

Fujitsu focus

The News on the Latest Semiconductor Technologies and Products from Fujitsu Microelectronics America, Inc.

Network-Security MCU Now Has New Real-Time Kernel and Network Protocol Stack Support from Micrium

Fujitsu has ported Micrium's μ C/OS-II real-time kernel and μ C/TCP-IP network protocol stack to its 32-bit MB9040x MCUs, which are designed to provide network security for users accessing the Internet from handheld or personal computers.

For more information, see page 2, or go to <http://www.us.fujitsu.com/micro/mcu>



32-bit Motor Control MCU for Quiet and Energy-Efficient Design

The latest 32-bit microcontroller family, the MB91F470 series, is suitable for brushless DC (BLDC) motor control. The RISC, high-speed CPU operates up to 80MHz. Its high performance makes the product ideal for sensor-less, brushless motor-control applications that require quiet, energy-efficient generation of the motor-driving signal.

For more information, see page 2, or go to <http://www.us.fujitsu.com/micro/mcu>



Fujitsu Stays Up to Date on FlexRay™

Fujitsu has kept current with FlexRay developments. The latest device, the MC88121A, supports specification Version 2.1. The MB88121A is designed to complement all the existing standard automotive buses, including CAN and LIN. Fujitsu is now delivering a starter kit to help companies easily implement this new technology.

For more information, see page 3, or go to <http://www.us.fujitsu.com/micro/mcu>



2D Graphics Display Controller for Mid-Range U.S. Automobile Navigation Systems

To meet the needs of the high-volume, mid-range automotive market, Fujitsu has introduced a 2D graphics display controller. The MB86276 addresses the needs of the evolving U.S. market for automobile "information devices" in a way that no other GDC can do. The product can render stunning graphics on multiple layers, and capture and display video on one or two screens (without needing any external logic).

For more information, see page 3, or go to <http://us.fujitsu.com/micro/graphicdisplay>



Recent Technical Papers and Fab Update

For more information, see page 4, or go to:

10-Gigabit Ethernet Switch Applications in Advanced TCA,

<http://www.fujitsu.com/us/services/edevices/microelectronics/networkingassps/whitepaper/10gATCA.html>

Designing a Subscriber Station Using the Fujitsu WiMAX SoC,

<http://www.fujitsu.com/us/services/edevices/microelectronics/broadbandwireless/whitepaper/appnote2.html>

Fujitsu to Construct New Fab, http://www.fujitsu.com/us/news/pr/fma_20060111-2.html



Network Security MCU has New Real-Time Kernel and Network Protocol Stack Support from Micrium

Ideal for High-security Applications

It's good news for network security application designers. Fujitsu has ported Micrium's μ C/OS-II real-time kernel and μ C/TCP-IP network protocol stack to its 32-bit MB9040x MCUs. This provides engineers an environment to design products for network Internet-enabled household appliances.

The Fujitsu 32-bit MB9040x network-security microcontroller series delivers a highly reliable network solution for high-security applications such as banking and finance. The devices incorporate a full

set of security features including encryption circuitry that supports the Advanced Data Encryption Standard (AES), Data Encryption Standard (DES), 3DES, and other established cryptographic systems.

Adding μ C/OS-II to the MB9040x microcontrollers complements Fujitsu's development solution for network security applications. μ C/OS-II is a ROMable, scalable, pre-emptive kernel (RTOS) for microprocessors and microcontrollers with performance comparable to - and in many cases exceeding - other commercially available kernels.

The real-time μ C/OS-II delivers constant, deterministic and rapid execution times, and features a compact, simple scheduler that provides very efficient operation in a wide range of applications. Written in ANSI C, the multi-tasking μ C/OS-II has been ported to more than 40 different processor architectures ranging from 8- to 64-bit CPUs. It supports IPv4, manages up to 255 different tasks, and provides services ranging from time and timer management to message queuing, task management, and event flags.

32-bit Advanced Motor Control MCU for Brushless DC Motor

Ideal for High-performance White-goods and Industrial-control Applications

The latest addition to the 32-bit microcontroller family, the MB91F470 series, is suitable for brushless DC (BLDC) motor control. This 32-bit RISC, high-speed CPU operates up to 80MHz and calculates accurate motor angles. A sophisticated multifunctional timer generates a driving signal for optimum motor performance. This new series also integrates a high-speed MAC (Multiplication and Addition Calculator, similar to a simple DSP), which delivers 32-bit x 32-bit + 72-bit calculations in parallel with the CPU operation, boosting performance.

