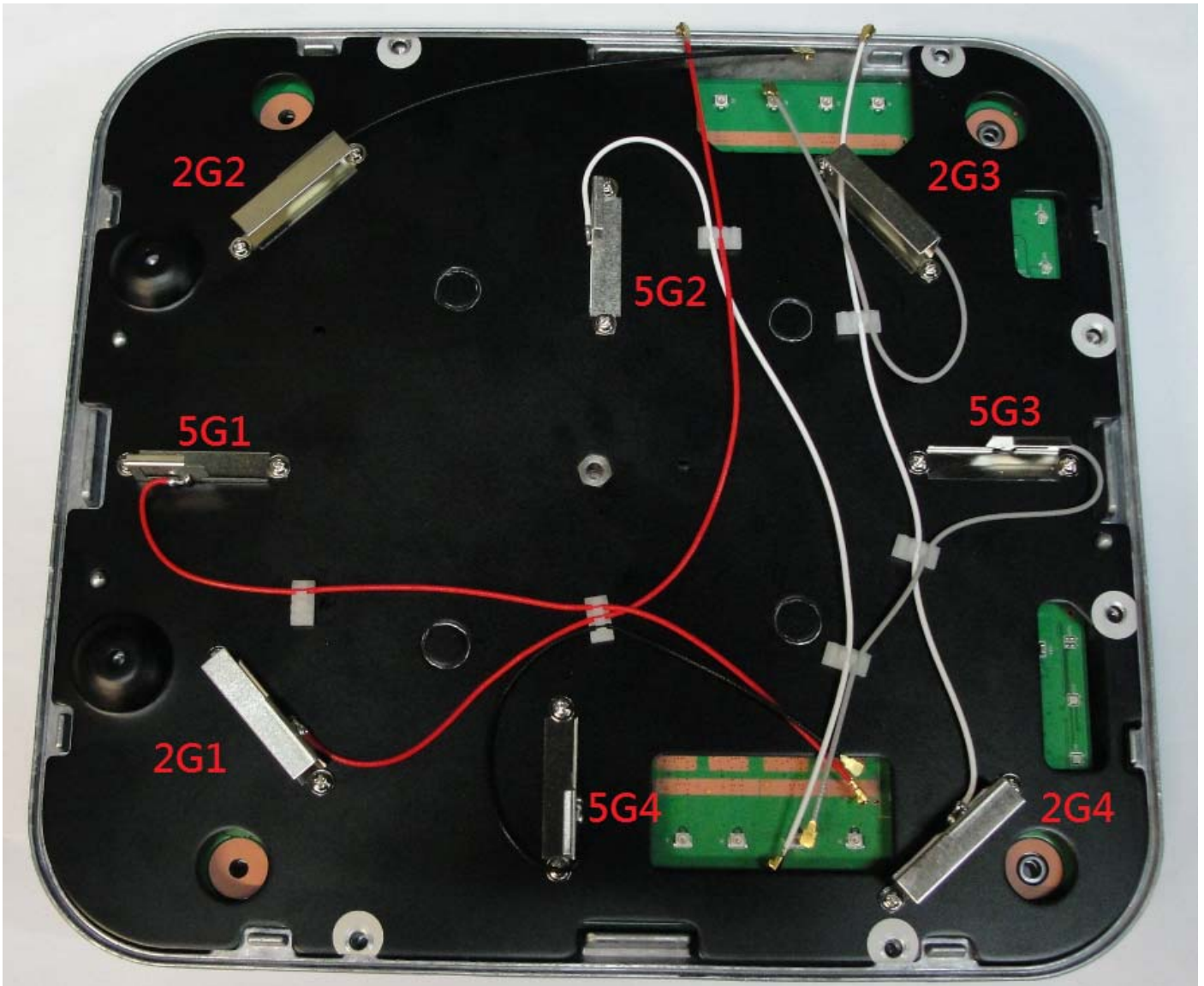


AT-TQ6602

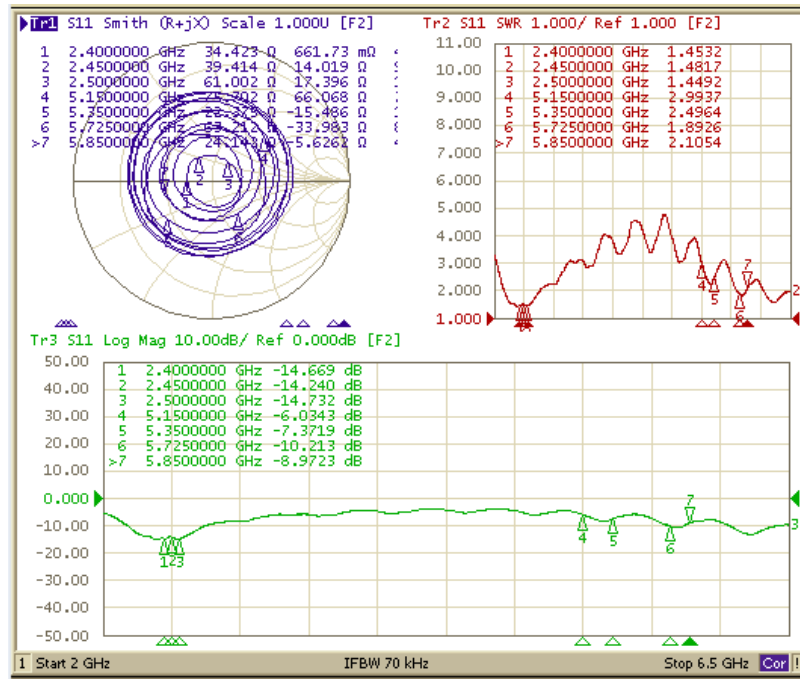
Antenna Test Report

1 Antenna Introduction

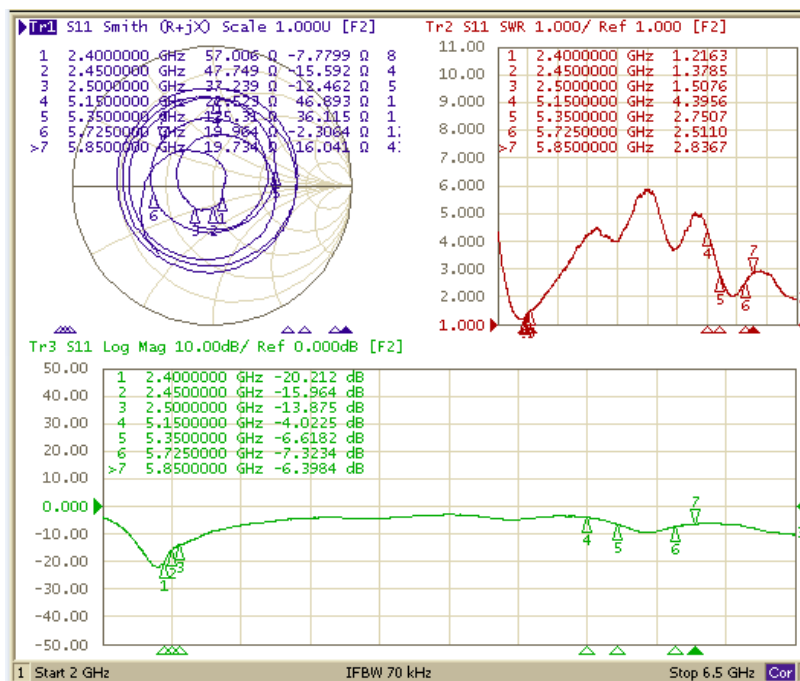


2.1 S11 test results

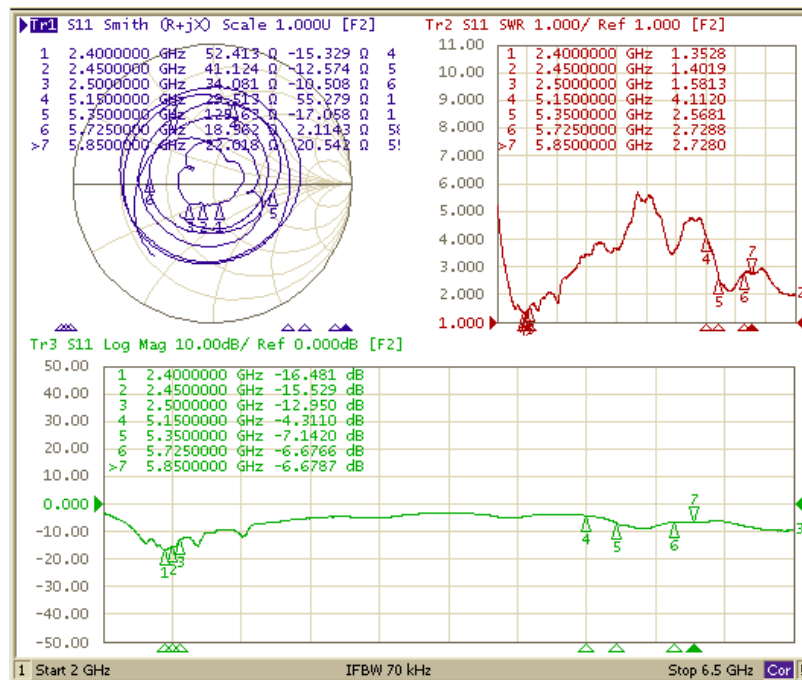
2.1.1 2G1



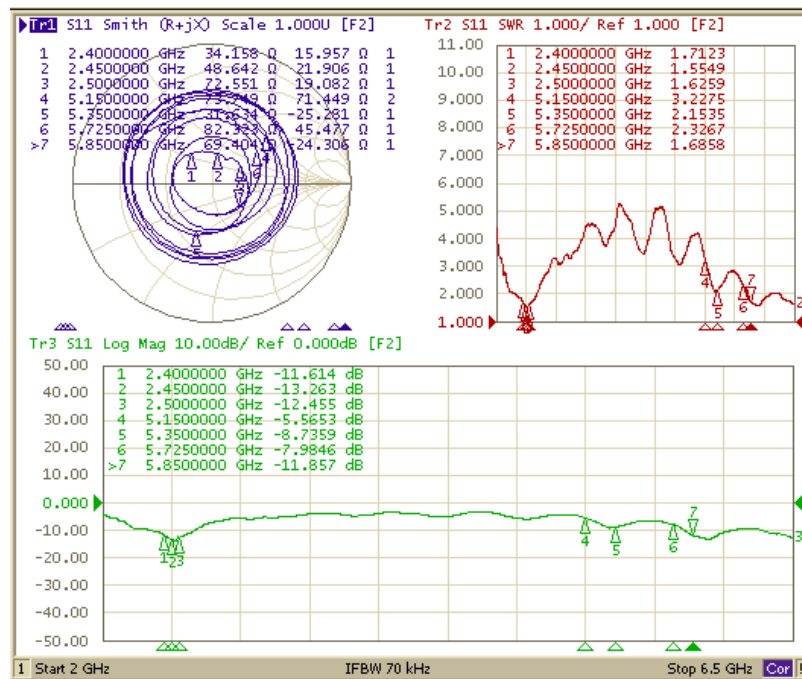
2.1.2 2G2



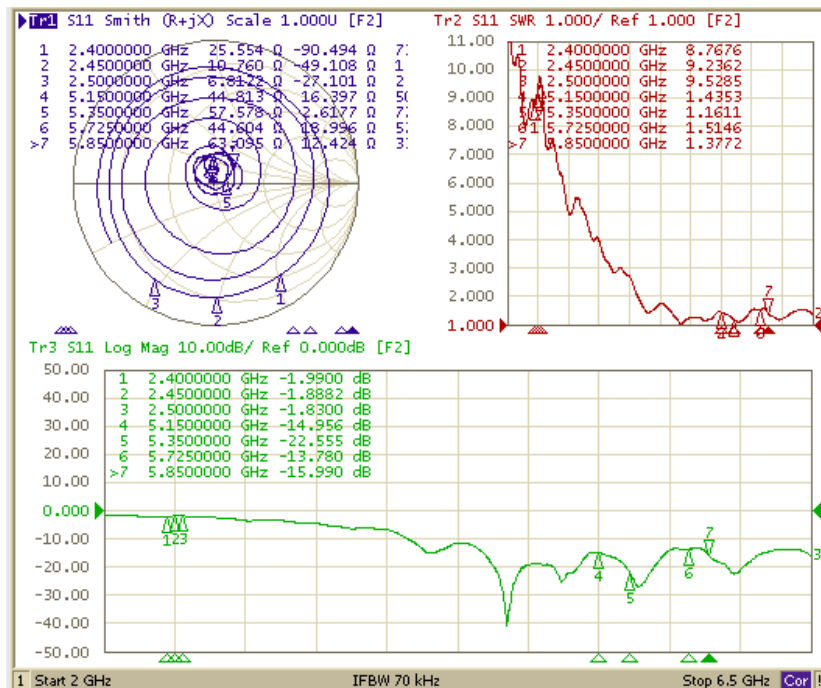
2.1.3 2G3



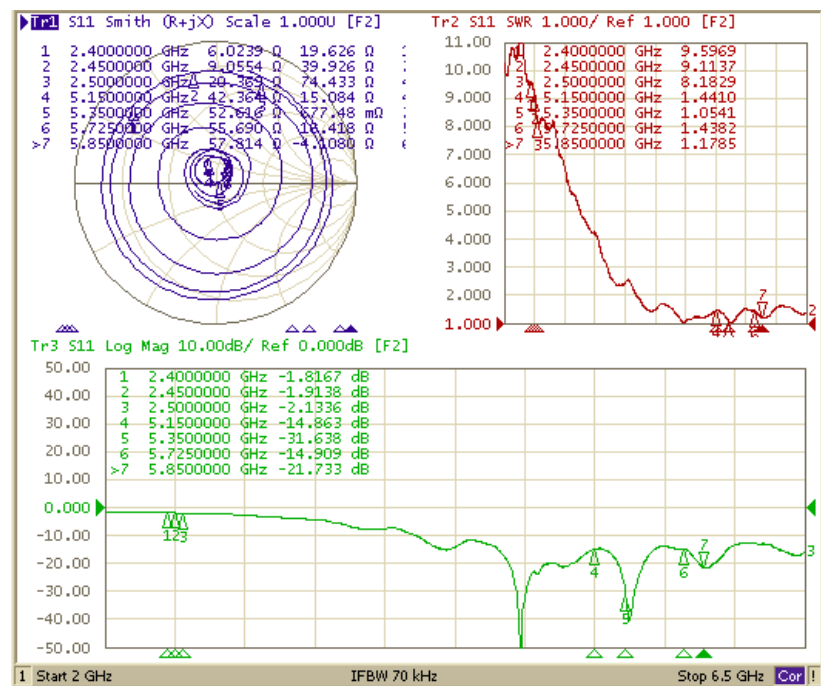
2.1.4 2G4



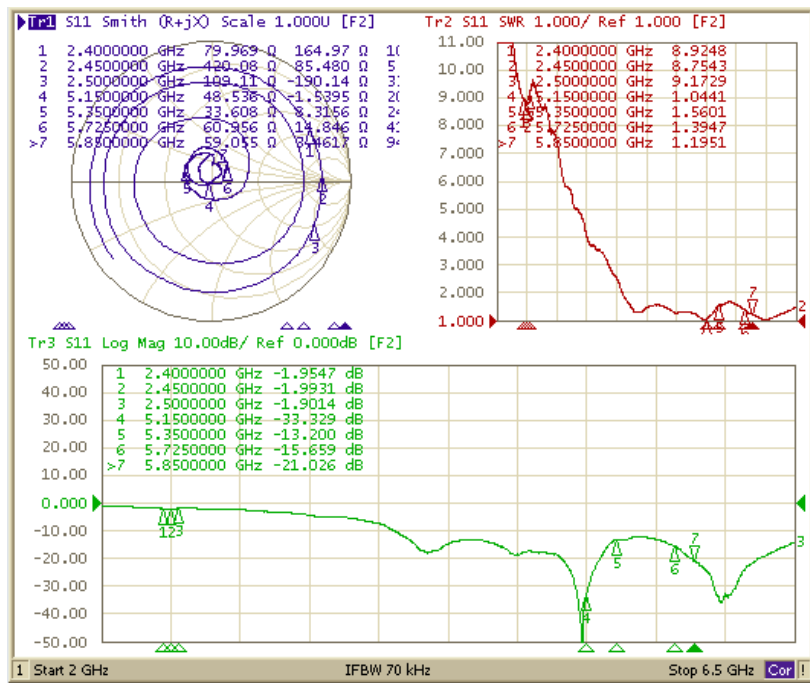
2.1.5 5G1



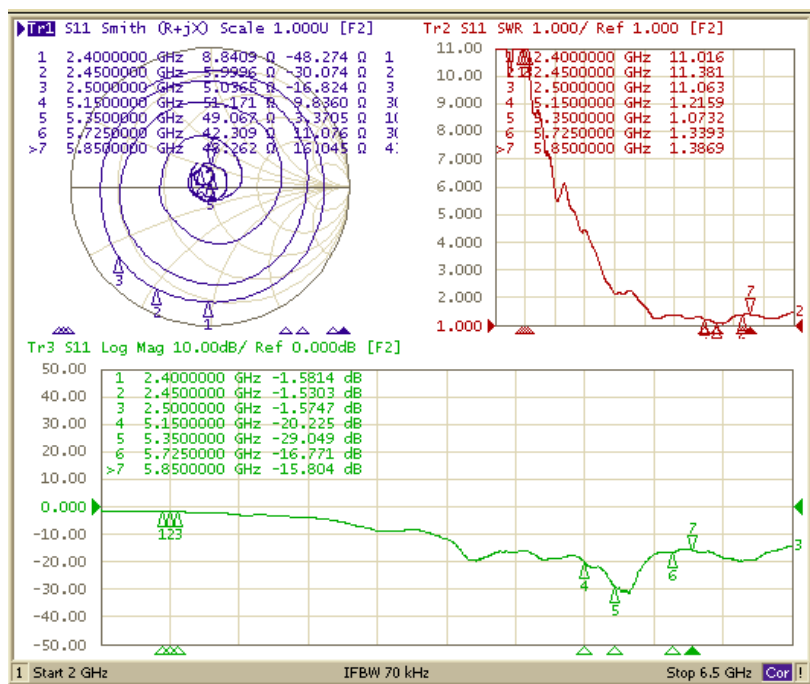
2.1.6 5G2



2.1.7 5G3

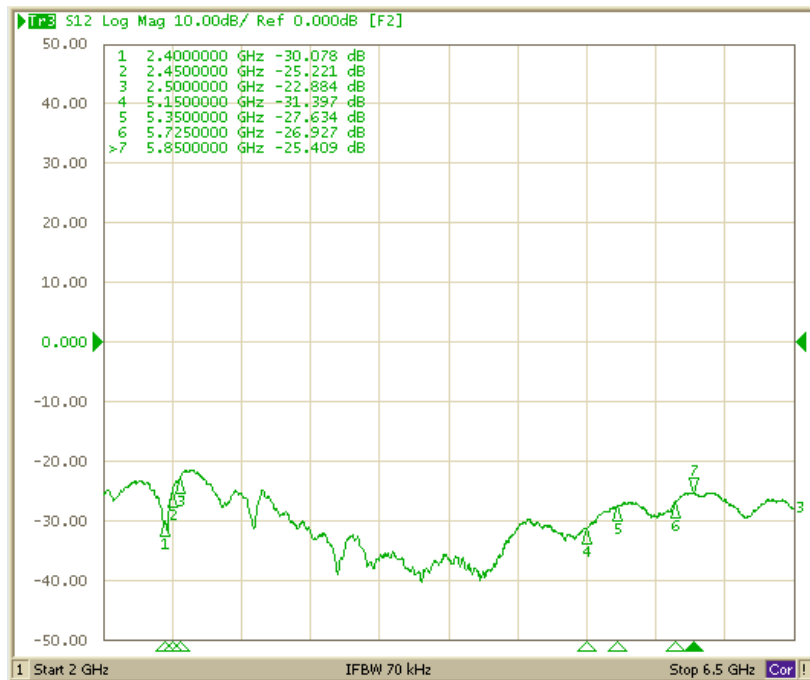


2.1.8 5G4

