# Technical Description

The Equipment Under Test (EUT) is a Bluetooth version 2.1 speaker operating from 2402-2480MHz with 1MHz channel spacing. The EUT is powered by 1 x 3.7VDC rechargeable battery. After switch on the EUT and paired with smart device, music can be played by EUT. Also, Music can be played by AUX in cable.

**The brief circuit description is listed as below:**

1) **IC1 acts as MCU (STM32F030K6T6).**
2) **U4 acts as Audio Amplifier (HT6873).**
3) **U2 acts as Charging Circuit (LY4057).**
4) **IC2 acts as Voltage Regulator (DIO6305B).**
5) **IC3 acts as Voltage Regulator (XC6206-3.3V).**
6) **M1 acts as Bluetooth Module Circuit (F-6188).**
7) **X1 is 26MHz crystal oscillator providing clock for M1.**

**Antenna Type: Internal antenna**
**Antenna Gain: 0dBi**
**Nominal rated field strength: 95.5dBμV/m at 3m**
**Maximum allowed field strength of production tolerance: +/- 3dB**

# The Bluetooth module F-6188 manual

## 一、Product overview：

Intelligent wireless audio data transmission products F-6188 Bluetooth module for the independent development of our company, is the high price of stereo wireless transmission scheme of low cost, module uses BEKEN chip to provide the high quality and compatibility for the module, the overall better performance. F-6188 Bluetooth module with free driving mode, customers only need to access the application module products, wireless transmission can quickly realize the music, enjoy wireless music.

## 二、Field of application：

This module is mainly used for music transmission in short distance, can be connected with mobile phone and personal computer, conveniently, the connection between PDA and other digital products, enjoy bluetooth wireless transmission of music.

