

Welcome to E-XFL.COM

What is "[Embedded - Microcontrollers](#)"?

"[Embedded - Microcontrollers](#)" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "[Embedded - Microcontrollers](#)"

Details

Product Status	Not For New Designs
Core Processor	S1C17
Core Size	16-Bit
Speed	8.2MHz
Connectivity	I ² C, IrDA, SPI, UART/USART
Peripherals	LCD, PWM, WDT
Number of I/O	28
Program Memory Size	64KB (64K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	4K x 8
Voltage - Supply (Vcc/Vdd)	1.8V ~ 3.6V
Data Converters	-
Oscillator Type	Internal
Operating Temperature	-20°C ~ 70°C (TA)
Mounting Type	Surface Mount
Package / Case	161-VFBGA
Supplier Device Package	161-VFBGA (7x7)
Purchase URL	https://www.e-xfl.com/product-detail/epson/s1c17704b102100

Low Power 16-bit Single Chip Microcontroller

- Low Power MCU (operating voltage 1.8 V, 1 μ A/SLEEP, 2.6 μ A/HALT)
- 64K-Byte Flash Memory and 4K-Byte RAM
- High Quality and Stable Display LCD Driver with Voltage Booster (56 SEG \times 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 \times 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 \times 32-dot LCD display, such as remote controllers and sports watches. The product lineup offers two S1C17704 models with a different main oscillator.

■ FEATURES

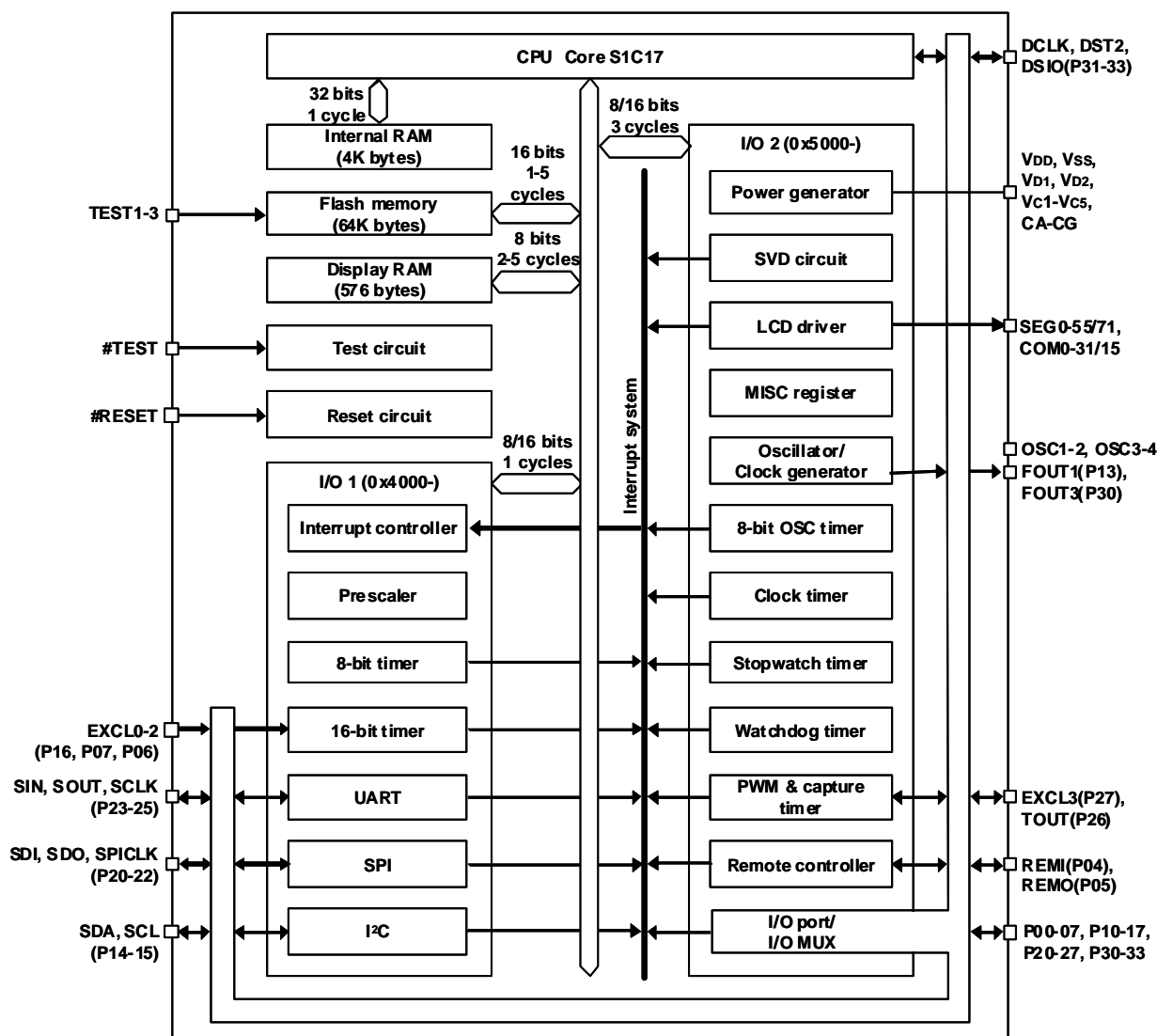
● CPU	Seiko Epson original 16-bit RISC CPU core S1C
● Main (OSC3) oscillator	Crystal/ceramic oscillator 8.2 MHz (max.) CR oscillator 2.2 MHz (max.)
● Sub (OSC1) oscillator	Crystal oscillator 32.768 kHz (typ.)
● Built-in flash memory	64K bytes (for instructions and data), 1,000 erase/program cycles, Read/program 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 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 \times 32 COM or 72 SEG \times 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 μ A typ. HALT state: 2.6 μ A typ. (32 kHz OSC1 crystal oscillator, LCD off)

