

GCPX3 Evaluation Kit J70D1

R30AN0276EJ0200

Rev.2.00

Apr 5, 2018

RTK0EE0003D01002BJ Schematics and BOM

Introduction

This document describes the schematics and the bill of materials of GCPX3 Evaluation Kit J70D1.

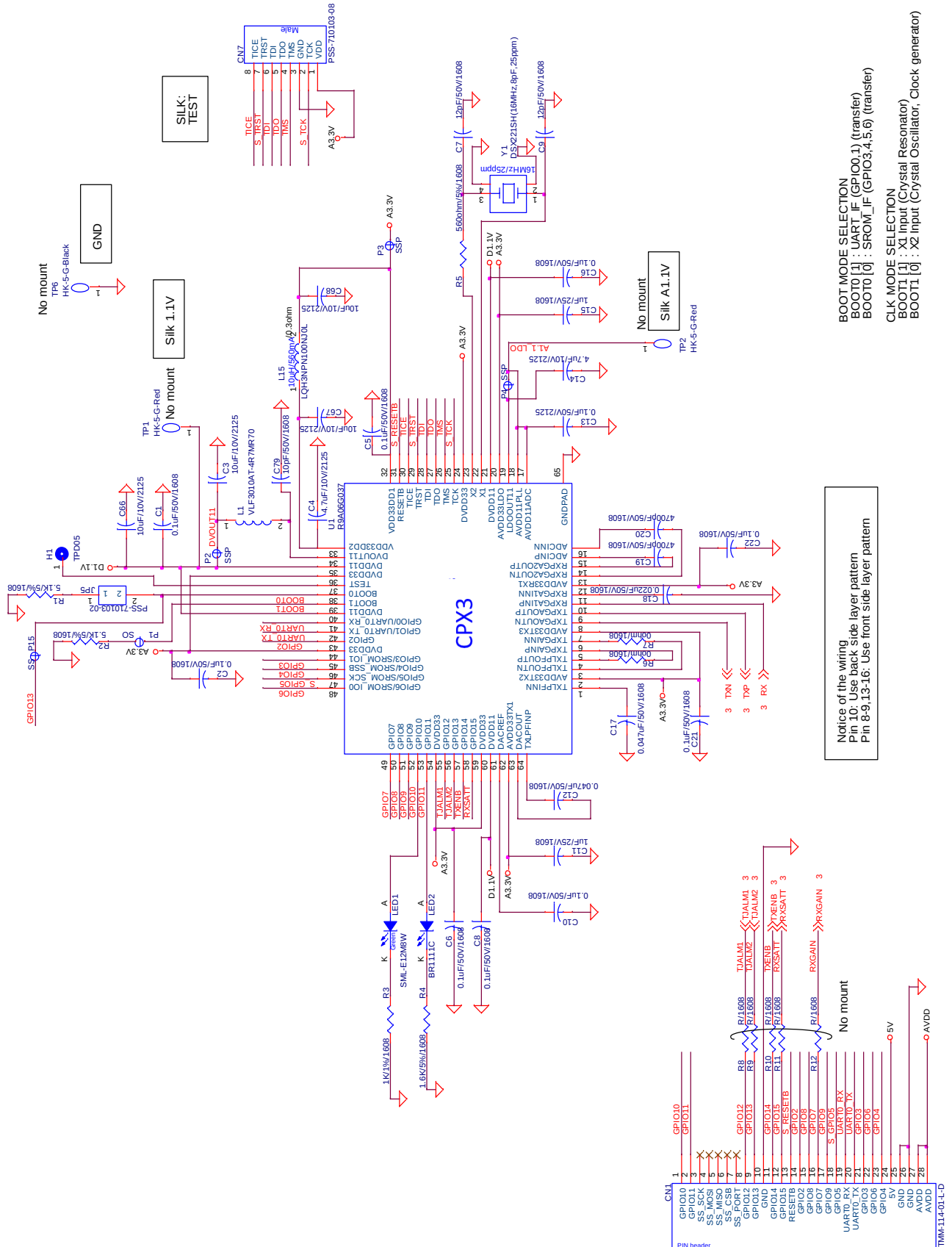
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1. Schematics

