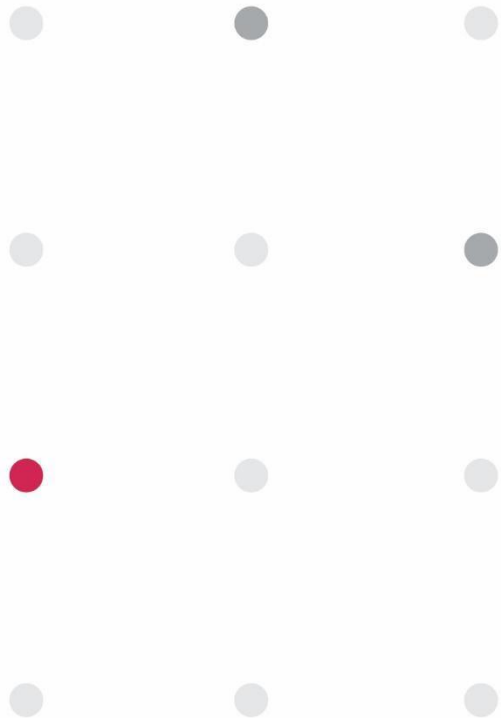


PSA

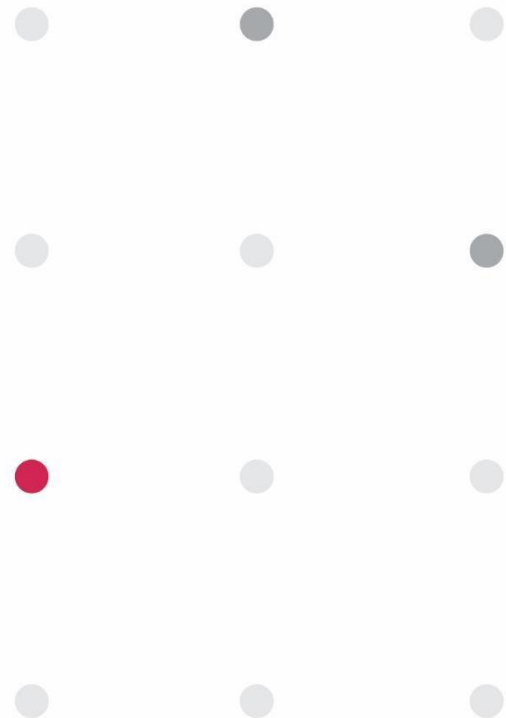
佳邦科技股份有限公司

INPAQ TECHNOLOGY CO., LTD.



PSA

PASSIVE SYSTEM ALLIANCE
INPAQ TECHNOLOGY CO., LTD.



盟創_EE6610-20

Presented by

Kerry Wu

Walsin Technology Corporation

2025/ 10/ 28



Version	Date	Description	Author
V01	2025/10/28	New Release	Kerry
V02	2026/8/12	補充數據	Ellen

OUTLINE

1. Measurement Information

1. Experimental Setup
2. Antenna Solution Detail

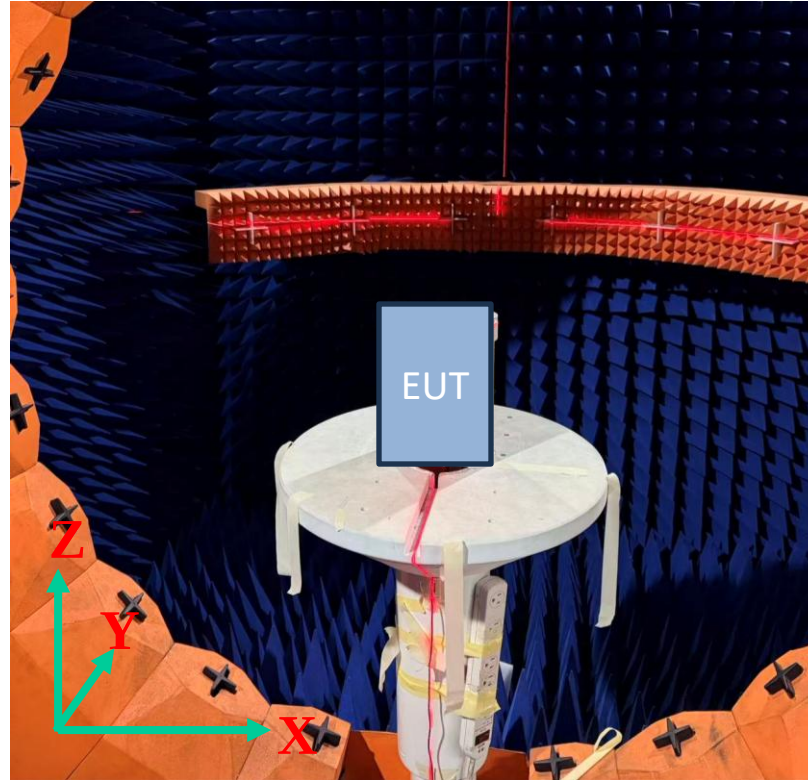
2. Antenna Characteristics

1. S-Parameter
2. Antenna Efficiency and Peak Gain
3. 3 views of antenna & 2D Radiation Patterns
4. 2D Combine Patterns

3. Summary

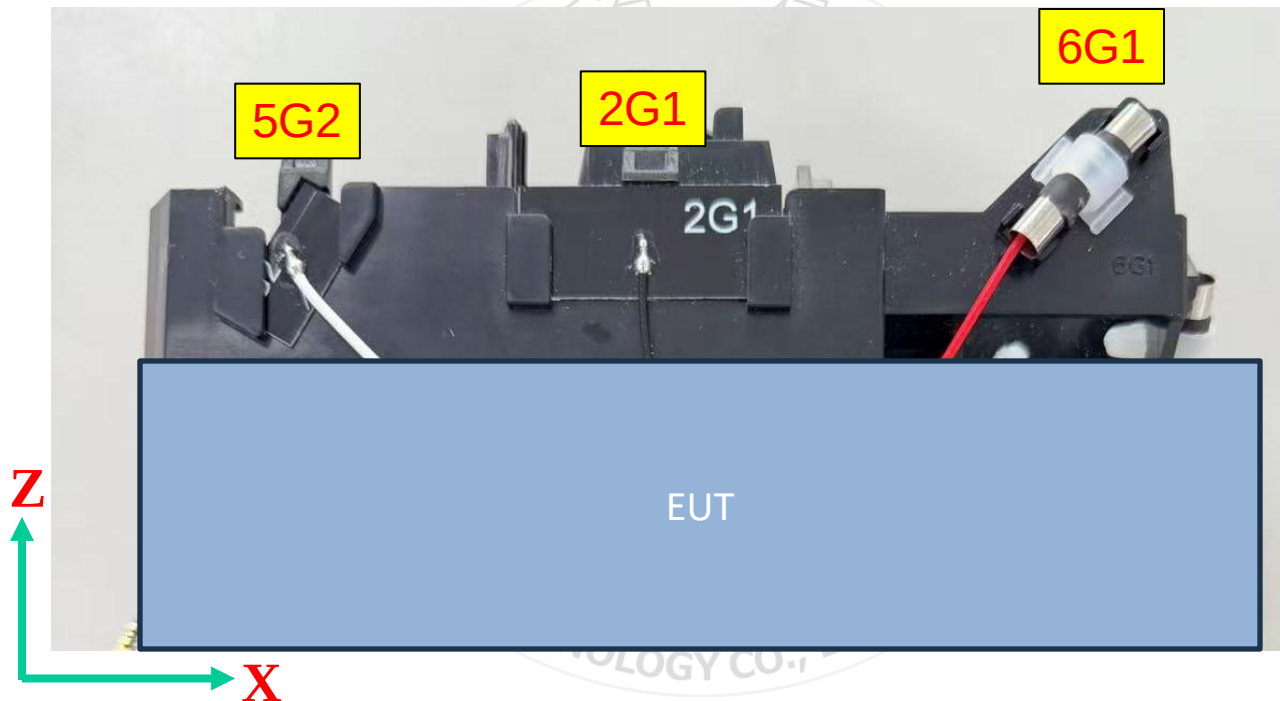
1. Measurement Information

1.1 Experimental Setup



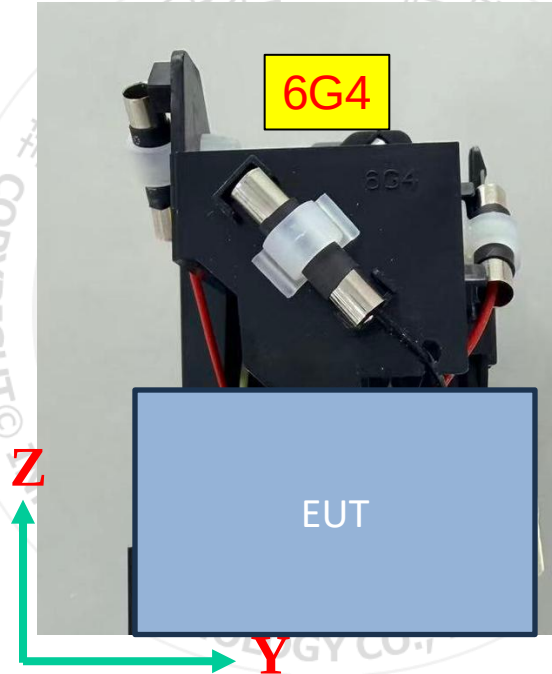
1. Measurement Information

1.2 Antenna Solution Detail



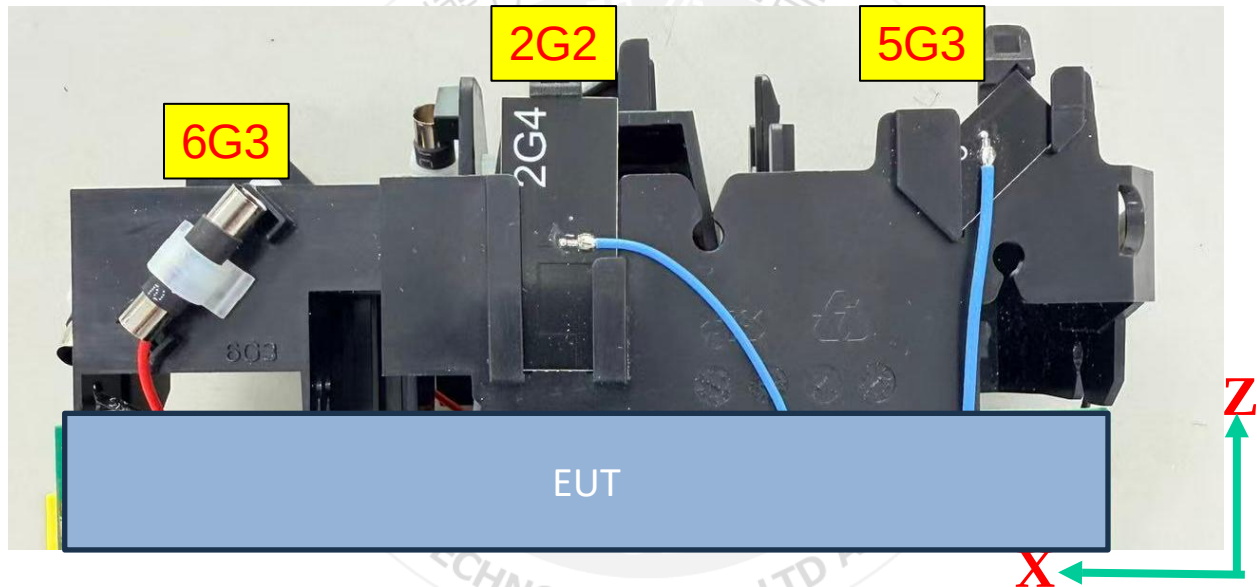
1. Measurement Information

1.2 Antenna Solution Detail



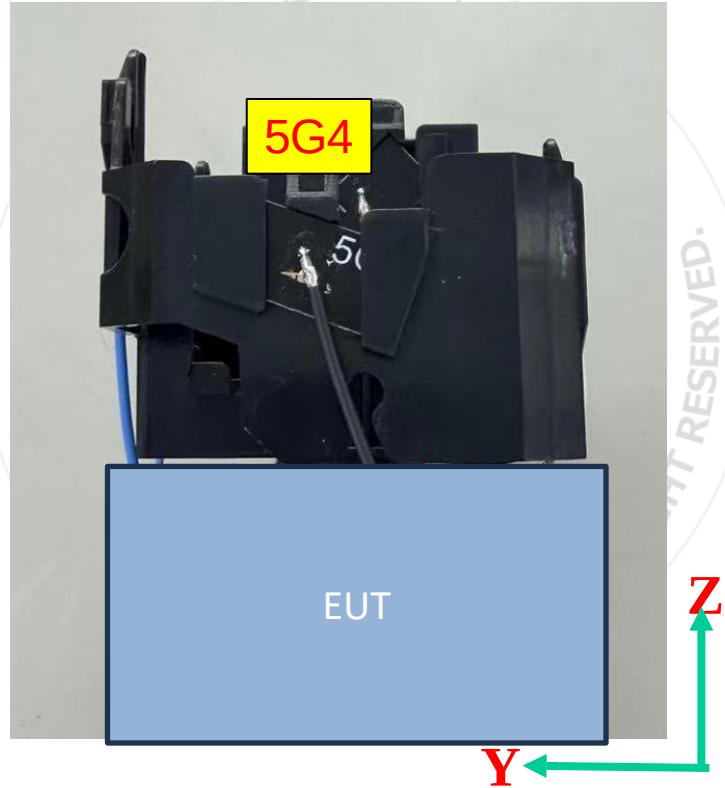
1. Measurement Information

1.2 Antenna Solution Detail



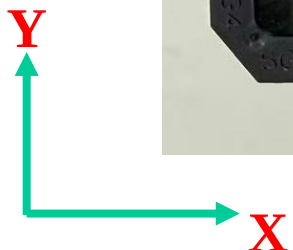
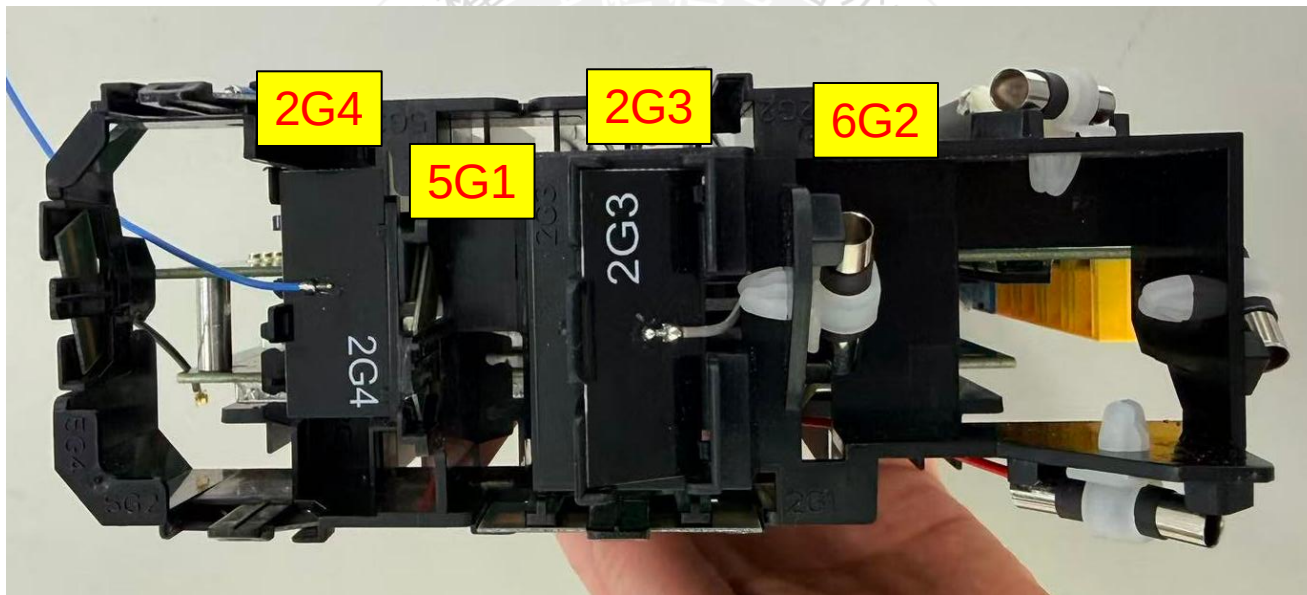
1. Measurement Information

1.2 Antenna Solution Detail



1. Measurement Information

1.2 Antenna Solution Detail



Antenna supplier: INPAQ Technology Co., Ltd.

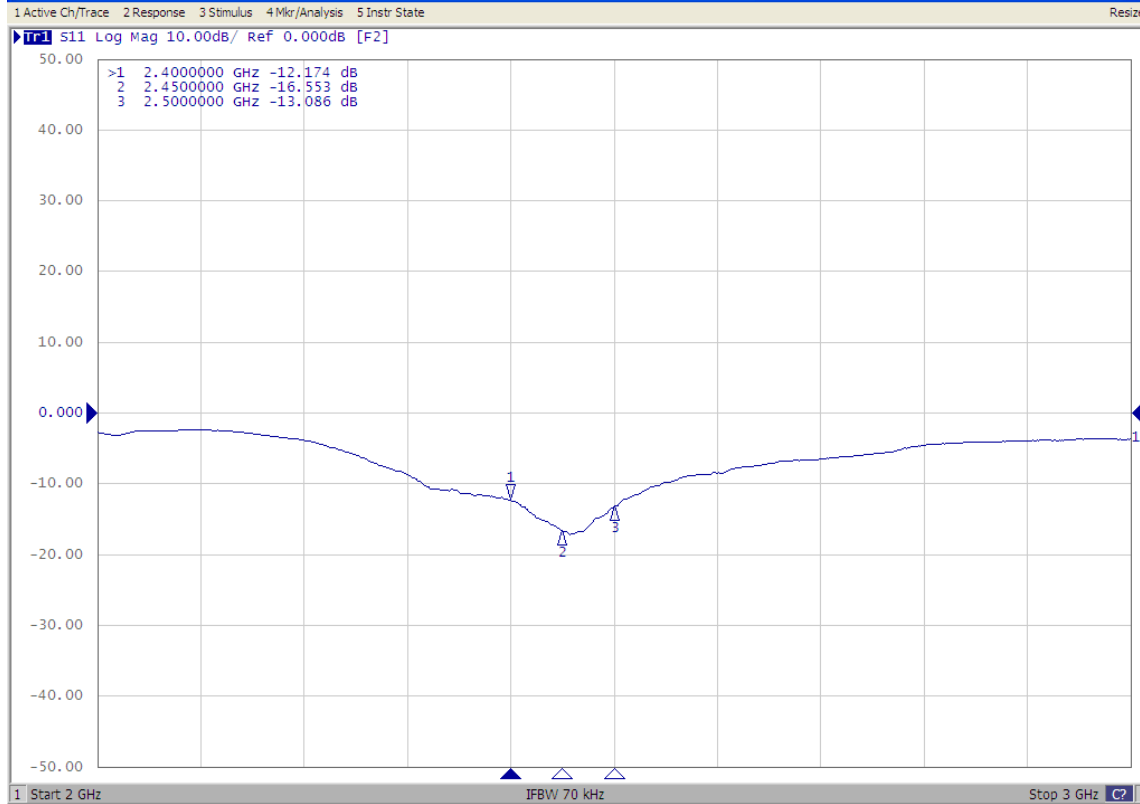
Antenna supplier's address: NO.11, KE-YI ST., CHUNAN TOWN, MIAOLI COUNTY 350402, TAIWAN, R.O.C.

