

R7S72100 CPU board

# RTK772100BC00000BR (GENMAI)

User's Manual

Renesas Microcomputer  
RZ/A Series

All information contained in these materials, including products and product specifications, represents information on the product at the time of publication and is subject to change by Renesas Electronics Corporation without notice. Please review the latest information published by Renesas Electronics Corporation through various means, including the Renesas Electronics Corporation website (<http://www.renesas.com>).

## Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
3. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from such alteration, modification, copy or otherwise misappropriation of Renesas Electronics product.
5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.  
"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots etc.  
"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; and safety equipment etc.  
  
Renesas Electronics products are neither intended nor authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems, surgical implantations etc.), or may cause serious property damages (nuclear reactor control systems, military equipment etc.). You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application for which it is not intended. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for which the product is not intended by Renesas Electronics.
6. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
7. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or systems manufactured by you.
8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
9. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You should not use Renesas Electronics products or technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. When exporting the Renesas Electronics products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
10. It is the responsibility of the buyer or distributor of Renesas Electronics products, who distributes, disposes of, or otherwise places the product with a third party, to notify such third party in advance of the contents and conditions set forth in this document, Renesas Electronics assumes no responsibility for any losses incurred by you or third parties as a result of unauthorized use of Renesas Electronics products.
11. This document may not be reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

## WEEE Directive

Renesas development tools and products are directly covered by the European Union's Waste Electrical and Electronic Equipment, (WEEE), Directive 2002/96/EC.

As a result, this equipment, including all accessories, must not be disposed of as household waste but through your locally recognised recycling or disposal schemes.

As part of our commitment to environmental responsibility Renesas also offers to take back the equipment and has implemented a Tools Product Recycling Program for customers in Europe. This allows you to return equipment to Renesas for disposal through our approved Producer Compliance Scheme.

To register for the program, click here "<http://www.renesas.com/weee>".



# About This Manual

## 1. Purpose and Target Readers

This manual is designed to provide the user with an understanding of the functions and operating specifications of this extension board. A basic knowledge of electrical circuits, logical circuits, and microcomputers (MCUs) is necessary in order to use this manual.

This manual is composed of an overview of the CPU board; its functional and operational specifications.

Carefully read all notes described in the body of text in the manual.

The Revision History summarizes the modifications and additions to the previous versions. Refer to the text of the manual for details.

The following document applies to the R7S72100 CPU board RTK772100BC00000BR.

Document Type	Description	Document Title	Document No.
User's Manual	Describes functional specifications (devices, memory maps, electrical characteristics), and operational specifications (connectors, and switches)	R7S72100 CPU board RTK772100BC00000BR User's Manual	This publication

The following documents apply to the RZ/A1H group. Make sure to refer to the latest version of these documents which can be obtained from Renesas Electronics website.

Document Type	Description	Document Title	Document No.
Application note	Applications, sample programs, etc.	Available on Renesas Electronics website	
RENESAS TECHNICAL UPDATE	Information regarding product specifications, documents, etc.		

## 2. Frequently Used Abbreviations and Acronyms

ACIA	Asynchronous Communication Interface Adapter
bps	Bits per second
CRC	Cyclic Redundancy Check
DMA	Direct Memory Access
DMAC	Direct Memory Access Controller
GSM	Global System for Mobile Communications
Hi-Z	High Impedance
IEBus	Inter Equipment bus
I/O	Input/Output
IrDA	Infrared Data Association
LSB	Least Significant Bit
MSB	Most Significant Bit
NC	Non-Connection
PLL	Phase Locked Loop
PWM	Pulse Width Modulation
SFR	Special Function Registers
SIM	Subscriber Identity Module
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator

All trademarks and registered trademarks are the property of their respective owners.

# Table of Contents

1. Overview.....	1-1
1.1 Overview .....	1-1
1.2 System Configuration .....	1-2
1.3 External Specifications .....	1-3
1.4 Exterior Appearance .....	1-5
1.5 Parts Layout .....	1-7
1.6 Memory Map .....	1-11
1.7 Absolute Maximum Ratings .....	1-12
1.8 Operating Conditions .....	1-12
2. Functional Specification.....	2-1
2.1 Functions Overview .....	2-1
2.2 CPU .....	2-2
2.2.1 R7S72100 Overview .....	2-2
2.2.2 R7S72100 Pin Functions .....	2-2
2.2.3 RTK772100BC00000BR Module Applicability.....	2-16
2.3 Memories .....	2-17
2.3.1 R7S72100 On-Chip RAM .....	2-17
2.3.2 NOR Flash Memory Interface .....	2-17
2.3.3 SDRAM Interface .....	2-20
2.3.4 Serial Flash Memory Interface.....	2-24
2.3.5 NAND Flash Memory Interface .....	2-26
2.3.6 EEPROM Interface .....	2-27
2.4 USB Interface .....	2-28
2.5 Serial Interface.....	2-30
2.6 I/O Ports.....	2-31
2.7 Interrupt Switches .....	2-32
2.8 Clocks .....	2-33
2.9 Reset Control .....	2-35
2.10 Power Supply.....	2-36
2.11 Debug Interface .....	2-37
2.12 CAN Interface.....	2-38
2.13 Video Input Interface .....	2-39
2.14 Audio Interface .....	2-40

2.15	SD Card Interface (4-bit) .....	2-41
2.16	MMC Card Interface (8-bit) .....	2-42
2.17	LAN Interface.....	2-43
2.18	LVDS Interface.....	2-44
2.19	TOSLINK Interface .....	2-45
2.20	MOST Interface .....	2-46
3.	Operational Specification.....	3-1
3.1	Connector Overview .....	3-1
3.1.1	RCA Connector for Video Input (J1).....	3-3
3.1.2	MOST I/F Connector (J3).....	3-4
3.1.3	Mic-in Pin Jack Assignments (J4) .....	3-6
3.1.4	Lineout Pin Jack (J6) .....	3-7
3.1.5	USB Connectors (J5 and J8).....	3-8
3.1.6	LAN Connector (J10) .....	3-10
3.1.7	SD Card Slot (J11).....	3-11
3.1.8	MMC Card Slot (J15) .....	3-12
3.1.9	CAN Connectors (J12 and J13) .....	3-13
3.1.10	LVDS Connectors (J14 and J16) .....	3-14
3.1.11	TOSLINK Connector (U26) .....	3-16
3.1.12	Serial Port Connectors (J17 and J19).....	3-17
3.1.13	UDI Connectors (J21 and J22).....	3-18
3.1.14	Power Supply Connectors (J23 and J25) .....	3-20
3.1.15	External Power Supply Connectors (J24 and J26 to J28) .....	3-21
3.1.16	Expansion Connectors (CN1 to CN9).....	3-23
3.2	Operation Parts Layout .....	3-32
3.2.1	Jumpers (JP1 to JP15, JP18, JP19 and JP21) .....	3-33
3.2.2	Switches and LEDs.....	3-36
3.3	Dimensions .....	3-39
	Appendix RTK772100BC00000BR Schematics.....	1



## 1. Overview

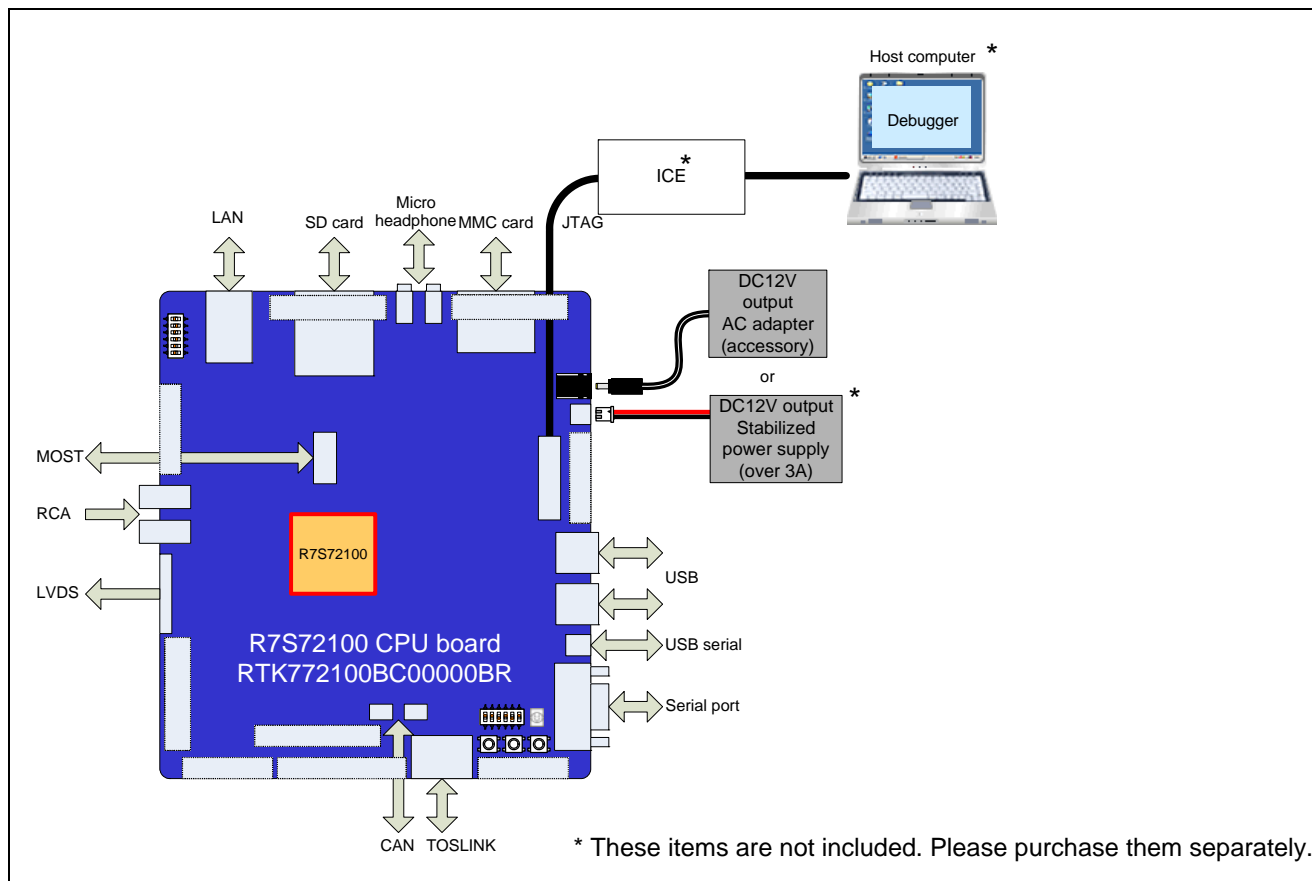
### 1.1 Overview

RTK772100BC00000BR is a CPU board to evaluate functions and performance of Renesas Electronics RISC microcomputer R7S72100 and to execute development and evaluation of its application software. The features of the R7S72100 CPU board are described below.

- The following external memories are generally included.
  - NOR flash memory: 64MB×2 (16-bit bus connection)
  - SDRAM: 64MB×2 (16-bit bus connection)
  - Serial flash memory: 64MB×3
  - EEPROM: 16KB×1
- Any of NOR flash memory, serial flash memory, SD controller on-chip NAND flash memory, and MMC controller on-chip NAND flash memory can be selected as a boot memory.
- A serial port connector (RS-232C or USB Mini-B), USB connectors, CAN connectors, SD card slot, MMC card slot, RCA connector for video input, and MOST I/F connector are generally included as the R7S72100 peripheral function interface.
- An audio CODEC is included to enable advance development of the audio system.
- The USB connectors generally include the series A receptacles. The board pattern enables the Mini-B receptacles to be implemented for the USB host/function module evaluation.
- A LAN connector is generally included to enable software development or evaluation using the Ethernet.
- Data bus, address bus and on-chip peripheral function pins of the R7S72100 are all connected to the expansion connectors to enable timing evaluation with the peripheral devices using measurement instrument, or development of expansion board for its application.
- The ARM JTAG 20 and the CoreSight 20 are mounted to connect with the R7S72100 user debug interface.

## 1.2 System Configuration

Figure 1.1 shows the System Configuration using RTK772100BC00000BR.



**Figure 1.1 System Configuration using RTK772100BC00000BR**

### 1.3 External Specifications

Table 1.1 and Table 1.2 list the RTK772100BC00000BR External Specifications.

**Table 1.1 RTK772100BC00000BR External Specifications (1)**

Item	Description
CPU	R7S72100 <ul style="list-style-type: none"> <li>• Input (XIN) clock: 13.33MHz</li> <li>• CPU clock (I<math>\phi</math>): Up to 400MHz</li> <li>• Image process clock (G<math>\phi</math>): Up to 266.67MHz</li> <li>• Internal bus clock (B<math>\phi</math>): Up to 133.33MHz</li> <li>• External bus clock (CKIO): Up to 66.67MHz</li> <li>• Peripheral clock 1 (P1<math>\phi</math>): Up to 66.67MHz</li> <li>• Peripheral clock 0 (P0<math>\phi</math>): Up to 33.33MHz</li> <li>• On-chip memory               <ul style="list-style-type: none"> <li>Large-capacity on-chip RAM: 10MB</li> <li>External memory: 128KB</li> <li>Instruction cache: 32KB</li> <li>Operand cache: 32KB</li> </ul> </li> <li>• Power supply voltage: 1.18V (internal), 3.3V (I/O)</li> <li>• 324-pin BGA 0.8mm pitch (package code: PRBG0324GA-A)</li> </ul>
Memories	<ul style="list-style-type: none"> <li>• NOR flash memory: 64MBx2               <ul style="list-style-type: none"> <li>- Spansion S29GL512S10T</li> </ul> </li> <li>• SDRAM: 64MBx2               <ul style="list-style-type: none"> <li>- ISSI IS42S16320B-75</li> </ul> </li> <li>• Serial flash memories: 64MBx3               <ul style="list-style-type: none"> <li>- Spansion S25FL512SDPM</li> </ul> </li> <li>• NAND flash memory: 512MBx1 (implementable board pattern)               <ul style="list-style-type: none"> <li>- Spansion S34ML04G100TFI</li> </ul> </li> <li>• EEPROM: 16KBx1               <ul style="list-style-type: none"> <li>- Renesas R1EX24128ASAS0A</li> </ul> </li> </ul>
Connectors	<ul style="list-style-type: none"> <li>• USB series A receptacles: 2 (can be changed to Mini-B receptacles)</li> <li>• LAN connector (RJ-45)</li> <li>• SD card slot (4-bit)</li> <li>• MMC card slot (8-bit)</li> <li>• Audio I/O mini jacks (<math>\phi</math>3.5): 2</li> <li>• RCA connector for image input (4 input)</li> <li>• CAN port connectors (3-pin, pin header): 2</li> <li>• TOSLINK connector (for SPDIF connection)</li> <li>• MOST I/F connector</li> <li>• Serial port connector (D-Sub 9-pin and USB Mini-B can be switched)</li> <li>• User debug interface connector (ARM JTAG 20, CoreSight 20): 1 for each</li> <li>• Expansion connectors: 34-pinx1, 30-pinx4, 20-pinx4 (partially mounted)</li> <li>• DC power jack</li> </ul>
LEDs	<ul style="list-style-type: none"> <li>• Power supply LED: 1</li> <li>• User LEDs: 2</li> <li>• LAN status LEDs: 3</li> </ul>

**Table 1.2 RTK772100BC00000BR External Specifications (2)**

Item	Description
Switches	<ul style="list-style-type: none"><li>Reset switch: 1</li><li>User switches: 3 (NMI, IRQ6<sup>+</sup>, TEST)</li><li>Toggle switch: 1 (IRQ6<sup>+</sup>)</li></ul> *parallel connection <ul style="list-style-type: none"><li>DIP switch for system setting: 6/package×1</li><li>DIP switch for I/F setting: 4/package×1</li><li>DIP switch for Ethernet PHY setting: 8/package×1</li></ul>
Board specification	<ul style="list-style-type: none"><li>Dimensions: 175mm×155mm</li><li>Mounting form: 6 layered double-sided</li><li>Number of board: 1</li></ul>

## 1.4 Exterior Appearance

Figure 1.2 shows the RTK772100BC00000BR Exterior Appearance.

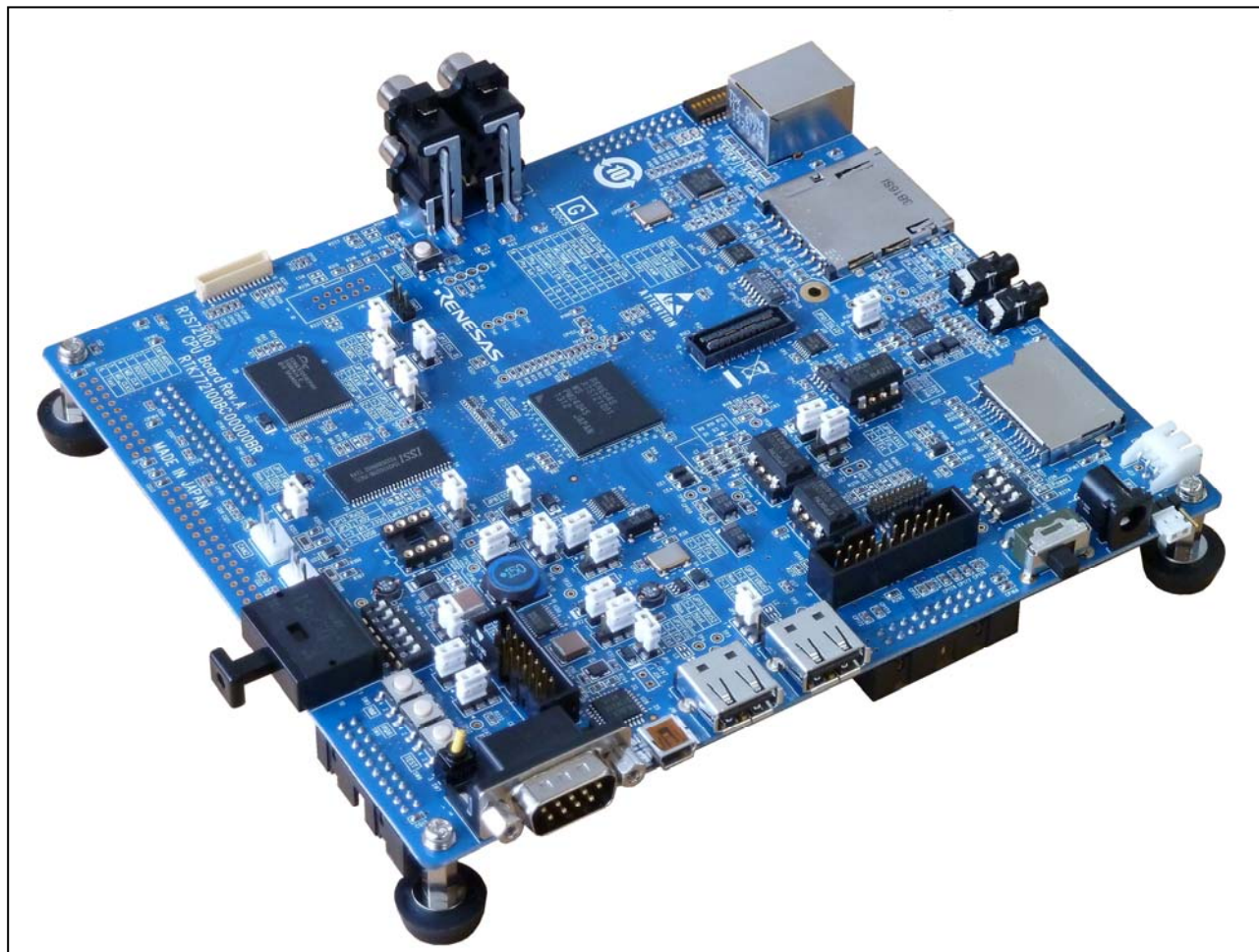


Figure 1.2 RTK772100BC00000BR Exterior Appearance

Figure 1.3 shows the RTK772100BC00000BR Block Diagram.

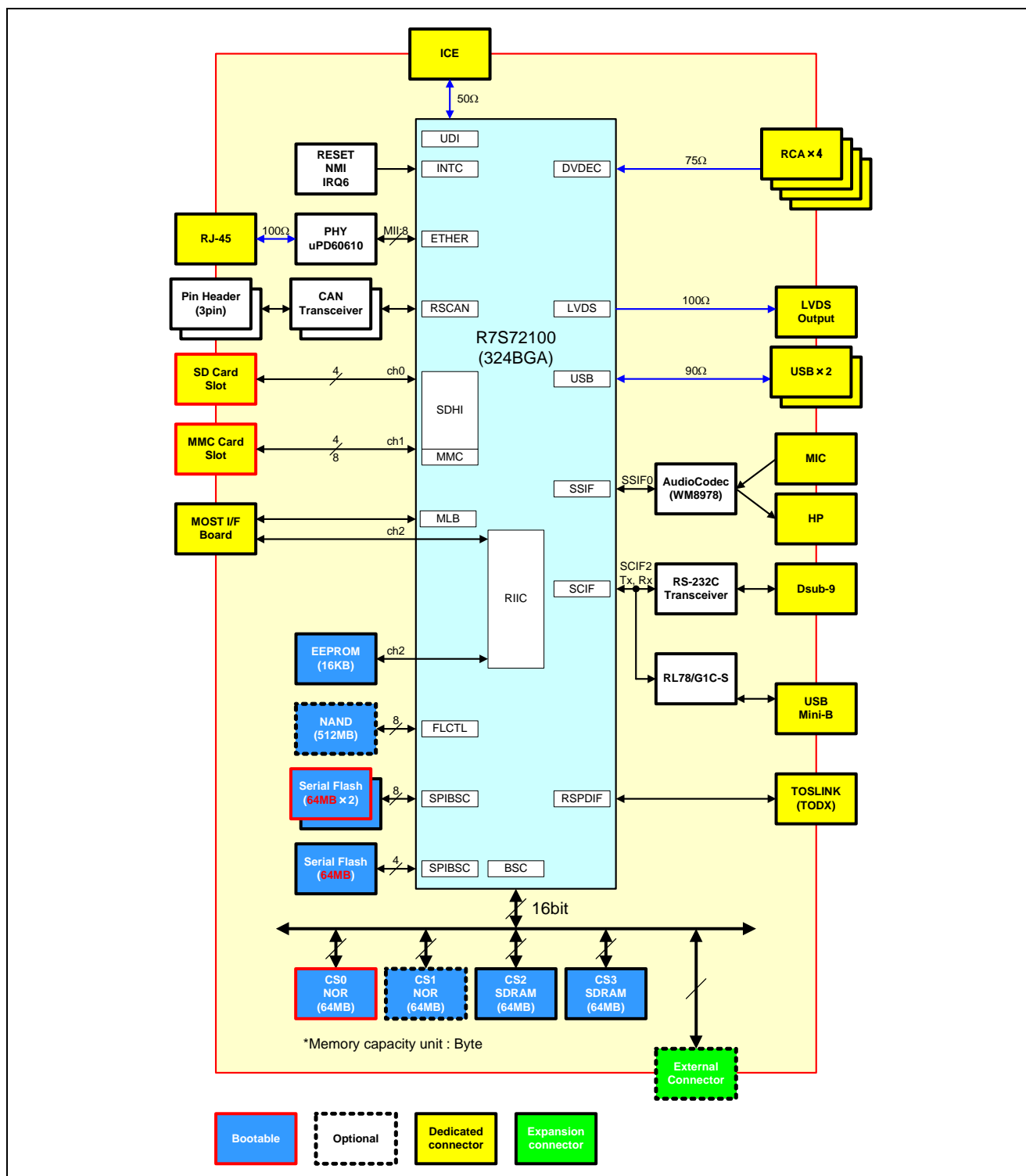


Figure 1.3 RTK772100BC00000BR Block Diagram

## 1.5 Parts Layout

Figure 1.4 and Figure 1.5 show the Parts Layout of the RTK772100BC00000BR.

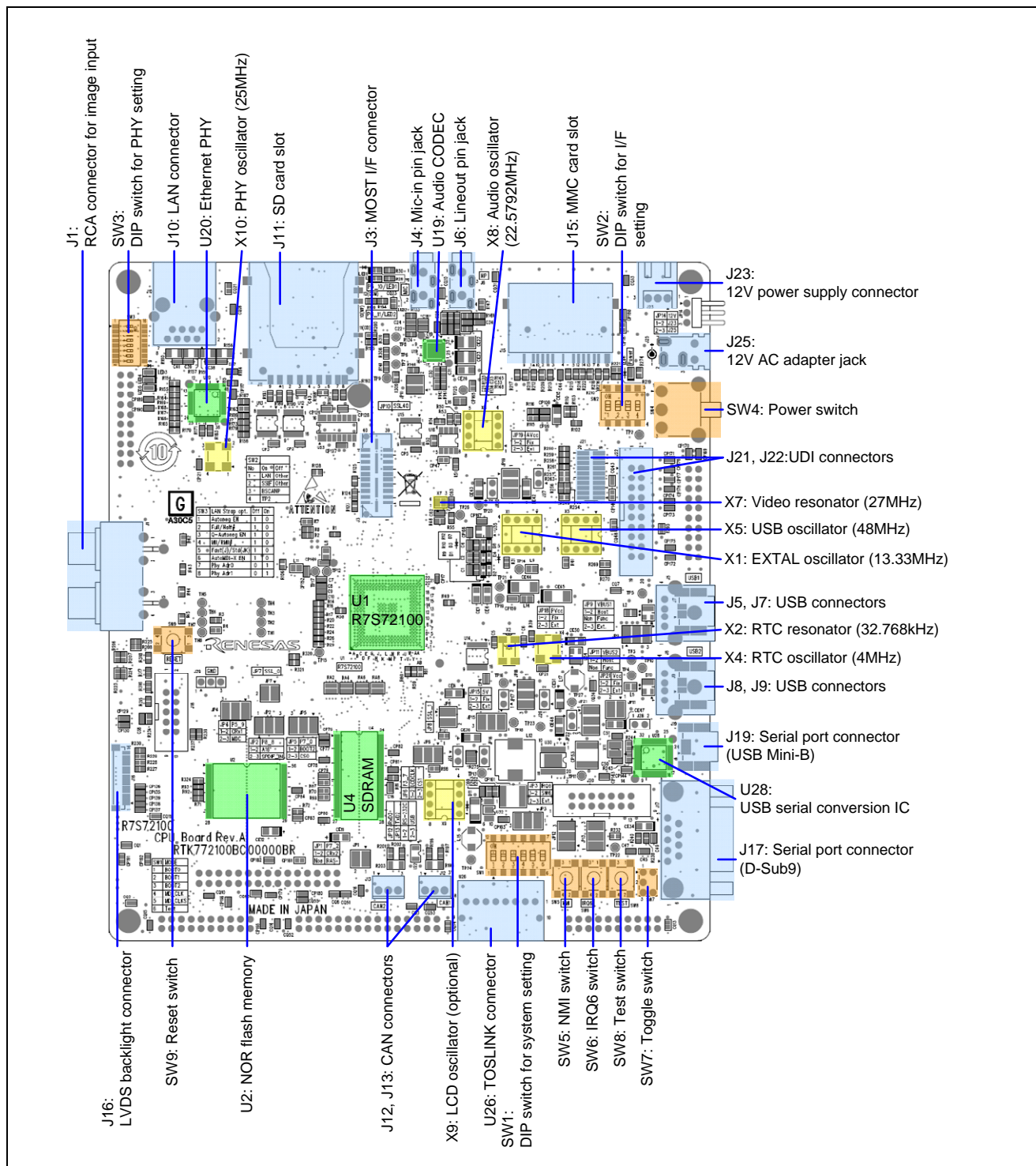


Figure 1.4 RTK772100BC00000BR Parts Layout (Top View of Component Side)



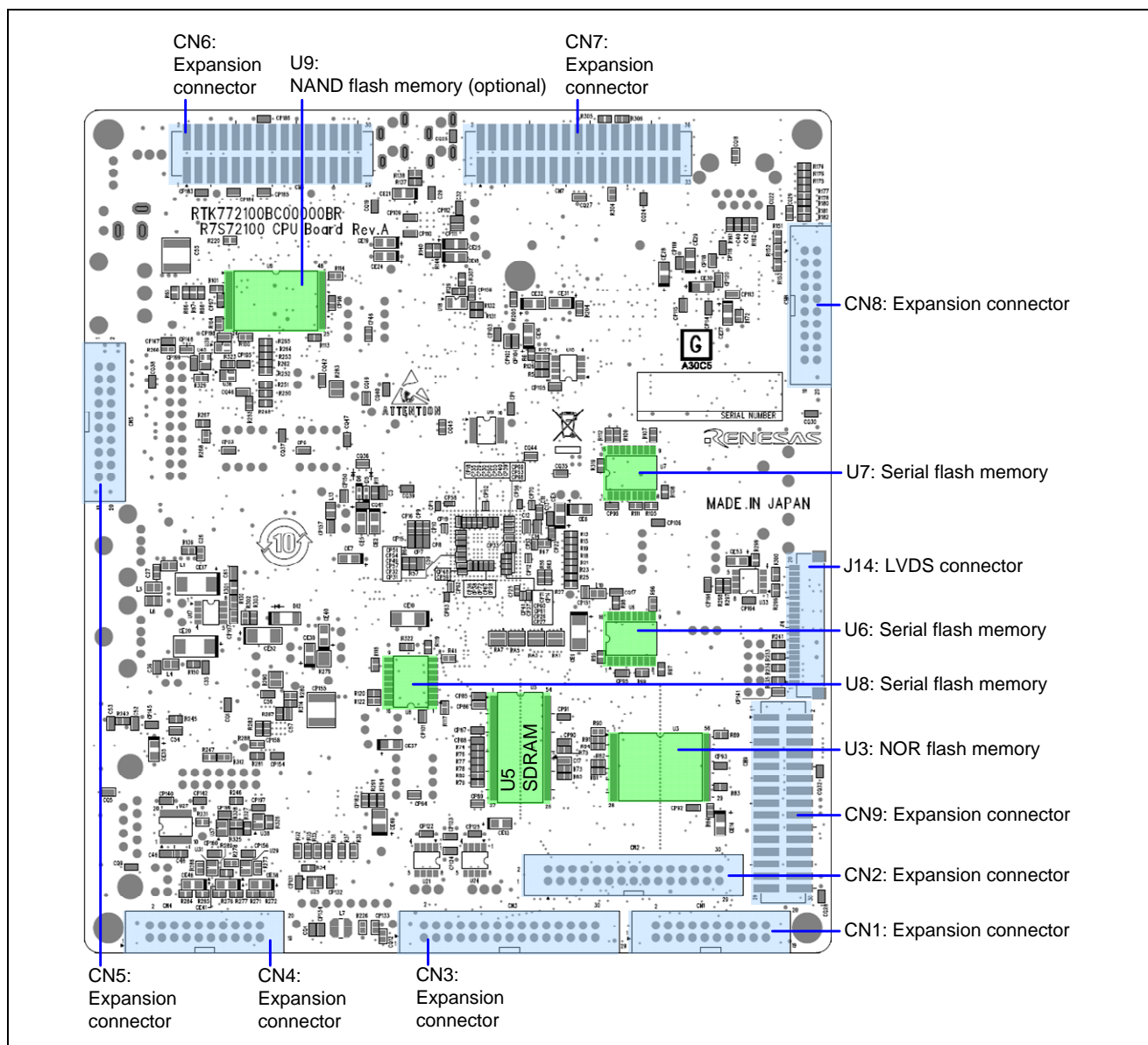


Figure 1.5 RTK772100BC00000BR Parts Layout (Top View of Solder Side)



Table 1.3 and Table 1.4 list the Main Parts of the RTK772100BC00000BR.

**Table 1.3 RTK772100BC00000BR Main Parts (1) IC**

Part Number	Part Name	Type (Manufacturer)	Recommended Optional Parts
U1	CPU	R7S72100 (Renesas)	
U2, U3	NOR flash memory	S29GL512S10T (Spansion)	
U4, U5	SDRAM	IS42S16320B-75 (ISSI)	
U6 to U8	Serial flash memory	S25FL512SDPM (Spansion)	
U9	NAND flash memory	Optional	S34ML04G100TFI (Spansion)
U10	EEPROM	R1EX24128ASAS0A (Renesas)	
U19	Audio CODEC	WM8978 (Wolfson)	
U20	Ethernet PHY	uPD60610 (Renesas)	
U21, U24	CAN transceiver	HA13721RPJE (Renesas)	
U27	RS-232C transceiver	MAX3222CPW (TI)	
U28	USB serial conversion IC	RL78/G1C-S (Renesas)	
U30	5V regulator	LM20343 (TI)	12V → 5V
U32	3.3V regulator	LM2833X (TI)	5V → 3.3V
U34	1.18V regulator	LM2830Z (TI)	5V → 1.18V
U35	Vref reference voltage supply	LM4132 (TI)	5V → 3.3V
U33	Reset IC	RNA51957BFP (Renesas)	
X1	XIN oscillator (socket mounted)	SG-8002DC-13.3333MHz (Epson)	
X2	RTC resonator	MC-306 32.768KHz (Epson)	
X4	RTC oscillator	SG8002CA_4MHz (Epson)	
X5	USB oscillator (socket mounted)	SG8002DC_48MHz (Epson)	
X7	Video recorder resonator	FA-128_27MHz (Epson)	
X8	Audio oscillator (socket mounted)	SG8002DC_22.5792MHz (Epson)	
X9	LCD oscillator (socket mounted)	Optional	SG-8002DC (Epson)
X10	Ethernet PHY oscillator	SG8002CA_25MHz (Epson)	
X11	USB serial conversion IC resonator	DSX321G_12MHz (KDS)	

**Table 1.4 RTK772100BC00000BR Main Parts (2) Connectors**

Part Number	Part Name	Type (Manufacturer)	Recommended Optional Parts
CN1, CN4, CN5, CN8	Expansion connectors (20-pin)	HIF3FC-20PA-2.54DSA (HRS)	CN1 is optional.
CN2, CN3	Expansion connectors (30-pin)	HIF3FC-30PA-2.54DSA (HRS)	CN3 is optional.
CN6, CN9	Expansion connectors (30-pin) Surface mount type	HTSS-115-01-L-DV (Samtec)	
CN7	Expansion connectors (34-pin) Surface mount type	HTSS-117-01-L-DV (Samtec)	
J1	RCA connector for video input	T5857 (EMUDEN)	
J3	MOST I/F connector	QSH-020-01-L-D-DP-A (Samtec)	
J4	Mic-in pin jack	HSJ1456-010320 (Hoshiden)	
J6	Lineout pin jack	HSJ1456-010320 (Hoshiden)	
J5, J8	USB series A receptacles	UBA-4R-D14T-4D (JST)	
J7, J9	USB Mini-B receptacles	Optional	54819-0572 (MOLEX)
J10	LAN connector (RJ-45)	TLA-6T718 (TDK)	
J11	SD card slot	DM1AA-SF-PEJ (HRS)	4-bit
J15	MMC card slot	7SDMM-X0-2211-B (KINGCONN)	8-bit
J12, J13	CAN connectors	B3P-SHF-1AA (JST)	
J14	LVDS connector	DF14A-20P-1.25H (HRS)	
J17	Serial port connector	XM2C-0942-132L (OMRON)	D-sub 9-pin
J19	Serial port connector	54819-0572 (MOLEX)	USB Mini-B
J21	ETM connector (20-pin)	FTSH-110-01 (Samtec)	CoreSight 20
J22	JTAG connector (20-pin)	HIF3FC-20PA-2.54DSA (HRS)	ARM JTAG 20
J25	DC power jack	LGP6531-0700F (SMK)	
J24, J26 to J28	External power supply connectors	Optional	A2-2PA-2.54DSA (HRS)
U26	TOSLINK connector	TODX2951 (Toshiba)	

## 1.6 Memory Map

Figure 1.6 shows the R7S72100 Memory Map.

Logical address	R7S72100 logical space	RTK772100BC00000BR memory map
H'0000 0000	CS0 space: 64MB	NOR flash memory (64MB) 16 bit bus
H'0400 0000	CS1 space: 64MB	NOR flash memory (64MB) 16 bit bus
H'0800 0000	CS2 space: 64MB	SDRAM (64MB) 16 bit bus
H'0C00 0000	CS3 space: 64MB	SDRAM (64MB) 16 bit bus
H'1000 0000	CS4 space: 64MB	User area
H'1400 0000	CS5 space: 64MB	User area
H'1800 0000	SPI multi I/O bus space 1: 64MB	Serial flash memory (64MB)
H'1C00 0000	SPI multi I/O bus space 2: 64MB	Serial flash memory (64MB)
H'2000 0000	Others: 512MB	Large-capacity on-chip RAM (10MB)
H'20A0 0000		Reserved area (Unusable)
H'4000 0000	CS0 to CS5 spaces, SPI multi I/O bus space (Mirror space)	CS0 to CS5 spaces, SPI multi I/O bus space (Mirror space)
H'6000 0000	Others: 2560MB (Mirror space)	Large-capacity on-chip RAM (10MB) (Mirror space)
H'60A0 0000		On-chip peripheral module, Reserved area
H'FFFF FFFF		

**Figure 1.6 R7S72100 Memory Map**

## 1.7 Absolute Maximum Ratings

Table 1.5 lists the RTK772100BC00000BR Absolute Maximum Ratings.

**Table 1.5 RTK772100BC00000BR Absolute Maximum Ratings**

Symbol	Item	Value	Remarks
12Vcc	12V system power supply voltage	-0.3V to 15V	Vss reference
5Vcc <sup>*1</sup>	5V system power supply voltage	-0.3V to 6.25V	Vss reference
VBUS <sup>*2</sup>	VBUS voltage	-0.3V to 5.5V	Vss reference
3Vcc <sup>*3</sup>	3.3V system power supply voltage	-0.3V to 4.6V	Vss reference
AVcc <sup>*4</sup>	Analog 3.3V system power supply voltage	-0.3V to 4.6V	AVss reference
1.18Vcc <sup>*5</sup>	1.18V system power supply voltage	-0.3V to 1.7V	Vss reference
T <sub>opr</sub>	Operating ambient temperature <sup>*6</sup>	0°C to 50°C	Do not expose to condensation or corrosive gases.
T <sub>stg</sub>	Storage ambient temperature <sup>*6</sup>	-10°C to 60°C	Do not expose to condensation or corrosive gases.

[Note] \*1 When providing 5V system power supply directly from the external power supply connector.

\*2 When providing VBUS power supply directly from the external power supply connector.

\*3 When providing 3.3V system power supply directly from the external power supply connector.

\*4 When providing analog 3.3V system power supply directly from the external power supply connector.

\*5 When providing 1.18V system power supply directly from the external power supply connector.

\*6 The ambient temperature is the air temperature immediate to the board.

## 1.8 Operating Conditions

Table 1.6 lists the RTK772100BC00000BR Operating Conditions.

**Table 1.6 RTK772100BC00000BR Operating Conditions**

Symbol	Item	Value	Remarks
12Vcc	12V system power supply voltage	10.8V to 13.2V	Vss reference
5Vcc <sup>*1</sup>	5V system power supply voltage	4.5V to 5.5V	Vss reference
3Vcc <sup>*2</sup>	3.3V system power supply voltage	3.0V to 3.6V	Vss reference
AVcc <sup>*3</sup>	Analog 3.3V system power supply voltage	3.0V to 3.6V	Vss reference
1.18Vcc <sup>*4</sup>	1.18V system power supply voltage	1.10V to 1.26V	Vss reference
-	Maximum consumption voltage	Up to 3A	Total value of 12V, 5V, 3.3V and 1.18V system power supplies
T <sub>opr</sub>	Operating ambient temperature <sup>*5</sup>	0°C to 40°C	Do not expose to condensation or corrosive gases.

[Note] \*1 When providing 5V system power supply directly from the external power supply connector.

\*2 When providing 3.3V system power supply directly from the external power supply connector.

\*3 When providing analog 3.3V system power supply directly from the external power supply connector.

\*4 When providing 1.18V system power supply directly from the external power supply connector.

\*5 The ambient temperature is the air temperature immediate to the board.

## 2. Functional Specification

### 2.1 Functions Overview

Table2.1.1 lists the RTK772100BC00000BR Function Modules.

**Table2.1.1 RTK772100BC00000BR Function Modules**

Section	Function	Description
2.2	CPU	<ul style="list-style-type: none"> <li>● R7S72100 <ul style="list-style-type: none"> <li>▪ Input (XIN) clock: 13.33MHz</li> <li>▪ Bus clock: Up to 66.67MHz</li> <li>▪ CPU clock: Up to 400MHz</li> </ul> </li> </ul>
2.3	Memories	<ul style="list-style-type: none"> <li>● On-chip memory <ul style="list-style-type: none"> <li>▪ Large-capacity on-chip RAM: 10MB</li> <li>▪ External memory: 128KB</li> </ul> </li> <li>● NOR flash memory: 64MB×2 <ul style="list-style-type: none"> <li>▪ Spansion S29GL512S10T</li> </ul> </li> <li>● SDRAM: 64MB×2 <ul style="list-style-type: none"> <li>▪ ISSI IS42S16320B-75</li> </ul> </li> <li>● Serial flash memory: 64MB×3 <ul style="list-style-type: none"> <li>▪ Spansion S25FL512SDPM</li> </ul> </li> <li>● NAND flash memory: Board pattern which enables to implement 512MB <ul style="list-style-type: none"> <li>▪ Spansion S34ML04G100TFI</li> </ul> </li> <li>● EEPROM: 16KB×1 <ul style="list-style-type: none"> <li>▪ Renesas R1EX24128ASAS0A</li> </ul> </li> </ul>
2.4	USB Interface	● Connection between the R7S72100 USB2.0 host/function module and the USB connector.
2.5	Serial Interface	● Connection between the R7S72100 FIFO on-chip serial communication interface (SCIF) and 1) the D-Sub 9 connector, or 2) the USB Mini-B connector.
2.6	I/O Ports	● Connection between the R7S72100 I/O ports and the LEDs and DIP switches.
2.7	Interrupt Switches	● Connection between the R7S72100 NMI pin, IRQ6 pin and TEST pin and the push switches.
2.8	Clocks	● System clock configuration
2.9	Reset Control	● Reset control for the device on the RTK772100BC00000BR
2.10	Power Supply	● The RTK772100BC00000BR system power supply configuration
2.11	Debug Interface	● Connection between the R7S72100 user debug interface and the connectors.
2.12	CAN Interface	● Connection between the R7S72100 controller area network (RSCAN) and the CAN transceiver.
2.13	Video Input Interface	● Connection between the R7S72100 digital video decoder and the RCA connector.
2.14	Audio Interface	● Connection between the R7S72100 and the audio CODEC (WM8978).
2.15	SD Card Interface (4-bit)	● Connection between the R7S72100 SD host interface (SDHI) channel 0 and MMC host interface (MMCIF) and the SD card slot.
2.16	MMC Card Interface (8-bit)	● Connection between the R7S72100 SD host interface (SDHI) channel 1 and MMC host interface (MMCIF) and the MMC card slot.
2.17	LAN Interface	● Connection between the R7S72100 Ethernet controller (ETHER) and the Ethernet PHY.
2.18	LVDS Interface	● Connection between the R7S72100 and the LVDS I/F connector.
2.19	TOSLINK Interface	● Connection between the R7S72100 and the TOSLINK connector.
2.20	MOST Interface	● Connection between the R7S72100 media local bus (MLB) and the MOST I/F connector.
-	Operating specifications	<ul style="list-style-type: none"> <li>● Connectors, switcheds and LEDs (described in Chapter 3)</li> </ul>

## 2.2 CPU

### 2.2.1 R7S72100 Overview

The RTK772100BC00000BR includes a 32-bit RISC microcomputer R7S72100 which runs at a maximum CPU clock frequency of 400MHz.