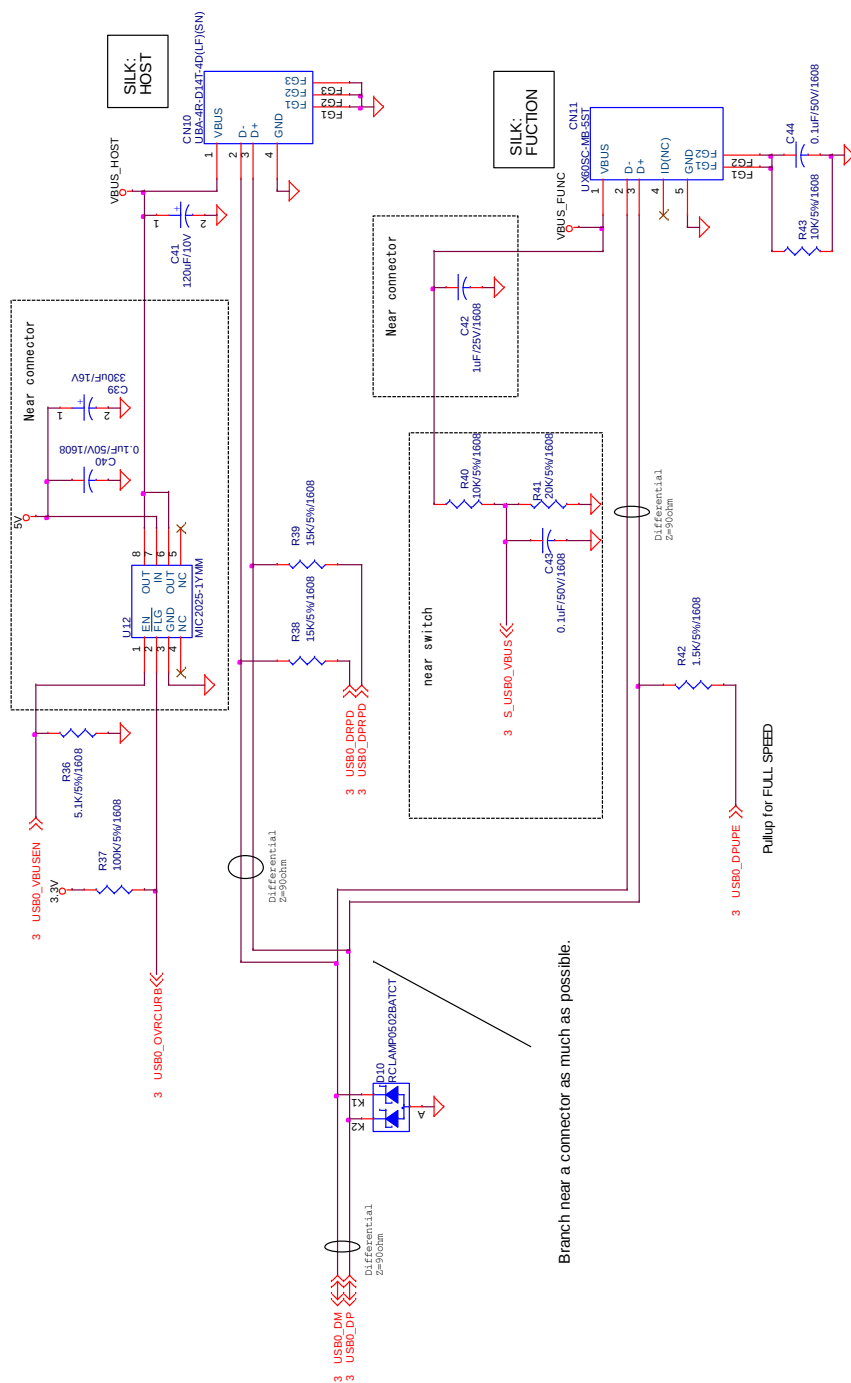
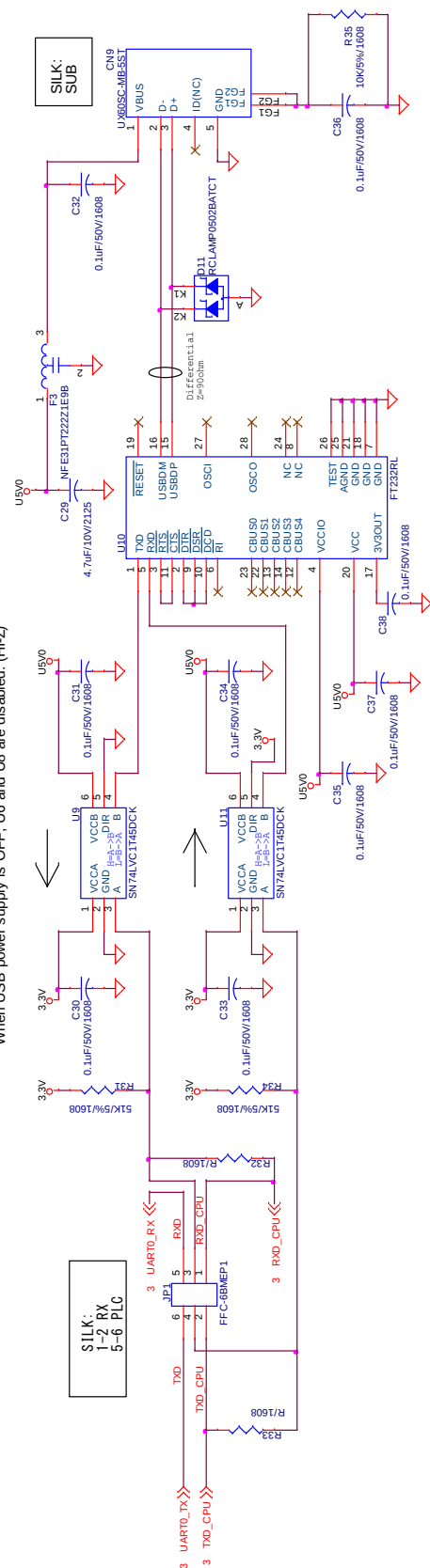
1.1 PLC board

