



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

Part Number: MT-25B-AC-B2L2W01

Features:

- 1*GNSS, 2*LTE, 2*WIFI Antenna Combination
- GPS L1&L2&L5 / GLONASS L1 / BEIDOU L1 Bands Supporting
- LTE 617-960MHz, 1710-2690MHz, 3300-3800MHz Supporting
- WiFi Dual Bands, 2400-2500MHz, 5150-5850MHz Supporting
- Excellent Out of Band Suppression, Up to 60dB
- 35dBi Active Peak Gain
- Customizable Cables and Connectors
- RoHS & REACH Compliant

Applications:

- Fleet Management & Telematics
- Vehicle Navigation

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

MODEL: MT-25B-AC-B2L2W01

WI-RD-D-315 V1.0

I. Specifications:

Items	GNSS Specifications				
Passive Antenna Performance					
Application Bands	GPS L5	GPS L2	BeiDou	GPS L1	GLONASS
Frequencies (MHz)	1176.45	1227.60	1561.00	1575.42	1602.00
Efficiency (%)	34.04	28.18	46.99	58.61	55.85
Average Gain (dBi)	-4.68	-5.50	-3.28	-2.32	-2.53
Peak Gain (dBi)	2.37	2.57	3.89	4.69	3.69
V.S.W.R	< 2				
Return loss (dB)	< -10				
Test Condition	310 x 225 mm ² (Ground Plane Dimension)				
Impedance (Ω)	50				
Dimension (mm)	25 x 25 x 4				
Polarization	R.H.C.P. (Right Handed Circular Polarization)				
Active Antenna Performance					
Application band	GPS_L5	GPS_L2	BeiDou	GPS_L1	GLONASS
Frequency (MHz)	1176	1227	1561 ± 2.046	1575.42 ± 1.023	1602 ± 5
Gain (dB)	37	35	37	38	35
Noise Figure (dB)	2.4	2.68	2.91	2.27	2.75
Current Consumption (mA)	27 ± 2 @ 5.0 V				
Output Impedance (Ω)	50				

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Out of Band Rejection									
Application Bands		GPS_L1			GPS_L2 & GPS_L5				
Frequencies (MHz)		600 ~ 1500		1660 ~ 3000	600 ~ 1100			1350 ~ 3000	
Out of Band Rejection (dB)		62		69	62			63	
ESD Protection		+/- 8 KV (direct discharge) +/- 15KV (air discharge)							
Cable/Connector		H100_3.1 Meters							
Connector		FAKRA II (C)							
Items		LTE Specifications							
Application Bands		LTE 700	LTE 700	GSM 850/900	DCS	PCS	UMTS1	LTE2600	5G NR Band
Frequencies (MHz)		617 ~ 698	698 ~ 824	824 ~ 960	1710 ~ 1880	1850 ~ 1990	1920 ~ 2170	2300 ~ 2690	3300 ~ 3800
Efficiency (%)									
LTE Main	30cm	45.01	56.65	62.63	56.55	57.09	55.28	58.33	66.91
	1m	42.62	53.40	58.90	51.89	52.36	50.60	52.67	59.13
	2m	39.42	49.08	53.96	45.90	46.27	44.60	45.52	49.56
	3m	36.46	45.10	49.43	40.59	40.88	39.31	39.34	41.54
	5m	31.19	38.10	41.48	31.75	31.93	30.54	29.39	29.19
LTE Aux	30cm	41.67	70.56	74.53	53.70	61.71	58.88	52.17	60.65
	1m	39.46	66.51	70.10	49.28	56.59	53.91	47.11	53.60
	2m	36.49	61.13	64.22	43.58	50.01	47.51	40.72	44.93
	3m	33.75	56.18	58.83	38.55	44.19	41.88	35.19	37.66
	5m	28.88	47.45	49.37	30.15	34.51	32.54	26.29	26.45
Average Gain (dBi)									
LTE Main	30cm	-3.47	-2.47	-2.03	-2.48	-2.43	-2.57	-2.34	-1.75
	1m	-3.70	-2.72	-2.30	-2.85	-2.81	-2.96	-2.78	-2.28
	2m	-4.04	-3.09	-2.68	-3.38	-3.35	-3.51	-3.42	-3.05
	3m	-4.38	-3.46	-3.06	-3.92	-3.88	-4.05	-4.05	-3.82
	5m	-5.06	-4.19	-3.82	-4.98	-4.96	-5.15	-5.32	-5.35

Average Gain (dBi)										
LTE Aux	30cm	-3.80	-1.51	-1.28	-2.70	-2.10	-2.30	-2.83	-2.17	
	1m	-4.04	-1.77	-1.54	-3.07	-2.47	-2.68	-3.27	-2.71	
	2m	-4.38	-2.14	-1.92	-3.61	-3.01	-3.23	-3.90	-3.48	
	3m	-4.72	-2.50	-2.30	-4.14	-3.55	-3.78	-4.54	-4.24	
	5m	-5.39	-3.24	-3.07	-5.21	-4.62	-4.88	-5.80	-5.78	
Peak Gain (dBi)										
LTE Main	30cm	3.04	6.78	6.40	4.67	5.24	5.24	6.07	7.49	
	1m	2.81	6.52	6.14	4.30	4.84	4.84	5.63	6.95	
	2m	2.47	6.16	5.78	3.76	4.28	4.28	4.99	6.19	
	3m	2.14	5.79	5.41	3.23	3.71	3.71	4.36	5.42	
	5m	1.47	5.06	4.68	2.16	2.58	2.58	3.09	3.89	
LTE Aux	30cm	2.90	6.86	5.81	4.67	6.21	6.21	4.65	6.32	
	1m	2.67	6.60	5.53	4.30	5.81	5.81	4.21	5.78	
	2m	2.33	6.24	5.13	3.76	5.25	5.25	3.57	5.02	
	3m	2.00	5.87	4.73	3.23	4.68	4.68	2.94	4.25	
	5m	1.33	5.14	3.93	2.16	3.57	3.57	1.67	2.72	
V.S.W.R										
LTE Main	< 3.0						< 2.5	< 2.5		
LTE Aux	< 4.5			< 3.0			< 2.5	< 2.5		
Return Loss (dB)										
LTE Main	< -6.0						< -8.0	< -9.0		
LTE Aux	< -4.0			< -6.0			< -8.0	< -9.0		
Test Condition	Free Space									
Impedance (Ω)	50									
Polarization	Linear									
Cable / Connector	SNC-200_3.1 Meters									
Connector										
LTE Main	FAKRA II (D)									
LTE Aux	FAKRA II (L)									

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Items		WIFI Specifications						
Frequencies (MHz)		2400	2450	2500	5150	5350	5725	5850
Efficiency (%)								
WIFI Main	30cm	73.62	80.91	85.51	84.72	65.77	66.99	61.66
	1m	66.48	73.06	77.21	72.89	56.58	57.02	52.48
	2m	57.46	63.14	66.73	58.79	45.64	45.29	41.69
	3m	49.66	54.58	57.68	47.42	36.81	35.97	33.11
	5m	37.10	40.77	43.09	30.86	23.95	22.70	20.89
WIFI Aux	30cm	71.78	81.85	79.25	69.82	62.52	65.46	58.88
	1m	64.81	73.90	71.56	60.07	53.79	55.72	50.12
	2m	56.02	63.88	61.85	48.45	43.38	44.26	39.81
	3m	48.42	55.21	53.46	39.08	34.99	35.16	31.62
	5m	36.17	41.24	39.93	25.43	22.77	22.18	19.95
Average Gain (dBi)								
WIFI Main	30cm	-1.33	-0.92	-0.68	-0.72	-1.82	-1.74	-2.10
	1m	-1.77	-1.36	-1.12	-1.37	-2.47	-2.44	-2.80
	2m	-2.41	-2.00	-1.76	-2.31	-3.41	-3.44	-3.80
	3m	-3.04	-2.63	-2.39	-3.24	-4.34	-4.44	-4.80
	5m	-4.31	-3.90	-3.66	-5.11	-6.21	-6.44	-6.80
WIFI Aux	30cm	-1.44	-0.87	-1.01	-1.56	-2.04	-1.84	-2.30
	1m	-1.88	-1.31	-1.45	-2.21	-2.69	-2.54	-3.00
	2m	-2.52	-1.95	-2.09	-3.15	-3.63	-3.54	-4.00
	3m	-3.15	-2.58	-2.72	-4.08	-4.56	-4.54	-5.00
	5m	-4.42	-3.85	-3.99	-5.95	-6.43	-6.54	-7.00

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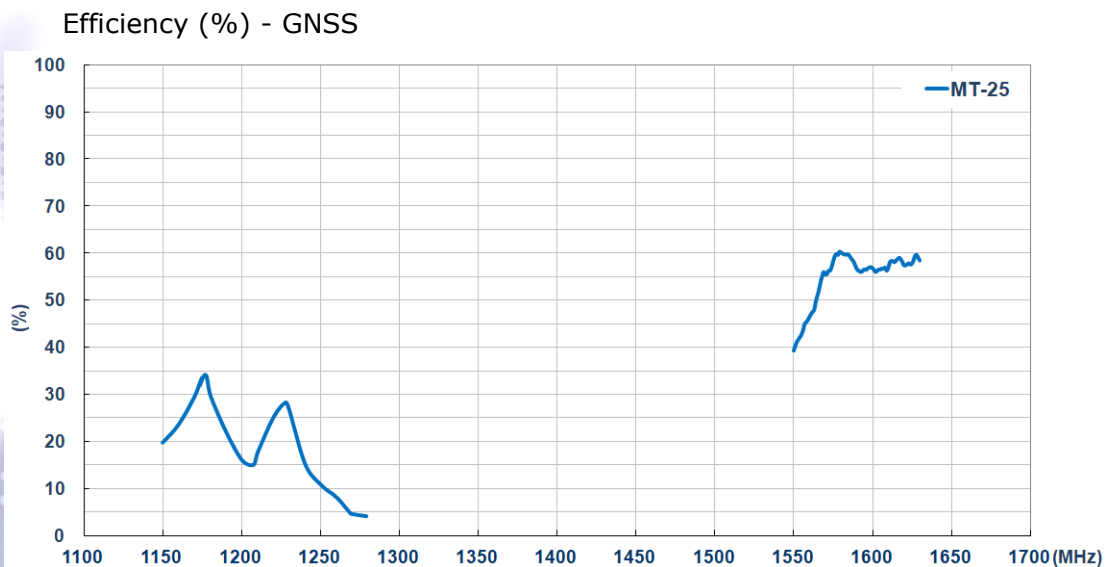
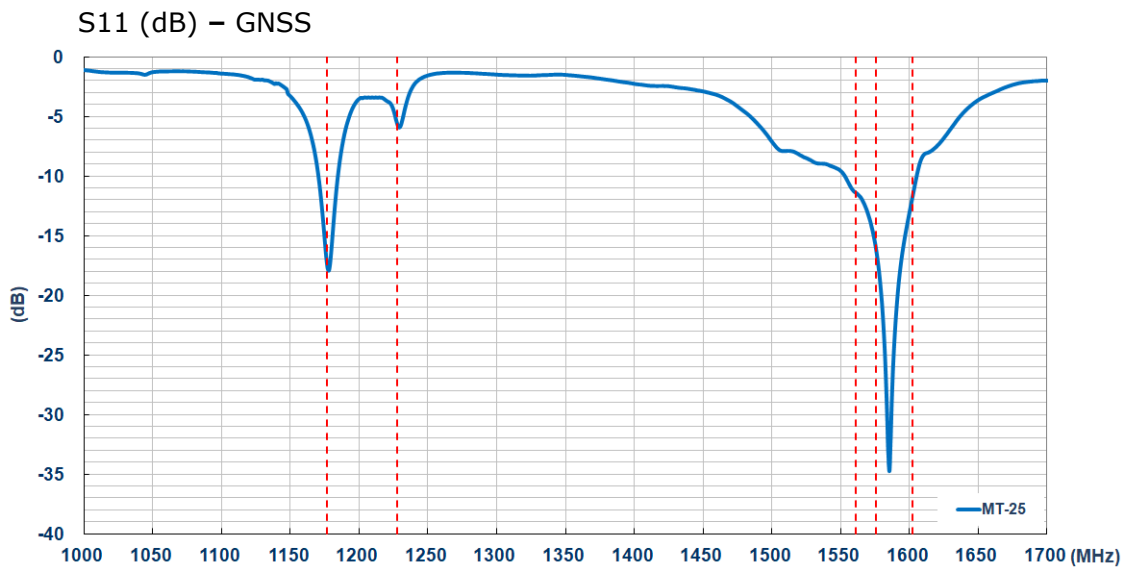
Peak Gain (dBi)								
WIFI Main	30cm	7.02	7.95	7.91	7.45	7.02	6.83	5.63
	1m	6.58	7.51	7.47	6.80	6.37	6.13	4.93
	2m	5.94	6.87	6.83	5.86	5.43	5.13	3.93
	3m	5.31	6.24	6.20	4.93	4.50	4.13	2.93
	5m	4.04	4.97	4.93	3.06	2.63	2.13	0.93
WIFI Aux	30cm	5.91	7.01	6.85	6.50	6.41	6.12	5.52
	1m	5.47	6.57	6.41	5.85	5.76	5.42	4.82
	2m	4.83	5.93	5.77	4.91	4.82	4.42	3.82
	3m	4.20	5.30	5.14	3.98	3.89	3.42	2.82
	5m	2.93	4.03	3.87	2.11	2.02	1.42	0.82
V.S.W.R								
WIFI Main		< 2						
WIFI Aux		< 2						
Return Loss (dB)								
WIFI Main		< -10						
WIFI Aux		< -10						
Test Condition		Free Space						
Impedance (Ω)		50						
Polarization		Linear						
Cable/Connector		SNC-200_3.1 Meters						
Connector	WIFI Main	FAKRA II (I)						
	WIFI Aux	FAKRA II (E)						
Mechanical								
Dimensions (mm)		135.95(L) x 135.95(W) x 29.89(H)						
Casing		ABS + PC						
Base and Thread		Zinc Alloy						
Weigh (g) (including cable)		1622						
Waterproof Resistant		IP69						
Maximum Assembly Torque		40 N-m						

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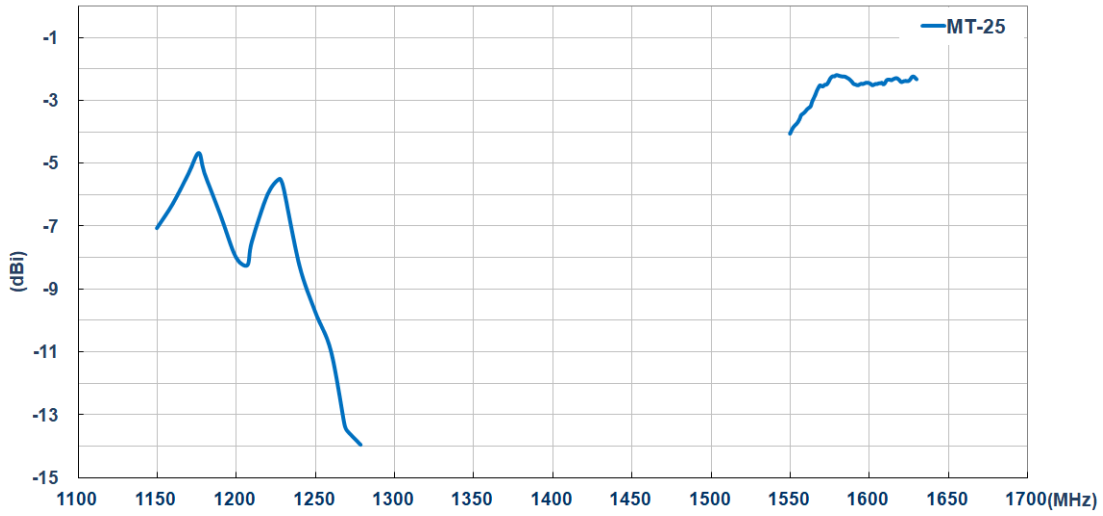
Environmental Conditions	
Operation Temperature (°C)	-40 ~ +85
Storage Temperature (°C)	-40 ~ +85
Humidity	Non-condensing 65 °C 95% RH

