

Antenna Datasheet

Product OC: YEMN017AA

Version: 1.4

Date: 2023-10-16

Status: Released

Product Name: 5G Screw Mount 5 IN 1 Antenna Box

Key Features:

Optimized for 5G and 4G Networks

Φ 103.5 mm × 42.5 mm

4 × 4 5G/4G MIMO + GPS L1 & L5

Screw Mount

SMA Male Connector

IP Rating: IP67 & IP69K

Compatible with ECE-R118 cables under demand

Overview

To meet customers' requirements for the high performance, high integration, and integrated appearance of their products, Quectel provides a combined antenna box series. The antenna box can integrate a variety of antennas, such as 5G, 4G, GNSS, Wi-Fi antennas, to achieve communication functions of 5G MIMO, 4G, GNSS, and Wi-Fi. These antenna boxes can be mounted on the surface of devices via screw, adhesive or other methods, supports multiple connector types and cable lengths. It is a more flexible and reliable high-performance antenna solution for outdoor applications.

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1 Specification

Test Condition: In Free Space & On 320 mm × 240 mm Metal Plane

1.1 Electrical

Electrical Specifications		
Frequency Range	LMHs	600–960 MHz, 1400–6000 MHz
	MHs	1400–6000 MHz
	GNSS	1164–1189 MHz, 1565–1606 MHz
Radiation Pattern	LMHs & MHs	Omni-directional
	GNSS	Directional
Polarization	LMHs & MHs	Linear
	GNSS	RHCP
Impedance		50 Ω
Isolation		≤ -6.9 dB

1.1.1 LMHs

SPEC	Band	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	Freq. (MHz)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850
Max VSWR	FS	9.5	2.4	5.7	2.0	1.4	1.4	1.3	1.3	2.5	1.9	1.7
	MP	8.5	3.7	5.3	2.1	1.9	1.6	1.5	1.4	2.8	2.0	1.9
Max Return	FS	-1.8	-7.7	-3.1	-9.5	-15.6	-15.6	-17.7	-17.7	-7.4	-10.2	-11.7

Loss (dB)	MP	-2.1	-4.8	-3.3	-9.0	-10.2	-12.7	-14.0	-15.6	-6.5	-9.5	-10.2
AVG Eff. (%)	FS	20.9	37.2	28.8	55.2	69.8	73.9	73.3	66.6	60.4	55.2	46.7
	MP	14.0	39.0	34.7	50.0	64.7	60.4	64.9	57.4	48.0	48.2	44.2
AVG AVG Gain (dB)	FS	-7.1	-4.4	-5.6	-2.6	-1.6	-1.3	-1.3	-1.8	-2.2	-2.6	-3.3
	MP	-9.0	-4.2	-4.7	-3.1	-1.9	-2.2	-1.9	-2.4	-3.3	-3.2	-3.5
Max Peak Gain (dBi)	FS	-1.7	0.5	0.1	1.6	2.0	1.6	2.0	2.5	5.0	3.9	3.7
	MP	-2.5	2.7	2.3	4.6	5.9	4.8	5.5	5.5	6.2	5.3	4.6
VSWR	FS	≤ 9.2										
	MP	≤ 8.5										
Return Loss	FS	≤ -1.9 dB										
	MP	≤ -2.0 dB										
Peak Gain	FS	≤ 5.0 dBi										
	MP	≤ 6.2 dBi										

- LMHs: LMH1, LMH2 Antennas
- MHs: MH1, MH2 Antennas
- FS: In Free Space
- MP: On 320 mm × 240 mm Metal Plane

1.1.2 MHs

SPEC	Band	Band	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	Freq. (MHz)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850	
Max VSWR	FS	-	-	-	4.0	2.8	3.8	3.3	2.9	1.9	2.2	2.4	
	MP	-	-	-	2.9	2.4	4.3	4.4	3.2	2.3	3.0	2.3	
Max Return Loss (dB)	FS	-	-	-	-4.5	-6.5	-4.7	-5.4	-6.2	-9.9	-8.3	-7.6	
	MP	-	-	-	-6.2	-7.6	-4.1	-4.0	-5.6	-8.3	-6.1	-8.1	
AVG Eff.	FS	-	-	-	48.7	55.7	38.0	37.0	42.1	63.0	51.8	49.2	

(%)	MP	-	-	-	39.7	60.0	36.2	34.4	39.8	64.4	45.9	53.1
AVG AVG	FS	-	-	-	-3.2	-2.6	-4.2	-4.4	-3.8	-2.0	-2.9	-3.1
Gain (dB)	MP	-	-	-	-4.1	-2.2	-4.4	-4.6	-4.0	-1.9	-3.4	-2.8
Max Peak	FS	-	-	-	1.2	2.5	1.2	3.2	3.5	4.9	4.4	4.9
Gain (dBi)	MP	-	-	-	3.9	6.7	2.8	2.8	4.1	8.2	3.9	5.8
VSWR	FS	≤ 4.0										
	MP	≤ 4.4										
Return Loss	FS	≤ -4.5 dB										
	MP	≤ -4 dB										
Peak Gain	FS	≤ 4.9 dBi										
	MP	≤ 8.2 dBi										

- LMHs: LMH1, LMH2 Antennas
- MHs: MH1, MH2 Antennas
- FS: In Free Space
- MP: On 320 × 240 mm Metal Plane

1.1.3 GNSS

Band Frequency (MHz)	GPS L5 GALILEO E5a BEIDOU B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BEIDOU B2b	GPS L2 QZSS L2C	GLONASS G2	BEIDOU B3	BEIDOU B1I	GPS L1 GALILEO E1 BEIDOU B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.61						1.52	1.49
Return Loss (dB)	-12.8						-13.6	-14
Efficiency (%)	47						42	40
Peak Gain (dBi)	-0.04						-1.49	-1.17

LNA Electrical	
LNA Gain	28 ±3 dB
Noise Figure	≤ 2.5 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	65dB f0 ±100 MHz f0 (1176 MHz, 1588 MHz)
Working Voltage	DC 2–5V
Working Current	12.3±3 mA
Impedance	50 Ω

1.2 Mechanical & Environment

Mechanical		
Antenna Size	YEMN017AA	Φ 103.5 mm × 42.5 mm
	YEMN518J1A	Φ 103.5 mm × 42.5 mm
	YEMW517J1A	Φ 103.5 mm × 42.5 mm
	YEMR517J1A	Φ 103.5 mm × 42.5 mm
	YEMM517J1A	Φ 127.7 mm × 71.7 mm
	YEMA517J1A	Φ 127.7 mm × 72.6 mm
Casing Material & Color		PC & Black
Cable Type & Length	LMHs & MHs	RG405 Black & 300 mm (YEMA517J1A & YEMM517J1A: 270 mm)
	GNSS	RG174 Black & 300 mm (YEMA517J1A & YEMM517J1A: 270 mm)
Connector Type		SMA Male (The current state of the SMA connector is not waterproof. If a waterproof connector is need, it can be customized.)
Weight	YEMN017AA	220 g Typical
	YEMN518J1A	220 g Typical
	YEMW517J1A	520 g Typical
	YEMR517J1A	720 g Typical
	YEMM517J1A	330 g Typical
	YEMA517J1A	330 g Typical
Mounting Type	YEMN017AA	Screw Mounting (M20)
	YEMN518J1A	Screw Mounting (M18)
	YEMW517J1A	Wall Mounting
	YEMR517J1A	Pole Mounting
	YEMM517J1A	Magnetic Mounting
	YEMA517J1A	Adhesive Mounting
Environmental		
Operation Temperature		-40 °C to +85 °C
Storage Temperature		-40 °C to +85 °C
Ingress Protection (IP) Rating		IP67 (After Installation) IP69K (After Installation)

Impact Protection (IK) Rating	IK09
RoHS & REACH Compliant	Yes

- LMHs: LMH1, LMH2 Antennas
- MHs: MH1, MH2 Antennas
- FS: In Free Space
- MP: On 320 × 240 mm Metal Plane

1.3 Supported Bands

5G NR/ LTE/ LTE-Advanced/ WCDMA/ HSPA/ HSPA+/ GPRS/ GSM/ NB-IoT					
Band	Frequency (MHz)	Uplink (MHz)	Downlink (MHz)	LMHs	MHs
1	2100	1920–1980	2110–2170	√	√
2	1900	1850–1910	1930–1990	√	√
3	1800	1710–1785	1805–1880	√	√
4	1700	1710–1755	2110–2155	√	√
5	850	824–849	869–894	√	-
7	2600	2500–2570	2620–2690	√	√
8	900	880–915	925–960	√	-
9	1800	1749.9–1784.9	1844.9–1879.9	√	√
11	1500	1427.9–1447.9	1475.9–1495.9	√	√
12	700	699–716	729–746	√	-
13	700	777–787	746–756	√	-
14	700	788–798	758–768	√	-
17	700	704–716	734–746	√	-
18	850	815–830	860–875	√	-
19	850	830–845	875–890	√	-
20	800	832–862	791–821	√	-
21	1500	1447.9–1462.9	1495.9–1510.9	√	√
22	3500	3410–3490	3510–3590	√	√
23	2100	2000–2020	2180–2200	√	√
24	1600	1626.5–1660.5	1525–1559	√	√
25	1900	1850–1915	1930–1995	√	√
26	850	814–849	859–894	√	-

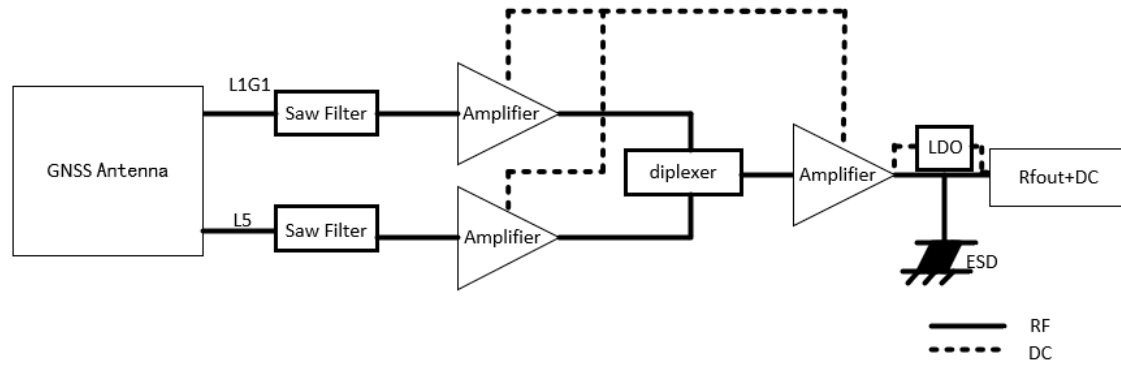
5G NR/ LTE/ LTE-Advanced/ WCDMA/ HSPA/ HSPA+/ GPRS/ GSM/ NB-IoT					
Band	Frequency (MHz)	Uplink (MHz)	Downlink (MHz)	LMHs	MHs
28	700	703–748	758–803	√	-
31	450	452.5–457.5	462.5–467.5	-	-
34	2100	2010–2025		√	√
38	2600	2570–2620		√	√
39	1900	1880–1920		√	√
40	2300	2300–2400		√	√
41	2500	2496–2690		√	√
42	3500	3400–3600		√	√
48	3500	3550–3700		√	√
66	1700	1710 - 1780	2110 - 2200	√	√
71	600	663 - 698	617 - 652	√	-
74	1500	1427 - 1470	1475 - 1518	√	√
77	3500	3300 - 4200		√	√
78	3500	3300 - 3800		√	√
79	4500	4400 - 5000		√	√
Note: Covered √ means efficiency > 20 %					

GNSS Frequency Bands (MHz)					
GPS	L1 Centre 1575.42 (1565–1586)	L2 Centre 1227.6 (1217–1238)	L5 Centre 1176.45 (1164–1189)		
	√	-	√		
GLONASS	G1-L10C-L10F Centre 1601 (1595–1606)	G2-L20C-L20F Centre 1248.06 (1241–1255)	G3-L30C Centre 1202.025 (1189–1213)		
	√	-	-		
GALILEO	E1 Centre 1575.42 (1563–1588)	E5a Centre 1176.45 (1166–1187)	E5b Centre 1207.14 (1197–1218)	E6 Centre 1278.75 (1258–1300)	
	√	√	-	-	
BEIDOU	B1I Centre 1561.098 (1559–1564)	B1C (BeiDou-3) Centre 1575.42 (1559–1592)	B2a-B2I Centre 1176.45 (1166–1187)	B2b Centre 1207.14 (1197–1217)	B3 Centre 1268.52 (1258–1279)
		√	√	-	-
QZSS	L1 Centre 1575.42 (1573–1578)	L2C Centre 1227.6 (1226–1229)	L5 Centre 1176.45 (1166–1187)	L6 Centre 1278.75 (1257–1300)	
	√	-	√	-	
IRNSS	L5 Centre 1176.45 (1164–1189)				
	√				

GNSS Bands and Constellations



1.4 Block Diagram (Active Antenna)



2 Drawing

Mounting Type



Screw Mount
YEMN017AA
M20 Screw Nut (included)



Screw Mount
YEMN518J1A
M18 Screw Nut (included)



Pole Mount
YEMR517J1A
Pole Bracket



Wall Mount
YEMW517J1A
Wall Mounting Bracket
(included)

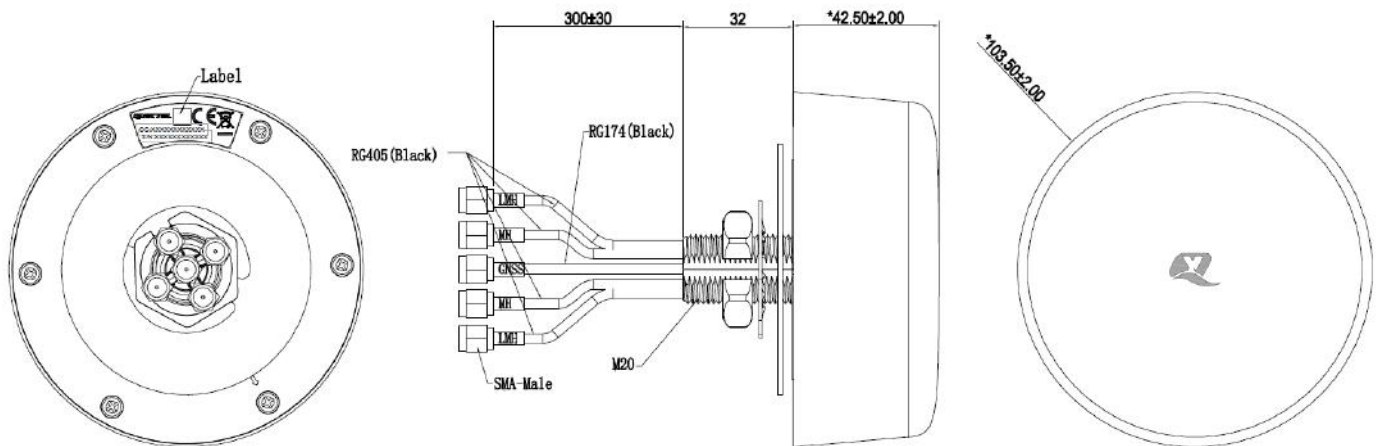


Magnetic Mount
YEMM517J1A
Magnetic Mount
For temporary and low
mobility installations.

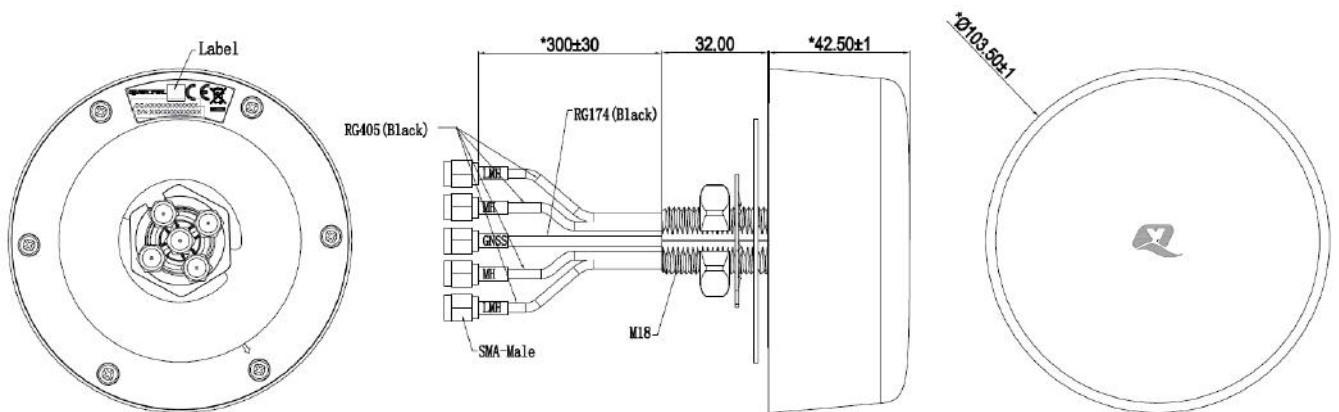


Adhesive Mount
YEMA517J1A
Adhesive Mount
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mobility installations.

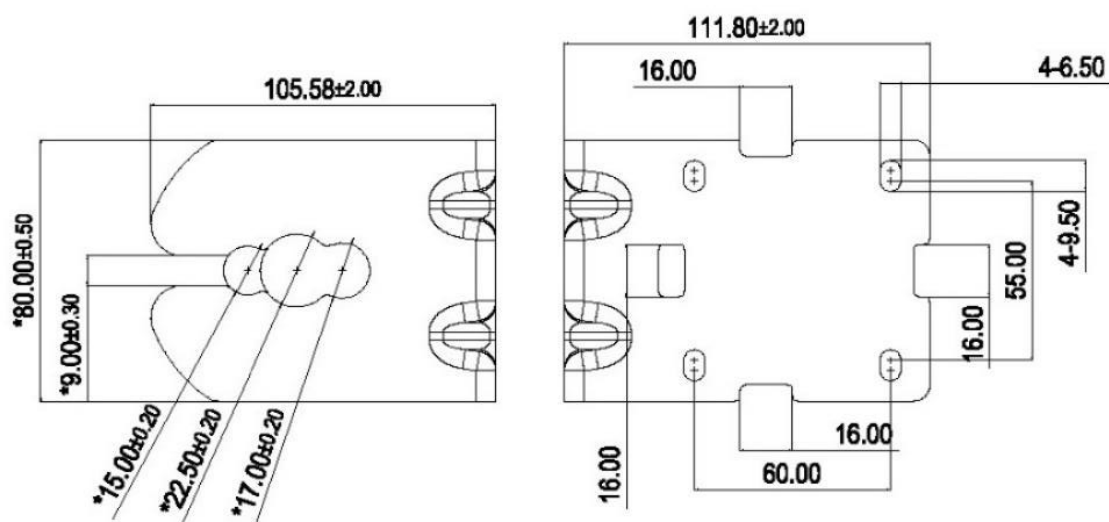
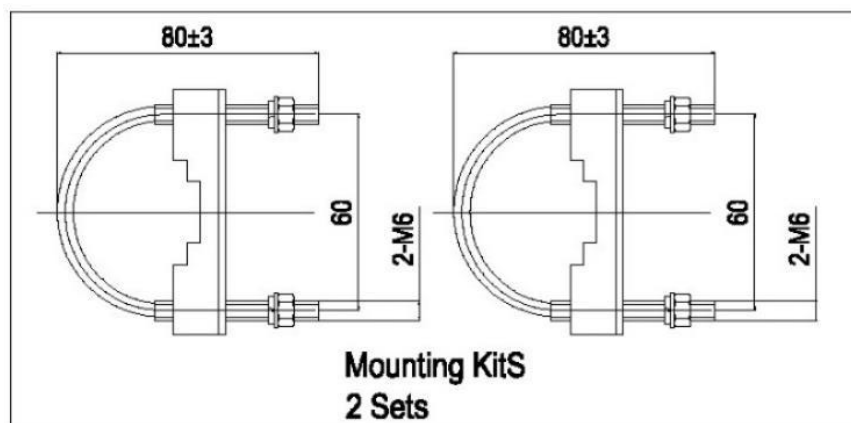
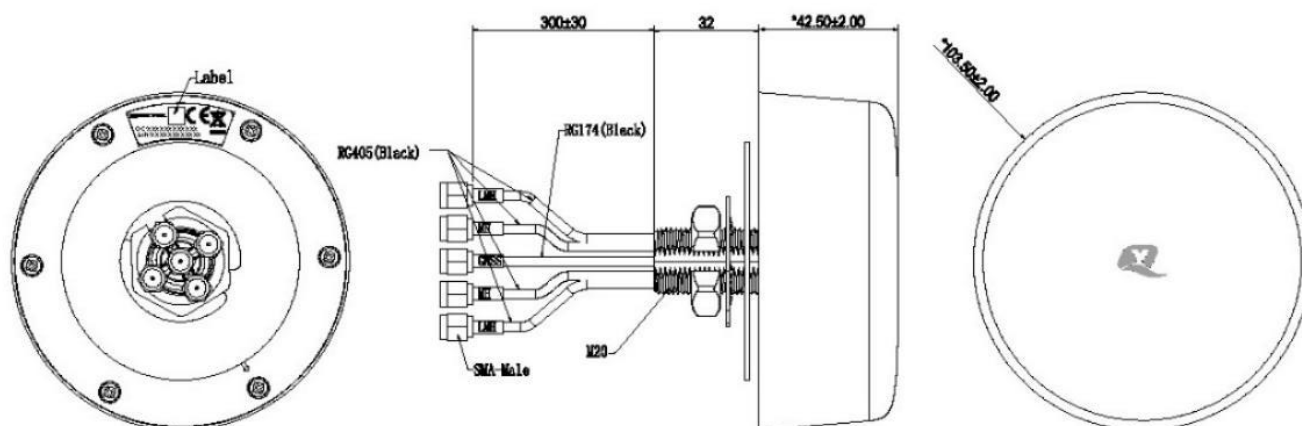
YEMN017AA



YEMN518J1A

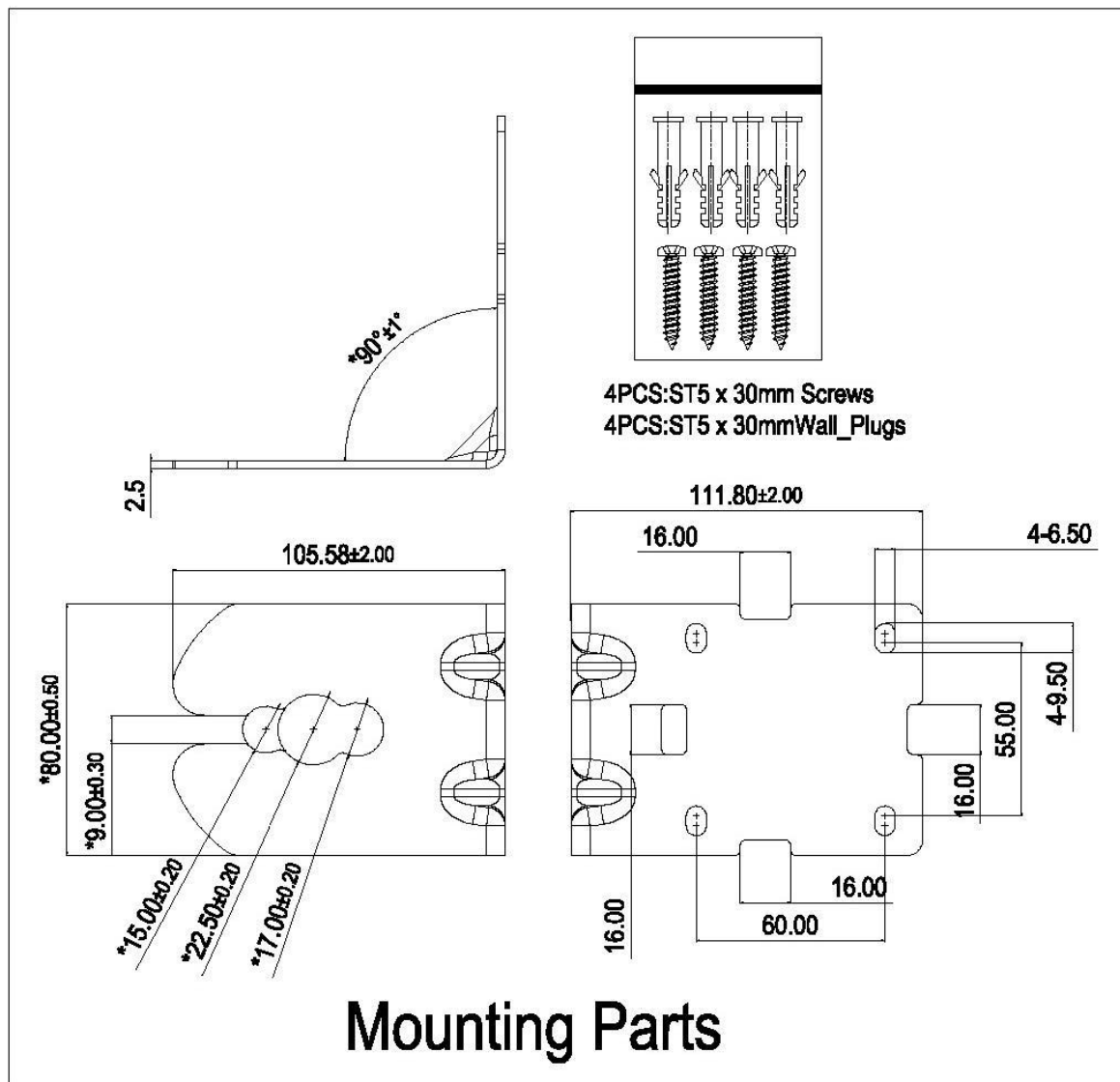
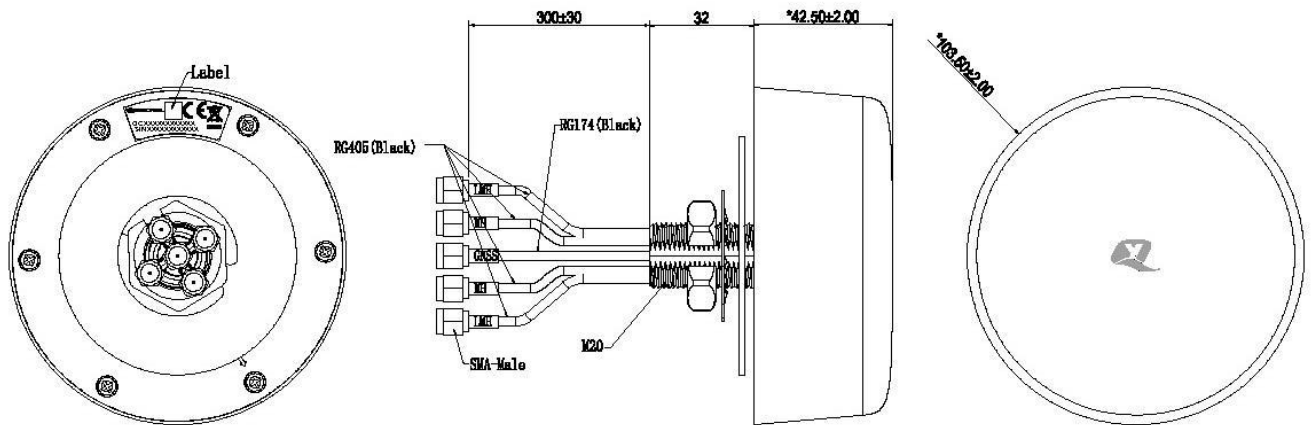


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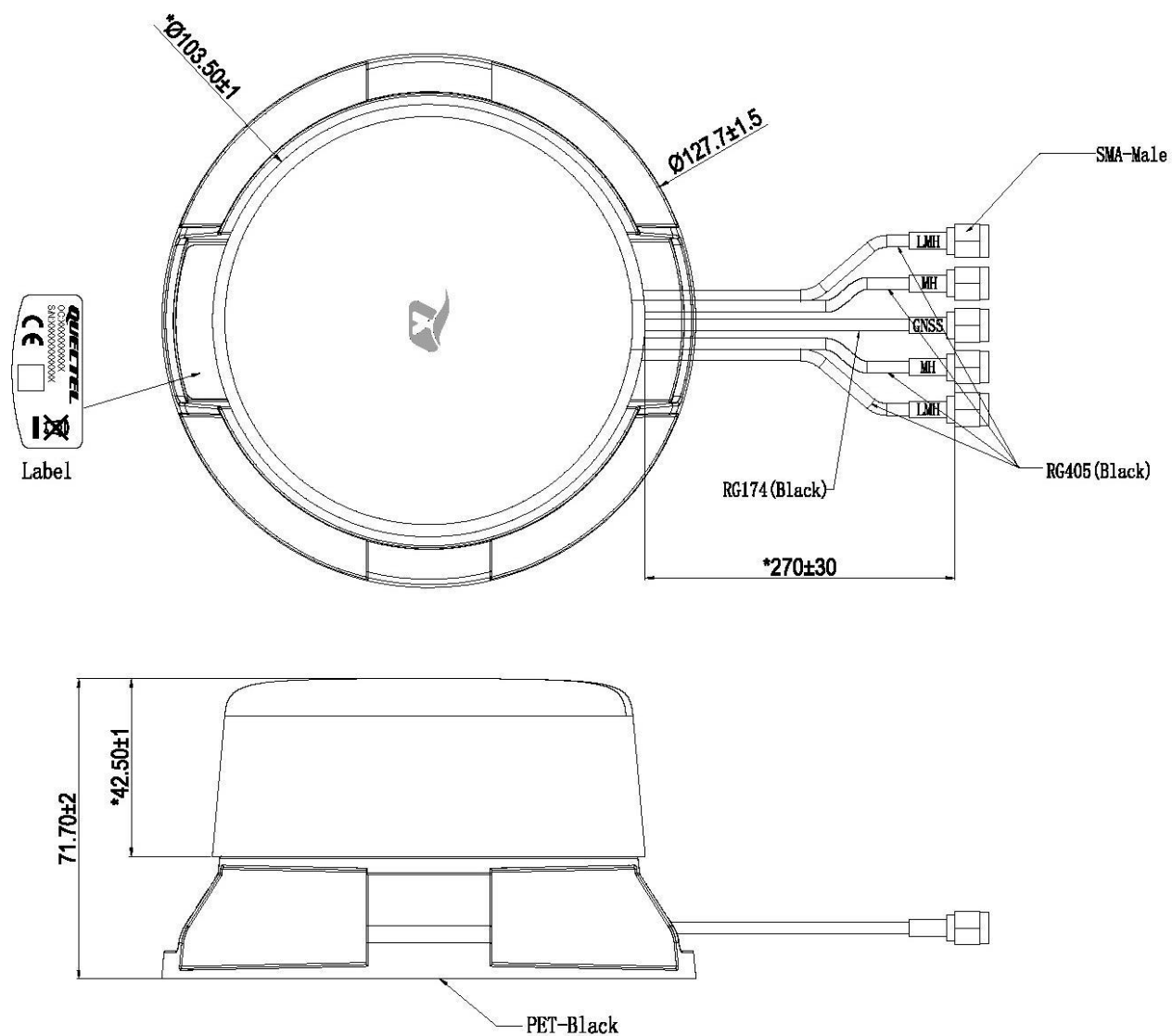


