SBEV-RZ/A2M
Evaluation Board
H/W Specification
Rev 1.05 20190621

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Notices on use and handling

You should follow those remarks to use this product safely. If you are not following those remarks, you may cause electrical shock, injury, fire or trouble.

Lightning

While lightning has occurred , never installing the product or connecting cables, it may cause an electrical shock by the thunderbolt.

Handle with care

Does not either drop, hit, or give a strong shock to the product.

Caution to electrostatic discharge

This product is mounted electrostatic sensitive parts.
The parts are possibly destroyed by electrostatic discharge; do not touch directly to contact area of the connectors and the parts.

Caution to connect or dis-connect cables

First turn off the power to this product to connect connecters on board and cables. If connecting or dis-connecting cables to this board without turn off the power, it may destroy this board and connected product.

Pay attention to touch this product

While the product is turned on or straight after the operation, it may cause an electrical shock or scald. (Some parts become higher temp.)

Unplug the Power source

Immediately unplug from the Power source when it smells or smokes. If continually keep supply power on while it smells or smokes, it may cause fire, an electrical shock or serious influence on this board and other equipments.

Do not use or store in the following places.

-Do not expose in direct sunlight
-Do not place where the temperature changes rapidly and wets with dew.
-Do not expose to rain or moisture.
-Do not place rolled or vibrated.
-Do not place dusty or carpet laid places cause electrostatic obstacles.
-Do not place where corrosive gas outbreaks.
-Do not directly place this product on the electro conductive materials (it may cause trouble)

Remark on operation of this product

The maximum operating temperature of this board is 40 degrees Celsius on case; it must operate under this temperature (it may need air cooling system to operate in high temp.)

Revision history

Revision	Release date	Revised contents	Remarks
Rev1.00	2018/10/02	Release	
Rev1.01	2018/11/07	Amend 5.7 LED Amend 5.13 LAN	
Rev1.02	2019/02/21	Amend 2. Specification list	
Rev1.03	2019/02/25	Amend 5.13 LAN	
Rev1.04	2019/02/27	Amend 5.10 Micro SD Card diagram, Add Comment	
Rev1.05	2019/06/21	Add 6. Signal Name	

Content

1. OVERVIEW

This board (SBEV-RZ/A2M) is an evaluation board which installed Renesas RZ/A2M.
This document is written hardware specifications.

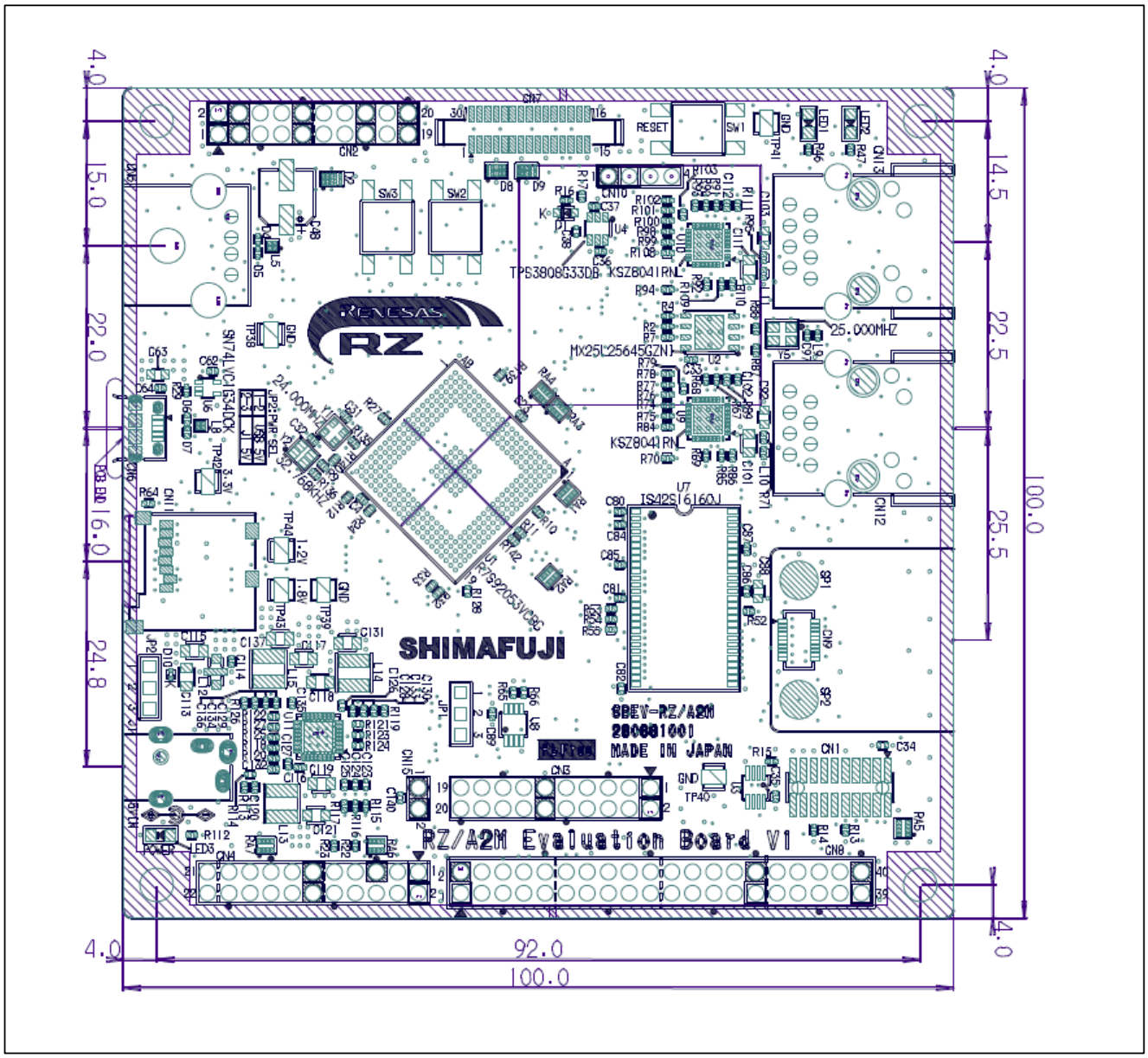
2. BOARD SPECIFICATIONS

Specification List

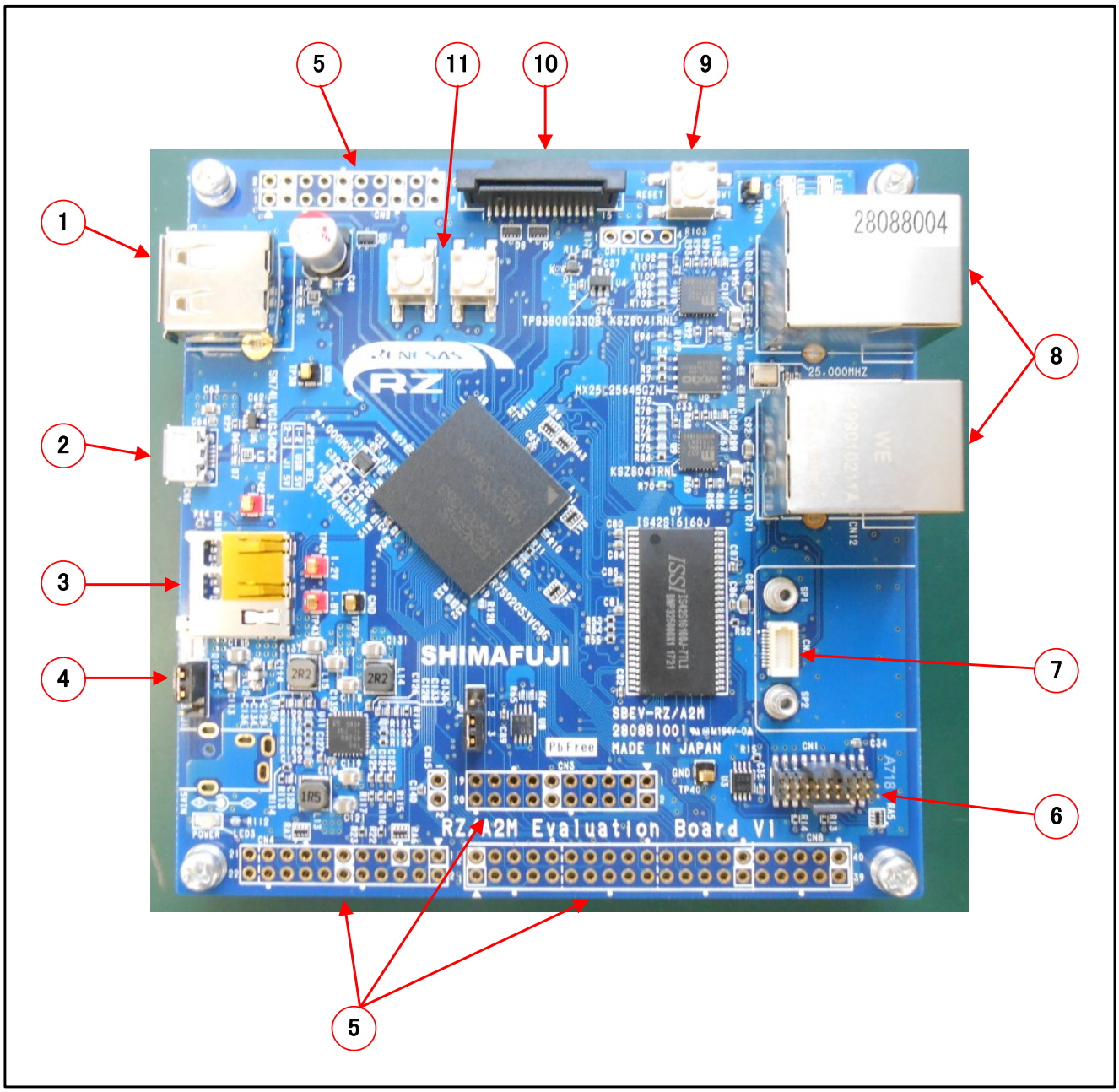
Function Module		Characteristic / Function outline
Power supply	Input voltage	DC 5V
	Consumption	T.B.D.
Power Connector		CN6 USB Micro B J1 DC Jack (Not mounted)
JTAG Connector		1.27mm pitch 20 Pin
CPU		R7S921053VCBG CPU Cortex-A9 (528MHz MAX) Internal Memory 4 M Byte DRP 6 tile
CPU Clock	Main	24MHz (Oscillator)
Connector	Micro SD	693071010811
	WiFi	20P3.0-JMCS-G-TF
	MIPI	1-1734248-5
	USB A	USB2.0 Host
	USB Micro B	USB2.0 Target
Memory		Serial Flash 8MByte (MX25L6433FZNI-08G)
		SDRAM 32Mbyte (IS42S16160J-7TL)
		EEPROM 2Kbyte (BR24G16FVM-3GTTR)
Ether		RMII Address 0x1
		RMII Address 0x3
Switch		General Push Switch 1bit NMI Push Switch 1bit Reset Push Switch 1bit
LED		General 2bit 5VPower 1bit
External Pin Header		CN2 (Not installed) 20 Pin (2.54mm pitch 2 rows x 10) CN3 (Not installed)) 20 Pin (2.54mm pitch 2 rows x 10) CN4 (Not installed)) 22 Pin (2.54mm pitch 2 rows x 11) CN8 (Not installed)) 40 Pin (2.54mm pitch 2 rows x 20) CN15 (Not installed)) 2 Pin (2.54mm pitch 2 rows x 1)
External Pin Socket		CN10 (Not installed)) 4 Pin (2.54mm pitch 1 rows x 4)
Operational Temperature		TBD
Board Size		100mm×100mm t = 1.6mm

