



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

Part Number: MT-4B-AC-BLW03

Features:

- 1*LTE, 1*GNSS, 1*WiFi Antenna Combination
- LTE 698-960MHz, 1710-2690MHz, 3300-3800MHz Supporting
- GPS / GLONASS / BEIDOU / GALILEO / QZSS / SBAS L1 Bands
- WiFi Dual Bands, 2400-2500MHz, 5150-5850MHz Supporting
- Excellent Out of Band Suppression, Up to 55 dB
- 27dB Active Peak Gain
- Customizable Cables and Connectors
- RoHS & REACH Compliant

Applications:

- Fleet Management & Telematics
- Vehicle Navigation



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

MODEL: MT-4B-AC-BLW03

WI-RD-D-340 V1.0

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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 ± 2.046	1575.42 ± 1.023	1602 ± 5
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	H-100 / 30cm		
Connector	SMA (RAP)		

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	50.32	52.44	51.30	54.41	56.06	66.22	49.97
	1m	44.24	46.10	42.28	44.36	45.16	52.00	37.39
	2m	36.79	38.34	32.07	33.14	33.16	36.81	24.70
	3m	30.60	31.89	24.33	24.76	24.35	26.06	16.32
	5m	21.17	22.06	14.00	13.81	13.12	13.06	7.12
With 30*30cm Ground Plane	30cm	51.39	43.46	34.41	45.74	45.09	62.33	42.36
	1m	45.17	38.20	28.36	37.30	36.32	50.45	30.46
	2m	37.57	31.77	21.51	27.86	26.67	34.71	20.94
	3m	31.25	26.43	16.32	20.81	19.58	24.60	13.84
	5m	21.62	18.28	9.39	11.61	10.56	12.35	6.04
Average Gain (dBi)								
Free Space	30cm	-2.98	-2.80	-2.90	-2.64	-2.51	-1.79	-3.01
	1m	-3.54	-3.36	-3.74	-3.53	-3.45	-2.84	-4.27
	2m	-4.34	-4.16	-4.94	-4.80	-4.79	-4.34	-6.07
	3m	-5.14	-4.96	-6.14	-6.06	-6.14	-5.84	-7.87
	5m	-6.74	-6.56	-8.54	-8.60	-8.82	-8.84	-11.47
With 30*30cm Ground Plane	30cm	-2.89	-3.62	-4.63	-3.40	-3.46	-2.05	-3.73
	1m	-3.45	-4.18	-5.47	-4.28	-4.40	-2.97	-5.16
	2m	-4.25	-4.98	-6.67	-5.55	-5.74	-4.60	-6.79
	3m	-5.05	-5.78	-7.87	-6.82	-7.08	-6.09	-8.59
	5m	-6.65	-7.38	-10.27	-9.35	-9.77	-9.08	-12.19

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Peak Gain (dBi)								
Free Space	30cm	2.21	2.72	3.21	3.58	3.69	3.59	3.17
	1m	1.65	2.16	2.37	2.69	2.75	2.54	1.91
	2m	0.85	1.36	1.17	1.43	1.41	1.04	0.11
	3m	0.05	0.56	-0.03	0.16	0.06	-0.46	-1.69
	5m	-1.55	-1.04	-2.43	-2.37	-2.62	-3.46	-5.29
With 30*30cm Ground Plane	30cm	2.95	1.97	2.83	3.93	3.67	5.27	5.33
	1m	2.39	1.41	1.99	3.04	2.73	4.37	3.81
	2m	1.59	0.61	0.79	1.78	1.38	2.72	2.27
	3m	0.79	-0.19	-0.41	0.51	0.04	1.23	0.47
	5m	-0.81	-1.79	-2.81	-2.02	-2.64	-1.76	-3.13
V.S.W.R								
Free Space	< 3							
With 30*30cm Ground Plane	< 3							
Return Loss (dB)								
Free Space	< -6							
With 30*30cm Ground Plane	< -6							
Impedance (Ω)	50							
Polarization	Linear							
Cable	H-100, 30cm							
Connector	SMA (RAP)							

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Category		WiFi						
Frequency (MHz)		2400	2450	2500	5150	5350	5750	5850
Efficiency (%)								
Free Space	30cm	71.78	73.28	77.80	83.37	69.34	63.97	60.39
	1M	56.36	57.02	61.09	51.17	50.47	45.60	37.07
	2M	39.90	40.74	43.25	33.88	28.18	25.00	23.60
	3M	28.25	28.84	30.62	19.95	16.60	14.39	13.58
	5M	14.16	14.45	15.35	6.92	5.75	4.76	4.50
With 30*30cm Ground Plane	30cm	63.97	61.80	69.50	75.34	68.23	63.53	55.21
	1M	50.23	47.64	54.58	47.42	46.56	41.02	35.81
	2M	35.56	34.36	38.64	30.62	27.73	24.83	21.58
	3M	25.18	24.32	27.35	18.03	16.33	14.29	12.42
	5M	12.62	12.19	13.71	6.25	5.66	4.73	4.11
Average Gain (dBi)								
Free Space	30cm	-1.44	-1.35	-1.09	-0.79	-1.59	-1.94	-2.19
	1M	-2.49	-2.44	-2.14	-2.91	-2.97	-3.41	-4.31
	2M	-3.99	-3.90	-3.64	-4.70	-5.50	-6.02	-6.27
	3M	-5.49	-5.40	-5.14	-7.00	-7.80	-8.42	-8.67
	5M	-8.49	-8.40	-8.14	-11.60	-12.40	-13.22	-13.47
With 30*30cm Ground Plane	30cm	-1.94	-2.09	-1.58	-1.23	-1.66	-1.97	-2.58
	1M	-2.99	-3.22	-2.63	-3.24	-3.32	-3.87	-4.46
	2M	-4.49	-4.64	-4.13	-5.14	-5.57	-6.05	-6.66
	3M	-5.99	-6.14	-5.63	-7.44	-7.87	-8.45	-9.06
	5M	-8.99	-9.14	-8.63	-12.04	-12.47	-13.25	-13.86

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Peak Gain (dBi)								
Free Space	30cm	4.34	5.14	4.94	5.37	5.01	5.03	4.21
	1M	3.29	4.07	3.89	3.22	3.07	3.53	2.31
	2M	1.79	2.59	2.39	1.46	1.10	0.95	0.13
	3M	0.29	1.09	0.89	-0.84	-1.20	-1.45	-2.27
	5M	-2.71	-1.91	-2.11	-5.44	-5.80	-6.25	-7.07
With 30*30cm Ground Plane	30cm	4.53	4.99	5.88	6.95	6.04	5.75	3.81
	1M	3.48	4.03	4.83	4.82	4.76	3.34	3.61
	2M	1.98	2.44	3.33	3.04	2.13	1.67	-0.27
	3M	0.48	0.94	1.83	0.74	-0.17	-0.73	-2.67
	5M	-2.52	-2.06	-1.17	-3.86	-4.77	-5.53	-7.47
V.S.W.R		< 2						
Return Loss (dB)		< -10						
Impedance (Ω)		50						
Polarization		Linear						
Cable		H-100, 30cm						
Connector		RSMA (RAP)						
Mechanical								
Dimension (mm)		ϕ 65(D) x 20.35(H)						
Casing		PC + TPE						
Waterproof Resistant		IP67						
Environmental Conditions								
Operation Temperature		-40 ~ +85 °C						
Storage Temperature		-40 ~ +85 °C						
Humidity		Non-condensing 65 °C 95% RH						

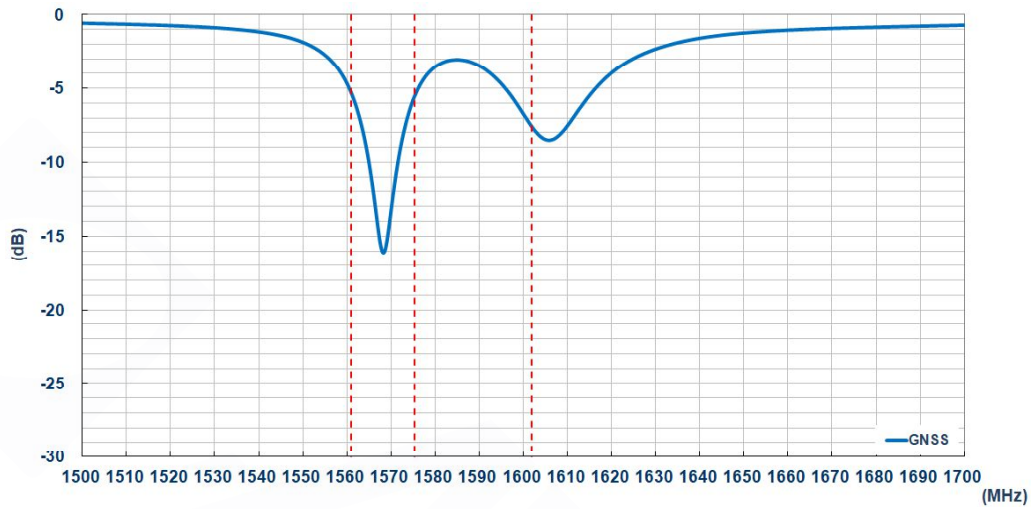
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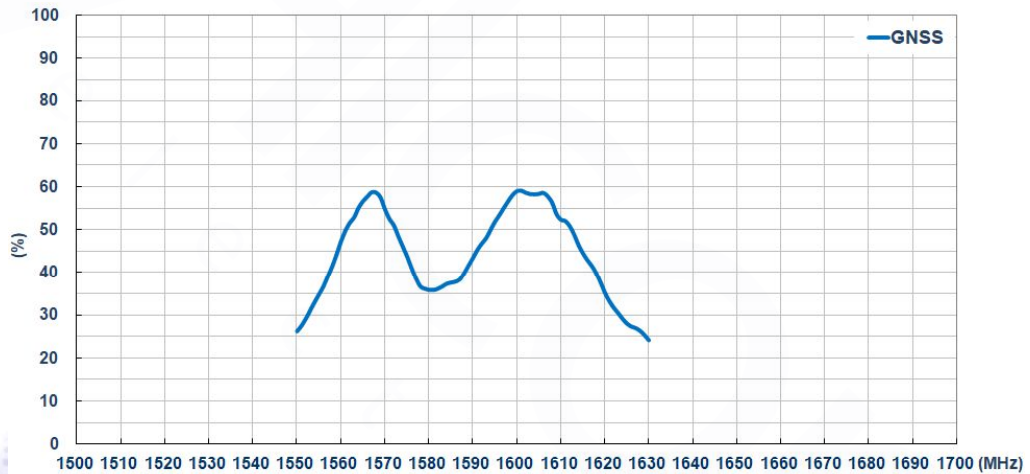
II. Antenna Technical Parameters:

GNSS

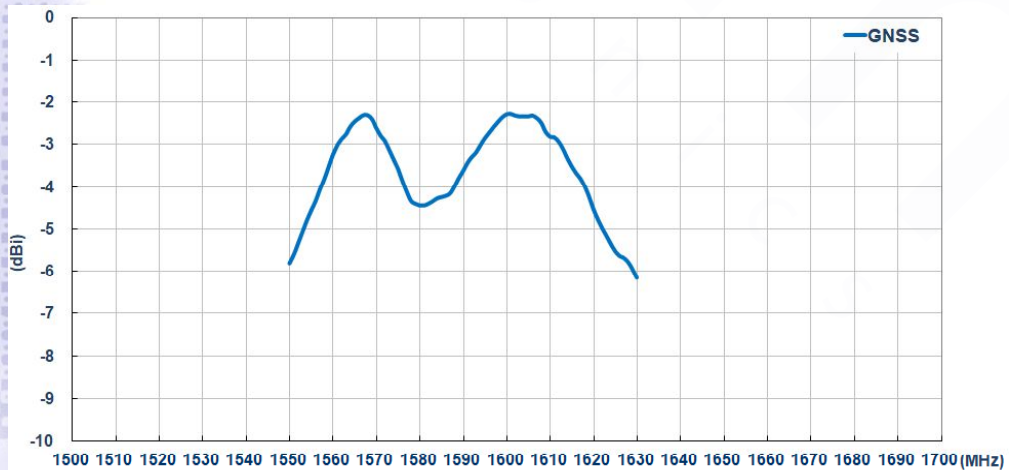
S11 (dB)



Efficiency (%)



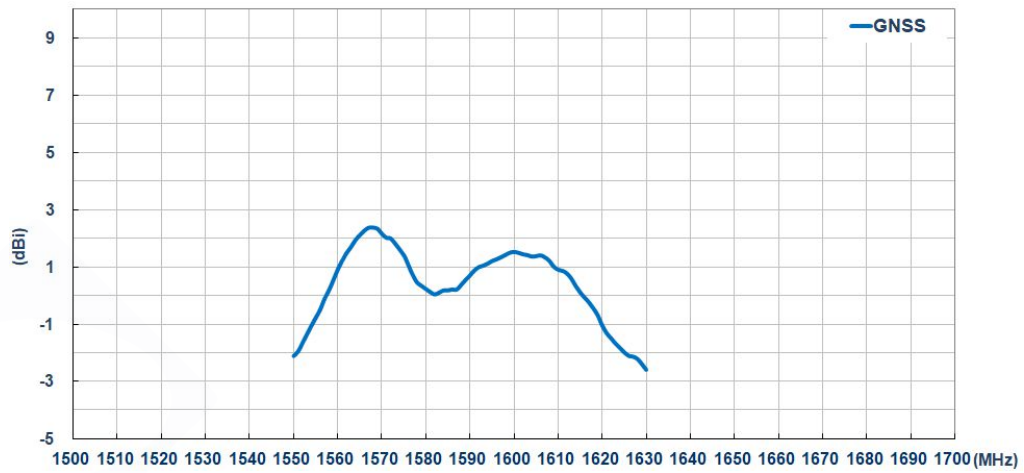
Average Gain (dBi)



