Pin assign support tool

TRAVEO™ T2G family

About this document

Scope and purpose

The pin assignment support tool helps in assignment for alternate function pin assignments features of the TRAVEO™ T2G device.

This guide describes how to assign pins to the TRAVEO™ T2G device.

The following is provided by the pin assign support tool.

- List of selected pins
- Display the selected pin function on the package figure
- Display the functional usage (number of usage channels) of each module from the selected pin information

As a result, it utilizes as follows.

- Share the pin layout used in the development stage within the users' group
- Helps to consider wiring routes and component layout at the board design stage
- Manage connection information between the MCU and external ICs or monitor pins by adding connection destinations according to the user's usage.

Intended audience

This document is intended for anyone using the TRAVEO™ T2G family to determine the assignment for alternative pin functions.

Table of contents

1 Overview

Figure 1 shows the pin assignment with alternate functions of the 176-pin package of the CYT2B7 device. With alternate functions, most pins are assigned not only GPIO functions, but also alternative functions such as timers, AD converters, CAN and LIN, and so on. Figure 2 shows the alternate pin functions in the Active mode of the CYT2B7 device. In this example, it is only for a part of pin 176. See the device datasheet for all pins.

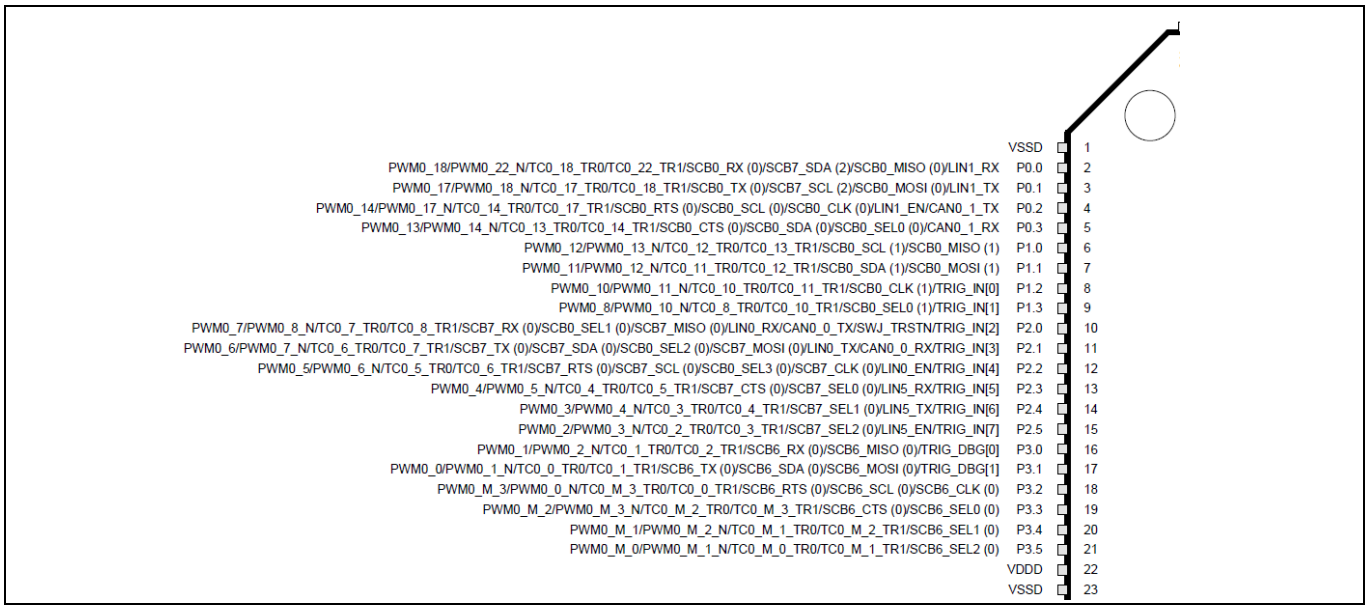


Figure 1 Pin assignment with alternate functions

Name	Active Mapping											
	HCon#8[24]	HCon#9	HCon#10	HCon#11	HCon#16	HCon#17	HCon#18	HCon#19	HCon#20	HCon#21	HCon#26	HCon#27
	ACT #0[25]	ACT #1	ACT #2	ACT #3	ACT #4	ACT #5	ACT #6	ACT #7	ACT #8	ACT #9	ACT #10	ACT #11
P0.0	PWM_18	PWM_22_N	TC_18_TR0	TC_22_TR1		SCB0_RX	SCB7_SDA		LIN1_RX			
P0.1	PWM_17	PWM_18_N	TC_17_TR0	TC_18_TR1		SCB0_TX	SCB7_SCL		LIN1_TX			
P0.2	PWM_14	PWM_17_N	TC_14_TR0	TC_17_TR1		SCB0_RTS			LIN1_EN	CAN0_1_TX		
P0.3	PWM_13	PWM_14_N	TC_13_TR0	TC_14_TR1		SCB0_CTS				CAN0_1_RX		
P1.0	PWM_12	PWM_13_N	TC_12_TR0	TC_13_TR1								
P1.1	PWM_11	PWM_12_N	TC_11_TR0	TC_12_TR1								
P1.2	PWM_10	PWM_11_N	TC_10_TR0	TC_11_TR1							TRIG_IN[0]	
P1.3	PWM_8	PWM_10_N	TC_8_TR0	TC_10_TR1							TRIG_IN[1]	
P2.0	PWM_7	PWM_8_N	TC_7_TR0	TC_8_TR1		SCB7_RX		SCB7_MISO	LIN0_RX	CAN0_0_TX	TRIG_IN[2]	
P2.1	PWM_6	PWM_7_N	TC_6_TR0	TC_7_TR1		SCB7_TX	SCB7_SDA	SCB7_MOSI	LIN0_TX	CAN0_0_RX	TRIG_IN[3]	
P2.2	PWM_5	PWM_6_N	TC_5_TR0	TC_6_TR1		SCB7_RTS	SCB7_SCL	SCB7_CLK	LIN0_EN		TRIG_IN[4]	
P2.3	PWM_4	PWM_5_N	TC_4_TR0	TC_5_TR1		SCB7_CTS		SCB7_SEL0	LIN5_RX		TRIG_IN[5]	
P2.4	PWM_3	PWM_4_N	TC_3_TR0	TC_4_TR1				SCB7_SEL1	LIN5_TX		TRIG_IN[6]	
P2.5	PWM_2	PWM_3_N	TC_2_TR0	TC_3_TR1				SCB7_SEL2	LIN5_EN		TRIG_IN[7]	
P3.0	PWM_1	PWM_2_N	TC_1_TR0	TC_2_TR1		SCB6_RX		SCB6_MISO				TRIG_DBG[0]
P3.1	PWM_0	PWM_1_N	TC_0_TR0	TC_1_TR1		SCB6_TX	SCB6_SDA	SCB6_MOSI				TRIG_DBG[1]
P3.2	PWM_M_3	PWM_0_N	TC_M_3_TR0	TC_0_TR1		SCB6_RTS	SCB6_SCL	SCB6_CLK				
P3.3	PWM_M_2	PWM_M_3_N	TC_M_2_TR0	TC_M_3_TR1		SCB6_CTS		SCB6_SEL0				
P3.4	PWM_M_1	PWM_M_2_N	TC_M_1_TR0	TC_M_2_TR1				SCB6_SEL1				
P3.5	PWM_M_0	PWM_M_1_N	TC_M_0_TR0	TC_M_1_TR1				SCB6_SEL2				

Figure 2 Alternate pin functions in the Active mode