### 2.2.2 R7S72100 Pin Functions

Table 2.2.1 to Table 2.2.11 list the R7S72100 pin functions used in the RTK772100BC00000BR.

**Table 2.2.1 R7S72100 Pin Functions (1)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
A1	Vss				
A2	P6_4 / D4 / LCD1_DATA12 / CRx2 / IRQ3 / RTS5 / RSPCK1 / DV0_DATA20	D4	Data bus	CN1-15	
A3	P0_3 / MD_CLKS	MD_CLKS	Connected to DIPSW as a clock selection input	-	SW1-5
A4	P11_0 / DV0_DATA12 / TIOC4A / SCK6 / LCD0_DATA7 / VIO_D12	DV0_DATA12 LCD0_DATA7 VIO_D12	Used on option board	CN9-28	
A5	P9_6 / LCD1_DATA22 / SPBIO20_0 / SSIWS2 / RTS1 / CS5	SPBIO20_0 LCD1_DATA22	Connected to serial flash memory 1 Used on option board	CN9-24	
A6	P9_3 / LCD1_DATA19 / SPBSSL_0 / TxD1	SPBSSL_0 LCD1_DATA19	Connected to serial flash memroy 1 and 2 Used on option board	CN9-19	JP7: Short JP7: Open
A7	P5_9 / WE2/DQMUL / ET_MDC / DV0_VSYNC / IRQ2 / CRx1 / IERxD / LCD1_DATA16	ET_MDC CRx1 P5_9 IERxD LCD1_DATA16	Connected to Ethernet PHY Connected to CAN transceiver Used on option board	CN9-16	JP4: 2-3 JP4: 1-2 JP4: Open
A8	Vss				
A9	P5_6 / TXOUT0P / LCD1_DATA6 / LCD0_DATA22 / DV1_DATA6 / TxD6 / IRQ6 / SPDIF_IN / DV0_DATA14	TXOUT0P LCD1_DATA6 DV1_DATA6	Connected to LCD panel for LVDS Used on option board	- CN9-8	
A10	P5_2 / TXOUT2P / LCD1_DATA2 / LCD0_DATA18 / DV1_DATA2 / SCK3 / TIOC1B / MOSI3	TXOUT2P LCD1_DATA2 DV1_DATA2	Connected to LCD panel for LVDS Used on option board	- CN9-4	
A11	P5_0 / TXCLKOUTP / LCD1_DATA0 / LCD0_DATA16 / DV1_DATA0 / TxD4 / TIOC0A / RSPCK3	TXCLKOUTP LCD1_DATA0 DV1_DATA0	Connected to LCD panel for LVDS Used on option board	- CN9-2	
A12	Vss				
A13	VIN2B		Channel 1 input pin 2 of Composit Video, Blanking, and Sync (CVBS)	-	
A14	VDAVss				
A15	VIN2A		Channel 0 input pin 2 of Composit Video, Blanking, and Sync (CVBS)	-	
A16	P0_2 / MD_CLK	MD_CLK	Connected to DIPSW as a clock mode input	-	SW1-4

■: 3.3V system power supply, ■: 1.18V system power supply, ■: GND

**Table 2.2.2 R7S72100 Pin Functions (2)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
A17	P1_6 / SCL3 / DV1_VSYNC / IERxD / IRQ6 / VIO_D12 / DV0_DATA12	SCL3	Used on option board	CN8-20	
		DV1_VSYNC			
A18	P1_3 / SDA1 / DV0_DATA19 / ET_COL / IRQ3 / ADTRG	SDA1	Connected to TH7	CN8-15	
A19	P1_0 / SCL0 / DV0_DATA16 / TCLKA / IRQ0 / VIO_VD / DV0_VSYNC	SCL0	Used on option board	CN8-14	
A20	P2_13 / D29 / SSL00 / DV0_DATA13 / SPBIO11_0 / CTx3 / SCK0 / LCD1_DATA13 / IRQ7	SPBIO11_0	Connected to serial flash memory 2	CN8-7	
		LCD1_DATA13	Used on option board		
A21	P2_12 / D28 / RSPCK0 / DV0_DATA12 / SPBIO01_0 / CRx3 / IRQ6 / LCD1_DATA12 / TIOC1B	SPBIO01_0	Connected to serial flash memory 2	CN8-8	
		LCD1_DATA12	Used on option board		
A22	Vss				
B1	Vcc				
B2	Vss				
B3	P6_0 / D0 / LCD1_DATA8 / LRXD0 / DV0_CLK / TIOC1A / IRQ5 / RxD3 / DV0_DATA16	D0	Data bus	CN1-20	
B4	P11_2 / DV0_DATA14 / TIOC4C / RxD6 / LCD0_DATA5 / VIO_D14	DV0_DATA14	Used on option board	CN9-30	
		LCD0_DATA5			
		VIO_D14			
B5	P9_7 / LCD1_DATA23 / SPBIO30_0 / SSIDATA2 / TIOC1A	SPBIO30_0	Connected to serial flash memory 1	CN9-23	
		LCD1_DATA23	Used on option board		
B6	P9_4 / LCD1_DATA20 / SPBIO00_0 / RxD1	SPBIO00_0	Connected to serial flash memory 1	CN9-22	
		LCD1_DATA20	Used on option board		
B7	P5_10 / WE3/DQMUU/AH / DV0_HSYNC / CTx1 / IETxD / LCD1_DATA17	P5_10	Connected to TH3	CN9-15	
		CTx1	Connected to CAN transceiver		
		IETxD	Used on option board		
		LCD1_DATA17			
B8	P5_8 / LCD0_EXTCLK / IRQ0 / DV1_CLK / DV0_CLK / CS2	CS2	Connected to CS pin of SDRAM 2	CN9-11	
		LCD0_EXTCLK	Used on option board		
B9	P5_7 / TXOUT0M / LCD1_DATA7 / LCD0_DATA23 / DV1_DATA7 / RxD6 / TIOC0D / SPDIF_OUT / DV0_DATA15	TXOUT0M	Connected to LCD panel for LVDS	-	
		LCD1_DATA7	Used on option board	CN9-7	
		DV1_DATA7			
B10	P5_3 / TXOUT2M / LCD1_DATA3 / LCD0_DATA19 / DV1_DATA3 / TxD3 / TIOC3C / MISO3	TXOUT2M	Connected to LCD panel for LVDS	-	
		LCD1_DATA3	Used on option board	CN9-3	
		DV1_DATA3			
B11	P5_1 / TXCLKOUTM / LCD1_DATA1 / LCD0_DATA17 / DV1_DATA1 / RxD4 / TIOC0B / SSL30	TXCLKOUTM	Connected to LCD panel for LVDS	-	
		LCD1_DATA1	Used on option board	CN9-1	
		DV1_DATA1			
B12	Vss				
B13	VIN1B		Channel 1 input pin 1 of Composit Video, Blanking, and Sync (CVBS)	-	
B14	VDAVcc				

 : 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND

**Table 2.2.3 R7S72100 Pin Functions (3)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
B15	VIN1A		Channel 0 input pin 1 of Composit Video, Blanking, and Sync (CVBS)	-	
B16	P1_7 / SDA3 / DV1_HSYNC / LRXD0 / IRQ7 / VIO_D13 / DV0_DATA13	SDA3	Used on option board	CN8-19	
		DV1_HSYNC			
B17	P1_4 / SCL2 / DV0_CLK / CRx1 / IRQ4 / CAN_CLK	SCL2	Connected to EEPROM	CN8-18	
			Used on option board		
B18	P1_2 / SCL1 / DV0_DATA18 / FRB / IRQ2 / LCD1_EXTCLK	SCL1	Connected to TH6	CN8-16	
		FRB	Connected to NAND flash memory		
B19	P2_15 / D31 / MISO0 / DV0_DATA15 / SPBIO31_0 / CAN_CLK / RxD0 / LCD1_DATA15 / IRQ1	SPBIO31_0	Connected to serial flash memory 2	CN8-9	
		LCD1_DATA15	Used on option board		
B20	PVcc				
B21	Vss				
B22	P2_10 / D26 / ET_RXD2 / DV0_DATA10 / SSIRxD0 / LTXD0 / LCD1_DATA10 / VIO_D10/MOSI4	ET_RXD2	Connected to Ethernet PHY	-	SW2-1: ON
		LTXD0	Used on option board	CN7-34	SW2-1: OFF
		LCD1_DATA10			
C1	P6_5 / D5 / LCD1_DATA13 / CTx2 / SCK5 / SSL10 / DV0_DATA21	D5	Data bus	CN1-14	
C2	Vcc				
C3	Vss				
C4	P6_2 / D2 / LCD1_DATA10 / LRXD1 / IRQ7 / TCLKA / TIOC2A / RxD2 / DV0_DATA18	D2	Data bus	CN1-18	
C5	P11_3 / DV0_DATA15 / TIOC4D / LCD0_DATA4 / VIO_D15	DV0_DATA15	Used on option board	CN9-29	
		LCD0_DATA4			
		VIO_D15			
C6	P11_1 / DV0_DATA13 / TIOC4B / TxD6 / LCD0_DATA6 / VIO_D13	DV0_DATA13	Used on option board	CN9-27	
		LCD0_DATA6			
		VIO_D13			
C7	P9_5 / LCD1_DATA21 / SPBIO10_0 / SSISCK2 / CTS1 / CS4	SPBIO10_0	Connected to serial flash memory 1	CN9-21	
		LCD1_DATA21	Used on option board		
C8	P9_2 / LCD1_DATA18 / SPBCLK_0 / LTXD0 / SCK1 / A0	SPBCLK_0	Connected to serial flash memroy 1 and 2	CN9-20	
		LCD1_DATA18	Used on option board		
C9	Vss				
C10	P5_5 / TXOUT1M / LCD1_DATA5 / LCD0_DATA21 / DV1_DATA5 / AUDIO_XOUT / TIOC0C / FCE / DV0_DATA13	TXOUT1M	Connected to LCD panel for LVDS	-	R110: Mounted
		FCE	Connected to NAND flash memory	CN9-5	
		LCD1_DATA5	Used on option board		
		DV1_DATA5			
C11	P5_4 / TXOUT1P / LCD1_DATA4 / LCD0_DATA20 / DV1_DATA4 / RxD3 / TIOC3D / DV0_DATA12	TXOUT1P	Connected to LCD panel for LVDS	-	
		LCD1_DATA4	Used on option board	CN9-6	
		DV1_DATA4			
C12	LVDSAPVcc				
C13	VRM		A/D converter BOTTOM reference voltage pin for video signal input	-	

: 3.3V systempower supply, 
 : 1.18V system power supply, 
 : GND






**Table 2.2.4 R7S72100 Pin Functions (4)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
C14	REXT		A/D converter reference voltage pin for video signal input	-	22k $\Omega \pm 1\%$
C15	Vss				
C16	P1_5 / SDA2 / DV1_CLK / CRx4 / IRQ5 / VIO_CLK / LCD1_EXTCLK	SDA2	Connected to EEPROM	CN8-17	
		DV1_CLK	Used on option board		
C17	P1_1 / SDA0 / DV0_DATA17 / TCLKC / IRQ1 / VIO_HD / DV0_HSYNC	SDA0	Used on option board	CN8-13	
C18	P2_14 / D30 / MOSI0 / DV0_DATA14 / SPBIO21_0 / CRx4 / TxD0 / LCD1_DATA14 / IRQ0	SPBIO21_0	Connected to serial flash memory 2	CN8-10	
		LCD1_DATA14	Used on option board		
C19	PVcc				
C20	Vss				
C21	P2_9 / D25 / ET_RXD1 / DV0_DATA9 / SSIWS0 / LRXD0 / LCD1_DATA9 / VIO_D9 / SSL40	ET_RXD1	Connected to Ethernet PHY	-	SW2-1: ON
		LRXD0	Used on option board	CN7-31	SW2-1: OFF
		LCD1_DATA9			
C22	P2_7 / D23 / ET_TXD3 / DV0_DATA7 / SSITxD5 / IETxD/RTS1 / VIO_D7 / LCD0_DATA23	ET_TXD3	Connected to Ethernet PHY	-	SW2-1: ON
		SSITxD5	Used on option board	CN7-29	SW2-1: OFF
D1	P6_7 / D7 / LCD1_DATA15 / LCD0_TCON6 / RxD5 / MISO1 / DV0_DATA23	D7	Data bus	CN1-12	
D2	P6_6 / D6 / LCD1_DATA14 / LCD0_TCON5 / TxD5 / MOSI1 / DV0_DATA22	D6	Data bus	CN1-13	
D3	Vcc				
D4	Vss				
D5	P6_3 / D3 / LCD1_DATA11 / LTxD1 / IRQ2 / CTS5 / TI0C2B / TxD2 / DV0_DATA19	D3	Data bus	CN1-17	
D6	P6_1 / D1 / LCD1_DATA9 / LTxD0 / IRQ4 / TI0C1B / SSIDATA4 / TxD3 / DV0_DATA17	D1	Data bus	CN1-19	
D7	PVcc				
D8	PVcc				
D9	LVDSPLL Vcc				
D10	Vss				
D11	LVDSREFRIN			-	5.6k $\Omega \pm 1\%$
D12	LVDSAPVcc				
D13	Vcc				
D14	VRP		A/D converter TOP reference voltage pin for video signal input	-	
D15	Vss				
D16	PVcc				
D17	PVcc				
D18	PVcc				
D19	Vss				

: 3.3V system power supply, 
 : 1.18V system power supply, 
 : GND

**Table2.2.5 R7S72100 Pin Functions (5)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
D20	P2_8 / D24 / ET_RXD0 / DV0_DATA8 / SSISCK0 / LCD0_TCON6 / LCD1_DATA8 / VIO_D8 / RSPCK4	ET_RXD0	Connected to Ethernet PHY	-	SW2-1: ON
		LCD1_DATA8	Used on option board	CN7-32	SW2-1: OFF
D21	P10_15 / DV0_DATA11 / SSITxD1 / MISO0 / LCD0_DATA8 / VIO_D11	DV0_DATA11	Used on option board	CN7-11	
		LCD0_DATA8			
		VIO_D11			
D22	P10_14 / DV0_DATA10 / SSIRxD1 / MOSI0 / LCD0_DATA9 / VIO_D10	DV0_DATA10	Used on option board	CN7-12	
		LCD0_DATA9			
		VIO_D10			
E1	P6_10 / D10 / DV0_DATA14 / LCD0_TCON5 / RxD0 / LCD0_DATA2 / IRQ2	D10	Data bus	CN1-8	
E2	P6_9 / D9 / DV0_DATA13 / TxD0 / LCD0_DATA1 / IRQ1	D9	Data bus	CN1-9	
E3	P6_8 / D8 / DV0_DATA12 / CAN_CLK / SCK0 / LCD0_DATA0 / IRQ0	D8	Data bus	CN1-10	
E4	Vcc				
E19	P2_11 / D27 / ET_RXD3 / DV0_DATA11 / SSITxD0 / TIOC1A / LCD1_DATA11 / VIO_D11 / MISO4	ET_RXD3	Connected to Ethernet PHY	-	SW2-1: ON
		P2_11	Used on option board	CN7-33	SW2-1: OFF
		LCD1_DATA11			
E20	P2_6 / D22 / ET_TXD2 / DV0_DATA6 / SSIRxD5 / RxD1 / VIO_D6 / LCD0_DATA22	ET_TXD2	Connected to Ethernet PHY	-	SW2-1: ON
		SSIRxD5	Used on option board	CN7-30	SW2-1: OFF
E21	P10_12 / DV0_DATA8 / SSISCK1 / RSPCK0 / LCD0_DATA11 / VIO_D8	DV0_DATA8	Used on option board	CN7-10	
		LCD0_DATA11			
		VIO_D8			
E22	P2_5 / D21 / ET_TXD1 / DV0_DATA5 / SSIWS5 / SPBSSL_1 / TxD1 / VIO_D5 / LCD0_DATA21	ET_TXD1	Connected to Ethernet PHY	-	SW2-1: ON
		SSIWS5	Used on option board	CN7-27	SW2-1: OFF
F1	P6_14 / D14 / DV0_DATA22 / TxD6 / LCD0_DATA6 / IRQ6	D14	Data bus	CN1-3	
F2	P6_13 / D13 / DV0_DATA21 / SCK6 / RXD1 / LCD0_DATA5 / IRQ5	D13	Data bus	CN1-4	
F3	P6_11 / D11 / DV0_DATA15 / LCD0_TCON6 / SCK1 / LCD0_DATA3 / IRQ3	D11	Data bus	CN1-7	
F4	Vcc				
F19	P2_4 / D20 / ET_TXD0 / DV0_DATA4 / SSISCK5 / SPBCLK_1 / SCK1 / VIO_D4 / LCD0_DATA20	ET_TXD0	Connected to Ethernet PHY	-	SW2-1: ON
		SSISCK5	Used on option board	CN7-28	SW2-1: OFF
F20	P10_13 / DV0_DATA9 / SSIWS1 / SSL00 / LCD0_DATA10 / VIO_D9	DV0_DATA9	Used on option board	CN7-9	
		LCD0_DATA10			
		VIO_D9			

 : 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND,

**Table2.2.6 R7S72100 Pin Functions (6)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
F21	P2_2 / D18 / ET_TXEN / DV0_DATA2 / SPBIO20_1 / MLB_SIG / TIOC2B / VIO_D2 / LCD0_DATA18	ET_TXEN	Connected to Ethernet PHY	-	SW2-1: ON
		MLB_SIG	Connected to MOST I/F connector	CN7-26	SW2-1: OFF
F22	P4_15 / LCD0_DATA23 / LCD1_TCON2 / SD_D2_0 / MMC_D2 / SPBIO31_1 / SSITxD3 / RxD2 / IRQ7	SD_D2_0	Connected to SD card slot DAT2 pin	CN7-19	
		LCD1_TCON2	Used on option board		
		SSITxD3			
G1	P11_13 / CTx1 / SSL10 / LCD0_TCON4 / MMC_D5 / LCD0_TCON1	LCD0_TCON1	Used on option board	CN2-19	
G2	P11_12 / CRx1 / RSPCK1 / IRQ3 / MMC_D4 / LCD0_TCON2	LCD0_TCON2	Used on option board	CN2-20	
G3	P6_15 / D15 / DV0_DATA23 / RxD6 / LCD0_DATA7 / IRQ7	D15	Data bus	CN1-2	
G4	P6_12 / D12 / DV0_DATA20 / TXD1 / LCD0_DATA4 / IRQ4	D12	Data bus	CN1-5	
G19	P4_14 / LCD0_DATA22 / LCD1_TCON1 / SD_D3_0 / MMC_D3 / SPBIO21_1 / SSIRxD3 / TxD2 / IRQ6	SD_D3_0	Connected to SD card slot	CN7-20	
		LCD1_TCON1	Used on option board		
G20	P2_3 / D19 / ET_CRS / DV0_DATA3 / SPBIO30_1 / IERxD / CTS1 / VIO_D3 / LCD0_DATA19	ET_CRS	Connected to Ethernet PHY	-	SW2-1: ON
		P2_3	Connected to MOST I/F connector (resetcontrol)	CN7-25	SW2-1: OFF
G21	P4_13 / LCD0_DATA21 / LCD1_TCON0 / SD_CMD_0 / MMC_CMD / SPBIO11_1 / SSIWS3 / RxD1 / IRQ5	SD_CMD_0	Connected to SD card slot	CN7-17	
		LCD1_TCON0	Used on option board		
		SSIWS3			
G22	Vss				
H1	P7_2 / RAS / DV0_DATA18 / ET_TXER / RxD4 / CRx2 / SSIWS1 / TIOC0C	RAS	Connected to SDRAM 1 and 2	CN2-28	JP1: Open
		CRx2	Connected to CAN transceiver		JP1: Short
H2	P7_1 / CS3 / DV0_DATA17 / ET_TXCLK / TXD4 / DV0_CLK / SSISCK1 / TIOC0B	CS3	Connected to SDRAM 2	CN2-29	
H3	P11_14 / SPDIF_IN / MOSI1 / LCD0_TCON5 / MMC_D6 / LCD0_TCON0	LCD0_TCON0	Used on option board	CN2-18	
H4	P7_0 / MD_BOOT2 / CS0 / DV0_DATA16 / ET_MDC / SCK4 / LTXD0 / TIOC0A	MD_BOOT2	Connected to DIPSW as a boot mode input	CN2-30	SW1-3
		CS0	Connected to NOR flash memroy 1		JP5: 1-2 JP5: 2-3
H19	P4_11 / LCD0_DATA19 / LCD1_TCON6 / SD_D0_0 / MMC_D0 / SSITxD5 / CTx4 / SCK1 / IRQ3	SD_D0_0	Connected to SD card slot	CN7-15	
		LCD1_TCON6	Used on option board		
H20	P10_11 / DV0_DATA7 / TIOC2B / ET_RXD3 / LCD0_DATA12 / VIO_D7	DV0_DATA7	Used on option board	CN7-7	
		LCD0_DATA12			
		VIO_D7			
H21	P10_10 / DV0_DATA6 / TIOC2A / ET_RXD2 / LCD0_DATA13 / VIO_D6	DV0_DATA6	Used on option board	CN7-8	
		LCD0_DATA13			
		VIO_D6			

: 3.3V systempower supply, 
  : 1.18V system power supply, 
  : GND

**Table2.2.7 R7S72100 Pin Functions (7)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
H22	P4_12 / LCD0_DATA20 / LCD1_CLK / SD_CLK_0 / MMC_CLK / SPBIO10_1 / SSISCK3 / TxD1 / IRQ4	SD_CLK_0	Connected to SD card slot	CN7-18	
		LCD1_CLK	Used on option board		
		SSISCK3			
J1	P7_5 / RD/WR / DV0_DATA21 / ET_TXD1 / RXD7 / SSISCK2 / TIOC1B	RD/WR	Connected to SDRAM 1 and 2	CN2-25	
		RxD7	Used on option board		
J2	P7_4 / CKE / DV0_DATA20 / ET_TXD0 / TXD7 / SSITxD1 / TIOC1A	CKE	Connected to SDRAM 1 and 2	CN2-26	
		TxD7	Used on option board		
J3	P7_3 / CAS / DV0_DATA19 / ET_TXEN / SCK7 / CTx2 / SSIRxD1 / TIOC0D	CAS	Connected to SDRAM 1 and 2	CN2-27	
		CTx2	Connected to CAN transceiver		
J4	P11_15 / SPDIF_OUT / MISO1 / IRQ1 / MMC_D7 / LCD0_CLK	LCD0_CLK	Used on option board	CN2-17	
J9	Vss				
J10	Vss				
J11	Vss				
J12	Vss				
J13	Vss				
J14	Vss				
J19	Vcc				
J20	P10_9 / DV0_DATA5 / TIOC1B / ET_RXD1 / LCD0_DATA14 / VIO_D5	DV0_DATA5	Used on option board	CN7-5	
		LCD0_DATA14			
		VIO_D5			
J21	P10_8 / DV0_DATA4 / TIOC1A / ET_RXD0 / LCD0_DATA15 / VIO_D4	DV0_DATA4	Used on option board	CN7-6	
		LCD0_DATA15			
		VIO_D4			
J22	P4_10 / LCD0_DATA18 / LCD1_TCON5 / SD_D1_0 / MMC_D1 / SSIRxD5 / RxD0 / IRQ2	SD_D1_0	Connected to SD card slot	CN7-16	
		LCD1_TCON5	Used on option board		
K1	P7_9 / A1 / SSIWS3 / ET_RXD0 / CTx0 / TIOC3B / IRQ0	A1	Address bus	CN3-30	
K2	P7_7 / WE1/DQMLU / DV0_DATA23 / ET_TXD3 / RTS7 / SSIDATA2 / TIOC2B	WE1/DQMLU	Connected to SDRAM 1 and 2	CN2-23	
		RTS7	Used on option board		
K3	P7_6 / WE0/DQMLL / DV0_DATA22 / ET_TXD2 / CTS7 / SSIWS2 / TIOC2A	WE0/DQMLL	Connected to SDRAM 1 and 2	CN2-24	
		CTS7	Used on option board		
K4	P7_8 / RD / SSISCK3 / CRx0 / TIOC3A / IRQ1	RD	Connected to NOR flash memory 1 and 2	CN2-22	
		P7_8	Used on option board		
K9	Vss				
K10	Vss				
K11	Vss				
K12	Vss				
K13	Vss				
K14	Vss				
K19	Vcc				

: 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND

**Table 2.2.8 R7S72100 Pin Functions (8)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
K20	P4_8 / LCD0_DATA16 / LCD1_TCON3 / SD_CD_0 / MMC_CD / SSISCK5 / CTx2 / SCK0 / IRQ0	SD_CD_0	Connected to SD card slot	CN7-14	
		LCD1_TCON3	Used on option board		
K21	P4_9 / LCD0_DATA17 / LCD1_TCON4 / SD_WP_0 / SSIWS5 / CRx2 / TxD0 / IRQ1	SD_WP_0	Connected to SD card slot	CN7-13	
		LCD1_TCON4	Used on option board		
K22	P2_1 / D17 / ET_TXER / DV0_DATA1 / SPBIO10_1 / MLB_DAT / TIOC2A / VIO_D1 / LCD0_DATA17	ET_TXER	Connected to Ethernet PHY	-	SW2-1: ON
		MLB_DAT	Connected to MOST I/F connector	CN7-23	SW2-1: OFF
L1	P11_5 / DV0_DATA17 / SD_WP_0 / SSIWS4 / LCD0_DATA2	DV0_DATA17	Used on option board	CN2-13	
		SSIWS4			
		LCD0_DATA2			
L2	P7_11 / A3 / SSITxD3 / ET_RXD2 / CRx1 / TIOC3D / IRQ3	A3	Address bus	CN3-28	
L3	P7_10 / A2 / SSIRxD3 / ET_RXD1 / CTx1 / TIOC3C / IRQ2	A2	Address bus	CN3-29	
L4	P11_4 / DV0_DATA16 / SD_CD_0 / SSISCK4 / MMC_CD / LCD0_DATA3	DV0_DATA16	Used on option board	CN2-14	
		SSISCK4			
		LCD0_DATA3			
L9	Vss				
L10	Vss				
L11	Vss				
L12	Vss				
L13	Vss				
L14	Vss				
L19	PVcc				
L20	P4_7 / LCD0_DATA15 / MISO1 / TIOC4D / PWM2H / SSITxD0 / DV0_DATA15	SSITxD0	Connected to audio CODEC (WM8978)	-	SW2-2: ON
				CN6-29	SW2-2: OFF
L21	P2_0 / D16 / ET_TXCLK / DV0_DATA0 / SPBIO00_1 / MLB_CLK / IRQ5 / VIO_D0 / LCD0_DATA16	ET_TXCLK	Connected to Ethernet PHY	-	SW2-1: ON
		MLB_CLK	Connected to MOST I/F connector	CN7-24	SW2-1: OFF
L22	P4_6 / LCD0_DATA14 / MOSI1 / TIOC4C / PWM2G / SSIRxD0 / DV0_DATA14	SSIRxD0	Connected to audio CODEC (WM8978)	-	SW2-2: ON
				CN6-30	SW2-2: OFF
M1	P7_12 / A4 / SSISCK4 / ET_RXD3 / TIOC4A / IRQ4	A4	Address bus	CN3-27	
M2	P11_6 / DV0_DATA18 / SD_D1_0 / SSIDATA4 / MMC_D1 / LCD0_DATA1	DV0_DATA18	Used on option board	CN2-12	
		SSIDATA4			
		LCD0_DATA1			
M3	P11_7 / DV0_DATA19 / SD_D0_0 / CTS5 / MMC_D0 / LCD0_DATA0	DV0_DATA19	Used on option board	CN2-11	
		LCD0_DATA0			
M4	Vcc				
M9	Vss				
M10	Vss				
M11	Vss				

: 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND

**Table 2.2.9 R7S72100 Pin Functions (9)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
M12	Vss				
M13	Vss				
M14	Vss				
M19	PVcc				
M20	P4_5 / LCD0_DATA13 / SSL10 / TIOC4B / PWM2F / SSIWS0 / DV0_DATA13	SSIWS0	Connected to audio CODEC (WM8978)	-	SW2-2: ON
				CN6-27	SW2-2: OFF
M21	P4_4 / LCD0_DATA12 / RSPCK1 / TIOC4A / PWM2E / SSISCK0 / DV0_DATA12	SSISCK0	Connected to audio CODEC (WM8978)	-	SW2-2: ON
				CN6-28	SW2-2: OFF
M22	P10_7 / DV0_DATA3 / TIOC0D / PWM2H / ET_TXD3 / LCD0_DATA16 / VIO_D3	DV0_DATA3	Used on option board	CN6-23	
		LCD0_DATA16			
		VIO_D3			
N1	P7_13 / A5 / SSIWS4 / ET_MDIO / TIOC4B / IRQ5	A5	Address bus	CN3-26	
N2	P7_14 / A6 / SSIDATA4 / ET_CRS / TIOC4C / IRQ6	A6	Address bus	CN3-25	
N3	P7_15 / A7 / RSPCK0 / ET_RXCLK / CTS5 / SCI_TXD0 / TIOC4D	A7	Address bus	CN3-24	
N4	PVcc				
N9	Vss				
N10	Vss				
N11	Vss				
N12	Vss				
N13	Vss				
N14	Vss				
N19	P10_4 / DV0_DATA0 / TIOC0A / PWM2E / ET_TXD0 / LCD0_DATA19 / VIO_D0	DV0_DATA0	Used on option board	CN6-22	
		LCD0_DATA19			
		VIO_D0			
N20	P10_5 / DV0_DATA1 / TIOC0B / PWM2F / ET_TXD1 / LCD0_DATA18 / VIO_D1	DV0_DATA1	Used on option board	CN6-21	
		LCD0_DATA18			
		VIO_D1			
N21	P10_6 / DV0_DATA2 / TIOC0C / PWM2G / ET_TXD2 / LCD0_DATA17 / VIO_D2	DV0_DATA2	Used on option board	CN6-24	
		LCD0_DATA17			
		VIO_D2			
N22	P4_3 / LCD0_DATA11 / TIOC0D / FWE / CTx3 / Rx D2 / MISO4 / MMC_D7	FWE	Connected to NAND flash memory	CN6-17	
		MMC_D7	Connected to MMC card slot		
		MISO4	Connected to audio CODEC (WM8978)		
			Used on option board		
P1	P8_0 / A8 / SSL00 / ET_RXER / SCK5 / SCI_SCK0	A8	Address bus	CN3-23	
P2	P8_1 / A9 / MOSI0 / ET_RXDV / TXD5 / SCI_RXD0	A9	Address bus	CN3-21	
P3	P8_2 / A10 / MISO0 / RXD5 / IRQ0	A10	Address bus	CN3-20	
P4	PVcc				
P9	Vss				
P10	Vss				
P11	Vss				
P12	Vss				
P13	Vss				

: 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND

**Table 2.2.10 R7S72100 Pin Functions (10)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
P14	Vss				
P19	Vss				
P20	P4_0 / LCD0_DATA8 / TIOC0A / FRE / RSPCK4 / MMC_D4	FRE	Connected to NAND flash memory	CN6-16	
		MMC_D4	Connected to MMC card slot		
		RSPCK4	Connected to audio CODEC (WM8978)		
			Used on option board		
P21	P4_2 / LCD0_DATA10 / TIOC0C / FALE / CRx3 / TxD2 / MOSI4 / MMC_D6	FALE	Connected to NAND flash memory	CN6-18	
		MMC_D6	Connected to MMC card slot		
		MOSI4	Connected to audio CODEC (WM8978)		
			Used on option board		
P22	P4_1 / LCD0_DATA9 / TIOC0B / FCLE / SCK2 / SSL40 / MMC_D5	FCLE	Connected to NAND flash memory	CN6-15	JP10: Open
		MMC_D5	Connected to MMC card slot		
		SSL40	Connected to audio CODEC (WM8978)		JP10: Short
R1	P8_3 / A11 / DV1_DATA0 / RSPCK2 / RTS5 / IRQ1 / SCK2	A11	Address bus	CN3-19	
R2	P8_4 / A12 / DV1_DATA1 / SSL20 / IERxD / RxD2	A12	Address bus	CN3-18	
R3	P8_5 / A13 / DV1_DATA2 / MOSI2	A13	Address bus	CN3-17	
R4	Vcc				
R19	Vcc				
R20	P3_15 / LCD0_DATA7 / NAF7 / TRACECTL / SD_D2_1 / MMC_D2	NAF7	Connected to NAND flash memory	CN6-11	
		SD_D2_1	Connected to MMC card slot		
		MMC_D2			
R21	P3_14 / LCD0_DATA6 / NAF6 / TRACECLK / SD_D3_1 / MMC_D3	NAF6	Connected to NAND flash memory	CN6-12	
		SD_D3_1	Connected to MMC card slot		
		MMC_D3			
		TRACECLK	Connected to UDI connector		
R22	P3_13 / LCD0_DATA5 / NAF5 / AUDIO_XOUT / SD_CMD_1 / MMC_CMD	NAF5	Connected to NAND flash memory	CN6-9	
		SD_CMD_1	Connected to MMC card slot		
		MMC_CMD			
T1	P11_8 / DV0_DATA20 / SD_CLK_0 / RTS5 / MMC_CLK / LCD0_TCON6	DV0_DATA20	Used on option board	CN2-8	
		LCD0_TCON6			
T2	P11_9 / DV0_DATA21 / SD_CMD_0 / SCK5 / MMC_CMD / LCD0_TCON5	DV0_DATA21	Used on option board	CN2-7	
		LCD0_TCON5			
T3	P11_10 / DV0_DATA22 / SD_D3_0 / TxD5 / MMC_D3 / LCD0_TCON4	DV0_DATA22	Used on option board	CN2-6	
		LCD0_TCON4			
T4	Vcc				
T19	Vcc				
T20	P3_10 / LCD0_DATA2 / NAF2 / TRACEDATA2 / TIOC4C / SD_D1_1 / MMC_D1	NAF2	Connected to NAND flash memory	CN6-4	
		SD_D1_1	Connected to MMC card slot		
		MMC_D1			
		TRACEDATA2	Connected to UDI connector		
T21	P3_11 / LCD0_DATA3 / NAF3 / TRACEDATA3 / TIOC4D / SD_D0_1 / MMC_D	NAF3	Connected to NAND flash memory	CN6-3	
		SD_D0_1	Connected to MMC card slot		
		MMC_D0			
		TRACEDATA3	Connected to UDI connector		

: 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND

**Table 2.2.11 R7S72100 Pin Functions (11)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
T22	P3_12 / LCD0_DATA4 / NAF4 / SD_CLK_1 / MMC_CLK	NAF4	Connected to NAND flash memory	CN6-10	
		SD_CLK_1	Connected to MMC card slot		
		MMC_CLK			
U1	Vss				
U2	P8_6 / A14 / DV1_DATA3 / MISO2 / IETxD / TxD2	A14	Address bus	CN3-16	
U3	P11_11 / DV0_DATA23 / SD_D2_0 / Rx D5 / MMC_D2 / LCD0_TCON3	DV0_DATA23	Used on option board	CN2-5	
		LCD0_TCON3			
U4	P8_7 / A15 / DV1_DATA4 / AUDIO_XOUT / IRQ5 / ET_COL	A15	Address bus	CN3-15	
U19	Vcc				
U20	JP0_1 / TDO	TD0	Test data output	-	
U21	TCK		Test clock	-	
U22	Vss				
V1	CKIO		Connected to SDRAM 1 and 2	CN2-2	
V2	P8_8 / A16 / DV1_DATA5 / SPBIO00_1 / SPDIF_IN / TIOC1A / PWM1A / Tx D3 / SSISCK5	A16	Address bus	CN3-14	JP2: 1-2
		SPDIF_IN	Connected to TOSLINK connector		JP2: 2-3
V3	P8_9 / A17 / DV1_DATA6 / SPBIO10_1 / SPDIF_OUT / TIOC1B / PWM1B / Rx D3 / SSIWS5	A17	Address bus	CN3-12	
		SPDIF_OUT	Connected to TOSLINK connector		
V4	P8_13 / A21 / SPBSSL_1 / TIOC3D / TXD5 / PWM1F / SGOUT_3 / SSIWS4	A21	Address bus	CN3-8	JP8: Open
		SPBSSL_1	Connected to serial flash memory 3		JP8: Short
V19	P3_8 / LCD0_DATA0 / NAF0 / TRACEDATA0 / TIOC4A / SD_CD_1 / MMC_CD	NAF0	Connected to NAND flash memory	CN6-2	
		SD_CD_1	Connected to MMC card slot		
		MMC_CD			
		TRACEDATA0	Connected to UDI connector		
V20	TRST#		Initialization signal input pin	-	
V21	JP0_0 / TDI	TDI	Test data input	-	
V22	TMS		Test mode select	-	
W1	Vss				
W2	P8_10 / A18 / DV1_DATA7 / SPBIO20_1 / TIOC3A / CTx4 / PWM1C / SGOUT_0 / SSITxD5	A18	Address bus	CN3-11	
		SPBIO20_1	Connected to serial flash memory 3		
W3	P8_11 / A19 / SPBIO30_1 / TIOC3B / Rx D5 / PWM1D / SGOUT_1 / DV0_CLK	A19	Address bus	CN3-10	
		SPBIO30_1	Connected to serial flash memory 3		
W4	PVcc				
W5	PVcc				
W6	PVcc				
W7	Vss				
W8	Vss				
W9	Vcc				
W10	Vcc				
W11	Vss				
W12	PVcc				
W13	PVcc				
W14	PLL Vcc				

: 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND



**Table 2.2.12 R7S72100 Pin Functions (12)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
W15	Vss				
W16	Vss				
W17	AVss			CN5-13, 14	
W18	AVcc			CN5-9, 10	
W19	PVcc				
W20	P3_9 / LCD0_DATA1 / NAF1 / TRACEDATA1 / TIOC4B / SD_WP_1 / IRQ6	NAF1	Connected to NAND flash memory	CN6-1	
		SD_WP_1	Connected to MMC card slot		
		TRACEDATA1	Connected to UDI connector		
W21	AUDIO_X2		Open	-	
W22	AUDIO_X1		Connected to audio external clock	-	22.5792MHz
Y1	P8_12 / A20 / SPBCLK_1 / TIOC3C / SCK5 / PWM1E / SGOUT_2 / SSISCK4	A20	Address bus	CN3-9	
		SPBCLK_1	Connected to serial flash memory 3		
Y2	P8_14 / A22 / SPBIO01_0 / SPBIO00_1 / TIOC2A / RSPCK2 / PWM1G / TxD4 / SSIDATA4	A22	Address bus	CN3-7	
		SPBIO01_0	Connected to serial flash memory 3		
Y3	PVcc				
Y4	P3_7 / LCD0_TCON6 / SSITxD1 / LCD1_EXTCLK / SCI_CTS0/RTS0 / TIOC3D / CS1 / WDTOVF	LCD1_EXTCLK	Connected to external clock for LCD panel	CN4-13	Empty socket JP6: 1-2
		CS1	Connected to NOR flash memory 2		JP6: 2-3
Y5	P3_4 / LCD0_TCON3 / ET_RXCLK / SSISCK1 / AUDIO_XOUT2 / SCI_SCK0 / TIOC3A / SCK3	ET_RXCLK	Connected to Ethernet PHY	-	SW2-1: ON
		SSISCK1	Used on option board	CN4-12	SW2-1: OFF
		SCI_SCK0			
		SCK3			
Y6	P10_2 / DV0_HSYNC / TCLKC / PWM2C / ET_TXEN / LCD0_DATA21 / VIO_HD	DV0_HSYNC	Used on option board	CN4-18	
		LCD0_DATA21			
		VIO_HD			
Y7	P3_2 / LCD0_TCON1 / ET_TXEN / RxD2 / SCI_RXD1 / TEND0 / PWM2C / MOSI3	RxD2	Connected to D-sub 9-pin connector via RS-232C transceiver	CN4-8	JP12: 1-2
			Connected to USB mini-B connector via USB serial conversion IC		JP12: 2-3
Y8	RES#		Connected to reset input switch	CN4-2	
Y9	NMI		Connected to non-maskable interrupt switch	CN4-1	
Y10	Vss				
Y11	VBUSIN1		USB channel 1VBUS input	-	JP11
Y12	VBUSIN0		USB channel 0VBUS input	CN5-17, 18	JP9
Y13	USBAVcc		Transceiver analog core power supply		
Y14	Vss				
Y15	P0_0 / MD_BOOT0	MD_BOOT0	Connected to DIPSW as a boot mode input	-	SW1-1
Y16	P0_1 / MD_BOOT1	MD_BOOT1	Connected to DIPSW as a boot mode input	-	SW1-2
Y17	P1_10 / AN2 / IRQ4 / TCLKB	AN2	Used on option board	CN5-16	
Y18	P1_13 / AN5 / DV0_HSYNC / WAIT	P1_13	Used on option board	CN5-11	
Y19	P1_15 / AN7	P1_15	Connected to Ethernet PHY (INT / GPIO4)	CN5-7	
Y20	PVcc				
Y21	VIDEO_X2		Open	-	
Y22	VIDEO_X1		Connects external clock for video decoder	-	27MHz
AA1	P8_15 / A23 / SPBIO11_0 / SPBIO10_1 / TIOC2B / SSL20 / PWM1H / RxD4	A23	Address bus	CN3-6	
		SPBIO11_0	Connected to serial flash memory 3		
AA2	PVcc				

: 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND

**Table 2.2.13 R7S72100 Pin Functions (13)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
AA3	P9_1 / A25 / SPBIO31_0 / CRx0 / IRQ0 / MISO2	A25	Address bus	CN3-3	
AA4	P3_5 / LCD0_TCON4 / ET_RXER / SSIWS1 / AUDIO_XOUT3 / SCI_TXD0 / TIOC3B / TxD3	ET_RXER	Connected to Ethernet PHY	-	SW2-1: ON
		SSIWS1	Used on option board	CN4-11	SW2-1: OFF
		SCI_TXD0			
		TxD3			
AA5	P10_1 / DV0_VSYNC / TCLKB / PWM2B / ET_TXER / LCD0_DATA22 / VIO_VD	DV0_VSYNC	Used on option board	CN4-19	
		LCD0_DATA22			
		VIO_VD			
AA6	P3_3 / LCD0_TCON2 / ET_MDIO / IRQ4 / BS / SCI_CTS1 / RTS1 / DACK0 / PWM2D / MISO3	ET_MDIO	Connected to Ethernet PHY	-	SW2-1: ON
		P3_3	Used on option board	CN4-7	SW2-1: OFF
AA7	P3_1 / LCD0_TCON0 / ET_TXER / IRQ6 / TxD2 / SCI_TXD1 / AUDIO_CLK / PWM2B / SSL30	IRQ6	Connected to interrupt switch	-	JP3: 1-2
		AUDIO_CLK	Used on option board	CN4-5	JP3: 2-3
AA8	RTC_X2		Connects RTC resonator	-	32.768KHz
AA9	P0_5 / RTC_X4	RTC_X4	Open	-	
AA10	Vss				
AA11	DM_1		USB channel 1 differential signal D- data	-	
AA12	DP_0		USB channel 0 differential signal D+ data	-	
AA13	REFRIN		Reference input	-	5.6k $\Omega \pm 1\%$
AA14	Vss				
AA15	USB_X2		Open	-	
AA16	XTAL		Open	-	
AA17	P1_8 / AN0 / IRQ2 / DREQ0 / VIO_D14 / DV0_DATA14	AN0	Used on option board	CN5-20	
AA18	P1_11 / AN3 / IRQ5 / TCLKD	AN3	Used on option board	CN5-15	
AA19	P1_14 / AN6 / ET_COL	ET_COL	Connected to Ethernet PHY	CN5-8	
AA20	AVcc			CN5-9, 10	
AA21	PVcc				
AA22	BSCANP		Connected to DIPSW as a pin for boundary scan mode setting	-	SW2-3
AB1	PVcc				
AB2	P9_0 / A24 / SPBIO21_0 / CTx0 / TCLKC / MOSI2	A24	Address bus	CN3-5	
AB3	P3_6 / LCD0_TCON5 / ET_RXDV / SSIRxD1 / SCI_RXD0 / TIOC3C / RxD3	ET_RXDV	Connected to Ethernet PHY	-	SW2-1: ON
		SSIRxD1	Used on option board	CN4-14	SW2-1: OFF
		SCI_RXD0			
		RxD3			
AB4	P10_0 / DV0_CLK / TCLKA / PWM2A / ET_TXCLK / LCD0_DATA23 / VIO_CLK	DV0_CLK	Used on option board	CN4-20	
		LCD0_DATA23			
		VIO_CLK			
AB5	P10_3 / TCLKD / PWM2D / ET_CRS / LCD0_DATA20 / VIO_FLD	LCD0_DATA20	Used on option board	CN4-17	
		P10_3			
AB6	P3_0 / LCD0_CLK / ET_TXCLK / IRQ2 / SCK2 / SCI_SCK1 / TxD2 / PWM2A / RSPCK3	TxD2	Connected to D-sub 9-pin via RS-232C transceiver	CN4-6	JP13: 1-2
			Connected to USB mini-B connector via USB serial conversion IC		JP13: 2-3
AB7	Vss				

: 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND

**Table 2.2.14 R7S72100 Pin Functions (14)**

Pin No.	Pin Name	Function	Description	Expansion Connector	Remarks
AB8	RTC_X1		Connects RTC resonator	-	32.768KHz
AB9	P0_4 / RTC_X3	RTC_X3	Connects RTC external clock	-	4MHz
AB10	Vss				
AB11	DP_1		USB channel 1 differential signal D+ data	-	
AB12	DM_0		USB channel 0 differential signal D- data	-	
AB13	Vss				
AB14	USBAPVcc		Transceiver analog pin power supply		
AB15	USB_X1		Connects USB external clock	-	48MHz
AB16	EXTAL		Connects crystal resonator as a system clock source	-	13.33MHz
AB17	Vss				
AB18	P1_9 / AN1 / IRQ3 / VIO_D15 / DV0_DATA15	AN1	Used on option board	CN5-19	
AB19	P1_12 / AN4 / DV0_VSYNC / VIO_FLD	P1_12	Used on option board	CN5-12	
AB20	AVss			CN5-13, 14	
AB21	AVref		ADC analog reference voltage		
AB22	Vss				

: 3.3V system power supply, 
  : 1.18V system power supply, 
  : GND

### 2.2.3 RTK772100BC00000BR Module Applicability

Table2.2.15 lists the RTK772100BC00000BR Module Applicability. The symbol of "Y" in the table indicates that both modules can be used in combination, and the "N" indicates that combination use is not applicable.

