

S1R72U01

Evaluation Board Manual

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Scope of Application

This document applies to the S1R72U01 serial (UART) – USB 2.0 host/device bridge LSI, which supports USB 2.0 FS/LS.

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1. Overview

This board is designed to evaluate various S1R72U01 functions.

This manual describes how to use this board.

2. Connectors

2. Connectors

List of board connectors

No.	Name
CN1	Power connector
CN2	For connecting to PORT00 to PORT03 (not provided)
CN3	For connecting to PORT14 to PORT17 (not provided)
CN4	Power supply connector for external board
CN5	ICE connection connector (not provided)
CN6	USB connector (mini B)
CN7	USB connector (standard A)
CN8	RS232 interface connector
CN9	Main CPU connection connector

3. Jumper Settings

The jumpers on the board are set as shown below. Items indicated in gray are default settings.

3.1 Insertion jumpers

No.	Content	Setting	
JP1	+5 V circuit input source power supply switching	1-2	+5 V (CN1) input
		2-3	VBUS (CN6) input
JP3	CVDD input source power supply switching	1-2	+5 V circuit (JP1 selection)
		2-3	+3.3 V regulator output
JP4	VRIN (U01 internal regulator input) source switching	1-2	+5 V circuit (JP1 selection)
		2-3	+3.3 V regulator output
JP5	VBUS_5V_IN input source switching	1-2	+5 V circuit (JP1 selection)
		2-3	External input (TP5)
JP16	VBUS output (CN7) switching	1-2	MAX8586 output
		2-3	U01 internal VBUS-SW output
SW1	UART	1-2	UART mode
		2-3	-
SW2	HOSTxDEVICE	1-2	Device mode
		2-3	Host mode
		Open	-
SW3	WAKEUP	1-2	-
		2-3	Wakeup trigger
		Open	-
SW4	INIT_BAUD	1-2	300 bps
		2-3	9,600 bps
SW5	RESET SW	PUSH	Forced reset
		-	Normal operation

Note: If the signal is asserted to Low when SW2 (HOSTxDEVICE) and SW3 (WAKEUP) are connected to the main CPU via CN9, SW2 and SW3 should either be left open or R62 and R63 should be removed.

3. Jumper Settings

3.2 Soldered jumpers

No.	Content	Setting	
JP11	U01 internal regulator enabling switching	1-2	Disable
		1-3	Enable
JP15	MAX8586 auto restart function selection (For detailed information, refer to the MAX8586 data sheet)	1-2	MAX8586-ENRESET pin = High
		1-3	MAX8586-ENRESET pin = Low
JP2	1.8 V circuit current measurement jumper	Open	-
		Short	Always shorted
JP6	CVDD current measurement jumper	Open	-
		Short	Always shorted
JP7	VRIN current measurement jumper	Open	-
		Short	Always shorted
JP17	VBUS_5V_IN current measurement jumper	Open	-
		Short	Always shorted
JP8	Clock frequency selection	Open	24 MHz
		Short	12 MHz
JP9	U01 internal regulator input capacitor (LVDD)	Open	With LVDD external input
		Short	When using U01 internal regulator
JP10	LVDD external input selection	Open	When using U01 internal regulator
		Short	With LVDD external input
JP12	U01 internal regulator input capacitor (UVDD3)	Open	With UVDD3 external input
		Short	When using U01 internal regulator
JP13	UVDD3 external input selection	Open	When using U01 internal regulator
		Short	With UVDD3 external input
JP14	122 uF capacitor discharge resistor selection for USB host VBUS output	Open	No discharge resistor
		Short	With discharge resistor
JP18 (EP)	MAX8586 EP-PAD connection selection (For detailed information, refer to the MAX8586 data sheet)	Open	-
		Short	Connect to GND

Note 1: If the CVDD value is between +1.8 V and +5 V (excluding +1.8 V and +5 V), remove the JP3 short pin and direct the voltage to JP3 Pin 2. (+1.8 V to +5.0 V)

Note 2: If the VRIN value is between +3.3 V and +5 V (excluding +3.3 V and +5 V), remove the JP4 short pin and direct the voltage to JP4 Pin 2. (+3.3 V to +5.0 V)

4. LEDs

The LEDs on the board illuminate as shown below.

No.	Name	ON/OFF	State
LED1	+5V	ON	On when +5.0 V is input to CN1.
		OFF	-
LED2	XIRQ_EVENT	ON	Event read request
		OFF	-
LED3	XIRQ_STATUS	ON	Status notification
		OFF	-
LED4	SIO_READY	ON	Transmission start ready notification
		OFF	-
LED5	VBUS_LED	ON	USB host VBUS output
		OFF	-
LED9	TPL	ON	Unsupported device
		OFF	-
LED10	ManyDEV	ON	Too many devices
		OFF	-
LED11	ManyHub	ON	Too many hubs
		OFF	-
LED12	VBUS_Cur	ON	VBUS overcurrent
		OFF	-

