Fujitsu Semiconductor Develops World's First 360° Wraparound View System with Approaching Object Detection

Releases automotive graphics processing LSI also enabling centralized control of display information for different driving situations

Yokohama, Japan, May 16, 2013 – Fujitsu Semiconductor Limited today announced the development of MB86R24, the company's third-generation high-performance graphic SoCs for automotive applications. The new product will be made available in sample quantities starting in August 2013, along with the related software.

Featuring improved CPU and GPU performance for faster processing and sharper image rendering, MB86R24 comes equipped with 6 full HD input channels and 3 display output channels, allowing for greater flexibility in input/output control. By employing the new chip, Fujitsu Semiconductor has, for the first time in the world, been able to incorporate the Approaching Object Detection functionality—which notifies drivers of nearby people, bicycles and other objects—into the 360° Wraparound View System that allows drivers to check their entire surroundings in 3D from any angle.

In addition, the product will also enable the development of integrated Human Machine Interface (HMI) systems that consolidate and provide centralized control over a variety of onboard vehicle information. Until now, the display of such information on multiple screens has been controlled independently for each screen.

MB86R24 is expected to significantly help in improving safety, comfort and peace of mind for automobiles, as well as for home and industrial applications that are becoming increasingly important.

In recent years, there has been growing concern regarding automobile safety, as can be seen by the establishment of the Kids and Transportation Safety Act in the United States. At the same time, demand for automotive systems is increasing on a daily basis. In light of these trends, Fujitsu Semiconductor developed MB86R24, a graphics SoC that makes it possible to create a 360° Wraparound View System that notifies drivers about objects approaching the vehicle, as well as integrated HMI systems that connects people with data from inside and outside the vehicle.

360° Wraparound View System with Approaching Object Detection

The 360° Wraparound View System uses cameras facing forward, backward, left, and right to synthesize a 3D model of the environment and then display the surroundings from any perspective (Figure 1). Last year, Fujitsu Semiconductor developed a 360° wraparound view system that employed a second-generation MB86R10 series graphics SoC and also worked with megapixel cameras. As systems such as this, which give clear visual confirmation of a vehicle's surroundings, grow in popularity, there will be increasing expectations for additional functionality that reduces the likelihood of driver oversights while promoting safer, more confident driving.
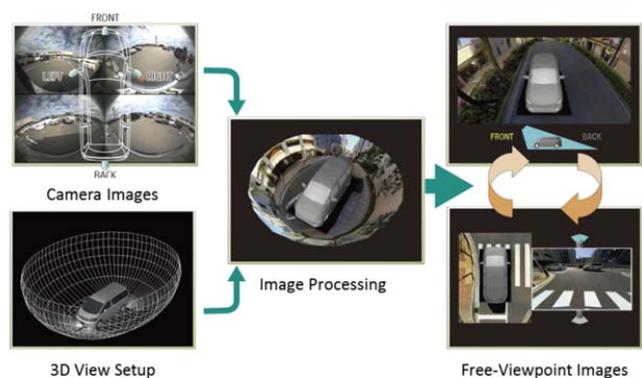
Fig.1 360°Wraparound View System

MB86R24 boasts roughly double the CPU performance and 5 times the GPU performance of its second-generation predecessor, delivering sharper images and the ability to view surroundings from any perspective. The chip also features Approaching Object Detection, which notifies the driver of nearby objects approaching the vehicle (Figure 2). The proximity detection algorithm was developed jointly with Fujitsu Laboratories, and is the world premiere to be implemented as part of a 360° wraparound view system.

This SoC can also take input from 6 cameras simultaneously, thereby enabling greater flexibility in rendering 3D imagery and making the technology applicable in a wider range of scenarios.
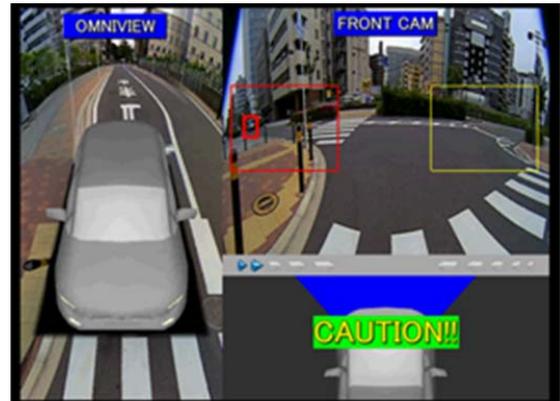
Fig.2 Approaching Object Detection

Integrated HMI Systems

In recent years, the amount of information shared between drivers, vehicles and the outside world has been steadily growing. Such information includes battery information for electric vehicles, camera imagery, navigation information, and connectivity with smartphones and the cloud. Different kinds of information are displayed on different screens, such as central console displays, cluster displays, or heads-up displays, all of which require separate display control (Figure 3). To provide such information in real time to drivers in an easy-to-understand manner, there is a need for technology that can collect information in a single location and centrally control how it is displayed depending on the driving scenario. HMI systems can accomplish this, and MB86R24 is able to control each display to present information that suits the current driving scenario.

Moreover, the new SoC facilitates the development of modules and platforms for displays that can be incorporated into multiple models, rather than one-off development for each car model as in the past. This, in turn, enables a significant reduction in part counts for display systems, while also making it easy to reuse products in different car models (Figure 4).

