



TAOGLAS®



Datasheet

Genesis II

Part No:
MA285.LBICG.026

Description:

Genesis II- 5in1 GNSS 2M RG-174LL FAKRA Code C Blue SMB(F) (GEN 2.0) LTE 1&2 2M RG-174LL Dual Mini FAKRA Vertical Code D Violet Plug Wi-Fi 1&2 2M RG-174LL Dual Mini FAKRA Code F Brown Plug

Features:

GPS/ GLONASS/BeiDou/Galileo
4G MIMO with fallback to 3G/2G
Dual Band Wi-Fi MIMO
Robust PC/ABS, IP67 Rated Enclosure
1.8~5.5V/30dB LNA
Cable: LTE: 2M RG-174LL, Wi-Fi: 2M RG-174LL & GNSS: 2M RG-174LL
Connector: LTE: Dual Mini FAKRA Vertical Code D Violet Plug
Wi-Fi: Dual Mini FAKRA Code F Brown Plug & GNSS: FAKRA Code C Blue SMB(F) (GEN 2.0)
Connectors Fully Customizable
Dimensions: 151.8 x 59 x 13mm
RoHS & REACH Compliant

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1. Introduction



The Taoglas MA285 is one of the smallest 5-in-1 low profile, adhesive mount, combination antennas on the market. Comprising of GNSS, 2* LTE MIMO and 2* Wi-Fi MIMO, this unique antenna delivers powerful 4G antenna technology, that includes backward compatibility to work at most worldwide 3G and 2G bands. Coupled with GPS, GLONASS & BeiDou and dual-band 2.4/5.8GHz Wi-Fi MIMO, it is ideal for next generation, multiple wireless technology systems, such as vehicle telematics and applications that require highly sophisticated antennas for real-time streaming demanding high-speed video uplink and downlink into the cabin of the vehicle. These challenges are resolved by the highly efficient, high gain MIMO antennas, with high isolation, all of which is necessary to achieve the required signal to noise ratio and throughput.

The Cellular & Wi-Fi antennas have an omnidirectional radiation pattern and the robust PC/ABS enclosure is fully IP67 waterproof and design for use in the harshest of environments. The GNSS antenna has been carefully designed to work equally well on both GPS/Galileo and GLONASS bands, leading to higher location accuracy and stability of tracking in urban environments.

Typical Applications Include:

- Next Generation OEM Automotive Connectivity
- Multimedia, Navigation and Telematics Systems
- V2V, V2X and Fleet Management Applications
- Real-time HD Video Streaming
- Digital Signage and Remote Monitoring
- First Net Responder Routers

Cable length and connector types are fully customizable. Contact your regional Taoglas customer support team to request these services or additional support to integrate and test this antenna's performance in your device.

2. Specifications

GNSS Frequency Bands Covered							
GPS/QZSS	L1 1575.42MHz	L2 1227.6MHz	L5 1176.45MHz	L6 1278.75MHz			
	■	□	□	□			
GLONASS	L5R 1176.45MHz	L3PT 1201.5MHz	L2PT 1246MHz	L1CR 1575.42MHz	L1PT 1602MHz		
	□	□	□	■	■		
Galileo	E5a 1176.45MHz	E5b 1201.5MHz	E4 1215MHz	E3 1256MHz	E6 1278.75MHz	E2 1561MHz	L1 1575.42MHz
	□	□	□	□	□	■	■
BeiDou	B1 1561MHz	B2 1207.14MHz	B3 1268.52MHz				
	■	□	□				
Compass	E5B(B2)/ E6(B3) 1268.56MHz	E2(B1) 1561MHz					
	□	■					
SBAS	Omnistar 1542.5MHz	WAAS/EGN OS 1575.42MHz					
	□	■					

Cellular Antenna

Band		LTE700	GSM850	GSM900	5G Bands 74,75,76	DCS	PCS	UMTS1	LTE2600	5G Bands 42,43,48,78
Frequency (MHz)		698~803	824~894	880~960	1427-1518	1710~1880	1850~1990	1920~2170	2300~2690	3300-3800
Efficiency (%)										
MIMO1	0.3m	56.88	64.17	68.41	67.53	62.92	60.73	62.35	61.23	42.11
	1m	53.80	61.28	65.33	63.02	57.39	55.39	57.31	55.84	37.17
	2m	50.21	56.24	59.59	56.3	51.13	48.72	50.18	48.36	31.35
	3m	46.49	52.16	55.25	50.06	45.48	43.10	44.40	42.01	26.38
	5m	43.05	48.38	51.24	44.49	40.44	38.14	39.28	36.50	22.19
MIMO2	0.3m	65.41	53.23	49.54	43.20	74.95	76.59	79.35	75.16	60.02
	1m	61.77	50.84	47.31	40.32	68.35	69.85	72.93	68.55	52.87
	2m	57.64	46.66	43.15	36.02	60.88	61.42	63.88	59.35	44.8
	3m	53.46	43.27	40.02	32.03	54.16	54.35	56.50	51.56	37.72
	5m	49.59	40.12	37.12	28.47	48.16	48.09	49.98	44.80	31.74
Average Gain (dB)										
MIMO1	0.3m	-2.45	-1.93	-1.65	-1.71	-2.01	-2.17	-2.05	-2.13	-3.79
	1m	-2.69	-2.13	-1.85	-2.01	-2.41	-2.57	-2.42	-2.53	-4.33
	2m	-2.99	-2.50	-2.25	-2.49	-2.91	-3.12	-2.99	-3.16	-5.07
	3m	-3.33	-2.83	-2.58	-3.01	-3.42	-3.66	-3.53	-3.77	-5.82
	5m	-3.66	-3.15	-2.90	-3.52	-3.93	-4.19	-4.06	-4.38	-6.57
MIMO2	0.3m	-1.84	-2.74	-3.05	-3.66	-1.25	-1.16	-1.00	-1.24	-2.22
	1m	-2.09	-2.94	-3.25	-3.96	-1.65	-1.56	-1.37	-1.64	-2.77
	2m	-2.39	-3.31	-3.65	-4.45	-2.16	-2.12	-1.95	-2.27	-3.49
	3m	-2.72	-3.64	-3.98	-4.96	-2.66	-2.65	-2.48	-2.88	-4.24
	5m	-3.05	-3.97	-4.30	-5.48	-3.17	-3.18	-3.01	-3.49	-4.99
Peak Gain (dBi)										
MIMO1	0.3m	2.49	2.84	2.58	2.58	4.05	4.63	5.01	3.85	1.02
	1m	2.29	2.64	2.38	2.28	3.65	4.23	4.71	3.45	0.49
	2m	1.99	2.34	1.98	1.79	3.15	3.63	4.11	2.85	-0.25
	3m	1.61	1.94	1.68	1.29	2.55	3.13	3.51	2.25	-1
	5m	1.31	1.54	1.38	0.76	1.95	2.63	2.91	1.65	-1.75
MIMO2	0.3m	2.98	3.35	2.83	0.64	4.69	3.58	4.20	4.22	2.39
	1m	2.68	3.15	2.63	0.34	4.29	3.18	3.90	3.82	1.84
	2m	2.38	2.75	2.23	-0.15	3.79	2.58	3.30	3.22	1.12
	3m	2.08	2.45	1.93	-0.66	3.29	2.08	2.70	2.62	0.37
	5m	1.78	2.15	1.63	-1.17	2.79	1.58	2.10	2.02	-0.37
Impedance			50 Ω							
Polarization			Linear							

Wi-Fi Antenna (2.4GHz/5.8GHz)			
Frequency (MHz)		2400~2500	4900~5850
Efficiency (%)			
MIMO 1	0.3m	56.61	64.55
	1m	51.63	55.53
	2m	47.11	47.78
	3m	41.01	38.77
	5m	31.11	25.47
MIMO 2	0.3m	52.46	67.41
	1m	47.84	58.00
	2m	43.63	49.89
	3m	38.00	40.49
	5m	28.83	26.60
Average Gain (dB)			
MIMO 1	0.3m	-2.21	-0.87
	1m	-2.61	-1.47
	2m	-3.01	-2.07
	3m	-3.61	-2.87
	5m	-4.81	-4.67
MIMO 2	0.3m	-2.13	-1.10
	1m	-2.53	-1.74
	2m	-2.93	-2.34
	3m	-3.53	-3.14
	5m	-4.73	-4.94
Peak Gain (dBi)			
MIMO 1	0.3m	2.12	4.10
	1m	1.72	3.44
	2m	1.12	2.53
	3m	0.52	1.62
	5m	-0.68	-0.21
MIMO 2	0.3m	2.16	3.62
	1m	1.76	2.96
	2m	1.16	2.05
	3m	0.56	1.14
	5m	-0.64	-0.69
Impedance		50 Ω	
Return loss		< -6 dB	
Polarization		Linear	

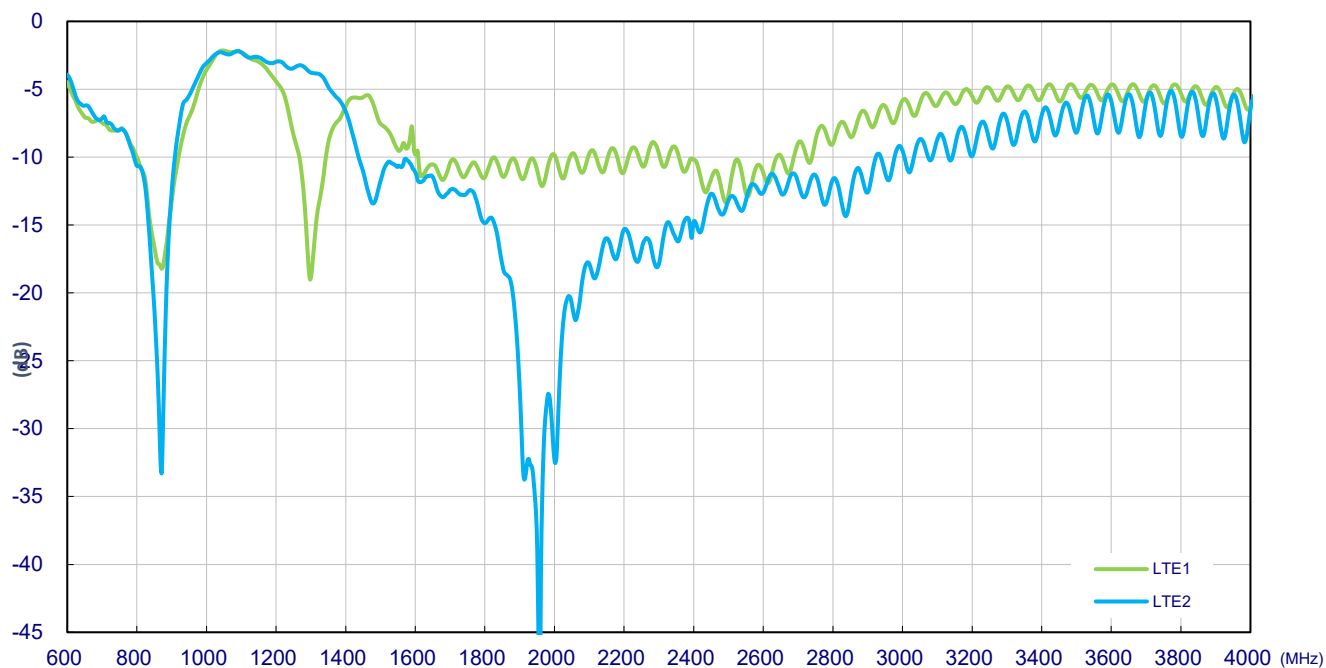
GNSS Antenna			
Frequency	BeiDou: 1561.098 ± 2.046MHz. GPS: 1575.42 ± 1.023MHz GLONASS: 1602 ± 5MHz		
Bandwidth	12.5 MHz min		
Return Loss	<-10 dB		
Return loss (GPS L1 GLONASS L1)	< -10 dB		
Passive Gain at Zenith (GPS L1 and GLONASS L1)	+2.3 dBi typ.		
Polarization	RHCP		
Impedance	50 Ω		
LNA Out-band Attenuation	fo = 1575.42MHz fo ± 50 MHz 8dB Min. fo ± 100 MHz 22dB Min. fo ± 150 MHz 26dB Min.		
Input Voltage	Min:1.8V	Typ. 3.0V	Max: 5.5V
Total Gain @ Zenith	25.3dBi	25.5dBi	25.3dBi
Current Consumption	5 mA	10 mA	23 mA
Noise Figure	3.0 dB	2.8 dB	3.0 dB
Mechanical			
Dimensions	151.8*59*13 mm		
Cable	LTE MIMO1/ MIMO2: 2M RG-174LL Wi-Fi MIMO1/MIMO2 : 2M RG-174LL GNSS: 2M RG-174LL		
Connector	LTE: Dual Mini FAKRA Vertical Code D Violet Plug Wi-Fi: Dual Mini FAKRA Code F Brown Plug GNSS: FAKRA Code C Blue SMB(F) (GEN 2.0)		
Casing	PC+ABS		
Adhesive	3M 9448HK + CR4305		
Sealant	Rubber Stopper		
Weight	245g		
Environmental			
Protection	IP67		
Temperature Range	-40°C to +85°C		
Thermal Shock	100 cycles -40°C to +85°C		
Humidity	Non-condensing 65°C 95% RH		
Cable Pull	RG174 - 4 Kg / TGC200 - 9Kg		

5G/4G Bands			
Band Number	5G NR / FR1 / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA		
	Uplink	Downlink	Covered
1	UL: 1920 to 1980	DL: 2110 to 2170	✓
2	UL: 1850 to 1910	DL: 1930 to 1990	✓
3	UL: 1710 to 1785	DL: 1805 to 1880	✓
4	UL: 1710 to 1755	DL: 2110 to 2155	✓
5	UL: 824 to 849	DL: 869 to 894	✓
7	UL: 2500 to 2570	DL: 2620 to 2690	✓
8	UL: 880 to 915	DL: 925 to 960	✓
9	UL: 1749.9 to 1784.9	DL: 1844.9 to 1879.9	✓
11	UL: 1427.9 to 1447.9	DL: 1475.9 to 1495.9	✓
12	UL: 699 to 716	DL: 729 to 746	✓
13	UL: 777 to 787	DL: 746 to 756	✓
14	UL: 788 to 798	DL: 758 to 768	✓
17	UL: 704 to 716	DL: 734 to 746 (LTE only)	✓
18	UL: 815 to 830	DL: 860 to 875 (LTE only)	✓
19	UL: 830 to 845	DL: 875 to 890	✓
20	UL: 832 to 862	DL: 791 to 821	✓
21	UL: 1447.9 to 1462.9	DL: 1495.9 to 1510.9	✓
22	UL: 3410 to 3490	DL: 3510 to 3590	✓
23	UL: 2000 to 2020	DL: 2180 to 2200 (LTE only)	✓
24	UL: 1625.5 to 1660.5	DL: 1525 to 1559 (LTE only)	✓
25	UL: 1850 to 1915	DL: 1930 to 1995	✓
26	UL: 814 to 849	DL: 859 to 894	✓
27	UL: 807 to 824	DL: 852 to 869 (LTE only)	✓
28	UL: 703 to 748	DL: 758 to 803 (LTE only)	✓
29	UL: -	DL: 717 to 728 (LTE only)	✓
30	UL: 2305 to 2315	DL: 2350 to 2360 (LTE only)	✓
31	UL: 452.5 to 457.5	DL: 462.5 to 467.5 (LTE only)	✗
32	UL: -	DL: 1452 - 1496	✓
35		1850 to 1910	✓
38		2570 to 2620	✓
39		1880 to 1920	✓
40		2300 to 2400	✓
41		2496 to 2690	✓
42		3400 to 3600	✓
43		3600 to 3800	✓
48		3550 to 3700	✓
66	UL: 1710-1780	DL: 2110-2200	✓
71		617 to 698	✗
74/75/76		1427 to 1518	✓
78		3300 to 3800	✓
79		4400 to 5000	✗
126		410 to 430	✗

