AUT Report

Product Model: EAP772-Outdoor

Manufacturer: TP-Link Systems Inc.

Test Date: 2024.09.13

Tested By: Yin Shufen YinShufen

TP-Link Systems Inc.
10 Mauchly, Irvine, CA 92618

Index

1. Antenna Distribution

EAP772-Outdoor
Figure 1-1 Refer to AUT photograph file

2. Electrical Characteristics

Ant1(2.4G WiFi)	
Frequency	2400~2500MHz
Impedance	50Ohm
Antenna Type	Alford
Antenna Gain	2.00dBi@2400~2500MHz
Radiation pattern	Omni-Directional
P/N	3101507199

Ant2(2.4G WiFi)	
Frequency	2400~2500MHz
Impedance	50Ohm
Antenna Type	Alford
Antenna Gain	2.00dBi@2400~2500MHz
Radiation pattern	Omni-Directional
P/N	3101507199

Ant3(2.4G&5G WiFi)	
Frequency	2400~2500 &5150~5850MHz
Impedance	50Ohm
Antenna Type	Dipole
Antenna Gain	2.00dBi@2400~2500MHz 2.48dBi@5150~5250MHz 2.50dBi@5250~5350MHz 3.00dBi@5470~5725MHz 2.97dBi@5725~5895MHz
Radiation pattern	Omni-Directional
P/N	3101507197

Ant4(2.4G&5G WiFi)	
Frequency	2400~2500 &5150~5850MHz
Impedance	50Ohm
Antenna Type	Dipole
Antenna Gain	2.00dBi@2400~2500MHz 1.74dBi@5150~5250MHz 1.75dBi@5250~5350MHz 3.00dBi@5470~5725MHz 2.77dBi@5725~5895MHz
Radiation pattern	Omni-Directional
P/N	3101507198

Ant5(6G WiFi)	
Frequency	5925~7125MHz
Impedance	50Ohm
Antenna Type	Franklin
Antenna Gain	3.00dBi@5925~6425MHz 1.76dBi@6425~6525MHz 2.48dBi@6525~6875MHz 2.68dBi@6875~7125MHz
Radiation pattern	Omni-Directional
P/N	3101507195

Ant6(6G WiFi)	
Frequency	5925~7125MHz
Impedance	50Ohm
Antenna Type	Franklin
Antenna Gain	2.11dBi@5925~6425MHz 2.76dBi@6425~6525MHz 3.00dBi@6525~6875MHz 2.65dBi@6875~7125MHz
Radiation pattern	Omni-Directional
P/N	3101507196

Ant7(BLE)	
Frequency	2400~2500MHz
Impedance	50Ohm
Antenna Type	IFA
Antenna Gain	3.00dBi@2400~2500MHz
Radiation pattern	Omni-Directional
P/N	EAP772OD-BLE-ANT

Ant8(GPS)	
Frequency	1559~1606MHz
Impedance	50Ohm
Antenna Type	IFA
Antenna Gain	3.00dBi@1559~1606MHz
Radiation pattern	Omni-Directional
P/N	EAP772OD-GPS-ANT

3. Gain and Radiation Pattern

3.1 Measurement Procedure

This measurement experiment adopted an antenna near-field measurement system, and the diagram of the measurement system was shown in Figure 3-1. The excitation signal was generated by the Keysight E5071C (300kHz-20GHz). Under the control of the central computer, the probe rotated in the θ direction, and the EUT rotated in the φ direction with the turntable. The probe sampling frame received and collected signals in the near-field range of the EUT. The software system which was controlled by the central computer completed the processing, output and display of the test data.

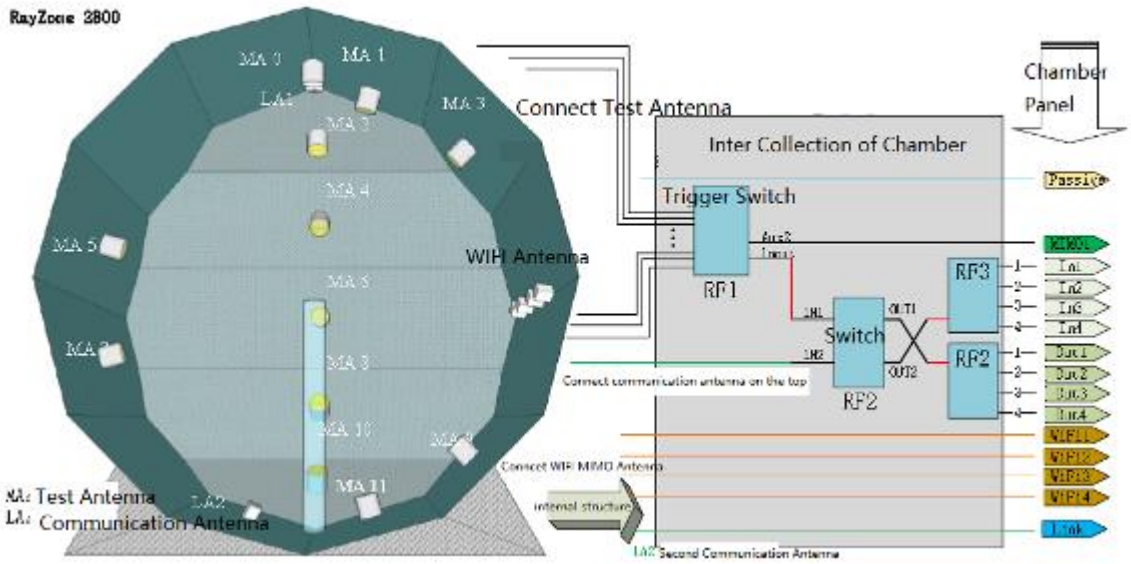


Figure 3-1

The test site was a full anechoic chamber with a size of 3.0m×3.1m×2.97m, which was built by GTS Rayzone2800. All six surfaces of the anechoic chamber were pasted with absorbing materials. And the chamber was calibrated by the authoritative third-party lab every year. The antenna anechoic chamber measurement system adopted a 13-probe multi-probe system. The probe antennas were evenly distributed on the spherical surface surrounding the EUT, and theirs operating frequency was 600MHz~8.5GHz.

During the measurement, the probe antennas were rotated in the θ direction under the control of the probe holder to sample the near-field data at the θ angle. At the same time, the EUT rotated with the turntable in the φ direction to sample the near field data at the φ angle. The sampling accuracy was 15°. The system diagram was shown in Figure 3-2. From the sampling results, the EUT's near-field test data of θ component, φ component and total component could be obtained.

