EX5512 2Gx4 5Gx4

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Reviewed By: Stone

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Contents

Revision History

Released Date	Version	Record
2022/03/03	2.01	2Gx4 5Gx4 Antenna Test Report (antenna cables grounded to the MB)

Specification

Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
2G	4	2412 – 2483.5MHz	
5G	4	4900 – 5900MHz	

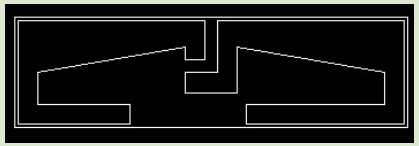
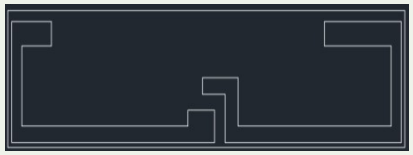
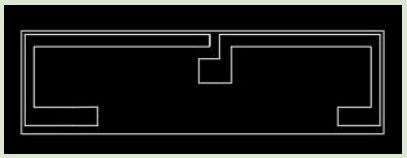
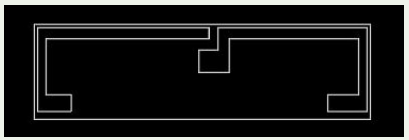
Requirements of Measurement

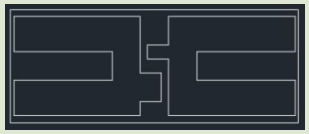
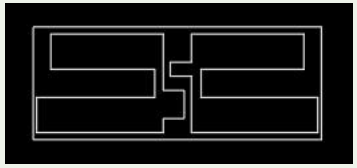
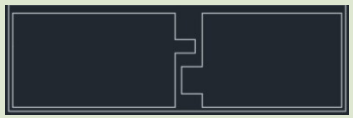
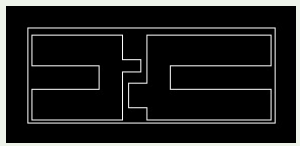
Test Item	Specification	Remark
Return Loss	2.4GHz >10dB ，5GHz >10dB	
Isolation	> 20dB	
Peak gain	< 3.5dBi for WiFi 2.4GHz, < 4.5dBi for WiFi 5GHz	
Efficiency	> 60%	
Directivity	2.4GHz< 4.5dB ， 5GHz< 4.8dB	

Antenna Placement & Solution

ANT	ANT Type	Size (L * W * H)	Cable Length (mm)	Cable Type	Connector
2G_ANT1	Dipole ANT	30mm*8.5mm*1mm	Total:313mm	Φ=1.13 Low Loss	CCT
2G_ANT2	Dipole ANT	30mm*8.5mm*1mm	Total:258mm	Φ=1.13 Low Loss	CCT
2G_ANT3	Dipole ANT	30mm*8.5mm*1mm	Total:263mm	Φ=1.13 Low Loss	CCT
2G_ANT4	Dipole ANT	30mm*8.5mm*1mm	Total:145mm	Φ=1.13 Low Loss	CCT
5G_ANT5	Dipole ANT	20.5mm*8mm*0.6mm	Total:59mm	Φ=1.13 Low Loss	CCT
5G_ANT6	Dipole ANT	20.61mm*7.9mm*0.6mm	Total:50mm	Φ=1.13 Low Loss	CCT
5G_ANT7	Dipole ANT	20.61mm*7.9mm*0.6mm	Total:45mm	Φ=1.13 Low Loss	CCT
5G_ANT8	Dipole ANT	20.61mm*7.9mm*0.6mm	Total:80mm	Φ=1.13 Low Loss	CCT

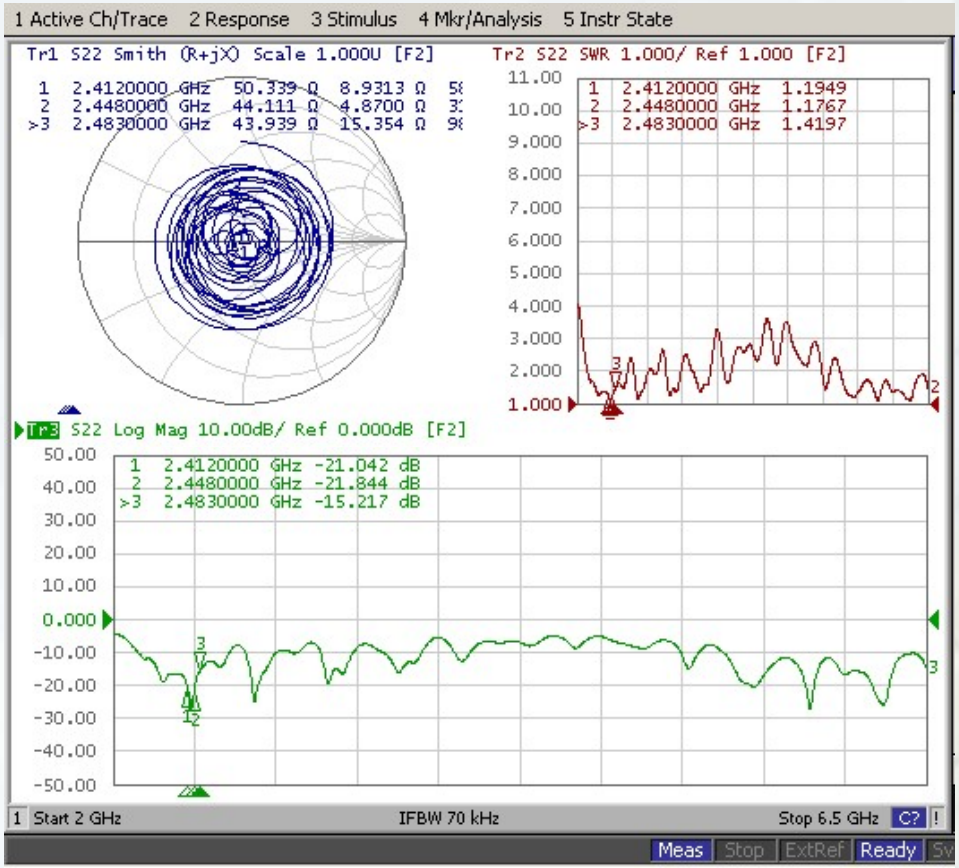
Antenna Placement & Solution

Antenna	Current Version
2G_ANT1	
2G_ANT2	
2G_ANT3	
2G_ANT4	

Antenna	Current Version
5G_ANT5	
5G_ANT6	
5G_ANT7	
5G_ANT8	

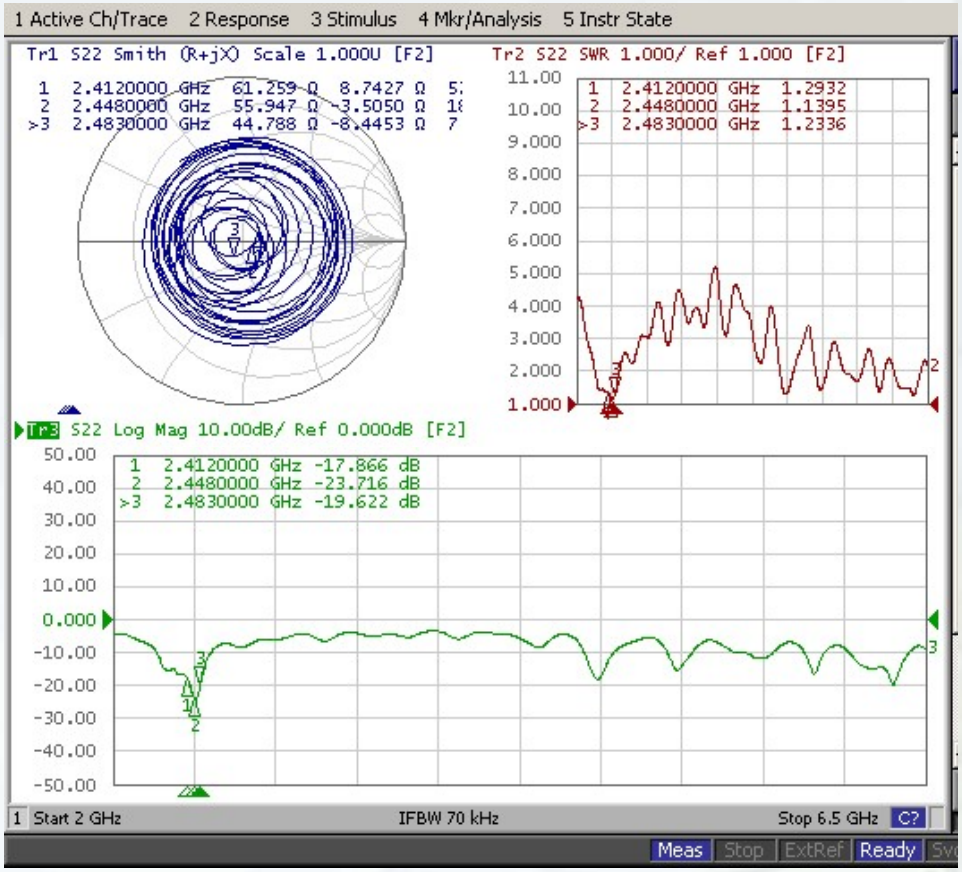
Return Loss Results

2G_ANT1 (2412 MHz– 2483.5MHz) (Criterion:>10dB)



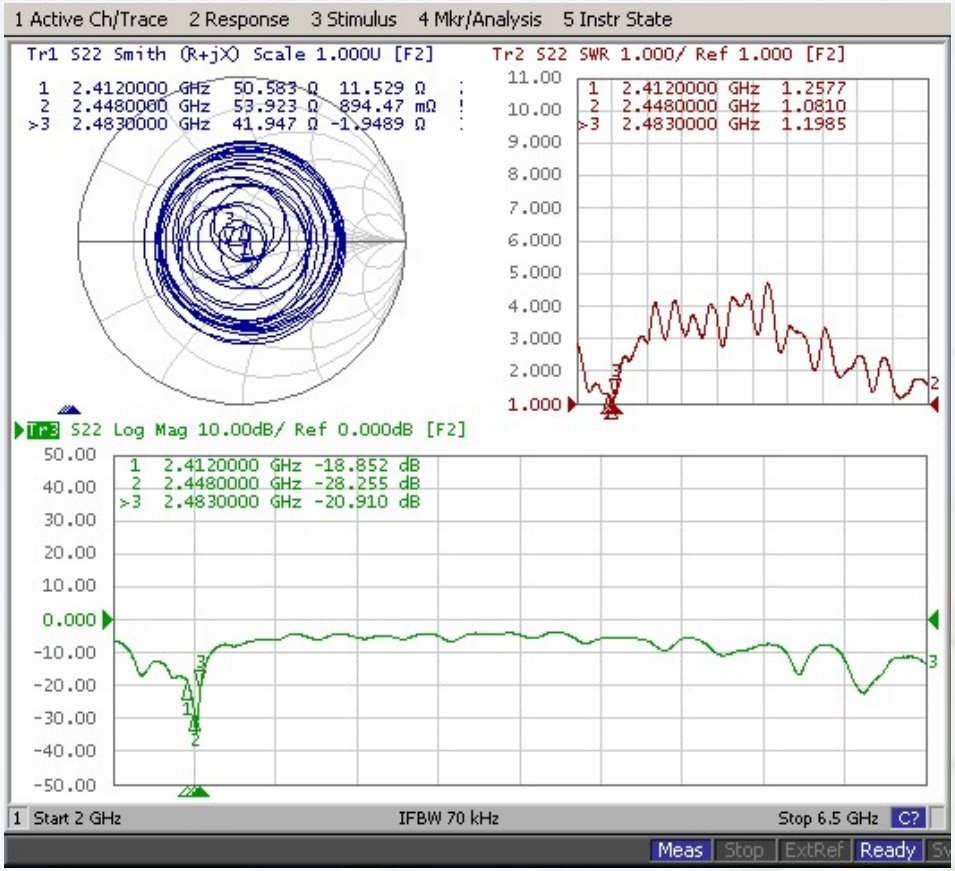
Return Loss Results

2G_ANT2 (2412 MHz– 2483.5MHz) (Criterion:>10dB)



