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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 "<u>Embedded - Microcontrollers</u>"

Details	
Product Status	Active
Core Processor	S1C17
Core Size	16-Bit
Speed	4.2MHz
Connectivity	I ² C, IrDA, SPI, UART/USART
Peripherals	LCD, PWM, RFC, WDT
Number of I/O	41
Program Memory Size	96KB (96K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	8K x 8
Voltage - Supply (Vcc/Vdd)	1.2V ~ 3.6V
Data Converters	-
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	128-TQFP
Supplier Device Package	128-TQFP15 (14x14)
Purchase URL	https://www.e-xfl.com/product-detail/epson/s1c17w23f101100-90

Email: info@E-XFL.COM

Address: Room A, 16/F, Full Win Commercial Centre, 573 Nathan Road, Mongkok, Hong Kong





16-bit Single Chip Microcontroller

- Low power operation from 1.2V with a single alkaline or silver oxide button battery.
- Low power consumption standby driving at HALT 0.3 μA .
 *super economy mode
- Built-in LCD Driver: 56 SEG x 24 COM (max.)
- Internal R/F converters enable to realize various sensing.

DESCRIPTIONS

The S1C17W22/W23 is a 16-bit MCU that features low-voltage operation from 1.2 V even though Flash memory is included. The embedded high-efficiency DC-DC converter generates the constant-voltage to drive the IC with lower power consumption than 4-bit MCUs. This IC includes a real-time clock, a stopwatch, an LCD driver, and a PWM timer capable of being used to generate drive waveforms for a motor driver as well as a high-performance 16-bit CPU. It is suitable for battery-driven applications that require an LCD display and timers.

■ FEATURES

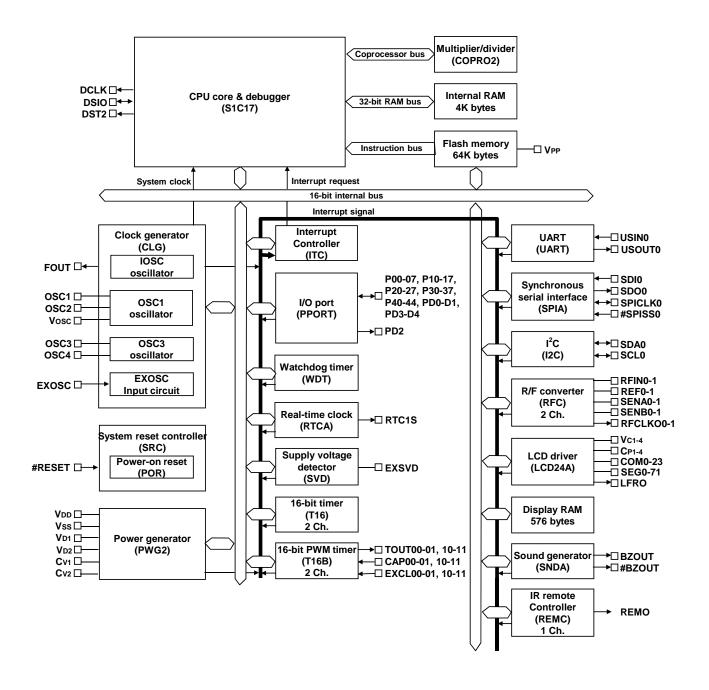
Model	S1C17W22	S1C17W23								
CPU	101011112	31311123								
CPU core	Seiko Epson original 16-bit RISC CPU core S1C17									
Other	On-chip debugger									
	Embedded Flash memory									
Capacity	64K bytes (for both instructions and data) 96K bytes (for both instructions and data)									
Erase/program count	50 times (min.) * Programming by the debu									
Other	Security function to protect from reading/pro	Security function to protect from reading/programming by ICDmini								
	On-board programming function using ICDr	nini								
Embedded RAM	<u>,</u>									
Capacity	4K bytes	8K bytes								
Embedded display RAM	- 7	, ,								
Capacity	576 bytes									
Clock generator (CLG)	<u></u>									
System clock source	4 sources (IOSC/OSC1/OSC3/EXOSC)									
System clock frequency	1.1 MHz (max.) VDD = 1.2 to 1.6 V									
(operating frequency) IOSC oscillator circuit	4.2 MHz (max.) VDD = 1.6 to 3.6 V									
IOSC oscillator circuit	700 kHz (typ.) embedded oscillator									
(boot clock source)	23 µs (max.) starting time (time from cancel	ation of SLEEP state to vector table								
	read by the CPU)									
OSC1 oscillator circuit	32.768 kHz (typ.) crystal oscillator	32.768 kHz (typ.) crystal oscillator								
	Oscillation stop detection circuit included									
OSC3 oscillator circuit	4.2 MHz (max.) crystal/ceramic oscillator									
	500 kHz, 1, 2, and 4 MHz-switchable embedded oscillator									
	500 Hz to 2 MHz CR oscillator (an external R is required)									
EXOSC clock input	4.2 MHz (max.) square or sine wave input									
Other	Configurable system clock division ratio									
	Configurable system clock used at wake up from SLEEP state									
	Operating clock frequency for the CPU and	all peripheral circuits is selectable.								
I/O port (PPORT)										
Number of	Input/output port: 41 bits (max.)									
general-purpose I/O	Output port: 1 bit (max.)									
ports	Pins are shared with the peripheral I/O.									
Number of input	37 bits									
interrupt ports										
Number of ports that	32 bits									
support	A peripheral circuit I/O function selected via software can be assigned to each port.									
universal port										
multiplexer (UPMUX)										
Timers Wetchdog timer (WDT) Congretog NIMI or wetchdog timer recet										
Watchdog timer (WDT)	Generates NMI or watchdog timer reset. 128–1 Hz counter, second/minute/hour/day/day of the week/month/year counters									
Real-time clock (RTCA)	Theoretical regulation function for 4 accord	l correction								
Theoretical regulation function for 1-second correction										

