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S2R72A Series LSI
Evaluation Board Manual

SEIKO EPSON CORPORATION

Rev.1.30

NOTICE

Scope

This document applies to the S2R72A04 EVA BOARD RoHS (Product code S5U2R72A04F0100) evaluation board for the S2R72A04 hub control LSI supporting USB 2.0 (Product code S2R72A44F12C400 / S2R72A43F12C400 / S2R72A42F12C400).

Table of Contents

1. Overview

This document explains how to use the S2R72A04 EVA BOARD RoHS (product code: S5U2R72A04F0100).

2. Connectors, LEDs, and Power Supply

2.1 Connectors

The connector uses are as shown below.

Ref.	Use
CN1	Power supply input (5 V)
CN2	Power supply input (3.3/1.8 V) (Note)
CN3	USB upstream port
CN4	Function expansion
CN5	USB downstream port 4
CN6	USB downstream port 3
CN7	USB downstream port 2
CN8	USB downstream port 1

Note: Not used when onboard regulator is used.

2.2 LEDs

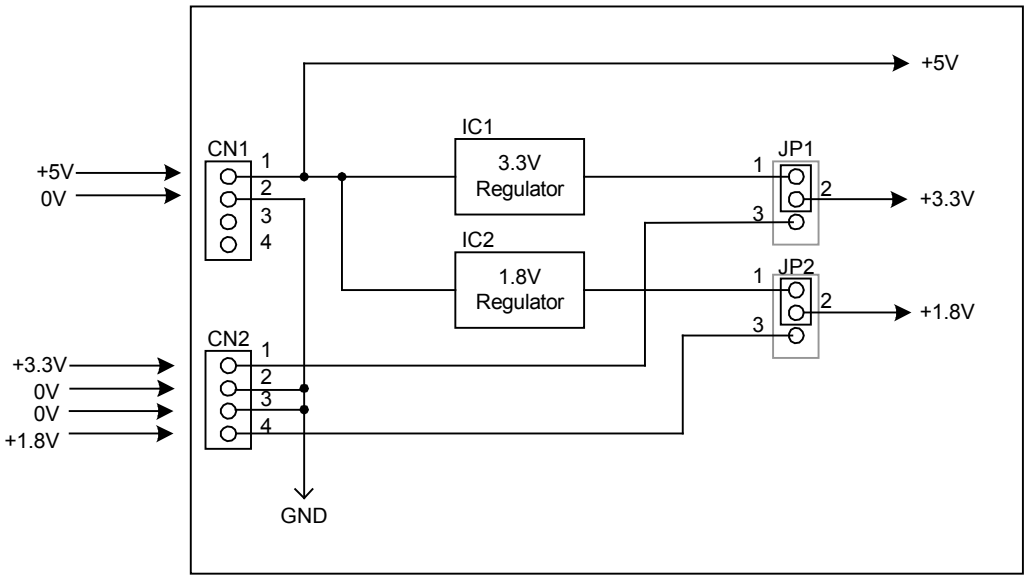
The LED illumination patterns are as shown below.

Ref.	Illumination pattern
LED1	Illuminates when 5 V power supply is input.
LED2	Illuminates when PORT4 VBUS switch (IC5) is on.
LED3	Illuminates when PORT3 VBUS switch (IC6) is on.
LED4	Illuminates when PORT2 VBUS switch (IC7) is on.
LED5	Illuminates when PORT1 VBUS switch (IC8) is on.

2.3 Power Supply

The diagram below illustrates the power supply configuration for the evaluation board. Provide +5 V to CN1. CN2 is not used.

Note that, if +3.3 V and +1.8 V external power supplies are provided, +5 V should be input to CN1, and +3.3 V and +1.8 V should be input to CN2. In this case, JP1 and JP2 described later must be changed from their default factory settings.



3. Function Settings

3.1 Jumper pin list

The pin uses and details are as shown below.

indicates default factory settings.

