低成本、符合汽车标准的产品。从而简化客户的开发和认证要求。

富士通早在几年前就已经实现了一致性和安全控制日益复杂一起趋势。我们已经开始和汽车厂家合作制定新一代的汽车系统级之外更好的简化汽车电子系统，从而提高其整体可靠性。

Ramiron
International公司
市场拓展经理
Duncan Bennett.
Ramiron认为汽车行业发展的趋势是更高的安全水平，更成熟的信息娱乐设备和更高效的动力传动系统。我们针对所有这些类别提供适合的解决方案。Ramiron的解决方案在安全应用中提升产品的功能，并为工程师带来便利。

安森美半导体
全球汽车部营销市场
Richard White.
汽车应用面临不少新的挑战，如节能、远程控制车辆通信、安全和网络、电气管理、以及降低运营成本。其中后者正在推动

着更新、更高效率等管理系统发展，以及融入燃气和燃油喷射注入等特性。业界将推动在替代能源和混合动力汽车的方向发展。消费者也期待汽车提供更多的连接功能，并能接入信息娱乐系统和电子紧急呼叫(e-Call)系统。受消费者需求和政府规范推动的安全系统也在推动着汽车稳定控制、乘客安全和车道偏离系统领域的创新。车载网络(V2X)正在取代线束，从而降低成本，并减轻车辆重量。诸如自动-停止-交流发电系统这样的创新的新系统也在继续降低二氧化碳排放，从而营造更加清洁的环境。安森美半导体为客户提供广泛的功能和产品，如定制ASIC和ASSP，帮助客户应对这些挑战。我们开发出众多专门的技术和产品，如信号调理(用于引擎管理系统中的多种传感器)、脉动量(用于燃气和燃油喷射注入)、多种通信收发器和电路用于信息娱乐系统和电子紧急呼叫系统，以及其他创新的解决方案用于盲点探测和自适应巡航控制等安全系统。此外，安森美半导体还在开发先进的功能，用于支持高温设备、以及静电放电(ESD)保护和电磁兼容(EMC)功能，使系统更为坚固。

随着信息娱乐等系统成为车辆内部的核心战略。这些系统必须确保它们对车辆内部安全的功能影响可忽略。安森美半导体和软件合作伙伴紧密合作，开发安全系统级解决方案。这些解决方案包括用于避免碰撞、语音识别信息娱乐系统和潜在危险预警系统的半导体器件。

Microchip Technology
全球汽车市场
总监 William Fitzgerald.
汽车电子产品的增长可以归因于在安全性、舒适性、保险理赔以及智能信息等方面的更多应用不断增长的需求。美国硅谷科技公司的业务主要集中在于提供低成本、可靠的增值系统。供嵌入式设计人员开发各种各样的系统，其中包括动力系统、车身控制、底盘控制、信息娱乐、安全以及智能信息系统。

■ 今日电子：汽车电子系统的设备周期较长，而消费电子和通信设备周期较短，贵公司/部门如何进行创新并满足研发和技术支持的需求，以满足这一需求？

William Fitzgerald: 产品进入市场的时间是做生意的关键因素。不仅对汽车厂家如此，对半导体供应商也是如此。通过建立本地的产品开发中心和技术支持中心来快速响应本地客户的需求。富士通已经完全准备好去应对这种挑战。在技术方面，富士通已经准备好去应对客户的挑战。我们针对客户整体系统提供定制化的支持。

Duncan Bennett: Ramiron在设计方面进行了大量的投资，从而帮助我们在开发时间上保持领先。过去几年，我们增加了更多的工程技术人员以支持客户的汽车应用。我们不仅加

增强了团队的实力以解决汽车应用的特定问题。如产品认证和报告等。

Richard White: 安森美半导体和硬件开发需要更设计周期的创新解决方案。虽然汽车产品的设计周期较长，但我们在产品和消费市场的开发中开发出了很多IP，能够利用这些IP，使其更适合于汽车市场。从而简化汽车解决方案的设计周期。安森美半导体为了解决汽车对严苛环境、可靠性和更复杂的控制需求，且通过复用IP库和系统级模块，我们的工程团队能够快速地为安森美半导体的汽车客户提供创新、可靠性和高性价比的解决方案。

安森美半导体为客户提供的价值主张涉及多个方面。首先就是先进的技术，由此带来具备增强性能、系统构建模块和知识产权的能力，以及拥有深奥且经验丰富的设计工程师。强大的产品阵容、卓越的文化氛围，以及能够支持全球客户的世界级物流、质量和技术支持团队。为了进一步提升带给客户的价值，安森美半导体在世界各地投资建立了了解决方案工程中心和系统级设计团队，负责了解客户的整体系统需求，以及汽车产品的系统要求。

Inayat Khajasha: 的确，为汽车生产产品和提供技术支持需要更多的时间和资源。不过，OVT的行政管理体系专注于支持和增长汽车业务。我们从首次的传感器开发开始于2005年，从那时开始，我们很快就开始开发多种产品(如传感器)。我们有自己的销售、市场、设计工程、产品工程、测试工程、质量及可靠性等多个团队，每天处理汽车

车的各种问题。我们的设备设备仅得于内部的ASIC-Q100资格验证。我们在汽车方面积累了丰富的工作经验。和各种硬件和软件开发合作伙伴以及系统方案供应商进行合作。所有这些结合起来可以帮助客户极大地缩短产品投资市场的时间。

Bernd Rucha: 产品上市时间对每个领域都非常重要。汽车电子也是如此。但是我们绝不牺牲质量为代价来缩短开发周期。作为半导体供应商，我们竭尽全力加强产品和系统解决方案的推出。同时，也提供高质量的开发工具和其他支持资源以缩短整个设计周期。

William Fitzgerald: 毫无疑问，无论半导体行业的制程周期有多长，Microchip公司都能够通过超额的制程周期交付可靠的产品。Microchip公司的质量体系通过了ISO/TS-16949，2002认证，以确保客户满意。

■ 今日电子：有些人认为中国的汽车电子公司只是将国外产品本地化，您是否同意这一观点？从技术发展水平的角度来看，您认为中国和全球市场的区别在哪里？

William Fitzgerald: 实际上，中国正在成为越来越独立的汽车市场。汽车工业的发展，已成为中国政府的国家战略。在不久的将来，我们将会看到本地汽车厂家开发出更多自己的汽车产品。从国外的汽车开发相比，我们认为，主要区别还是处在不同的技术开发阶

段。中国市场的地位在成本驱动的阶段。所以，系统成本非常敏感。

Duncan Bennett: 目前，中国的汽车企业仅仅关注以更低成本实现产品本地化。这是阻碍中国快速发展的中国汽车市场所面临的。中国的制造商在国际市场上竞争，需要获得质量进一步提升。中国供应商需要达到AEC-Q100、PPAP规范以及所有相关质量认证的要求。这些要求在世界其他地区的汽车行业已是一项标准。

Richard White: 我们并不认同这种说法。安森美半导体在中国和亚洲地区都有很大的业务量。我们占公司超过50%的销售收入来自亚洲和中国地区。中国对半导体提供本地化是毋庸置疑的设计趋势。但同时呈现的趋势是，随着中国本土公司掌握更多专业设计技术，本地设计含量正在增加，而且质量水平也越来越高。我们已经看到许多本地电子设计，特别是针对中国本土市场的设计。我们相信这个趋势将持续下去。这就是为什么安森美半导体持续在中国投资、强化销售与技术支援以及制造和物流的原因。作为汽车解决方案供应商，我们致力于成为中国当前及未来汽车市场的重要供应商。

Inayat Khajasha: 我深信中国有大量的人才。我访问过十多个汽车供应商和OEM的总部。中国不仅可以对海外开发的产品进行本土化，而且也能生产极好的产品。比如FAW的豪华轿车(我曾试驾过140km/h)这辆汽车几乎具备了美国或欧洲汽车所具有的一切。

■ 今日电子：安全和引擎控制等复杂系统的发展需要半导体厂商、终端电子产品厂商和汽车制造三方合作，您是否觉得在这三方中汽车制造商占主导地位？

王钰: 今天，在半导体厂家和汽车厂家之间，会有越来越多的直接合作。很多新一代的产品都是在和汽车厂家合作之下开发出来的。所以，密切的合作关系正在被改变。新的三方合作关系会比原来的沟通更好。当然，有一点是不会改变的。在新的合作关系中，汽车厂家处于非常强势的地位，而且在未来会更加明显。

