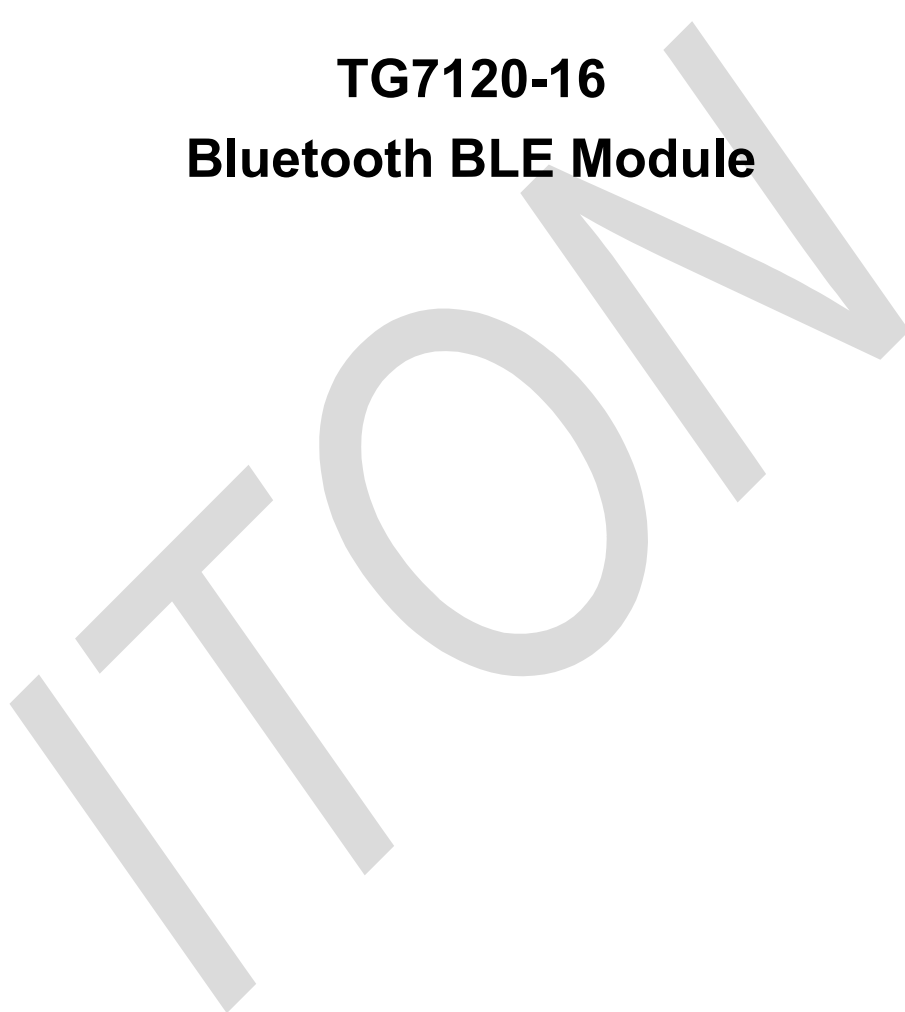


TG7120-16

Bluetooth BLE Module



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1. Product Features and Specifications

1.1 Describe

The TG7120-16 module is designed based on the Bluetooth 5.0 chip TG7120B. It is a Bluetooth wireless communication module that realizes ultra-low power consumption Internet of Things. The Bluetooth chip in the module is equipped with an ultra-low power consumption CK802 32-bit processor, equipped with 512KB/256KB Flash and 64KB SRAM, featuring ultra-low power consumption, high performance and wireless multi-mode. The TG7120-16 module design includes the peripheral basic circuit of the Bluetooth chip, and the module is designed as a mail hole interface, which is very convenient for customers to design and use.

The module supports low-power Bluetooth 5.0 features, and provides rich hardware interfaces including UART, PWM, ADC, SPI, GPIO, etc., enabling simple and fast access to the Tmall Genie ecosystem.