At the same time, Fujitsu Semiconductor also offers the software needed to build these systems. This enables one-stop development of high-performance systems with far less work than before.
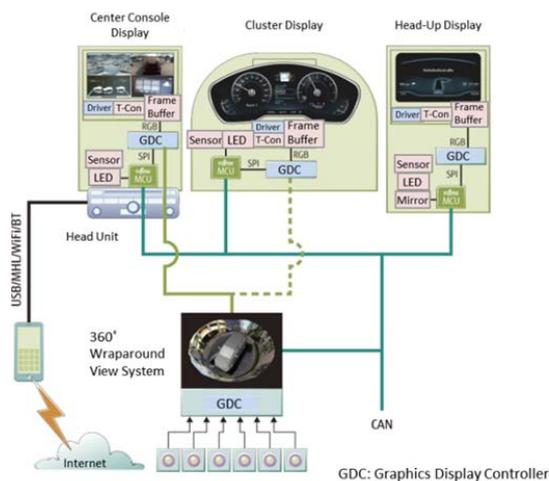
Fig.3 Previous Display Control System
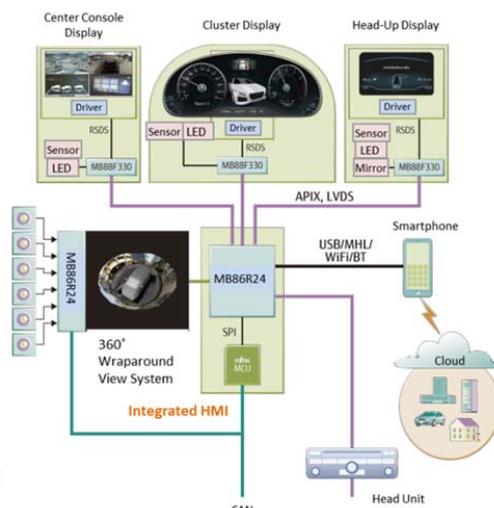
Fig.4 Integrated HMI

Product Features

1. High-performance CPU and GPU

The CPU employs two ARM® Cortex™-9 cores along with the PowerVR™SGX543 3D graphics engine, enabling roughly double the CPU performance and 5 times the GPU performance of its predecessors. MB86R24 also features Fujitsu Semiconductor's proprietary 2D graphics engine. Since the 3D and 2D graphics engine each run independently of one another, it is possible to obtain even greater graphics processing performance.

2. Multiple video input sources, enhanced display output

With support for input from 6 full HD input channels and 3 graphics output channels, the system can accept input from high-resolution cameras and high-definition content, which can then be displayed on multiple high-resolution screens.

3. Advanced rendering performance with multi-layer support

In addition to a 2D engine, 3D engine, and video capture function, all of which can be run simultaneously, the new SoC features 8 rendering layers, making it possible to perform graphics processing on different layers that is optimized to meet the needs of specific applications and content.

4. Extensive software toolset

The 360° Wraparound View System with Approaching Object Detection works with the toolset software for the previous edition of the technology, and software enabling Approaching Object Detection functionality will also be made available.

For integrated HMI systems, Fujitsu Semiconductor offers CGI Studio, an authoring tool that allows content designers and engineers to collaboratively design media for the system.

Sample Price and Release Schedule

Product Name	Price (with Tax)	Delivery
MB86R24	JPY 5,000	August 2013

Sales Target

3,000,000 pieces per year

For More Information

http://jp.fujitsu.com/group/fsl/en/ (Fujitsu Semiconductor)
http://www.fujitsu.com/global/services/microelectronics/product/assp/gdc/ (Graphics Display Controllers)

About Fujitsu Semiconductor

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

Press Contacts
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Inquiry: https://www-s.fujitsu.com/jp/group/fsl/en/release/inquiry.html

Appendix

MB86R24 Sample Picture
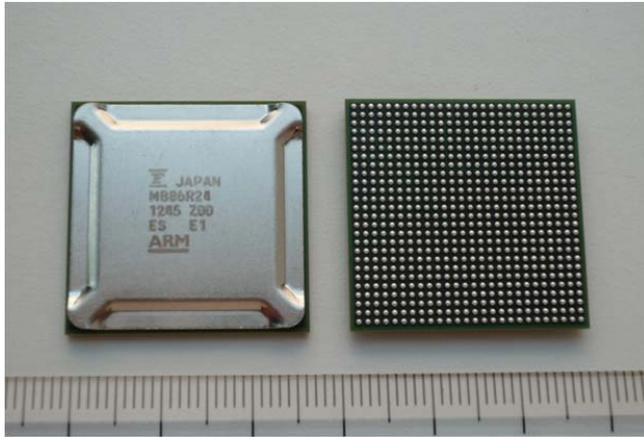
MB86R24 Features

Processor:
Dual ARM® Cortex™ -A9, 2x 533 MHz (Automotive)
ARM® Neon™ SIMD Engine

Graphics:
Display Controllers:
2x up to 1920x720p, 1x up to 1920x1080p

3D Engine: PowerVR™ SGX543 3D Engine
6,4GFLOPS, 1GPix/s, 35MPoly @ 200MHz
OpenGL® ES, OpenVG™, OpenCL™

2D Engine: Fujitsu Proprietary

Video:
Video Capture 6x 1920x1080i

Memory:
DDR3/3L-800/1066
x16, x32, x64

Peripherals:
Standard I/O:
I^2C, I^2S, UART, USART, ADC, HS-SPI, SPI, USB 2.0, SD/MMC, FPD-Link

Network:
CAN, Ethernet, MediaLB