



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

Part Number: MT-4B-AS-B2L01

Features:

- 1*GNSS, 2*LTE Antenna Combination
- Support GPS L1/ GLONASS L1/ BeiDou L1 Bands
- Support 5G NR/ 4G LTE Full Frequency Bands, 698-960MHz, 1710-2690MHz, 3300-3800MHz
- Excellent Out of Band Suppression, Up to 55dB
- 27dB Active Peak Gain
- Customizable Cables and Connectors
- RoHS & REACH Compliant

Applications:

- Fleet Management & Telematics
- Vehicle Navigation

3-in-1 GNSS/ 5G NR/ 4G LTE Combination Antenna

MODEL: MT-4B-AS-B2L01

Rev.A

I. Specifications:

Items	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 ~ 5.0		
Current Consumption (mA) (typical)	9.0		
Output Impedance (Ω)	50		

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GNSS _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, 3 meters		
Connector	SMA (Male)		

Items		LTE 1						
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	52.82	57.71	72.54	71.12	62.90	57.59	57.54
	1m	46.43	50.73	59.67	57.68	50.53	45.22	43.05
	2m	38.62	42.19	45.15	42.76	36.96	32.01	28.44
	3m	32.12	35.10	34.16	31.70	27.03	22.66	18.79
	5m	22.22	24.28	19.56	17.42	14.46	11.36	8.20
Average Gain (dBi)								
Free Space	30cm	-2.77	-2.39	-1.39	-1.48	-2.01	-2.40	-2.40
	1m	-3.33	-2.95	-2.24	-2.39	-2.96	-3.45	-3.66
	2m	-4.13	-3.75	-3.45	-3.69	-4.32	-4.95	-5.46
	3m	-4.93	-4.55	-4.66	-4.99	-5.68	-6.45	-7.26
	5m	-6.53	-6.15	-7.09	-7.59	-8.40	-9.45	-10.86
Peak Gain (dBi)								
Free Space	30cm	2.51	3.22	3.83	4.16	4.16	3.57	2.30
	1m	3.07	3.78	4.67	5.07	5.07	4.62	3.56
	2m	2.27	2.98	3.47	3.77	3.77	3.12	1.76
	3m	1.47	2.18	2.27	2.47	2.47	1.62	-0.04
	5m	-0.13	0.58	-0.13	-0.13	-0.13	-1.38	-3.64
V.S.W.R		< 3						

Return Loss (dB)	< -6
Impedance (Ω)	50
Polarization	Linear
Cable / Length	H-100, 3 meters
Connector	SMA (Male)

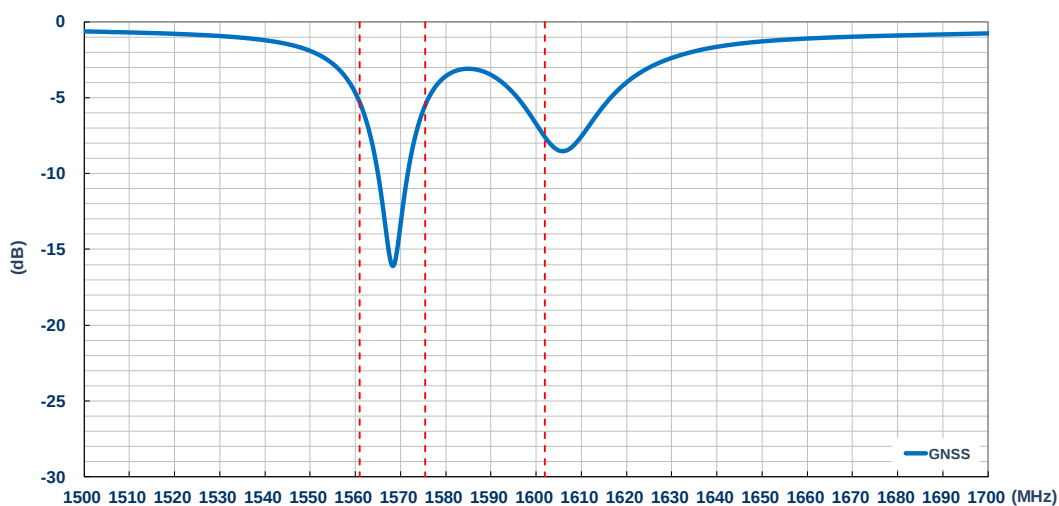
Items		LTE 2						
Application Bands		LTE 700	GSM 850/900	DCS	PCS	UMTS1	LTE2600	5G NR Band
Frequencies (MHz)		698 ~ 824	824 ~ 960	1710 ~ 1880	1850 ~ 1990	1920 ~ 2170	2300 ~ 2690	3300 ~ 3800
Efficiency (%)								
Free Space	30cm	45.91	49.75	37.97	47.28	47.62	38.16	33.62
	1m	52.23	56.59	46.16	58.30	59.27	48.59	44.94
	2m	43.45	47.07	34.92	43.22	43.35	34.40	29.69
	3m	36.14	39.15	26.42	32.04	31.71	24.35	19.62
	5m	25.00	27.09	15.13	17.61	16.96	12.21	8.56
Average Gain (dBi)								
Free Space	30cm	-3.38	-3.03	-4.21	-3.25	-3.22	-4.18	-4.73
	1m	-2.82	-2.47	-3.36	-2.34	-2.27	-3.13	-3.47
	2m	-3.62	-3.27	-4.57	-3.64	-3.63	-4.63	-5.27
	3m	-4.42	-4.07	-5.78	-4.94	-4.99	-6.13	-7.07
	5m	-6.02	-5.67	-8.20	-7.54	-7.71	-9.13	-10.67
Peak Gain (dBi)								
Free Space	30cm	3.18	4.52	4.13	4.05	5.17	5.02	1.74
	1m	3.74	5.08	4.97	4.97	6.15	6.07	3.00
	2m	2.94	4.28	3.77	3.66	4.75	4.57	1.20
	3m	2.14	3.48	2.57	2.36	3.35	3.07	-0.60
	5m	0.54	1.88	0.17	-0.24	0.55	0.07	-4.20
V.S.W.R		< 3						
Return Loss (dB)		< -6						
Impedance (Ω)		50						
Polarization		Linear						

Cable / Length	H-100, 3 meters
Connector	SMA (Male)
Mechanical	
Dimension (mm)	φ65.00(D) x 15.80(H)
Casing	PC
Weigh (g) (including cable)	95.5
Waterproof Resistant	IP67 / IP69K
Environmental Conditions	
Operation Temperature (°C)	-40 ~ +85
Storage Temperature (°C)	-40 ~ +85
Humidity	95% non-condensing

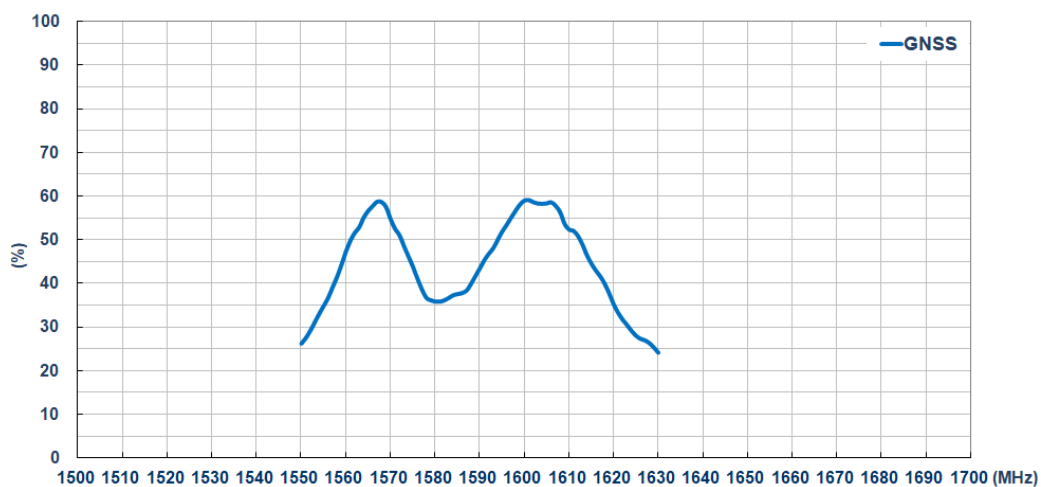
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II. Antenna Technical Parameters:

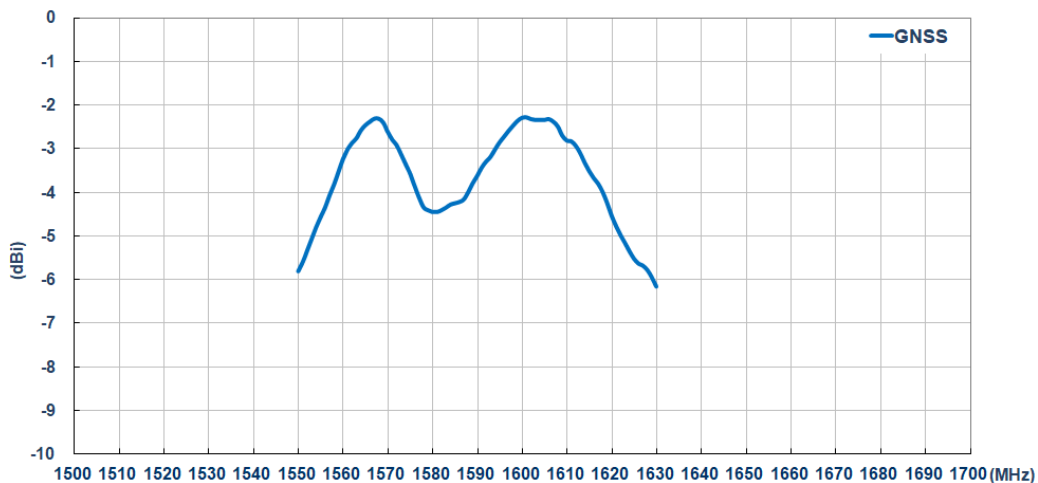
GNSS
S11 (dB)



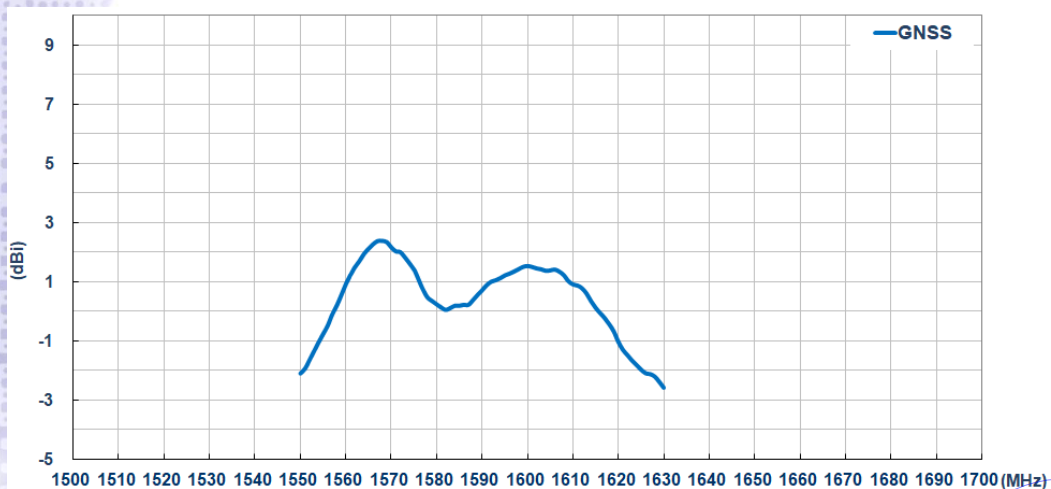
Efficiency (%)



Average Gain (dBi)

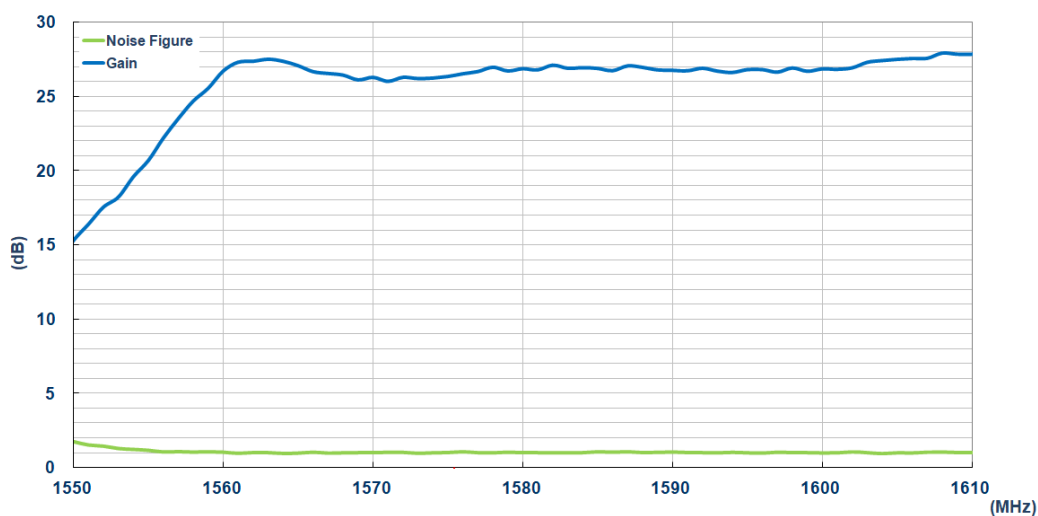


Peak Gain (dBi)



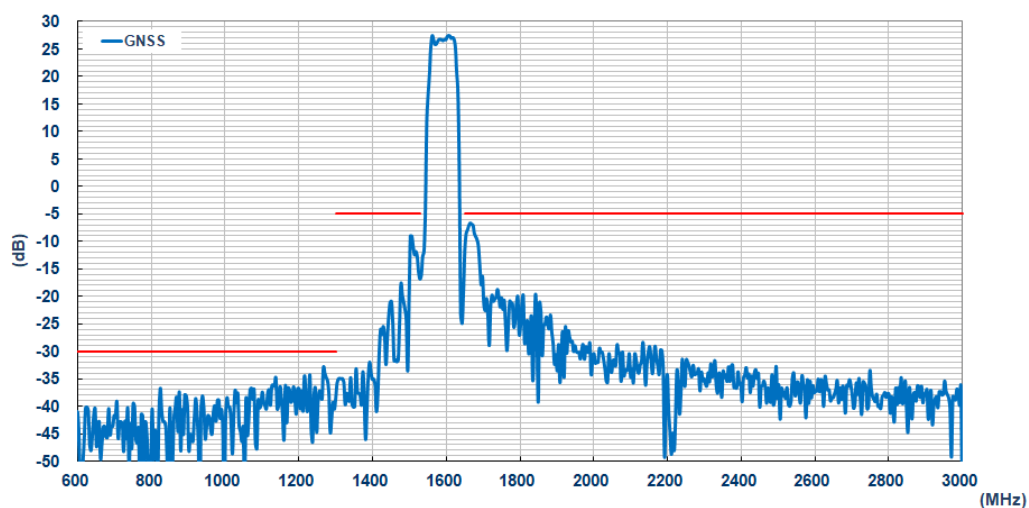
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Noise Figure & Gain (dB)



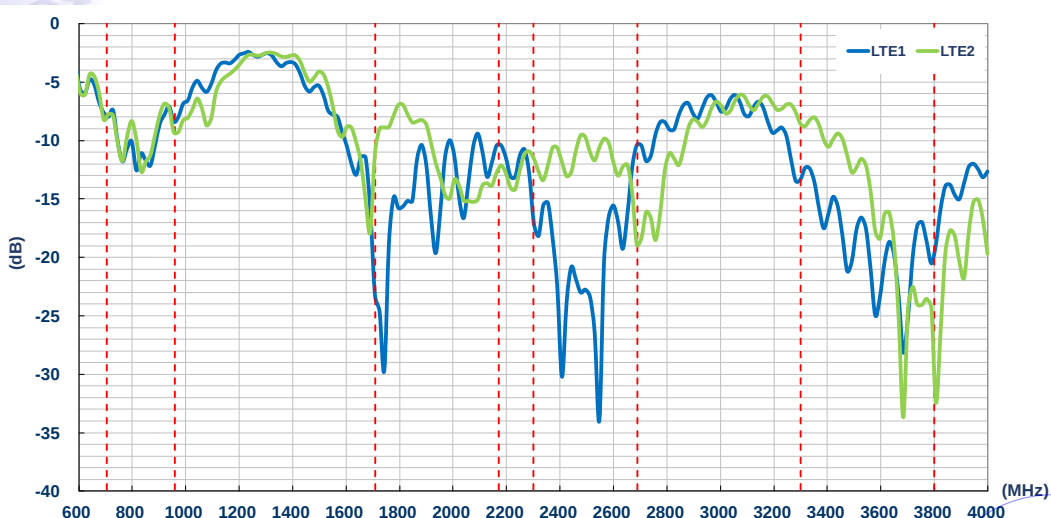
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Out of Band Rejection (dB)