As in this example, in the TRAVEO™ T2G family, multiple functions are assigned to one pin, and the user selects a function from them and assigns it to the corresponding pin for use. With this pin assignment support tool, only the assigned function can be displayed in an easy-to-read manner.

2 How to use the pin assign support tool

This chapter explicitly explains how to use the pin assign support tool.

One package consists of these three Excel sheets:

- PFxxx
- PAxxx
- PCHxxx

Where xxx corresponds to the number of pins in the package.

For example, PF176/PA176/PCH176 for the LQFP-176 package.

It is a description of each sheet as follows:

1. PFxxx sheet

This sheet allows the user to select the function they want to assign to each pin.

2. PAxxx sheet

This sheet automatically displays the pinout diagram to which the function selected in the PFxxx sheet is assigned.

3. PCHxxx sheet

This sheet automatically shows the number of channels for the function selected in the PFxxx sheet.

2.1 PFxxx sheet

Figure 3 and Figure 4 show an example of a specific variety.

(Function)		(DEBUG)	(SPI)	(Analog)							
Name	Pin	DeepSleep Mapping		Analog	Selected Pin Attribute				I/O Port		Board Connection	
		HCon#29 DS #1	HCon#30 DS #2		Function	SMARTIO	Note	Memo	Type	Power Source	Connection_1	Connection_2
VSSD	1	NA	NA	NA	VSSD	NA		Main digital ground	-	-		
P0.0	2	NA	SCB0_MISO	NA	SCB0_MISO (0)	NA	See the Notice *2		GPIO_ENH	VDDD		
P0.1	3	NA	SCB0_MOSI	NA	SCB0_MOSI (0)	NA	See the Notice *2		GPIO_ENH	VDDD		
P0.2	4	NA	SCB0_CLK (0)	NA	CAN0_1_TX	NA			GPIO_ENH	VDDD		
P0.3	5	NA	SCB0_SEL0 (0)	NA	CAN0_1_RX	NA			GPIO_ENH	VDDD		
P1.0	6	NA	SCB0_MISO	NA	SCB0_MISO (1)	NA	See the Notice *2		GPIO_STD	VDDD		
P1.1	7	NA	SCB0_MOSI	NA	SCB0_MOSI (1)	NA	See the Notice *2		GPIO_STD	VDDD		
P1.2	8	NA	SCB0_CLK (1)	NA	SCB0_CLK (1)	NA	See the Notice *2		GPIO_STD	VDDD		
P1.3	9	NA	SCB0_SEL0 (1)	NA	SCB0_SEL0 (1)	NA	See the Notice *2		GPIO_STD	VDDD		
P2.0	10	SWJ_TRSTN	SCB0_SEL1 (0)	NA	SCB0_SEL1 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P2.1	11	NA	SCB0_SEL2 (0)	NA	SCB0_SEL2 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P2.2	12	NA	SCB0_SEL3 (0)	NA	SCB0_SEL3 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P2.3	13	NA	NA	NA	SCB7_SEL0 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P2.4	14	NA	NA	NA	SCB7_SEL1 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P2.5	15	NA	NA	NA	SCB7_SEL2 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P3.0	16	NA	NA	NA	PWM_1	NA			GPIO_STD	VDDD		
P3.1	17	NA	NA	NA	PWM_0	NA			GPIO_STD	VDDD		
P3.2	18	NA	NA	NA	SCB6_CLK (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P3.3	19	NA	NA	NA	SCB6_SEL0 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P3.4	20	NA	NA	NA	SCB6_SEL1 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P3.5	21	NA	NA	NA	SCB6_SEL2 (0)	NA	See the Notice *2		GPIO_STD	VDDD		
VDDD	22	NA	NA	NA	VDDD	NA		Main digital supply	-	-		
VSSD	23	NA	NA	NA	VSSD	NA		Main digital ground	-	-		
P4.0	24	NA	NA	NA	SCB5_MISO (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P4.1	25	NA	NA	NA	SCB5_MOSI (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P4.2	26	NA	NA	NA	SCB5_CLK (0)	NA	See the Notice *2		GPIO_STD	VDDD		
P4.3	27	NA	NA	NA	CAN0_1_TX	NA			GPIO_STD	VDDD		
P4.4	28	NA	NA	NA	CAN0_1_RX	NA			GPIO_STD	VDDD		
P5.0	29	NA	NA	NA	SCB5_SEL2 (0)	NA	See the Notice *2		GPIO_STD	VDDD		

