



Well Green Technology Co., Ltd

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TWINHEAD T8N

Antenna Test Report

Data 07/12/06

RD Manager	Supervisor	RD engineer	Sales engineer
David	Johnson	Tim	Jerry

1 Information Overview

1.1 Platform Information

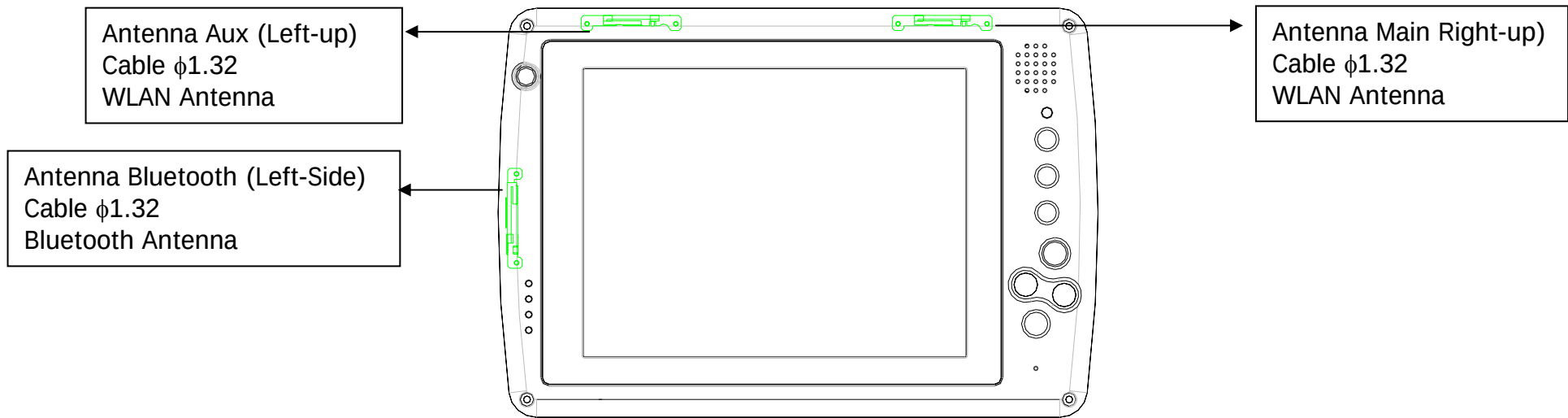
	Description	Comments
Project Code of System		
Project Stage	☐ Prototype ☒ EPR ☐ PPR ☐ MP	
Platform Type	☐ Notebook PC ☒ Tablet PC	

1.2 Antenna Information

Manufacturer	Well Green Technology Co., Ltd.	
Design Stage	☐ Handmade ☐ Machine ☒ Tooling	
Antenna Aux		
Type	PIFA	
Model Name	T8N-L	
Part Number	TWT8NWIP101B	
Antenna Location	Left-up of the panel	
Antenna Purpose	Wireless LAN 802.11abg Aux Antenna	
Connector Manufacturer	IPEX	
Connector Part No.	20278-101R-32 20278-111R-32	
Frequency GHz	2.4 – 2.5, 5.15 – 5.85	
Impedance	50Ω	
Cable Manufacturer & PN	Wonderful Double	
Cable Diameter ψmm	1.32	
Cable Length		
Antenna Main		
Type	PIFA	
Model Name	T8N-R	
Part Number	TWT8NWIP102B	
Antenna Location	Right-up of the panel	
Antenna Purpose	Wireless LAN 802.11abg Main Antenna	
Connector Manufacturer	IPEX	
Connector Part No.	20278-101R-32 20278-111R-32	
Frequency GHz	2.4 – 2.5, 5.15 – 5.85	
Impedance	50Ω	
Cable Manufacturer & PN	Wonderful Double	
Cable Diameter ψmm	1.32	
Cable Length		
Antenna Bluetooth		
Type	PIFA	
Model Name	T8N- Left side	
Part Number	TWT8NBLPI01B	
Antenna Location	Left side	
Antenna Purpose	Bluetooth Antenna	
Connector Manufacturer	IPEX	
Connector Part No.	20278-101R-32 20278-111R-32	
Frequency GHz	2.4 – 2.5	
Impedance	50Ω	
Cable Manufacturer & PN	Wonderful Double	
Cable Diameter ψmm	1.32	
Cable Length		

