

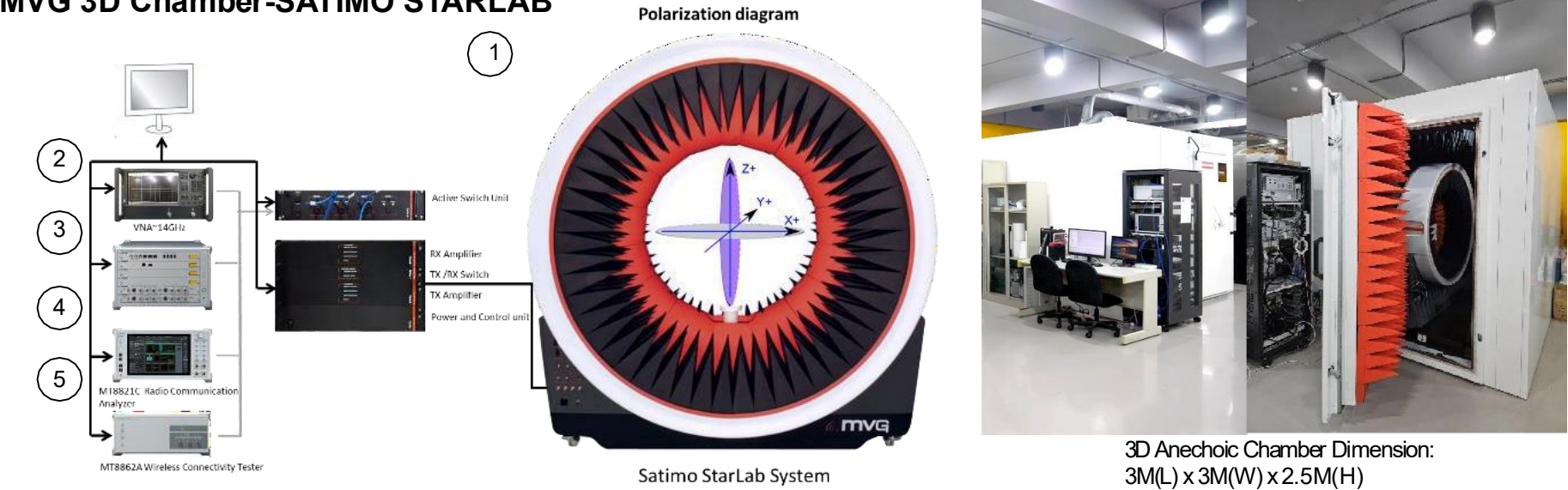
A2 Antenna Test Report –V2

Outlines

- Testing Environment P.3
- Antenna Placement P.4
- Performance summary – Isolation P.5
- VSWR P.6~P.14
- Efficiency / Peak Gain / Radiation Pattern P.15~P.40

Testing Environment

MVG 3D Chamber-SATIMO STARLAB



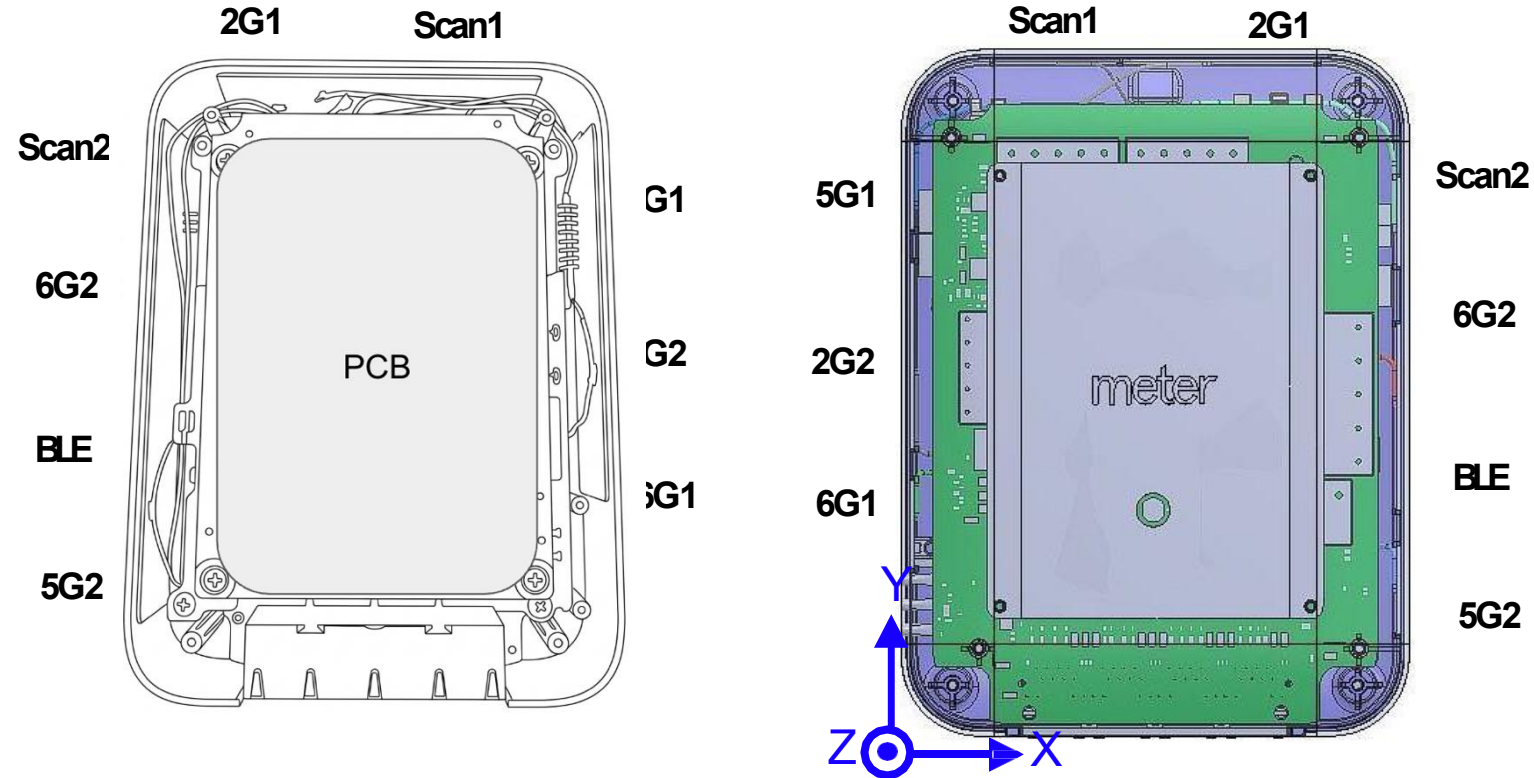
ITEM	DESCRIPTION	BRAND / Part number	CALIBRATION DATE
1	StarLab System	MVG	16/Apr/2025
2	Vector Network Analyzer	Keysight 5080B	01/Jan/2024
3	5G Radio Communication Station	Anritsu MT8000A	16/Dec/2024
4	4G Radio Communication Analyzer	MT8821C	16/Dec/2024
5	Wireless Connectivity Tester	MT8862A	06/Dec/2024

Antenna Placement

Antenna Definition and Distribution

Antenna: 2x2.4G + 2x5G + 2x6G+ 1x BLE+2x Scanning

NO	Antenna	Frequency(MHz)	OD 1.13 low loss cable length(mm)	cable color
ANT1	2G1	2400~2500 MHz	122	Gray
ANT2	2G2	2400~2500 MHz	54	Green
ANT3	5G1	5150~5850MHz	45	Black
ANT4	5G2	5150~5850MHz	180	Yellow
ANT5	6G1	5925~7125MHz	175	White
ANT6	6G2	5925~7125MHz	56	Blue
ANT7	Scan1	2400~2500 MHz 5150~7125MHz	72	Yellow
ANT8	Scan2	2400~2500 MHz 5150~7125MHz	103	Green
ANT9	BLE	2400~2500 MHz	40	Red

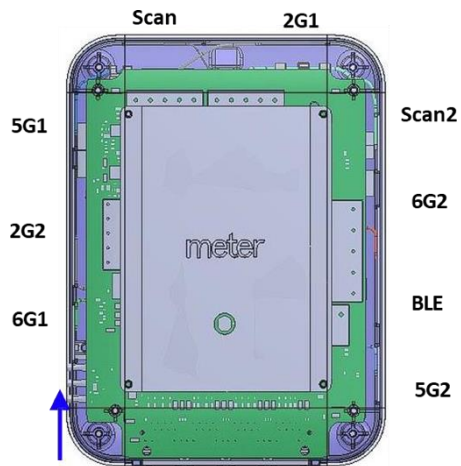
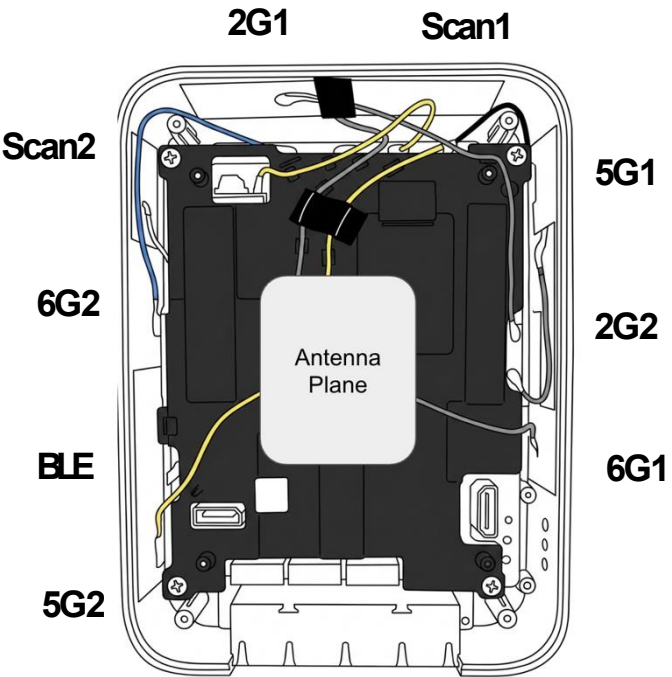


- Performance Summary

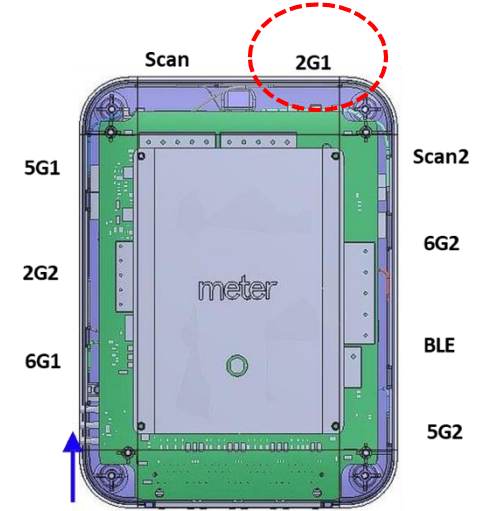
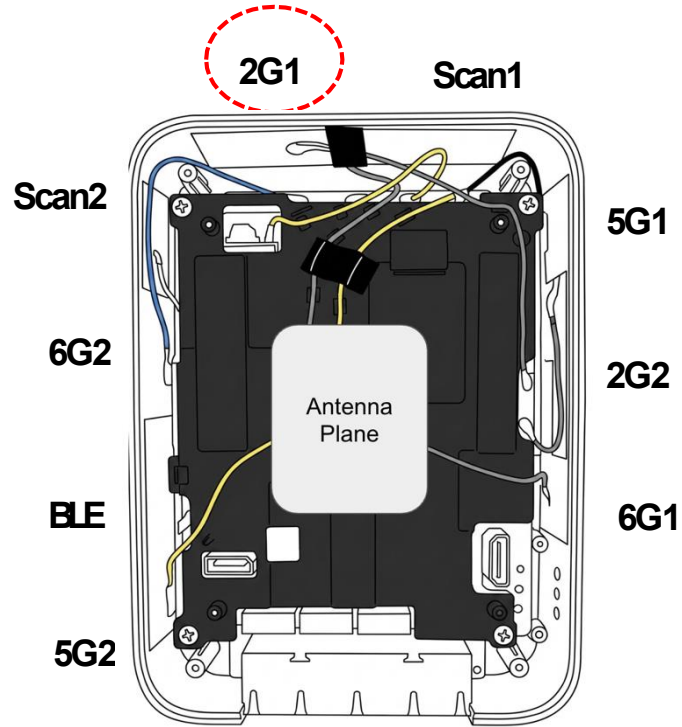
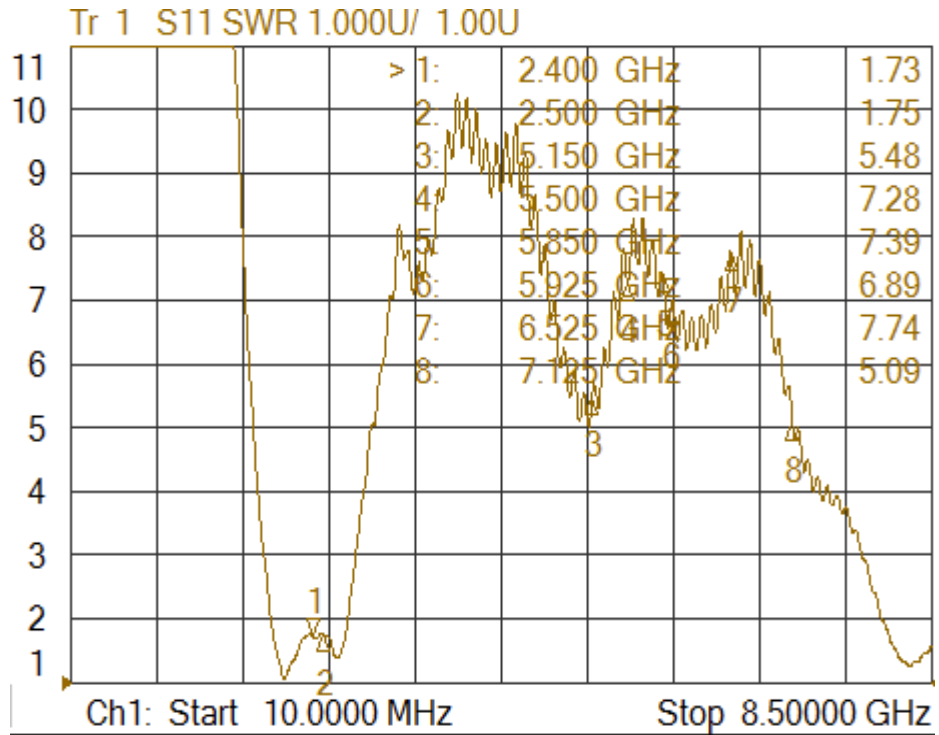
Isolation

Metal base

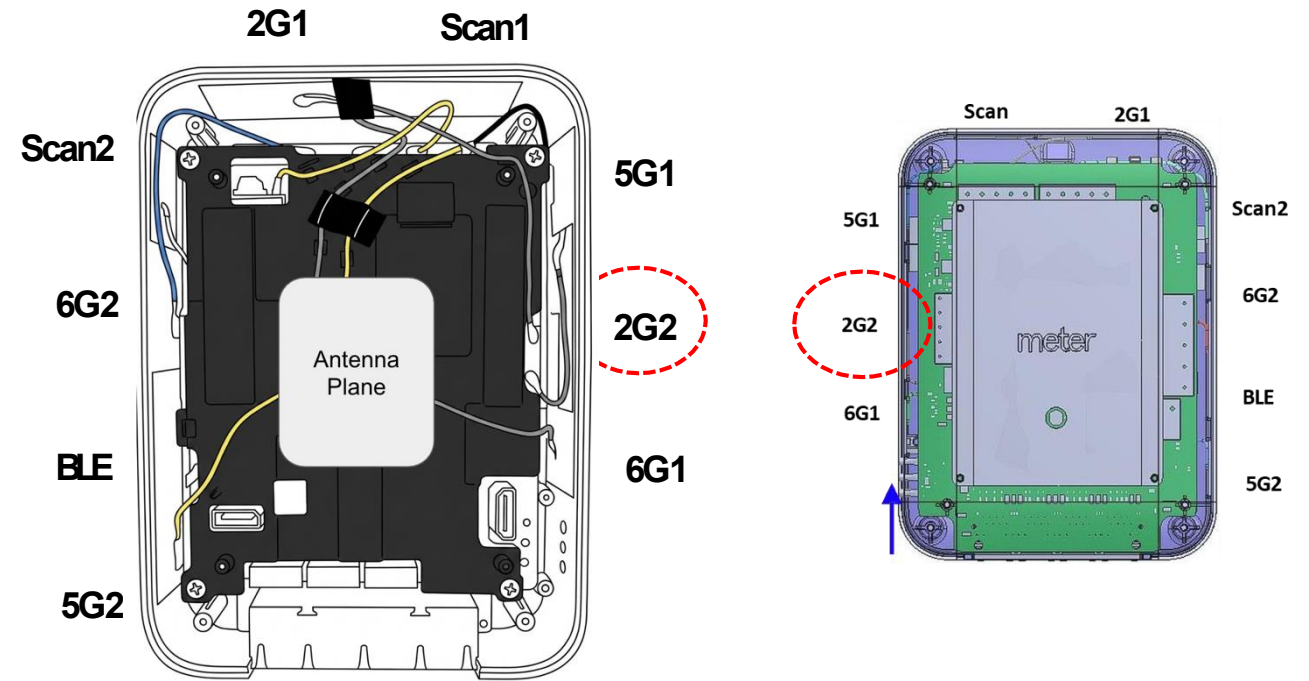
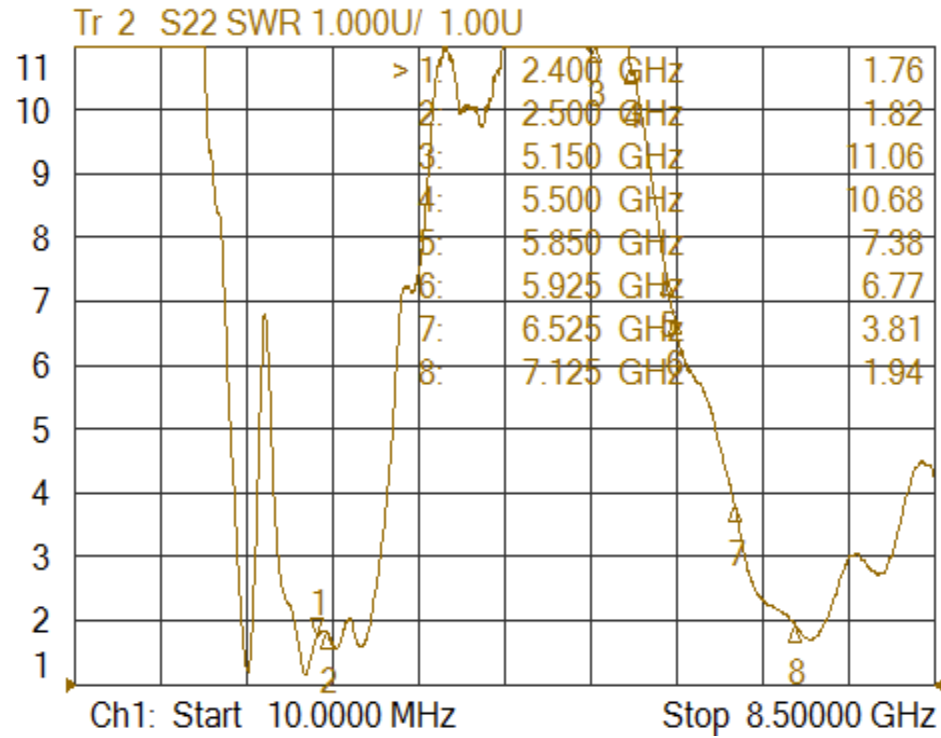
	2G1	2G2	5G1	5G2	6G1	6G2	SCAN1	SCAN2	BLE
2G1		20.2	20	30	35	23	16	10	18
2G2			19	33	20	37	-8	26	24
5G1				33	22	27	16	30	36
5G2					34	21	21	25	14
6G1						43	24	28	31
6G2							27	11	19
SCAN1								17	28
SCAN2									20