※ Bluetooth audio

※ Bluetooth stereo headset

※ hands-free phone

The Bluetooth wireless audio transmission

## 三、Essential qualities：

Bluetooth Profiles

※ Bluetooth v2.1+EDR specification support

※ A2DPv1.2

※ AVRCPv1.0

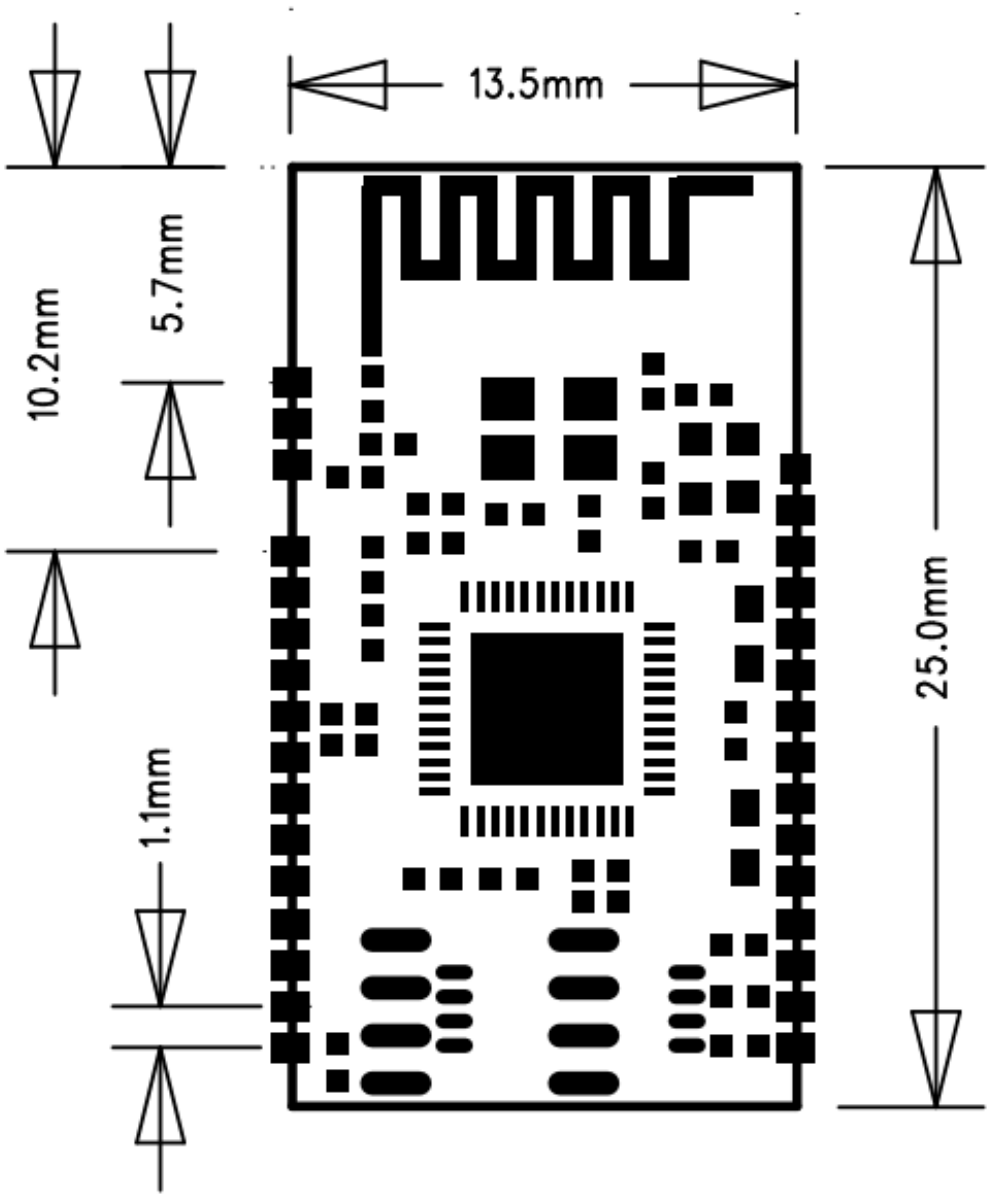
※ HFPv1.5

## 四、Performance parameters：

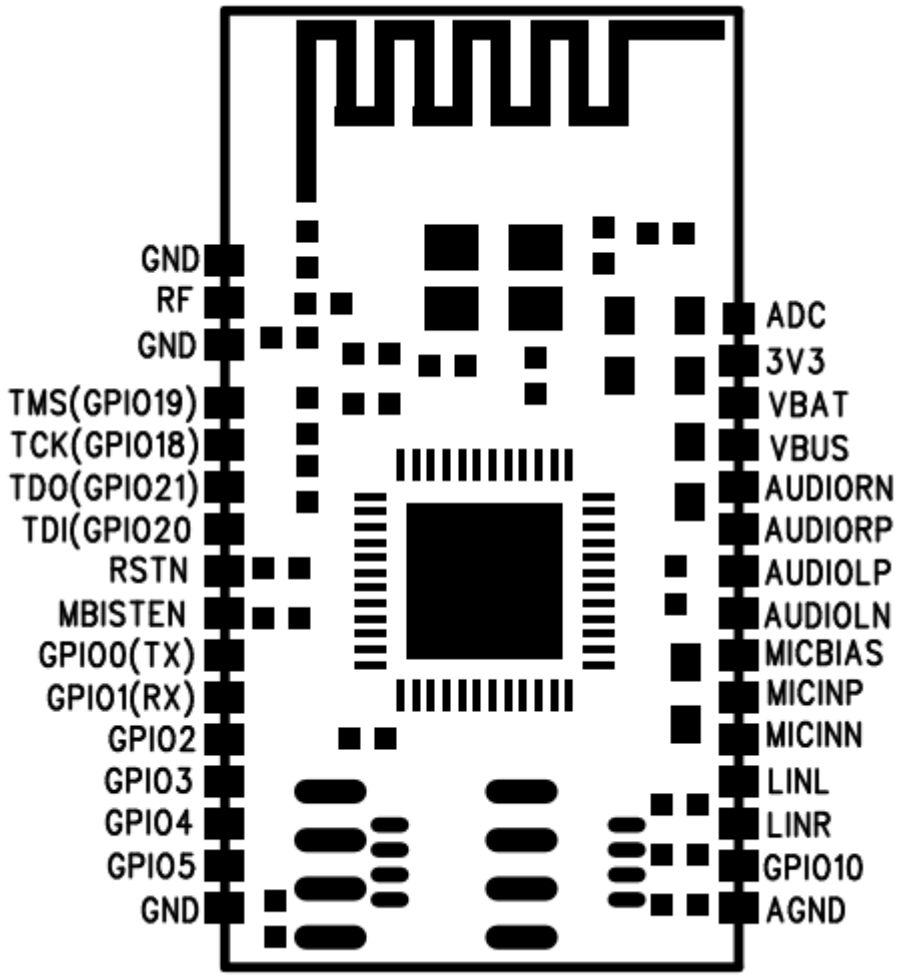
| Model | F-6188 |
|---|---|
| Bluetooth | Bluetooth V2.1 |

