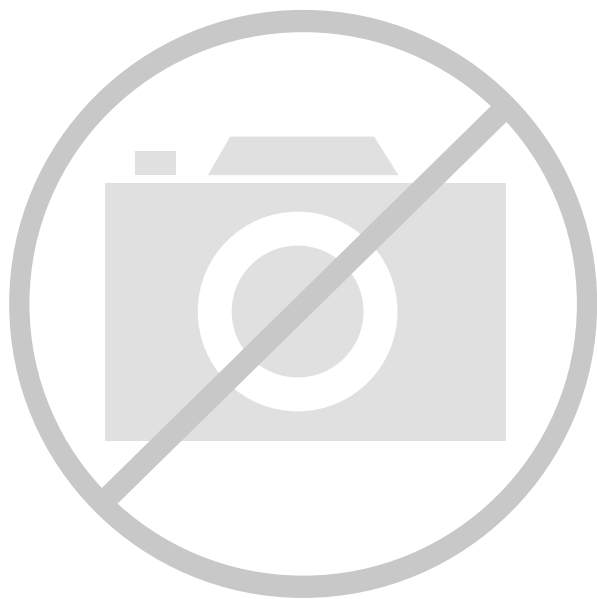




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What is "[Embedded - Microcontrollers](#)"?

"[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	Active
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	35
Program Memory Size	512KB (512K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	12K x 8
Voltage - Supply (Vcc/Vdd)	1.8V ~ 3.6V
Data Converters	A/D 8x10b
Oscillator Type	Internal
Operating Temperature	-25°C ~ 70°C (TA)
Mounting Type	Surface Mount
Package / Case	240-BFQFP
Supplier Device Package	-
Purchase URL	https://www.e-fl.com/product-detail/epson/s1c17705f101100

S1C17705/703

EPSON
EXCEED YOUR VISION

Low Power 16-bit Single Chip Microcontroller

- Low power MCU : lower operating voltage 1.8V, 1.2μA/SLEEP, 2.7μA/HALT *
- Large capacity flash memory: 512K bytes*
- LCD driver: 128 SEG x 32 COM (max.)*, pseudo 64 SEG x 64 COM* display support by 64 COM emulation mode
- Analog I/F: A/D converter, R/F converter(for temperature and humidity instruments), Supply Voltage Detector
- RISC CPU core S1C17: the compact code optimized for C-language, and high throughput of an instruction/clock, supports serial ICE

* For S1C17705

■ DESCRIPTIONS

The S1C17705/703 is a 16-bit MCU featuring high-speed low-power operations, compact dimensions, wide address space, and on-chip ICE. Based on an S1C17 CPU core, this product consists of Flash memory, RAM, serial interface modules supporting sensors such as UART to support high-bit rate and IrDA1.0, SPI, and I2C, various timers, maximum 35 general input/output ports, maximum 128 segment × 32 common LCD driver and a power supply voltage booster circuit, A/D converter, R/F converter, supply voltage detector, and 32 kHz and maximum 8.2 MHz oscillator circuits.

It allows 8.2 MHz high-speed operation at a minimum of 1.8 V operating voltage, and executes a basic instruction in one clock cycle with 16-bit RISC processing. The S1C17705/703 also includes a coprocessor supporting multiplication, division, and MAC (multiply and accumulation) operations.

The on-chip ICE function allows onboard Flash programming/erasing, program debugging, and evaluations using the ICDmini (S5U1C17001H) that can be connected with three signal wires.

The S1C17705/703 is ideal for applications, such as remote controllers, health care products, and sports watches, that must be driven with battery power and require sensor interfaces and a high-definition LCD display.

