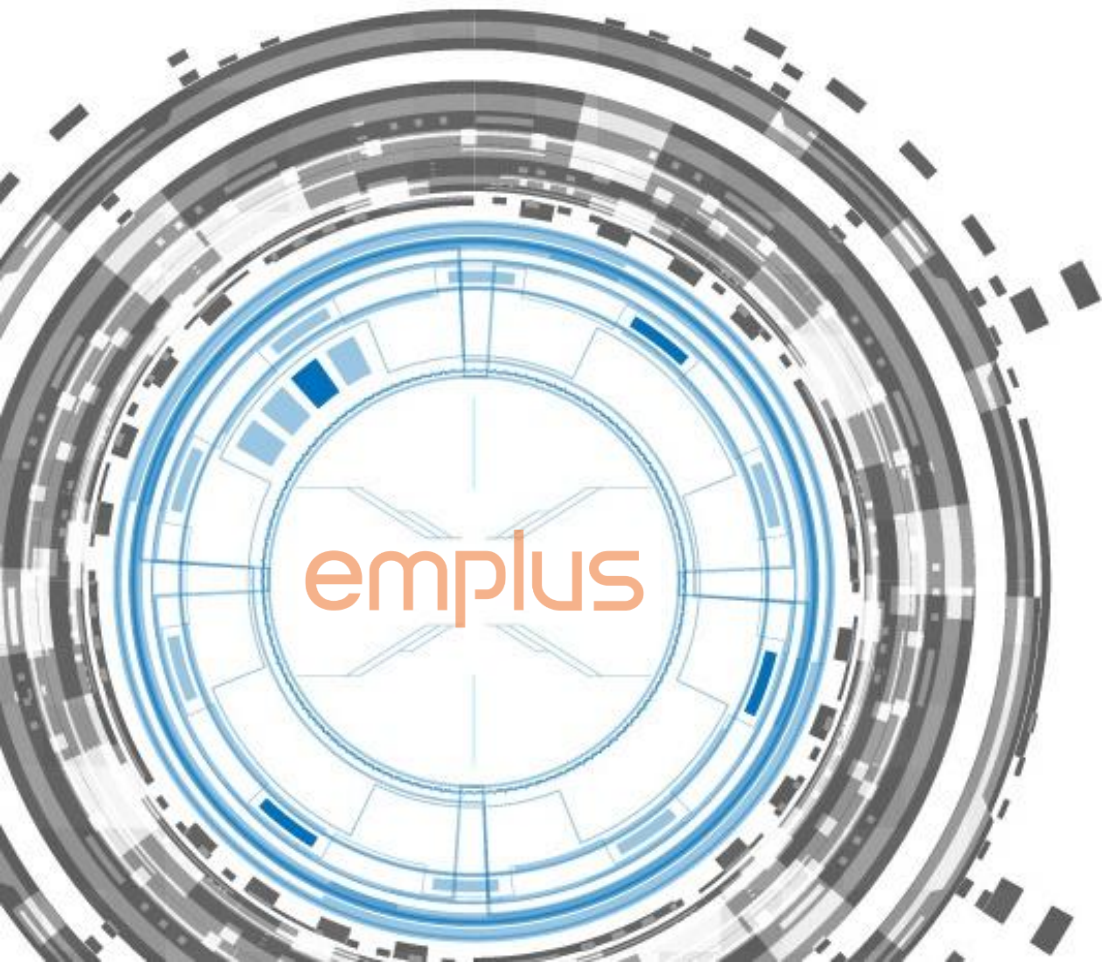




RA641 Antenna design proposal

V0.1
Tim Chao
2022/12/29

Agenda

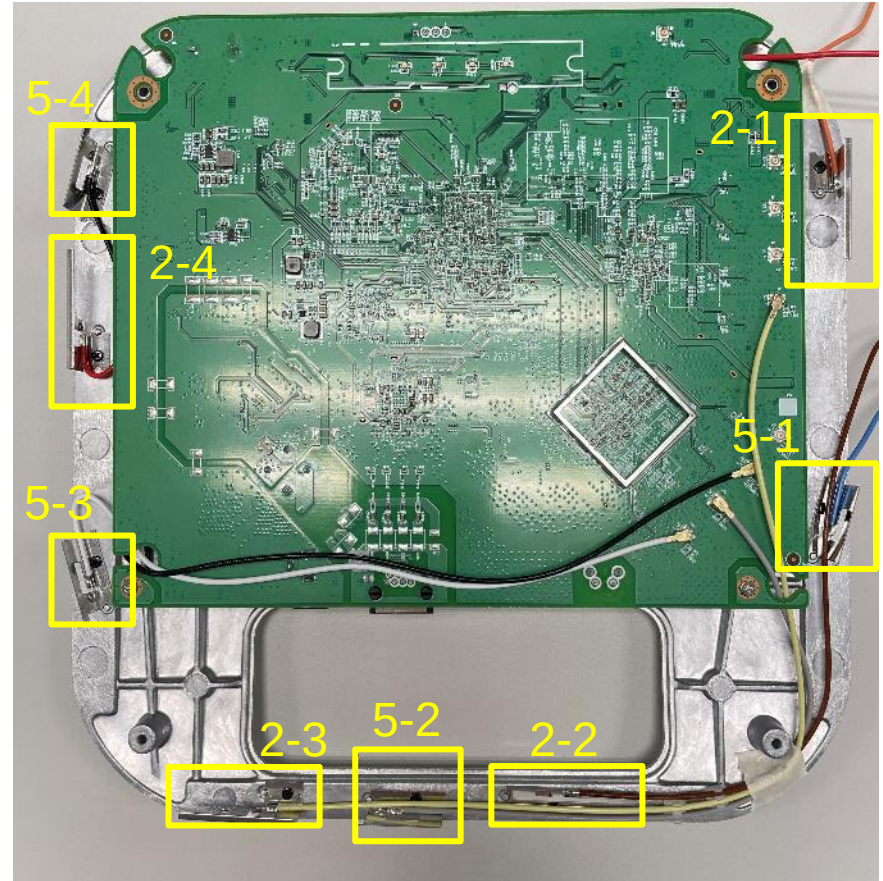
- History
- Antenna Placement
- Antenna pictures
- Return loss & Isolation
- Gain table
- 2D Radiation Pattern
- Combine Pattern