Mounting Parts

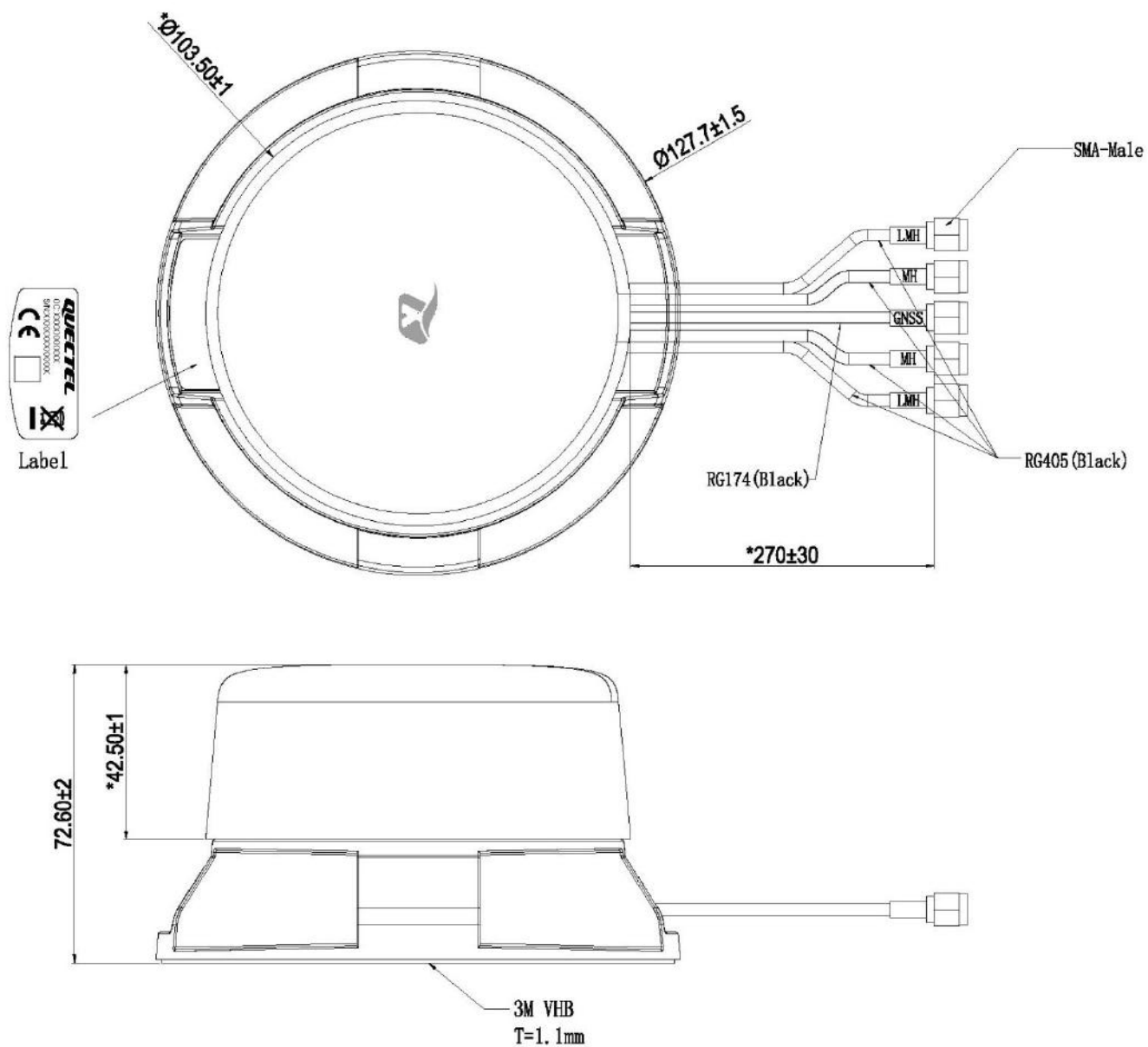
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YEMM517J1A



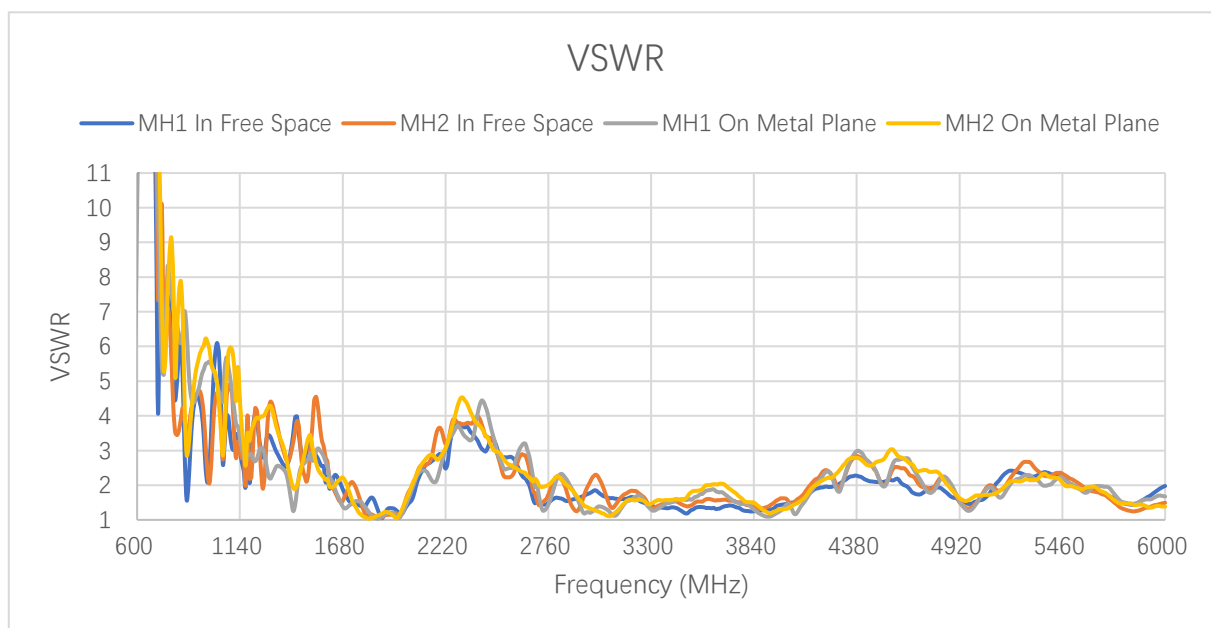
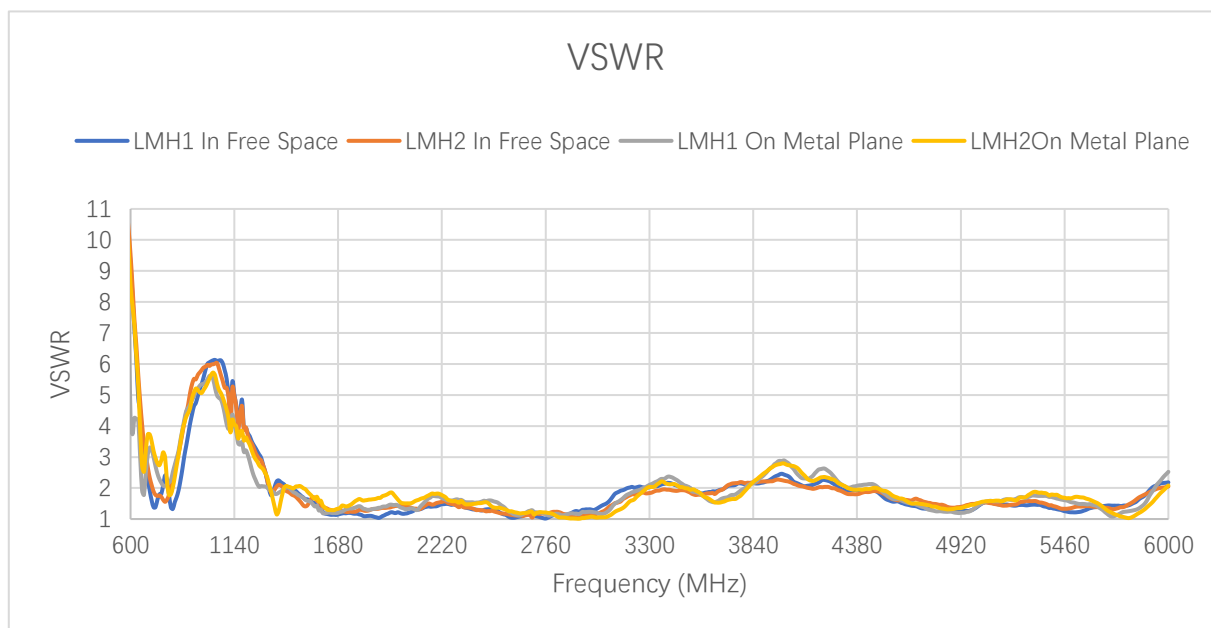
YEMA517J1A



3 Detailed Performance

3.1 S-Parameter Test

3.1.1 VSWR

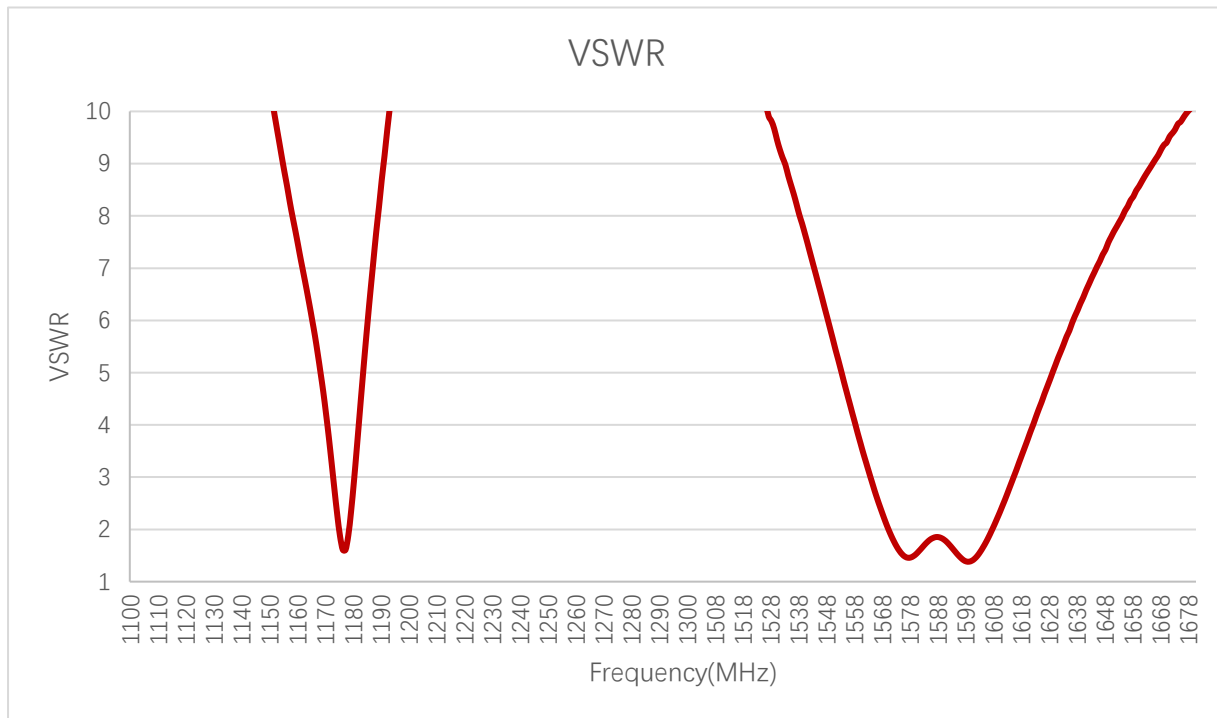


VSWR - LMHs

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	9.2	6.2	1.6	1.5	3.7	5.2	2.0	1.2	1.2	1.1
	MP	4.2	4.2	3.2	2.7	4.6	5.3	1.9	1.3	1.3	1.3
LMH2	FS	9.5	6.6	2.1	2.6	4.7	5.7	1.8	1.2	1.2	1.3
	MP	8.5	6.3	3.5	2.4	4.4	5.1	2.0	1.4	1.4	1.7
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	1.2	1.4	1.4	1.3	1.0	1.2	1.4	1.4	1.2	2.2
	MP	1.5	1.6	1.5	1.6	1.1	1.3	1.4	1.4	1.5	2.5
LMH2	FS	1.4	1.5	1.4	1.2	1.1	1.0	1.6	1.5	1.4	2.0
	MP	1.8	1.7	1.5	1.5	1.2	1.2	1.5	1.5	1.7	2.1

VSWR - MHs

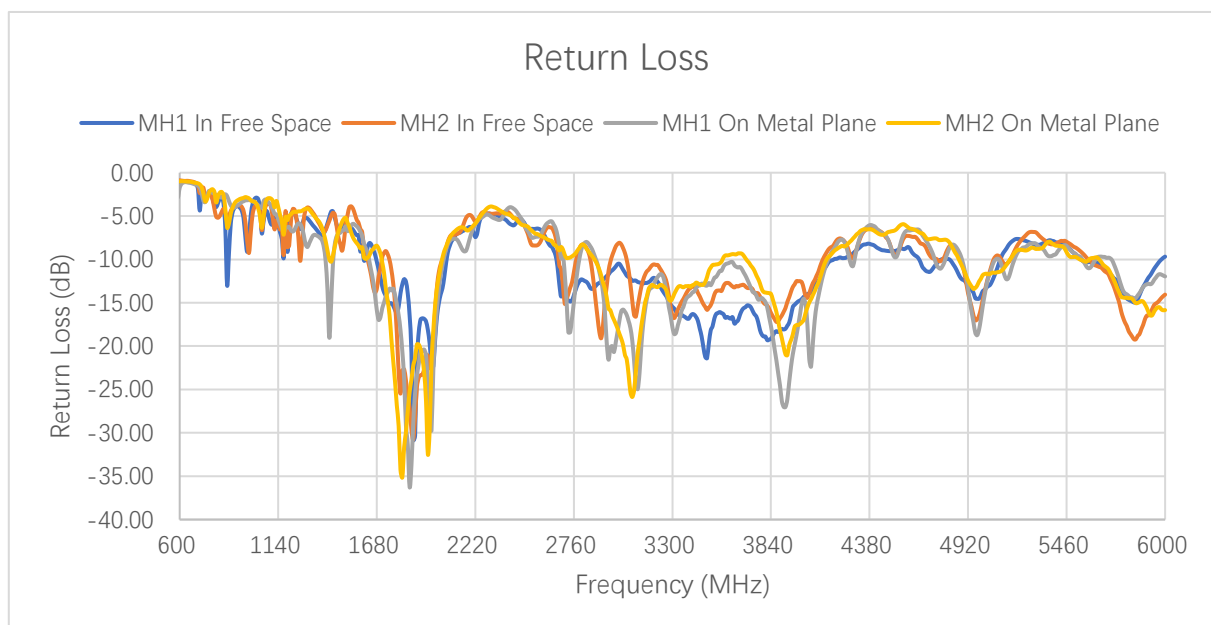
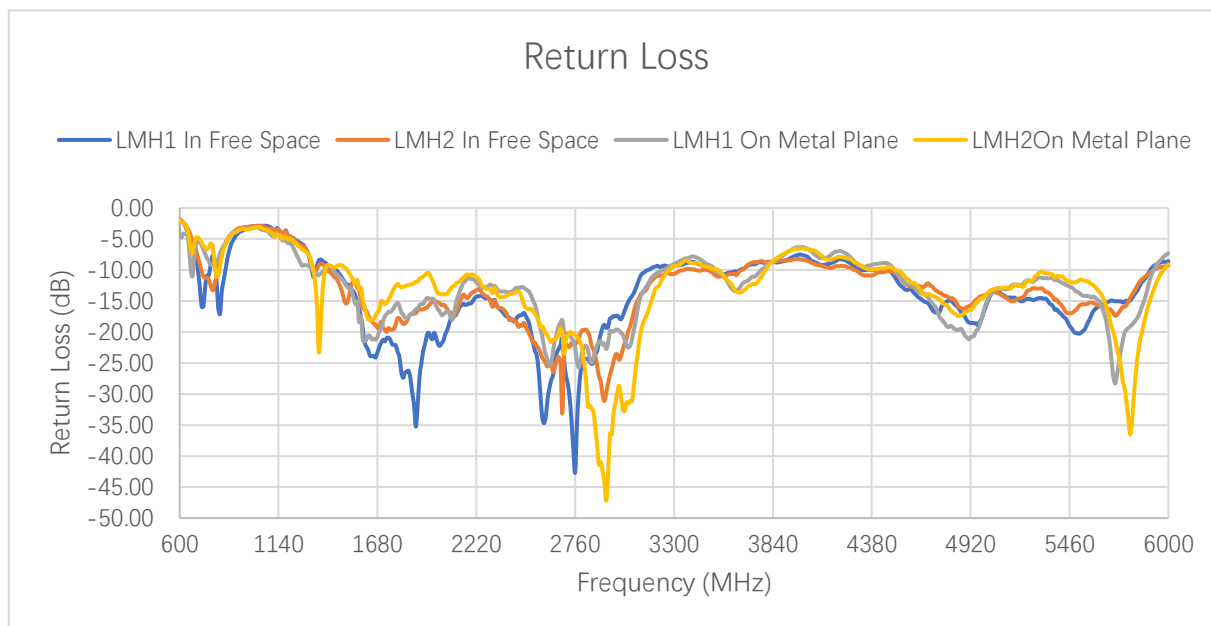
Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	4.0	1.6	1.4	1.1
	MP	-	-	-	-	-	-	1.9	1.4	1.5	1.1
MH2	FS	-	-	-	-	-	-	3.8	2.0	2.0	1.1
	MP	-	-	-	-	-	-	2.0	1.9	1.4	1.2
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	1.3	2.7	3.5	3.2	2.5	1.4	1.7	1.5	2.1	2.0
	MP	1.2	2.2	3.3	3.9	2.9	1.9	2.3	1.4	2.1	1.7
MH2	FS	1.2	2.7	3.8	3.3	2.7	1.6	2.1	1.5	2.2	1.5
	MP	1.1	2.9	4.1	3.3	2.5	2.0	2.4	1.7	2.0	1.4



VSWR-GNSS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.61						1.52	1.49

3.1.2 Return Loss

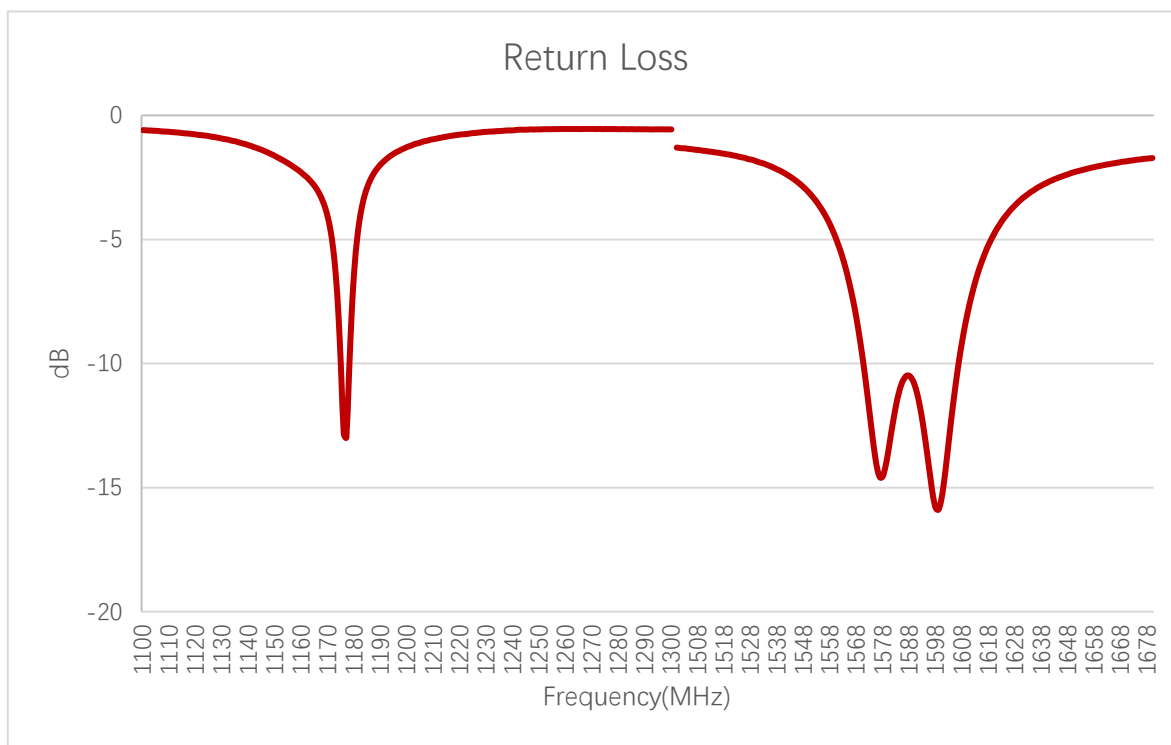


Return Loss (dB) - LMHs

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	-1.9	-2.8	-12.8	-13.4	-4.8	-3.4	-9.8	-21.3	-20.9	-31.7
	MP	-4.2	-4.2	-5.6	-6.6	-3.9	-3.3	-10.1	-18.5	-16.8	-16.7
LMH2	FS	-1.8	-2.6	-9.0	-6.9	-3.8	-3.1	-11.0	-19.2	-19.4	-17.0
	MP	-2.0	-2.8	-5.1	-7.9	-4.0	-3.5	-9.6	-15.1	-14.8	-12.1
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	-20.5	-15.7	-16.4	-17.4	-33.5	-21.1	-15.9	-16.2	-20.2	-8.6
	MP	-14.5	-12.7	-13.5	-13.1	-23.7	-18.1	-14.9	-15.7	-13.5	-7.3
LMH2	FS	-16.1	-14.5	-16.1	-19.2	-25.1	-33.1	-12.5	-14.0	-16.3	-9.3
	MP	-10.5	-11.5	-14.4	-13.4	-20.2	-20.0	-14.0	-14.1	-11.9	-9.1

Return Loss (dB) - MHs

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	-4.4	-12.7	-15.6	-26.4
	MP	-	-	-	-	-	-	-10.2	-15.6	-14.0	-26.4
MH2	FS	-	-	-	-	-	-	-4.7	-9.5	-9.5	-26.4
	MP	-	-	-	-	-	-	-9.5	-10.2	-15.6	-20.8
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	-17.7	-6.8	-5.1	-5.6	-7.4	-15.6	-11.7	-14.0	-9.0	-9.5
	MP	-20.8	-8.5	-5.4	-4.6	-6.2	-10.2	-8.1	-15.6	-9.0	-11.7
MH2	FS	-20.8	-6.8	-4.7	-5.4	-6.8	-12.7	-9.0	-14.0	-8.5	-14.0
	MP	-26.4	-6.2	-4.3	-5.4	-7.4	-9.5	-7.7	-11.7	-9.5	-15.6



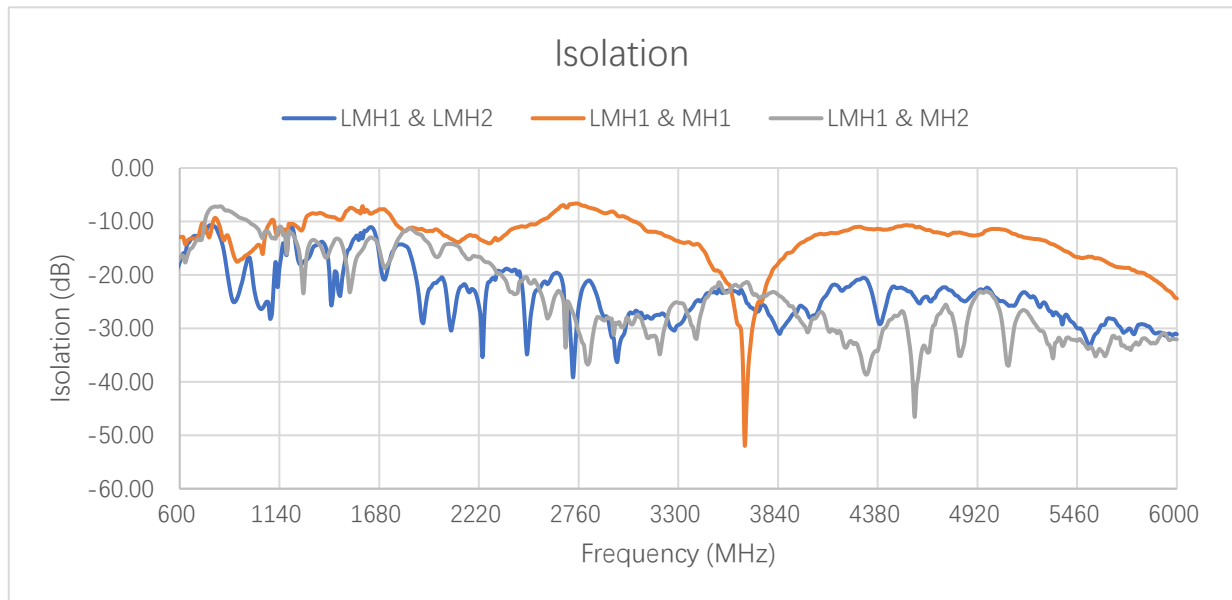
Return Loss (dB) - GNSS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss(dB)	-12.8	-	-	-	-	-	-13.6	-14