Figure 3 Part of the Excel table

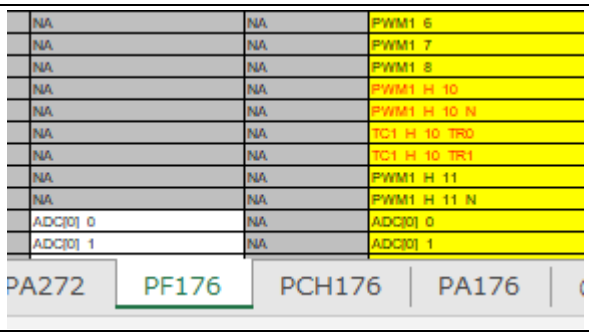


Figure 4 Part of the Excel tab

Select the tab for the package type, such as "PF176". The "PFxxx" is a pin file. The "PAxxx" is the package figure.

The Name column shows the pin name. The Pin column shows the pin number. From column D to R show the function name. The Analog column shows the analog pin. Column T shows the SMARTIO pin.

The Function column shows the selected pin attribute. Click the cell to change the pin attribute. Select the pin attribute you wish to use.

SMARTIO column shows the selected SMARTIO pin. Click the cell to change the SMARTIO pin. Pins that cannot be set as SMARTIO are grayed out.

2.2 PAxxx sheet

Figure 5 shows a figure of the package image. This is automatically generated in the “PAxxx” sheet.

Red is a power pin. Black is the ground pin. Blue is a dedicated pin.

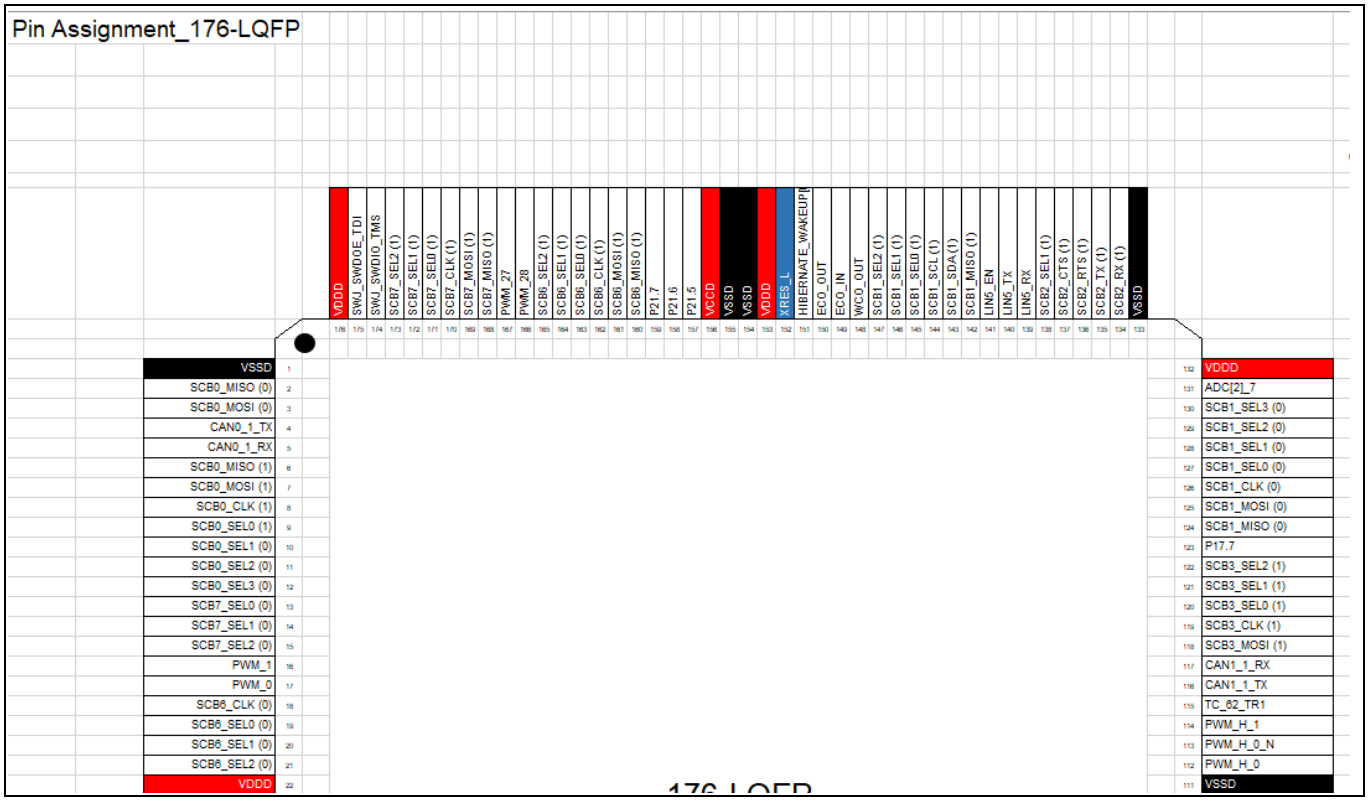


Figure 5 Generated package image

2.3 PCHxxx sheet

Figure 6 shows pin usage status (PCHxxx sheet). The function selected in the PFxxx sheet is expressed numerically. Red indicates duplicate functions.

