



产品规格书 Specification

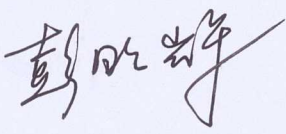
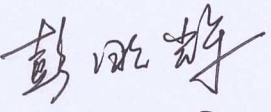
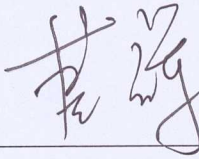
产品名称 Product name : 蓝牙模块 Bluetooth module

产品型号 Product model: F-3109

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目录(Content)

| | |
|--|----|
| 一、产品概述 INTRODUCTION: | 4 |
| 二、应用领域 APPLICATIONS: | 4 |
| 三、基本特性 FEATURES: | 5 |
| 四、模块方框图 MODULE BLOCK DIAGRAM..... | 6 |
| 五、性能参数 PARAMETERS: | 6 |
| 五、模块尺寸图 OUTLINE DIMENSION (MODULE FOOT PRINT): : | 7 |
| 六、模块脚位定义图 DEVICE PINOUT DIAGRAM..... | 7 |
| 七、引脚功能说明 PIN DEFINITION..... | 8 |
| 八、电路连接注意 CIRIUIT CONNECT NOTES: | 10 |
| 九、注意事项 Notes..... | 10 |
| 十、应用电路 APPLICATION CIRIUIT: | 11 |
| 十二、推荐回流温度 THE REFLOW TEMPERATURE..... | 14 |



一、产品概述 INTRODUCTION:

F-3109 蓝牙模块为本公司自主开发的智能型无线音频数据双模传输产品，是低成本的高效率的立体声无线传输方案，模块采用了 CSR8675/8670 芯片为模块提供了高品质的音质和兼容性，整体性能更优化。F-3109 蓝牙模块采用免驱动方式，客户只需要把模块接入应用产品，就可以快捷地实现音乐的无线传输，享受无线音乐的乐趣。

F-3109 is the Bluetooth module for intelligent wireless audio transmission products designed by our company . F-2825 also is the low cost stereo audio Bluetooth solution with high performance. The main chip uses Actions CSR8675/8670 chip, providing the high quality and best compatibility. Without any driver, you can connect the module with your device to enjoy the high quality music easily.

二、应用领域 APPLICATIONS:

该模块主要用于短距离的音乐传输，可以方便地和笔记本电脑，手机，PDA 等数码产品的蓝牙设备相连，实现音乐的无线传输。

F-3109 is used for Bluetooth audio transmission and it is convenience to connect with mobile phone , personal computer , PDA and other digital products with Bluetooth hardware to enjoy the music wirelessly .The major application are included :

- ※ 高档蓝牙音响 Bluetooth speaker
- ※ 蓝牙立体声耳机 Bluetooth stereo headset
- ※ 免提电话 Hands-free Phone
- ※ 蓝牙无线传输音频 Bluetooth speaker with data transmission
- ※ 蓝牙数传应用 Bluetooth data transmission application
- ※ 支持移动互联周边设备 Supporting mobile Internet peripherals



三、基本特性 FEATURES:

