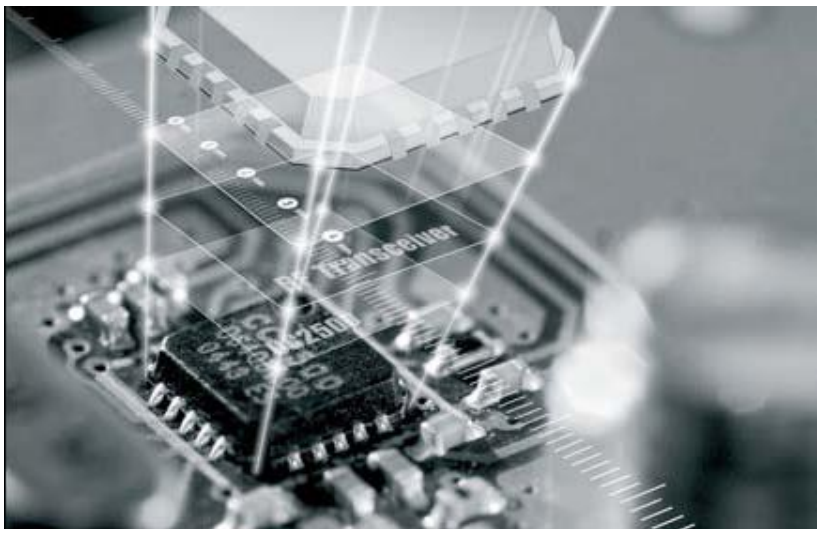
SPECIFICATION

WiFi Microcontroller Module



Model	:	**WiFi Microcontroller Module**
Part No	:	TC3200-S-ANT
Version	:	V1.1
Date	:	2017.08.23

■ Applications

- *Internet of Things (IoT)*
- *Cloud Connectivity*
- *Home Automation*
- *Home Appliances*
- *Access Control*
- *Security Systems*
- *Smart Energy*
- *Internet Gateway*
- *Industrial Control*
- *Smart Plug and Metering*
- *Wireless Audio*
- *IP Network Sensor Nodes*
- *Wearables*

■ Selection Guide

Denomination ：**WiFi Microcontroller Module**

Part No. ：**TC3200-S-ANT** **(with Shielding case)**

Absolute Maximum Ratings

Caution! *ESD sensitive device. Precaution should be used when handling the device in order to prevent permanent damage.*

These specifications indicate levels where permanent damage to the module can occur. Functional operation is not ensured under these conditions. Operation at absolute maximum conditions for extended periods can adversely affect long-term reliability of the module.

Symbol	Condition	Min	Typ	Max	Unit
VBAT and VIO	Respect to GND	–0.5	3.3	3.8	V
Digital I/O	Respect to GND	–0.5	–	VBAT + 0.5	V
Operating temperature	–	–20	25	70	°C

Recommended Operation Condition

Function operation is not ensured outside this limit, and operation outside this limit for extended periods can adversely affect long-term reliability of the module.

Symbol	Condition	Min	Typ	Max	Unit
VBAT and VIO	Battery mode	2.3	3.3	3.6	V

Electrical Specifications

- RESET REQUIREMENT

Parameter	Symbol	Min	Typ	Max	Unit
Operation mode level	ViH		0.65 × VBAT		V
Shutdown mode level	ViL	0	0.35 × VBAT		V
Minimum time for nReset low for resetting the module		5			ms
Rise/fall times	Tr/Tf		20		µs

- CURRENT CONSUMPTION

VBAT = 3.6V

Mode	Parameters	Conditions	Min	Typ	Max	Unit
Active Mode(1)	TX Current	1DSSS		272		mA
		6OFDM		248		
		54OFDM		223		
	RX Current	1DSSS		54		
		54OFDM		54		
	Calibration Current(2)	VBAT=3.3V		480	600	
		VBAT=2.3V		660	800	
Listen Mode	RX Current			37		
Low Power Mode	LPDS			120		uA
	Hibernate			20		

