SUNNYWAY

SWD004

PN: SW20010IB66



Features:

- Frequency bands from 824 – 960 MHz 1710 – 2170 MHz .
- SMD Compliant.
- Impedance 50 Ohm.
- Size 26 x 7.65 x 3 mm.

Applications:

- 2G/3G Cellular antenna.
- GPRS.
- Nb-IoT, LTE Cat M1.

Sunnyway Technology

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1. Electrical Specifications

Standards	2G&3G	
Frequency range (MHz)	824~960MHz	1710~2170MHz
Peak Gain (dBi)	0.3~2.7	1.3~5.5
Average Gain (dB)	-3.6~-2.0	-3.5~-1.3
VSWR	< 3.3	< 3.5
Return Loss	< -5.5	< -5.2
Efficiency (%)	43~64	44~74
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 110*50mm

2. Mechanical and Environmental Specification

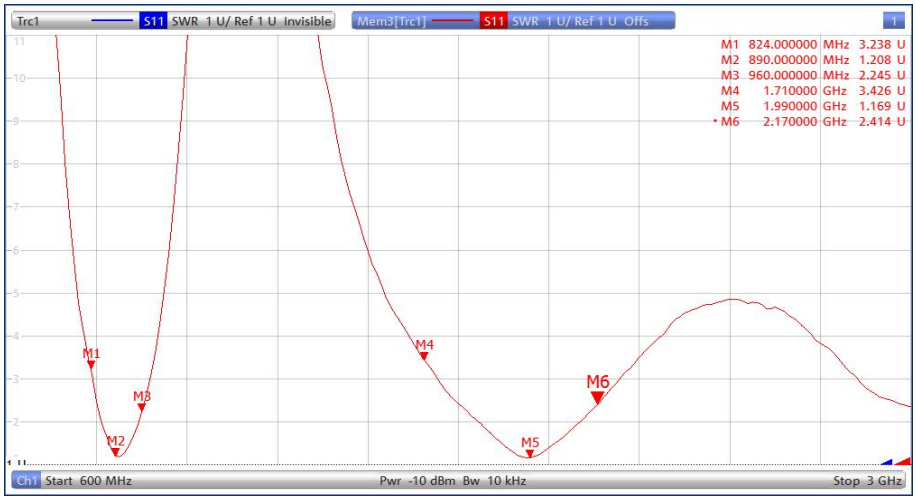
Mounting Type	SMD
Antenna size(mm)	26.0 (L) x 7.65 (W) x 3.0 (H)
Material	PCB
Operating Temperature (˚C)	- 40 ˚C ~ + 85 ˚C
Storage Temperature(˚C)	- 40 ˚C ~ + 85 ˚C

3. Antenna parameters

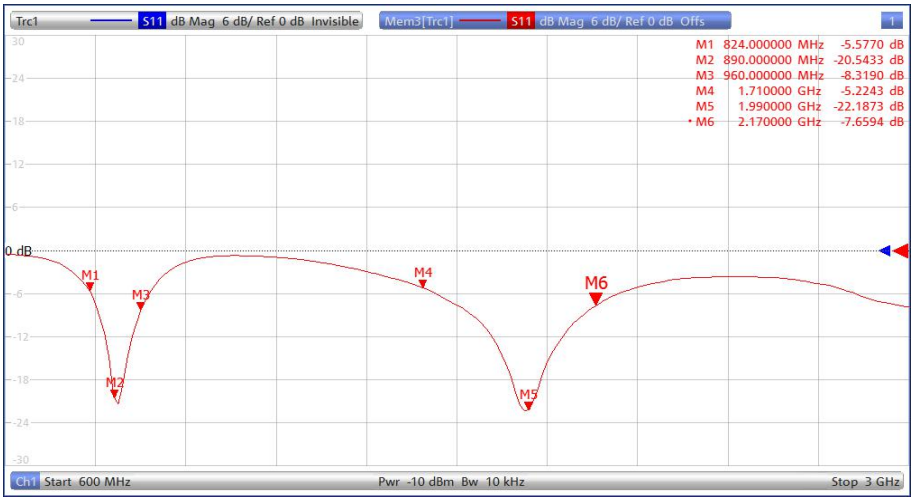
3.1 General Data

FRE (MHz)	824	890	960	1710	1990	2170
VSWR	3.23	1.20	2.24	3.42	1.16	2.41
Return Loss	-5.57	-20.54	-8.31	-5.22	-22.18	-7.65
Eff (%)	43.9	61.5	49.7	44.5	65.1	54.9
Average Gain(dB)	-3.6	-2.1	-3.0	-3.5	-1.8	-2.6