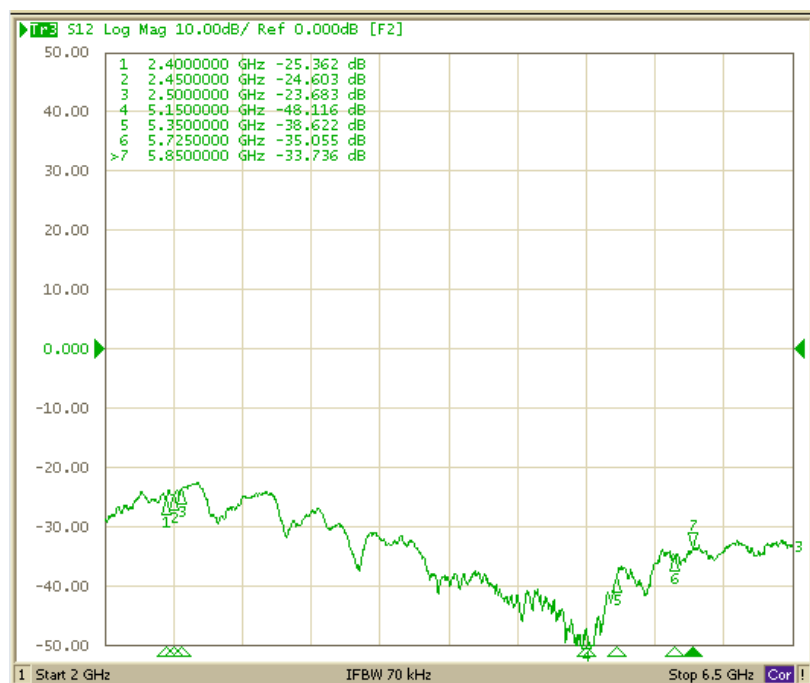


2.2 Isolation test results

2.2.1 2G1 & 2G2



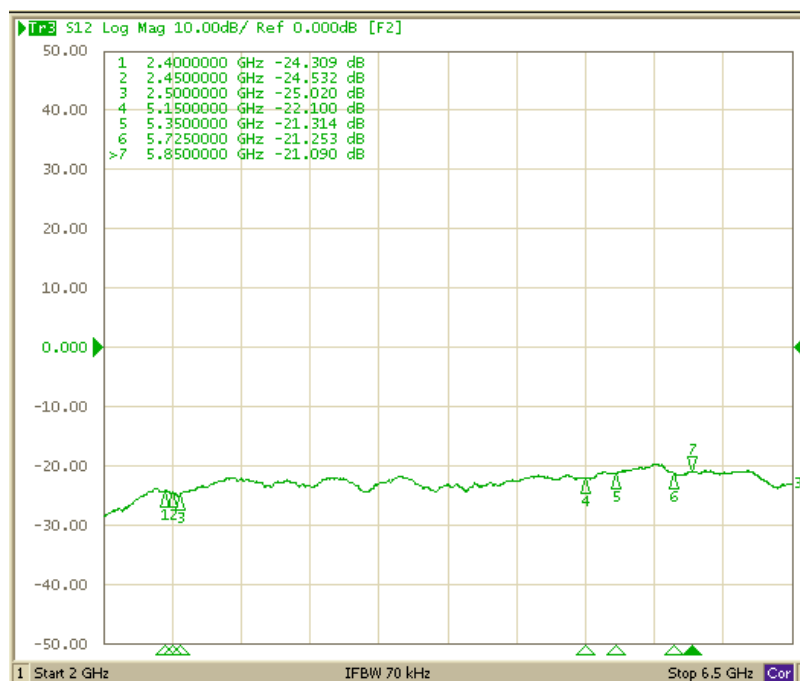
2.2.2 2G1 & 2G3



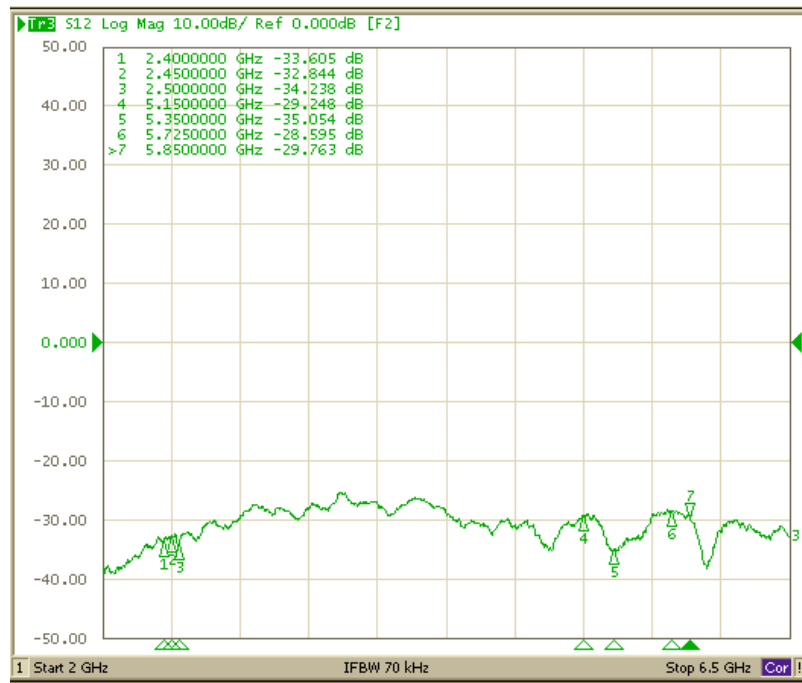
2.2.3 2G1 & 2G4



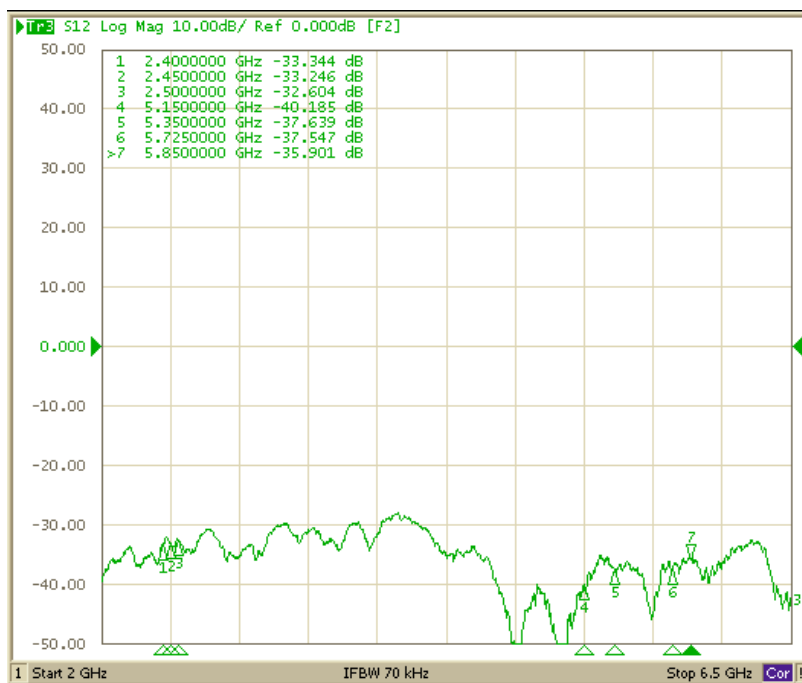
2.2.4 2G1 & 5G1



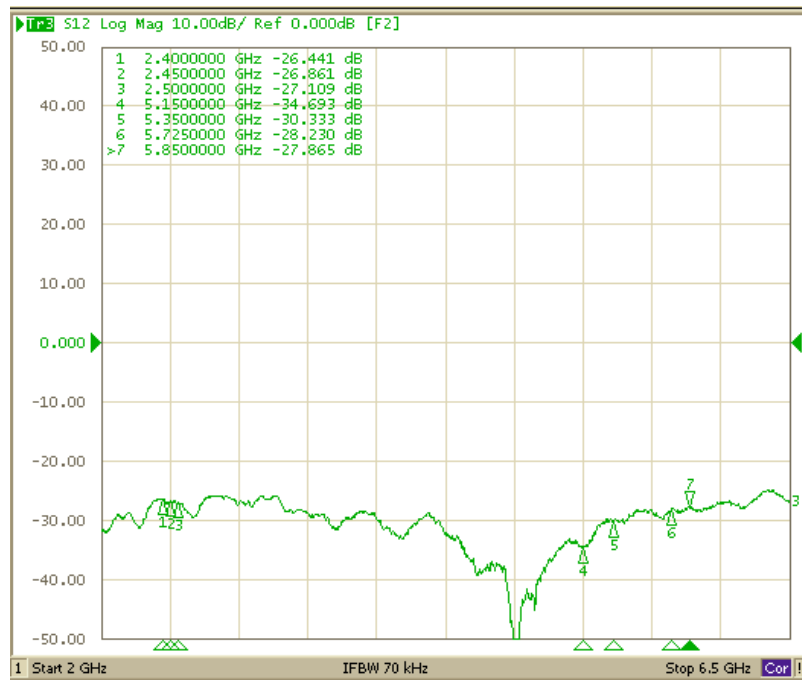
2.2.5 2G1 & 5G2



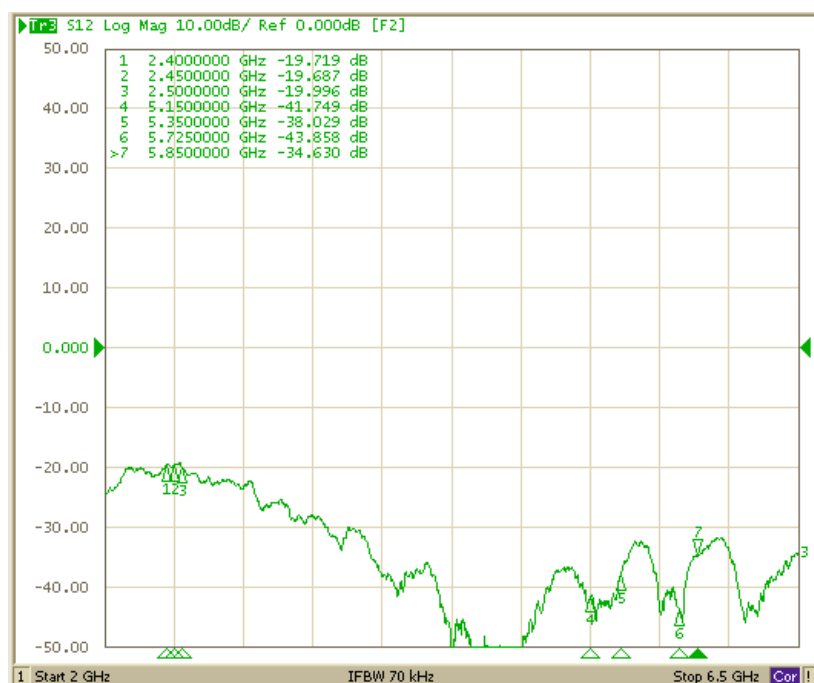
2.2.6 2G1 & 5G3



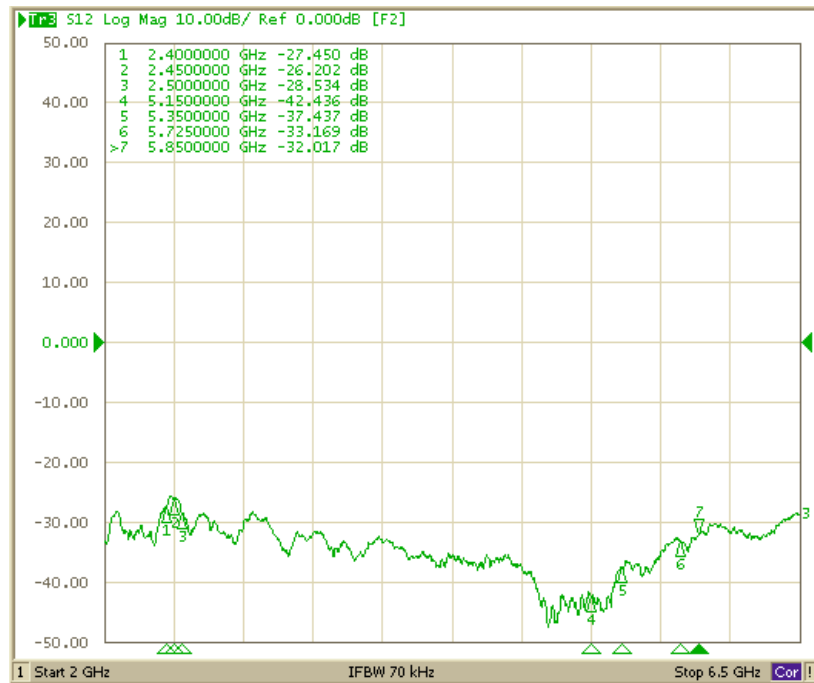
2.2.7 2G1 & 5G4



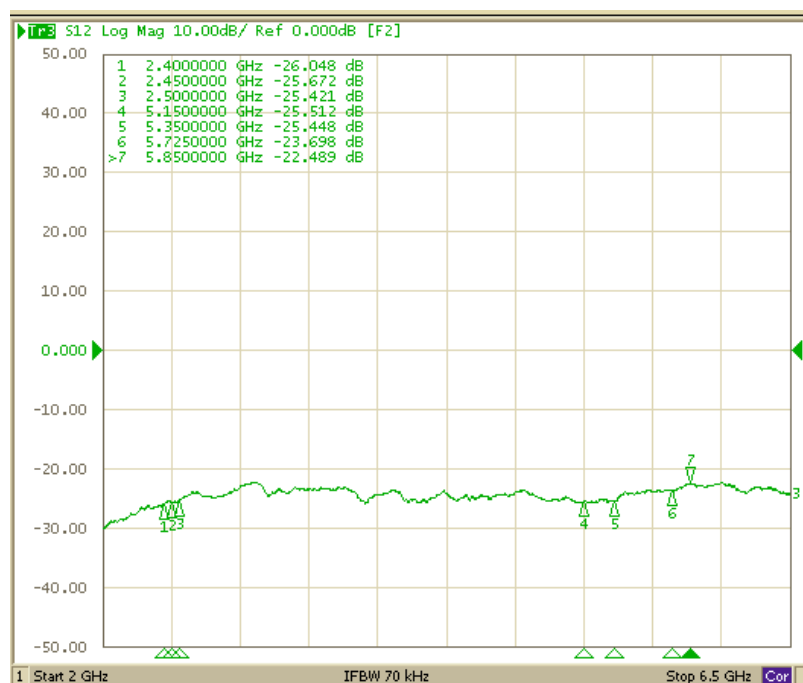
2.2.8 2G2 & 2G3



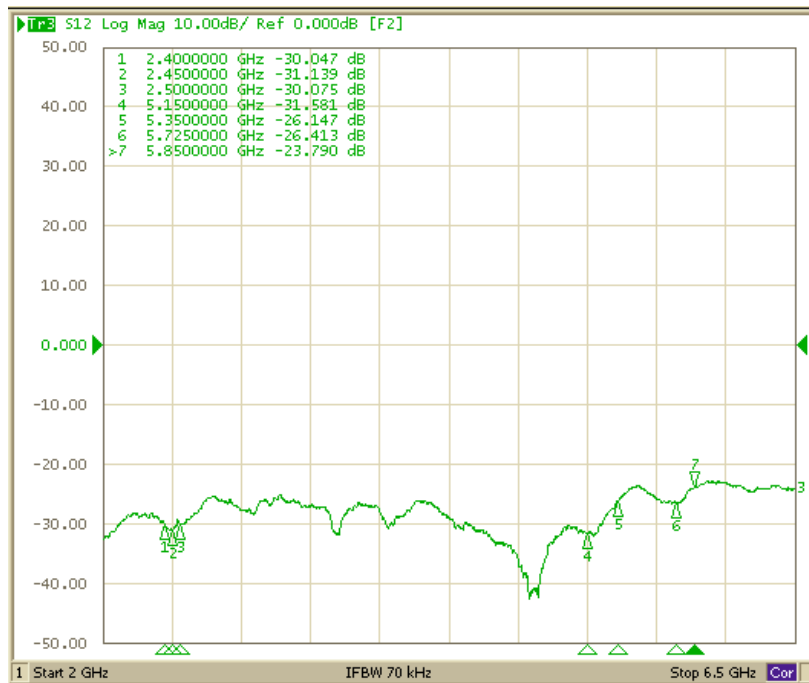
2.2.9 2G2 & 2G4



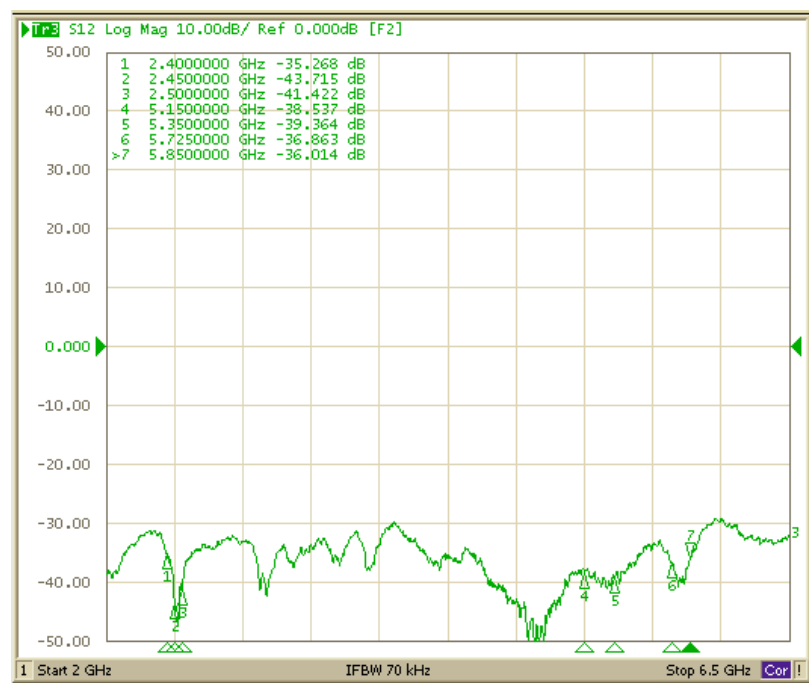
