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.) 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, Read/program protection 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
I2C (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) 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) 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
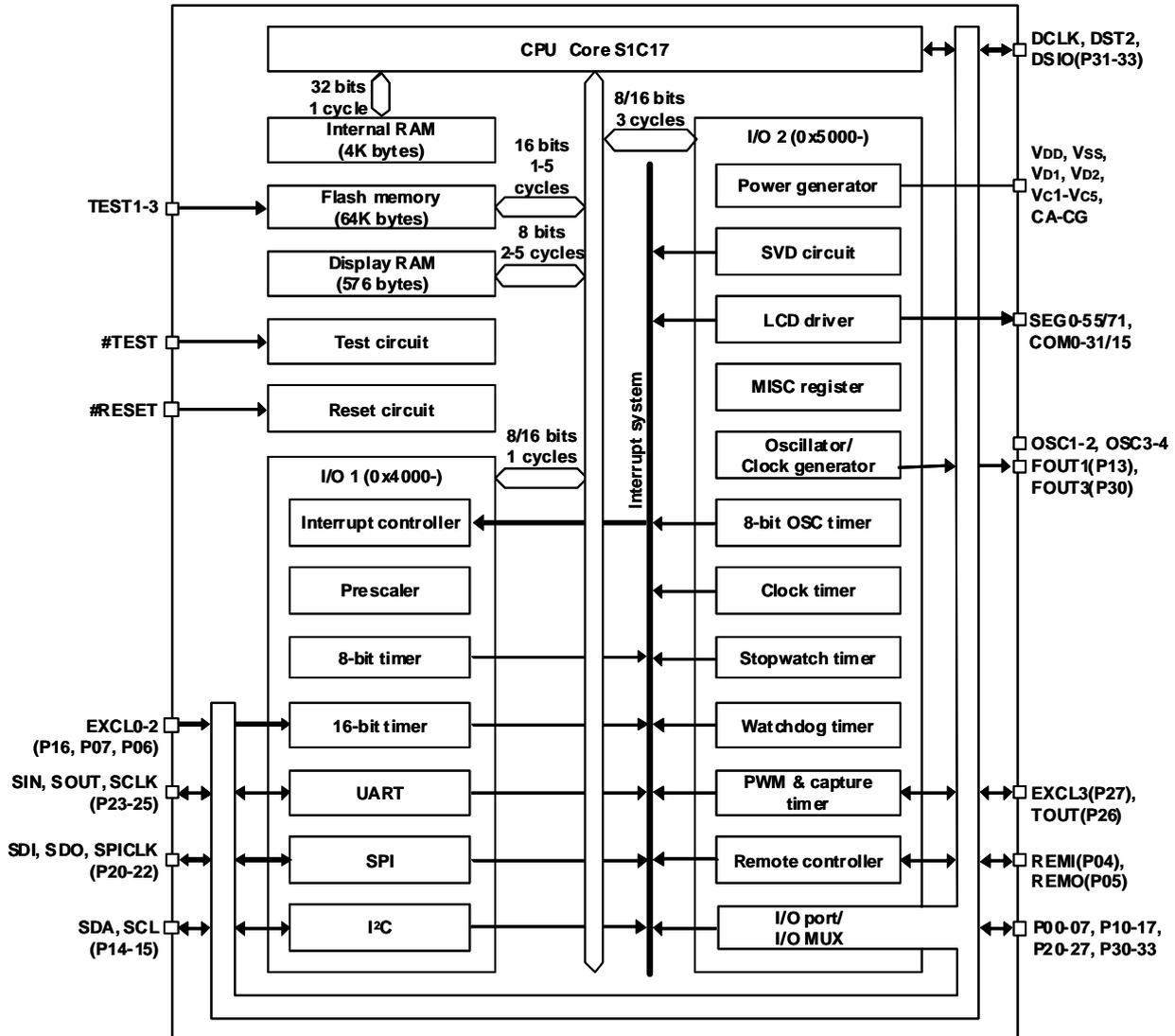
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