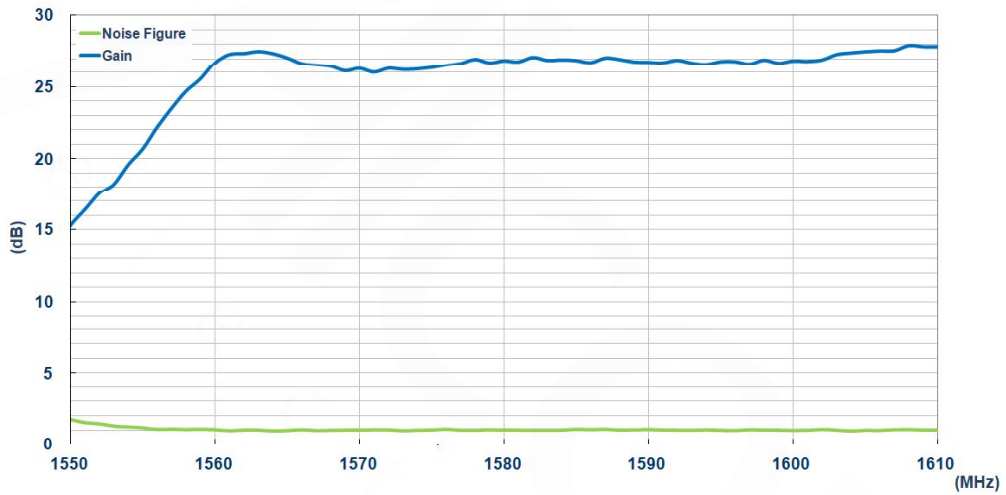
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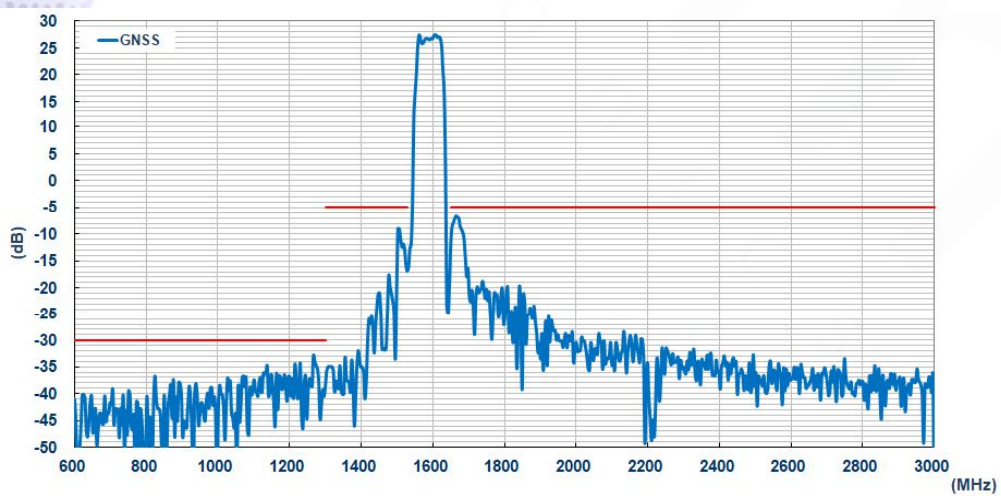
Peak Gain (dBi)



Noise Figure & Gain (dB)

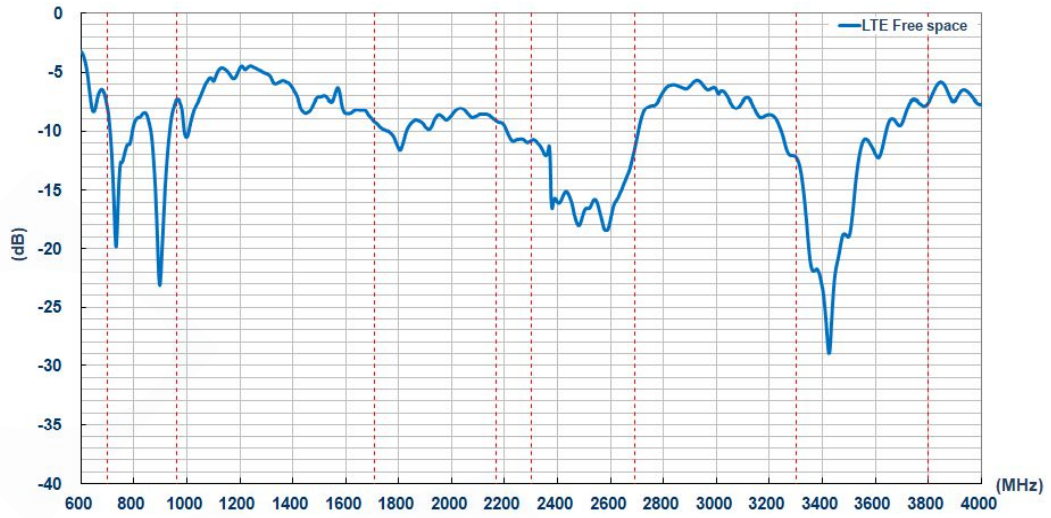


Out of Band Rejection (dB)

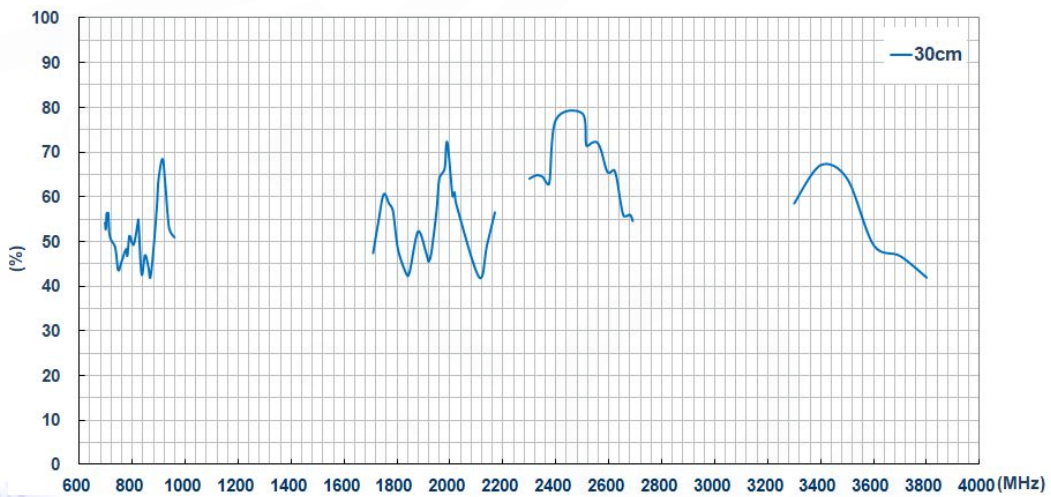


Free Space - LTE

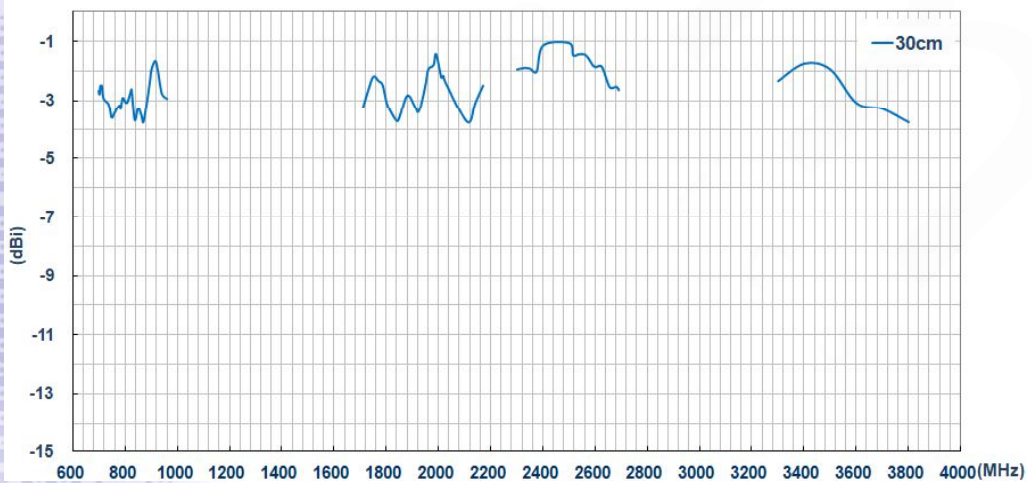
S11 (dB)



Efficiency (%)



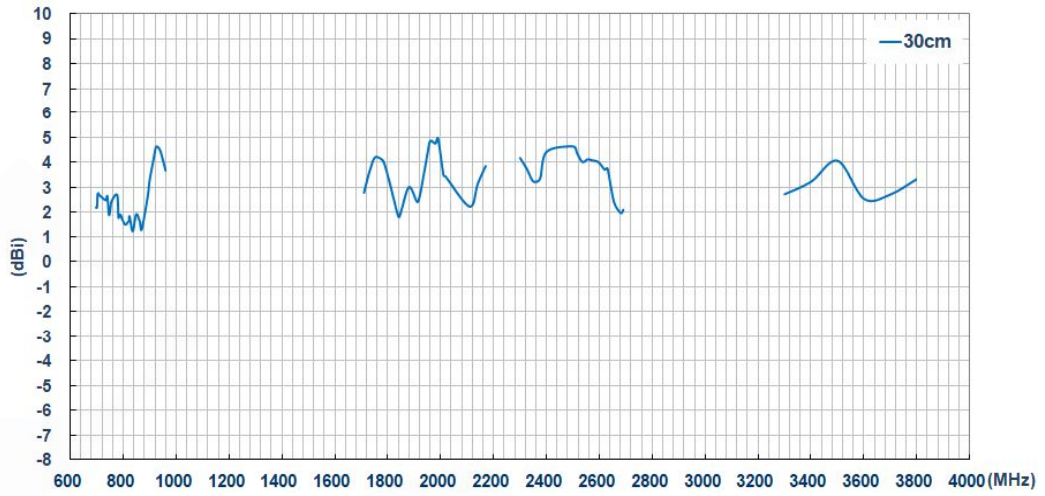
Average Gain (dBi)



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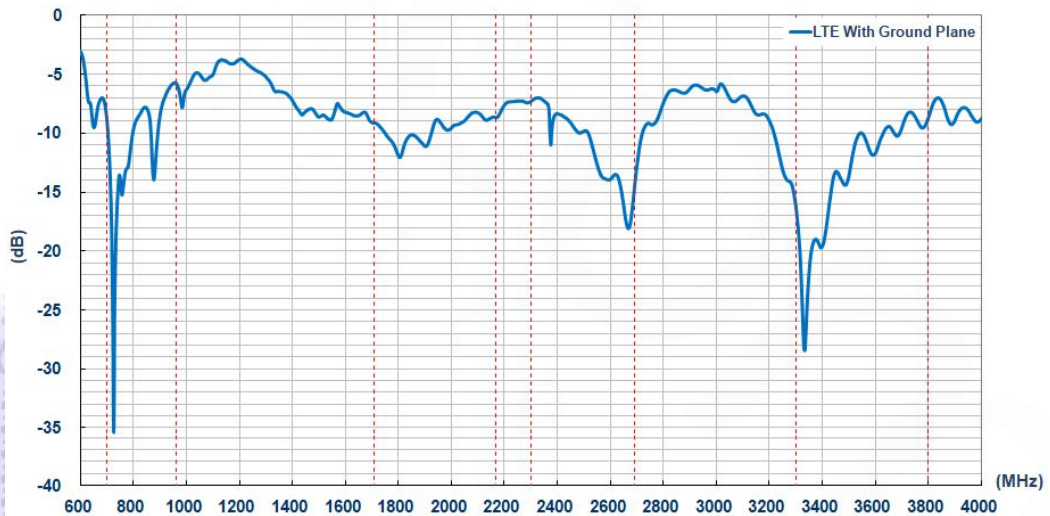
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Peak Gain (dBi)

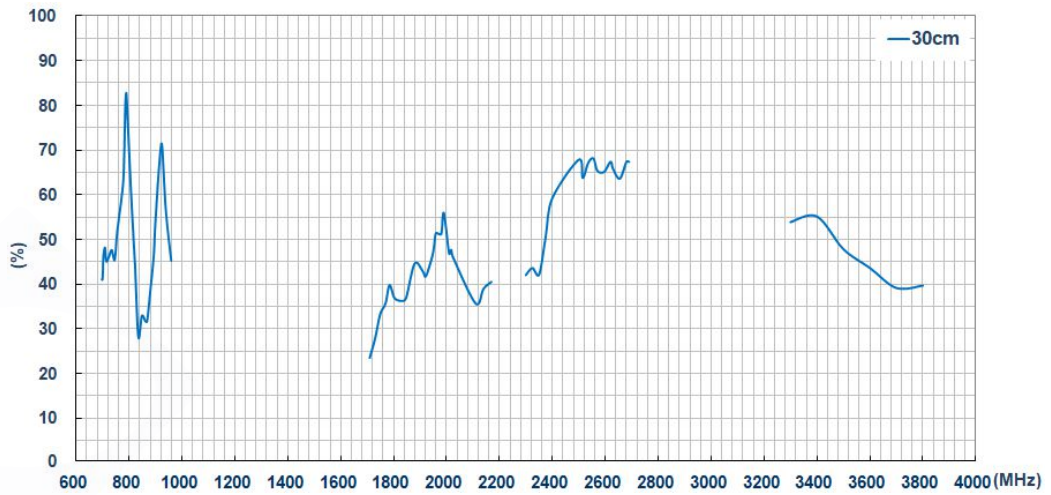


With 30*30cm Ground Plane - LTE

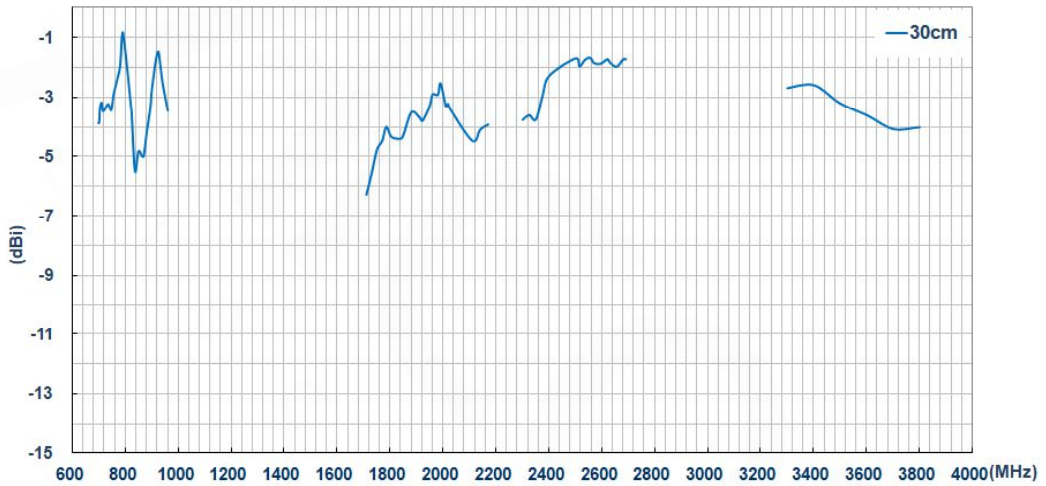
S11 (dB)