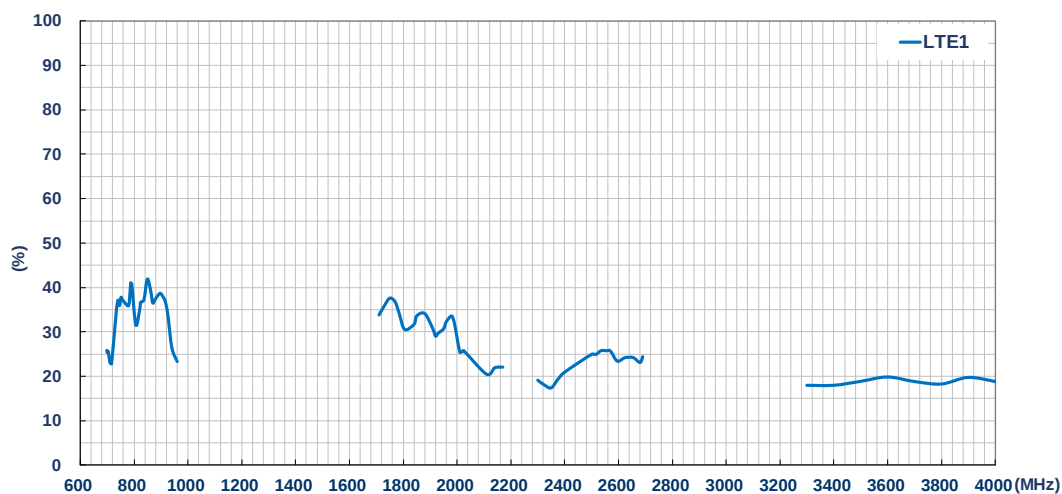


Free Space

S11 (dB) - LTE 1 & LTE 2

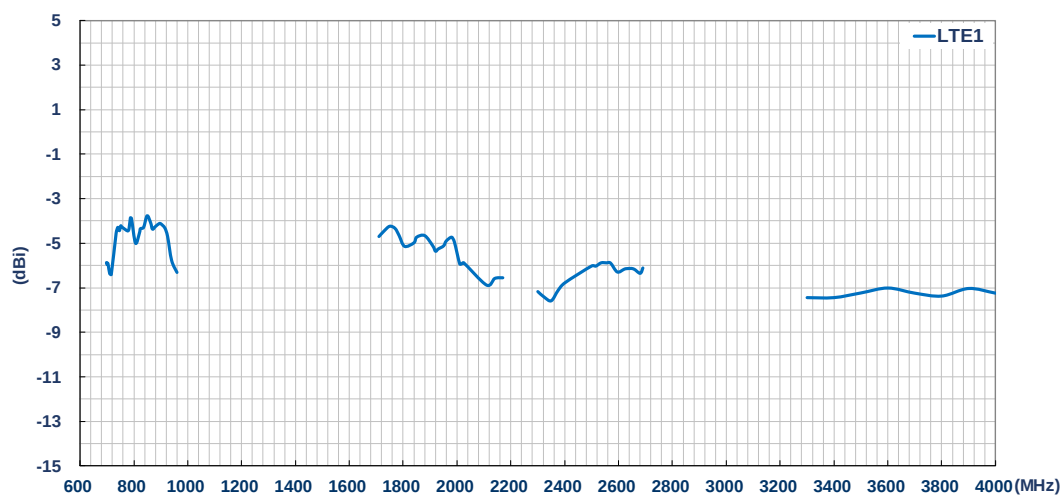


Efficiency (%) – LTE 1

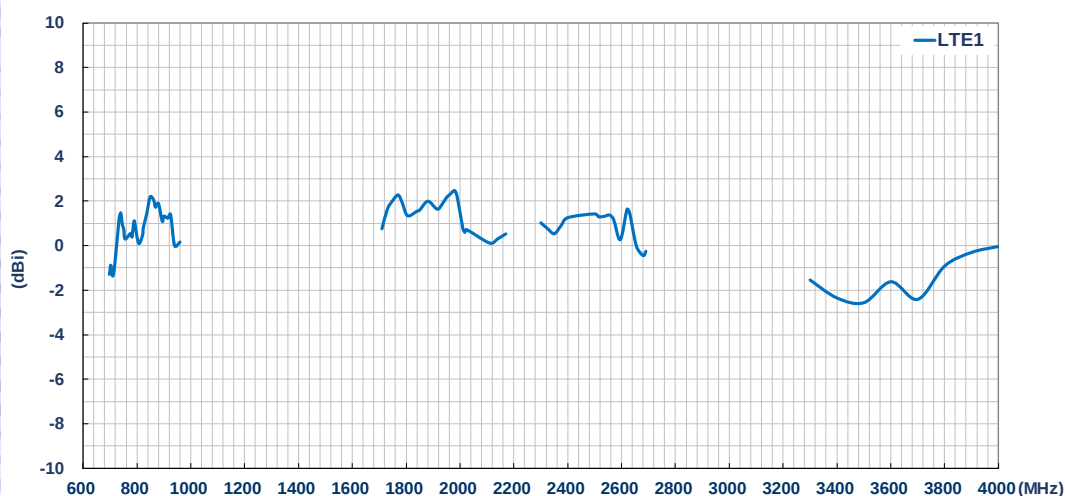


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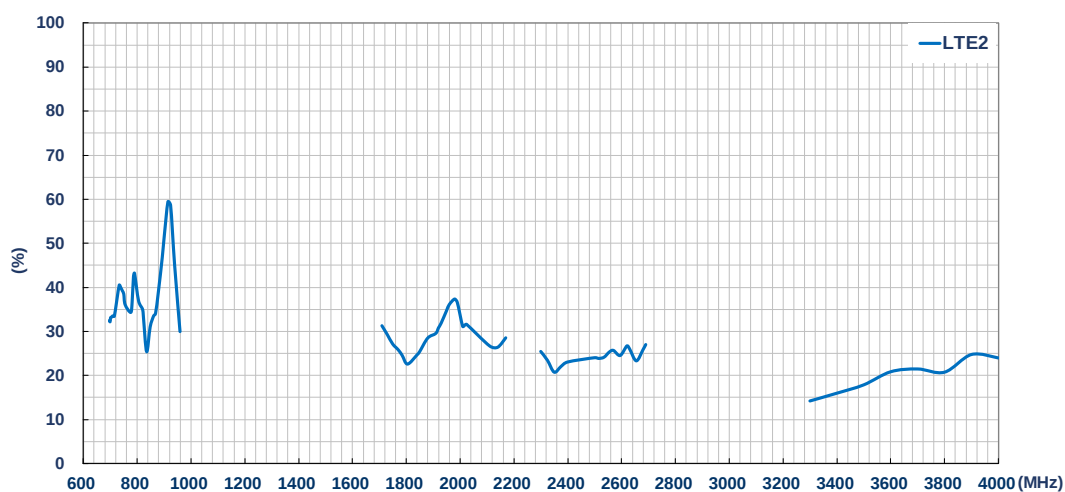
Average Gain (dBi) – LTE 1



