

Freenove BT05 Module

SPECIFICATION

1. Overview

FN-BT05 is a next-generation, class 2, Bluetooth 4.0 module. Support the AT command, the user can according to need to change the baud rate of serial port, name of equipment, matching parameters such as password, use agile. FN-BT05 is a highly integrated and sophisticated Bluetooth module, containing all the necessary elements. Therefore FN-BT05 provides an ideal solution for developers who want to integrate Bluetooth wireless technology into their designs with limited knowledge of Bluetooth and RF technologies.



2. Feature

Bluetooth protocol: Bluetooth Specification V4.0 BLE, send and receive no byte limit, open environment and iPhone 4s can achieve 110 meters extreme distance communication.

Based on TI CC2541 chipset

Bluetooth class 2

Industrial level SPP Bluetooth module

Integrated chip antenna

Size: 26.7 x 13 x 2 mm

Industrial temperature range from -40°C to +85°C

Support for on-board applications

Operating frequency: 2.4 GHz ISM band

Modulation method: GFSK (Gaussian Frequency Shift Keying)

Acuity: -84 DBM or less BER at 0.1%

Transfer rate: Asynchronous: 6 KBPS Synchronous: KBPS

Security features: Authentication and encryption

Support services: Central and Peripheral UUID FFE0, FFE1

FN-BT05 Bluetooth Module

Power consumption: automatic sleep mode, the standby current 400 ~ 1.5 mA, transfer 8.5 mA.

Power supply: + 3.3 VDC 50 ma

RoHS compliant

3. Application Fields

Cable replacement

Point-of-sales systems

Barcode readers and pay terminals

Telemetry and machine-to-machine devices

Logistics and transportation systems

Automotive inspection and measurement systems

Medical systems

Fitness and sports telemetry devices

PDA and other portable terminals

PCs and laptop

OBD

4. Physical Characteristics

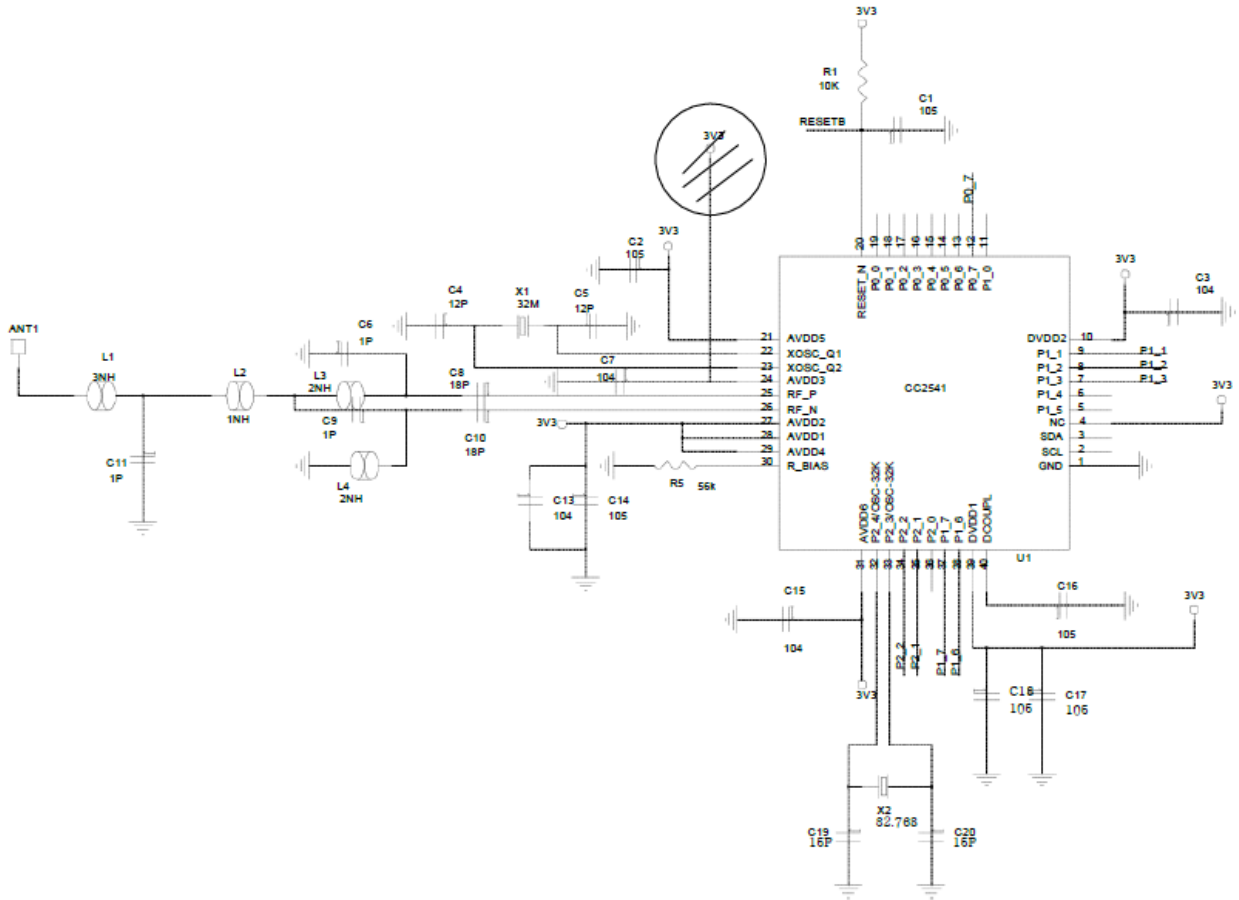
| | |
|--------------------------|--------------------------------|
| Operating Frequency Band | 2.4GHz ISM band |
| Bluetooth Specification | BLE4.0 |
| Output Power Class | Class 2 |
| Operating Voltage | 3.3V |
| Host Interface | UART |
| Dimension | 27mm (L) x 13 (W) mm x 2mm (H) |

