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S5U1C17F57T Manual

(Software Evaluation Tool for S1C17F57)

SEIKO EPSON CORPORATION

Rev.1.1

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Configuration of product number

●Devices

S1 C 17xxx F 00E1 00

■Packing specifications
- 00: Besides tape & reel
- 0A: TCP BL — 2 directions
- 0B: Tape & reel — BACK
- 0C: TCP BR — 2 directions
- 0D: TCP BT — 2 directions
- 0E: TCP BD — 2 directions
- 0F: Tape & reel — FRONT
- 0G: TCP BT — 4 directions
- 0H: TCP BD — 4 directions
- 0J: TCP SL — 2 directions
- 0K: TCP SR — 2 directions
- 0L: Tape & reel — LEFT
- 0M: TCP ST — 2 directions
- 0N: TCP SD — 2 directions
- 0P: TCP ST — 4 directions
- 0Q: TCP SD — 4 directions
- 0R: Tape & reel — RIGHT
- 99: Specs not fixed

■Specification

■Package
[D: bare chip, F: QFP, B: BGA]

■Model number

■Model name
[C: microcomputer, digital products]

■Product classification
[S1: semiconductor]

● Development tools

S5U1 C 17000 Y2 1 00

■Packing specifications
[00: standard packing]

■Version
[1: Version 1]

■Tool type
- Hx: ICE
- Dx: Evaluation board
- Ex: ROM emulation board
- Mx: Emulation memory for external ROM
- Tx: A socket for mounting
- Cx: Compiler package
- Sx: Middleware package
- Yx: Writer software

■Corresponding model number
[17xxx: for S1C17xxx]

■Tool classification
[C: microcomputer use]

■Product classification
[S5U1: development tool for semiconductor products]

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1. Overview

The S5U1C17F57T1 (SVT17F57: Software eValuation Tool for S1C17F57) and the S5U1C17F57T2(SVTmini 17F57: Software eValuation Tool for S1C17F57) [*1] are evaluation and development support boards for the Seiko Epson single-chip microcontroller S1C17F57.

The S5U1C17F57T1 is composed of a CPU board and a peripheral board. In the CPU board, an IC socket for the S1C17F57, extension connectors, debug connectors for the S1C17F57 and others are built-in. In the peripheral board, an EPD (Electrophoretic Display) panel, EPD panel connectors, EPD panel connector pads, a buzzer, a tact switch and others are built-in. These make it possible to perform the functions such as the EPD drive display, buzzer rumbling and switch input.

The S5U1C17F57T2 is composed only of the CPU board that is used in the S5U1C17F57T1, and can be applicable for various applications using the extension connectors.

1)	CPU	S1C17F57 (QFP15-128)
2)	Power supply voltage	External power supply (DC3.0V) Coin battery (CR2032: 3.0 V) (inserted in the battery folder)
3)	CPU clock	OSC1 : 32.768kHz crystal oscillator OSC3 : 4.000MHz crystal oscillator
4)	Built-in devices	
	CPU board:	IC socket for S1C17F57 (S1C17F57 is inserted) Crystal oscillator Reset switch Extension connector LED USB interface and connector Jumper switches for various settings
	Peripheral board:	EPD panel connectors and connector pads EPD panel (DM-EPS2) Tact switches Buzzer Power supply switch Jumper switches for various settings
5)	Accessories	Jumper switch × 3 Power supply cable
6)	Operating temperature range	5 °C to 35 °C
7)	Operating voltage range	2.0 V to 5.5 V

*1: The S5U1C17F57T1 is a package of the CPU board and the peripheral board, and the S5U1C17F57T2 is a package only of the CPU board.

1. Overview

1.1 Usage Method

The S1C17F57 software debugging and evaluation environment can be set up with the following procedures.

<For Software Debugging>

(1) Connect the 4-pin connector for the target and the 4-pin connector for the Flash programming power supply of the ICDminiVer.2 to the connectors (CN2-1 (J5) and CN2-2 (J6)) of the CPU board, respectively, using the dedicated cables that are included in the S5U1C17001H2 (ICDminiVer.2).

(2) Place the VDD power supply selection jumper switch (JP14) of the CPU board on the “EXT” side.

(3) Place the VPP power supply selection jumper switch (JP12) of the CPU board on the “ICD” side.

(4) Set the jumper switches of the CPU board as follows.
JP1, JP2, JP3, JP17: Short
JP13, JP18, JP19: Open
If the peripheral board is connected, set JP23 of the peripheral board to open.

(5) Supply the power output from a stabilized power supply or the power output from the ICDminiVer.2 to the power supply connector (CN3 (J8)) of the CPU board. The power supply voltage should be within the S1C17F57 operating power supply voltage range.

(6) Connect the ICDminiVer.2 to the PC using the USB cable included in the ICDminiVer.2.

In addition, set DIP switches of the ICDminiVer.2 as follows
“Selecting the DSIO signal level” (SW4, SW5) “Voltage input from the target”
“Selecting the Flash programming voltage output” (SW8) ON

<For Free-run with External Power Supply>

(1) Place the VDD power supply selection jumper switch (JP14) of the CPU board on the “EXT” side.

(2) Set the jumper switches of the CPU board as follows.
JP1, JP2, JP3, JP17: Short
JP13, JP18, JP19: Open
If the peripheral board is connected, set JP23 of the peripheral board to open.

(3) Supply the power output from a stabilized power supply to the power supply connector (CN3 (J8)) of the CPU board. The power supply voltage should be within the S1C17F57 operating power supply voltage range.

<For Free-run with Coin Battery (when the CPU board and the peripheral board are used as a set)>

(1) Place the VDD power supply selection jumper switch (JP14) of the CPU board on the “EXT” side.

(2) Set the jumper switches of the CPU board as follows.
JP1, JP2, JP3 Short
JP13, JP17, JP18, JP19 Open
Place JP23 of the peripheral board on the “BATT” side.

(3) Insert the coin battery to the battery folder mounted on the peripheral board.

(4) Set the power supply switch (SW2) of the peripheral board to the “ON” side.

The factory default settings are the above.

Table 1.1 Jumper setting list in each mode

Board	Jumper switch number	Software debugging	Free-run with external power supply	Free-run with coin battery
CPU	JP1-JP3	ON	ON	ON
	JP4-JP11	—	—	—
	JP12	ICD	—	—
	JP13	OPEN	OPEN	OPEN
	JP14	EXT	EXT	EXT
	JP15-16	—	—	—
	JP17	ON	ON	OPEN
	JP18-19	OPEN	OPEN	OPEN
Peripheral	JP1-22	—	—	—
	JP23	OPEN	OPEN	BATT
	JP24-29	—	—	—

ON: Place the jumper switch
OPEN: Remove the jumper switch
—: Arbitrary
Other: Place the jumper switch to the side of this name

2. Name and Functions of Each Part

2.1 Name of Each Part

The followings show the name of each part.

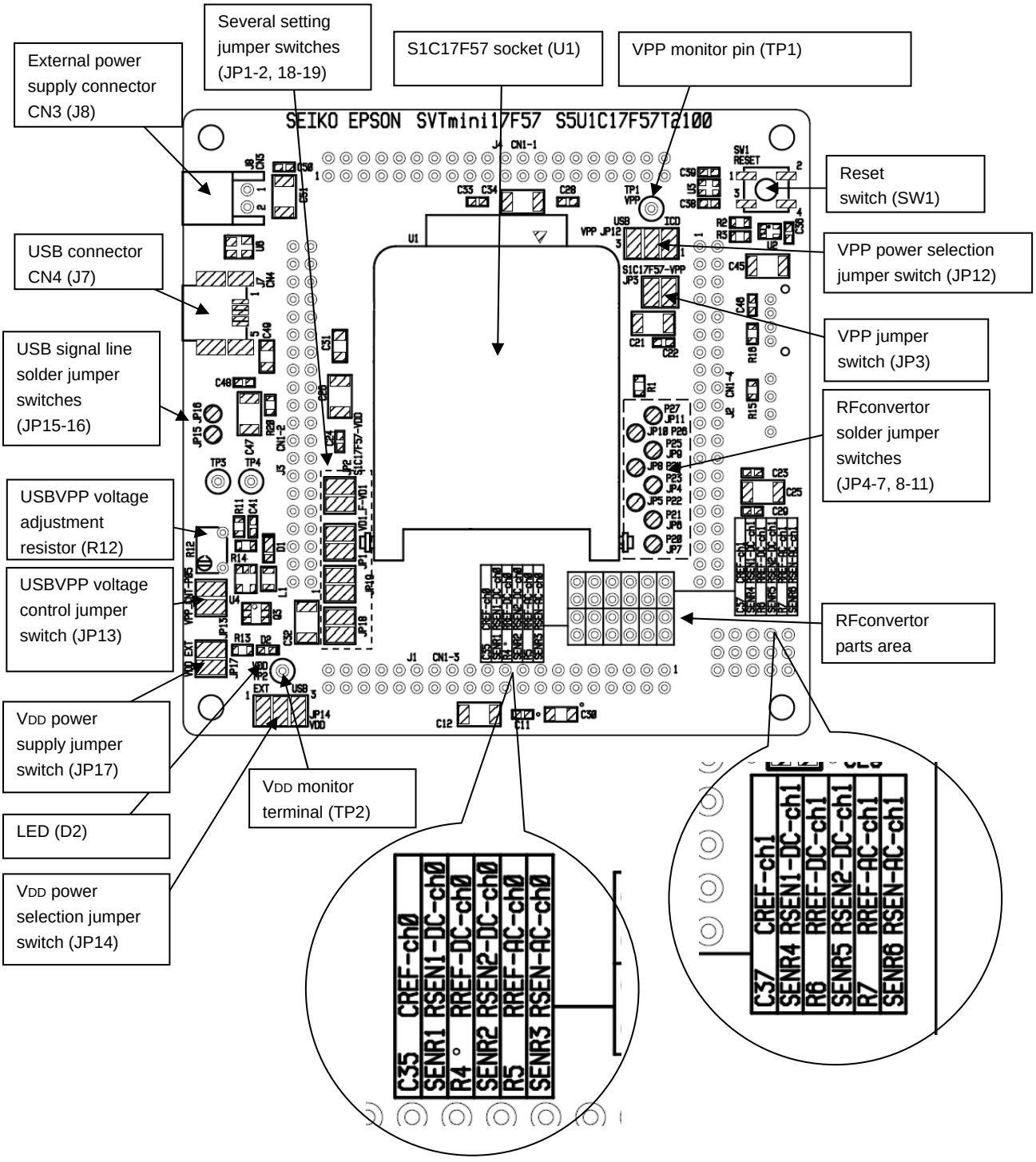


Figure 2.1 Name of each part for S5U1C17F57T1 CPU board (front side)

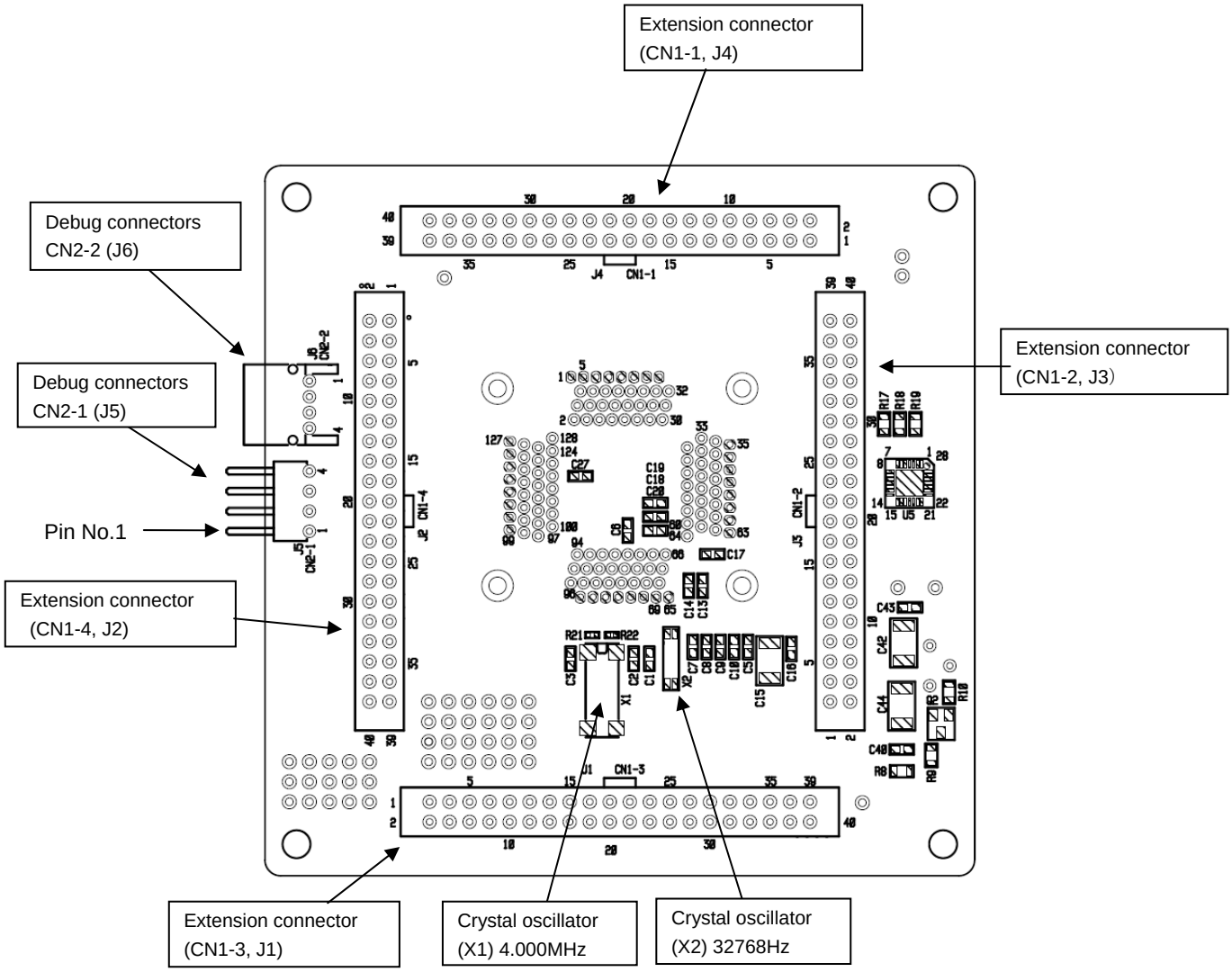


Figure 2.2 Name of each part for S5U1C17F57T1 CPU board (reverse side)

Note: The No.1 pin position of the CN2-1 (J5) connector is shown above. When connecting the ICDminiVer.2 to this board, confirm the direction of the connector carefully.

