SUNNYWAY

SWD008

PN: SW20014IB66-L/SW20014IB66-R



Features:

- Frequency bands from 791 – 960 MHz
- Impedance 50 Ohm.
- Size 20x 11 x 1.6 mm.

Applications:

- Antenna for LP-WAN applications.
- Including NB-IOT, LoRa, SigFox, ISM and Weightless-P
- Maintains high performance on device: DFI (Designed for Integration),

Sunnyway Technology

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1. Electrical Specifications

Standards	NB2-B20	NB2-B5/B8
Frequency range (MHz)	791~862MHz	824~960MHz
Peak Gain (dBi)	0.5~2.7	0.5~2.0
Average Gain (dB)	-4.9~-2.5	-4.3~-2.7
VSWR	< 2.9	<2.6
Return Loss	< -6.2	<-7.2
Efficiency (%)	32.2~56.4	37.0~54.2
Polarization mode	Linear	Linear
Radiation pattern	Omni-Directional	Omni-Directional
Output impedance (Ω)	50	50
Max. Input Power(W)	5	5

Note:

All parameters are measured with Sunnyway's EVK which size is 115*35mm

2. Mechanical and Environmental Specification

Mounting Type	SMD
Antenna size(mm)	20.0mm(L)X11.0mm(W)X1.6mm(H)
Material	PCB
Operating Temperature (˚C)	- 40 ˚C ~ + 85 ˚C
Storage Temperature(˚C)	- 40 ˚C ~ + 85 ˚C

3. Antenna parameters

3.1 General Data

Band	B20		B5 and B8			
FRE (MHz)	791	862	824	894	880	960
VSWR	2.5	2.9	2.2	2.5	2.1	2.6
Return Loss	-7.6	-6.2	-8.2	-7.3	-8.9	-7.2
Eff (%)	32.2	36.6	37.0	39.3	45.6	41.6
Average Gain (dB)	-4.9	-4.4	-4.3	-4.1	-3.4	-3.8

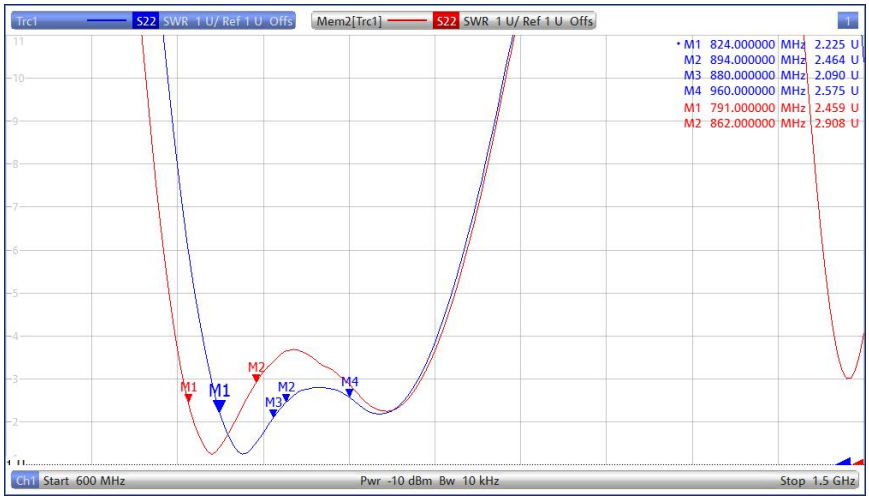
Note:

The performance is shown for two tuned variants (Tuning dependent on required bandS). Matching circuit is used for band selection.