- WAKEUP Sequence

Symbol	Parameter	Device Starting Up from Initial State of:		
		Shutdown	Hibernate	Low Power Deep Sleep (LPDS)
t1	Hardware Reset Time	24 msec	17 msec	5.6 msec
t2	Software Reset Time(Crystal)	1.6 msec	5 msec	0.01 msec
t3	Time to download image from sFlash	6 msec for 8KBtye Data	6 msec for 8KBtye Data	0

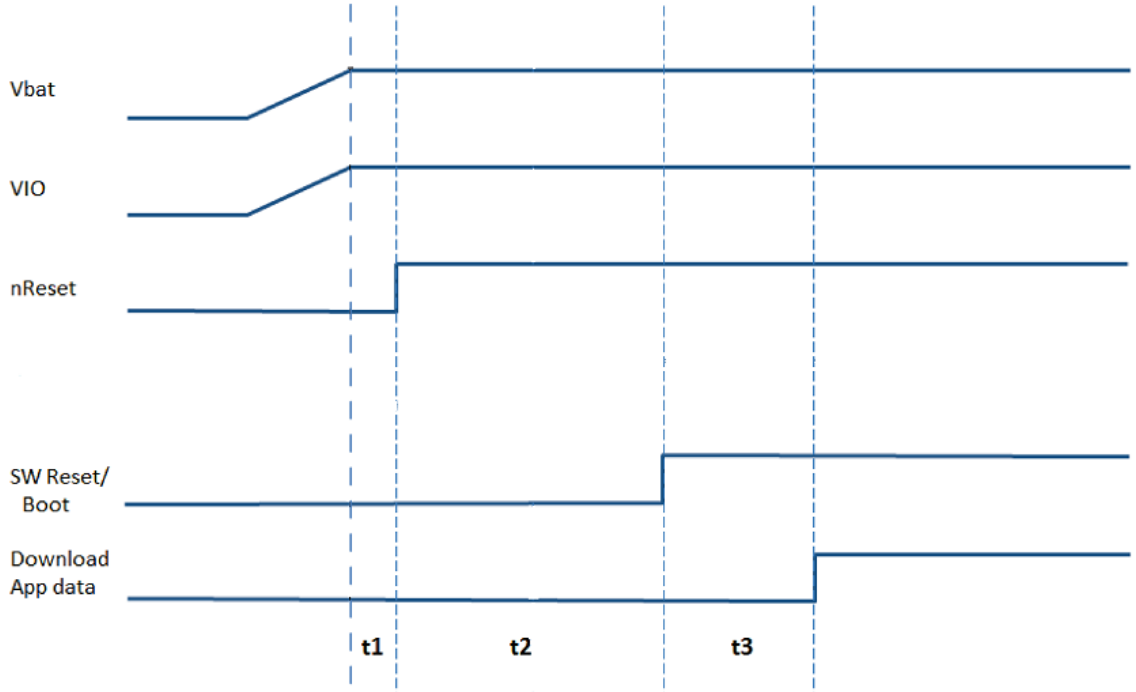


Figure 4-1. Wake-Up Sequence

■ WLAN RF Characteristics

● WLAN RECEIVER Characteristic

TA = 25°C and VDD = 3.3 V, unless otherwise noted.

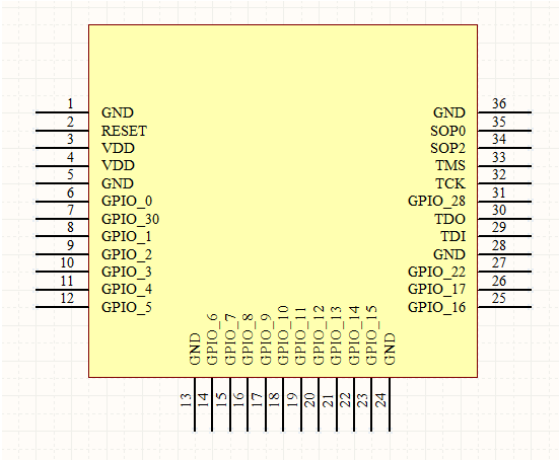
Parameters	Conditions	Min	Typ	Max	Unit
Sensitivity (8% PER for 11b rates, 10% PER for 11g/11n rates)	1DSSS		-94.7		dBm
	2DSSS		-92.6		
	11CCK		-87		
	6OFDM		-89		
	9OFDM		-88		
	18OFDM		-85		
	36OFDM		-79.5		
	54OFDM		-73		
	MCS0 (GF)(1)		-88		
	MCS7 (GF)(1)		-70		
Max Input Level at 10% PER	802.11b		-4		
	802.11g		-10		