History

Date	Description	Version
2022/12/29	Copy from WAP380 ; 2.4GHz*4, 5GHz*4, BT*1	V0.1

Antenna Placement

- RA641 have total eight antennas as figure :
- 2.45GHz * 4
- 5GHz * 4



Antenna pictures

	Size(mm)	Material	PN	Type
2-1	29x10x7	Metal	7102A0581000	PIFA
2-2	31x9.9x5.3	Metal	7102A0578000	PIFA
2-3	29x10x7	Metal	7102A0582000	PIFA
2-4	29x10x7	Metal	7102A0583000	PIFA
5-1	21x10x5	Metal	7102A0584000	PIFA
5-2	21x10x5	Metal	7102A0587000	PIFA
5-3	21x10x5	Metal	7102A0585000	PIFA
5-4	21x10x5	Metal	7102A0586000	PIFA



2-1
ANT4



2-2
ANT2



2-3
ANT1



2-4
ANT3



5-1
ANT4



5-2
ANT3

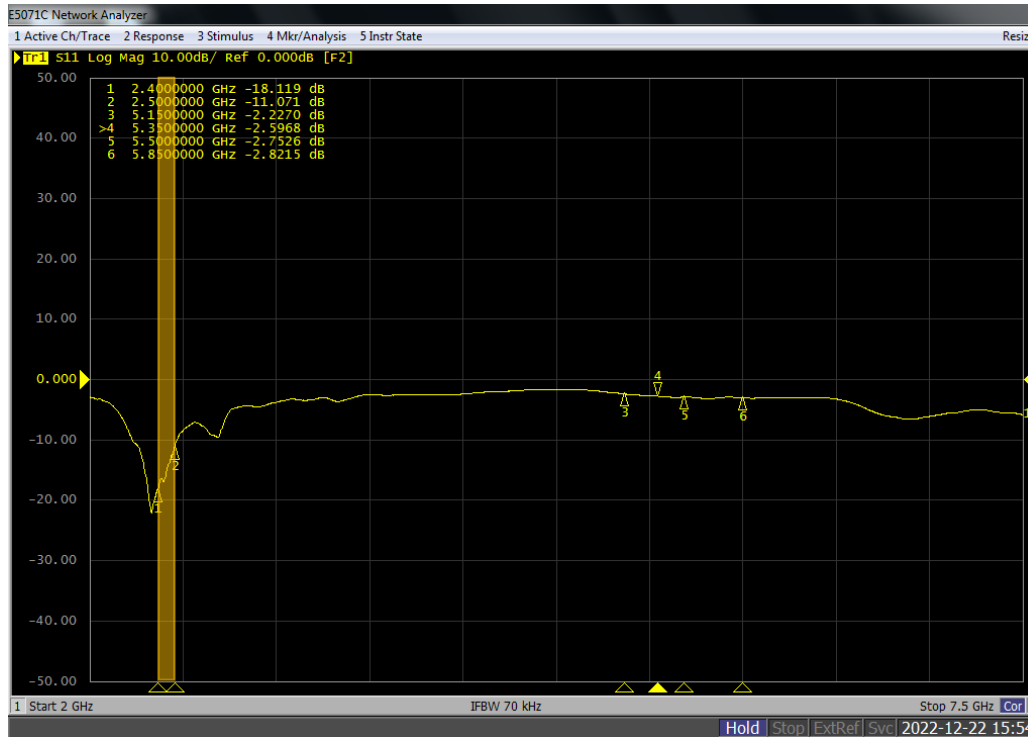


5-3
ANT1



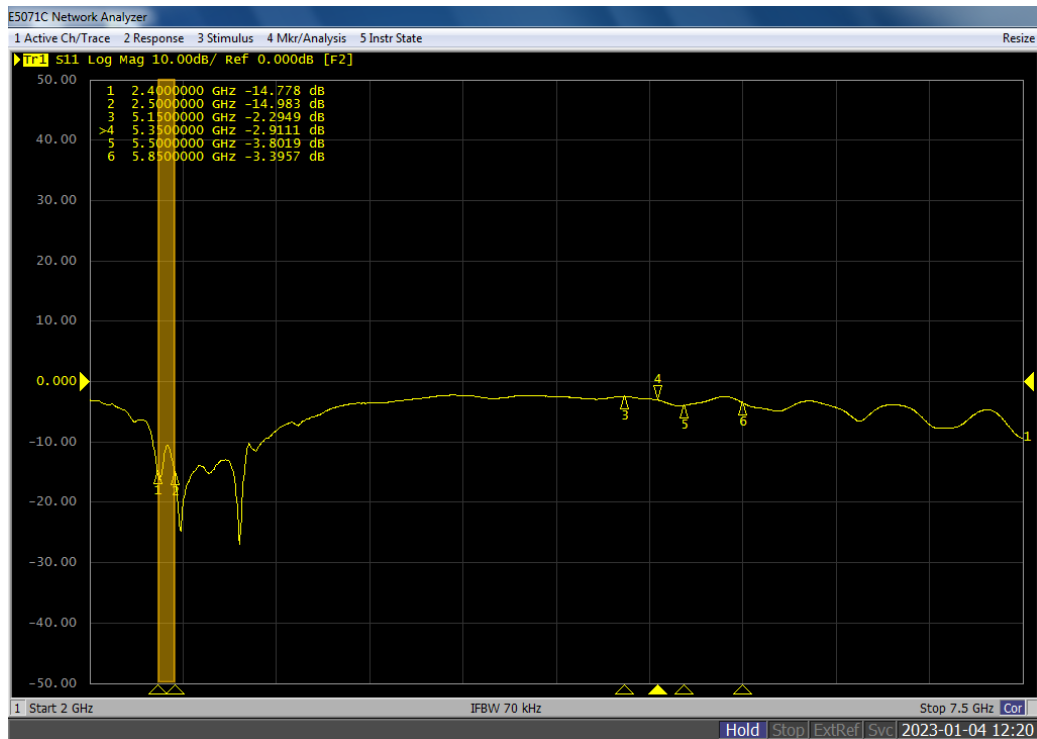
5-4
ANT2

Return Loss : 2-1



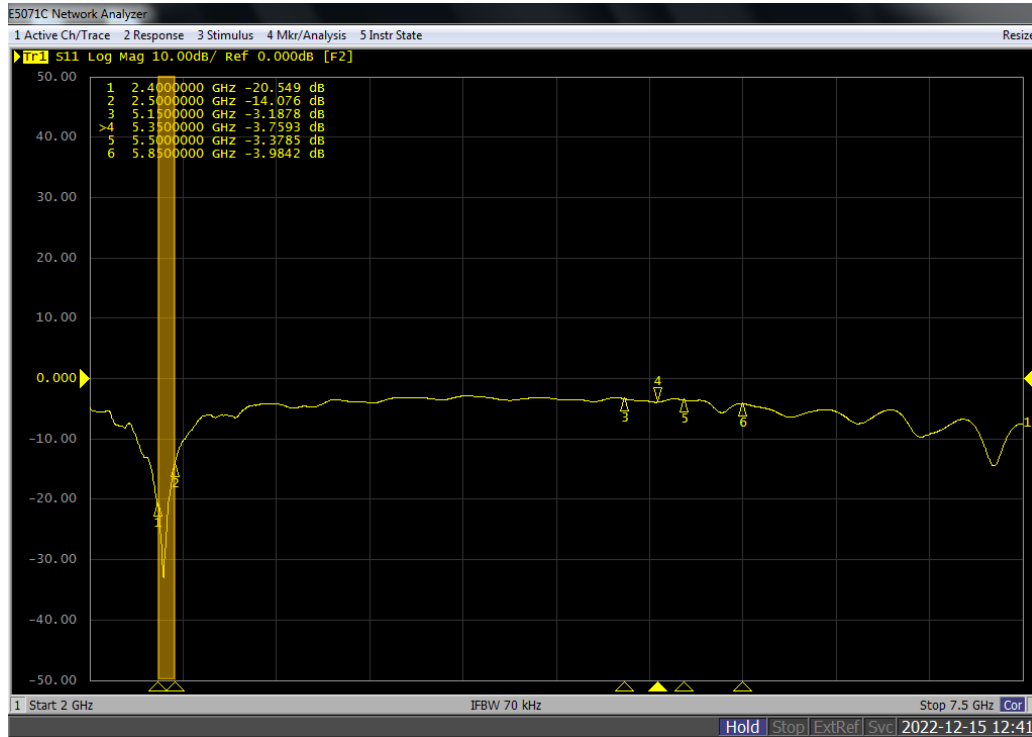
Criteria : $\leq -10\text{dB}$