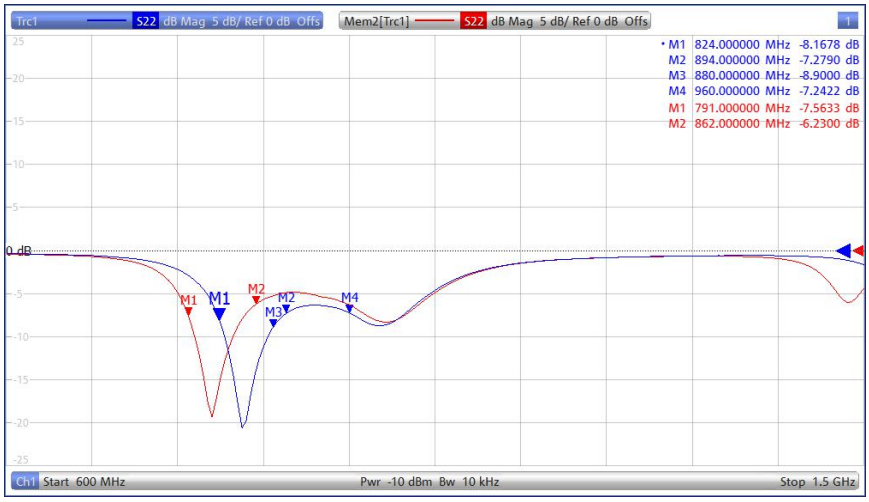
B20: 791 – 862MHz

B5 and B8: 824-894MHz; 880- 960MH

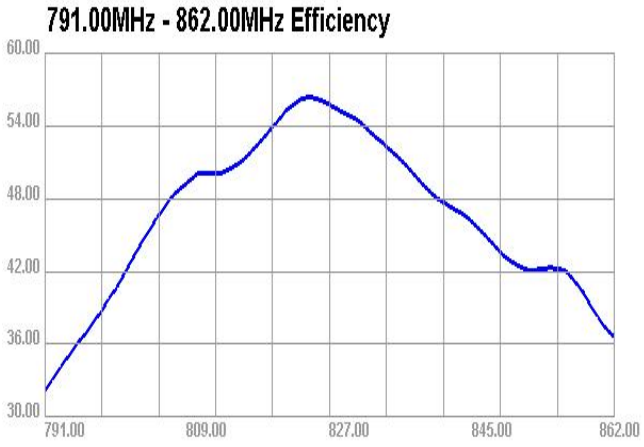
3.2 VSWR

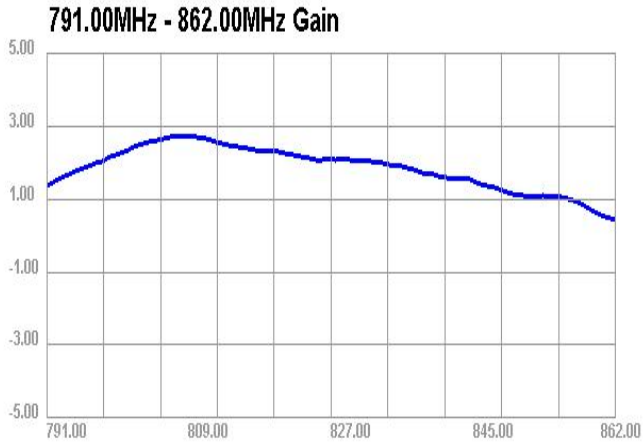


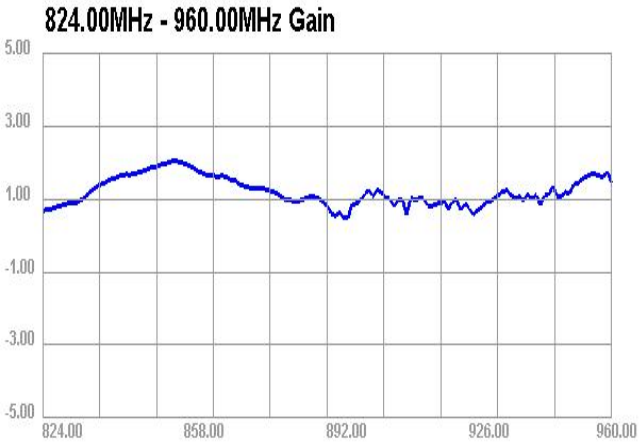
3.3 Return Loss

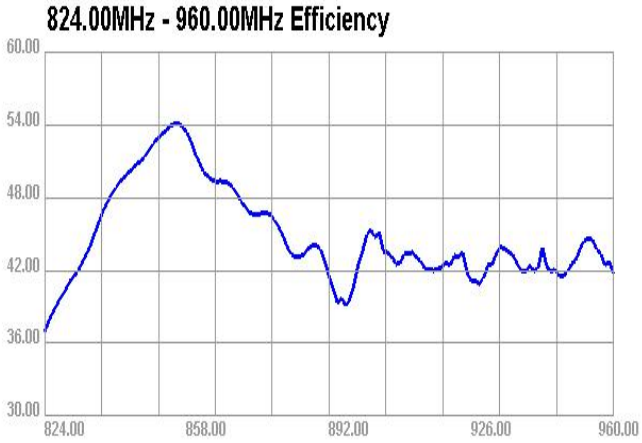


3.4 Efficiency and Gain

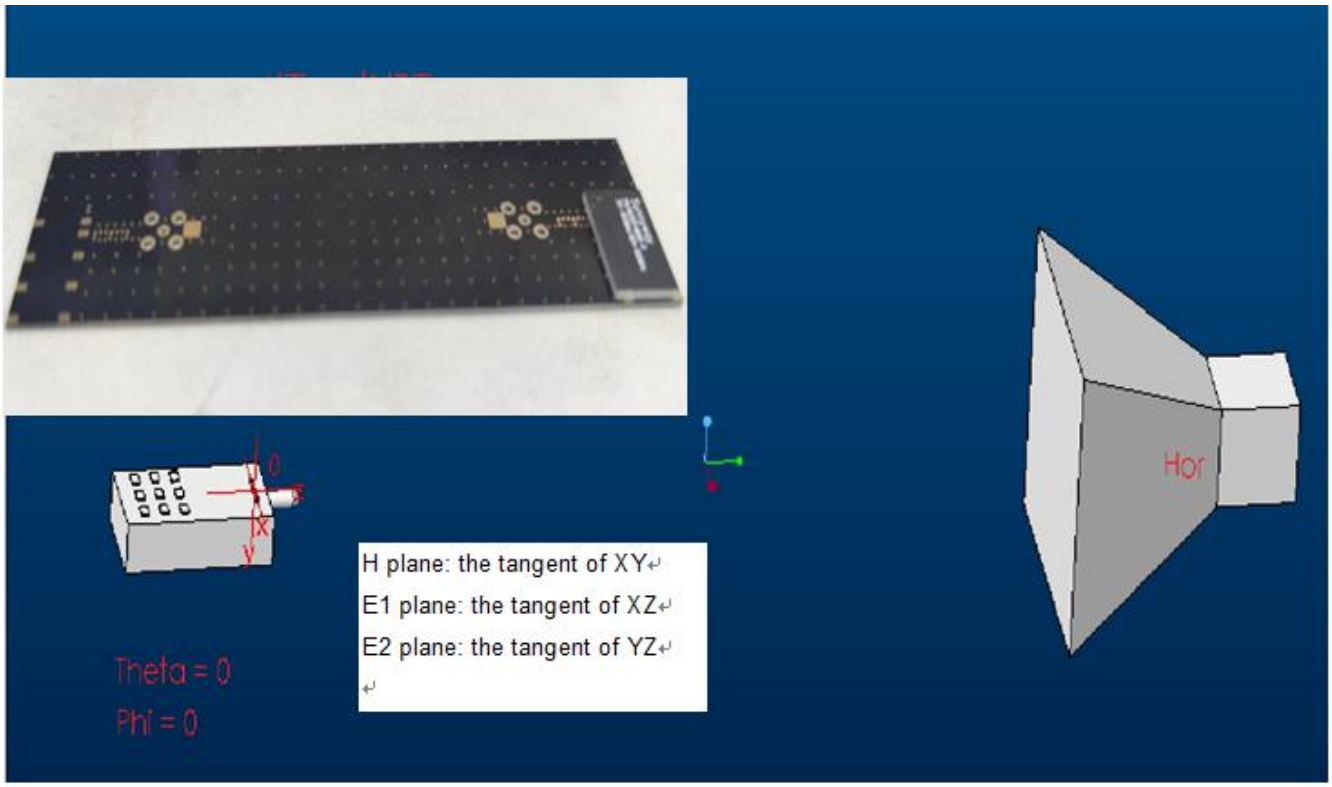


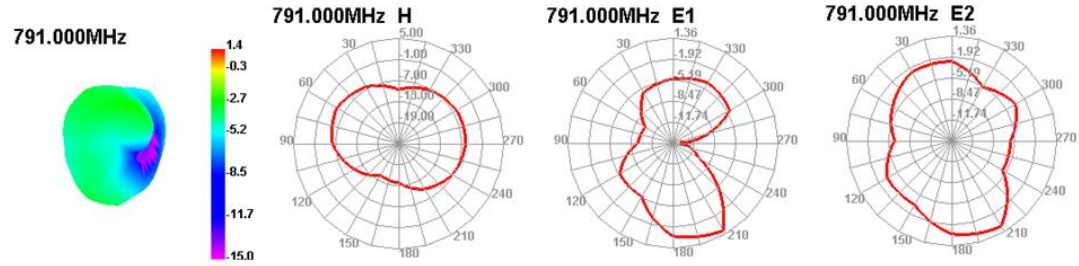


