



Seiko Epson Corporation ("Epson") has developed the S1C17701, a new 16-bit RISC MCU which contains 16 MB of memory space and features low power consumption and circuit size equivalent to an 8-bit microcontroller. Shipments of samples of this product will commence in September 2007. Volume shipments, with a monthly output of 500,000 units, are scheduled to begin in October 2007.

The S1C17701 is a single-chip microcontroller featuring on-chip Flash ROM and a high-resolution dot matrix LCD driver. With 64 KB of Flash ROM, the product is ideal for software development and evaluation activities.

Epson has utilized the low power consumption technology developed for its watch applications to achieve low current consumption (typically 2.5  $\mu$ A during standby mode) and enable high-speed operation (8.2 MHz) with low operation voltage (1.8 V). In most cases, this product will allow customers currently using 8-bit microcontrollers to enjoy higher performance with the same power consumption. In addition, it will enable customers already using 16-bit microcontrollers to benefit from longer battery life as a result of low operating voltage.

Epson plans to continue its efforts to respond to customer demands in this area by expanding its device lineup based on the following core technologies--a low leak process to drastically cut current consumption during standby mode, an algorithm which significantly improves system power efficiency, and analog circuits that are optimally designed for low power consumption.

Please see below for [specifications](#).

### **Special features of S1C17701**

#### **1. Low Power Consumption**

16-bit RISC microcontroller with low power consumption and circuit size equivalent to an 8-bit microcontroller

SLEEP state: 1  $\mu$ A (typical)

HALT state (32.768 KHz): 2.5  $\mu$ A (typical)

RUN state (32.768 KHz): 13.5  $\mu$ A (typical)

LCD ON state (32.768 KHz): 6.5  $\mu$ A (typical) <sup>\*1</sup>

#### **2. On-Chip High-Resolution Dot Matrix LCD Driver**

On-chip grayscale display driver with resolution of 56 SEG x 32 COM (1792 dots)

Large-scale LCD display that doesn't require external circuits, featuring built-in voltage regulator/booster circuits

#### **3. Reduced Development Time for Customers**

Allows for preparation and immediate evaluation of software simulators and compact development tools

C compiler and instruction set with high level of code efficiency

Compact, reduced-pin serial ICE

On-chip Flash ROM (supports self programming)

Quick delivery: volume production shipments within a minimum of 8 days <sup>\*2</sup>

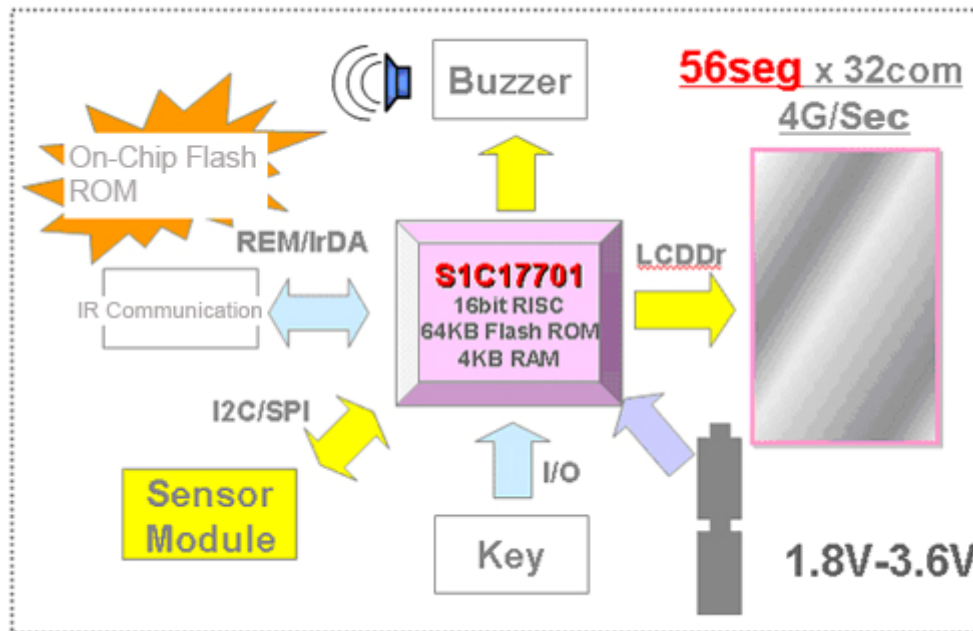
\*1. Zero panel load, HALT state

\*2. From receipt of order to release of product for shipment. (This delivery period may increase subject to manufacturing capacity and the number of orders received.)

### Suitable applications

The S1C17701 is ideal for applications such as remote controllers, sports watches, and portable healthcare equipment that are being upgraded in terms of battery operation, sensor interface, compact size, and grayscale LCD display.

#### Example of application (remote controller)



### Specifications

Product name	S1C17701	
Core CPU	Epson original 16-bit RISC CPU core S1C17	
Main (OSC3) oscillator circuit	S1C17701F00B100: Crystal/ceramic oscillator 8.2 Mz (max.) S1C17701F00E100: CR oscillator 2.2 MHz (max.)	
Sub (OSC1) oscillator circuit	Crystal oscillator 32.768 kHz (typical)	
Instruction set	184 instructions	
On-chip ROM	64 KB Flash memory (for instructions and data) 1,000 erase/program cycles Read/program protection On-board programming by debugging function, self programming by software control	
On-chip RAM	4 KB	
I/O Ports	Max. 28-bit general-purpose I/O ports (Terminals are shared with peripheral I/O ports.)	
Serial interfaces	SPI (master/slave)	1 ch.
	I <sup>2</sup> C (master)	1 ch.
	UART (115200 bps, IrDA 1.0)	1 ch.

	Remote controller	1 ch.
Timers	8-bit timer	1 ch.
	16-bit timer	3 ch.
	PWM & capture timer	1 ch.
	Clock timer	1 ch.
	Stopwatch timer	1 ch.
	Watchdog timer	1 ch.
	8-bit OSC1 timer	1 ch.
LCD driver	56 SEG x 32 COM or 72 SEG x 16 COM (1/5 bias) Built-in voltage booster circuit	
Watchdog timer	Built-in	
Supply voltage detector	13 programmable levels (1.8 V to 2.7 V)	
Interrupts	NMI	
	P-port input interrupt	2 levels
	Serial interface interrupt	4 levels
	Timer interrupt	8 levels
	LCD interrupt SVD interrupt <sup>*1</sup>	
Power supply voltage	1.8 V to 3.6 V (for normal operation using regulator for 1.8 V internal voltage)	
	2.7 V to 3.6 V (for Flash ROM erasing/programming with 2.5 V internal voltage)	
Current consumption (typical)	SLEEP state:	1 $\mu$ A
	HALT state (32.768 KHz):	2.5 $\mu$ A
	RUN state (32.768 KHz):	13.5 $\mu$ A
	LCD state (32.768 KHz):	6.5 $\mu$ A <sup>*2</sup>
Shipping form	TQFP24-144-pin plastic package	
	Bare chip	

\*1. Supply voltage detector

\*2. Zero panel load, HALT state

Note:

This product uses technology provided by [Silicon Storage Technology, Inc.](#)