Return Loss Results

2G_ANT3 (2412 MHz– 2483.5MHz) (Criterion:>10dB)



Return Loss Results

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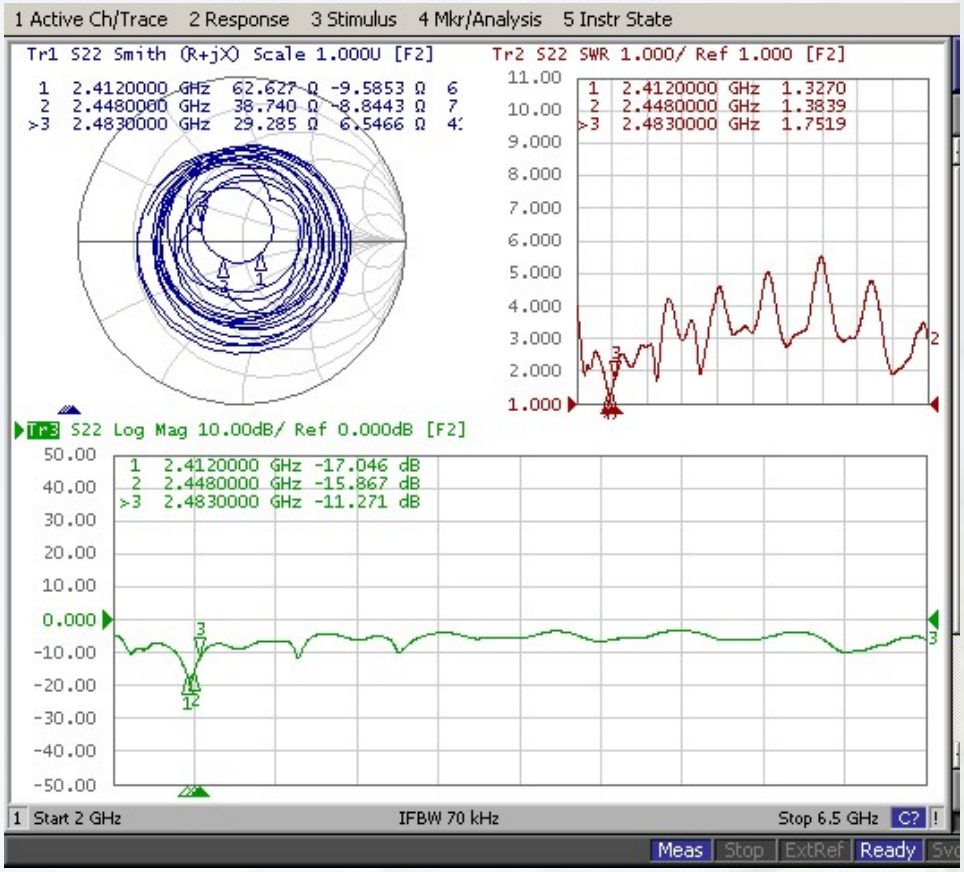
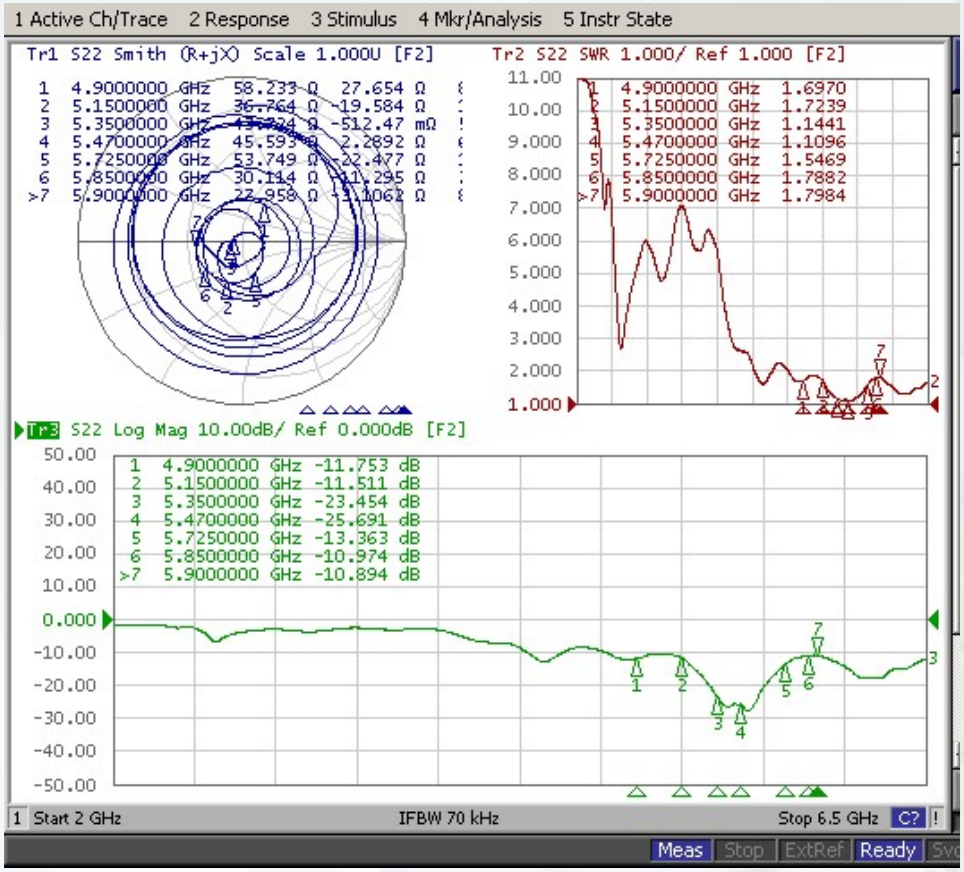


Return Loss Results

5G_ANT5 (4900MHz~5900MHz) (Criterion:>10dB)



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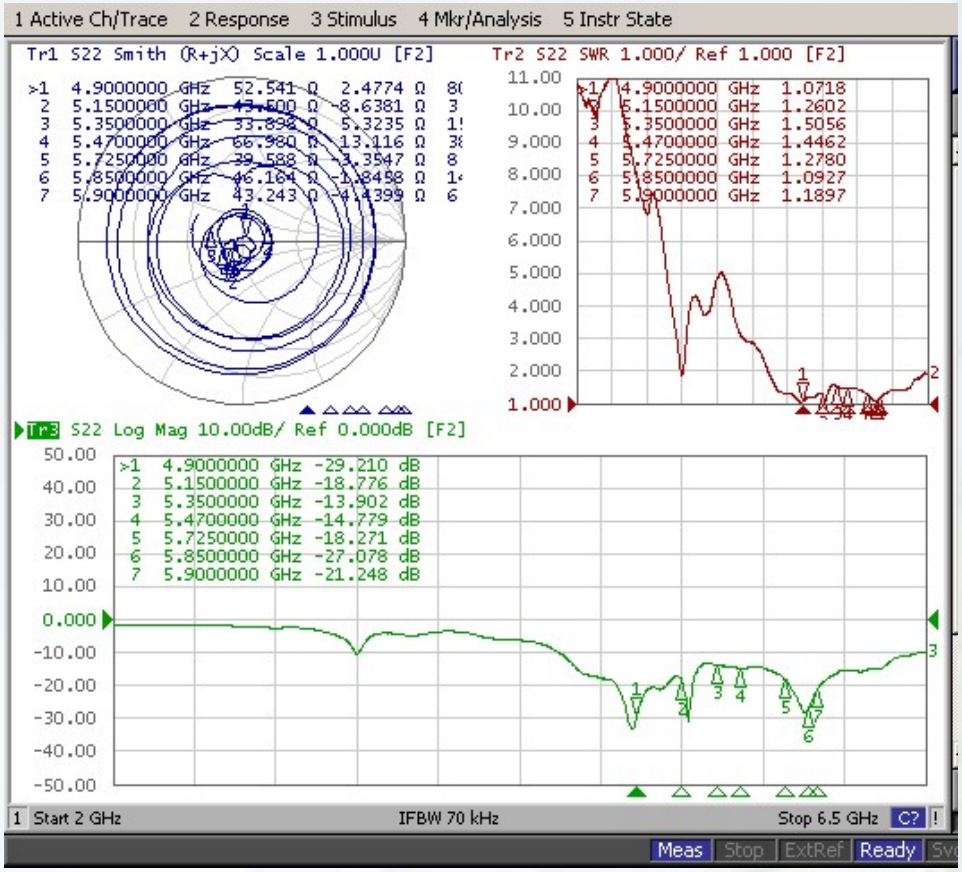
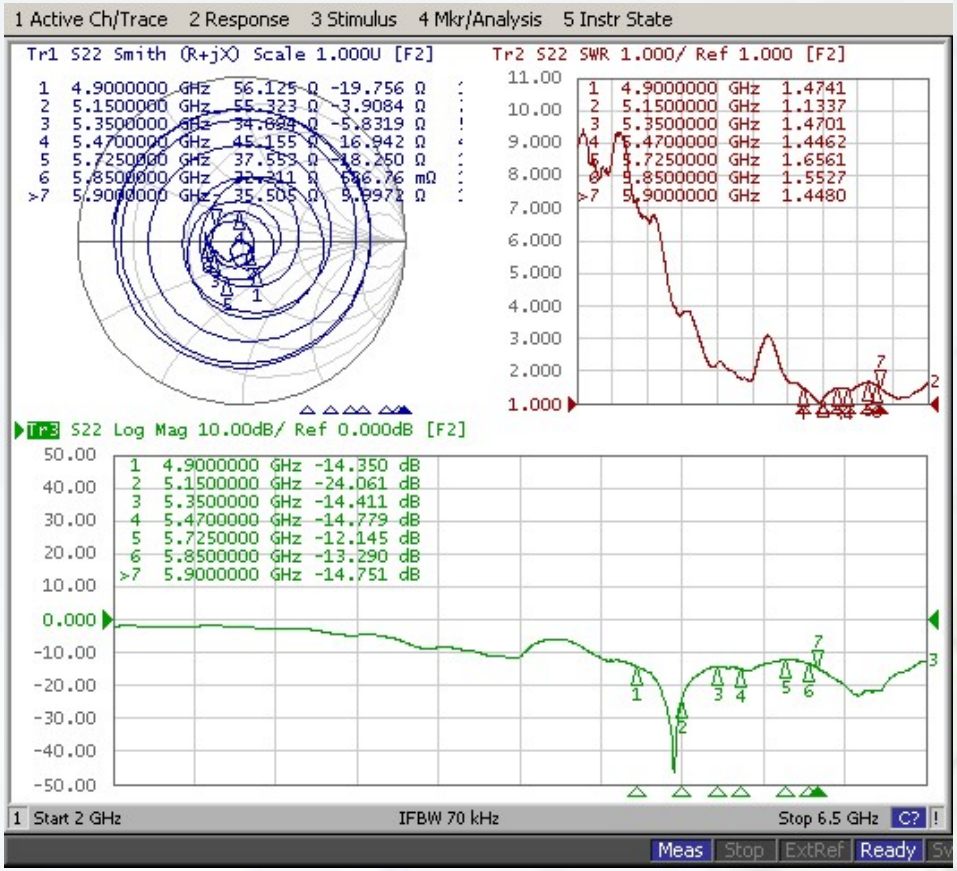
Return Loss Results

5G_ANT6 (4900MHz~5900MHz) (Criterion:>10dB)