Peak Gain (dBi) – LTE 1

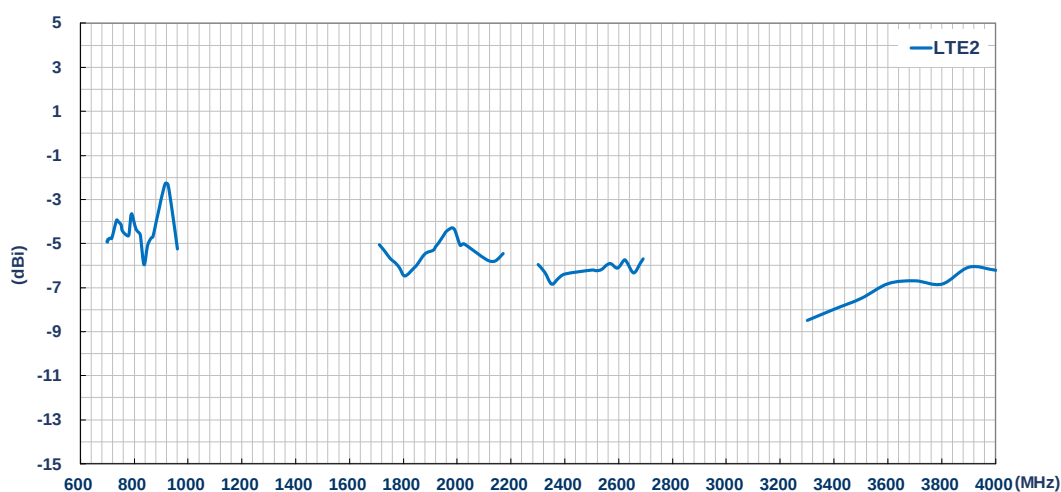


Efficiency (%) – LTE 2

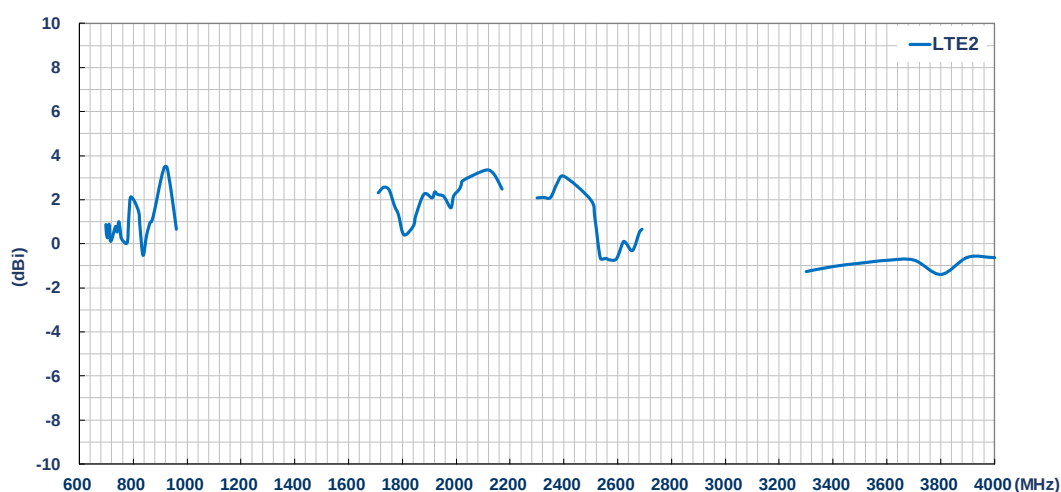


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Average Gain (dBi) – LTE 2

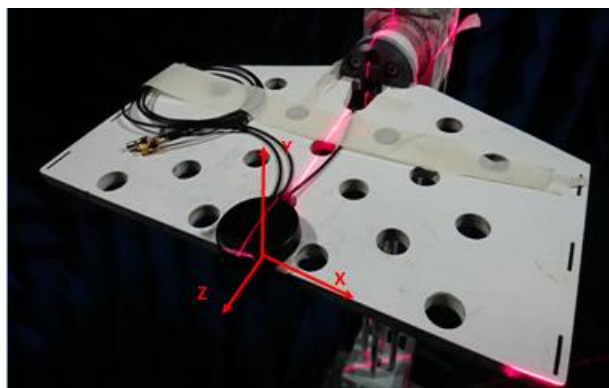


Peak Gain (dBi) – LTE 2



III. Antenna Radiation Pattern Measurement:

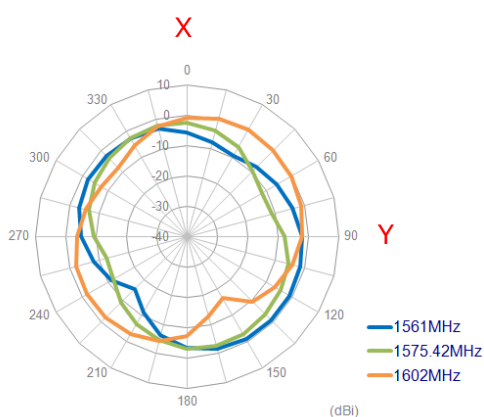
The antenna radiation patterns were measured in 3D Anechoic Chamber.
The measurement setup is as show below,
Free Space



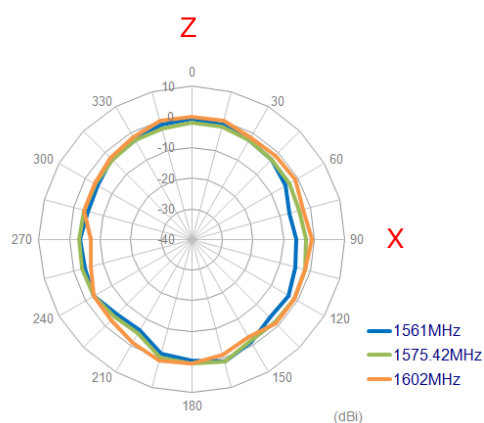
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IV. 2D Radiation Pattern:

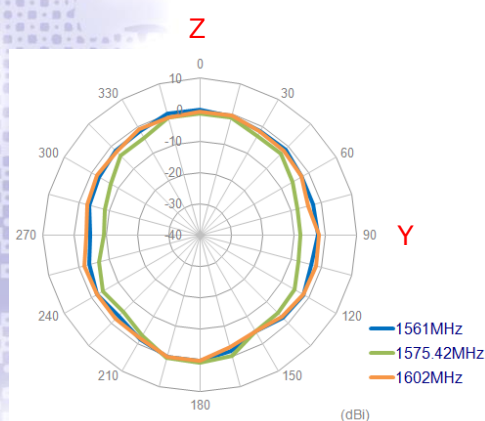
GNSS X-Y Plane



GNSS X-Z Plane

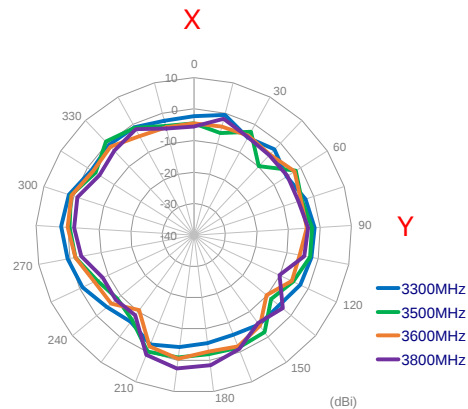
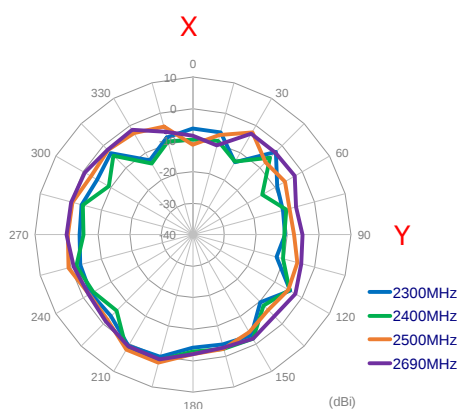
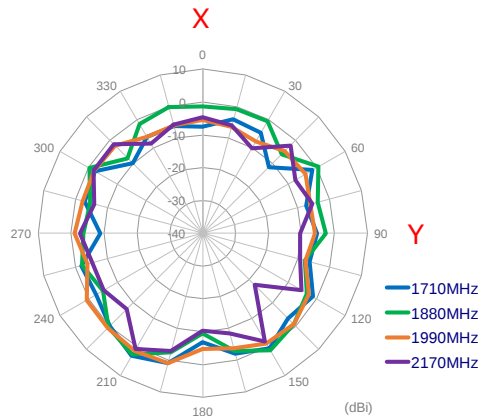
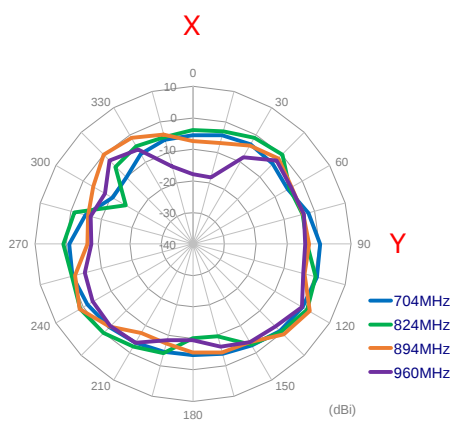


GNSS Y-Z Plane

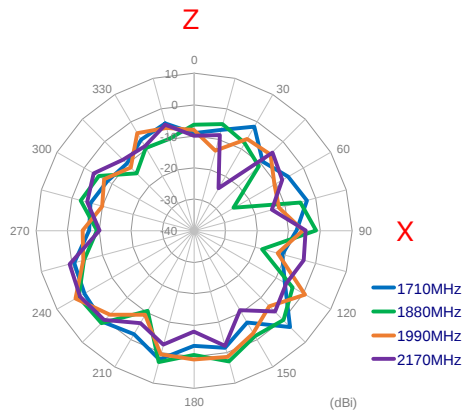
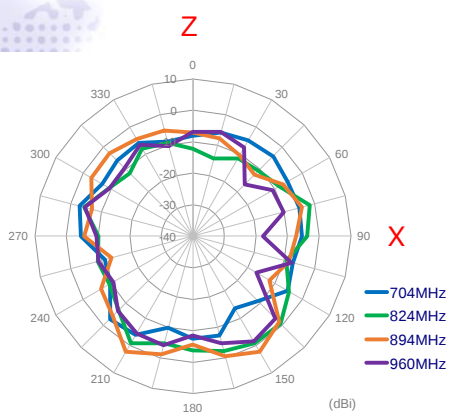


Free Space – LTE 1

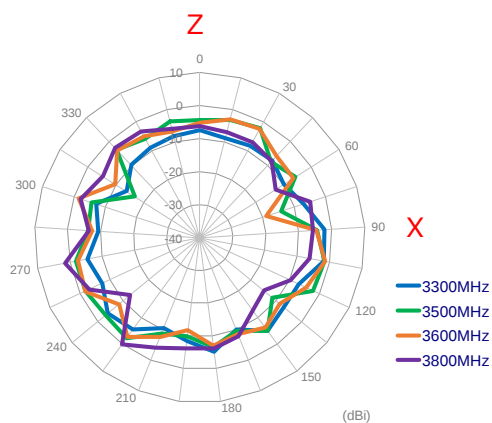
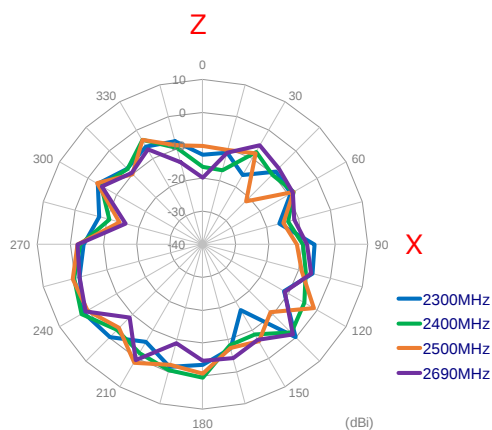
X-Y Plane



