SWD003

PN: SW20009IB66

Features:

- Frequency bands from 698 – 960 MHz 1420-2700 MHz .
- SMD Compliant.
- Impedance 50 Ohm.
- Antenna for LTE applications including MIMO systems
- Size 40.0 x 7.0 x 3.0 mm.

Applications:

- 2G/3G/4G Cellular antenna.
- LTE ,Nb-IoT, Cat M1,. GPS&GLONASS&GALILEO&BEIDOU
- Femto / Pico base stations
- Portable Devices
- Remote monitoring
- Network Devices

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1. Electrical Specifications

Standards	4G/3G/2G/GPS&GLONASS&GALILEO&BEIDOU				
Frequency range(MHz)	698-960MHz	1420-2700MHz	1559MHz	1575.42MHz	1602MHz
Peak Gain (dBi)	-0.5~2.3	0.9~5.5	4.2	3.8	3.4
Average Gain (dB)	-3.3~-1.2	-3.9~-0.9	-1.3	-1.5	-1.8
VSWR	< 5.0	< 5.0	2.3	2.2	2.1
Return Loss	< -3.5	< -3.5	-8.0	-8.4	-8.8
Efficiency (%)	47~76	40~80	74.5	70.5	66.3
Polarization mode	Linear	Linear	Linear	Linear	Linear
Radiation pattern	Omni-Directional	Omni-Directional	Omni-Directional	Omni-Directional	Omni-Directional
Output impedance (Ω)	50	50	50	50	50
Max. Input Power(W)	5	5	5	5	5

Note:

All parameters are measured with Sunnyway's EVK which size is 135*40mm

2. Mechanical and Environmental Specification

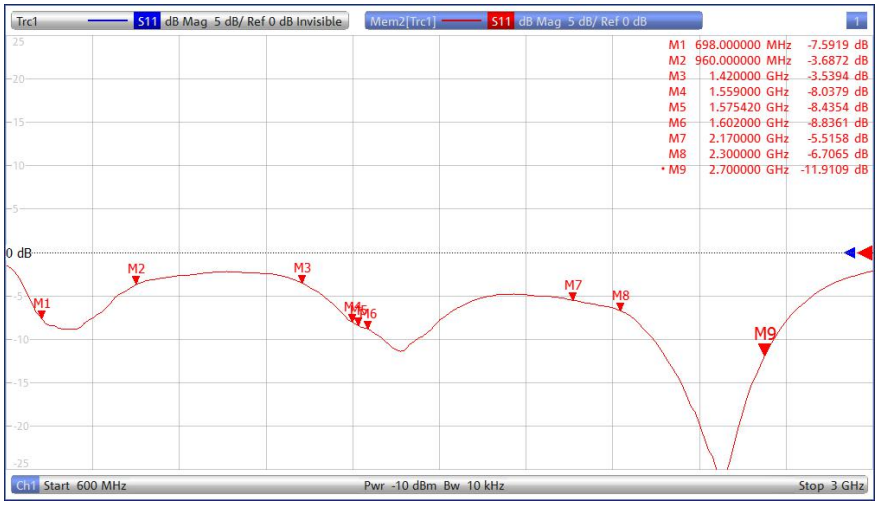
Mounting Type	SMD
Antenna size(mm)	40.0 (L) x 7.0 (W) x 3.0 (H)
Material	PCB
Operating Temperature (˚C)	- 40 ˚C ~ + 85 ˚C
Storage Temperature(˚C)	- 40 ˚C ~ + 85 ˚C

