

Fujitsu Launches Graphics Controller for Digital Dashboards & Car Navigation

- Industry's first 1-chip controller handling 4 video inputs and output to 4 displays -

Tokyo, March 3, 2009 - Fujitsu Microelectronics Limited today announced the launch of a new graphics controller for automotive infotainment systems, such as next-generation car navigation and digital dashboards. The new controller, the MB86298, offers the highest-class graphics capability for embedded systems, as well as an industry first of providing output to up to 4 displays, and up to 4 video inputs.

Featuring superior input and output functionality, the MB86298 can process 4 inputted video streams while outputting video to 4 displays. The inputted videos can be modified, synthesized together, and put on 3-D graphics surfaces within a single screen. Subsequently, with 4 cameras mounted on all sides of the automobile (front, back, left, and right), it is possible to freely choose the desired viewpoint and form for display. In addition, the controller's industry-leading capabilities enable display of 8 layers and inter-layer blends⁽¹⁾, where each information stream is processed separately so that users can selectively change the information screen to be displayed, as well as being able to synthesize the information streams together smoothly and display them.

In recent years, the amount of electronics in automobiles has continued to rise, providing information and entertainment to the driver and passengers, bringing about increased safety, more comfort and reduced environmental impact to the driving experience: for example, car navigation systems that change with real-time traffic information, video from blind-spot cameras, streaming TV and DVD video to passenger seat displays, and so-called "eco-drive" functions which support low fuel consumption by displaying information of the car's running condition.

There are increasing needs to simultaneously show several video and image streams to several displays within the automobile, such as showing different images to the driver's seat and front passenger seat (dual-view LCD displays), and viewing TV and DVDs on the rear seat displays. At the same time, automotive infotainment systems that capture and display information of the vehicle's periphery from several cameras mounted on the vehicle have emerged. Subsequently, such automotive systems demand high-performance graphics chips that can process in real-time several

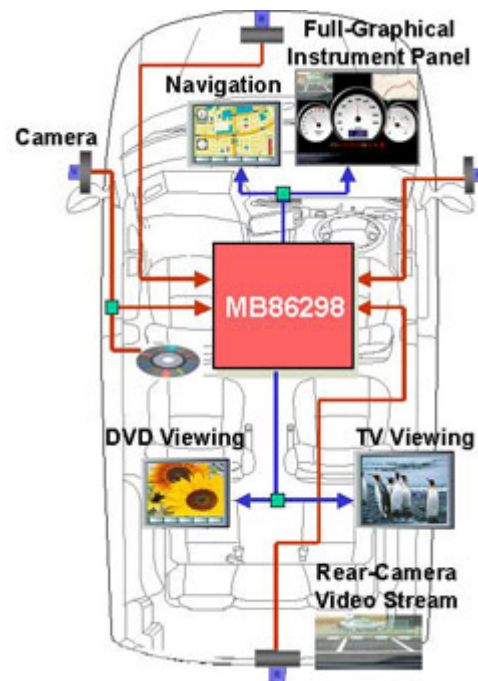


Figure 1: Example of the MB86298 controller at the nexus of an in-vehicle infotainment system

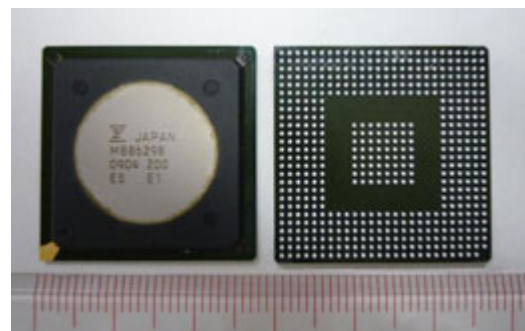


Figure 2: Graphics Controller(unit: cm)

Press Contacts

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different images and video streams, and process such large volumes of imaging data at high-speed.

On a single chip, this new MB86298 controller contains the necessary functions demanded for next-generation automotive infotainment systems, providing high-speed video and graphics processing to handle an industry first of 4 video inputs, and output to 4 displays. This controller can not only realize systems which show navigation images to the driver - while showing TV and videos to the passenger displays - as previously possible, but can also process and display the dashboard instrument cluster in 3-D graphics, including meter needles. In addition, the controller can handle the inputs from 4 cameras (front, back, left, right) mounted on the vehicle and process them and synthesize them together in real-time. Also, for car navigation 3-D mapping, this controller can output to high-resolution 1,600 x 600 pixel displays to bring out rich image detail, not just of the roads, but of surrounding buildings and scenery.