1.1.1 PLC modem LSI (R9A06G037:CPX3)



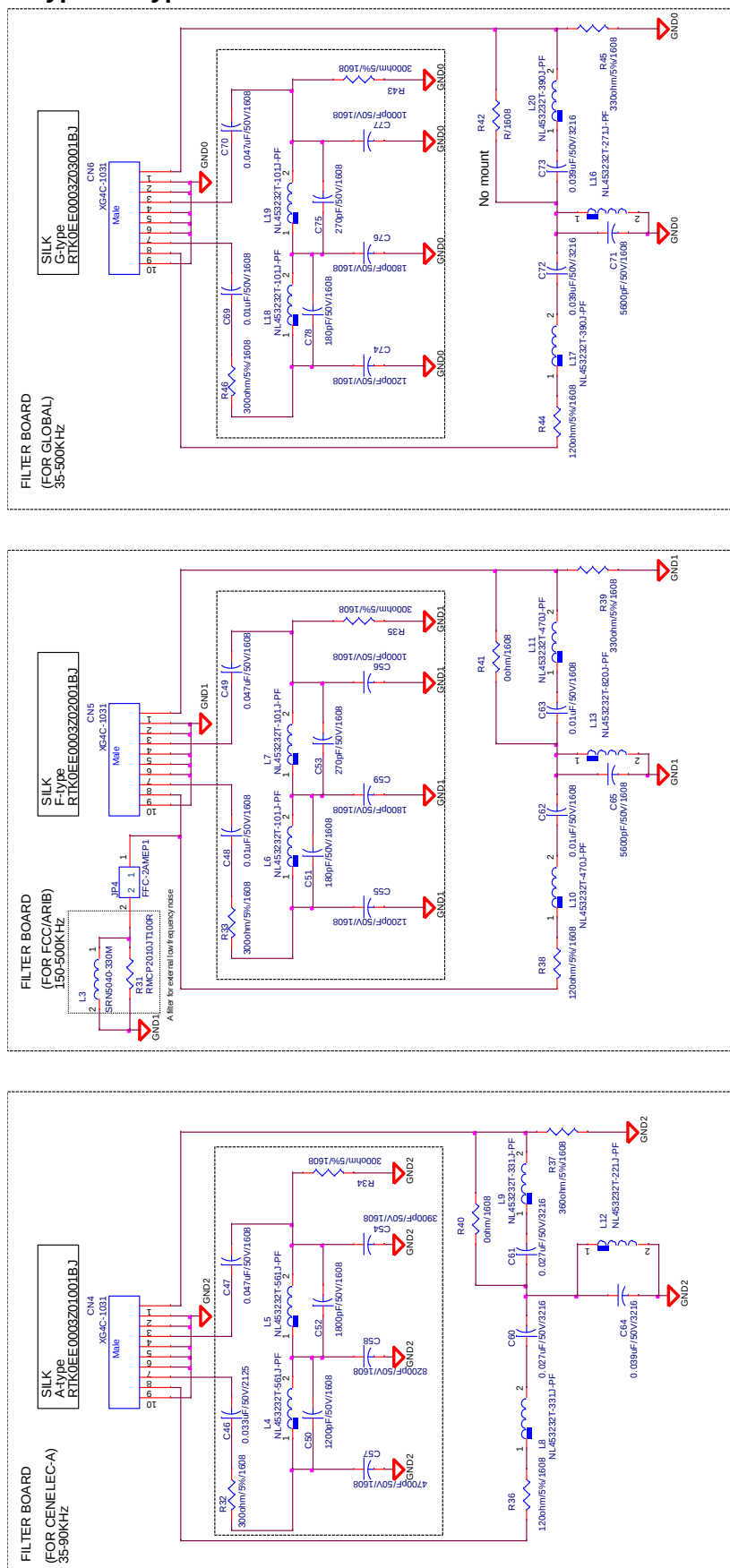
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When USB power supply is OFF, U6 and U8 are disabled. (H1-Z)