Richard White: 我们向OEM会提供系统级设计工作包给一提供供应商。而一流供应商会提供系统级设计工作包给半导体供应商提供。我们的客户要求我们更多地参与设计和开发系统电子产品。其中包括提供系统电源和完整信号通道的元件。

Inayat Khajasha: OVT实际上已经建立了这种三角关系。事实上，还有另一个方案供应商——也就是与厂商和半导体供应商合作的系统集成商。通过协同合作，我们部署构建了系统开发时间。此外，在实际中，OEM很少(除了生产半导体、系统和芯片)直接找半导体供应商采购，因此缺少了解半导体或传感器的进展。因此，我们主动与OEM开发传感器开发和未来趋势的讨论。这样，他们在与直接供应商做生意时会更加自信。事实上，我

们的举措非常受各方力量的推动——其中包括半导体供应商、系统集成商、汽车供应商和OEM。

■ 今日电子：随着CO/DOV、MP3和电视显示屏之后，越来越多的消费电子产品有望转移到汽车之中，您认为什么将是下一个被大量移入汽车的产品？

王钰: 汽车的信息系统，包括车上的监视和传感器系统，告知车主汽车的各种状态，以及车内的多媒体和娱乐系统，包括游戏和因特网连接等。

Duncan Bennett: 目前的增强现实是有消费电子产品的接口。IPOD、蓝牙和USB接口正在迅速成为汽车的必备功能。人们了解到汽车行业无法跟上消费电子行业的发展步伐，因此正在推动消费电子产品进入汽车应用。

Richard White: 汽车在增强现实和接入功能方面的趋势持续下去，因为消费者在推动着电子紧急呼叫系统(e-Call)、卫星导航、视频以及互联网接入等系统领域的持续创新。新的服务包括实时交通报告、道路关闭警告、靠近购物中心、加油站和餐厅位置提醒、天气和其他导航信息，以及MP3播放和其他消费设备的方便连接等。

Inayat Khajasha: 有许多提供便利的设备会利用图像传感器——比如夜视摄像头、360°视野(或前视视野)、盲点监测、倒车辅助、自动巡航、车头灯弯曲和速度调节等。

Bernd Rucha: 在中国，导航系

越来越多的应用到汽车信息系统中，我们期望未来几年会有更快的增长。汽车电子的创新产品将受到环境、健康和安全的、以及网络这几大趋势的影响。

■ 今日电子：贵公司未来三年将发布哪些新技术产品？

王钰: 富士通将投资开发更多车内网络和相应系统级的技术和产品。

Duncan Bennett: Ramiron将继续推出能够改善速度、精度和提高性能的新产品，并且继续致力于开发新的技术和改进现有技术。

Richard White: 安森美半导体开发了多种创新的系统和技术，如电池管理、盲点探测、采用车载网络(V2X)产品增加连接性，以及系统级芯片等。此外还有用于汽车停止-启动系统的交流发电机电压调节、低静态电流(LT)调节器，以及用于引擎管理、车身、安全和信息娱乐系统的高集成度ASIC和ASSP。

Inayat Khajasha: OVT的OmniPixel3-11S技术提供了极低的CMOS感光灵敏度。因此，我们也可以制造微米尺寸非常小的传感器，也就可生产小型模块。这些尺寸非常小的模块可以用于实现行人检测以及自动驾驶等功能的智能摄像头在内的许多应用。此外，OVT也有最好的波前畸变控制技术。它使用从10mm到无限大尺寸的图像，而且图像清晰可见。这只不过是其中一些发展——OVT还参与开发了很多其他的全新视觉及引擎趋势的技术。

Eng version

The Electronic Promote the Fully Development of the Environmental Protection, Safety and Entertainment

According to statistics, the electronic components used in every car have increased by 4%~5% annually. Advanced electronic technology is ubiquitous in a car, such as, engine management, driver assistance, entertainment and information system, etc. After MP3 and mobile TV, what is the next consumer electronic product which will be widely used by auto industry? The security control system is becoming more and more complicated. What electronics will do to meet this challenge? To answer the questions like these, raised by Wang Renzhen, the editor of "Today's electronic" magazine, and analyst of iSuppli, we invited the different electronic component suppliers in the areas of power management, memories, sensors and micro-control.

Today's electronic: What are the new demands and challenges in the areas of security, information, power and network? The security control and consistency of the electronic system in cars are becoming more and more complicated, what will your company do to face this challenge?

OmniVision Technologies (Inayat Khjasha, senior manager of auto product): OVT's auto products oriented to the driver assistance and visual safety. For instance, our image sensors can be used in lane departure warning, or rear view camera and rain sensor, they can also be used in driver warning system and occupant sensing. The challenge we are facing is the lack of standard. The vision sensor in the auto industry is a new technology, this is one of the reasons why there's a lack of standard.

The requirements for security control and consistency is getting higher and higher. For instance, the lane departure warning system will warn the driver when he/she got departed from the lane, even if he/she's playing DVD/CD. This is also suitable for traffic control and adaptive cruise control (ACC).

Bernd Rucha, director of auto electronics of Freescale Asia-Pacific region: As a top supplier of auto electronics, Freescale has extensive microprocessor production lines for information and entertainment. Take the new product of S12HY series 16 bit MCU for example, it can reduce the cost and complexity of the entry-level car dashboard effectively. Moreover, Freescale provides complete system-level solutions, real-time software and extensive software and tools, third-party ecosystem to meet the intelligence and connection demands of safety, body electronics, driving information and communication.

Wang Yu, marketing senior manager of Fujitsu: Today, we see a lot of emerging market demands in the automotive applications. Many consumer electronic products entered into the auto industry, such as, iPod, USB, blue tooth, hand phone, GPS, game console, mobile TV, etc. Many traditional mechanical systems have been replaced by electronics. This requires a reliable network system to link up the different electronic parts. As an automotive system supplier, how to integrate a better user-friendly system is a great challenge.

Fujitsu has rich experiences in the auto industry. We have developed different products to cater for different auto applications and provide well-established solutions for our customers, such as, body application, in-car network connection, security control and multi-media system. The challenge before us is that Fujitsu has to develop new products with lower cost and in line with the auto standards, so as to help our customers to simplify their development and certification.

Years ago, Fujitsu pre-recognized the increasingly complexity of the security control and consistency in the future and we worked together with some auto makers to develop new system-on-chip to simplify automotive electronic systems in order to improve the overall reliability.

Duncan Bennett, marketing manager of Ramtron International: Ramtron believes the development of the auto industry is moving towards high-level security, more sophisticated entertainment device and more efficient power train. We provide suitable solutions for these applications. Our solutions boosted the functions of many security applications and facilitated the engineers.

Richard White, marketing manager of auto dept of ON Semiconductor: automotive applications faces many new challenges, such as energy saving, remote unlock and communications, safety and security, emissions management, as well as reduce the cost of wiring harness, which the latter is driving the a newer, more efficient engine management system development and integration of gas and diesel fuel injection and other features.

The industry has been pushing towards alternative energy sources and hybrid vehicles direction. Consumers also need more connectivity in a car, and the car can be accessed to the information systems and electronic entertainment SOS (e-Call) system. The security system driven by the demand of consumers and the government norm is also driving the innovation of the automotive stable control, passenger safe control and lane departure system.

Vehicle Network (IVN) is to replace the wiring harness in order to reduce costs as well as the vehicle weight; such as the innovative new system of start - stop the alternator is also contribute to reduce emissions, thereby creating a cleaner environment.

ON Semiconductor offers customers a broad range of functions and products, such as customized ASIC and ASSP, to help customers address these challenges requirements.

We have developed a large number of specialized technologies and products, such as signal conditioning (for the variety of sensors in engine management), the drive (for gas and diesel fuel injection), a variety of communications transceiver and power supply (for information and entertainment systems SOS electronic systems), as well as other innovative solutions (for blind spot detection and adaptive headlamps and other security systems).

In addition, ON Semiconductor is also developing advanced features to support high-temperature equipment, and electrostatic discharge (ESD) protection and electromagnetic compatibility (EMC) features, making the system more robust.