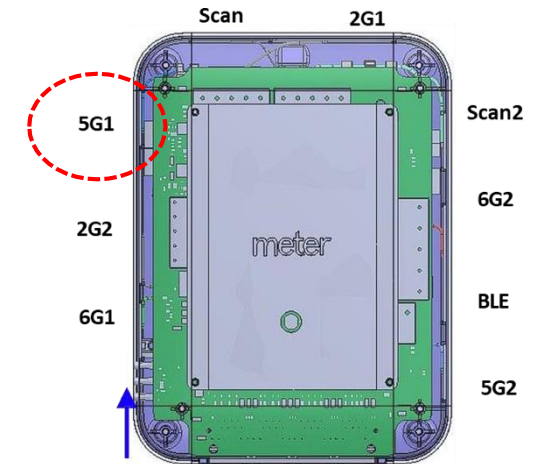
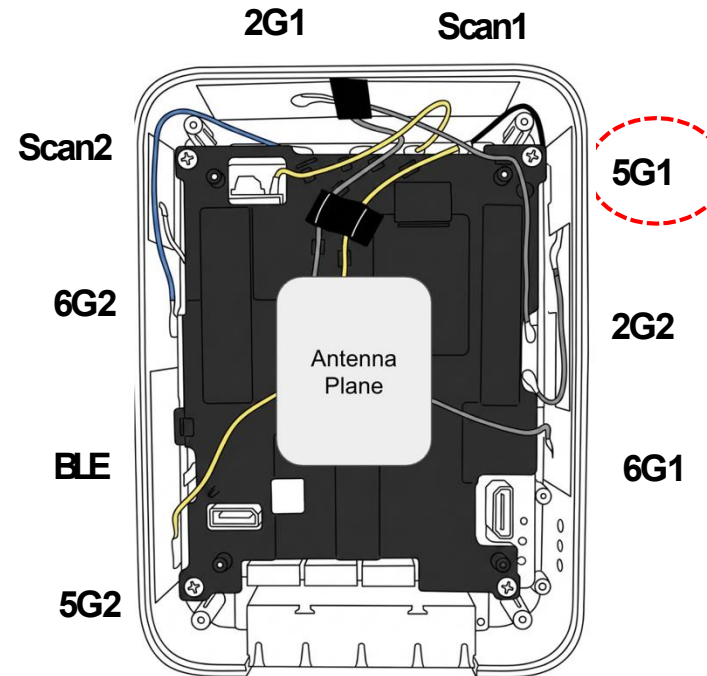
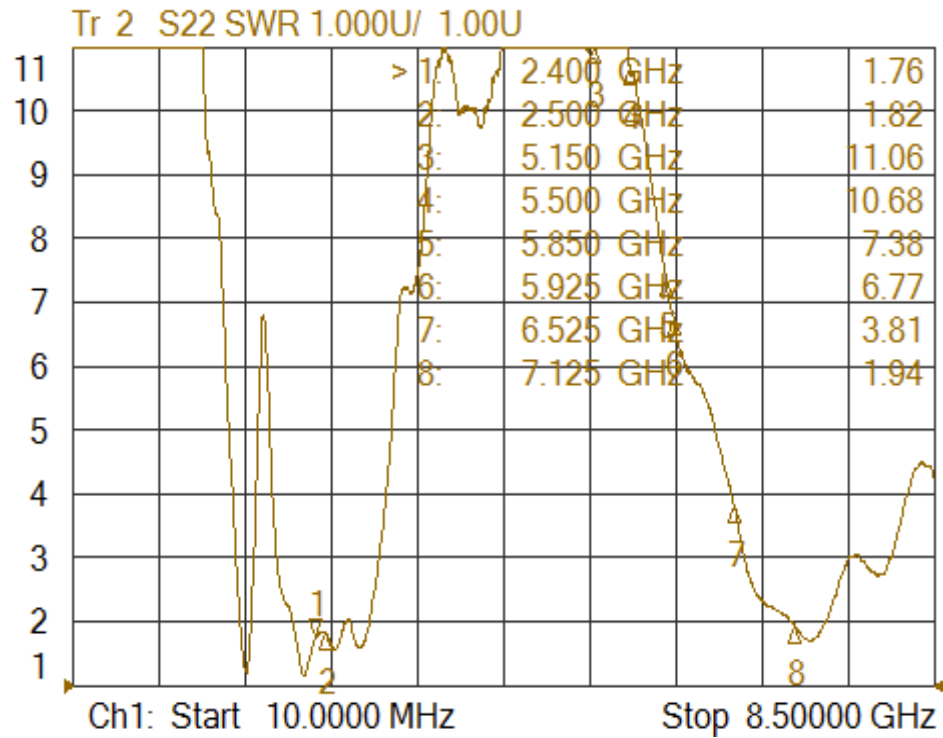
- Performance –VSWR-2G1



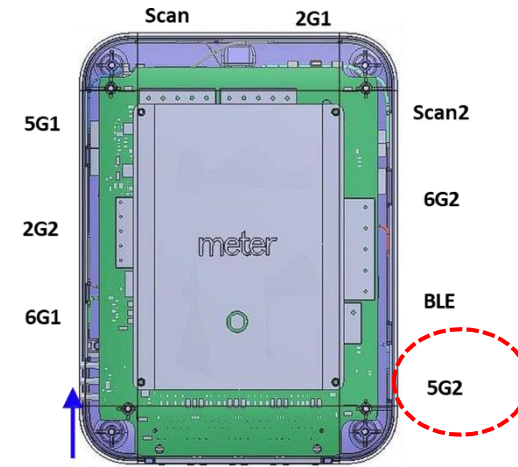
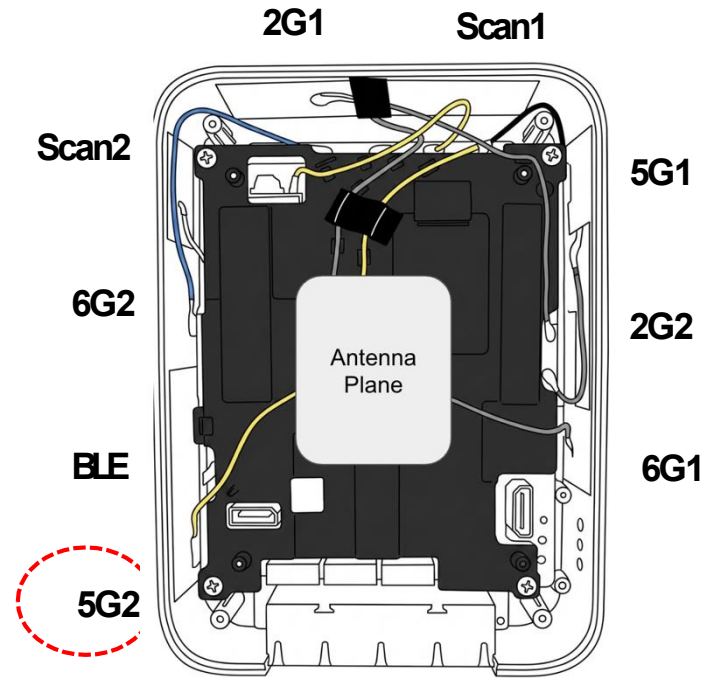
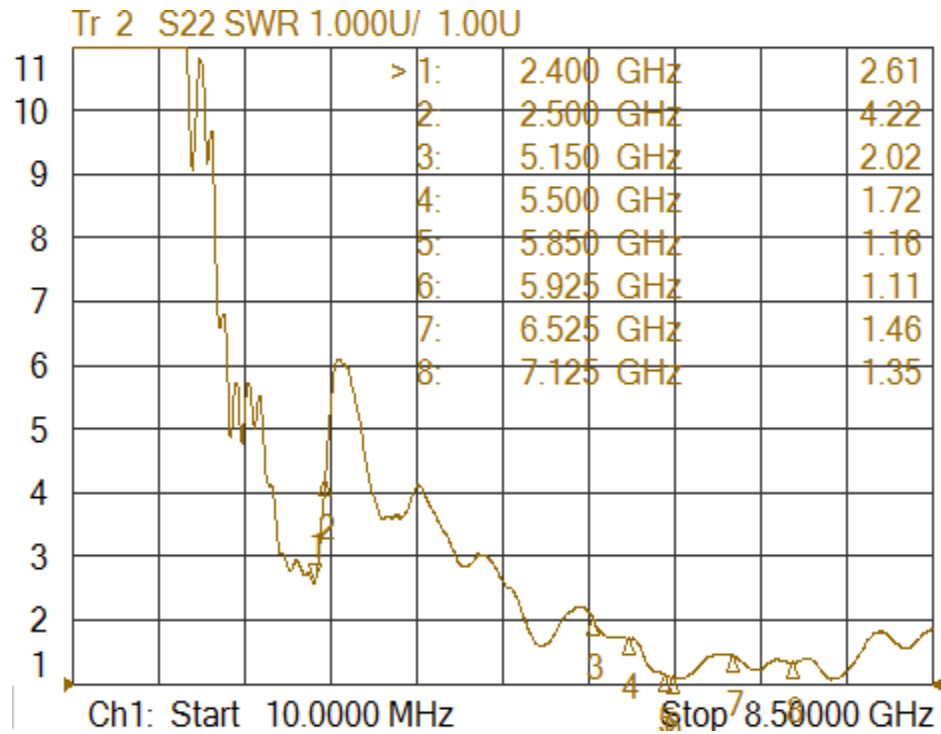
- Performance –VSWR-2G2



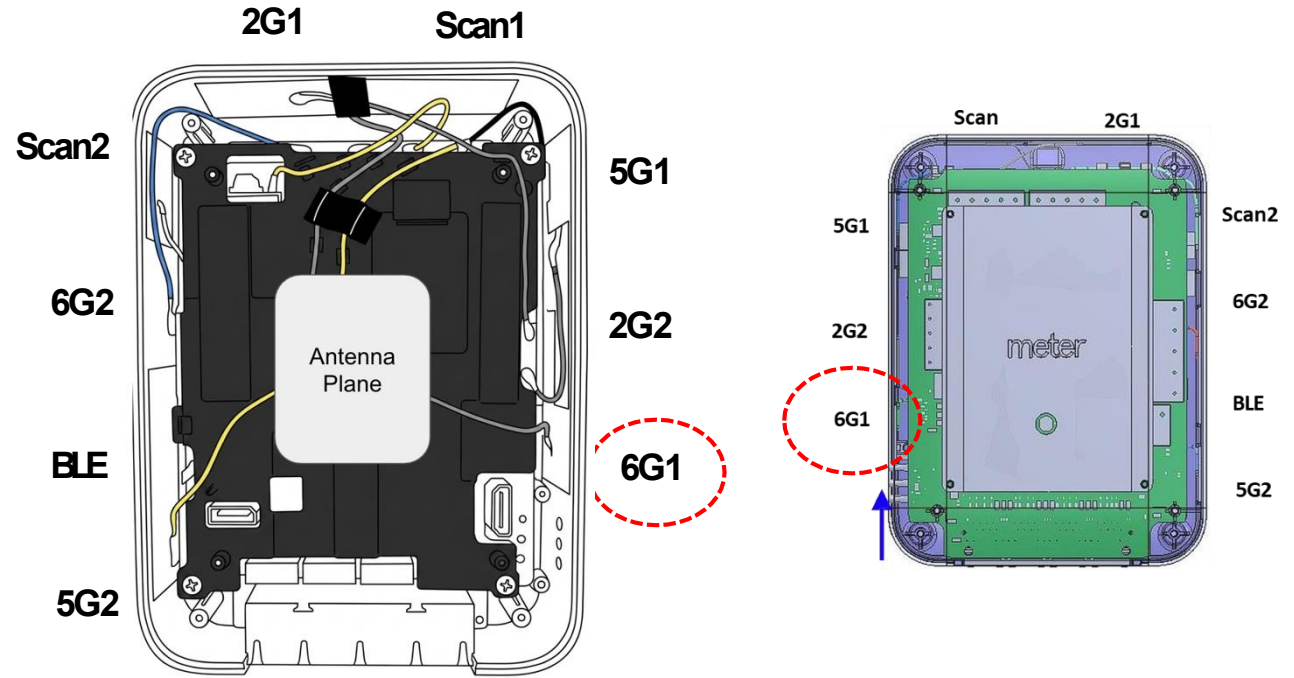
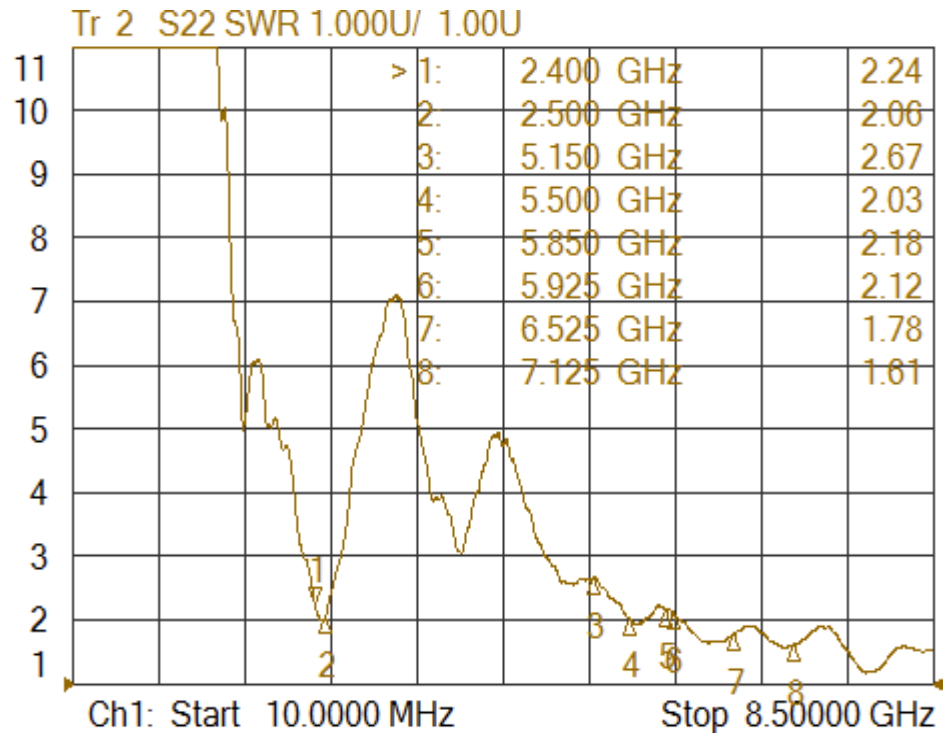
- Performance –VSWR-5G1