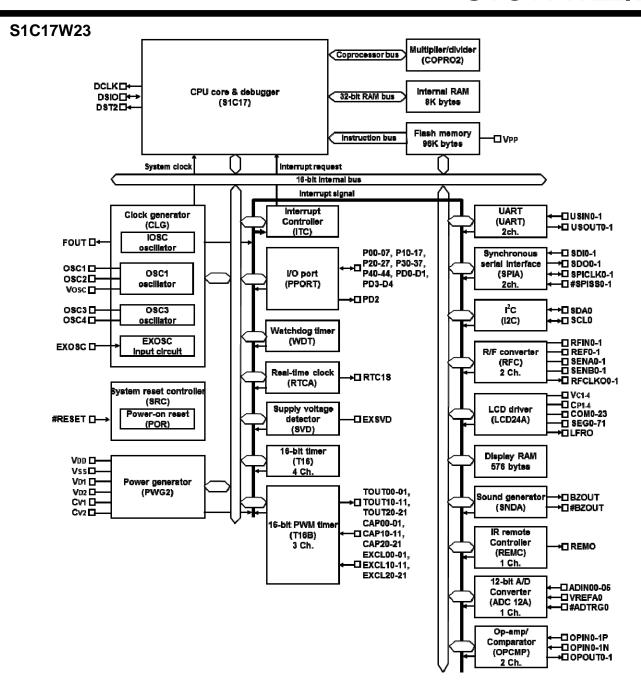
	Alama and atanwatah funations								
16-bit timer (T16)	Alarm and stopwatch functions 2 channels 4 channels								
10-bit timer (110)	1 channel can generate the SPIA master	Generates the SPIA master clocks							
	clock.	and							
		the ADC12A trigger signal.							
16-bit PWM timer	2 channels 3 channels								
(T16B)	Event counter/capture function								
	PWM waveform generation function								
Number of PWM output or capture input ports: 2 ports/channel Supply voltage detector (SVD)									
Detection level	30 levels (1.2 to 3.6 V)								
Other	Intermittent operation mode								
Other		Generates an interrupt or reset according to the detection level evaluation.							
Serial interfaces	, constant and an interest and a second a second and a second a second and a second a second and								
UART (UART)	1 channel	2 channels							
	Baud-rate generator included, IrDA1.0 supp								
Synchronous Serial	1 channel	2 channels							
Interface (SPIA)	2 to 16-bit variable data length	and rate generator in magazar made							
12C (I2C)	The 16-bit timer (T16) can be used for the b	aud-rate generator in master mode.							
120 (120)	1 channel Baud-rate generator included								
Sound generator (SNDA)	Dada Tate generator included								
Buzzer output function	512 Hz to 16 kHz output frequencies								
•	One-shot output function								
Melody generation	Pitch: 128 Hz to 16 kHz ≈ C3 to C6								
function	Duration: 7 notes/rests (Half note/rest to thin	rty-second note/rest)							
	Tempo: 16 tempos (30 to 480)								
ID assessed a sentential of OEA	Tie may be specified.								
IR remote controller (REN Number of transmitter	/IC)	1 shannal							
channels		1 channel							
LCD driver (LCD24A)									
LCD output	72 SEG × 1–8 COM (max.), 64 SEG × 9–16	6 COM (max.), 56 SEG × 17–24 COM							
	(max.)	(,, 55 5 2 5 2 . 5 5							
LCD contrast	32 levels (TBD to TBD V)								
Other 1/4 or 1/3 bias power supply included, external voltage can be applied.									
R/F converter (RFC) Conversion method	CD application type with 24 bit counters								
Number of conversion	CR oscillation type with 24-bit counters	ected to each channel)							
channels	2 channels (Up to two sensors can be connected to each channel.)								
Supported sensors	DC-bias resistive sensors, AC-bias resistive	e sensors (Ch.0 only)							
12-bit A/D converter (ADC		,							
Conversion method	-	Successive approximation type							
Resolution	-	12 bits							
Number of conversion	-	1 channel							
channels Number of analog signal	-	6 ports/channel							
inputs		ο ροιτο/οπαπιτοι							
Operational amplifier/com	parator (OPCMP)								
Number of channels	-	2 channels							
Multiplier/divider (COPRC									
Arithmetic functions	16-bit × 16-bit multiplier								
	16-bit × 16-bit + 32-bit multiply and accumu	lation unit							
Poset	32-bit ÷ 32-bit divider								
Reset #RESET pin	Reset when the reset pin is set to low.								
Power-on reset	Reset at power on.								
Key entry reset	Reset when the P00 to P01/P02/P03 keys are pressed simultaneously (can be								
	enabled/	, com so							
	disabled using a register).								
Watchdog timer reset	Reset when the watchdog timer overflows (can be enabled/disabled using a							
Overally well to see that	register).								
Supply voltage detector	Reset when the supply voltage detector det	ects the set voltage level (can be							
reset	enabled/ disabled using a register).								
Interrupt	a register j.								
ппопарі									

