



4G LTE

Wi Fi

RoHS
Compliant

Product Name: 2-in-1 5G NR/ 4G LTE/ WiFi Combination Antenna

Part Number: MT-18B-AC-LW01

Features:

- 1*LTE, 1*WiFi Antenna Combination
- Support 5G NR/ 4G LTE Full Frequency Bands, 698-960MHz, 1710-2690MHz, 3300-3800MHz
- Support WiFi Dual Bands, 2400-2500MHz, 5150-5850MHz
- IP67 Waterproof
- Customizable Cables and Connectors
- RoHS & REACH Compliant

Applications:

- Fleet Management & Telematics
- Vehicle Navigation

2-in-1 5G NR/ 4G LTE/ WiFi Combination Antenna

MODEL: MT-18B-AC-LW01

WI-RD-D-372 V1.0

I. Specifications:

Items			LTE Specifications						
Application Bands			LTE 700	GSM 850/900	DCS	PCS	UMTS1	LTE2600	5G NR Band
Frequencies (MHz)			698	824	1710	1850	1920	2300	3300
			~	~	~	~	~	~	~
			824	960	1880	1990	2170	2690	3800
Efficiency (%)	Free Space	30cm	56.76	59.12	76.99	79.05	75.06	59.93	52.44
		1m	49.49	51.55	62.44	64.33	61.04	46.68	38.92
		2m	40.70	42.39	46.29	47.94	45.42	32.67	25.42
		3m	33.46	34.85	34.31	35.72	33.80	22.86	16.60
		5m	22.62	23.56	18.86	19.83	18.72	11.20	7.08
	With Ground Plane	30cm	26.80	28.58	78.85	82.25	77.19	54.80	49.15
		1m	23.37	24.92	63.94	66.70	62.60	42.69	36.48
		2m	19.22	20.49	47.40	49.44	46.41	29.88	23.82
		3m	15.80	16.85	35.14	36.65	34.40	20.91	15.56
		5m	10.68	11.39	19.31	20.14	18.91	10.24	6.64
Average Gain (dBi)	Free Space	30cm	-2.46	-2.28	-1.14	-1.02	-1.25	-2.22	-2.80
		1m	-3.05	-2.88	-2.05	-1.92	-2.14	-3.31	-4.10
		2m	-3.90	-3.73	-3.35	-3.19	-3.43	-4.86	-5.95
		3m	-4.75	-4.58	-4.65	-4.47	-4.71	-6.41	-7.80
		5m	-6.45	-6.28	-7.25	-7.03	-7.28	-9.51	-11.50

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Average Gain (dBi)	With Ground Plane	30cm	-5.72	-5.44	-1.03	-0.85	-1.12	-2.61	-3.09
		1m	-6.31	-6.04	-1.94	-1.76	-2.03	-3.70	-4.38
		2m	-7.16	-6.89	-3.24	-3.06	-3.33	-5.25	-6.23
		3m	-8.01	-7.74	-4.54	-4.36	-4.63	-6.80	-8.08
		5m	-9.71	-9.44	-7.14	-6.96	-7.23	-9.90	-11.78
Peak Gain (dBi)	Free Space	30cm	4.56	5.42	5.20	5.73	5.73	5.98	5.53
		1m	3.96	4.82	4.29	4.89	4.89	4.89	4.97
		2m	3.11	3.97	2.99	3.69	3.69	3.34	3.12
		3m	2.26	3.12	1.69	2.49	2.49	1.79	1.27
		5m	0.56	1.42	-0.91	0.09	0.09	-1.31	-2.43
	With Ground Plane	30cm	1.69	2.87	4.88	4.71	4.41	3.67	2.80
		1m	1.09	2.27	3.97	3.80	3.50	2.58	1.50
		2m	0.24	1.42	2.67	2.50	2.20	1.03	-0.35
		3m	-0.61	0.57	1.37	1.20	0.90	-0.52	-2.20
		5m	-2.31	-1.13	-1.23	-1.40	-1.70	-3.62	-5.90
V.S.W.R	Free Space	< 5.85		< 2	< 2.32				
	With Ground Plane	< 5.85		< 2	< 2.32				
Return Loss (dB)	Free Space	< -3		< -10	< -8				
	With Ground Plane	< -3		< -10	< -8				
Test Conditions			Free Space						
			310 x 225 mm² (Ground Plane Dimensions)						
Impedance (Ω)			50						
Polarization			Linear						
Cable			H-100, 1.5 meters						
Connector			RSMA (Male)						

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Items			WiFi Specifications						
Frequencies (MHz)			2400	2450	2500	5150	5350	5750	5850
Efficiency (%)	Free Space	30cm	66.07	66.68	64.86	61.24	62.37	52.48	48.31
		1m	52.48	52.97	51.52	43.35	44.16	36.31	33.42
		2m	38.02	38.37	37.33	26.73	27.23	20.89	19.23
		3m	26.92	27.16	26.42	16.48	16.79	12.30	11.32
		5m	14.13	14.26	13.87	6.12	6.24	4.17	3.84
	With Ground Plane	30cm	67.30	69.34	68.39	53.46	61.38	47.64	46.34
		1m	53.46	55.08	54.33	37.84	43.45	32.96	32.06
		2m	38.73	39.90	39.36	23.33	26.79	18.97	18.45
		3m	27.42	28.25	27.86	14.39	16.52	11.17	10.86
		5m	14.39	14.83	14.62	5.35	6.14	3.78	3.68
Average Gain (dBi)	Free Space	30cm	-1.80	-1.76	-1.88	-2.13	-2.05	-2.80	-3.16
		1m	-2.80	-2.76	-2.88	-3.63	-3.55	-4.40	-4.76
		2m	-4.20	-4.16	-4.28	-5.73	-5.65	-6.80	-7.16
		3m	-5.70	-5.66	-5.78	-7.83	-7.75	-9.10	-9.46
		5m	-8.50	-8.46	-8.58	-12.13	-12.05	-13.80	-14.16
	With Ground Plane	30cm	-1.72	-1.59	-1.65	-2.72	-2.12	-3.22	-3.34
		1m	-2.72	-2.59	-2.65	-4.22	-3.62	-4.82	-4.94
		2m	-4.12	-3.99	-4.05	-6.32	-5.72	-7.22	-7.34
		3m	-5.62	-5.49	-5.55	-8.42	-7.82	-9.52	-9.64
		5m	-8.42	-8.29	-8.35	-12.72	-12.12	-14.22	-14.34
Peak Gain (dBi)	Free Space	30cm	3.18	3.39	3.15	2.63	2.74	1.33	0.82
		1m	2.18	2.39	2.15	1.13	1.24	-0.27	-0.78
		2m	0.78	0.99	0.75	-0.97	-0.86	-2.67	-3.18
		3m	-0.72	-0.51	-0.75	-3.07	-2.96	-4.97	-5.48
		5m	-3.52	-3.31	-3.55	-7.37	-7.26	-9.67	-10.18
	With Ground Plane	30cm	3.12	3.21	3.27	3.08	3.59	2.43	1.87
		1m	2.12	2.21	2.27	1.58	2.09	0.83	0.27
		2m	0.72	0.81	0.87	-0.52	-0.01	-1.57	-2.13
		3m	-0.78	-0.69	-0.63	-2.62	-2.11	-3.87	-4.43
		5m	-3.58	-3.49	-3.43	-6.92	-6.41	-8.57	-9.13

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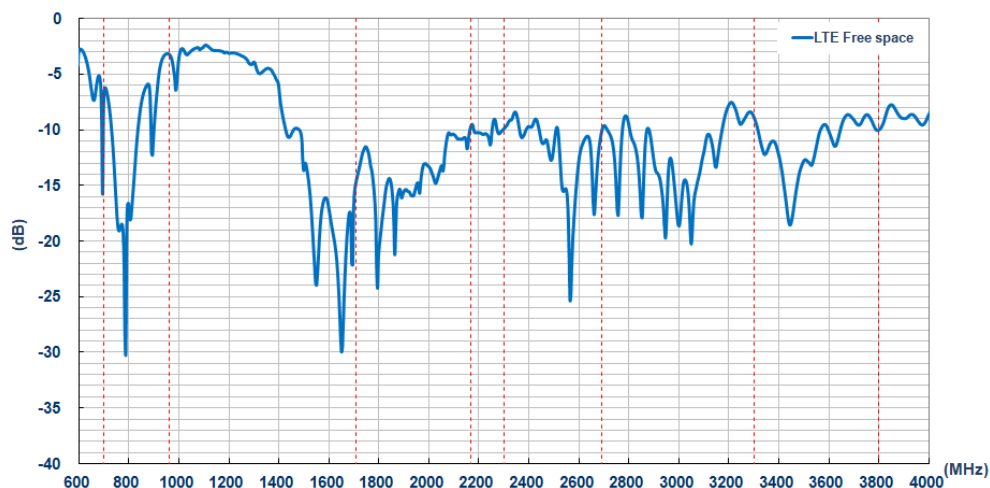
V.S.W.R	Free Space	< 2
	With Ground Plane	< 2
Return Loss (dB)	Free Space	< -10
	With Ground Plane	< -10
Impedance (Ω)		50
Test Conditions		Free Space
		310 x 225 mm ² (Ground Plane Dimensions)
Polarization		Linear
Cable		H-100, 1.5 meters
Connector		RSMA (Male)
Mechanical		
Dimension (mm)		$\phi 42.00(\text{Dia.}) \times 80.80(\text{H})$
Casing		ABS
Base and Thread		Zinc Alloy
Weigh (g) (including cable)		141
Waterproof		IP67
Maximum Assembly Torque		40 N-m
Environmental Conditions		
Operation Temperature ($^{\circ}\text{C}$)		-40 ~ +85
Storage Temperature ($^{\circ}\text{C}$)		-40 ~ +85
Humidity		Non-condensing 65 $^{\circ}\text{C}$ 95% RH

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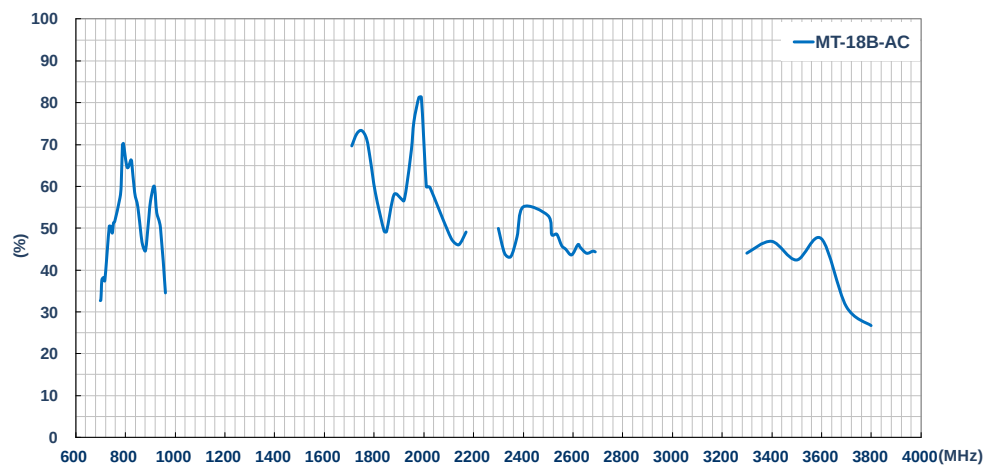
II. Passive Electrical Properties:

A) LTE Testing Condition : Free Space

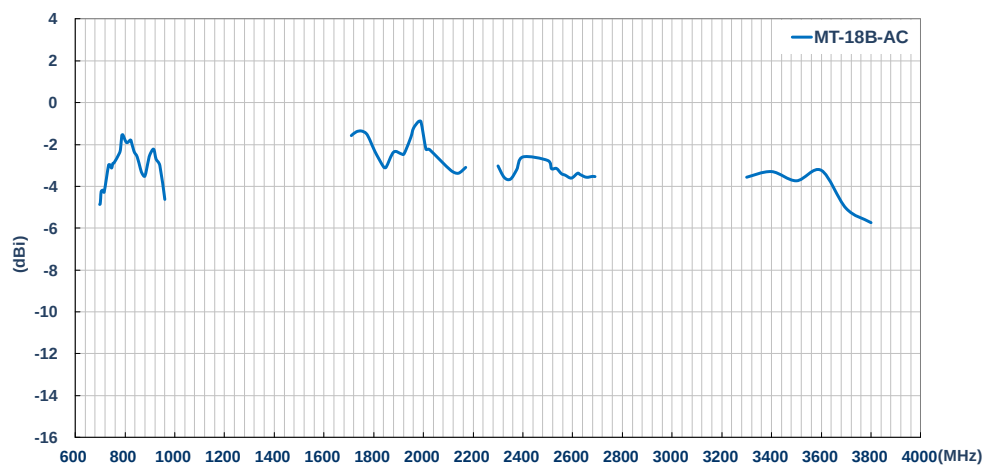
S11 (dB)



