Bluetooth module F-3288 manual

一、 Product description：

F-3288 Bluetooth module is Intelligent wireless audio data transmission products of the independent development made by our company, which enjoy the reasonable price and low cost of stereo wireless transmission scheme , module uses 8635 chip to provide the high quality and compatibility , the overall performance is better. F-3288 Bluetooth module with free driving mode, customers only need to connect the module to the application product, can quickly realize the music wireless transmission, enjoy wireless music.It is also supporting SPP program

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 v4.0 specification support
※ HFP v1.6 wideband speech (HD voice ready)
※ HSP v1.2
※ A2DP v1.2

※ **AVRCP v1.4**

※ **Support for smartphone applications (apps)**

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Improved Audio Quality

CSR's latest 2-mic CVC audio enhancements for narrowband and wideband connections including:

※ **1-mic far-end audio enhancements**

※ **Near-end audio enhancements (noise suppressionand AEQ)**

※ **Wind noise reduction**

※ **Packet loss concealment**

※ **Bit error concealment**

※ **Automatic gain control and automatic volumecontrol**

※ **Frequency expansion for improved speech intelligibility**

※ **mSBC codec support for wideband speech**

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Music Enhancements

※ **Configurable 5-band EQ for music playback (rock,pop, classical, jazz, dance etc)**

※ **SBC, MP3, AAC and Faststream decoder**

※ **Stereo widening (S3D)**

※ **Volume Boost Additional Functionality Additional Functionality**

※ **Support for voice recognition**

※ **Support for multi-language programmable audio prompts**

※ **CSR's proximity pairing and CSR's proximity connection**

※ **Multipoint support for HFP connection to 2 handsets for voice**

※ **Multipoint support for A2DP connection to 2 A2DP sources for music playback**

※ **Talk-time extension**

四、Performance parameters：

Model	F-3288
Bluetooth specification	**Bluetooth V4.0**
Modulation	**GFSK，π/4 DQPSK, 8DPSK**
Supply voltage：	**3.3-4.2V**
Support Bluetooth protocol	**HFP V1.6，HSP V1.2, A2DP V1.2,AVRCP V1.4，DI V1.3**
Working current	**≤30mA**
Standby current	**<50uA**
Temperature range	**-40ºC to +80ºC**
The wireless transmission range ：	**<10 meter**
Transmission power：	**Support　CLASS1/CLASS2/CLASS3　max 8dBm**
sensitivity：	**-80dBm<0.1%BER**
Frequency range：	**2.4GHz-2.480GHz**
External port：	**PIO, SPI,Audio in/out and PCM,USB**

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Audio performance	Support AAC, MP3, SBC,stero
The audio Signal to Noise Ratio：：	≥75dB
Distortion	≤0.1%
Module size	21.9X14.1*1.8MM