**Table2.2.15 RTK772100BC00000BR Module Applicability**

RTK772100BC00000BR

RTK772100BC00000BR																											
R7S72100 Peripheral Function	Part No.	Module Name	NOR flash memory 1	NOR flash memory 2	SDRAM1	SDRAM2	Serial flash memory 1 and 2	Serial flash memory 3	NAND flash memory	EEPROM	USB	Ethernet	Video input	LCD output	Audio CODEC	CAN1	CAN2	SD card slot	MMC card slot	LVDS output	TOSLINK	MOST	CoreSight 20	ARM JTAG 20	IRQ6 switch	Serial port	
BSC	U2	NOR flash memory 1 (connected with CS0)		Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	
BSC	U3	NOR flash memory 2 (connected with CS1)	Y		Y	Y	Y	N	Y	Y	Y	Y	Y	*1	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	
BSC	U4	SDRAM1 (connected with CS2)	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	
BSC	U5	SDRAM2 (connected with CS3)	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	
SPIBSC	U6, U7	Serial flash memory 1 and 2 (connected with SPIBSC0)	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
SPIBSC	U8	Serial flash memory 3 (connected with SPIBSC1)	N	N	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
FLCTL	U9	NAND flash memory	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	
RIIC	U10	EEPROM	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
USB	J5, J8	USB	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
ETHER	U20	Ethernet	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
DVDEC	J1	Video input	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
VDC5	X9	LCD output (LCD1_EXTCLK)	Y	*1	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
SSIF, RSPi	U19	Audio CODEC	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y		Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	
RSCAN	U21	CAN1	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
RSCAN	U24	CAN2	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	
SDHI0, MMCIF	J11	SD card slot (4-bit)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	
SDHI1, MMCIF	J15	MMC card slot (8-bit)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y		Y	Y	N	Y	Y	Y	Y	
LVDS	J14	LVDS output	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	
RSPDiF	U26	TOSLINK	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	
MLB	J3	MOST	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	
UDI	J21	CoreSight 20	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y		N	Y	Y	
UDI	J22	ARM JTAG 20	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N		Y	Y	
INTC	SW6	IRQ6 switch	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
SCIF	J17, J19	Serial port	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

\*1: P3\_7 / CS1 / LCD1\_EXTCLK is a common terminal. When LCD1\_EXTCLK is not used, it may be used in combination.

## 2.3 Memories

The RTK772100BC00000BR includes NOR flash memory, SDRAM, serial memory and EEPROM as external memories other than the R7S72100 on-chip RAM. The details are described as follows.

### 2.3.1 R7S72100 On-Chip RAM

The R7S72100 includes a 2MB high-speed RAM with high-speed access, a 10MB large-capacity on-chip RAM, and a 128KB data-retention RAM as on-chip memories.

### 2.3.2 NOR Flash Memory Interface

The RTK772100BC00000BR generally includes two NOR flash memories (listed in Table2.3.1) to store the user program. The NOR flash memories are controlled by the bus state controller (BSC) which is embedded in the R7S72100. The NOR flash memories and the BSC are connected by 16-bit bus width.

The R7S72100 address pins (A23 to A18) are in common with the SPI multi I/O interface (SPIBSC) channel 1 pin. When applying the NOR flash memories, the serial flash memory 3 cannot be used. JP8 should be disconnected.

The R7S72100 address pin (A16) is in common with the Renesas SPDIF interface (RSPDIF) pin. When applying the NOR flash memories, the TOSLINK connector cannot be used.

Figure 2.3.1 shows the NOR Flash Memory Block Diagram, and Table2.3.2 lists the JP2, JP5, JP6 and JP8 Function Settings.

**Table2.3.1 NOR Flash Memory Overview**

NOR No.	Bus Size	Capacity	Access Time
S29GL512S10T	16 bits	64MB (16 bits×32M words)	100ns

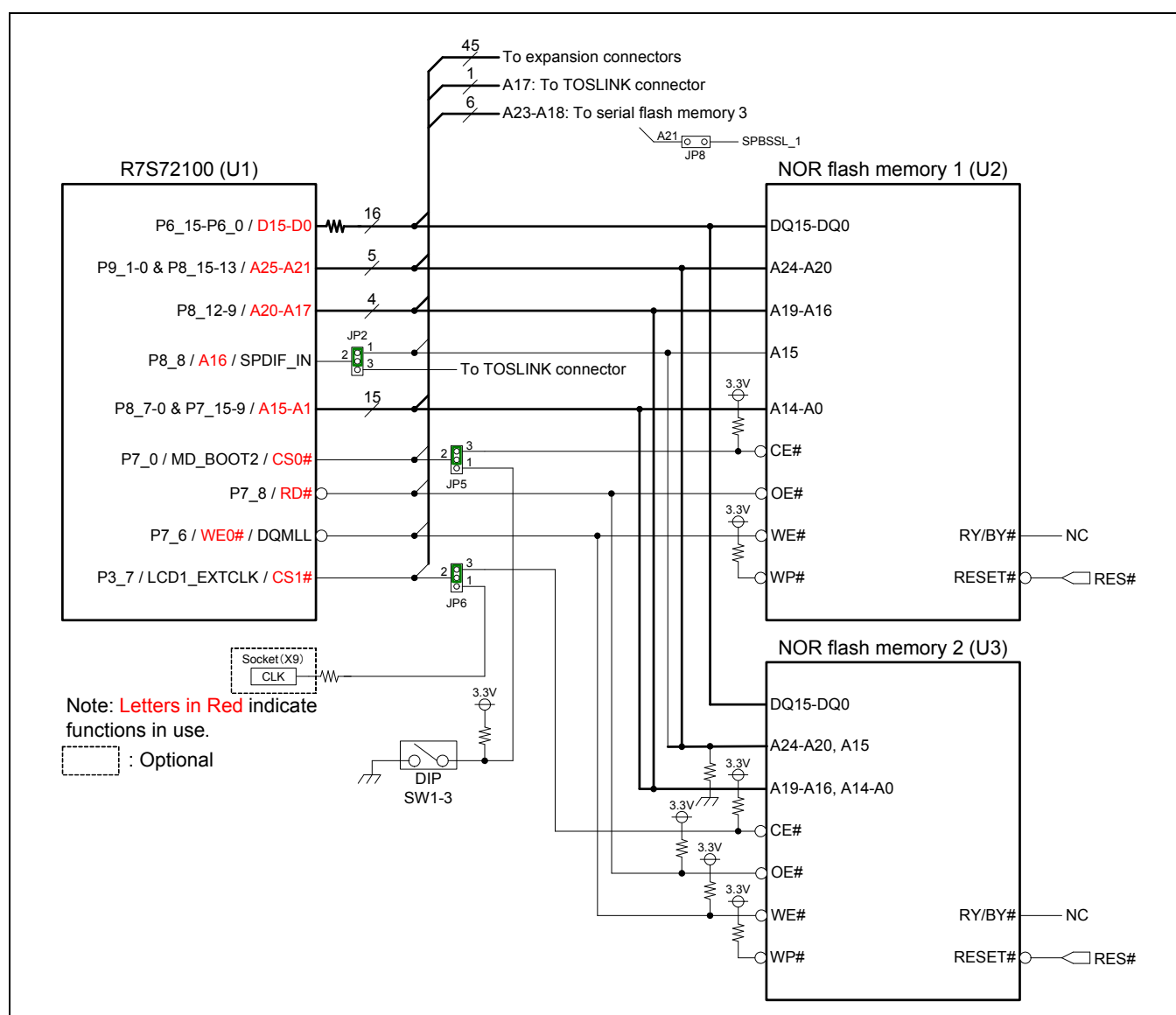


Figure 2.3.1 NOR Flash Memory Block Diagram

Table2.3.2 JP2, JP5, JP6 and JP8 Function Settings

Jumper	1-2	2-3 or Open
JP2	Use P8_8 as A16 output pin (initial setting)	Use P8_8 as SPDIF_IN input pin
JP5	Use P7_0 as MD_BOOT2 input pin	Use P7_0 as CS0 output pin (initial setting)
JP6	Use P3_7 as LCD1_EXTCLK input pin	Use P3_7 as CS1 output pin (initial setting)
JP8	Use P8_13 as SPBSSL_1 output pin	Use P8_13 as A21 output pin (initial setting)

indicates setting function.

Figure2.3.2 shows the Example of NOR Flash Memory Write/Read Access Timing, and Table2.3.3 lists the Setting for Bus State Controller (NOR Flash Memory Writing/Reading) when the R7S72100 bus block runs at 66.67MHz.

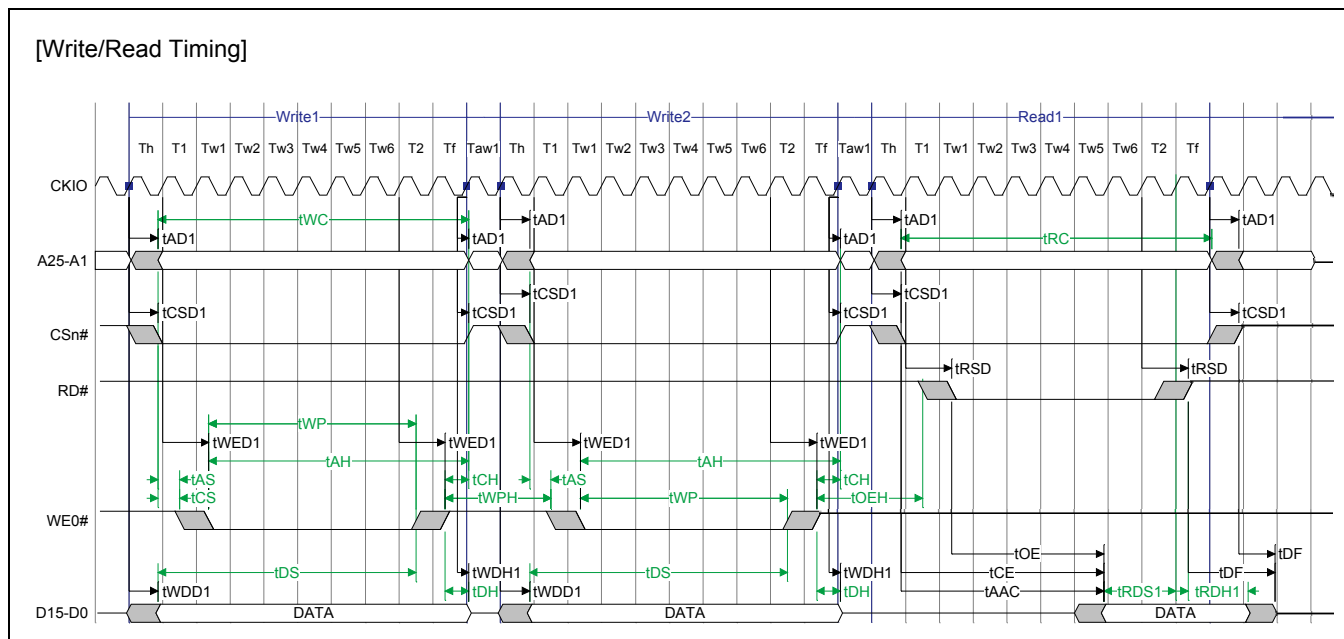


Figure2.3.2 Example of NOR Flash Memory Write/Read Access Timing

Table2.3.3 Setting for Bus State Controller (NOR Flash Memory Writing/Reading)

User Area	Target Device	Setting for Bus State Controller
CS0 CS1	S29GL512S10T	<p>CSn space bus control register (CSnBCR) (n=0, 1): Initial value: H'36DB 0C00 (in boot mode 0) Recommended setting value: H'1000 0C00</p> <ul style="list-style-type: none"> <li>Idle specification between write-read/write-write cycles: IWW[2:0] = B'001; insert 1 address cycle</li> <li>Idle specification between different space read-write cycles: IWRWD[2:0] = B'000; No idle cycle</li> <li>Idle specification between identical space read-write cycles: IWRWS[2:0] = B'000; No idle cycle</li> <li>Data bus width specification: BSZ[1:0] = B'10; 16-bit bus width</li> </ul> <p>CSn space wait control register (CSnWCR) (n=0, 1): Initial value: H'0000 0500 Recommended setting value: H'0000 0B40</p> <ul style="list-style-type: none"> <li>Address, CSn# assert → RD#, WEn# assert delay cycle counts: SW[1:0] = B'01; 1.5 cycles</li> <li>Access wait cycle counts: WR[3:0] = B'0110; 6 cycles</li> <li>External wait mask specification: WM = B'1; Ignore external wait input</li> <li>RD#, WEn# negate → Address, CSn# negate delay cycle counts: HW[1:0] = B'00; 0.5 cycles</li> </ul>

### 2.3.3 SDRAM Interface

The RTK772100BC00000BR generally includes two SDRAMs (listed in Table 2.2.4) as external SDRAM. The SDRAMs are controlled by the bus state controller (BSC) which is embedded in the R7S72100. The SDRAMs and the BSC are connected by 16-bit width. The RAS output pin is in common with the CRx2 input pin, and therefore JP1 must be set when using the SDRAMs.

Figure2.3.3 shows the SDRAM Block Diagram, and Table2.3.5 lists the JP1 Function Setting.

**Table2.3.4 SDRAM Overview**

Spec.	Contents
Part number	IS42S16320B-75
Composition	64MB (8M words×16 bits×4 banks)×2
Capacity	64MB
Access time	7.5ns
CAS latency	2 (system clock:66.67MHz)
Refresh interval	8192 refresh cycles every 64 ms
Low address	A12-A0
Column address	A9-A0
Bank counts	4-bank operation controlled by BA0 and BA1



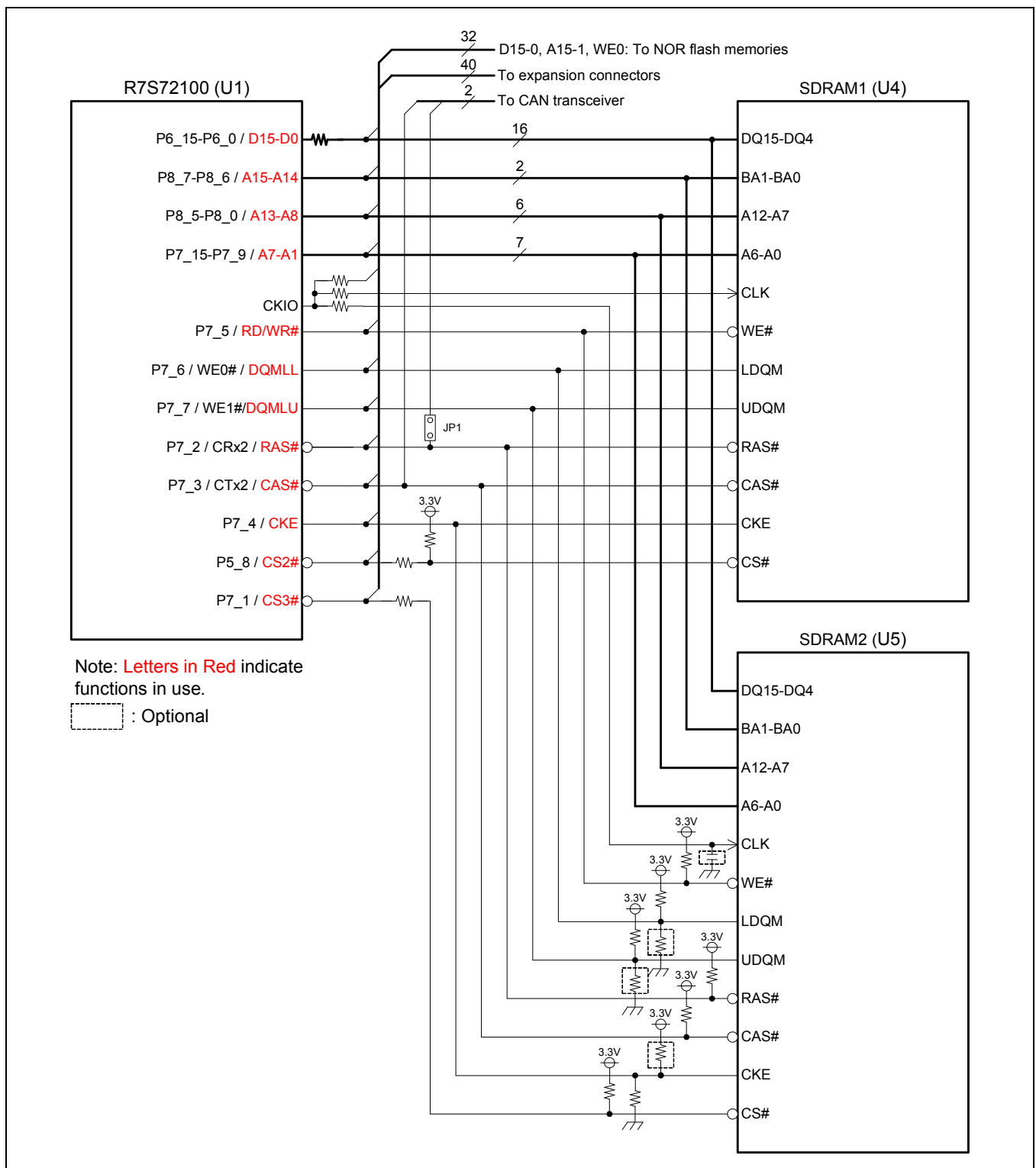


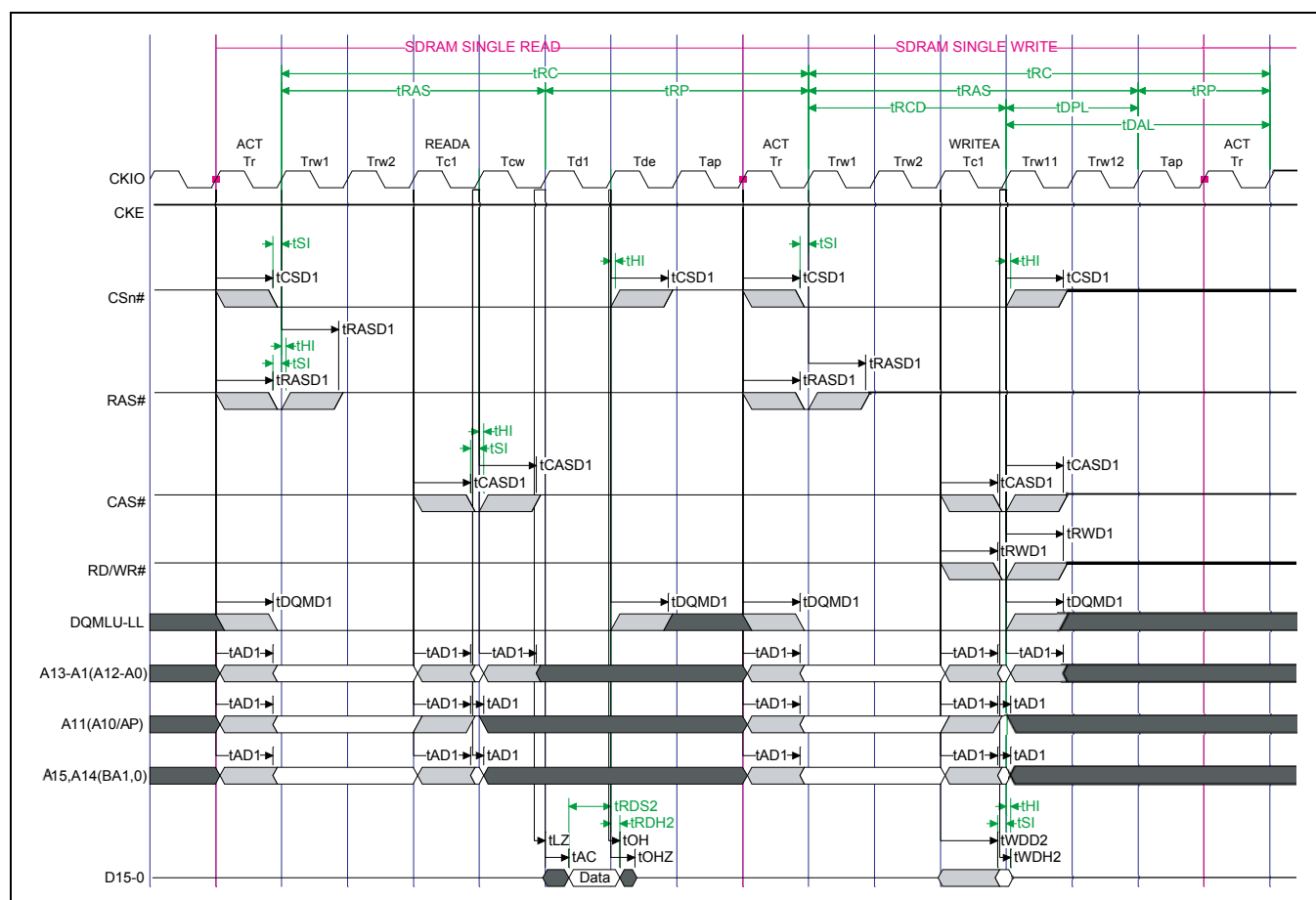
Figure2.3.3 SDRAM Block Diagram

### Table2.3.5 JP1 Function Setting

Jumper	1-2 (Short)	None (Open)
JP1	Use P7_2 as CRx2 input pin	Use P7_2 as RAS output pin (initial setting)

■ indicates setting function.

Figure2.3.4 shows the Example of SDRAM Single Read/Write Timing, and Table2.3.6 lists the Setting for Bus State Controller (SDRAM Reading/Writing) when the R7S72100 bus clock runs at a frequency of 66.67MHz.



### Figure2.3.4 Example of SDRAM Single Read/Write Timing

**Table2.3.6 Setting for Bus State Controller (SDRAM Reading/Writing)**

User Area	Target Device	Setting for Bus State Controller
CS2 CS3	IS42S16320B-75	<p>CSn space bus control register (CSnBCR) (n=2, 3):</p> <p>Initial value: H'36DB 0C00</p> <p>Recommended setting value: H'0000 4C00</p> <ul style="list-style-type: none"> <li>Memory specification: TYPE[2:0] = B'100; SDRAM</li> <li>Data bus width specification: BSZ[1:0] = B'10; 16-bit bus width</li> </ul> <p>CSn space wait control register (CSnWCR) (n=2, 3):</p> <p>Initial value: H'0000 0500</p> <p>Recommended setting value: H'0000 0480 (CS2), H'0000 2492 (CS3)</p> <ul style="list-style-type: none"> <li>Wait cycle counts for precharge completion: WTRP[1:0] = B'01; 1 cycle</li> <li>ACTV command → Wait cycle counts between READ(A)/WRITE(A) commands: WTRCD[1:0] = B'01; 1 cycle</li> <li>Area 3CAS latency: A3CL[1:0] = B'01; 2 cycles</li> <li>Wait cycle counts for precharge activation: TRWL[1:0] = B'10; 2 cycles</li> <li>REF command/self refresh cancellation → Idle cycle counts between ACTV/REF/MRS commands: WTRC[1:0] = B'10; 5 cycles</li> </ul> <p>SDRAM control register (SDCR):</p> <p>Initial value: H'0000 0000</p> <p>Recommended setting value: H'0012 0812</p> <ul style="list-style-type: none"> <li>Refresh control: RFSH = B'1; Execute refresh</li> <li>Refresh control: RMODE = B'0; Auto refresh</li> <li>Bank active mode: BACTV = B'0; Auto precharge mode</li> <li>Area 3 low address bit counts: A3ROW[1:0] = B'10; 13 bits</li> <li>Area 3 column address bit counts: A3COL[1:0] = B'10; 10 bits</li> </ul> <p>Refresh timer control/status register (RTCSR):</p> <p>Initial value: H'0000 0000</p> <p>Recommended setting value: H'A55A 0010</p> <ul style="list-style-type: none"> <li>Clock select: CKS[2:0] = B'010; CKIOΦ/16</li> <li>Refresh counts: RRC[2:0] = B'000; 1 time</li> </ul> <p>Refresh time constant register (RTCOR):</p> <p>Initial value: H'0000 0000</p> <p>Recommended setting value: H'A55A 0020</p> <p>1 cycle: 240nsec (66.67MHz/16=4.166875MHz)</p> <p>Refresh request interval for this SDRAM: 7.8125μsec/time</p> <p>7.8125μsec /240nsec = 32(0x20) cycles/ refresh</p>

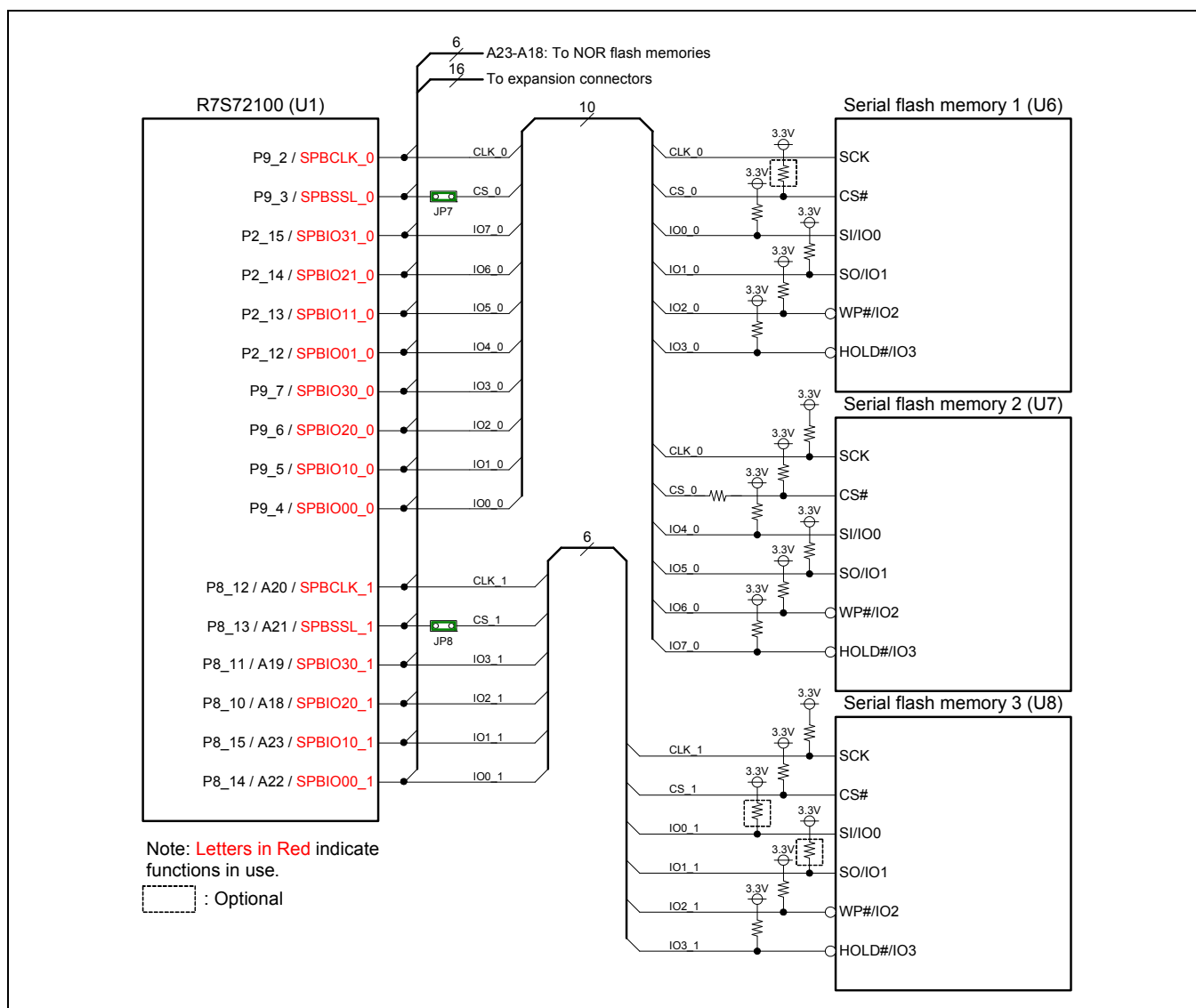
### 2.3.4 Serial Flash Memory Interface

The RTK772100BC00000BR generally includes three serial flash memories, which are controlled by the SPI multi I/O buscontroller (SPIBSC) embedded in the R7S72100. The data (program) is read out from the serial flash memory 1 at the time of booting (boot mode 3).

The 8-bit width can be achieved by concurrent access to the serial flash memory 1 and 2. The CS pin of the serial flash memory 3 is in common with address A21. When using the flash memory 3, the NOR flash memory can not be used. When using the serial flash memory 3 SPBCLK at a frequency of 66.67MHz, R41 should be removed from the board. Figure2.3.5 shows the Serial Flash Memory Interface Block Diagram, and Table2.3.8 lists the JP7 and JP8 Function Settings.

**Table2.3.7 Serial Flash Memory Overview**


Part No.	Serial flash No.	Connection interface for the R7S72100	Capacity	Package
U6, U7	S25FL512SDPM	10-wire system serial (SPIBSC)	64MB×2	16-pin SOIC
U8	S25FL512SDPM	6-wire system serial (SPIBSC)	64MB	16-pin SOIC



**Figure2.3.5 Serial Flash Memory Interface Block Diagram**

**Table2.3.8 JP7 and JP8 Function Settings**

Jumper	Short	Open
JP7	Use P9_3 as SPBSSL_0 output pin (initial setting)	Use P9_3 on option board
JP8	Use P8_13 as SPBSSL_1 output pin	Use P8_13 as A21 output pin (initial setting)

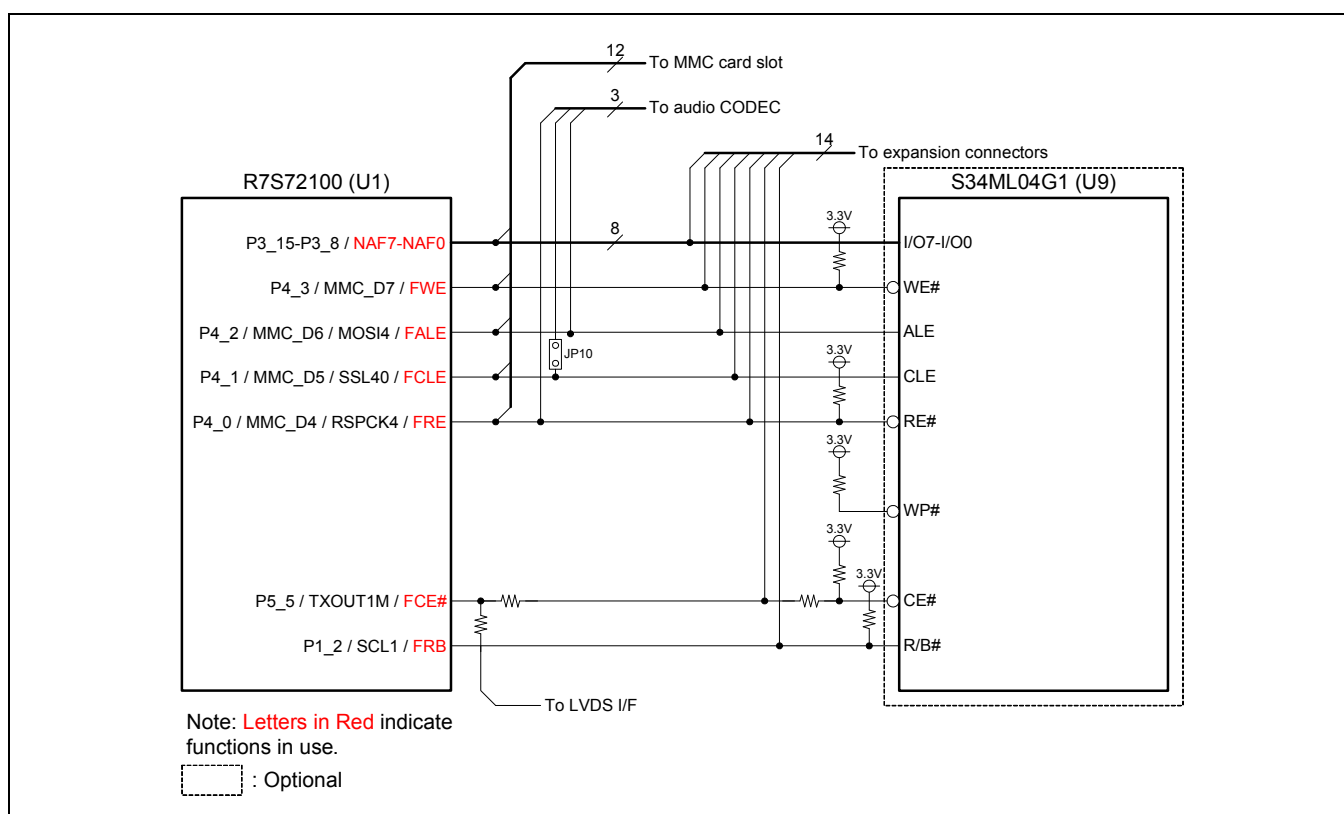
 indicates setting function.

### 2.3.5 NAND Flash Memory Interface

The RTK772100BC00000BR has a board pattern which enables to mount a NAND flash memory (listed in Table2.3.9). The NAND flash memory is control by the NAND flash memory controller (FLCTL) embedded in the R7S72100. The FLCTL pin is in common with the pins for SD host interface (SDHI) channel 1 and MMC host interface (MMCIF), Renesas serial peripheral interface (RSPI) channel 4, and LVDS interface. When using the NAND flash memory, the MMC card slot, audio interface and the LVDS interface can not be used. JP10 should be set for the use of NAND flash memory. Figure2.3.6 shows the NAND Flash Memory Interface Block Diagram, and Table2.3.10 lists the JP10 Function Setting.

**Table2.3.9 NAND Flash Memory Overview**

Nand No.	Bus Size	Capacity	Access Time
S34ML04G100TFI	8 bits	512MB (8 bits×512M words)	Random: 25μs (Max) Sequential: 25ns (Min)



**Figure2.3.6 NAND Flash Memory Interface Block Diagram**

**Table2.3.10 JP10 Function Setting**

Jumper	1-2 (Short)	None (Open)
JP10	Use P4_1 as SSL40 output pin (initial setting)	Use P4_1 as FCLE output pin or MMC_D5 I/O pin

■ indicates setting function.

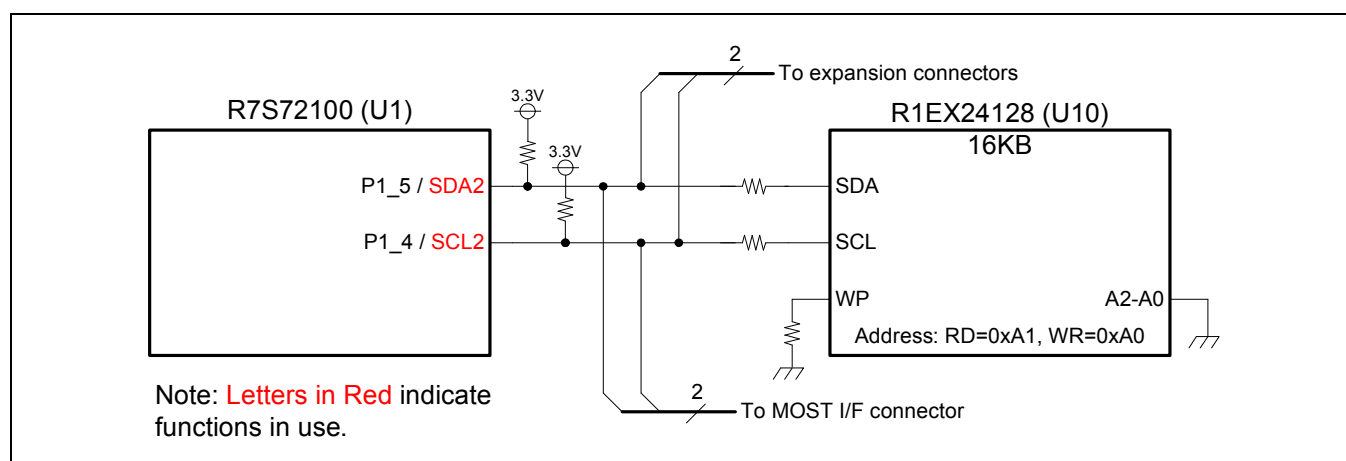
### 2.3.6 EEPROM Interface

The RTK772100BC00000BR generally includes an EEPROM (listed in Table2.3.11). The EEPROM is controlled by the I2C bus interface (RIIC) which is embedded in the R7S72100.

Figure2.3.7 shows the EEPROM Interface Block Diagram.

**Table2.3.11 EEPROM Overview**

EEPROM No.	Interface	Capacity	Package
R1EX24128ASAS0A	2-wire system serial (RIIC)	16KB (16K words×8 bits)	8-pin SOP



**Figure2.3.7 EEPROM Interface Block Diagram**

## 2.4 USB Interface

The RTK772100BC00000BR generally includes two USB series A receptacles as USB connector, and has a board pattern which enables to mount Mini-B receptacles to evaluate the USB host/function modules. When mounting the Mini-B receptacles, the USB series A receptacles should be removed. When using such receptacles as a function, JP9 and JP11 should be disconnected. The VBUS power supply for the USB channel 0 can be provided from the expansion connectors. Figure2.4.1 shows the USB Interface Block Diagram, and Table2.4.1 lists the JP9 and JP11 Function Settings.