Efficiency (%)

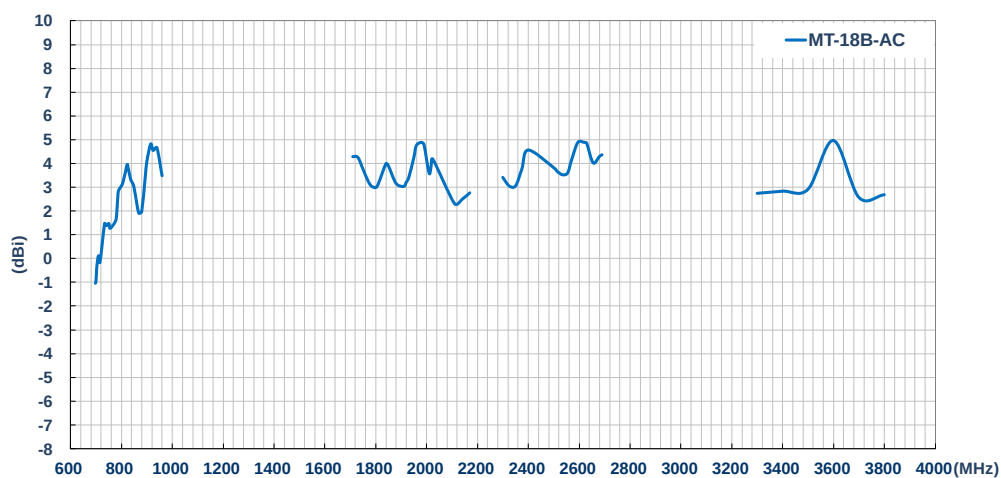


Average Gain (dBi)



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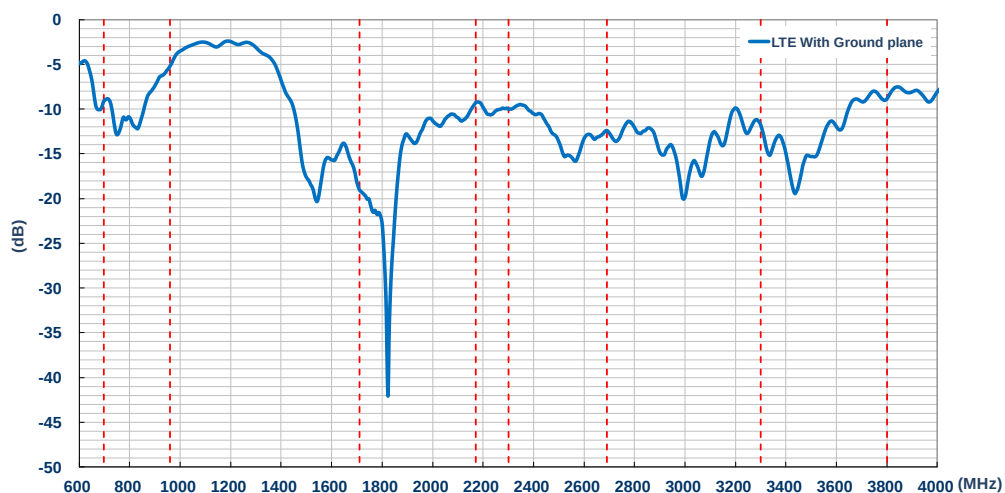
Peak Gain (dBi)



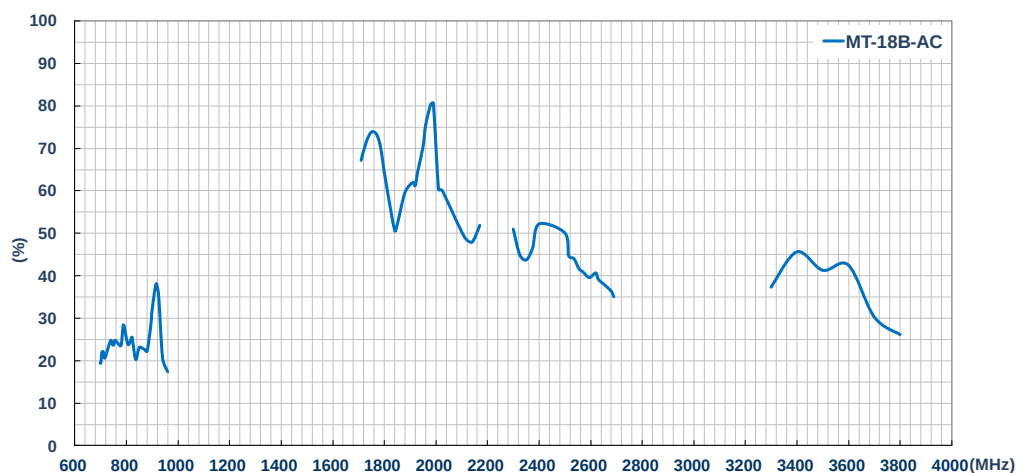
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B) LTE Testing Condition : With Ground Plane (310 x 225 mm²)

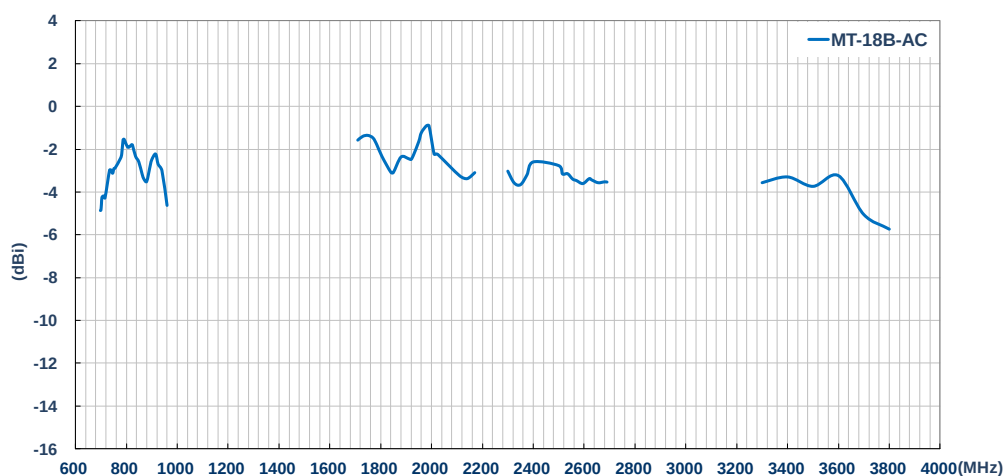
S11 (dB)



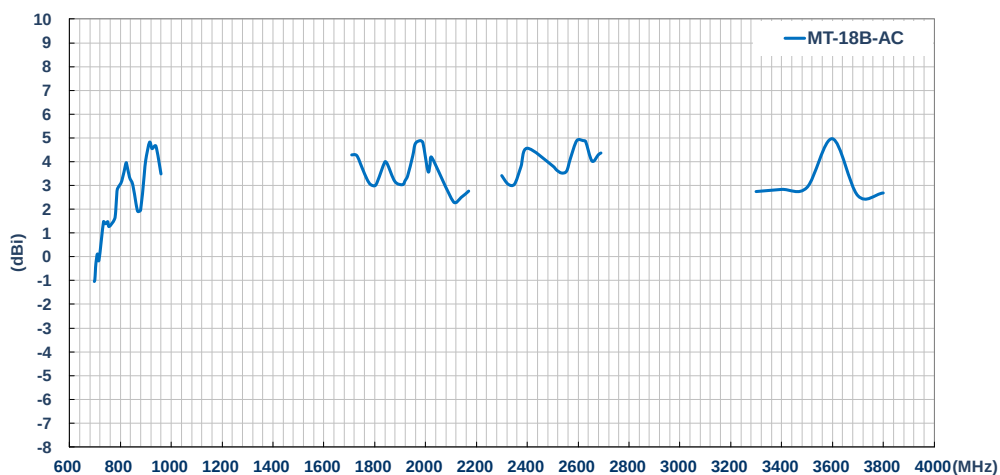
Efficiency (%)



Average Gain (dBi)

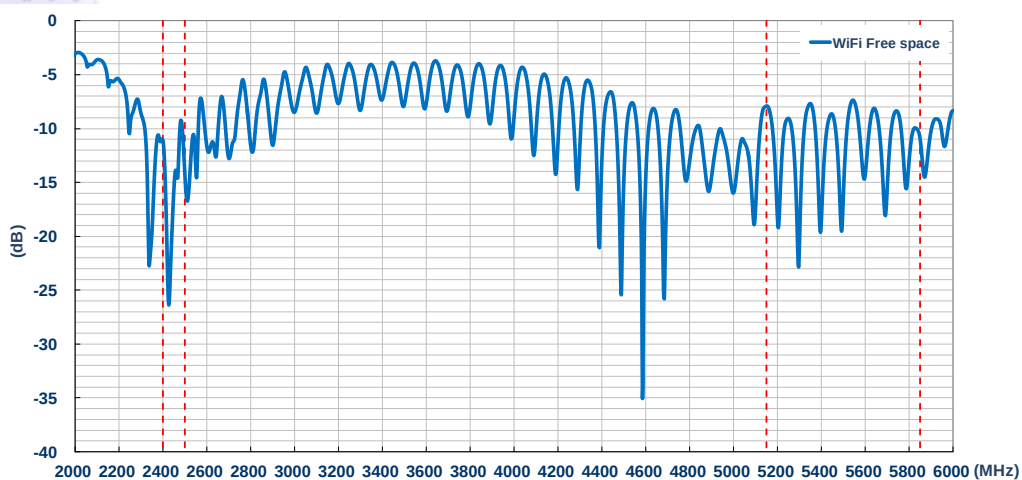


Peak Gain (dBi)



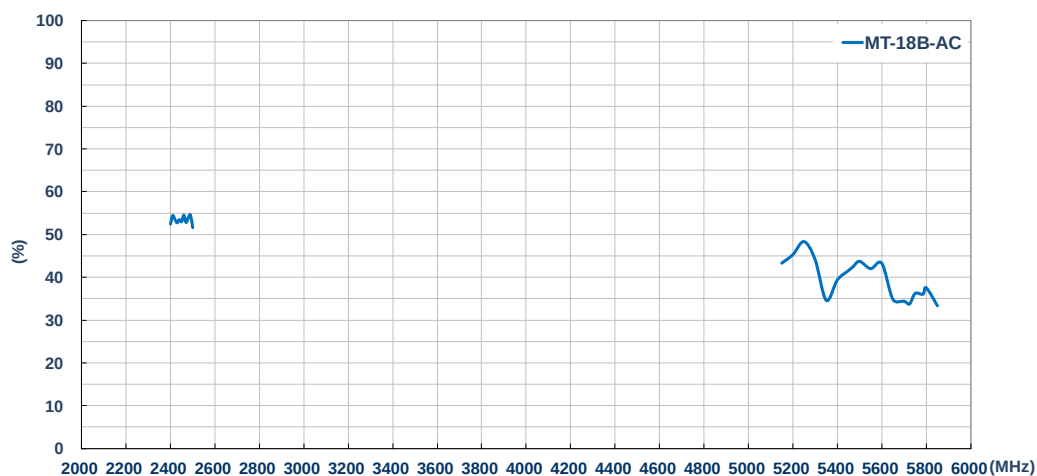
C) WiFi Testing Condition : Free Space

S11 (dB)

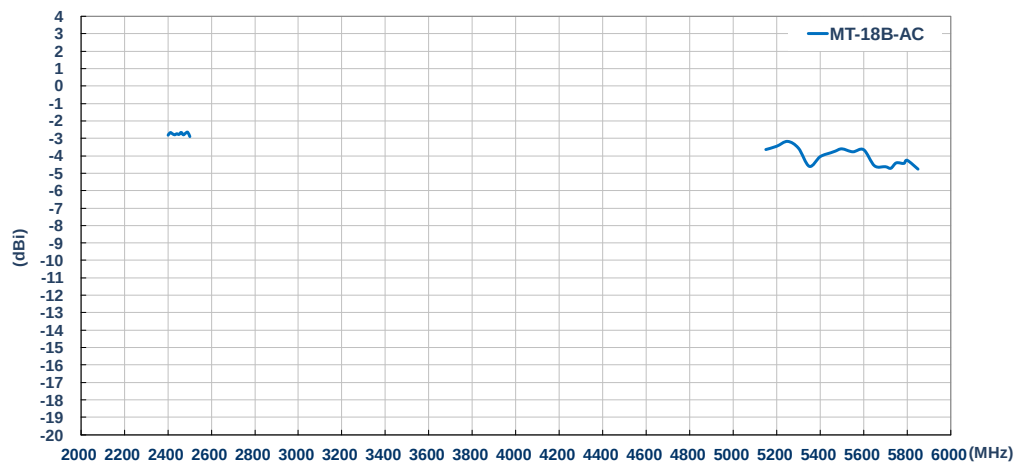


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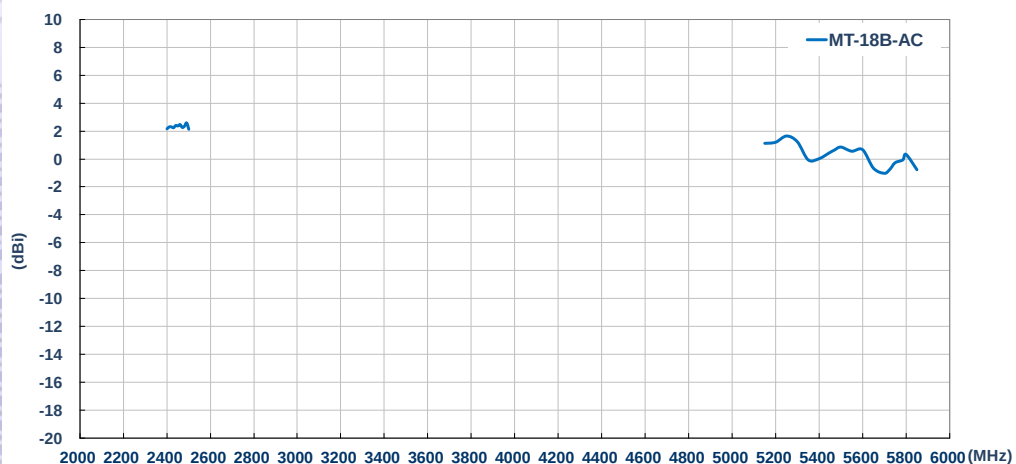
Efficiency (%)