● WLAN TRANSMITTER Characteristic

TA = 25°C and VDD = 3.3 V, unless otherwise noted.

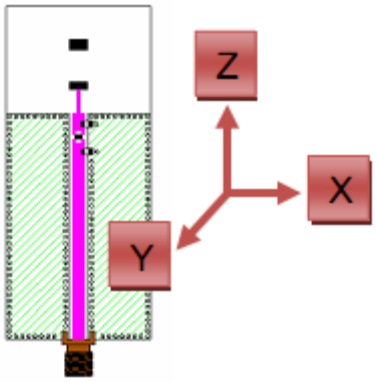
Parameters	Conditions	Min	Typ	Max	Unit
Max RMS Output Power measured at 1dB from IEEE spectral mask or EVM	1DSSS		17		dBm
	2DSSS		17		
	11CCK		17.25		
	6OFDM		16.25		
	9OFDM		16.25		
	18OFDM		16		
	36OFDM		15		
	54OFDM		13.5		
	MCS7 (MM)		12		
Transmit center frequency accuracy		-20		-20	ppm

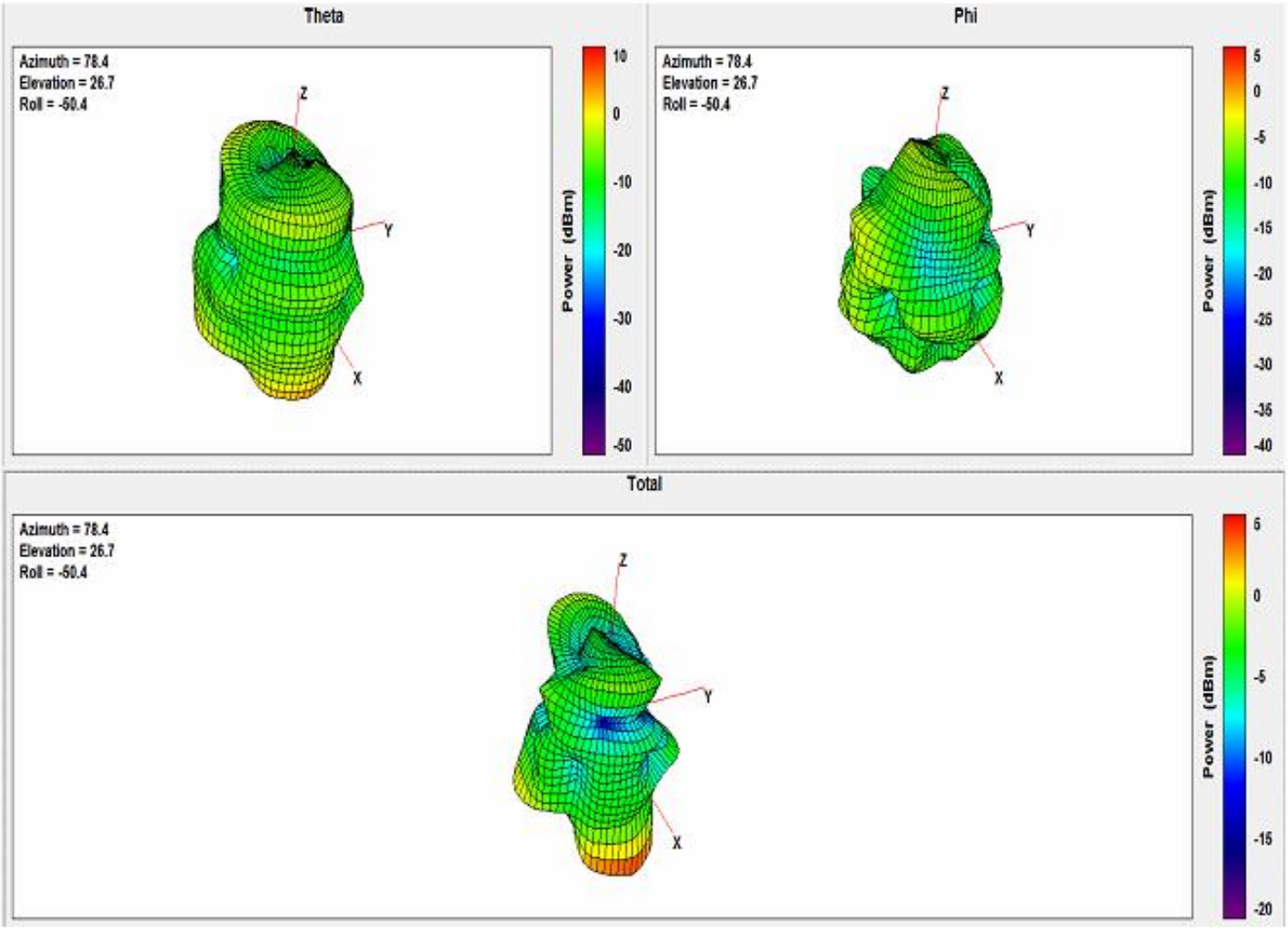
■ TC3200-S WiFi Module Pin Configuration