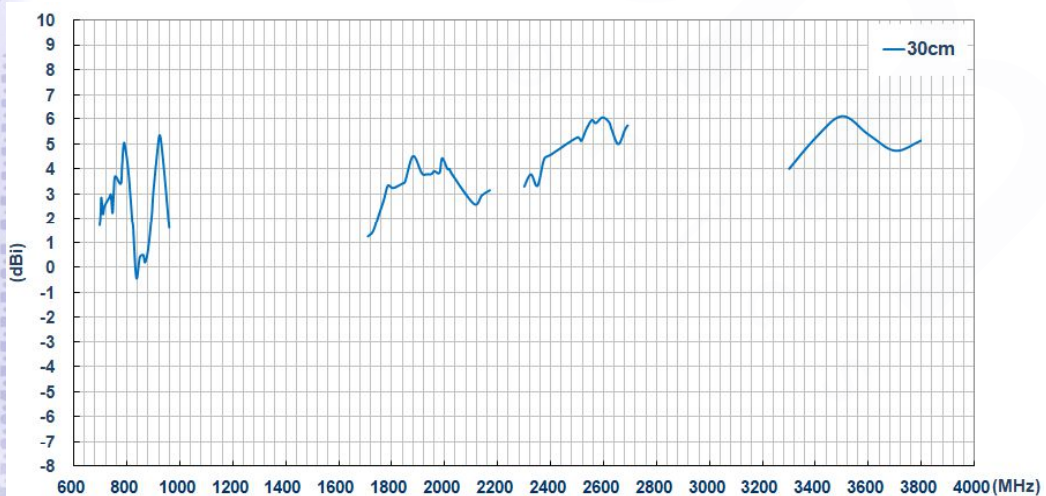
Efficiency (%)



Average Gain (dBi)



Peak Gain (dBi)

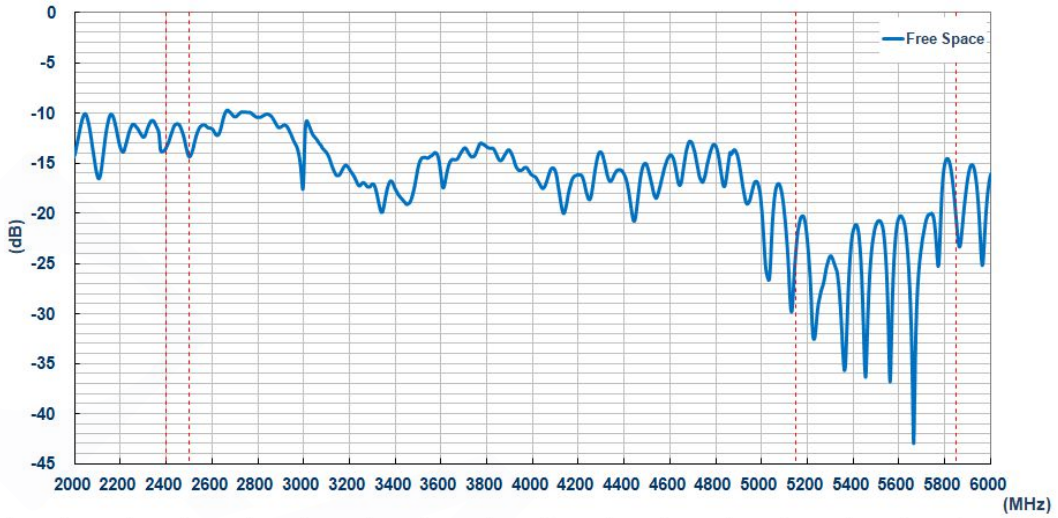


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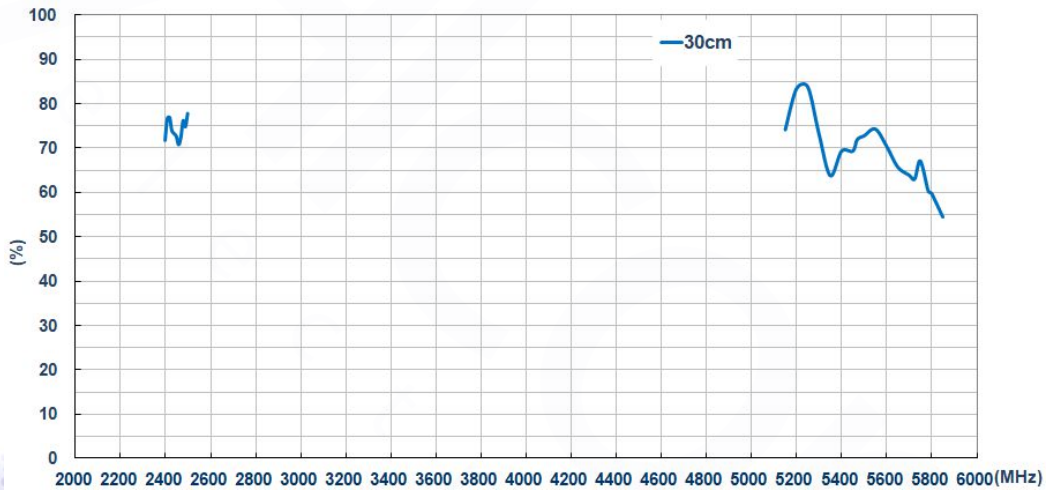
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Free Space – WiFi

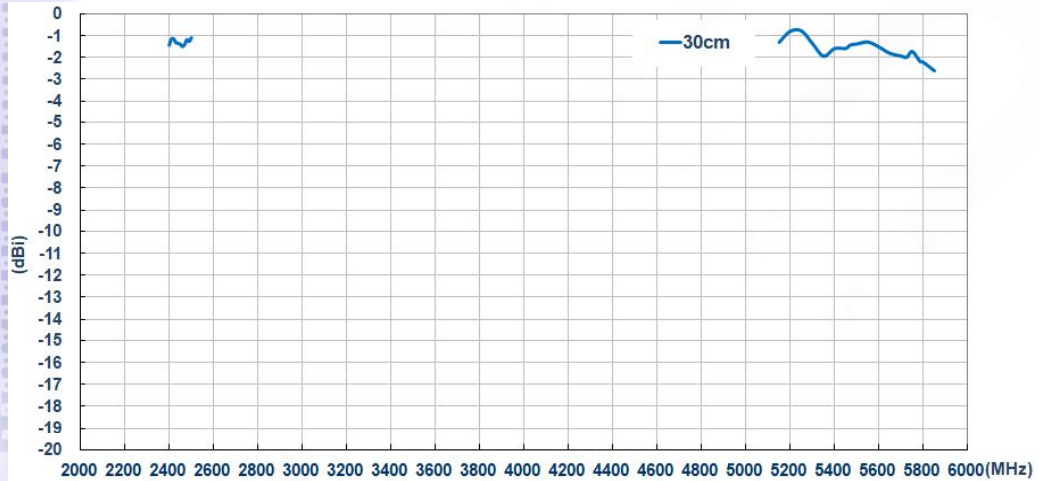
S11 (dB)



Efficiency (%)

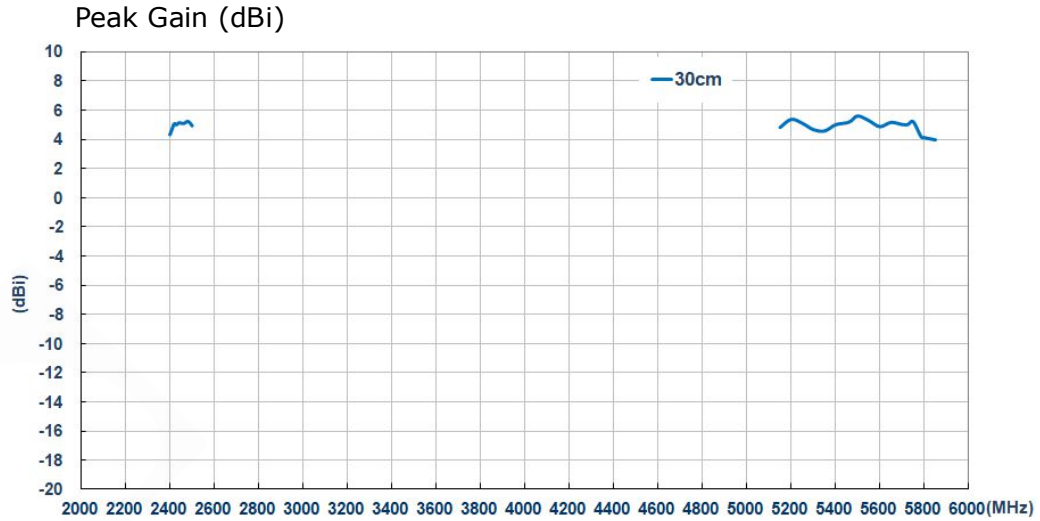


Average Gain (dBi)

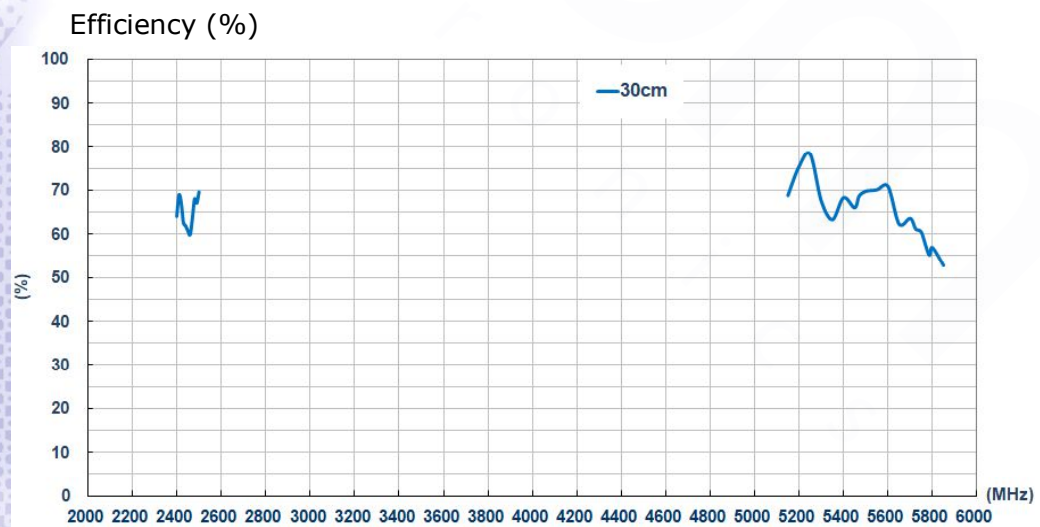
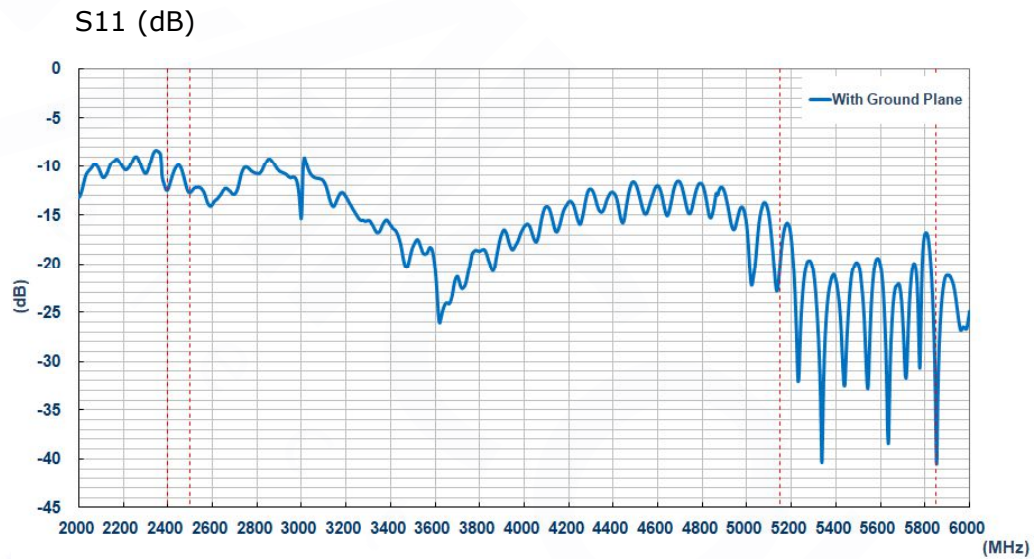


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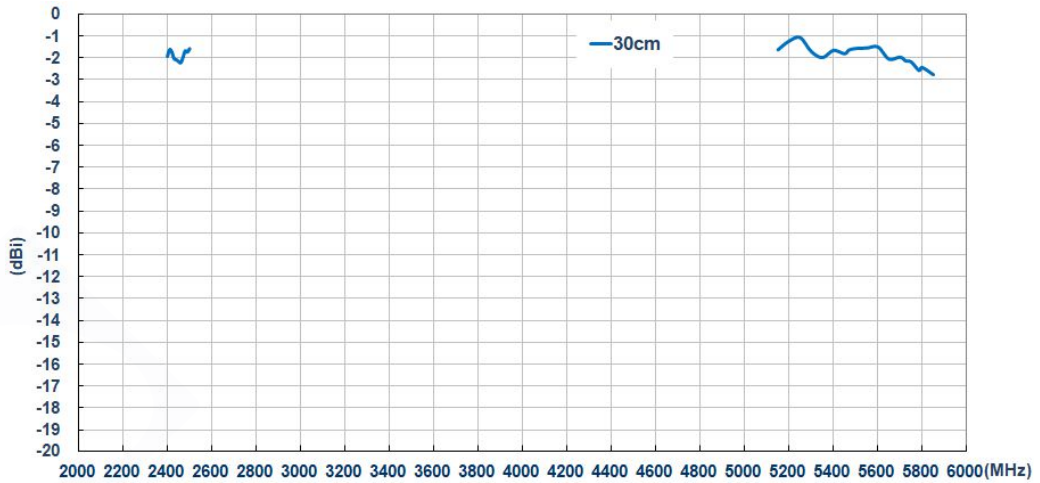
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With 30*30cm Ground Plane – WiFi

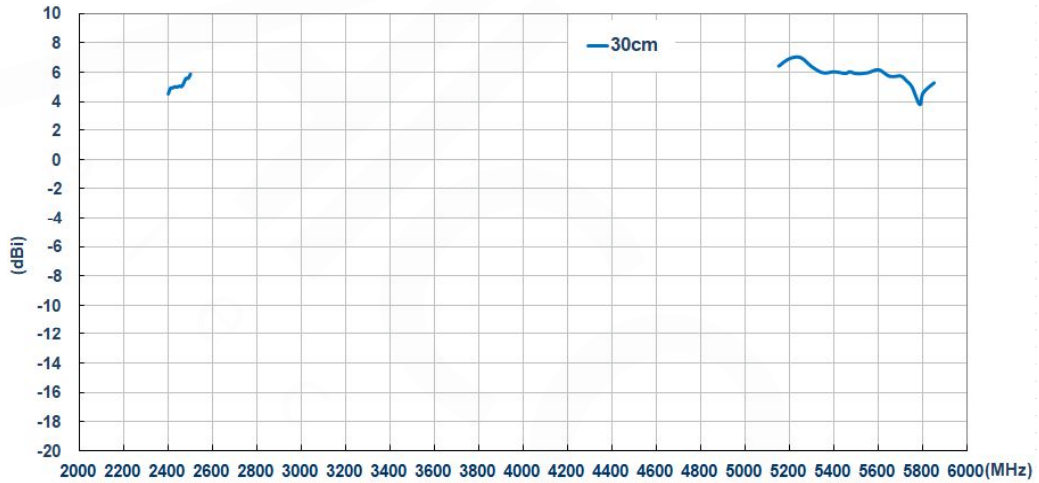


Average Gain (dBi)