Average Gain (dBi)



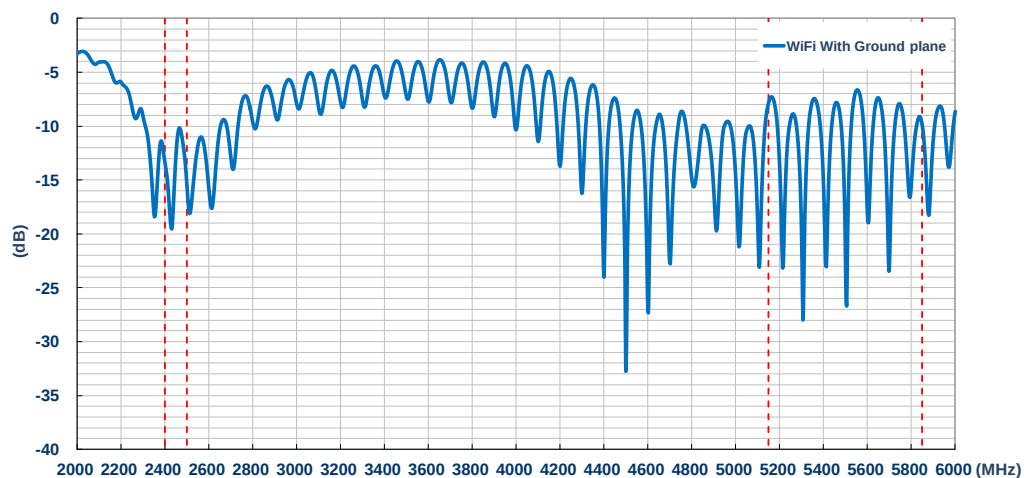
Peak Gain (dBi)



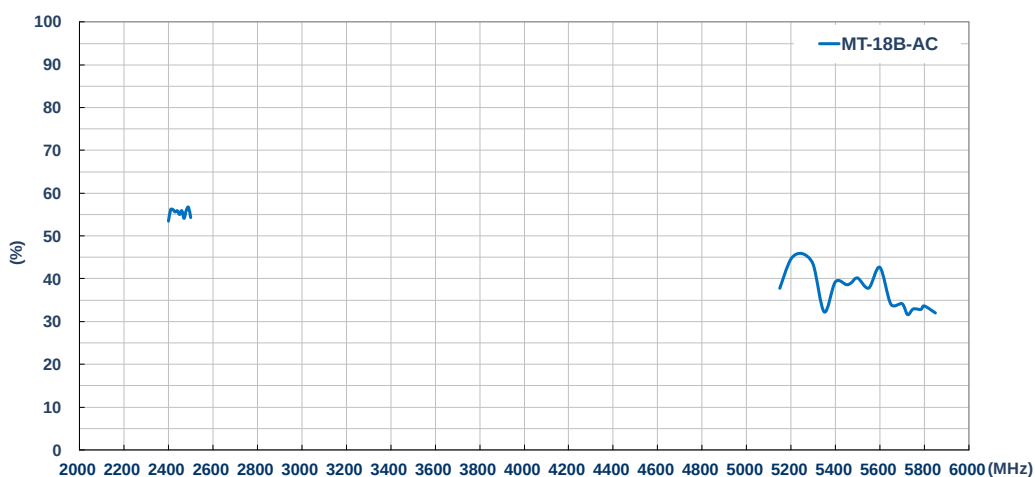
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D) WiFi Testing Condition : With Ground Plane (310 x 225 mm²)

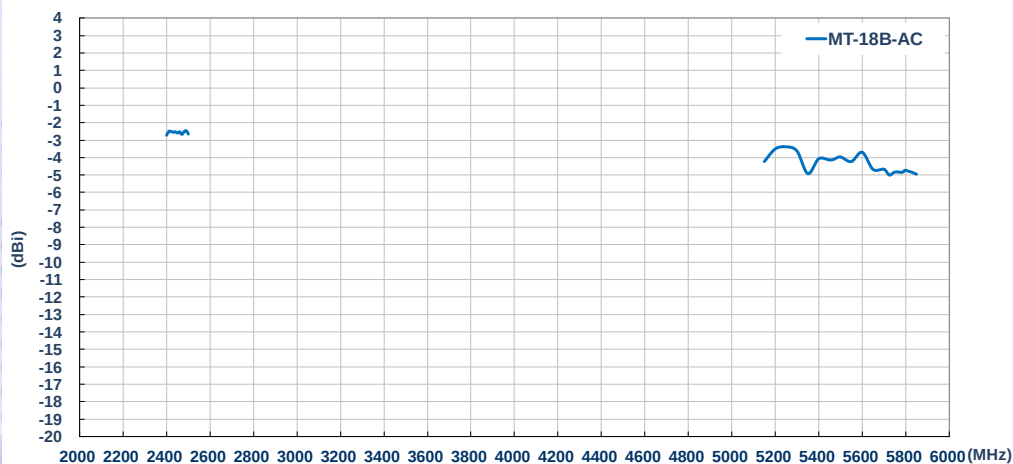
S11 (dB) -WiFi



Efficiency (%) -WiFi

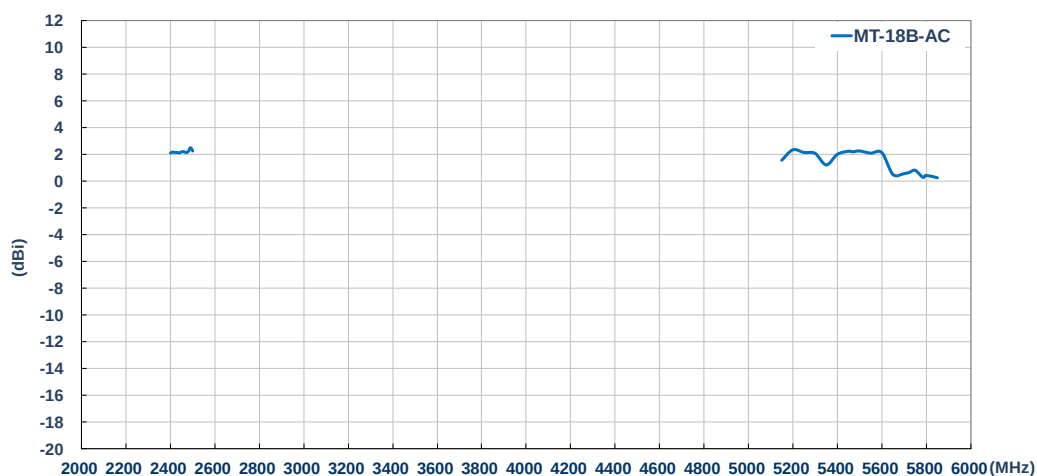


Average Gain (dBi) - WiFi



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Peak Gain (dBi) – WiFi



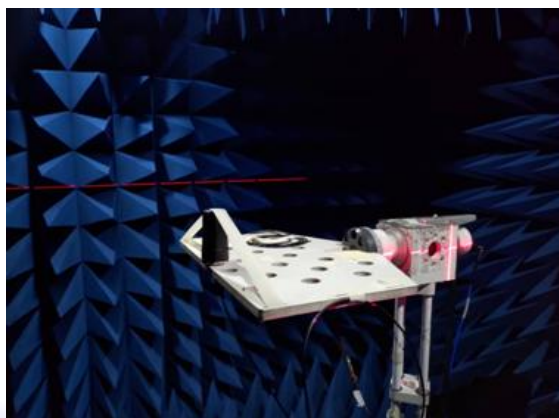
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III. Antenna Radiation Pattern Measurement:

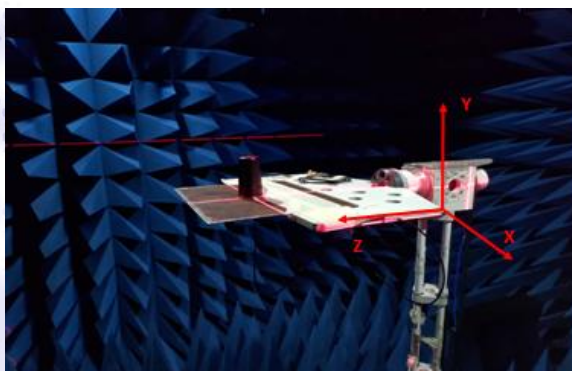
The antenna radiation patterns are measured in 3D Anechoic Chamber.

The measurement setup is as show below,

Free Space



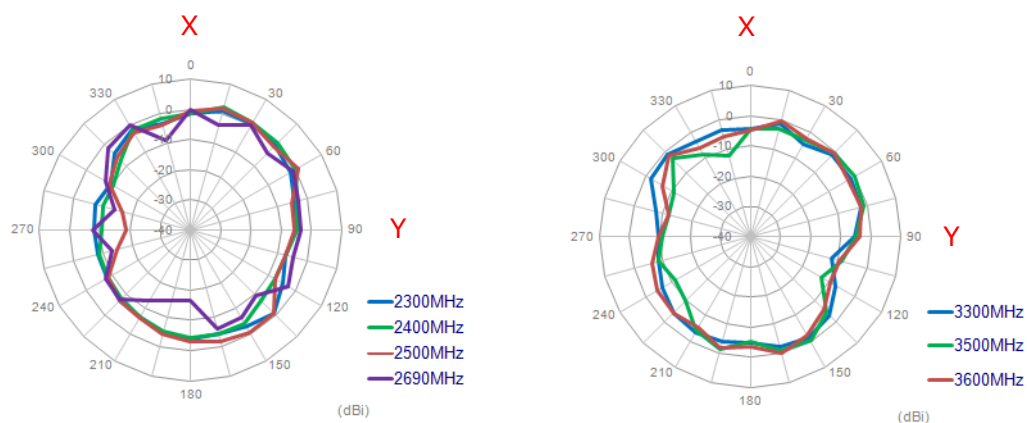
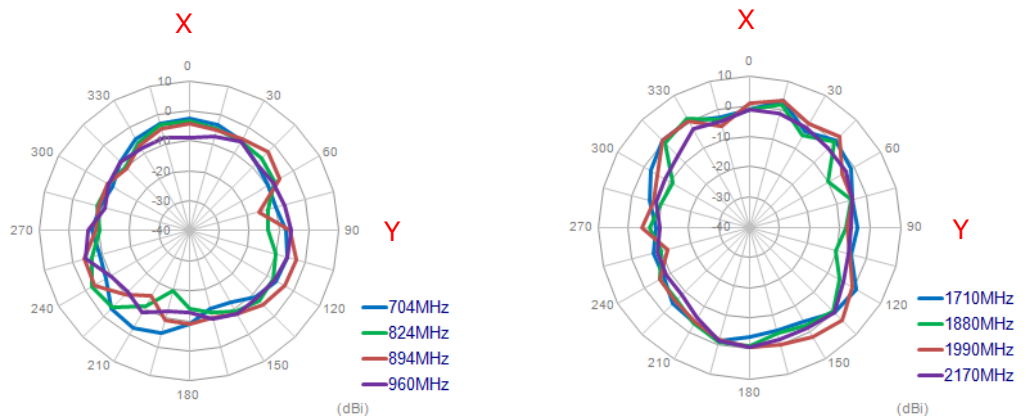
With Ground Plane