3. BOARD

3.1. BOARD SIZE



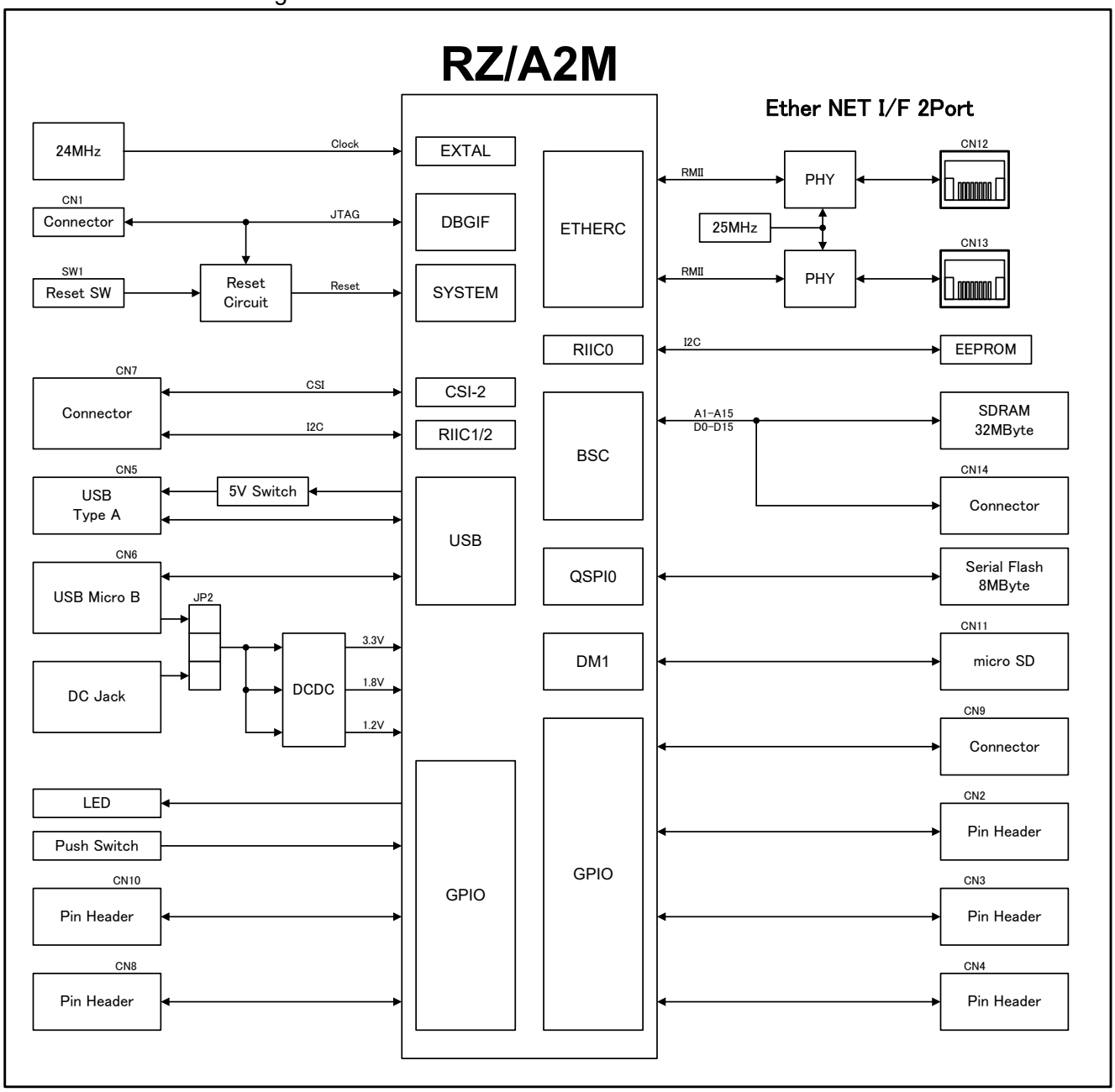
3.2. EXTERNAL VIEW



No.	Component Description	No.	Component Description
1	USB Type A	7	WiFi Connector
2	USB Micro B	8	RJ-45
3	IoT-Engine Connector	9	Reset Switch
4	Power source select JP	10	MIPI Connector
5	External Pin Header (Not mounted)	11	Push Switch
6	JTAG Connector	-	

4. BLOCK DIAGRAM

This board block diagram.



5. FUNCTIONS

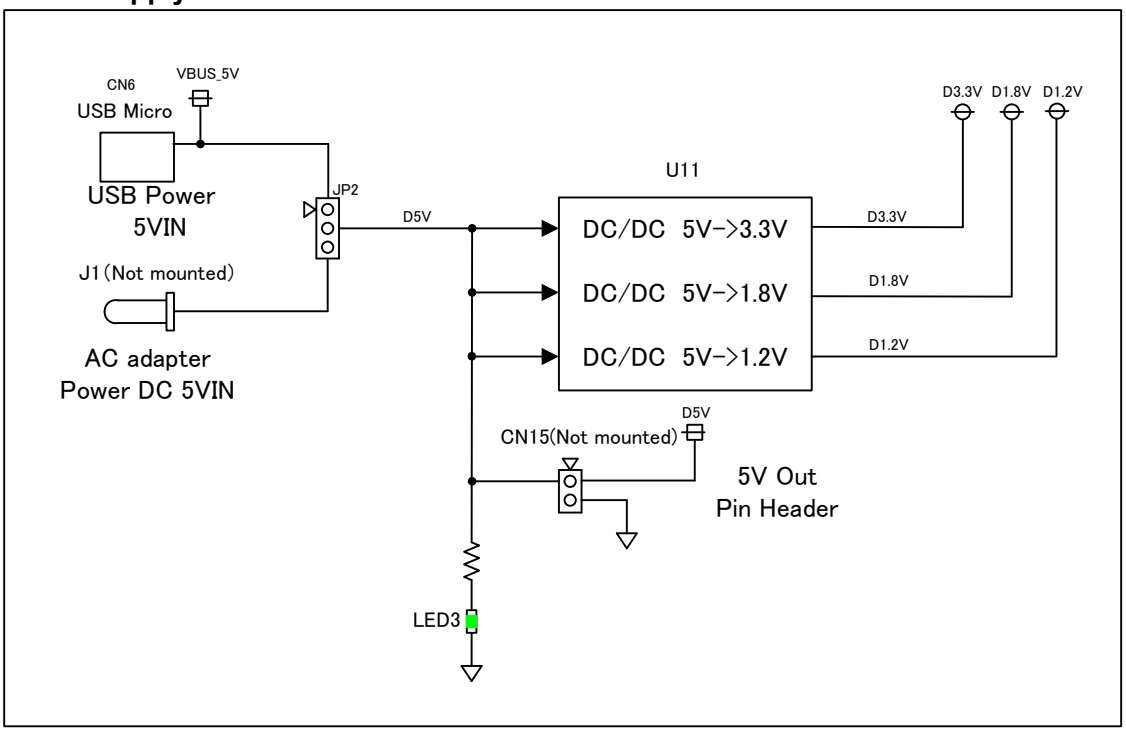
5.1. POWER

This board has a power input connector USB Micro B (CN6) and DC jack (J1) to supply DC power. The DC-DC convertor on this board generate the several power which used on this board and the LED 3 illuminate when power is supplied.