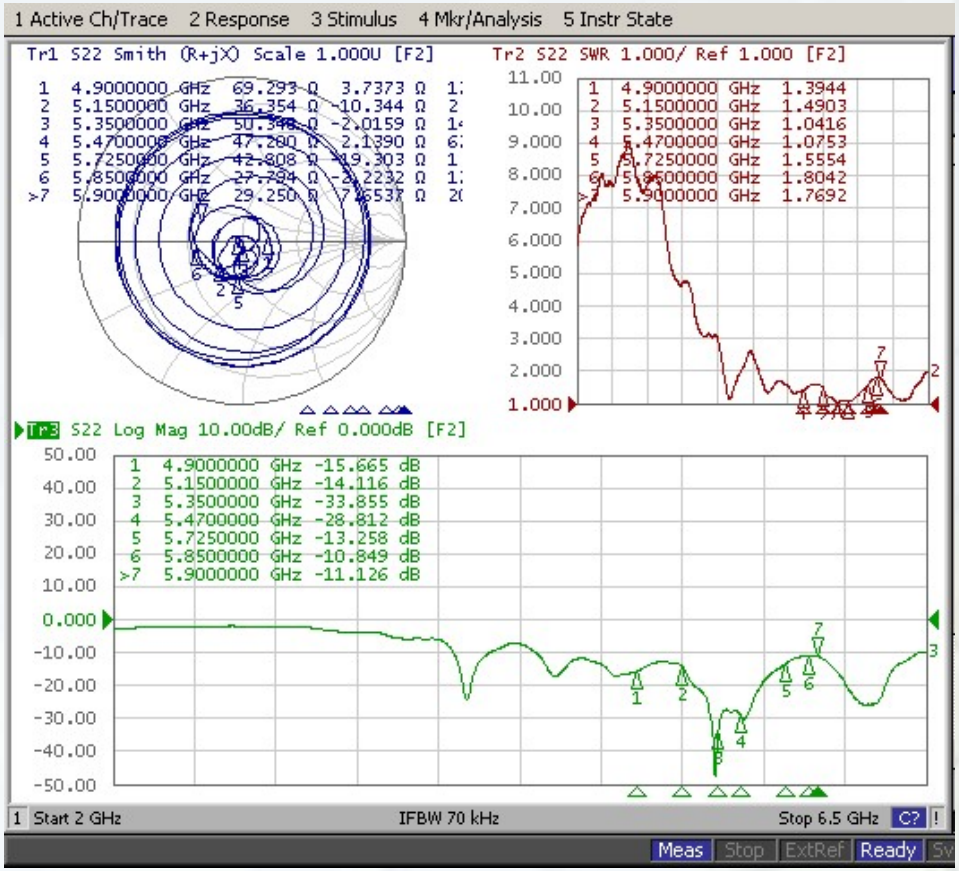
Return Loss Results

5G_ANT7 (4900MHz~5900MHz) (Criterion:>10dB)



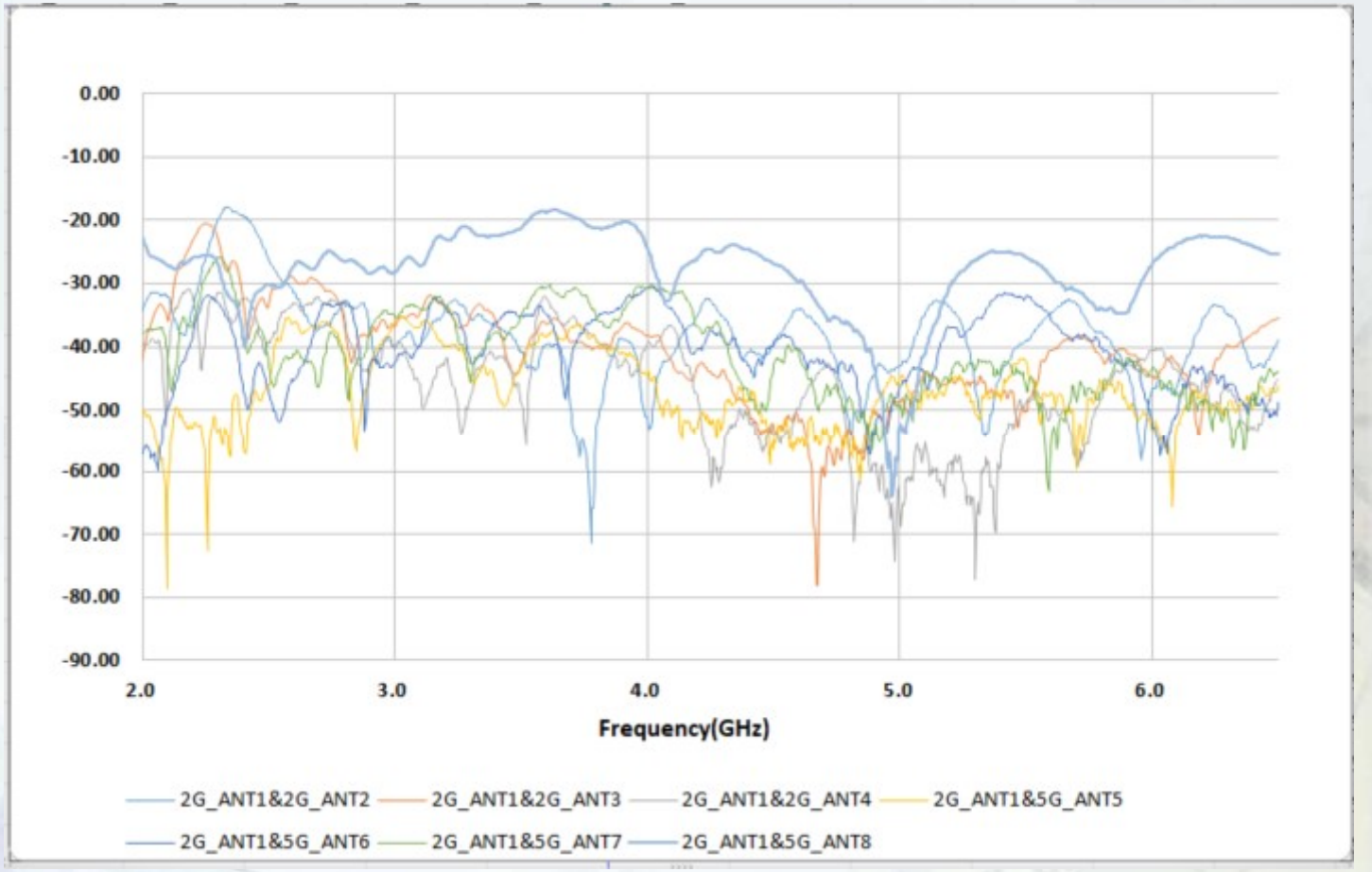
Return Loss Results

5G_ANT8 (4900MHz~5900MHz) (Criterion:>10dB)