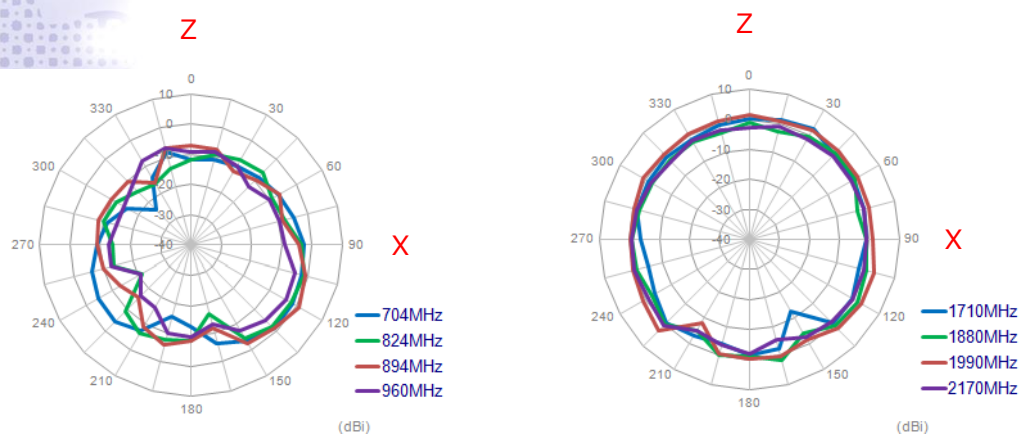
A) 2D Radiation Pattern:

a) Free Space - LTE

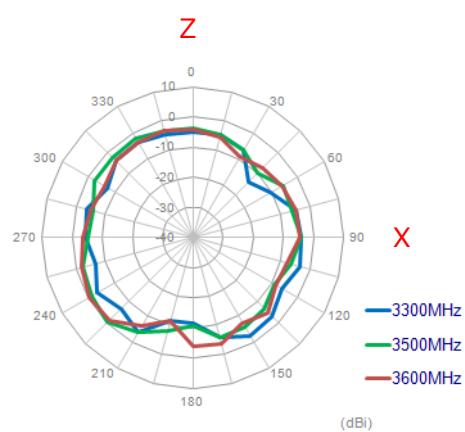
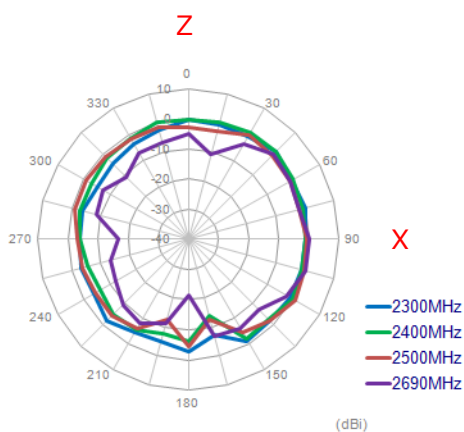
X-Y Plane



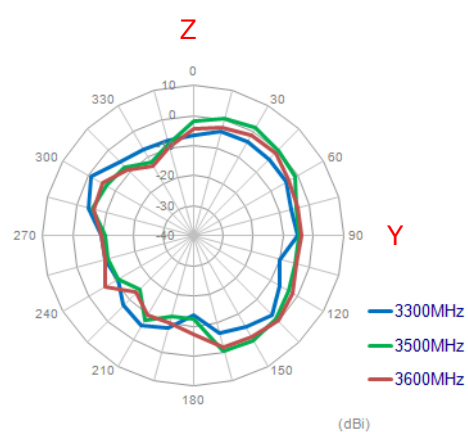
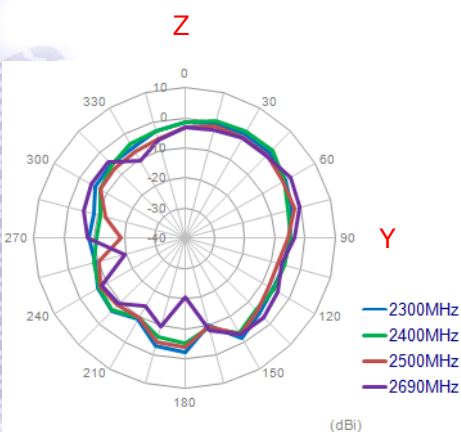
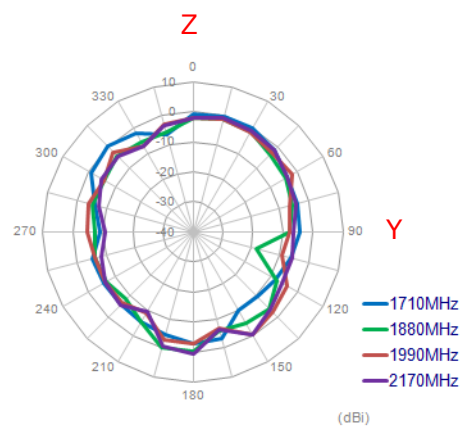
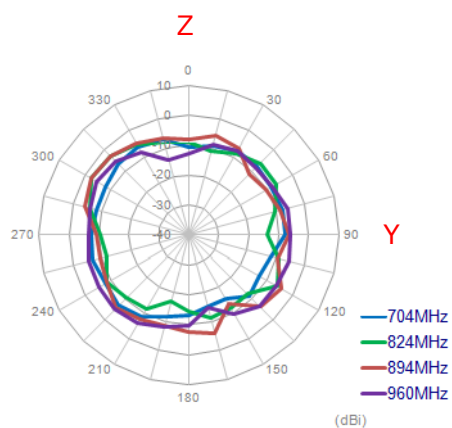
X-Z Plane



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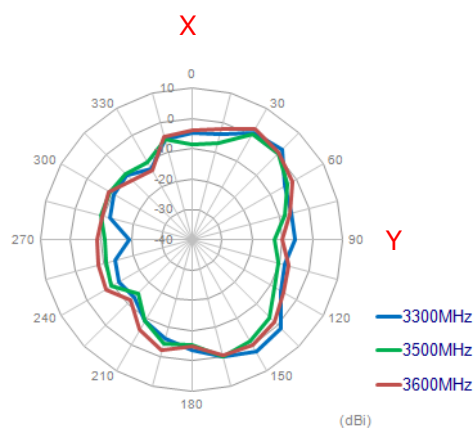
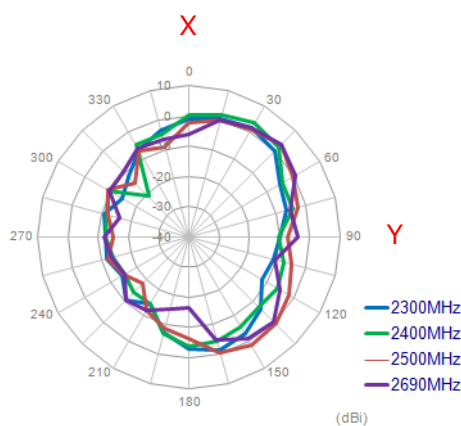
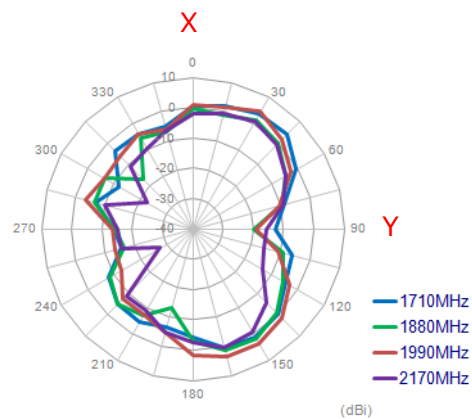
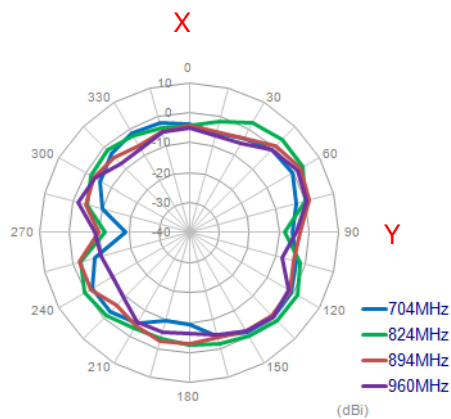


Y-Z Plane

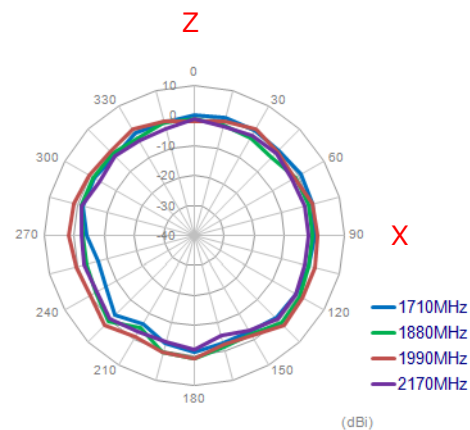
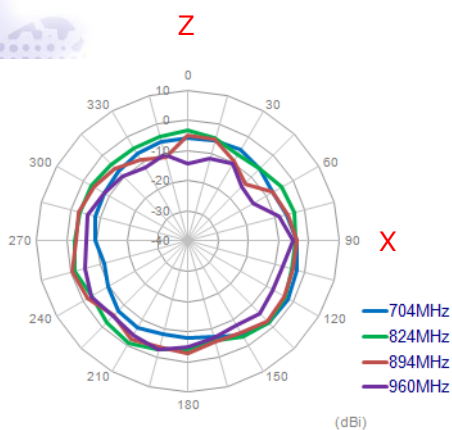


b) With Ground Plane – LTE

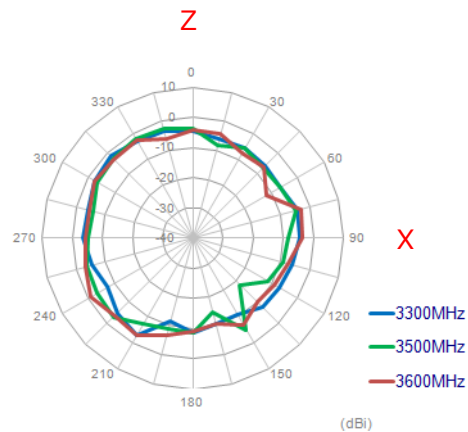
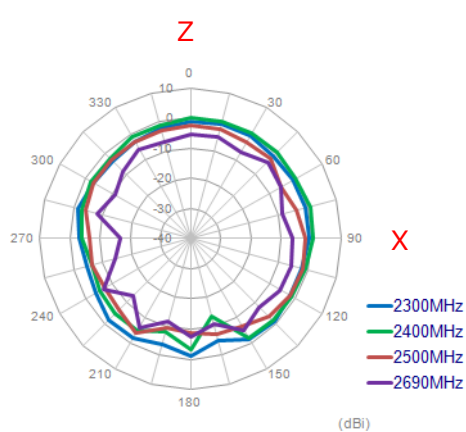
X-Y Plane



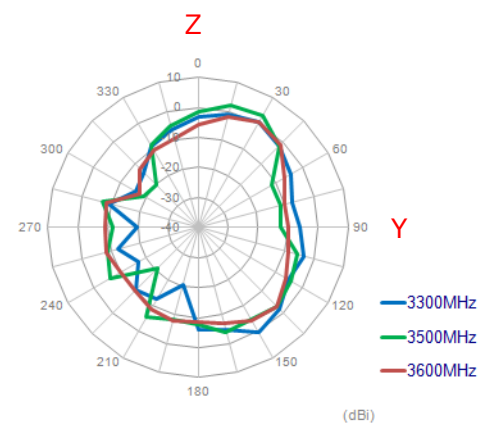
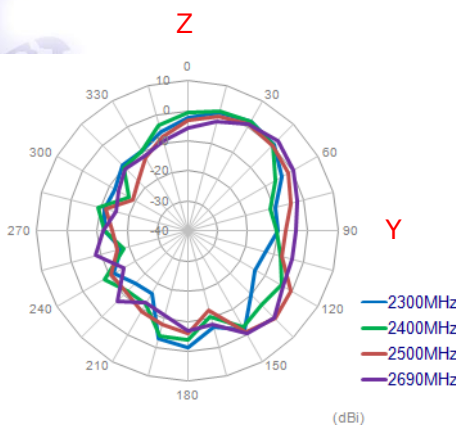
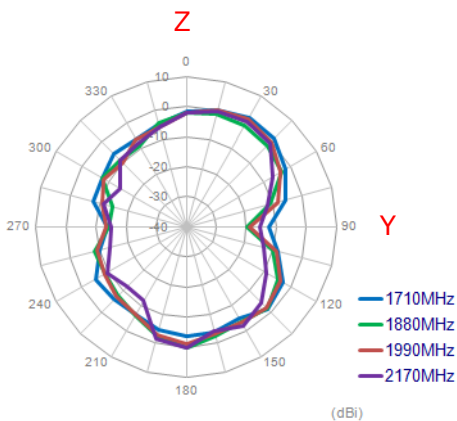
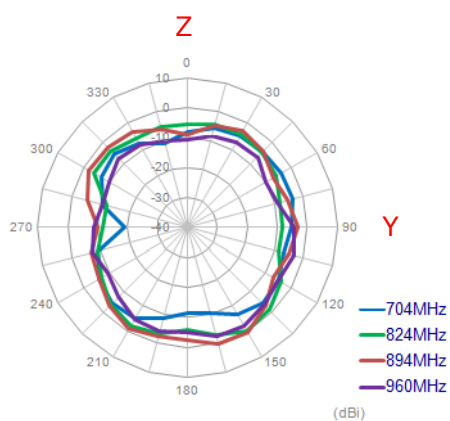
X-Z Plane



