



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

Part Number: MT-4B-AS-BLW04

Features:

- 1*GNSS, 1*LTE, 1*WiFi Antenna Combination
- Support GPS / GLONASS / BEIDOU / GALILEO / QZSS / SBAS L1 Bands
- Support 5G NR/ 4G LTE Full Frequency Bands, 698-960MHz, 1710-2690MHz, 3300-3800MHz
- Support WiFi Dual Bands, 2400-2500MHz, 5150-5850MHz
- Excellent Out of Band Rejection, Up to 55dB
- 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

MODEL: MT-4B-AS-BLW04

Rev.A

I. Specifications:

Items	GNSS Specifications		
GNSS Electrical Characteristics			
Application Bands	BeiDou	GPS	GLONASS
Frequencies (MHz)	1561.00	1575.42	1602.00
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 Bands	BeiDou	GPS	GLONASS
Frequencies (MHz)	1561 ± 2.046	1575.42 ± 1.023	1602 ± 5
Gain (dB)	27	27	27
Noise Figure (dB)	0.98	0.98	0.92
Operation Voltage (V)	3.3 ~ 5		
Current Consumption (mA) (typical)	9.0		
Output Impedance (Ω)	50		

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Out Of Band Rejection			
Frequencies (MHz)	600 ~ 1300	1300 ~ 1530	1650 ~ 3000
Out Of Band Rejection (dB)	55	30	30
ESD Protection	±8 KV (direct discharge) ±15 KV (air discharge)		
Cable / Length	H100, 6 meters		
Connector	FAKRA(C)		

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Items			LTE Specifications						
Application Bands			LTE 700	GSM 850/900	DCS	PCS	UMTS1	LTE2600	5G NR Band
Frequencies (MHz)			698 ~ 824	824 ~ 960	1710 ~ 1880	1850 ~ 1990	1920 ~ 2170	2300 ~ 2690	3300 ~ 3800
Efficiency (%)	Free Space	30cm	63.52	79.37	78.72	85.38	75.89	67.20	61.94
		1m	55.84	69.86	64.88	69.61	61.13	52.77	46.34
		2m	46.45	58.22	49.22	52.00	44.88	37.36	30.62
		3m	38.63	48.52	37.33	38.84	32.95	26.45	20.23
		5m	26.73	33.70	21.48	21.68	17.77	13.26	8.83
Average Gain (dBi)	Free Space	30cm	-1.97	-1.00	-1.04	-0.69	-1.20	-1.73	-2.08
		1m	-2.53	-1.56	-1.88	-1.57	-2.14	-2.78	-3.34
		2m	-3.33	-2.35	-3.08	-2.84	-3.48	-4.28	-5.14
		3m	-4.13	-3.14	-4.28	-4.11	-4.82	-5.78	-6.94
		5m	-5.73	-4.72	-6.68	-6.64	-7.50	-8.78	-10.54
Peak Gain (dBi)	Free Space	30cm	5.04	6.00	5.89	6.27	6.27	5.18	4.53
		1m	4.48	5.48	5.05	5.36	5.36	4.13	3.27
		2m	3.68	4.78	3.85	4.06	4.06	2.63	1.47
		3m	2.88	4.08	2.65	2.76	2.76	1.13	-0.33
		5m	1.28	2.68	0.25	0.18	0.16	-1.87	-3.93
V.S.W.R			< 3						
Return Loss (dB)			< -6						
Impedance (Ω)			50						

Polarization			Linear						
Cable / Length			H-100, 6 meters						
Connector			FAKRA(D)						
Items			WiFi Specifications						
Frequencies (MHz)			2400	2450	2500	5150	5350	5725	5850
Efficiency (%)	Free Space	30cm	79.43	80.17	79.80	71.29	69.34	59.43	53.09
		1m	62.37	62.95	62.66	55.98	54.45	46.67	41.69
		2m	44.16	44.57	44.36	39.63	38.55	33.04	29.51
		3m	31.26	31.55	31.41	28.05	27.29	23.39	20.89
		5m	15.67	15.81	15.74	14.06	13.68	11.72	10.47
Average Gain (dBi)	Free Space	30cm	-1.00	-0.96	-0.98	-1.47	-1.59	-2.26	-2.75
		1m	-2.05	-2.01	-2.03	-2.52	-2.64	-3.31	-3.80
		2m	-3.55	-3.51	-3.53	-4.02	-4.14	-4.81	-5.30
		3m	-5.05	-5.01	-5.03	-5.52	-5.64	-6.31	-6.80
		5m	-8.05	-8.01	-8.03	-8.52	-8.64	-9.31	-9.80
Peak Gain (dBi)	Free Space	30cm	7.65	8.23	7.03	7.63	7.34	3.52	3.78
		1m	6.60	7.18	5.98	6.58	6.29	2.47	2.73
		2m	5.10	5.68	4.48	5.08	4.79	0.97	1.23
		3m	3.60	4.18	2.98	3.58	3.29	-0.53	-0.27
		5m	0.60	1.18	-0.02	0.58	0.29	-3.53	-3.27
V.S.W.R			< 2						
Return Loss (dB)			< -10						
Impedance (Ω)			50						
Polarization			Linear						
Cable / Length			H-100, 6 meters						
Connector			FAKRA(I)						
Mechanical									
Dimensions (mm)			Φ65.0(Dia.) x 15.8(H)						
Casing			PC						
Waterproof			IP67 / IP69K						
Maximum Assembly Torque			40 N-m						

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Environmental Conditions	
Operation Temperature (°C)	-40 ~ +85
Storage Temperature (°C)	-40 ~ +85
Humidity	Non-condensing 65 °C 95% RH

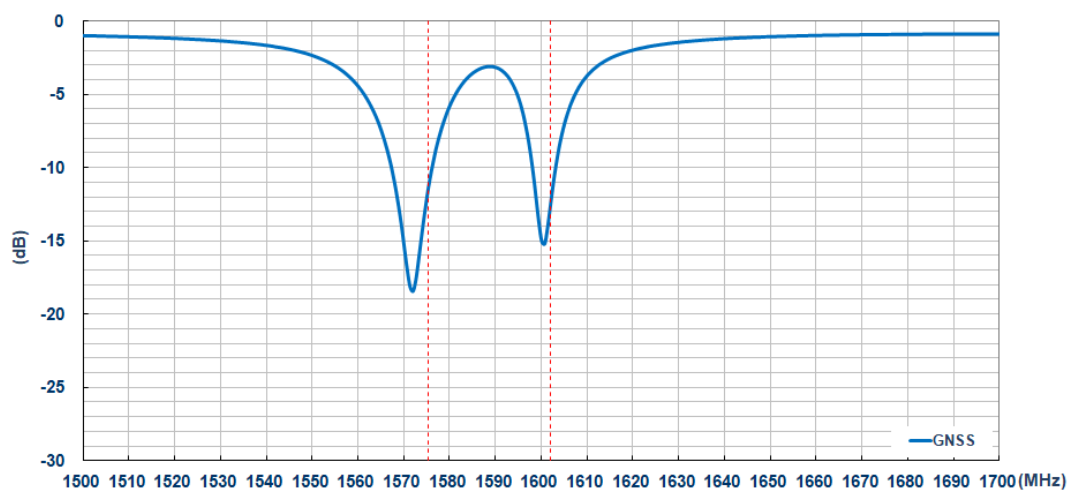
Note:

Add one-meter cable length 2~3GHz has 2.25dB loss / 5~6GHz has 3.6 dB loss.

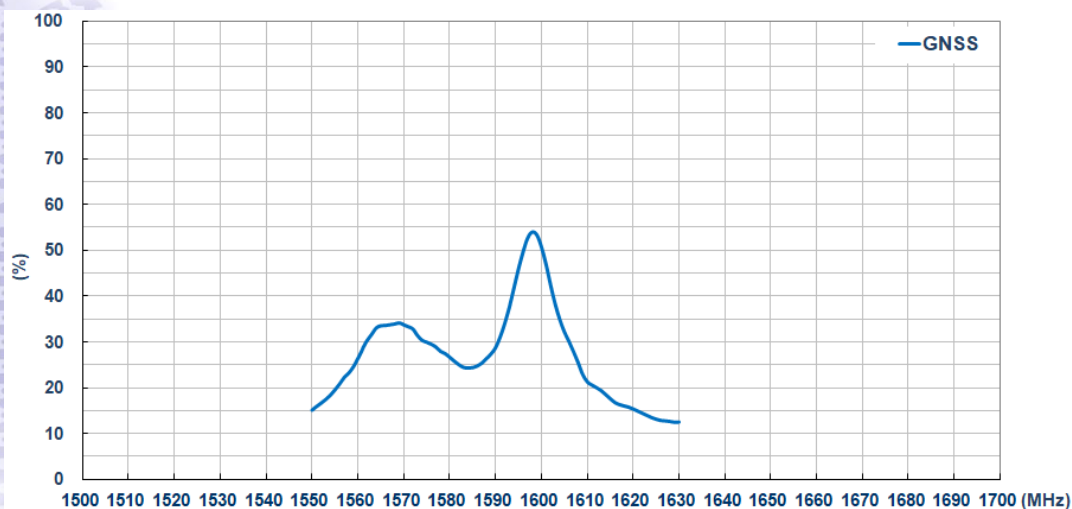
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II. Antenna Technical Parameters:

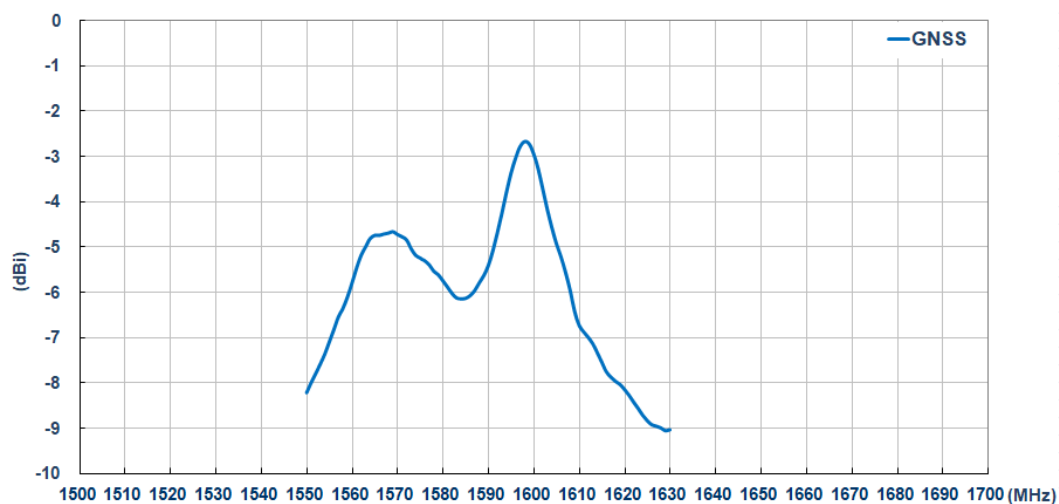
S11 (dB) – GNSS



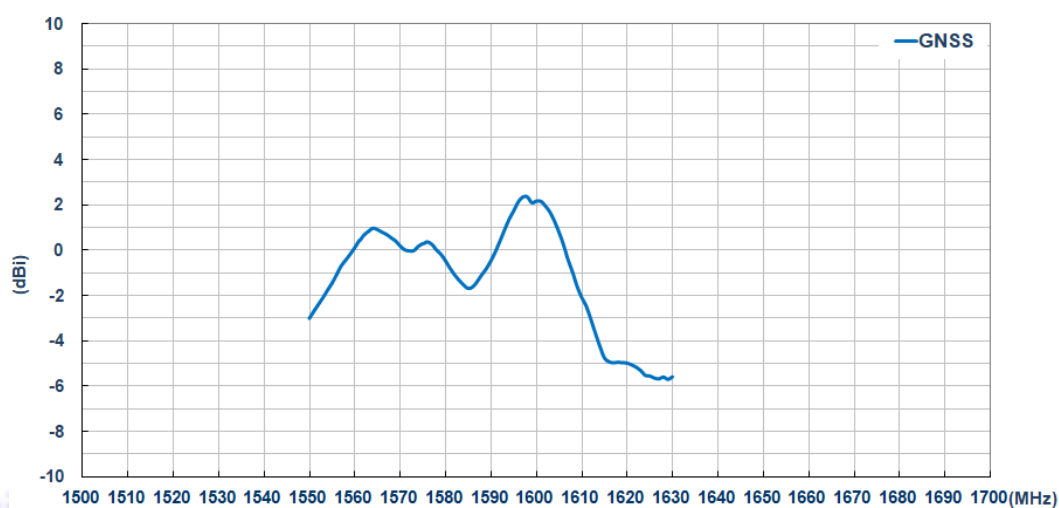
Efficiency (%) - GNSS



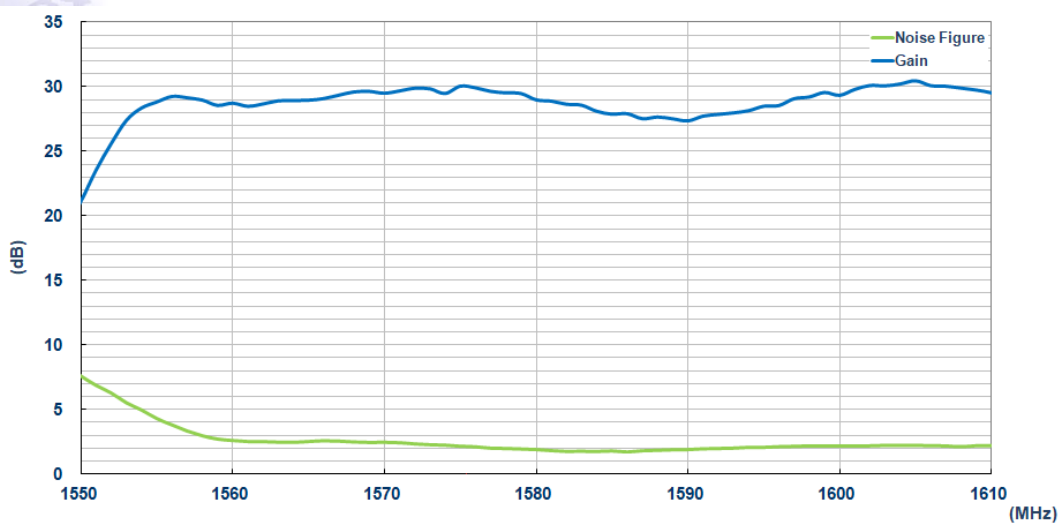
Average Gain (dBi) - GNSS



Peak Gain (dBi) - GNSS

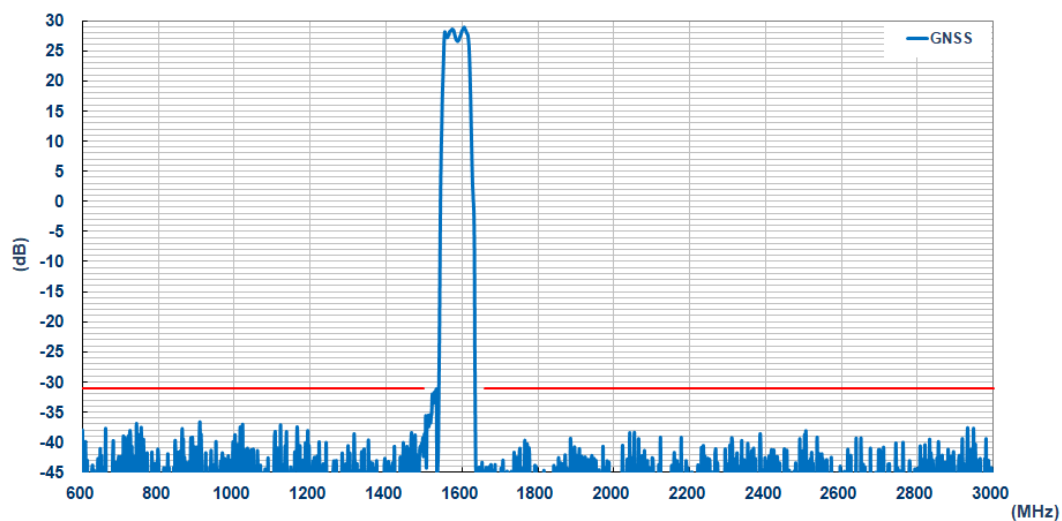


Noise Figure & Gain (dB) - GNSS



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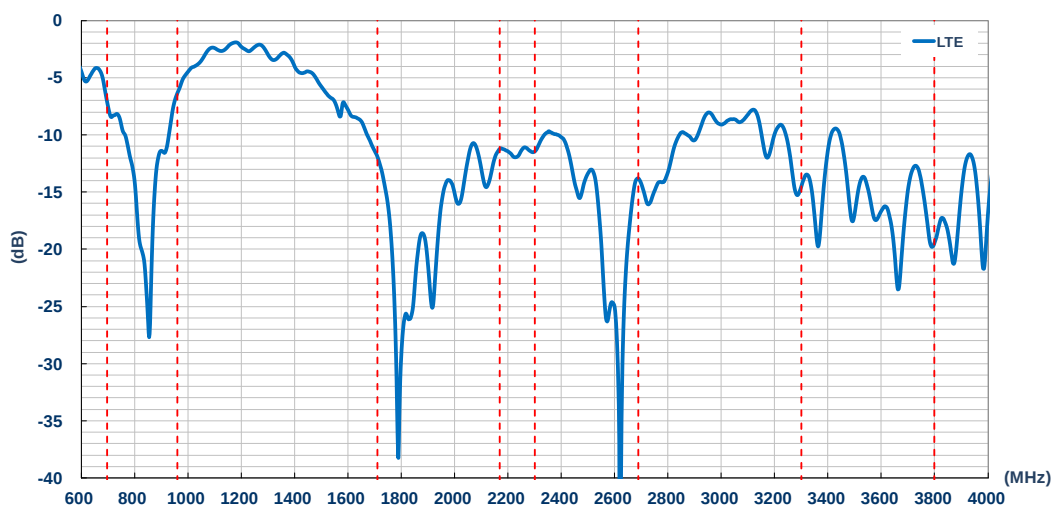
Out of Band Rejection (dB) - GNSS