A high-speed, accurate A/D converter performs 8/10-bit conversions at 1.2 microseconds; and a separate 12-bit A/D



conversion unit supports a 2.0 microseconds conversion speed. This performance makes the product ideal for sensor-less motor-control white-goods applications that require quiet, energy-efficient generation of the motor-driving signal.

With its fast interrupt response at six clock cycles, this MCU series is also appropriate for industrial-control applications that require high-speed interrupt handling. Peripheral blocks provide timers, counters, I2C, multiple channels of UART with a dedicated baud-rate generator, and DMAC. Four Giga bytes of external memory area are supported, making the product ideal for large-size applications as well.

Fujitsu Stays Up to Date on FlexRay™

Fujitsu delivered the industry's leading FlexRay controller ASSP, the MB88121, last September, and has kept current with FlexRay developments. The latest device, the MB88121A, supports specification Version 2.1. Fujitsu is committed to continually updating the communications controller whenever new protocol definitions are released.

The MB88121A is designed to complement all the existing standard automotive buses, including the Controller Area Network (CAN) and Local Interconnect Network (LIN). FlexRay-based technology, which can provide approximately 10 times the throughput of CAN per channel, is expected to gradually replace CAN as automakers and their suppliers adopt x-by-wire solutions in new generations of vehicles.

A member of the FlexRay Consortium, Fujitsu has been a world leader in FlexRay product development, and was the first company to provide a complete developers' kit designed to enable early-stage application development. Fujitsu is now delivering a starter kit to help companies easily implement this new technology.

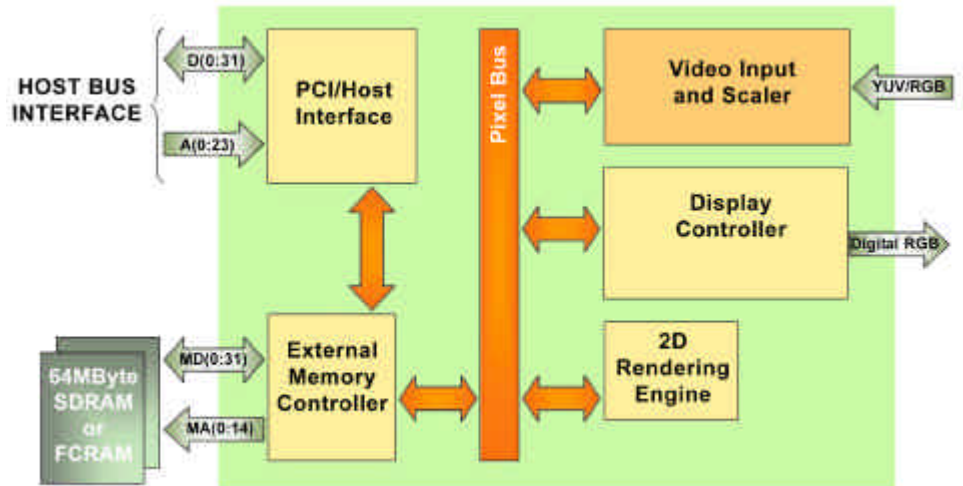
2D GDC Meets the Needs of Mid-Range Automobile Navigation Systems in the U.S. Market

Given the lack of market demand for automobile navigation systems, the U.S. auto industry is repositioning the product as an information unit, changing features, adding value and lowering prices. In this environment, a 3D navigation system is simply not practical, but video is relatively inexpensive and highly regarded.

The appeal increases with the addition of safety features such as perimeter cameras and rear-seat infant monitors, and with screen-extension functions that allow output from portable devices such as iPods and BlackBerries to be viewed on the in-dash screen.

Also, the economics are compelling. A 7" TFT screen (the most popular size) currently sells for less than \$120 and will easily be under \$80 when the 2008 models hit the production line.