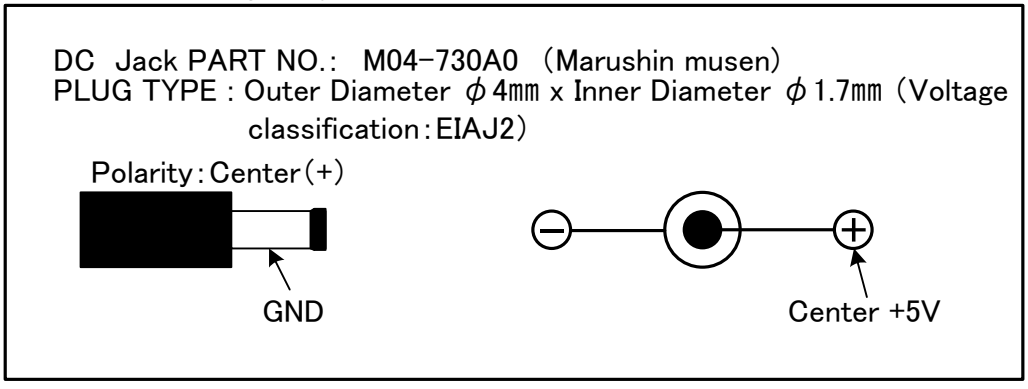
Note : A DC jack is not mounted at factory.

- Input Voltage : DC 5V (+5%, -5%) , Max Current : T.B.D.

Power supply structure



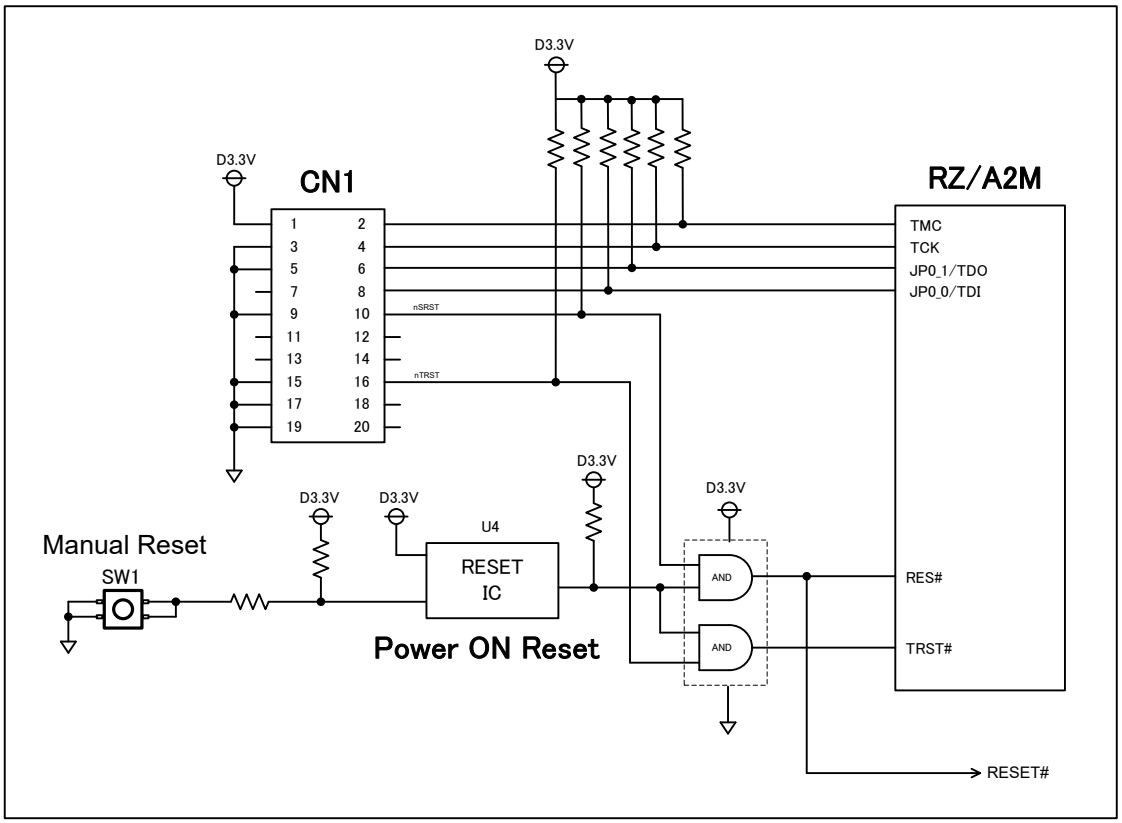
The recommended plug and jack



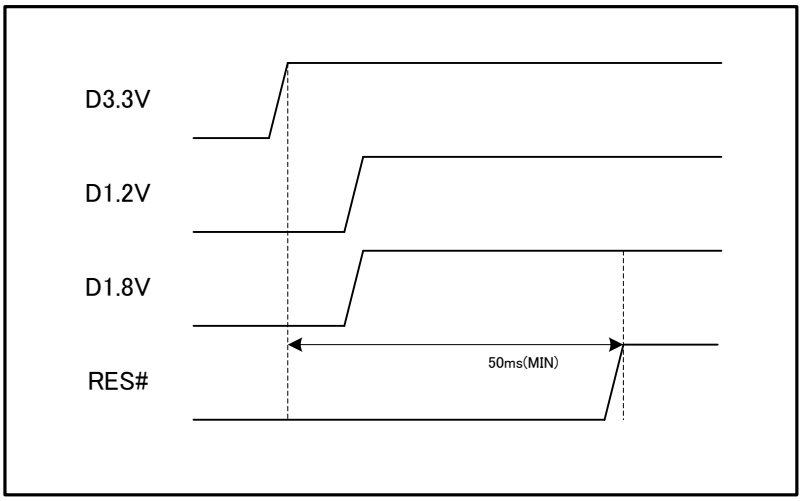
5.2. RESET AND JTAG

This board reset operations are the power on reset, the ICE reset and the Switch reset.

Reset and JTAG structure



This board the power on reset timing



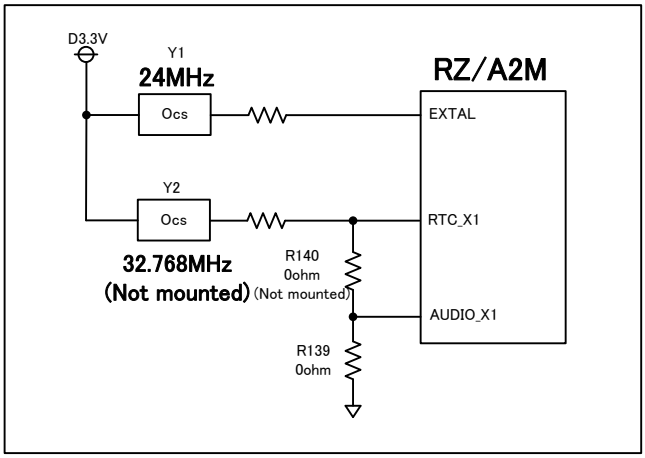
5.3. CLOCK

This board is mounted those Oscillators.

- Ocs1 : ASDMB-24.000MHZ-LY-T (Abracon)
- Ocs2 : ASDK-32.768KHZ-LRT (Abracon)

Note : Y2 is not mounted at the factory

The clock structures



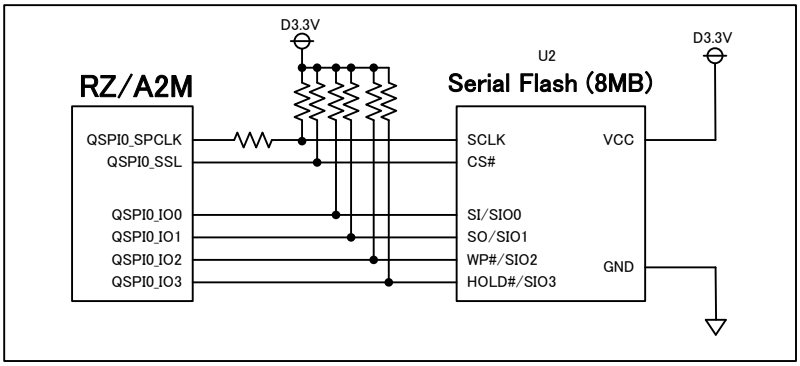
5.4. SERIAL FLASH ROM

This board is mounted a Serial Flash ROM (8MB) .

- Serial Flash ROM (U2) : MX25L6433FZNI-08G (Macronix)

Note1: It has no reset pin type flash memory on this board.
There is a risk that the serial flash will not be able to boot normally because it does not meet the settings required for booting if the power is turned off or reset after the serial flash is set to Quad mode.
Note2: The Silk print on the board is MX25L25645GZNI, but X25L6433FZNI-08G is mounted at the factory.

The Serial Flash ROM structure

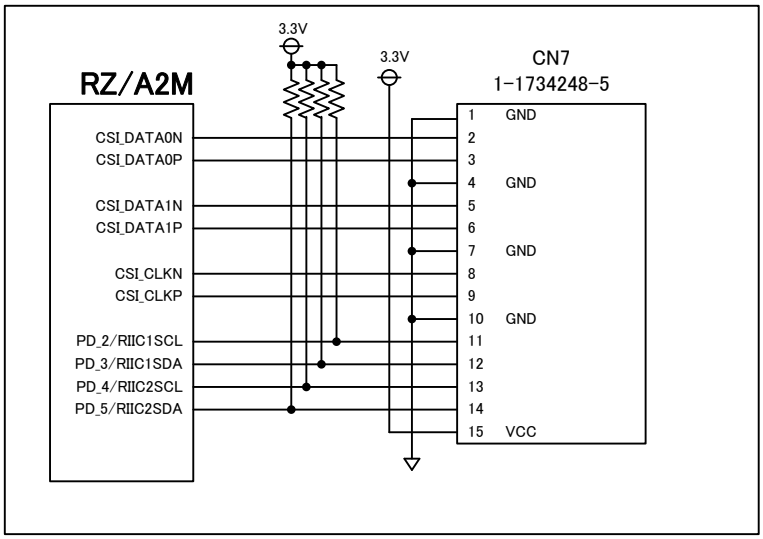


5.5. MIPI

This board is mounted an FFC connector for MIPI CSI-2 I/F.
A 1mm pitch flexible cable can be inserted.

