



Antenna Datasheet

Product OC: YEMN926J1A

Version: 1.4

Date: 2024-06-22

Status: Released

Product Name: 5G & GNSS 9-in-1 Screw Mount Combo Antenna

Key Features:

Optimized for 5G and 4G Networks, GNSS L1 & L5

Dimensions: Φ 167 mm $\times$ 57 mm

RoHS and REACH Compliant

IP67 & IP69K

Compatible with ECE-R118 cables under demand

Overview

YEMN926J1A is a 5G & GNSS 9-in-1 combo antenna measuring Φ 167 mm $\times$ 57 mm. This ultra-wide-band 5G & GNSS antenna provides broad coverage from 600–6,000 MHz whilst offering backward-compatibility to support 3G and 2G networks as well as LTE Cat-M and narrowband IoT (NB-IoT). The antenna is available with connection via 9 cable lengths from 300–5,000 mm (Compatible with ECE-R118 cables), terminated with SMA Male connectors. Ideal for applications where the antenna is required to be discrete, this low profile, screw mount omni-directional antenna is easy to install with maximum durability assured thanks to its IP67 & IP69K and IK09 rated enclosure. It is compatible with Quectel's RM520x Series modules.

YEMN926J1A has 4 $\times$ 5G LMH antennas, 4 $\times$ 5G MH/WIFI antennas and 1 $\times$ GNSS L1 & L5 antenna. It allows high efficiency, stable signal transmission and reception for active GNSS from 1164–1189 MHz & 1565–1606 MHz, and 5G/4G bands from 600–960 MHz and 1400–6000 MHz. In the meantime, this product also offers high isolation between antennas to avoid self-interference. All in all, this unique product is designed to provide stable and high-speed data connection to 5G & GNSS applications. YEMN926J1A can be used in harsh environments thanks to its robust UV resistant (UL 746c f1) and flame resistant (UL 94 V-0) enclosure.

Typical Applications Include:

- Smart Utilities and Buildings
- Digital Signage
- Warehouses & Logistic systems
- Industrial factory automation, robotic machinery and other M2M systems
- Transport (Busses, Utility & Public Safety)
- Mining Vehicles & Machinery communications, telemetry and automation

Quectel provides comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs. We have regional R & D centers to offer quick response to meet your requirements. Please contact our sales & FAEs if you have any requests.

Below are the variants based on YEMN926J1A.

Combo variants overview							
OC	5G LMH	5G MH/WIFI	GNSS L1 & L5 (28 dB)	GNSS L1&L5 (17 dB)	Total	Mounting Type	Screw Nut
YEMN926J1A	4	4	1	-	9-in-1	Screw	M27
YEMN901J1AH	4	4	-	1	9-in-1	Screw	M27
YEMN801J1AH	4	4	-	-	8-in-1	Screw	M27
YEMN703J1AH	4	2	1	-	7-in-1	Screw	M27
YEMN702J1BH	4	2	-	1	7-in-1	Screw	M27
YEMN600J1AH	4	2	-	-	6-in-1	Screw	M27
YEMN502J1AH	4	-	1	-	5-in-1	Screw	M27
YEMN504J1BH	4	-	-	1	5-in-1	Screw	M27
YEMN503J1CH	4	1	-	-	5-in-1	Screw	M27
YEMN405J1AH	2	2	-	-	4-in-1	Screw	M27
YEMN404J1BH	4	-	-	-	4-in-1	Screw	M27

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1 Specification

Test Condition: In Free Space & On 500 mm × 500 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, 1559–1606 MHz
Radiation Pattern	LMHs & MHs	Omni-directional
	GNSS	Directional
Polarization	LMHs & MHs	Linear
	GNSS	RHCP
Impedance		50 Ω
Isolation	FS	≤ -4.6 dB
	MP	≤ -7.4 dB
Axial Ratio (GNSS)		< 3 dB

1.1.1. LMHs

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	4.4	1.6	2.6	6.0	2.4	1.6	2.1	3.0	2.8	2.0	2.1
	MP	4.7	2.3	2.0	6.1	2.5	1.7	2.1	3.1	2.6	2.0	2.1
Max Return Loss (dB)	FS	-4.0	-12.8	-7.0	-2.9	-7.8	-12.5	-9.0	-5.9	-6.6	-9.3	-9.2
	MP	-3.7	-7.9	-9.8	-2.9	-7.5	-12.0	-9.2	-5.8	-6.9	-9.5	-8.9
AVG Eff. (%)	FS	31.5	43.1	42.2	29.0	54.4	60.0	51.0	43.9	52.8	49.1	41.2
	MP	15.5	23.6	25.1	30.7	54.6	55.3	46.9	42.3	52.9	50.6	39.5
AVG AVG Gain (dB)	FS	-5.0	-3.7	-3.7	-5.4	-2.6	-2.2	-2.9	-3.6	-2.8	-3.1	-3.8
	MP	-8.1	-6.3	-6.0	-5.1	-2.6	-2.6	-3.3	-3.7	-2.8	-3.0	-4.0
Max Peak Gain (dBi)	FS	0.8	1.2	1.2	1.4	3.8	2.3	1.9	1.4	4.3	4.3	3.2
	MP	0.6	3.6	4.2	4.9	6.7	6.0	5.2	4.2	6.8	6.0	5.5
VSWR	FS	≤ 6.0										
	MP	≤ 6.1										
Return Loss	FS	≤ -2.9 dB										
	MP	≤ -2.9 dB										
Peak Gain	FS	≤ 4.3 dBi										
	MP	≤ 6.8 dBi										

- LMHs: LMH antennas (LMH1, LMH2, LMH3, LMH4)
- MHs: MH antennas (MH1, MH2, MH3, MH4)
- FS: In Free Space
- MP: On 500 mm × 500 mm Metal Plane

1.1.2. MHs

Band 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	-	-	-	4.6	2.4	2.4	2.5	2.1	3.0	2.5	2.3
	MP	-	-	-	7.5	3.8	2.3	2.4	1.8	3.3	2.4	2.3
Max Return Loss (dB)	FS	-	-	-	-3.9	-7.8	-7.5	-7.2	-9.2	-6.0	-7.3	-8.0
	MP	-	-	-	-2.3	-4.7	-8.1	-7.7	-10.9	-5.4	-7.7	-8.1
AVG Eff. (%)	FS	-	-	-	34.0	53.8	52.9	46.5	54.5	53.5	52.9	45.8
	MP	-	-	-	18.3	46.2	44.9	39.2	49.1	57.1	57.5	46.7
AVG AVG Gain (dB)	FS	-	-	-	-4.7	-2.7	-2.8	-3.3	-2.6	-2.7	-2.8	-3.4
	MP	-	-	-	-7.4	-3.4	-3.5	-4.1	-3.1	-2.4	-2.4	-3.3
Max Peak Gain (dBi)	FS	-	-	-	1.6	3.5	2.2	2.2	3.3	4.3	3.6	5.4
	MP	-	-	-	2.1	5.2	4.5	4.6	6.2	7.7	7.6	8.8
VSWR	FS	≤ 4.6										
	MP	≤ 7.5										
Return Loss	FS	≤ -3.9 dB										
	MP	≤ -2.3 dB										
Peak Gain	FS	≤ 5.4 dBi										
	MP	≤ 8.8 dBi										

- LMHs: LMH antennas (LMH1, LMH2, LMH3, LMH4)
- MHs: MH antennas (MH1, MH2, MH3, MH4)
- FS: In Free Space
- MP: On 500 mm × 500 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	1.48	-	-	-	-	1.63	1.54	1.42
Return Loss (dB)	-14.2	-	-	-	-	-12.3	13.4	-15.2
Efficiency (%)	85	-	-	-	-	53	66	45.6
AVG Gain (dB)	-0.9	-	-	-	-	-3.37	-2.47	-4.03
Peak Gain (dBi)	4.67	-	-	-	-	2.85	3.82	2.25
Axial Ratio (dB)	2.44	-	-	-	-	1.2	0.79	0.77

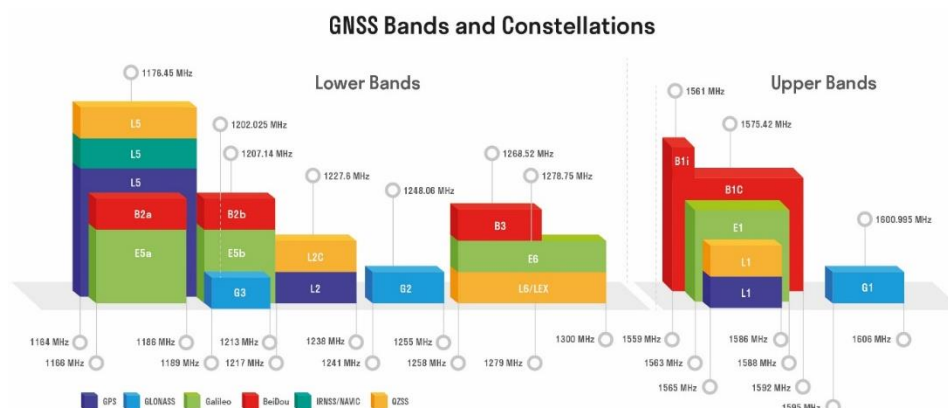
LNA Electrical	
LNA Gain	22 ±3 dB
Noise Figure	≤ 2.5 dB
Output VSWR	< 2.0
Filter Out-of-Band Attenuation	60 dB f0 ±100 MHz f0 (1164–1189 MHz, 1559–1606 MHz)
Working Voltage	3–5 V
Working Current	18.8 ±4 mA
Impedance	50 Ω

1.2. 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)				
	√				

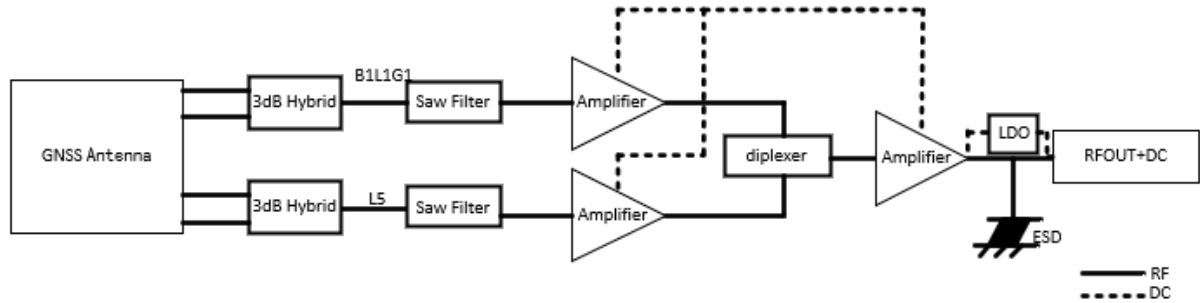


1.3. Mechanical & Environment

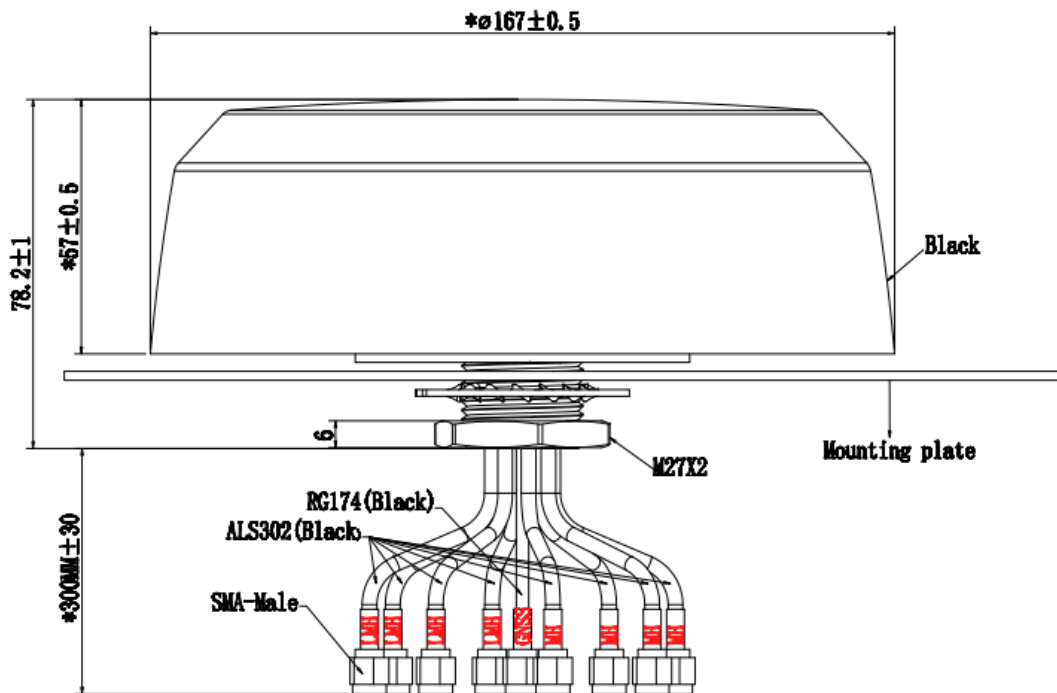
Mechanical		
Antenna Size		Φ 167 mm × 57 mm
Casing Material & Color		PC & Black
Cable Type & Length	LMHs & MHs	ALS302 Black & 300 mm
	GNSS	RG174 Black & 300 mm
Connector Type		SMA Male
Weight		Typ. 585 g
Mounting Type		Screw (M27 Nut)
Environmental		
Operation Temperature		-40 °C to +85 °C
Storage Temperature		-40 °C to +85 °C
Ingress Protection (IP) Rating		IP67 (After Installation) IP69K (After Installation)
Impact Protection (IK) Rating		IK09
RoHS & REACH Compliant		Yes
Housing Flame Rating		UL 94 V-0
Housing UV Resistant		UL 746c f1

- LMHs: LMH antennas (LMH1, LMH2, LMH3, LMH4)
- MHs: MH antennas (MH1, MH2, MH3, MH4)
- FS: In Free Space
- MP: On 500 mm × 500 mm Metal Plane

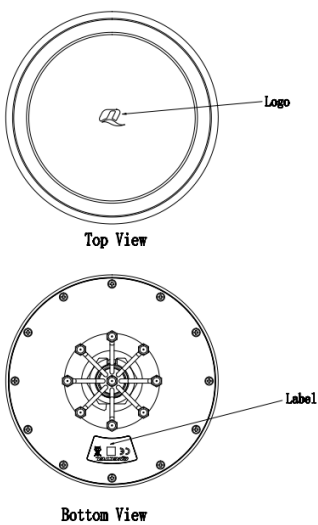
1.4. Block Diagram (Active Antenna)



2 Drawing



- 4 LMHs can be connected arbitrarily, and 4 MHs can be connected arbitrarily.
- Recommended assembly hole diameter: 28.0 mm.
- Recommended mounting plane thickness: 3.0 mm.

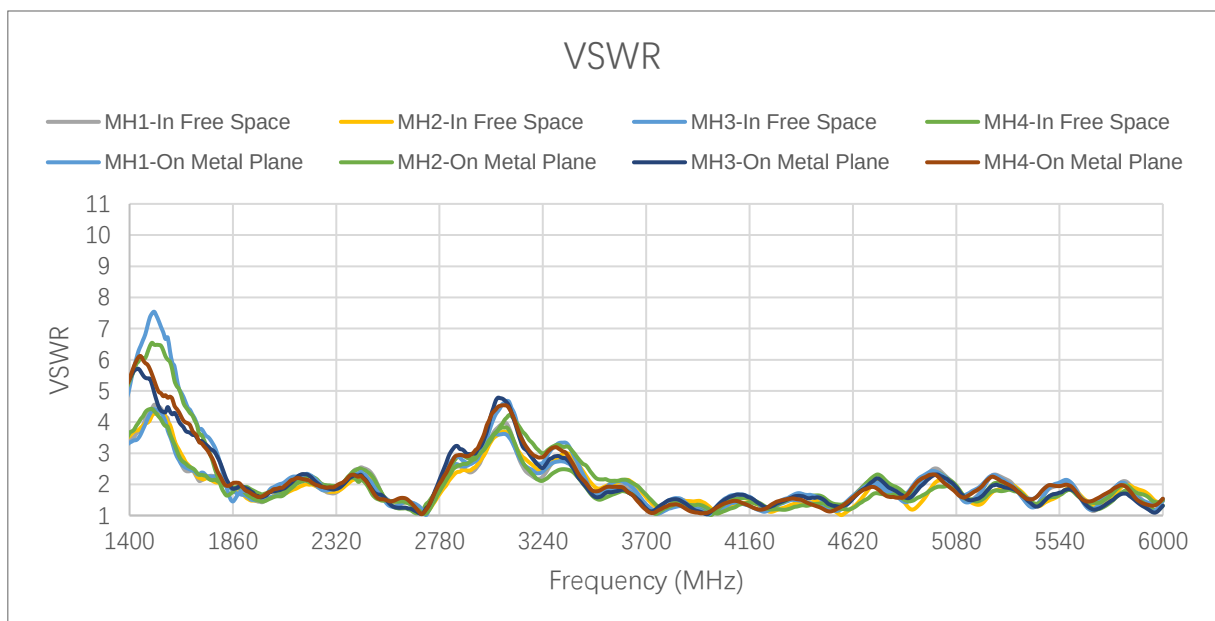
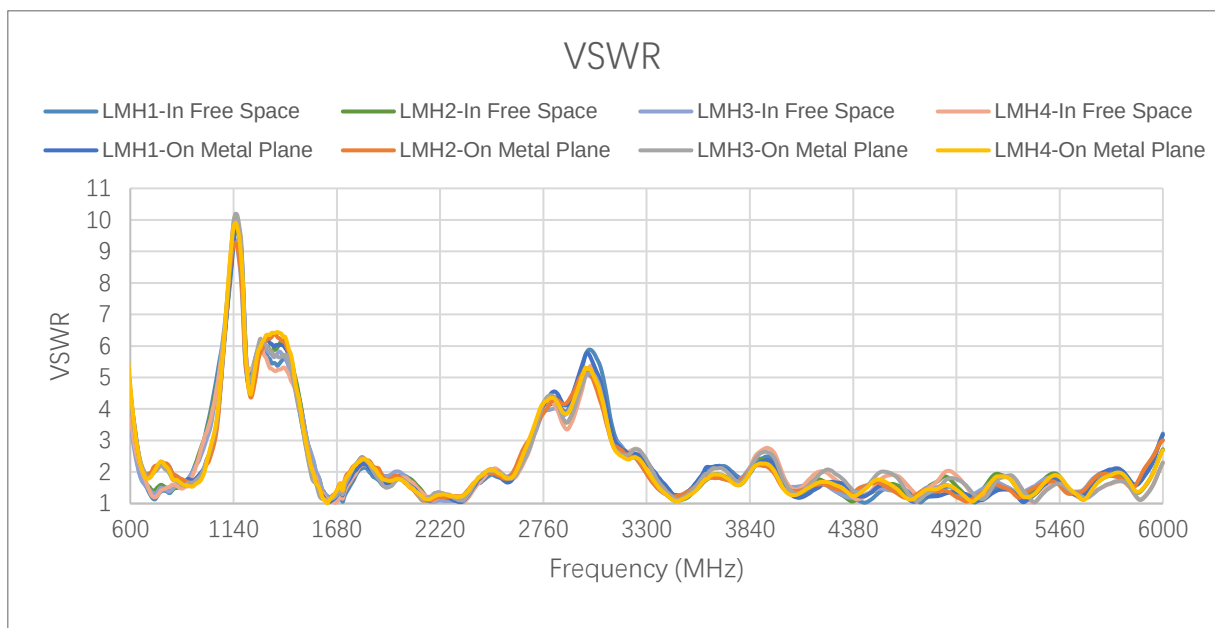


The current state of the SMA connector is not waterproof. If a waterproof connector is required, it can be customized, such as a waterproof FAKRA connector.

3 Detail Performance

3.1. S-Parameter Test

3.1.1. VSWR



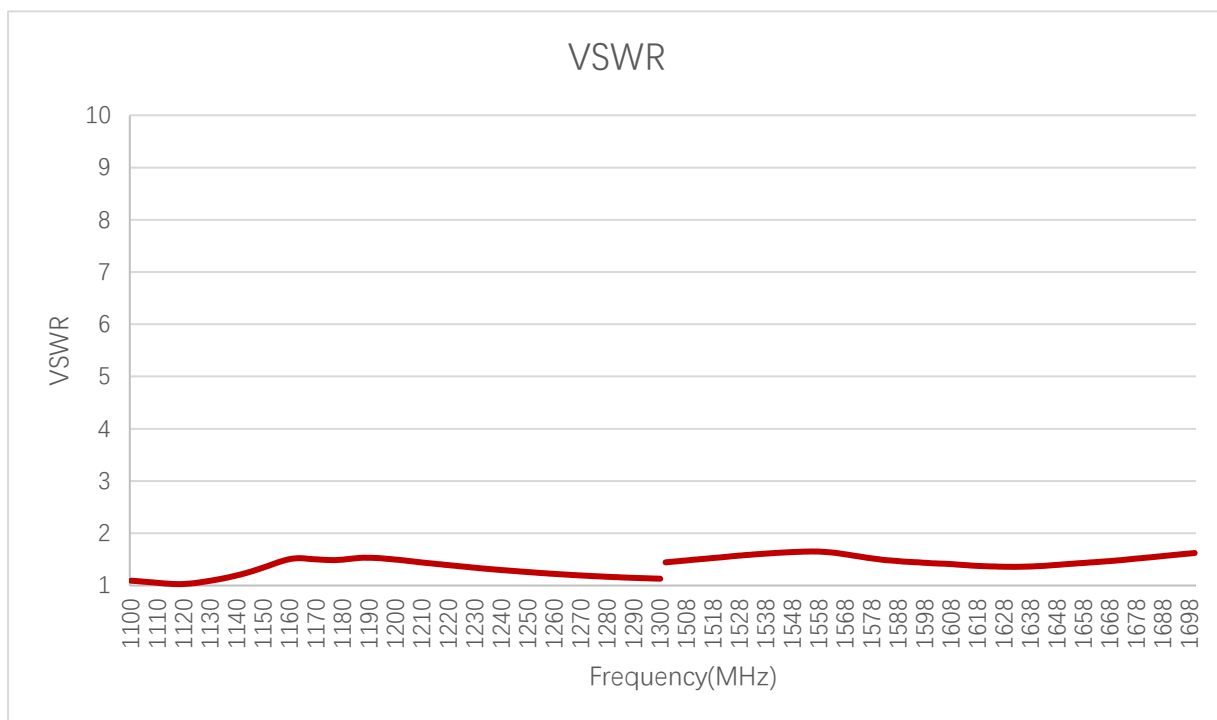
VSWR - LMH

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	4.0	2.5	1.2	1.5	1.8	2.5	5.3	1.1	1.5	1.8
	MP	4.6	3.1	1.9	1.9	1.8	1.9	5.4	1.3	1.7	1.9
LMH2	FS	4.4	2.7	1.4	1.5	1.7	2.6	5.5	1.2	1.6	2.1
	MP	4.6	3.0	2.0	1.9	1.7	1.7	5.6	1.4	2.0	2.1
LMH3	FS	3.9	2.4	1.4	1.5	1.8	2.4	5.1	1.2	1.7	2.1
	MP	4.4	3.0	1.9	1.7	1.6	1.8	5.3	1.3	1.8	1.9
LMH4	FS	3.9	2.6	1.3	1.6	1.5	2.5	4.9	1.2	1.6	2.0
	MP	4.7	3.0	1.9	1.8	1.6	1.7	5.7	1.4	1.9	2.1
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	1.6	1.2	1.1	1.8	1.8	1.9	1.2	1.1	1.4	3.2
	MP	1.6	1.1	1.1	1.9	1.8	2.0	1.1	1.2	1.4	3.2
LMH2	FS	1.7	1.3	1.1	1.9	1.9	1.7	1.1	1.2	1.5	2.7
	MP	1.8	1.1	1.3	1.9	2.0	1.7	1.3	1.1	1.3	3.0
LMH3	FS	1.9	1.2	1.2	1.8	2.0	1.7	1.2	1.2	1.4	3.0
	MP	1.5	1.1	1.1	2.0	1.8	1.9	1.1	1.4	1.5	2.3
LMH4	FS	1.5	1.3	1.1	1.8	1.8	1.8	1.3	1.3	1.5	2.3
	MP	1.7	1.2	1.3	1.9	1.9	1.7	1.2	1.1	1.6	2.7

VSWR - MH

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	3.7	2.1	2.2	1.8
	MP	-	-	-	-	-	-	6.3	3.8	3.6	1.6
MH2	FS	-	-	-	-	-	-	3.7	2.2	2.2	1.7
	MP	-	-	-	-	-	-	5.9	3.6	3.3	1.9
MH3	FS	-	-	-	-	-	-	3.5	2.3	2.3	1.7
	MP	-	-	-	-	-	-	5.7	3.4	3.3	1.9
MH4	FS	-	-	-	-	-	-	4.0	2.3	2.3	1.9

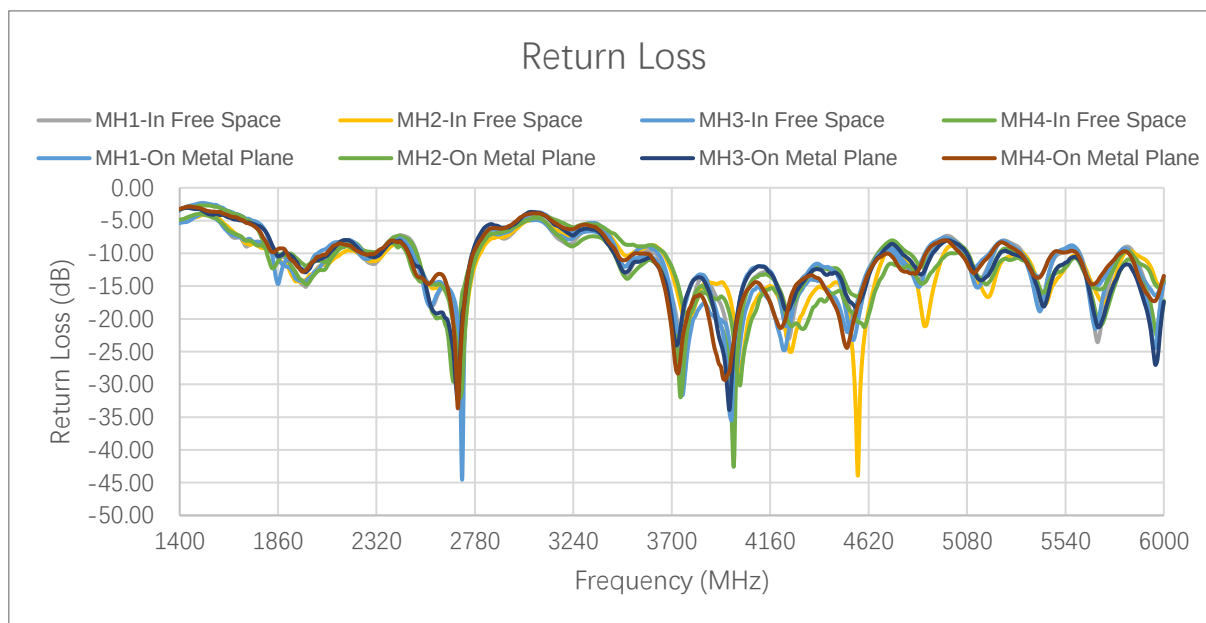
	MP	-	-	-	-	-	-	6.1	3.4	3.2	2.0
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	1.5	2.2	1.9	2.5	1.3	2.0	2.1	2.5	1.9	1.5
	MP	1.7	2.2	2.0	2.3	1.4	2.1	2.0	2.4	1.9	1.5
MH2	FS	1.5	1.9	1.9	2.2	1.4	2.1	1.9	2.1	1.5	1.5
	MP	1.8	2.0	2.0	2.0	1.4	2.1	1.6	1.9	1.6	1.5
MH3	FS	1.5	2.1	2.0	2.3	1.5	1.9	2.0	2.3	2.0	1.5
	MP	1.7	2.2	2.0	2.2	1.2	1.8	2.1	2.3	1.6	1.3
MH4	FS	1.5	2.0	2.0	2.4	1.2	1.8	2.2	2.4	1.6	1.3
	MP	1.7	2.2	2.1	2.1	1.5	1.9	1.9	2.2	2.0	1.5



VSWR - GNSS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	1.48	-	-	-	-	1.63	1.54	1.42

3.1.2. Return Loss



Return Loss (dB)

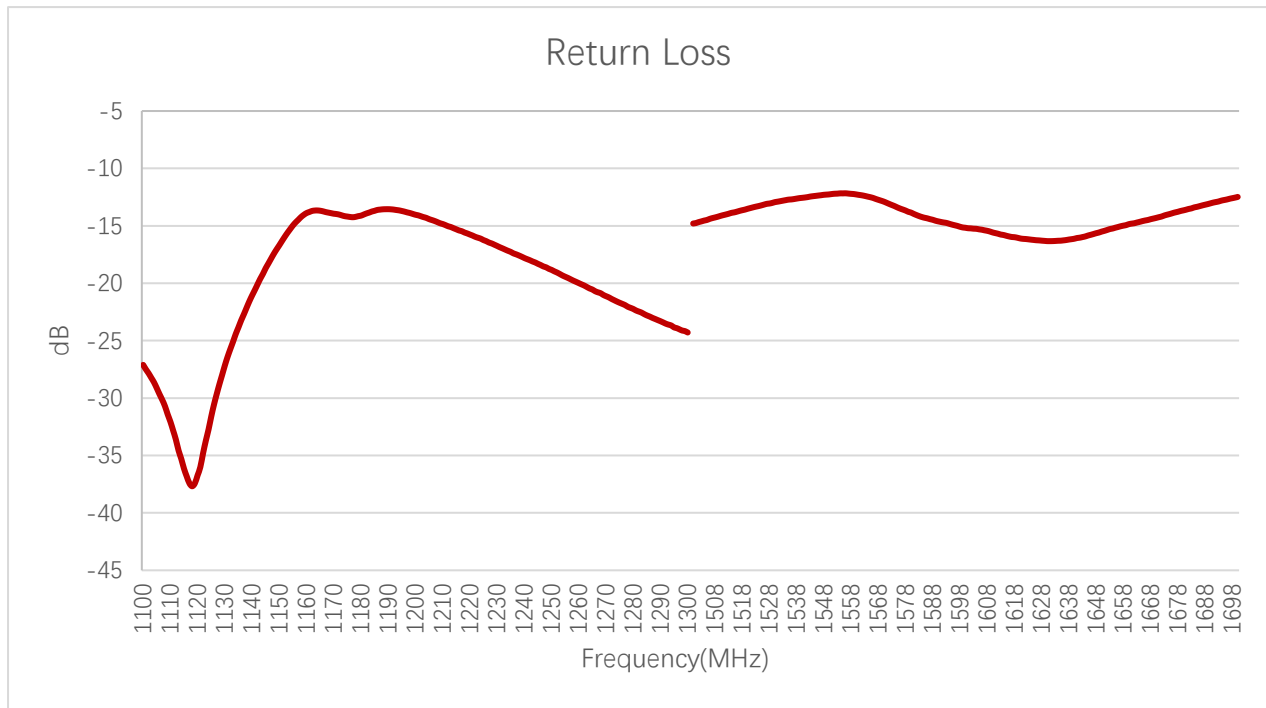
Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	-4.5	-7.3	-20.0	-14.1	-11.2	-7.3	-3.3	-31.3	-14.6	-10.7
	MP	-3.8	-5.8	-10.1	-10.2	-11.0	-10.1	-3.3	-18.8	-11.7	-10.1
LMH2	FS	-4.0	-6.7	-14.8	-14.3	-11.6	-7.0	-3.2	-20.3	-12.5	-9.1
	MP	-3.9	-5.9	-9.6	-10.1	-11.8	-11.8	-3.2	-14.9	-9.8	-8.8

LMH3	FS	-4.6	-7.7	-16.0	-13.6	-11.2	-7.8	-3.4	-19.6	-12.1	-8.9
	MP	-4.0	-6.0	-10.2	-11.4	-12.2	-10.6	-3.3	-17.9	-10.9	-10.0
LMH4	FS	-4.6	-7.0	-18.4	-12.8	-13.4	-7.4	-3.6	-23.0	-12.8	-9.5
	MP	-3.7	-6.0	-10.4	-11.3	-13.2	-11.8	-3.1	-15.3	-10.1	-9.0
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	-13.3	-19.5	-26.7	-11.3	-10.6	-10.2	-20.6	-27.9	-14.9	-5.6
	MP	-12.2	-25.1	-24.2	-9.9	-11.0	-9.4	-31.1	-20.7	-15.5	-5.7
LMH2	FS	-11.7	-18.3	-23.6	-9.9	-10.2	-11.9	-24.2	-23.1	-13.6	-6.7
	MP	-11.1	-27.0	-17.4	-9.9	-9.7	-11.4	-19.1	-23.7	-17.1	-6.0
LMH3	FS	-10.3	-20.8	-20.7	-10.5	-9.7	-11.7	-19.9	-19.5	-16.2	-6.0
	MP	-13.8	-23.6	-23.5	-9.7	-10.8	-10.2	-25.6	-16.2	-14.4	-8.1
LMH4	FS	-13.3	-18.6	-28.7	-10.7	-11.0	-10.5	-16.7	-17.4	-14.5	-8.1
	MP	-11.5	-23.1	-17.8	-9.9	-10.5	-11.5	-22.5	-30.0	-13.2	-6.8

Return Loss (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	-4.8	-9.0	-8.3	-10.5
	MP	-	-	-	-	-	-	-2.8	-4.7	-5.0	-12.2
MH2	FS	-	-	-	-	-	-	-4.8	-8.5	-8.6	-11.4
	MP	-	-	-	-	-	-	-3.0	-4.9	-5.5	-10.0
MH3	FS	-	-	-	-	-	-	-5.1	-8.0	-8.1	-11.7
	MP	-	-	-	-	-	-	-3.1	-5.3	-5.5	-10.2
MH4	FS	-	-	-	-	-	-	-4.5	-8.1	-8.2	-10.1
	MP	-	-	-	-	-	-	-2.9	-5.3	-5.7	-9.3
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	-13.7	-8.5	-10.0	-7.4	-16.8	-9.7	-8.8	-7.4	-10.3	-14.2
	MP	-11.7	-8.3	-9.5	-8.1	-16.4	-9.1	-9.4	-7.8	-10.0	-14.4
MH2	FS	-14.3	-10.5	-10.3	-8.3	-15.3	-8.8	-9.9	-8.9	-13.9	-14.3

	MP	-10.9	-9.4	-9.5	-9.3	-14.8	-8.8	-12.4	-10.0	-12.9	-14.0
MH3	FS	-14.0	-9.2	-9.4	-8.2	-14.5	-10.4	-9.5	-8.1	-9.7	-13.5
	MP	-11.4	-8.6	-9.6	-8.7	-19.2	-10.7	-9.2	-8.1	-12.3	-17.4
MH4	FS	-13.3	-9.6	-9.3	-7.5	-19.9	-11.0	-8.6	-7.8	-12.3	-17.2
	MP	-12.0	-8.6	-9.2	-8.9	-13.3	-10.3	-10.1	-8.4	-9.7	-13.5



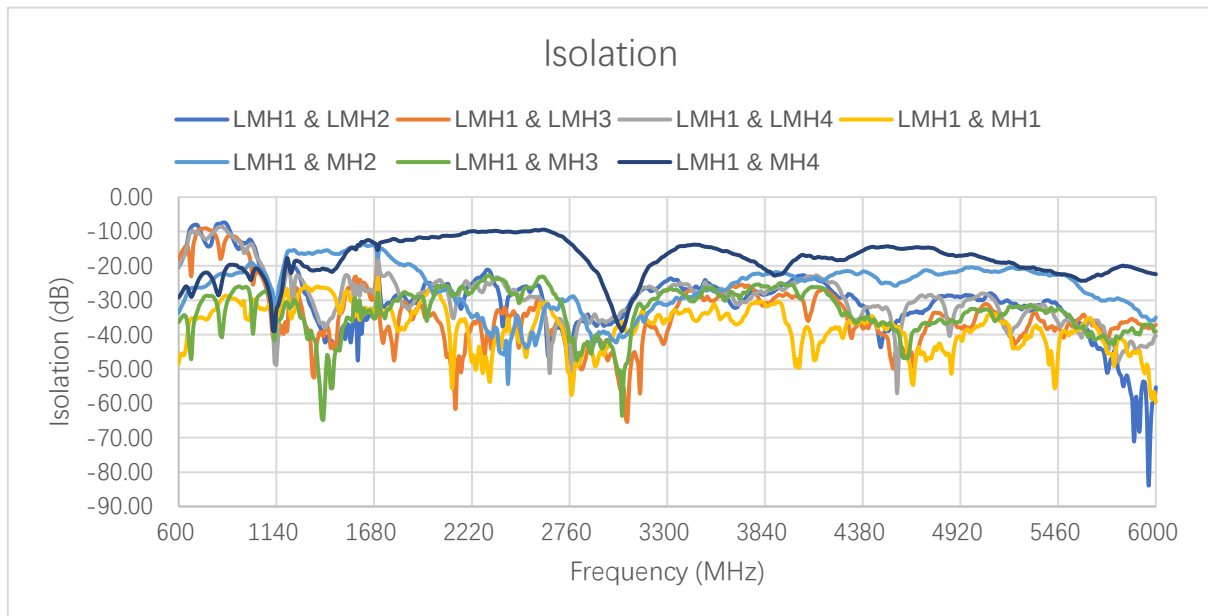
Return Loss (dB) - GNSS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-14.2	-	-	-	-	-12.3	-13.4	-15.2

