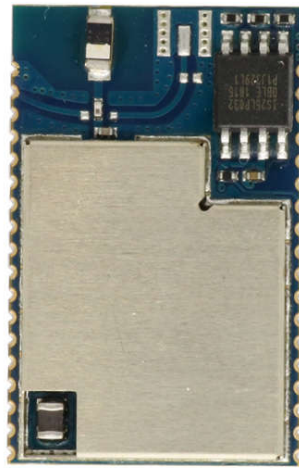


Wi-Fi module RF-WM-3220B1

(Hardware version)



Shenzhen RF-star Technology Co.,Ltd.

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1 Introduction

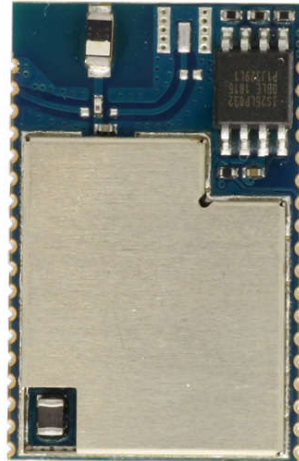


Figure 1. RF-WM-3220B1 Module

1.1 Module P/N description

CC3220SF is an upgraded version of CC3220S. It supports 4 stations maximum in AP mode, IPV6 and Apple Homekit; We enhanced Wi-Fi RF design to get lower standby power consumption; this module has been improved configuration success rate of SmartConfig, and supports the Security function to protect the Flash Code from infringement (CC3220S/CC3220SF support, CC3220R does not support).

P/N	Chip	Description
RF-WM-3220RB1	CC3220R	Embedded with 256k RAM;
RF-WM-3220SB1	CC3220S	CC3220R+Flash Application code security encryption;
RF-WM-3220B1	CC3220SF	CC3220S+internal 1MB XIP (Executed in place) Flash;

1.2 Functions and Features

RF-WM-3220B1 module is the latest embedded Wi-Fi module presented by RF-Star. RF-WM-3220B1 uses the latest SimpleLink Wi-Fi CC3220SF chip design by Texas Instruments, built-in with high performance ARM Cortex-M4 MCU, and contains a variety of peripherals, such

as parallel camera interface, I2S, SD/MMC, UART, SPI, I2C, ADC and GPIO etc. This module supports 802.11 b/g/n wireless standards, and it can work in Station, AP or Wi-Fi direct connection modes. RF-WM-3220B1 supports WPA2 encryption at personal or enterprise level, supporting TCP/IP and TLS/SSL stacks. In addition, the hardware of module also offer 3 kinds of antennas, including the ceramic antenna, IPEX base, and the antenna welding.

RF-WM-3220B1 module integrates with TCP/IP protocols and applications, it can be widely used in IoT applications, such as home automation, home appliance control, security systems, smart energy, internet gateway, industrial control, smart plug, smart metering, wireless audio, wireless doorbell, sensor networking node etc..

