

REV	REF	DATE	DRAWN BY
1.00	Release	31.1.2020	KOS

# Renesas Solution Starter Kit for RX23W CPU Board Schematics

SHEET	DESCRIPTION
1	INDEX
2	RX23W Microcontroller
3	MCU Pin Function Select
4	PSU
5	E1/E2 Lite Emulator, MCU & Emulator Mode Setting
6	Reset, Switches, LEDs, DIP-Switch
7	Pmod, IIC EEPROM, Pull-up resistors
8	USB to Serial Interface
9	CAN
10	USB (Host / Function)
11	Touch Interface
12	2.4GHz Antenna
13	Microcontroller Pin Headers

### Note:

**C** : Capacitor  
**D** : Diode  
**J** : Connector, Jumper  
**L** : Inductor  
**LED** : Light Emitting Diode  
**MR** : Resistor Array  
**PWR** : Power Jack  
**R** : Fixed Resistor  
**RES** : Reset Switch  
**RV** : Potentiometer  
**SW** : Switch  
**T** : Test Point  
**U** : Integrated Circuit  
**X** : Crystal, Oscillator

\* "DNF" marking means that component is not fitted by default.

\*\*The following off-page connectors used in this schematics do not indicated the signal direction.



### Abbreviations:

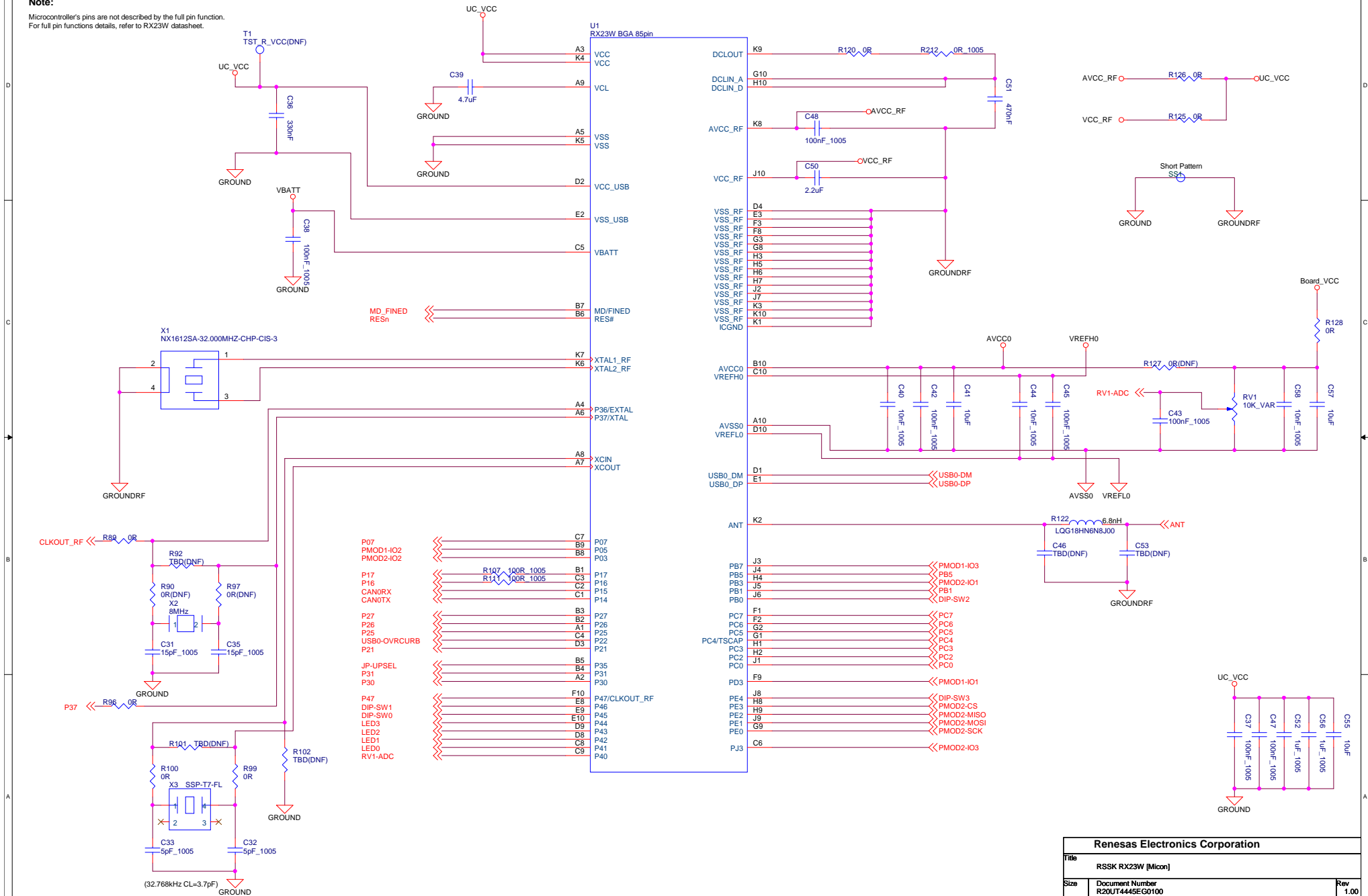
**CAN** : Controller Area Network  
**IIC** : Philips(TM) Inter-Integrated Circuit Connection Bus  
**LED** : Light Emitting Diode  
**MCU** : Microcontroller Unit  
**N/A** : Not Applicable  
**PSU** : Power Supply Unit  
**RSSK** : Renesas Solution Starter Kit  
**USB** : Universal Serial Bus