五、The size graph of the module：
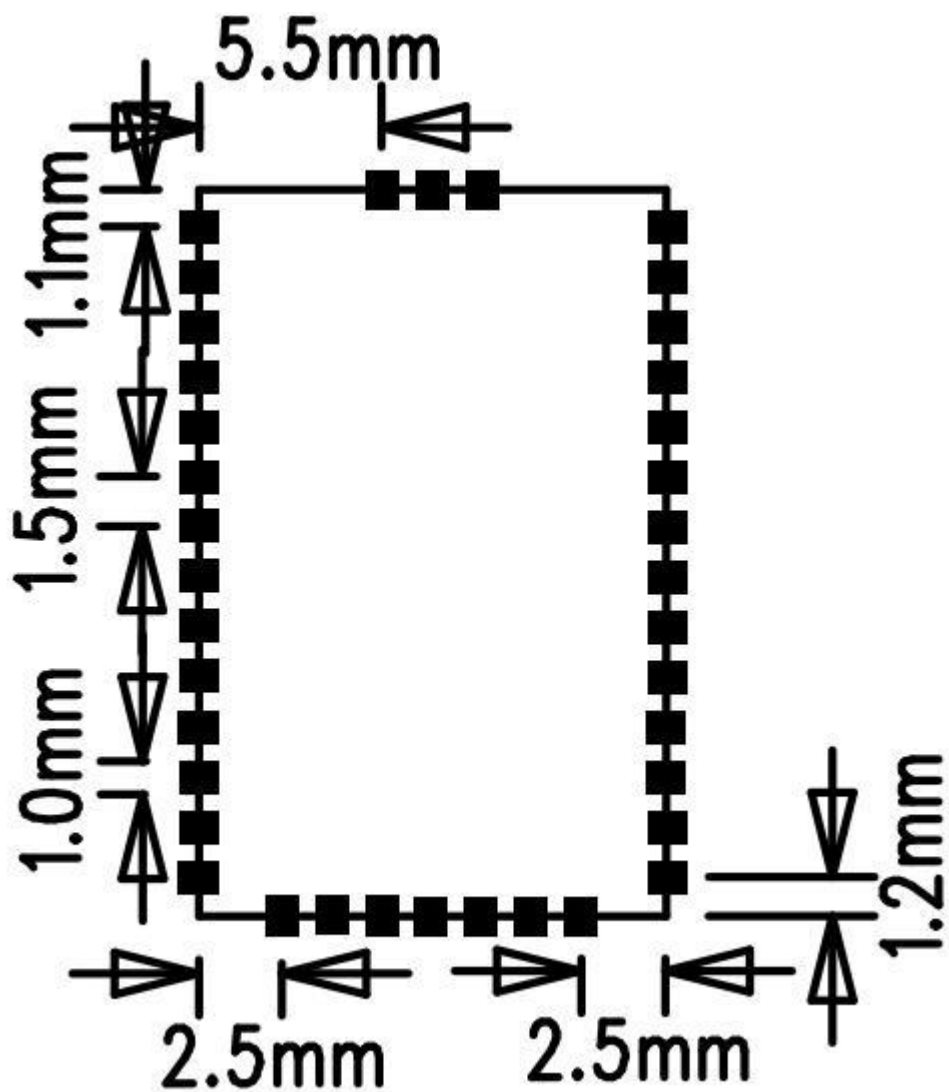
六、Module pin definition diagram
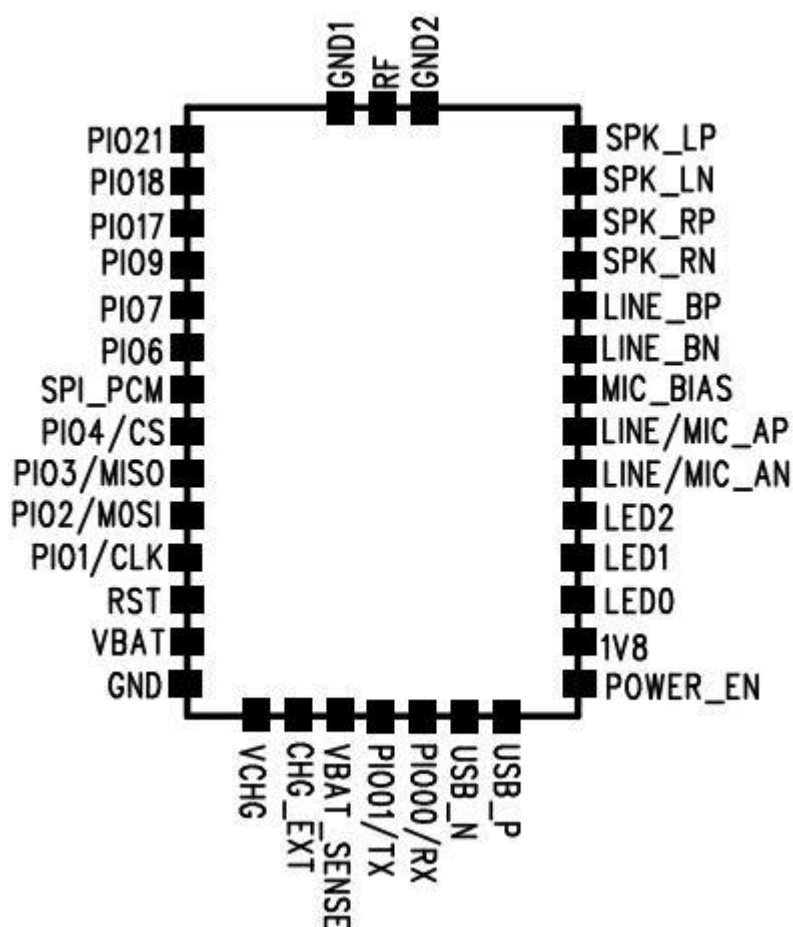
七、Pin description