1.3 Pin Assignment

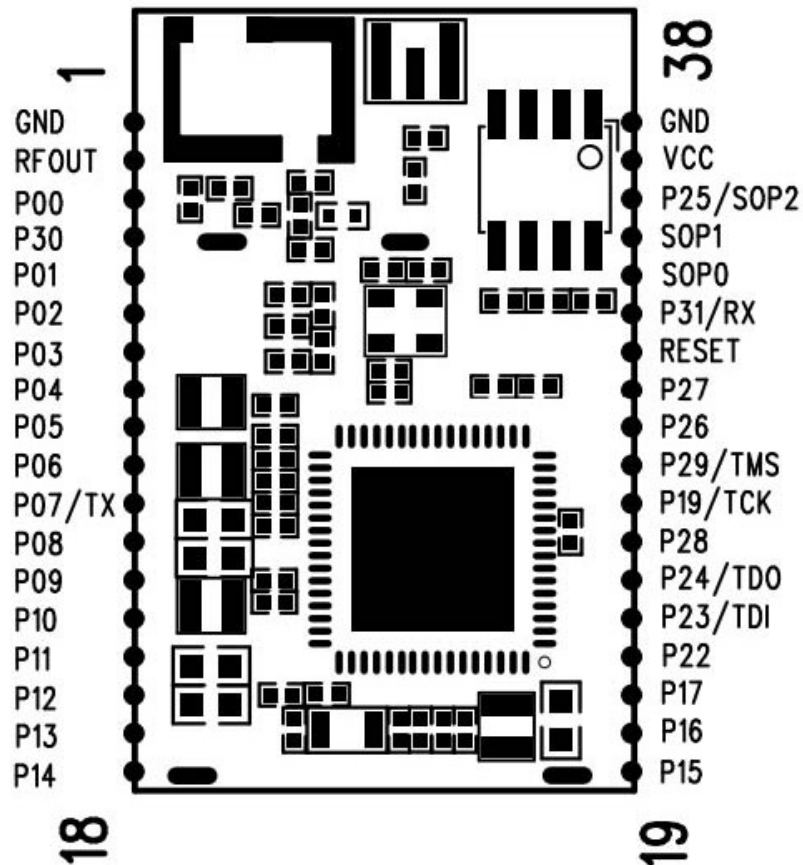


Figure 2. Pin Assignment

Module Pin	Chip Pin	Name	Function
1		GND	Module grounding
2		RF_OUT	RF output interface
3	50	GPIO00	GPIO0

			UART0_CTS
			McAXR1
			GT_CCP00
			GSPI_CS
			UART1_RTS
			UART0_RTS
			McAXR0
4	53	GPIO30	GPIO30
			UART0_TX
			McACLK
			McAFSX
			GT_CCP05
			GSPI_MISO
5	55	GPIO01	GPIO1
			UART0_TX
			pCLK Pixel (PIXCLK)
			UART1_TX
			GT_CCP01
6	57	GPIO02	ADC_CH0
			GPIO2
			UART0_RX
			UART1_RX
			GT_CCP02
7	58	GPIO03	ADC_CH1
			GPIO3
			UART1_TX
			pDATA7(CAM_D3)
8	59	GPIO04	ADC_CH2
			GPIO4
			UART1_RX
			pDATA6(CAM_D2)
9	60	GPIO05	ADC_CH3
			GPIO5
			pDATA5(CAM_D1)
			McAXR1
			GT_CCP05
10	61	GPIO06	GPIO6
			UART0_RTS
			pDATA4(CAM_D0)
			UART1_CTS
			UART0_CTS

			GT_CCP06
11	62	GPIO07	GPIO7
			McACLKX
			UART1_RTS
			UART0_RTS
			UART0_TX
12	63	GPIO08	GPIO8
			SDCARD_IRQ
			McAFSX
			GT_CCP06
13	64	GPIO09	GPIO9
			GT_PWM05
			SDCARD_DATA0
			McAXR0
			GT_CCP00
14	1	GPIO10	GPIO10
			I2C_SCL
			GT_PWM06
			UART1_TX
			SDCARD_CLK
15	2	GPIO11	GT_CCP01
			GPIO11
			I2C_SDA
			GT_PWM07
			pXCLK(XVCLK)
			SDCARD_CMD
			UART1_RX
			GT_CCP02
McAFSX			
16	3	GPIO12	GPIO12
			McACLK
			pVS (VSYNC)
			I2C_SCL
			UART0_TX
			GT_CCP03
17	4	GPIO13	GPIO13
			I2C_SDA
			pHS (HSYNC)
			UART0_RX

			GT_CCP04
18	5	GPIO14	GPIO14
			I2C_SCL
			GSPI_CLK
			pDATA8(CAM_D4)
			GT_CCP05
19	6	GPIO15	GPIO15
			I2C_SDA
			GSPI_MISO
			pDATA9(CAM_D5)
			GT_CCP06
20	7	GPIO16	SDCARD_DATA0
			GPIO16
			GSPI_MOSI
			pDATA10(CAM_D6)
			UART1_TX
21	8	GPIO17	GT_CCP07
			SDCARD_CLK
			GPIO17
			UART1_RX
			GSPI_CS
22	15	GPIO22	pDATA11(CAM_D7)
			SDCARD_CMD
			GPIO22
			McAFSX
23	16	JTAG TDI	GT_CCP04
			TDI
			GPIO23
			UART1_TX
24	17	JTAG TDO	I2C_SCL
			TDO
			GPIO24
			PWM0
			UART1_RX
			I2C_SDA
			GT_CCP06
McAFSX			
25	18	GPIO28	GPIO28
26	19	JTAG TCK	TCK
			GT_PWM03