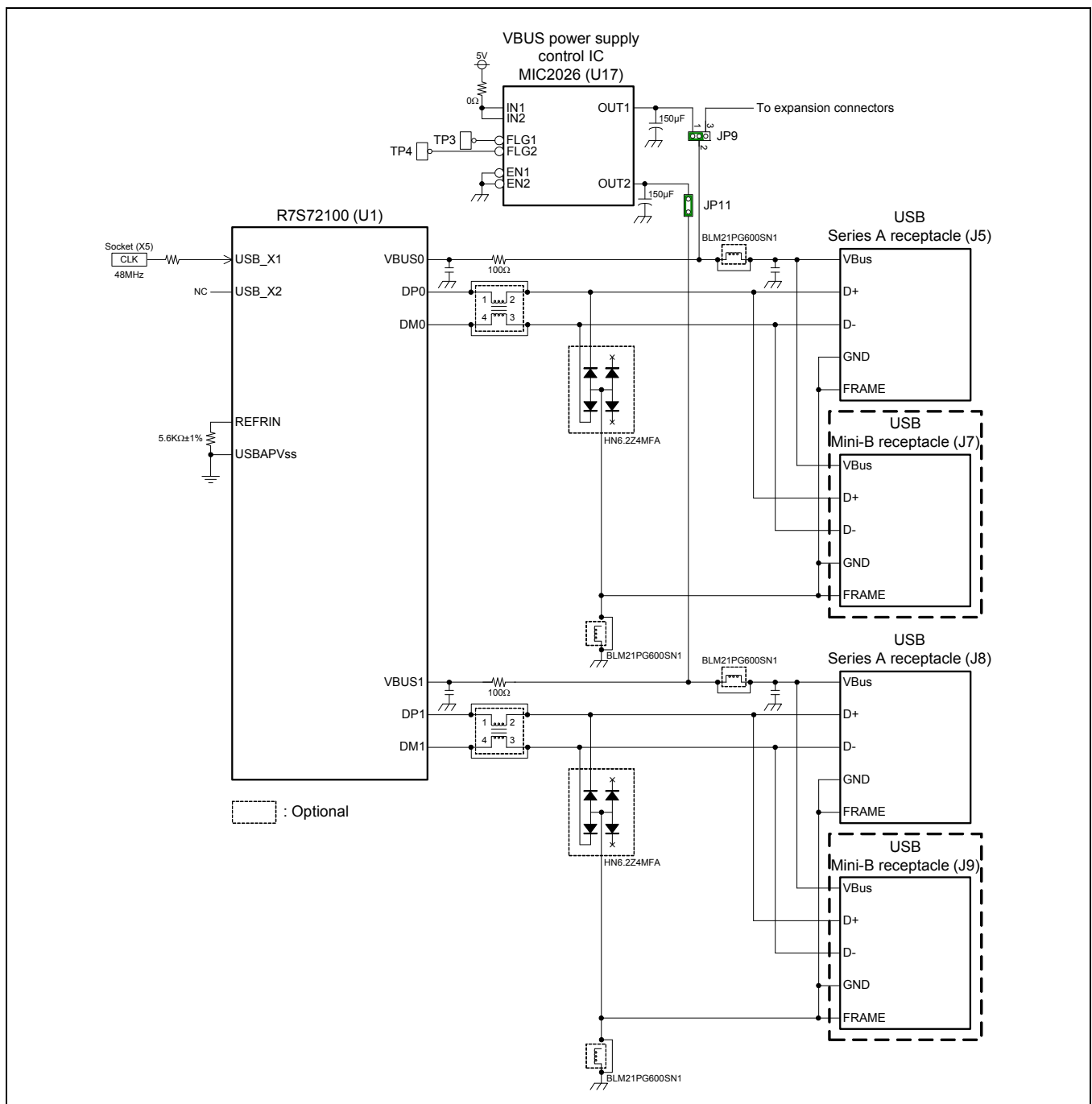


Figure2.4.1 USB Interface Block Diagram



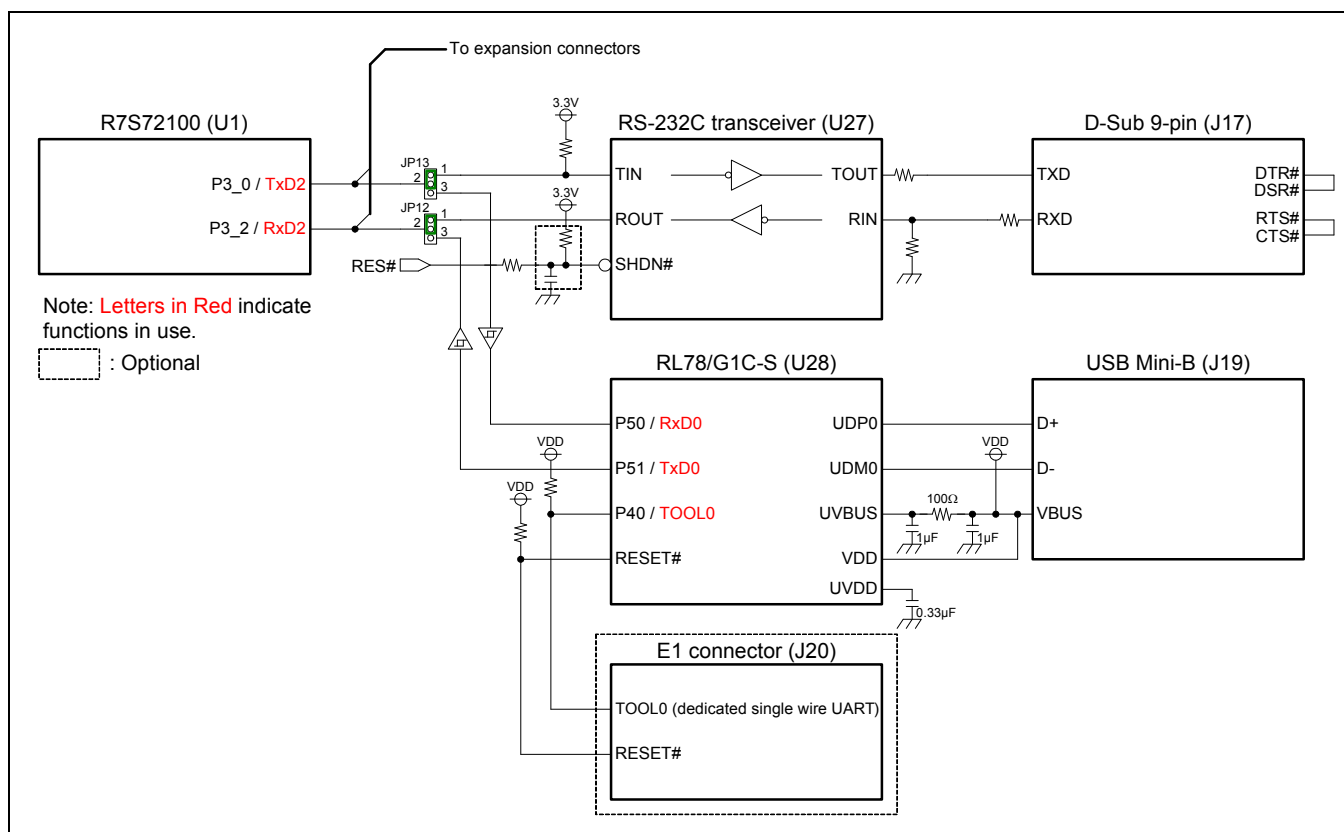
**Table2.4.1 JP9 and JP11 Function Settings**

Jumper	1-2	None	2-3
JP9	Provide VBUS0 power supply (initial setting)	Do not provide VBUS0 power supply	Provide VBUS0 power supply from expansion connectors
JP11	Provide VBUS1 power supply (initial setting)	Do not provide VBUS1 power supply	-

## 2.5 Serial Interface

The RTK772100BC00000BR connects the FIFO on-chip serial communication interface (SCIF) channel 2 in the R7S72100 to 1) the D-Sub 9-pin connector via the RS-232C transceiver, and 2) to the USB Mini-B connector via the USB serial conversion IC (RL78/G1C-S). JP12 or JP13 should be set to connect to either 1 or 2 mentioned above.

Figure2.5.1 shows the Serial Interface Block Diagram, and Table2.5.1 lists the JP12 and JP13 Function Settings.



**Figure2.5.1 Serial Interface Block Diagram**

**Table2.5.1 JP12 and JP13 Function Settings**

Jumper	1-2	2-3
JP12	Connect P3_2 / RxD2 to RS-232C transceiver (initial setting)	Connect P3_2 / RxD2 to USB serial conversion IC
JP13	Connect P3_0 / TxD2 to RS-232C transceiver (initial setting)	Connect P3_0 / TxD2 to USB serial conversion IC

## 2.6 I/O Ports

The RTK772100BC00000BR connects the R7S72100 I/O ports to the switches and the LEDs. Figure2.6.1 shows the I/O Ports Block Diagram.

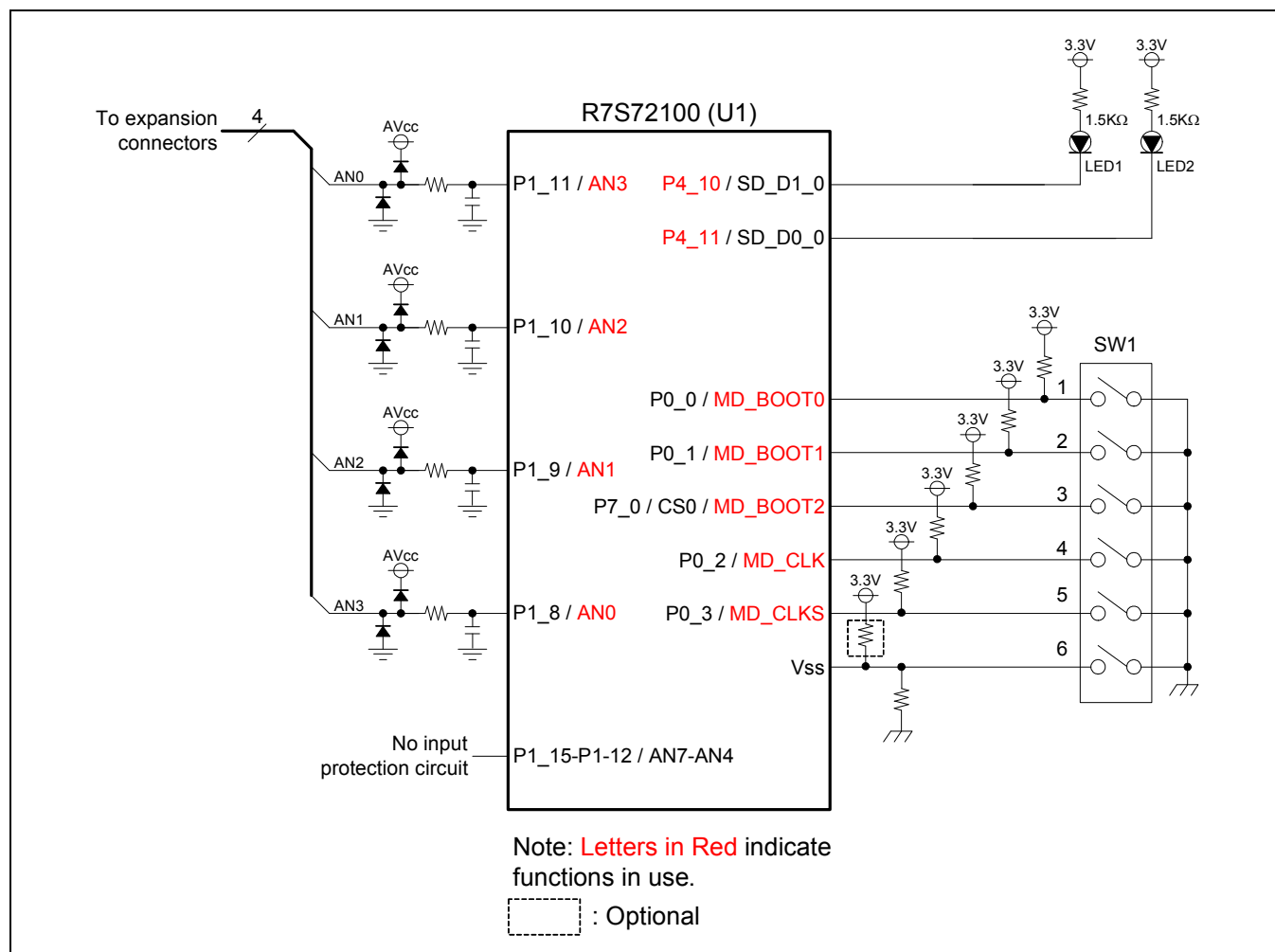


Figure2.6.1 I/O Ports Block Diagram

## 2.7 Interrupt Switches

The RTK772100BC00000BR has push switches (NMI switch and IRQ6 switch) for R7S72100 NMI and IRQ6 interrupt signal input and a push switch (test switch) for test signal.

The IRQ6 switch is also connected to the toggle switch. The test switch is left open to be connected to any terminal.

Figure2.7.1 shows the Interrupt Switch Block Diagram, and Table2.7.1 lists the JP3 Function Setting.

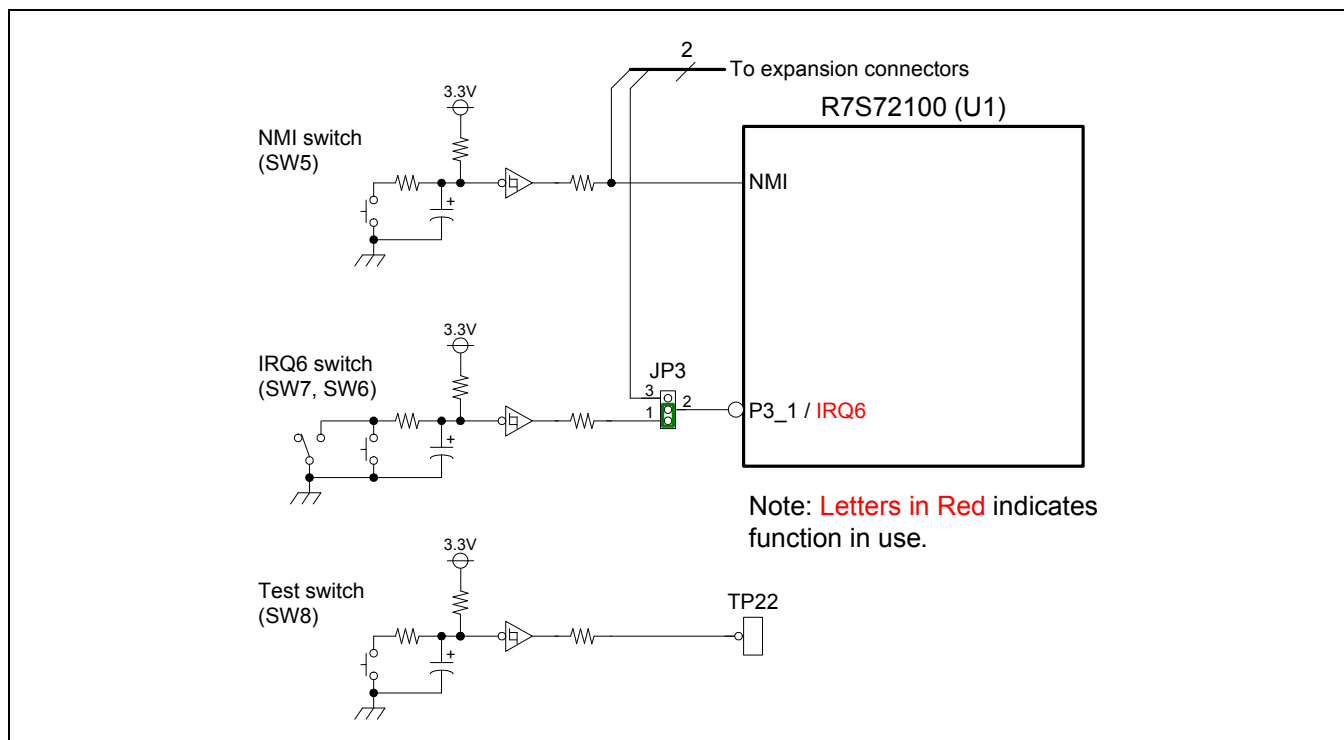


Figure2.7.1 Interrupt Switch Block Diagram

Table2.7.1 JP3 Function Setting

Jumper	1-2	2-3
JP3	Use P3_1 as IRQ6 input pin (initial setting)	Use P3_1 on option board

■ Indicates setting function.

## 2.8 Clocks

The following seven clocks are input in the R7S72100 on the RTK772100BC00000BR.

- R7S72100 Input clock : 13.33MHz
- R7S72100 RTC clock : 32.768kHz
- R7S72100 RTC clock (high precision) : 4MHz
- R7S72100 USB clock : 48MHz
- R7S72100 Video decoder clock : 27MHz
- R7S72100 LCD clock : Optional
- R7S72100 Audio clock : 22.5792MHz

Figure2.8.1 shows the Clock Configuration. Table2.8.1 and Table2.8.2 list the DIP Switch SW1 Function Settings and the JP6 Function Setting respectively.

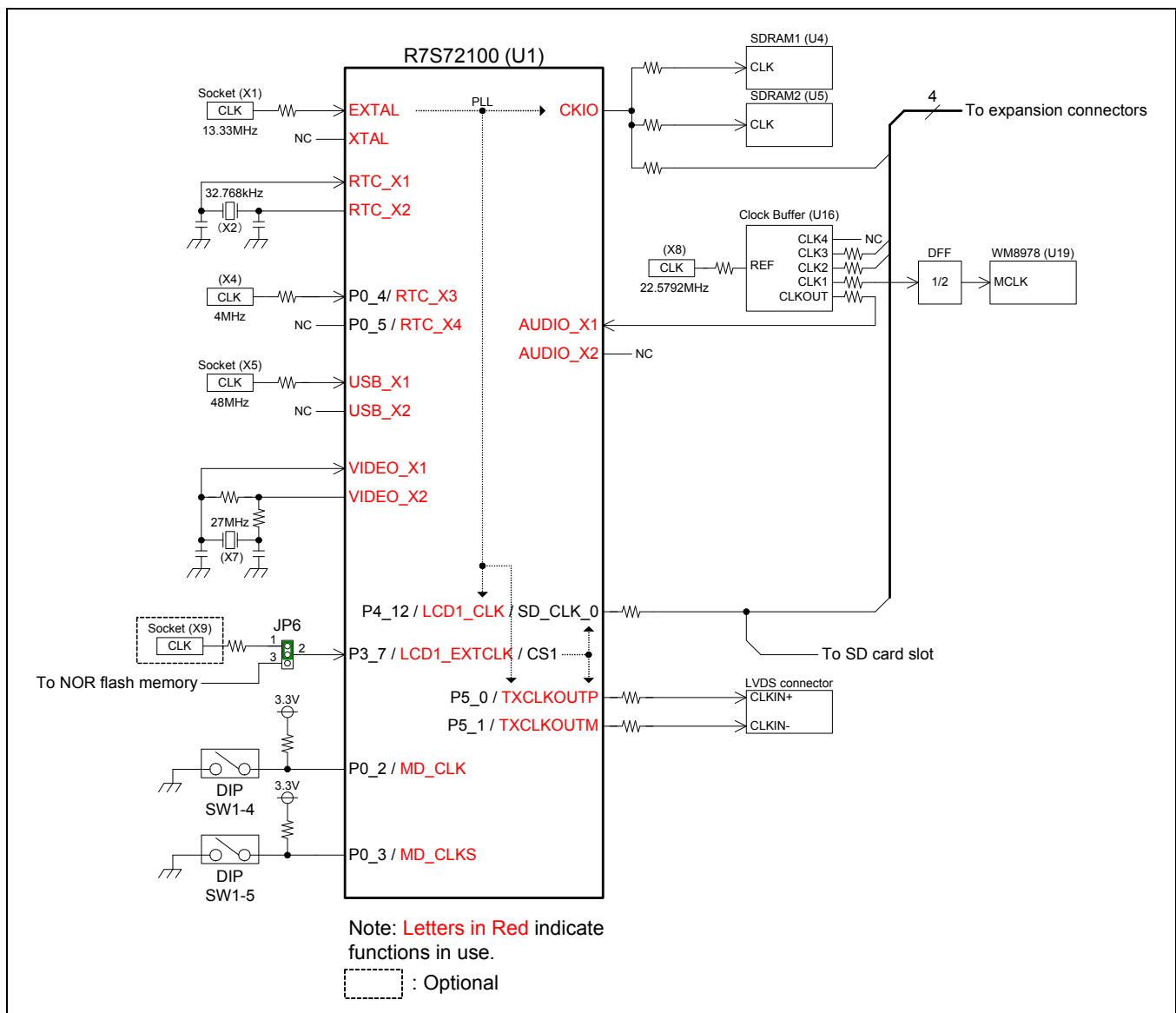



Figure2.8.1 Clock Configuration

**Table2.8.1 DIP Switch SW1 Function Settings**

DIP Switch	Function	
	ON	OFF
SW1-4	Receive EXTAL input as input clock (initial setting)	Receive USB_X1 input as input clock
SW1-5	Set SSCG function OFF (initial setting)	Set SSCG fuction ON

**Table2.8.2 JP6 Function Setting**

Jumper	1-2	2-3
JP6	Use P3_7 as LCD1_EXTCLK input pin*	Use P3_7 as CS1 output pin (initial setting)

 Indicates setting function.

\*: When using P3\_7 as LCD1\_EXTCLK input pin, an oscillator should be mounted to X9.

## 2.9 Reset Control

The RTK772100BC00000BR controls the reset signals connected to the R7S72100, memories, connectors, the Ethernet PHY, the RS-232C transceiver and others by using the reset IC.

The system reset has two types of resets; power on reset and reset by switch.

Figure2.9.1 shows the Reset Control Block Diagram.

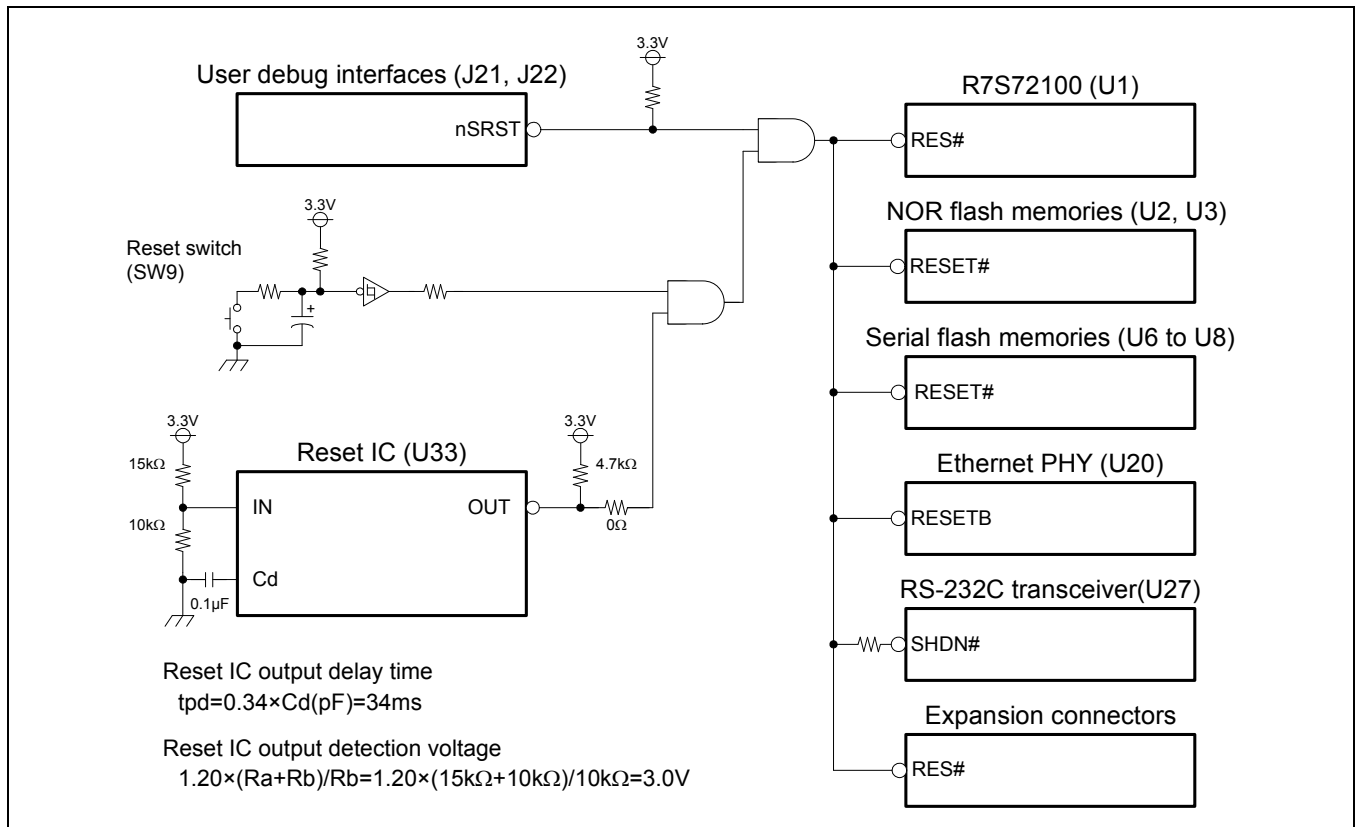


Figure2.9.1 Reset Control Block Diagram

## 2.10 Power Supply

The RTK772100BC00000BR generates 5V, 3.3V and 1.18V by regulator using 12V power supply.

The 5V power supply, the I/O power supply (3.3V), the analog power supply (3.3V), and the internal power supply (1.18V) for the R7S72100 can also be provided from the outside.

The USB serial conversion IC (U28) is run by the VBUS power supply provided from the USB Mini-B connector (J19).

Figure2.10.1 shows the Power Supply Configuration Diagram.

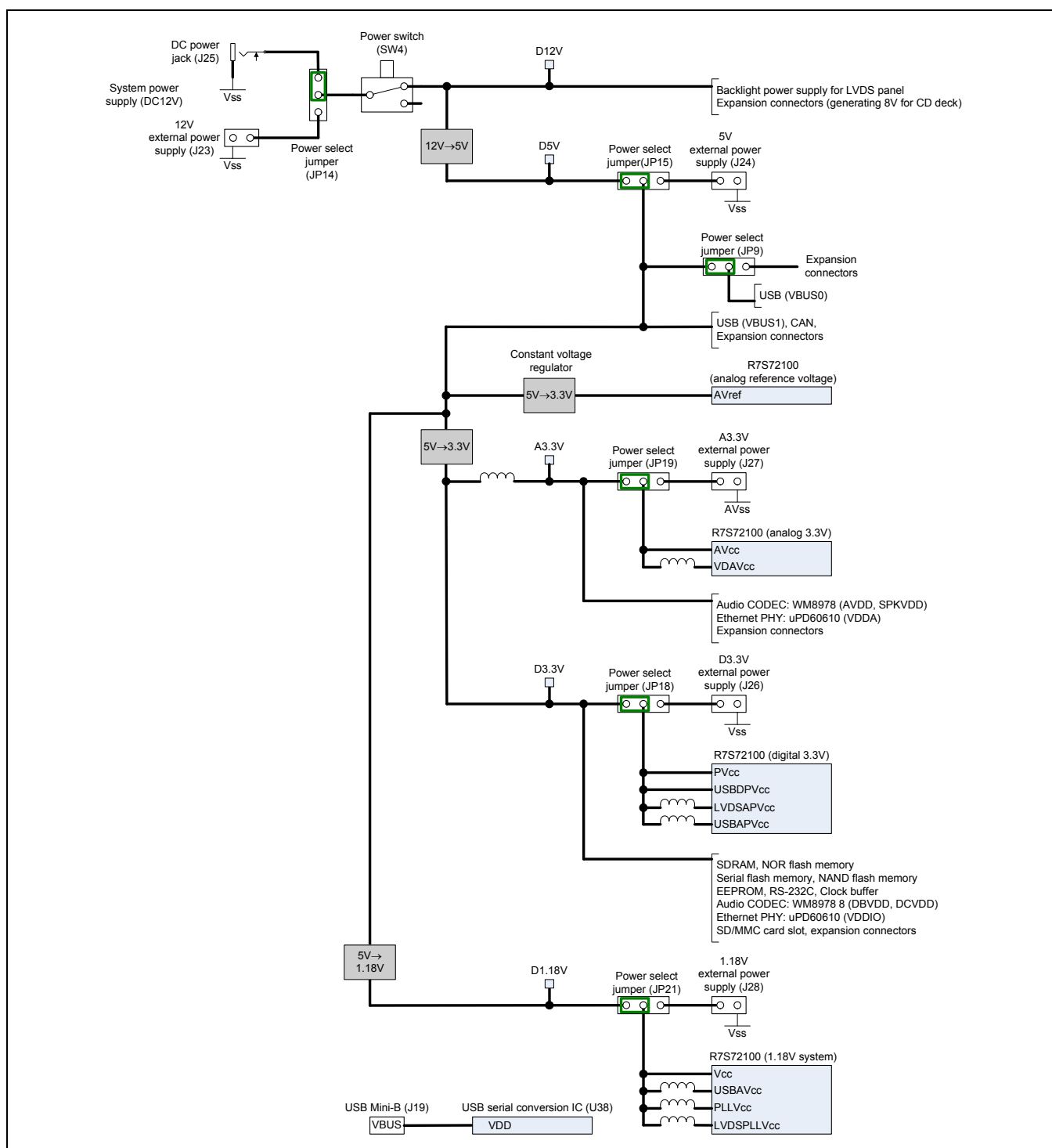


Figure2.10.1 Power Supply Configuration Diagram



## 2.11 Debug Interface

The RTK772100BC00000BR has the ARM JTAG 20 connector (J22) and the CoreSight 20 connector (J21) to connect with the R7S72100 user debug interface. The CoreSight 20 connector cannot be connected in JTAG mode. When connecting in JTAG mode, the ARM JTAG 20 connector should be used.

Figure2.11.1 shows the Debug Interface Block Diagram.

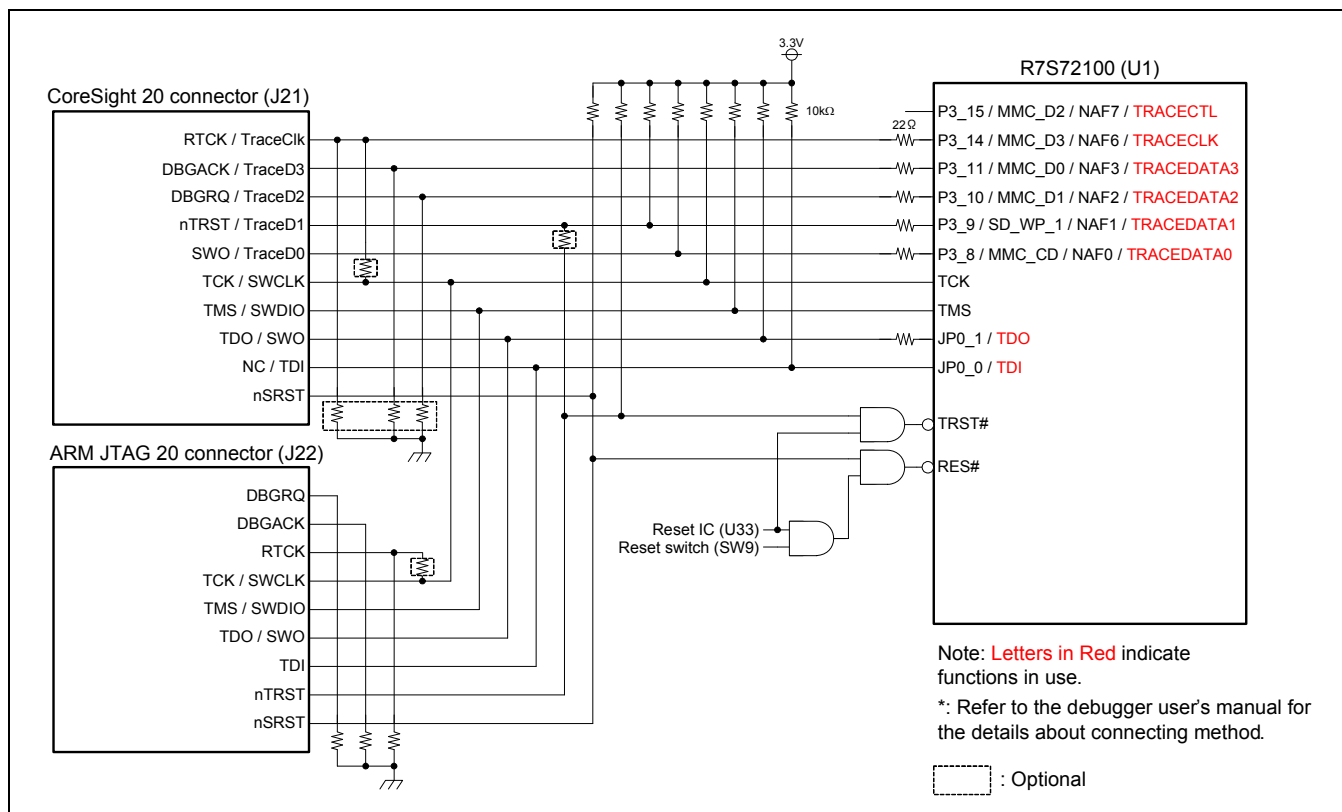


Figure2.11.1 Debug Interface Block Diagram

## 2.12 CAN Interface

The R7S72100 has controller area network (RSCAN). The RTK772100BC00000BR connects the R7S72100 RSCAN channel 1 and 2 to the 3-pin 2.5mm pitch connector via the power voltage level shifter and the CAN transceiver IC to enable CAN communication.

The RSCAN channel 1 pin is in common with the Ethernet PHY, and the channel 2 pin is in common with the SDRAMs. When applying the CAN interface, these pins cannot be used together.

Figure2.12.1 shows the CAN interface Block Diagram, and Table2.12.1 lists the JP1 and JP4 Function Settings.

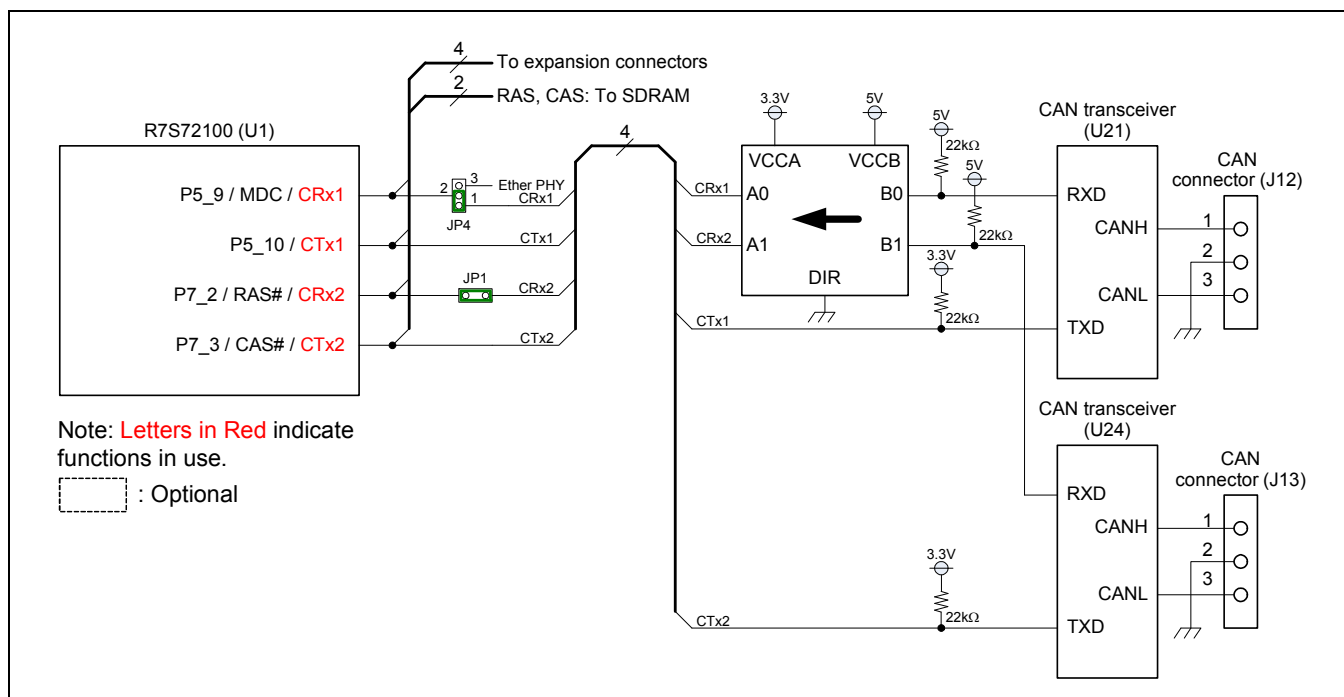


Figure2.12.1 CAN interface Block Diagram

Table2.12.1 JP1 and JP4 Function Settings

Jumper	1-2	None or 2-3
JP1	Use P7_2 as CRx2 input pin	Use P7_2 as RAS output pin (initial setting)
JP4	Use P5_9 as CRx1 input pin	Use P5_9 as MDC output pin (initial setting)

■ Indicates setting function.

## 2.13 Video Input Interface

The R7S72100 has digital video decoder function, which enables direct input of the composite video signal (CVBS).

The RTK772100BC00000BR has a RCA connector for CVBS input.

Figure2.13.1 shows the Video Input Interface Block Diagram.

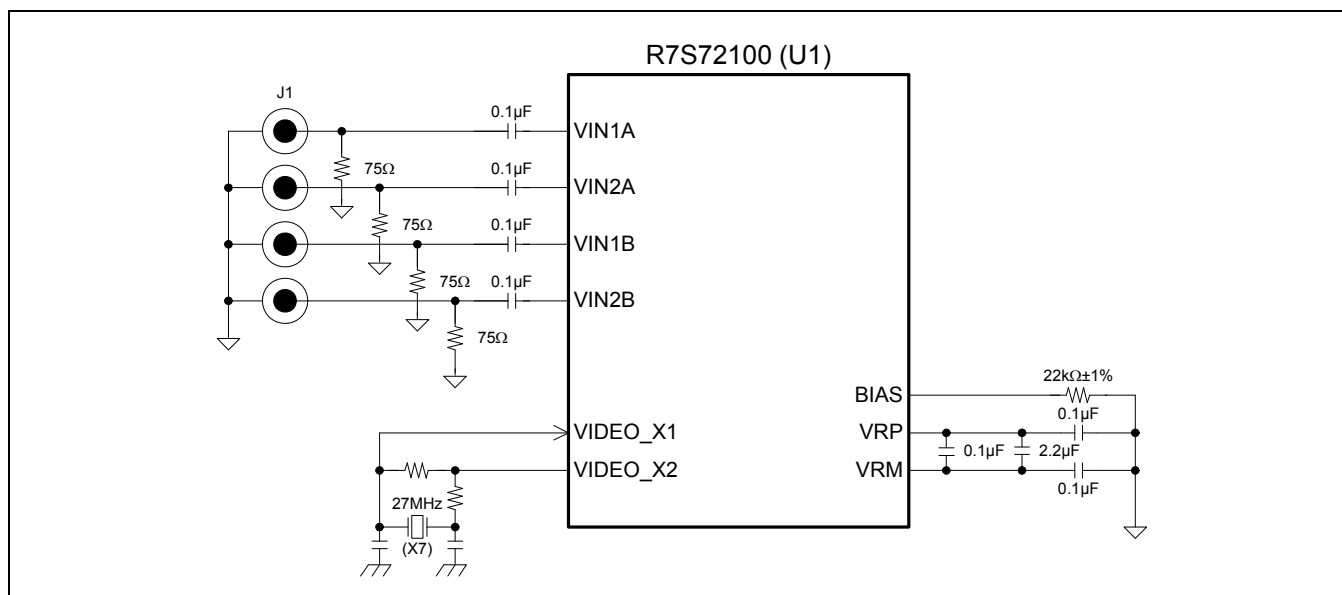


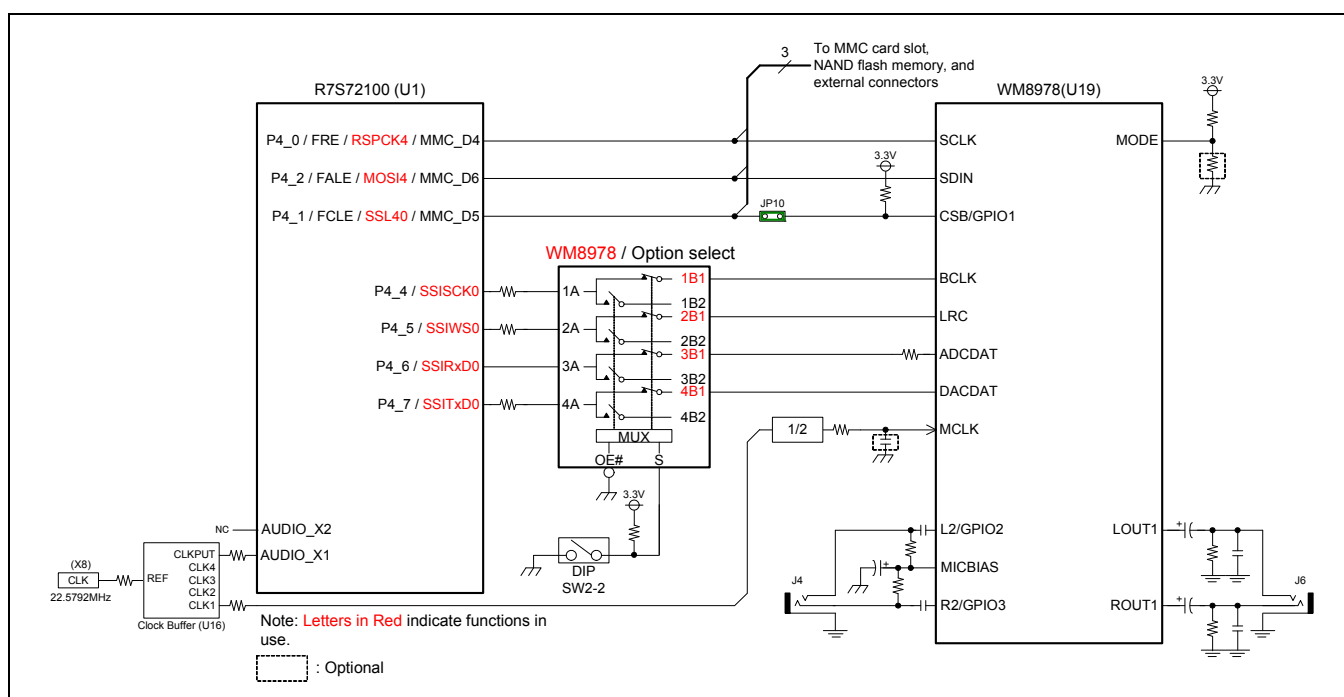
Figure2.13.1 Video Input Interface Block Diagram

## 2.14 Audio Interface

The RTK772100BC00000BR has the Wolfson audio CODEC WM8978 as an audio interface. The WM8978 register is controlled by the Renesas serial peripheral interface (RSPI) channel 4, and the audio data input/output is controlled by the serial sound interface (SSIF) channel 0.

The RSPI pin is in common with the NAND flash memory controller (FLCTL) pin and the MMC host interface (MMCIF) pin. When applying the WM8978, the NAND flash memory cannot be used. Also, the MMC card slot cannot be used in 8-bit mode.

Figure2.14.1 shows the Audio Interface Block Diagram. Table2.14.1 and Table2.14.2 list the DIP Switch SW2-2 Function Setting and the JP10 Function Setting respectively.



**Figure2.14.1 Audio Interface Block Diagram**

**Table2.14.1 DIP Switch SW2-2 Function Setting**

DIP Switch	Function	
	ON	OFF
SW2-2	Use P4_4[7:4] as SSIF pin (initial setting)	Use P4_4[7:4] on option board

■ Indicates setting function.

**Table2.14.2 JP10 Function Setting**

Jumper	1-2 (Short)	None (Open)
JP10	Use P4_1 as SSL40 output pin (initial setting)	Use P4_1 as FCLE output pin or MMC_D5 I/O pin

■ Indicates setting function.

## 2.15 SD Card Interface (4-bit)

The RTK772100BC00000BR has a 4-bit SD card slot which is connected with the SD host interface (SDHI) channel 0 in the R7S72100. MMC card can be used by setting the dual-purpose pin, MMC host interface (MMCIF).

Figure2.15.1 shows the SD Card Interface Block Diagram.

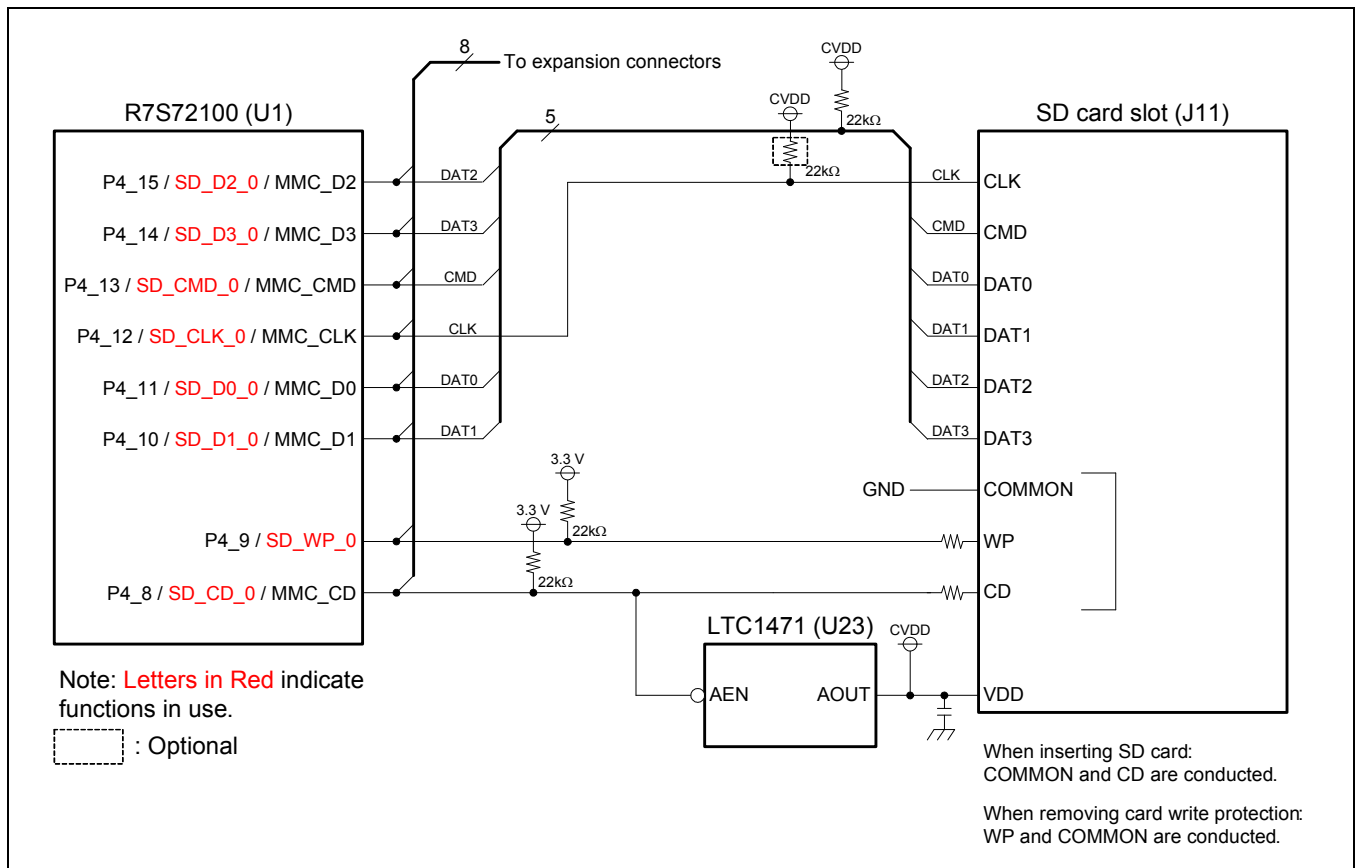


Figure2.15.1 SD Card Interface Block Diagram

## 2.16 MMC Card Interface (8-bit)

The RTK772100BC00000BR has an 8-bit MMC card slot, which is connected with the MMC host interface (MMCIF) in the R7S72100. SD card can be used by setting the dual-purpose pin, SD host interface (SDHI) channel 1.

