



Product Name: 3-in-1 5G NR/4G LTE/WiFi/GNSS Combination Antenna,
Magnetic Mount or Adhesive Mount

Part Number: MT-4B-AS-BL03

Features:

- 1*LTE, 1*WiFi, 1*GNSS Antenna Combination
- 5G NR/4G LTE Full Frequency Bands, 698-3800MHz
- WiFi Dual Bands, 2400-2500MHz, 5150-5850MHz Supporting
- GPS / GLONASS / BEIDOU L1 Band
- Excellent Out of Band Suppression, Up to 55 dB
- 27dB Active Peak Gain
- Customizable Mount Types, Adhesive Mount or Magnetic Mount
- Customizable Cables and Connectors
- RoHS & REACH Compliant

Applications:

- Fleet Management & Telematics
- Vehicle Navigation



3-in-1 5G NR/4G LTE / WiFi / GNSS Combination Antenna, Adhesive or Magnetic Mount

MODEL: MT-4B-AS-BL03

WI-RD-D-269 V1.0

I. Specifications:

Category	GNSS		
Passive Antenna Performance			
Application Band	BeiDou	GPS	GLONASS
Frequency (MHz)	1561	1575.42	1602
Efficiency (%)	49.89	42.76	58.61
Average Gain (dBi)	-3.02	-3.69	-2.32
Peak Gain (dBi)	1.21	1.21	1.44
V.S.W.R	< 3		
Return loss (dB)	< -6		
Impedance (Ω)	50		
Polarization	R.H.C.P. (Right Handed Circular Polarization)		
Active Antenna Performance			
Application band	BeiDou	GPS	GLONASS
Frequency (MHz)	1561±2.046MHz	1575.42±1.023MHz	1602 ±5MHz
Gain (dB)	27	27	27
Noise Figure (dB)	0.98	0.98	0.92
Current Consumption	9.0mA (typical)		
Output Impedance (Ω)	50		
GNSS _Out of Band Rejection			
Frequency (MHz)	600~1300	1300~1530	1650~3000
Gain (dB)	55	30	30
ESD Protection	+/- 8 KV (direct discharge) +/- 15KV (air discharge)		
Cable/Connector	H-100, 3 meters , SMA(M)		

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Category		LTE						
Application Band		LTE 700	GSM 850/900	DCS	PCS	UMTS1	LTE2600	5G NR Band
Frequency (MHz)		698 ~ 824	824 ~ 960	1710 ~ 1880	1850 ~ 1990	1920 ~ 2170	2300 ~ 2690	3300~ 3800
Efficiency (%)								
Free space	30cm	55.81	70.29	67.89	73.24	64.68	58.18	15.73
	1m	54.29	68.18	65.13	70.22	61.80	55.05	14.78
	2m	49.51	61.59	56.73	61.00	53.11	45.79	12.02
	3m	45.16	55.63	49.41	52.99	45.64	38.08	9.77
	5m	37.56	45.39	37.48	39.99	33.70	26.35	6.45
On the 30*30 cm ground plane	30cm	40.09	48.87	52.66	60.24	57.01	40.48	17.21
	1m	38.99	47.40	50.52	57.75	54.47	38.30	16.17
	2m	35.56	42.81	44.00	50.17	46.81	31.86	13.14
	3m	32.43	38.67	38.32	43.58	40.23	26.50	10.68
	5m	26.98	31.56	29.07	32.89	29.71	18.33	7.06
Average Gain (dBi)								
Free space	30cm	-2.53	-1.53	-1.68	-1.35	-1.89	-2.35	-8.03
	1m	-2.65	-1.66	-1.86	-1.54	-2.09	-2.59	-8.30
	2m	-3.05	-2.11	-2.46	-2.15	-2.75	-3.39	-9.20
	3m	-3.45	-2.55	-3.06	-2.76	-3.41	-4.19	-10.10
	5m	-4.25	-3.43	-4.26	-3.98	-4.72	-5.79	-11.90
On the 30*30 cm ground plane	30cm	-3.97	-3.11	-2.79	-2.20	-2.44	-3.93	-7.64
	1m	-4.09	-3.24	-2.97	-2.38	-2.64	-4.17	-7.91
	2m	-4.49	-3.68	-3.57	-3.00	-3.30	-4.97	-8.81
	3m	-4.89	-4.13	-4.17	-3.61	-3.96	-5.77	-9.71
	5m	-5.69	-5.01	-5.37	-4.83	-5.27	-7.37	-11.51
Peak Gain (dBi)								
Free space	30cm	3.74	4.39	4.95	4.95	4.49	7.36	-0.51
	1m	3.62	4.24	4.77	4.77	4.31	7.12	-0.78
	2m	3.22	3.74	4.17	4.17	3.71	6.32	-1.68



	3m	2.82	3.24	3.57	3.57	3.11	5.52	-2.58
	5m	2.02	2.24	2.37	2.37	1.91	3.92	-4.38
On the 30*30 cm ground plane	30cm	2.42	3.82	3.61	4.60	4.62	3.75	1.30
	1m	2.30	3.70	3.43	4.39	4.41	3.51	1.03
	2m	1.90	3.30	2.83	3.79	3.79	2.71	0.13
	3m	1.50	2.90	2.23	3.19	3.19	1.91	-0.77
	5m	0.70	2.10	1.03	1.99	1.99	0.31	-2.57
V.S.W.R	< 3							
Return loss (dB)	< -6							
Impedance (Ω)	50							
Polarization	Linear							

Category		WiFi						
Frequency (MHz)		2400	2450	2500	5150	5350	5725	5850
Efficiency (%)								
Free space	30cm	92.47	90.16	93.76	84.53	80.72	71.78	58.48
	1m	73.45	71.61	74.47	59.84	57.15	49.66	40.46
	2m	53.21	51.88	53.95	36.90	35.24	28.58	23.28
	3m	37.67	36.73	38.19	22.75	21.73	16.83	13.71
	5m	19.77	19.28	20.04	8.45	8.07	5.70	4.65
On the 30*30 cm ground plane	30cm	61.80	58.88	62.95	76.03	79.07	71.45	52.60
	1m	49.09	46.77	50.00	53.83	55.98	49.43	36.39
	2m	35.56	33.88	36.22	33.19	34.51	28.44	20.94
	3m	25.18	23.99	25.64	20.46	21.28	16.75	12.33
	5m	13.21	12.59	13.46	7.60	7.91	5.68	4.18
Average Gain (dBi)								
Free space	30cm	-0.34	-0.45	-0.28	-0.73	-0.93	-1.44	-2.33
	1m	-1.34	-1.45	-1.28	-2.23	-2.43	-3.04	-3.93
	2m	-2.74	-2.85	-2.68	-4.33	-4.53	-5.44	-6.33
	3m	-4.24	-4.35	-4.18	-6.43	-6.63	-7.74	-8.63
	5m	-7.04	-7.15	-6.98	-10.73	-10.93	-12.44	-13.33

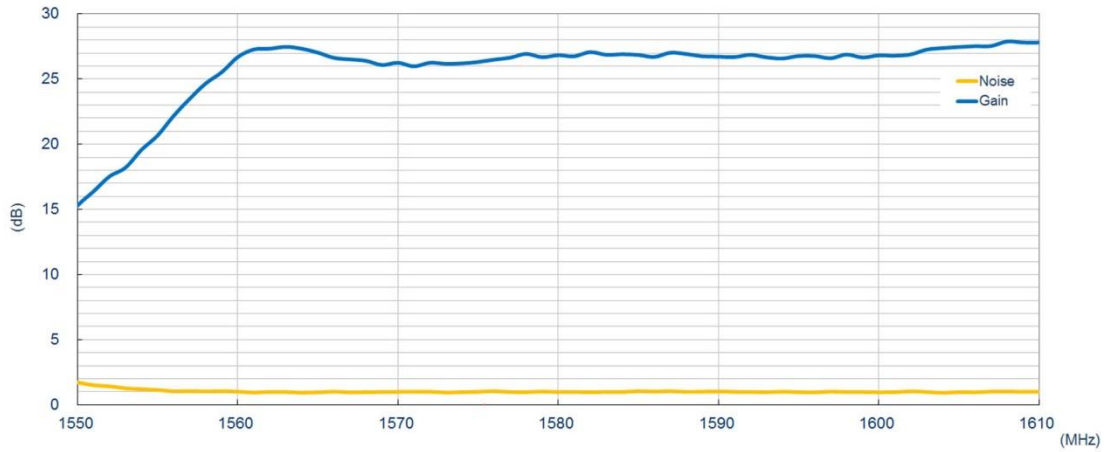


On the 30*30 cm ground plane	30cm	-2.09	-2.30	-2.01	-1.19	-1.02	-1.46	-2.79
	1m	-3.09	-3.30	-3.01	-2.69	-2.52	-3.06	-4.39
	2m	-4.49	-4.70	-4.41	-4.79	-4.62	-5.46	-6.79
	3m	-5.99	-6.20	-5.91	-6.89	-6.72	-7.76	-9.09
	5m	-8.79	-9.00	-8.71	-11.19	-11.02	-12.46	-13.79
Peak Gain (dBi)								
Free space	30cm	7.44	8.23	8.87	8.47	6.39	6.06	5.79
	1m	6.44	7.23	7.87	6.97	4.89	4.46	4.19
	2m	5.04	5.83	6.47	4.87	2.79	2.06	1.79
	3m	3.54	4.33	4.97	2.77	0.69	-0.24	-0.51
	5m	0.74	1.53	2.17	-1.53	-3.61	-4.94	-5.21
On the 30*30 cm ground plane	30cm	4.44	3.85	4.19	6.14	6.75	6.86	3.22
	1m	3.44	2.85	3.19	4.64	5.25	5.26	1.62
	2m	2.04	1.45	1.79	2.54	3.15	2.86	-0.78
	3m	0.54	-0.05	0.29	0.44	1.05	0.56	-3.08
	5m	-2.26	-2.85	-2.51	-3.86	-3.25	-4.14	-7.78
V.S.W.R	< 2							
Return loss (dB)	< -10							
Impedance (Ω)	50							
Polarization	Linear							
Physical Condition								
Dimension (mm)	ϕ 64.7(D) x 15.8(H)							
Environmental Conditions								
Operation Temperature	-40 ~ +85 °C							
Storage Temperature	-40 ~ +85 °C							