27	20	JTAG TMS	TMS
			GPIO29
28	29	ANTSEL1	IO □
29	30	ANTSEL2	IO □
30	32	RESET	Module reset pin; internal pull-up by default; low level to reset
31	45	DCDC_ANA2_SW_P	GPIO31
			UART0_RX
			McAFSX
			UART1_RX
			McAXR0
			GSPI_CLK
32	35	SOP0	SOP0
33	34	SOP1	SOP1
34	21	SOP2	GPIO25
			GT_PWM02
			McAFSX
			TCXO_EN
35		VCC	Power supply, 2.1V-3.6V
36		GND	Module grounding

Chart 1. RF-WM-3220B1 Pin Definition

1.4 Package Size

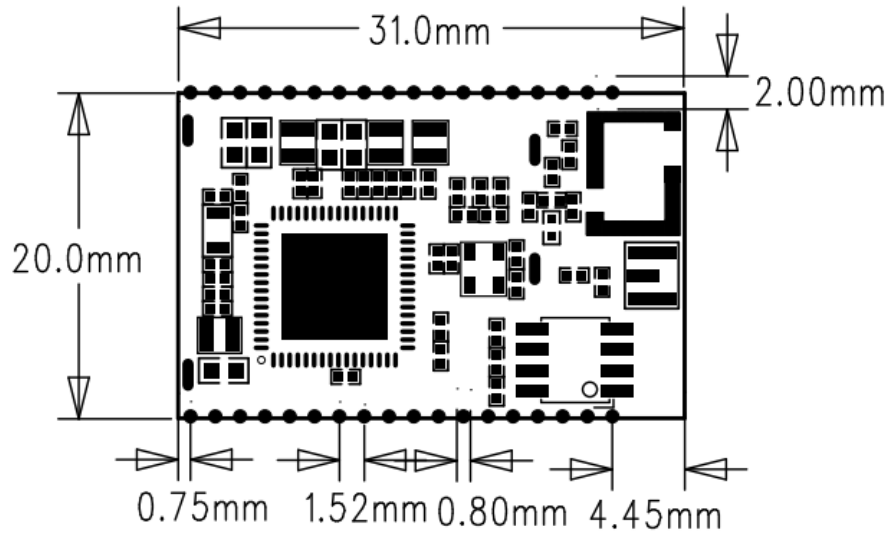


Figure 3 Package Size

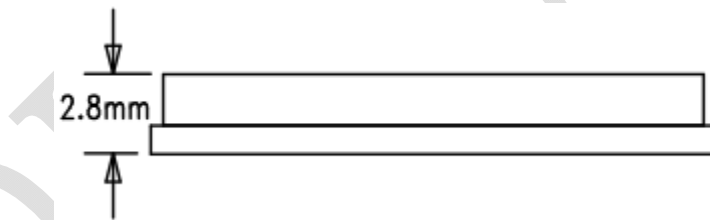


Figure 4 Module thickness

1.5 Antennas

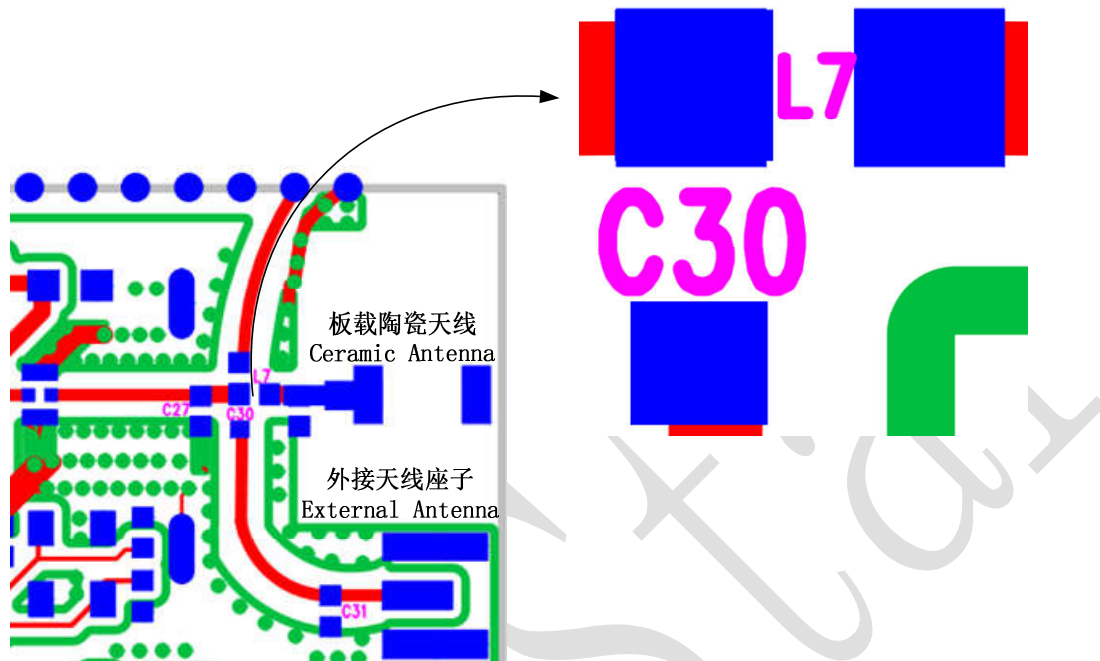