REEL Drawing No. D016502\_04

Renesas Electronics Corporation		
Title RSSK RX23W [Index]		
Size	Document Number R20UT4445EG0100	Rev 1.00
Date:	Friday, January 31, 2020	Sheet 1 of 13

# RX23W Microcontroller

**Note:**  
Microcontroller's pins are not described by the full pin function.  
For full pin functions details, refer to RX23W datasheet.



Renesas Electronics Corporation		
Title	RSSK RX23W [Micon]	
Size	Document Number	Rev
	R20UT4445EG0100	1.00
Date:	Friday, January 31, 2020	Sheet 2 of 13

MCU Pin Function Select

AVCC0(PinB10)



AVSS0(PinA10)



VREFH0(PinC10)



VREFL0(PinD10)



RES#(PinB6)



MD\_FINED(PinB7)



P07(PinC7)



P17(PinB1)



P16(PinC3)



P27(PinB3)



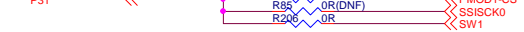
P26(PinB2)



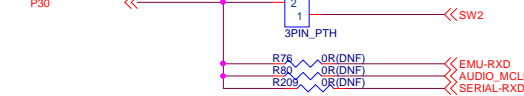
P25(PinA1)



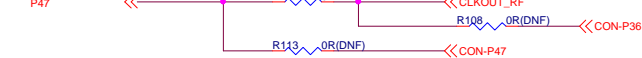
P31(PinB4)



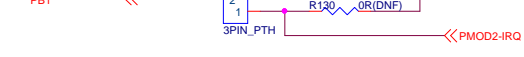
P30(PinA2)



P47(PinF10)



PB1(PinJ5)



PB5(PinJ4)



PC7(PinF1)



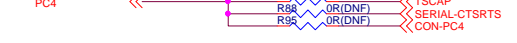
PC6(PinF2)



PC5(PinG2)



PC4(PinG1)



PC3(PinH1)



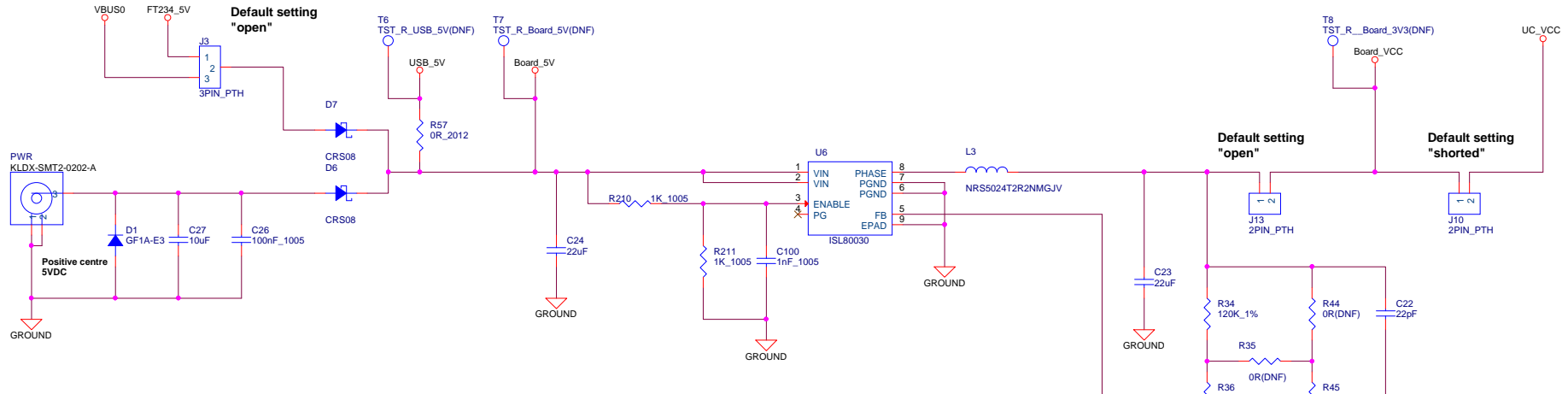
PC2(PinH2)



