MegaChips

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MEMBERSHIP

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Notice of Development of Sensor Hub LSI "frizz"

MegaChips Corporation ("the Company") announces that it has developed the Sensor Hub LSI "frizz" (Model No.: MA60000). The Company is scheduled to begin delivering samples at the end of October 2014 and shipping commercial products in January 2015. The FY2015 sales target for the product is 10 million units. The details of the product are outlined below.

Currently, smartphones and wearable devices (activity meters, smart watches, etc.) are equipped with multiple sensors including acceleration sensors, gyro sensors, and terrestrial magnetism sensors. These sensors have led to new utilizations, including recognition of the human movement or the state of a device, either to control the device or to record the human activity. When the main processor processes these data from the sensors, the power consumption of the device increases significantly. To solve this problem, an LSI called the Sensor Hub has been developed. The Sensor Hub is located between the main processor and the sensor. While the main processor is not working, the Sensor Hub with its "Always on" function constantly receives signals from the sensor and buffer them. The newly developed "frizz" is not just a hub for the buffer, but a next-generation Sensor Hub LSI with DSP that performs advanced arithmetic processing with low power consumption.

For smartphones, which continue to advance rapidly, battery life is a key issue. In addition, in the evolution of smartphones, functions that are expected to spread rapidly include "status detection", to detect the status of holding a data terminal, "behavior recognition", to detect behaviors such as walking and taking the train, and "Pedestrian Dead-Reckoning (PDR)", to realize a navigation system in locations where GPS radio waves cannot be received. To achieve these functions, a high-performance Sensor Hub LSI with low power consumption is essential. In order to meet this demand, the "frizz" is equipped with an exclusively designed DSP for data processing with low power consumption. For example, the DSP processes heavy operations including the orientation estimation used in PDR with a parallelized arithmetic processing circuit. As a result, low clock operation with ultra-low power consumption becomes possible.

To prepare for the upcoming aging society, the area of wearable devices that use a variety of sensors for healthcare and monitoring of the elderly and children is where strong growth is expected in the future. In this area, the "frizz," taking advantage of the Sensor Hub LSI based on DSP, responds to not only motion sensors for acceleration and gyro, but a biosensor for which complex processing is required, including pulse detection. In addition, the Company is advancing the creation of a library of software for processing and operating all sorts of sensors to contribute to the rapid launch of its customers' products.

For the software development environment, an Eclipse-based Integrated Development Environment (IDE) has been prepared and developers can create software using “C/C++,” which is what they are accustomed to using. In addition, as an evaluation kit, the Company has prepared an evaluation board with ten sensors including acceleration, gyro, terrestrial magnetism, and atmospheric pressure to allow the evaluation of the software developed.

Upon the release of the “frizz,” Kenji Nakamura (Officer and Deputy General Manager, Division No.2, AS Business Headquarters, which is responsible for the ASSP product business) makes the following comments: “Our ‘frizz’ is a high-performance Sensor Hub LSI with ultra-low power consumption that will significantly change the world of smartphones and wearable devices. We are proud that we are able to provide products that make your lives safe, secure, and comfortable, including a navigation system for underground malls and buildings and a remote monitoring system for children and the elderly.”

■ Main Features:

1. DSP-based Sensor Hub that performs outstanding high-speed algorithm operations
2. Maximum operating frequency 40MHz high-speed operation with ultra-low power consumption
3. User-friendly development environment

■ Basic Specifications:

・ Processor core:	Cadence Xtensa LX4 based 32bit DSP “ParaForce”	
・ Maximum operating frequency:	40MHz	
・ Embedded memory:	Instruction RAM	256KByte
	Data RAM	256KByte
・ Host I/F:	SPI x 1, I2C x 1	
	Dual Purpose RAM (32 bit x 64 word)	
・ External I/F:	UART x 1, I2C x 1, SPI x 1 (4 devices control), GPIO x 4	
・ Supply voltage:	Core	1.2V
	IO	1.8 / 2.5 / 2.8 / 3.0 / 3.3V compatible
・ Power consumption:	Active mode	96.9uA/MHz
・ Package:	3.5 x 3.5 x 0.65 (mm)	

■ Glossary

・Wearable device:
A device with a high-performance processor that can be worn while walking around.
The device is available as watch, wristband and head-mount/display versions, with usage including healthcare and as an input device.

・PDR (Pedestrian Dead-Reckoning):
Dead-Reckoning for the trajectory of pedestrians based on information including acceleration, gyro, and terrestrial magnetism. One of the indoor positioning methods.