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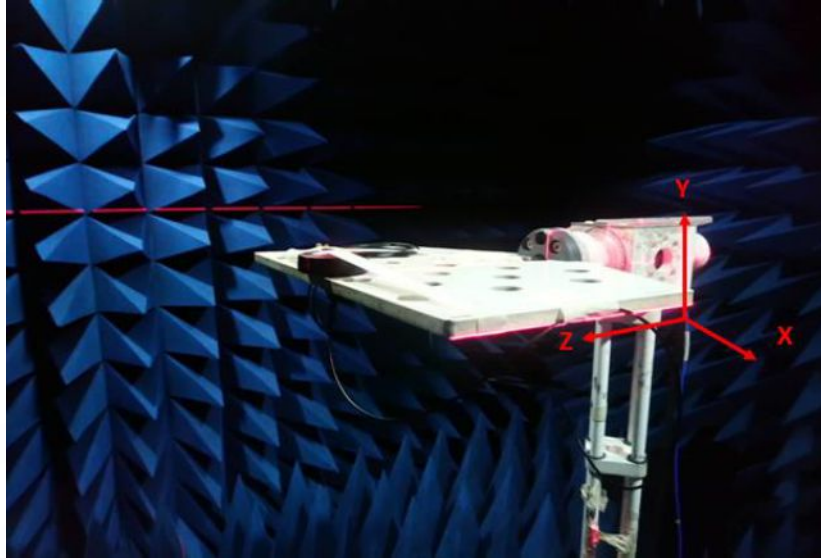
Peak Gain (dBi)



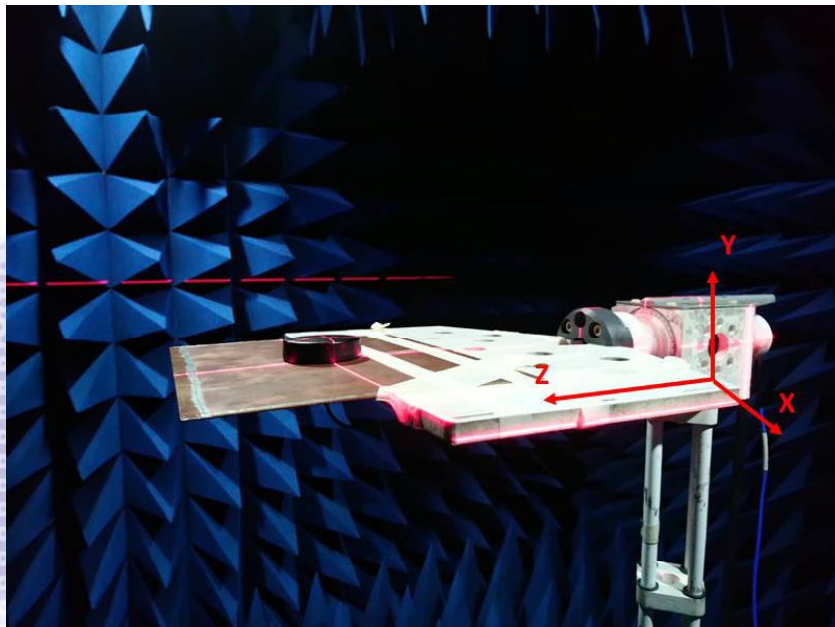
III. Antenna Radiation Pattern Measurement:

The antenna radiation patterns were measured in Anechoic Chamber.
The measurement setup as below,

Free Space



With 30*30cm Ground Plane

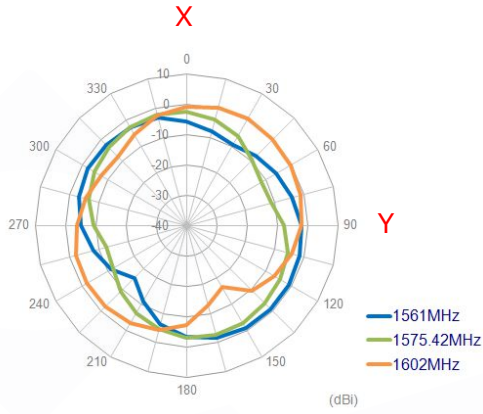


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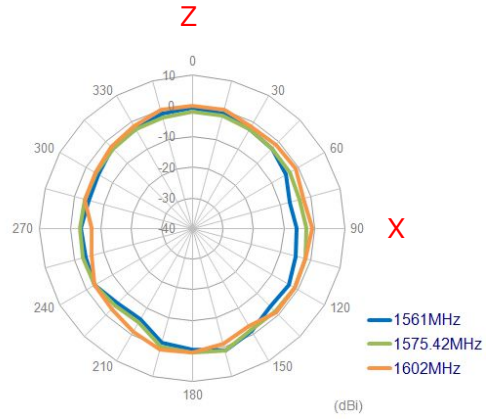


IV. 2D Radiation Pattern:

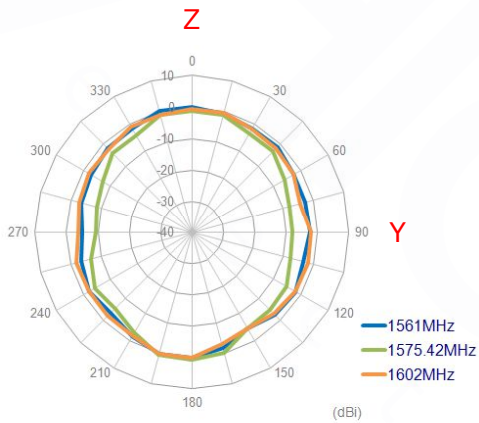
GNSS X-Y Plane



GNSS X-Z Plane

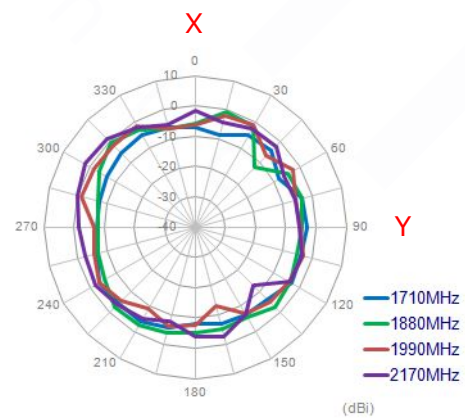
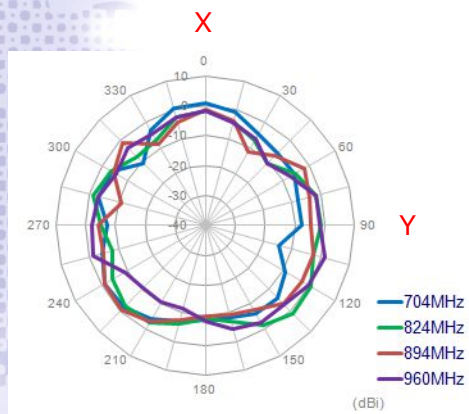


GNSS Y-Z Plane



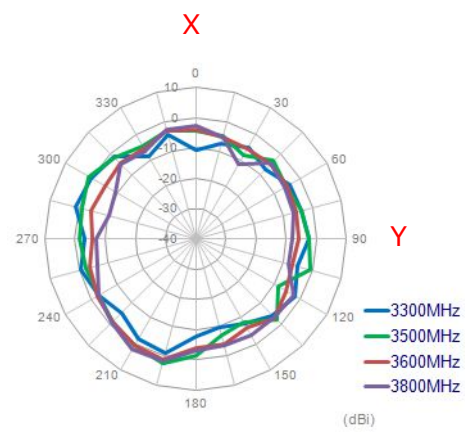
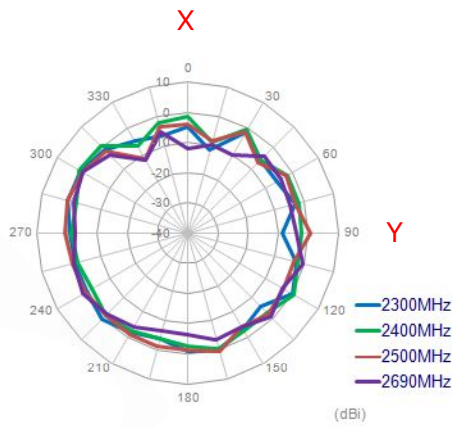
Free Space - LTE

X-Y Plane

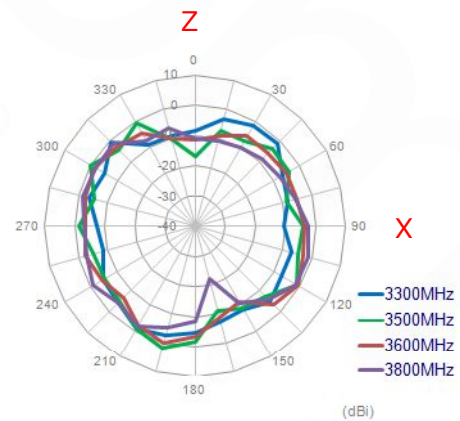
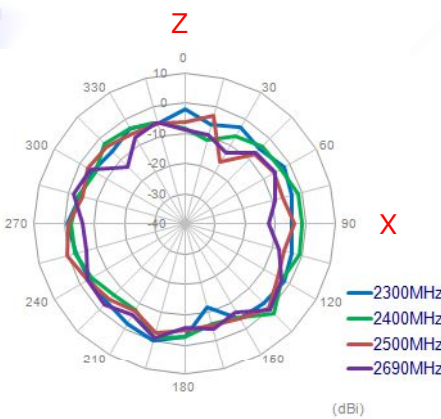
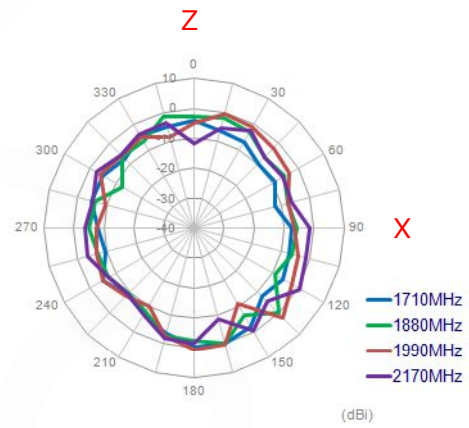
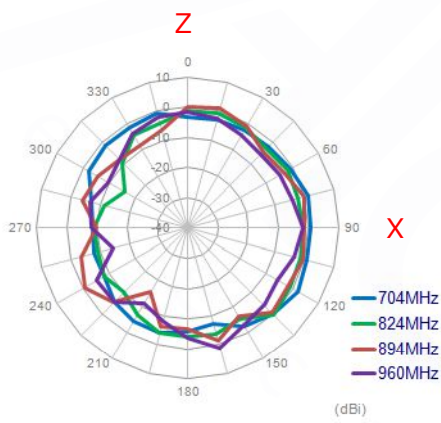


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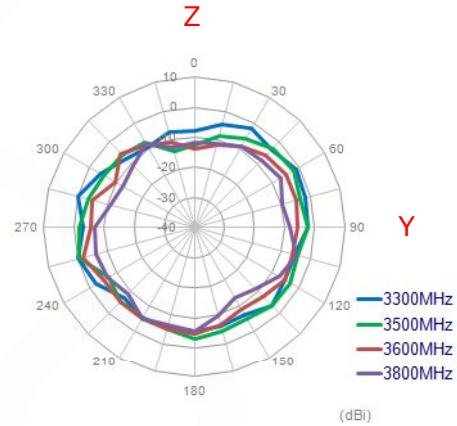
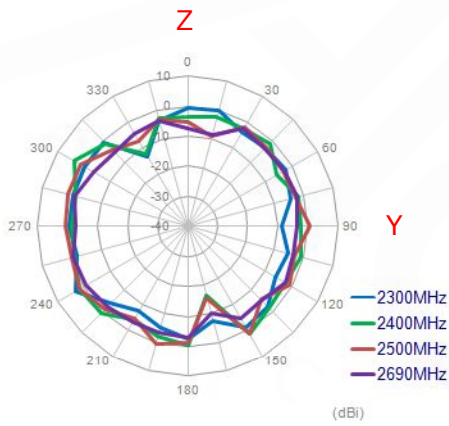
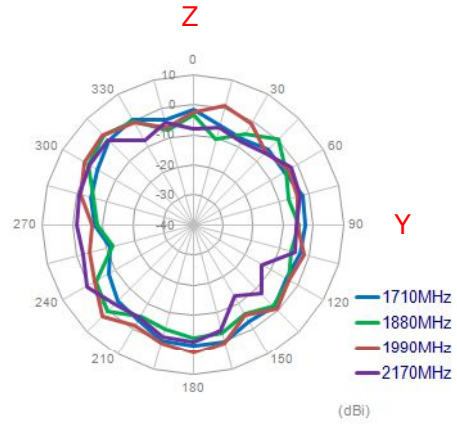
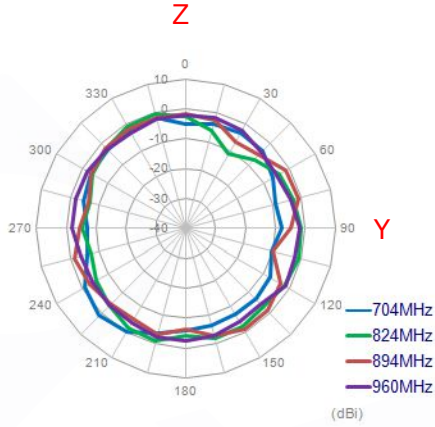
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X-Z Plane

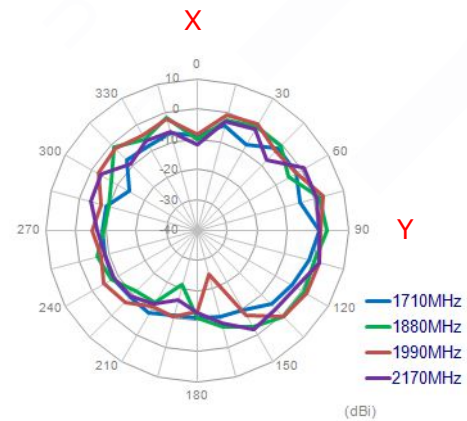
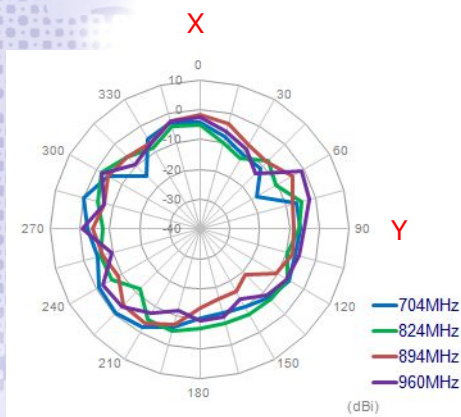


