瑞瀛ZigBee模块

智慧点亮生活

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REXENSE

REX3GT581 Module Datasheet V2.0

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Version Updates

V1.0.0	20220401	Initial version
V5.0.0	20220622	Update Pin Definition
V5.0.1	20221011	Update RF Performance Parameter

Content

1. Product Overview

1.1 Introduction

REX3GT581 is a small-sized, high-sensitivity and low-power Zigbee module. Based on chip RT51, it provides a complete, high-performance, low-power and low-cost ZIGBEE wireless communication system, which complies with the IEEE802.15.4 specification and Zigbee 3.0 protocol standard.
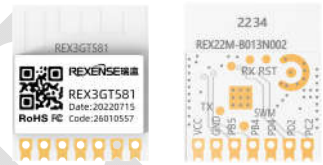
The module integrates 32-bit RISC MCU, Zigbee3.0 wireless communication, 64KB SRAM, 1024KB built-in Flash, 5-channel PWM, and a quadrature decoder (QDEC).

REX3GT581 module conforms to FCC, IC, CE and RoHS regulations, and can be applied to devices under many different environments. The Company also provides a complete set of development and evaluation kits, and users can choose different versions of kits for testing and development according to their own needs.

1.2 Main Features

- Dimension：17.3(L)* 15(W)* 2.8(H) mm (with shield)
- Max Receiving Sensitivity: -99.5dBm
- Reliable Communication Distance: 300m（outdoor view distance）
- Multiple Antenna Options
- Extreme Low Power Consumption:
  - Sleeping Mode：2.6μA
  - Receiving Mode：8.4mA
  - Transmitting Mode：10.8mA@10dBm
- Frequency Deviation Range: ±10ppm
- Rich Storage:
  - Flash: 1024K Byte
  - RAM: 64K Byte

2. Module Interface

2.1 Packaging Information

Dimension: 17.3mm(L)* 15mm(W)* 2.8mm(H)   (with shield)

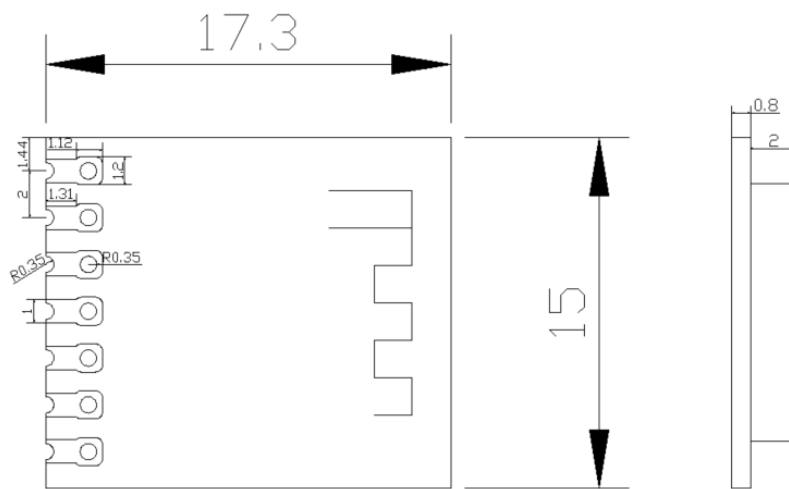Dimension Tolerance: length and width±0.25 mm; height±0.15mm

Figure2-1 Dimensions
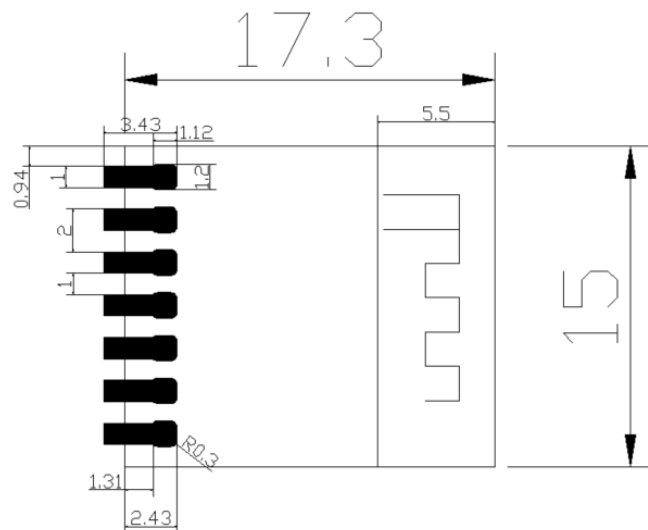
Figure2-2 Packaging

2.2 Pin Definition

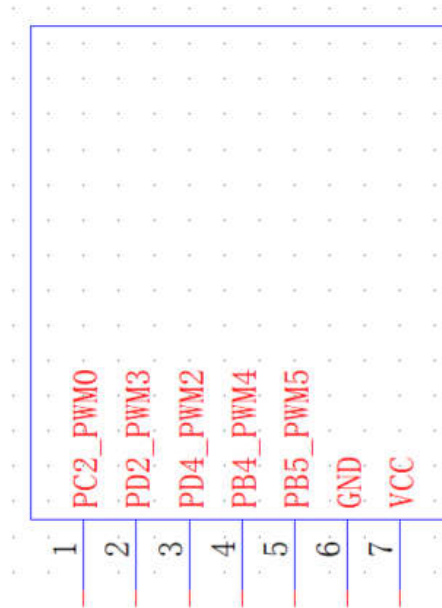Figure2-3 Pin Configuration

Module Pin NO.	Pin Name	Pin Specification
1	PC2	PWM, GPIO
2	PD2	PWM, GPIO
3	PD4	PWM, GPIO
4	PB4	PWM, GPIO
5	PB5	PWM, GPIO
6	GND	GND
7	VCC	3.3V