5. USB Interface Peripheral Circuit

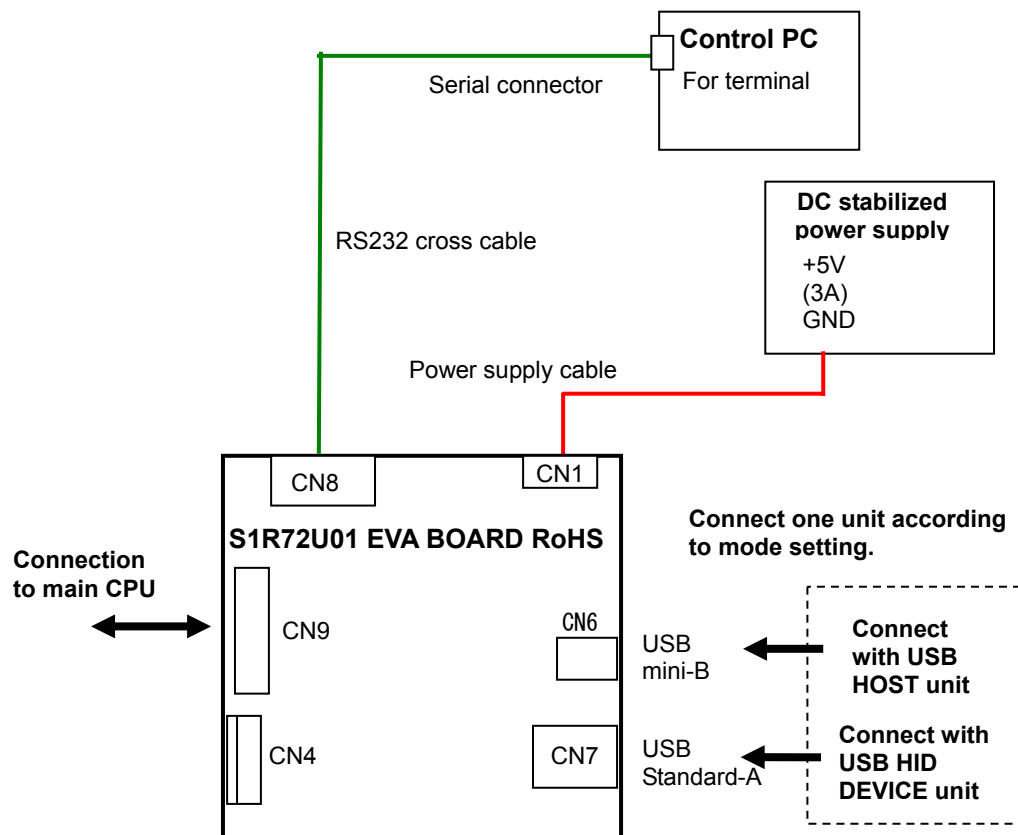
5. USB Interface Peripheral Circuit

This board includes the following two USB connectors:

- CN6 (USB Mini B) for device functions
- CN7 (USB Standard A) for host functions

These DP and DM pins for these connectors are also connected to the DP and DM pins on this IC to make evaluation easier, but such circuits are not recommended. This is because mounting such components or using such wiring patterns may affect impedance matching and reduce signal quality, resulting in communications problems. For detailed information, see the *S1R72V Series USB 2.0 Hi-Speed PCB Design Guidelines*.

6. Connection Example

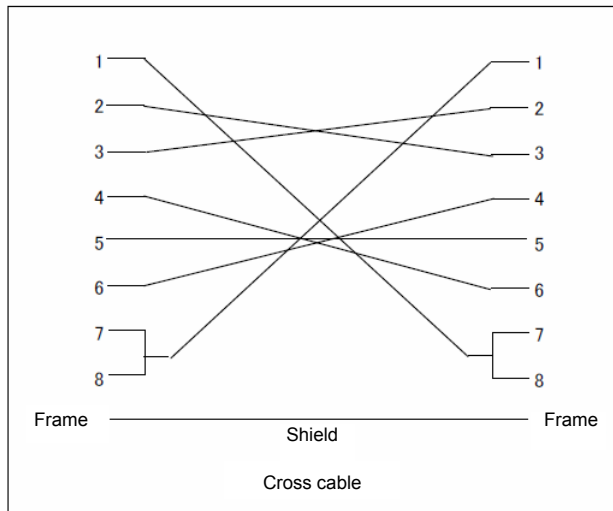


Use the following cable (or equivalent cable meeting the following specifications) to connect this board to the control PC.

- RS-232C cross cable/Dsub 9-pin female – Dsub 9-pin female
- KR-EC99R-2 (Sanwa Supply)

6. Connection Example

Connection specifications



7. Connection to Main CPU

7.1 Main CPU connection signal

The S1R72U01 EVA BOARD RoHS can be connected to the main CPU via CN9.

CN9 signal	I/O	Signal description	Destination to which main CPU is connected
MISO	Tri	Serial data output (Hi-z output when SS is High)	Serial data input (Rx)
MOSI	I	Serial data input	Serial data output (Tx)
SCK	I	Serial clock input (not used)	Not connected
SS	I	Slave select input (Can be used for MISO pin output control. Fix to Low when Hi-z output is not required.)	CS
XIRQ_EVENT	O	Event read request output	General input port (GPI)
XIRQ_STATUS	O	Status notification output	General input port (GPI)
SIO_READY	O	Transmission start ready notification output	General input port (GPI)
CLKOUT	O	Clock output	Clock input
HOSTxDEVICE	I	Host/device mode setting input (S1R72U01 is reset when the setting is switched)	General output port (GPO)
WAKEUP	I	Wakeup input (Wakeup triggered at leading edge)	General output port (GPO)