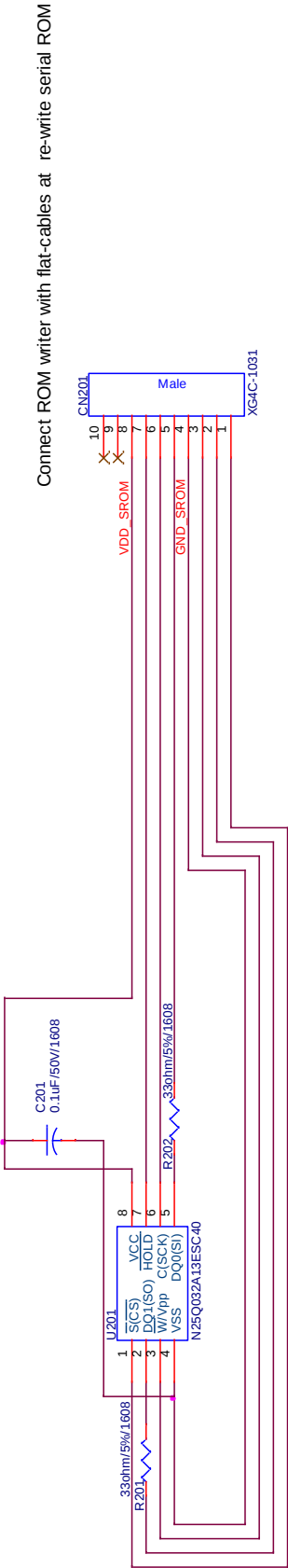
Branch near a connector as much as possible.

1.3.1 A-type / F-type / G-type



1.4 S-ROM board

Serial ROM board



2. Bill of materials

2.1 PLC board

Table 2.1 PLC board (1/2)