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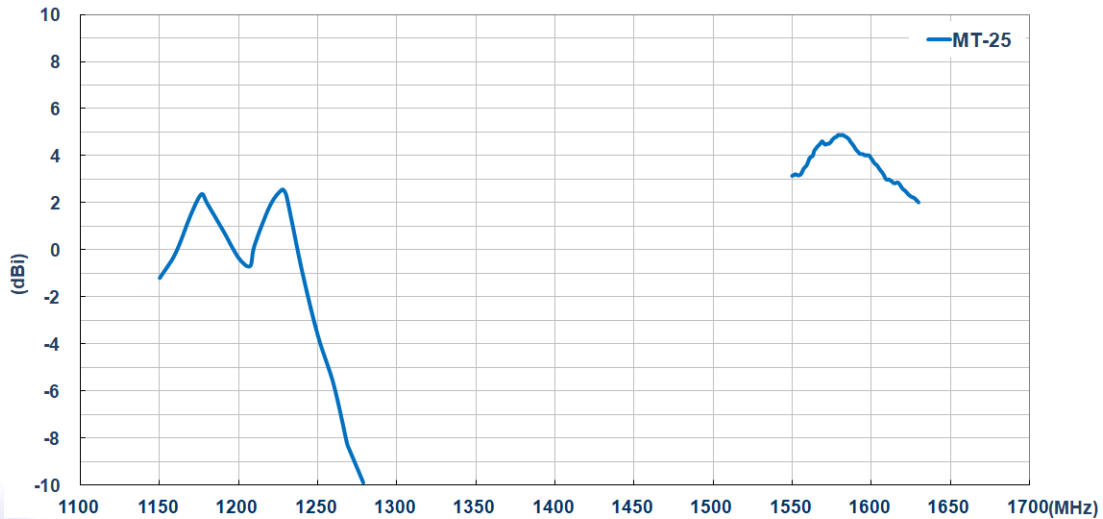
II. Antenna Technical Parameters:



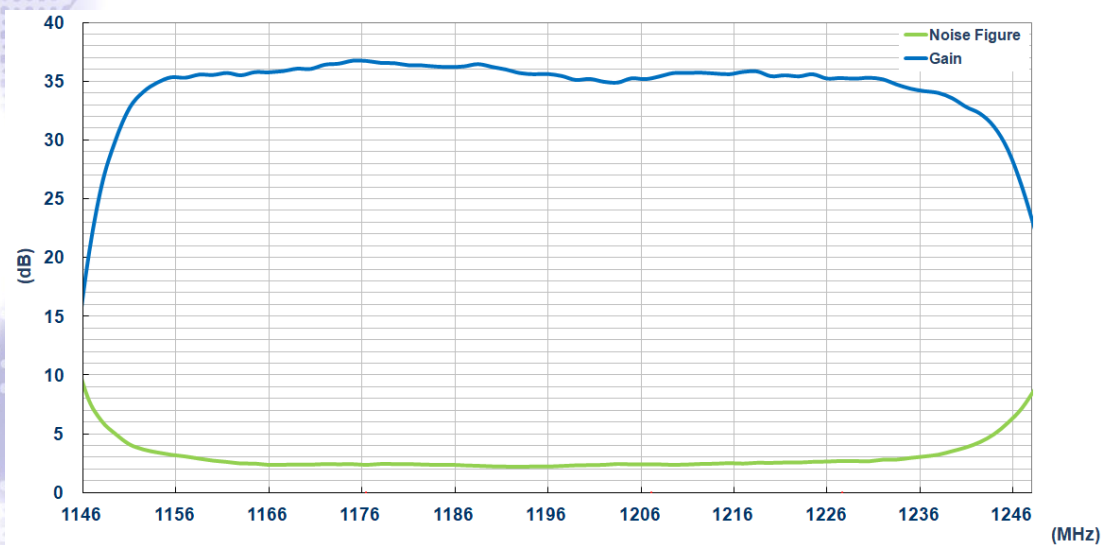
Average Gain (dBi) - GNSS



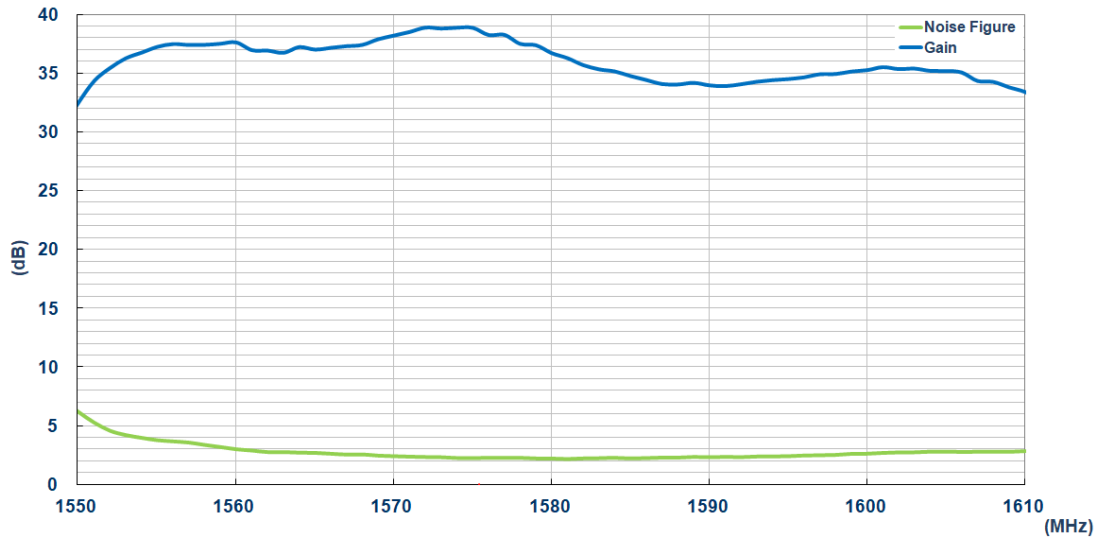
Peak Gain (dBi) - GNSS



Noise Figure & Gain (dB) - GNSS

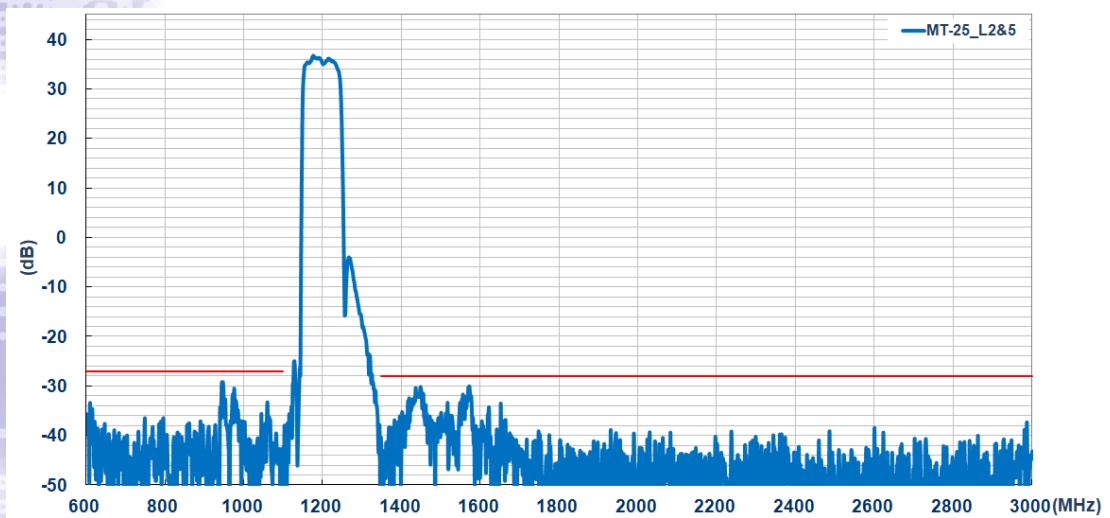
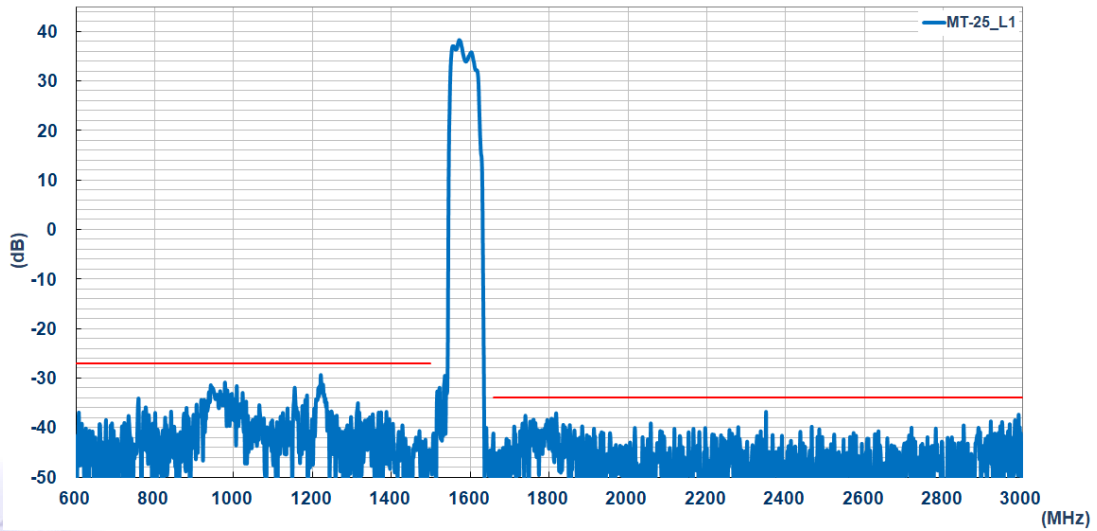


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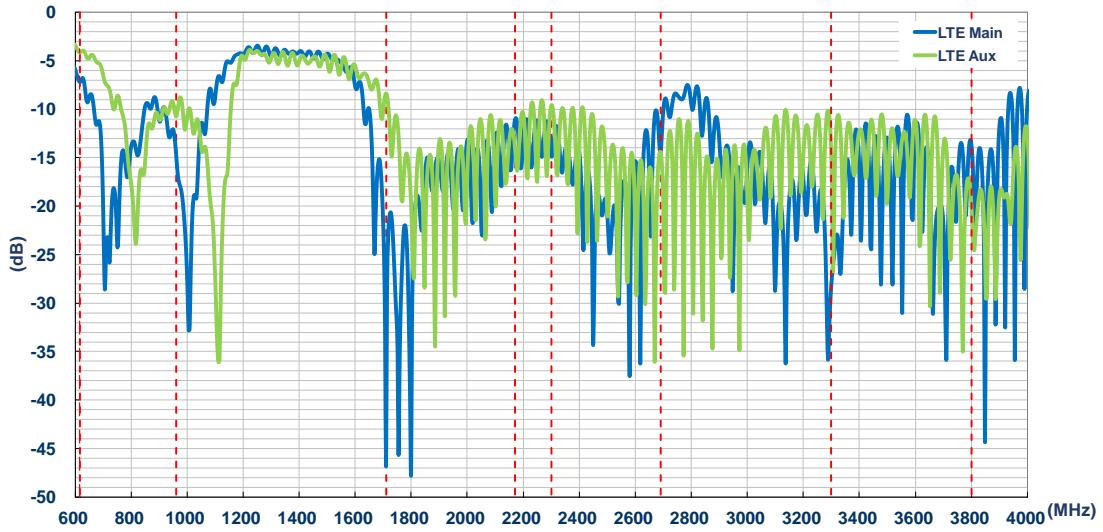


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Out of Band Rejection (dB) - GNSS

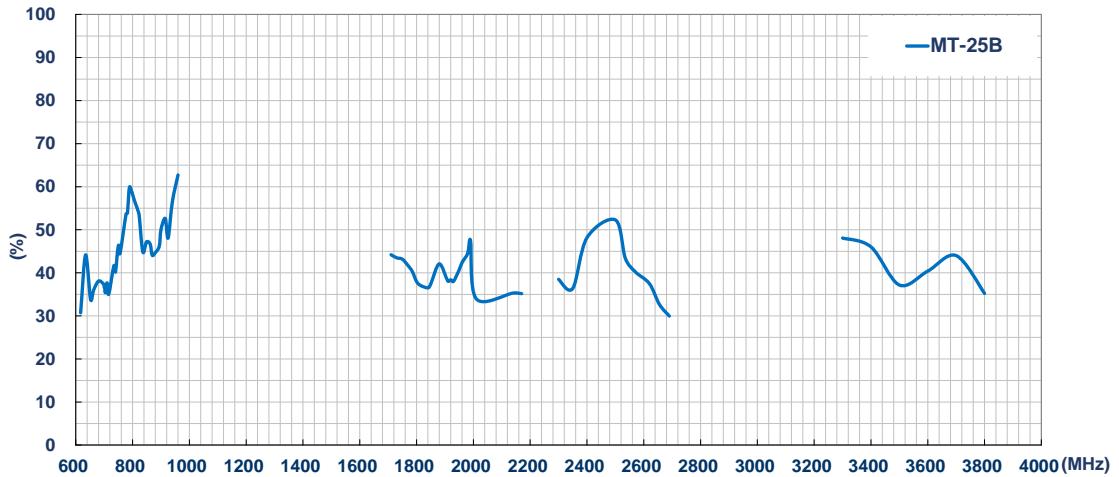


S11 (dB) – LTE Main / LTE Aux

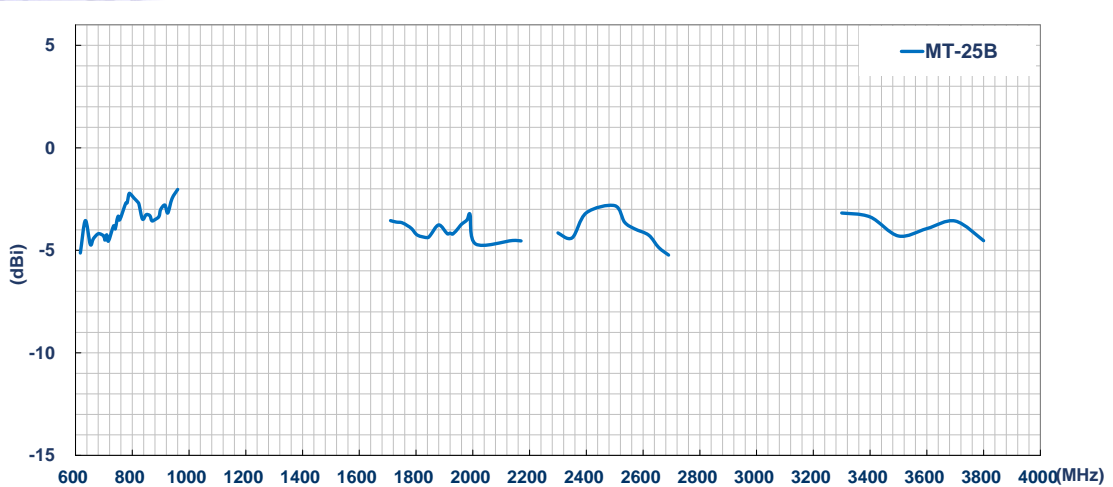


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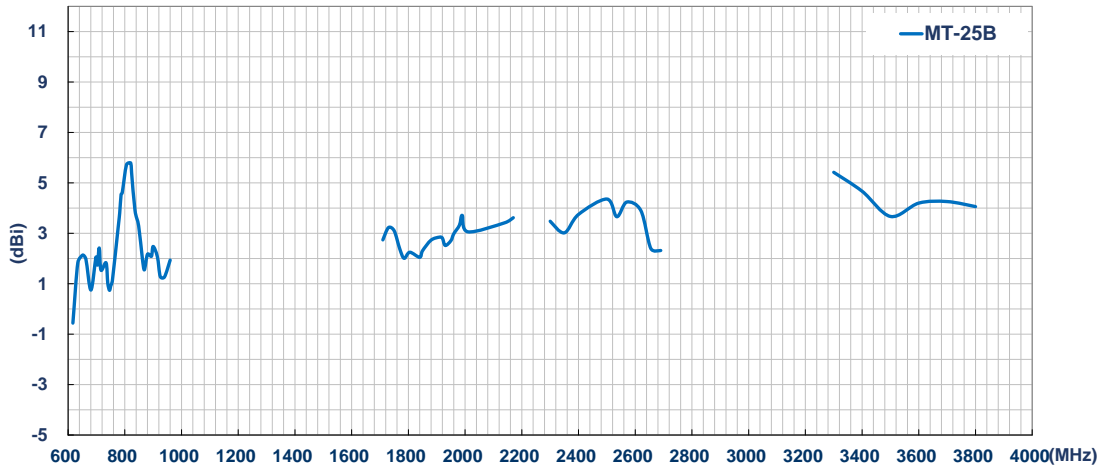
Efficiency (%) – LTE Main