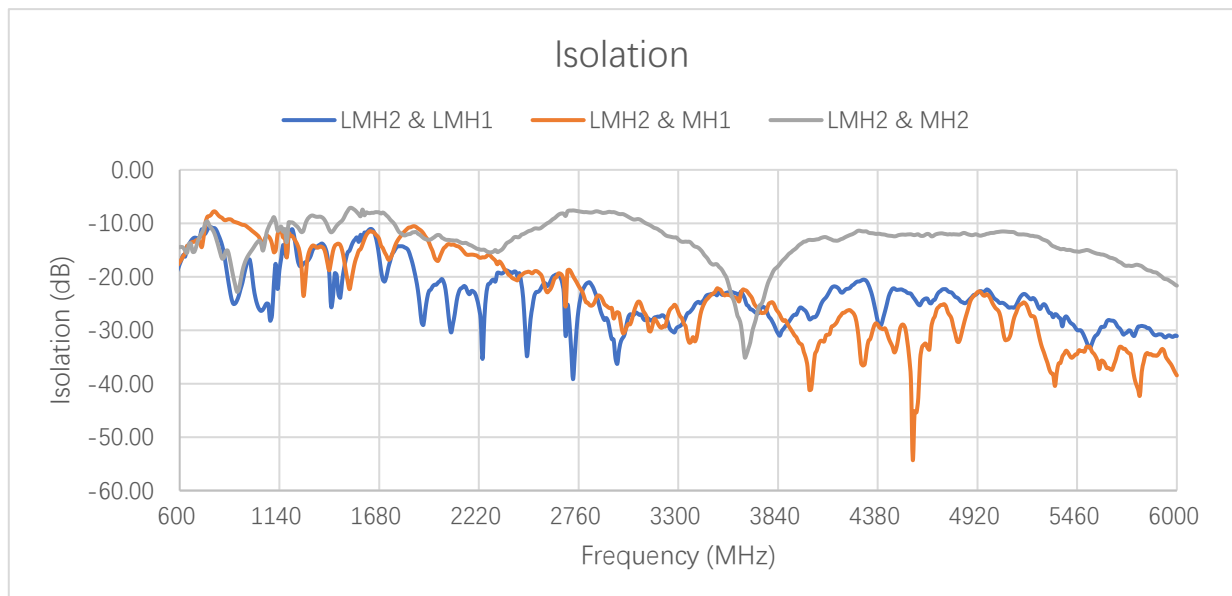
3.1.3 Isolation

3.1.3.1 Test Status: In Free Space

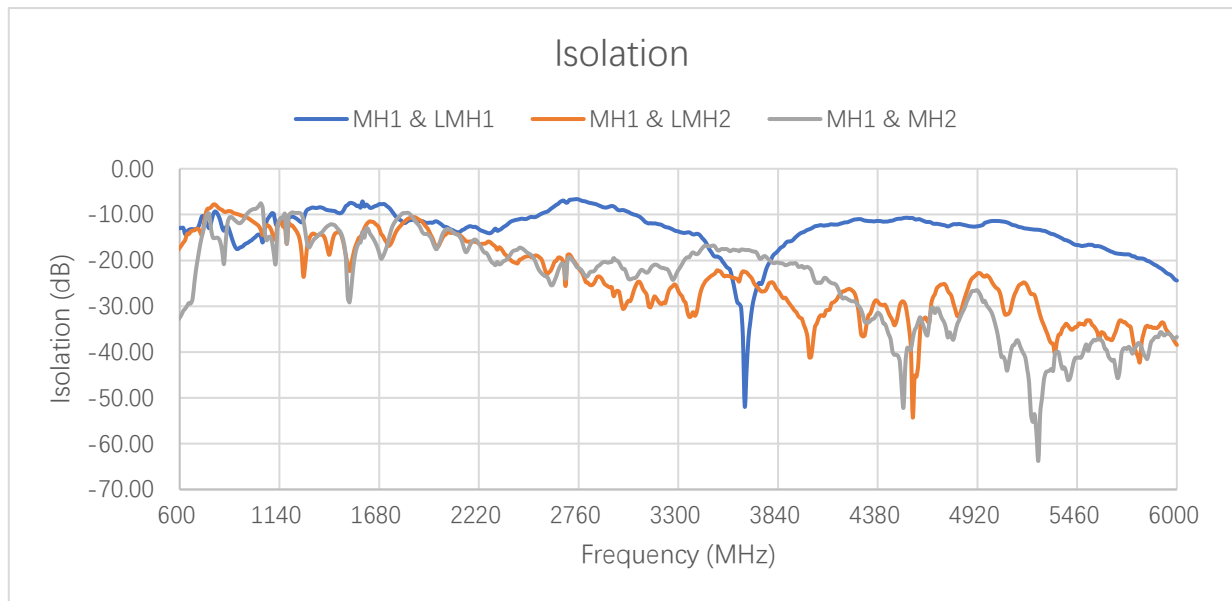
3.1.3.1.1 LMH1



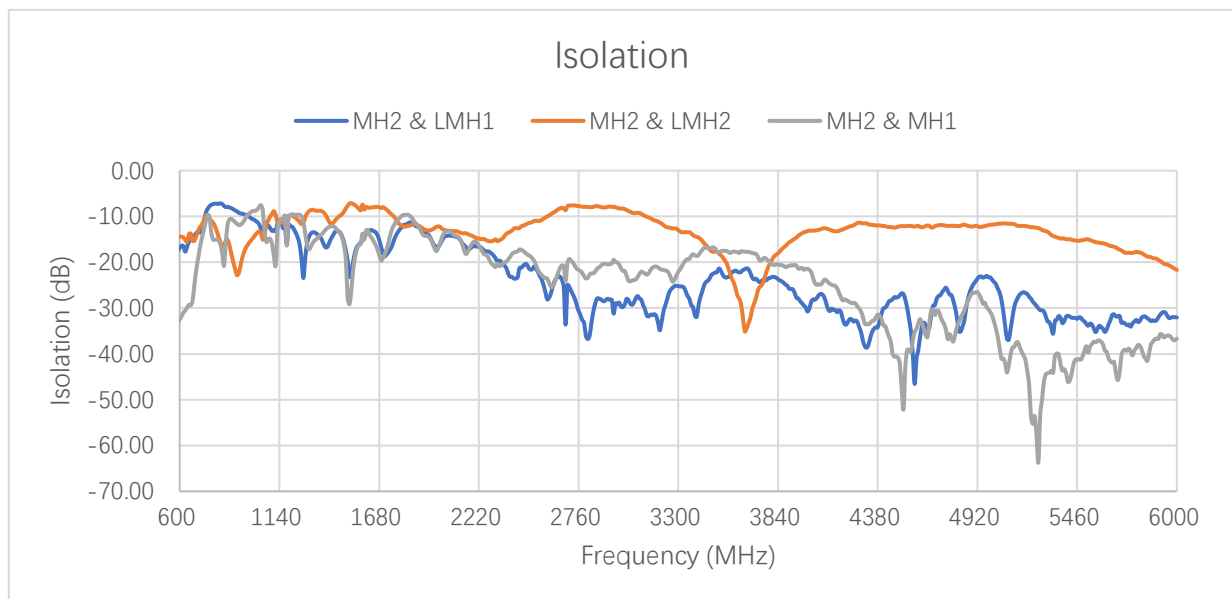
3.1.3.1.2 LMH2



3.1.3.1.3 MH1

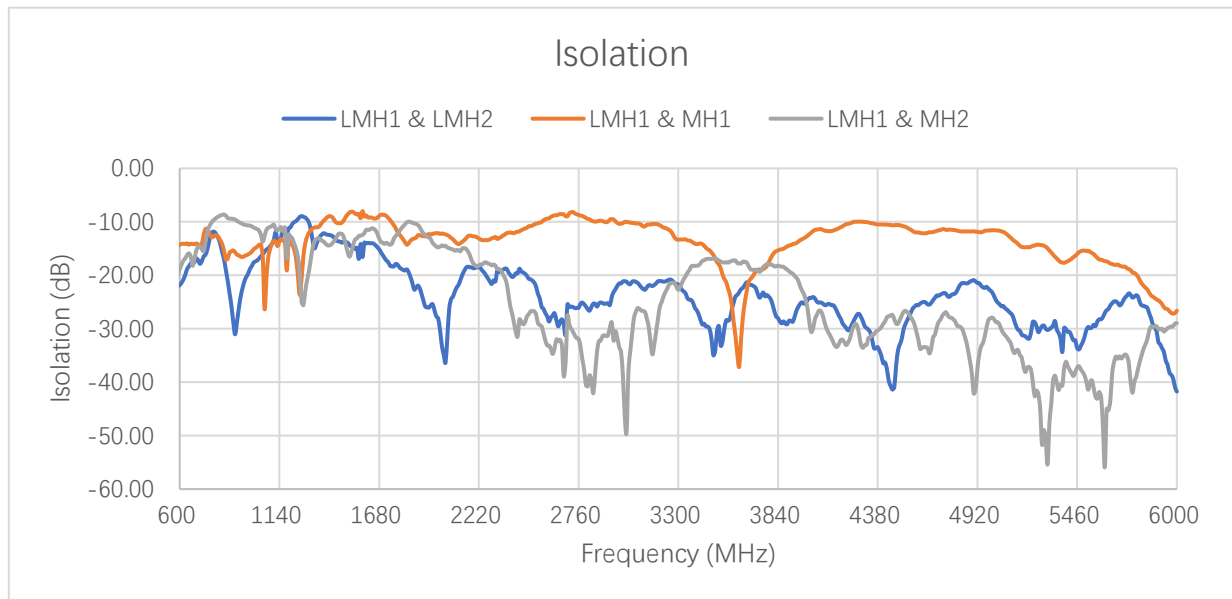


3.1.3.1.4 MH2

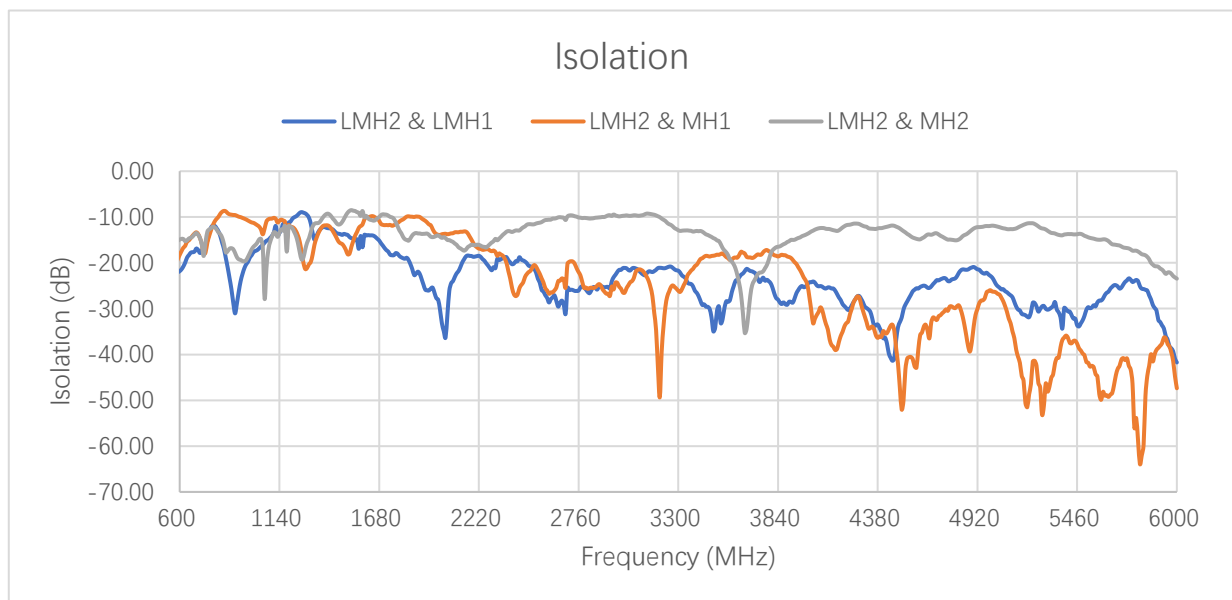


3.1.3.2 Test Status: On 320 × 240 mm Metal Plane

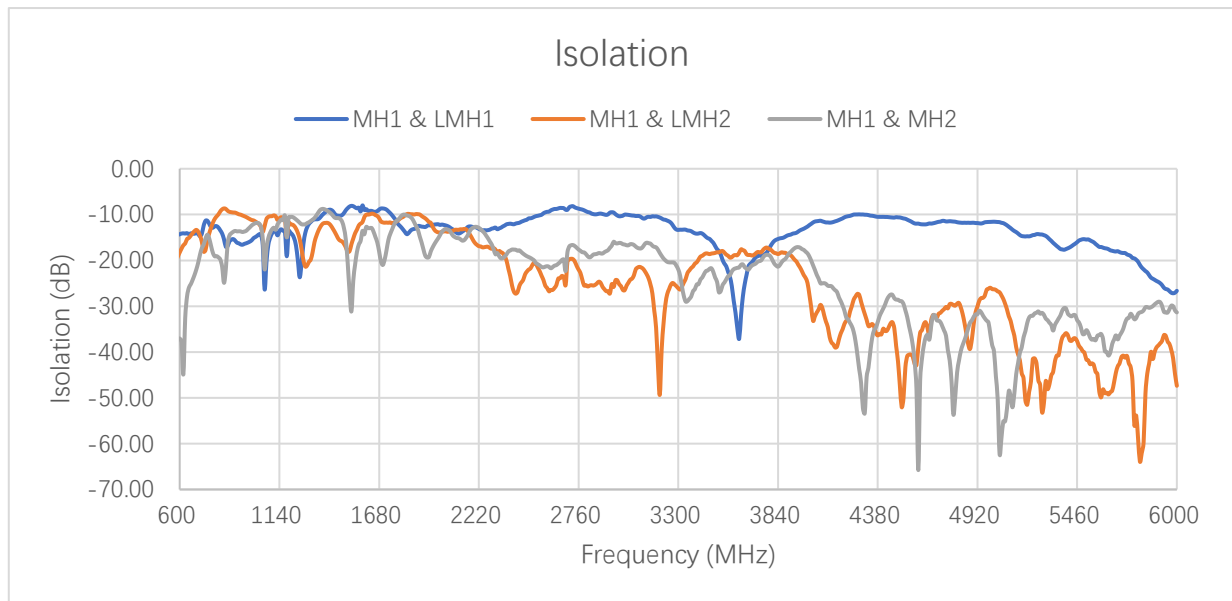
3.1.3.2.1 LMH1



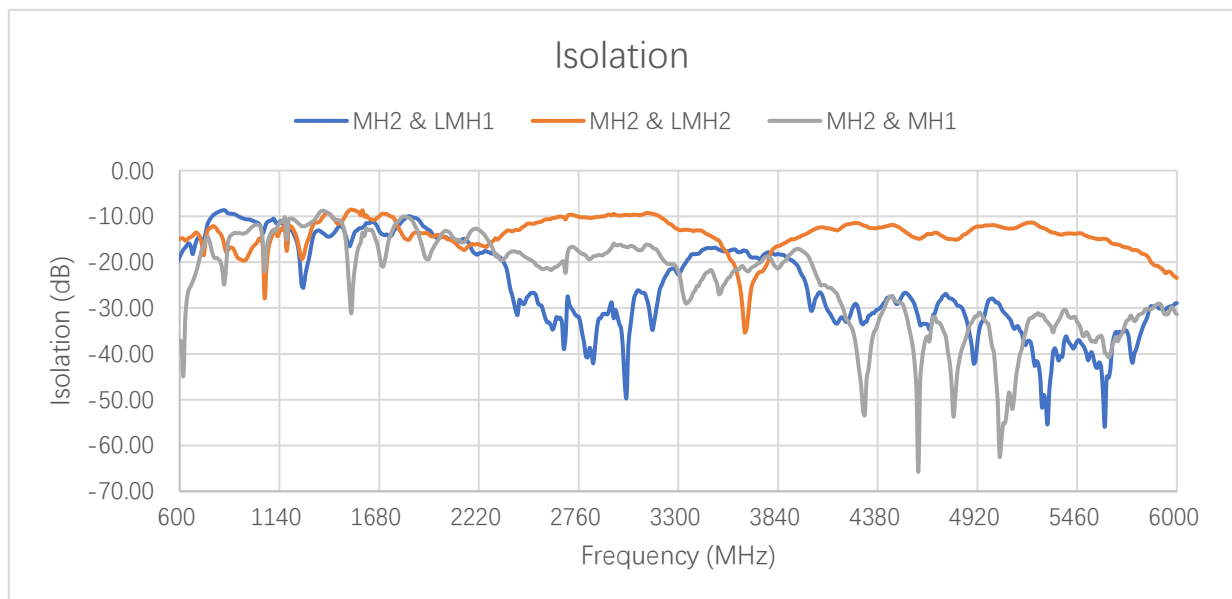
3.1.3.2.2 LMH2



3.1.3.2.3 MH1



3.1.3.2.4 MH2



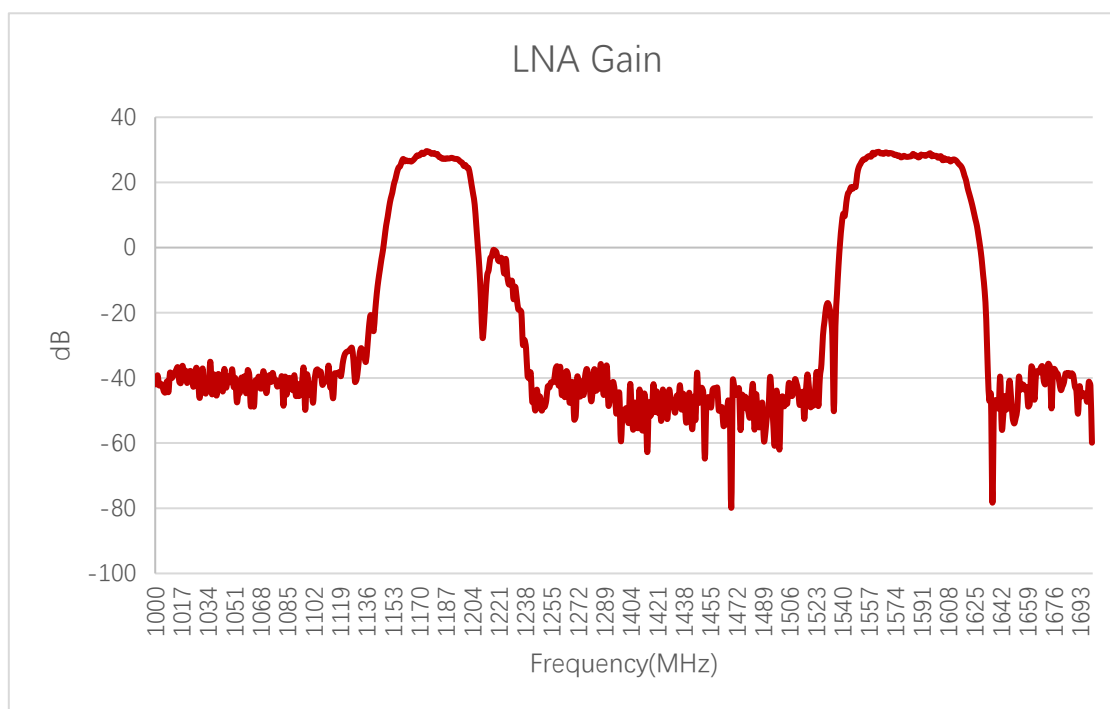
- FS: In Free Space
- MP: On 320 × 240 mm Metal Plane

Max Isolation (dB)

	Band	B71	B12/ B13/ B28	B5/ B8/ B26	N74/ N75/ N76	B1/ B2/ B3	B40	Wi-Fi 2G	B38/ B41	B42/ B48/ N77	N79	Wi-Fi 5G
	Freq. (MHz)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850
LMH1	FS	-12.7	-7.2	-7.2	-7.5	-7.7	-11.4	-10.5	-6.9	-11.7	-10.7	-12.7
	MP	-14.1	-9.0	-8.6	-8.3	-8.7	-12.0	-10.8	-8.5	-10.6	-10.5	-14.3
LMH2	FS	-12.7	-7.8	-8.8	-7.2	-8.2	-13.1	-11.4	-8.2	-12.6	-11.8	-12.1
	MP	-13.3	-9.9	-8.7	-8.7	-9.4	-13.1	-11.6	-10.0	-12.0	-11.9	-11.3
MH1	FS	-12.8	-7.8	-8.8	-7.5	-7.7	-11.4	-10.5	-6.9	-11.7	-10.7	-12.7
	MP	-13.3	-9.9	-8.7	-8.3	-8.7	-12.0	-10.8	-8.5	-10.6	-10.5	-14.3
MH2	FS	-13.1	-7.2	-7.2	-7.2	-8.2	-13.1	-11.4	-8.2	-12.6	-11.8	-12.1
	MP	-13.5	-9.0	-8.6	-8.7	-9.4	-13.1	-11.6	-10.0	-12.0	-11.9	-11.3

- FS: In Free Space
- MP: On 320 × 240 mm Metal Plane

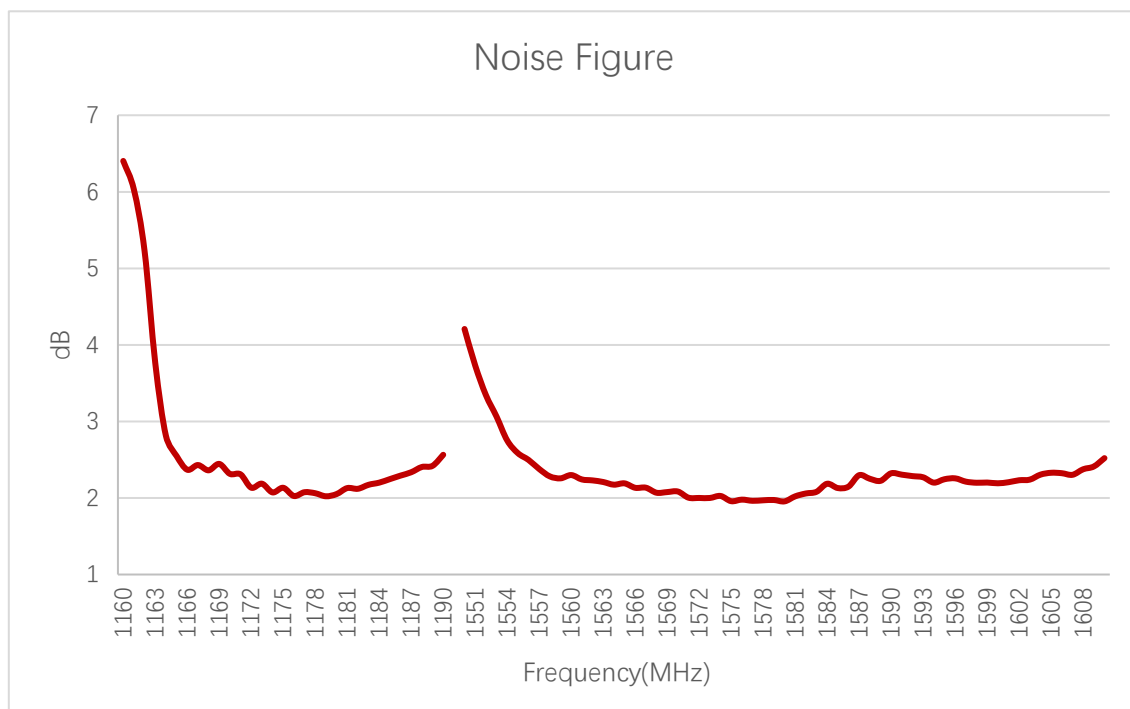
3.1.4 GNSS LNA Gain



LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain(dB)	29.3	-	-	-	-	-	28.1	27.9

3.1.5 GNSS Noise Figure

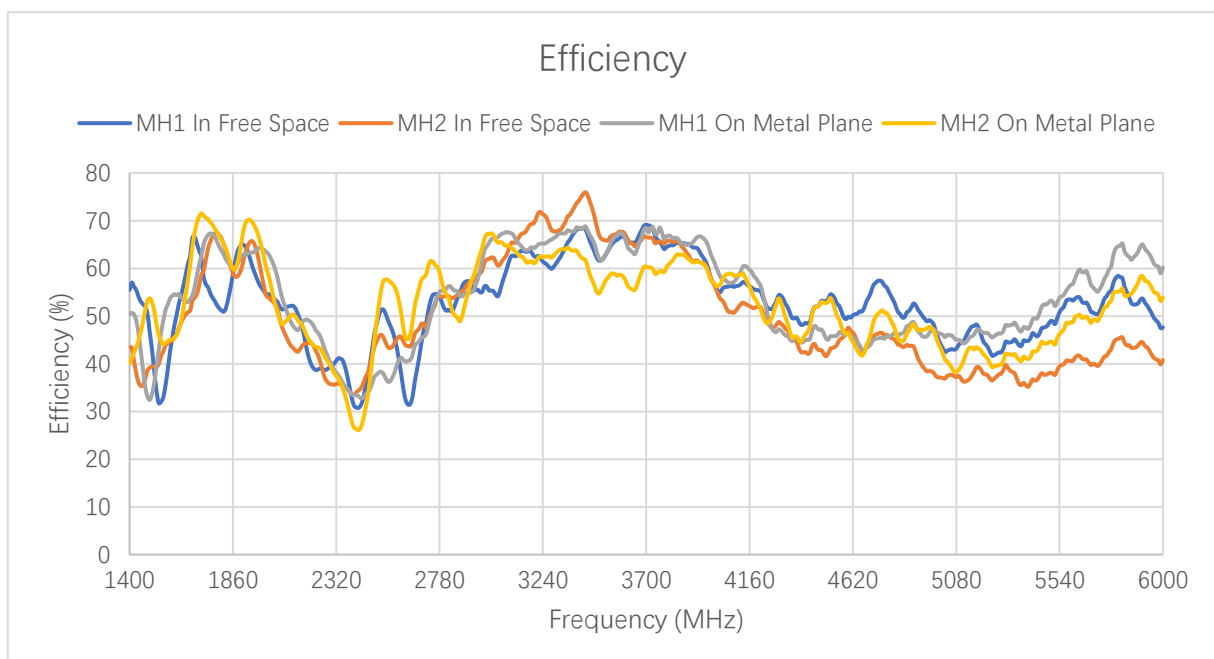
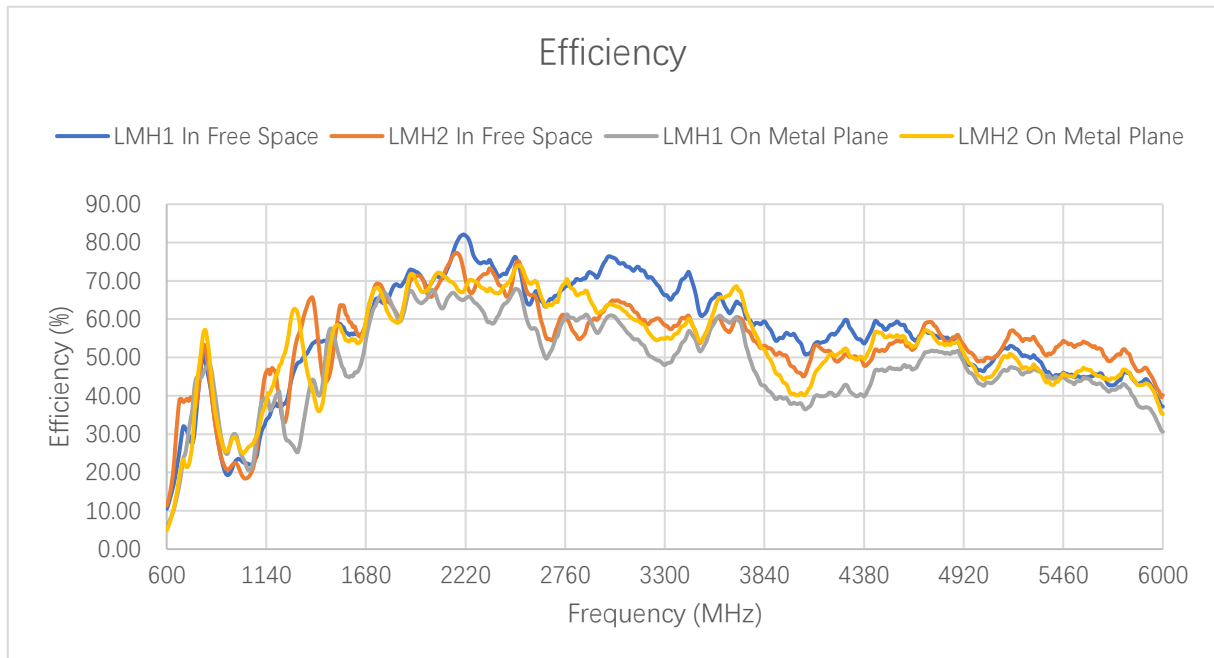


Noise Figure(dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure (dB)	2.02	-	-	-	-	-	1.95	2.23

3.2 Radiation Performance Test

3.2.1 Efficiency

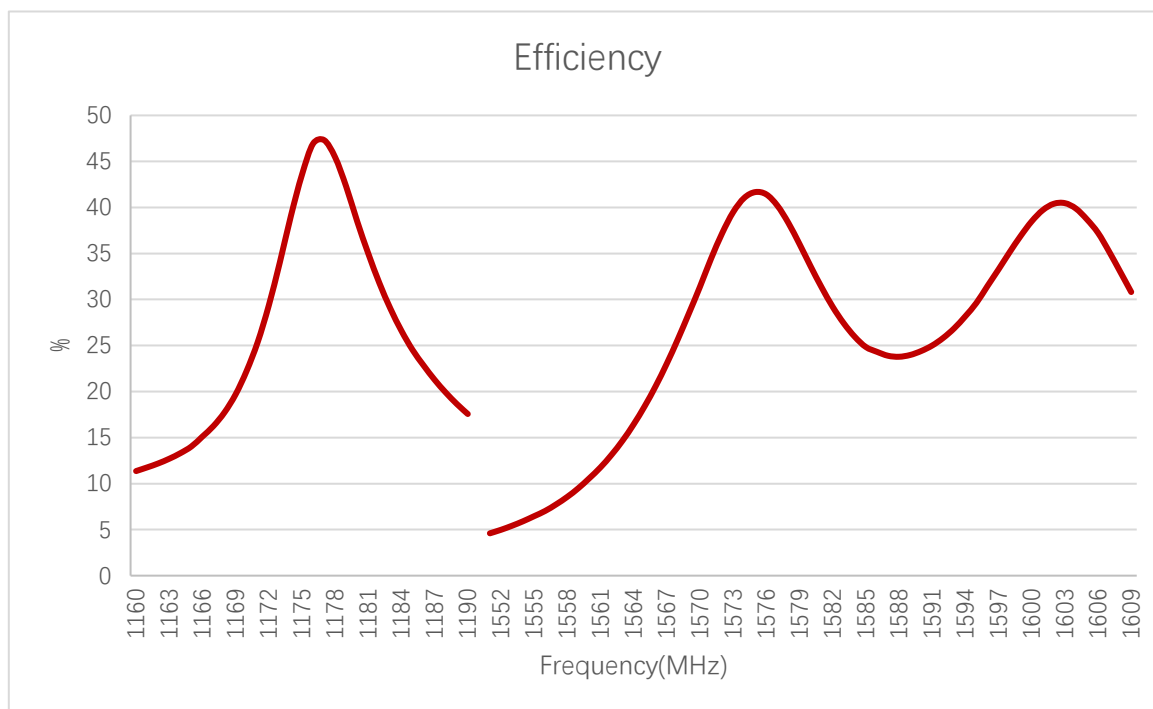


Efficiency (%) - LMHs

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	10.5	15.4	30.8	44.1	22.9	21.7	54.1	62.2	65.4	69.3
	MP	6.1	9.1	27.5	48.6	28.1	29.9	41.5	60.9	64.5	60.9
LMH2	FS	11.3	18.1	39.2	45.9	23.3	22.2	46.6	65.7	69.3	62.1
	MP	4.9	9.1	21.4	51.1	27.6	29.1	37.2	65.8	68.2	62.5
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	72.4	75.4	75.5	73.0	67.3	66.4	56.4	46.7	45.5	37.2
	MP	65.5	66.6	59.3	64.8	57.5	60.9	50.4	43.3	43.7	30.6
LMH2	FS	71.1	75.4	73.3	66.1	65.8	60.1	57.6	49.0	53.6	40.2
	MP	70.1	69.8	68.0	69.5	70.0	65.7	56.3	45.3	45.1	35.3

Efficiency (%) - MHs

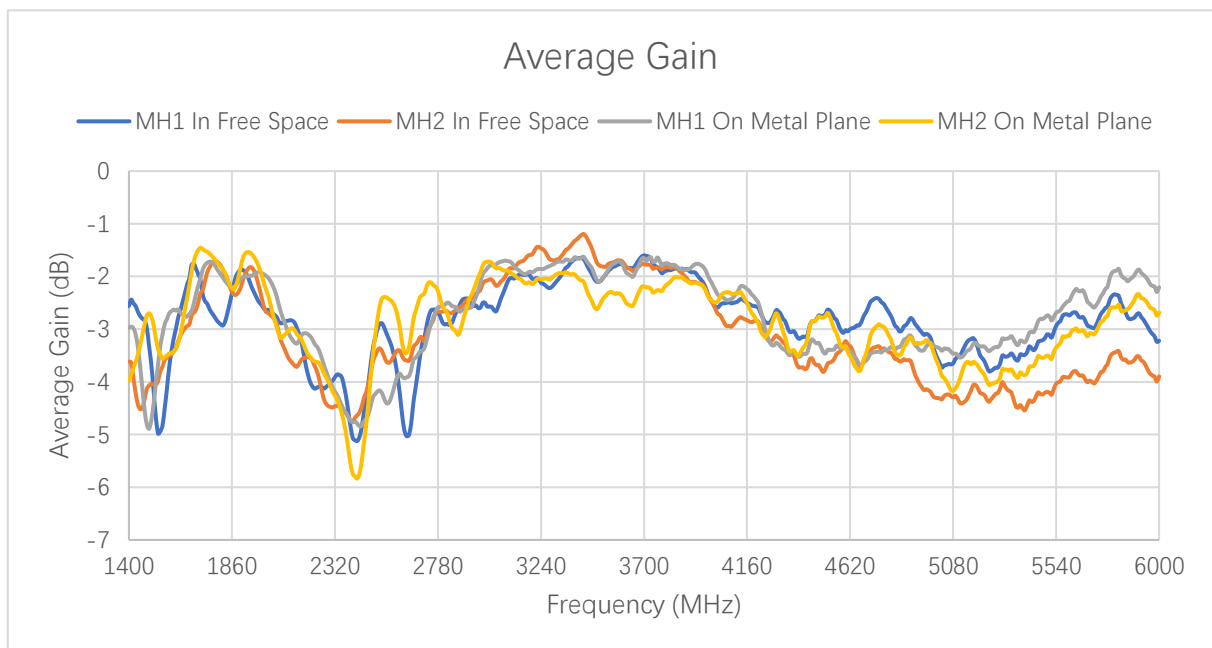
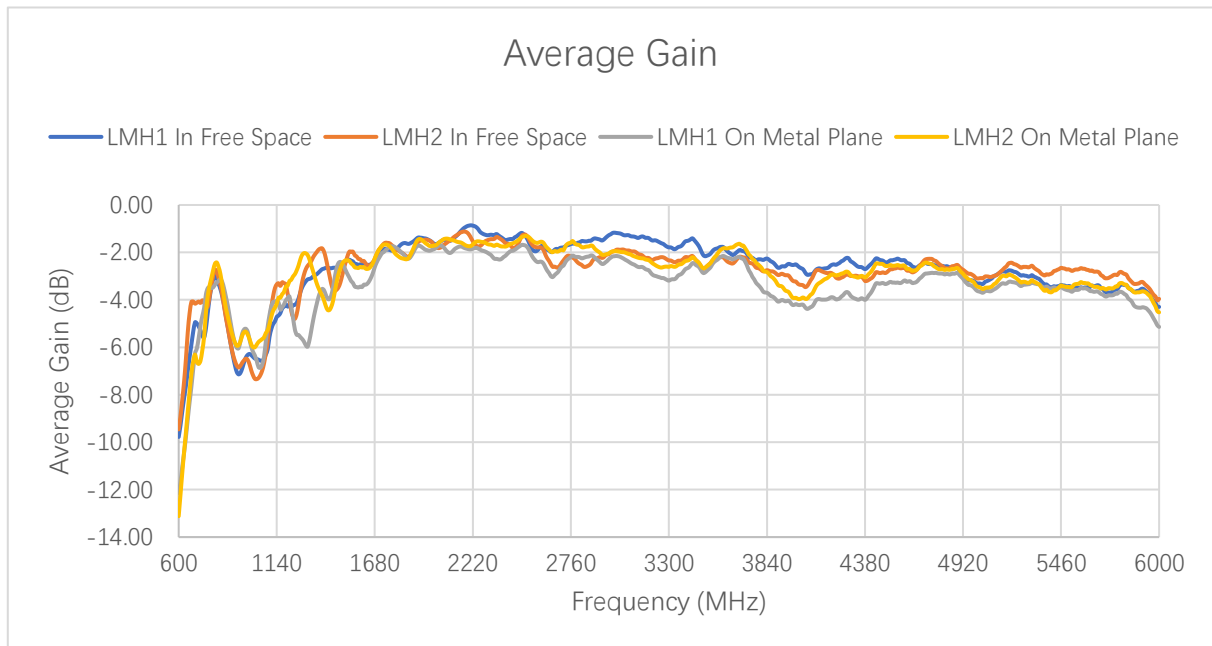
Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	54.1	63.7	56.6	63.4
	MP	-	-	-	-	-	-	46.4	60.7	66.3	60.9
MH2	FS	-	-	-	-	-	-	36.1	56.4	61.9	58.3
	MP	-	-	-	-	-	-	44.9	70.9	70.6	61.0
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	59.9	51.5	40.6	35.0	40.6	66.8	54.9	45.2	48.9	47.6
	MP	63.3	47.3	36.0	33.5	40.8	66.9	44.1	46.4	53.2	60.2
MH2	FS	65.5	42.7	35.5	37.2	45.7	67.5	44.4	37.1	38.1	40.8
	MP	69.4	49.8	34.7	30.6	53.0	58.1	46.4	44.3	44.7	53.9



Efficiency (%) - GNSS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	47	-	-	-	-	-	42	40

