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TROLINK TI7100CB1 IOT Module Instruction Manual

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Contents

Profile

TI7100CB1 is an intelligent new generation of highly integrated Wi-Fi and BLE combination chip TG7100C. The wireless subsystem includes 2.4G RF, Wi-Fi 802.11b/g/n and BLE baseband/MAC design. The microcontroller subsystem includes a low-power 32-bit RISC CPU, cache and memory. The power management unit provides flexible settings to achieve low power consumption mode and supports multiple security functions.
This Demo board is designed based on TG7100C and can be debugged by JTAG. It provides rich hardware interfaces including UART, PWM, ADC, DAC, I2C, SPI, GPIO, SDIO, etc.

Product Characteristic

802.11b/g/n 1*1 standard

WiFi+BLE 5.0 Combo, Support STA, Soft AP mode and Sniffer mode

Open source independent controllable RISC-V CPU, 1　160MHz adjustable, 276KB SRAM;
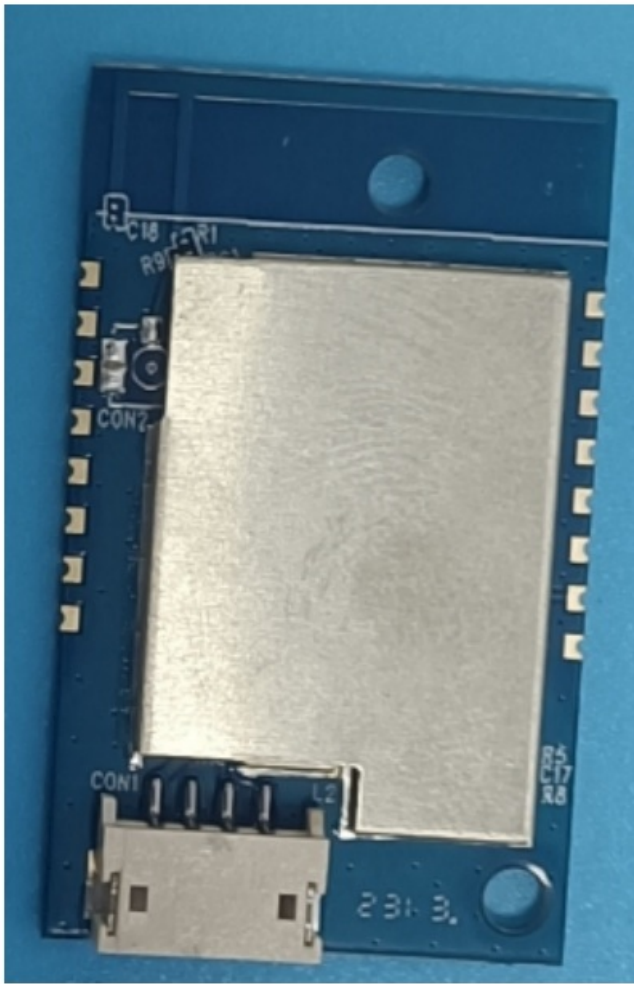
Ultra long distance, the maximum transmission power is 21dBm, the sensitivity is – 98dBm, and more than one wall is penetrated;