Pin	Symb	I/O	Description
1	PIO21	Bi-directional with strong pull-down	Programmable input/output
2	PIO18	Bi-directional with strong pull-down	Programmable input/output
3	PIO17	Bi-directional with strong pull-down	Programmable input/output
4	PIO9	Bi-directional with strong pull-down	Programmable input/output
5	PIO7	Bi-directional with strong pull-down	Programmable input/output
6	PIO6	Bi-directional with strong pull-down	Programmable input/output
7	PCM	Input with weak	SPI/PCM select input

			pull-down	0: PCM/PIO interface 1: SPI
8	CS	Bi-directional with weak pull-down	Programmable input/output Alternative function: SPI data Output PCM1 synchronous data sync	
9	MISO	Bi-directional with weak pull-down	Programmable input/output Alternative function: SPI data Output PCM1 synchronous data Output	
10	MOSI	Bi-directional with weak pull-down	Programmable input/output Alternative function: SPI data input PCM1 synchronous data output	
11	CLK	Bi-directional with weak pull-down	Programmable input/output Alternative function: SPI clock PCM1 synchronous data Clock	
12	RST		Reset if low,pull low minimum 5ms to case a reset	
13	VBAT	Battery positive terminal	3.3-4.2V	
14	GND	Ground	Ground connect battery negative	
15	VCHG	Charger input		
16	CHG_EXT	External Battery charger	Charge	
17	VBAT_SENSE	Battery charger sense input	BAT_SENSE	
18	TX	Bi-directional with strong pull-down	Programmable input/output Alternative function: UART data output	
19	RX	Bi-directional with weak pull-down	Programmable input/output Alternative function: UART data input	
20	USB_N	Bi-directional	USB data plus with selectable internal 1.5K pull up resistor	
21	USB_P	Bi-directional	USB data minus	
22	POWER_EN	Input with weak pull-down	Regulator enable input	
23	1V8	POWER	+1.8V Output	
24	LED0	Bi-directional	LED Driver	
25	LED1	Bi-directional	LED Driver	
26	LED2	Bi-directional	LED Driver	
27	LINE/MIC_AN	Analogue in	LINE or Microphone input positive ,channel A	

28	LINE/MIC_AP	Analogue in	LINE or Microphone input negative ,channel A
29	MIC_BIAS	Analogue out	Microphone bias
30	LINE_BN	Analogue in	LINE input negative ,channel A
31	LINE_BP	Analogue in	LINE input negative ,channel A
32	SPK_RN	Analogue out	Speaker output negative, right
33	SPK_RP	Analogue out	Speaker output positive, right
34	SPK_LN	Analogue out	Speaker output negative, right
35	SPK_LP	Analogue out	Speaker output positive, right
36	GND2	Ground	Ground connect battery negative
37	RF	radio-frequency signal	RF signal output
38	GND1	Ground	Ground connect battery negative

八、Design notice：

PIO21，PIO18，PIO17，PIO9，PIO7，PIO6 the 6IO port can be used as the key,other port as the output.

九、Connection circuit notice：

When F-3288 connecting a power amplifier , must be connected to the differential input amplifier, if not then the differential input amplifier, must be connected to an operational amplifier to balance two difference level, otherwise there will be "impact sound Pa Pa".

十、Notice

A.   If the   module antenna next to the battery、   metal, liquid crystal screen, loudspeaker, at least

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keep them from antenna distance 15mm

B. **Layout recommends the use of star power supply line line, and to ensure that the Bluetooth module power supply linearity is better, and BT to be operational amplifier, power amplifier, separate MCU etc., and the underside of the BT have no other interference**

C. **control line, power line, audio line, MIC interference line don't happen**

around antenna

D **If the module antenna near a row seat, shell with metallic iron net impact on signal, it is recommended to avoid, can choose the high gain antenna professional**