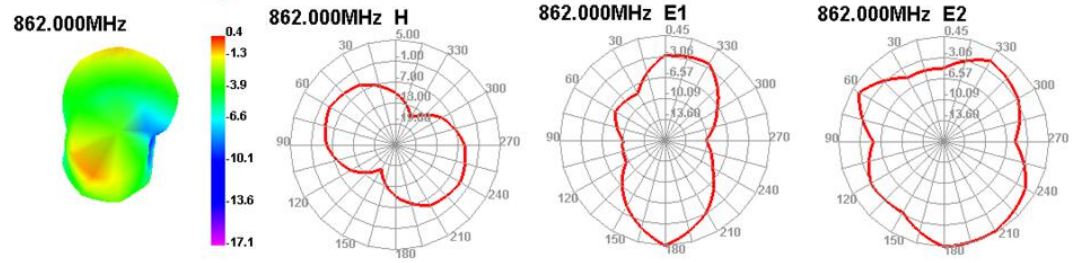


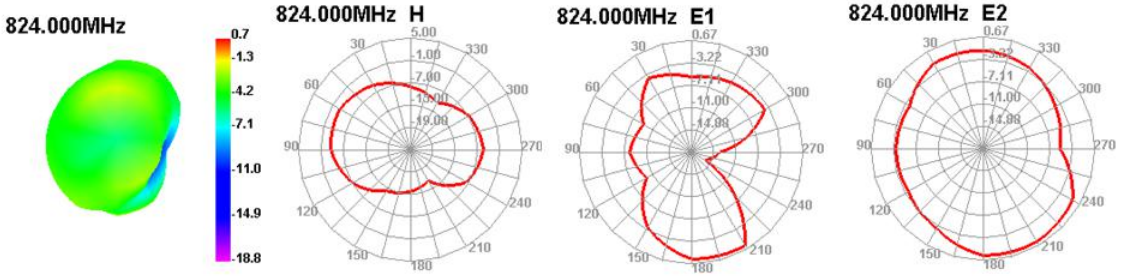


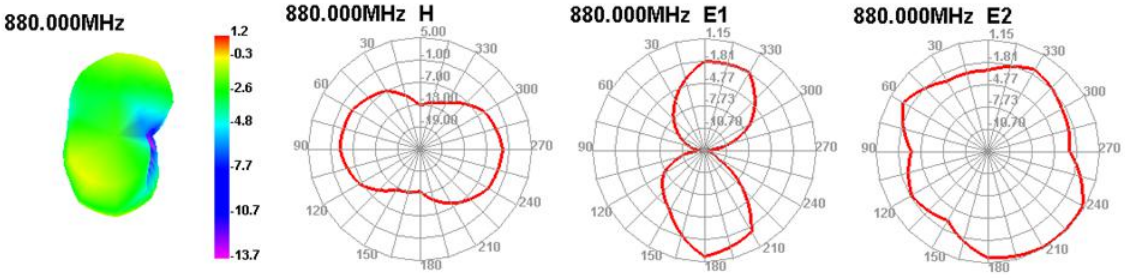
3.5 Directional pattern

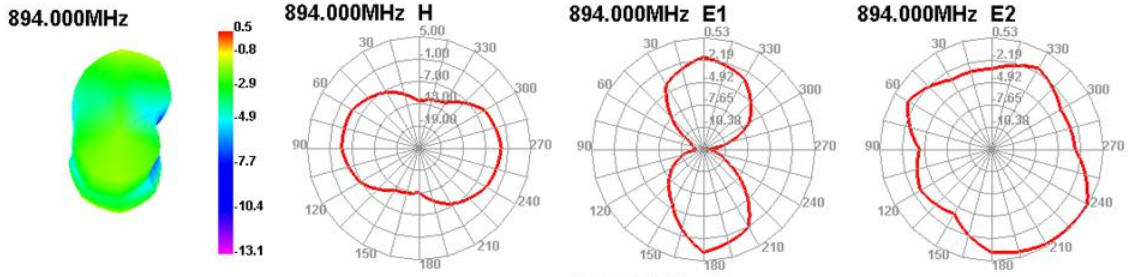


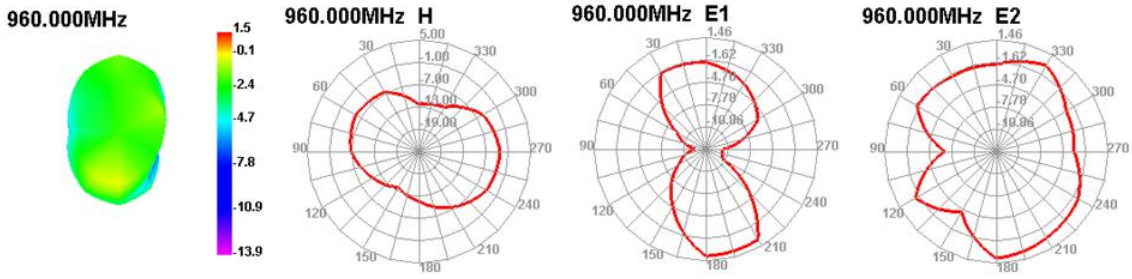

791.000MHz
791.000MHz H
791.000MHz E1
791.000MHz E2


862.000MHz
862.000MHz H
862.000MHz E1
862.000MHz E2


824.000MHz
824.000MHz H
824.000MHz E1
824.000MHz E2