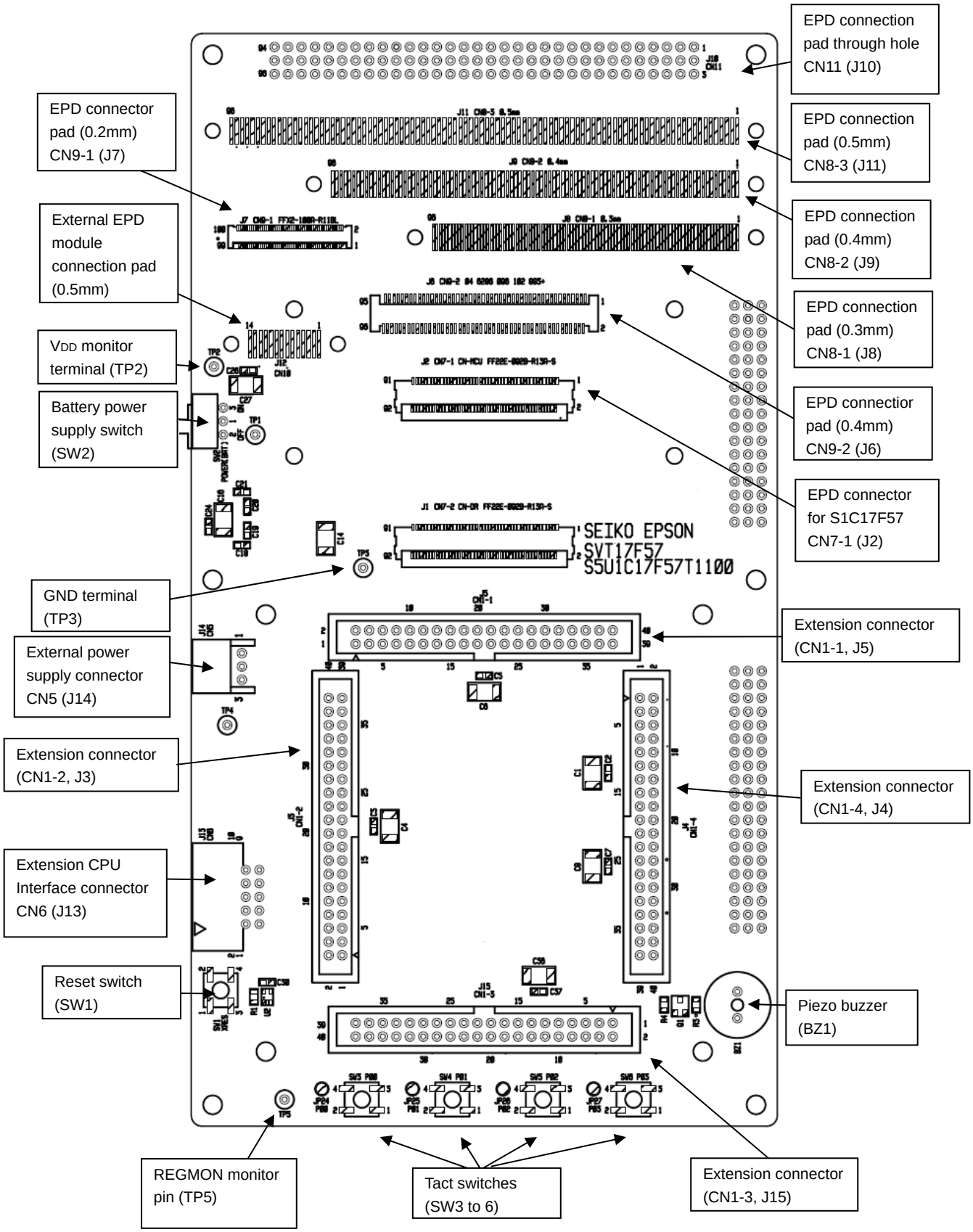


Figure 2.3 Name of each part for S5U1C17F57T1 peripheral board (front side)

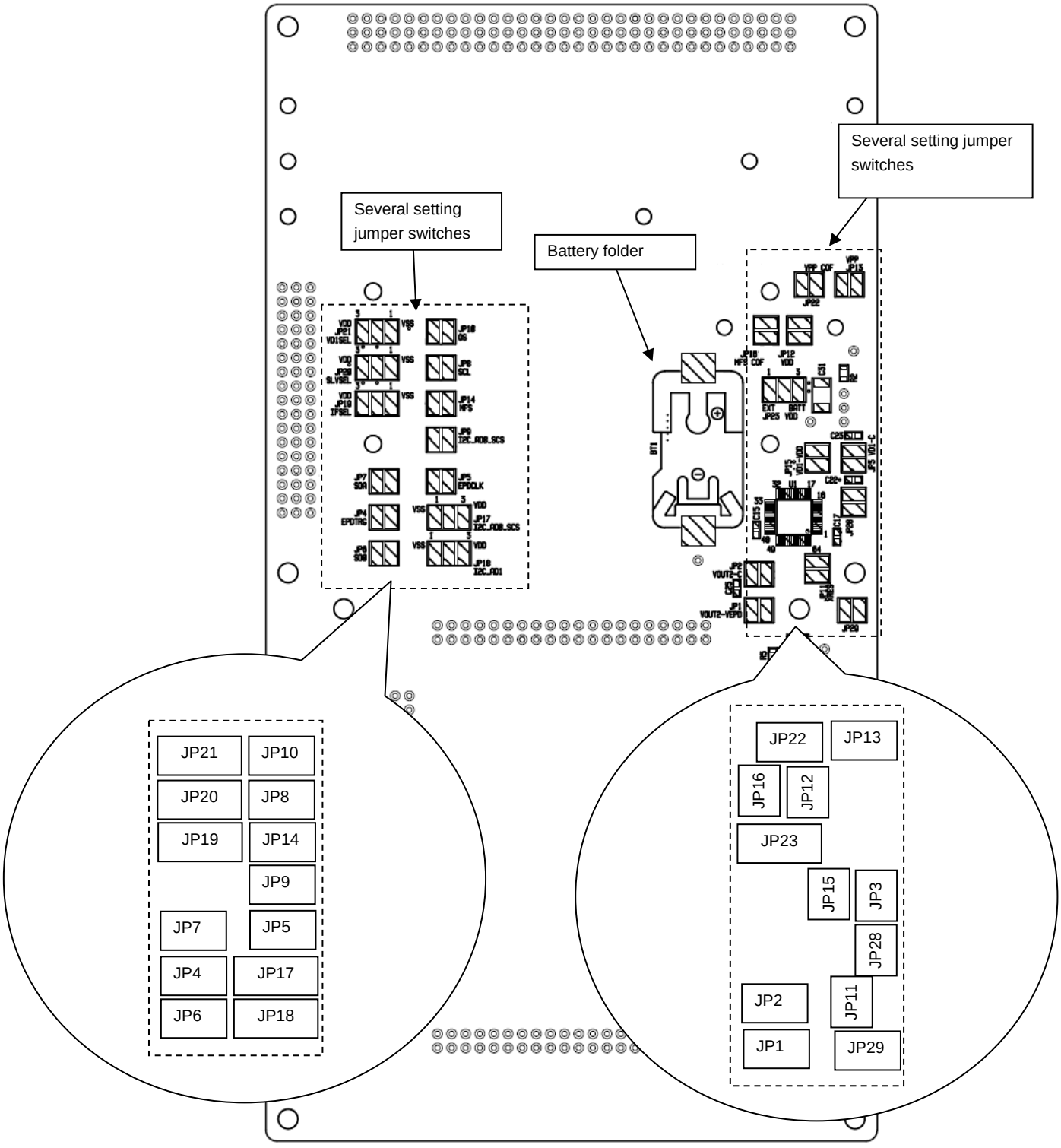


Figure 2.4 Name of each part for S5U1C17F57T1 peripheral board (reverse side)

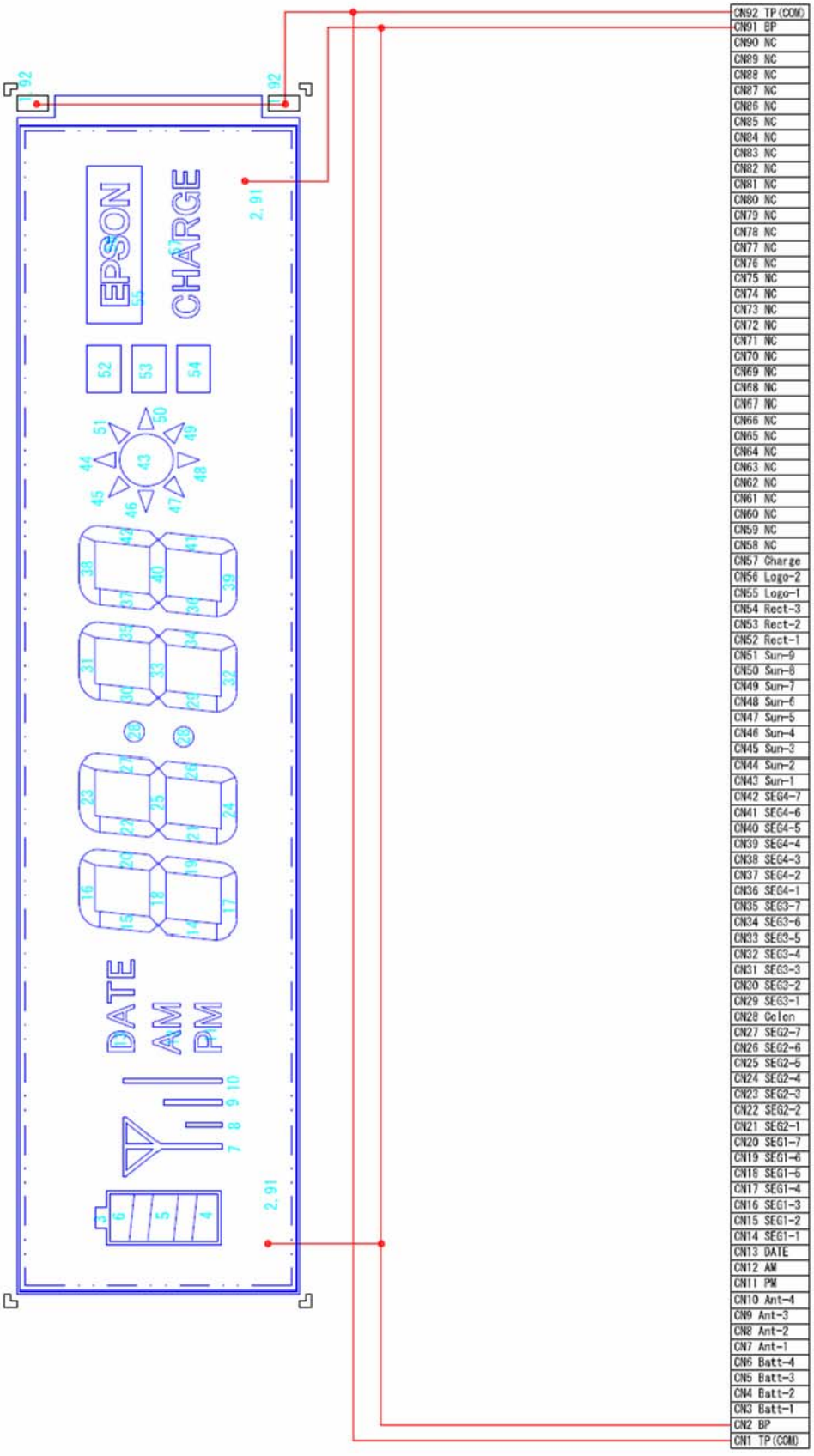


Figure 2.5 Connection diagram of EPD module (DM-EPS2)

2.2 Functions of Each Part

2.2.1 Jumper Switch Functions

Table 2.2.1 Jumper function list for CPU board

Name	Type	Function	Factory default setting	Selectable setting
JP1 (VD1_F-VD1)	Pin	Connects the S1C17F57 VD1_F terminal to the VD1 terminal.	Short	Open
JP2 (S1C17F57-VDD)	Pin	Connects the S1C17F57 VDD terminal to the VDD power supply.	Short	Open
JP3 (S1C17F57-VPP)	Pin	Connects the S1C17F57 VPP terminal to the VPP power supply.	Short	Open
JP4 to JP7	Solder bridge	Selects the usage of the S1C17F57 P20 to P23 terminals. Short: General purpose I/O Open: RF converter component connection	Short	Open
JP8 to JP11	Solder bridge	Selects the usage of the S1C17F57 P24 to P27 terminals. Short: General purpose I/O Open: RF converter component connection	Short	Open
JP12(VPP)	Pin	Selects the S1C17F57 Flash programming power supply. 1(ICD): External power supply connector CN2-2(J6) 3(USB): USB VBUS boost power supply	1(ICD)	3(USB)
JP13 (VPP_CNT-P05)	Pin	Enables the USB power supply boost circuit. Short: Enables the USB power supply boost control Open: Disables the USB power supply boost control	Open	Short
JP14(VDD)	Pin	Selects the S1C17F57 VDD power supply. 1(EXT): External power supply connector CN3(J8) 3(USB): USB VBUS power supply When using the coin battery in the peripheral board, set to “1 (EXT)” and set JP17 to open. Or remove this jumper switch.	1(EXT)	3(USB) Open
JP15	Solder bridge	Connects the signal line (SIN) between the CP2102 and the S1C17F57.	Open	Short
JP16	Solder bridge	Connects the signal line (SOUT) between the CP2102 and the S1C17F57.	Open	Short
JP17 (VDD_EXT)	Pin	Supplies the power from the external VDD power supply connector CN3 (J8). Short: Supplies Open: Does no supply.	Open	Short
JP18	Pin	Connects the S1C17F57 VE1 terminal to the VE2 terminal.	Open	Short
JP19	Pin	Connects the S1C17F57 VE2 terminal to the VDD terminal.	Open	Short