Pin Usage Status_176-LQFP for peripheral

[Rule]
- The selected pin cell is yellow.
- Duplicate pin names are red.

CAN0		CAN0_0	CAN0_1	CAN0_2
Number of pins used	RX	0	2	0
	TX	0	2	0

CAN1		CAN1_0	CAN1_1	CAN1_2
Number of pins used	RX	0	1	0
	TX	0	1	0

LIN		LIN0	LIN1	LIN2	LIN3	LIN4	LIN5	LIN6	LIN7
Number of pins used	RX	0	0	0	0	0	1	0	0
	TX	0	0	0	0	0	1	0	0
	EN	0	0	0	0	0	1	0	0

SCB		SCB0	SCB1	SCB2	SCB3	SCB4	SCB5	SCB6	SCB7
Number of pins used for SPI	CLK (0)	0	1	0	1	1	0	0	0
	CLK (1)	1	0	1	0	0	1	1	1
	MOSI (0)	0	1	0	1	1	0	0	0
	MOSI (1)	1	0	1	0	0	1	1	1
	MISO (0)	0	1	0	1	1	0	0	0
	MISO (1)	1	0	1	0	0	1	1	1
	SEL0 (0)	0	1	0	1	1	0	0	0
	SEL0 (1)	1	0	1	0	0	1	1	1
	SEL1 (0)	0	1	0	1	1	0	0	0
	SEL1 (1)	0	0	1	0	0	1	1	1
	SEL2 (0)	0	1	0	1	1	0	0	0
	SEL2 (1)	0	0	1	0	0	1	1	1
	SEL3 (0)	0	1	0	1	1	0	0	0
	SEL3 (1)	0	0	0	0	0	0	0	0
	TX (0)	0	0	0	0	0	0	0	0
	TX (1)	0	0	0	0	0	0	0	0

Figure 6 Pin usage status

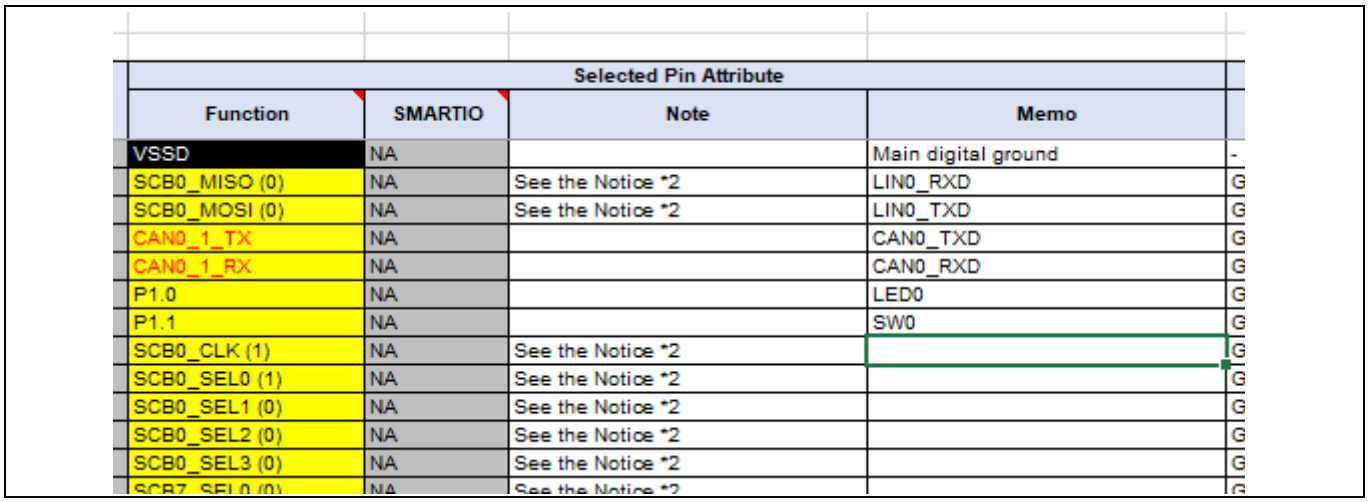
2.4 Example of use

Figure 7 and Figure 8 show the actual input method.

If the function is selected, the cell will fill in yellow.

The power supply is filled in red. The grand is filled in black.

If it overlaps, the yellow fill selected in red will not affect it.