PC0(PinJ1)



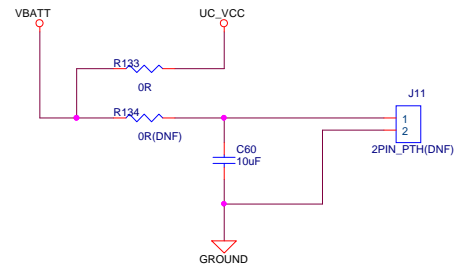
**Power Supply Unit**



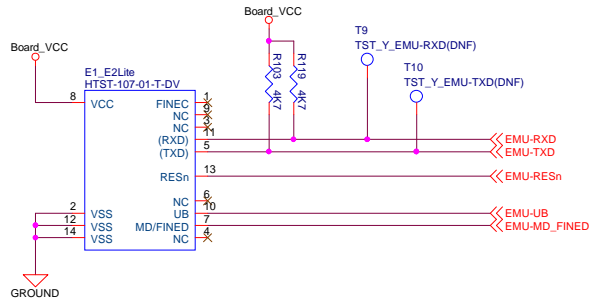
**Power Supply Configuration**

Power Supply Source	Conditions						Board_5V	Board_VCC	Unavailable Feature
	J3	J13	J10	J5	J4	R37			
E2 Lite / E1(3V3)	Open	Open	Shorted	1-2 Shorted	1-2 Shorted	Fit	R44	R35	USB(Host)(Function-Buspowered), CAN_5V Interface EEPROM
PWR	Open	Shorted	Shorted	2-3 Shorted	don't care	Fit	DNF	DNF	USB(Function-Buspowered)(Function-Selfpowered)
	Open	Shorted	Shorted	1-2 Shorted	1-2 Shorted	Fit	DNF	DNF	USB(Host)(Function-Buspowered)
USBD0_2	2-3 Shorted	Shorted	Shorted	don't care	don't care	DNF	Fit	DNF	USB(AH) Function_LED_PWMOD
USBCN0	1-2 Shorted	Shorted	Shorted	1-2 Shorted	2-3 Shorted	Fit	DNF	DNF	USB(Host)(Function-Selfpowered)
	1-2 Shorted	Shorted	Shorted	1-2 Shorted	1-2 Shorted	Fit	DNF	DNF	USB(Host)(Function-Buspowered)

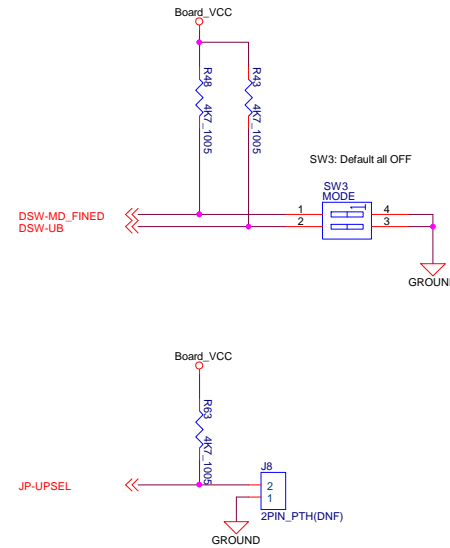
Note1: Do not use 5V Interface Pmods.  
 Note2: J4, J5 Refers to page 10.



### E1/E2 Lite



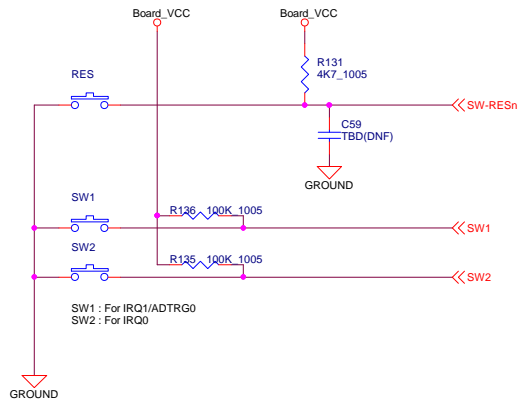
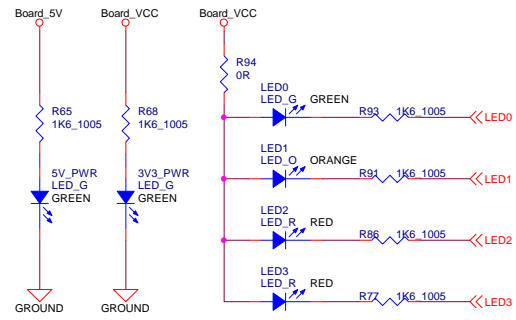
### MCU & Emulator Mode Setting



