

Fujitsu Semiconductor Releases New Microcontroller for Automotive Applications, Integrating Optimal Functions for Digital Power Supply System onto a Single Chip Greatly contributes to improve the environmental performance of HEVs

Yokohama, Japan, May 21, 2013 — Fujitsu Semiconductor Limited today announced the release of a new 32-bit microcontroller for automotive applications, MB91F552, which is optimal for use in power supply system for batteries as well as power transmission circuitry in hybrid electric vehicles (HEV). The new product will be made available in sample quantities beginning May 31, 2013.

In addition to incorporating optimal functions for control of a digital power supply system, such as a 200MHz PWM module, onto a single microcontroller chip, MB91F552 also supports peak current mode control and substantially contributes to power supply stability and lower system costs.

With HEVs and other electric vehicles that have gained in popularity in recent years, electric power generated during travel is stored in a battery, and this power is then supplied to motors, audio systems, lights, and other on-board electrical components, in addition to being used to charge the vehicle's auxiliary battery. Currently, in order to supply this stored power to the motor or on-board electrical components, a power supply control system—which manages power conversion circuitry, such as DC/DC converters and DC/AC inverters—is necessary. There is also demand for power supply control ICs that enable stable voltage levels while supporting fluctuations in battery voltage and load fluctuations in the components to which power is being supplied.

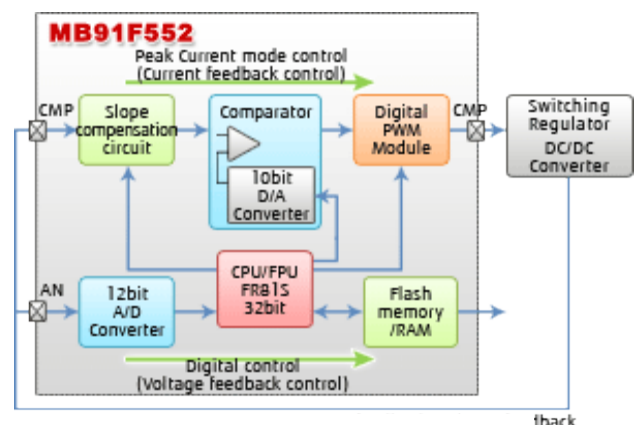


Fig1. Schematic diagram of DC/DC converter control using MB91F552

Incorporates digital power supply system control onto a single microcontroller chip

In addition to CAN, multi-function serial and other network control functions, MB91F552 incorporates a host of optimal functions for digital power supply control such as a 200MHz digital PWM module—on a single microcontroller chip. The new chip can easily perform digital power supply control, such as the digitalization of output voltage and other analog signal feedback, as well as computation-based PWM waveform generation. Moreover, while existing power supply systems are composed of a combination of discrete units, making it difficult to make specification changes, with MB91F552, modifications can be made via software. The new microcontroller is able to change operating frequencies and PWM waveform output timing depending on the application, thereby helping to reduce development lead times for power supply systems, optimize system costs, and contribute to system standardization.

Combines digital control and peak current mode control

In addition to digital power supply control, MB91F552 can also handle peak current mode control through current feedback, thereby enabling more stable power supply control. By incorporating a slope compensation circuit, which has traditionally been included as an external component, within the microcontroller, MB91F552 is able to ensure a stable power supply while also decreasing required part counts, which greatly reduces system costs.

With these features, MB91F552 contributes to the better performance and lower cost of the power supply system, improving the environmental performance of HEVs and other electric vehicles, which are expected to grow more and more popular.

Product Features

- 1. Incorporates digital power supply control onto a single general-purpose microcontroller chip**
In addition to CAN, multi-function serial and other network control functions, MB91F552 incorporates a host of optimal functions for digital power supply control—including a 12-bit A/D converter with 4-channel simultaneous sampling, a floating-point unit (FPU), and a 200MHz digital PWM module—all on a single microcontroller chip. The new chip can easily perform digital power supply control, such as the digitalization of output voltage and other analog signal feedback, as well as computation-based PWM waveform generation.
- 2. Helps significantly improve power supply system stability through the combination of digital power supply control and peak current mode control**
The comparators and slope compensation circuits included on the MB91F552 provide support for peak current mode control, a method for controlling DC/DC converters and other switched-mode power supplies, in addition to digital control.
Output voltage feedback is performed by digital control during normal operations. MB91F552 is also equipped with a function that performs control using peak current feedback in order to accommodate large electric current fluctuations. Moreover, because it employs two comparator channels, the microcontroller is also able to perform overcurrent protection via input-stage current feedback. This, in turn, contributes to the stability of power supply systems.
- 3. Featuring slope compensation circuit improves the ease of making system-wide adjustments**
While slope compensation circuits have conventionally been incorporated into systems as separate components, MB91F552 integrates them on board the microcontroller. This enables easy adjustment of operating margin for a more stable supply of power. Along with the improved ease of making system-wide adjustments, MB91F552 also reduces external part counts, allowing for the development of high-quality power supply systems at a lower cost.

Sample Price and Release Schedule

Product Name	Price (with TAX)	Delivery
MB91F552	JPY 2,000	May 2013

Sales Target

2,000,000 pieces per year (in Fiscal 2016)

For More Information:

<http://jp.fujitsu.com/group/fsl/en/> (Fujitsu Semiconductor)

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/>

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MB91F552 Features

Process Technology:	90nm
Operating Frequency:	80MHz
Main Flash Memory:	192KB
Working Flash Memory:	64KB
Main RAM:	24KB
AC/DC Converter:	12-bit, 8-channel 12-bit, 4-channel simultaneous sampling
Comparator:	3-channel
Multi-Function Serial:	3-channel (UART, CSIO, LIN)
CAN:	1-channel (64 message buffer)
Slope Compensation:	1-channel
PWM:	2-channel, 3 pairs
PWC:	2-channel
Operating Voltage:	4.5~5.5V
Operating Temperature:	-40 ~ +125 °C
Package:	LQFP-64

Built-In Functionalities:

- On-chip RC Oscillator
- Clock Supervisor
- Low Voltage Detection Reset
- Hardware Watchdog

MB91F552 Sample Picture