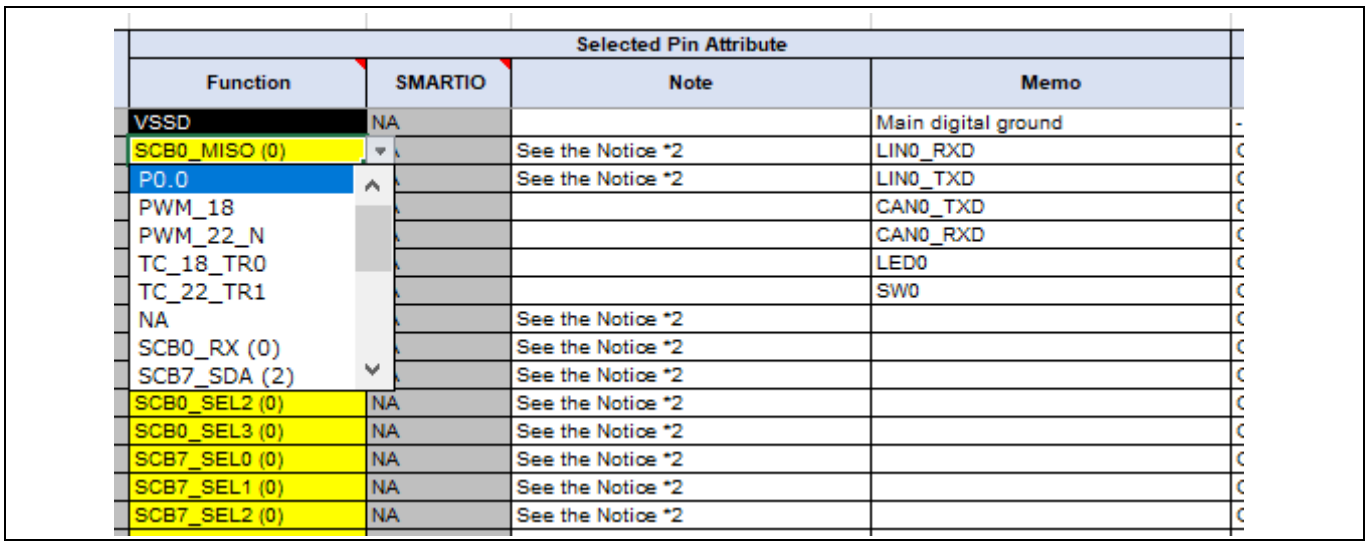


Selected Pin Attribute				
Function	SMARTIO	Note	Memo	
VSSD	NA		Main digital ground	-
SCB0_MISO (0)	NA	See the Notice *2	LIN0_RXD	G
SCB0_MOSI (0)	NA	See the Notice *2	LIN0_TXD	G
CAN0_1_TX	NA		CAN0_TXD	G
CAN0_1_RX	NA		CAN0_RXD	G
P1.0	NA		LED0	G
P1.1	NA		SW0	G
SCB0_CLK (1)	NA	See the Notice *2		G
SCB0_SEL0 (1)	NA	See the Notice *2		G
SCB0_SEL1 (0)	NA	See the Notice *2		G
SCB0_SEL2 (0)	NA	See the Notice *2		G
SCB0_SEL3 (0)	NA	See the Notice *2		G
SCB7_SEL0 (0)	NA	See the Notice *2		G

Figure 7 Selected pin attribute

For example, to change **PWM_18**, click the **PWM_18** cell in the selected pin attributed column.

Then, as shown in Figure 8, the selectable functions of that terminal are displayed in the pull-down menu.



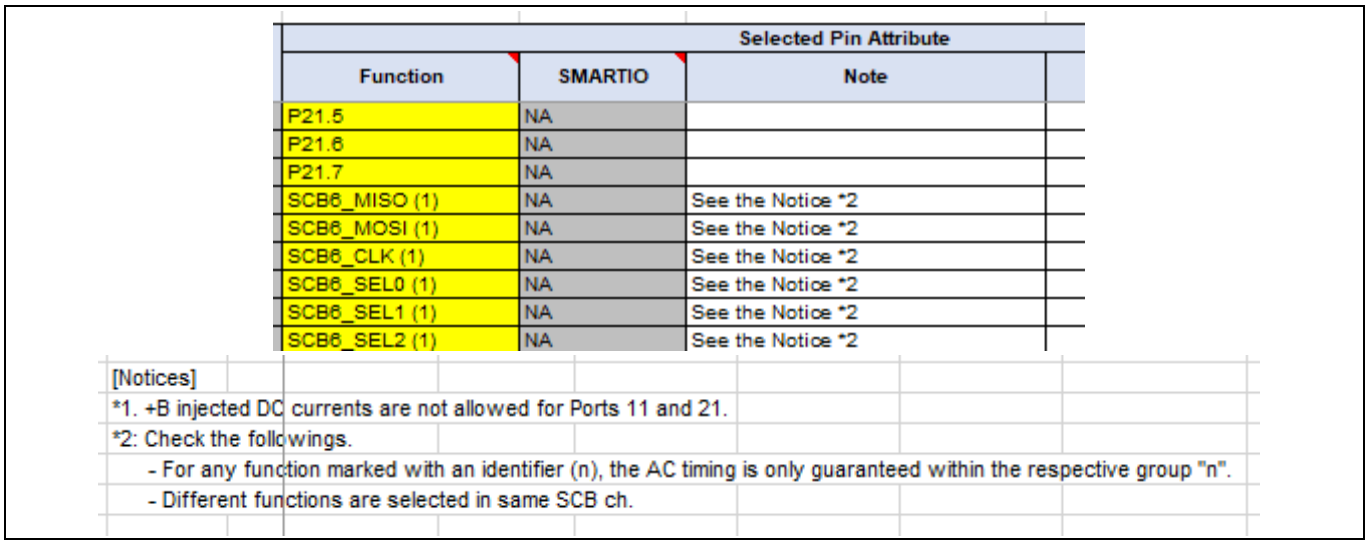
Selected Pin Attribute			
Function	SMARTIO	Note	Memo
VSSD	NA		Main digital ground
SCB0_MISO (0)		See the Notice *2	LIN0_RXD
P0.0		See the Notice *2	LIN0_TXD
PWM_18			CAN0_TXD
PWM_22_N			CAN0_RXD
TC_18_TR0			LED0
TC_22_TR1			SW0
NA		See the Notice *2	
SCB0_RX (0)		See the Notice *2	
SCB7_SDA (2)		See the Notice *2	
SCB0_SEL2 (0)	NA	See the Notice *2	
SCB0_SEL3 (0)	NA	See the Notice *2	
SCB7_SEL0 (0)	NA	See the Notice *2	
SCB7_SEL1 (0)	NA	See the Notice *2	
SCB7_SEL2 (0)	NA	See the Notice *2	

Figure 8 Select alternate pin functions

Select the function you want to use from the pull-down menu.