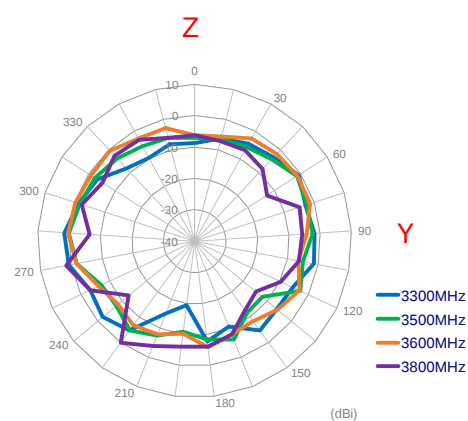
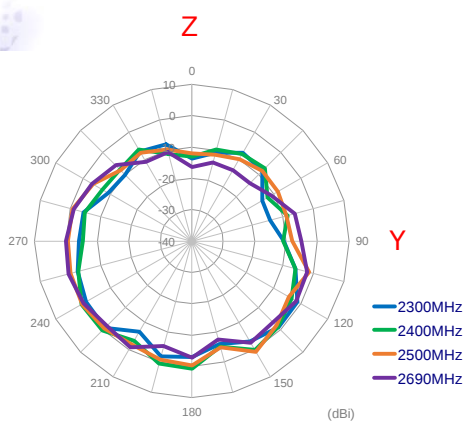
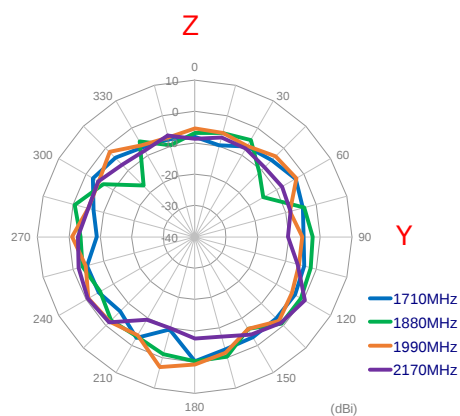
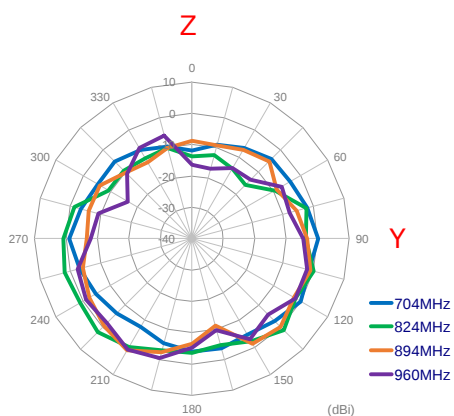
X-Z Plane



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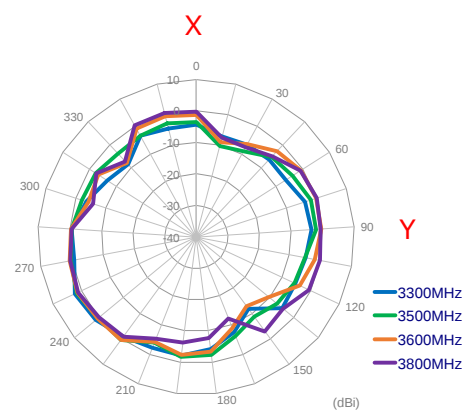
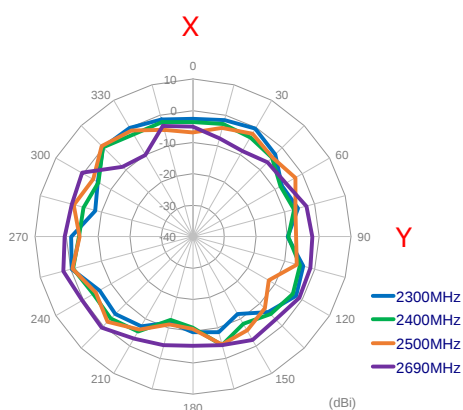
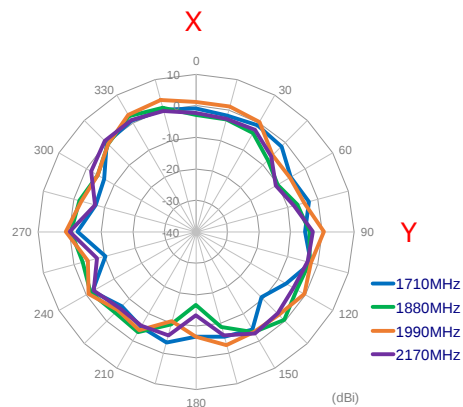
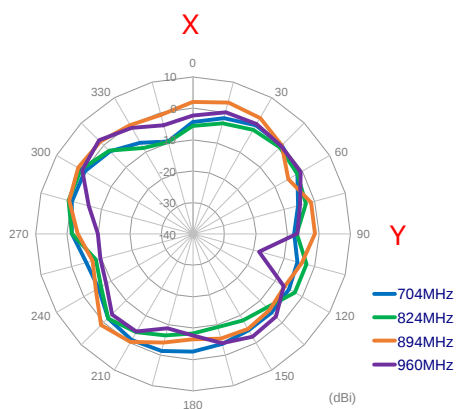


Y-Z Plane

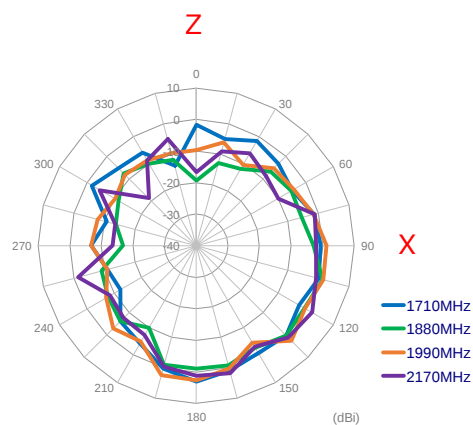
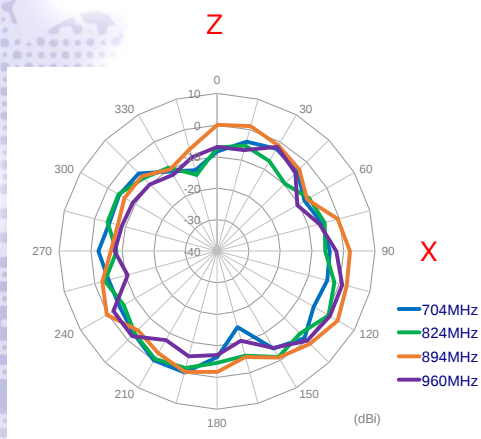


Free Space – LTE 2

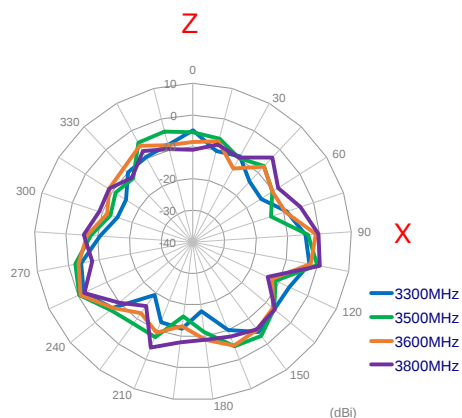
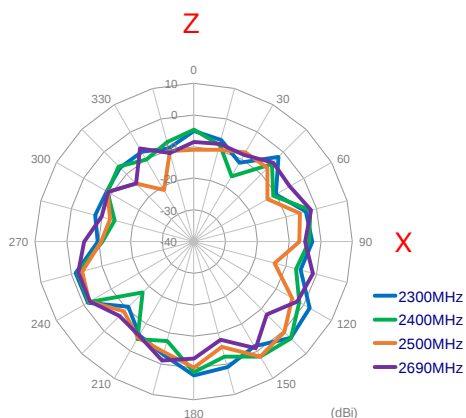
X-Y Plane