Bluetooth Profiles

- ※ Bluetooth v4.0 specification support
 - ※ Support for smartphone applications (apps)
 - ※ Support for TWS
 - ※ support for up to 6 capacitive touch sensor inputs
 - ※ support for 802.11co-existence
- ~~~~~

Improved Audio Quality

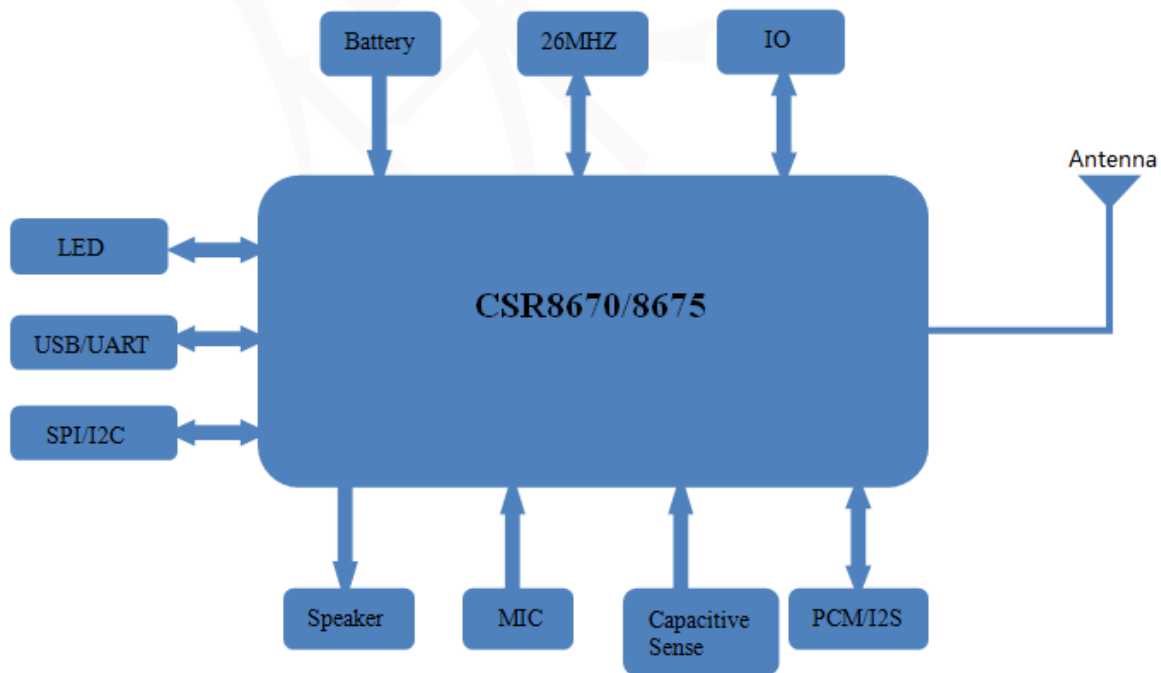
- ※ Stereo codec with 2 channels ADC and up to 6 microphone inputs(include bias generators and digital microphone support)
 - ※ Wind noise reduction
 - ※ Multipoint support for HFP connection to 2 handsets for voice.
- ~~~~~

Music Enhancements

- ※ Configurable 5-band EQ for music playback (rock,pop, classical, jazz, dance etc)
- ※ SBC, MP3, AAC,APTX andAAC+ Faststream decoder
- ※ 16MHZ internal flash memory(64-bit wide,45ns);optional support for 64Mb of external SPI flash
- ※ Support for voice recognition
- ※ Support for multi-language programmable audio prompts
- ※ CSR's proximity pairing and CSR's proximity connection
- ※ Multipoint support for A2DP connection to 2 A2DP sources for music playback
- ※ Talk-time extension



四、模块方框图 MODULE BLOCK DIAGRAM



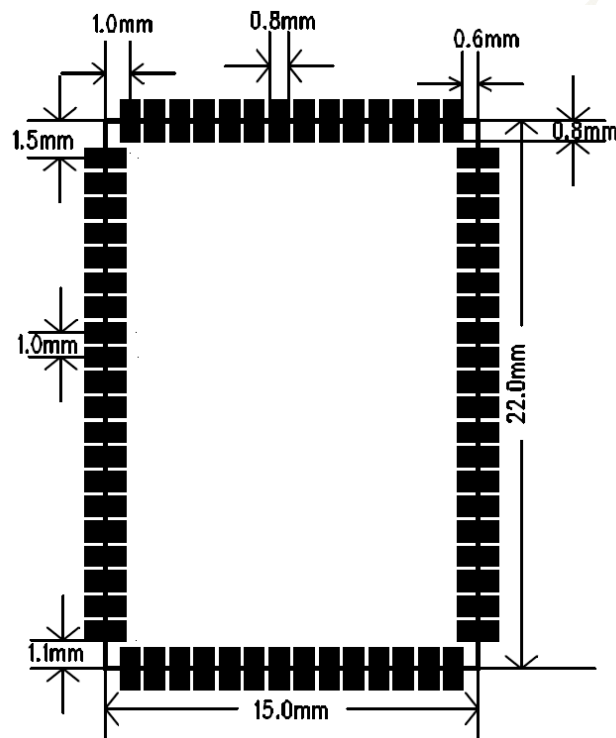
五、性能参数 PARAMETERS:

| | |
|---|--|
| 型号 Model | F-3109 V1.0 |
| 蓝牙规格 Bluetooth specification | Bluetooth V4.2 |
| 调制方式 Modulation mode | GFSK, $\pi/4$ DQPSK, 8DPSK |
| 供电电压 Service voltage | 3.3-4.2V |
| 支持蓝牙协议 Bluetooth Profile | HFPV1.6,HSPV1.2,A2DPV1.2,AVRCPV1.0,PBAP,SPP,OPP,GOEP,FTP,HID 等 |
| 工作电流 Supply voltage | $\leq 30\text{mA}$ |
| 待机电流 Standby current | $< 50\mu\text{A}$ |
| 温度范围 Temperature range | -40°C to $+80^{\circ}\text{C}$ |
| 无线传输范围 The wireless transmission range | ≥ 10 米(m) |
| 传输功率 Transmission power | 支持 CLASS1/CLASS2/CLASS3 最大可调 8dBm |
| 灵敏度 Sensitivity | $-80\text{dBm} < 0.1\% \text{BER}$ |
| 频率范围 Frequency range | 2.402GHz-2.480GHz |

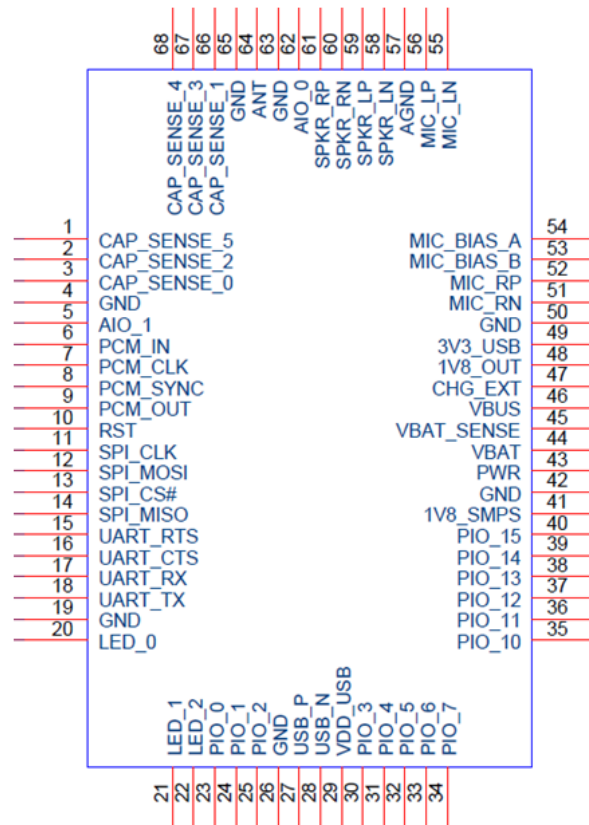


| | |
|--|---|
| 对外接口 The external interface | PIO, SPI,AIO,UART,USB,PCM,I2S,,SPDIF,SPK(L/R) |
| 支持系统 Support system | 支持安卓（android），苹果（IOS）和 windows 系统 |
| 音频性能 Audio performance | 支持 AAC, MP3, SBC,AAC+ Faststream , APTX |
| 音频信噪比 The audio signal to noise ratio | $\geq 75\text{dB}$ |
| 失真度 Degree of distortion | $\leq 0.1\%$ |
| 模块尺寸 Module size | 22*15*3MM |

五、模块尺寸图 OUTLINE DIMENSION (MODULE FOOT PRINT): :