Jumper pin settings

	Use	1–2 shorted	2–3 shorted
JP1	3.3 V power supply selection	Onboard regulator	External input (CN2)
JP2	1.8 V power supply selection	Onboard regulator	External input (CN2)
JP3	LSI 3.3 V consumption current measurement	Always shorted	–
JP4	MODE4 selection	H: For enabled down port setting	L
JP5	MODE3 selection	H: For enabled down port setting	L
JP6	MODE2 selection	H: Individual mode	L: Gang mode
JP7	MODE1 selection	H: VBUS control enabled	L: VBUS control disabled
JP8	MODE0 selection	H: USB1.1 mode	L: USB2.0 mode
JP9	TST0 selection	H: Prohibited	L: Constant

Jumper soldering settings

	Use	1–2 shorted	1–3 shorted
JP10	TESTEN selection	L: Constant	H: Prohibited
JP11	PORT4–VBUS supply selection	Onboard VBUS switch	External supply (CN4)
JP12	PORT3–VBUS supply selection	Onboard VBUS switch	External supply (CN4)
JP13	PORT2–VBUS supply selection	Onboard VBUS switch	External supply (CN4)
JP14	PORT1–VBUS supply selection	Onboard VBUS switch	External supply (CN4)

3.2 Mode settings

Enabled downstream port setting

Set using MODE[4-3] (JP4 and JP5). All four are enabled with the default factory settings.

MODE4 (JP4)	MODE3 (JP5)	Downstream port			
		D1	D2	D3	D4
L	L	Enabled	Enabled	Disabled	Disabled
L	H	Enabled	Enabled	Enabled	Disabled
H	H	Enabled	Enabled	Enabled	Enabled
H	L	Disabled			

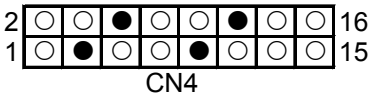
VBUS supply mode settings

Set using MODE[2-1] (JP6 and JP7). These are set to "Individual" with the default factory settings.

MODE2 (JP6)	MODE1 (JP7)	JP11 to JP13	JP14	CN4	VBUS supply mode
H	H	1–2 shorted	1–2 shorted	Not connected	Individual mode
L	H	1–3 shorted	1–2–3 all shorted	Connection 1	Gang mode
H/L	L	1–3 shorted	1–3 shorted	Connection 2	Non-control mode

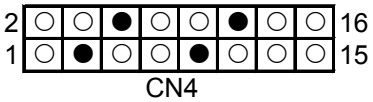
Connection 1: When using in Gang mode, CN4 should also be set as shown below.

The pins shown below as solid circles (pins 3, 6, 9, 12) should be shorted with lead wires.



Connection 2: When using in non-control mode, CN4 should also be set as shown below.

The pins shown below as solid circles (pins 3, 6, 9, 12) should be shorted with lead wires and fed with +5 V.



Note: IC8 may be detected as having overcurrent when using in Gang mode, depending on the consumption current of the USB device connected, as IC8 feeds the VBUS for all downstream ports. The initial overcurrent detection setting (R24 = 39 kΩ) is 0.925 A (typ.), and so R24 should be changed appropriately if the total VBUS supply current for all downstream ports exceeds this. For more information, refer to the IC8 data sheet.

USB Version mode settings

Set using MODE[0] (JP8). This is set to "USB 2.0 mode" (High Speed) with the default factory settings.

MODE0 (JP8)	USB Version mode
H	USB1.1 (Full Speed)
L	USB2.0 (High Speed)

4. S2R72A43/S2R72A42

S2R72A43 or S2R72A42 can be used as shown below if they are mounted in place of S2R72A44 for IC4.