2.2.10 2G2 & 5G1



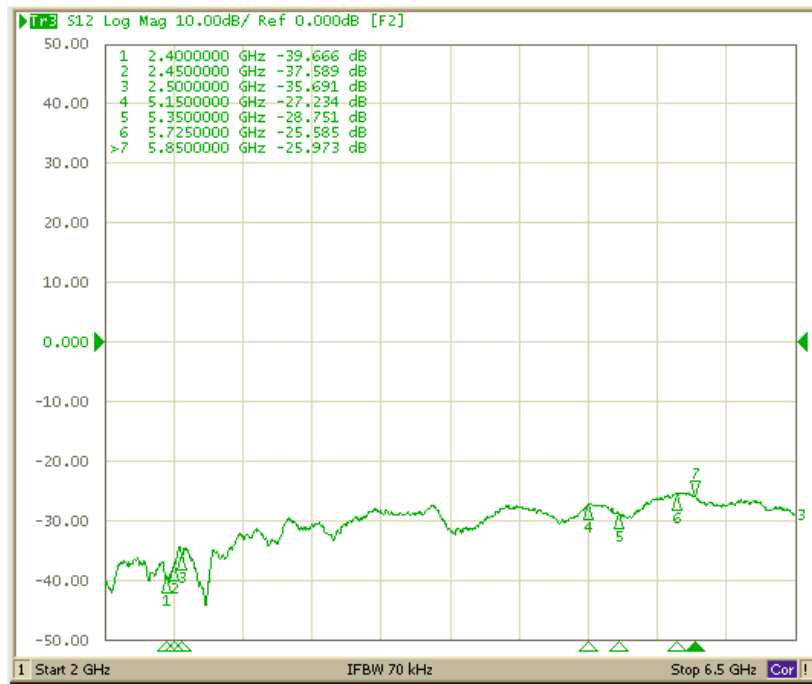
2.2.11 2G2 & 5G2



2.2.12 2G2 & 5G3



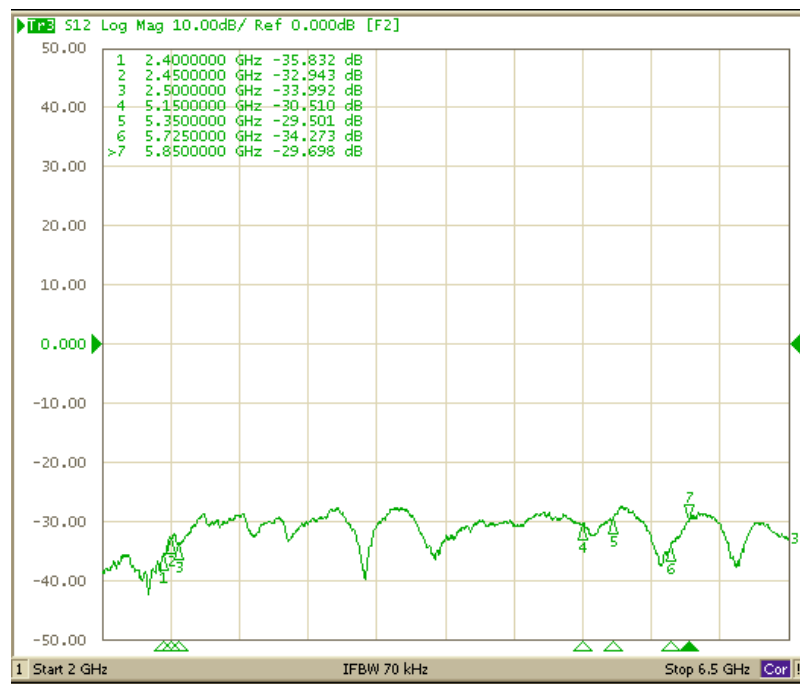
2.2.13 2G2 & 5G4



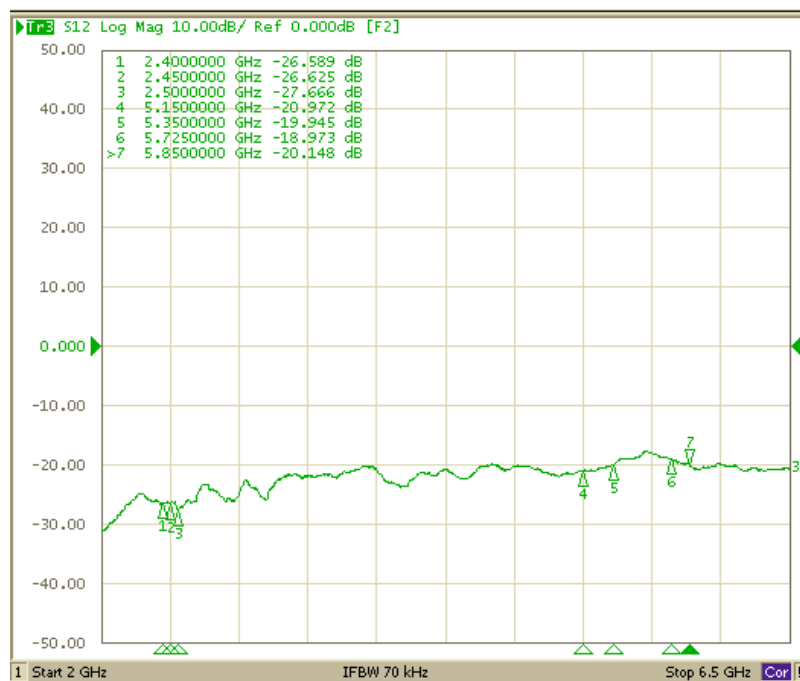
2.2.14 2G3 & 2G4



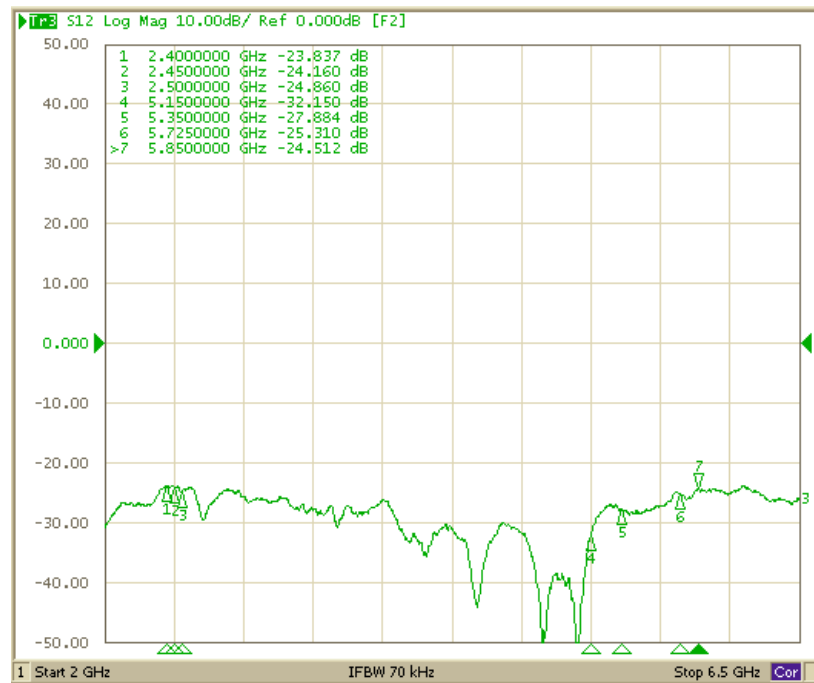
2.2.15 2G3 & 5G1



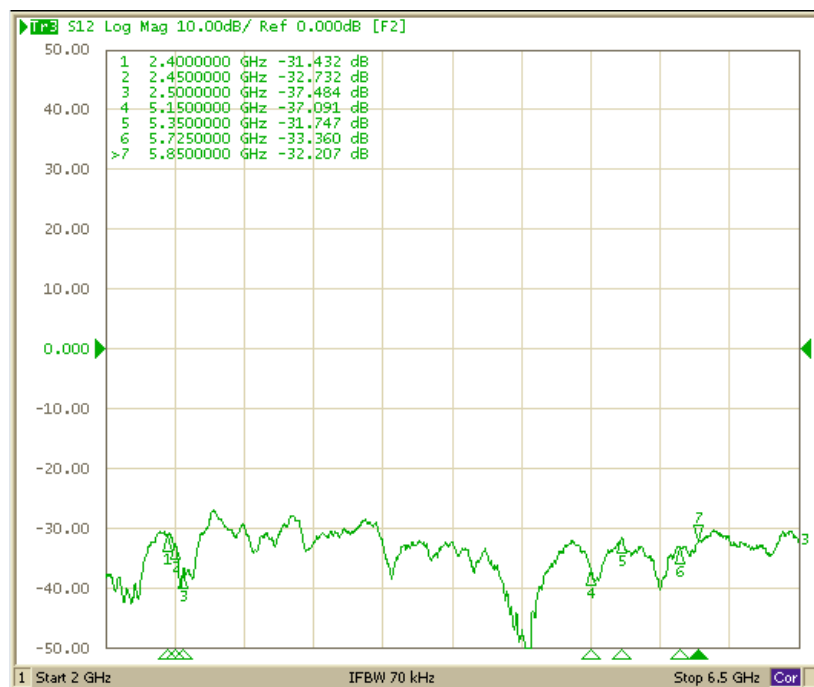
2.2.16 2G3 & 5G2



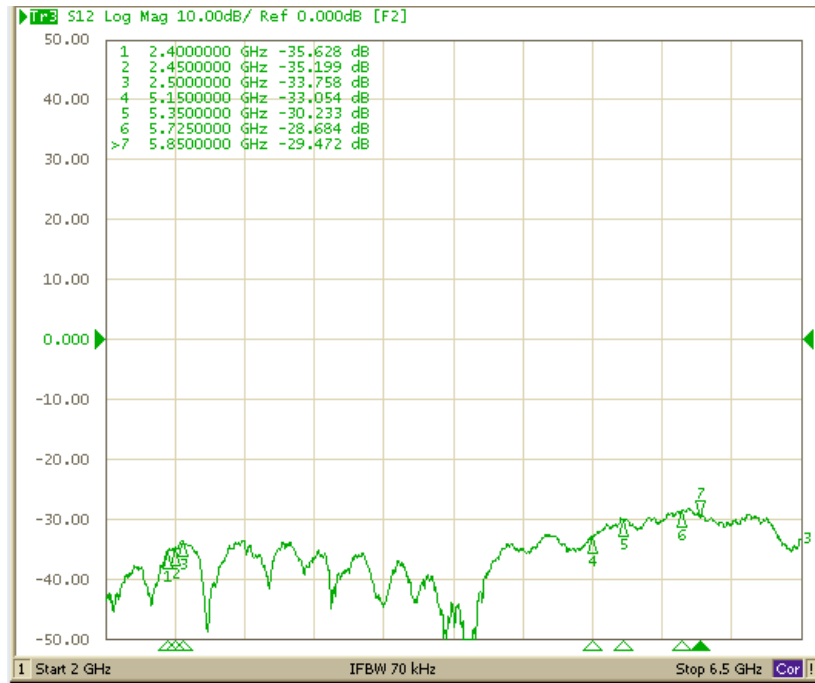
2.2.17 2G3 & 5G3



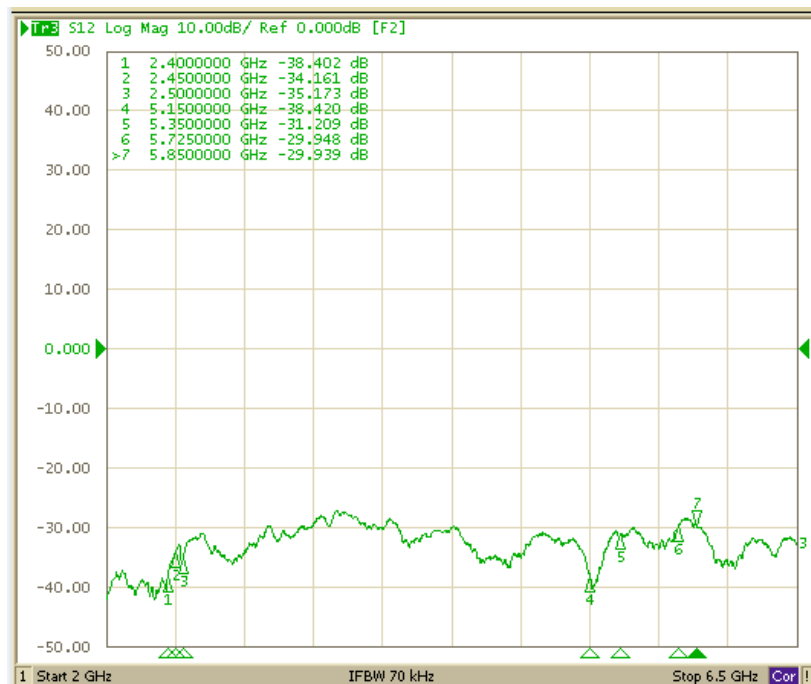
2.2.18 2G3 & 5G4



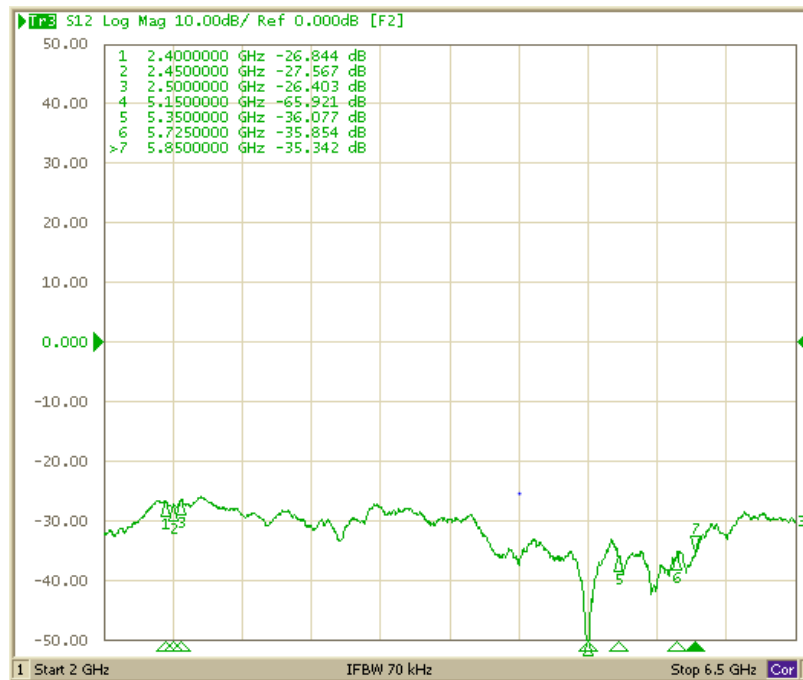
2.2.19 2G4 & 5G1



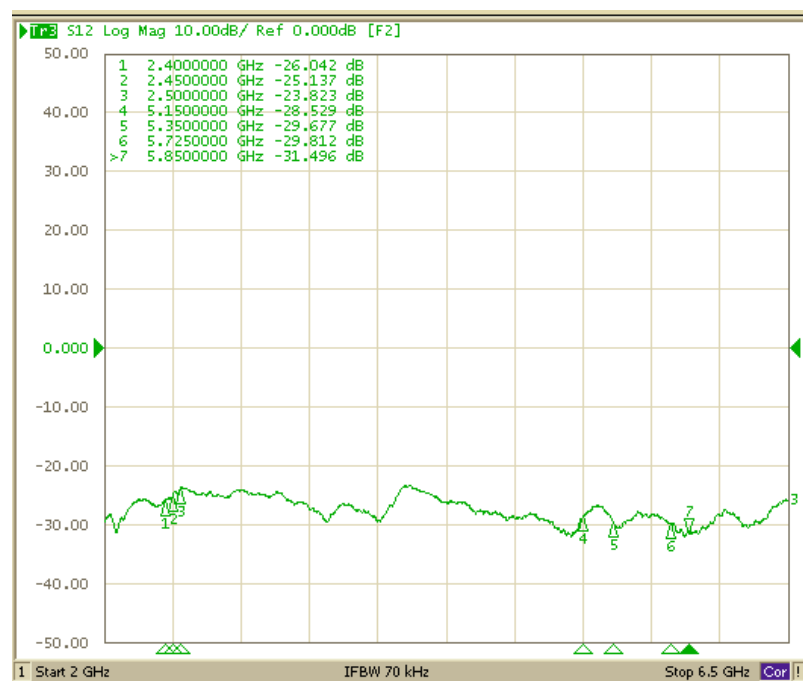
2.2.20 2G4 & 5G2



