**FOR IMMEDIATE RELEASE**

# EPSON SHIPPING SAMPLES OF NEW 16-BIT MCU FOR DRIVING LEDs UP TO 56 mA

## - Ideal for control panels with displays for factory automation systems and home applications -



**16-bit S1C17M13 MCU with integrated Flash memory**

**Evaluation board**

**-TOKYO, Japan, April 14, 2016 -**

Seiko Epson Corporation (TSE: 6724, "Epson") has developed and recently begun shipping samples of three new models in the company's S1C17W series of low-power 16-bit microcontrollers with on-chip Flash memory. The new models are the S1C17W34, S1C17W35, and S1C17W36. Epson plans to produce 200,000 units per month of each model when volume production beings in October 2016.

Epson's original 16-bit microcontrollers with built-in Flash memory have proved to be a popular choice for embedding in mobile devices owing to their exceptionally low power consumption. The S1C17W series, which entered volume production in 2013, has been especially popular for use in digital watches because of low power consumption and liquid crystal driving capability. Digital watches have been gaining an increasing number of features and functions in recent years. In addition to sensors for tracking activity and measuring things such as temperature, and altitude, many timepieces have also added GPS, Bluetooth® and other wireless features, so the amount of data processed by the microcontroller has steadily grown.

The need for more on-chip microcontroller memory has increased commensurately. Also, since more watches now need to display more information, their LCD screens tend to be larger and have higher definition. These screens require high-resolution liquid crystal drivers.

The S1C17W36 meets these needs with 384 Kbytes of on-chip Flash memory, the most in the series, and an integrated liquid crystal driver that drives up to 2,084 dots. The low voltage and low current operation of the microcontrollers makes them ideally suited to customers who develop watches that are not designed to be recharged by users.

Since the integrated liquid crystal drivers are capable of driving LCDs with resolutions as high as 2,048 dots, displays can render crisp characters, graphs, and other graphics.
The microcontroller has a built-in real-time clock that is capable of instantly calling up and displaying the time in cities in three different time zones. This feature has the benefit of lightening the load on the CPU and reducing program size. In addition to shipping in a 176-pin plastic package (QFP21-176), the microcontrollers will also be available as bare die to help users reduce the board area within their finished products.

The new microcontrollers provide customers with Flash memory size options. In addition to the S1C17W36, which has 384 Kbytes of memory, customers can choose the S1C17W34, which as 128 Kbytes of memory, or the S1C17W35, which has 256 Kbytes, depending on size requirements of control programs. In addition, the three new models are drop-in compatible and can be swapped for one another without any special settings. This interchangeability gives customers the flexibility to upgrade to a microcontroller with more Flash memory when, for example, the customer wants to add additional control programs.

- The Bluetooth word mark and logo are registered trademarks of the Bluetooth SIG, Inc. Seiko Epson Corporation has licensed the use of these trademarks.

**Feature and Specifications**

**Key Product Features**

1. High-capacity Flash memory integrated on-chip to support larger control programs
- S1C17W34 (128 Kbytes), S1C17W35（256 Kbytes), and S1C17W36 (384 Kbytes)
- Self-programmable at 3 V
2. Low-voltage, low-current requirements that dramatically extend battery life
- Guaranteed operating range: 1.2 V - 3.6 V
- 0.6 µA (typical) in HALT mode (real-time clock operation)
- 0.15 µA (typical) in Sleep mode
3. Embedded circuits that help customers reduce total product part counts, save board      space, and shrink software development times
- LCD driver that can directly drive an LCD with up to 2,048 dots
- Real-time clock that supports three time zones
- Oscillator circuit that is switchable between 4, 2, and 1 MHz; 500, 384, and 250 kHz, and 700 kHz*1
- Supply voltage detector (SVD) circuit that does not require an external power supply supervisor
- Circuitry that allows I/O port functions to be assigned with software

**Product Specifications**

| | |
|---|---|
| Product model number | S1C17M13 |
| CPU core | 16-bit RISC processor with multiply and accumulation unit and multiplier/divider |
| Flash memory | 16 Kbytes |
| RAM | 2 Kbytes |
| Operating voltage | Guaranteed operating range: 1.8 V - 5.5 V |
| Current consumption | SLEEP mode: 0.5 µA (typical)<br>RUN mode: 1.7 mA/16 MHz (typical) |
| Supply voltage detector | VDD: 28 levels (1.8 to 5.0 V) / external voltage: 32 levels (1.2 to 5.0 V) |
| LED controller | Up to 5-digit, 7-segment LED output (8 segments x 1 to 5 common pins)<br>Dynamic drive control<br>Anode common mode, cathode common mode, and pin status when OFF are selectable with software.<br>4-level brightness adjustment |
| Infrared remote controller | 1 channel (can be used to generate EL lamp driving waveforms) |
| Analog-digital converter | Successive approximation ADC, 12-bit resolution, 8 input channels |
| Timer | 16-bit PWM timer, 1 channel<br>16-bit timer, 4 channels<br>Watchdog timer |
| Serial interfaces | UART (1 ch.), SPI (2 ch.), and $I^2C$ (1 ch.) interfaces |
| I/O ports | 38 max.<br>21 universal support multiplexers |
| Package | 48-pin TQFP12-48 (lead pitch: 0.5 mm) |

**Notes:**

Use the following link to see full press release:

http://global.epson.com/newsroom/2016/news_20160720.html

Use the following link for information on MCU's:

http://global.epson.com/products/semicon/products/mcu/16bit_index.html#ac02

**About Epson**

Epson is a global technology leader dedicated to connecting people, things and information with its original efficient, compact and precision technologies. With a lineup that ranges from inkjet printers and digital printing systems to 3LCD projectors, smart glasses, sensing systems and industrial robots, the company is focused on driving innovations and exceeding customer expectations in inkjet, visual communications, wearables and robotics.

Led by the Japan-based Seiko Epson Corporation, the Epson Group comprises more than 67,000 employees in 90 companies around the world, and is proud of its contributions to the communities in which it operates and its ongoing efforts to reduce environmental impacts.

http://global.epson.com

**About Epson Electronics America, Inc.**

Epson Electronics America, Inc. (EEA), is a subsidiary of Japan-based Seiko Epson Corporation (SEC) and is responsible for sales, marketing and engineering of the product lines of SEC's Microelectronics Device Division in the America's. EEA provides a wide array of timing and frequency control products, integrated circuits, sensing device and system solutions for customer products and applications that require high levels of accuracy, reliability, stability, energy efficiency and compact design. Based in San Jose, California, the EEA Group has three regional offices, more than 40 sales offices in the U.S. and a growing network of exclusive distributors.

http://www.eea.epson.com