Next to the TFT screen, the graphics display controller (GDC), with its associated memory, is the single most expensive component. To meet the needs of the high-volume, mid-range automotive market, Fujitsu has developed a non-3D device,



which is really a scaled-down version of the MB86296, Fujitsu's full 2D/3D graphics display controller. The new MB86276 does not include a geometry processor, which is required for high-speed 3D processing. The new 2D GDC will cost about half the price of the MB86296, but will provide about 75% of the functionality.

The Fujitsu 2D graphics display controller addresses the needs of the evolving U.S. automotive market in a way that no

other GDC can do. The product can render stunning graphics on multiple layers, and capture and display video on one or two screens (without needing any external logic). All that for a price that is comparable to non-rendering display controllers or FPGA alternatives.

Designing a Subscriber Station

Using the Fujitsu WiMAX SoC

A new applications note from Fujitsu describes how to design a subscriber station using the Fujitsu WiMAX SoC. Fujitsu's WiMAX SoC-powered subscriber-station reference design board can be used as an enabling platform for developing both indoor and outdoor CPE products, speeding time to market. Both Time Division Duplex (TDD) and Half Duplex Frequency Division Duplex (HDX-FDD) subscriber stations, operating in licensed or license-exempt bands from 2 to 11GHz, can be developed.

The system software deliverables include the MAC layer software and device drivers for various operating systems. Modem configuration and control; network monitoring and management; multiple QoS profiles for different applications like Voice over IP, video surveillance, and audio and video streaming; can be implemented in the application software.

Dynamic allocation and management of bandwidth and burst profiles based on the type of service and propagation environment can also be the part of application software. Based on the directivity characteristics, channel bandwidths and frequency of operation, different types of antennas including the narrow beam, broad beam and adaptive gain antennas can be connected to the modem either as a built-in or external unit. The modem can be connected to the local network of clients via the 10/100 Base-T Ethernet interface.

To download an applications note entitled "Designing a Subscriber Station Using the Fujitsu WiMAX SoC," go to the company's website: <http://www.fujitsu.com/us/services/edevices/microelectronics/wsubstation.html>

10-Gigabit Ethernet Switch

Applications in Advanced TCA

To help standardize building practices for future platforms, the telecom market is moving toward adopting the Advanced Telecom Computing Architecture (ATCA). The availability of silicon solutions for 10-Gigabit Ethernet creates a wealth of opportunities for system developers who can leverage these solutions in ATCA products. 10-Gigabit Ethernet provides the cost-effective bandwidth needed to open existing throughput bottlenecks as well as fuel a variety of emerging applications.

Fujitsu recently released a new technical paper that describes the capabilities of the technology, and profiles the implementation of 10-Gigabit Ethernet switches using Fujitsu silicon solutions in ATCA backplanes. The 10-Gigabit switches are among most crucial components because they are at the heart of any high-performance network and essential for efficient, reliable network traffic.

An understanding of the implementation and its underlying technology is necessary to maximize performance with minimal latencies and low power. System developers can then take advantage of both current and emerging 10-Gigabit Ethernet opportunities.

To download a Fujitsu technical paper entitled "10-Gigabit Ethernet Switch Applications in ATCA," go to the company's website: <http://www.fujitsu.com/us/services/edevices/microelectronics/networkingassps/whitepaper/10gATCA.html>



Fab Updates

Fujitsu to Construct New Fab

65nm Process Technology and 300mm Wafers

Fujitsu will construct a new fab to mass-produce logic semiconductors employing leading-edge 65nm process technology and 300mm wafers. The fab will be constructed at Fujitsu's Mie semiconductor plant in central Japan. This will be the second 300mm fab at the plant, and will be referred to as 300mm Fab No. 2.

By fiscal 2007, Fujitsu will have invested more than US \$1 billion in the new fab, and the production capacity will reach 10,000 wafers per month. Further investments will be made in stages as the company evaluates market demand. Fujitsu expects the maximum capacity of the facility will be 25,000 wafers per month.

The construction of the new fab enables Fujitsu to meet the increasing demand for semiconductors produced using advanced processes. The fab demonstrates Fujitsu's commitment to offering high-performance products based on leading-edge technology, and to providing optimized solutions that maximize the company's technical expertise. The forward-looking investment also illustrates Fujitsu's commitment to being a trusted business partner to its customers.