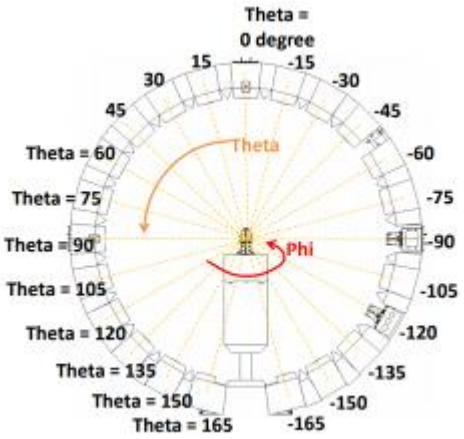


Figure 3-2

Before the measurement, calibrated the vector network analyzer, and then connected the input end of each antenna to the output end of the vector network analyzer, and evenly the antennas to be measured.

Test Equipment listed below:

Equipments	Model	Manufacturer	S/N	Cali. Interval	Cali. Due Date
Chamber	Rayzone2800	GTS(General Test System)	MY53470435	12months	2025/01/15
Vector Network Analyzer	E5071C	Keysight	MY46315238	24months	2025/03/13
GTS MaxSign100 Software	V2.1	GTS(General Test System)	/	/	/

3.2 Test Setup

The test setup was shown in Figure 3-3, 3-4:

Figure 3-3

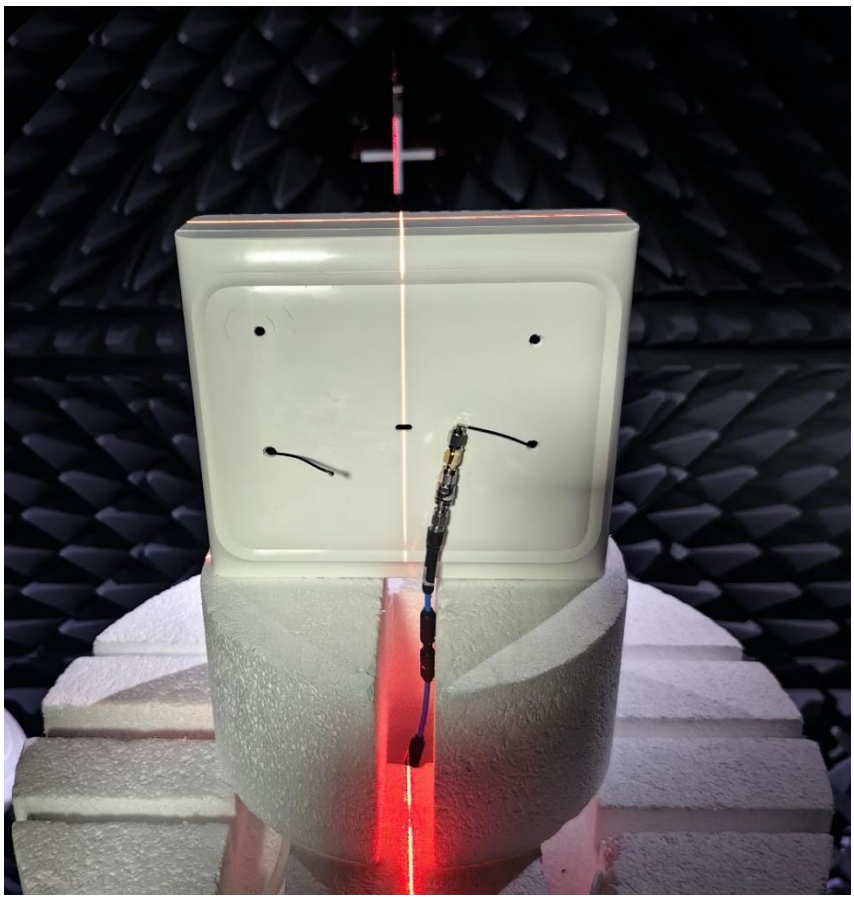
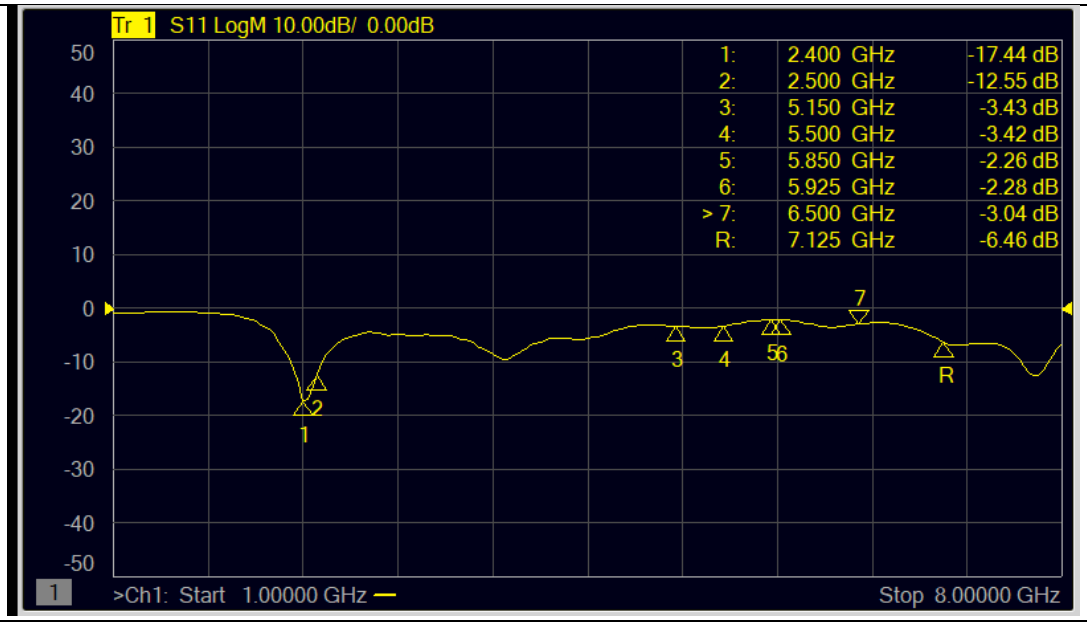
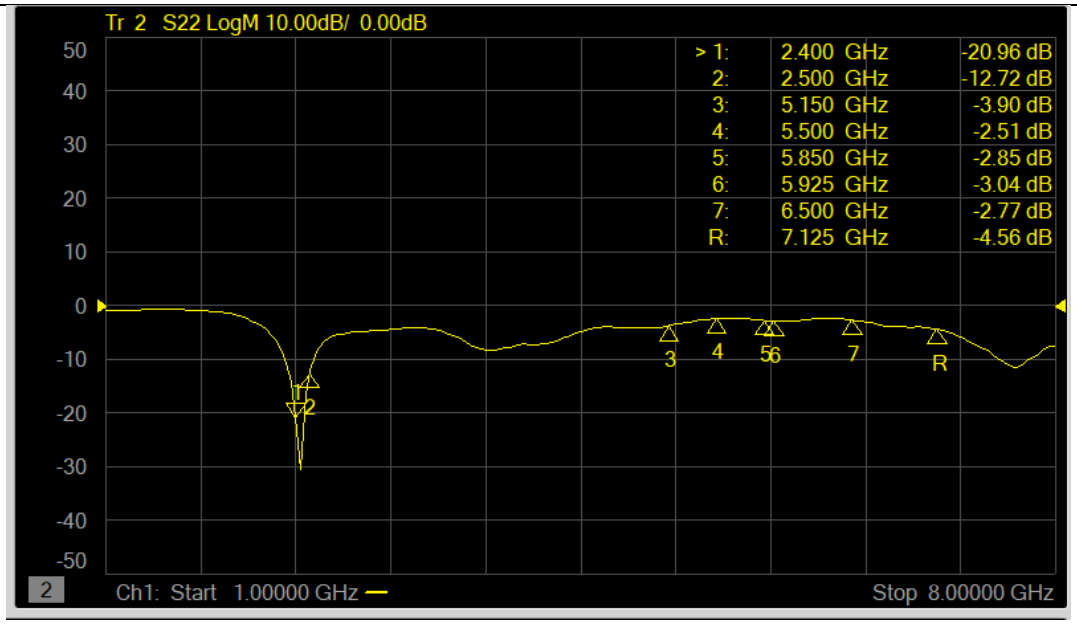