High security: support safe startup, safe debugging, AES 128/192/256, Encryption engine, WPA3 ,MD5, SHA-1/224/256', PKA(RSA/ECC)
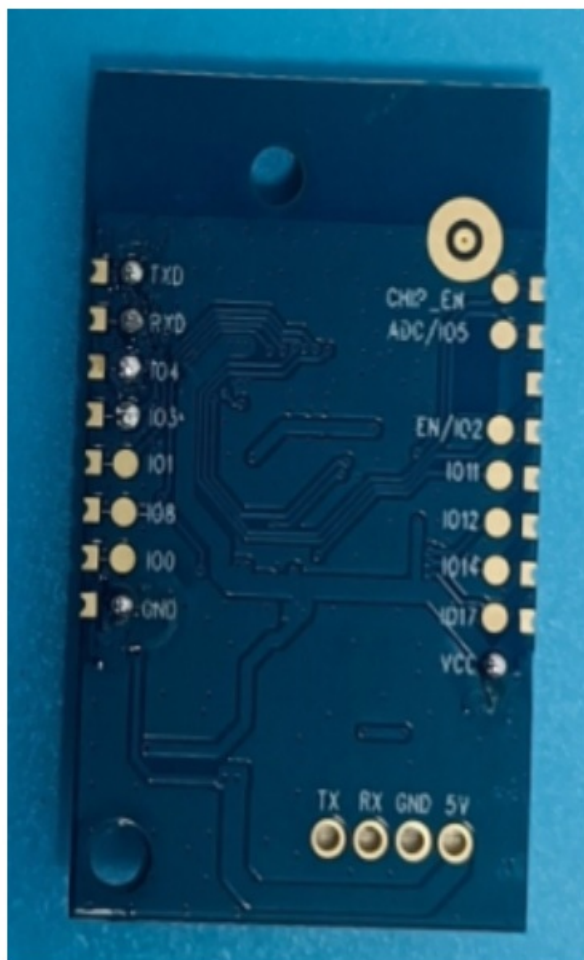
Support the coexistence of Wi-Fi and BLE

Product Picture

(TOP)

(BOTTOM)

Chip Block Diagram
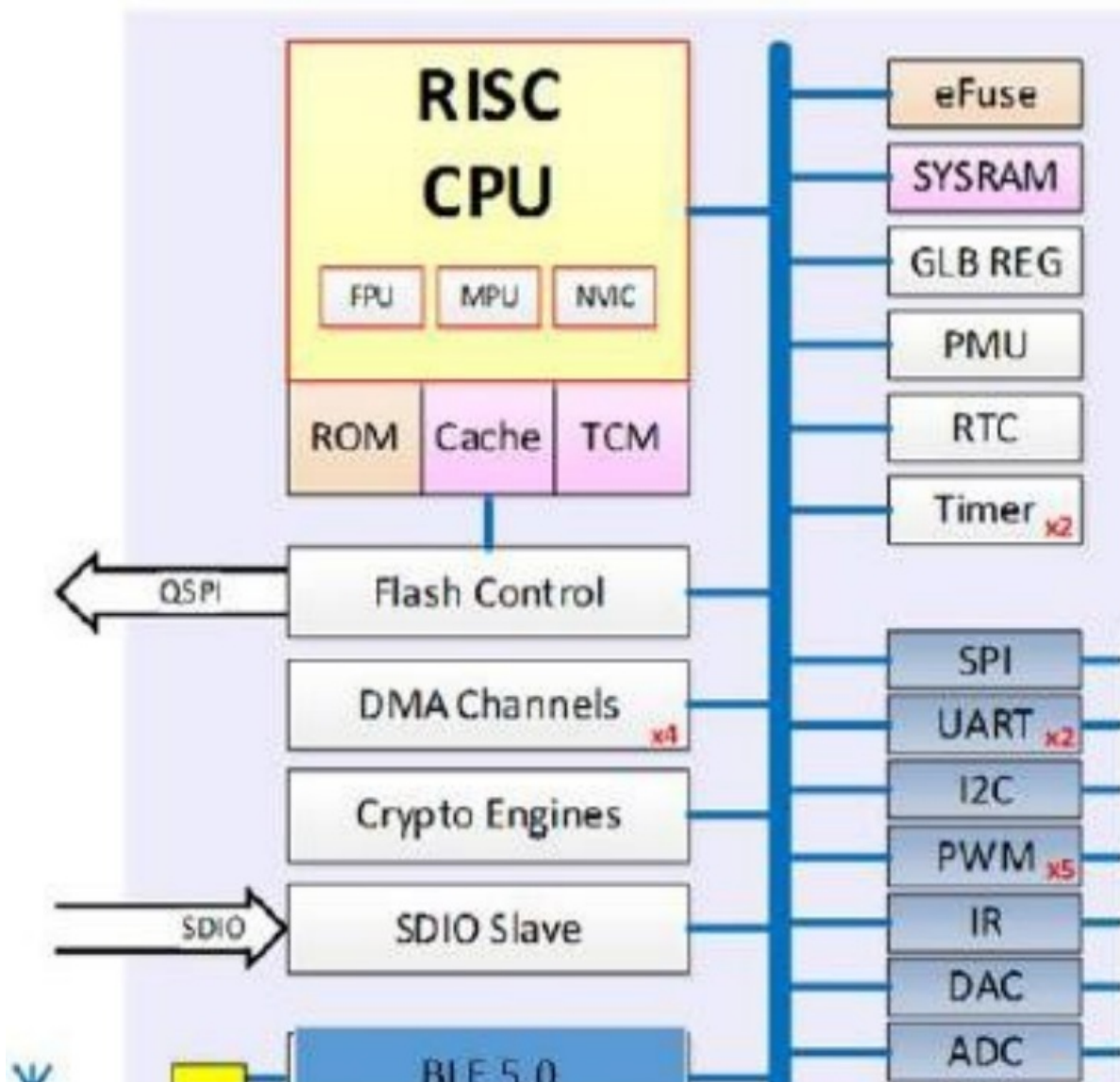
Wireless Module Outline

