EPSON
EXCEED YOUR VISION

S1C17601

CMOS 16-bit Single Chip Microcontroller

Preliminary

- **Low Power MCU (operating voltage 1.8 V, 1 µA/SLEEP, 1.5 µA/HALT)**
- **External LCD Driver I/F (Bus) or Built-in LCD Driver (40 SEG × 4 COM)**
- **Built-in 10-bit A/D Converter, Multiply and Accumulate Module**
- **S1C17 High Performance 16-bit RISC CPU Core with C Optimized Compact Code and Serial ICE Support**
- **32K-Byte Flash Memory and 4K-Byte RAM**

■ DESCRIPTIONS

The S1C17601 is a 16-bit MCU that features high-speed operation, low power consumption, small size, large address space, and on-chip ICE. The S1C17601 provides two LCD drive features. One is the built-in LCD driver for driving a segment type LCD panel of up to 40 segments × 4 commons. This is suitable for applications with a small display such as meter modules with sensors. The other supports external LCD drivers through the external bus interface. It also supports an LCD driver DMA function to interface with the EPSON S1D15xxx built-in RAM LCD driver. This is suitable for applications with medium- and small sized dot-matrix LCD displays such as sports watches.

The S1C17601 consists of an S1C17 CPU Core with a multiplier extended, a 32K-byte Flash memory, a 4K-byte RAM, an external bus interface for an LCD driver with a DMA function and other devices, a 10-bit A/D converter, serial interface modules (UART that supports high bit rate and IrDA 1.0, SPI and I^2C) for connecting various sensor modules, 8-bit timers, 16-bit timers, a PWM & capture timer, a clock timer, a stopwatch timer, a watchdog timer, 24 GPIO ports, an LCD driver with 40-segment × 4-common outputs and a voltage booster, a supply voltage detector, 32 kHz (typ.) and 8.2 MHz (max.) oscillators, and a voltage regulator for generating the 1.8 V internal voltage. The S1C17601 is capable of high-speed operation (8.2 MHz) with low operating voltage (1.8 V). Its 16-bit RISC processor executes one instruction in one clock cycle, and low current consumption (1 µA in standby mode). The S1C17601 also provides an on-chip ICE function that allows on-board erasing/programming of the embedded Flash memory, on-board debugging and evaluating the program by connecting the S1C17601 to the serial ICE (ICD17) with only three wires.

∗ This product uses SuperFlash® Technology licensed from Silicon Storage Technology, Inc.

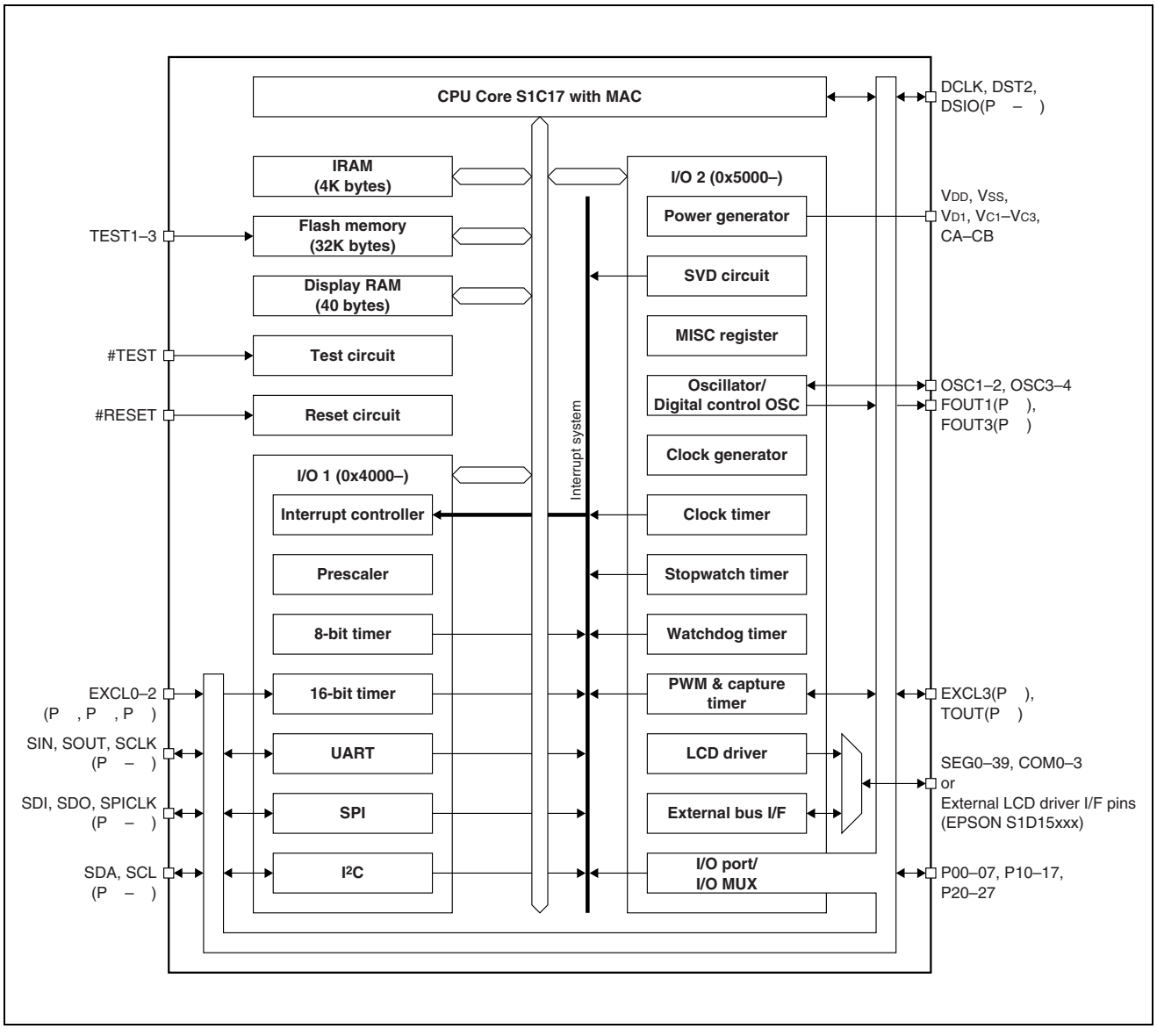
This product is under planning; the specifications may be changed in the release model.