客户料号	敘述	ANT
56-001-000847Z	RFPCA351515IMAB402	2G1
56-001-000848Z	RFPCA351512IMAB403	2G2
56-001-000849Z	RFPCA351516IMAB403	2G3
56-001-000850Z	RFPCA351510IMAB402	2G4
56-001-000851Z	RFPCA201007IM5B901	5G1
56-001-000852Z	RFPCA201005IM5B902	5G2
56-001-000853Z	RFPCA201009IM5B902	5G3
56-001-000854Z	RFPCA201005IM5B901	5G4
56-001-000855Z	RFDPA100507IM6B903	6G1
56-001-000856Z	RFDPA100506IM6B905	6G2
56-001-000857Z	RFDPA100507IM6B905	6G3
56-001-000858Z	RFDPA100506IM6B907	6G4

2. Antenna Characteristics

2G1

2.1 S-Parameter



2. Antenna Characteristics

2G2

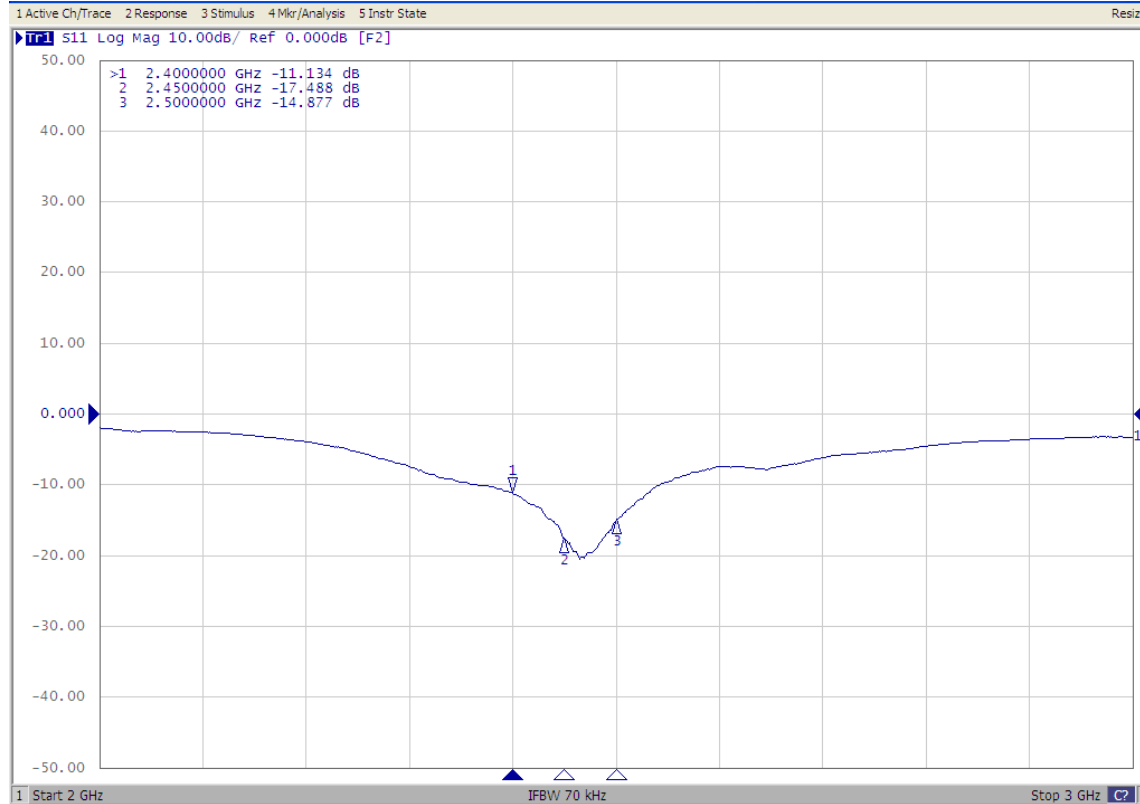
2.1 S-Parameter



2. Antenna Characteristics

2G3

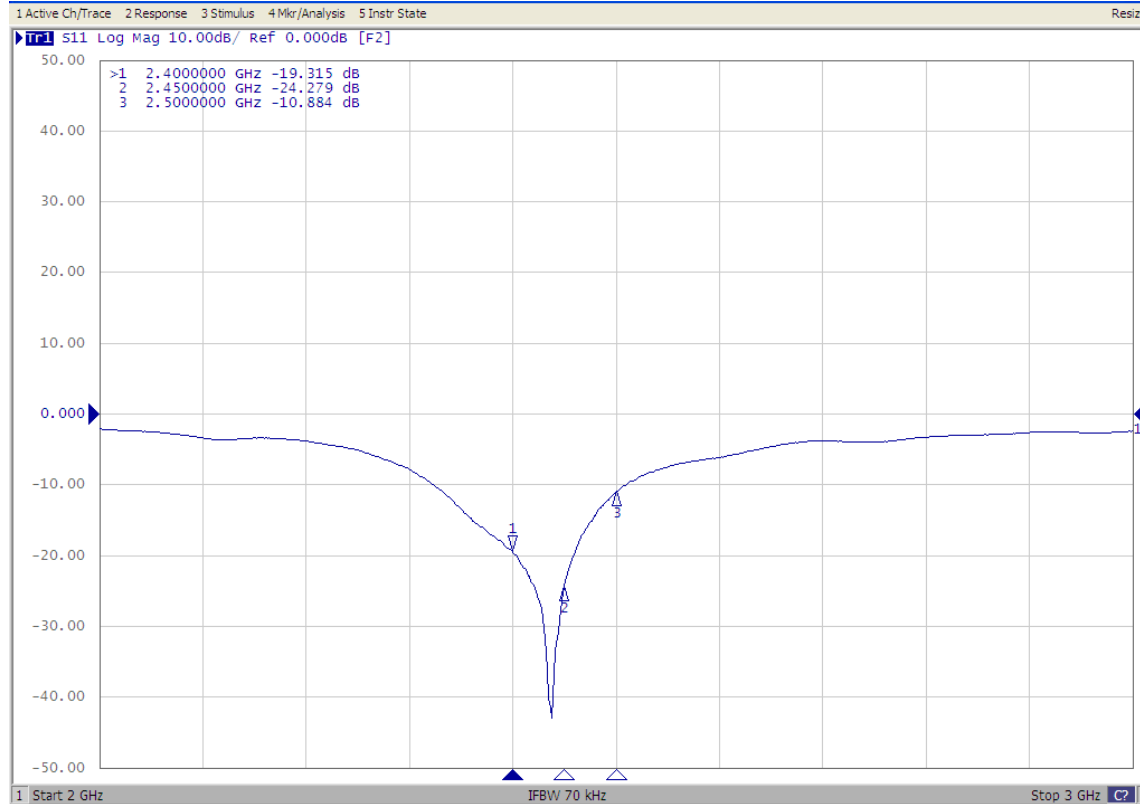
2.1 S-Parameter



2. Antenna Characteristics

2G4

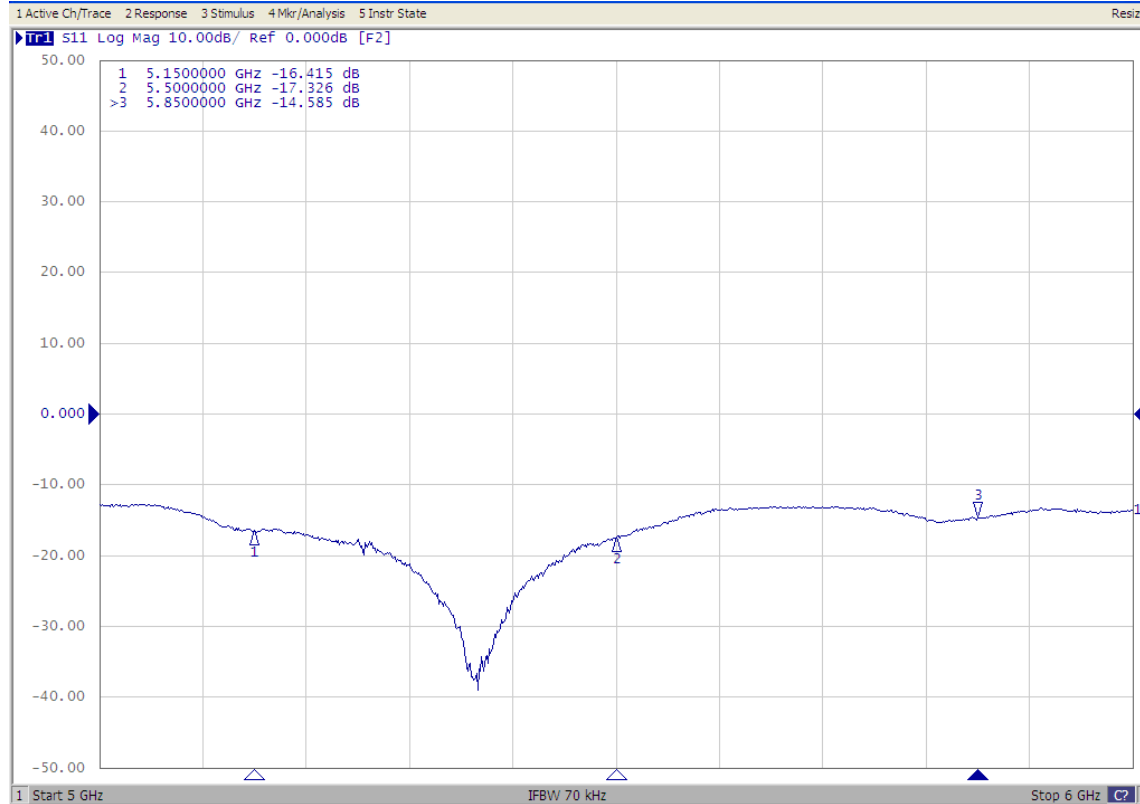
2.1 S-Parameter



2. Antenna Characteristics

5G1

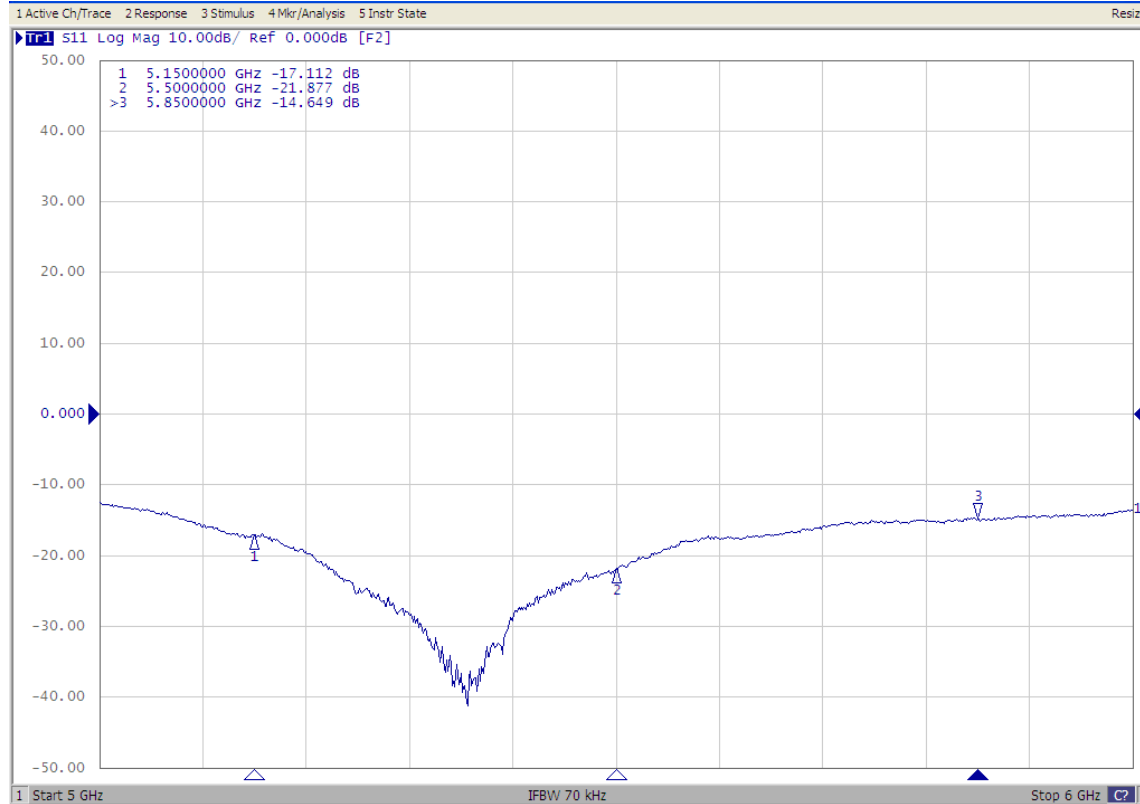
2.1 S-Parameter



2. Antenna Characteristics