Table 2.2.2 Jumper function list for peripheral board

Name	Type	Function	Factory default setting	Selectable setting
JP1(VOUT2-VEPD)	Pin		Short	Open
JP2(VOUT2-C)	Pin		Short	Open
JP3(VD1-C)	Pin		Short	Open
JP4(EPDTRG)	Pin		Short	Open
JP5(EPDCLK)	Pin		Short	Open
JP6(SDO)	Pin		Short	Open
JP7(SDA)	Pin		Short	Open
JP8(SPICLK)	Pin		Short	Open
JP9(I2C_AD0_SCS)	Pin		Short	Open
JP10(OS)	Pin		Open	Short
JP11(XRES)	Pin		Short	Open
JP12(V_{DD})	Pin		Short	Open
JP13(VPP)	Pin		Open	Short
JP14(MFS)	Pin		Open	Short
JP15(VD1-V_{DD})	Pin		Open	Short
JP16(MFS)	Pin	Connects the external EPD module connector pad CN10 (J12) to the MFS terminal.	Open	Short
JP17(I2C_AD0_SCS)	Pin		Open	1(V_{SS}) 3(V_{DD})
JP18(I2C_AD1)	Pin		Open	1(V_{SS}) 3(V_{DD})
JP19(IFSEL)	Pin		3(V_{DD})	1(V_{SS}) Open
JP20(SLVSEL)	Pin		3(V_{DD})	1(V_{SS}) Open
JP21(VD1SEL)	Pin		3(V_{DD})	1(V_{SS}) Open
JP22(VPP)	Pin	Connect the external EPD module connector pad CN10 (J12) to the VPP terminal.	Open	Short
JP23(V_{DD})	Pin	Selects the V_{DD} power supply. 3(BATT): Coin battery 1(EXT): Power supply connector CN5(J14)	3(BATT)	1(EXT) Open
JP24-27	Solder bridge	Connects tact switches to the P00 – P03 port.	Short	Open
JP28	Pin		Open	Short
JP29	Pin		Short	Open

2.2.2 Functions of Each Component

Table 2.2.3 Component and function list for CPU board

Name	Location	Function
IC socket	U1	For the S1C17F57
Connector	CN1-1 to 4 (J4,J3,J1,J2)	Interface with the peripheral board (external)
Connector	CN2-1 to 2(J5,J6)	Debug interface (for the S5U1C17001H2)
Connector	CN3(J8)	External power supply connector
Connector	CN4(J7)	USB connector
LED	D2	Lit when using the external V_{DD} power supply
Switch	SW1	System reset
Monitor pin	TP1(VPP)	VPP (USB VBUS boost) power supply monitor pin
Monitor terminal	TP2(V_{DD})	V_{DD} power supply monitor through-hole
Monitor terminal	TP3,TP4	Serial interface signal monitor through-hole
Capacitor	C35	Reference capacitor (DC/AC bias, channel 0)

Resistor	R4	Reference resistor (DC bias, channel 0)
Sensor	SENR1	Resistive sensor 1 (DC bias, channel 0)
Sensor	SENR2	Resistive sensor 2 (DC bias, channel 0)
Resistor	R5	Reference resistor (AC bias, channel 0)
Resistive sensor	SENR3	Resistive sensor (AC bias, channel 0)
Capacitor	C37	Reference capacitor (DC/AC bias, channel 1)
Resistor	R6	Reference resistor (DC bias, channel 1)
Sensor	SENR4	Resistive sensor 1 (DC bias, channel 1)
Sensor	SENR5	Resistive sensor 2 (DC bias, channel 1)
Resistor	R7	Reference resistor (AC bias, channel 1)
Resistive sensor	SENR6	Resistive sensor (AC bias, channel 1)

Table 2.2.4 Component and function list for peripheral board

Name	Location	Function
IC	U1	
Connector	CN1-1 to 4(J5,J3,J15,J4)	Interface with the CPU board
Connector	CN5(J14)	Dedicated external power supply connector for the peripheral board with stand-alone operation (When the CPU board is connected, the external power supply connector CN3 is used.)
Connector	CN6(J13)	Interface with the external CPU
Connector	CN7-1 to 2 (J2,J1)	EPD panel connector (0.3 mm pitch, staggered arrangement)
Connector pad	CN8-1 to 3 (J8,J9,J11)	EPD panel connector pad (0.3, 0.4 and 0.5 mm pitch, straight alignment)
Connector pad	CN9-1 to 2 (J7,J6)	EPD panel connector pad (0.2 and 0.4 mm pitch, staggered arrangement)
Connector pad	CN10(J12)	Connector pad for the external EPD module (0.5 mm pitch)
Through-holes	CN11(J10)	Through-holes for the EPD panel connection (2.54 mm pitch)
Switch	SW1	System reset
Switch	SW2	Battery power supply switch
Switch	SW3 to SW6	P00 - P03 port input switch
Monitor terminal	TP1	V_{DD} power supply (battery)
Monitor terminal	TP2	V_{DD} power supply (selected power supply)
Monitor terminal	TP3	GND terminal
Monitor terminal	TP4	V_{DD} (external power supply)
Monitor pin	TP5	P00 (REGMON) monitor pin
Buzzer	BZ1	Piezo buzzer
Battery folder	BT1	For the coin battery (When the coin battery is inserted, do not supply a power from the CN3 (external power supply connector) of the CPU board.)

3. Block Diagram

The S5U1C17F57T1 block diagram is shown below.

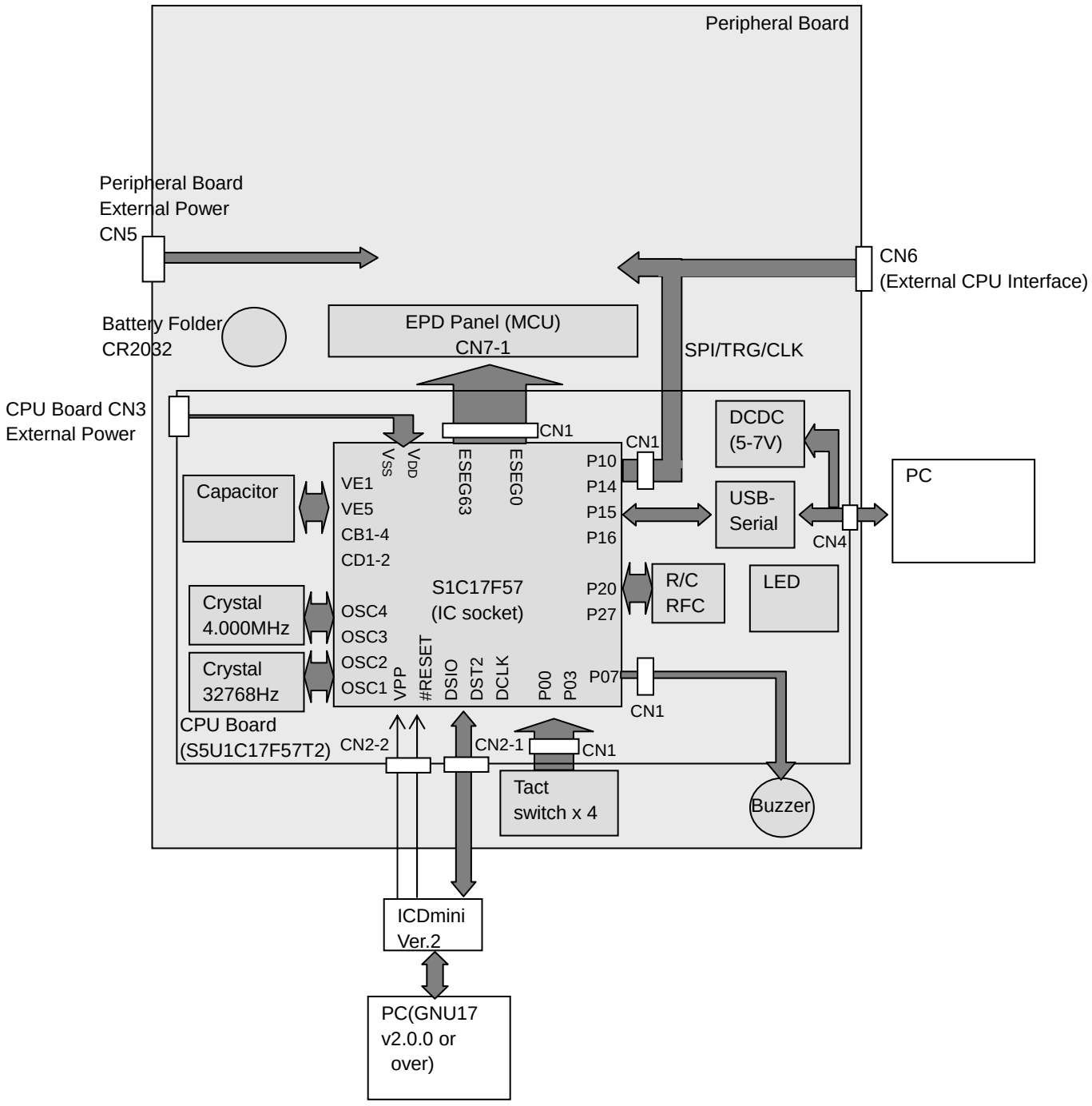


Figure 3.1 S5U1C17F57T1 block diagram

4. Connectors

4.1 CPU Board Connectors

4.1.1 CPU board interface connector (CN1-1 to CN1-4)

Table 4.1 Pin assignment table for CPU board interface connector (CN1-1)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	VSS	—	Power supply (-)	21	ESEG23	O	EPD segment output
2	VSS	—	Power supply (-)	22	ESEG22	O	EPD segment output
3	ESEG39	O	EPD segment output	23	ESEG21	O	EPD segment output
4	ESEG38	O	EPD segment output	24	ESEG20	O	EPD segment output
5	ESEG37	O	EPD segment output	25	ESEG19	O	EPD segment output
6	ESEG36	O	EPD segment output	26	VDD	—	Power supply (+)
7	ESEG35	O	EPD segment output	27	VDD	—	Power supply (+)
8	ESEG34	O	EPD segment output	28	ESEG18	O	EPD segment output
9	ESEG33	O	EPD segment output	29	ESEG17	O	EPD segment output
10	ESEG32	O	EPD segment output	30	ESEG16	O	EPD segment output
11	ESEG31	O	EPD segment output	31	ESEG15	O	EPD segment output
12	ESEG30	O	EPD segment output	32	ESEG14	O	EPD segment output
13	VDD	—	Power supply (+)	33	ESEG13	O	EPD segment output
14	VDD	—	Power supply (+)	34	ESEG12	O	EPD segment output
15	ESEG29	O	EPD segment output	35	ESEG11	O	EPD segment output
16	ESEG28	O	EPD segment output	36	ESEG10	O	EPD segment output
17	ESEG27	O	EPD segment output	37	ESEG9	O	EPD segment output
18	ESEG26	O	EPD segment output	38	ESEG8	O	EPD segment output
19	ESEG25	O	EPD segment output	39	VSS	—	Power supply (-)
20	ESEG24	O	EPD segment output	40	VSS	—	Power supply (-)

Table 4.2 Pin assignment table for CPU board interface connector (CN1-2)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	VSS	—	Power supply (-)	21	ESEG55	O	EPD segment output
2	VSS	—	Power supply (-)	22	ESEG54	O	EPD segment output
3	#RESET_PER	I	Initial reset input	23	ESEG53	O	EPD segment output
4	NC	—	Unconnected	24	ESEG52	O	EPD segment output
5	NC	—	Unconnected	25	ESEG51	O	EPD segment output
6	VE2	—	EPD system power supply circuit output	26	VDD	—	Power supply (+)
7	VEPD	—	EPD system power supply circuit output	27	VDD	—	Power supply (+)
8	ETP1	O	EPD top plane	28	ESEG50	O	EPD segment output
9	EBP1	O	EPD back plane	29	ESEG49	O	EPD segment output
10	NC	—	Unconnected	30	ESEG48	O	EPD segment output
11	ESEG63	O	EPD segment output	31	ESEG47	O	EPD segment output
12	ESEG62	O	EPD segment output	32	ESEG46	O	EPD segment output
13	VDD	—	Power supply (+)	33	ESEG45	O	EPD segment output
14	VDD	—	Power supply (+)	34	ESEG44	O	EPD segment output
15	ESEG61	O	EPD segment output	35	ESEG43	O	EPD segment output
16	ESEG60	O	EPD segment output	36	ESEG42	O	EPD segment output
17	ESEG59	O	EPD segment output	37	ESEG41	O	EPD segment output
18	ESEG58	O	EPD segment output	38	ESEG40	O	EPD segment output
19	ESEG57	O	EPD segment output	39	VSS	—	Power supply (-)
20	ESEG56	O	EPD segment output	40	VSS	—	Power supply (-)

Table 4.3 Pin assignment table for CPU board interface connector (CN1-3)

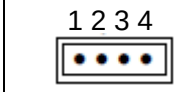
No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	VSS	—	Power supply (-)	21	P10	I/O	P10/SPICLK
2	VSS	—	Power supply (-)	22	VSS	—	Power supply (-)
3	NC	—	Unconnected	23	P07	I/O	P07/BZ
4	P20	I/O	P20/SDAS/SENB0/BZ	24	VSS	—	Power supply (-)
5	VSS	—	Power supply (-)	25	P06	I/O	P06/TOUTB1/CAPB1/#BZ
6	P17	I/O	P17/#BFR/EPDCLK	26	VDD	—	Power supply (+)
7	VSS	—	Power supply (-)	27	VDD	—	Power supply (+)
8	P16	I/O	P16/SOUT/SCLM	28	P05	I/O	P05/TOUTA1/CAPA1
9	VSS	—	Power supply (-)	29	VSS	—	Power supply (-)
10	P15	I/O	P15/SIN/SDAM	30	P04	I/O	P04/EXCL1
11	VSS	—	Power supply (-)	31	VSS	—	Power supply (-)
12	P14	I/O	P14/SCLK/EPDTRG	32	P03	I/O	P03/TOUTB0/CAPB0
13	VDD	—	Power supply (+)	33	VSS	—	Power supply (-)
14	VDD	—	Power supply (+)	34	P02	I/O	P02/TOUTA0/CAPA0
15	P13	I/O	P13/#SPISS/FOUTA	35	VSS	—	Power supply (-)
16	VSS	—	Power supply (-)	36	P01	I/O	P01/EXCL0
17	P12	I/O	P12/SDI/SCLS	37	VSS	—	Power supply (-)
18	VSS	—	Power supply (-)	38	P00	I/O	P00/RFCLKO/REGMON
19	P11	I/O	P11/SDO/SDAS	39	VSS	—	Power supply (-)
20	VSS	—	Power supply (-)	40	VSS	—	Power supply (-)

Table 4.4 Pin assignment table for CPU board interface connector (CN1-4)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	VSS	—	Power supply (-)	21	DST2	I/O	DST2/P33
2	VSS	—	Power supply (-)	22	VSS	—	Power supply (-)
3	ESEG7	O	EPD segment output	23	DSIO	I/O	DSIO/P32
4	ESEG6	O	EPD segment output	24	VSS	—	Power supply (-)
5	ESEG5	O	EPD segment output	25	P31	I/O	P31/EPDCLK
6	ESEG4	O	EPD segment output	26	VDD	—	Power supply (+)
7	ESEG3	O	EPD segment output	27	VDD	—	Power supply (+)
8	ESEG2	O	EPD segment output	28	P30	I/O	P30/FOUTB/#SPISS
9	ESEG1	O	EPD segment output	29	P27	I/O	P27/SENB1
10	ESEG0	O	EPD segment output	30	P26	I/O	P26/SENA1
11	EBP0	O	EPD back plane output	31	P25	I/O	P25/REF1
12	ETP0	O	EPD top plane output	32	P24	I/O	P24/RFIN1
13	VPP	—	Flash memory programming power supply	33	VSS	—	Power supply (-)
14	VPP	—	Flash memory programming power supply	34	P23	I/O	P23/SCLM/RFIN0
15	NC	—	Unconnected	35	VSS	—	Power supply (-)
16	TEST0	I	Input for testing	36	P22	I/O	P22/SDAM/REF0
17	#RESET	O	Initial reset output	37	VSS	—	Power supply (-)
18	VSS	—	Power supply (-)	38	P21	I/O	P21/SCLS/SENA0/#BZ
19	DCLK	I/O	DCLK/P34	39	VSS	—	Power supply (-)
20	VSS	—	Power supply (-)	40	VSS	—	Power supply (-)

4.1.2 Debug Interface Connectors (CN2-1 to CN2-2)

Table 4.5 Pin assignment table for CPU board debug interface connector (CN2-1)



No.	Terminal name	I/O	Function
1	DCLK	O	Clock signal for debugging
2	GND	—	Power supply (GND)
3	DSIO	I/O	Serial communication I/O signal for debugging
4	DST2	O	Debug status signal

Note: The No.1 pin position of the CN2-1 (J5) connector is shown above. When connecting the ICDminiVer.2 to this board, confirm the direction of the connector carefully.