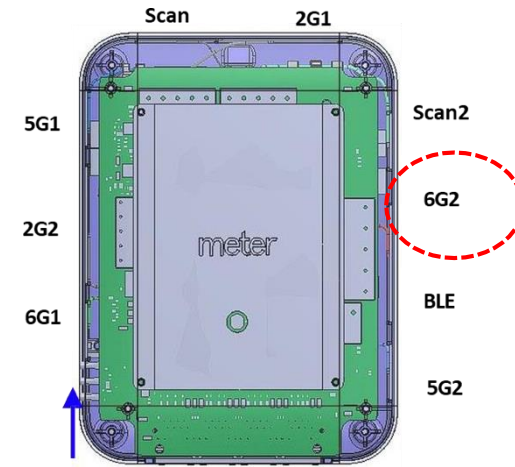
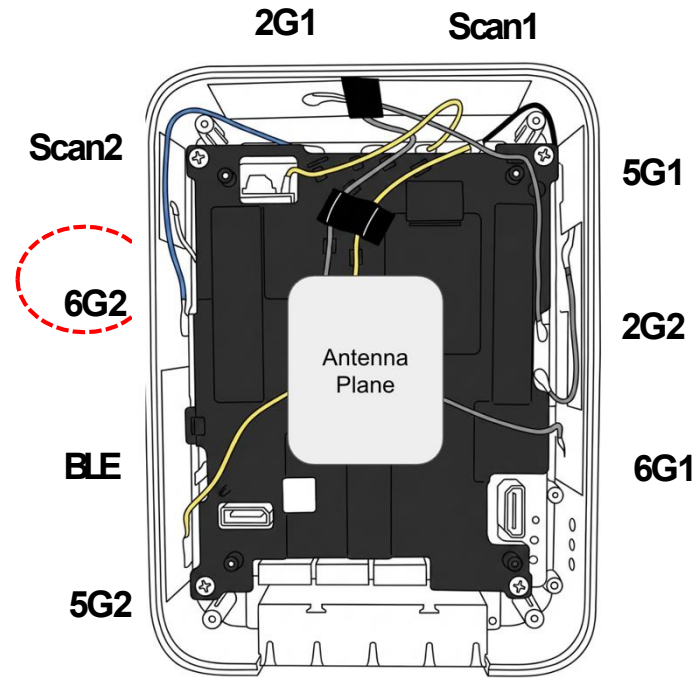
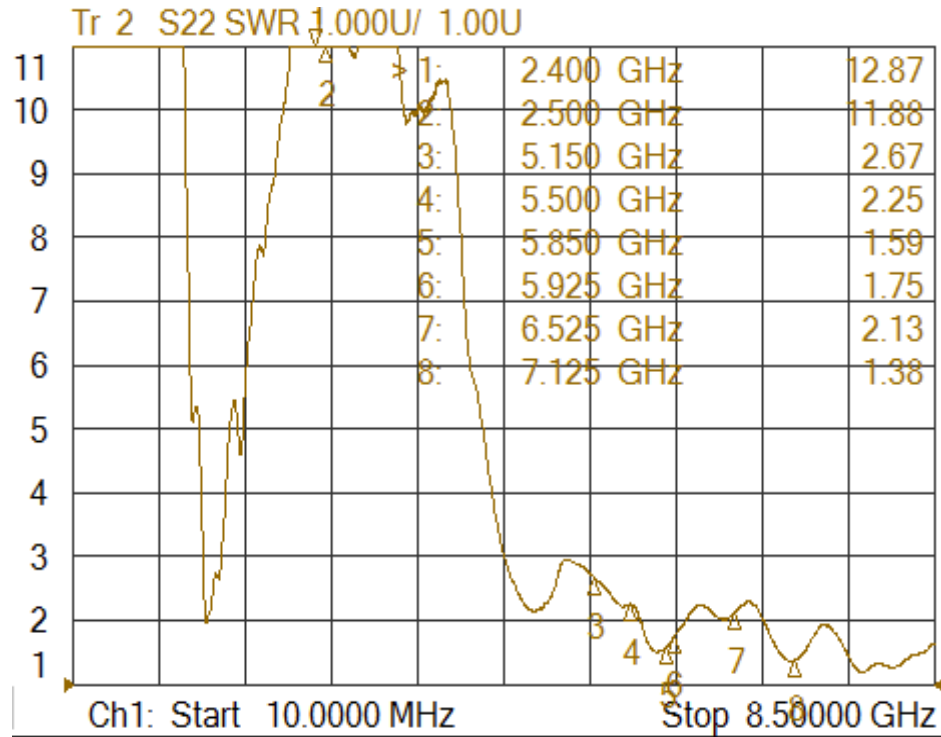
- Performance –VSWR-5G2



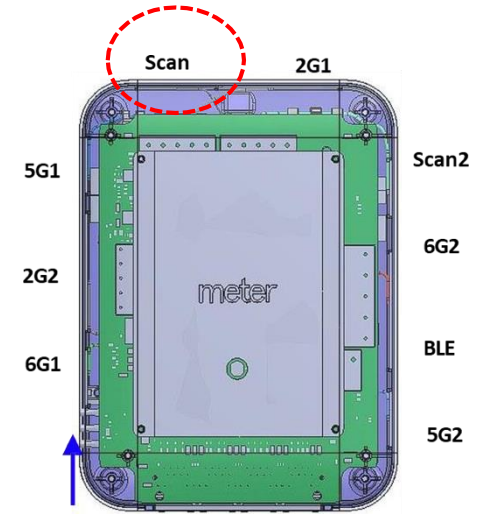
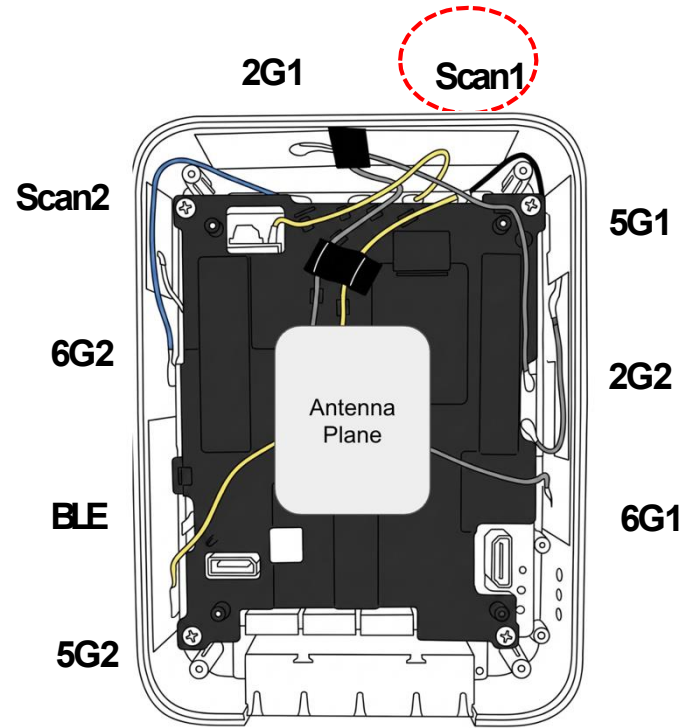
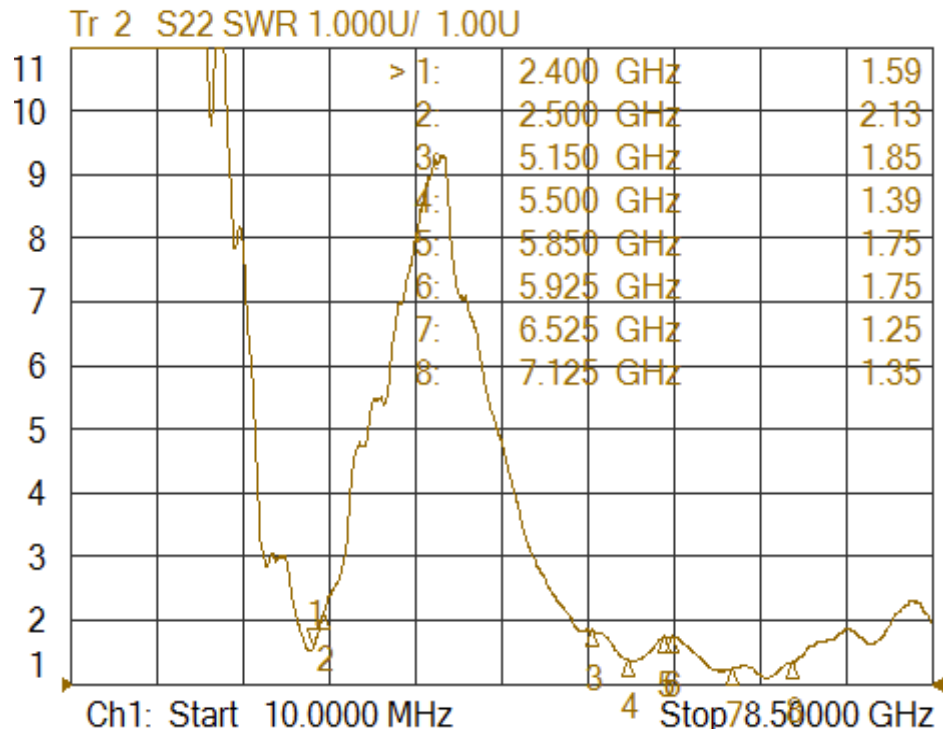
- Performance –VSWR-6G1



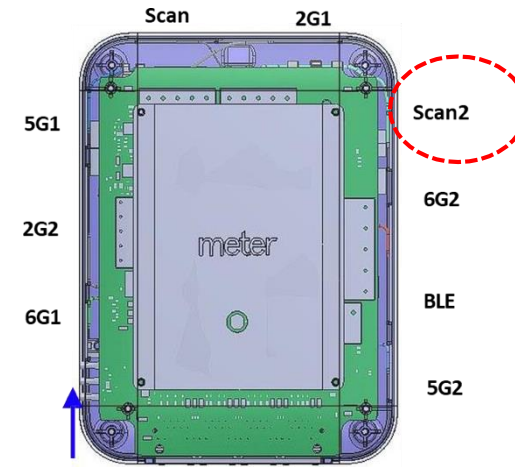
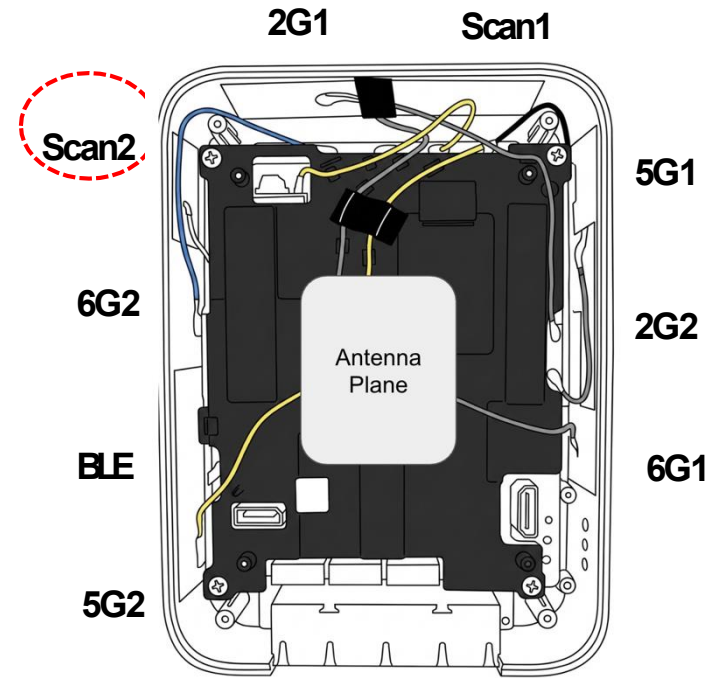
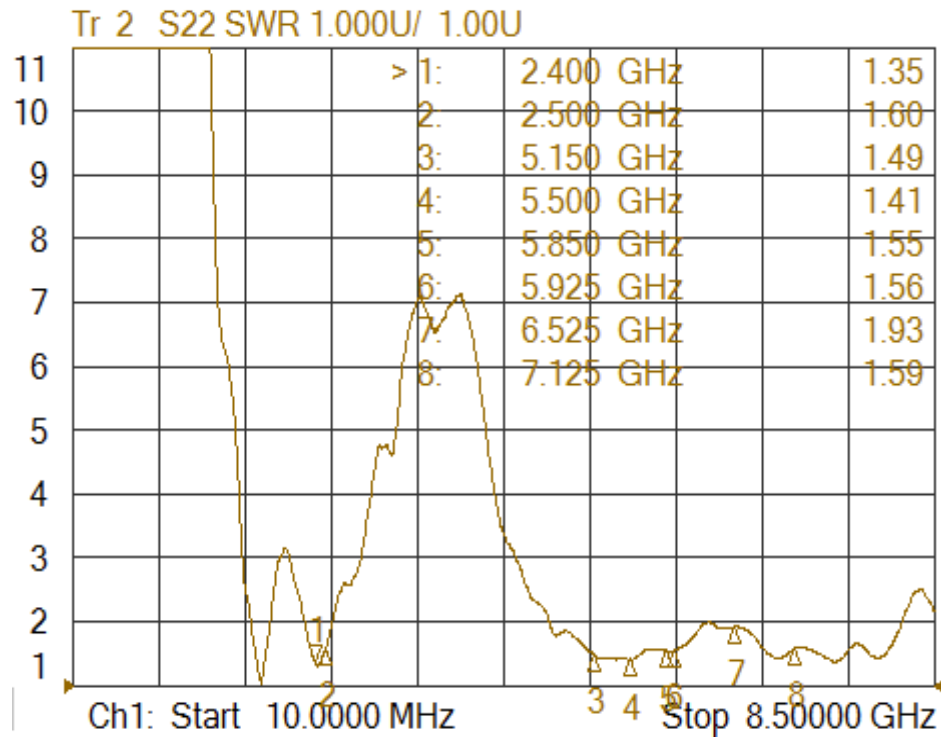
- Performance –VSWR-6G2



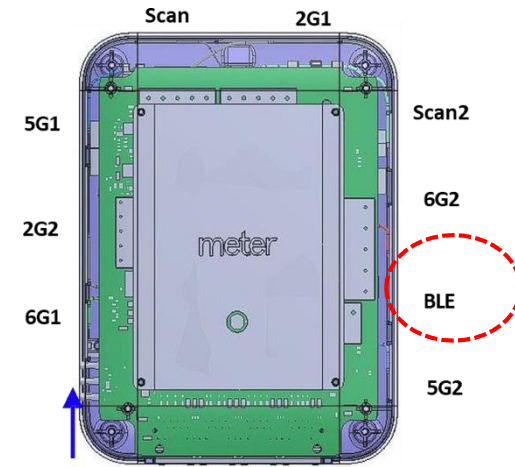
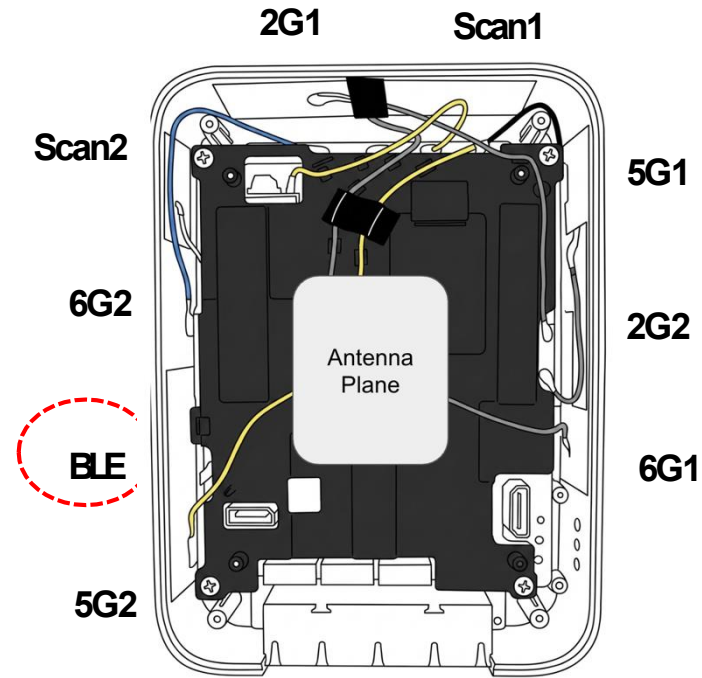
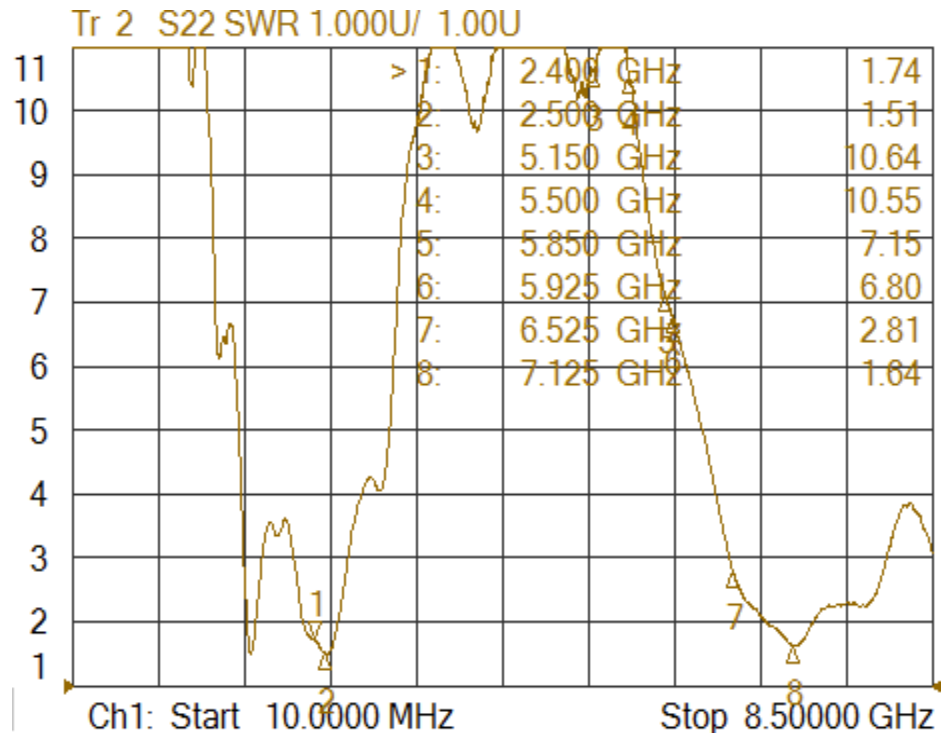
- Performance –VSWR-SCAN1