5G2

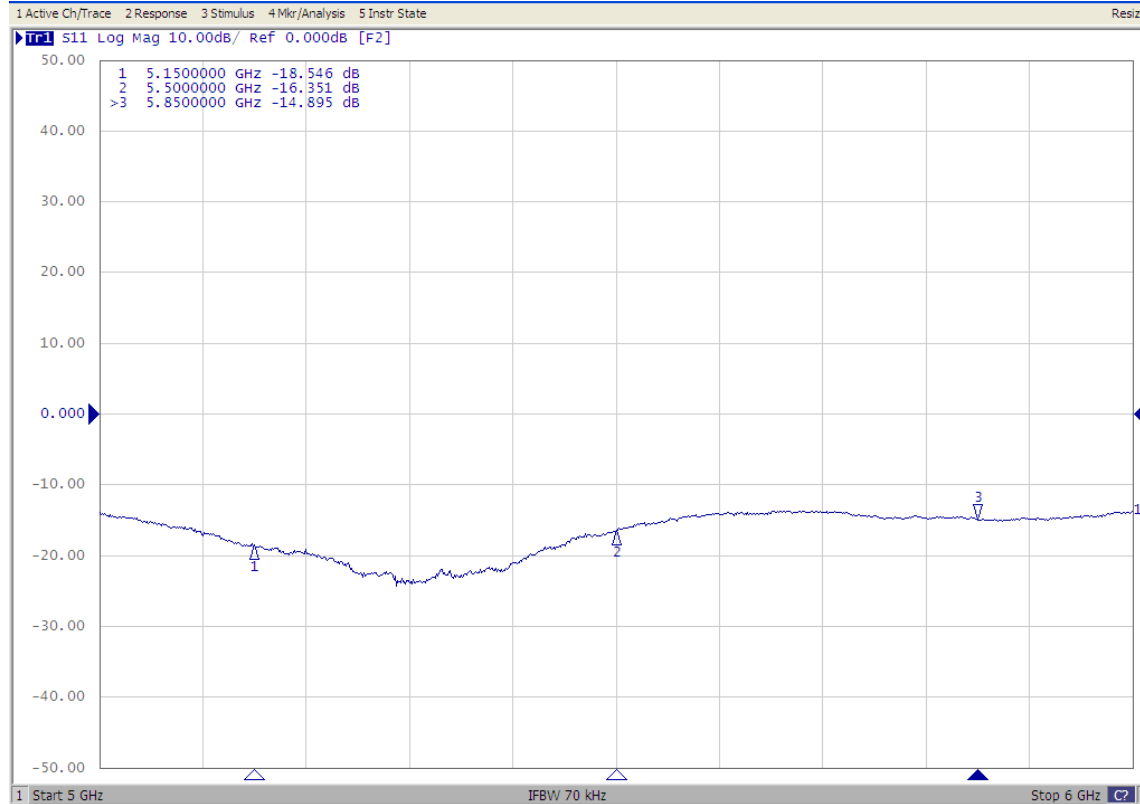
2.1 S-Parameter



2. Antenna Characteristics

5G3

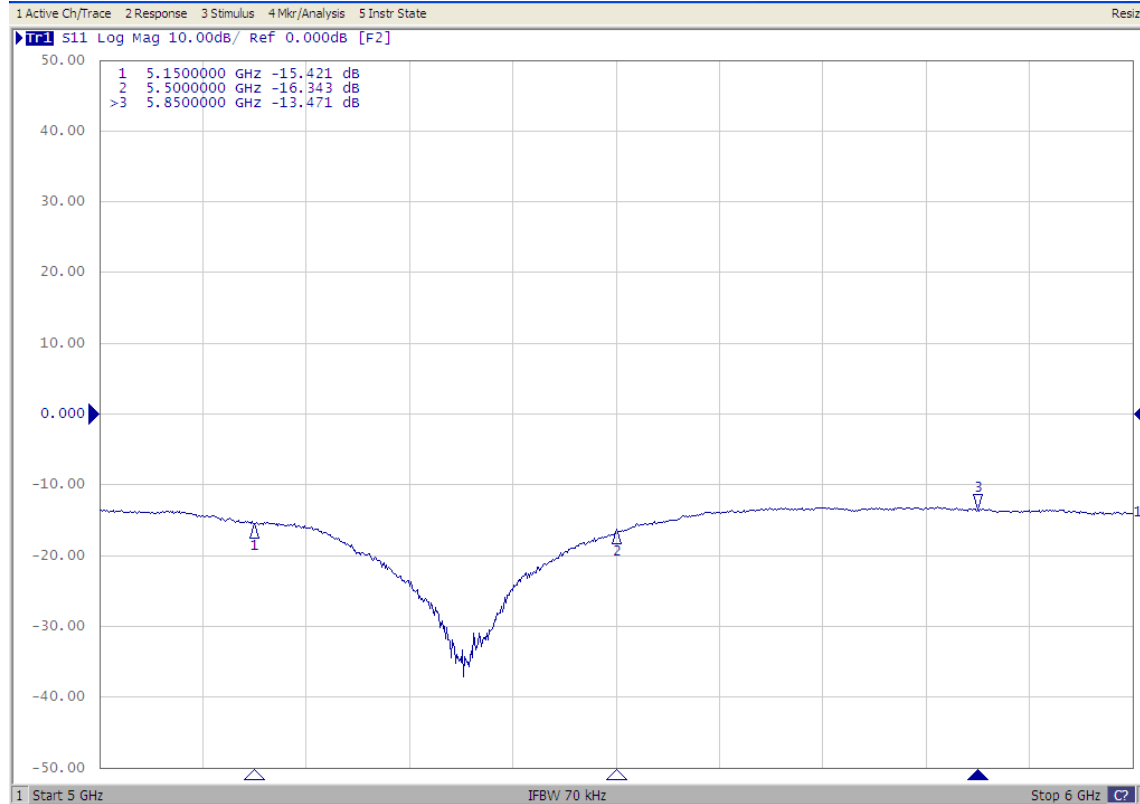
2.1 S-Parameter



2. Antenna Characteristics

5G4

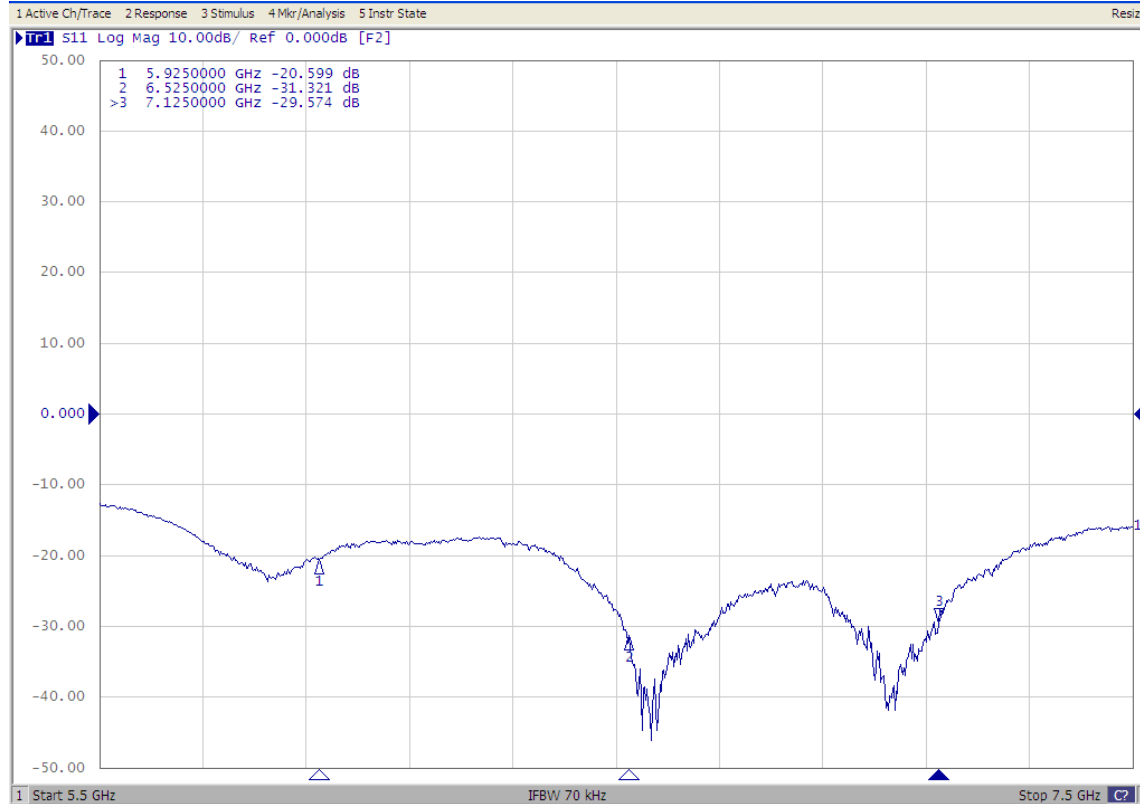
2.1 S-Parameter



2. Antenna Characteristics

6G1

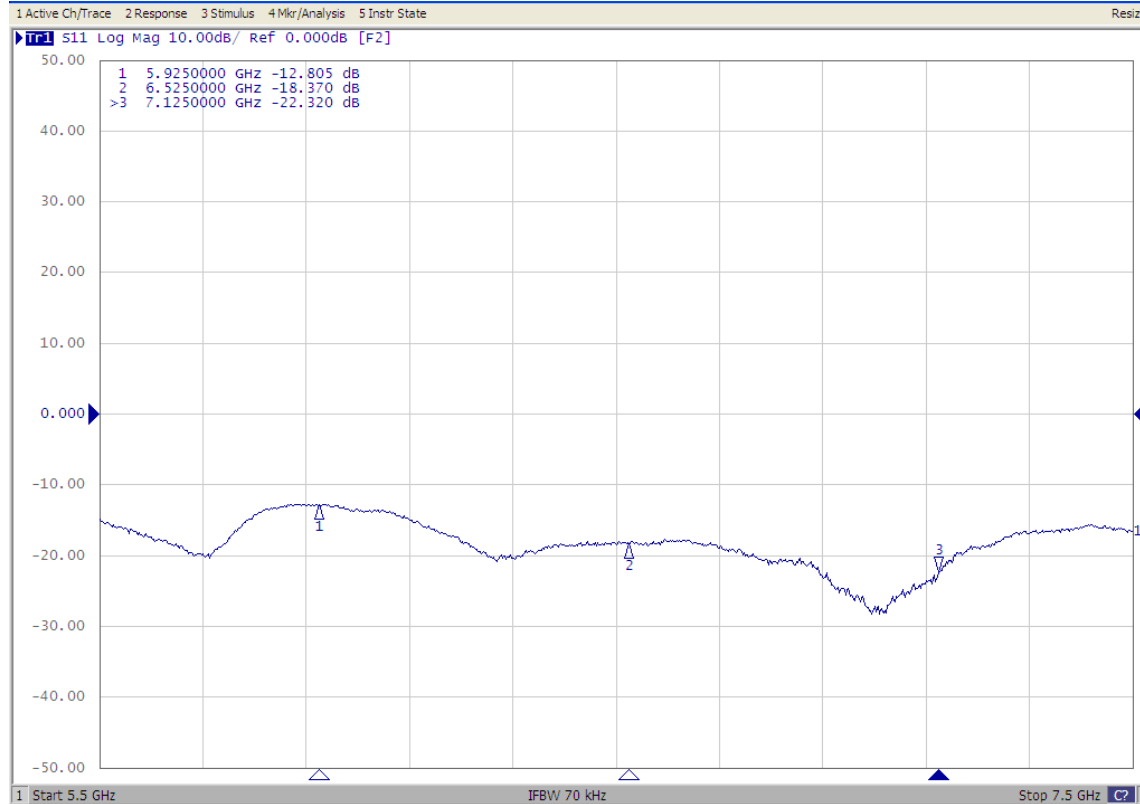
2.1 S-Parameter



2. Antenna Characteristics

6G2

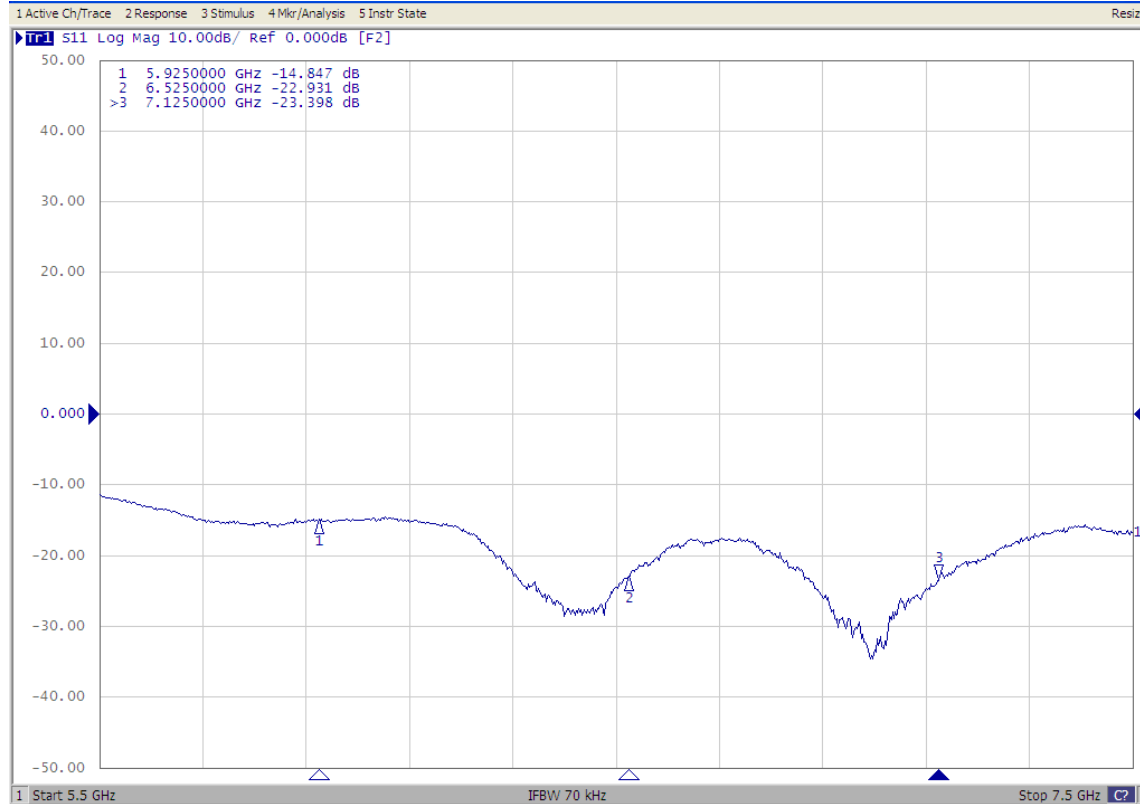
2.1 S-Parameter



2. Antenna Characteristics

6G3

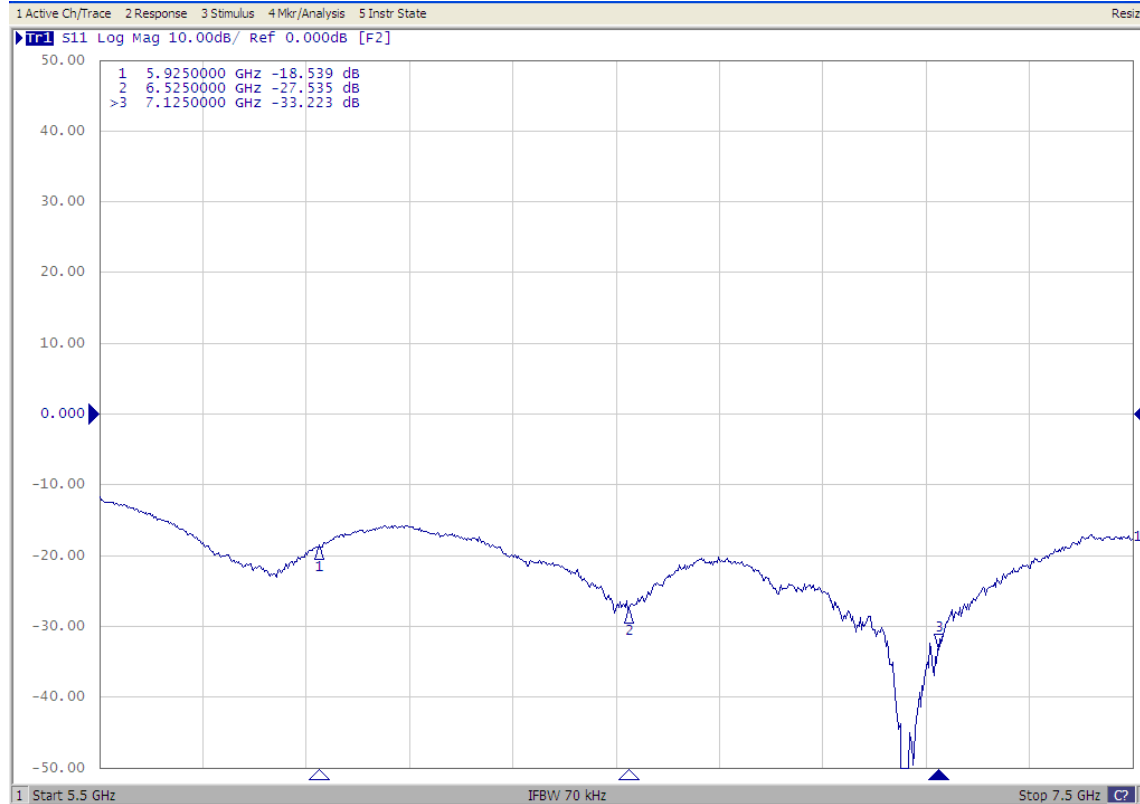
2.1 S-Parameter



2. Antenna Characteristics

6G4

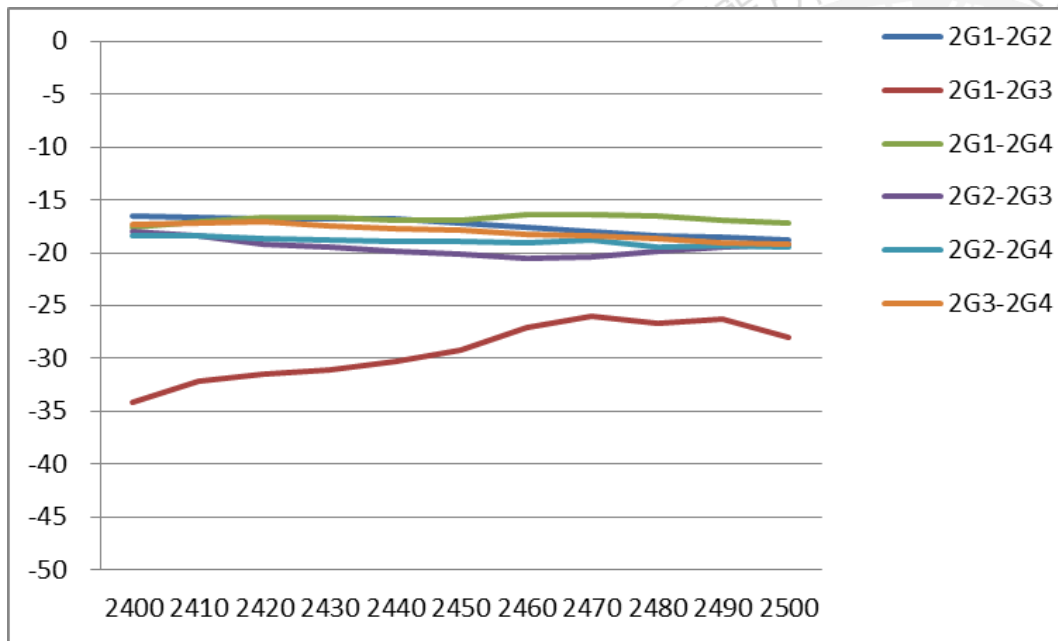
2.1 S-Parameter



2. Antenna Characteristics

2.1 S-Parameter

Isolation@2400~2500MHz



Frequency(MHz)

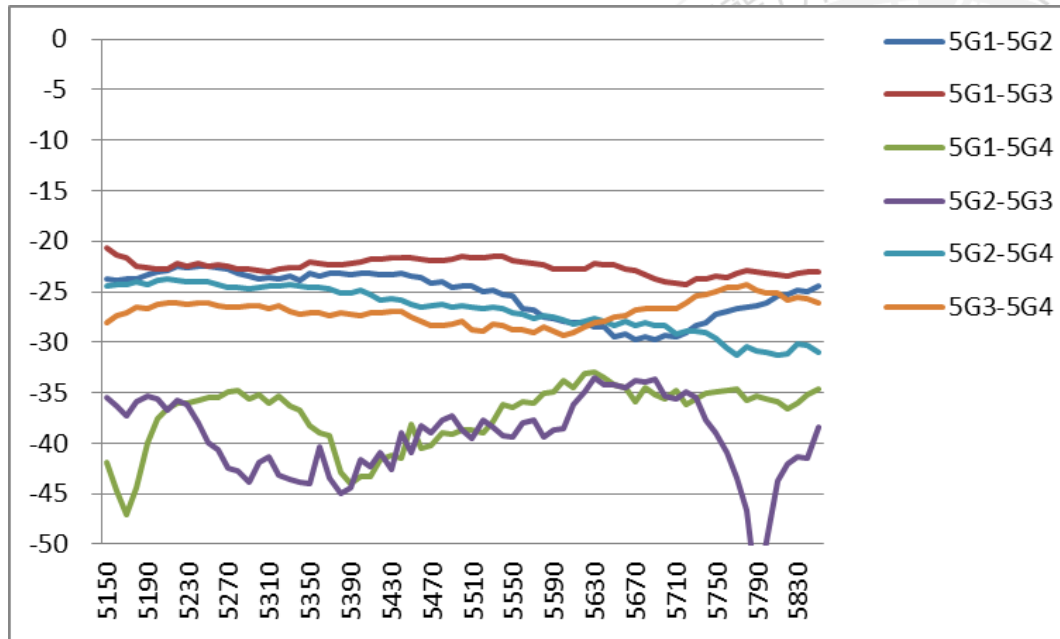
2G同頻-Isolation

2. Antenna Characteristics

5G同頻-Isolation

2.1 S-Parameter

Isolation@5150~5850MHz

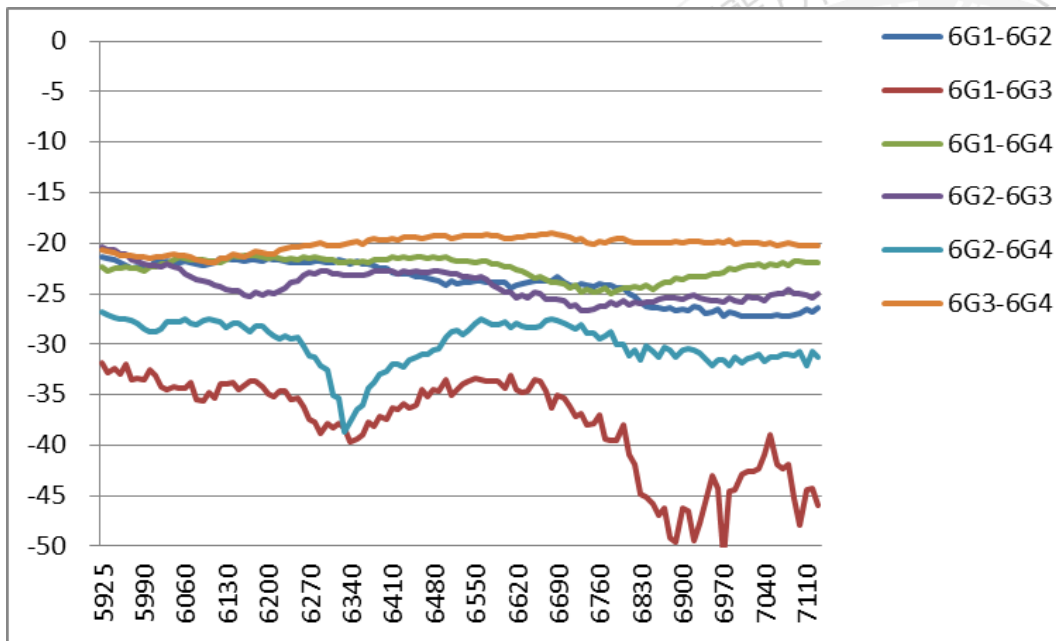


Frequency(MHz)