Non-maskable interrupt	4 systems (Reset, address misaligned inte	rrupt, debug, NMI)						
Programmable interrupt	External interrupt: 1 system (8 levels)							
	Internal interrupt: 16 systems (8 levels)	Internal interrupt: 23 systems (8 levels)						
Power supply voltage								
VDD operating voltage	1.2 to 3.6 V							
VDD operating voltage	1.8 to 3.6 V (VPP = 7.5 V external power supply is required.)							
for Flash programming								
VDD operating voltage	2.7 to 3.6 V							
for super economy								
mode								
Operating temperature	1 40 4 05 00							
Operating temperature	-40 to 85 °C							
range Current consumption								
SLEEP mode	0.15 µA (TBD)							
SLEEF Mode	IOSC = OFF, OSC1 = OFF, OSC3 = OFF							
HALT mode	0.5 µA (TBD)							
	OSC1 = 32 kHz, RTC = ON							
	0.3 μA (TBD)							
	OSC1 = 32 kHz, RTC = ON, super economy mode							
	1.5 µA (TBD)							
	OSC1 = 32 kHz, RTC = ON, CPU = OSC1, LCD = ON (no panel load, VC2							
	reference,							
BUN	1/3 bias), super economy mode							
RUN mode	8 µA (TBD)	FLACLICIA/ALT DDW/ALTI4/OLbito = 0×4						
	OSC1 = 32 kHz, RTC = ON, CPU = OSC1	, FLASHCWAIT.RDWAIT[1:0] DILS = UXT						
	4 µA (TBD) OSC1 = 32 kHz, RTC = ON, CPU = OSC1	super economy mode						
	FLASHCWAIT.RDWAIT[1:0] bits = 0x1	, super economy mode,						
	250 µA (TBD)							
	OSC3 = 1 MHz (internal oscillator), OSC1 = 32 kHz, RTC = ON, CPU = OSC3,							
	FLASHCWAIT.RDWAIT[1:0] bits = 0x1							
Shipping form								
1	TQFP15-128pin (Lead pitch: 0.4 mm)							
2	Die form (Pad pitch: 80 µm (min.))							