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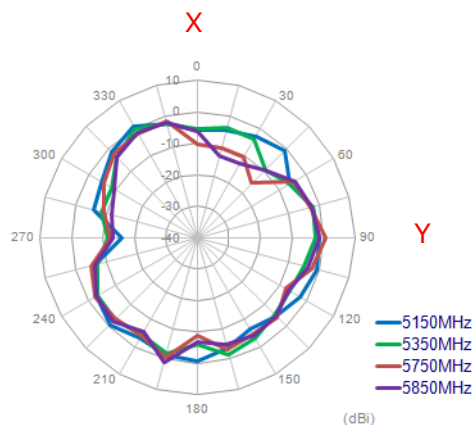
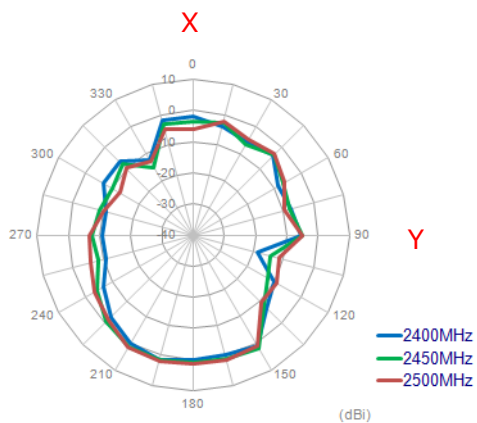


Y-Z Plane

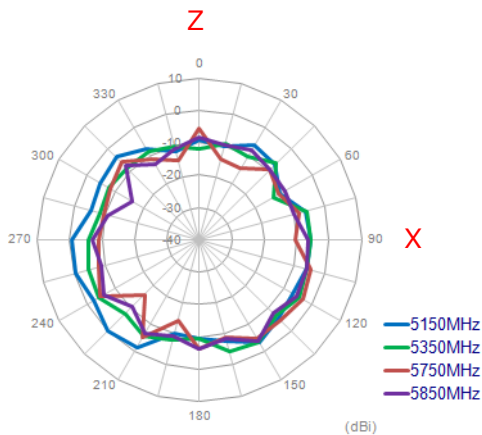
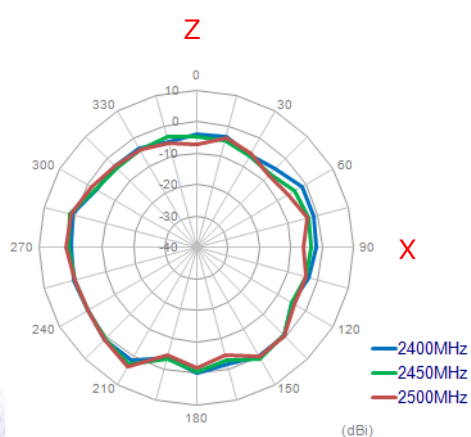


c) Free Space - WiFi

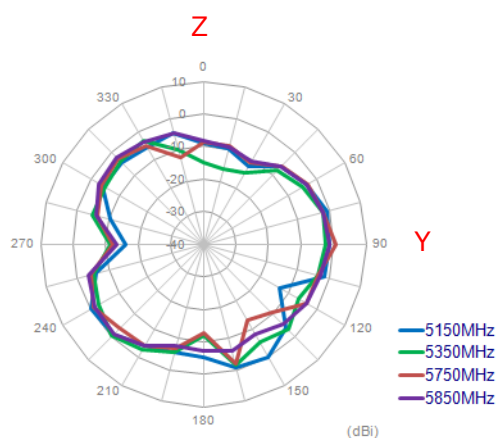
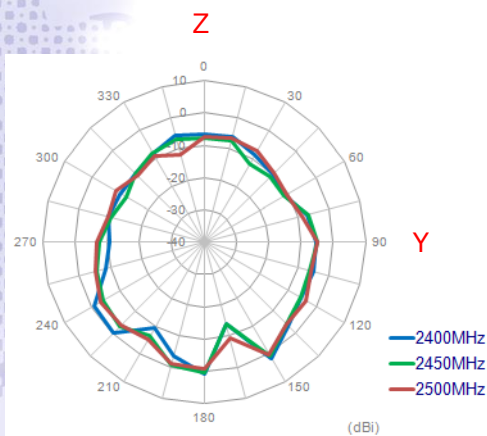
X-Y Plane



X-Z Plane



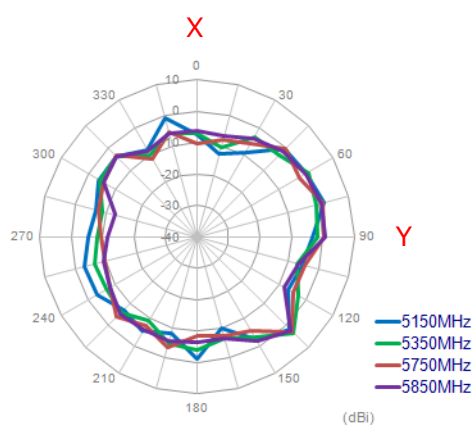
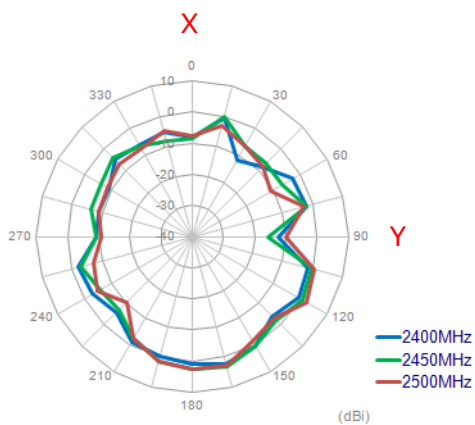
Y-Z Plane



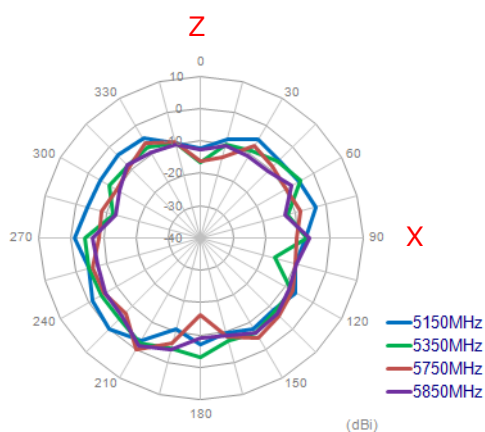
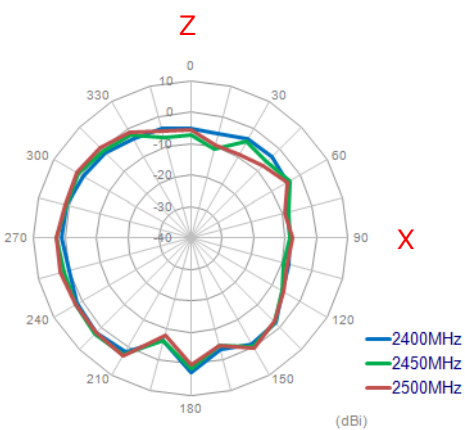
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d) With Ground Plane – WiFi

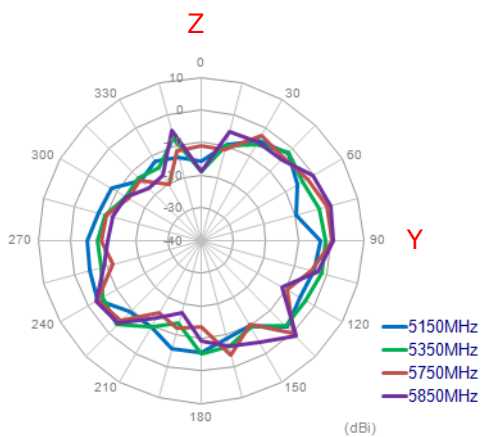
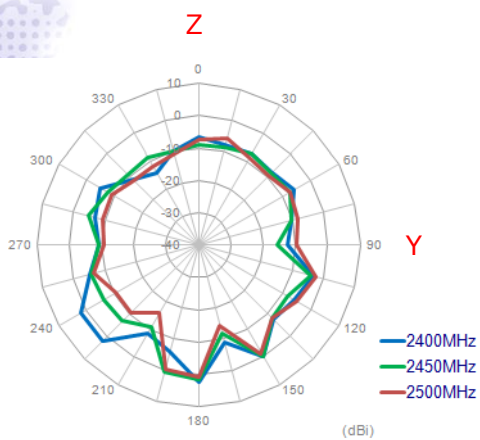
X-Y Plane



X-Z Plane



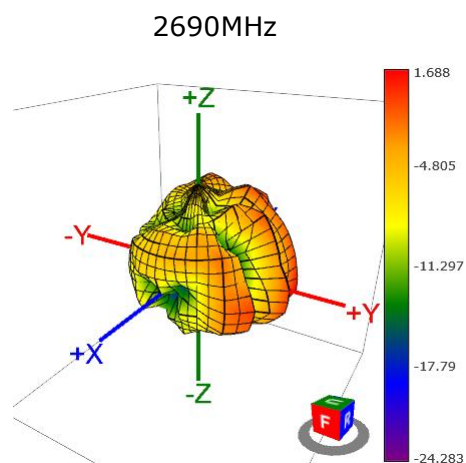
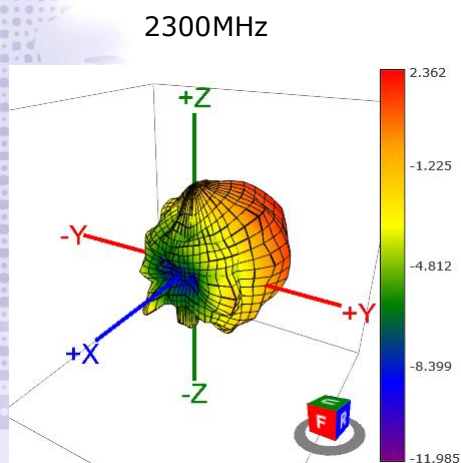
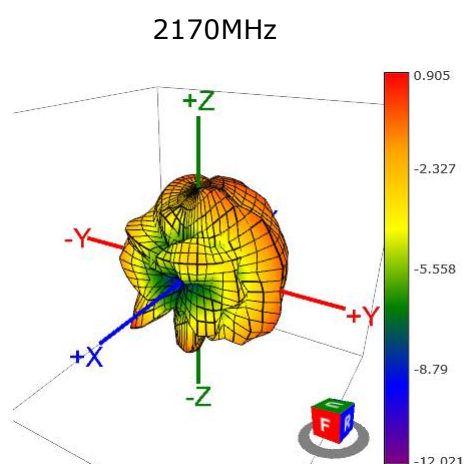
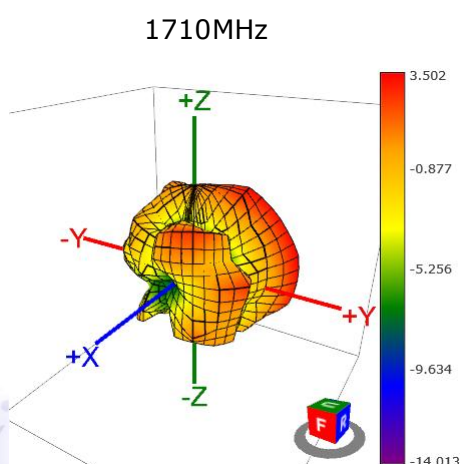
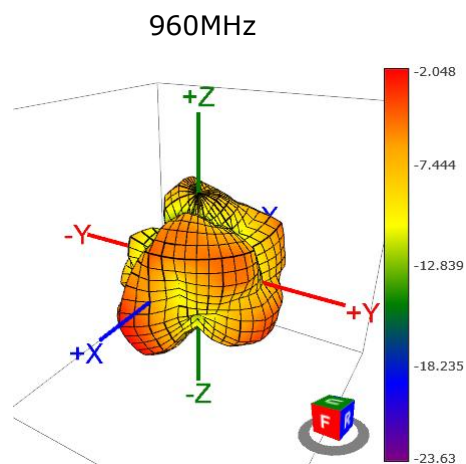
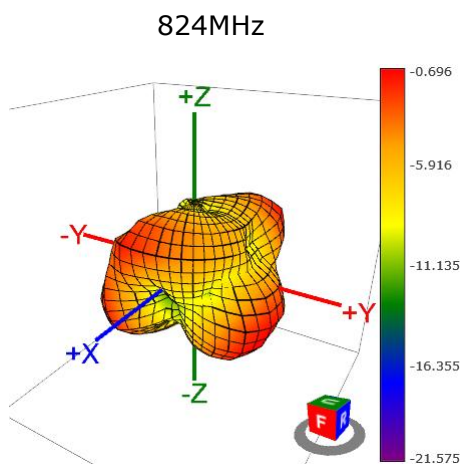
Y-Z Plane

