Epson develops new microcontroller to maximize e-paper performance

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Seiko Epson today announced that it has recently developed and begun shipping samples of the S1C17F57, a new 16-bit microcontroller with a built-in driver optimized for small- and medium-sized segmented electronic paper displays (e-paper displays or EPDs) such as E Ink SURFTM. The company plans to begin volume shipments in March 2011, with monthly production of one million units. Epson at the same time announced it had started shipping its newly developed S1D14F50 series of energy-efficient driver ICs capable of wringing the maximum performance from segmented EPDs.

The EPD market is rapidly expanding due to an explosion in demand for products such as e-books. The high contrast, flexibility, image stability, and low power consumption make EPDs the ideal replacement for liquid crystal displays in products like these, and in many segmented

applications.

To meet the increased demand for segmented EPDs, Epson developed the S1C17F57, a microcontroller with standard functions such as memory (ROM and RAM), timers, and serial interfaces. The product also includes embedded features such as a real-time clock, theoretical regulation, a high performance segmented EPD driver, and a temperature sensor. As a result, the device does not simply drive the display, but also corrects temperature effects that could potentially distort the image on the display thus maximizing the characteristics of an e-paper display with a single chip.

Active matrix-type display

Epson also leveraged its expertise with energy efficient technologies to achieve very low power draw (120 nA in Sleep mode). Moreover, the microcontroller can be shipped as - bare die only 200-microns thick, making it perfect for applications in smart cards and other small mobile devices that demand long battery life and thin form factors.

Epson has also jointly developed with Citizen Seimitsu, an integrated e-paper display module that includes the S1C17F57. Citizen Seimitsu has already begun shipping this chip-on-flex (COF) module, and has attached an e-paper display that makes it easy for manufacturers to

design e-paper products.

"Epson has a long track record of providing energy efficient semiconductors for various battery driven products. By adding this unique microcontroller unit to the product family, we will be able to support emerging e-paper applications such as display cards," said Ryuhei Miyagawa, deputy chief operating officer of Epson's Microdevices Operations Division.

"Epson developed the world's first embedded e-paper driver microcontroller," said Shuji Watanabe, Division Manager of Citizen Seimitsu's Display Division. "Citizen Seimitsu's integrated e-paper display module incorporating Epson's microcontroller provides EPDs with high image quality, flexibility, and ultra-low power consumption and we are now moving forward with applications for IC cards, watches, and small mobile devices. Citizen Seimitsu participated in the development of this controller from the planning stage and in addition to COF (chip-on-film), we can also mount the controller directly to an EPD. We believe that it this will make it possible to produce an integrated e-paper display module with a small-footprint at low cost."

"Epson's new 16-bit microcontroller driving E Ink SURF displays aims at a large and growing market segment that include applications such as smartcards, shelf labels, battery indicators, wrist watches and electronic signage" said Sriram Peruvemba, Chief Marketing Officer for E Ink Holdings. "We congratulate Epson on the launch of the S1C17F57".

Epson simultaneously developed a new series of low-power driver ICs, called the S1D14F50 series. Drawing just 100 nA of power in Deep Standby mode, these driver ICs can expand the segment display domain when coupled with the S1C17F57. Since display circuitry optimized for driving EPDs is built-in, outstanding performance is also demonstrated even when used as a standalone driver IC.

Going forward, Epson will continue to expand its lineup of microcontrollers and driver ICs for EPDs and develop products that meet customers' needs.

Segmented displays are often used in digital watches and calculators. They are used when certain fixed segments of the display contain characters or digits. They are generally superior in terms of energy consumption, response speed and thinness compared to the active matrix-type displays that use fine dots to show detailed images. Both methods are likely to be used with e-paper displays, with the usage increasingly dependent on the type of application.

More information: For documentation and further details about the S1C17F57, please see the following link: www.epson.jp/device/semicon_e/ … /mcu/16bit/index.htm

Source: Epson