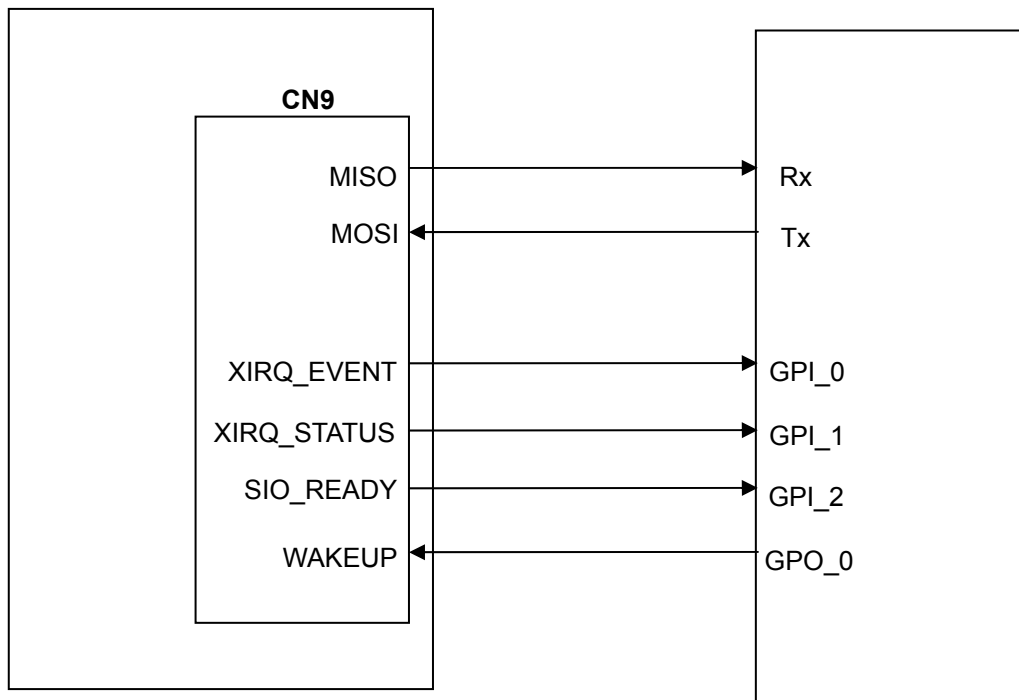
Note 1: I/O Tri means that three states (H level, L level, and Hi-z) are possible.

Note 2: The input/output levels for each signal will be the CVDD levels for S1R72U01.

<Connection example>

S1R72U01 EVA BOARD RoHS

Main CPU



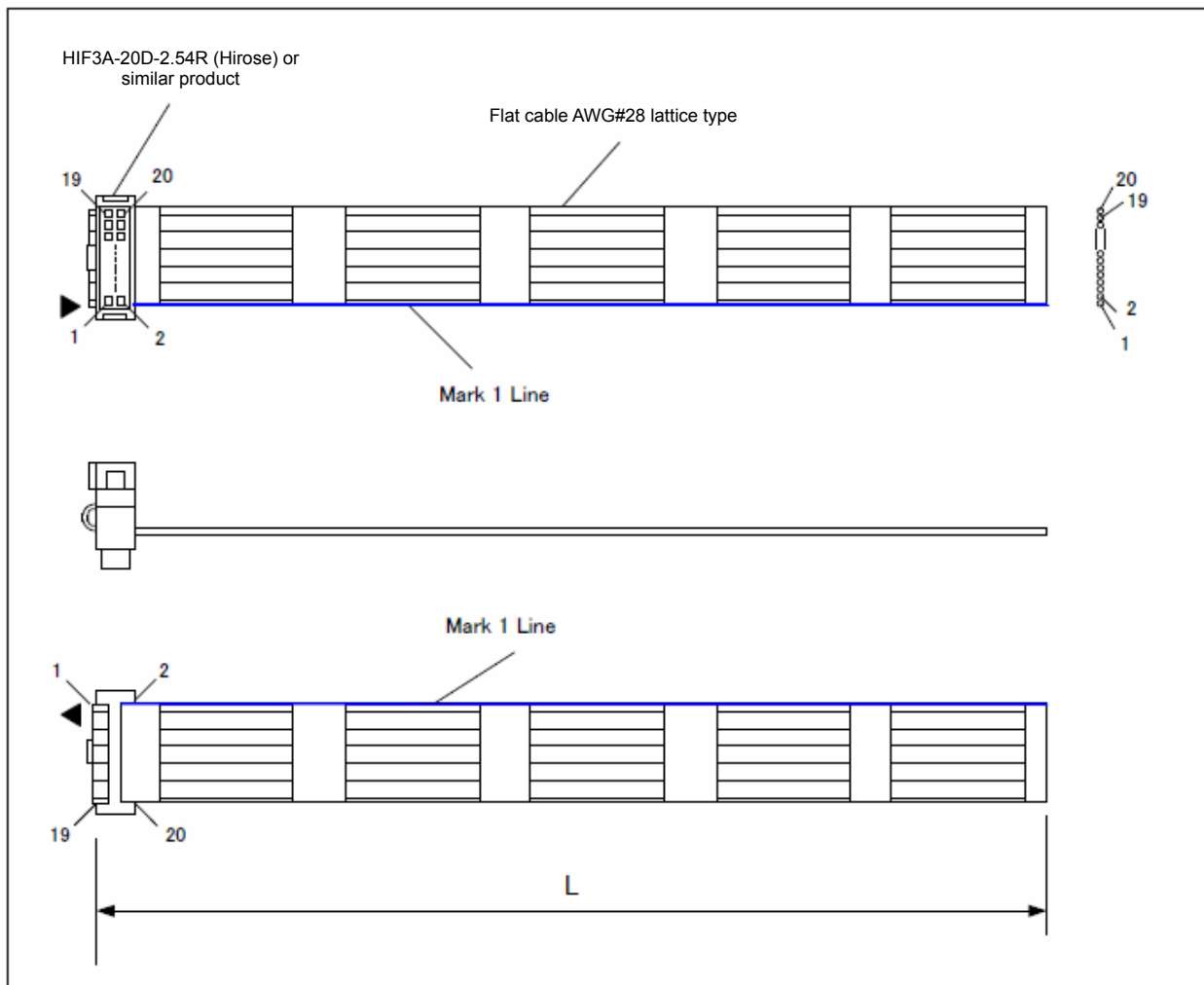
7. Connection to Main CPU

7.2 Connection cable example

This is a typical cable used to connect to CN9.

