1.1 GENERAL DESCRIPTION

QZBT628 is a BLE module operating at ISM frequency band of 2,4GHz for low-power wireless applications.which is Bluetooth 4.2 fully standard compliant to allow easy connectivity with Bluetooth Smart Ready mobile phones, tablets, laptops.

The QZBT628 integrates a power-balanced 32-bit proprietary MCU, a high performance BLE/2.4GHz Radio, 16kB SRAM, a 512kB/128kB flash, a general-purpose ADC, a quadrature decoder (QDEC), PWM, flexible I/O interfaces and other peripheral blocks required for Bluetooth Low Energy application development.

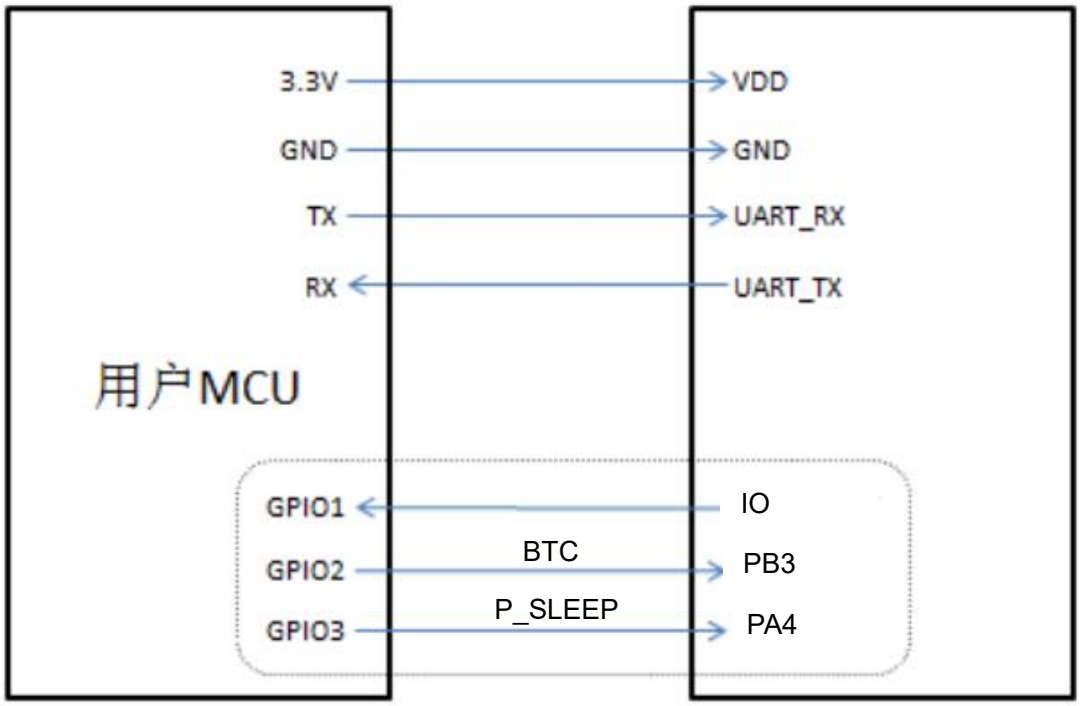
1.2 General features

1. Bluetooth V4.2 standard specification
2. Rf power level II, Ultra-low power consumption, uA working current
3. Ultra-low voltage power supply, 3V button Cell can be used
4. Multiple interfaces: PIO/UART/AIO/I^2C/SPI/PWM
5. RoHS lead-free production process does not require APP for transmission, and data can be directly transmitted to the mobile phone
6. Module Size 15.1mm(L) * 11.2mm(W)
7. The QZBT628-1 module does not have a shield cover, and the QZBT628-2 module has a shield cover

✧ 1.3 Hardwork Features

- 1 serial port and11 GPIO
- using hardware flow control UART interface, hong Debug debugging interface
- PWM for up to six channels
- 10 channel ADC
- TX Output power: up to +8 dBm

1.4 The connection diagram of MCU and module



Note: The function of the module pins can be to customer needs

PB3 can be set for Bluetooth external control pin (BTC) and can control the switch of other devices

PA4 can be set to P_SLEEP (low power control) to wake up the Bluetooth module

2.Key Electrical Specifications

2.1 Absolute maximum ratings

Item	Sym.	Min.	Max	Unit	Conditions
Supply Voltage	V_{DD}	-0.3	3.9	V	All AVDD and DVDD pin must have the same voltage
Voltage on input pin	V_{IN}	-0.3	V_{DD}+0.3	V	-
Output voltage	V_{OUT}	0	V_{DD}	V	-
Storage temperature range	T_{Str}	-65	150	℃	-
Soldering temperature	T_{Sld}	-	260	℃	-

2.2 Recommended operating condition

Item	Sym.	Min	Typ.	Max	Unit	Conditions
Power-supply voltage	V_{DD}	1.9	3.3	3.6	V	-
Supply rise time (from 1.6 V to 1.8 V)	T_r	-	-	1	ms	-
Operating temperature range	T_{Opr}	-40	-	85	℃	-