Figure 5 Antennas selection

Parameter Antenna	C27	C30	C31	L7
Ceramic Antenna	1pF	NC	NC	1.8nH
External Antenna	NC	0Ω	NC	NC

Chart 2 RF-WM-3220B1 antenna parameter

RF-WM-3220B1 uses the on-board ceramic antenna by default. If you need to use an external antenna, please switch according to the above table and Figure 5.

Remarks: NC: Not Connect

C30: When using an external antenna, the position of C30 is measured as 0Ω according to the actual simulation test.

2 Module Operations

2.1 SOP Configuration

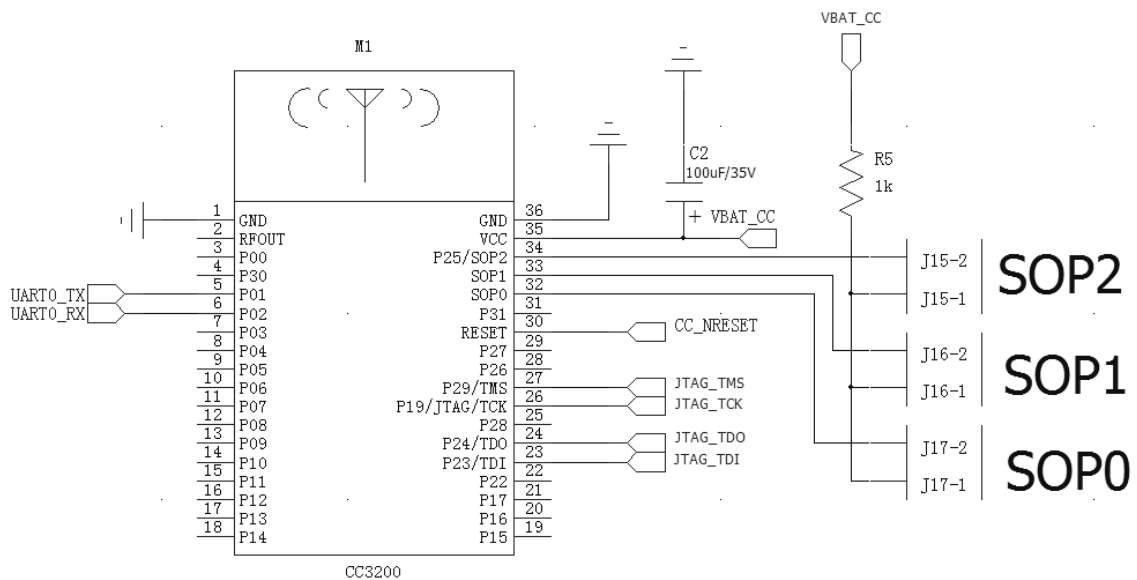


Figure 6 SOP Configuration

Remarks:

- 1) When Pin 1 & 2 of J16 are in short connection, disconnect J15 and J17, then SOP[2,1,0] = 0 1 0, the module is in flash programming mode. The firmware could be burned into flash via UART0_TX and UART0_RX.
- 2) When disconnect J15, J16 and J17, then SOP[2,1,0]=000, the module is in Functional mode + 4 Wire JTAG mode.
- 3) When Pin 1 & 2 of J17 are in shorted connection, disconnect J15 and J16, the module is in Functional mode + 2 Wire JTAG mode.
- 4) Specific programming configuration method, please refer to "CC3220 Getting Started Guide".

2.2 User's Guide

When you need to use one serial port and two IO ports, you could consult to the pin assignment table to select and decide which pins will be used. For example, you could select GPIO3 as UART1_TX, GPIO4 as UART1_RX, GPIO2 as normal output and GPIO5 as normal input.

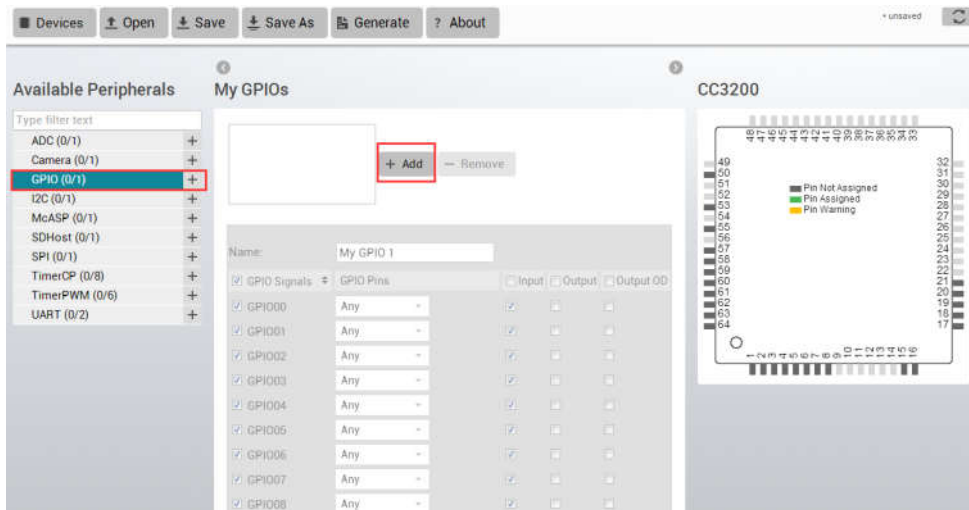
6	57	GPIO02	ADC_CH0
			GPIO2
			UART0_RX
			UART1_RX
7	58	GPIO03	GT_CCP02
			ADC_CH1
			GPIO3
			UART1_TX
8	59	GPIO04	pDATA7(CAM_D3)
			ADC_CH2
			GPIO4
			UART1_RX
9	60	GPIO05	pDATA6(CAM_D2)
			ADC_CH3
			GPIO5
			pDATA5(CAM_D1)
			McAXR1
			GT_CCP05

Chart 3. Example of Selecting Pins

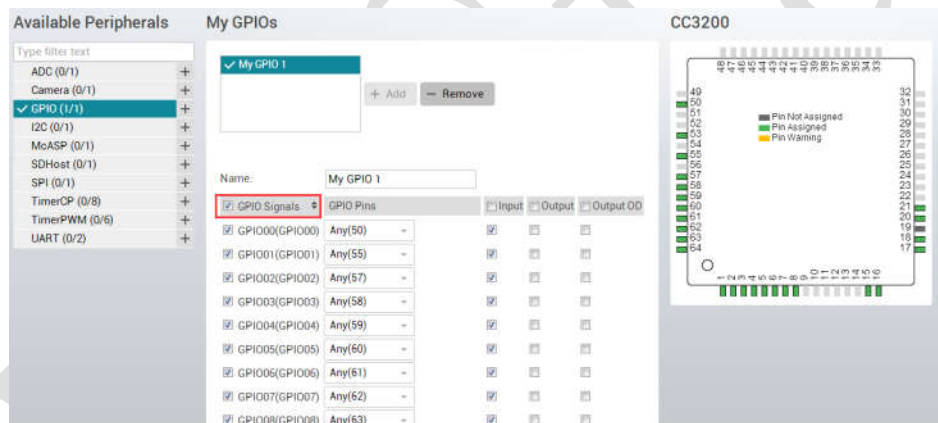
With the program “Pin Mux” offered by Texas Instruments, the functions of IO ports could be configured flexibly. The following, using CC3200 as example.