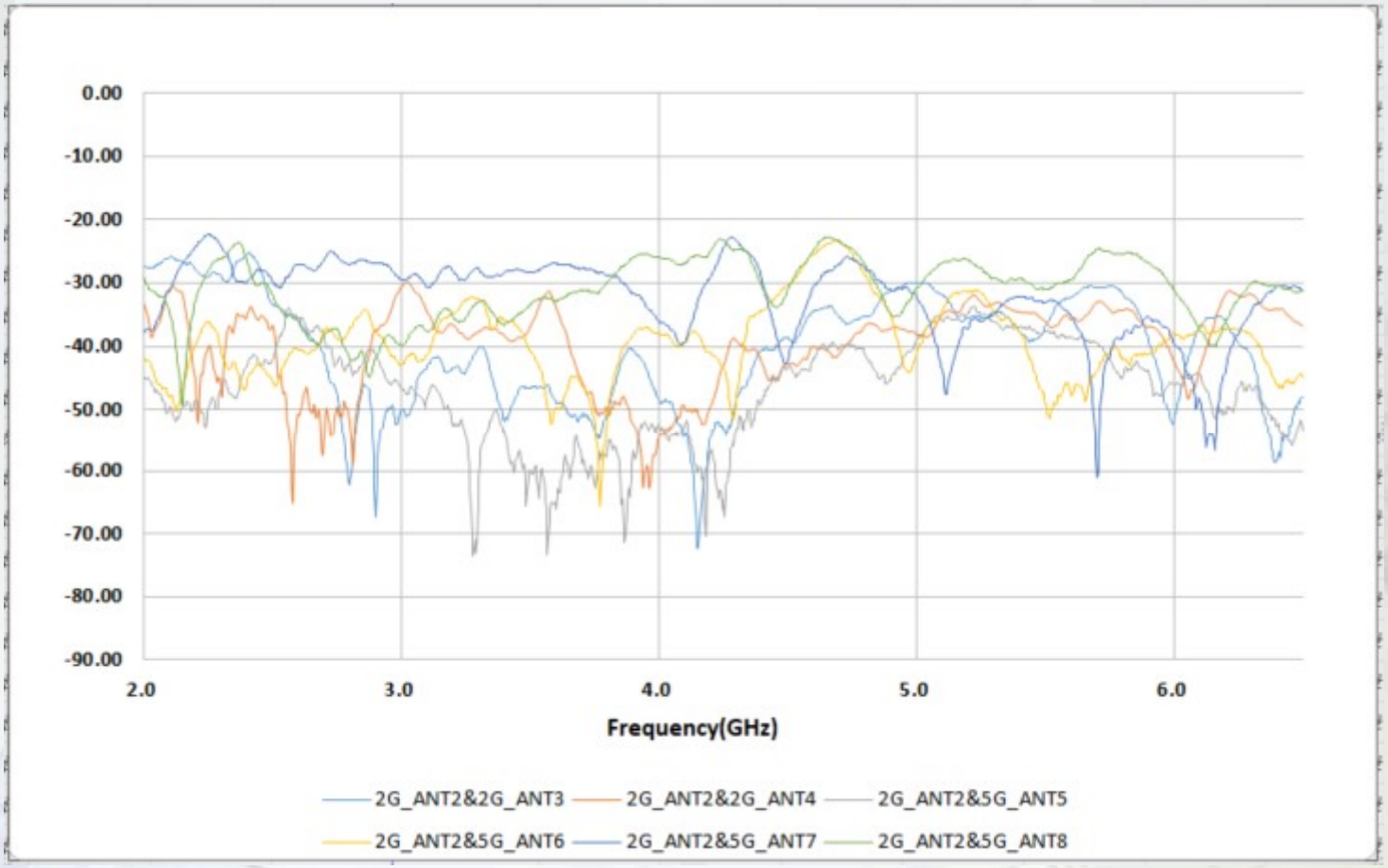
Isolation Results

2G_ANT1 to 5G_ANT8



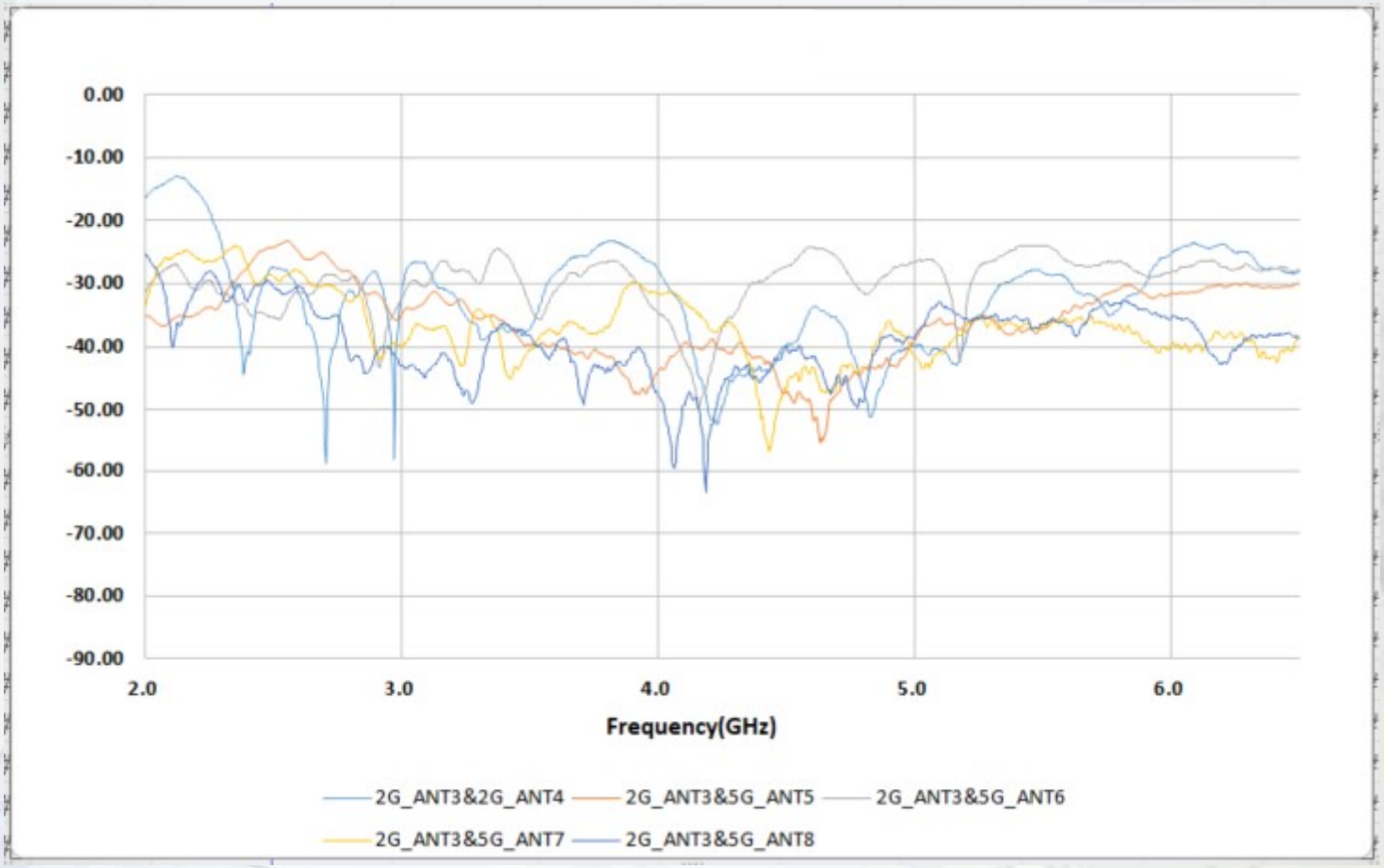
Isolation Results

2G_ANT2 to 5G_ANT8



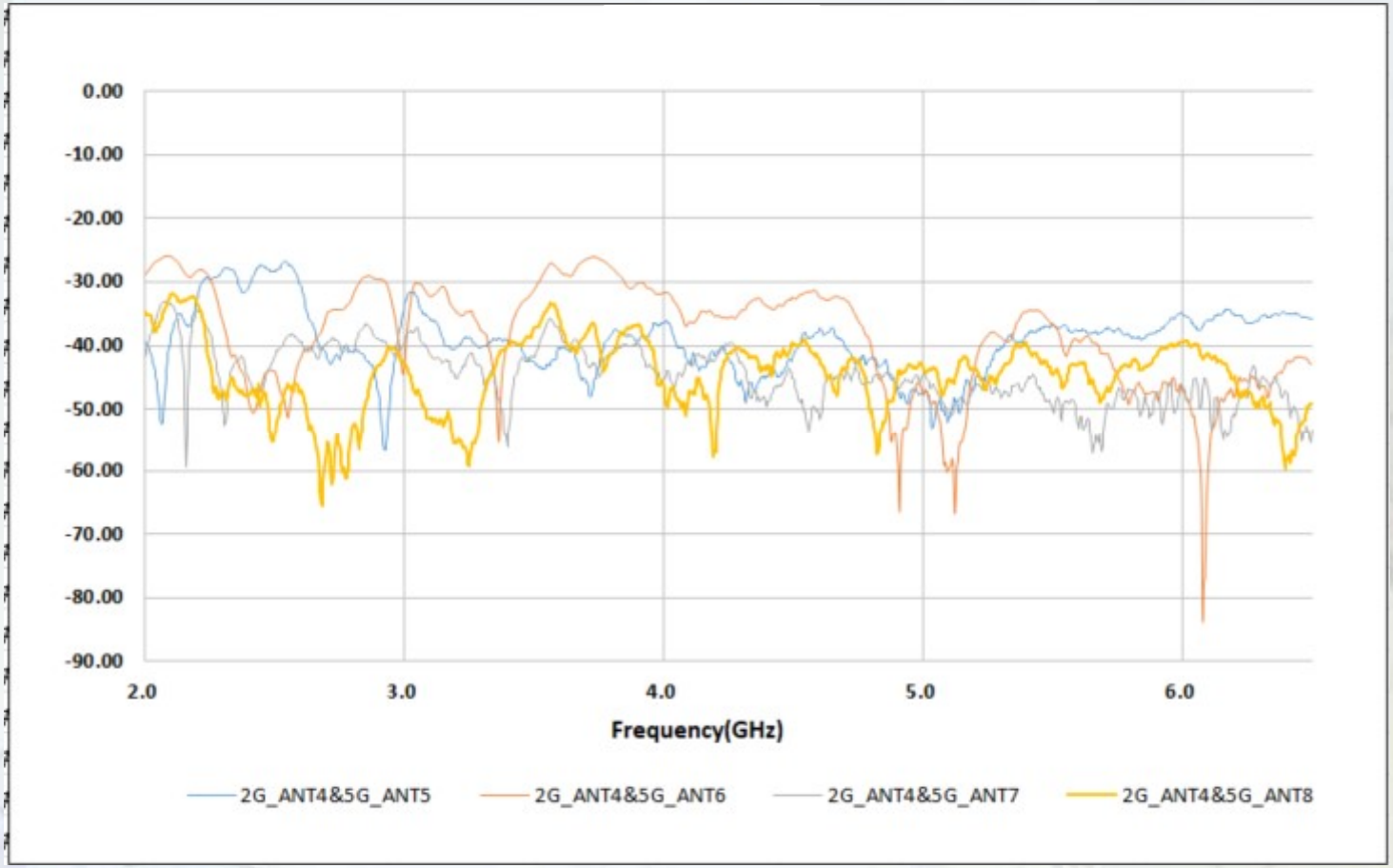
Isolation Results

2G_ANT3 to 5G_ANT8



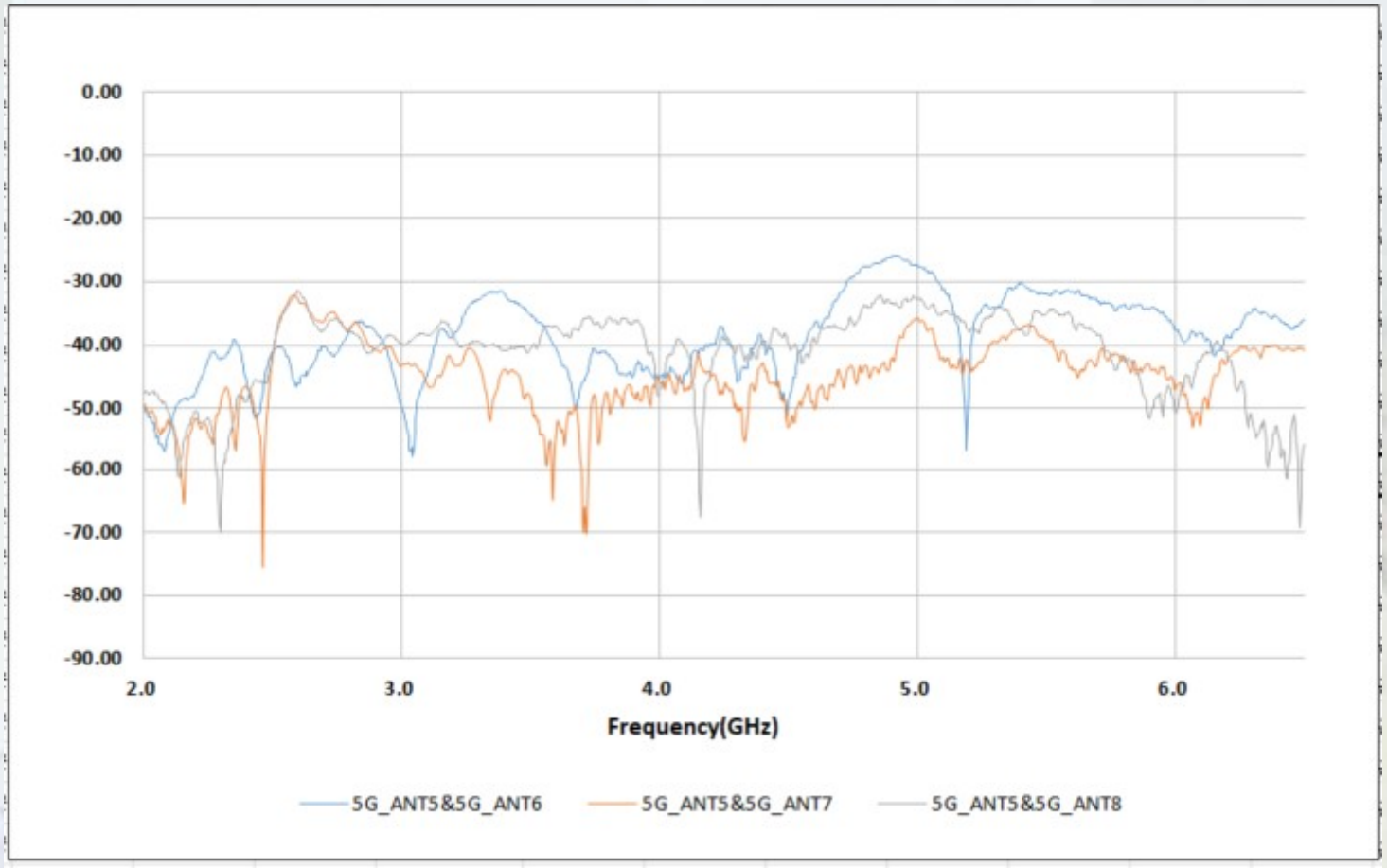
Isolation Results

2G_ANT4 to 5G_ANT8



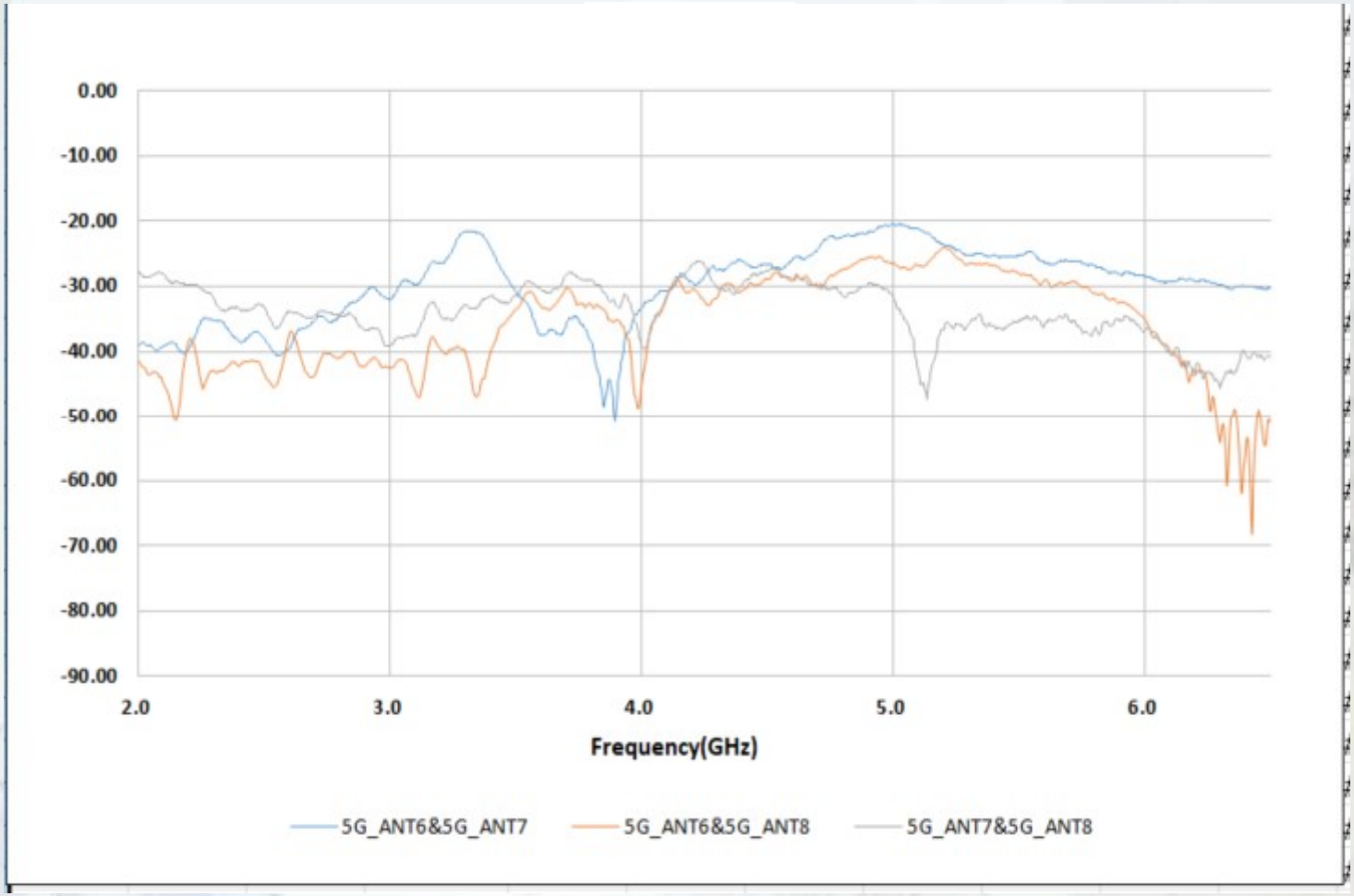
Isolation Results

5G_Ant5 to 5G_ANT8

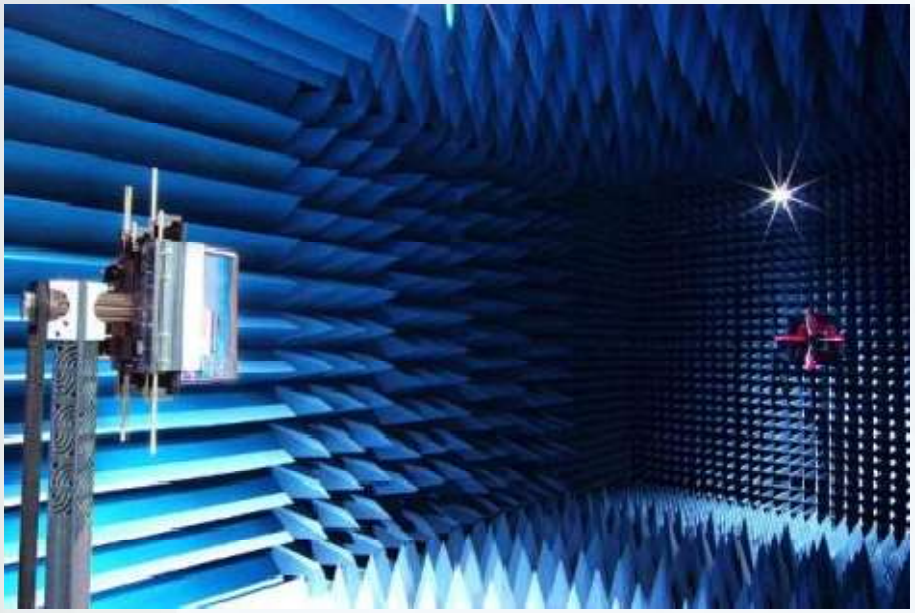