■ BLOCK DIAGRAM

S1C17W22

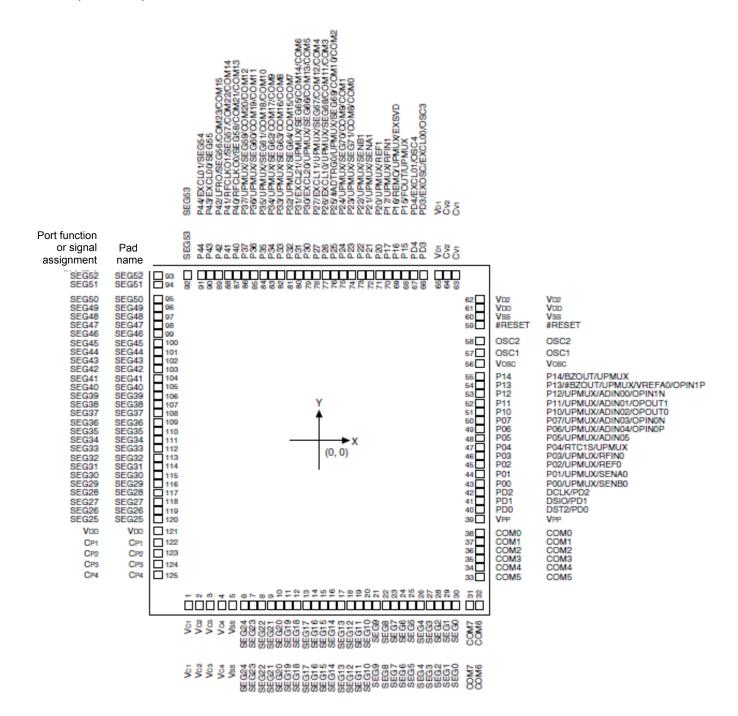


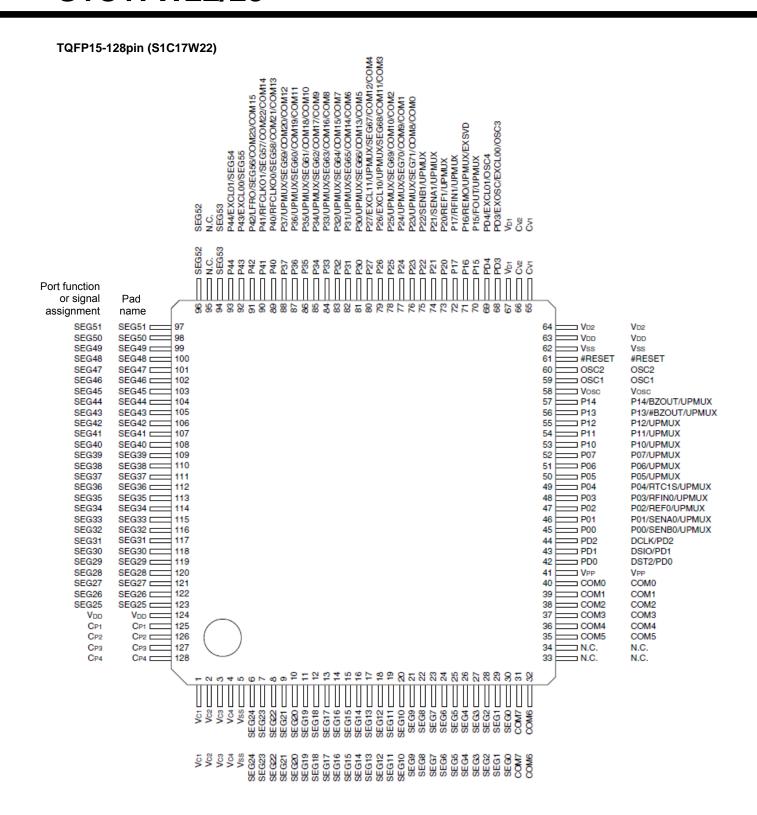


■ Pin Configuration Diagram

CHIP (S1C17W22) 12/00M4 11/00M3 P44/EXCL01/SEG54
P43/EXCL00/SEG56
P42/LFD/SEG56/COM23/COM15
P40/FFCLKO1/SEG57/COM22/COM14
P40/FFCLKO1/SEG57/COM21/COM13
P40/FFCLKO1/SEG57/COM21/COM13
P40/FFCLKO1/SEG57/COM21/COM13
P34/UPMUX/SEG61/COM19/COM11
P34/UPMUX/SEG61/COM19/COM10
P34/UPMUX/SEG61/COM11/COM9
P34/UPMUX/SEG61/COM11/COM9
P34/UPMUX/SEG61/COM11/COM9
P34/UPMUX/SEG61/COM11/COM19/COM10
P26/UPMUX/SEG61/COM11/COM19/COM10
P26/UPMUX/SEG61/COM11/COM19/COM10
P26/UPMUX/SEG61/COM10/COM11/COM10
P26/UPMUX/SEG61/COM10/COM11/COM10
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P26/UPMUX/SEG61/UCOM10/COM11/COM10
P26/UPMUX/SEG61/UCOM10/COM11/COM10/ Port function PP444 PP4441 PP4 or signal assignment Pad name 93 94 SEG52 SFG52 SEG51 SEG51 288888888888888888888888888888888 SEG50 SEG50 95 96 97 98 99 100 101 102 103 104 105 106 106 107 108 62 61 Vna Vna SEG49 SEG49 VDD VDD SEG48 SEG47 SEG48 SEG47 60 59 Vss Vss #RESET #RESET SEG46 SEG45 SEG46 SEG45 OSC₂ OSC2 SEG44 SEG43 SEG44 57 OSC1 OSC1 SEG43 Vosc 56 Vosc SEG42 SEG42 P14/BZOUT/UPMUX 55 SEG41 SEG40 SEG41 SEG40 P13 P12 P13/#BZOUT/UPMUX P12/UPMUX 53 SEG39 SEG38 P11 P10 P07 P11/UPMUX P10/UPMUX P07/UPMUX 52 SEG38 51 50 SEG37 SEG37 SEG36 SEG35 SEG36 SEG35 49 P06 P05 P06/UPMUX P05/UPMUX | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 48 SEG34 SEG34 P04/RTC1S/UPMUX P03/RFIN0/UPMUX 47 P04 SFG33 SEG33 (0, 0)P03 SEG32 SEG31 SEG30 SEG32 46 45 P02/REF0/UPMUX SEG31 SEG30 44 P01 P01/SENA0/UPMUX P00 P00/SENB0/UPMUX SEG29 SEG29 SEG28 43 PD2 PD1 42 DCLK/PD2 DSIO/PD1 SEG28 41 40 PDO DST2/PD0 SEG26 SEG26 SEG25 SEG25 39 ___121 COM0 COM1 COM2 VDD VDD COM0 38 COM1 COM2 37 36 CP1 C_{P1} ___122 CP2 C_{P2} **123** Die No. CJxxxxx 35 COM3 COM4 COM3 COM4 СРЗ СРЗ 124 CP4 125 CP4 COM5 COM5 32 SEG22 SEG22 SEG22 SEG32