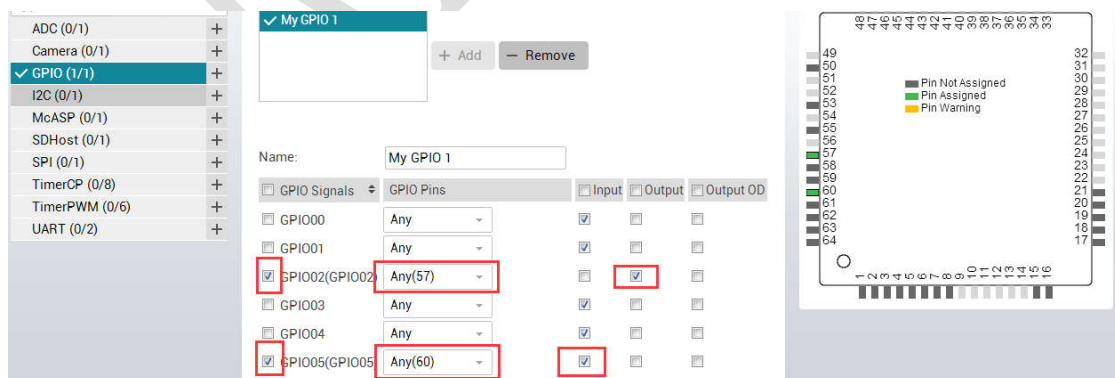
Select “CC3200” as “Device” and click “Start”



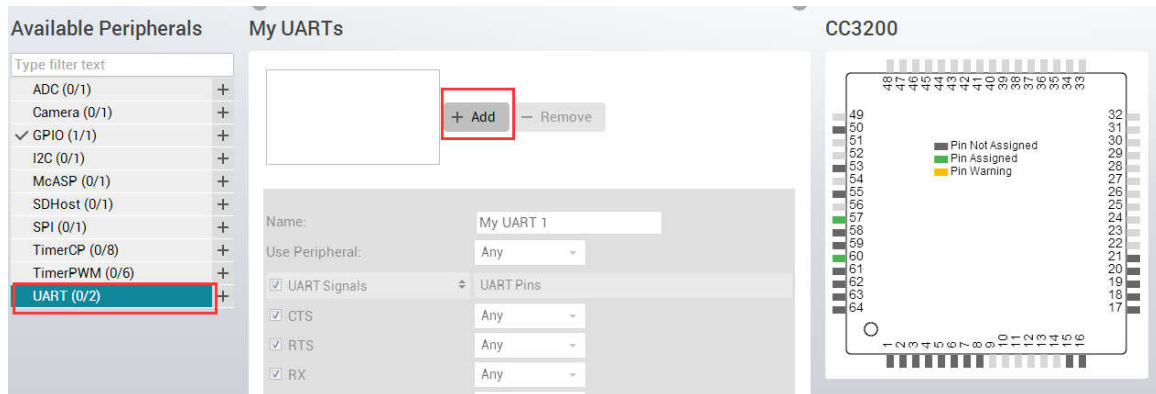
Select "GPIO" and click "+ Add"