1. Antenna placement and Photo

1.1 Antennas placement

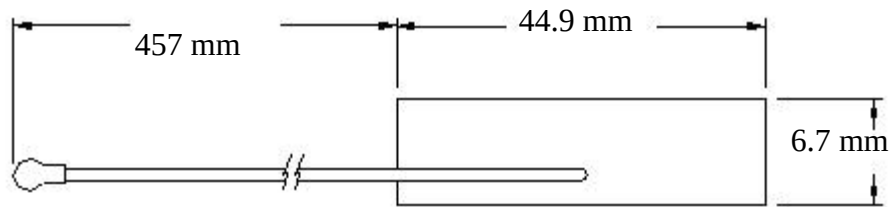


1.2 Antenna Assembly Photo

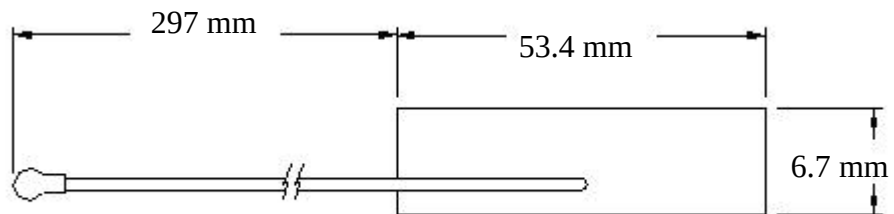


3. Antenna Dimension

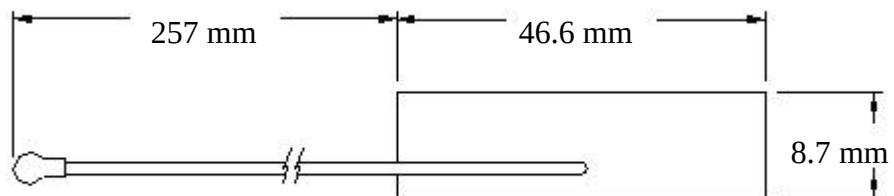
3.1 Antenna Aux



