



SWD006

PN: SW20012IB66

Features:

- Frequency bands: 1559~1609MHz
- SMD Compliant
- Impedance 50 Ohm
- Size 7.0 x 5.8 x 0.4 mm.
- Ultra flat compact design of only 0.4mm thickness
- Solution for all global public constellations: GPS, GLONASS, BEIDOU and GALILEO

Applications:

- Trackers
- Portable Devices
- Drones
- Network Devices
- Wearable devices
- Others

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1. Introduction



The Sunnyway RF SWD006 is a low profile SMD LTE/cellular 4G/3G/2G embedded antenna designed for direct SMD mount on a device PCB. It provides high efficiency in a very small factor 7.0*5.8*0.4mm.

Its rectangular shape and small size make it very easy to integrate - it is packaged in tape and reel, and solder can be directly reflowed to the edge of PCB by picking and placing. This antenna is recommended for long ground planes of 110 mm or longer to obtain the highest rated efficiency.

Typical applications:

- Trackers
- Portable Devices
- Drones
- Network Devices
- Wearable devices
- Others

2. Electrical Specification

Standards	GPS&GLONASS&GALILEO&BEIDOU
Frequency range (MHz)	1559~1609MHz
Peak Gain (dBi)	3.4~4.4
Average Gain (dB)	-2.2~-1.5
VSWR	< 1.4
Return Loss	< -16.5
Efficiency (%)	59.8~71.6%
Polarization mode	Linear
Radiation pattern	Omni-Directional
Output impedance (Ω)	50
Max. Input Power(W)	5

Note:

All parameters are measured with Sunnyway RF's EVK which size is 80*35mm

3. Mechanical and Environmental Specification

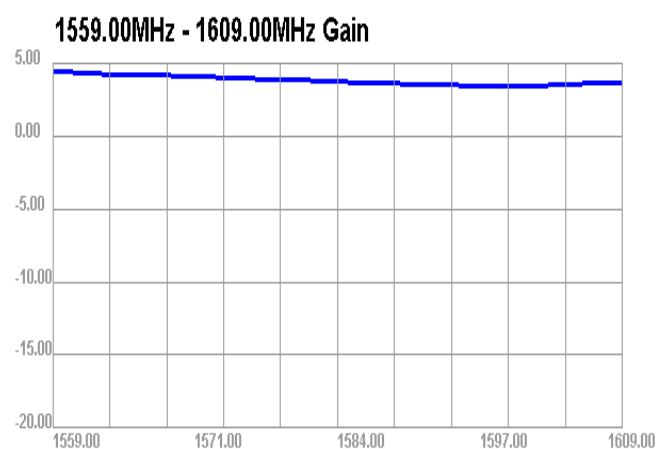
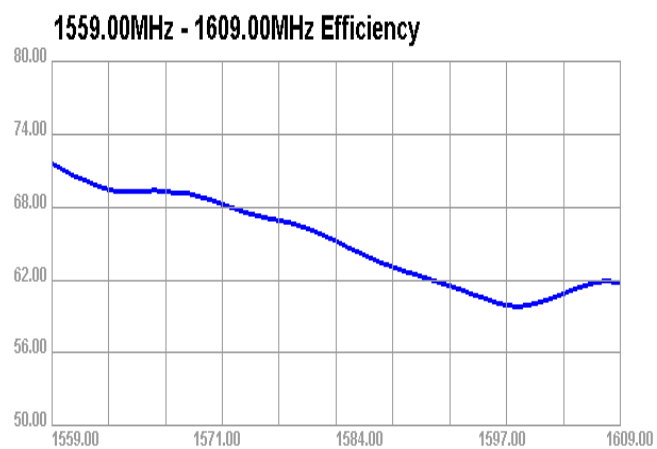
Mounting Type	SMD
Antenna size(mm)	7.0(L) x5.8 (W) x 0.4(H)
Material	PCB
Operating Temperature (°C)	- 40 °C ~ + 85 °C
Storage Temperature(°C)	- 40 °C ~ + 85 °C