2. Antenna Characteristics

2.1 S-Parameter

Isolation@5925~7125MHz



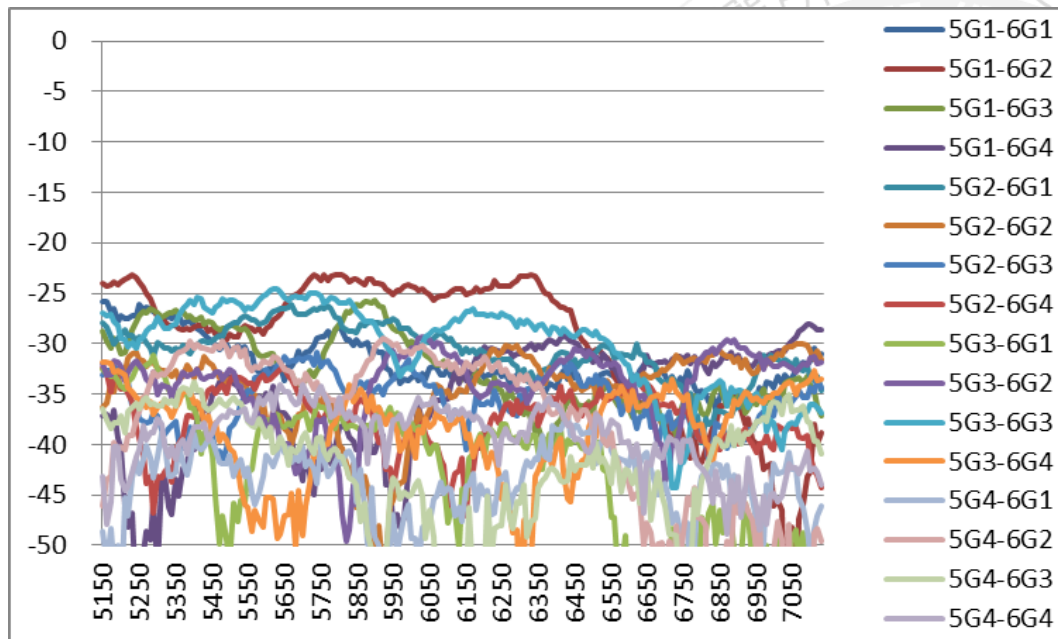
Frequency(MHz)

2. Antenna Characteristics

5G-6G異頻

2.1 S-Parameter

Isolation@5150~7125MHz



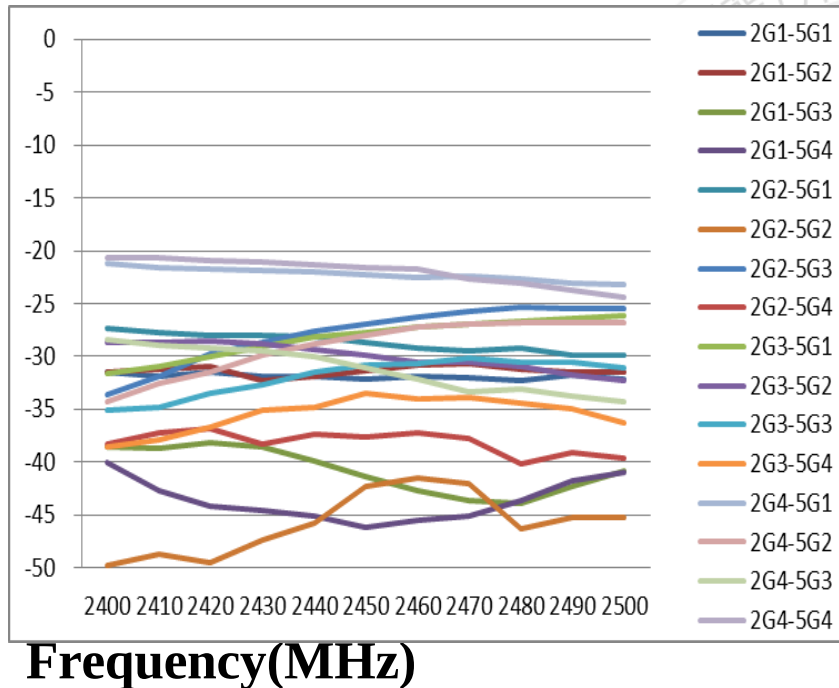
Frequency(MHz)