Figure 3-4

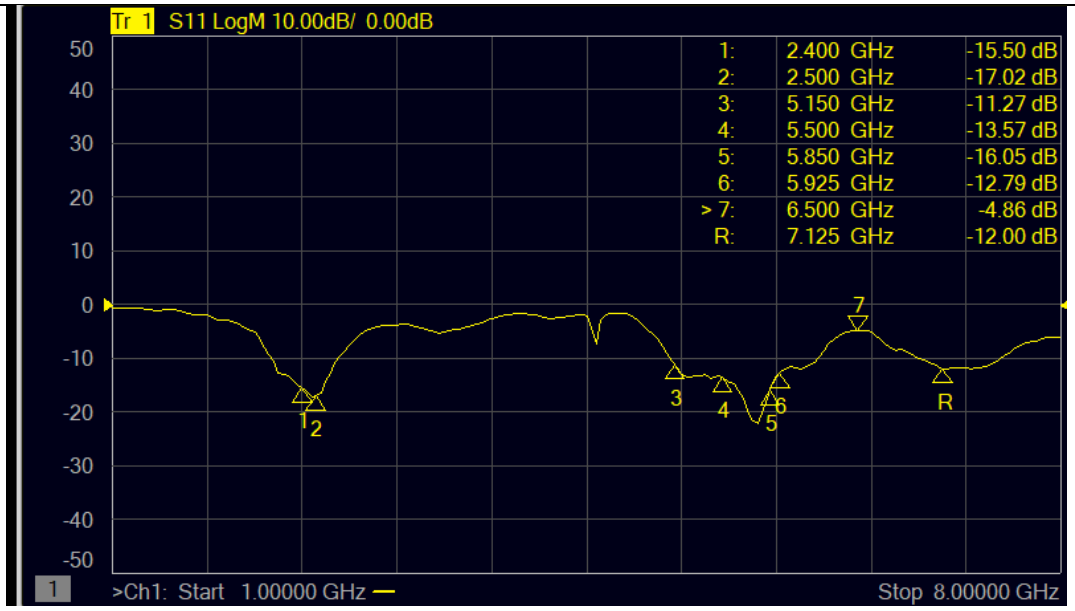
4. S Parameter Test Data

Ant1


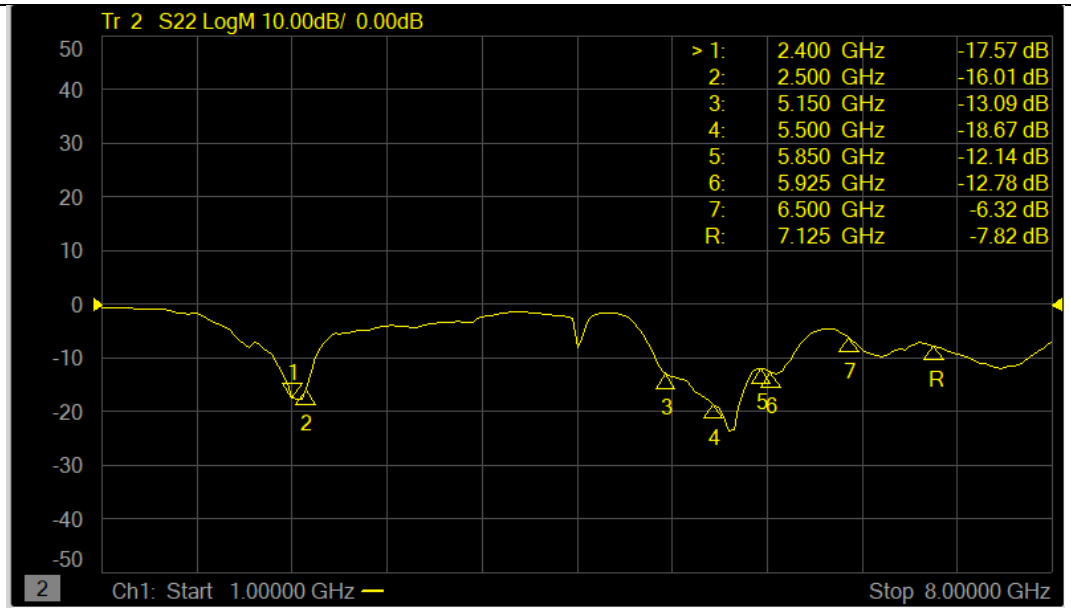
Ant2


Tr 2 S22 LogM 10.00dB/ 0.00dB
> 1: 2.400 GHz -20.96 dB
2: 2.500 GHz -12.72 dB
3: 5.150 GHz -3.90 dB
4: 5.500 GHz -2.51 dB
5: 5.850 GHz -2.85 dB
6: 5.925 GHz -3.04 dB
7: 6.500 GHz -2.77 dB
R: 7.125 GHz -4.56 dB
50
40
30
20
10
0
-10
-20
-30
-40
-50
2
Ch1: Start 1.00000 GHz
Stop 8.00000 GHz