1.2 Module block diagram

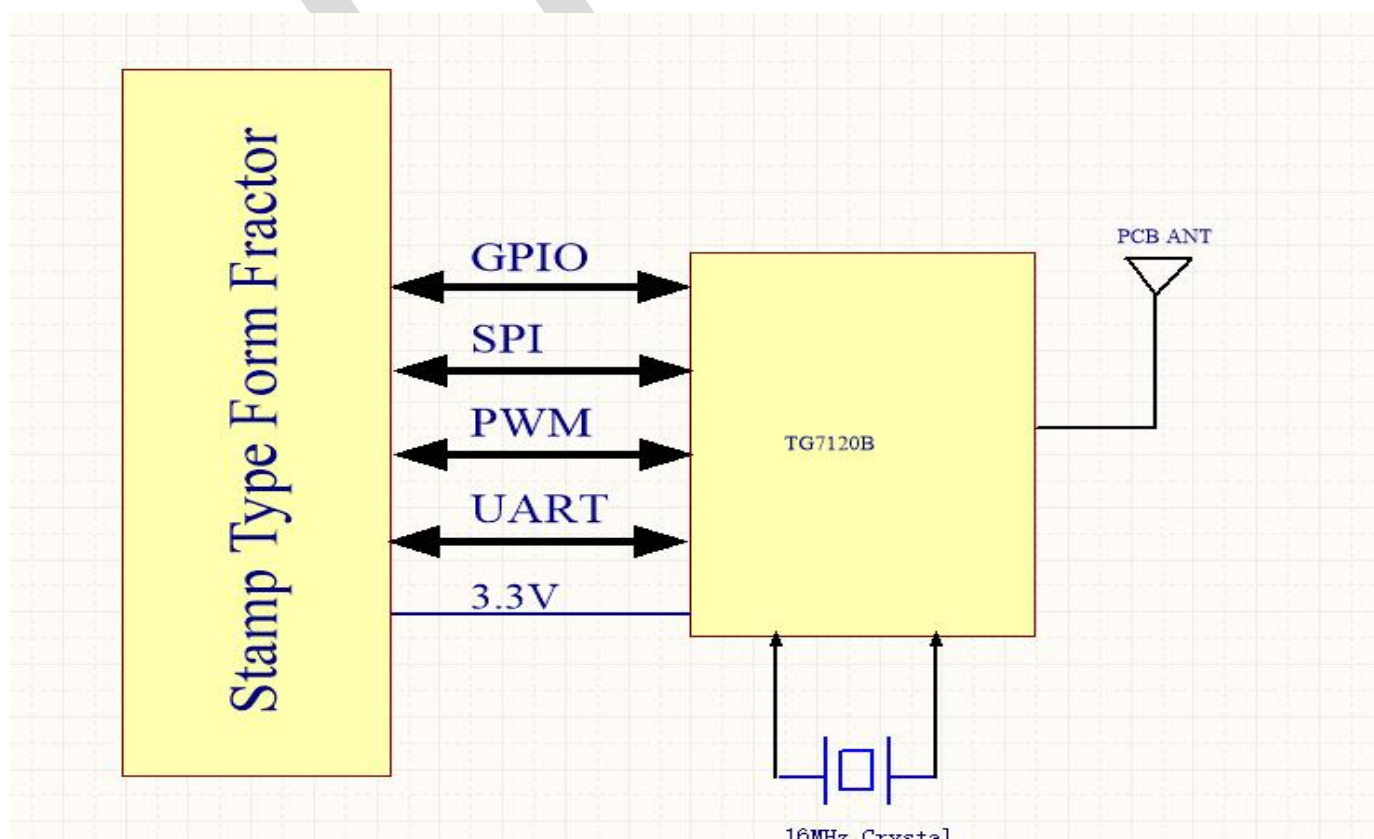
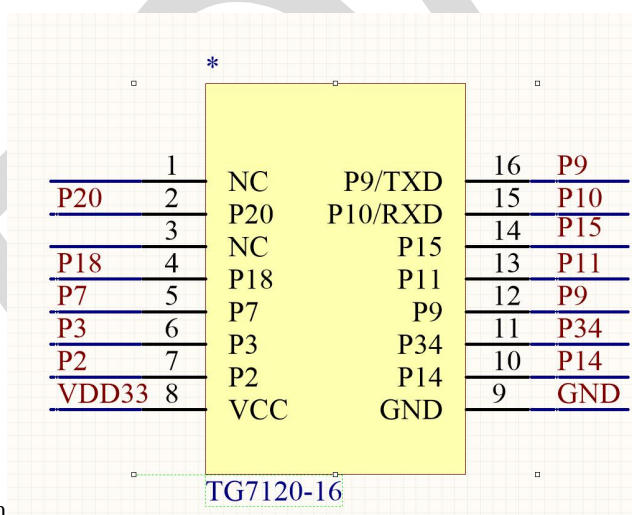