With the expansion of the scope of access of the information and entertainment systems in vehicles, we must take the system's affect to the safety of passengers into account. ON Semiconductor is committed to actively and continuously to work with customers together to explore the both the solutions that can both provide the rich experience and a safe environment for passengers. These solutions include hands-free communication, voice-activated information and entertainment system and the early warning systems to the potential dangers.

The global automotive marketing director of Microchip Technology's, Willie Fitzgerald: the growth of automotive electronic products can be attributed to the growing requirements to the safety, comfort, information security devices, as well as driving more applications. American Microchip Technology focus on providing low-cost, reliable, value-added system for embedded designers to develop a wide range of systems, including power systems, body control, chassis control, information and entertainment, security and driving information systems.

Today, electronic: The design cycle of automotive electronic system is longer, while the consumers are willing to get new technologies. How to carry out innovative R & D and improve the efficiency of the development and technical support in your company / department?

Wang Yu: The time-to-market of a product is a key factor to gain the business, and it is not only suitable for automobile manufacturers, but also suitable for semiconductor suppliers. Through the establishment of local product development centers and technical support center to rapidly respond the needs of local customer, Fujitsu has been fully ready to meet the challenge. For technical support, Fujitsu has upgraded to the overall system design support to customer from the original simple component level support.

Duncan Bennett: Ramtron has a large amount of investment to the design tool, thus significantly shortening the time to market of the developing projects. Over the past few years, we added more engineering and technical resources to support customers on automotive applications. We have also enhanced the team's strength in automotive applications to address specific questions, such as product certification and reporting.

Richard White: ON Semiconductor commits to develop the innovative solutions which requires a shorter design cycle. Although the automotive industry design cycle is longer, but we have developed a lot of IPs in PC and consumer markets, which can be used for the automotive market, thereby reducing design cycle of automobile solutions. ON Semiconductor full understand high requirement of the automotive industry to harsh environment, reliability and control change. In addition, through the reuse of the IP library and system building blocks, our engineers can quickly provide our automotive customers with innovative, reliable new solutions.

The value proposition that ON Semiconductor provides covers many aspects. The first is advanced technology, which have been extended to be of the capabilities to enhance the robustness, system building blocks and intellectual property (IP) and own a well-trained and experienced design engineers, huge product line, zero-defect culture, as well as the ability to support customer with world-class global logistics, quality and technical support team. In order to further enhance our value to customers, ON Semiconductor has invested to set up the solution engineering centers worldwide and accredited system designer is responsible for collect client's overall system requirements, as well as the system requirements for the automotive industry.

Inayat Khajasha: Indeed, to produce the product and provide technical support for the automotive required a lot of time and resources. However, OVT administration is focused on the support and growth of automobile business. We began to deploy the sensors in 2005 for the first time. Since then, we soon begin the development of more than 10 kinds of products (image sensor). We have dedicated sales, marketing, design engineering, product engineering, test engineering, quality and reliability and many other teams, dealing with daily issues related to motor vehicles. A large number of our equipments are used only for internal AEC-Q100 qualification. In the automotive area, we has accumulated a wealth of comprehensive experience and a variety of hardware and software development cooperation Partners, as well as system solutions providers. The combination of all these achievements can help customers significantly reduce time to market.

Bernd Rucha: Time to market is very important for each area as well as automotive electronics area. However we will never sacrifice quality in order to reduce the cost of R & D cycle. As semiconductor suppliers, we make every effort to accelerate the development of new products and the launch of system solutions. At the same time, we also provide efficient development tools and other support resources to shorten the whole design cycle.

Willie Fitzgerald: For a long time, regardless of how long the development cycle of the semiconductor industry, Microchip companies are able to deliver reliable products through a shorter development cycle. Microchip Microchip's quality system passed ISO/TS-16949: 2002 certification and can ensure customer satisfaction.

Today, electronics: Some people think that China's automotive electronics company is only the localization of foreign products, whether you agree with this view? From the perspective of technical development, where do you think the difference between China and the global market?

Wang Yu: It is not the case. In fact, China is becoming more and more independent automotive market. The development of the automobile industry has become China's national strategy. In the near future, we will see the local car manufacturers develop more of their own car platform. Compared to vehicle development of the foreign countries, we believe that the main difference is at different stages of technology development. Chinese market is still in the cost-driven stage. Therefore, the system cost is very sensitive.

Duncan Bennett: At present, China's automobile industry is only concerned on the lower cost product localization, which is driven by the small but fast-developing China's automobile industry. If the manufactures in China will to compete in the international arena, it will be necessary to further improve the quality of the Chinese suppliers, and they are required to meet AEC-Q100, PPAP quality norms and all relevant agencies requirements, which in other parts of the world in automotive industry is already a standard.

Richard White: We do not agree this view. ON Semiconductor has large business coverage in China and in the Asian region. In our company, more than 50% of sales revenue is from Asia and China regions. The current situation is that China is localizing the oversea modules. However, at the same time, we can see a tendency that the quantity of local design is increasing with good quality, on basis of their respective professional design techniques. We have already seen many local electronic designs, especially for the domestic market. We believe that this trend will go on. That is why the ON Semiconductor continues to invest in China, to strengthen sales and technical support as well as manufacturing and logistics. As a motor solutions provider, we are committed to become China's major supplier of automotive market currently and in the future.

Inayat Khajasha: I have no doubt that China has a lot of talents. I have visited more than 10 automotive suppliers and OEM cities. China is not only be able to localize the overseas products, but also be able to produce excellent cars, luxury cars such as FAW (I once had to drive 140km!) This car owns almost every similar feature as the car from the United States or Europe.

Today electronics: The development of the complicated system such as safety and engine control needs the cooperation from the semiconductor vendors, terminal manufacturers and automotive electronic products factory. Do you think that these three parties are the dominate ones in automobile industry?

Wang Yu: Today, there will be more and more direct cooperation between the manufacturers and automotive manufacturers. Many new products are developed under the cooperation of automotive manufacturers. Therefore, the old relations of cooperation are being changed, the new tripartite cooperative relations will be better for the communication than the original one. Of course, there is one thing that will be not changed is that, the car manufacturers will be in a very advantage position in the new partnership and this advantage will be clearer in the future.

Richard White: We expect the OEM will continue to outsource the system-level design work to the first-class suppliers, and the first-class suppliers will continue outsource the system lever design to the suppliers of semiconductor components. Our customers require us to become more involved in system design and development of electronic products, including the system power and the components of integrity signal path.

Inayat Khajasha: OVT is actually involved in this triangular relationship. In fact, there is another solution provider - that is the system integrator cooperating with the manufacturers and semiconductor suppliers. Through collaboration, we significantly shorten the system development time. In addition, in practice, OEM rarely (apart from BYD which produces the semiconductors, systems and car) purchase directly from semiconductor suppliers, so they are not familiar with the development of the semiconductor or sensor area. Therefore, we take the initiative to provide the training for the OEM on sensor development and technical trends. By doing so, they will be more confident when have business with supplier. In fact, our measure is very highly regarded by the relevant parties - including semiconductor suppliers, system integrators, automotive supplier and OEM.

Today, electronic: Following the CD / DVD, MP3 and TV screen, after a growing number of consumer electronic products is expected to be transplanted into the car, what products do you think will be under a substantial transplantation into a car?

Wang Yu: Car information systems, including vehicle monitoring and sensor systems will inform the drivers of various states as well the vehicle multimedia entertainment systems, including the Games and the Internet connection.

Duncan Bennett: Currently, the growth areas are the interface of the existing consumer electronic products. iPod, Bluetooth and USB interface is fast becoming a necessary feature of a car. People understand that automotive industry cannot keep up with the pace of development of consumer electronics industry; therefore they are driving the consumer electronics products into automotive applications.

Richard White: The trend of the Automotive in enhancing connectivity and access functions will continue, because consumers are promoting the innovation of SOS system, the electronic (e-Call), satellite broadcasting, video and Internet access systems. The new service will include real-time traffic reports, road closure alert, close to shopping malls, gas stations and restaurants location data, weather and other navigation information, as well as MP3 players and the connectivity FOR other consumer devices.

Inayat Khajasha: There are many facilities will use camera sensors - such as a rearview camera, 360 ° field of vision (or at the top of field of vision), blind spot monitoring, parking assistance, automatic wipers, headlights, such as bending and brightness adjustment.