- MIPI Connector (CN7) : 1-1734248-5 (TE)

The MIPI connector structure

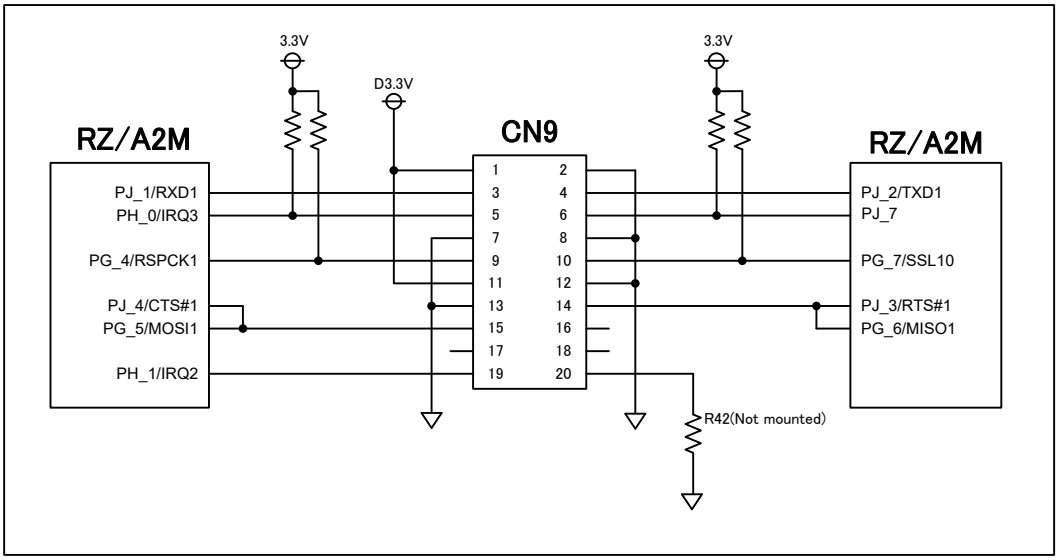


5.6. WiFi

This board is mounted a connector for IoT-Engine WiFi ESP32 (SEMB1401-1).
Attention: The IO input / output settings when connect extension board.

- WiFi ESP32 Connector (CN9) : 20P3.0-JMCS-G-TF(JST)
- Compatible connector : 20R-JMCS-G-TF(JST)

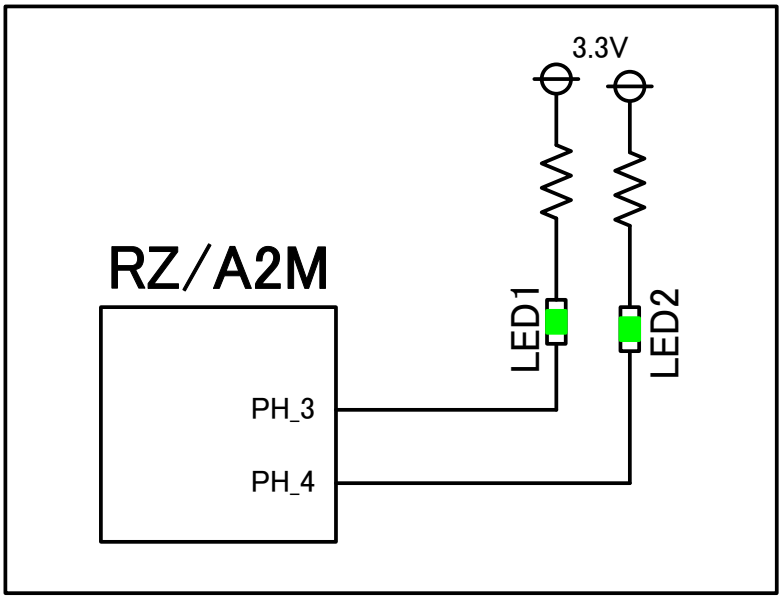
The WiFi connector structure



5.7. LED

This board is mounted 4 LEDs.
The LED illuminate when the pins become low.

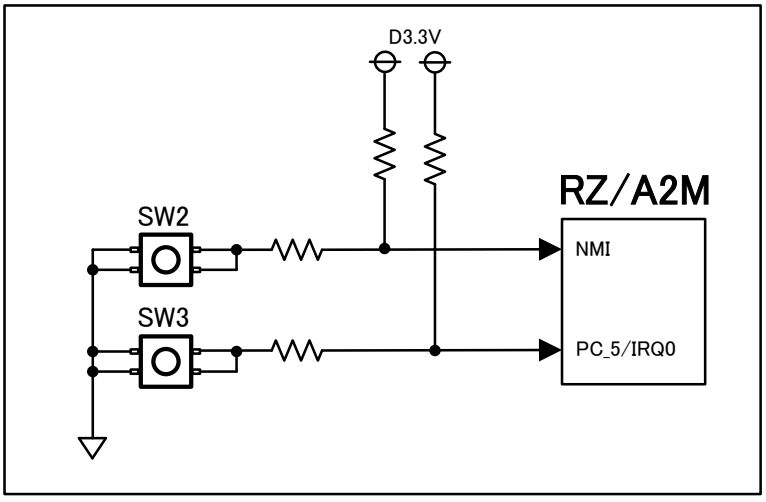
The LED structures



5.8. PUSH SW

This board is mounted a general Push SW and an NMI Push SW.

The Push SW structures

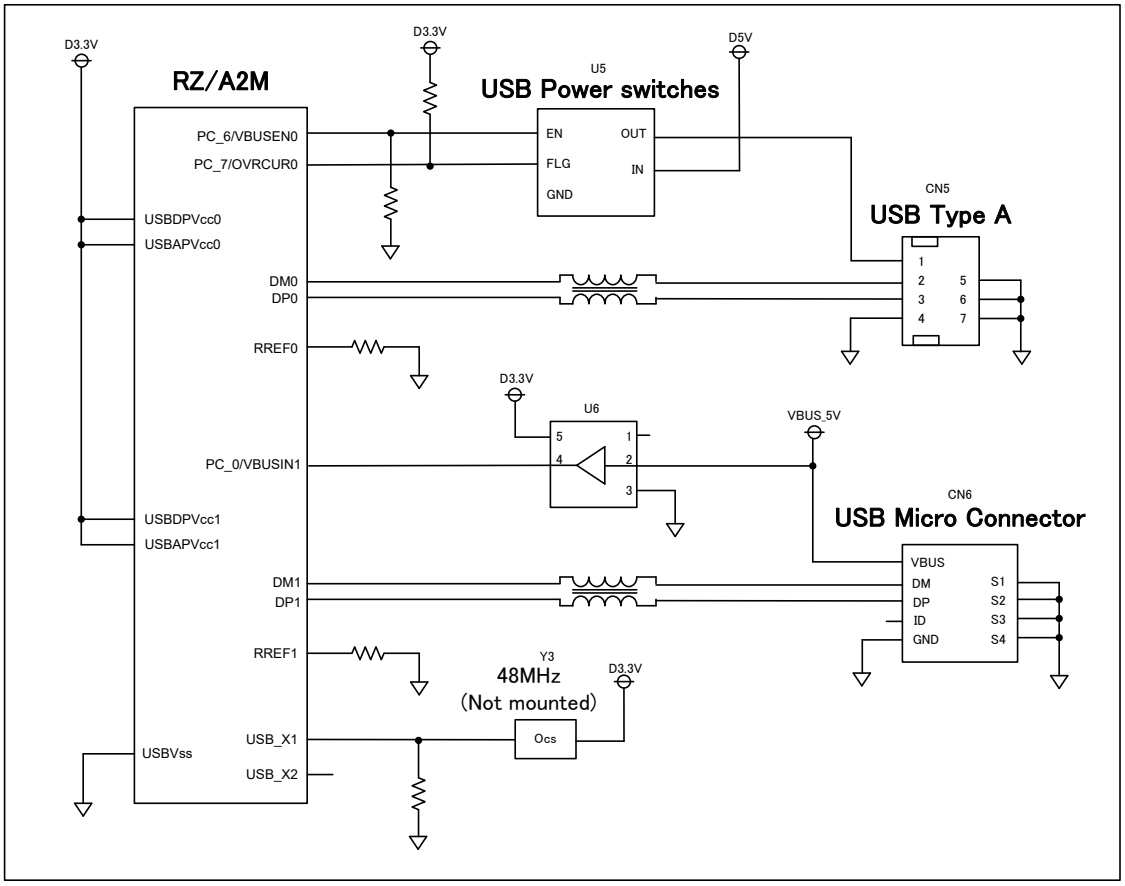


5.9. USB

This board is mounted a USB Type A connector and a USB Micro B connector.
The USB Type A connector is connected to USB2.0 host module ch0 .
The USB Type B connector is connected to USB2.0 function module ch1 .