CHIP (S1C17W23)





TQFP15-128pin (S1C17W23) PATIFICA, NOTISEGAT XONAZZOONA PATIFICA, NOTISEGAT XONAZZOONA PANIFICA, NOTISEGAS YOONA ZOONA SATUPA ULVISEGAS YOONA ZOONA SATUPA ULVISEGAS YOONA TOONA PANIFICANI STOONA TO PANIFICANI STOONA TOONA PANIFICA ZALUPA ULXISEGAS CONTISCOMA TAOONA PANIFICA ZALUPA ULXISEGAS CONTISCOMA PANIFICA TAUDAMULXISEGAS CONTISCOMA PANIFICA TAUDAMULXISEGAS CONTISCOMA PANIFICA TAUDAMULXISEGAS CONTISCOMA PANIFICANI TAUDAMULXISEGAS TAUDAMULXISEGAS CONTISCOMA PANIFICANI TAUDAMULXISEGAS TAUDAMULXISEGAS TAUDAMULXISEGAS TAUDAMULXISEGAS TAUDAMULXISEGAS TAUDAMULXISEGAS TAUDAMULXISEANI PRANIFICANI TAUDAMULXISEANI TAUDAMULXISEANI TAUDAMULXISEANI TAUDAMULXISEANI TAUDAMULXISEANI TAUDAMULXISEANI TAUDAMULXISEANI TAUDAMULXISEANI TAUDAMULXISEANI TAUDAMULXI TAUDAM Port function or signal Pad assignment name SEG54 SEGM F 97 T Vns Voo SEG49 SEG49 _____ 99 62 Vss Vss Vss SEG48 SEG48 100 #RESET #RESET SEG47 101 SEG47 60 OSC2 OSC2 SEG46 SEG45 SEG46 SEG45 102 OSC1 58 Vosc Vosc P14/BZOUT/UPMUX P13/#BZOUT/UPMUX/VREFA0/OPIN1P P12/UPMUX/ADIN00/OPIN1N SEG44 SEG44 104 105 □ P14 SEG43 SEG43 **=**P13 SEG42 SEG42 106 55 P12 SEG41 SEG41 P11/UPMUX/ADIN01/OPOUT SEG40 53 52 P10/UPMUX/ADIN02/OPOUT0 P07/UPMUX/ADIN03/OPIN0N P06/UPMUX/ADIN04/OPIN0P 108 □ P10 □ P07 SEG40 SEG39 109 SEG38 SEG38 110 51 ■ P06 P05 P05/UPMUX/ADIN05 P04/RTC1S/UPMUX SEG37 50 49 SEG36 SEG36 112 P03/UPMUX/RFIN0 P02/UPMUX/REF0 P01/UPMUX/SENA0 SEG35 ==== — P03 — P02 SEG35 113 114 SEG34 SEG33 SEG33 115 46 ___ P01 SEG32 SEG32 = P00 P00/UPMUX/SENB0 SEG31 117 44 PD2 DCLK/PD2 42 SEG29 SEG29 119 $\neg PD0$ DST2/PD0 SEG28 = 120 VPP COM0 Vpp COM0 SEG28 SEG27 SEG26 SEG26 c 122 39 38 □ COM1 COM1 SEG25 123 COM2 COM2 VDD CP1 CP2 CP3 VDD CP1 124 125 COM3 37 36 COM3 COM4 COME N.C. N.C. CP₂ = 126 35 COM5 127 N.C.