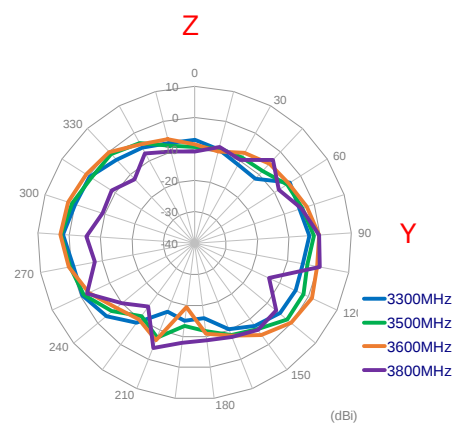
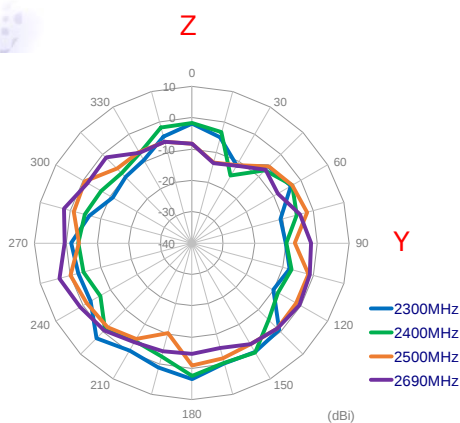
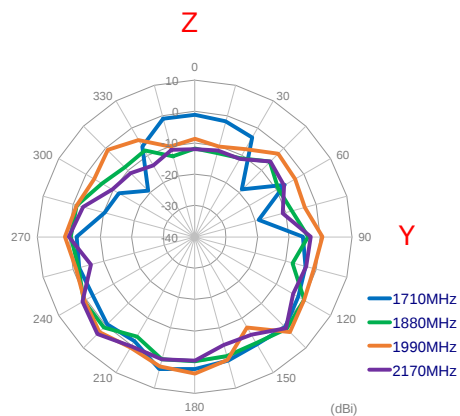
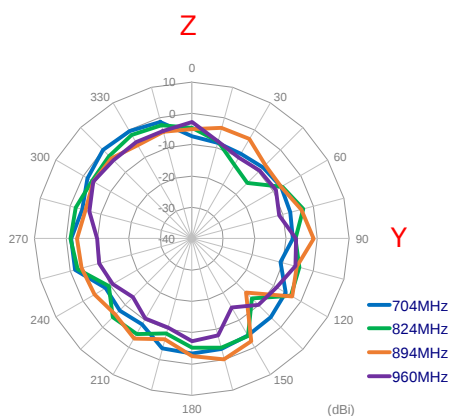
X-Z Plane



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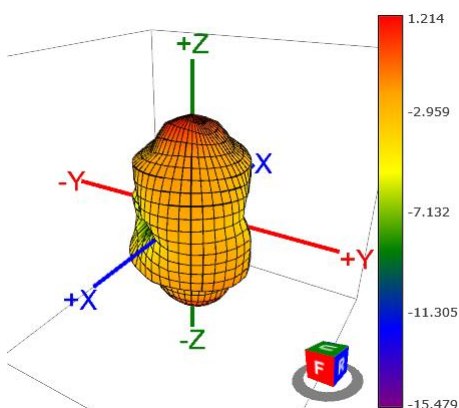
Y-Z Plane



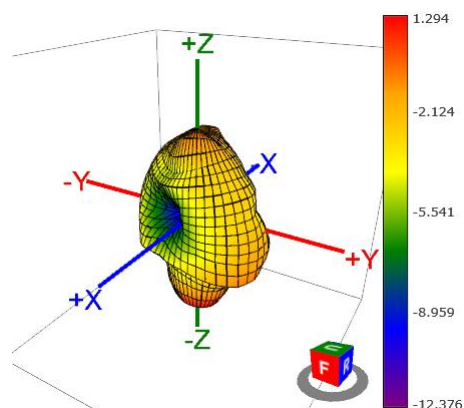
V. 3D Radiation Pattern:

GNSS

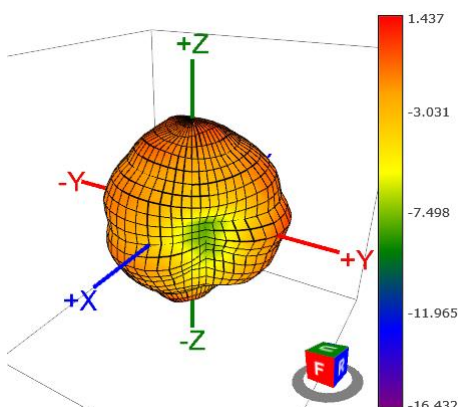
1561MHz



1575.42MHz

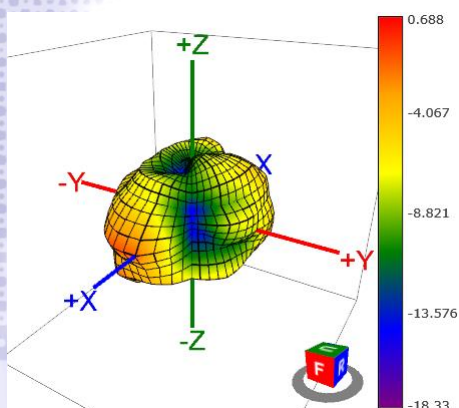


1602MHz

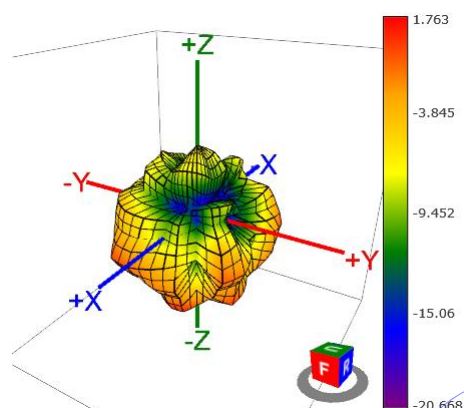


Free Space – LTE 1

704MHz

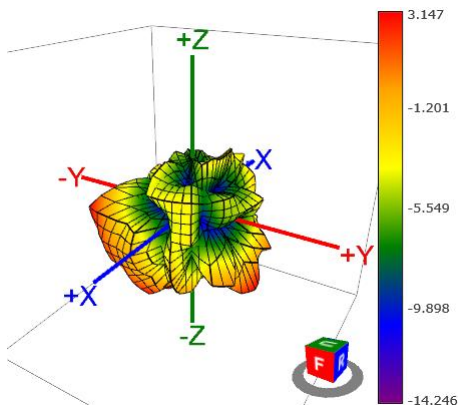


960MHz

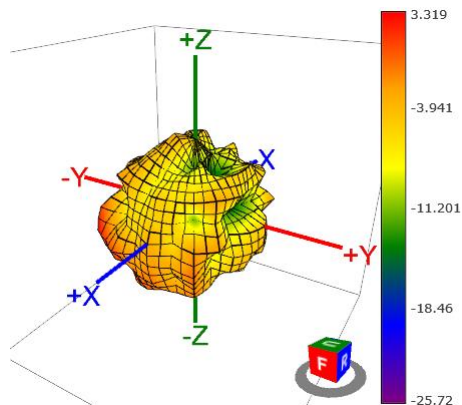


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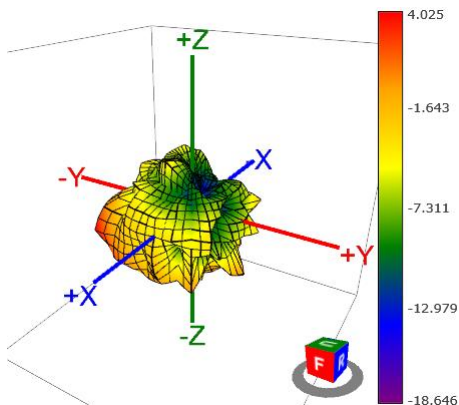
1710MHz



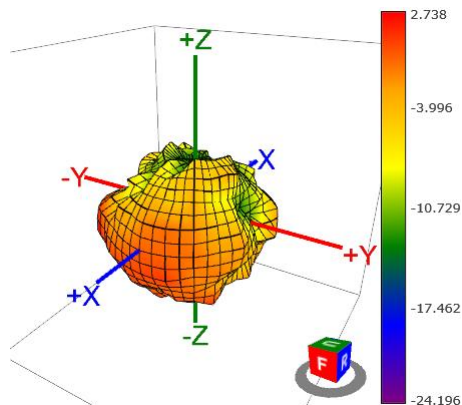
2170MHz



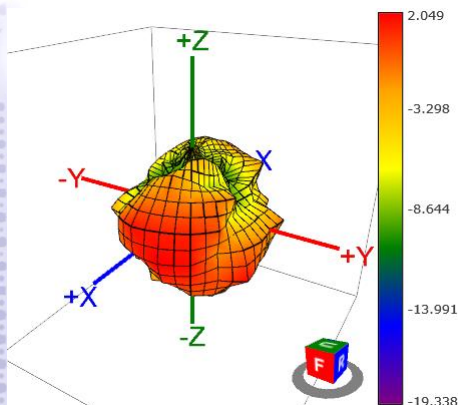
2300MHz



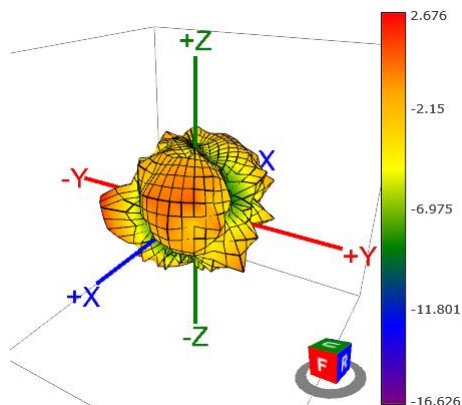
2690MHz



3300MHz



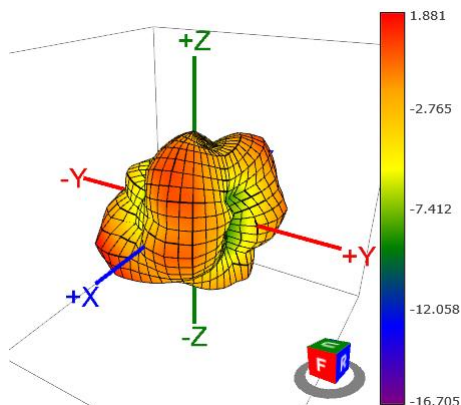
3600MHz



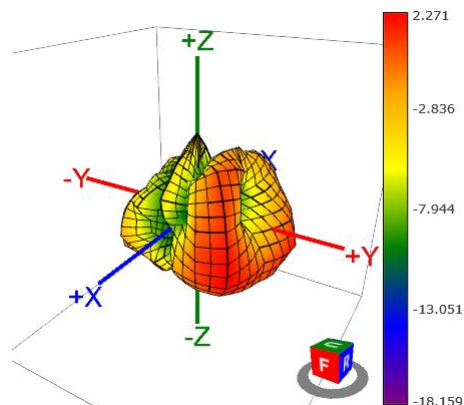
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Free Space – LTE 2

