# S1C17704

**EPSON**

EXCEED YOUR VISION

# Low Power 16-bit Single Chip Microcontroller

- ● Low Power MCU (operating voltage 1.8 V, 1 μA/SLEEP, 2.6 μA/HALT)
- ● 64K-Byte Flash Memory and 4K-Byte RAM
- ● High Quality and Stable Display LCD Driver with Voltage Booster (56 SEG × 32 COM)
- ● Infrared Remote Controller with Carrier Generator
- ● S1C17 High Performance 16-bit RISC CPU Core with C Optimized Compact Code and Serial ICE Support

## ■ DESCRIPTIONS

The S1C17704 is a 16-bit MCU that features high-speed operation, low power consumption, small size, large address space, and on-chip ICE. The S1C17704 consists of an S1C17 CPU Core, a 64K-byte Flash memory, a 4K-byte RAM, serial interface modules (UART that supports high bit rate and IrDA 1.0, SPI and I2C) for connecting various sensor modules, 8-bit timers, 16-bit timers, a PWM & capture timer, a clock timer, a stopwatch timer, a watchdog timer, 28 GPIO ports, an LCD driver with 56-segment × 32-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 S1C17704 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 1 clock cycles.

The S1C17704 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 S1C17704 to the ICD Mini (S5U1C17001H) with only three wires. The S1C17704 is suitable for battery driven applications with sensor interfaces and up to 56 × 32-dot LCD display, such as remote controllers and sports watches.

The product lineup offers two S1C17704 models with a different main oscillator.
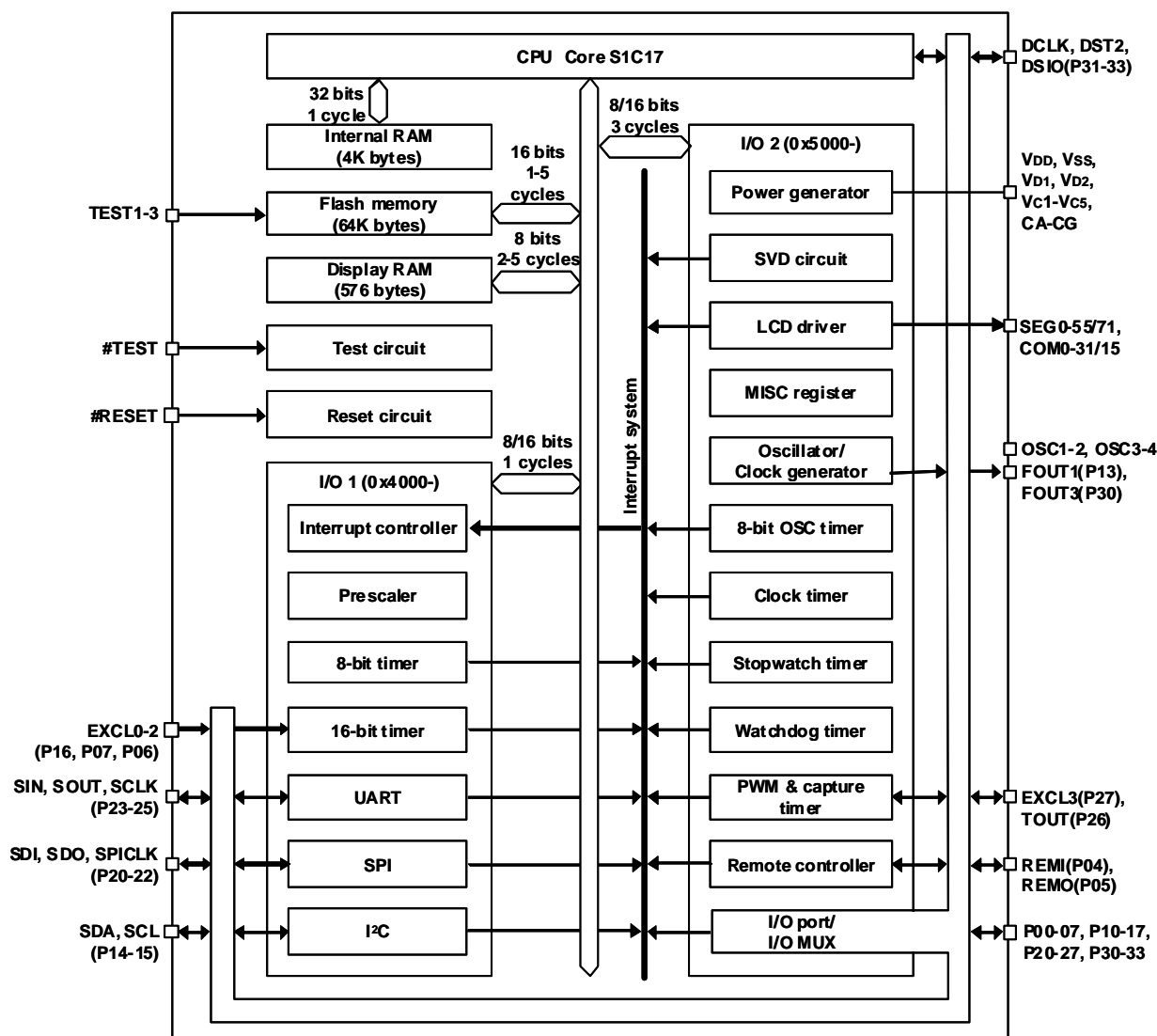
## ■ FEATURES

