Operational Description

INDEX

1. Features

- 2.4GHz ISM Band
- modulation GFSK
- Low LBOM cost
- Long distance > 50m (Line of sight)
- Broadcasting mode
- RF frequency hopping in 34 channels
- USB and analog dual audio input
- Support no audio detection function
- Programmable delay time 20ms / 55ms (Default 55ms – otherwise need firmware upgrade)
- Audio format 16bit , 48KHz sampling rate
- Power ON/OFF pop noise reduction
- Robust Packet error correction
- Low power consumption
- No RF induced audio noise
- Ready to go reference system

2. Application

- Wireless HTiB Rear Speaker
- Wireless Outdoor Speaker
- Wireless Multi-Room Speaker
- Wireless Audio Sender

3. RF Specification

Item		Unit	Note
Frequency Range	2406 ~ 2472	MHz	
Channel	34		
Modulation	GFSK		
RF Tx Power	Typ. 15	dBm	Radiation Power
Rx Sensitivity	Typ. -78	dBm	

4. Audio Specification

Item		Unit	Note
SNR	Typ. 96	dB	OP output @1KHz
THD + N	Typ. -70	dB	OP output @1KHz
Frequency Response	+0.5 / +0.5	dB	20 ~20KHz
Crosstalk	Typ. -96	dB	OP output @1KHz
FSIV	0.64	Vrms	TX module Input Level
FSOV	0.7	Vrms	RX module Output Level

5. Electrical Specification

Item		Unit	Note
Power supply voltage			
Tx	3.3	V	Typical 3.3V
Rx	3.3	V	Typical 3.3V
Power supply current			
Tx	170	mA	Typical value
Rx	40	mA	Typical value
Operating Temperature	0 ~ +60	℃	Ambient temperature

6. Mechanical Specification

- Dimension：
  1. TX：44* 32 *0.8 mm
  2. RX： 44* 32 *0.8 mm
- Net Weight：(TBD)
- PCB 2 Layers