| specification | |
|---|---|
| supply voltage | DC2.8-4.2V |
| Support Bluetooth protocol | HFPV1.5, A2DPV1.2,AVRCPV1.0 |
| working current | ≤60mA |
| standby current | <500uA |
| temperature range | -40°C to +85°C |
| The wireless tranmission range | <10 meter |
| Transmission power: | CLASS2, 4dbm |
| sensitivity: | -80dBm<0.1%BER |
| frequency range : | 2.4GHz-2.480GHz |
| External Port: | I2C, SPI and UART interface |
| audio performance | SBCdecode |
| The audio Signal to Noise Ratio: | ≥75dB |
| Module size | 25X13.5X1.8MM |

## 五、The size graph of the module :


13.5mm
5.7mm
10.2mm
1.1mm
25.0mm

## 六、Module pin definition diagram




## 七、Pin description

| Pin | Symb | I/O | Description |
|---|---|---|---|
| 1 | RF_GND | RF_GND | RF_GND |
| 2 | ANT | ANT | ANT PORT |
| 3 | RF_GND | RF_GND | RF_GND |
| 4 | TMS(GPIO19) | Digital I/O | JTAG pin |
| 5 | TCK(GPIO18) | Digital I/O | JTAG pin |
| 6 | TDO(GPIO21) | Digital I/O | JTAG pin |
| 7 | TDI(GPIO20 | Digital I/O | JTAG pin |
| 8 | RSTN | Digital I/O | JTAG pin / Reset pin-low active |
| 9 | MBISTEN | Digital I/O | Memory bit check |
| 10 | GPIO0(TX) | Digital I/O | UART TX |
| 11 | GPIO1(RX) | Digital I/O | UART RX |
| 12 | GPIO2 | Digital I/O | GPIO2 |
| 13 | GPIO3 | Digital I/O | GPIO3 |
| 14 | GPIO4 | Digital I/O | GPIO4 |
| 15 | GPIO5 | Digital I/O | GPIO5 |
| 16 | GND | GND | Ground connect battery negative |
| 17 | AGND | AGND | Ground connect battery negative |
| 18 | GPIO10 | Digital I/O | GPIO10 |
| 19 | LINR | AUX_INPUT | LINR |
| 20 | LINL | AUX_INPUT | LINL |
| 21 | MICINN | MIC- | MICINN |
| 22 | MICINP | MIC+ | MICINP |
| 23 | MICBIAS | MICBIAS | MICBIAS |
| 24 | AUDIOLN | Audio output | Left channel audio output negative |
| 25 | AUDIOLP | Audio output | Left channel audio output positive |
| 26 | AUDIORP | Audio output | Right channel audio output positive |
| 27 | AUDIORN | Audio output | Right channel audio output negative |
| 28 | VBUS | Charge port | VBUS |
| 29 | VBAT | Power supply | Power supply |
| 30 | 3V0 | Power | 3.0V output |
| 31 | ADC | Power | ADC input |
| 32 | | | |

## 八、Connection circuit notice:

The F-6188 module in the application process, please pay attention to avoid the influence of power amplifier, a boost circuit to avoid interference source module, module power supply circuit with high power circuit unit to form a series circuit, in order to improve the SNR