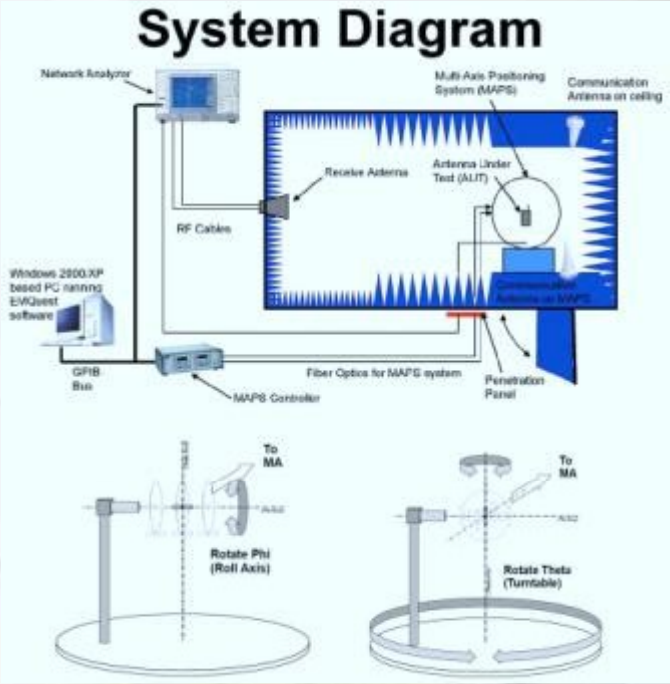
Isolation Results

5G_Ant6 to 5G_ANT8 & 5G_Ant7 to 5G_Ant8



Chamber Information

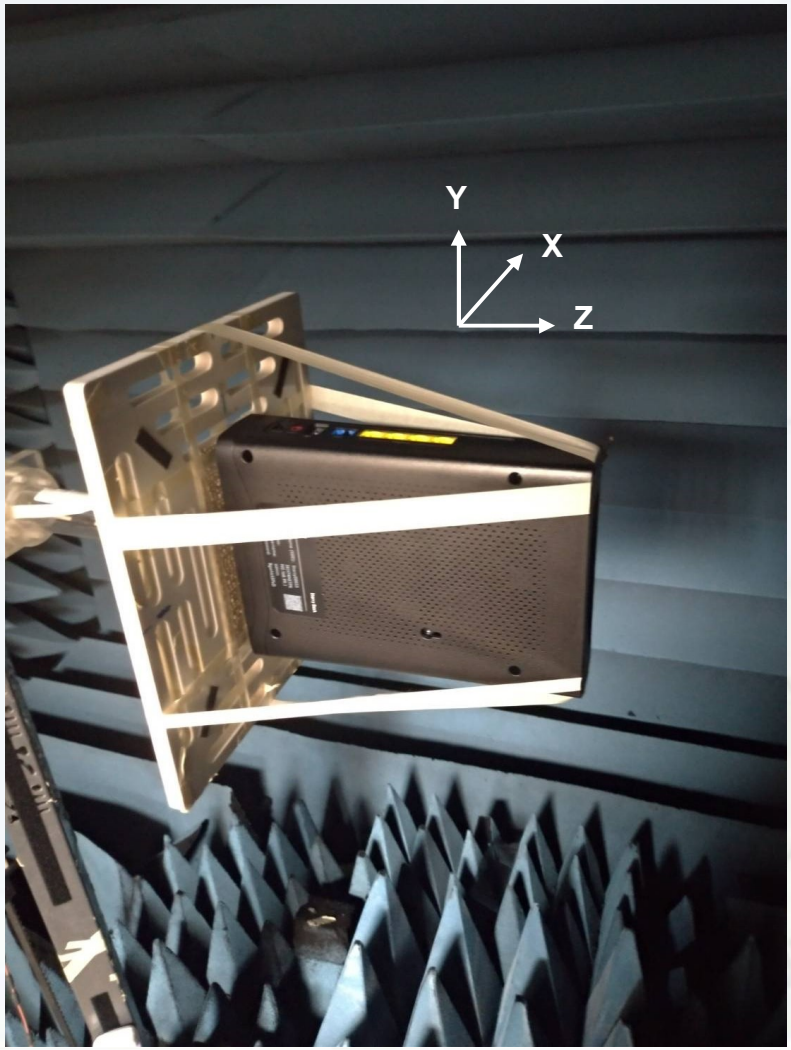




Chamber	Brand	Model	Location
ETS	ETS	AMS-8200	Taiwan HsinChu

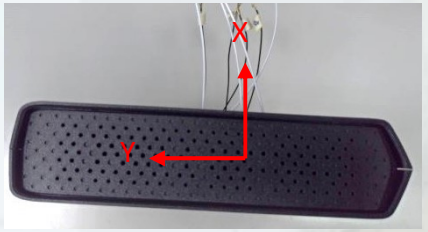
	θ	ϕ
Total angle	180˚	360˚
How many angle scan one point	15˚	15˚
Total scan point	12	24

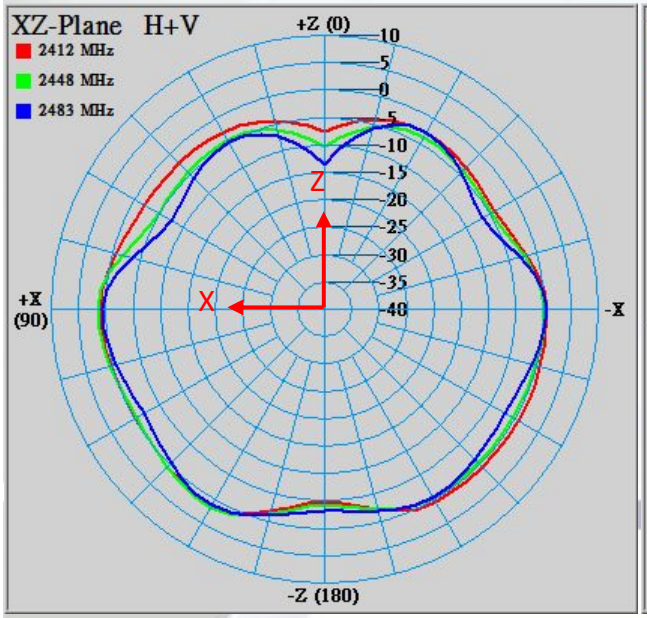
Test Setup for Radiation Pattern Measurement