- Performance –VSWR-SCAN2



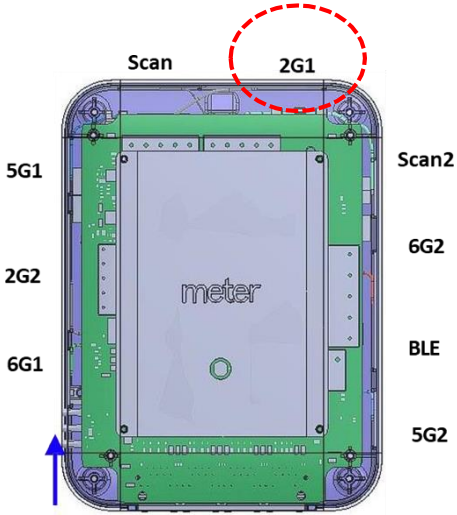
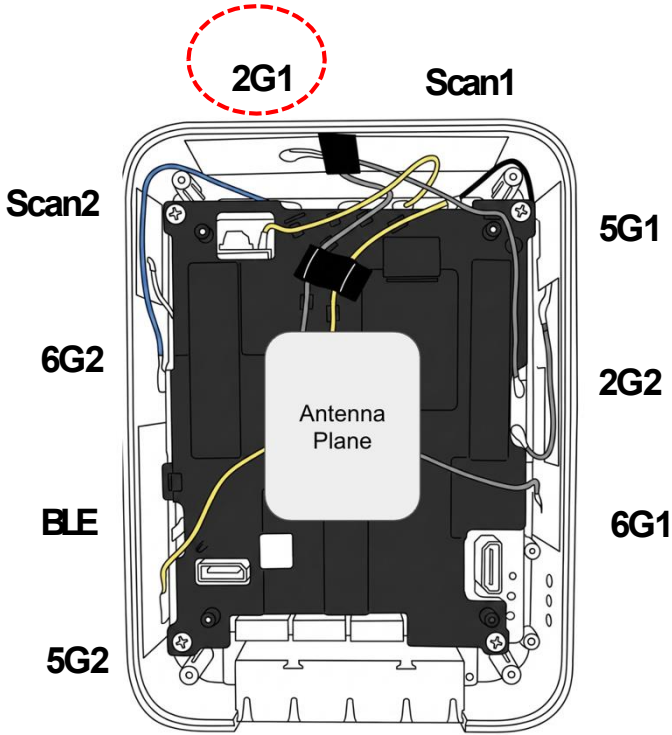
- Performance –VSWR-BLE



• Performance -2G1

Metal base

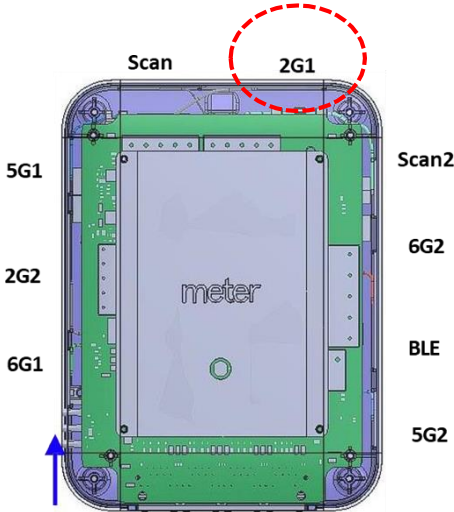
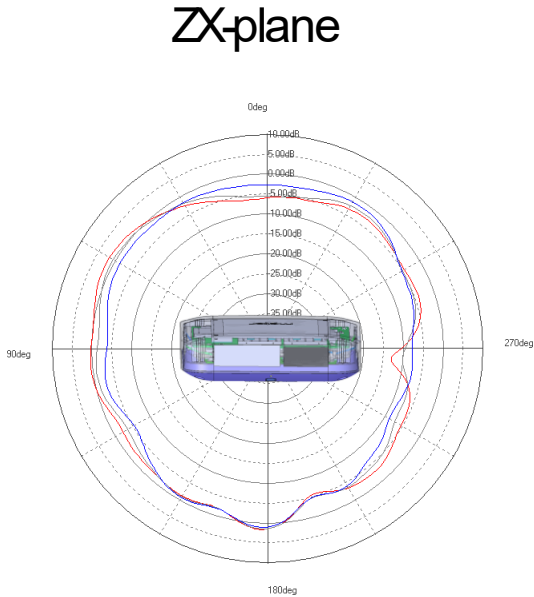
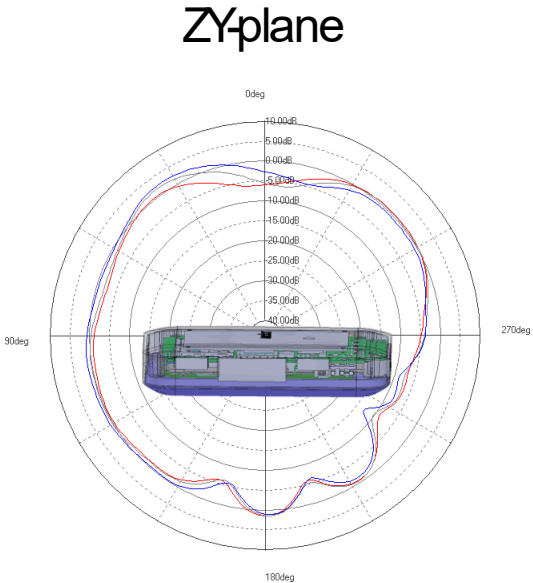
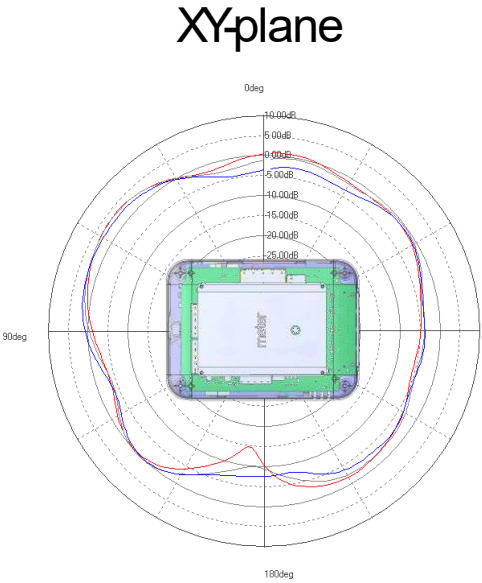
Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
2400	68%	-1.7	3.4
2450	71%	-1.5	4.1
2500	68%	-1.7	4.2



• Performance -2G1

Metal base

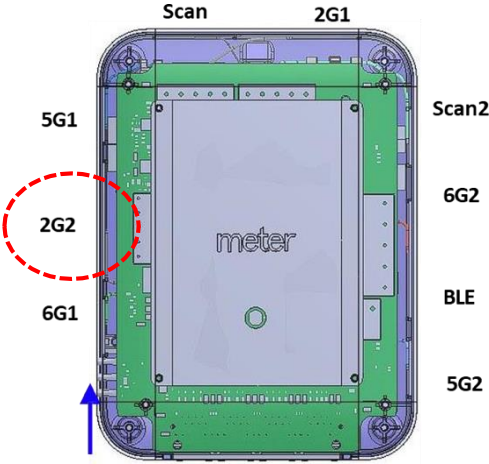
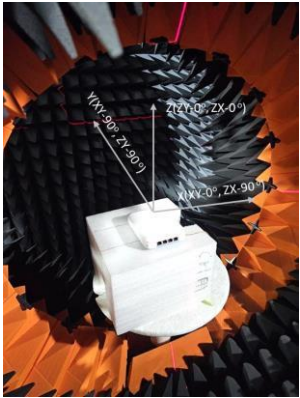
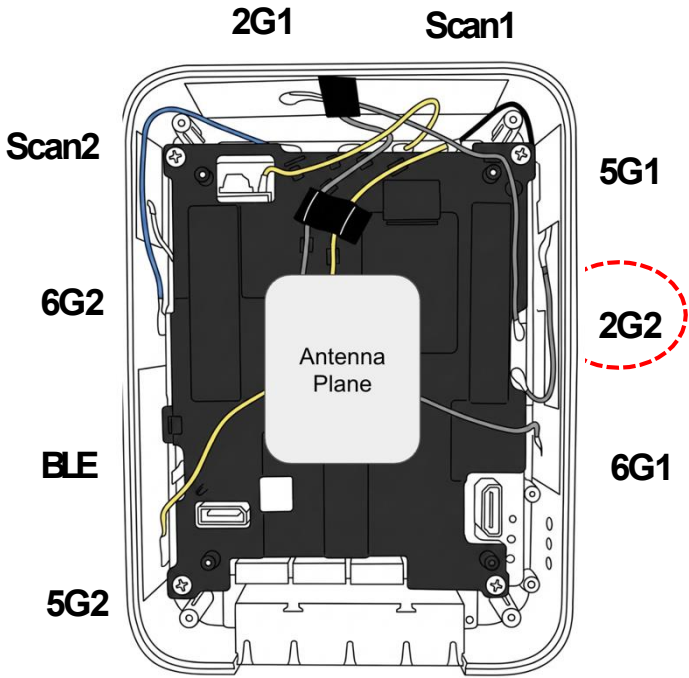
- Legend
- 2400.00(MHz)
 - 2450.00(MHz)
 - 2500.00(MHz)



• Performance -2G2

Metal base

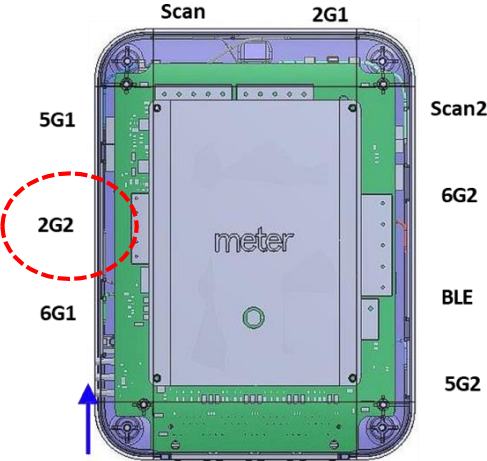
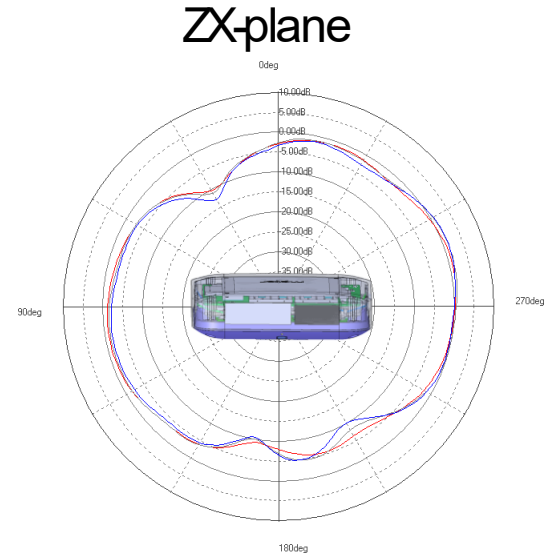
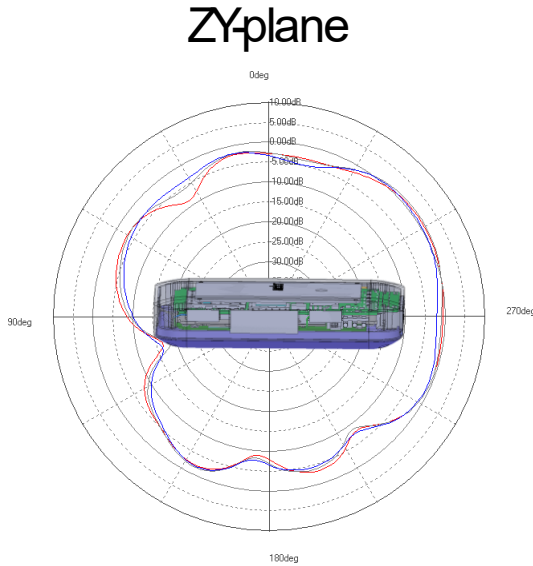
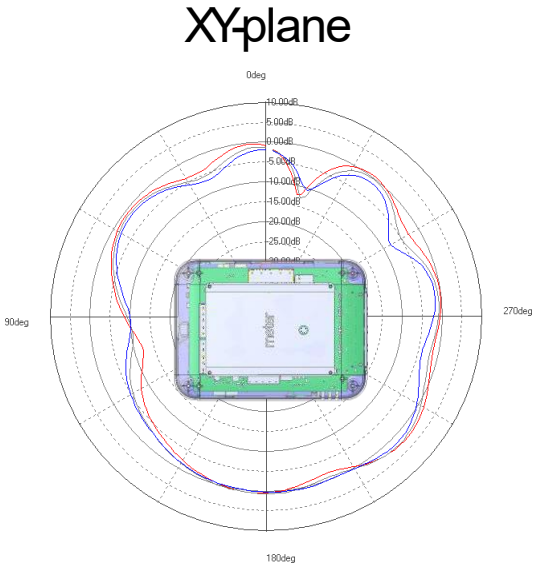
Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
2400	55%	-2.6	2.6
2450	55%	-2.6	2.3
2500	51%	-3.0	1.6



• Performance -2G2

Metal base

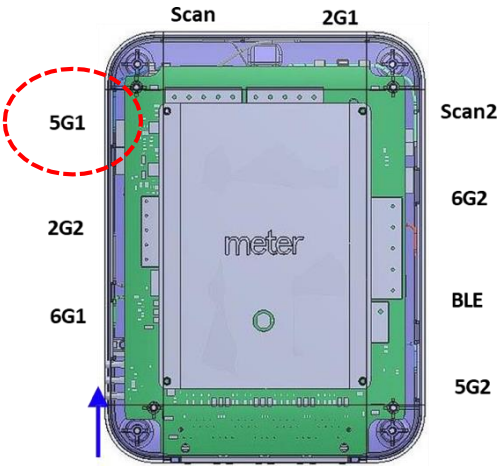
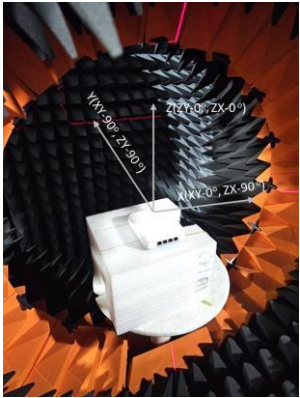
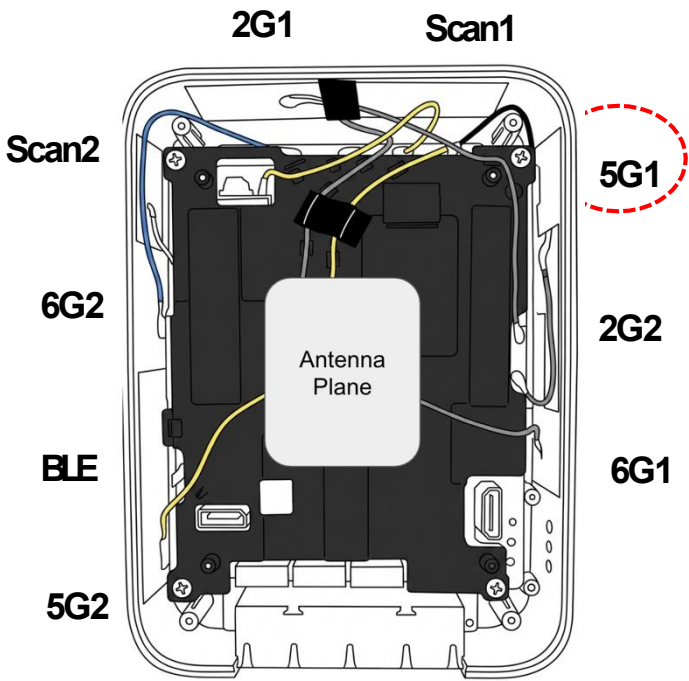
- Legend
- 2400.00(MHz)
 - 2450.00(MHz)
 - 2500.00(MHz)



• Performance -5G1

Metal base

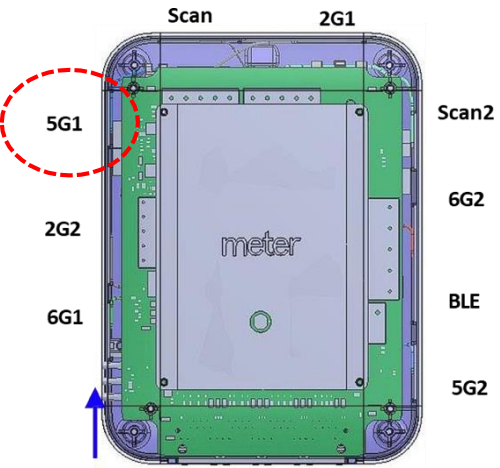
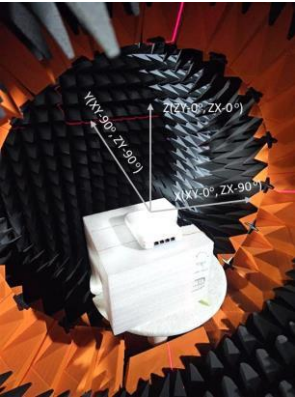
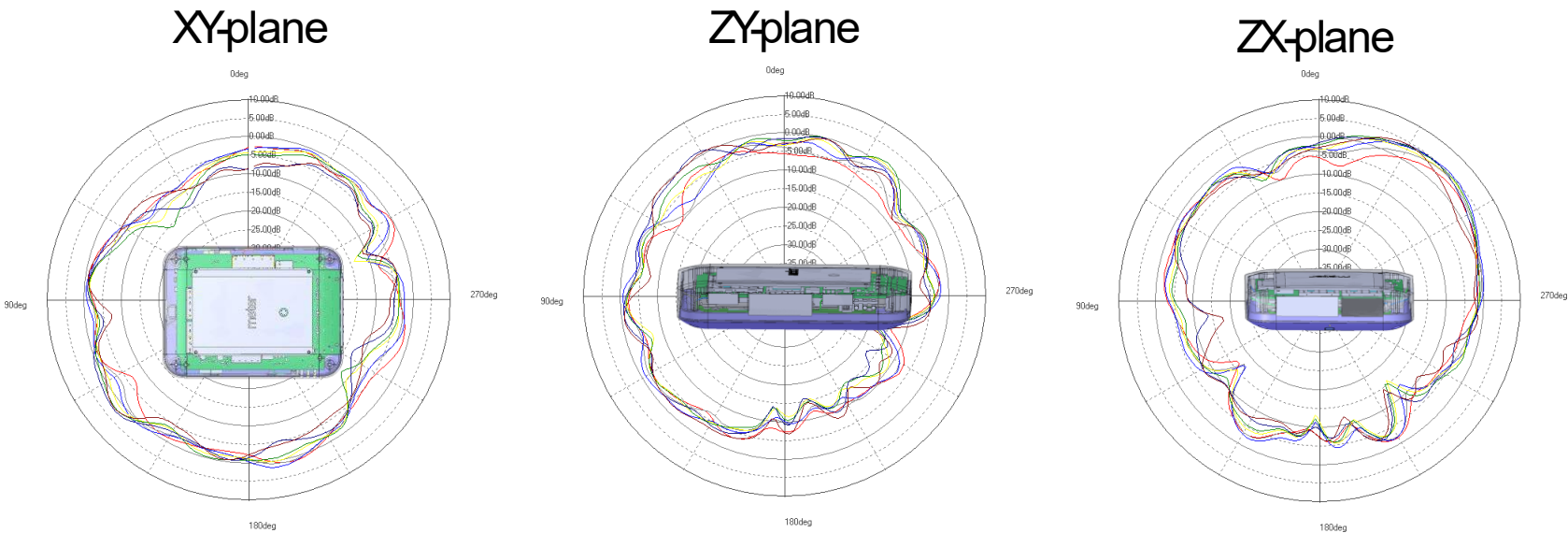
Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
5150	55%	-2.6	3.3
5250	53%	-2.8	3.9
5350	59%	-2.3	5.0
5470	52%	-2.8	4.5
5550	56%	-2.5	5.1
5725	55%	-2.6	4.5
5850	52%	-2.9	4.3