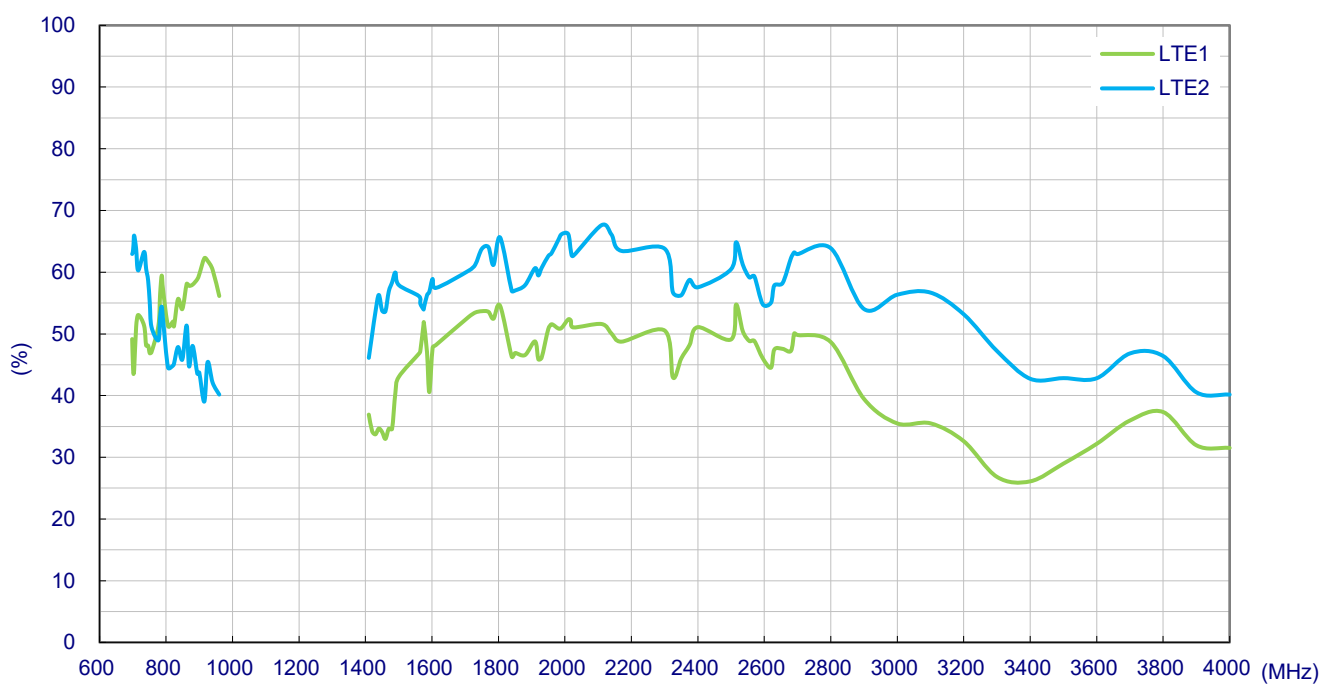
3. Antenna Characteristics

3.1 LTE MIMO1 and MIMO2 Antennas

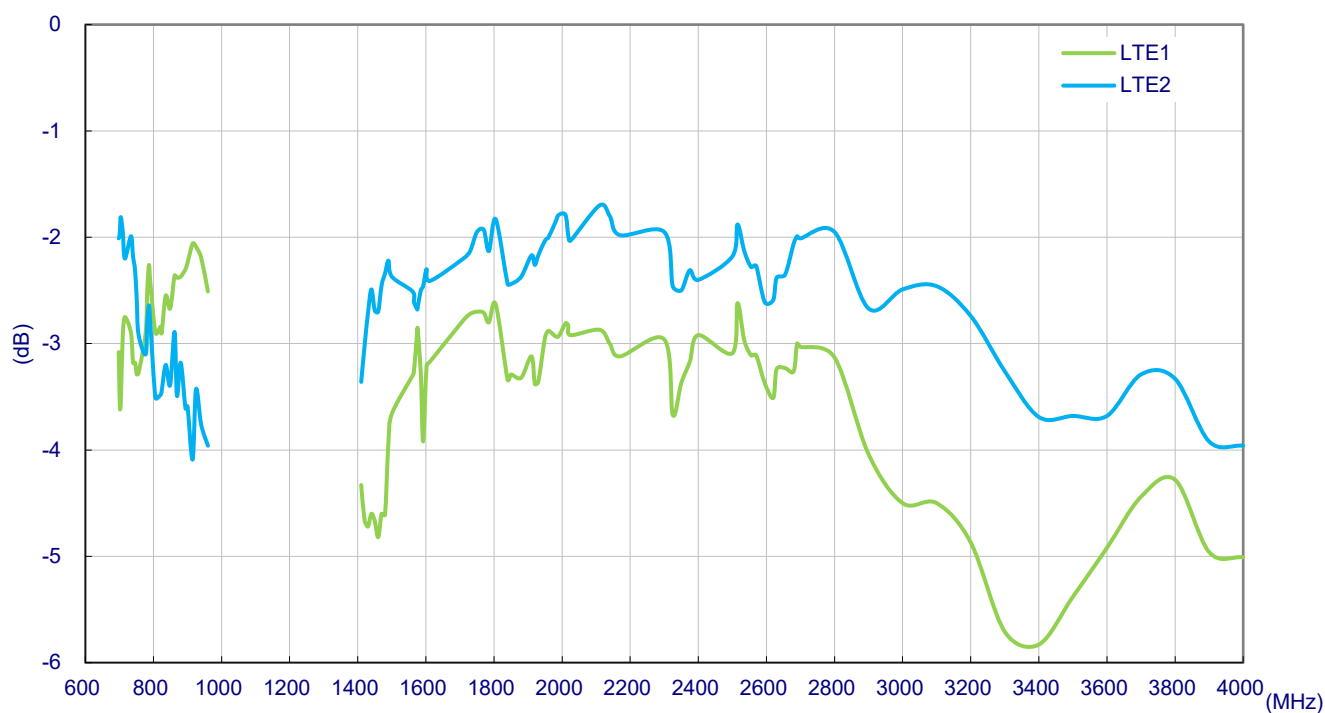
3.1.1. Return Loss – LTE MIMO1 and MIMO2



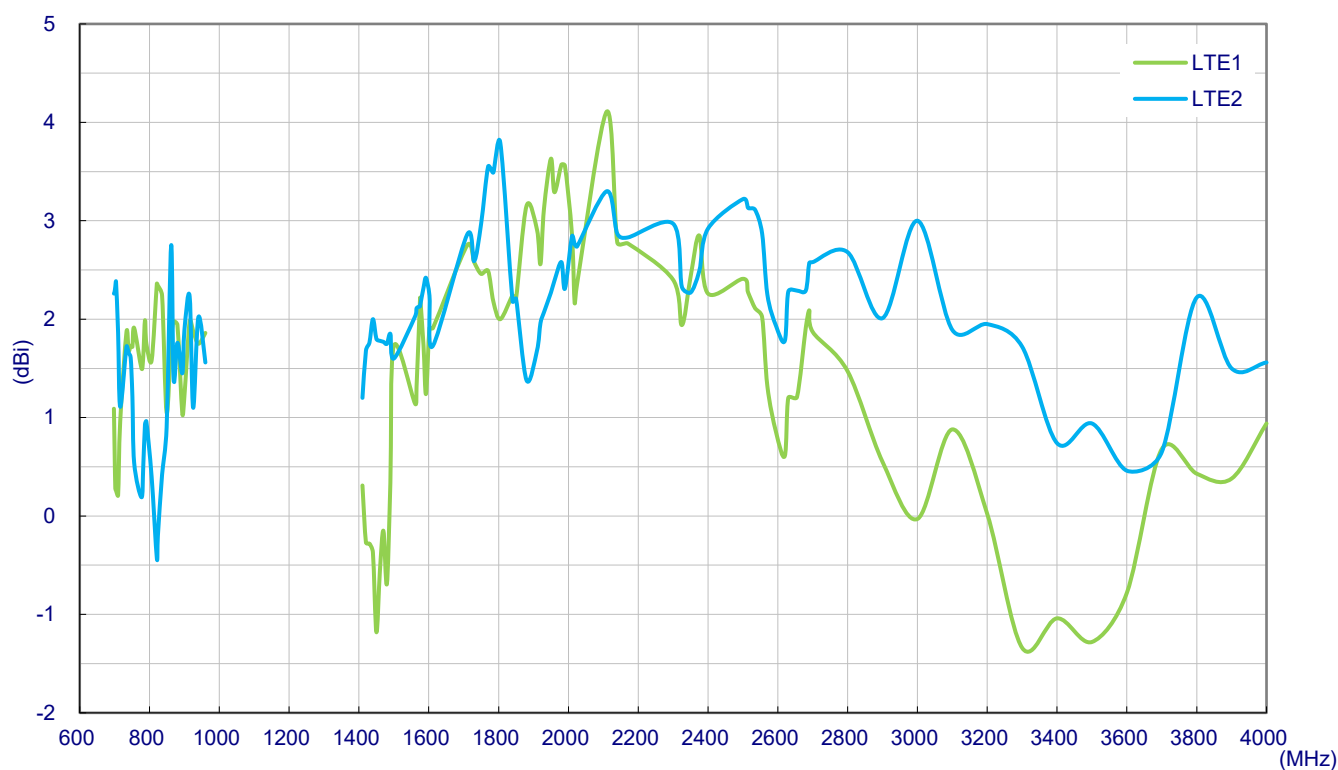
3.1.2. Efficiency – LTE MIMO1 and MIMO2



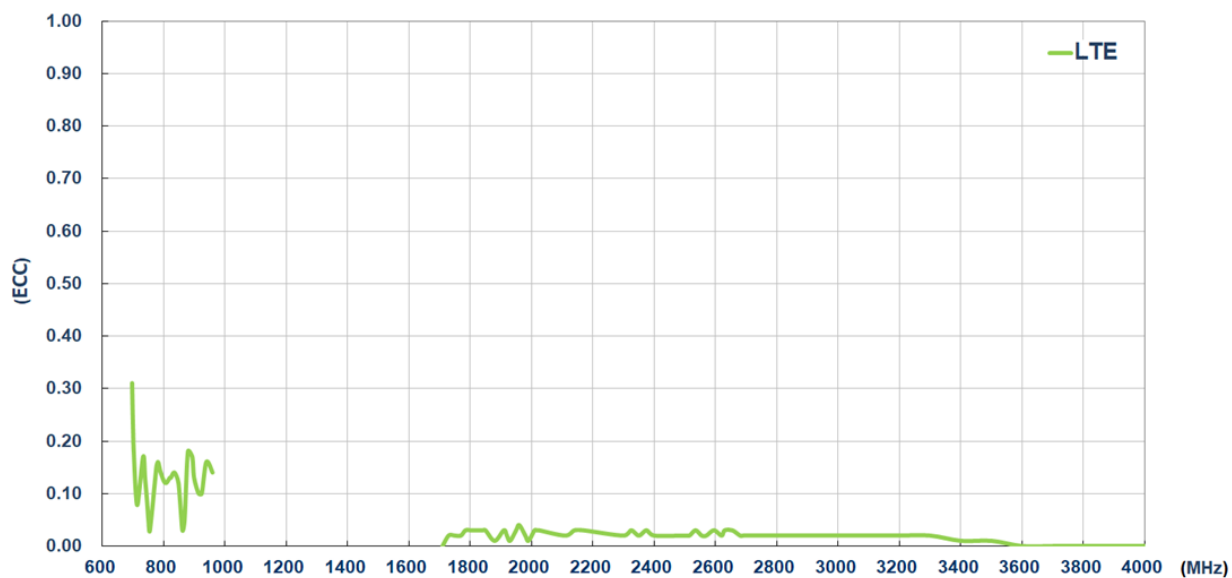
3.1.3. Average Gain – LTE MIMO1 and MIMO2