When using S2R72A43

Pin not connected on IC4	Evaluation board configuration
35pin : D4_VBUSEN	R9 not mounted and CN4 pin 1 not used
28pin : D4_VBUSFLG	R10 not mounted and CN4 pin 2 not used
21pin : D4_DP	CN5 not used
20pin : D4_DM	CN5 not used

When using S2R72A42

Pin not connected on IC4	Evaluation board configuration
35pin : D4_VBUSEN	R9 not mounted and CN4 pin 1 not used
28pin : D4_VBUSFLG	R10 not mounted and CN4 pin 2 not used
21pin : D4_DP	CN5 not used
20pin : D4_DM	CN5 not used
34pin : D3_VBUSEN	R11 not mounted and CN4 pin 4 not used
27pin : D3_VBUSFLG	R12 not mounted and CN4 pin 5 not used
18pin : D3_DP	CN6 not used
17pin : D3_DM	CN6 not used

5. Appendix

5.1 External dimension diagram

Included at the end of the document.

5.2 Circuit diagram

Included at the end of the document.

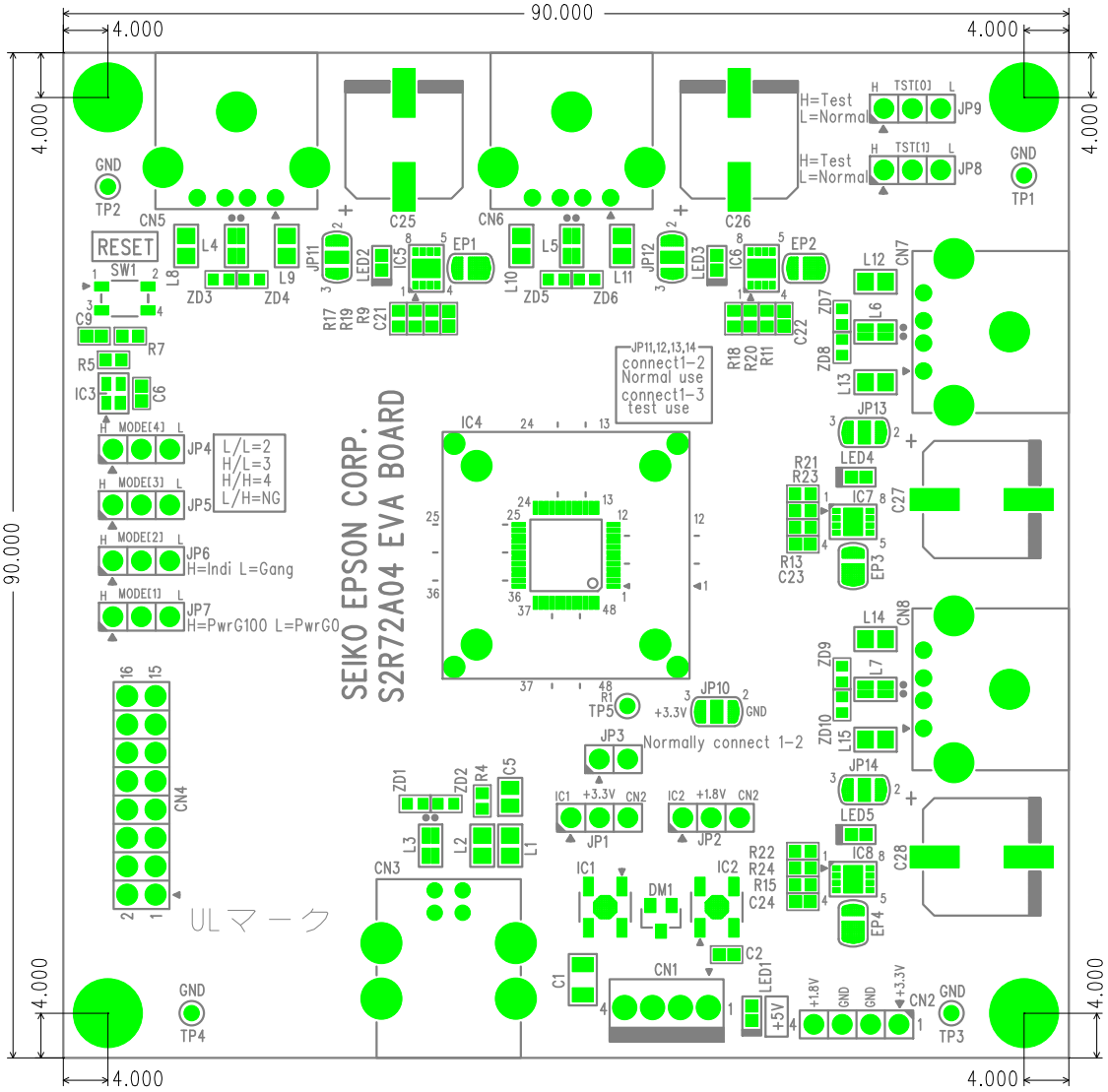
5. Appendix

5.3 Parts list

partName	Quantity	Maker	value	rating	tolerance	reference
GCM31CR71C106KA49B	4	Murata	10u	16V	-100	C1,C3,C29,C31
GCM188R11H104KA42B	9	Murata	0.1u	50V	-100	C2,C4,C30,C10
						C32,C11,C12,C13,C14
GCM21BR11E105KA42B	1	Murata	1u	25V	-100	C5
GCM188R11E223KA01B	2	Murata	0.022u	50V	-100	C6,C9
GRM1885C1H7R0DZ01D	2	Murata	7p	50V	+0.5p/-0.5p	C7,C8
GCM188C71A105KA40B	4	Murata	1u	10V	-100	C21,C22,C23,C24
GRM188F11H103ZA01	6	Murata	0.01u	50V	+80/-20%	C15,C16,C17,C18,C19
						C20
GRM188B31A225KE33	3	Murata	2.2u	10V	10%	C10,C11,C14
GRM21BB10J106KE01B	1	Murata	10u	6.3V	10%	C20
EEEHD1C221AP	4	Panasonic	220u	16V	-100	C25,C26,C27,C28