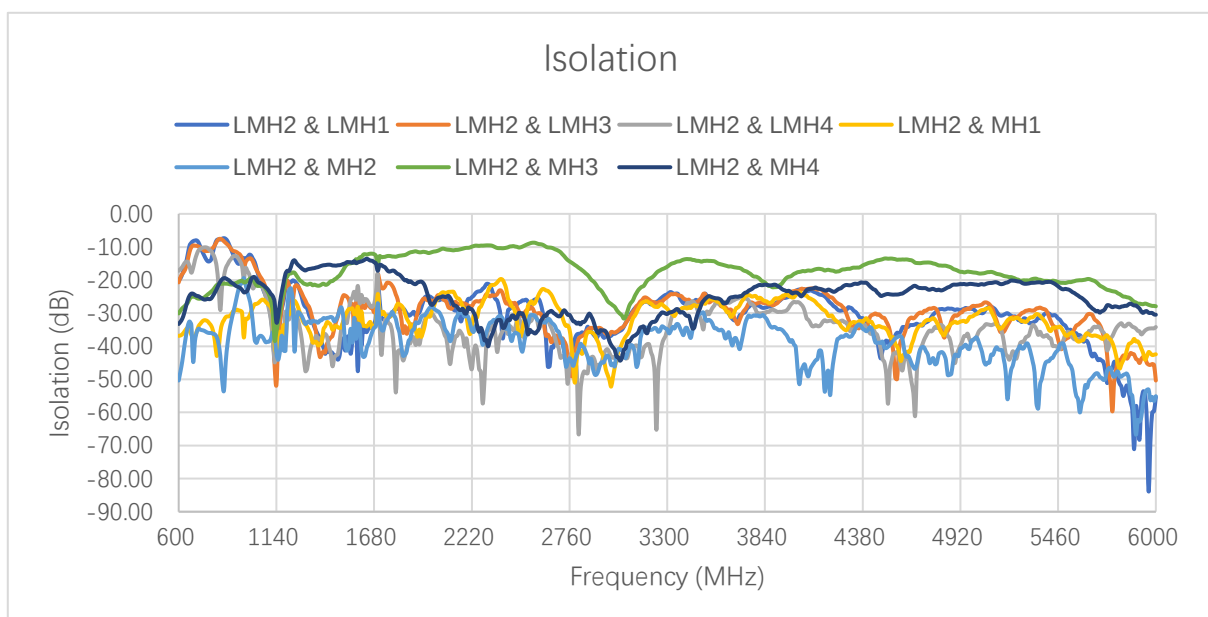
3.1.3. Isolation

3.1.3.1. Test Status: In Free Space

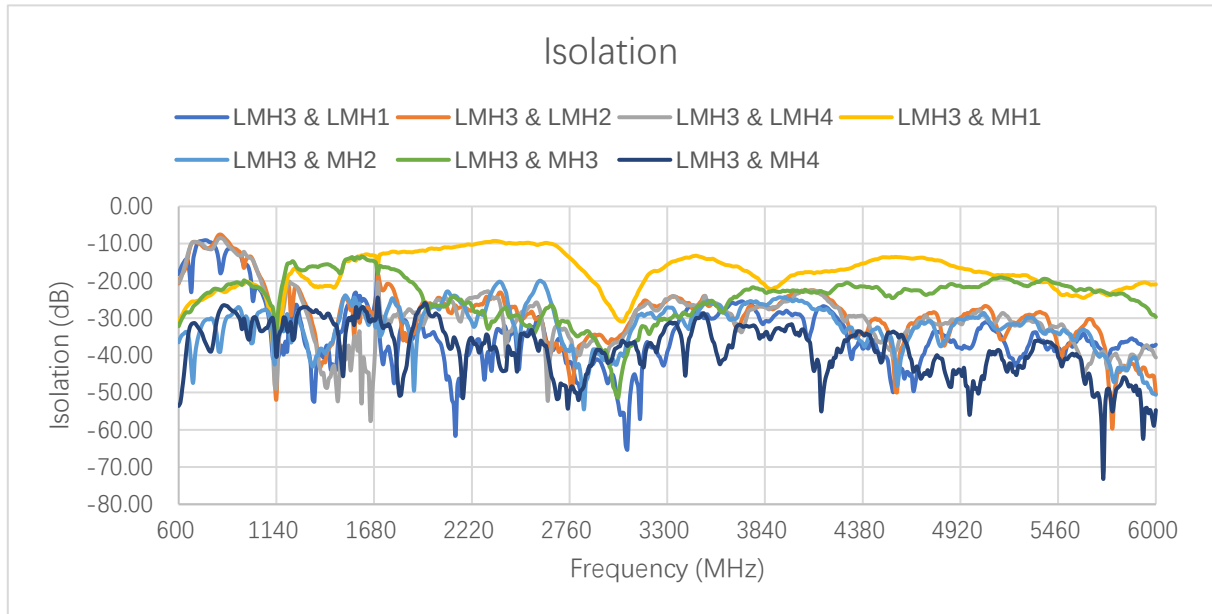
3.1.3.1.1. LMH1



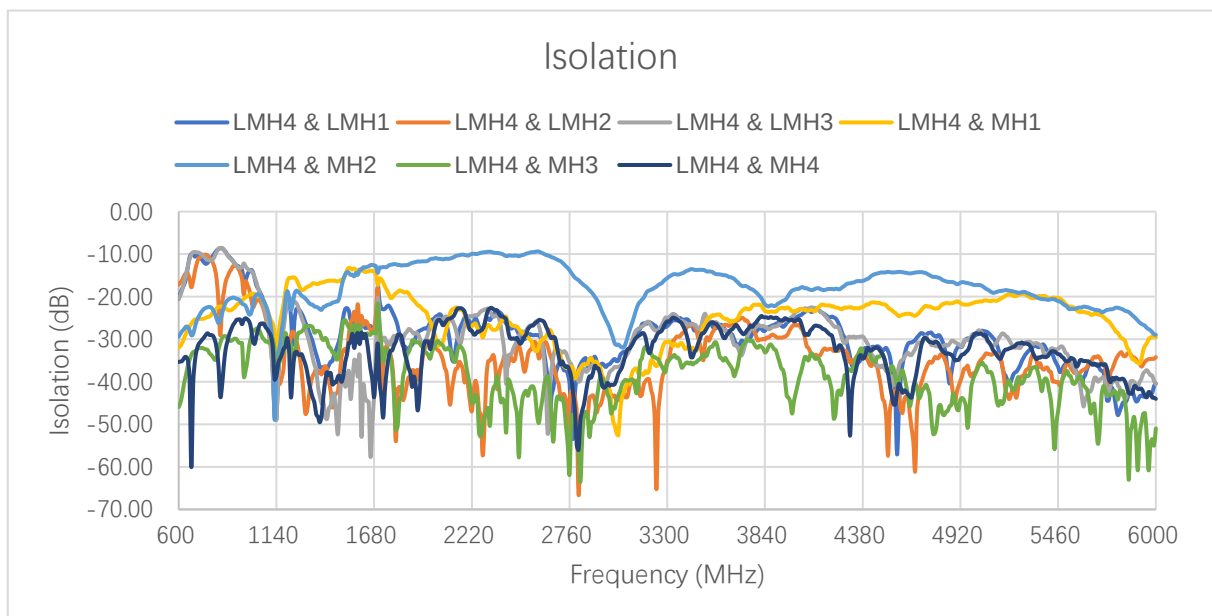
3.1.3.1.2. LMH2



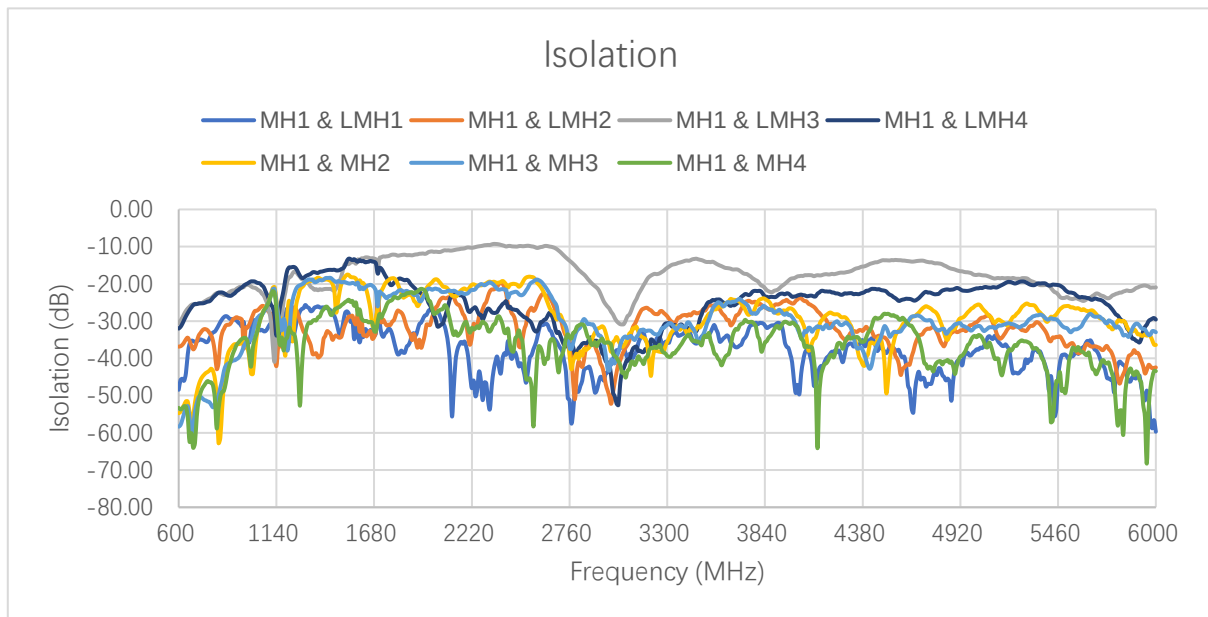
3.1.3.1.3. LMH3



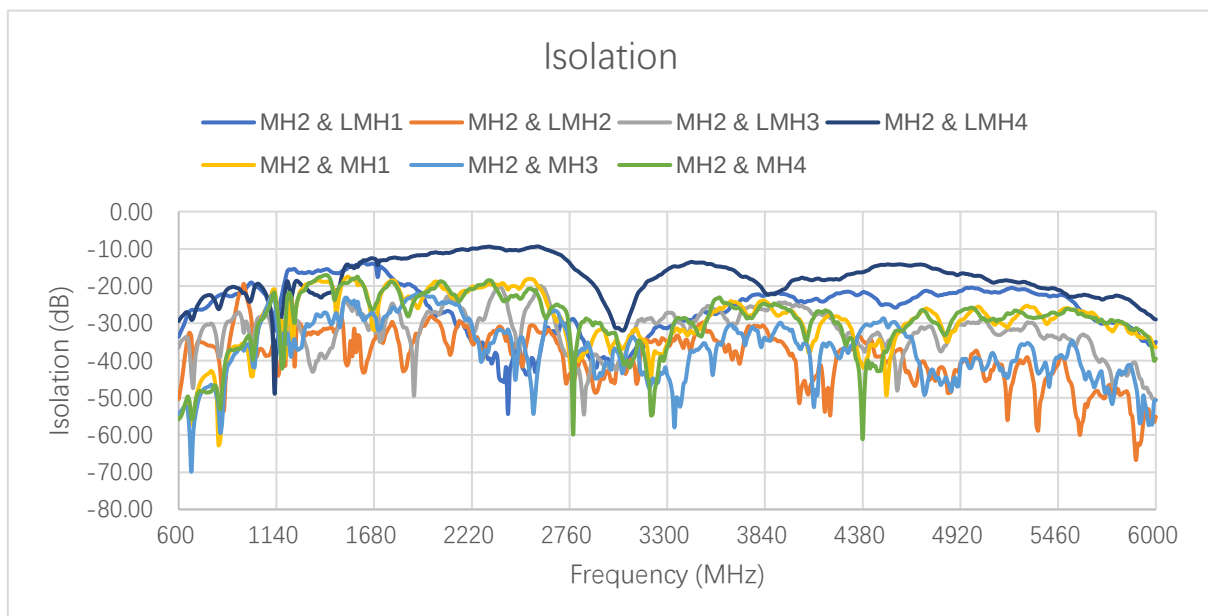
3.1.3.1.4. LMH4



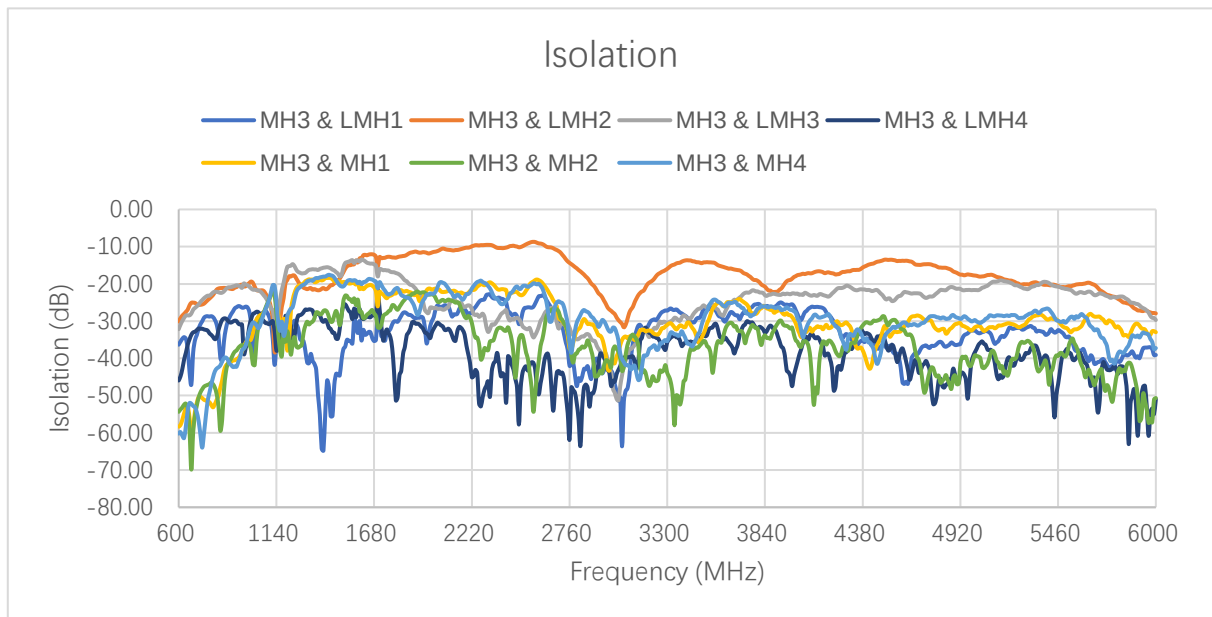
3.1.3.1.5. MH1



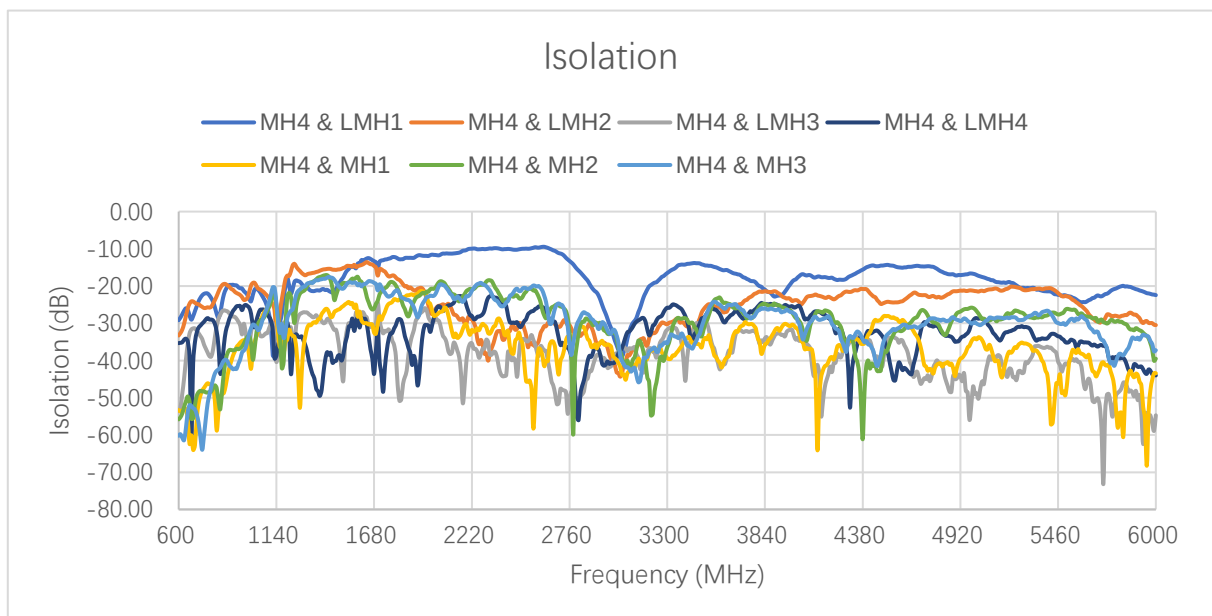
3.1.3.1.6. MH2



3.1.3.1.7. MH3

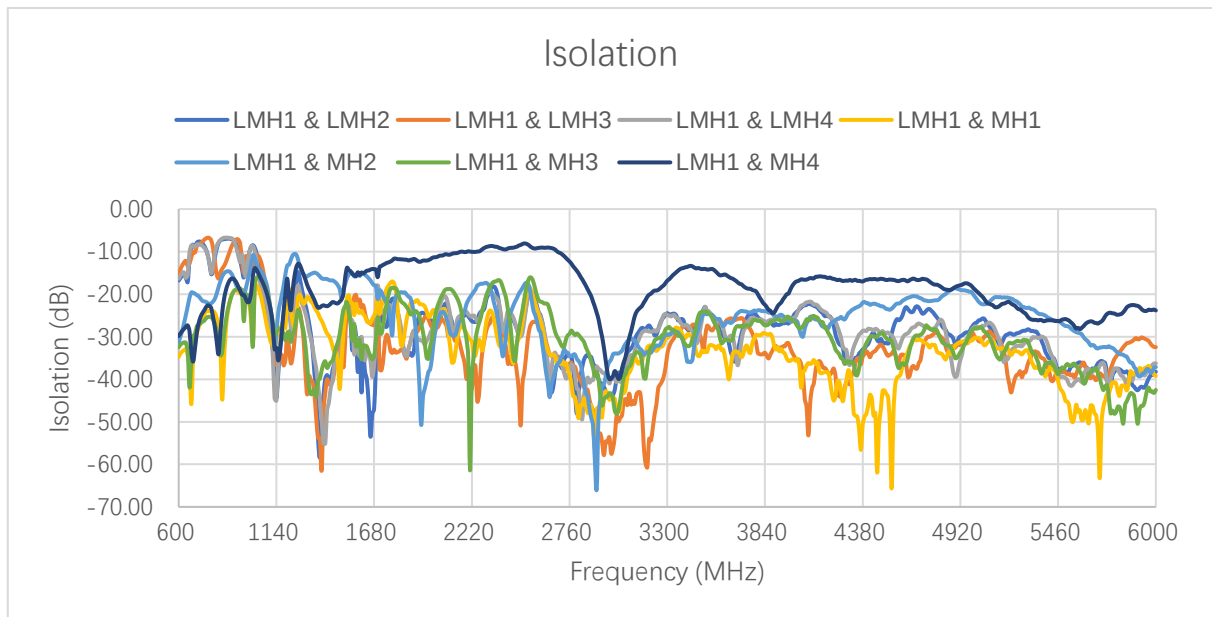


3.1.3.1.8. MH4

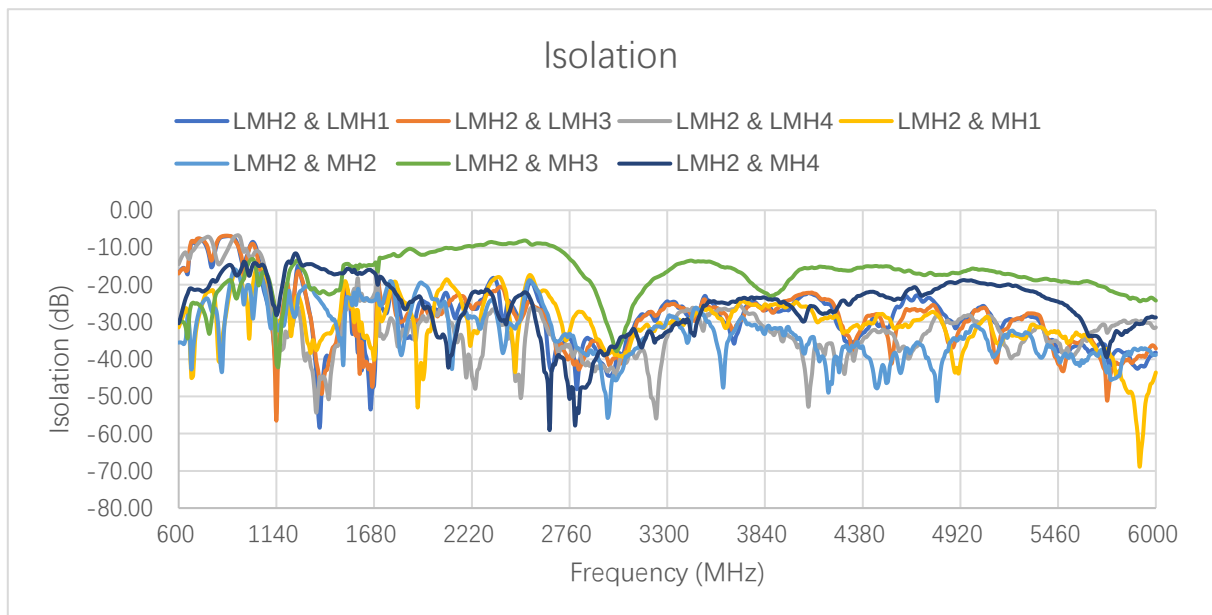


3.1.3.2. Test Status: On 500 mm × 500 mm Metal Plane

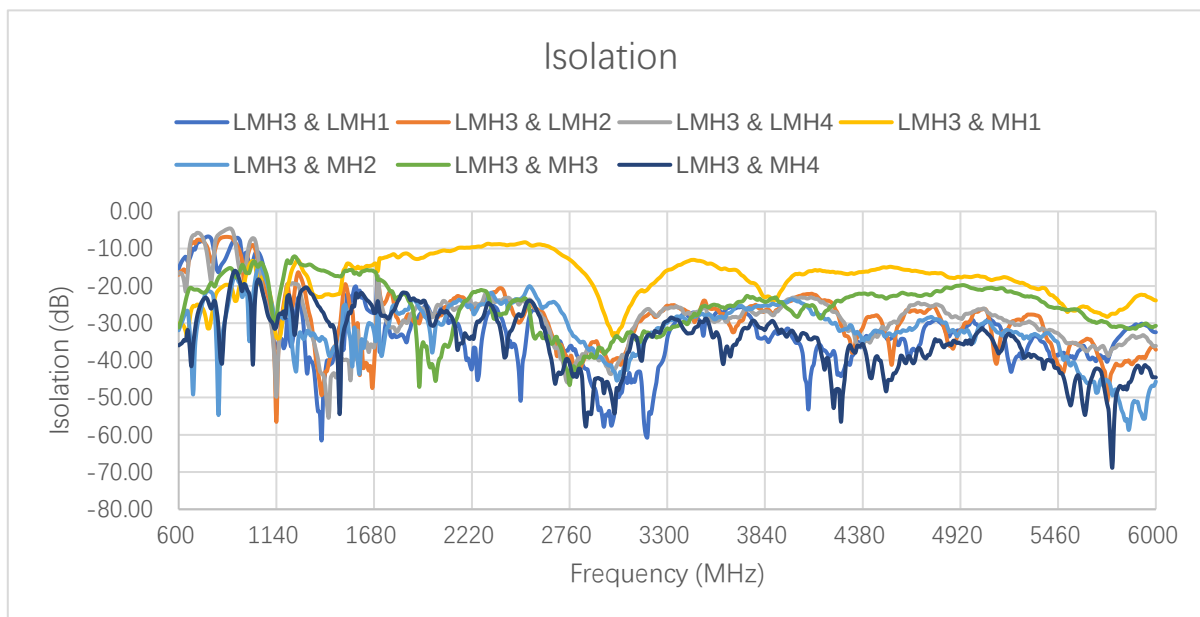
3.1.3.2.1. LMH1



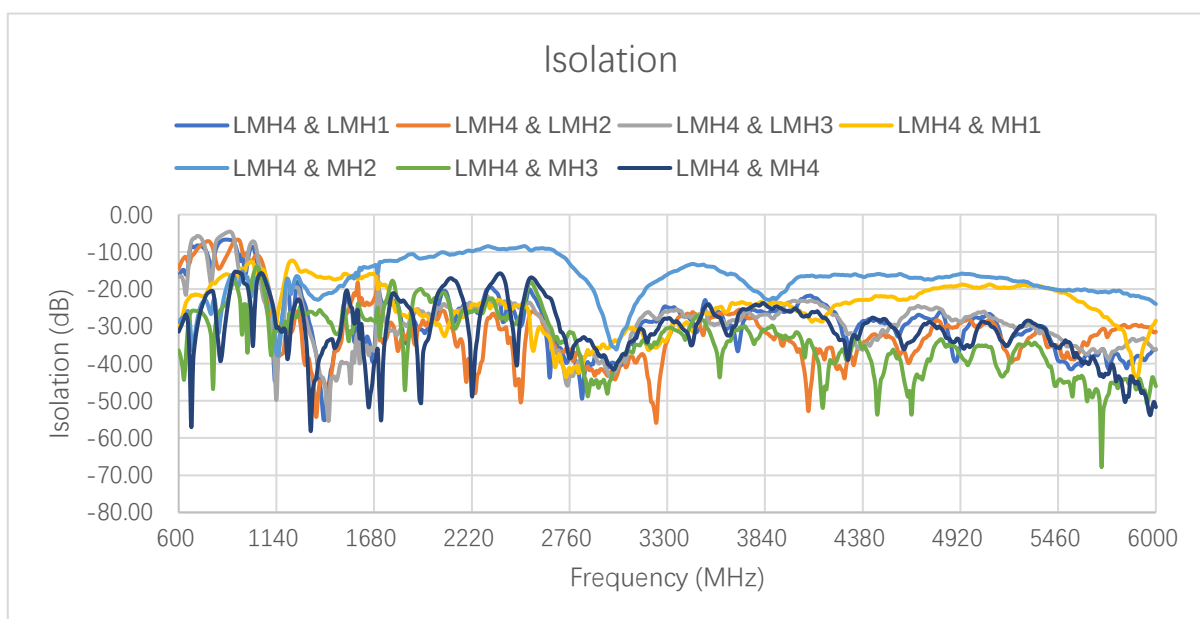
3.1.3.2.2. LMH2



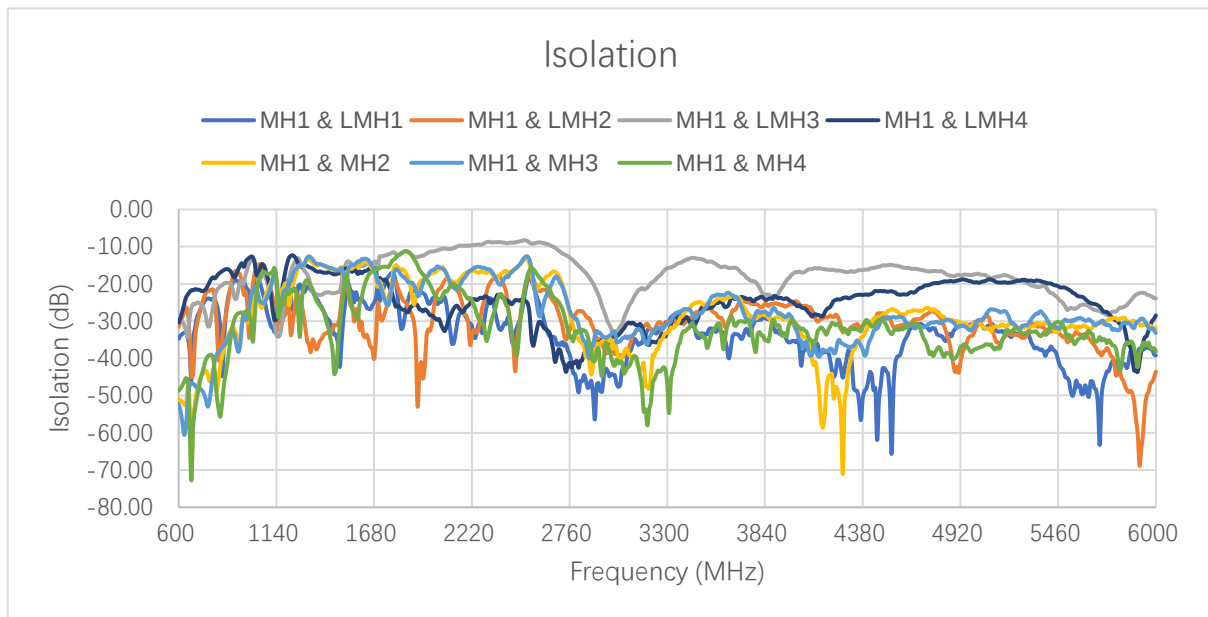
3.1.3.2.3. LMH3



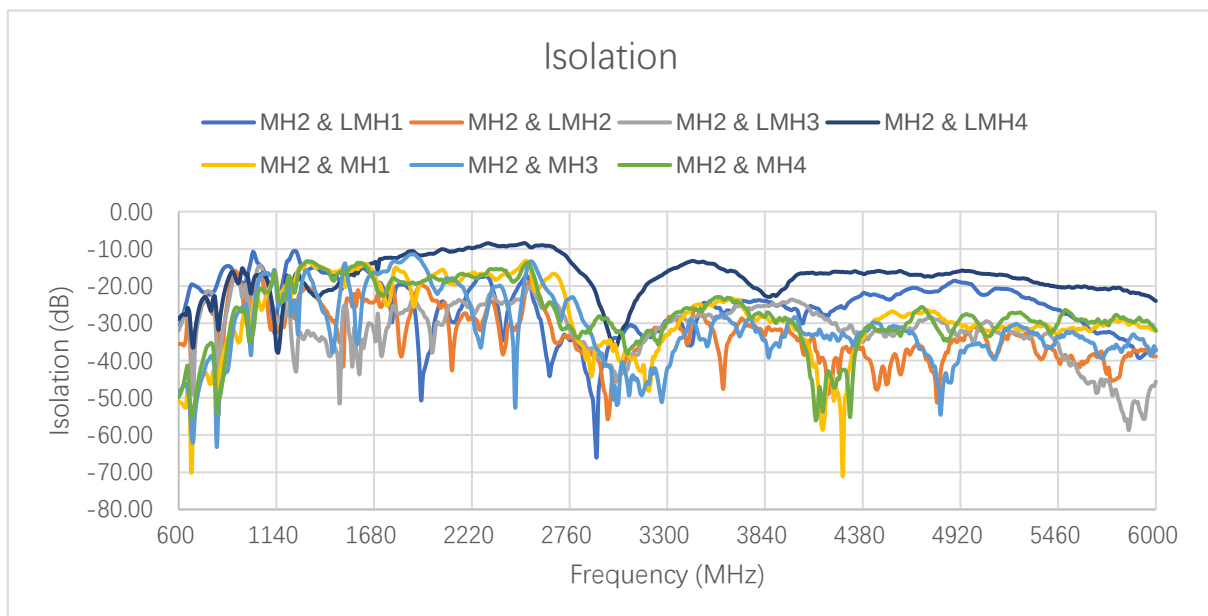
3.1.3.2.4. LMH4



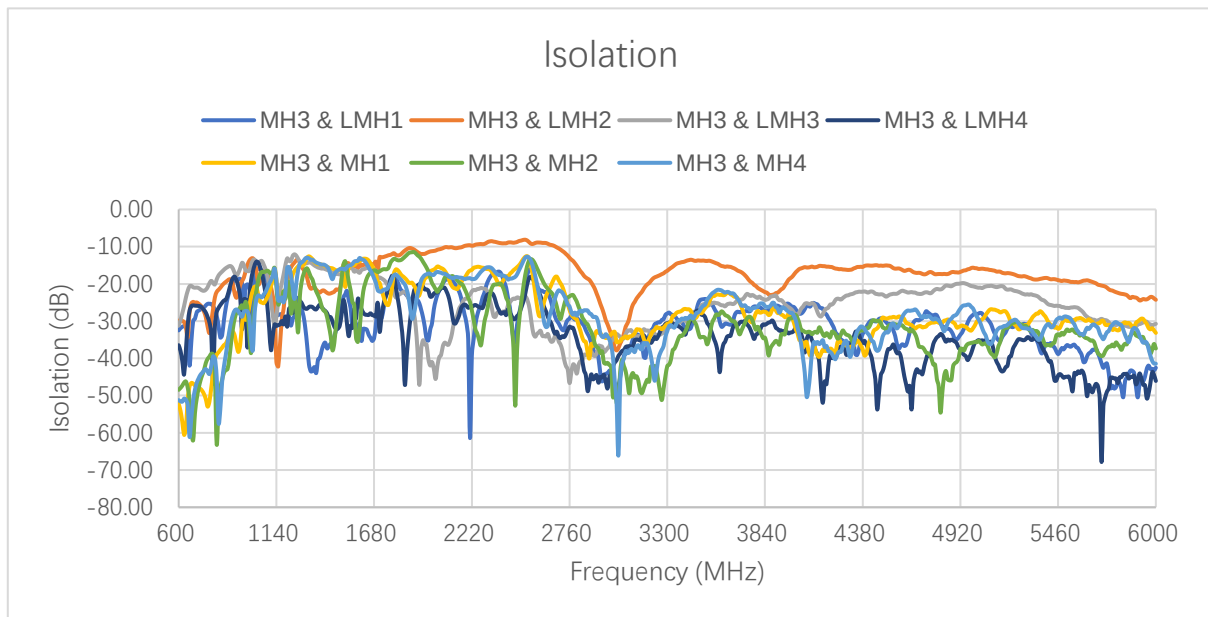
3.1.3.2.5. MH1



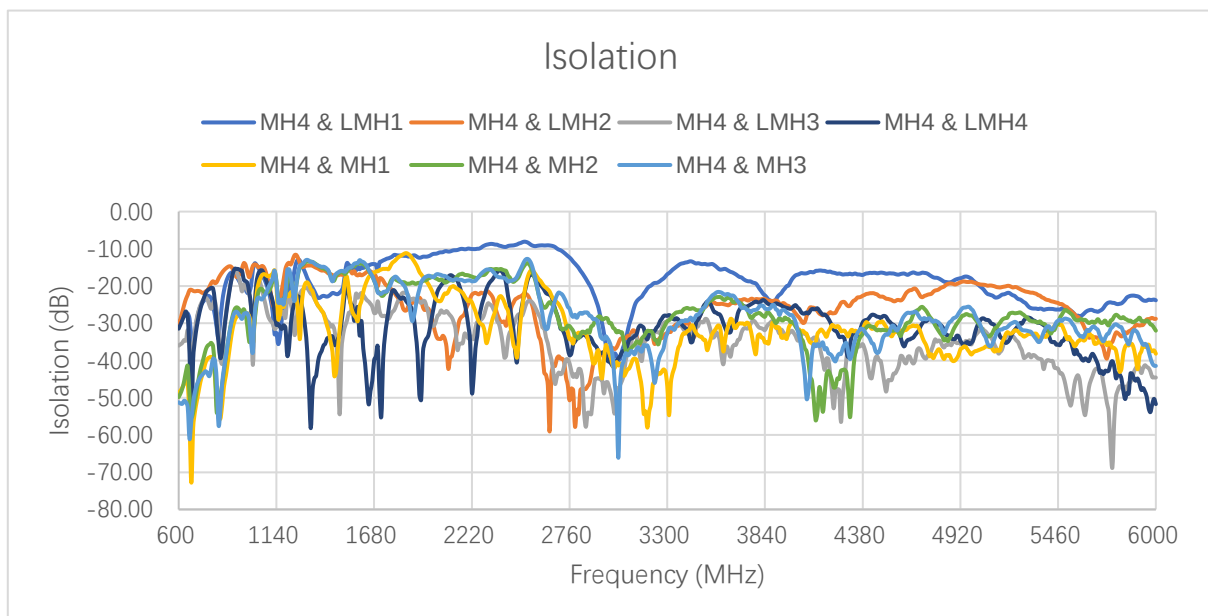
3.1.3.2.6. MH2



3.1.3.2.7. MH3



3.1.3.2.8. MH4

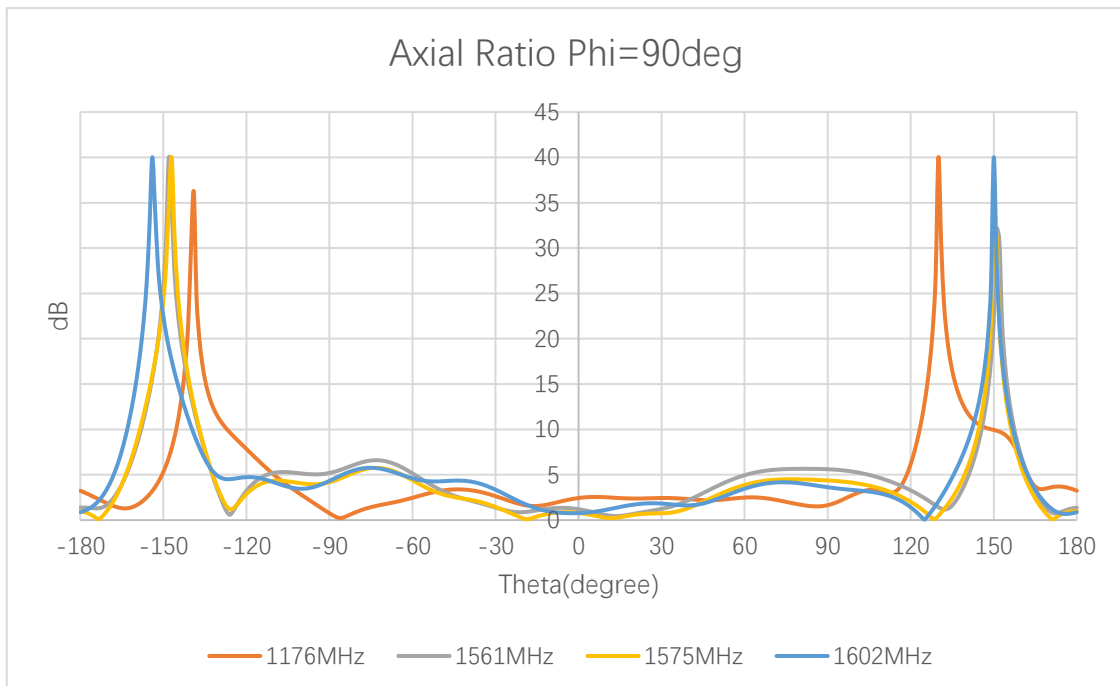
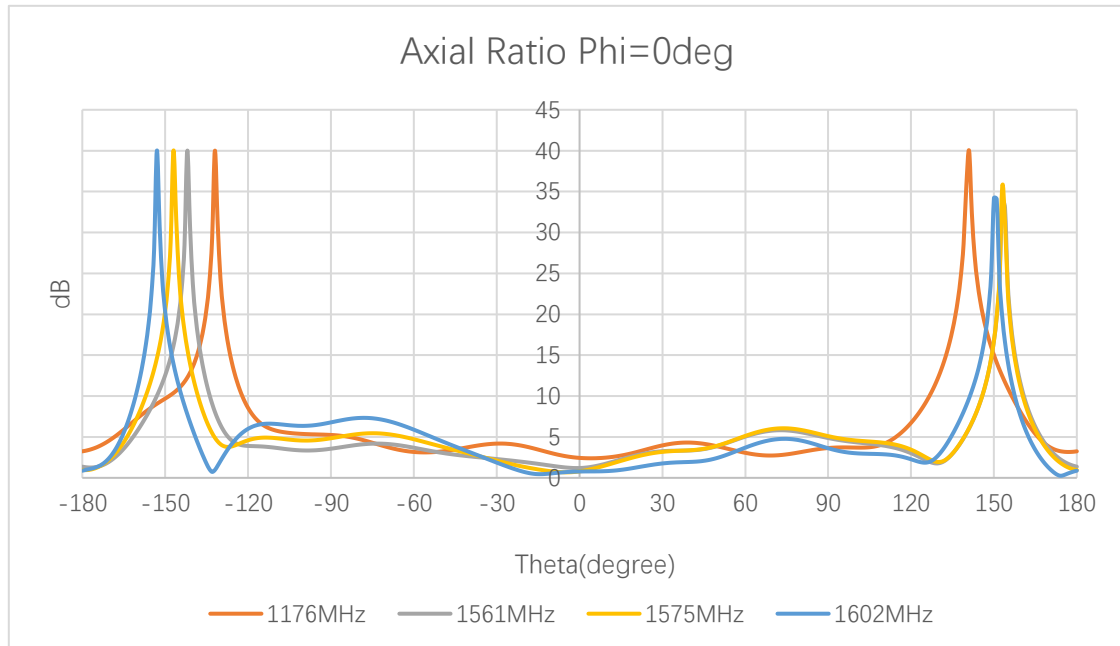


Max Isolation (dB)