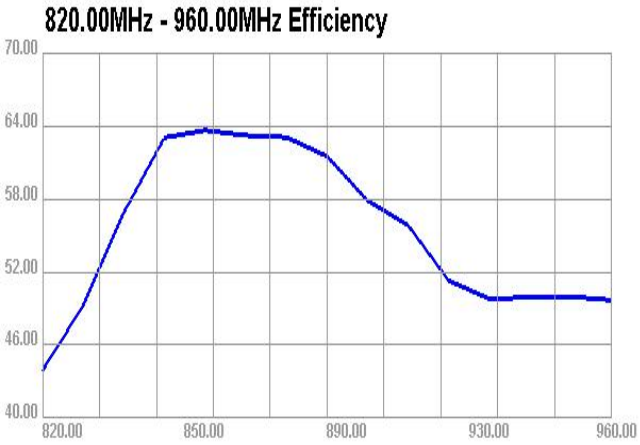
3.2 VSWR

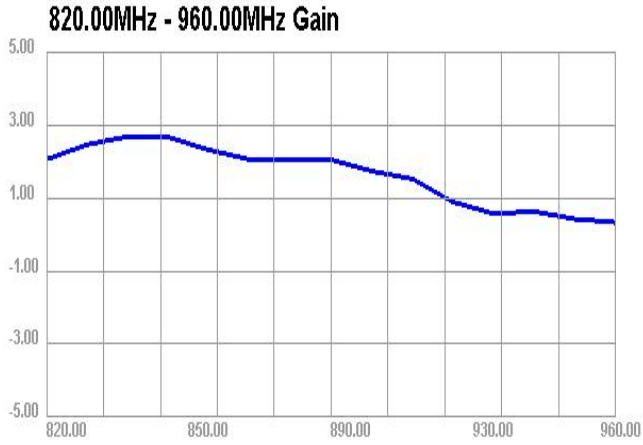


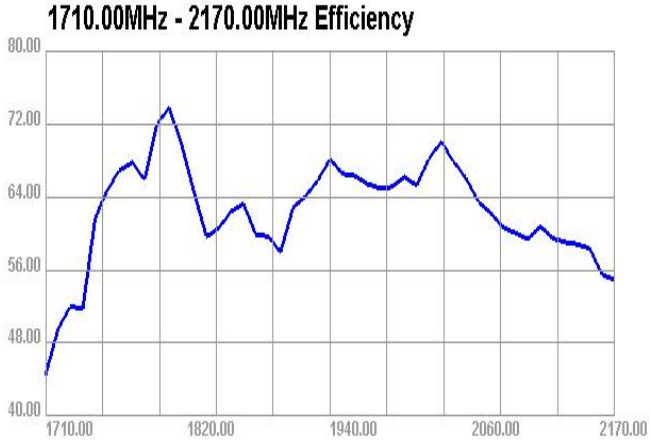
3.3 Return Loss

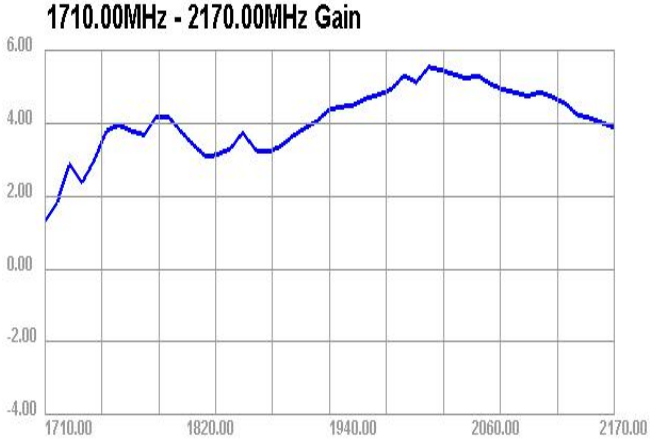


3.4 Efficiency and Gain

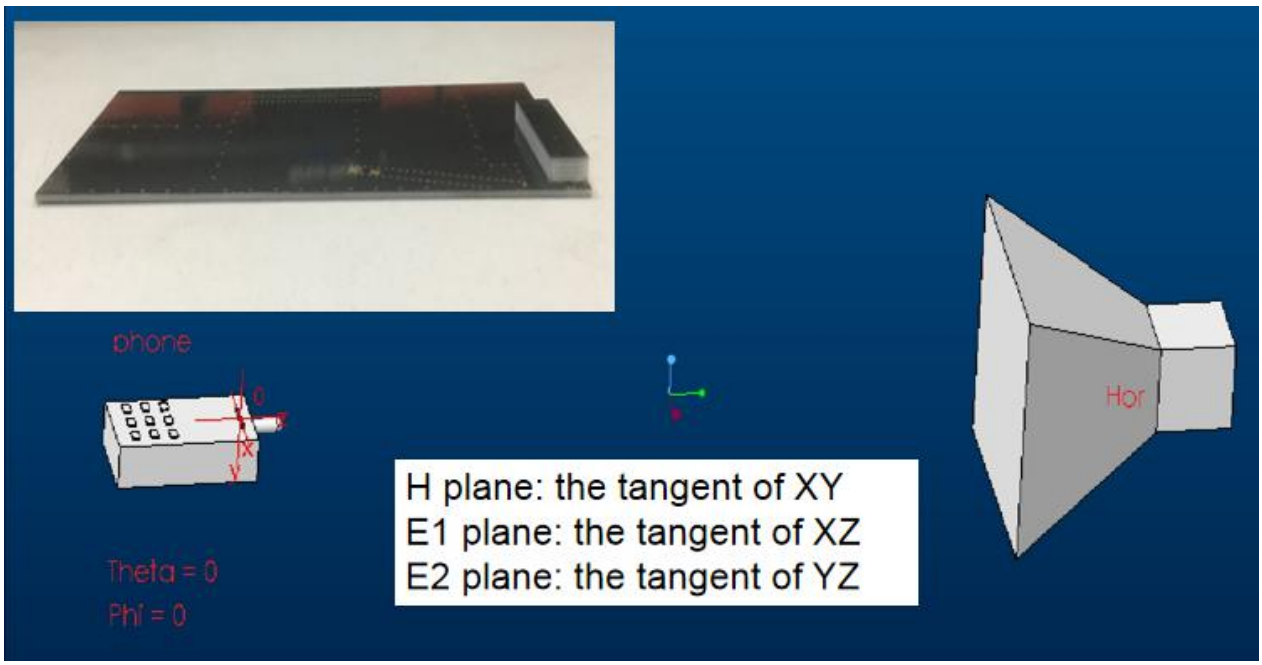




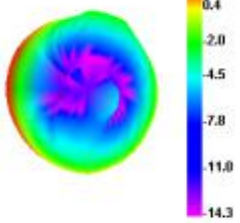




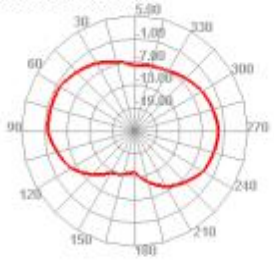
3.5 Directional pattern



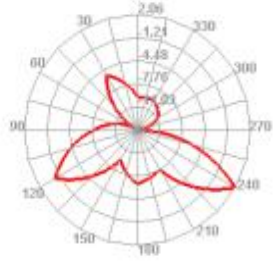
820.000MHz



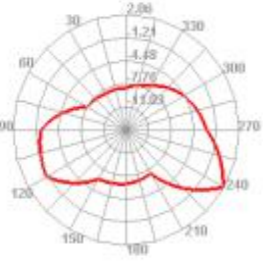
820.000MHz H



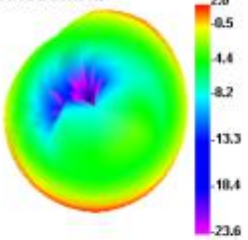
820.000MHz E1



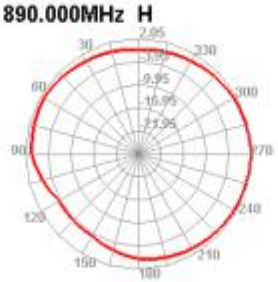
820.000MHz E2