3.1.4. Peak Gain – LTE MIMO1 and MIMO2

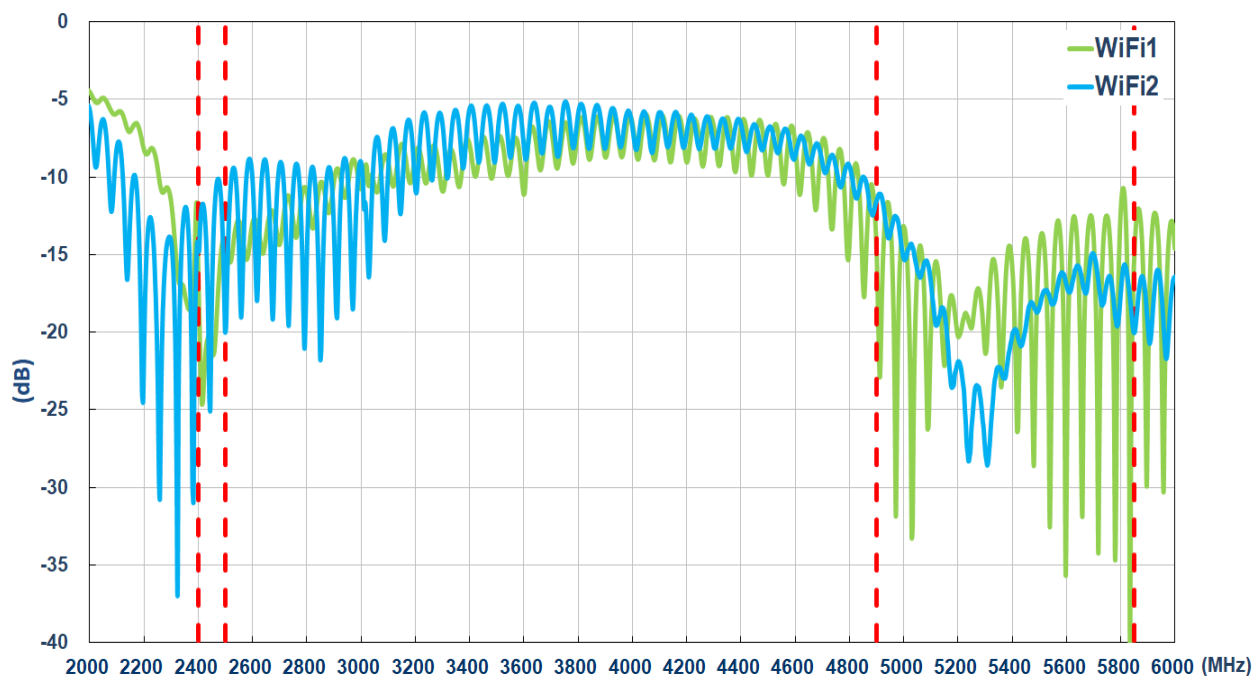


3.1.5. ECC – LTE MIMO1 and MIMO2

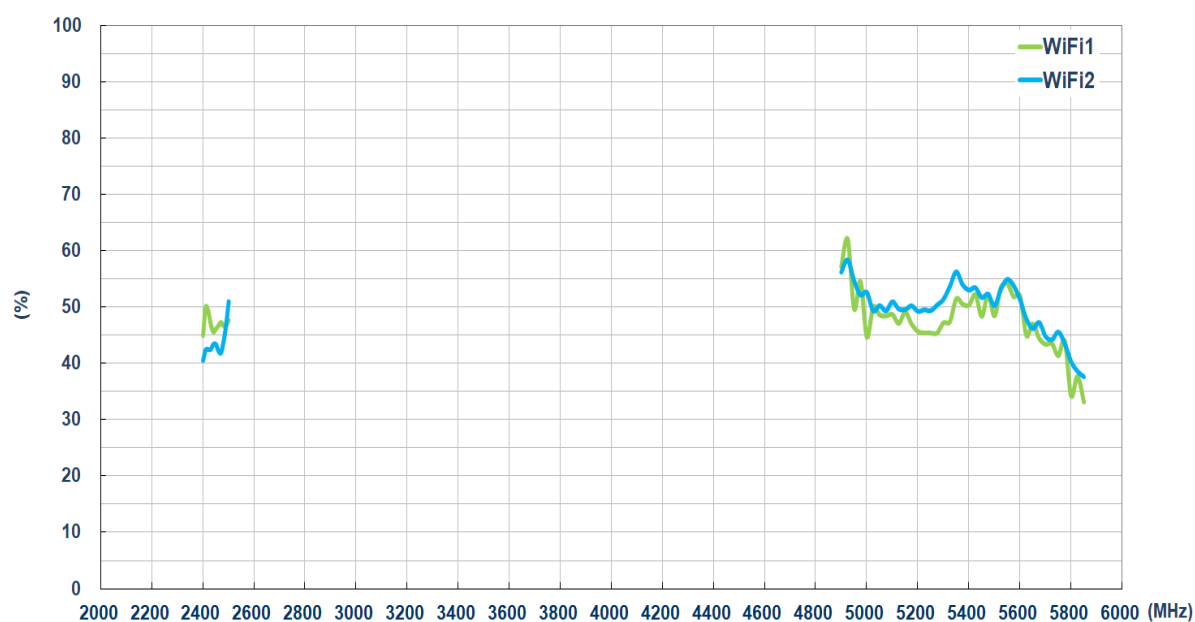


3.2 Wi-Fi MIMO1 and MIMO2 Antennas

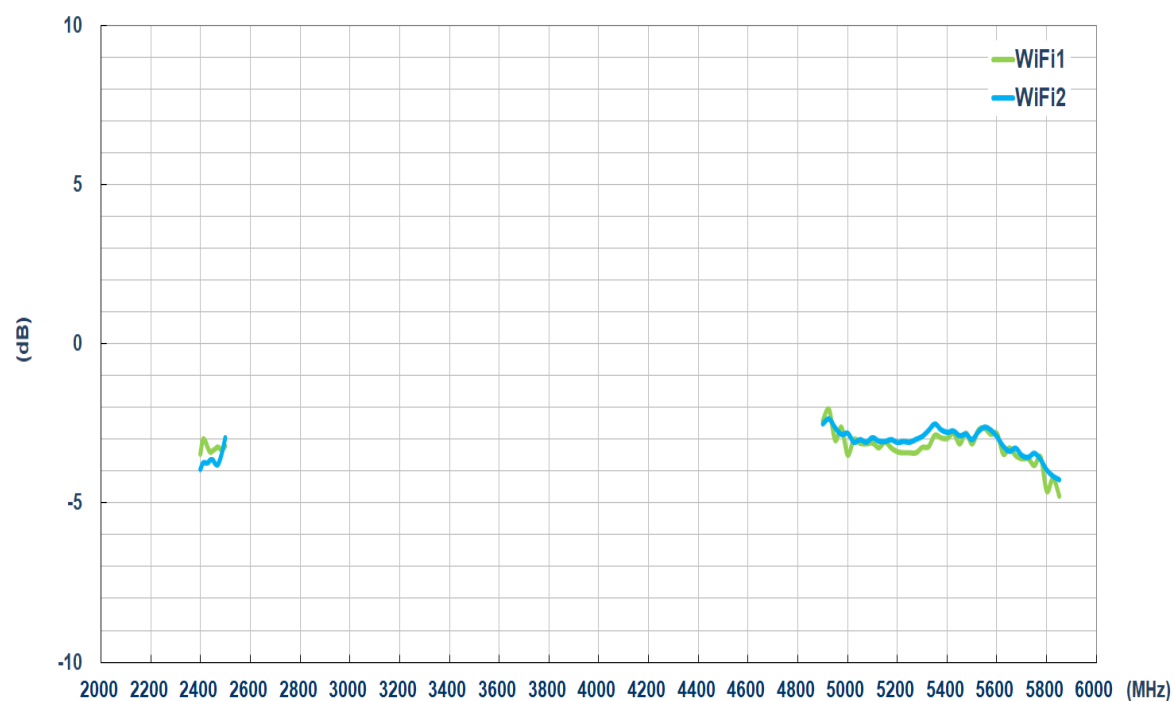
3.2.1. Return Loss – Wi-Fi MIMO1 and MIMO2



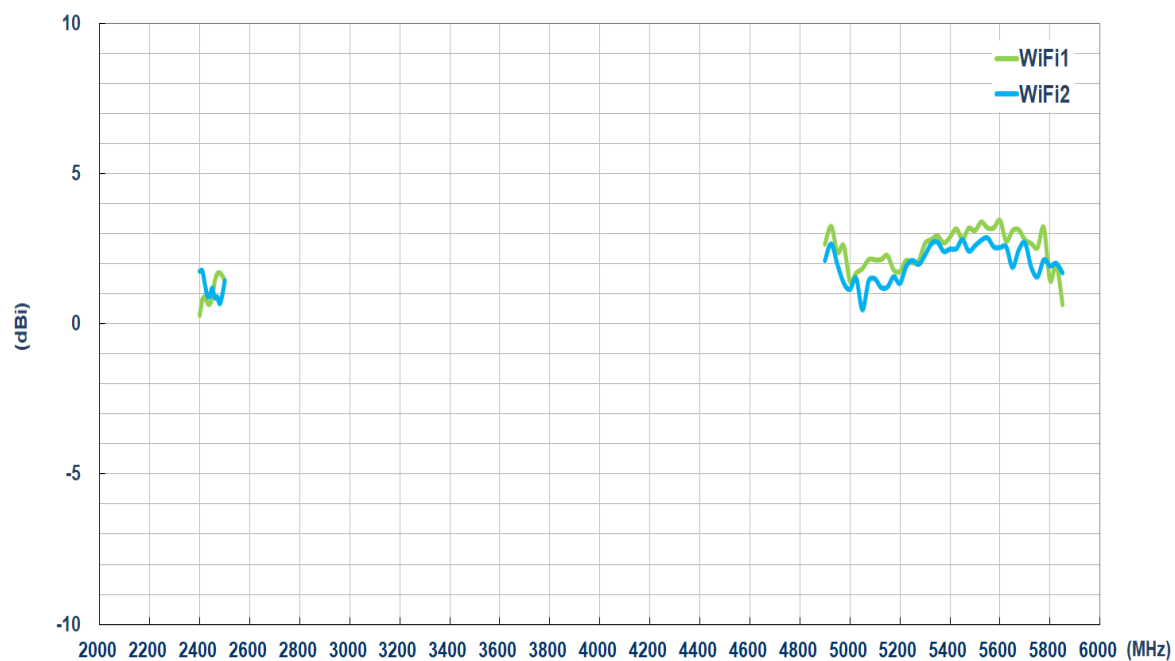
3.2.2. Efficiency – Wi-Fi MIMO1 and MIMO2



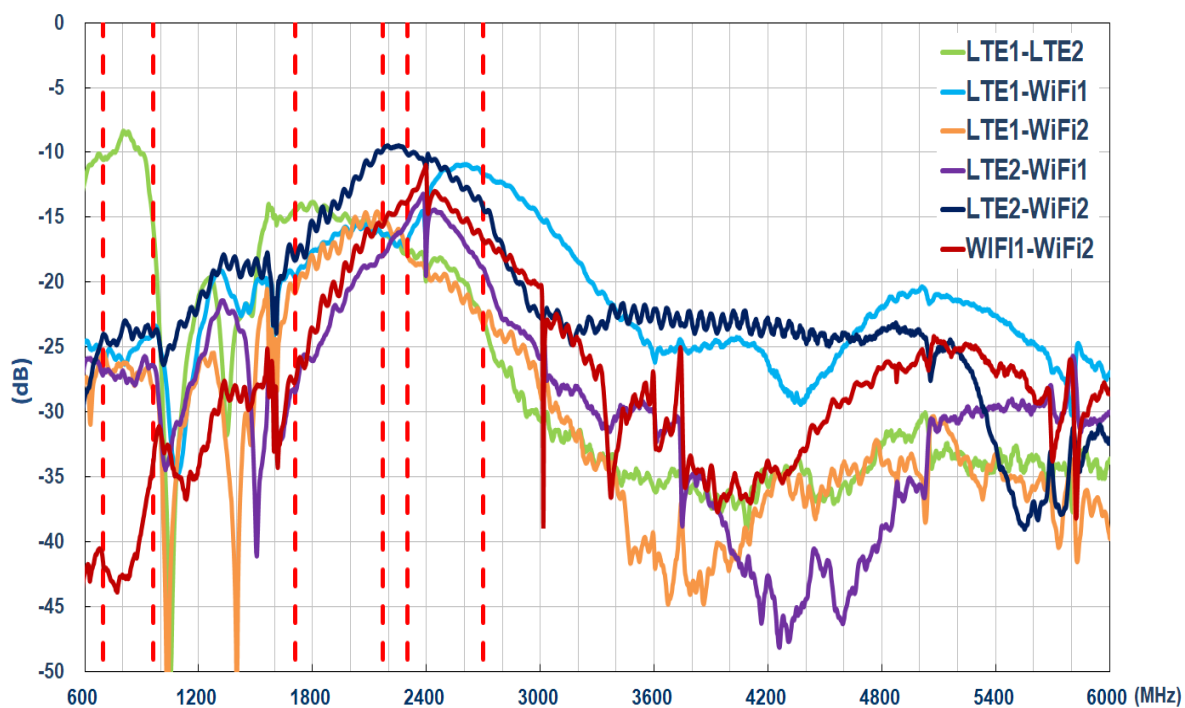
3.2.3. Average Gain – Wi-Fi MIMO1 and MIMO2