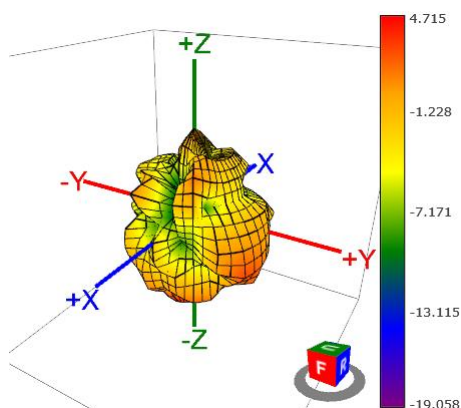
704MHz



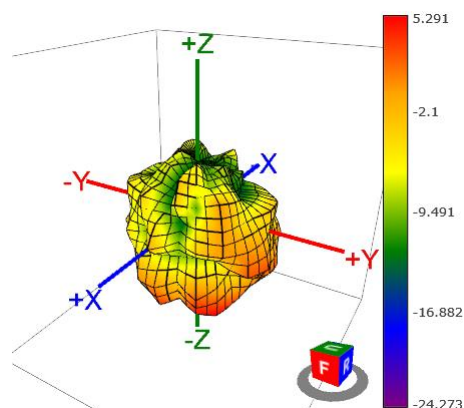
960MHz



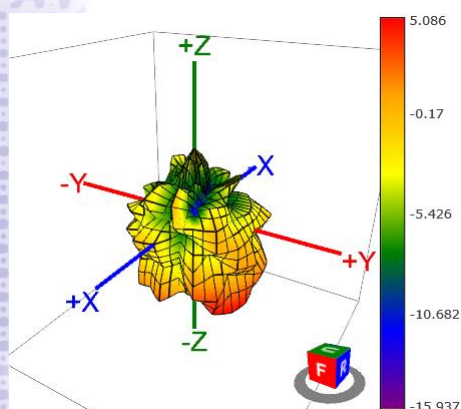
1710MHz



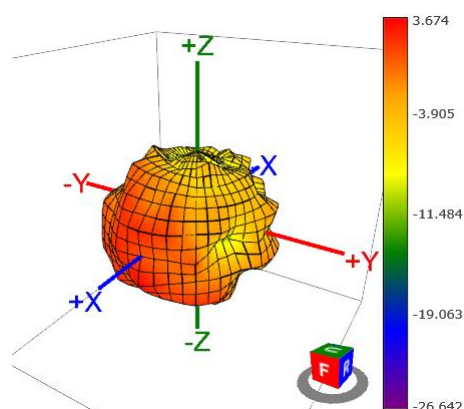
2170MHz



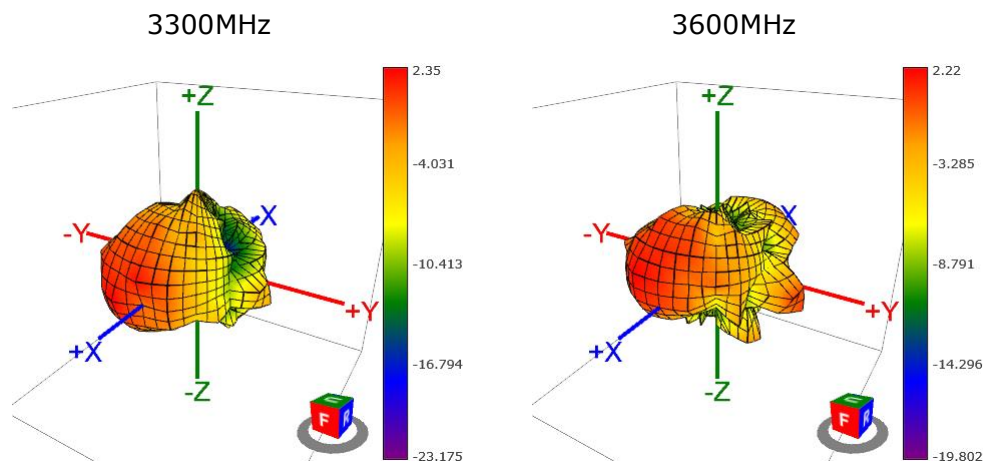
2300MHz



2690MHz

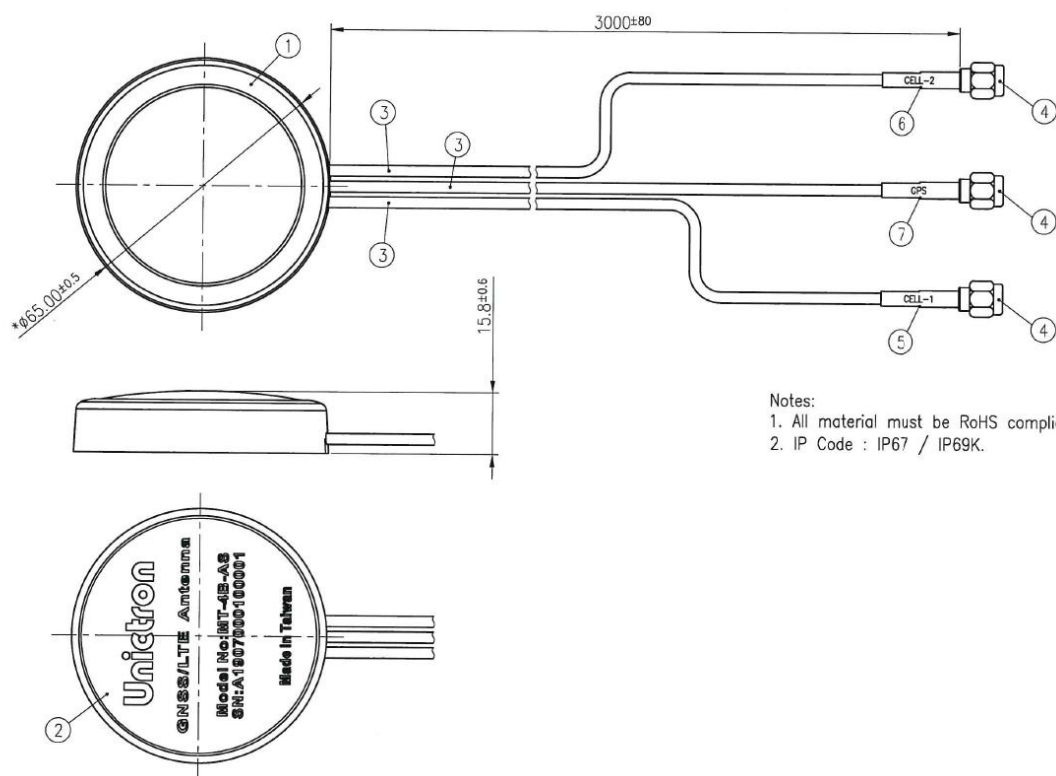


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VI. Mechanical Drawing (Unit:mm):



- Notes:
1. All material must be RoHS compliant.
 2. IP Code : IP67 / IP69K.