2.3 DC characteristics (V_{DD} = 3.3 V, T= 25℃)

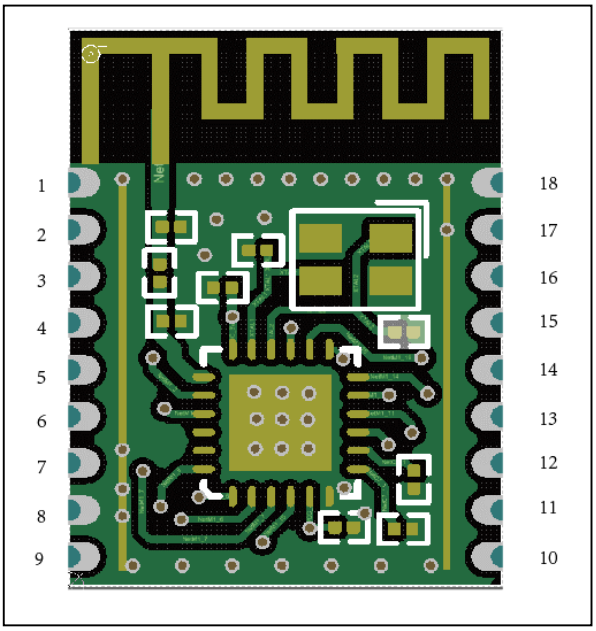
Mode	Sym.	Min	Typ.	Max	Unit	Conditions
TX	I_{Tx}	-	14.5	-	mA	0dBm Continuous Tx transmission
		-	25	-	mA	8dBm Continuous Tx transmission
RX	I_{Tx}	-	16.	- -	mA	Continuous Rx reception
Suspend	I_{susp}	-	8	-	μA	IO wake up
		-	10	-	μA	Timer wake up
Deep sleep	I_{Deep1}	-	1	-	μA	Flash not included, without 32kHz external XOSC, and internal 32kHz RC OSC off
	I_{Deep2}	-	1.7	--	μA	Flash not included, with 32kHz external XOSC, and internal 32kHz RC OSC off
	I_{Deep3}	-	2.2	-	μA	Flash not included, without 32kHz external XOSC, and internal 32kHz RC OSC on

NOTE:

Without 32K RC: The wakeup source is external signal from GPIO input， the internal 32K RC is disabled

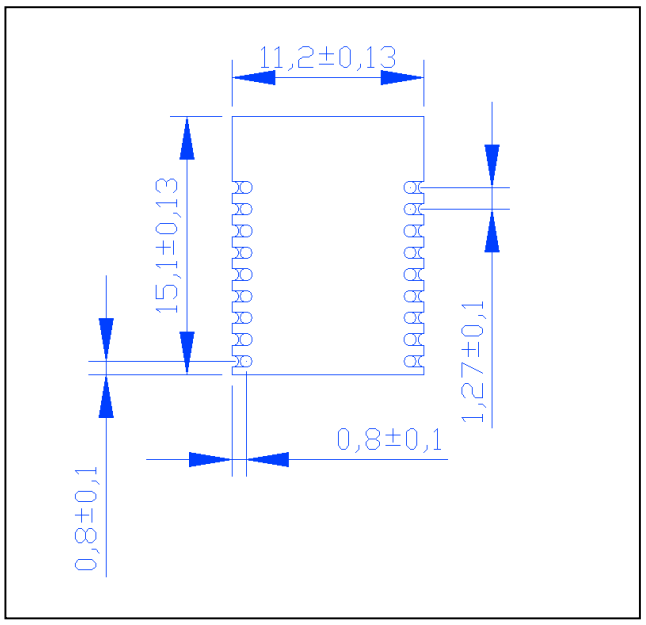
With 32K RC: The wakeup source is 32K RC， it is enabled.

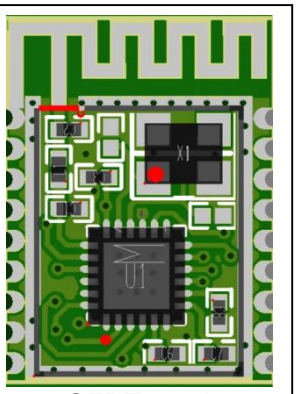
3.Pins and description



NO.	名称	描述
1,8,18	GND	GND
2	VCC	3.3V
3	PC1	PWM2 inverting output / GPIO PC[1]
4	PC2	SPI Slave chip select (active low) / SPI Master chip select(active low) / PWM0 inverting output/ UART_CTS / GPIO PC[2]
5	SWS	Single wire slave / PWM3 output / GPIO PC[7]
6	PA1	PWM3 inverting output / UART_CTS / GPIO PA[1]
7	PA3	PWM4 output / UART_TX / I2C Master clock / SPI Slave data input / GPIO PA[3]
9	PC5	SPI Slave clock / I2C Master clock / SPI Master clock / UART_RX / GPIO PC[5]
10	PA4	PWM2 output / UART_RX / I2C Master serial data / SPI Slave clock / GPIO PA[4] (Can Set to P_SLEEP)
11	I2C_SDA	PWM4 inverting output / I2C Slave serial data / I2C Master serial data / Control external LNA / GPIO PA[6]
12	I2C_CLK	PWM5 output / I2C Slave clock / I2C Master clock / GPIO PA[5]
13	PB1	PWM1 output / SPI Master data output / Control external PA / GPIO PB[1] /PGA input
14	PB2	PWM2 output / SPI Master data input / UART_CTS / I2C Master clock / GPIO PB[2] / PGA input
15	PB3	PWM0 output / SPI Master clock / UART_RTS / I2C Master serial data / GPIO PB[3] (Can set to BT_C)
16	USRT_TX	PWM1 inverting output / UART_TX / GPIO PB[4] / PGA input
17	UART_RX	PWM4 output / UART_RX / GPIO PB[5] / PGA input