3. Antenna parameters

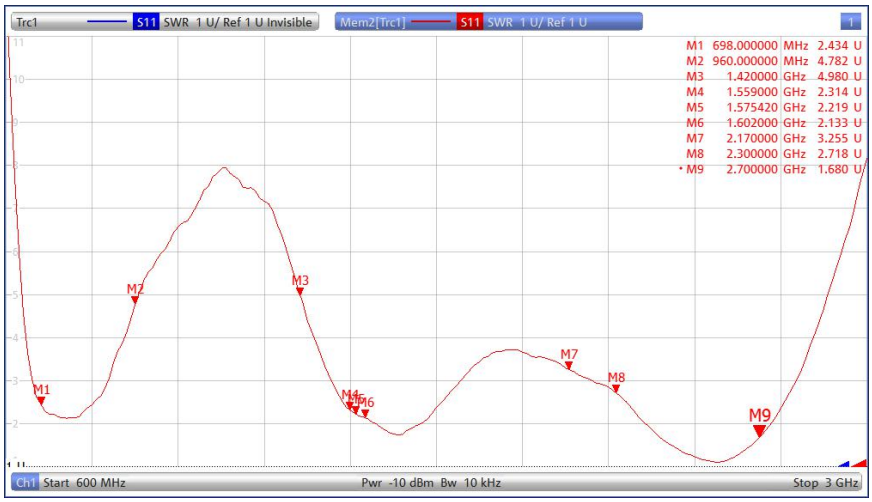
3.1 General Data

FRE (MHz)	698	960	1420	1559	1575.42	1602	2170	2300	2700
VSWR	2.43	4.78	4.98	2.31	2.21	2.13	3.25	2.71	1.68
Return Loss	-7.59	-3.68	-3.53	-8.03	-8.43	-8.83	-8.51	-6.70	-11.91
Eff (%)	52.9	61.3	54.1	74.5	70.5	66.3	47.1	43.4	71.6
Average	-2.8	-2.1	-2.7	-1.3	-1.5	-1.8	-3.3	-3.6	-1.5