	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 –152 0	1700 –217 0	2300 –240 0	2400 –250 0	2500 –269 0	3300 –420 0	4400 –500 0	5150 –585 0
LMH 1	FS	-7.9	-6.7	-6.7	-16.1	-10.0	-8.7	-8.2	-8.1	-13.3	-16.3	-20.7
	MP	-8.0	-8.0	-7.4	-15.4	-10.5	-9.8	-10.0	-9.5	-13.8	-14.3	-18.9
LMH 2	FS	-7.7	-7.1	-6.7	-14.5	-10.0	-8.5	-8.2	-8.1	-13.5	-15.0	-17.0
	MP	-8.0	-8.0	-7.4	-15.0	-10.5	-9.5	-9.7	-8.7	-13.7	-13.5	-18.5
LMH 3	FS	-5.8	-5.8	-4.6	-15.2	-9.7	-8.7	-8.4	-8.3	-13.0	-14.9	-17.6
	MP	-9.5	-9.1	-7.5	-14.4	-10.5	-9.3	-9.8	-9.8	-13.2	-13.6	-18.4
LMH 4	FS	-5.8	-5.8	-4.6	-15.9	-10.1	-8.5	-8.6	-8.5	-13.3	-15.8	-17.0
	MP	-9.5	-9.6	-8.5	-14.8	-10.1	-9.4	-10.2	-9.4	-13.5	-14.2	-18.5
MH1	FS	-21.4	-18.3	-14.5	-15.2	-9.7	-8.7	-8.4	-8.3	-13.0	-14.9	-17.6
	MP	-25.4	-22.8	-20.5	-14.6	-10.5	-9.3	-9.8	-9.8	-13.2	-13.6	-18.4
MH2	FS	-19.6	-20.2	-14.6	-13.9	-10.1	-8.5	-8.6	-8.5	-13.3	-15.8	-17.0
	MP	-25.6	-22.4	-19.4	-14.8	-10.1	-9.4	-10.2	-9.4	-13.5	-14.2	-18.5
MH3	FS	-20.6	-19.2	-14.3	-13.9	-10.0	-8.5	-8.2	-8.1	-13.5	-15.0	-17.0
	MP	-25.0	-22.1	-19.9	-14.4	-10.5	-9.5	-9.7	-8.7	-13.7	-13.5	-18.5
MH4	FS	-21.0	-18.7	-13.8	-15.4	-10.0	-8.7	-8.2	-8.1	-13.3	-16.3	-19.9
	MP	-24.1	-21.9	-19.4	-15.0	-10.5	-9.8	-10.0	-9.5	-13.8	-14.3	-18.9

- FS: In Free Space
- MP: On 500 mm × 500 mm Metal Plane

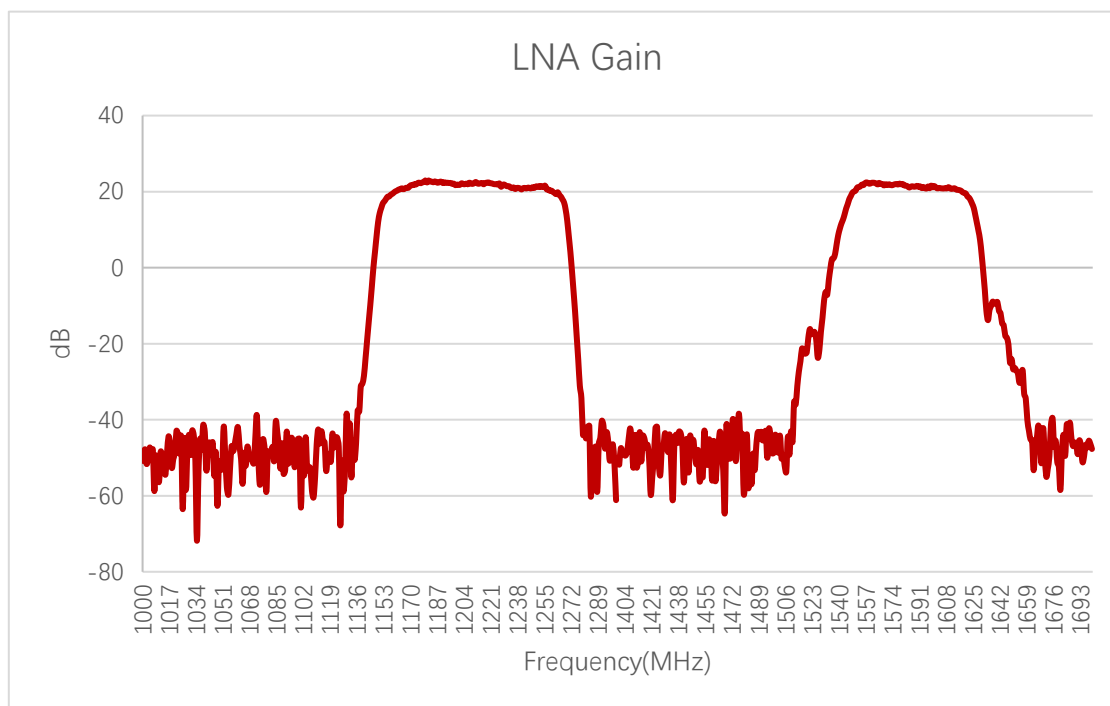
3.1.4. GNSS Axial Ratio



Axial Ratio (dB)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	2.44	-	-	-	-	1.2	0.79	0.77
	Phi = 90 (deg) Theta = 0 (deg)	2.44	-	-	-	-	1.2	0.79	0.77

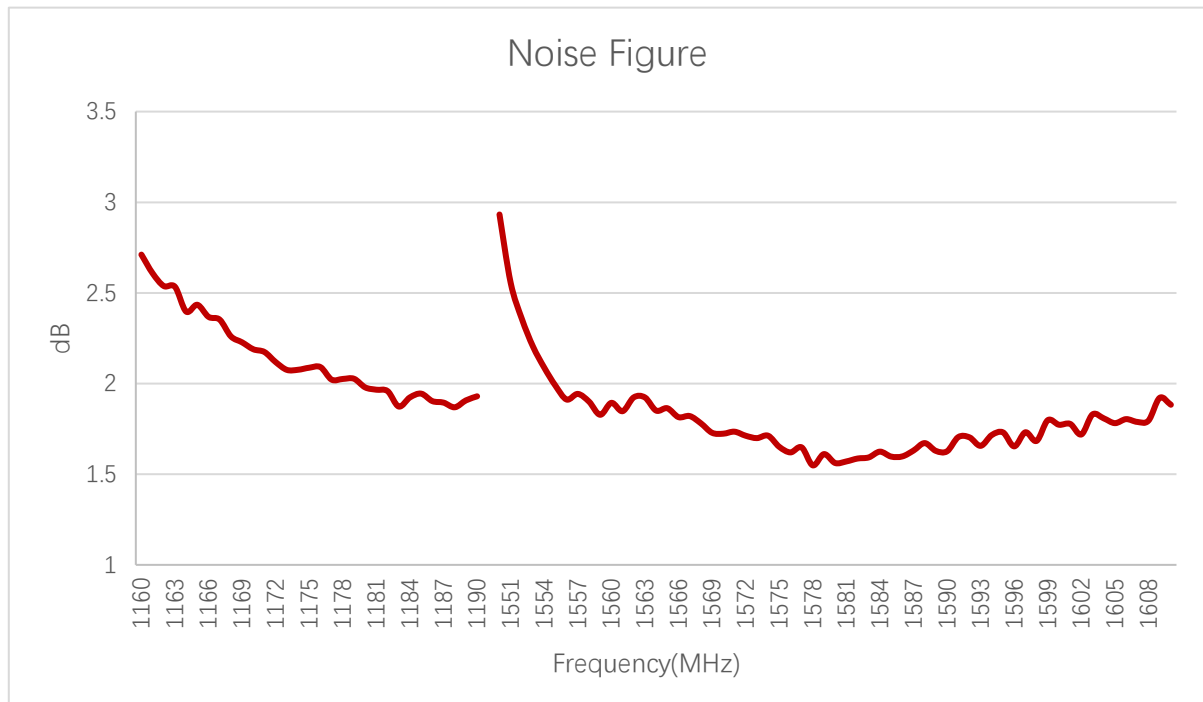
3.1.5. GNSS LNA Gain



LNA Gain (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
LNA Gain (dB)	22.2	-	-	-	-	22.3	21.9	20.8

3.1.6. GNSS Noise Figure

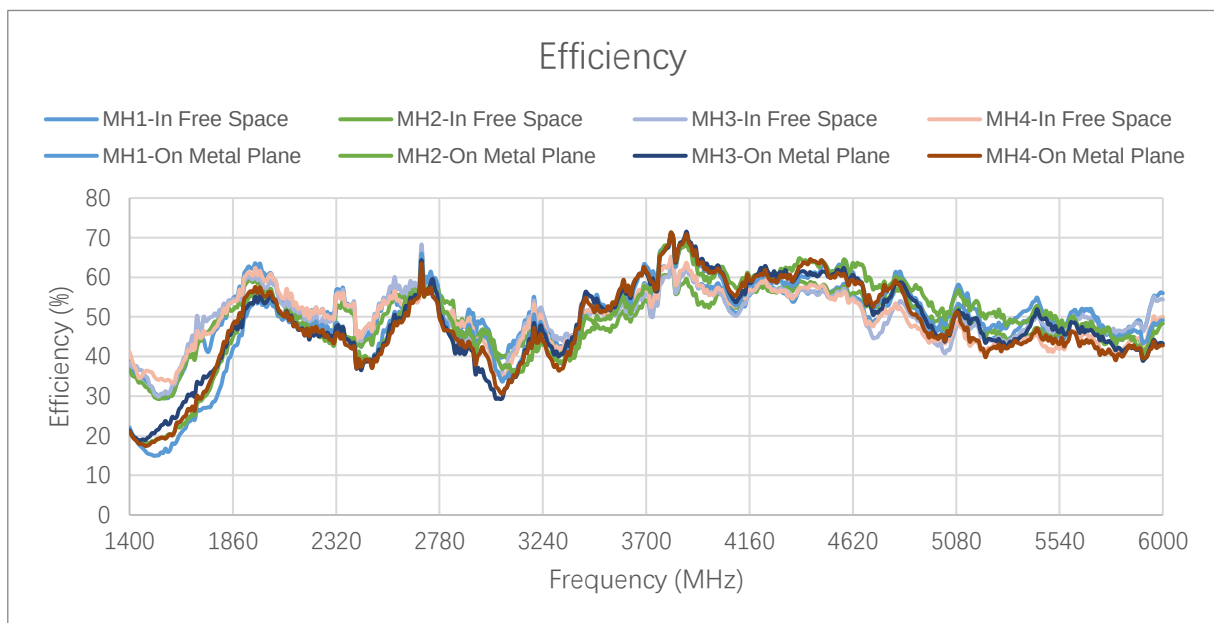
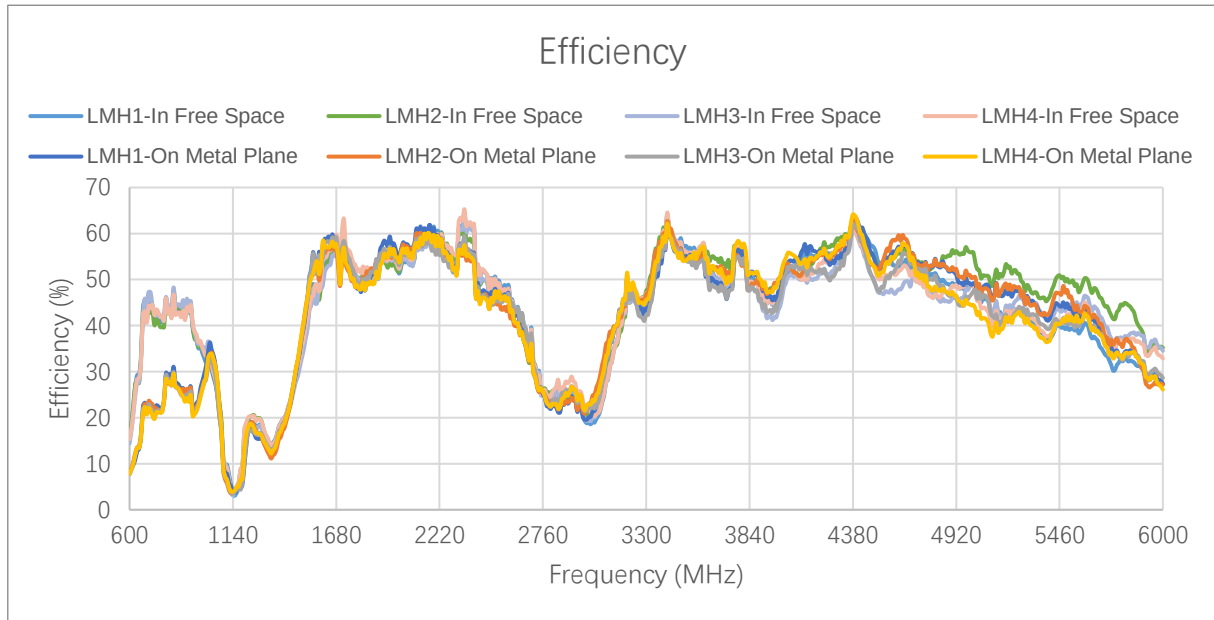


Noise Figure (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Noise Figure (dB)	2.09	-	-	-	-	1.84	1.65	1.71

3.2. Radiation Performance Test

3.2.1. Efficiency



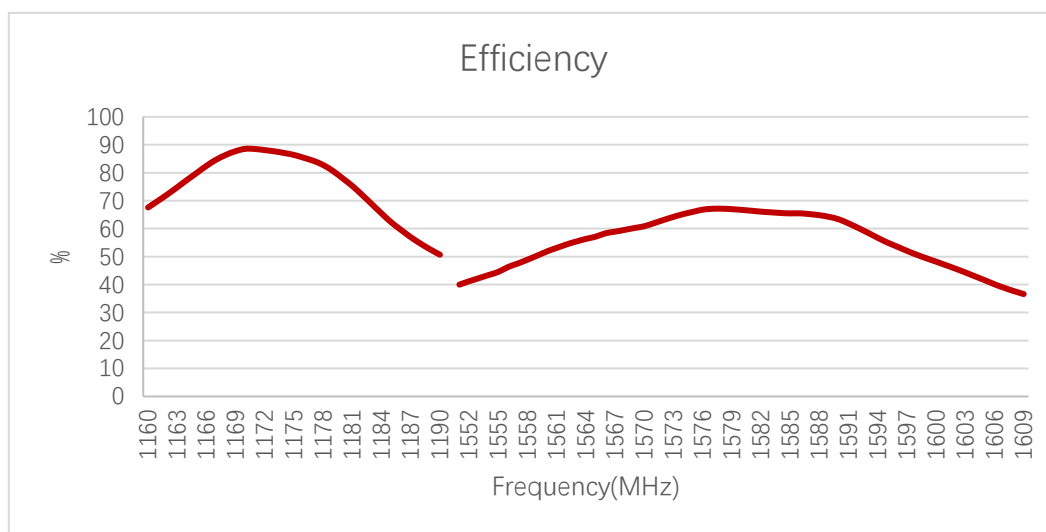
Efficiency (%)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	15.7	26.9	45.2	47.3	44.0	35.1	25.6	57.7	54.7	51.7
	MP	8.2	10.9	22.3	31.1	26.1	23.7	25.2	55.5	53.5	51.2
LMH2	FS	16.2	27.4	42.7	47.9	44.7	35.4	25.3	55.9	54.3	50.6
	MP	7.8	12.3	23.2	29.6	26.3	23.3	25.3	53.8	52.1	51.8
LMH3	FS	14.4	24.7	47.2	48.3	45.9	35.9	24.4	56.3	55.2	50.1
	MP	7.8	12.0	22.2	29.9	25.1	23.1	25.9	56.9	55.0	51.7
LMH4	FS	15.4	25.8	43.8	46.7	44.0	36.4	25.7	60.4	56.5	51.1
	MP	7.8	12.0	21.6	29.6	24.3	22.6	25.7	54.6	52.9	49.2
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	54.3	60.5	64.3	51.9	45.7	57.4	52.9	48.9	39.7	27.3
	MP	57.2	61.2	59.1	47.7	44.5	55.0	54.8	48.9	44.8	27.4
LMH2	FS	52.6	59.3	62.3	49.9	43.2	57.9	54.1	55.9	50.2	35.2
	MP	54.9	60.0	57.6	46.6	42.0	55.9	55.1	50.3	47.8	27.1
LMH3	FS	54.3	58.3	63.9	50.0	44.6	56.9	50.1	48.8	44.1	34.5
	MP	55.6	59.4	59.5	46.6	45.0	54.4	53.8	46.9	41.4	28.6
LMH4	FS	54.2	59.9	65.3	52.1	45.2	57.9	50.9	49.1	42.5	32.9
	MP	54.9	60.0	57.5	46.1	43.3	57.2	53.6	44.4	42.1	26.1

Efficiency (%)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	34.3	45.5	41.9	55.2
	MP	-	-	-	-	-	-	17.3	26.3	27.0	43.0
MH2	FS	-	-	-	-	-	-	33.4	43.9	45.8	52.4
	MP	-	-	-	-	-	-	18.9	28.8	30.2	46.2
MH3	FS	-	-	-	-	-	-	36.6	47.2	48.9	54.1

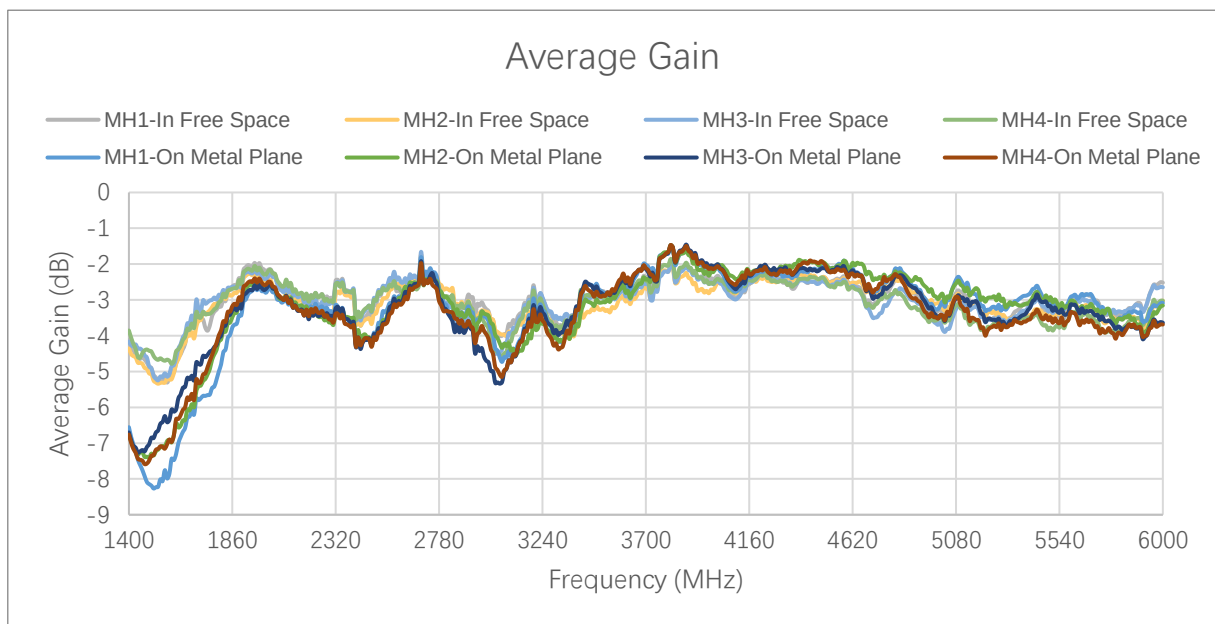
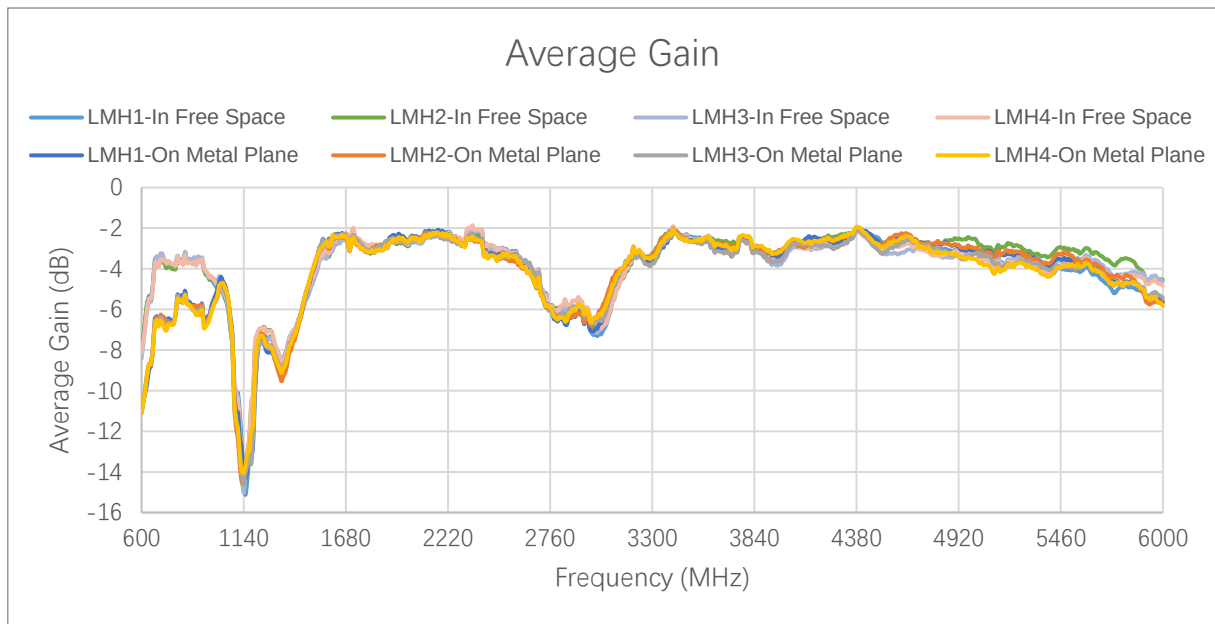
	MP	-	-	-	-	-	-	18.9	33.2	34.7	46.9
MH4	FS	-	-	-	-	-	-	34.6	44.9	45.7	54.3
	MP	-	-	-	-	-	-	17.9	29.3	31.2	48.6
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	62.2	52.5	57.4	44.6	53.8	54.3	49.0	46.7	45.2	56.0
	MP	53.2	48.7	47.6	38.7	51.3	55.9	53.6	47.2	49.5	49.1
MH2	FS	58.8	50.9	54.1	44.0	55.6	51.5	52.3	49.2	45.4	49.9
	MP	55.2	49.4	47.0	40.2	50.7	55.2	59.4	50.4	51.0	48.3
MH3	FS	59.5	52.4	56.9	46.7	57.9	53.6	46.0	42.7	46.8	54.4
	MP	53.4	48.4	47.4	38.8	49.8	57.9	52.6	44.5	48.1	43.3
MH4	FS	60.5	53.7	56.1	47.3	54.3	55.2	48.2	44.3	41.9	49.9
	MP	56.2	48.3	45.6	39.2	48.9	59.4	53.9	44.5	44.9	42.8



Efficiency (%) - GNSS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	85	-	-	-	-	53	66	45.7

3.2.2. Average Gain



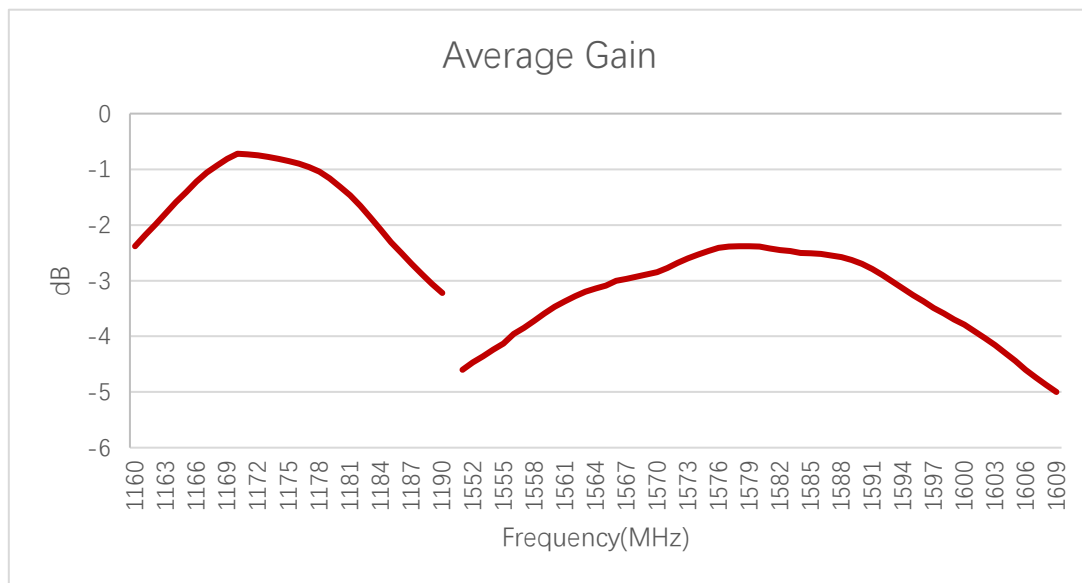
Average Gain (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	-8.0	-5.7	-3.4	-3.3	-3.6	-4.5	-5.9	-2.4	-2.6	-2.9
	MP	-10.9	-9.6	-6.5	-5.1	-5.8	-6.3	-6.0	-2.6	-2.7	-2.9
LMH2	FS	-7.9	-5.6	-3.7	-3.2	-3.5	-4.5	-6.0	-2.5	-2.7	-3.0
	MP	-11.1	-9.1	-6.3	-5.3	-5.8	-6.3	-6.0	-2.7	-2.8	-2.9
LMH3	FS	-8.4	-6.1	-3.3	-3.2	-3.4	-4.4	-6.1	-2.5	-2.6	-3.0
	MP	-11.1	-9.2	-6.5	-5.2	-6.0	-6.4	-5.9	-2.4	-2.6	-2.9
LMH4	FS	-8.1	-5.9	-3.6	-3.3	-3.6	-4.4	-5.9	-2.2	-2.5	-2.9
	MP	-11.1	-9.2	-6.7	-5.3	-6.1	-6.5	-5.9	-2.6	-2.8	-3.1
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	-2.7	-2.2	-1.9	-2.8	-3.4	-2.4	-2.8	-3.1	-4.0	-5.6
	MP	-2.4	-2.1	-2.3	-3.2	-3.5	-2.6	-2.6	-3.1	-3.5	-5.6
LMH2	FS	-2.8	-2.3	-2.1	-3.0	-3.6	-2.4	-2.7	-2.5	-3.0	-4.5
	MP	-2.6	-2.2	-2.4	-3.3	-3.8	-2.5	-2.6	-3.0	-3.2	-5.7
LMH3	FS	-2.7	-2.3	-1.9	-3.0	-3.5	-2.4	-3.0	-3.1	-3.6	-4.6
	MP	-2.5	-2.3	-2.3	-3.3	-3.5	-2.6	-2.7	-3.3	-3.8	-5.4
LMH4	FS	-2.7	-2.2	-1.9	-2.8	-3.4	-2.4	-2.9	-3.1	-3.7	-4.8
	MP	-2.6	-2.2	-2.4	-3.4	-3.6	-2.4	-2.7	-3.5	-3.8	-5.8

Average Gain (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	-4.6	-3.4	-3.8	-2.6
	MP	-	-	-	-	-	-	-7.6	-5.8	-5.7	-3.7
MH2	FS	-	-	-	-	-	-	-4.8	-3.6	-3.4	-2.8
	MP	-	-	-	-	-	-	-7.2	-5.4	-5.2	-3.4
MH3	FS	-	-	-	-	-	-	-4.4	-3.3	-3.1	-2.7

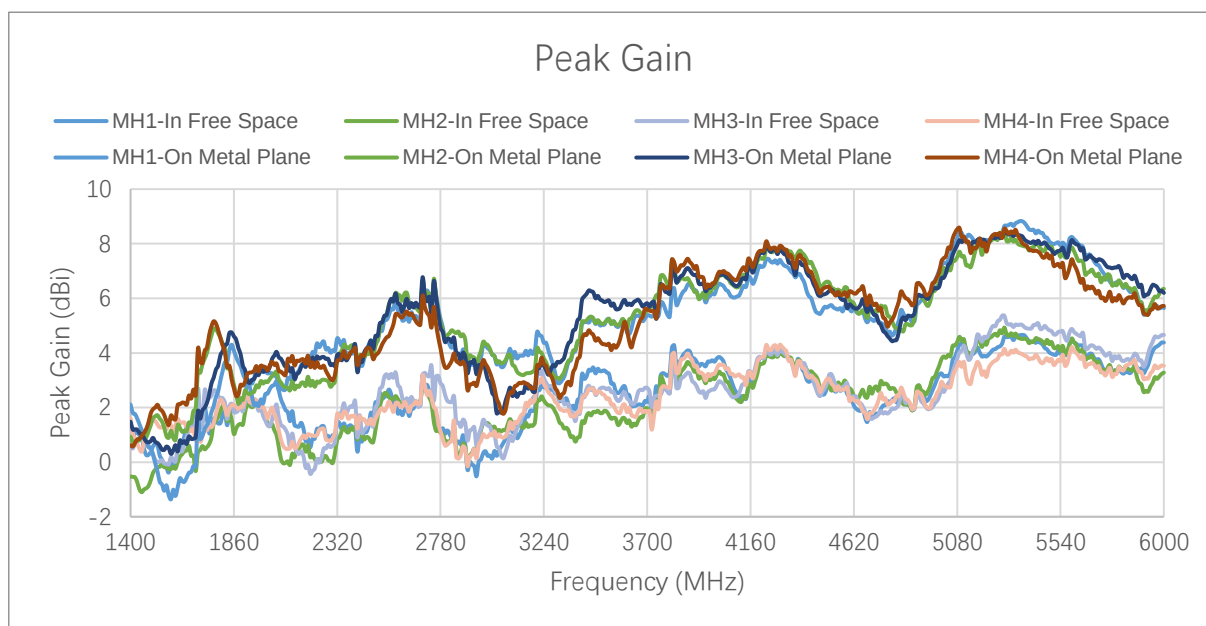
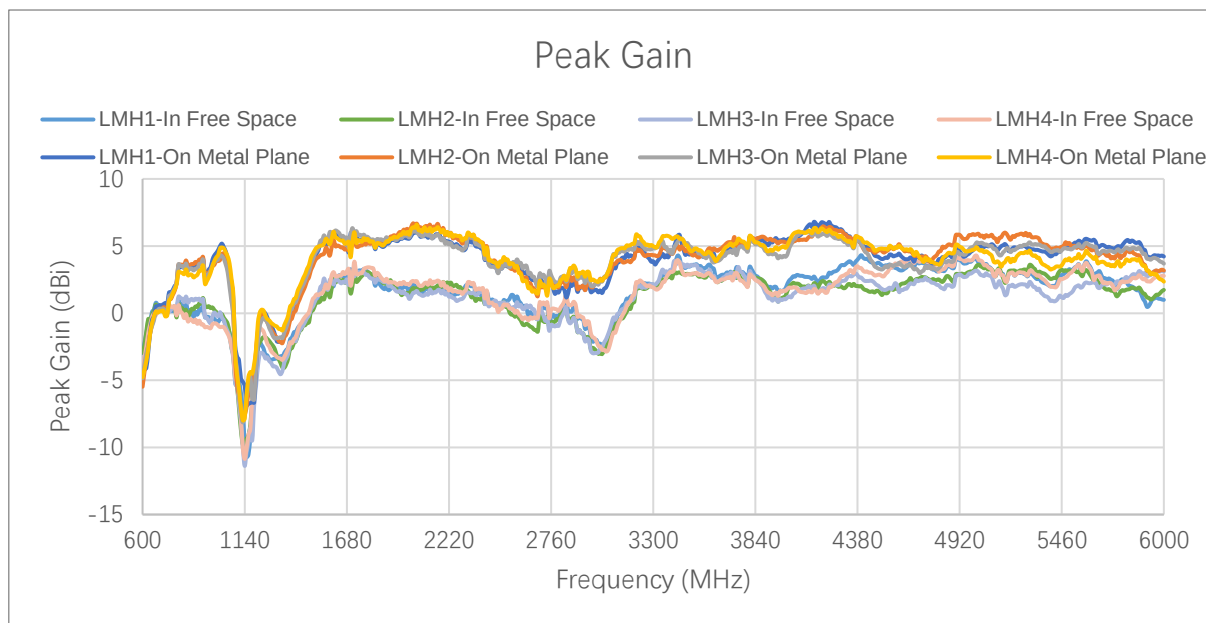
	MP	-	-	-	-	-	-	-7.2	-4.8	-4.6	-3.3
MH4	FS	-	-	-	-	-	-	-4.6	-3.5	-3.4	-2.7
	MP	-	-	-	-	-	-	-7.5	-5.3	-5.1	-3.1
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	-2.1	-2.8	-2.4	-3.5	-2.7	-2.7	-3.1	-3.3	-3.4	-2.5
	MP	-2.7	-3.1	-3.2	-4.1	-2.9	-2.5	-2.7	-3.3	-3.1	-3.1
MH2	FS	-2.3	-2.9	-2.7	-3.6	-2.5	-2.9	-2.8	-3.1	-3.4	-3.0
	MP	-2.6	-3.1	-3.3	-4.0	-2.9	-2.6	-2.3	-3.0	-2.9	-3.2
MH3	FS	-2.3	-2.8	-2.4	-3.3	-2.4	-2.7	-3.4	-3.7	-3.3	-2.6
	MP	-2.7	-3.2	-3.2	-4.1	-3.0	-2.4	-2.8	-3.5	-3.2	-3.6
MH4	FS	-2.2	-2.7	-2.5	-3.3	-2.7	-2.6	-3.2	-3.5	-3.8	-3.0
	MP	-2.5	-3.2	-3.4	-4.1	-3.1	-2.3	-2.7	-3.5	-3.5	-3.7



Average Gain(dB) - GNSS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Average Gain (dB)	-0.9	-	-	-	-	-3.37	-2.47	-4.03

3.2.3. Peak Gain



Peak Gain (dBi)

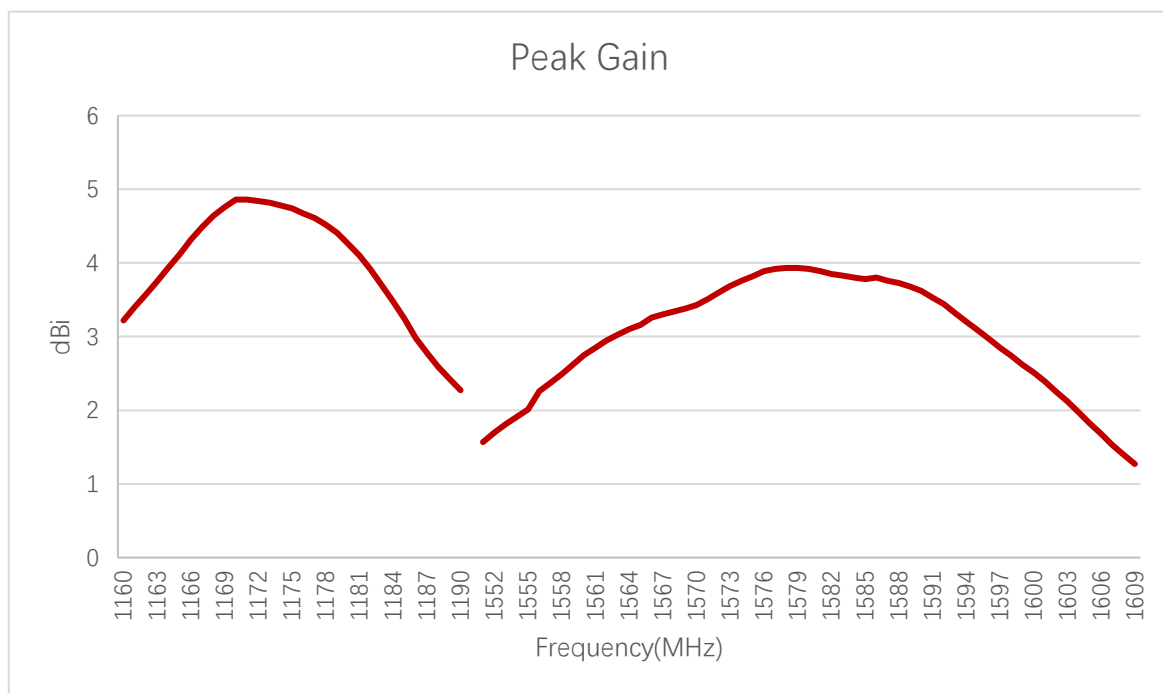
Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
LMH1	FS	-3.0	-0.8	0.1	0.7	0.3	-0.5	-0.7	2.9	3.2	1.8
	MP	-4.8	-2.9	0.7	3.8	3.7	3.4	1.9	5.7	5.5	5.0
LMH2	FS	-2.9	-0.4	0.2	0.3	0.7	0.4	-0.9	2.0	2.4	2.2

	MP	-5.5	-2.4	0.4	3.9	4.0	3.2	1.7	5.1	4.9	5.3
LMH3	FS	-4.2	-1.9	0.6	1.2	1.1	-0.7	-0.9	3.1	3.0	2.3
	MP	-4.9	-2.5	0.4	3.7	3.7	3.2	2.1	6.3	5.8	5.4
LMH4	FS	-4.3	-1.5	0.3	-0.1	-0.6	-1.1	-0.5	2.7	2.9	2.4
	MP	-4.8	-2.7	0.2	3.3	3.2	3.0	2.6	5.3	5.4	5.2
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
LMH1	FS	1.9	1.9	2.2	1.0	0.7	3.6	3.7	4.0	3.3	1.0
	MP	5.4	5.7	5.4	3.6	3.4	4.7	4.2	4.9	5.0	4.2
LMH2	FS	1.6	1.9	1.4	0.8	-0.5	2.8	2.6	3.3	3.2	1.7
	MP	5.9	6.5	5.8	3.9	3.0	4.8	4.3	5.8	5.2	3.2
LMH3	FS	1.6	1.6	1.5	0.8	0.6	3.2	2.4	3.1	1.4	3.1
	MP	5.5	5.7	5.7	3.5	3.7	4.4	3.2	5.1	4.8	3.7
LMH4	FS	2.1	2.3	2.2	0.8	-0.3	2.9	3.9	4.2	2.9	2.8
	MP	5.7	6.3	5.9	3.9	2.9	4.5	4.4	4.8	4.1	2.4

Peak Gain (dBi)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
MH1	FS	-	-	-	-	-	-	0.9	1.9	1.6	2.0
	MP	-	-	-	-	-	-	1.2	0.9	1.4	3.7
MH2	FS	-	-	-	-	-	-	-1.1	0.4	0.6	1.4
	MP	-	-	-	-	-	-	1.0	3.3	4.0	2.1
MH3	FS	-	-	-	-	-	-	0.8	1.7	2.4	1.9
	MP	-	-	-	-	-	-	1.0	1.6	2.2	4.2
MH4	FS	-	-	-	-	-	-	0.4	0.8	1.2	2.0
	MP	-	-	-	-	-	-	1.0	3.7	4.2	2.5
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
MH1	FS	3.1	1.3	1.4	1.1	1.9	2.8	1.7	3.2	4.0	4.4