■ Pin Descriptions

Symbol meanings

Assigned signal: The signal listed at the top of each pin is assigned in the initial state. The pin function must

be switched via software to assign another signal (see the "I/O Ports" chapter).

O = Output
I/O = Input/output
P = Power supply
A = Analog signal
Hi-Z = High impedance state

Initial state: I (Pull-up) = Input with pulled up

I (Pull-down) = Input with pulled down
Hi-Z = High impedance state
O (H) = High level output

O (L) = High level output

Tolerant fail-safe structure:

= Over voltage tolerant fail-safe type I/O cell included

(see the "I/O Ports" chapter)

Pin/pad name	Assigned signal	I/O	Initial state	Tolerant fail-safe structure	Function
VDD	VDD	Р	_	_	Power supply (+)
VSS	VSS	Р	_	_	GND
VPP	VPP	Р	_	_	Power supply for Flash programming
VD1	VD1	Α	_	_	DC-DC converter output
VD2	VD2	Α	_	_	DC-DC converter stabilization capacitor connect pin
CV1-2	CV1-2	Α	_	_	DC-DC converter charge pump capacitor connect pins
VC1-4	VC1-4	P	_	_	LCD panel driver power supply
CP1-4	CP1-4	Α	_	_	LCD power supply booster capacitor connect pins
VOSC	VOSC	Α	_	_	OSC1 oscillator circuit voltage regulator output
OSC1	OSC1	Α	_	_	OSC1 oscillator circuit input
OSC2	OSC2	Α	_	_	OSC1 oscillator circuit output
#RESET	#RESET	1	I (Pull-up)	_	Reset input
P00	P00	I/O	Hi-Z	_	I/O port
. 00	UPMUX	1/0			User-selected I/O (universal port multiplexer)
	SENB0	A			R/F converter Ch.0 sensor B oscillator pin
P01	P01	1/0	Hi-Z		I/O port
	UPMUX	1/0	1112		User-selected I/O (universal port multiplexer)
	SENA0	A			R/F converter Ch.0 sensor A oscillator pin
P02	P02	1/0	Hi-Z		I/O port
1 02	UPMUX	1/0	111-2	_	User-selected I/O (universal port multiplexer)
	REF0	A			R/F converter Ch.0 reference oscillator pin
P03	P03	1/0	Hi-Z		I/O port
FU3	UPMUX	1/0	⊓I-Z	_	User-selected I/O (universal port multiplexer)
	RFIN0				R/F converter Ch.0 oscillation input
P04	P04	I/O	Hi-Z		I/O port
P04	RTC1S	0	⊓I-Z	✓	
	UPMUX	1/0			Real-time clock 1-second cycle pulse output
DOF			11: 7		User-selected I/O (universal port multiplexer)
P05	P05 UPMUX	I/O I/O	Hi-Z	_	I/O port
					User-selected I/O (universal port multiplexer)
	ADIN05	Α			12-bit A/D converter Ch.0 analog signal input 5
P06	P06	I/O	Hi-Z		(S1C17W23 only)
P06	UPMUX	1/0	⊓I-Z	_	
	ADIN04	1/O A			User-selected I/O (universal port multiplexer) 12-bit A/D converter Ch.0 analog signal input 4
	ADIN04	A			(S1C17W23 only)
	OPIN0P	Α			Operational amplifier/comparator Ch.0 analog signal input (+)
	01 11101	'`			(S1C17W23 only)
P07	P07	I/O	Hi-Z	_	I/O port
. 0.	UPMUX	1/0			User-selected I/O (universal port multiplexer)
	ADIN03	A			12-bit A/D converter Ch.0 analog signal input 3
	1.0.1100	^`			(S1C17W23 only)
	OPIN0N	А			Operational amplifier/comparator Ch.0 analog signal input (-) (S1C17W23 only)
P10	P10	I/O	Hi-Z	_	I/O port
-	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	ADIN02	A			12-bit A/D converter Ch.0 analog signal input 2
					(S1C17W23 only)
	OPOUT0	Α			Operational amplifier/comparator Ch.0 analog signal output