六、模块脚位定义图 DEVICE PINOUT DIAGRAM



七、引脚功能说明 PIN DEFINITION

| Pin | Symb | I/O | Description |
|-----|----------------|---------------------------|--|
| 1 | CAP_SENSE5 | Aualogue in | Capacitive touch sensor input |
| 2 | CAP_SENSE2 | Aualogue in | Capacitive touch sensor input |
| 3 | CAP_SENSE0 | Aualogue in | Capacitive touch sensor input |
| 4 | GND | GND | GND |
| 5 | AIO1 | PIO1 | Analogue programmable input/output line |
| 6 | PCM_IN_PIO17 | PIO17 | Synchronous data input.alternative funtion PIO17 |
| 7 | PCM_CLK_PIO20 | PIO20 | Synchaon data clock . alternative funtion PIO20 |
| 8 | PCM_SYNC_PIO19 | PIO19 | Synchaon data sync . alternative funtion PIO19 |
| 9 | PCM_OUT_PIO18 | PIO18 | Synchaon data output . alternative funtion PIO18 |
| 10 | RST | Reset | Reset if low . |
| 11 | SPI_CLK | Input with weak pull_down | SPI clock |
| 12 | SPI_MOSI | Input with weak pull_down | SPI data input |
| 13 | SPI_CSB | Input with weak pull_down | Chip select for SPI,active low |
| 14 | SPI_MISO | Input with weak pull_down | SPI data output |
| 15 | UART_RTS | PIO16 | UART request to send .active low, Alternative funtion PIO16 |



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F-3109 V1.0

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|----|------------|-----------------|--|
| 16 | UART_CTS | PADS_1 | UART data to send,active low. |
| 17 | UART_TX | PADS_1 | UART data output |
| 18 | UART_RX | ADS_1 | UART data input |
| 19 | GND | GND | GND |
| 20 | LED0_PIO29 | PIO29 | LED driver .Alternative function PIO29 |
| 21 | LED1_PIO30 | PIO30 | LED Driver. Alternative function PIO30 |
| 22 | LED2_PIO31 | PIO31 | LED Driver. Alternative function PIO31 |
| 23 | PIO_0 | PIO_0 | programmable input/output line |
| 24 | PIO_1 | PIO_1 | programmable input/output line |
| 25 | PIO_2 | PIO_2 | programmable input/output line |
| 26 | GND | GND | GND |
| 27 | USB_DN | USB_DN | USB_DN |
| 28 | USB_DP | USB_DP | USB_DP |
| 29 | VDD | +3.3V | Positive supply for USB ports |
| 30 | PIO_3 | PIO_3 | programmable input/output line |
| 31 | PIO_4 | PIO_4 | programmable input/output line |
| 32 | PIO_5 | PIO_5 | programmable input/output line |
| 33 | PIO_6 | PIO_6 | programmable input/output line |
| 34 | PIO_7 | PIO_7 | programmable input/output line |
| 35 | PIO_10 | PIO_10 | programmable input/output line |
| 36 | PIO_11 | PIO_11 | programmable input/output line |
| 37 | PIO_12 | IO_12 | programmable input/output line |
| 38 | PIO_13 | IO_13 | programmable input/output line |
| 39 | PIO_14 | PIO_14 | programmable input/output line |
| 40 | PIO_15 | PIO_15 | programmable input/output line |
| 41 | VDD_PADS | VDD_1.8V | 1.8V positive supply input for input/output ports: |
| 42 | GND | GND | GND |
| 43 | PWR | Power_en | Power_en |
| 44 | VBAT | VBAT_3.3V--4.2V | Battery positive terminal |
| 45 | Vbat_SENSE | Power_en | Battery charge sense input |
| 46 | VBUS | +5V | Battery charge input |
| 47 | CHG_EXT | CHG_en | External battery charge control |
| 48 | 1V8_OUT | Power_OUT | 1V8_OUT |
| 49 | 3V3_OUT | Power_OUT | USB_3V3_OUT |
| 50 | GND | GND | GND |
| 51 | MIC_RN | MIC in | Microphone input negative,right |
| 52 | MIC_RP | MIC in | Microphone input positive ,right |
| 53 | MIC_BIAS_B | MIC out | Microphone bias B |