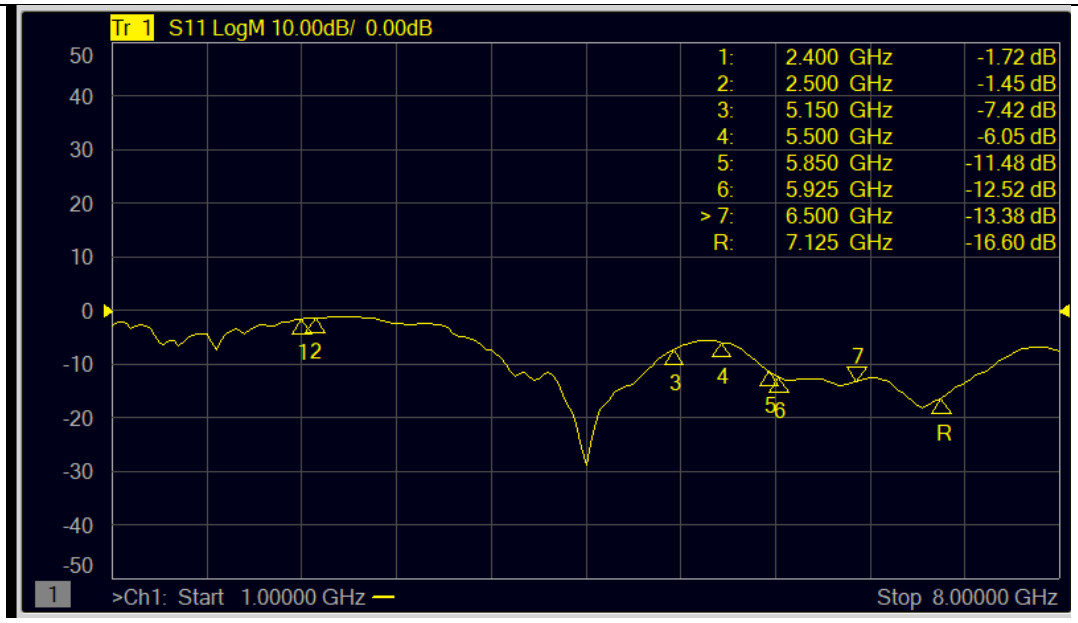
Ant3


Tr 1 S11 LogM 10.00dB/ 0.00dB
1: 2.400 GHz -15.50 dB
2: 2.500 GHz -17.02 dB
3: 5.150 GHz -11.27 dB
4: 5.500 GHz -13.57 dB
5: 5.850 GHz -16.05 dB
6: 5.925 GHz -12.79 dB
> 7: 6.500 GHz -4.86 dB
R: 7.125 GHz -12.00 dB
50
40
30
20
10
0
-10
-20
-30
-40
-50
1
>Ch1: Start 1.00000 GHz
Stop 8.00000 GHz

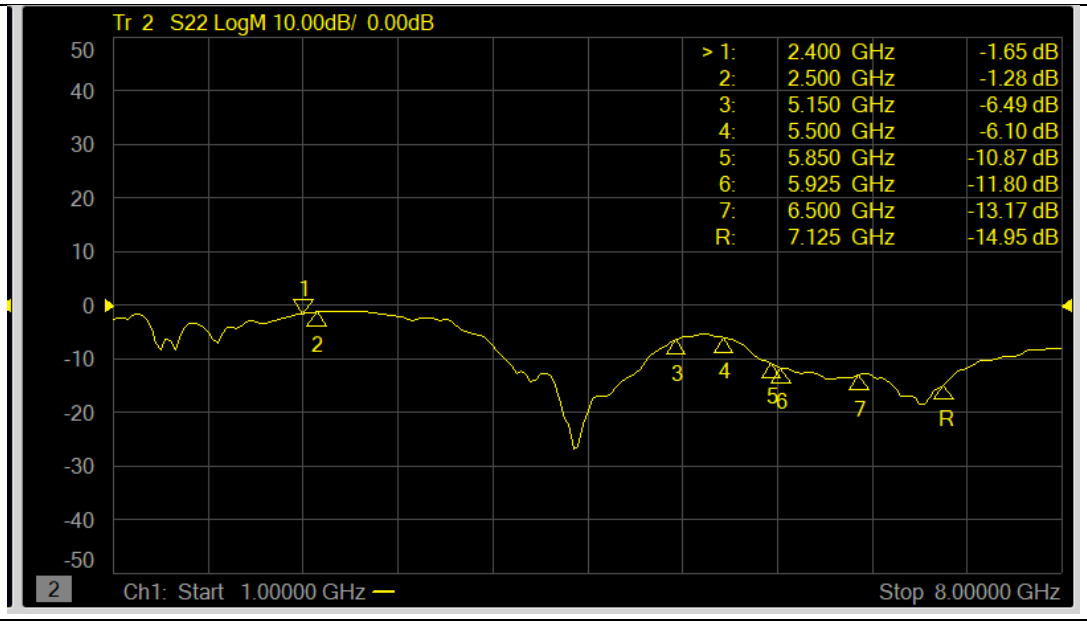
Ant4


Tr 2 S22 LogM 10.00dB/ 0.00dB
> 1: 2.400 GHz -17.57 dB
2: 2.500 GHz -16.01 dB
3: 5.150 GHz -13.09 dB
4: 5.500 GHz -18.67 dB
5: 5.850 GHz -12.14 dB
6: 5.925 GHz -12.78 dB
7: 6.500 GHz -6.32 dB
R: 7.125 GHz -7.82 dB
50
40
30
20
10
0
-10
-20
-30
-40
-50
2
Ch1: Start 1.00000 GHz
Stop 8.00000 GHz