■ FEATURES

● CPU	• Seiko Epson original 16-bit RISC CPU core S1C17	
● Multiplier	• Multiply and accumulate function (16 bits × 16 bits + 32 bits)	
● Internal oscillator	• 2 MHz or 6 MHz (±10%, 1.8 V, 25°C), starts up within 10 µs (TBD)	
● OSC3 oscillator	• Crystal/ceramic oscillator 8.2 MHz (max.)	
	• CR oscillator 2.2 MHz (max.)	
● OSC1 oscillator	• Crystal oscillator 32.768 kHz (typ.)	
● On-chip Flash memory	• 32K bytes (for instructions and data)	
	• 1,000 erase/program cycles (TBD)	
	• Read/program protection	
	• On-board programming by ICD17 and self-programming by software control	
● On-chip RAM	• 4K bytes	
● A/D converter	• 10-bit resolution	
	• ±1.5 LSB	
	• Current consumption during conversion: 150 µA	
● I/O ports	• Max. 24 general-purpose I/O ports (Pins are shared with the peripheral I/O.)	
● Serial interfaces	• SPI (master/slave)	1 ch.
	• I^2C (master)	1 ch.
	• UART (high transfer rate, IrDA 1.0)	1 ch.
● Timers	• 8-bit timer (T8F)	1 ch.
	• 16-bit timer (T16)	3 ch.
	• PWM & capture timer (T16E)	1 ch.
	• Clock timer (CT)	1 ch.
	• Stopwatch timer (SWT)	1 ch.
	• Watchdog timer (WDT)	1 ch.

- LCD driver ..... • 40 segments × 4 commons (1/3 bias)
  - Built-in voltage booster
- External bus interface ..... • 8- or 16-bit data bus
  - 20-bit address bus
  - Up to 4 chip-enable outputs
  - Supports LCD driver DMA function for EPSON S1D15xxx.
- Supply voltage detector (SVD) ..... • 13 programmable detection levels (1.8 V to 2.7 V)
- Interrupts ..... • Reset
  - NMI
  - 16 programmable interrupts (8 levels)
- Power supply voltage ..... • 1.8 V to 3.6 V (for normal (low-power) operation with the 1.8 V internal voltage)
  - 2.7 V to 3.6 V (for Flash erasing/programming with the 2.5 V internal voltage)
- Current consumption (typ.) ..... • SLEEP state: 1.0 µA
  - HALT state: 1.5 µA (32 kHz OSC1 crystal oscillator, LCD off)
  - Run state: TBD µA (32 kHz OSC1 crystal oscillator, LCD off)
    TBD µA (8 MHz OSC3 ceramic oscillator, LCD off)
- Shipping form ..... • TQFP14-100pin plastic package

■ BLOCK DIAGRAM



THIS PAGE IS BLANK.

S1C17601

SEIKO EPSON CORPORATION
SEMICONDUCTOR OPERATIONS DIVISION

IC Sales Dept.
IC International Sales Group
421-8, Hino, Hino-shi, Tokyo 191-8501, JAPAN
Phone: +81-42-587-5814 FAX: +81-42-587-5117

■ EPSON Electronic Devices Website
http://www.epson.jp/device/semicon_e

Document code: 410954301
Issue August, 2007
Printed in Japan (L)