880.000MHz
880.000MHz H
880.000MHz E1
880.000MHz E2

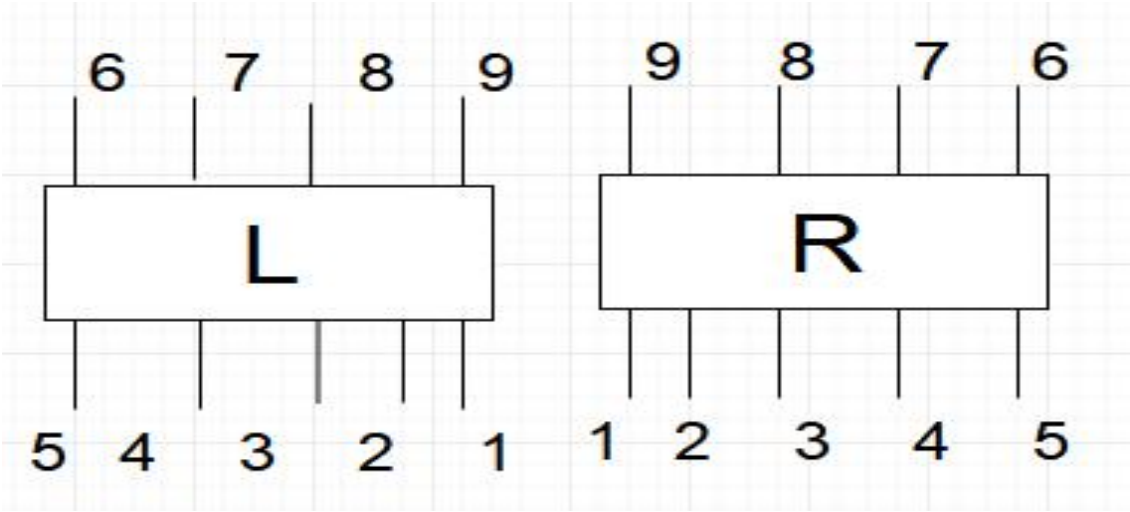

894.000MHz
894.000MHz H
894.000MHz E1
894.000MHz E2


960.000MHz
960.000MHz H
960.000MHz E1
960.000MHz E2

4. Schematic symbol and Pin definition

The pin assignment for the SWD008 antenna are as follows. The antenna has 9pins and only two work.

All other pins are designed for mechanical strength.