■ FEATURES

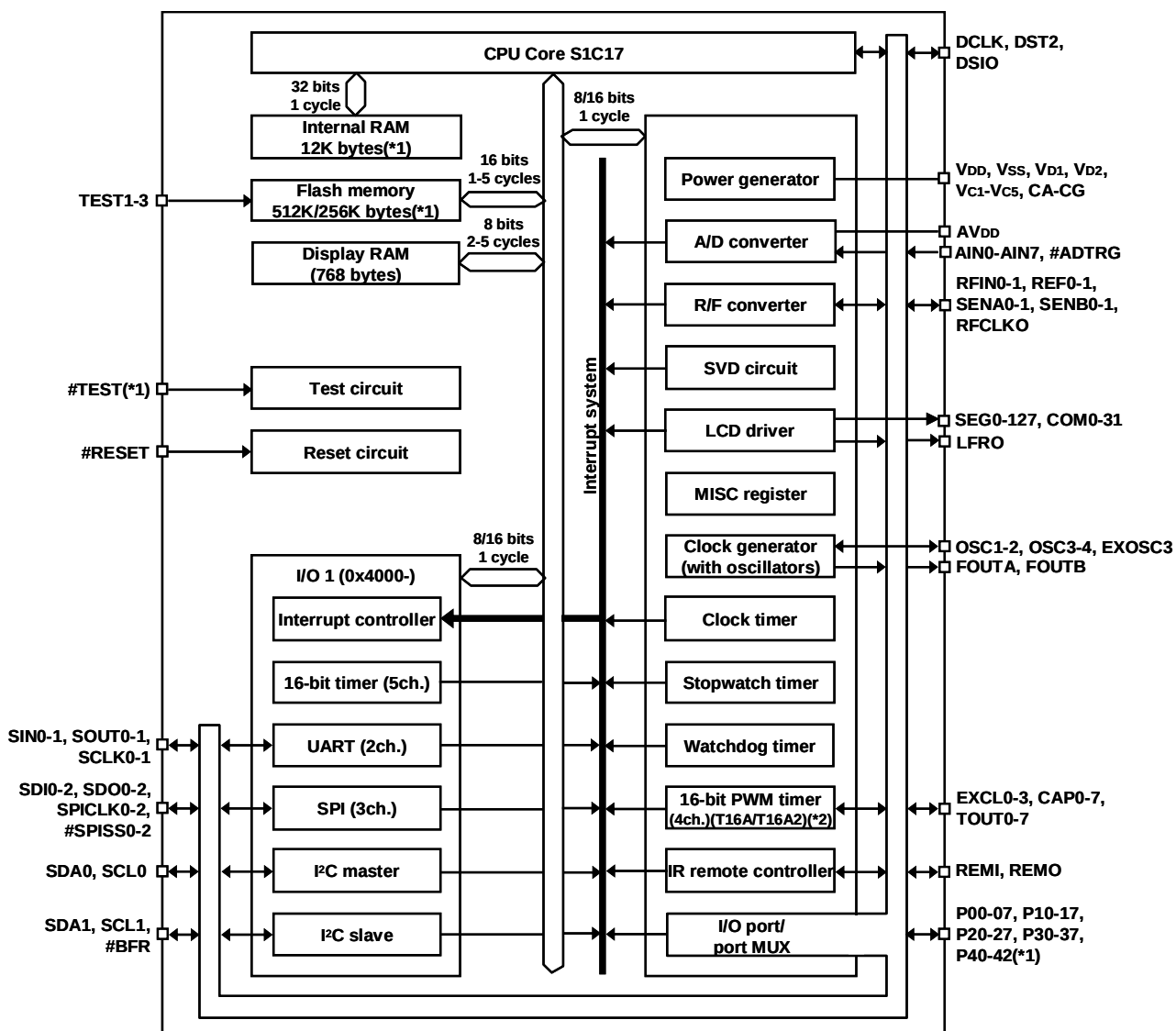
The main features of the S1C17705/703 are listed below.

Model	S1C17705	S1C17703
CPU		
CPU core	Seiko Epson original 16-bit RISC CPU core S1C17	
Multiplier/Divider (COPRO)	• 16-bit × 16-bit multiplier • 16-bit × 16-bit + 32-bit multiply and accumulation unit • 16-bit ÷ 16-bit divider	
Internal Flash memory		
Capacity	512K bytes (for both instructions and data)	256K bytes (for both instructions and data)
Erase/program count	1,000 cycles (min.)	
Other	• Read/program protection function • Allows on-board programming using a debugging tool such as ICDmini (S5U1C17001H) and self-programming by software control.	
Internal RAM		
Capacity	12K bytes	
Internal Display RAM		
Capacity	768 bytes	
Clock generator		
System clock source	3 sources (IOSC/OSC3/OSC1)	
IOSC oscillator circuit	2.7 MHz(typ.) internal oscillator circuit (oscillation start time 5 μs min.)	
OSC3 oscillator circuit	8.2 MHz (max.) crystal or ceramic oscillator circuit Supports an external clock input.	
OSC1 oscillator circuit	32.768 kHz (typ.) crystal oscillator circuit	
Other	• Core clock frequency control • Peripheral module clock supply control • IOSC control for quick-restart processing from SLEEP mode	
I/O ports		
Number of general-purpose I/O ports	Max. 35 bits (Pins are shared with the peripheral I/O.)	Max. 34 bits
Serial interfaces		
SPI	3 channels	
I ² C master (I2CM)	1 channel	
I ² C slave (I2CS)	1 channel	