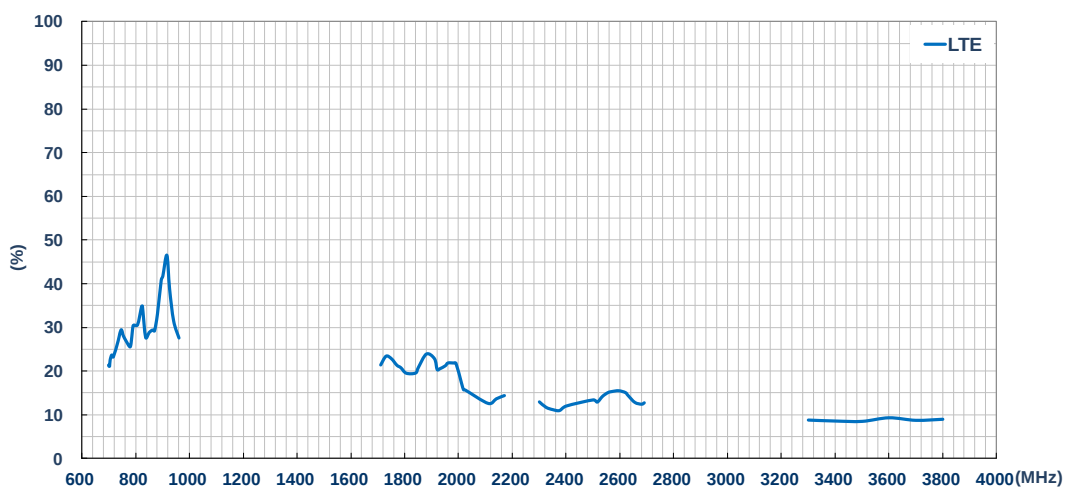
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Free Space - LTE

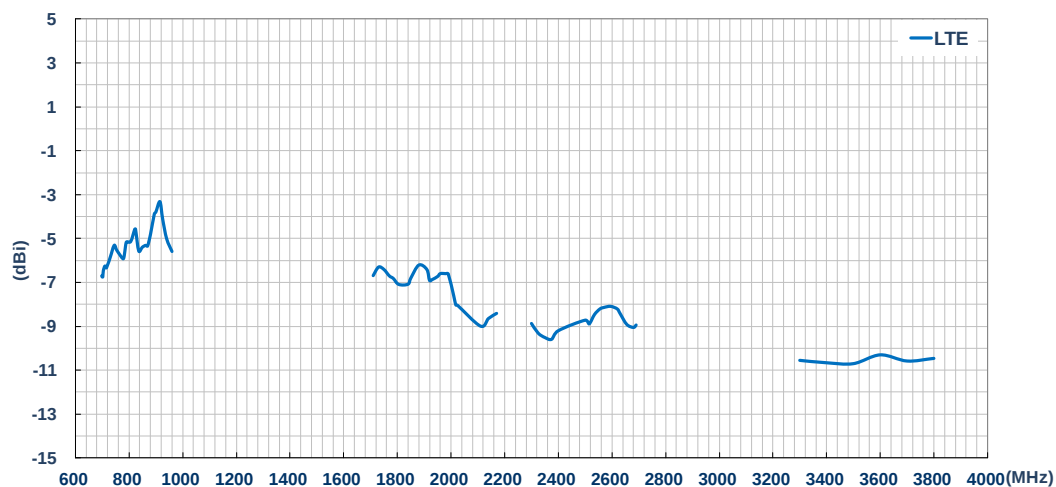
S11 (dB)



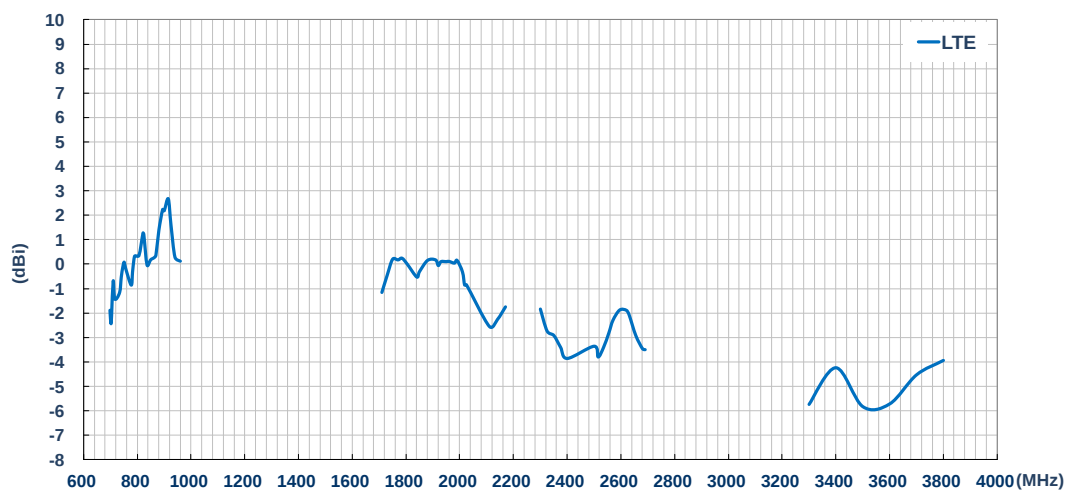
Efficiency (%)



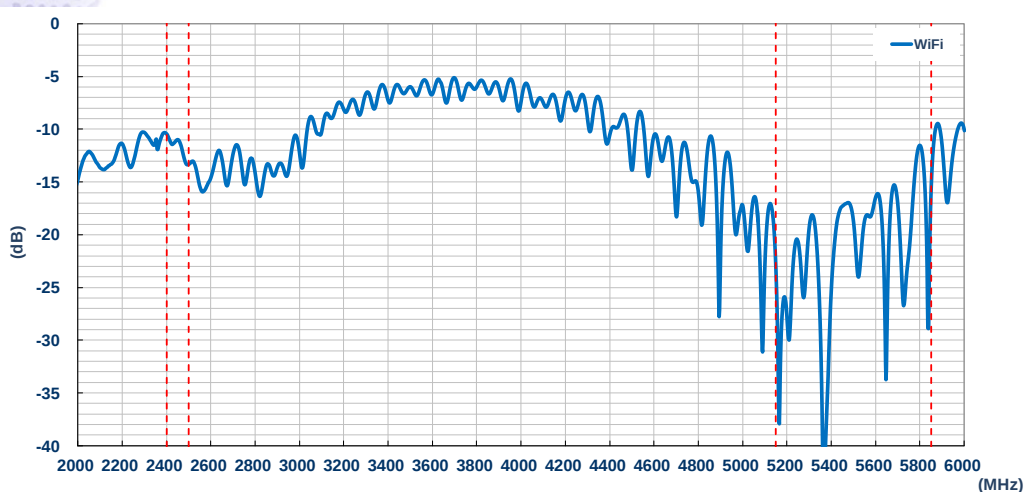
Average Gain (dBi)



Peak Gain (dBi)