3.2 Antenna Main

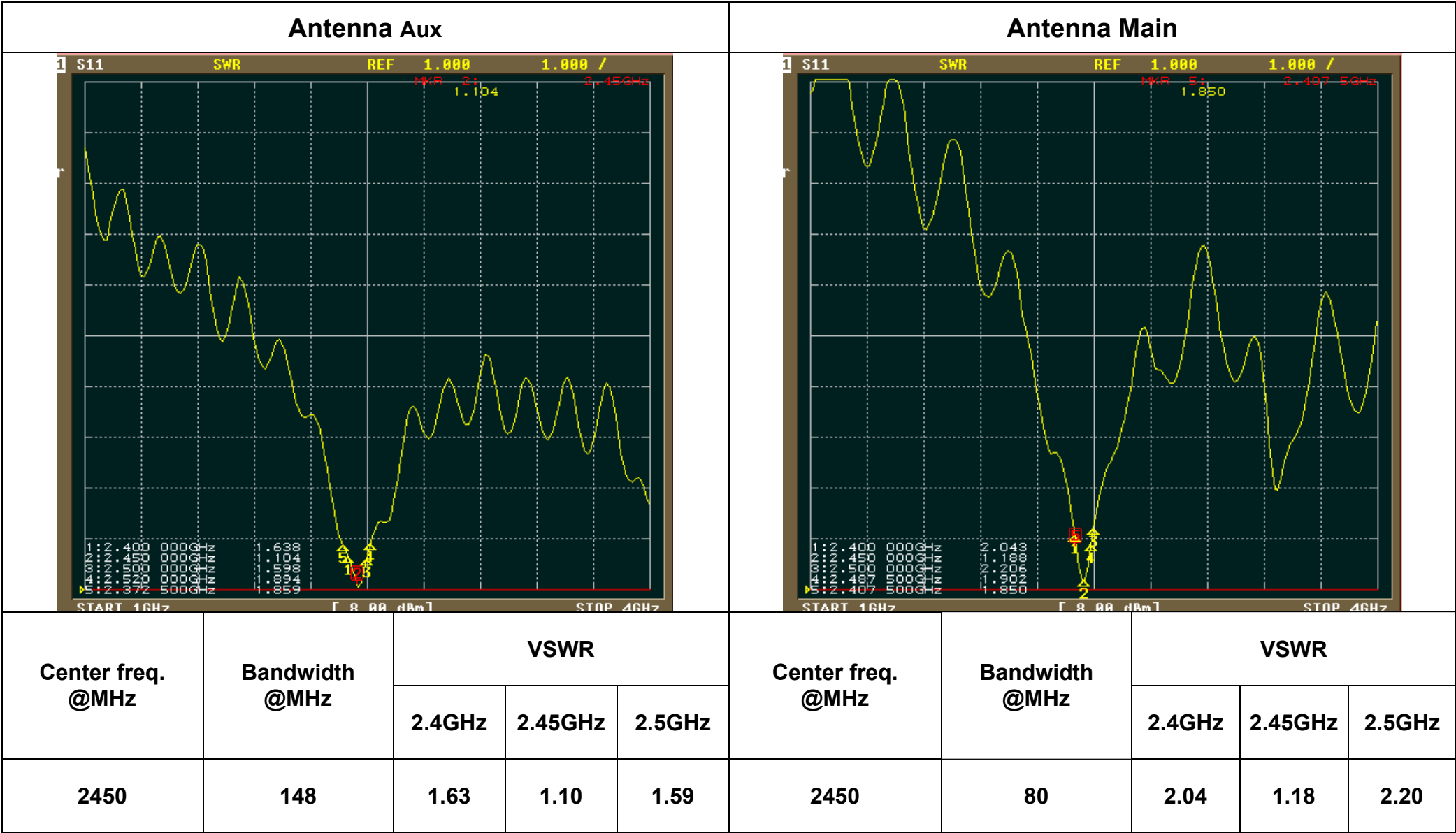


3.3 Antenna Bluetooth

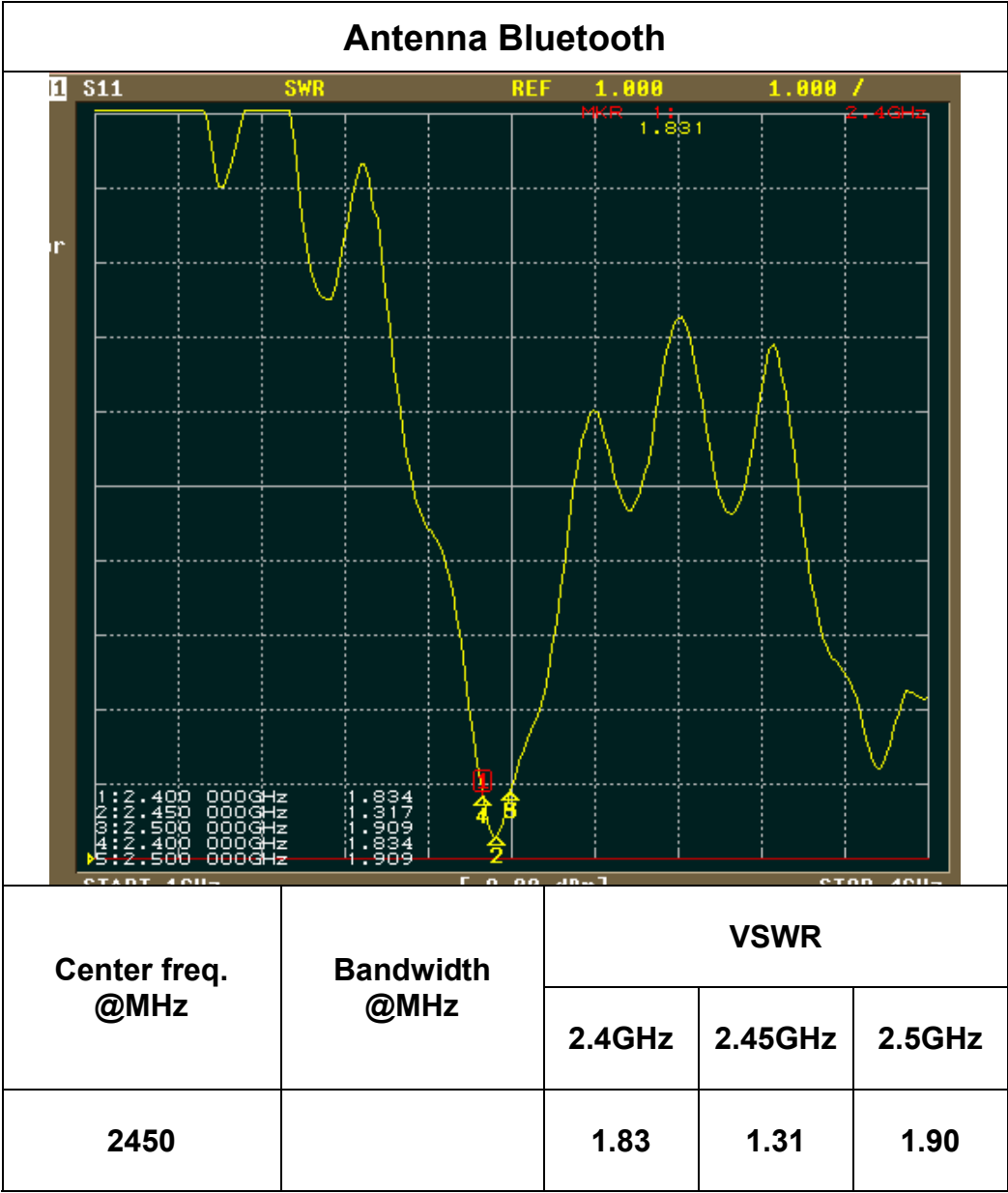