Average Gain (dBi) - LTE Main

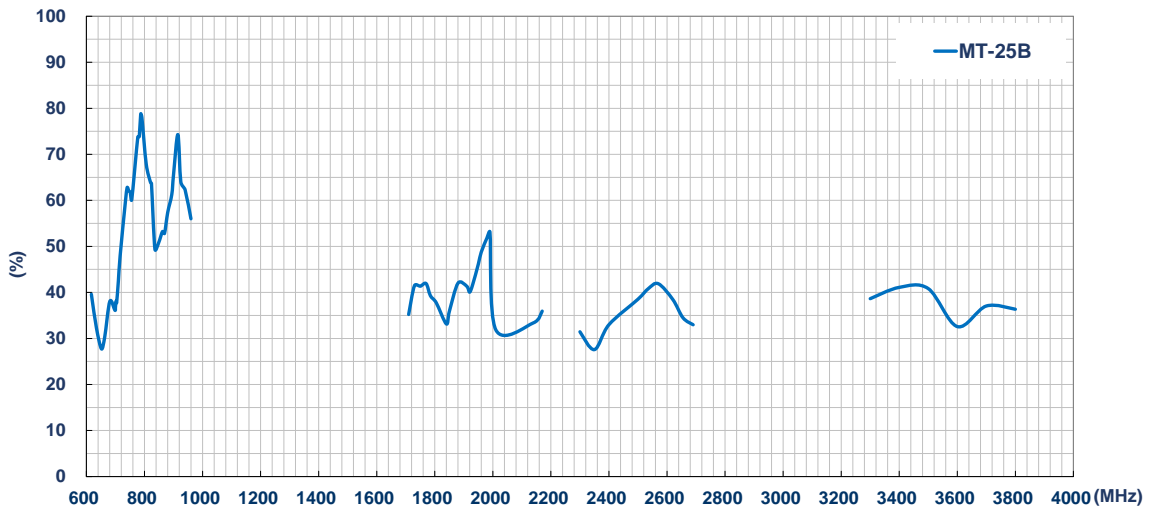


Peak Gain (dBi) – LTE Main

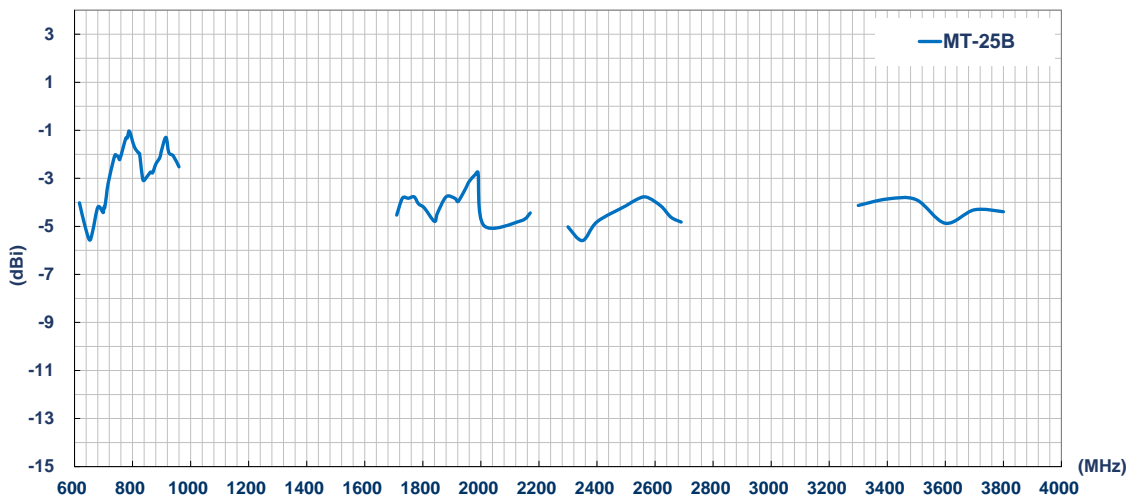


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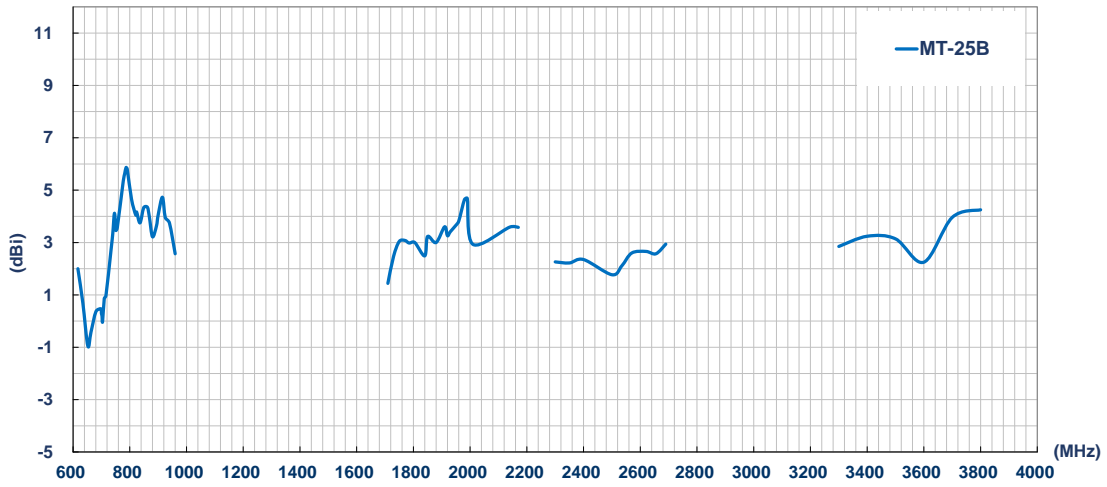
Efficiency (%) – LTE Aux



Average Gain (dBi) - LTE Aux

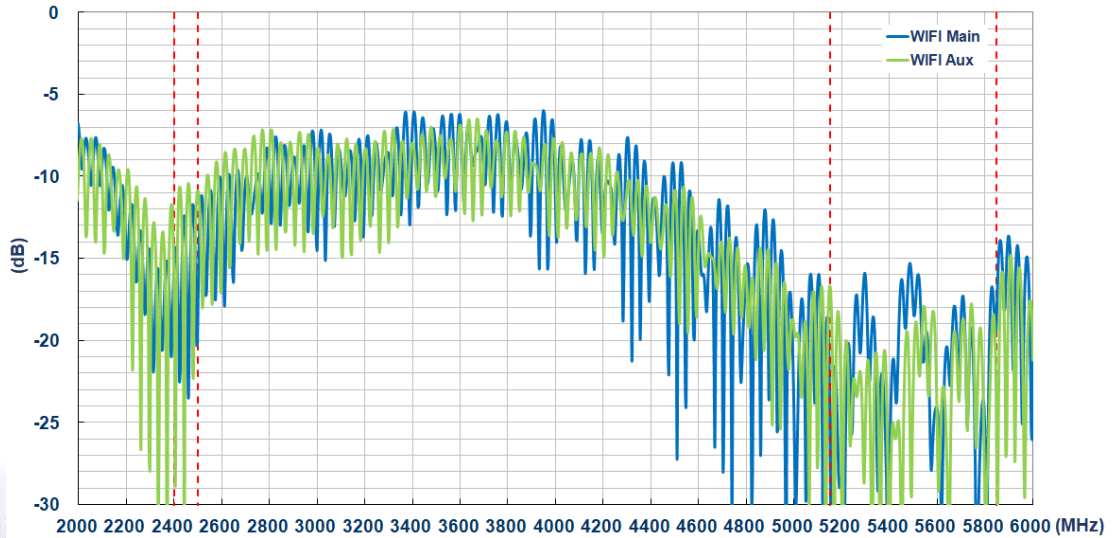


Peak Gain (dBi) – LTE Aux

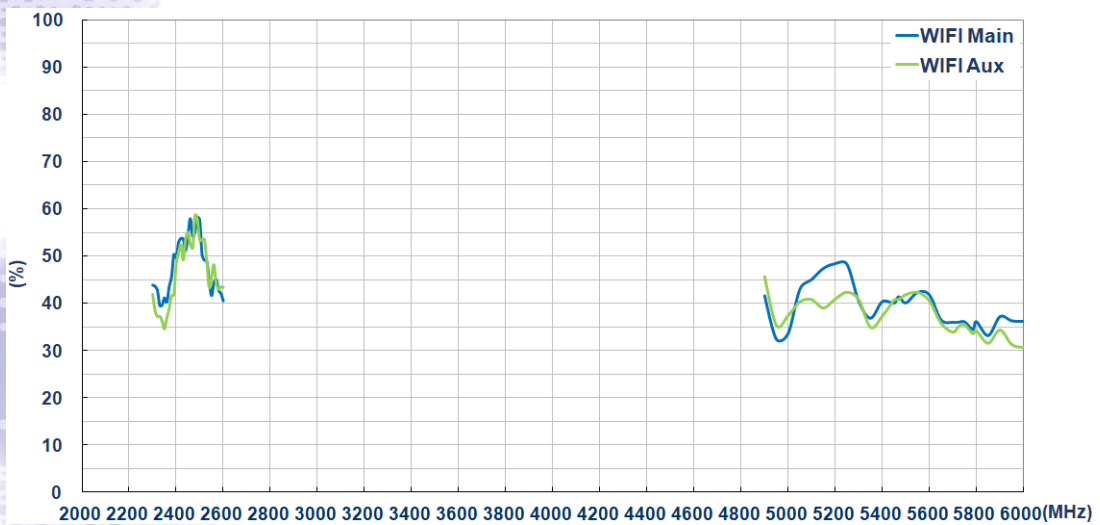


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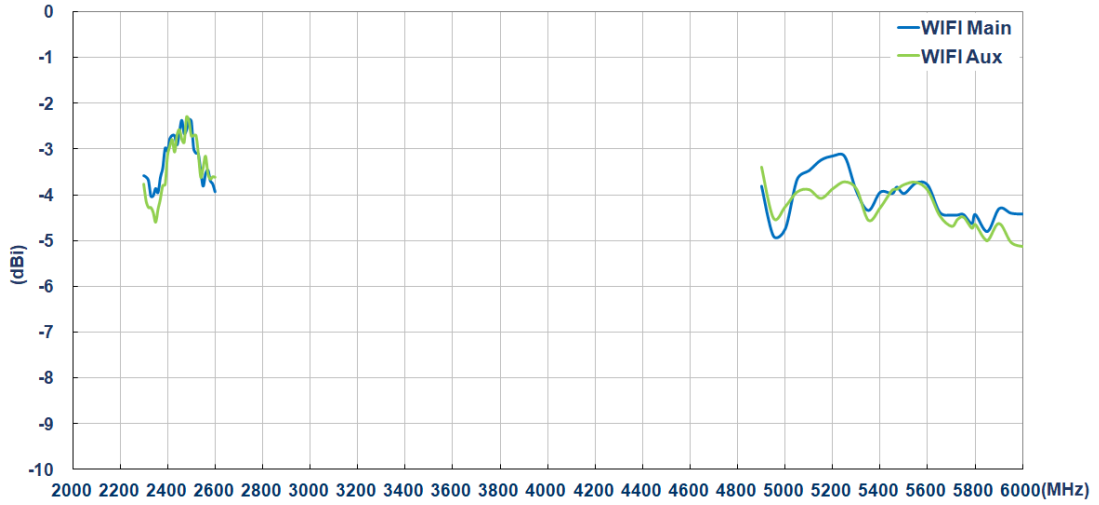
S11 (dB) – WIFI Main / WIFI Aux



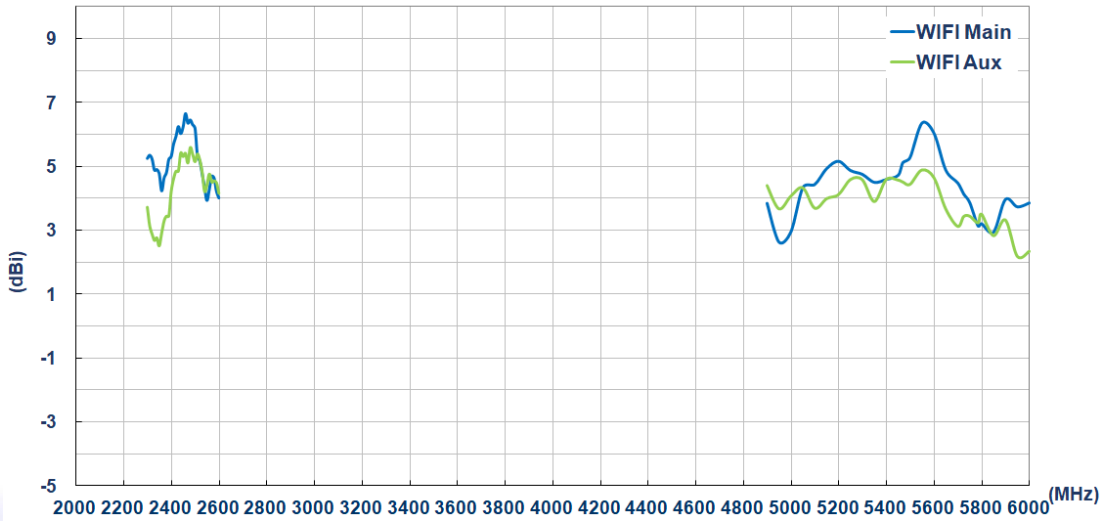
Efficiency (%) – WIFI Main / WIFI Aux



Average Gain (dBi) - WIFI Main / WIFI Aux



Peak Gain (dBi) – WIFI Main / WIFI Aux

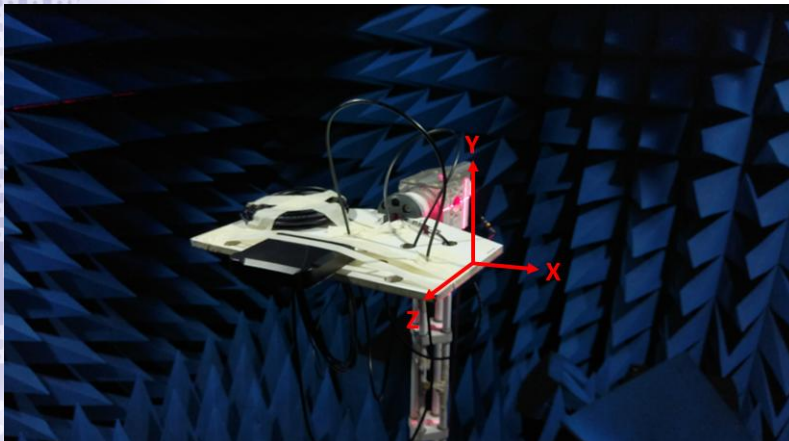


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III. Antenna Radiation Pattern Measurement:

The antenna radiation patterns were measured in Anechoic Chamber.