35.6mm

Pin Assignments

CHIP_EN	P1	P16	TXD
ADC/IO5	P2	P15	RXI
EN/IO2	P3	P14	TXD
GPIO11	P4	P13	RXI
GPIO12	P5	P12	GPI
GPIO14	P6	P11	GPI
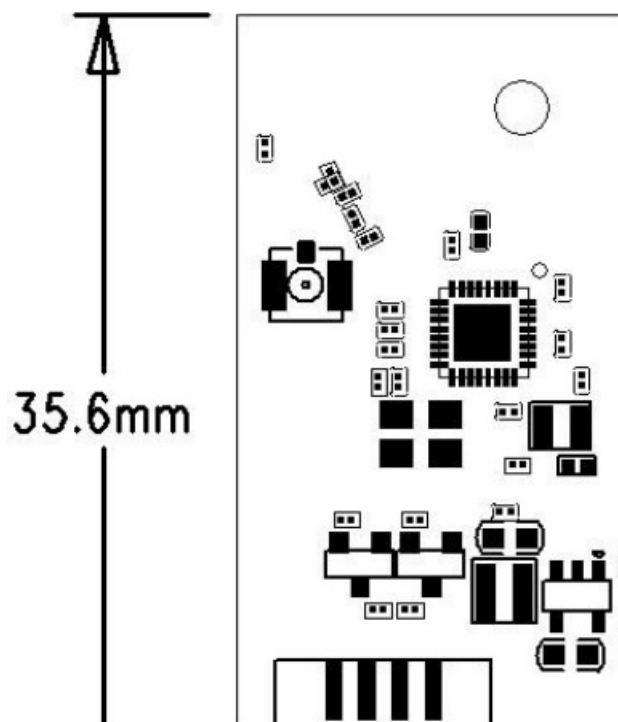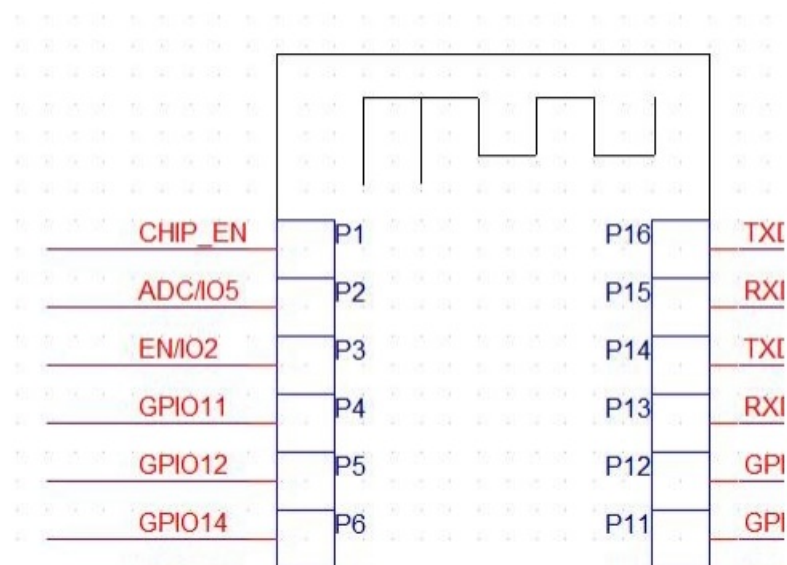
NO	Pin Name	Description
1	Chip_EN	Chip enable pin (active high)
2	GPIO5	ADC
3	GPIO2	EN
4	GPIO11	GPI011
5	GPIO12	GPIO12
6	GPIO14	GPIO14
7	GPIO17	GPIO17
8	VCC	Power supply 3.3V is required
9	GND	Ground
10	GPIO0	GPIO0
11	GPIO8	GPIO8 (Boot option)
12	GPIO1	GPIO1
13	GPIO3	RXD (5V) Communication serial port
14	GPIO4	TXD(5V)Communication serial port
15	GPIO16	RXD(3.3V) Burning serial port
16	GPIO7	TXD(3.3V) Burning serial port