十、Application circuit：
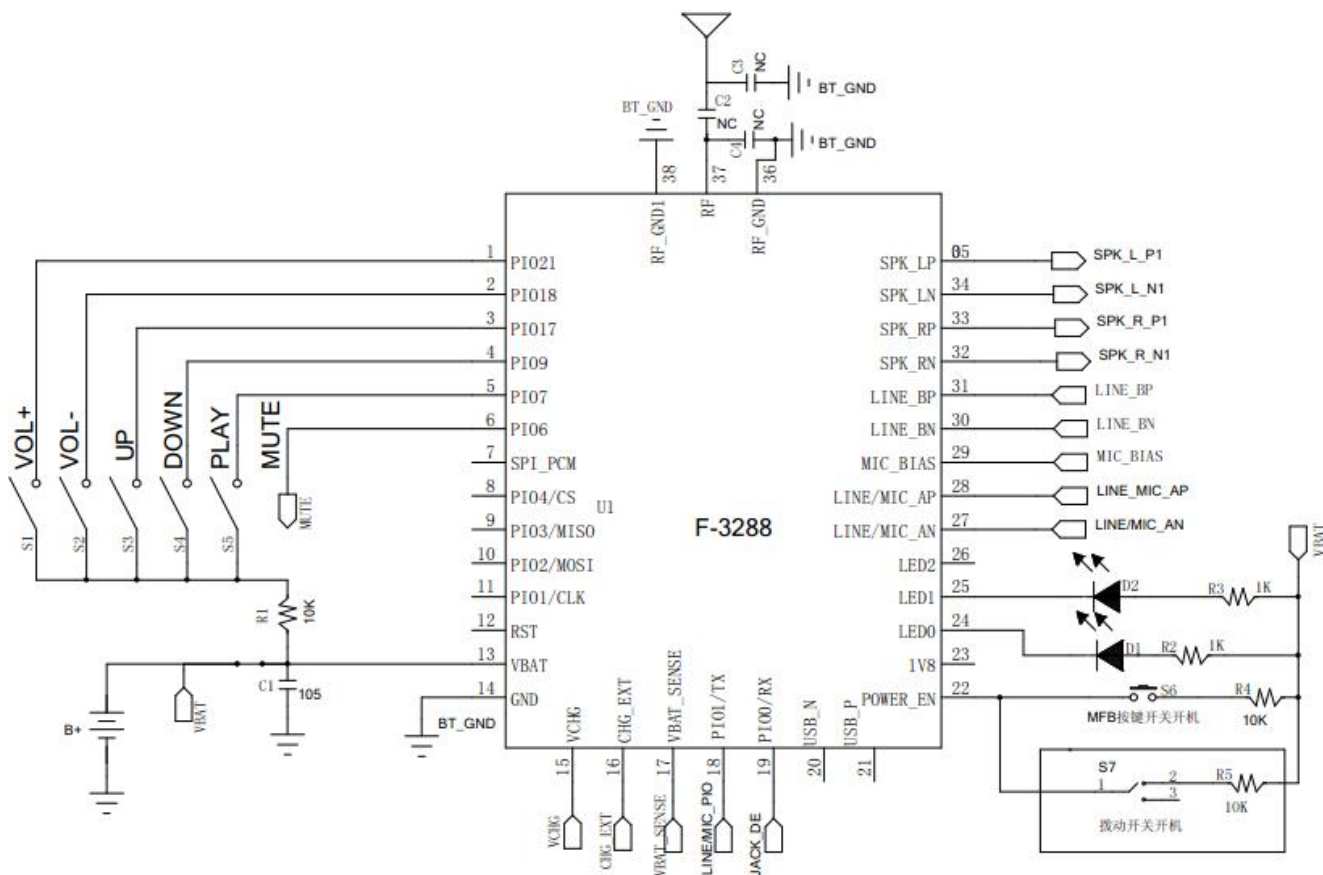
Application principle of Bluetooth module
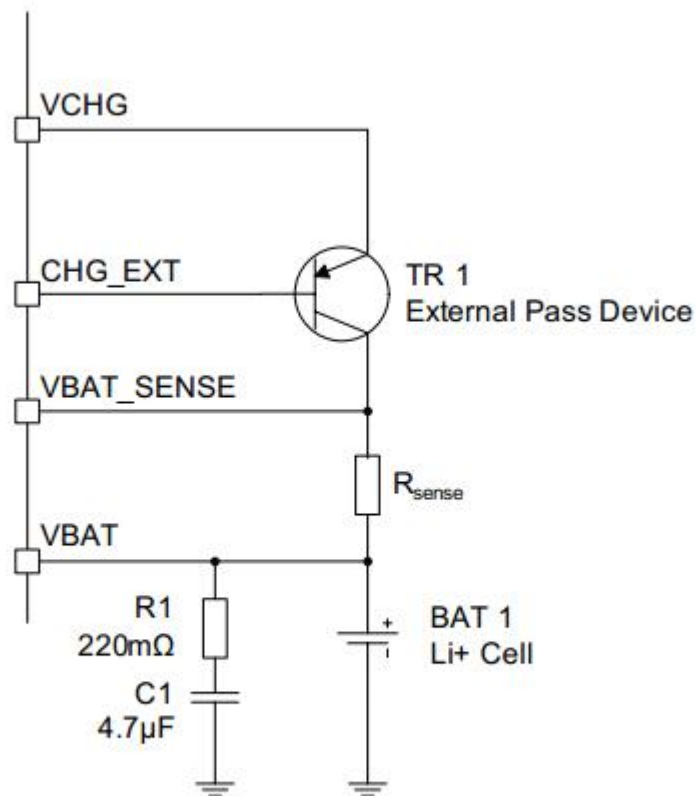
Figure 11.2: Battery Charger External Mode Typical Configuration

