



Product Name: 15 Series_ 6 in 1 Adhesive Mount Combination Antenna

Part Number: MT-15B-AS-B2L3W01

Features:

- 2*LTE, 3*WiFi, 1*GNSS Antenna Combination
- Support LTE 698-960MHz, 1710-2170MHz, 2300-2690MHz, 3300-3800MHz , 5150-5925MHz
- Support WiFi Dual Bands, 2400-2500MHz, 5150-5850MHz
- GPS / GLONASS / BEIDOU / GALILEO / QZSS / SBAS L1 Bands
- Adhesive Mounting, Direct Stick on Target Plate
- Customizable Cables and Connectors
- RoHS & REACH Compliant

Applications:

- Vehicle Communication
- IoT Application
- Vending Machine Application

6 in 1 Adhesive Mount Combination Antenna

MODEL: MT-15B-AS-B2L3W01

Rev. Preliminary

I. Specifications:

Items	Specifications		
GNSS Electrical Characteristics			
Application Bands	BeiDou	GPS	GLONASS
Frequencies (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
Active Antenna Performance			
Application band	BeiDou	GPS	GLONASS
Frequencies (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			
Frequencies (MHz)	600~1300	1300~1530	1650~3000
Out Of Band Rejection (dB)	55	30	30
ESD Protection			
Contact (KV)	± 8		
Air (KV)	± 15		

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Passive Antenna Performance									
V.S.W.R		< 2							
Return loss (dB)		< -10							
Impedance (Ω)		50							
Polarization		R.H.C.P. (Right Handed Circular Polarization)							
Cable / Length		H-100 / 3 meters							
Connector		SMA (Male)							
Items		LTE MIMO1							
Application Bands	LTE 700	GSM 850/900	DCS	PCS	UMTS1	LTE2600	5G NR Band	5G NR Band	
Frequencies (MHz)	698 ~ 824	824 ~ 960	1710 ~ 1880	1850 ~ 1990	1920 ~ 2170	2300 ~ 2690	3300 ~ 3800	5150 ~ 5925	
Efficiency (%)									
Free Space	30cm	45.72	55.91	66.24	76.72	73.49	71.50	67.05	56.61
	1M	44.47	54.23	63.55	73.55	70.23	67.66	62.52	50.34
	2M	40.56	48.99	55.35	63.89	60.35	56.27	49.50	34.03
	3M	36.99	44.25	48.21	55.51	51.86	46.81	39.19	23.01
	5M	30.77	36.11	36.57	41.89	38.30	32.38	24.56	10.52
Average Gain (dBi)									
Free Space	30cm	-3.40	-2.53	-1.79	-1.15	-1.34	-1.46	-1.74	-2.47
	1M	-3.52	-2.66	-1.97	-1.33	-1.54	-1.70	-2.04	-2.98
	2M	-3.92	-3.10	-2.57	-1.95	-2.19	-2.50	-3.05	-4.68
	3M	-4.32	-3.54	-3.17	-2.56	-2.85	-3.30	-4.07	-6.38
	5M	-5.12	-4.42	-4.37	-3.78	-4.17	-4.90	-6.10	-9.78
Peak Gain (dBi)									
Free Space	30cm	2.52	2.89	3.75	4.71	4.71	3.50	5.05	4.13
	1M	2.40	2.74	3.57	4.53	4.53	3.26	4.78	3.62
	2M	2.00	2.24	2.97	3.93	3.93	2.46	3.88	1.92
	3M	1.60	1.74	2.37	3.33	3.33	1.66	2.98	0.22
	5M	0.80	0.74	1.17	2.13	2.13	0.06	1.18	-3.18

V.S.W.R		< 3							
Return Loss (dB)		< -6							
Impedance (Ω)		50							
Polarization		Linear							
Cable / Length		SNC-200 / 3 meters							
Connector		SMA (Male)							
Items		LTE MIMO2							
Application Bands	LTE 700	GSM 850/900	DCS	PCS	UMTS1	LTE2600	5G NR Band	5G NR Band	
Frequencies (MHz)	698 ~ 824	824 ~ 960	1710 ~ 1880	1850 ~ 1990	1920 ~ 2170	2300 ~ 2690	3300 ~ 3800	5150 ~ 5925	
Efficiency (%)									
Free Space	30cm	41.35	53.11	66.94	75.16	73.72	58.93	60.06	62.70
	1M	40.22	51.51	64.22	72.06	70.44	55.76	55.99	55.76
	2M	36.68	46.53	55.93	62.60	60.53	46.38	44.33	37.70
	3M	33.45	42.03	48.72	54.38	52.02	38.58	35.10	25.49
	5M	27.83	34.30	36.95	41.04	38.41	26.69	22.00	11.65
Average Gain (dBi)									
Free Space	30cm	-3.84	-2.75	-1.74	-1.24	-1.32	-2.30	-2.21	-2.03
	1M	-3.96	-2.88	-1.92	-1.42	-1.52	-2.54	-2.52	-2.54
	2M	-4.36	-3.32	-2.52	-2.03	-2.18	-3.34	-3.53	-4.24
	3M	-4.76	-3.76	-3.12	-2.65	-2.84	-4.14	-4.55	-5.94
	5M	-5.56	-4.65	-4.32	-3.87	-4.16	-5.74	-6.58	-9.34
Peak Gain (dBi)									
Free Space	30cm	2.45	6.96	3.69	4.61	4.61	4.75	4.18	4.66
	1M	2.33	6.81	3.51	4.40	4.40	4.51	3.91	4.15
	2M	1.93	6.31	2.91	3.70	3.70	3.71	3.01	2.45
	3M	1.53	5.81	2.31	3.09	3.09	2.91	2.11	0.75
	5M	0.73	4.81	1.11	1.89	1.89	1.31	0.31	-2.65
V.S.W.R		< 3							
Return Loss (dB)		< -6							
Impedance (Ω)		50							

Polarization	Linear							
Cable / Length	SNC-200 / 3 meters							
Connector	SMA (Male)							
Items	WiFi MIMO1							
Frequencies (MHz)	2400	2450	2500	5150	5350	5750	5850	
Efficiency (%)								
Free Space	30cm	64.65	54.90	44.94	77.97	87.28	97.48	75.32
	1M	54.08	45.92	37.58	53.33	59.70	66.68	51.52
	2M	44.98	38.19	31.26	36.06	40.36	45.08	34.83
	3M	37.41	31.77	26.00	24.38	27.29	30.48	23.55
	5M	25.88	21.98	17.99	11.14	12.47	13.93	10.76
Average Gain (dBi)								
Free Space	30cm	-1.89	-2.60	-3.47	-1.08	-0.59	-0.11	-1.23
	1M	-2.67	-3.38	-4.25	-2.73	-2.24	-1.76	-2.88
	2M	-3.47	-4.18	-5.05	-4.43	-3.94	-3.46	-4.58
	3M	-4.27	-4.98	-5.85	-6.13	-5.64	-5.16	-6.28
	5M	-5.87	-6.58	-7.45	-9.53	-9.04	-8.56	-9.68
Peak Gain (dBi)								
Free Space	30cm	2.80	3.85	3.76	6.59	6.96	5.58	4.75
	1M	2.02	3.07	2.98	4.94	5.31	3.93	3.10
	2M	1.22	2.27	2.18	3.24	3.61	2.23	1.40
	3M	0.42	1.47	1.38	1.54	1.91	0.53	-0.30
	5M	-1.18	-0.13	-0.22	-1.86	-1.49	-2.87	-3.70
V.S.W.R	< 3							
Return Loss (dB)	< -6							
Impedance (Ω)	50							
Polarization	Linear							
Cable / Length	SNC-200 / 3 meters							
Connector	SMA (Male)							

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Items		WiFi MIMO2						
Frequencies (MHz)		2400	2450	2500	5150	5350	5750	5850
Efficiency (%)								
Free Space	30cm	72.54	61.46	60.48	76.72	93.09	93.73	71.76
	1M	60.67	51.40	50.58	52.48	63.68	64.12	49.09
	2M	50.47	42.76	42.07	35.48	43.05	43.35	33.19
	3M	41.98	35.56	34.99	23.99	29.11	29.31	22.44
	5M	29.04	24.60	24.21	10.96	13.30	13.40	10.26
Average Gain (dBi)								
Free Space	30cm	-1.39	-2.11	-2.18	-1.15	-0.31	-0.28	-1.44
	1M	-2.17	-2.89	-2.96	-2.80	-1.96	-1.93	-3.09
	2M	-2.97	-3.69	-3.76	-4.50	-3.66	-3.63	-4.79
	3M	-3.77	-4.49	-4.56	-6.20	-5.36	-5.33	-6.49
	5M	-5.37	-6.09	-6.16	-9.60	-8.76	-8.73	-9.89
Peak Gain (dBi)								
Free Space	30cm	3.24	2.71	2.92	6.77	8.18	8.30	6.83
	1M	2.46	1.93	2.14	5.12	6.53	6.65	5.18
	2M	1.66	1.13	1.34	3.42	4.83	4.95	3.48
	3M	0.86	0.33	0.54	1.72	3.13	3.25	1.78
	5M	-0.74	-1.27	-1.06	-1.68	-0.27	-0.15	-1.62
V.S.W.R		< 3						
Return Loss (dB)		< -6						
Impedance (Ω)		50						
Polarization		Linear						
Cable / Length		SNC-200 / 3 meters						
Connector		SMA (Male)						

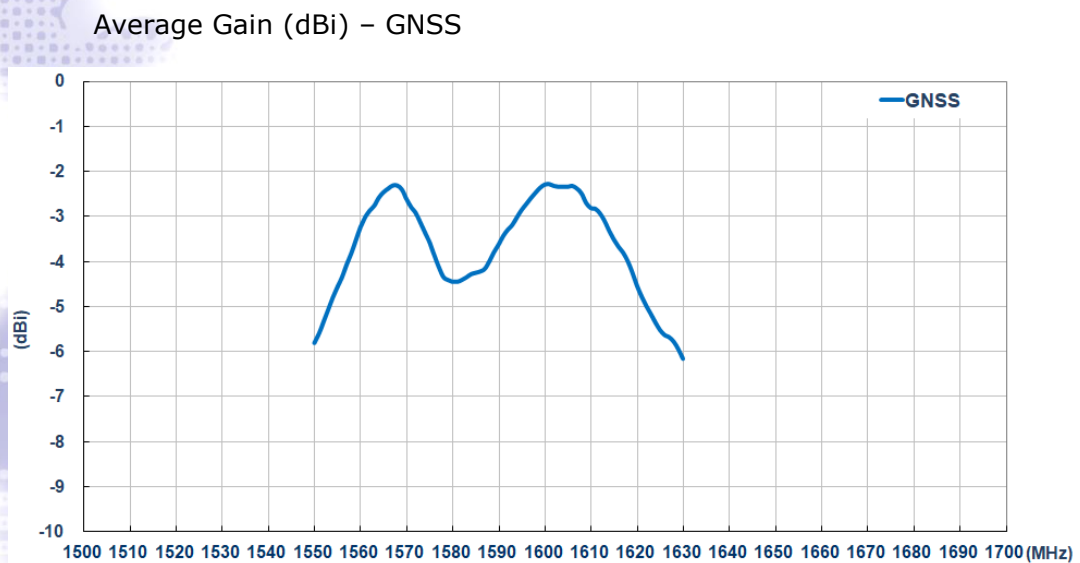
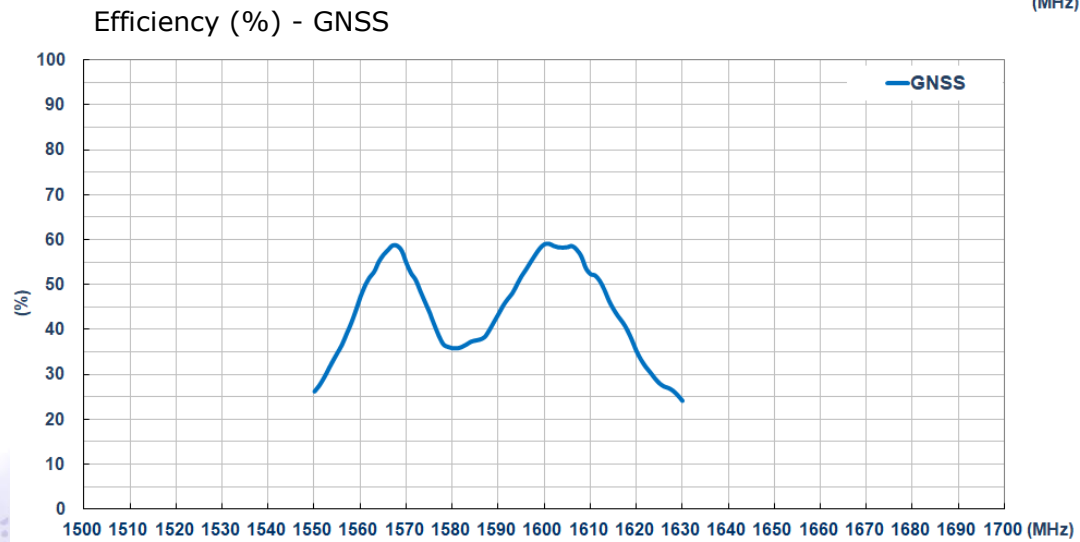
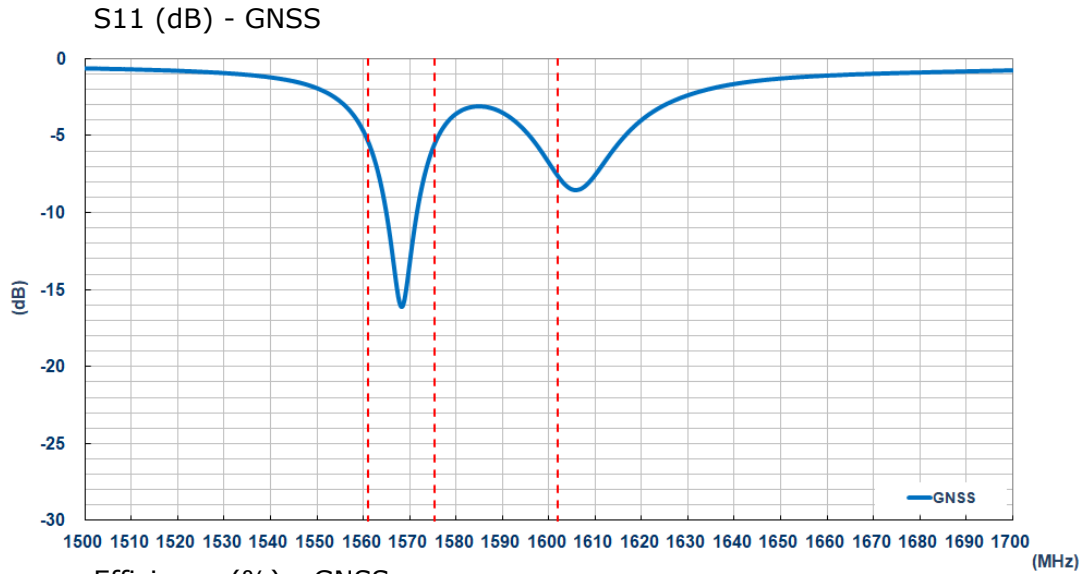
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Items		WiFi MIMO3						
Frequencies (MHz)		2400	2450	2500	5150	5350	5750	5850
Efficiency (%)								
Free Space	30cm	65.40	76.49	72.54	52.35	59.28	80.89	72.59
	1M	54.70	63.97	60.67	35.81	40.55	55.34	49.66
	2M	45.50	53.21	50.47	24.21	27.42	37.41	33.57
	3M	37.84	44.26	41.98	16.37	18.54	25.29	22.70
	5M	26.18	30.62	29.04	7.48	8.47	11.56	10.38
Average Gain (dBi)								
Free Space	30cm	-1.84	-1.16	-1.39	-2.81	-2.27	-0.92	-1.39
	1M	-2.62	-1.94	-2.17	-4.46	-3.92	-2.57	-3.04
	2M	-3.42	-2.74	-2.97	-6.16	-5.62	-4.27	-4.74
	3M	-4.22	-3.54	-3.77	-7.86	-7.32	-5.97	-6.44
	5M	-5.82	-5.14	-5.37	-11.26	-10.72	-9.37	-9.84
Peak Gain (dBi)								
Free Space	30cm	5.78	6.46	6.54	3.68	3.94	4.74	4.08
	1M	5.00	5.68	5.76	2.03	2.29	3.09	2.43
	2M	4.20	4.88	4.96	0.33	0.59	1.39	0.73
	3M	3.40	4.08	4.16	-1.37	-1.11	-0.31	-0.97
	5M	1.80	2.48	2.56	-4.77	-4.51	-3.71	-4.37
V.S.W.R		< 3						
Return Loss (dB)		< -6						
Impedance (Ω)		50						
Polarization		Linear						
Cable / Length		SNC-200 / 3 meters						
Connector		SMA (Male)						
Dimension (mm)		170.34(L) x 70.34(W) x 15.4(T)						
Environmental Conditions								
Operation Temperature		-40 ~ +85 °C						
Storage Temperature		-40 ~ +85 °C						
Waterproof Resistant		IP67						
Relative Humidity		95% non-condensing						