Connect the connector end to CN9. The main CPU end should be modified as required to suit the client's configuration.

(L= desired length)



8. Power Supply

The power supply for this board should be supplied to CN1 as shown below.

Pin 1	+5V
Pin 2	GND
Pin 3	N.C.
Pin 4	N.C.

Note: Before providing a different voltage to CVDD or VRIN, refer to Notes 1 and 2 in “3. Jumper Settings.”

9. Setting Example

9. Setting Example

9.1 Power supply input

When providing +5 V from CN1, +5 V to CVDD, +3.3 V to VRIN, and CN1 +5 V to VBUS_5V_IN.

(Select blue settings)

No.	Content	Setting	
JP1	+5 V circuit input source power supply switching	1-2	+5 V (CN1) input
		2-3	VBUS (CN6) input
JP3	CVDD input source power supply switching	1-2	+5 V circuit (JP1 selection)
		2-3	+3.3 V regulator output
JP4	VRIN (U01 internal regulator input) source switching	1-2	+5 V circuit (JP1 selection)
		2-3	+3.3 V regulator output
JP5	VBUS_5V_IN input source switching	1-2	+5 V circuit (JP1 selection)
		2-3	External input (TP5)

9.2 VBUS-SW selection

When U01 internal VBUS-SW output is selected for VBUS output.

(Select blue settings)

No.	Content	Setting	
JP16	VBUS output (CN7) switching	1-2	MAX8586 output
		2-3	U01 internal VBUS-SW output

9.3 LVDD and UVDD3 input settings

9.3.1 When using S1R72U01 internal regulator output for LVDD and UVDD3.

(Select blue settings)

No.	Content	Setting	
JP9	U01 internal regulator input capacitor	Open	With LVDD external input
		Short	When using U01 internal regulator
JP10	LVDD external input selection	Open	When using U01 internal regulator
		Short	With LVDD external input
JP11	U01 internal regulator enabling switching	1-2	Disable
		1-3	Enable
JP12	U01 internal regulator input capacitor	Open	With UVDD3 external input
		Short	When using U01 internal regulator
JP13	UVDD3 external input selection	Open	When using U01 internal regulator
		Short	With UVDD3 external input

9.3.2 When using external input for LVDD and UVDD3

(Select blue settings)

No.	Content	Setting	
JP9	U01 internal regulator input capacitor	Open	With LVDD external input
		Short	When using U01 internal regulator
JP10	LVDD external input selection	Open	When using U01 internal regulator
		Short	With LVDD external input
JP11	U01 internal regulator enabling switching	1-2	Disable
		1-3	Enable
JP12	U01 internal regulator input capacitor	Open	With UVDD3 external input
		Short	When using U01 internal regulator
JP13	UVDD3 external input selection	Open	When using U01 internal regulator
		Short	With UVDD3 external input

Note: External input will be +3.3 V for UVDD3 and +1.8 V for LVDD.

9.4 CLKIN

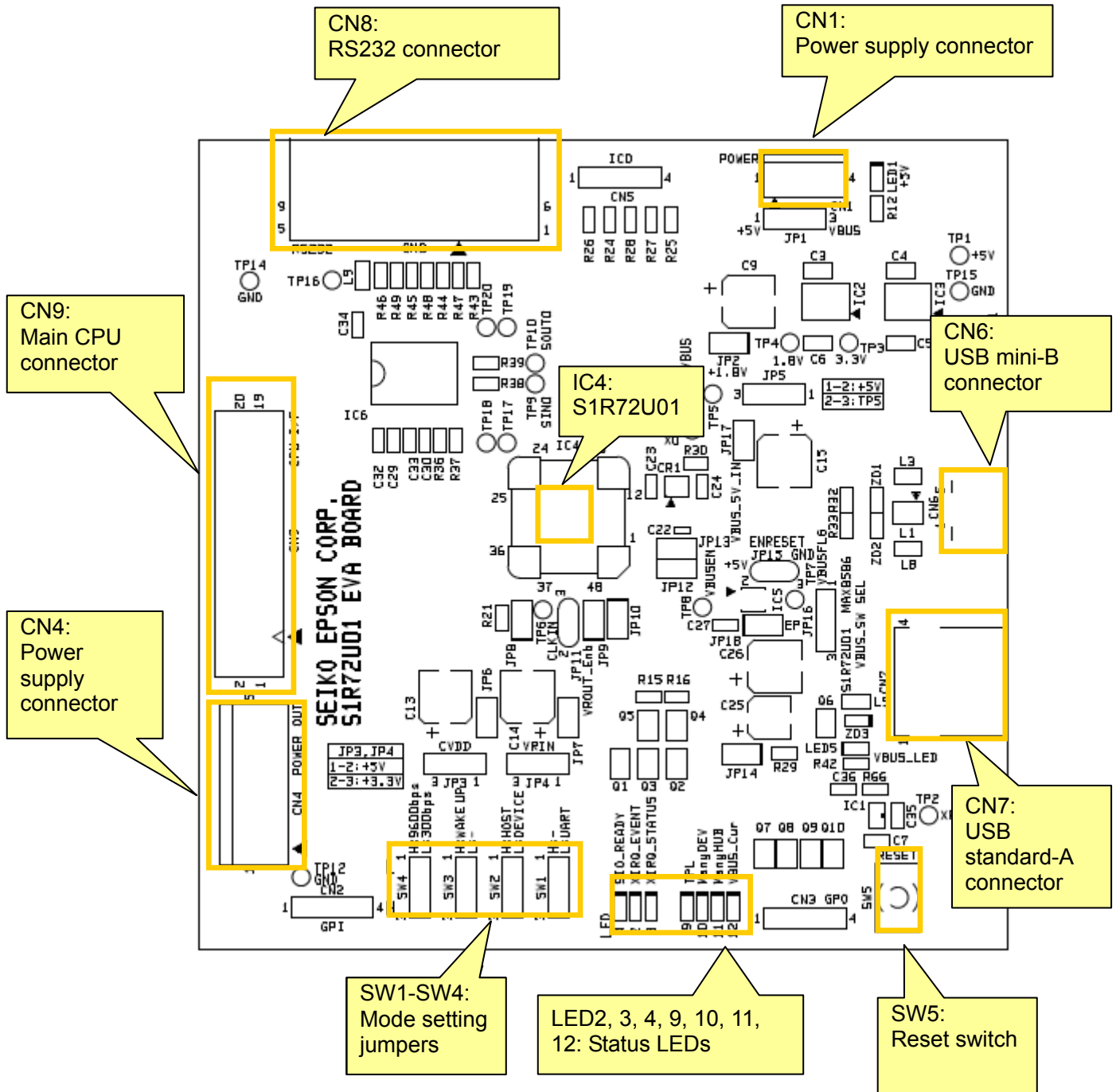
The following procedures must be performed to feed clock input to the S1R72U01 CLKIN pin on this board.