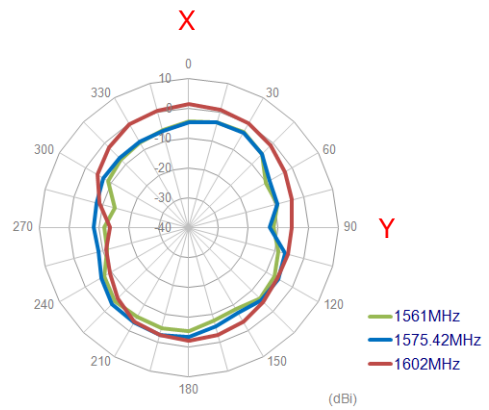
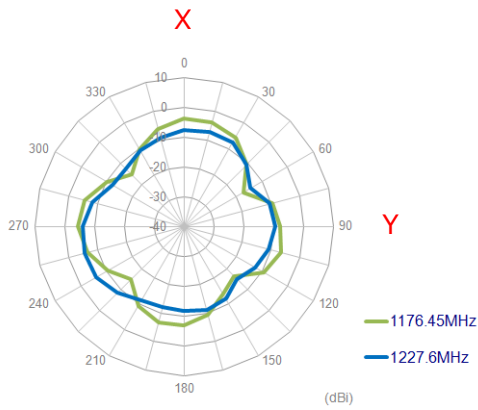
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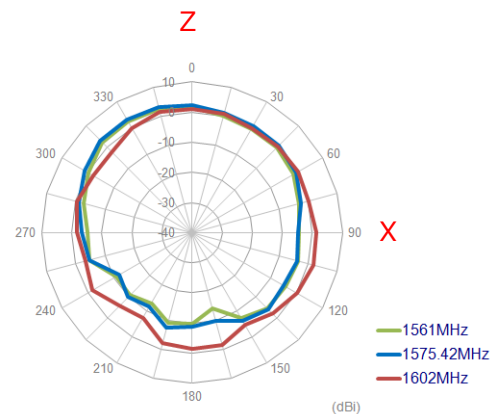
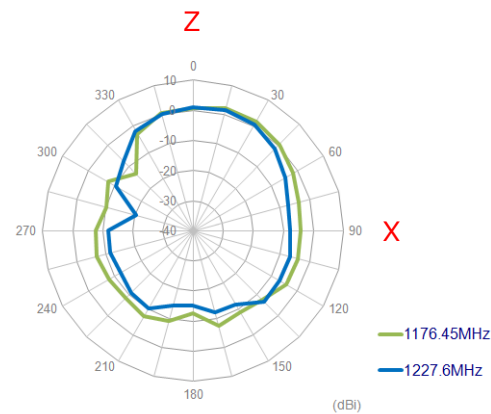
IV. 2D Radiation Pattern:

GNSS

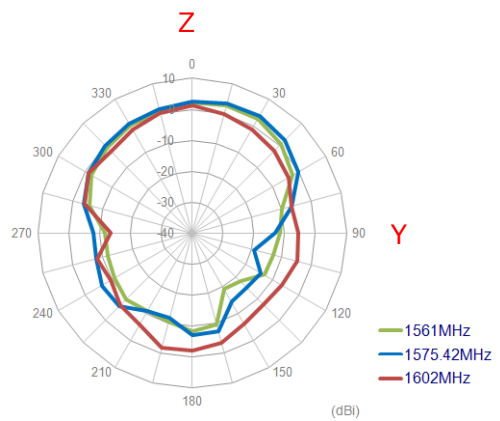
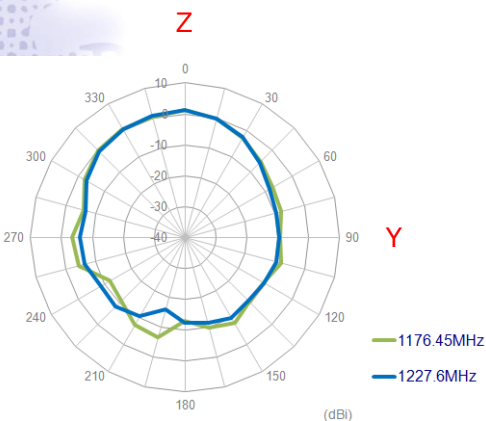
X-Y Plane



X-Z Plane



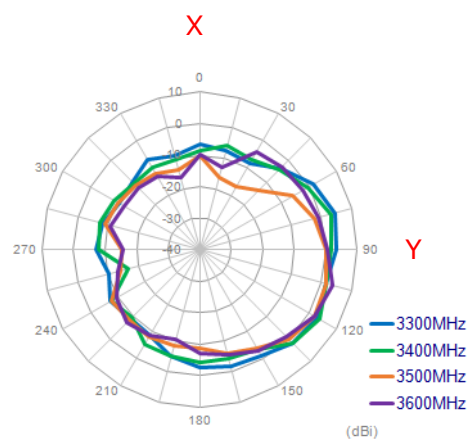
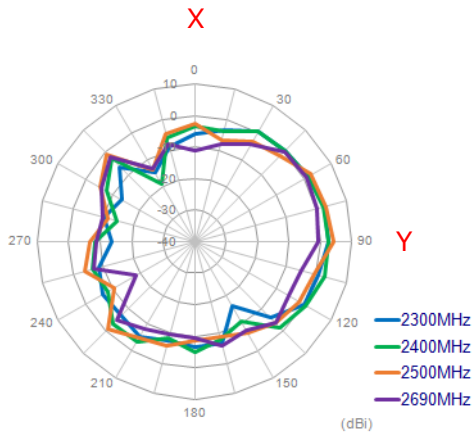
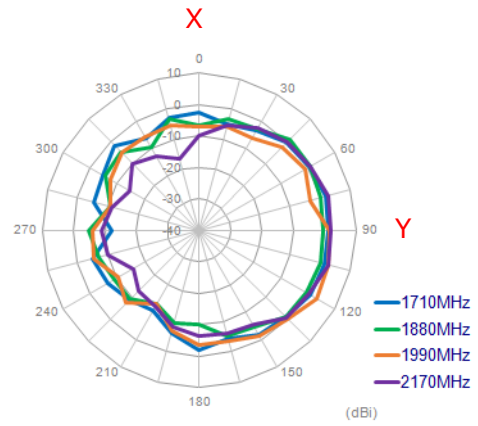
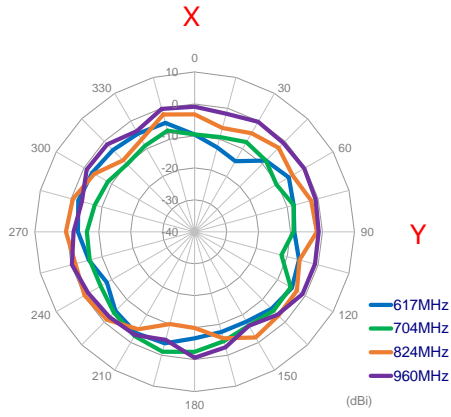
Y-Z Plane



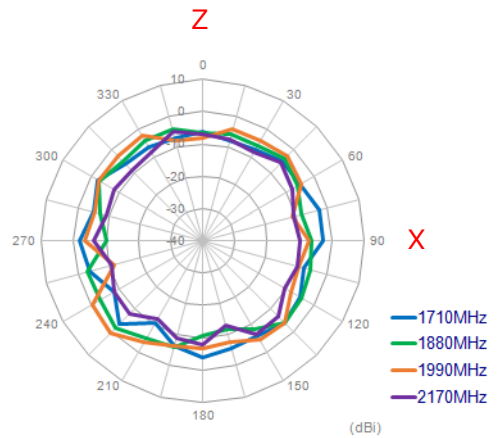
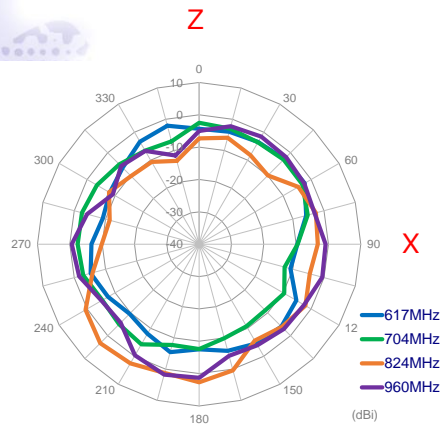
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LTE Main

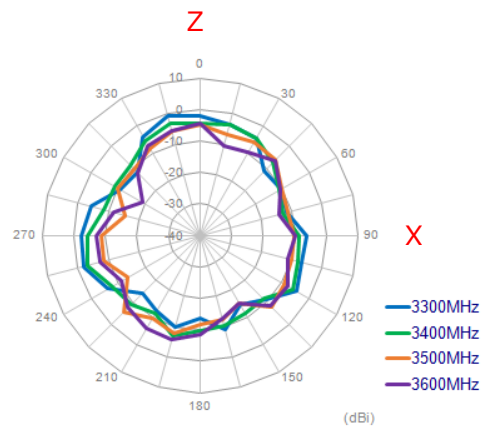
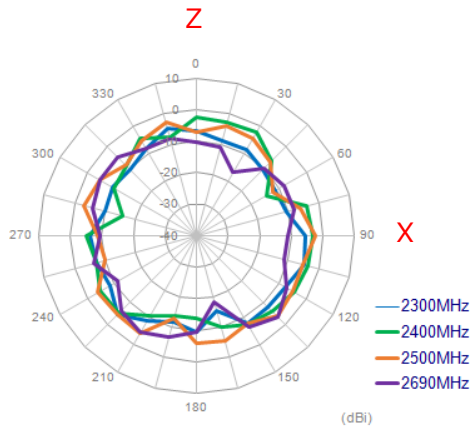
X-Y Plane



X-Z Plane

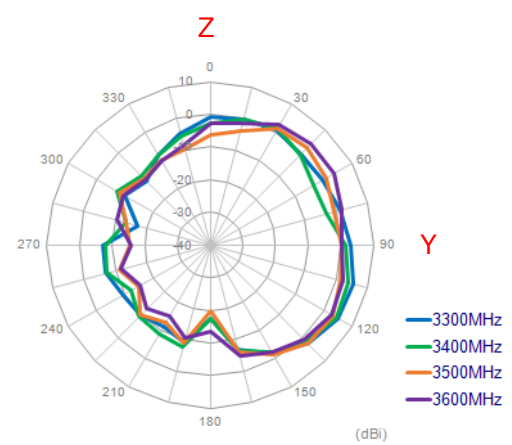
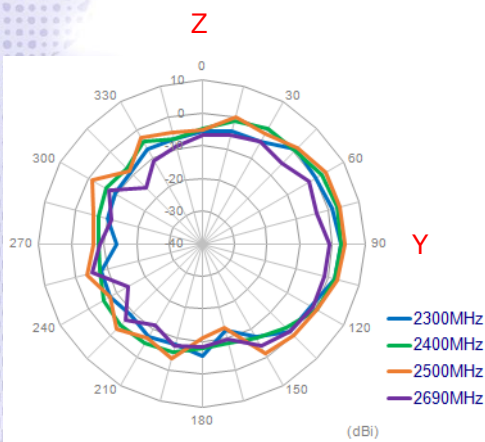
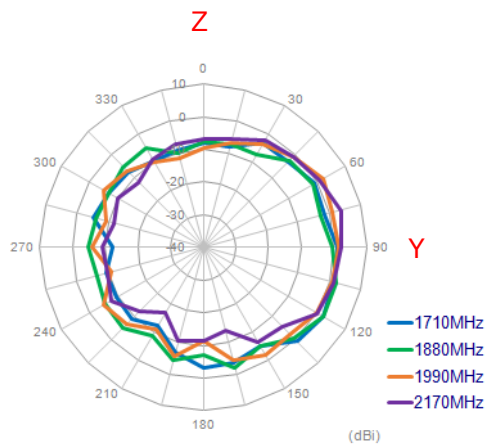
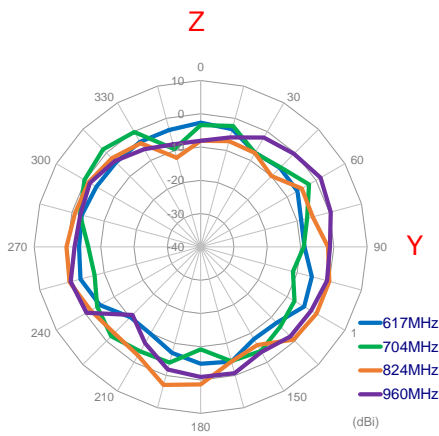


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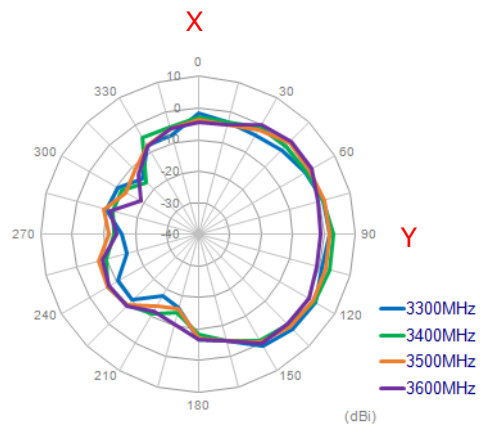
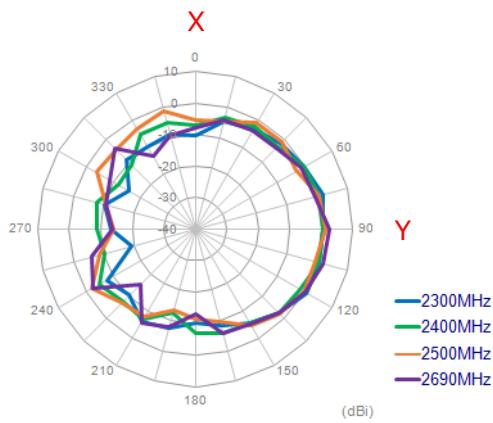
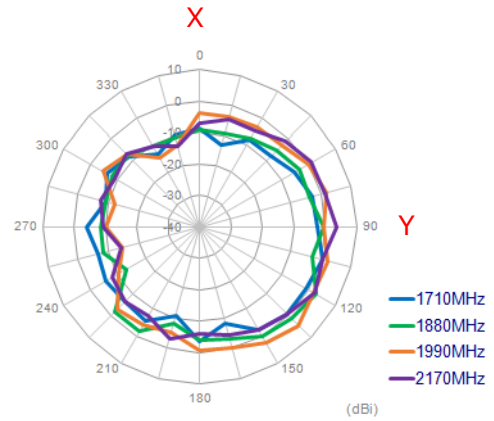
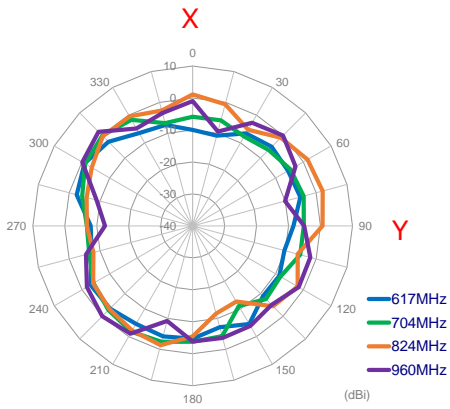
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Y-Z Plane