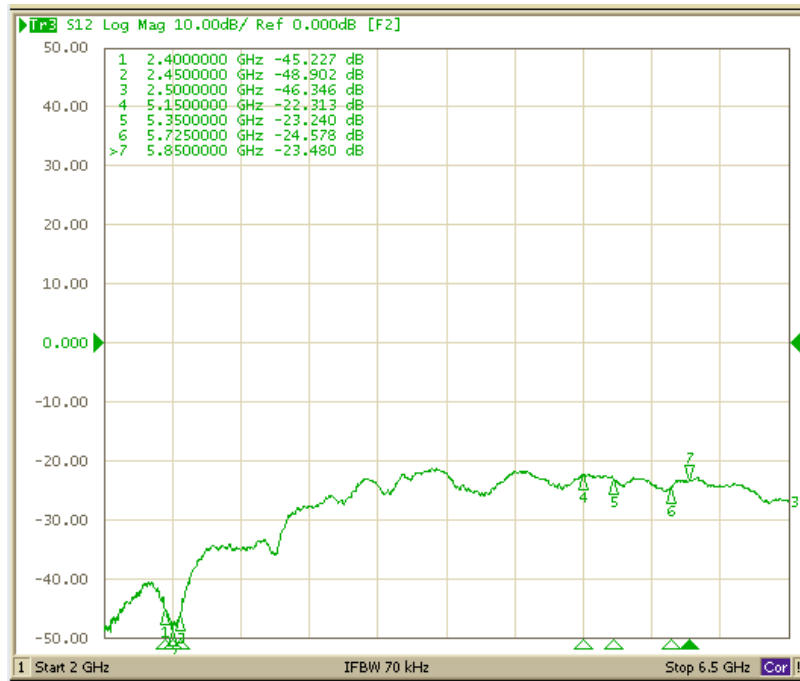
2.2.21 2G4 & 5G3



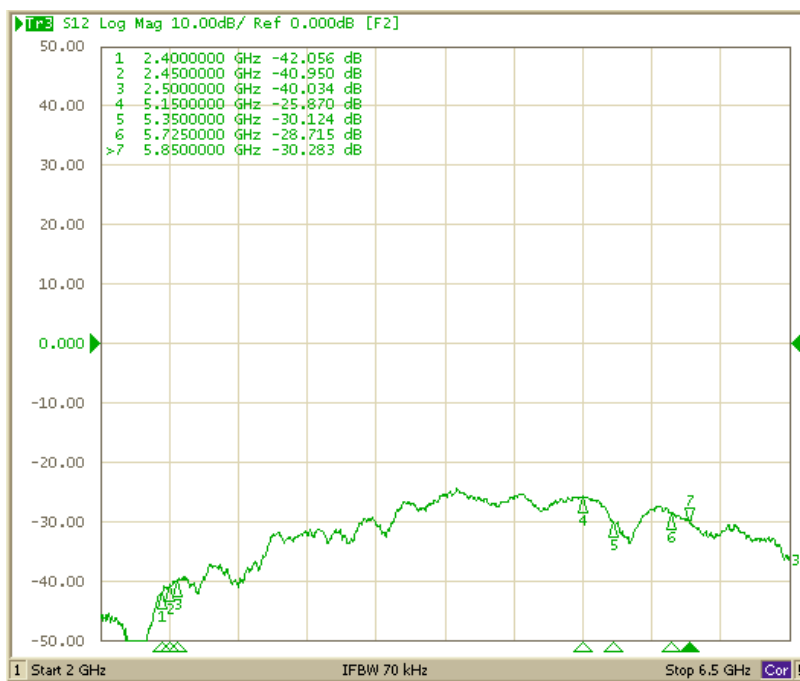
2.2.22 2G4 & 5G4



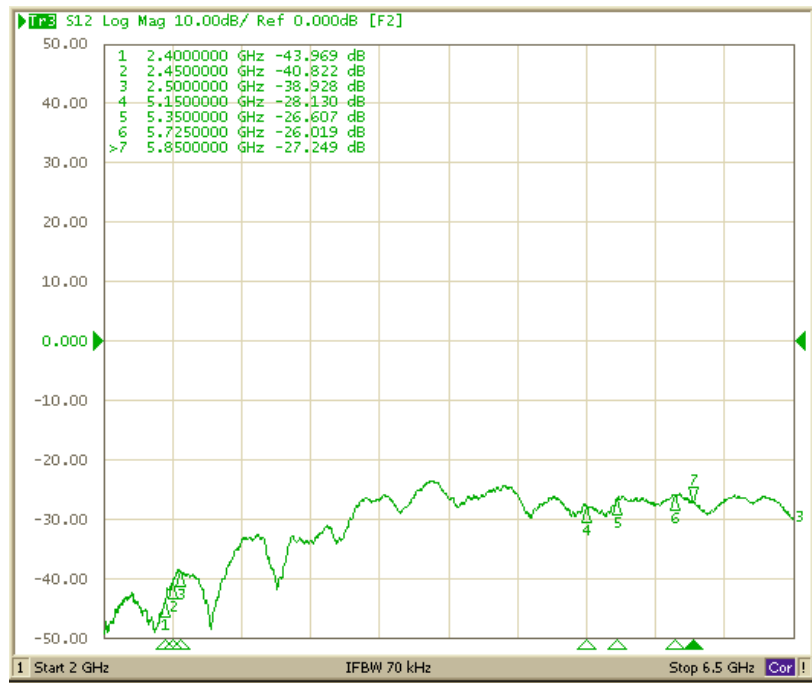
2.2.23 5G1 & 5G2



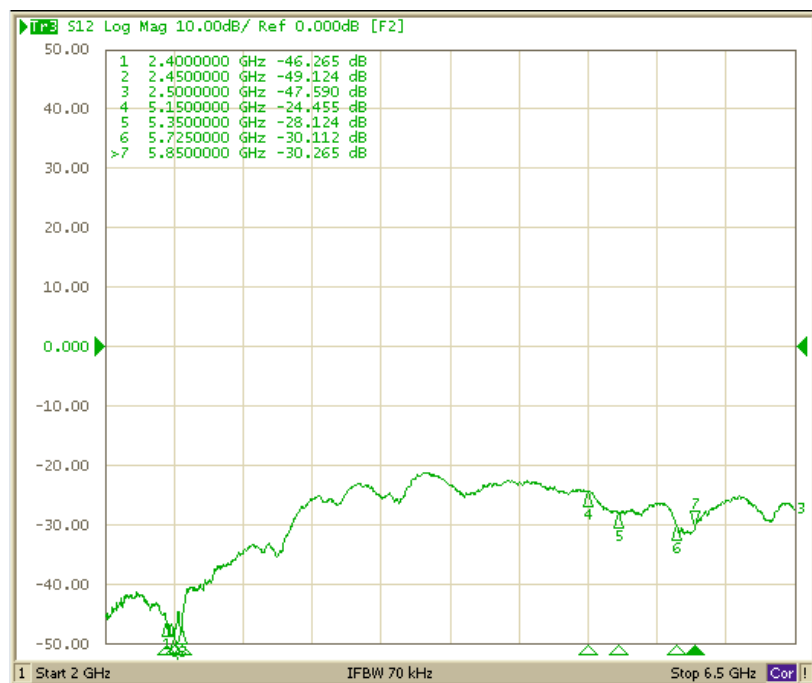
2.2.24 5G1 & 5G3



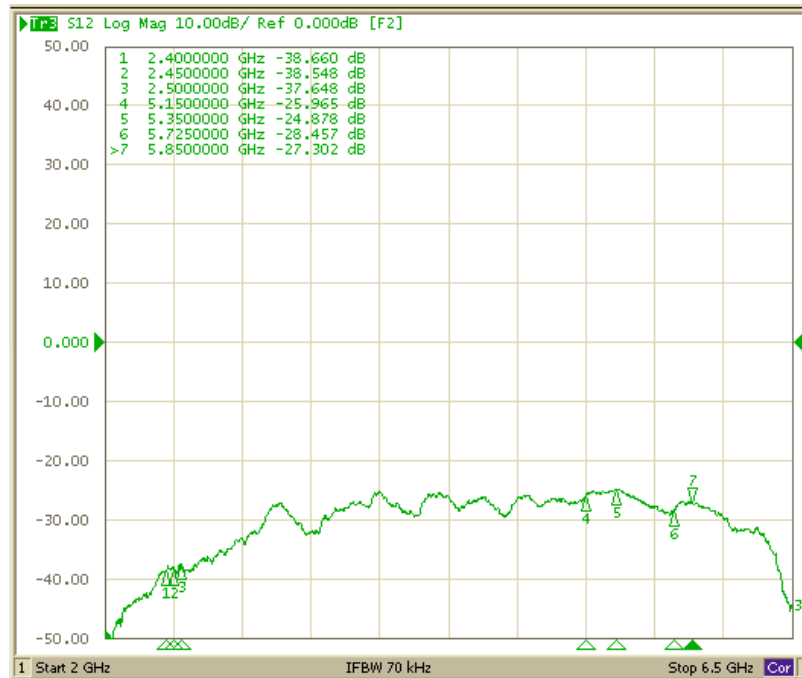
2.2.25 5G1 & 5G4



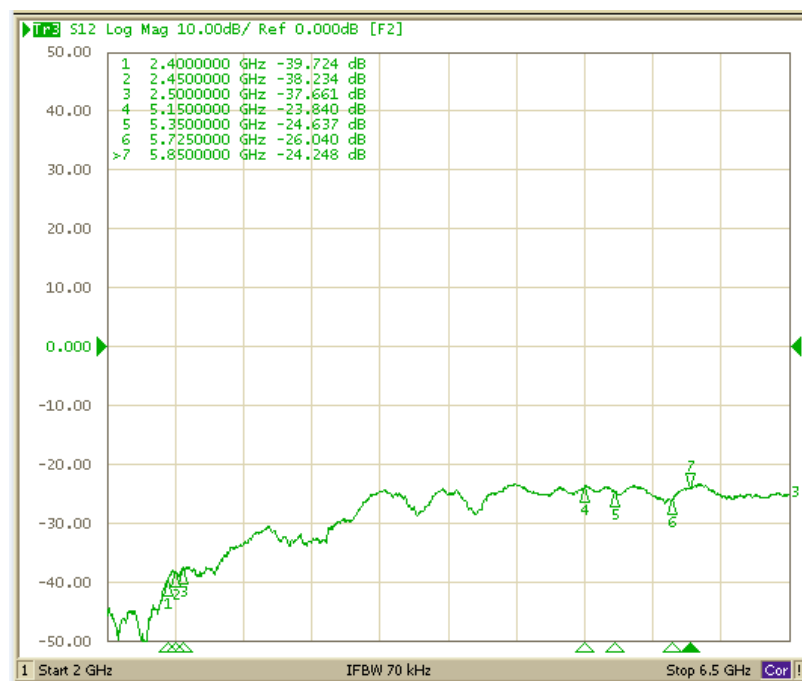
2.2.26 5G2 & 5G3



2.2.27 5G2 & 5G4



2.2.28 5G3 & 5G4



3. Gain & Patterns test results

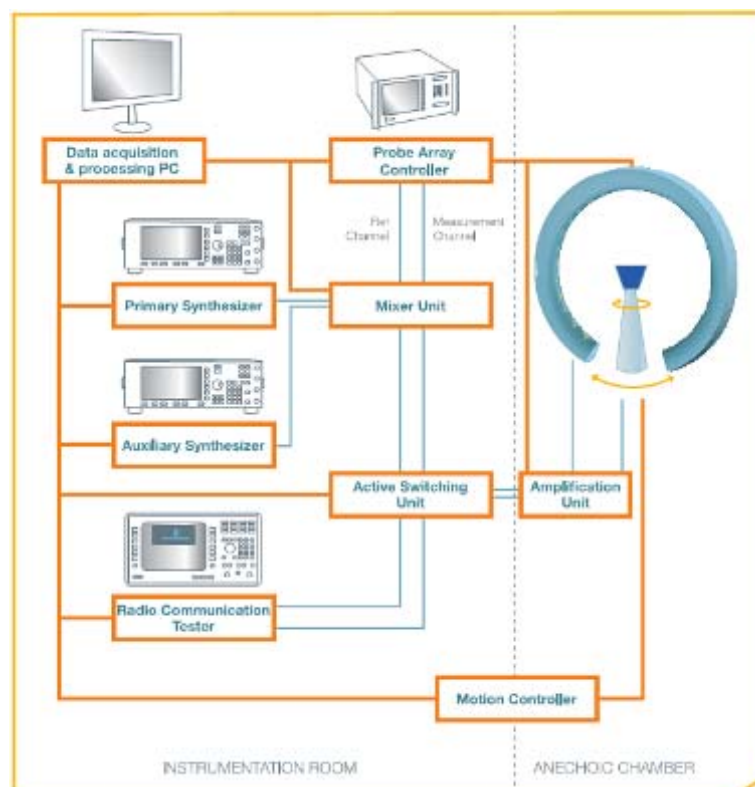
3.1 Lab information

- Lab name : Satimo
- Address : No.326 Sec.2, Kung Tao 5 Road, HsinChu City, Taiwan