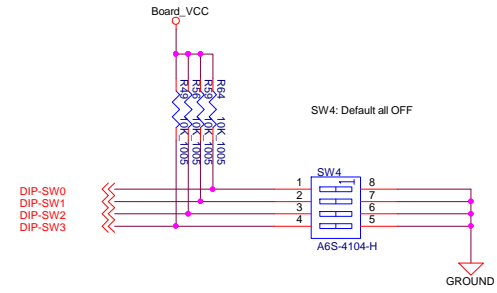
### MCU Operating Mode Configuration

SW3 Pin1	SW3 Pin2	J8	Operating Mode
OFF	Don't care	Don't care	Single Chip Mode
OFF	OFF	Don't care	FINE Boot Mode
ON	OFF	Don't care	SCI Boot Mode
ON	ON	Open	USB Boot Mode (Bus Powered)
ON	ON	Shorted Pin	USB Boot Mode (Self Powered)

### Switches, LEDs, RESET



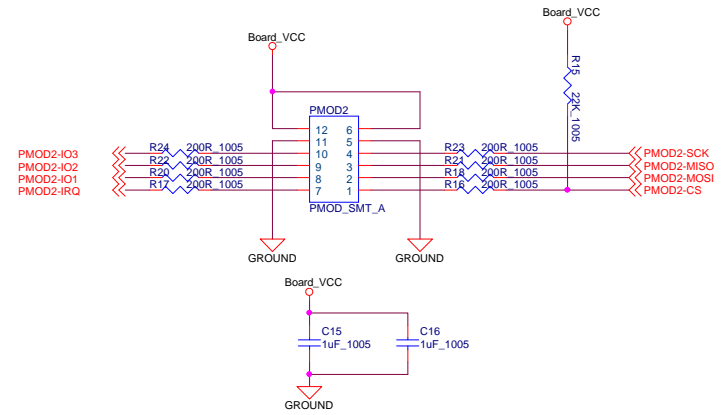
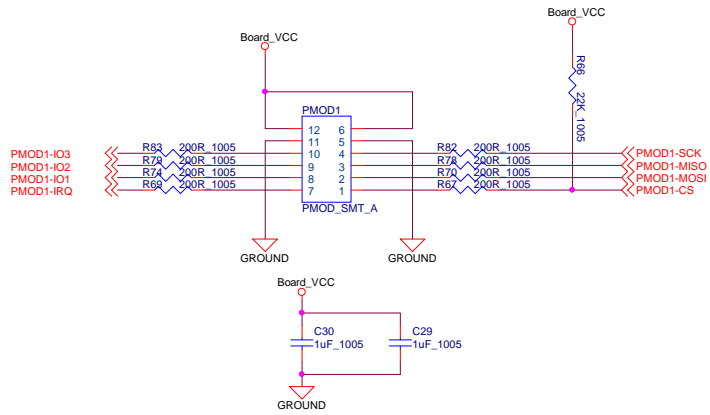
### DIP-Switch



<b>Renesas Electronics Corporation</b>		
Title RSSK RX23W [RESET, Switches, LEDs, DIP-Switch]		
Size	Document Number R20UT4445EG0100	Rev 1.00
Date:	Friday, January 31, 2020	Sheet 6 of 13

Pmod connectors

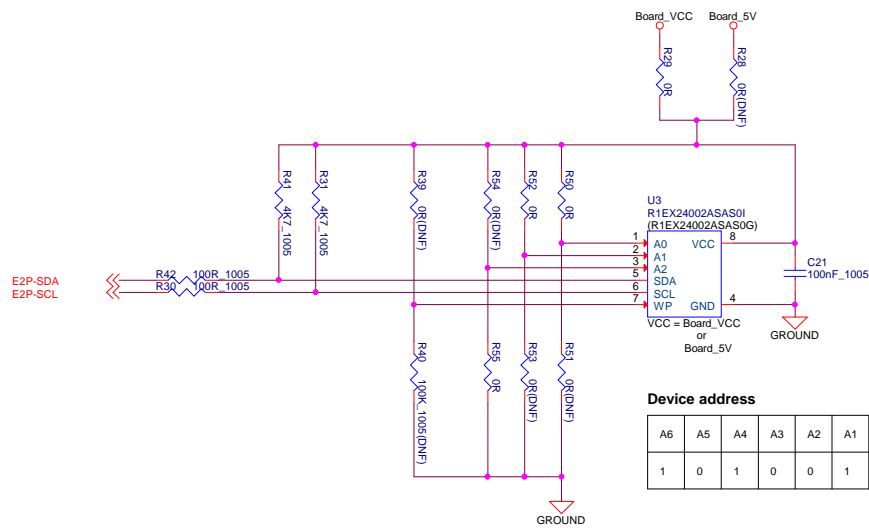
PMOD1: Angle type connector  
 PMOD2: Angle type connector