The MMCIF pin and the SDHI pin are in common with the NAND flash memory controller (FLCTL) pin and the Renesas serial peripheral interface (RSPI) pin. When inserting the MMC card or the SD card to the MMC card slot, the NAND flash memory cannot be used. Also, when applying the MMC card in 8-bit mode, the audio interface cannot be used.

Figure2.16.1 shows the MMC Card Interface Block Diagram, and Table2.16.1 lists the JP10 Function Setting.

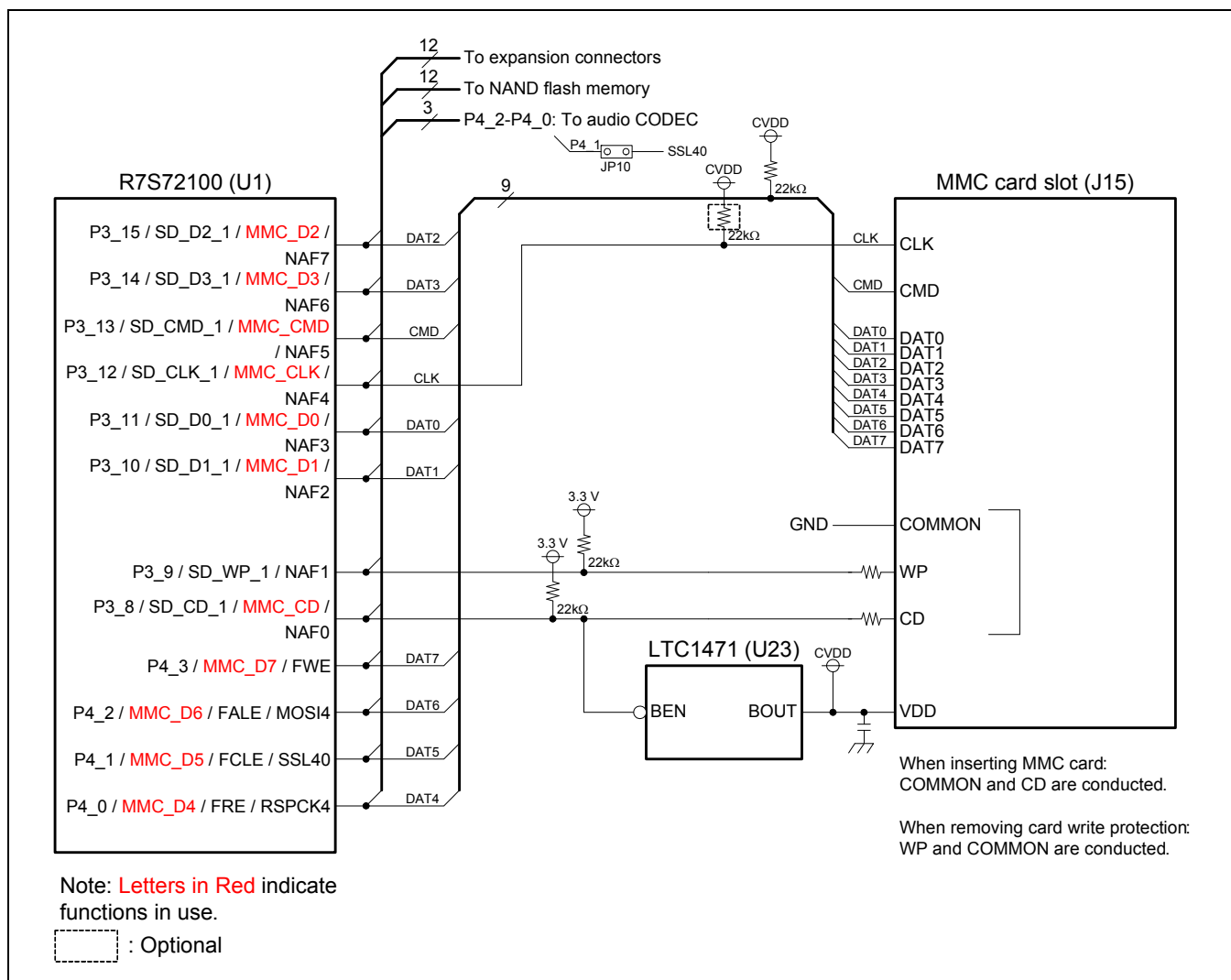


Figure2.16.1 MMC Card Interface Block Diagram

Table2.16.1 JP10 Function Setting

Jumper	1-2 (Short)	None (Open)
JP10	Use P4_1 as SSL40 output pin (initial setting)	Use P4_1 as FCLE output pin or MMC_D5 I/O pin

■ Indicates setting function.

## 2.17 LAN Interface

The RTK772100BC00000BR has the Renesas Ethernet PHY  $\mu$ PD60610 to enable the Ethernet communication using the Ethernet controller (ETHER) embedded in the R7S72100.

Figure2.17.1 shows the LAN Interface Block Diagram. Table2.17.1 and Table2.17.2 list the DIP Switch SW2-1 Function Setting and the JP4 Function Setting respectively.

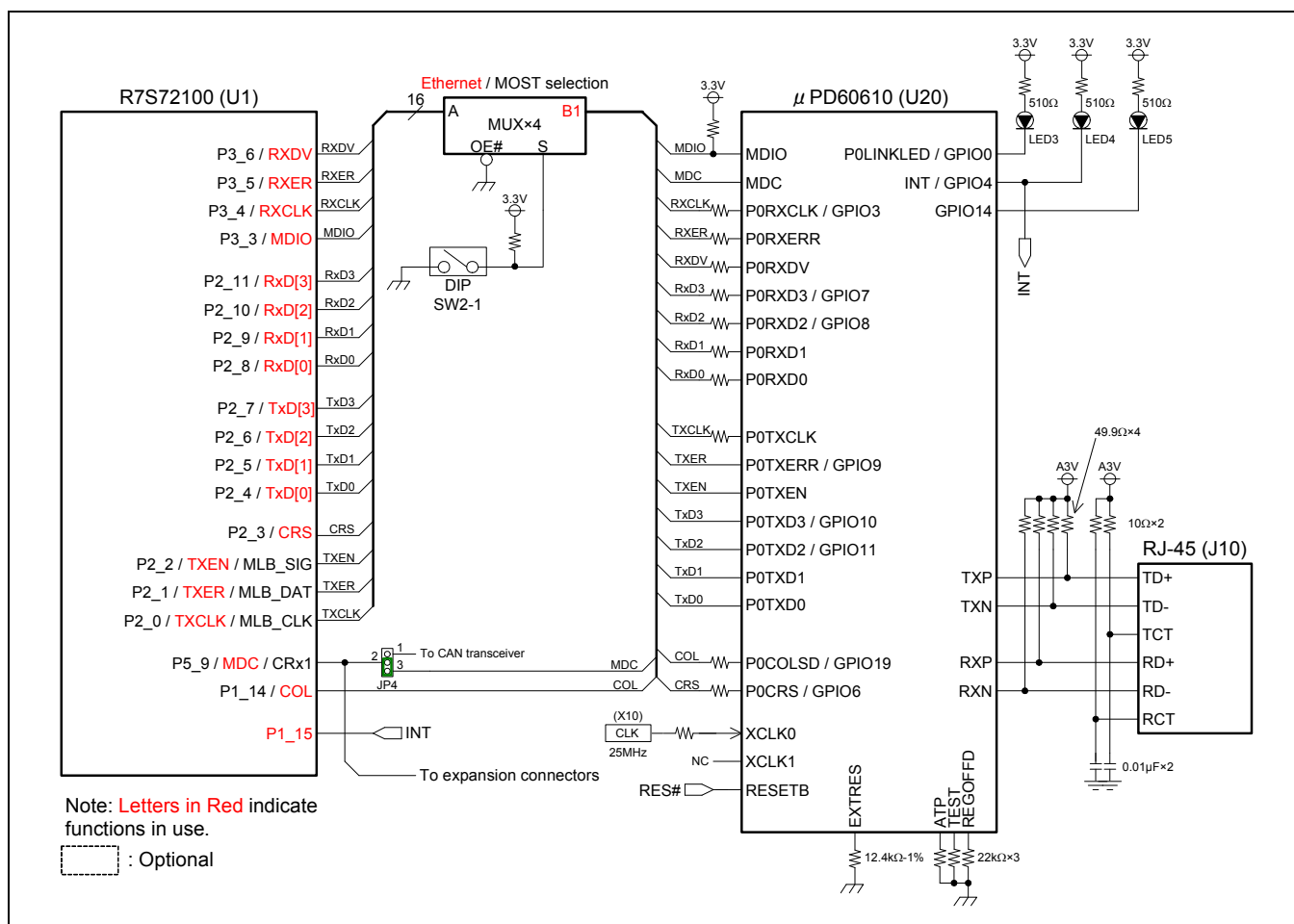


Figure2.17.1 LAN Interface Block Diagram

Table2.17.1 DIP Switch SW2-1 Function Setting

DIP Switch	Function	
	ON	OFF
SW2-1	Use P3_[6:3] and P2_[11:0] as Ethernet PHY control pin (initial setting)	Use P3_[6:3] and P2_[11:0] as MOST control pin and expansion connectors

■ Indicates setting function.

Table2.17.2 JP4 Function Setting

Jumper	1-2	2-3
JP4	Use P5_9 as CRx1 input pin	Use P5_9 as MDC output pin (initial setting)

■ Indicates setting function.

## 2.18 LVDS Interface

The RTK772100BC00000BR includes a connector for the Mitsubishi LCD module (AA104XD02) which can be connected with the R7S72100 LDVS interface. The backlight power supply voltage should be raised by using the TDK-lambda DC-DC converter ALD-414012PJ126 or ALD-514012PJ134. If it effects on the differential signals, remove the 0Ω resistors RE0 to RE7.

Figure2.18.1 shows the LDVS Interface Block Diagram.

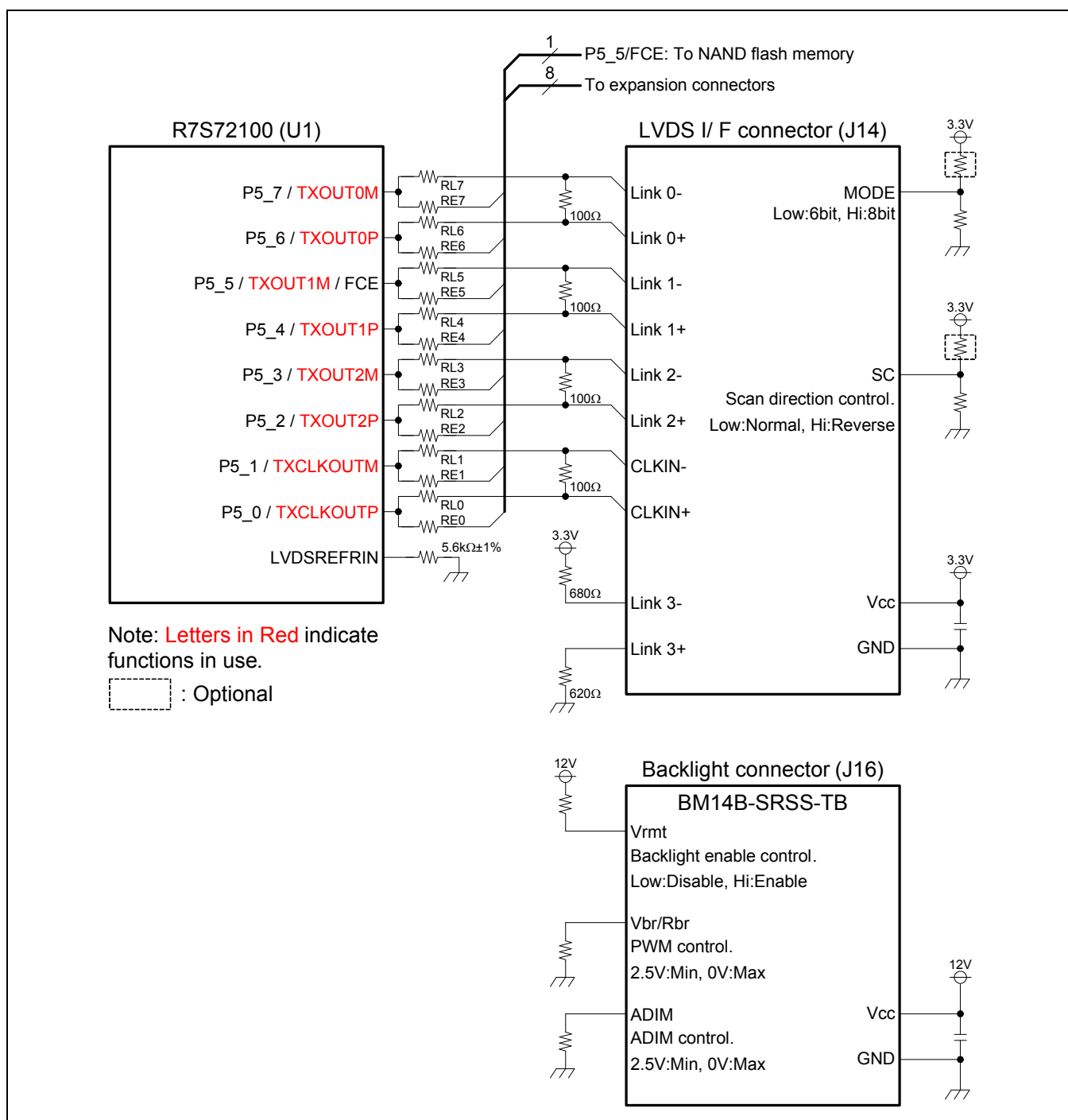


Figure2.18.1 LDVS Interface Block Diagram



## 2.19 TOSLINK Interface

The RTK772100BC00000BR includes a TOSLINK connector to connect the R7S72100 Renesas SPDIF interface (RSPDIF).

The RSPDIF pin is in common with the address pins (A17 and A16). When using the TOSLINK connector, the NOR flash memory can not be used.

Figure2.19.1 shows the TOSLINK Interface Block Diagram, and Table2.19.1 lists the JP2 Function Setting.

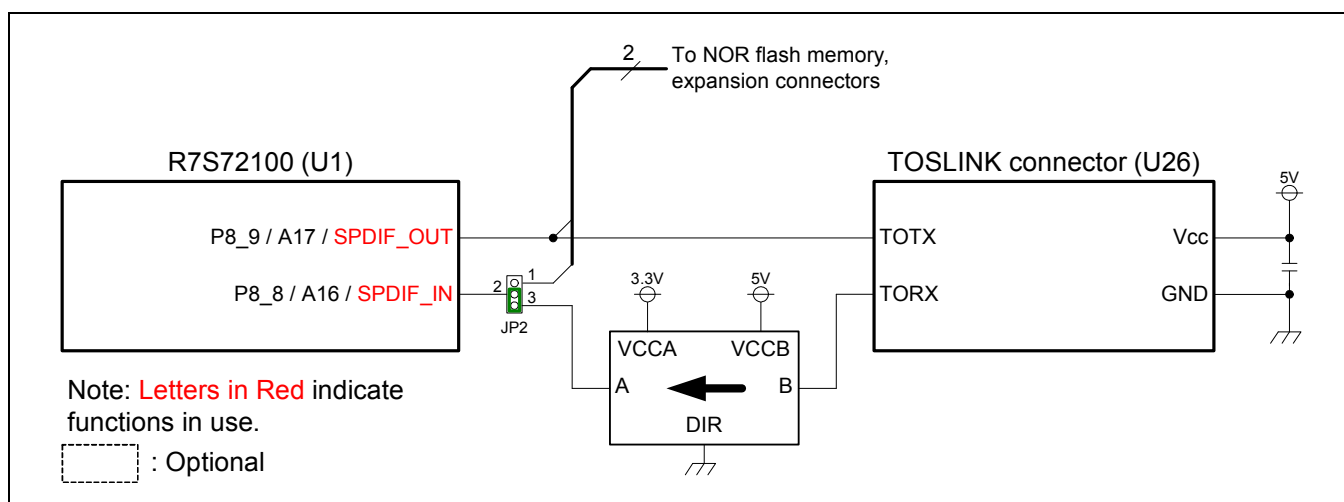


Figure2.19.1 TOSLINK Interface Block Diagram

Table2.19.1 JP2 Function Setting

Jumper	1-2	2-3
JP2	Use P8_8 as A16 output pin (initial setting)	Use P8_8 as SPDIF_IN input pin

Indicates setting function.



### 3. Operational Specification

#### 3.1 Connector Overview

Figure 3.1.1 and Figure 3.1.2 show the RTK772100BC00000BR Connector Assignments.

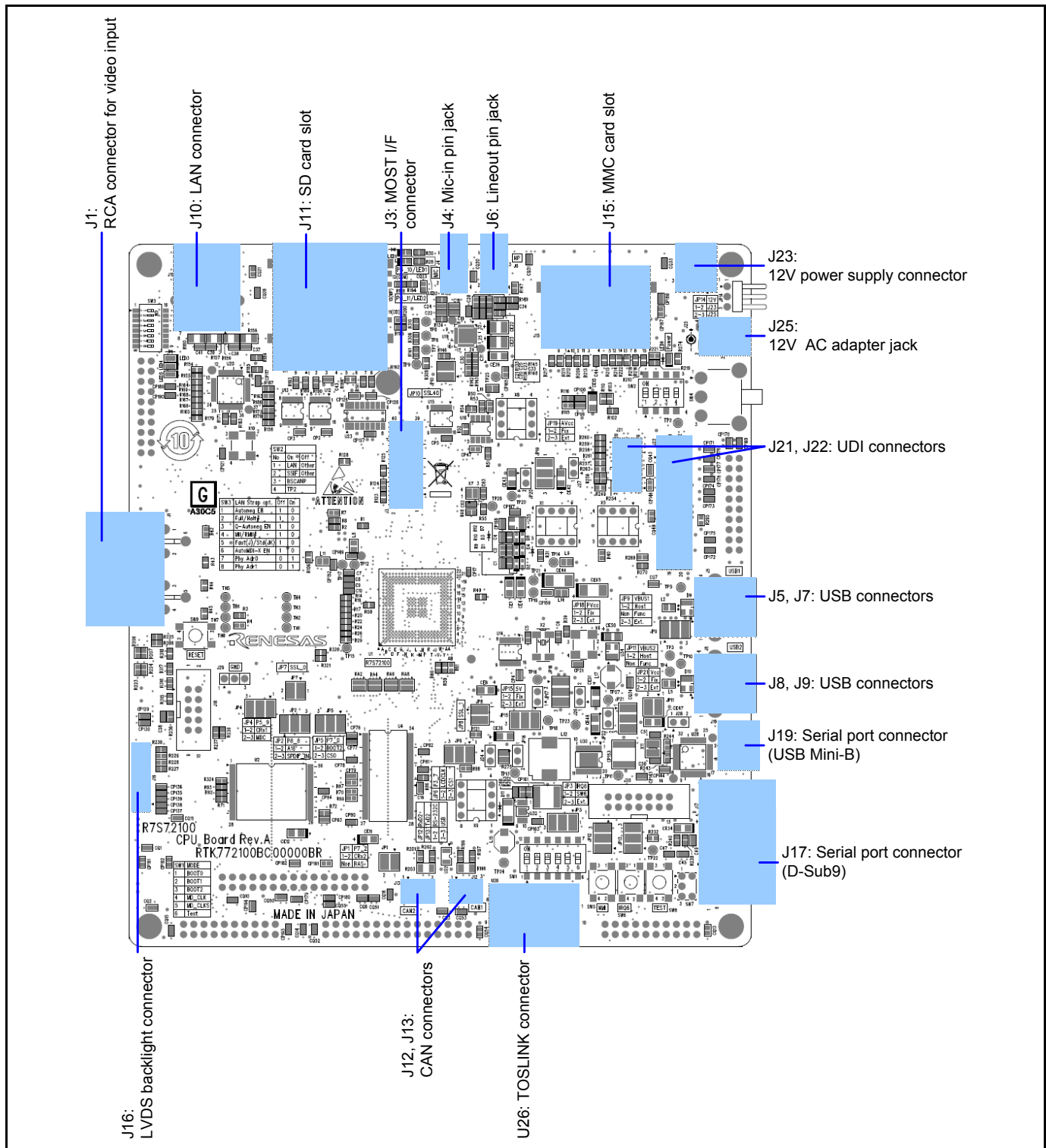


Figure 3.1.1 RTK772100BC00000BR Connector Assignments (Top View of Component Side)

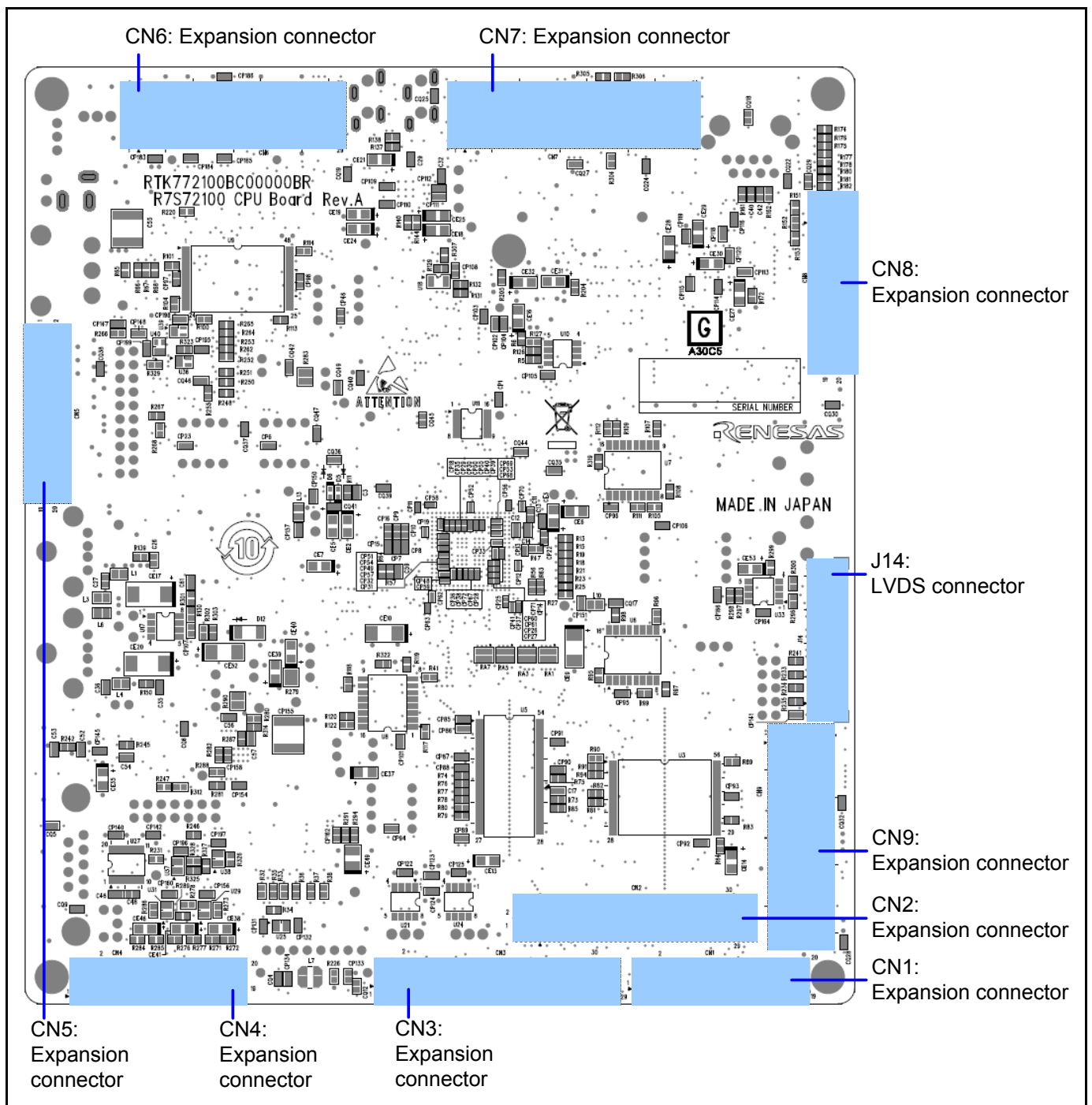
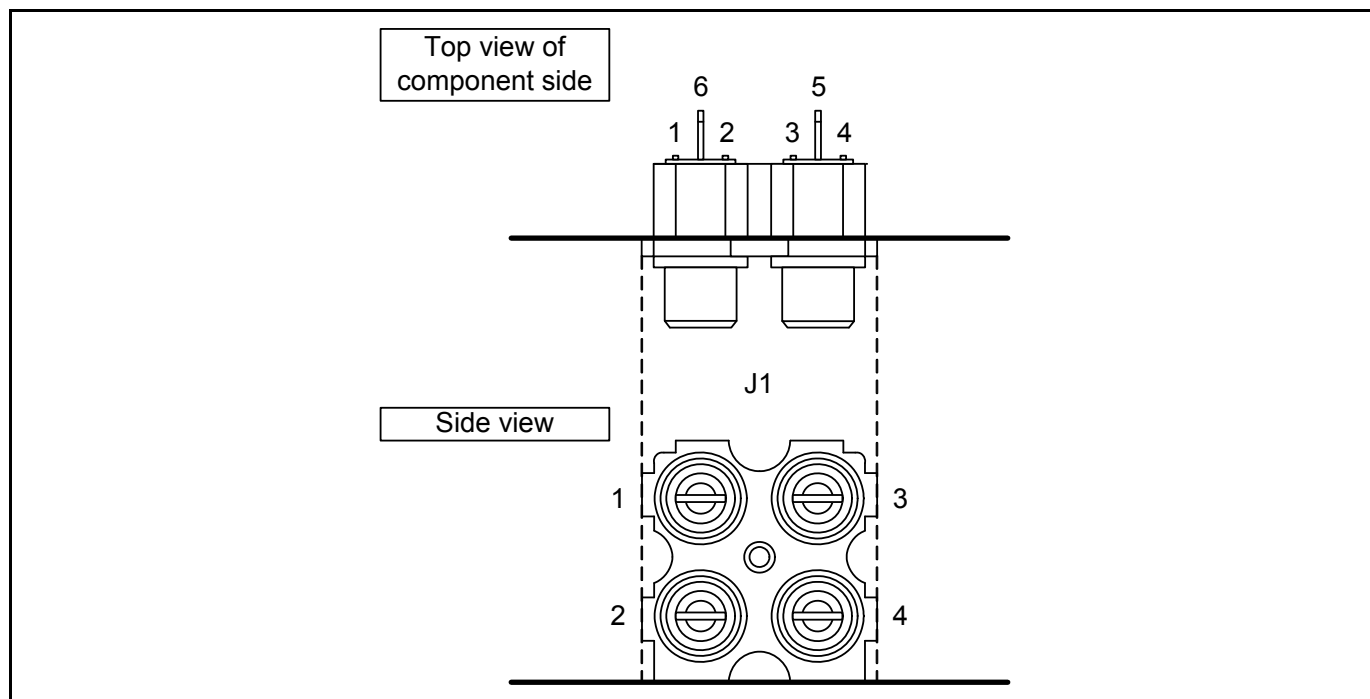


Figure 3.1.2 RTK772100BC00000BR Connector Assignments (Top View of Solder Side)

### 3.1.1 RCA Connector for Video Input (J1)

The RTK772100BC00000BR has a RCA connector for video input (J1).

Figure3.1.3 shows the RCA Connector for Video Input Pin Assignments, and Table3.1.1 lists the RCA Connector for Video Input Pin Descriptions.



**Figure3.1.3 RCA Connector for Video Input Pin Assignments**

**Table3.1.1 RCA Connector for Video Input Pin Descriptions**

Pin No.	Signal Name
1	VIN1A
2	VIN2A
3	VIN1B
4	VIN2B
5	GND (AVss)
6	GND (AVss)

### 3.1.2 MOST I/F Connector (J3)

The RTK772100BC00000BR has a connector to connect with the SMSC MOST I/F board (J3).

Figure3.1.4 shows the MOST I/F Connector Pin Assignments, and Table3.1.2 lists the MOST I/F Connector Pin Descriptions.

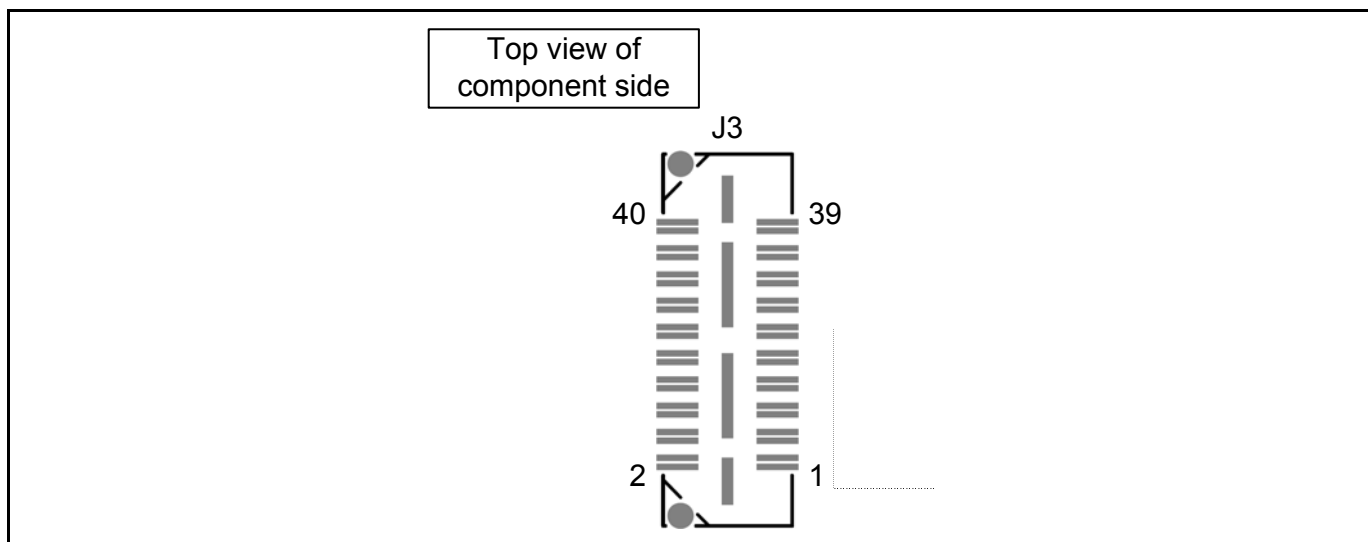


Figure3.1.4 MOST I/F Connector Pin Assignments

**Table3.1.2 MOST I/F Connector Pin Descriptions**

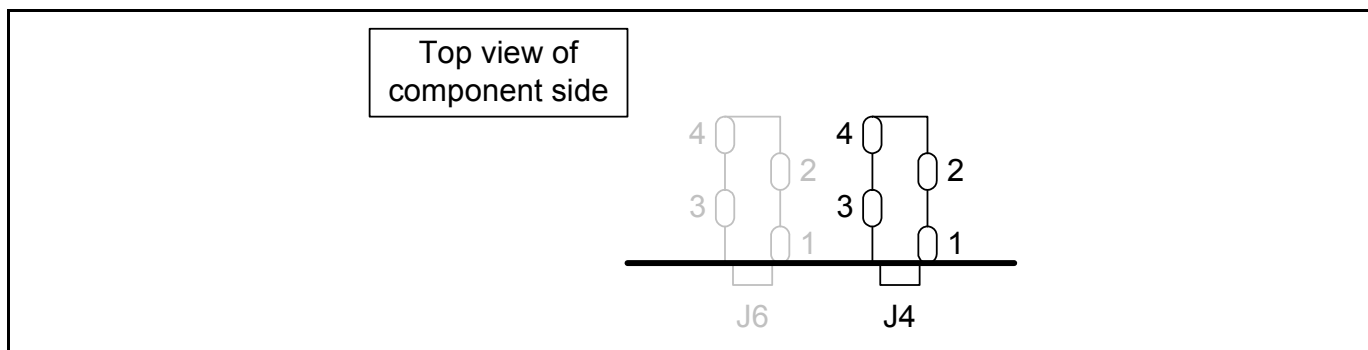
Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	MLB_CLK (P2_0 / D16 / ET_TXCLK / DV0_DATA0 / SPBIO00_1 / <b>MLB_CLK</b> / IRQ5 / VIO_D0 / LCD0_DATA16)
3	NC	4	NC
5	NC	6	MLB_SIG (P2_2 / D18 / ET_TXEN / DV0_DATA2 / SPBIO20_1 / <b>MLB_SIG</b> / TIOC2B / VIO_D2 / LCD0_DATA18)
7	NC	8	NC
9	NC	10	MLB_DAT (P2_1 / D17 / ET_TXER / DV0_DATA1 / SPBIO10_1 / <b>MLB_DAT</b> / TIOC2A / VIO_D1 / LCD0_DATA17)
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	NC
19	NC	20	NC
21	NC	22	NC
23	NC	24	NC
25	RESETB ( <b>P2_3</b> / D19 / ET_CRS / DV0_DATA3 / SPBIO30_1 / IERxD / CTS1 / VIO_D3 / LCD0_DATA19)	26	NC
27	NC	28	NC
29	NC	30	NC
31	NC	32	NC
33	SCL (P1_4 / <b>SCL2</b> / DV0_CLK / CRx1 / IRQ4 / CAN_CLK)	34	NC
35	SDA (P1_5 / <b>SDA2</b> / DV1_CLK / CRx4 / IRQ5 / VIO_CLK / LCD1_EXTCLK)	36	NC
37	+3.3V	38	+3.3V
39	+3.3V	40	NC

Note: Bold letters indicate setting functions.

### 3.1.3 Mic-in Pin Jack Assignments (J4)

The RTK772100BC00000BR has a mic-in pin jack (J4).

Figure3.1.5 shows the Mic-in Pin Jack Pin Assignments, and Table3.1.3 lists the Mic-in Pin Jack Pin Descriptions.



**Figure3.1.5 Mic-in Pin Jack Pin Assignments**

**Table3.1.3 Mic-in Pin Jack Pin Descriptions**

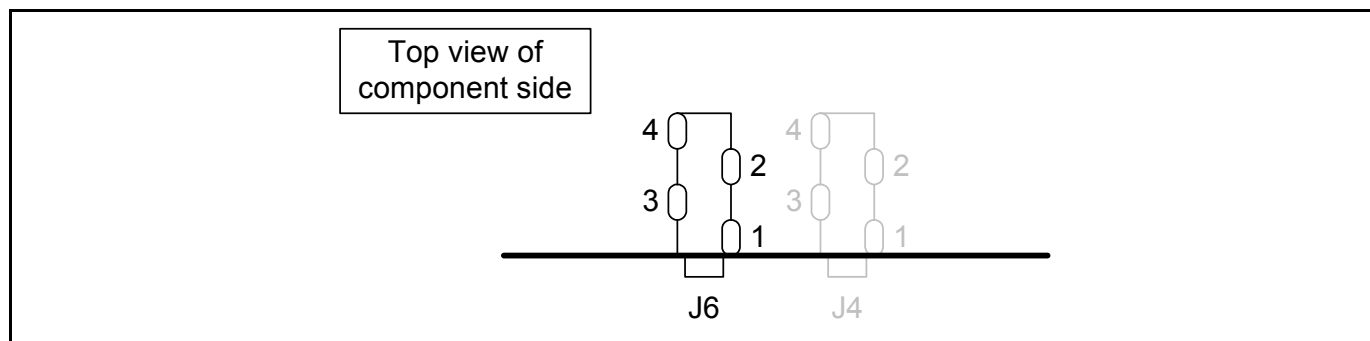
Pin No.	Signal Name
1	GND (AVss)
2	L2 (A/D converter Lch analog input pin)
3	R2 (A/D converter Rch analog input pin)
4	NC



### 3.1.4 Lineout Pin Jack (J6)

The RTK772100BC00000BR has a lineout pin jack (J6).

Figure3.1.6 shows the Lineout Pin Jack Pin Assignments, and Table3.1.4 lists the Lineout Pin Jack Pin Descriptions.



**Figure3.1.6 Lineout Pin Jack Pin Assignments**

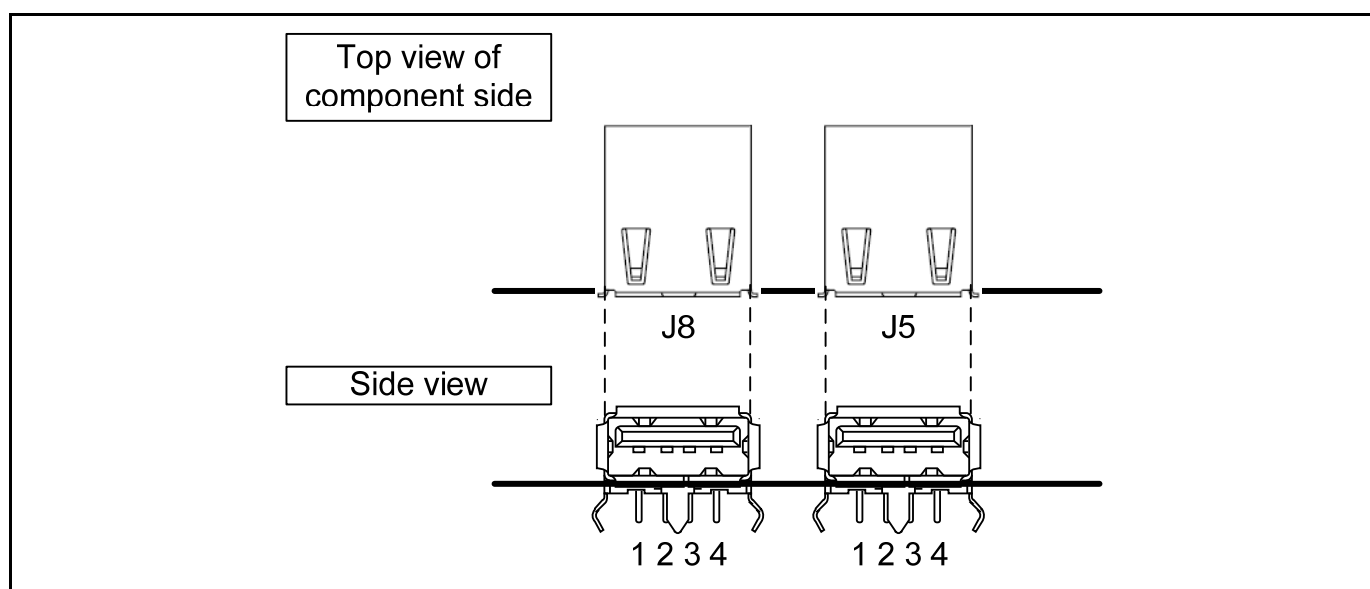
**Table3.1.4 Lineout Pin Jack Pin Descriptions**

Pin No.	Signal Name
1	GND (AVss)
2	LOUT1 (D/A converter Lch analog output pin)
3	ROUT1 (D/A converter Rch analog output pin)
4	NC

### 3.1.5 USB Connectors (J5 and J8)

The RTK772100BC00000BR has two series A receptacles (J5 and J8), but Mini-B receptacles (J7 and J9) are also applicable for this board. When using the Mini-B receptacles, the series A receptacles should be removed. Refer to Table 1.4 of Chapter 1 for the parts of Mini-B receptacles.

Figure3.1.7 and Figure3.1.8 show the Pin Assignments for Series A Receptacle and Mini-B receptacle respectively. Table3.1.5 and Table3.1.6 list the Pin Descriptions for Series A Receptacle and Mini-B Receptacle respectively.