| | |
|---|---|
| ● CPU | Seiko Epson original 16-bit RISC CPU core S1C |
| ● Main (OSC3) oscillator | Crystal/ceramic oscillator 8.2 MHz (max.)<br>CR oscillator 2.2 MHz (max.) |
| ● Sub (OSC1) oscillator | Crystal oscillator 32.768 kHz (typ.) |
| ● Built-in flash memory | 64K bytes (for instructions and data), 1,000 erase/program cycles,<br>Read/program protection<br>On-board programming by a debugging tool such as ICD Mini (S5U1C17704H) and self-programming by software control |
| ● Built-in RAM | 4K bytes |
| ● Built-in display RAM | 576 bytes |
| ● I/O ports | Max. 28 general-purpose I/O ports (Pins are shared with the peripheral I/O.) |

| ● Serial interfaces | | |
|---|---|---|
| | SPI (master/slave) | 1ch |
| | I$^2$C (master) | 1ch |
| | UART (115200 bps, IrDA 1.0) | 1ch |
| | Remote controller (REMC) | 1ch |

| ● Timers | | |
|---|---|---|
| | 8-bit timer (T8F) | 1ch |
| | 16-bit timer (T16) | 3ch |
| | PWM & capture timer (T16E) | 1ch |
| | 8-bit OSC1 timer (T8OSC1) | 1ch |
| | Clock timer (CT) | 1ch |
| | Stopwatch timer (SWT) | 1ch |
| | Watchdog timer (WDT) | 1ch |

| | |
|---|---|
| ● LCD Driver | 56 SEG × 32 COM or 72 SEG × 16 COM (1/5 bias)<br>Built-in voltage booster |
| ● Supply voltage detector | 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)<br>2.7 V to 3.6 V (for Flash erasing/programming with the 2.5 V internal voltage) |
| ● Operating temperature | -20°C to 70°C |

| ● Power consumption | | |
|---|---|---|
| | SLEEP state: | 1 μA typ. |
| | HALT state: | 2.6 μA typ. (32 kHz OSC1 crystal oscillator, LCD off) |

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|  | Run state: | 17 µA typ. (32 kHz OSC1 crystal oscillator, LCD off) |
|  |  | 1950 µA typ. (8 MHz OSC3 ceramic oscillator, LCD off) |

● Shipping form   TQFP24-144pin plastic package(16 mm × 16 mm × 1.0 mm, lead pitch: 0.4 mm)
PFBGA6U-96 package*(6 mm × 6 mm × 1.0 mm, ball pitch: 0.5 mm)
VFBGA7H-161 package(7 mm × 7 mm × 1.0 mm, ball pitch: 0.5 mm)
VFBGA10H-144 package(10 mm × 10 mm × 1.0 mm, ball pitch: 0.8 mm)
Chip

**Seiko Epson Corporation**

## ■ Block Diagram



**NOTICE:**

# AMEYA360
## Components Supply Platform

Authorized Distribution Brand :

ROHM    Sunlord    SSM SUSUMU    AVERLOGIC    NXP    Elprotronic

2Pai Semi    Ambarella    CanaanTek    Firstohm    GigaDevice    威冒半导体

Website :

Welcome to visit    www.ameya360.com

Contact Us :

- Address :

  401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
  Minhang District, Shanghai , China

- Sales :

  Direct        +86 (21) 6401-6692

  Email        amall@ameya360.com

  QQ            800077892

  Skype        ameyasales1  ameyasales2

- Customer Service :

  Email        service@ameya360.com

- Partnership :

  Tel        +86 (21) 64016692-8333

  Email        mkt@ameya360.com