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.

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

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 (SRTP) 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.

Fujitsu Microelectronics Holds F^2MC-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 F^2MC-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.
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:

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 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.
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'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.

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

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.
"It is necessary, in the same cases, to put DSP into MCU, because it raised the processing efficiency of the CPU" Mr. Welch Ding said. NSP+MCU architecture has gained a strong position in some industrial sectors. NSP+MCU architecture has a great market potential in industrial control area, such as, UPS, power supply and transducer etc. Mr. Matsui agrees that DSP+MCU has some advantages in performance/cost, he said, "But nowadays, some of the market shares has been taken over by Specialized chip+MCU, or, SoC." In some sectors, such as, ammeter industry in China, the high-end three-phase meters and the end products hold some market share, but, they are still in the risk of being pushed out by other architectures.

In fact, the real risk lies in the DSP+MCU architecture itself. DSP+MCU architecture requires higher level system designers. It is not easy for new engineers to fully understand and well use the DSP+MCU architecture, including digital control method, the programme of embedded software, the features of DSP and the coordination between MCU and USP, not to mention the strict operating conditions of the industrial control application.

With the coming up of DSP+MCU architecture, the price of 32 bit MCU comes down quietly, the application of 32 bit MCU in the industry is increasing, the application value of 32 bit MCU has been recognized. The "SEMICAST" report predicted that the sales of 32 bit MCU/MPU in the industry and commercial areas will be increased dramatically.

Mr. Matsui is quite positive about the advantages of 32 bit, but he said, "The hot sales of 32 bit MCU in some sectors doesn't necessarily mean that 32 bit MCU will dominate the industrial control market." He pointed out, that every designer has to balance the factors of MIPS, programmable space, expansion, power consumption and cost, etc and makes his choice accordingly. "In present China, in IA/FA sector, 32 bit MCU takes more market: in lighting and security sector, 16 bit MCU is maybe the mainstream; in measurement and meter sector, 8 bit MCU dominates the market."
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 overseas 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 form 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.

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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).

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
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
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 μs\textsuperscript{3}. 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...
New Products

MB01F630/F637/F647

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

Table 1 presents the list of functions in this series.

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

Table 1 List of FR805/T1 Series Functions

<table>
<thead>
<tr>
<th>Product type</th>
<th>MB01F637 / MB01F639</th>
<th>MB01F647</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash memory/ROM</td>
<td>512K bytes/48K bytes, 1M bytes/64K bytes</td>
<td>512K bytes/48K bytes</td>
</tr>
<tr>
<td>Pin number</td>
<td>144 pin</td>
<td>176 pin</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>Single power supply: 2.7V to 3.6V</td>
<td>I/O power supply: 2.7V to 3.6V Internal logic: 1.65V to 1.95V</td>
</tr>
<tr>
<td>Operation frequency</td>
<td>60MHz</td>
<td></td>
</tr>
<tr>
<td>External bus mode</td>
<td>Separate/multiplex bus</td>
<td></td>
</tr>
<tr>
<td>DMAC</td>
<td>8 channels</td>
<td></td>
</tr>
<tr>
<td>16-bit timer</td>
<td>16 channels (reload timer/PPG/PWM mode switching possible, also addresses 32-bit mode)</td>
<td></td>
</tr>
<tr>
<td>Multi-function serial interface</td>
<td>12 channels (UART/SIO/I/C mode switching possible, 4 channels with 16 bytes FIFO, some channels with 5V withstand voltage)</td>
<td></td>
</tr>
<tr>
<td>External interrupt</td>
<td>32 channels some channels with 5V withstand voltage</td>
<td></td>
</tr>
<tr>
<td>10-bit A/D</td>
<td>31 channels (2 units)</td>
<td>32 channels (2 units)</td>
</tr>
<tr>
<td>8-bit D/A</td>
<td>3 channels</td>
<td></td>
</tr>
<tr>
<td>16-bit reload timer</td>
<td>3 channels</td>
<td></td>
</tr>
<tr>
<td>32-bit FR/ICUO/ICU</td>
<td>Free-run timer: 2 channels, input capture: 8 channels, output compare: 8 channels</td>
<td></td>
</tr>
<tr>
<td>16-bit U/D counter</td>
<td>4 channels</td>
<td></td>
</tr>
<tr>
<td>Clock timer</td>
<td>Equipped</td>
<td></td>
</tr>
<tr>
<td>Package</td>
<td>LOFP-144 (0.5mm pitch, 20mm × 20mm) BGA-144 (0.8mm pitch, 12mm×12mm)</td>
<td>LOFP-176 (0.5mm pitch, 24mm × 24mm) BGA-176 (0.8mm pitch, 12mm×12mm)</td>
</tr>
</tbody>
</table>

Table 2 Development Environment Configuration for FR805/T1 Series

<table>
<thead>
<tr>
<th>Product type</th>
<th>MB01F637 / MB01F639</th>
<th>MB01F647</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development environment hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICE</td>
<td>MB2199-01</td>
<td></td>
</tr>
<tr>
<td>Adapter board</td>
<td>MB2198-700-E</td>
<td></td>
</tr>
<tr>
<td>Evaluation chip</td>
<td>MB91V650</td>
<td></td>
</tr>
<tr>
<td>Header board*</td>
<td>MB2198-702-E : LOFP-144 (0.5mm pitch, 20×20mm)</td>
<td>In planning</td>
</tr>
<tr>
<td>Development environment software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unified development environment</td>
<td>Sunwave V6 Professional Pack (SP0650301180AC)</td>
<td></td>
</tr>
<tr>
<td>Writer for Flash microcontroller</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallel writer</td>
<td>AF9709B or MB9708 (for writing 1 piece), AF9723 (for writing several pieces simultaneously)</td>
<td></td>
</tr>
<tr>
<td>Parallel writer adapter</td>
<td>LOFP-144: In development BGA-144: In development</td>
<td>QFP-176: In development BGA-176: In development</td>
</tr>
</tbody>
</table>

*Header boards for BGA package products are not supported.
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.

Figure 4 Application Example of MB91F639

Figure 5 Application Example of MB91F647

NOTES
- Other company names and brand names are the trademarks or registered trademarks of their respective owners.
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.
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:
  - On ordinary programmer with adaptor as with traditional OTP devices
  - Using Fujitsu embedded serial programming mode via on-chip UART/SIO directly to the flash ROM
  - 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).
Fujitsu launched ultra-low power full HD H.264 CODEC LSIs.

Fujitsu Microelectronics Ltd has expanded its lineup of H.264 CODEC LSIs that encode and decode Full HD (1920 dots x 1080 lines) video in the H.264 format with the development of two LSIs—MB96H15 and MB96H15E. The ultra-low power MB96H15 features power consumption of only 0.5W during Full HD encoding including the in-package memory. The MB96H15E, meanwhile, offers processing of full HD video at 60fps (progressive), 60p, to improve picture quality even further.

The 151pin 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 MB94H51 CODEC151, 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 ECU and in-package, as well as have an enhanced scaler for expansion or reduction of the picture. In units of 16bit 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 16bit parallel interface and a T5 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.
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.
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.

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.

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:

- MB956200 as power management controller –
  The configurable idle and sleep modes allow design engineers to fine tune their system's power consumption to the minimum.

- MB956320 as controller for small scale system –
  Given the small pin count and economical cost, it is ideal for any space-constrained application.

- MB958200 as sub-microcontroller –
  MB958200 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:

- Optimized 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 (OIP/SOP Packages)
- Easy to learn architecture & comprehensive online technical support

THE POSSIBILITIES ARE INFINITE