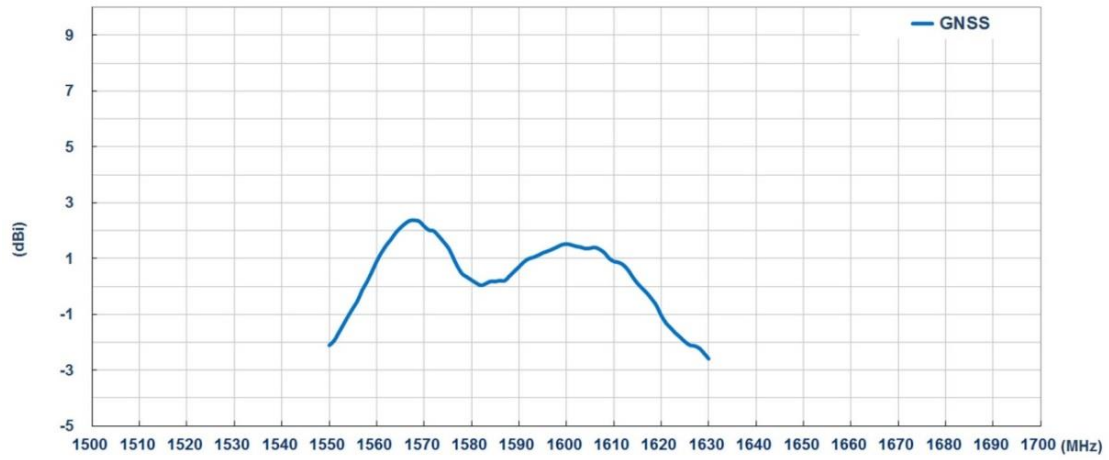
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II. Antenna Technical Parameters:

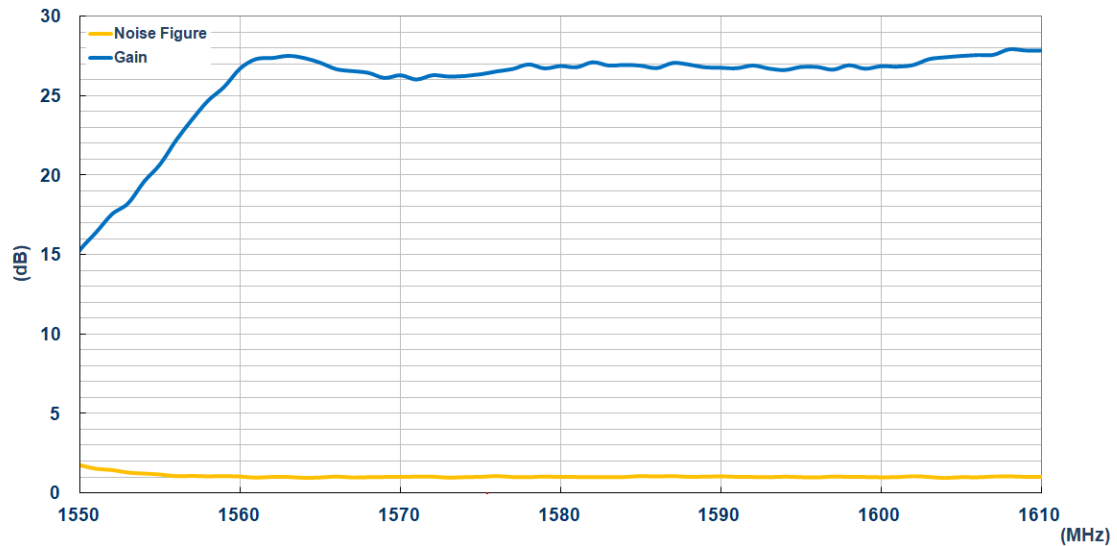
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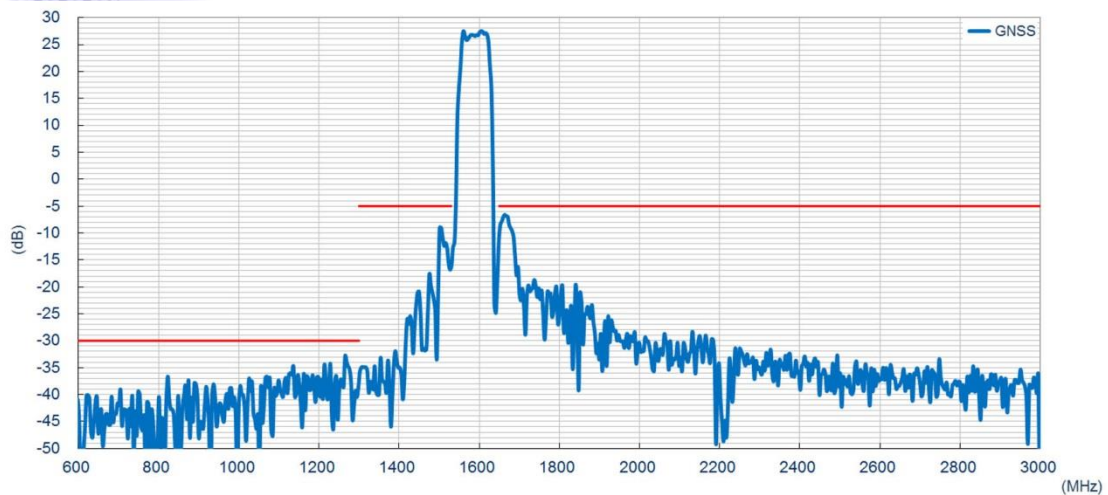
Peak Gain (dBi) – GNSS