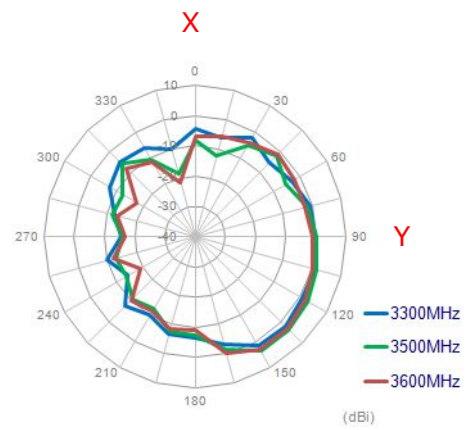
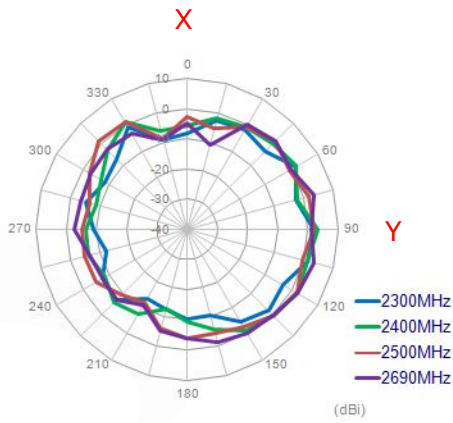
Y-Z Plane



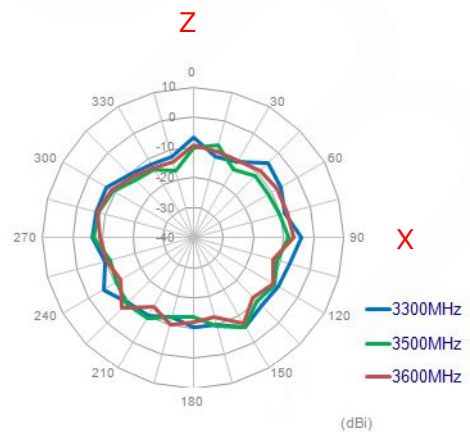
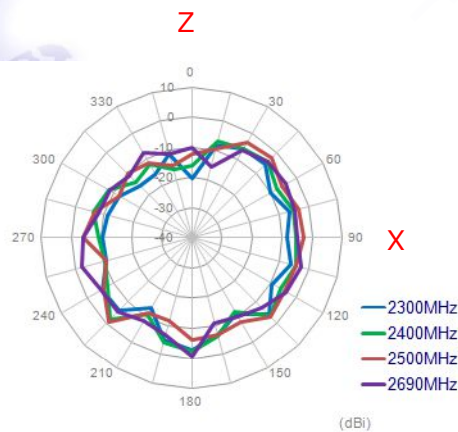
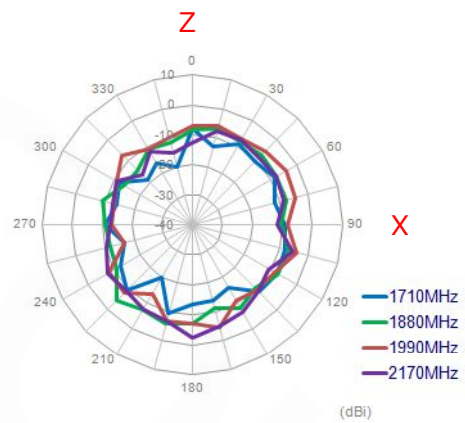
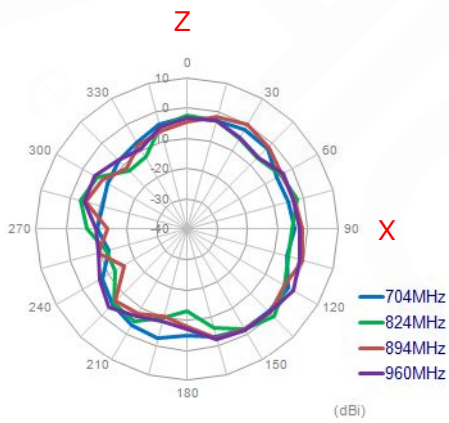
With Ground Plane - LTE

X-Y Plane

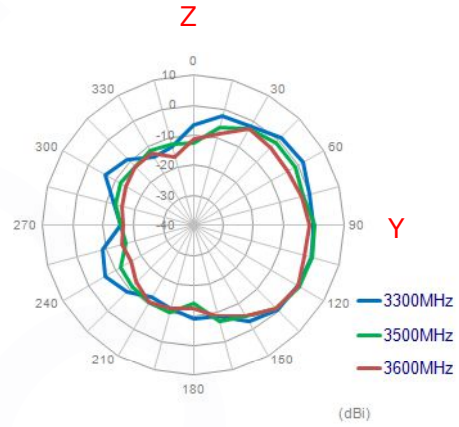
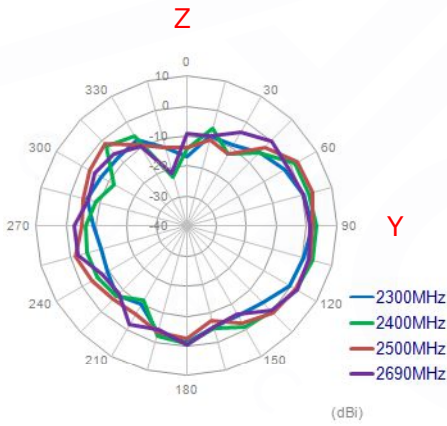
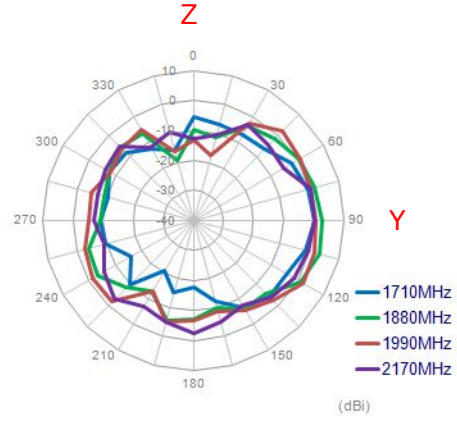
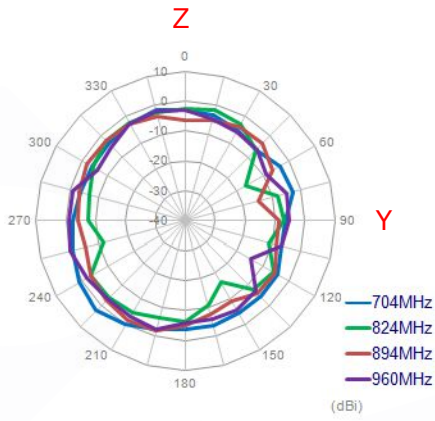




X-Z Plane

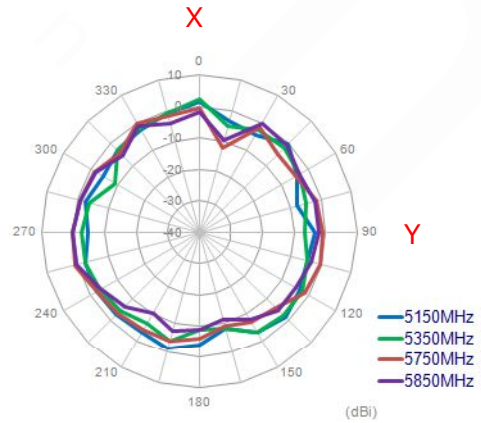
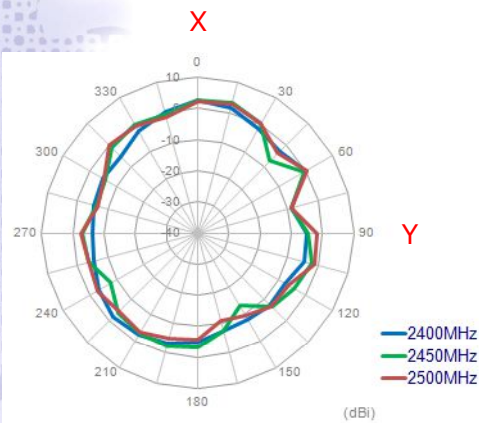


Y-Z Plane

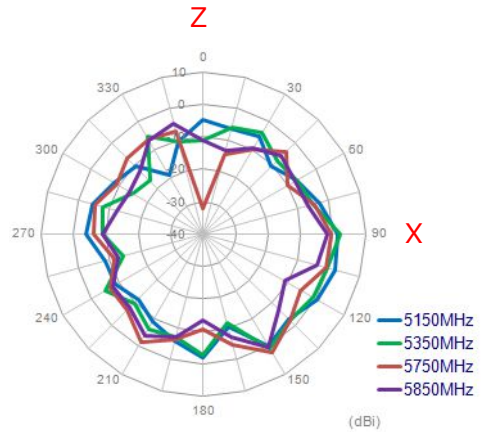
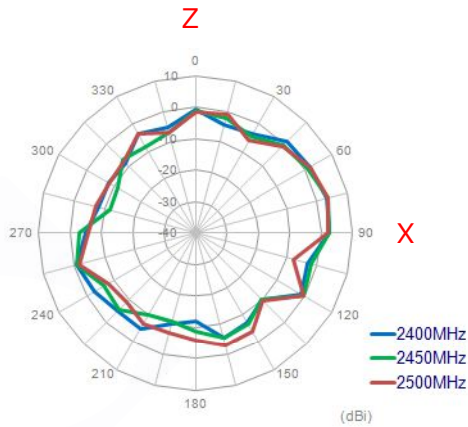


Free Space – WiFi

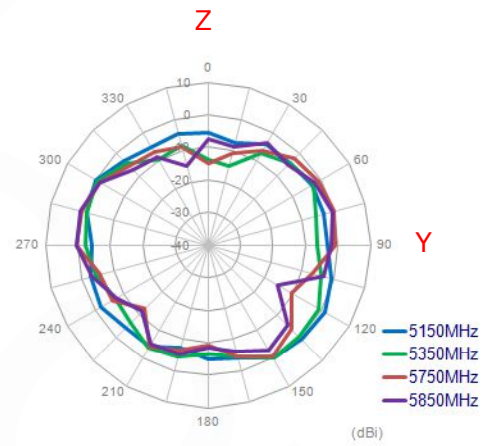
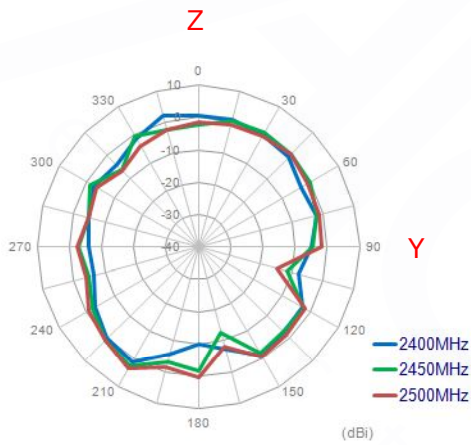
X-Y Plane



X-Z Plane

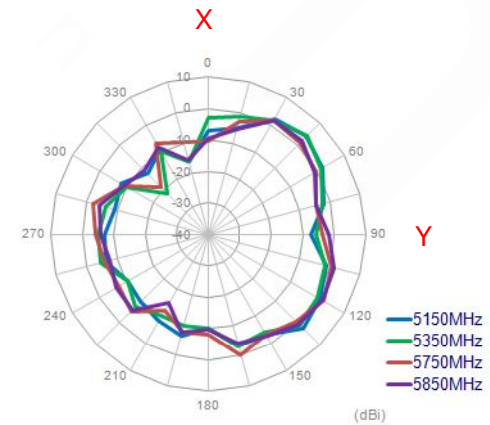
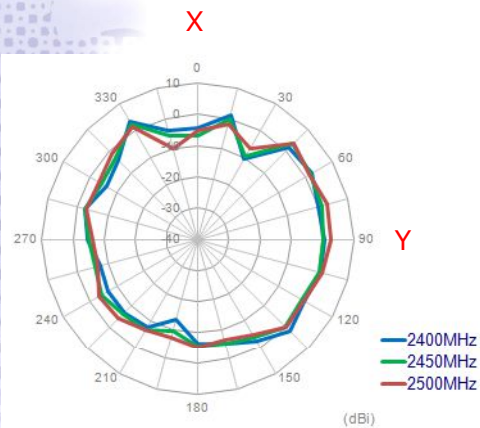


Y-Z Plane

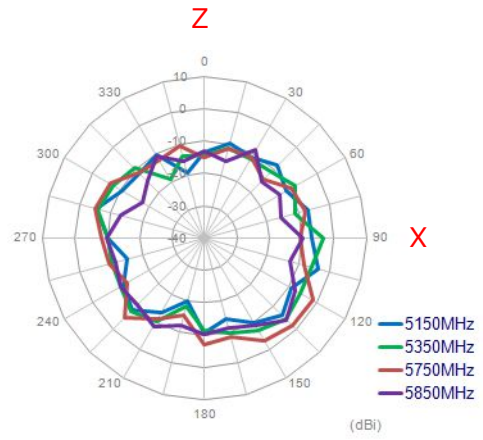
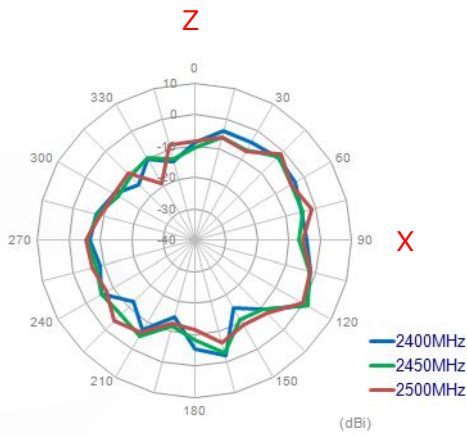


With Ground Plane – WiFi

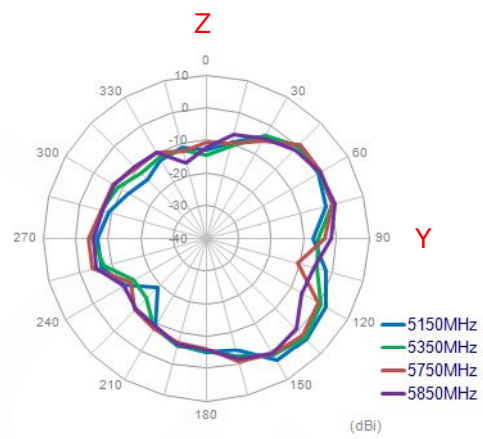
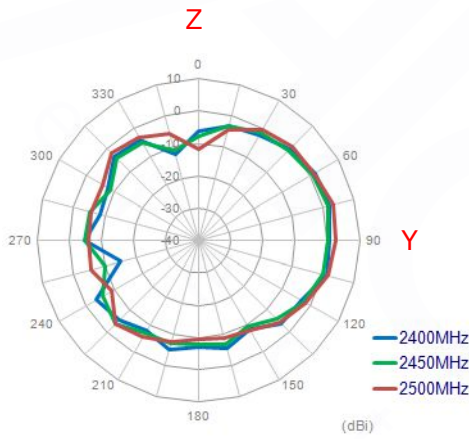
X-Y Plane