Notice： Rsense for charging current control resistor

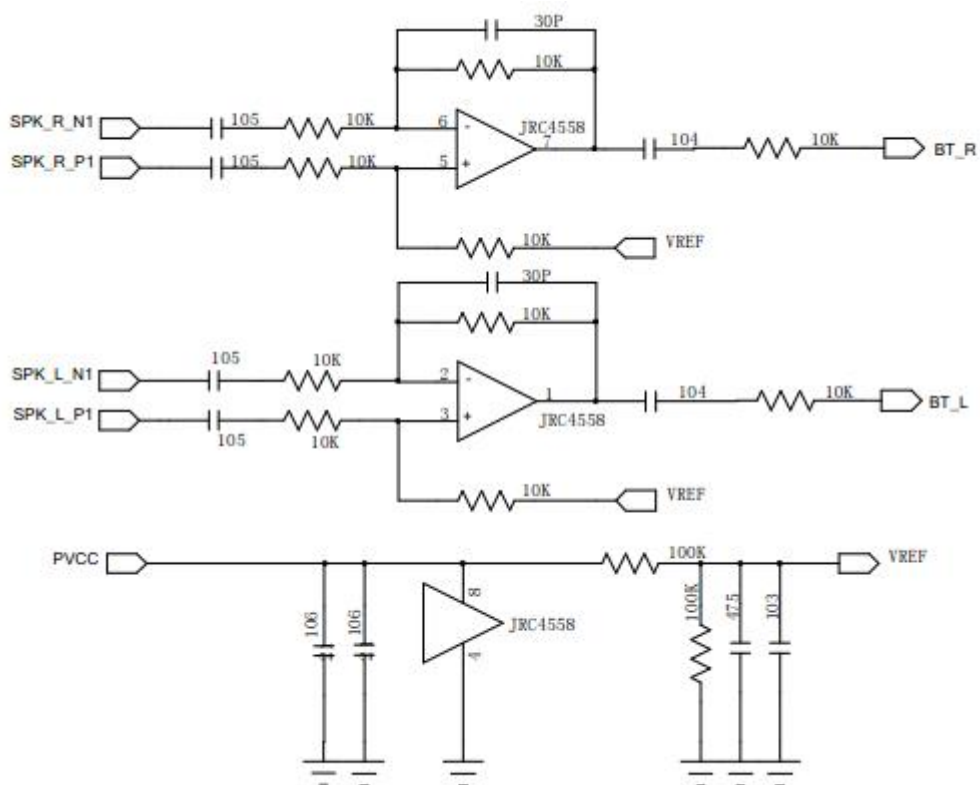Notice 1.Using the IC internal charging current up to 250mA.

2The use of external current maximum to 750mA

3.The RF output pin of the C2.C3.C4 antenna matching network, at least should be reserved for the C2, C3 or C2, C4