4. Antenna parameters

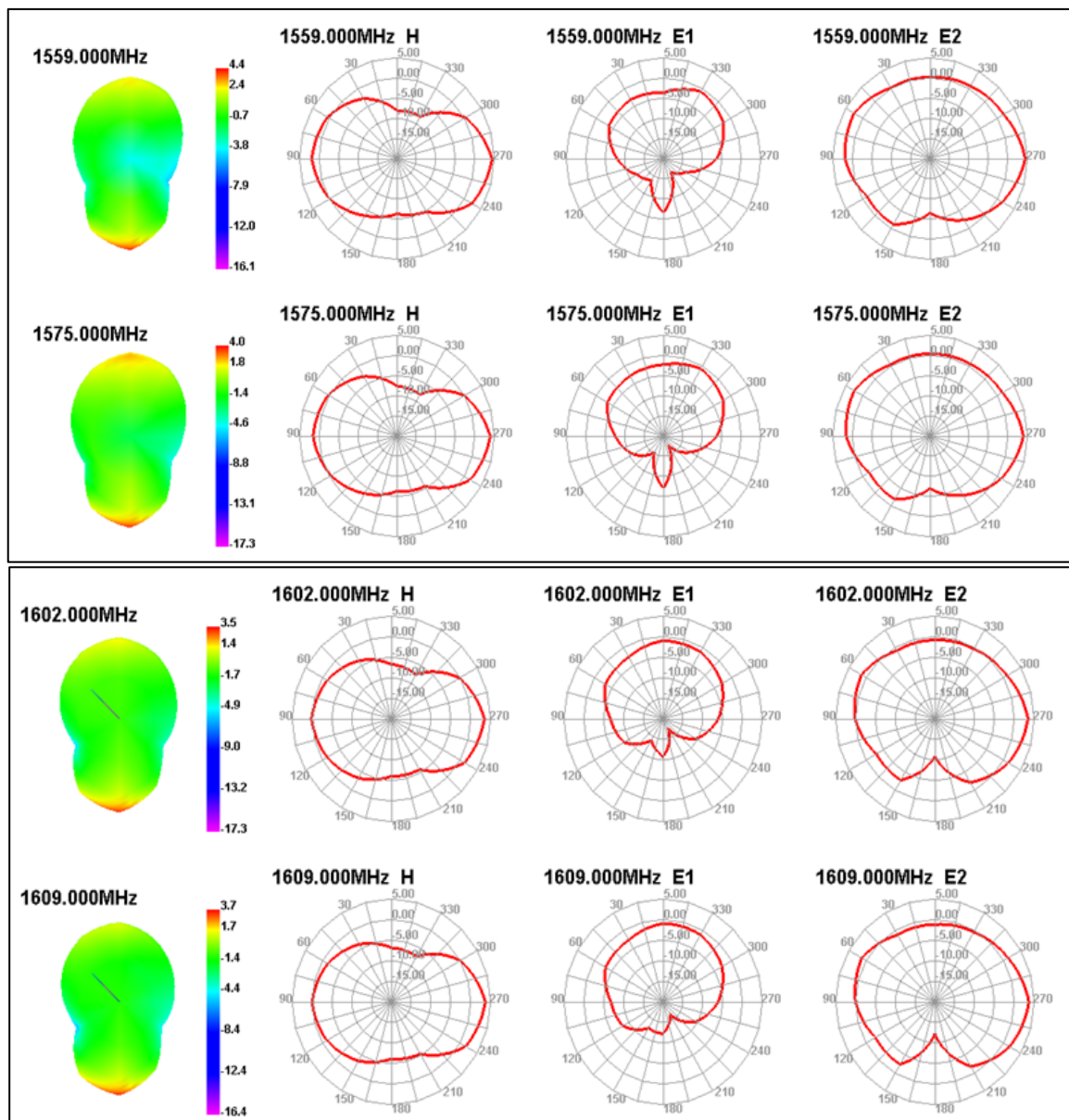
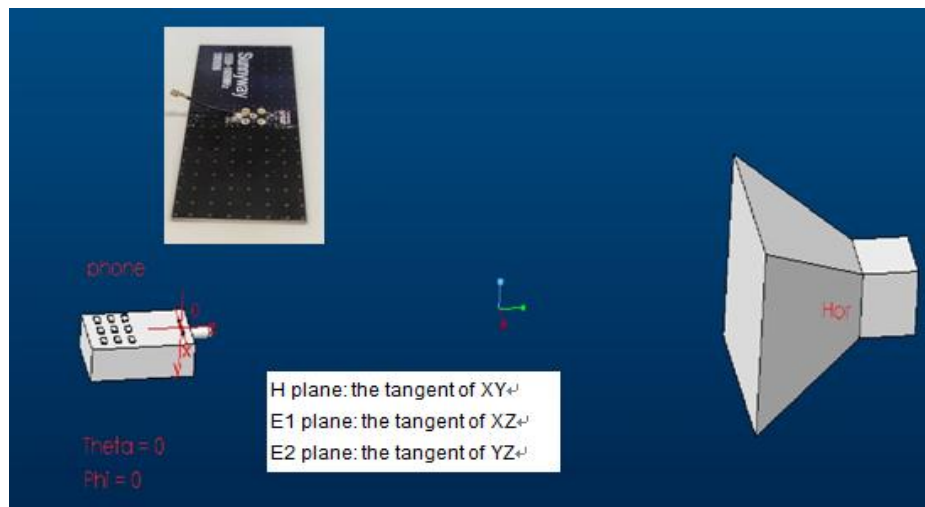
4.1 VSWR and Return Loss