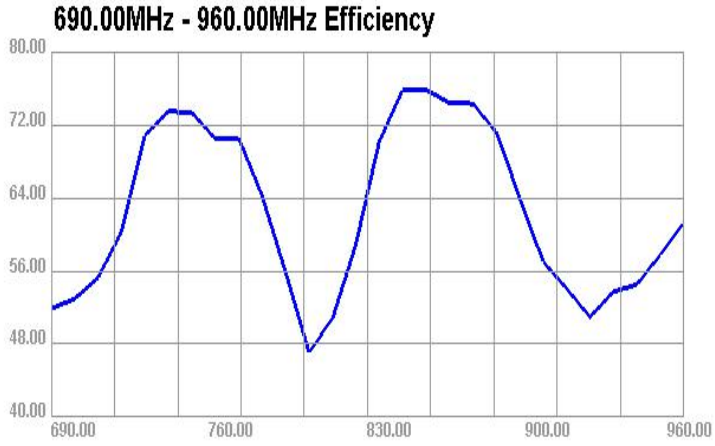
3.2 VSWR

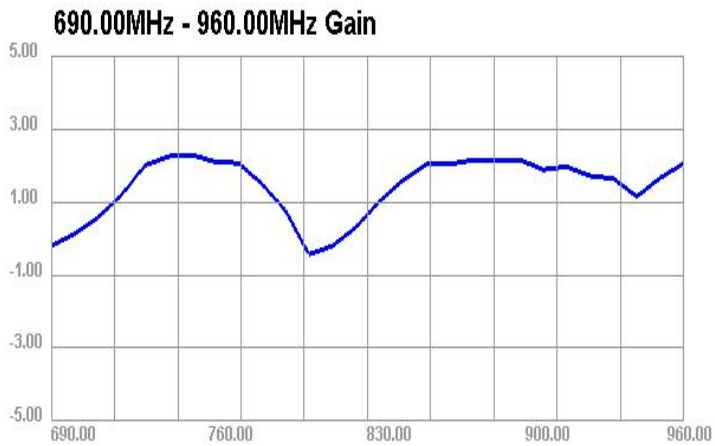


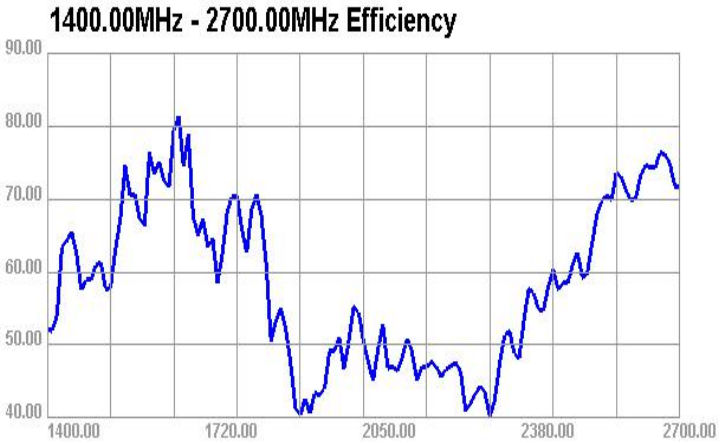
3.3 Return Loss

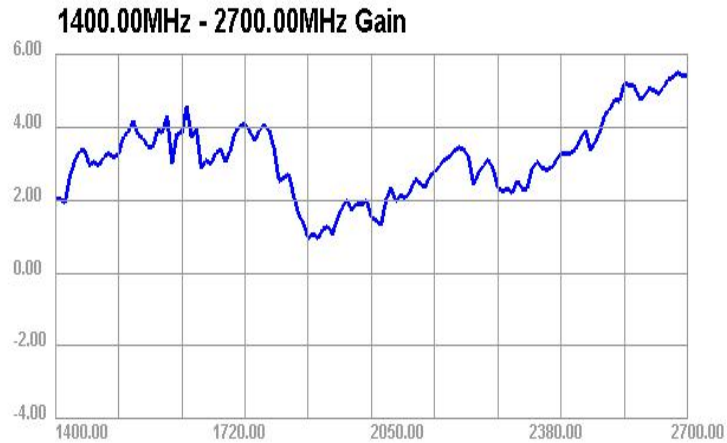


3.4 Efficiency and Gain

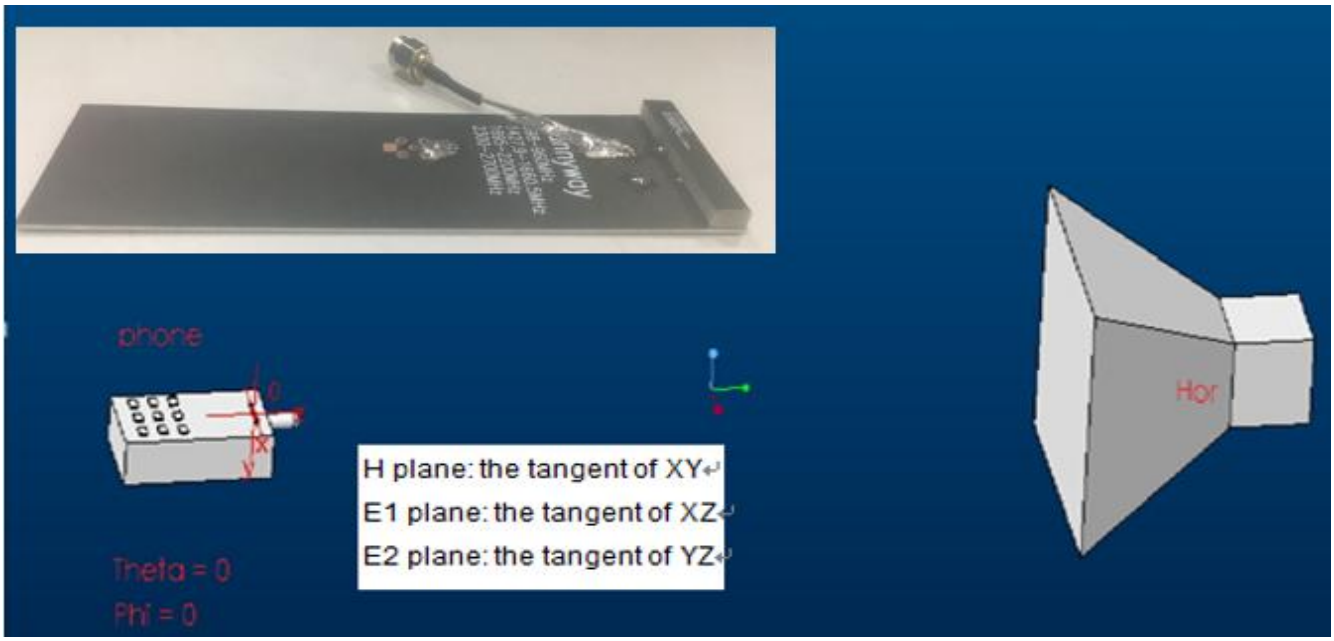


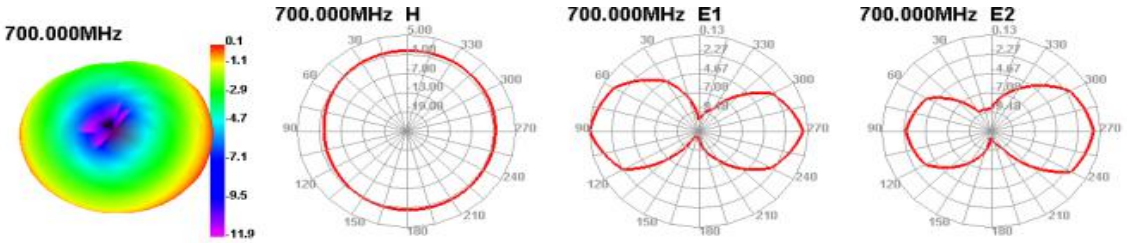