**Figure3.1.7 Series A Receptacle Pin Assignments**

**Table3.1.5 Series A Receptacle Pin Descriptions**

Pin No.	Signal Name	
	J8	J5
1	VBUS (VBUS1)	VBUS (VBUS0)
2	DM (DM1)	DM (DM0)
3	DP (DP1)	DP (DP0)
4	GND (Vss)	GND (Vss)

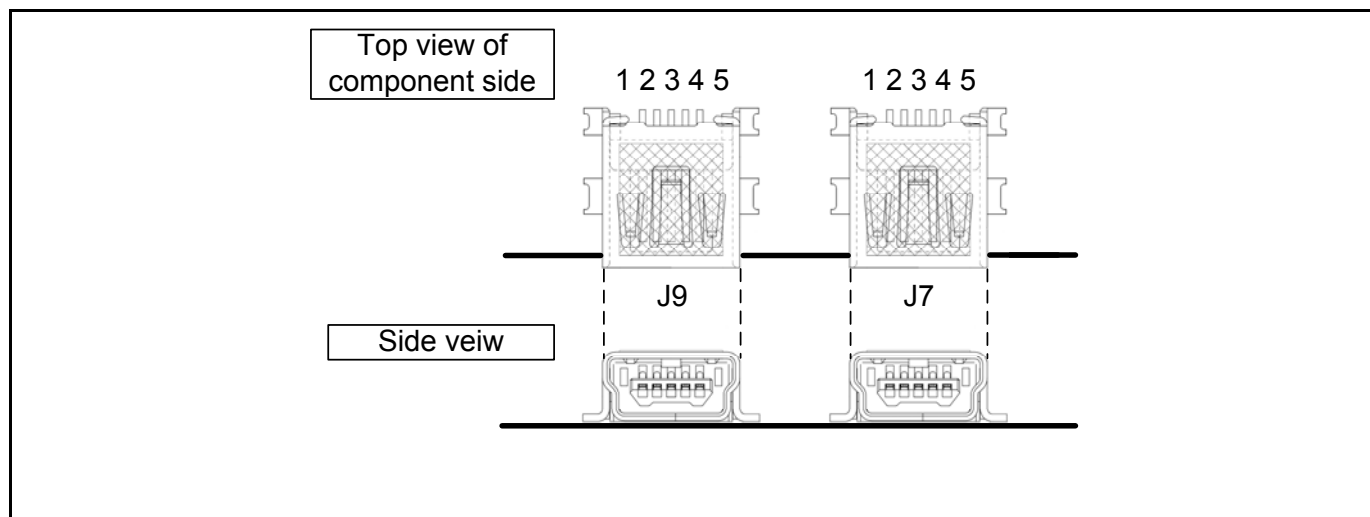


Figure 3.1.8 Mini-B Receptacle Pin Assignments

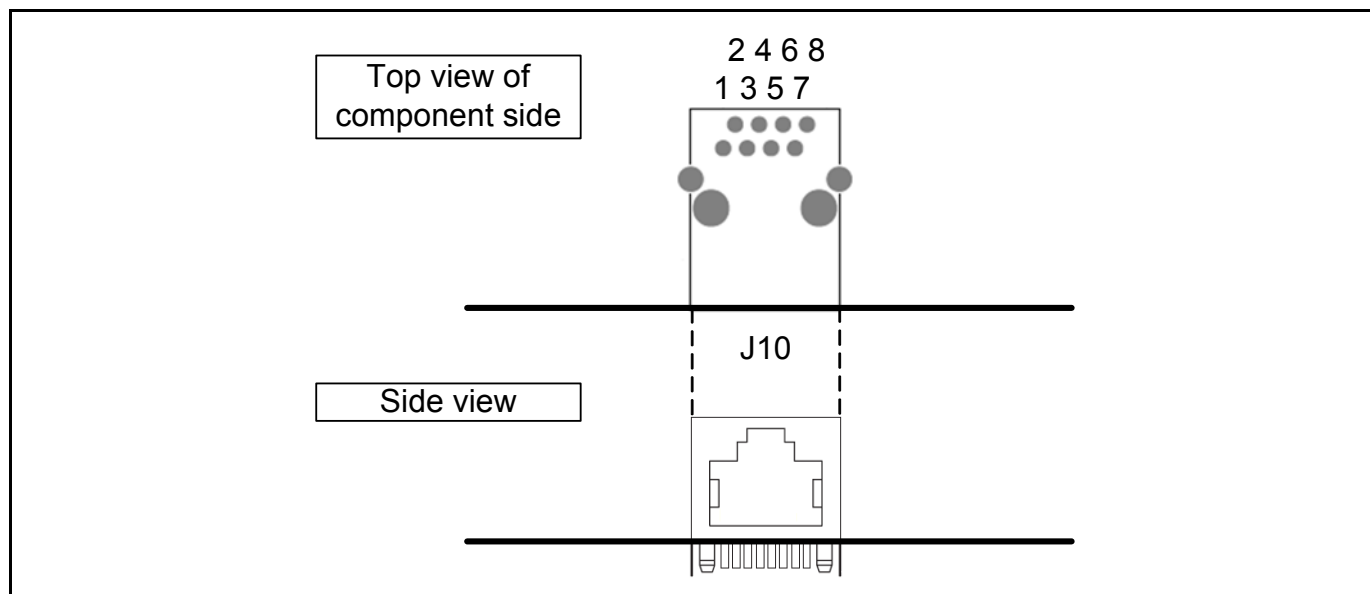
Table 3.1.6 Mini-B Receptacle Pin Descriptions

Pin	Signal Names	
	J9	J7
1	VBUS (VBUS1)	VBUS (VBUS0)
2	DM (DM1)	DM (DM0)
3	DP (DP1)	DP (DP0)
4	ID (Connected to test pin TP10)	ID (Connected to test pin TP5)
5	GND (Vss)	GND (Vss)

### 3.1.6 LAN Connector (J10)

The RTK772100BC00000BR has a LAN connector (J10).

Figure3.1.9 shows the LAN Connector Pin Assignments, and Table3.1.7 lists the LAN Connector Pin Descriptions.



**Figure3.1.9 LAN Connector Pin Assignments**

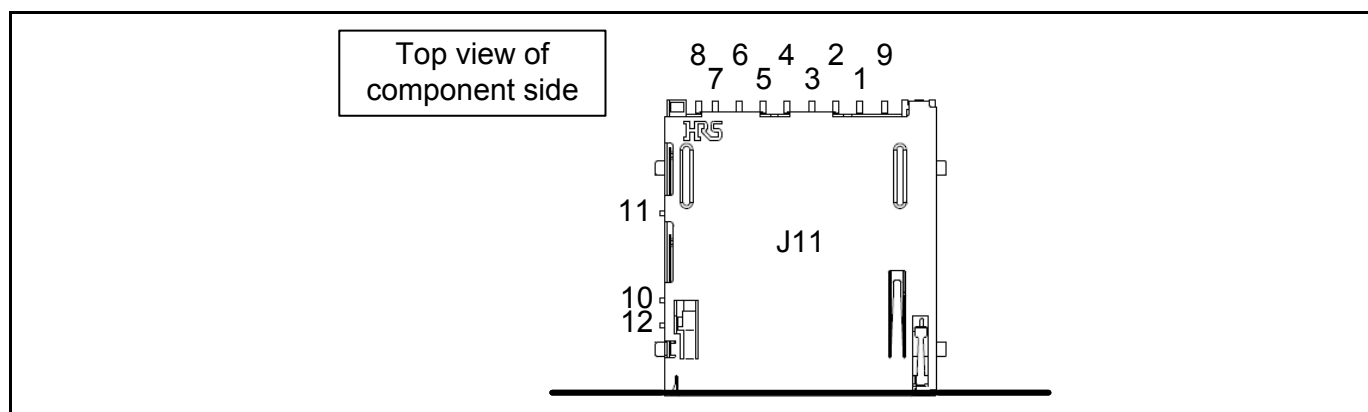
**Table3.1.7 LAN Connector Pin Descriptions**

Pin No.	Signal Name	Pin No.	Signal Name
1	TD+ (P0TXP)	2	TD- (P0TXN)
3	TCT	4	RD+ (P0RXP)
5	RD- (P0RXN)	6	RCT
7	NC	8	GND (AVss)

### 3.1.7 SD Card Slot (J11)

The RTK772100BC00000BR has a SD card slot (J11).

Figure3.1.10 shows the SD Card Slot Pin Assignments, and Table3.1.8 lists the SD Card Slot Pin Descriptions.



**Figure3.1.10 SD Card Slot Pin Assignments**

**Table3.1.8 SD Card Slot Pin Descriptions**

Pin No.	Signal Name	Pin No.	Signal Name
1	DAT3 (P4_14 / LCD0_DATA22 / LCD1_TCON1 / <b>SD_D3_0</b> / MMC_D3 / SPBIO21_1 / SSIRxD3 / TxD2 / IRQ6)	2	CMD (P4_13 / LCD0_DATA21 / LCD1_TCON0 / <b>SD_CMD_0</b> / MMC_CMD / SPBIO11_1 / SSIWS3 / RxD1 / IRQ5)
3	GND (Vss)	4	+3.3V
5	CLK (P4_12 / LCD0_DATA20 / LCD1_CLK / <b>SD_CLK_0</b> / MMC_CLK / SPBIO10_1 / SSISCK3 / TxD1 / IRQ4)	6	GND (Vss)
7	DAT0 (P4_11 / LCD0_DATA19 / LCD1_TCON6 / <b>SD_D0_0</b> / MMC_D0 / SSITxD5 / CTx4 / SCK1 / IRQ3)	8	DAT1 (P4_10 / LCD0_DATA18 / LCD1_TCON5 / <b>SD_D1_0</b> / MMC_D1 / SSIRxD5 / RxD0 / IRQ2)
9	DAT2 (P4_15 / LCD0_DATA23 / LCD1_TCON2 / <b>SD_D2_0</b> / MMC_D2 / SPBIO31_1 / SSITxD3 / RxD2 / IRQ7)	10	WP (P4_9 / LCD0_DATA17 / LCD1_TCON4 / <b>SD_WP_0</b> / SSIWS5 / CRx2 / TxD0 / IRQ1)
11	CD (P4_8 / LCD0_DATA16 / LCD1_TCON3 / <b>SD_CD_0</b> / MMC_CD / SSISCK5 / CTx2 / SCK0 / IRQ0)	12	COMMON (Vss)

Note: Bold letters indicate setting functions.

### 3.1.8 MMC Card Slot (J15)

The RTK772100BC00000BR has a MMC card slot (J15).

Figure3.1.11 shows the MMC Card Slot Pin Assignments, and Table3.1.9 lists the MMC Card Slot Pin Descriptions.

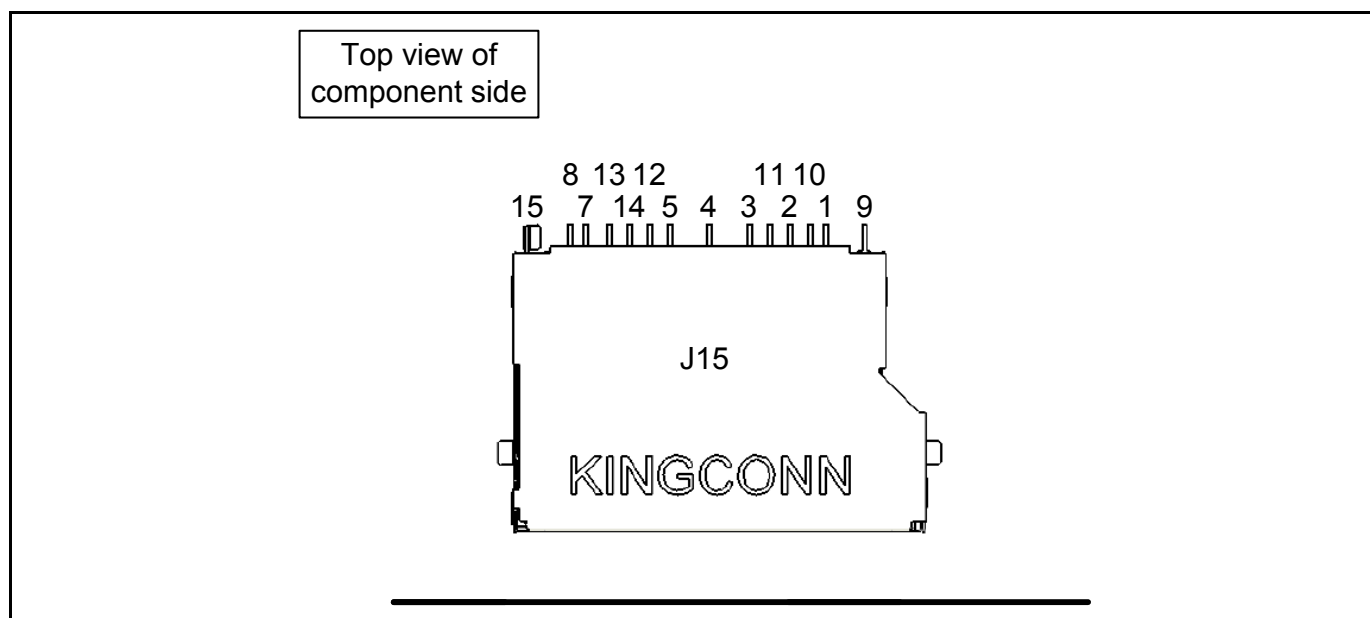


Figure3.1.11 MMC Card Slot Pin Assignments

Table3.1.9 MMC Card Slot Pin Descriptions

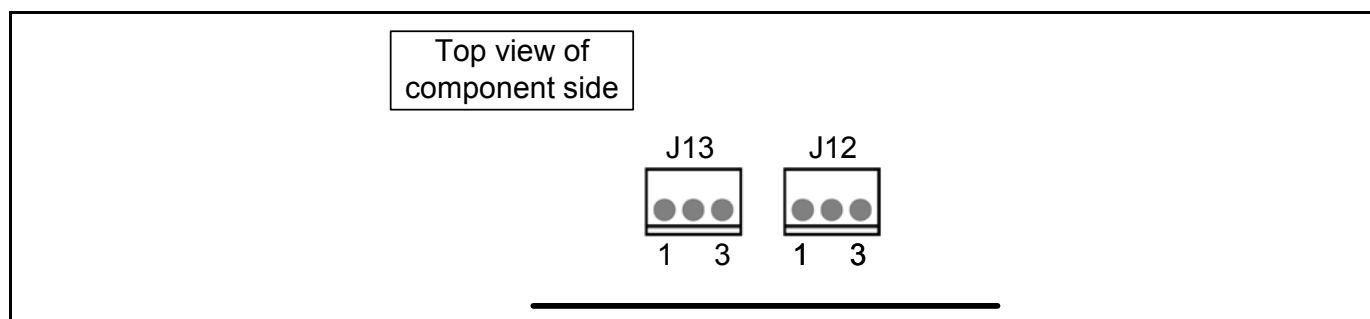
Pin No.	Signal Name	Pin No.	Signal Name
1	DAT3 (P3_14 / LCD0_DATA6 / NAF6 / TRACECLK / SD_D3_1 / <b>MMC_D3</b> )	2	CMD (P3_13 / LCD0_DATA5 / NAF5 / AUDIO_XOUT / SD_CMD_1 / <b>MMC_CMD</b> )
3	GND (Vss)	4	+3.3V
5	SCLK (P3_12 / LCD0_DATA4 / NAF4 / SD_CLK_1 / <b>MMC_CLK</b> )	6	-
7	DAT0 (P3_11 / LCD0_DATA3 / NAF3 / TRACEDATA3 / TIOC4D / SD_D0_1 / <b>MMC_D0</b> )	8	DAT1 (P3_10 / LCD0_DATA2 / NAF2 / TRACEDATA2 / TIOC4C / SD_D1_1 / <b>MMC_D1</b> )
9	DAT2 (P3_15 / LCD0_DATA7 / NAF7 / TRACECTL / SD_D2_1 / <b>MMC_D2</b> )	10	DAT4 (P4_0 / LCD0_DATA8 / TIOC0A / FRE / RSPCK4 / <b>MMC_D4</b> )
11	DAT5 (P4_1 / LCD0_DATA9 / TIOC0B / FCLE / SCK2 / SSL40 / <b>MMC_D5</b> )	12	DAT6 (P4_2 / LCD0_DATA10 / TIOC0C / FALE / CRx3 / TxD2 / MOSI4 / <b>MMC_D6</b> )
13	DAT7 (P4_3 / LCD0_DATA11 / TIOC0D / FWE / CTx3 / RxD2 / MISO4 / <b>MMC_D7</b> )	14	CD (P3_8 / LCD0_DATA0 / NAF0 / TRACEDATA0 / TIOC4A / SD_CD_1 / <b>MMC_CD</b> )
15	WP (P3_9 / LCD0_DATA1 / NAF1 / TRACEDATA1 / TIOC4B / SD_WP_1 / IRQ6)		

Note: Bold letters indicate setting functions.

### 3.1.9 CAN Connectors (J12 and J13)

The RTK772100BC00000BR has two CAN connectors (J12 and J13).

Figure3.1.12 shows the CAN Connector Pin Assignments, and Table3.1.10 lists the CAN Connector Pin Descriptions.



**Figure3.1.12 CAN Connector Pin Assignments**

**Table3.1.10 CAN Connector Pin Descriptions**

Pin No.	Signal Name	
	J13 (CAN2)	J12 (CAN1)
1	CANH	CANH
2	GND (Vss)	GND (Vss)
3	CANL	CANL

### 3.1.10 LVDS Connectors (J14 and J16)

The RTK772100BC00000BR has a LVDS I/F connector (J14) to connect the Mitsubishi LCD panel AA104XD02 and the TDK Lambda DC-DC converter ALD-414012PJ126 or ALD-514012PJ134 connector (J16) for backlight power supply.

Figure3.1.13 and Figure3.1.14 show the Pin Assignments for LVDS I/F Connector and Backlight Power Supply Connector respectively. Table3.1.11 and Table3.1.12 list the Pin Descriptions for LVDS I/F Connector and Backlight Power Supply Connector respectively.

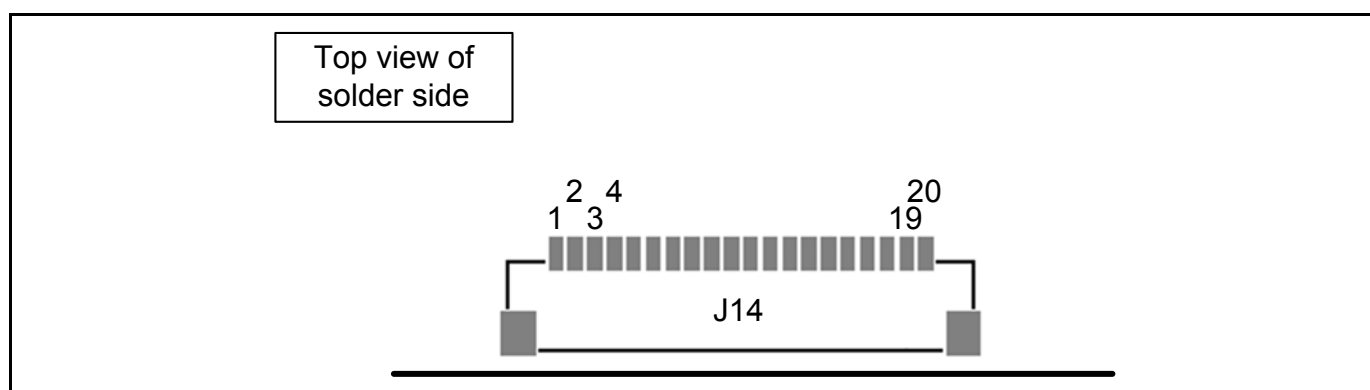


Figure3.1.13 LVDS I/F Connector Pin Assignments

Table3.1.11 LVDS I/F Connector Pin Descriptions

Pin No.	Signal Name
1	+3.3V
2	+3.3V
3	GND (Vss)
4	GND (Vss)
5	Link0- (P5_7 / <b>TXOUT0M</b> / LCD1_DATA7 / LCD0_DATA23 / DV1_DATA7 / RxD6 / TIOC0D / SPDIF_OUT / DV0_DATA15)
6	Link0+ (P5_6 / <b>TXOUT0P</b> / LCD1_DATA6 / LCD0_DATA22 / DV1_DATA6 / TxD6 / IRQ6 / SPDIF_IN / DV0_DATA14)
7	GND (Vss)
8	Link1- (P5_5 / <b>TXOUT1M</b> / LCD1_DATA5 / LCD0_DATA21 / DV1_DATA5 / AUDIO_XOUT / TIOC0C / FCE / DV0_DATA13)
9	Link1+ (P5_4 / <b>TXOUT1P</b> / LCD1_DATA4 / LCD0_DATA20 / DV1_DATA4 / RxD3 / TIOC3D / DV0_DATA12)
10	GND (Vss)
11	Link2- (P5_3 / <b>TXOUT2M</b> / LCD1_DATA3 / LCD0_DATA19 / DV1_DATA3 / TxD3 / TIOC3C / MISO3)
12	Link2+ (P5_2 / <b>TXOUT2P</b> / LCD1_DATA2 / LCD0_DATA18 / DV1_DATA2 / SCK3 / TIOC1B / MOSI3)
13	GND (Vss)
14	CLKIN- (P5_1 / <b>TXCLKOUTM</b> / LCD1_DATA1 / LCD0_DATA17 / DV1_DATA1 / RxD4 / TIOC0B / SSL30)
15	CLKIN+ (P5_0 / <b>TXCLKOUTP</b> / LCD1_DATA0 / LCD0_DATA16 / DV1_DATA0 / TxD4 / TIOC0A / RSPCK3)
16	GND (Vss)
17	Link3- (Connected to +3.3V via 680Ω resistor)
18	Link3+ (Connected to Vss via 620Ω resistor)
19	MODE (Connected to Vss via 22kΩ resistor)
20	SC (Connected to Vss via 22kΩ resistor)

Note: Bold letters indicate setting functions.



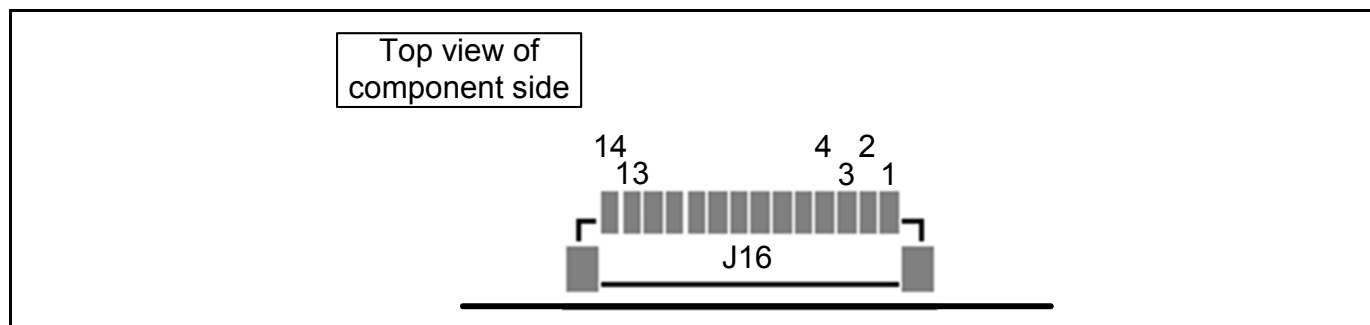


Figure3.1.14 Backlight Power Supply Connector Pin Assignments

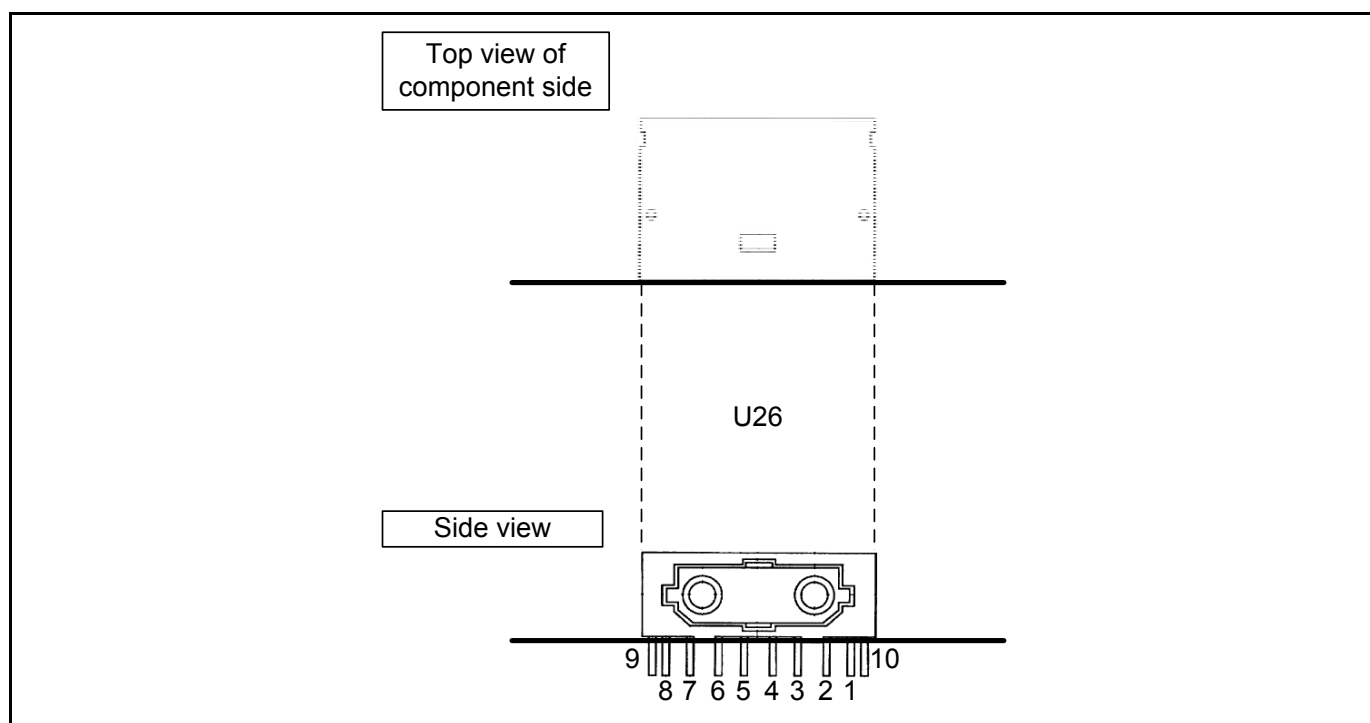
Table3.1.12 Backlight Power Supply Connector Pin Descriptions

Pin No.	Signal Name
1	+12V
2	+12V
3	+12V
4	+12V
5	+12V
6	GND (Vss)
7	GND (Vss)
8	GND (Vss)
9	GND (Vss)
10	GND (Vss)
11	Vrmt (Connected to +3.3V via 1kΩ resistor)
12	Vbr/Rbr (Connected to Vss via 22kΩ resistor)
13	ADIM (Connected to Vss via 22kΩ resistor)
14	Vst (Connected to Vss via 22kΩ resistor)

### 3.1.11 TOSLINK Connector (U26)

The RTK772100BC00000BR has a TOSLINK connector (U26) for digital audio.

Figure3.1.15 shows the TOSLINK Connector Pin Descriptions, and Table3.1.13 lists the TOSLINK Connector Pin Descriptions.



**Figure3.1.15 TOSLINK Connector Pin Assignments**

**Table3.1.13 TOSLINK Connector Pin Descriptions**

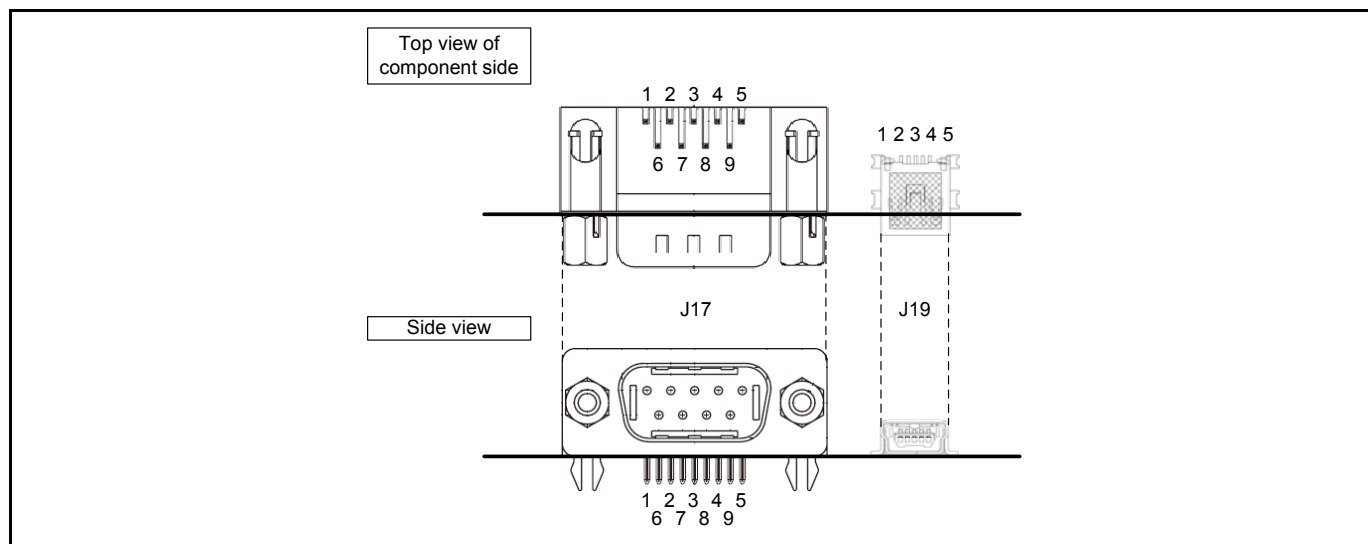
Pin No.	Signal Name	Pin No.	Signal Name
1	RX (P8_8 / A16 / DV1_DATA5 / SPBIO00_1 / <b>SPDIF_IN</b> / TIOC1A / PWM1A / TxD3 / SSISCK5)	2	GND (Vss)
3	+5V	4	GND (Vss)
5	GND (Vss)	6	LED (Connected to +5V via 1.2kΩ resistor)
7	+5V	8	TX (P8_9 / A17 / DV1_DATA6 / SPBIO10_1 / <b>SPDIF_OUT</b> / TIOC1B / PWM1B / RxD3 / SSIWS5)

Note: Bold letters indicate setting functions.

### 3.1.12 Serial Port Connectors (J17 and J19)

The RTK772100BC00000BR has two types of serial port connectors (J17 for Dsub-9, J19 for USB Mini-B).

Figure3.1.16 shows the Serial Port Connector Pin Assignments. Table3.1.14 and Table3.1.15 list the Pin Descriptions for J17 and J19.



**Figure3.1.16 Serial Port Connector Pin Assignments**

**Table3.1.14 Serial Port Connector (J17) Pin Descriptions**

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	6	DSR#
2	RXD (P3_2 / LCD0_TCON1 / ET_TXEN / <b>RxD2</b> / SCI_RXD1 / TEND0 / PWM2C / MOSI3)	7	RTS#
3	TXD (P3_0 / LCD0_CLK / ET_TXCLK / IRQ2 / SCK2 / SCI_SCK1 / <b>TxD2</b> / PWM2A / RSPCK3)	8	CTS#
4	DTR#	9	NC
5	GND (Vss)		

Note: Bold letters indicate setting functions.

Pin 4 to 6, 7 and 8 are connected by using loopback.

**Table3.1.15 Serial Port Connector (J19) Pin Descriptions**

Pin No.	Signal Name
1	VBUS (UVBUS)
2	DM (UDM0)
3	DP (UDP0)
4	ID (NC)
5	GND (Vss)

### 3.1.13 UDI Connectors (J21 and J22)

The RTK772100BC00000BR has the CoreSight 20 connector with 1.27mm (J21) and the ARM JTAG 20 connector with 2.54mm (J22) to connect the ICE (In Circuit Emulator).

Figure3.1.17 shows the UDI Connector Pin Assignments. Table3.1.16 and Table3.1.17 list the Pin Descriptions for UDI Connectors (J21 and J22).

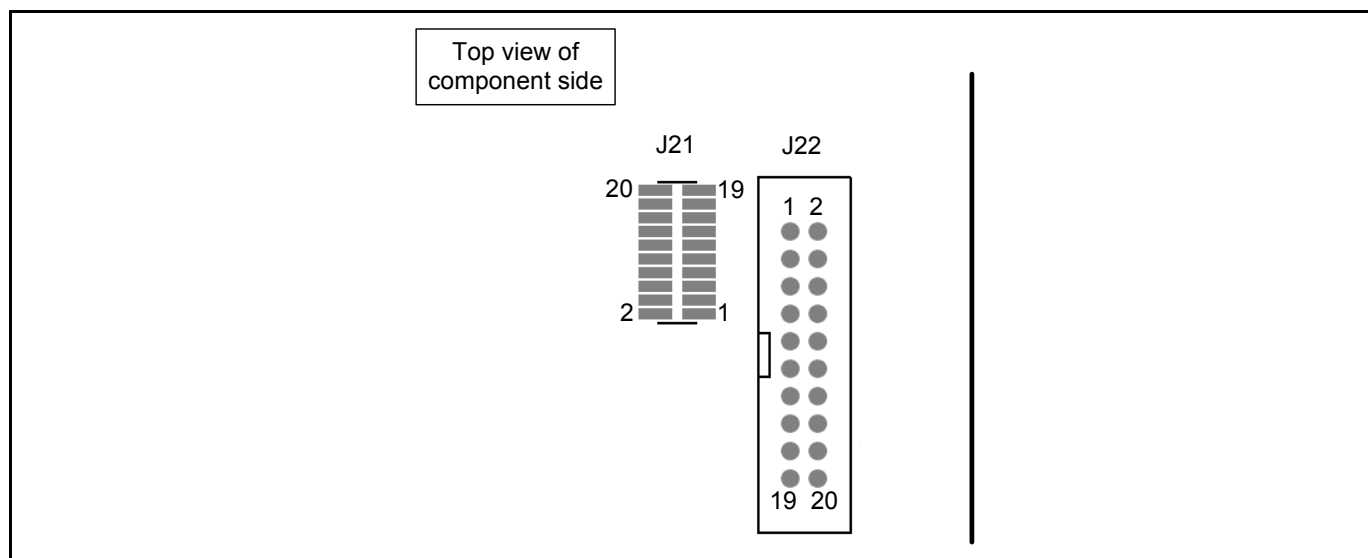


Figure3.1.17 UDI Connector Pin Assignments

Table3.1.16 CoreSight 20 Connector (J21) Pin Descriptions

Pin No.	Signal Name	Pin No.	Signal Name
1	+3.3V	2	TMS/SWDIO
3	GND (Vss)	4	TCK/SWCLK
5	GND (Vss)	6	TDO/SWO
7	KEY (NC)	8	TDI
9	GND (Vss)	10	nSRST (RES#)
11	NC	12	RTCK/TraceCLK (P3_14 / LCD0_DATA6 / NAF6 / <b>TRACECLK</b> / SD_D3_1 / MMC_D3)
13	NC	14	SWO/TraceD0 (P3_8 / LCD0_DATA0 / NAF0 / <b>TRACEDATA0</b> / TIOC4A / SD_CD_1 / MMC_CD)
15	GND (Vss)	16	nTRST/TraceD1 (P3_9 / LCD0_DATA1 / NAF1 / <b>TRACEDATA1</b> / TIOC4B / SD_WP_1 / IRQ6)
17	GND (Vss)	18	DBGREQ/TraceD2 (P3_10 / LCD0_DATA2 / NAF2 / <b>TRACEDATA2</b> / TIOC4C / SD_D1_1 / MMC_D1)
19	GND (Vss)	20	DBGACK/TraceD3 (P3_11 / LCD0_DATA3 / NAF3 / <b>TRACEDATA3</b> / TIOC4D / SD_D0_1 / MMC_D0)

Note: Bold letters indicate setting functions.

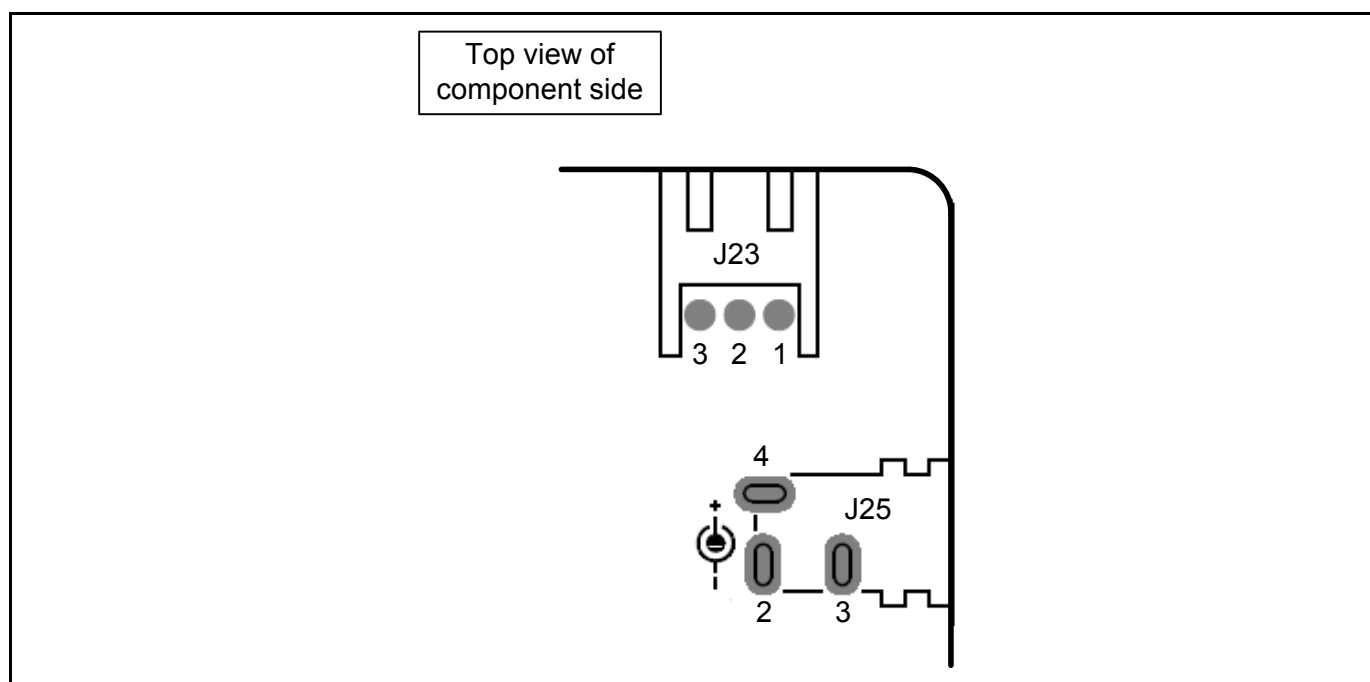
Table3.1.17 ARM JTAG 20 Connector (J22) Pin Descriptions

Pin No.	Signal Name	Pin No.	Signal Name
1	+3.3V	2	+3.3V
3	nTRST (TRST#)	4	GND (Vss)
5	TDI	6	GND (Vss)
7	TMS/SWDIO	8	GND (Vss)
9	TCK/SWCLK	10	GND (Vss)
11	RTCK	12	GND (Vss)
13	TDO/SWO	14	GND (Vss)
15	nSRST (RES#)	16	GND (Vss)
17	DBGRQ (Connected to Vss via 10kΩ resistor)	18	GND (Vss)
19	DBGACK (Connected to Vss via 10kΩ resistor)	20	GND (Vss)

### 3.1.14 Power Supply Connectors (J23 and J25)

The RTK772100BC00000BR has a 3-pin connector (J23) and an AC adapter jack (J25) for system power supply.

Figure3.1.18 shows the Power Supply Connector Pin Assignments. Table3.1.18 and Table3.1.19 list the Power Supply Connector Pin Descriptions for J23 and J25.



**Figure3.1.18 Power Supply Connector Pin Assignments**

**Table3.1.18 Power Supply Connector (J23) Pin Descriptions**

Pin No.	Signal Name
1	+12V
2	NC
3	GND (Vss)

**Table3.1.19 Power Supply Connector (J25) Pin Descriptions**

Pin No.	Signal Name
1	NC (without pins)
2	+12V
3	GND (Vss)
4	GND (Vss)

### 3.1.15 External Power Supply Connectors (J24 and J26 to J28)

The RTK772100BC00000BR has a board pattern which enables external power supply connectors (J24, J26 to J28) to be mounted in order to provide digital 5V, digital 3.3V, analog 3.3V and digital 1.18V directly from the outside. The internal power supply and the external power supply are switched at the jumpers, JP15, JP18, JP19, and JP21.

Figure3.1.19 shows the External Power Supply Connector Pin Assignments. Table3.1.20 to Table3.1.23 list the Pin Descriptions for External Power Supply Connectors (JP15, JP18, JP19 and JP21).

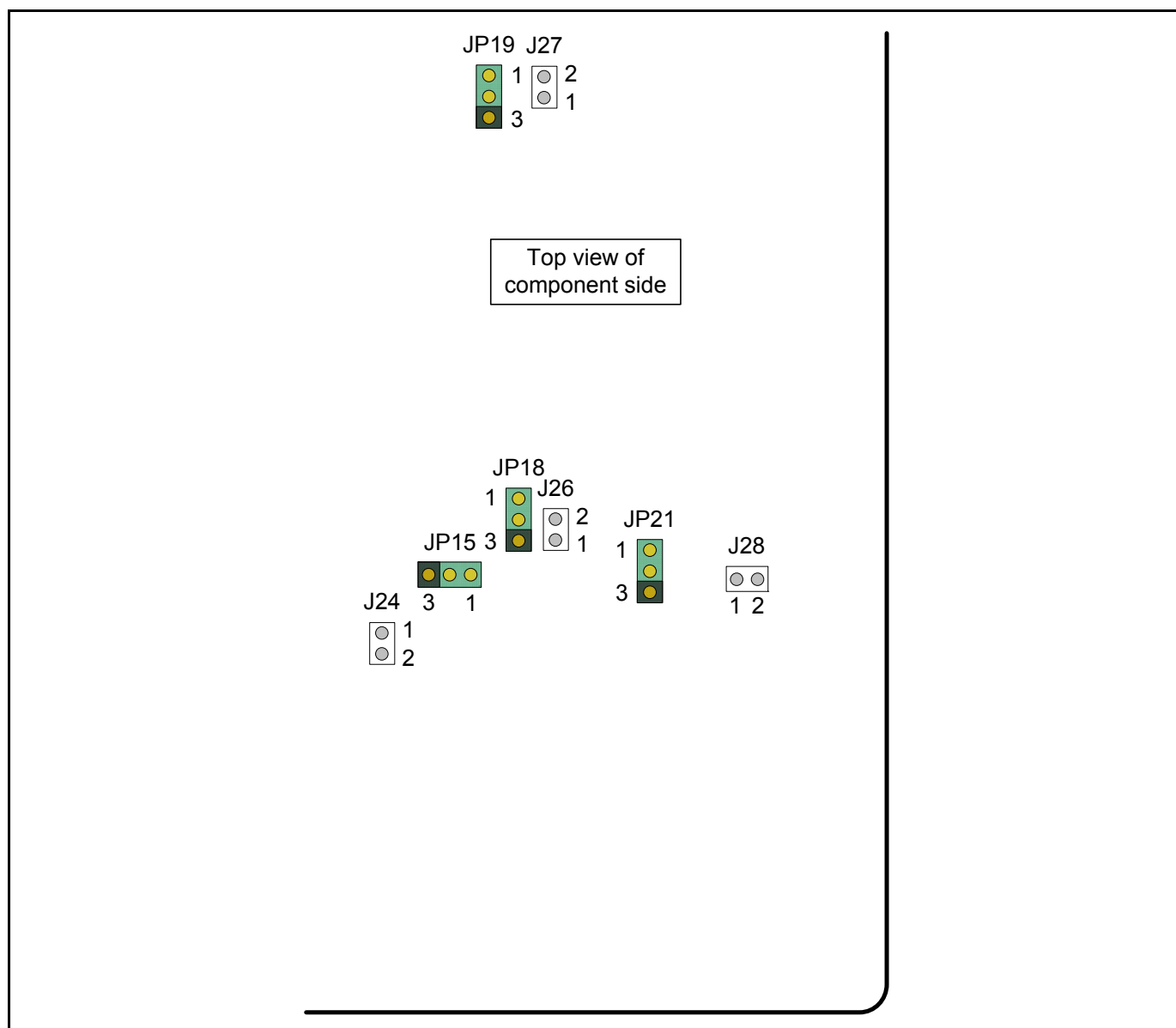


Figure3.1.19 External Power Supply Connector Pin Assignments

Table3.1.20 Digital 5V External Power Supply Connector (J24) Pin Descriptions

Pin No.	Signal Name	Pin No.	Signal Name
1	+5V	2	GND (Vss)

Table3.1.21 Digital 3.3V External Power Supply Connector (J26) Pin Descriptions

Pin No.	Signal Name	Pin No.	Signal Name
1	+3.3V	2	GND (Vss)

Table3.1.22 Analog 3.3V External Power Supply Connector (J27) Pin Descriptions

Pin No.	Signal Name	Pin No.	Signal Name
1	+3.3V	2	GND (AVss)

Table3.1.23 Digital 1.18V External Power Supply Connector (J28) Pin Descriptions

Pin No.	Signal Name	Pin No.	Signal Name
1	+1.18V	2	GND (Vss)



### 3.1.16 Expansion Connectors (CN1 to CN9)

The RTK772100BC00000BR has through holes which enables the expansion connectors (CN1 to CN9) to be mounted.

Figure3.1.20 shows the Expansion Connector Pin Assignments. Table3.1.24 to Table3.1.32 list the Expansion Connector Pin Descriptions.