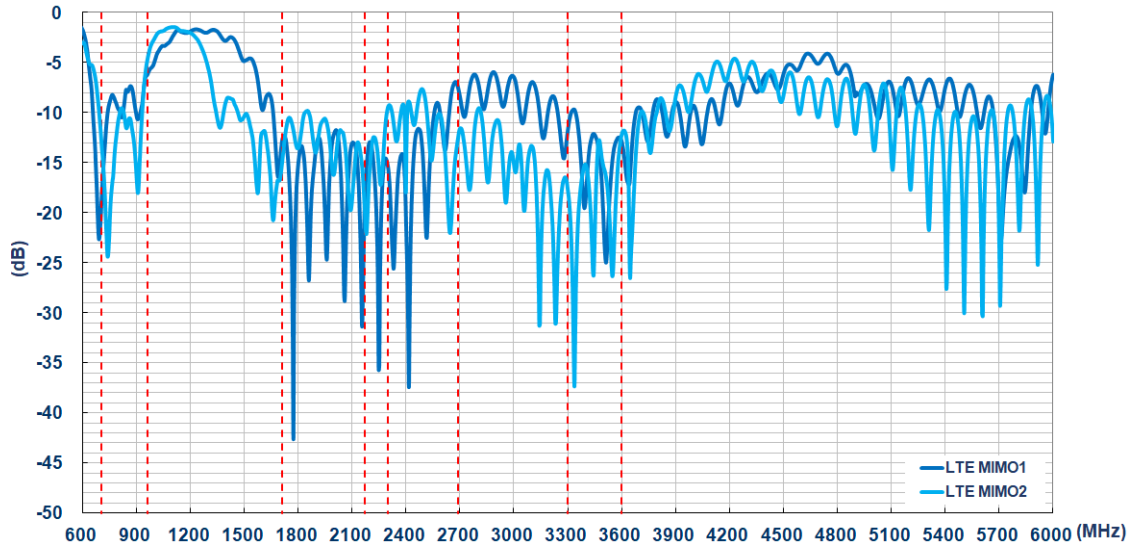
Noise Figure & Gain (dB) - GNSS



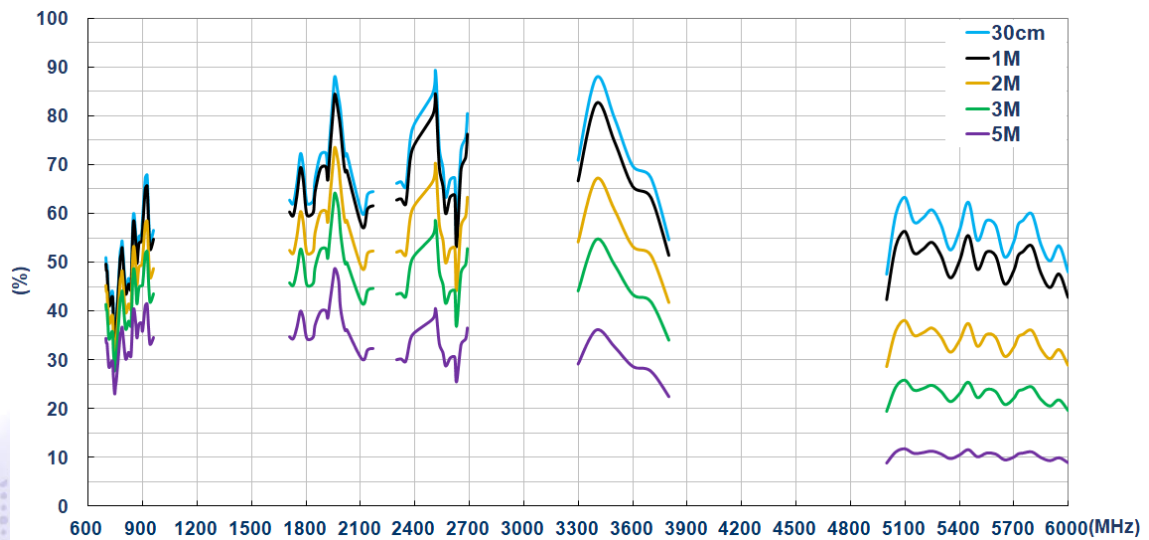
Out Of Band Rejection (dB) - GNSS



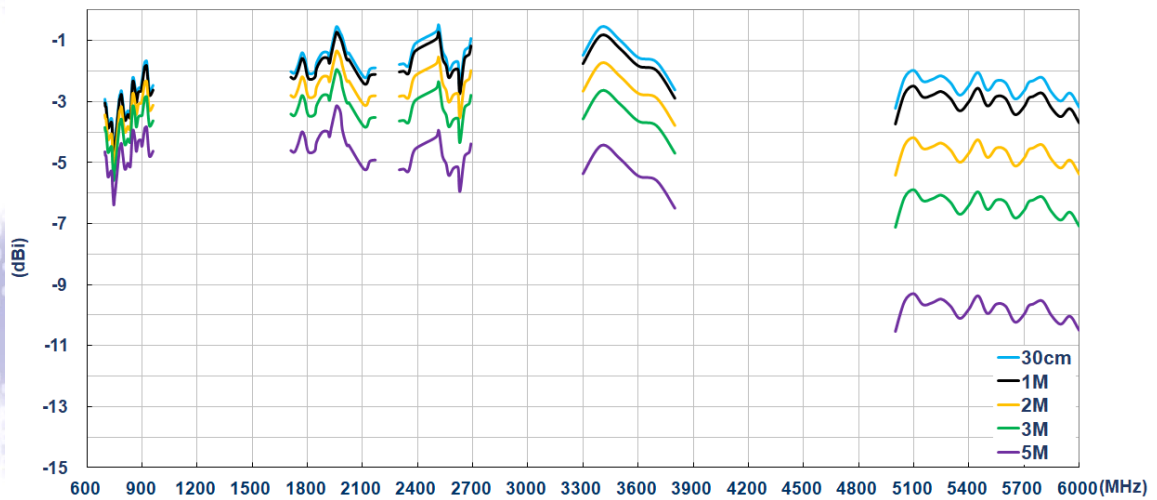
S11 (dB) – LTE MIMO1 & MIMO2



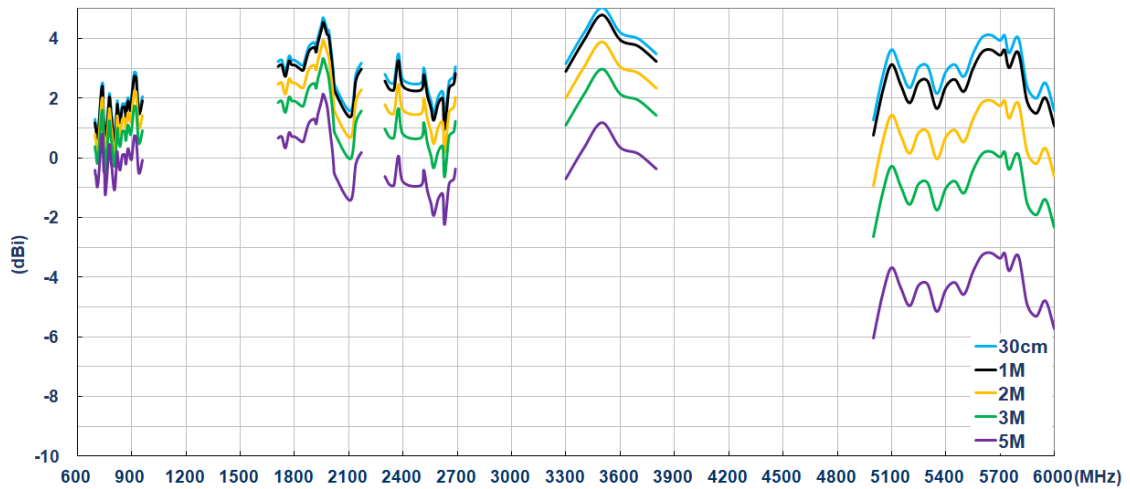
Efficiency (%) – LTE MIMO1



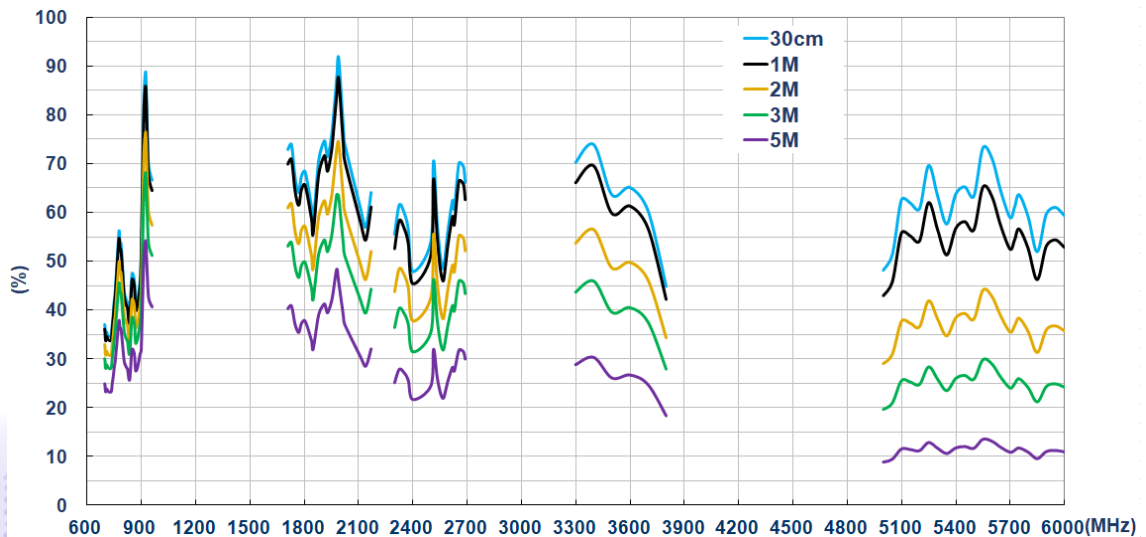
Average Gain (dBi) - LTE MIMO1



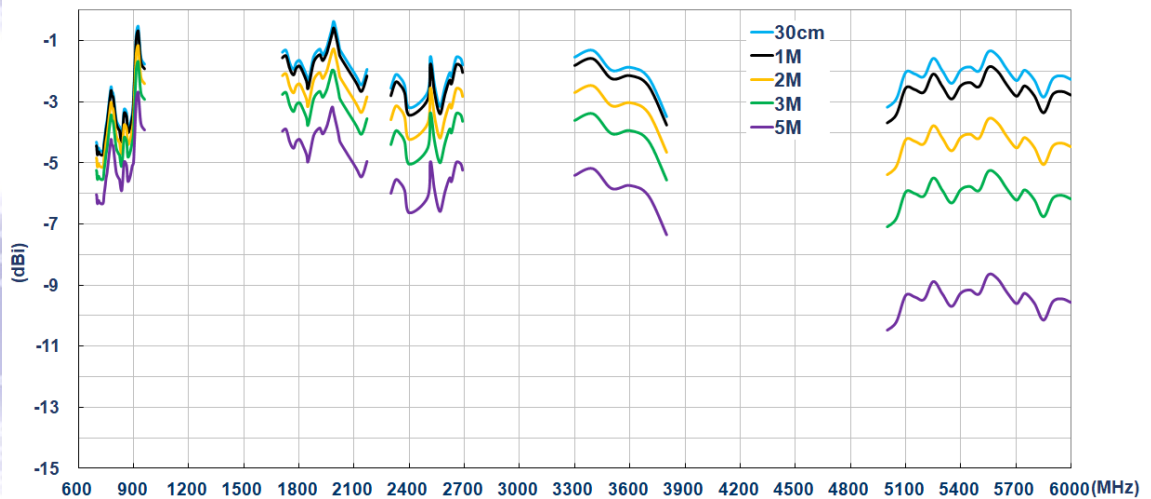
Peak Gain (dBi) -LTE MIMO1



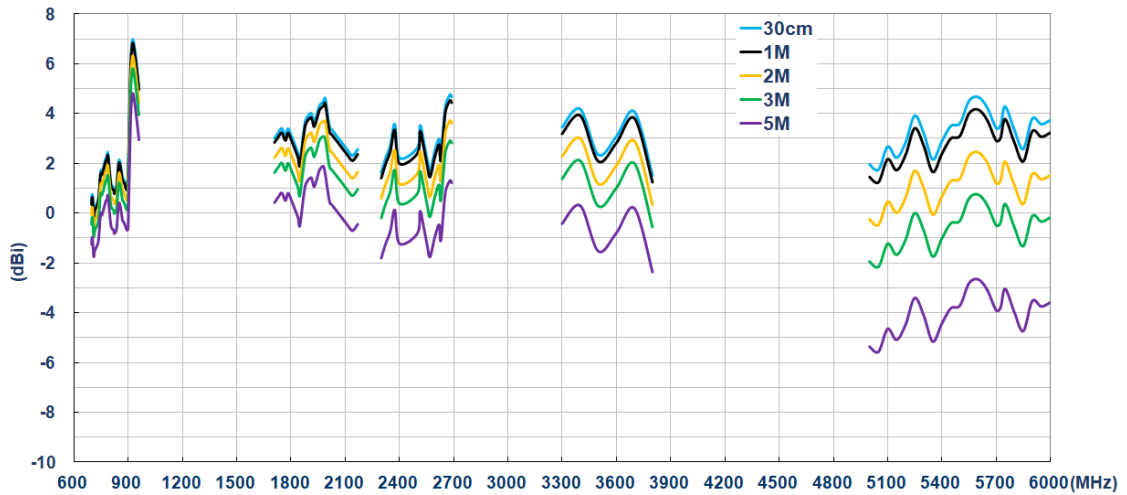
Efficiency (%) -LTE MIMO2



Average Gain (dBi) - LTE MIMO2

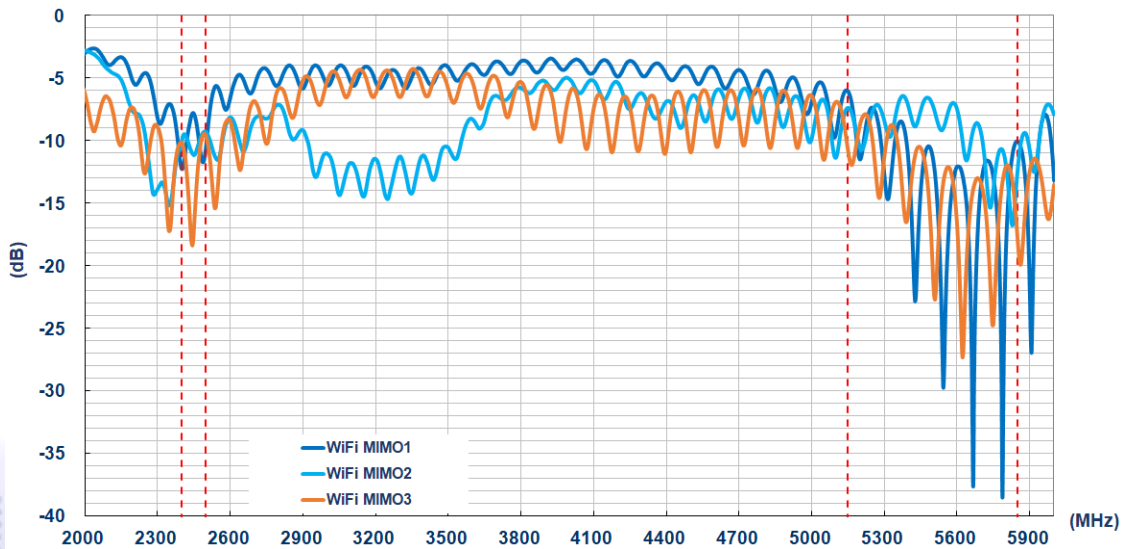


Peak Gain (dBi) –LTE MIMO2

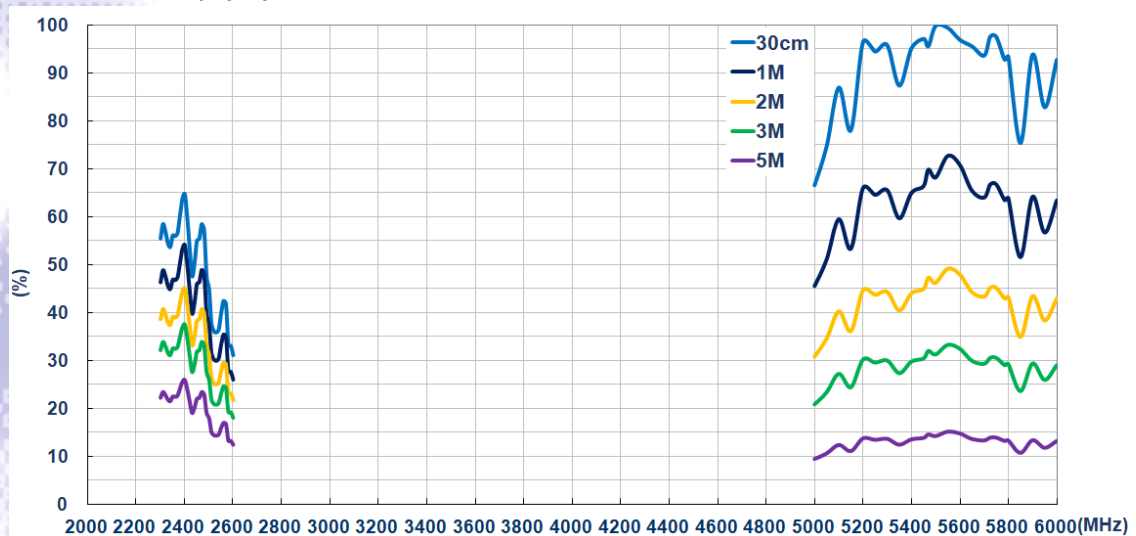


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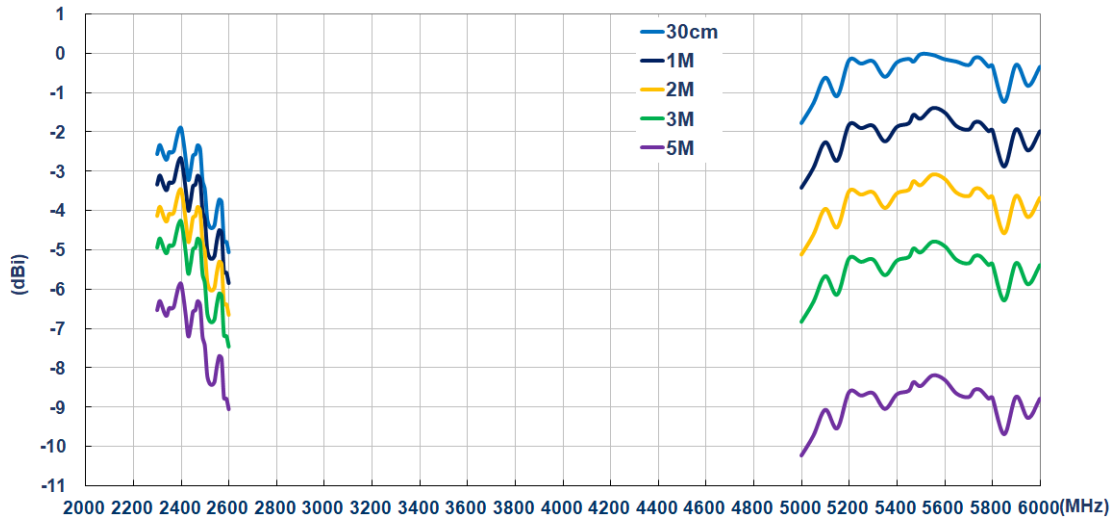
S11 (dB) – WiFi MIMO1 & MIMO2 & MIMO3