S1C17704

● Shipping form

Run state: 17 μ A typ. (32 kHz OSC1 crystal oscillator, LCD off)
1950 μ A typ. (8 MHz OSC3 ceramic oscillator, LCD off)
TQFP24-144pin plastic package(16 mm \times 16 mm \times 1.0 mm, lead pitch: 0.4 mm)
PFBGA6U-96 package*(6 mm \times 6 mm \times 1.0 mm, ball pitch: 0.5 mm)
VFBGA7H-161 package(7 mm \times 7 mm \times 1.0 mm, ball pitch: 0.5 mm)
VFBGA10H-144 package(10 mm \times 10 mm \times 1.0 mm, ball pitch: 0.8 mm)
Chip

■ Block Diagram



NOTICE:

No part of this material may be reproduced or duplicated in any form or by any means without the written permission of Seiko Epson. Seiko Epson reserves the right to make changes to this material without notice. Seiko Epson does not assume any liability of any kind arising out of any inaccuracies contained in this material or due to its application or use in any product or circuit and, further, there is no representation that this material is applicable to products requiring high level reliability, such as, medical products. Moreover, no license to any intellectual property rights is granted by implication or otherwise, and there is no representation or warranty that anything made in accordance with this material will be free from any patent or copyright infringement of a third party. This material or portions thereof may contain technology or the subject relating to strategic products under the control of the Foreign Exchange and Foreign Trade Law of Japan and may require an export license from the Ministry of Economy, Trade and Industry or other approval from another government agency.

All brands or product names mentioned herein are trademarks and/or registered trademarks of their respective companies.

©Seiko Epson Corporation 2010, All rights reserved

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

SEIKO EPSON CORPORATION

SEMICONDUCTOR OPERATIONS DIVISION

IC Sales Department

IC International Sales Group

421-8 Hino, Hino-shi, Tokyo 191-8501, JAPAN

Phone: +81-42-587-5814 FAX: +81-42-587-5117

■ Epson semiconductor website

http://www.epson.jp/device/semicon_e/

Document code: 411717801

First issue Oct, 2009

Revised Feb, 2010 in Japan