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4.Shall burn the foot SPI_PCM, design of CS, MOSI, MISO, CLK, 1V8, GND leading testing point
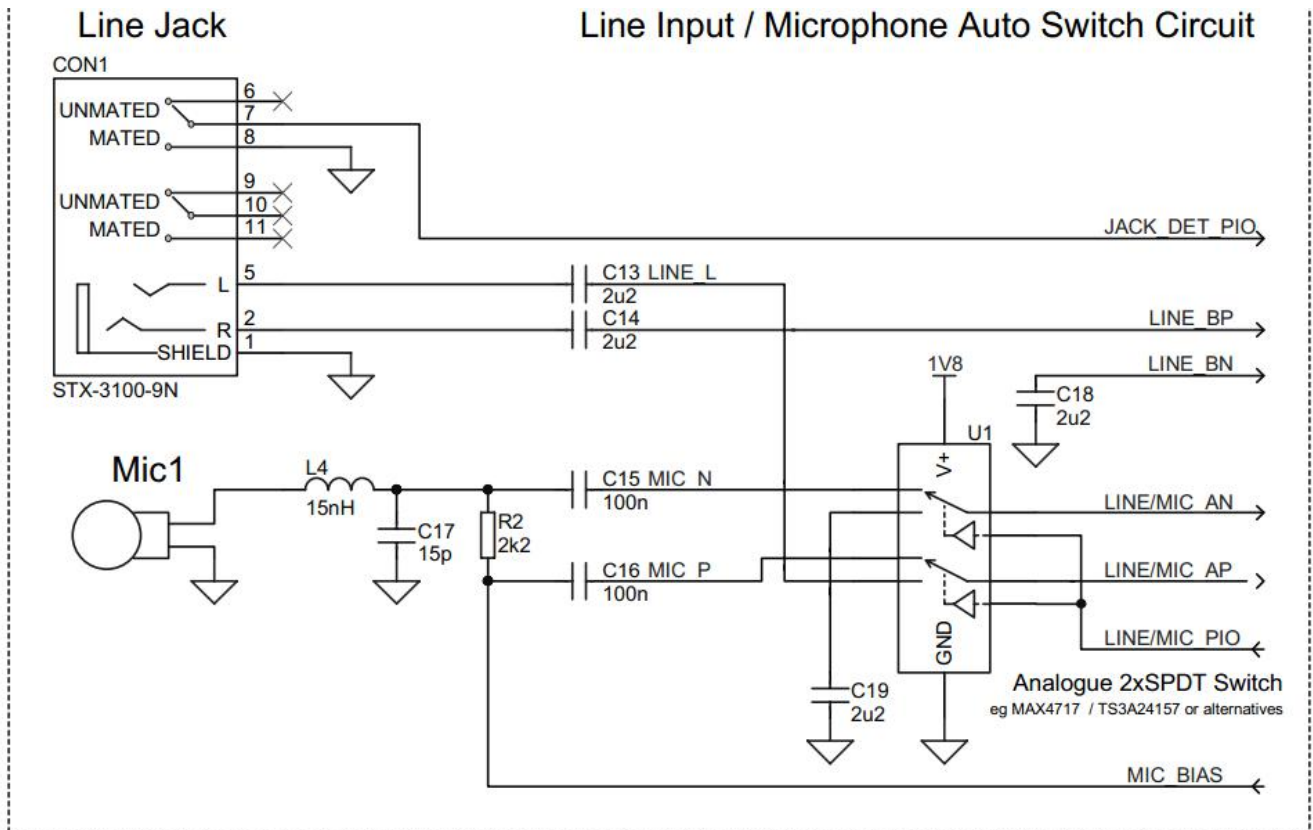
Stereo LINE IN input and MIC conversion circuit