Figure 9 shows the **Note** column.

If there is a duplicate on the SCB pin or other peripherals, **see the Notice *2** is displayed in the **Note** column.



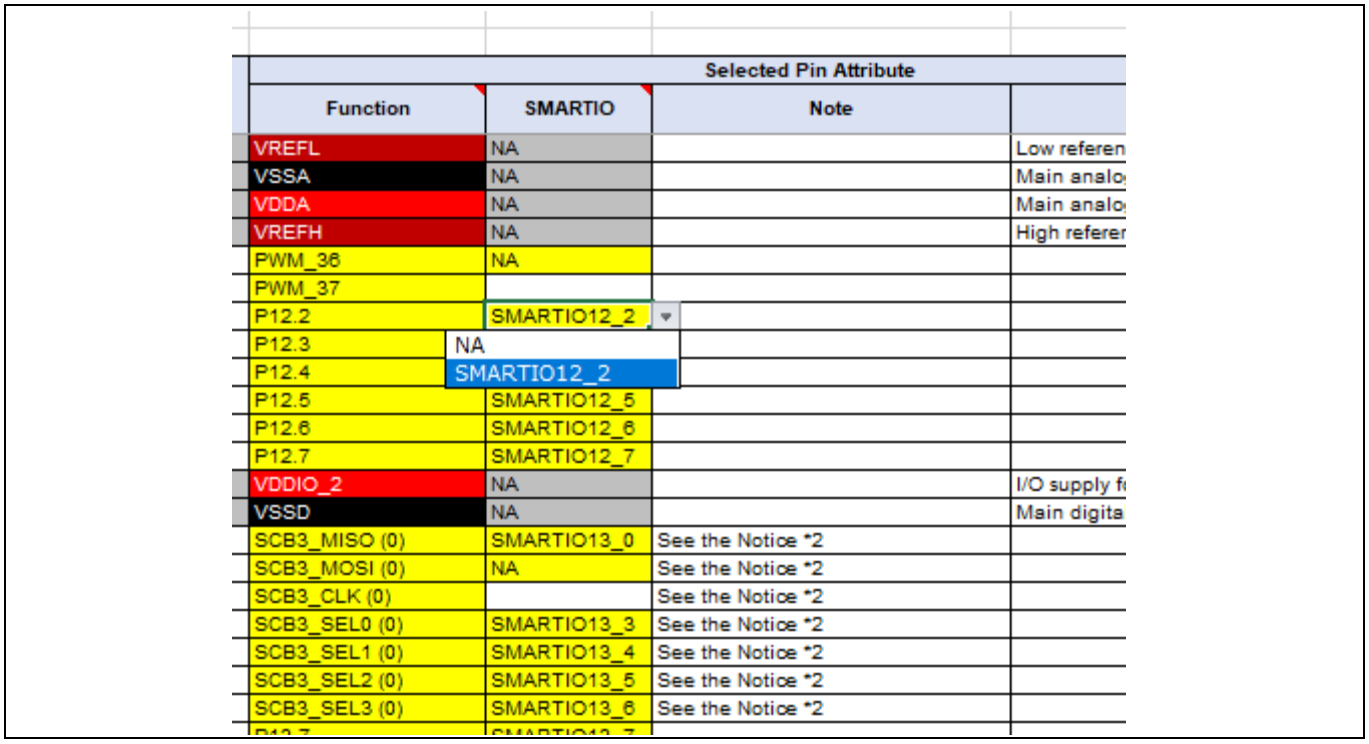
Selected Pin Attribute		
Function	SMARTIO	Note
P21.5	NA	
P21.6	NA	
P21.7	NA	
SCB6_MISO (1)	NA	See the Notice *2
SCB6_MOSI (1)	NA	See the Notice *2
SCB6_CLK (1)	NA	See the Notice *2
SCB6_SEL0 (1)	NA	See the Notice *2
SCB6_SEL1 (1)	NA	See the Notice *2
SCB6_SEL2 (1)	NA	See the Notice *2

[Notices]
*1. +B injected DC currents are not allowed for Ports 11 and 21.
*2: Check the followings.
- For any function marked with an identifier (n), the AC timing is only guaranteed within the respective group "n".
- Different functions are selected in same SCB ch.

Figure 9 Note for selected pin attribute

For example, to change SMARTIO column, click the SMARTIO cell in the selected SMARTIO pin as shown in Figure 10.

The selected pins are yellow. Pins that cannot be set as SMARTIO are grayed out.