Table 4.6 Pin assignment table for CPU board interface connector (CN2-2)

No.	Terminal name	I/O	Function
1	VPP	I	Flash memory programming power supply input
2	GND	—	Power supply (GND)
3	RESET	I	Reset signal input for the target
4	VCCIN	O	Target voltage output

4.1.3 Power Supply Connector (CN3)

Table 4.7 Pin assignment table for CPU board power supply connector (CN3)

No.	Terminal name	I/O	Function
1	V_{DD}	—	Power supply (+)
2	GND	—	Power supply (GND)

4.1.4 USB Connector (CN4)

Table 4.8 Pin assignment table for CPU board USB connector (CN4)

No.	Terminal name	I/O	Function
1	VBUS	—	Power supply (+5V)
2	D-	I/O	D-
3	D+	I/O	D+
4	ID	—	Unconnected
5	USBGND	—	Power supply (GND)

4.2 Peripheral Board Connectors

4.2.1 Power supply Connector (CN5)

Table 4.9 Pin assignment table for peripheral board power supply connector (CN5)

No.	Terminal name	I/O	Function
1	V_{DD}	—	Power supply (+)
2	GND	—	Power supply (GND)
3	VPP	—	Flash memory programming power supply input

4.2.2 General Purpose CPU Interface (CN6)

Table 4.10 Pin assignment table for general purpose CPU interface connector (CN6)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	SDO	O	SPI interface control data output	6	XRES	-	Unconnected
2	SDI	I	SPI interface control data output	7	V_{DD}	—	Power supply (+)
3	V_{SS}	—	Power supply (-)	8	NC	—	Unconnected
4	SCL	I	SPI interface control clock input	9	NC	—	Unconnected
5	SCS	I	SPI interface control chip select	10	NC	—	Unconnected

4.2.3 EPD Panel Interface Connector (CN7-1)

Table 4.11 Pin assignment table for EPD interface connector (CN7-1)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	CN92	O	ETP0(MCU)	47	CN46	O	ESEG20(MCU)
2	CN91	O	EBP0(MCU)	48	CN45	O	ESEG21(MCU)
3	CN90	—	NC	49	CN44	O	ESEG22(MCU)
4	CN89	—	NC	50	CN43	O	ESEG23(MCU)
5	CN88	—	NC	51	CN42	O	ESEG24(MCU)
6	CN87	—	NC	52	CN41	O	ESEG25(MCU)
7	CN86	—	NC	53	CN40	O	ESEG26(MCU)
8	CN85	—	NC	54	CN39	O	ESEG27(MCU)
9	CN84	—	NC	55	CN38	O	ESEG28(MCU)
10	CN83	—	NC	56	CN37	O	ESEG29(MCU)
11	CN82	—	NC	57	CN36	O	ESEG30(MCU)
12	CN81	—	NC	58	CN35	O	ESEG31(MCU)
13	CN80	—	NC	59	CN34	O	ESEG32(MCU)
14	CN79	—	NC	60	CN33	O	ESEG33(MCU)
15	CN78	—	NC	61	CN32	O	ESEG34(MCU)
16	CN77	—	NC	62	CN31	O	ESEG35(MCU)
17	CN76	—	NC	63	CN30	O	ESEG36(MCU)
18	CN75	—	NC	64	CN29	O	ESEG37(MCU)
19	CN74	—	NC	65	CN28	O	ESEG38(MCU)
20	CN73	—	NC	66	CN27	O	ESEG39(MCU)
21	CN72	—	NC	67	CN26	O	ESEG40(MCU)
22	CN71	—	NC	68	CN25	O	ESEG41(MCU)
23	CN70	—	NC	69	CN24	O	ESEG42(MCU)
24	CN69	—	NC	70	CN23	O	ESEG43(MCU)
25	CN68	—	NC	71	CN22	O	ESEG44(MCU)
26	CN67	—	NC	72	CN21	O	ESEG45(MCU)
27	CN66	O	ESEG0(MCU)	73	CN20	O	ESEG46(MCU)
28	CN65	O	ESEG1(MCU)	74	CN19	O	ESEG47(MCU)
29	CN64	O	ESEG2(MCU)	75	CN18	O	ESEG48(MCU)
30	CN63	O	ESEG3(MCU)	76	CN17	O	ESEG49(MCU)
31	CN62	O	ESEG4(MCU)	77	CN16	O	ESEG50(MCU)
32	CN61	O	ESEG5(MCU)	78	CN15	O	ESEG51(MCU)
33	CN60	O	ESEG6(MCU)	79	CN14	O	ESEG52(MCU)
34	CN59	O	ESEG7(MCU)	80	CN13	O	ESEG53(MCU)
35	CN58	O	ESEG8(MCU)	81	CN12	O	ESEG54(MCU)
36	CN57	O	ESEG9(MCU)	82	CN11	O	ESEG55(MCU)
37	CN56	O	ESEG10(MCU)	83	CN10	O	ESEG56(MCU)
38	CN55	O	ESEG11(MCU)	84	CN9	O	ESEG57(MCU)
39	CN54	O	ESEG12(MCU)	85	CN8	O	ESEG58(MCU)
40	CN53	O	ESEG13(MCU)	86	CN7	O	ESEG59(MCU)
41	CN52	O	ESEG14(MCU)	87	CN6	O	ESEG60(MCU)
42	CN51	O	ESEG15(MCU)	88	CN5	O	ESEG61(MCU)
43	CN50	O	ESEG16(MCU)	89	CN4	O	ESEG62(MCU)
44	CN49	O	ESEG17(MCU)	90	CN3	O	ESEG63(MCU)
45	CN48	O	ESEG18(MCU)	91	CN2	O	EBP1(MCU)
46	CN47	O	ESEG19(MCU)	92	CN1	O	ETP1(MCU)

4.2.4 EPD Panel Interface Connector (CN7-2)

Table 4.12 Pin assignment table for EPD interface connector (CN7-2)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	CN92			47	CN46	O	ESEG44(MCU)
2	CN91			48	CN45	O	ESEG45(MCU)
3	CN90	O	ESEG0(MCU)	49	CN44	O	ESEG46(MCU)
4	CN89	O	ESEG1(MCU)	50	CN43	O	ESEG47(MCU)
5	CN88	O	ESEG2(MCU)	51	CN42	O	ESEG48(MCU)
6	CN87	O	ESEG3(MCU)	52	CN41	O	ESEG49(MCU)
7	CN86	O	ESEG4(MCU)	53	CN40	O	ESEG50(MCU)
8	CN85	O	ESEG5(MCU)	54	CN39	O	ESEG51(MCU)
9	CN84	O	ESEG6(MCU)	55	CN38	O	ESEG52(MCU)
10	CN83	O	ESEG7(MCU)	56	CN37	O	ESEG53(MCU)
11	CN82	O	ESEG8(MCU)	57	CN36	O	ESEG54(MCU)
12	CN81	O	ESEG9(MCU)	58	CN35	O	ESEG55(MCU)
13	CN80	O	ESEG10(MCU)	59	CN34	O	ESEG56(MCU)
14	CN79	O	ESEG11(MCU)	60	CN33	O	ESEG57(MCU)
15	CN78	O	ESEG12(MCU)	61	CN32	O	ESEG58(MCU)
16	CN77	O	ESEG13(MCU)	62	CN31	O	ESEG59(MCU)
17	CN76	O	ESEG14(MCU)	63	CN30	O	ESEG60(MCU)
18	CN75	O	ESEG15(MCU)	64	CN29	O	ESEG61(MCU)
19	CN74	O	ESEG16(MCU)	65	CN28	O	ESEG62(MCU)
20	CN73	O	ESEG17(MCU)	66	CN27	O	ESEG63(MCU)
21	CN72	O	ESEG18(MCU)	67	CN26		
22	CN71	O	ESEG19(MCU)	68	CN25		
23	CN70	O	ESEG20(MCU)	69	CN24		
24	CN69	O	ESEG21(MCU)	70	CN23		
25	CN68	O	ESEG22(MCU)	71	CN22		
26	CN67	O	ESEG23(MCU)	72	CN21		
27	CN66	O	ESEG24(MCU)	73	CN20		
28	CN65	O	ESEG25(MCU)	74	CN19		
29	CN64	O	ESEG26(MCU)	75	CN18		
30	CN63	O	ESEG27(MCU)	76	CN17		
31	CN62	O	ESEG28(MCU)	77	CN16		
32	CN61	O	ESEG29(MCU)	78	CN15		
33	CN60	O	ESEG30(MCU)	79	CN14		
34	CN59	O	ESEG31(MCU)	80	CN13		
35	CN58	O	ESEG32(MCU)	81	CN12		
36	CN57	O	ESEG33(MCU)	82	CN11		
37	CN56	O	ESEG34(MCU)	83	CN10		
38	CN55	O	ESEG35(MCU)	84	CN9		
39	CN54	O	ESEG36(MCU)	85	CN8		
40	CN53	O	ESEG37(MCU)	86	CN7		
41	CN52	O	ESEG38(MCU)	87	CN6		
42	CN51	O	ESEG39(MCU)	88	CN5		
43	CN50	O	ESEG40(MCU)	89	CN4		
44	CN49	O	ESEG41(MCU)	90	CN3		
45	CN48	O	ESEG42(MCU)	91	CN2		
46	CN47	O	ESEG43(MCU)	92	CN1		

4.2.5 EPD Panel Interface Connector Pads (CN8-1 to 3)

Table 4.13 Pin assignment table for EPD interface connector pads (CN8-1 to CN8-3)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	CN96			49	CN48	O	ESEG18(MCU)
2	CN95			50	CN47	O	ESEG19(MCU)
3	CN94			51	CN46	O	ESEG20(MCU)
4	CN93			52	CN45	O	ESEG21(MCU)
5	CN92			53	CN44	O	ESEG22(MCU)
6	CN91			54	CN43	O	ESEG23(MCU)
7	CN90			55	CN42	O	ESEG24(MCU)
8	CN89			56	CN41	O	ESEG25(MCU)
9	CN88			57	CN40	O	ESEG26(MCU)
10	CN87			58	CN39	O	ESEG27(MCU)
11	CN86			59	CN38	O	ESEG28(MCU)
12	CN85			60	CN37	O	ESEG29(MCU)
13	CN84			61	CN36	O	ESEG30(MCU)
14	CN83			62	CN35	O	ESEG31(MCU)
15	CN82			63	CN34	O	ESEG32(MCU)
16	CN81			64	CN33	O	ESEG33(MCU)
17	CN80			65	CN32	O	ESEG34(MCU)
18	CN79			66	CN31	O	ESEG35(MCU)
19	CN78			67	CN30	O	ESEG36(MCU)
20	CN77			68	CN29	O	ESEG37(MCU)
21	CN76			69	CN28	O	ESEG38(MCU)
22	CN75			70	CN27	O	ESEG39(MCU)
23	CN74			71	CN26	O	ESEG40(MCU)
24	CN73			72	CN25	O	ESEG41(MCU)
25	CN72			73	CN24	O	ESEG42(MCU)
26	CN71			74	CN23	O	ESEG43(MCU)
27	CN70			75	CN22	O	ESEG44(MCU)
28	CN69			76	CN21	O	ESEG45(MCU)
29	CN68	O	ETP0(MCU)	77	CN20	O	ESEG46(MCU)
30	CN67	O	EBP0(MCU)	78	CN19	O	ESEG47(MCU)
31	CN66	O	ESEG0(MCU)	79	CN18	O	ESEG48(MCU)
32	CN65	O	ESEG1(MCU)	80	CN17	O	ESEG49(MCU)
33	CN64	O	ESEG2(MCU)	81	CN16	O	ESEG50(MCU)
34	CN63	O	ESEG3(MCU)	82	CN15	O	ESEG51(MCU)
35	CN62	O	ESEG4(MCU)	83	CN14	O	ESEG52(MCU)
36	CN61	O	ESEG5(MCU)	84	CN13	O	ESEG53(MCU)
37	CN60	O	ESEG6(MCU)	85	CN12	O	ESEG54(MCU)
38	CN59	O	ESEG7(MCU)	86	CN11	O	ESEG55(MCU)
39	CN58	O	ESEG8(MCU)	87	CN10	O	ESEG56(MCU)
40	CN57	O	ESEG9(MCU)	88	CN9	O	ESEG57(MCU)
41	CN56	O	ESEG10(MCU)	89	CN8	O	ESEG58(MCU)
42	CN55	O	ESEG11(MCU)	90	CN7	O	ESEG59(MCU)
43	CN54	O	ESEG12(MCU)	91	CN6	O	ESEG60(MCU)
44	CN53	O	ESEG13(MCU)	92	CN5	O	ESEG61(MCU)
45	CN52	O	ESEG14(MCU)	93	CN4	O	ESEG62(MCU)
46	CN51	O	ESEG15(MCU)	94	CN3	O	ESEG63(MCU)
47	CN50	O	ESEG16(MCU)	95	CN2	O	EBP1(MCU)
48	CN49	O	ESEG17(MCU)	96	CN1	O	ETP1(MCU)