2. Antenna Characteristics

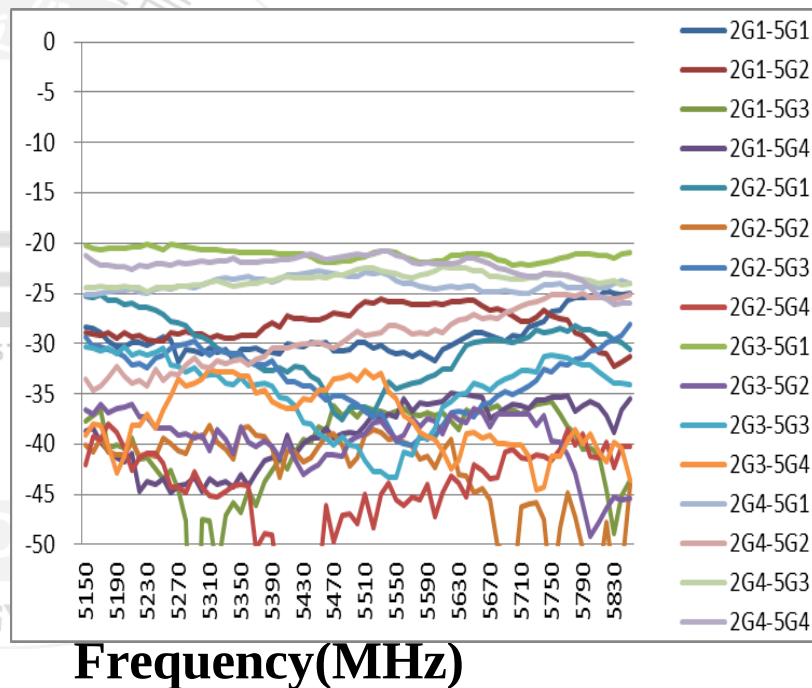
2G-5G異頻

2.1 S-Parameter

Isolation@2400~2500MHz



Isolation@5150~5850MHz

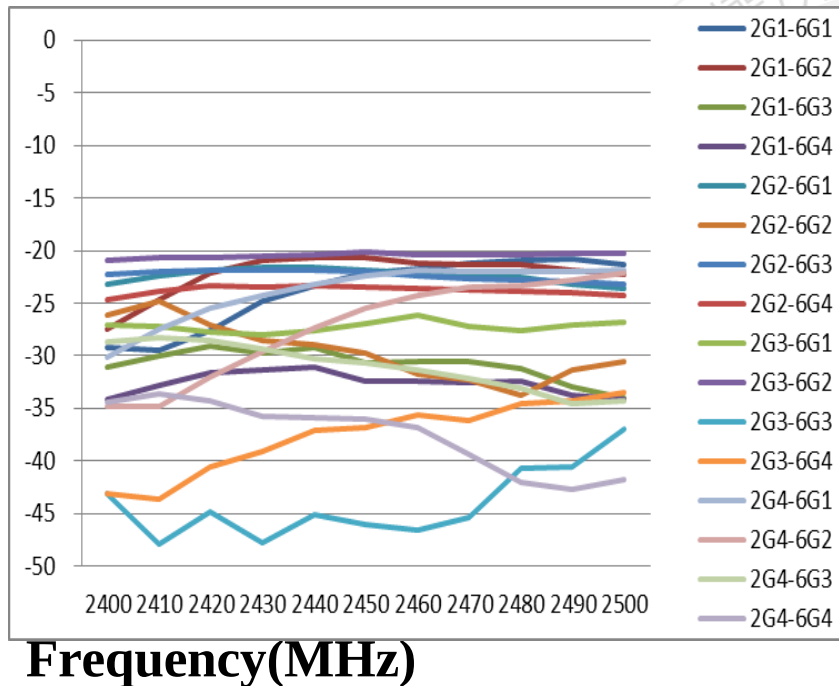


2. Antenna Characteristics

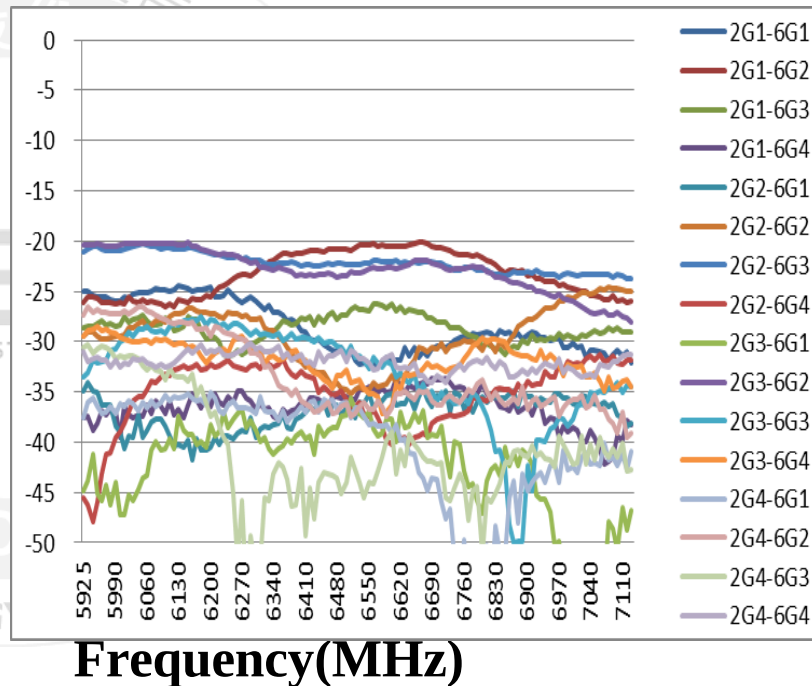
2G-6G異頻

2.1 S-Parameter

Isolation@2400~2500MHz



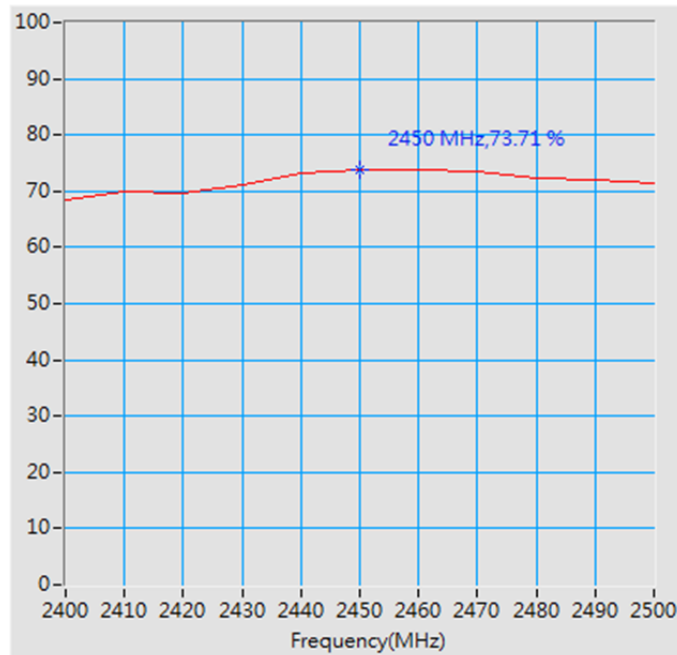
Isolation@5925~7125MHz



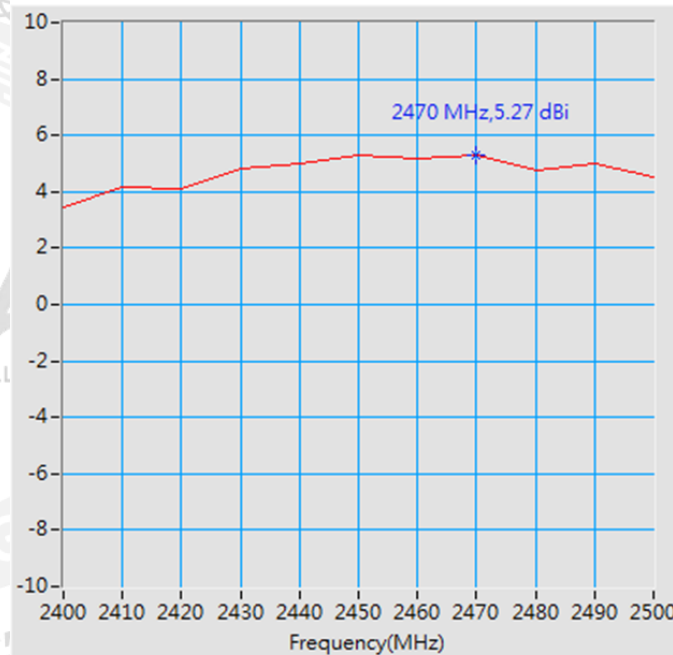
2. Antenna Characteristics

2G1

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2450MHz : 73.71 %

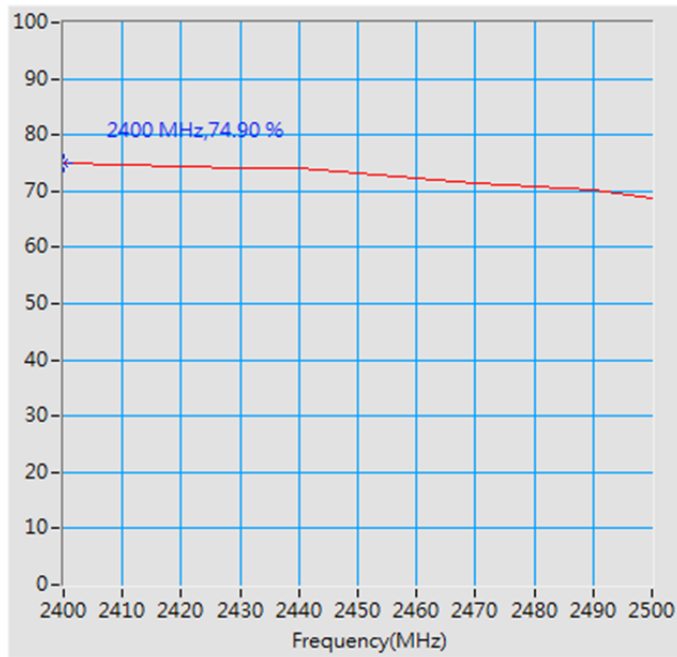


Maximum Peak Gain at 2470MHz : 5.27 dBi

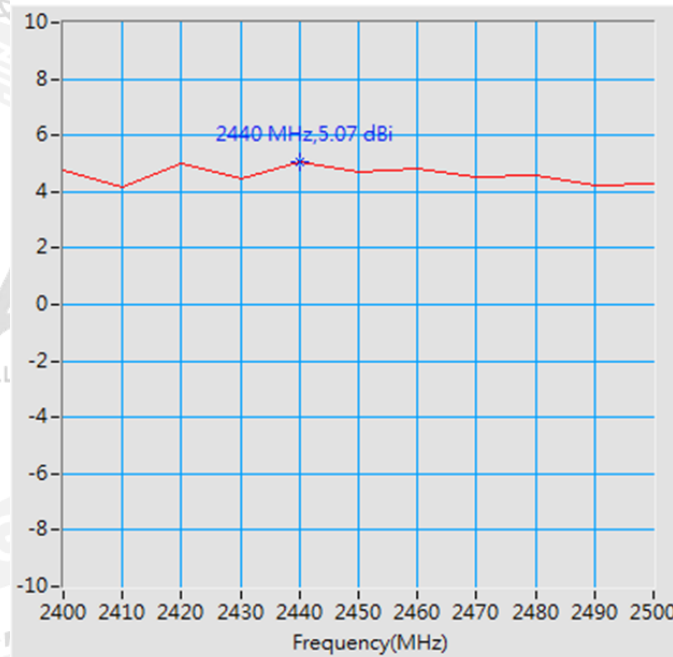
2. Antenna Characteristics

2G2

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2400MHz : 74.90 %

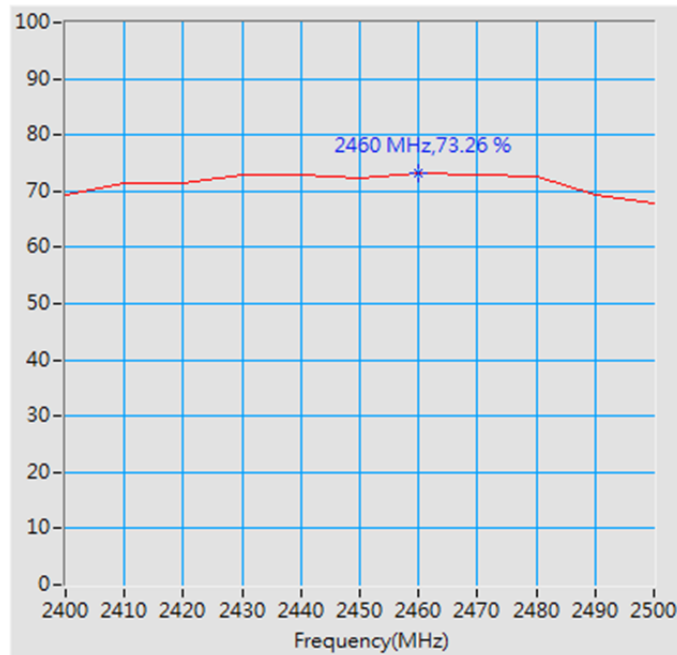


Maximum Peak Gain at 2440MHz : 5.07 dBi

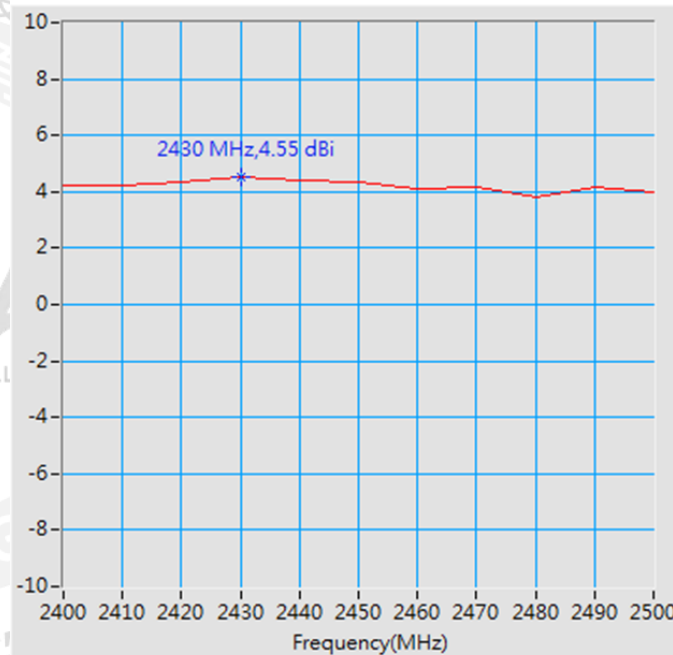
2. Antenna Characteristics

2G3

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2460MHz : 73.26 %

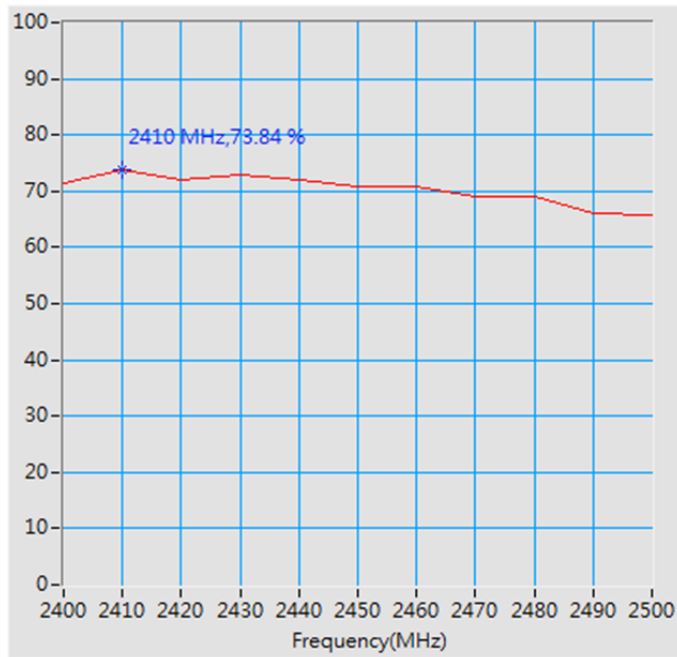


Maximum Peak Gain at 2430MHz : 4.55 dBi

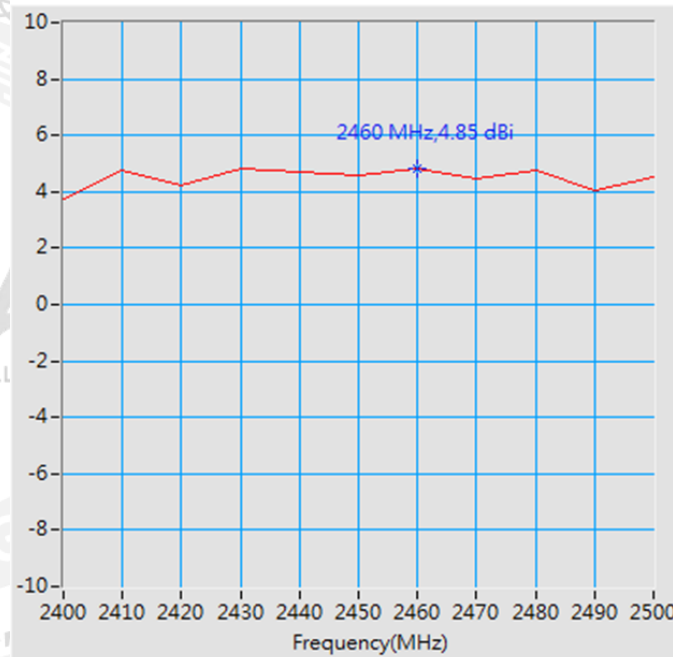
2. Antenna Characteristics

2G4

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2410MHz : 73.84 %

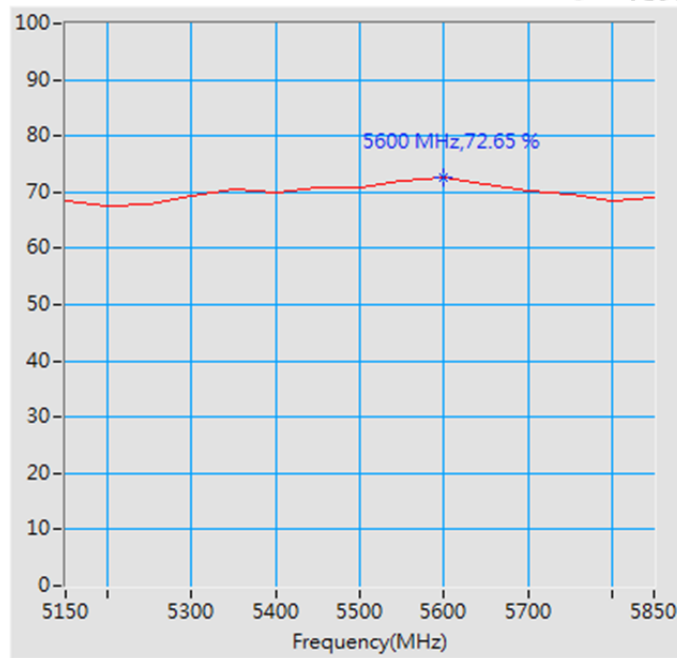


Maximum Peak Gain at 2460MHz : 4.85dBi

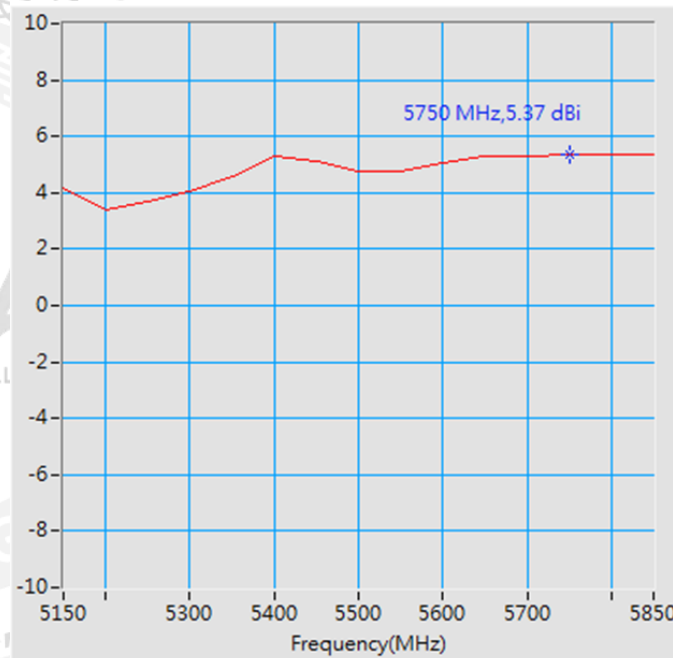
2. Antenna Characteristics

5G1

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 5600MHz : 72.65 %

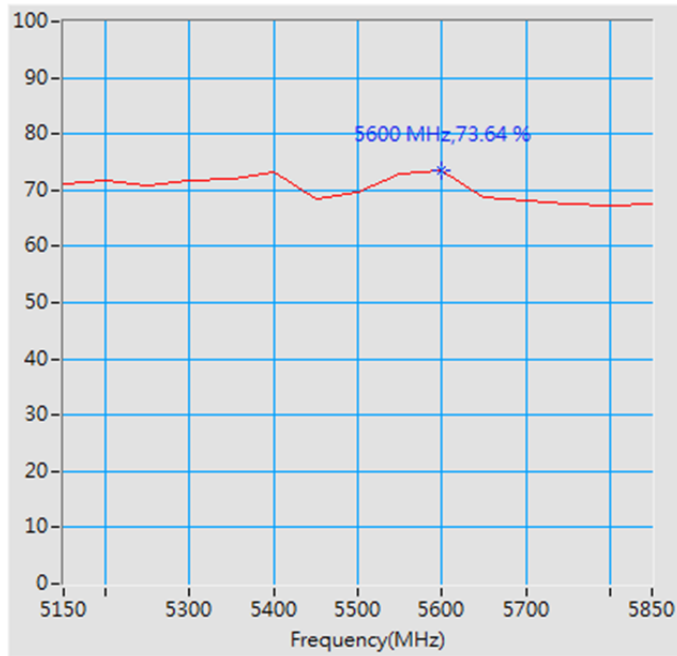


Maximum Peak Gain at 5750MHz : 5.37 dBi

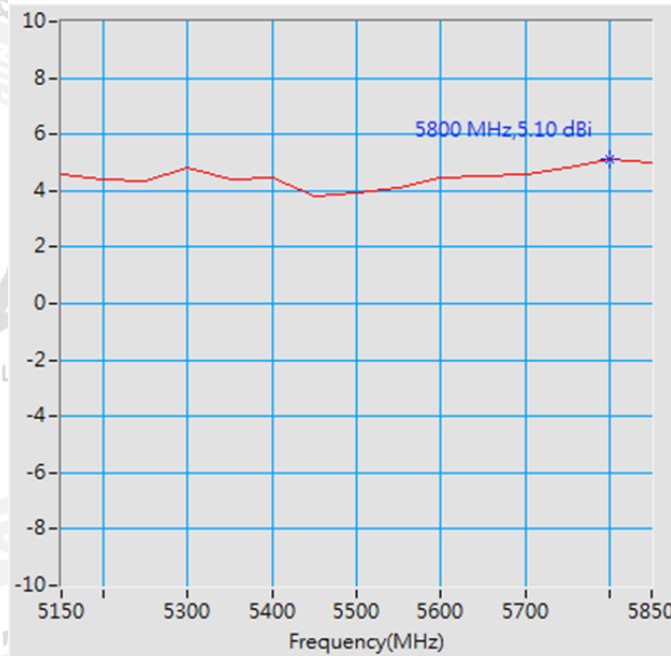
2. Antenna Characteristics

5G2

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 5600MHz : 73.64 %

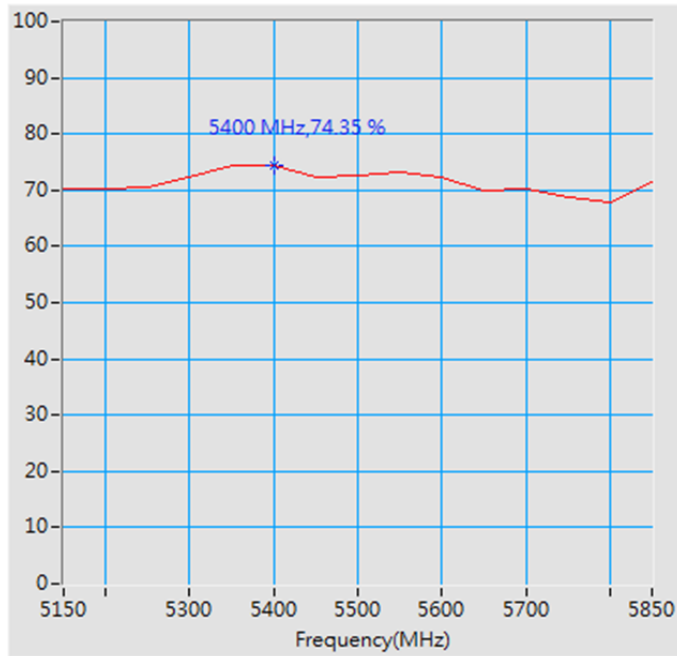


Maximum Peak Gain at 5800MHz : 5.10 dBi

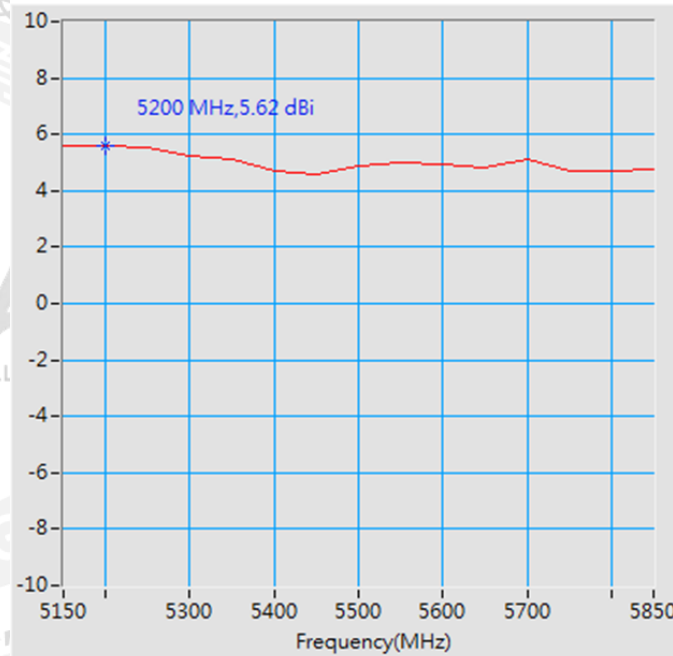
2. Antenna Characteristics

5G3

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 5400MHz : 74.35 %

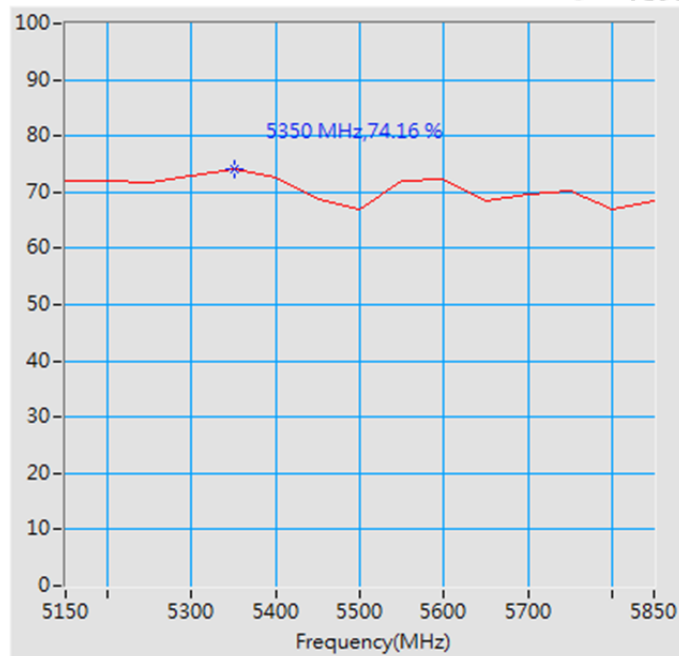


Maximum Peak Gain at 5200MHz : 5.62 dBi

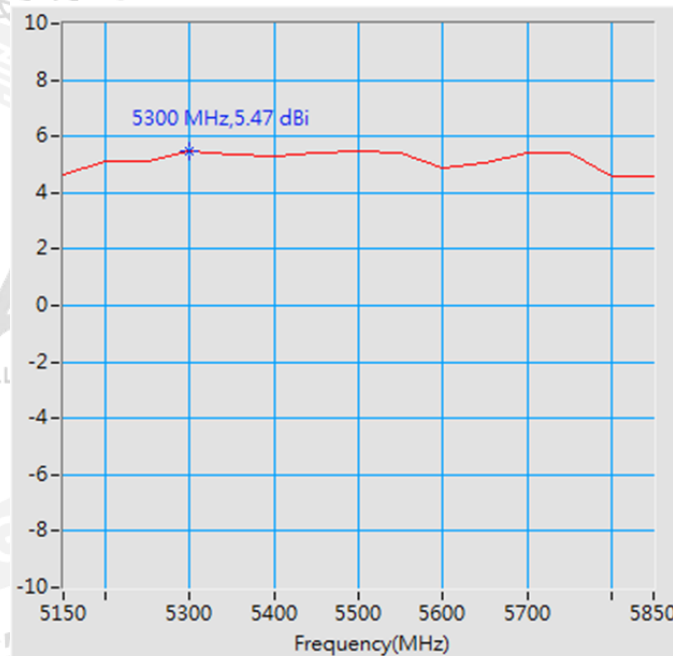
2. Antenna Characteristics

5G4

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 5350MHz : 74.16 %

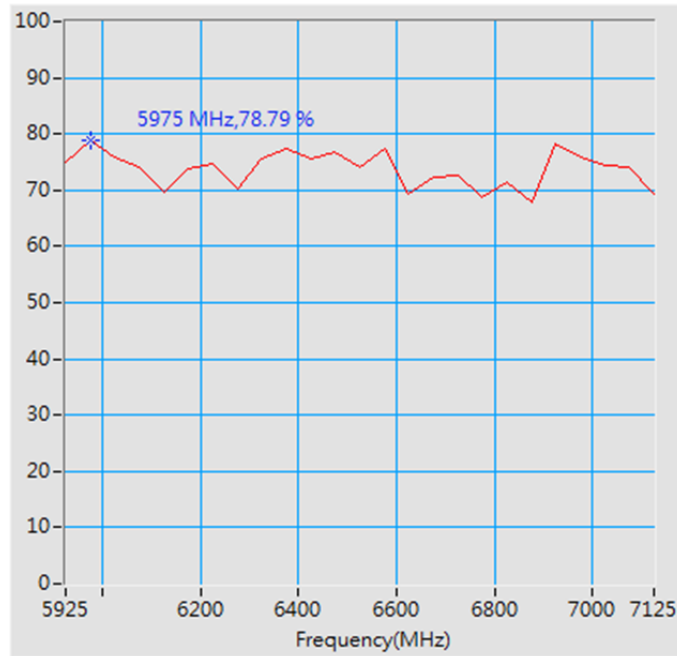


Maximum Peak Gain at 5300MHz : 5.47 dBi

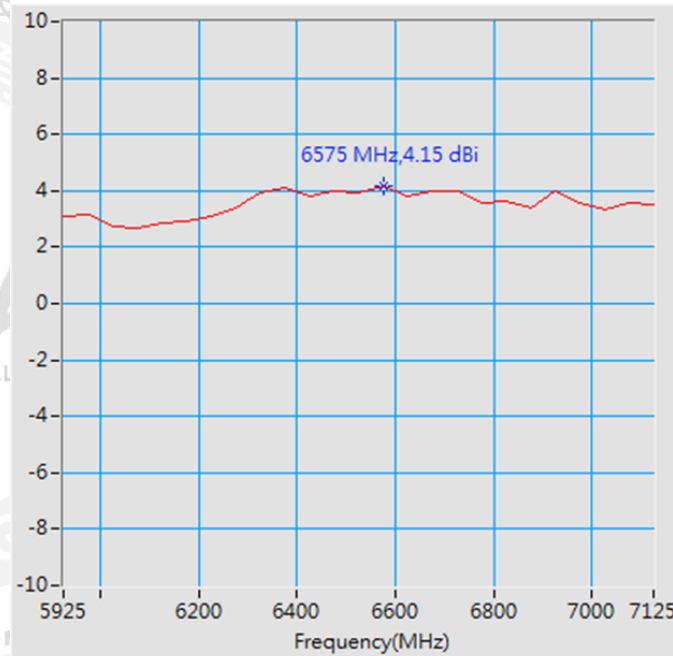
2. Antenna Characteristics

6G1

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 5975MHz : 78.79 %

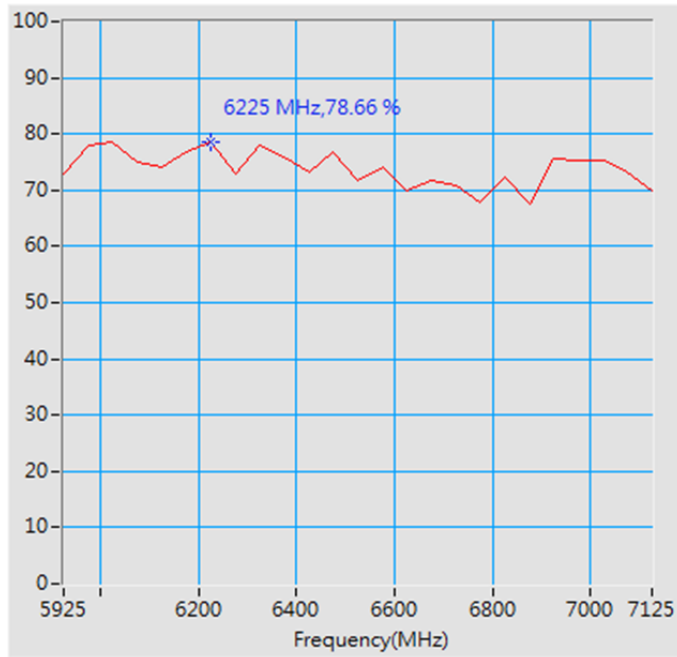


Maximum Peak Gain at 6575MHz : 4.15 dBi

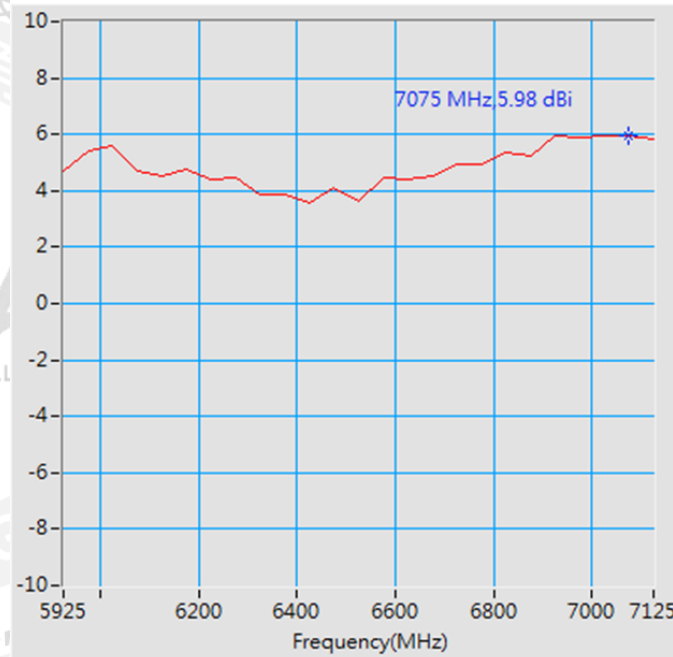
2. Antenna Characteristics

6G2

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 6225MHz : 78.66 %

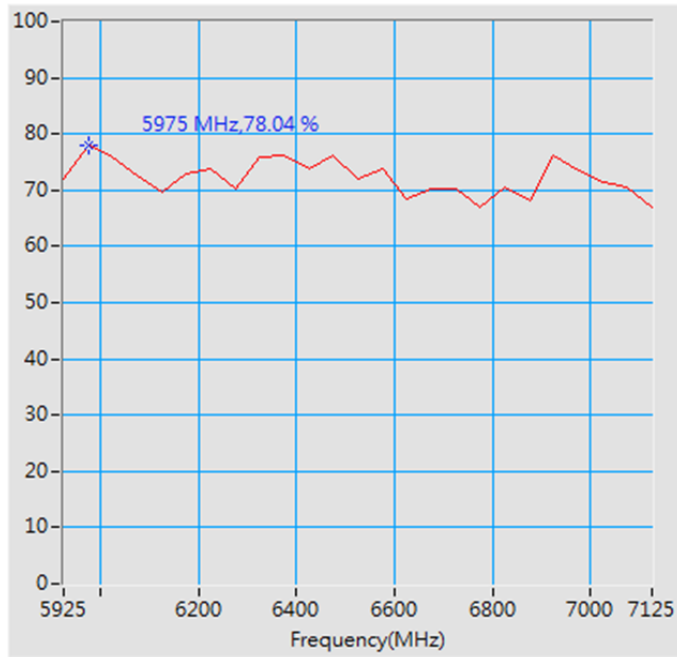


Maximum Peak Gain at 7075MHz : 5.98 dBi

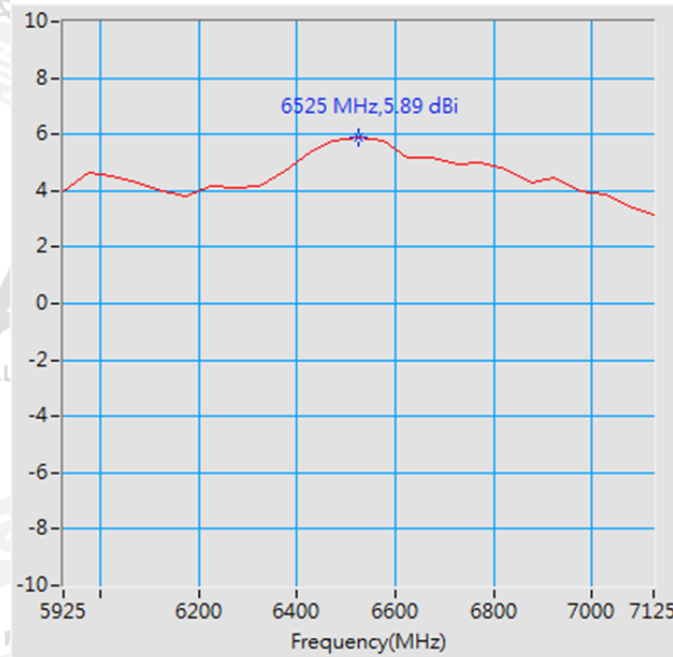
2. Antenna Characteristics

6G3

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 5975MHz : 78.04 %

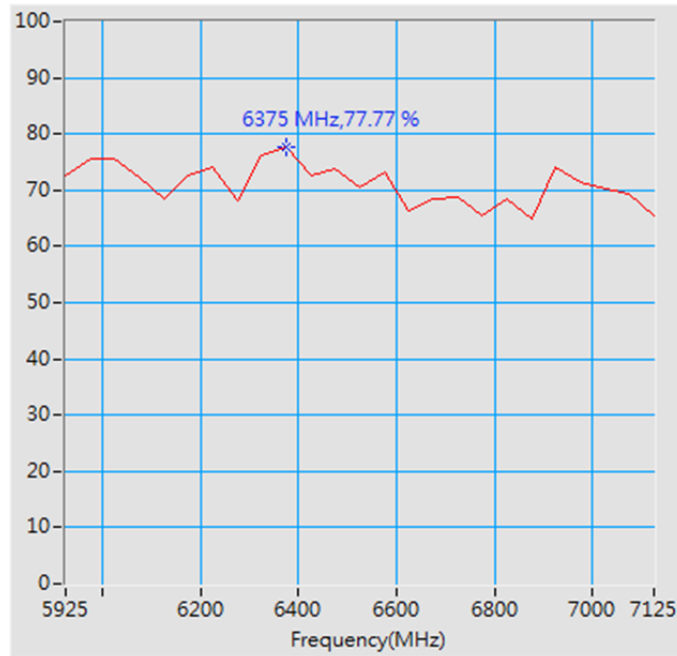


Maximum Peak Gain at 6525MHz : 5.89 dBi