Electrical Characteristic

Item	Description
Model No.	TI7100CB1
Chipset	TG7100C
Interface	URAT
Frequency Band.	2.4 – 2.483.5MHz
WiFi Standard	IEEE 802.11b/g/n
Modulation Mode	802.11b: CCK, DQPSK, DBPSK 802.11g 64-QAM, 16-QAM, QPSK BPSK 802.11n:64-QAM,16QAM,QPSK, BPSK
Transmit Power	1,2,5.5,6,11,12,18,22,24,30,36,48,54,65,,72.2Mbps
Module Size	35.6*21.6*0.8mm(L*W*H)
Working Voltage.	DC 5V
Encryption method	AES 128/192/256 WPA3, MD5.,SHA-1/224/256, PKA(RSA/ECC)
Working Temp	-230°C to +85°C
Storage Temp	-55°C to +85°C

RF Parameter

Transmit power	802.11b:17±1.5dBm
	802.11g:15±1.5dBm
	802.11n HT20:14±1.5dBm
EVM	802.11b: <-20dB@11Mbps
	802.11g: <-27dB@54Mbps
	802.11nHT20:< -28dB@65Mbps
Receiving sensitivity	11b-1Mbps: -98dBm
	11b-11Mbps: -91dBm
	11g-54Mbps: -77dBm
	11n HT20-MCS0: -92dBm
	11n HT20-MCS7: -73dBm

DC Consumption

Test condition: DC3.3V ; Temperature 25 °C Unit: mA		
Mode	TX/RX	Current consumption
802.11b (11Mbps)	TX	132
	RX	35
802.11g (54Mbps)	TX	120
	RX	37
802.11n HT20 (MCS7)	TX	108
	RX	37