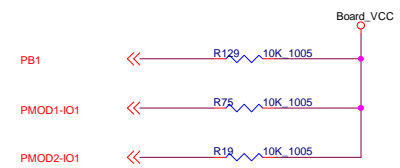
IIC EEPROM(2Kbits) - RIIC

Warning:

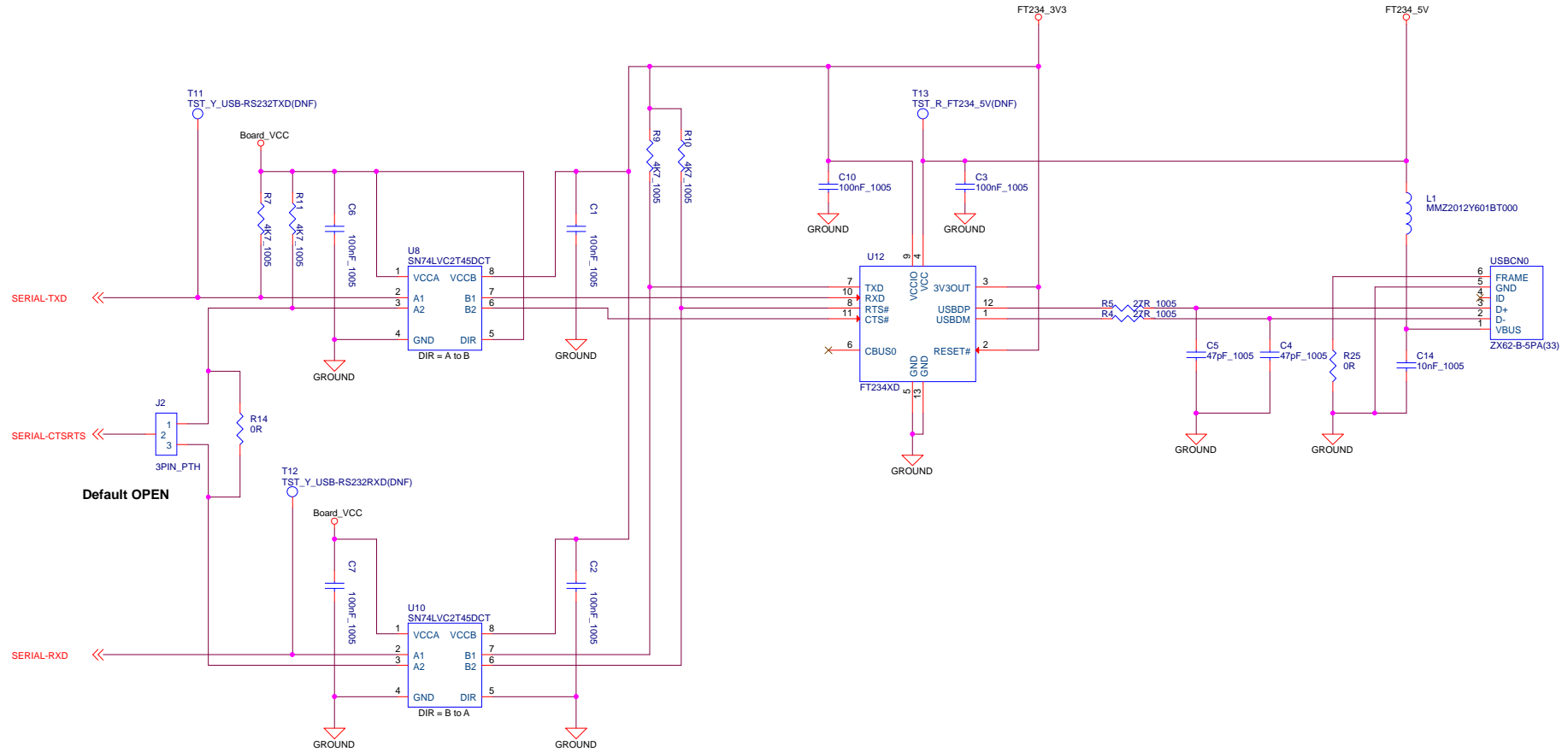
NEVER FIT R29 and R28 simultaneously.