Quantity	Reference	KIND	Parts Name	Manufacturer	Memo
1	CN1	CONNECTOR	TMM-114-01-L-D	SAMTEC	
1	CN2	CONNECTOR	TMM-104-01-L-D	SAMTEC	
1	CN3	CONNECTOR	XG4H-1031	OMRON	
1	CN7	CONNECTOR	PSS-710103-08	HIROSUGI	
13	C1,C2,C5,C6,C8,C10,C16,C21,C22,C32,C44,C45,C13	CERAMIC CAPACITOR	CC0603KRX7R9BB104	Yageo	0.1uF/50V/1608/X7R 10%
7	C3,C38,C42,C43,C66,C67,C68	CERAMIC CAPACITOR	LMK212B7106KG-TD	Taiyo Yuden	10uF/10V/2125/X7R 10%
2	C19,C20	CERAMIC CAPACITOR	CGA3E2C0G1H472J	TDK	4700pF/50V/1608/C0G 5% 30ppm
2	C7,C9	CERAMIC CAPACITOR	C1608C0G1H120J	TDK	12pF/50V/1608/C0G 5%
9	C11,C15,C25,C28,C33,C34,C35,C36,C40	CERAMIC CAPACITOR	TMK107B7105KA-T	Taiyo Yuden	1uF/25V/1608/X7R 10%
2	C12,C17	CERAMIC CAPACITOR	CC0603KRX7R9BB473	Yageo	0.047uF/50V/1608/X7R 10%
2	C14,C4	CERAMIC CAPACITOR	C2012X7R1A475K	TDK	4.7uF/10V/2125/X7R 10%
4	C18,C24,C27,C31	CERAMIC CAPACITOR	C1608X7R1H223K	TDK	0.022uF/50V/1608/X7R 10%
1	C26	CERAMIC CAPACITOR	GRM32ER71H106KA12L	TDK	10uF/50V/3225/X7R 10%
1	C30	CERAMIC CAPACITOR	C1608C0G1H122J	TDK	1200pF/50V/1608/C0G 5% 30ppm
1	C37	ALUM CAP	EEH-ZC1E101XP	Panasonic	
1	C39	CERAMIC CAPACITOR	C1608C0G1H101J080AA	TDK	100pF/50V/1608 C0G 5%
1	C41	CERAMIC CAPACITOR	LMK316AB7226ML-TR	Taiyo Yuden	22uF/10V/3216/X7R 20%
1	C79	CERAMIC CAPACITOR	GRM1885C1H100JA01D	MURATA	10pF/50V/1608/C0G 5%
2	C124,C127	CERAMIC CAPACITOR	C1608C0G1E103J080AA	TDK	0.01uF/50V/1608/C0G 5% 30ppm
2	D3,D1	DIODE	ES3AB-13-F	Diodes Inc	
1	D2	DIODE	KDZTR16B	ROHM	
3	JP5,JP6,JP7	CONNECTOR	PSS-710103-02	HIROSUGI	
1	LED1	LED	SML-E12M8W	Rohm	
1	LED2	LED	BR1111C	STANLEY	
1	L1	INDUCTOR	VLF3010AT-4R7MR70	TDK	alternative : VLS3015ET-4R7M(TDK) VLS3012HBX-4R7M(TDK) NR3010T4R7M(Taiyo Yuden) NR3012T4R7M(Taiyo Yuden)
1	L2	INDUCTOR	NR3010T4R7M	Taiyo Yuden	alternative : NR3012T4R7M(Taiyo Yuden) VLS3015ET-4R7M(TDK) VLS3012HBX-4R7M(TDK)
1	L15	INDUCTOR	LQH3NPN100NJ0L	Murata	alternative : LQH3NPN100MJ0L(Murata) VLS3012CX-100M-1(TDK)

Table 2.2 PLC board (2/2)

Quantity	Reference	KIND	Parts Name	Manufacturer	Memo
2	R2,R1	RESISTOR	5.1K/5%/1608		
1	R3	RESISTOR	1K/1%/1608		
1	R4	RESISTOR	1.6K/5%/1608		
1	R5	RESISTOR	560ohm/5%/1608		
2	R6,R7	RESISTOR	0ohm/1608		
2	R19,R14	RESISTOR	681ohm/1%/1608		
2	R15,R23	RESISTOR	6.81K/1%/1608		
1	R16	RESISTOR	3522ZR	TE AMP	
3	R17,R21,R25	RESISTOR	390ohm/5%/1608		
1	R20	RESISTOR	51ohm/5%/1608		
1	R24	RESISTOR	3K/5%/1608		
1	R26	RESISTOR	33ohm/5%/1608		
1	R27	RESISTOR	150K/1%/1608		
1	R28	RESISTOR	56.2K/1%/1608		
1	R29	RESISTOR	100K/1%/1608		
1	R30	RESISTOR	31.6K/1%/1608		
1	R22	RESISTOR	10K/5%/1608		
1	U1	IC	R9A06G037GNP#AA0	Renesas	
1	U2	IC	NJM45001	NJRC	
1	U3	IC	RAA230215GSB#HA0	Renesas	
1	Y1	CRYSTAL	DSX221SH(16MHz,8pF,25ppm)	KDS	alternative : KCD, CX2520DB16000D0FLJCC

2.2 BASE board

Table 2.3 BASE board (1/2)