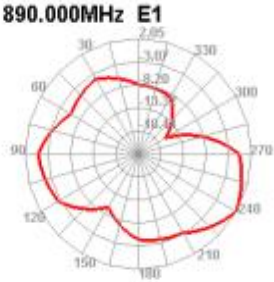
890.000MHz



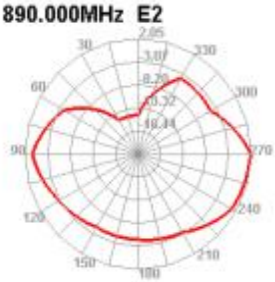
890.000MHz H



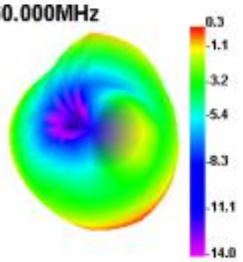
890.000MHz E1



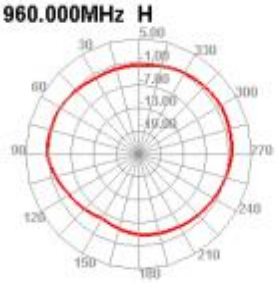
890.000MHz E2



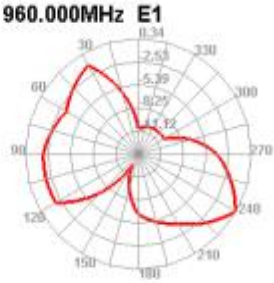
960.000MHz



960.000MHz H



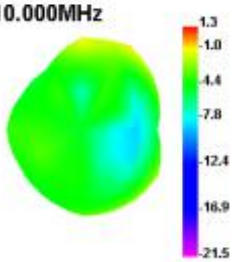
960.000MHz E1



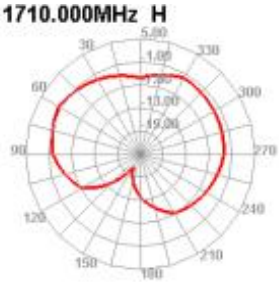
960.000MHz E2



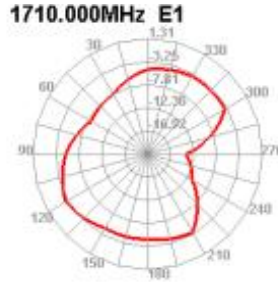
1710.000MHz



1710.000MHz H



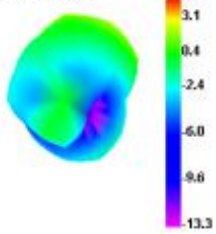
1710.000MHz E1



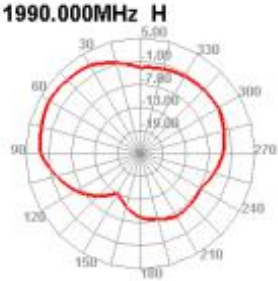
1710.000MHz E2