- Certification : none (Satimo system certification: CTIA, 3GPP, Wi-Fi alliance and WiMAX Forum)
- Size (LxWxH) : 5m x 5m x 5m
- Isolation level : >100dB
- Normal applications : Antenna radiation pattern measurement, OTA performance testing.
- Frequency measurement range : 0.4 to 6 GHz
- EUT scanning method : conical cut method
- Measurement distance : 1.6m
- Measurement Antenna specification (for θ and Φ polarization each) : dual polarization Antenna for 0.4 to 6.0 GHz frequency range



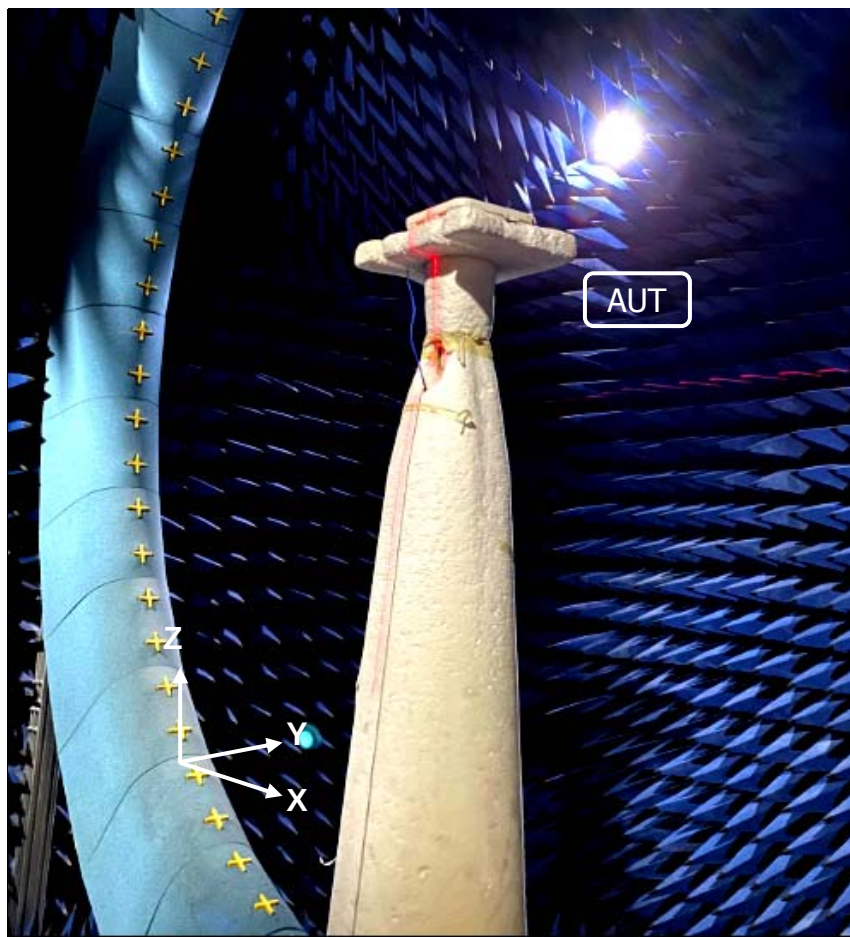
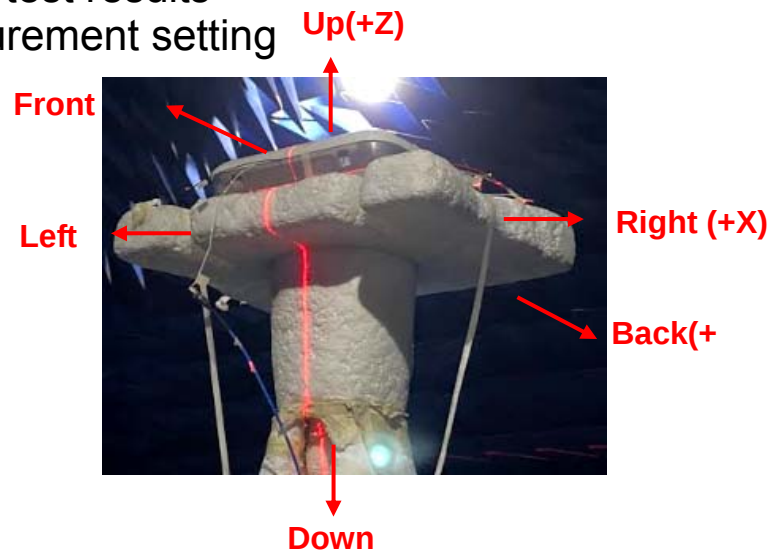
> 0.4 to 6.0 GHz probe