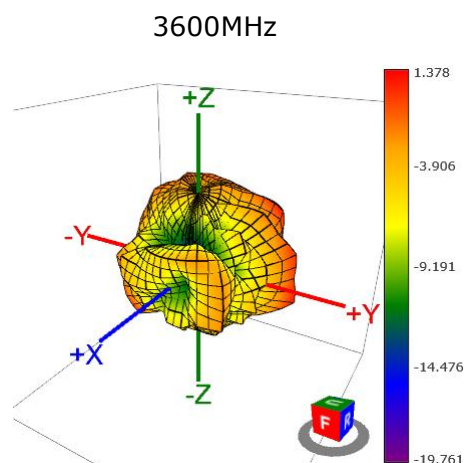
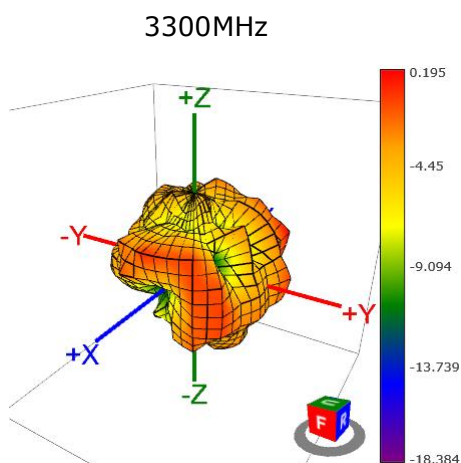


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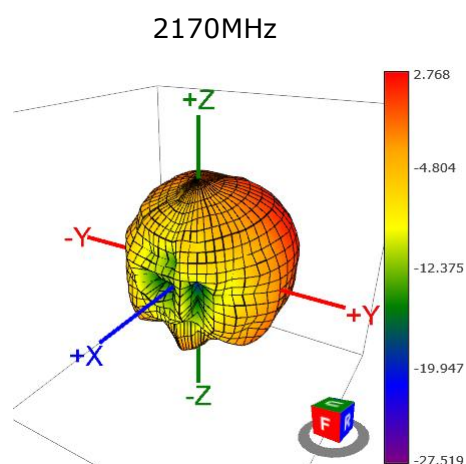
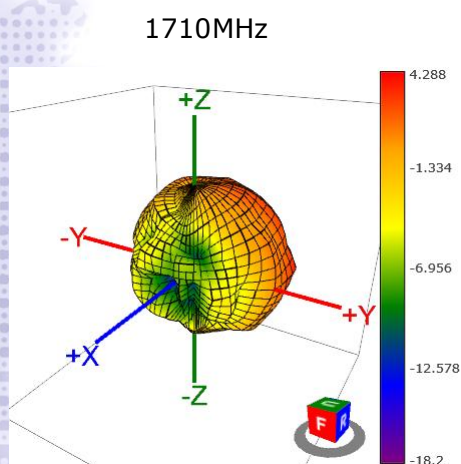
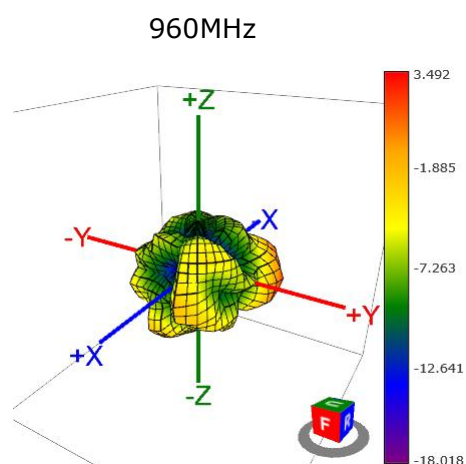
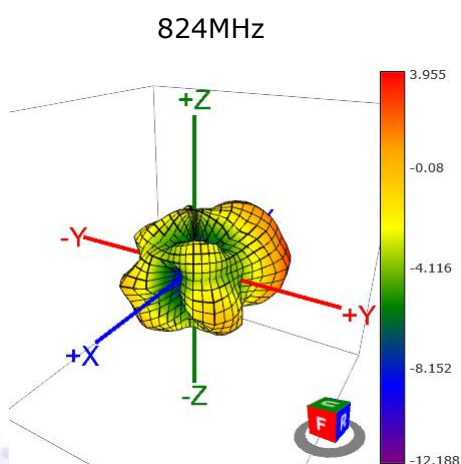
B) 3D Radiation Pattern:

a) Free Space – LTE

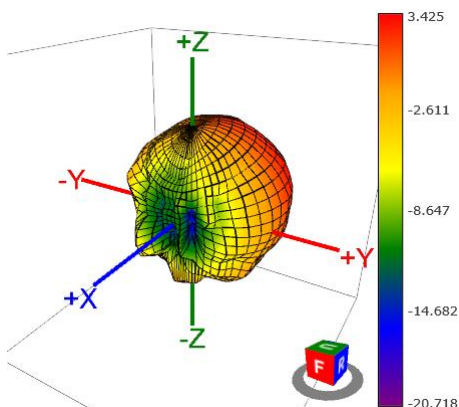




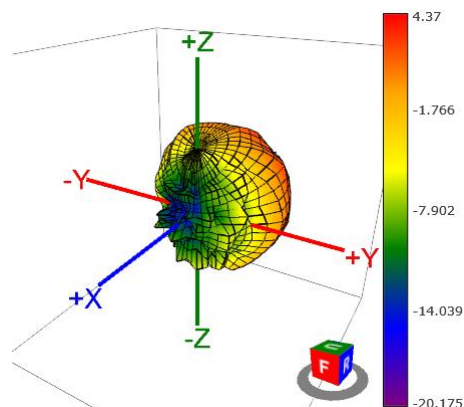
b) With Ground Plane – LTE



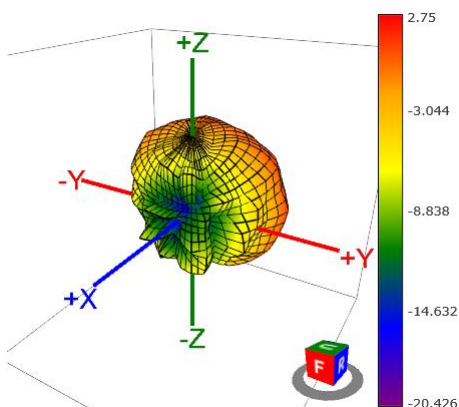
2300MHz



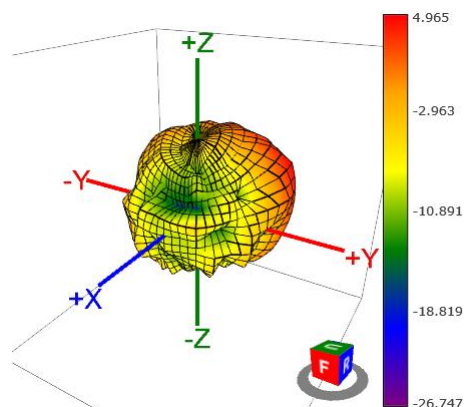
2690MHz



3300MHz

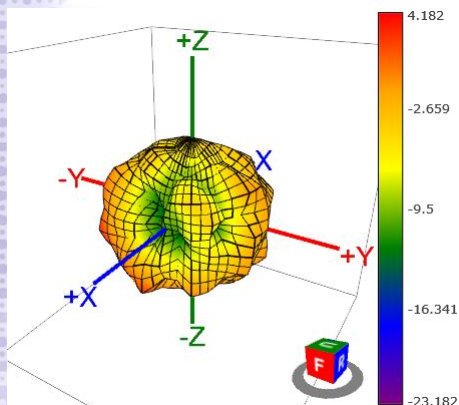


3600MHz

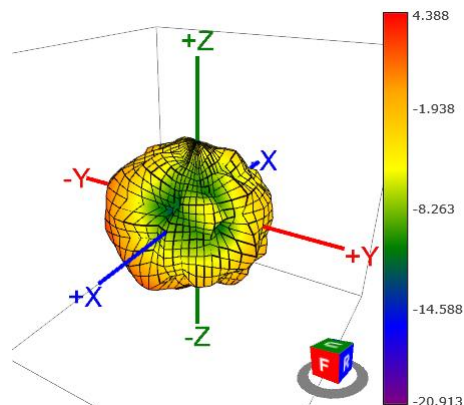


c) Free Space - WiFi

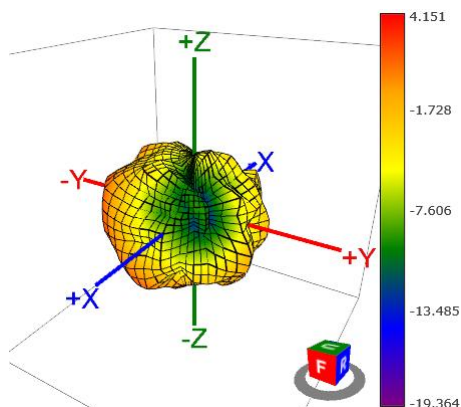
2400MHz



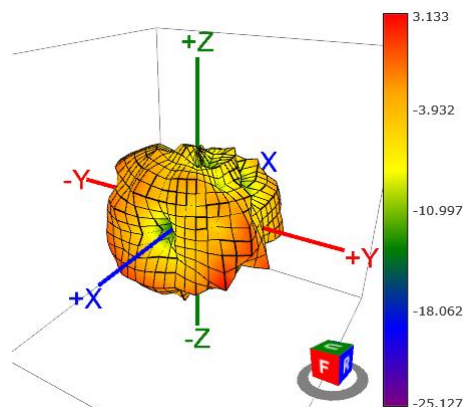
2450MHz



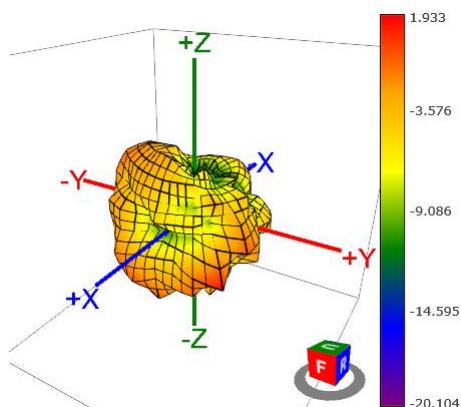
2500MHz



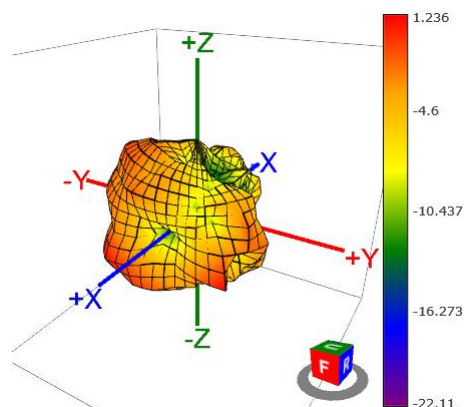
5150MHz



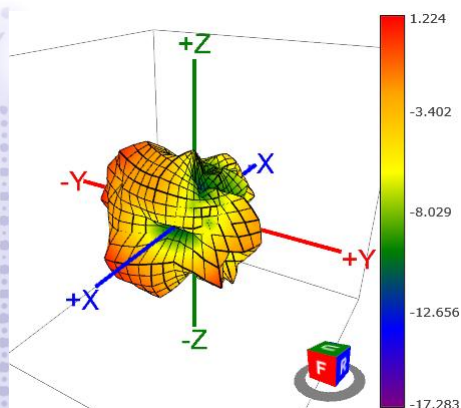
5350MHz



5750MHz

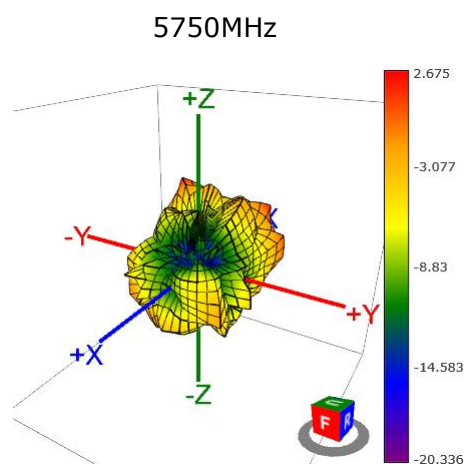
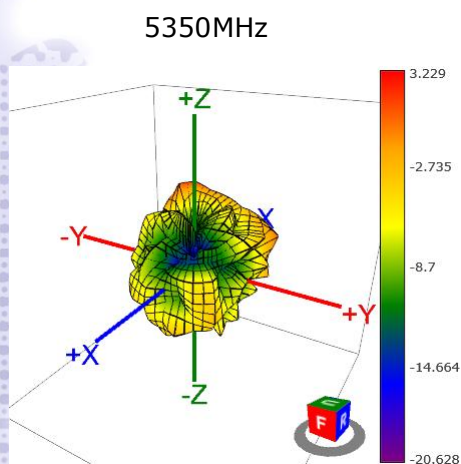
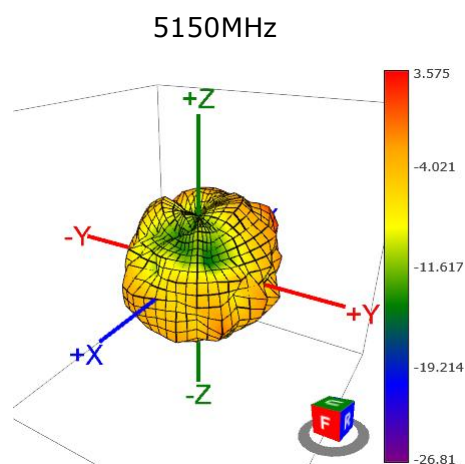
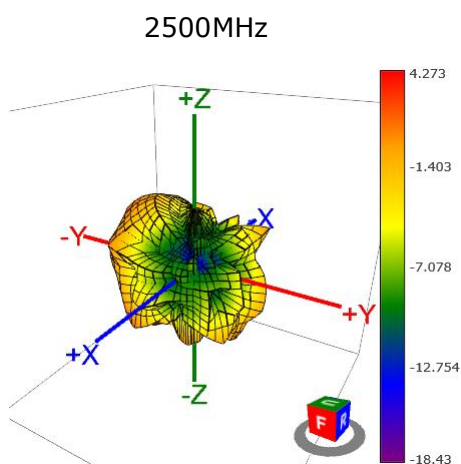
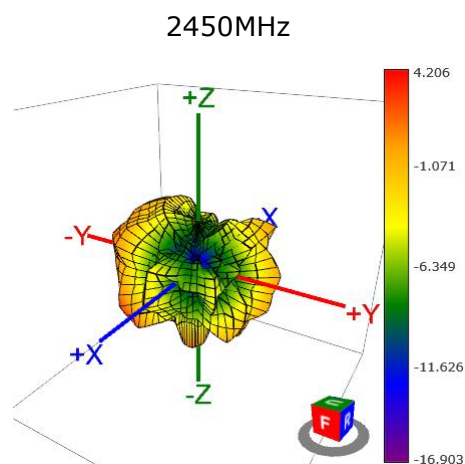
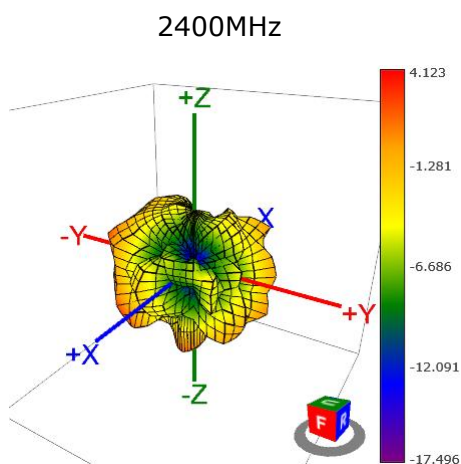


5850MHz

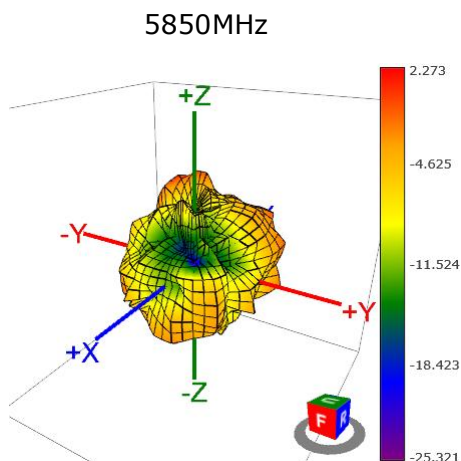


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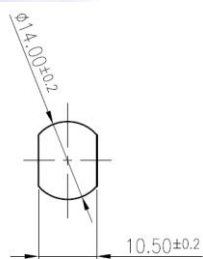
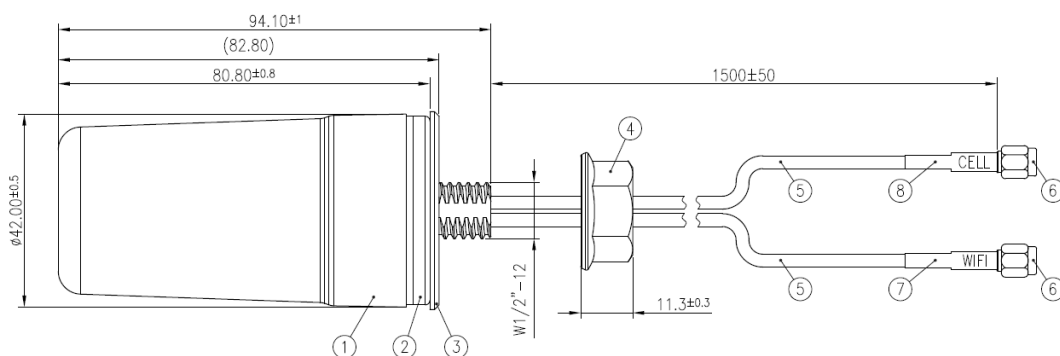
d) With Ground Plane – WiFi



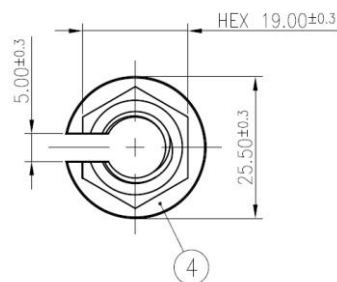
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IV. Mechanical Drawing (Unit:mm):



Recommended assembly
hole dimensions



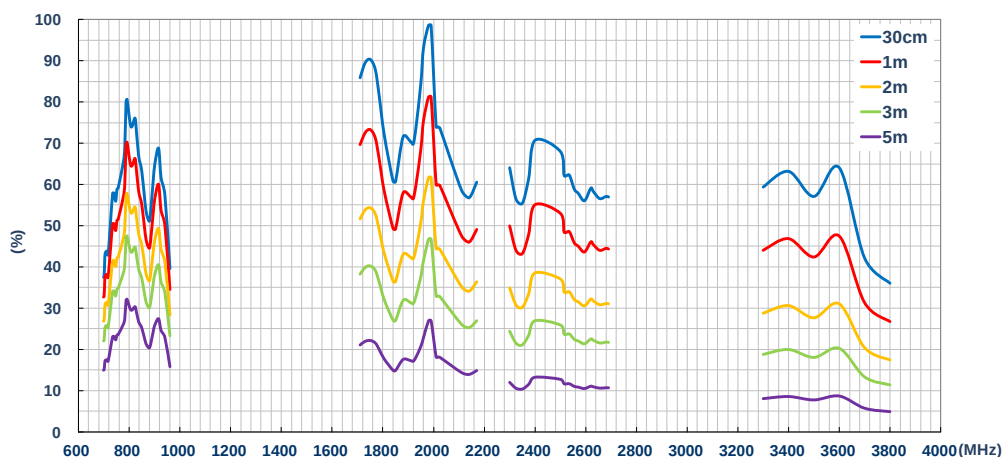
8	CELL Heat Shrink Tube	CTMS	White	1
7	WIFI Heat Shrink Tube	CTMS	Yellow	1
6	RSMA(M) Connector	Brass	Au Plated	2
5	Cable H100	PVC	Black	2
4	Nut	Steel	Cr3+Zinc Black	1
3	Gasket	EPDM	Black	1
2	Bottom Base	Zinc Alloy	Ni Plated	1
1	Top Housing	ABS	Black	1
No	NAME	MATERIAL	FINISH	Q'TY

V. Applications Note:

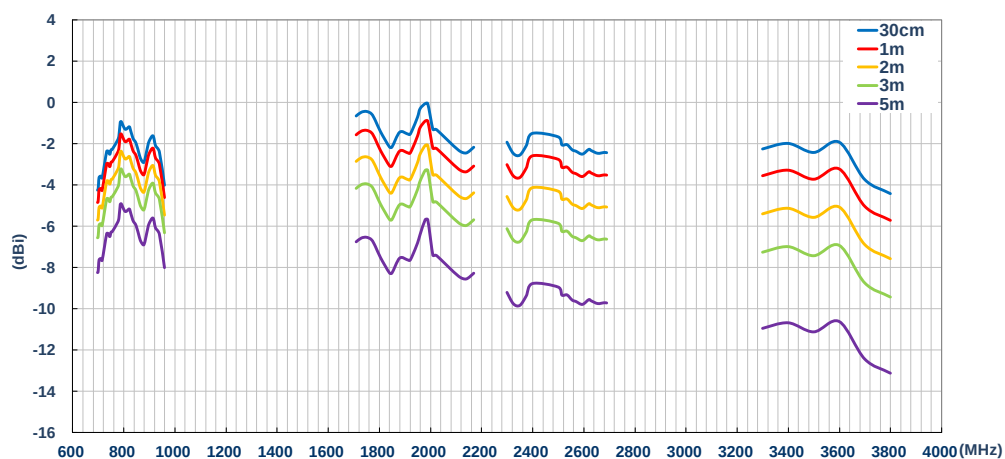
The antenna performance with different cable lengths is shown below.

a) Free Space – LTE

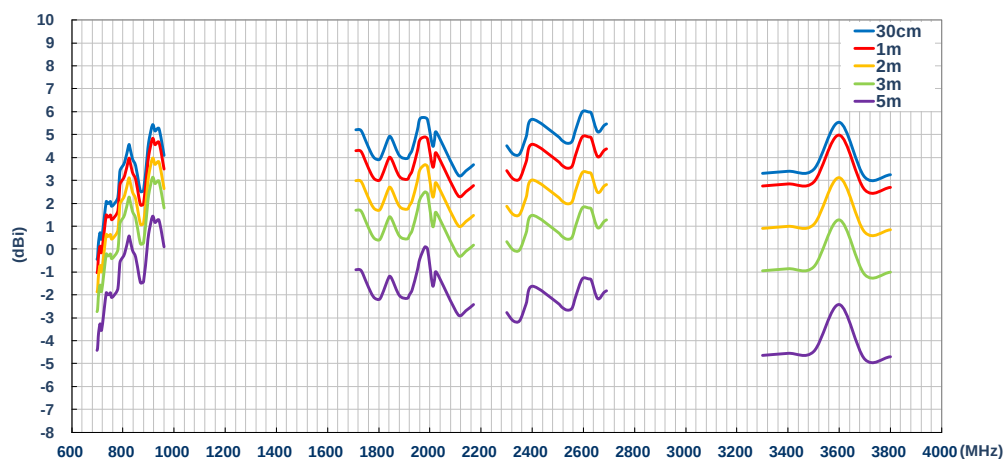
Efficiency (%)



Average Gain (dBi)

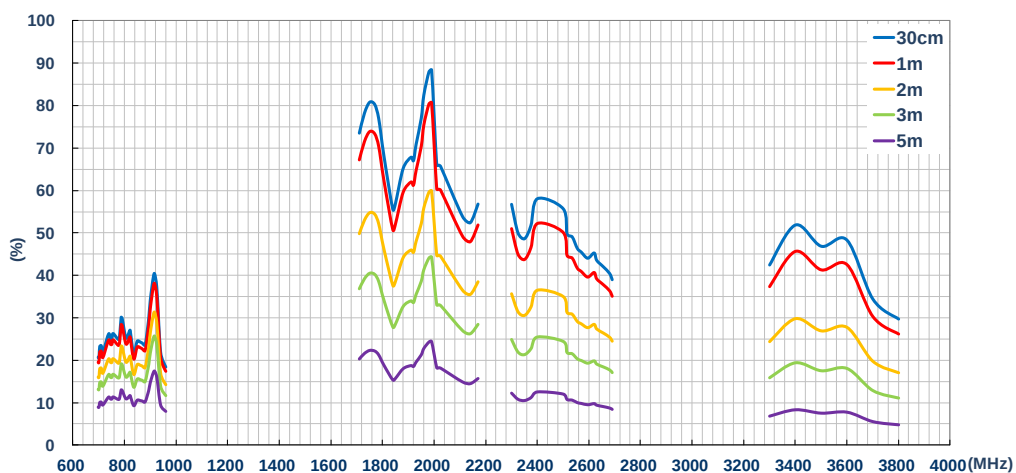


Peak Gain (dBi)