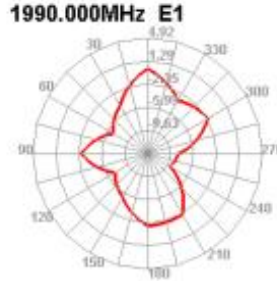
1990.000MHz



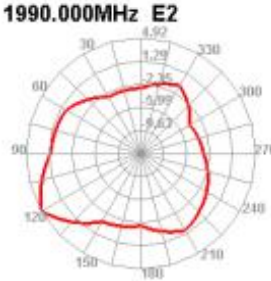
1990.000MHz H



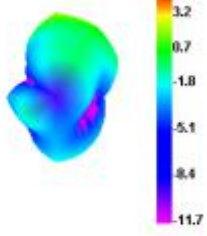
1990.000MHz E1



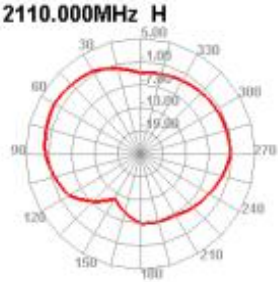
1990.000MHz E2



2110.000MHz



2110.000MHz H



2110.000MHz E1

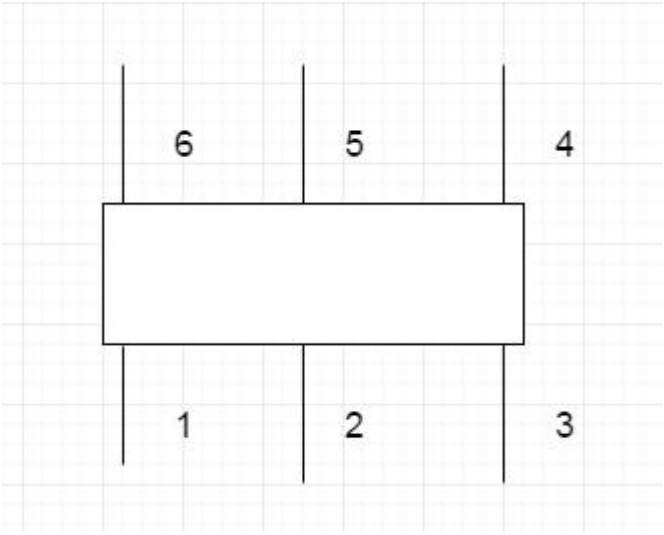


2110.000MHz E2



4. Schematic symbol and Pin definition

The pin assignment for the SWD004 antenna are as follows. The antenna has 6 pins and only two work. All other pins are designed for mechanical strength.



Pin No.	Description
3.4	Feed
1,2,5,6	Not used (Mechanical only)