171825-4	1	AMP				CN1
WL-1-4	1	Mac8				CN2
DUSB-BRA42-T11-FA	1	Daiichi-Denshi				CN3
WLW-8-8PW	1	Mac8				CN4
DUSB-ARA42-T11A-FA	4	Daiichi-Denshi				CN5,CN6,CN7,CN8
FA-23A(12MHz)	1	EPSON_QD				CR1
HRW0202B	1	Renesas				DM1
R1170H331B	1	RICOH				IC1
R1130H181B	1	RICOH				IC2
S-80927CNNB	1	SII				IC3
S2R72A04	1	EPSON				IC4
MAX8586ETA+	4	Maxim				IC5,IC6,IC7,IC8
WL-1-2	1	Mac8				JP3
WL-1-3	8	Mac8				JP1,JP2,JP4,JP5,
						JP6,JP7,JP8,JP9
JS-1	9	Mac8				JP15,JP16,JP17,
						JP18,JP19,JP20,
						JP21,JP22,JP23
DLW21SN900SQ2L	5	Murata	90			L3,L4,L5,L6,L7
BLM21PG600SN1	10	Murata	60			L1,L2,L8,L9,L10,
						L11,L12,L13,L14,
						L15
SML-512PW(A)	5	ROHM				LED1,LED2,LED3,
						LED4,LED5
MCR03EZHJ100	1	ROHM	10	1/16W	5%	R4
MCR03EZHJ000	20	ROHM	0	1/16W	5%	R2,R3,R5,R6,R9,R10
						,R11,R12,R13,R14,
						R15,R16,R17,R18,
						R21,R22,R25,R26,
						R27,R28
MCR03EZHJ104	1	ROHM	100k	1/16W	5%	R7
RR0816P-123-D	1	SSM	12k	1/16W	0.50%	R8
MCR03EZHJ393	4	ROHM	39k	1/16W	5%	R19,R20,R23,R24
MCR03EZHJ821	5	ROHM	820	1/16W	5%	R1,R29,R30,R31,R32
SKRPABE010	1	ALPS				SW1
LC-33-S-Black	4	Mac8				TP1,TP2,TP3,TP4
LC-33-S-Yellow	1	Mac8				TP5
AVRL161A6R8GBA	10	TDK				ZD1,ZD2,ZD3,ZD4,
						ZD5,ZD6,ZD7,ZD8,
						ZD9,ZD10

Note:

- Equivalent products may be mounted.
- Includes components not mounted. Check the “No_Mount” indication in the circuit diagram.
- Recommend CR1 is amended from FA-23A to FA-238A. Please see “S2R72A04x/4x Series Application Note”.