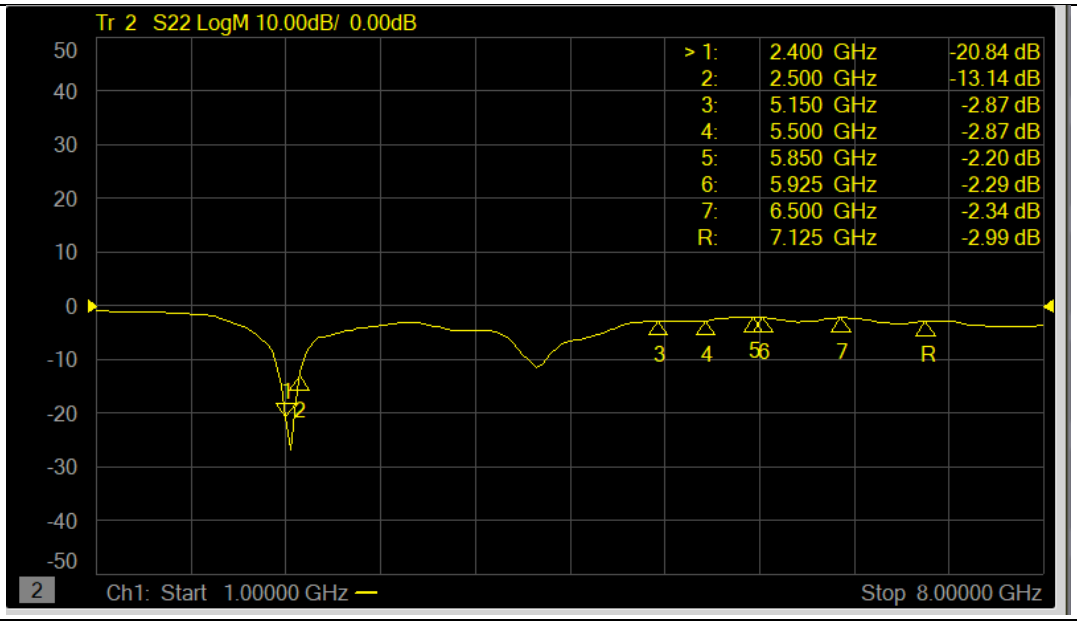
Ant5


Tr 1 S11 LogM 10.00dB/ 0.00dB
1: 2.400 GHz -1.72 dB
2: 2.500 GHz -1.45 dB
3: 5.150 GHz -7.42 dB
4: 5.500 GHz -6.05 dB
5: 5.850 GHz -11.48 dB
6: 5.925 GHz -12.52 dB
> 7: 6.500 GHz -13.38 dB
R: 7.125 GHz -16.60 dB
50
40
30
20
10
0
-10
-20
-30
-40
-50
1
>Ch1: Start 1.00000 GHz
Stop 8.00000 GHz

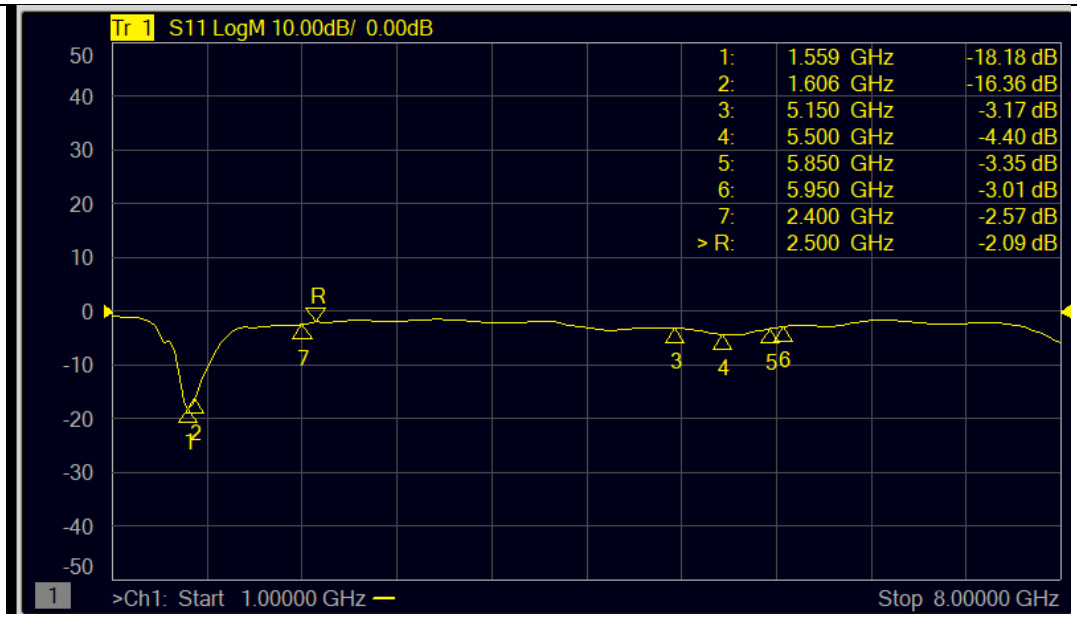
Ant6


Tr 2 S22 LogM 10.00dB/ 0.00dB
> 1: 2.400 GHz -1.65 dB
2: 2.500 GHz -1.28 dB
3: 5.150 GHz -6.49 dB
4: 5.500 GHz -6.10 dB
5: 5.850 GHz -10.87 dB
6: 5.925 GHz -11.80 dB
7: 6.500 GHz -13.17 dB
R: 7.125 GHz -14.95 dB
50
40
30
20
10
0
-10
-20
-30
-40
-50
Ch1: Start 1.00000 GHz
Stop 8.00000 GHz

Ant7


Tr 2 S22 LogM 10.00dB/ 0.00dB
> 1: 2.400 GHz -20.84 dB
2: 2.500 GHz -13.14 dB
3: 5.150 GHz -2.87 dB
4: 5.500 GHz -2.87 dB
5: 5.850 GHz -2.20 dB
6: 5.925 GHz -2.29 dB
7: 6.500 GHz -2.34 dB
R: 7.125 GHz -2.99 dB
50
40
30
20
10
0
-10
-20
-30
-40
-50
Ch1: Start 1.00000 GHz
Stop 8.00000 GHz

Ant8



4.1 Antenna Gain

4.1.1 Peak Gain

Frequency	2.45GHz 2400~2500MHz
Ant1 MaxGain(dBi)	2.00
Ant2 MaxGain(dBi)	2.00
Ant3 MaxGain(dBi)	2.00
Ant4 MaxGain(dBi)	2.00
Ant1 Polarization/ Φ (°) / θ (°)	Phi/120/105
Ant2 Polarization/ Φ (°) / θ (°)	Phi/60/90
Ant3 Polarization/ Φ (°) / θ (°)	Theta/120/105
Ant4 Polarization/ Φ (°) / θ (°)	Theta/45/105
Max Gain(dBi)	2.00

Frequency	5.2GHz 5150~5250MHz	5.3GHz 5250~5350MHz	5.6GHz 5470~5725MHz	5.8GHz 5725~5850MHz
Ant3 MaxGain(dBi)	2.48	2.50	3.00	2.97
Ant4 MaxGain(dBi)	1.74	1.75	3.00	2.77
Ant3 Polarization/ Φ (°) / θ (°)	Theta/120/90	Theta/105/90	Theta/105/90	Theta/105/90
Ant4 Polarization/ Φ (°) / θ (°)	Theta/75/90	Theta/75/90	Theta/75/90	Theta/90/90
Max Gain(dBi)	2.48	2.50	3.00	2.97

Frequency	6.175GHz	6.475GHz	6.725GHz	7.025GHz

	5925~6425MHz	6425~6525MHz	6525~6875MHz	6875~7125MHz
Ant5 MaxGain(dBi)	3.00	1.76	2.48	2.68
Ant6 MaxGain(dBi)	2.11	2.76	3.00	2.65
Ant5 Polarization/Φ (°) / θ (°)	Theta/135/90	Theta/120/90	Theta/120/90	Theta/120/90
Ant6 Polarization/Φ (°) / θ (°)	Theta/0/90	Theta/0/90	Theta/345/90	Theta/0/90
Max Gain(dBi)	3.00	2.76	3.00	2.68