Bernd Rucha: In China, the navigation systems are more and more used in the car information systems. We expect a faster growth in the next few years. The pace of innovation in automotive electronics will eventually be subject to several major trends such as environmental protection, health and safety, as well as the network.

Today, electronic: What new technology or products will your company release the next three years?

Wang Yu: Fujitsu will invest in the development of more vehicle networking and entertainment system technology and products.

Duncan Bennett: Ramtron will introduce new product with improved speed, density and performance, and continue to develop new technologies as well as improve the existing technology.

Richard White: ON Semiconductor has developed a wide range of innovative systems and technology, such as battery management, blind spot detection, the use of vehicle network (IVN) to increase connectivity products, as well as the basic system chips. In addition, there are also alternator voltage regulator for the stop - start system in the vehicle, low quiescent current (Iq) voltage regulator, as well as the highly integrated ASIC and ASSP for engine management, body, safety and infotainment system.

Inayat Khajasha: The Omnipixel3-HS technology of OVT provides extremely high CMOS low light sensitivity. Therefore, we can also construct a sensor with small pixel size, and also can produce small modules. These very small-size modules can be used to realize pedestrian monitoring and automatic adjustment of headlights and other functions of the forward-looking camera, including a number of applications. In addition, OVT also has the best wave-front coding technology, which uses from 10cm to infinity-size images, and images clearly visible. It is a part of our development - OVT is also involved in the development of many other industry-leading and trend-leading technologies.



Compotech China, Jan 2009

Fujitsu Microelectronics Pacific Asia Ltd., Taiwan Branch participated in the Survey on Best Products and Technology in Semiconductor Electronics Industry of 2008 organized by Compotech China and recommended MB95200 (Milbeaut LSI) and MB86H55 (Full HD H.264 CODEC LSI).

Fujitsu Microelectronics Pacific Asia Ltd., Taiwan Branch
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2. Video：品名：“Milbeaut”系列 LSI 產品、Full HD H.264 編解碼 LSI 晶片 MB86H55、MB86H55

推薦理由或產品特色：

1. 最靈活運算方案為“Milbeaut”系列 LSI 產品，這是 Milbeaut 系列中針對影像功能手機應用的產品。該產品採用 90nm CMOS 製程技術製造的影像引擎，功耗極低，可以針對高解析/高速/小型化的 CMOS 影像感測器之影像進行，提供不失真的影像處理。MC-3 產品使用內置的線性緩衝器，無需外部記憶體就可以進行必要的影像處理，因此可以應用於小型和低成本的手機相機。MC-3 的影像處理能力可高達 500 萬像素。
2. 富士通低功耗微處理器 MB95200 系列(LPC)，MB95200 系列是擁有嵌入式快閃記憶體和數位光效能微處理器，具備 20 個計數以下(包含 20 個)的邏輯腳數(LPC)全新系列。該系列產品採用最佳化程序，可實現更低的功耗。其內置的 FLASH 可容納 10 萬次讀寫，20 年資料保存，並提供

有最可靠的資料存取功能。在開發方面，該系列擁有單一整合的開發環境，指令設置簡單，可簡單建置。該系列可在單晶片上實現。開發時透過對片上庫使用一個針對，所以能最大程度地減少產品開發時間。

3. 富士通低功耗 Full HD H.264 編解碼 LSI 晶片 MB86H55、MB86H55，此兩款 LSI 晶片加強了富士通 H.264 編解碼 LSI 晶片陣容，針對 H.264 格式的 Full HD(1920 x 1080)影片進行編碼與解碼。兩款產品中率先上市的是低功耗型 MB86H55，此晶片之特點之一為在進行 Full HD 編碼時，其功耗可低至 500mW，省電效率為業界之冠。

主要應用市場：行動裝置、數位家庭、汽車電子、工業 / 醫療

2008 年重大企業新聞：

1. e-Shuttle 與香港科技園攜手為亞洲中心型公司提供多項自營服務
2. Fujitsu Global Mobile Platform 公司開始營運

Eng version

The best products that Fujitsu recommend:

1. **MPU/MCU/DSP:** MB95200 family (LPC)
2. **Video:** Milbeaut series, full HD H.264 CODEC LSI chip MB86H55, MB86H56

Reasons for recommending these products and product features:

1. Milbeaut line of image-processing chips:

These chips are developed using 90nm CMOS technology process are for a variety of mobile phones that have imaging functions. The product incorporate image engines that process high-resolution, high-speed, and small CMOS images sensor images beautifully and at high speed with low power consumption. The MC-3 can execute the necessary signal processing without an external memory by utilizing the built-in line buffer in the LSI. This enables the construction of small and low-price camera modules. MC-3 is capable of processing images up to 5 million pixels.

2. MB95200 Low Pin Count Series of Microcontrollers: MB95200

The MB95200 series of microcontrollers are 8-bit general purpose single-chip products with embedded flash memory and 20 pins or less.

The series of single-chip standard microcontrollers with 8-24 pins is powered by an optimized core, with low-leakage technology and embedded flash, which has 100,000 erase cycles and 20 years' data retention. In addition, the series can also protect the contents of the flash memory. The product offers an integrated development environment. Users can easily set instructions and the series also employ a 1-line on-chip debug that uses only one pin on the microcontroller, reducing time-to-market.

3. Ultra Low Power Full HD H.264 Codec: MB86H55 and MB86H56

These two products are the new members of Fujitsu's H.264 LSI chips. They can compress and decompress full high-definition video (1920 dots x 1080 lines) in the H.264 format in real-time. The MB86H55, which was launched before the other product, features power consumption of only 500mW during Full HD encoding including the in-package memory, an industry-leading level for low power consumption.

Main targeted market: Handheld devices, digital home, auto-electronics, industrial/medical

Major Corporate News in 2008:

1. e-Shuttle and Hong Kong Science and Technology Parks Collaborate to Provide Silicon Shuttle Services for Asian Start-ups
2. Fujitsu Global Mobile Platform Starts Operations

▸ Technical Article



Electronic Design-China, Dec 2008

32-bit Microcontrollers for Digital Consumer Electronics FR Family FR80S/T1 Series MB91F639/F637/F647

32-bit Microcontrollers for Digital Consumer Electronics

FR Family FR80S/T1 Series

MB91F639/F637/F647

Integrating a FR80S CPU core with improved CPU performance and numerous peripheral functions with reinforcements, these products are optimal for digital consumer electronics.

Overview

Digital household appliances and AV products are equipped with additional convenient functions with each model change; the processing of microcontrollers evolves concurrently. The amount of data to be processed by microcontrollers has also been increasing, leading to greater demands for increased CPU performance speed so as to realize a variety of displays, etc.

To meet these needs, FUJITSU offers a lineup of microcontrollers integrating 32-bit CPU core "FR80S" with processing performance improved by 30% or more compared to conventional products. Since the specifications of peripheral functions for all products are identical, it is possible to divert the software assets and easily carry out the model developments of customer applications.

Lineup

As the first FR80S-integrated microcontroller product, we have developed the "FR80S/T1 Series," which realizes high-speed operation. The distribution of "MB91F639" will begin for audio devices and printers with increased program capacities and "MB91F647" for digital single-lens reflex cameras and digital TVs requiring an increased number of pins in microcontrollers for improved product functions. We will continue to address the diverse needs of our customers in the future by providing a rich

product lineup including low power consumption and multi-function versions.

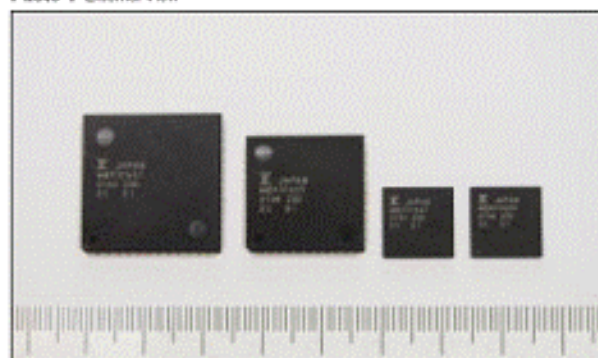
Fig.1 presents the product lineup from this series.

Product Features

- Improved processing performance achieved with the new built-in CPU core "FR80S"

These products have a built-in FR80S CPU core with the CPU processing performance improved by 30% or more over the

Photo 1 External View



exiting FR core due to the advanced pipeline processing, internal bus operation efficiency, and so forth.