## Reference design for PCBA

Circuit design
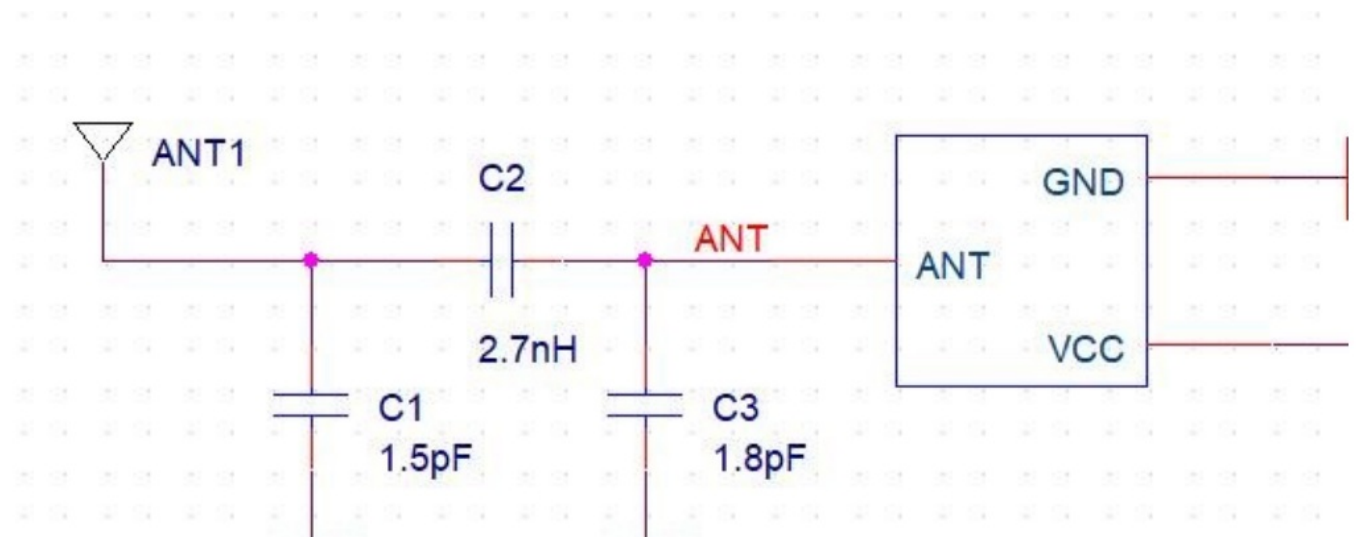
Requirement about layout of PCB

a. RF layout needs to be grounded and 50 ohm impedance

Environment about Working and Storage

Working Temp	Temperature:-30°Cto+85°C
	Relative Humidity:10-90%(non-condensing)
Storage Temp	Temperature:-55°Cto+85°C(non-condensing)