4. Voltage Standing Wave Ratio (VSWR)

4.1 VSWR 2.4 GHz ~ 2.5 GHz



VSWR 2.4 GHz ~ 2.5 GHz



Center freq.
@MHz

Bandwidth
@MHz

VSWR

2.4GHz

2.45GHz

2.5GHz

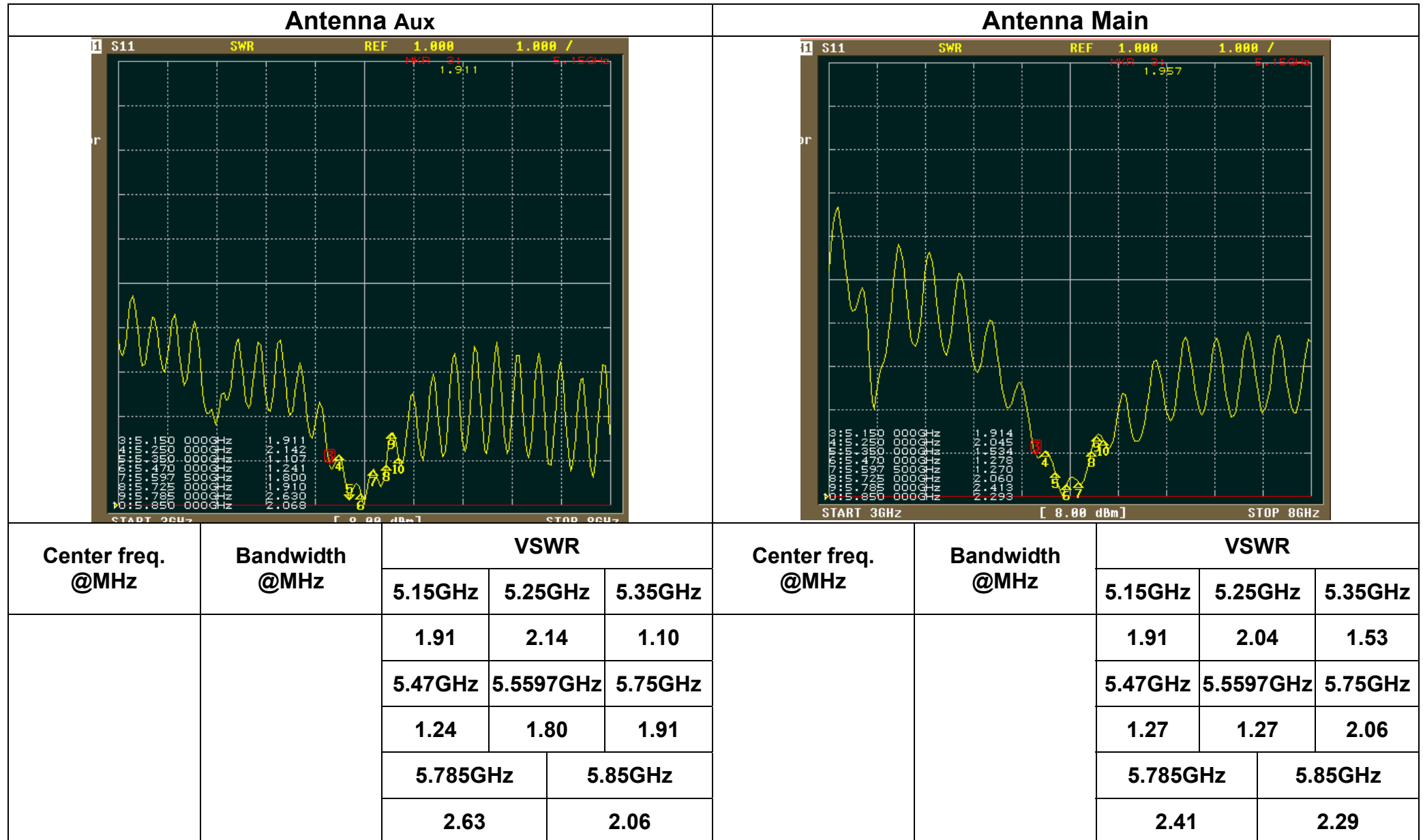
2450

1.83

1.31