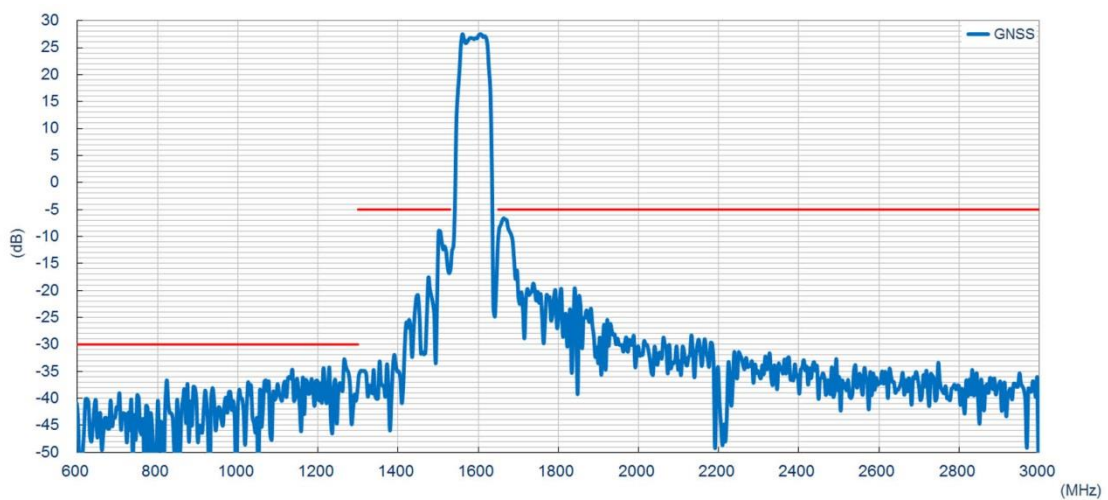


II. Analysis Antenna Performance:

Noise & Gain (dB) - GNSS



Out of Band Rejection (dB) - GNSS

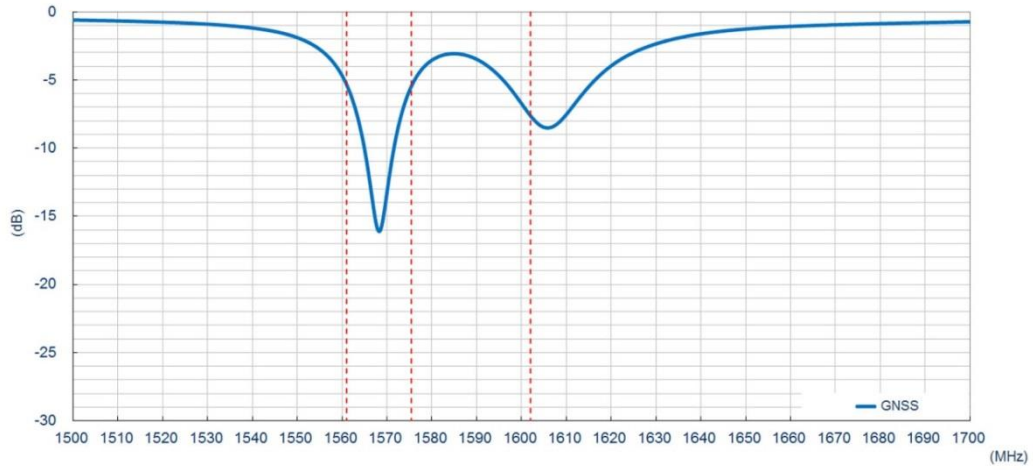


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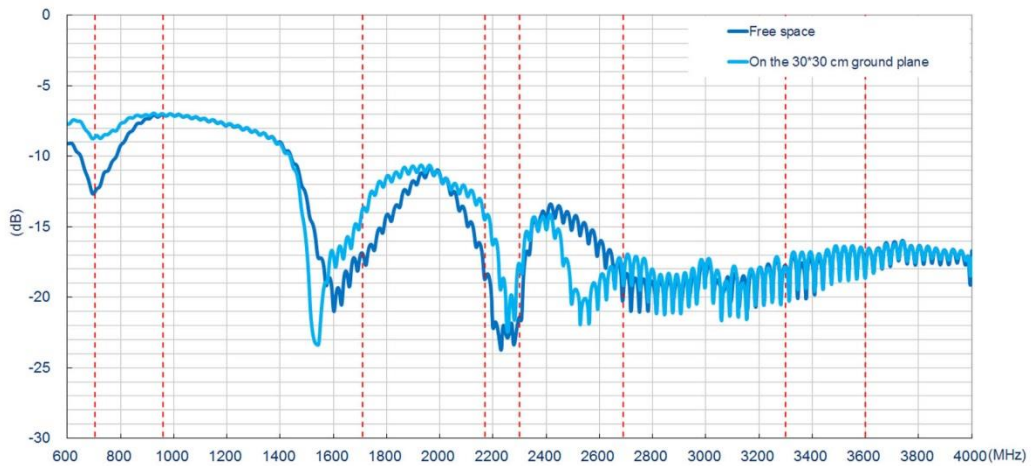


S11 (dB)

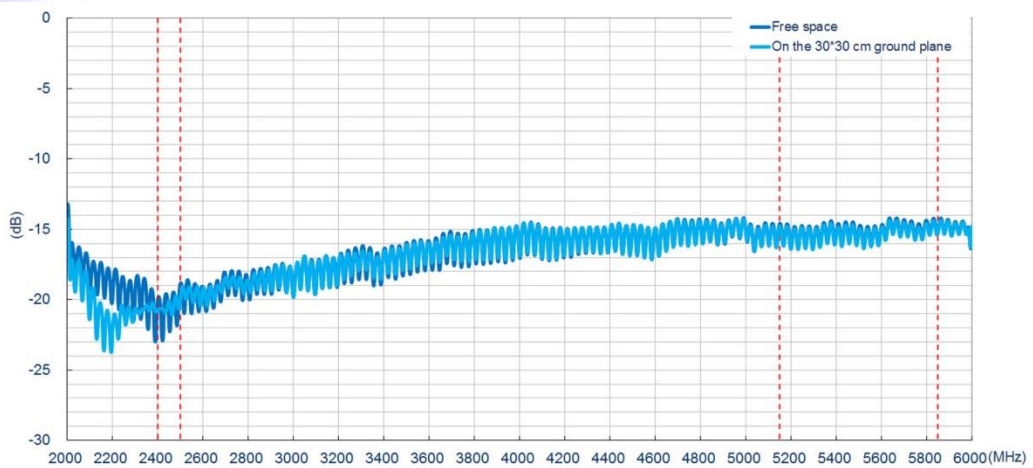
GNSS



LTE

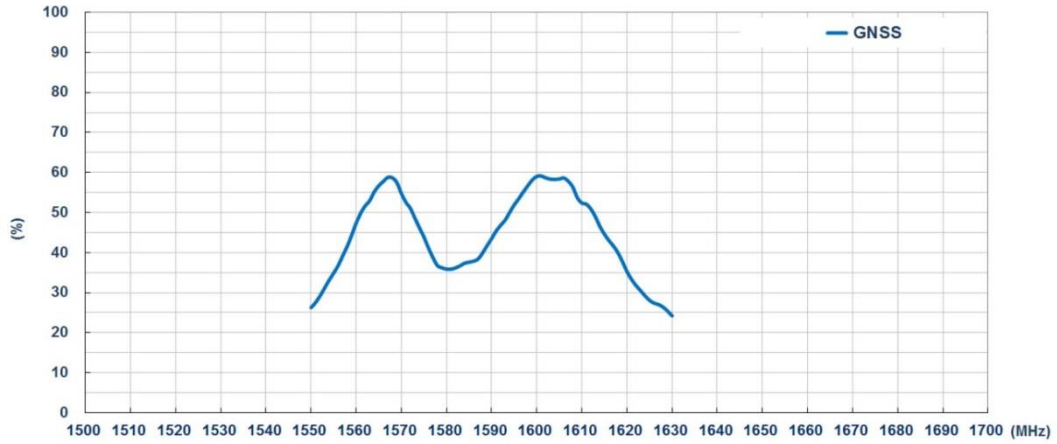


WiFi

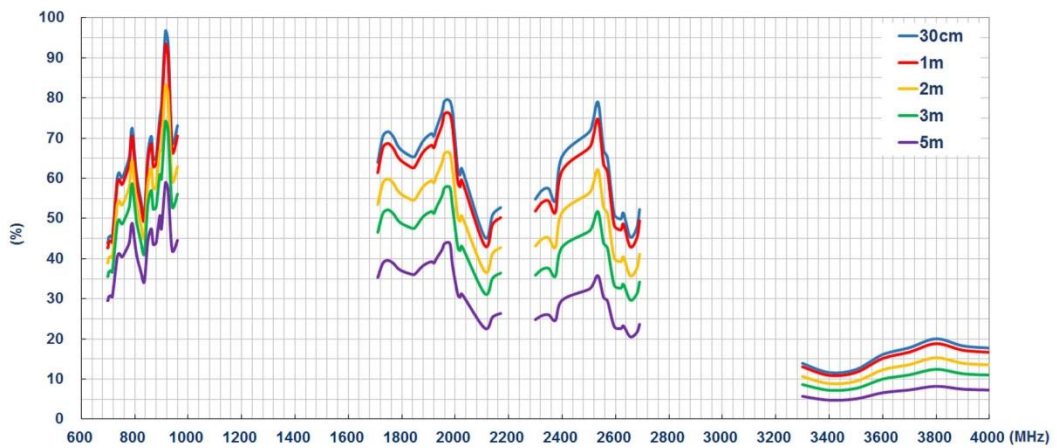


Efficiency (%)

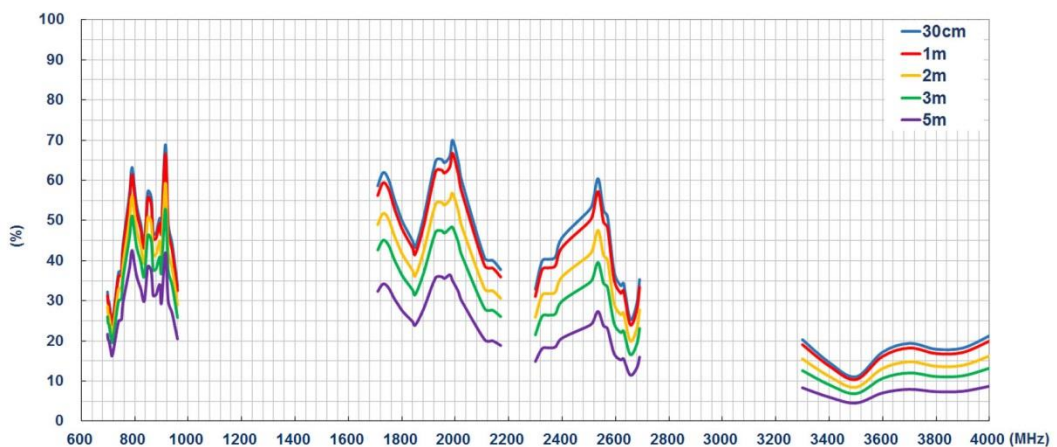
GNSS



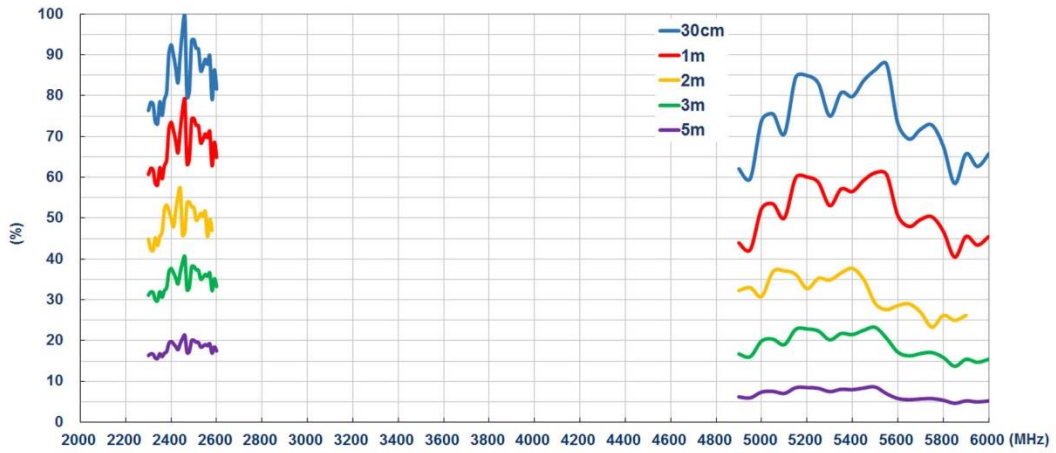
LTE (Free space)



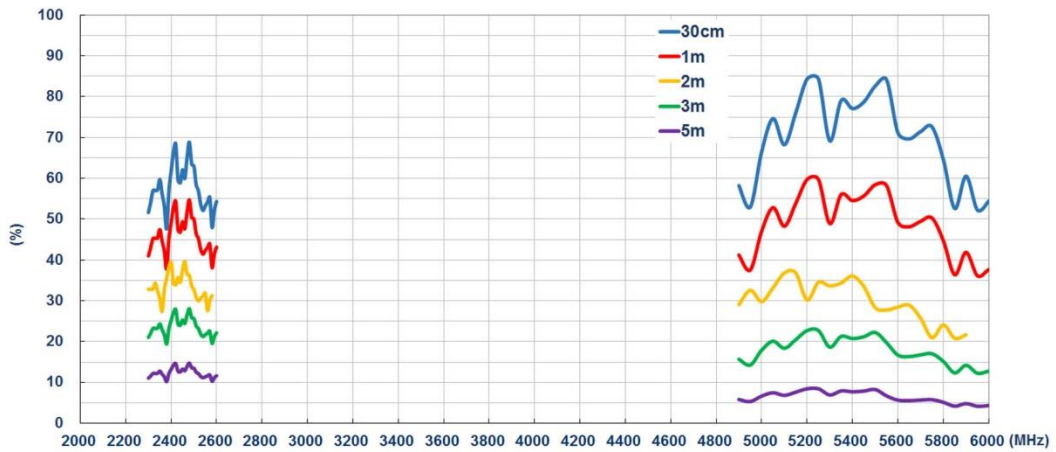
LTE (On the 30*30 cm ground plane)