Return Loss : 2-2



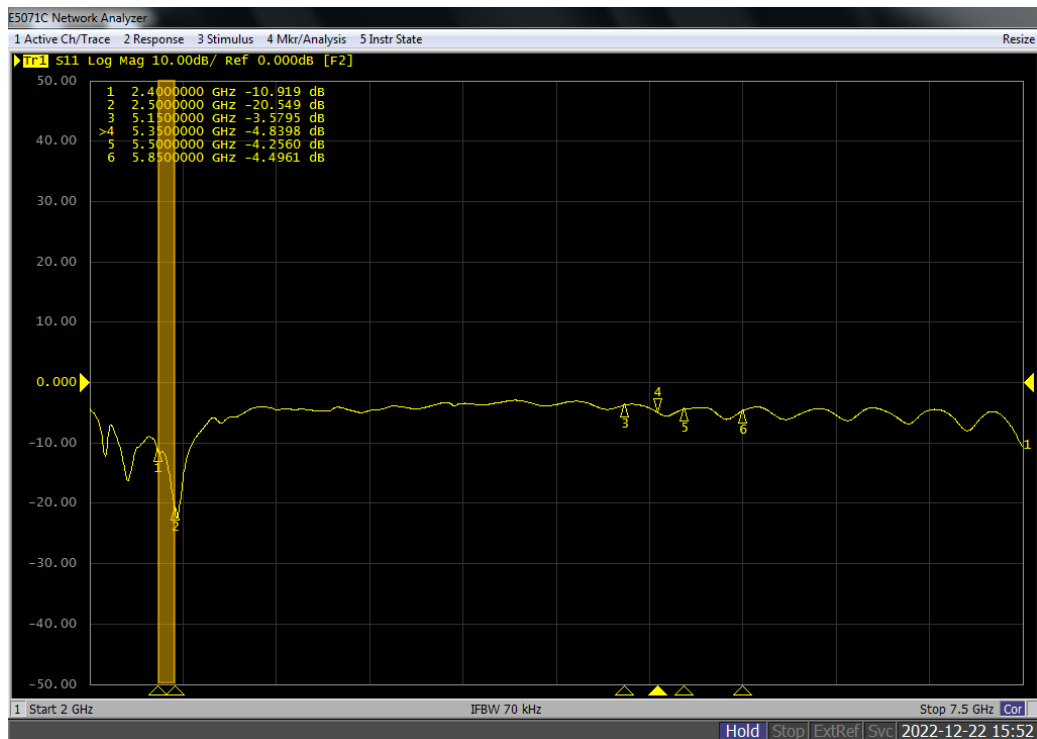
Criteria : ≤ -10 dB

Return Loss : 2-3



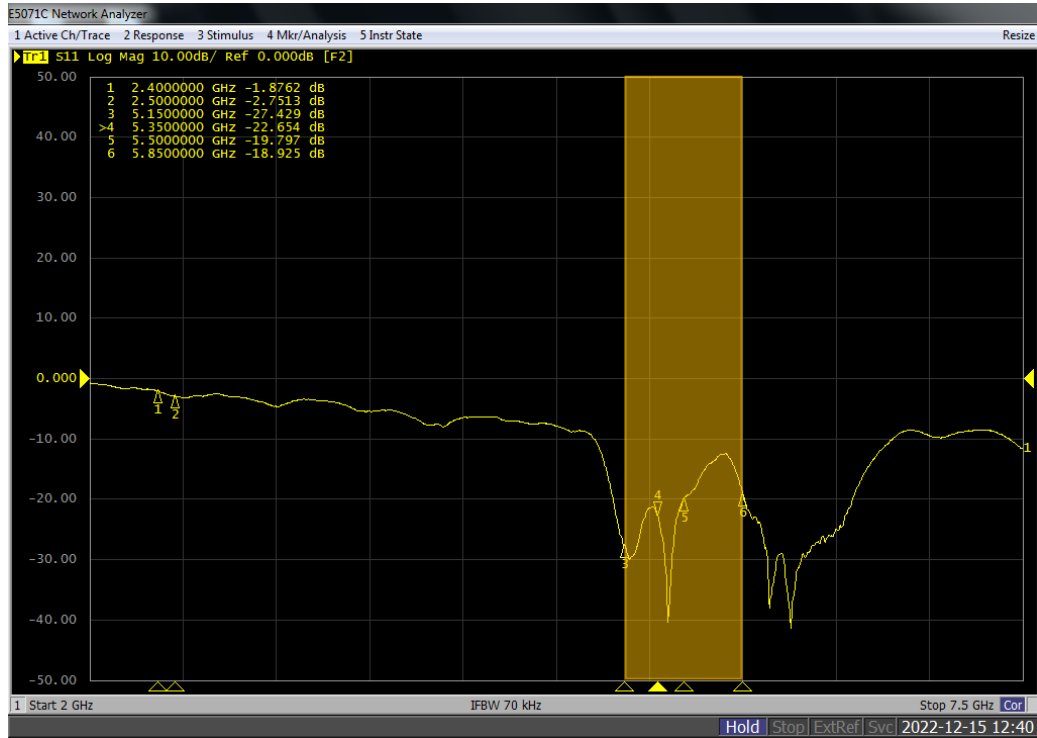
Criteria : $\leq -10\text{dB}$

Return Loss : 2-4



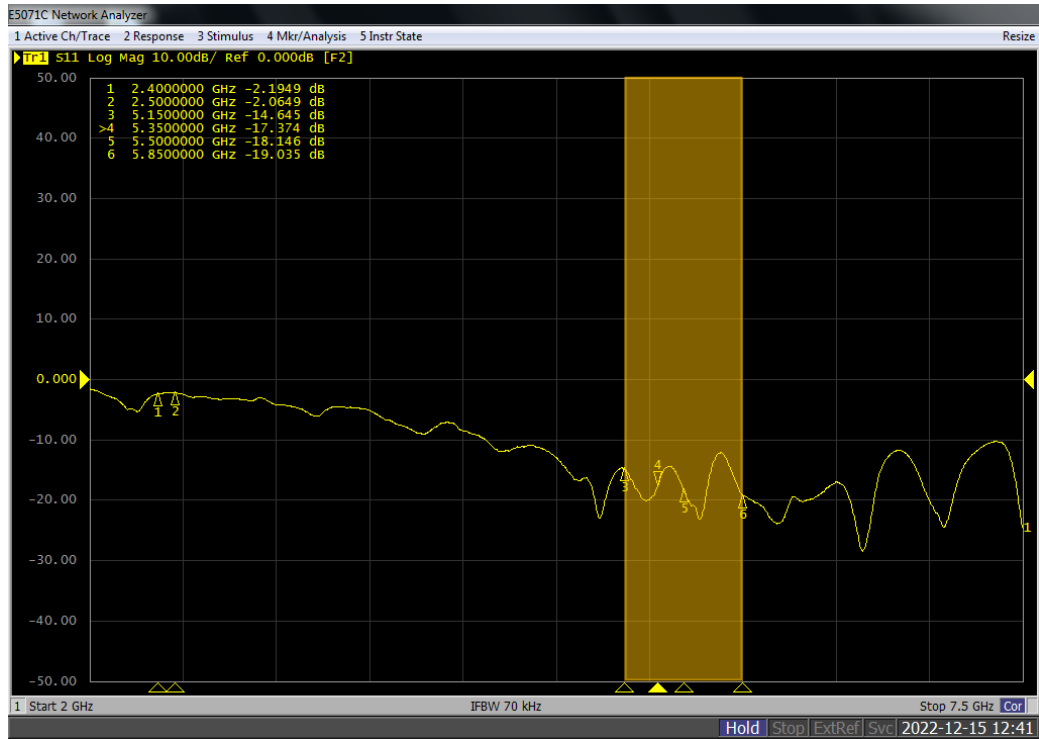
Criteria : $\leq -10\text{dB}$

Return Loss : 5-1



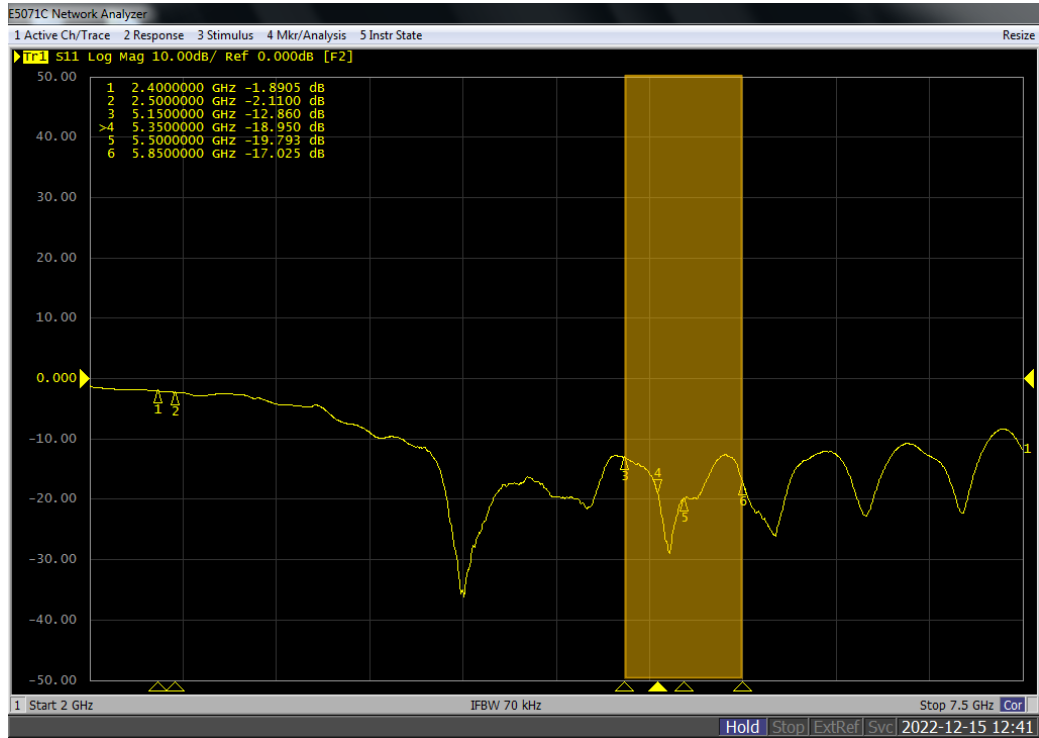
Criteria : $\leq -10\text{dB}$

Return Loss : 5-2