| | | | |
|----|------------|--------------|---|
| 54 | MIC_BIAS_A | MIC out | Microphone bias A |
| 5 | MIC_LN | MIC in | Microphone input negative ,left |
| 56 | MIC_LP | MIC in | Microphone input positive ,left |
| 57 | AGND | Analogue GND | Analogue GND |
| 58 | SPKL_LN | SPKL out | Speaker output negative,left |
| 59 | SPKL_LP | SPKL out | Speaker output positive,left |
| 60 | SPKR_RN | SPKL out | Speaker output negative,right |
| 61 | SPKR_RP | SPKL out | Speaker output positive,right |
| 62 | AIO0 | PIO0 | Analogue programmable input/output line |
| 63 | GND | GND | GND |
| 64 | RF_IN | RF_OUT | RF OUTPUT |
| 65 | GND | GND | GND |
| 66 | CAP_SENSE1 | Aualogue in | Capacitive touch sensor input |
| 67 | CAP_SENSE3 | Aualogue in | Capacitive touch sensor input |
| 68 | CAP_SENSE4 | Aualogue in | Capacitive touch sensor input |

八、电路连接注意 CIRIUIT CONNECT NOTES:

F-3109 V1.0 外接功放的时候，必须接差分输入的功放，如果不接差分输入的功放，必须接一个运放平衡两个差分的电平，否则会有“啪啪”的冲击声。

When F-3109 V1.0 connected a external power amplifier ,which must be a differential input amplifier, if not,, must be connected to an operational amplifier to balance two difference level, otherwise there will be "impact sound Pa Pa".

九、注意事项 Notes

- A. 如果模组天线旁边有电池，金属物，液晶屏，喇叭等，要求离天线距离至少 15mm

If the module antenna next to the battery、 metal, liquid crystal screen, loudspeaker, at least keep them away from antenna distance 15mm

- B. layout 时供电线路建议使用星形走线，并确保蓝牙模组供电线性度要好，还有 BT 的地须与运放，功放，MCU 等的地分开，而且 BT 下侧不可有其他干扰地

When layout the power supply line recommended star line, and to ensure that the Bluetooth module Power supply lines is better , and BT should be with the amplifier, power amplifier, MCU, separately, and the underside of the BT has no other interference.

- C. 天线周围不可走控制线，电源线，音频线，MIC 等干扰线。



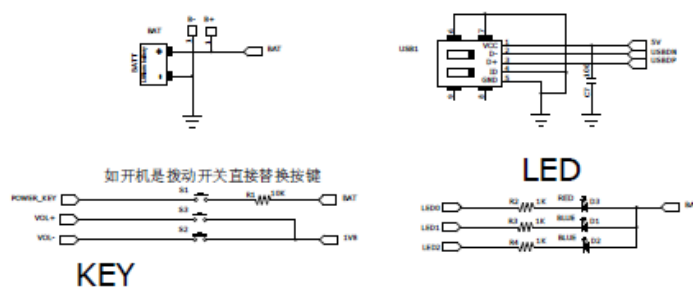
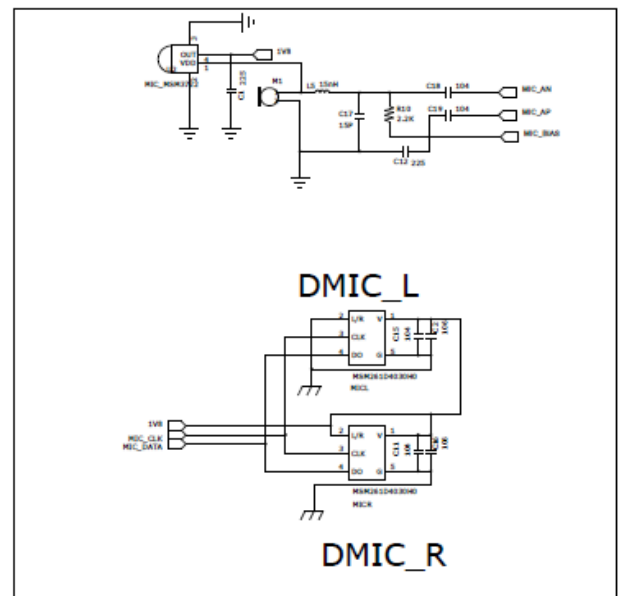
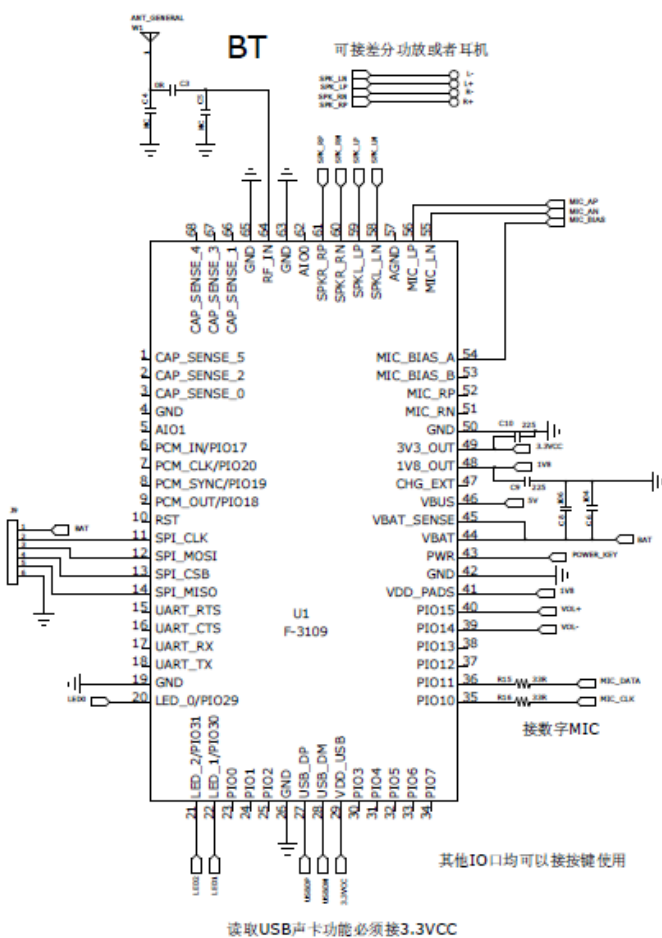
Please don't let control lines, power lines, audio lines, MIC and other interference lines around the antenna .