Quantity	Reference	KIND	Parts Name	Manufacturer	Memo
1	CN1	CONNECTOR	MMS-114-01-L-DV	SAMTEC	
1	CN2	CONNECTOR	MMS-104-01-L-DV	SAMTEC	
1	CN3	CONNECTOR	CCT2302-0771F	CMK	alternative:AC-M11PB73C(ECHO ELECTRIC)
1	CN4	CONNECTOR	HEC0470-01-630	HOSHIDEN	
1	CN6	CONNECTOR	XG4C-1431	OMRON	
1	CN7	CONNECTOR	XG4H-1631	OMRON	
1	CN8	CONNECTOR	XG4H-1031	OMRON	
2	CN11,CN9	CONNECTOR	UX60SC-MB-5ST	HIROSE	
1	CN10	CONNECTOR	UBA-4R-D14T-4D(LF)(SN)	JST	alternative:UE27AC54100(A mphenol)
1	C1	FILM CAPACITOR	B32923C3105M	EPCOS	
1	C3	CERAMIC CAPACITOR	C1608C0G1H470J	TDK	47pF/50V/1608/C0G 5%
2	C42,C4	CERAMIC CAPACITOR	TMK107B7105KA-T	Taiyo Yuden	1uF/25V/1608/X7R 10%
3	C5,C10,C11	CERAMIC CAPACITOR	GMK316AB7106KL-TR	Taiyo Yuden	10uF/35V/3216/X7R 10%
2	C6,C7	CERAMIC CAPACITOR	LMK316AB7226ML-TR	Taiyo Yuden	22uF/10V/3216/X7R 10%
1	C8	CERAMIC CAPACITOR	CC0603KRX7R9BB333	Yageo	0.033uF/50V/1608/X7R 10%
1	C9	CERAMIC CAPACITOR	C1608X7R1H334K080AC	TDK	0.33uF/50V/1608/X7R 10%
3	C12,C13,C39	ELECTROLYTIC CAP	EEU-FM1C331	Panasonic	
23	C14,C17,C20,C21,C22,C23,C24,C25,C26,C27,C28,C30,C31,C32,C33,C34,C35,C36,C37,C38,C40,C43,C44	CERAMIC CAPACITOR	CC0603KRX7R9BB104	Yageo	0.1uF/50V/1608/X7R 10%
2	C16,C15	CERAMIC CAPACITOR	GRM1885C1H130JA01D	MURATA	13pF/50V/1608 5%
2	C19,C18	CERAMIC CAPACITOR	C1608C0G1H270J	TDK	27pF/50V/1608 5%
1	C29	CERAMIC CAPACITOR	C2012X7R1A475K	TDK	4.7uF/10V/1215/X7R 10%
1	C41	ELECTROLYTIC CAP	UPJ1A121MED	Nichicon	
1	C45	ELECTROLYTIC CAP	EEV-FK1V681Q	Panasonic	
1	D1	DIODE	SMAJ8.5CA	Bourns Inc.	
2	D2,D4	DIODE	1N4448HWS-7-F	Diodes Inc	
1	D3	DIODE	SL22	Vishay	
2	D11,D10	DIODE	RCLAMP0502BATCT	Semtech	
1	FU1	FUSE	3403.0277	Schurter Inc	
1	FU2	FUSE	3403.0283	Schurter Inc	
3	F1,F2,F3	FILTER	NFE31PT222Z1E9B	Murata	
2	JP1,JP2	CONNECTOR	FFC-6BMEP1	HONDA	
1	JP3	CONNECTOR	FFC-2AMEP1	HONDA	
3	LED3,LED4,LED5	LED	SML-E12M8W	Rohm	
1	L2	INDUCTOR	VLC5045T-3R3N	TDK	alternative : VLS5045EX-3R3N(TDK) 74404054033(WE) NR5040T3R3N(Taiyo Yuden)
1	L3	INDUCTOR	VLC6045T-100M	TDK	alternative : VLS6045EX-100M(TDK) CDRH60D43RNP-100MC(Sumida) NR6045T100M(Taiyo Yuden)
1	L4	INDUCTOR	NRS8040T4R7NJGJ	Taiyo Yuden	

Table 2.4 BASE board (2/2)