Figure 1 TG7120-16 module block diagram

1.3 Application scenarios

- (1) Smart Lighting
- (2) Smart switch
- (3) Smart socket
- (4) Smart clothes drying rack
- (5) Smart Curtain
- (6) Health sensor



2. Module pin definition

Figure 1 Module pins (TOP View)

Pin number	Pin name	Pin Default Function	Pin Alternate Function
1	NC		
2	P20/DRX	Universal GPIO	ADC/PWM/Debug serial port DRX
3	NC		
4	P7	Universal GPIO	PWM
5	P18	Universal GPIO	ADC/PWM
6	P3	Universal GPIO	SWCLK/PWM/ debug port
7	P2	Universal GPIO	SWDIO/PWM/ debug port
8	VDD	3.3V Power supply	

9	GND		
10	P14/DTX	Universal GPIO	ADC/PWM/INT/Debug serial port DTX
11	P34	Universal GPIO	SPI-CLK/PWM
12	P9	MultiplexGPIO	PWM
13	P11	Universal GPIO	PWM/INT/ADC
14	P15	Universal GPIO	PWM
15	P10/RXD	User communication serial portRXD	SWS
16	P9/TXD	User communication serial portTXD	

3. Module electrical parameter limit value

parameter	Parameter Description	minimum	Typical value	maximum value	unit
VDD	供电电压	2.2	3.3	3.6	V
I _{supply}	模组供电电流	20		-	mA

4. Recommended values of module electrical parameters

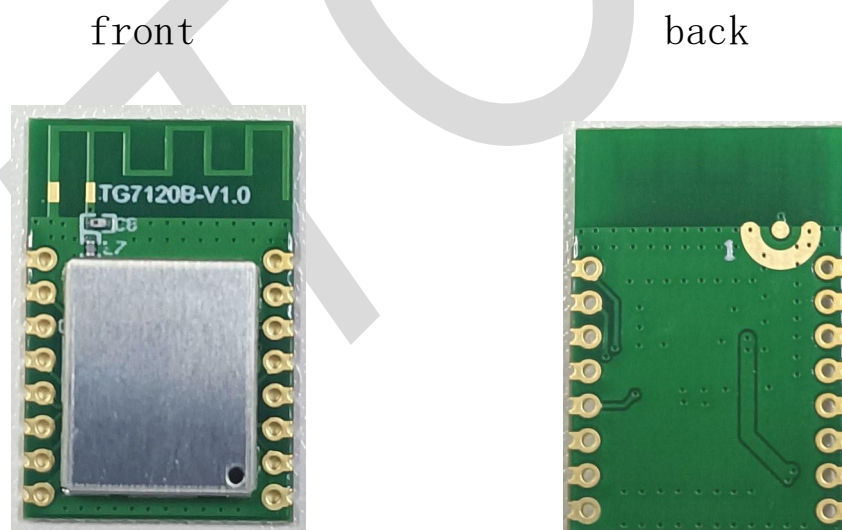
parameter	Parameter Description	minimum	Typical value	maximum value	unit
VDD	Supply voltage	2.2	3.3	3.6	V
工作温度		-40°C	25°C	85°C	Celsius
存储温度		-40°C	25°C	125°C	Celsius
V _{IH}	input high level	0.9*VDD33		VDD33	V
V _{IL}	input low level	0		0.1*VDD33	V
V _{OH}	input high level	VDD33-0.4		VDD33	V
V _{OL}	input low level			0.4	V
ESD HBM	Human Body Model Class 2	-	2000	-	V
ESD CDM	Charged Device Model	-	500	-	V

5. Module radio frequency index

parameter	Parameter Description	minimum	Typical value	maximum value	unit
Maximum transmit power		-20	0	+5	dBm
Receive sensitivity @1Mbps		-	-95	-	dBm
0dBm Emission current		-	10	-	mA
receive current		-	10	-	mA