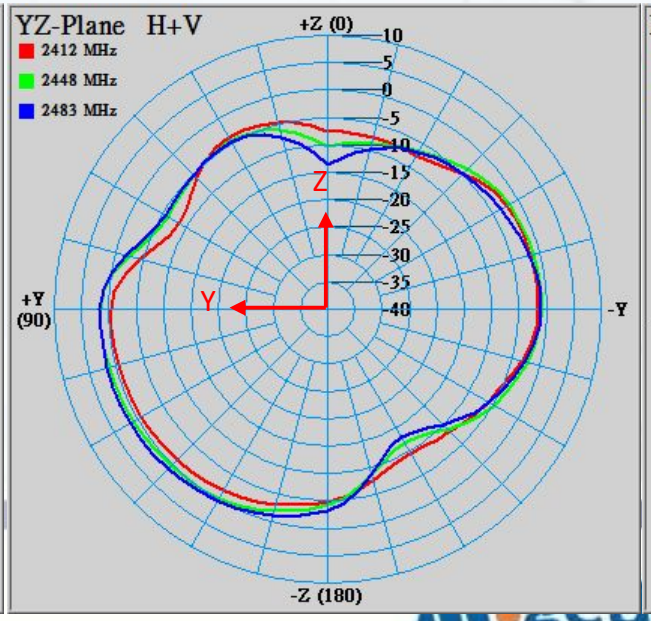


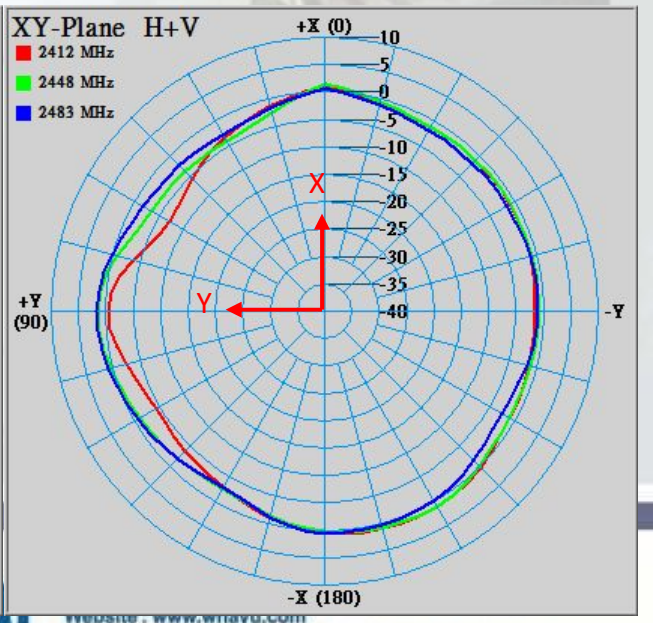
2D Radiation Pattern Results

2G_ANT1









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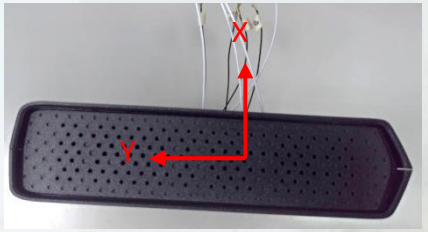
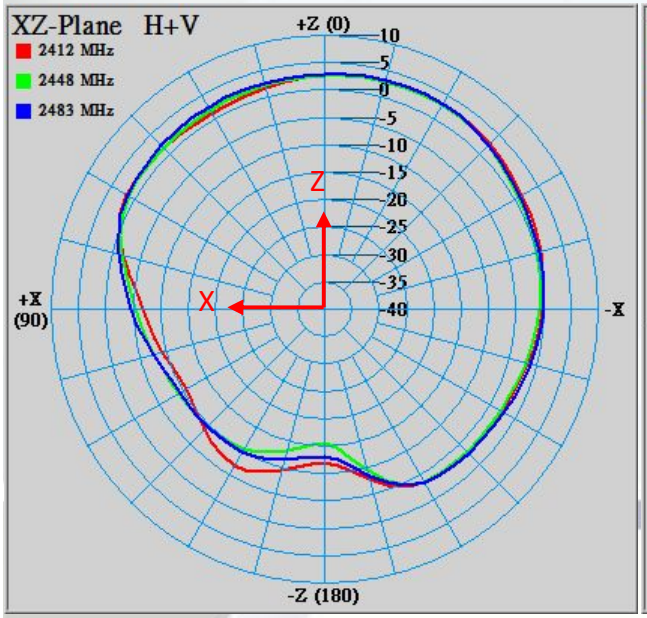
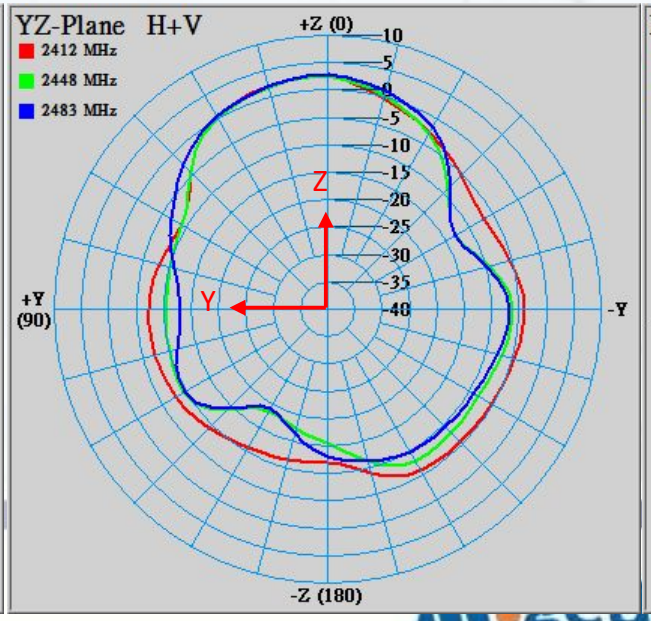
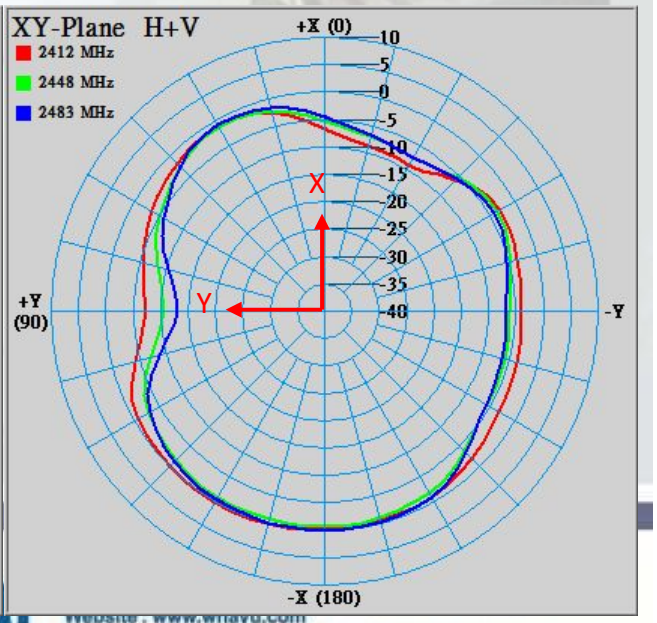
2D Radiation Pattern Results

2G_ANT2



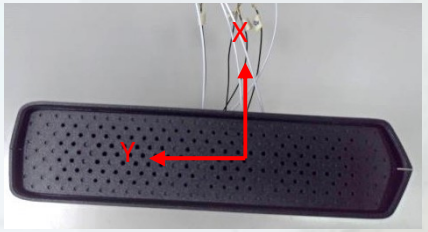


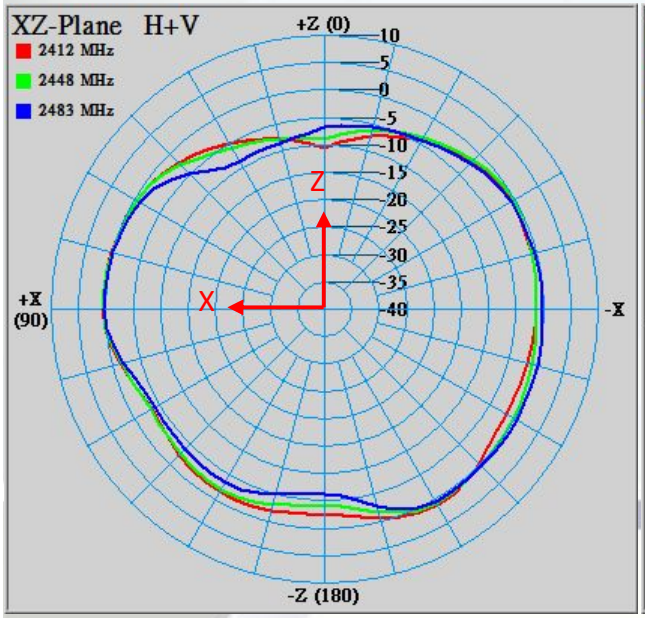


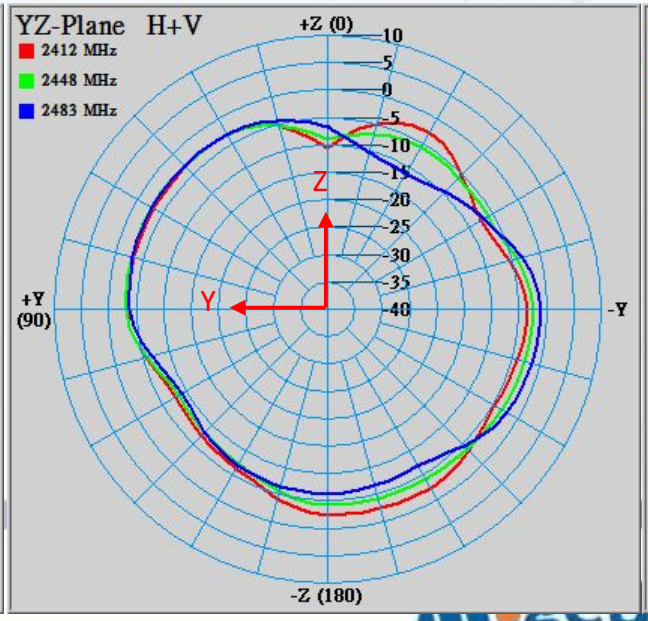


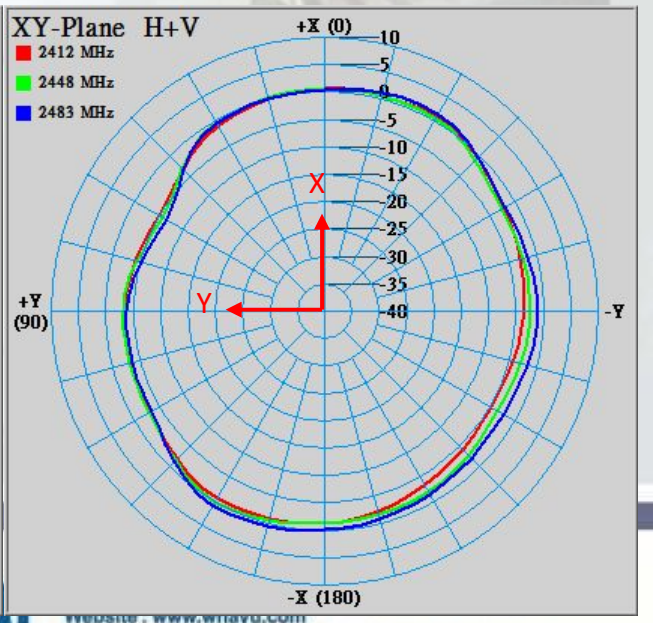
2D Radiation Pattern Results

2G_ANT3









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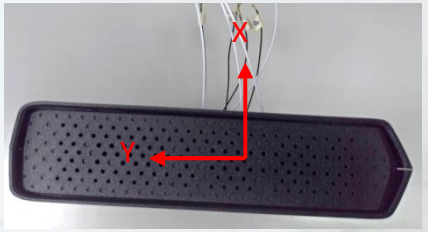
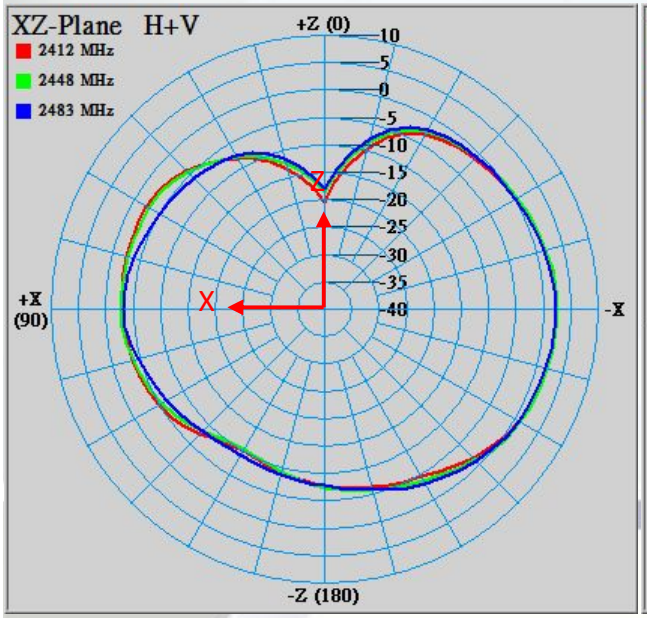
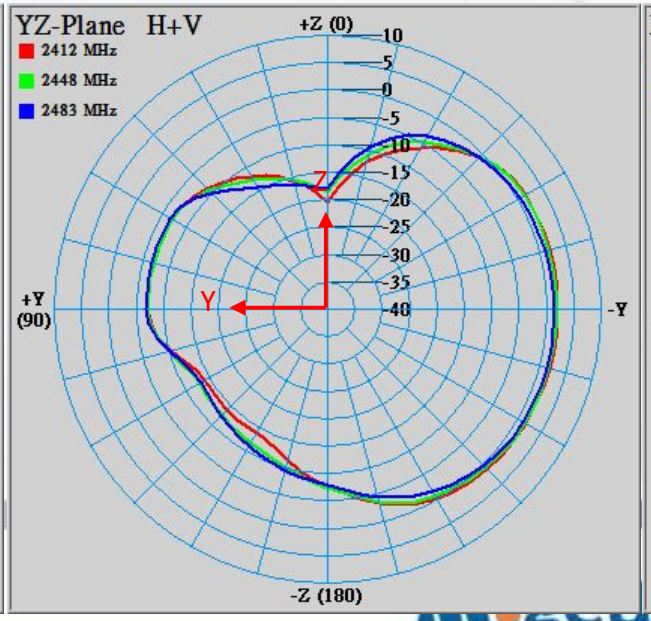
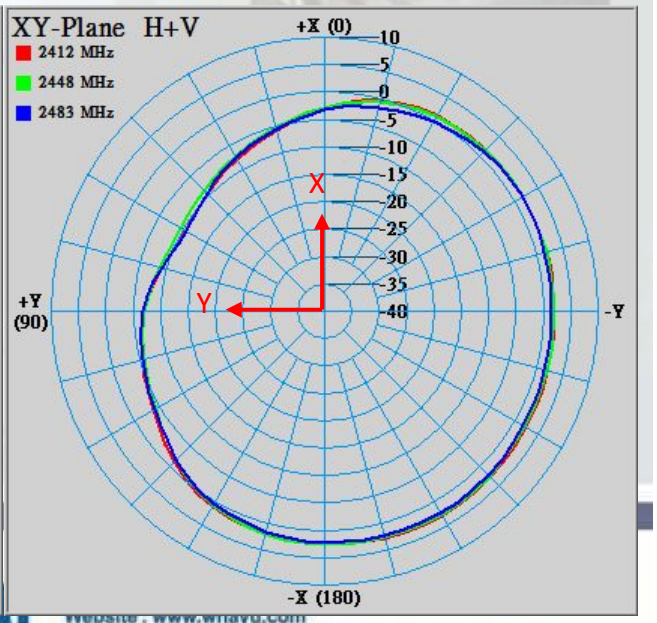
2D Radiation Pattern Results