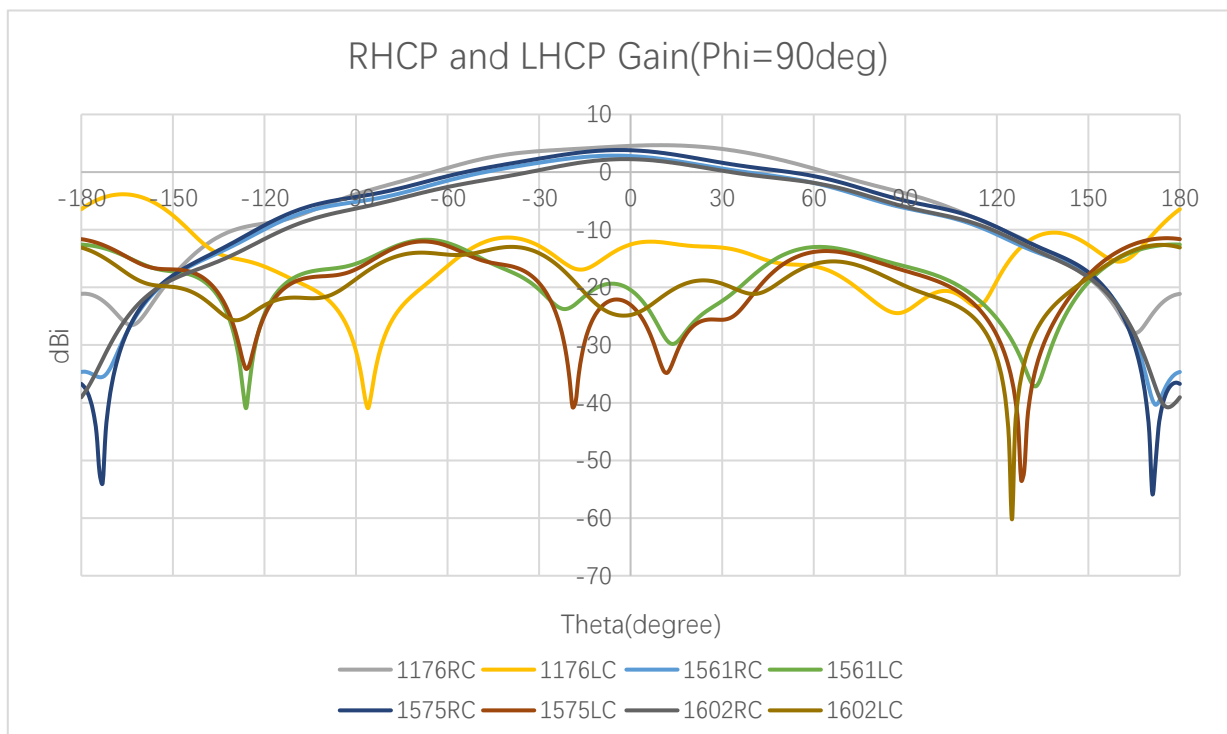
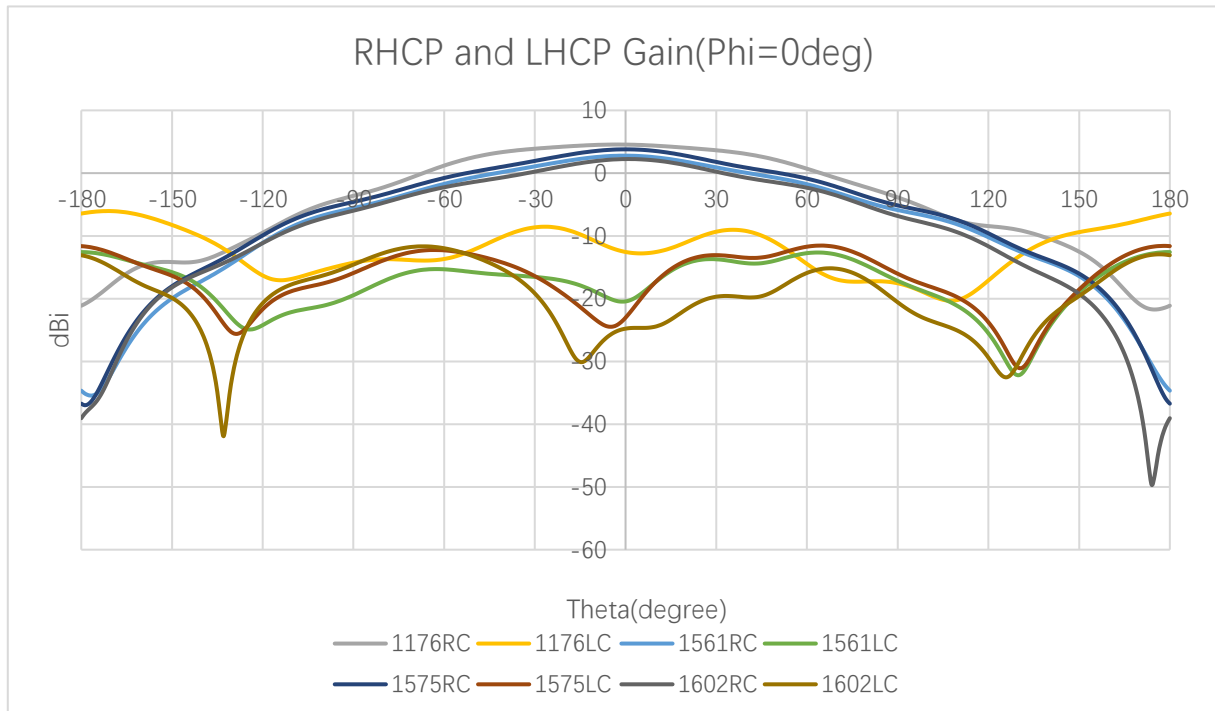
	MP	2.1	3.3	4.5	4.1	5.5	5.1	5.2	7.0	8.0	5.6
MH2	FS	2.1	0.5	1.3	0.9	2.2	1.6	2.5	3.5	4.4	3.3
	MP	2.6	2.8	4.3	4.0	6.1	5.2	5.5	6.6	7.9	6.4
MH3	FS	2.1	0.4	2.2	1.3	2.7	2.6	1.6	2.4	4.8	4.7
	MP	3.1	3.2	4.0	4.2	5.8	5.9	5.6	6.4	7.8	6.2
MH4	FS	2.3	0.6	1.9	1.4	2.0	2.1	1.8	2.7	3.8	3.5
	MP	3.4	3.7	4.1	4.1	5.3	5.1	5.9	7.0	7.6	5.7



Peak Gain (dBi) - GNSS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	4.67	-	-	-	-	2.85	3.82	2.25

3.2.4. GNSS 2D RHCP and LHCP Gain



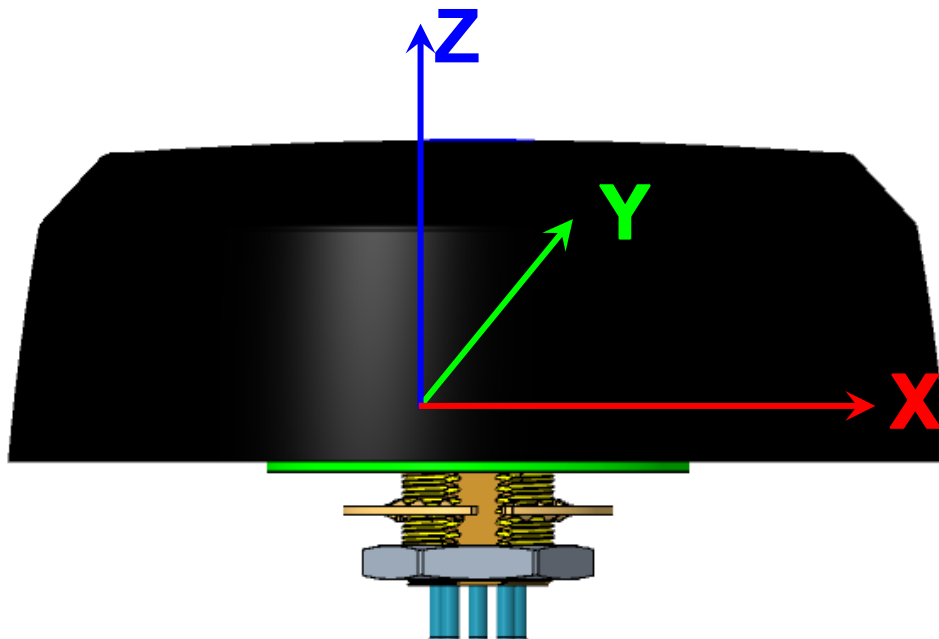
2D RHCP and LHCP Gain (dBi)

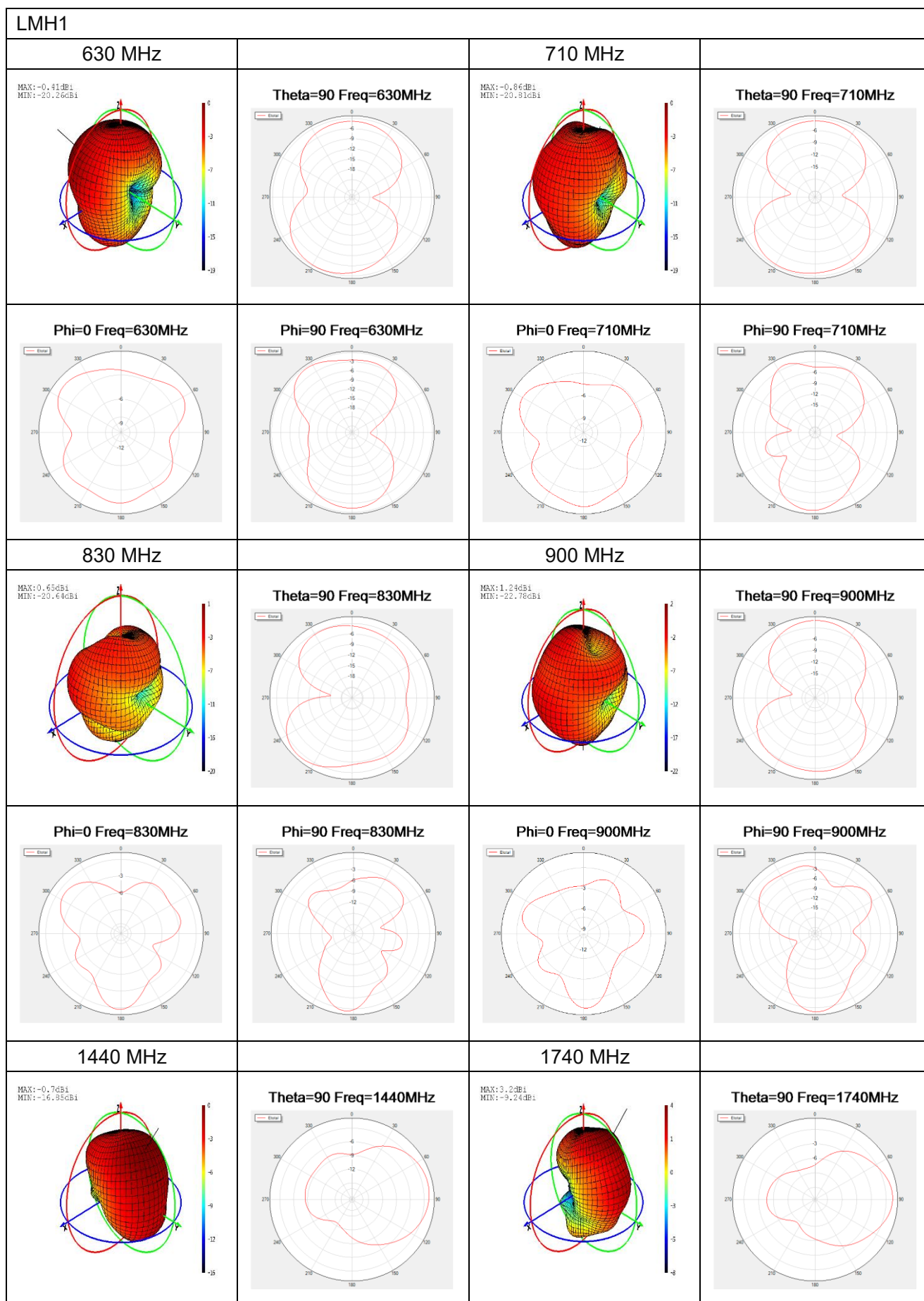
Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	4.55	-	-	-	-	2.78	3.79	2.24
	Phi = 90 (deg) Theta = 0 (deg)	4.55	-	-	-	-	2.78	3.79	2.24
LC Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-12.56	-	-	-	-	-20.4	-23	-24.7
	Phi = 90 (deg) Theta = 0 (deg)	-12.56	-	-	-	-	-20.4	-23	-24.7

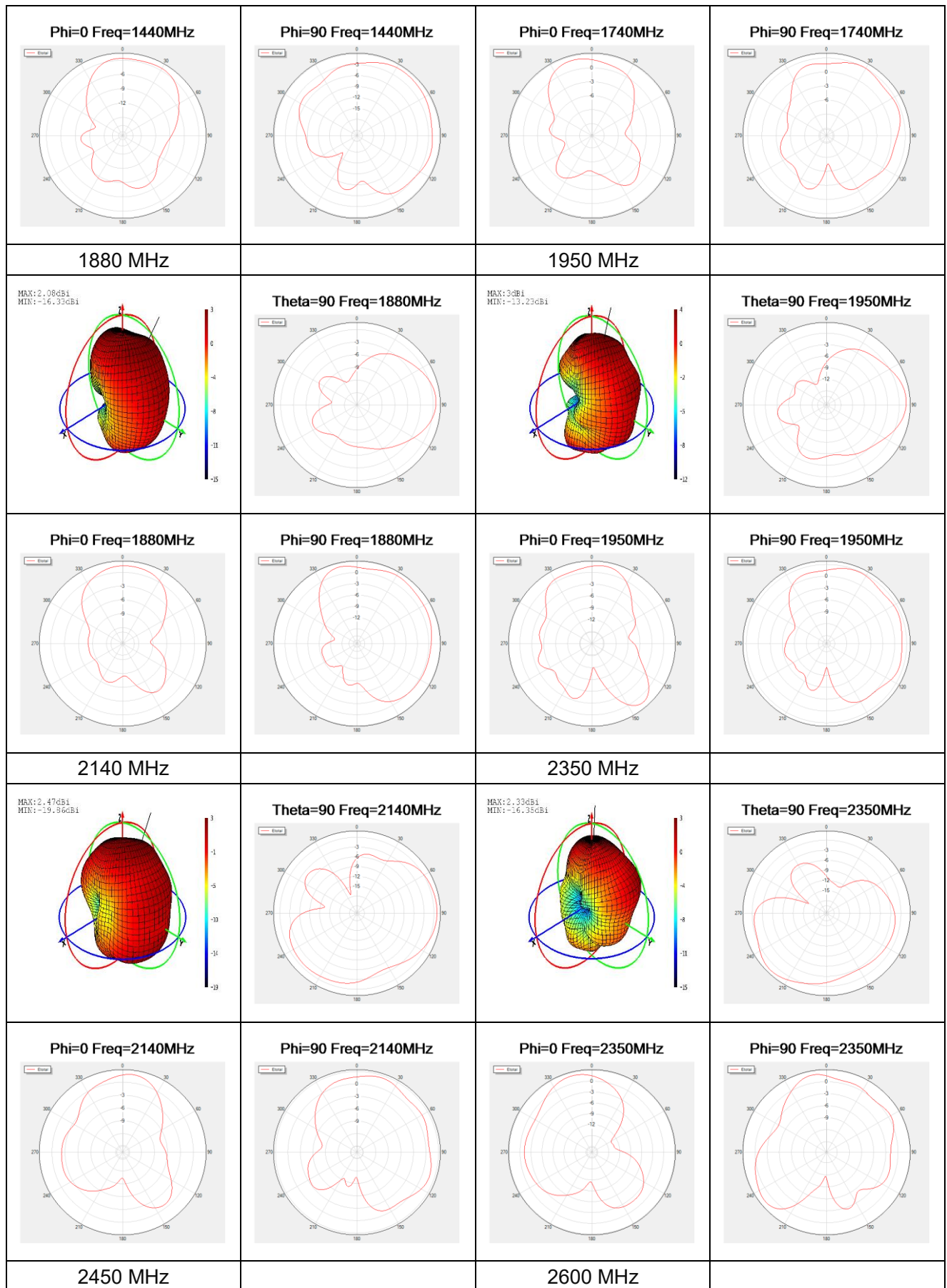
3.2.5. 3D & 2D Radiation Pattern

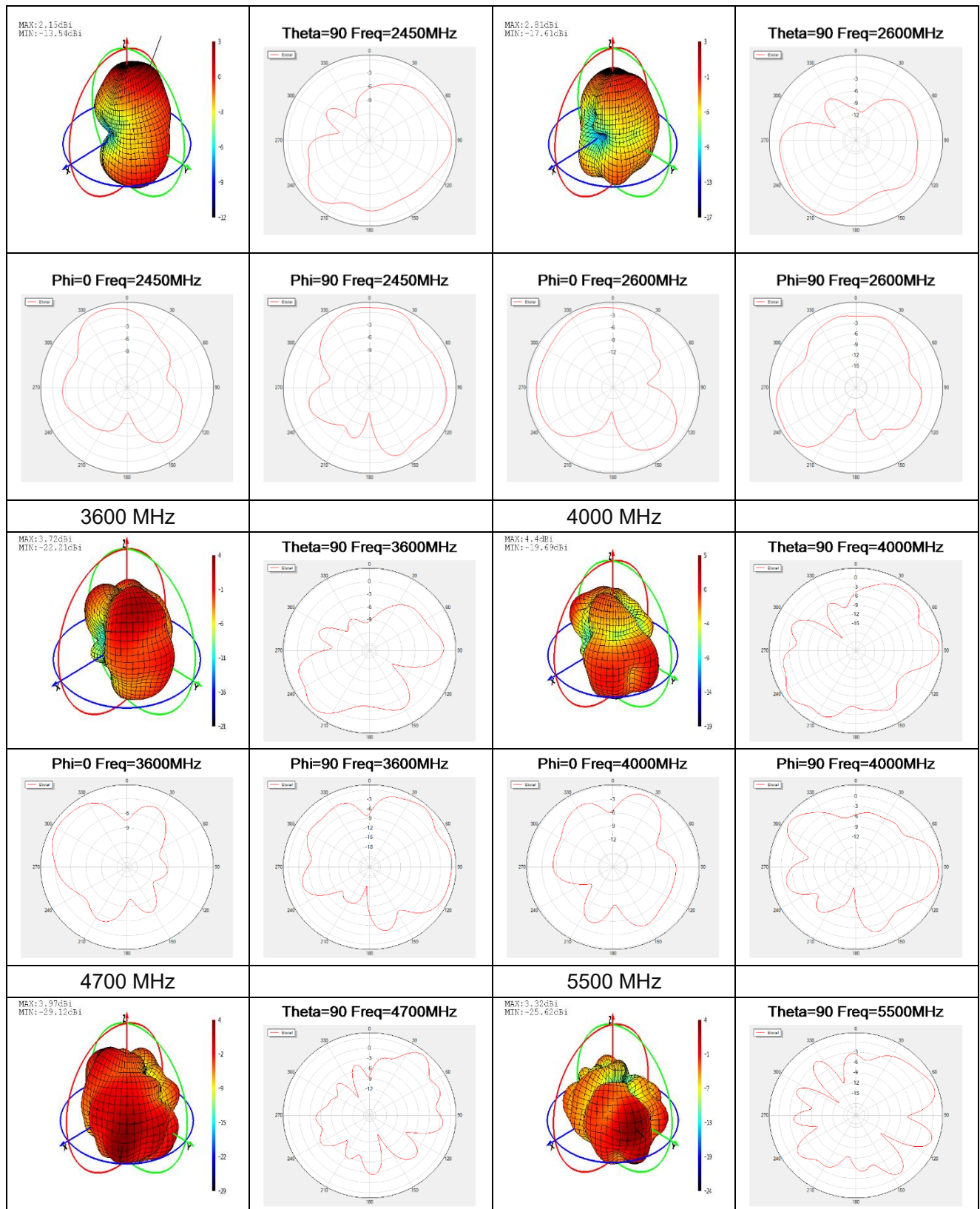
3.2.5.1. Test Status: In Free Space

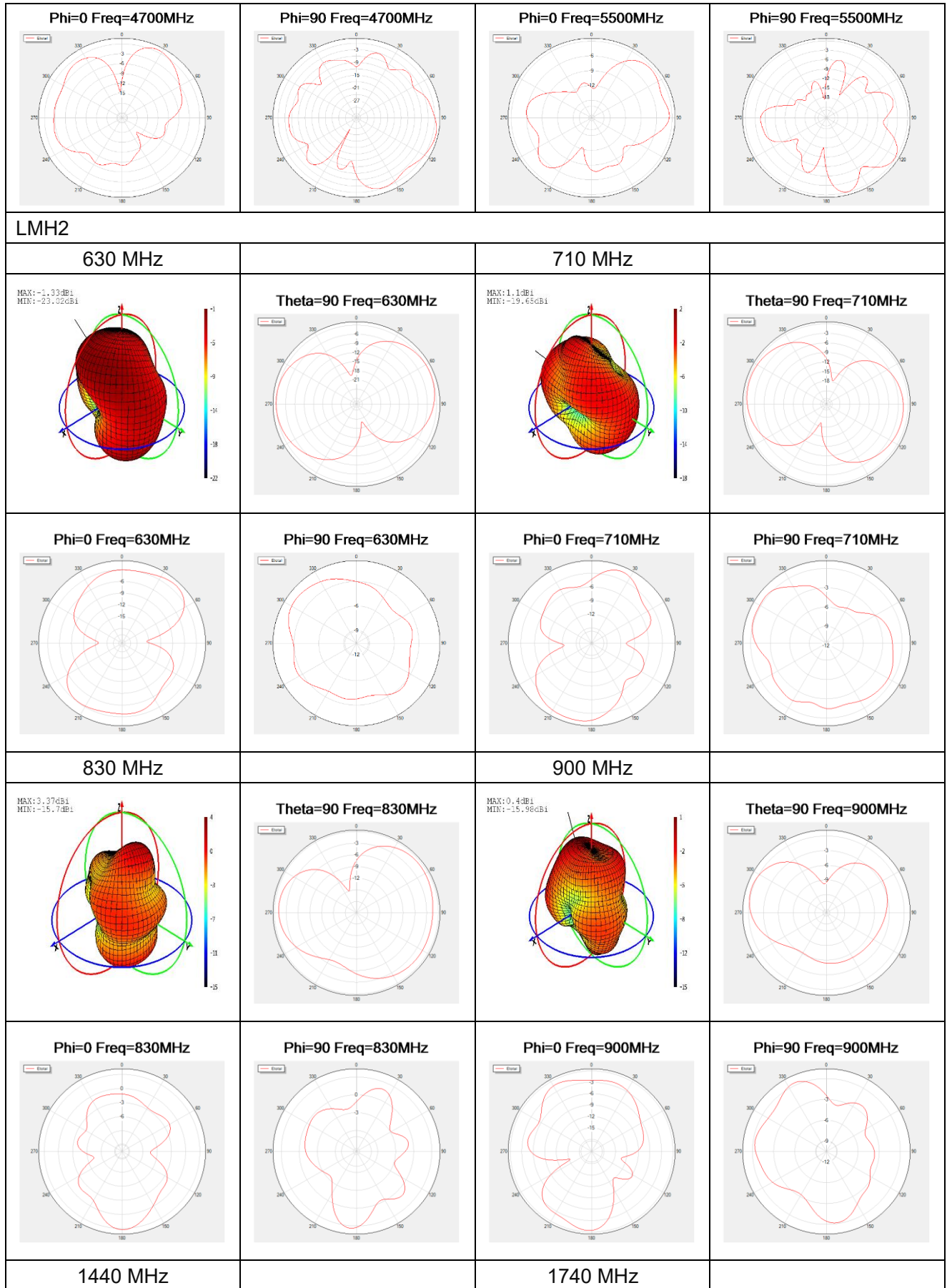
- Test Condition: In Free Space
- Test Chamber: FS-S-1