Module dimensions

6.1 Mod appearance picture



6.2 Recommended package size

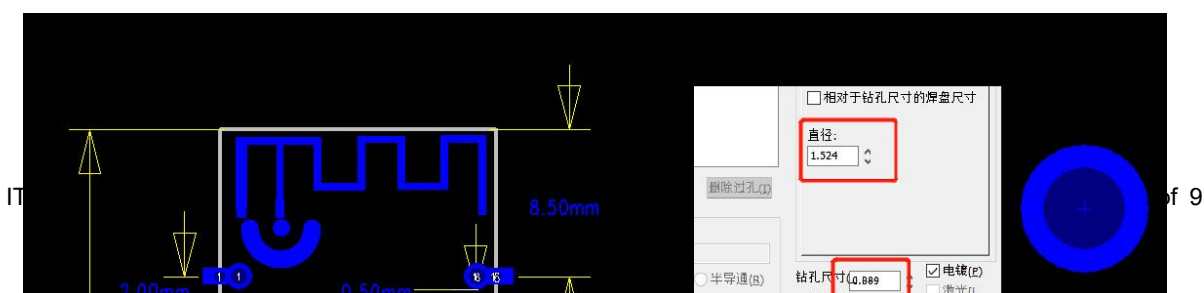


Figure 2 Recommended package size of the module

7. Module Application Notes

7.1 Layout Precautions

“ANT AREA” Clearance is required and wiring is prohibited, it is best to hollow out this part

- (1) The module power supply filter capacitor should be as close as possible to the module VDD signal interface
- (2) Try not to take the power supply or other strong signal lines at the bottom of the module
- (3) P9,P10, GND, VDD The four signals are the interfaces for downloading and debugging the module, and test points need to be reserved

