

TC6203D

BLE mesh module specification

Warning!

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.

REVISION HISTORY

Version	Date	Description	Author	Auditor
1.0	2019-02-22	Created document	Xiaobing Yu	
1.1	2020-03-04	Added the definition of IIC interface	Ronglu Zhang	

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1 product overview

1.1 overview

TC6203d-SMT is a small and low-power bluetooth module, which can be used for SMT and pin manufacturing, and is very suitable for smart household consumer electronics products. TC6203d-SMT which is Based on advanced CMOS technology and highly integrated single BLE chip.

1.2 module features

- Based on the bluetooth 4.2 standard and Bluetooth® Mesh
- Support Relay、Proxy、Friend、Low Power Node
- Support Mesh OTA、GATT OTA
- 8dBm TX power and RSSI value -92dBm
- Built-in low power 32bit MCU, maximum frequency is 52MHz

1.3 module parameters

Table 1. TC6203D-SMT parameters

average output RF power	normal: 8dBm maximum: 13dBm
Rx RSSI value	-92dBm
Operating temperature	-40 ~ 105 °C
Operating voltage	Safe working value: 2.0 ~ 3.6 V normal: 3.3V
Continuous sending with 0dBm output power	13 mA
Continuous receiving working state with mesh net	10 uA

1.4 main application areas

- Smart home (bulb、socket、light switch and other device)

2 hardware introduction

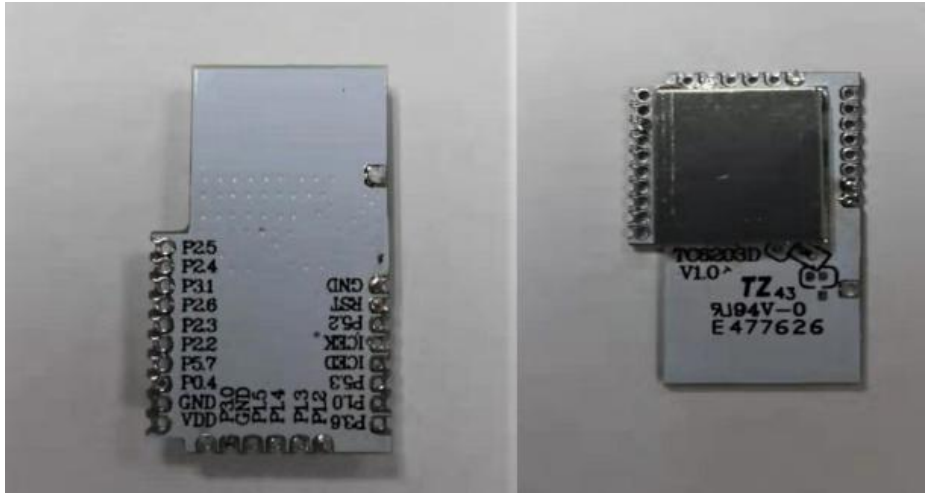


Figure 1. TC6203D-SMT outside view

2.1 PIN definition

Table 2. TC6203D-SMT PIN definition

Num	Name	I/O	description
1	P2.5	I/O	\
2	P2.4	I/O	\
3	P3.1	I/O	\
4	P2.6	I/O	\
5	P2.3	I/O	IIC1_SDA
6	P2.2	I/O	PWM1 / IIC1_SCL
7	P5.7	I/O	PWM2
8	P0.4	I/O	\
9	GND	GND	GND
10	VDD	VDD	VDD
11	P3.0	I/O	\
12	GND	GND	\
13	P1.5	I/O	\

14	P1.4	I/O	\
15	P1.3	I/O	\
16	P1.2	I/O	\
17	P3.6	I/O	\
18	P1.0	I/O	\
19	P5.3	I/O	\
20	ICED	-	JLINK的data
21	ICEK	-	JLINK的clk
22	P5.2	I/O	\
23	RST	RST	RST
24	GND	GND	GND

2.2 electrical specification

Table 3. TC6203D-SMT electrical specification

item	state	Minimum value	normal	Maximum value	unit
Storage temperature		-45		125	°C
Welding temperature	IPC/JEDEC J-STD-020			260	°C
Operating voltage		2		3.6	V
Electric current	Work		20		mA
	Deep sleep		10		uA
Any I/O pin voltage		2		3.3	V
Static levels (HBM)	TAMB=25°C			2	KV

2.3 module mechanical dimensions

TC6203D-SMT physical size (units: mm) :