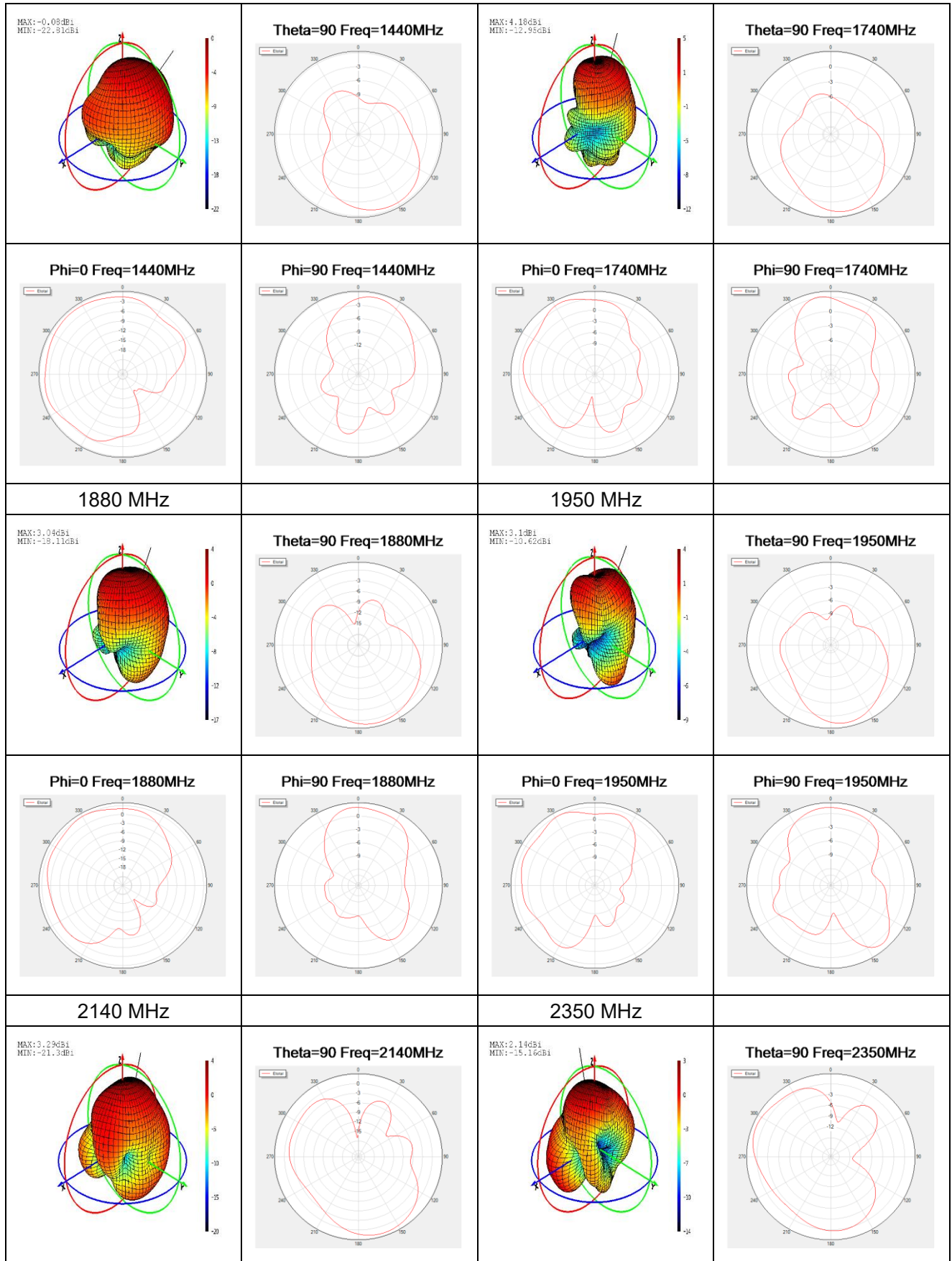


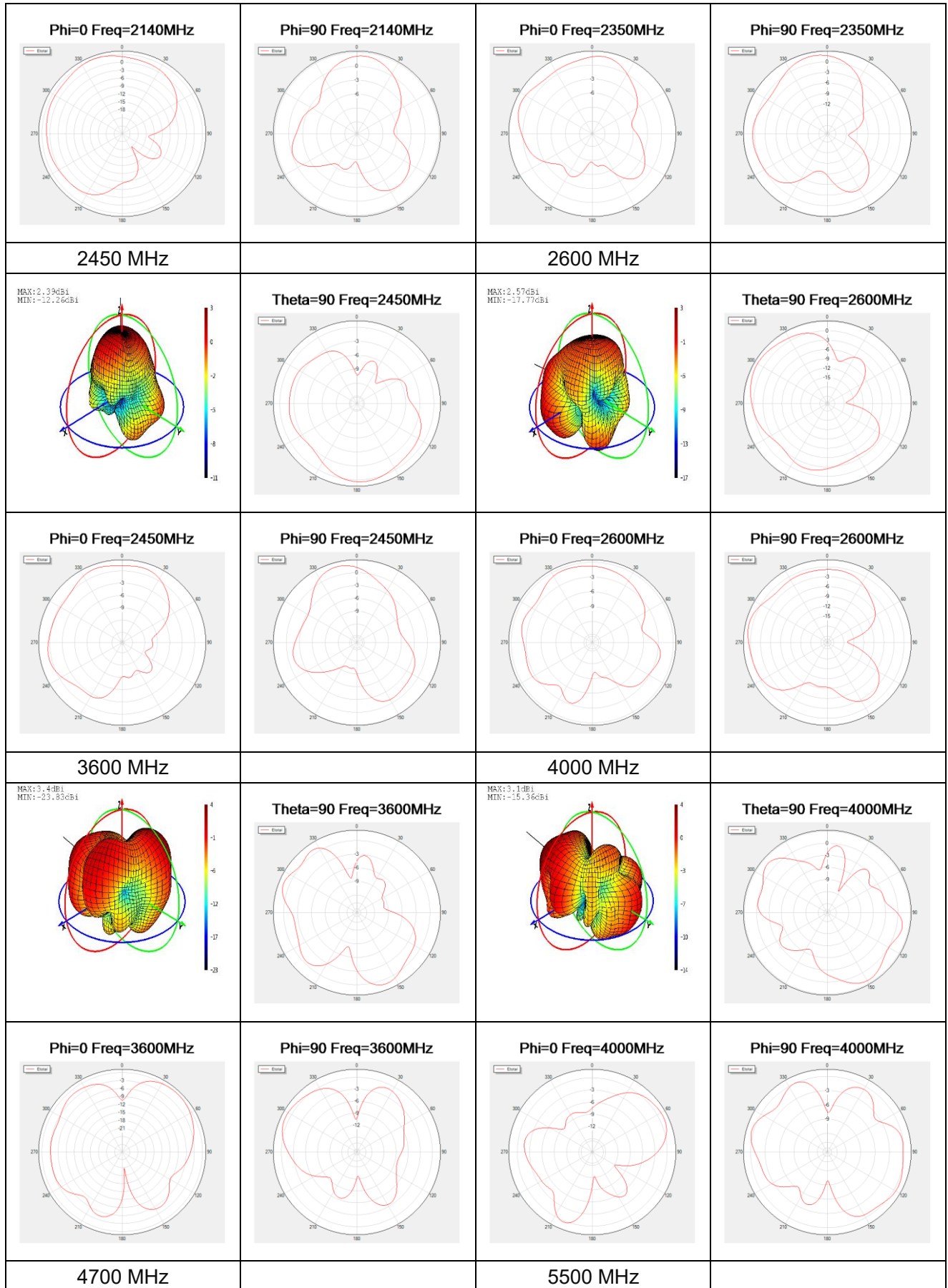


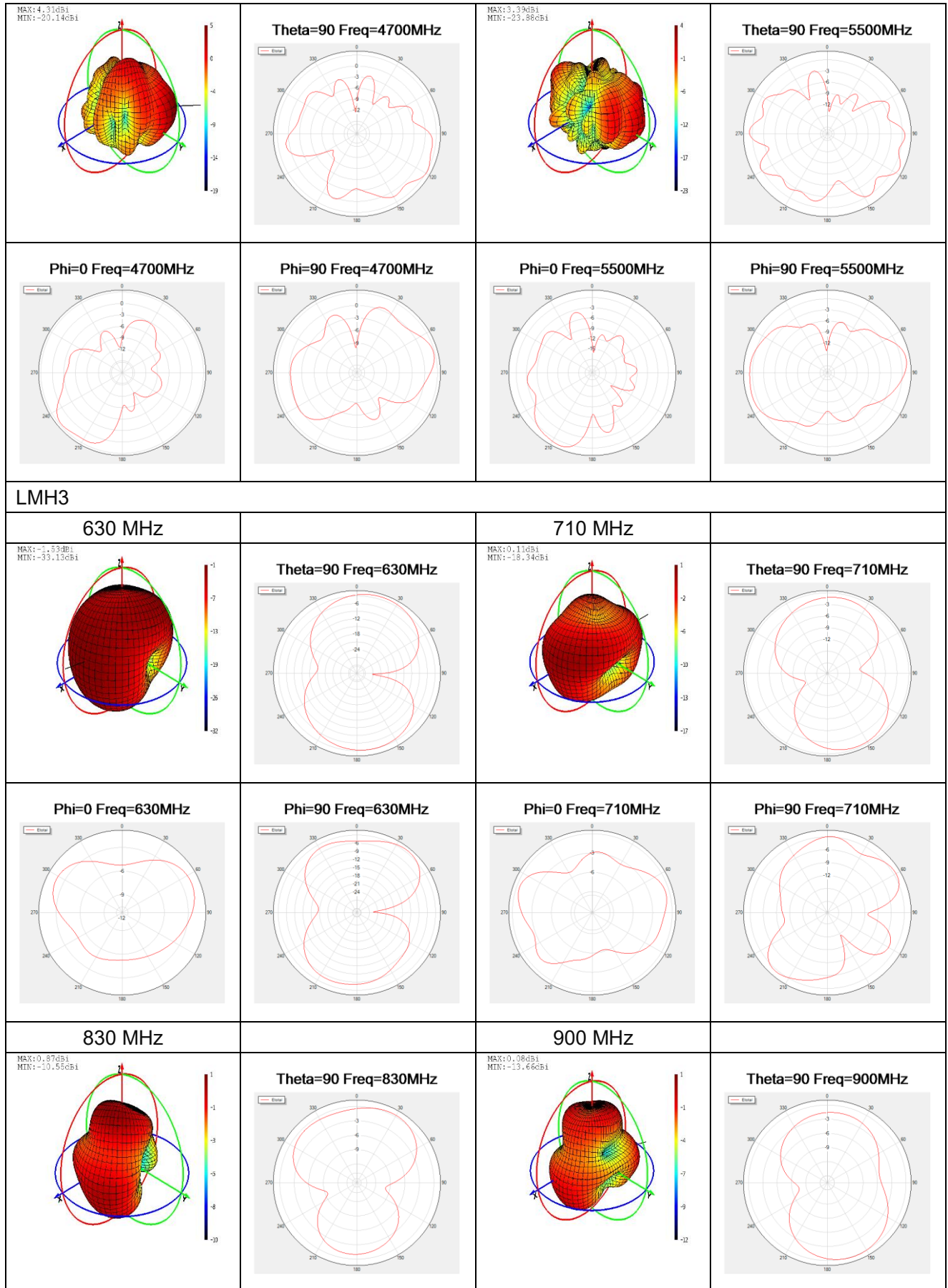


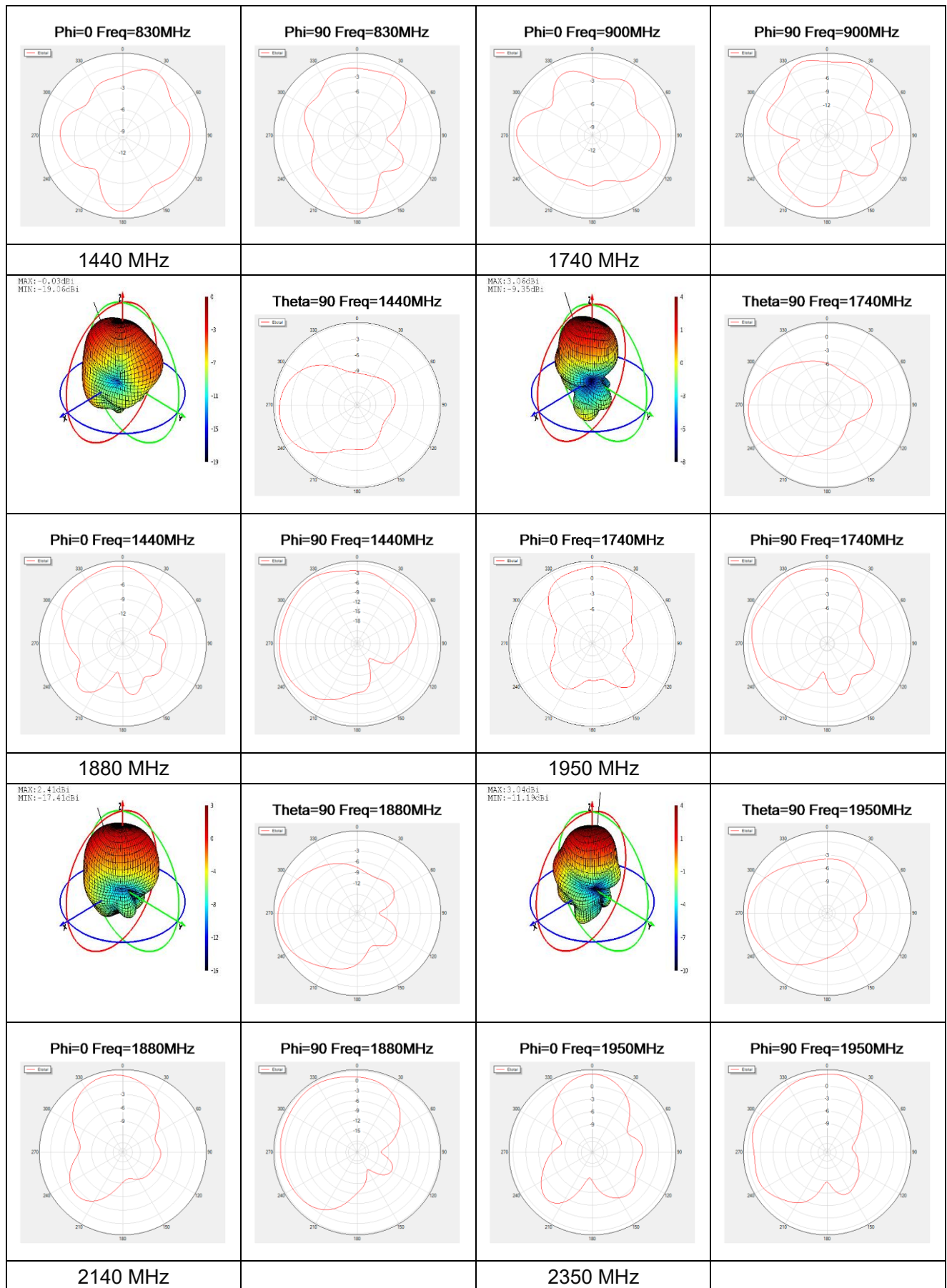


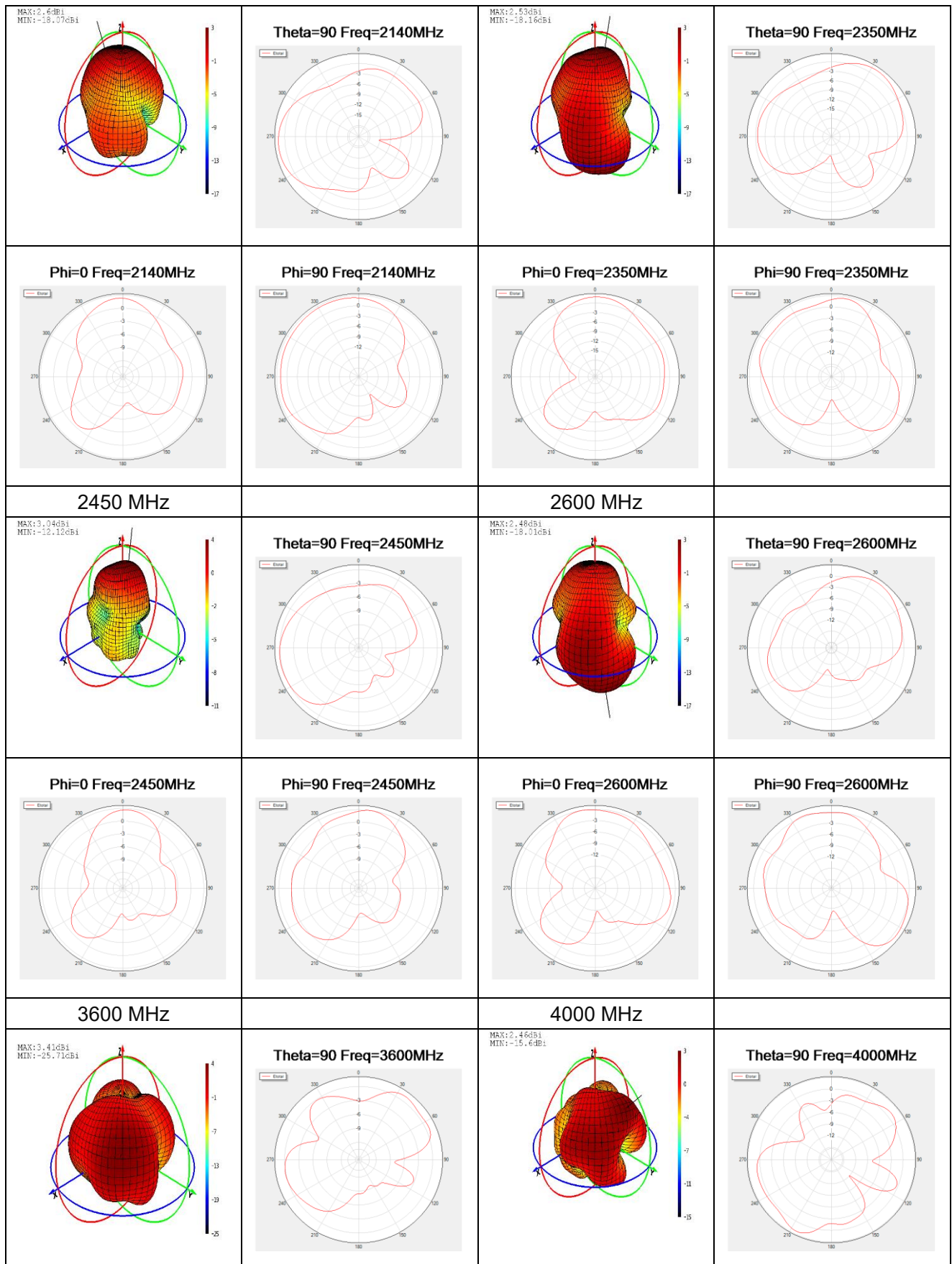


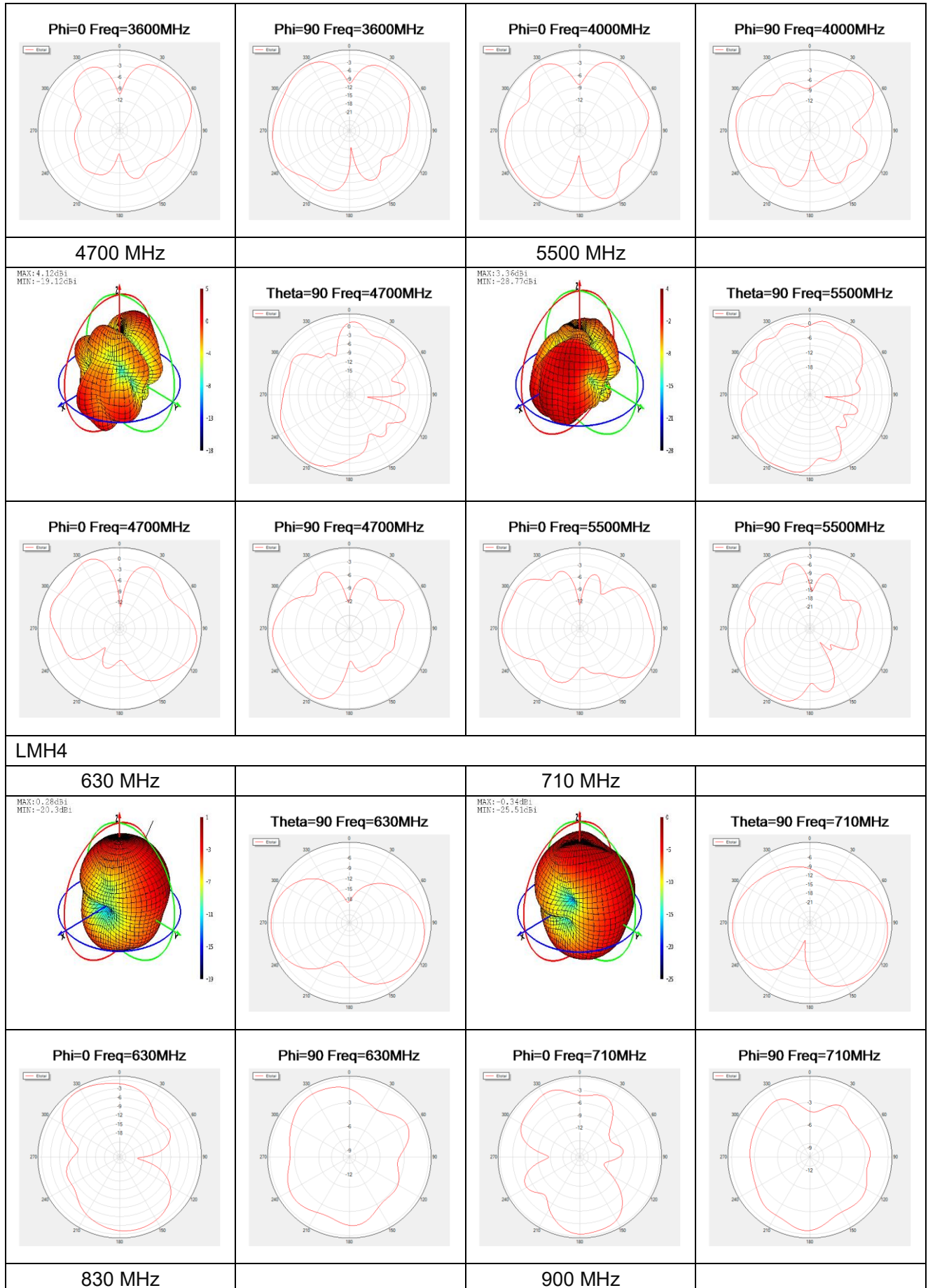


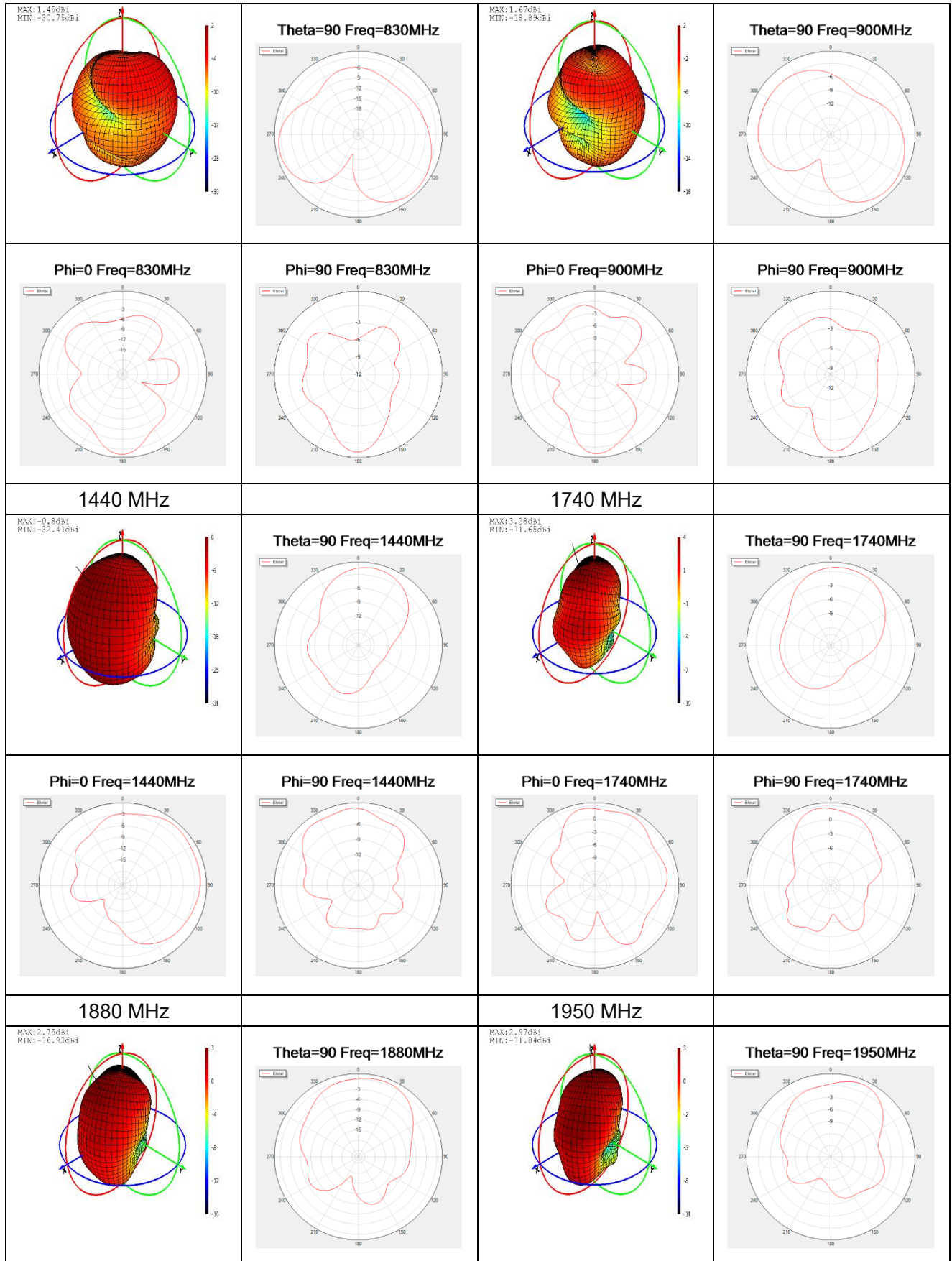


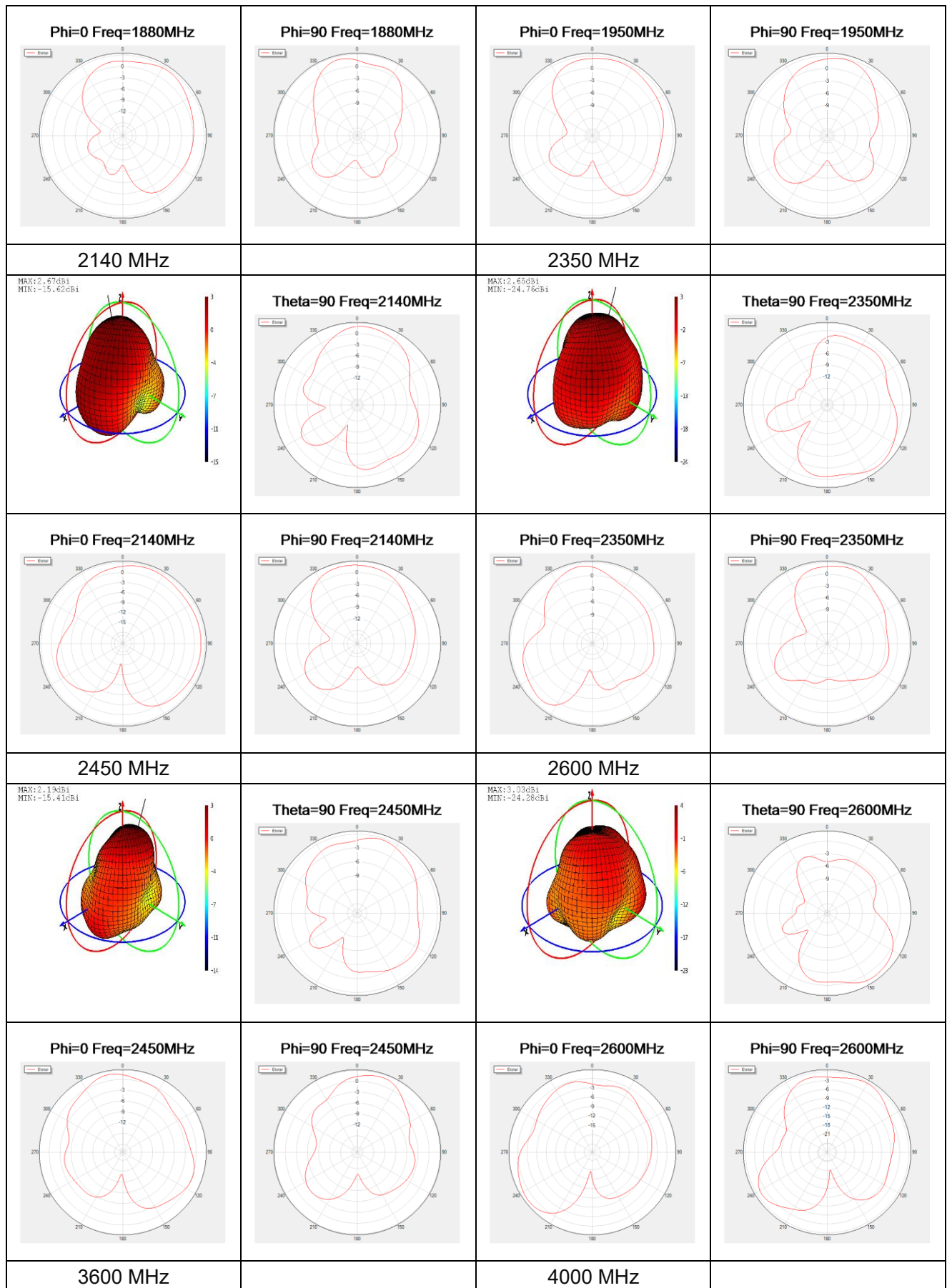


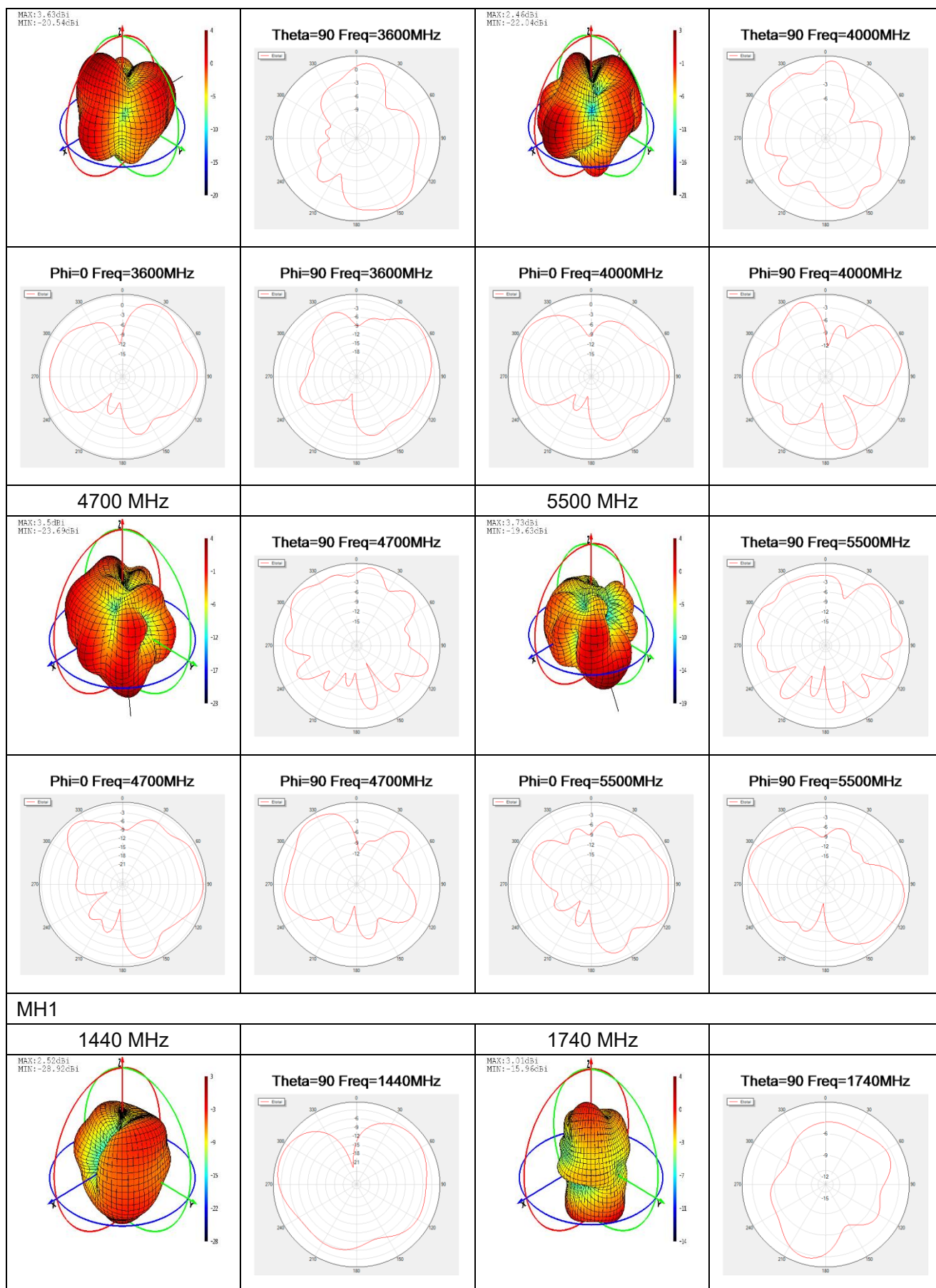


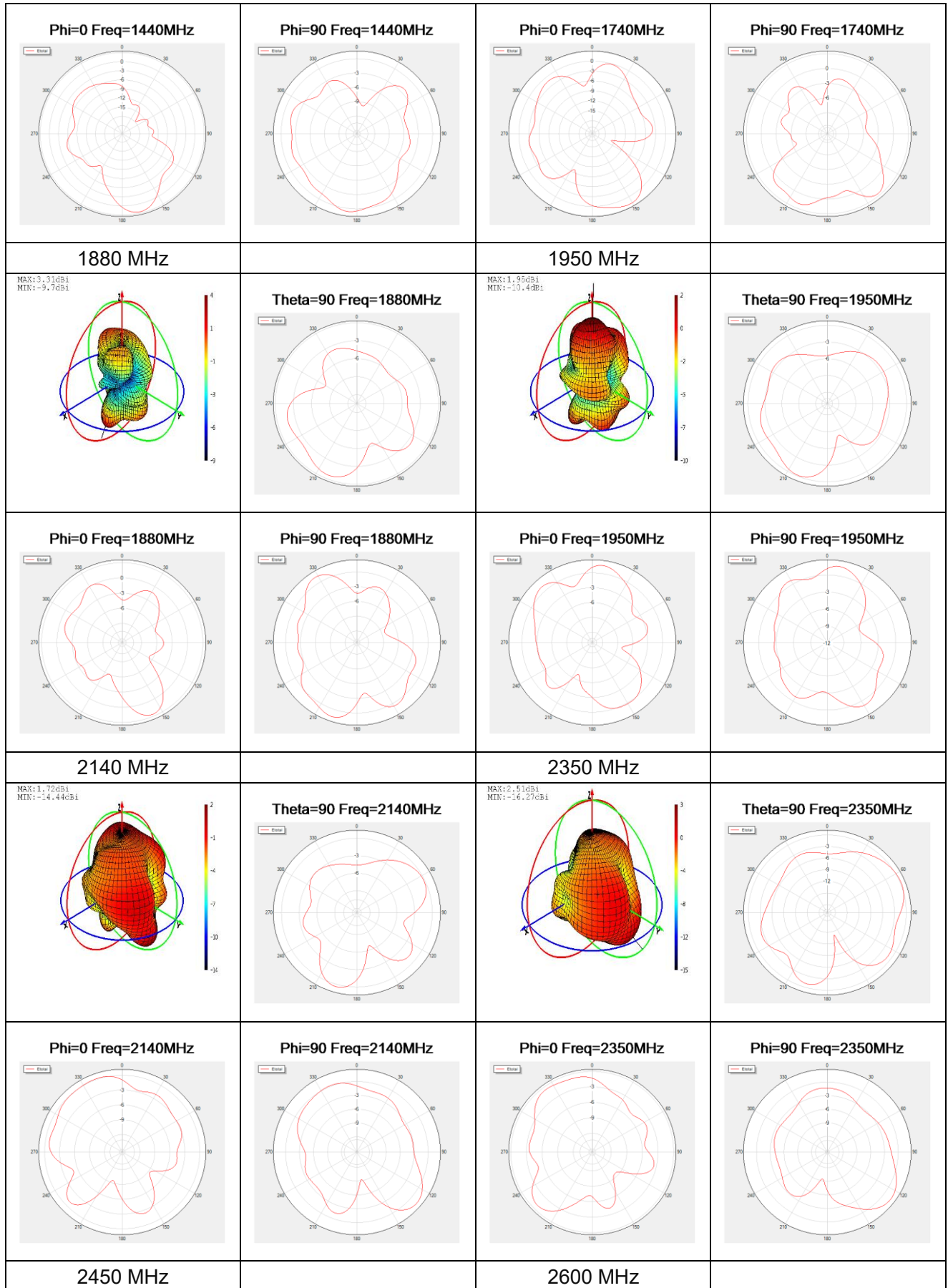


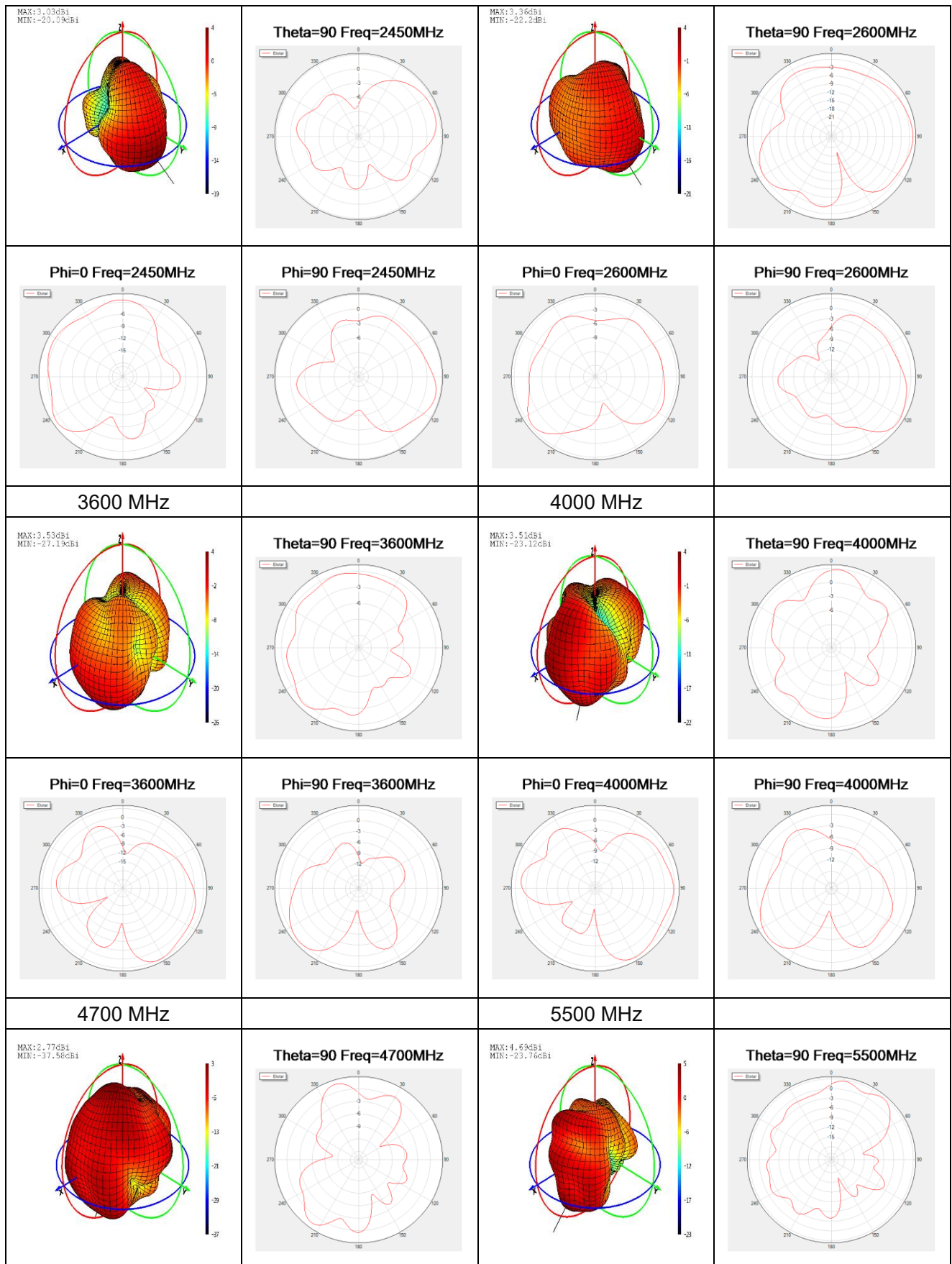


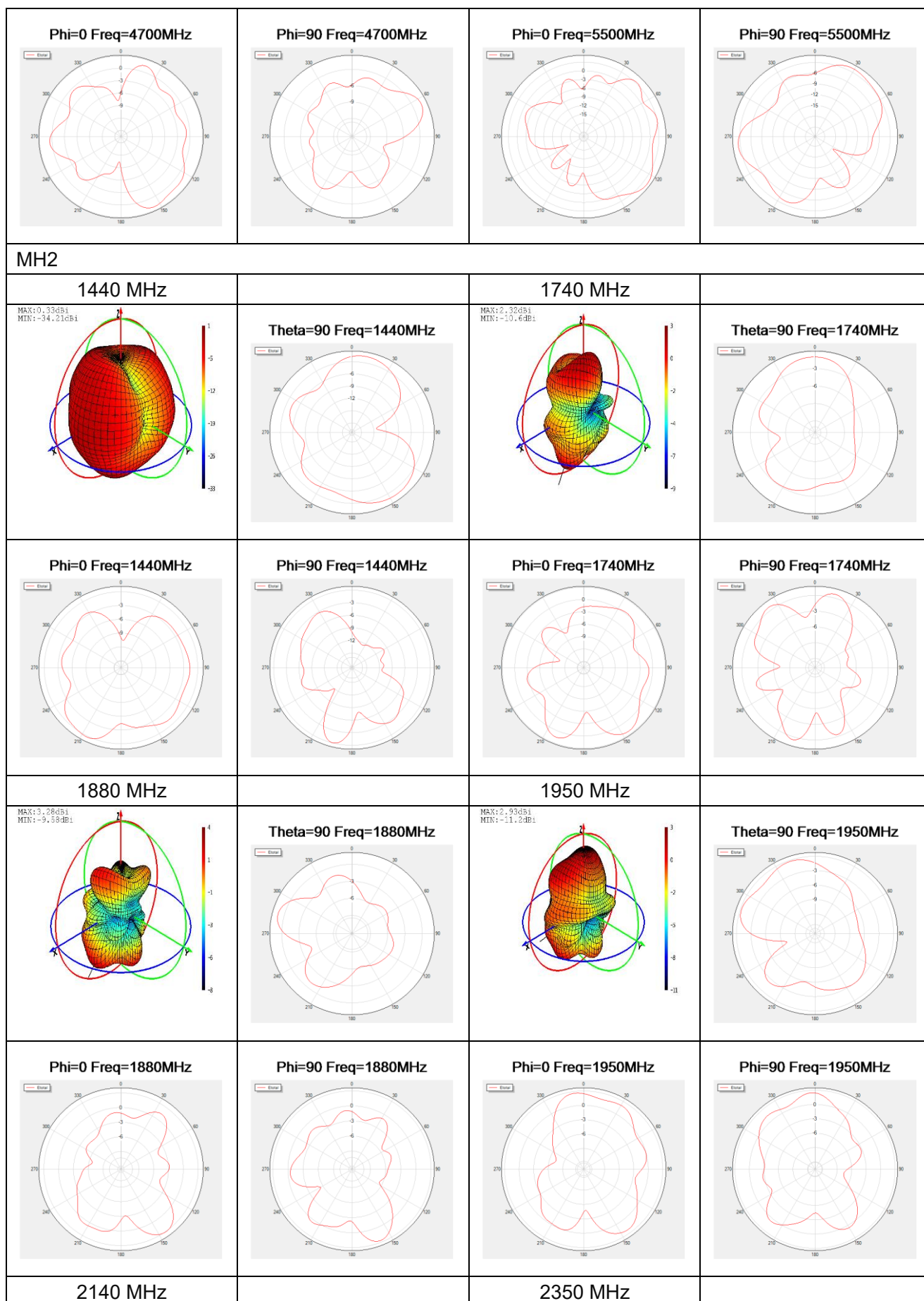


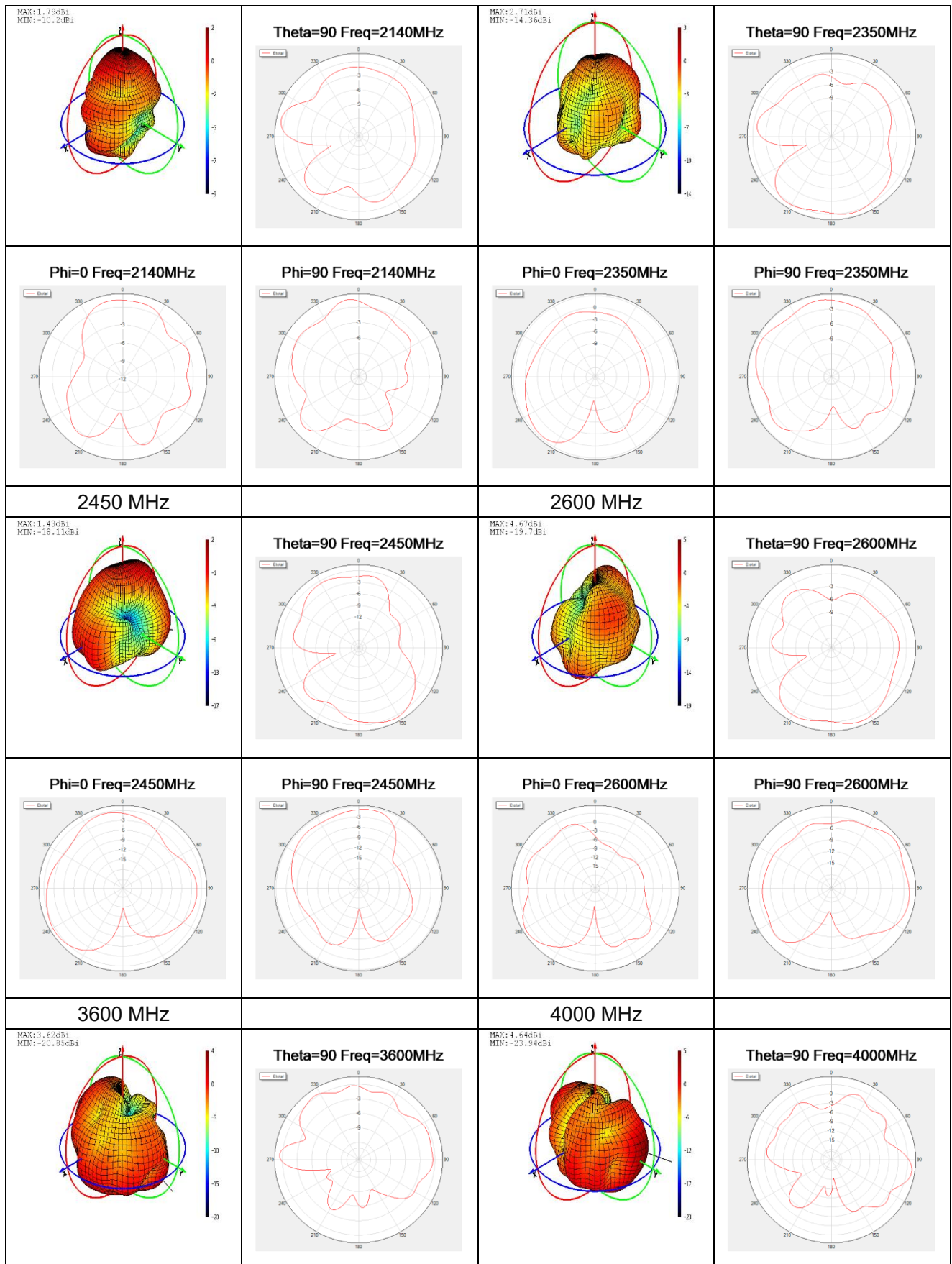


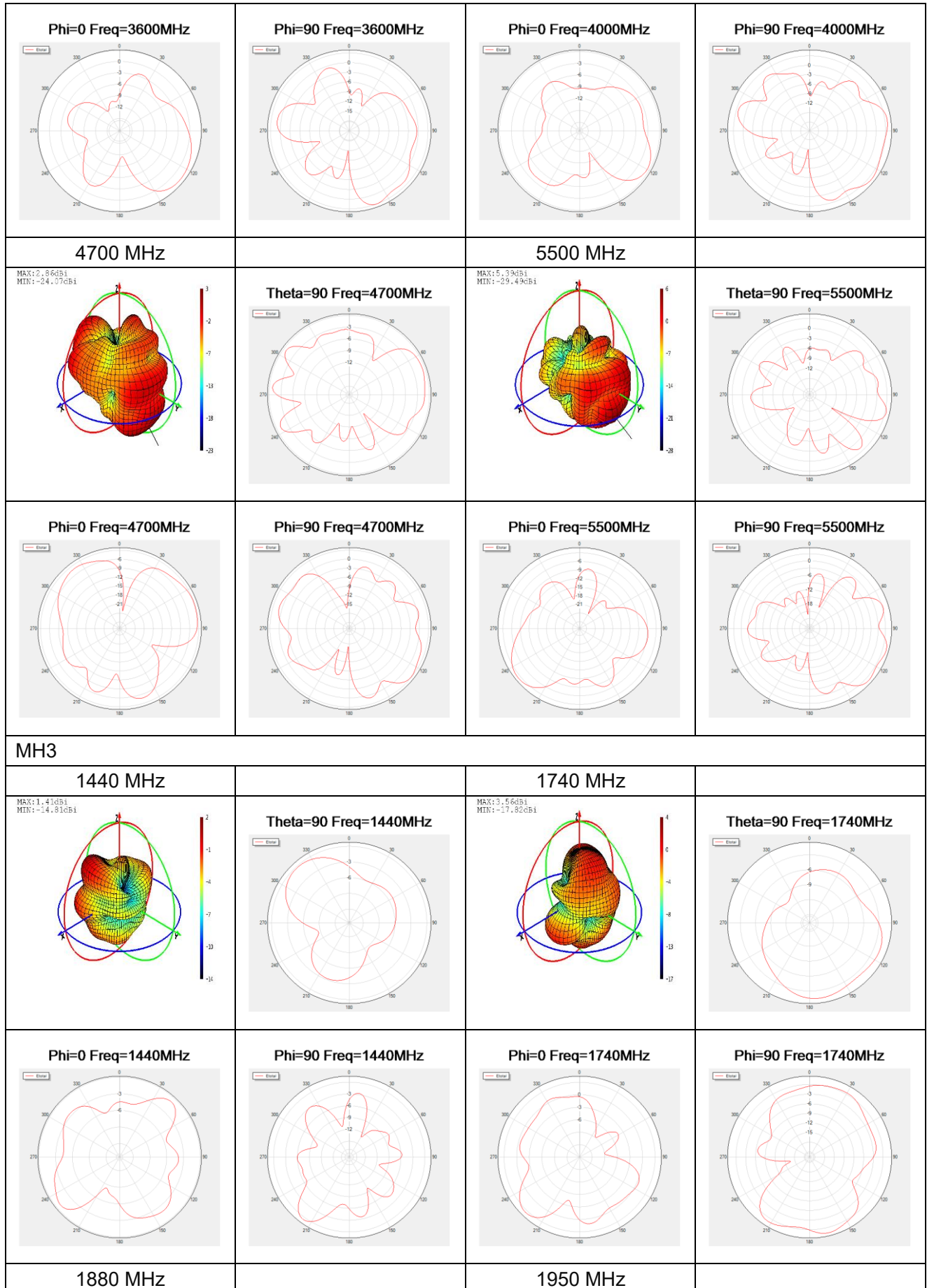


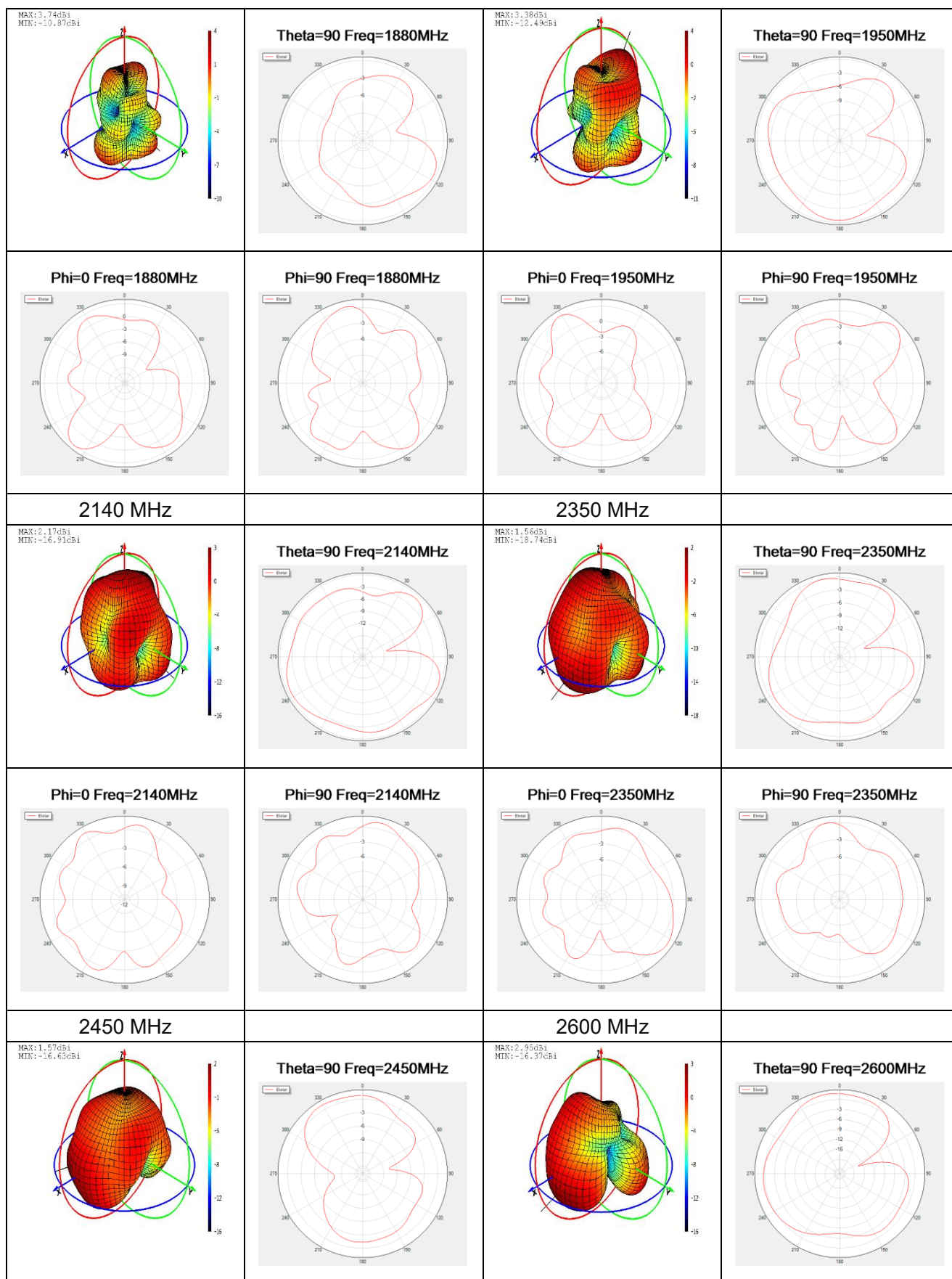


