EPSON EXCEED YOUR VISION

S1C17624/604/622/602/621

16-bit Single Chip Microcontroller

- ●Low Power MCU: Operating voltage 1.8V, 0.75uA/SLEEP, 2.3uA/HALT
- Built in Flash memory: 8.2MHz high-speed operation with 1.8V low voltage
- Built in LCD driver: 52SEG × 8COM(max.), power supply voltage booster circuit
- Analog I/F: 10-bit A/D converter, 24-bit R/F converter, Supply voltage detector
- Real time clock: calendar function(support leap year)

■ DESCRIPTIONS

The S1C17624/604/622/602/621 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 a 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 47 general input/output ports, maximum 52 segment × 8 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 S1C17624/604/622/602/621 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 S1C17624/604/622/602/621 is ideal for applications, such as health care products with sensors, sports watches, and meter modules that must be driven with battery power and require sensor interfaces and a high-definition LCD display.

■ FEATURES

The main features of the S1C17624/604/622/602/621 are listed below.

Model	S1C17624			S1C17602	S1C17621	
CPU	31017024	31017004	31017022	31017002	31017021	
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					
Embedded Flash memory						
Capacity	128K bytes		64K bytes		32K bytes	
	(Can be used for both instructions and data.)					
Erase/program count	1,000 cycles (min.)					
Other	 Read/progr 	Read/program protection function				
	Allows on	-board progran	nming using a	a debugging	tool such as	
	ICDmini (S5U1C17001H) and self-programming by software control.					
Embedded RAM	(85010170	orn) and sell-p	orogramming by	/ sollware con	troi.	
Capacity	9K bytoc		1K bytoc		2K bytes	
Embedded Display RAM	8K bytes 4K bytes 2K bytes				ZN bytes	
. ,	EC bytes	10 bytes	EC bytoo	40 bytes		
Clock generator	56 bytes	40 bytes	56 bytes	40 bytes		
Clock generator	10 0000000 (10	00/0000/000	1\			
System clock source IOSC oscillator circuit	3 sources (IOSC/OSC3/OSC1)					
	2.7 MHZ(typ.)	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 (t	yn) crystal osci	put. Nator circuit			
OSCI OSCINATOI CIICUIT	32.768 kHz (typ.) crystal oscillator circuit Supports an external clock input.					
Other	Core clock frequency control					
	Peripheral module clock supply control					
	IOSC control for quick-restart processing from SLEEP mode					
Real-time clock						
RTC module	Included					
		cond, minute,		_		
	hour,	week, month,				
	and	WEEK, IIIOIIIII,				
	year counter	s.)				