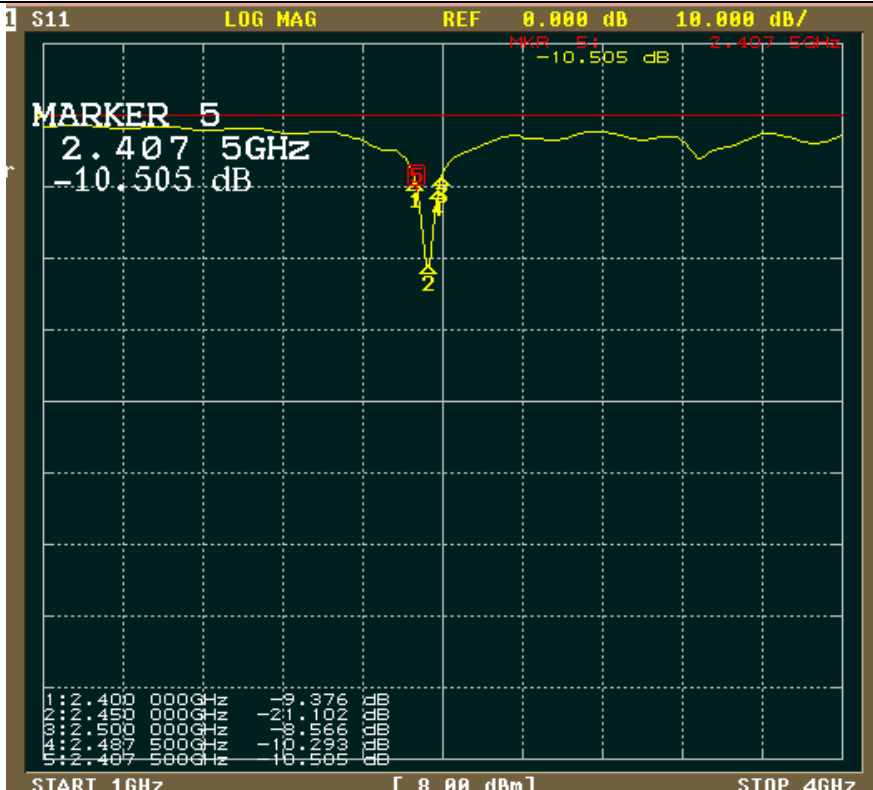
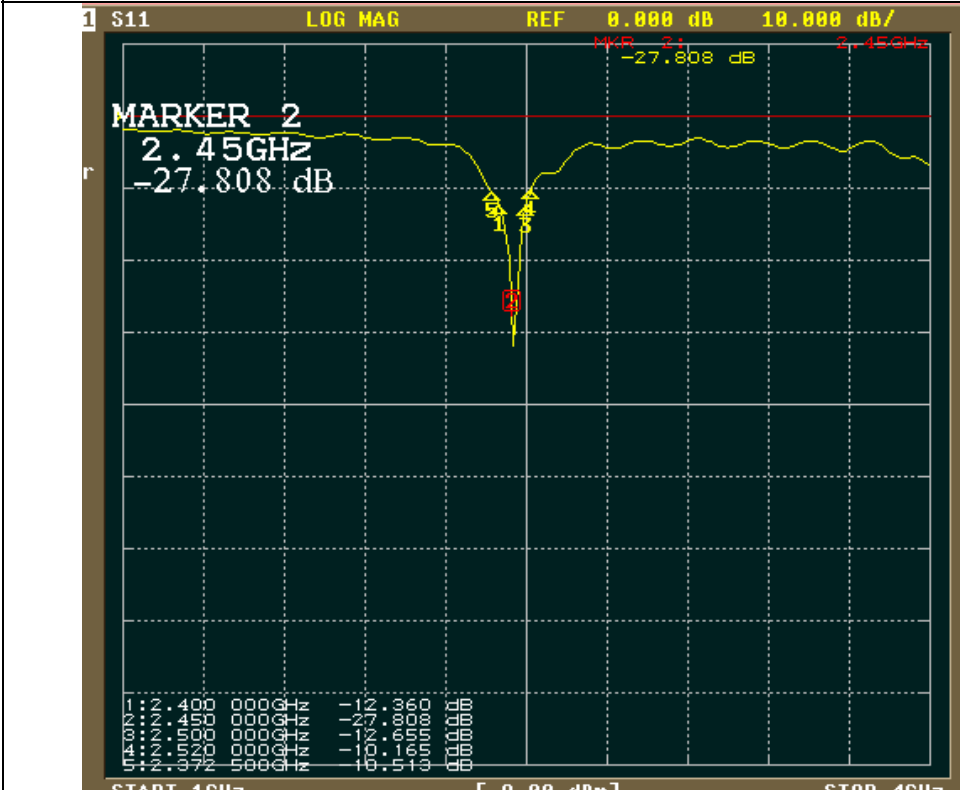
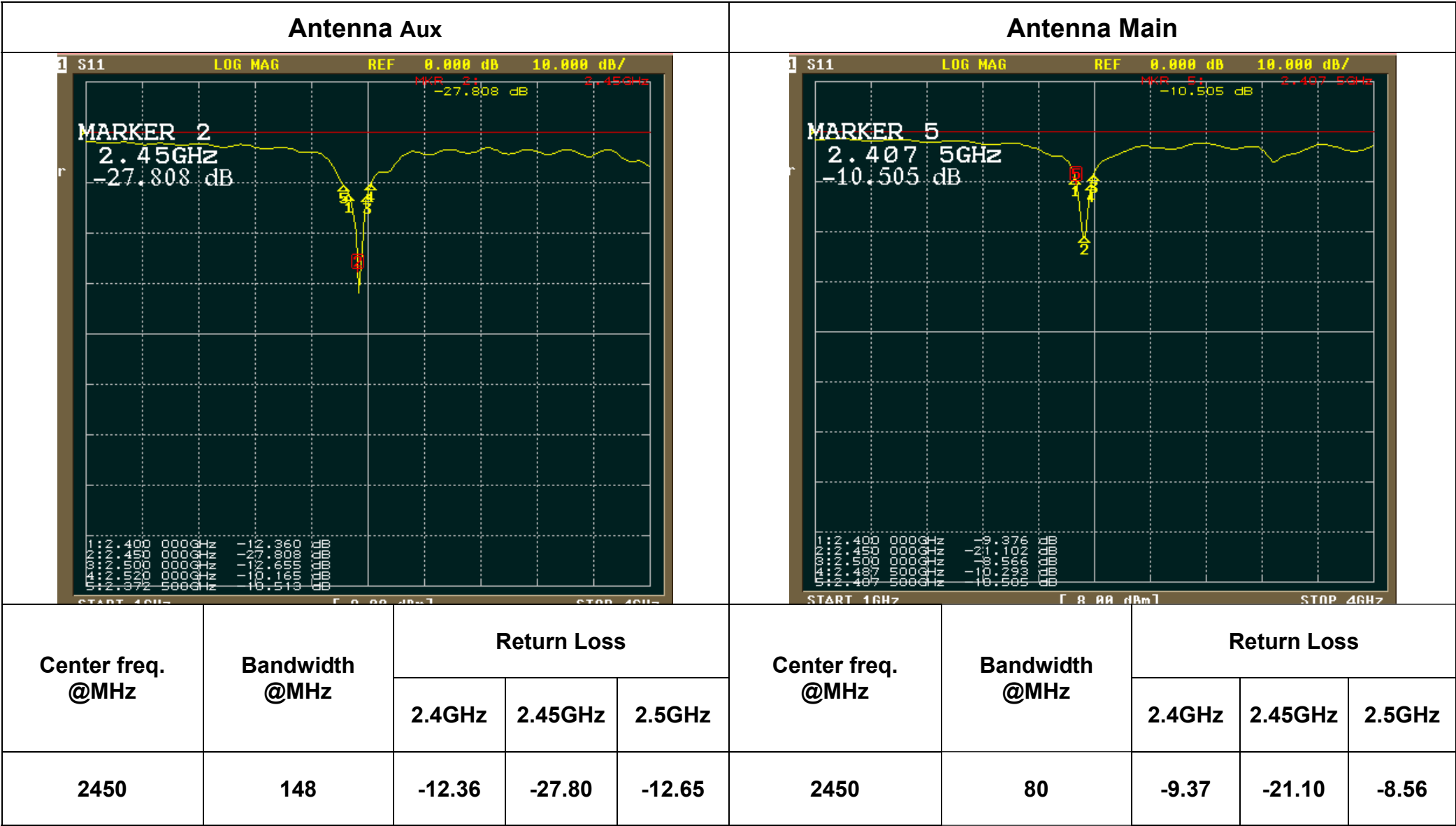
1.90