4.2.6 EPD Panel Interface Connector Pads (CN9-1)

Table 4.14 Pin assignment table for EPD interface connector pads (CN9-1)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	NC	—		51	CN50	O	ESEG16(MCU)
2	NC	—		52	CN49	O	ESEG17(MCU)
3	NC	—		53	CN48	O	ESEG18(MCU)
4	NC	—		54	CN47	O	ESEG19(MCU)
5	CN96			55	CN46	O	ESEG20(MCU)
6	CN95			56	CN45	O	ESEG21(MCU)
7	CN94			57	CN44	O	ESEG22(MCU)
8	CN93			58	CN43	O	ESEG23(MCU)
9	CN92			59	CN42	O	ESEG24(MCU)
10	CN91			60	CN41	O	ESEG25(MCU)
11	CN90			61	CN40	O	ESEG26(MCU)
12	CN89			62	CN39	O	ESEG27(MCU)
13	CN88			63	CN38	O	ESEG28(MCU)
14	CN87			64	CN37	O	ESEG29(MCU)
15	CN86			65	CN36	O	ESEG30(MCU)
16	CN85			66	CN35	O	ESEG31(MCU)
17	CN84			67	CN34	O	ESEG32(MCU)
18	CN83			68	CN33	O	ESEG33(MCU)
19	CN82			69	CN32	O	ESEG34(MCU)
20	CN81			70	CN31	O	ESEG35(MCU)
21	CN80			71	CN30	O	ESEG36(MCU)
22	CN79			72	CN29	O	ESEG37(MCU)
23	CN78			73	CN28	O	ESEG38(MCU)
24	CN77			74	CN27	O	ESEG39(MCU)
25	CN76			75	CN26	O	ESEG40(MCU)
26	CN75			76	CN25	O	ESEG41(MCU)
27	CN74			77	CN24	O	ESEG42(MCU)
28	CN73			78	CN23	O	ESEG43(MCU)
29	CN72			79	CN22	O	ESEG44(MCU)
30	CN71			80	CN21	O	ESEG45(MCU)
31	CN70			81	CN20	O	ESEG46(MCU)
32	CN69			82	CN19	O	ESEG47(MCU)
33	CN68	O	ETP0(MCU)	83	CN18	O	ESEG48(MCU)
34	CN67	O	EBP0(MCU)	84	CN17	O	ESEG49(MCU)
35	CN66	O	ESEG0(MCU)	85	CN16	O	ESEG50(MCU)
36	CN65	O	ESEG1(MCU)	86	CN15	O	ESEG51(MCU)
37	CN64	O	ESEG2(MCU)	87	CN14	O	ESEG52(MCU)
38	CN63	O	ESEG3(MCU)	88	CN13	O	ESEG53(MCU)
39	CN62	O	ESEG4(MCU)	89	CN12	O	ESEG54(MCU)
40	CN61	O	ESEG5(MCU)	90	CN11	O	ESEG55(MCU)
41	CN60	O	ESEG6(MCU)	91	CN10	O	ESEG56(MCU)
42	CN59	O	ESEG7(MCU)	92	CN9	O	ESEG57(MCU)
43	CN58	O	ESEG8(MCU)	93	CN8	O	ESEG58(MCU)
44	CN57	O	ESEG9(MCU)	94	CN7	O	ESEG59(MCU)
45	CN56	O	ESEG10(MCU)	95	CN6	O	ESEG60(MCU)
46	CN55	O	ESEG11(MCU)	96	CN5	O	ESEG61(MCU)
47	CN54	O	ESEG12(MCU)	97	CN4	O	ESEG62(MCU)
48	CN53	O	ESEG13(MCU)	98	CN3	O	ESEG63(MCU)
49	CN52	O	ESEG14(MCU)	99	CN2	O	EBP1(MCU)
50	CN51	O	ESEG15(MCU)	100	CN1	O	ETP1(MCU)

4.2.7 EPD Panel Interface Connector Pads (CN9-2)

Table 4.15 Pin assignment table for EPD interface connector pads (CN9-2)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	CN96			49	CN48	O	ESEG18(MCU)
2	CN95			50	CN47	O	ESEG19(MCU)
3	CN94			51	CN46	O	ESEG20(MCU)
4	CN93			52	CN45	O	ESEG21(MCU)
5	CN92			53	CN44	O	ESEG22(MCU)
6	CN91			54	CN43	O	ESEG23(MCU)
7	CN90			55	CN42	O	ESEG24(MCU)
8	CN89			56	CN41	O	ESEG25(MCU)
9	CN88			57	CN40	O	ESEG26(MCU)
10	CN87			58	CN39	O	ESEG27(MCU)
11	CN86			59	CN38	O	ESEG28(MCU)
12	CN85			60	CN37	O	ESEG29(MCU)
13	CN84			61	CN36	O	ESEG30(MCU)
14	CN83			62	CN35	O	ESEG31(MCU)
15	CN82			63	CN34	O	ESEG32(MCU)
16	CN81			64	CN33	O	ESEG33(MCU)
17	CN80			65	CN32	O	ESEG34(MCU)
18	CN79			66	CN31	O	ESEG35(MCU)
19	CN78			67	CN30	O	ESEG36(MCU)
20	CN77			68	CN29	O	ESEG37(MCU)
21	CN76			69	CN28	O	ESEG38(MCU)
22	CN75			70	CN27	O	ESEG39(MCU)
23	CN74			71	CN26	O	ESEG40(MCU)
24	CN73			72	CN25	O	ESEG41(MCU)
25	CN72			73	CN24	O	ESEG42(MCU)
26	CN71			74	CN23	O	ESEG43(MCU)
27	CN70			75	CN22	O	ESEG44(MCU)
28	CN69			76	CN21	O	ESEG45(MCU)
29	CN68	O	ETP0(MCU)	77	CN20	O	ESEG46(MCU)
30	CN67	O	EBP0(MCU)	78	CN19	O	ESEG47(MCU)
31	CN66	O	ESEG0(MCU)	79	CN18	O	ESEG48(MCU)
32	CN65	O	ESEG1(MCU)	80	CN17	O	ESEG49(MCU)
33	CN64	O	ESEG2(MCU)	81	CN16	O	ESEG50(MCU)
34	CN63	O	ESEG3(MCU)	82	CN15	O	ESEG51(MCU)
35	CN62	O	ESEG4(MCU)	83	CN14	O	ESEG52(MCU)
36	CN61	O	ESEG5(MCU)	84	CN13	O	ESEG53(MCU)
37	CN60	O	ESEG6(MCU)	85	CN12	O	ESEG54(MCU)
38	CN59	O	ESEG7(MCU)	86	CN11	O	ESEG55(MCU)
39	CN58	O	ESEG8(MCU)	87	CN10	O	ESEG56(MCU)
40	CN57	O	ESEG9(MCU)	88	CN9	O	ESEG57(MCU)
41	CN56	O	ESEG10(MCU)	89	CN8	O	ESEG58(MCU)
42	CN55	O	ESEG11(MCU)	90	CN7	O	ESEG59(MCU)
43	CN54	O	ESEG12(MCU)	91	CN6	O	ESEG60(MCU)
44	CN53	O	ESEG13(MCU)	92	CN5	O	ESEG61(MCU)
45	CN52	O	ESEG14(MCU)	93	CN4	O	ESEG62(MCU)
46	CN51	O	ESEG15(MCU)	94	CN3	O	ESEG63(MCU)
47	CN50	O	ESEG16(MCU)	95	CN2	O	EBP1(MCU)
48	CN49	O	ESEG17(MCU)	96	CN1	O	ETP1(MCU)

4.2.8 EPD module interface connector pad (CN10)

Table 4.16 Pin assignment table for EPD module interface connector pad (CN10)

No.	Terminal name	I/O	Function	No.	Terminal name	I/O	Function
1	SDI	I	SPI interface control data input	8	VSS	—	Power supply (-)
2	SDO	O	SPI interface control data output	9	MFC	O	Flash memory serial control clock output
3	VSS	—	Power supply (-)	10	MFS	O	Flash memory serial control chip select output
4	SCL	O	SPI interface control serial clock output	11	OS	O	Flash memory serial control clock output
5	SCS	O	SPI interface control chip select output	12	XRES	O	Initialization control output
6	MFDI	I	Flash memory serial control data input	13	VDD	—	Power supply (+)
7	MFDO	O	Flash memory serial control data output	14	VPP	—	Flash memory programming power supply

5. Sample Software Manipulation

The S5U1C17F57T is shipped with the demonstration software that is programmed to the S1C17F57 mounted in this board. The manipulation method is described here.

By manipulating the demonstration software, various functions such as temperature measurement, timer, switch input, EPD display and current consumption measurement are confirmed. Refer to the source codes for the detailed explanations of the demonstration software. For the demonstration software development environment, refer to the "S5U1C17001C Manual". And for the details of the S1C17F57 peripheral circuits, refer to the "S1C17F57 Technical Manual".

5.1 Jumper Switch Settings

Set the jumper switches according to Table 1.1 "Jumper setting list in each mode". For the jumper switches with arbitrary setting, use the factory default settings, referring Table 2.2.1 "Jumper function list for CPU board" and Table 2.2.2 "Jumper function list for peripheral board".

5.2 Basic Function Manipulation Method

5.2.1 Function Overview

The basic functions are shown below.

Table 5.1 Basic functions of demonstration software

Function	Explanation
EPD display method selection	Selects the EPD display method.
RTC demonstration (clock)	Displays the clock on the EPD.
RTC demonstration (date: month, day)	Displays the date (month, day) on the EPD.
RTC demonstration (date: year)	Displays the date (year) on the EPD.
Temperature measurement Demonstration	Measures the temperature and displays the result on the EPD.
Current consumption demonstration	Sets various conditions for the S1C17F57 to measure the current consumption under the conditions easily.

5.2.2 Software Startup

Start the S5U1C17F57T1. If the S5U1C17F57T1 operates stand-alone using the coin battery, it becomes the waiting state for the EPD display method selection by turning ON the battery power supply switch (SW2) on the peripheral board.

5.2.3 EPD Drive Waveform Selection

This demonstration software has the function to select the EPD display method. When the switch of SW3 or SW4 is pressed during the waiting state for the EPD display method selection described in the above 5.2.2, the EPD display method is selected and the EPD display is initialized (repeating black → white → black → white). After that the RTC demonstration (clock display) starts.

When the SW3 is pressed: The display is changed after displaying the whole area black → white.
When the SW4 is pressed: The display is changed without displaying black → white.

5.2.4 RTC Demonstration

The software runs the RTC that is built in the S1C17F57 and displays the results.

Immediately after the EPD display waveform selection, the RTC starts to display [time: minute, second, (mark of the sun)]. When the SW3 is pressed while the RTC is displaying [time: minute, second, (mark of the sun)], the display changes to [month, day]. When the SW3 is pressed while the RTC is displaying [month, day], the display changes to [year]. Moreover, when the SW3 is pressed while the RTC is displaying [year], the display returns to [time: minute, second, (mark of the sun)].

Table 5.2 RTC demonstration contents

Item	Content
RTC demonstration (clock)	Executes the RTC and displays [time: minute, second, (mark of the sun)].
RTC demonstration (date (month, day))	Executes the RTC and displays [month, day].
RTC demonstration (date (year))	Executes the RTC and displays [year].

Figure 5.1 Display example of RTC demonstration

5.2.5 Temperature Measurement Demonstration

The software uses the temperature measurement function built in the S1C17F57 and displays the result.

When the SW4 is pressed while the RTC demonstration software is running, the temperature is displayed. When the SW3 is pressed while the temperature measurement, [time: minute, second, (mark of the sun)] is displayed.

Figure 5.2 Display example of temperature measurement

5.2.6 Current Consumption Measurement Demonstration

The software can set the S1C17F57 in each mode to measure the current consumed by the S1C17F57.

The S1C17F57 is set in each mode by turning on the power soppy while holding down each switch, as shown in the following table.

When measuring the current, insert an ammeter between both sides of the jumper switch (JP2) on the CPU board.

Table 5.3 Setting list for current consumption measurement mode

Setting method	CPU operation	Operation of each peripheral circuit							
		OSCA1	OSCB1	OSC3A*1	OSC3B*2	RTC	PCLK	HVLD	EPD
Press the reset key while holding down the SW3.	Sleep	On	—	Off	Off	Off	On	Off	Off
Press the reset key while holding down the SW4.		On	—	Off	Off	On	On	Off	Off
Press the reset key while holding down the SW3 and SW4.	Halt	On	—	Off	Off	Off	Off	Off	Off
Press the reset key while holding down the SW5.		—	On	Off	Off	Off	Off	Off	Off
Press the reset key while holding down the SW3 and SW5.		On	—	Off	Off	On	Off	Off	Off
Press the reset key while holding down the SW4 and SW5.		On	—	Off	Off	Off	On	Off	Off
Press the reset key while holding down the SW3, SW4 and SW5.		On	—	On	Off	Off	On	Off	Off
Press the reset key while holding down the SW6.		On	—	Off	On	Off	On	Off	Off
Press the reset key while holding down the SW3 and SW6.	run (NOP)	On	—	Off	Off	Off	On	Off	Off
Press the reset key while holding down the SW4 and SW6.		On	—	On	Off	Off	On	Off	Off
Press the reset key while holding down the SW3, SW4 and SW6.		On	—	Off	On	Off	On	Off	Off
Press the reset key while holding down the SW5 and SW6.		On	—	Off	Off	Off	On	On	Off
Press the reset key while holding down the SW3, SW5 and SW6.		On	—	Off	Off	Off	On	Off	On*3