3.2.2 Average Gain



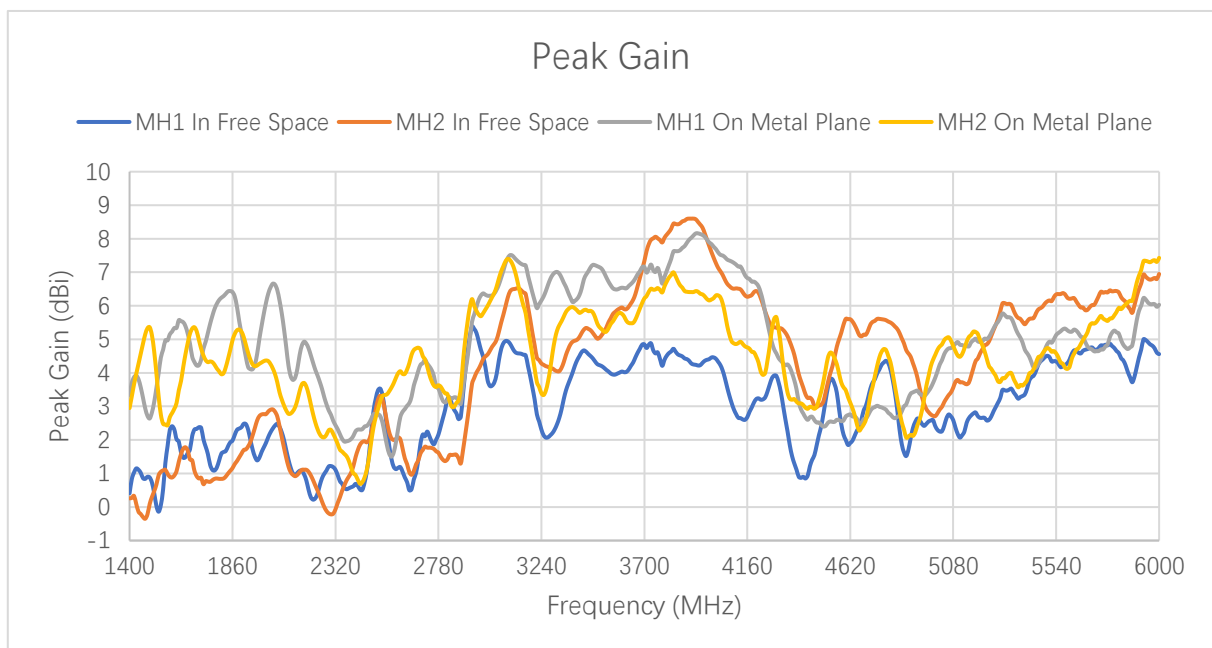
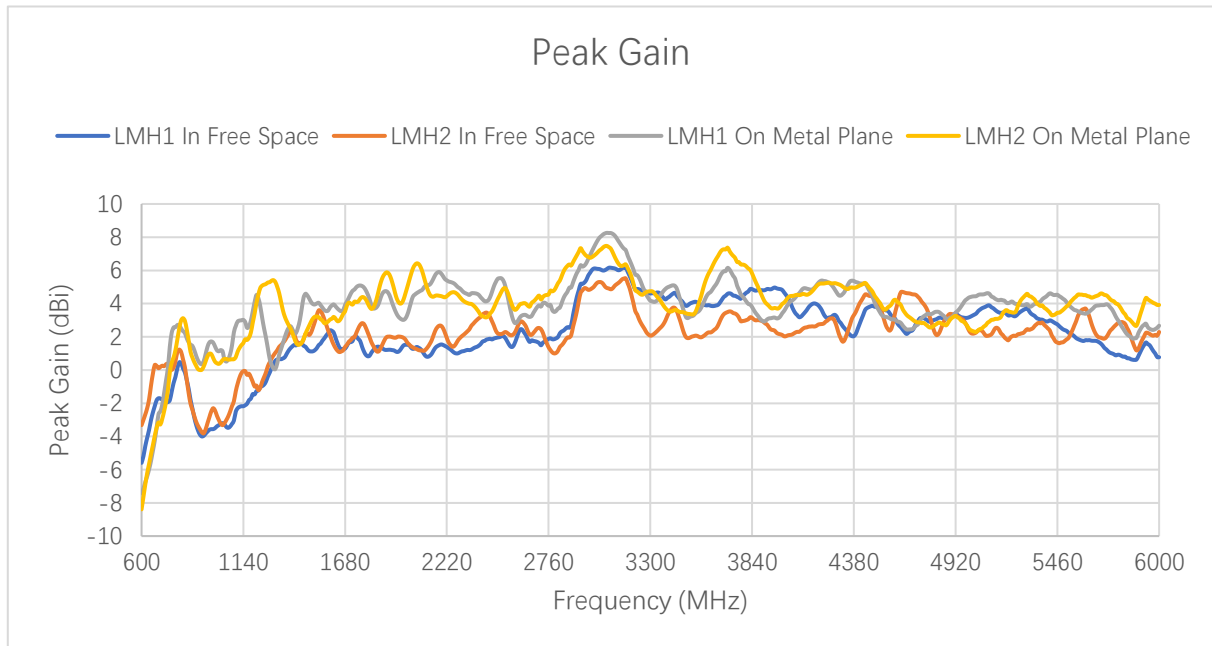
Average Gain (dB) - LMHs

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	-9.8	-8.1	-5.1	-3.6	-6.4	-6.6	-2.7	-2.1	-1.8	-1.6
	MP	-12.1	-10.4	-5.6	-3.1	-5.5	-5.3	-3.8	-2.2	-1.9	-2.2
LMH2	FS	-9.5	-7.4	-4.1	-3.4	-6.3	-6.6	-3.3	-1.8	-1.6	-2.1
	MP	-13.1	-10.4	-6.7	-2.9	-5.6	-5.4	-4.3	-1.8	-1.7	-2.0
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	-1.4	-1.2	-1.2	-1.4	-1.7	-1.8	-2.5	-3.3	-3.4	-4.3
	MP	-1.8	-1.8	-2.3	-1.9	-2.4	-2.2	-3.0	-3.6	-3.6	-5.1
LMH2	FS	-1.5	-1.2	-1.4	-1.8	-1.8	-2.2	-2.4	-3.1	-2.7	-4.0
	MP	-1.5	-1.6	-1.7	-1.6	-1.6	-1.8	-2.5	-3.4	-3.5	-4.5

Average Gain (dB) - MHs

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	-2.7	-2.0	-2.5	-2.0
	MP	-	-	-	-	-	-	-3.3	-2.2	-1.8	-2.2
MH2	FS	-	-	-	-	-	-	-4.4	-2.5	-2.1	-2.3
	MP	-	-	-	-	-	-	-3.5	-1.5	-1.5	-2.1
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	-2.2	-2.9	-3.9	-4.6	-3.9	-1.8	-2.6	-3.5	-3.1	-3.2
	MP	-2.0	-3.3	-4.4	-4.7	-3.9	-1.7	-3.6	-3.3	-2.7	-2.2
MH2	FS	-1.8	-3.7	-4.5	-4.3	-3.4	-1.7	-3.5	-4.3	-4.2	-3.9
	MP	-1.6	-3.0	-4.6	-5.1	-2.8	-2.4	-3.3	-3.5	-3.5	-2.7

3.2.3 Peak Gain

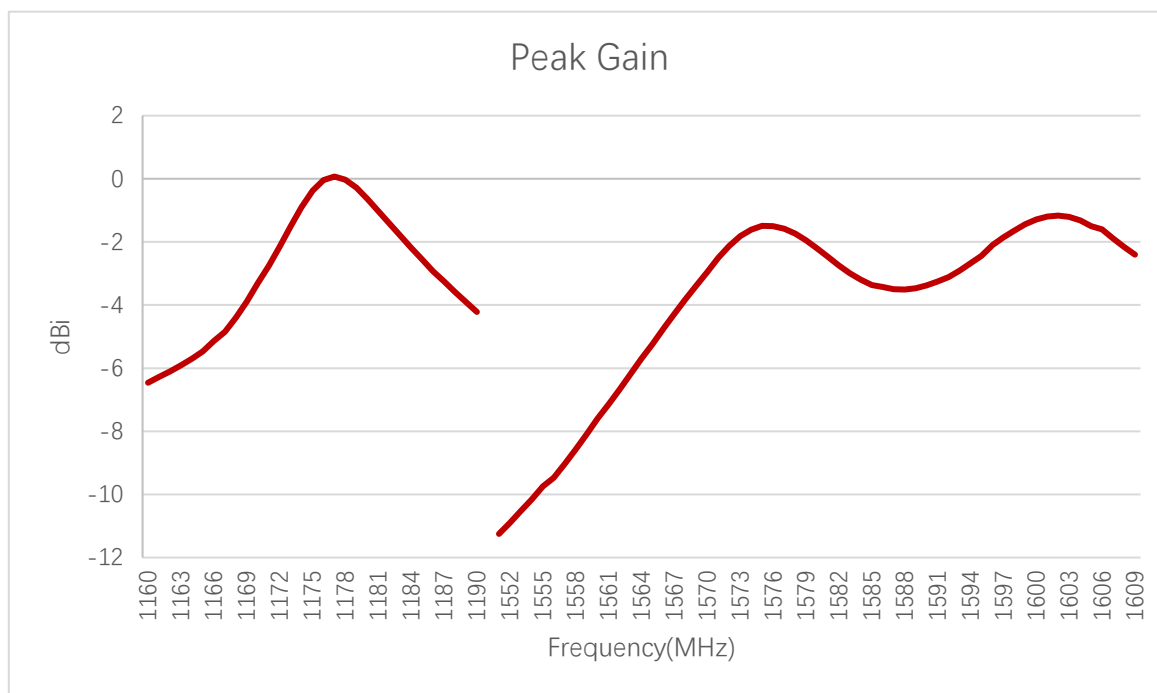


Peak Gain (dBi) - LMHs

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	-5.6	-4.1	-1.8	-0.1	-3.7	-3.6	1.6	1.7	2.0	1.3
	MP	-7.4	-6.4	-2.1	2.2	0.6	1.7	3.0	4.6	5.0	4.6
LMH2	FS	-3.3	-2.3	0.3	0.2	-3.4	-2.8	1.6	1.8	2.2	1.6
	MP	-8.4	-6.2	-2.9	3.0	0.1	1.0	1.5	4.0	4.1	5.6
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	1.1	1.0	1.2	1.9	2.2	3.9	2.6	3.2	2.4	0.8
	MP	3.5	5.3	4.6	4.4	3.0	4.5	2.6	4.4	4.2	2.7
LMH2	FS	2.0	1.8	2.7	3.2	2.7	2.2	4.6	2.2	1.8	2.3
	MP	4.5	4.4	4.0	3.4	3.8	5.6	3.0	2.4	3.7	3.9

Peak Gain (dBi) - MHs

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	1.1	2.4	1.8	2.3
	MP	-	-	-	-	-	-	3.8	4.2	4.9	6.0
MH2	FS	-	-	-	-	-	-	-0.1	0.9	0.8	1.4
	MP	-	-	-	-	-	-	4.3	5.0	4.4	5.3
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	1.7	1.0	0.7	0.7	1.2	4.0	3.3	2.4	4.5	4.6
	MP	4.1	3.9	2.0	2.4	2.3	6.5	2.7	3.9	4.9	6.0
MH2	FS	2.1	0.9	0.5	2.0	2.1	6.0	5.3	2.7	6.1	7.0
	MP	4.3	3.0	1.7	0.9	4.0	5.8	2.9	4.5	4.7	7.4

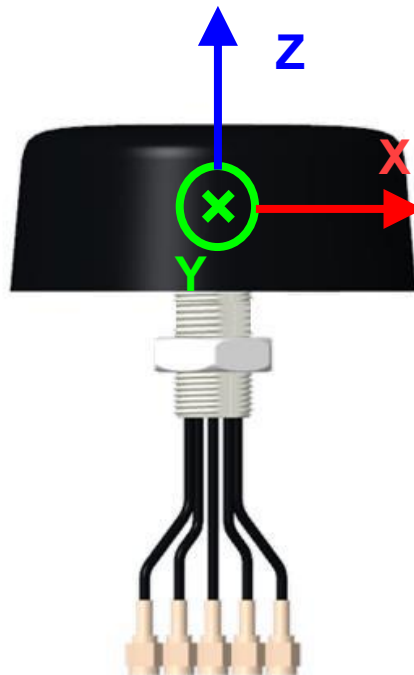


Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-0.04	-	-	-	-	-	-1.49	-1.17

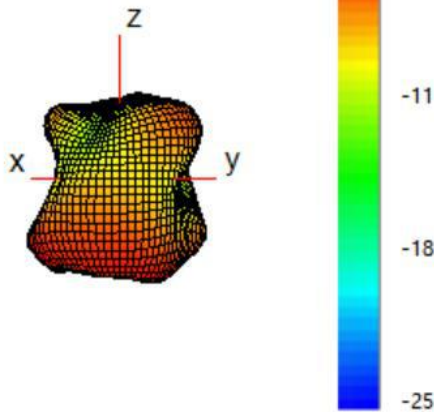
3.2.4 3D & 2D Radiation Pattern

3.2.4.1 Test Status: In Free Space

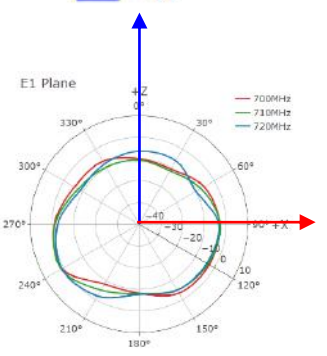
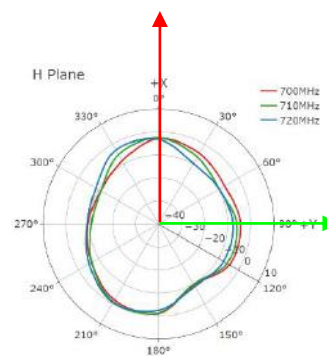
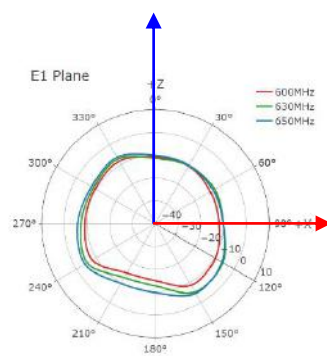
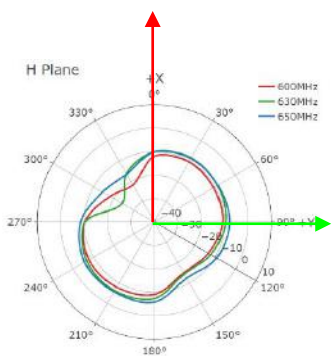
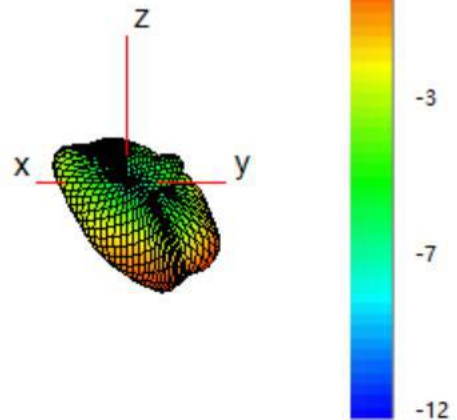


● **LMH1**

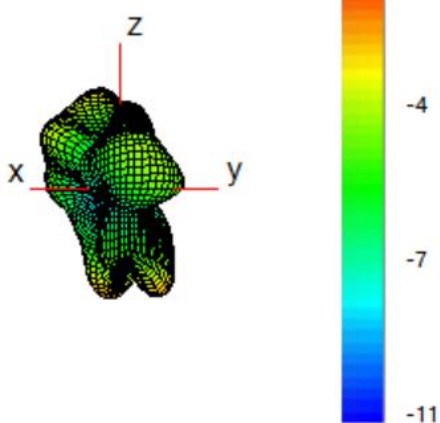
630 MHz



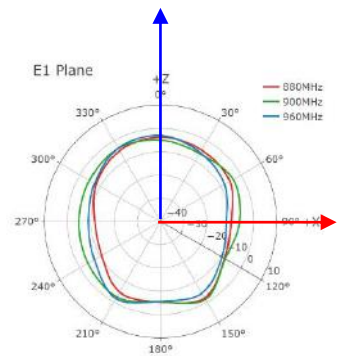
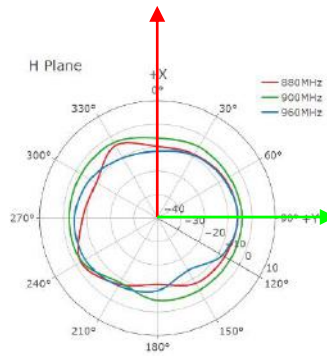
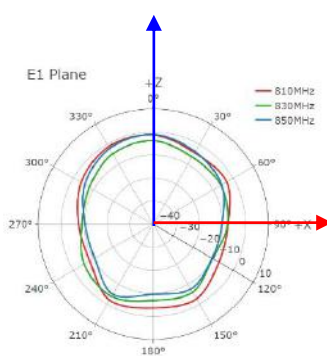
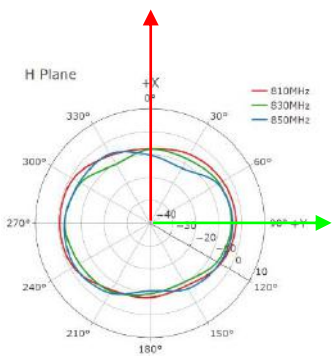
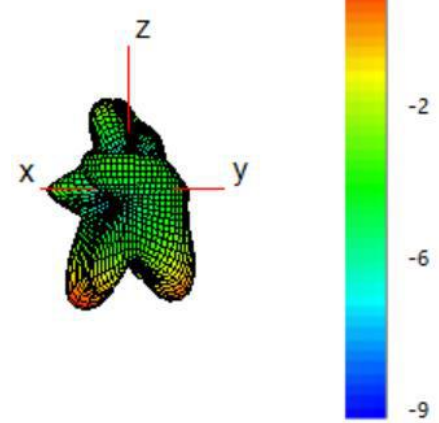
710 MHz



830 MHz

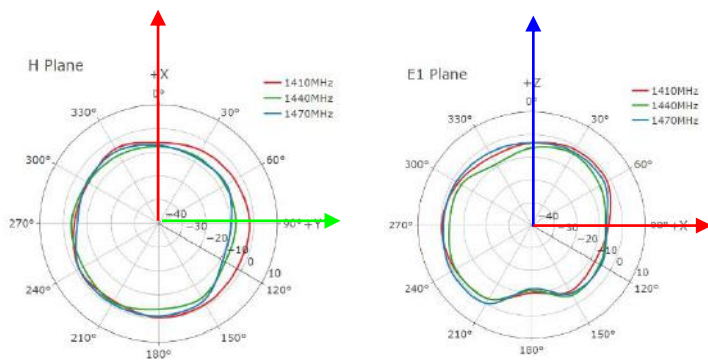
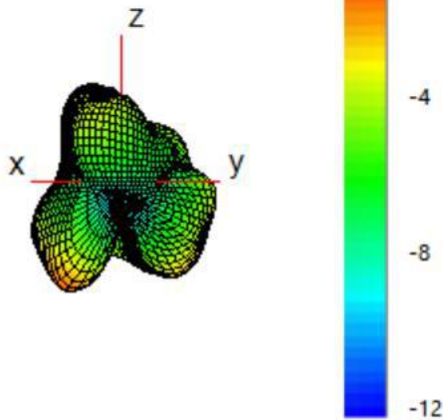


900 MHz

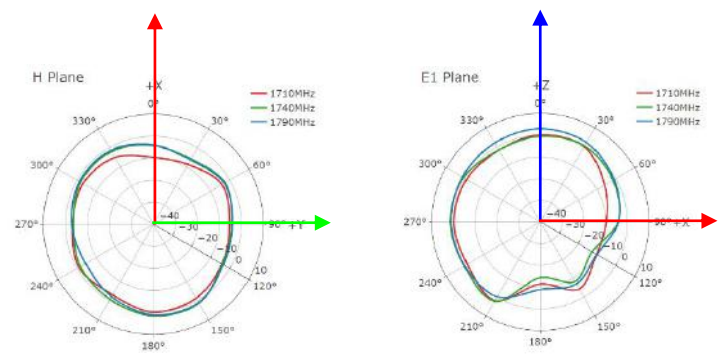
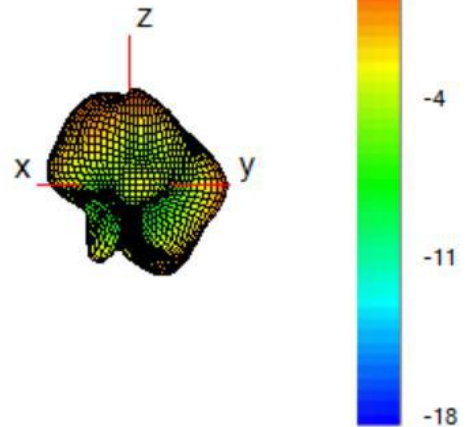


● **LMH1**

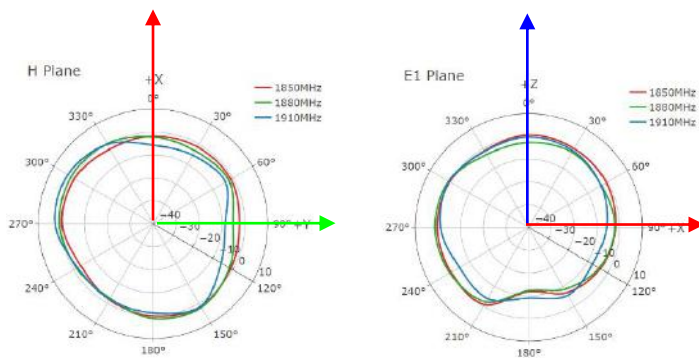
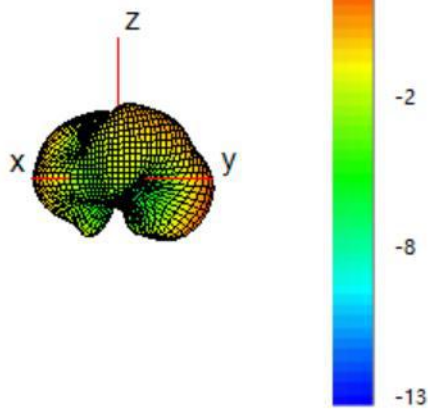
1440 MHz



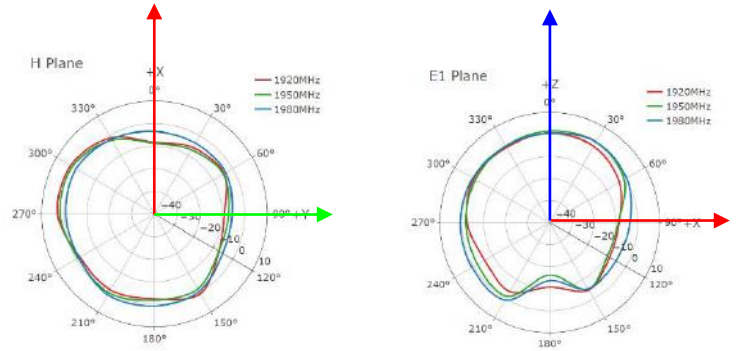
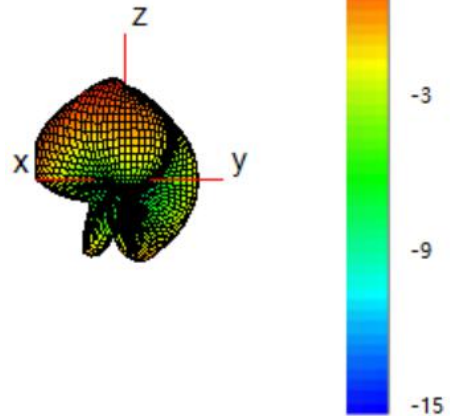
1740 MHz



1880 MHz

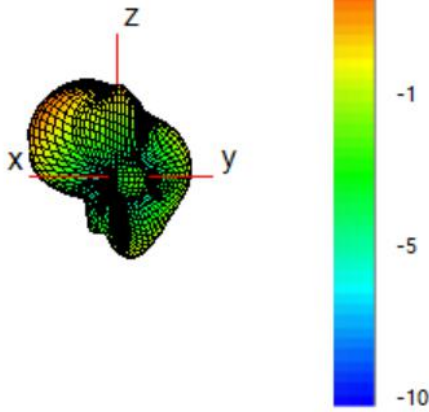


1960 MHz

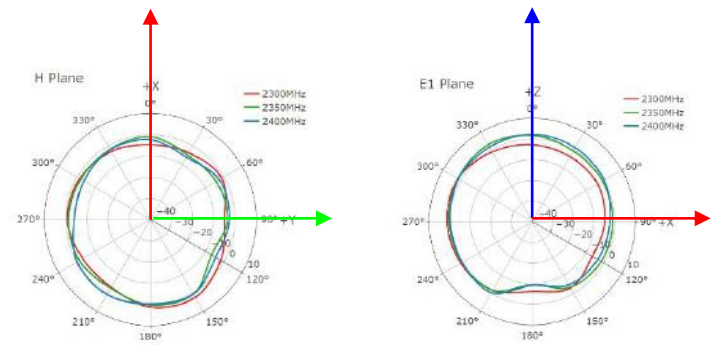
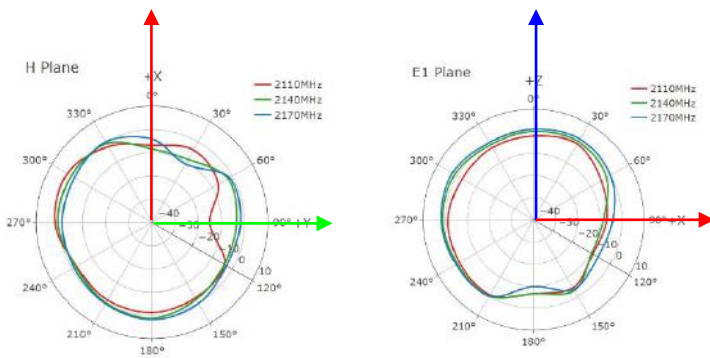
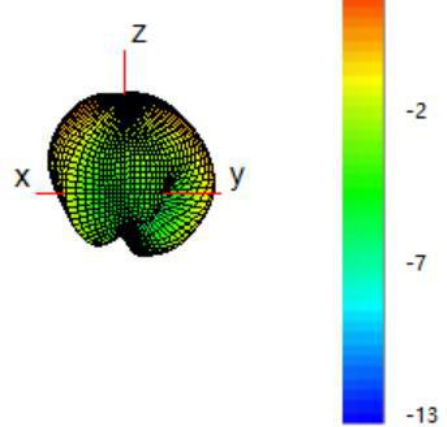


● **LMH1**

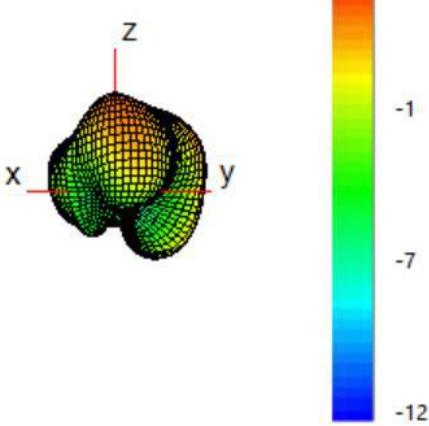
2140 MHz



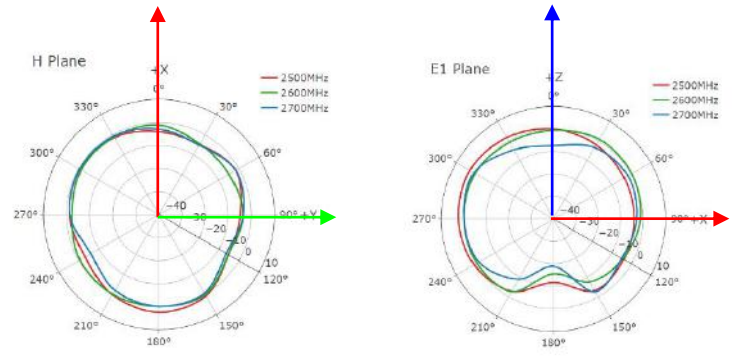
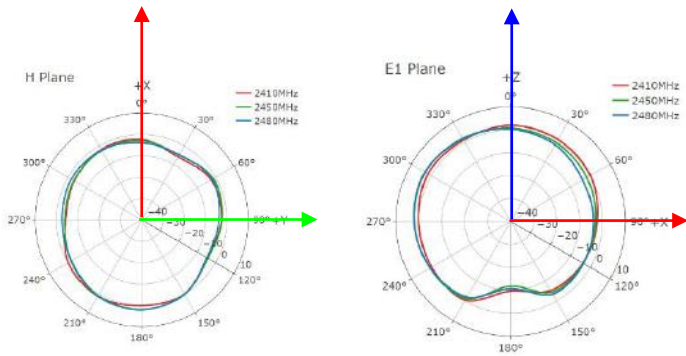
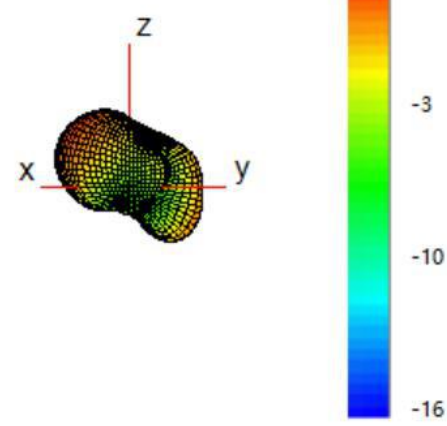
2350 MHz



2450 MHz

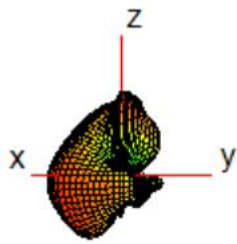


2600 MHz

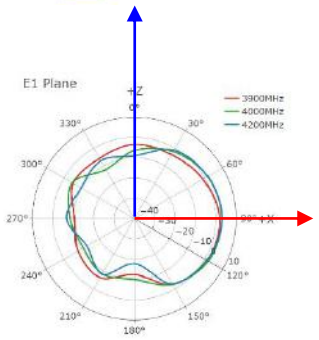
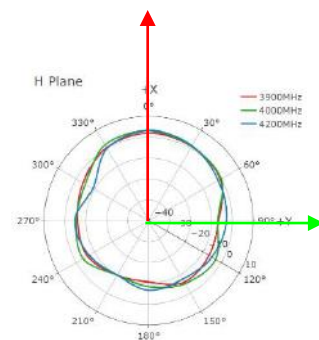
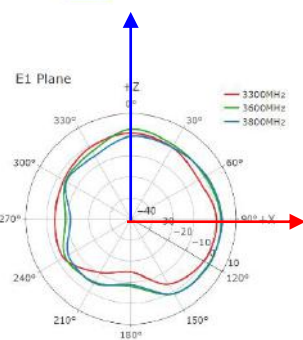
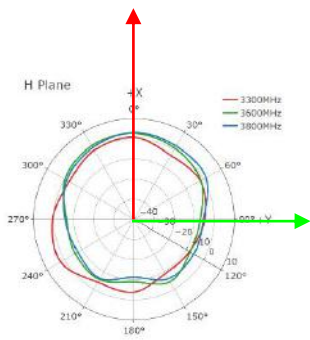
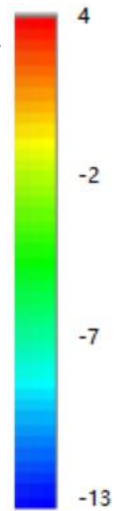
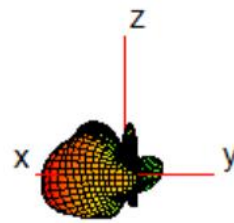


● **LMH1**

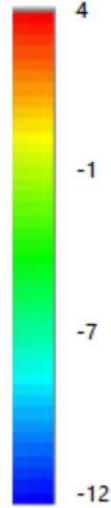
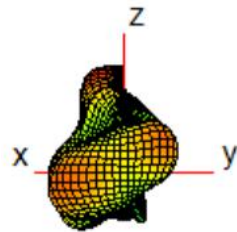
3600 MHz