- Remove CR1.
- Set JP8 to Open. (When CLKSEL = 24 MHz)
- Remove C23, C24, R30, R22, R23.
- Mount 100 kΩ on R64.
- Connect the CR1-1 pin side (IC4 XI pin side) of C23 to GND via a jumper. Leave the XO pin open.
- Input clock to TP6 (CLKIN).

Note: Set the input clock amplitude for the CLKIN pin to the same voltage selected for CVDD with JP3.

10. Appendix

10.1 Exterior diagram



10.2 Circuit diagram

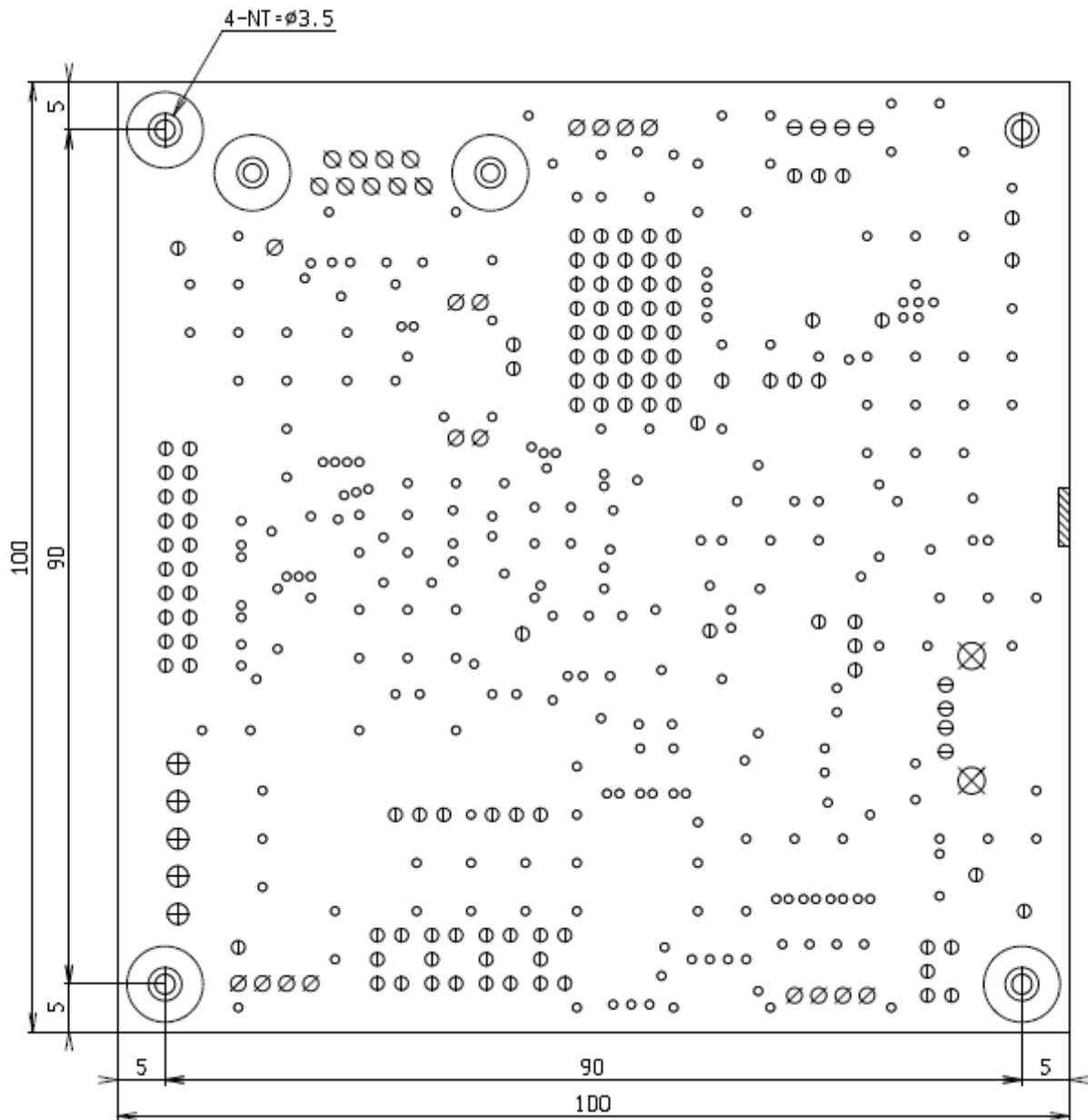
Refer to attachments.