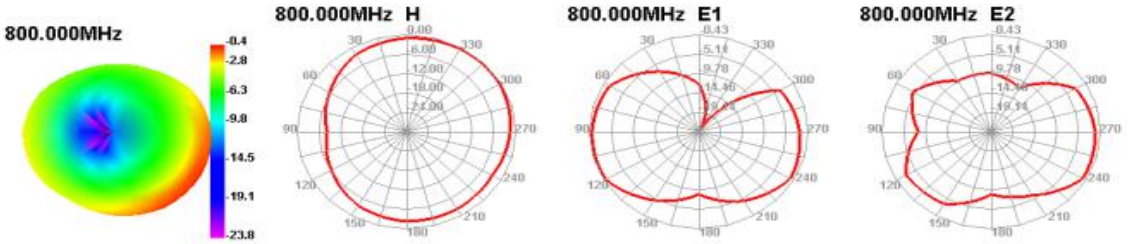


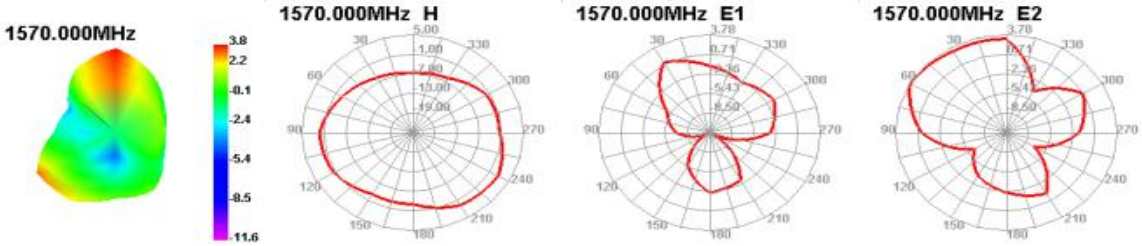


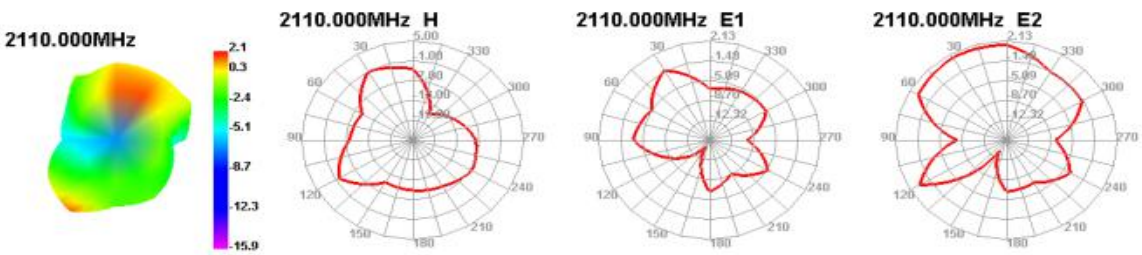
3.5 Directional pattern

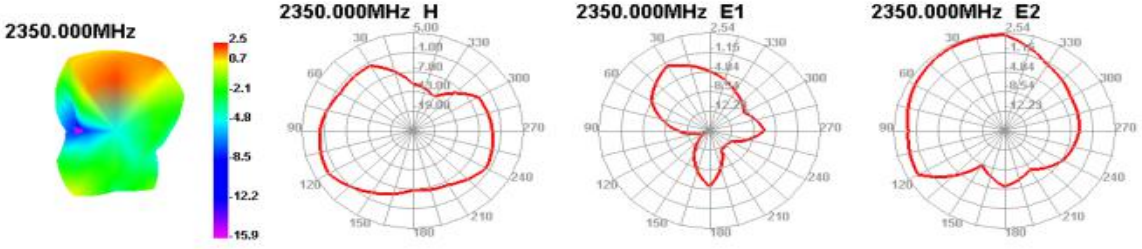


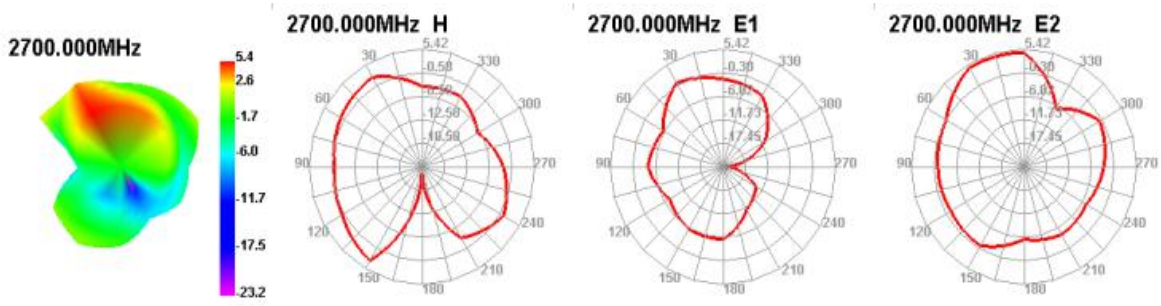






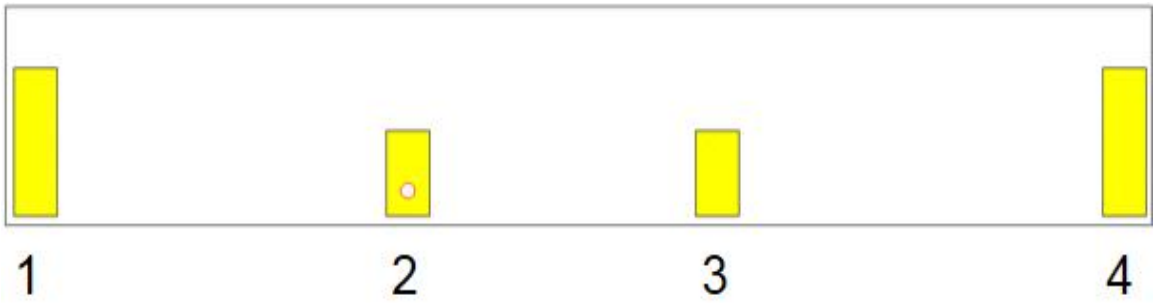






4. Schematic symbol and Pin definition

The pin assignment for the SWD003 antenna are as follows. The antenna has 4 pins and only two work. All other pins are designed for mechanical strength.



Pin No.	Description
2	Feed
3	Return/GND
1,4	Not used (Mechanical only)