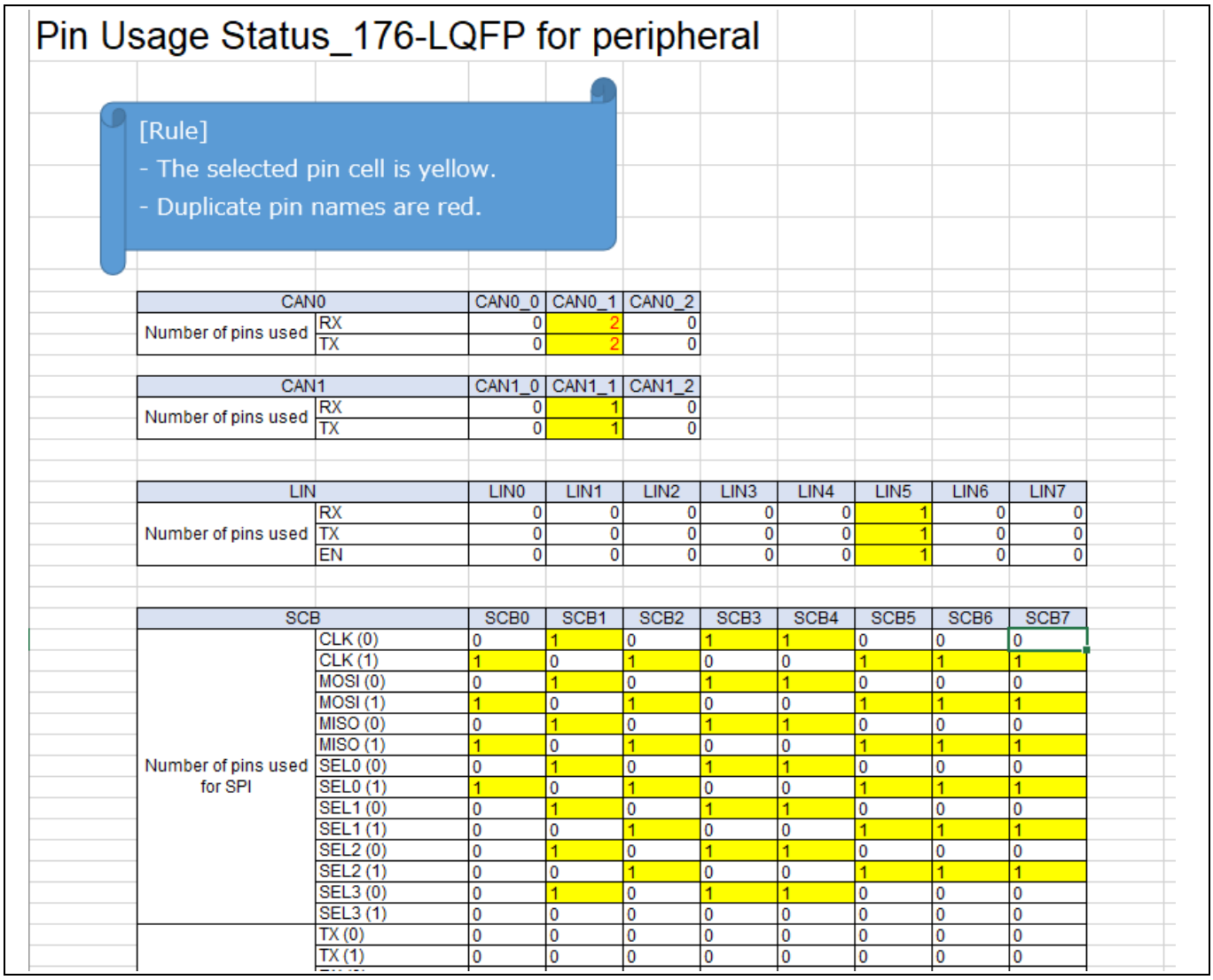


Selected Pin Attribute			
Function	SMARTIO	Note	
VREFL	NA		Low referen
VSSA	NA		Main analo
VDDA	NA		Main analo
VREFH	NA		High referer
PWM_36	NA		
PWM_37			
P12.2	SMARTIO12_2		
P12.3	NA		
P12.4	SMARTIO12_2		
P12.5	SMARTIO12_5		
P12.6	SMARTIO12_6		
P12.7	SMARTIO12_7		
VDDIO_2	NA		I/O supply f
VSSD	NA		Main digita
SCB3_MISO (0)	SMARTIO13_0	See the Notice *2	
SCB3_MOSI (0)	NA	See the Notice *2	
SCB3_CLK (0)		See the Notice *2	
SCB3_SEL0 (0)	SMARTIO13_3	See the Notice *2	
SCB3_SEL1 (0)	SMARTIO13_4	See the Notice *2	
SCB3_SEL2 (0)	SMARTIO13_5	See the Notice *2	
SCB3_SEL3 (0)	SMARTIO13_6	See the Notice *2	

Figure 10 Select SMARTIO pin

When you select a function on the PFxxx sheet, the selected function is displayed in Figure 11 (PCHxxx sheet).

Then, an image diagram is generated on the corresponding PAxxx sheet.



Pin Usage Status_176-LQFP for peripheral

[Rule]
- The selected pin cell is yellow.
- Duplicate pin names are red.

CAN0		CAN0_0	CAN0_1	CAN0_2
Number of pins used	RX	0	2	0
	TX	0	2	0

CAN1		CAN1_0	CAN1_1	CAN1_2
Number of pins used	RX	0	1	0
	TX	0	1	0

LIN		LIN0	LIN1	LIN2	LIN3	LIN4	LIN5	LIN6	LIN7
Number of pins used	RX	0	0	0	0	0	1	0	0
	TX	0	0	0	0	0	1	0	0
	EN	0	0	0	0	0	1	0	0

SCB		SCB0	SCB1	SCB2	SCB3	SCB4	SCB5	SCB6	SCB7
Number of pins used for SPI	CLK (0)	0	1	0	1	1	0	0	0
	CLK (1)	1	0	1	0	0	1	1	1
	MOSI (0)	0	1	0	1	1	0	0	0
	MOSI (1)	1	0	1	0	0	1	1	1
	MISO (0)	0	1	0	1	1	0	0	0
	MISO (1)	1	0	1	0	0	1	1	1
	SEL0 (0)	0	1	0	1	1	0	0	0
	SEL0 (1)	1	0	1	0	0	1	1	1
	SEL1 (0)	0	1	0	1	1	0	0	0
	SEL1 (1)	0	0	1	0	0	1	1	1
	SEL2 (0)	0	1	0	1	1	0	0	0
	SEL2 (1)	0	0	1	0	0	1	1	1
	SEL3 (0)	0	1	0	1	1	0	0	0
	SEL3 (1)	0	0	0	0	0	0	0	0
	TX (0)	0	0	0	0	0	0	0	0
	TX (1)	0	0	0	0	0	0	0	0

Figure 11 Pin usage status (PCHxxx sheet)

2.5 User free space

The PFxxx sheet can utilize the user free space. According to the application, you can manage connection information with external ICs and monitor pins on the sheet by adding connection destinations.