8. Reflow Soldering Reference Curve

Referred to IPC/JEDEC standard. Peak temperature: <250°C

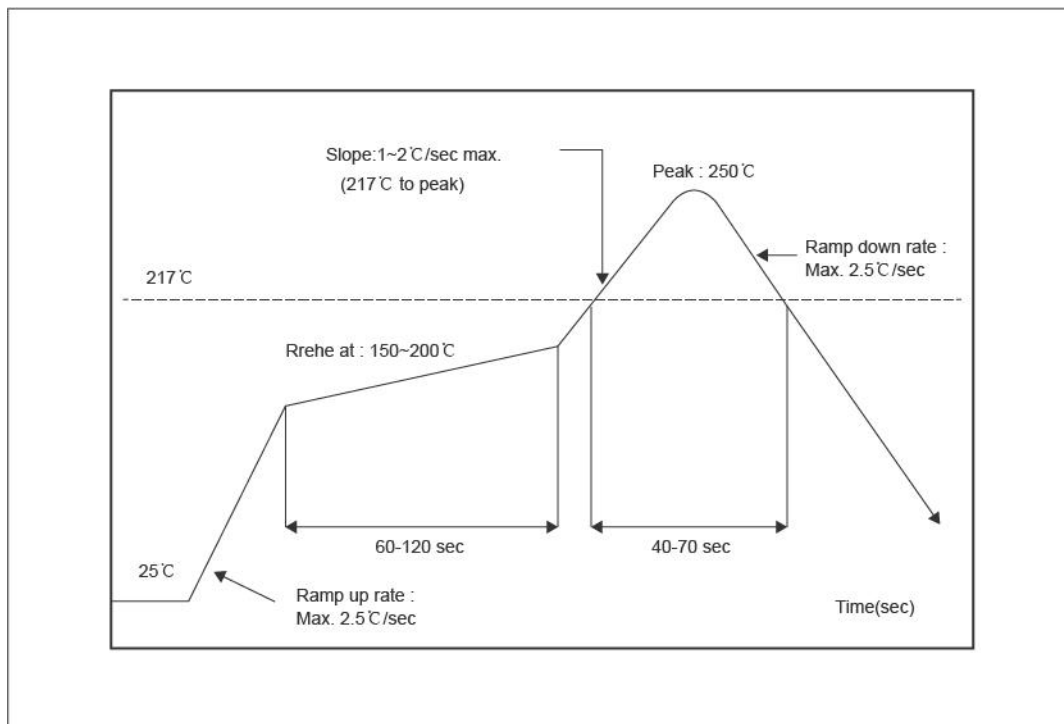
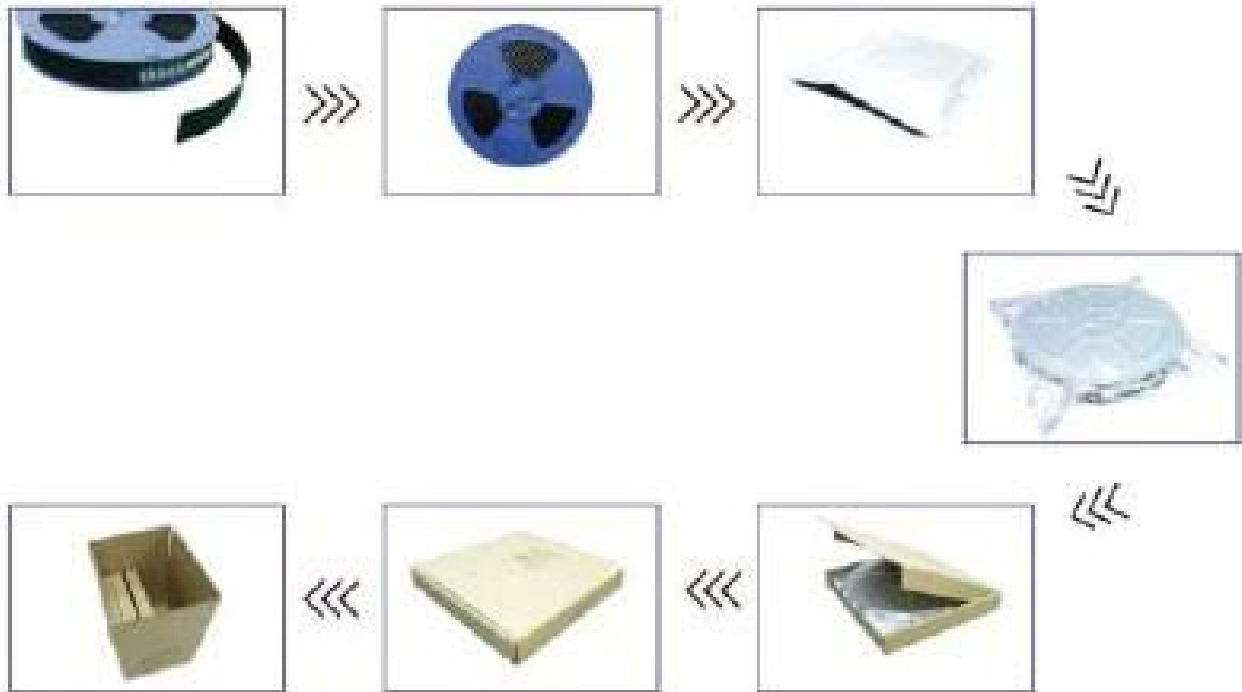


Figure 7 Reflow Soldering Reference Curve

Note: It is not recommended to pass the module twice through the furnace

9. Packing



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 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.

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 20mm between the radiator & your body.

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

2.2 List of applicable FCC rules

FCC Part 15 Subpart C 15.247 & 15.207 & 15.209

2.3 Specific operational use conditions

Operation Frequency:2402~2480MHz

Number of Channel:40 Channels

Modulation Type:GFSK

Antenna Type:PCB antenna

Antenna Gain(Peak):1.57 dBi (Provided by customer)

The module can be used for mobile or portable applications with a maximum 1.57dBi antenna. The host manufacturer installing this module into their product must ensure that the final composit 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.

2.4 Limited module procedures

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

2.5 Trace antenna designs

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



2.6 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 FCC ID 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.

2.7 Antennas

Antenna Specification are as follows:

Antenna Type:PCB antenna

Antenna Gain(Peak):1.57 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.).

2.8 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating "Contains FCC ID VYV-TG7120B-16 With their finished product.

2.9 Information on test modes and additional testing requirements

Operation Frequency:2402~2480MHz

Number of Channel:40 Channels

Modulation Type:GFSK

Antenna Type:PCB antenna

Antenna Gain(Peak):1.57 dBi (Provided by customer)

Host manufacturer must perform 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.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is **only** FCC authorized for FCC Part 15 Subpart C 15.247 & 15.207 & 15.209 and 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 circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.