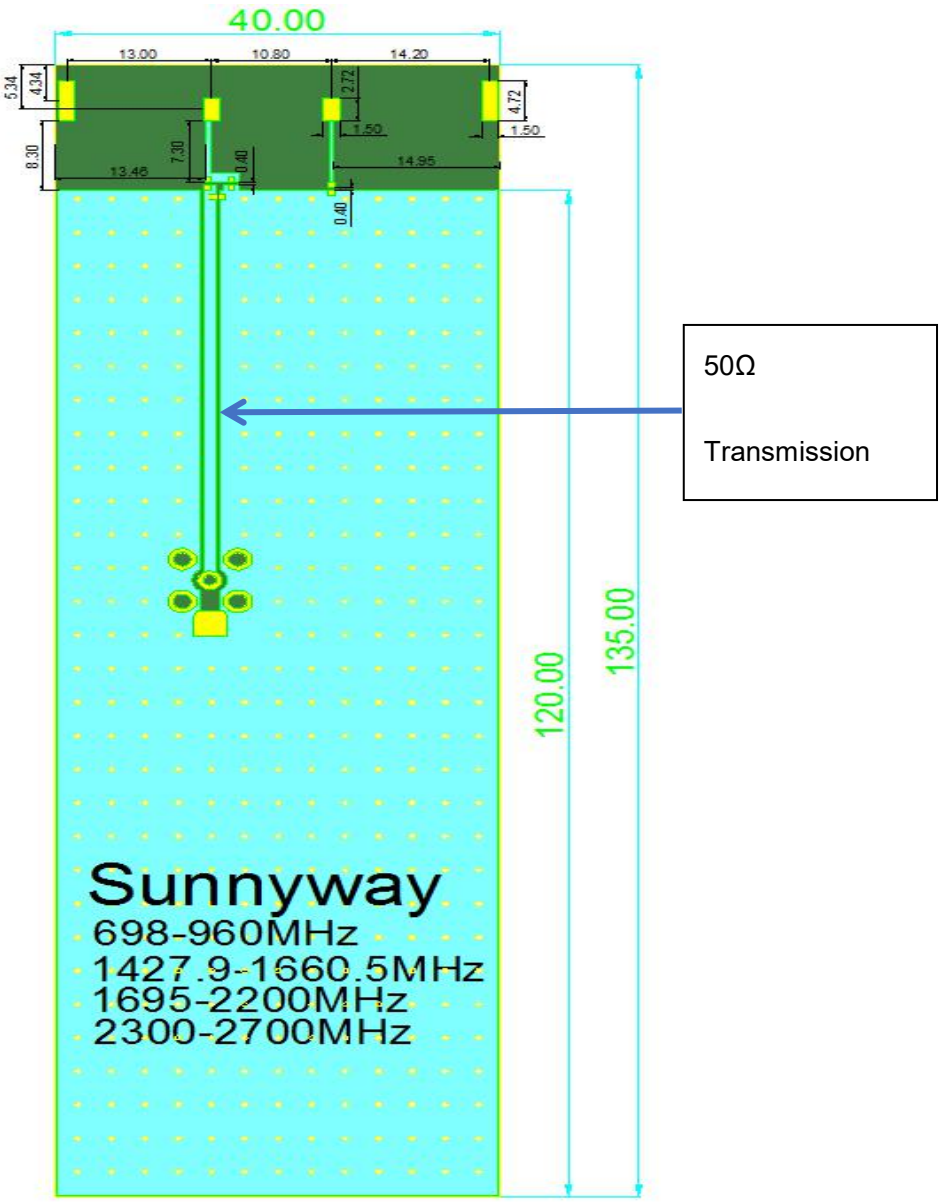
5. Transmission Line

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

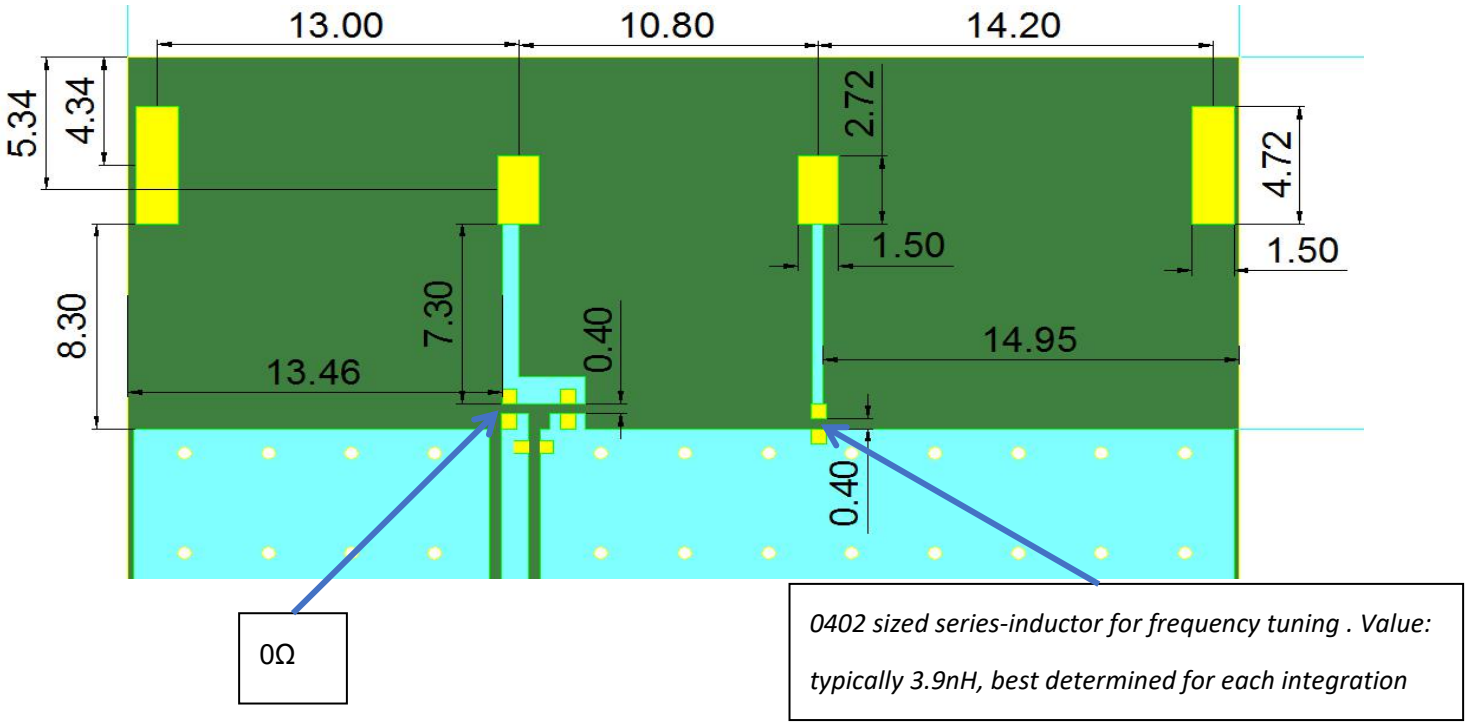
• The length of the transmission lines should be kept to as short as possible