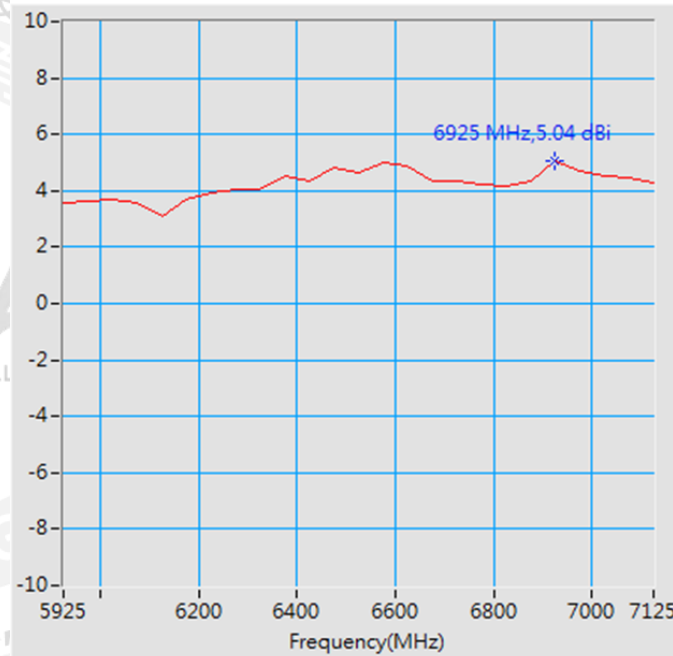
2. Antenna Characteristics

6G4

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 6375MHz : 77.77 %



Maximum Peak Gain at 6925MHz : 5.04 dBi

2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

	Frequency(MHz)	2400-2500
2G1	Efficiency (%)	73.71
	Avg. Gain (dB)	-1.32
	Peak Gain (dBi)	5.27
2G2	Efficiency (%)	74.90
	Avg. Gain (dB)	-1.26
	Peak Gain (dBi)	5.07
2G3	Efficiency (%)	73.26
	Avg. Gain (dB)	-1.35
	Peak Gain (dBi)	4.55
2G4	Efficiency (%)	73.84
	Avg. Gain (dB)	-1.32
	Peak Gain (dBi)	4.85
Frequency (MHz)		2450
Directional Gain (dBi)		7.57

Directional Gain is calculated for each angle,
And each angle has a value, it forms a sphere.
Then the maximum value is found from each angle.

- Unequal antenna gain, equal transmit powers [New guidance]
For antenna gains = $G_1, G_2, \dots, G_N$ dBi
 - If transmit signals are correlated, then
 - Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N]$ dBi
 - If all transmit signals are completely uncorrelated, then
 - Directional gain = $10 \log[(10^{G_1/10} + 10^{G_2/10} + \dots + 10^{G_N/10}) / N]$ dBi

2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

	Frequency(MHz)	5150-5250	5250-5350	5470-5850(Low)	5470-5850(High)
5G1	Efficiency (%)	68.49	69.84	68.96	72.65
	Avg. Gain (dB)	-1.64	-1.56	-1.61	-1.39
	Peak Gain (dBi)	4.18	4.03	4.76	5.37
5G2	Efficiency (%)	71.84	71.77	67.44	73.64
	Avg. Gain (dB)	-1.44	-1.44	-1.71	-1.33
	Peak Gain (dBi)	4.59	4.81	3.85	5.10
5G3	Efficiency (%)	70.25	73.44	71.50	72.73
	Avg. Gain (dB)	-1.53	-1.34	-1.46	-1.38
	Peak Gain (dBi)	5.62	5.10	4.68	4.90
5G4	Efficiency (%)	71.98	74.16	67.01	68.54
	Avg. Gain (dB)	-1.43	-1.30	-1.74	-1.64
	Peak Gain (dBi)	5.02	5.47	4.61	5.46
Frequency (MHz)		5150-5250	5250-5350	5470-5850(Low)	5470-5850(High)
Directional Gain (dBi)		8.02	7.50	7.46	8.09

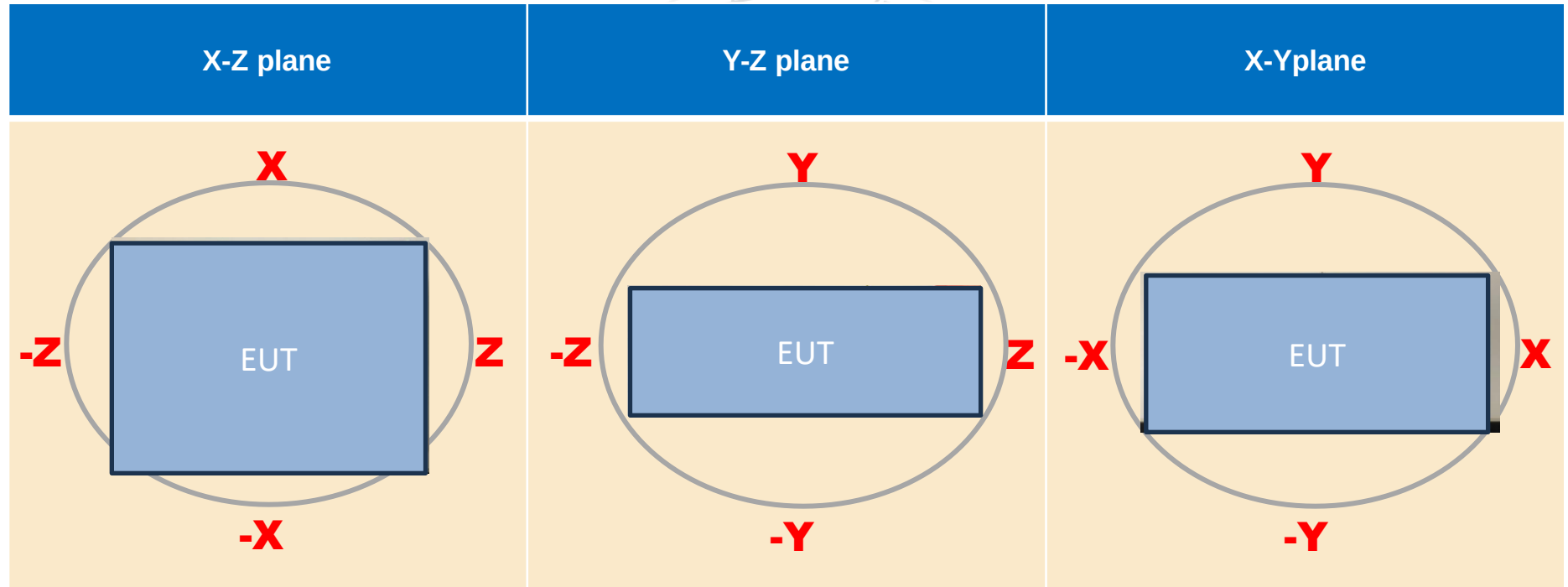
2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

	Frequency(MHz)	5925-6425	6425-6525	6525-6875	6875-7125
6G1	Efficiency (%)	78.79	75.44	73.11	74.98
	Avg. Gain (dB)	-1.04	-1.22	-1.36	-1.25
	Peak Gain (dBi)	3.23	3.97	4.15	3.53
6G2	Efficiency (%)	78.66	73.48	72.54	76.04
	Avg. Gain (dB)	-1.04	-1.34	-1.39	-1.19
	Peak Gain (dBi)	4.67	3.77	5.33	5.98
6G3	Efficiency (%)	78.04	74.49	70.91	72.74
	Avg. Gain (dB)	-1.08	-1.28	-1.49	-1.38
	Peak Gain (dBi)	4.08	5.89	5.21	3.96
6G4	Efficiency (%)	77.77	73.68	67.29	70.01
	Avg. Gain (dB)	-1.09	-1.33	-1.72	-1.55
	Peak Gain (dBi)	3.98	4.66	4.88	5.04
Frequency (MHz)		5925-6425	6425-6525	6525-6875	6875-7125
Directional Gain (dBi)		8.21	8.01	8.15	7.53

2. Antenna Characteristics

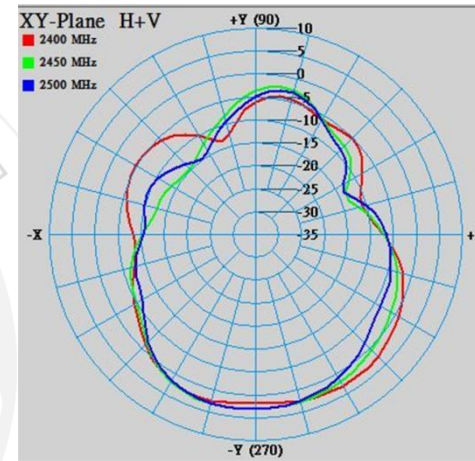
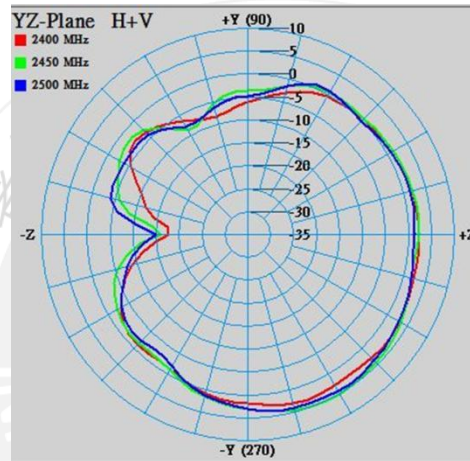
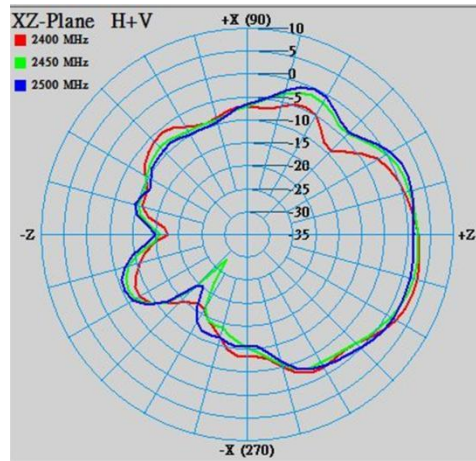
2.3 3 views of antenna



2. Antenna Characteristics

2G1

2.3 2D Radiation Patterns

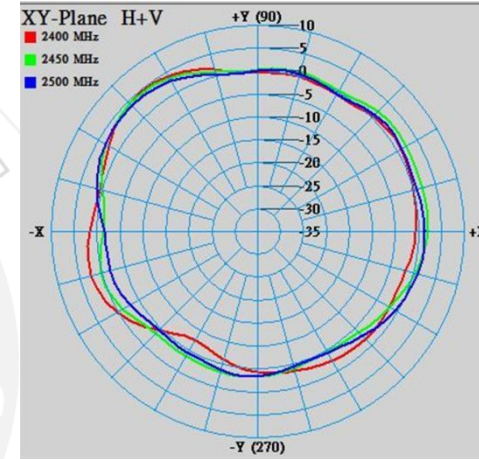
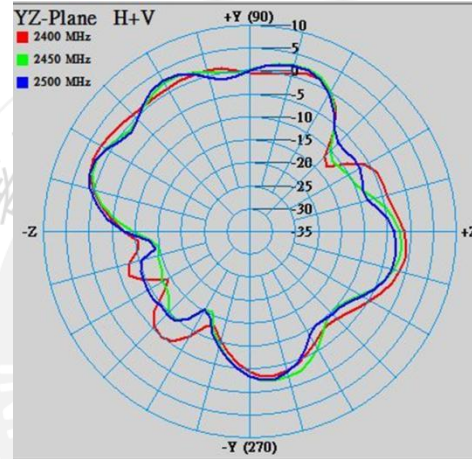
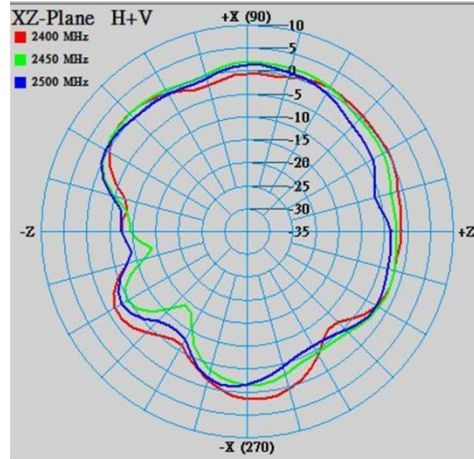