WiFi (Free space)

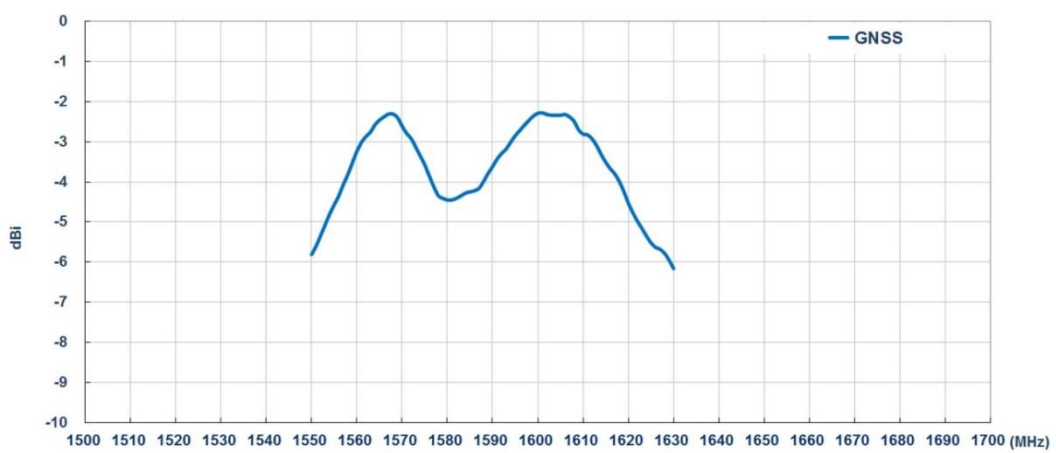


WIFI (On the 30*30 cm ground plane)



Average Gain (dBi)

GNSS



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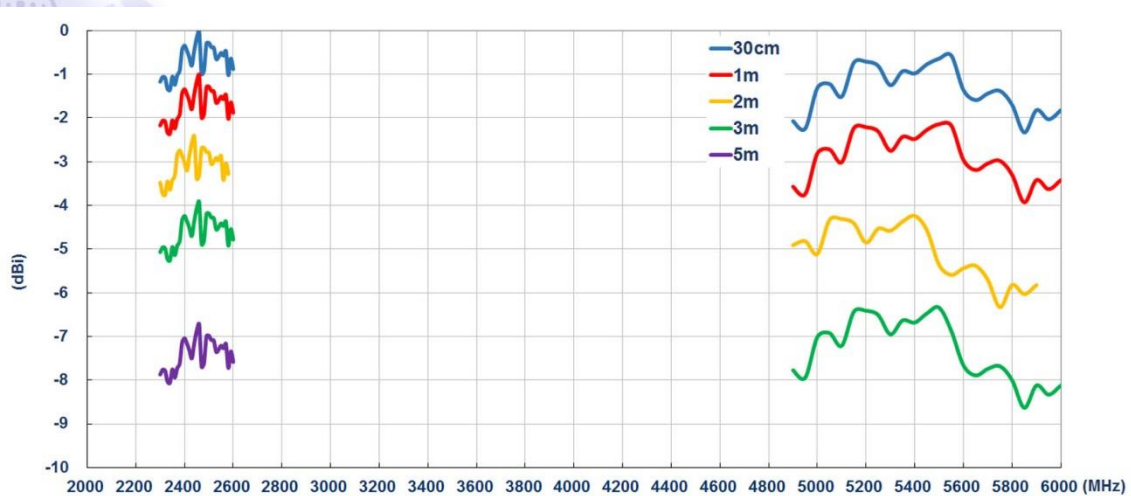
LTE (Free space)



LTE (On the 30*30 cm ground plane)



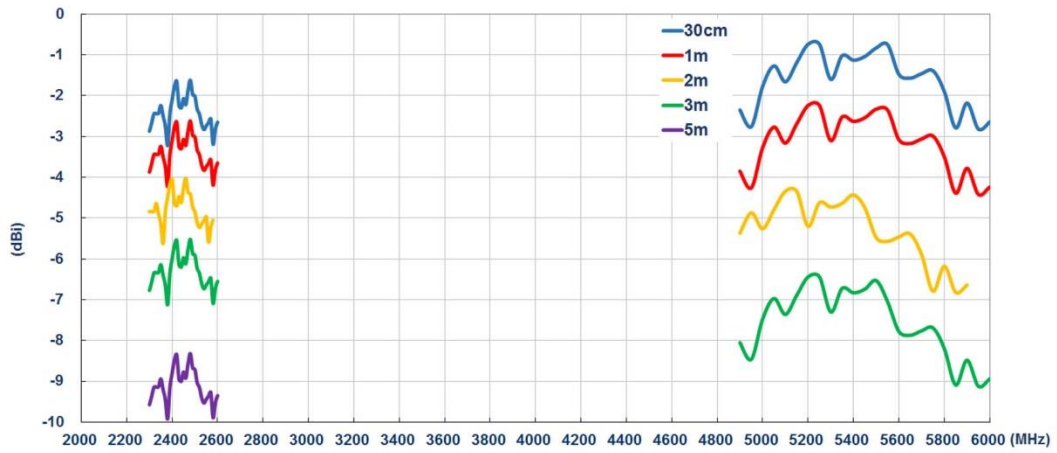
WiFi (Free space)



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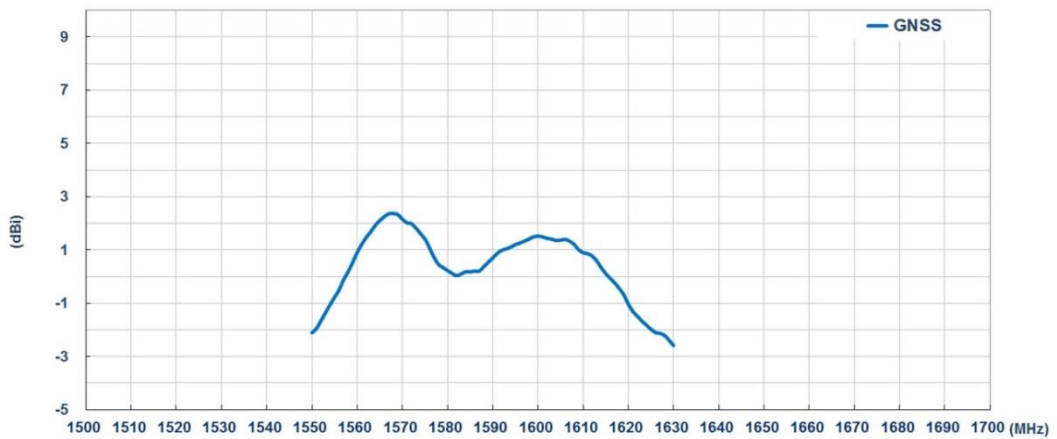
WiFi (On the 30*30 cm ground plane)



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Peak Gain (dBi)

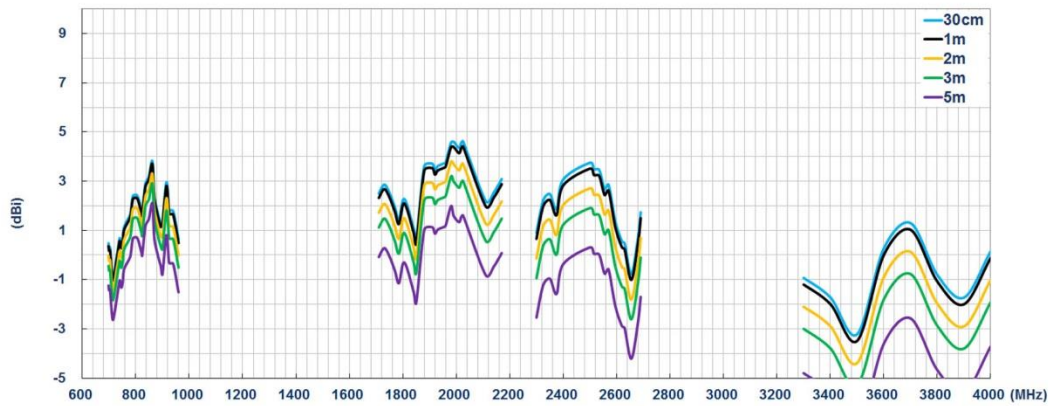
GNSS



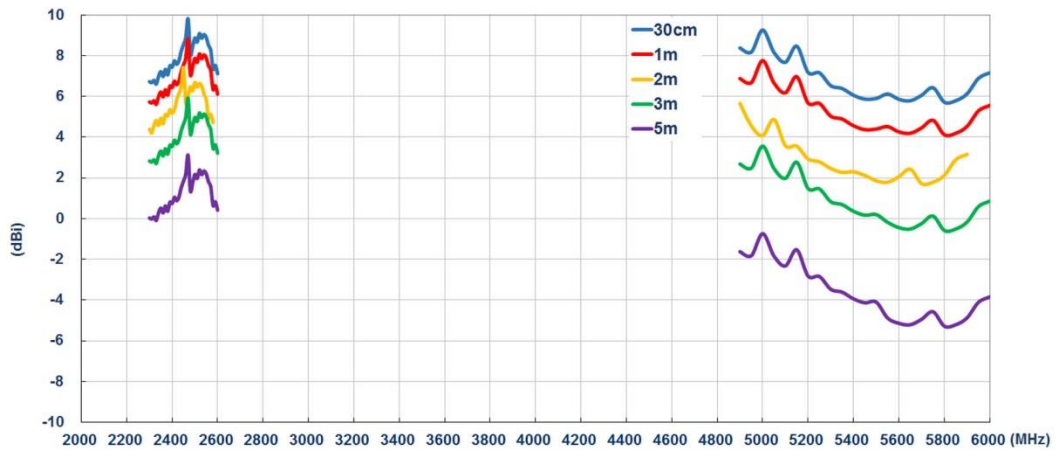
LTE (Free space)



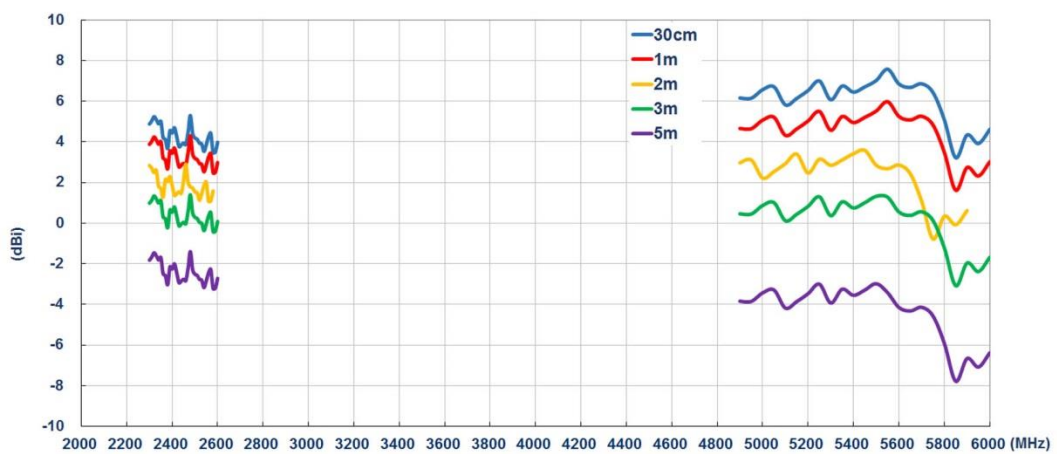
LTE (On the 30*30 cm ground plane)