5. Electrical Characteristics

| Absolute Maximum Ratings | | |
|--------------------------|----------|----------|
| Rating | Min | Max |
| Storage temperature | -40°C | +150°C |
| Supply voltage: VBAT | -0.4V | 5.6V |
| Other terminal voltages | VSS-0.4V | VDD+0.4V |

| Recommended Operating Conditions | | |
|--|-------|---------------------|
| Operating Condition | Min | Max |
| Operating temperature range | -40°C | +150°C |
| Guaranteed RF performance range ^(a) | -40°C | +150°C |
| Supply voltage: VBAT | 2.2V | 4.2V ^(b) |

6. Application Circuit Diagram



Note: This application circuit for the Bluetooth serial port circuitry, such as the need for other application, please contacts us .

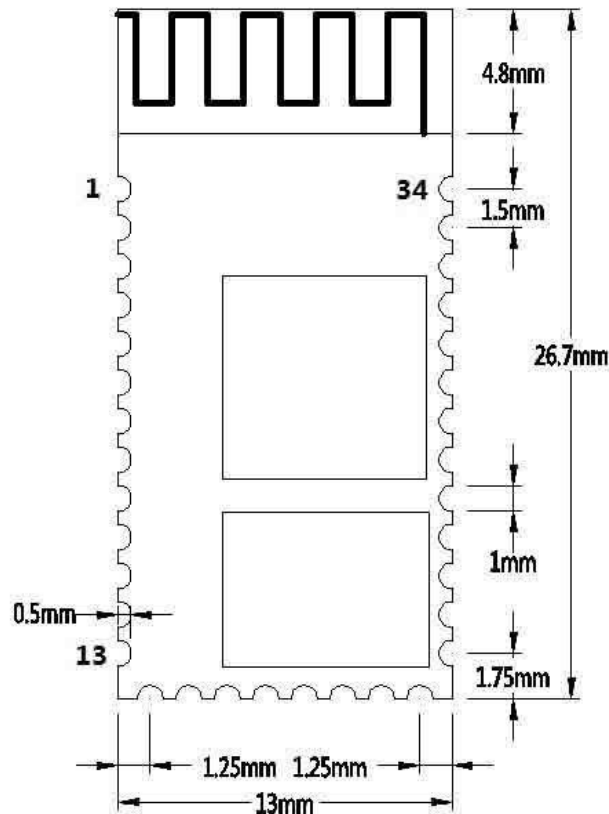
7 .Pin Configurations

| PIN NO. | NAME | FUNCTION |
|---------|----------|---------------------------------|
| 1 | UART-TX | UART Data Output |
| 2 | UART-RX | UART Data Input |
| 3 | UART-CTS | UART Clear To Send Active Low |
| 4 | UART-RTS | UART Request To Send Active Low |
| 5 | NC | NC |
| 6 | NC | NC |
| 7 | P2_2 | Debug the clock |
| 8 | P2_1 | Debug the data |
| 9 | P2_0 | Programmable Input/Output Line |
| 10 | NC | NC |