Frequency	2.45GHz(BLE) 2400~2500MHz
Ant7 MaxGain(dBi)	3.00
Ant7 Polarization/Φ (°) / θ (°)	Theta/90/90
Max Gain(dBi)	3.00

Frequency	1.575GHz(GPS) 1559~1606MHz
Ant8 MaxGain(dBi)	3.00
Ant8 Polarization/Φ (°) / θ (°)	Theta/90/90
Max Gain(dBi)	3.00

4.2 Horizontal plane Gain

4.2.1 5150~5250MHz

θ	>30°
Ant3 MaxGain(dBi)	-7.17
Ant4 MaxGain(dBi)	-6.38
Max Gain(dBi)	-6.38

4.2.2 5925~6425MHz

θ	>30°
Ant5 MaxGain(dBi)	-7.75
Ant6 MaxGain(dBi)	-6.15
Max Gain(dBi)	-6.15

4.2.3 6425~6525MHz

θ	>30°
Ant5 MaxGain(dBi)	-7.13
Ant6 MaxGain(dBi)	-7.01
Max Gain(dBi)	-7.01

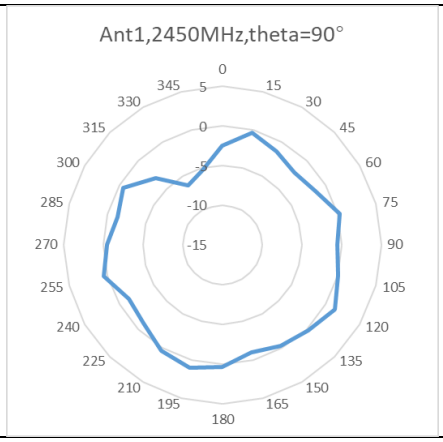
4.2.4 6525~6875MHz

θ	>30°
Ant5 MaxGain(dBi)	-7.20

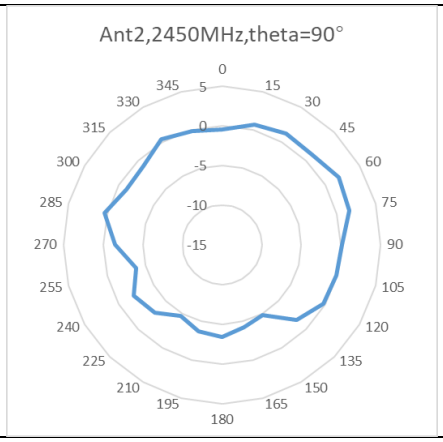
Ant6 MaxGain(dBi)	-7.07
Max Gain(dBi)	-7.07