- Equipment list :

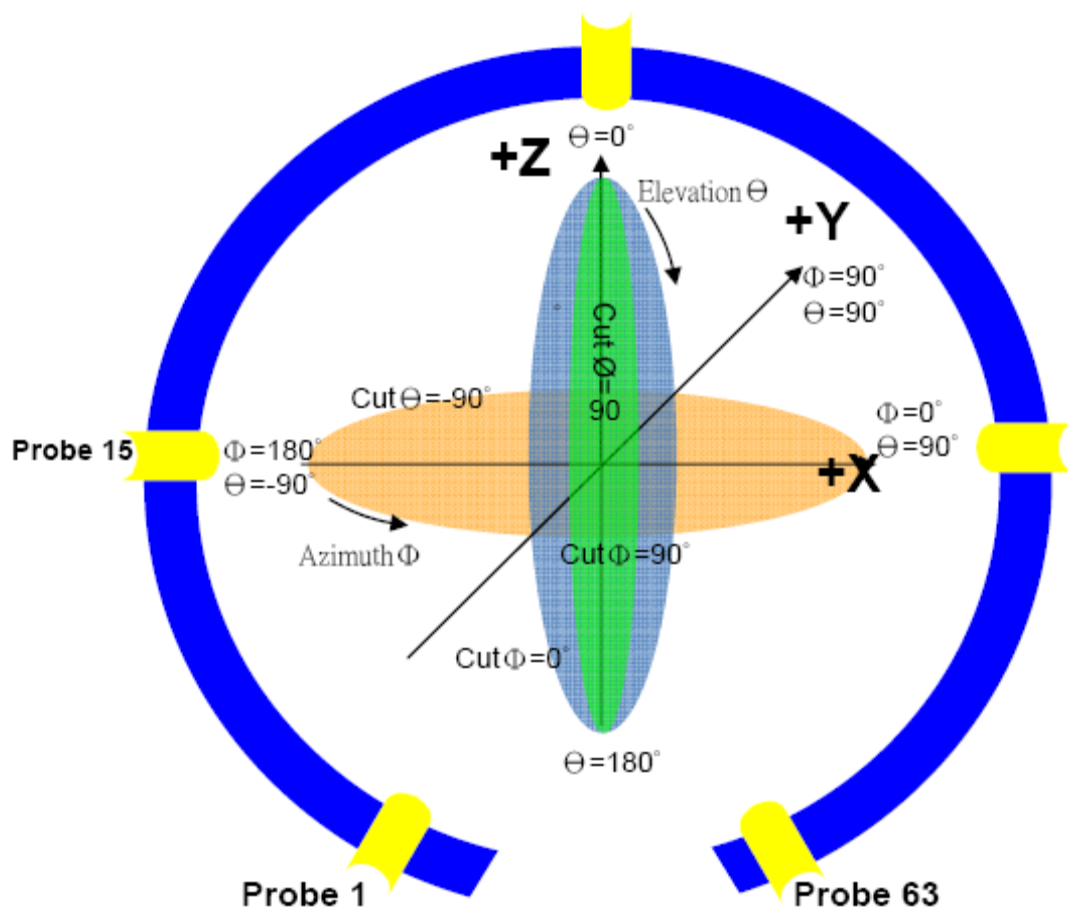


4. Gain & Patterns test results

4.1 Measurement setting



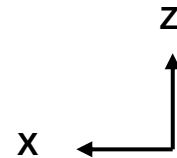
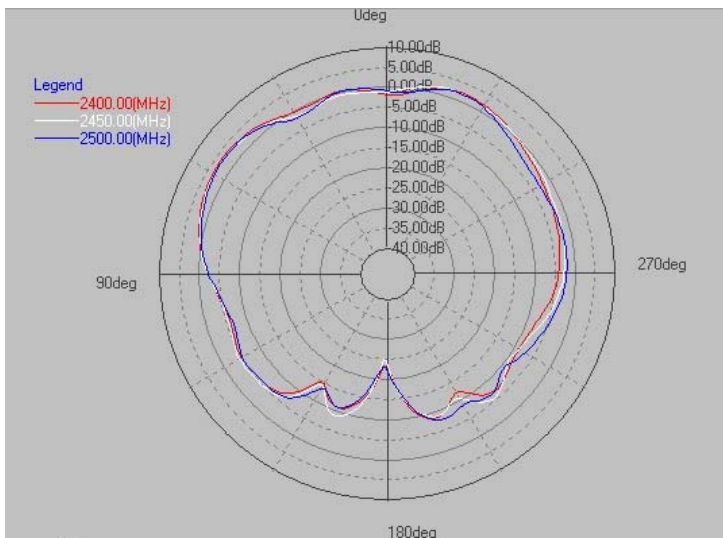
	XY	YZ	XZ
0°	Right	Up	Up
90°	Back	Back	Right
180°	Left	Down	Down
270°	Front	Front	Left



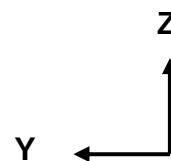
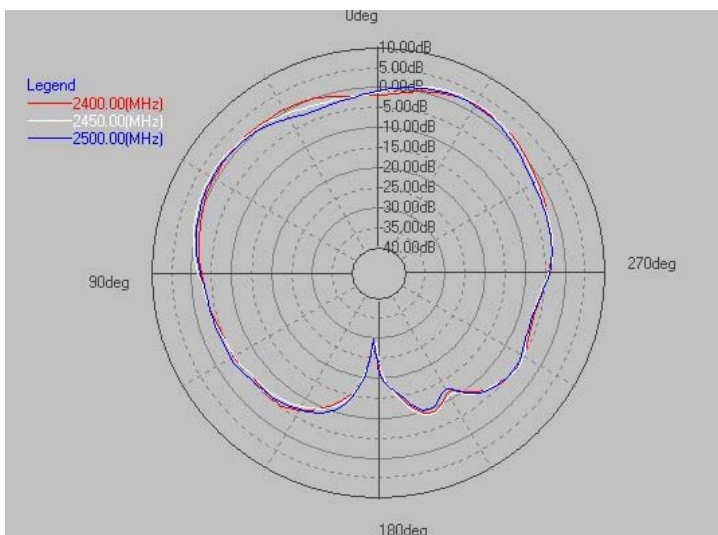
	θ	ϕ
Total angle	175°	360°
How many angle scan one point	5°	5°
Total scan point	36	73

4.2 2D patterns

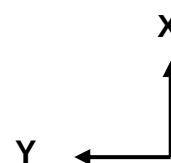
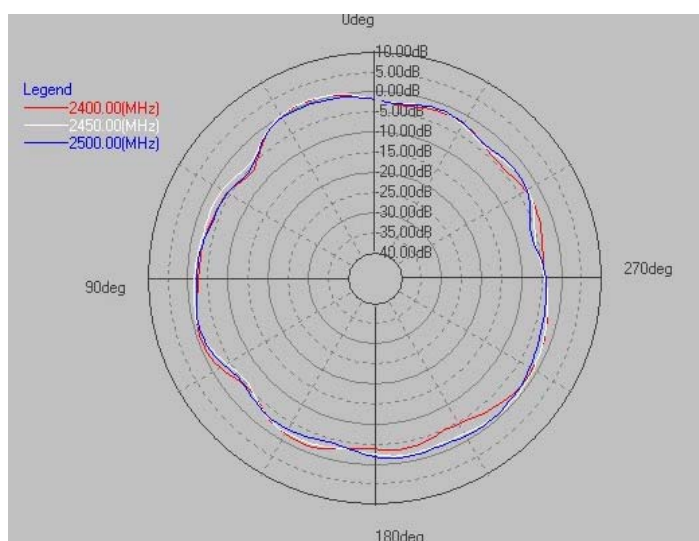
4.2.1 2G1



X-Z Plane (E-total)

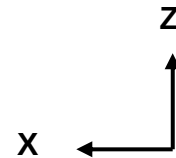
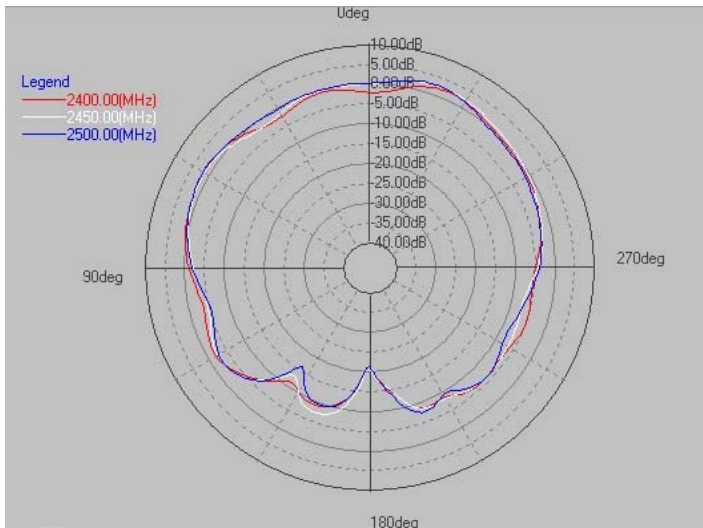


Y-Z Plane (E-total)

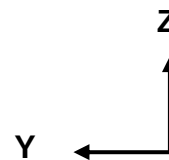
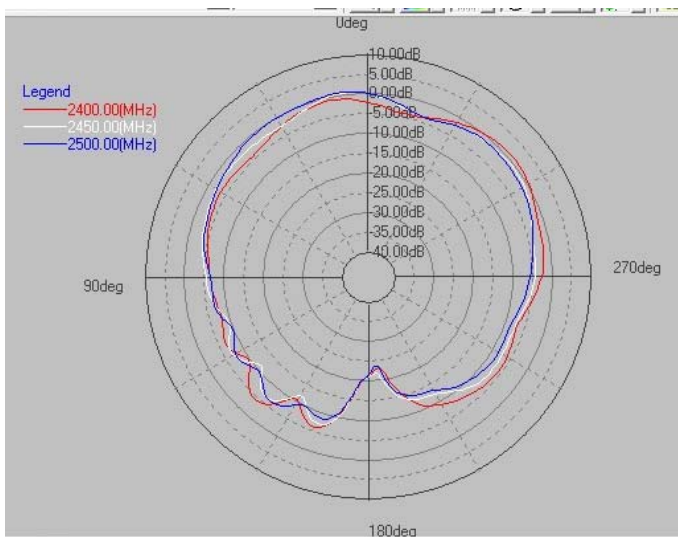


X-Y Plane (E-total)

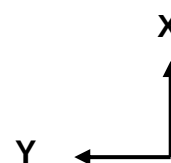
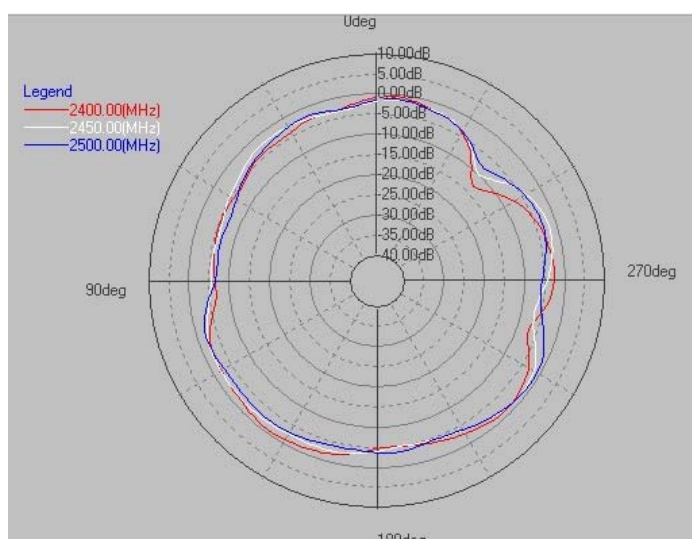
4.2.2 2G2



X-Z Plane (E-total)

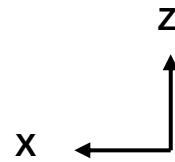
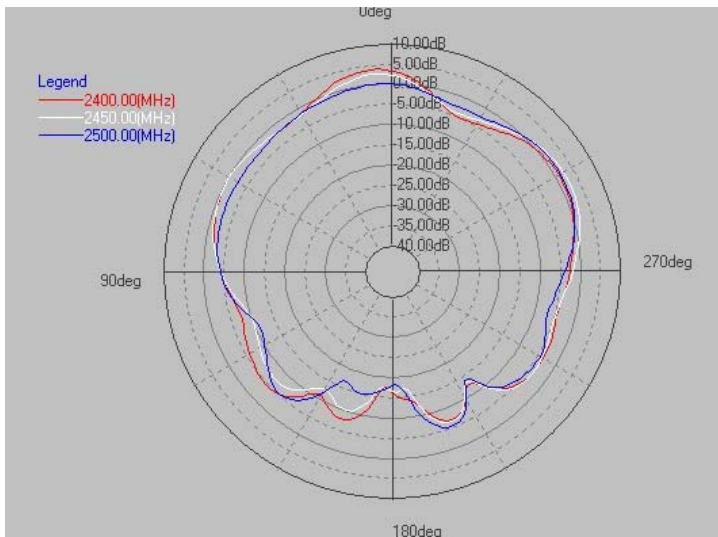