■ Mechanical Drawing：

For connector or switch , detail information please refer to page 8

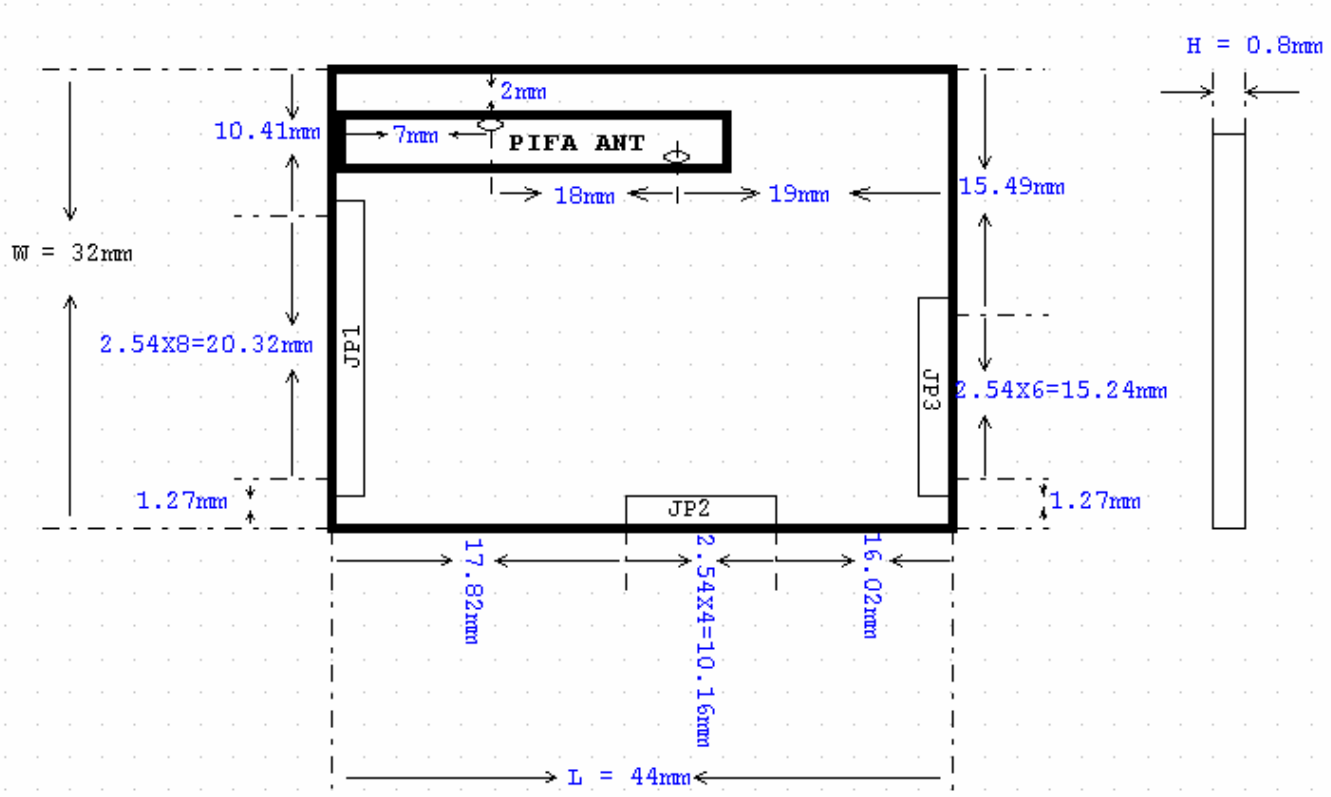


Fig 6.1. TX module

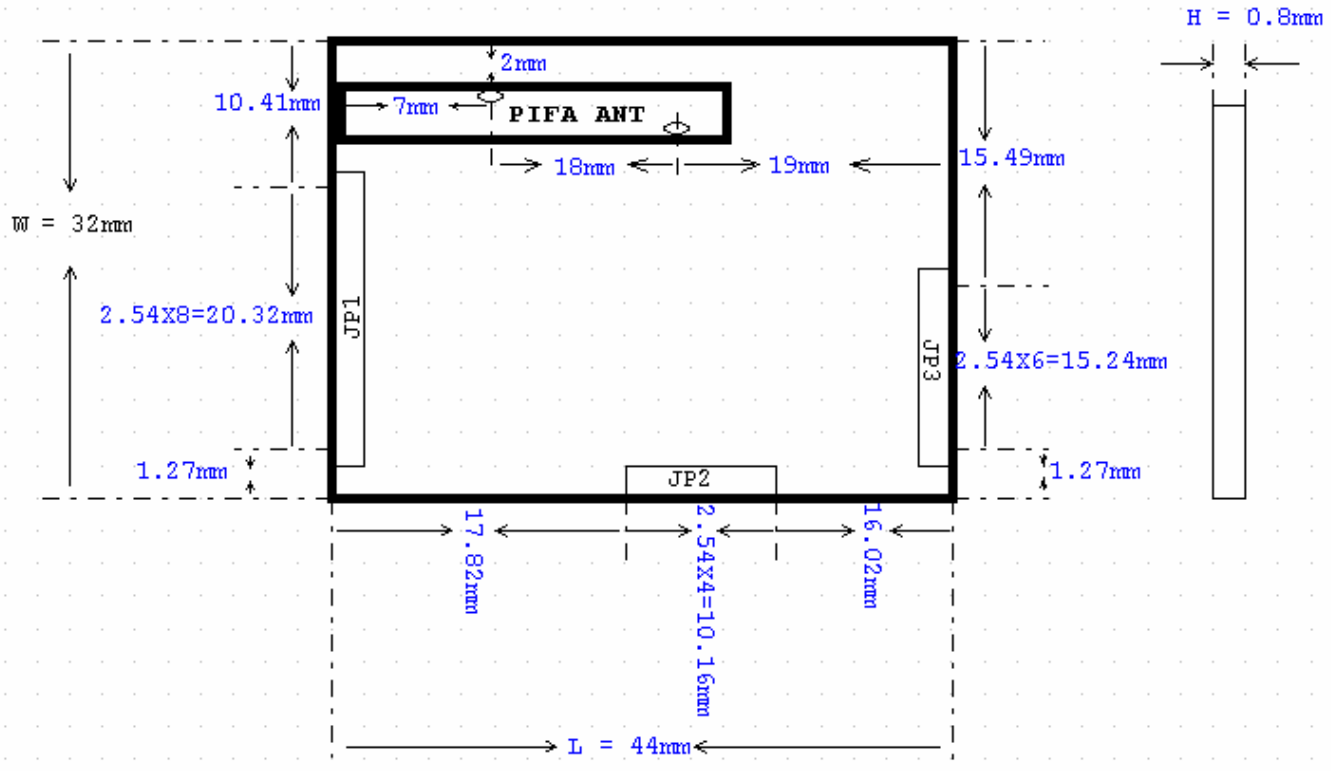


Fig 6.2. RX module

7. Physical

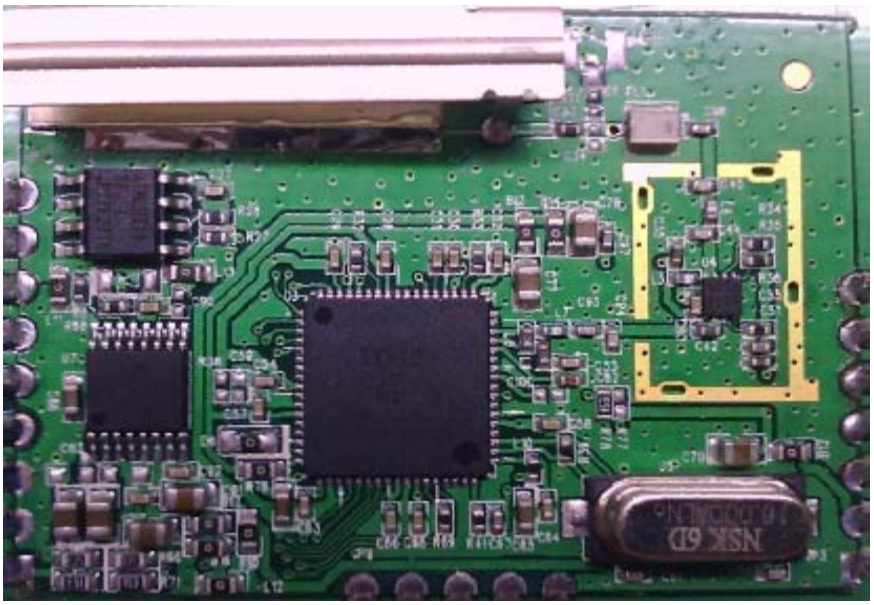


Fig 7.1. TX module

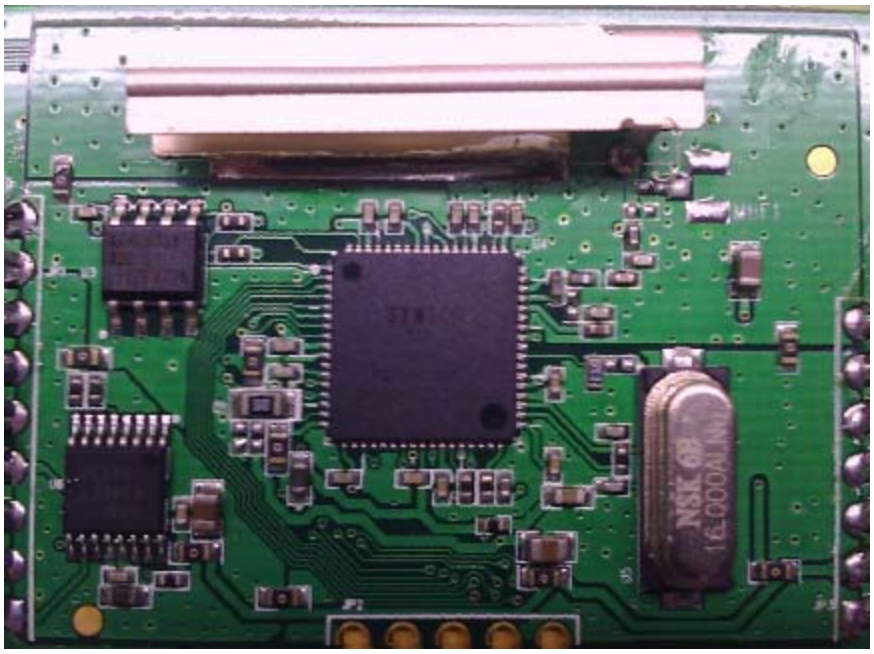


Fig 7.2. RX module

8. Block Diagram

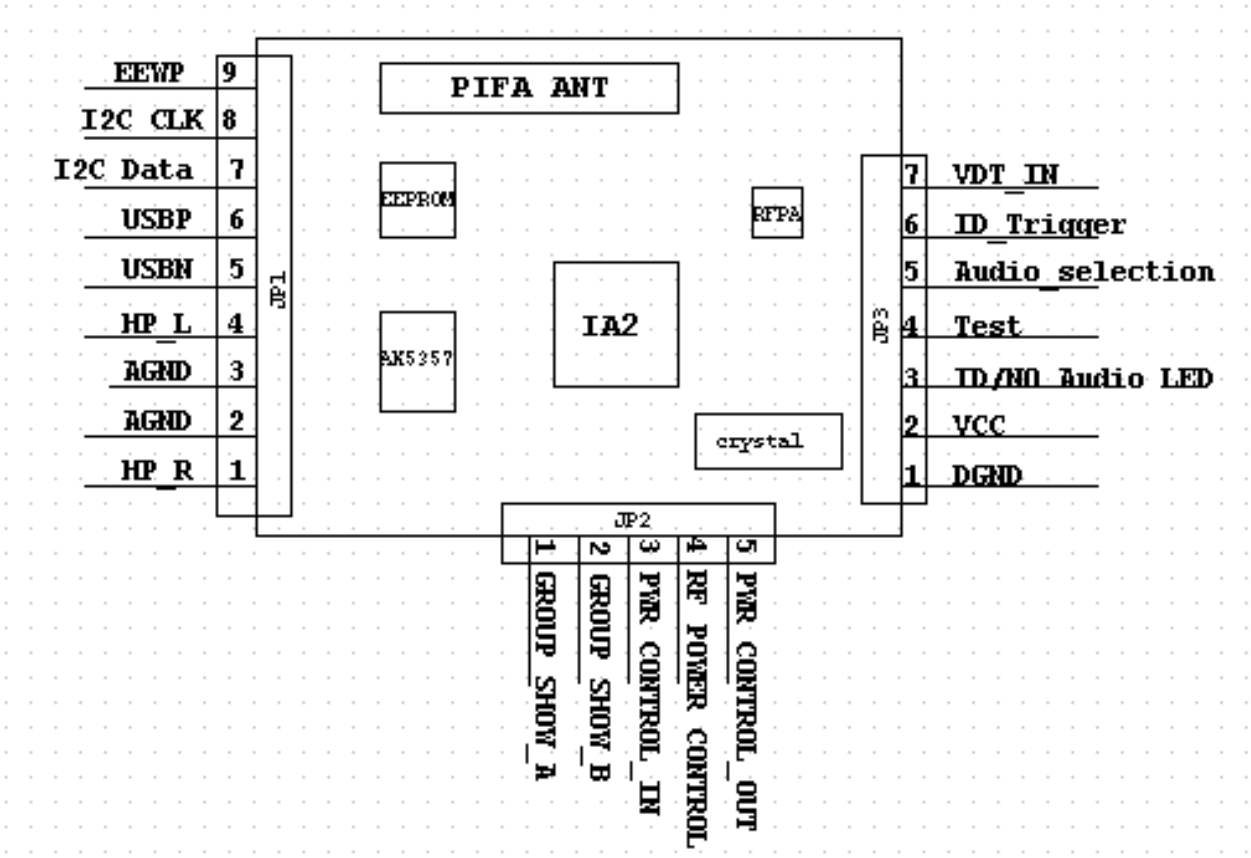


Fig 8.1. TX module

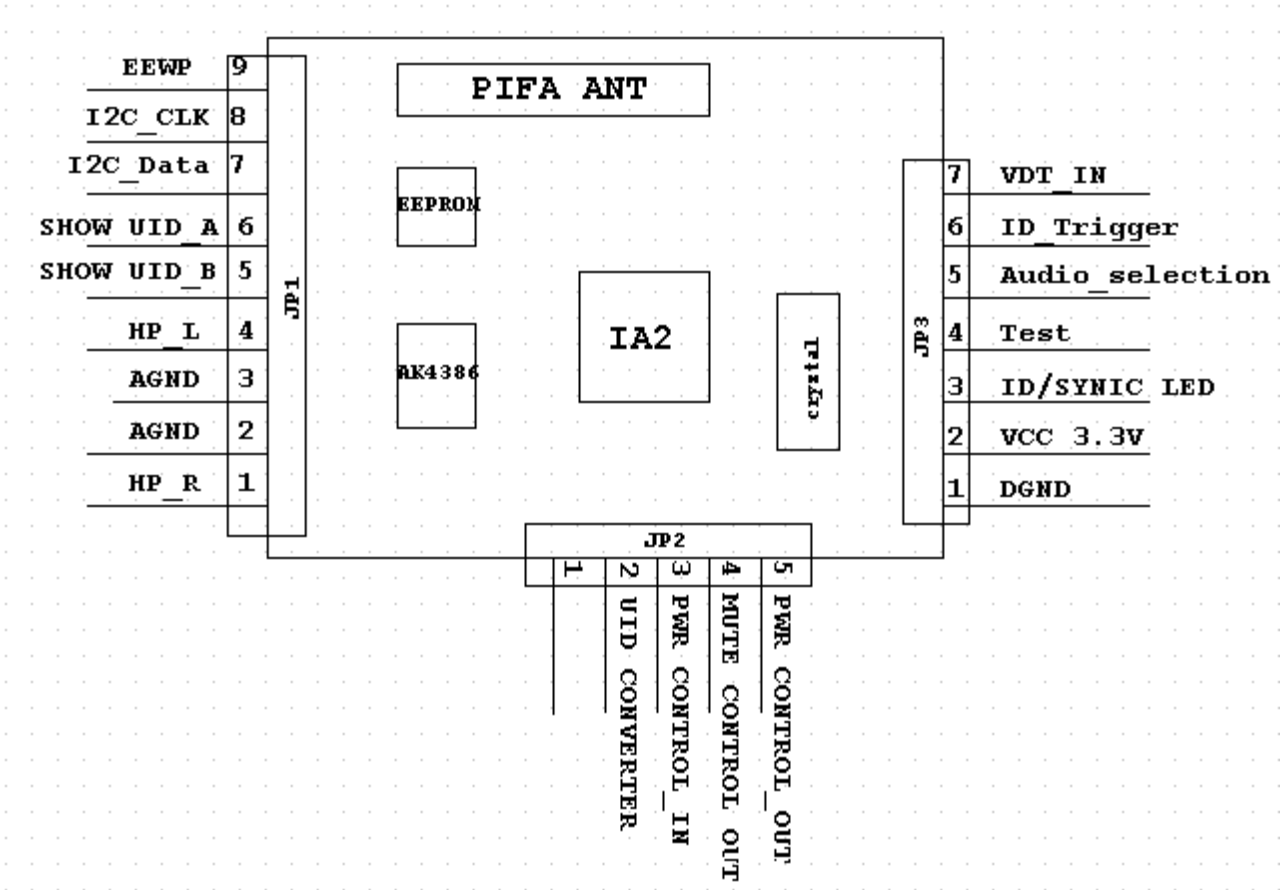


Fig 8.2. RX module

9. Interface

■ TX Module：

Connector	Function	Descri