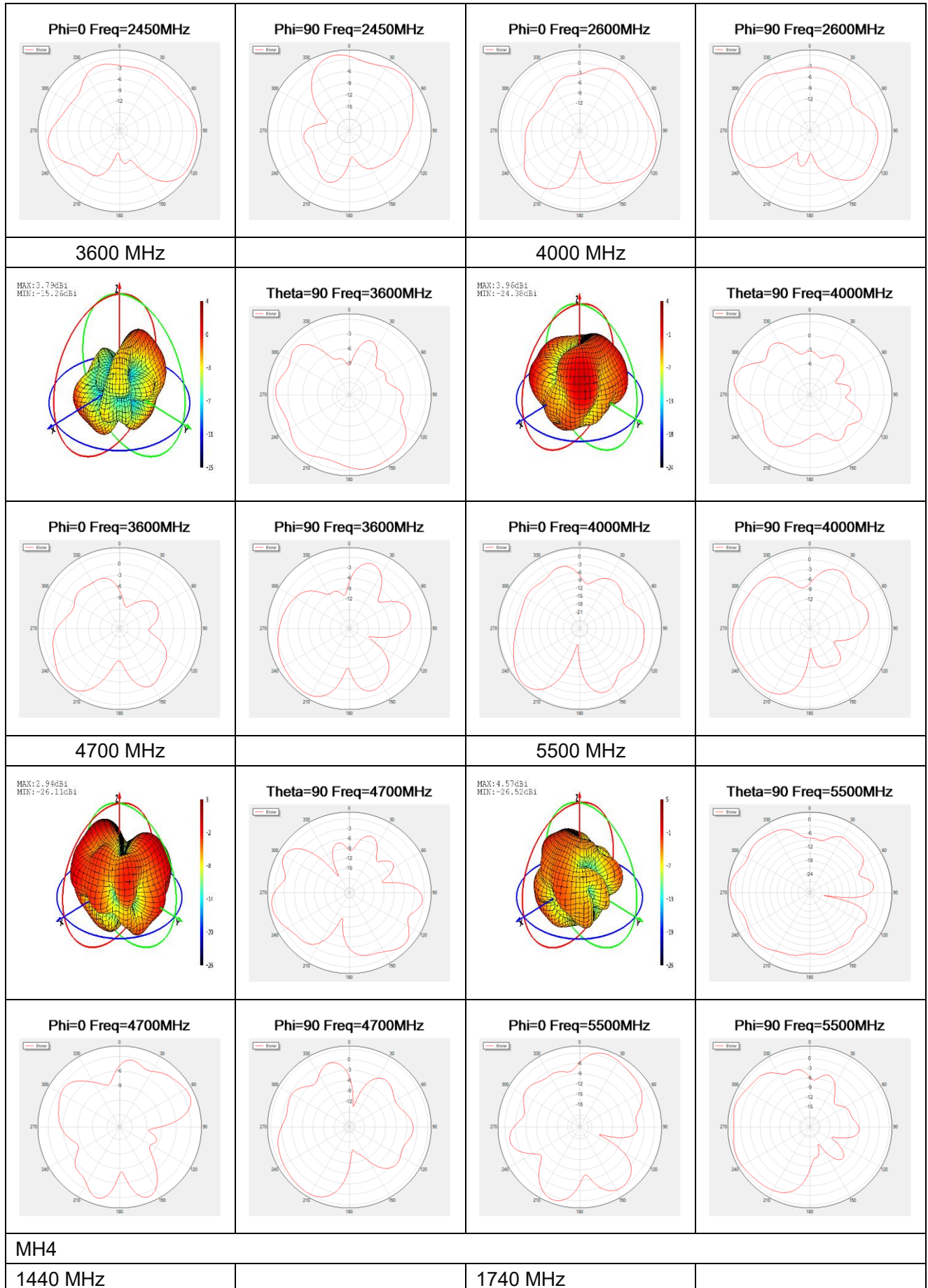


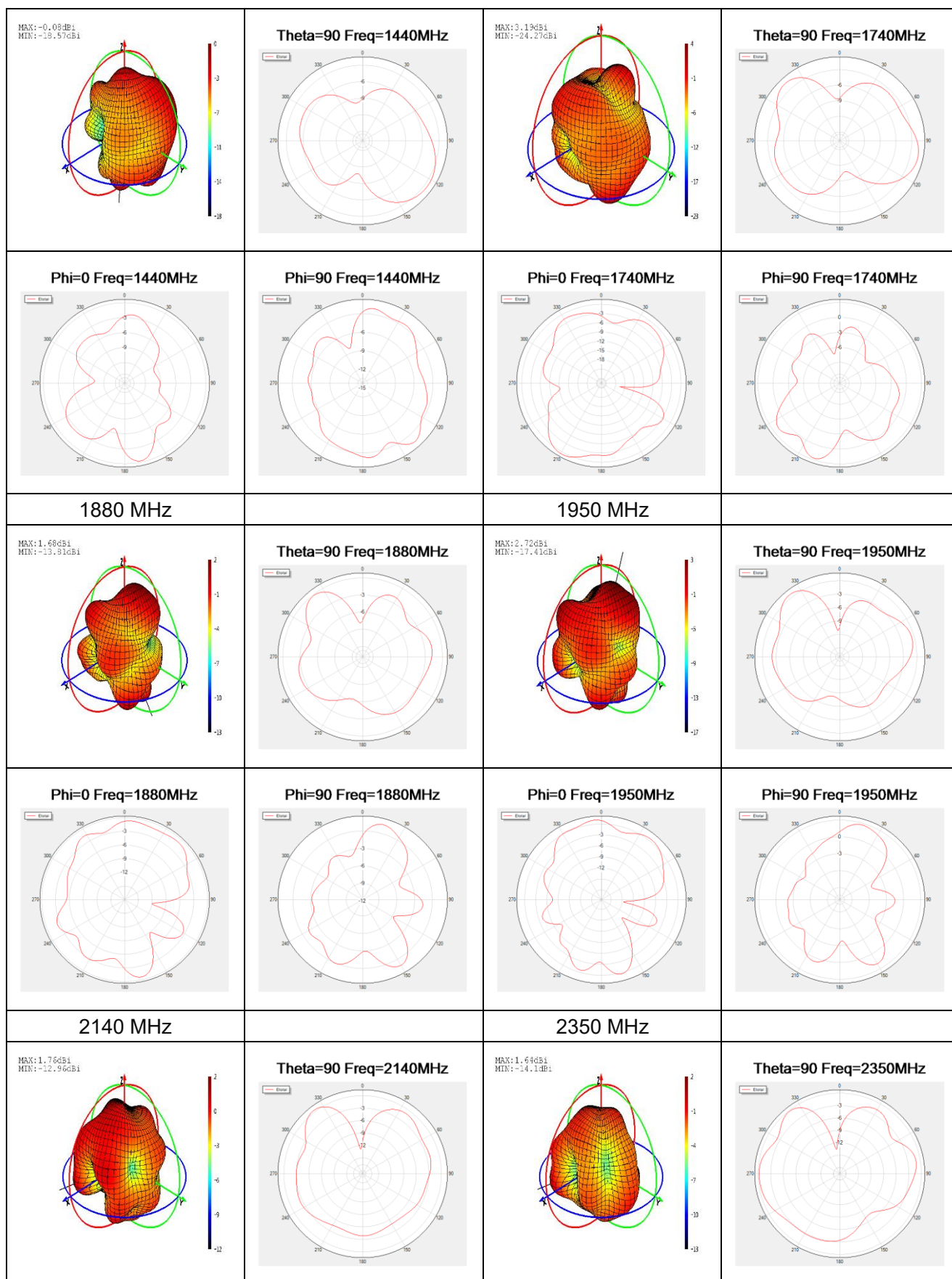


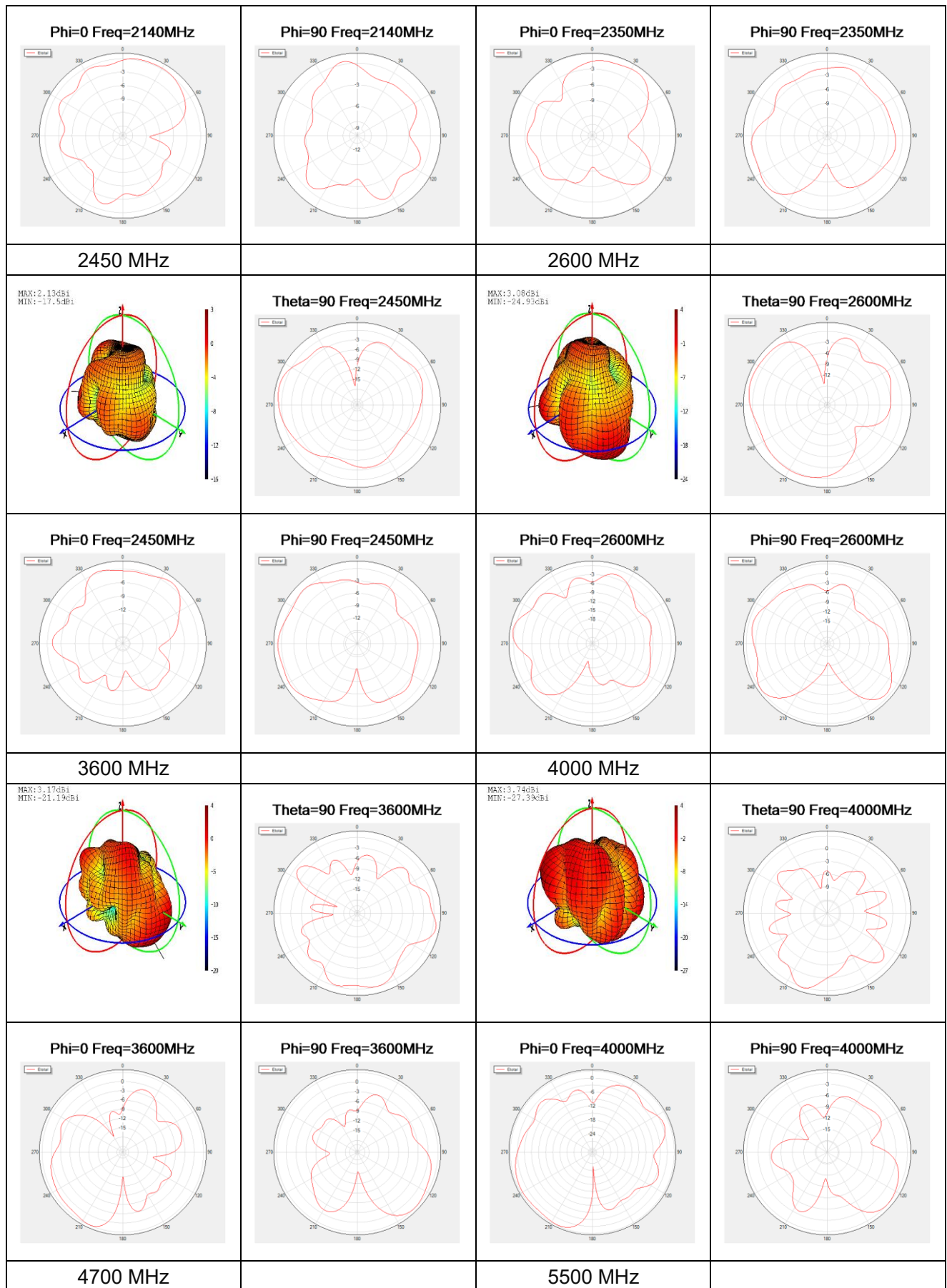


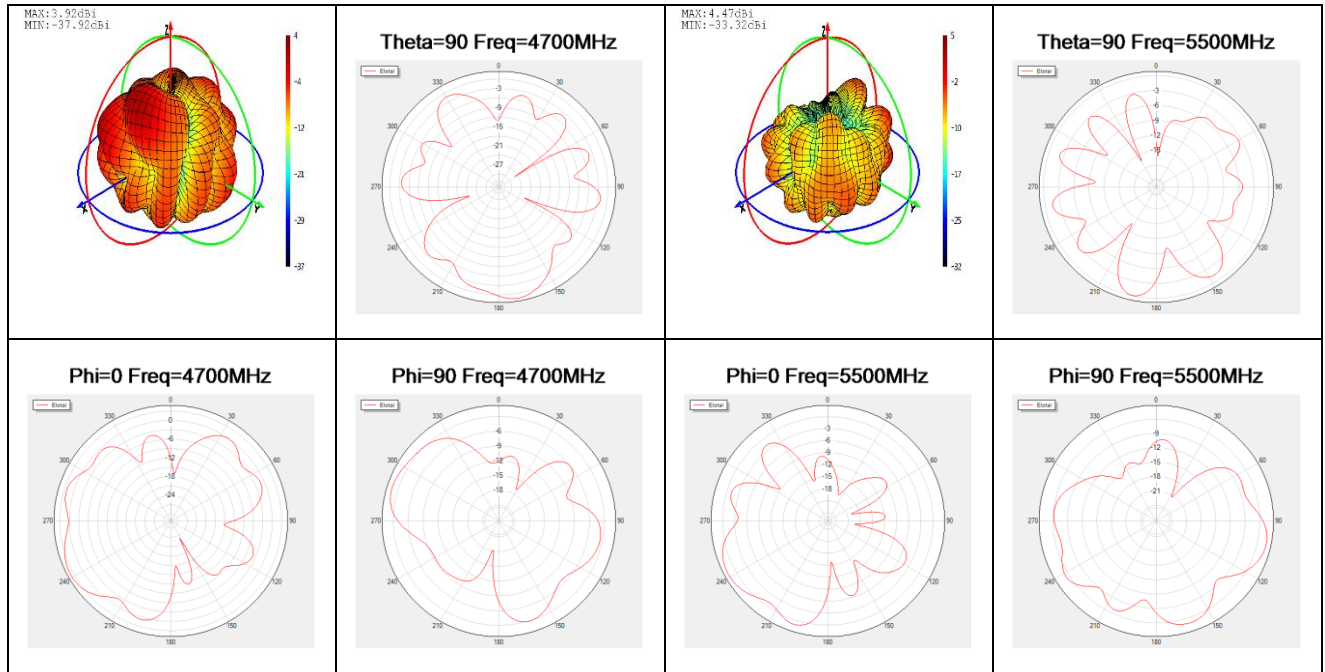




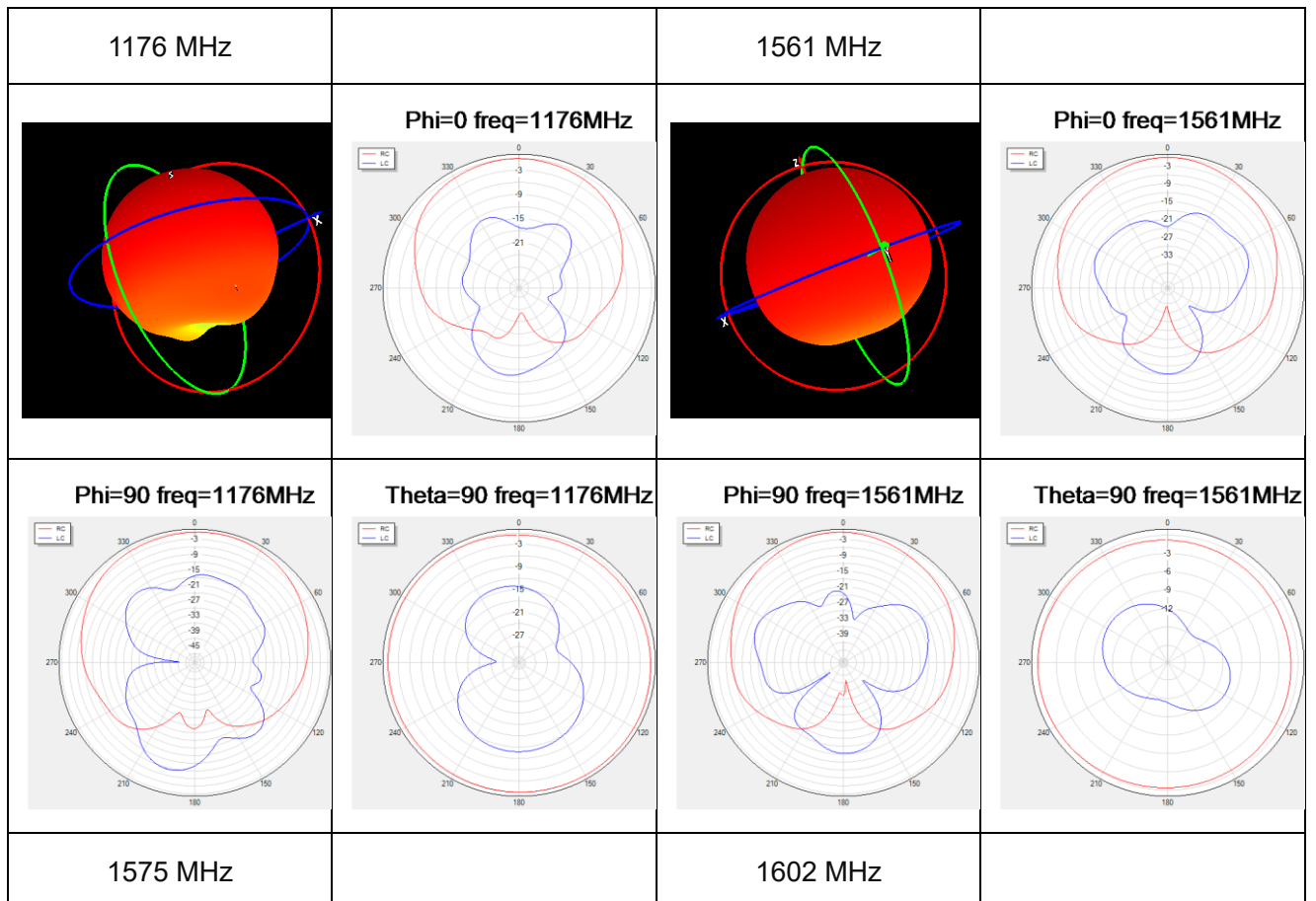


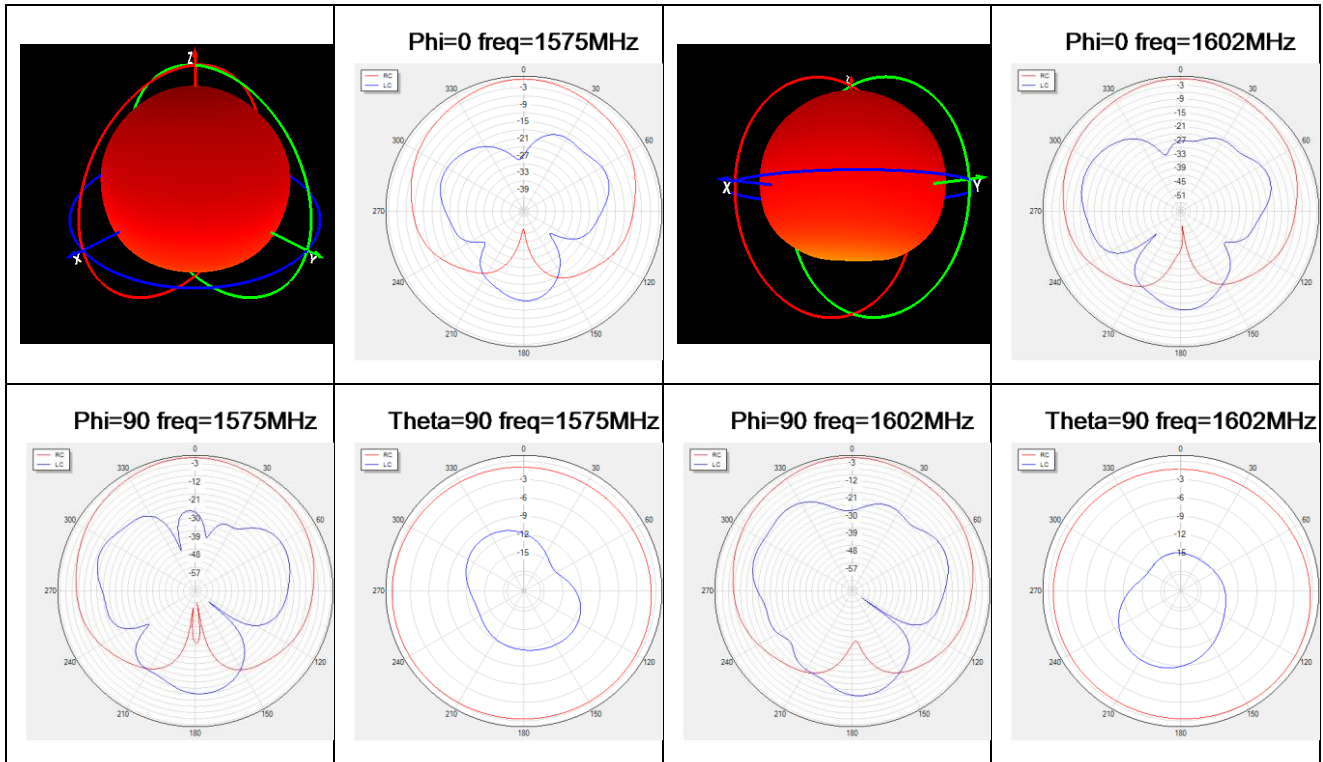






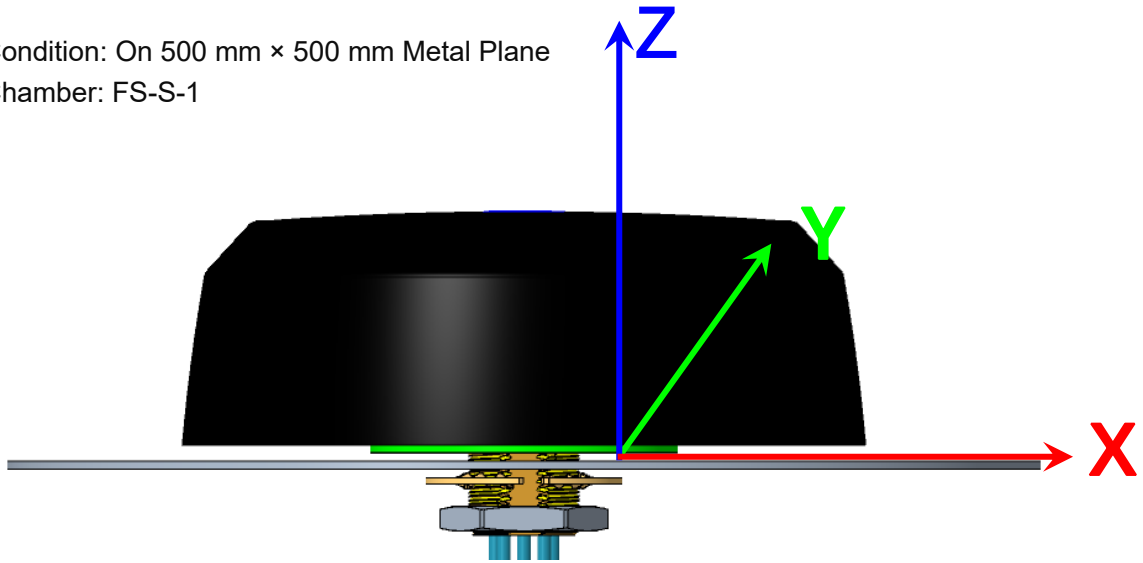
● **GNSS**

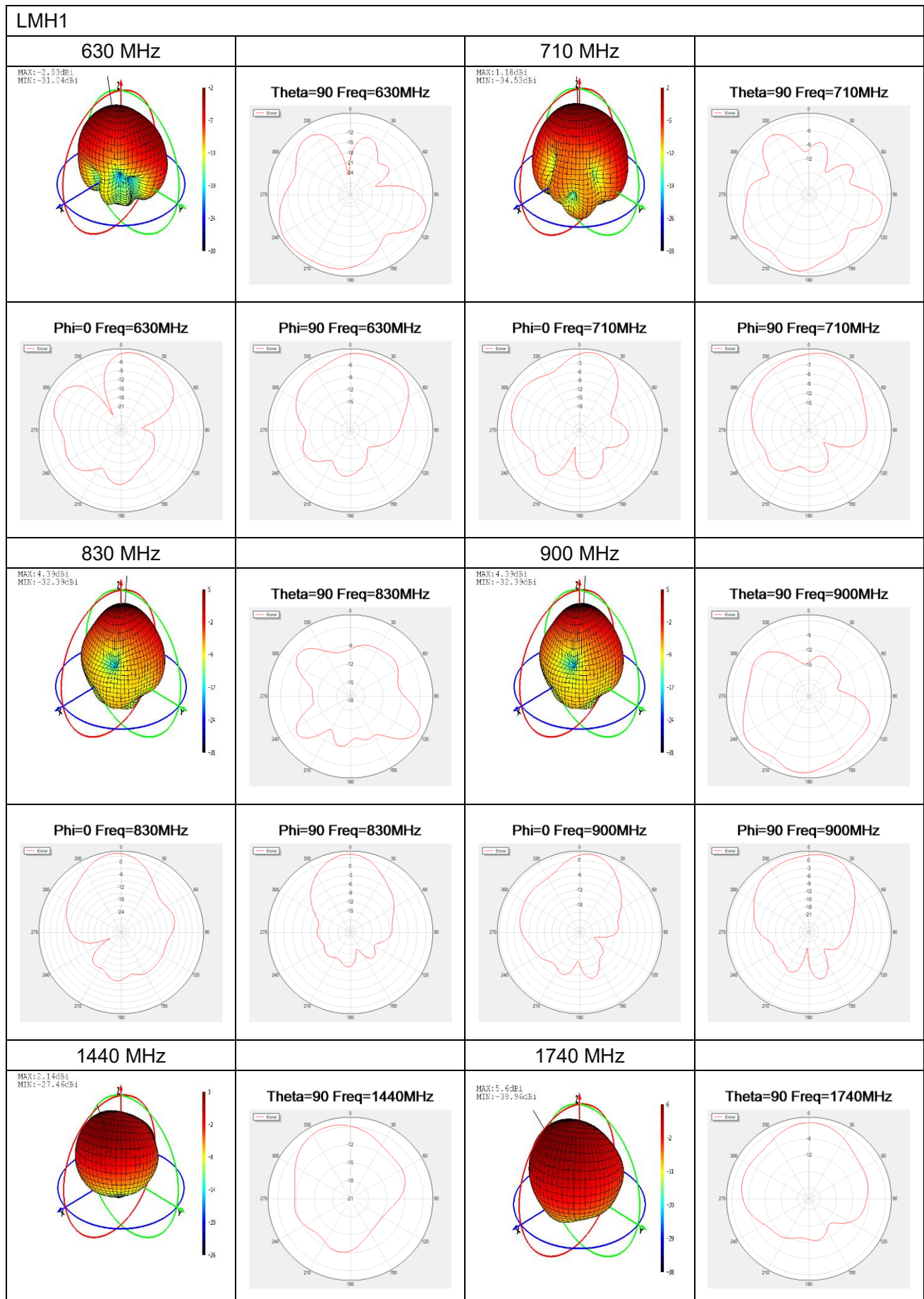


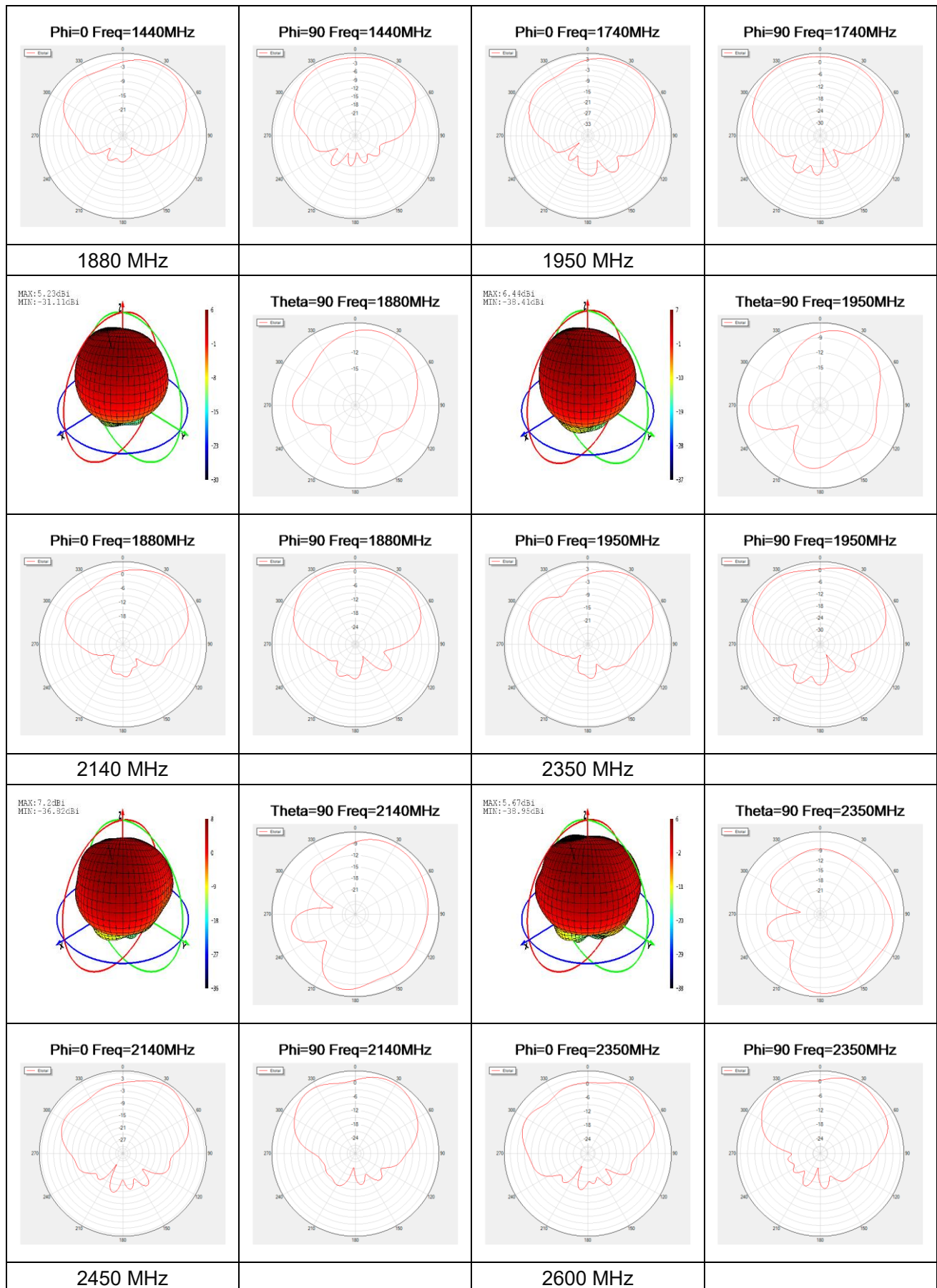


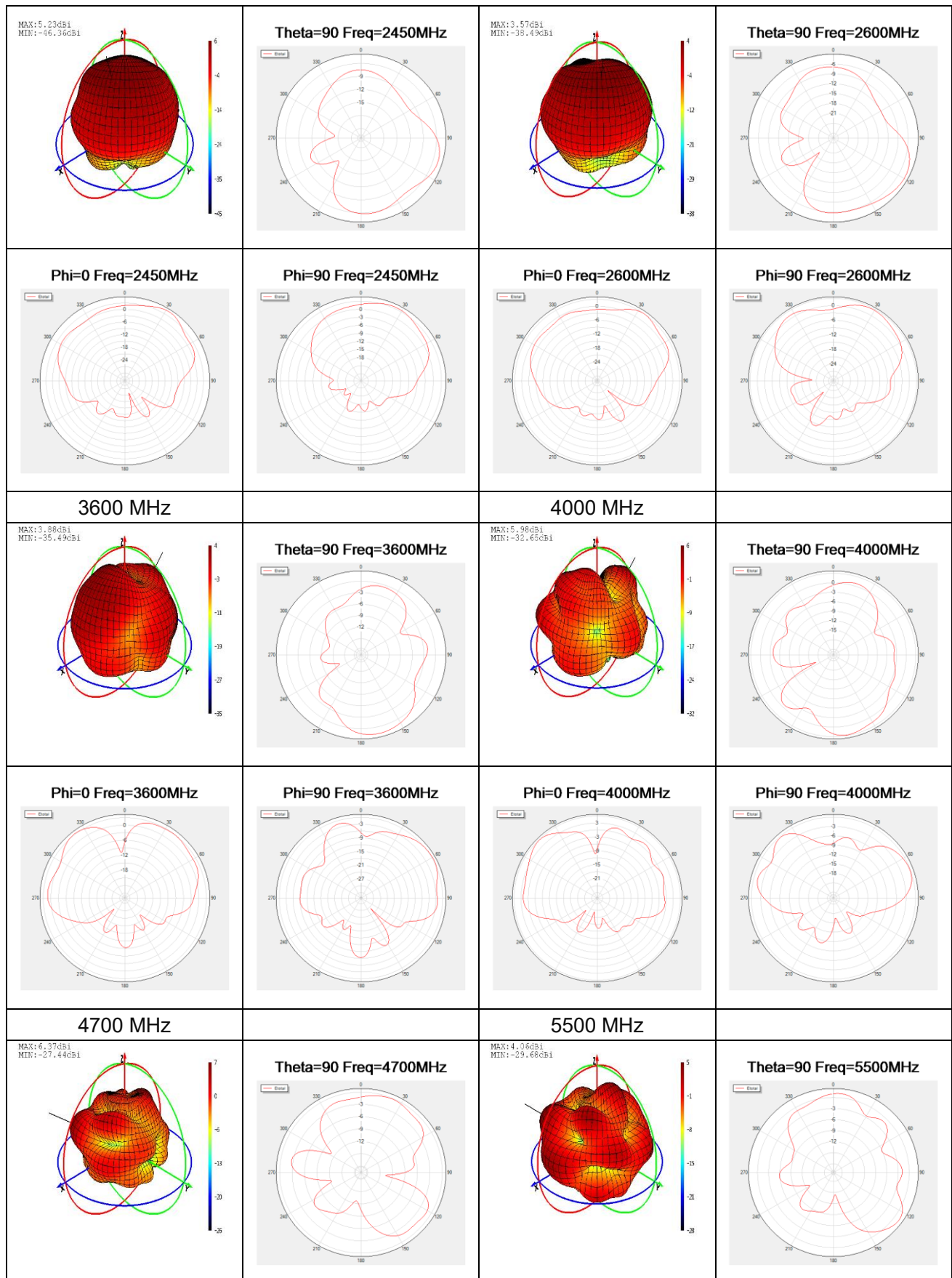
3.2.5.2. Test Status: On 500 mm × 500 mm Metal Plane

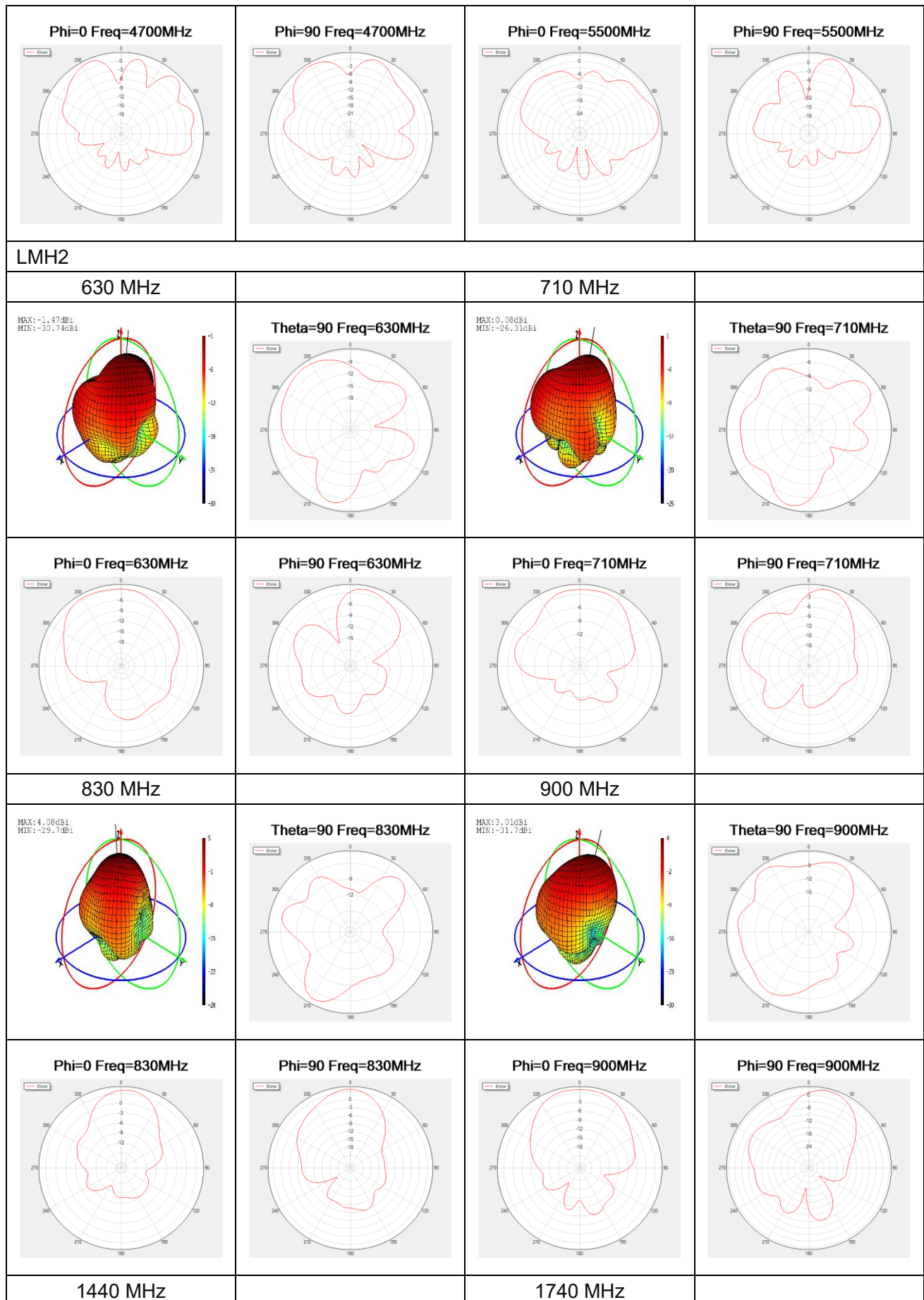
- Test Condition: On 500 mm × 500 mm Metal Plane
- Test Chamber: FS-S-1