X-Z Plane



Y-Z Plane

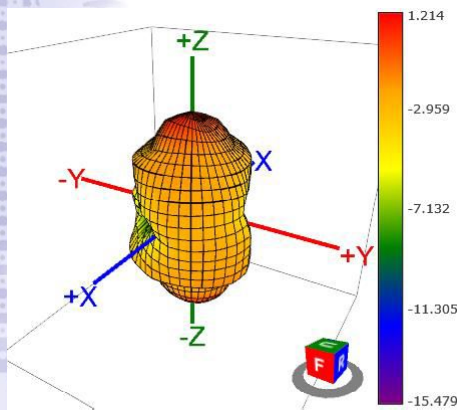


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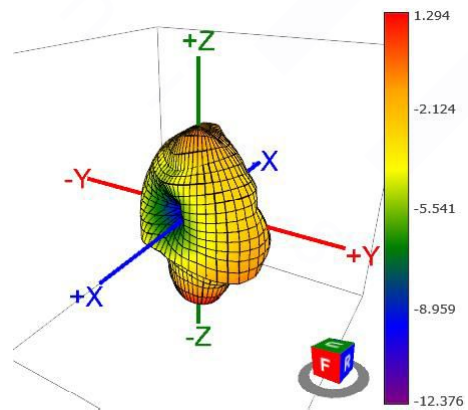
V. 3D Radiation Pattern:

GNSS

1561MHz

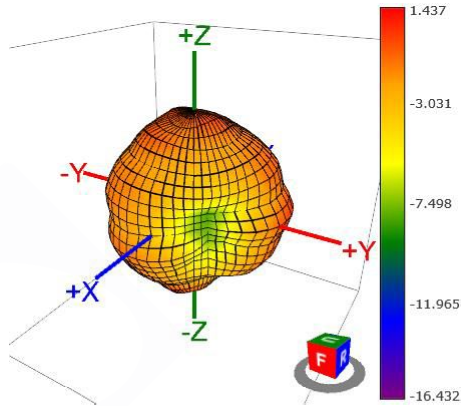


1575.42MHz



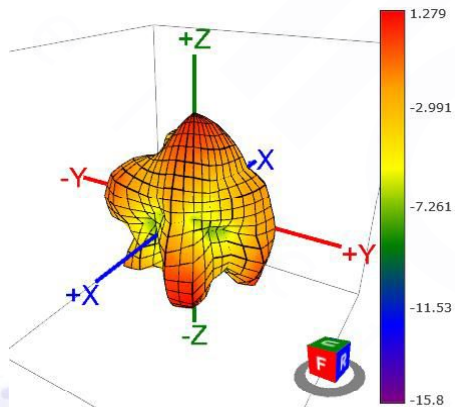
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1602MHz

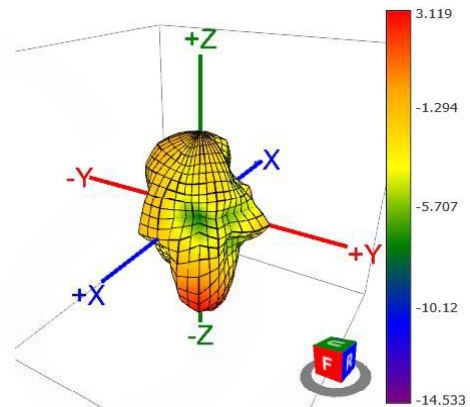


Free Space - LTE

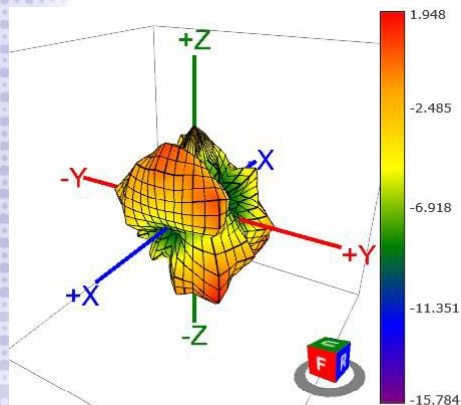
824MHz



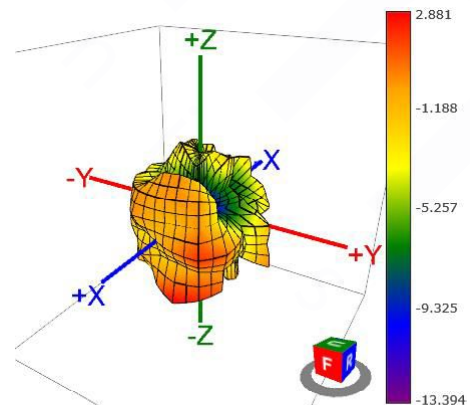
960MHz



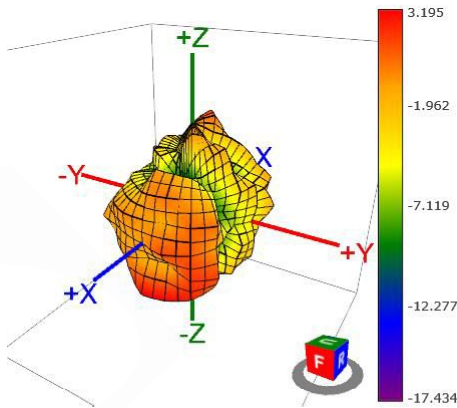
1710MHz



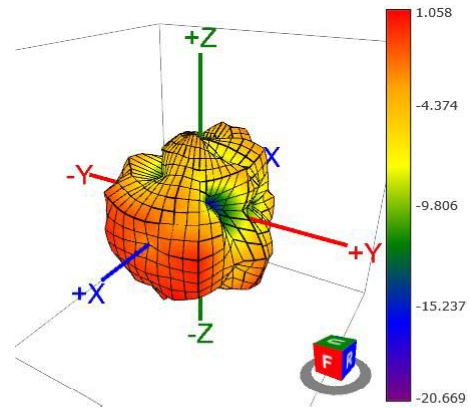
2170MHz



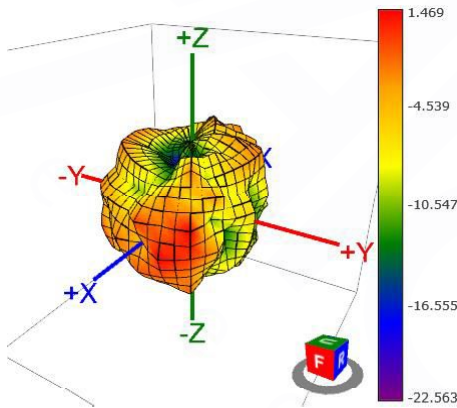
2300MHz



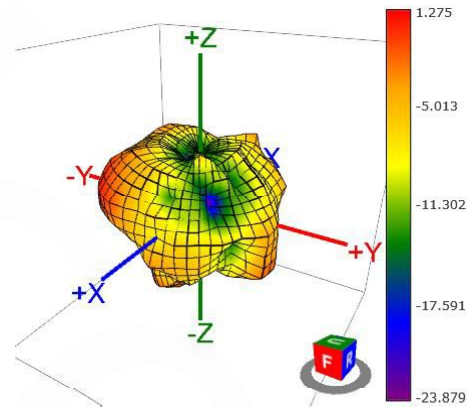
2690MHz



3300MHz

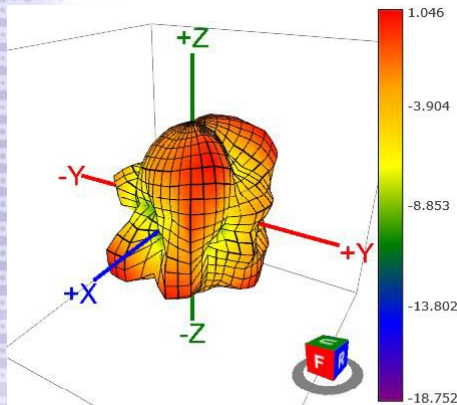


3600MHz

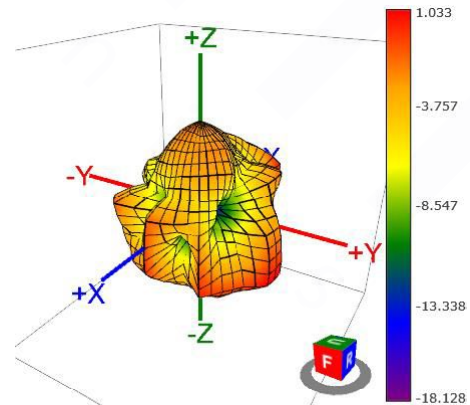


With Ground Plane - LTE

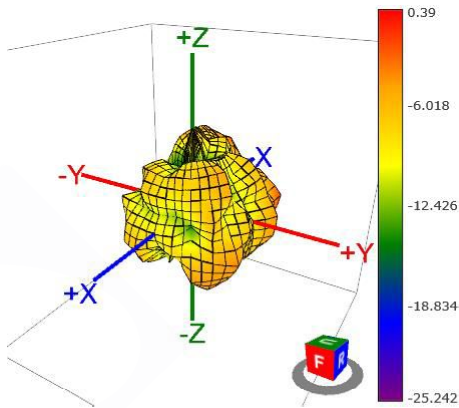
824MHz



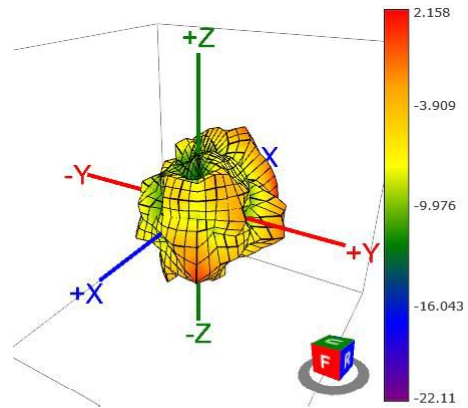
960MHz



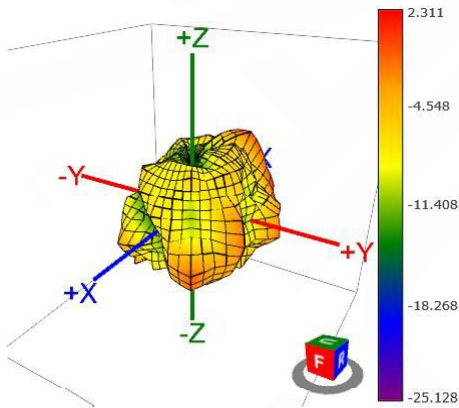
1710MHz



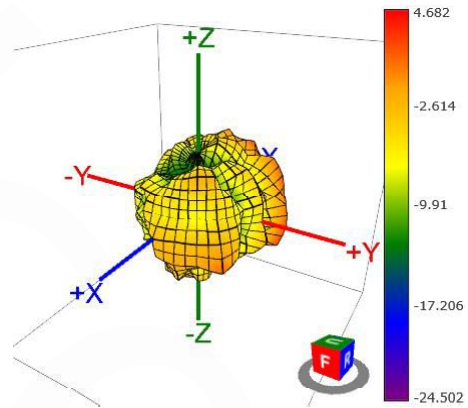
2170MHz



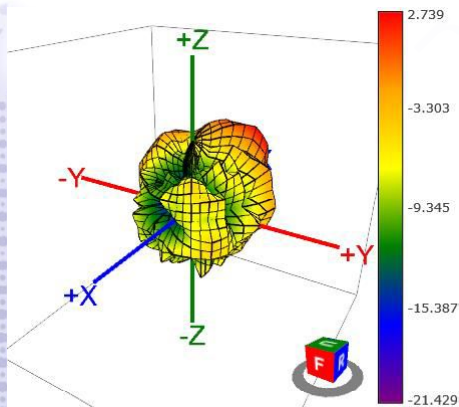
2300MHz



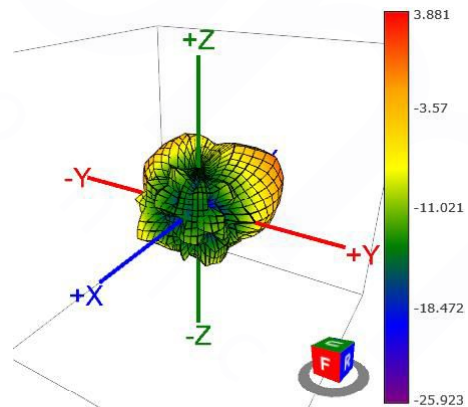
2690MHz



3300MHz



3600MHz

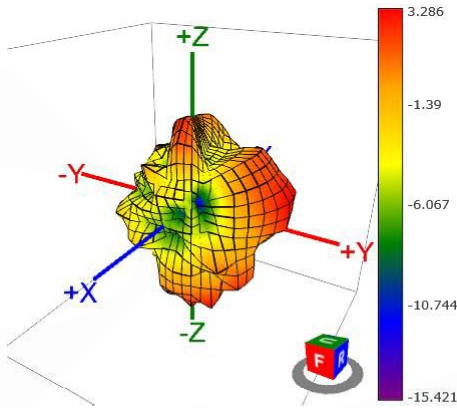


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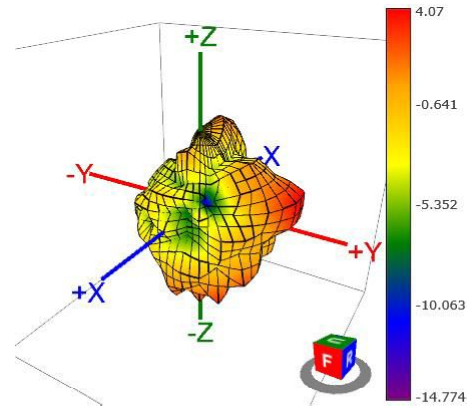