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	3.36	-3.29	3.33	-0.05	3.16	-1.61
2450	2.68	-3.08	5.23	0.80	3.24	-1.99
2500	2.36	-2.81	4.51	0.33	3.20	-2.57

2. Antenna Characteristics

2G2

2.3 2D Radiation Patterns

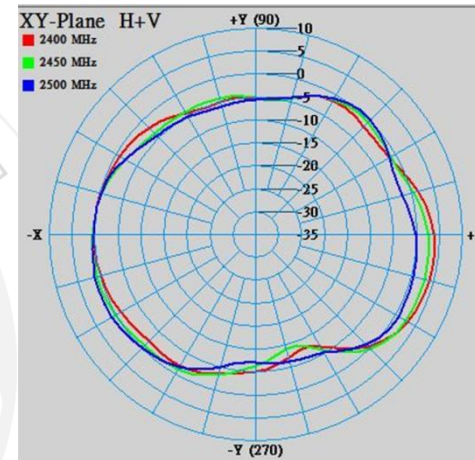
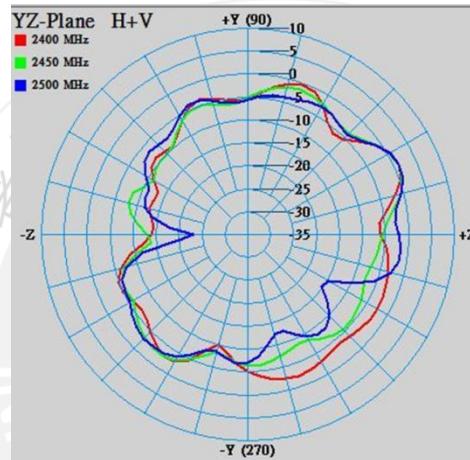
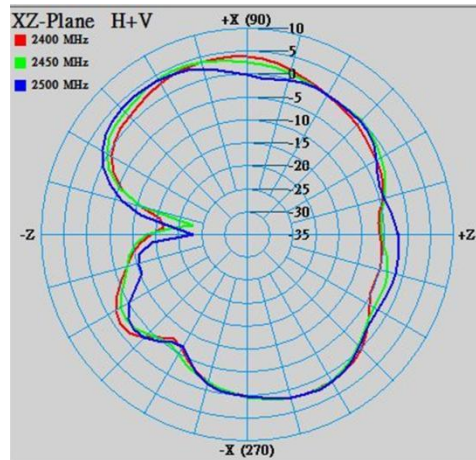


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	1.74	-1.29	2.57	-2.14	4.57	0.21
2450	2.06	-1.54	2.80	-2.37	4.44	0.45
2500	1.52	-2.27	2.95	-2.46	3.90	0.03

2. Antenna Characteristics

2G3

2.3 2D Radiation Patterns

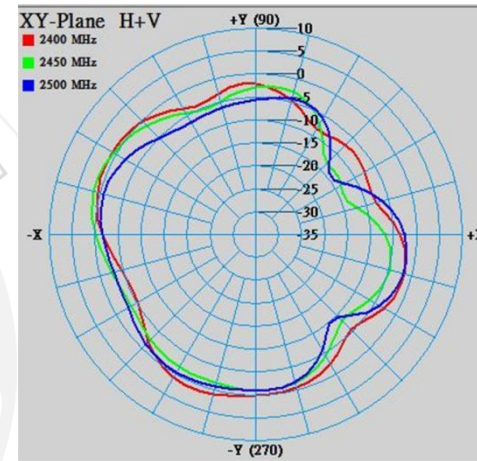
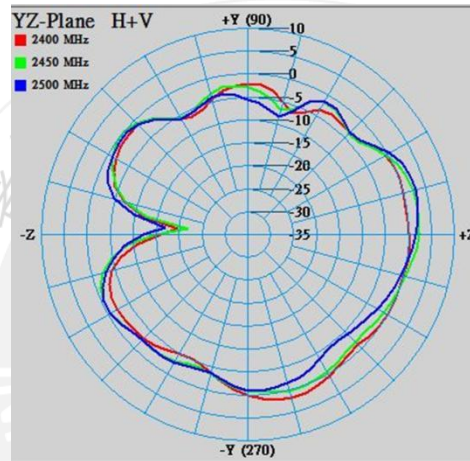
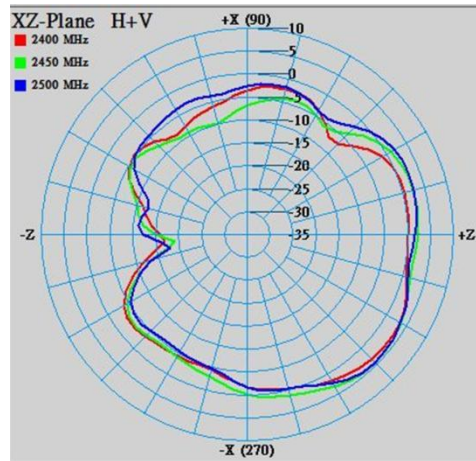


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	3.89	-0.40	1.33	-4.12	4.21	-0.64
2450	4.27	-0.19	1.17	-4.81	3.03	-0.81
2500	3.96	-0.35	1.31	-4.89	1.43	-1.47

2. Antenna Characteristics

2G4

2.3 2D Radiation Patterns

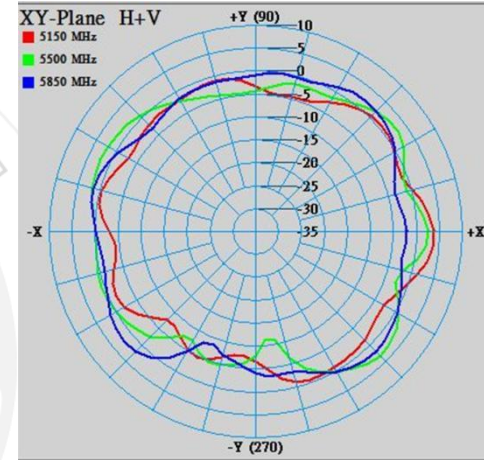
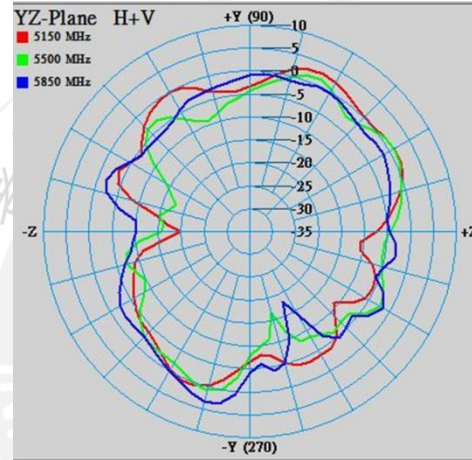
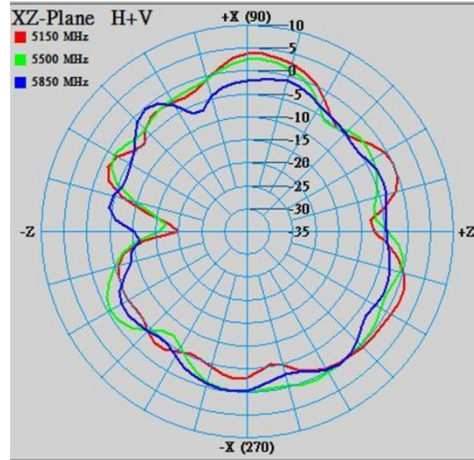


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	3.70	-1.71	1.87	-1.81	1.23	-2.07
2450	4.58	-0.84	2.59	-1.46	1.54	-2.97
2500	4.51	-0.80	2.87	-1.91	-0.23	-3.30

2. Antenna Characteristics

5G1

2.3 2D Radiation Patterns

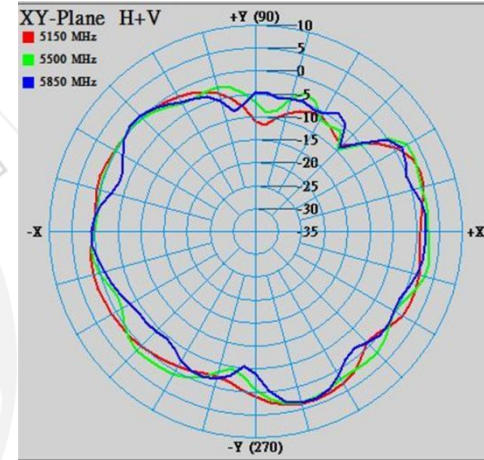
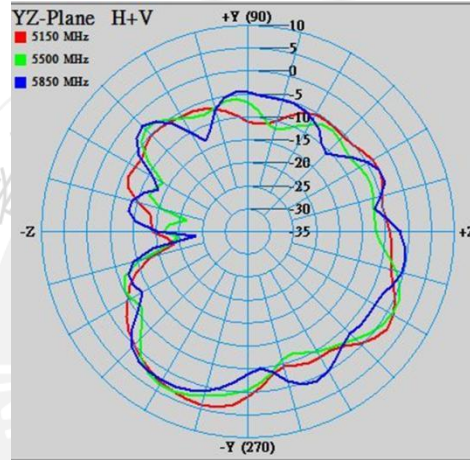
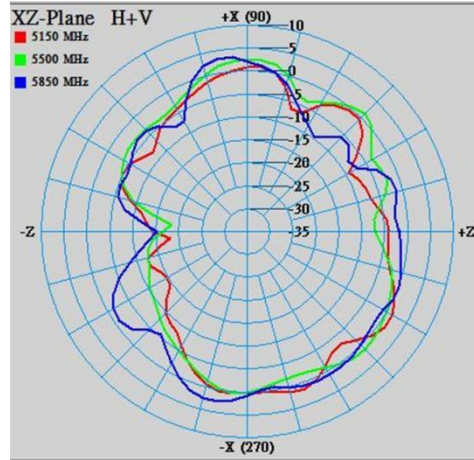


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5150	3.88	-1.58	2.90	-2.40	3.77	-1.43
5500	2.77	-1.66	1.64	-3.46	3.32	-0.24
5850	0.22	-2.96	3.36	-2.53	2.47	-0.44

2. Antenna Characteristics

5G2

2.3 2D Radiation Patterns

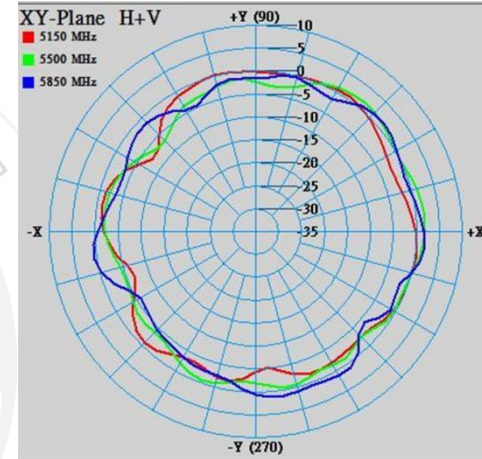
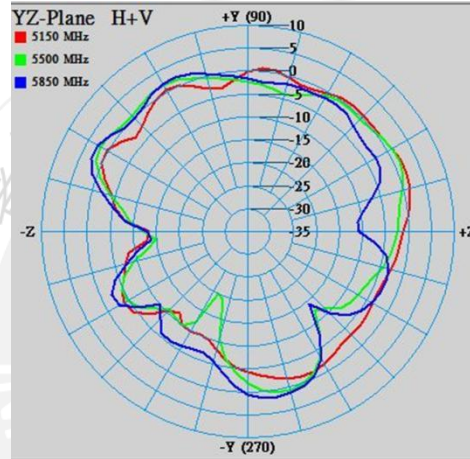
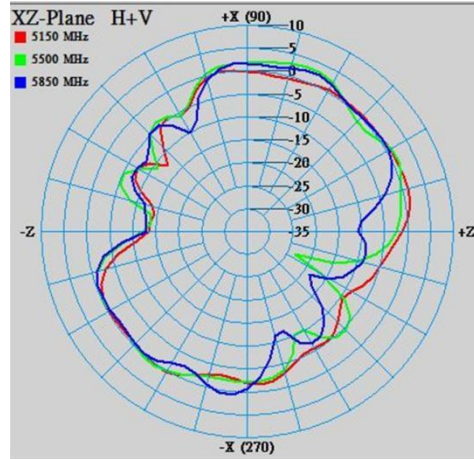


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5150	1.65	-2.69	4.06	-2.37	3.95	0.28
5500	2.58	-1.98	3.67	-3.21	3.70	0.38
5850	3.33	-1.42	2.56	-3.06	3.86	-0.80

2. Antenna Characteristics

5G3

2.3 2D Radiation Patterns

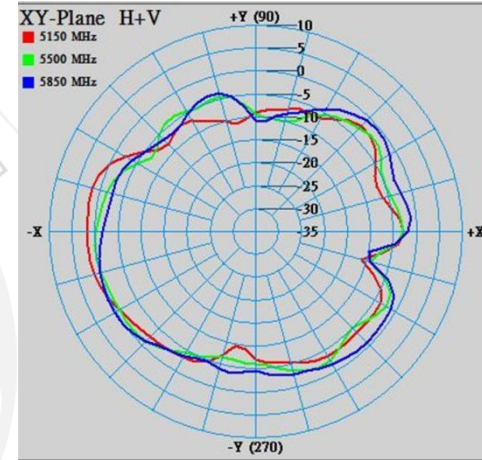
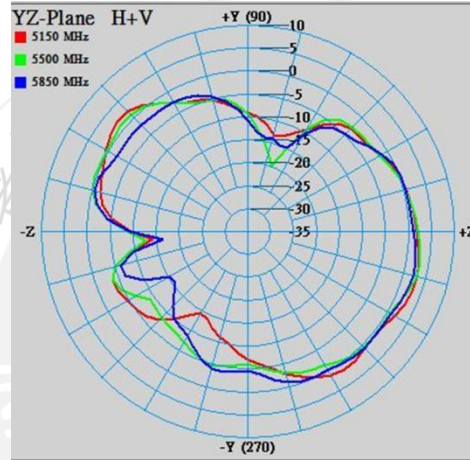
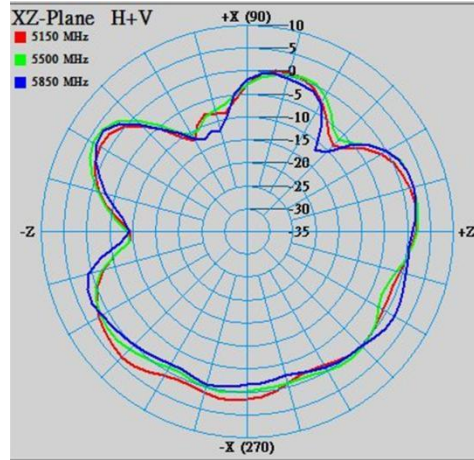


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5150	1.39	-1.97	1.90	-1.91	0.82	-1.54
5500	3.35	-1.56	1.99	-2.07	1.88	-1.20
5850	2.56	-2.24	2.95	-2.00	1.89	-0.92

2. Antenna Characteristics

5G4

2.3 2D Radiation Patterns

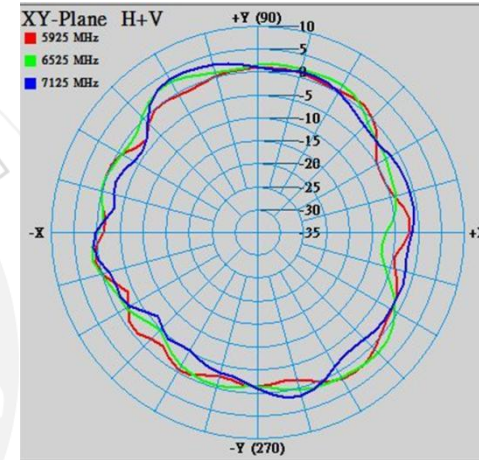
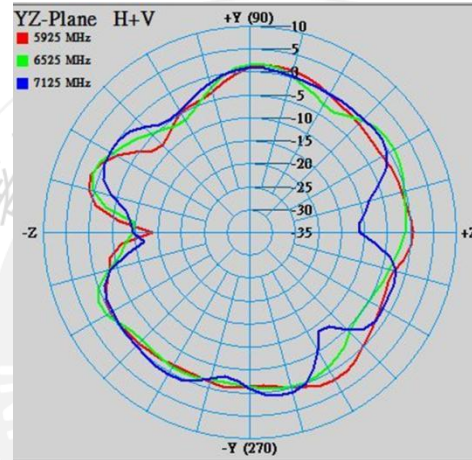
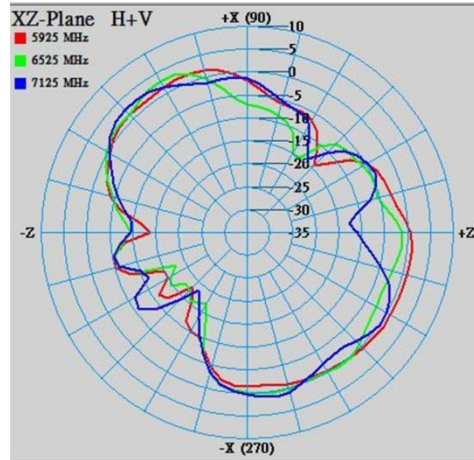


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5150	3.66	-0.23	3.32	-1.65	1.84	-3.19
5500	3.93	-0.31	3.15	-1.83	0.21	-3.49
5850	3.33	-0.58	2.41	-2.29	0.45	-2.67

2. Antenna Characteristics

6G1

2.3 2D Radiation Patterns

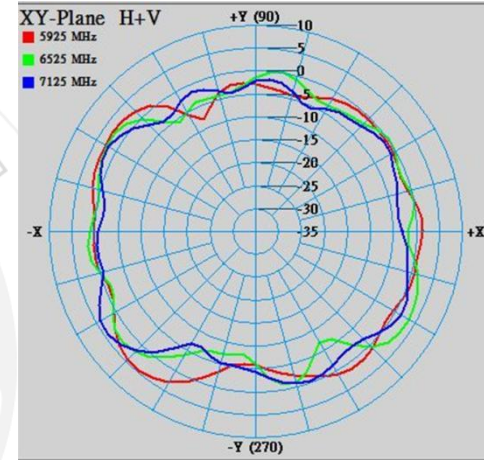
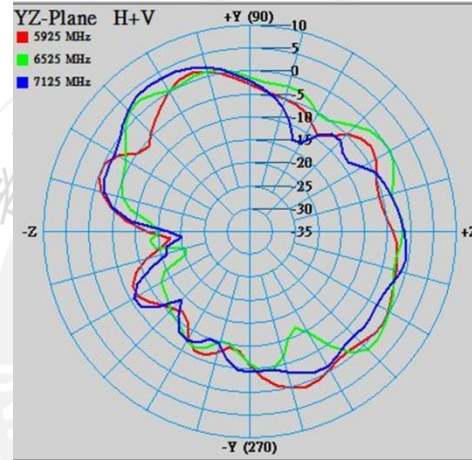
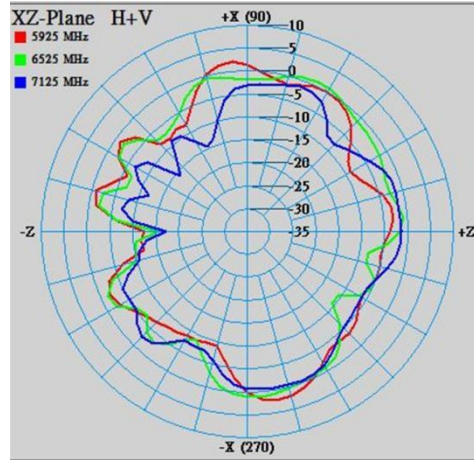