Differential input single output amplifier circuit
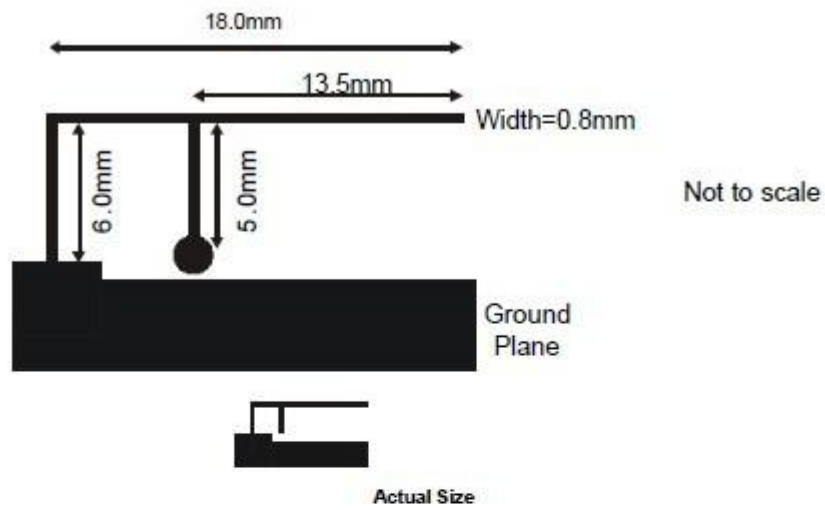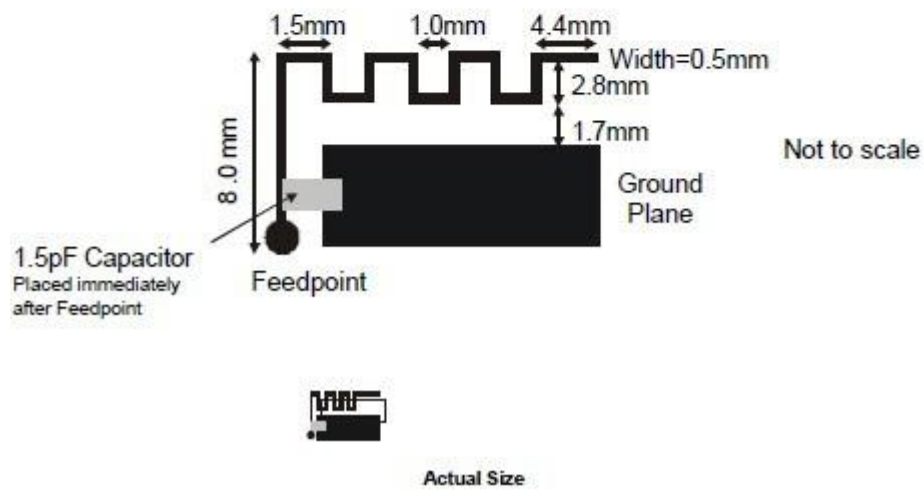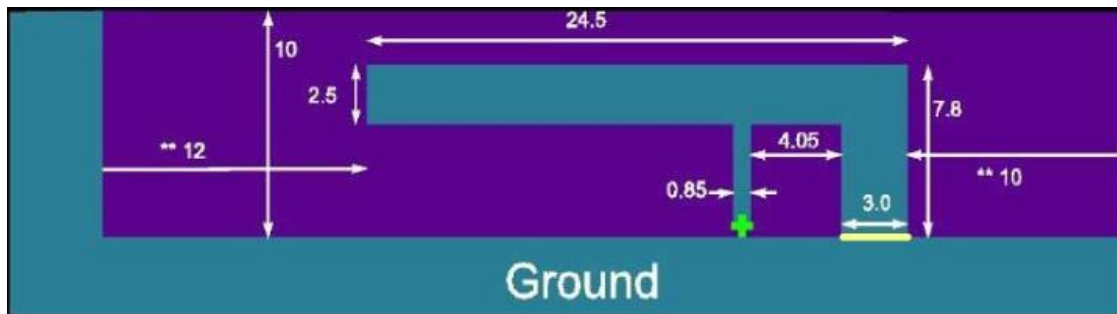
十一. **Printed PCB antenna selection**