2G_ANT4









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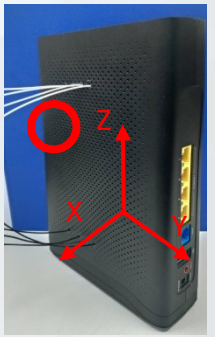
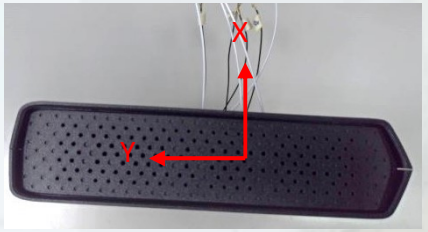
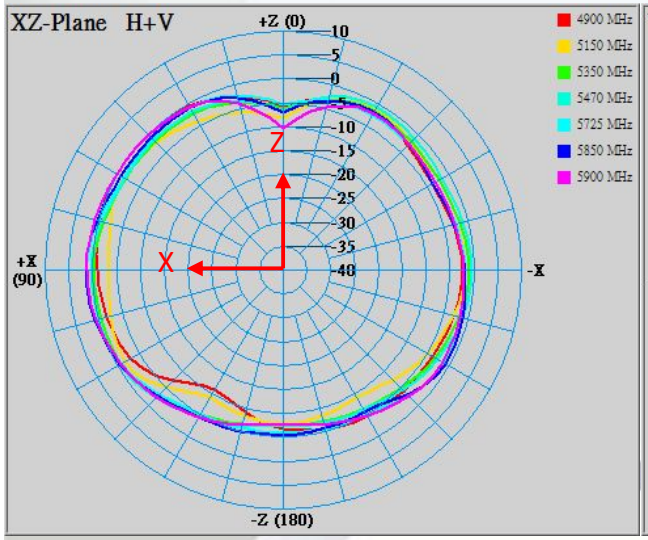
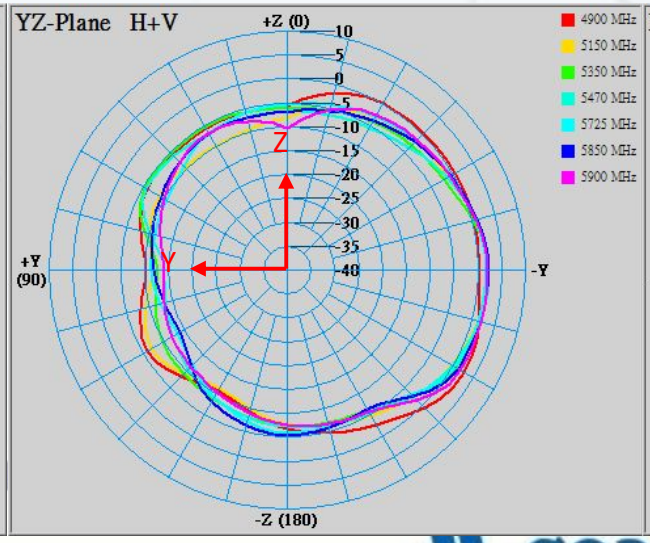
2D Radiation Pattern Results

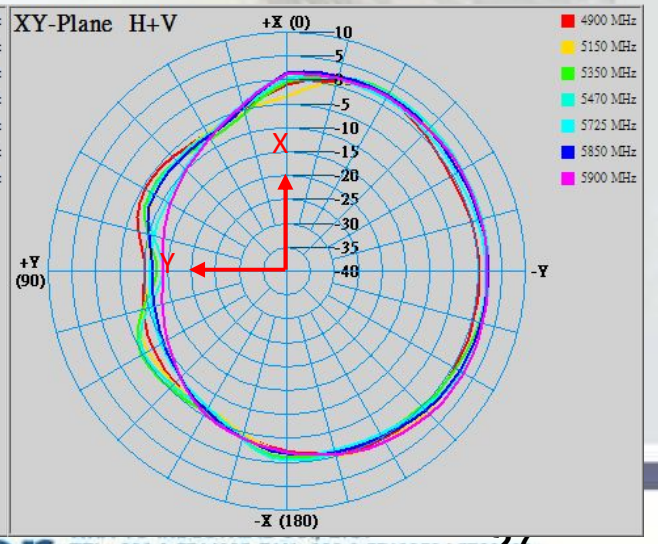
5G_ANT5





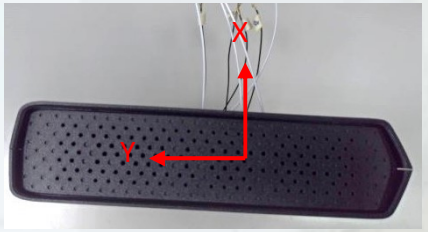


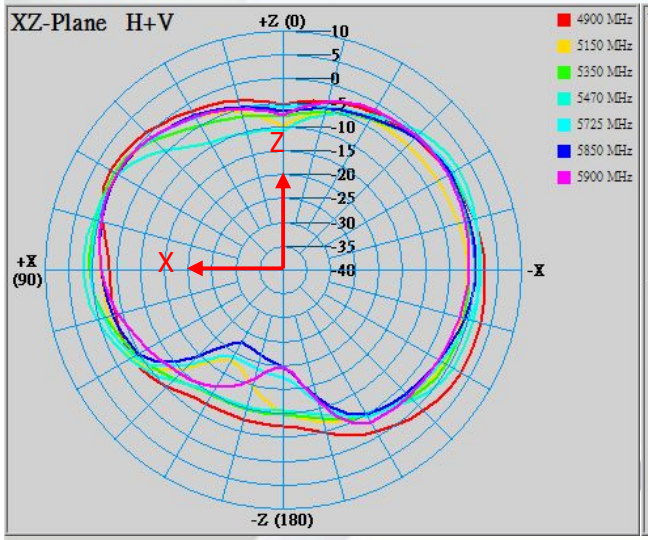


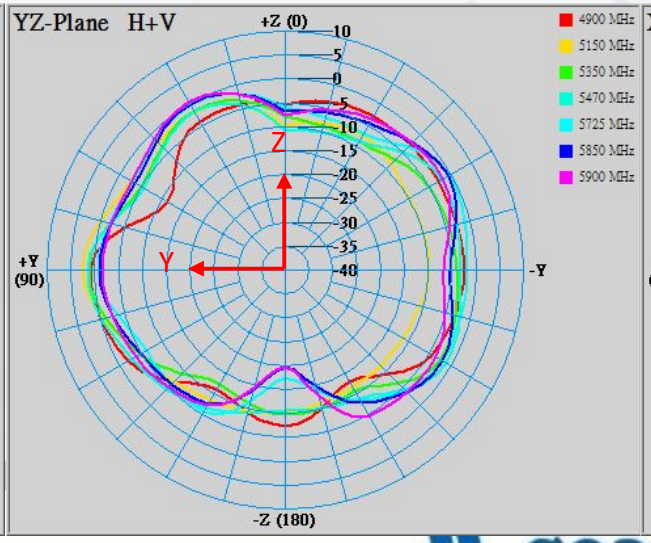


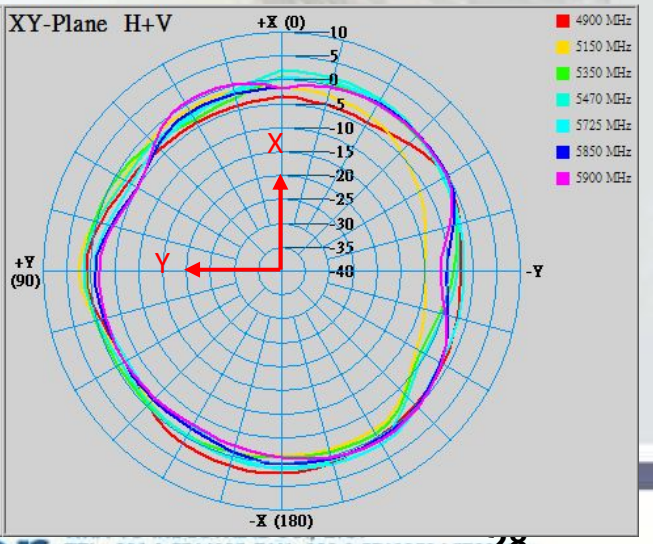
2D Radiation Pattern Results

5G_ANT6









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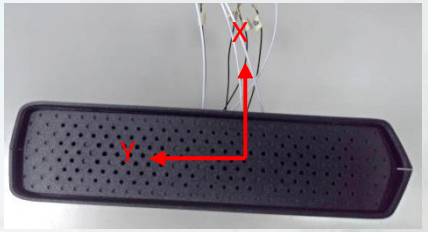
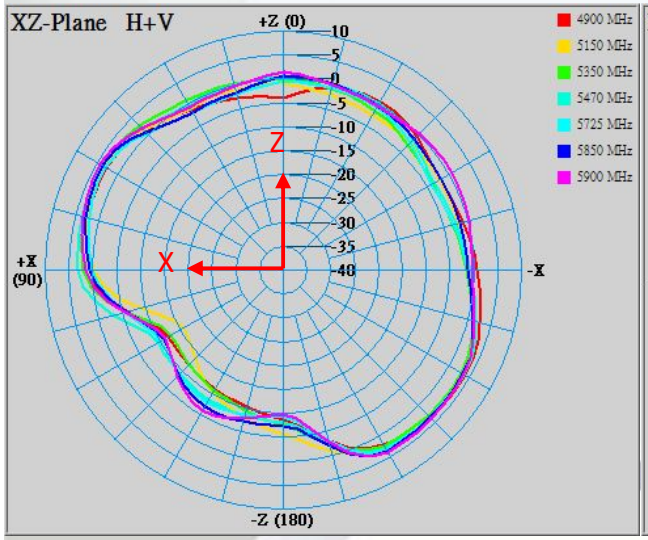
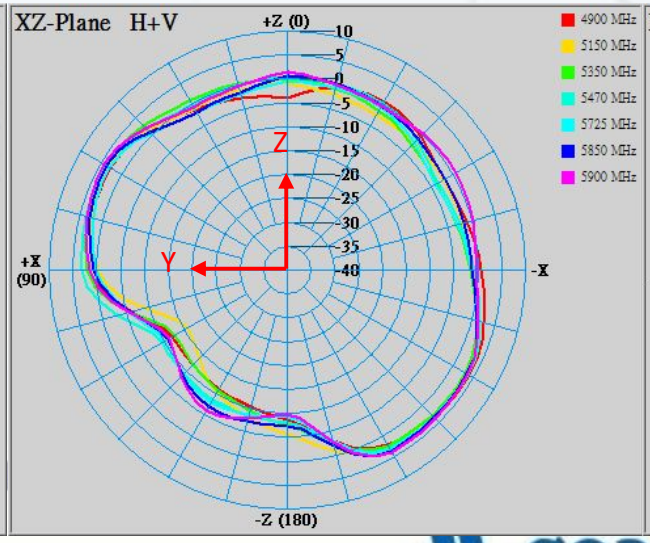
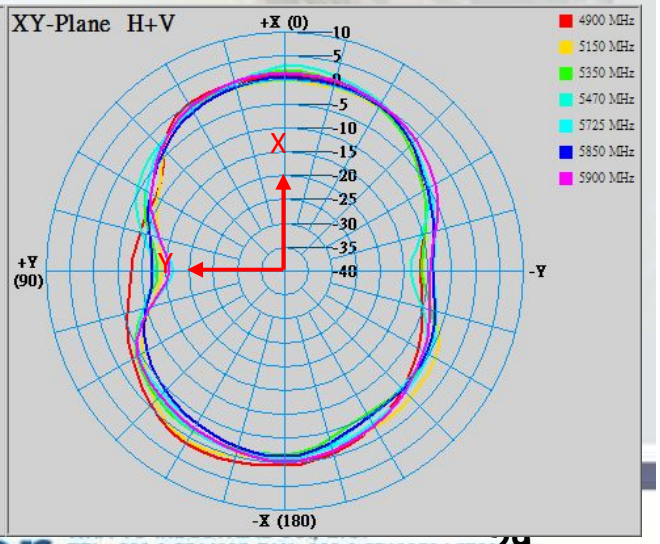
2D Radiation Pattern Results