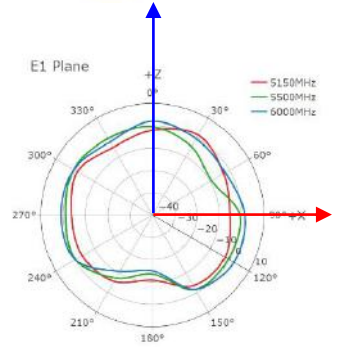
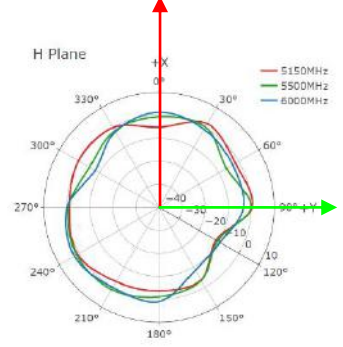
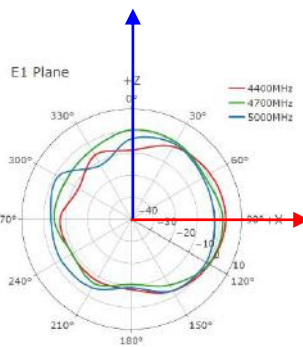
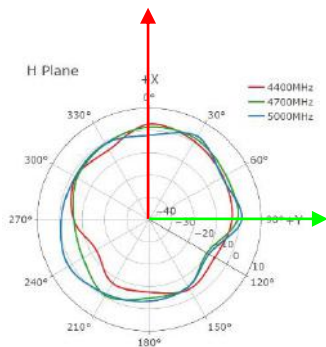
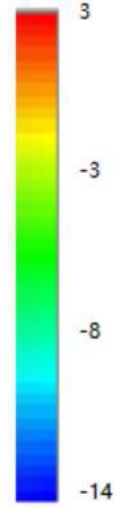
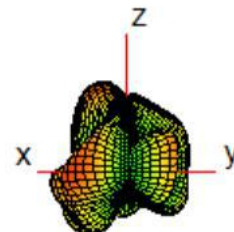
4000 MHz



4700 MHz

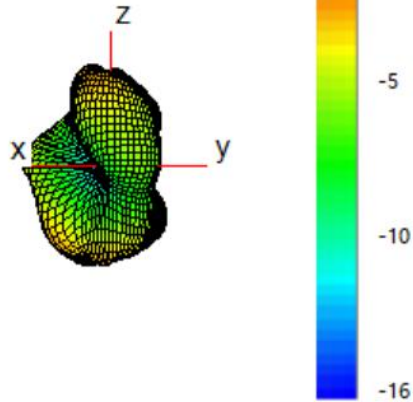


5500 MHz

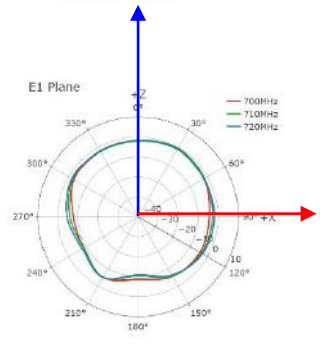
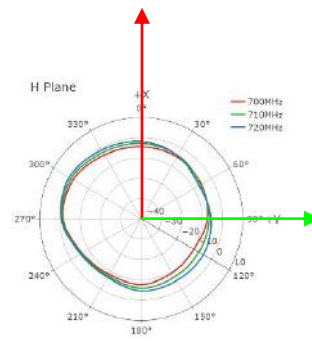
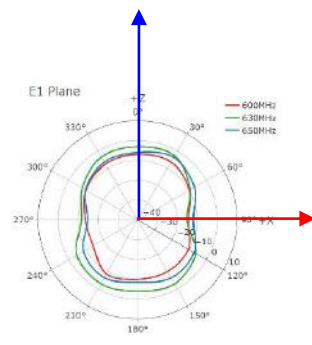
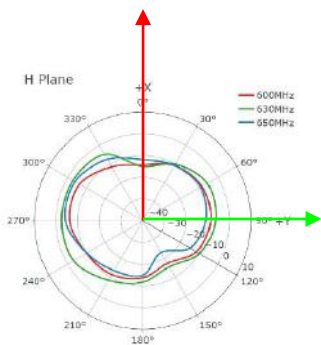
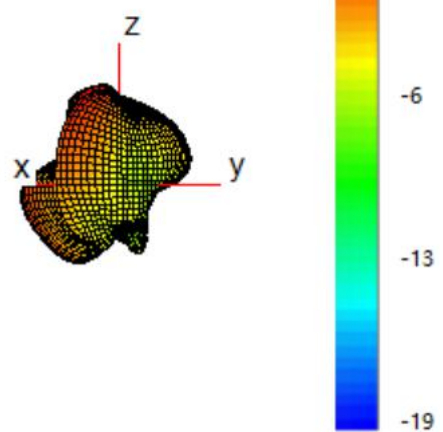


● **LMH2**

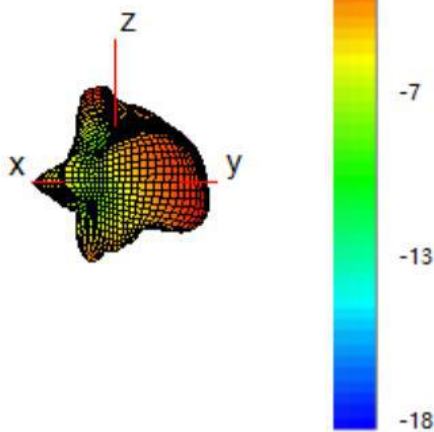
630 MHz



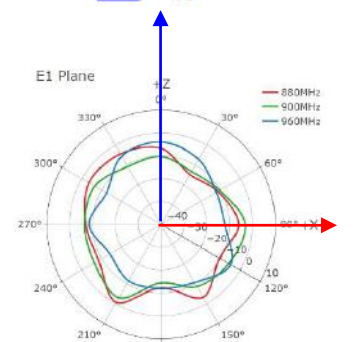
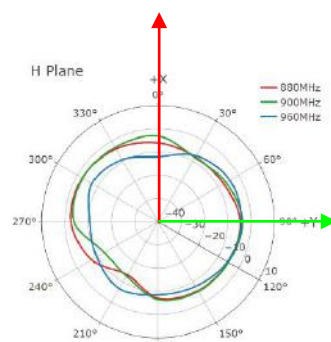
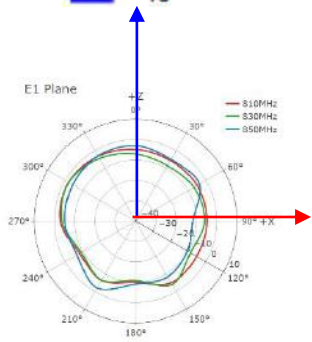
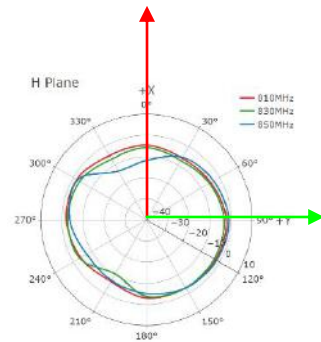
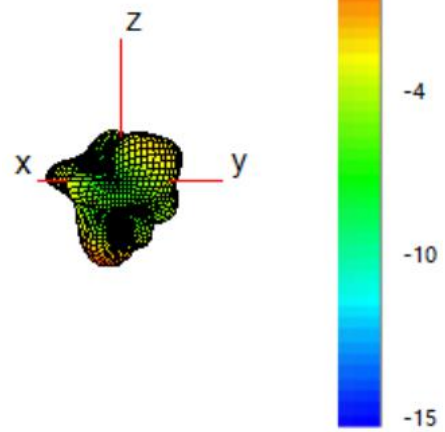
710 MHz



830MHz

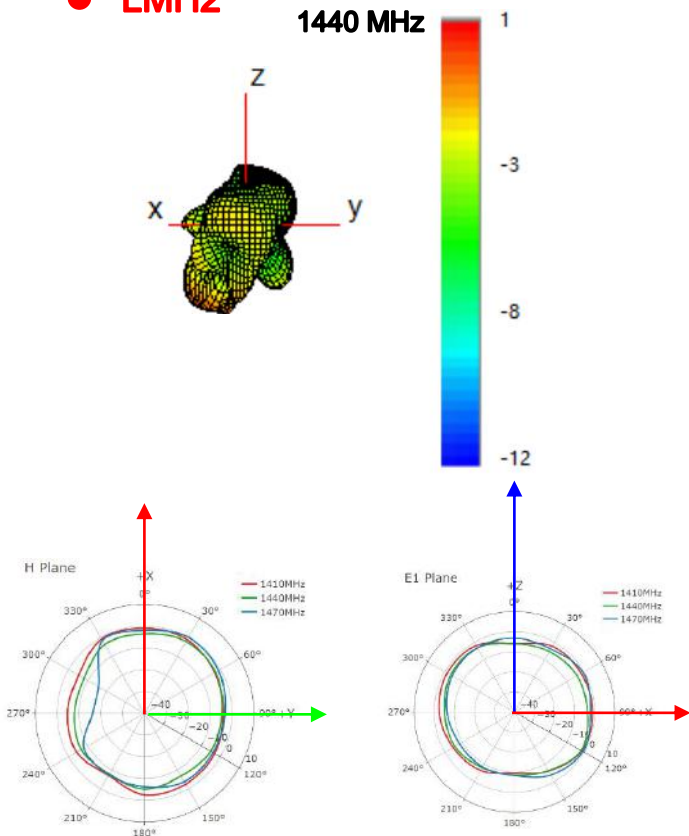


900MHz

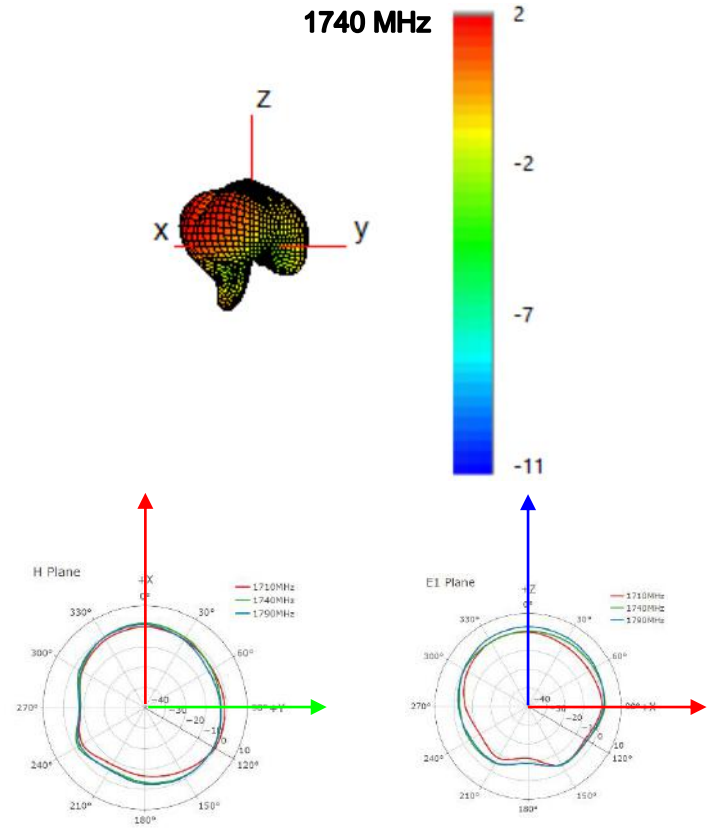


● **LMH2**

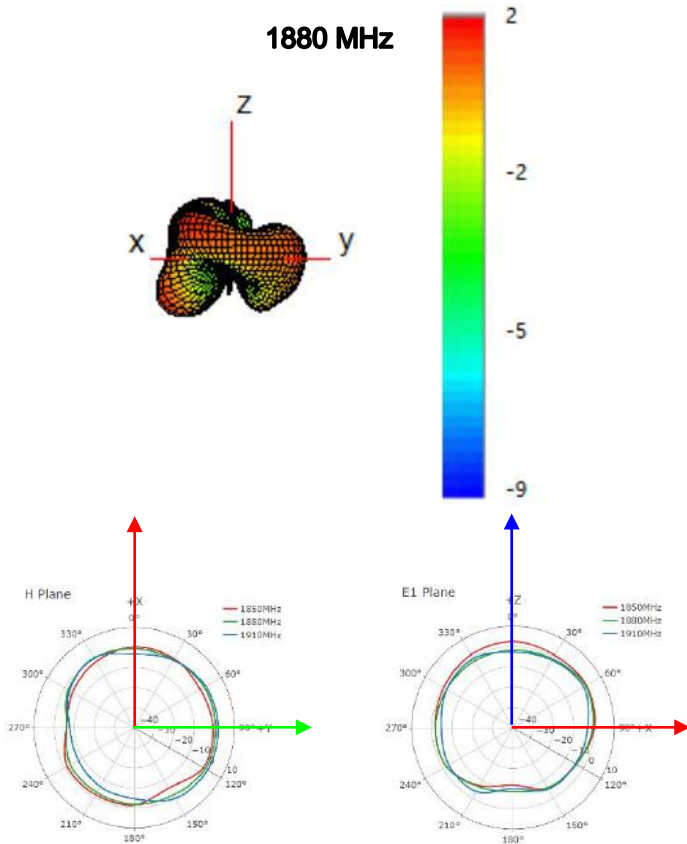
1440 MHz



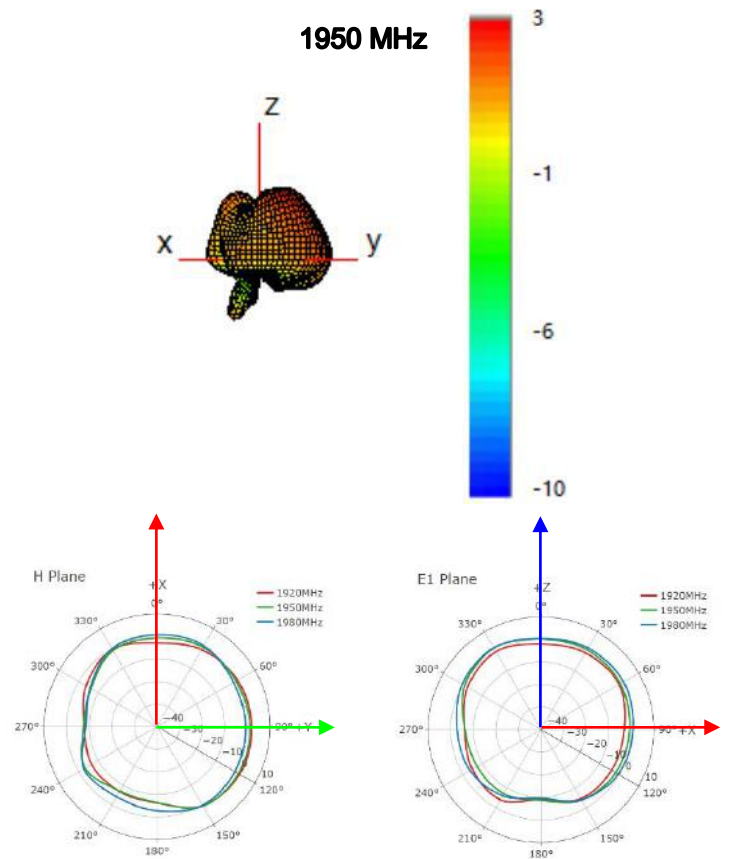
1740 MHz



1880 MHz

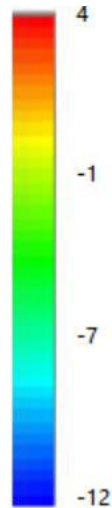
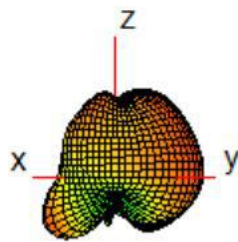


1950 MHz

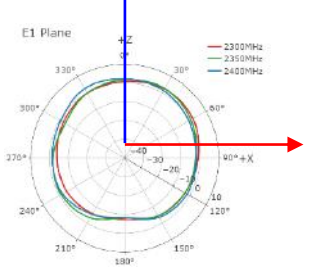
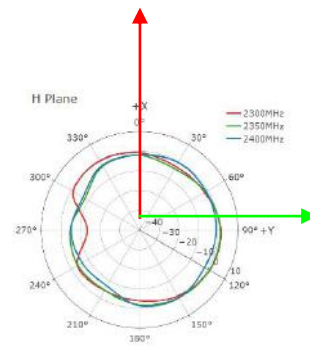
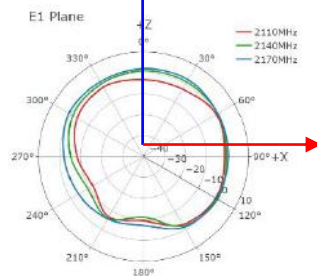
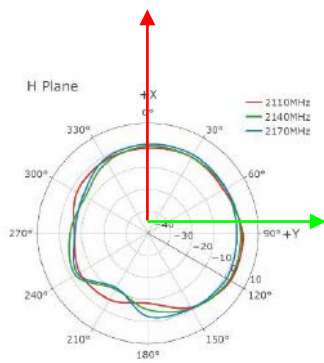
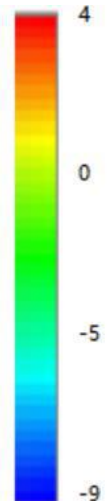
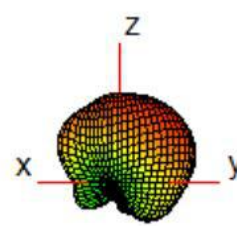


● **LMH2**

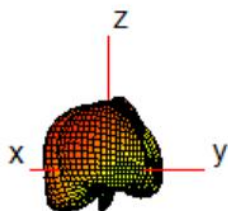
2140 MHz



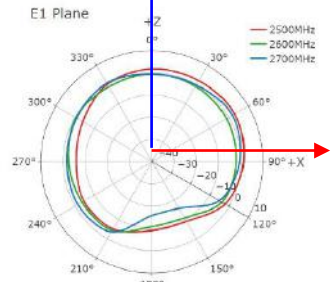
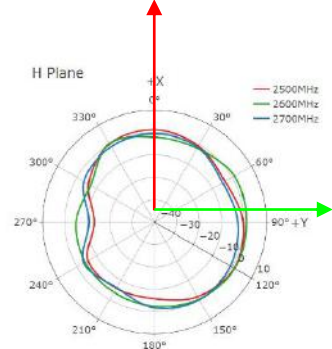
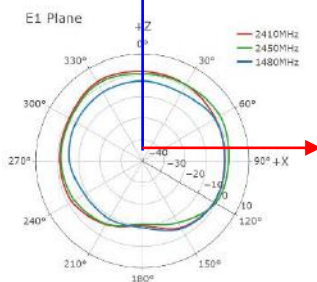
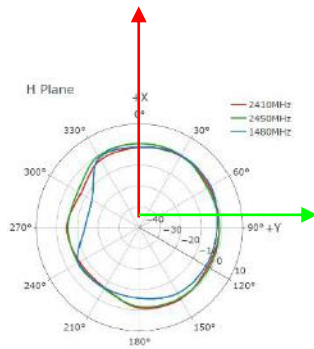
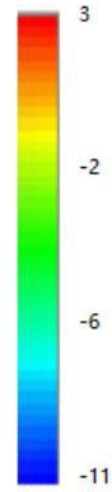
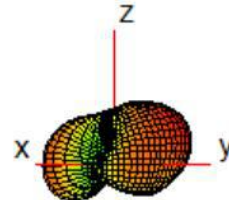
2350 MHz



2450 MHz

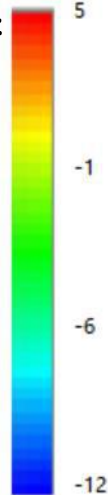
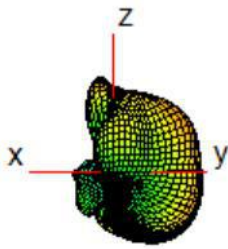


2600 MHz

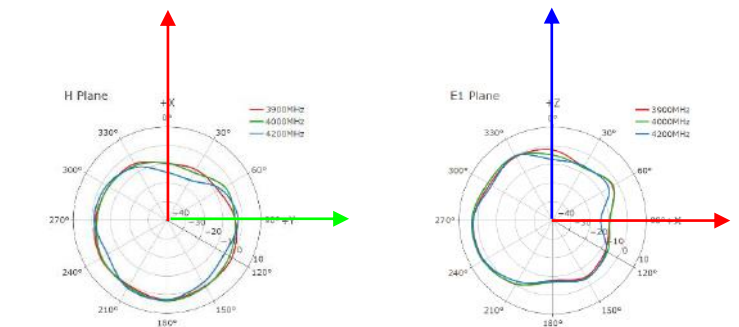
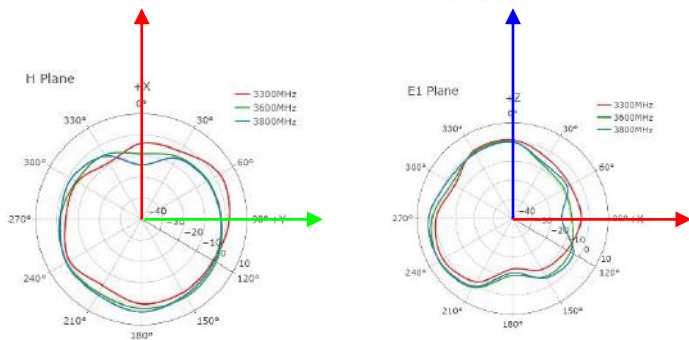
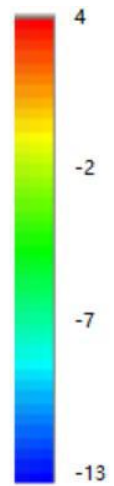
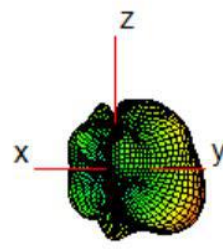


● **LMH2**

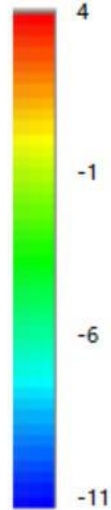
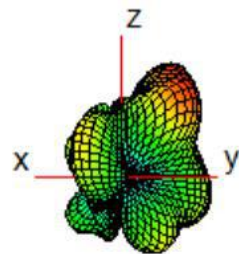
3600 MHz



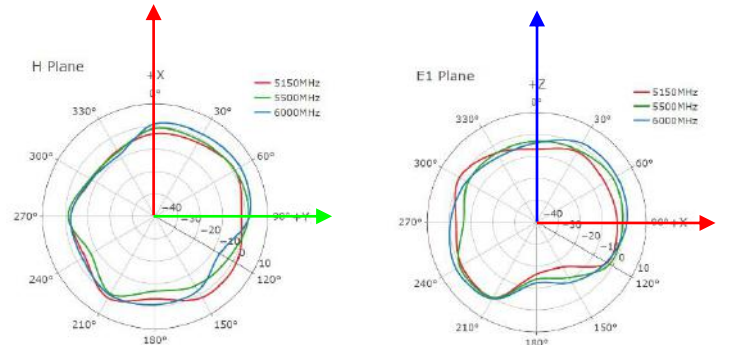
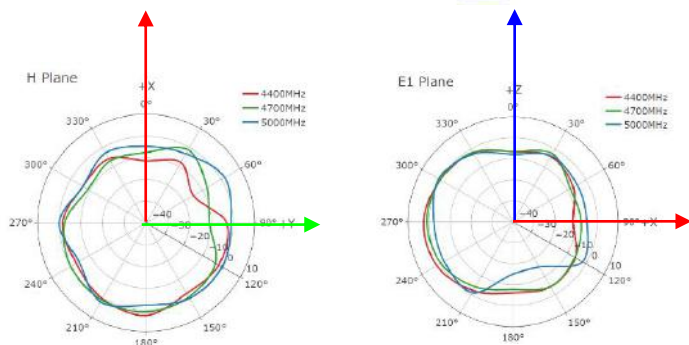
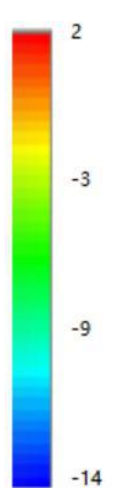
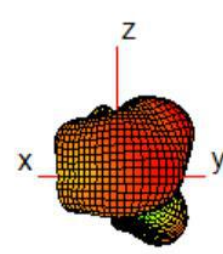
4000 MHz



4700 MHz

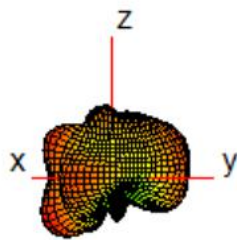


5500 MHz

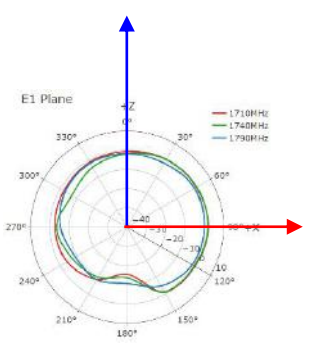
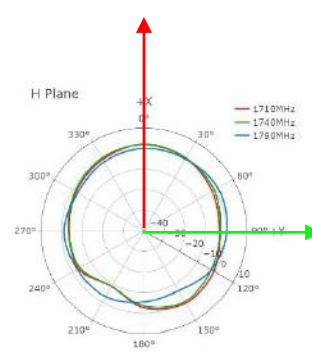
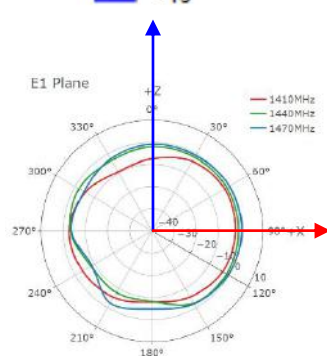
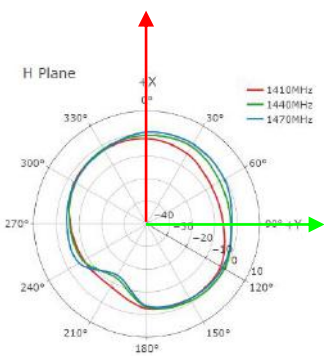
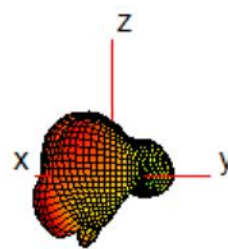


● **MH1**

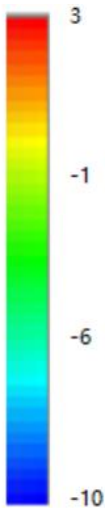
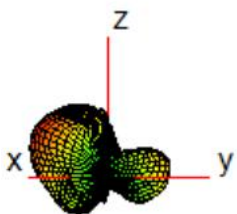
1440 MHz



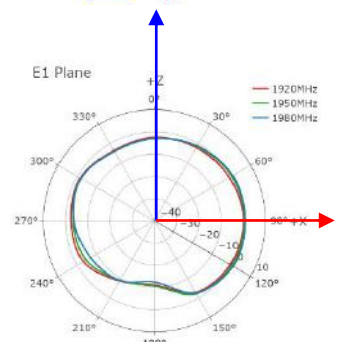
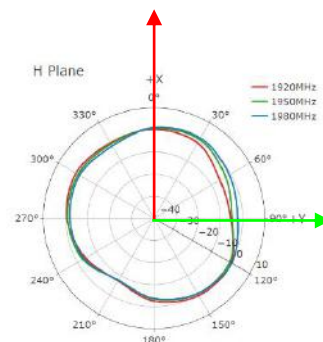
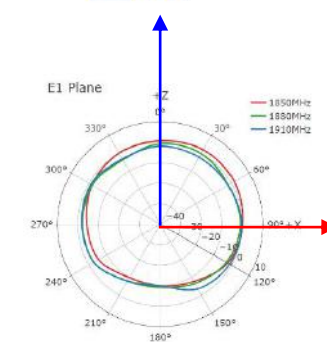
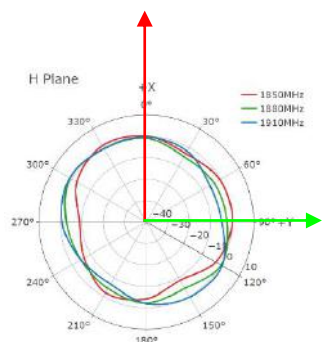
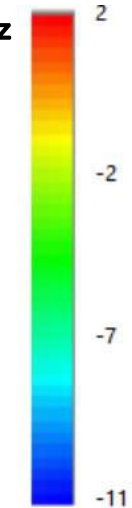
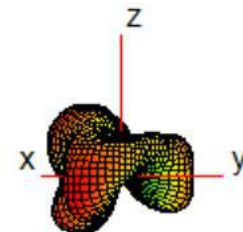
1740 MHz



1880 MHz

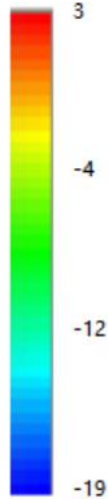
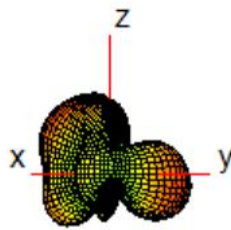


1950 MHz

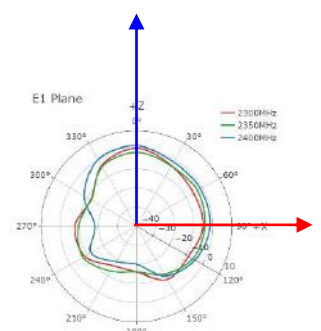
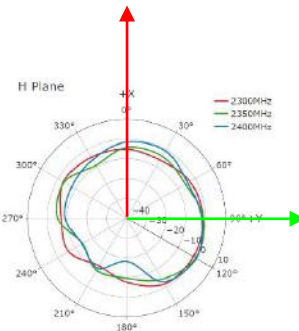
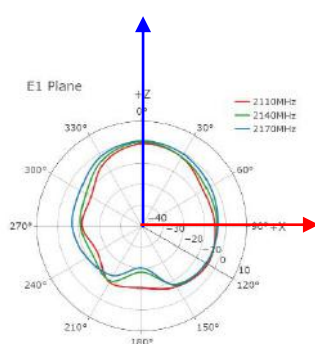
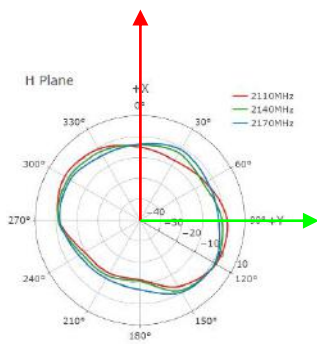
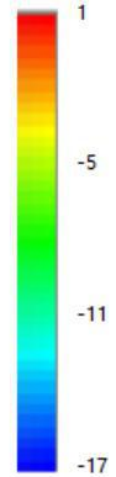
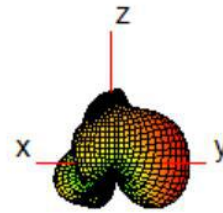


● **MH1**

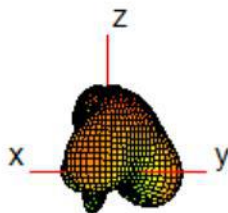
2140 MHz



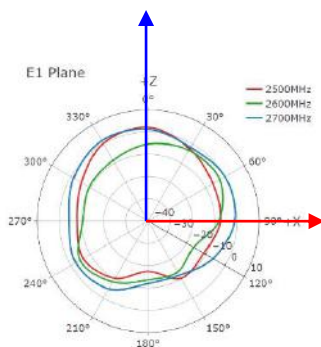
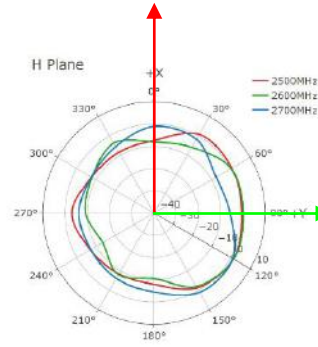
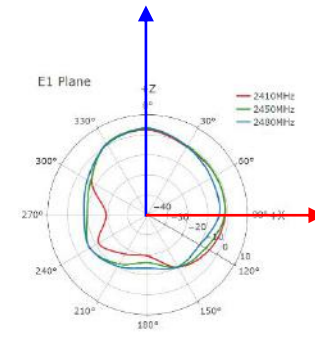
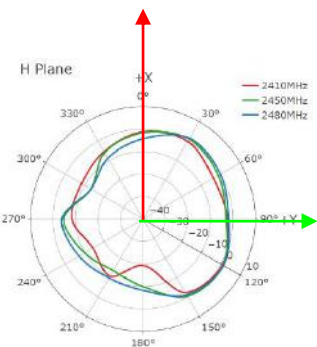
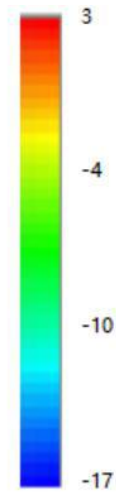
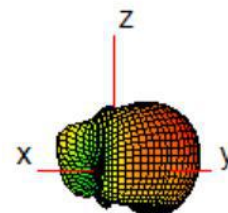
2360 MHz