4. Dimension





QZBT628-1

QZBT628-2

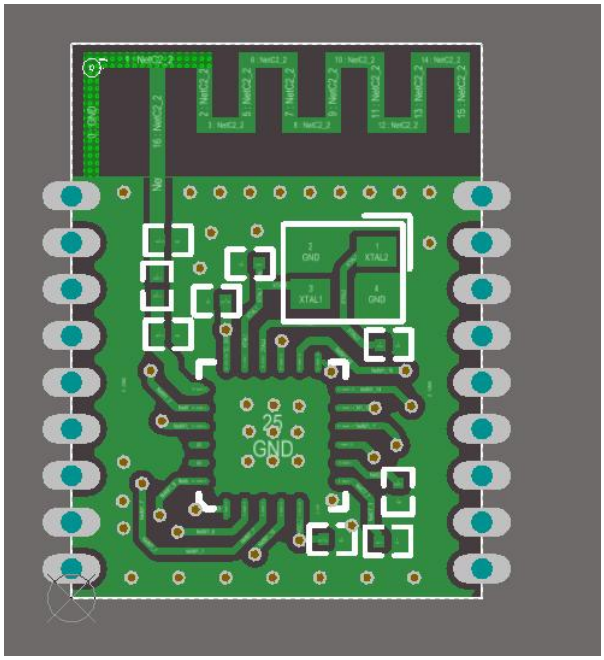
5. Schematic

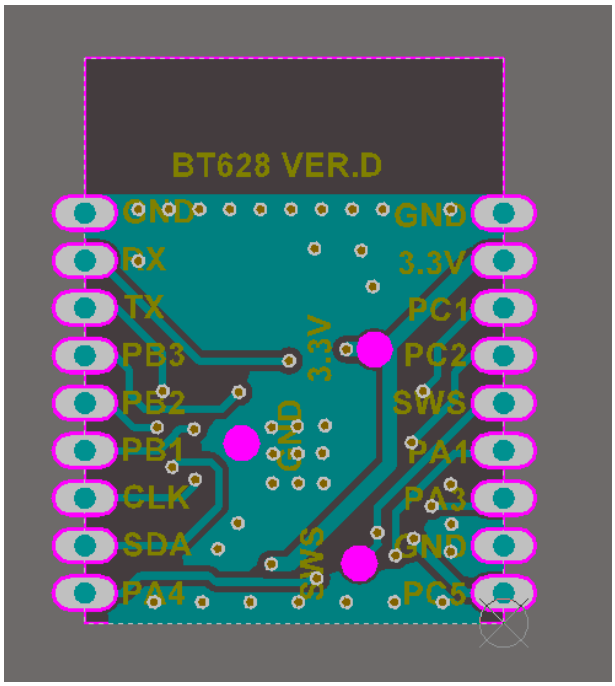
CONFIDENTIAL

6.BOM

PCB assembly parts				
Part Name	**Description**	**QTY.**	**Unit**	**Remark**
Capacitor	ROHS 1.8pF 0201, X7R, +/-10%	2		C1, C2
Capacitor	ROHS 1μF 0201, X7R, +/-10%	4		C3, C6, C7, C8
Inductor	ROHS 2.2nH 0402, +/-5%	1		L1
IC	Telink 2.4G Bluetooth IC'TLSR8232F512ET24 QFN24	1		U1
Crystal	24 MHz 12 pF 20 ppM 2016 Package	1		Y1
PCB	ROHS Double sideFR4 Thickness 0.8mm Size:15.1mm*11.2mm	1		Main PCB
Shielding case	Copper-Nickel Alloy Thickness 0.2mm	1		For QZBT628-2

7. PCB Layout


25
GND


BT628 VER.D
GND
RX
TX
PB3
PB2
PB1
CLK
SDA
PA4
GND
3.3V
SWS
GND
3.3V
PC1
PC2
SWS
PA1
PA3
GND
PC5

FCC Statement
FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
Device is equipped with PCB antenna , Antenna gain -6.25dBi

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.
Any 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
The modular can be installed or integrated in mobile or fix devices . This modular cannot be installed in any portable device if without further certification such as C2PC with SAR. This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: 2BAMT-QZBT628-2 Or Contains FCC ID: 2BAMT-QZBT628-2”

When the module is installed inside another device, the user manual of the host must contain below warning statements;
1. 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;
(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.

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install the modular with modular approval should perform the test of radiated & conducted emission and spurious emission, etc. according to FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement, then the host can be sold legally.