4.2 Efficiency and Gain



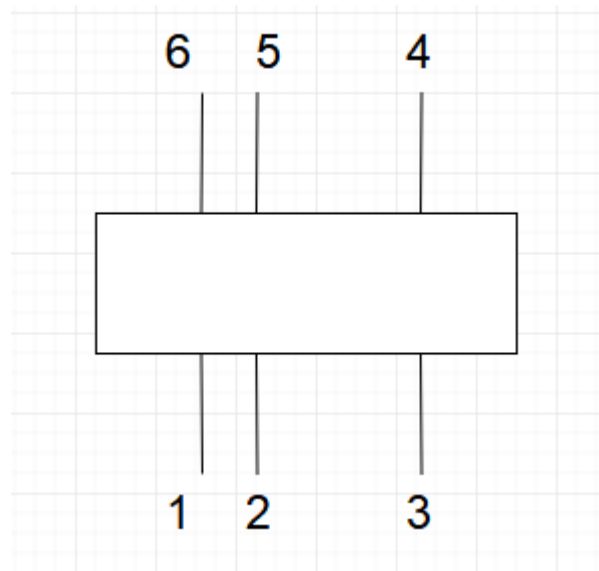
4.3 Directional pattern



5. Schematic symbol and Pin definition

The pin assignment for the SWD006 antenna are as follows. The antenna has 6 pins and 4 work.

Another pins are designed for mechanical strength.