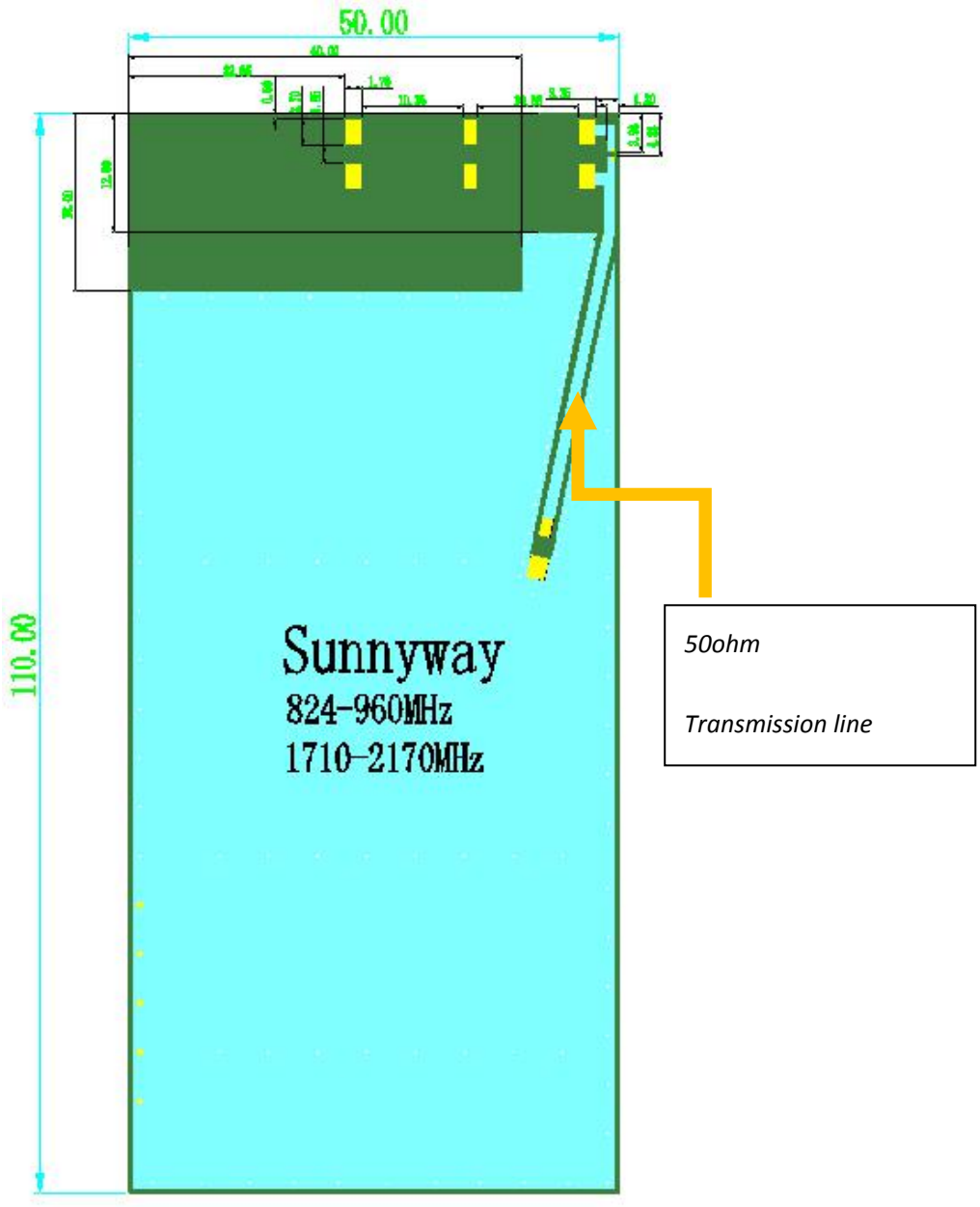
5. Transmission Line

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

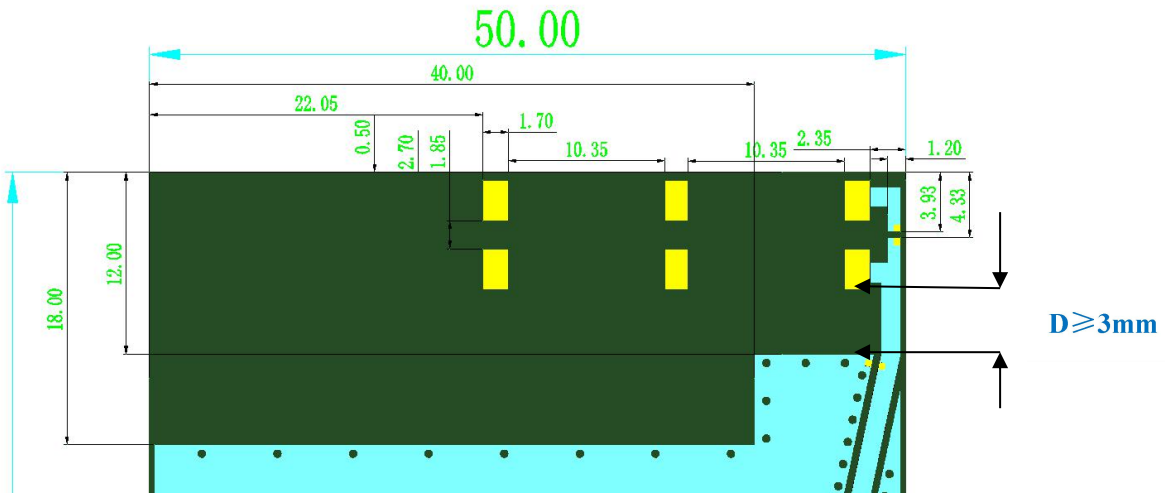
• All dimensions are in mm



6. Host PCB Requirement

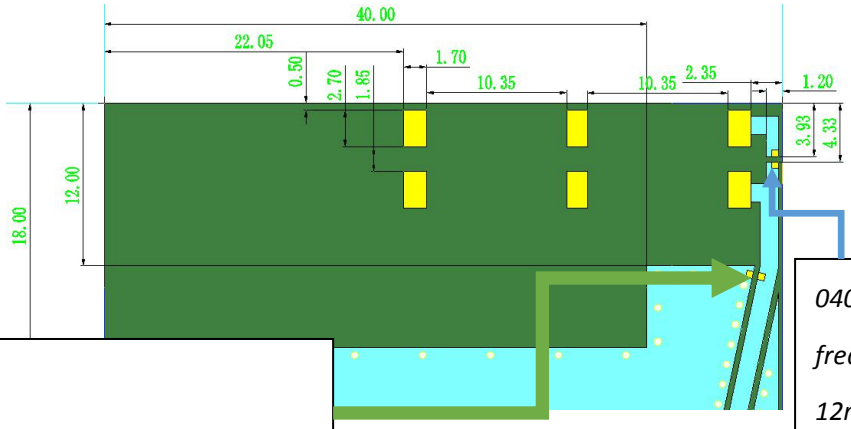