• Performance -5G1

Metal base

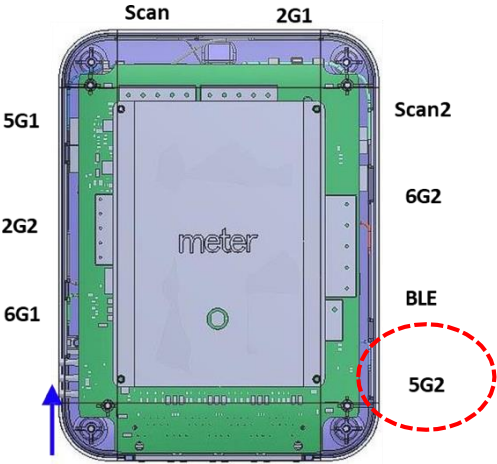
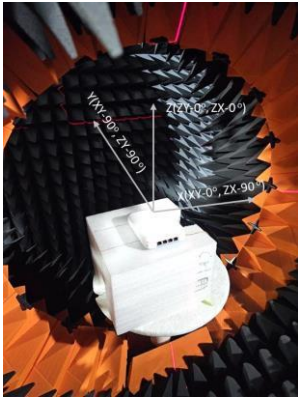
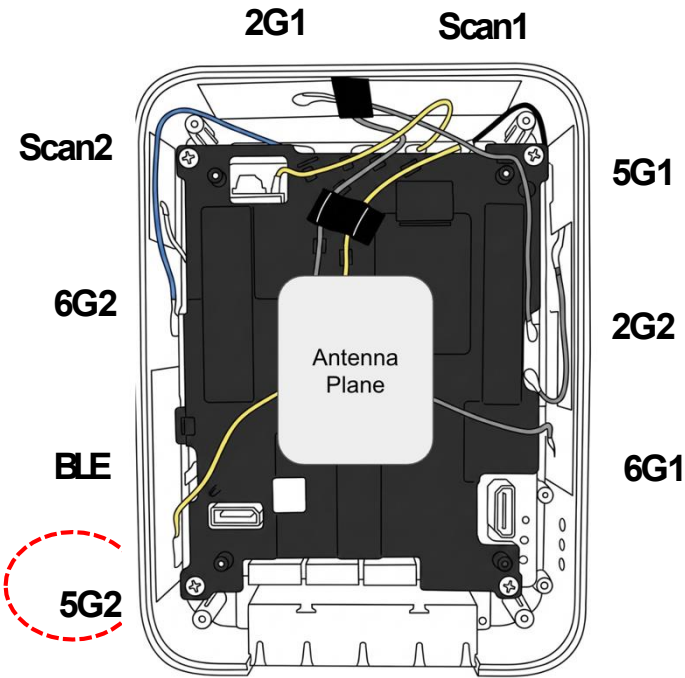
- Legend
- 5150.00(MHz)
 - 5250.00(MHz)
 - 5350.00(MHz)
 - 5470.00(MHz)
 - 5550.00(MHz)
 - 5725.00(MHz)
 - 5850.00(MHz)



• Performance -5G2

Metal base

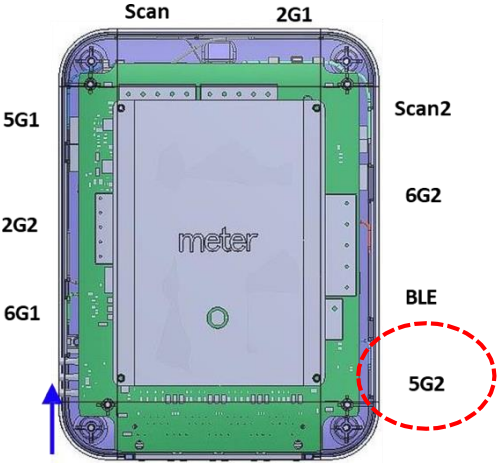
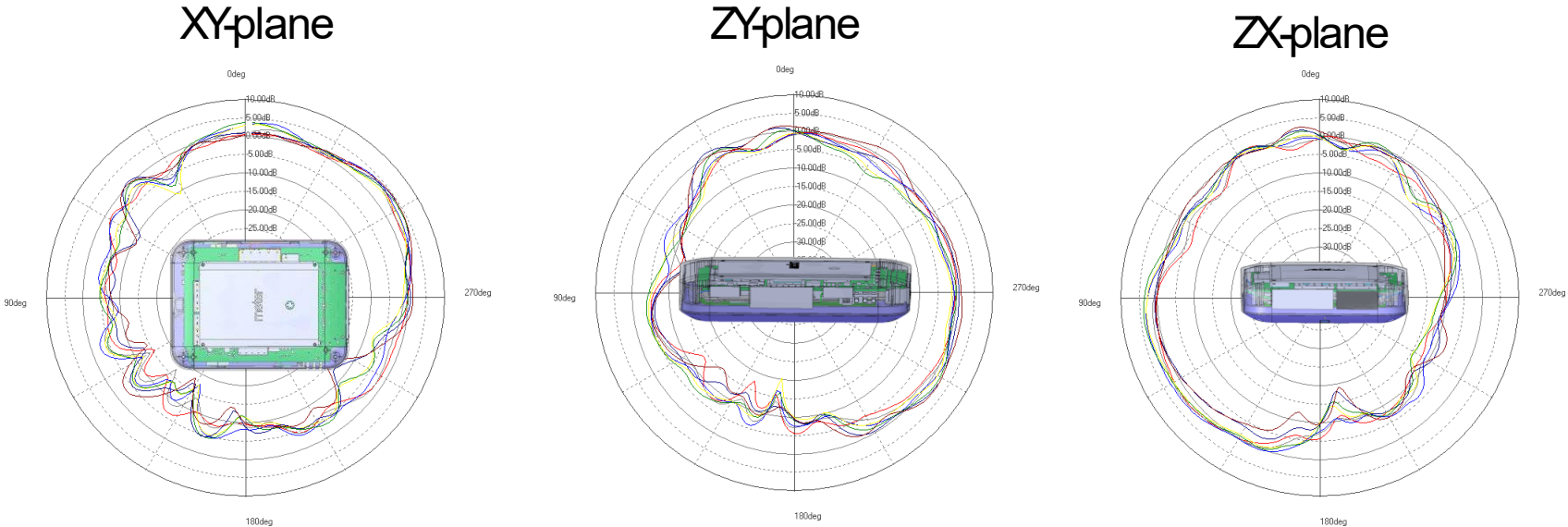
Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
5150	52%	-2.8	4.5
5250	53%	-2.8	4.3
5350	58%	-2.4	4.4
5470	54%	-2.7	3.4
5550	57%	-2.4	4.6
5725	57%	-2.4	5.1
5850	61%	-2.1	5.2



• Performance-5G2

Metal base

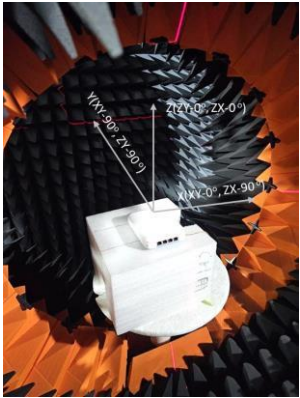
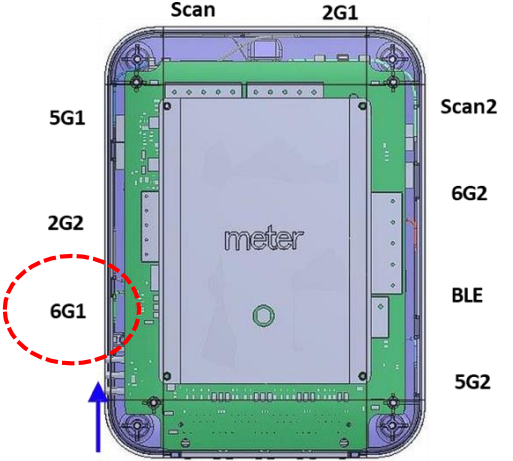
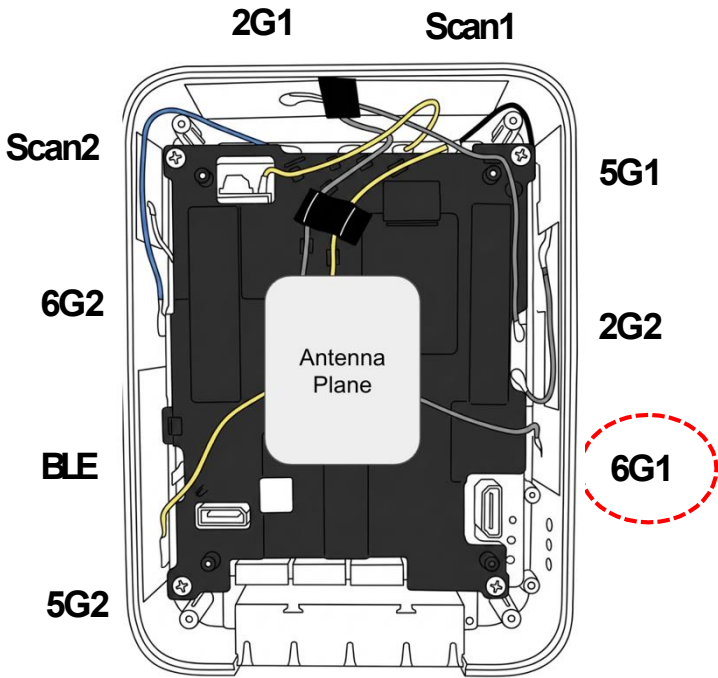
- Legend
- 5150.00(MHz)
 - 5250.00(MHz)
 - 5350.00(MHz)
 - 5470.00(MHz)
 - 5550.00(MHz)
 - 5725.00(MHz)
 - 5850.00(MHz)



• Performance -6G1

Metal base

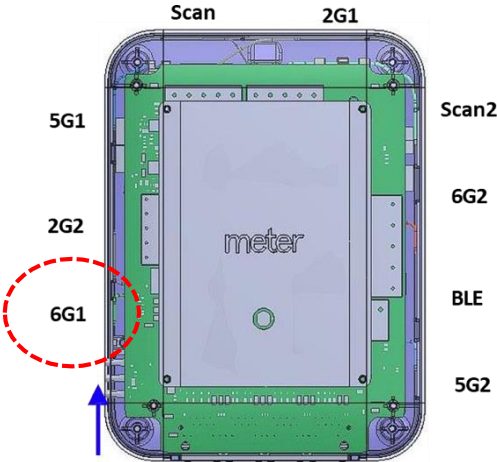
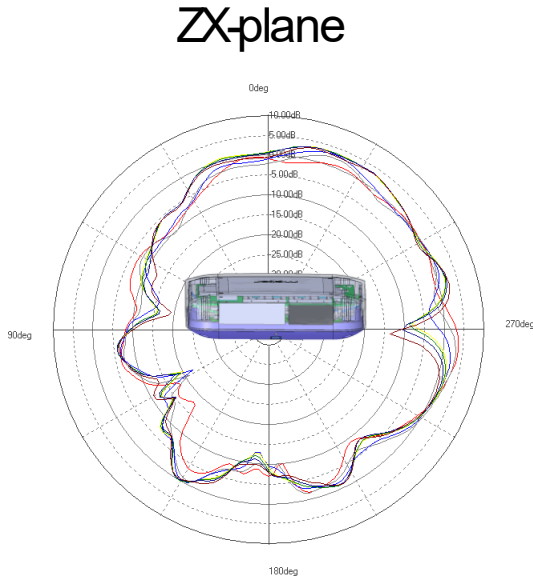
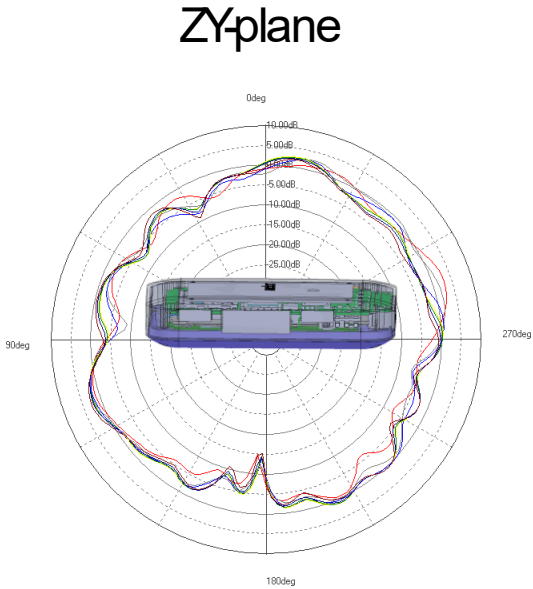
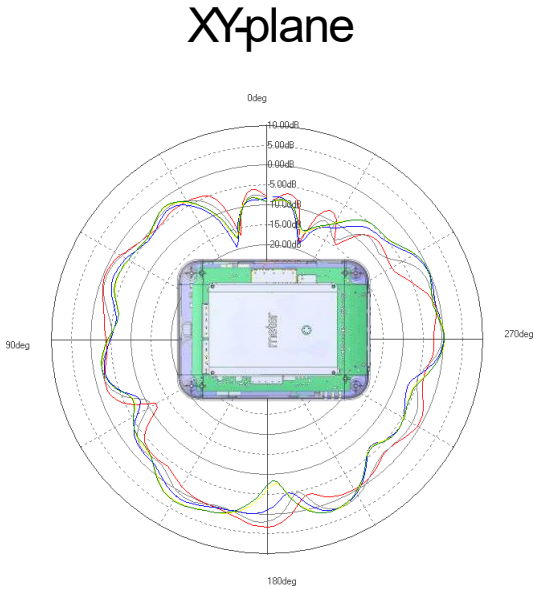
Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
5925	59%	-2.3	4.0
6085	65%	-1.9	4.2
6245	60%	-2.2	4.7
6405	64%	-2.0	5.3
6425	63%	-2.0	5.3
6465	62%	-2.1	5.2
6525	60%	-2.2	5.1
6645	60%	-2.2	5.3
6795	58%	-2.4	4.7
6875	54%	-2.6	4.5
6975	56%	-2.5	4.8
7095	62%	-2.1	5.5
7125	61%	-2.1	5.4



• Performance -6G1

Metal base

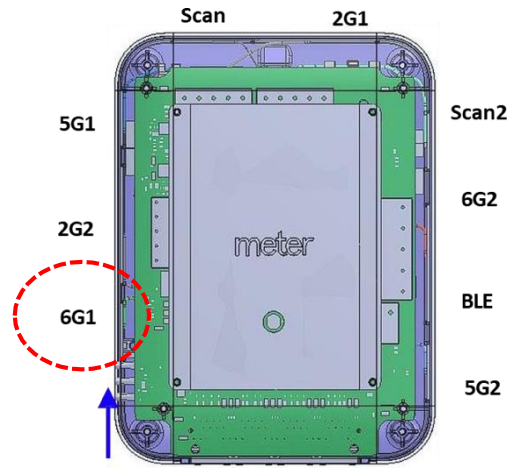
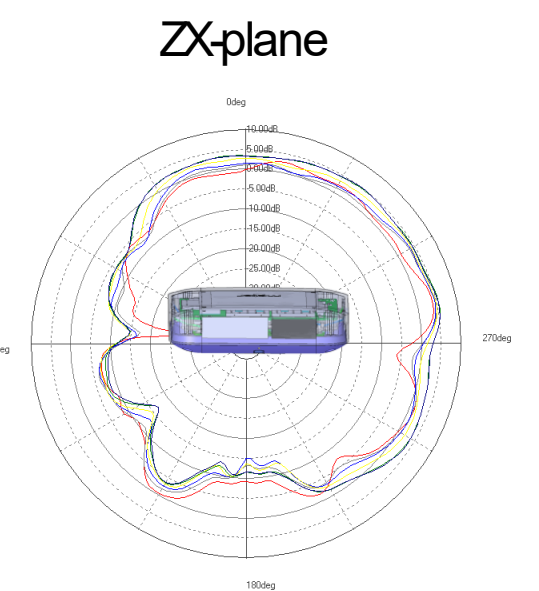
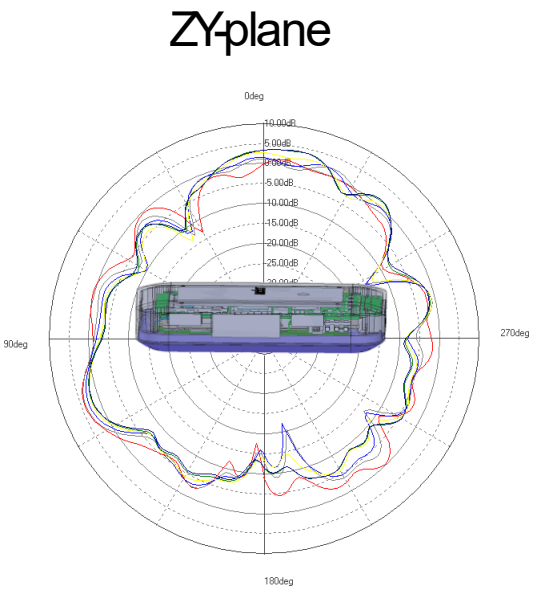
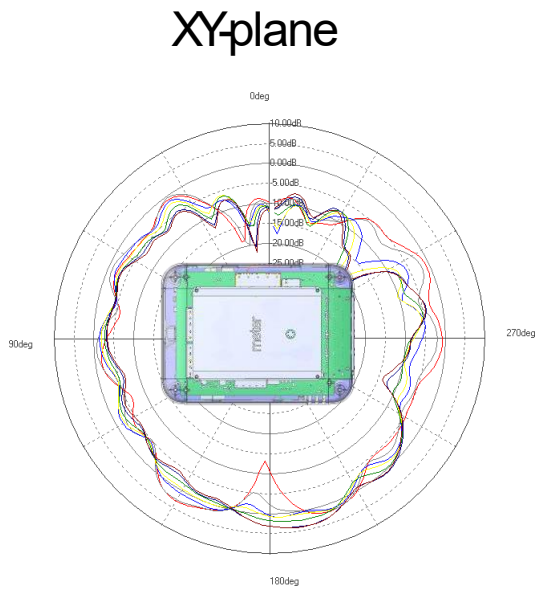
- Legend
- 5925.00(MHz)
 - 6085.00(MHz)
 - 6245.00(MHz)
 - 6405.00(MHz)
 - 6425.00(MHz)
 - 6465.00(MHz)
 - 6525.00(MHz)