## 九、Notice:

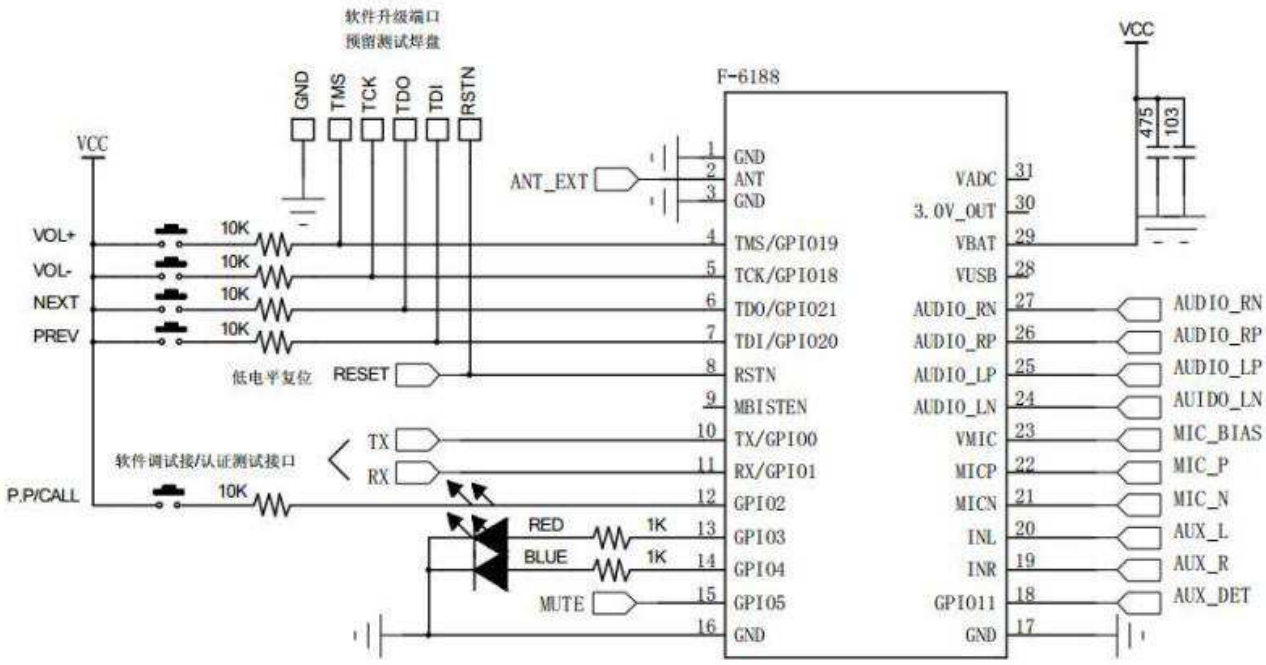
A. About the Bluetooth wireless application environment, wireless signal includes a Bluetooth application are influenced by the surrounding environment, such as

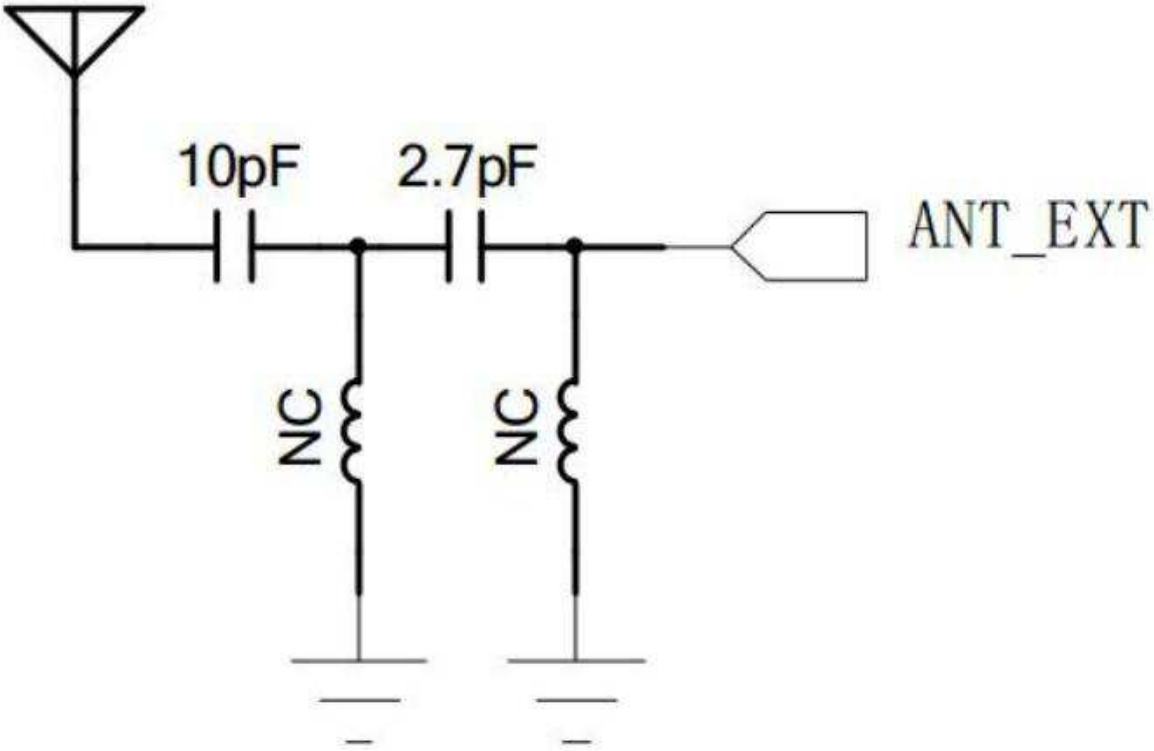
Wood, metal and other obstacles will be absorbed on the wireless signal, thus in the practical application, influence the distance of data transmission