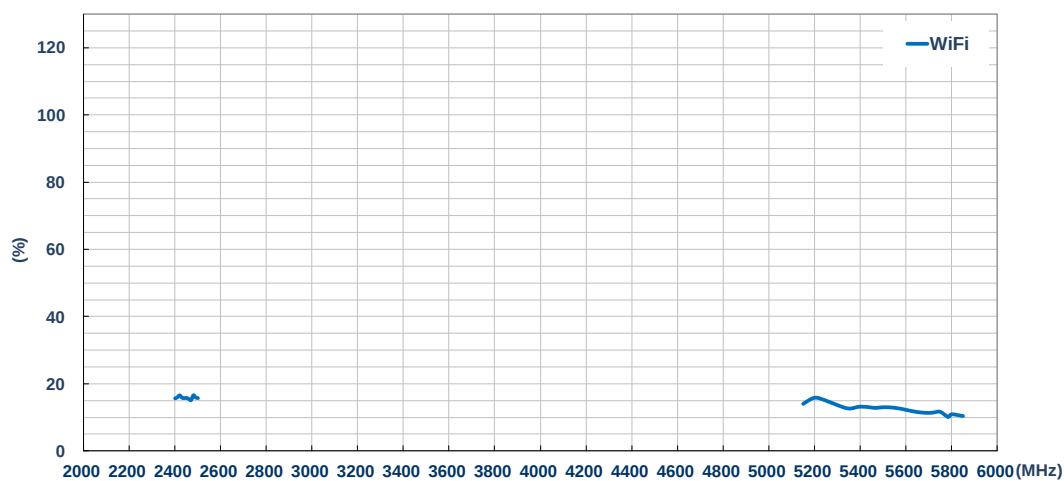


Free Space
S11 (dB) – WiFi

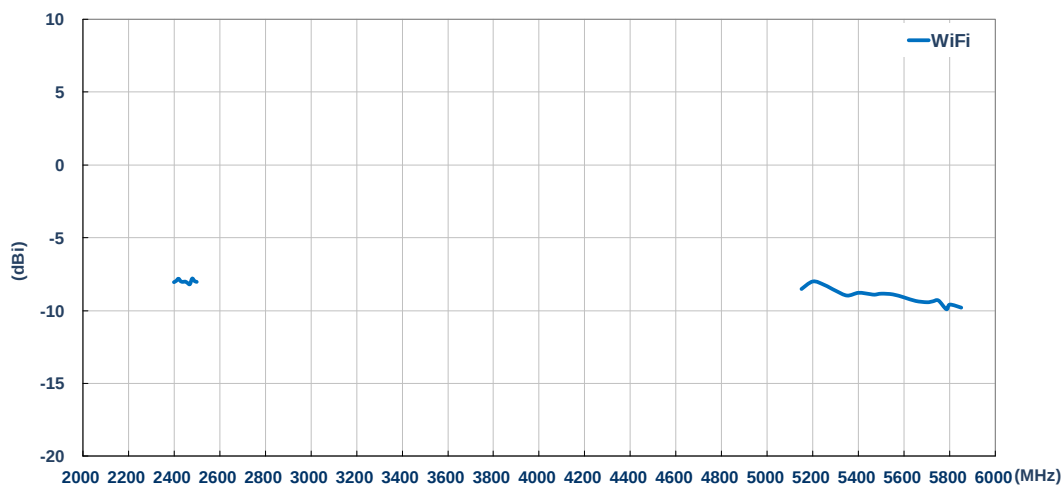


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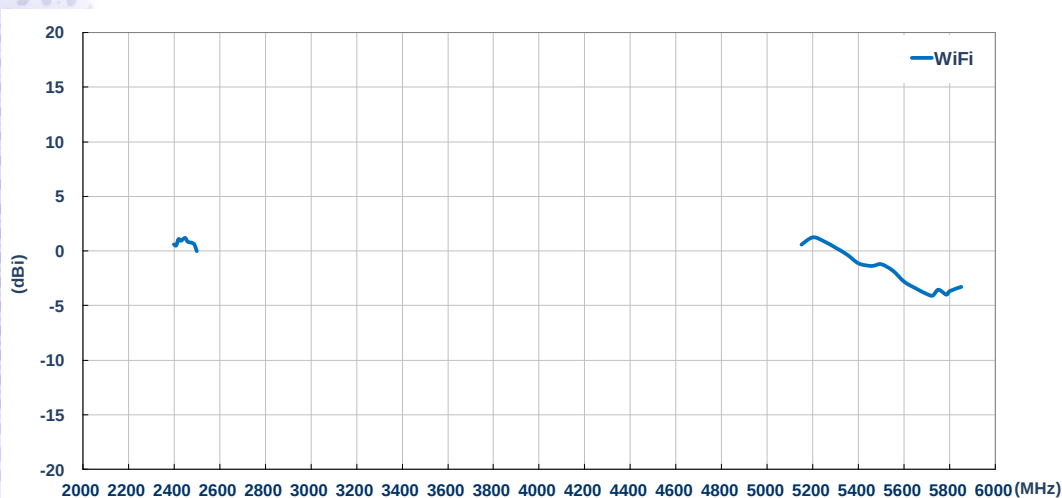
Efficiency (%) – WiFi



Average Gain (dBi) – WiFi



Peak Gain (dBi) – WiFi

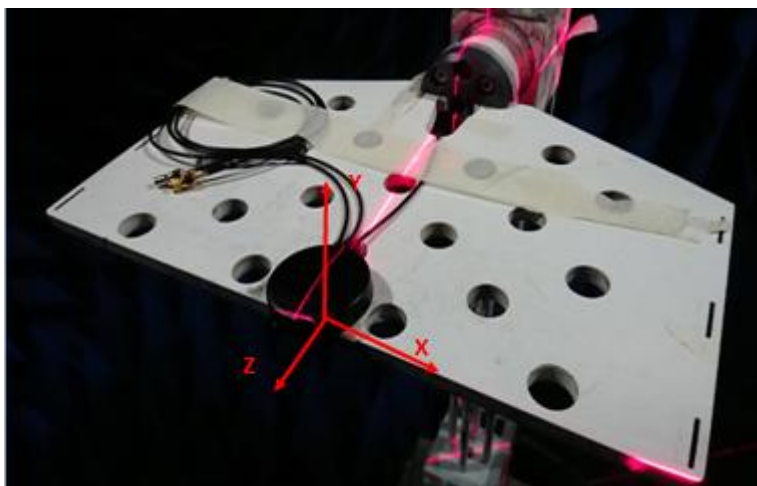


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III. Antenna Radiation Pattern Measurement:

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

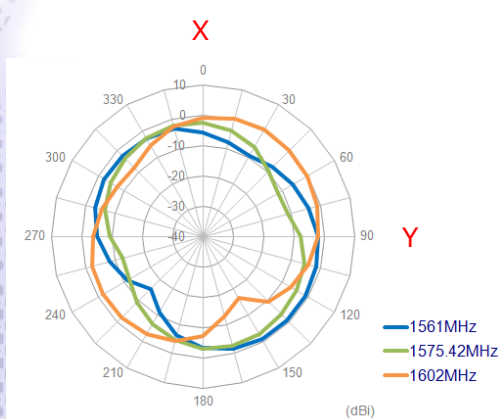
Free Space



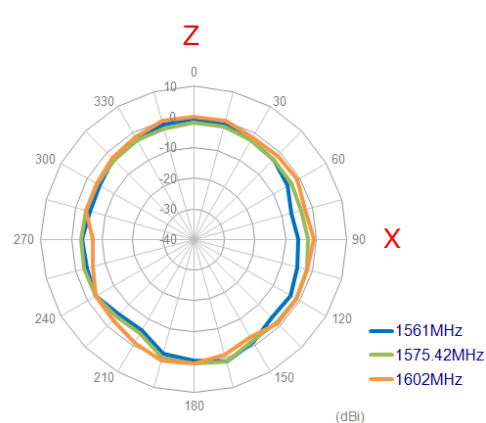
IV. 2D Radiation Pattern:

GNSS

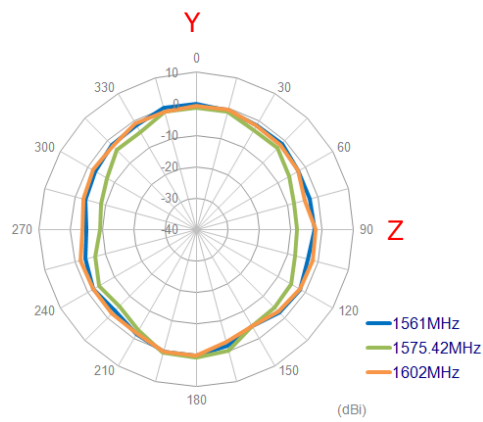
X-Y Plane



X-Z Plane

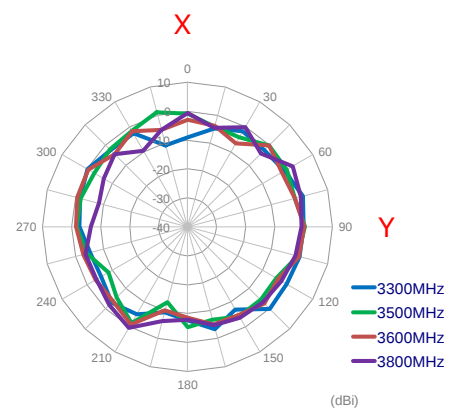
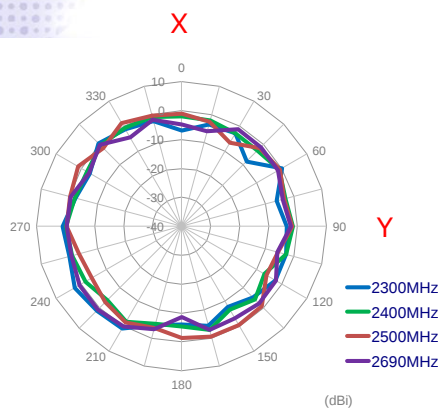
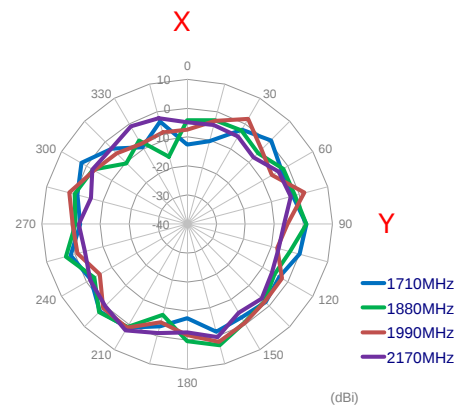
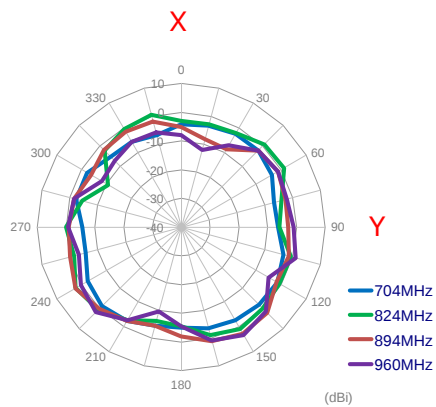


Y-Z Plane

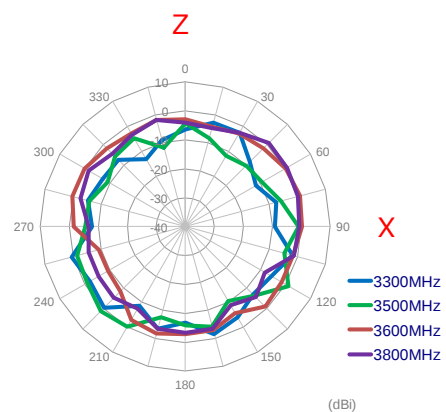
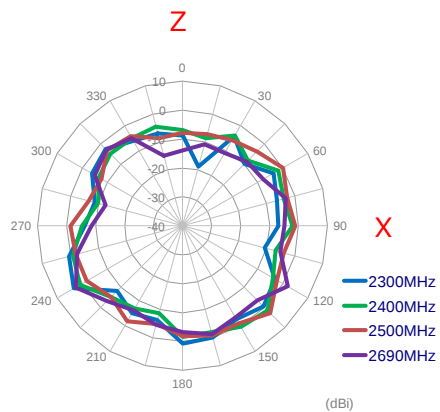
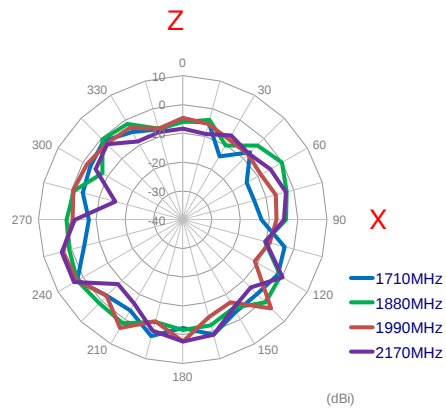
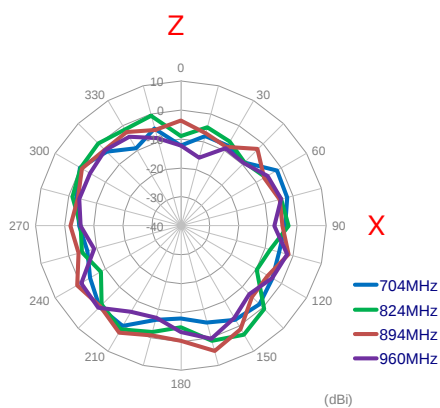


Free Space - LTE

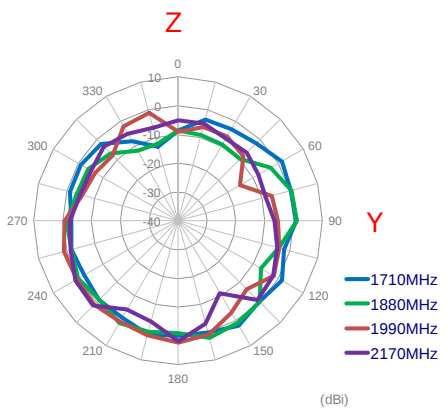
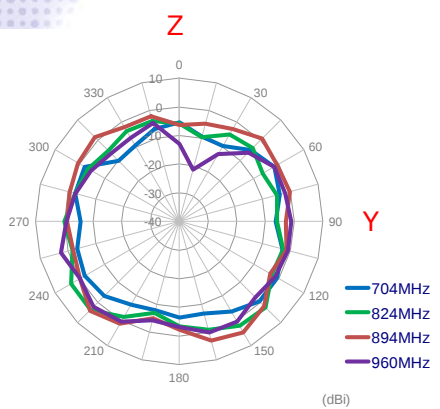
X-Y Plane



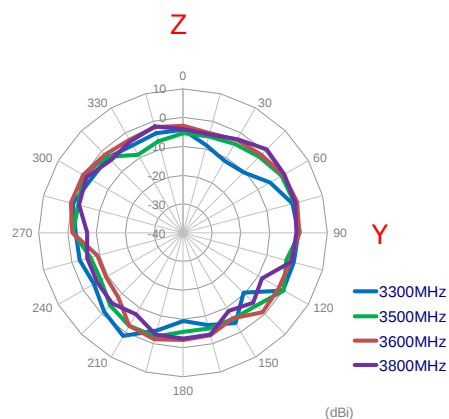
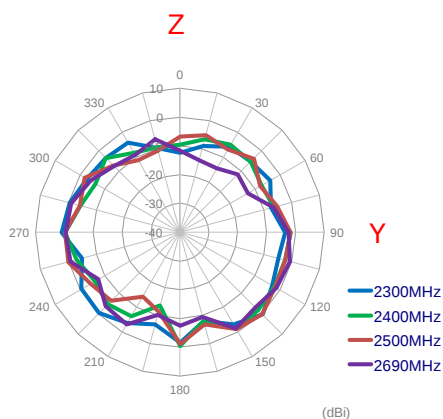
X-Z Plane



Y-Z Plane

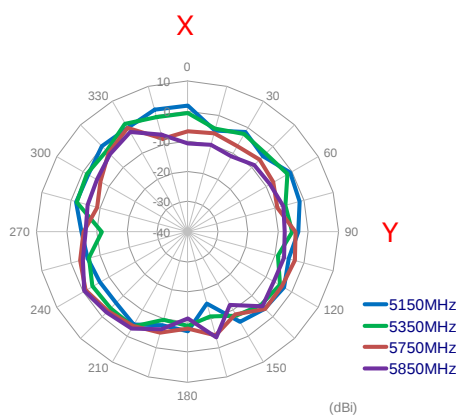
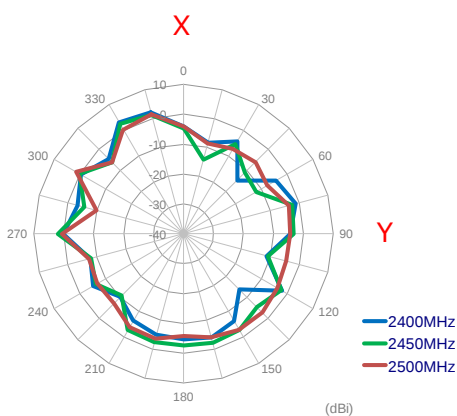


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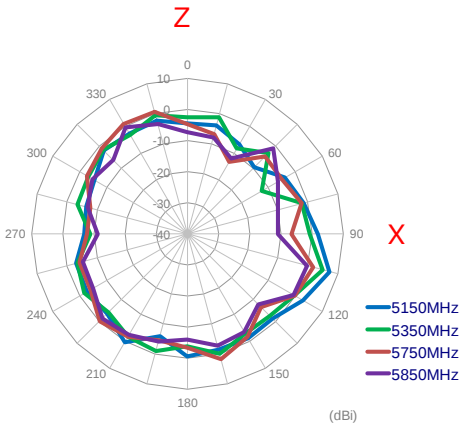
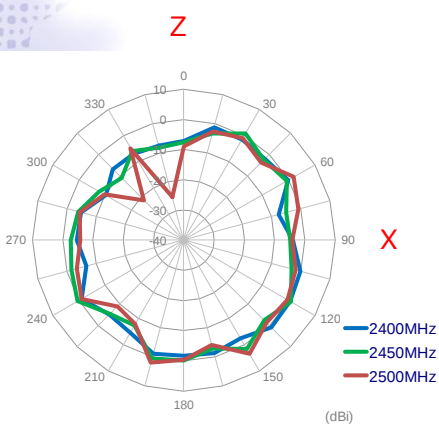