3.2.4. Peak Gain – Wi-Fi MIMO1 and MIMO2

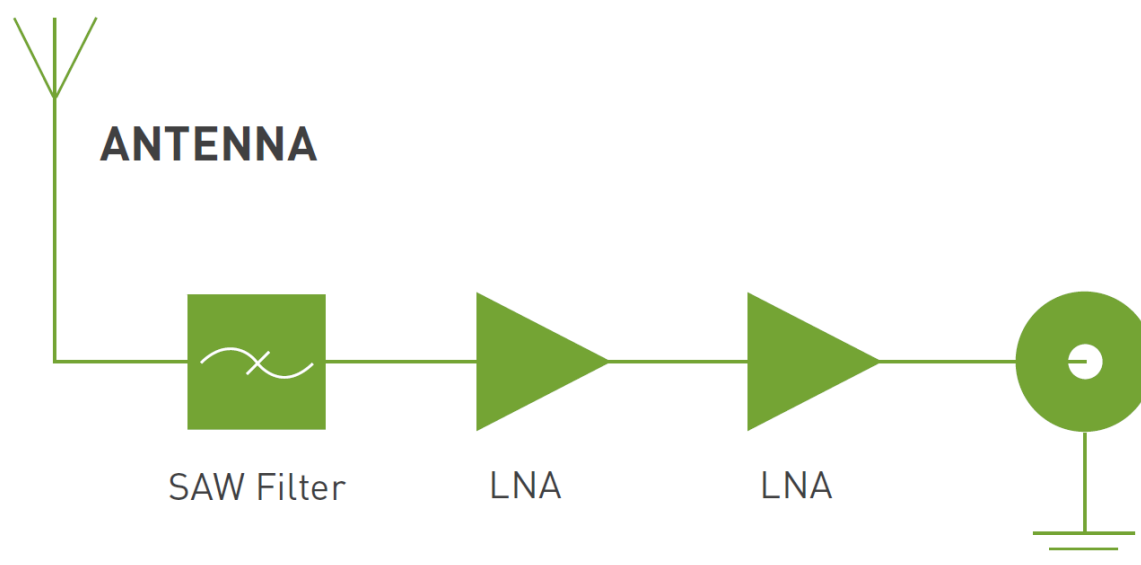


3.2.5. Isolation – Wi-Fi MIMO1 and MIMO2

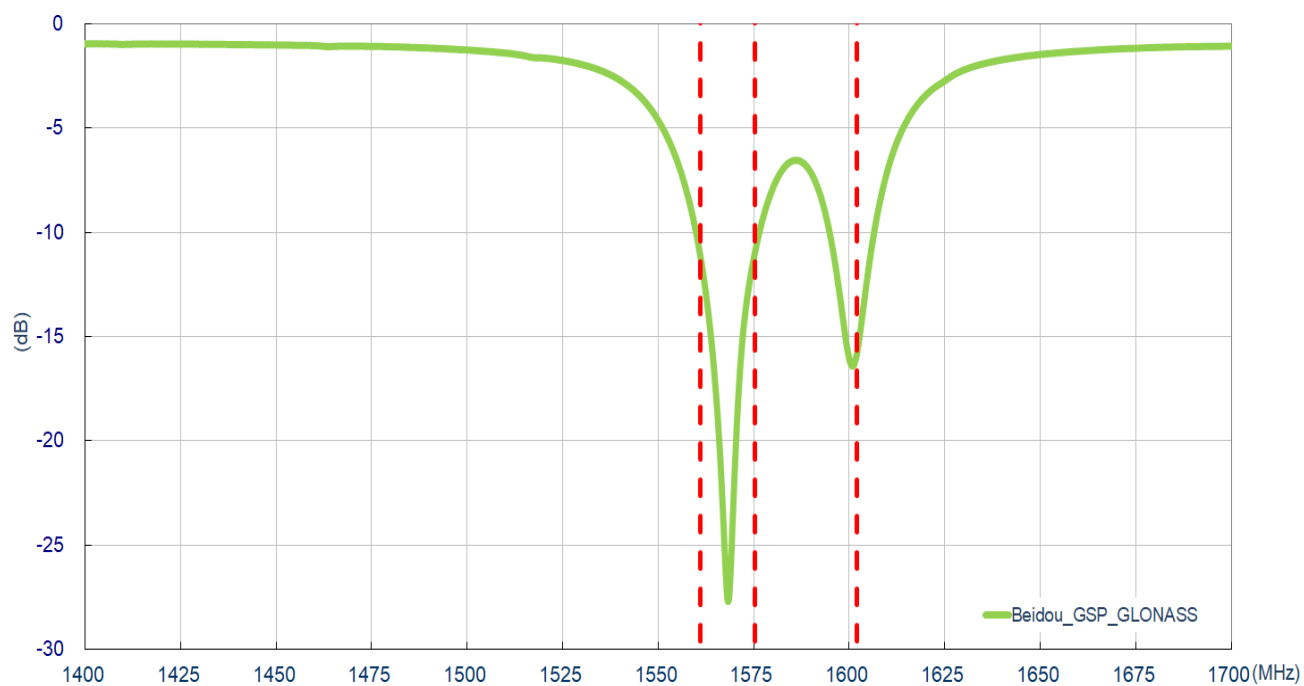


3.3 GNSS Antenna

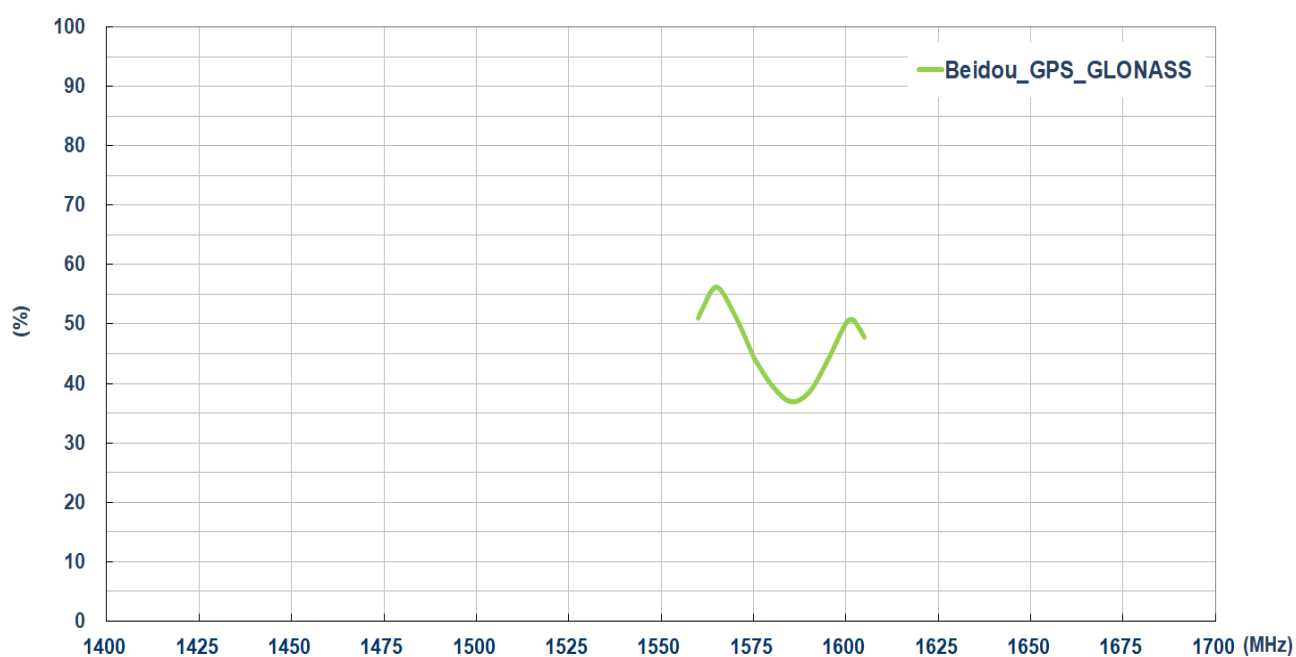
3.3.1. Block Diagram (Active antenna)



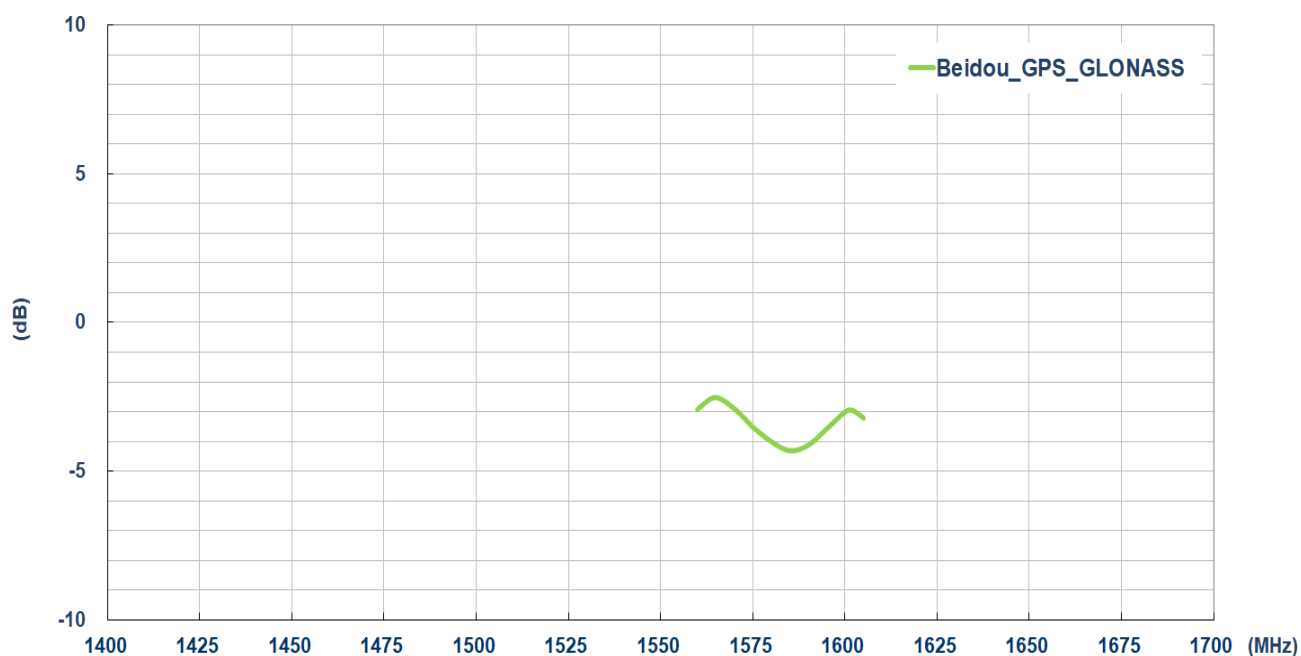
3.3.2. Return Loss – GNSS Antenna



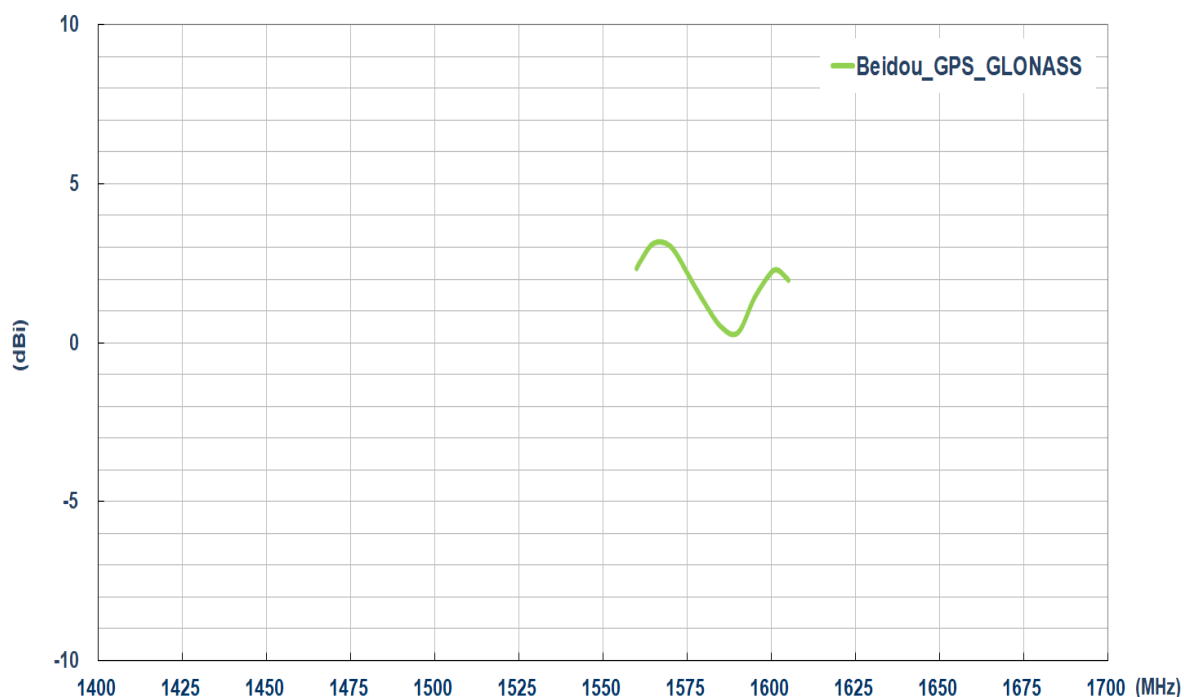
3.3.3. Efficiency – GNSS Antenna (passive measurement)



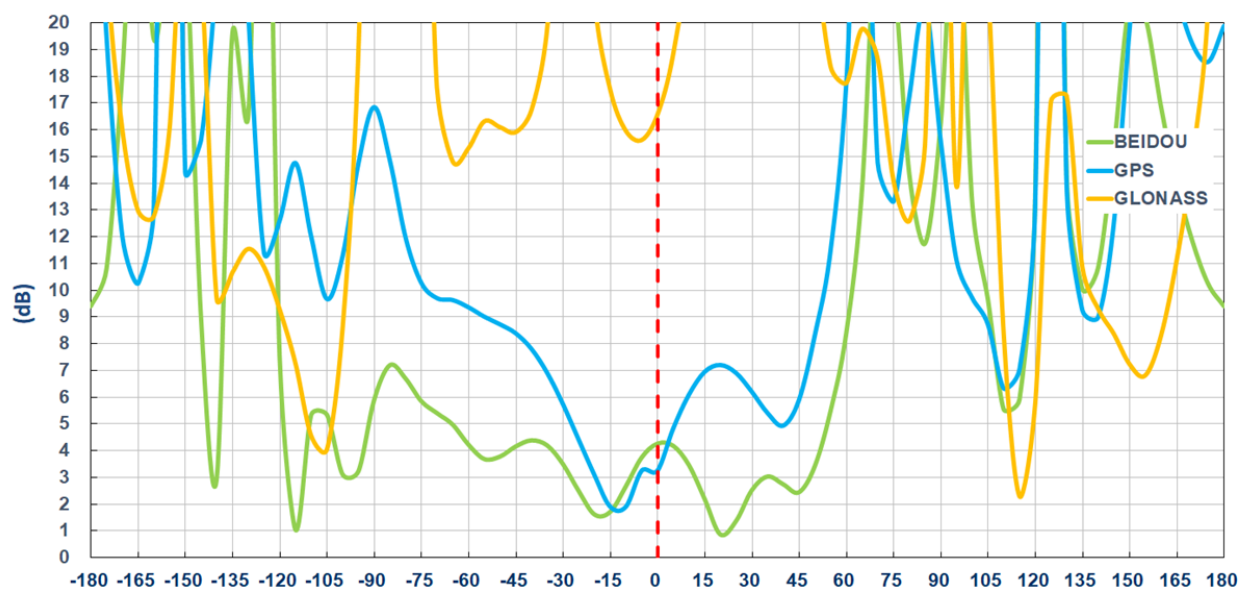
3.3.4. Average Gain – GNSS Antenna (passive measurement)



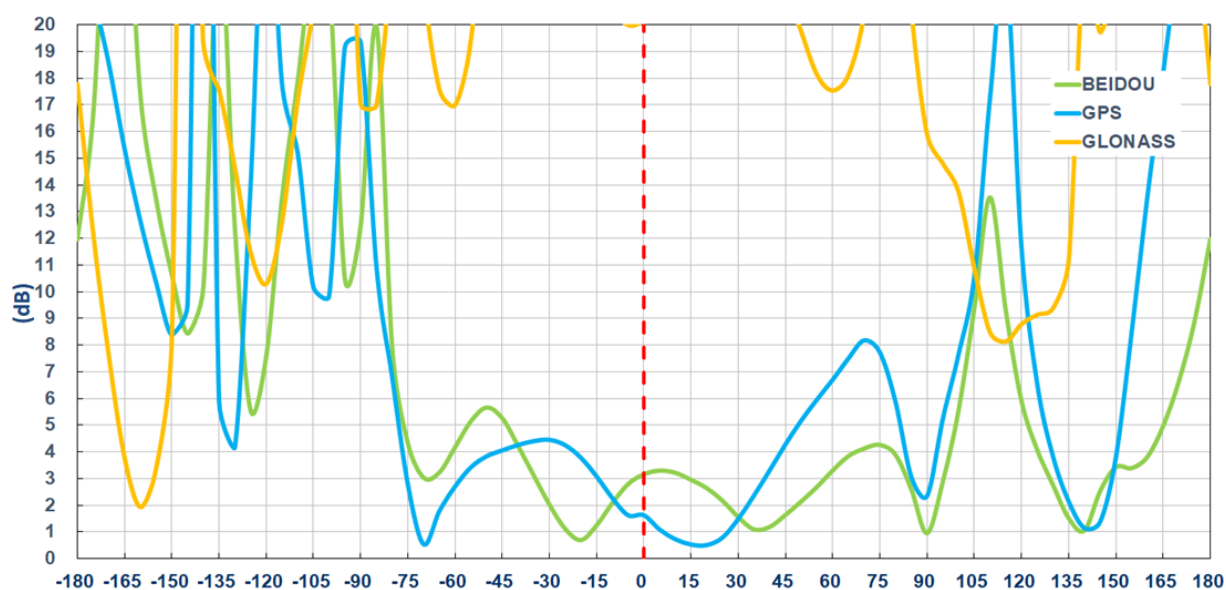
3.3.5. Peak Gain – GNSS Antenna (passive measurement)



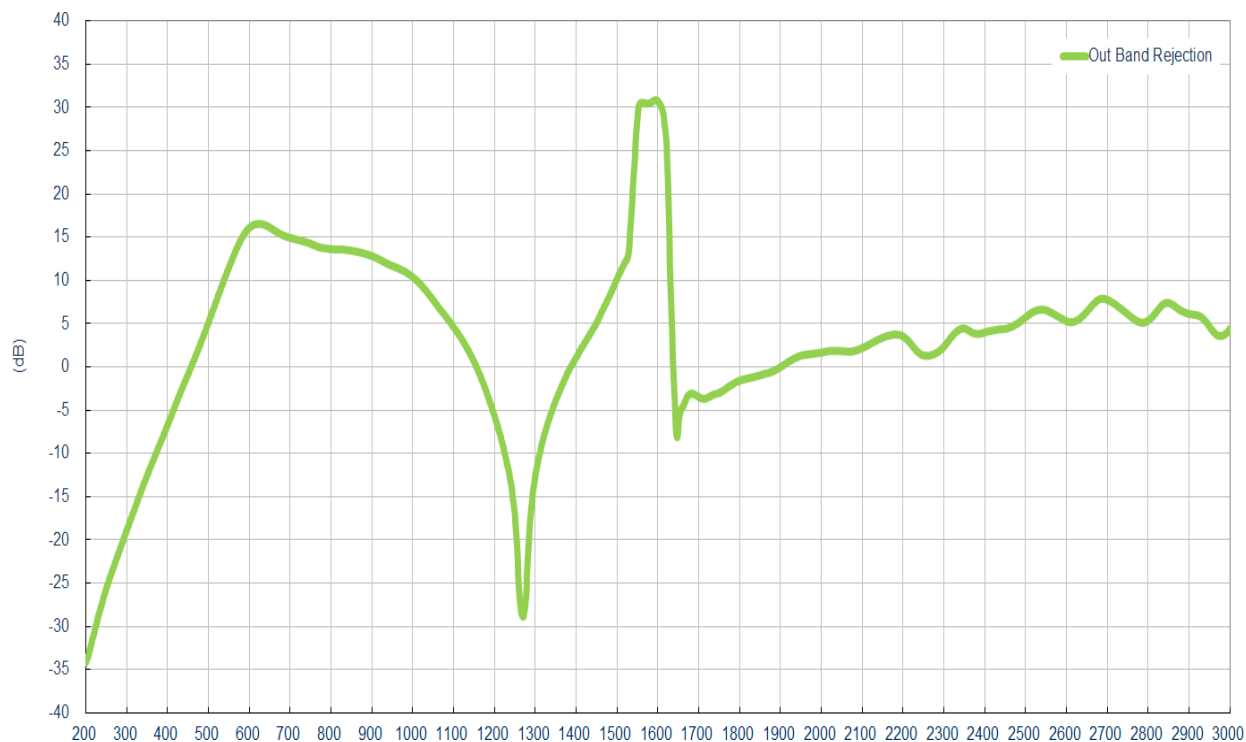
3.3.6. Axial Ratio (XY Plane) – GNSS Antenna (Zenith is at 0°)