Pin No.	Description
2	Feed
1	Band Select (B.SEL)
3,4,5,6,7,8,9	Not used (Mechanical only)

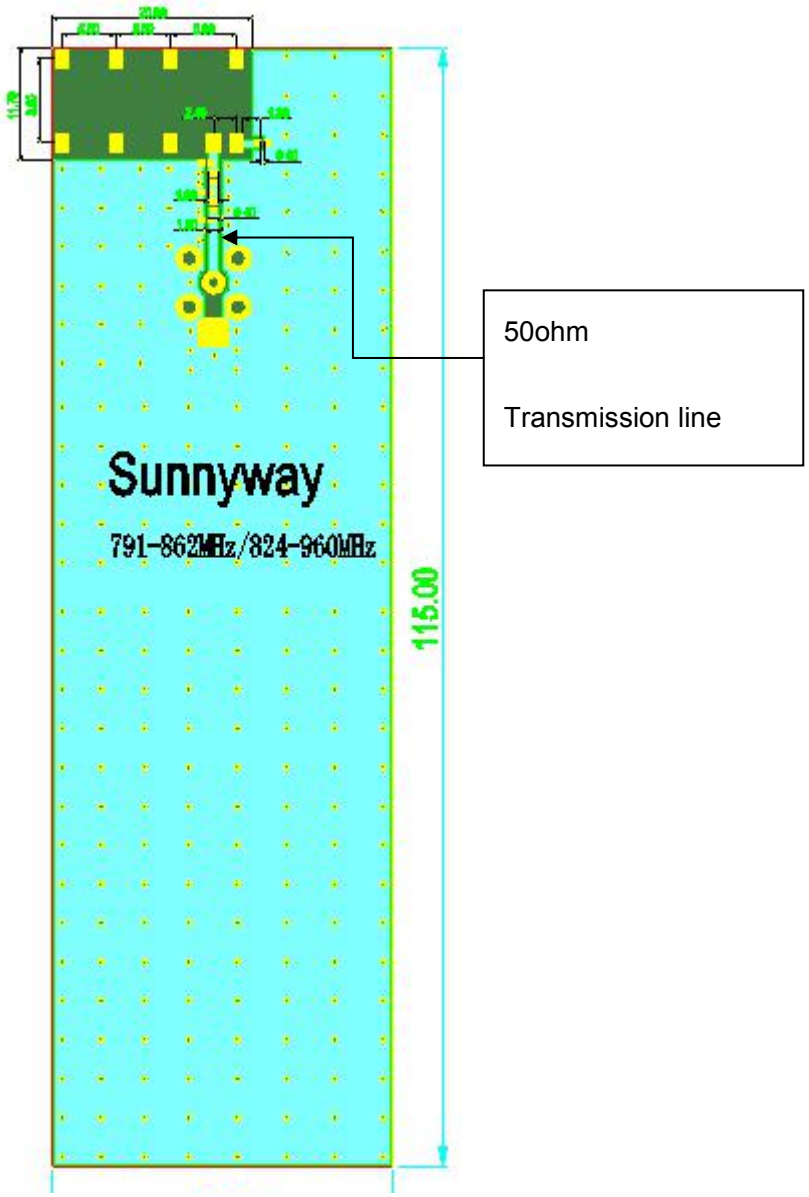
5. Transmission Line

The characteristic impedance of all transmission lines shall be designed as 50 Ω.

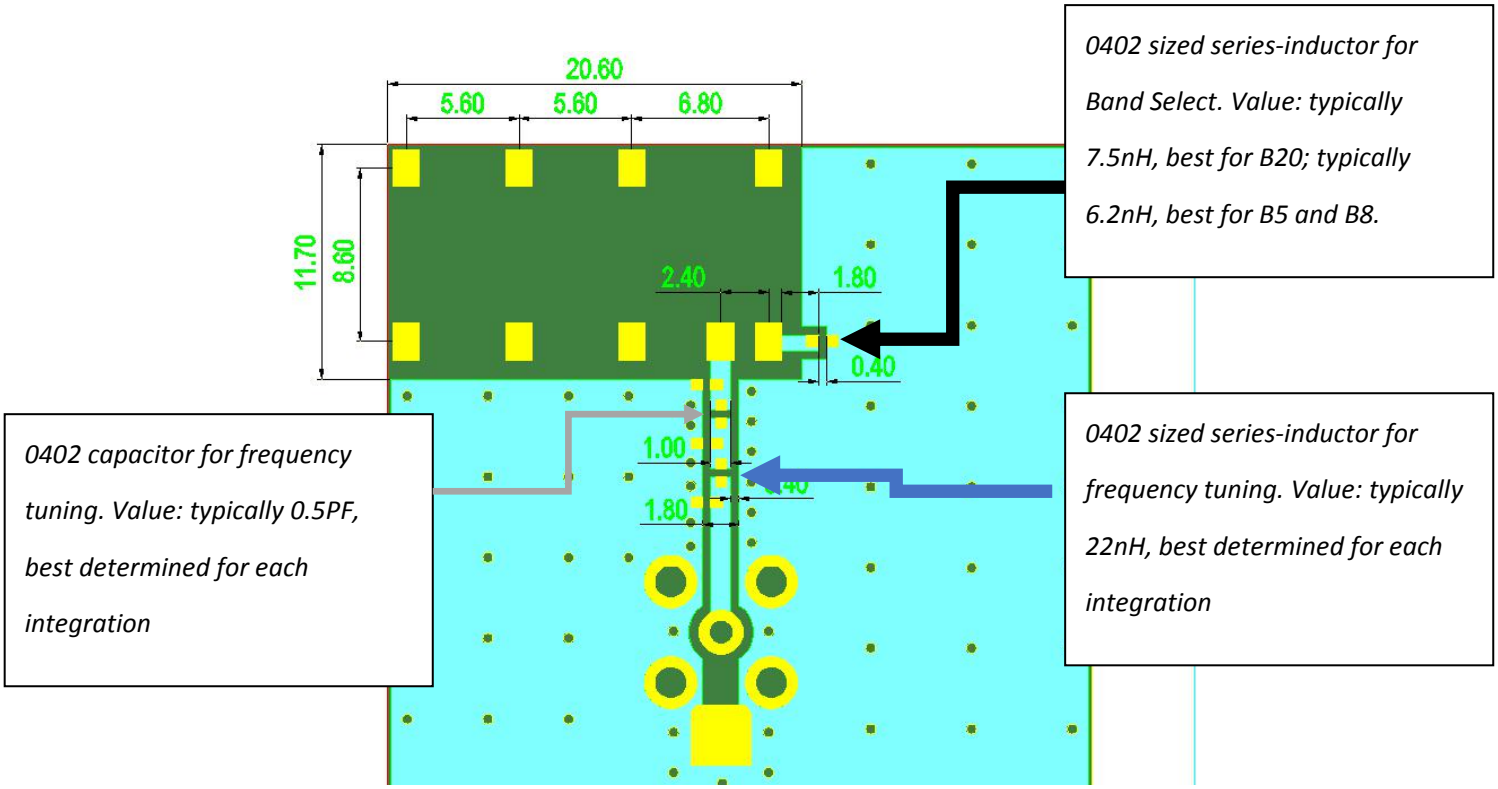
• The length of the transmission lines should be kept to as short as possible