Fig.2 presents the features of the FR80S internal bus structure and **Fig.3** a comparison of CPU performance between FR80S and ER60.

- Two built-in units of A/D converters with the fastest speed in the industry

These products have two built-in units of high-speed A/D converters capable of converting analog signals into digital

signals at approx. $1.2\mu s^{*1}$. This enables the high-speed processing of information from various different sensors. It also has 16 stages of built-in FIFO for storing A/D conversion data and is capable of A/D conversion with reduced CPU loads.

- Total of 12 channels of built-in serial interface, the largest number in the industry

These products have 12 channels of built-in multi-function serial interface to control various devices for image and audio processing. Multi-function serial interface is capable of

Figure 1 Product Lineup for FR90S/T1 Series

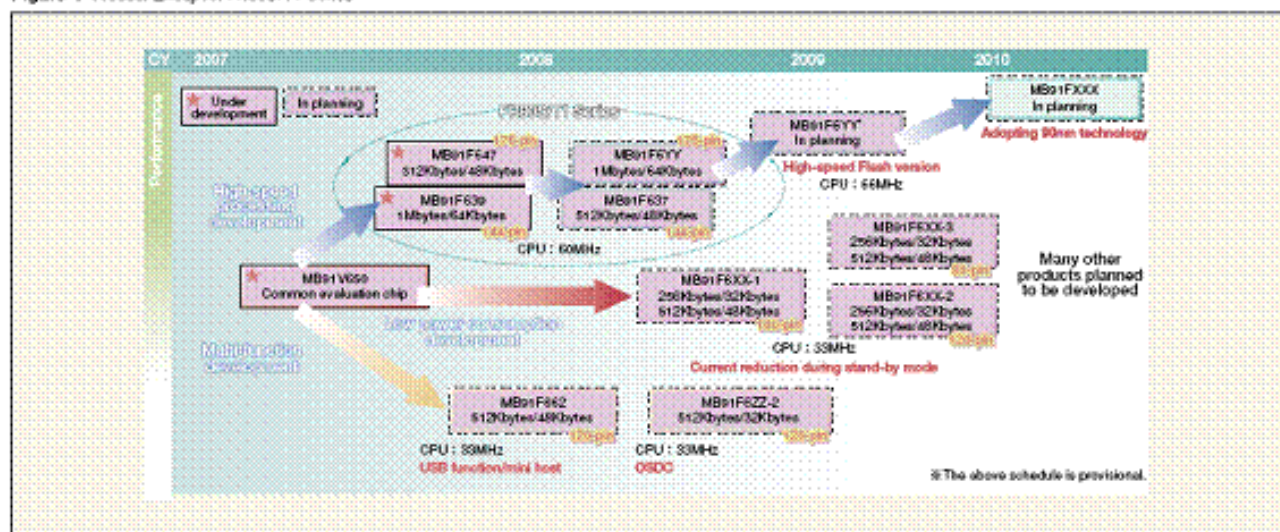


Figure 2 Features of EP80S Internal Bus Structure

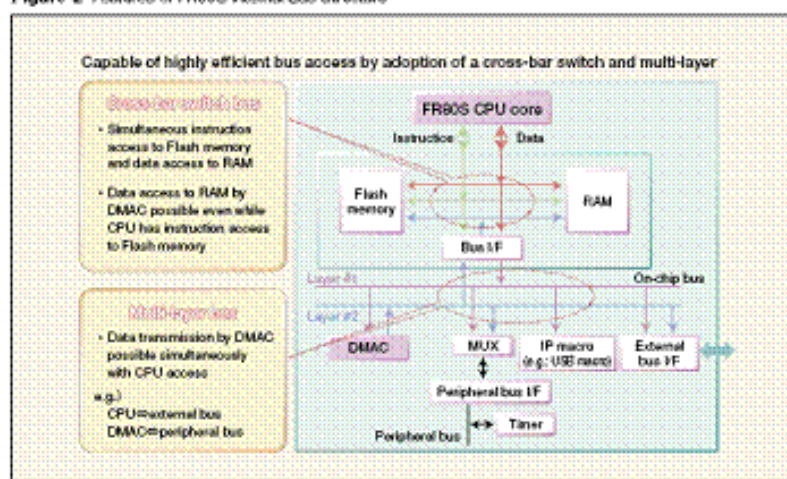
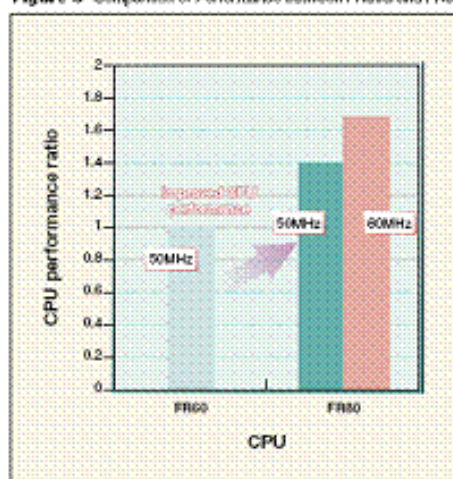


Figure 3 Comparison of Performance between FR00S and FR50



addressing SIO, UART, and I²C communication methods by software switching. It also integrates 16bytes FIFO for reception and 16bytes FIFO for transmission in 4 channels.

Table 1 presents the list of functions in this series.

*1: Approx. 1.2μs. The minimum A/D conversion period varies depending on the operation clock for peripheral functions and the conditions of external circuits.

Table 1 List of FR80S/T1 Series Functions

Product type	MB91F637/MB91F639	MB91F647
Flash memory/RAM	512Kbytes/48Kbytes, 1Mbytes/64Kbytes	512Kbytes/48Kbytes
Pin number	144-pin	176-pin
Power supply voltage	Single power supply: 2.7V to 3.6V	I/O power supply: 2.7V to 3.6V Internal logic: 1.65V to 1.95V
Operation frequency	60MHz	
External bus mode	Separate/multiplex bus	
DMAC	8 channels	
16-bit base timer	16 channels (reload timer:PPG/PWM/PWC mode switching possible, also addresses 32-bit mode)	
Multi-function serial interface	12 channels (UART/SIO/I ² C mode switching possible, 4 channels with 16bytes FIFO, some channels with 5V withstand voltage)	
External interrupt	32 channels some channels with 5V withstand voltage	
10-bit A/D	31 channels (2 units)	32 channels (2 units)
8-bit D/A	3 channels	
16-bit reload timer	3 channels	
32-bit FRT/ICU/OCU	Free-run timer: 2 channels, input capture: 8 channels, output compare: 8 channels	
16-bit U/D counter	4 channels	
Clock timer	Equipped	
Package	LOFP-144 (0.5mm pitch, 20mm × 20mm) BGA-144 (0.8mm pitch, 12mm × 12mm)	LOFP-176 (0.5mm pitch, 24mm × 24mm) BGA-176 (0.8mm pitch, 12mm × 12mm)

Table 2 Development Environment Configuration for FR80S/T1 Series

Product type		MB91F637/MB91F639	MB91F647
Development environment hardware	ICE	MB2198-01	
	Adapter board	MB2198-700-E	
	Evaluation chip	MB91V650	
	Header board*	MB2198-702-E : LOFP-144 (0.5mm pitch, 20×20mm)	In planning
	Evaluation board	BBF2004-FR144SQF-NS manufactured by Sunhayato, Inc.	BBF2004-FR176SQF-NS manufactured by Sunhayato, Inc.
Development environment software	Unified development environment	SOMTEC V6 Professional Pack (SP365030118QAC)	
Writer for Flash microcontrollers	Serial writer	Fujitsu USB Programmer (writing using MB2146-09A-E) Fujitsu MCU Programmer (writing using RS232C I/F) AF9101 by Flash Support Group, Inc. MegaNETIMPRESS series by Yokogawa Digital Computer, Inc.	
	Parallel writer	AF9709B or MB9708 (for writing 1 piece), AF9723 (for writing several pieces simultaneously)	
	Parallel writer adapter	LOFP-144: In development BGA-144: In development	OFP-176: In development BGA-176: In development

*Header boards for BGA package products are not supported.

Development Environment

Table 2 presents the development environment configuration for this series.