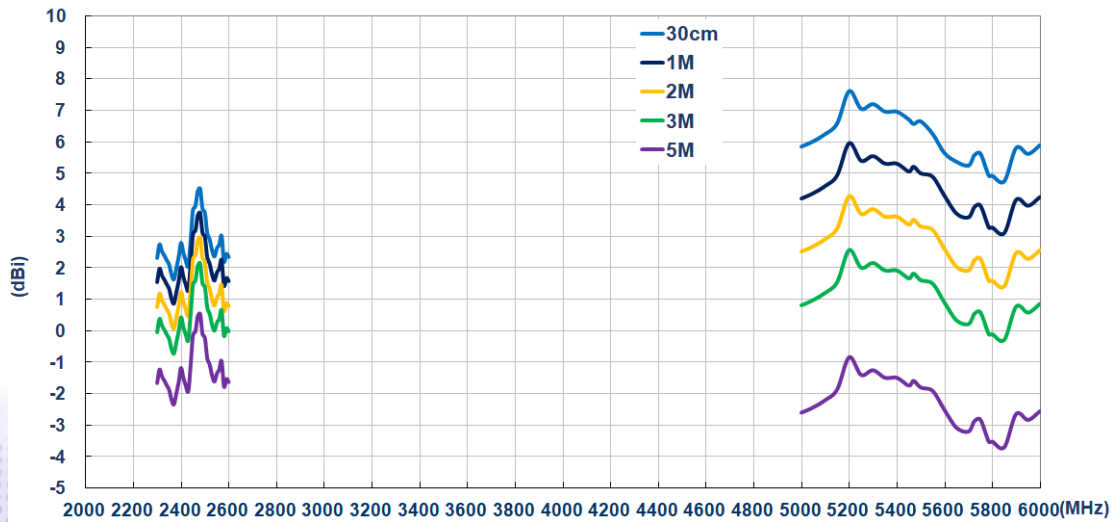
Efficiency (%) – WiFi MIMO1



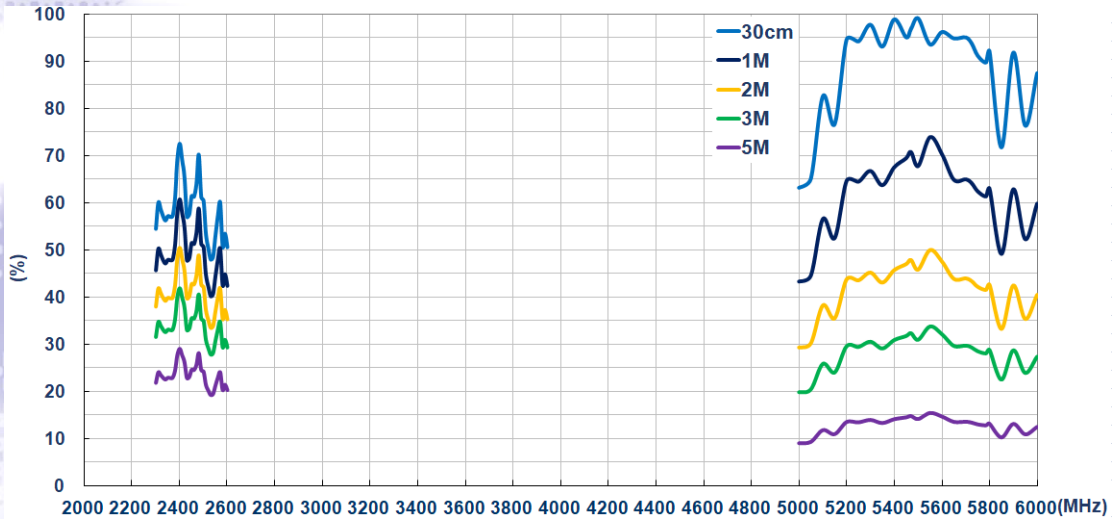
Average Gain (dBi) - WiFi MIMO1



Peak Gain (dBi) - WiFi MIMO1

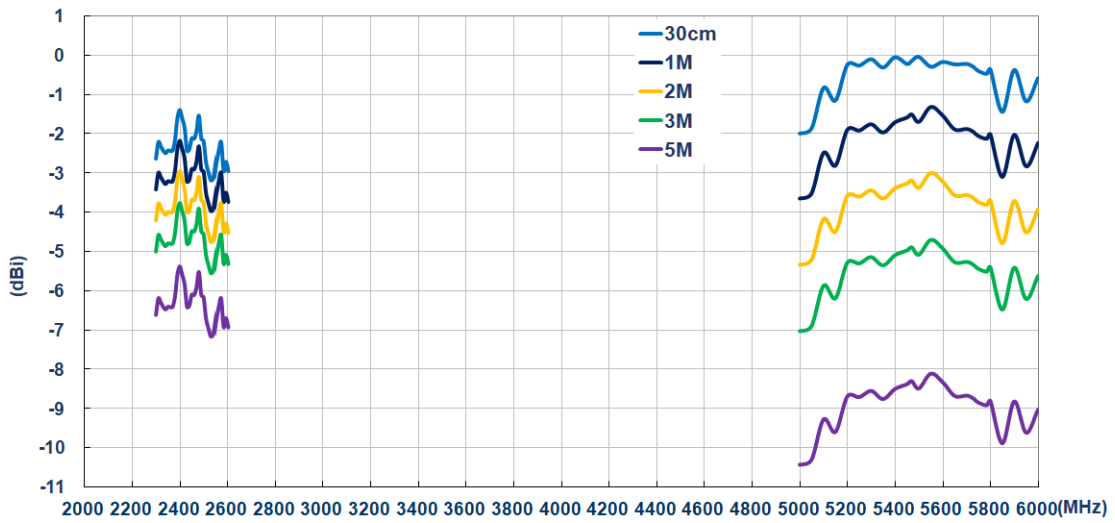


Efficiency (%) - WiFi MIMO2

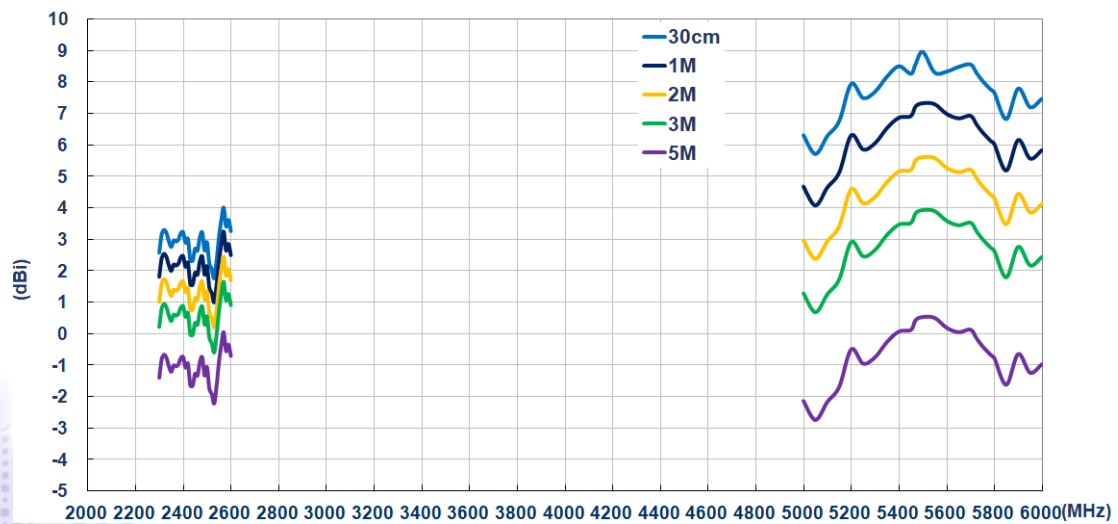


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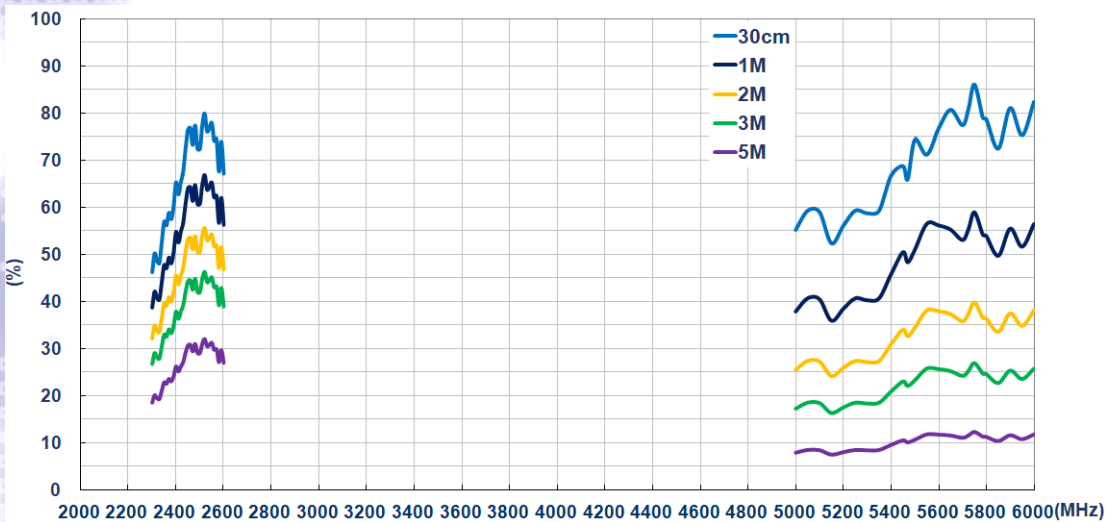
Average Gain (dBi) - WiFi MIMO2



Peak Gain (dBi) - WiFi MIMO2

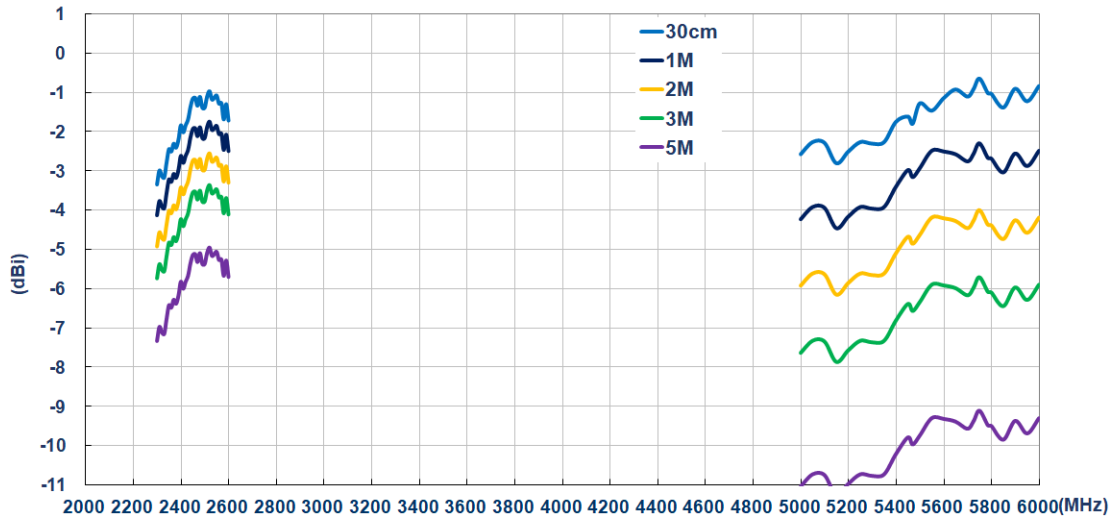


Efficiency (%) - WiFi MIMO3



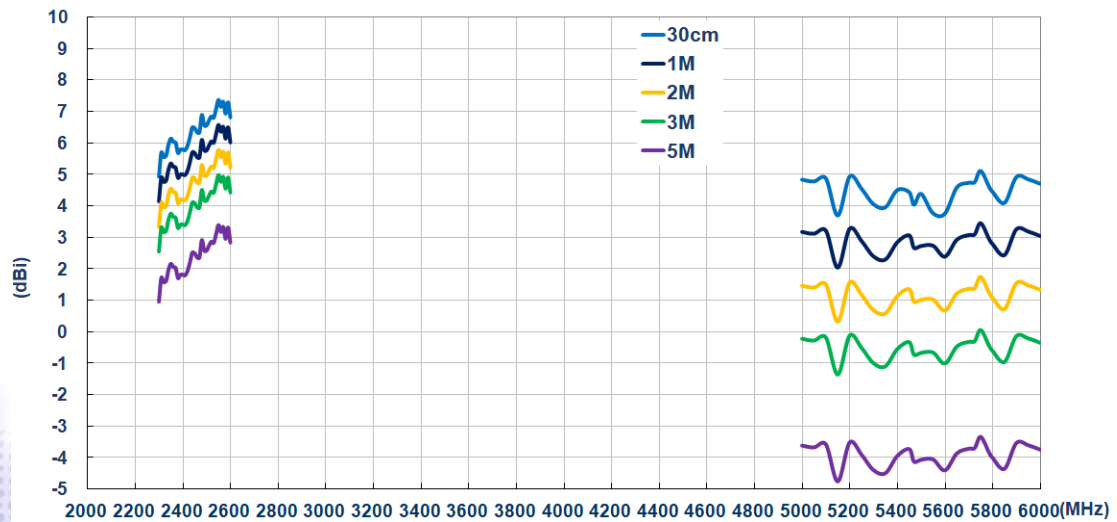
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Average Gain (dBi) - WiFi MIMO3



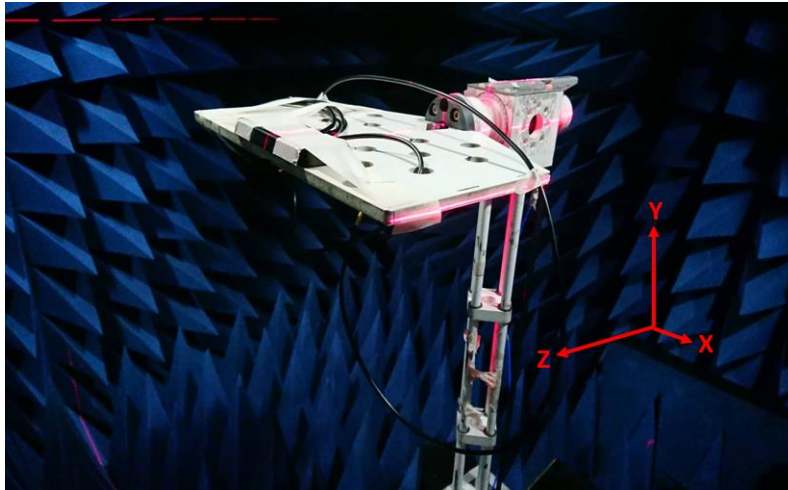
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Peak Gain (dBi) - WiFi MIMO3



III. Antenna Radiation Pattern Measurement:

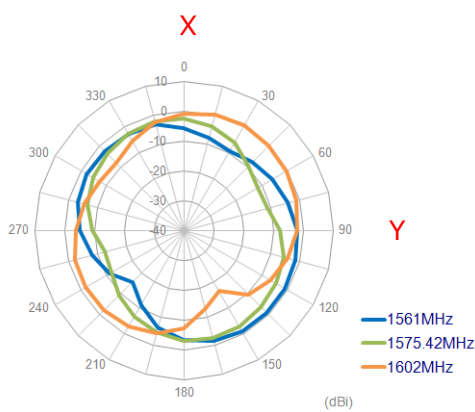
The antenna radiation patterns were measured in Anechoic Chamber. The measurement setup as below,



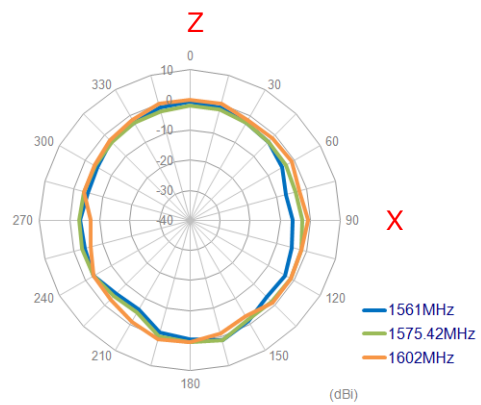
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IV. 2D Radiation Pattern:

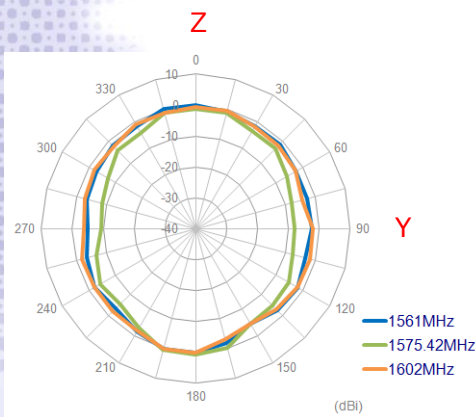
GNSS X-Y Plane



GNSS X-Z Plane

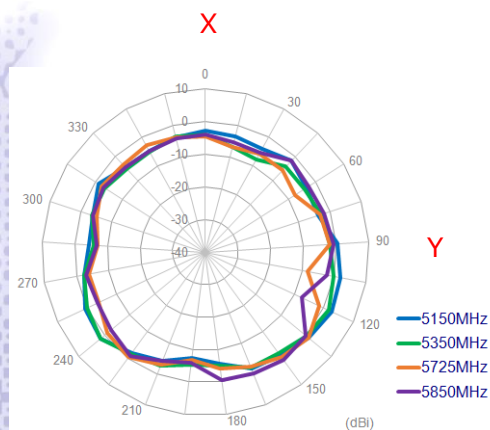
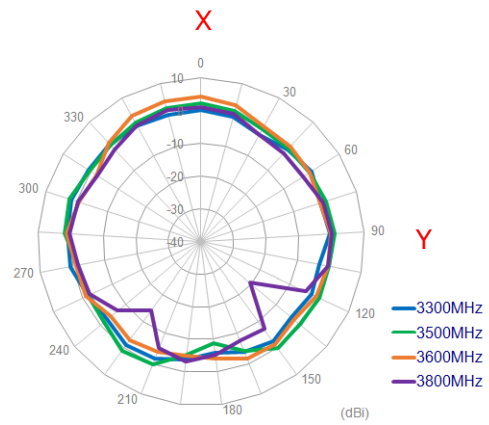
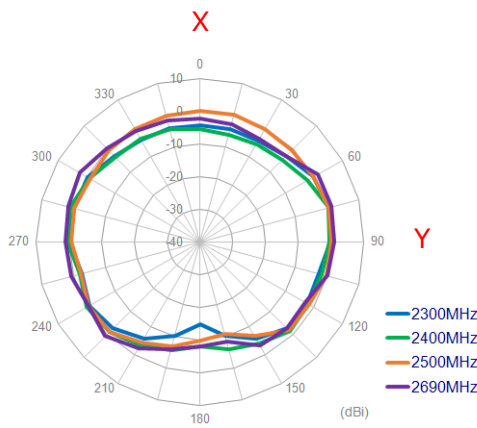
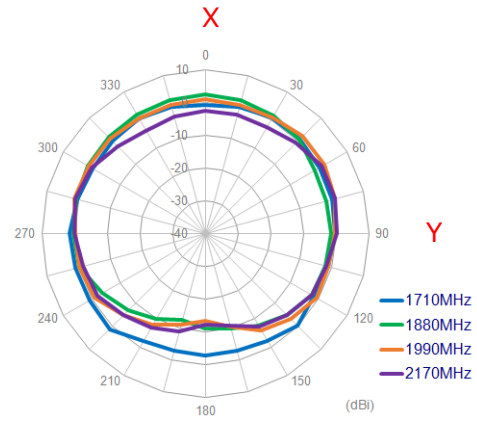
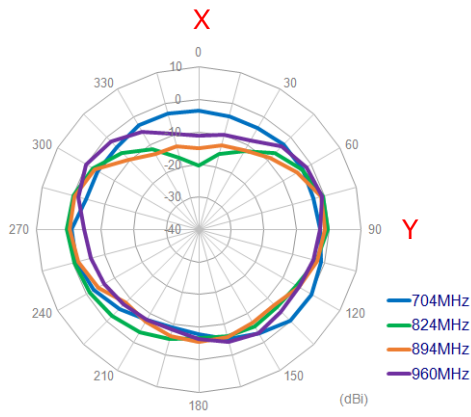