Quantity	Reference	KIND	Parts Name	Manufacturer	Memo
1	R1	RESISTOR	SPRM12B105J	Akabane Dengu	
1	R3	RESISTOR	FMP200JR-52-200K	Yageo	
3	R4,R38,R39	RESISTOR	15K/5%/1608		
1	R5	RESISTOR	178K/1%/1608		
1	R6	RESISTOR	16K/5%/1608		
1	R7	RESISTOR	15K/1%/1608		
4	R8,R10,R11,R47	RESISTOR	1K/1%/1608		
2	R9,R12	RESISTOR	0ohm/1608		
13	R13,R14,R15,R16,R17,R18,R19,R21,R23,R25,R26,R27,R36	RESISTOR	5.1K/5%/1608		
2	R20,R22	RESISTOR	22ohm/5%/1608		
1	R24	RESISTOR	100ohm/5%/1608		
2	R34,R31	RESISTOR	51K/5%/1608		
3	R35,R40,R43	RESISTOR	10K/5%/1608		
1	R37	RESISTOR	100K/5%/1608		
1	R41	RESISTOR	20K/5%/1608		
1	R42	RESISTOR	1.5K/5%/1608		
1	R44	RESISTOR	5.49K/1%/1608		
1	R45	RESISTOR	0ohm/2125		
1	R46	RESISTOR	PR01000101808JR500	Vishay	
1	SW1	Switch	CHS-08TB	COPAL	
3	SW2,SW3,SW5	SWITCH	SSSS222700	ALPS	
1	SW4	SWITCH	SKQMBBE010	ALPS	
2	TP6,TP7	TEST PIN	HK-5-G-Black	MAC8	
1	T2	TRANS	T60403-K5032-X102	VAC Magnetic	
1	U1	Surge Absorber	ERZ-E14A471	panasonic	
1	U2	PHOTOCOUPLER	PS2561FL-1	CEL	
1	U3	IC	TPS61087DRCR		
1	U4	REGULATOR	MCP1703T-3302E/DB	Microchip	
1	U5	Transistor	DMN3404L-7	Diodes Incorporated	
1	U6	IC	LTC4361ITS8-2#TRMPBF	Linear Technology	
1	U7	IC	R5F5631EDDFP#V0	Renesas	
1	U8	IC	BD5232G	Rohm	
2	U11,U9	IC	SN74LVC1T45DCK	TI	
1	U10	IC	FT232RL	FTDI	
1	U12	IC	MIC2025-1YMM	Micrel	
1	Y1	CRYSTAL	ST3215SB32768E0HPWAA	Kyocera	
1	Y2	CRYSTAL	ABM3C-12.000MHZ-D4Y	Abracon	

2.3 FILTER board

Table 2.5 Filter board (A-type)

Quantity	Reference	KIND	Parts Name	Manufacturer	Memo
1	CN4	CONNECTOR	XG4C-1031	OMRON	
2	L4,L5	INDUCTOR	NL453232T-561J-PF	TDK	
2	L8,L9	INDUCTOR	NL453232T-331J-PF	TDK	
1	L12	INDUCTOR	NL453232T-221J-PF	TDK	
1	C46	CERAMIC CAPACITOR	CGA4J2C0G1H333J125AA	TDK	0.033uF/50V/2125/C0G 5% 30ppm
1	C47	CERAMIC CAPACITOR	CC0603KRX7R9BB473	Yageo	0.047uF/50V/1608/X7R 10%
1	C50	CERAMIC CAPACITOR	C1608C0G1H122J	TDK	1200pF/50V/1608/C0G 5% 30ppm
1	C52	CERAMIC CAPACITOR	CGA3E2C0G1H182J	TDK	1800pF/50V/1608/C0G 5% 30ppm
1	C54	CERAMIC CAPACITOR	CGA3E2C0G1H392J	TDK	3900pF/50V/1608/C0G 5% 30ppm
1	C57	CERAMIC CAPACITOR	CGA3E2C0G1H472J	TDK	4700pF/50V/1608/C0G 5% 30ppm
1	C58	CERAMIC CAPACITOR	CGA3E2C0G1H822J	TDK	8200pF/50V/1608/C0G 5% 30ppm
2	C60,C61	CERAMIC CAPACITOR	GRM3195C1H273JA01D	MURATA	0.027uF/50V/3216/C0G 5% 30ppm
1	C64	CERAMIC CAPACITOR	GRM3195C1H393JA01D	MURATA	0.039uF/50V/3216/C0G 5% 30ppm
2	R32,R34	RESISTOR	300ohm/5%/1608		
1	R36	RESISTOR	120ohm/5%/1608		
1	R37	RESISTOR	360ohm/5%/1608		
1	R40	RESISTOR	0ohm/1608		

Table 2.6 Filter board (F-type)