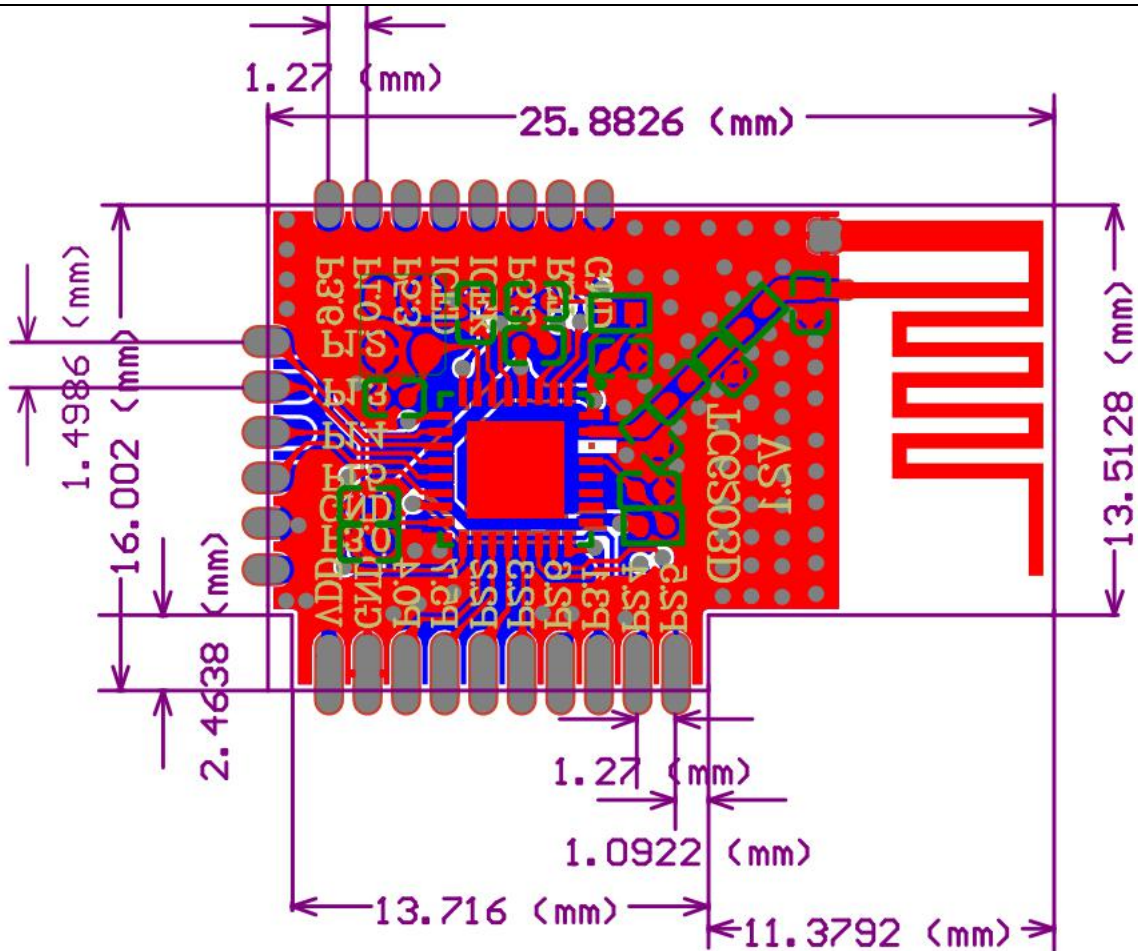


Figure 2. TC6203D-SMT mechanical dimensions

3 operation instruction

3.1 Production guide

It is suggested to use SMT machine to patch the package module of stamp mouth, and finish the patch within 24 hours after the packaging is unpacked. Otherwise, it should be vacuumized again to avoid the bad patch caused by dampness.

If the package contains a humidity indicator card, it is recommended to judge whether the module needs to be baked according to the humidity indicator card. The baking conditions are as follows:

Stoving temperature: $125^{\circ}\text{C}\pm 5^{\circ}\text{C}$;

Alarm temperature: 130°C ;

After cooling less than 36°C under natural conditions, SMT patch can be performed.

If the unsealing time is more than 3 months, special attention should be paid to whether the product is affected by moisture. Because of the PCB process, more than 3 months may lead to the oxidation of the welding pad, and problems such as virtual welding and missed welding may occur during the placement process.

In order to ensure the qualified rate of reflow welding, it is recommended to extract 10% of the product for the first patch for visual inspection and AOI detection, so as to ensure the rationality of furnace temperature control, device adsorption mode and placement mode.

Operators at all stations must wear electrostatic gloves during production.