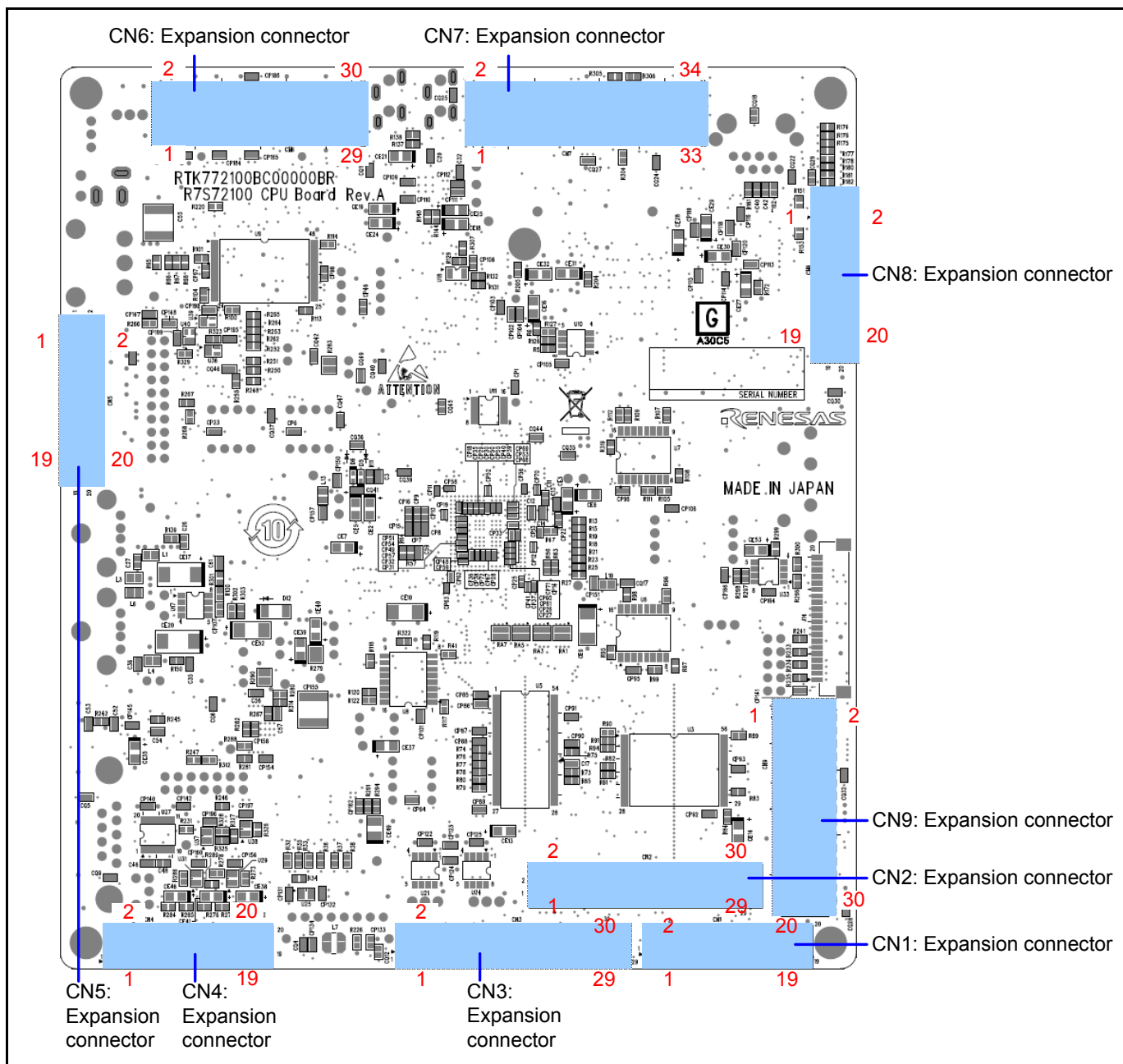


Figure3.1.20 Expansion Connector Pin Assignments

**Table3.1.24 Expansion Connector (CN1) Pin Descriptions 1**

Pin No.	Signal Name	Pin No.	Signal Name
1	5VCC	2	P6_15 / D15 / DV0_DATA23 / RxD6 / LCD0_DATA7 / IRQ7
3	P6_14 / D14 / DV0_DATA22 / TxD6 / LCD0_DATA6 / IRQ6	4	P6_13 / D13 / DV0_DATA21 / SCK6 / RxD1 / LCD0_DATA5 / IRQ5
5	P6_12 / D12 / DV0_DATA20 / TxD1 / LCD0_DATA4 / IRQ4	6	3VCC
7	P6_11 / D11 / DV0_DATA15 / LCD0_TCON6 / SCK1 / LCD0_DATA3 / IRQ3	8	P6_10 / D10 / DV0_DATA14 / LCD0_TCON5 / RxD0 / LCD0_DATA2 / IRQ2
9	P6_9 / D9 / DV0_DATA13 / TxD0 / LCD0_DATA1 / IRQ1	10	P6_8 / D8 / DV0_DATA12 / CAN_CLK / SCK0 / LCD0_DATA0 / IRQ0
11	Vss	12	P6_7 / D7 / LCD1_DATA15 / LCD0_TCON6 / RxD5 / MISO1 / DV0_DATA23
13	P6_6 / D6 / LCD1_DATA14 / LCD0_TCON5 / TxD5 / MOSI1 / DV0_DATA22	14	P6_5 / D5 / LCD1_DATA13 / CTx2 / SCK5 / SSL10 / DV0_DATA21
15	P6_4 / D4 / LCD1_DATA12 / CRx2 / IRQ3 / RTS5 / RSPCK1 / DV0_DATA20	16	Vss
17	P6_3 / D3 / LCD1_DATA11 / LTXD1 / IRQ2 / CTS5 / TI0C2B / TxD2 / DV0_DATA19	18	P6_2 / D2 / LCD1_DATA10 / LRxD1 / IRQ7 / TCLKA / TI0C2A / RxD2 / DV0_DATA18
19	P6_1 / D1 / LCD1_DATA9 / LTXD0 / IRQ4 / TI0C1B / SSIDATA4 / TxD3 / DV0_DATA17	20	P6_0 / D0 / LCD1_DATA8 / LRxD0 / DV0_CLK / TI0C1A / IRQ5 / RxD3 / DV0_DATA16

: 5V system power supply, 
  : 3.3V system power supply, and 
  : GND

**Table3.1.25 Expansion Connector (CN2) Pin Descriptions 2**

Pin No.	Signal Name	Pin No.	Signal Name
1	Vss	2	CKIO
3	Vss	4	Vss
5	P11_11 / DV0_DATA23 / SD_D2_0 / RxD5 / MMC_D2 / LCD0_TCON3	6	P11_10 / DV0_DATA22 / SD_D3_0 / TxD5 / MMC_D3 / LCD0_TCON4
7	P11_9 / DV0_DATA21 / SD_CMD_0 / SCK5 / MMC_CMD / LCD0_TCON5	8	P11_8 / DV0_DATA20 / SD_CLK_0 / RTS5 / MMC_CLK / LCD0_TCON6
9	3VCC	10	3VCC
11	P11_7 / DV0_DATA19 / SD_D0_0 / CTS5 / MMC_D0 / LCD0_DATA0	12	P11_6 / DV0_DATA18 / SD_D1_0 / SSIDATA4 / MMC_D1 / LCD0_DATA1
13	P11_5 / DV0_DATA17 / SD_WP_0 / SSIWS4 / LCD0_DATA2	14	P11_4 / DV0_DATA16 / SD_CD_0 / SSISCK4 / MMC_CD / LCD0_DATA3
15	3VCC	16	3VCC
17	P11_15 / SPDIF_OUT / MISO1 / IRQ1 / MMC_D7 / LCD0_CLK	18	P11_14 / SPDIF_IN / MOSI1 / LCD0_TCON5 / MMC_D6 / LCD0_TCON0
19	P11_13 / CTx1 / SSL10 / LCD0_TCON4 / MMC_D5 / LCD0_TCON1	20	P11_12 / CRx1 / RSPCK1 / IRQ3 / MMC_D4 / LCD0_TCON2
21	Vss	22	P7_8 / RD / SSISCK3 / CRx0 / TIOC3A / IRQ1
23	P7_7 / WE1/DQMLU / DV0_DATA23 / ET_TXD3 / RTS7 / SSIDATA2 / TIOC2B	24	P7_6 / WE0/DQMLL / DV0_DATA22 / ET_TXD2 / CTS7 / SSIWS2 / TIOC2A
25	P7_5 / RD/WR / DV0_DATA21 / ET_TXD1 / RXD7 / SSISCK2 / TIOC1B	26	P7_4 / CKE / DV0_DATA20 / ET_TXD0 / TXD7 / SSITxD1 / TIOC1A
27	P7_3 / CAS / DV0_DATA19 / ET_TXEN / SCK7 / CTx2 / SSIRxD1 / TIOC0D	28	P7_2 / RAS / DV0_DATA18 / ET_TXER / RXD4 / CRx2 / SSIWS1 / TIOC0C
29	P7_1 / CS3 / DV0_DATA17 / ET_TXCLK / TXD4 / DV0_CLK / SSISCK1 / TIOC0B	30	P7_0 / MD_BOOT2 / CS0 / DV0_DATA16 / ET_MDC / SCK4 / LTXD0 / TIOC0A

: 5V system power supply, 
  : 3.3V system power supply, and 
  : GND

**Table3.1.26 Expansion Connector (CN3) Pin Descriptions 3**

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	NC
3	P9_1 / A25 / SPBIO31_0 / CRx0 / IRQ0 / MISO2	4	Vss
5	P9_0 / A24 / SPBIO21_0 / CTx0 / TCLKC / MOSI2	6	P8_15 / A23 / SPBIO11_0 / SPBIO10_1 / TIOC2B / SSL20 / PWM1H / RxD4
7	P8_14 / A22 / SPBIO01_0 / SPBIO00_1 / TIOC2A / RSPCK2 / PWM1G / TxD4 / SSIDATA4	8	P8_13 / A21 / SPBSSL_1 / TIOC3D / TXD5 / PWM1F / SGOUT_3 / SSIWS4
9	P8_12 / A20 / SPBCLK_1 / TIOC3C / SCK5 / PWM1E / SGOUT_2 / SSISCK4	10	P8_11 / A19 / SPBIO30_1 / TIOC3B / RxD5 / PWM1D / SGOUT_1 / DV0_CLK
11	P8_10 / A18 / DV1_DATA7 / SPBIO20_1 / TIOC3A / CTx4 / PWM1C / SGOUT_0 / SSITxD5	12	P8_9 / A17 / DV1_DATA6 / SPBIO10_1 / SPDIF_OUT / TIOC1B / PWM1B / RxD3 / SSIWS5
13	Vss	14	P8_8 / A16 / DV1_DATA5 / SPBIO00_1 / SPDIF_IN / TIOC1A / PWM1A / TxD3 / SSISCK5
15	P8_7 / A15 / DV1_DATA4 / AUDIO_XOUT / IRQ5 / ET_COL	16	P8_6 / A14 / DV1_DATA3 / MISO2 / IETxD / TxD2
17	P8_5 / A13 / DV1_DATA2 / MOSI2	18	P8_4 / A12 / DV1_DATA1 / SSL20 / IERxD / RxD2
19	P8_3 / A11 / DV1_DATA0 / RSPCK2 / RTS5 / IRQ1 / SCK2	20	P8_2 / A10 / MISO0 / RXD5 / IRQ0
21	P8_1 / A9 / MOSI0 / ET_RXDV / TXD5 / SCI_RXD0	22	Vss
23	P8_0 / A8 / SSL00 / ET_RXER / SCK5 / SCI_SCK0	24	P7_15 / A7 / RSPCK0 / ET_RXCLK / CTS5 / SCI_TXD0 / TIOC4D
25	P7_14 / A6 / SSIDATA4 / ET_CRS / TIOC4C / IRQ6	26	P7_13 / A5 / SSIWS4 / ET_MDIO / TIOC4B / IRQ5
27	P7_12 / A4 / SSISCK4 / ET_RXD3 / TIOC4A / IRQ4	28	P7_11 / A3 / SSITxD3 / ET_RXD2 / CRx1 / TIOC3D / IRQ3
29	P7_10 / A2 / SSIRxD3 / ET_RXD1 / CTx1 / TIOC3C / IRQ2	30	P7_9 / A1 / SSIWS3 / ET_RXD0 / CTx0 / TIOC3B / IRQ0

: 5V system power supply, 
  : 3.3V system power supply, and 
  : GND

**Table3.1.27 Expansion Connector (CN4) Pin Descriptions 4**

Pin No.	Signal Name	Pin No.	Signal Name
1	NMI	2	RES#
3	NC	4	NC
5	P3_1 / LCD0_TCON0 / ET_TXER / IRQ6 / TxD2 / SCI_TXD1 / AUDIO_CLK / PWM2B / SSL30	6	P3_0 / LCD0_CLK / ET_TXCLK / IRQ2 / SCK2 / SCI_SCK1 / TxD2 / PWM2A / RSPCK3
7	P3_3 / LCD0_TCON2 / ET_MDIO / IRQ4 / BS / SCI_CTS1 / RTS1 / DACK0 / PWM2D / MISO3	8	P3_2 / LCD0_TCON1 / ET_TXEN / Rx2D / SCI_RXD1 / TEND0 / PWM2C / MOSI3
9	Vss	10	Vss
11	P3_5 / LCD0_TCON4 / ET_RXER / SSIWS1 / AUDIO_XOUT3 / SCI_TXD0 / TIOC3B / TxD3	12	P3_4 / LCD0_TCON3 / ET_RXCLK / SSISCK1 / AUDIO_XOUT2 / SCI_SCK0 / TIOC3A / SCK3
13	P3_7 / LCD0_TCON6 / SSITxD1 / LCD1_EXTCLK / SCI_CTS0/RTS0 / TIOC3D / CS1 / WDTOVF	14	P3_6 / LCD0_TCON5 / ET_RXDV / SSIRxD1 / SCI_RXD0 / TIOC3C / Rx2D
15	Vss	16	Vss
17	P10_3 / TCLKD / PWM2D / ET_CRS / LCD0_DATA20 / VIO_FLD	18	P10_2 / DV0_HSYNC / TCLKC / PWM2C / ET_TXEN / LCD0_DATA21 / VIO_HD
19	P10_1 / DV0_VSYNC / TCLKB / PWM2B / ET_TXER / LCD0_DATA22 / VIO_VD	20	P10_0 / DV0_CLK / TCLKA / PWM2A / ET_TXCLK / LCD0_DATA23 / VIO_CLK

: 5V system power supply, 
  : 3.3V system power supply, and 
  : GND

**Table3.1.28 Expansion Connector (CN5) Pin Descriptions 5**

Pin No.	Signal Name	Pin No.	Signal Name
1	+12V	2	+12V
3	+12V	4	+12V
5	+12V	6	+12V
7	P1_15 / AN7	8	P1_14 / AN6 / ET_COL
9	AVcc	10	AVcc
11	P1_13 / AN5 / DV0_HSYNC / WAIT	12	P1_12 / AN4 / DV0_VSYNC / VIO_FLD
13	AVss	14	AVss
15	P1_11 / AN3 / IRQ5 / TCLKD	16	P1_10 / AN2 / IRQ4 / TCLKB
17	VBUS	18	VBUS
19	P1_9 / AN1 / IRQ3 / VIO_D15 / DV0_DATA15	20	P1_8 / AN0 / IRQ2 / DREQ0 / VIO_D14 / DV0_DATA14

: 5V system power supply, 
  : 3.3V system power supply, and 
  : GND

**Table3.1.29 Expansion Connector (CN6) Pin Descriptions 6**

Pin No.	Signal Name	Pin No.	Signal Name
1	P3_9 / LCD0_DATA1 / NAF1 / TRACEDATA1 / TIOC4B / SD_WP_1 / IRQ6	2	P3_8 / LCD0_DATA0 / NAF0 / TRACEDATA0 / TIOC4A / SD_CD_1 / MMC_CD
3	P3_11 / LCD0_DATA3 / NAF3 / TRACEDATA3 / TIOC4D / SD_D0_1 / MMC_D0	4	P3_10 / LCD0_DATA2 / NAF2 / TRACEDATA2 / TIOC4C / SD_D1_1 / MMC_D1
5	5VCC	6	5VCC
7	5VCC	8	5VCC
9	P3_13 / LCD0_DATA5 / NAF5 / AUDIO_XOUT / SD_CMD_1 / MMC_CMD	10	P3_12 / LCD0_DATA4 / NAF4 / SD_CLK_1 / MMC_CLK
11	P3_15 / LCD0_DATA7 / NAF7 / TRACECTRL / SD_D2_1 / MMC_D2	12	P3_14 / LCD0_DATA6 / NAF6 / TRACECLK / SD_D3_1 / MMC_D3
13	3VCC	14	3VCC
15	P4_1 / LCD0_DATA9 / TIOC0B / FCLE / SCK2 / SSL40 / MMC_D5	16	P4_0 / LCD0_DATA8 / TIOC0A / FRE / RSPCK4 / MMC_D4
17	P4_3 / LCD0_DATA11 / TIOC0D / FWE / CTx3 / RxD2 / MISO4 / MMC_D7	18	P4_2 / LCD0_DATA10 / TIOC0C / FALE / CRx3 / TxD2 / MOSI4 / MMC_D6
19	Vss	20	Vss
21	P10_5 / DV0_DATA1 / TIOC0B / PWM2F / ET_TXD1 / LCD0_DATA18 / VIO_D1	22	P10_4 / DV0_DATA0 / TIOC0A / PWM2E / ET_TXD0 / LCD0_DATA19 / VIO_D0
23	P10_7 / DV0_DATA3 / TIOC0D / PWM2H / ET_TXD3 / LCD0_DATA16 / VIO_D3	24	P10_6 / DV0_DATA2 / TIOC0C / PWM2G / ET_TXD2 / LCD0_DATA17 / VIO_D2
25	Vss	26	Vss
27	P4_5 / LCD0_DATA13 / SSL10 / TIOC4B / PWM2F / SSIWS0 / DV0_DATA13	28	P4_4 / LCD0_DATA12 / RSPCK1 / TIOC4A / PWM2E / SSISCK0 / DV0_DATA12
29	P4_7 / LCD0_DATA15 / MISO1 / TIOC4D / PWM2H / SSITxD0 / DV0_DATA15	30	P4_6 / LCD0_DATA14 / MOSI1 / TIOC4C / PWM2G / SSIRxD0 / DV0_DATA14

: 5V system power supply, 
  : 3.3V system power supply, and 
  : GND

**Table3.1.30 Expansion Connector (CN7) Pin Descriptions 7**

Pin No.	Signal Name	Pin No.	Signal Name
1	AUDIO_XTAL1	2	AUDIO_XTAL2
3	Vss	4	Vss
5	P10_9 / DV0_DATA5 / TIOC1B / ET_RXD1 / LCD0_DATA14 / VIO_D5	6	P10_8 / DV0_DATA4 / TIOC1A / ET_RXD0 / LCD0_DATA15 / VIO_D4
7	P10_11 / DV0_DATA7 / TIOC2B / ET_RXD3 / LCD0_DATA12 / VIO_D7	8	P10_10 / DV0_DATA6 / TIOC2A / ET_RXD2 / LCD0_DATA13 / VIO_D6
9	P10_13 / DV0_DATA9 / SSIWS1 / SSL00 / LCD0_DATA10 / VIO_D9	10	P10_12 / DV0_DATA8 / SSISCK1 / RSPCK0 / LCD0_DATA11 / VIO_D8
11	P10_15 / DV0_DATA11 / SSITxD1 / MISO0 / LCD0_DATA8 / VIO_D11	12	P10_14 / DV0_DATA10 / SSIRxD1 / MOSI0 / LCD0_DATA9 / VIO_D10
13	P4_9 / LCD0_DATA17 / LCD1_TCON4 / SD_WP_0 / SSIWS5 / CRx2 / TxD0 / IRQ1	14	P4_8 / LCD0_DATA16 / LCD1_TCON3 / SD_CD_0 / MMC_CD / SSISCK5 / CTx2 / SCK0 / IRQ0
15	P4_11 / LCD0_DATA19 / LCD1_TCON6 / SD_D0_0 / MMC_D0 / SSITxD5 / CTx4 / SCK1 / IRQ3	16	P4_10 / LCD0_DATA18 / LCD1_TCON5 / SD_D1_0 / MMC_D1 / SSIRxD5 / RxD0 / IRQ2
17	P4_13 / LCD0_DATA21 / LCD1_TCON0 / SD_CMD_0 / MMC_CMD / SPBIO11_1 / SSIWS3 / RxD1 / IRQ5	18	P4_12 / LCD0_DATA20 / LCD1_CLK / SD_CLK_0 / MMC_CLK / SPBIO10_1 / SSISCK3 / TxD1 / IRQ4
19	P4_15 / LCD0_DATA23 / LCD1_TCON2 / SD_D2_0 / MMC_D2 / SPBIO31_1 / SSITxD3 / RxD2 / IRQ7	20	P4_14 / LCD0_DATA22 / LCD1_TCON1 / SD_D3_0 / MMC_D3 / SPBIO21_1 / SSIRxD3 / TxD2 / IRQ6
21	Vss	22	Vss
23	P2_1 / D17 / ET_TXER / DV0_DATA1 / SPBIO10_1 / MLB_DAT / TIOC2A / VIO_D1 / LCD0_DATA17	24	P2_0 / D16 / ET_TXCLK / DV0_DATA0 / SPBIO00_1 / MLB_CLK / IRQ5 / VIO_D0 / LCD0_DATA16
25	P2_3 / D19 / ET_CRS / DV0_DATA3 / SPBIO30_1 / IERxD / CTS1 / VIO_D3 / LCD0_DATA19	26	P2_2 / D18 / ET_TXEN / DV0_DATA2 / SPBIO20_1 / MLB_SIG / TIOC2B / VIO_D2 / LCD0_DATA18
27	P2_5 / D21 / ET_TXD1 / DV0_DATA5 / SSIWS5 / SPBSSL_1 / TxD1 / VIO_D5 / LCD0_DATA21	28	P2_4 / D20 / ET_TXD0 / DV0_DATA4 / SSISCK5 / SPBCLK_1 / SCK1 / VIO_D4 / LCD0_DATA20
29	P2_7 / D23 / ET_TXD3 / DV0_DATA7 / SSITxD5 / IETxD / RTS1 / VIO_D7 / LCD0_DATA23	30	P2_6 / D22 / ET_TXD2 / DV0_DATA6 / SSIRxD5 / RxD1 / VIO_D6 / LCD0_DATA22
31	P2_9 / D25 / ET_RXD1 / DV0_DATA9 / SSIWS0 / LRXD0 / LCD1_DATA9 / VIO_D9 / SSL40	32	P2_8 / D24 / ET_RXD0 / DV0_DATA8 / SSISCK0 / LCD0_TCON6 / LCD1_DATA8 / VIO_D8 / RSPCK4
33	P2_11 / D27 / ET_RXD3 / DV0_DATA11 / SSITxD0 / TIOC1A / LCD1_DATA11 / VIO_D11 / MISO4	34	P2_10 / D26 / ET_RXD2 / DV0_DATA10 / SSIRxD0 / LTxD0 / LCD1_DATA10 / VIO_D10 / MOSI4

: 5V system power supply, 
  : 3.3V system power supply, and 
  : GND

**Table3.1.31 Expansion Connector (CN8) Pin Descriptions 8**

Pin No.	Signal Name	Pin No.	Signal Name
1	P3_4 / LCD0_TCON3 / ET_RXCLK / SSISCK1 / AUDIO_XOUT2 / SCI_SCK0 / TIOC3A / SCK3	2	P3_3 / LCD0_TCON2 / ET_MDIO / IRQ4 / BS / SCI_CTS1 / RTS1 / DACK0 / PWM2D / MISO3
3	P3_6 / LCD0_TCON5 / ET_RXDV / SSIRxD1 / SCI_RXD0 / TIOC3C / RxD3	4	P3_5 / LCD0_TCON4 / ET_RXER / SSIWS1 / AUDIO_XOUT3 / SCI_TXD0 / TIOC3B / TxD3
5	3VCC	6	3VCC
7	P2_13 / D29 / SSL00 / DV0_DATA13 / SPBIO11_0 / CTx3 / SCK0 / LCD1_DATA13 / IRQ7	8	P2_12 / D28 / RSPCK0 / DV0_DATA12 / SPBIO01_0 / CRx3 / IRQ6 / LCD1_DATA12 / TIOC1B
9	P2_15 / D31 / MISO0 / DV0_DATA15 / SPBIO31_0 / CAN_CLK / RxD0 / LCD1_DATA15 / IRQ1	10	P2_14 / D30 / MOSI0 / DV0_DATA14 / SPBIO21_0 / CRx4 / TxD0 / LCD1_DATA14 / IRQ0
11	Vss	12	Vss
13	P1_1 / SDA0 / DV0_DATA17 / TCLKC / IRQ1 / VIO_HD / DV0_HSYNC	14	P1_0 / SCL0 / DV0_DATA16 / TCLKA / IRQ0 / VIO_VD / DV0_VSYNC
15	P1_3 / SDA1 / DV0_DATA19 / ET_COL / IRQ3 / ADTRG	16	P1_2 / SCL1 / DV0_DATA18 / FRB / IRQ2 / LCD1_EXTCLK
17	P1_5 / SDA2 / DV1_CLK / CRx4 / IRQ5 / VIO_CLK / LCD1_EXTCLK	18	P1_4 / SCL2 / DV0_CLK / CRx1 / IRQ4 / CAN_CLK
19	P1_7 / SDA3 / DV1_HSYNC / LRXD0 / IRQ7 / VIO_D13 / DV0_DATA13	20	P1_6 / SCL3 / DV1_VSYNC / IERxD / IRQ6 / VIO_D12 / DV0_DATA12

  : 5V system power supply, 
   : 3.3V system power supply, and 
   : GND



**Table3.1.32 Expansion Connector (CN9) Pin Descriptions 9**

Pin No.	Signal Name	Pin No.	Signal Name
1	P5_1 / TXCLKOUTM / LCD1_DATA1 / LCD0_DATA17 / DV1_DATA1 / RxD4 / TIOC0B / SSL30	2	P5_0 / TXCLKOUTP / LCD1_DATA0 / LCD0_DATA16 / DV1_DATA0 / TxD4 / TIOC0A / RSPCK3
3	P5_3 / TXOUT2M / LCD1_DATA3 / LCD0_DATA19 / DV1_DATA3 / TxD3 / TIOC3C / MISO3	4	P5_2 / TXOUT2P / LCD1_DATA2 / LCD0_DATA18 / DV1_DATA2 / SCK3 / TIOC1B / MOSI3
5	P5_5 / TXOUT1M / LCD1_DATA5 / LCD0_DATA21 / DV1_DATA5 / AUDIO_XOUT / TIOC0C / FCE / DV0_DATA13	6	P5_4 / TXOUT1P / LCD1_DATA4 / LCD0_DATA20 / DV1_DATA4 / RxD3 / TIOC3D / DV0_DATA12
7	P5_7 / TXOUT0M / LCD1_DATA7 / LCD0_DATA23 / DV1_DATA7 / RxD6 / TIOC0D / SPDIF_OUT / DV0_DATA15	8	P5_6 / TXOUT0P / LCD1_DATA6 / LCD0_DATA22 / DV1_DATA6 / TxD6 / IRQ6 / SPDIF_IN / DV0_DATA14
9	Vss	10	Vss
11	P5_8 / LCD0_EXTCLK / IRQ0 / DV1_CLK / DV0_CLK / CS2	12	Vss
13	Vss	14	Vss
15	P5_10 / WE3/DQM0U/AH / DV0_HSYNC / CTx1 / IETxD / LCD1_DATA17	16	P5_9 / WE2/DQMUL / ET_MDC / DV0_VSYNC / IRQ2 / CRx1 / IERxD / LCD1_DATA16
17	Vss	18	Vss
19	P9_3 / LCD1_DATA19 / SPBSSL_0 / TxD1	20	P9_2 / LCD1_DATA18 / SPBCLK_0 / LTXD0 / SCK1 / A0
21	P9_5 / LCD1_DATA21 / SPBIO10_0 / SSISCK2 / CTS1 / CS4	22	P9_4 / LCD1_DATA20 / SPBIO00_0 / RxD1
23	P9_7 / LCD1_DATA23 / SPBIO30_0 / SSIDATA2 / TIOC1A	24	P9_6 / LCD1_DATA22 / SPBIO20_0 / SSIWS2 / RTS1 / CS5
25	3VCC	26	3VCC
27	P11_1 / DV0_DATA13 / TIOC4B / TxD6 / LCD0_DATA6 / VIO_D13	28	P11_0 / DV0_DATA12 / TIOC4A / SCK6 / LCD0_DATA7 / VIO_D12
29	P11_3 / DV0_DATA15 / TIOC4D / LCD0_DATA4 / VIO_D15	30	P11_2 / DV0_DATA14 / TIOC4C / RxD6 / LCD0_DATA5 / VIO_D14

  : 5V system power supply, 
   : 3.3V system power supply, and 
   : GND

### 3.2 Operation Parts Layout

Figure3.2.1 shows the RTK772100BC00000BR Operation Parts Layout.

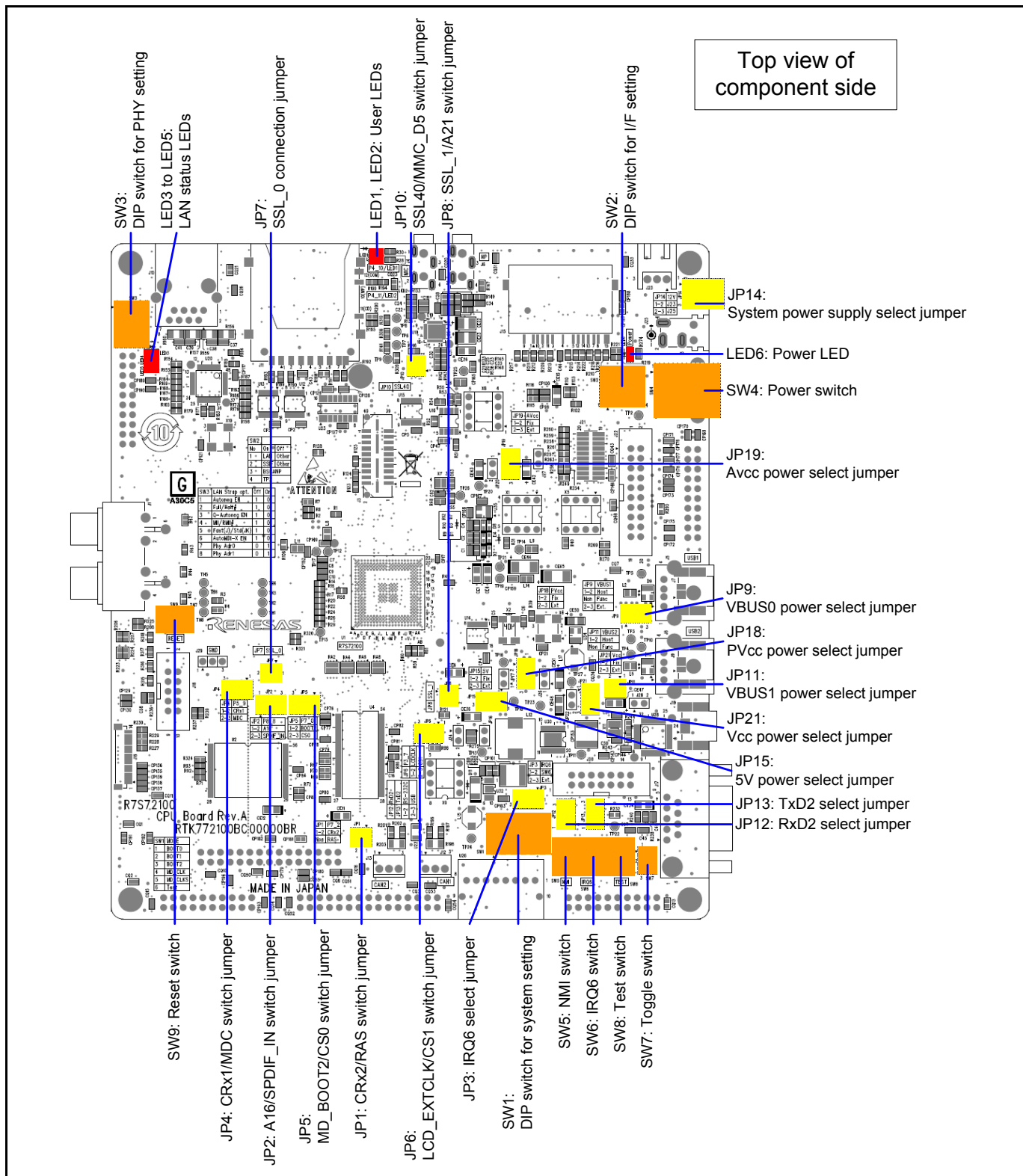


Figure3.2.1 RTK772100BC00000BR Operation Parts Layout

### 3.2.1 Jumpers (JP1 to JP15, JP18, JP19 and JP21)

The RTK772100BC00000BR has 18 jumpers for system setting.

Figure3.2.2 shows the RTK772100BC00000BR System Setting Jumper Assignments. Table3.2.1 to Table3.2.3 list the Jumper Settings.

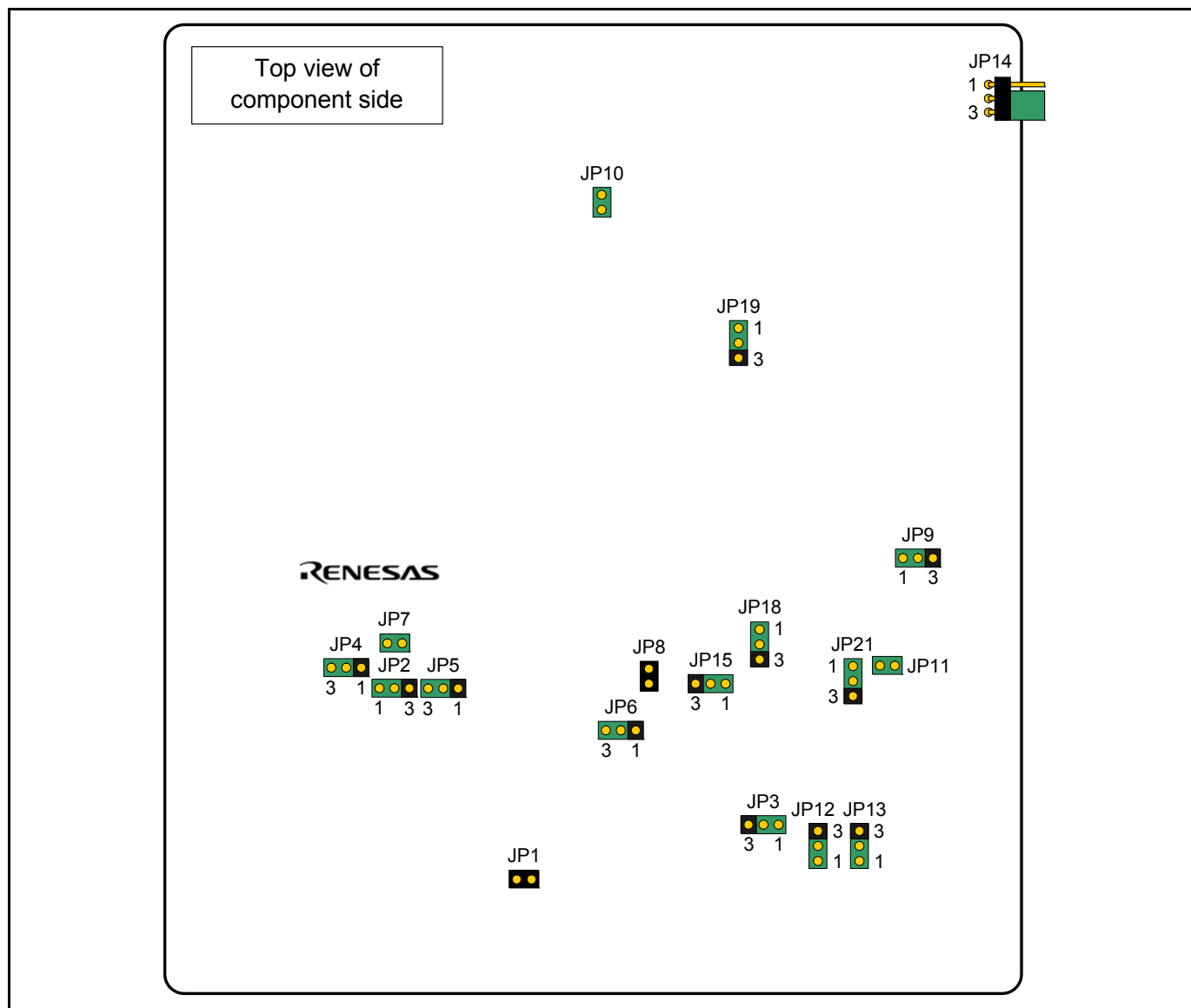


Figure3.2.2 RTK772100BC00000BR System Setting Jumper Assignments.

**Table3.2.1 Jumper Setting for Switching Multifunctional pins (JP1 to JP8, JP10, JP12 and JP13)**

Jumper	Setting	Function
JP1 RAS/CRx2	1 - 2	Connected to CAN transceiver IC (U24) as CRx2 input pin
	None (open)	Connected to SDRAM (U4 and U5) as RAS output pin
JP2 A16/SPDIF_IN	1 - 2	Connected to NOR flash memories (U2 and U3) as A16 output pin
	2 - 3	Connected to TOSLINK connector (U26) as SPDIF_IN input pin
JP3 IRQ6/Ext	1 - 2	Connected to IRQ6 switch (SW6) as IRQ6 input pin
	2 - 3	Connected to expansion connectors (CN4 to CN5)
JP4 CRx1/ET_MDC	1 - 2	Connected to CAN transceiver (U21) as CRx1 input pin
	2 - 3	Connected to Ethernet PHY (U29) as ET_MDC output pin
JP5 MD_BOOT2/CS0	1 - 2	Connected to DIP switch for system setting (SW-3) as MD_BOOT2 input pin
	2 - 3	Connected to NOR flash memory 1 (U2) as CS0 output pin
JP6 LCD1_EXTCLK/CS1	1 - 2	Connected to Crystal oscillator (X9) as LCD1_EXTCLK input pin
	2 - 3	Connected to NOR flash memory 2 (U3) as U3CS1 output pin
JP7 SPBSSL_0/Ext	1 - 2	Connected to serial flash memories (U6 and U7) as SPBSSL_0 output pin
	None (open)	Connected to expansion connectors (CN9 to CN19)
JP8 SPBSSL_1/A21	1 - 2	Connected to serial flash memory (U8) as SPBSSL_1 output pin
	None (open)	Connected to NOR flash memory (U2 and U3) as A21 output pin
JP10 SSL40/ FCLE/MMC_D5	1 - 2	Connected to audio CODEC (U19) as SSL40 output pins
	None (open)	Connected to NAND flash memory (U9) as FCLE output pin Connected to MMC card slot (J15) as MMC_D5 I/O pin
JP12 for Rx D2 connection	1 - 2	Connected to RS-232C transceiver (U27) as Rx D2 input pin
	2 - 3	Connected to USB serial converter IC (U28) as Rx D2 input pin
JP13 for Tx D2 connection	1 - 2	Connected to RS-232C transceiver (U27) as Tx D2 output pin
	2 - 3	Connected to USB serial converter IC (U28) as Tx D2 output pin

indicates initial setting.

**Note:** The power of the board should be off when changing the jumpers.

**Table3.2.2 Jumper Setting for USB VBUS Power Supply (JP9 and JP11)**

Jumper	Setting	Function
JP9 for USB ch0	1 - 2	Used USB ch0 in host mode (Provides VBUS0 power supply)
	None (open)	Used USB ch0 in function mode (Does not provide VBUS0 power supply)
	2 - 3	Used USB ch0 in host mode (Provides VBUS0 power supply from expansion connectors)
JP11 for USB ch1	1 - 2	Used USB ch1 in host mode (Provides VBUS1 power supply)
	None (open)	Used USB ch1 in function mode (Does not provide VBUS1 power supply)

indicates initial setting.

**Note:** The power of the board should be off when changing the jumpers.

**Table3.2.3 Jumper Setting for Power Select (JP14, JP1, JP18, JP19 and JP21)**

Jumper	Setting	Function
JP14 for system power supply	1 - 2	Provides system power supply from J23
	2 - 3	Provides system power supply from J25 (using AC adapter)
JP15 for 5V power supply	1 - 2	Provides 5V power supply from U30 (Internal power supply)
	2 - 3	Provides 5V power supply from J24. (External power supply)
JP18 for D3.3V power supply	1 - 2	Provides R7S72100 digital 3.3V power supply from U32 (Internal power supply)
	2 - 3	Provides R7S72100 digital 3.3V power supply from J26 (External power supply)
JP19 for A3.3V power supply	1 - 2	Provides R7S72100 analog 3.3V power supply from U32 (Internal power supply)
	2 - 3	Provides R7S72100 analog 3.3V power supply from J27 (External power supply)
JP21 for 1.18V power supply	1 - 2	Provides R7S72100 1.18V power supply from U34 (Internal power supply)
	2 - 3	Provides R7S72100 1.18V power supply from J28 (External power supply)

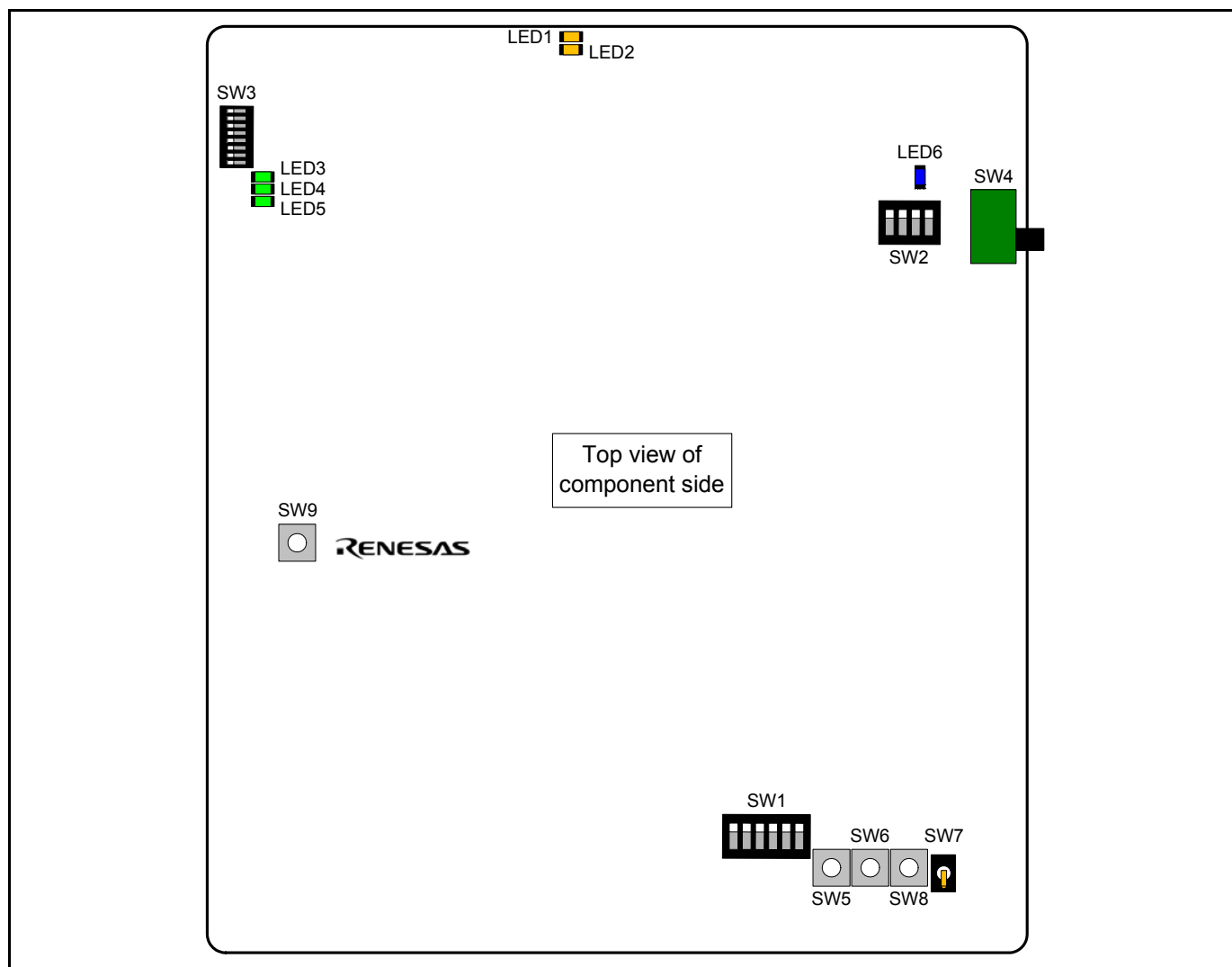
 indicates initial setting.