5G_ANT7









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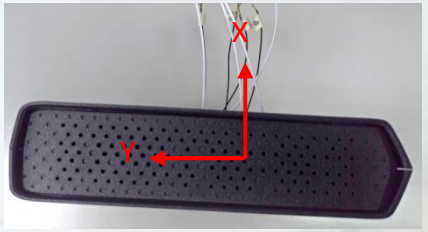
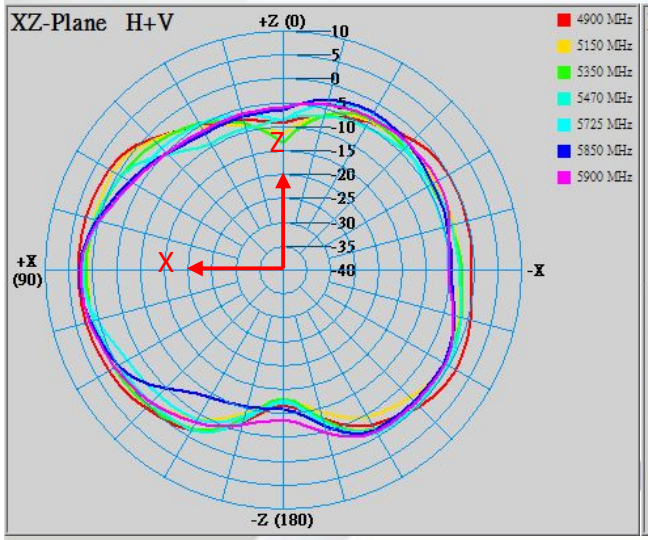
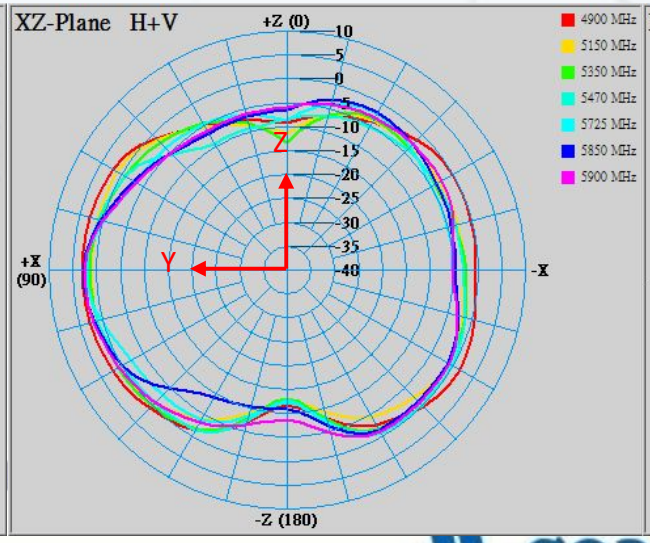
Website : www.whayu.com
E-mail : market@whayu.com

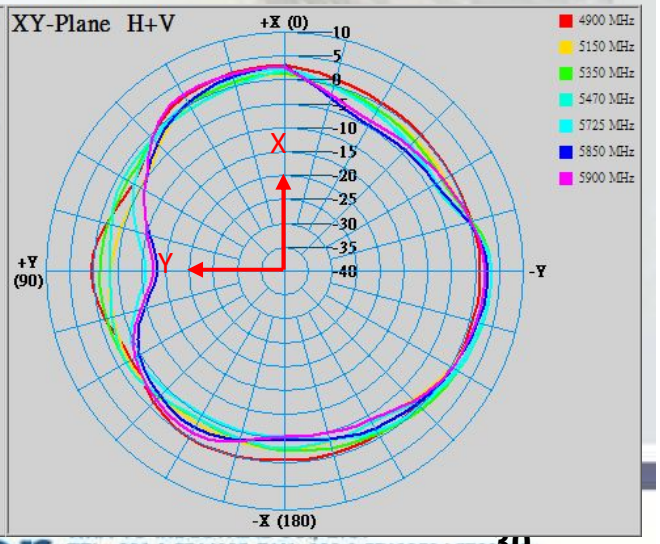
2D Radiation Pattern Results

5G_ANT8









M.gear
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Results Summary

Return Loss (Criterion: >10dB)

Frequency (MHz)	2G_ANT1	2G_ANT2	2G_ANT3	2G_ANT4
2412 MHz	21.0	17.8	18.8	17.0
2448 MHz	21.8	23.7	28.2	15.8
2483 MHz	15.2	19.6	20.9	11.2

Results Summary

Return Loss (Criterion: >10dB)

Frequency (MHz)	5G_ANT5	5G_ANT6	5G_ANT7	5G_ANT8
4900 MHz	11.7	29.2	14.3	15.6
5150 MHz	11.5	18.7	24.0	14.1
5350 MHz	23.4	13.9	14.4	33.8
5470 MHz	25.6	14.7	14.7	28.8
5725 MHz	13.3	18.2	12.1	13.2
5850 MHz	10.9	27.0	13.2	10.8
5900 MHz	10.9	21.2	14.7	11.1

Results Summary

Isolation (Criterion: >20dB)

	2G Ant1 & 2G Ant2	2G Ant1 & 2G Ant3	2G Ant1 & 2G Ant4	2G Ant1 & 5G Ant5	2G Ant1 & 5G Ant6	2G Ant1 & 5G Ant7	2G Ant1 & 5G Ant8
2412 MHz	23	37	32	57	49	40	23
2448 MHz	21	35	34	47	44	39	21
2483 MHz	24	33	41	47	44	39	24
4900 MHz	44	51	59	49	53	52	44
5150 MHz	33	45	62	48	42	46	33
5350 MHz	53	47	58	48	34	42	53
5470 MHz	40	51	48	42	32	44	40
5725 MHz	35	38	57	56	39	46	35
5850 MHz	40	41	44	47	42	43	40
5900 MHz	44	41	43	49	42	42	44

Results Summary

Isolation (Criterion: >20dB)

	2G Ant2 & 2G Ant3	2G Ant2 & 2G Ant4	2G Ant2 & 5G Ant5	2G Ant2 & 5G Ant6	2G Ant2 & 5G Ant7	2G Ant2 & 5G Ant8
2412 MHz	25	34	42	44	29	28
2448 MHz	27	36	43	43	28	30
2483 MHz	32	37	43	45	29	31
4900 MHz	31	37	45	35	31	35
5150 MHz	35	35	36	32	42	26
5350 MHz	35	34	37	35	33	30
5470 MHz	39	35	38	46	33	31
5725 MHz	31	33	40	42	46	25
5850 MHz	34	35	43	41	37	25
5900 MHz	39	37	44	41	35	27

Results Summary

Isolation (Criterion: >20dB)

	2G Ant3 & 2G Ant4	2G Ant3 & 5G Ant5	2G Ant3 & 5G Ant6	2G Ant3 & 5G Ant7	2G Ant3 & 5G Ant8
2412 MHz	39	26	35	28	31
2448 MHz	31	24	34	29	30
2483 MHz	27	24	35	28	29
4900 MHz	42	42	28	35	38
5150 MHz	42	36	33	38	34
5350 MHz	30	37	25	36	35
5470 MHz	27	37	24	36	37
5725 MHz	32	32	27	36	33
5850 MHz	31	30	27	37	33
5900 MHz	30	31	28	39	34

Results Summary

Isolation (Criterion: >20dB)

	2G Ant4 & 5G Ant5	2G Ant4 & 5G Ant6	2G Ant4 & 5G Ant7	2G Ant4 & 5G Ant8
2412 MHz	29	50	46	46
2448 MHz	27	46	48	49
2483 MHz	28	43	43	53
4900 MHz	46	57	46	44
5150 MHz	49	55	48	42
5350 MHz	38	38	46	40
5470 MHz	36	35	48	42
5725 MHz	37	42	49	46
5850 MHz	38	47	49	43
5900 MHz	37	47	47	41

Results Summary

Isolation (Criterion: >20dB)

	5G Ant5 & 5G Ant6	5G Ant5 & 5G Ant7	5G Ant5 & 5G Ant8
2412 MHz	48	47	47
2448 MHz	50	53	45
2483 MHz	42	47	44
4900 MHz	26	41	33
5150 MHz	35	43	35
5350 MHz	31	38	34
5470 MHz	31	38	34
5725 MHz	33	41	40
5850 MHz	33	44	44
5900 MHz	34	43	51

Results Summary

Isolation (Criterion: >20dB)

	5G Ant6 & 5G Ant7	5G Ant6 & 5G Ant8	5G Ant7 & 5G Ant8
2412 MHz	38	41	33
2448 MHz	37	41	33
2483 MHz	37	41	32
4900 MHz	21	25	29
5150 MHz	22	25	43
5350 MHz	24	26	34
5470 MHz	25	27	35
5725 MHz	26	29	35
5850 MHz	27	31	35
5900 MHz	28	32	35

Results Summary

Peak gain & Efficiency – 2G_ANT1

Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
2412MHz	2.2	63.5
2448MHz	2.3	65.7
2483MHz	2.6	67.6

Results Summary

Peak gain & Efficiency – 2G_ANT2

Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
2412MHz	3.2	61.5
2448MHz	3.1	63.2
2483MHz	3.3	65.4

Results Summary

Peak gain & Efficiency – 2G_ANT3

Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
2412MHz	2.8	62.6
2448MHz	3.1	63.4
2483MHz	2.8	61.8

Results Summary

Peak gain & Efficiency – 2G_ANT4

Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
2412MHz	3.2	73.3
2448MHz	2.9	74.2
2483MHz	2.7	68.3

Results Summary

Peak gain & Efficiency – 5G_ANT5

Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
4900MHz	3.1	67.7
5150MHz	3.2	63.3
5350MHz	3.4	63.6
5470MHz	4.0	66.8
5725MHz	2.9	64.0
5850MHz	3.3	69.2
5900MHz	3.6	71.1

Results Summary

Peak gain & Efficiency – 5G_ANT6

Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
4900MHz	3.6	69.3
5150MHz	2.5	62.1
5350MHz	2.2	62.6
5470MHz	3.2	66.7
5725MHz	2.4	64.8
5850MHz	2.0	65.1
5900MHz	2.7	67.4

Results Summary

Peak gain & Efficiency – 5G_ANT7

Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
4900MHz	4.0	70.4
5150MHz	3.6	67.4
5350MHz	3.8	63.3
5470MHz	3.9	70.0
5725MHz	3.4	63.6
5850MHz	3.8	67.0
5900MHz	4.2	74.8

Results Summary

Peak gain & Efficiency – 5G_ANT8

Frequency (MHz)	Peak Gain (dBi)	Efficiency (%)
4900MHz	3.0	75.8
5150MHz	2.4	68.0
5350MHz	3.4	65.9
5470MHz	3.4	64.6
5725MHz	3.2	63.1
5850MHz	3.2	65.6
5900MHz	2.6	65.9