3.2 reflow welding instructions

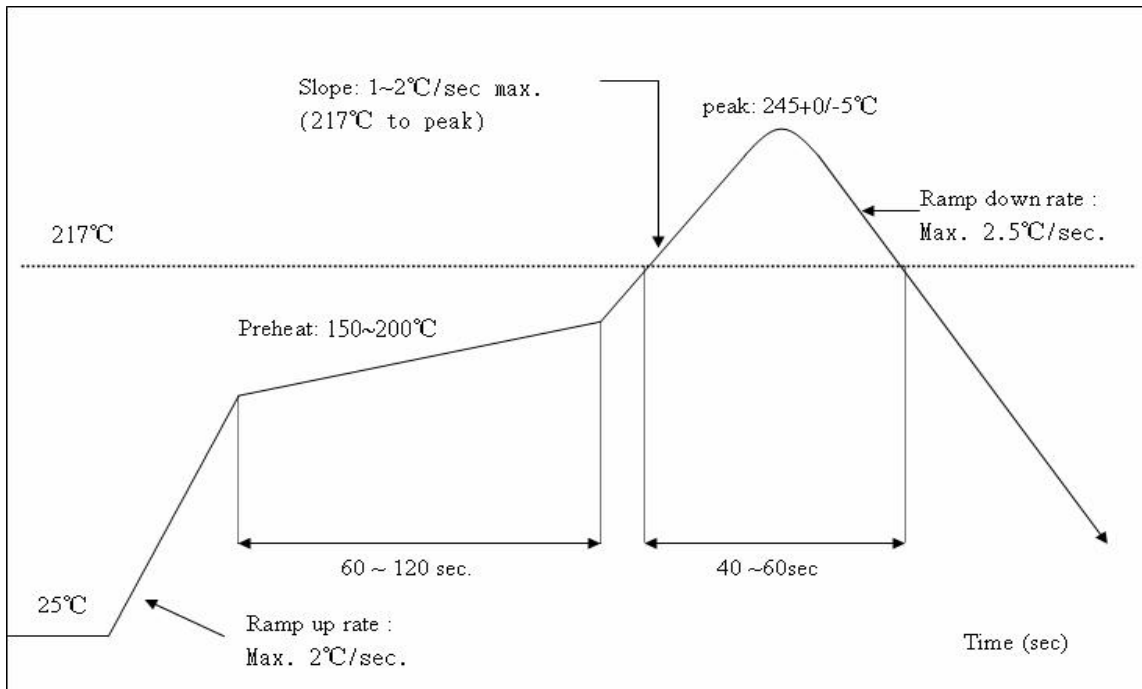


Figure3. TC6203D-SM graph of reflow welding temperature

4 product package

4.1 pack manner

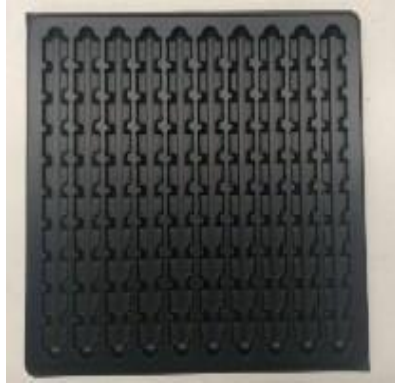
This model module adopts the packing method of blister tray.

4.2 product package

Schematic diagram of pallet packaging materials: Antistatic shielding bag (internal vacuum) .



Figure 4. TC6203D-SMT Packaging anti-static shielding bag



note: The picture on the label is for reference only.

1. Open the cover of the blister tray to load the accessories (100pcs per tray) .
2. Cover with blister top cover, use sellotape to stick the base and top cover.
3. Put into anti-static shielding bag plastic seal (Ten box per pack) .

FCC Modular Usage Statement

Note 1: This module certified complies with RF exposure requirements under mobile or fixed condition; this module is to be installed only in mobile or fixed applications.

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at one location and is not able to be easily moved to another location.

Note 2: Host product manufacturers must provide in their user manual the required RF exposure information for mobile & fixed usage of this module. Host product manufacturers must use the following RF exposure statement in their user manual "This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and all persons. This transmitter must not be co-location or operating in conjunction with any other antenna or transmitter."

Note 3: Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user shall have no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Note 4: Additional testing and certification may be necessary when multiple modules are used.

Note 5: The module may be operated only with the integral chip antenna with which it is authorized.

Note 6: To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Supplier's Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, the manufacturer shall provide guidance to the host manufacturer for compliance with the part 15B requirements.

Note 7: The FCC ID label on the final system must be labeled with "Contains **FCC ID: 2AVUD-TC6203D**" or "Contains transmitter module **FCC ID: 2AVUD-TC6203D**".

Note 8: The FCC rule/s for this module are CFR 47 Part 15 Subpart C.

Note 9: This modular transmitter is only FCC authorized for the specific rule parts listed on its grant. The host product manufacturer is responsible to any other FCC rules that apply to the host not covered by the modular