	Relative Humidity:10-90%(non-condensing)

Recommended Reflow Profile
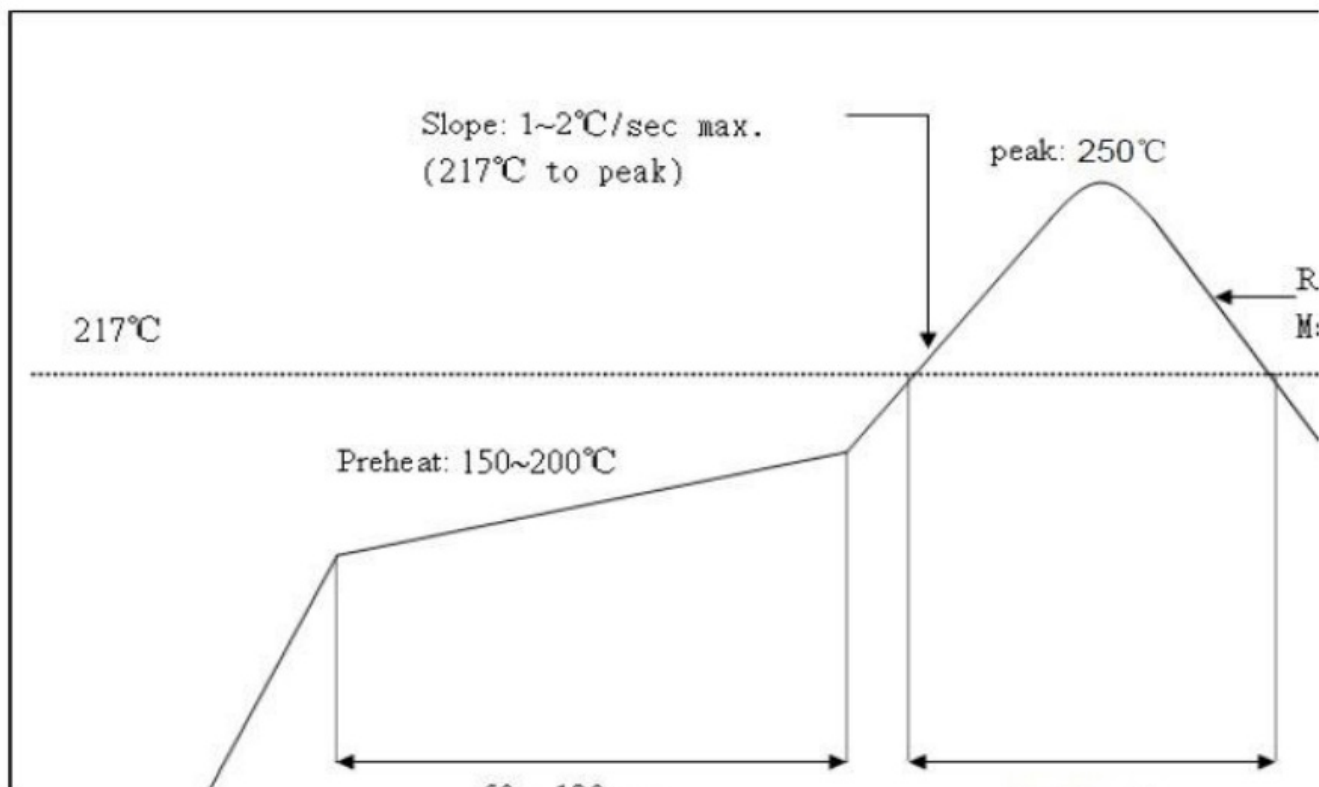
Heating Stage Temp <150℃ Time 60 90/sec, Ramp rate: 1 3℃/S
Preheat Range Temp 150℃ 200℃ Time 60-120/sec, Ramp rate : 0.3-0.8
Reflow Stage Peak temp:235℃~250℃(advise peak temp 245℃ Time:30-70 /sec
Cooling Stage Temp 217℃~170℃ ramp rate: 3 5℃/S . Sn&Ag&Cu Lead-free solder(SAC305)