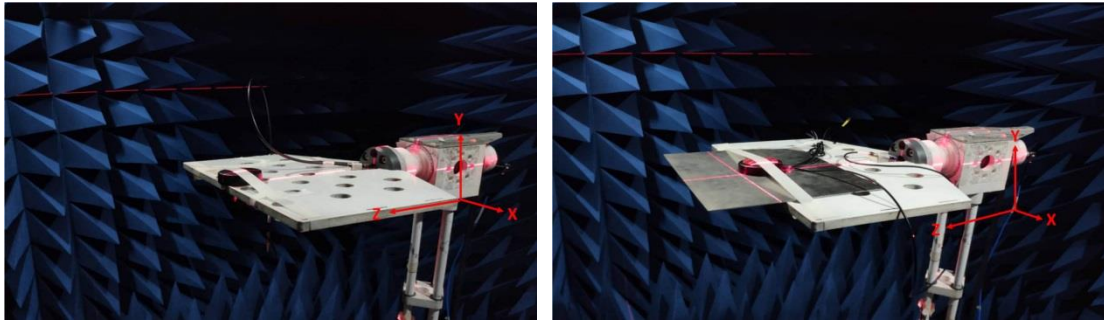
WiFi (Free space)



WiFi (On the 30*30 cm ground plane)



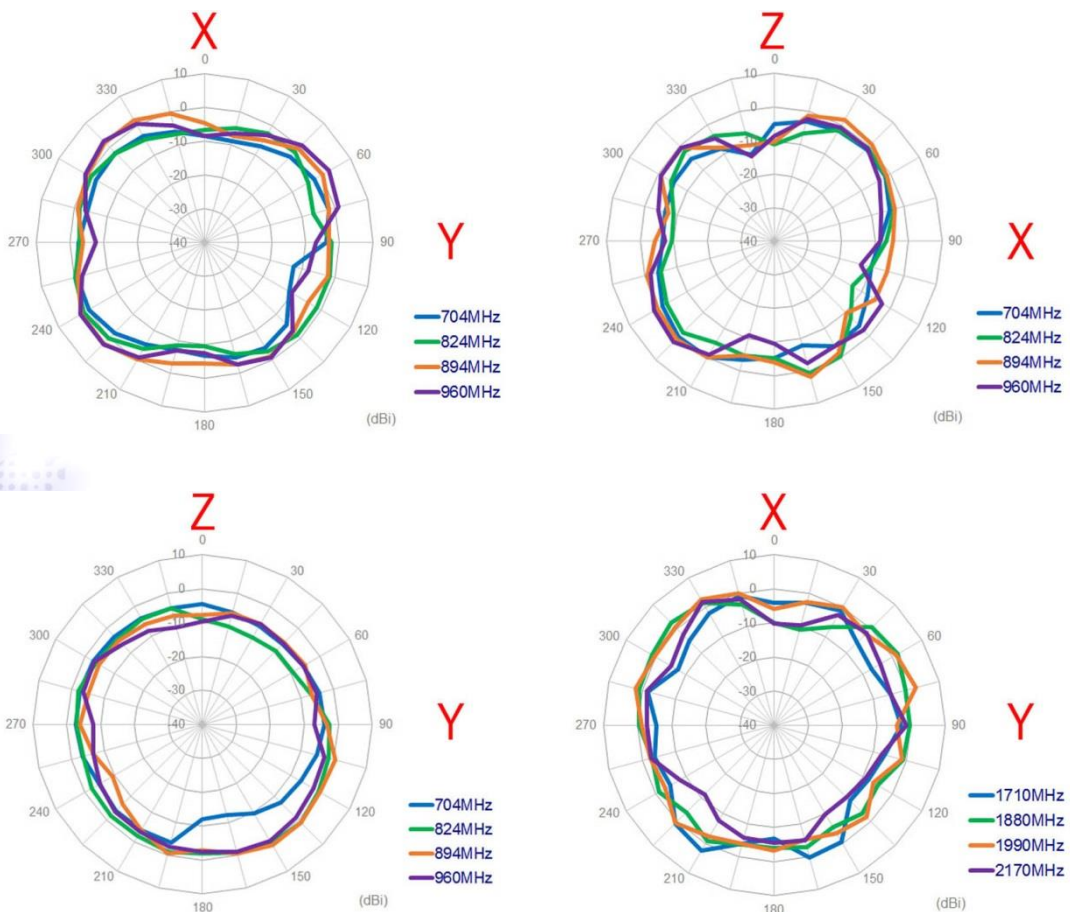
III. Antenna Radiation Pattern Measurement:



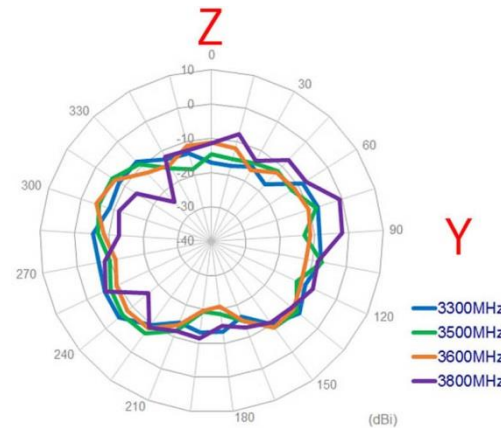
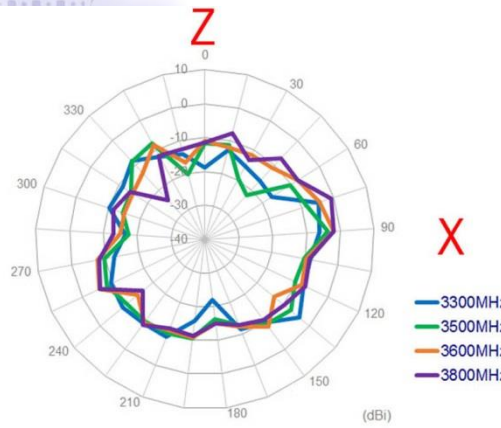
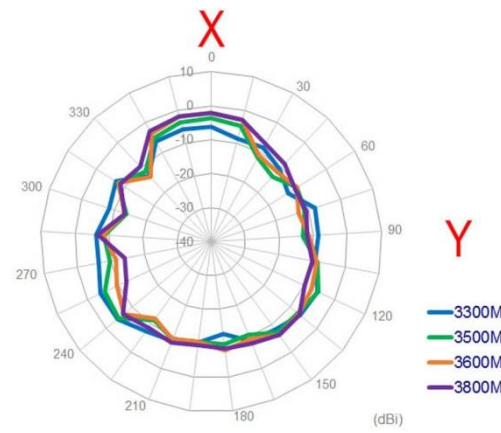
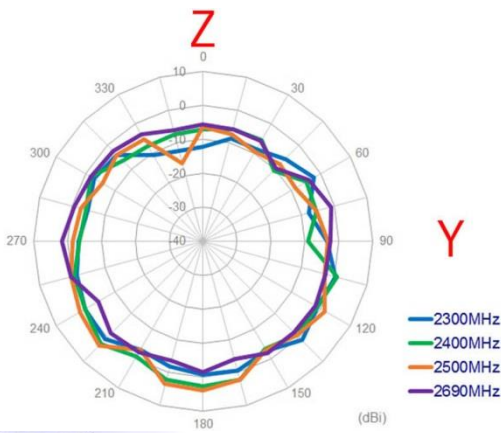
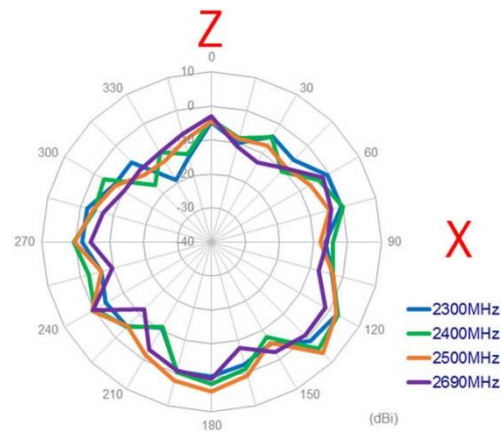
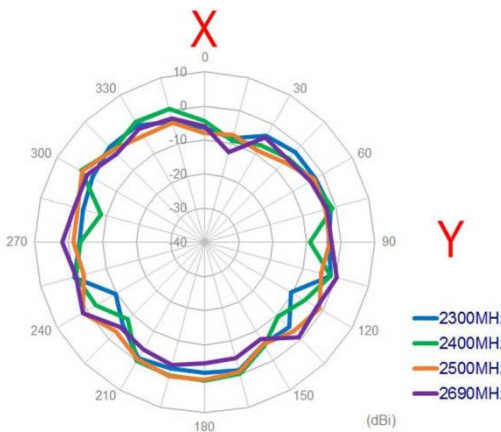
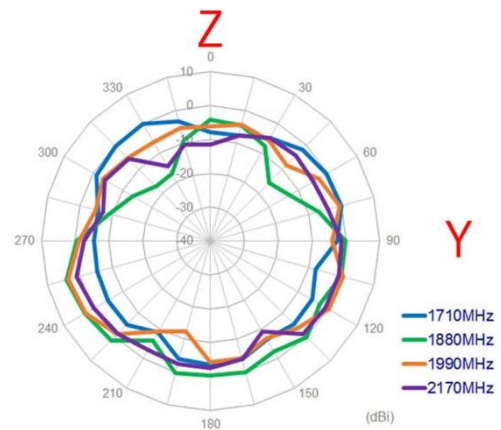
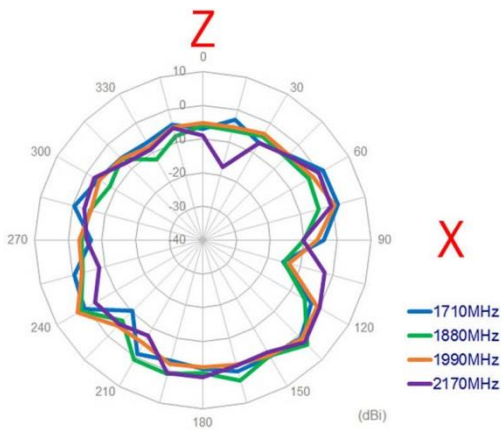
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IV. 2D radiation pattern :

LTE (Free space)



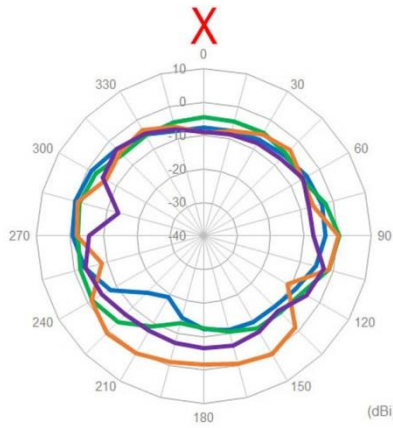
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DCC



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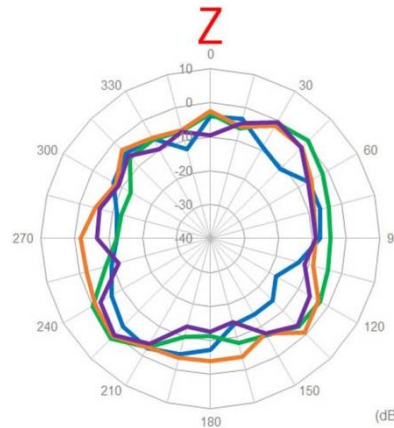
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LTE (On the 30*30 cm ground plane)



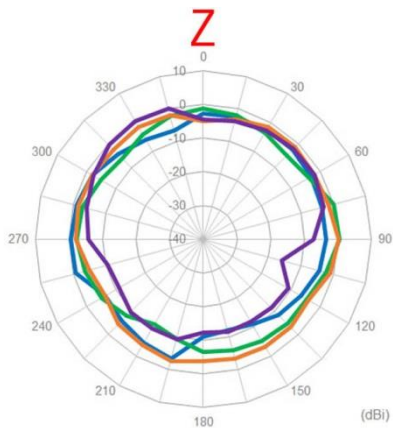
Y

- 704MHz
- 824MHz
- 894MHz
- 960MHz



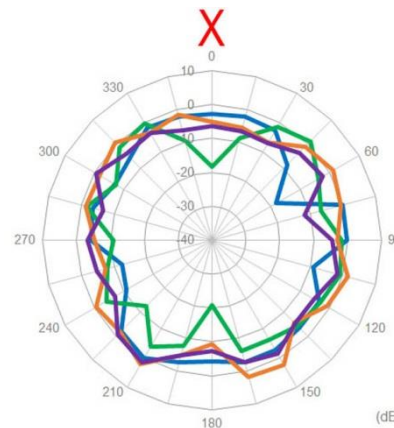
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- 704MHz
- 824MHz
- 894MHz
- 960MHz