S1C17705/703

UART	2 channels (IrDA1.0 supported)	
IR remote controller (REMC)	1 channel	
LCD driver		
LCD outputs	• 128 SEG × 32 COM • Supports 64 SEG × 64 COM emulation RAM mapping.	• 120 SEG × 32 COM • Supports 60 SEG × 64 COM emulation RAM mapping.
Other	1/5 bias (built-in power supply voltage booster circuit)	
Timers		
16-bit timer (T16)	5 channels	
16-bit PWM timer (T16A)	4 channels	
16-bit PWM timer (T16A2)		4 channels
Clock timer (CT)	1 channel	
Stopwatch timer (SWT)	1 channel	
Watchdog timer (WDT)	1 channel	
A/D converter		
Conversion method	Successive approximation type	
Number of analog input channels	8 channels (max.)	
Resolution	10 bits	
R/F converter		
Conversion method	CR oscillation type with 24-bit counter	
Number of conversion channels	2 channels (2 sensors can be connected to each channel.)	
Sensor supported	DC-bias resistive/capacitive sensors and AC-bias resistive sensors	
Other	Supports external input for counting pulses.	
Supply voltage detector (SVD)		
Detection levels	15 programmable detection levels (1.8 V to 3.2 V)	
Interrupts		
Reset interrupt	#RESET pin	
NMI	Watchdog timer	
Programmable interrupts	26 systems (8 levels)	
Power supply voltage		
Operating voltage (V _{DD})	• 1.8 V to 3.6 V (for normal operation) • 2.5 V to 3.6 V (for Flash erasing/programming) • Built-in voltage regulator (two operating voltages switchable)	
Analog voltage (AV _{DD})	AV _{DD} = V _{DD}	
Operating temperature		
Operating temperature range	-25°C to 70°C	
Current consumption (Typ. value)		
SLEEP state (OSC1 = Off, IOSC = Off, OSC3 = Off)	1.2μA	1.0μA
HALT state (OSC1 = 32kHz, IOSC = Off, OSC3 = Off, LCD = Off)	2.7μA	2.5μA
HALT state (OSC1 = 32kHz, IOSC = Off, OSC3 = Off, LCD = On)	9.7μA	9.5μA
Run state (OSC1 = 32kHz, IOSC = Off, OSC3 = Off, LCD = Off)	18μA	15μA
Run state (OSC1 = Off, IOSC = Off, OSC3 = 1 MHz ceramic, LCD = Off)	557μA	450μA
A/D converting current	200 μA (AVDD = 3.6 V, 100 kHz sampling)	
Shipping form		
1	QFP23-240pin	QFP21-216pin
2	Chip	Chip
3	VFBGA10H-240	
Size/pitch	QFP23-240pin (body size: 32 mm × 32 mm, lead pitch: 0.5 mm) QFP21-216pin (body size: 24 mm × 24 mm, lead pitch: 0.4 mm) VFBGA7H-240 (body size: 10 mm × 10 mm, ball pitch: 0.5 mm) Chip (S1C17705) (pad pitch: 90 μm) Chip (S1C17703) (pad pitch: 80 μm)	

■ BLOCK DIAGRAM



*1: The models have a different memory size, LCD outputs and I/O/test port configurations.

*2: 16-bit PWM timer (T16A) is available in the S1C17705 and 16-bit PWM timer (T16A2) is available in the S1C17703.

Memory/function	S1C17705	S1C17703
Flash memory	512K bytes	256K bytes
SEG/COM output pins (1/16, 1/24, 1/32 duty)	SEG0–SEG127 COM0–COM31	SEG0–SEG119 COM0–COM31
I/O port pins	35 (P00–P42)	34 (P00–P41)
#TEST pin	Available	Unavailable
16-bit PWM timer (T16A)	Available	Unavailable
16-bit PWM timer (T16A2)	Unavailable	Available

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