The printed circuit board of the host must ensure that the antenna clearance area meets the antenna specifications. It is suggested that putting the antenna in the corner of the PCB.

An example of a PCB layout shown as below:



Gap D is required from the edge of the antenna to the ground plane. This should be maintained along the edge of the antenna placement, **minimum value is 3mm**.

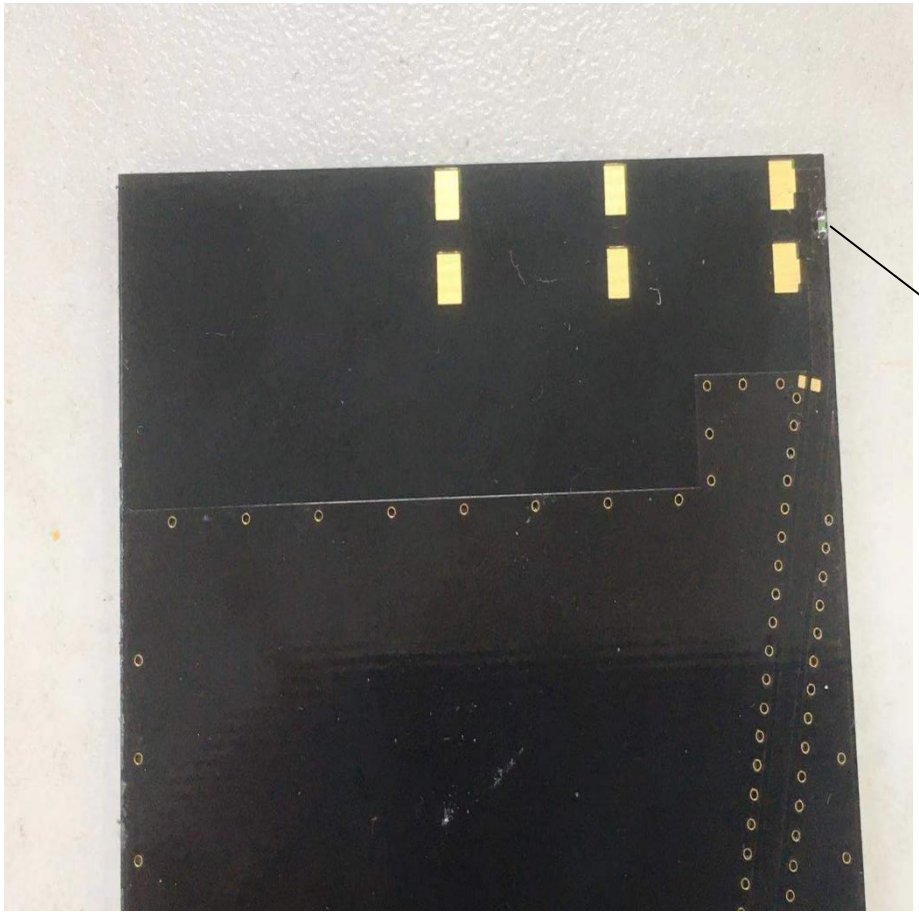
7. Matching circuit



OPTIONAL

0402 sized shunt inductor/capacitor for impedance matching . Value best determined during integration.