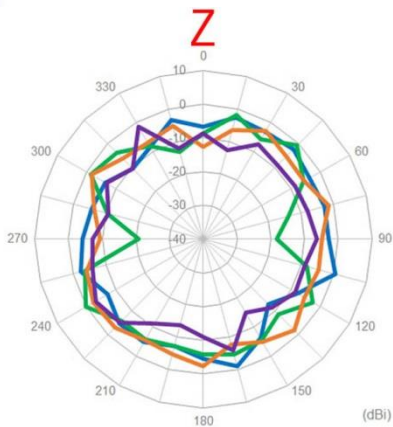
Y

- 704MHz
- 824MHz
- 894MHz
- 960MHz



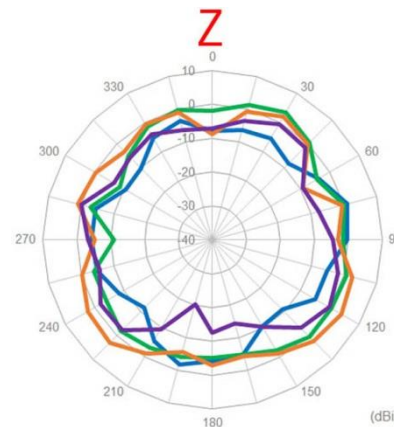
Y

- 1710MHz
- 1880MHz
- 1990MHz
- 2170MHz



X

- 1710MHz
- 1880MHz
- 1990MHz
- 2170MHz

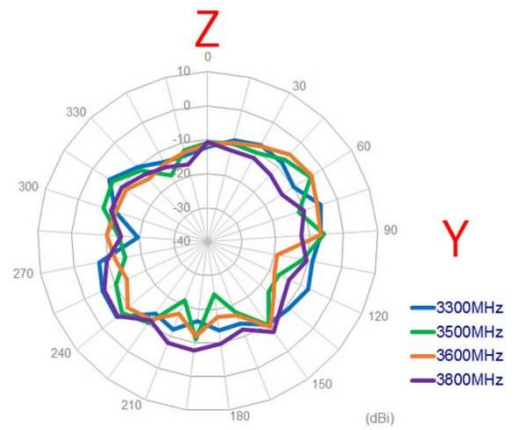
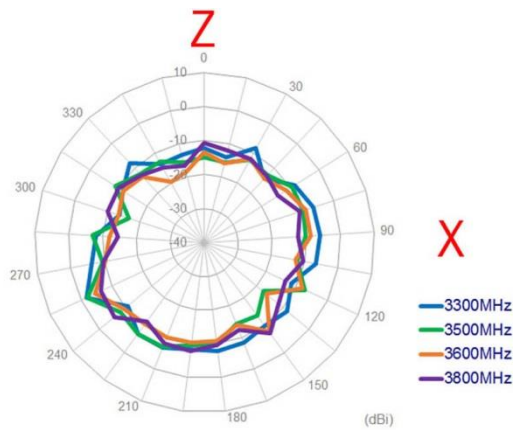
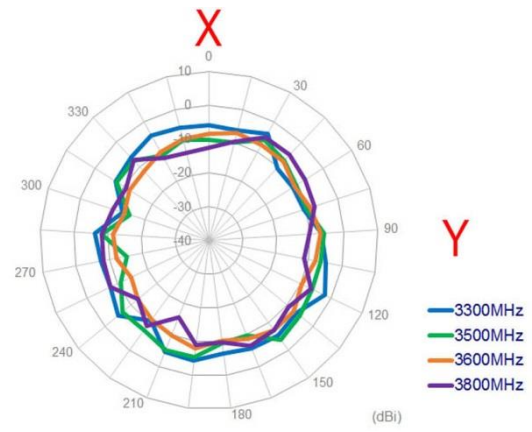
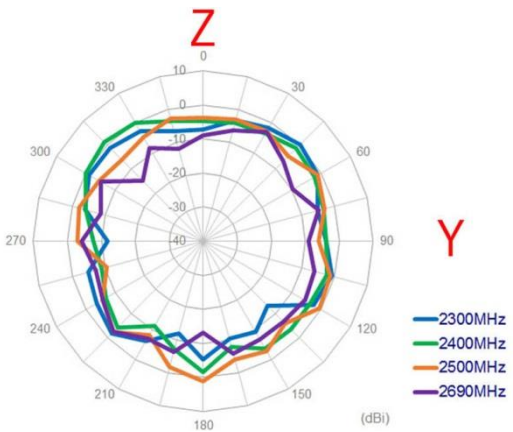
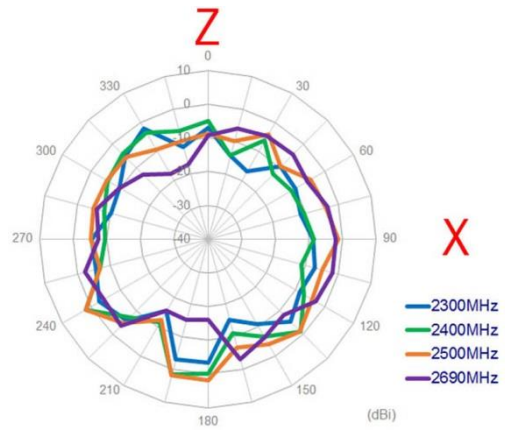
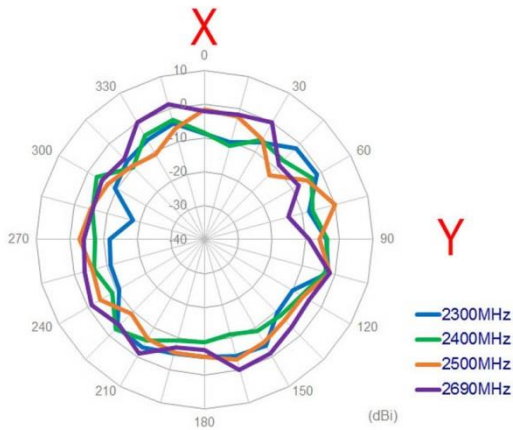


Y

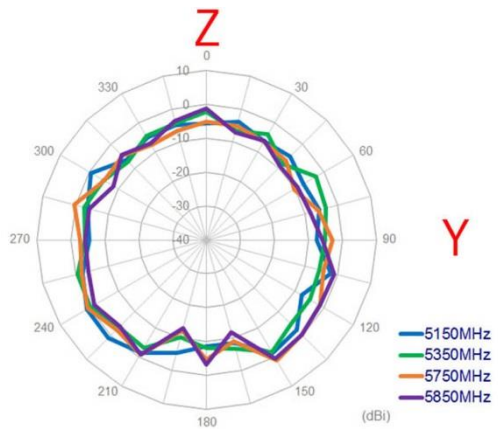
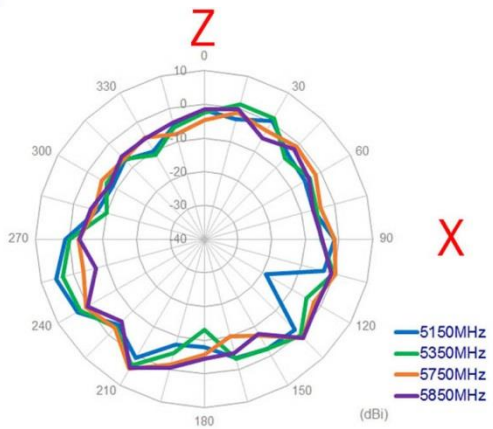
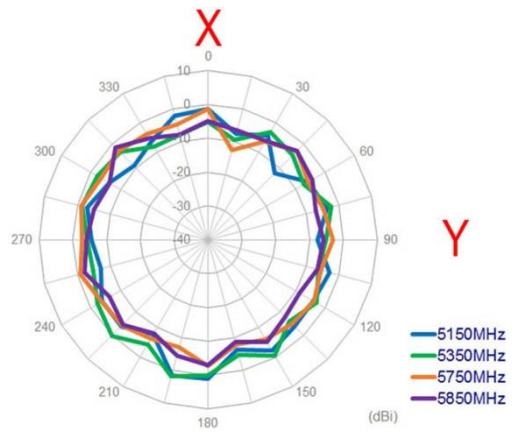
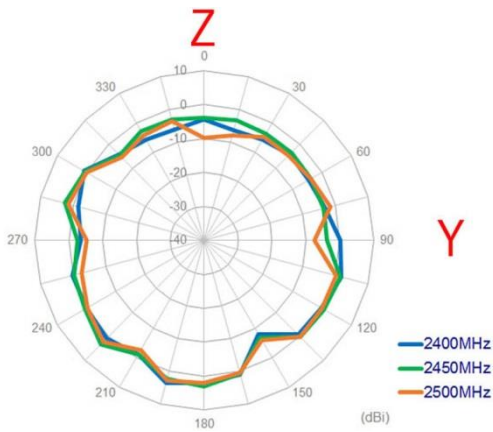
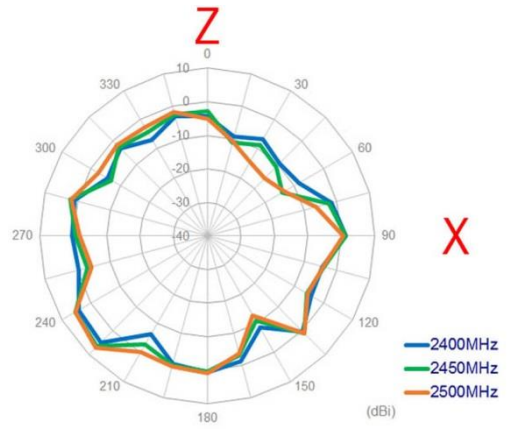
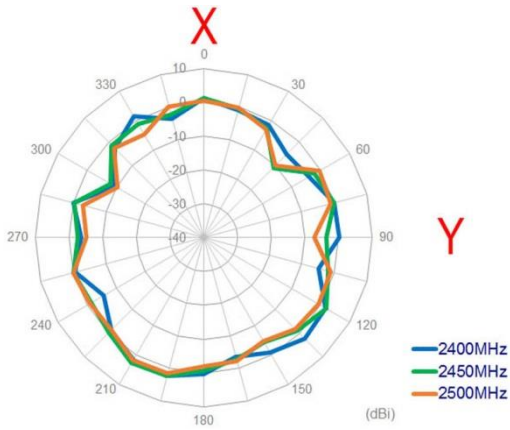
- 1710MHz
- 1880MHz
- 1990MHz
- 2170MHz