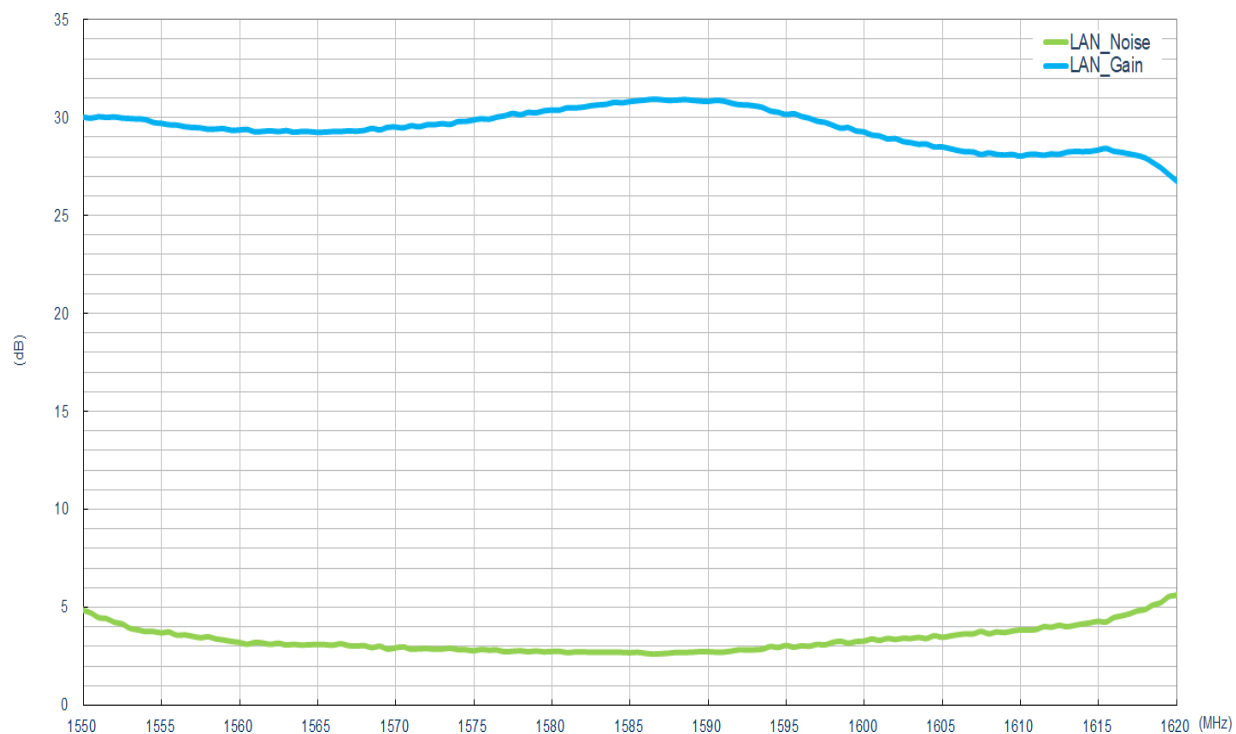
3.3.7. Axial Ratio (XZ Plane) – GNSS Antenna (Zenith is at 0°)



3.3.8. GNSS Antenna Active Measurements LNA Gain @ 3.0V



3.3.9. LNA Gain and Noise Figure @ 3.0V



4. Antenna Radiation Patterns

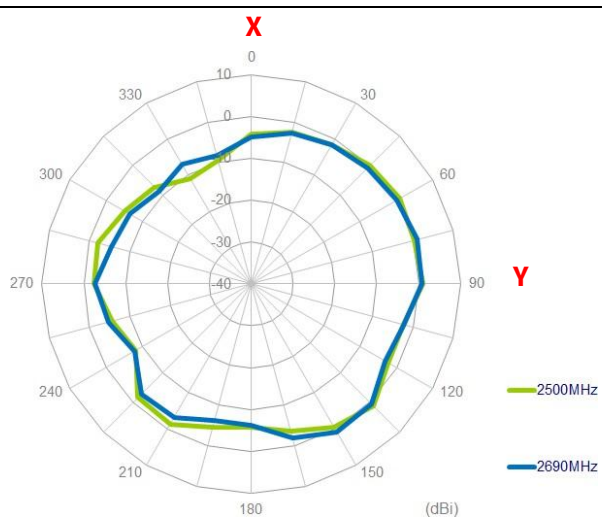
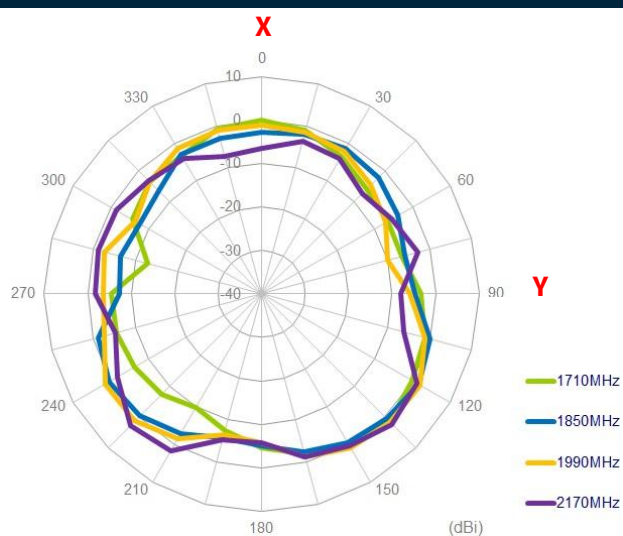
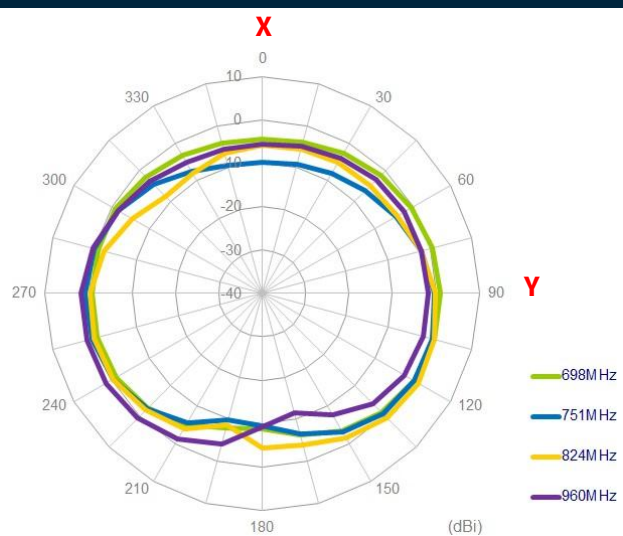
4.1 Test Setup – Free Space



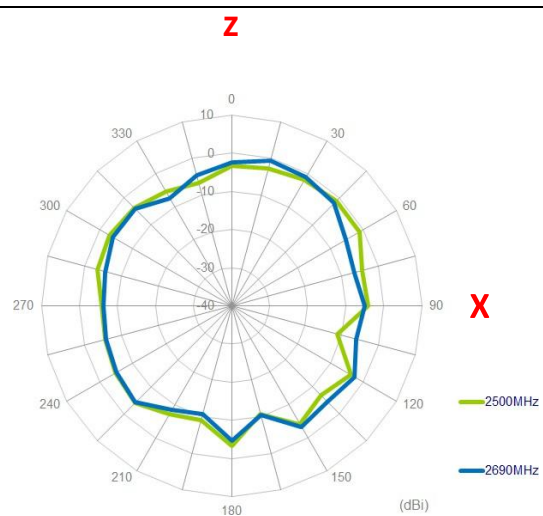
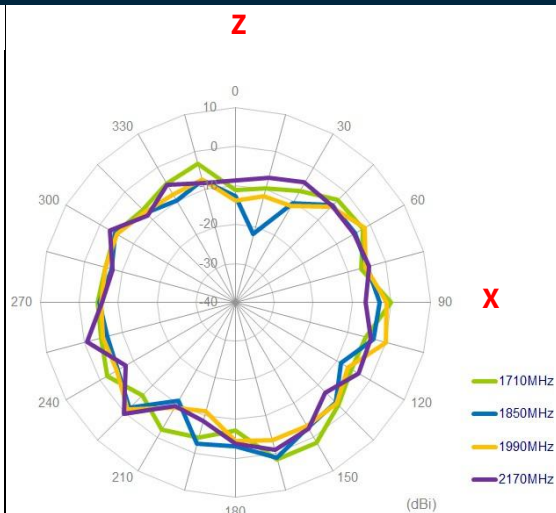
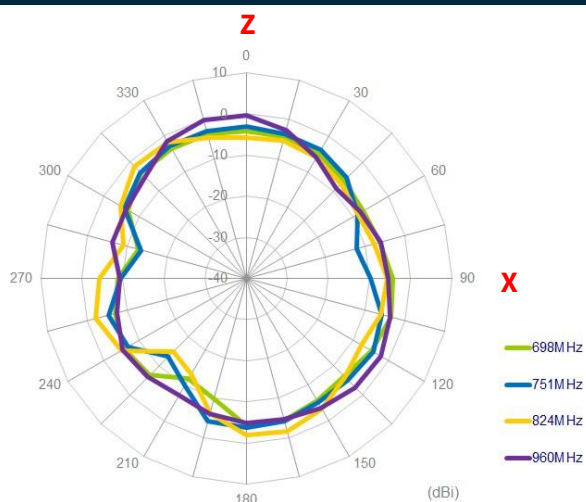
4.2 2D Radiation Patterns

4.2.1. LTE MIMO1

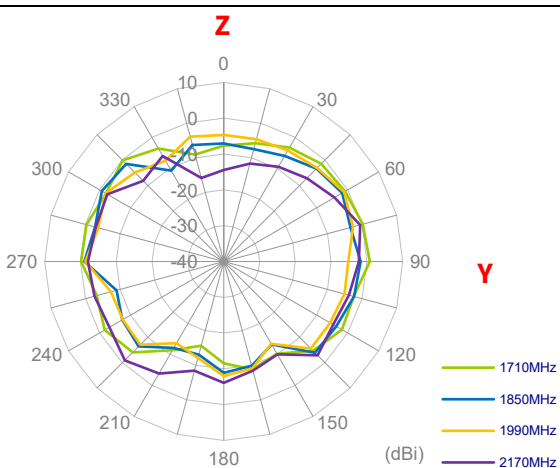
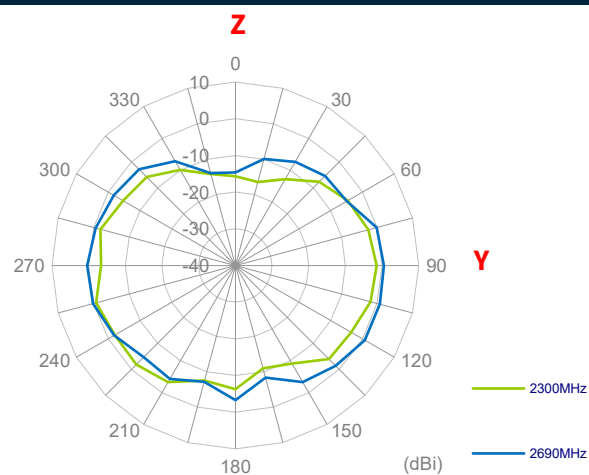
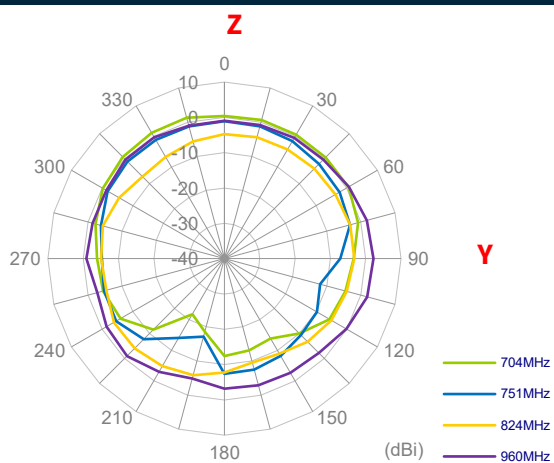
XY Plane



XZ Plane

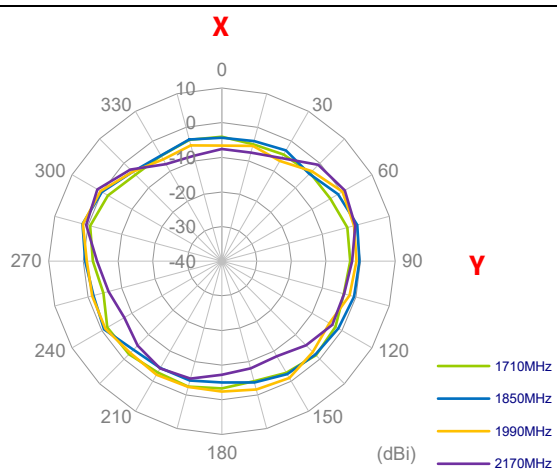
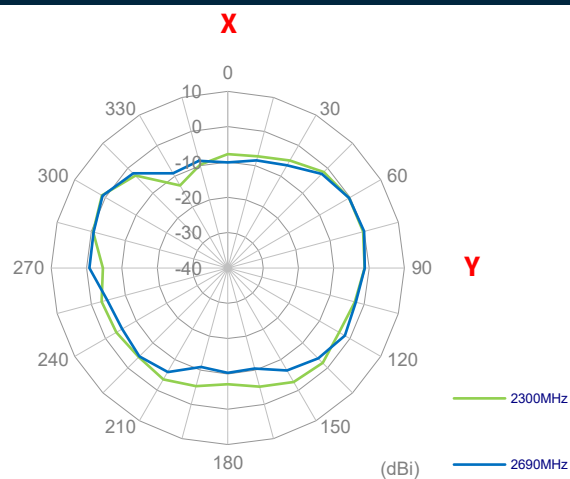
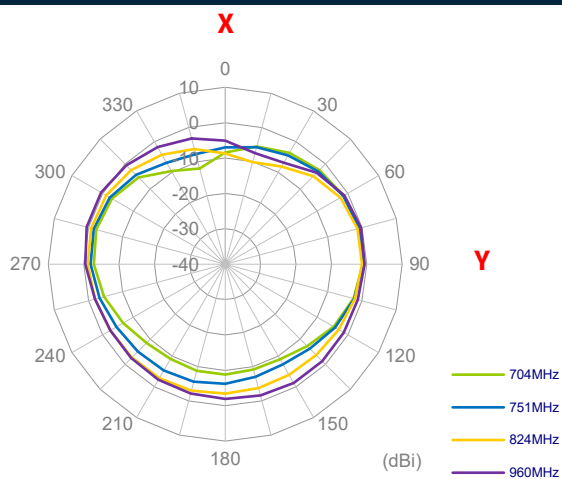