D. 如果模组天线附近有排座，外壳有金属铁网等对信号有影响的，建议选用专业的高增益天线

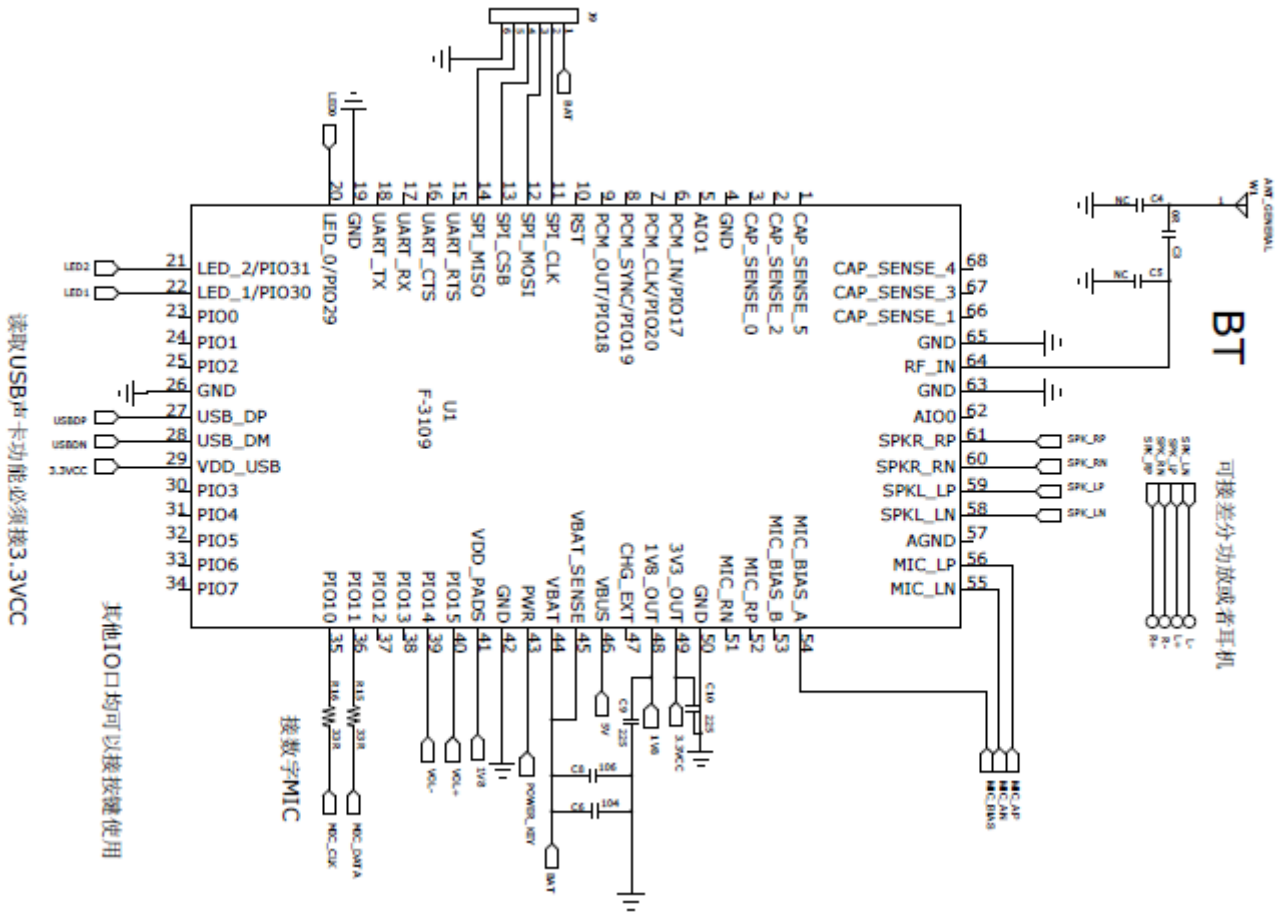
If the module antenna near the row seats, Because of metal will block the signal transmission, it is recommended to use professional high-gain antenna.