Fujitsu Microelectronics will be exhibiting related products at Embedded World 2009 to be held in Nuremberg, Germany, from March 3-5, 2009 (Hall 12, Stand 12-314).

Sample Pricing and Shipment

Product	Sample Price	Sample Availability
MB86298	JPY 7,000	From April 2009

Sales Target

1 million units per month in 2nd half of fiscal year 2009 (October 2009 to March 2010)

Key Features of the New Series

1. Allows 4 video capture inputs and output to 4 displays

To each of 2 display ports, it is possible to output 2 screen images - for each screen image, 8 levels and inter-layer blends can be displayed. Therefore, on top of a map of the surroundings, explanation notes can be overlaid, as well as an overlay of images of the surroundings from the vehicle cameras. In such cases, the outline of cars is extracted and overlaid, so it is like the overlaid image blends into the background image of the surroundings. Dither⁽²⁾ and gamma⁽³⁾ correction functions are included, offering high-quality imaging on displays of varying resolutions and color characteristics. Furthermore, the 4 video inputs enable various video inputs to undergo simultaneous processing. Inputs up to resolutions of 1,280 x 720 pixels can be handled, and functions are included for enlargement/reduction, and conversion of interlace format - suitable for motion - to progressive format⁽⁴⁾ which has less noise.

2. Industry-leading high-speed, high-resolution rendering

Features top-class rendering performance in its industry with 400 million pixels per second, providing real-life maps with minute detail and smooth rendering. As graphics memory, 800MHz DDR2 SDRAM is used - with a maximum data rate of 6.4 gigabytes per second (6.4Gbps), it is possible to display several layers of display data on top of each other at high resolutions. The controller also contains a unified programmable shader⁽⁵⁾ that is capable of operations at 17 gigaflops (17 GFLOPS), which can render highly textured and detailed surfaces, such as the metallic surfaces of a car body, in life-like detail. With such high rendering performance, this controller can output in real-time to high-resolution 1,600 x 600 pixel displays, to bring out rich image detail.

3. OpenGL® ES2.0 graphics acceleration

The MB86298 graphics controller contains an acceleration function for OpenGL® ES2.0⁽⁶⁾, making it simpler to construct an in-vehicle entertainment environment. Also, Fujitsu Microelectronics plans to provide OpenVG™1.0 support for smooth enlargement/reduction of characters and straight or curved lines.

Glossary and Notes

1 Inter-layer blends:

A function that allows several screen images to be mixed together to form one screen image.

2 Dither function:

A function that can produce intermediate colors on displays that have few colors.

3 Gamma function:

A function that corrects color data to match the display characteristics.

4 Conversion of interlace format - suitable for motion - to progressive format:

A function that improves picture quality when converting from interlace format to progressive format.

5 Programmable shader:

Programmable shader: A function used in 3-D graphics that can render objects to be real-life looking by allowing the user to freely program to match the image they are trying to create, rather than the fixed shading processing previously used.

6 OpenGL ES:

OpenGL ES: A subset of OpenGL for embedded devices. OpenGL is a standard program and library to handle graphics on computers.

Press Contact:

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Inquiries

<https://www-s.fujitsu.com/global/news/contacts/inquiries/index.html>

For more information

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Fujitsu Microelectronics Ltd. - Graphics Display Controllers

About Fujitsu Microelectronics (FML)

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Key specifications of the MB86298 graphics controller

Process Technology	90nm CMOS
Operating Voltage	Internal: $1.2 \pm 0.1V$, I/O: $3.3 \pm 0.3V$ DDR2 memory: $1.8 \pm 0.1V$
Operating Frequency (max.)	266MHz, DDR2 800MHz
Peripheral I/O	PCI-Express, I ² C(Master), GPIO, JTAG
Operating Temperature Range	-40°C~85°C
Power Consumption	4.0W (TYP)
Package	TEBGA 543 pin
Application	Navigation, Cluster (car dashboard), Car center console etc.

[Development Environment]

Fujitsu Microelectronics plans to support the following development environment:

- **MB86298 Evaluation Board**

In the form of a PCI Express card. Can connect to PCI Express bus of a PC with Microsoft[®] Windows[®] XP Professional operating system.

- **OpenGL[®] ES2.0 Library**

With the use of the OpenGL ES, the standard graphics API optimized for embedded applications, embedded systems with real 3-D graphics can be realized.

- **Graphics Controller Access Library**

A set of drivers will be provided to access simply the rendering peripherals such as display controller and video capture on the MB86298.

- **OpenVG[™] 1.0 Library**

With the use of this library, the functions of the MB86298 can be used to a maximum to render high-quality vector graphics.

PCI Express[®] is a registered trademark of PCI-SIG.