YZ Plane

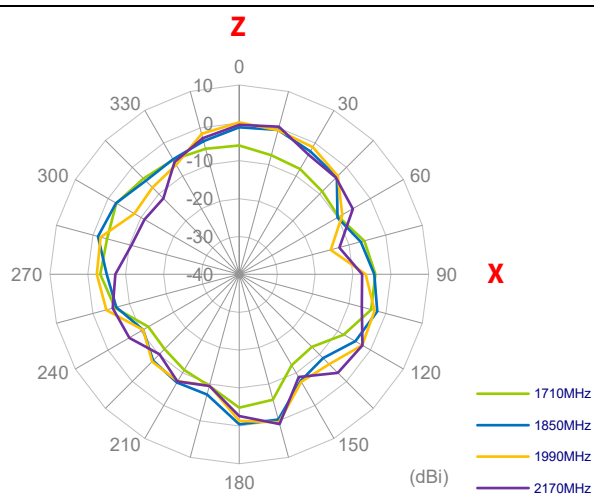
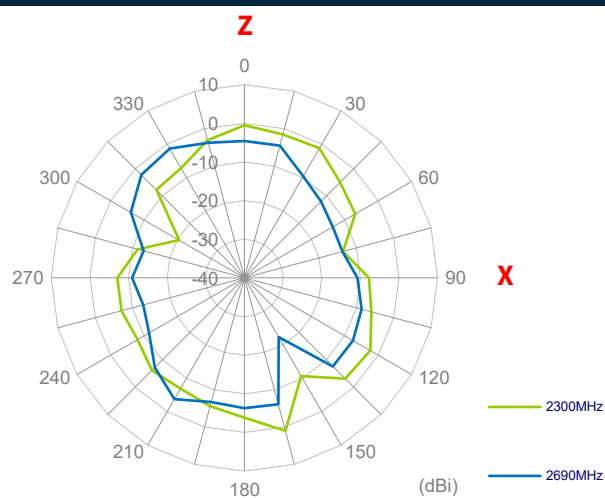
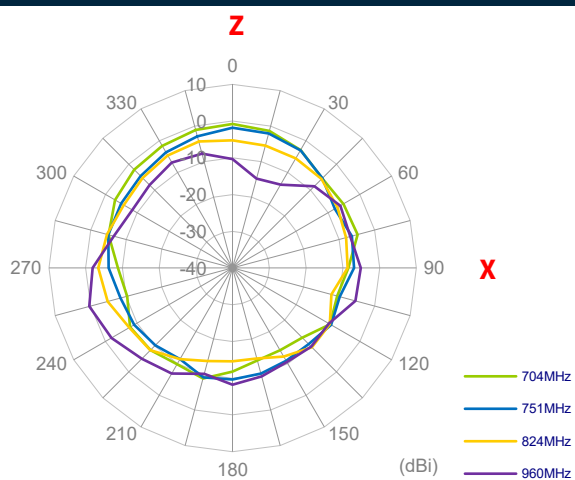


4.2.2. LTE MIMO2

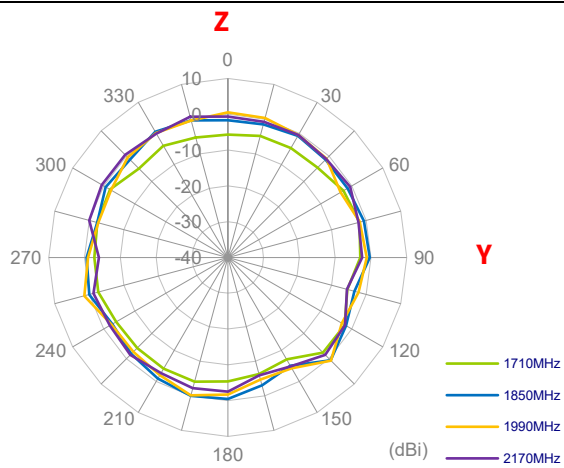
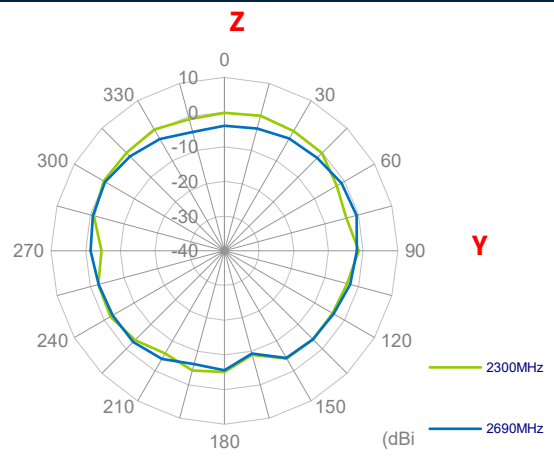
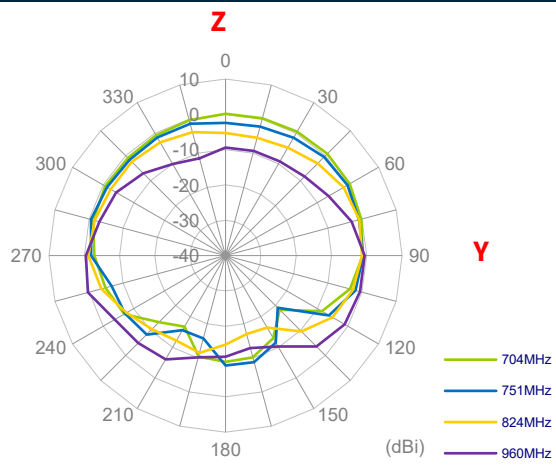
XY Plane



XZ Plane

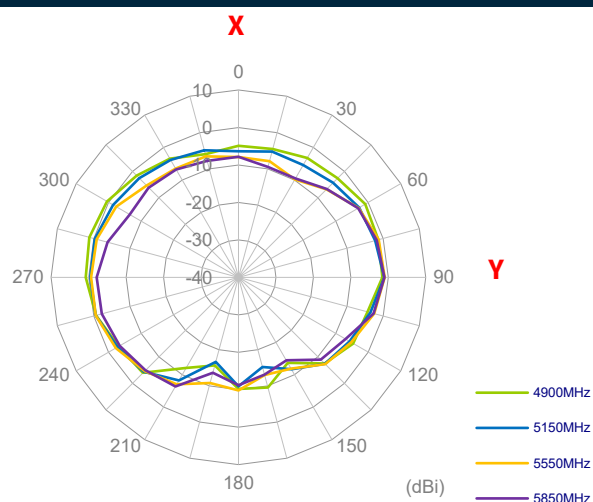
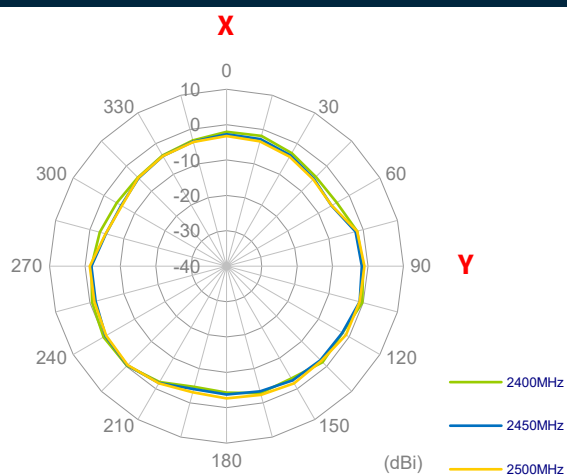


YZ Plane

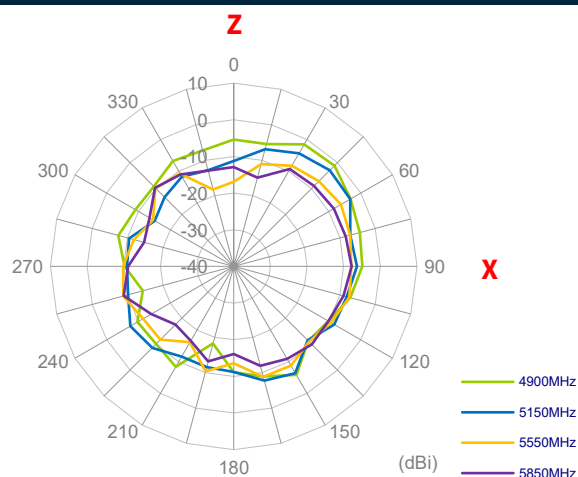
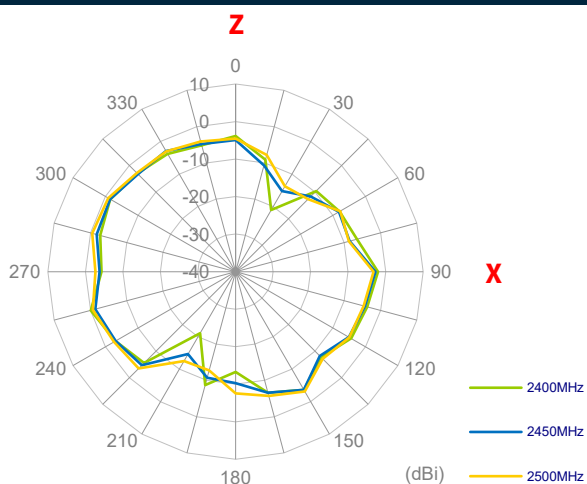


4.2.3. Wi-Fi MIMO1

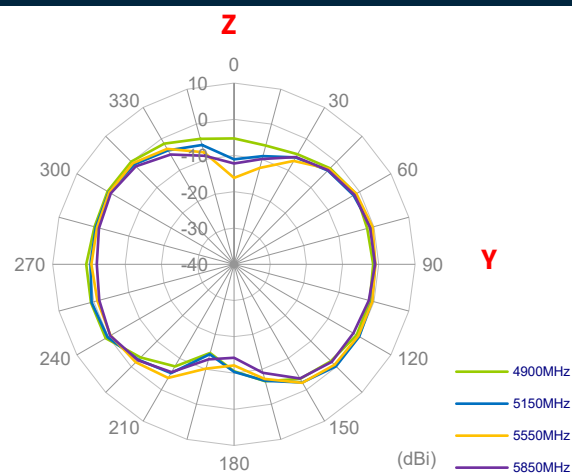
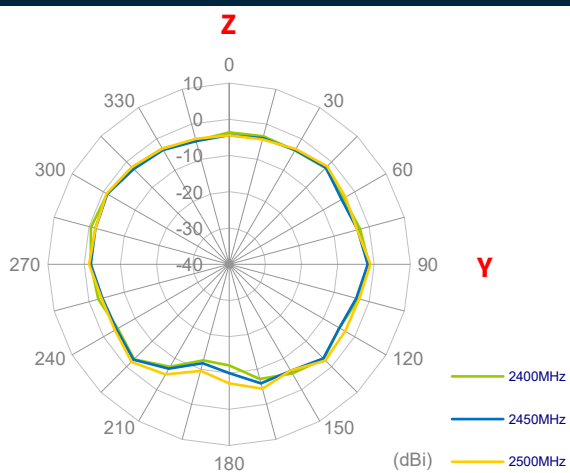
XY Plane



XZ Plane

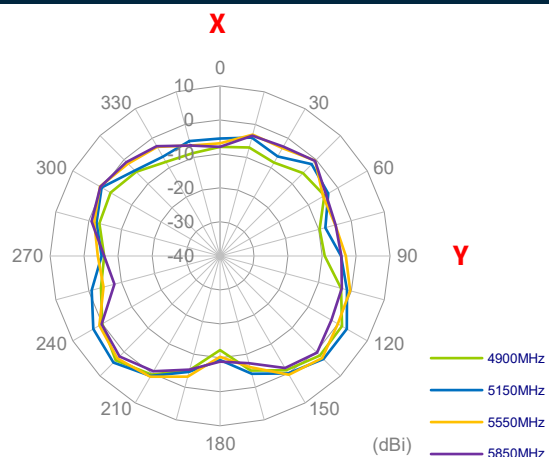
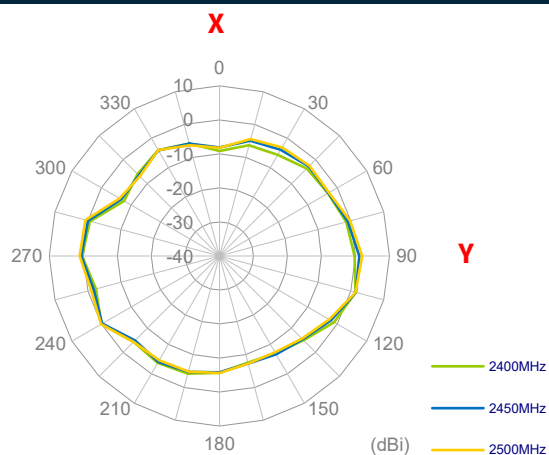


YZ Plane

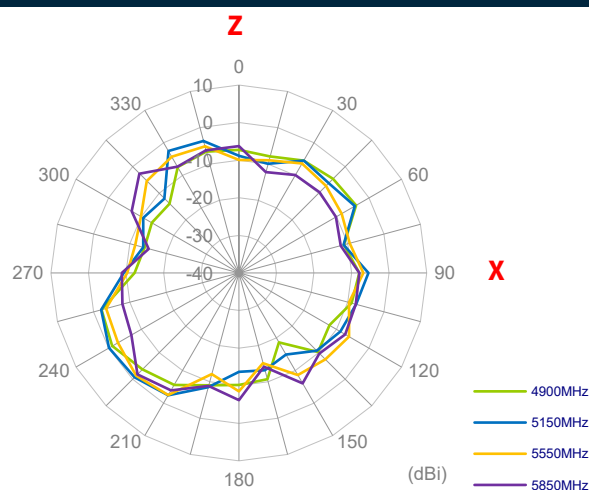
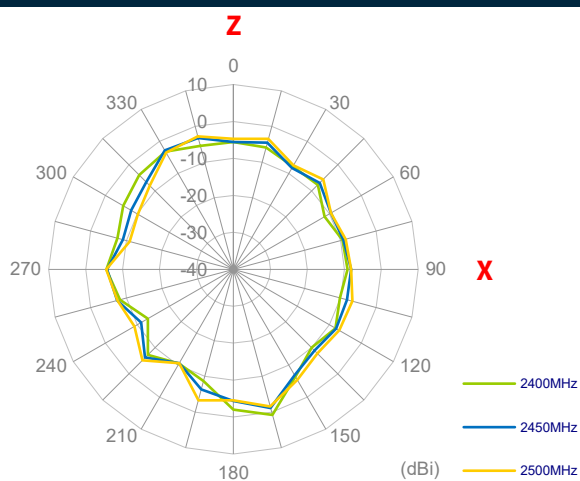