JP1 pin1--4	Audio in	Analog audio source input
JP1 pin5,6	USB	USB audio input
JP3 pin1,2	DC Power	3.3V Power source
JP2 Pin1,2	RF Channel Indictor (**)	JP2 pin1 / JP2 pin2 Group1 0 0 Group2 0 1 Group3 1 0 Group4 1 1
JP2 Pin3	Power control(**)	Power control in
JP2 Pin5	Power control(**)	Power control out
JP2 Pin4	RF Power control(**)	1 = High power , 0 = Low power

(Note : ** please refer history V05 description need firmware upgrade)

Connector	Function	Descript
JP3 pin6	ID Learning Trigger	When simultaneously pull low both on Tx and Rx module longer than 3 seconds, the ID learning process will be enable.
JP3 pin5	Audio Source Select	Analog input or USB audio input

Connector	Function	Description
JP3(Pin7)	VDT_IN (**)	Voltage detection, use 15K resistance pull low
JP3(Pin1,2)	System GND/Power	DGND/DC3.3V Input
JP3(Pin4)	Test Pin	Hi=Normal , Low= FT_EMI_Selection
JP3 pin3	ID / Synic	1. When audio input LED on 2. When no audio input LED blinking by 1s on / 1s off. 3. When ID learning LED blinking 15sec by 0.25s on / 0.25s off. 4. When sleep mode LED blinking by 0.5s on / 2s off.