90.000
4.000
4.000
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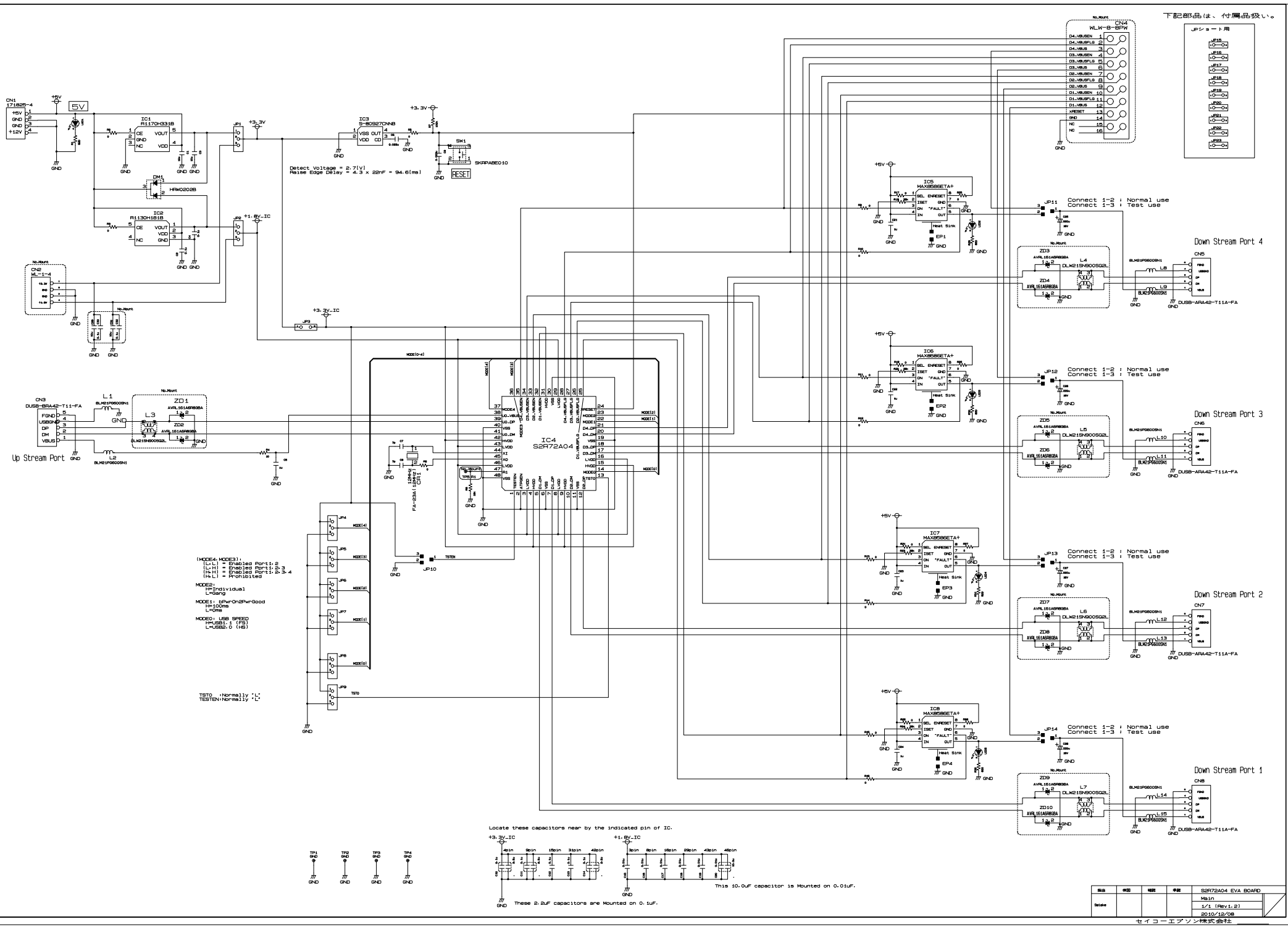
SEIKO EPSON CORP.
S2R72A04 EVA BOARD
GND
TP2
GND
TP1
GND
TP4
GND
TP3
RESET
SW1
CN5
CN6
CN7
CN8
CN4
CN3
CN1
CN2
L4
L5
L6
L7
L8
L9
L10
L11
L12
L13
L14
L15
ZD3
ZD4
ZD5
ZD6
ZD7
ZD8
ZD9
ZD10
JP11
JP12
JP13
JP14
LED2
LED3
LED4
LED5
IC5
IC6
IC7
IC8
EP1
EP2
EP3
EP4
C25
C26
C27
C28
C9
R7
R5
IC3
C6
R17
R19
R9
C21
R18
R20
R11
C22
R21
R23
R13
C23
H=Test
L=Normal
JP9
JP8
TST[0]
TST[1]
JP11,12,13,14
connect1-2
Normal use
connect1-3
test use
IC4
JP4
JP5
JP6
JP7
MODE[4]
MODE[3]
MODE[2]
MODE[1]
L/L=2
H/L=3
H/H=4
L/H=NG
H=Indi L=Gang
H=PwrG100 L=PwrG0
R1
TP5
+3.3V
JP10
GND
JP3
Normally connect 1-2
ZD1
ZD2
R4
C5
L3
L2
L1
IC1
IC2
DM1
JP1
JP2
+3.3V
+1.8V
R22
R24
R15
C24
C2
C1
LED1
+5V
+1.8V
GND
GND
+3.3V
ULマーク