Option pull-up resistor

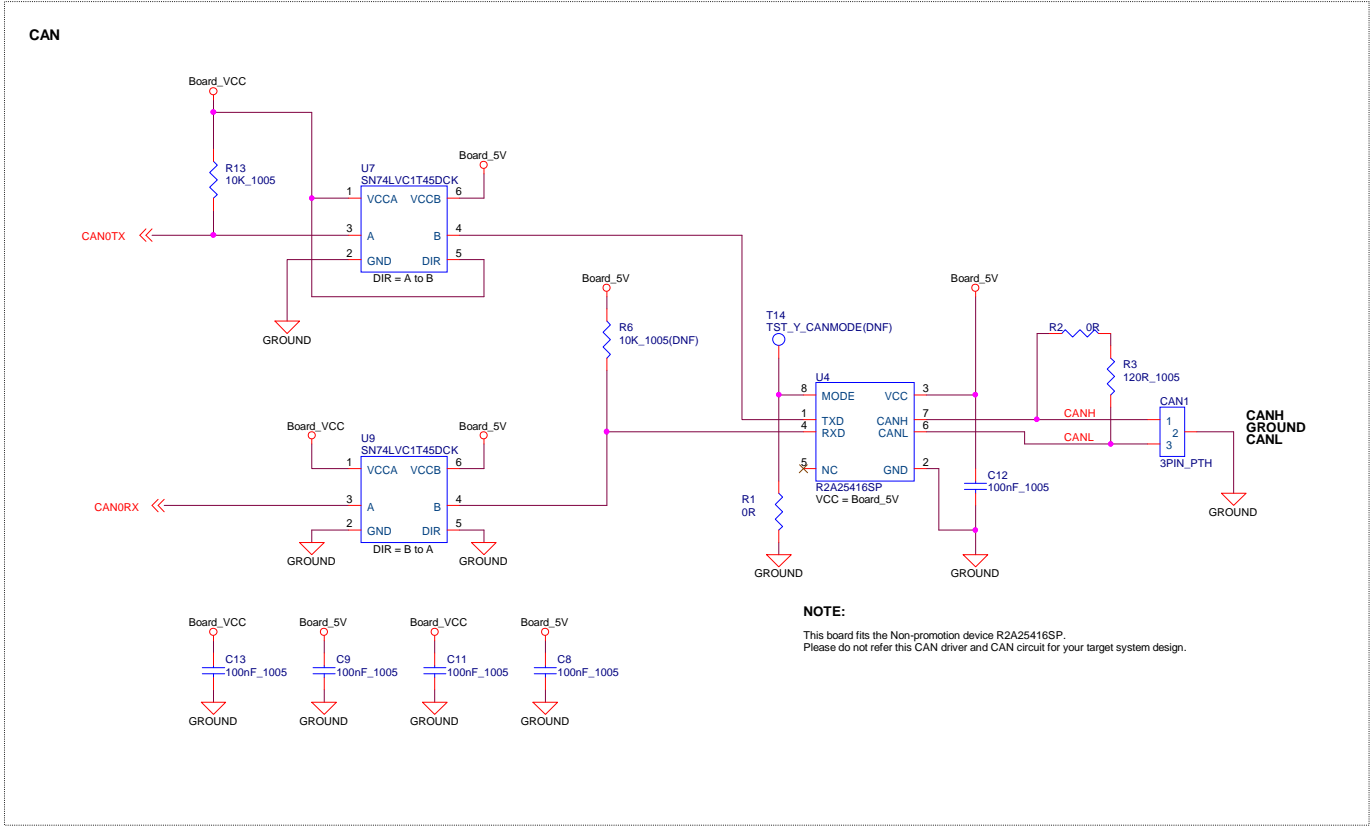


USB to Serial Interface



Renesas Electronics Corporation		
Title: RSK RX23W [USB to Serial Interface]		
Size: R2OUT4445EG0100	Rev: 1.00	
Date: Friday, January 31, 2020	Sheet: 8	of 13





**NOTE:**  
 This board fits the Non-promotion device R2A25416SP.  
 Please do not refer this CAN driver and CAN circuit for your target system design.

<b>Renesas Electronics Corporation</b>		
Title: RSK RX23W [CAN]		
Size: R20UT4445EG0100	Document Number: R20UT4445EG0100	Rev: 1.00
Date: Friday, January 31, 2020	Sheet: 9	of 13