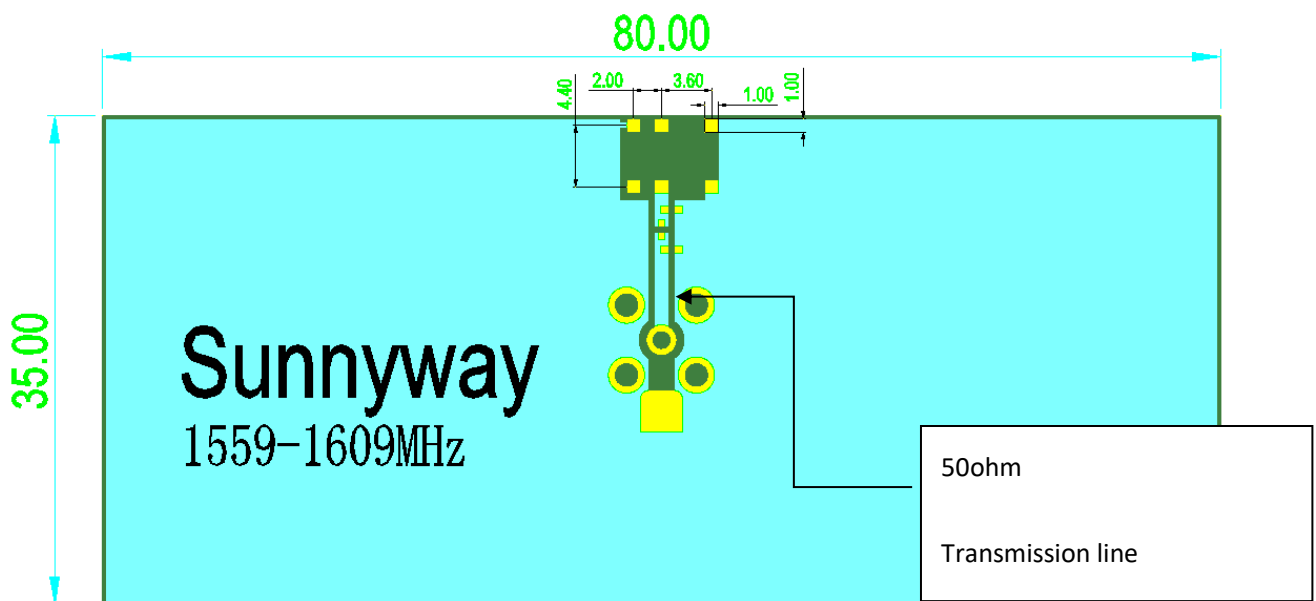


Pin No.	Description
2	Feed
3,4,6	Grounding
1,5	Not used (Mechanical only)

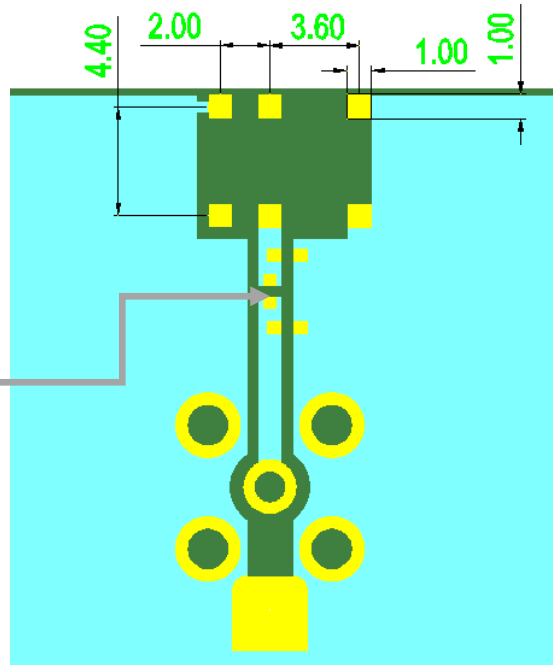
6. Transmission Line

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

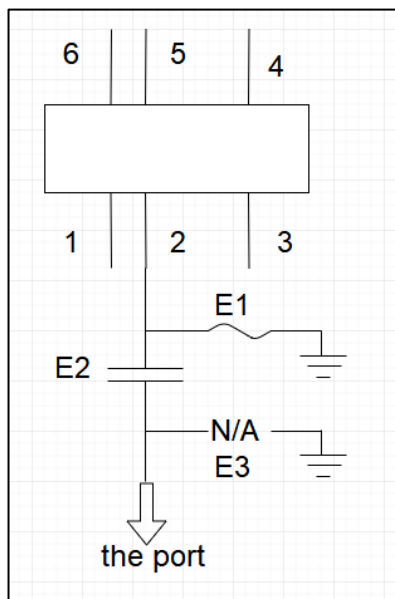
- The length of the transmission lines should be kept to as short as possible
- Any other part of the RF system, such as transceiver, power amplifiers, etc., shall also be designed with an impedance of 50 Ω