GNSS Y-Z Plane



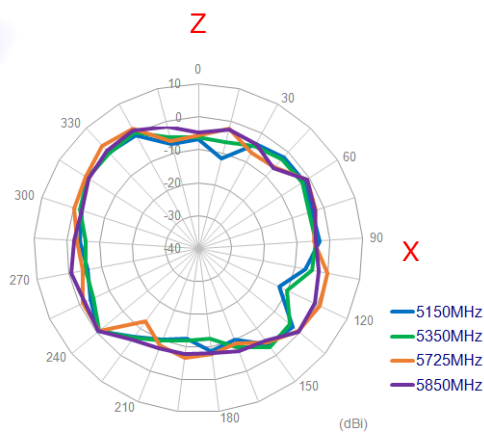
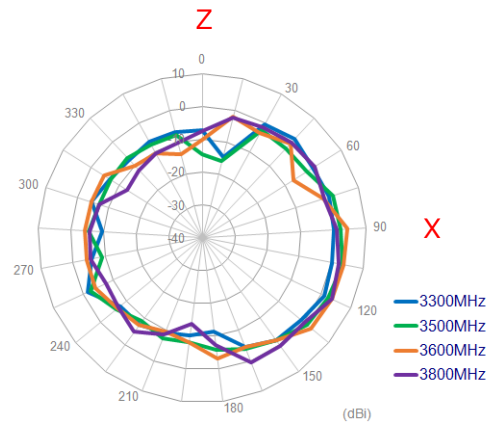
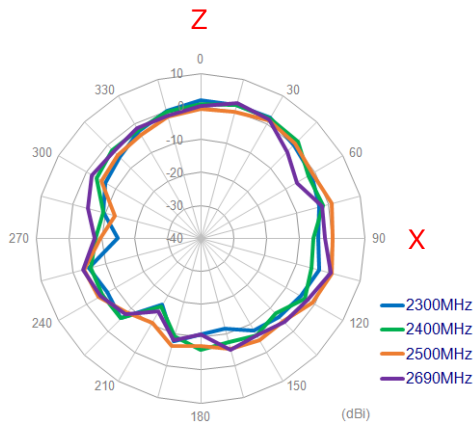
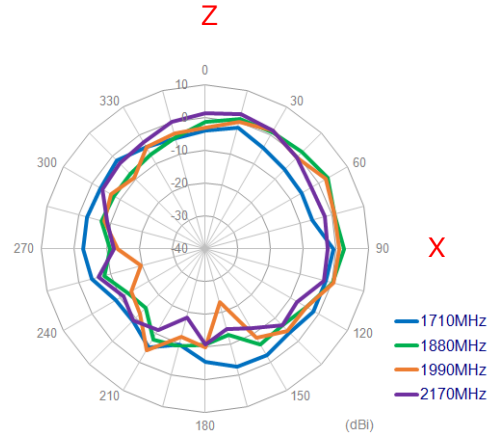
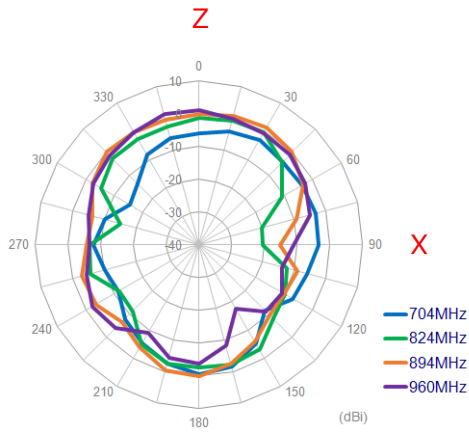
LTE MIMO1

X-Y Plane



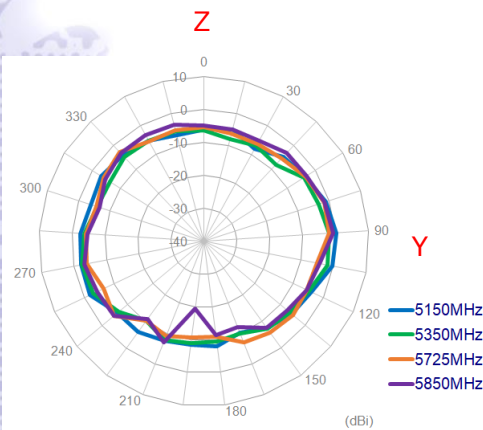
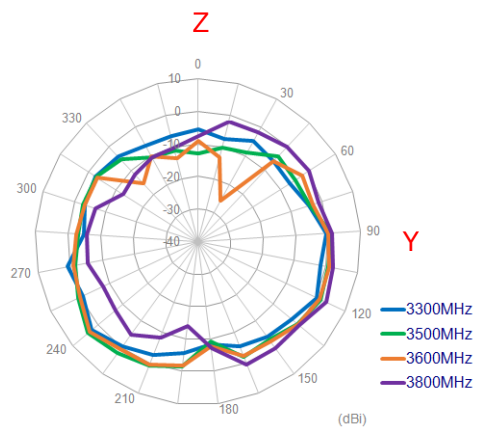
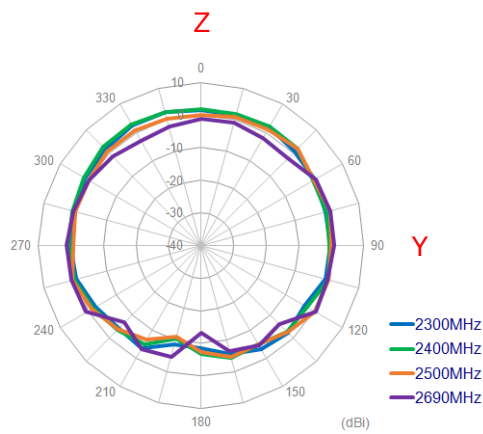
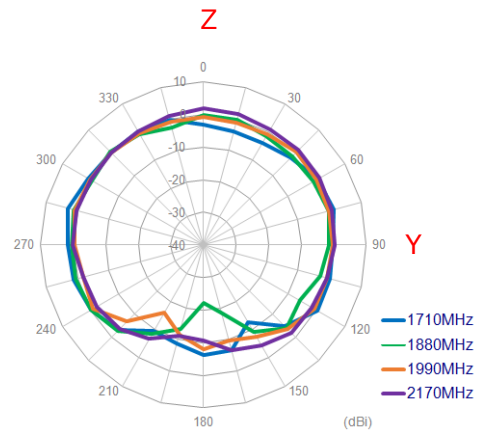
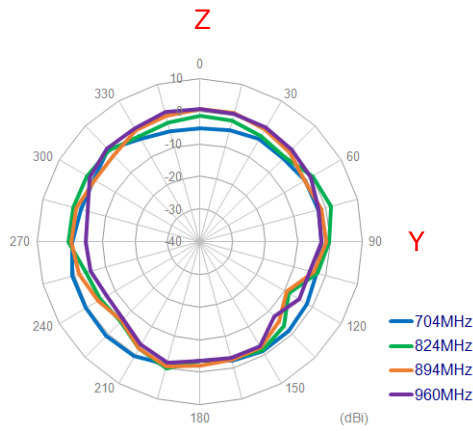
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X-Z Plane



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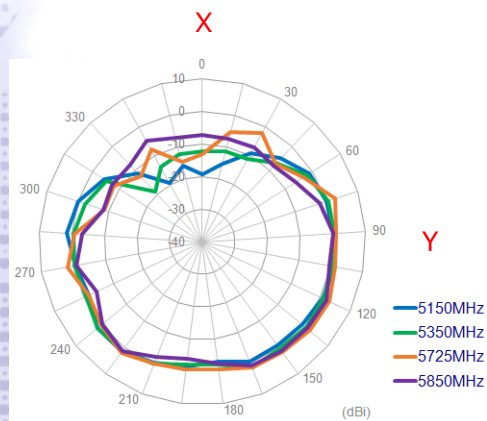
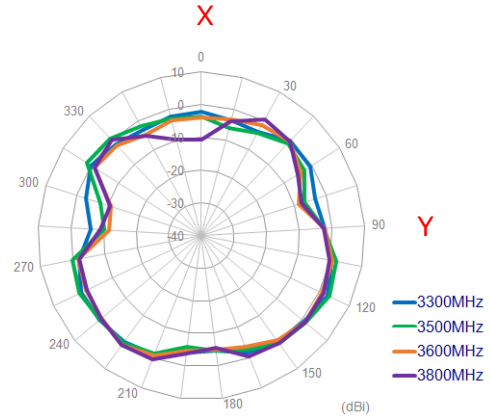
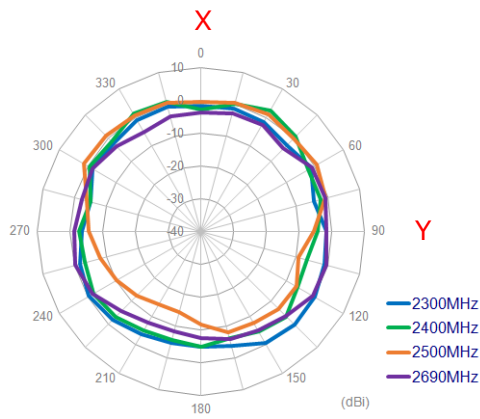
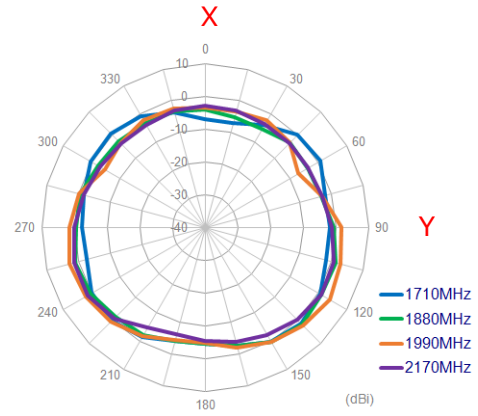
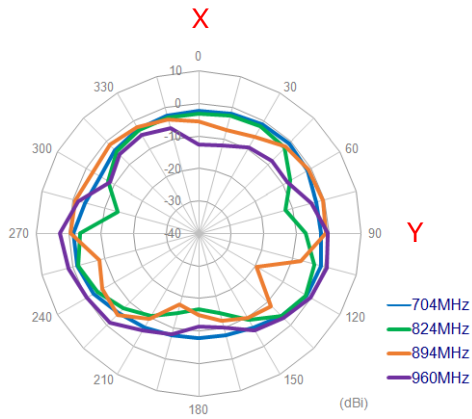
Y-Z Plane



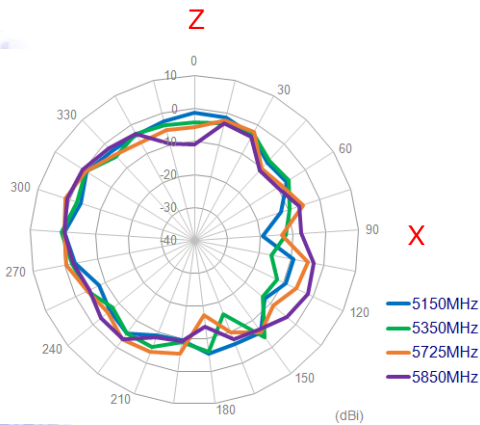
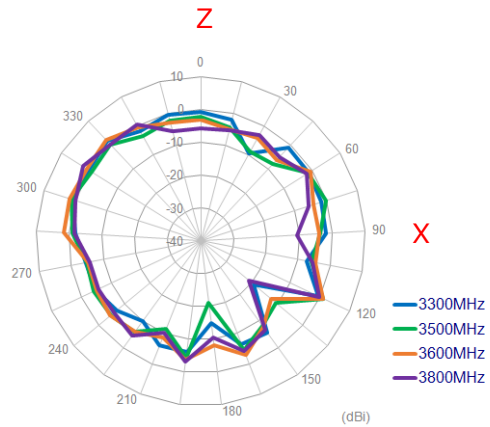
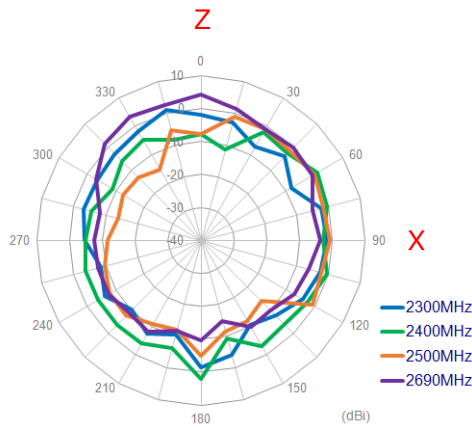
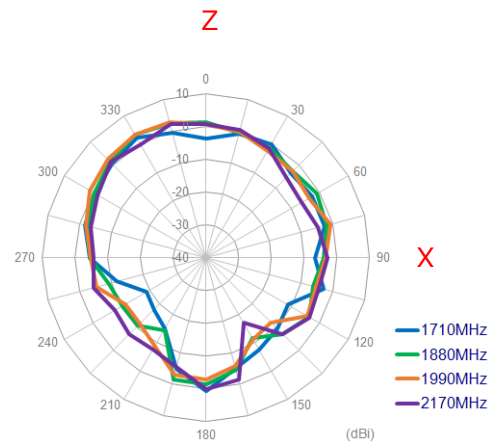
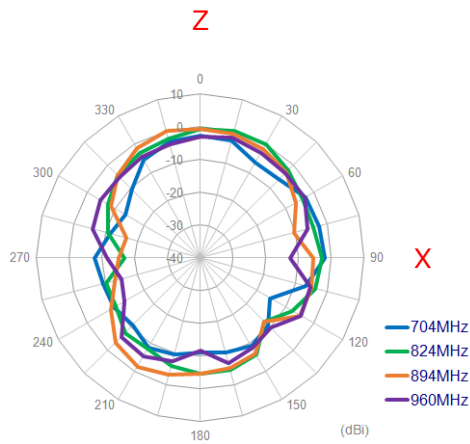
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LTE MIMO2