**USB0 Host/Function**

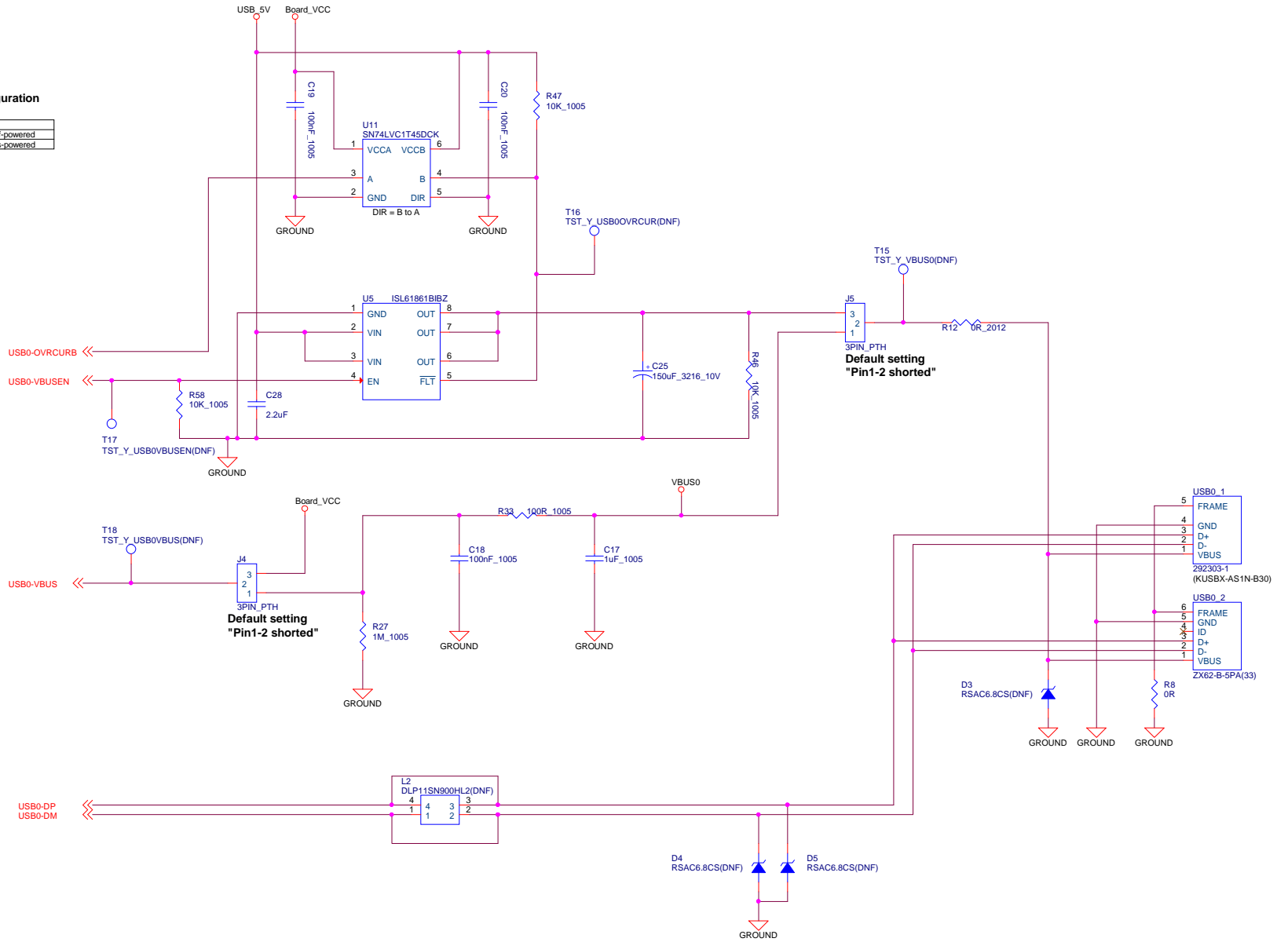
**USB0 Host/Function Select**

J3	Function Mode
1-2 shorted	Function Mode
2-3 shorted	Host Mode

**Self-powered/Bus-powered Configuration for Function Mode**

J3	J4	Self-powered
1-2 shorted or Open	1-2 shorted	Self-powered
2-3 shorted	2-3 shorted	Bus-powered

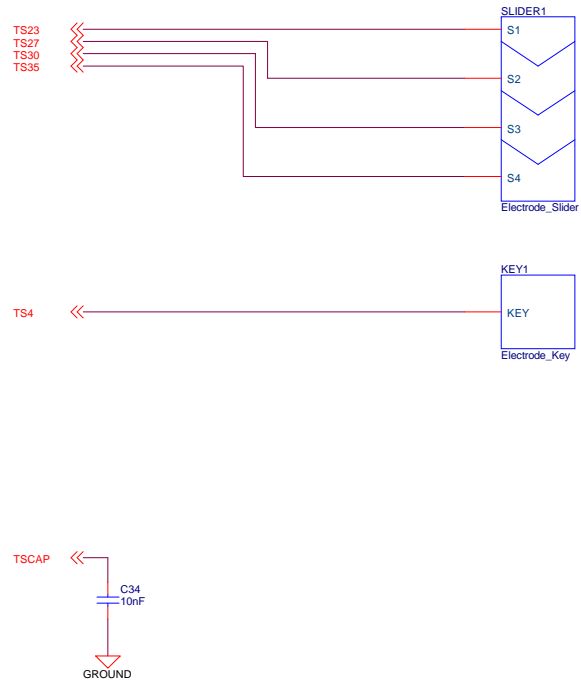
Note: J3 Refers to page4.