					(S1C17W23 only)
P11	P11	I/O	Hi-Z	_	I/O port
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	ADIN01	Α			12-bit A/D converter Ch.0 analog signal input 1
					(S1C17W23 only)
	OPIOUT1	Α			Operational amplifier/comparator Ch.1 analog signal output
					(S1C17W23 only)
P12	P12	I/O	Hi-Z	_	I/O port
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	ADIN00	Α			12-bit A/D converter Ch.0 analog signal input 0
	OPIN1N	Α			(S1C17W23 only) Operational amplifier/comparator Ch.1 analog signal input (-)
	OPININ	A			(S1C17W23 only)
P13	P13	I/O	Hi-Z	_	I/O port
	#BZOUT	0			Sound generator inverted output
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	VREFA0	Α			12-bit A/D converter Ch.0 reference voltage input
					(S1C17W23 only)
	OPIN1P	Α			Operational amplifier/comparator Ch.1 analog signal input (+)
					(S1C17W23 only)
P14	P14	I/O	Hi-Z	_	I/O port
	BZOUT	0			Sound generator output
P15	UPMUX P15	I/O I/O	Hi-Z	,	User-selected I/O (universal port multiplexer) I/O port
PIS	FOUT	0	⊓I-Z	✓	Clock external output
	UPMUX	1/0			User-selected I/O (universal port multiplexer)
P16	P16	1/0	Hi-Z	_	I/O port
1 10	REMO	0	111-2		IR remote controller transmit data output
	UPMUX	1/0			User-selected I/O (universal port multiplexer)
	EXSVD	A			External power supply voltage detection input
P17	P17	I/O	Hi-Z	1	I/O port
	UPMUX	I/O		-	User-selected I/O (universal port multiplexer)
	RFIN1	Α			R/F converter Ch.1 oscillation input
P20	P20	I/O	Hi-Z	✓	I/O port
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	REF1	Α			R/F converter Ch.1 reference oscillator pin
P21	P21	I/O	Hi-Z	✓	I/O port
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
P22	SENA1 P22	A I/O	Hi-Z	1	R/F converter Ch.1 sensor A oscillator pin I/O port
F22	UPMUX	1/0	⊓I-Z	v	User-selected I/O (universal port multiplexer)
	SENB1	A			R/F converter Ch.1 sensor B oscillator pin
P23	P23	1/0	Hi-Z	1	I/O port
1 - 20	UPMUX	I/O		•	User-selected I/O (universal port multiplexer)
	SEG71	Α			LCD segment output
	COM8/COM0	Α			LCD COMMON OUTPUT
P24	P24	I/O	Hi-Z	1	I/O port
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	SEG70	Α			LCD segment output
	COM9/COM1	Α			LCD COMMON OUTPUT
P25	P25	I/O	Hi-Z	✓	I/O port
	#ADTRG0	1/0			12-bit A/D converter Ch.0 trigger input (S1C17W23 only)
	UPMUX SEG69	I/O			User-selected I/O (universal port multiplexer)
	COM10/COM2	A			LCD segment output LCD COMMON OUTPUT
P26	P26	I/O	Hi-Z	/	I/O port
- 20	EXCL10	ı, U	111-2	,	16-bit PWM timer Ch.1 event counter input 0
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	SEG68	A			LCD segment output
	COM11/COM3	Α			LCD COMMON OUTPUT
P27	P27	I/O	Hi-Z	✓	I/O port
	EXCL11	I			16-bit PWM timer Ch.1 event counter input 1
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	SEG67	Α			LCD segment output
	COM12/COM4	A	,=		LCD COMMON OUTPUT
P30	P30	I/O	Hi-Z	✓	I/O port
	EXCL20				16-bit PWM timer Ch.2 event counter input 0 (S1C17W23
	UPMUX	I/O			only) User-selected I/O (universal port multiplexer)
	SEG66	1/O A			LCD segment output
	COM13/COM5	A			LCD COMMON OUTPUT
P31	P31	1/0	Hi-Z	/	I/O port
	1		· · · · · -	•	The state of the s

