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Fujitsu Semiconductor Limited

Fujitsu Semiconductor Releases New System Controller LSI with High-Performance Graphics for Automotive Applications

Yokohama, Japan, July 26, 2010 - Fujitsu Semiconductor Limited today announced the forthcoming release of six products in the MB91590 series of system controllers for automotive dashboards (instrument clusters using color displays) and center consoles (onboard information displays). The new products will start becoming available in late September 2010. This series of vehicle-system LSI devices integrates the FR81S, a high-performance CPU core that has an established achievement as the vehicle microcontroller (system controller), with a graphics-display controller and functions for video capture and communications.

The company also announced the forthcoming release of two products in the MB91570 series of microcontrollers for segment-display dashboard panels. These products will start becoming available in late December 2010.

As advanced vehicle electronics are being deployed as new control systems for hybrid and electric vehicles, the trend towards higher performance and increasing integration of functionality in these control units is expected to continue. These systems require high-performance system controllers that can respond to information coming from a variety of peripheral components in real time and that can display this information using rich graphics. In addition, the need to display

video is also expected to grow, as onboard cameras are increasingly being used for improved safety.

Figure 1. MB91590 series

To meet these needs in applications for dashboards and other human-machine interface systems in automotives, Fujitsu Semiconductor is launching six products in the MB91590 series, all of which are single-chip system controllers that integrate the FR81S, a world-class, high-performance CPU core, with a graphics-display controller that has outstanding sprite functions, video capture to input from exterior video signals, and communications functions, including CAN and LIN. The company will also launch two products in the MB01570 series for dashboards using segment liquid-crystal displays.

Figure 2. Road-map of 32 bit microcontroller for dashboards

To ensure that developers can work these products into their designs with minimum difficulty, Fujitsu Semiconductor is offering a starter kit, sample programs, a graphic-design tool that allows designers to try out screen designs visually, and a graphics library.
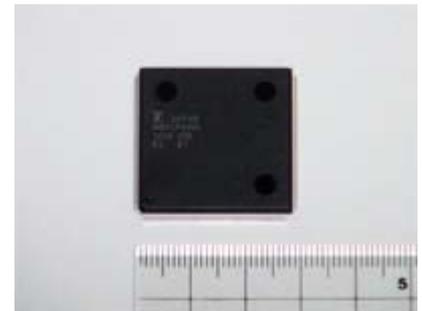
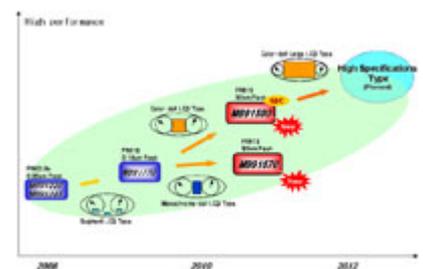Fujitsu Semiconductor plans to expand its product line to meet the diverse needs for electronic dashboard controllers.

Sample Price and Release Schedule

Product	Price	Sample release schedule
MB91F591	JPY 1,800	End of Sept. 2010
MB91F592	JPY 1,900	End of Sept. 2010
MB91F594	JPY 2,000	End of Sept. 2010
MB91F596	JPY 2,000	End of March 2011
MB91F597	JPY 2,100	End of March 2011
MB91F599	JPY 2,200	End of March 2011
MB91F575	JPY 1,200	End of Dec. 2010
MB91F577	JPY 1,300	End of Dec. 2010

Sales Target

2 million units per Year

Product Features

1. **FR81S high-performance 32-bit CPU core**
   The models in this series use the FR81S core running at 128 MHz. With a CAN embedded microcontroller, this offers world-class high-speed processing function.
   It also incorporates a single-precision floating-point unit for filtering and other high-speed image processing, as well as a memory-protection unit that can guard access to regions of memory.
   To make the most of the CPU's performance, it include a new macro for NOR flash memory, along with faster and low-power MCU operations.