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

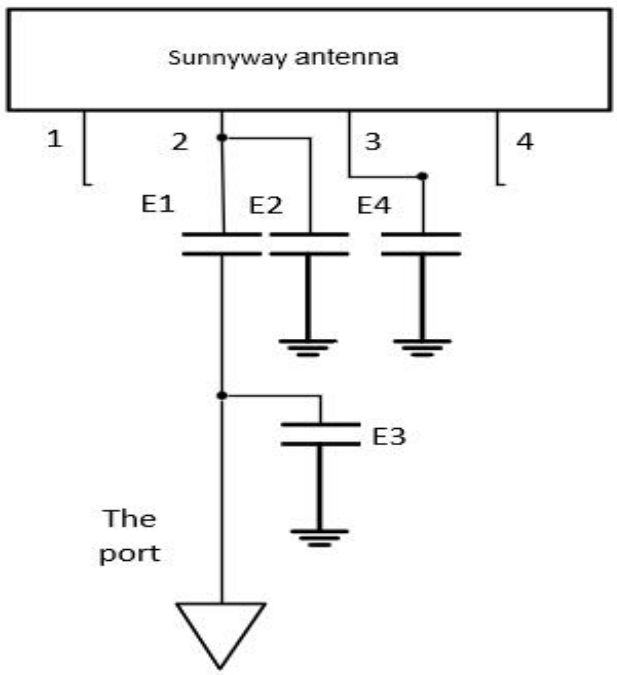
• All dimensions are in mm



6. Matching circuit



The antenna requires a matching circuit that must be optimized for each product. The matching circuit will require up to four 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.