4.3 Antenna Radiation Pattern

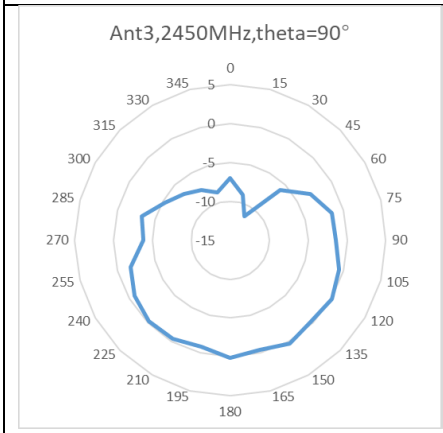
Ant1

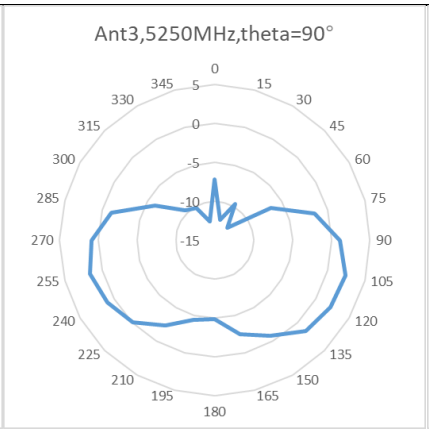


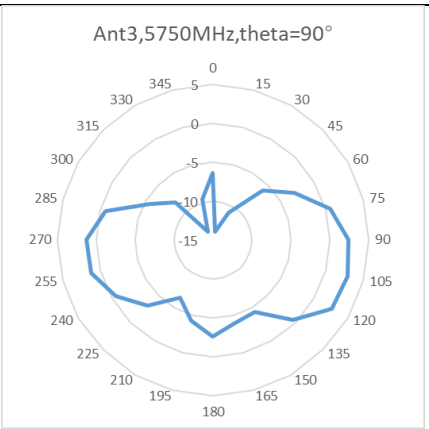
Ant2

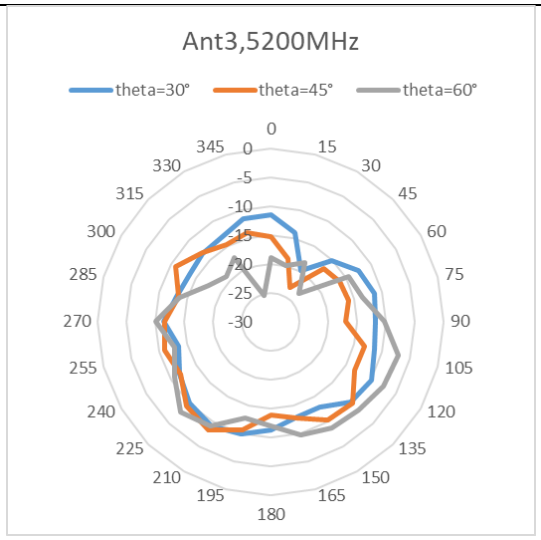


Ant3



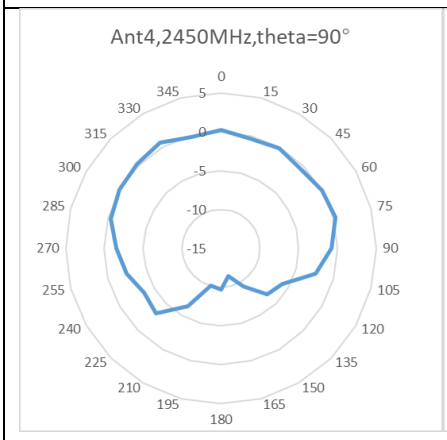


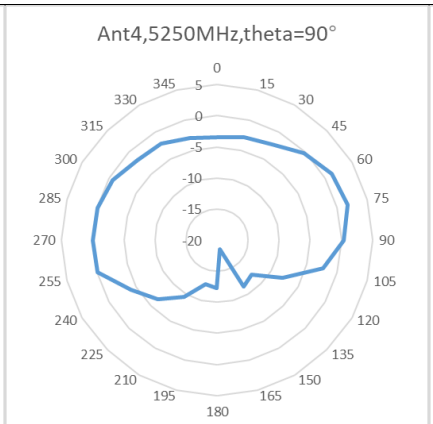


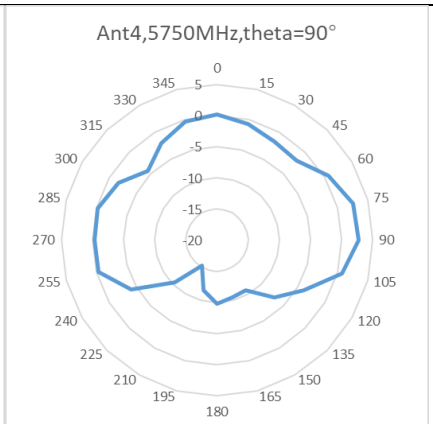


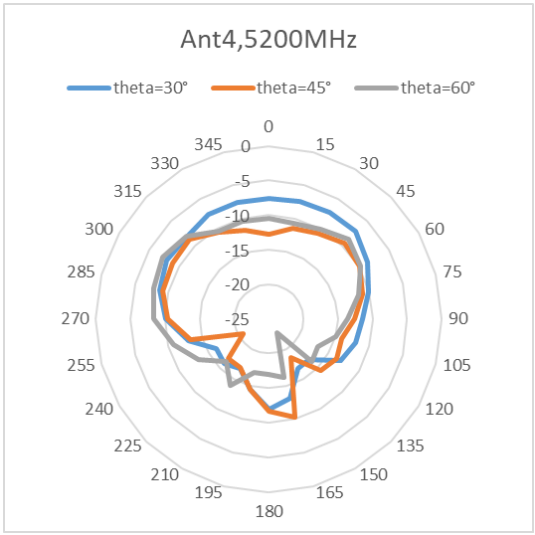
5.2GHz PeakGain at elevation angle above 30° =-7.17dBi

Ant4



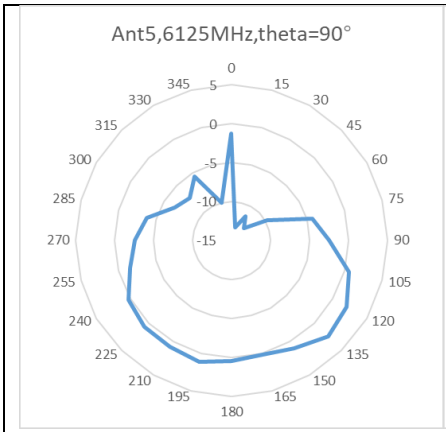


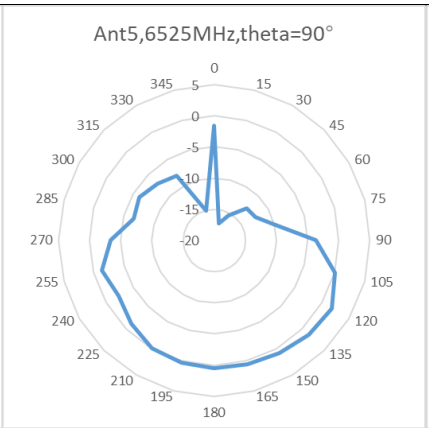


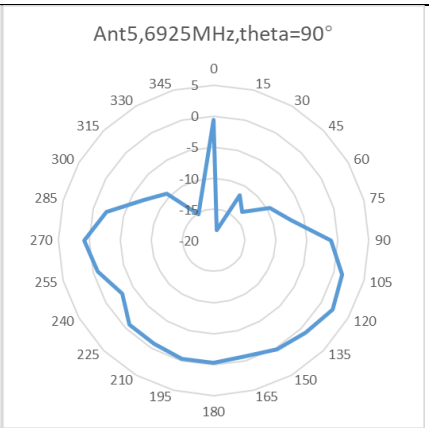


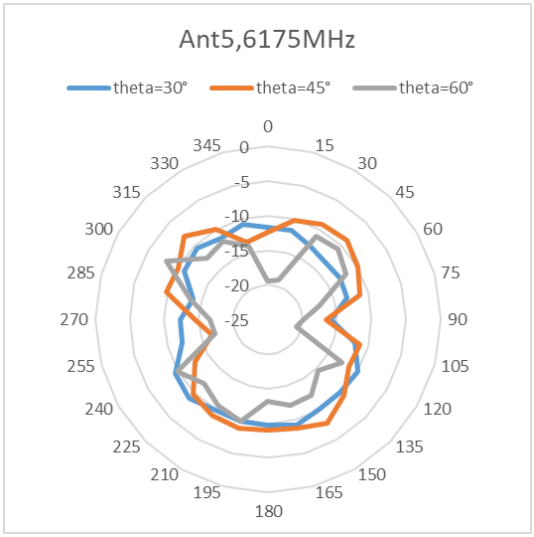
5.2GHz PeakGain at elevation angle above 30° =-6.38dBi