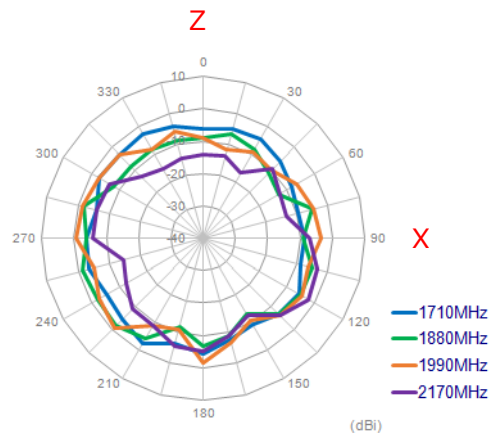
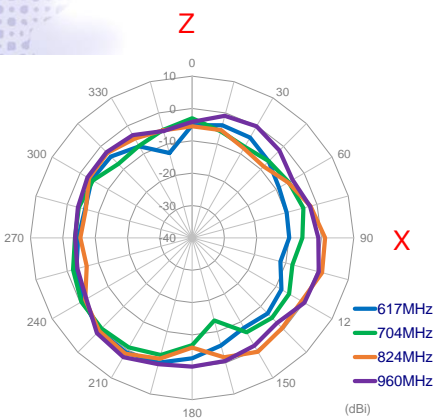


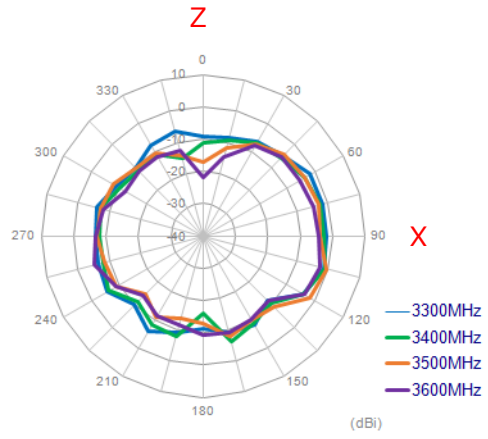
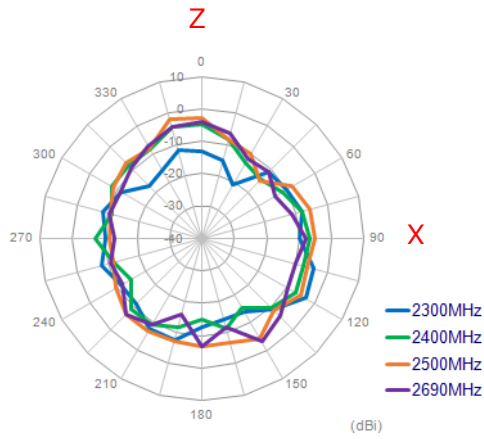
LTE Aux

X-Y Plane



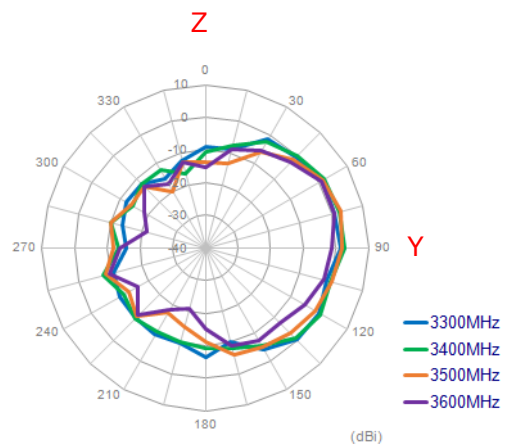
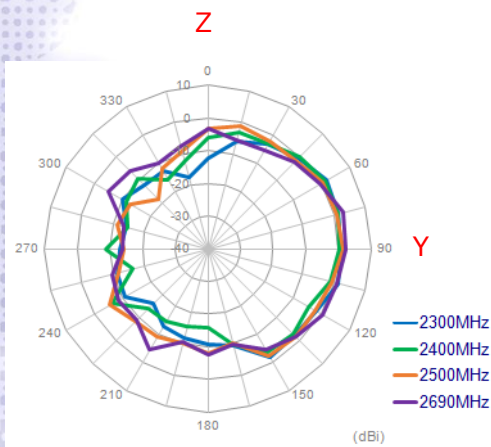
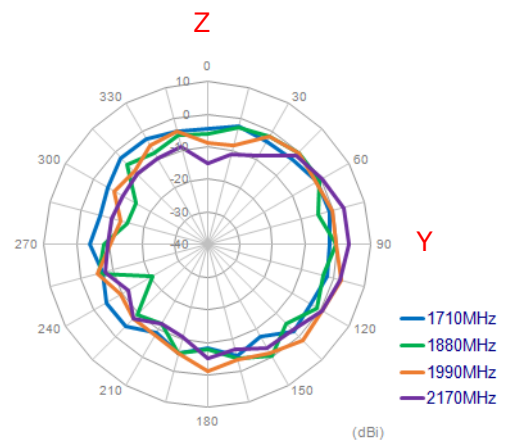
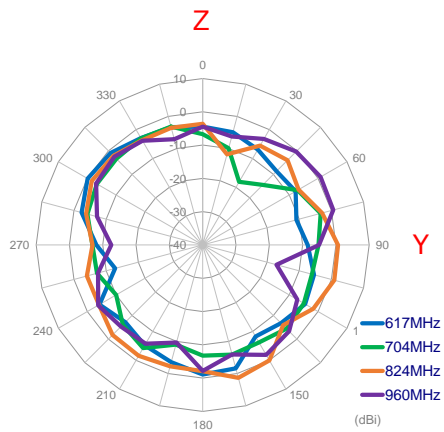
X-Z Plane





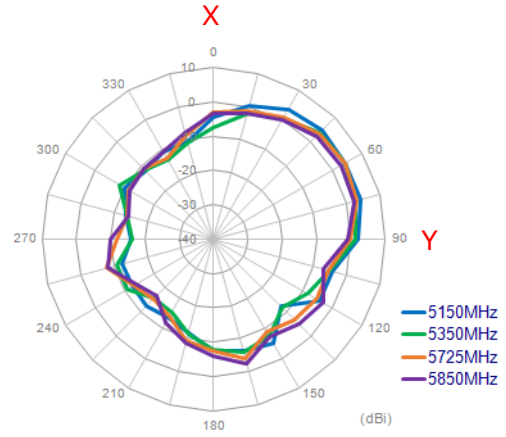
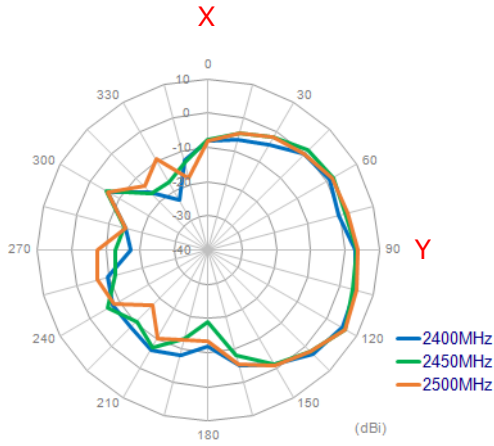
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Y-Z Plane

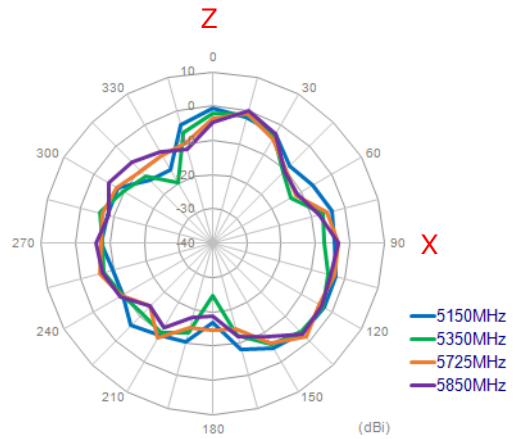
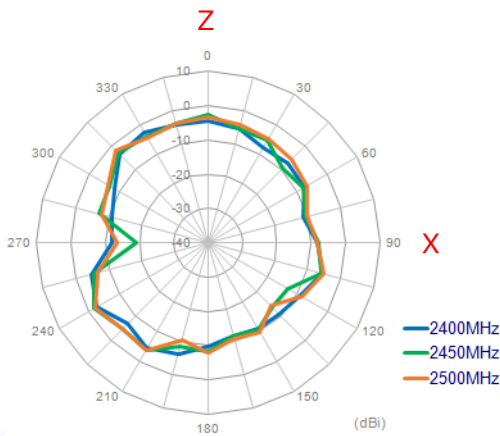


WIFI Main

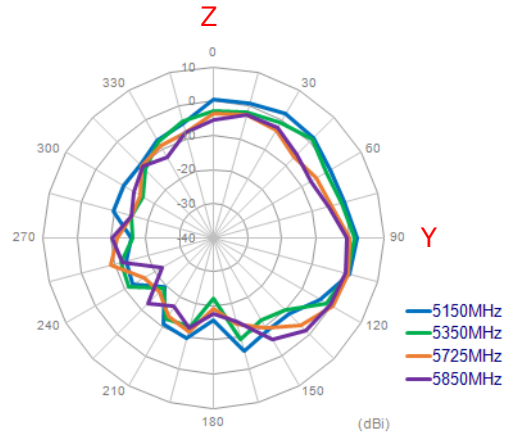
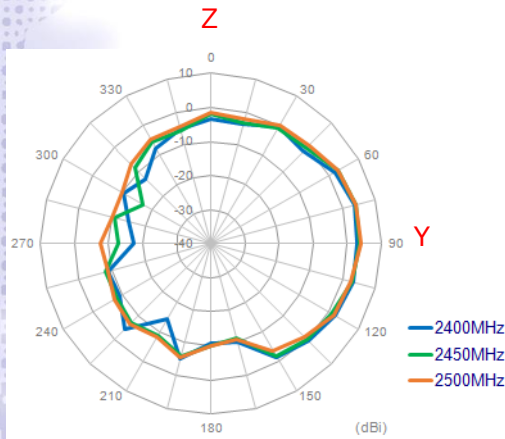
X-Y Plane



X-Z Plane



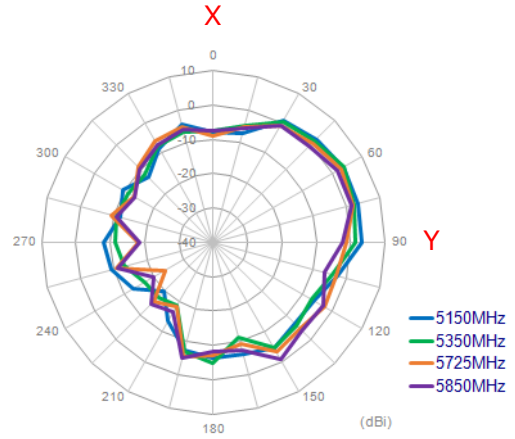
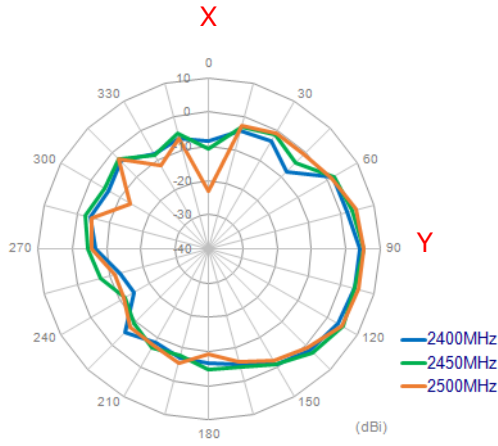
Y-Z Plane



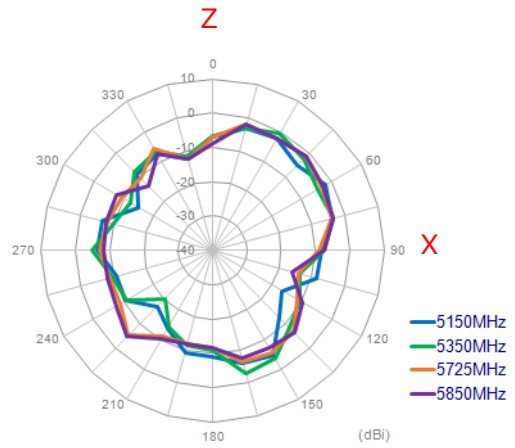
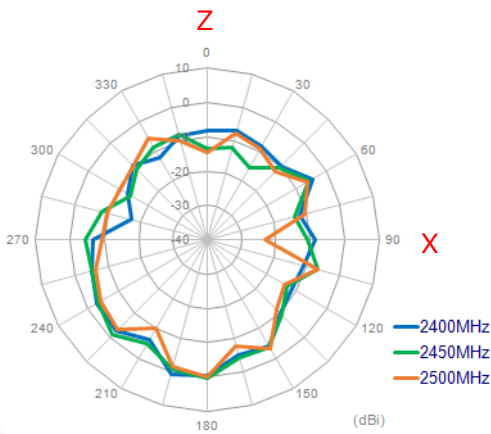
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WIFI Aux

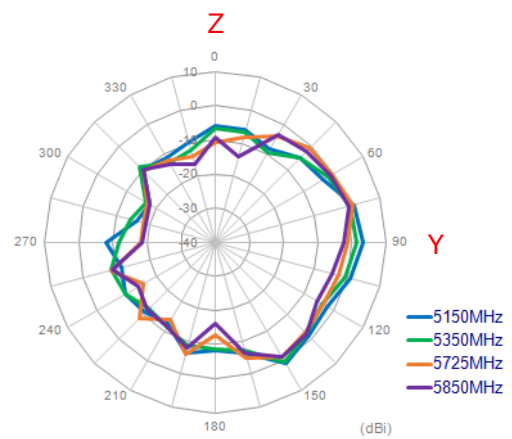
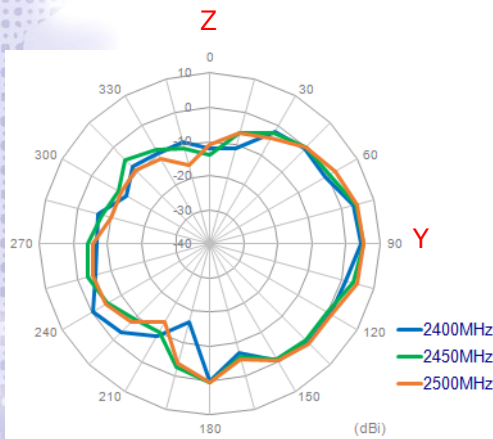
X-Y Plane