- USB Type A (CN5) : 61400416021(WE)
- USB Micro B (CN6) : 10118194-0001LF(Amphenol)

The USB structures



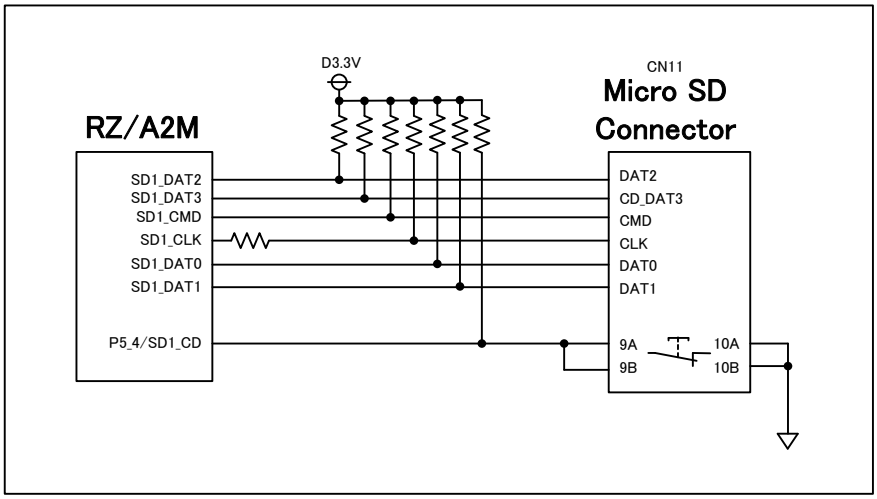
5.10. Micro SD CARD

This board is mounted a Micro SD connector.
The Micro SD is connected to SD/MMC host I/F ch1.

The CD terminal of the Micro SD Card connector become “close” when the SD card is not inserted and “open” when the SD card is inserted.

- Micro SD Connector (CN11) : 693071010811 (WE)

The Micro SD structures

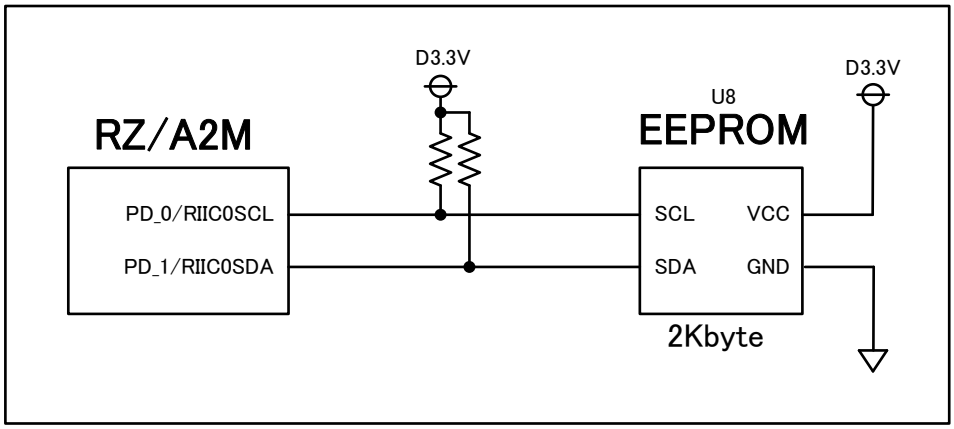


5.11. EEPROM

This board is mounted an EEPROM.
The EEPROM is connected to I2C bus I/F ch0.

- EEPROM 2KByte (U8) : BR24G16FVM-3GTTR (Rohm)

The EEPROM structures

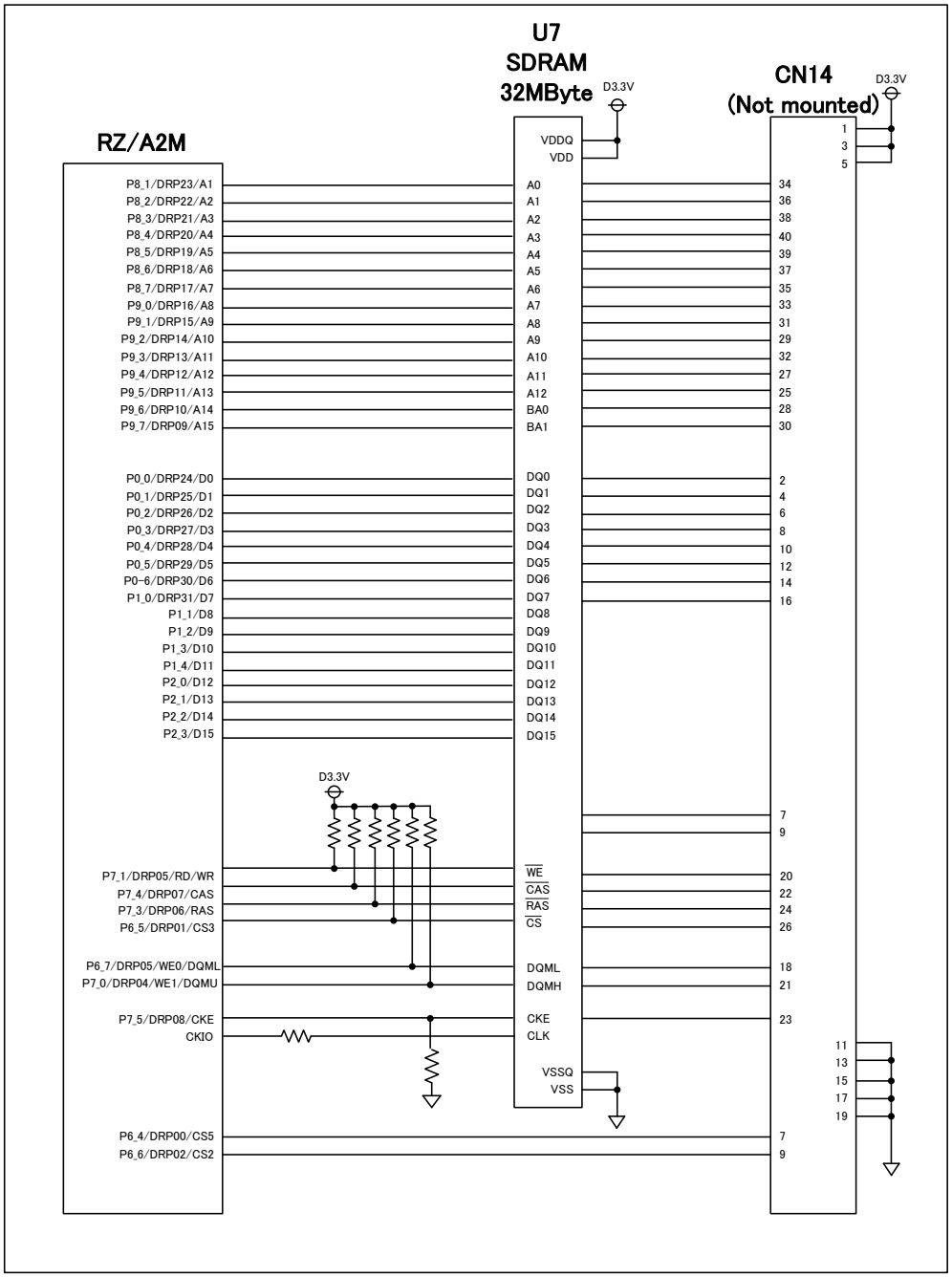


5.12. SDRAM

This board is mounted an SDRAM.
The SDRAM is connected to bus state controller.
A part of the bus state controller signals are also connected to CN14.

- SDRAM 32MByte (U7) : IS42S16160J-7TL (ISSI)