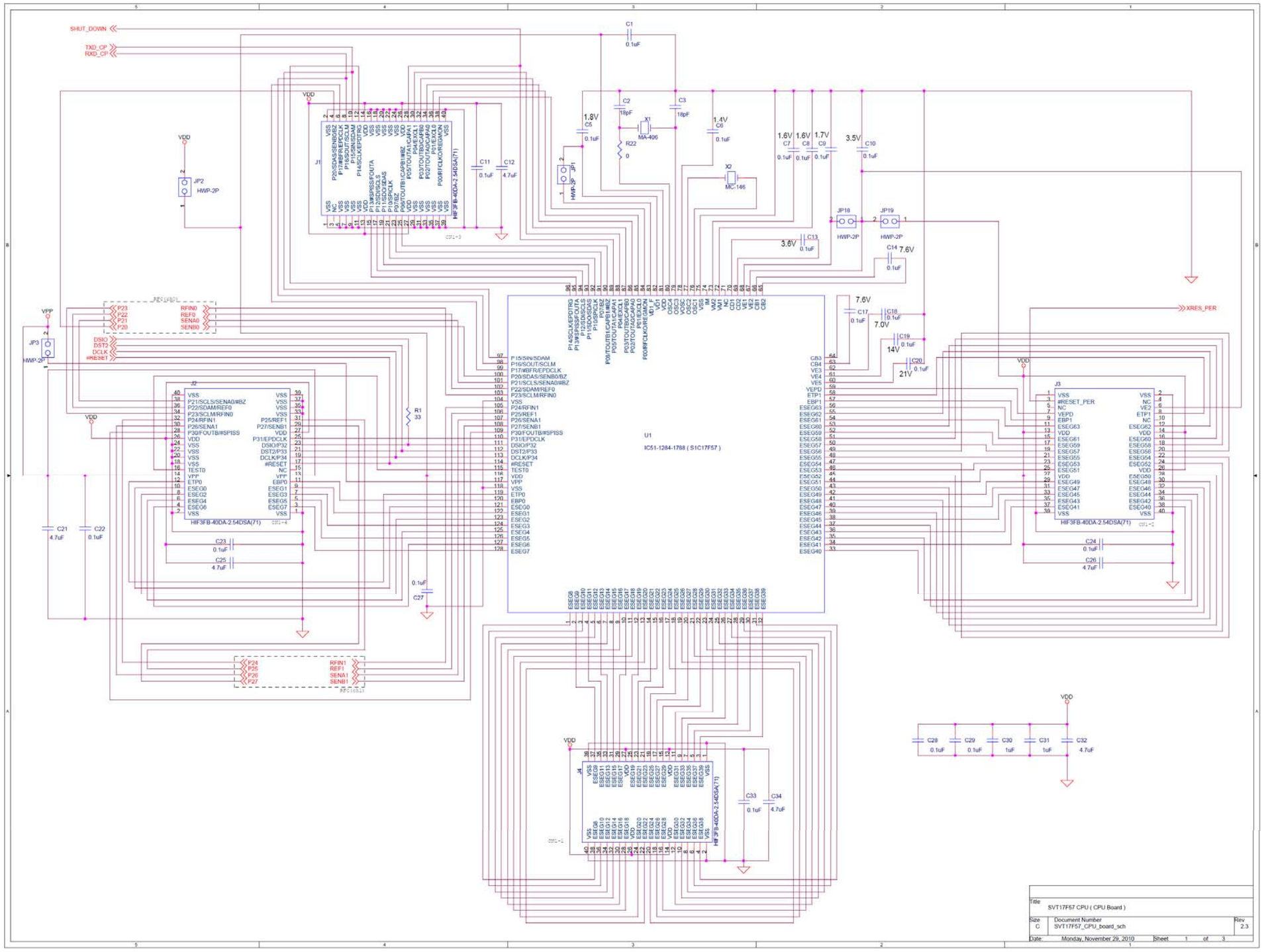
*1 4MHz
*2 2MHz
*3 TCLK:256Hz(OSC1/256), Doubler=On, DCLK=32768Hz(OSC1/1), Booster=On, BCLK=16384Hz(OSC1/2), VEPD=15V, VE1=1.76V

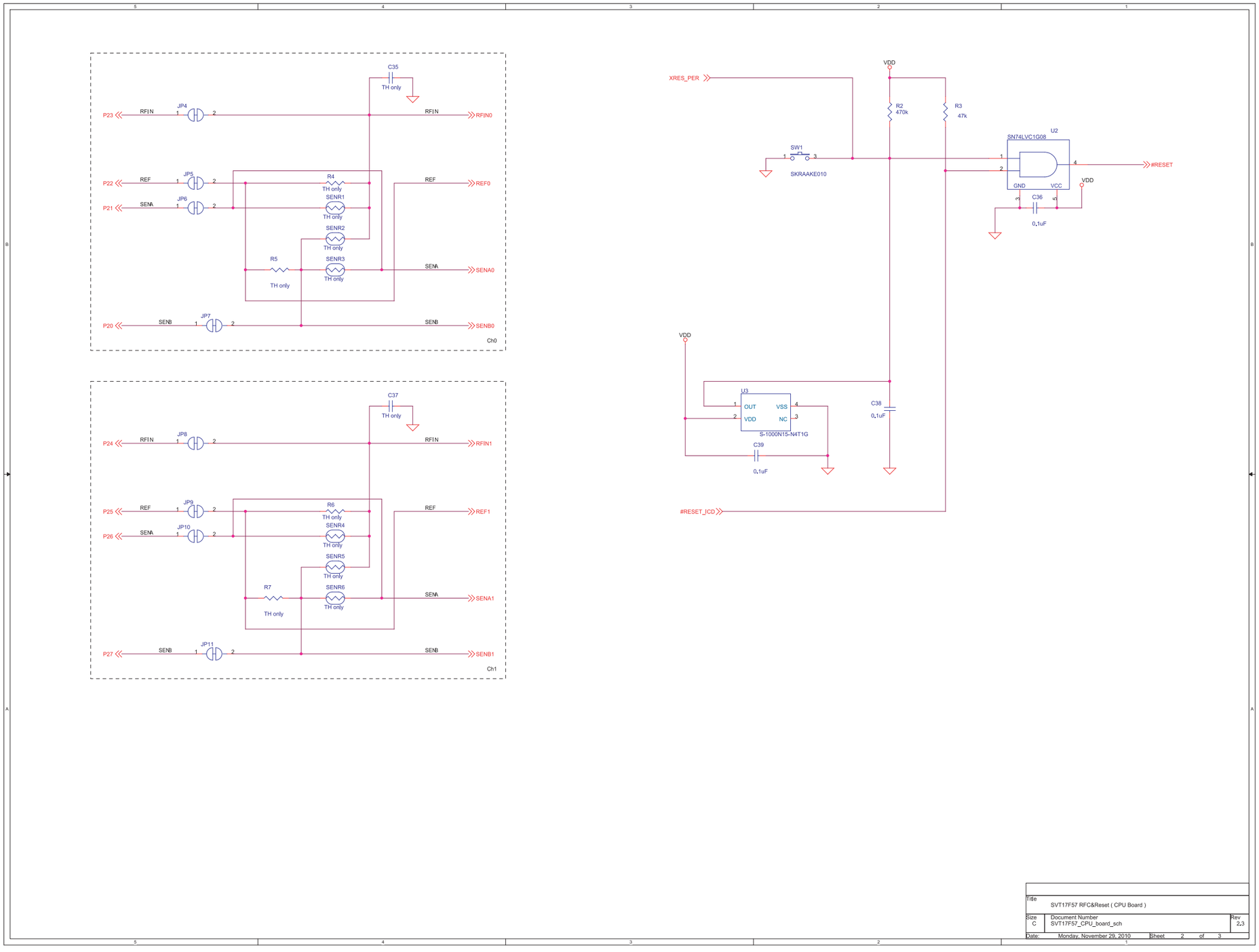
Appendix A Sample Software File Configuration

The sample software configuration is shown below.

```
[s1c17f57demoExtEPD]
    │
    ├GNU17 Project File, Command File, etc.
    ├…
    ├…
    │
    │
    ├── [mcu]   Boot, Model register offset header file
    │       ├── s1c17F57_peripheral.h
    │       ├── s1c17Fxx.h
    │       └── boot.c
    │
    ├── [apl]     Application relating source
    │       ├── main.h          main.c
    │       ├── clg_osc_main.c
    │       ├── current_main.c
    │       ├── epd_main.c
    │       ├── ext_epd_main.c
    │       ├── menu_tbl.c
    │       ├── port_main.c
    │       ├── rtc_main.c
    │       ├── t8_main.c
    │       └── tem_ main.c
    │
    ├── [driver]   Driver Relating Source, Header File
    │       ├── clg.h           clg.c
    │       ├── port.h          port.c
    │       …
    │       ├── t16a2.h         t16a2.c
    │       ├── epd.h           epd.c
    │       ├── ext_epd.h       ext_epd.c
    │       └── tem.h           tem.c
    │
    └── [common]   Application relating header file
            ├── clg_api.h
            ├── port_api.h
            …
            ├── t16a2_api.h
            ├── epd_api.h
            ├── ext_epd_api.h
            └── tem_api.h
```