• Any other part of the RF system, such as transceiver, power amplifiers, etc., shall also be designed with an impedance of 50 Ω

• All dimensions are in mm

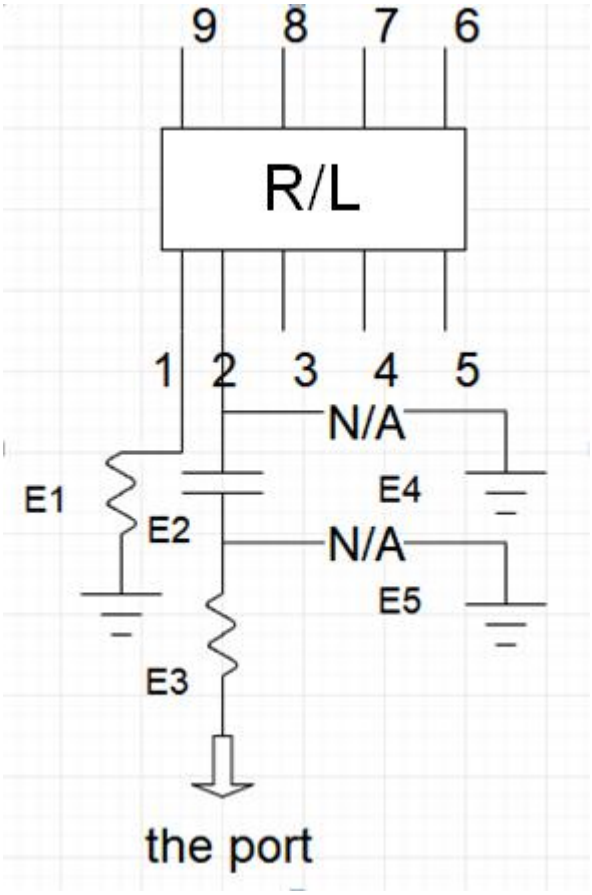


6. Matching circuit



The antenna requires a matching circuit that must be optimized for each product. The matching circuit will require up to five components and the following circuit should be designed into the host PCB. Not all components may be required but should be included as a precaution. The matching network must be placed close to the antenna feed to ensure it is more effective in tuning the antenna.

The SWD008-L and SWD008-R matching circuits are the same.



B.SEL (Band Selection pin component)			
Frequency band		**Type**	**Value**
E1	B20	Inductor	7.5nH
	B5, B8	Inductor	6.2nH