Quantity	Reference	KIND	Parts Name	Manufacturer	Memo
1	CN5	CONNECTOR	XG4C-1031	OMRON	
1	JP4	CONNECTOR	FFC-2AMEP1	HONDA	
1	L3	INDUCTOR	SRN5040-330M	Bourns Inc.	
2	L6,L7	INDUCTOR	NL453232T-101J-PF	TDK	
2	L10,L11	INDUCTOR	NL453232T-470J-PF	TDK	
1	L13	INDUCTOR	NL453232T-820J-PF	TDK	
3	C48,C62,C63	CERAMIC CAPACITOR	C1608C0G1E103J080AA	TDK	0.01uF/50V/1608/C0G 5% 30ppm
1	C49	CERAMIC CAPACITOR	CC0603KRX7R9BB473	Yageo	0.047uF/50V/1608/X7R 10%
1	C51	CERAMIC CAPACITOR	C1608C0G1H181J	TDK	180pF/50V/1608/C0G 5% 30ppm
1	C53	CERAMIC CAPACITOR	C1608C0G1H271J	TDK	270pF/50V/1608/C0G 5% 30ppm
1	C55	CERAMIC CAPACITOR	C1608C0G1H122J	TDK	1200pF/50V/1608/C0G 5% 30ppm
1	C56	CERAMIC CAPACITOR	C1608C0G1H102J	TDK	1000pF/50V/1608/C0G 5% 30ppm
1	C59	CERAMIC CAPACITOR	CGA3E2C0G1H182J	TDK	1800pF/50V/1608/C0G 5% 30ppm
1	C65	CERAMIC CAPACITOR	CGA3E2C0G1H562J080AA	TDK	5600pF/50V/1608/C0G 5% 30ppm
1	R31	RESISTOR	RMCP2010JT100R	Stackpole	
2	R33,R35	RESISTOR	300ohm/5%/1608		
1	R38	RESISTOR	120ohm/5%/1608		
1	R39	RESISTOR	330ohm/5%/1608		
1	R41	RESISTOR	0ohm/1608		

Table 2.7 Filter board (G-type)

Quantity	Reference	KIND	Parts Name	Manufacturer	Memo
1	CN6	CONNECTOR	XG4C-1031	OMRON	
2	L18,L19	INDUCTOR	NL453232T-101J-PF	TDK	
1	L16	INDUCTOR	NL453232T-271J-PF	TDK	
2	L17,L20	INDUCTOR	NL453232T-390J-PF	TDK	
1	C69	CERAMIC CAPACITOR	C1608C0G1E103J080AA	TDK	0.01uF/50V/1608/C0G 5% 30ppm
1	C70	CERAMIC CAPACITOR	CC0603KRX7R9BB473	Yageo	0.047uF/50V/1608/X7R 10%
1	C71	CERAMIC CAPACITOR	CGA3E2C0G1H562J080AA	TDK	5600pF/50V/1608/C0G 5% 30ppm
2	C72,C73	CERAMIC CAPACITOR	GRM3195C1H393JA01D	MURATA	0.039uF/50V/3216/C0G 5% 30ppm
1	C74	CERAMIC CAPACITOR	C1608C0G1H122J	TDK	1200pF/50V/1608/C0G 5% 30ppm
1	C75	CERAMIC CAPACITOR	C1608C0G1H271J	TDK	270pF/50V/1608/C0G 5% 30ppm
1	C76	CERAMIC CAPACITOR	CGA3E2C0G1H182J	TDK	1800pF/50V/1608/C0G 5% 30ppm
1	C77	CERAMIC CAPACITOR	C1608C0G1H102J	TDK	1000pF/50V/1608/C0G 5% 30ppm
1	C78	CERAMIC CAPACITOR	C1608C0G1H181J	TDK	180pF/50V/1608/C0G 5% 30ppm
2	R43,R46	RESISTOR	300ohm/5%/1608		
1	R44	RESISTOR	120ohm/5%/1608		
1	R45	RESISTOR	330ohm/5%/1608		

2.4 S-ROM board

Table 2.8 S-ROM board

Quantity	Reference	KIND	Parts Name	Manufacturer	Memo
1	CN201	CONNECTOR	XG4C-1031	OMRON	
1	C201	CERAMIC CAPACITOR	CC0603KRX7R9BB104	Yageo	0.1uF/50V/1608/X7R 10%
2	R202,R201	RESISTOR	33ohm/5%/1608		
1	U201	IC	N25Q032A13ESC40	Micron	alternative : AT25SF321-SSHD-T(Adesto)

Website and Support

Renesas Electronics Website

<http://www.renesas.com/>

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Revision History

Rev.	Date	Description	
		Page	Summary
1.00	DEC 01, 2016		First Edition issued
2.00	APL 05, 2018	9	Addition of the alternative : L1, L2, L15
		10	Modification of the part number : U1, U3
		11	Addition of the alternative : L2, L3
		15	Addition of the alternative : U201

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Handling of Unused Pins

Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.

- The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

The state of the product is undefined at the moment when power is supplied.

- The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.
In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

Access to reserved addresses is prohibited.

- The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

- When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

- The characteristics of Microprocessing unit or Microcontroller unit products in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

Notice

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