Appendix B Circuit Diagram and Component List




C35
TH only
P23
RFIN
JP4
RFIN
RFIN0
P22
REF
JP5
R4
TH only
REF
REF0
P21
SENA
JP6
SENR1
TH only
SENR2
TH only
R5
SENR3
TH only
SENA
SENA0
TH only
P20
SENB
JP7
SENB
SENB0
Ch0
C37
TH only
P24
RFIN
JP8
RFIN
RFIN1
P25
REF
JP9
R6
TH only
REF
REF1
P26
SENA
JP10
SENR4
TH only
SENR5
TH only
R7
SENR6
TH only
SENA
SENA1
TH only
P27
SENB
JP11
SENB
SENB1
Ch1
XRES_PER
VDD
R2
470k
R3
47k
SW1
SKRAAKE010
U2
SN74LVC1G08
#RESET
GND
VCC
VDD
C36
0.1uF
VDD
U3
OUT
VSS
VDD
NC
S-1000N15-N4T1G
C38
0.1uF
C39
0.1uF
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Rev
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Date:
Monday, November 29, 2010
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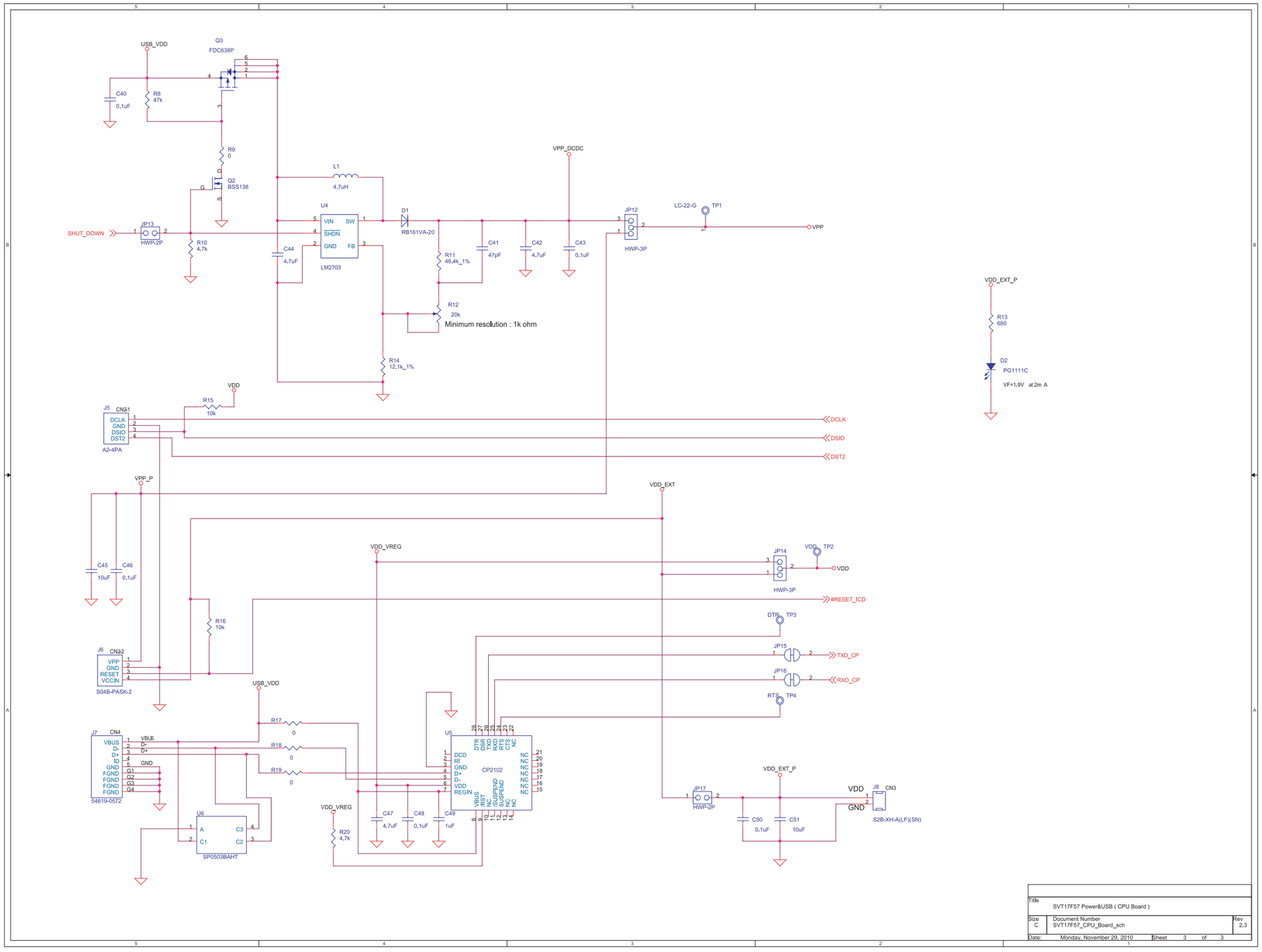
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FDC638P
C40
0.1uF
R8
47k
R9
0
Q2
BSS138
L1
4.7uH
VPP_DCDC
U4
VIN
SW
SHDN
GND
FB
LM2703
D1
RB161VA-20
JP12
HWP-3P
LC-22-G
TP1
VPP
SHUT_DOWN
JP13
HWP-2P
R10
4.7k
C44
4.7uF
C41
47pF
C42
4.7uF
C43
0.1uF
R11
46.4k_1%
R12
20k
Minimum resolution : 1k ohm
R14
12.1k_1%
VDD_EXT_P
R13
680
D2
PG1111C
VF=1.9V at 2m A
VDD
R15
10k
J5
CN21
DCLK
GND
DSIO
DST2
A2-4PA
DCLK
DSIO
DST2
VPP_P
VDD_EXT
C45
10uF
C46
0.1uF
VDD_VREG
JP14
HWP-3P
VDD
TP2
R16
10k
#RESET_ICD
DTR
TP3
J6
CN22
VPP
GND
RESET
VCCIN
S04B-PASK-2
JP15
TXD_CP
JP16
RXD_CP
RTS
TP4
USB_VDD
R17
0
R18
0
R19
0
J7
CN4
VBUS
D-
D+
ID
GND
FGND
54819-0572
U5
CP2102
DCD
RI
GND
D+
D-
VDD
REGIN
VBUS
RST
NC
/SUSPEND
SUSPEND
NC
DTR
DSR
DCD
RXD
CTS
RI
U6
SP0503BAHT
VDD_VREG
R20
4.7k
C47
4.7uF
C48
0.1uF
C49
1uF
JP17
HWP-2P
VDD_EXT_P
C50
0.1uF
C51
10uF
VDD
GND
J8
CN3
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Document Number
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Rev
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Date:
Monday, November 29, 2010
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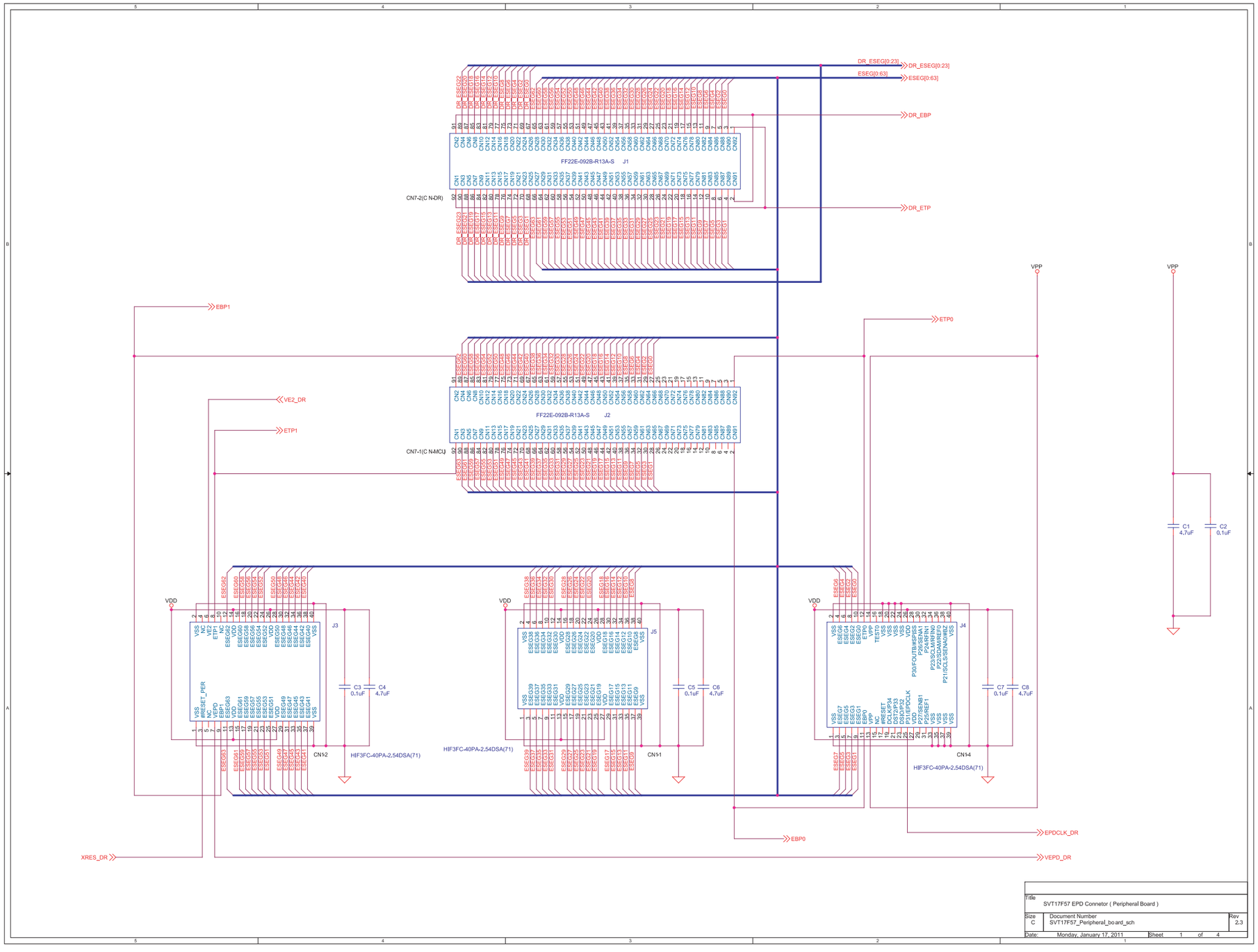
3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DR_ETP
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FF22E-092B-R13A-S J2
CN7-1(C N-MCU)
EBP1
VE2_DR
ETP1
ETP0
VPP
VDD
J3
J5
J4
CN1-2
CN1-1
CN1-4
HIF3FC-40PA-2,54DSA(71)
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C2 0.1uF
C3 0.1uF
C4 4.7uF
C5 0.1uF
C6 4.7uF
C7 0.1uF
C8 4.7uF
EBP0
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XRES_DR
VEPD_DR
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Rev 2.3
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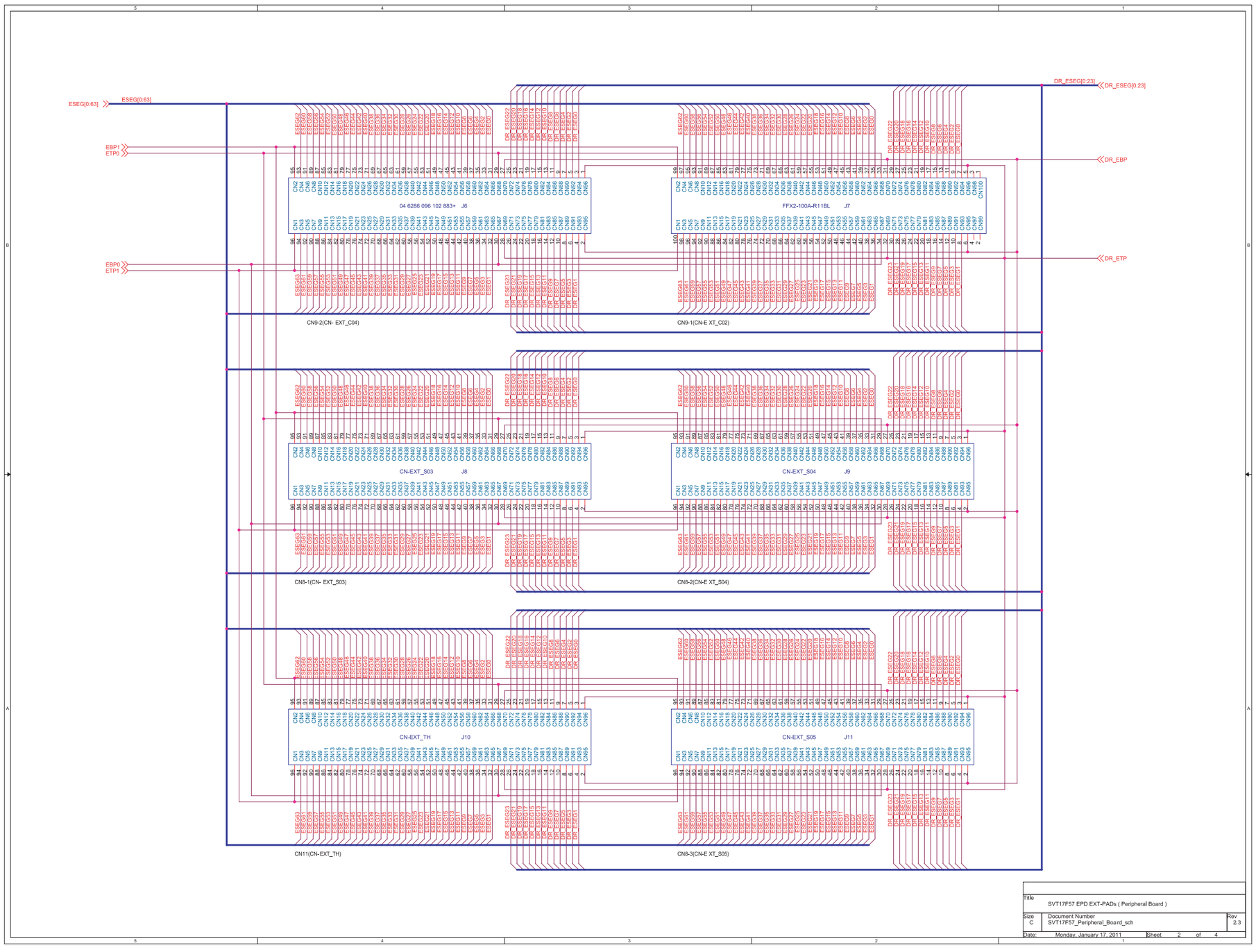
Sheet 1 of 4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DR_ESEG[0:23]
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ETP0
EBP0
ETP1
DR_EBP
DR_ETP
04 6286 096 102 883+ J6
FFX2-100A-R11BL J7
CN9-2(CN- EXT_C04)
CN9-1(CN-E XT_C02)
CN-EXT_S03 J8
CN-EXT_S04 J9
CN8-1(CN- EXT_S03)
CN8-2(CN-E XT_S04)
CN-EXT_TH J10
CN-EXT_S05 J11
CN11(CN-EXT_TH)
CN8-3(CN-E XT_S05)
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Rev
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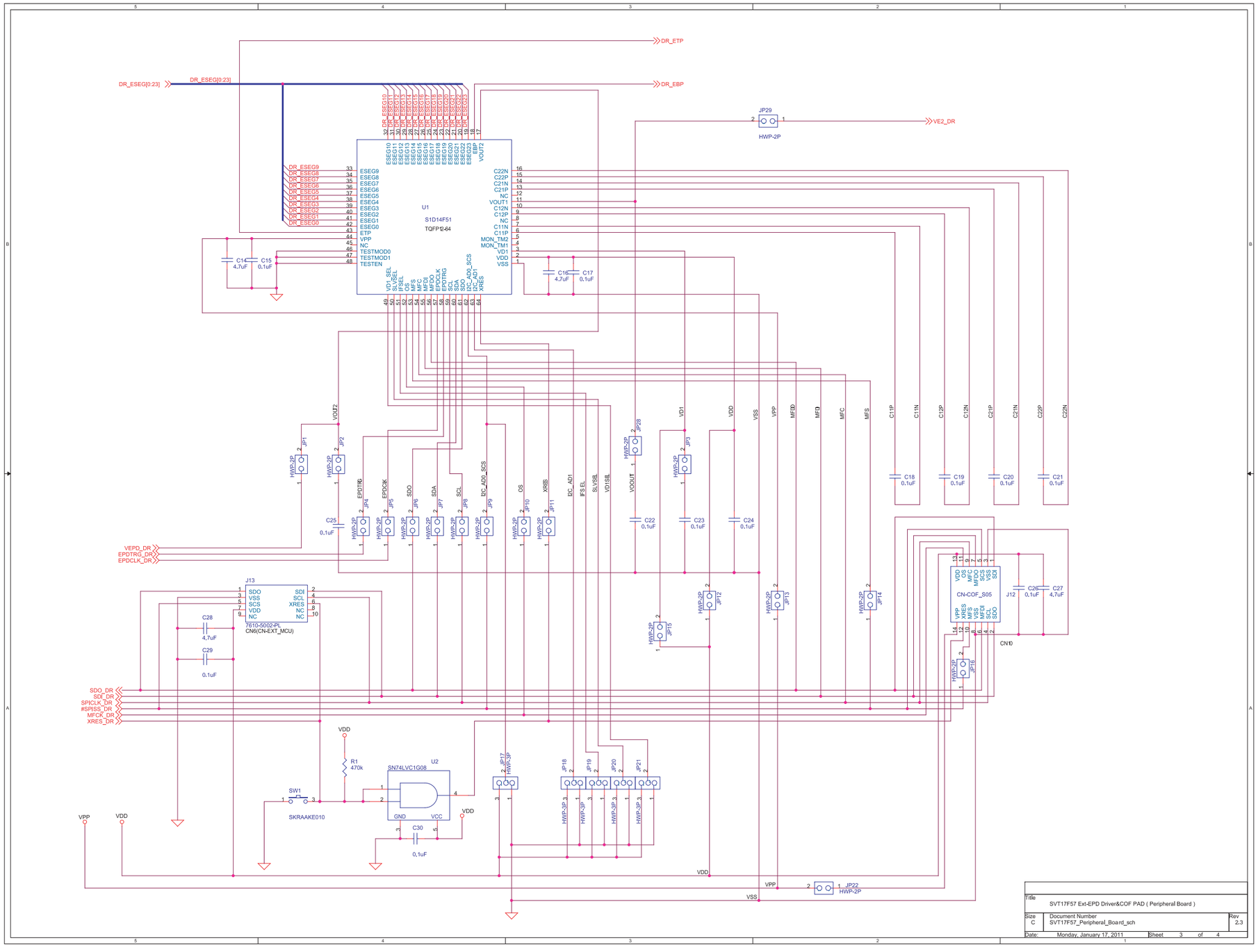
Monday, January 17, 2011
Sheet 2 of 4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DR_EBP
DR_ESEG[0:23]
VE2_DR
JP29
HWP-2P
U1
S1D14F51
TQFP2-64
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C15 0.1uF
C16 4.7uF
C17 0.1uF
C18 0.1uF
C19 0.1uF
C20 0.1uF
C21 0.1uF
C22 0.1uF
C23 0.1uF
C24 0.1uF
C25 0.1uF
C26 0.1uF
C27 4.7uF
C28 4.7uF
C29 0.1uF
C30 0.1uF
J13
76110-5002-PL
CN6(CN-EXT_MCU)
CN-COF_S05
J12
CN10
R1 470k
SW1
SKRAAKE010
U2
SN74LVC1G08
JP22
HWP-2P
VEPD_DR
EPDTRG_DR
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VSS
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Date: Monday, January 17, 2011
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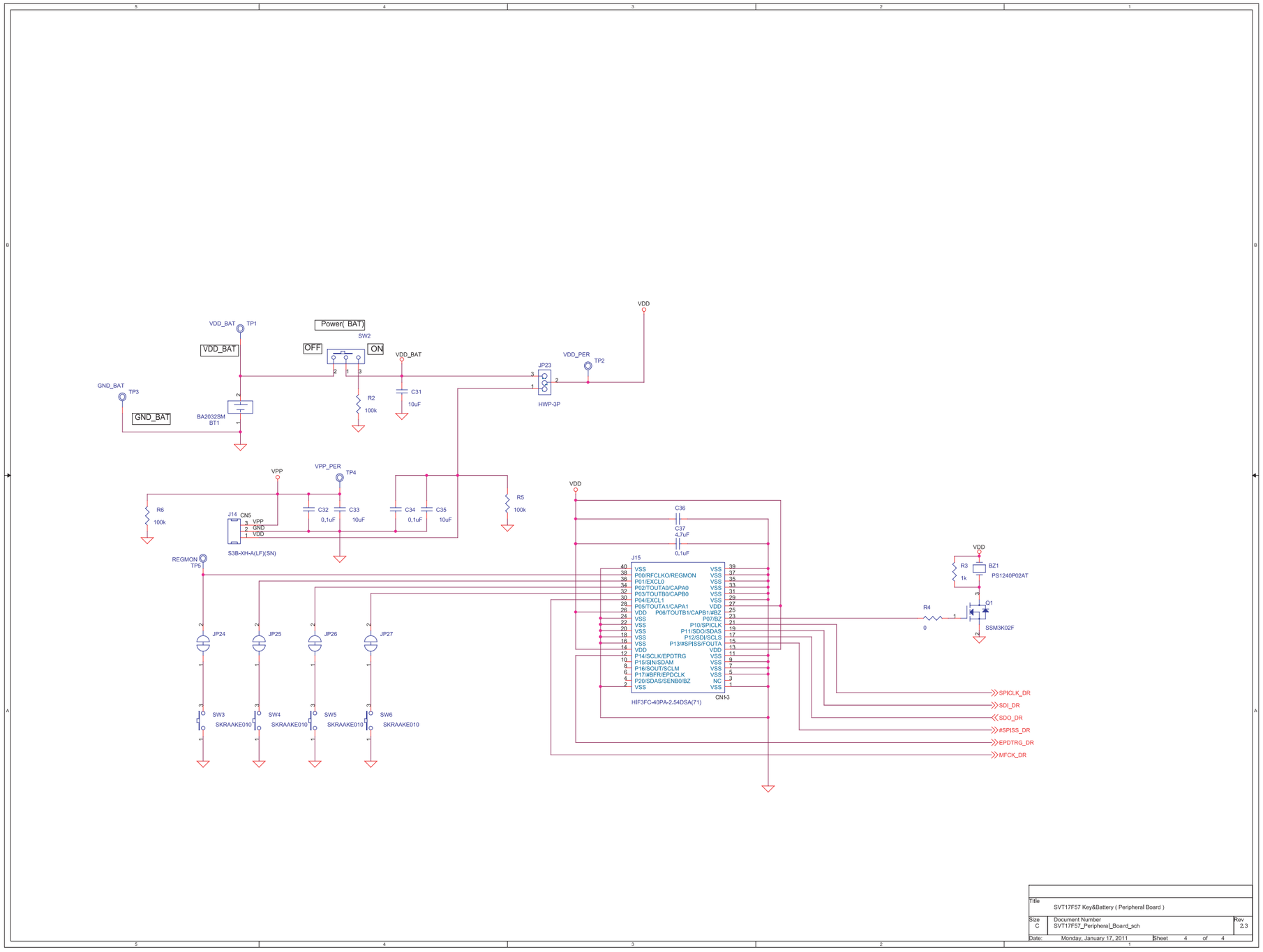
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TP1
VDD_BAT
Power(BAT)
OFF
ON
SW2
VDD_BAT
VDD_PER
TP2
JP23
HWP-3P
VDD
GND_BAT
TP3
GND_BAT
BA2032SM
BT1
R2
100k
C31
10uF
VPP
VPP_PER
TP4
R6
100k
J14
CN5
VPP
GND
VDD
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0,1uF
C33
10uF
C34
0,1uF
C35
10uF
R5
100k
REGMON
TP5
JP24
JP25
JP26
JP27
SW3
SW4
SW5
SW6
SKRAAKE010
J15
HIF3FC-40PA-2,54DSA(71)
CN13
C36
C37
4,7uF
0,1uF
R3
1k
BZ1
PS1240P02AT
Q1
SSM3K02F
R4
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SDI_DR
SDO_DR
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EPDTRG_DR
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Size
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Document Number
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Rev
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Date:
Monday, January 17, 2011
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of
4