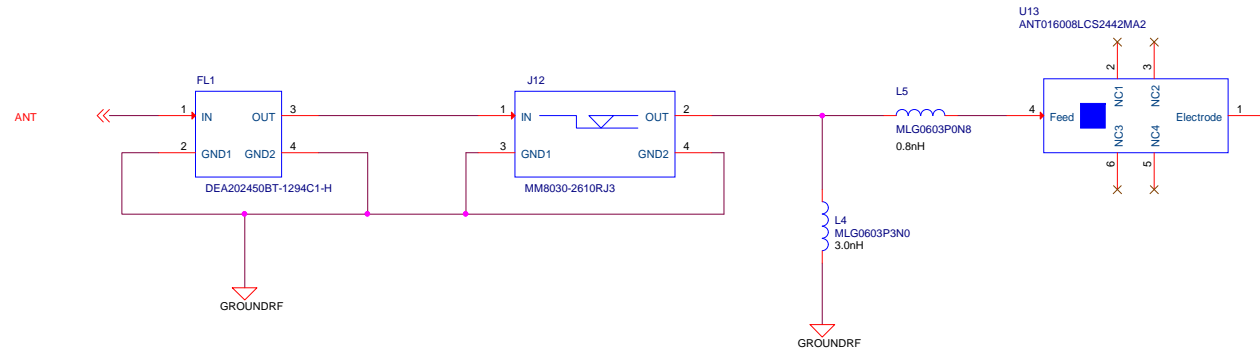
### Touch Interface

#### Note:

Touch signals require careful route pattern.  
For technical design information, please refer to application note 'CTSU Basis of Cap touch detection' (R30AN0218EJ).



2.4GHz Antenna



Renesas Electronics Corporation		
Title RSSK RX23W [2.4GHz Antenna]		
Size R20UT4445EG0100	Document Number R20UT4445EG0100	Rev 1.00
Date: Friday, January 31, 2020	Sheet 12 of 13	

Microcontroller Pin Headers

P07      << P07 ⊖ C7 pin  
 PMOD1-IO2 << P05 ⊖ B9 pin  
 PMOD2-IO2 << P03 ⊖ B8 pin  
 SSITXD0 << P17 ⊖ B1 pin  
 P16      << P16 ⊖ C3 pin  
 CAN0RX << P15 ⊖ C2 pin  
 CAN0TX << P14 ⊖ C1 pin  
 SSIWS0 << P27 ⊖ B3 pin  
 SSIRXD0 << P26 ⊖ B2 pin  
 CON-P25 << P25 ⊖ A1 pin  
 USB0-OVRCURB << P22 ⊖ C4 pin  
 P21      << P21 ⊖ D3 pin  
 P37      << P37 ⊖ A6 pin  
 CON-P36 << P36 ⊖ A4 pin  
 JP-UPSEL << P35 ⊖ B5 pin  
 SSISCK0 << P31 ⊖ B4 pin  
 AUDIO\_MCLK << P30 ⊖ A2 pin

CON-P47 << P47 ⊖ F10 pin  
 DIP-SW1 << P46 ⊖ E8 pin  
 DIP-SW0 << P45 ⊖ E9 pin  
 LED3 << P44 ⊖ E10 pin  
 LED2 << P43 ⊖ D9 pin  
 LED1 << P42 ⊖ D8 pin  
 LED0 << P41 ⊖ C8 pin  
 RV1-ADC << P40 ⊖ C9 pin  
 PMOD1-IO3 << PB7 ⊖ J3 pin  
 PB5      << PB5 ⊖ J4 pin  
 PMOD2-IO1 << PB3 ⊖ H4 pin  
 PB1      << PB1 ⊖ J5 pin  
 DIP-SW2 << PB0 ⊖ J6 pin  
 PC7      << PC7 ⊖ F1 pin  
 PC6      << PC6 ⊖ F2 pin  
 CON-PC5 << PC5 ⊖ G2 pin  
 CON-PC4 << PC4 ⊖ G1 pin  
 CON-PC3 << PC3 ⊖ H1 pin  
 CON-PC2 << PC2 ⊖ H2 pin  
 CON-PC0 << PC0 ⊖ J1 pin

PMOD1-IO1 << PD3 ⊖ F9 pin  
 DIP-SW3 << PE4 ⊖ J8 pin  
 PMOD2-CS << PE3 ⊖ H8 pin  
 PMOD2-MISO << PE2 ⊖ H9 pin  
 PMOD2-MOSI << PE1 ⊖ J9 pin  
 PMOD2-SCK << PE0 ⊖ G9 pin  
 PMOD2-IO3 << PJ3 ⊖ C6 pin

<b>Renesas Electronics Corporation</b>		
Title: RSK RX23W [Microcontroller Pin Headers]		
Size:	Document Number: R20UT4445EG0100	Rev: 1.00
Date:	Friday, January 31, 2020	Sheet 13 of 13

# Revision History

REV	DATE	PAGE	DESCRIPTION
1.00	31.1.2020	---	1st release edition.

<b>Renesas Electronics Corporation</b>			
Title RSK RX23W (Revision History)			
Size	Document Number	Rev	1.00
	R20UT4445EG0100		
Date:	Friday, January 31, 2020	Sheet	X of X