Application Examples

Figs.4 and 5 present application examples of MB91F639 and MB91F647. These products can be used for the main control of AV amplifiers and digital single-lens reflex cameras by utilizing the features of built-in multiple-channel serial interface and multi-unit A/D. It can also be used in various industrial devices for motor control and so forth. *

NOTES

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

Figure 4 Application Example of MB91F639

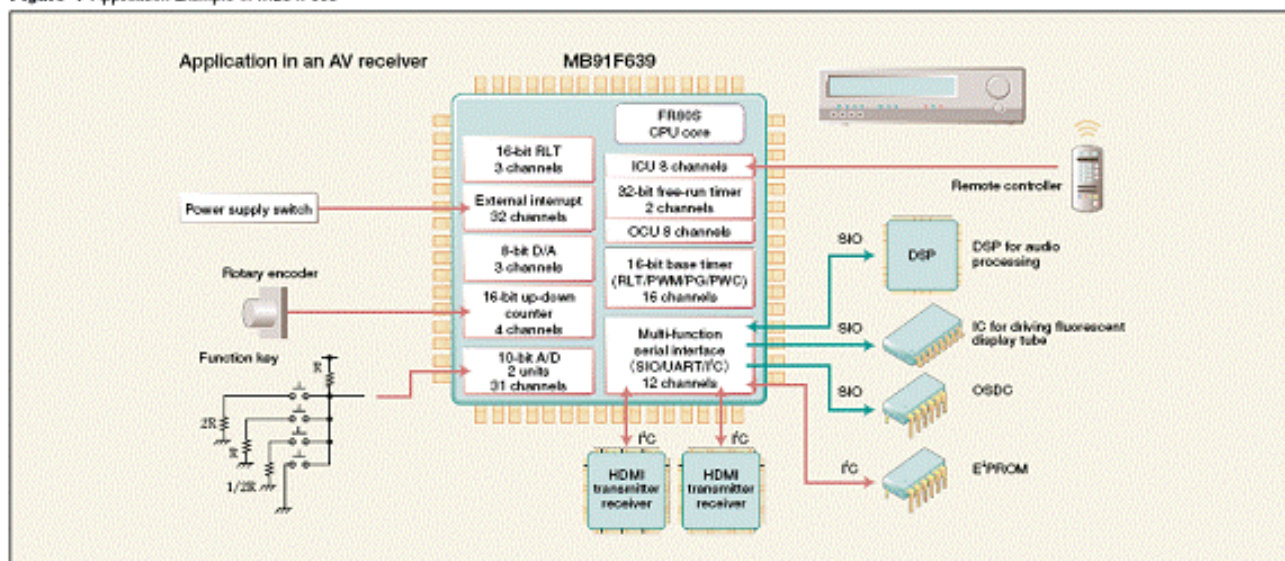
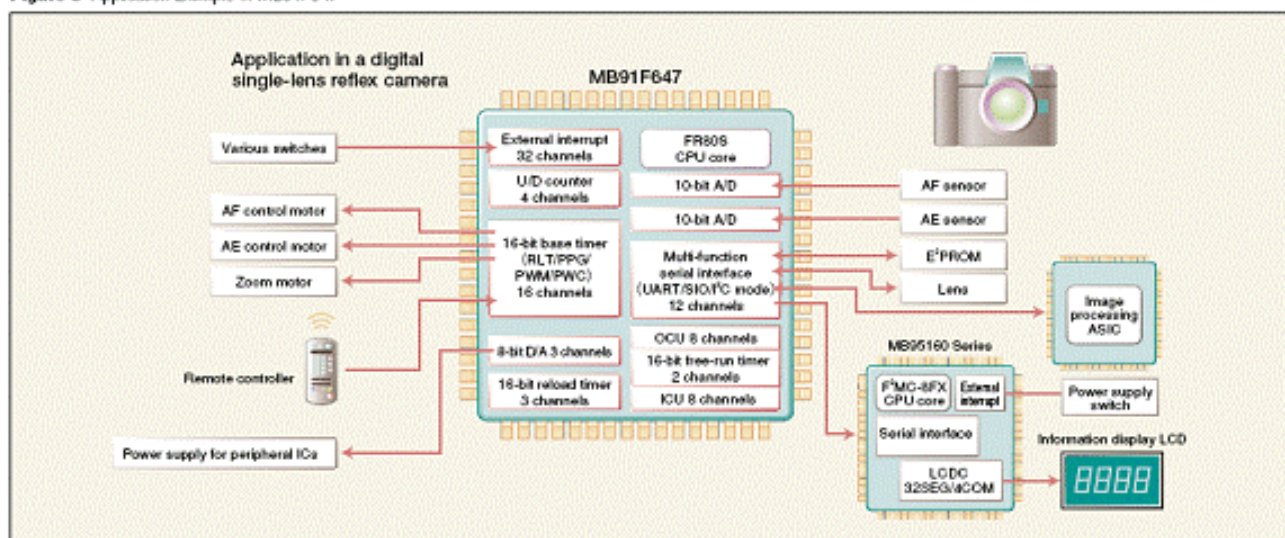
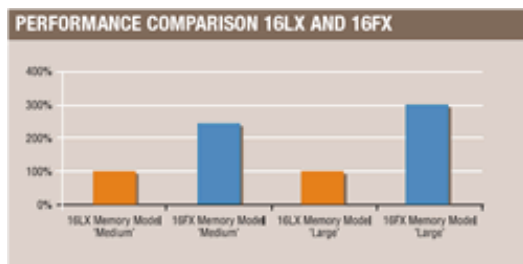


Figure 5 Application Example of MB91F647



F²MC-16FX Next Generation Microcontrollers

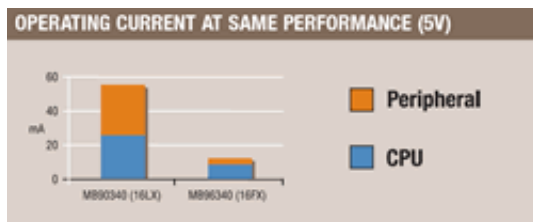
Fujitsu Microelectronics Limited Asia introduces the next generation of 16-bit microcontrollers - the 16FX series.



Graph 1 shows the performance ratio (Dhrystone 2.1) of 16FX compared to 16LX at 24MHz CPU frequency for different memory models. 16LX = 100%.

Fast

16FX series is based on an improved CPU with significantly increased internal bus bandwidth. As a result, program execution is accelerated, as can be seen in the Dhrystone benchmark (Dhrystone 2.1 compared to MB90340 series). 16FX is about 3 times faster (depending on the memory model used) than 16LX at the same clock frequency. For example at 24MHz 16FX achieves more than 11 real MIPS (Dhrystone 2.1). The architecture improvement is particularly visible when handling large data structures (see memory model 'Large' in graph 1). But that's not all. New technology and improved design allow for CPU frequencies up to 56MHz - thus achieving processing performance ranges of 32-bit processors.



Graph 2 compares 16FX operating current simulation result to 16LX typical values, both operating at 4MIPS (Dhrystone 2.1) performance. 16FX achieves the performance at lower frequency with only 22% of the power consumption.

Efficient

16FX combines the advantages of 16- and 32-bit architectures. The C-code efficiency benefits from the 16-bit instruction set. Instruction Pipelining, a technique widely used in the 32-bit RISC world, allows 16FX to reach RISC-like performance. With instructions completed in less clock cycles, the same performance is achieved with less power consumption (compared to architectures without pipelining).

The 16-bit bus width again is an advantage for a low power consumption result compared to 32-bit architectures. A 32-bit bus will have a higher capacitance which increases current consumption particularly at high frequencies. The use of latest CMOS technology also translates into efficient use of silicon space (smaller chip) and lower power consumption.

16FX specific power reduction features include a reduced internal CPU supply voltage, peripheral clock speed selectable independently from CPU speed, and reduced number of clocks per instruction (CPI). The result is an 80% reduction in power consumption compared to 16LX at the same performance.

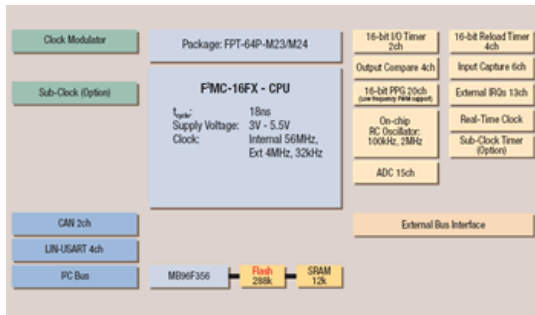
Features

Next generation 16FX microcontroller delivers 5x the computing power, 78% less power consumption and is pin compatible with its proven predecessor - the 16LX.

