# Epson introduces Compact Packages to its S1C17W00 Series of 1.2V, 16-bit Flash Microcontrollers



## - Ideal for use in miniature sensor systems and wearable devices -

## - San Jose, California, February 18, 2015

Epson Electronics America, Inc. ("EEA") has announced that it has begun volume production of the S1C17W03 and S1C17W04, two new offerings in the company's S1C17W00 series of low-power 16-bit microcontrollers (MCU) featuring on-chip flash memory and 1.2 V supply operation. Epson plans to produce 200,000 of each new MCU per month.

The low-power MCUs in the S1C17W00 series are ideal for integration in portable electronic devices that run on a small, low-capacity power sources such as coin cells. They also support a wide variety of sensors. Designed specifically for applications that do not require a display function, the new products are smaller than the other chips in the series and are an excellent fit for products such as miniature sensor systems and wearable devices.

With the earlier products in the S1C17W00 series Epson primarily targeted applications such as digital watches and electronic price tags, so LCD driver circuits were integrated into the chips. However, demand has risen in recent years for simple, low-power MCUs without display functions. These microcontrollers are used for gas alarms, motion sensors, electronic keys, and other industrial and home sensor systems, as well as in wearable devices that will be paired with smartphones.

Epson responded to this demand by parting ways with the display function to create the S1C17W03 and S1C17W04. These MCUs are housed in tiny packages that have only a small fraction of the surface area of other products in the series.

The products in the S1C17W00 series operate from power supplies ranging from 1.2 V to 3.6 V. They run on a wide variety of batteries, from silver-oxide button cells to lithium-ion coin cells. In addition, Epson's low-leak process and power circuit technology limit current consumption in Sleep mode to 0.15 microampere, regardless of voltage. These MCUs have on-chip a 12-bit A/D converter, an R/F converter that has been optimized for temperature and humidity measurements, and UART, I2C, and SPI serial interfaces. The ability to connect to a variety of sensors means they can be used as sensor node controllers in a broad range of fields. These MCUs can be shipped in packaged or aside form.

Epson is committed to improving the performance of its customers' products by leveraging its energy saving technology and other advantages to provide unique semiconductors.

## **Product Features and Specifications**

Product features

(1) Low voltage and low current consumption that dramatically extend battery life

\* Low voltage operation Guaranteed operating range: 1.2 V to 3.6 V A/D converter operating range:1.8 V to 3.6 V

\* Low current consumption operation Sleep mode:  $0.15 \ \mu A$  (typical)

Halt mode (32.768 kHz): 0.3 µA (typical)

Run mode (32.768 kHz): 4 µA (typical)

Run mode (1 MHz): 250 µA (typical)

(2) Supports many types of peripheral circuits, a feature in high demand for sensor node controllers

- UART, I2C, and SPI serial interfaces enable communication with a wide variety of sensors.

- Resistance-to-frequency type A/D converter (R/F converter) for temperature and humidity measurements that enables connection to sensors in low-voltage environments

- 12-bit successive-approximation AD converter that enables connection of common voltage output analog sensors

- Supply voltage detection circuit that does not require an external power monitoring IC and is accurate to  $\pm 3\%$  (-40°C to 85°C)

- Universal port multiplexers that offer a greater degree of design freedom for board layouts
- Sound generators that support three octaves and seven types of notes and rests
- IR remote controller capable of infrared remote control output

Product model number	S1C17W03	S1C17W04
Flash memory	16 KB	32KB
RAM	2KB	
CPU core	16-bit RISC processor + multiplier/divider	
AD converter (12-bit successive-approximation ADC)	6 ports/channel (48-pin package or chip) 5 ports/channel (32-pin package)	
R/F converter (CR oscillation type with 24-bit counters)	2 channels (48-pin package or chip) 1 channel (32-pin package)	
Supply voltage detection circuit	Voltage detection accurate to ±3.0% (-40°C to 85°C) when divided 30 times between 1.2 V and 3.6 V	
Serial interfaces	2 channel UART, 2 channel SPI, and 1 channel I <sup>2</sup> C interfaces	
Packages	TQFP12-48pin (7 mm × 7 mm; Lead pitch: 0.5 mm) with 75% smaller surface area*8	
	SQFN5-32pin (5 mm × 5 mm; Lead pitch: 0.5 mm) with 87% smaller surface area	
	Die form (Pad pitch: 80 µm (min.))	

#### **Product specifications**

## 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.

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#### About Epson

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