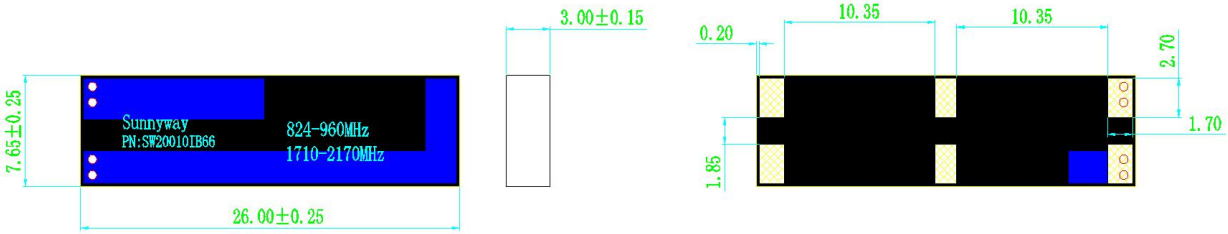
0402 sized series-inductor for frequency tuning . Value: typically 12nH Best determined for each integration

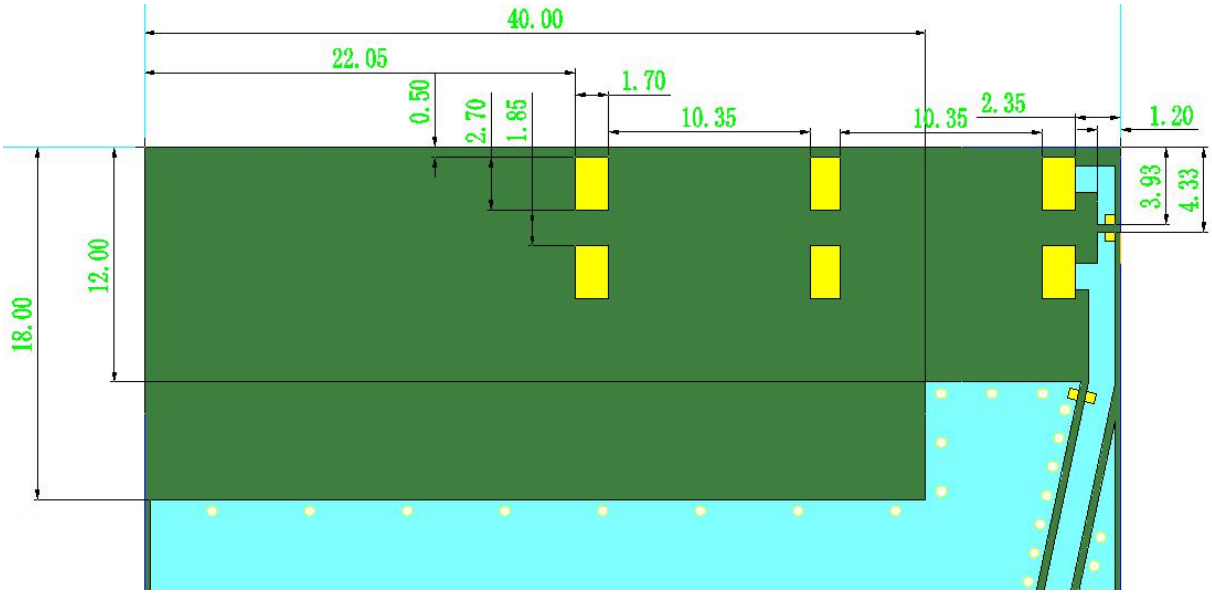


0402 12nH

8.Antenna Drawings

All dimensions are in mm







9. 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

10. Reflow Profile