十、应用电路 APPLICATION CIRCUIT:

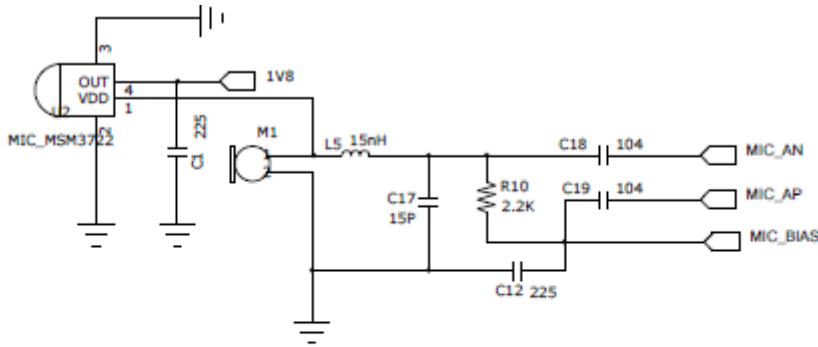
1) 完整电路图 Complete circuit diagram



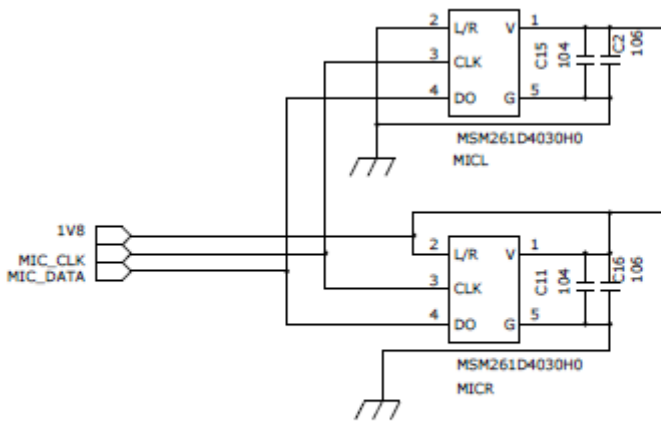
2) 部分清晰电路图 Partial clear circuit diagram