B. Because Bluetooth module to complete the existing system, placed in the shell. Because of the metal shell on the radio frequency signal Is a shielding effect. It is recommended not to install in a metal shell.

C. PCB Layout: The antenna part of the Bluetooth module is the PCB antenna, the metal will weaken the function of antenna, while to the module layout, below the antenna module is prohibit paving and walk the line, if hollow out it is better

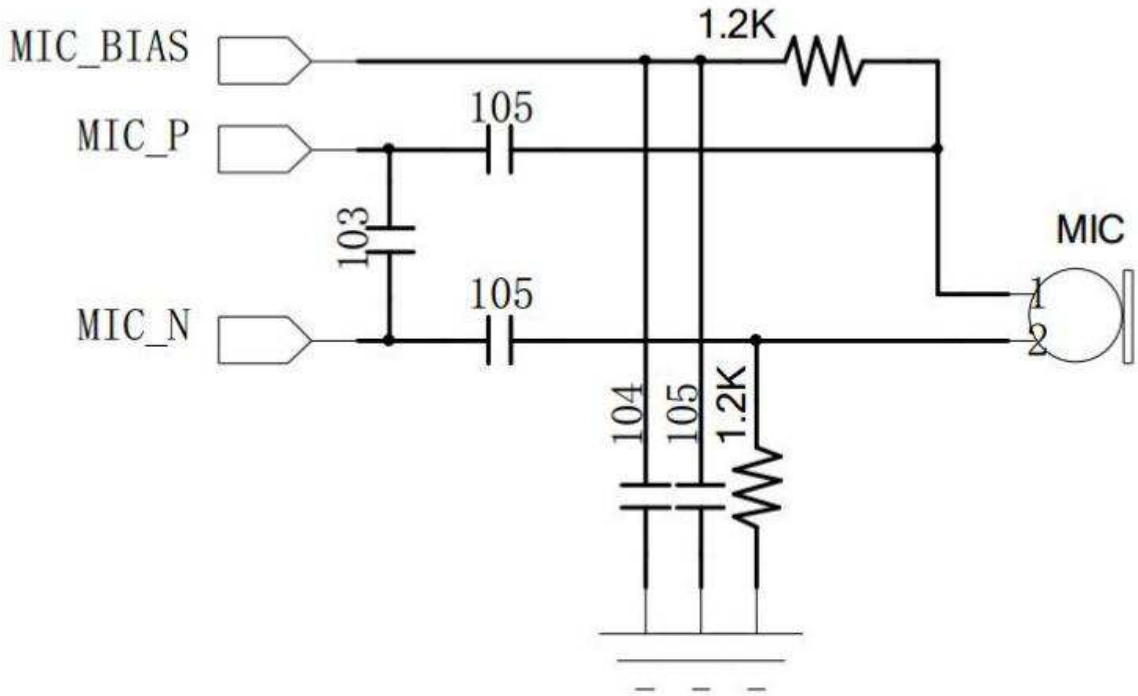
## 十、Application ciriuit:






**Notice:** The module has built-in antenna, external antenna as the need increases

MIC circuit:




MIC Recommended Specification:sensitivity-38dB/+-2dB DC2V working voltage