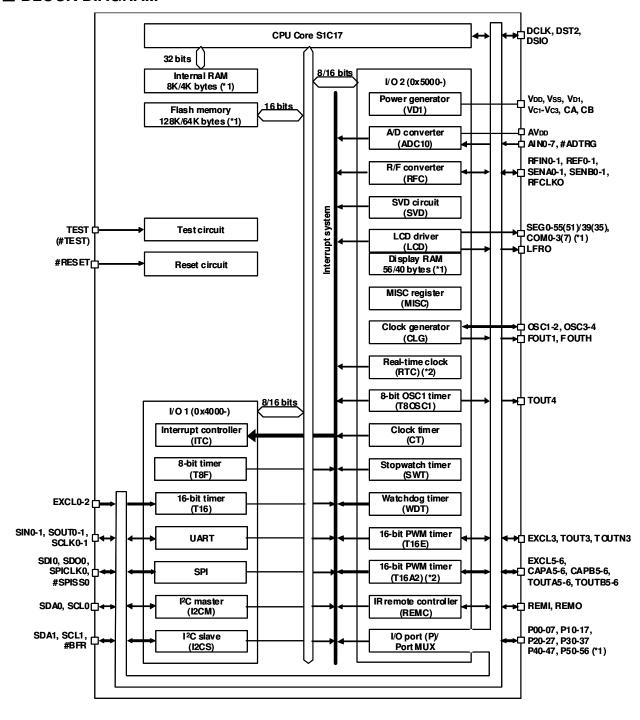
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Model	S1C17624	S1C17604	S1C17622	S1C17602 S1C17621		
I/O ports	ı		'	,		
Number of general-purpose	Max. 47 bits	Max. 36 bits	Max. 47 bits	Max. 36 bits		
I/O ports	(Pins are shared with the peripheral I/O.)					
Serial interfaces	, , ,					
SPI	1 channel					
I ² C master (I2CM)	1 channel					
I ² C slave (I2CS)	1 channel					
UART	2 channels (IrDA1.	0 supported)				
IR remote controller (REMC)	1 channel					
LCD driver	T	T	T			
LCD outputs	· 56SEG × 4COM · 52SEG × 8COM	· 40SEG × 4COM · 36SEG × 8COM	 56SEG × 4COM 52SEG × 8COM 	· 40SEG × 4COM · 36SEG × 8COM		
Other		wer supply voltage		- 303EG x 800IVI		
Timers	in blac (balle in pe	The supply reliage	2000101 01100117			
8-bit timer (T8F)	2 channels (with fir	ne mode)				
16-bit timer (T16)	3 channels					
16-bit PWM timer (T16E)	1 channel					
16-bit PWM timer (T16A2)	2 channels					
8-bit OSC1 timer (T8OSC1)	1 channel					
Clock timer (CT)	1 channel					
Stopwatch timer (SWT)	1 channel					
Watchdog timer (WDT)	1 channel					
A/D converter						
Conversion method	Successive approx	timation type				
Number of analog input	8 channels (max.)					
channels Resolution	10 bits					
R/F converter	10 0115					
Conversion method	CR oscillation type	with 24-bit counter				
Number of conversion channels			ed to each chann	el)		
Sensor supported	2 channels (2 sensors can be connected to each channel.) DC-bias resistive/capacitive sensors and AC-bias resistive sensors					
Other						
Supply voltage detector (S)						
Detection levels		detection levels (1.8	V to 3.2 V)			
Interrupts	· ·	·	,			
Reset interrupt	#RESET pin					
NMI	Watchdog timer					
Programmable interrupts	20 systems (8 leve	els) 19	systems (8 levels	s)		
Power supply voltage						
Operating voltage (VDD)	1.8 V to 3.6 V (fo	or normal operation)				
	. Ruilt-in voltage r	or Flash erasing/pró egulator (two operat	gramming) ting voltages swite	shahle)		
Analog voltage (AVDD)	AVDD = VDD	egulator (two operal	ing voitages swite	nabic)		
Operating temperature	1					
Operating temperature range	-25°C to 70°C					
Current consumption (Typ.	value)					
SLEEP state (ISLP)	0.75µA					
	OSC1 = OFF, IOSC	C = OFF, OSC3 = O	FF			
HALT state (IHALT1)	2.3µA			5μA		
	-	SC = OFF, OSC3 =		-		
HALT state (IHALT1 +	4.0µA			δμA		
ILCD2)		SC = OFF, OSC3 =				
Run state (IEXE1)		splayed, highest co				
Tiuli State (IEXET)	14µA	C1 = 32kHz, IOSC =		µA EE LCD OEE		
Run state (IEXE2)	400μA	J I = 32KMZ, IUSU =	· · · · · · · · · · · · · · · · · · ·	oµA		
Tiuli State (IEAEZ)		11 - 32kHz IOSC -		ина ИНz ceramic oscillation		
	01 0 = 0303, 030	J I = JZKI IZ, IUJU =	· Oi i , O3O3 = II	m 12 ociaitilo oscillation		

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Model	S1C17624	S1C17604	S1C17622	S1C17602	S1C17621		
Shipping form							
1	TQFP15-128pin	TQFP14-100pin	TQFP15-128pin	TQFP14-100pin			
2	Die form						
3			VFBGA7H-144				
Size/pitch	TQFP15-128pin (body size: 14 mm \times 14 mm, lead pitch: 0.4 mm) TQFP14-100pin (body size: 12 mm \times 12 mm, lead pitch: 0.4 mm) VFBGA7H-144 (body size: 7 mm \times 7 mm, ball pitch: 0.5 mm) Die form (pad pitch: 100 μ m)						

■ BLOCK DIAGRAM



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- *1: The models have a different memory size, LCD outputs and I/O port configurations.
- *2: The real-time clock (RTC) and 16-bit PWM timer (T16A2) are available only in the S1C17624 and S1C17604.

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SEIKO EPSON CORPORATION

SEMICONDUCTOR OPERATIONS DIVISION

IC Sales Department
IC International Sales Group
421-8 Hino, Hino-shi, Tokyo 191-8501, JAPAN
Phone: 042-587-5814
FAX: 042-587-5117

Document code: 411828100 First issue April, 2010