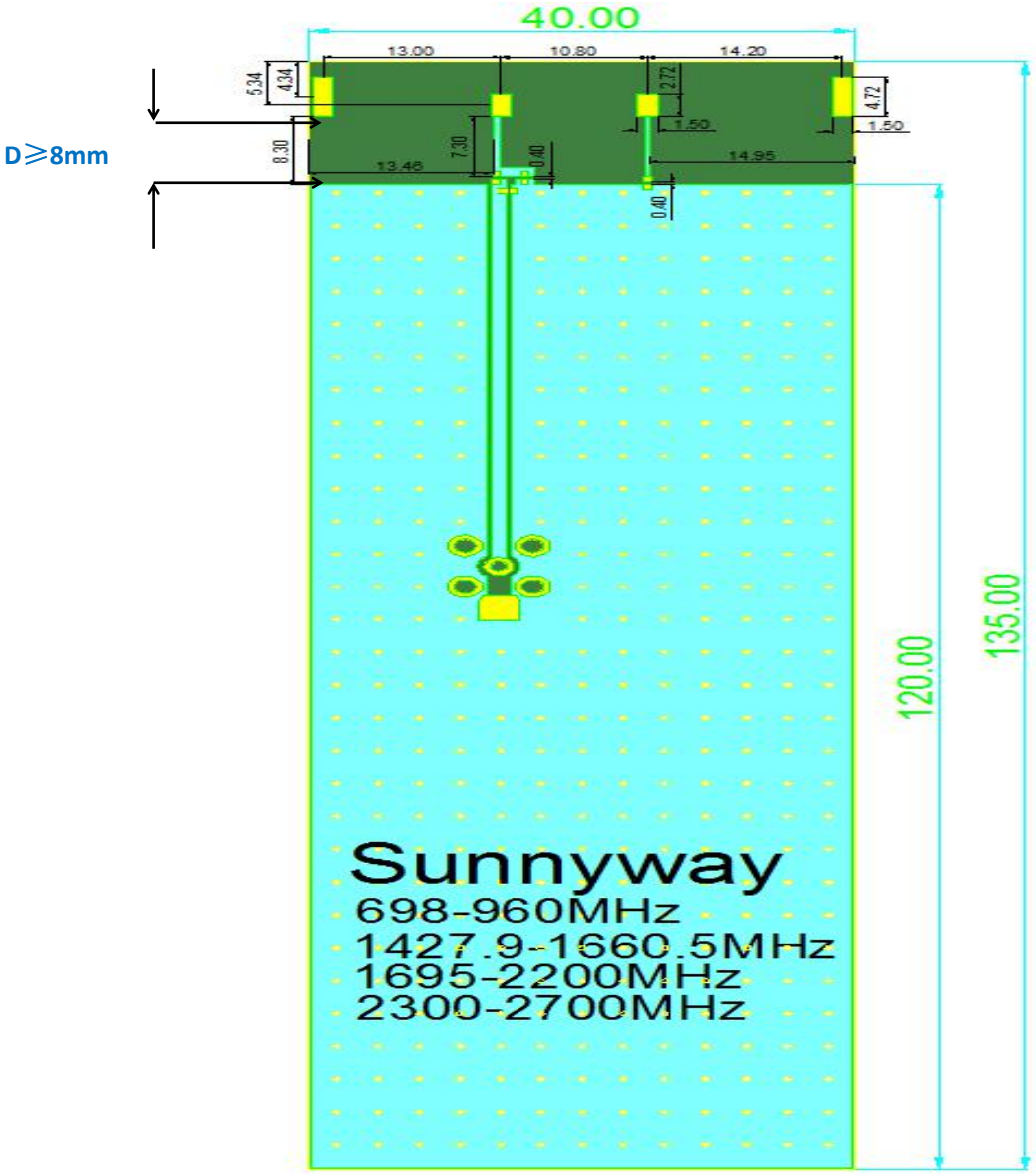


	Type	Value
E1	Resistance	0Ω
E2	N/A	N/A
E3	N/A	N/A
E4	Inductor	3.9*nH*

7. Host PCB Requirement

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

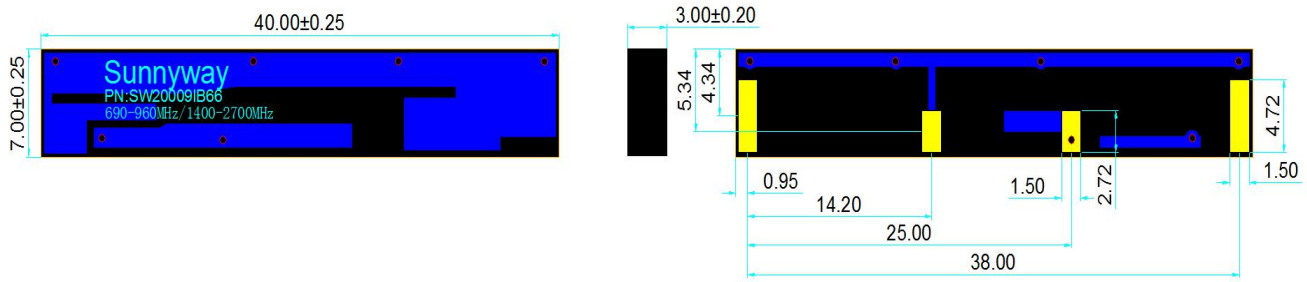
An example of a PCB layout shown as below:

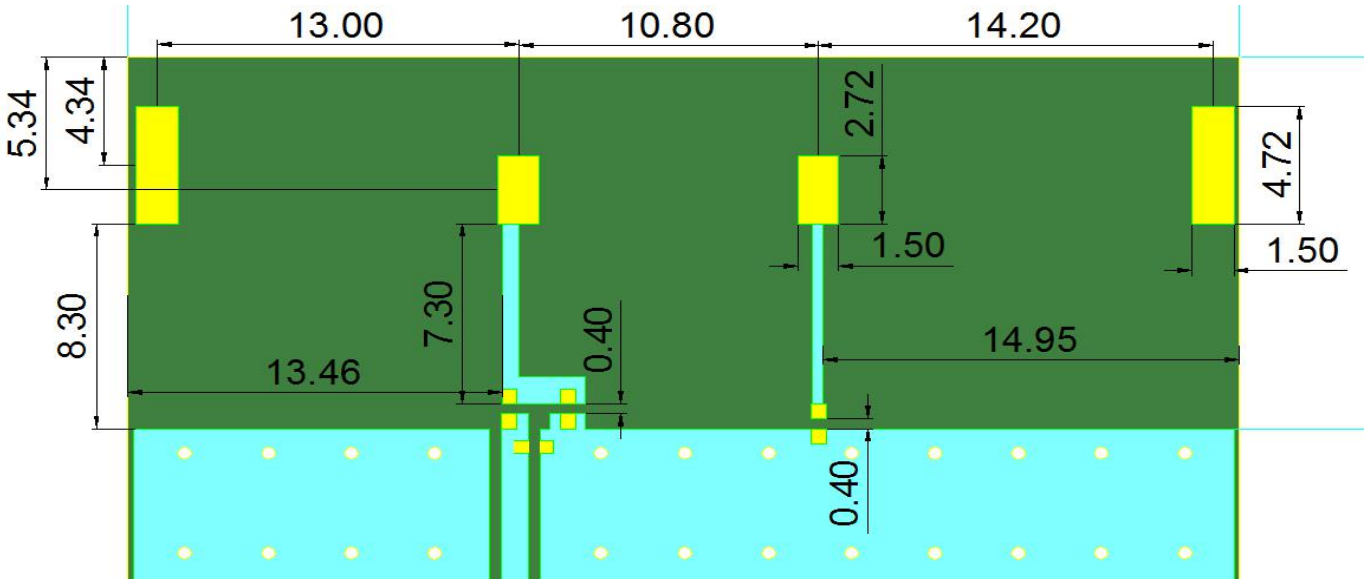


Gap D is required from the edge of the antenna to the ground plane. This should be maintained along the edge of the antenna placement, **value is 8mm**.

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