**Note:** The power of the board should be off when changing the jumpers.

### 3.2.2 Switches and LEDs

The RTK772100BC00000BR includes nine switches and six LEDs.

Figure3.2.3 shows the RTK772100BC00000BR Switches, LED Pin Assignments. Table3.2.5 to Table3.2.7 list the Function Descriptions for DIP switches, and Table3.2.8 lists the Descriptions of RTK772100BC00000BR LEDs.



**Figure3.2.3 RTK772100BC00000BR Switches, LED Pin Assignments**

**Table3.2.4 RTK772100BC00000BR Switches**

No.	Function	Remarks
SW1	DIP switch for system setting (6/package)	Refer to Table3.2.5 for more details
SW2	DIP switch for I/F setting (4/package)	Refer to Table3.2.6 for more details
SW3	DIP switch for Ethernet PHY setting (8/package)	Refer to Table3.2.7 for more details
SW4	Power supply switch	-
SW5	NMI switch	Refer to Section 2.7 for more details
SW6	IRQ6 switch	
SW7	IRQ6 toggle switch	
SW8	TEST switch	
SW9	Reset switch	Refer to Section 2.9 for more details

**Table3.2.5 Function Descriptions of DIP Switch for System Setting (SW1)**

No.	Function	Remarks
SW1-1 MD_BOOT0	OFF MD_BOOT0 = "H"	Boot mode MD_BOOT[2:0] 0 (B'*00) NOR flash memory (bus width 16-bit) 1 (B'*10) NOR flash memory (bus width 32-bit) 3 (B'101) Serial flash memory 4 (B'011) eSD 5 (B'111) eMMC
	ON MD_BOOT0 = "L"	
SW1-2 MD_BOOT1	OFF MD_BOOT1 = "H"	
	ON MD_BOOT1 = "L"	
SW1-3 MD_BOOT2	OFF MD_BOOT2 = "H"	
	ON MD_BOOT2 = "L"	
SW1-4 MD_CLK	OFF MD_CLK = "H"	Inputs system clock from USB_X1
	ON MD_CLK = "L"	Inputs system clock from EXTAL
SW1-5 MD_CLKS	OFF MD_CLKS = "H"	SSCG operation ON
	ON MD_CLKS = "L"	SSCG operation OFF
SW1-6	OFF	Sets without reference to setting
	ON	

indicates initial setting.

**Table3.2.6 Function Descriptions of DIP Switch for I/F Setting (SW2)**

No.	Function	Remarks
SW2-1 P2_[11:0], P3_[6:3] for connection destination	OFF LAN#/MLB,EXT = "H"	Connected to MOST I/F connector (J3) and expansion connectors
	ON LAN#/MLB,EXT = "L"	Connected to Ethernet PHY (U20)
SW2-2 P4_[7:4] for connection destination	OFF SSIF#/EXT = "H"	Connected to expansion connectors
	ON SSIF#/EXT = "L"	Connected to audio CODEC (U19)
SW2-3 BSCANP	OFF BSCANP = "H"	Boundary scan operation
	ON BSCANP = "L"	Normal operation
SW2-4 TP2	OFF TP2 = "H"	
	ON TP2 = "L"	

indicates initial setting.

**Table3.2.7 Function Descriptions of DIP Switch for Ethernet PHY Setting (SW3)**

No.	Function		Remarks
SW3-1 Autoneg	OFF	P0RXD3 = "H"	Autoneg enabled, 100BaseT
	ON	P0RXD3 = "L"	Autoneg disabled, 100BaseT
SW3-2 Duplex	OFF	P0RXD2 = "H"	If Autoneg disabled : Full Duplex If Autoneg enabled : Forced Full Duplex in parallel detect
	ON	P0RXD2 = "L"	If Autoneg disabled : Half Duplex If Autoneg enabled : Parallel detect ends in half duplex mode
SW3-3 Quick Autoneg	OFF	P0RXCLK = "H"	If Autoneg enabled : Quick Autonegotiation, shortest times If Autoneg disabled : Special Isolate. In this mode the PHYs will not set up a link unless programmed and enabled through the SMI.
	ON	P0RXCLK = "L"	Disable Quick Autonegotiation
SW3-4 Interface	OFF	P0RXERR = "H"	Configure MII Interface
	ON	P0RXERR = "L"	Configure RMII Interface
SW3-5 Frame detection	OFF	P0TXCLK = "H"	Fast Mode, Only "J" required for Start of Frame detection. Do not use in RMII Mode.
	ON	P0TXCLK = "L"	Standard Mode, "JK" required for Start of Frame detection.
SW3-6 AUTOMDI-X	OFF	P0CRS = "H"	AUTOMDI-X enabled
	ON	P0CRS = "L"	AUTOMDI-X disabled
SW3-7 PHY Address0	OFF	P0RXD0 = "L"	Configures the upper two bits N and M of the PHY addresses. 00: device uses address 00xxx for SMI 01: device uses address 01xxx for SMI 10: device uses address 10xxx for SMI 11: device uses address 11xxx for SMI
	ON	P0RXD0 = "H"	
SW3-8 PHY Address1	OFF	P0RXD1 = "L"	
	ON	P0RXD1 = "H"	

 indicates initial setting.

**Table3.2.8 Descriptions of RTK772100BC00000BR LEDs**

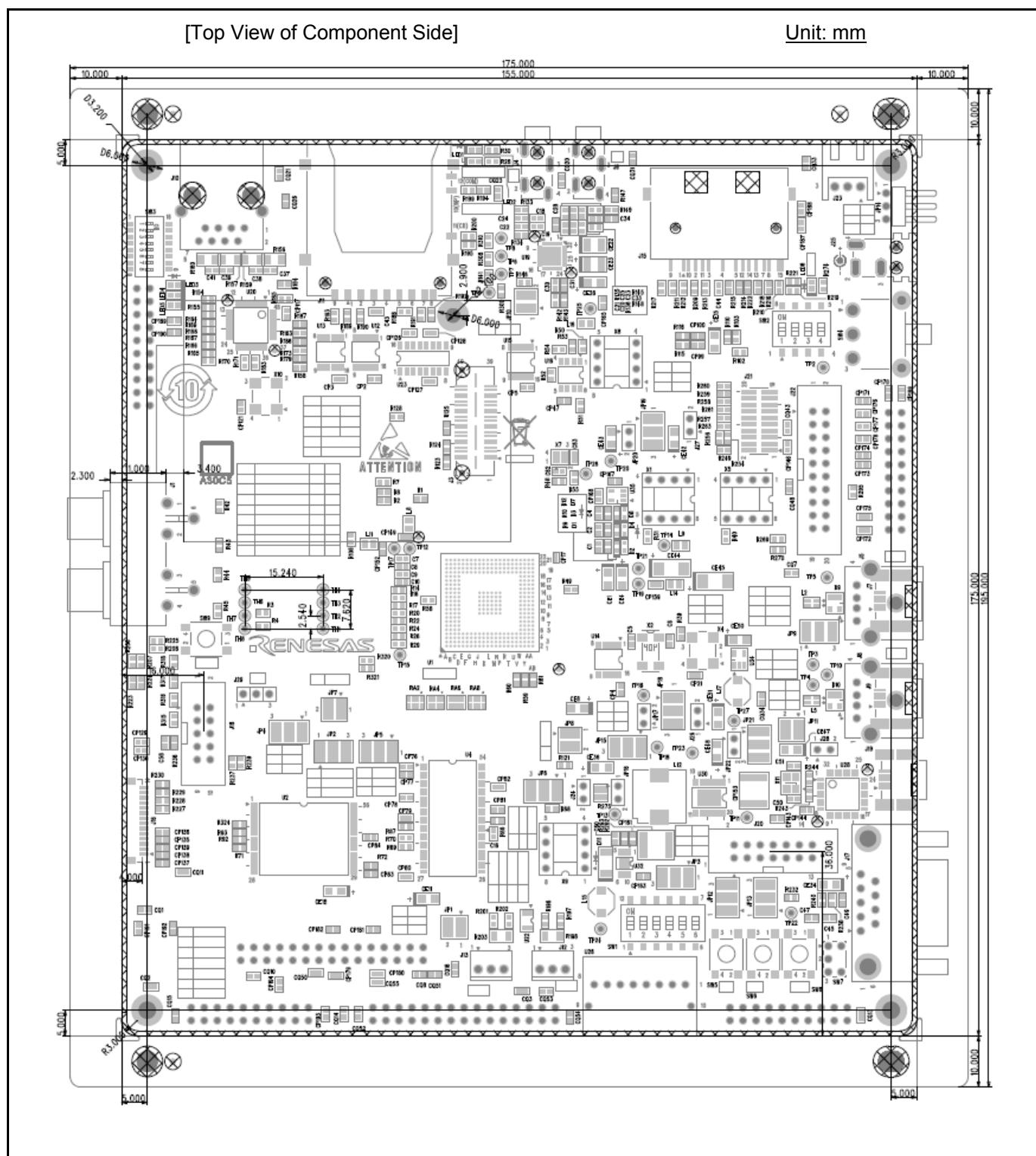
No.	Color	Function
LED1	Yellow	User LED (Lights up when P4_10 outputs "L")
LED2	Yellow	User LED (Lights up when P4_11 outputs "L")
LED3	Green	LAN status LED (LinkA: lights up when linked up)
LED4	Green	LAN status LED (ACT: blinks when communicating)
LED5	Green	LAN status LED (FD: lights up in full duplex communication)
LED6	Blue	Power supply LED (Lights up when 12V power is supplied)



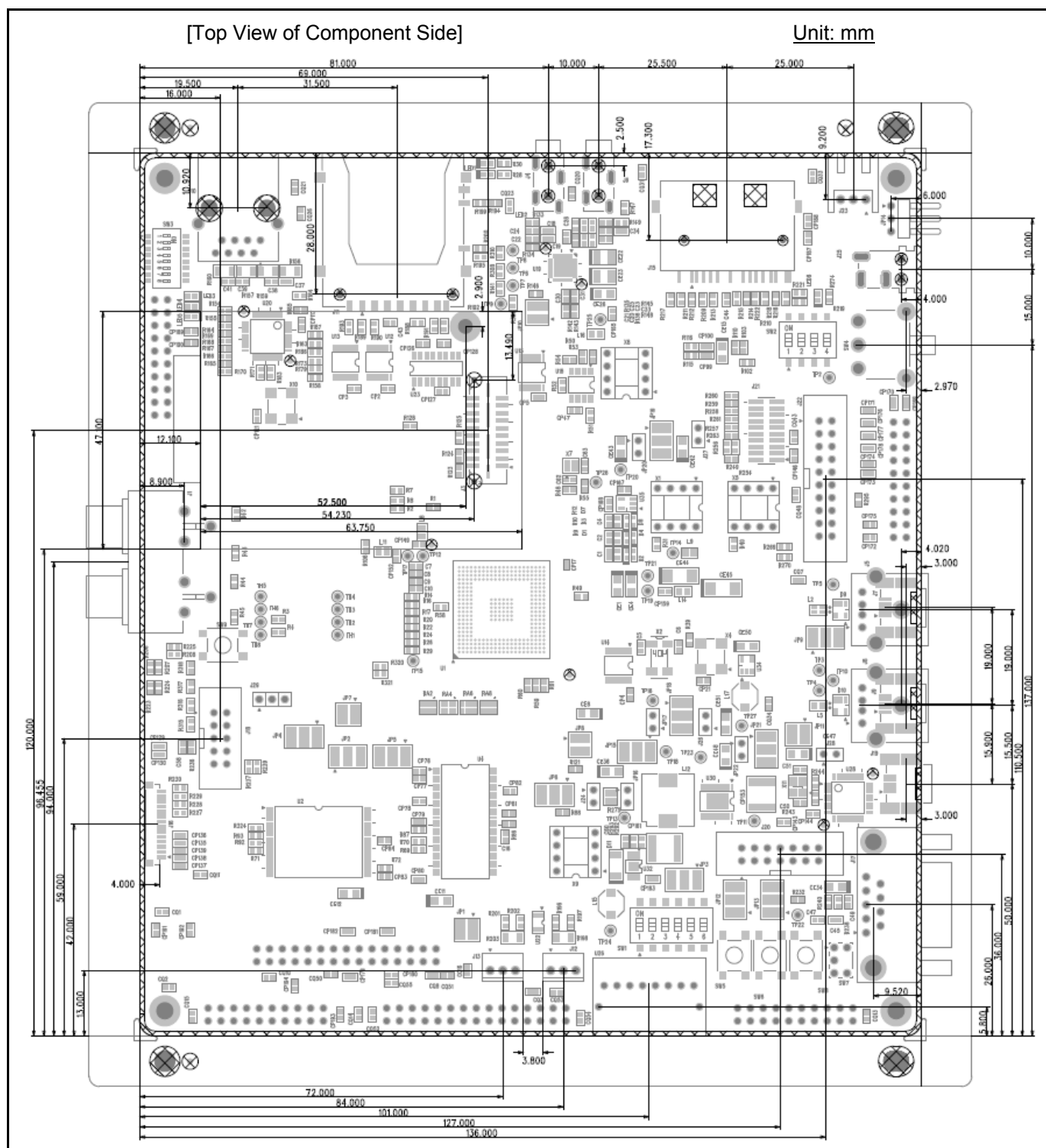
### 3.3 Dimensions

Figure3.3.1 and Figure3.3.2 show the RTK772100BC00000BR Dimensions of Top View of Component Side.

Figure3.3.3 shows the RTK772100BC00000BR Dimensions of Perspective View of Component Side.



**Figure3.3.1 RTK772100BC00000BR Dimensions 1 (Top View of Component Side)**



**Figure3.3.2 RTK772100BC00000BR Dimensions 2 (Top View of Component Side)**

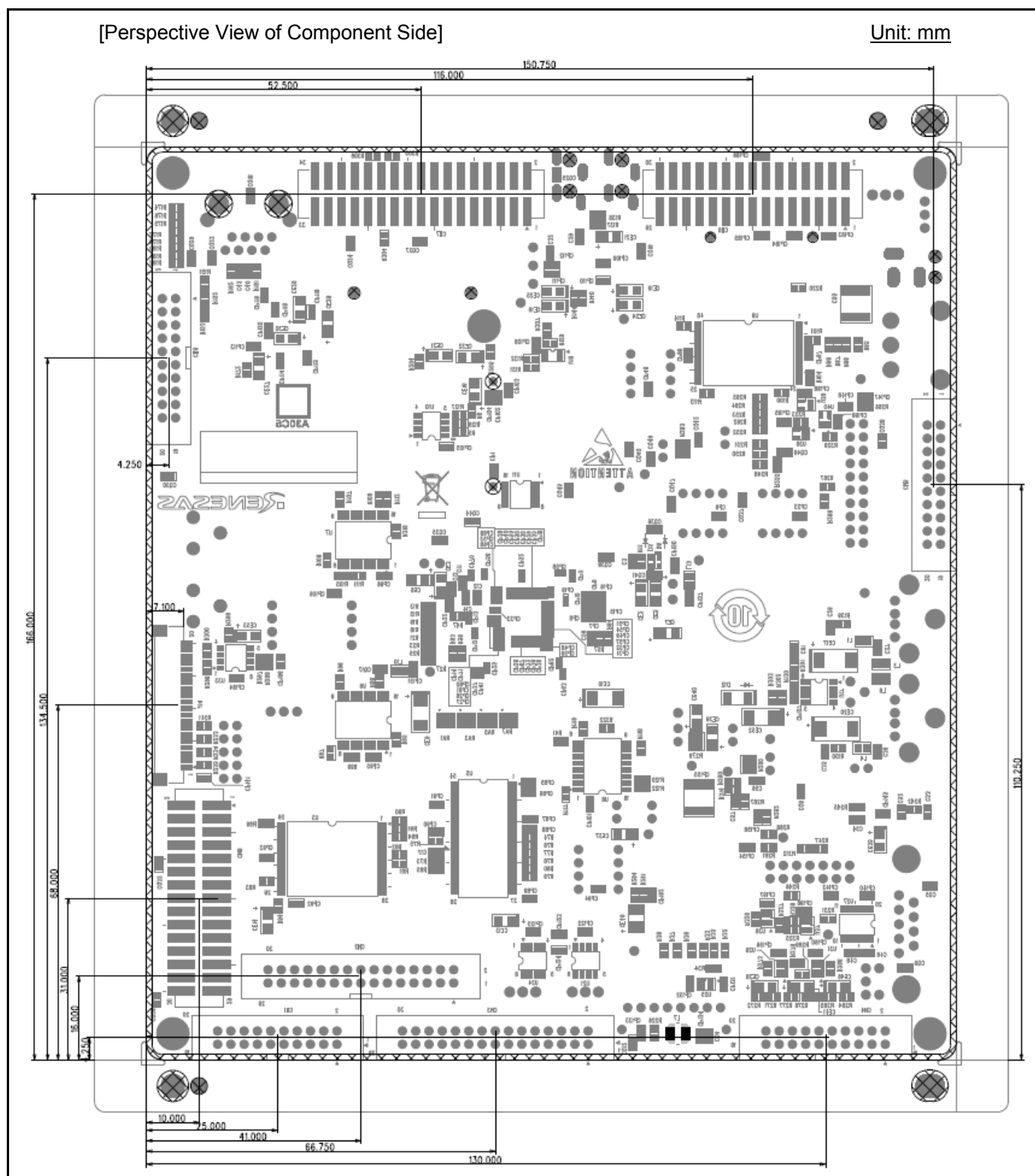


Figure3.3.3 RTK772100BC00000BR Dimensions 3 (Perspective View of Component Side)

This page intentionally left blank

## Appendix RTK772100BC00000BR Schematics



# R7S72100 CPU board RTK772100BC00000BR SCHEMATICS (RZ/A1H, BGA324)


## TITLE

Index  
CPU-main  
CPU-power & clock, Dip-SW  
NOR-flash, SDRAM  
Serial-flash, NAND, EEPROM, MOST  
Audio-codec, USB, LAN  
SD/MMC, SPDIF, CAN, LVDS  
Serial(RS-232C, USB), UDI  
Power, Reset, Push-SW  
Ext. Connector


## PAGE

1  
2  
3  
4  
5  
6  
7  
8  
9  
10

## Note:

 Digital GND (GND)

 Analog GND (AVss)

 Not mounted

12VCC = Digital 12V (System Power)

5VCC = Digital 5V

3VCC = Digital 3.3V

PVcc = 3.3V for CPU I/O

Vcc = 1.18V for CPU Core

PLLVcc = Digital 1.18V for PLL

USBAPVcc = Analog 3.3V for USB

USBAVcc = Analog 1.18V for USB

AVcc = Analog 3.3V

AVref = 3.3V for ADC Voltage Reference

AN3V = Analog 3.3V for Audio-codec, LAN

R = Fixed Resistors

RA = Resistor Array

C = Ceramic Caps

CE = Tantalum Electrolytic Caps

CP = Decoupling Caps

CHANGE

Renesas Solutions Corp.

RTK772100BC00000BR

SCALE

DRAWN

CHECKED

DESIGNED

APPROVED

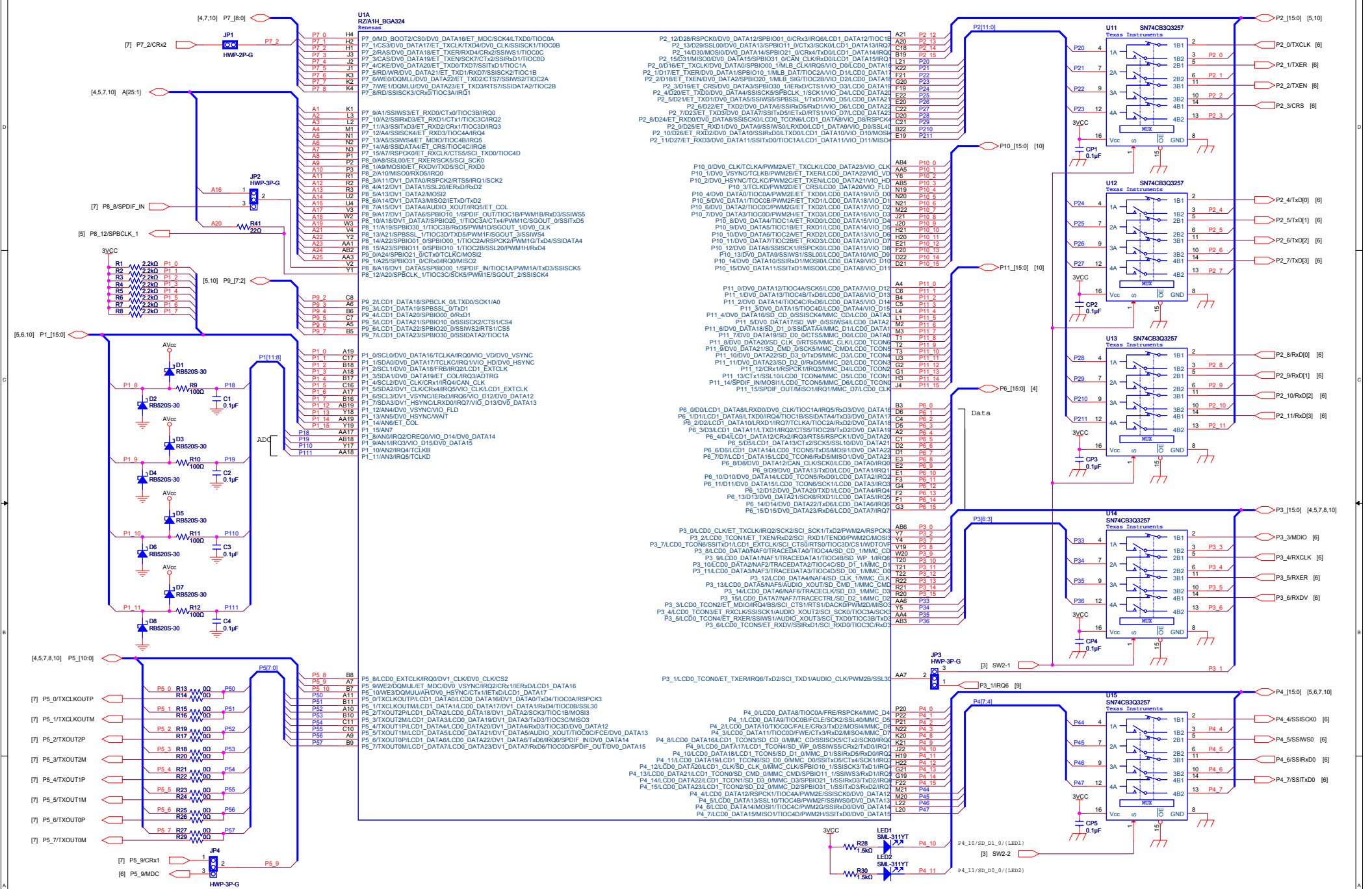
INDEX

( 1 / 10 )

DATE

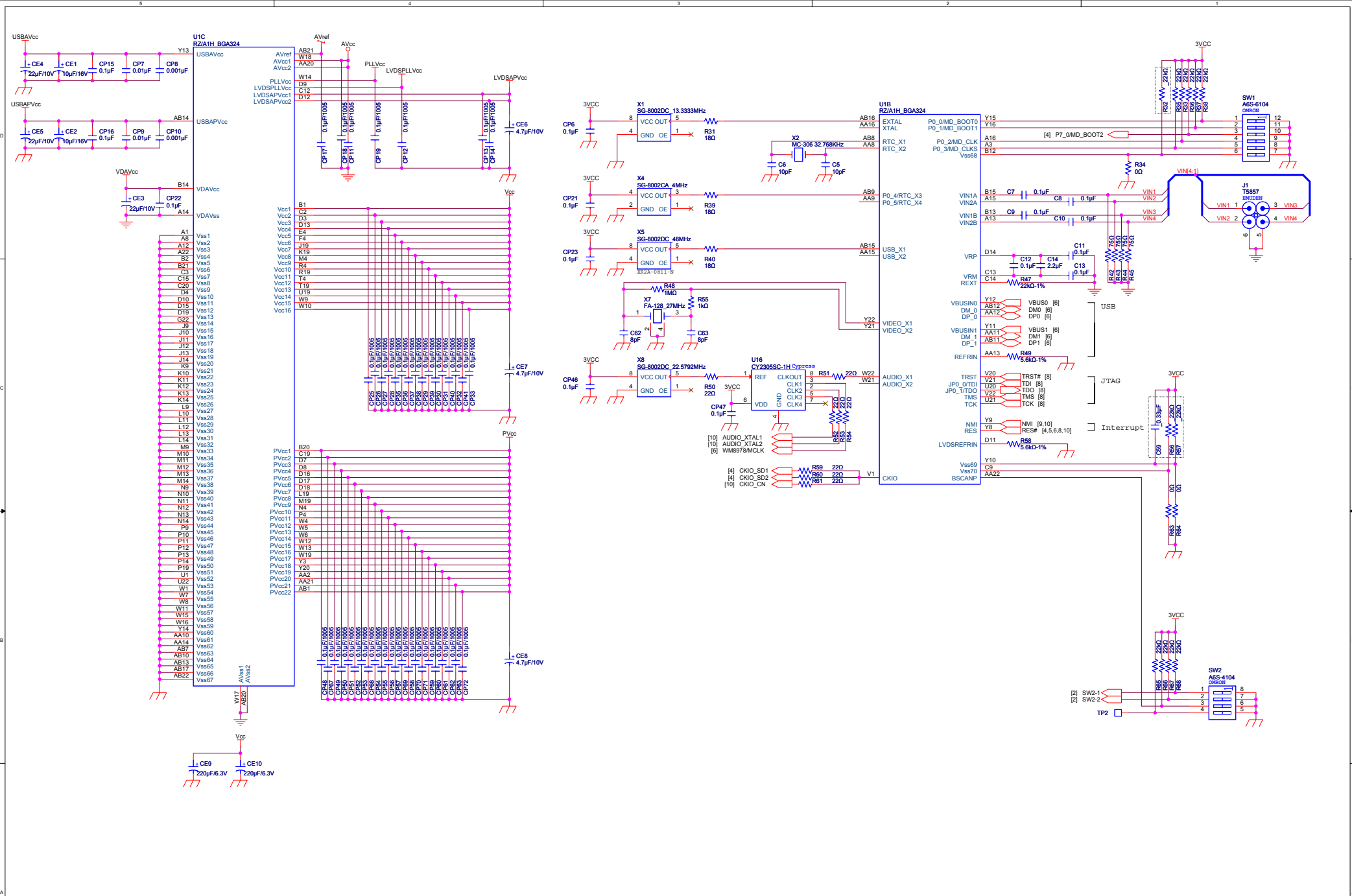
13-12-19

D-RTK772100BC00000BR\_C-A-R03

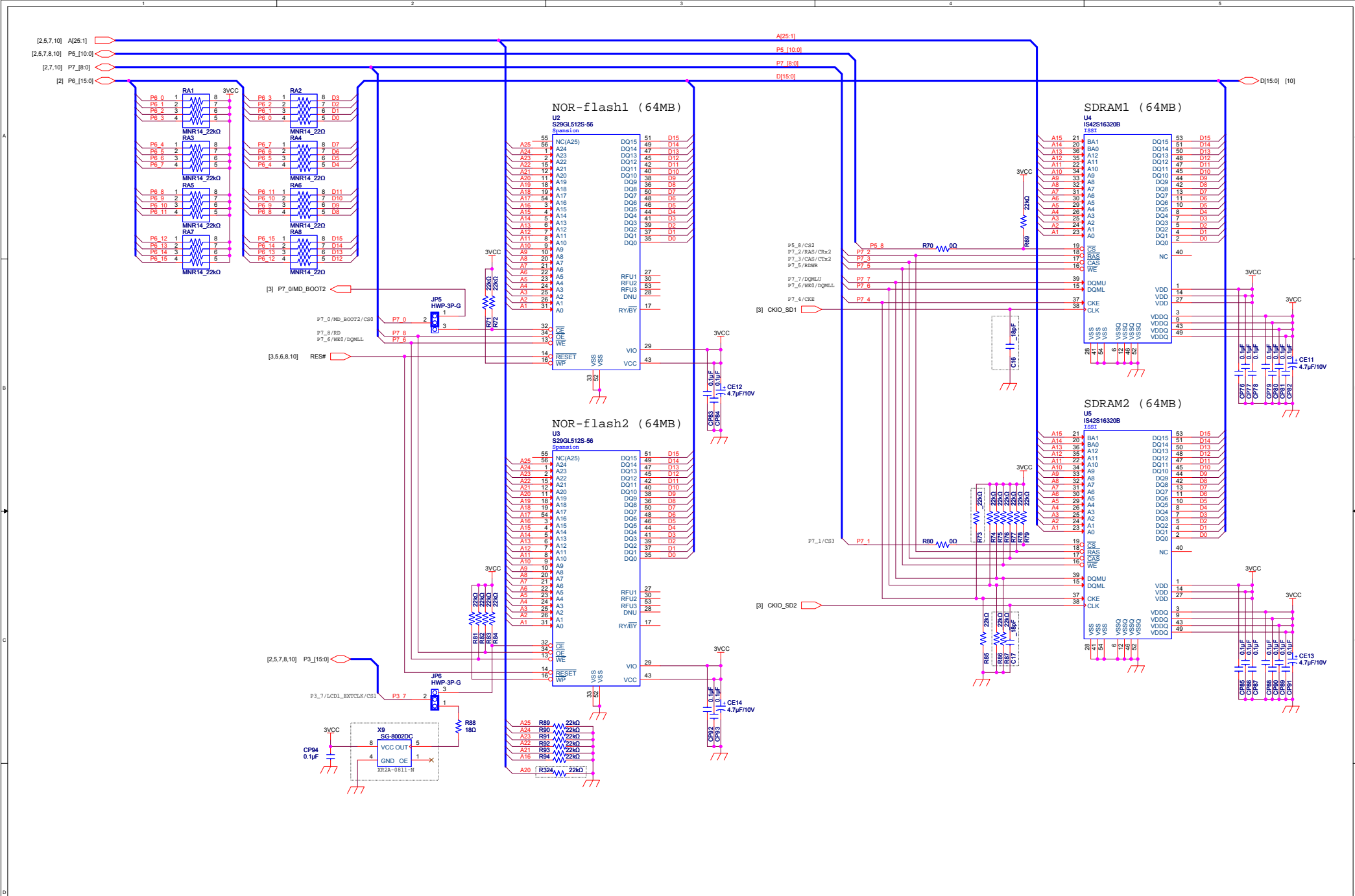


CHANGE	Renesas Solutions Corp.					RTK772100BC00000BR	
						CPU-main	
						( 2 / 10 )	
						D-RTK772100BC00000BR_C-A-R03	
SCALE		DRAWN	CHECKED	DESIGNED	APPROVED		
DATE		13-12-19					

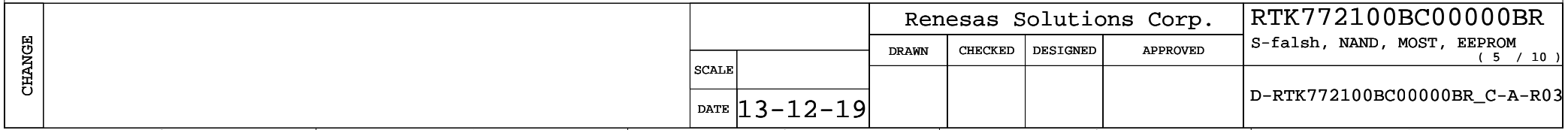




CHANGE					Renesas Solutions Corp.				RTK772100BC00000BR
					DRAWN	CHECKED	DESIGNED	APPROVED	CPU-power & clock, Dip-SW ( 3 / 10 )
	SCALE						D-RTK772100BC00000BR_C-A-R03		
	DATE	13-12-19							



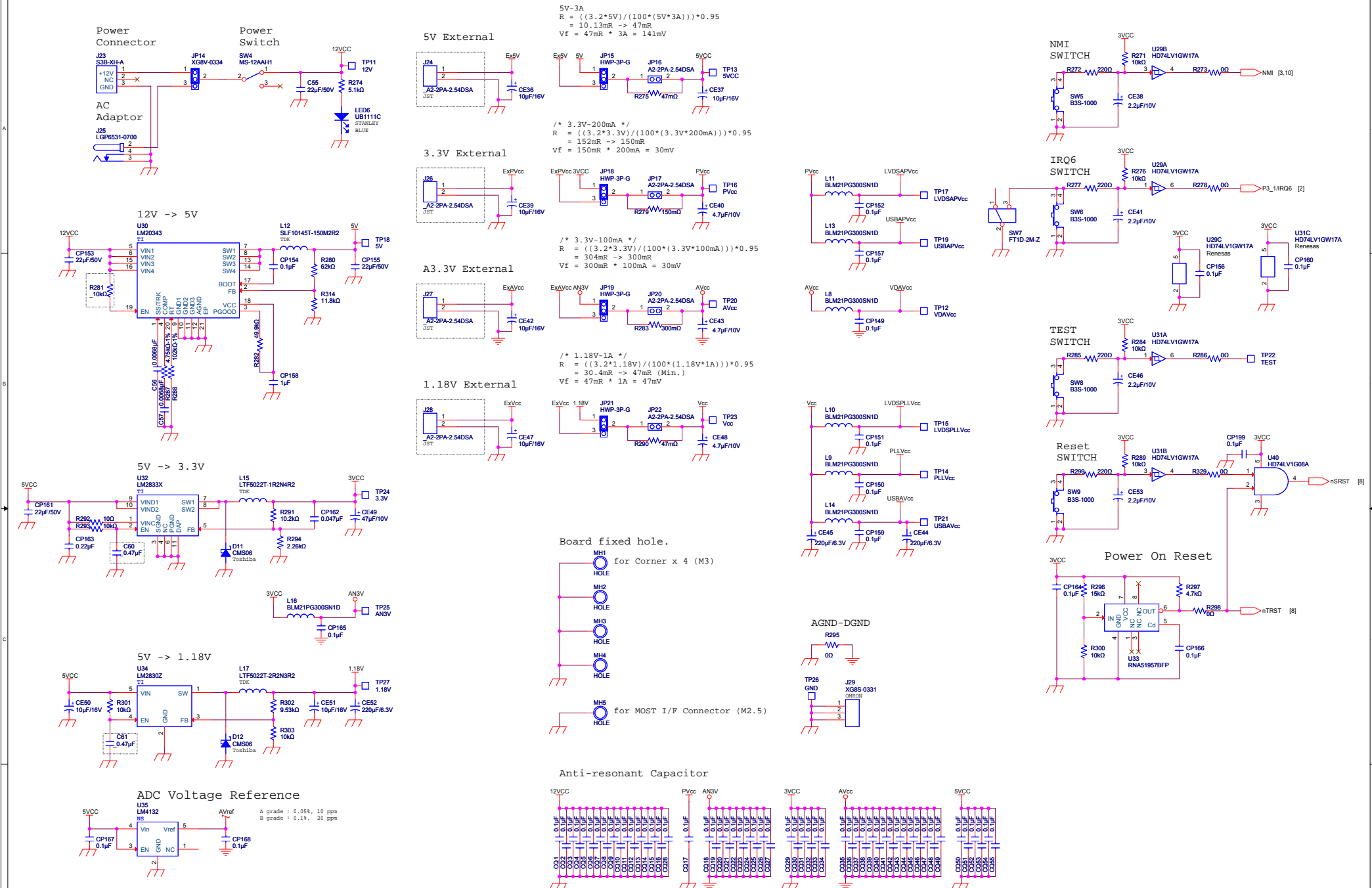
CHANGE	Renesas Solutions Corp.				RTK772100BC00000BR	
					NOR-flash, SDRAM	
					( 4 / 10 )	
					D-RTK772100BC00000BR_C-A-R03	
SCALE		DRAWN		CHECKED	DESIGNED	APPROVED
DATE		13-12-19				



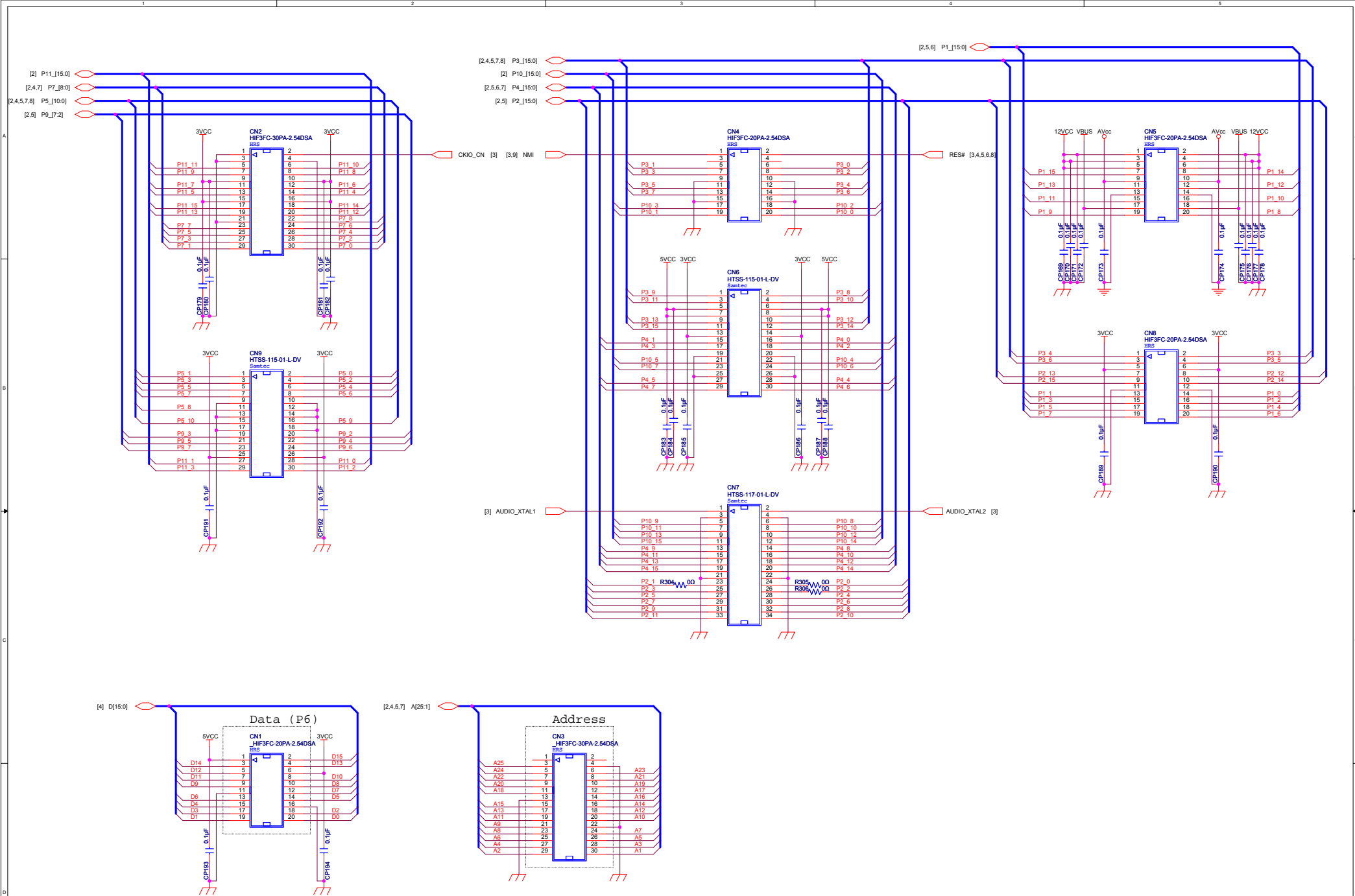








CHANGE					Renesas Solutions Corp.				RTK772100BC00000BR	
									Power, Reset, SW	
					DRAWN	CHECKED	DESIGNED	APPROVED	( 9 / 10 )	
					SCALE				D-RTK772100BC00000BR_C-A-R03	
				DATE	13-12-19					



CHANGE	Renesas Solutions Corp.				RTK772100BC00000BR	
					Ext. Connector	
					( 10 / 10 )	
					D-RTK772100BC00000BR_C-A-R03	
SCALE		DRAWN		CHECKED	DESIGNED	APPROVED
DATE		13-12-19				



REVISION HISTORY	R7S72100 CPU board RTK772100BC00000BR User's Manual
------------------	---

Rev.	Date	Description	
		Page	Summary
0.01	Jul. 6, 2012	-	First edition
0.02	Jul. 31, 2012	-	Review specifications. Correct the erroneous descriptions.
0.03	Dec. 12, 2012	-	Revise the items pointed out when deciding the details. Correct the erroneous descriptions.
0.04	Apr. 26, 2013	-	Review the pin names and part structures. Correct the erroneous descriptions.
0.05	May. 21, 2013	-	Correct the erroneous descriptions.
0.06	Jun. 6, 2013	-	Add a general name "GENMAI" for the board. Correct the erroneous descriptions.
0.07	Oct. 18, 2013	-	Correct the erroneous descriptions. Update the schematics.
0.08	Dec. 19, 2013	2-36 Appendix	Figure2.10.1 Error correction (5V channel and R7S72100 power supply section were reviewed.) Update the schematics.

---

R7S72100 CPU board RTK772100BC00000BR User's Manual

Publication Date: Dec. 19, 2013    Rev.0.08  
Published by: Renesas Electronics Corporation

---



## SALES OFFICES

## Renesas Electronics Corporation

<http://www.renesas.com>

Refer to "<http://www.renesas.com/>" for the latest and detailed information.

### **Renesas Electronics America Inc.**

2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.  
Tel: +1-408-588-6000, Fax: +1-408-588-6130

### **Renesas Electronics Canada Limited**

1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada  
Tel: +1-905-898-5441, Fax: +1-905-898-3220

### **Renesas Electronics Europe Limited**

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.  
Tel: +44-1628-651-700, Fax: +44-1628-651-804

### **Renesas Electronics Europe GmbH**

Arcadiastrasse 10, 40472 Düsseldorf, Germany  
Tel: +49-211-65030, Fax: +49-211-6503-1327

### **Renesas Electronics (China) Co., Ltd.**

7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China  
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

### **Renesas Electronics (Shanghai) Co., Ltd.**

Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China  
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

### **Renesas Electronics Hong Kong Limited**

Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong  
Tel: +852-2886-9318, Fax: +852 2886-9022/9044

### **Renesas Electronics Taiwan Co., Ltd.**

13F, No. 363, Fu Shing North Road, Taipei, Taiwan  
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

### **Renesas Electronics Singapore Pte. Ltd.**

80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre Singapore 339949  
Tel: +65-6213-0200, Fax: +65-6213-0300

### **Renesas Electronics Malaysia Sdn.Bhd.**

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

### **Renesas Electronics Korea Co., Ltd.**

11F., Samik Lavied' or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea  
Tel: +82-2-558-3737, Fax: +82-2-558-5141

R7S72100 CPU board  
RTK772100BC00000BR  
(GENMAI)  
User's Manual