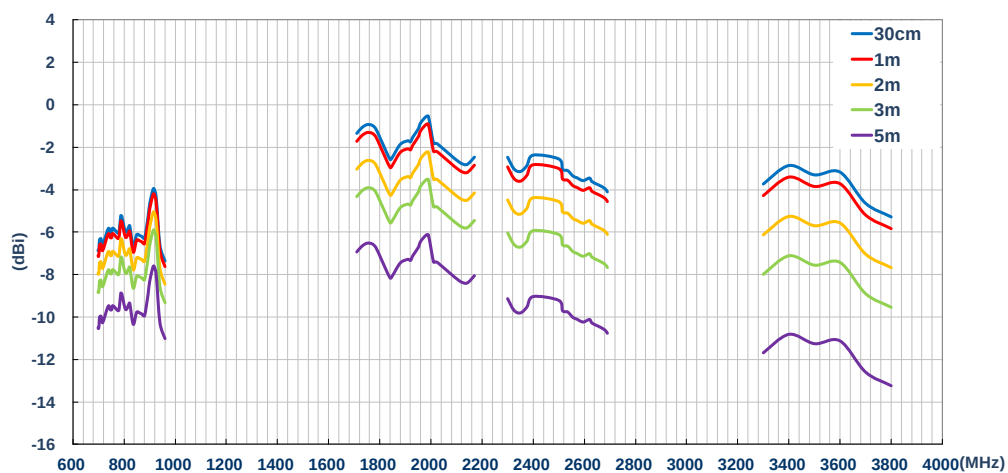


b) With Ground Plane – LTE

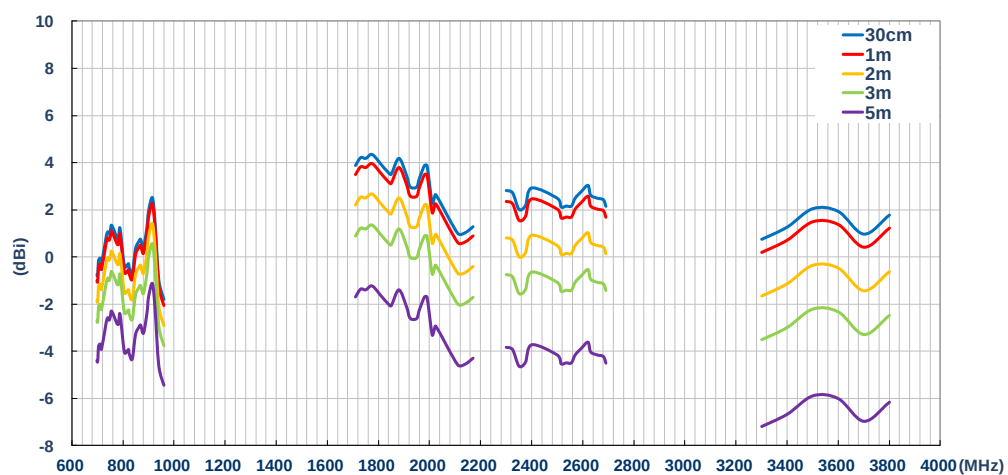
Efficiency (%)



Average Gain (dBi)



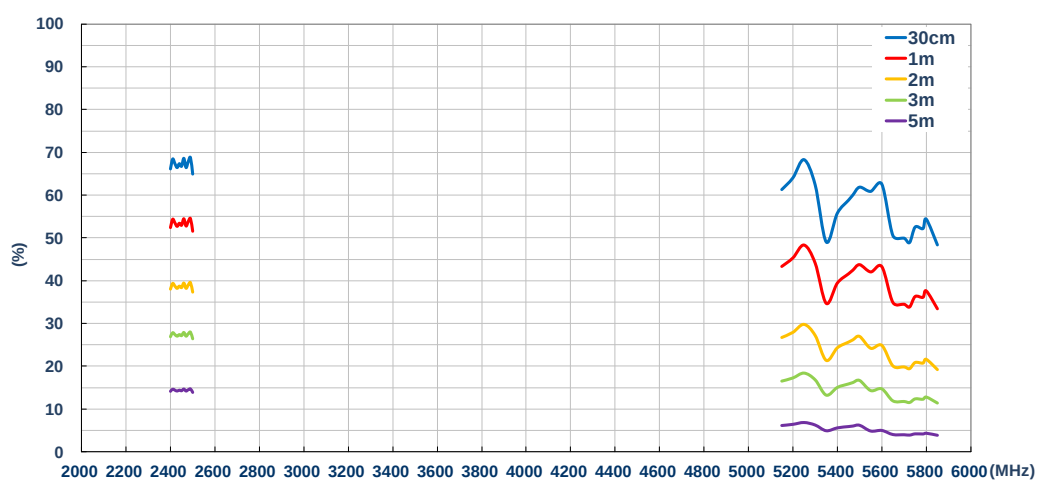
Peak Gain (dBi)



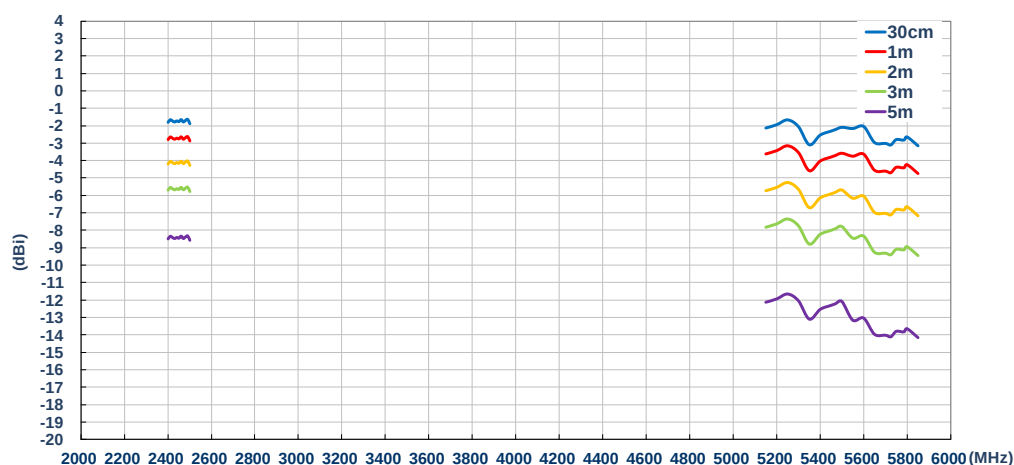
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c) Free Space – WiFi

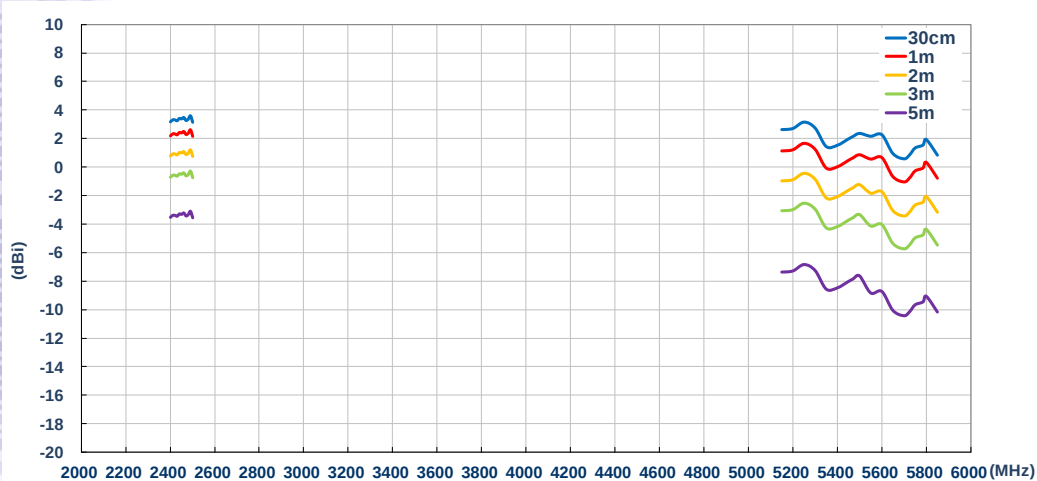
Efficiency (%)



Average Gain (dBi)



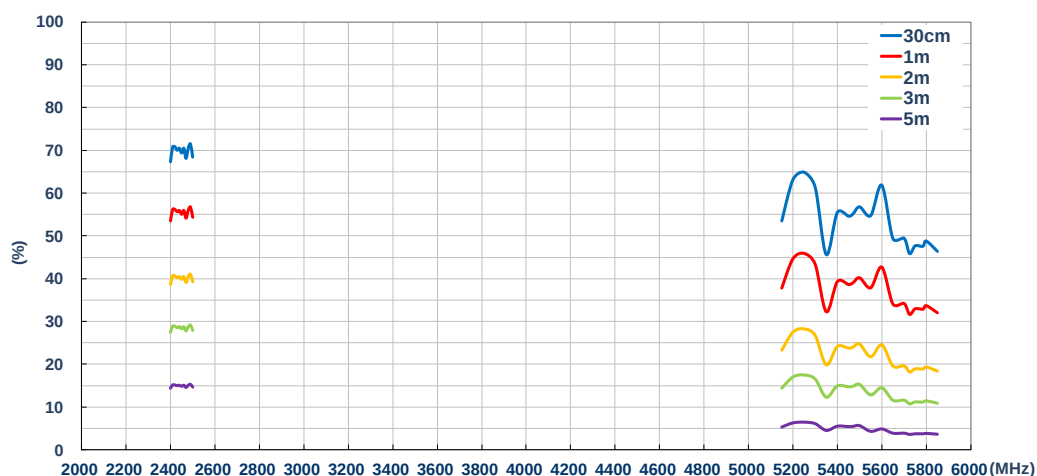
Peak Gain (dBi)



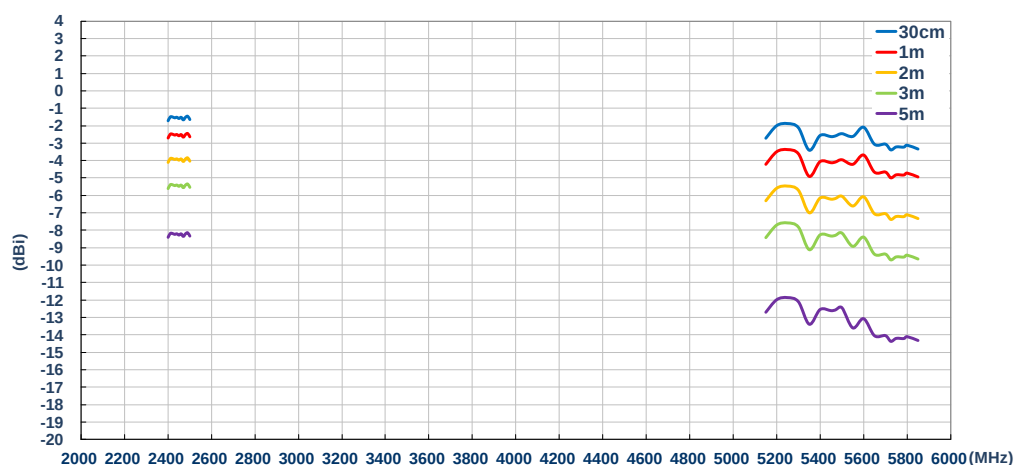
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d) With Ground Plane – WiFi

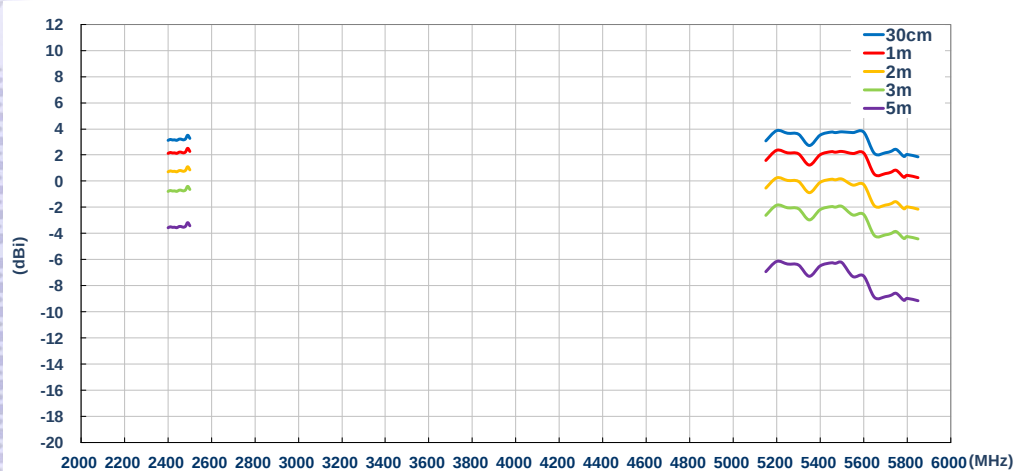
Efficiency (%)



Average Gain (dBi)



Peak Gain (dBi)



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