Ant5

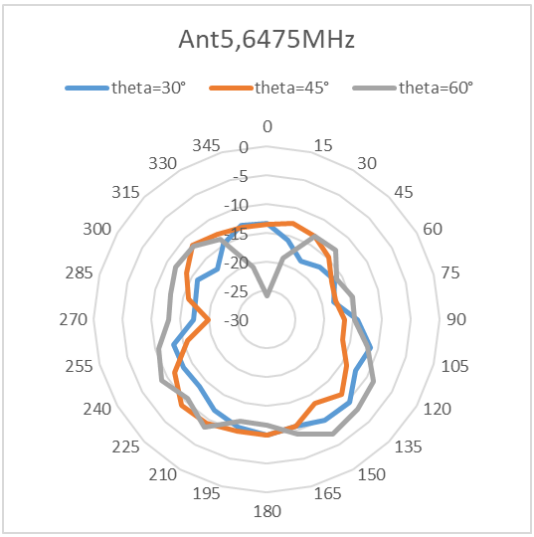




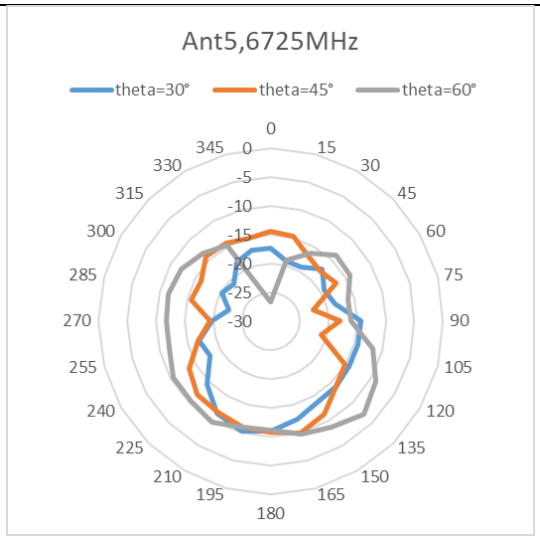




6.175GHz PeakGain at elevation angle above 30° =-7.75dBi

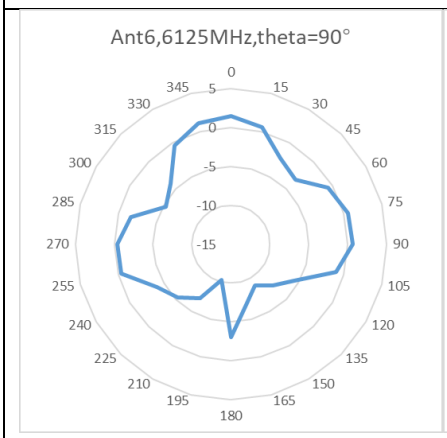


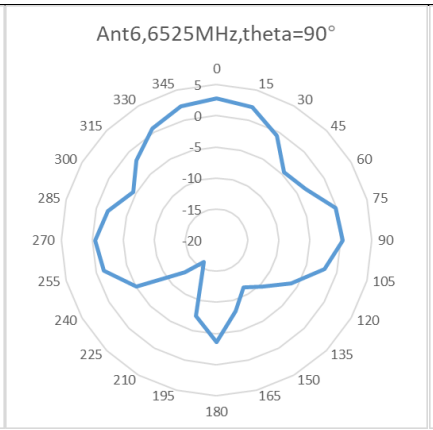
6.475GHz PeakGain at elevation angle above 30° =-7.13dBi

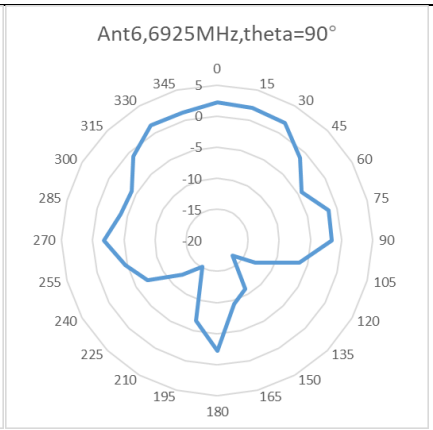


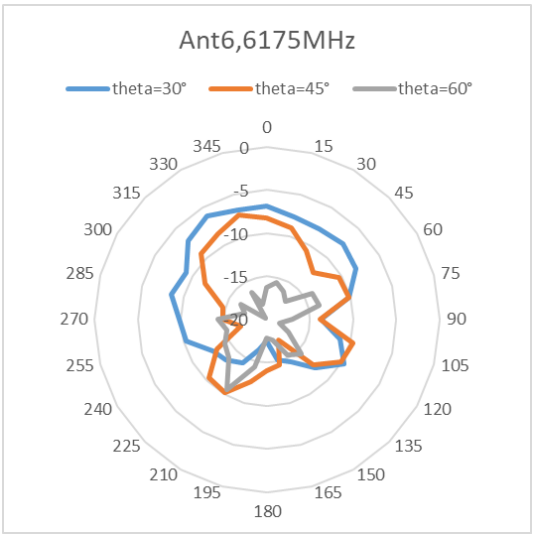
6.725GHz PeakGain at elevation angle above 30° =-7.20dBi

Ant6

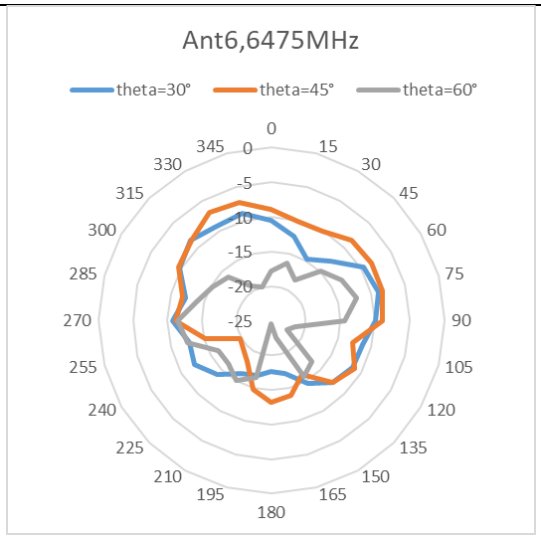




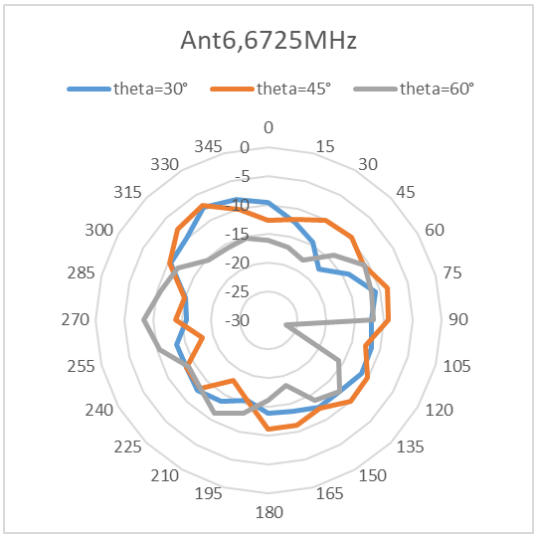




6.175GHz PeakGain at elevation angle above 30° =-6.15dBi

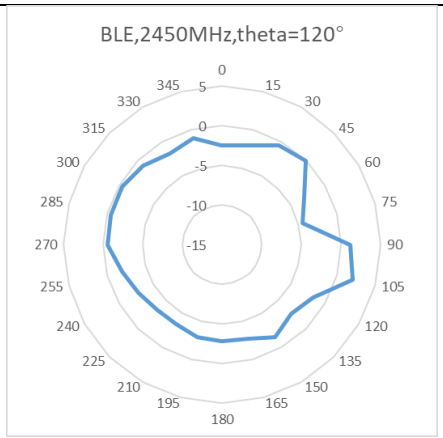


6.475GHz PeakGain at elevation angle above 30° =-7.01dBi

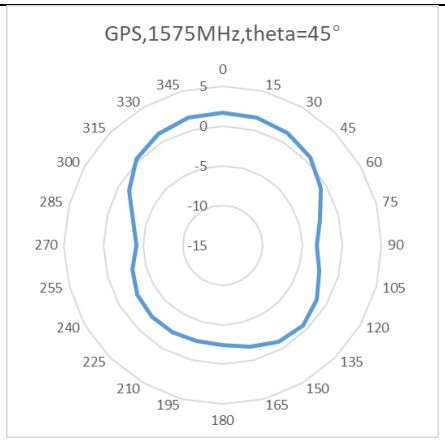


6.725GHz PeakGain at elevation angle above 30° =-7.07dBi

Ant7



Ant8


GPS,1575MHz,theta=45°
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
5
0
-5
-10
-15