• Performance -6G1

Metal base

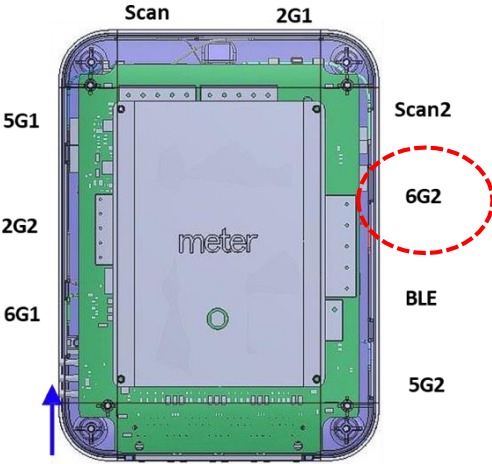
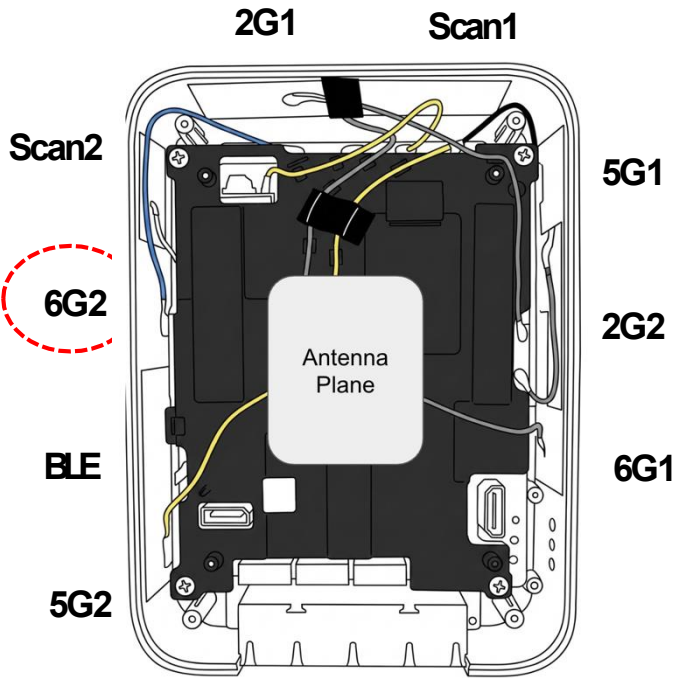
- Legend
- 6645.00(MHz)
 - 6795.00(MHz)
 - 6875.00(MHz)
 - 6975.00(MHz)
 - 7095.00(MHz)
 - 7125.00(MHz)



• Performance -6G2

Metal base

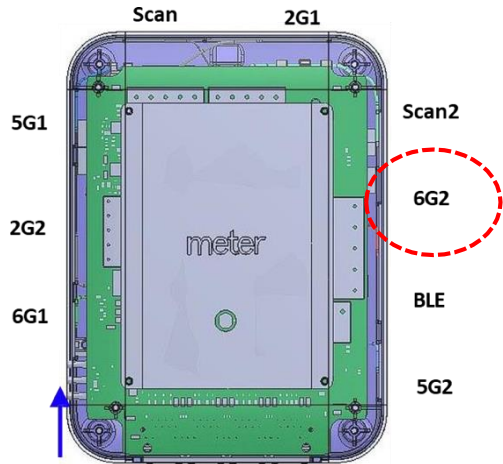
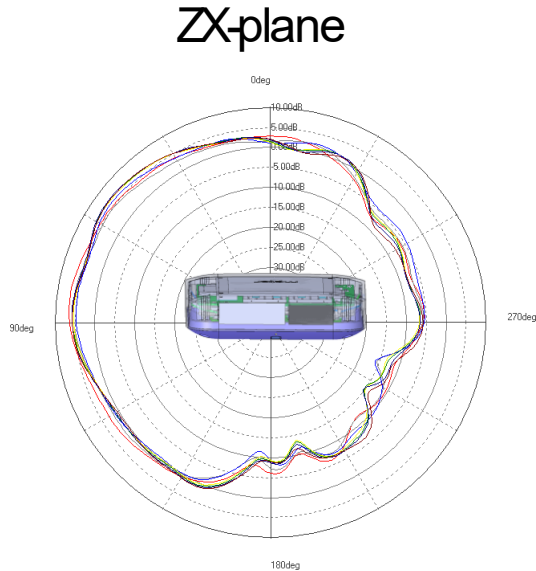
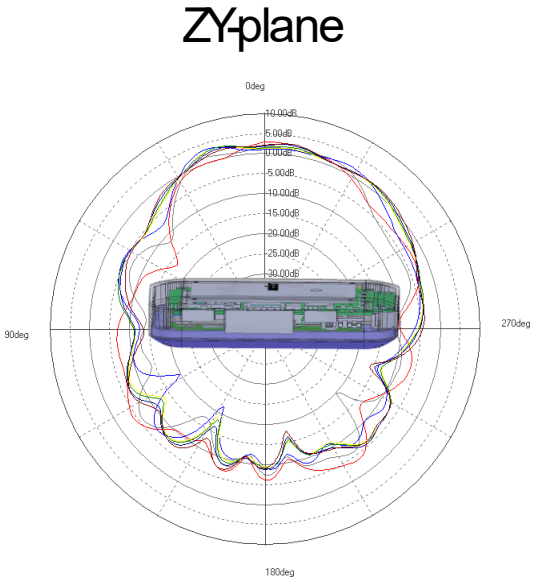
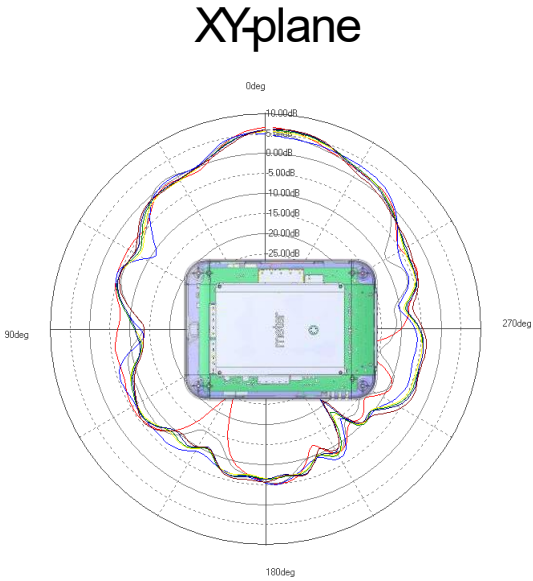
Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
5925	66%	-1.8	6.7
6085	62%	-2.1	5.6
6245	66%	-1.8	5.9
6405	64%	-2.0	6.5
6425	66%	-1.8	6.7
6465	67%	-1.7	6.9
6525	66%	-1.8	7.0
6645	67%	-1.7	6.8
6795	68%	-1.7	6.3
6875	69%	-1.6	6.5
6975	66%	-1.8	6.9
7095	64%	-1.9	7.1
7125	65%	-1.9	7.0



• Performance -6G2

Metal base

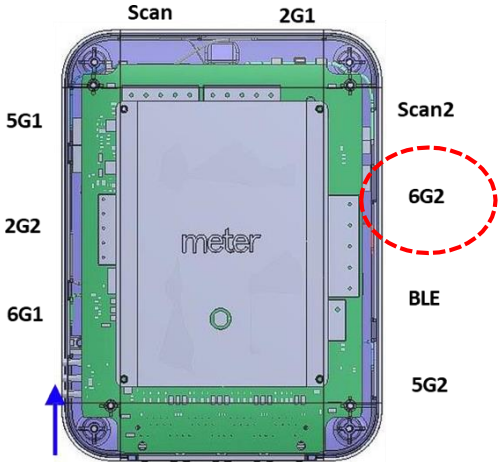
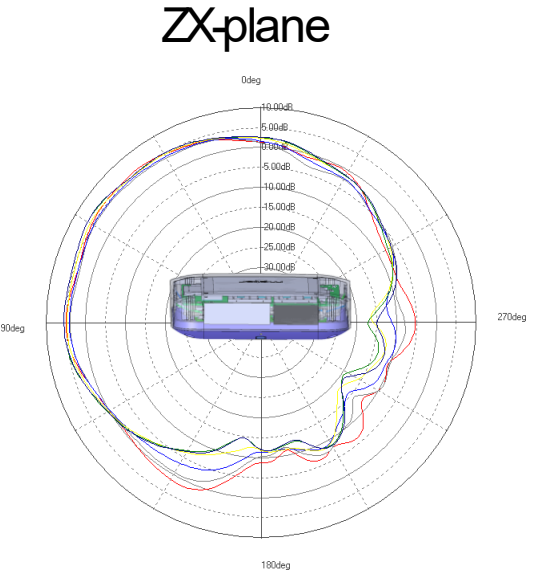
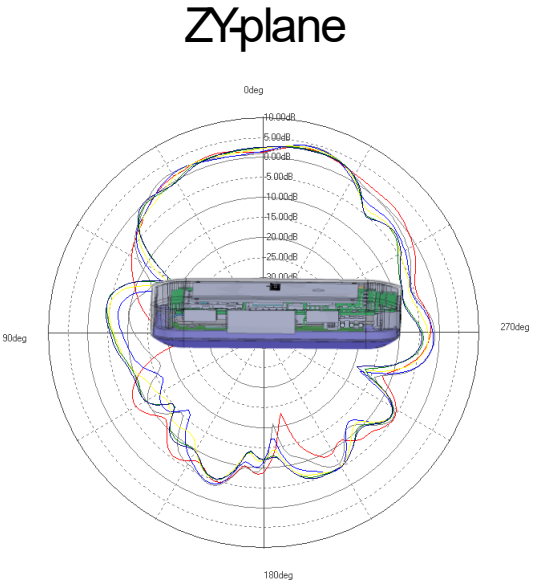
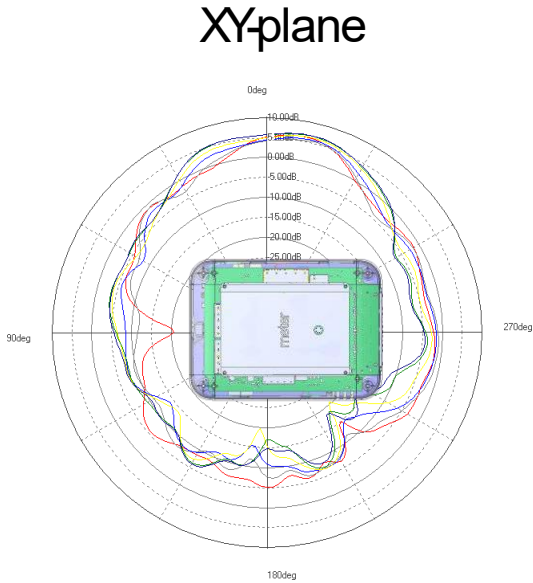
- Legend
- 5925.00(MHz)
 - 6085.00(MHz)
 - 6245.00(MHz)
 - 6405.00(MHz)
 - 6425.00(MHz)
 - 6465.00(MHz)
 - 6525.00(MHz)



• Performance -6G2

Metal base

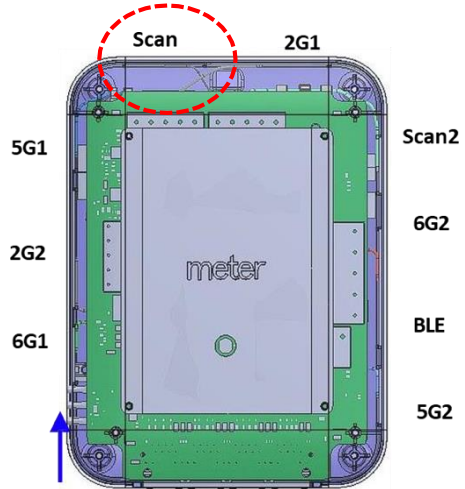
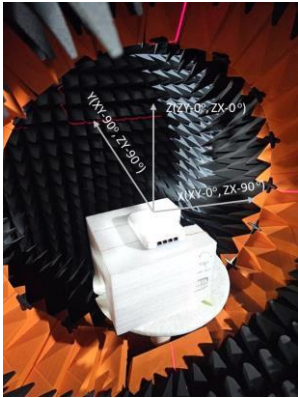
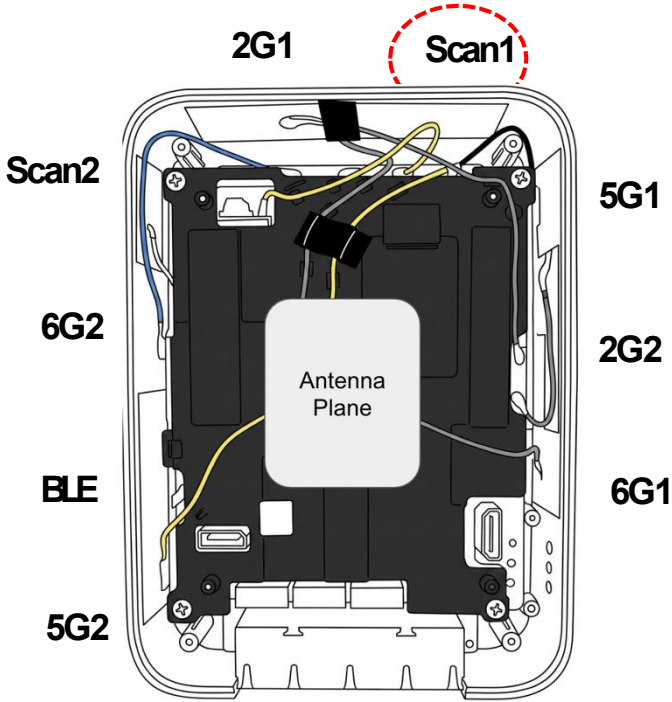
- Legend
- 6645.00(MHz)
 - 6795.00(MHz)
 - 6875.00(MHz)
 - 6975.00(MHz)
 - 7095.00(MHz)
 - 7125.00(MHz)



• Performance –Scan1

Metal base

Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
2400	53%	-2.7	1.8
2450	55%	-2.6	1.6
2500	54%	-2.7	1.1
5150	62%	-2.1	4.3
5250	65%	-1.9	4.4
5350	62%	-2.1	4.7
5470	63%	-2.0	4.8
5550	67%	-1.7	5.1
5725	66%	-1.8	4.6
5850	65%	-1.8	3.7
5925	66%	-1.8	3.9
6085	66%	-1.8	3.8
6245	64%	-1.9	4.7
6405	66%	-1.8	5.1
6425	67%	-1.7	5.1
6465	68%	-1.7	5.1
6525	68%	-1.7	4.8
6645	69%	-1.6	4.3
6795	67%	-1.7	4.2
6875	67%	-1.8	4.7
6975	67%	-1.8	5.0
7095	69%	-1.6	5.2
7125	70%	-1.6	5.3