The SDRAM structures

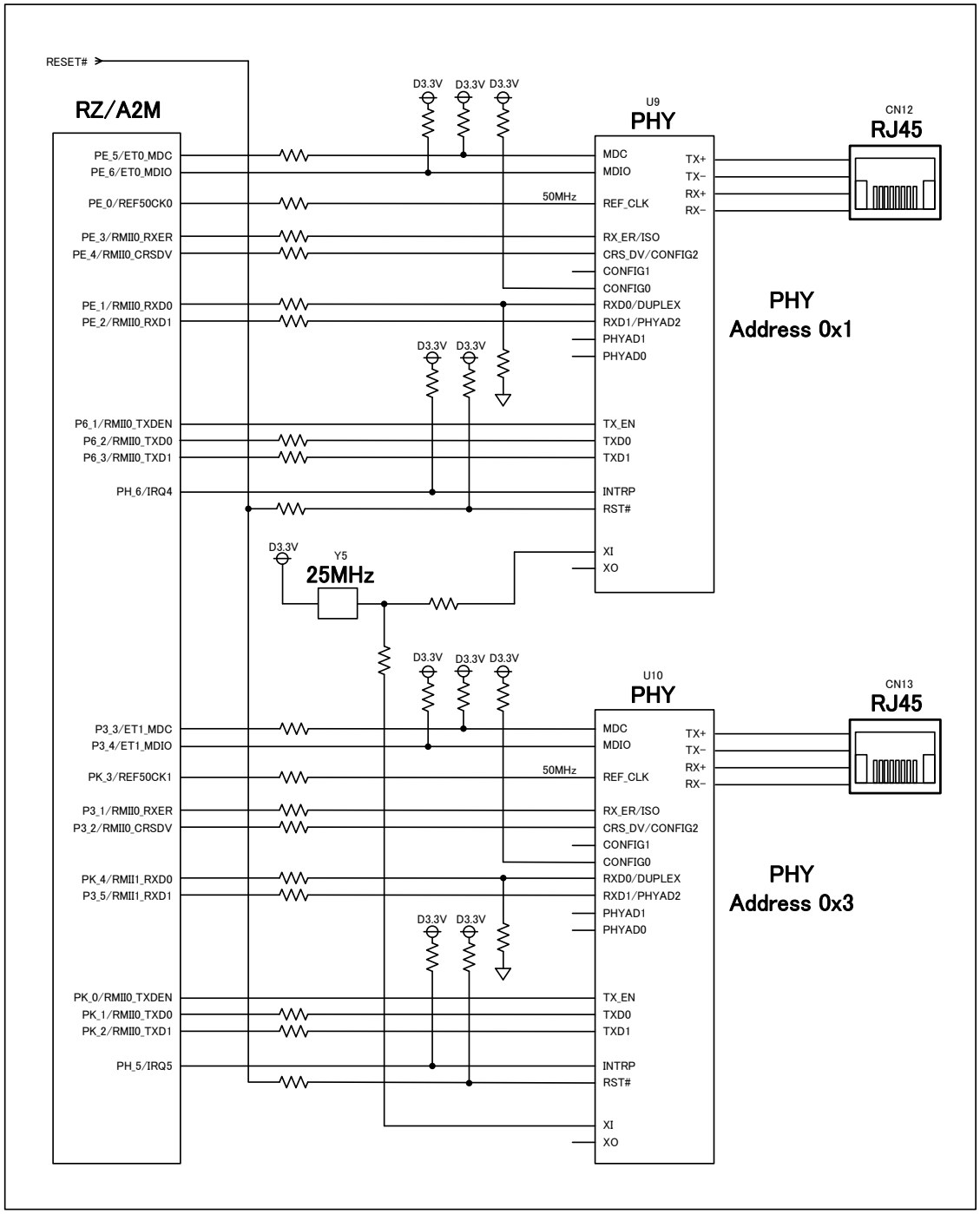


5.13. LAN

This board is mounted 2 RJ45 connectors.
The PHY of CN12 is connected to Ethernet controller ch0 via RMII.
The PHY of CN13 is connected to Ethernet controller ch1 via RMII.

- PHY (U9/U10) : KSZ8041RNL (Microchip)
- RJ-45 (CN12/CN13) : 7499010211A (WE)

The LAN structures

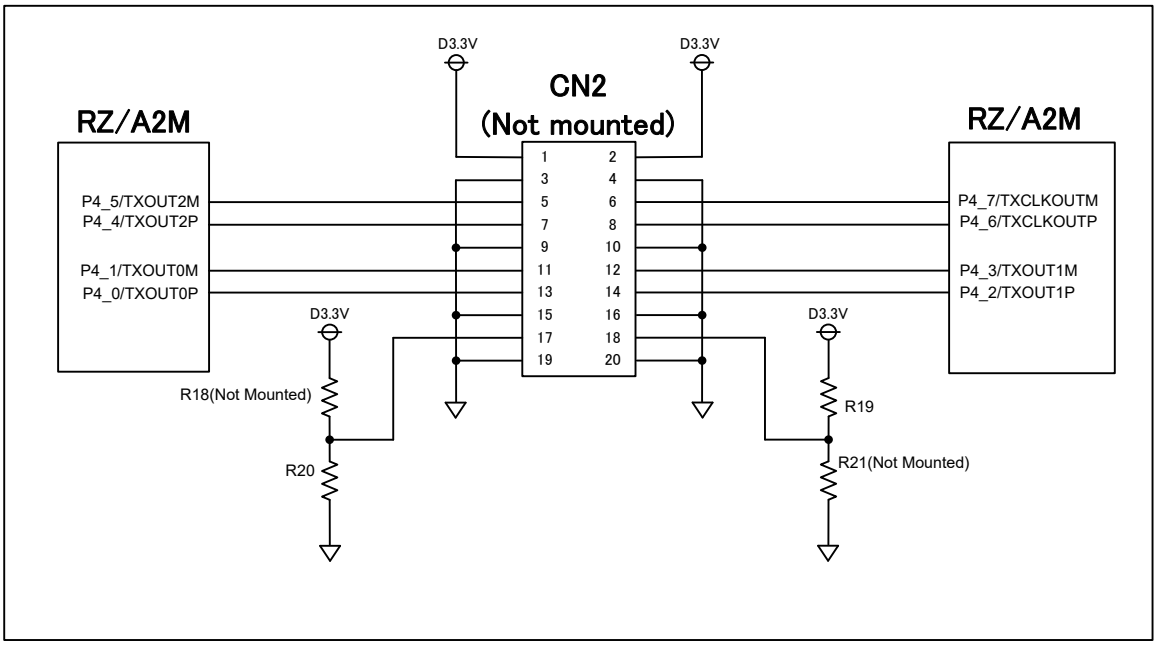


5.14. EXTEND PIN HEADER

This board has through hole for 5 external pin headers.
It can extend when mount the pin header.