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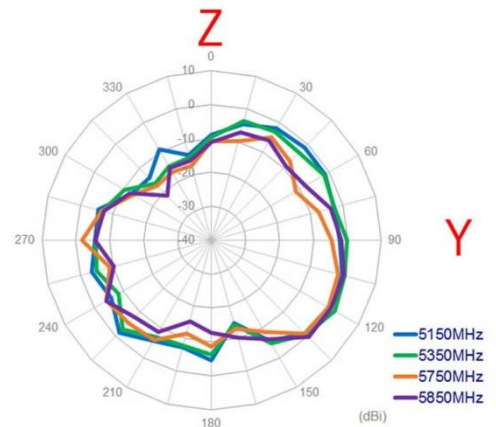
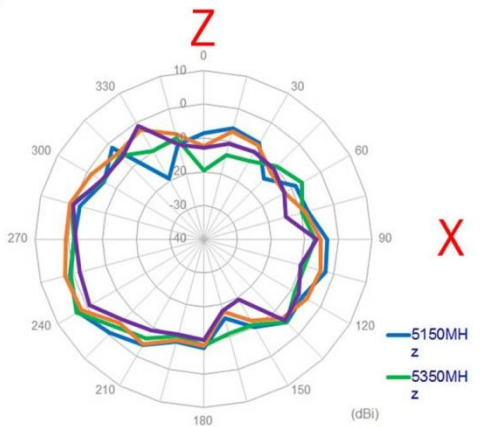
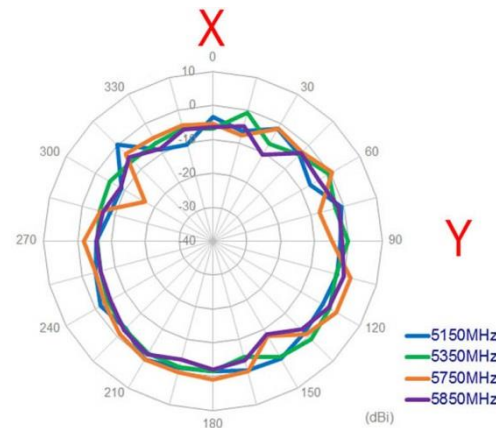
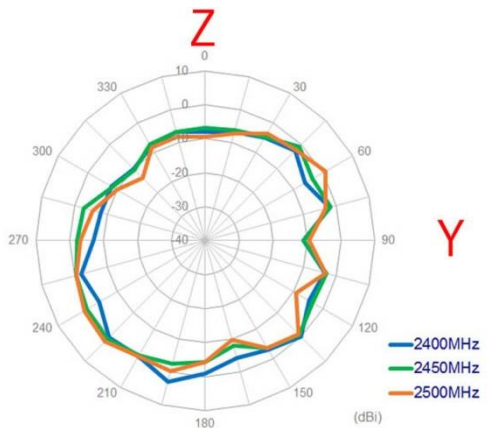
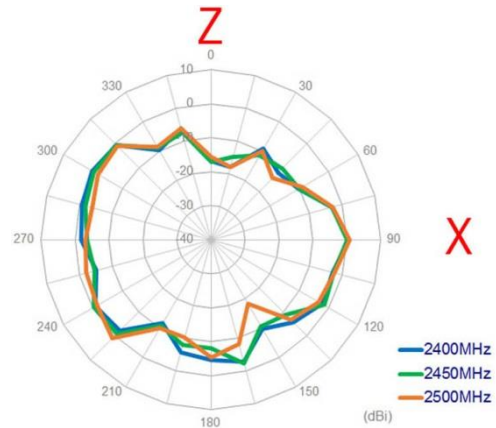
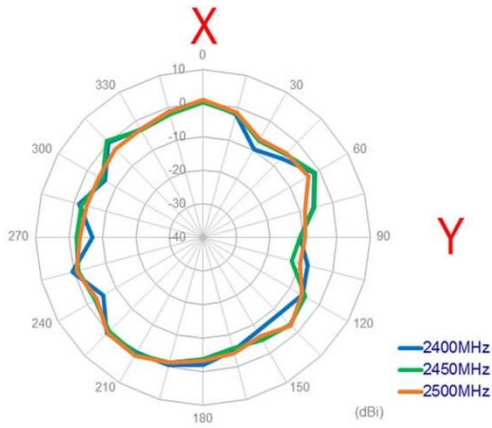
WiFi (Free space)



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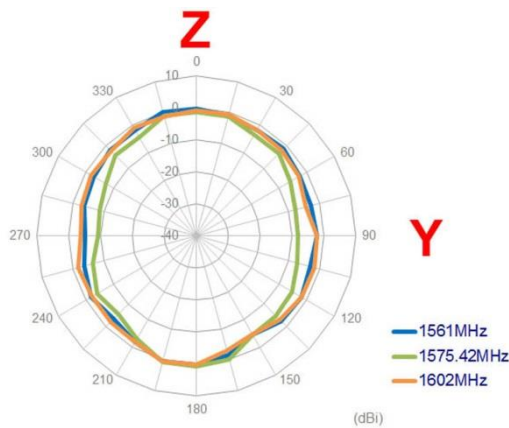
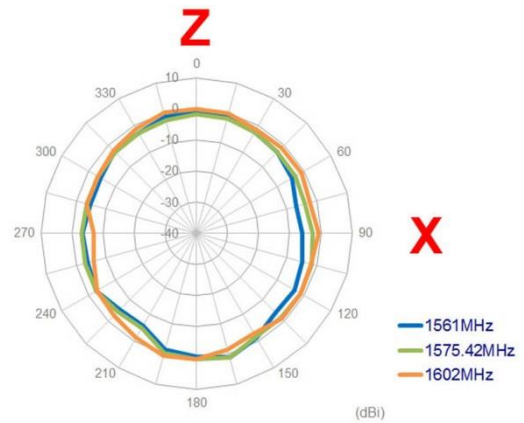
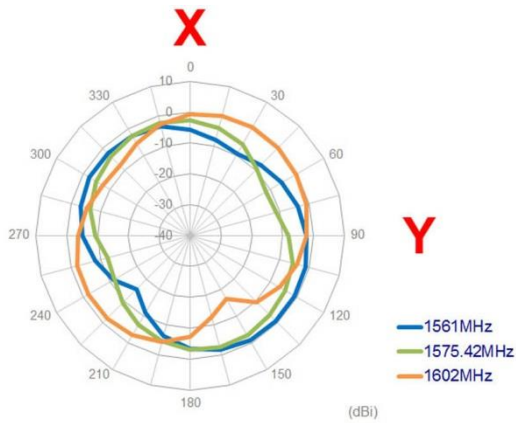
WiFi (On the 30*30 cm ground plane)



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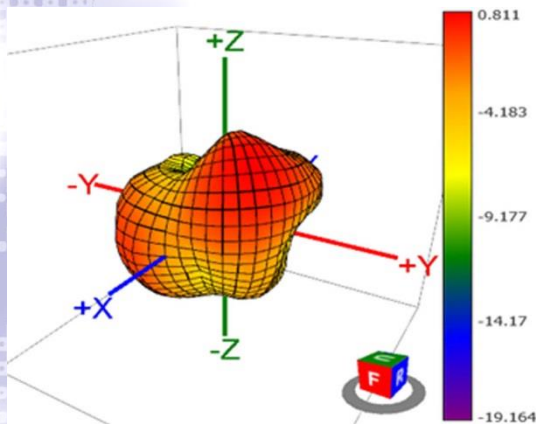
GNSS



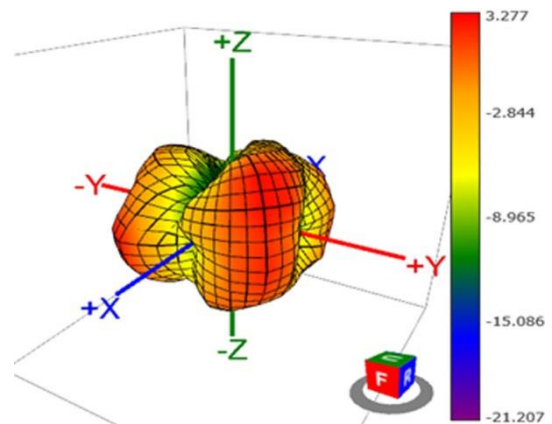
V. 3D radiation pattern :

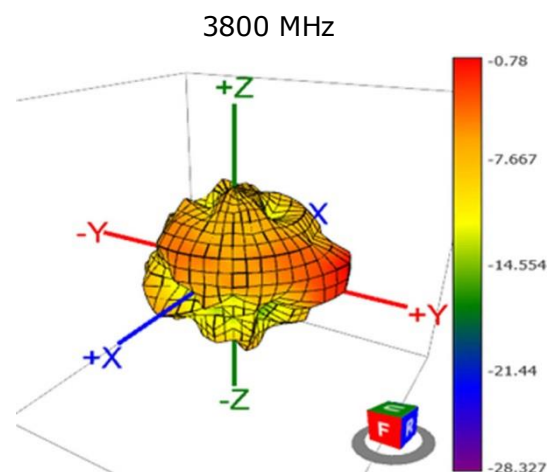
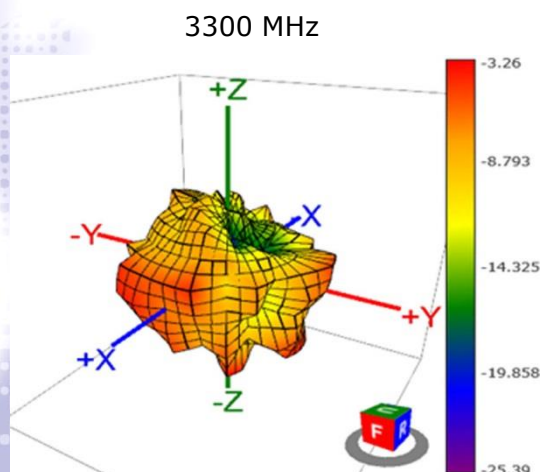
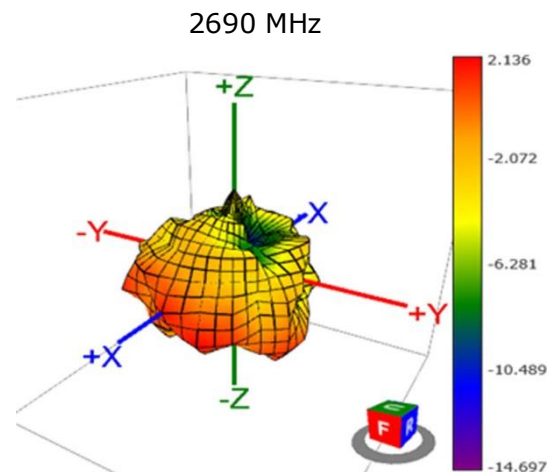
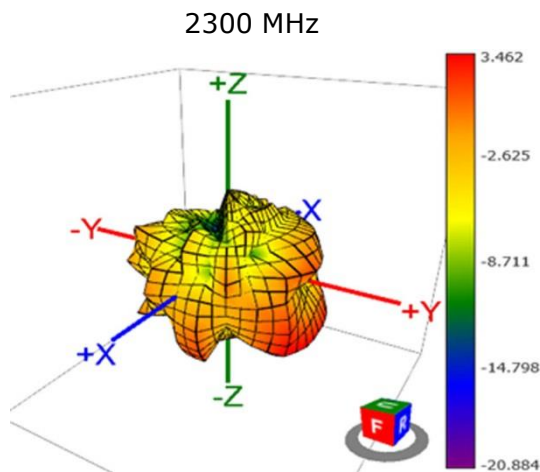
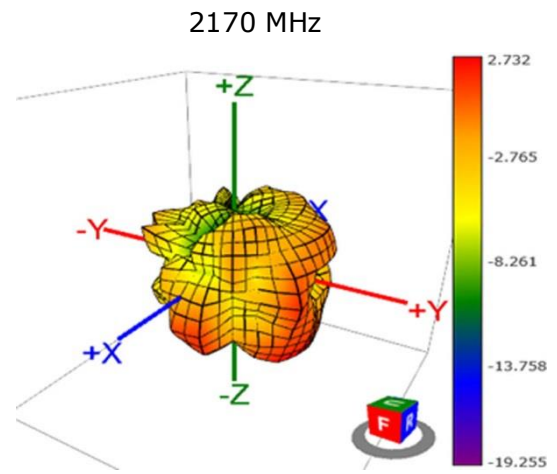
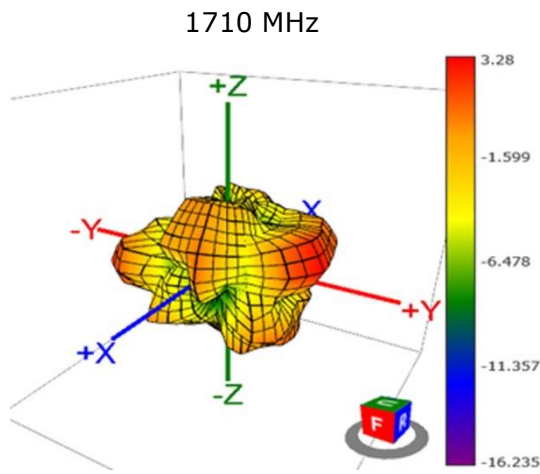
LTE (Free space)