S5U1C17F57T1100/T2100 (CPU board) component list [*1]

No.	Location	Name	Model number	Specifications	Qty	Manufacturer
1	C1,C5,C6,C7, C8,C9,C10, C11,C13,C14, C17,C18,C19, C20,C22,C23, C24,C27,C28, C29,C33,C36, C38,C39,C40, C43,C46,C48, C50	Capacitor	C1608JB1H104K	0.1μF, 50V, 1608, JB	29	TDK Corporation
2	C2,C3	Capacitor	C1608CH1H180J	18pF, 50V, 1608, CH	2	TDK Corporation
3	SENR1,SENR2, SENR3,SENR4, R4,C4,SENR5, R5,SENR6,R6, R7,C35,C37	Sensor	TH only	—	0	—
4	C12,C21,C25, C26,C32,C34, C42,C44,C47	Capacitor	C4532JB1H475K	4.7μF, 50V, JB	9	TDK Corporation
5	C30,C31,C49	Capacitor	C3216JB1H105K	1μF, 50V, JB	3	TDK Corporation
6	C41	Capacitor	C1608CH1H470J	47pF, 50V, 1608, CH	1	TDK Corporation
7	C51,C45	Capacitor	C4532JB1E106K	10μF, 25V, JB	2	TDK Corporation
8	D1	Diode	RB161VA-20	Diode, Schotky, 1A/20V, 2513	1	ROHM Co., Ltd.
9	D2	LED	PG1111C	Green	1	STANLEY ELECTRIC CO., LTD.
10	U6	Diode array	SP0503BAHTG	SOT143	1	Littelfuse, Inc.
11	JP1,JP2,JP3, JP13,JP17, JP18,JP19	Check pin	HWP-2P	2pin	7	Mac-Eight Co.,Ltd.
12	JP4,JP5,JP6, JP7,JP8,JP9, JP10,JP11, JP15,JP16	SOLDER_ JUMPER	PAT only	—	0	—
13	JP14,JP12	Checkpin	HWP-3P	3pin	2	Mac-Eight Co.,Ltd.
14	J1,J2,J3,J4	Connector CN1-1 to 4	HIF3FB-40DA-2.54DSA (71)	40pin, 2.54mm, Female	4	HIROSE ELECTRIC CO., LTD.

No.	Location	Name	Model number	Specifications	Qty	Manufacturer
15	J5	Connector CN2-1	A2-4PA-2.54DS(71)	4pin	1	HIROSE ELECTRIC CO., LTD.
16	J6	Connector CN2-2	S04B-PASK-2	4pin	1	J.S.T. Mfg. Co.,Ltd.
17	J7	Connector CN4	54819-0572	USBmini	1	Molex Ltd.
18	J8	Connector CN3	S2B-XH-A(LF)(SN)	2pin	1	J.S.T. Mfg. Co.,Ltd.
19	L1	Inductor	LQM2HPN4R7MG0L	2520, 4.7μH, 1.1A, ±20%	1	Murata Manufacturing Co., Ltd.
20	Q3	Transistor	FDC638P	SSOT-6	1	Fairchild Semiconductor Incorporated.
21	Q2	Transistor	BSS138	SOT-23, 3pin	1	Fairchild Semiconductor Incorporated.
22	R1	Resistor	RK73H2ATTD33R0F	33Ω, 2125	1	KOA Corporation
23	R2	Resistor	RK73H2ATTD4703F	470kΩ, 2125	1	KOA Corporation
24	R3,R8	Resistor	RK73H2ATTD4702F	47kΩ, 2125	2	KOA Corporation
25	R9,R17,R18, R19	Resistor	RK73Z2AT	0Ω, 2125	4	KOA Corporation
26	R20,R10	Resistor	RK73H2ATTD4701F	4.7kΩ, 2125	2	KOA Corporation
27	R11	Resistor	RK73H2ATTD4642F	46.4kΩ, ±1%, 2125	1	KOA Corporation
28	R12	Variable resistor	64WR20KLF	20kΩ	1	BI Technologies
29	R13	Resistor	RK73H2ATTD6800F	680Ω, 2125	1	KOA Corporation
30	R14	Resistor	RK73H2ATTD1212F	12.1kΩ, ±1%, 2125	1	KOA Corporation
31	R16,R15	Resistor	RK73H2ATTD1002F	10kΩ, 2125	2	KOA Corporation
32	SW1	Tact switch	SKRAAKE010	Surface mount	1	ALPS ELECTRIC CO., LTD.
33	TP1	Check pin	LC-22-G-RED	Red, ϕ1.0mm	1	Mac-Eight Co.,Ltd.
34	TP2	V_{DD}	PAT only	—	0	—
35	TP3	DTR	PAT only	—	0	—
36	TP4	RTS	PAT only	—	0	—
37	U1	IC socket	IC51-1284-1788	QFP15-128	1	Yamaichi Electronics Co., Ltd.

No.	Location	Name	Model number	Specifications	Qty	Manufacturer
38	U2	IC	SN74LVC1G08DCK	SOT(SC-70)-DCK	1	Texas Instruments
39	U3	IC	S-1000N15-N4T1G	1.5V, Nch open drain, SC-82AB	1	Seiko Instruments Inc.
40	U4	IC	LM2703MF-ADJ	SOT-23, 5pin	1	National Semiconductor Corporation
41	U5	IC	CP2102	QFN-28	1	Silicon Laboratories Inc.
42	X1	Crystal oscillator	MA-406(CL=16pF)	4.000MHz	1	EPSON TOYOCOM CORPORATION
43	X2	Crystal oscillator	MC-146(CL=12.5pF)	32768Hz	1	EPSON TOYOCOM CORPORATION
44	R22	Resistor	RK73Z1ETTP(1005)	0Ω	1	KOA Corporation

*1: The components and accessories are subject to change without notice.

S5U1C17F57T1100 (peripheral board) component list [*1]

No.	Location	Name	Model number	Specifications	Qty	Manufacturer
1	BT1	Coin battery Folder	BA2032SM	CR2032×1	1	TAKACHI ELECTRONICS ENCLOSURE CO., LTD.
2	BZ1	Buzzer	PS1240P02BT	3V, 4.0kHz, 70dB	1	TDK Corporation
3	C1,C4,C6,C8, C14,C16,C27, C28,C36	Capacitor	C4532JB1H475K	4.7μF, 50V, JB	9	TDK Corporation
4	C2,C3,C5,C7, C15,C17,C18, C19,C20,C21, C22,C23,C24, C25,C26,C29, C30,C32,C34, C37	Capacitor	C1608JB1H104K	0.1μF, 50V, 1608, JB	20	TDK Corporation
5	C31,C33,C35	Capacitor	C4532JB1E106K	10μF, 25V, JB	3	TDK Corporation
6	JP1,JP2,JP3, JP4,JP5,JP6, JP7,JP8,JP9, JP10,JP11, JP12,JP13, JP14,JP15, JP16,JP22, JP28,JP29	Checkpin	HWP-2P	2pin	19	Mac-Eight Co.,Ltd.
7	JP17,JP18, JP19,JP20, JP21,JP23	Checkpin	HWP-3P	3pin	6	Mac-Eight Co.,Ltd.
8	JP24,JP25, JP26,JP27	SOLDER_ JUMPER2	PAT only	—	0	—
9	J2,J1	Connector CN7-1 to 2	FF22E-092B-R13A-S	92pin, zigzag, 0.3mm	2	DDK Ltd.
10	J3,J4,J5,J15	Connector CN1-1 to 4	HIF3FC-40PA-2.54DS A(71)	40pin, 2.54mm, Male	4	HIROSE ELECTRIC CO., LTD.
11	J6	Connector CN9-2 (CN-EXT_C04)	PAT only(04 6286 096 102 883+)	96pin, zigzag, 0.4mm	0	KYOCERA ELCO Corporation
12	J7	Connector CN9-1 (CN-EXT_C02)	PAT only (FFX2-100A-R11AL)	100pin, 0.2mm	0	DDK Ltd.
13	J8	Connector CN8-1 (CN-EXT_S03)	PAT only	—	0	—
14	J9	Connector CN8-2 (CN-EXT_S04)	PAT only	—	0	—

No.	Location	Name	Model number	Specifications	Qty	Manufacturer
15	J10	Connector CN11 (CN-EXT_TH)	PAT only	—	0	—
16	J11	Connector CN8-3 (CN-EXT_S05)	PAT only	—	0	—
17	J12	Connector CN10 (CN-COF_S05)	PAT only	—	0	—
18	J13	Connector CN6 (CN-EXT_MCU)	7610-5002-PL	10pin, 2.54mm	1	3M Limited
19	J14	Connector CN5	S3B-XH-A(LF)(SN)	3pin	1	J.S.T. Mfg. Co.,Ltd.
20	Q1	Transistor	SSM3K02F	TO-236MOD, SC-59, 2-3F1F	1	TOSHIBA CORPORATION
21	R1	Resistor	RK73H2ATTD4703F	470kΩ, 2125	1	KOA Corporation
22	R2, R5, R6	Resistor	RK73H2ATTD1003F	100kΩ, 2125	3	KOA Corporation
23	R3	Resistor	RK73H2ATTD1001F	1kΩ, 2125	1	KOA Corporation
24	R4	Resistor	RK73Z2AT	0Ω, 2125	1	KOA Corporation
25	SW1,SW3, SW4,SW5,SW6	Tact switch	SKRAAKE010	Surface mount	5	ALPS ELECTRIC CO., LTD.
26	SW2	Slide switch	09 10290 01	1pole-2position	1	EAO
27	TP1	VDD_BAT	PAT only	—	0	—
28	TP2	VDD_PER	PAT only	—	0	—
29	TP3	GND_BAT	PAT only	—	0	—
30	TP4	VPP_PER	PAT only	—	0	—
31	U1	IC	No mount	TQFP12-64	0	
32	U2	IC	SN74LVC1G08DCK	SOT (SC-70)-DCK	1	Texas Instruments
33	TP5	Checkpin	LC-22-G-RED	Red, ϕ1.0mm	1	Mac-Eight Co.,Ltd.

*1: The components and accessories are subject to change without notice.

S5U1C17F57T1100 component list (mounted component and accessory)

No.	Location	Name	Model number	Specifications	Qty	Manufacturer
1	Mounted component	Jumper switch	JS-1		21	Mac-Eight Co.,Ltd.
2	Accessory	Jumper switch	JS-1		3	Mac-Eight Co.,Ltd.
3	Accessory	Power supply cable & connector	XHP-2	Housing	1	J.S.T. Mfg. Co.,Ltd.
			BXH-001T-P0.6	Contact	1	J.S.T. Mfg. Co.,Ltd.
			AWM1007/TR-64	wire: AWG#24, length: 20cm	1	SHINAGAWA ELECTRIC WIRE CO., LTD.
4	Mounted component	IC	S1C17F57		1	SEIKO EPSON CORPORATION
5	Mounted component	Panel	DM_EPS2		1	CITIZEN SEIMITSU CO.,LTD.
6	Mounted component	Coin battery	CR2032	CR2032EC	1	TOSHIBA CORPORATION
7	Mounted component	Panel clamping Screw	PCNT-02	Nut	2	Wilco.
8	Mounted component	Panel clamping Screw	PC-0205-T	Pan head screw + Plain washer	2	Wilco.
9	Mounted component	Spacer	ASB-309.5E	M=3, L=9.5mm	6	HIROSUGI-KEIKI Co., Ltd.
10	Mounted component	Spacer clamping screw	FB-0305N	M=3, L=5mm	14	Wilco.
11	Mounted component	Spacer	ASB-312E	M=3, L=12mm	4	HIROSUGI-KEIKI Co., Ltd.

*1: The components and accessories are subject to change without notice.

Revision History

Attachment-1

Code No.	Page	Contents
412124900	All	Newly established
	1,6,10,11,12,16,18,19,20,21,38	The description concerning S1D14F51 was deleted.
	Back cover	“NOTICE “was changed.

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