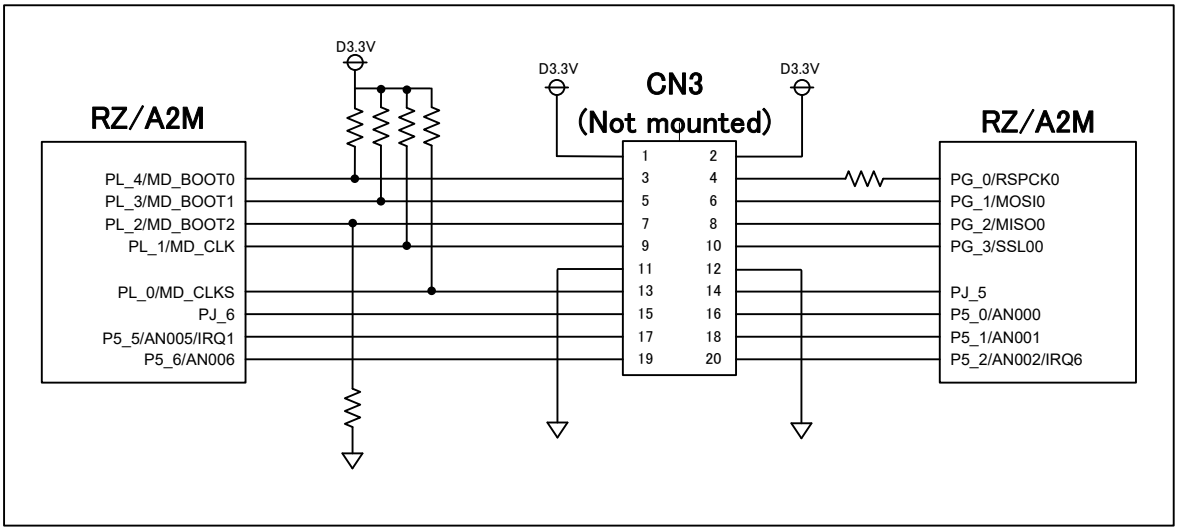
5.14.1. CN2

The CN2 structures



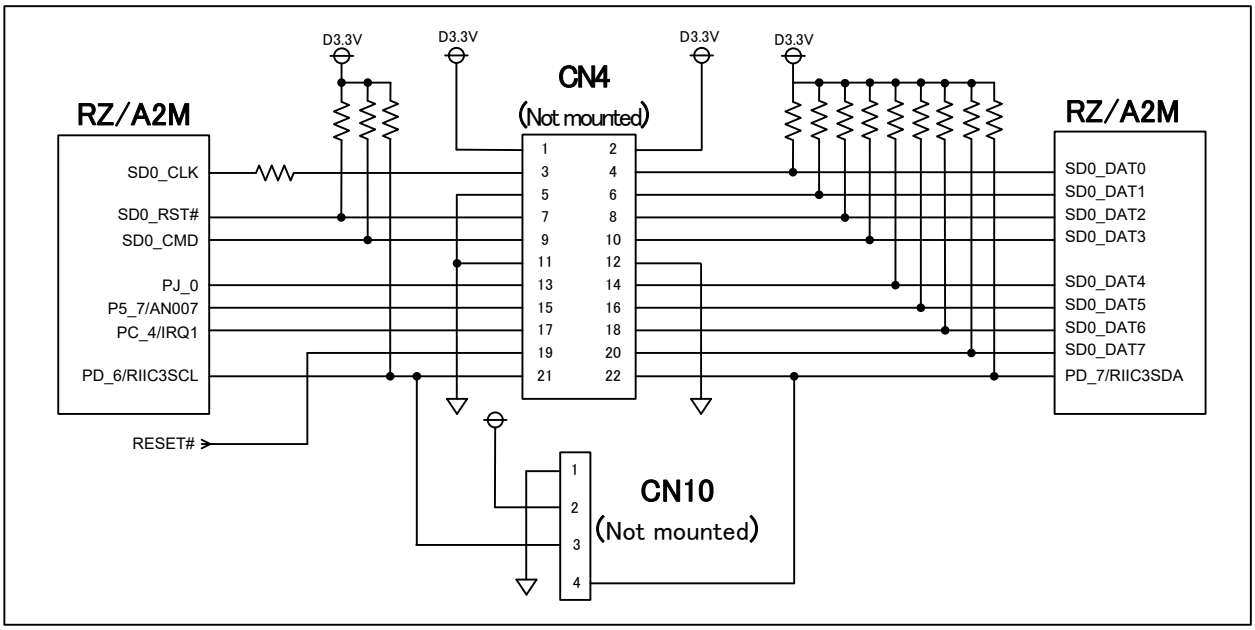
5.14.2. CN3

The CN3 structures



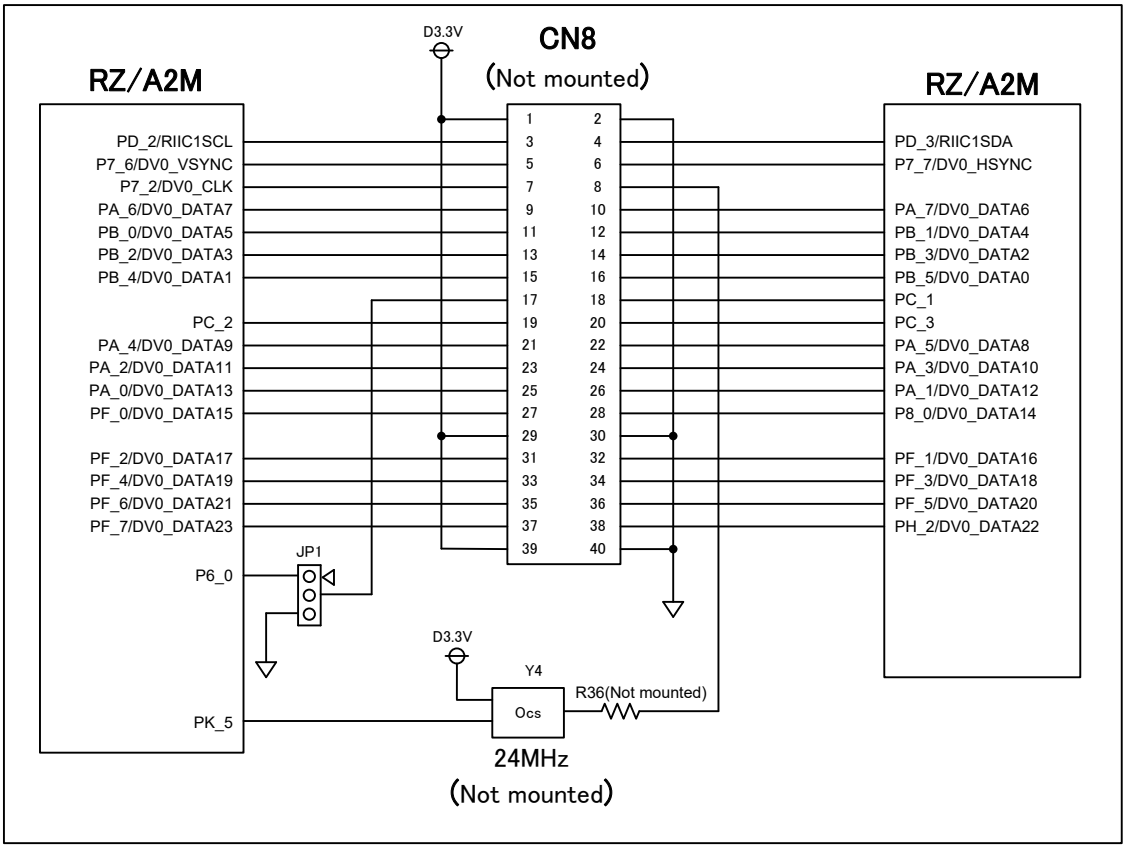
5.14.3. CN4 and CN10

The CN4 and CN10 structures



5.14.4. CN8

The CN8 structures



6. CONNECTORS

6.1. CONNECTOR LIST

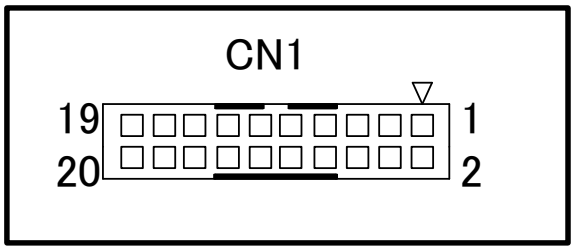
Connector List

CN-No.	Connector Model Number	Remarks
CN1	SS2-19A-H70/0-55/11	JTAG
CN2	FFC-20BMEP1	Not mounted
CN3	FFC-20BMEP1	Not mounted
CN4	FFC-22BMEP1	Not mounted
CN5	61400416021	USB Type A
CN6	10118194-0001LF	USB Micro B
CN7	1-1734248-5	MIPI
CN8	HIF3H-40DA-2.54DSA	Not mounted
CN9	20P3.0-JMCS-G-TF	WiFi
CN10	Z-220-4FD	Not mounted
CN11	693071010811	Micro SD
CN12	7499010211A	RJ-45
CN13	7499010211A	RJ-45
CN14	PSM-720153-20	Not mounted
CN15	FFC-2AMEP1	Not mounted

6.1.1. CN1

PART NO. : SS2-19A-H70/0-55/11

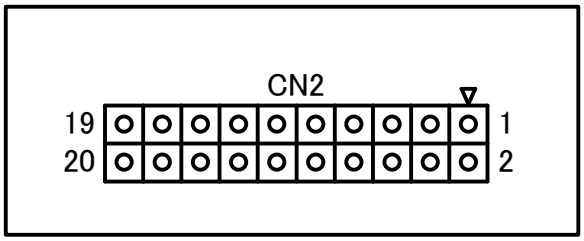
Pin No.	Signal Name	Remarks	Pin No.	Signal Name	Remarks
1	D3.3V		2	TMS	PU
3	GND		4	TCK	PU
5	GND		6	TDO	PU
7	Key	Without Pin	8	TDI	PU
9	GND		10	nSRST	PU
11			12		
13			14		
15	GND		16	nTRST	PU
17	GND		18		
19	GND		20		



6.1.2. CN2

PART NO. : FFC-20BMEP1

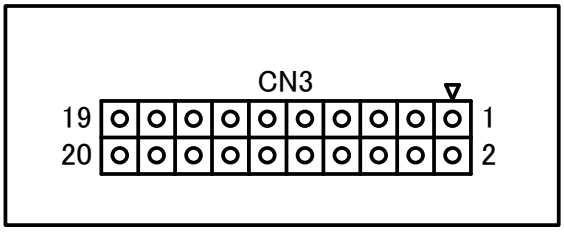
Pin No.	Signal Name	Remarks	Pin No.	Signal Name	Remarks
1	D3.3V		2	D3.3V	
3	GND		4	GND	
5	P4_5/TXOUT2M/ SCI_RXD0/RxD4		6	P4_7/TXCLKOUTM/ SCI_SCK0	
7	P4_4/TXOUT2P/ SCI_CTS0/RTS0//CTS0		8	P4_6/TXCLKOUTP/ SCI_TXD0/TXD4	
9	GND		10	GND	
11	P4_1/TXOUT0M/ SCI_RXD1//RXD0/IRQ1		12	P4_3/TXOUT1M/ SCI_CTS1/RTS1/RTS0/IRQ3	
13	P4_0/TXOUT0P/ SCI_SCK1//IRQ0		14	P4_2/TXOUT1P/ SCI_TXD1/TXD0/IRQ2	
15	GND		16	GND	
17	L/R	PD	18	U/D	PU
19	GND		20	GND	



6.1.3. CN3

PART NO. : FFC-20BMEP1

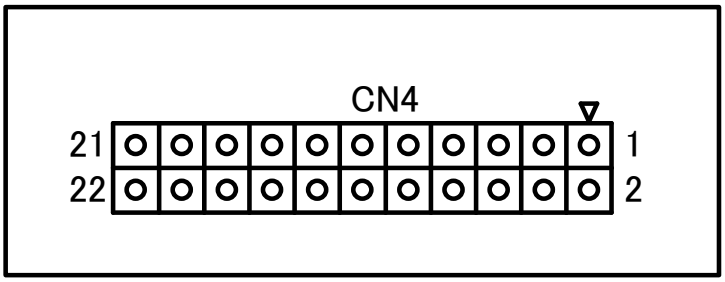
Pin No.	Signal Name	Remarks	Pin No.	Signal Name	Remarks
1	D3.3V		2	D3.3V	
3	PL_4/MD_BOOT0		4	PG_0/RSPCK0	
5	PL_3/MD_BOOT1		6	PG_1/MOSI0	
7	PL_2/MD_BOOT2		8	PG_2/MISO0	
9	PL_1/MD_CLK		10	PG_3/SSL00	
11	GND		12	AGND	
13	PL_0/MD_CLKS		14	PJ_5/ MTIOC1A/IRQ4	
15	PJ_6/ MTCLKC/IRQ0		16	P5_0/AN000	
17	P5_5/AN005/IRQ1		18	P5_1/AN001	
19	P5_6/AN006 /IRQ2		20	P5_2/AN002/IRQ6	



6.1.4. CN4

PART NO. : FFC-22BMEP1

Pin No.	Signal Name	Remarks	Pin No.	Signal Name	Remarks
1	D3.3V		2	D3.3V	
3	SD0_CLK		4	SD0_DAT0	PU
5	GND		6	SD0_DAT1	PU
7	SD0_RST#	PU	8	SD0_DAT2	PU
9	SD0_CMD	PU	10	SD0_DAT3	PU
11	GND		12	GND	
13	PJ_0/ SCK1		14	SD0_DAT4	PU
15	P5_7/AN007 /IRQ3		16	SD0_DAT5	PU
17	PC_4/IRQ1		18	SD0_DAT6	PU
19	RESET#		20	SD0_DAT7	PU
21	PD_6/RIIC3SCL	PU Share with CN10-3	22	PD_7/RIIC3SDA	PU Share with CN10-4