704 MHz



960 MHz

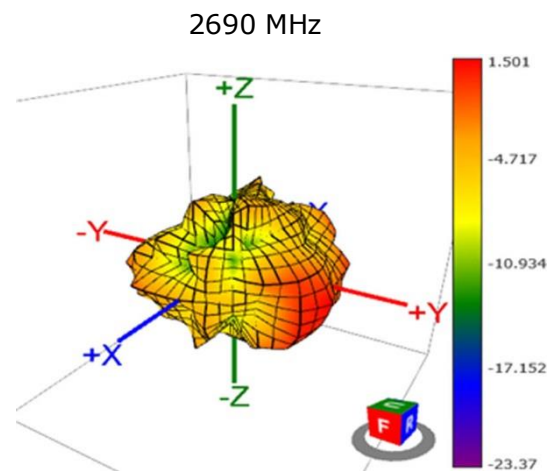
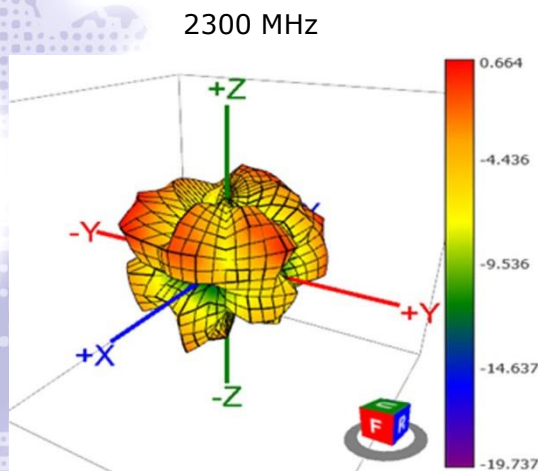
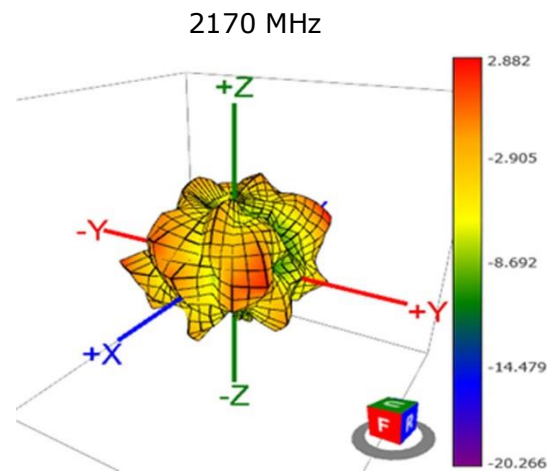
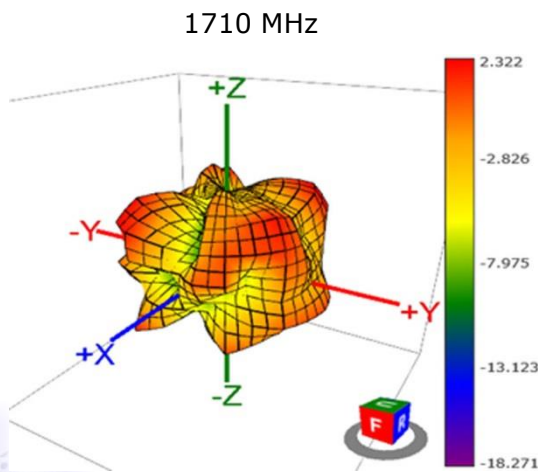
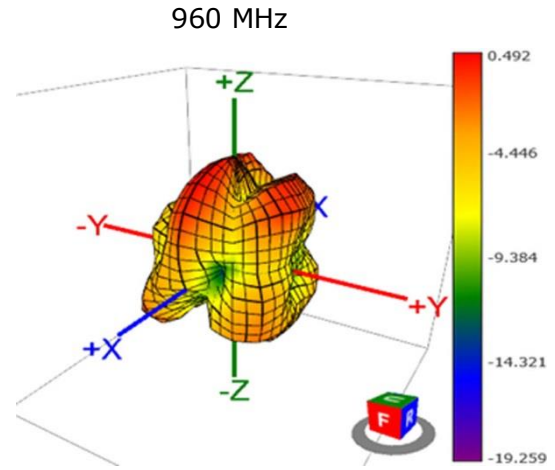
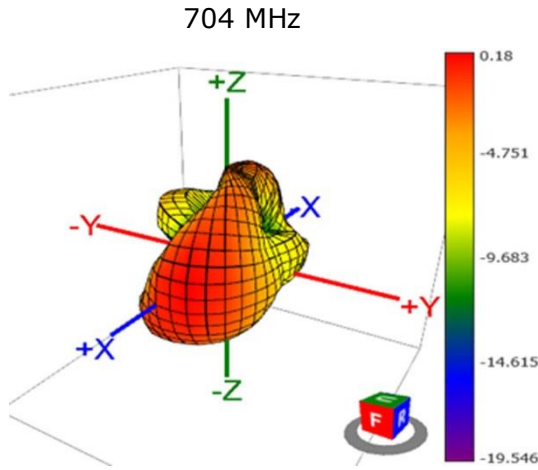


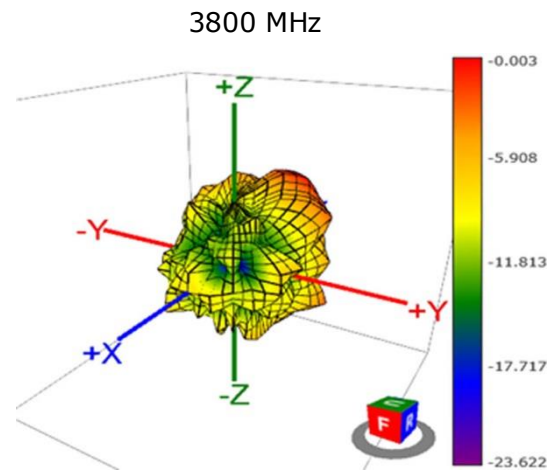
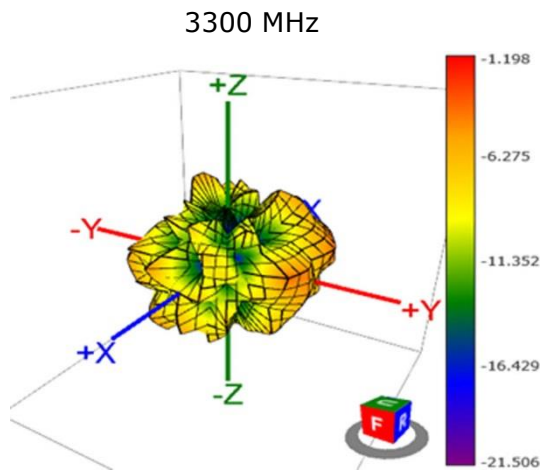


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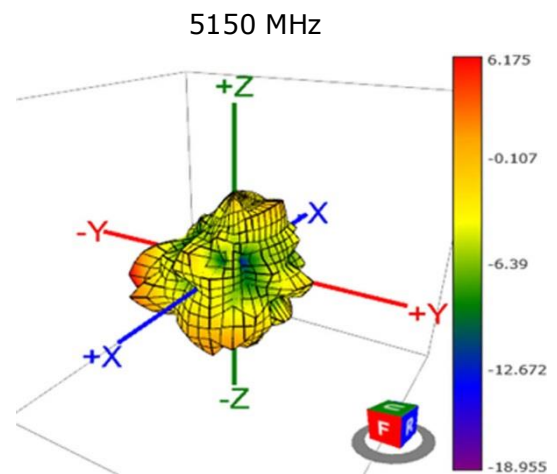
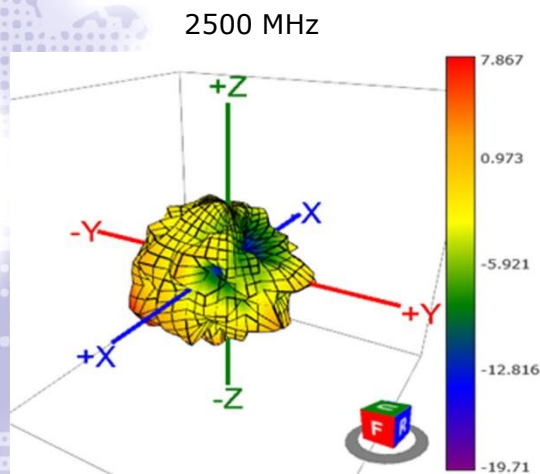
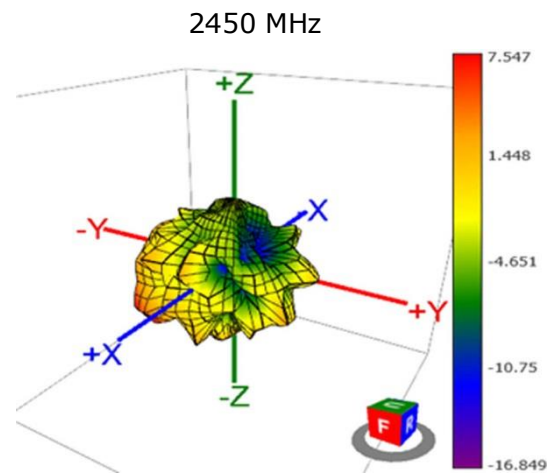
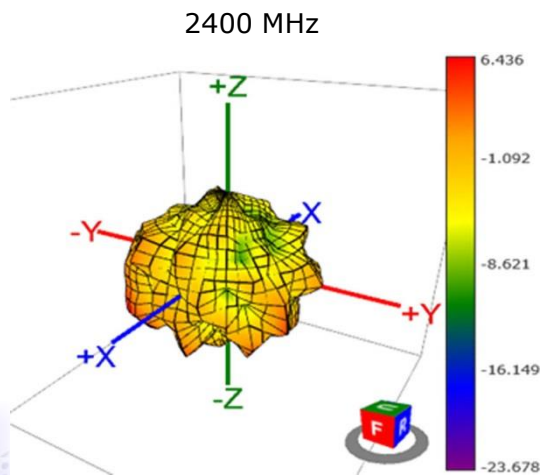
LTE (On the 30*30 cm ground plane)

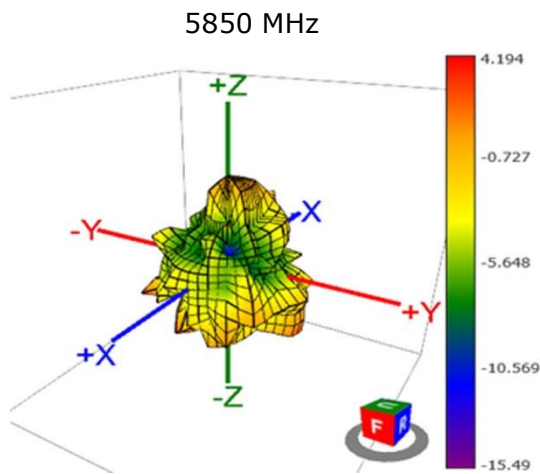
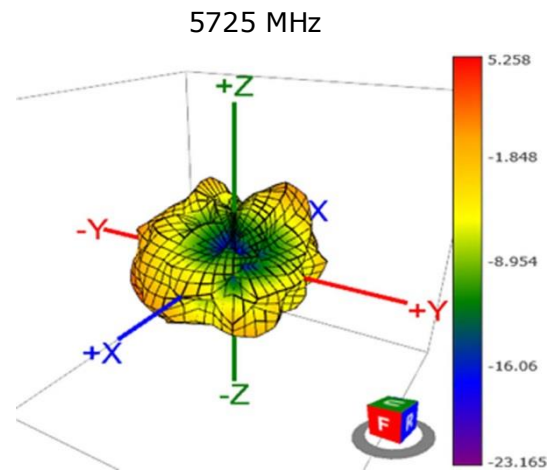
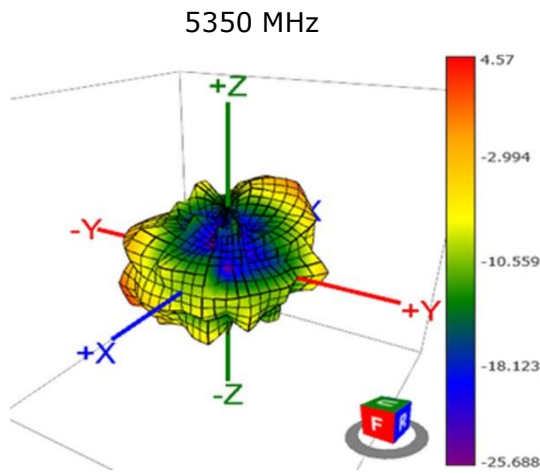
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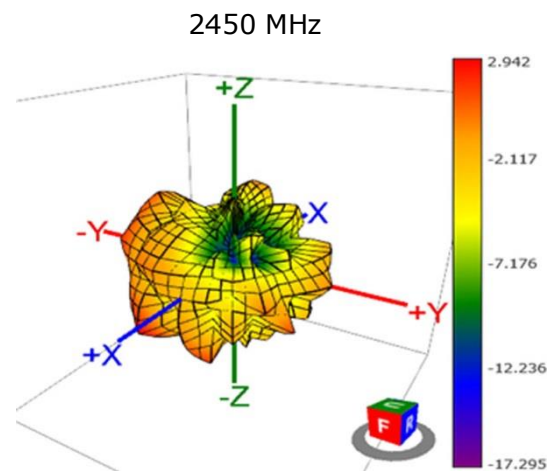
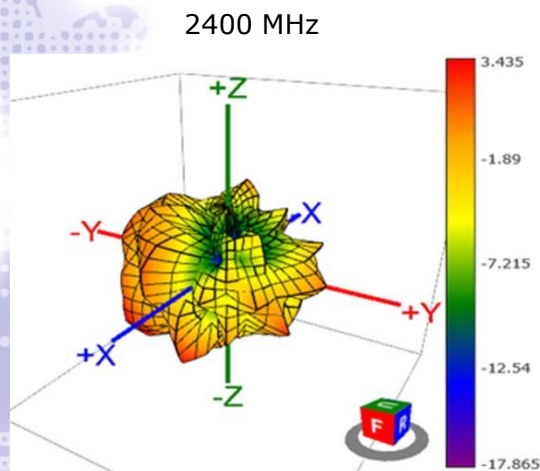