X-Y Plane

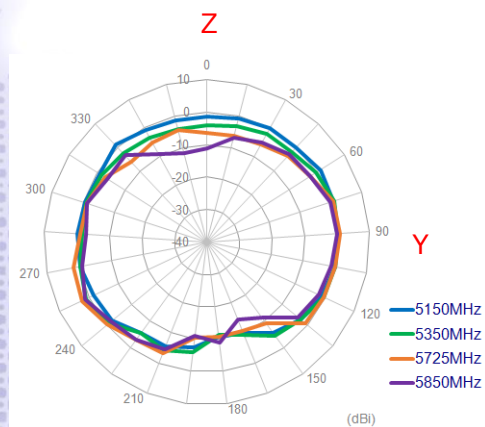
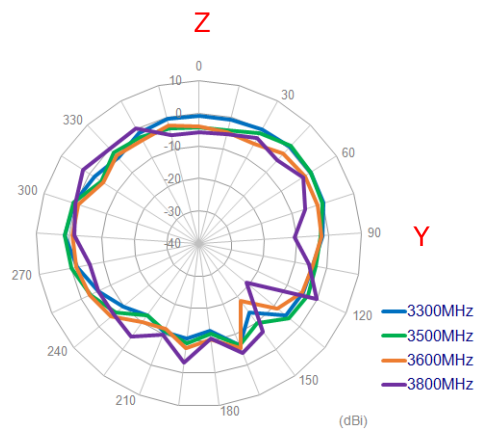
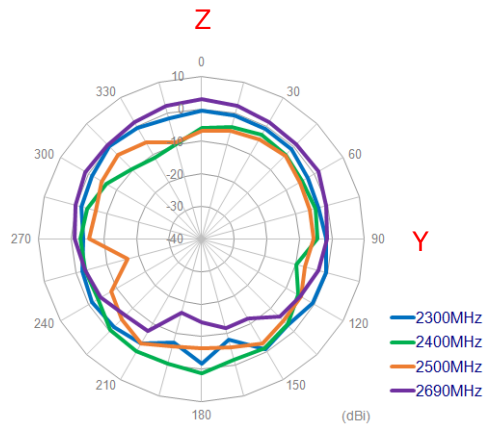
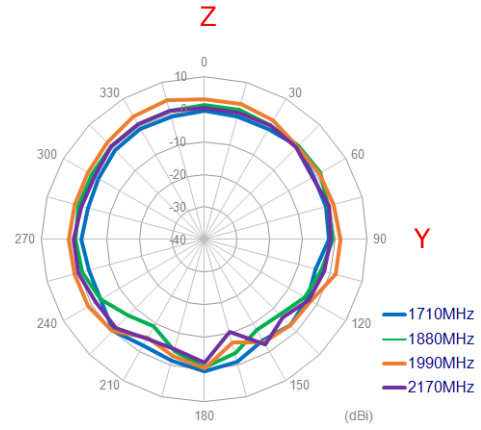
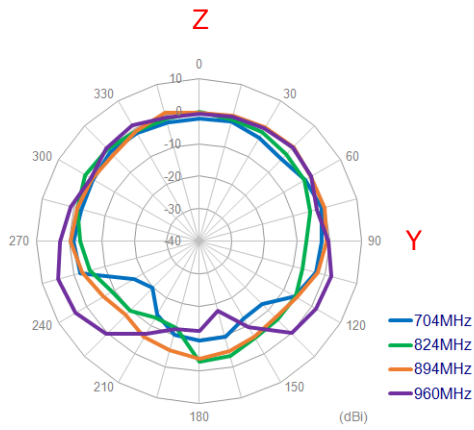


X-Z Plane



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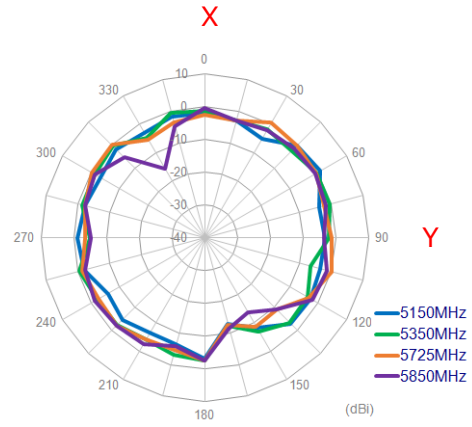
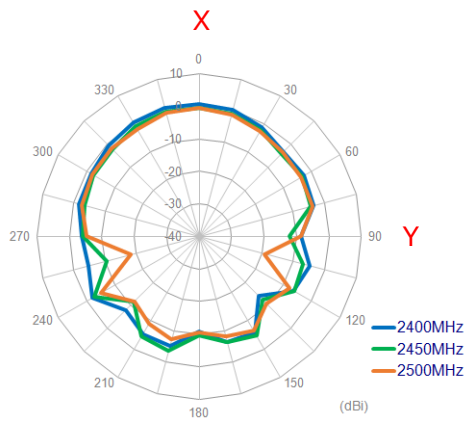
Y-Z Plane



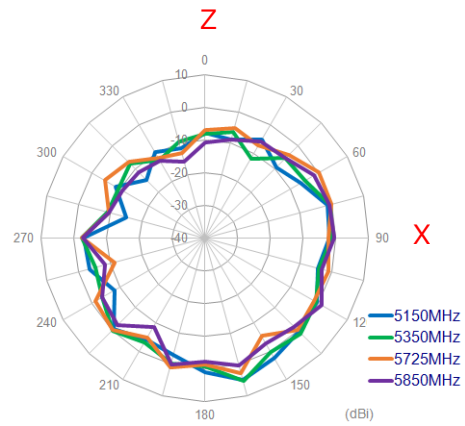
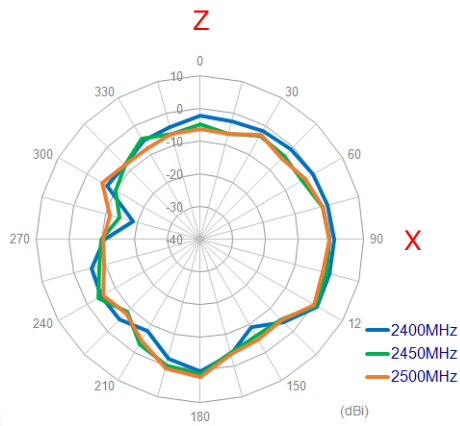
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WiFi MIMO1

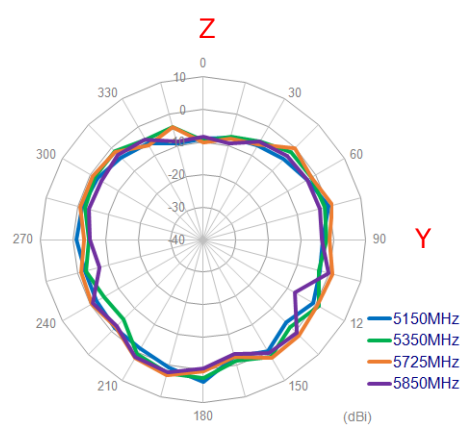
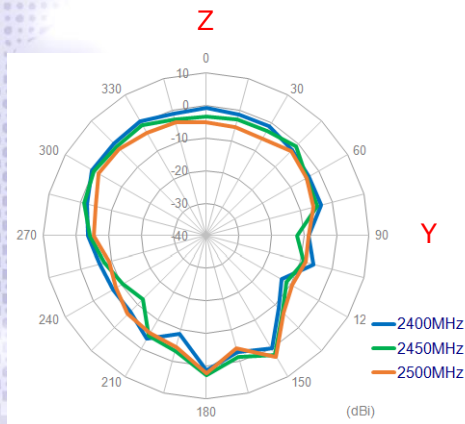
X-Y Plane



X-Z Plane

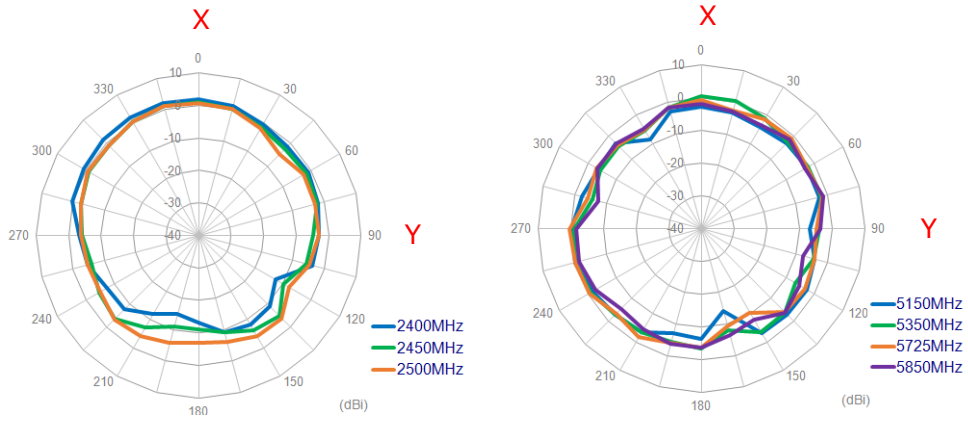


Y-Z Plane

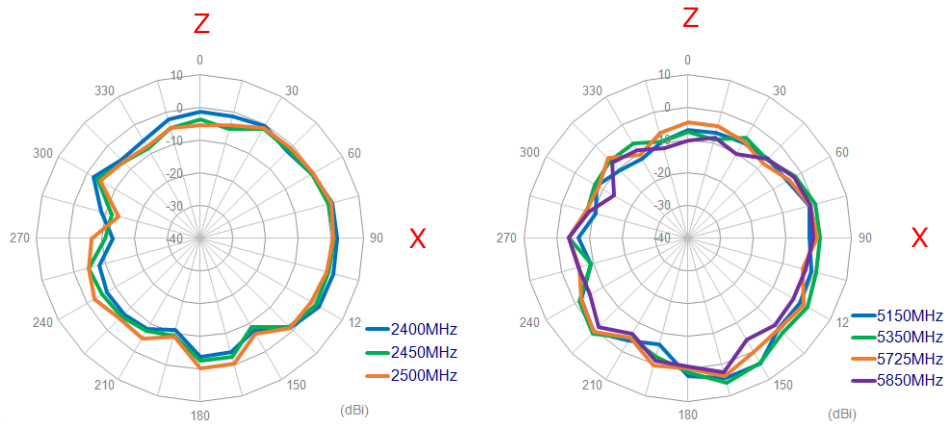


WiFi MIMO2

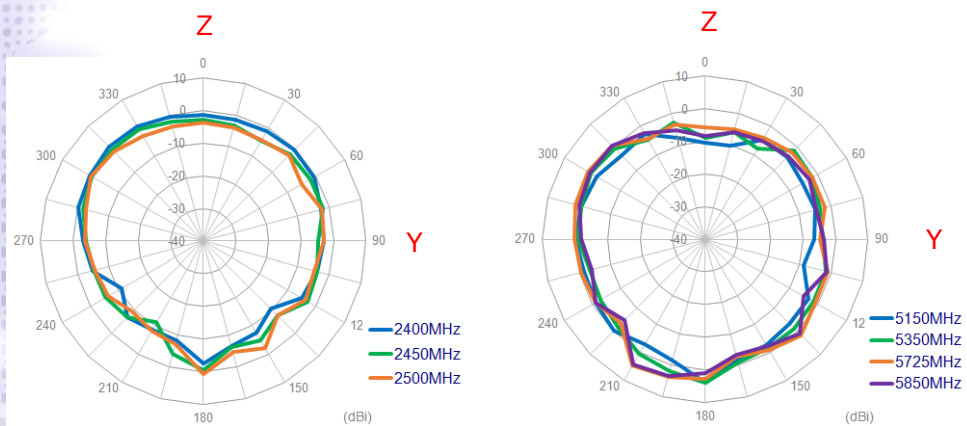
X-Y Plane



X-Z Plane

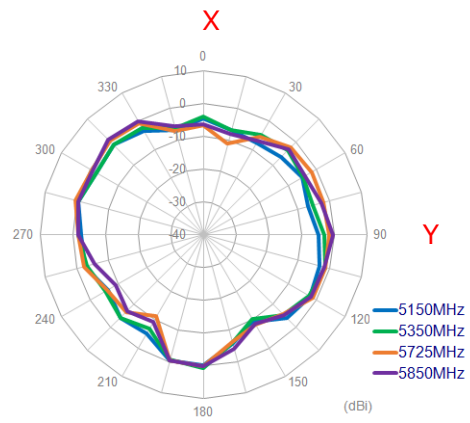
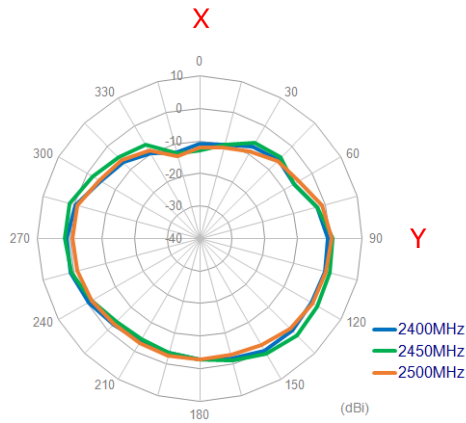


Y-Z Plane

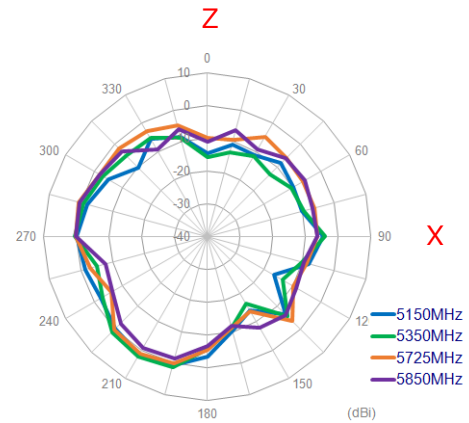
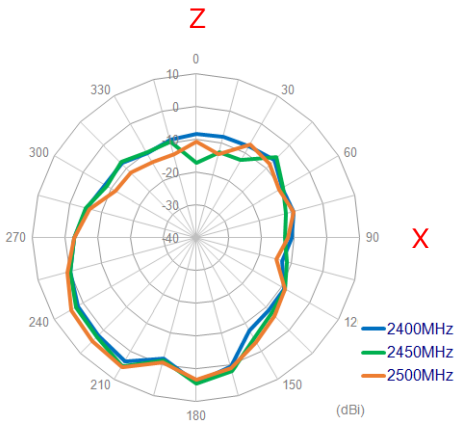


WiFi MIMO3

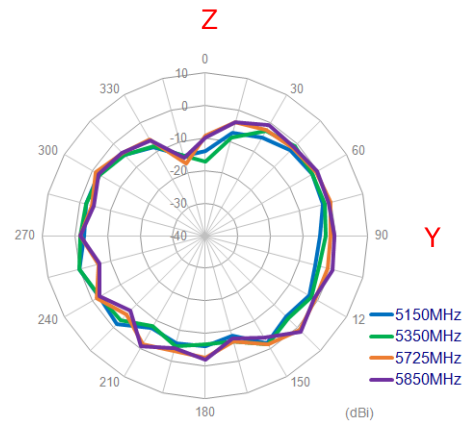
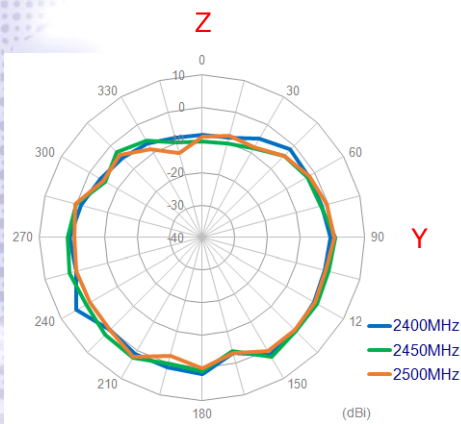
X-Y Plane