X-Z Plane



Y-Z Plane

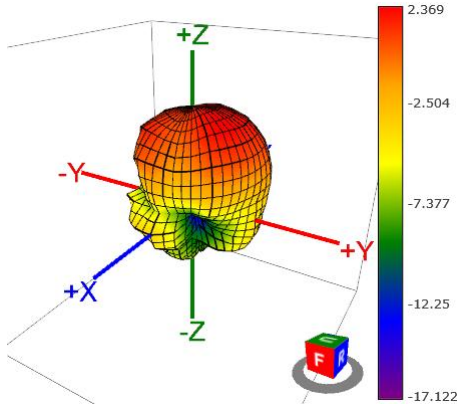


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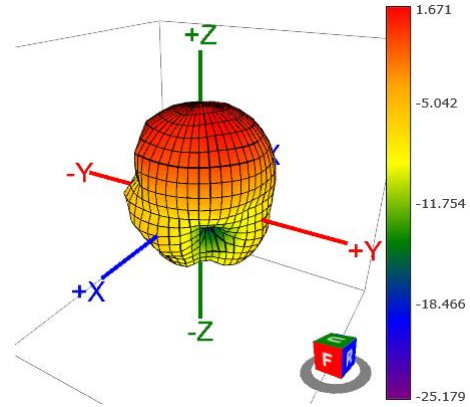
V. 3D Radiation Pattern:

GNSS

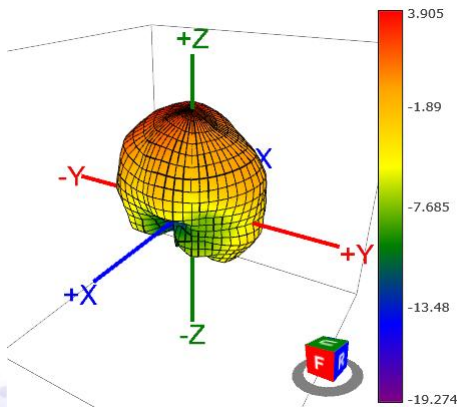
1176.45MHz



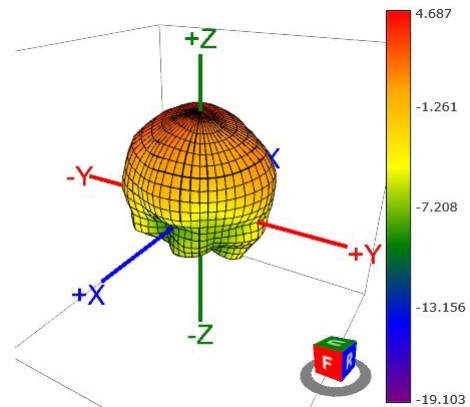
1227.6MHz



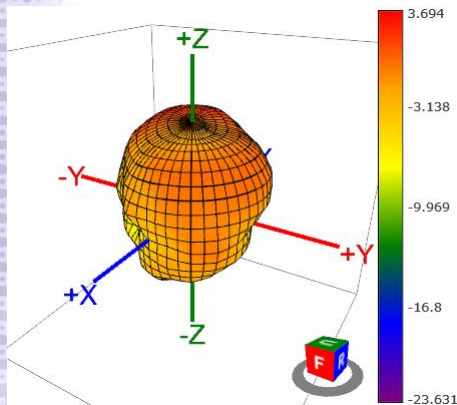
1561MHz



1575.42MHz

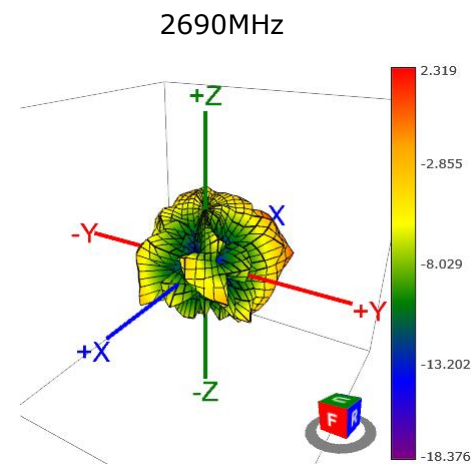
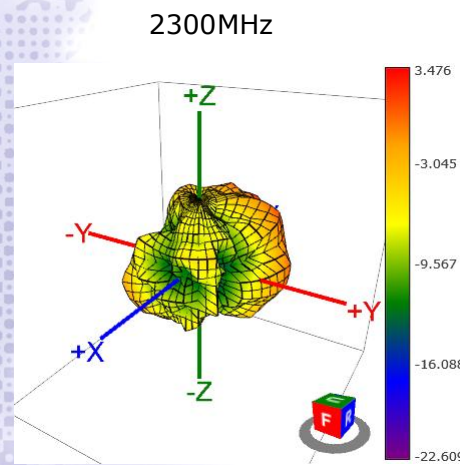
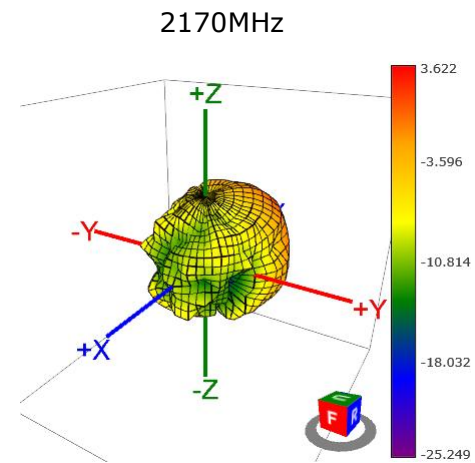
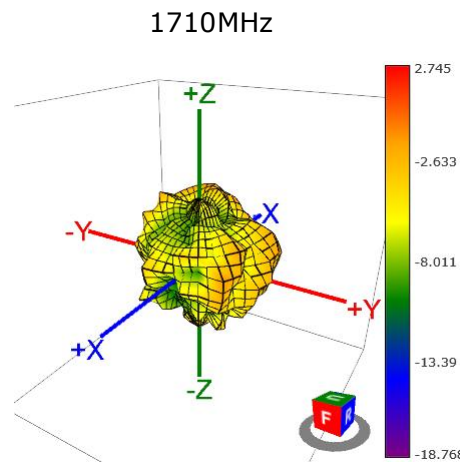
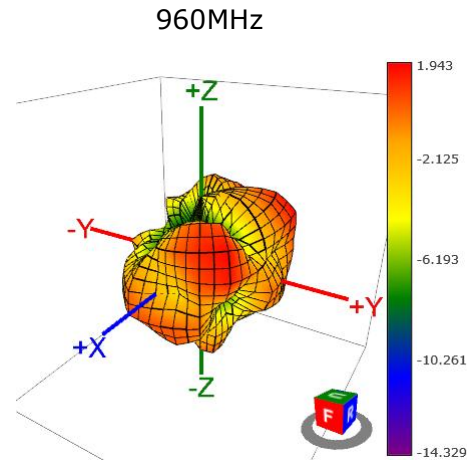
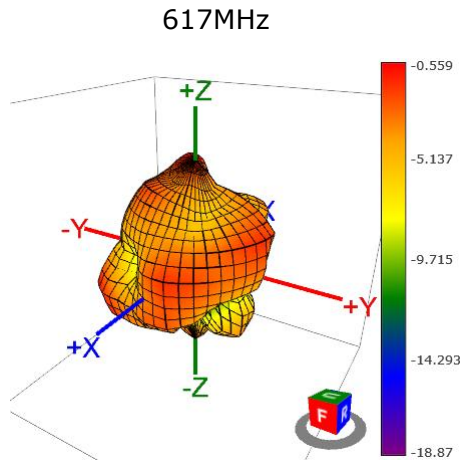


1602MHz

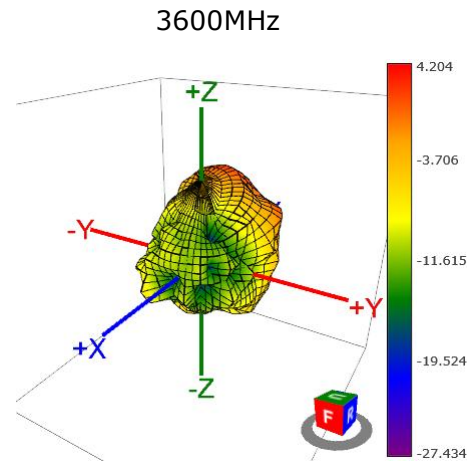
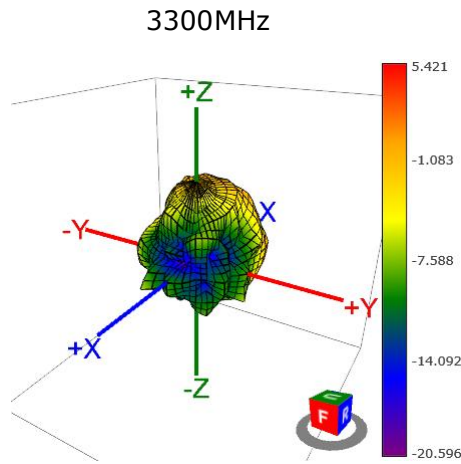


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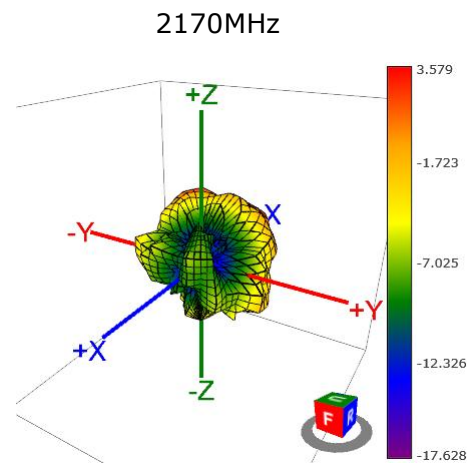
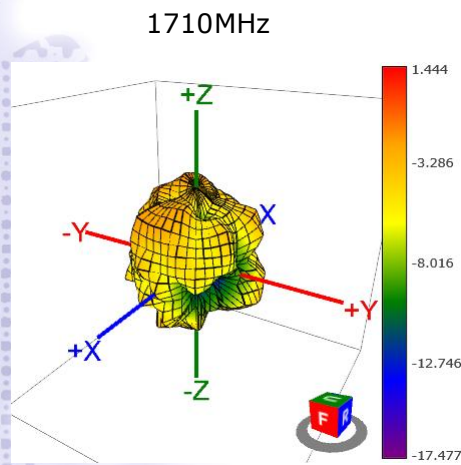
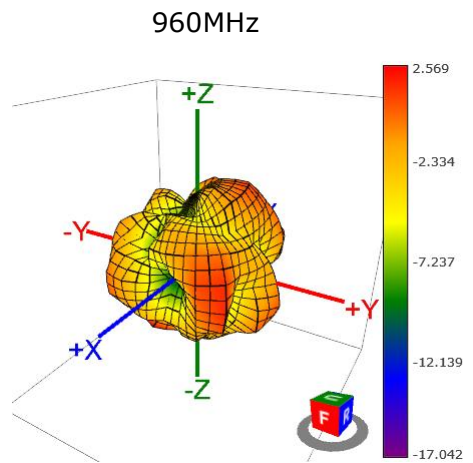
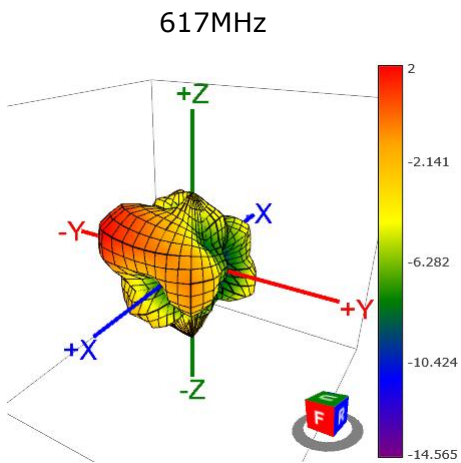
LTE Main



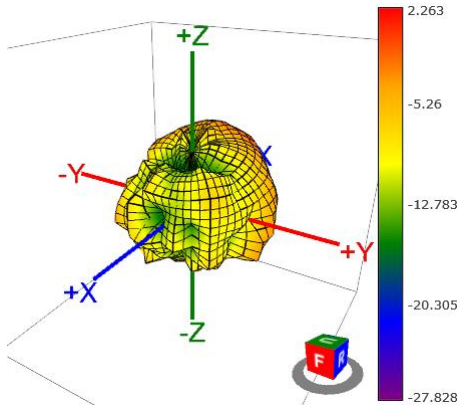
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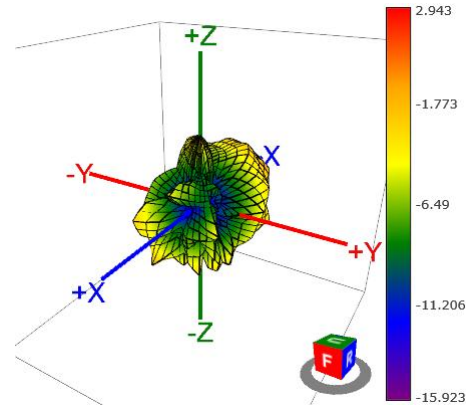
LTE Aux