	EVOL04		1		140 L '' DIAMA (' 01 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	EXCL21	ı			16-bit PWM timer Ch.2 event counter input 1 (S1C17W23
	LIDAMIN	1/0	-		only)
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	SEG65	Α			LCD segment output
	COM14/COM6	Α			LCD COMMON OUTPUT
P32	P32	I/O	Hi-Z	✓	I/O port
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	SEG64	Α			LCD segment output
	COM15/COM7	Α			LCD COMMON OUTPUT
P33	P33	I/O	Hi-Z	/	I/O port
	UPMUX	I/O		-	User-selected I/O (universal port multiplexer)
	SEG63	Α			LCD segment output
	COM16/COM8	A	1		LCD COMMON OUTPUT
P34	P34	I/O	Hi-Z	/	I/O port
1 34	UPMUX	1/0	111-2	•	User-selected I/O (universal port multiplexer)
	SEG62	A			LCD segment output
	COM17/COM9	A			LCD COMMON OUTPUT
P35	P35	I/O	Hi-Z	✓	I/O port
	UPMUX	I/O			User-selected I/O (universal port multiplexer)
	SEG61	Α			LCD SEGMENT OUTPUT
	COM18/COM10	Α			LCD COMMON OUTPUT
P36	P36	I/O	Hi-Z	✓	I/O port
	UPMUX	I/O		-	User-selected I/O (universal port multiplexer)
	SEG60	Α			LCD SEGMENT OUTPUT
	COM19/COM11	A	1		LCD COMMON OUTPUT
P37	P37	1/0	Hi-Z	/	I/O port
1 37	UPMUX	1/0	111-2	•	User-selected I/O (universal port multiplexer)
	SEG59	_			LCD SEGMENT OUTPUT
		A			
D.10	COM20/COM12	A			LCD COMMON OUTPUT
P40	P40	I/O	Hi-Z	✓	I/O port
	RFCLKO0	0			R/F converter Ch.0 clock monitor output
	SEG58	Α			LCD SEGMENT OUTPUT
	COM21/COM13	Α			LCD COMMON OUTPUT
P41	P41	I/O	Hi-Z	✓	I/O port
	RFCLKO1	0			R/F converter Ch.1 clock monitor output
	SEG57	Α	1		LCD SEGMENT OUTPUT
	COM22/COM14	Α			LCD COMMON OUTPUT
P42	P42	I/O	Hi-Z	/	I/O port
' '-	LFRO	0	1	•	LCD frame signal monitor output
	SEG56	A			LCD SEGMENT OUTPUT
	COM23/COM15	A			LCD COMMON OUTPUT
D42			11: 7	,	
P43	P43	I/O	Hi-Z	✓	I/O port
	EXCL00	<u>!</u>			16-bit PWM timer Ch.0 event counter input 0
	SEG55	Α			LCD SEGMENT OUTPUT
P44	P44	I/O	Hi-Z	✓	I/O port
	EXCL01	I]		16-bit PWM timer Ch.0 event counter input 1
	SEG54	Α			LCD SEGMENT OUTPUT
PD0	DST2	0	O (L)	1	On-chip debugger status output
	PD0	I/O] ' '		I/O port
PD1	DSIO	I/O	I (Pull-up)	✓	On-chip debugger status output
	PD1	I/O	(- : : - : - /	•	I/O port
PD2	DCLK	0	O (H)	1	On-chip debugger status output
	PD2	0	(11)	"	I/O port
PD3	PD3	1/0	Hi-Z	_	I/O port
1 03	EXOSC	1/0	111-2	_	Clock generator external clock input
		l I			
	EXCL00	ļ			16-bit PWM timer Ch.0 event counter input 0
	OSC3	A	ļ		OSC3 oscillator circuit input
PD4	PD4	I/O	Hi-Z	-	I/O port
	EXCL01	l]		16-bit PWM timer Ch.0 event counter input 1
	OSC4	Α			OSC3 oscillator circuit output
COM0-7	COM0-7	Α	Hi-Z	_	LCD COMMON OUTPUT
SEG0-53	SEG0-53	Α	Hi-Z	_	LCD SEGMENT OUTPUT
Notoo	In the periphers		t description	the essianed sign	ad name is used so the nin name

Notes:

[·] In the peripheral circuit descriptions, the assigned signal name is used as the pin name.

[·] Both the S1C17W23 A/D converter and operational amplifier/comparator pins are assigned to the same pin function.

Universal port multiplexer (UPMUX)

The universal port multiplexer (UPMUX) allows software to select the peripheral circuit input/output function to be assigned to each pin from those listed below.

Peripheral circuit	Signal to be assigned	I/O	Channel number n	Function
Synchronous serial	SDI <i>n</i>	I	S1C17W22: n = 0	SPIA Ch.n data input
interface	SDO <i>n</i>	0	S1C17W23: n = 0, 1	SPIA Ch.n data output
(SPIA)	SPICLK <i>n</i>	I/O		SPIA Ch.n clock input/output
	#SPISSn	I		SPIA Ch.n slave-select input
I2C	SCL <i>n</i>	I/O	S1C17W22: n = 0	I2C Ch.n clock input/output
(I2C)	SDA <i>n</i>	I/O	S1C17W23: n = 0	I2C Ch.n data input/output
UART	USIN <i>n</i>	I	S1C17W22: n = 0	UART Ch.n data input
(UART)	USOUT <i>n</i>	0	S1C17W23: n = 0, 1	UART Ch.n data output
16-bit PWM timer	TOUTn0/CAPn0	I/O	S1C17W22: n = 0, 1	T16B Ch.n PWM output/capture input 0
(T16B)	TOUTn1/CAPn1	I/O	S1C17W23: <i>n</i> = 0, 1, 2	T16B Ch.n PWM output/capture input 1

Note: Do not assign a function to two or more pins simultaneously.

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