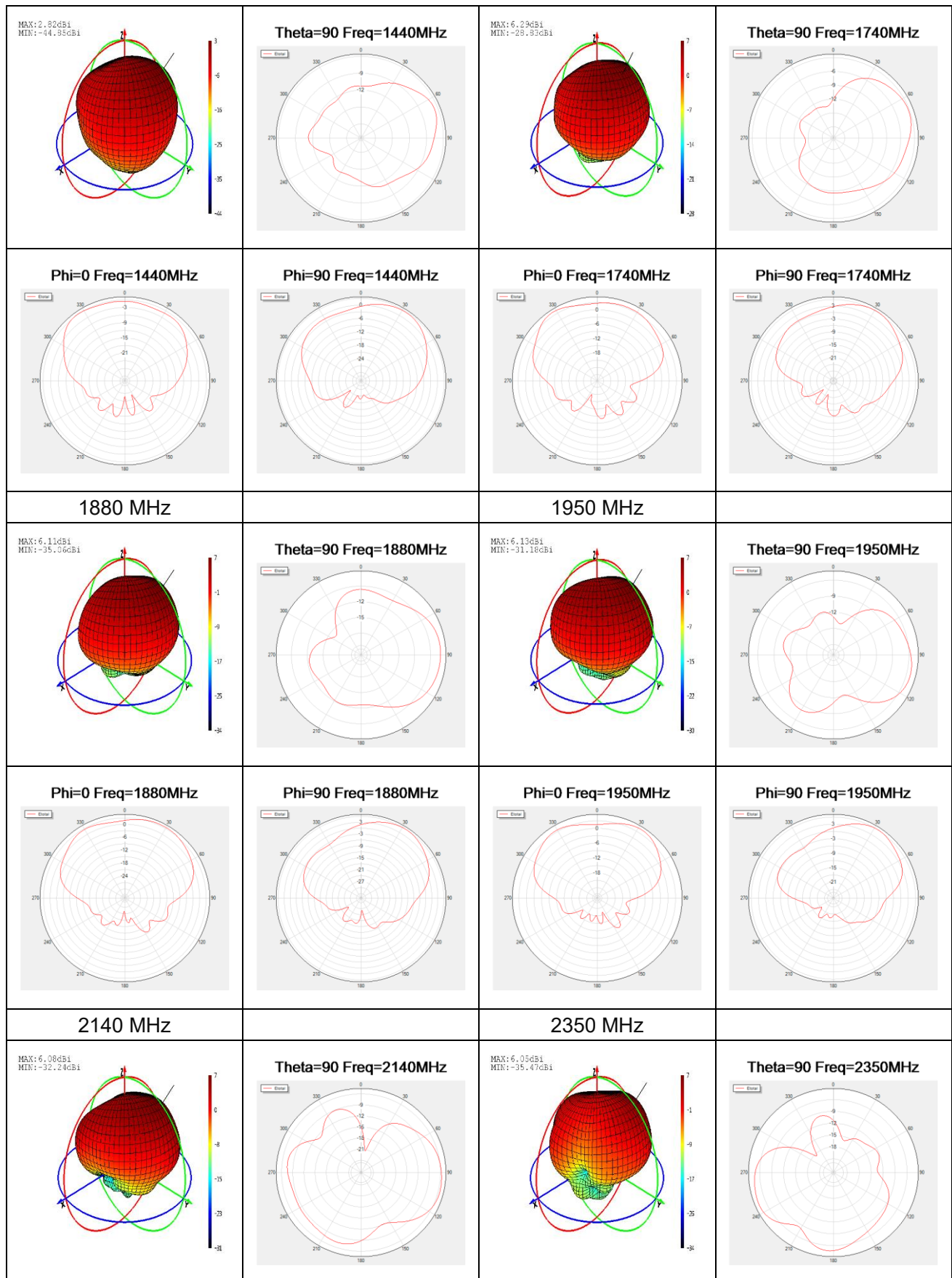


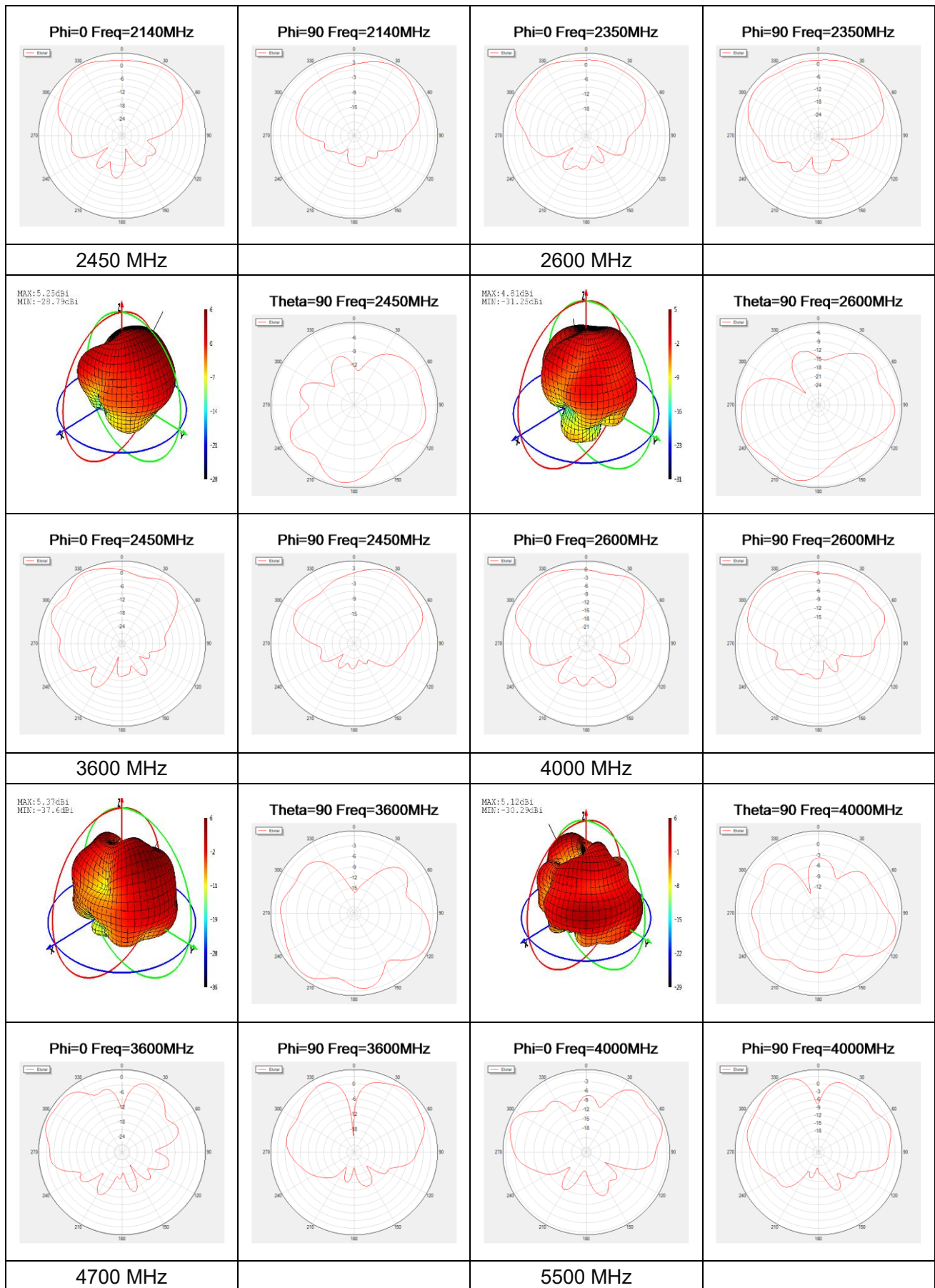


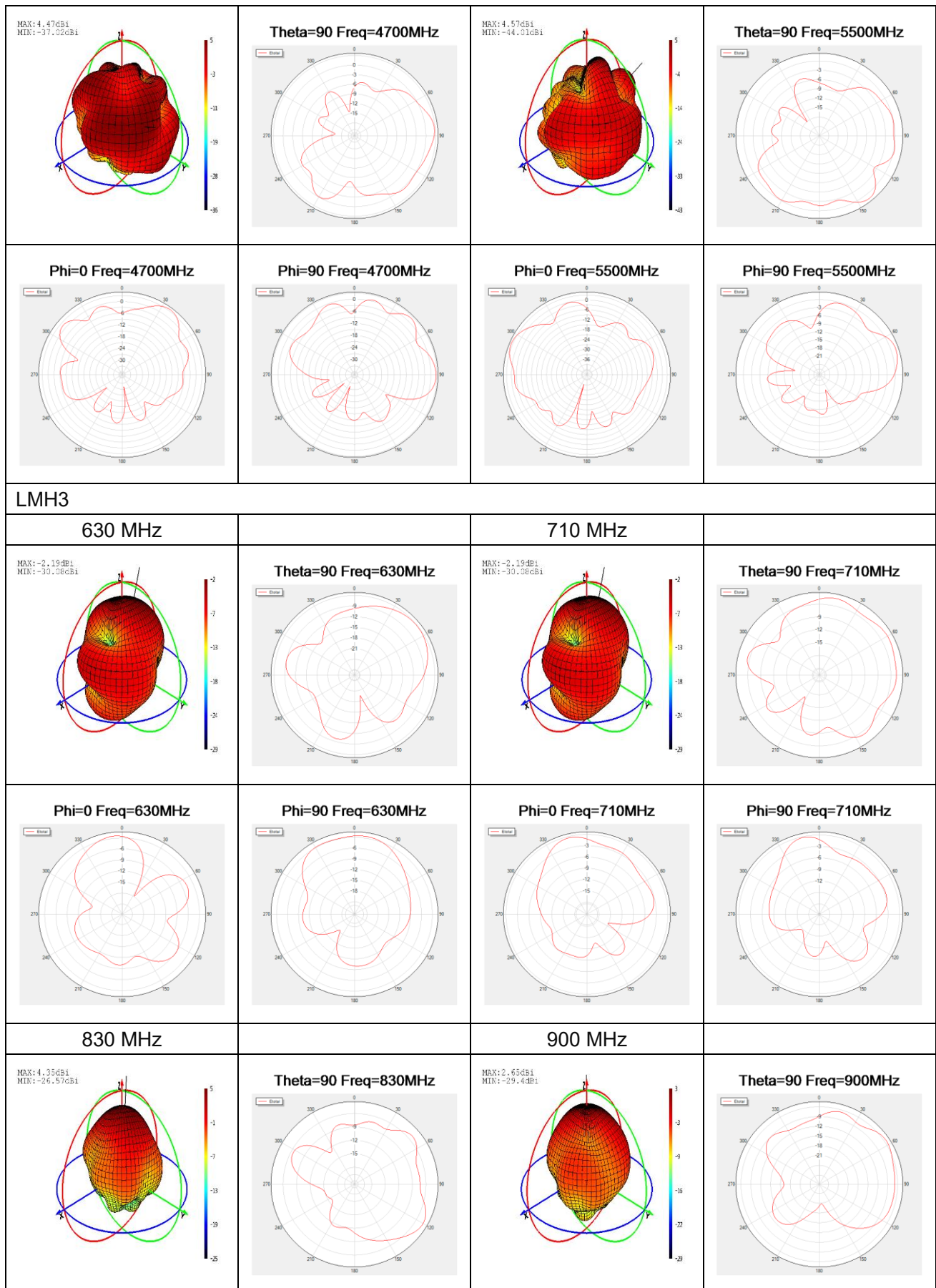


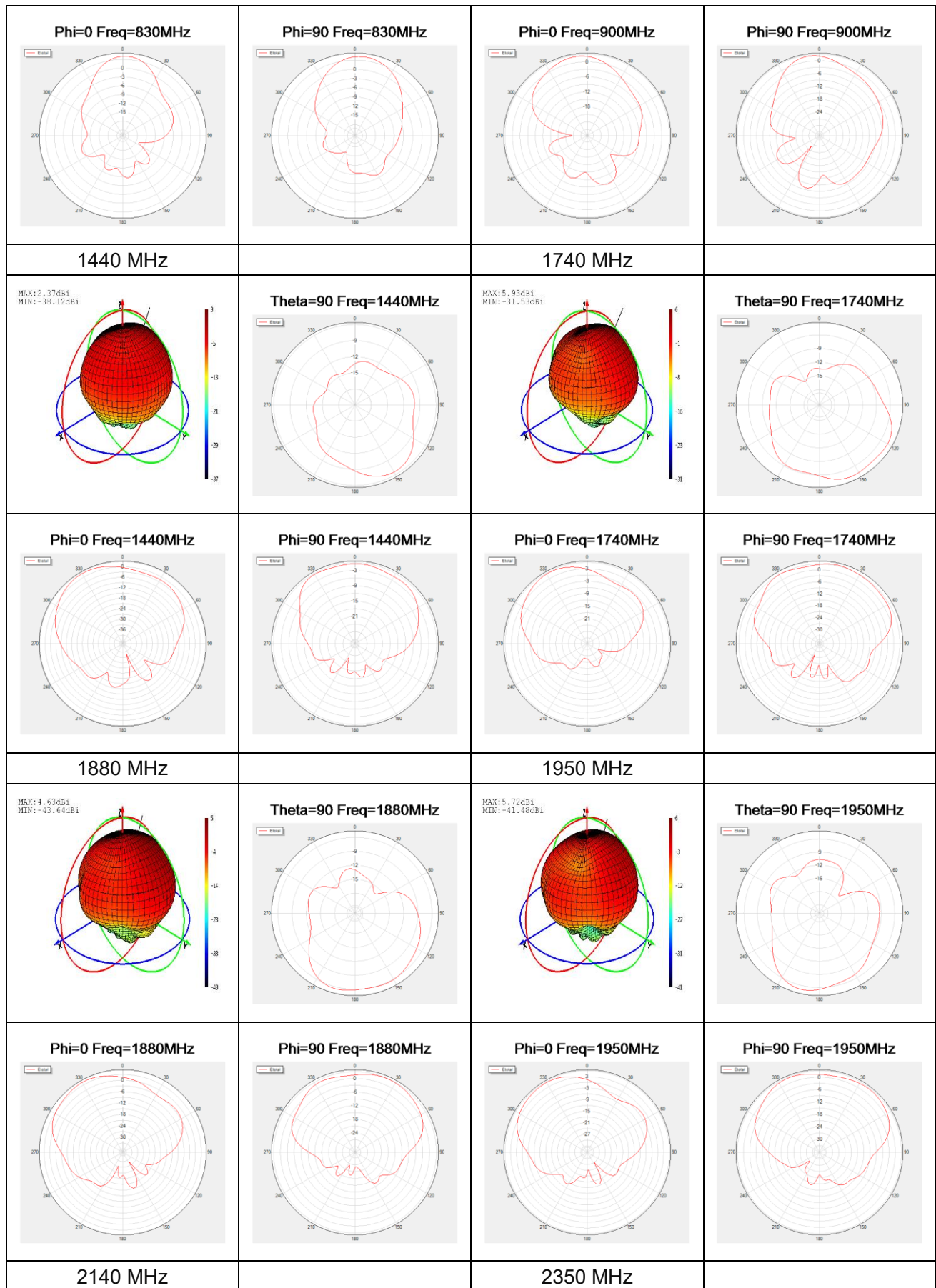


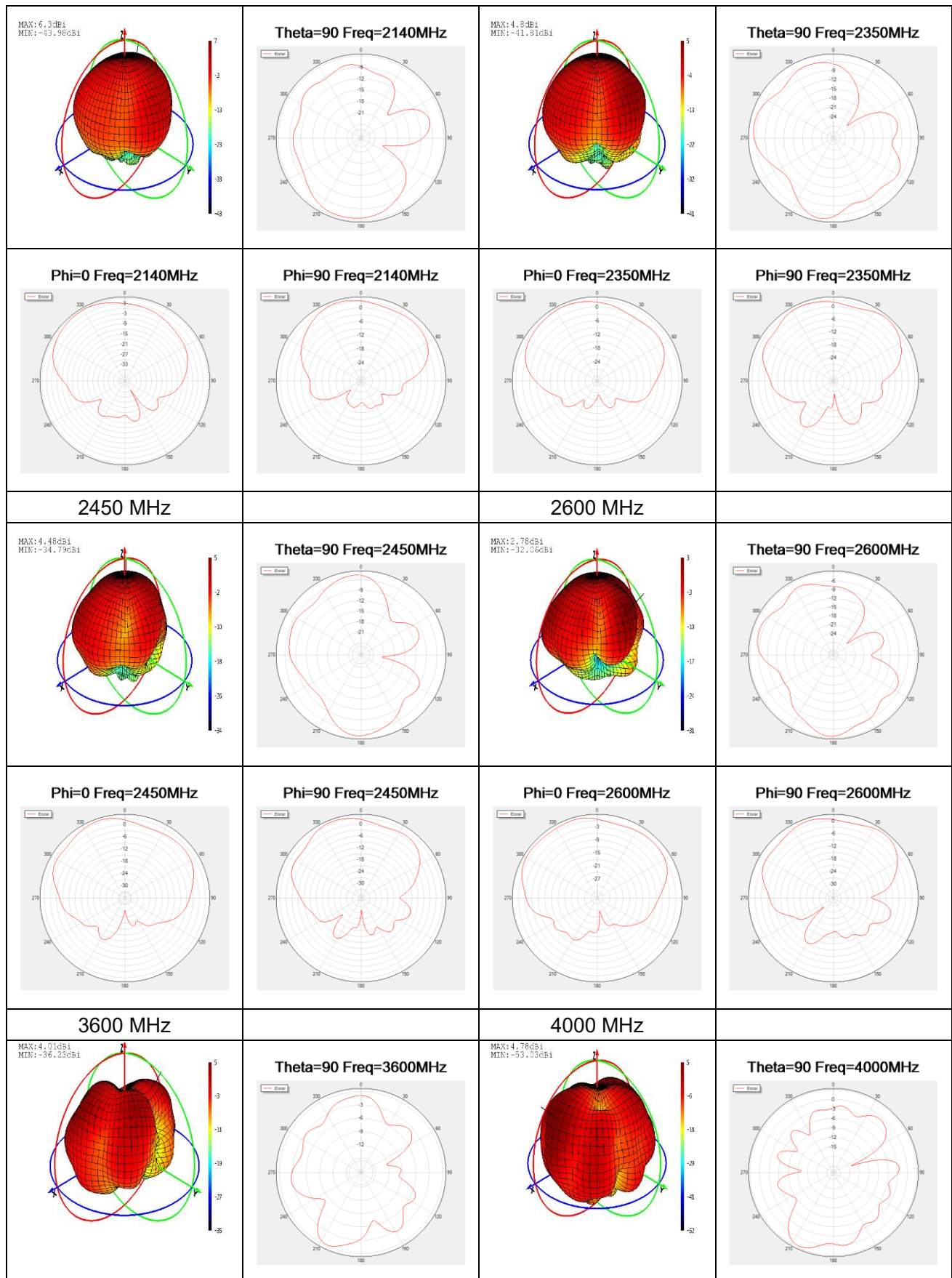


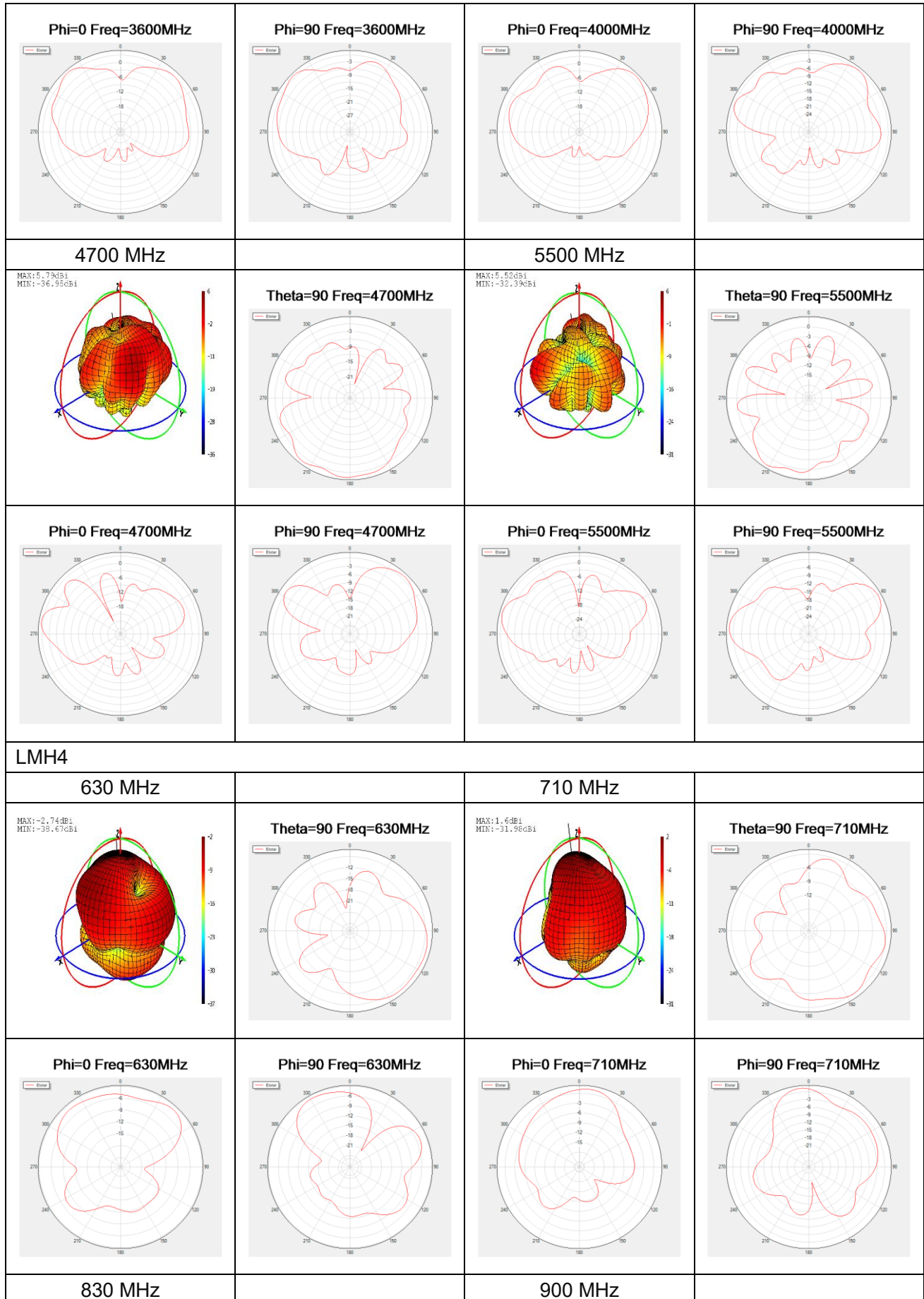


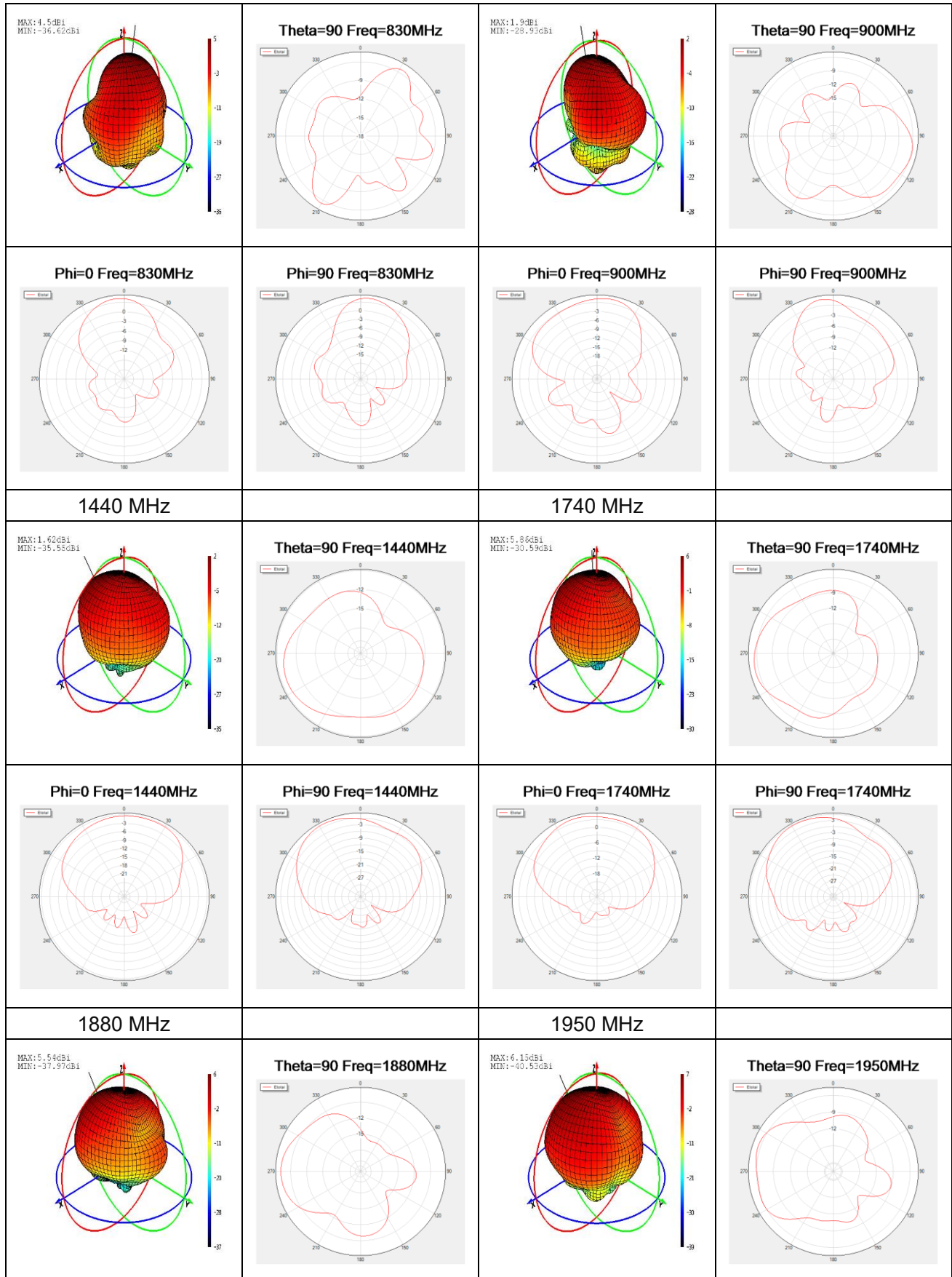


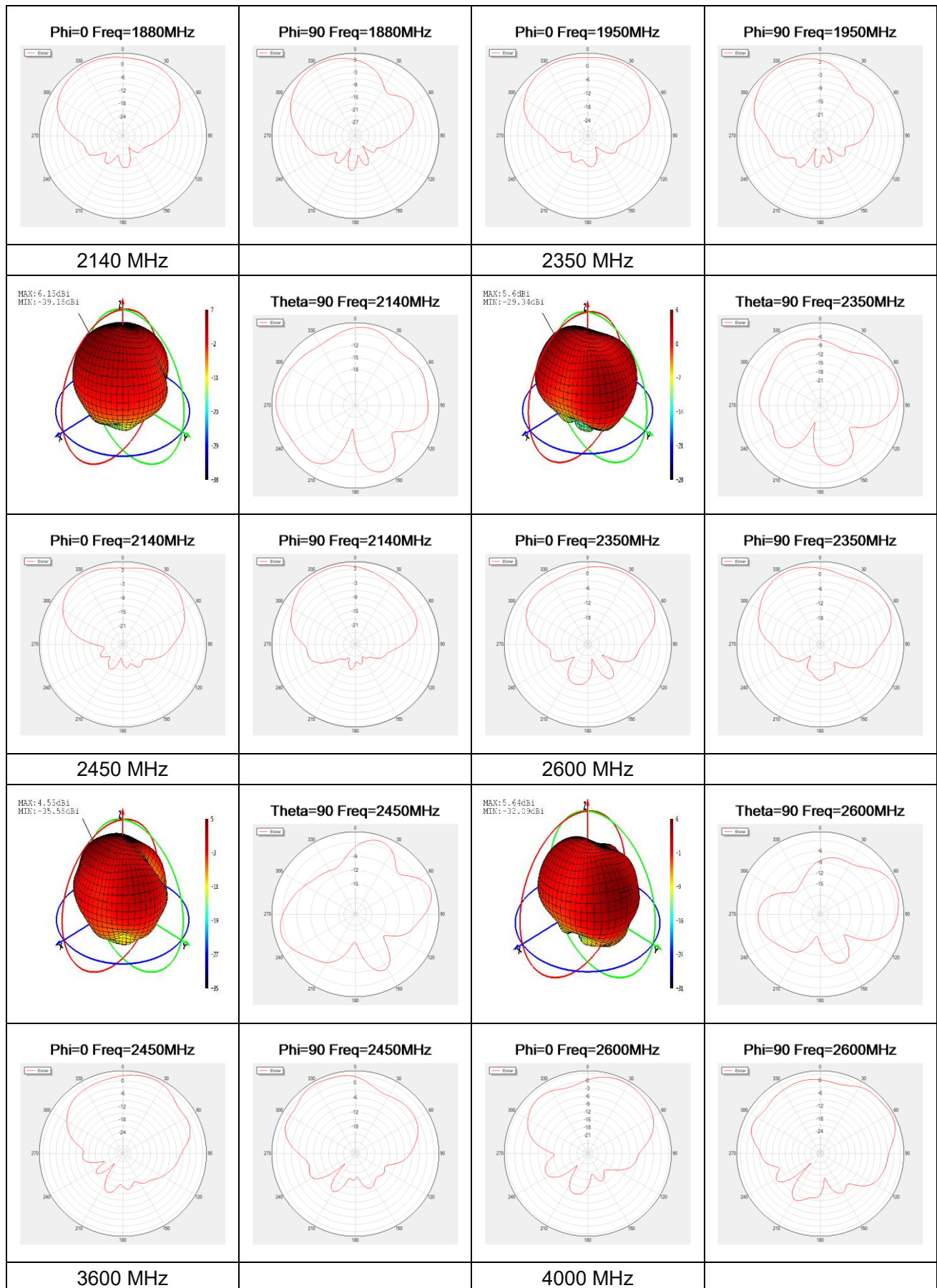


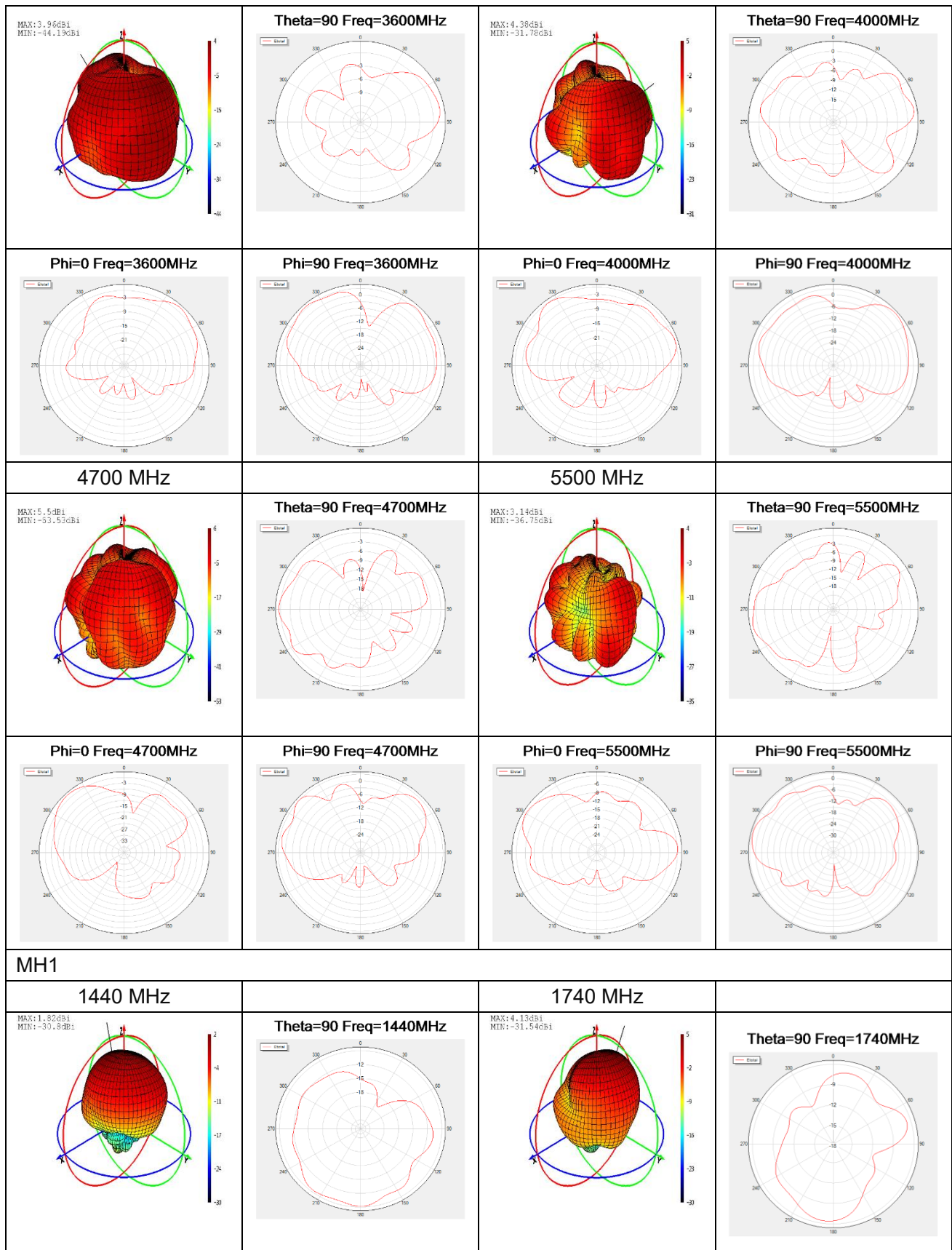


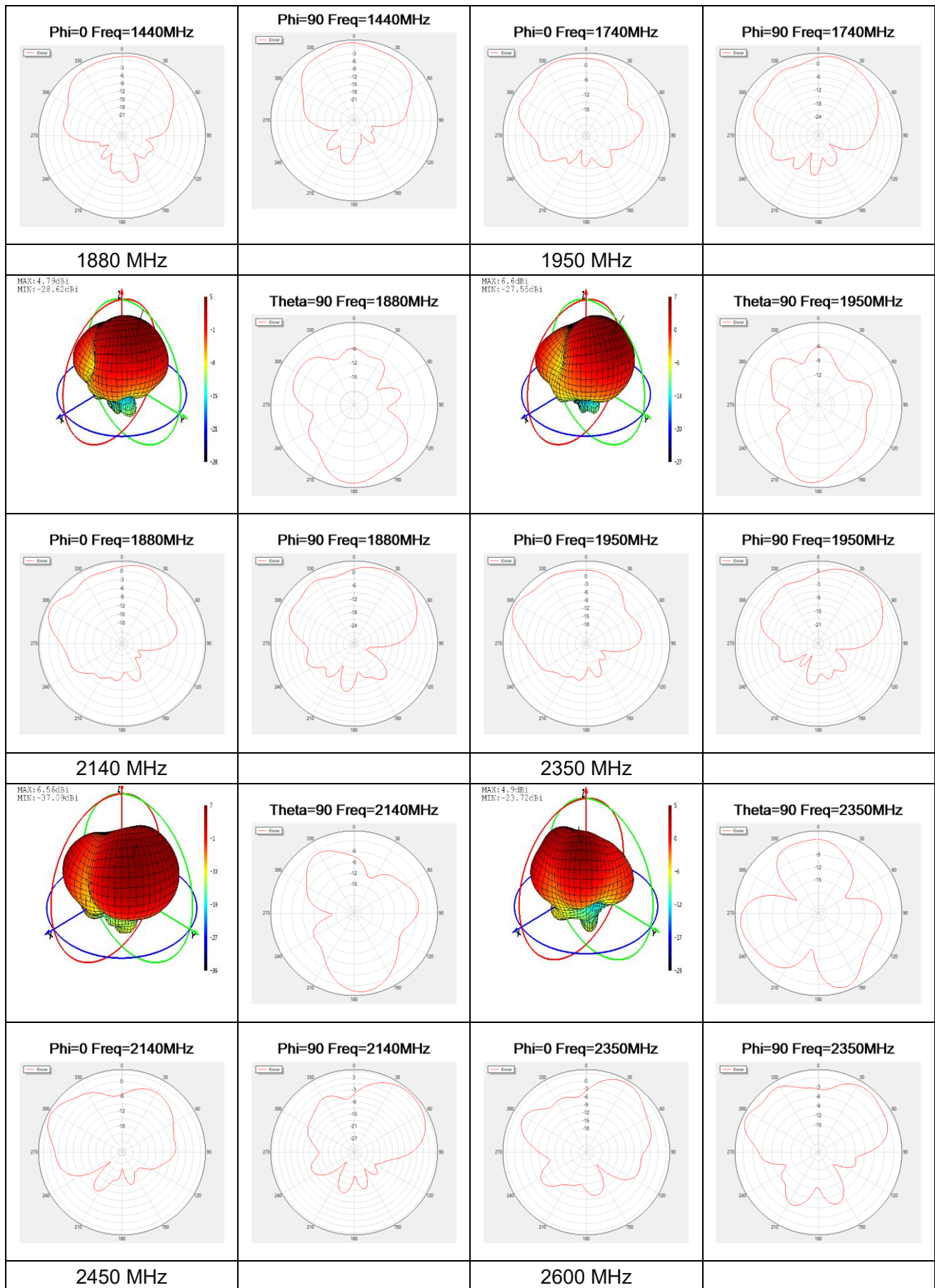


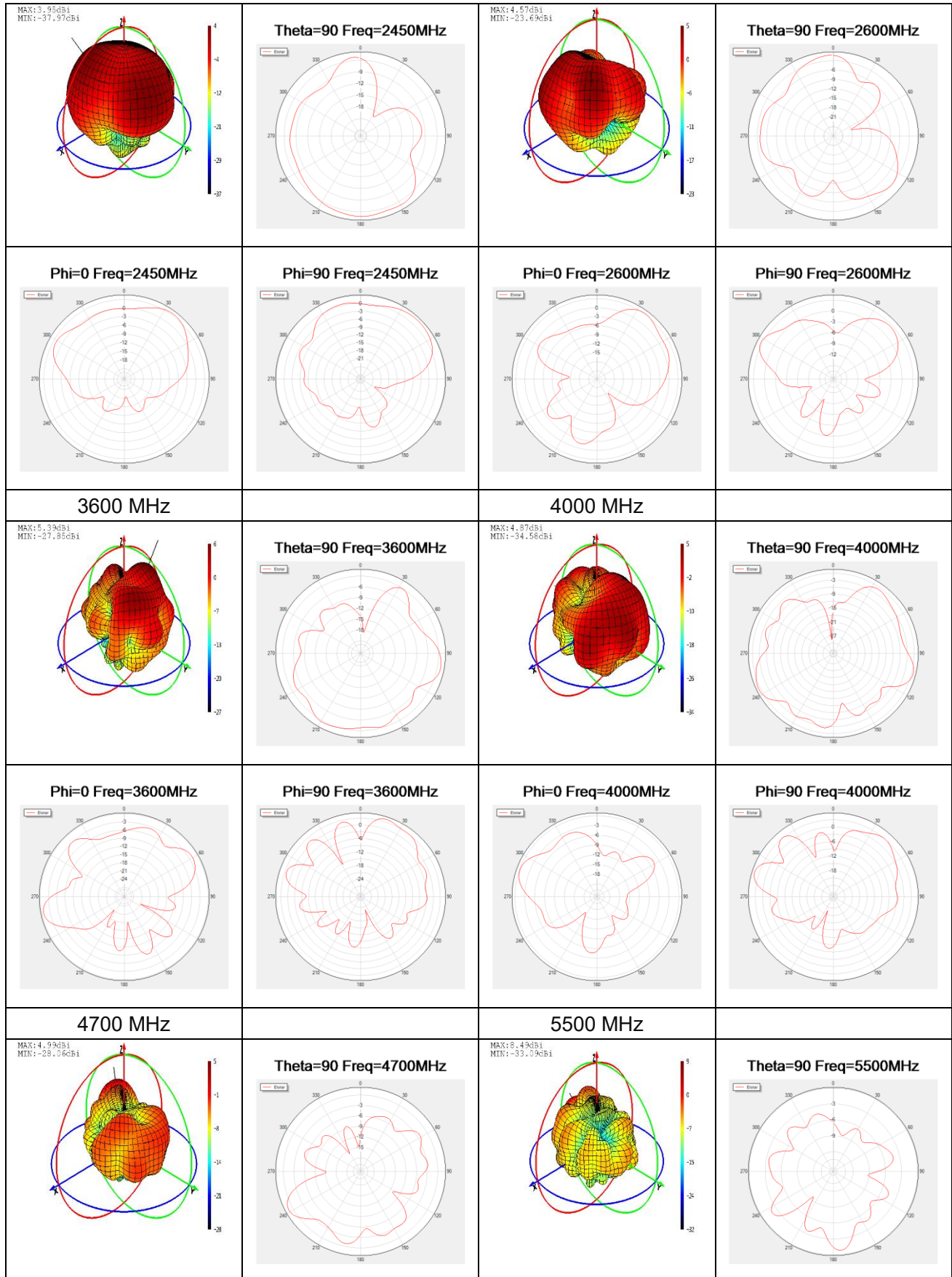


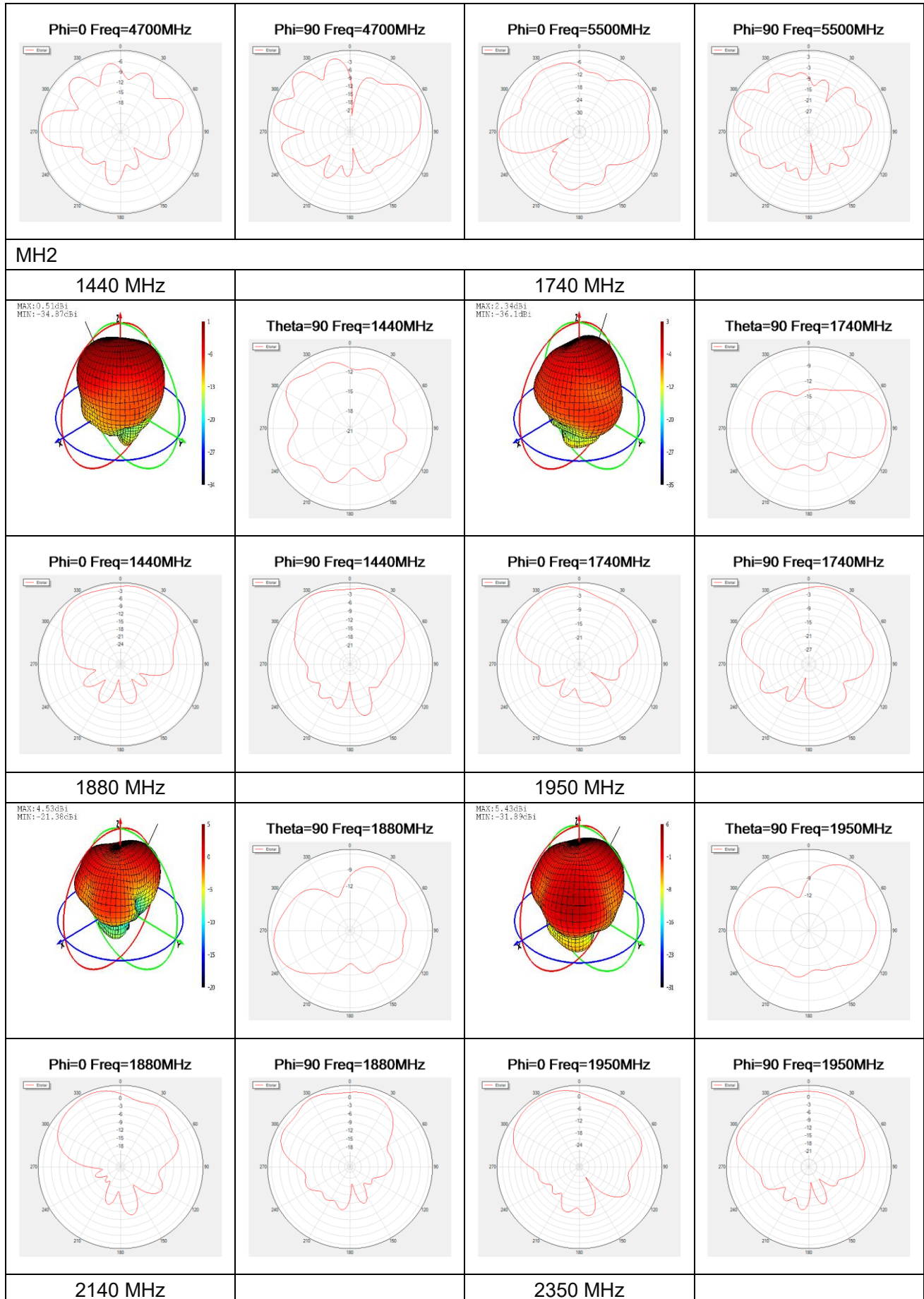


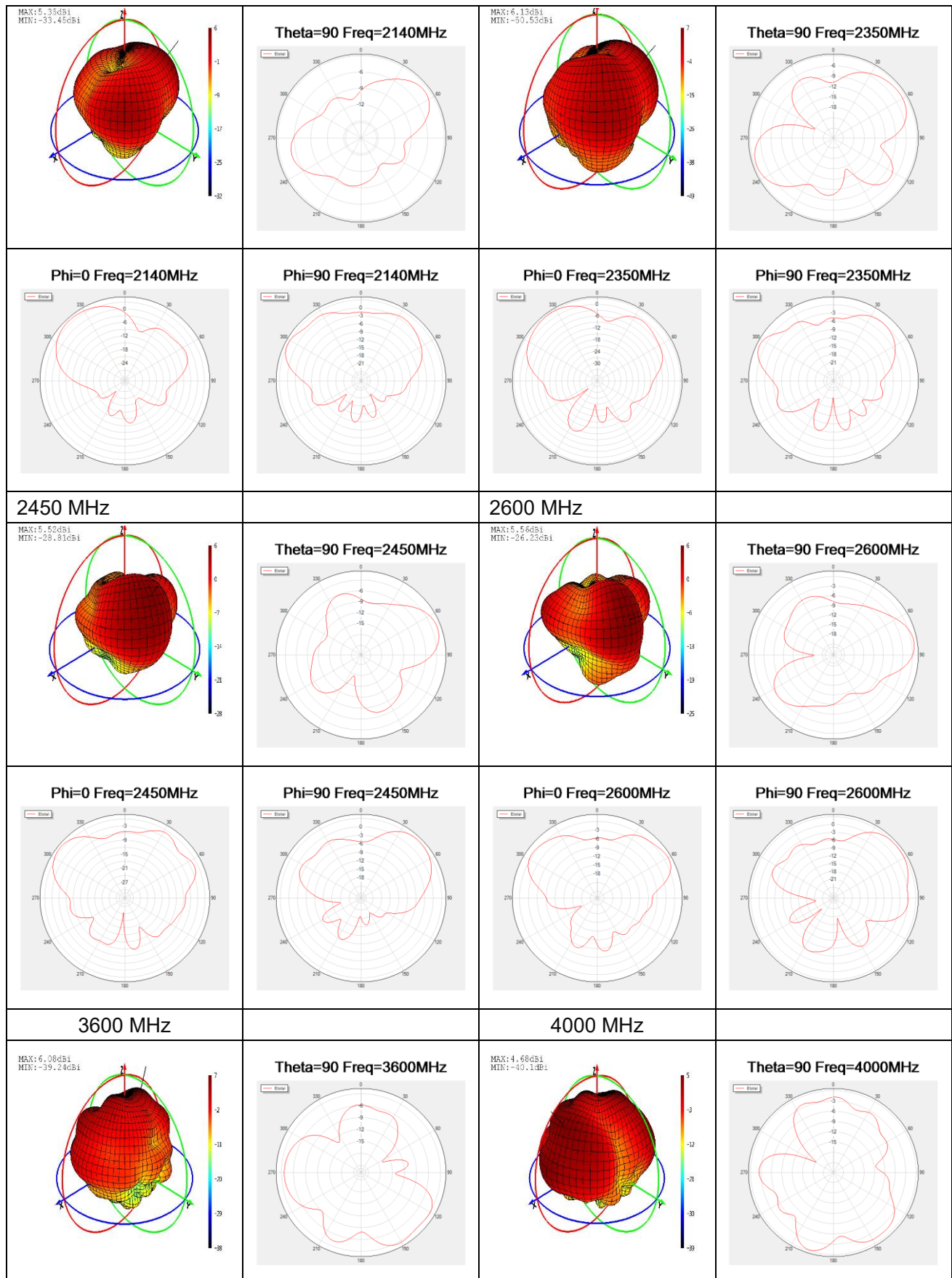


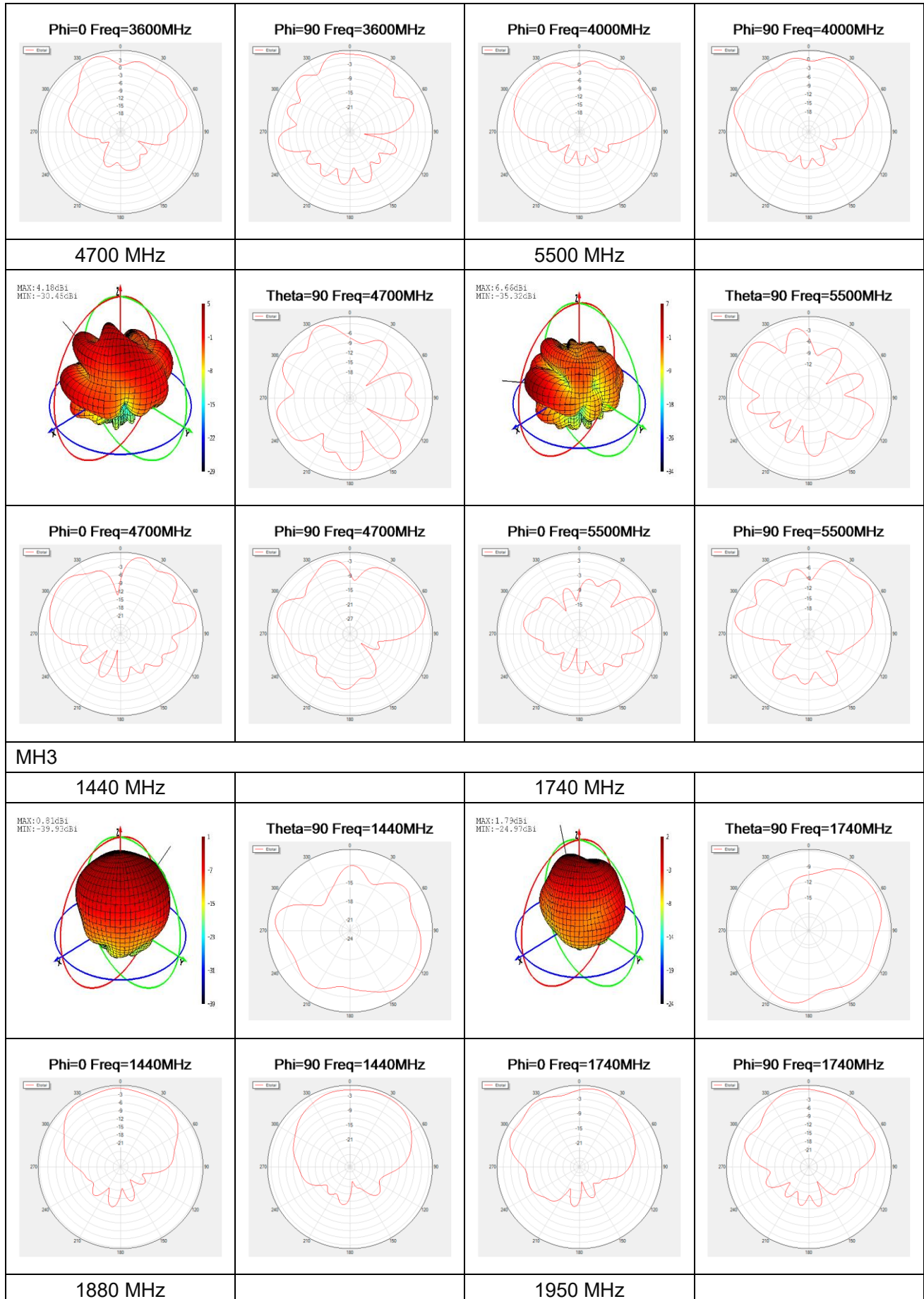


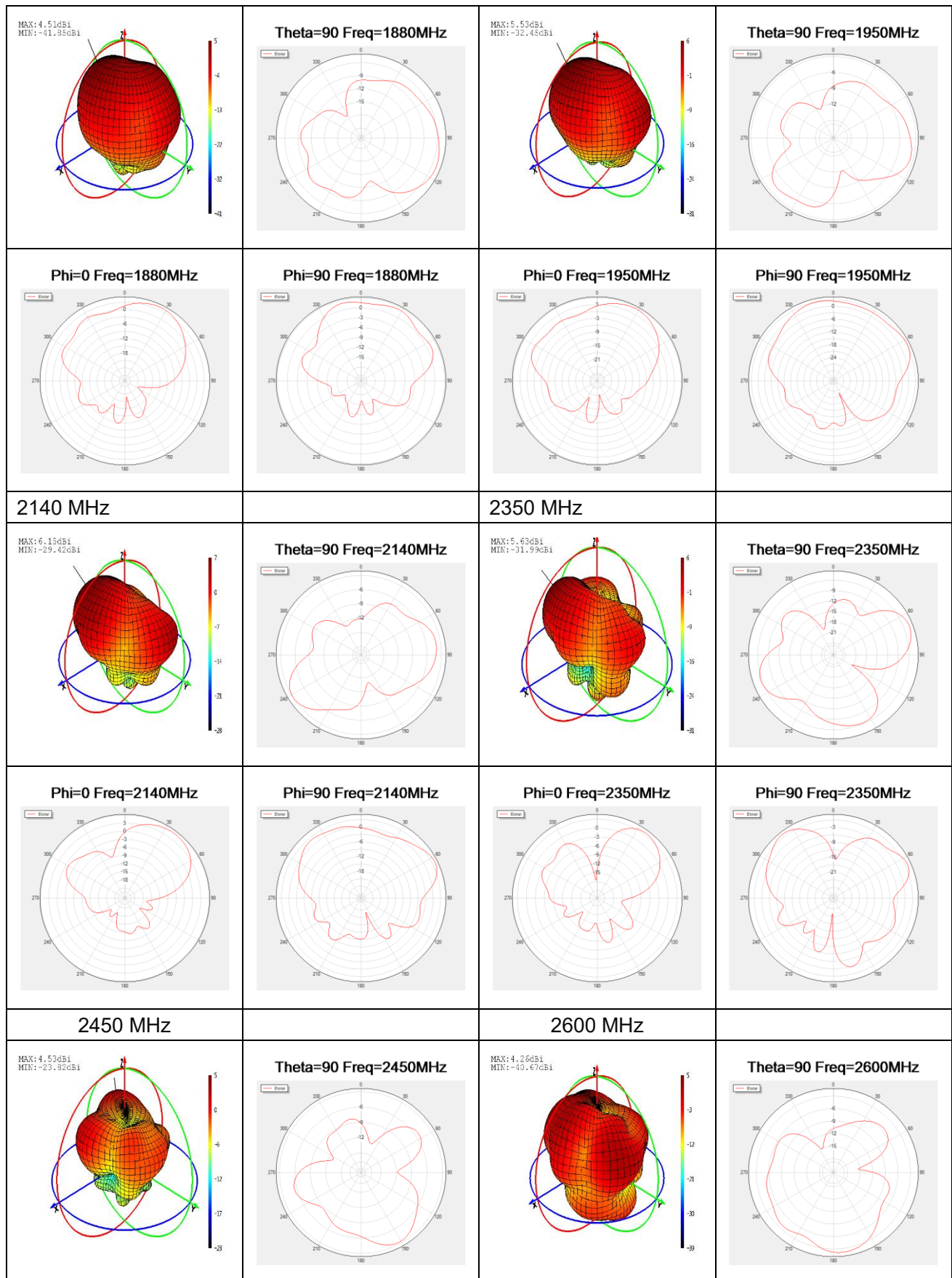


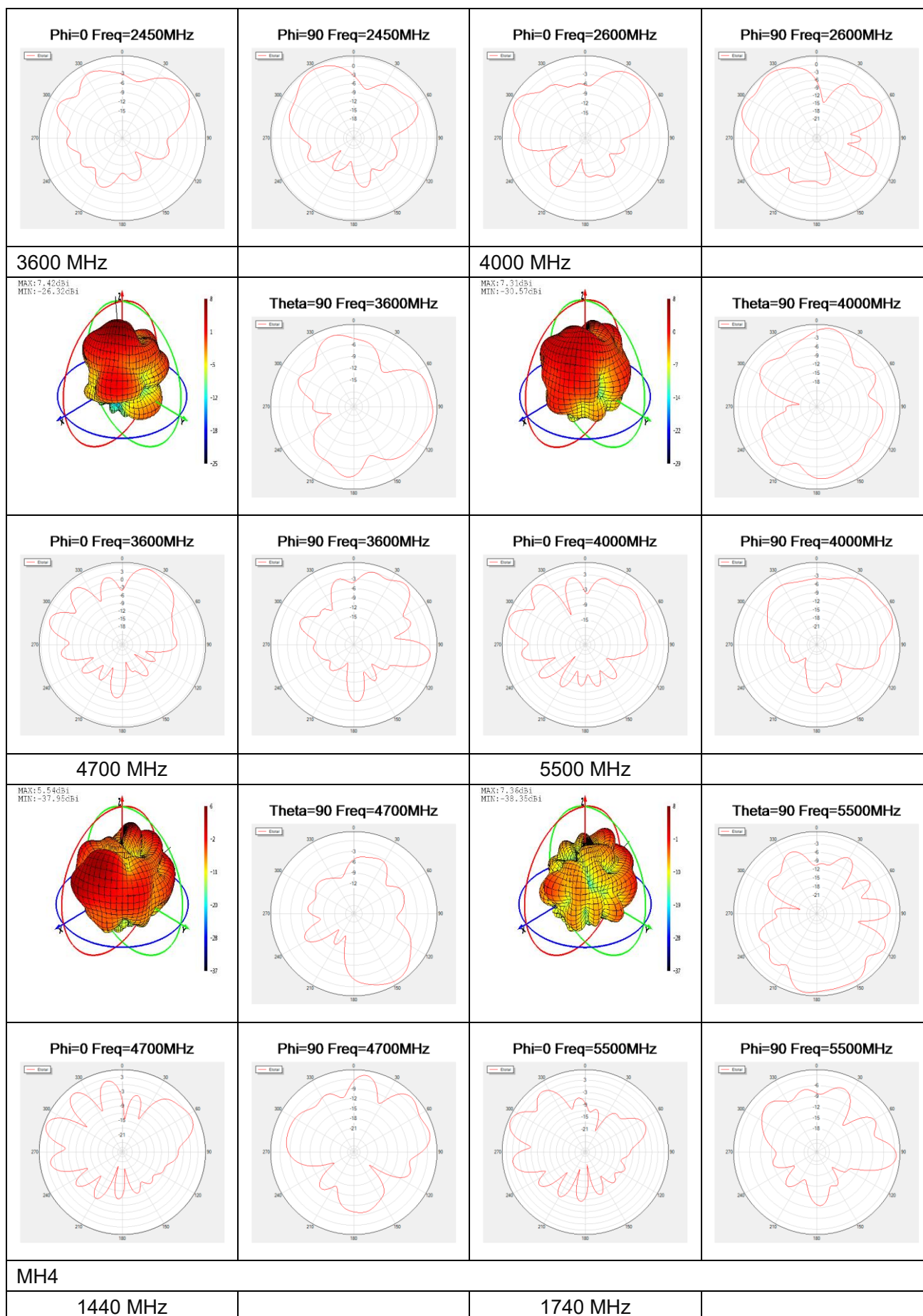


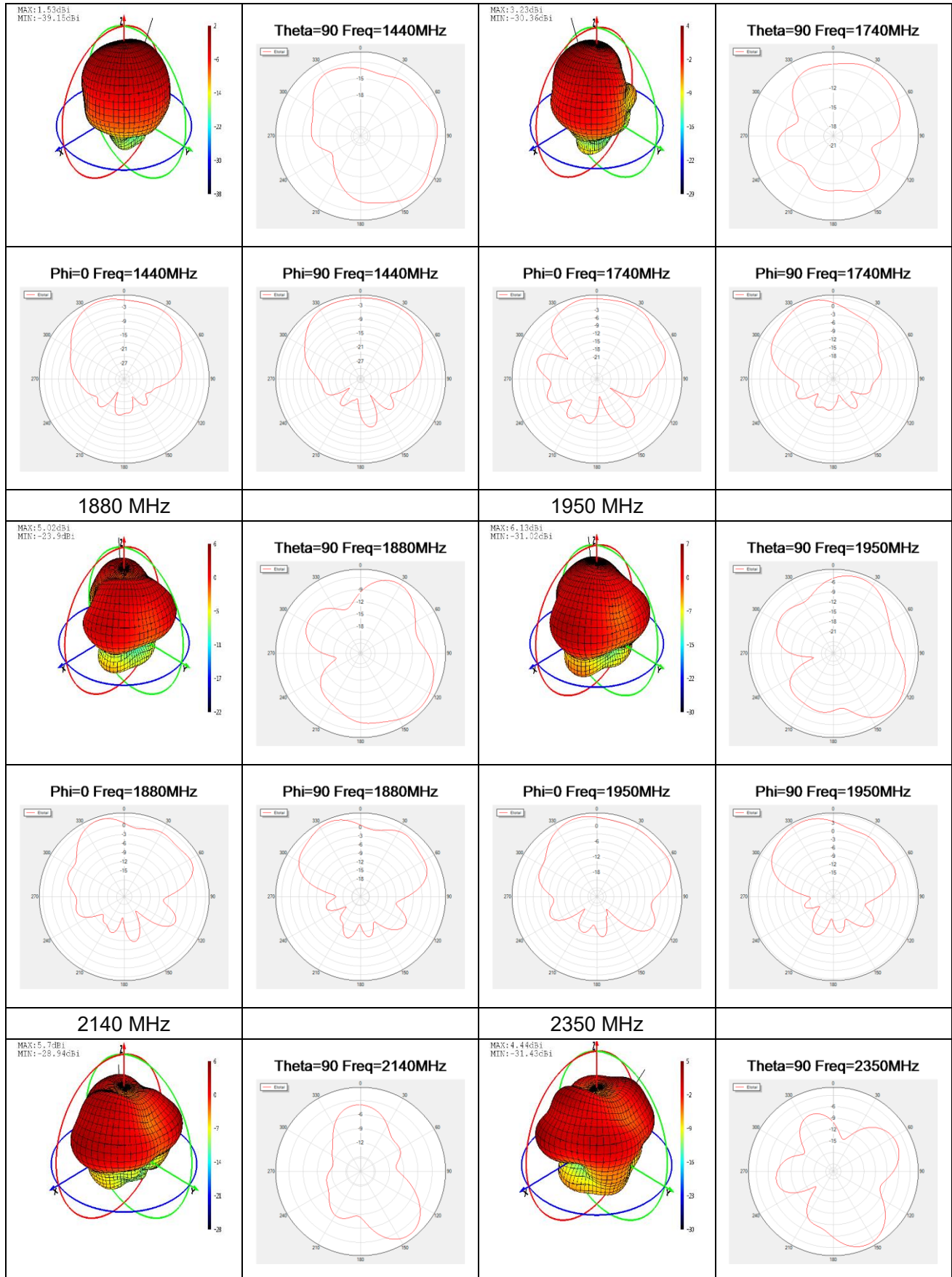


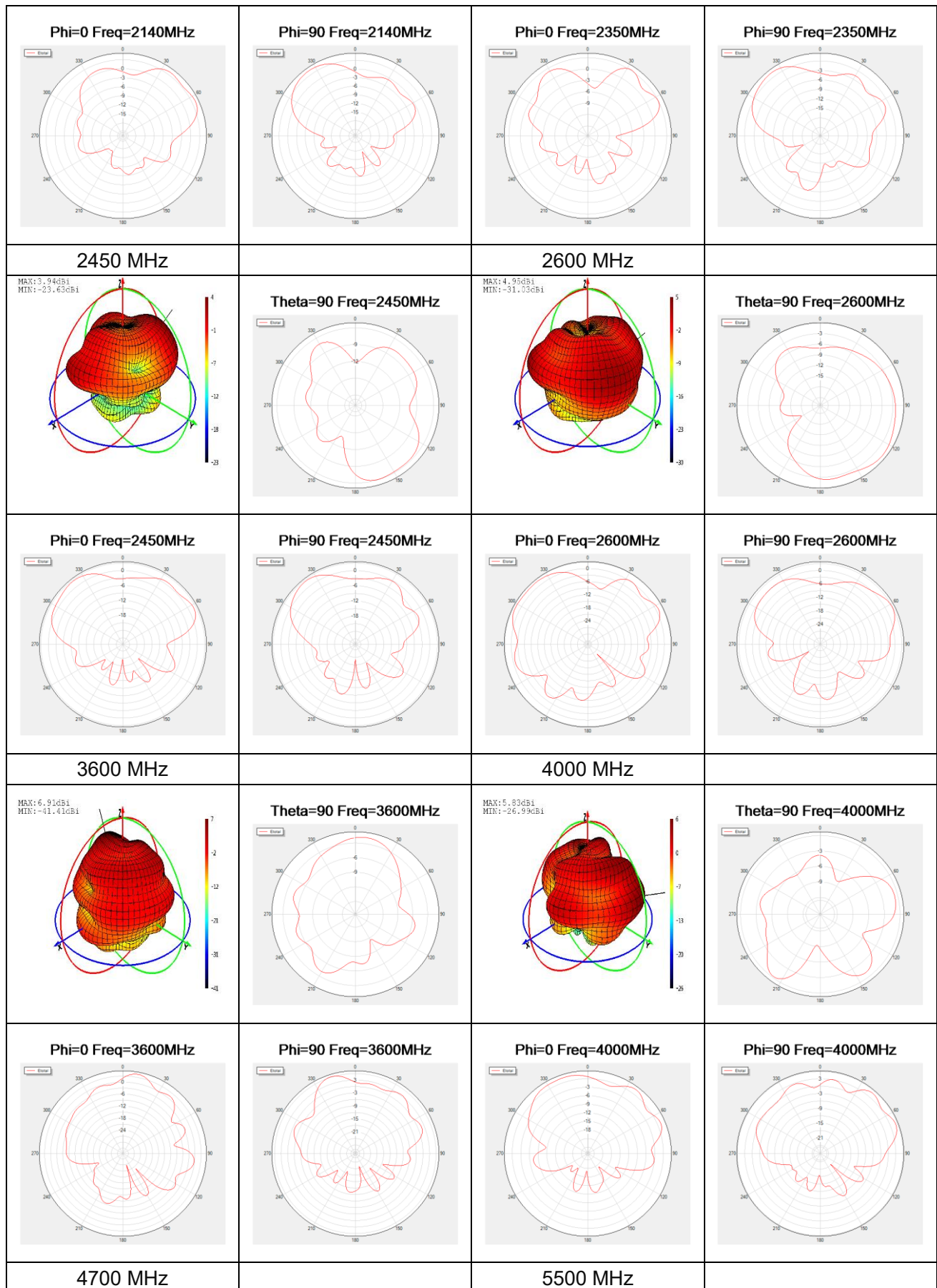


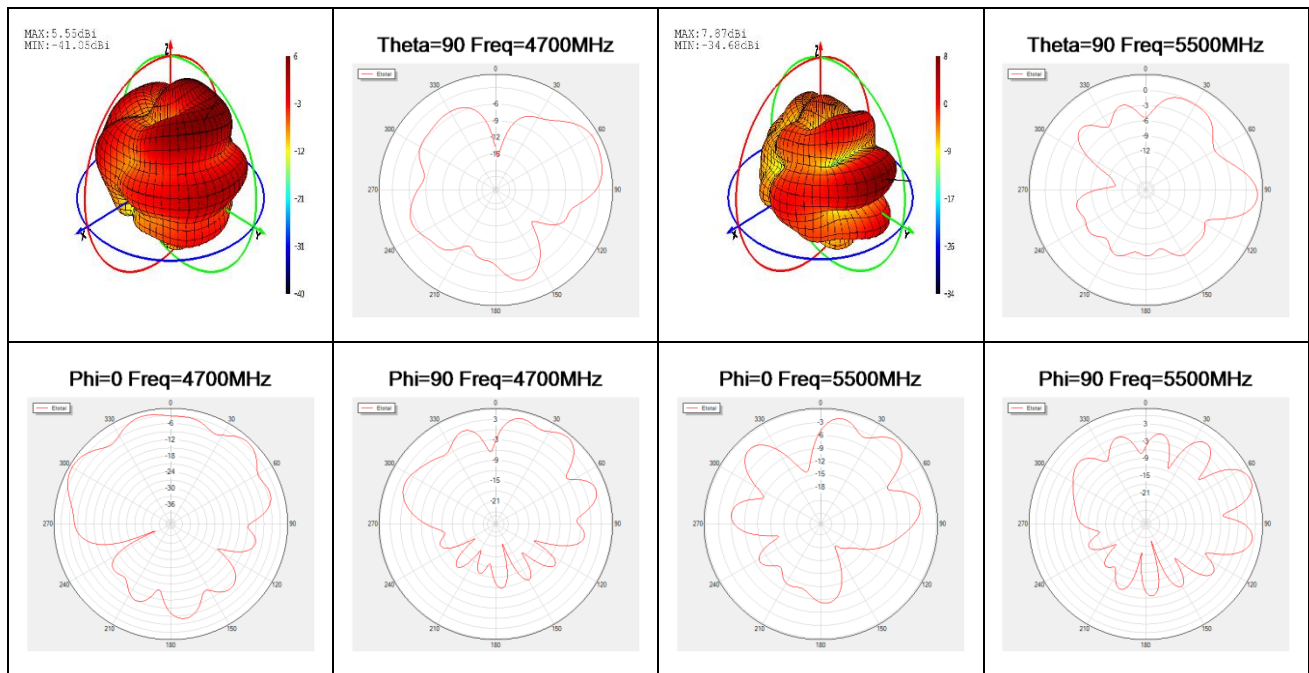












3.3. Active OTA Test

- Based on Module: RG502Q-EA & RG500L-NA
- Test Status: In Free Space

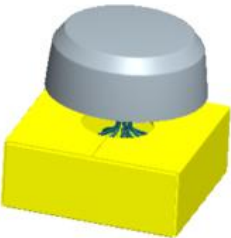
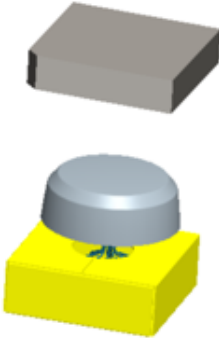
Band		Channel	TRP (dBm)	Channel	TIS (dBm)
LTE	B1 (10M)	18050	20.2	50	-102.7
		18350	19.9	350	-101.7
		18550	19.6	550	-102.1
	B2 (10M)	18650	19.0	650	-101.4
		18900	19.6	900	-101.8
		19150	19.8	1150	-101.4
	B3 (10M)	19250	21.1	1250	-100.4
		19575	20.1	1575	-100.9
		19900	20.7	1900	-100.1
	B4 (10M)	20000	20.5	2000	-102.7
		20175	20.6	2175	-102.6
		20350	20.9	2350	-102.0

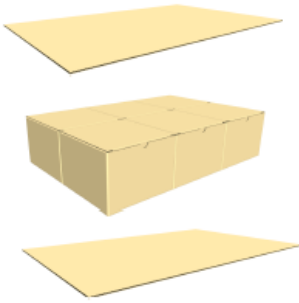
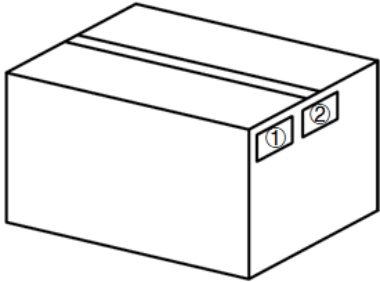
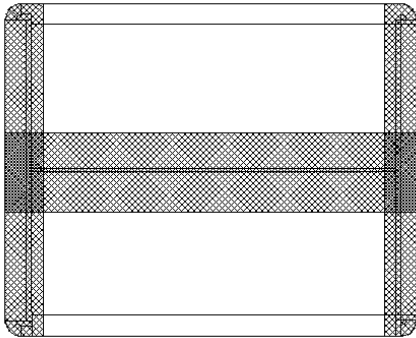
Band		Channel	TRP (dBm)	Channel	TIS (dBm)
	B5 (10M)	20450	19.3	2450	-96.8
		20525	19.4	2525	-96.6
		20600	19.2	2600	-96.9
	B7 (10M)	20800	19.1	2800	-98.3
		21100	20.0	3100	-99.8
		21400	20.7	3400	-100.8
	B8 (10M)	21500	20.0	3500	-97.4
		21625	20.3	3625	-97.7
		21750	20.2	3750	-98.2
	B12 (5M)	23035	19.0	5035	-98.5
		23095	19.2	5095	-97.3
		23155	19.9	5155	-96.1
	B13 (10M)	-	-	-	-
		23230	19.3	5230	-96.2
		-	-	-	-
	B14 (10M)	-	-	-	-
		23330	19.0	5330	-95.0
		-	-	-	-
	B17 (10M)	23780	18.4	5780	-95.9
		23790	18.6	5790	-95.7
		23800	18.6	5800	-95.3
	B18 (10M)	23900	20.4	5900	-97.9
		23925	19.7	5925	-97.8
		23950	19.1	5950	-97.7
	B19 (10M)	24050	19.7	6050	-97.0

Band		Channel	TRP (dBm)	Channel	TIS (dBm)
		24075	20.4	6075	-97.3
		24100	20.2	6100	-97.3
	B20 (10M)	24200	20.0	6200	-96.9
		24300	19.6	6300	-97.2
		24400	19.7	6400	-97.3
	B25 (10M)	26090	19.4	8090	-100.2
		26365	19.7	8365	-99.8
		26640	19.0	8640	-99.4
	B26 (10M)	26740	18.9	8740	-99.1
		26865	19.3	8865	-97.6
		26990	20.6	8990	-98.9
	B28 (10M)	27260	19.2	9260	-96.1
		27335	19.6	9335	-96.6
		27410	18.8	9410	-97.1
	B38 (20M)	37850	20.1	37850	-97.6
		38000	21.7	38000	-97.5
		38150	22.3	38150	-97.6
	B39 (20M)	38350	20.1	38350	-98.3
		38450	20.2	38450	-98.3
		38550	20.2	38550	-98.6
	B40 (20M)	38750	21.4	38750	-97.9
		39150	21.0	39150	-98.4
		39550	20.3	39550	-98.2
	B41 (20M)	40340	20.5	40340	-97.3
		40620	20.9	40620	-97.4

Band		Channel	TRP (dBm)	Channel	TIS (dBm)
	B66 (10M)	41140	20.1	41140	-97.2
		132022	20.4	66486	-101.8
		132322	20.1	66886	-102.1
		132622	19.5	67086	-101.7
	B71 (10M)	133172	19.9	68636	-96.0
		133297	19.5	68761	-95.1
		133422	19.3	68886	-95.5
5G	N41 (100M)	509202	21.77	509202	-90.18
		518598	21.46	518598	-89.72
		528000	22.00	528000	-90.44
	N77 (100M)	623334	22.03	623334	-89.77
		650000	22.60	650000	-90.89
		676666	22.48	676666	-90.11
	N78 (100M)	623334	22.20	623334	-90.01
		636666	22.41	636666	-90.59
		650000	22.58	650000	-91.25
	N79 (100M)	697094	20.67	697094	-89.76
		713990	20.23	713990	-89.48
		729468	19.78	729468	-89.10