2450 MHz

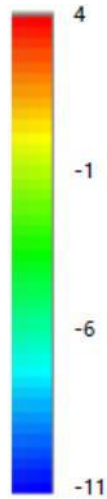
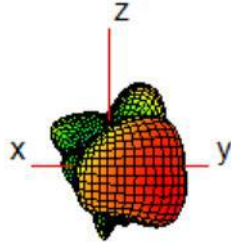


2600 MHz

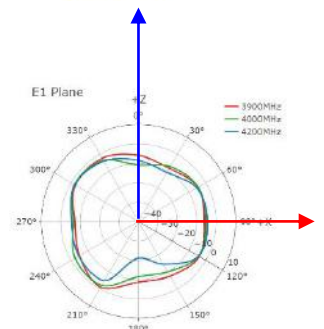
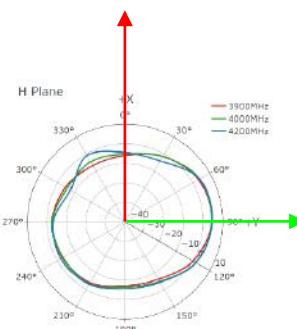
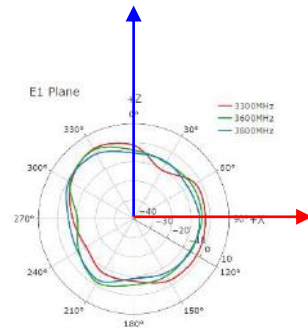
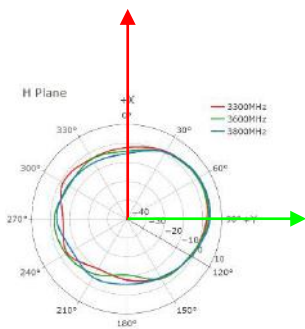
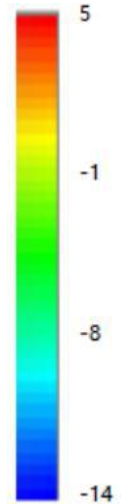
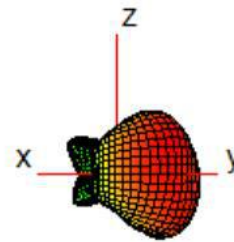


● **MH1**

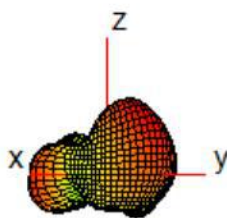
3600 MHz



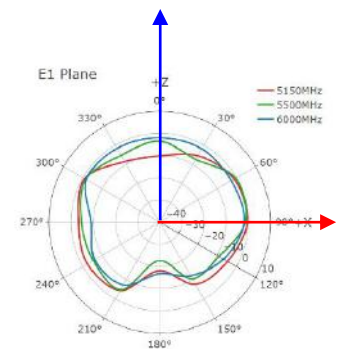
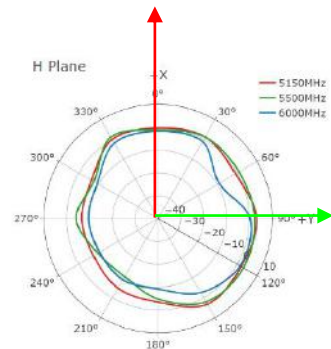
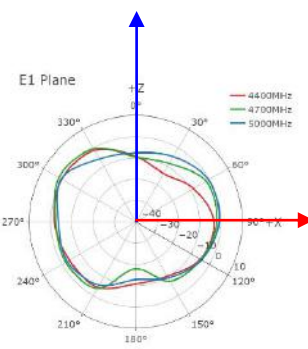
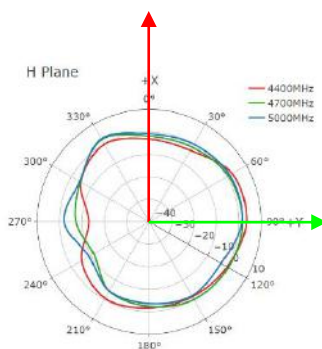
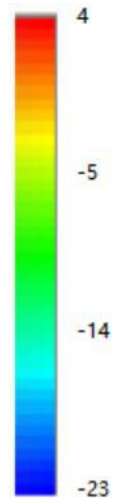
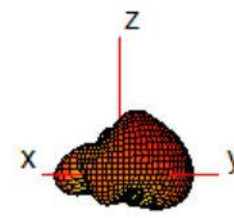
4000 MHz



4700 MHz

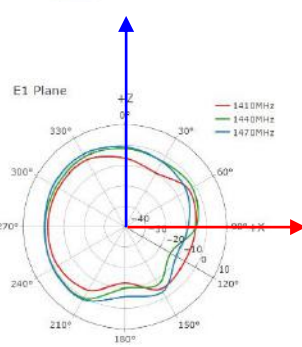
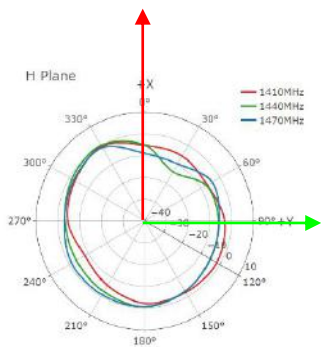
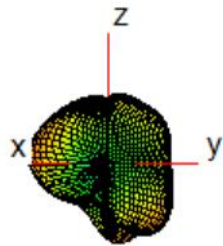


5500 MHz

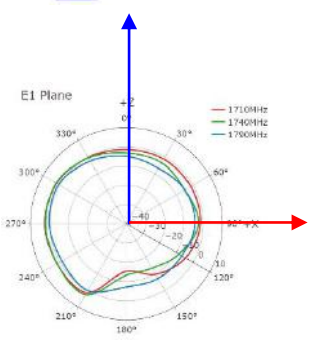
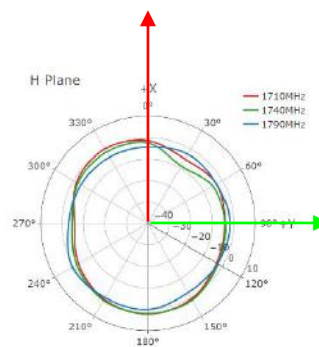
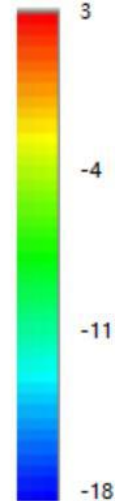
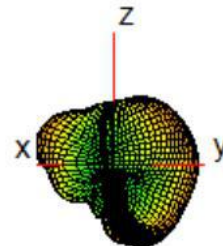


● **MH2**

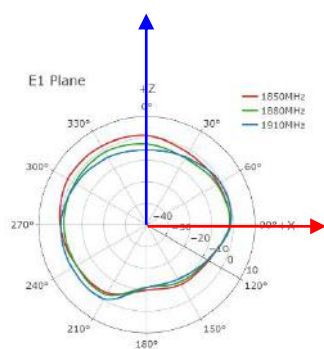
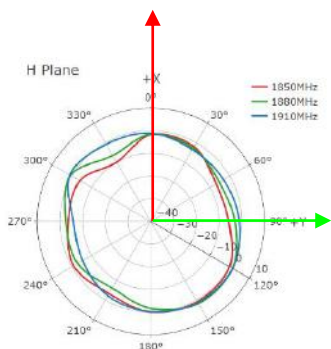
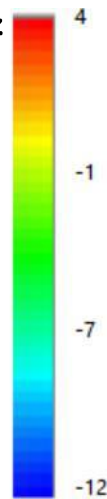
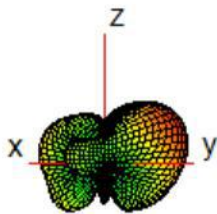
1440 MHz



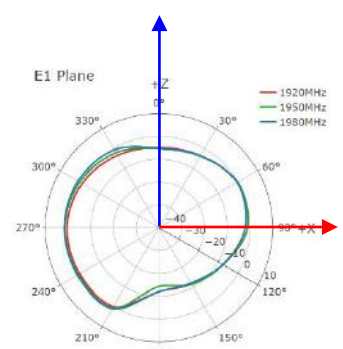
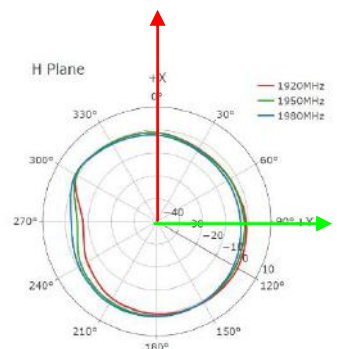
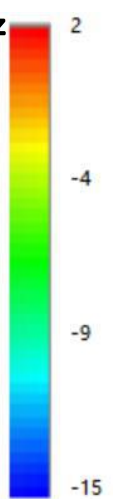
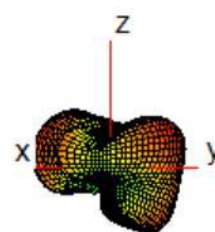
1740 MHz



1880 MHz

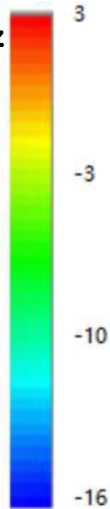
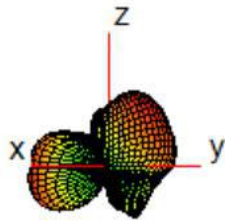


1950 MHz

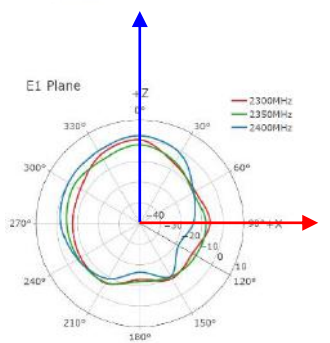
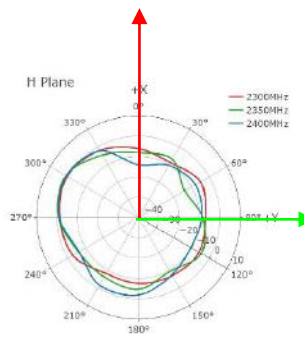
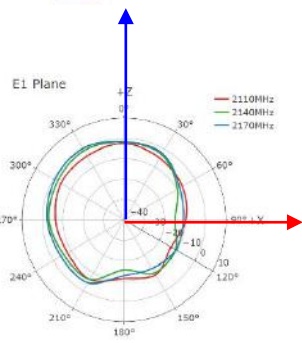
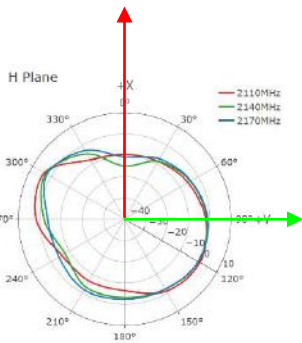
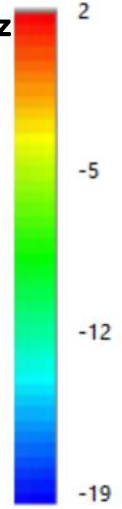
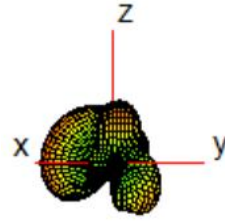


● **MH2**

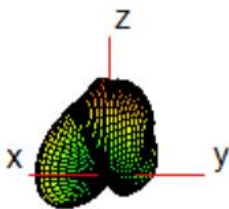
2140 MHz



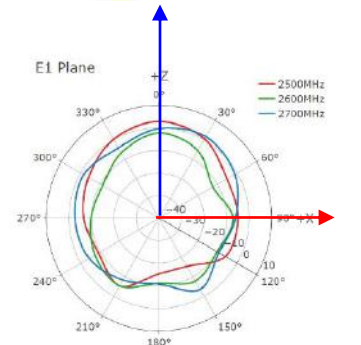
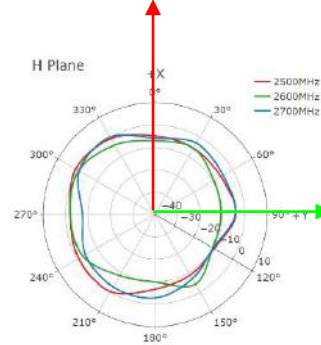
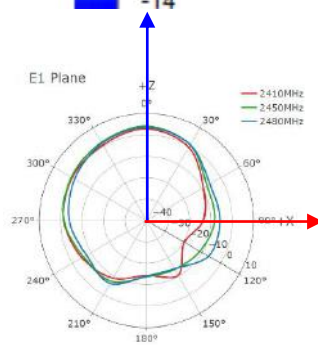
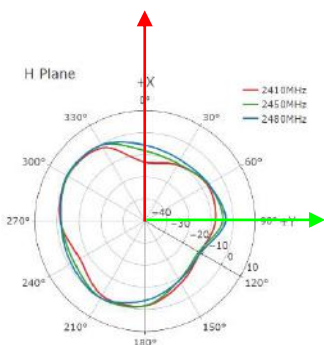
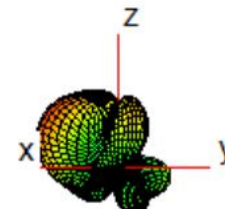
2350 MHz



2450 MHz

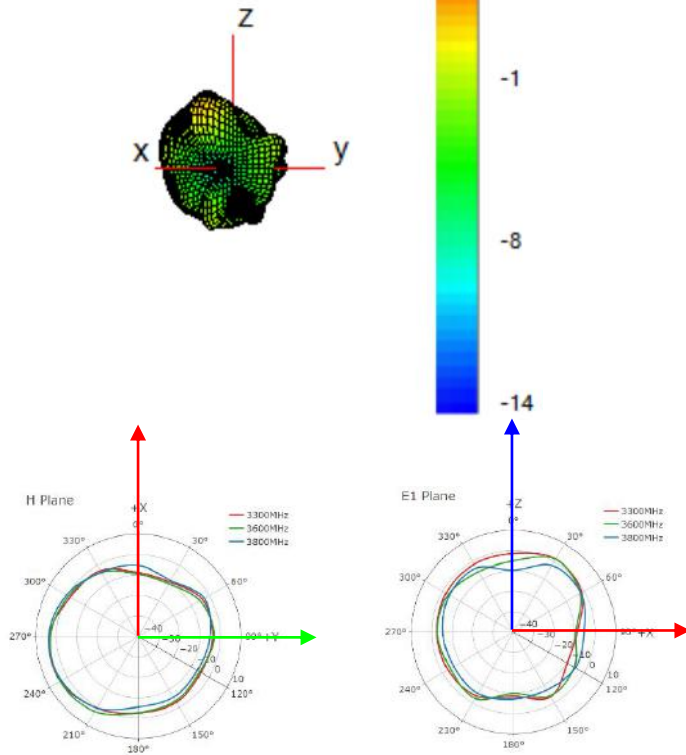


2600 MHz

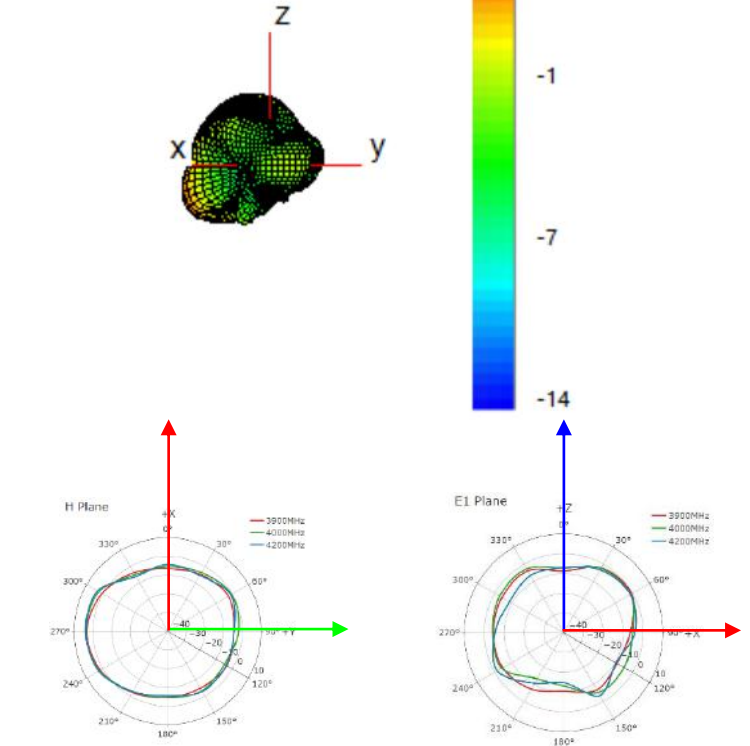


● **MH2**

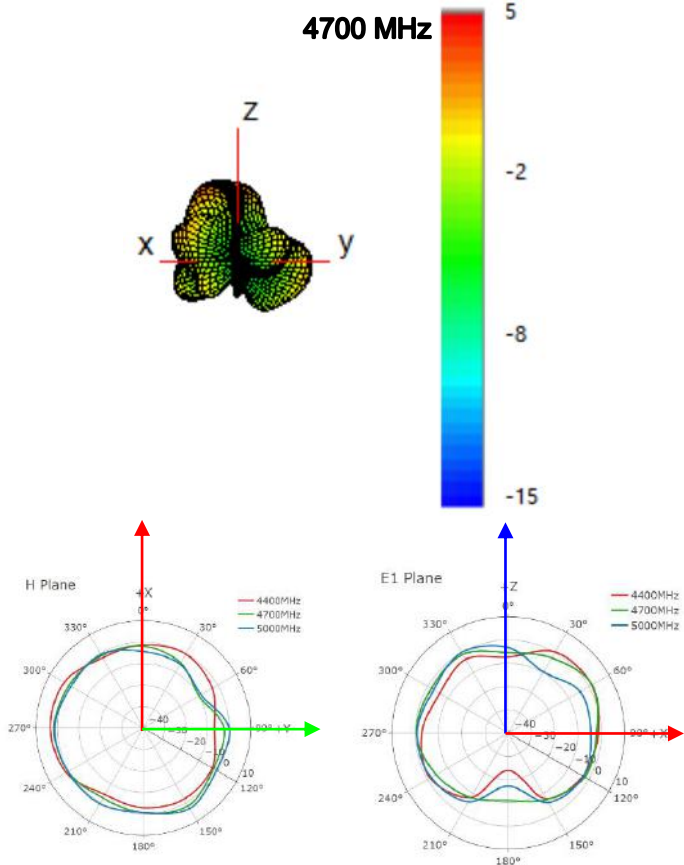
3600 MHz



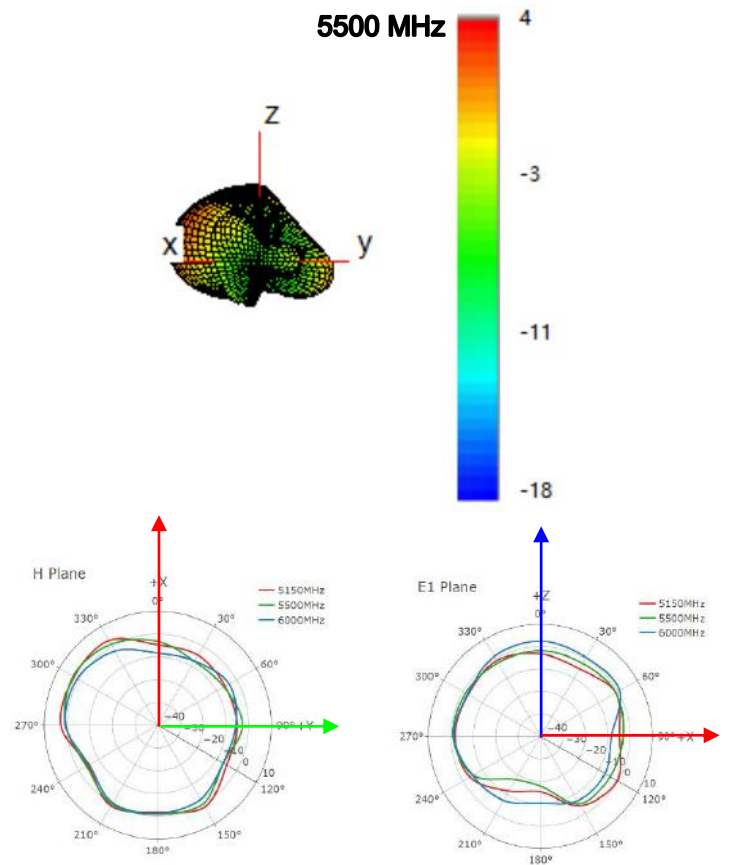
4000 MHz



4700 MHz

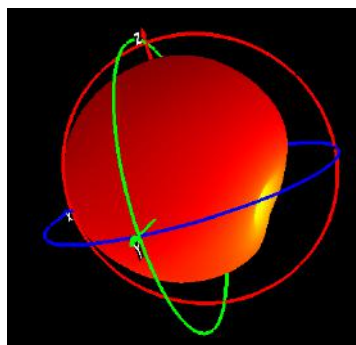


5500 MHz

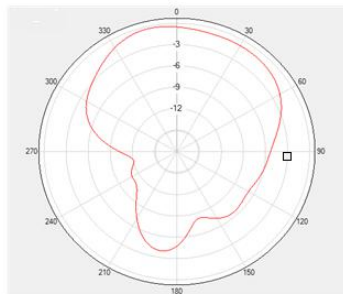


● GNSS

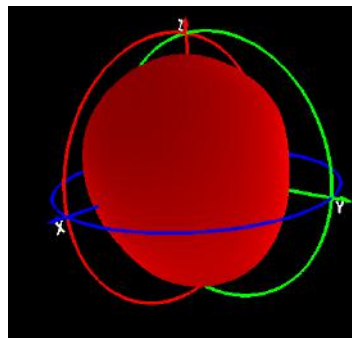
1176 MHz



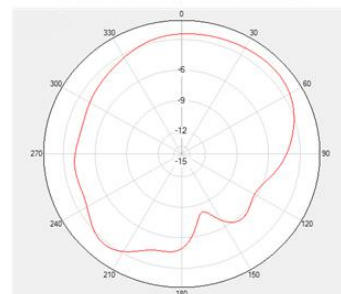
Phi=0 Freq=1176MHz



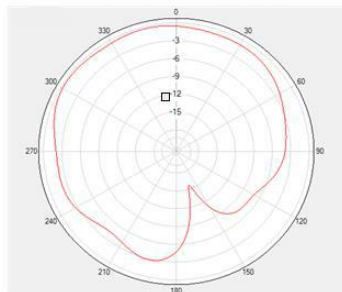
157.5MHz



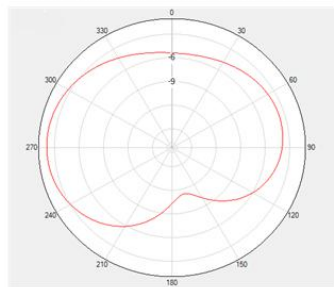
Phi=0 Freq=1575MHz



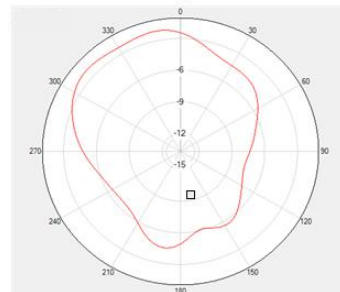
Phi=90 Freq=1176MHz



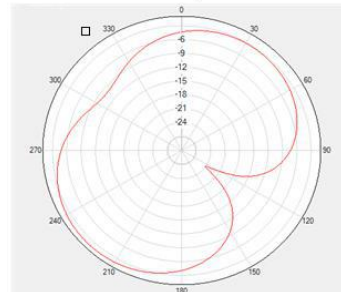
Theta=90 Freq=1176MHz



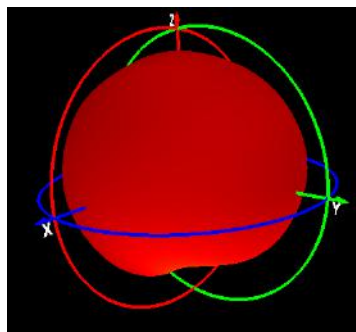
Phi=90 Freq=1575MHz



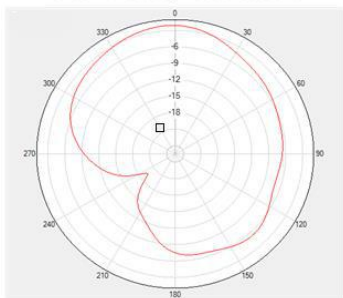
Theta=90 Freq=1575MHz



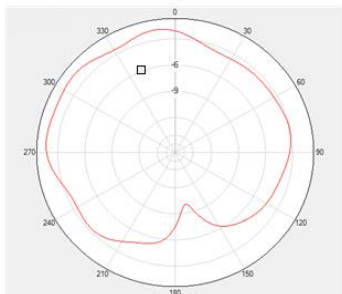
1602MHz



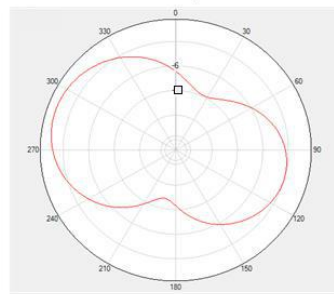
Phi=0 Freq=1602MHz



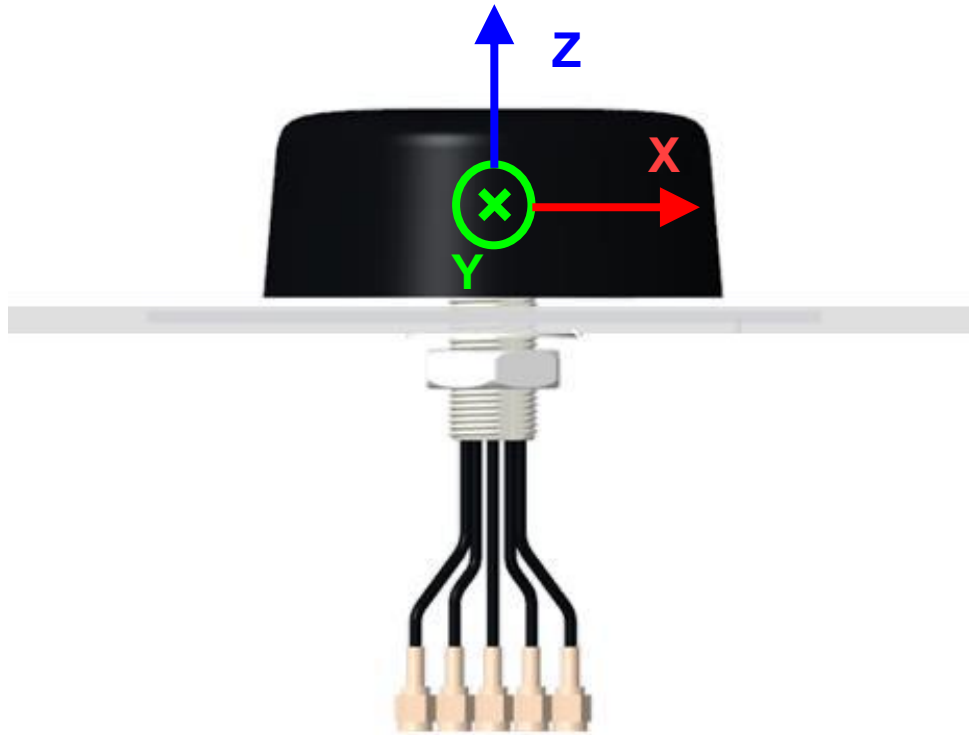
Phi=90 Freq=1602MHz



Theta=90 Freq=1602MHz

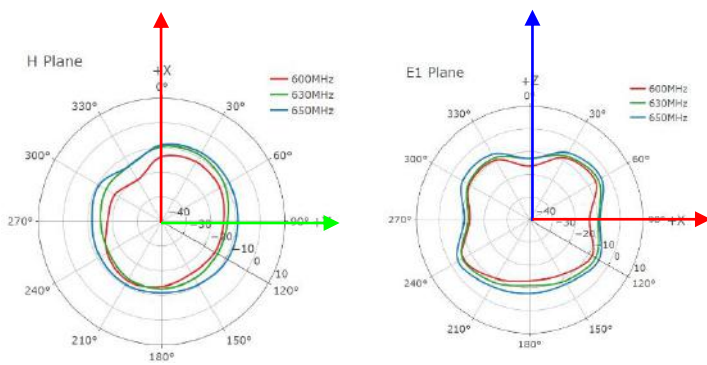
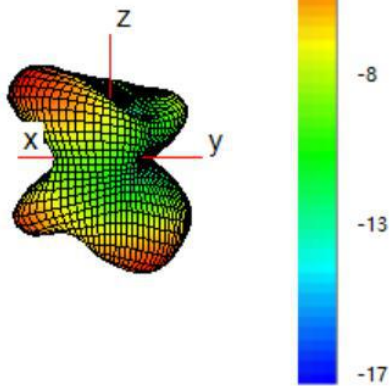


3.2.4.2 Test Status: On 320 × 240 mm Metal Plane

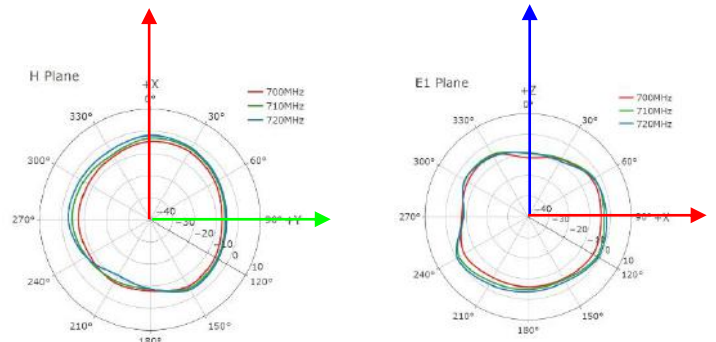
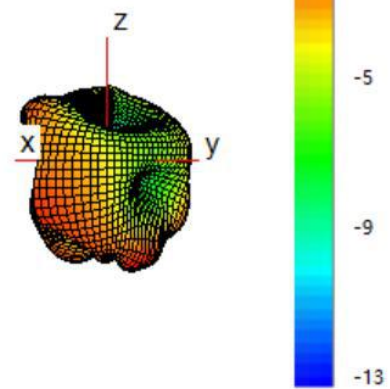