Y-Z Plane (E-total)

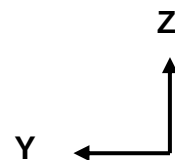
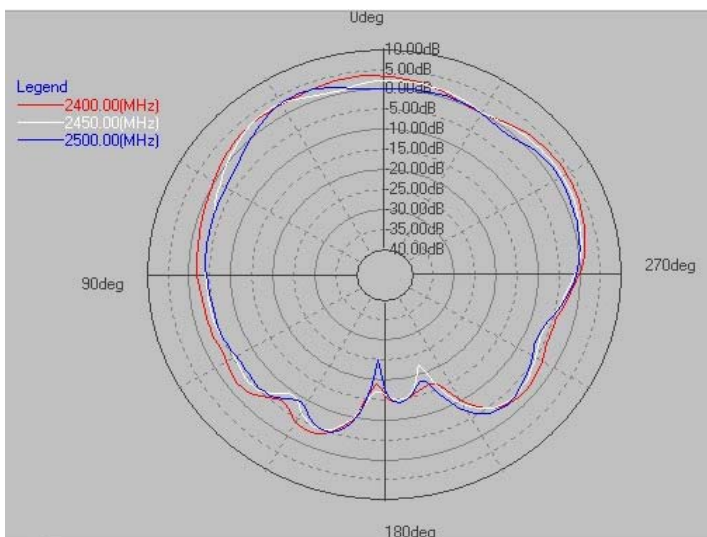


X-Y Plane (E-total)

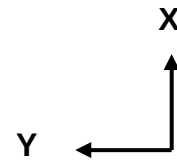
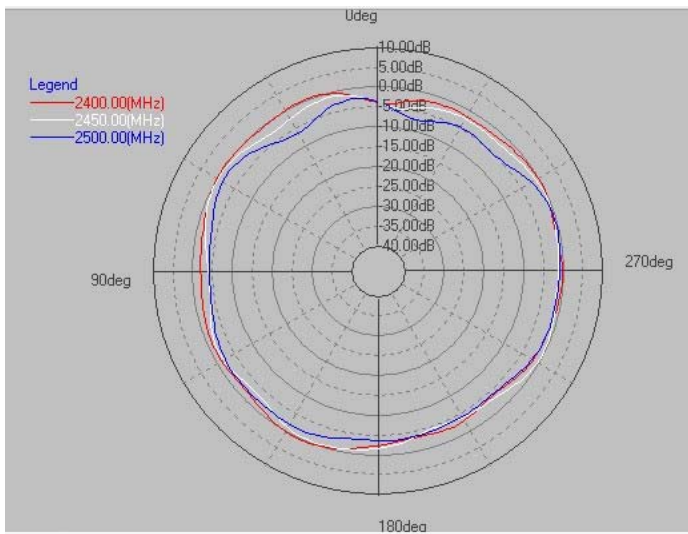
4.2.3 2G3



X-Z Plane (E-total)

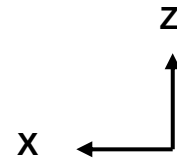
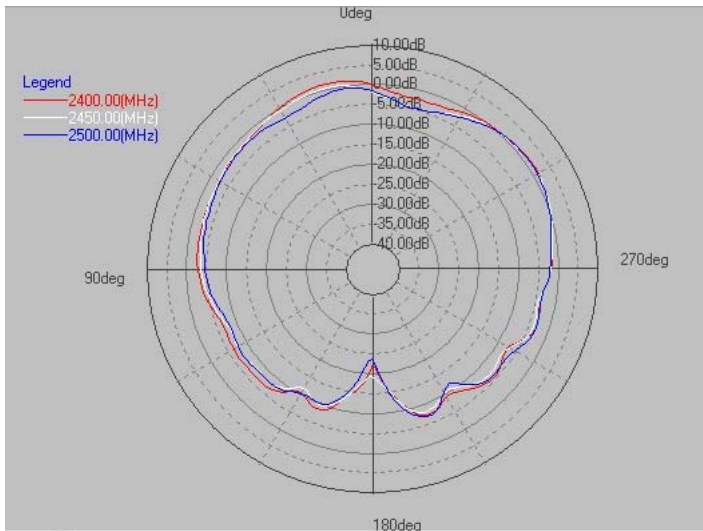


Y-Z Plane (E-total)

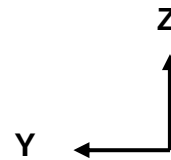
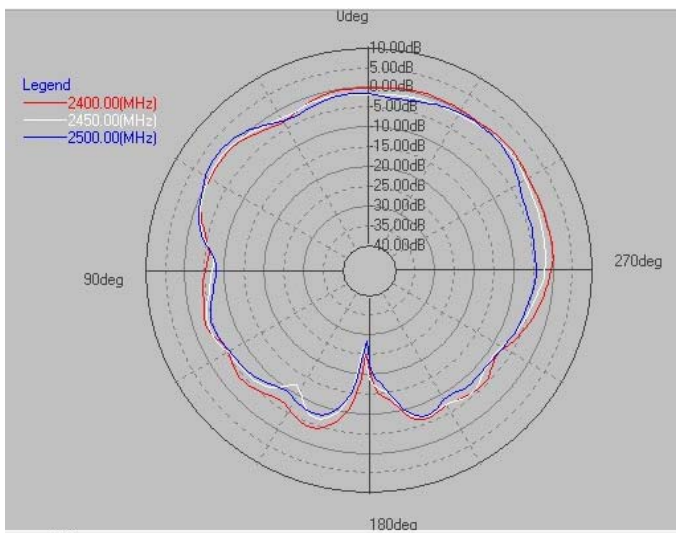


X-Y Plane (E-total)

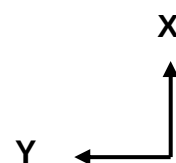
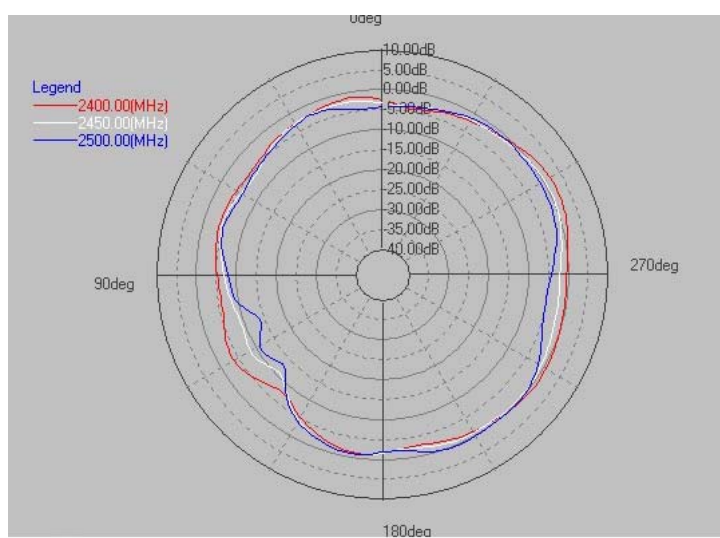
4.2.4 2G4



X-Z Plane (E-total)

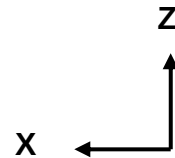
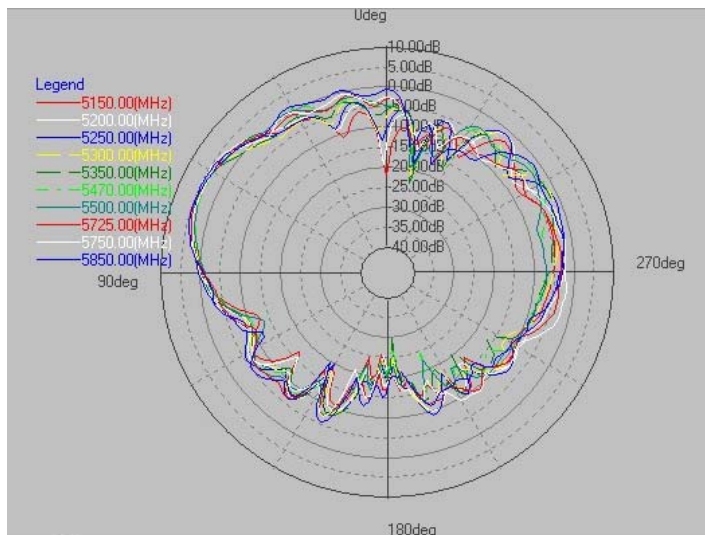


Y-Z Plane (E-total)

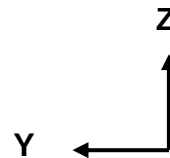
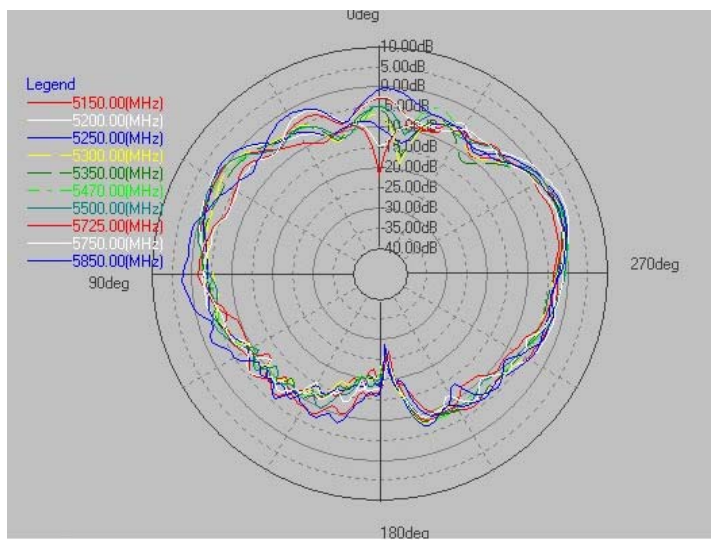


X-Y Plane (E-total)

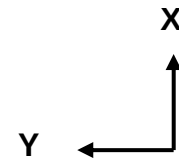
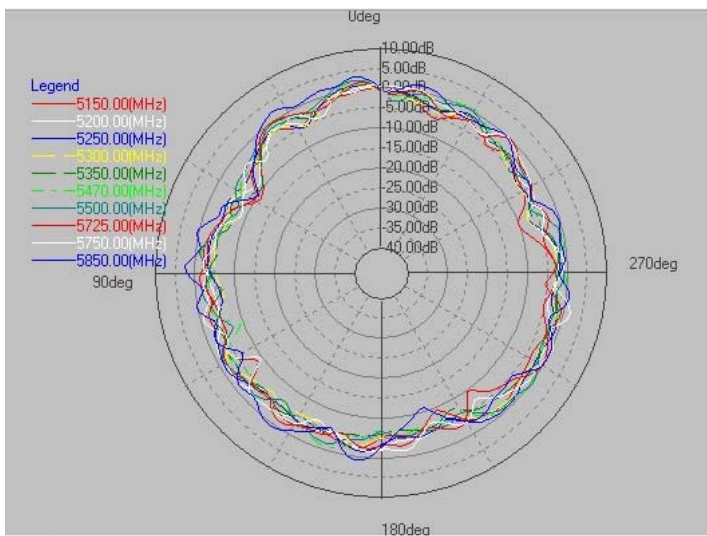
4.2.5 5G1



X-Z Plane (E-total)

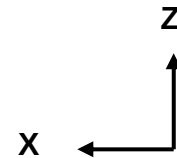
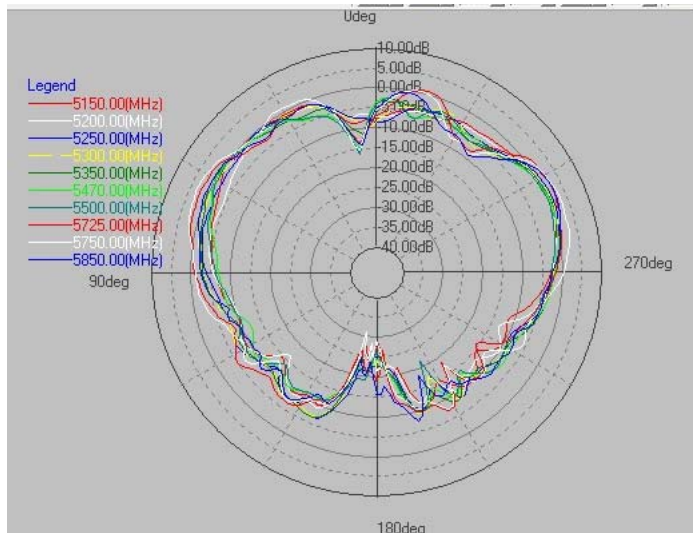


Y-Z Plane (E-total)

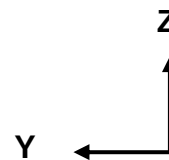
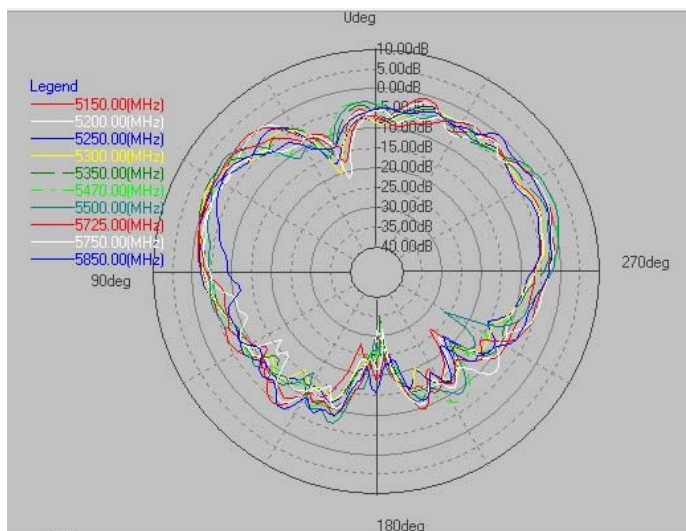


X-Y Plane (E-total)