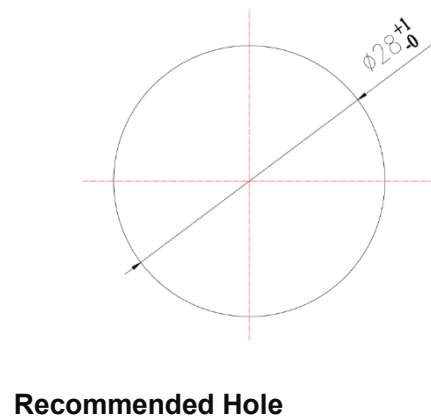
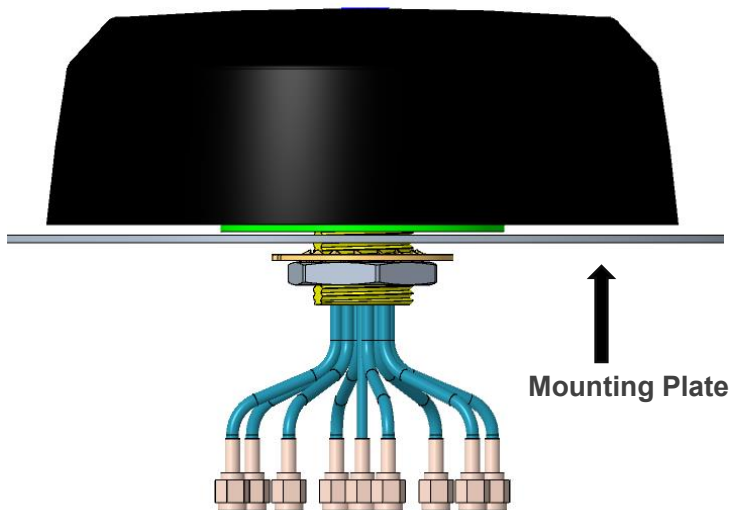
4 Packaging

Step	Packaging Picture / 2D Picture	Description
1	 Lined with cardboard	1 PCS: Antenna 1 PCS: Lined with Cardboard Size: 185 mm × 185 mm × 60 mm Arrange the antenna and put it in the lined cardboard
2	 EPE Pearl Foam Lined with cardboard	1 PCS: EPE Pearl Foam Size: 186 mm × 186 mm × 40 mm After placing the product, use EPE Pearl Foam on the upper layer
3	 Inner Box	1 PCS: Inner Box Size: 191 mm × 191 mm × 135 mm Place the antenna and lining cardboard in Inner Box

4	 Clapboard Inner Box Clapboard	1 PCS: Carton Size: 600 mm × 404 mm ×164 mm Antenna: 6 PCS / Carton 2 PCS: Clapboard Size: 588 mm ×392 mm Place 1 Clapboard on the bottom Then 6 pcs Antenna in the middle Then 1 pcs Clapboard on the top
5		Position for Attaching Labels ① Carton Label ② Quality Label
6		Sealing Cartons “I” type sealing cartons

5 Installation

- Recommended hole dimensions as below view.
- Recommended mounting plate thickness: 2–10 mm.



Installation Instructions					
Tube Mark	Tube Color	Cable	Connector	Frequency (MHz)	Technology
LMH	Red	ALS302	SMA Male	600–960 MHz, 1400–6000 MHz	5G/4G/3G/2G
MH	Black	ALS302	SMA Male	1400–6000 MHz	5G MIMO/WIFI/BT
GNSS	Blue	RG174	SMA Male	1164–1189 MHz, 1565–1606 MHz	GPS/GLONASS/GALILEO/BEIDOU/QZSS/IRNSS

- Note: YEMN926J1A (9IN1=4 x LMH+4 x MH+1 x GNSS)

6 Appendix Reference

Abbreviation	Description
5G	5th-Generation Mobile Communication Technology
4G	4th-Generation Mobile Communication Technology
3G	3rd-Generation Mobile Communication Technology
2G	2nd-Generation Mobile Communication Technology
GNSS	Global Navigation Satellite System
GLONASS	Global Navigation Satellite System (Russia)
GPS	Global Positioning System
QZSS	Quasi-Zenith Satellite System
IRNSS	Indian Regional Navigation Satellite System
LTE	Long Term Evolution
LTE-A	LTE-Advanced
NB-IoT	Narrow Band Internet of Things
LPWA	Low Power Wide Area
WCDMA	Wideband Code Division Multiple Access
GSM	Global System for Mobile Communications
WIFI	Wireless Fidelity
GND	Ground
LMH	Low-Middle-High Bands
LMHs	LMH antennas
MH	Middle-High Envelope Bands
MHs	MH antennas

FS	In Free Space
MP	On Metal Plane
VSWR	Voltage Standing Wave Ratio
S-Parameter	Scatter Parameter
LNA	Low Noise Amplifier
GPRS	General Packet Radio Service
WLAN	Wireless Local Area Network
HSPA	High-Speed Packet Access
RHCP	Right Hand Circularly Polarized
RoHS	Restriction of Hazardous Substances
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
IP	Ingress Protection
IK	Impact Protection
ECE R118	UN Regulation No. 118 (ECE R118-approved cables are flame-resistant cables)

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Revision History

Version	Date	Author	Note
-	2023-05-29	Mordecai LIU/ Junsen LI/ Hart HU/ David LIU/ Vinnie LIU	Creation of the document
1.0	2023-07-21	Mordecai LIU/ Junsen LI/ Hart HU/ David LIU/ Vinnie LIU	First official release
1.1	2023-10-20	Mordecai LIU/ Junsen LI/ Aria CHU	Update the data in the 5G section and working voltage. (Chapters 1.1.3 and 1.2).
1.2	2023-11-16	Hart HU	Updated the drawing (Chapter 2).
1.3	2024-01-30	Hart HU/ Vinnie LIU	Updated Housing Flame Rating and Housing UV Resistant (Chapter 1.3).
1.4	2024-06-22	Junsen LI/ Hart HU / David LIU/ Vinnie LIU	- Updated the overview. - Updated peak gain data, LNA gain data and working current (Chapter 1.1.3) - Added installation (Chapter 5). - Added appendix reference (Chapter 6).



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