■ RX Module：

Connector	Function	Descriptio		
JP1 pin1--4	Audio out	Analog audio source output		
JP1 pin6,5	Audio Source Indictor & Audio Source pairing Indictor (**)		JP1 pin6	JP1 pin5
		Audio #1	0	0
		Audio #2	0	1
		Audio #3	1	0
		Audio #4	1	1
		With JP3 pin 6 then indicate which Audio # is in ID learning processing Without JP3 pin 6 indicate Audio Source # operation		
JP3 pin1,2	Power in	DC3.3V Power source		
JP2 pin4	mute control out	1 = no mute, 0 = mute When no audio delay 3 seconds = 0		
JP2 pin2	Audio Source & pairing select (**)	Choose Audio Channel or Pairing Channel.		
JP2 pin3	Power control(**)	Power control in		
JP2 pin5	Power control(**)	Power control out		

JP3 pin6	ID Learning Trigger	When simultaneously pull low both on Tx and Rx module longer than 3 seconds, the ID learning process will be enabled.

JP3 pin3	ID / Synic	1. When audio playing LED on. 2. When No audio input LED blinking by 1s on /1s off. 3. When ID learning LED blinking by 0.25s on /0.25s off, then keeping on after learning success. 4. When sleep mode LED blinking by 0.5s on /2s off.