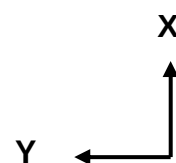
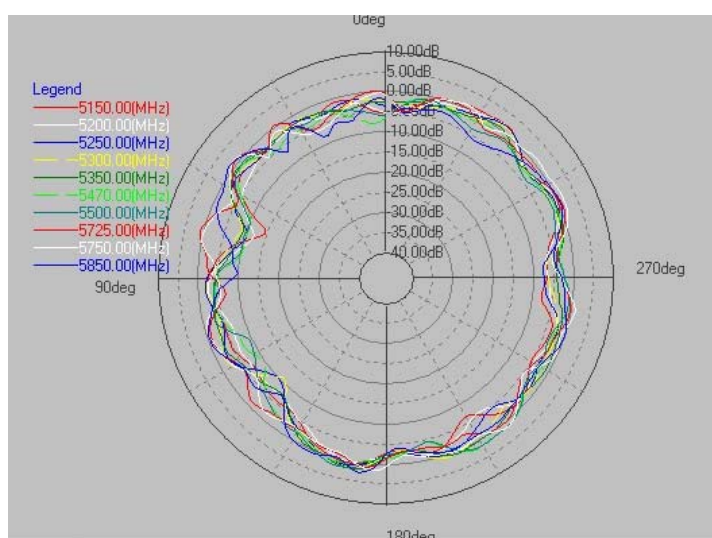
4.2.6 5G2



X-Z Plane (E-total)

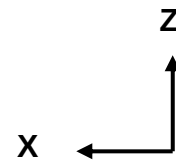
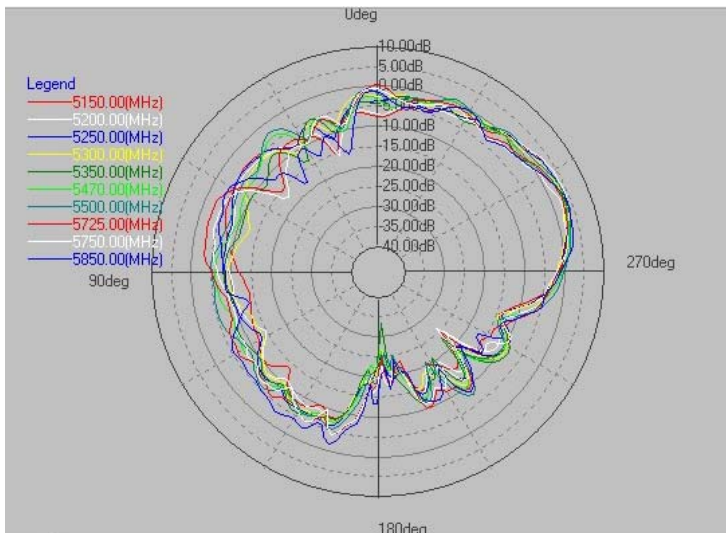


Y-Z Plane (E-total)

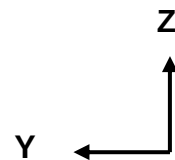
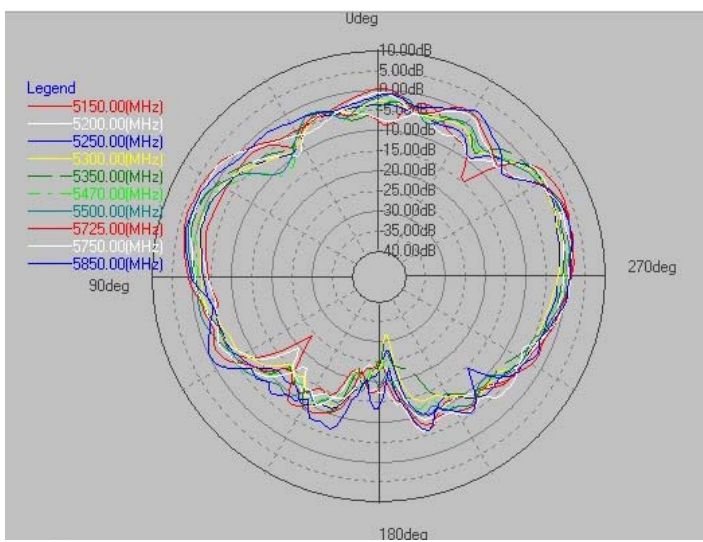


X-Y Plane (E-total)

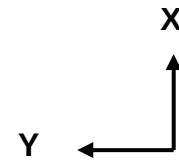
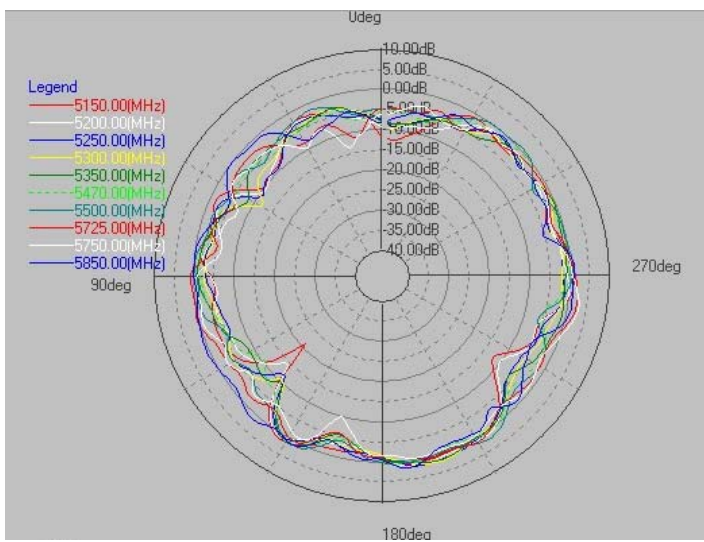
4.2.7 5G3



X-Z Plane (E-total)

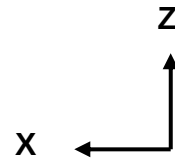
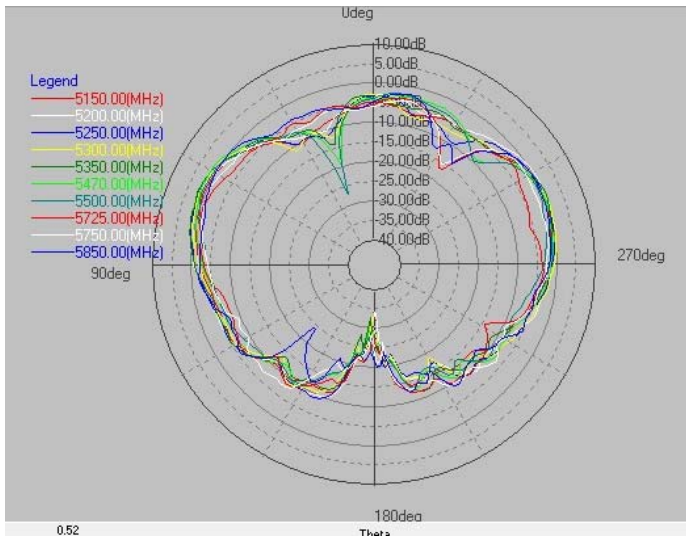


Y-Z Plane (E-total)

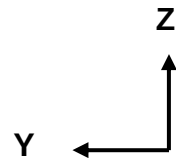
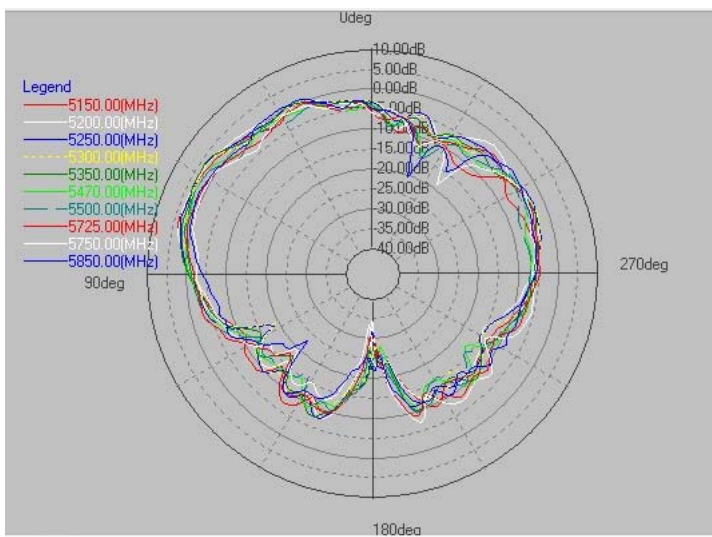


X-Y Plane (E-total)

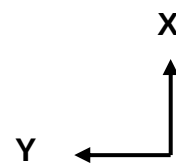
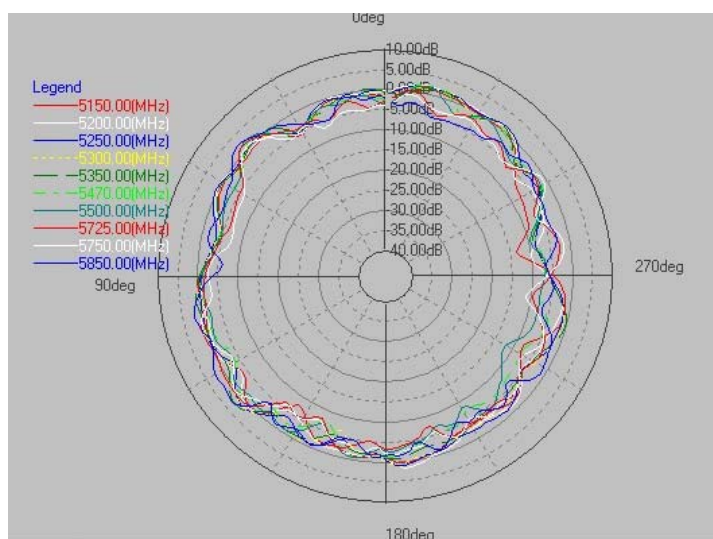
4.2.8 5G4



X-Z Plane (E-total)



Y-Z Plane (E-total)



X-Y Plane (E-total)

5. Summary

5.1 Return Loss

Frequency	2G1 (dB)	2G2 (dB)	2G3 (dB)	2G4 (dB)
2400 MHz	14	20	16	11
2450 MHz	14	15	15	13
2500 MHz	14	12	12	12

Frequency	5G1 (dB)	5G2 (dB)	5G3 (dB)	5G4 (dB)
5150 MHz	14	14	33	20
5350 MHz	22	31	13	29
5725 MHz	13	14	15	16
5850 MHz	15	21	21	15

5.2 Isolation

Frequency	2G1 & 2G2 (dB)	2G1 & 2G3 (dB)	2G1 & 2G4 (dB)	2G1 & 5G1 (dB)	2G1 & 5G2 (dB)	2G1 & 5G3 (dB)
2400 MHz	30	25	22	24	33	33
2450 MHz	25	24	23	24	32	33
2500 MHz	22	23	23	25	34	32
5150 MHz	31	48	37	22	29	40
5350 MHz	27	38	38	21	35	37
5725 MHz	26	35	34	21	28	37
5850 MHz	25	33	42	21	29	35

Frequency	2G1 & 5G4 (dB)	2G2 & 2G3 (dB)	2G2 & 2G4 (dB)	2G2 & 5G1 (dB)	2G2 & 5G2 (dB)	2G2 & 5G3 (dB)
2400 MHz	26	19	37	26	30	35
2450 MHz	26	19	26	25	31	43
2500 MHz	27	19	28	25	30	41
5150 MHz	34	41	42	25	31	38
5350 MHz	30	38	37	25	26	39
5725 MHz	28	43	33	23	26	36
5850 MHz	27	34	32	22	23	36

Frequency	2G2 & 5G4 (dB)	2G3 & 2G4 (dB)	2G3 & 5G1 (dB)	2G3 & 5G2 (dB)	2G3 & 5G3 (dB)	2G3 & 5G4 (dB)
2400 MHz	39	20	34	26	23	31
2450 MHz	37	21	32	26	24	32
2500 MHz	35	21	33	27	24	37
5150 MHz	27	33	30	20	32	37
5350 MHz	28	33	29	19	27	31
5725 MHz	25	41	33	18	25	33
5850 MHz	25	41	31	20	24	32

Frequency	2G4 & 5G1 (dB)	2G4 & 5G2 (dB)	2G4 & 5G3 (dB)	2G4 & 5G4 (dB)	5G1 & 5G2 (dB)	5G1 & 5G3 (dB)
2400 MHz	35	38	26	26	44	43
2450 MHz	35	34	27	25	46	42
2500 MHz	33	35	26	23	46	40
5150 MHz	33	38	65	28	23	25
5350 MHz	30	31	36	29	21	30
5725 MHz	28	29	35	29	24	26
5850 MHz	29	29	35	31	23	30

Frequency	5G1 & 5G4 (dB)	5G2 & 5G3 (dB)	5G2 & 5G4 (dB)	5G3 & 5G4 (dB)		
2400 MHz	44	44	38	38		
2450 MHz	41	49	38	36		
2500 MHz	38	50	38	37		
5150 MHz	27	26	26	23		
5350 MHz	28	26	24	23		
5725 MHz	25	28	28	25		
5850 MHz	26	30	25	23		

5.3.3D total Peak Gain & Efficiency

Frequency	2G1		2G2	
	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)
2400 MHz	3.54	64	3.27	61
2450 MHz	3.14	61	3.41	62
2500 MHz	3.24	63	3.20	61

Frequency	2G3		2G4	
	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)
2400 MHz	3.67	62	3.45	65
2450 MHz	3.62	62	3.40	61
2500 MHz	3.43	65	3.35	64

Frequency	5G1		5G2	
	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)
5150 MHz	4.26	62	4.20	62
5200 MHz	4.77	65	4.64	63
5250 MHz	4.68	64	4.21	64
5300 MHz	4.28	61	4.35	68
5350 MHz	4.36	67	4.40	60
5470 MHz	4.40	62	4.73	63
5500 MHz	4.35	63	4.74	61
5725 MHz	4.63	62	4.64	62
5750 MHz	4.78	61	4.63	64
5850 MHz	4.67	62	4.25	63

Frequency	5G3		5G4	
	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)
5150 MHz	4.66	62	4.33	64
5200 MHz	4.53	61	4.35	63
5250 MHz	4.24	63	4.58	62
5300 MHz	4.20	64	4.48	63
5350 MHz	4.39	62	4.55	63
5470 MHz	4.17	62	4.60	61
5500 MHz	4.64	61	4.66	64
5725 MHz	4.13	63	4.86	63
5750 MHz	4.18	61	4.29	62
5850 MHz	4.63	63	4.75	63