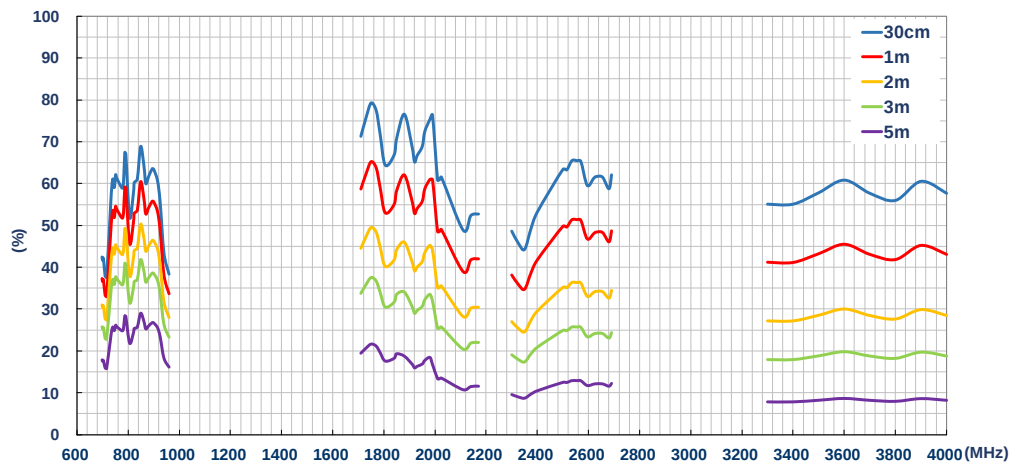
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6	CELL-2 Heat Shrink Tube	CTMS	White	1
5	CELL-1 Heat Shrink Tube	CTMS	White	1
4	SMA(M) Connector	Brass	Au Plated	3
3	Cable H-100	PVC	Black	3
2	Label	PET	Silver	1
1	Housing	PC	Black	1
No	NAME	MATERIAL	FINISH	Q'TY

VII. Applications Note:

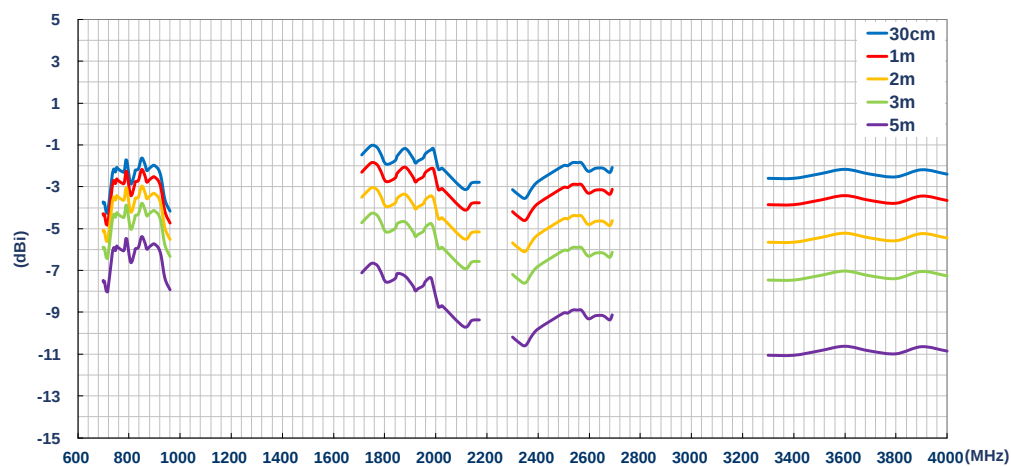
The antenna performance with different cable lengths is shown below.

Free Space – LTE 1

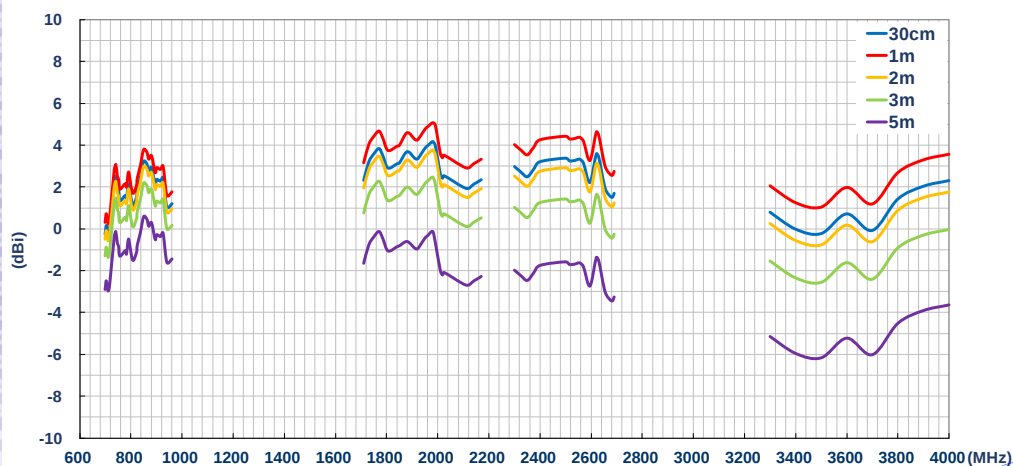
Efficiency (%)



Average Gain (dBi)



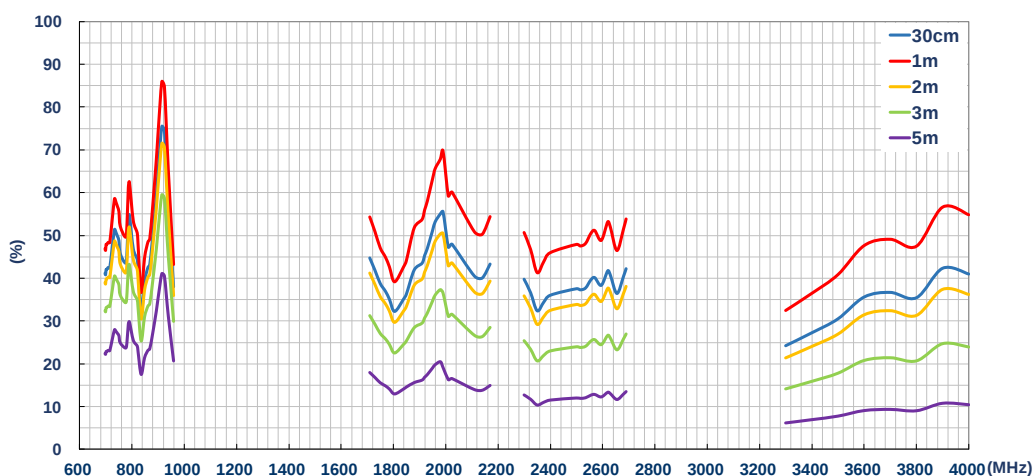
Peak Gain (dBi)



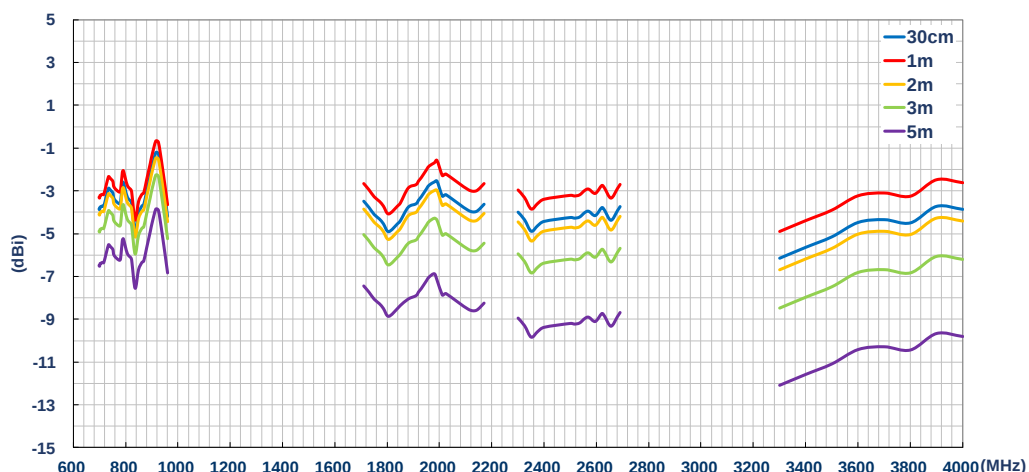
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Free Space – LTE 2

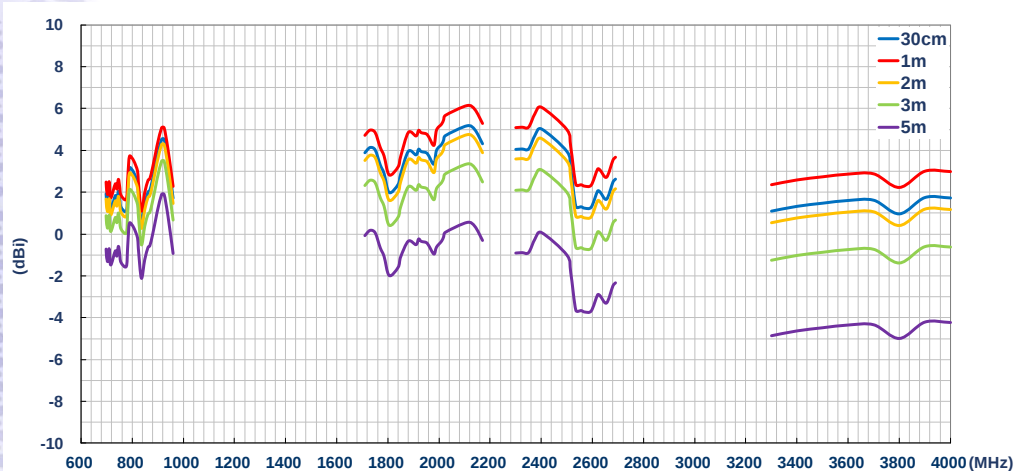
Efficiency (%)



Average Gain (dBi)



Peak Gain (dBi)



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