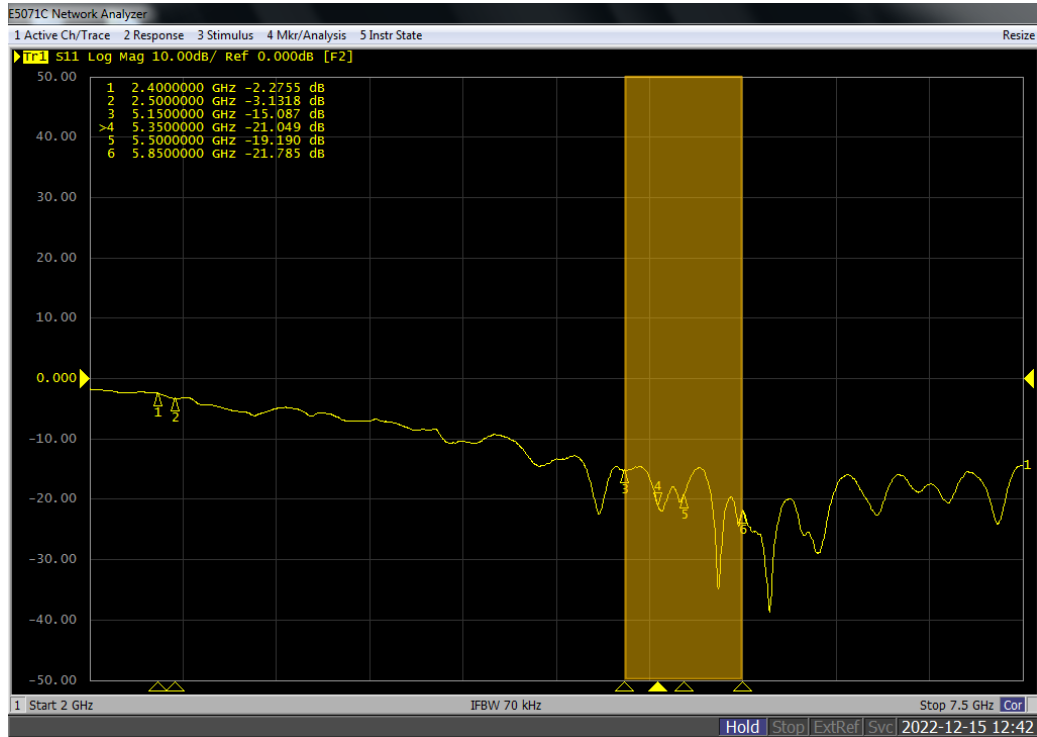
Criteria : $\leq -10\text{dB}$

Return Loss : 5-3



Criteria : $\leq -10\text{dB}$

Return Loss : 5-4



Criteria : $\leq -10\text{dB}$

Return loss table

S11(dB)	2.4GHz	2.5GHz	5.15GHz	5.35GHz	5.5GHz	5.85GHz
2-1	-18.1	-11				
2-2	-14.7	-14.9				
2-3	-20.5	-14				
2-4	-10.9	-20.5				
5-1			-27	-22	-19	-18
5-2			-14	-17	-18	-19
5-3			-12	-18	-19	-17
5-4			-15	-21	-19	-21