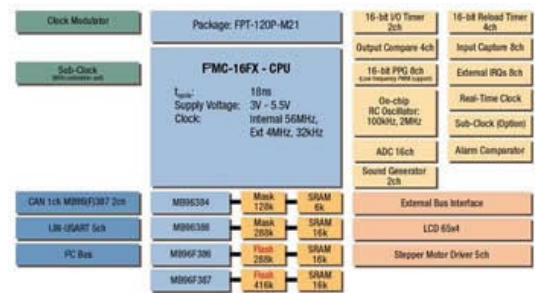
- 20 Dhrystone MIPS computing performance (V.2.1)
- On-chip oscillators for short start-up, clock supervisor function, sub-clock or main clock operation
- Start-up time <1ms to RC run mode, <8ms to PLL run mode
- Operating voltage range 3.0-5.5V
- Internal CPU voltage reduced to 1.8V (less current consumption, less EM emissions)
- New energy-saving options: separate clock dividers for core and peripherals
- DMA: several channels that can be assigned to any peripheral resource
- One Byte per clock cycle transfer speed
- Embedded Debugging: firmware support for debugging via USART (no need to link a monitor kernel to application software)
- Low voltage detection reset: available on all 16FX devices
- Interrupt: every resource has its own interrupt. A table base register allows relocating the base address of the interrupt vector table
- Ports: up to 4 different input levels selectable by software 'port input enable' function allows pins to be left open (no termination by resistor required)
- CAN: each channel offers 32 message buffers. Bosch C-CAN.
- PWM generation: improved programmable pulse generators offer more channels at full 16-bit resolution. Duty cycle and frequency are controlled in separate registers.

MB96320 FX series block diagram

MB96340 FX series preliminary block diagram



MB96350 FX series preliminary block diagram



MB96380 FX series preliminary block diagram

Embedded flash technology

All of the F²MC-16 series are supported by at least one device that has Flash ROM as the user programmable memory.

Features

- Blocks divided into separately erasable sectors
- Erase protection by sector capability
- Supports programming by on-chip firmware Embedded Algorithm™
- No second programming voltage required
- 10,000 erase cycles
- 20-year data retention
- Programming by three methods:
 - o On ordinary programmer with adaptor as with traditional OTP devices
 - o Using Fujitsu embedded serial programming mode via on-chip UART/SIO directly to the flash ROM
 - o Copying or downloading to flash using customer's own bootstrap software
- Programming via CAN possible
- 'Flash Security' read-out protection available on most flash devices

Microcontrollers with CAN bus controller

Fujitsu has a unique portfolio of 16-bit devices available offering a full featured CAN bus protocol controller as an on chip peripheral for automotive and industrial applications. The details of these parts are listed in the tables listing the device features in our Product Overview and on our web site.

16LX compatible

The 16FX CPU uses all 16LX machine instructions. With the same instruction set, the Assembler and C-compiler are also unchanged when switching from LX to FX CPU. Quite a few of the 16LX peripherals can be found again on 16FX - making software conversion from LX to FX an easy task. On the hardware side it is even easier. The first 16FX product is fully pin-compatible to the successful MB90340 (16LX) series. No need for a PCB change. You can even use the same Fujitsu Starter Kit (Flash-CAN-100P-340).

Package size	Pin compatible 16LX series	Available 16FX products	16FX products under development
144-pin	-	-	MB96F338 (544kB Flash) MB96F337 (416kB Flash)
120-pin	-	MB96F387 (416kB Flash) MB96F386 (288kB Flash)	MB96384 (128kB ROM)
100-pin	MB90340 128kB-512kB Flash 128kB-256kB ROM MB90860 128kB Flash / ROM	MB96F348H (544kB+32kB Flash) MB96F348R (544kB Flash) MB96F347R (416kB Flash) MB96F346R (288kB Flash)	MB96F345H (160kB+32kB Flash) MB96344R (128kB ROM)
80-pin	-	-	MB96F326 (288kB)
64-pin	MB90350 64kB-128kB Flash / ROM	-	MB96F356 (288kB)
48-pin	MB90360 64kB Flash / ROM MB90960 64kB Flash	-	MB96F365 (160kB Flash)

16-bit flash microcontrollers compatibility overview.

Fujitsu reserves the right to change the specification of products under development without notice.

► Special Press Report



Wireless Design & Development Asia, Jan/Feb 2009

Fujitsu launches ultra-low power full HD H.264 CODEC LSIs.

Fujitsu Launches Ultra-low Power Full HD H.264 CODEC LSIs

Fujitsu Microelectronics Ltd has expanded its line-up of H.264 CODEC LSIs that encode and decode Full HD (1,920 dots x 1,080 lines) video in the H.264 format with the development of two LSIs—MB86H55 and MB86H56. The ultra-low power MB86H55 features power consumption of only 0.5W during Full HD encoding including the in-package memory. The MB86H56, meanwhile, offers processing of Full HD video at 60fps (progressive), 60p, to improve picture quality even further.

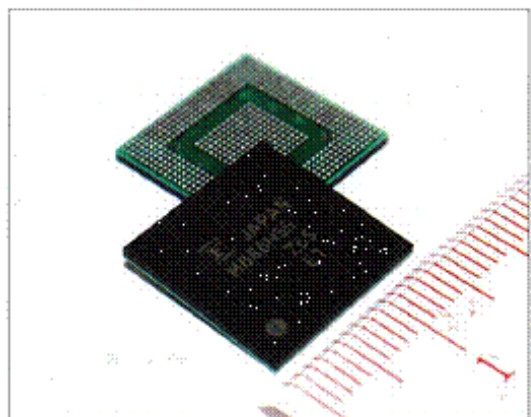
The 15x15mm devices have memory in-package, making it ideal to record, play and transmit superior picture quality HD video on portable devices such as digital camcorders, as well as on home networked appliances, commercial broadcast equipment, and security cameras.

The devices, as well as the existing MB86H51 CODEC LSI, utilize Fujitsu Laboratories' proprietary picture quality algorithm for superior picture quality and a reduced video processing burden enabled by

high-compression technology.

Both products contain one 512Mb memory FCRAM in-package, as well as have an embedded scaler for expansion or reduction of the picture. In units of 16 bit x 32 lines, pictures can be expanded by a maximum of six times or reduced to 1/6, therefore enabling flexible accommodation of the requirements for picture quality, resolution, and bit rate depending on the application.

The LSIs also contain many interfaces for improved connectivity. For the host interface to connect to an external CPU, there is a 16 bit parallel interface and a TS interface as the video stream interface. In addition, there is a serial interface in which a reduction of



pins for host interface is possible, as well as a PCI interface for connecting a PC or a recorder. Connection to external ROM is also possible.

Fujitsu Releases CMOS Logic-based High-voltage Transistor for Power Amplifiers

(Product News, 29 Dec 2008)

Fujitsu Laboratories Ltd and Fujitsu Microelectronics Ltd have co-developed a CMOS logic process-based high-voltage transistor featuring high breakdown voltage, suitable for power amplifiers used in wireless devices. The 45nm-generation CMOS-based transistor is capable of handling 10V power output, enabling the transistor to handle high-output requirements necessary for power amplifiers used in WiMAX and other high-frequency applications. The new technology makes it possible for power amplifiers to be formed on the same die as CMOS logic control circuitry to achieve single-chip integration, thereby making high-performance, low-cost power amplifiers feasible.

Fujitsu developed a new transistor structure with the following key characteristics:

1. The transistor's drain is surrounded by a "lightly doped drain" (LDD) region, which overlaps with the gate. This lowers the electrical field extending horizontally to the drain, and the electrical field extending to the gate oxide layer, thereby raising the breakdown voltage.
2. The dopant distribution in the transistor channel follows a lateral gradient. This lowers the density of dopant on the drain side of the channel, thus limiting the increase in drain resistance, which is the main part of on-resistance. It also lowers the electrical field extending horizontally to the drain, also raising the breakdown voltage.

The typical method for raising the breakdown voltage of a CMOS transistor has been to widen the gap separating gate and drain. This new structure suppresses on-resistance effectively compared to the conventional method, without increasing the gap.