Package details

- Packed as vacuum reel
- Reel color: blue Carton size: 33.7cm*33.7cm*9.5cm
- 2 packs desiccant, 1 pcs humidity card

FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: This device may not cause harmful interference, and
This device must accept any interference received, including interference that may cause undesired operation. Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. NOTE: This equipment has been tested and found to comply with the limits for a Class 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. FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator &your body.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

List of applicable FCC rules
FCC Part 15 Subpart C 15.247 & 15.207 & 15.209

Specific operational use conditions
Operation Frequency: BLE 2402~2480MHz WIFI 2412~2462MHz
Number of Channel: BLE 40 Channels WIFI 11 Channels
Modulation Type: BLE GFSK WIFI 802.11b: DSSS (CCK, DQPSK, DBPSK)
802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM)
802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type: PCB antenna
Antenna Gain(Peak):3.54 dBi (Provided by customer)
The module can be used for mobile or portable applications with a maximum 3.54dBi antenna. The host manufacturer installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory
information/warning as show in this manual.

Limited module procedures

Not applicable. The module is a Single module and complies with the requirement of FCC Part 15.212.

Trace antenna designs
Not applicable. The module has its own antenna, and doesn't need a host's printed board microstrip trace antenna etc.
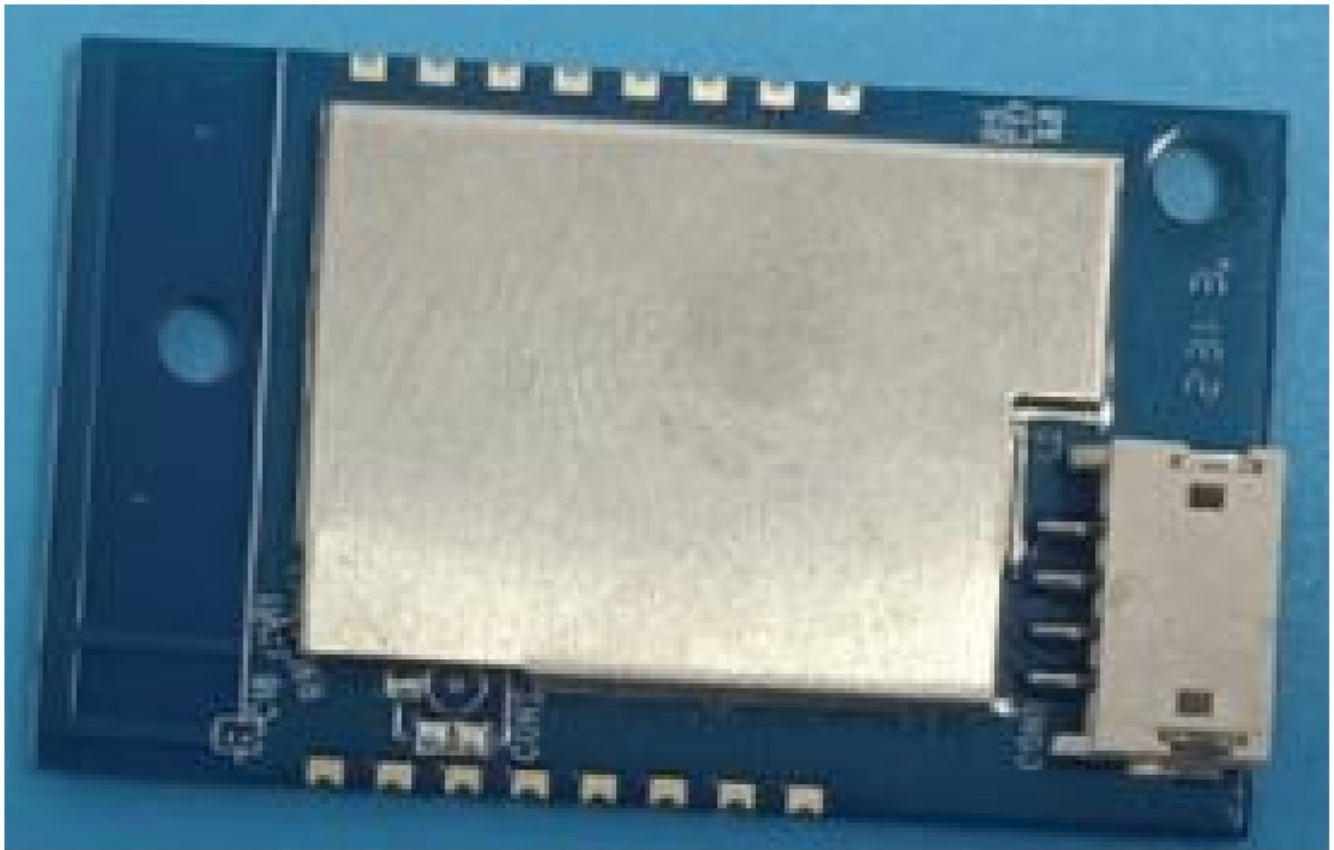
RF exposure considerations

The module must be installed in the host equipment such that at least 20mm is maintained between the antenna and users' body; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCCID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Antennas
Antenna Specification are as follows:
Antenna Type: PCB antenna
Antenna Gain(Peak):3.54 dBi (Provided by customer)
This device is intended only for host manufacturers under the following conditions:
The transmitter module may not be co-located with any other transmitter or antenna;
The module shall be only used with the External antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a 'unique' antenna coupler.

As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Label and compliance information
Host product manufacturers need to provide a physical or e-label stating "Contains FCCID 2AYHW-TI7100CB1 With their finished product.

Information on test modes and additional testing requirements
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802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM)
802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)

Antenna Type: PCB antenna

Antenna Gain(Peak):3.54 dBi (Provided by customer)

Host manufacturer must preform test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 & 15.207 &15.209and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15Subpart B compliance testing with the modular transmitter installed.

Documents / Resources

	TROLINK TI7100CB1 IOT Module [pdf] Instruction Manual TI7100CB1, TI7100CB1 IOT Module, IOT Module, Module

References

- 🌐 **wifi module_Wireless module_wifi module manufacturer_Shenzhen Chuangling Zhilian wifi module company**