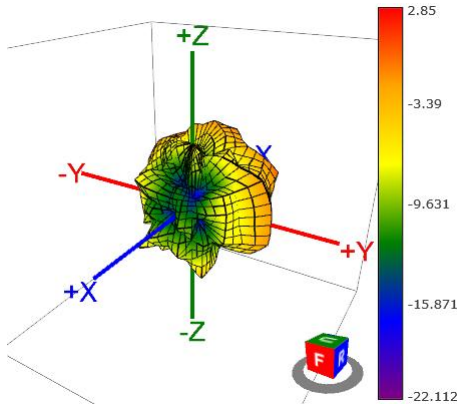
2300MHz



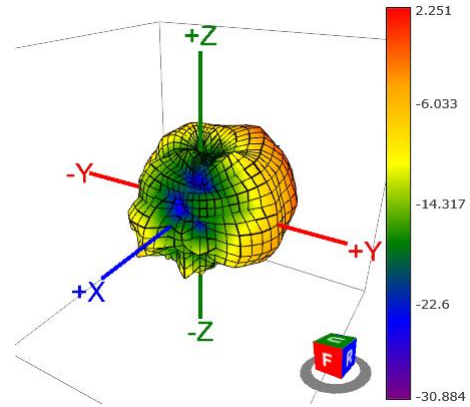
2690MHz



3300MHz

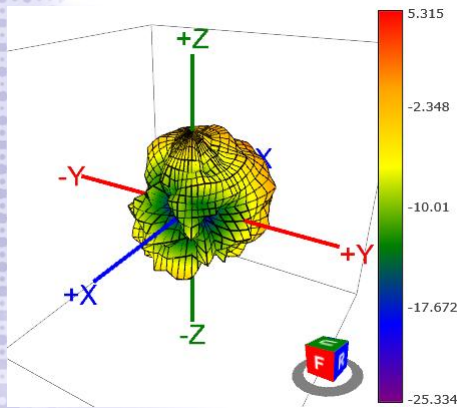


3600MHz

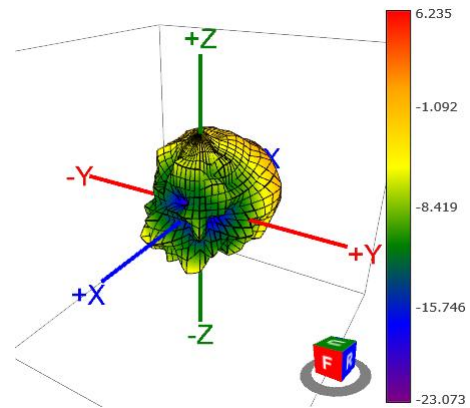


WIFI Main

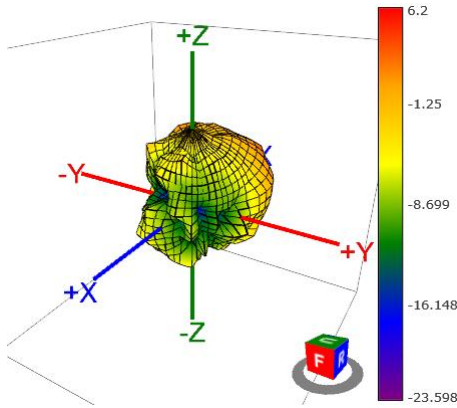
2400MHz



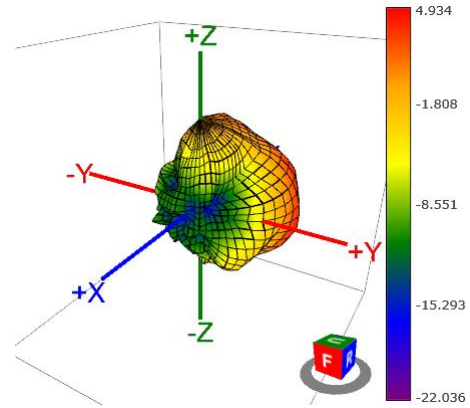
2450MHz



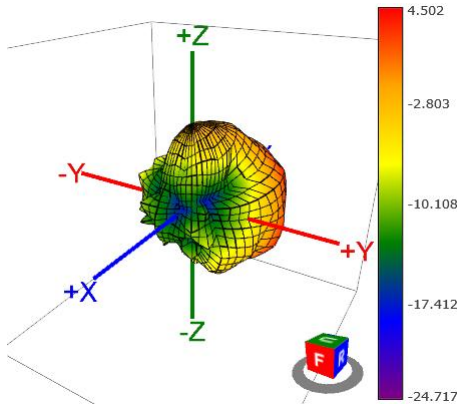
2500MHz



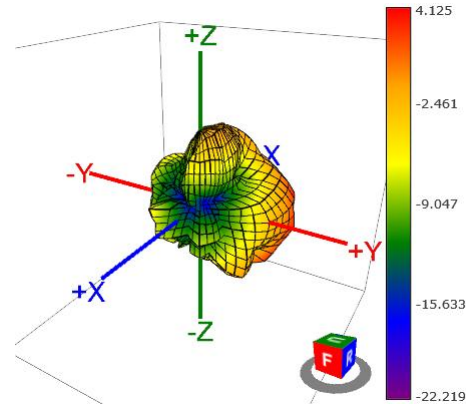
5150MHz



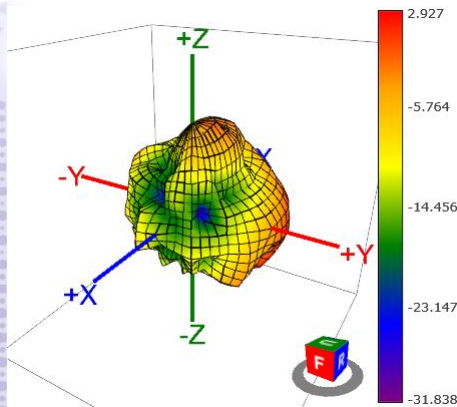
5350MHz



5725MHz



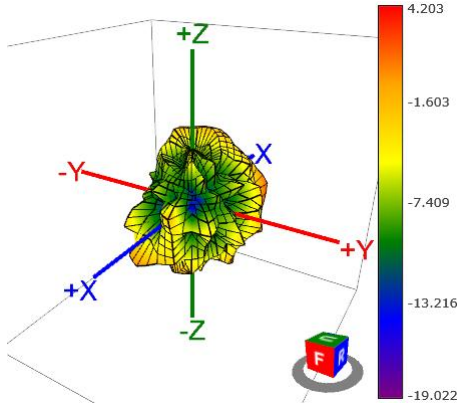
5850MHz



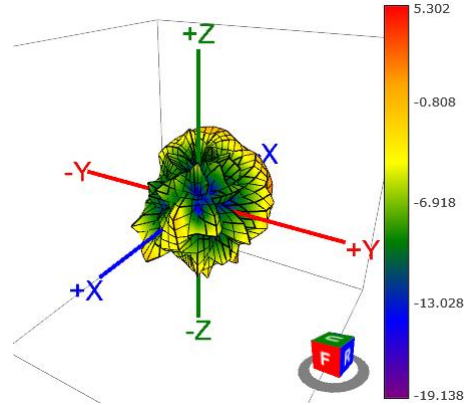
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WIFI Aux

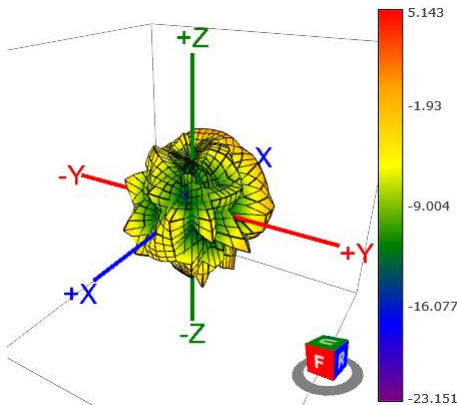
2400MHz



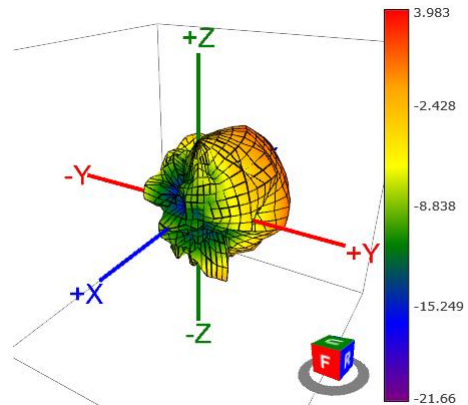
2450MHz



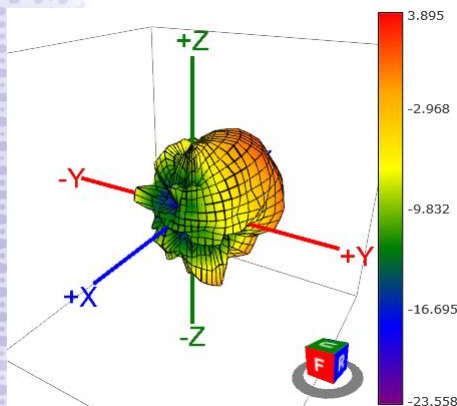
2500MHz



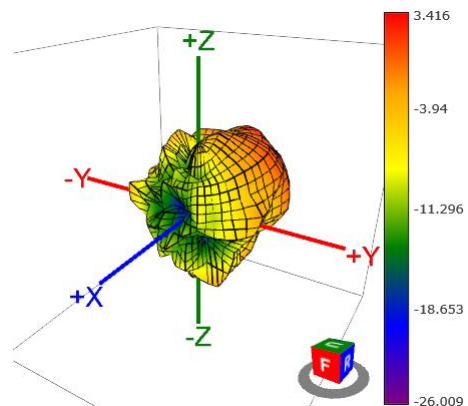
5150MHz



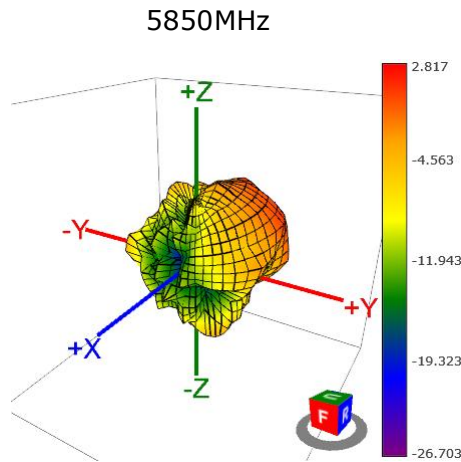
5350MHz



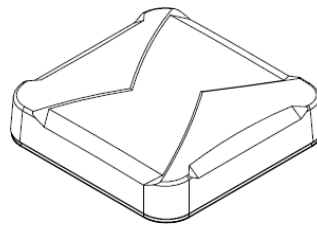
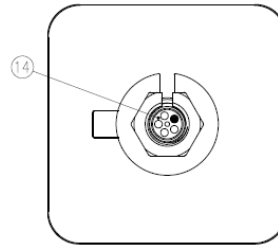
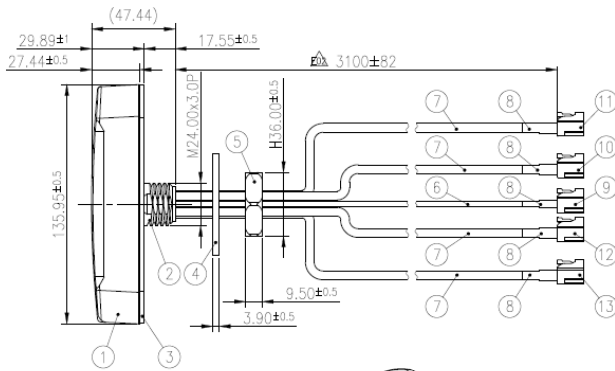
5725MHz



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VI. Mechanical Drawing (Unit:mm):



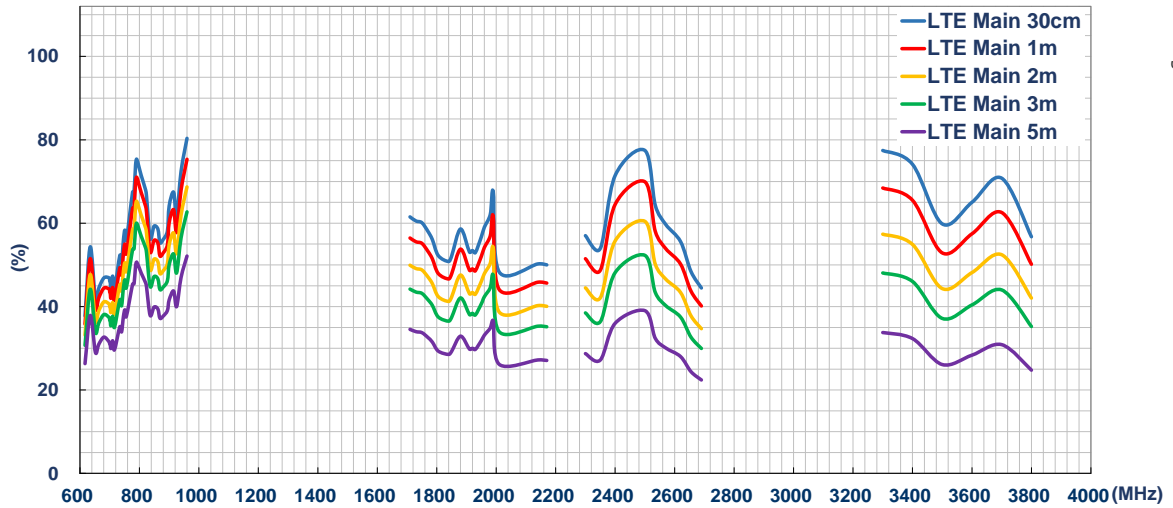
3D View

14	Cable Rubber	Silicone	Black	1
13	Fakra II (L) Connector	PA66	Camine Red	1
12	Fakra II (I) Connector	PA66	Beige	1
11	Fakra II (E) Connector	PA66	Green	1
10	Fakra II (D) Connector	PA66	Bordeaux	1
9	Fakra II (C) Connector	PA66	Blue	1
8	Heat Shrink Tube	EVA	Black	5
7	Cable SNC200	PVC	Black	4
6	Cable H100	PVC	Black	1
5	Nut	Steel	Zn Plated	1
4	Washer	Steel	Zn Plated	1
3	Adhesive	Silicone	White Liner	1
2	Bottom Base	Zinc Alloy	Ni Plated	1
1	Top Housing	PC+ABS	Black	1
No	NAME	MATERIAL	FINISH	Q'TY

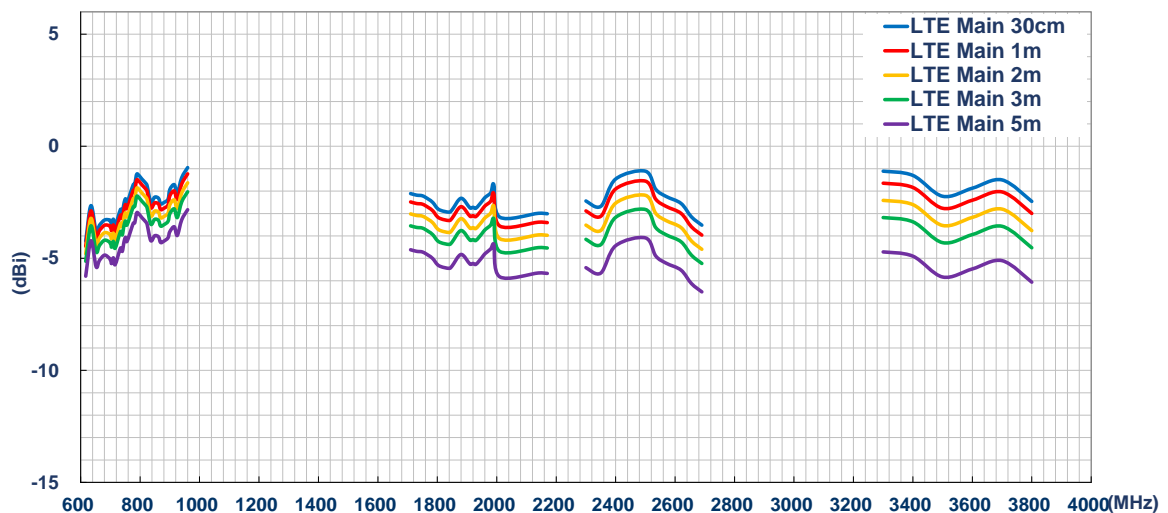
VII. Applications Note:

The antenna performance with different cable lengths is shown below.