CIOL India, Dec 2008

Transistors

Fujitsu develops CMOS logic-based HV transistor

Enables single-chip integration of power amplifiers and CMOS logic control circuitry

Monday, December 29, 2008

BANGALORE, INDIA: Fujitsu Microelectronics Asia Pte Ltd (FMAL) announced that Fujitsu Laboratories Ltd and Fujitsu Microelectronics Ltd have co-developed a CMOS logic process-based high-voltage transistor featuring high breakdown voltage, suitable for power amplifiers used in wireless devices.

As a world's first, Fujitsu developed a 45nm-generation CMOS-based transistor capable of handling 10V power output, thus enabling the transistor to handle high-output requirements necessary for power amplifiers used in WiMAX and other high-frequency applications. The new technology makes it possible for power amplifiers to be formed on the same die as CMOS logic control circuitry to achieve single-chip integration, thereby making high-performance, low-cost power amplifiers feasible.

Details of this technology were presented at the 2008 IEEE International Electron Devices Meeting (IEDM) held from December 15-17 in San Francisco. (Session/Presentation: 19.1)

Background

Due to the fact that power amplifiers for wireless devices demand high power output at high frequencies, currently compound semiconductors such as gallium-arsenide (GaAs) are commonly used, mounted as a chip separate from control circuitry based on a general-purpose CMOS logic chip.

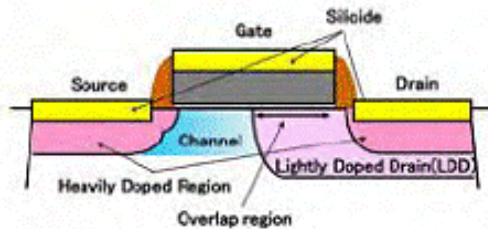
If these chips' functions could be integrated onto a single chip, it would enable cost reduction of the overall module and likely speed adoption of wireless devices to be used with wireless communication standards such as WiMAX and LTE. Thus, there is a need for transistors that are compatible with CMOS

logic process technology, and which can satisfy the requirements of power amplifiers necessary for WiMAX and other wireless communication standards.

Technological challenges

The power output required of power amplifiers for use in high-frequency applications, such as WiMAX, exceeds the breakdown voltage of transistors used with standard CMOS logic processes. Overcoming this hurdle while remaining compatible with CMOS process technology requires an increase in the transistor's breakdown voltage, which is achieved with a structure that lowers the electric field around the drain, as electric fields can lead to transistor failure. Furthermore, structures with high breakdown voltages typically increase the transistor's on-resistance, making it difficult to obtain satisfactory performance at high frequencies. Therefore, any solution would need to both raise breakdown voltage and avoid increasing on-resistance.

Newly Developed Technology



To overcome the aforementioned issues, Fujitsu developed a new transistor structure with the following key characteristics (Fig. 1):

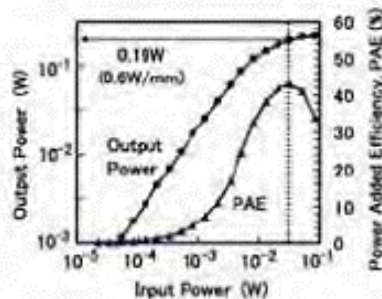
1. The transistor's drain is surrounded by a "lightly doped drain" (LDD) region, which overlaps with the gate. This lowers the electrical field extending horizontally to the drain, and the electrical field extending to the gate oxide layer, thereby raising the breakdown voltage.

2. The dopant distribution in the transistor channel follows a lateral gradient. This lowers the density of dopant on the drain side of the channel, thus limiting the increase in drain resistance, which is the main part of on-resistance. It also lowers the electrical field extending horizontally to the drain, also raising the breakdown voltage.

The typical method for raising the breakdown voltage of a CMOS transistor has been to widen the gap separating gate and drain. This new structure suppresses on-resistance effectively compared to the conventional method, without increasing the gap.

Furthermore, this new structure is believed to be highly compatible with standard transistors with 3.3V I/O(5), since it requires only the additional steps of forming the LDD region and the custom channel region.

Results



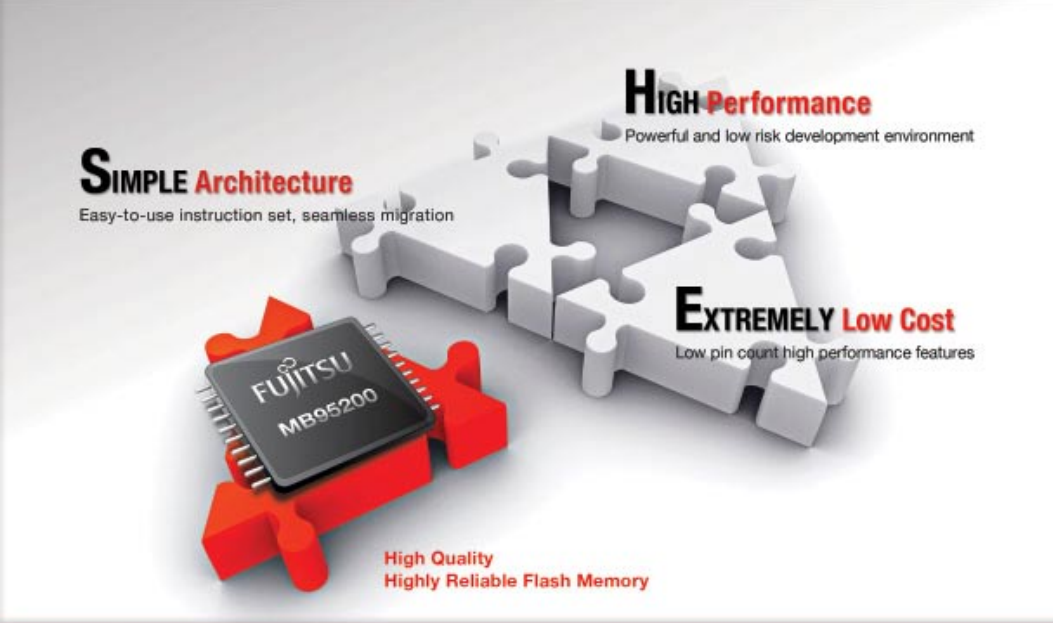
By using 45nm process technology to apply the new transistor's technology to standard transistors with 3.3V I/O, Fujitsu developed the world's first transistor that raises the breakdown voltage from 6V to 10V.

In regard to features that make the new transistor suitable for use in power amplifiers, power output of 0.6 W per gate width of 1mm (0.6W/mm) was reached at maximum oscillation frequency of 43 GHz (Fig. 2), thereby demonstrating sufficient performance for use

Fujitsu MB95200

Fujitsu Microelectronics Limited Asia has presented its MB95200 series in the recent advertisements.

MB95200 is a newly launched 8-bit microcontroller series which is low cost but high in performance and quality. They are easy to use and offer a complete all-in-one development environment.



SIMPLE Architecture
Easy-to-use instruction set, seamless migration

HIGH Performance
Powerful and low risk development environment

EXTREMELY Low Cost
Low pin count high performance features

**High Quality
Highly Reliable Flash Memory**

MB95200 Series of 8-Bit Microcontrollers

The new series of low pin count microcontrollers are easy-to-use and offer a complete all-in-one development environment.

POSSIBLE USAGE: ➤ MB95200 as power management controller – The configurable idle and sleep modes allow design engineers to fine tune their system's power consumption to the minimum. ➤ MB95200 as controller for small scale system – Given the small pin count and economical cost, it is ideal for any space-constrained application. ➤ MB95200 as sub-microcontroller – MB95200 series microcontrollers can be used as I/O expander for new features to be added to existing applications. This can avoid costly and time-consuming silicon revisions or board changes.	KEY FEATURES: • Optimised core, and low leakage • 100,000 times erase cycle, 20-year data retention • Precise on-chip oscillator • Flash content protection • Small pin count support, as low as 8-pin (DIP/SOP Packages) • Easy to learn architecture & comprehensive online technical support
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FUJITSU

THE POSSIBILITIES ARE INFINITE

Get samples and datasheets at www.fujitsu.com/cn/fmc/en/services/mcu/mb95200
Join our Microcontrollers Technical Forum at www.fujitsu-mcubbs.com/en