Isolation at 2.45GHz

	2-1	2-2	2-3	2-4	BT
2-1	NA	-24.4	-23.6	-21.5	-21.3
2-2	NA	NA	-16	-28.3	-20
2-3	NA	NA	NA	-23.3	-31.5
2-4	NA	NA	NA	NA	-26.1

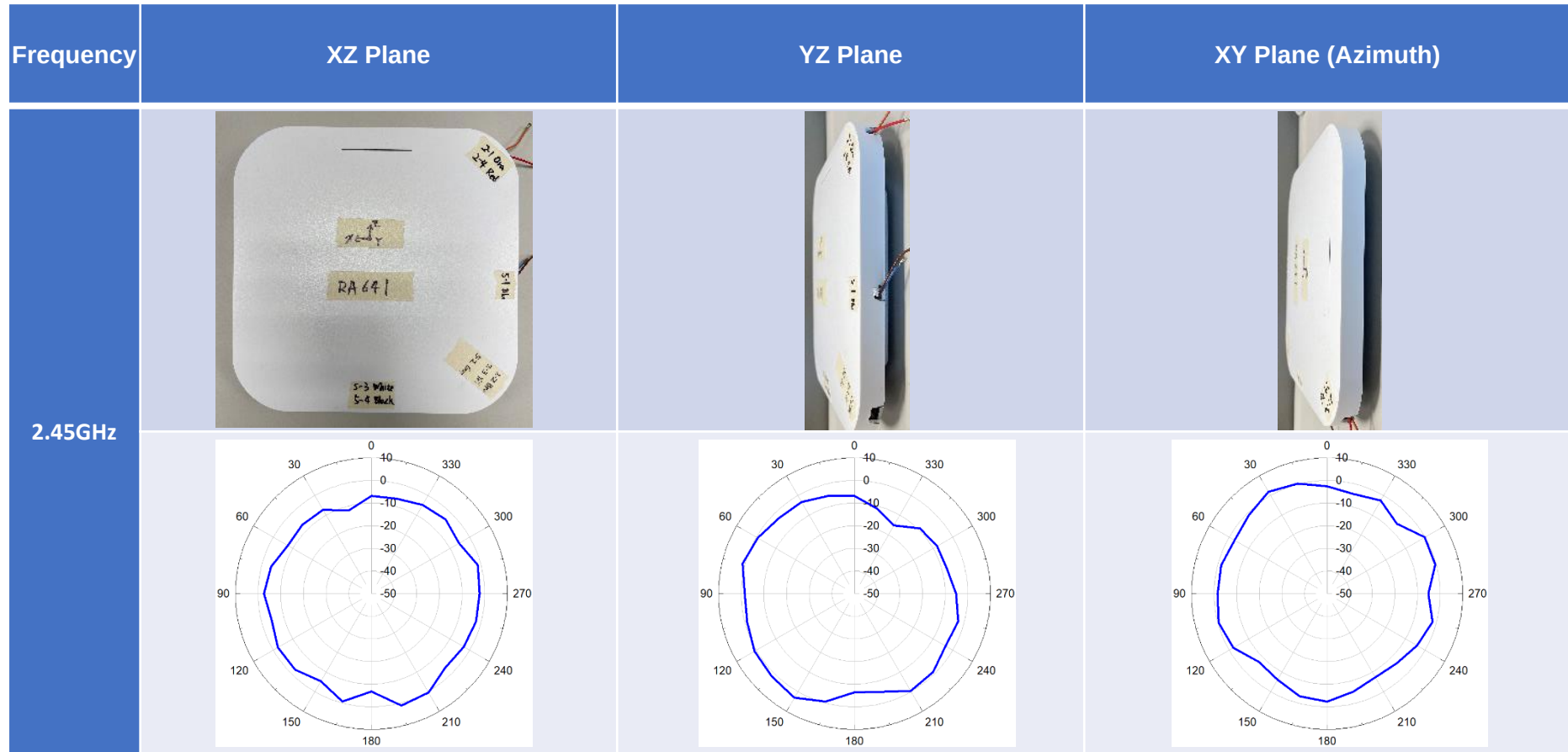
Isolation at 5.5GHz

	5-1	5-2	5-3	5-4
5-1	NA	-24.3	-32.6	-43.6
5-2	NA	NA	-31.2	-32.1
5-3	NA	NA	NA	-25.5
5-4	NA	NA	NA	NA

Gain table

Antenna		2400~2483.5MHz	5150~5250MHz	5250~5350MHz	5470~5725MHz	5725~5850MHz
2-1	Peak Gain (dBi)	3.2				
	Effi.(%)	67.8				
2-2	Peak Gain (dBi)	2.3				
	Effi.(%)	56.9				
2-3	Peak Gain (dBi)	3.7				
	Effi.(%)	70.6				
2-4	Peak Gain (dBi)	1.9				
	Effi.(%)	52.5				
5-1	Peak Gain (dBi)		4.6	5.6	5.2	5.4
	Effi.(%)		73.8	76.3	75	75.2
5-2	Peak Gain (dBi)		3.7	4.1	3.5	4.2
	Effi.(%)		60.3	56.7	61.8	62.4
5-3	Peak Gain (dBi)		4.7	5.9	5.1	5.2
	Effi.(%)		69.7	74.8	72.8	75.2
5-4	Peak Gain (dBi)		4.4	5.2	4.6	4.3
	Effi.(%)		59.7	65.3	60	63

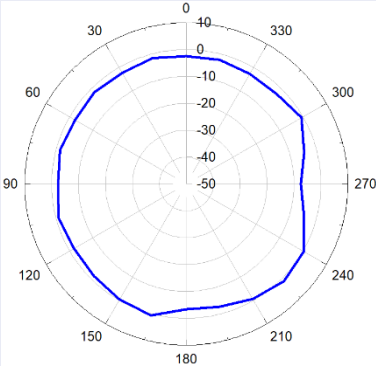
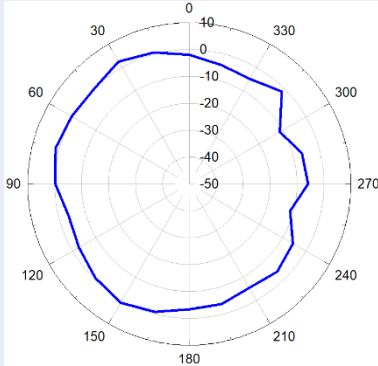
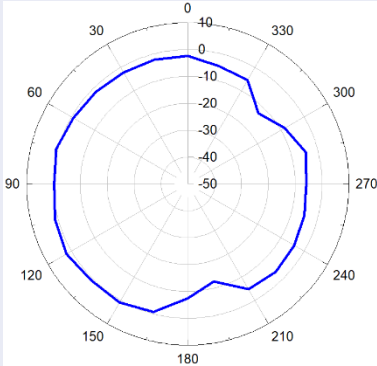
2D pattern : 2-1



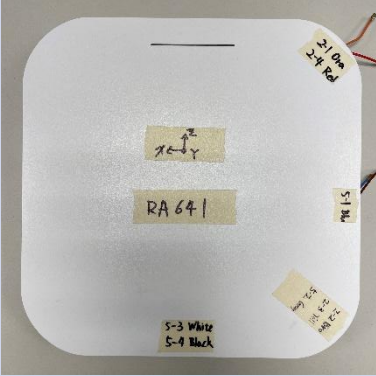
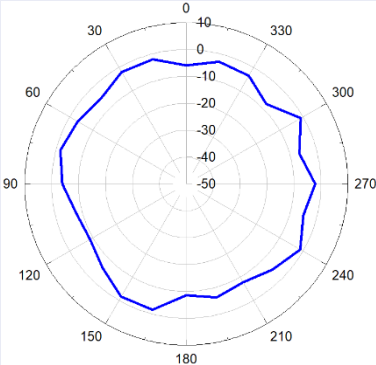
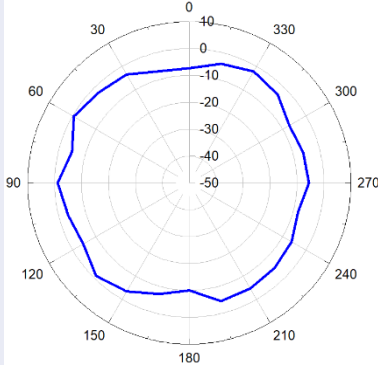
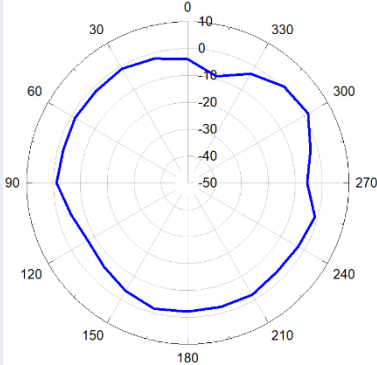
2D pattern : 2-2