(Note : ** please refer history V05 description need firmware upgrade)

10. Operation

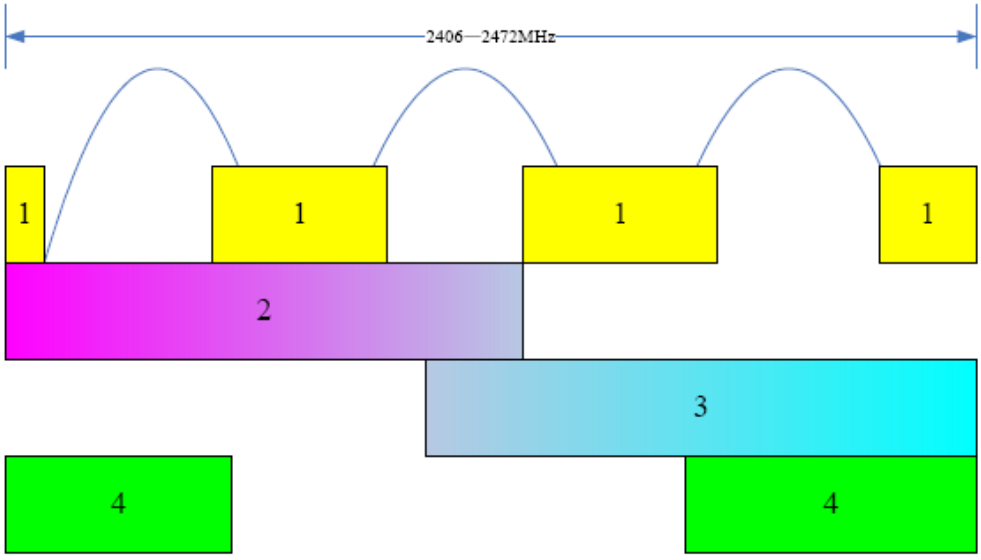
Function	Action Description
ID Learning	1) When TX ID_trigger pin pull low over 3sec , start the ID_learning process. It does not care when to release the TX ID_trigger pin. TX ID_LED blinks by 0.25s on /0.25s off, ID_learning process will continue 15s. 2) RX ID_trigger pin pull low over 3sec , it also starts ID_learning and ID_LED is also blinking. It also doesn't care when to release the pin. When ID_Learn is succeed, ID_LED will stop blinking and keep on 3sec, and then return to normal mode. If ID_Learn is not success, this process will be stopped after 15sec and return to normal mode.

Pseudorandom Frequency Hopping Sequence

This module is controlled by microchip (IA2E embedded uP) to generate Pseudorandom Frequency Hopping Sequence. IA2 module RF normal operation mode support 15 hopping channel/Per Sequence.
There are four hopping sequences list as below:

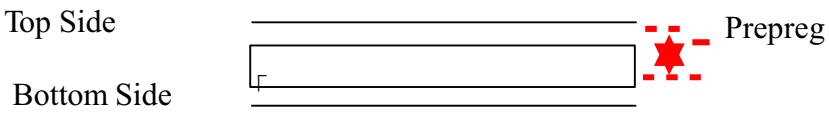
Sequence 1: 2406, 2420, 2422, 2424, 2426, 2428, 2444, 2446, 2448, 2450, 2452, 2456, 2468, 2470, 2472 MHz
Sequence 2: 2406, 2408, 2410, 2412, 2414, 2416, 2418, 2420, 2422, 2424, 2426, 2428, 2430, 2438, 2446 MHz
Sequence 3: 2432, 2440, 2448, 2450, 2452, 2454, 2456, 2458, 2460, 2462, 2464, 2466, 2468, 2470, 2472 MHz
Sequence 4: 2406, 2408, 2410, 2412, 2414, 2416, 2418, 2426, 2454, 2462, 2464, 2466, 2468, 2470, 2472 MHz

The reference diagram drawing as below :



11. Design note

- PCB Spec：
  - 2 Layers PCB
  - Dielectric constant = 4.3ε_r
  - Impedance：RF trace need meet 50Ω
  - Layer configuration：



Layer	Material	Thickness (mils)
Top Side	Copper	1oz(1.4mils)
1-2	Prepreg	29 mils
Bottom Side	Copper	1oz(1.4mils)

12. PIFA Antenna PCB Footprint

Unit : mm