Free Space - WiFi

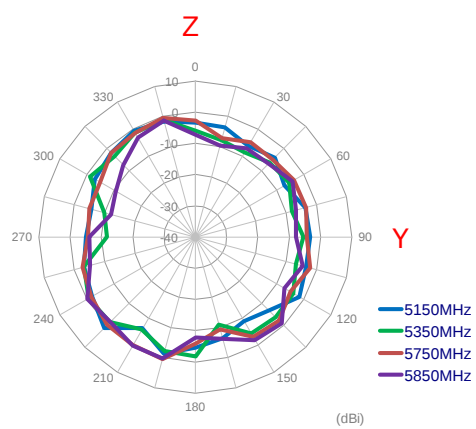
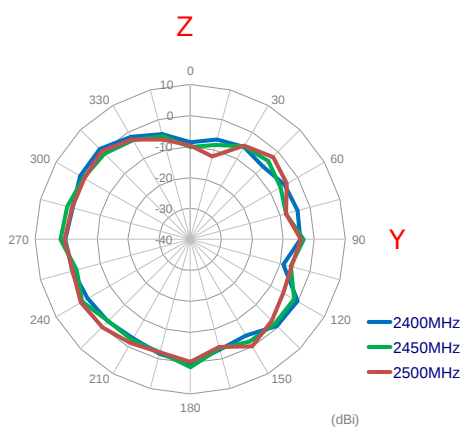
X-Y Plane



X-Z Plane



Y-Z Plane

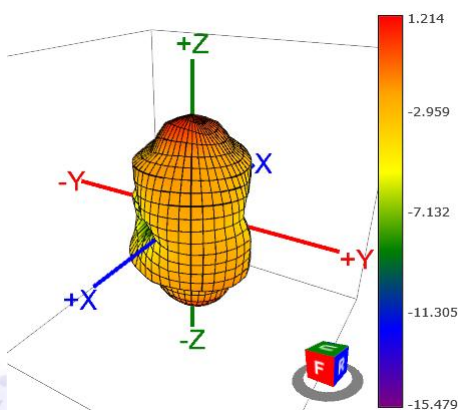


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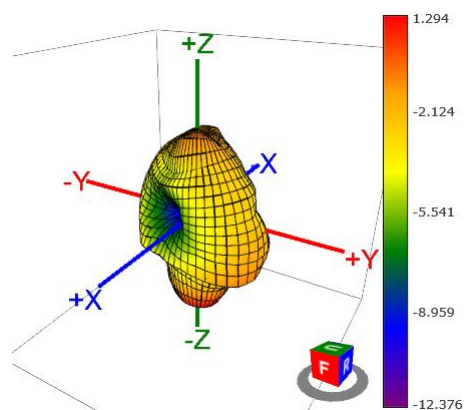
V. 3D Radiation Pattern:

GNSS

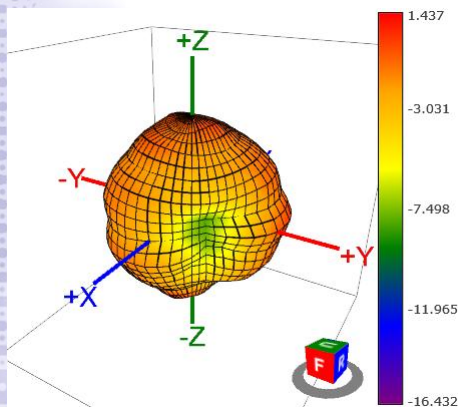
1561MHz



1575.42MHz

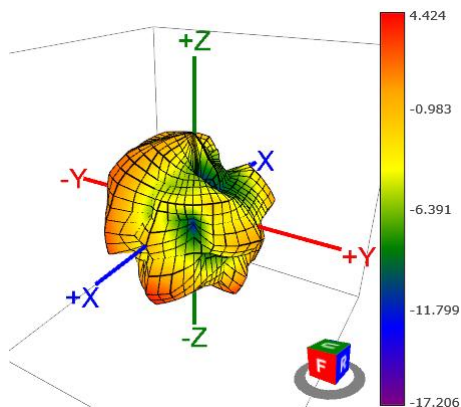


1602MHz

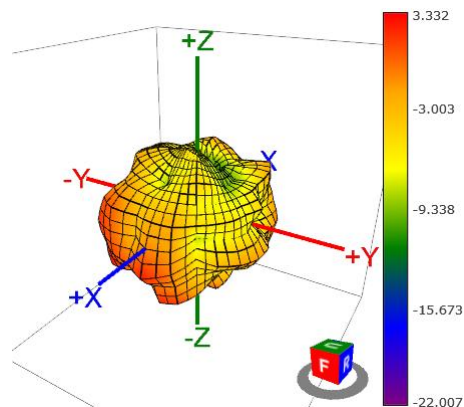


Free Space – LTE

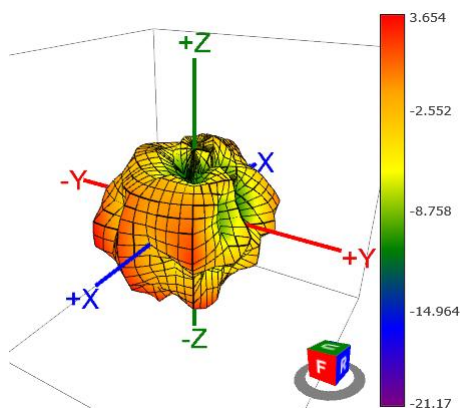
824MHz



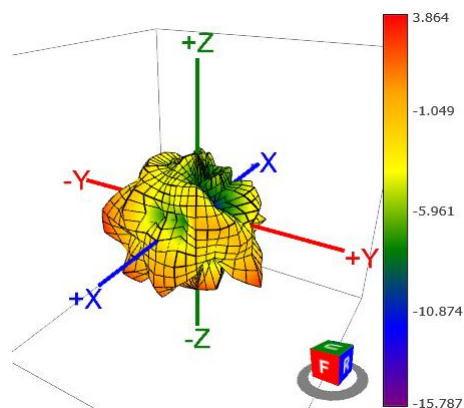
960MHz



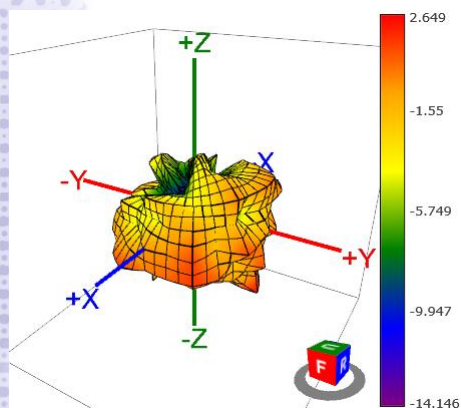
1710MHz



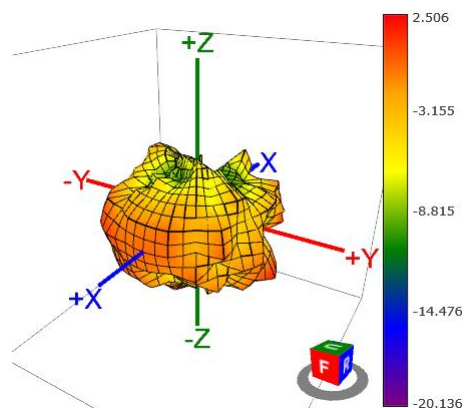
2170MHz



2300MHz

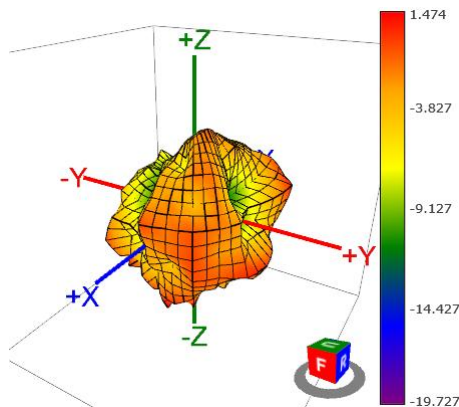


2690MHz

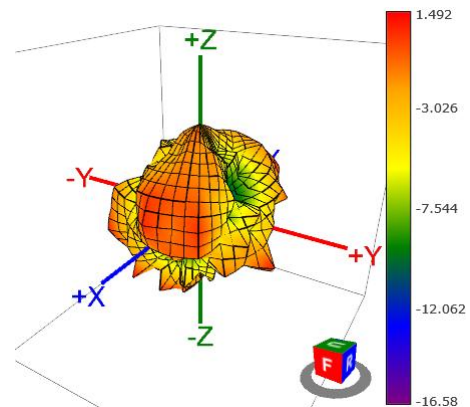


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3300MHz

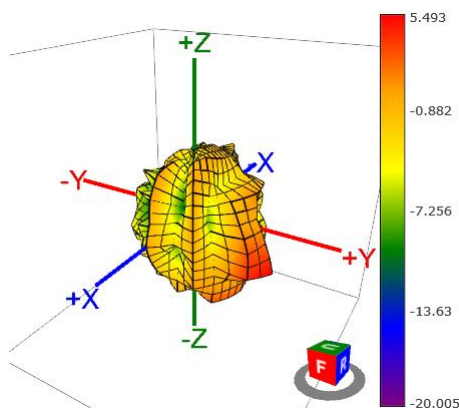


3600MHz

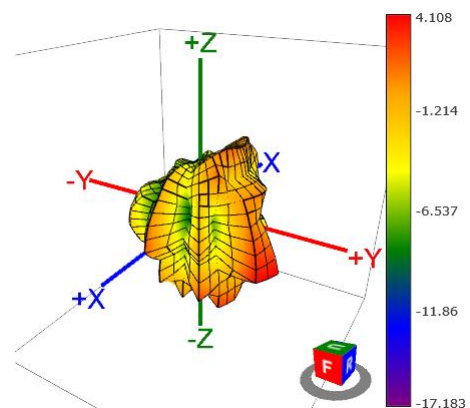


Free Space - WiFi

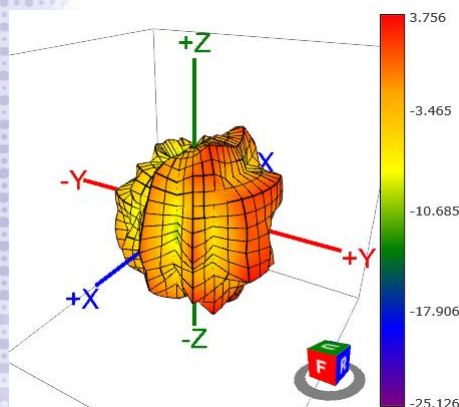
2400MHz



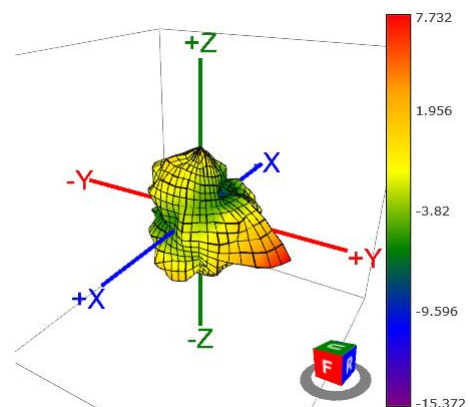
2450MHz

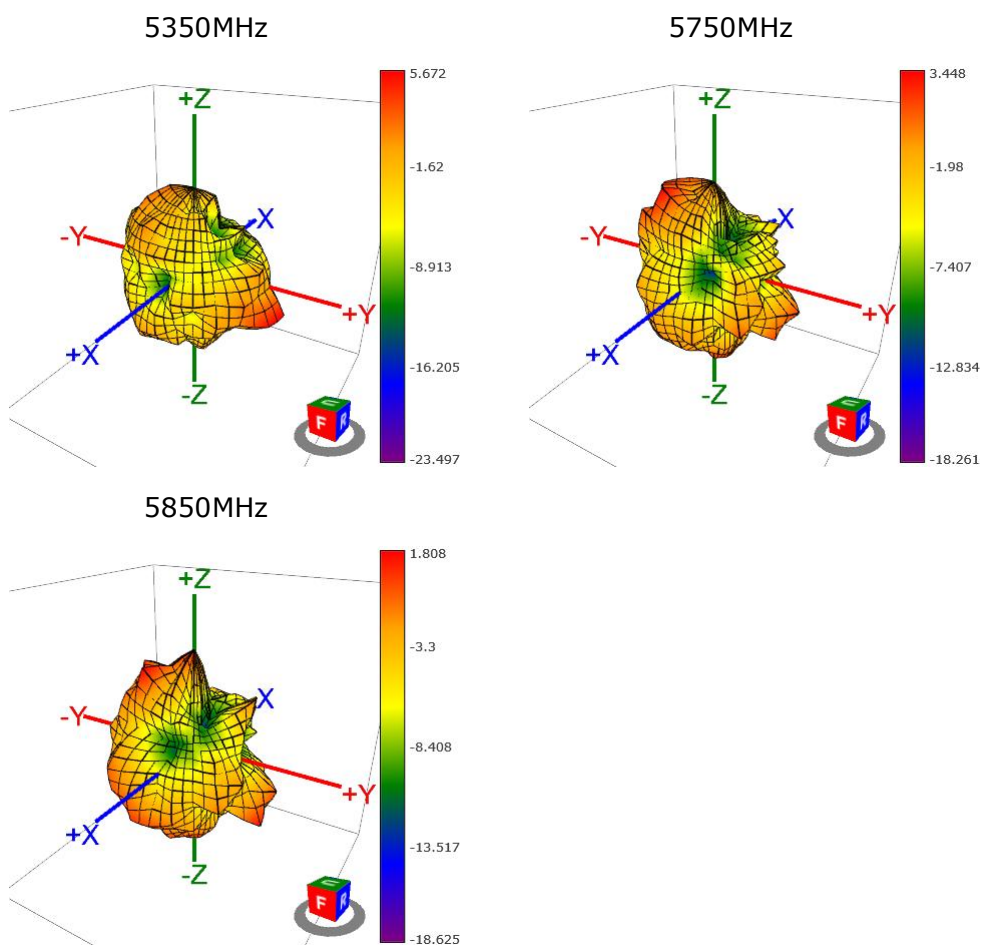


2500MHz



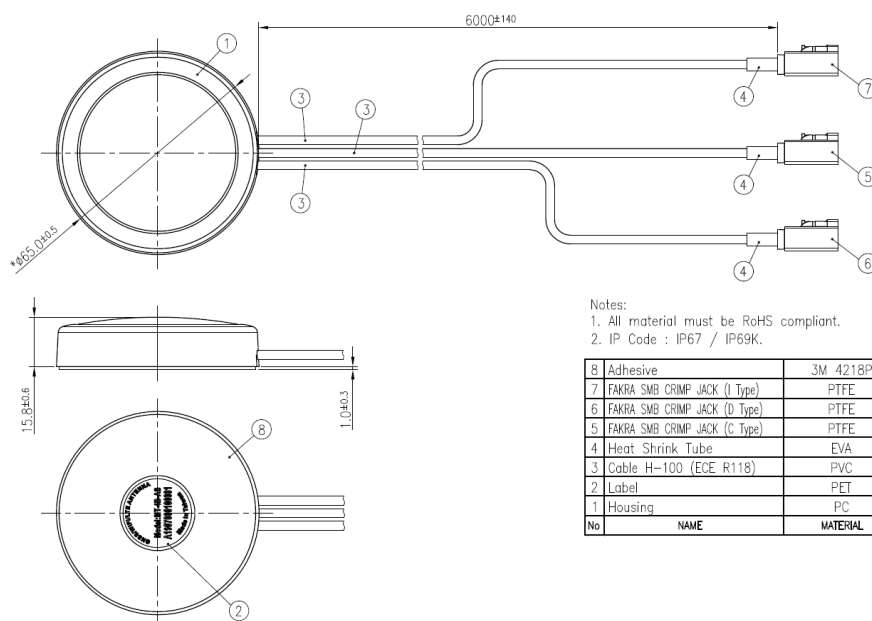
5150MHz





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VI. Mechanical Drawing (Unit:mm):