● **LMH1**

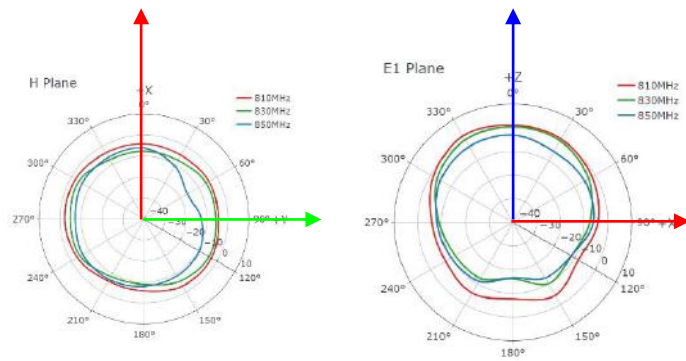
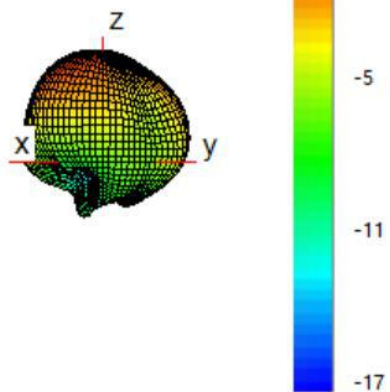
630 MHz



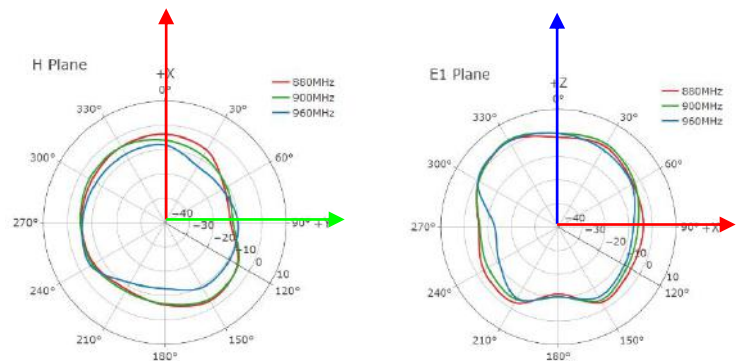
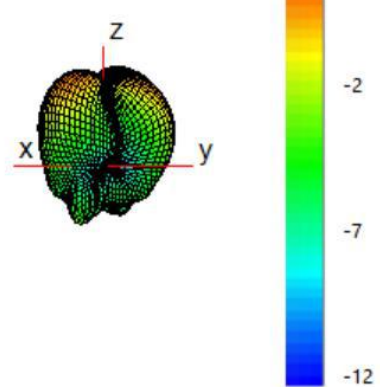
710 MHz



830 MHz

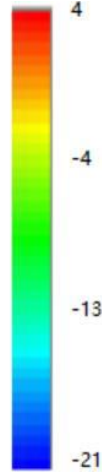
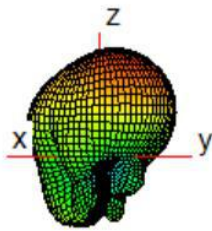


900 MHz

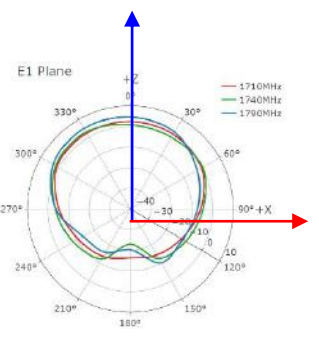
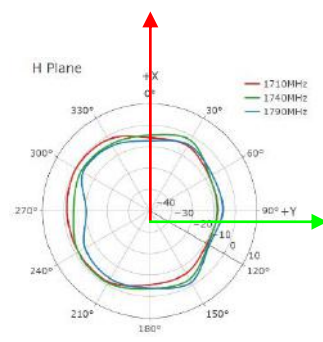
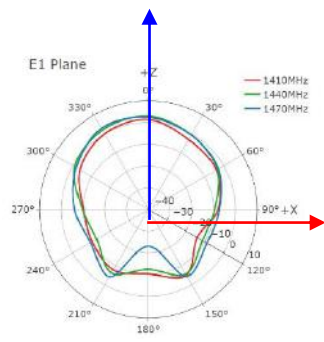
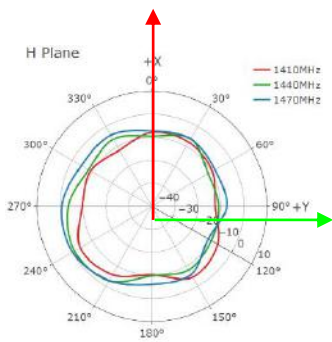
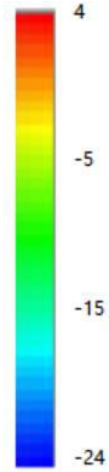
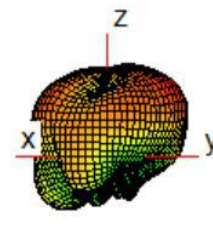


● **LMH1**

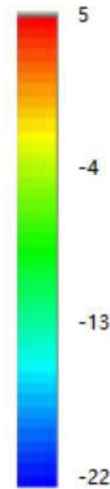
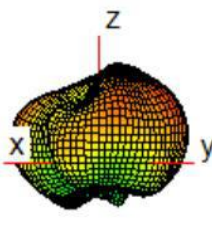
1440 MHz



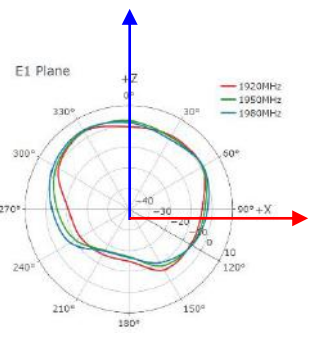
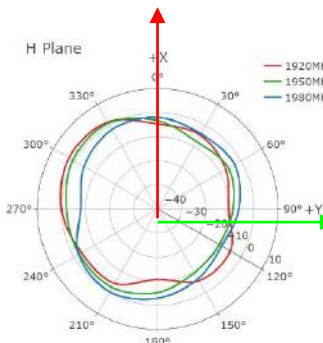
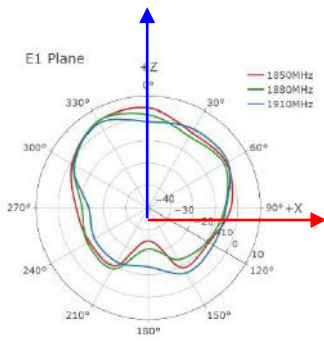
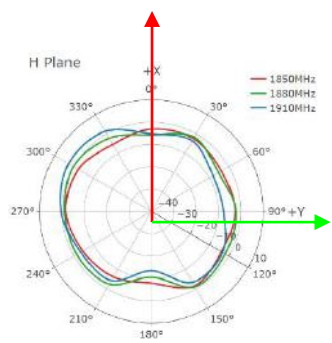
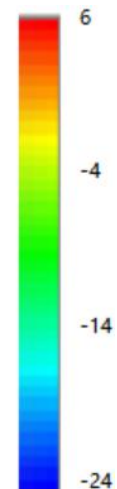
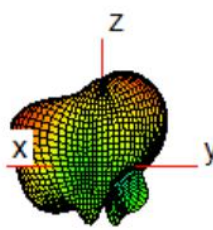
1740 MHz



1880 MHz

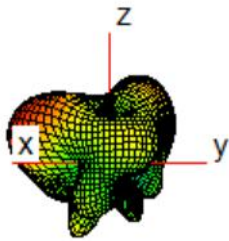


1950 MHz

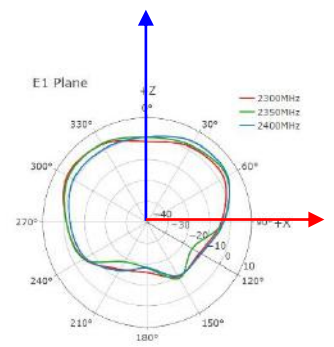
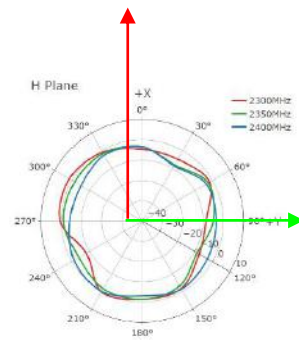
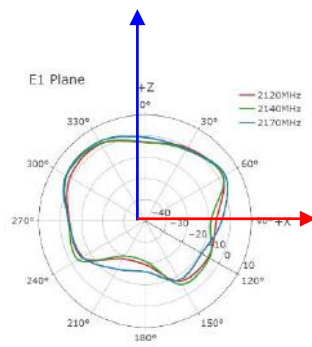
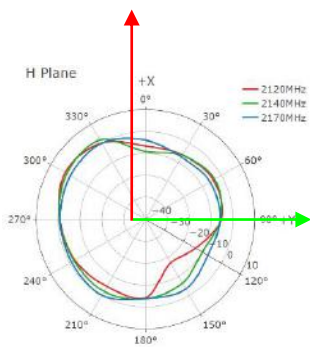
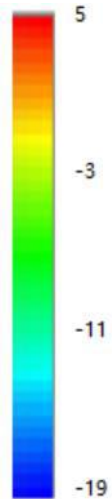
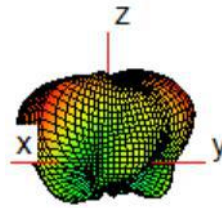


● **LMH1**

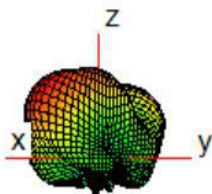
2140 MHz



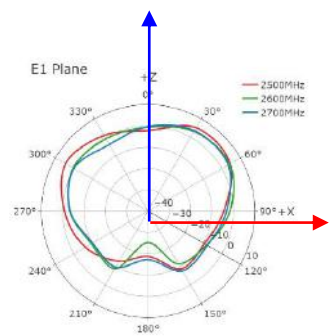
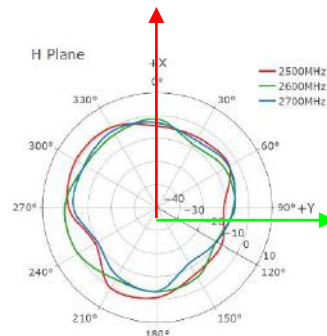
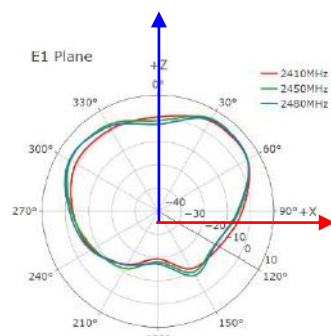
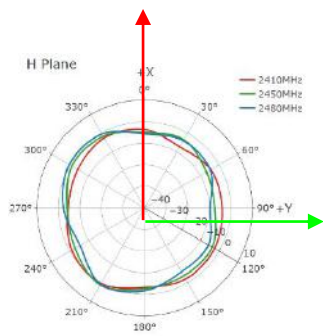
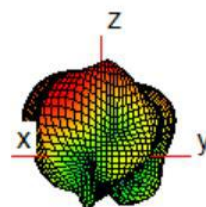
2350 MHz



2450 MHz

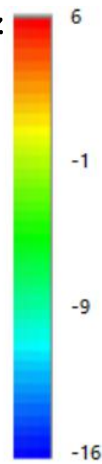
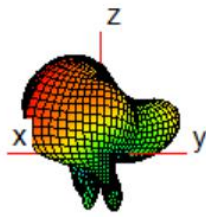


2600 MHz

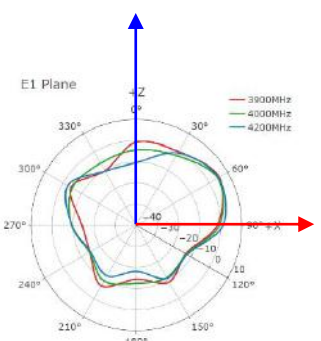
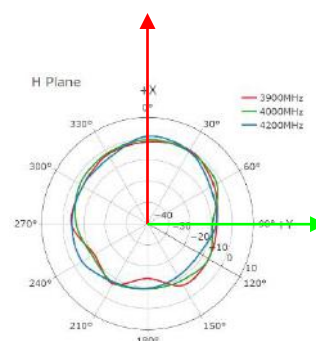
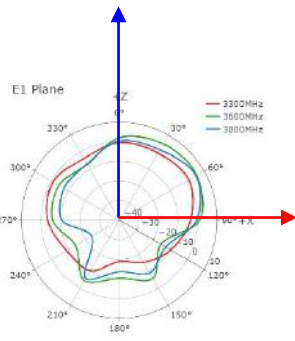
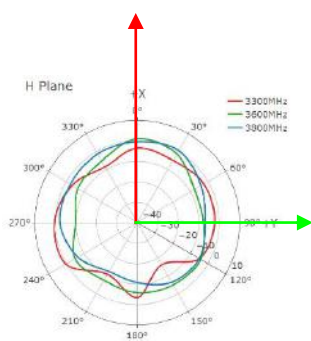
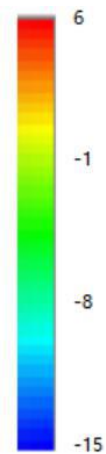
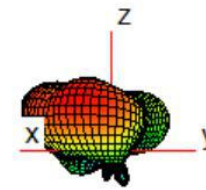


● **LMH1**

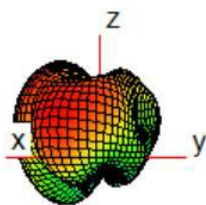
3600 MHz



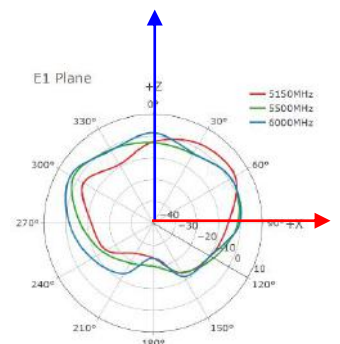
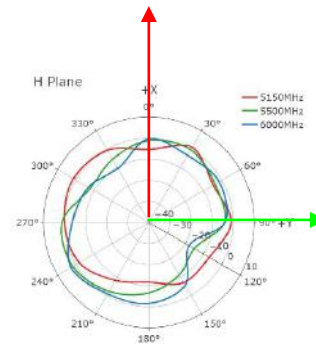
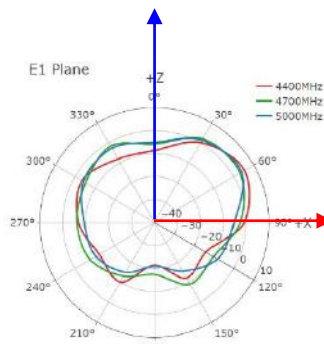
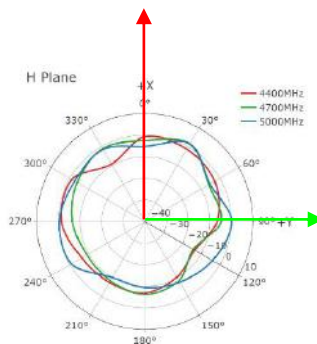
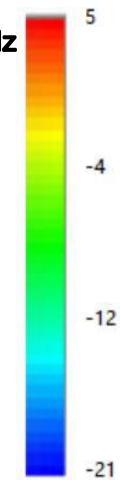
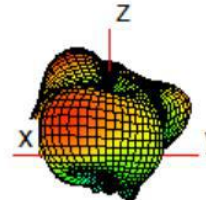
4000 MHz



4700 MHz

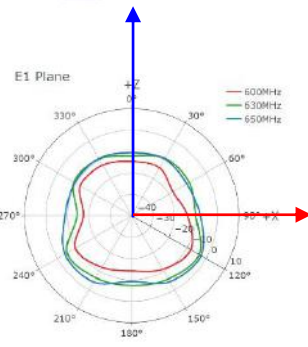
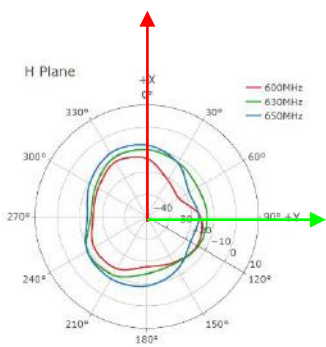
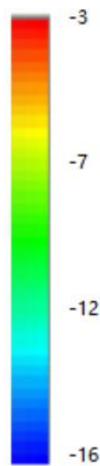
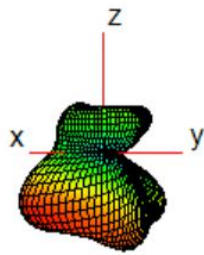


5500 MHz

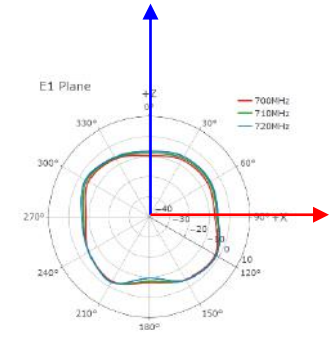
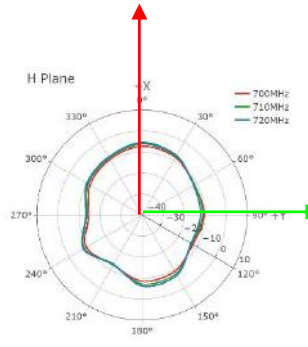
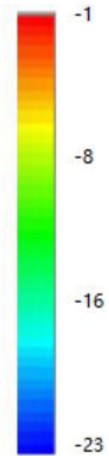
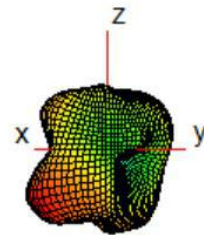


● **LMH2**

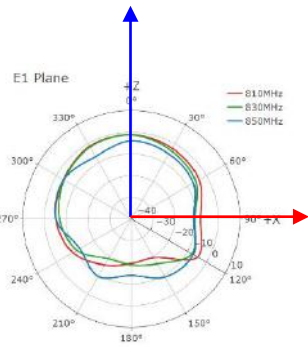
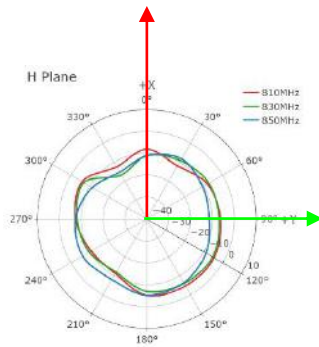
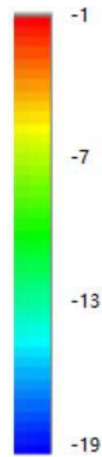
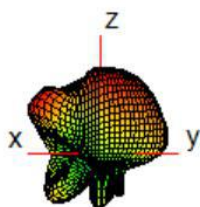
630 MHz



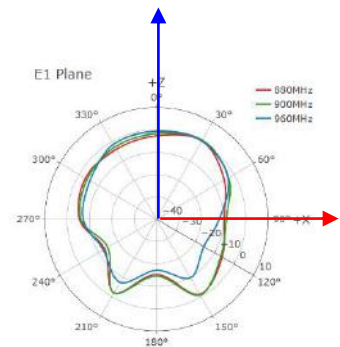
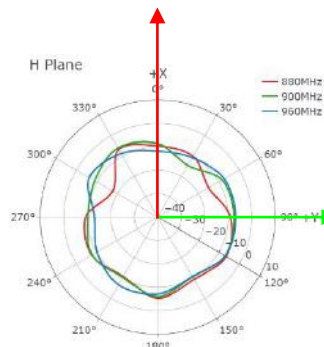
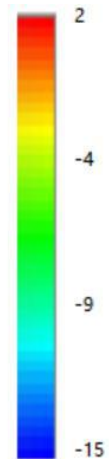
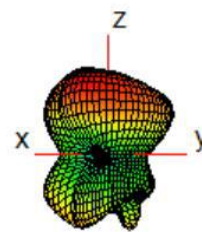
710 MHz



830 MHz

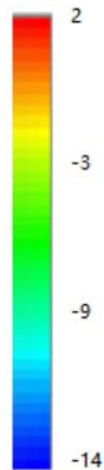
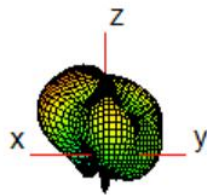


900 MHz

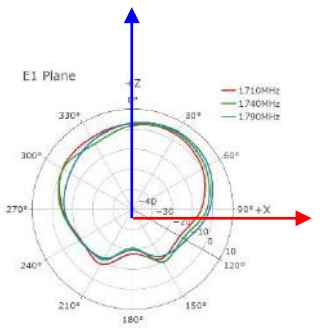
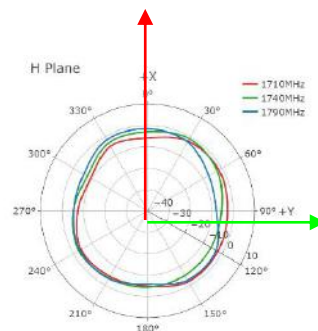
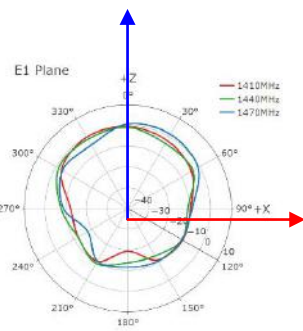
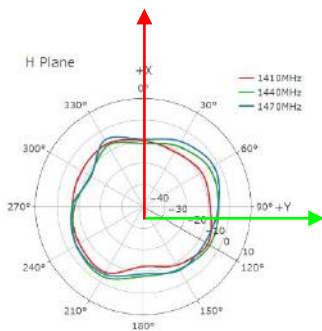
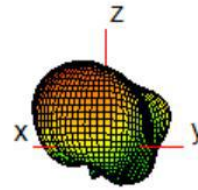


● **LMH2**

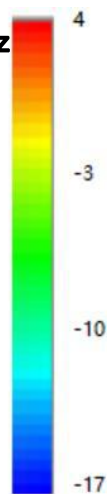
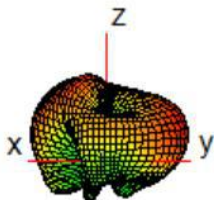
1440 MHz



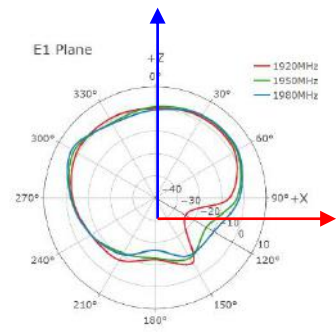
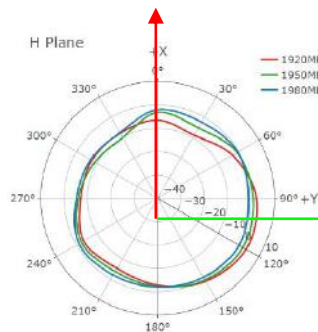
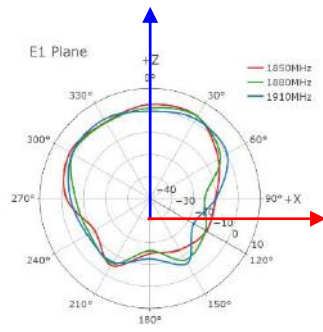
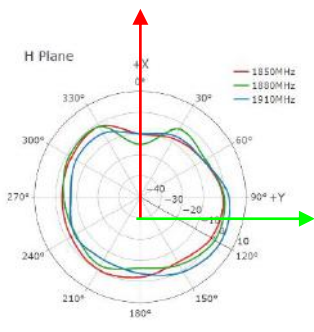
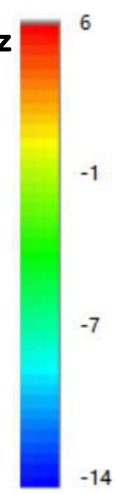
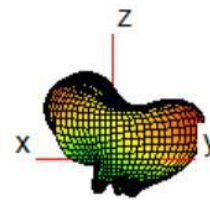
1740 MHz



1880 MHz

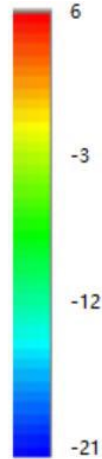
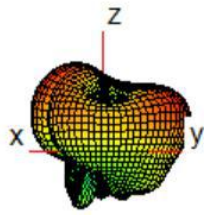


1950 MHz

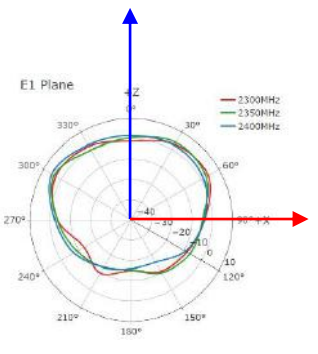
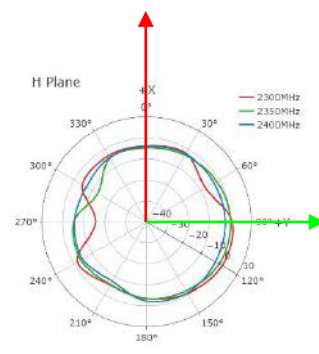
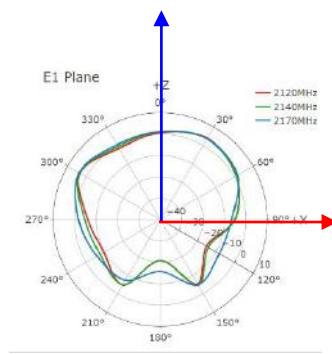
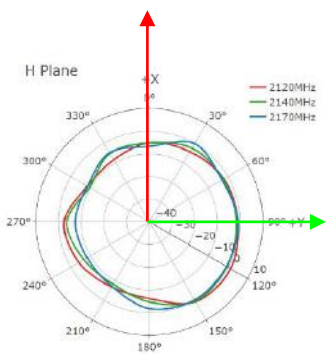
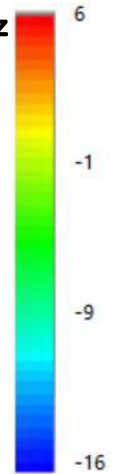
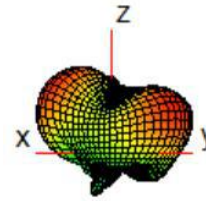


● **LMH2**

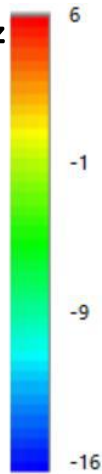
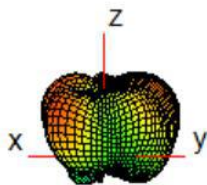
2140 MHz



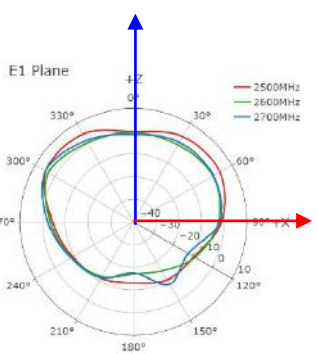
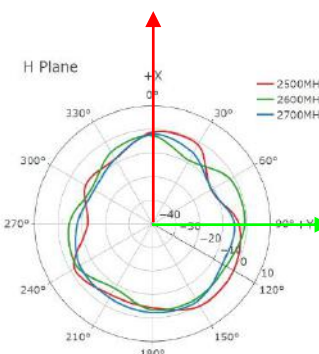
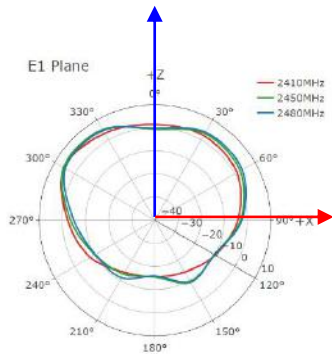
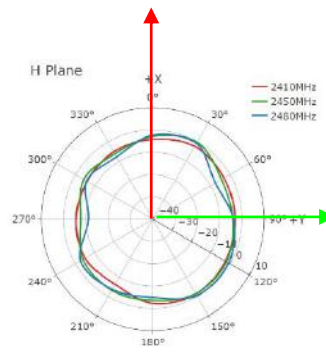
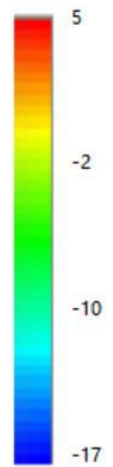
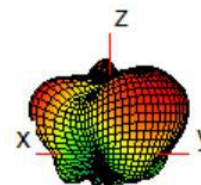
2350 MHz



2460 MHz

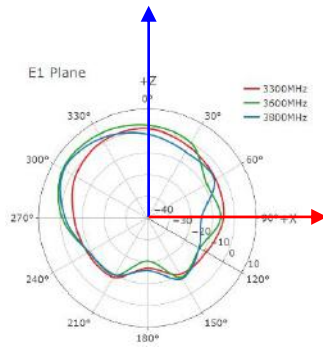
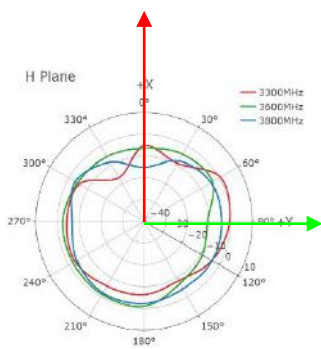
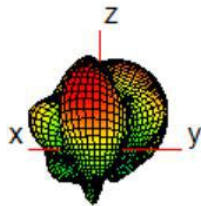


2600 MHz

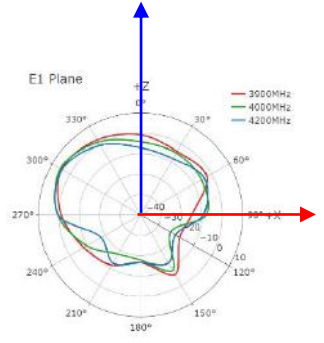
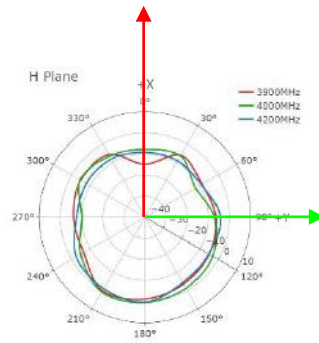
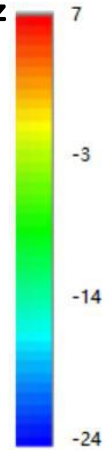
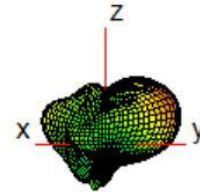


● **LMH2**

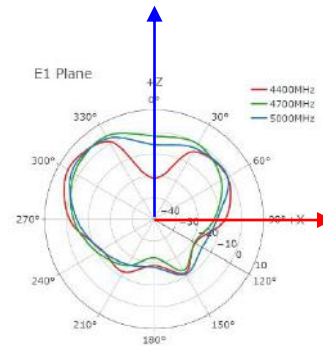
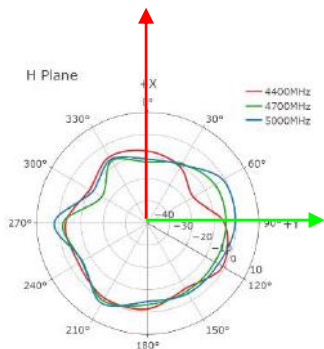
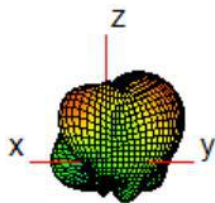
3600 MHz



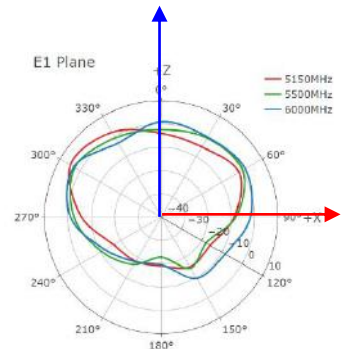
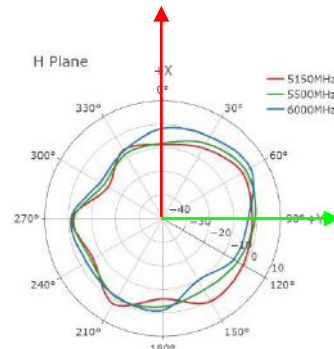
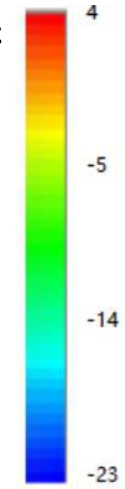
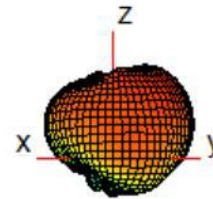
4000 MHz