X-Z Plane



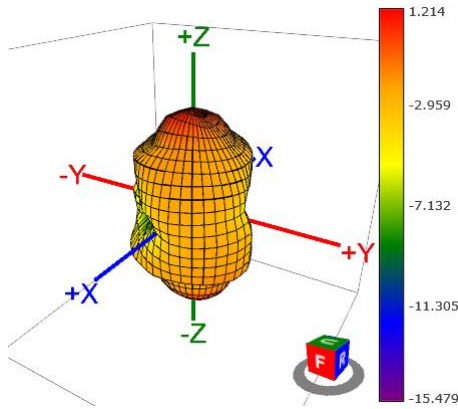
Y-Z Plane



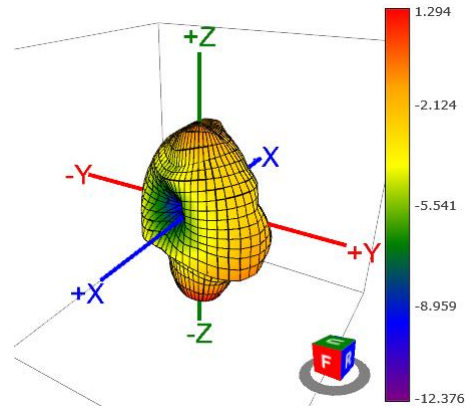
V. 3D Radiation Pattern:

GNSS

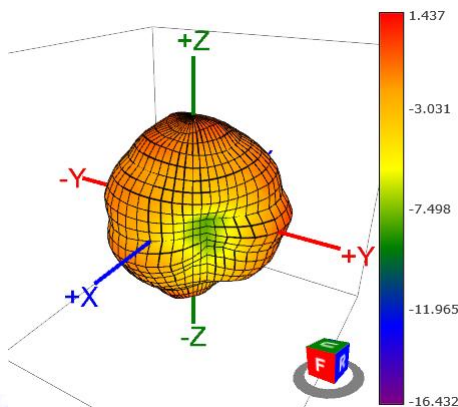
1561MHz



1575.42MHz

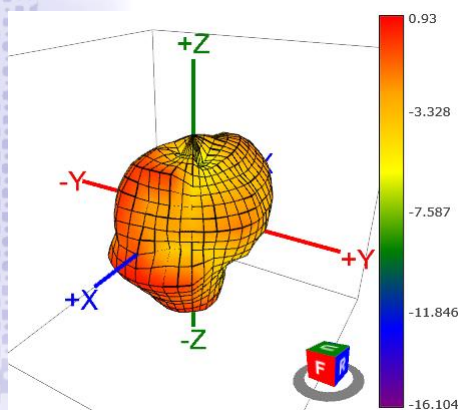


1602MHz

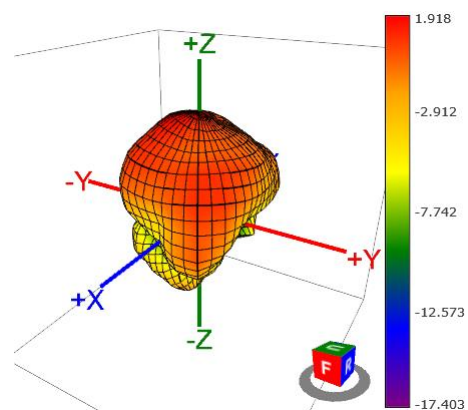


LTE MIMO1

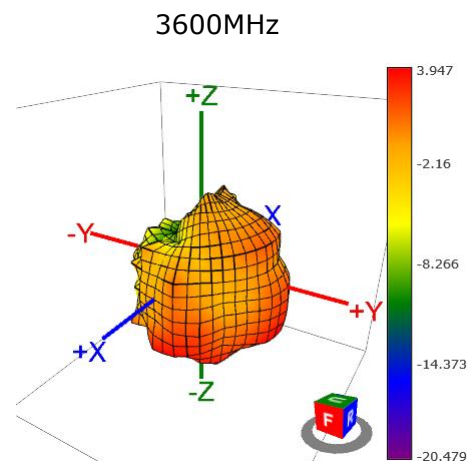
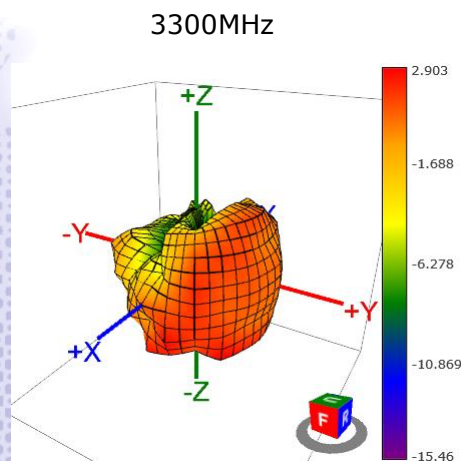
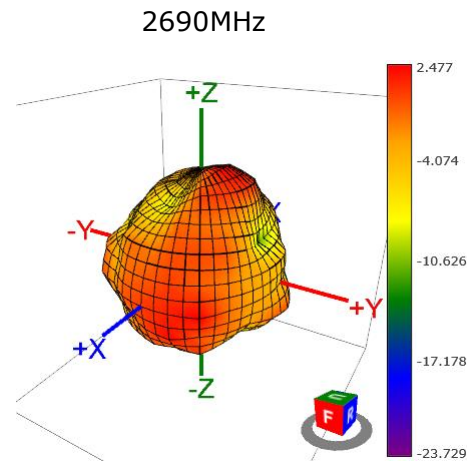
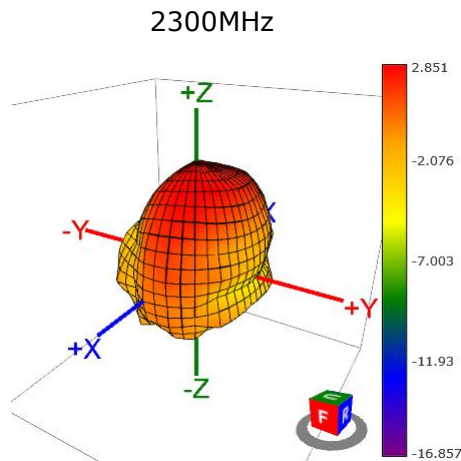
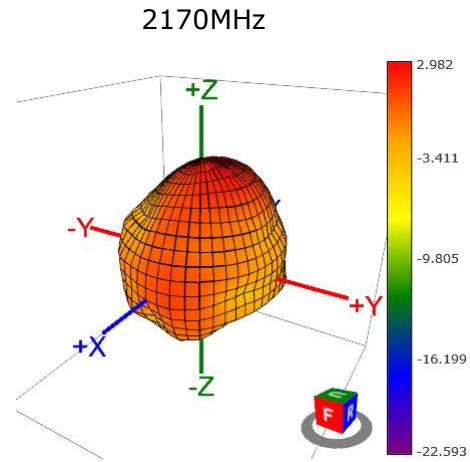
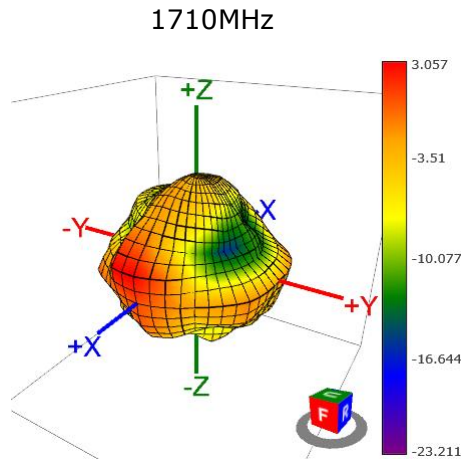
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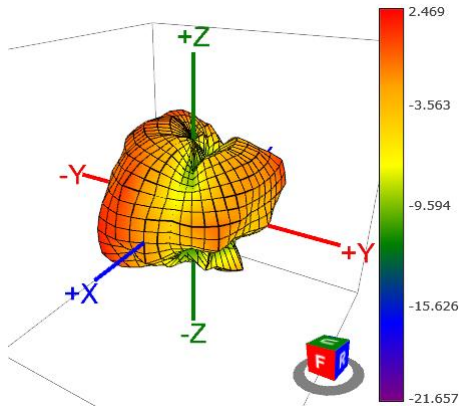
960MHz



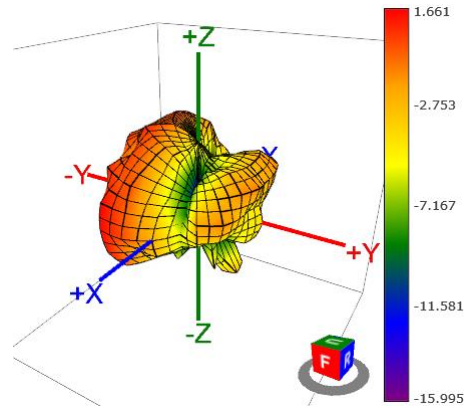
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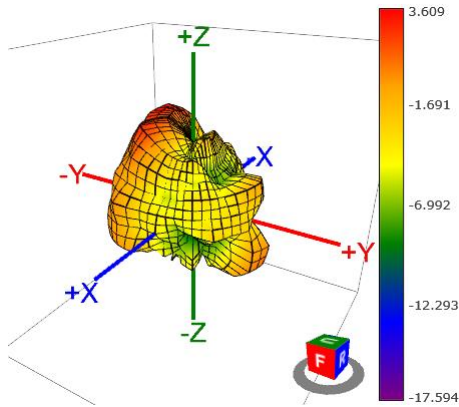
5150MHz



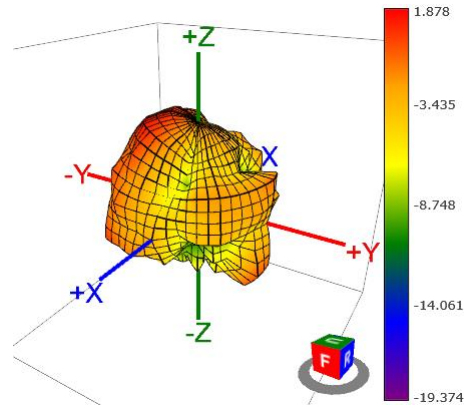
5350MHz



5725MHz

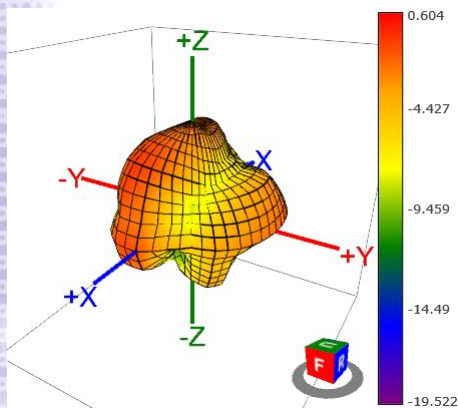


5850MHz

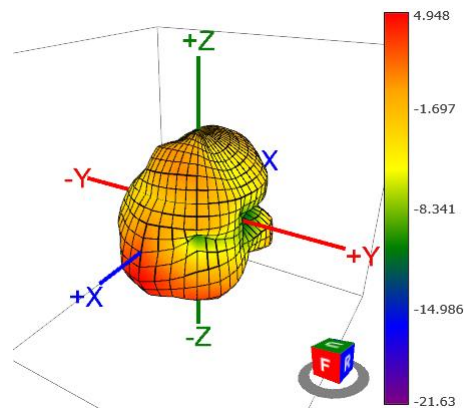


LTE MIMO2

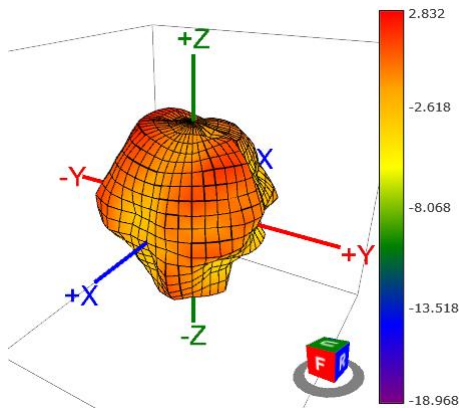
704MHz



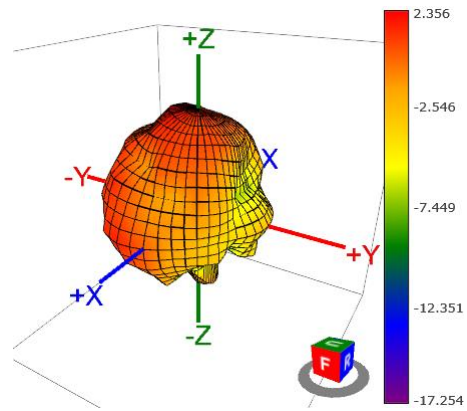
960MHz



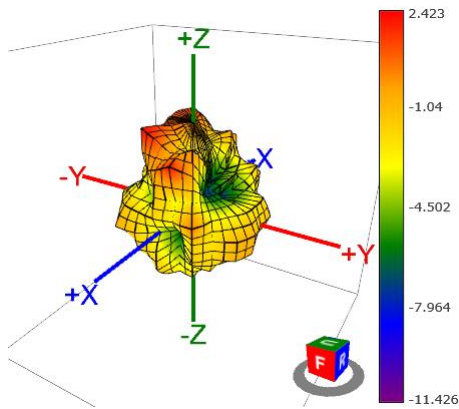
1710MHz



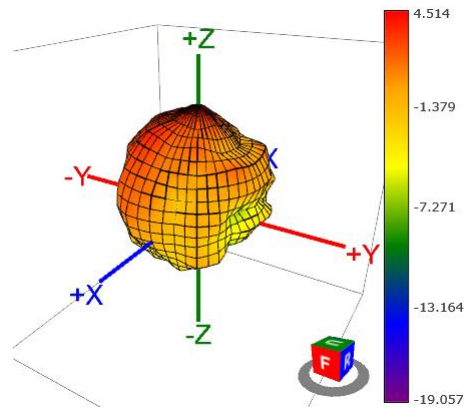
2170MHz



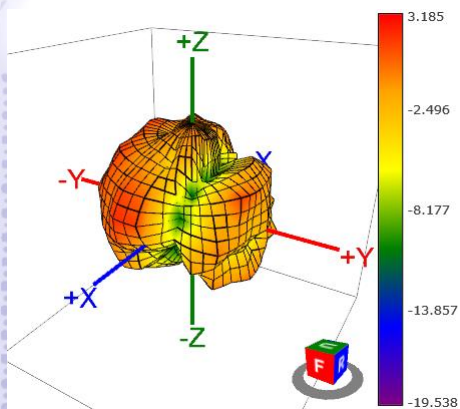
2300MHz



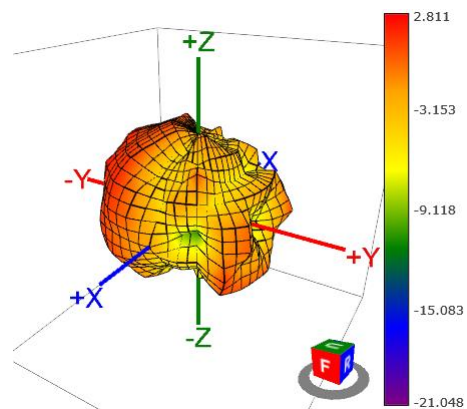
2690MHz



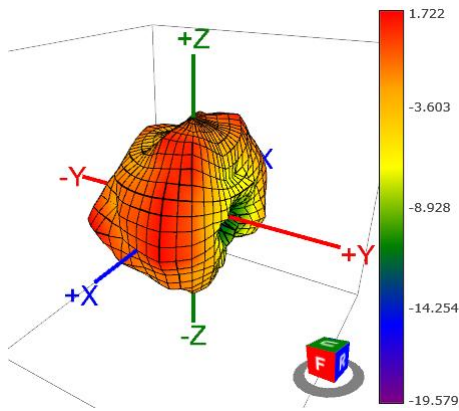
3300MHz



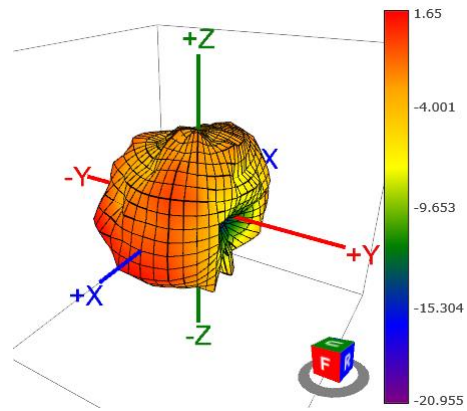
3600MHz



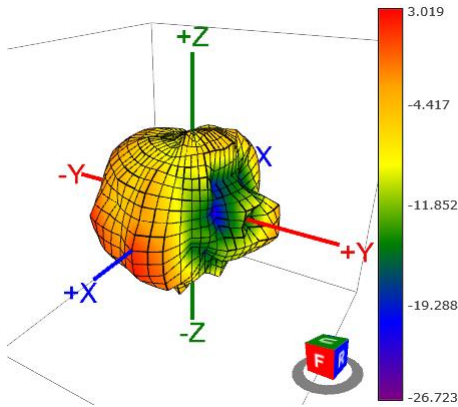
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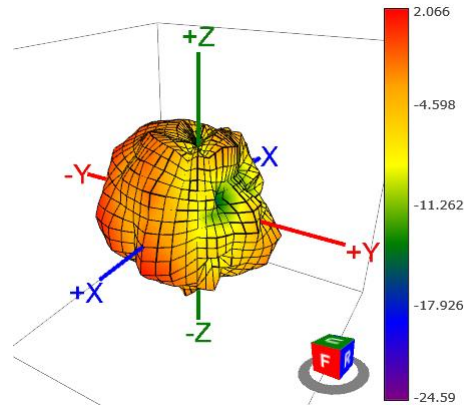
5350MHz