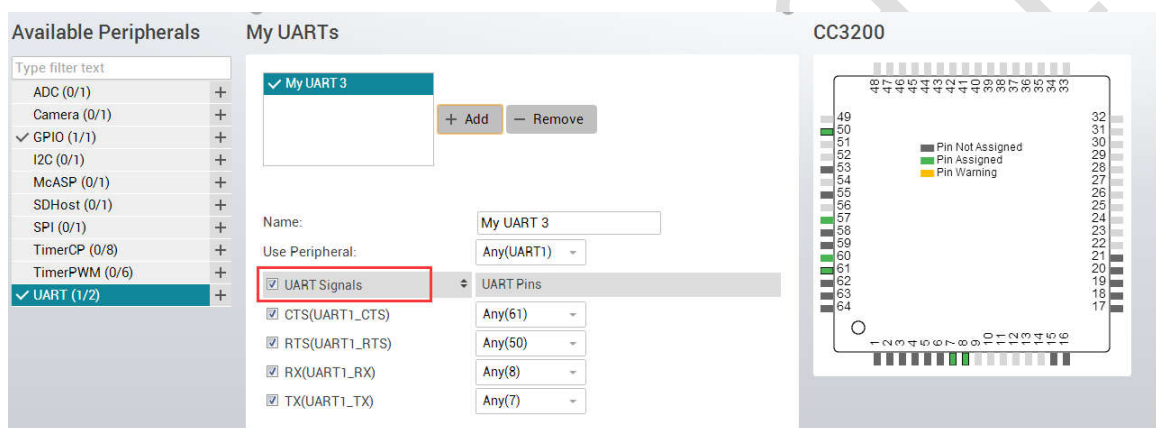
Don't select "GPIO Signals".



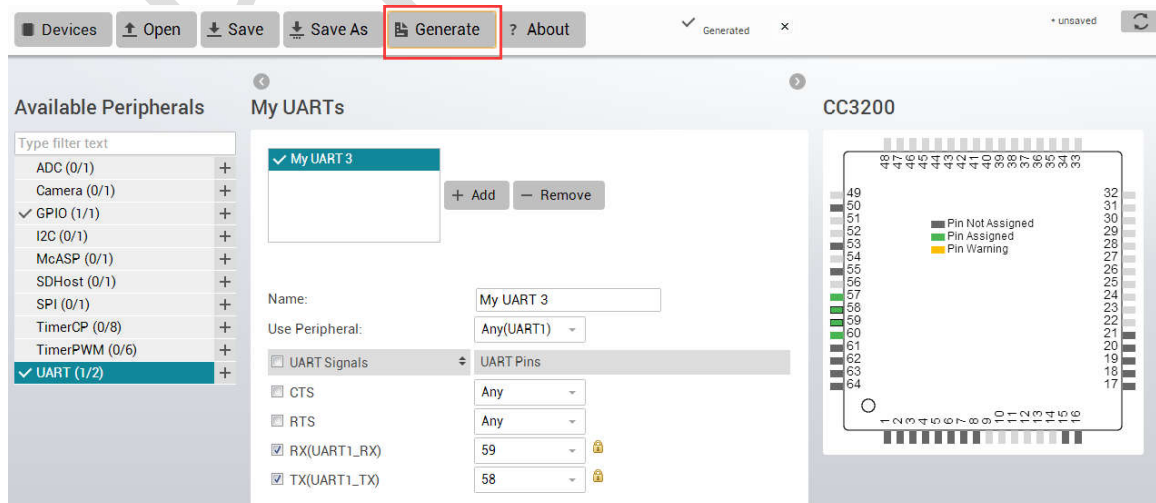
Select "GPIO2" and "GPIO5", and choose the corresponding IO type.



Select "UART" and click "+ Add"



As the pin numbers of GPIO03 and GPIO04 are 58 and 59 respectively, just select the corresponding pin as shown in the diagram above.



After configuration is done, click "Generate" to generate .c and .h files. Add the files generated into the corresponding program and it is OK.

3 Technical parameters

3.1 Temperature

Condition	Value
Storage temperature	-55 ~ +125 °C
Work temperature	-10 ~ +70 °C

Remarks: CC3220R/S/SF chip support -40 to +85 °C

3.2 RF

Wireless mode	Communication rate(modulation)	Tx power (typical value)	Receive sensitivity (typical value)
IEEE802.11 B	11Mbps@CCK	17.0dBm	-82dBm
IEEE802.11 G	54Mbps@OFDM	13.0dBm	-70dBm
IEEE802.11 N	HT20@MCS7	12.0dBm	-67dBm

3.3 Distance

TBD.

Appendix

Version History

Version	Time	Update by	Remarks
1.0.0	2017-10-20	Eaton	Original version