4700 MHz

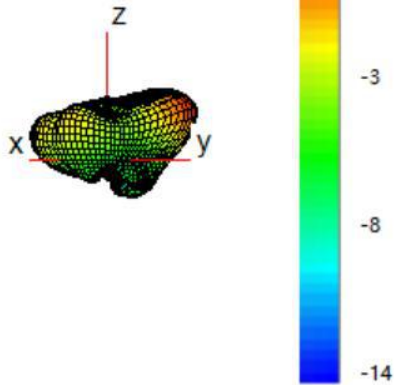


5500 MHz

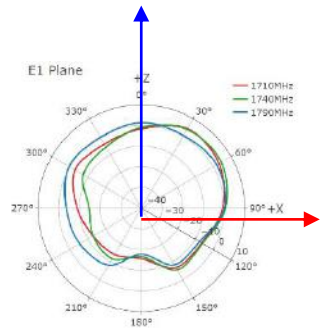
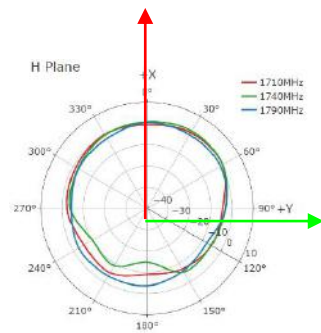
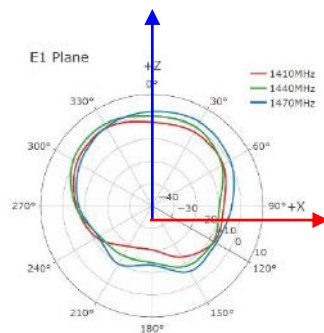
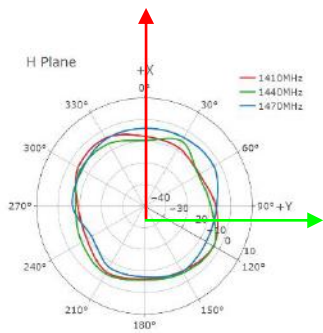
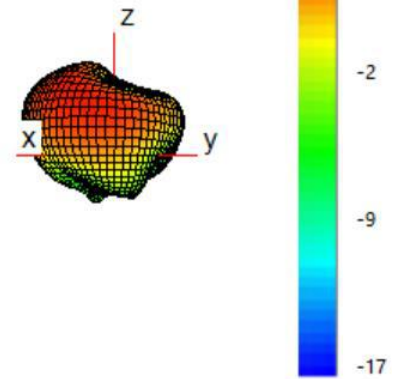


● **MH1**

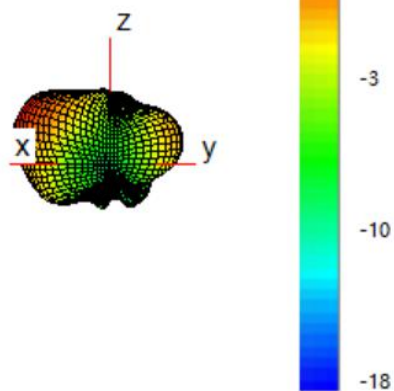
1440 MHz



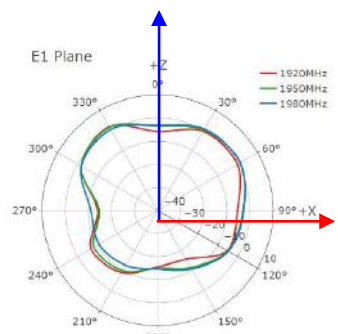
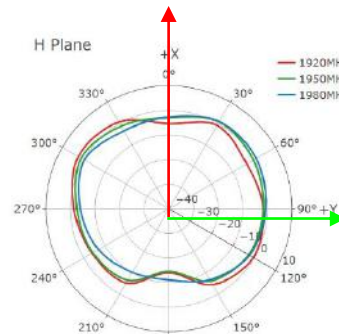
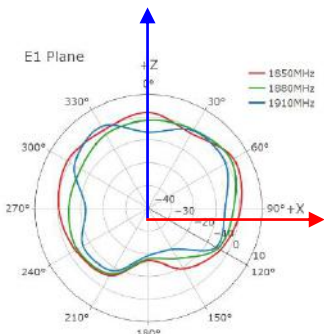
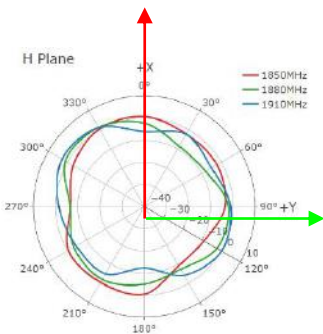
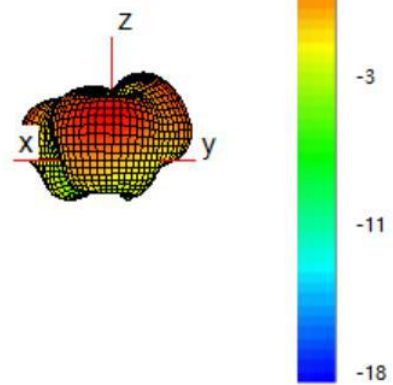
1740 MHz



1880 MHz

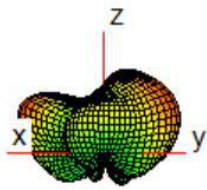


1950 MHz

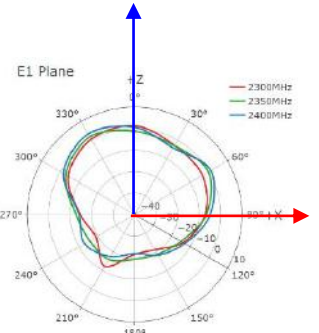
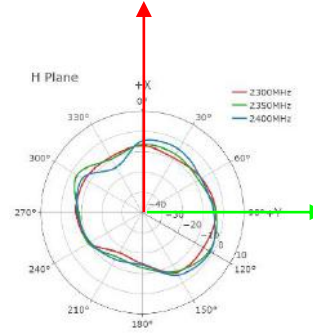
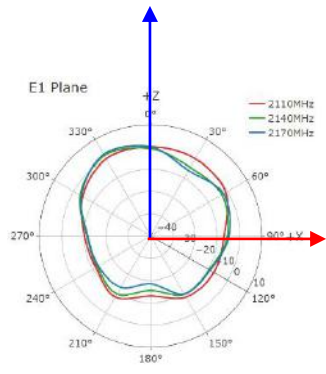
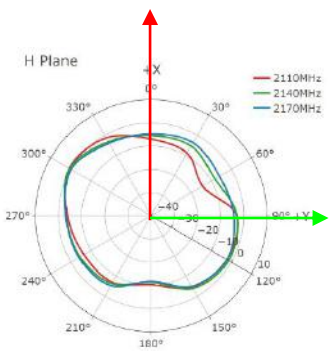
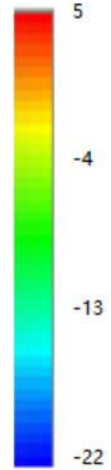
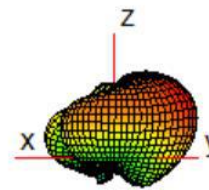


● **MH1**

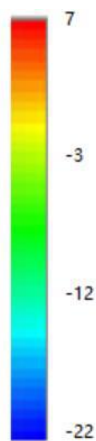
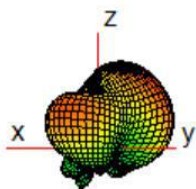
2140 MHz



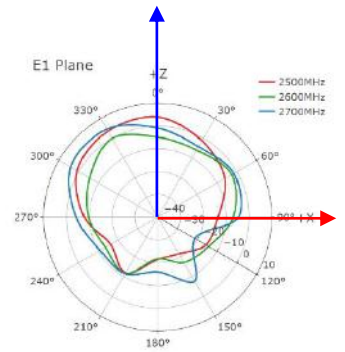
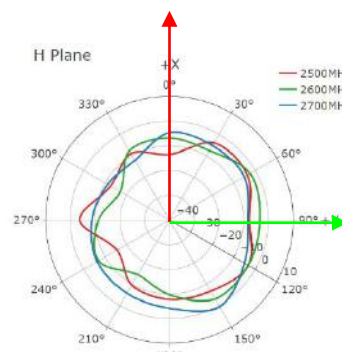
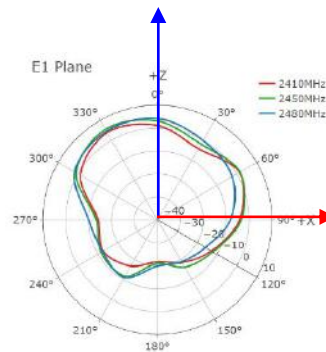
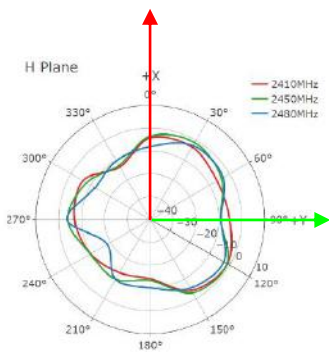
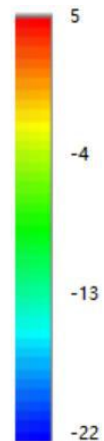
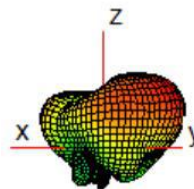
2350 MHz



2450 MHz

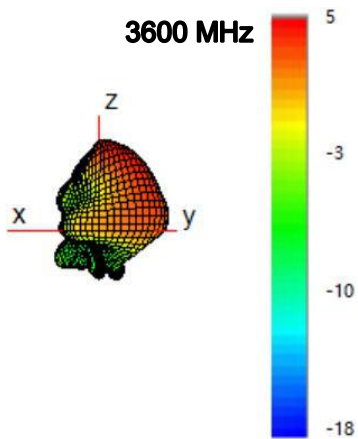


2600 MHz

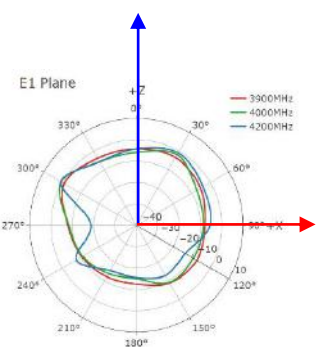
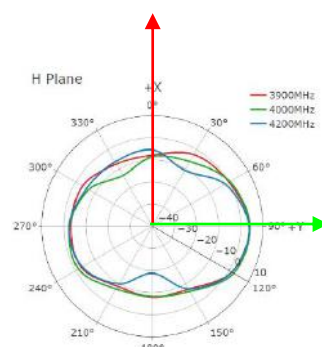
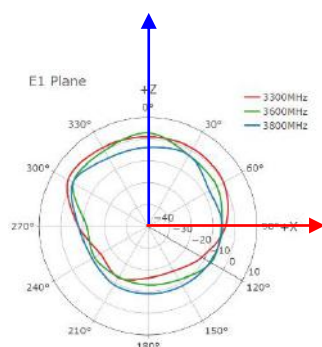
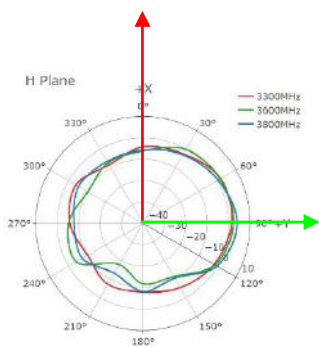
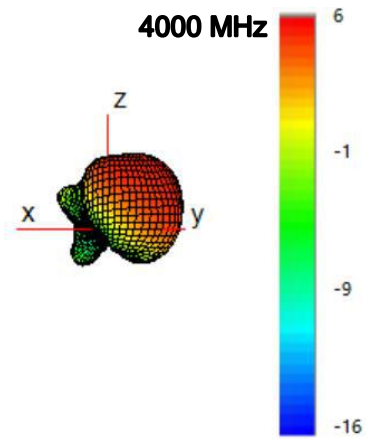


● **MH1**

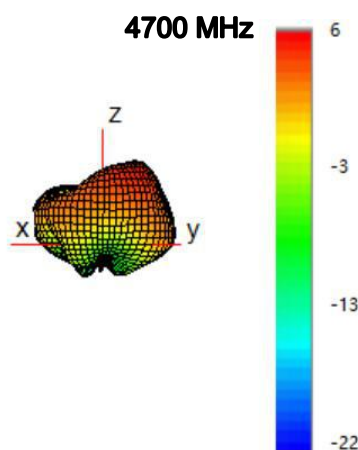
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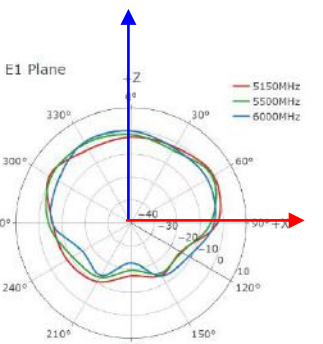
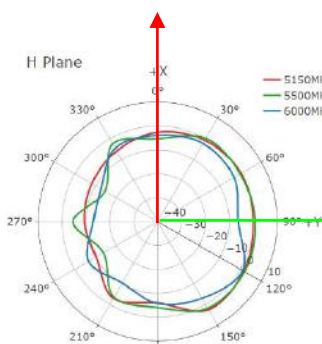
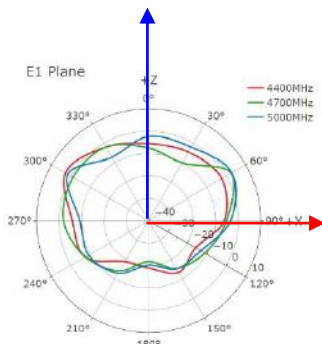
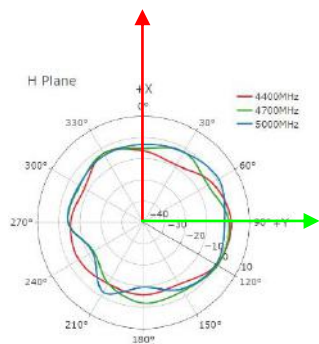
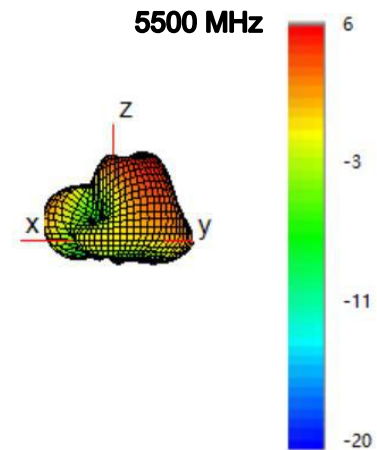
4000 MHz



4700 MHz

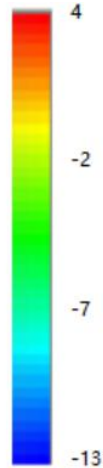
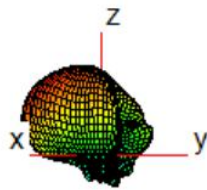


5500 MHz

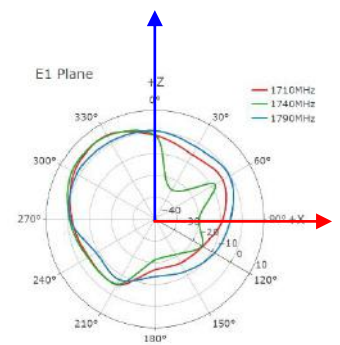
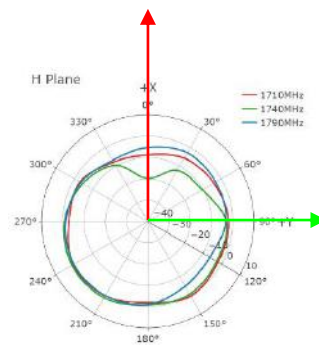
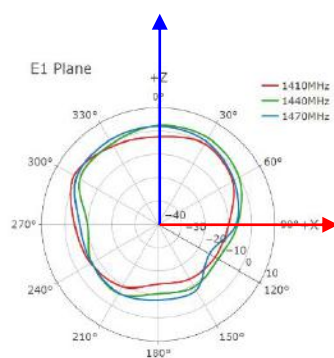
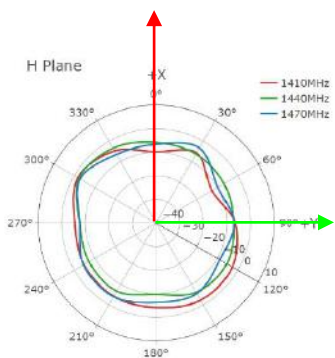
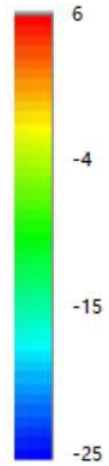
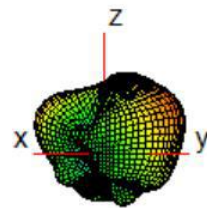


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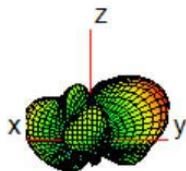
1440 MHz



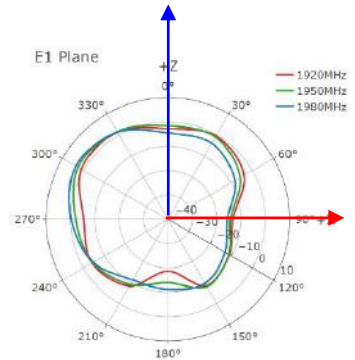
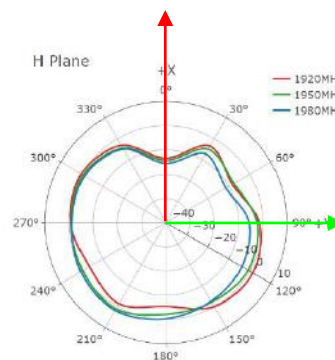
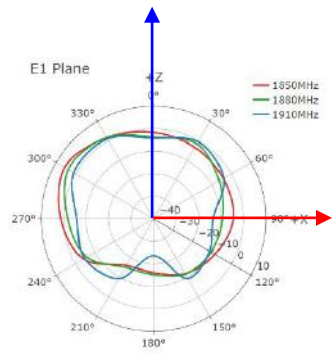
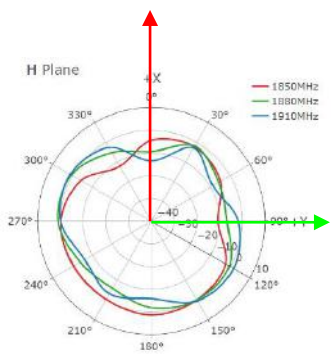
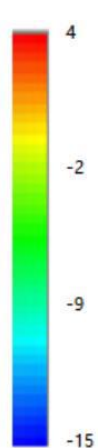
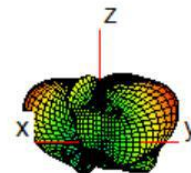
1740 MHz



1880 MHz

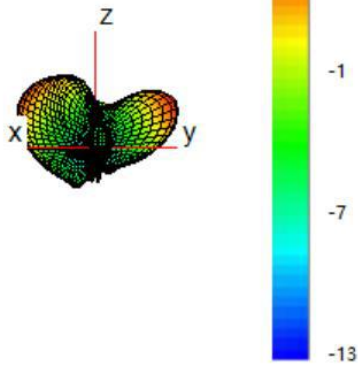


1950 MHz

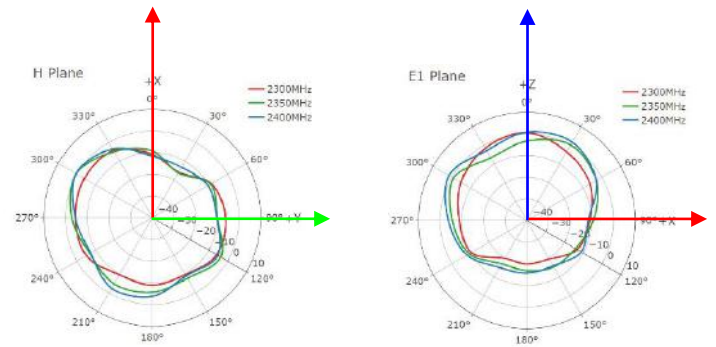
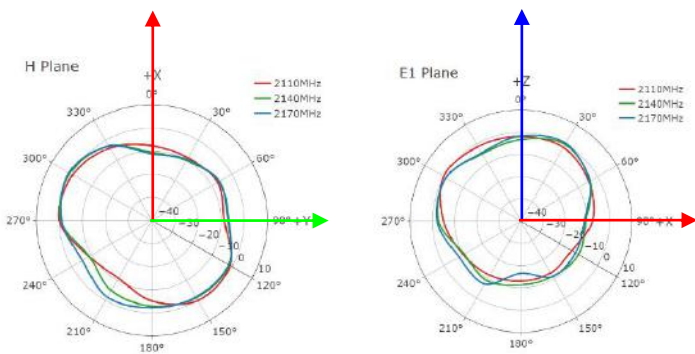
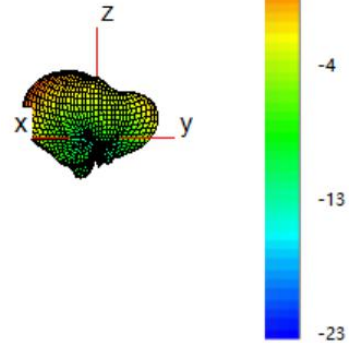


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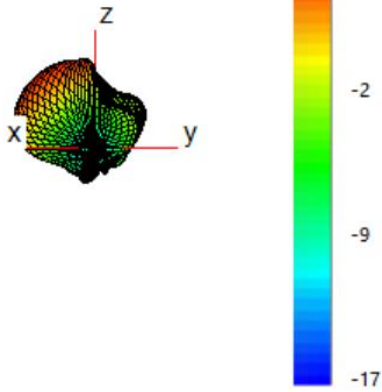
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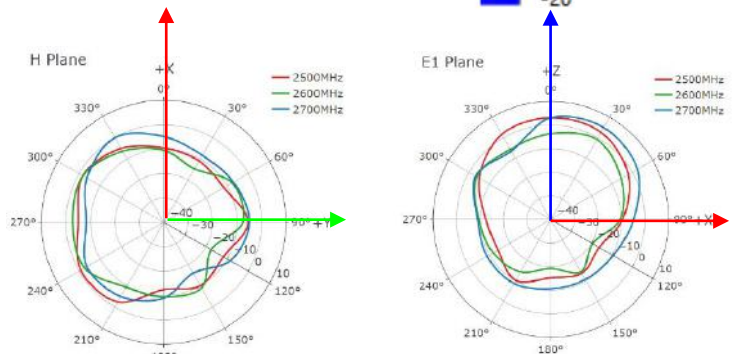
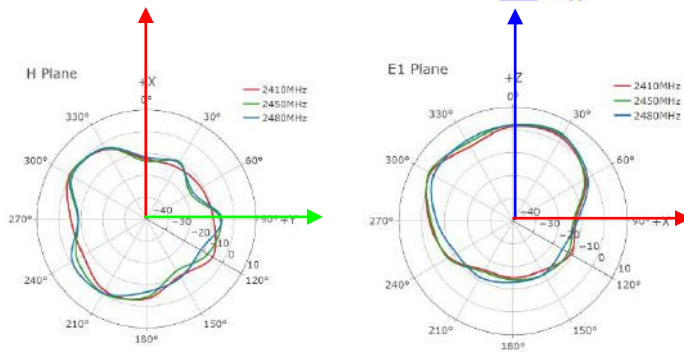
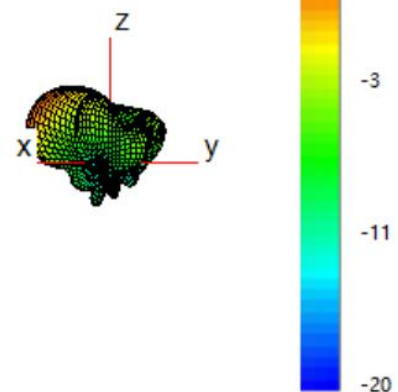
2350 MHz



2450 MHz

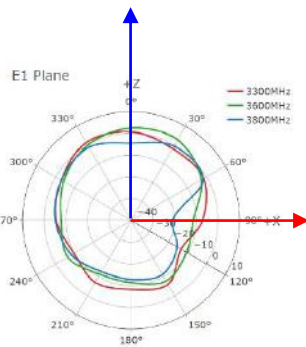
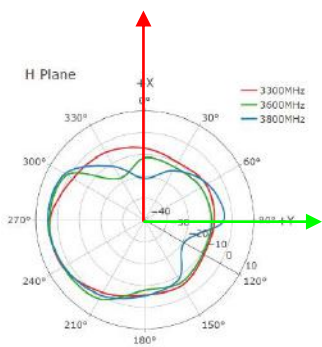
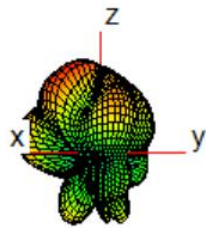


2600 MHz

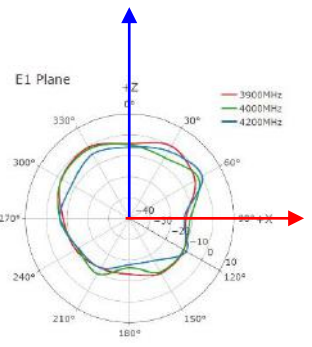
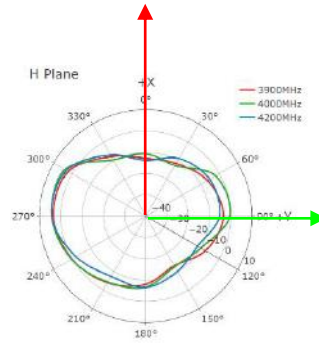
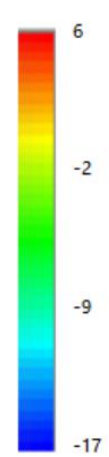
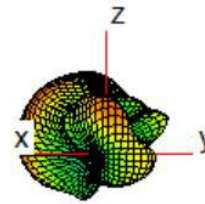


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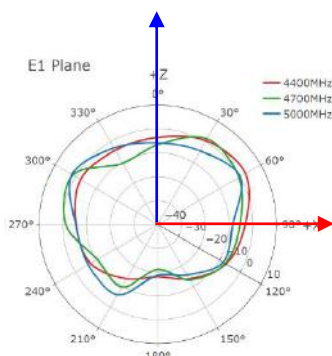
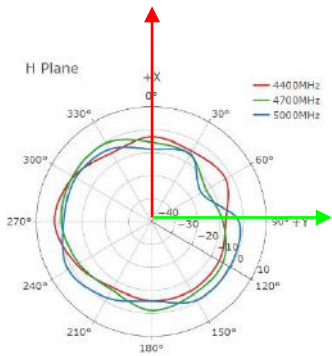
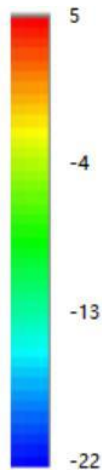
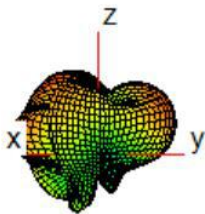
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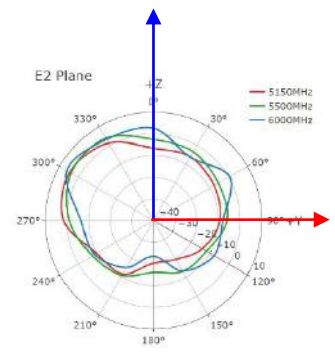
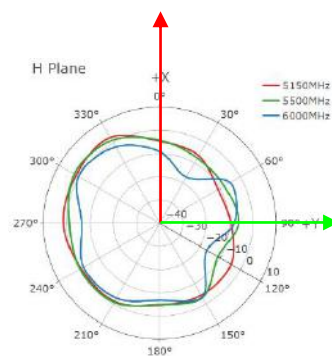
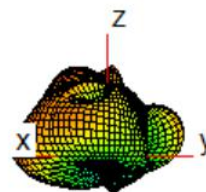
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4700 MHz



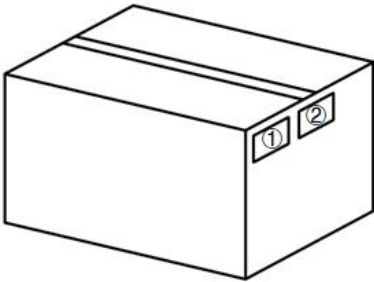
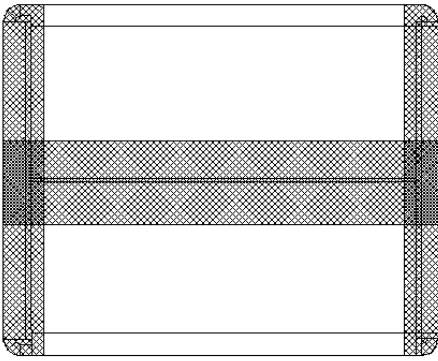
5500 MHz



4 Packaging

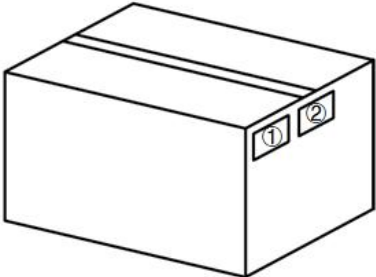
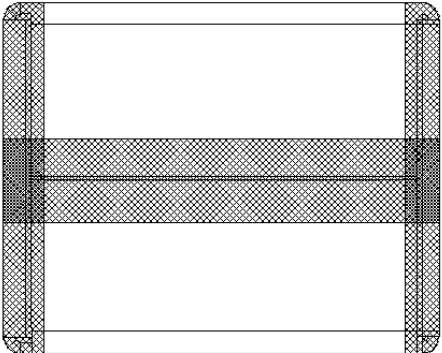
- YEMN017AA
- YEMN518J1A
- YEMR517J1A
- YEMW517J1A

Step	Packaging Picture / 2D Picture	Description
1		Put the product in a PE bag inside the inner box.
2		Top the product with the pearl cotton.

		Inner box diagram <u>Inner Box Size:</u> <u>L × W × H = 191 × 191 × 175 mm</u>
3		(6 inner boxes per carton box) (6 pcs antennas per carton box) <u>Carton Size:</u> <u>L × W × H = 606 × 410 × 218 mm</u>
4		Position for Attaching Labels ① Carton Label ② Quality Label
5		Sealing Cartons “I” type sealing cartons

- YEMA517J1A
- YEMM517J1A

Step	Packaging Picture / 2D Picture	Description
1		Put the product in a PE bag inside the inner box.
2		Top the product with a pearl cotton.
		Inner box diagram <u>Inner Box Size:</u> <u>L × W × H= 191 × 191 × 135 mm</u>

3		(6 inner boxes per carton box) (6 pcs antennas per carton box) <u>Carton Size:</u> <u>L × W × H = 600 × 404 × 164 mm</u>
4		Position for Attaching Labels ① Carton Label ② Quality Label
5		Sealing Cartons “I” type sealing cartons

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Revision History

Version	Date	Author	Note
-	2023-06-09	Wilson BAO/ Lance SUN/ David LIU/ Vinnie LIU	Creation of the document
1.0	2023-06-09	Wilson BAO/ Lance SUN/ David LIU/ Vinnie LIU	First official release
1.1	2023-06-21	Wilson BAO/ Lance SUN/ David LIU/ Vinnie LIU	Updated some details of the datasheet.
1.2	2023-09-06	Lance SUN/ Vinnie LIU	1. Updated the description of overview. 2. Deleted antenna working humidity and added its connector type (Chapter 1.3).
1.3	2023-09-19	David LIU	Updated the packaging (Chapter 4).
1.4	2023-10-18	Junsen LI	Updated the GNSS data.



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