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5925	1.88	-1.82	2.12	-0.91	2.24	-0.71
6525	3.11	-2.42	1.69	-1.28	2.95	-0.10
7125	2.92	-2.50	1.31	-1.50	3.44	-0.61

2. Antenna Characteristics

6G2

2.3 2D Radiation Patterns

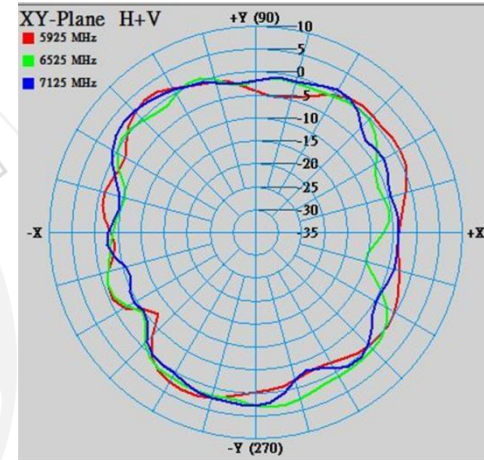
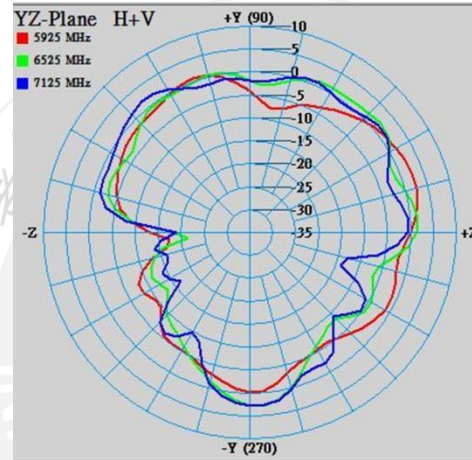
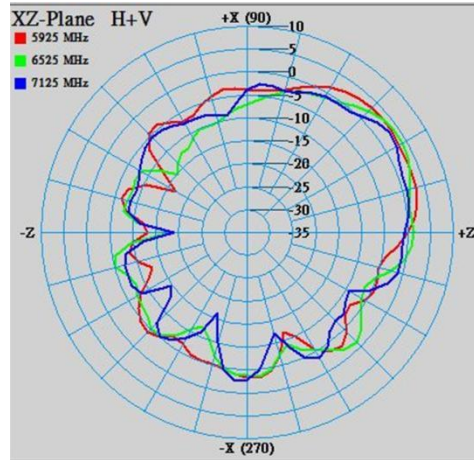


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5925	2.40	-2.72	1.81	-2.99	4.67	0.24
6525	1.30	-2.44	2.40	-2.62	3.55	-0.43
7125	-0.33	-4.17	3.71	-2.46	4.18	-0.99

2. Antenna Characteristics

6G3

2.3 2D Radiation Patterns

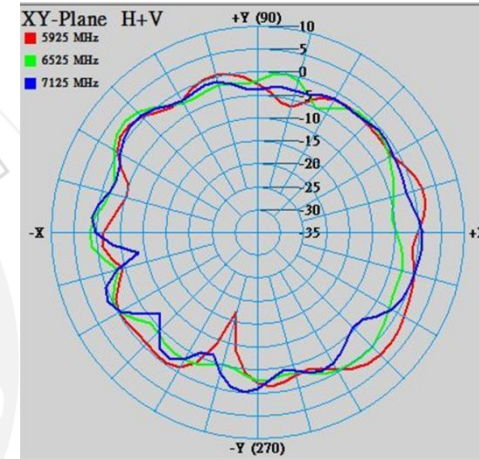
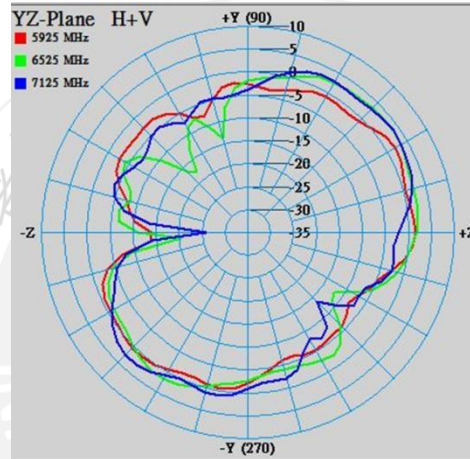
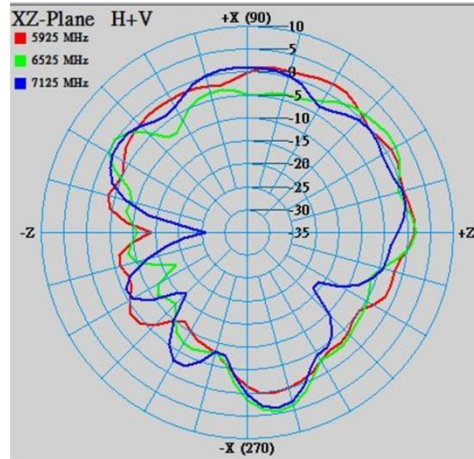


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5925	3.64	-2.37	2.68	-2.12	3.03	-0.54
6525	4.11	-2.78	2.92	-1.60	3.19	-0.69
7125	2.93	-3.51	2.88	-1.62	2.76	-0.85

2. Antenna Characteristics

6G4

2.3 2D Radiation Patterns

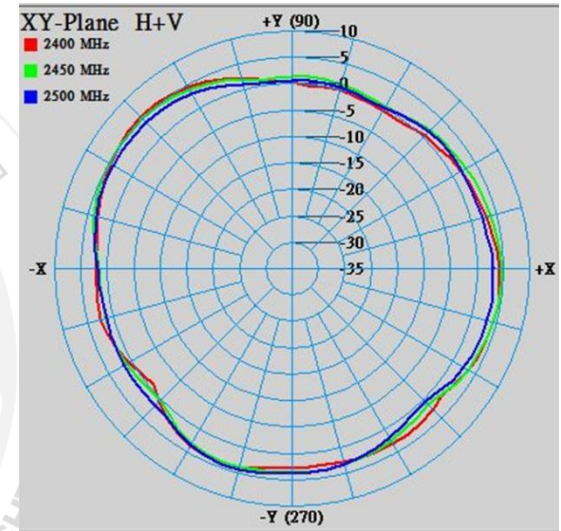
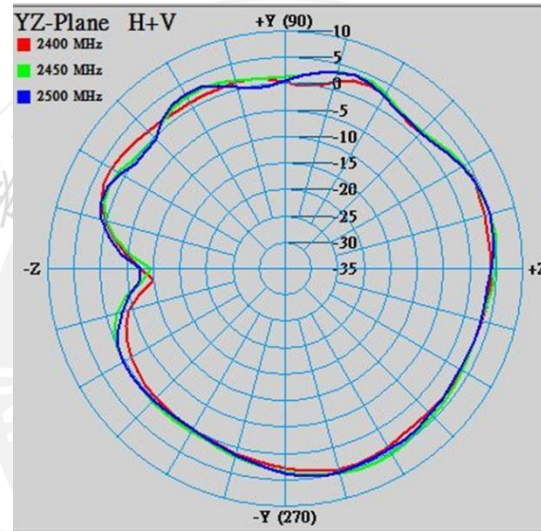
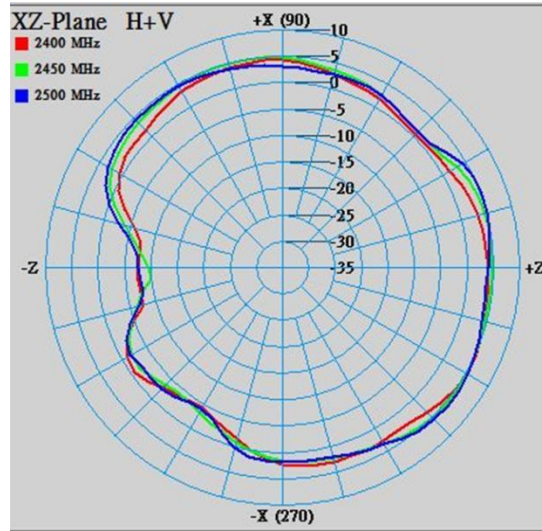


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5925	2.52	-1.56	2.06	-2.00	2.80	-0.76
6525	4.57	-1.97	3.73	-0.99	2.71	-1.47
7125	3.82	-2.25	3.82	-0.87	1.24	-1.44

2. Antenna Characteristics

2G

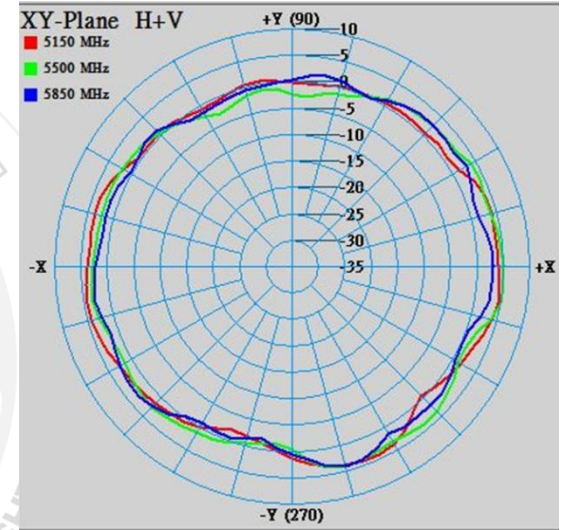
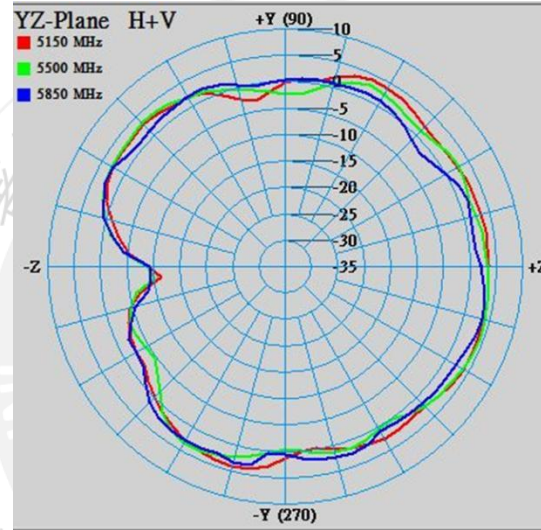
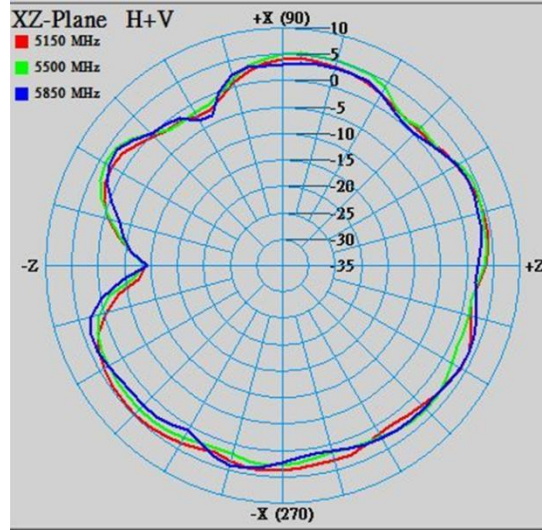
2.4 2D Combine Patterns



2. Antenna Characteristics

5G

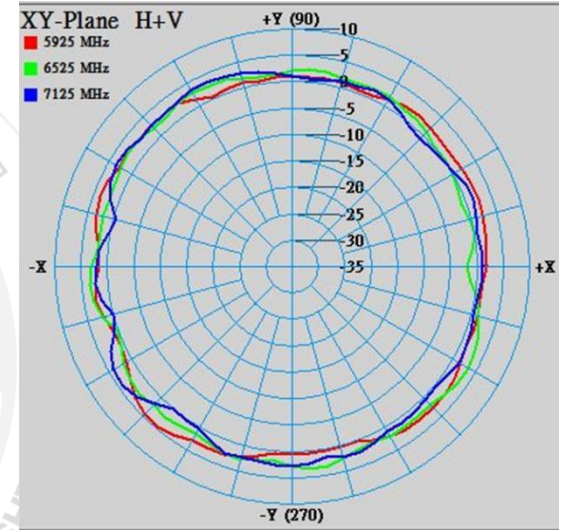
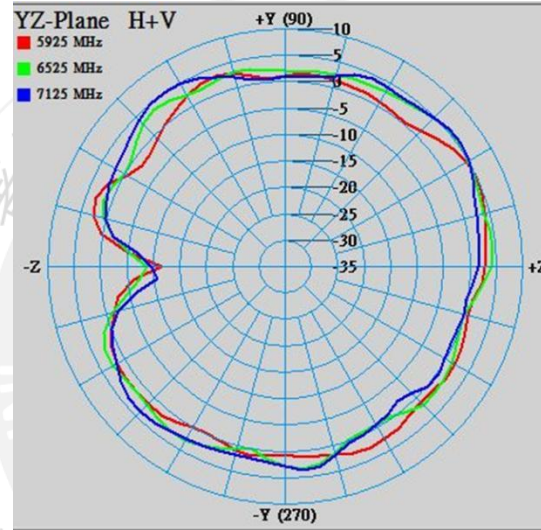
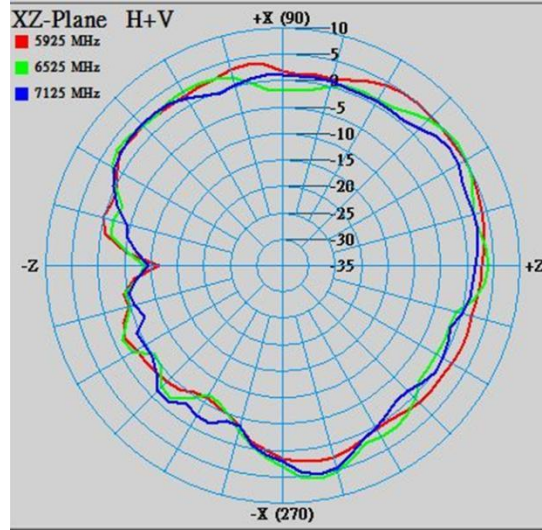
2.4 2D Combine Patterns



2. Antenna Characteristics

6G

2.4 2D Combine Patterns



3. Summary

- The performance of antennas is shown in table

	Maximum Efficiency (%)	Maximum Gain (dBi)
2G1	73.71	5.27
2G2	74.90	5.07
2G3	73.26	4.55
2G4	73.84	4.85
5G1	72.65	5.37
5G2	73.64	5.10
5G3	74.35	5.62
5G4	74.16	5.47

3. Summary

- The performance of antennas is shown in table

	Maximum Efficiency (%)	Maximum Gain (dBi)
6G1	78.79	4.15
6G2	78.66	5.98
6G3	78.04	5.89
6G4	77.77	5.04

3. Summary

- The ECC(Pattern) of antennas is shown in table

2400MHz	2G1	2G2	2G3	2G4
2G1		0.03	0.03	0.03
2G2	0.03		0.04	0.04
2G3	0.03	0.04		0.05
2G4	0.03	0.04	0.05	

2500MHz	2G1	2G2	2G3	2G4
2G1		0.03	0.02	0.03
2G2	0.03		0.04	0.05
2G3	0.02	0.04		0.05
2G4	0.03	0.05	0.05	

2450MHz	2G1	2G2	2G3	2G4
2G1		0.03	0.02	0.03
2G2	0.03		0.02	0.03
2G3	0.02	0.02		0.05
2G4	0.03	0.03	0.05	

3. Summary

- The ECC(Pattern) of antennas is shown in table

5150MHz	5G1	5G2	5G3	5G4
5G1		0.05	0.05	0.02
5G2	0.05		0.02	0.04
5G3	0.05	0.02		0.03
5G4	0.02	0.04	0.03	

5250MHz	5G1	5G2	5G3	5G4
5G1		0.04	0.05	0.02
5G2	0.04		0.02	0.04
5G3	0.05	0.02		0.04
5G4	0.02	0.04	0.04	

5350MHz	5G1	5G2	5G3	5G4
5G1		0.03	0.04	0.02
5G2	0.03		0.02	0.03
5G3	0.04	0.02		0.05
5G4	0.02	0.03	0.05	

5475MHz	5G1	5G2	5G3	5G4
5G1		0.04	0.05	0.02
5G2	0.04		0.02	0.03
5G3	0.05	0.02		0.05
5G4	0.02	0.03	0.05	

3. Summary

- The ECC(Pattern) of antennas is shown in table

5500MHz	5G1	5G2	5G3	5G4
5G1		0.03	0.03	0.03
5G2	0.03		0.02	0.03
5G3	0.03	0.02		0.03
5G4	0.03	0.03	0.03	

5600MHz	5G1	5G2	5G3	5G4
5G1		0.03	0.05	0.02
5G2	0.03		0.02	0.02
5G3	0.05	0.02		0.05
5G4	0.02	0.02	0.05	

5725MHz	5G1	5G2	5G3	5G4
5G1		0.03	0.04	0.02
5G2	0.03		0.02	0.03
5G3	0.04	0.02		0.04
5G4	0.02	0.03	0.04	

5750MHz	5G1	5G2	5G3	5G4
5G1		0.04	0.05	0.02
5G2	0.04		0.02	0.03
5G3	0.05	0.02		0.05
5G4	0.02	0.03	0.05	

3. Summary

- The ECC(Pattern) of antennas is shown in table

5825MHz	5G1	5G2	5G3	5G4
5G1		0.03	0.04	0.02
5G2	0.03		0.02	0.02
5G3	0.04	0.02		0.05
5G4	0.02	0.02	0.05	

5875MHz	6G1	6G2	6G3	6G4
6G1		0.03	0.02	0.03
6G2	0.03		0.04	0.02
6G3	0.02	0.04		0.04
6G4	0.03	0.02	0.04	

6525MHz	6G1	6G2	6G3	6G4
6G1		0.02	0.02	0.02
6G2	0.02		0.03	0.03
6G3	0.02	0.03		0.02
6G4	0.02	0.03	0.02	

3. Summary

- Return loss: under -10 dB
- 2G to 5G/6G isolation: under -20 dB
- 5G to 6G isolation: under -23 dB
- 6G isolation: under -19 dB
- Efficiency: >60%
- Antenna Gain: under 6 dBi
- ECC: < 0.3
- 2G cable 160mm , 5G cable 100mm , 6G cable 100mm .