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| | | |
|----|--------|---|
| 11 | RESETB | Reset if low Input debounced so must below for>5ms to cause a reset |
| 12 | VCC | +3.3V Supply |
| 13 | GND | Ground |
| 14 | GND | Ground |
| 15 | SDA | Data port |
| 16 | NC | NC |
| 17 | NC | NC |
| 18 | NC | NC |
| 19 | NC | NC |
| 20 | SDL | Clock port |
| 21 | GND | Ground |
| 22 | GND | Ground |
| 23 | P1_3 | SW1 system key, see Other configuration |
| 24 | P1_2 | State instructions LED, see Other configuration |
| 25 | P1_1 | Programmable Input/Output Line |
| 26 | P1_0 | Programmable Input/Output Line |
| 27 | P0_7 | Programmable Input/Output Line |
| 28 | P0_6 | Programmable Input/Output Line |
| 29 | P0_5 | Programmable Input/Output Line |
| 30 | P0_4 | Programmable Input/Output Line |
| 31 | P0_3 | Programmable Input/Output Line |
| 32 | P0_2 | Programmable Input/Output Line |
| 33 | P0_1 | Programmable Input/Output Line |
| 34 | P0_0 | Programmable Input/Output Line |

8. Contour Dimension



9. Other configuration

State Instructions LED: P1_2

| Model | LED Display | Status |
|-------|---|----------------------|
| Slave | Even slow flash (800ms-on,800ms-off) | Waiting for matching |
| | Long bright | connection |

Module dormancy set

Is only meaningful in from dormancy mode module, from the mode via a serial port to send "AT + SLEEP", if no accident, the module will return "OK" and enter a dormant state, this state to be found and connection status.

Wake up the module Settings

There are two ways:

Method one: you can send the length of the string is greater than or equal to 80 to activate the module. Send the activated string cannot contain the AT command, success after WAKE up, a serial port will output "+ WAKE OK" string.

Method 2: short press the system button SW1.

System key SW1(P1_3)

P1_3 for input pin, short press control, can realize the following functions:

1, the module is in a state of dormancy:

Module will be awakened to the normal state, the success after WAKE up, a serial port will output "+ WAKE OK" string.

2, the module is in a state of connection:

Disconnected module will initiate the request.

10.Layout Announcements

1, FN-BT05 bluetooth module serial level should be 3.3 V, if the connection and 5V level system need to increase the level conversion chip.

2, Bluetooth signal is highly affected by the surrounding, such as trees, metal, wall can have certain absorption on the bluetooth signal or block, so the installation is not recommended in the metal case.

3, Due to metal will weaken the function of antenna, it is suggested that Lay in the module board, don't lay GND and a line under the antenna module, it is best to hollow out.

FCC 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.

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 important announcement

Important Note:

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 0cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/Canada.

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

1. The antenna must be installed such that 0 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 the three conditions above are met, further transmitter testing 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.

Important Note:

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.

End Product Labeling

The final end product must be labeled in a visible area with the following" Contains FCC ID: **2A4TN-FNBT05**"

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.

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

Manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 0cm between the radiator & your body.

2.7 Antennas

This radio transmitter **2A4TN-FNBT05** has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

| Antenna No. | Model No. of antenna: | Type of antenna: | Gain of the antenna (Max.) | Frequency range: |
|-------------|-----------------------|------------------|----------------------------|------------------|
| Bluetooth | / | PCB Antenna | 1.0dBi for 2402-2480MHz; | |

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID: 2A4TN-FNBT05".

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.

ISED Statement

- English: This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

The digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B).

- French: Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. L'appareil numérique du CIEM conforme canadien peut - 3 (b) / nmb - 3 (b).

This device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS 102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Cet appareil est conforme à l'exemption des limites d'évaluation courante dans la section 2.5 du CNR - 102 et conformité avec RSS 102 de l'exposition aux RF, les utilisateurs peuvent obtenir des données canadiennes sur l'exposition aux champs RF et la conformité.

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé.

This equipment should be installed and operated with minimum distance 0cm between the radiator & your body.

Cet équipement doit être installé et utilisé à une distance minimale de 0 cm entre le radiateur et votre corps.

ISED Modular Usage Statement

NOTE 1: When the ISED certification 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 the wording "Contains transmitter module IC: 28247-FNBT05" or "Contains IC: 28247-FNBT05".

NOTE 1: Lorsque le numéro de certification ISED n'est pas visible lorsque le module est installé dans un autre appareil, l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au module inclus. Cette étiquette extérieure peut être libellée Contient le module émetteur IC: 28247-FNBT05 ou Contient IC: 28247-FNBT05.