6.1.5. CN5

PART NO. : 61400416021

Pin No.	Signal Name	Remarks
1	D5.0V	
2	DM0	
3	DP0	
4	GND	

6.1.6. CN6

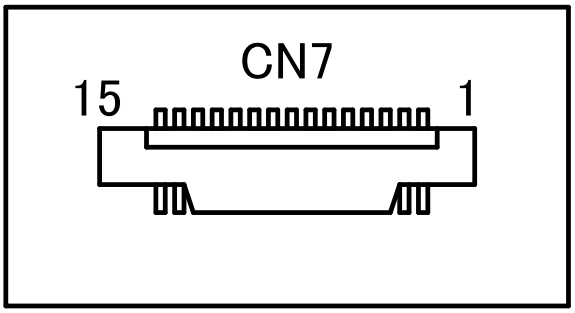
PART NO. : 10118194-0001LF

Pin No.	Signal Name	Remarks
1	VBUS	
2	DM1	
3	DP1	
4	Open	
5	GND	

6.1.7. CN7

PART NO. : 1-1734248-5

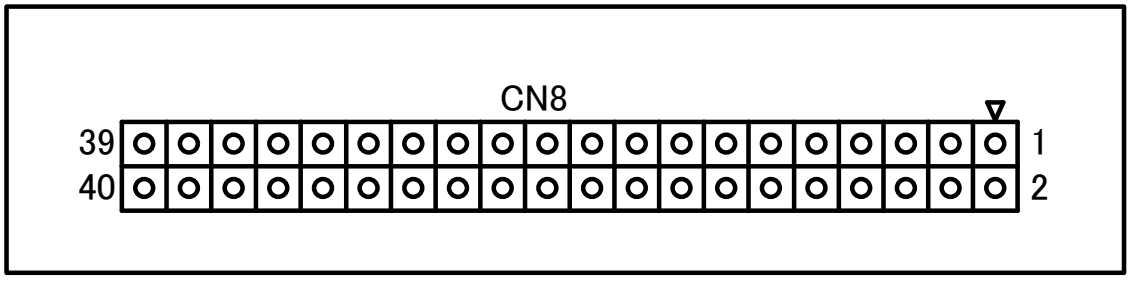
Pin No.	Signal Name	Remarks
1	GND	
2	CSI_DATA0N	
3	CSI_DATA0P	
4	GND	
5	CSI_DATA1N	
6	CSI_DATA1P	
7	GND	
8	CSI_CLKN	
9	CSI_CLKP	
10	GND	
11	PD_2/RIIC1SCL	PU Share with CN8-3
12	PD_3/RIIC1SDA	PU Share with CN8-4
13	PD_4/RIIC2SCL	PU
14	PD_5/RIIC2SDA	PU
15	D3.3V	



6.1.8. CN8

PART NO. : HIF3H-40DA-2.54DSA

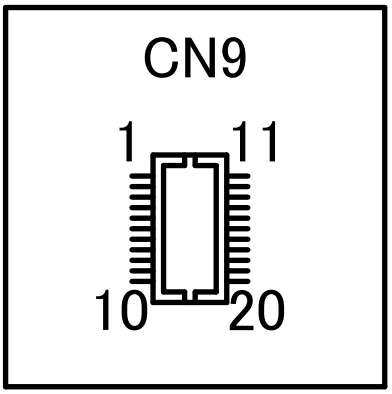
Pin No.	Signal Name	Remarks	Pin No.	Signal Name	Remarks
1	D3.3V		2	GND	
3	PD_2/RIIC1SCL		4	PD_3/RIIC1SDA	
5	P7_6/DV0_VSYNC/ SCK0		6	P7_7/DV0_HSYNC/ RxD0	
7	P7_2/DV0_CLK		8	24MHz Ocs	Not mounted
9	PA_6/DV0_DATA7/ SCI_SCK0/MTIOC0A		10	PA_7/DV0_DATA6	
11	PB_0/DV0_DATA5		12	PB_1/DV0_DATA4	
13	PB_2/DV0_DATA3		14	PB_3/DV0_DATA2/ CTS0	
15	PB_4/DV0_DATA1/ RTS0		16	PB_5/DV0_DATA0/ TxD0	
17	GND 又は P6_0	Select JP1	18	PC_1 /MOSI2	
19	PC_2/ MISO2		20	PC_3 /MISO2	
21	PA_4/DV0_DATA9/ SCI_TXD0		22	PA_5/DV0_DATA8/ SCI_RXD0/MTIOC0B/IRQ5	
23	PA_2/DV0_DATA11/ SCI_SCK1/MTIOC8A		24	PA_3/DV0_DATA10/ SCI_CTS0/RTS0/MTIOC0D	
25	PA_0/DV0_DATA13/ SCI_TXD1/MTIOC8C		26	PA_1/DV0_DATA12/ SCI_RXD1/MTIOC8B/IRQ6	
27	PF_0/DV0_DATA15/ SCK3/RSPCK1		28	P8_0/DV0_DATA14/ SCI_CTS1/RTS1/MTIOC8D	
29	D3.3V		30	GND	
31	PF_2/DV0_DATA17/ TxD3/MISO1		32	PF_1/DV0_DATA16/ RxD3/MTIOC7B/MOSI1	
33	PF_4/DV0_DATA19/ RxD2/MTIOC6A/IRQ1		34	PF_3/DV0_DATA18/ SCK2/MTIOC7D/SSL10	
35	PF_6/DV0_DATA21/ RTS2/MTIOC6C		36	PF_5/DV0_DATA20/ TXD2/MTIOC6B	
37	PF_7/DV0_DATA23/ IRQ1		38	PH_2/DV0_DATA22/ CTS2/MTIOC6D	
39	D3.3V		40	GND	



6.1.9. CN9

PART NO. : 20P3.0-JMCS-G-TF

Pin No.	Signal Name	Remarks	Pin No.	Signal Name	Remarks
1	D3.3V		11	D3.3V	
2	GND		12	GND	
3	PJ_1/RxD1		13	GND	
4	PJ_2/TXD1		14	PJ_3/RTS#1 PG_6/MISO1	Or connection
5	PH_0/IRQ3	PU	15	PJ_4/CTS#1 PG_5/MOSI1	Or connection
6	PJ_7	PU	16	Open	
7	GND		17	Open	
8	GND		18	Open	
9	PG_4/RSPCK1		19	PH_1/IRQ2	
10	PG_7/SSL10		20	Open	



6.1.10. CN10

PART NO. : Z-220-4FD

Pin No.	Signal Name	Remarks
1	GND	
2	D3.3V	
3	PD_6/RIIC3SCL	PU Share with CN4-21
4	PD_7/RIIC3SDA	PU Share with CN4-22

6.1.11. CN11

PART NO. : 693071010811

Pin No.	Signal Name	Remarks
1	SD1_DAT2	PU
2	SD1_DAT3	PU
3	SD1_CMD	PU
4	D3.3V	
5	SD1_CLK	PU
6	GND	
7	SD1_DAT0	PU
8	SD1_DAT1	PU
9A/B	P5_4/SD1_CD	PU

6.1.12. CN12

PART NO. : 7499010211A

Pin No.	Signal Name	Remarks
1	TX+	
2	TX-	
3	RX+	
4	NC	
5	NC	
6	RX-	
7	NC	
8	NC	

6.1.13. CN13

PART NO. : 7499010211A

Pin No.	Signal Name	Remarks
1	TX+	
2	TX-	
3	RX+	
4	NC	
5	NC	
6	RX-	
7	NC	
8	NC	

6.1.14. CN14

PART NO. : PSM-720153-20

Pin No.	Signal Name	Remarks	Pin No.	Signal Name	Remarks
1	D3.3V		2	P0_0/DRP24/D0	Share with U7
3	D3.3V		4	P0_1/DRP25/D1	Share with U7
5	D3.3V		6	P0_2/DRP26/D2	Share with U7
7	P6_4/DRP00/CS5	Share with U7	8	P0_3/DRP27/D3	Share with U7
9	P6_6/DRP02/CS2	Share with U7	8	P0_4/DRP28/D4	Share with U7
11	GND		12	P0_5/DRP29/D5	Share with U7
13	GND		14	P0_6/DRP30/D6	Share with U7
15	GND		16	P1_0/DRP31/D7	Share with U7
17	GND		18	P6_7/DRP03/WE0/DQML	Share with U7
19	GND		20	P7_1/DRP05/RD/WR	Share with U7
21	P7_0/DRP04/WE1/DQMU	Share with U7	22	P7_4/DRP07/CAS	Share with U7
23	P7_5/DRP08/CKE	Share with U7	24	P7_3/DRP06/RAS	Share with U7
25	P9_5/DRP11/A13	Share with U7	26	P6_5/DRP01/CS3	Share with U7
27	P9_4/DRP12/A12	Share with U7	28	P9_6/DRP10/A14	Share with U7
29	P9_2/DRP14/A10	Share with U7	30	P9_7/DRP09/A15	Share with U7
31	P9_1/DRP15/A9	Share with U7	32	P9_3/DRP13/A11	Share with U7
33	P9_0/DRP16/A8	Share with U7	34	P8_1/DRP23/A1	Share with U7
35	P8_7/DRP17/A7	Share with U7	36	P8_2/DRP22/A2	Share with U7
37	P8_6/DRP18/A6	Share with U7	38	P8_3/DRP21/A3	Share with U7
39	P8_5/DRP19/A5	Share with U7	40	P8_4/DRP20/A4	Share with U7

6.1.15. CN15

PART NO. : FFC-2AMEP1

Pin No.	Signal Name	Remarks
1	D5V	
2	GND	

7. SWITCH

7.1. SWITCH LIST

Switch List

CN-NO.	Switch model No.	Remarks
SW1	2-1437565-9	Reset
SW2	2-1437565-9	NMI
SW3	2-1437565-9	General I/O

8. JUMPER PINS

8.1. JUMPER LIST

Jumper List

CN-NO.	Jumper pin model No.	Remarks
JP1	XJ8D-0311	Signal switch
JP2	XJ8D-0311	Input power connector select