7. Matching circuit



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



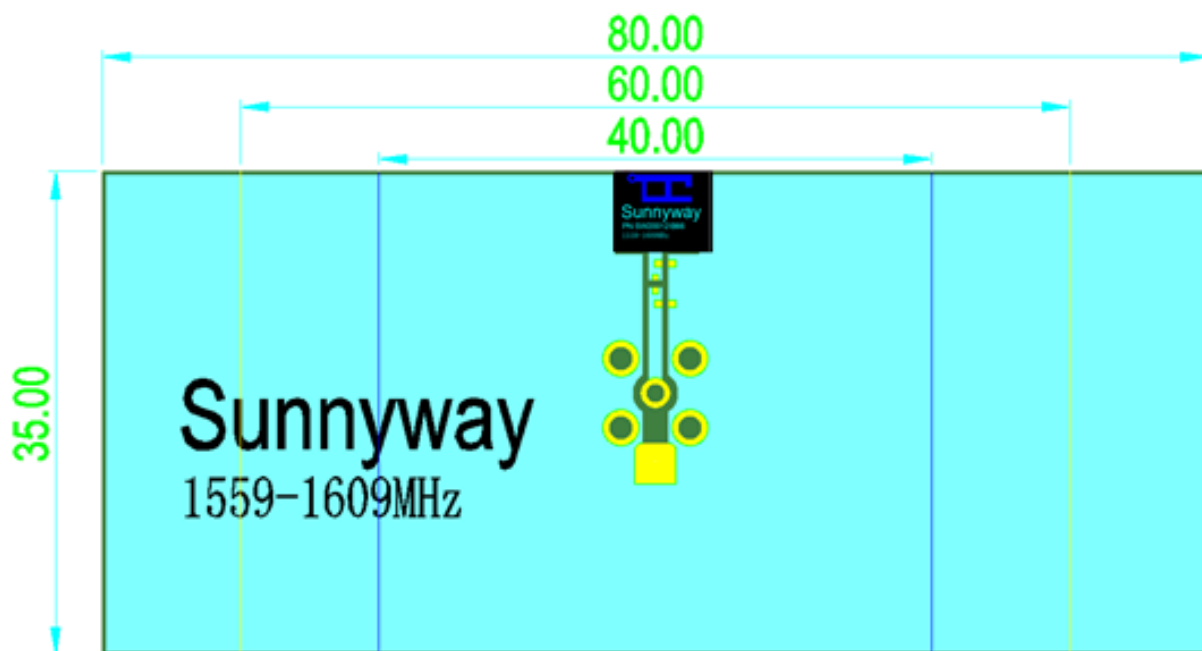
	Type	Value
E1	N/A	N/A
E2	Capacitor	2.2PF
E3	N/A	N/A

8. Host PCB Requirement

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

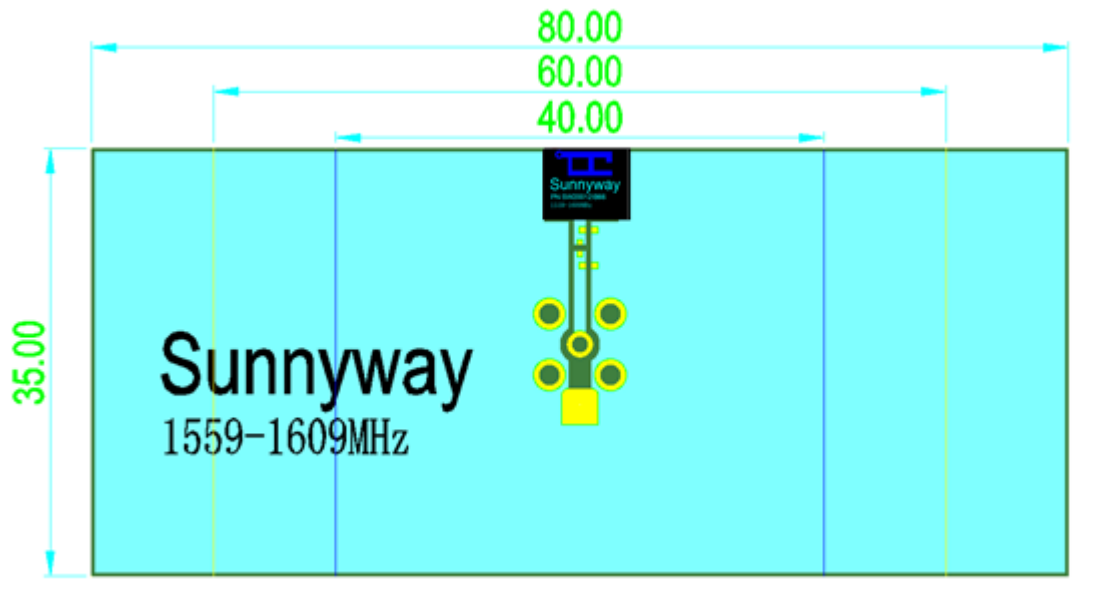
Whichever the host PCB size used, the antenna should be placed ideally on the host PCB's longest edge at the center.