Efficiency (%) – LTE Main

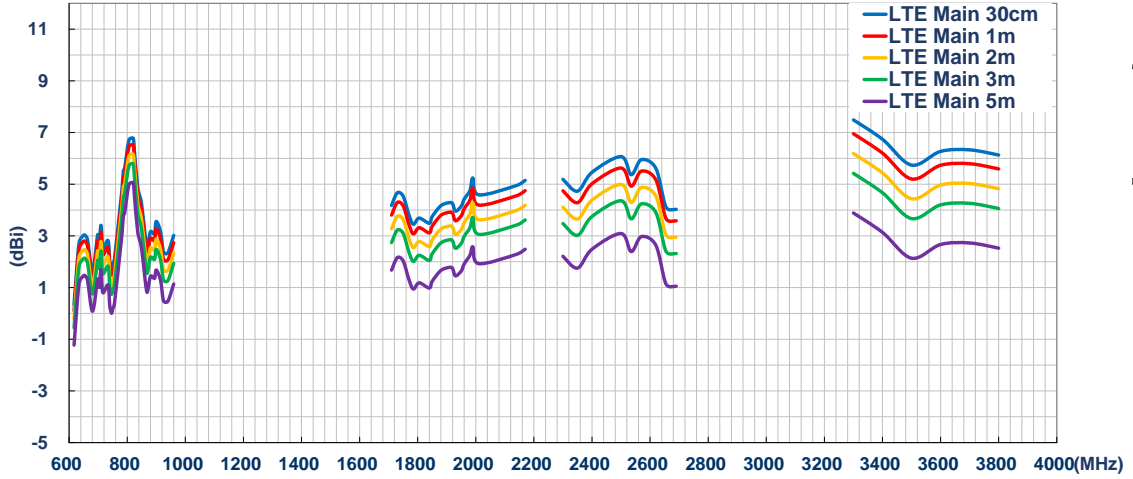


Average Gain (dBi) - LTE Main



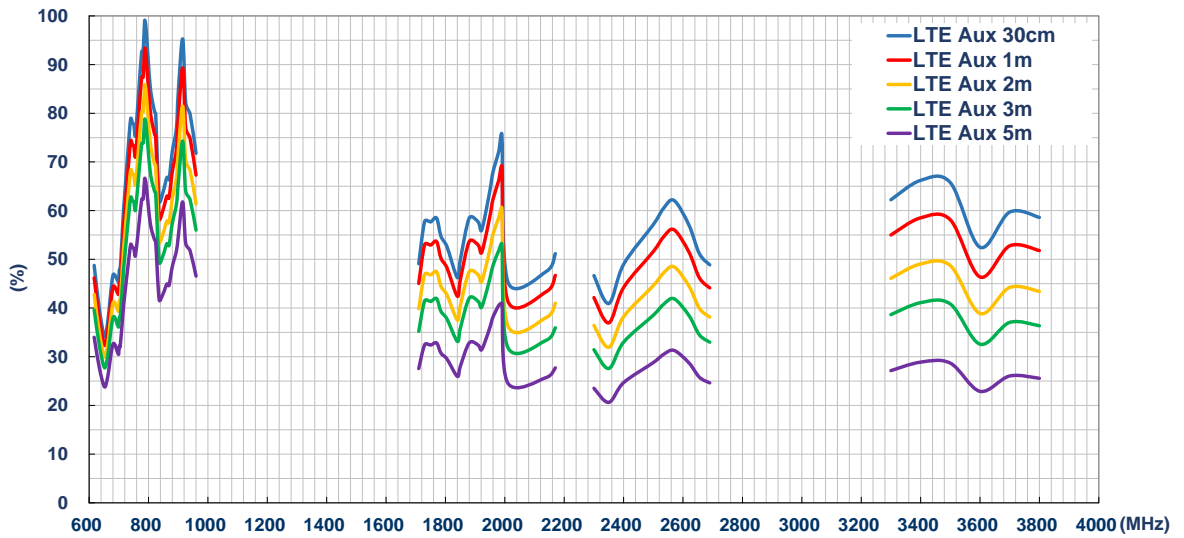
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Peak Gain (dBi) – LTE Main

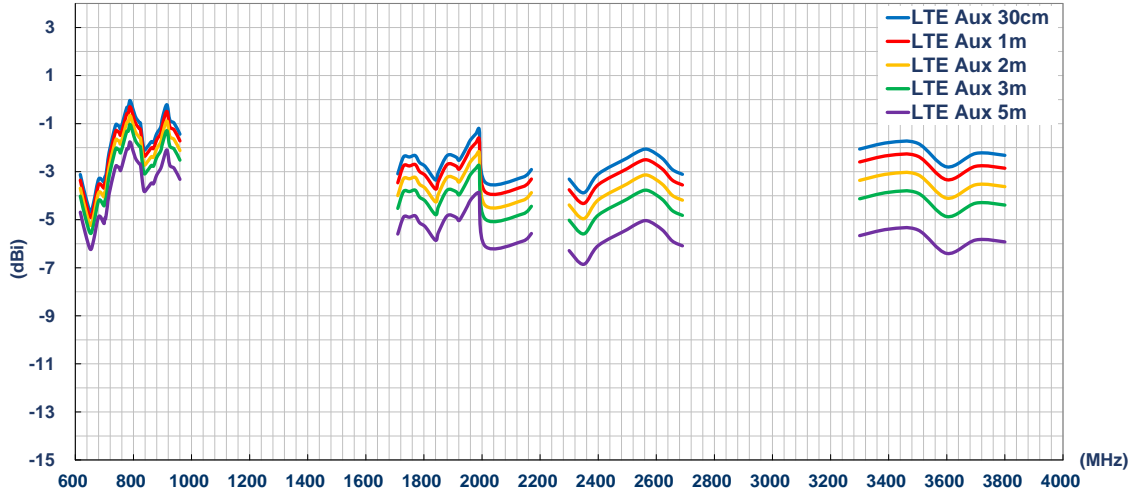


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Efficiency (%) – LTE Aux

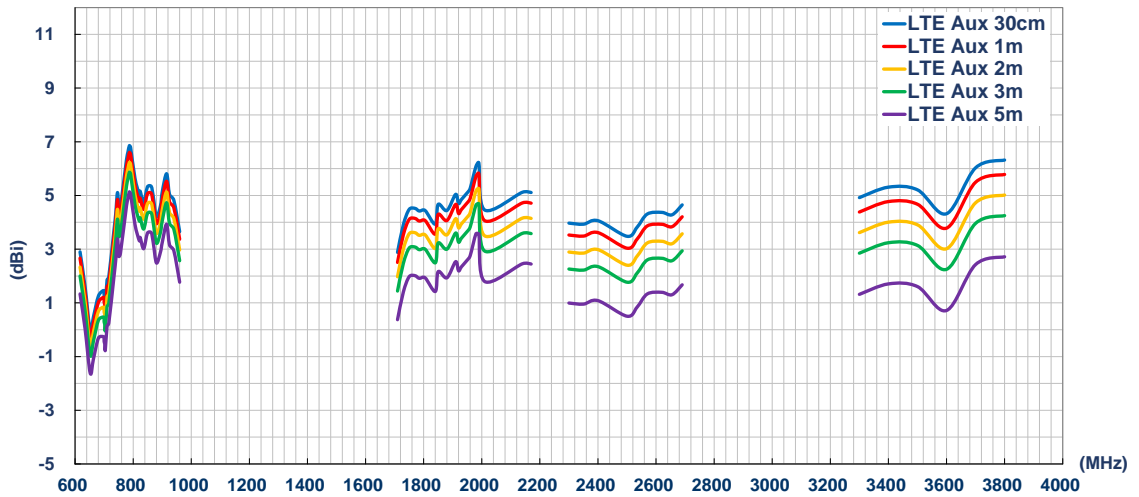


Average Gain (dBi) - LTE Aux

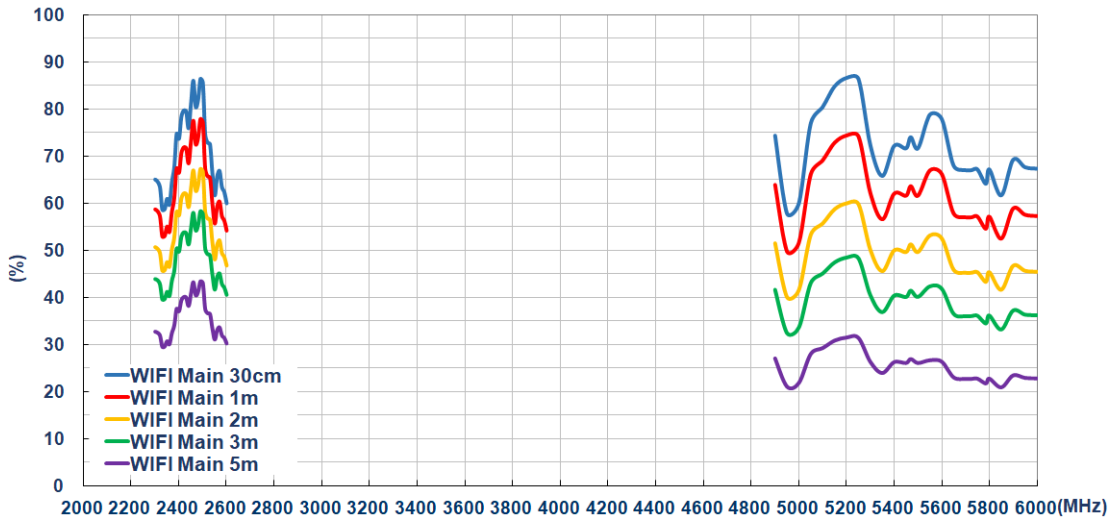


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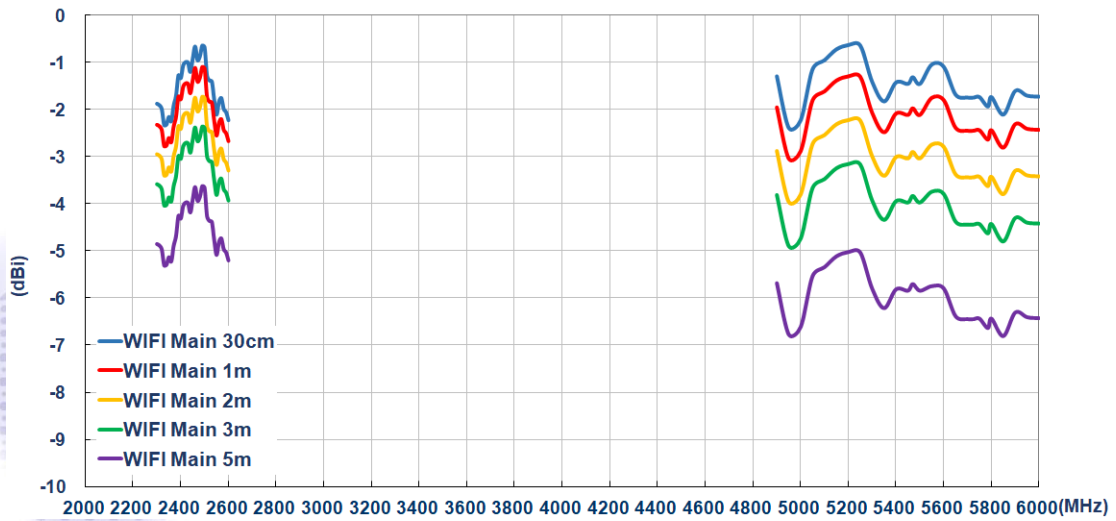
Peak Gain (dBi) - LTE Aux



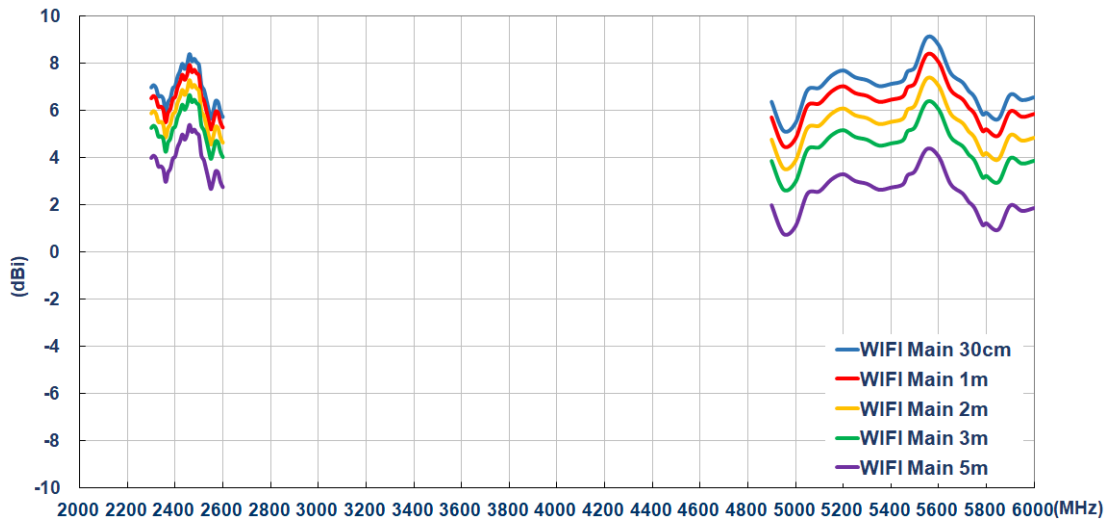
Efficiency (%) - WIFI Main



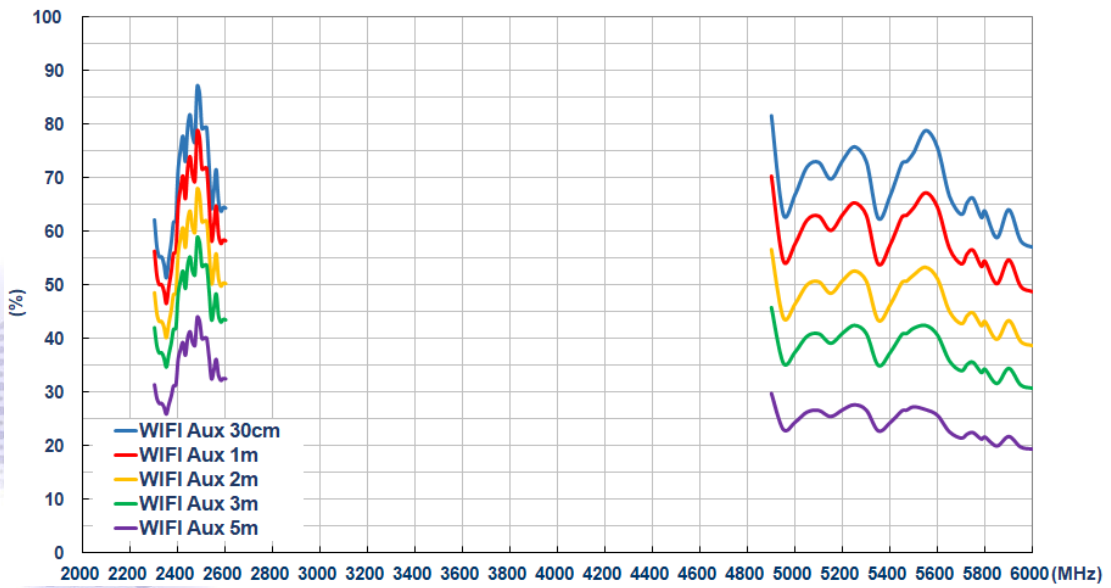
Average Gain (dBi) - WIFI Main



Peak Gain (dBi) – WIFI Main

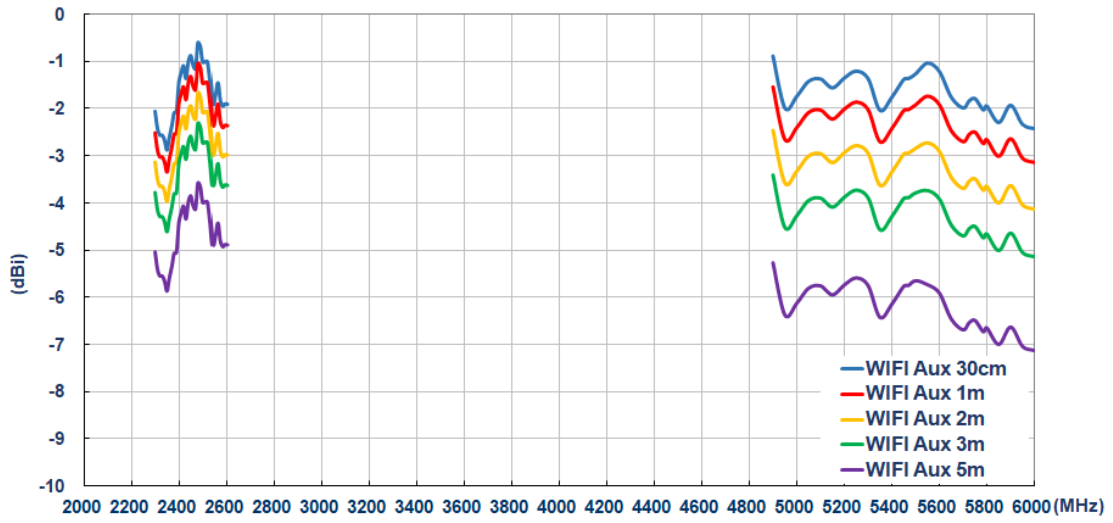


Efficiency (%) – WIFI Aux



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Average Gain (dBi) - WIFI Aux



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Peak Gain (dBi) – WIFI Aux