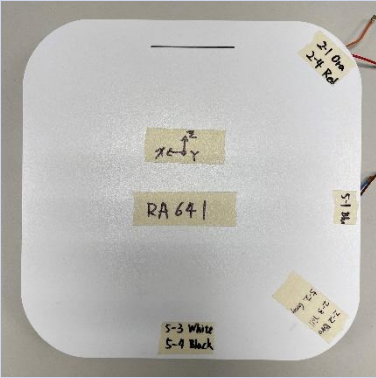
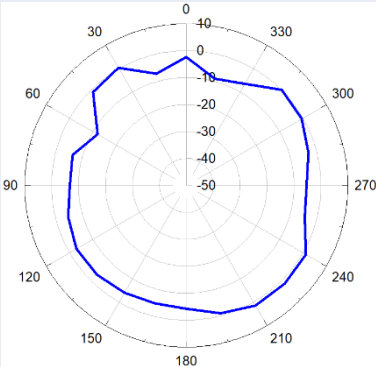
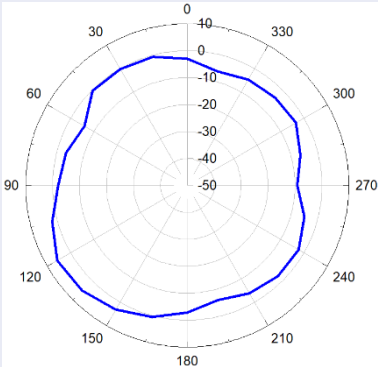
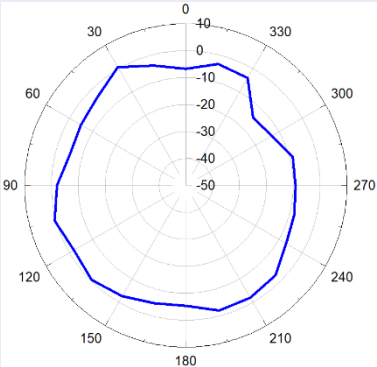
2D pattern : 2-3

Frequency	XZ Plane	YZ Plane	XY Plane (Azimuth)
2.45GHz			
			

2D pattern : 2-4

Frequency	XZ Plane	YZ Plane	XY Plane (Azimuth)
2.45GHz			
			

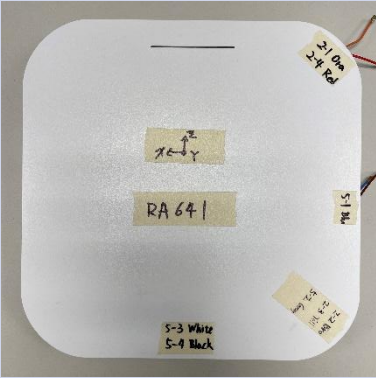
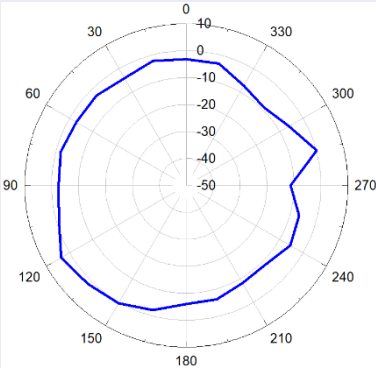
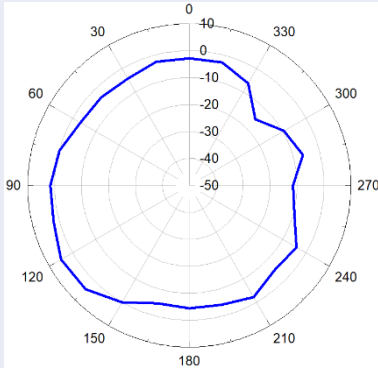
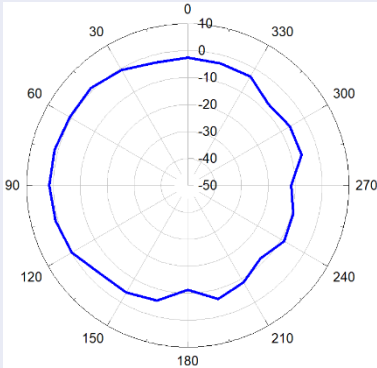
2D pattern : 5-1