4.2.4. Wi-Fi MIMO2

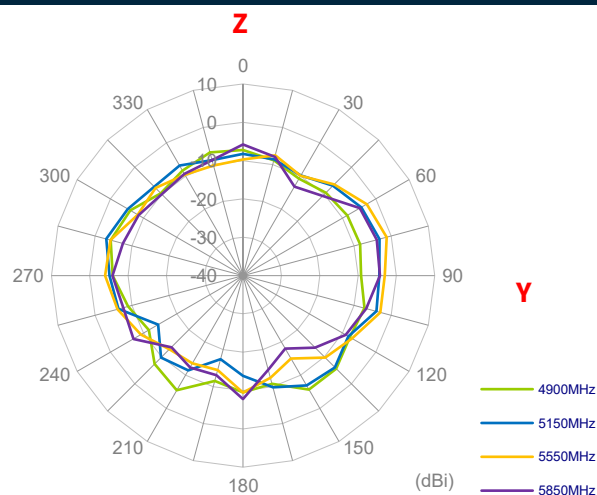
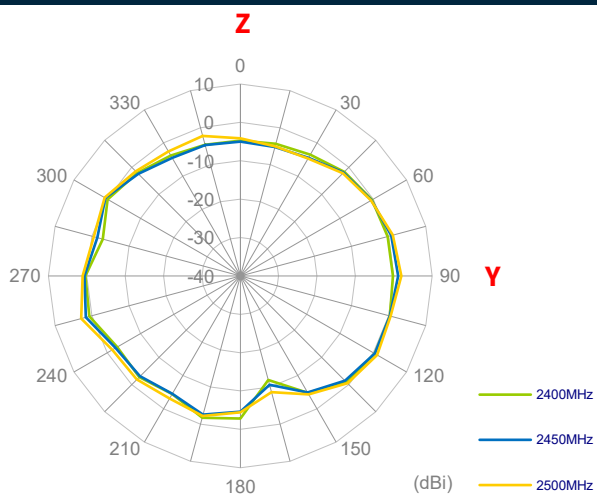
XY Plane



XZ Plane

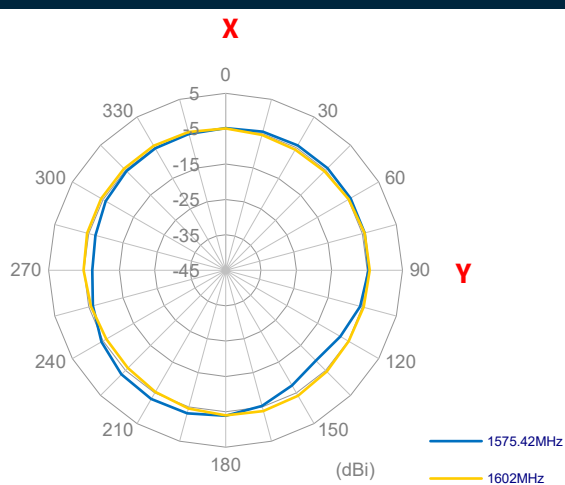


YZ Plane

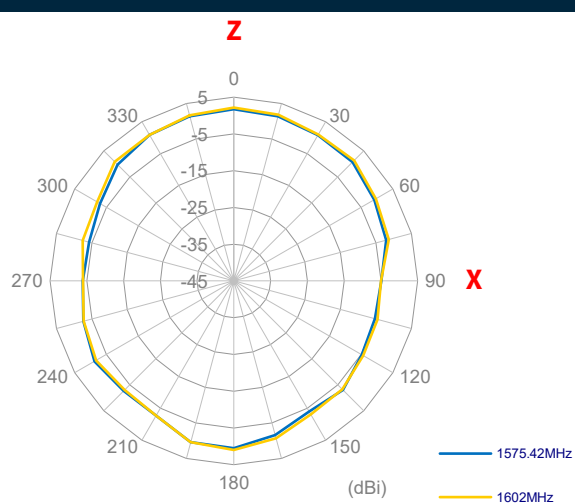


4.2.5. GNSS

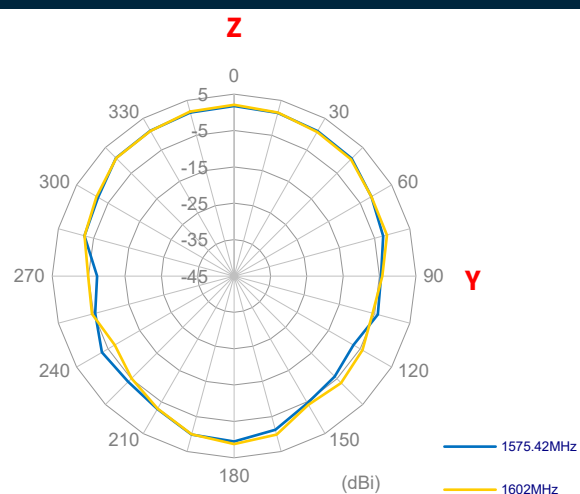
XY Plane



XZ Plane

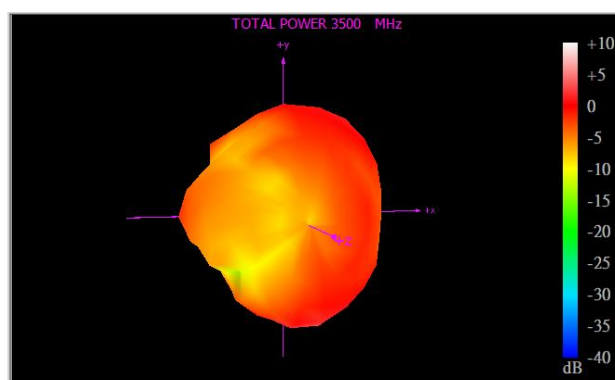
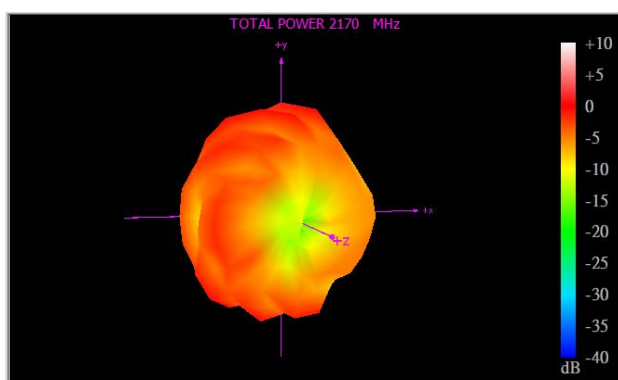
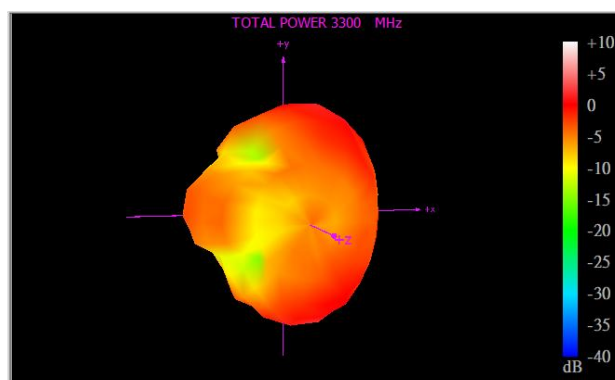
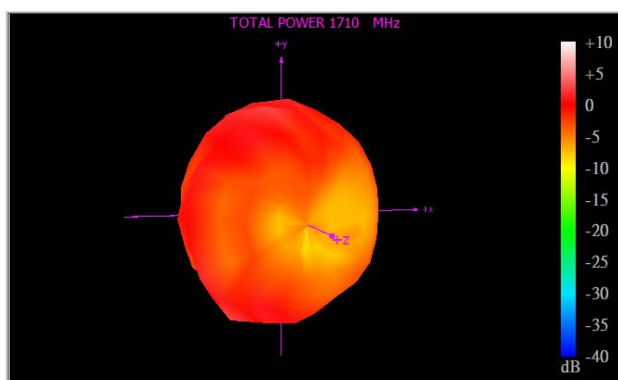
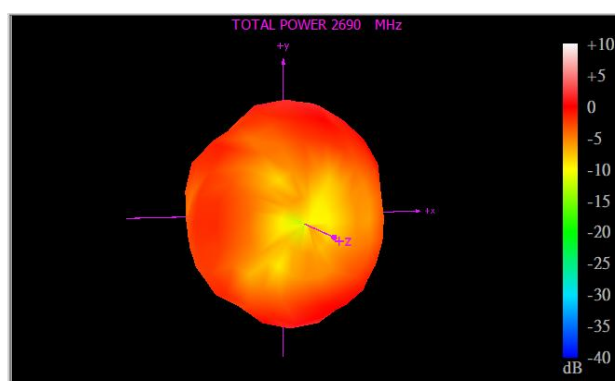
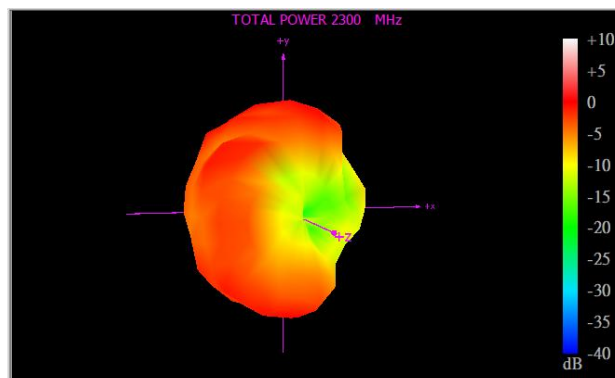
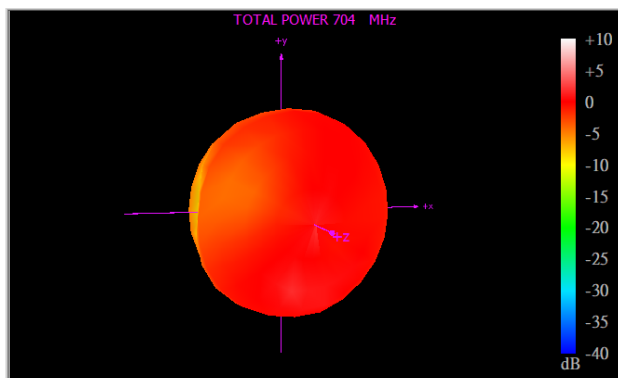


YZ Plane

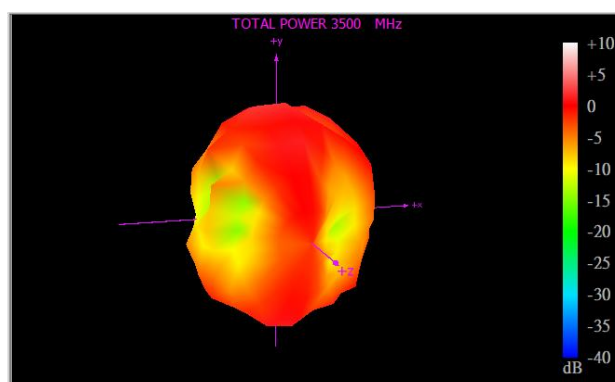
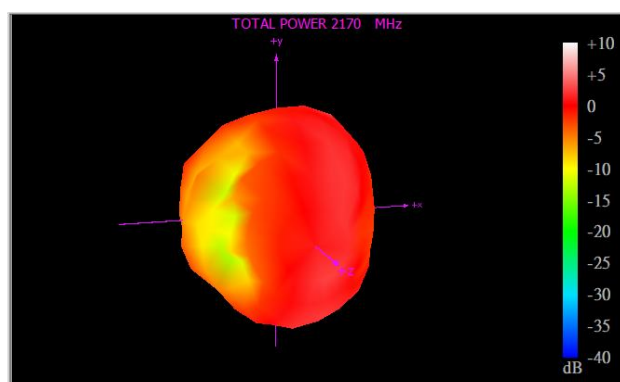
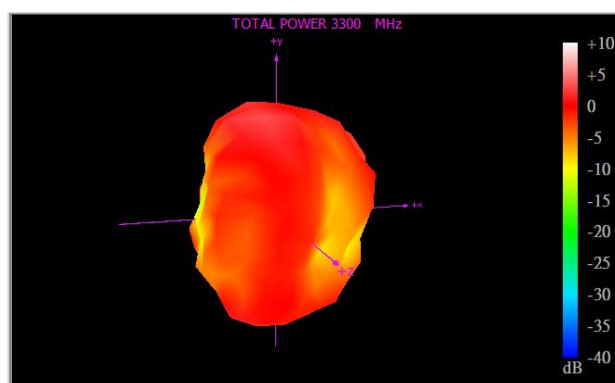
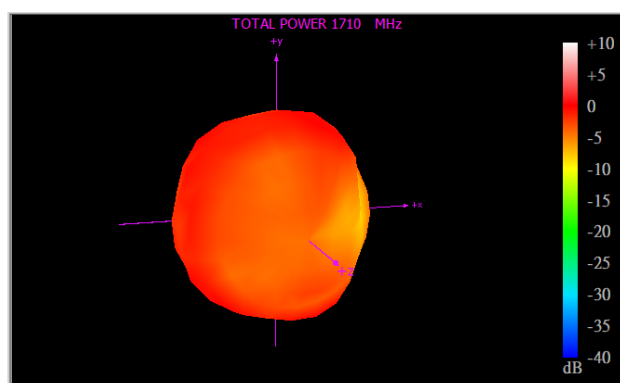
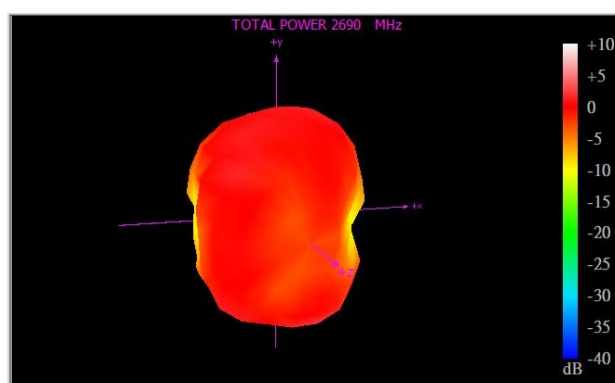
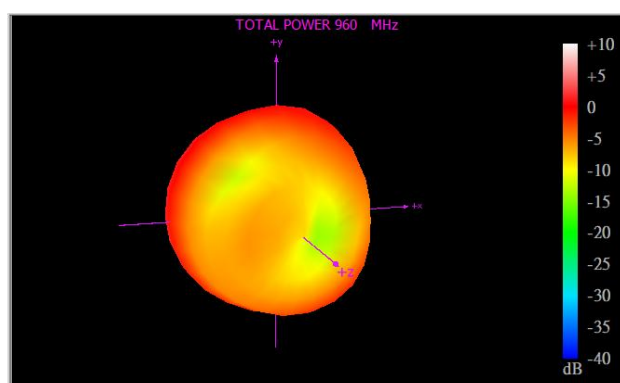
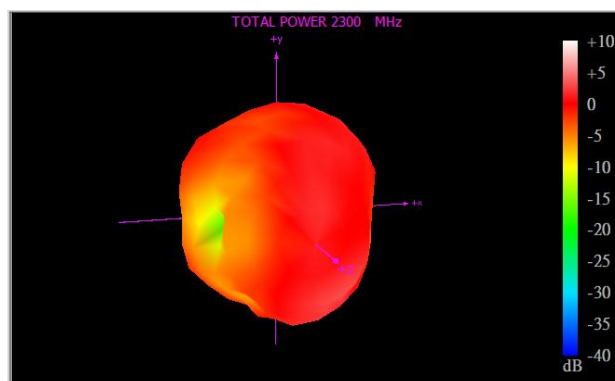