• Performance -Scan1

2G

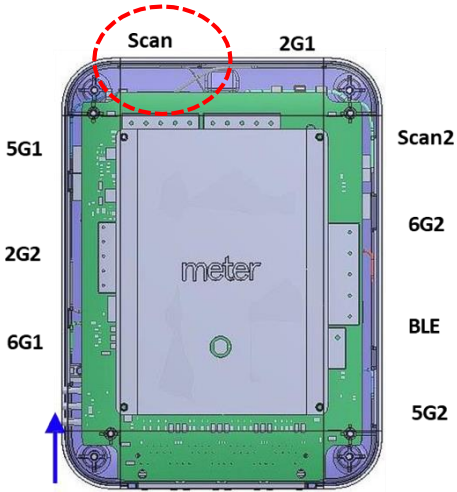
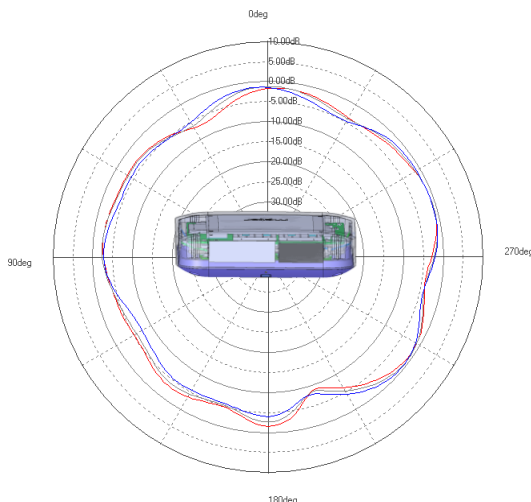
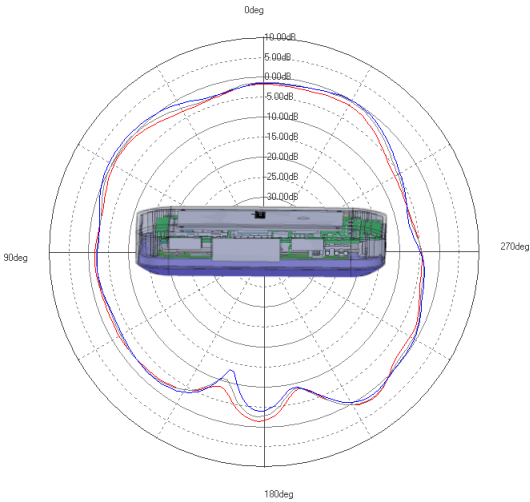
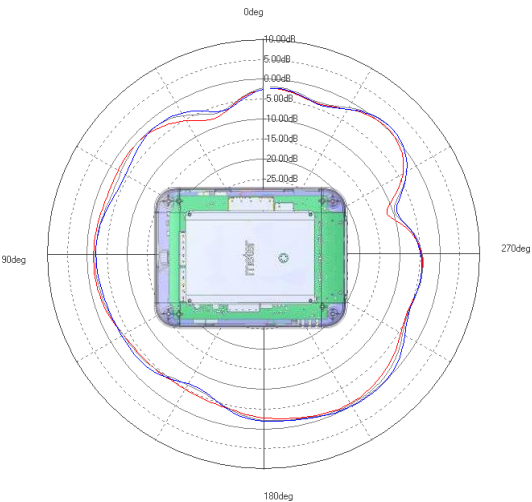
XY-plane

ZY-plane

ZX-plane

Metal base

- Legend
- 2400.00(MHz)
 - 2450.00(MHz)
 - 2500.00(MHz)

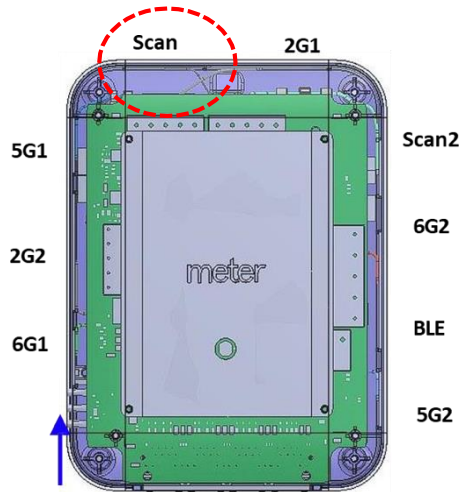
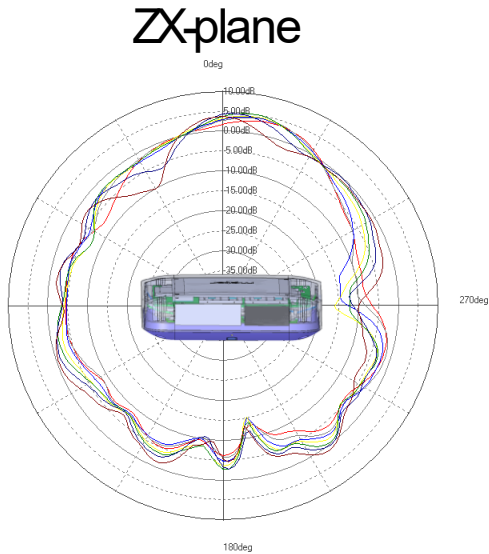
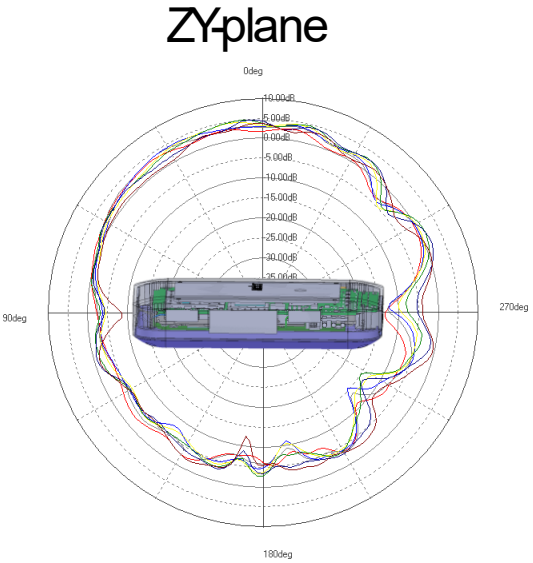
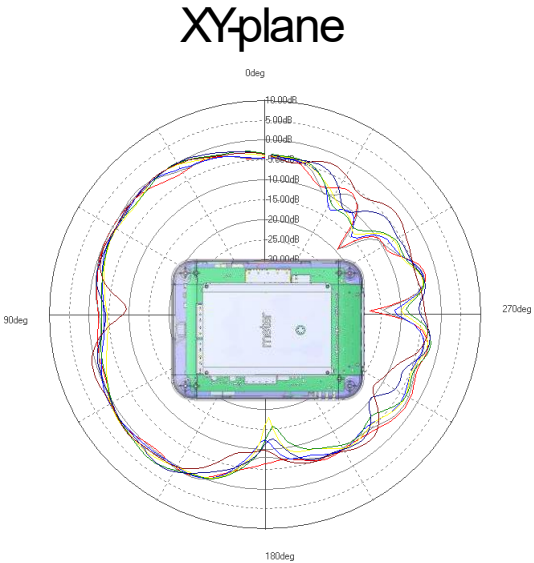


• Performance -Scan1

5G

Metal base

- Legend
- 5150.00(MHz)
 - 5250.00(MHz)
 - 5350.00(MHz)
 - 5470.00(MHz)
 - 5550.00(MHz)
 - 5725.00(MHz)
 - 5850.00(MHz)



• Performance -Scan1

6G

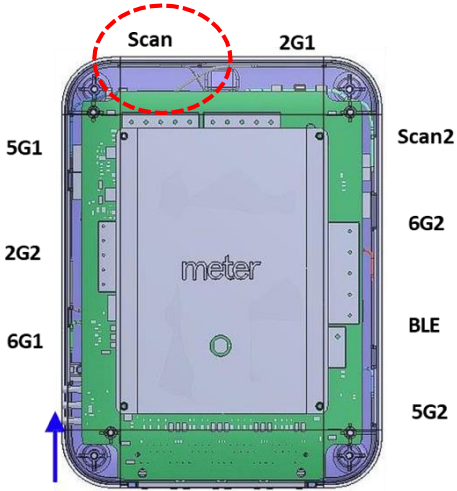
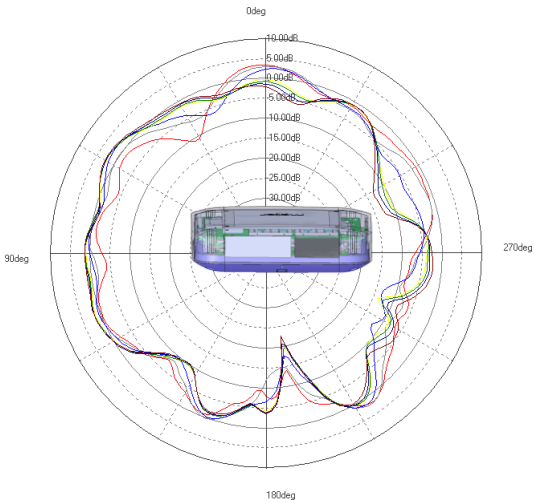
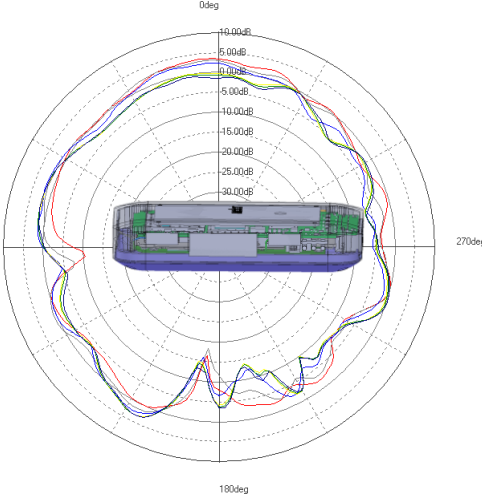
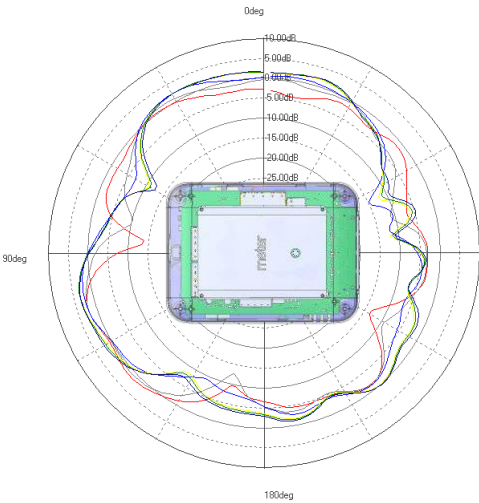
XY-plane

ZY-plane

ZX-plane

Metal base

- Legend
- 5925.00(MHz)
 - 6085.00(MHz)
 - 6245.00(MHz)
 - 6405.00(MHz)
 - 6425.00(MHz)
 - 6465.00(MHz)
 - 6525.00(MHz)

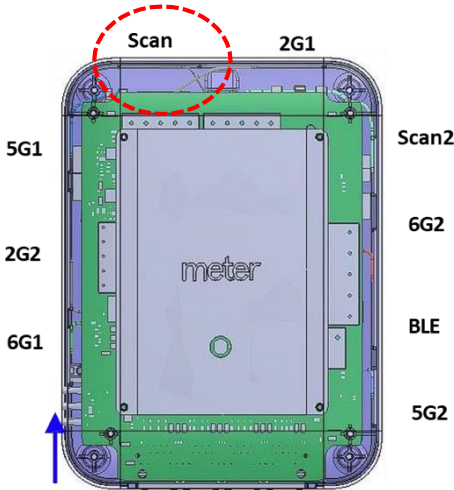
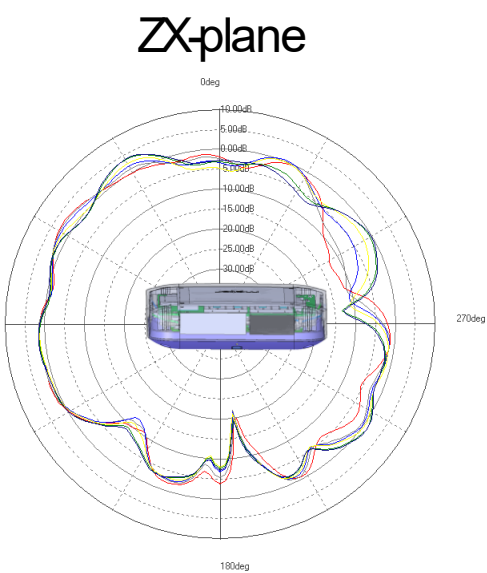
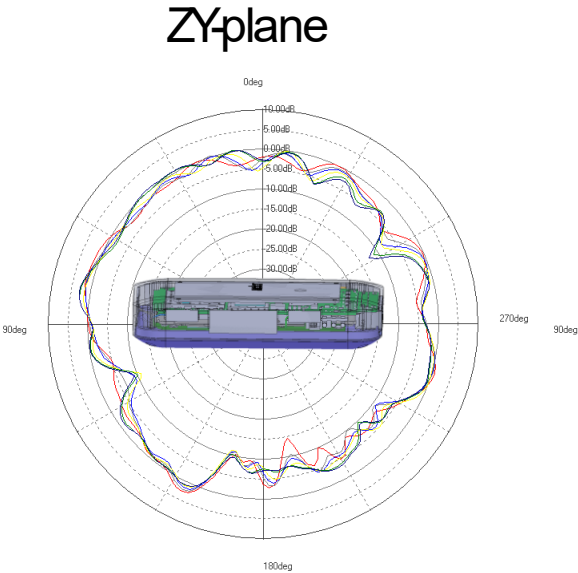
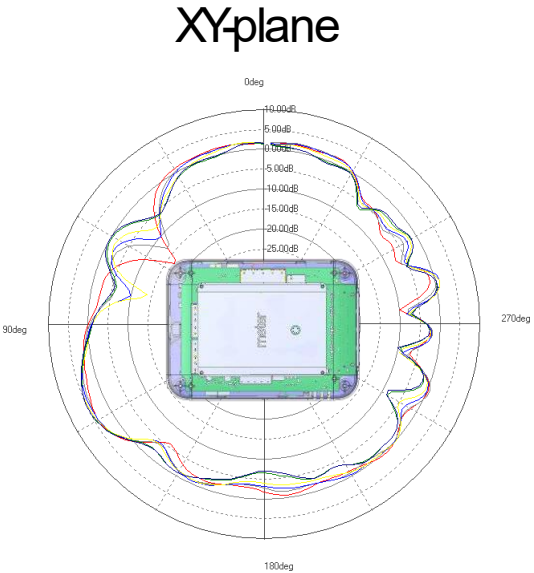


• Performance -Scan1

6G

Metal base

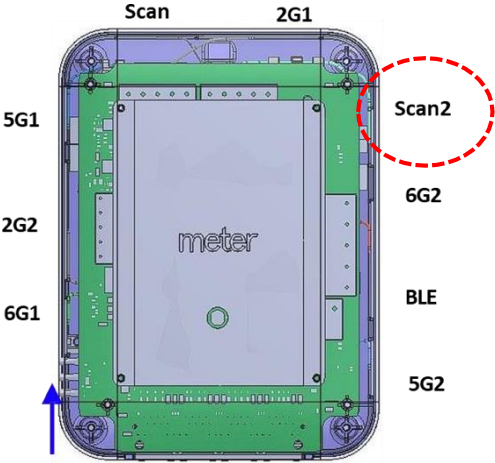
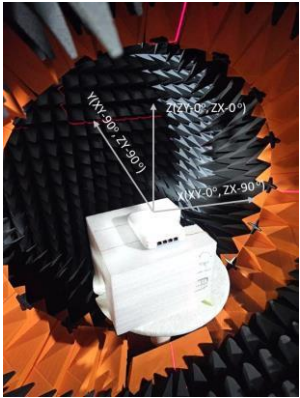
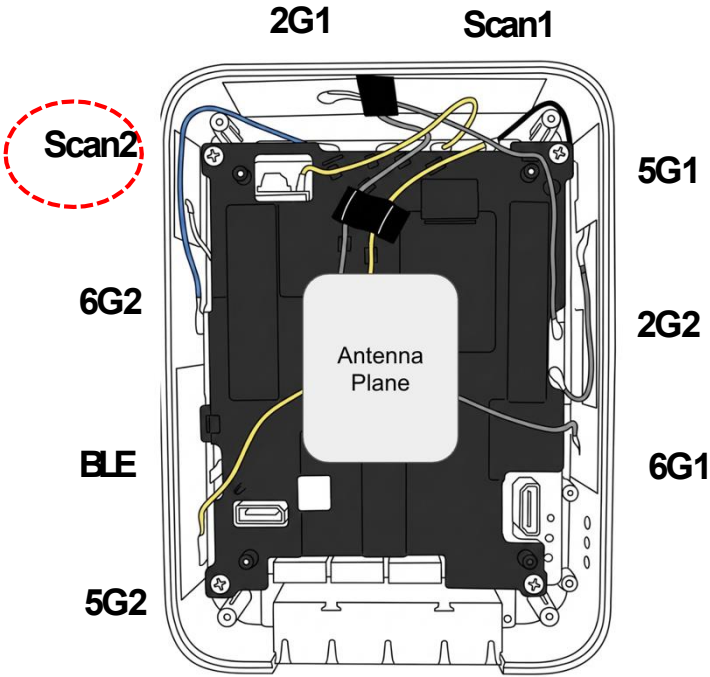
- Legend
- 6645.00(MHz)
 - 6795.00(MHz)
 - 6875.00(MHz)
 - 6975.00(MHz)
 - 7095.00(MHz)
 - 7125.00(MHz)



• Performance –Scan2

Metal base

Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
2400	56%	-2.5	1.4
2450	52%	-2.9	1.5
2500	47%	-3.3	1.1
5150	55%	-2.6	2.3
5250	56%	-2.5	3.0
5350	60%	-2.2	3.7
5470	56%	-2.5	3.9
5550	55%	-2.6	3.6
5725	62%	-2.1	5.9
5850	64%	-1.9	5.8
5925	67%	-1.8	5.6
6085	59%	-2.3	4.3
6245	53%	-2.8	3.7
6405	58%	-2.4	3.8
6425	59%	-2.3	3.8
6465	57%	-2.4	3.5
6525	56%	-2.6	3.4
6645	55%	-2.6	3.8
6795	57%	-2.4	3.8
6875	58%	-2.4	3.3
6975	60%	-2.2	3.4
7095	67%	-1.8	3.9
7125	70%	-1.6	4.1