10.3 Component list

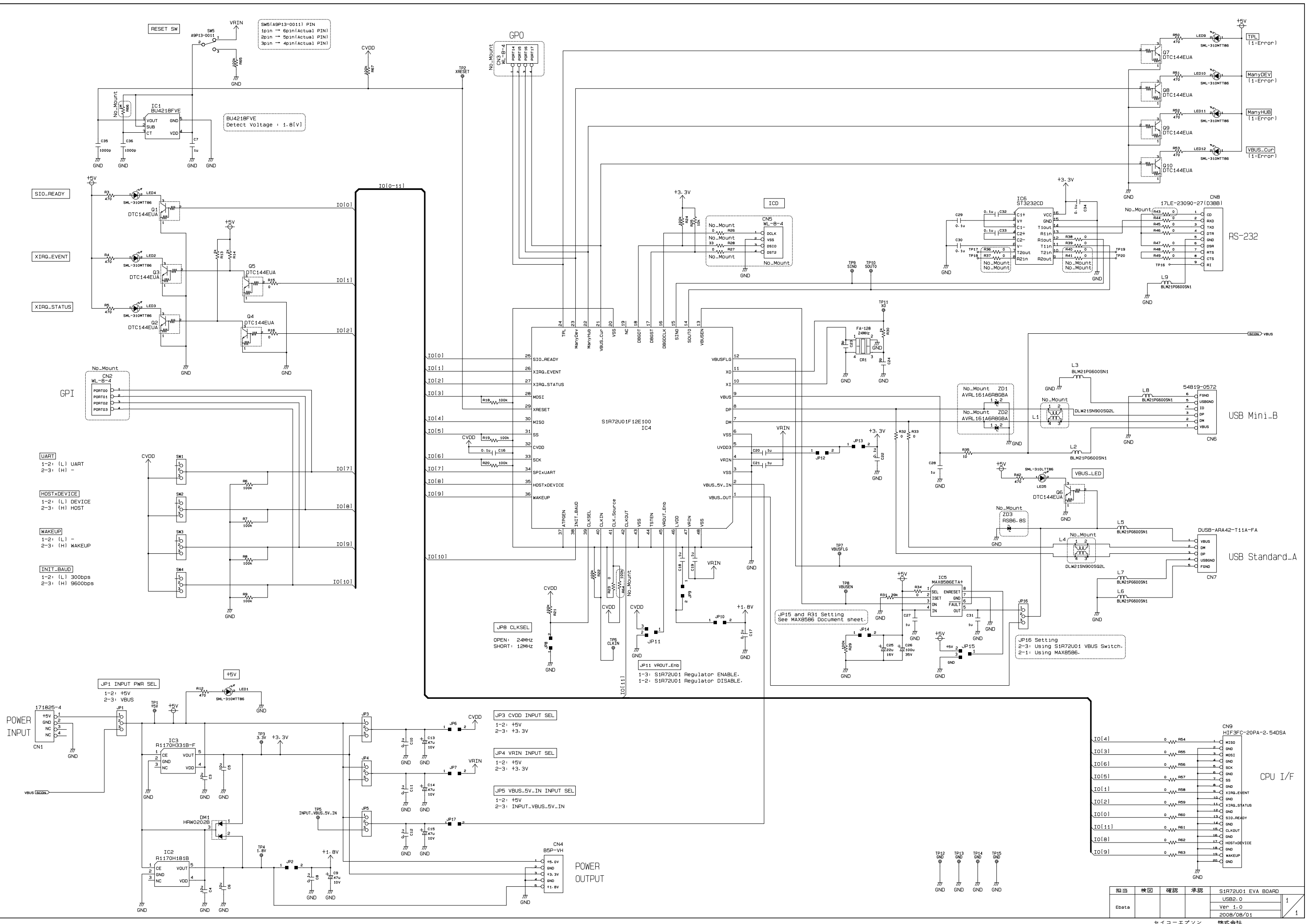
Refer to attachments.