4.3 3D Radiation Patterns

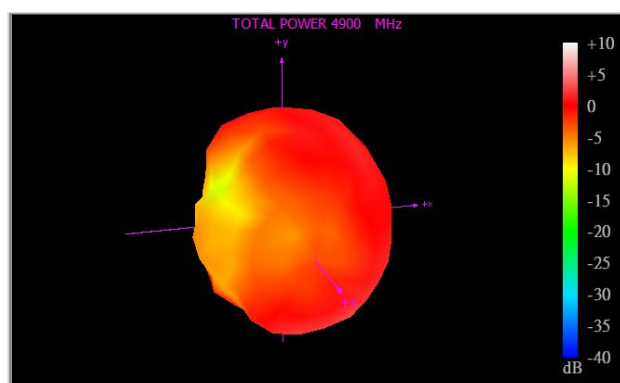
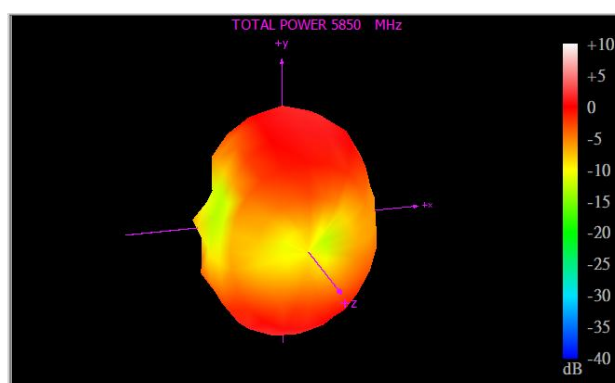
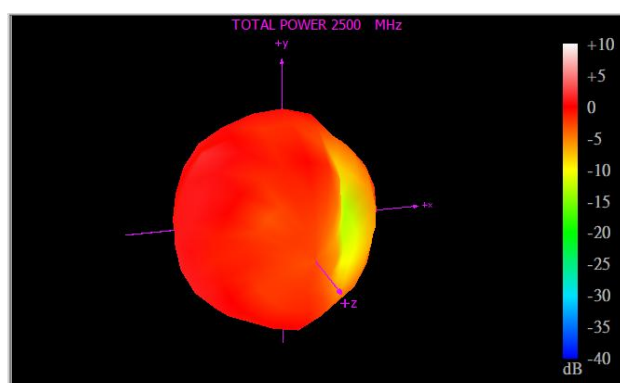
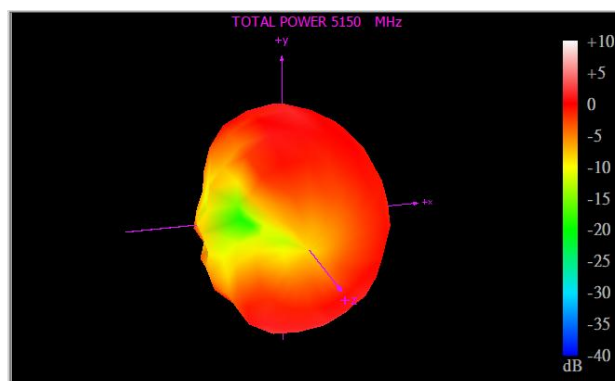
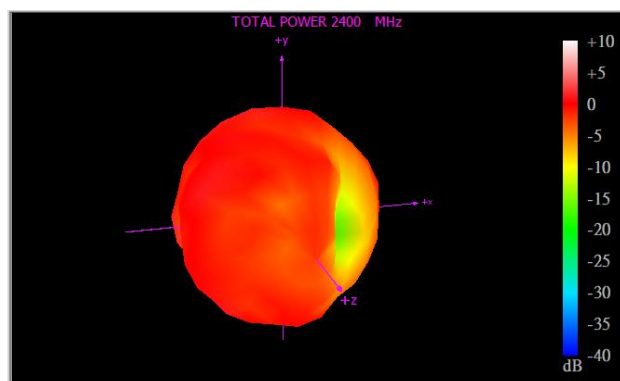
4.3.1. LTE MIMO1



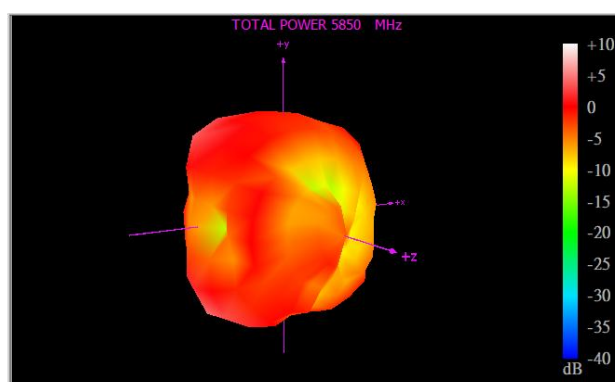
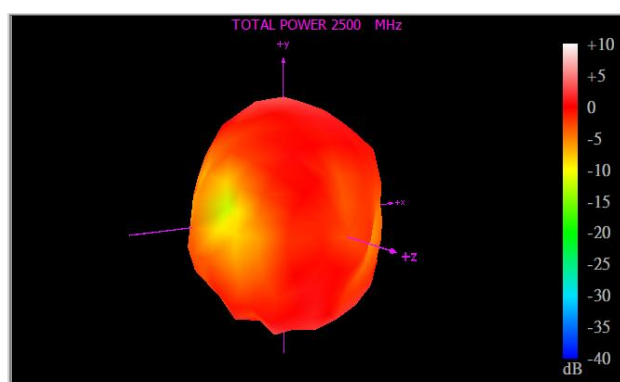
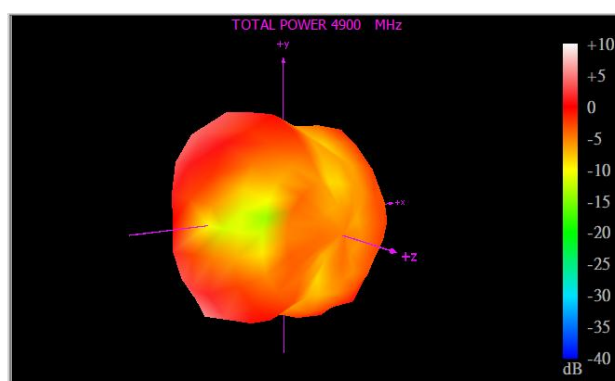
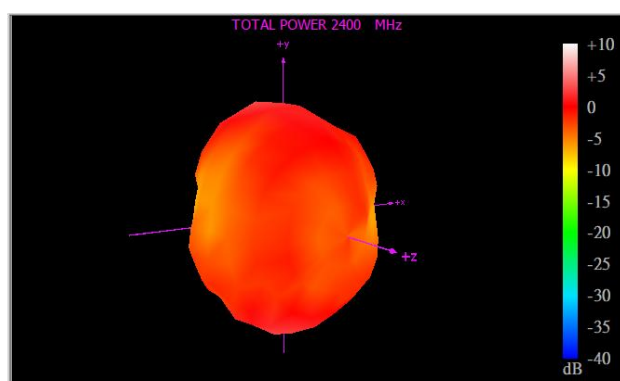
4.3.2. LTE MIMO2



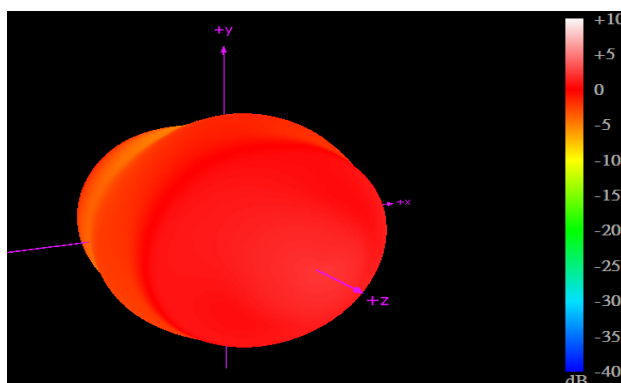
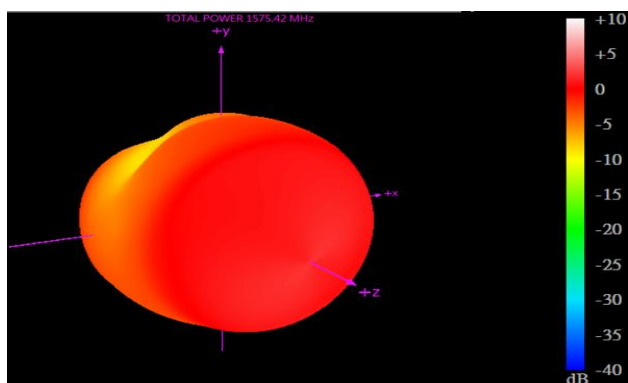
4.3.3. Wi-Fi MIMO1



4.3.4. Wi-Fi MIMO2



4.3.5. GNSS



5. Mechanical Drawing (Units: mm)

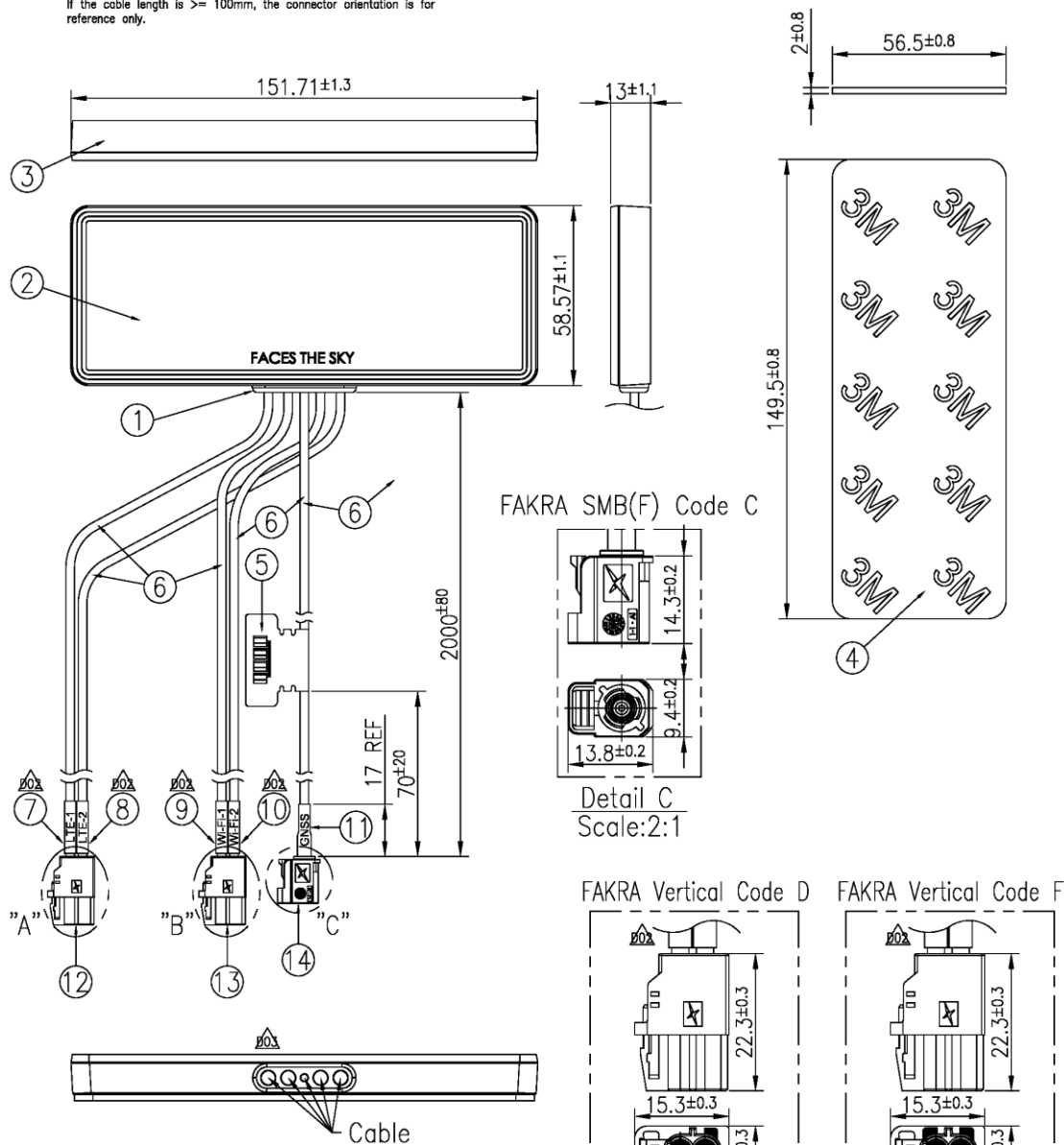
ISO NO.: EDW.007221

STATE: RELEASE

NOTES:

1. All material must be RoHS compliant.
2. The connector orientation is defined as per drawing:
If the cable length is $< 100\text{mm}$, the connector orientation should be same as per drawing.
If the cable length is $\geq 100\text{mm}$, the connector orientation is for reference only.

REV.	DESCRIPTION	ENG.	APPROVED	DATE
<u>001</u>	INITIAL DESIGN	Denis	Aaron	2025/07/31
<u>002</u>	Modify the drawing	Aron Yan	Aaron	2025/08/20
<u>003</u>	Cancel epoxy at hole.	Denis	Aaron	2025/09/24



	Name	Material	Finish	QTY
1	5in1 Casing Rubber	Silicone	Black	1
2	Top Housing	ABS+PC/SABIC C1200	Black	1
3	Bottom Housing	ABS+PC/SABIC C1200	Black	1
4	Double-Sided Adhesive	3M4945+CR4305	Black Foam/White Liner	1
5	Empty Label	PEPA	White	1
6	RG174 L Coaxial Cable	PVC	Black	5
7	Heat Shrink Tube(TE-1)	PE	Red Tube/White Text	1
8	Heat Shrink Tube(TE-2)	PE	Red Tube/White Text	1
9	Heat Shrink Tube(W-F1)	PE	Yellow Tube/Black Text	1
10	Heat Shrink Tube(W-F2)	PE	Yellow Tube/Black Text	1
11	Heat Shrink Tube(GNSS)	PE	Blue Tube/White Text	1
12	FAKRA Vertical Code D Jack	PBT	Bordeaux Violet	1
13	FAKRA Vertical Code F Jack	PBT	Green	1
14	FAKRA Gen2 Code C SMB(F)	PA66	Blue	1

APPROVED BY: Aaron	 TAOGLAS TW Design Centre This drawing and its inherent design concepts are property of TAOGLAS. Not to be copied or given to third parties without the written consent of TAOGLAS.				
CHECK BY: Aaron					
DRAWN BY: Denis					
DATE: 2025/07/31					
UNLESS OTHERWISE SPECIFIED TOLERANCES ON:	TITLE : Sin1 GNSS-2M RG-174LL FAKRA Code C Blue SMB(F) (GEN 2.0), LTE 1&2: 2M RG-174LL Dual Mini FAKRA Vertical Code D Violet Plug, WiFi 1&2 2M RG-174LL Dual Mini FAKRA Code F Brown Plug PART NO. : MA285.LBICG.026				
THIRD ANGLE PROJECTION	 <table><tr><td>UNIT: mm</td><td>SCALE: 1:2</td><td>PAGES: 1/1</td><td>REV. D03</td></tr></table>	UNIT: mm	SCALE: 1:2	PAGES: 1/1	REV. D03
UNIT: mm	SCALE: 1:2	PAGES: 1/1	REV. D03		

6. Packaging



☑ 1 PCS / PE bag

☑ PE bag (mm): 280x450(Ref.)

☑ Weight (g): 250 ±3%

weight without packaging (g): 245 ±3%

☑ SPQ Label



☑ 20 PCS / Carton

☑ Carton(mm): 390x260x330

☑ Weight (kg): 5.9 ±3%

☑ Carton Label

Changelog for the datasheet

SPE-26-8-076 - MA285.LBICG.026

Revision: A (Original First Release)	
Date:	2026-04-17
Notes:	Initial Release
Author:	Gary West

Previous Revisions



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