2. **Includes graphics controller for rich 2D graphics (MB91590 series only)**
   In addition to advanced sprite functionality, with features for automatic blinking, movement animation, and anti-aliasing, this incorporates numerous display functions in high demand for dashboard monitors, including internal video memory, line drawing, and region copy. The video-capture function can accept digital YUB/RGB video signals and includes an NTSC decoder to handle analog video. It can zoom captured images and perform 90° rotations. In addition, because it can expand and display run-length encoded video, it demands relatively little memory capacity to handle video data.

3. **Well-chosen support for peripheral functions**
   This series supports a well-chosen assortment of peripheral dashboard-system functions, including a stepping-motor controller, sound generator for turning signals and alarms, and a UART that supports CAN and LIN, with a 64-message buffer ideal for vehicle network control. Additional utility features, such as a CR internal oscillator, hardware watchdog, and low-voltage circuit, minimize the number of peripheral components required.

For more information:
Fujitsu Semiconductor: http://jp.fujitsu.com/group/fsl/en/

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: http://jp.fujitsu.com/group/fsl/en/

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Specifications of "MB91590 Series"

Specifications		MB91F591	MB91F592	MB91F594	MB91F596	MB91F597	MB91F599
Memory	Flash(Main)	576Kbytes	576Kbytes	1088Kbytes	576Kbytes	576Kbytes	1088Kbytes
	Flash(Data)	64Kbyte					
	RAM	48Kbytes	48Kbytes	72Kbytes	48Kbytes	48Kbytes	72Kbytes
GDC	Main Function	VRAM indication(No. of layer:5), Sprite, Line, Video Chapter(Interface:NTCS/RGB666/BT656, Enlargement/Reduction, Rotation), RLE Decoder, SIG					
	VRAM	260Kbytes	800Kbytes	800Kbytes	260Kbytes	800Kbytes	800Kbytes
	ROM I/F	Parallel 16 bit bus (64Mbyte(Max.)) / SPI					
Communication	CAN	64Msg:1ch + 32Msg:2ch					
	Serial Communication	6ch(LIN, USART, SIO) + 2ch(FIFO, LIN/USART/SIO/I2C)					
Analog Function		A/D Converter:32ch(8/10 bit)					
Timer Function	General Purpose Timer	16 bit reload timer:4ch, 16 bit base timer:2ch, 16 bit PPG timer:24ch, 32 bit free-run timer:2ch(Input chapterx6ch, Output comparex4ch)					
	Real Time Clock	1ch(Day, Hour, Minute, Second)					
	Watch-dog	2ch					
Stepping Motor Control		6ch					
Sound Generator		5ch					
Package		LQFP(*1)			HQFP(*2)		
		208pins、0.5mm pitches、28mm square					

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Specifications of "MB91570 Series"

Specifications		MB91F575	MB91F577
Memory	Flash(Main)	576Kbyte	1088Kbyte
	Flash(Data)	64Kbyte	
	RAM	48Kbyte	72Kbyte
External bus interface		Address:22 bit, Data:16 bit(Multiplex/Sprit bus)	
Communication	CAN	64Msg:1ch + 32Msg:2ch	
	Serial Communication	6ch(LIN, USART, SIO) + 4ch(FIFO, LIN/USART/SIO/I2C)	
Analog Function		A/D Converter:40ch(8/10 bit), D/A Converter:2ch	
Timer Function	General Purpose Timer	16 bit Reload Timer:4ch, 16 bit base timer:2ch, 16 bit PPG timer:24ch, 32 bit free-run timer:6ch(Input chater:12ch, Output compare:12ch), 8/16 bit up/down counter:2ch	
	Real Time Clock	1ch(Day, Hour, Minute, Second)	
	Watch-dog	2ch	
LCD Controller		32seg x 4	
Stepping Motor Control		6ch	
Sound Generator		5ch	
Package		LQFP	
		144pins, 0.5mm pitches, 20mm square / 144pins, 0.4mm pitches, 16mm square	

*1: LQFP; Low-profile Quad Flat Package.
*2: HQFP; Quad Flat Package with Heat-spreader.

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