Pin #.	Pin Name	Pin Type	Description
1	GND	Ground	
2	RESET	nRESET	Do not require external RC circuit
3	VDD	POWER	2.3~3.6V power supply
4	VDD	POWER	2.3~3.6V power supply
5	GND	Ground	
6	GPIO_00	Digital I/O	
7	GPIO_30	Digital I/O	
8	GPIO_01	Digital I/O	
9	GPIO_02	Digital I/O	
10	GPIO_03	Digital I/O	
11	GPIO_04	Digital I/O	
12	GPIO_05	Digital I/O	
13	GND	Ground	
14	GPIO_06	Digital I/O	
15	GPIO_07	Digital I/O	
16	GPIO_08	Digital I/O	
17	GPIO_09	Digital I/O	
18	GPIO_10	Digital I/O	
19	GPIO_11	Digital I/O	
20	GPIO_12	Digital I/O	
21	GPIO_13	Digital I/O	
22	GPIO_14	Digital I/O	
23	GPIO_15	Digital I/O	
24	GND	Ground	
25	GPIO_16	Digital I/O	
26	GPIO_17	Digital I/O	
27	GPIO_22	Digital I/O	
28	GND	Ground	
29	JTAG_TDI	Digital I/O	
30	JTAG_TDO	Digital I/O	
31	GPIO_28	Digital I/O	
32	JTAG_TCK	Digital I/O	
33	JTAG_TMS	Digital I/O	
34	SOP2	Config I/O	Add option to pull up required for entering the UART load mode for flashing.
35	SOP0	Config I/O	Reserve(Do not use)
36	GND	GND	Ground