An example of a PCB layout shown as below:



9. Host PCB Size

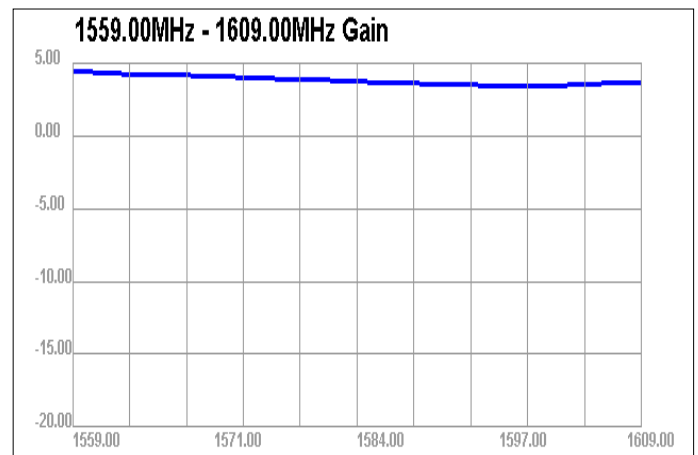
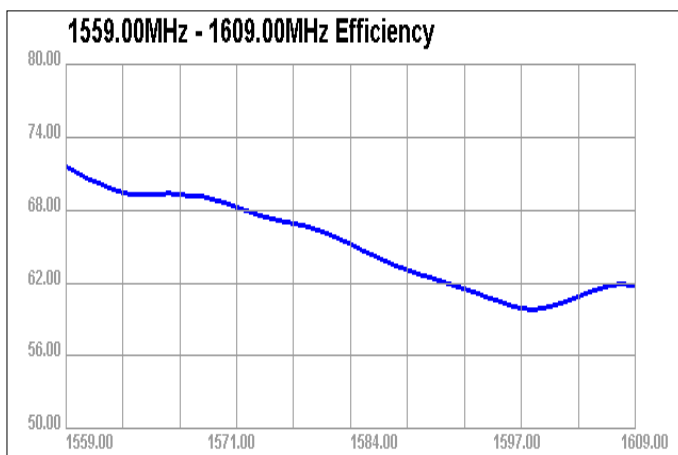
The minimum recommended host PCB size to be used is 40 x 20 (mm). Below is the antenna performance vs PCB length.



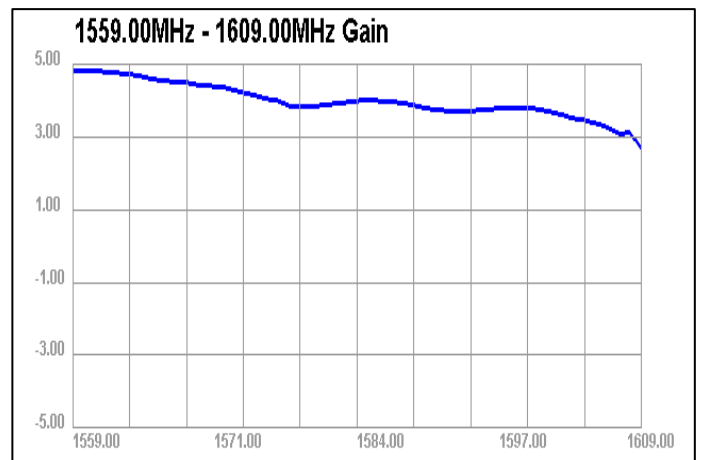
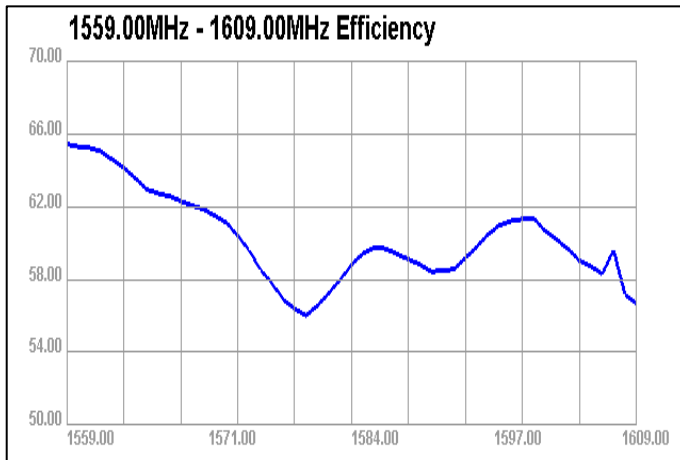
Passive Efficiency vs. PCB length