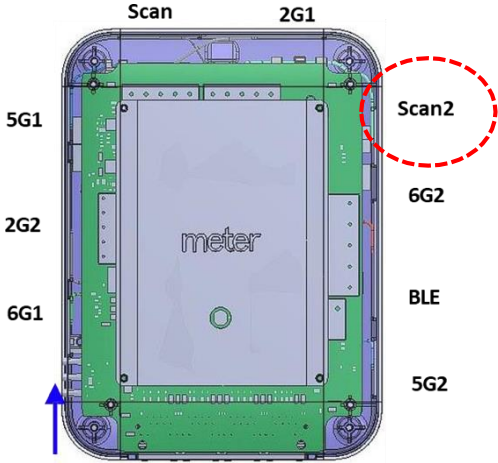
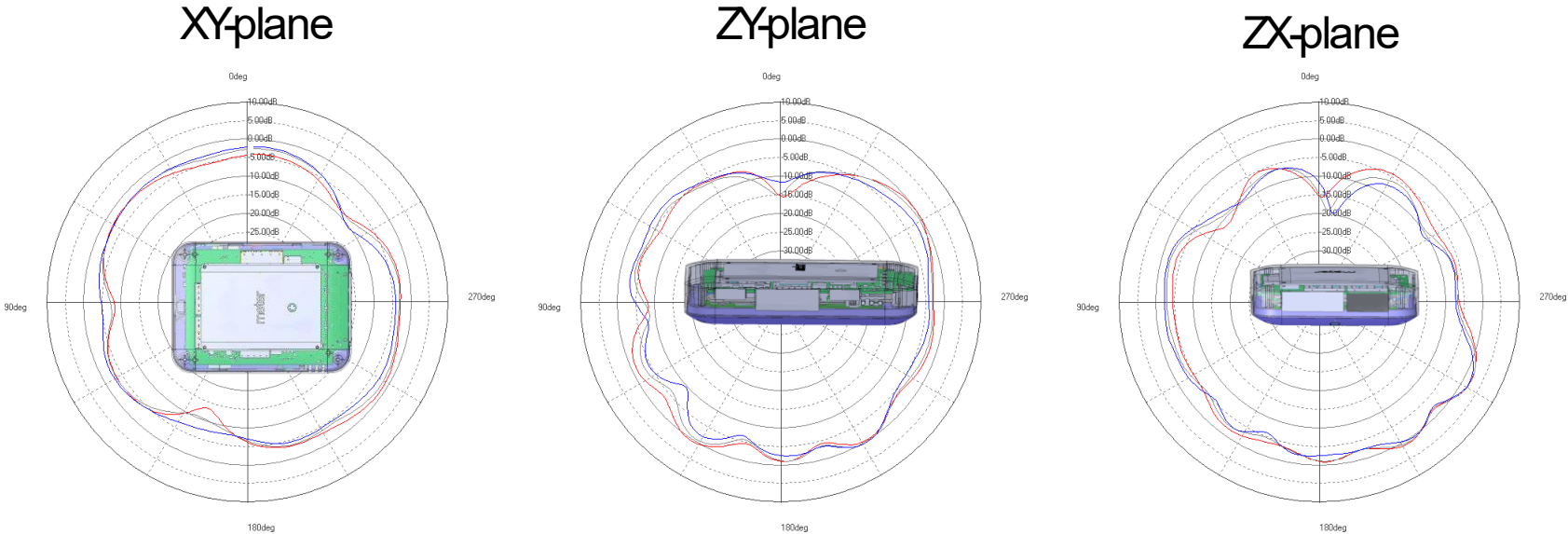


• Performance –Scan2

2G

Metal base

- Legend
- 2400.00(MHz)
 - 2450.00(MHz)
 - 2500.00(MHz)

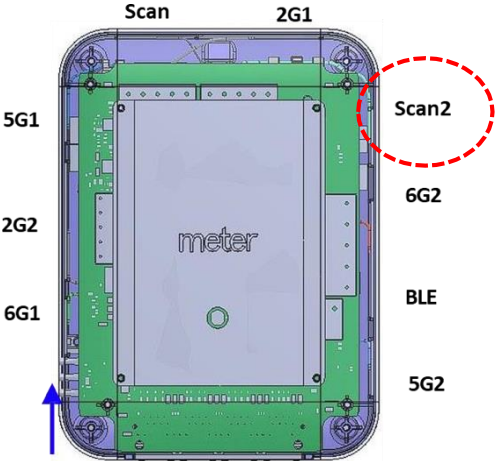
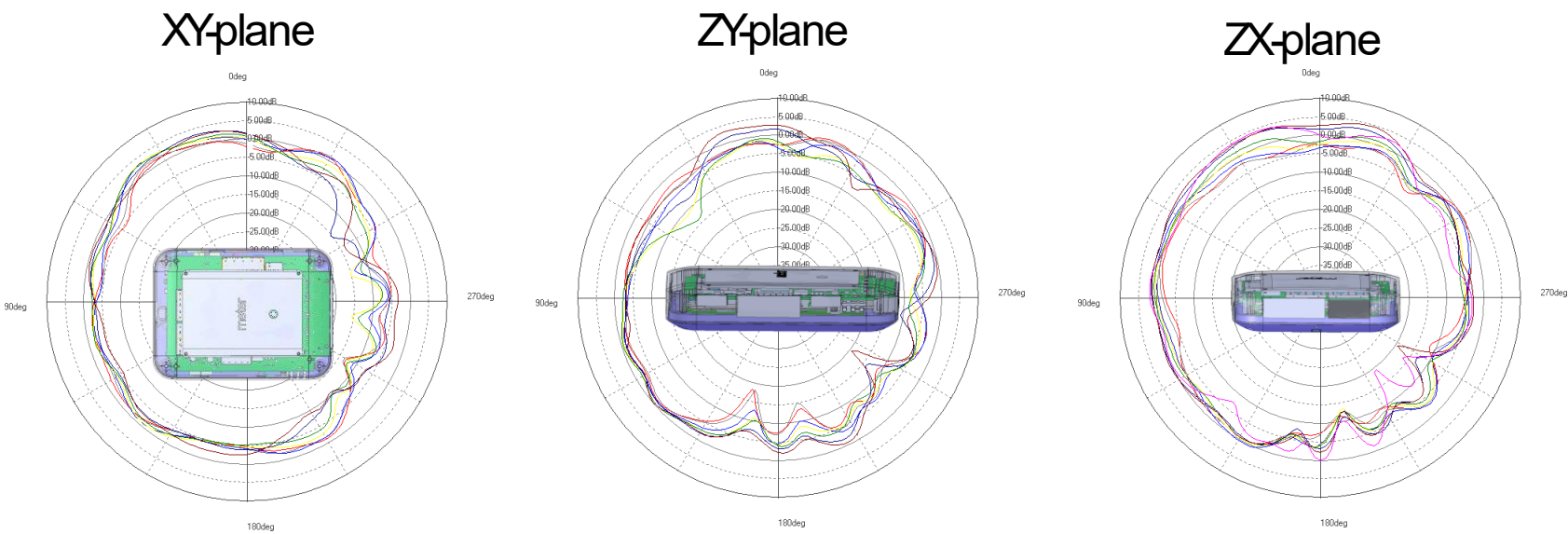


• Performance –Scan2

5G

Metal base

- Legend
- 5150.00(MHz)
 - 5250.00(MHz)
 - 5350.00(MHz)
 - 5470.00(MHz)
 - 5550.00(MHz)
 - 5725.00(MHz)
 - 5850.00(MHz)



• Performance –Scan2

6G

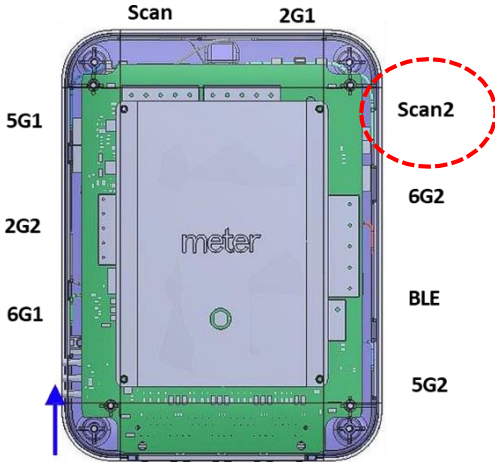
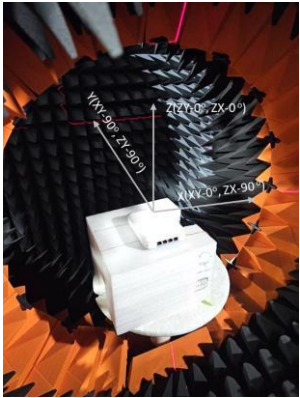
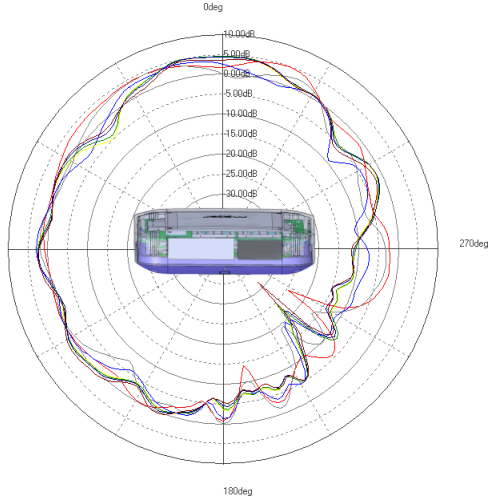
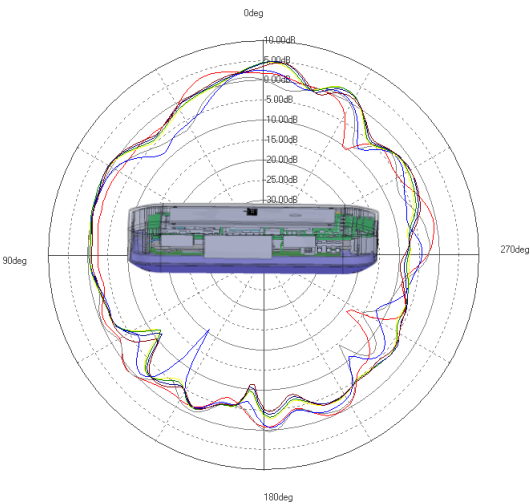
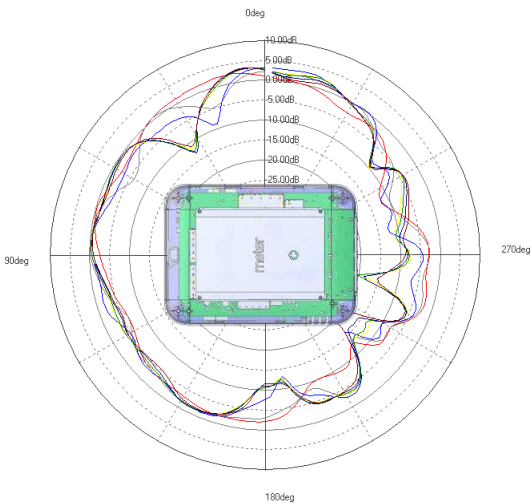
XY-plane

ZY-plane

ZX-plane

Metal base

- Legend
- 5925.00(MHz)
 - 6085.00(MHz)
 - 6245.00(MHz)
 - 6405.00(MHz)
 - 6425.00(MHz)
 - 6465.00(MHz)
 - 6525.00(MHz)



• Performance –Scan2

6G

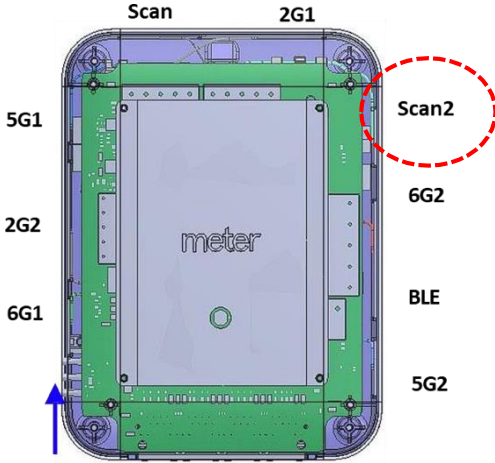
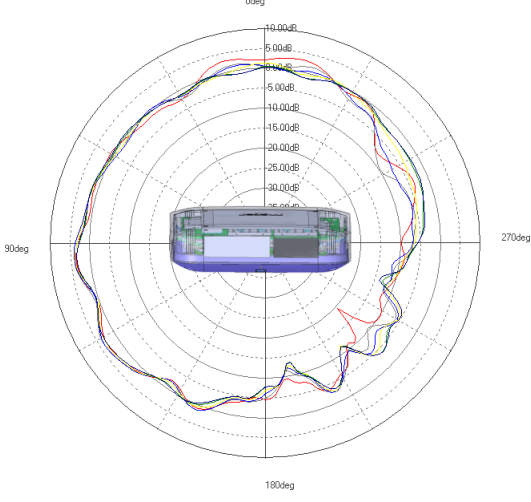
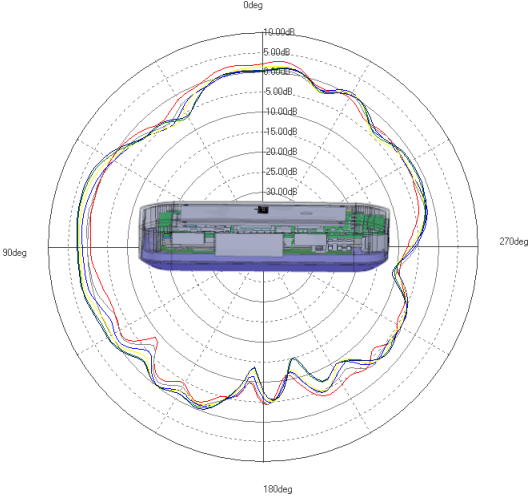
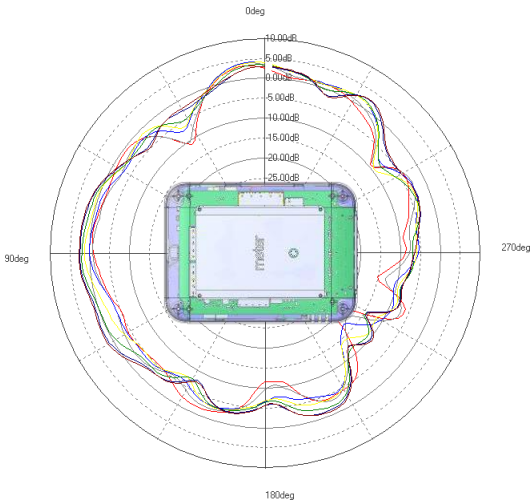
XY-plane

ZY-plane

ZX-plane

Metal base

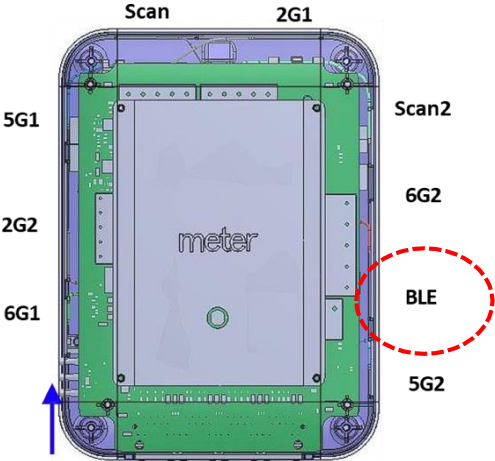
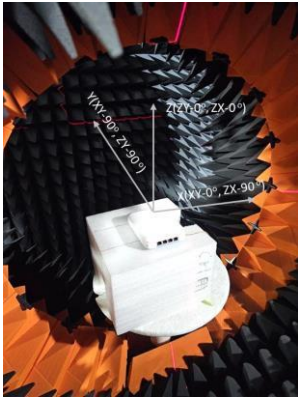
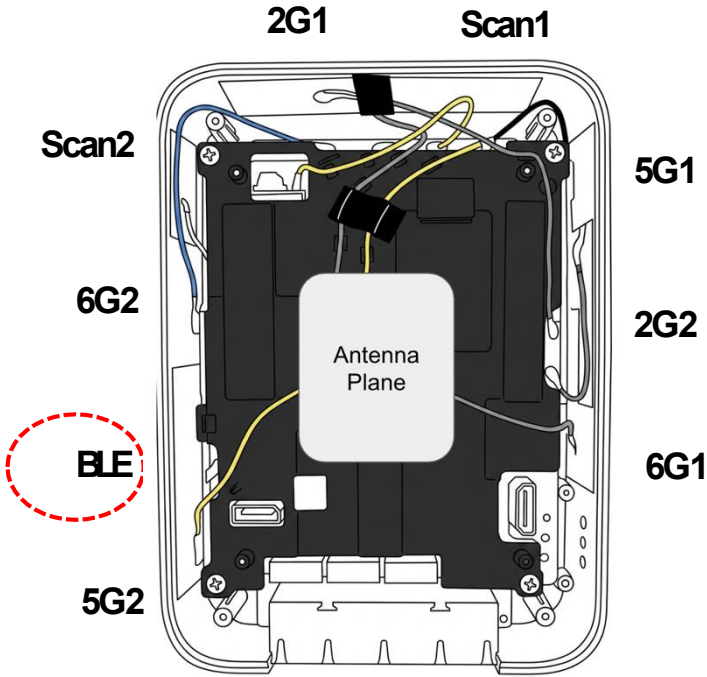
- Legend
- 6645.00(MHz)
 - 6795.00(MHz)
 - 6875.00(MHz)
 - 6975.00(MHz)
 - 7095.00(MHz)
 - 7125.00(MHz)



• Performance -BLE

Metal base

Frequency (MHz)	3D		
	Efficiency	Avg. Gain	Peak Gain
2400	51%	-2.93	2.72
2410	55%	-2.61	3.39
2420	56%	-2.53	3.83
2430	56%	-2.49	4.23
2440	57%	-2.46	4.54
2450	55%	-2.57	4.59
2460	57%	-2.45	4.63
2470	55%	-2.61	4.42
2480	54%	-2.67	4.02
2490	56%	-2.49	3.71
2500	57%	-2.47	3.46



• Performance -BLE

Metal base

- Legend
- 2400.00(MHz)
 - 2410.00(MHz)
 - 2420.00(MHz)
 - 2430.00(MHz)
 - 2440.00(MHz)
 - 2450.00(MHz)
 - 2460.00(MHz)
 - 2470.00(MHz)
 - 2480.00(MHz)
 - 2490.00(MHz)
 - 2500.00(MHz)

