

FOR IMMEDIATE RELEASE

EPSON SHIPPING SAMPLES OF NEW 16-BIT MCU

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



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



Evaluation Board

- TOKYO, Japan, July 20, 2016 -

Seiko Epson Corporation (TSE: 6724, "Epson") has begun shipping samples of the S1C17M13, a new 16-bit microcontrol unit (MCU) with Flash memory integrated on-chip. This MCU is designed to drive light-emitting diodes (LEDs) at up to 56 mA*. Epson plans to produce 200,000 units per month when volume production begins in March 2017.

Epson has long integrated drivers in its MCUs to control LCDs in applications that use them. Recently, however, there has also been a sharp increase in the number of factory automation products and home appliances that use 7-segment LED displays or LED indicators. Epson anticipates ongoing demand for LEDs as a means for displaying simple information, as LEDs are bright, self-emitting, and easily visible even in dark environments.

On the other hand, LEDs have to be driven at a current of about 10 mA to produce a constant level of brightness. This has made it necessary to add dedicated external driving circuits to today's low-voltage, low-power MCUs. Moreover, users have had to develop their own control software and embed it in an MCU to achieve efficient multiple-digit segment displays. LEDs are simple, but they require more external driving components than LCDs. Users have thus had to spend considerable time and money developing LED software-as much if not more than for LCDs. Reducing users' costs and development times has thus been an issue.

The S1C17M13, Epson's first MCU for LED display applications, is ideally engineered to solve this issue. This product operates at voltages ranging from 1.8 V to 5.5 V and readily supports the 5 V needed for most factory automation products. The new MCU has five pins that can output up to 56 mA*. By using these high-output

pins as common pins in combination with an additional eight other segment pins, users can drive a segment LED display with up to 8 segments x 5 common pins without the use of external transistors on the common lines.

In addition, the MCU has an integrated hardware controller that supports dynamic lighting control. Customers can use a simple software setting to select any segment (LED) they wish to light up. They can fine-tune the lighting interval and adjust the brightness to any of four levels. These new features will help users reduce the cost of their products as well as their total development times.

Epson also plans to commercialize a derivative product in the series (the S1C17M12) that does not include the 12-bit AD converter. Two types of evaluation boards are also available for the new product.

* Maximum output current per pin at an operating voltage of 5 V. Not capable of multiple simultaneous outputs.

Feature and Specifications

Key Product Features

1. Ideal specifications for LED display applications
 - Five pins capable of up to 56 mA* output.
 - Integrated hardware controller that supports dynamic lighting control
2. Embedded circuits that help customers reduce total product part counts, save board space, and shrink software development times
 - Oscillator circuit that is switchable between 16, 12, 8, and 4 MHz and 700 kHz
 - 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 (universal port multiplexers)
 - UART, SPI, and I2C serial interface circuits
3. Low-voltage and low-current consumption that extend battery life
 - Guaranteed operating range: 1.8 V - 5.5 V
 - Sleep mode current consumption: 0.5 μ A

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 μ A (typical) 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) Dynamic drive control Anode common mode, cathode common mode, and pin status when OFF are selectable with software. 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 16-bit timer, 4 channels Watchdog timer
Serial interfaces	UART (1 ch.), SPI (2 ch.), and I ² C (1 ch.) interfaces
I/O ports	38 max. 21 universal support multiplexers
Package	48-pin TQFP12-48 (lead pitch: 0.5 mm)

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Notes:

Use the following link to see full press release:

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

Please see the link below for further details about these products:

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

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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.

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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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