For example, enter the selected function name in the Note field of the PFxxx sheet as shown in Figure 12.

Selected Pin Attribute				
Function	SMARTIO	Note	Memo	
VSSD	NA		Main digital ground	-
SCB0_MISO (0)	NA	See the Notice *2	LIN0_RXD	G
SCB0_MOSI (0)	NA	See the Notice *2	LIN0_TXD	G
CAN0_1_TX	NA		CAN0_TXD	G
CAN0_1_RX	NA		CAN0_RXD	G
P1.0	NA		LED0	G
P1.1	NA		SW0	G
SCB0_CLK (1)	NA	See the Notice *2		G
SCB0_SEL0 (1)	NA	See the Notice *2		G
SCB0_SEL1 (0)	NA	See the Notice *2		G
SCB0_SEL2 (0)	NA	See the Notice *2		G
SCB0_SEL3 (0)	NA	See the Notice *2		G
SCB7_SEL0 (0)	NA	See the Notice *2		G

Figure 12 Example of memo field

For example, the connection information at the time of board design is entered in the board connection, but please use it as a user-free space according to your purpose, as shown in Figure 13.

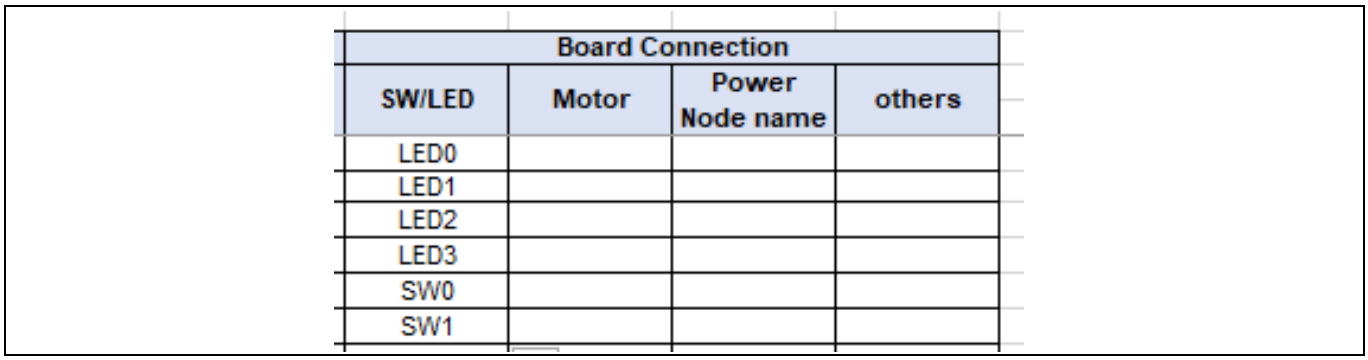
Board Connection	
Connection_1	Connection_2

Figure 13 Board connection field

This area is used by filling in the connection destination on the board.

Please add the device and column of the connection destination according to the purpose, and fill in freely, such as entering the connection destination.

Figure 14 shows an example of the entry.



Board Connection			
SW/LED	Motor	Power Node name	others
LED0			
LED1			
LED2			
LED3			
SW0			
SW1			

Figure 14 Example of board connection field

Revision history

Document revision	Date	Description of changes
**	2022-05-13	Initial release
*A	2022-12-15	Attached the Excel files • Pin_Assign_Tool_CYT2B7_0A.xlsx • Pin_Assign_Tool_CYT2B9_0A.xlsx • Pin_Assign_Tool_CYT3BB_4BB_0A.xlsx • Pin_Assign_Tool_CYT4BF_0A.xlsx
*B	2023-09-07	Updated Figure 6 and Figure 11. Revised the following attached Excel files: • Pin_Assign_Tool_CYT2B9_0B.xlsx • Pin_Assign_Tool_CYT3BB_4BB_0B.xlsx • Pin_Assign_Tool_CYT4BF_0B.xlsx Added the following Excel files: • Pin_Assign_Tool_CYT2BL_00.xlsx • Pin_Assign_Tool_CYT2CL_00.xlsx
*C	2023-11-28	Added the following Excel files: • Pin_Assign_Tool_CYT4DN_00.xlsx • Pin_Assign_Tool_CYT3DL_00.xlsx
*D	2024-03-13	Updated the following Excel files: • Pin_Assign_Tool_CYT2BL_0A.xlsx • Pin_Assign_Tool_CYT4BF_0C.xlsx Added the following Excel file: • Pin_Assign_Tool_CYT6BJ_00.xlsx

Trademarks
All referenced product or service names and trademarks are the property of their respective owners.

Edition 2024-03-13

Published by

Infineon Technologies AG

81726 Munich, Germany

Do you have a question about this document?

Email: erratum@infineon.com

Document reference

002-34925 Rev.*D

Important notice
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics (“Beschaffenheitsgarantie”)

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer’s compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

Warnings
Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies’ products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.