Frequency	XZ Plane	YZ Plane	XY Plane (Azimuth)
5.5GHz	 	 	 

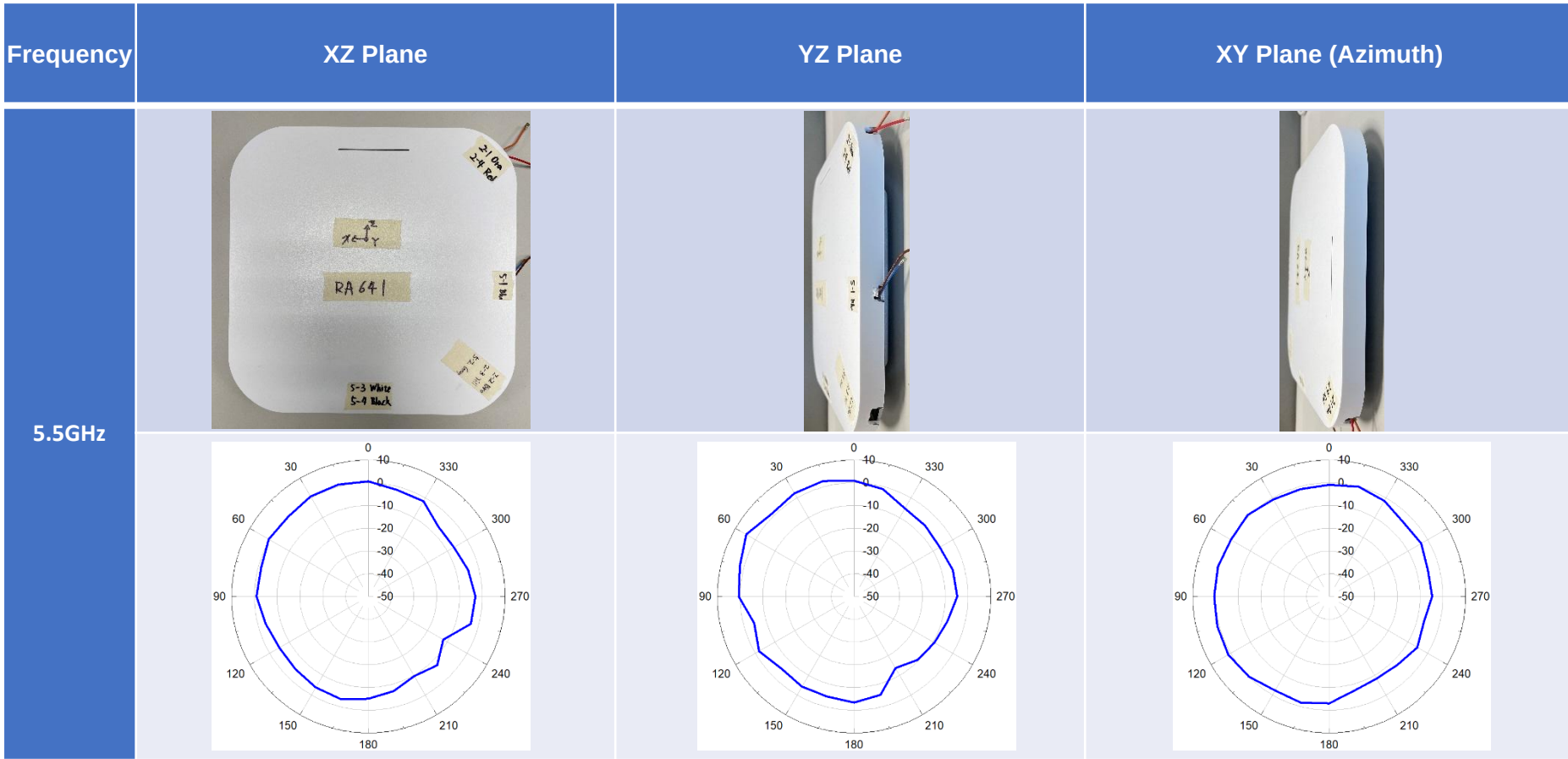
2D pattern : 5-2



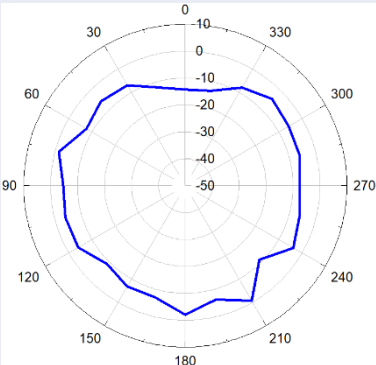
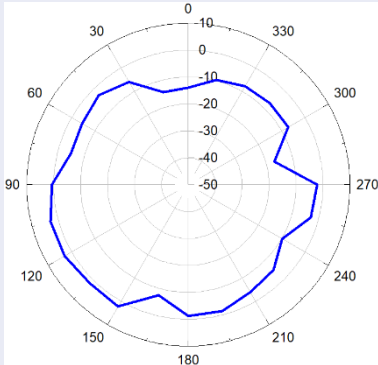
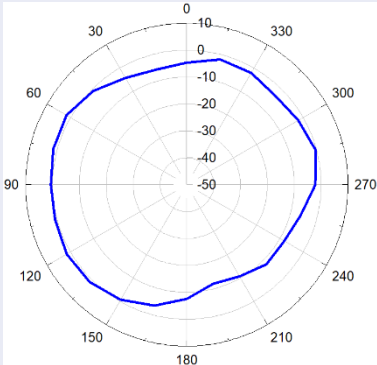
2D pattern : 5-3

Frequency	XZ Plane	YZ Plane	XY Plane (Azimuth)
5.5GHz			
			

2D pattern : 5-4



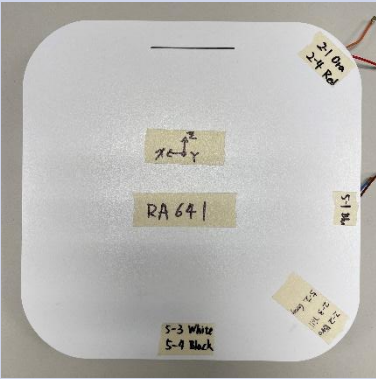
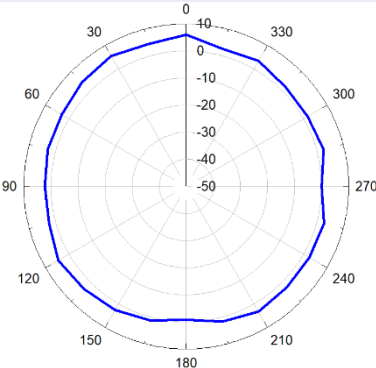
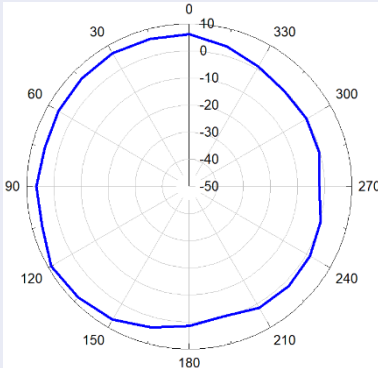
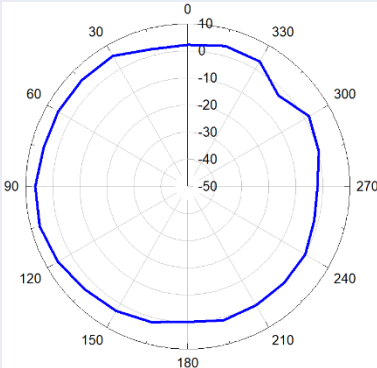
2D pattern : BT

Frequency	XZ Plane	YZ Plane	XY Plane (Azimuth)
2.45GHz			
			

Combine pattern : 2.45GHz



Combine pattern : 5.5GHz

Frequency	XZ Plane	YZ Plane	XY Plane (Azimuth)
5.5GHz	 	 	 



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