Free Space – WiFi

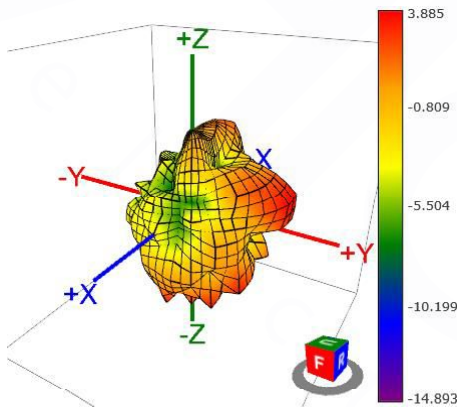
2400MHz



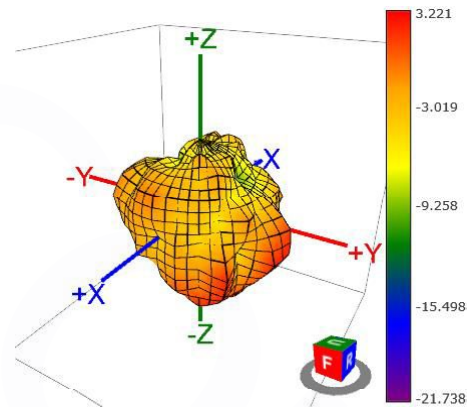
2450MHz



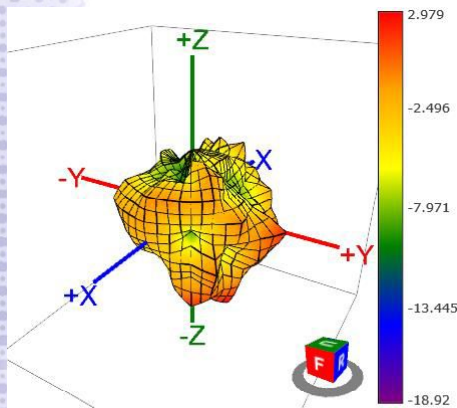
2500MHz



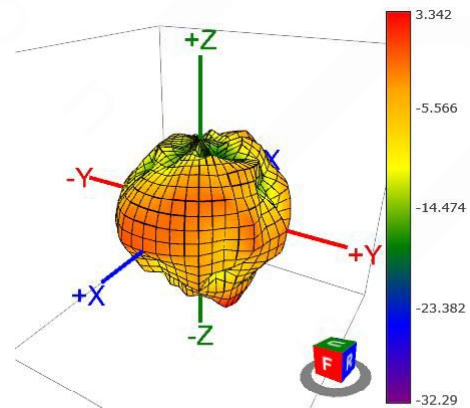
5150MHz



5350MHz



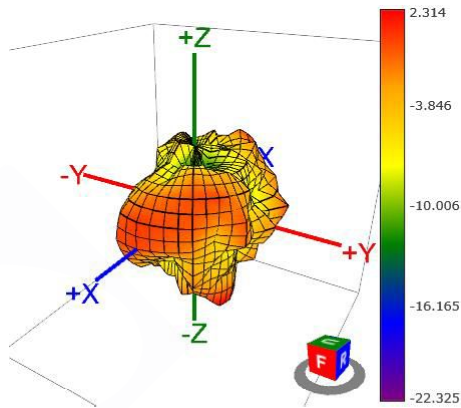
5750MHz



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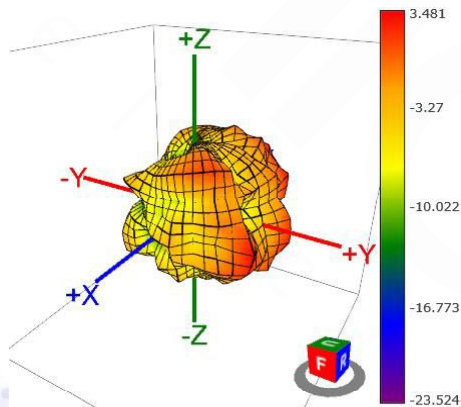


5850MHz

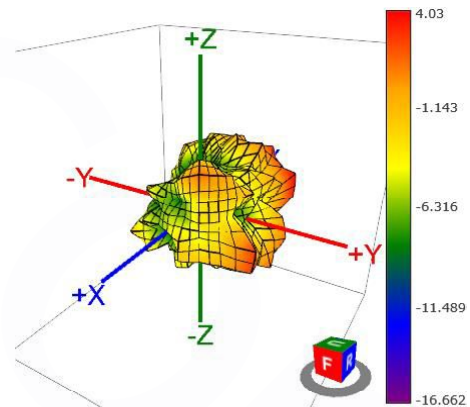


With Ground Plane – WiFi

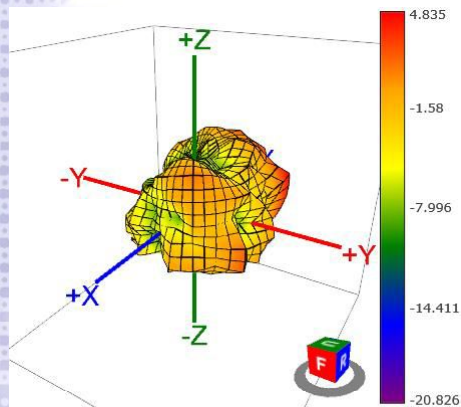
2400MHz



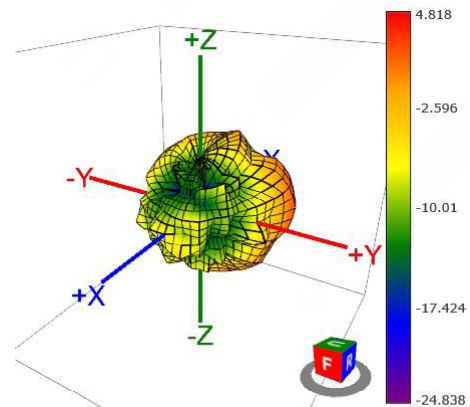
2450MHz

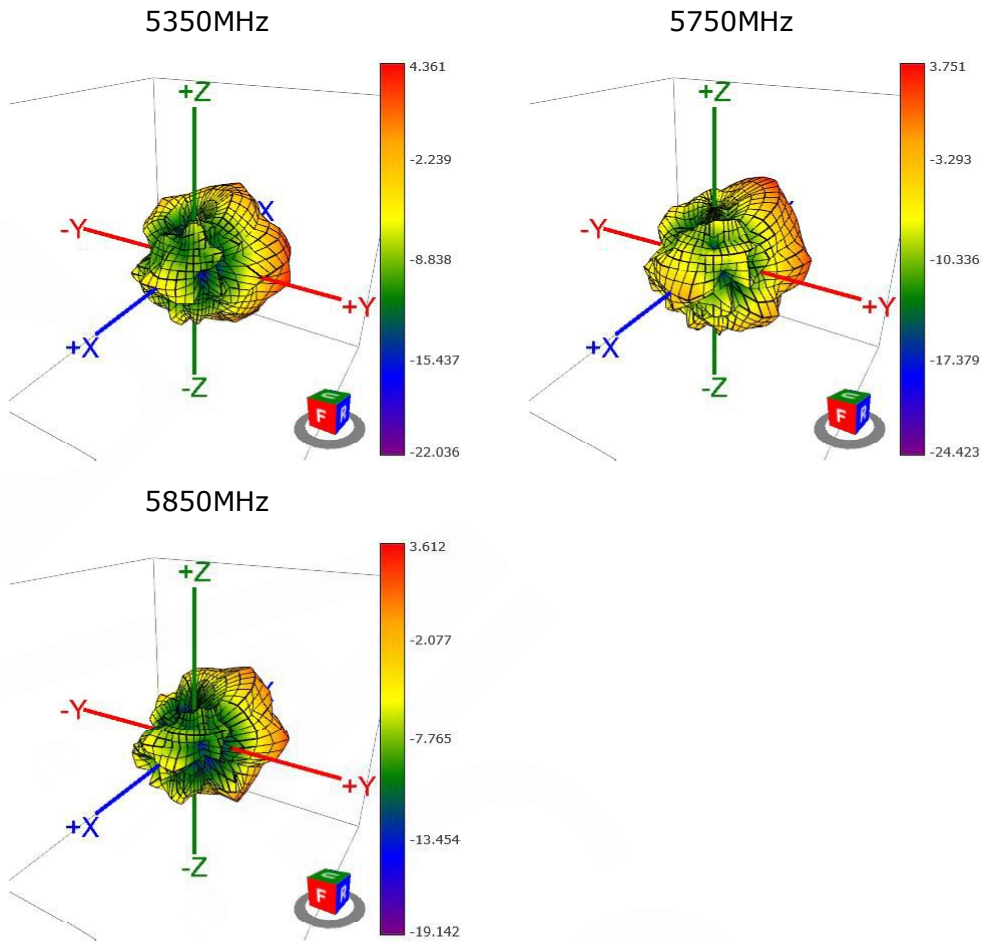


2500MHz

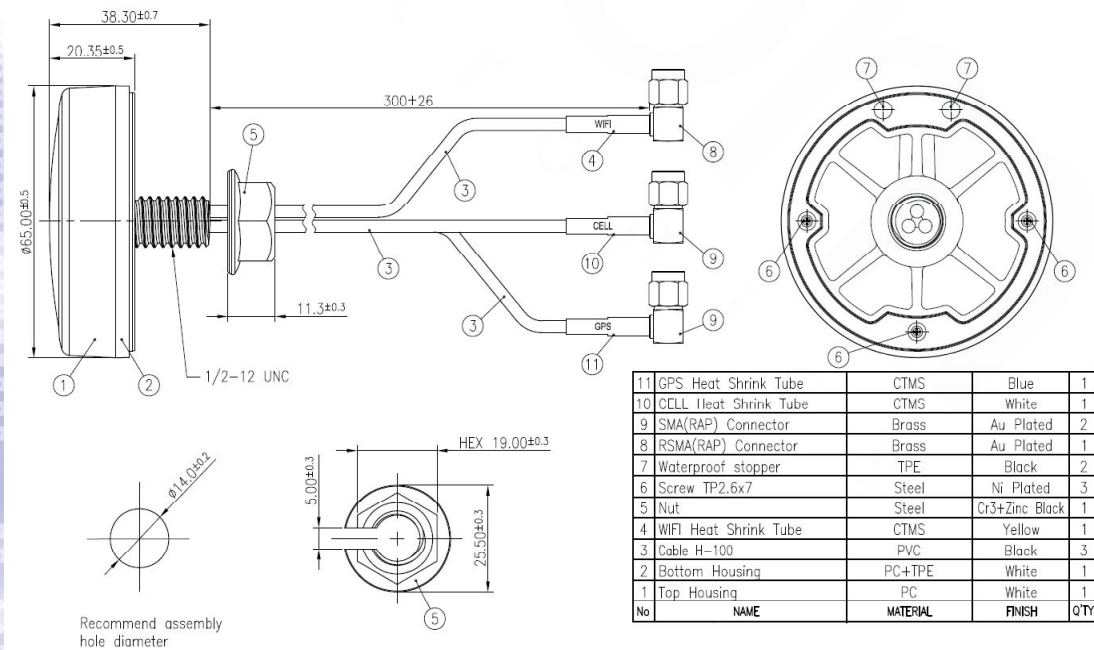


5150MHz





VI. Mechanical Drawing (Unit:mm):



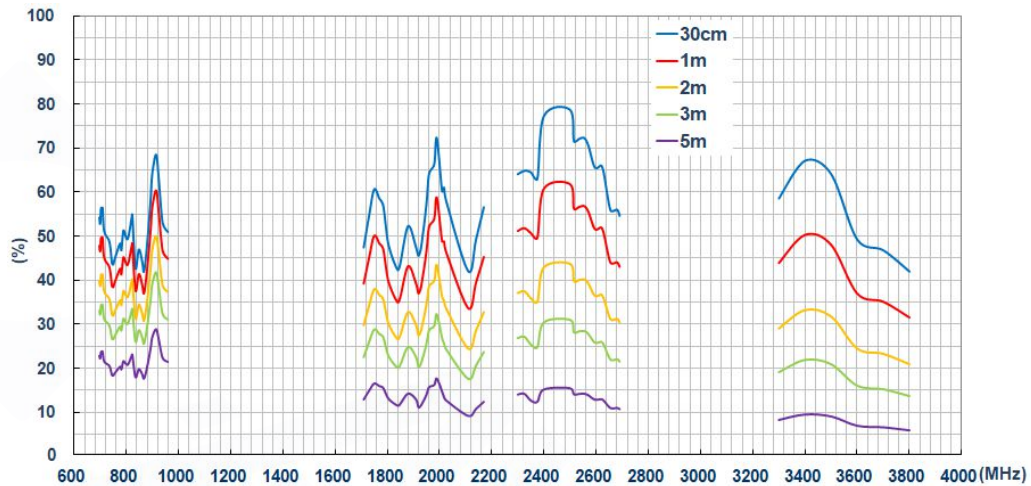
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VII. Applications Note:

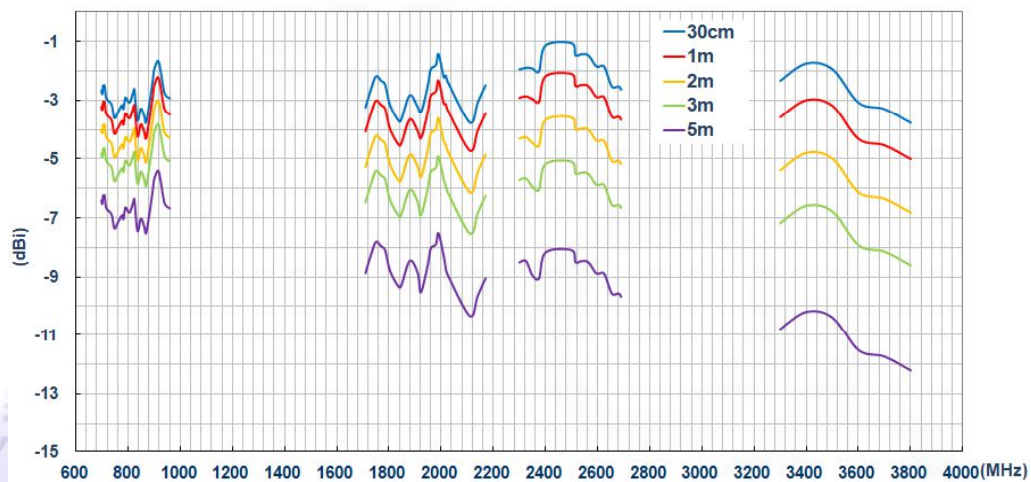
The antenna performance with different cable lengths is shown below.