3. Electrical/Physical Specifications

3.1 Electrical Specifications

Parameter	Min	Max
Module Input Voltage (VCC)	1.8V	3.6V
Pin Voltage (except ADC pin)	-0.3V	VDD_PADS+0.3
ADC Pin Voltage	-3.3V	VCC+0.3V
Chip I/O Drive Current	2mA	16 mA

3.2 Current Specifications

Parameter	Average	Max	Unit
Receiving Current	8.4	8.5	mA
Transmitting Current (@10dBm)	10.8	10.9	mA
Sleeping Current	2.6	-	µA

3.3 Processor Specifications

Parameter	Value	Unit
On-Chip Flash Storage	1024K	bytes
On-Chip RAM Storage	64K 32K (SRAM Retention) + 32K (Without SRAM Retention)	bytes
Working Frequency	48	MHz

3.4 Physical/Ambient Characteristics

Parameter	Value	Note
Physical Size	17.3mm*15mm*2.8mm (with shield)	
Weight	<1g	
Working Temperature	-40°C to +105°C (default)	
Relative Working Humidity	<95%	

4. Radio Frequency (RF) Performance

4.1 Basic RF Performance

Parameter	Range	Unit
Working Frequency	2400~2483.5	MHz
Quantity of Channels	16	
Number of Channels	0B~1A	Hex
Channel Space	5	MHz
Rated Input/Output Impedance	50	Ω

4.2 Receiving Performance

Parameter	Min	Typical Value	Max	Unit
Receiver Sensitivity (PER < 1%)	-99.5	-99	-98.5	dBm

5. Antenna Specification

5.1 PCB Antenna

Notes for using PCB antenna:

- Avoid placing module in a metal shell.

- Keep metal objects away from the PCB antenna (at least over 1cm, better over 2.7cm).

- Do not place the module next to devices that emit electromagnetic radiation, such as transformers, etc.

The design of the user's circuit board should prevent its components, traces or ground from interfering with the PCB antenna of the wireless module. The basic principle is:

- Do not route wires, lay the ground or place other components around the PCB antenna.

- The PCB antenna should extend out of the PCB board.

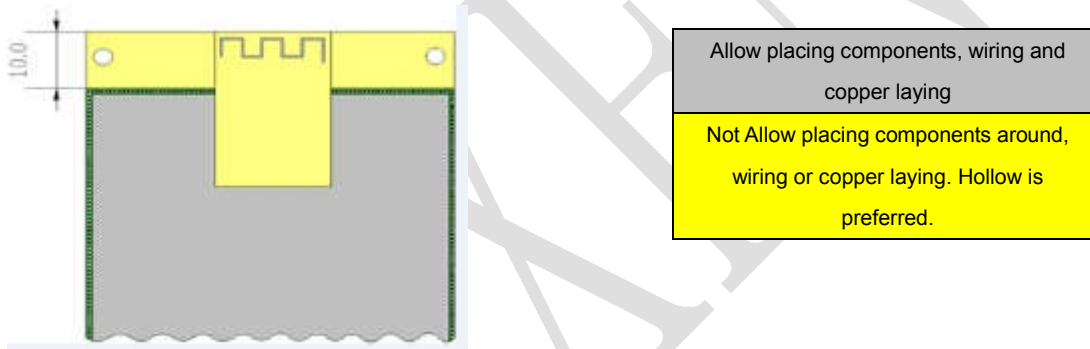- Do not use a metal casing around the PCB antenna

Allow placing components, wiring and copper laying
Not Allow placing components around, wiring or copper laying. Hollow is preferred.

Figure5-1 Schematic Diagram of PCB Layout for Module Antenna Position Selection

6. FCC Regulations

Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.

2. This module is limited to installation in mobile or fixed applications, according to Part 2.1091(b).

3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations

4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part

15 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that

the module's intentional emissions are compliant (i.e. fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are complaint with the transmitter(s) rule(s).

The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

Important Note

notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify to XXXX that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the USI, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

End Product Labeling

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: 2AOE2REX3GT581"

The FCC ID can be used only when all FCC compliance requirements are met.

Antenna Installation

(1) The antenna must be installed such that 20 cm is maintained between the antenna and users,

(2) The transmitter module may not be co-located with any other transmitter or antenna.

(3) Only antennas of the same type and with equal or less gains as shown below may be used with this module. Other types of antennas and/or higher gain antennas may require additional authorization for operation.

Antenna type	Zigbee Peak Gain (dBi)
PCB	1.77

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information to the End User

The OEM integrator 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.

Federal Communication Commission Interference 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.

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 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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

List of applicable FCC rules

This module has been tested and found to comply with part15.247 requirements for Modular Approval.
The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter
rules) listed on the grant, 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 circuity), 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.

This device is intended only for OEM integrators under the following conditions:

(For module device use)

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.
As long as 2 conditions above are met, further transmitter test will not be required. However, the
OEM integrator is still responsible for testing their end-product for any additional compliance
requirements required with this module installed.

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 20 cm between the radiator & your body.