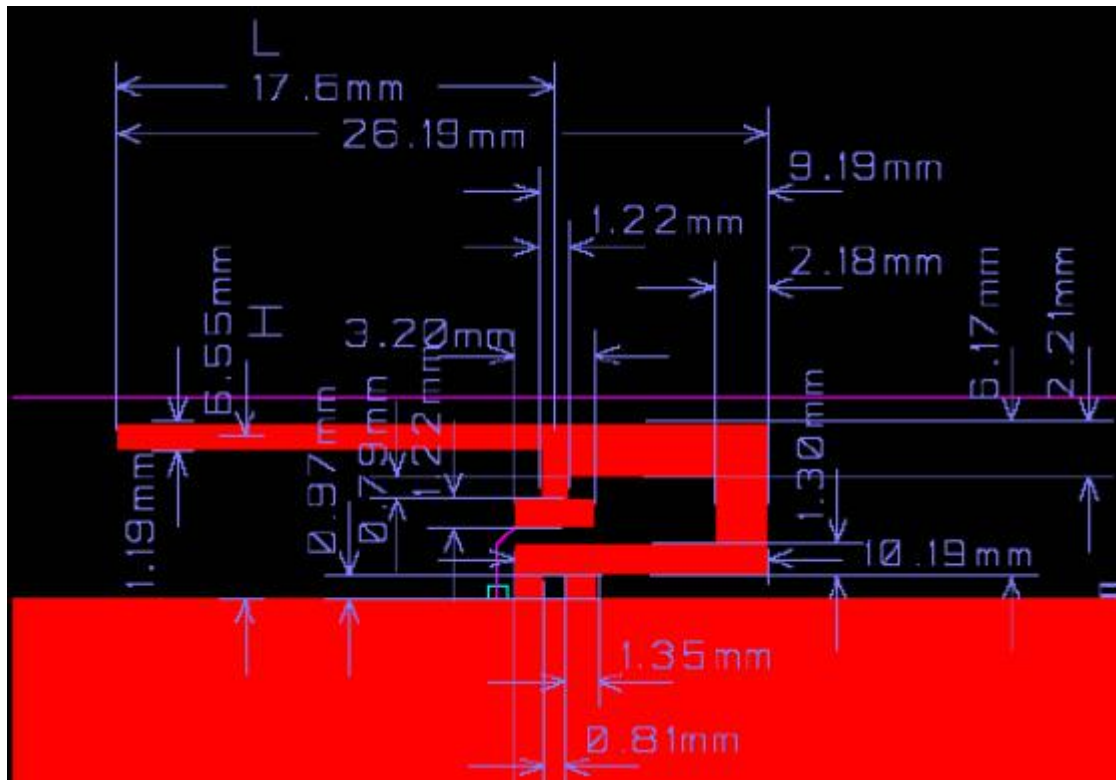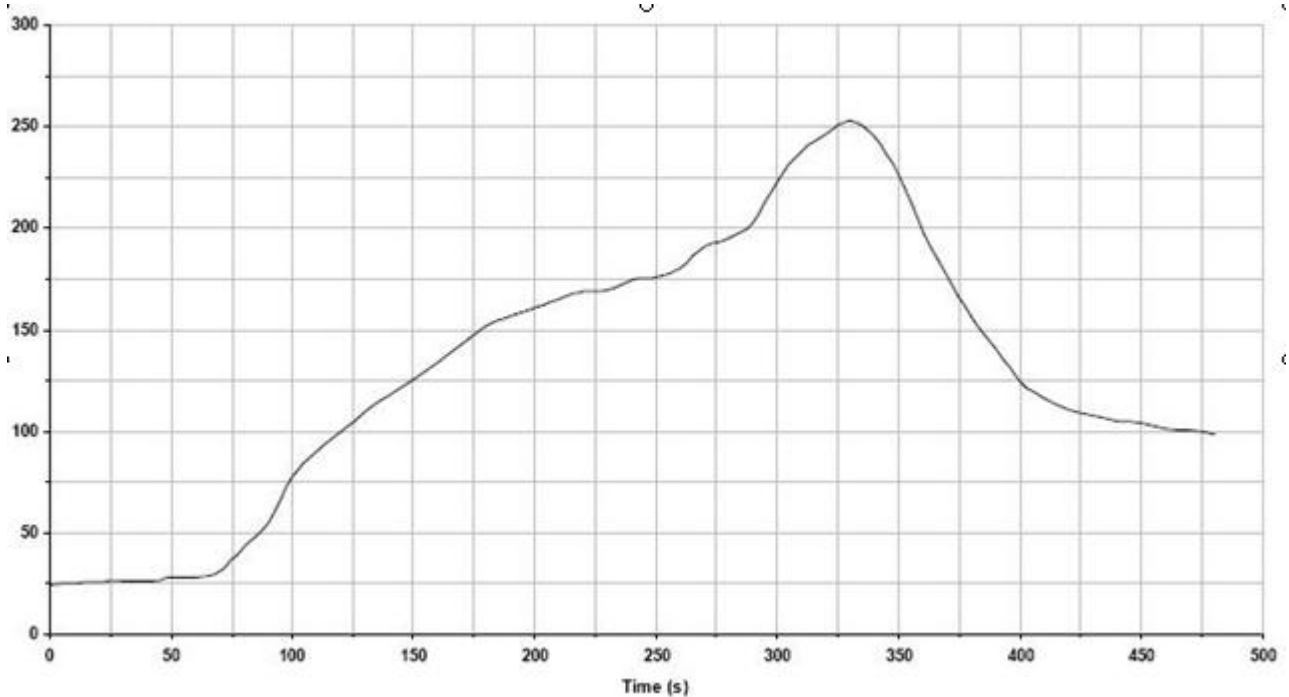
Real Designs

Figure 4.1: Approximate Dimensions of Inverted-F Antenna

十二、**Recommended Reflow temperature**

Key features of the profile:

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