10.4 Circuit board dimensional diagram

External dimensions: 100.00 [mm] x 100.00 [mm]



[mm]



RESET SW
ASP13-0011

SW5(A9P13-0011) PIN
1pin → 5pin(Actual) PIN
2pin → 6pin(Actual) PIN
3pin → 4pin(Actual) PIN

BU4218FVE
Detect Voltage : 1.8[V]

IO[0-11]

GPI

UART
1-2: (L) UART
2-3: (H) -

HOSTxDEVICE
1-2: (L) DEVICE
2-3: (H) HOST

WAKEUP
1-2: (L) -
2-3: (H) WAKEUP

INIT_BAUD
1-2: (L) 300bps
2-3: (H) 9600bps

POWER INPUT

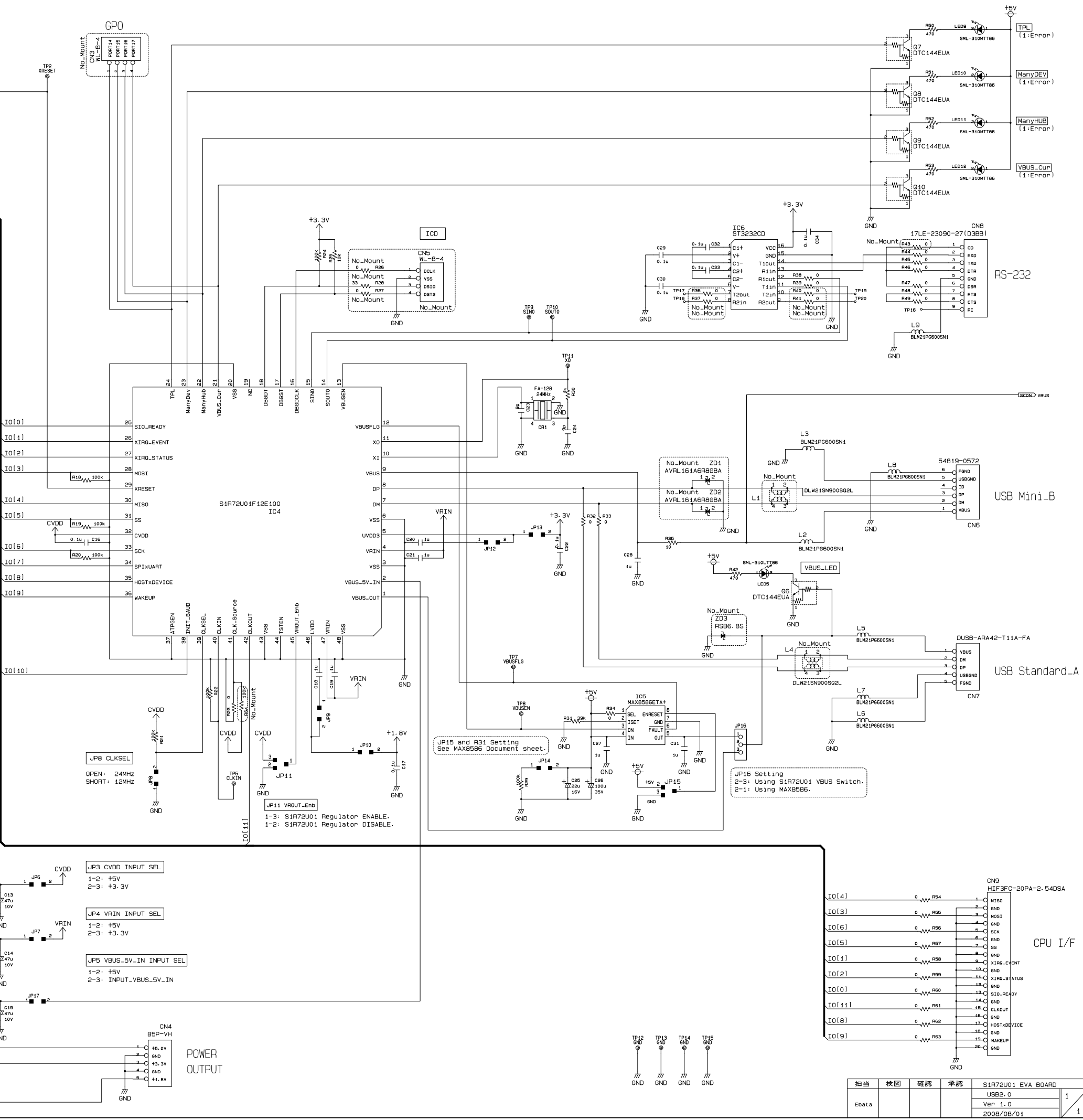
JP1 INPUT PWR SEL
1-2: +5V
2-3: VBUS

JP3 CVDD INPUT SEL
1-2: +5V
2-3: +3.3V

JP4 VRIN INPUT SEL
1-2: +5V
2-3: +3.3V

JP5 VBUS_5V_IN INPUT SEL
1-2: +5V
2-3: INPUT_VBUS_5V_IN

POWER OUTPUT



担当	検回	確認	承認	S1R72U01 EVA BOARD
Ebata				USB2.0 Ver 1.0 2008/08/01

S1R72U01 EVA BOARD RoHS Component List

Note: Quantities are also shown for components not mounted. For non-mounted components, refer to "Output for non-mounted components."

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Revision:

5

Part Name	Quantity	Maker	Value	Rating	Tolerance	Reference	Remarks
C3225JB1A106M	4	TDK	10 u	10 V	20%	C3, C4, C5, C6	May be replaced with item meeting equivalent specifications.
10SVP47M	4	SANYO	47u	10 V	20%	C9, C13, C14, C15	
GRM188F11A105ZA01	5	Murata	1u	10 V	+80/-20%	C7, C18, C19, C20, C21	May be replaced with item meeting equivalent specifications.
GRP155B11A104ZA	7	Murata	0.1u	10 V	10%	C8, C10, C11, C12, C16	May be replaced with item meeting equivalent specifications. C17, C22
UMK107CH090DZ	2	Taiyo Yuden	9 p	50 V	0.5 pF	C23, C24	May be replaced with item meeting equivalent specifications.
UWT1C220MCL	1	Nichicon	22 u	16 V	20%	C25	
UWT1V101MCL	1	Nichicon	100 u	35 V	20%	C26	
GRM31MF11E105ZA01L	3	Murata	1 u	25 V		C27, C28, C31	May be replaced with item meeting equivalent specifications.
GRM188R11H104JA01	5	Murata	0.1 u	50 V	5%	C29, C30, C32, C33, C34	May be replaced with item meeting equivalent specifications.
C1608CH1H102J	2	TDK	1000 p	50 V	5%	C35, C36	May be replaced with item meeting equivalent specifications.
171825-4	1	AMP				CN1	
B5P-VH	1	JST				CN4	
WL-8-4	3	MAC8				CN2, CN3, CN5	
54819-0572	1	MOLEX				CN6	
DUSB-ARA42-T11A-FA	1	DDK				CN7	
17LE-23090-27(D3BB)	1	DDK				CN8	
HIF3FC-20PA-2.54DSA	1	Hirose				CN9	
FA-128(24MHz)	1	Epson Toyocom	24 MHz	CL=10 pF	±50 ppm	CR1	
HRW0202B	1	Hitachi				DM1	
BU4218FVE	1	ROHM				IC1	
R1170H181B-F	1	RICOH				IC2	
R1170H331B-F	1	RICOH				IC3	
S1R72U01F12E100	1	EPSON				IC4	
MAX8586ETA+	1	Maxim				IC5	
ST3232CD	1	ST Micro				IC6	
JP-2-A	10					JP2, JP6, JP7, JP8, JP9, JP10, JP12, JP13, JP14, JP17	Solder jumper
JP-3-L	2					JP11, JP15	Solder jumper
XJ8D-0311	9	OMRON				JP1, JP3, JP4, JP5, JP16, SW1, SW2, SW3, SW4	
XJ8A-0211	9	OMRON				JP1, JP3, JP4, JP5, JP16, SW1, SW2, SW3, SW4	XJ8D-0311 shorting pin
DLW21SN900SQ2L	2	Murata	90			L1, L4	
BLM21PG600SN1	7	Murata	60			L2, L3, L5, L6, L7, L8, L9	
SML-310MTT86	8	ROHM				LED1, LED2, LED3, LED4, LED9, LED10, LED11, LED12	
SML-310LTT86	1	ROHM				LED5	
DTC144EUA	10	ROHM				Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10	
MCR03EZJH102	3	ROHM	1 k	1/16 W	5%	R13, R14, R30	May be replaced with item meeting equivalent specifications.
MCR03EZJHJ000	31	ROHM	0	1/16 W	5%	R15, R16, R23, R26, R27, R32, R33, R34, R36, R37, R38, R39, R40, R41, R43, R44, R45, R46, R47, R48, R49, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63	May be replaced with item meeting equivalent specifications.
MCR03EZJH104	14	ROHM	100 k	1/16 W	5%	R6, R7, R8, R9, R18, R19, R20, R21, R22, R24, R29, R64, R65, R67	May be replaced with item meeting equivalent specifications.
MCR03EZJH103	1	ROHM	10 k	1/16 W	5%	R25	May be replaced with item meeting equivalent specifications.
MCR03EZJHJ330	1	ROHM	33	1/16 W	5%	R28	May be replaced with item meeting equivalent specifications.
MCR03EZJHJ393	1	ROHM	39 k	1/16 W	5%	R31	May be replaced with item meeting equivalent specifications.
MCR03EZJHJ100	1	ROHM	10	1/16 W	5%	R35	May be replaced with item meeting equivalent specifications.
MCR03EZJHJ471	9	ROHM	470	1/16 W	5%	R3, R4, R5, R12, R42, R50, R51, R52, R53	May be replaced with item meeting equivalent specifications.
MCR03EZJH105	1	ROHM	1 M	1/16 W	5%	R66	May be replaced with item meeting equivalent specifications.
A9P13-0011	1	OMRON				SW5	
LC-33-S-Red	3	MAC8				TP1, TP3, TP4	
LC-33-S-Yellow	8	MAC8				TP2, TP5, TP6, TP7, TP8, TP9, TP10, TP11	
LC-33-S-Black	4	MAC8				TP12, TP13, TP14, TP15	
Round_Pattern	5	no_maker				TP16, TP17, TP18, TP19, TP20	Hole diameter 1.1 mm, land diameter 1.6 mm TH
AVRL161A6R8GBA	2	TDK				ZD1, ZD2	
RSB6.8S	1	ROHM				ZD3	

**** Output for non-mounted components ****

<u>Ref</u>	<u>Component</u>	<u>Unmounted flag</u>
L1	DLW21SN900SQ2L	No_Mount
L4	DLW21SN900SQ2L	No_Mount
ZD2	AVRL161A6R8GBA	No_Mount
ZD3	RSB6.8S	No_Mount
CN5	WL-8-4	No_Mount
CN3	WL-8-4	No_Mount
CN2	WL-8-4	No_Mount
ZD1	AVRL161A6R8GBA	No_Mount
R43	MCR03EZHJ000	No_Mount
R64	MCR03EZHJ104	No_Mount
R66	MCR03EZHJ105	No_Mount
R26	MCR03EZHJ000	No_Mount
R27	MCR03EZHJ000	No_Mount
R28	MCR03EZHJ330	No_Mount
R36	MCR03EZHJ000	No_Mount
R37	MCR03EZHJ000	No_Mount
R40	MCR03EZHJ000	No_Mount
R41	MCR03EZHJ000	No_Mount

Revision History

Revision History

Date	Revision details			
	Rev.	Page	Type	Details
08/25/2008	1.0	All	New	Newly established

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