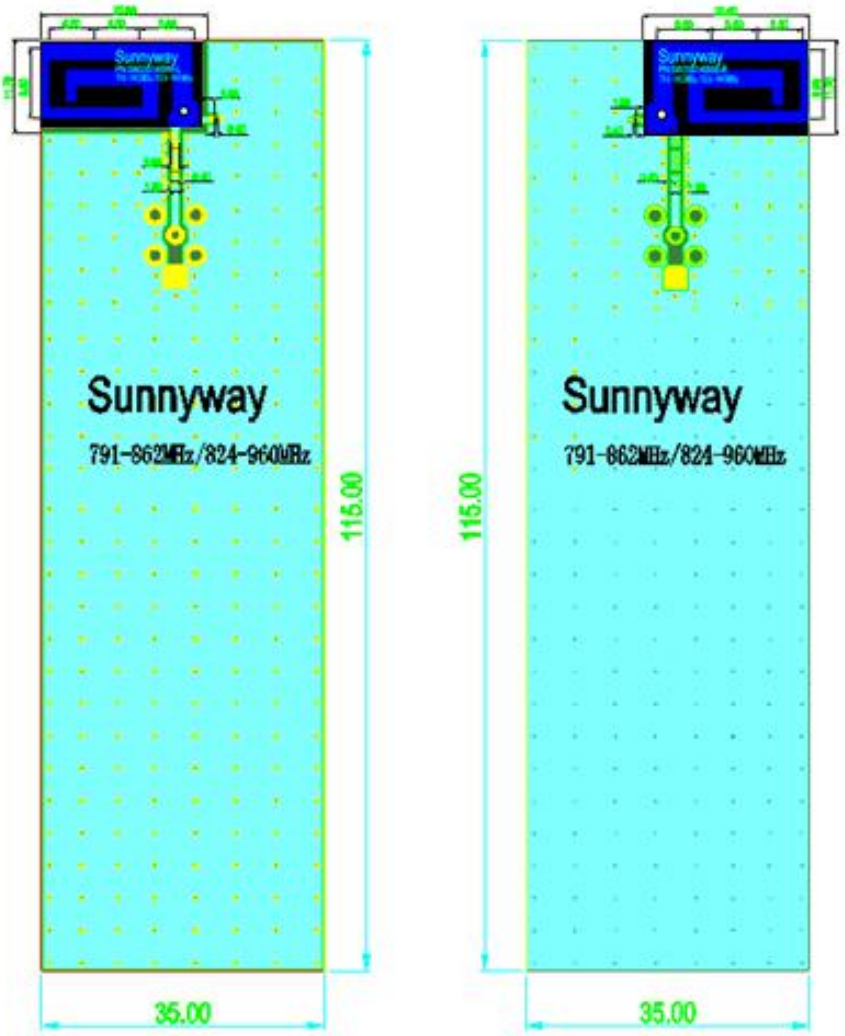
	Type	**Value**
E2	Capacitor	*0.5Pf*
E3	Inductor	22nH
E4	N/A	N/A
E5	N/A	N/A

7. Host PCB Requirement

The printed circuit board of the host must ensure that the antenna clearance area meets the antenna specifications.

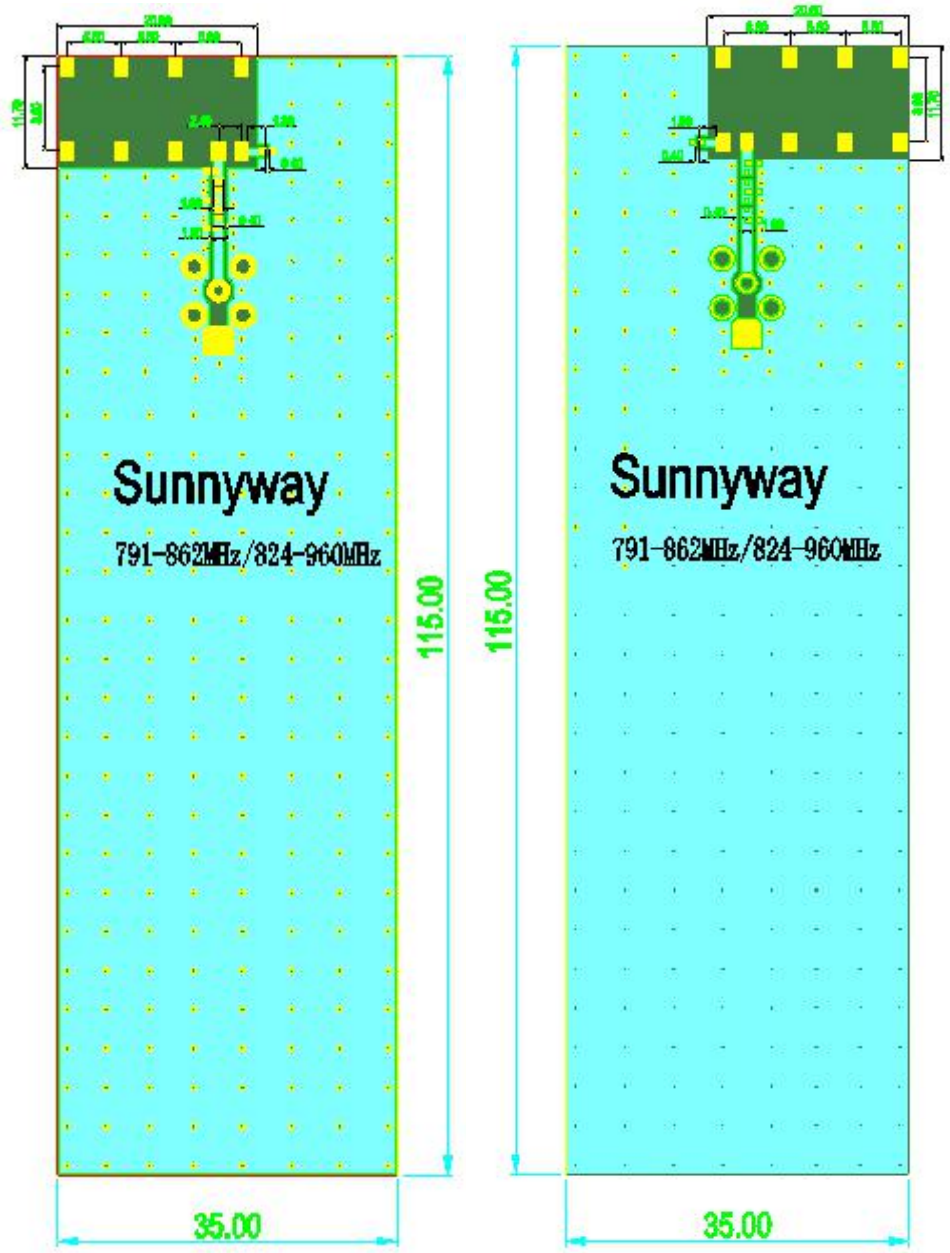
No matter how big the main circuit board is, the antenna is best placed on the shortest side of the main circuit board, in the corner. The left / right antennas are placed in the corresponding corner of the PCB: SWD008-L (Left Corner) and SWD008-R (Right Corner).