5725MHz

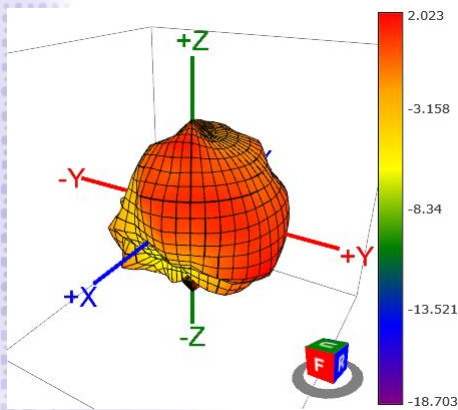


5850MHz

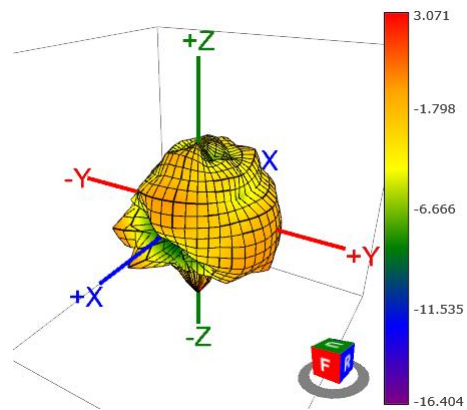


WiFi MIMO1

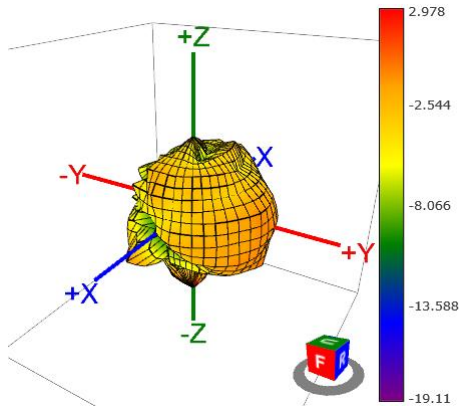
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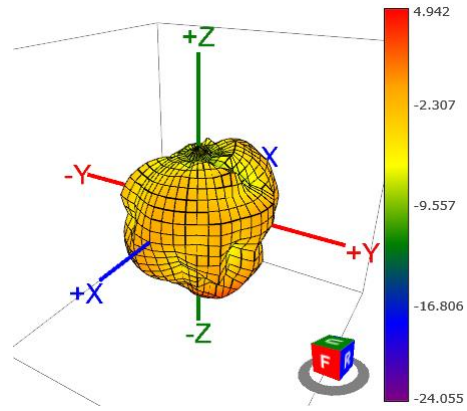
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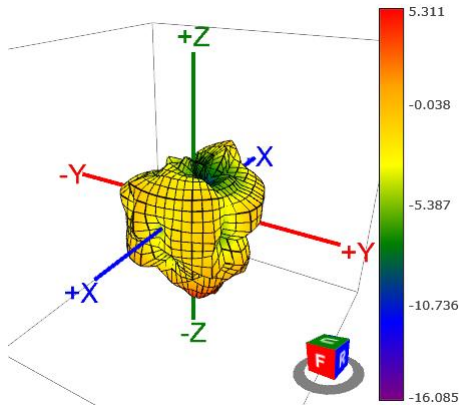
2500MHz



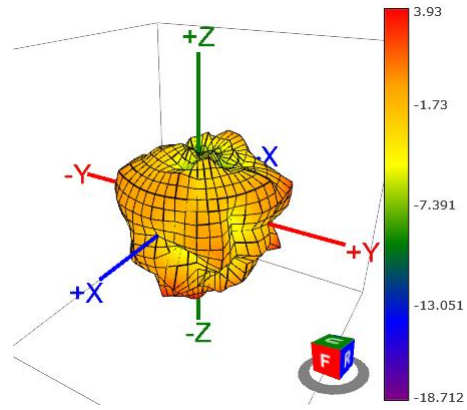
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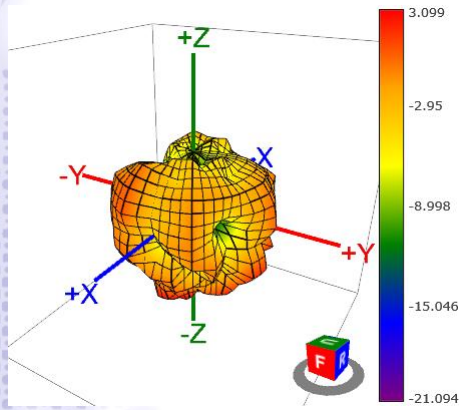
5350MHz



5750MHz



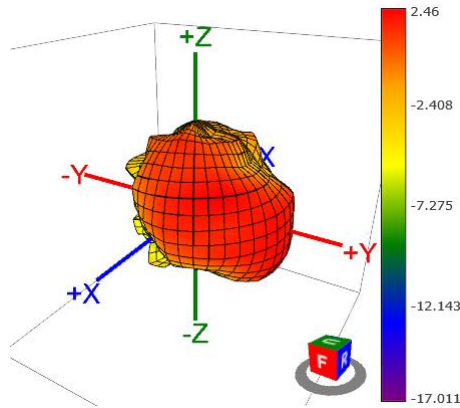
5850MHz



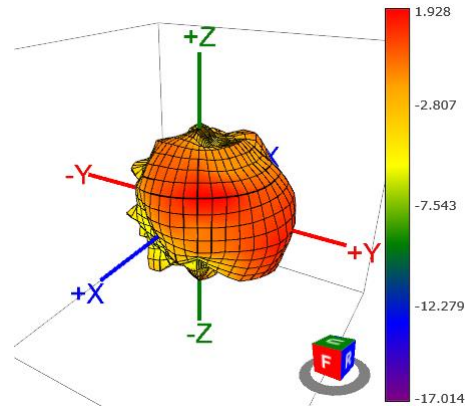
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WiFi MIMO2

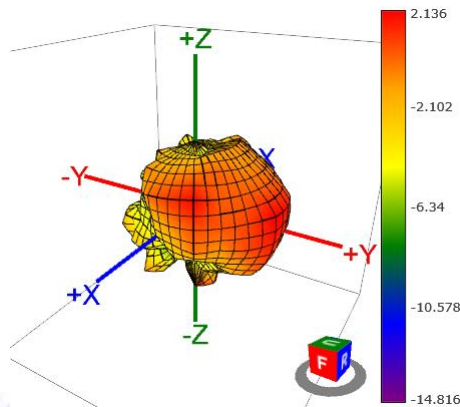
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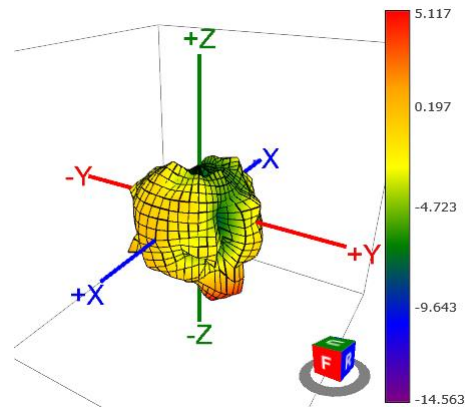
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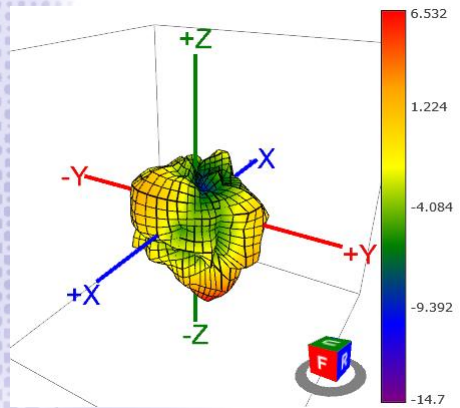
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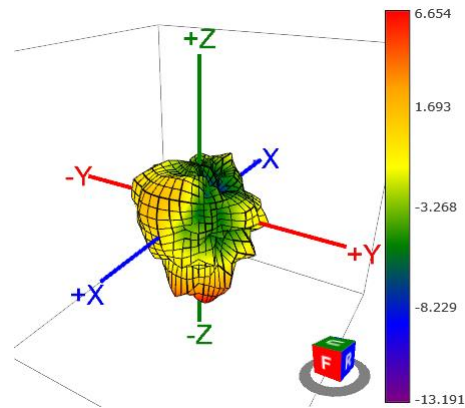
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5350MHz

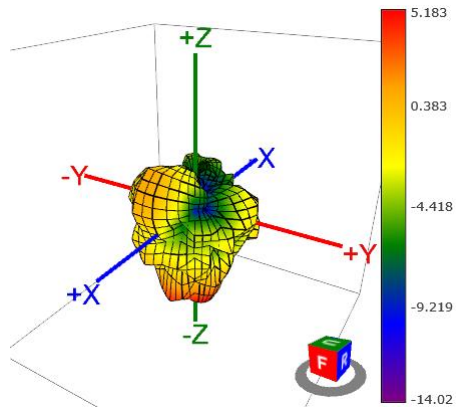


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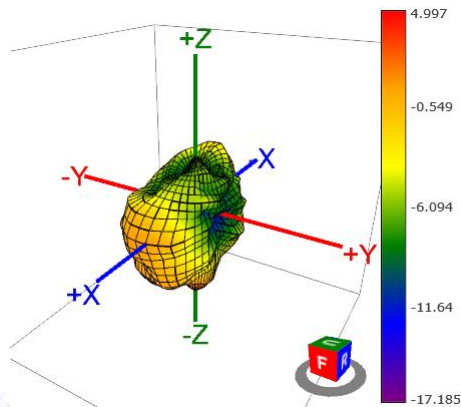
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5850MHz

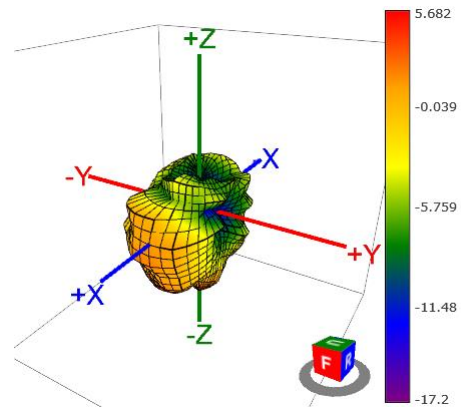


WiFi MIMO3

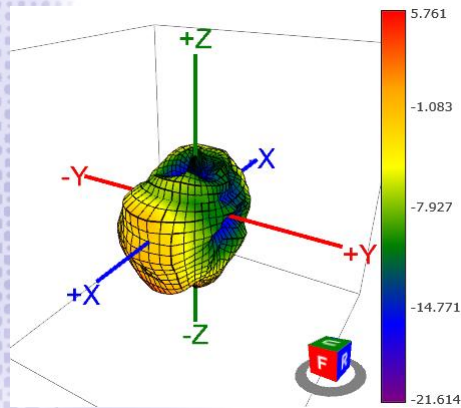
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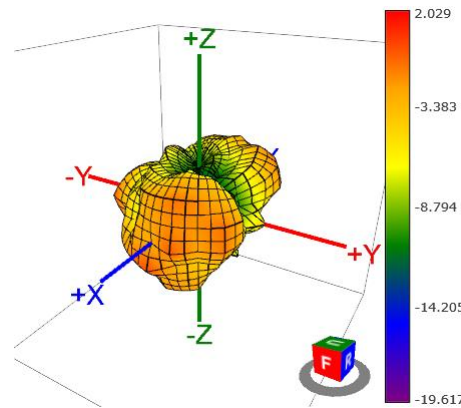
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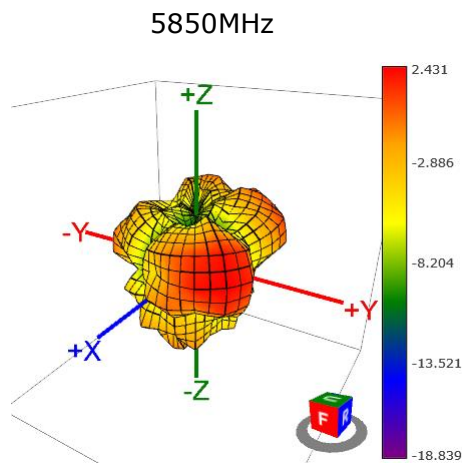
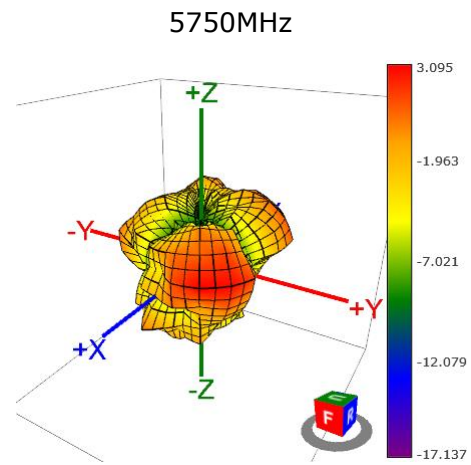
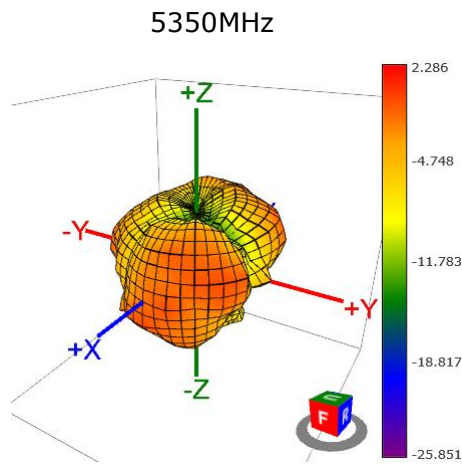


2500MHz



5150MHz





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VI. Mechanical Drawing (Unit:mm):