WiFi (Free space)

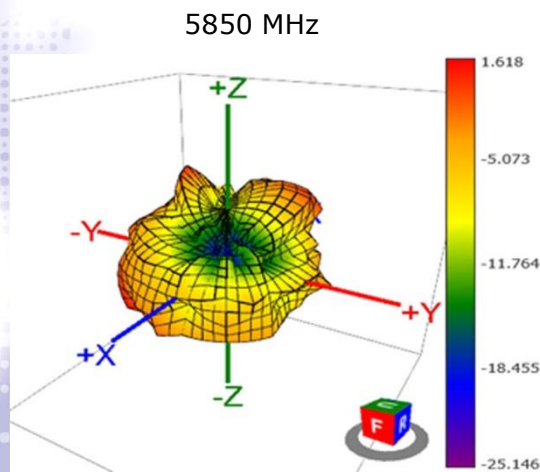
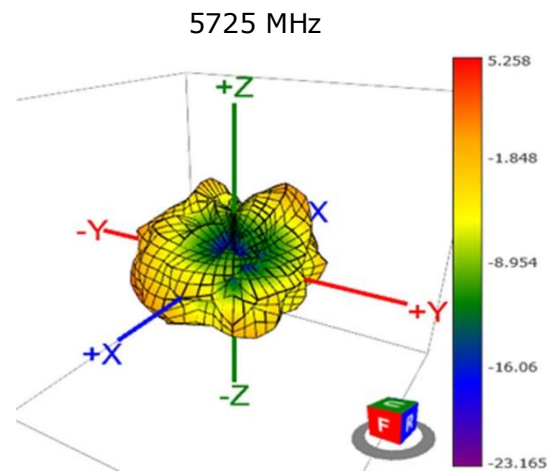
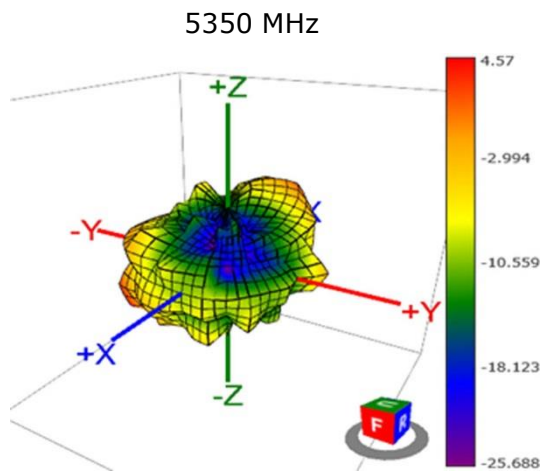
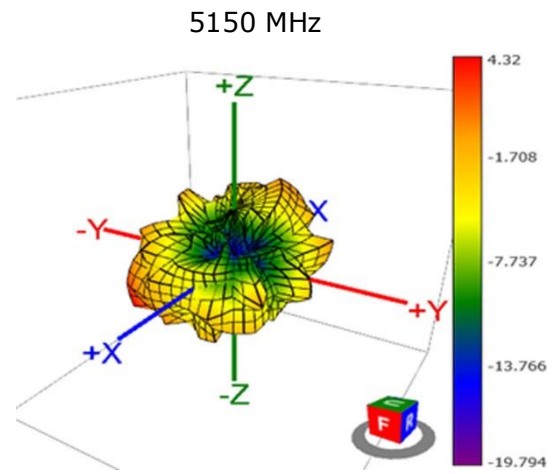
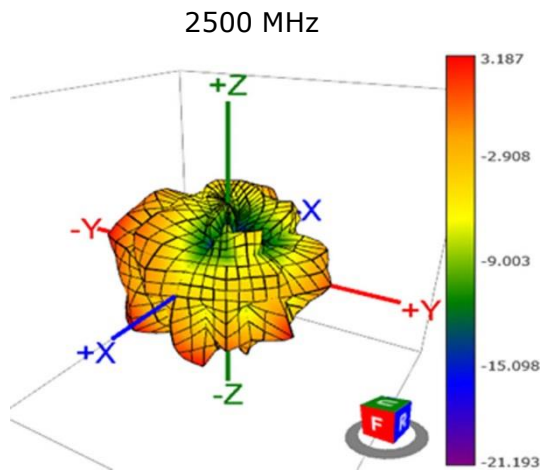




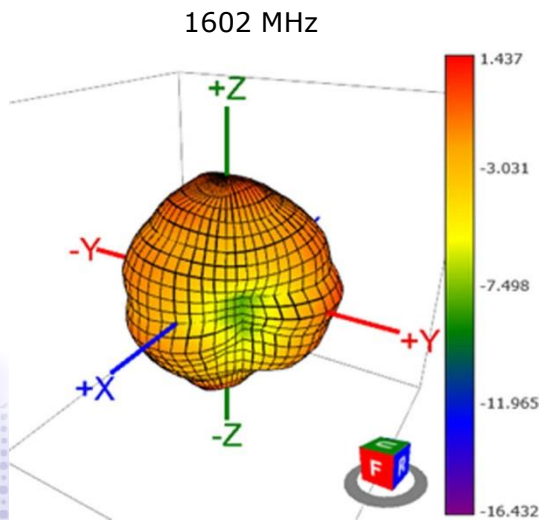
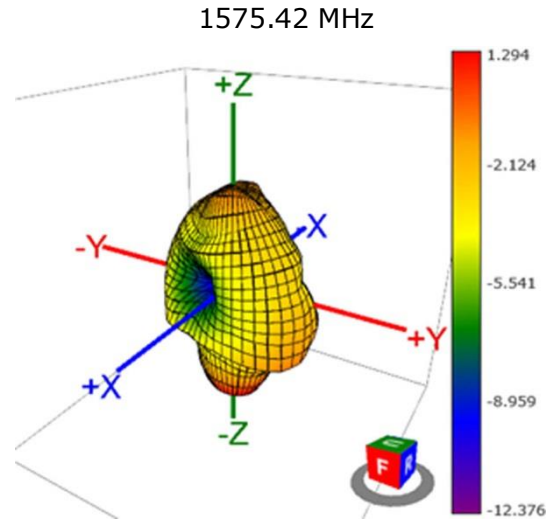
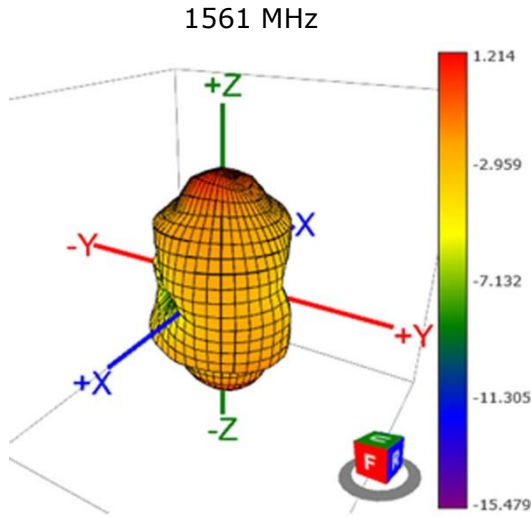
WiFi (On the 30*30 cm ground plane)



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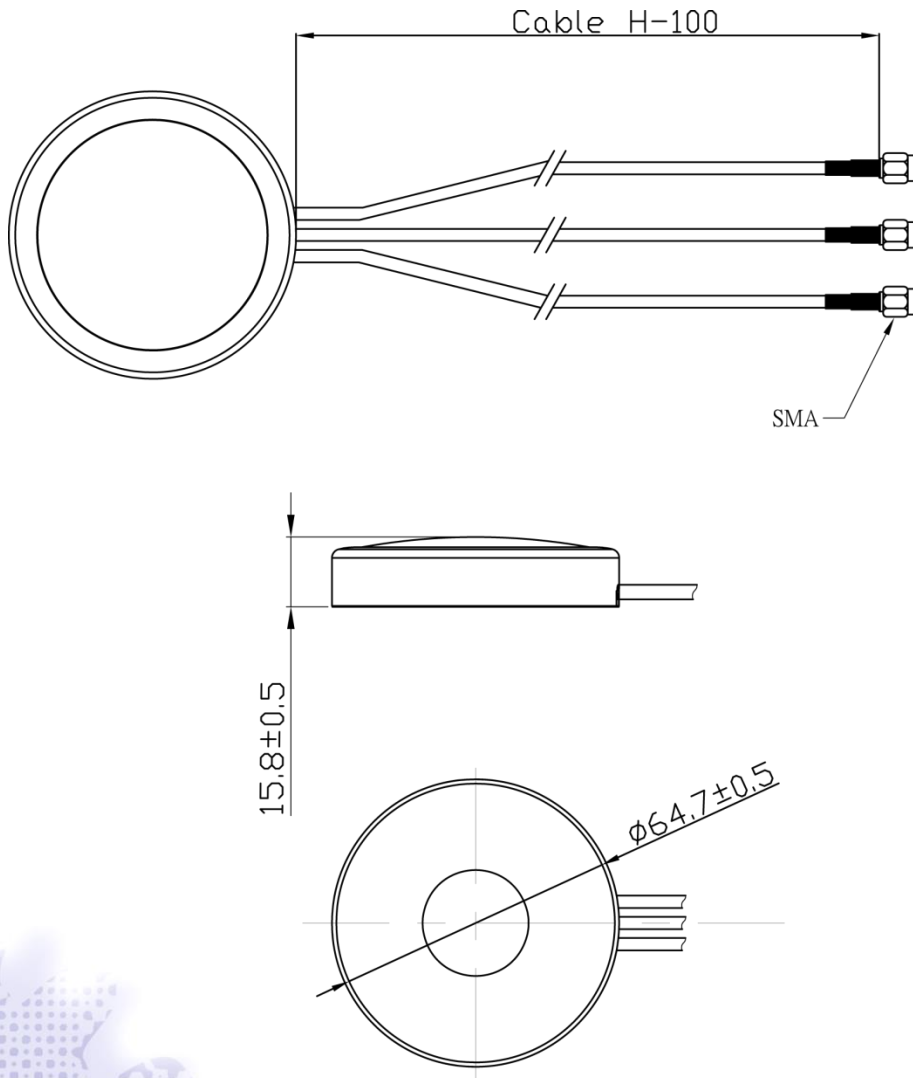
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VI. Mechanical Drawing (Unit:mm):



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