All results measured in Sunnyway RF's anechoic chamber

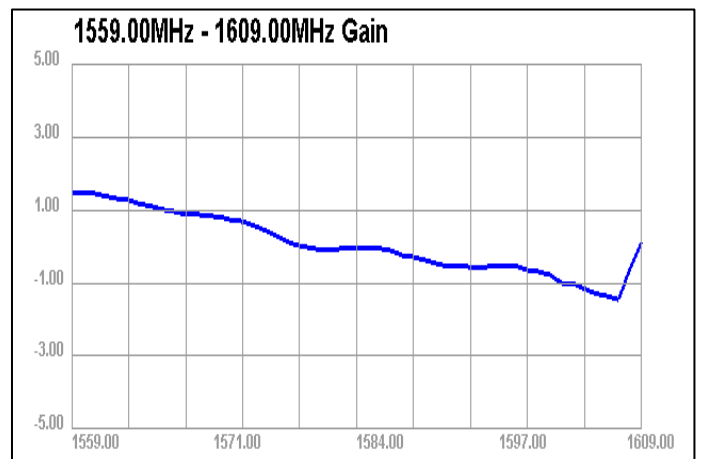
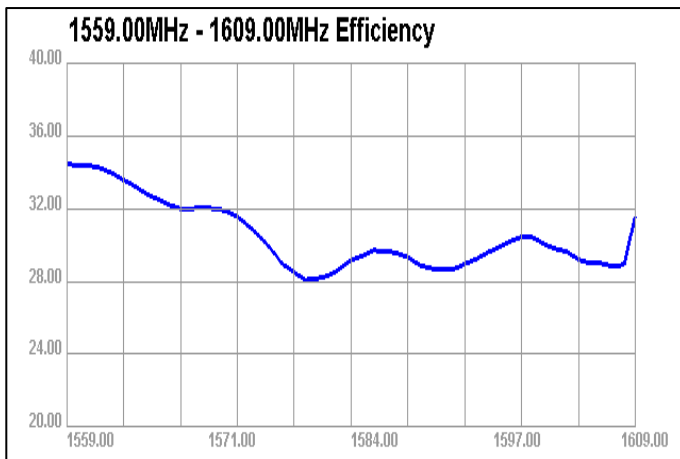
Board length 80mm