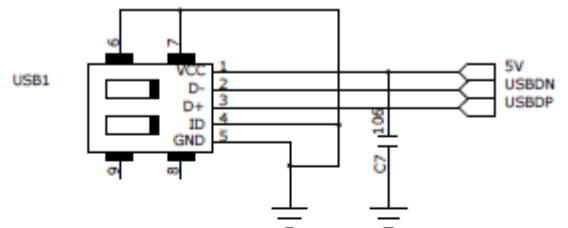
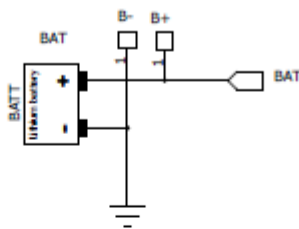
COMET



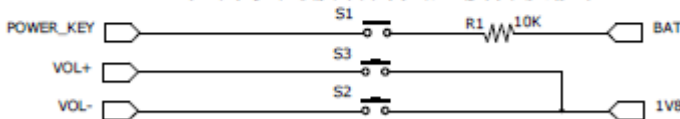
DMIC_L



DMIC_R



如开机是拨动开关直接替换按键



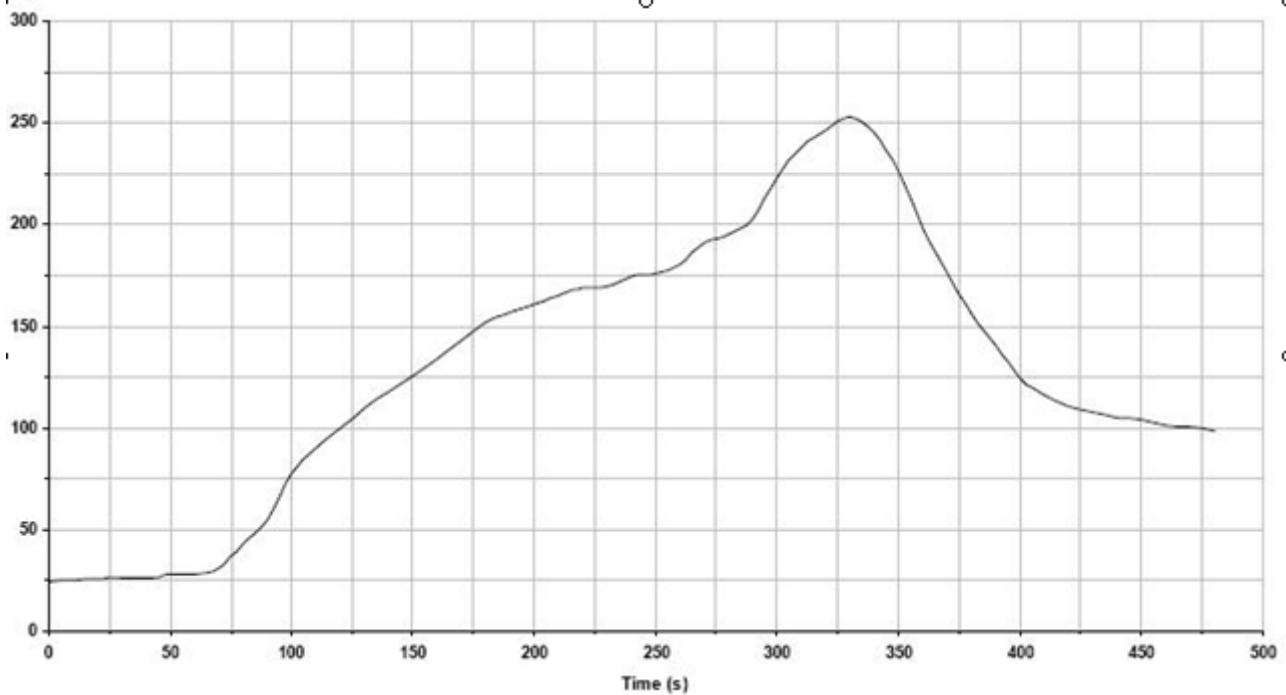
KEY

LED





十二、推荐回流温度 THE REFLOW TEMPERATURE



Key features of the profile:

- Initial Ramp=1-2.5°C/sec to 175°C equilibrium
- Equilibrium time=60 to 80 seconds
- Ramp to Maximum temperature (250°C)=3°C/sec Max
- Time above liquidus temperature(217°C): 45 - 90 seconds
- Device absolute maximum reflow temperature: 250°C