下記部品は、付属品扱い。
JPショート用
Up Stream Port
Down Stream Port 4
Down Stream Port 3
Down Stream Port 2
Down Stream Port 1
Connect 1-2 : Normal use
Connect 1-3 : Test use
IC4
S2R72A04
Detect Voltage = 2.7[V]
Raise Edge Delay = 4.3 x 22nF = 94.6[ms]
(MODE4,MODE3):
[L,L] = Enabled Port:2
[L,H] = Enabled Port:2,3
[H,H] = Enabled Port:2,3,4
[H,L] = Prohibited
MODE2:
H=Individual
L=Gang
MODE1: bPwrOn2PwrGood
H=100ms
L=0ms
MODE0: USB SPEED
H=USB1.1 (FS)
L=USB2.0 (HS)
TSTO :Normally "L"
TESTEN:Normally "L"
Locate these capacitors near by the indicated pin of IC.
These 2.2uF capacitors are Mounted on 0.1uF.
This 10.0uF capacitor is Mounted on 0.01uF.
S2R72A04 EVA BOARD
Main
1/1 (Rev1.2)
2010/12/08
セイコーエプソン株式会社

Revision History

Attachment-1

Rev. No.	Date	Page	Type	Revision details (including previous details) and reason
Rev. 1.00	08/05/2009	All	New	New issue
Rev. 1.10	03/15/2010	P.7 P.9	Correction	Capacitor Value for IC4, XAL are modified.
Rev 1.20	12/07/2010	Title	Correction	Before: “S2R72A04 Evaluation Board Manual” After: “S2R72A Series LSI Evaluation Board Manual”
Rev 1.20	12/07/2010	Scope	Add	Add Product Code
Rev 1.20	12/07/2010	P.5	Correction	Before: “S2R72A04”, “S2R72A03”, “S2R72A02” After: “S2R72A44”, “S2R72A43”, “S2R72A42”
Rev 1.20	12/07/2010	P.7 P.9	Correction	Capacitor (C20) Value for LVDD is modified. Before: 0.01uF + 4.7uF After: 0.01uF + 10.0uF
Rev 1.30	10/01/2015	P.8	Add	Recommended CR1 is amended from FA-23A to FA-238A.

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Document Code: 411801203
First Issue August 2009 in JAPAN ⓓ
Reviced October 2015 in JAPAN