Free Space – LTE

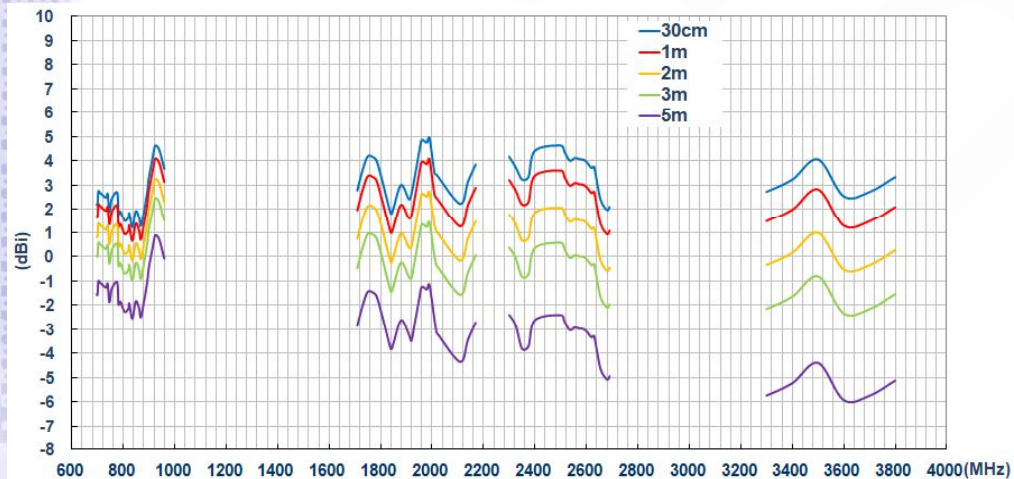
Efficiency (%)



Average Gain (dBi)



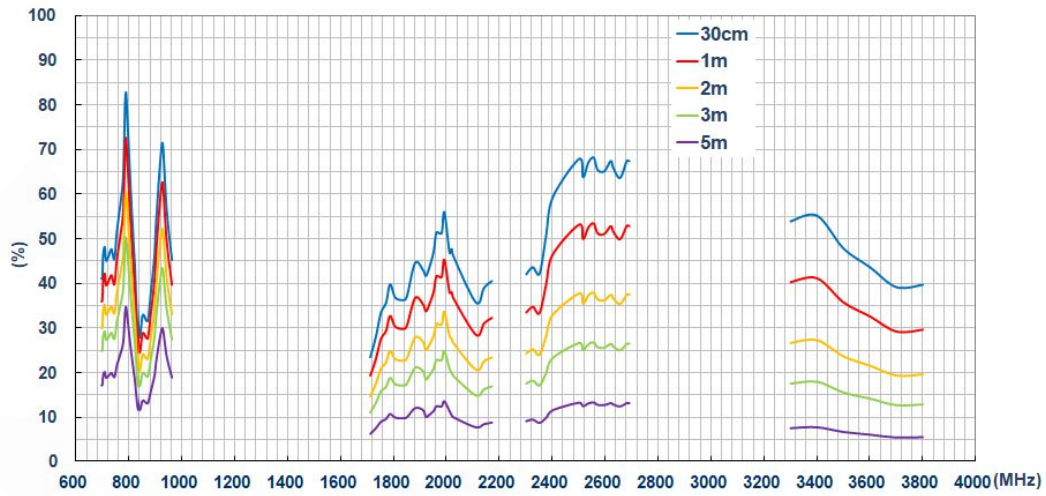
Peak Gain (dBi)



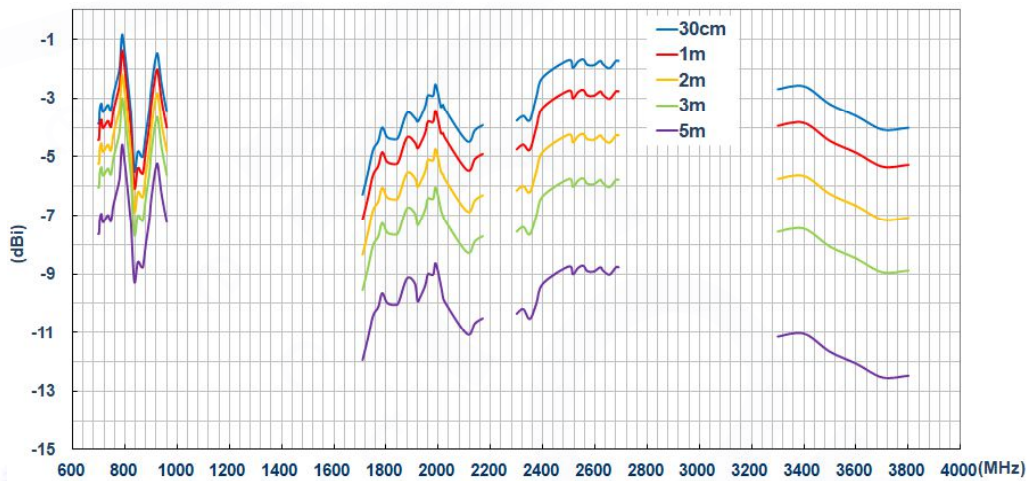
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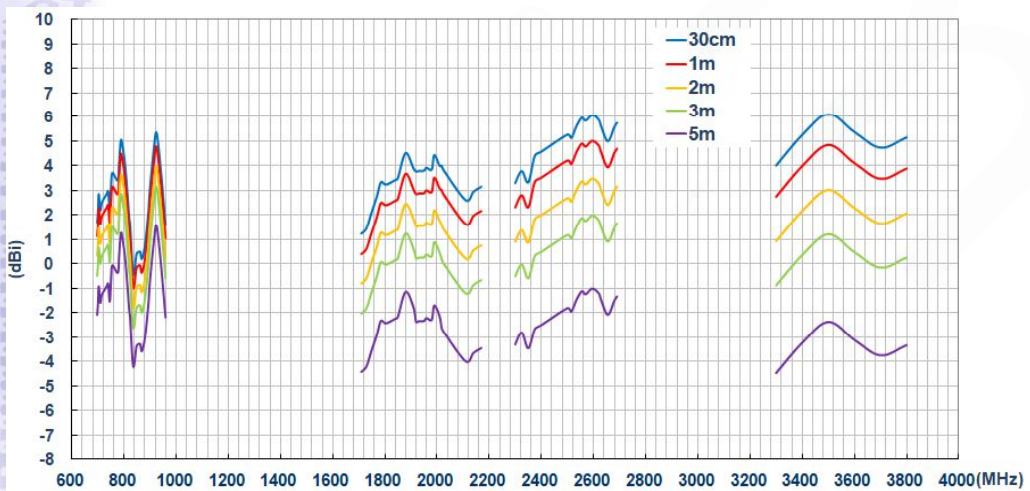
With Ground Plane – LTE
Efficiency (%)



Average Gain (dBi)



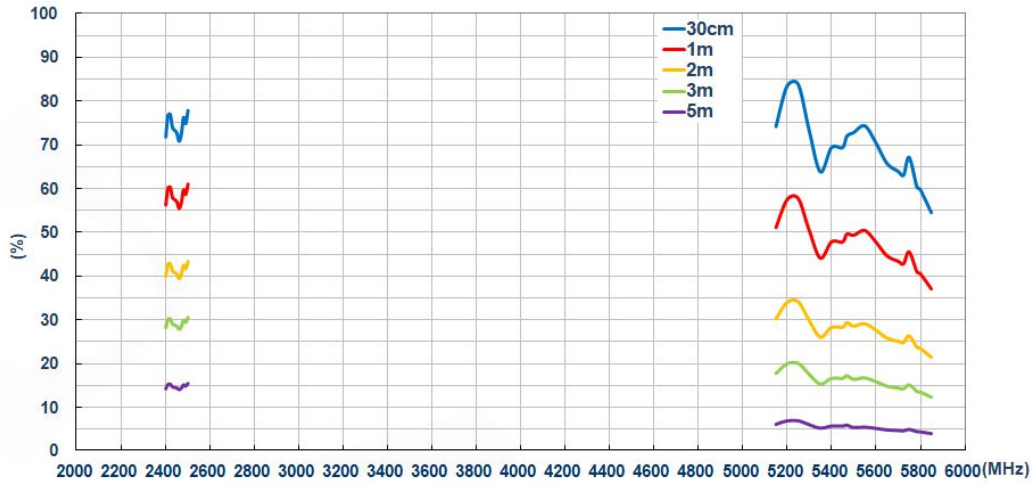
Peak Gain (dBi)



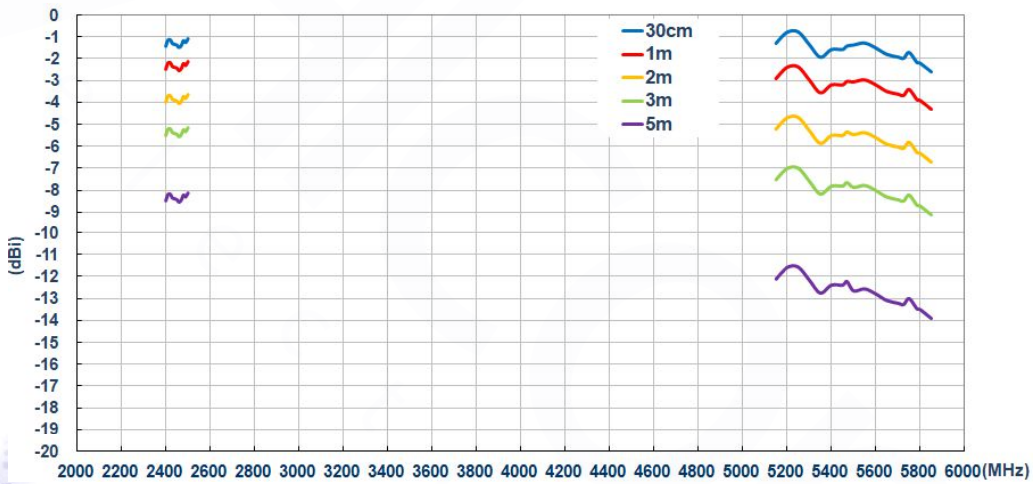
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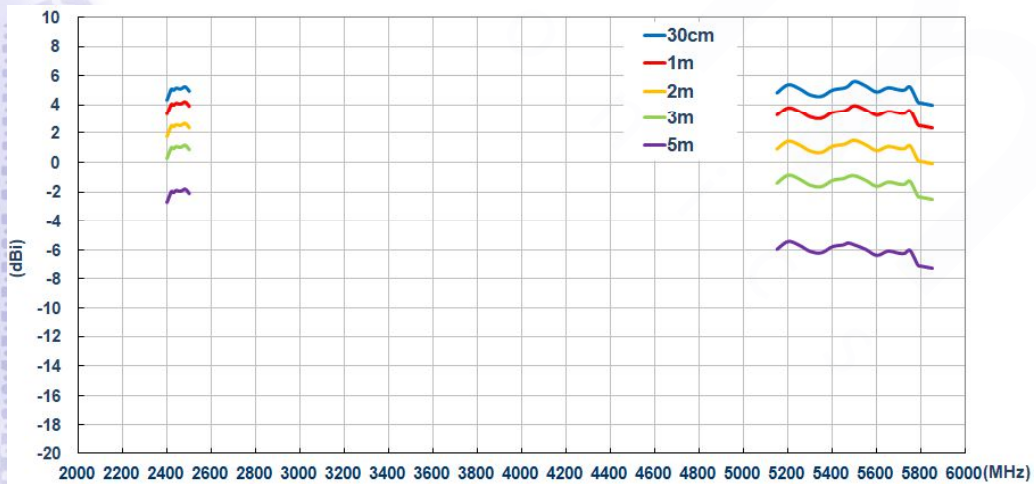
Free Space – WiFi
Efficiency (%)



Average Gain (dBi)



Peak Gain (dBi)

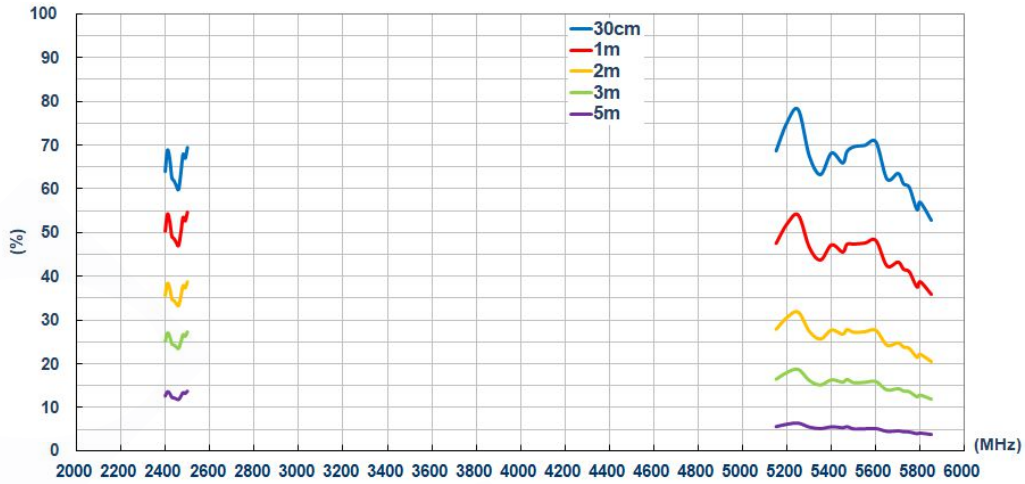


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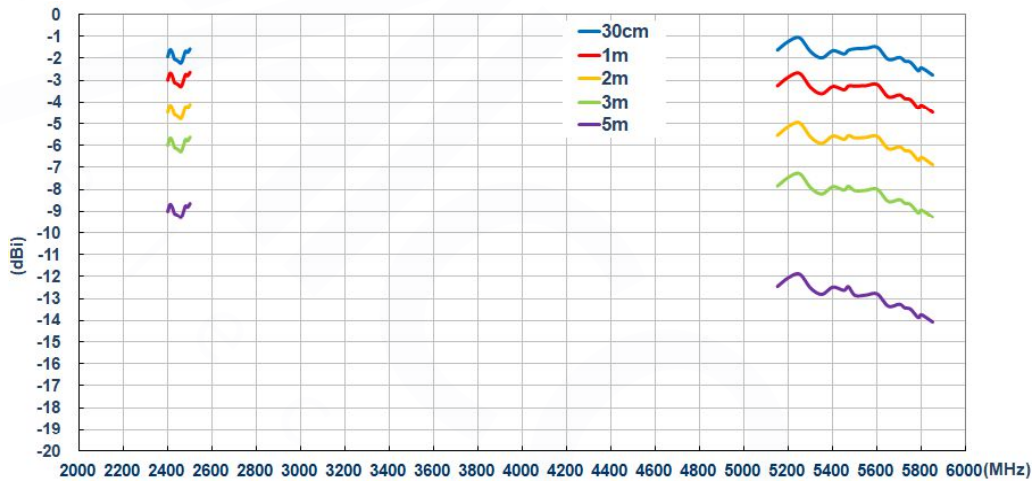


With Ground Plane – WiFi

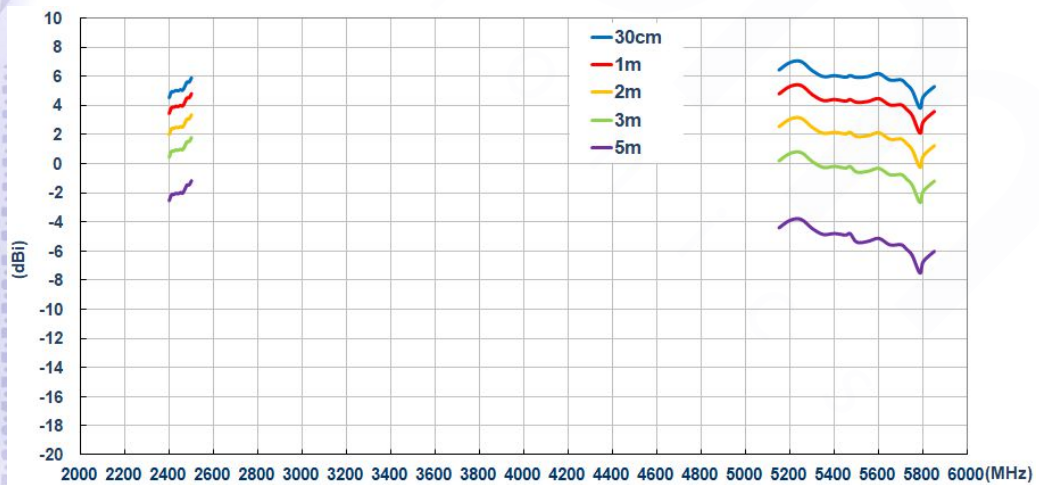
Efficiency (%)



Average Gain (dBi)



Peak Gain (dBi)



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