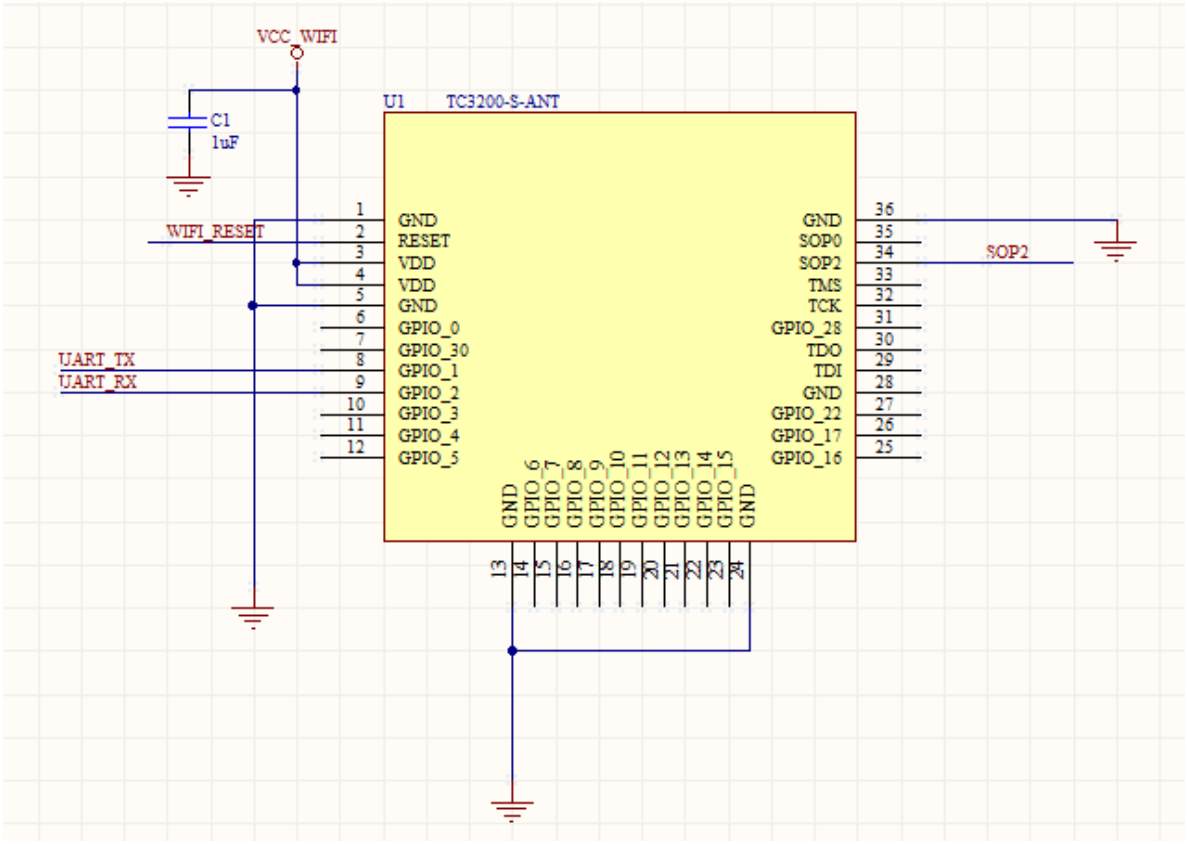
■ Antenna Radiation Pattern



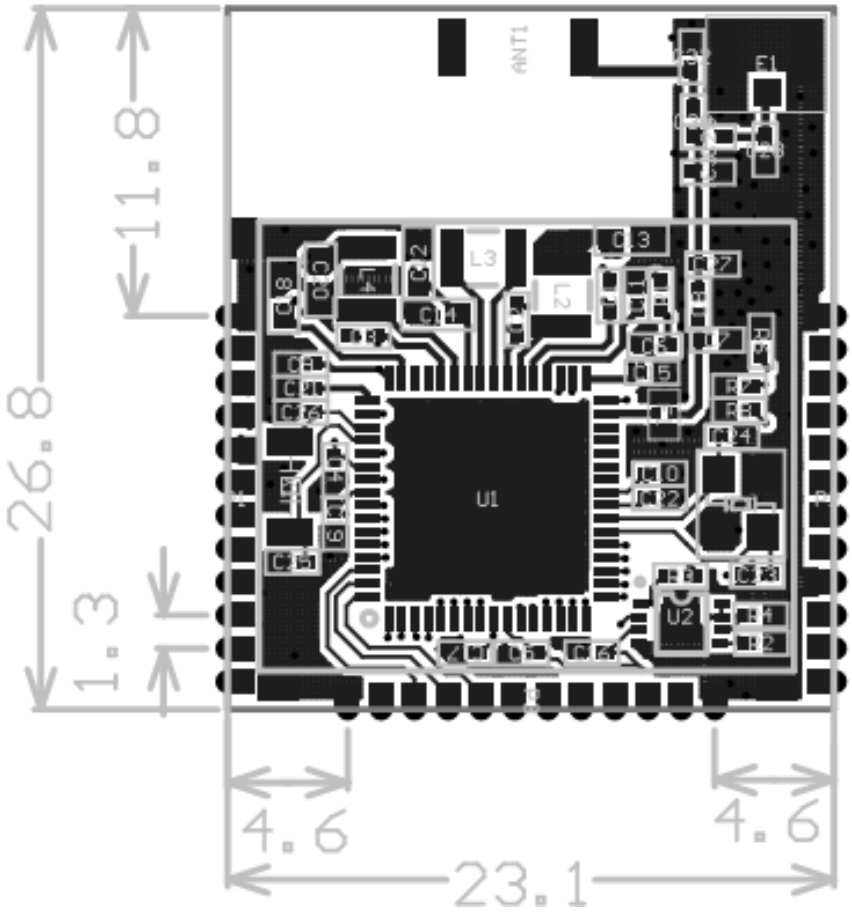


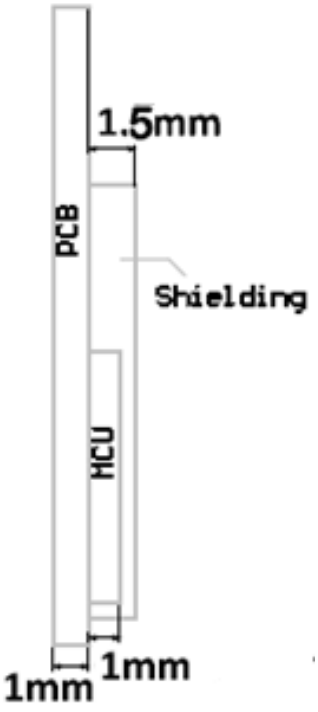
■ TC3200-S-ANT WiFi Module Example Design schematic

Example schematic:

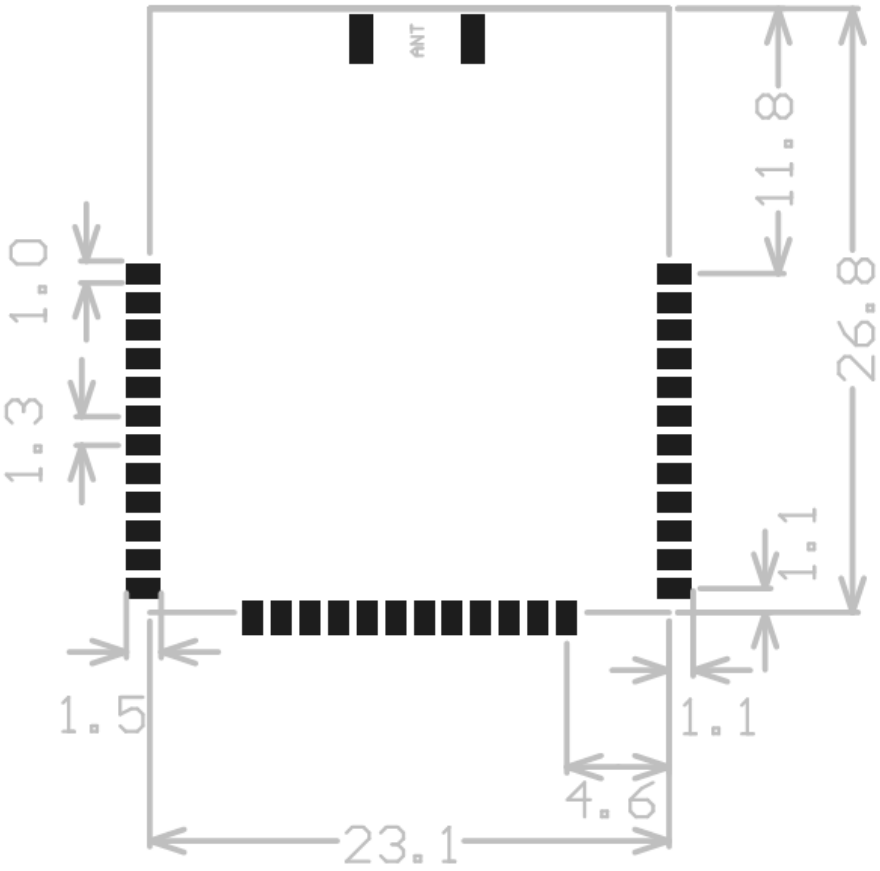


■ TC3200-S-ANT　WIFI Module Dimension

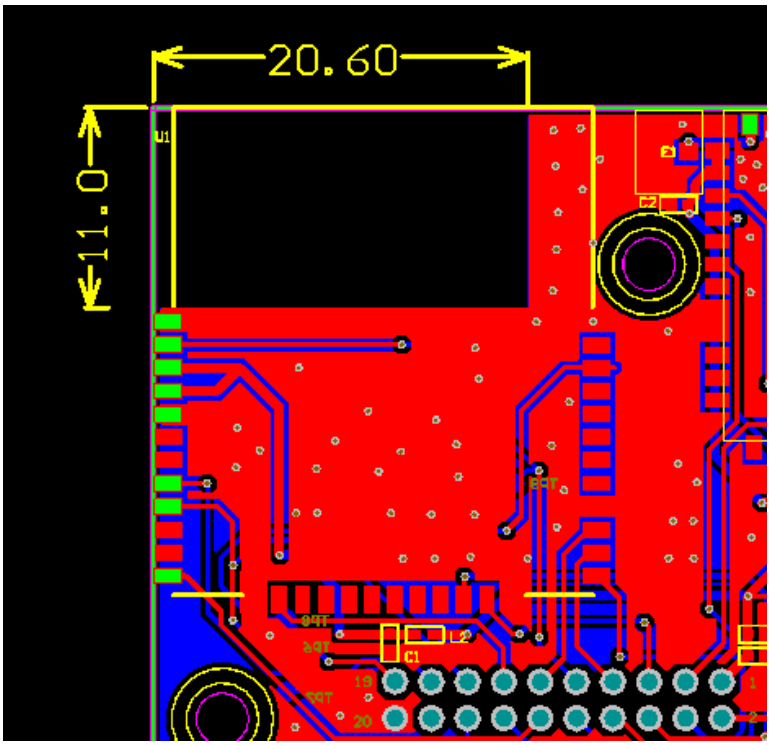




■ Recommended PCB layout for Module



■ Antenna Forbidden Area for PCB Layout



■ FCC Statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The user manual of the final host must contain a statement similar to this:

This transmitter must be installed in a way that a separation distance of at least 20cm from all persons in normal use is maintained.

■ Important FCC notice:

In accordance with FCC Part 15C, this module is listed as a Modular Transmitter device.

The antenna of this transmitter must not be co-located or operating in conjunction with any other antenna or transmitters within a host device, except in accordance with FCC multitransmitter product approval procedures.

■ FCC Lable Instruction:

The outside of final products that contains this module device must display a label referring to the enclosed module. This exterior label can use wording such as the following: Contains Transmitter Module FCC ID: 2AEQ402 or "Contains FCC ID:2AEQ402 Any similar wording that expresses the same meaning may be used.

■ Taiwan requlatory information(NCC)

低功率電波輻射性電機管理辦法

第十二條　經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條　低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信法規定作業之無線電通信。
低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

■ Document History

Revision	Date	Description/Changes
1.0	2016.11.16	First release
1.1	2017.08.23	ADD FCC/NCC statement

■ Address Information

24250 新北市新莊區中山路一段 107 號 13 樓之 1
電話:02-8522-8250
傳真:02-8522-8121
E-mail:rifo@rifo.com.tw
http://www.rifo.com.tw

13F.-1, No.107, Sec. 1, Zhongshan Rd., Xinzhuang Dist., New Taipei City 24250, Taiwan (R.O.C.)
Tel :886-2-8522-8250
Fax:886-2-8522-8121