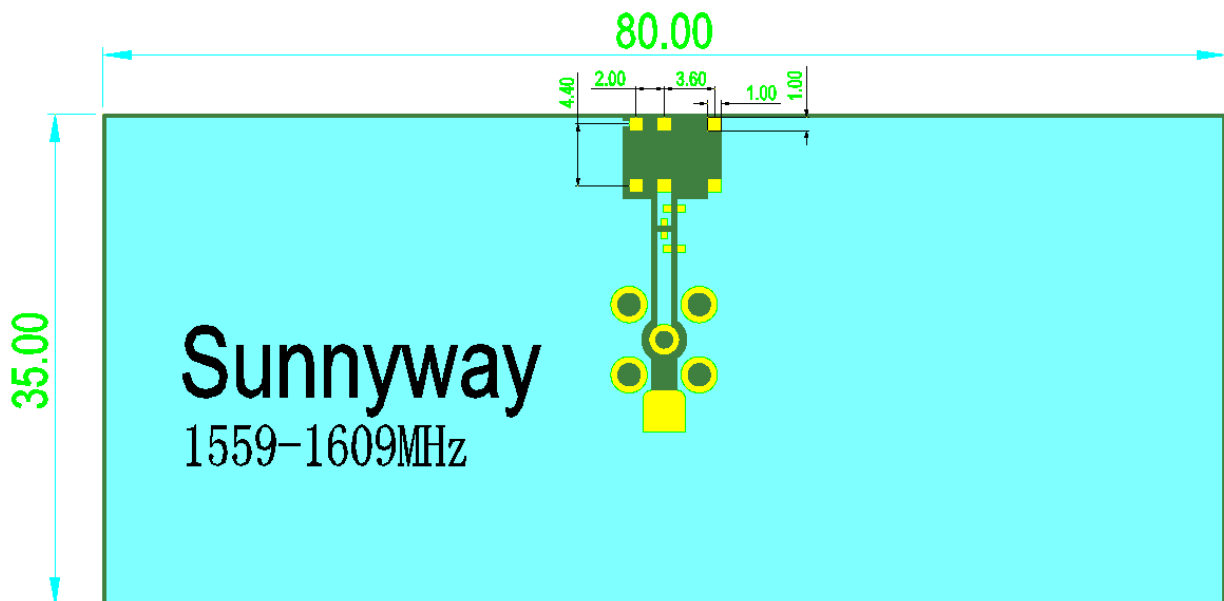
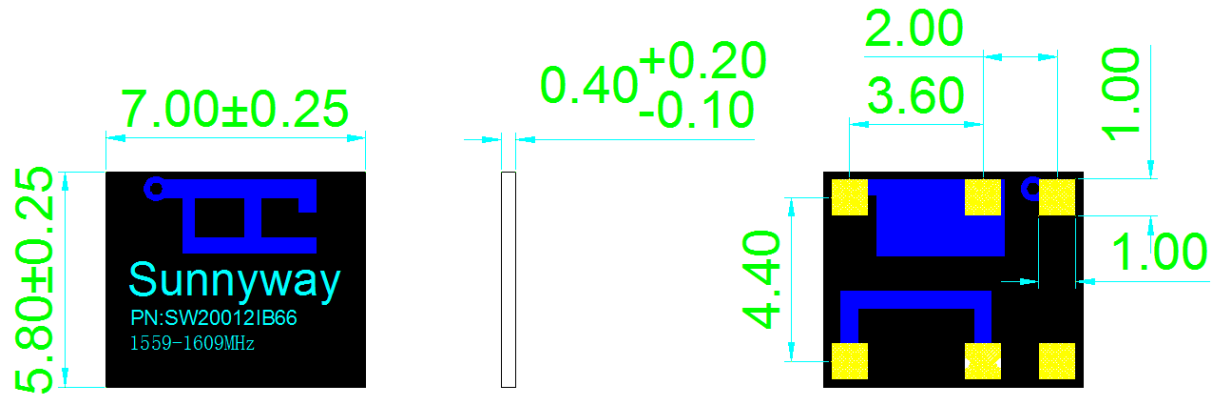
Board length 60mm



Board length 40mm



10. Antenna Drawing(Unit:mm)



11. Soldering Temperature

PHASE	PROFILE FEATURES	PB-Free Assembly(max.)
RAMP-UP	Avg.Ramp-up Rate (T _{smax} to T _p)	3°C/second(max.)
PREHEAT	Temperature Min (T _{smin})	150°C
	Temperature Max (T _{smax})	180°C
	Time (t _{smin} to t _{smax})	120seconds max
REFLOW	Temperature (T _L)	210°C
	Total Time above T _L (T _L)	50seconnds max
PEAK	Temperature (T _p)	260°C
	Time(T _p)	10seconnds max
RAMP-DOWN	Rate	5°C/second max

12. Reflow Profile