An example of a PCB layout shown as below:



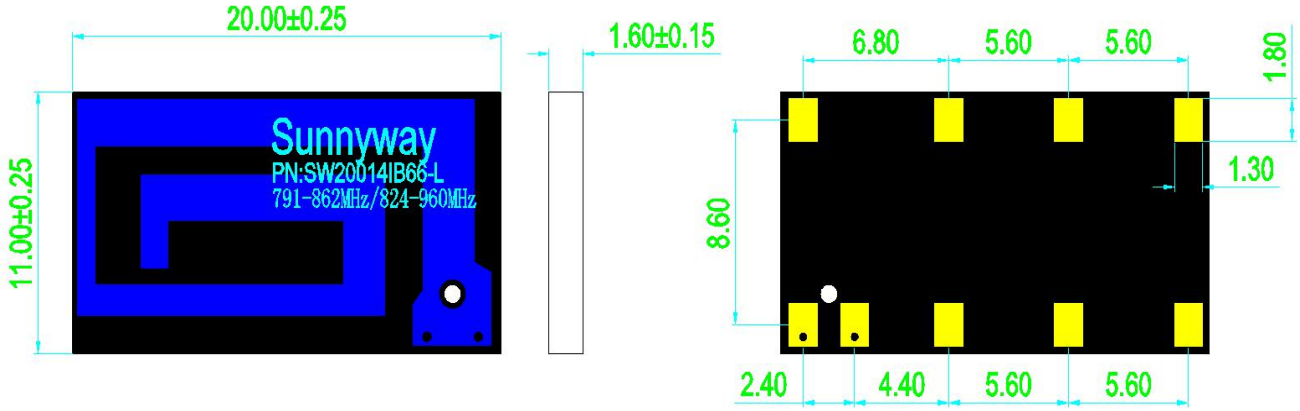
8. Host PCB Size

The minimum recommended host PCB size to be used is 115 x 35 (mm). Below is the antenna dimension.

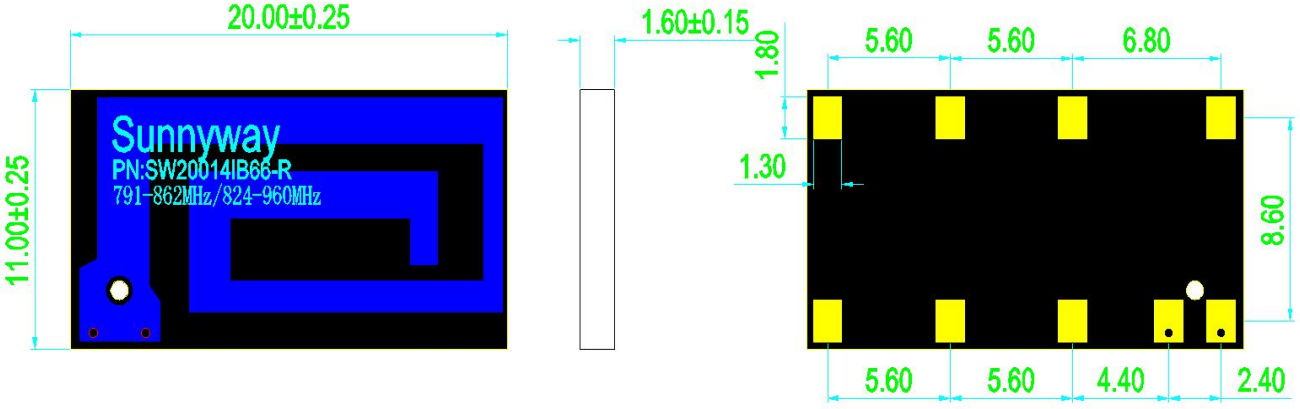


9.Antenna Drawings

All dimensions are in mm



SWD008-L



SWD008-R

10. Soldering Temperature

PHASE	PROFILE FEATURES	PB-Free Assembly(max.)
RAMP-UP	Avg.Ramp-up Rate(Tsmax to Tp)	3℃/second(max.)
PREHEAT	Temperature Min(Tsmin) Temperature Max(Tsmax) Time(tsmin to tsmax)	150℃ 180℃ 120seconds max
REFLOW	Temperature(TL) Total Time above TL(tl)	210℃ 50seconnds max
PEAK	Temperature(Tp) Time(tp)	260℃ 10seconnds max
RAMP-DOWN	Rate	5℃/second max

11. Reflow Profile