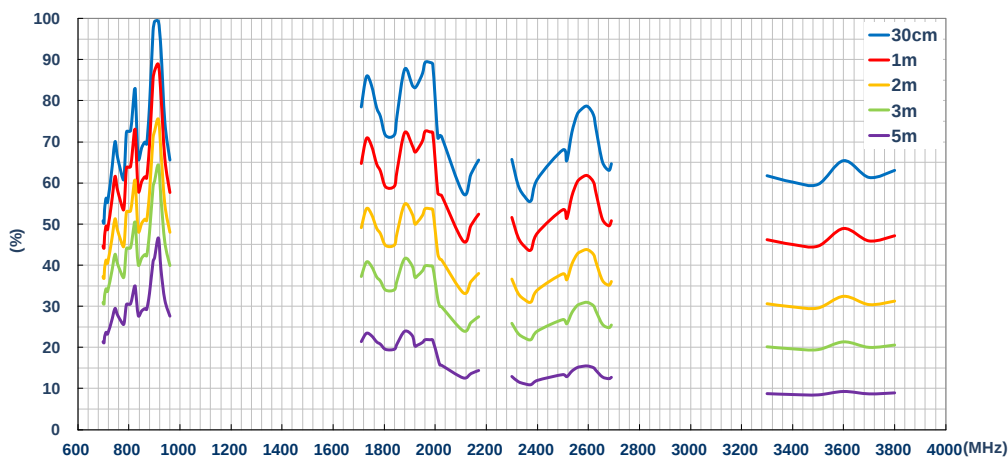


VII. Applications Note:

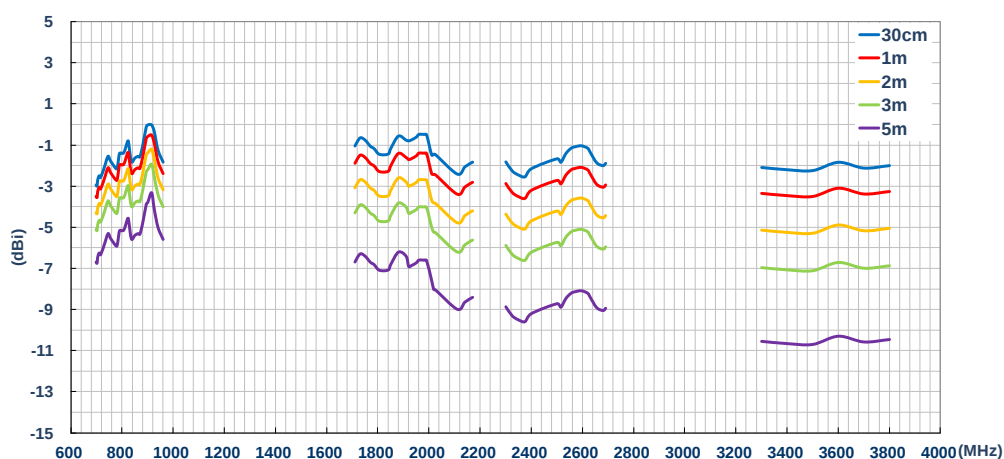
The antenna performance with different cable lengths is shown below.

Free Space – LTE

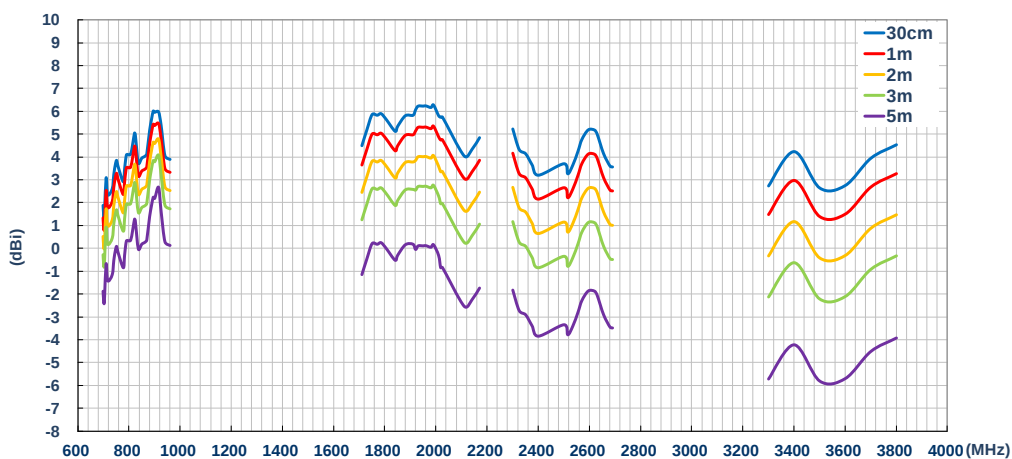
Efficiency (%)



Average Gain (dBi)



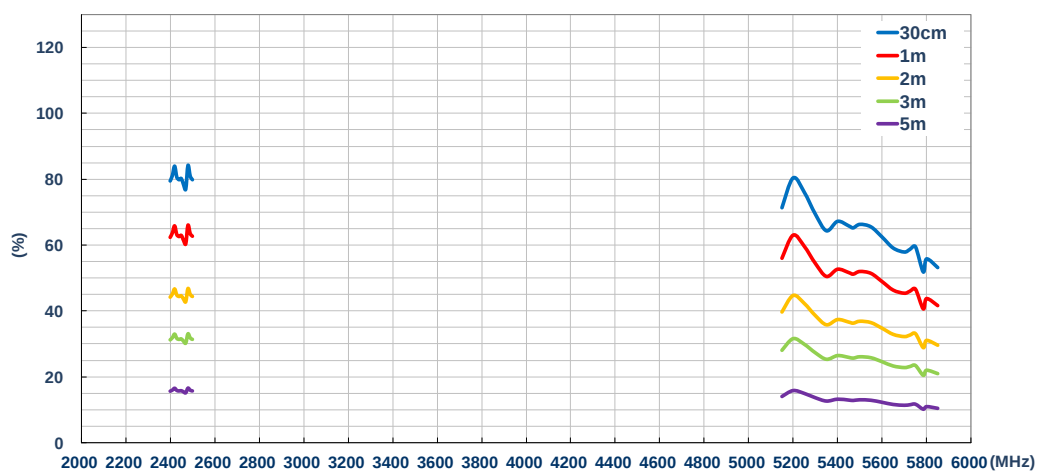
Peak Gain (dBi)



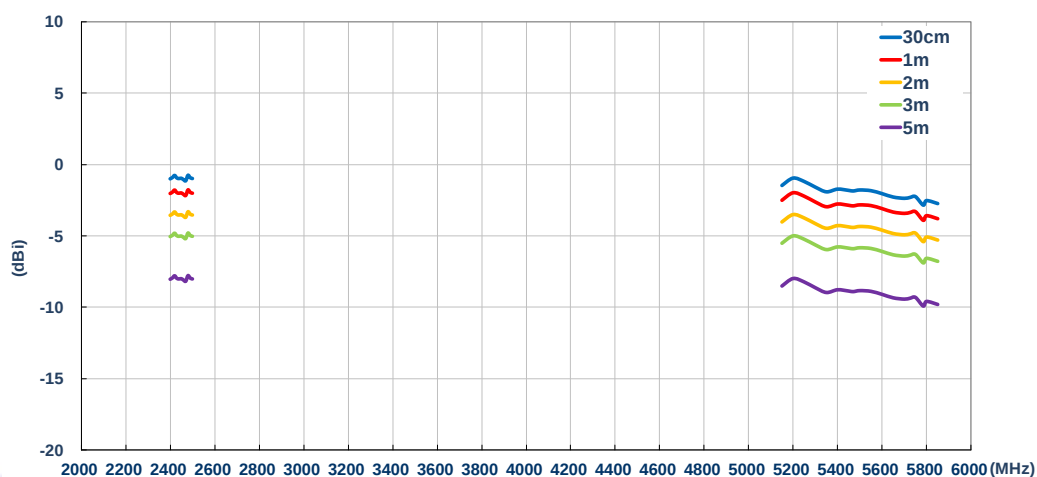
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Free Space – WIFI

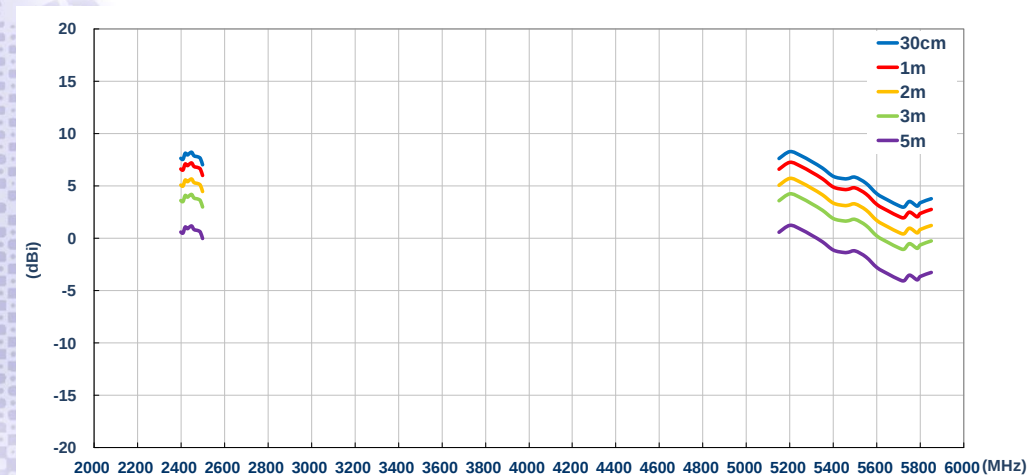
Efficiency (%)



Average Gain (dBi)



Peak Gain (dBi)



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