4.2 VSWR 5.15 GHz ~ 5.85 GHz

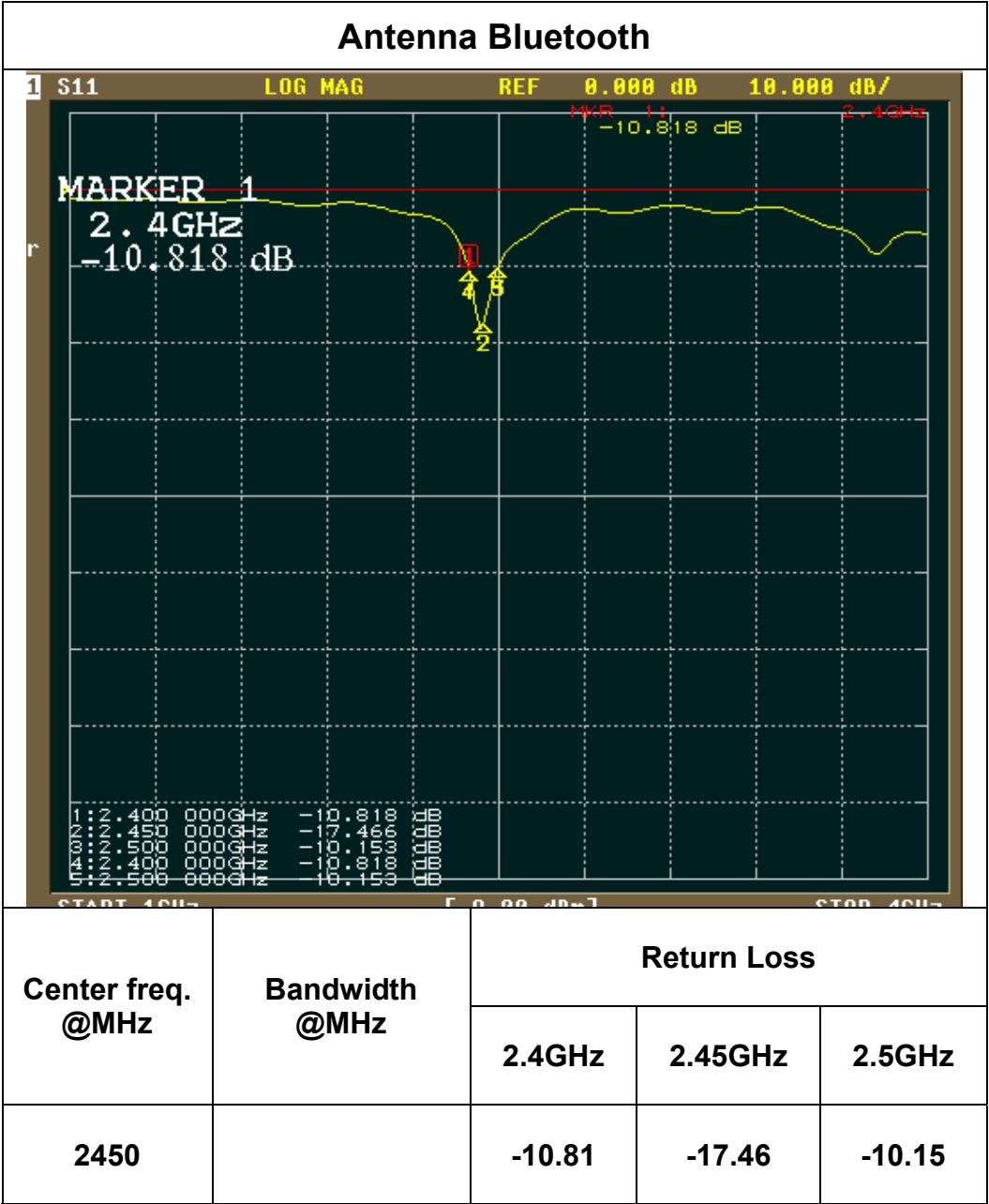


5. Return Loss

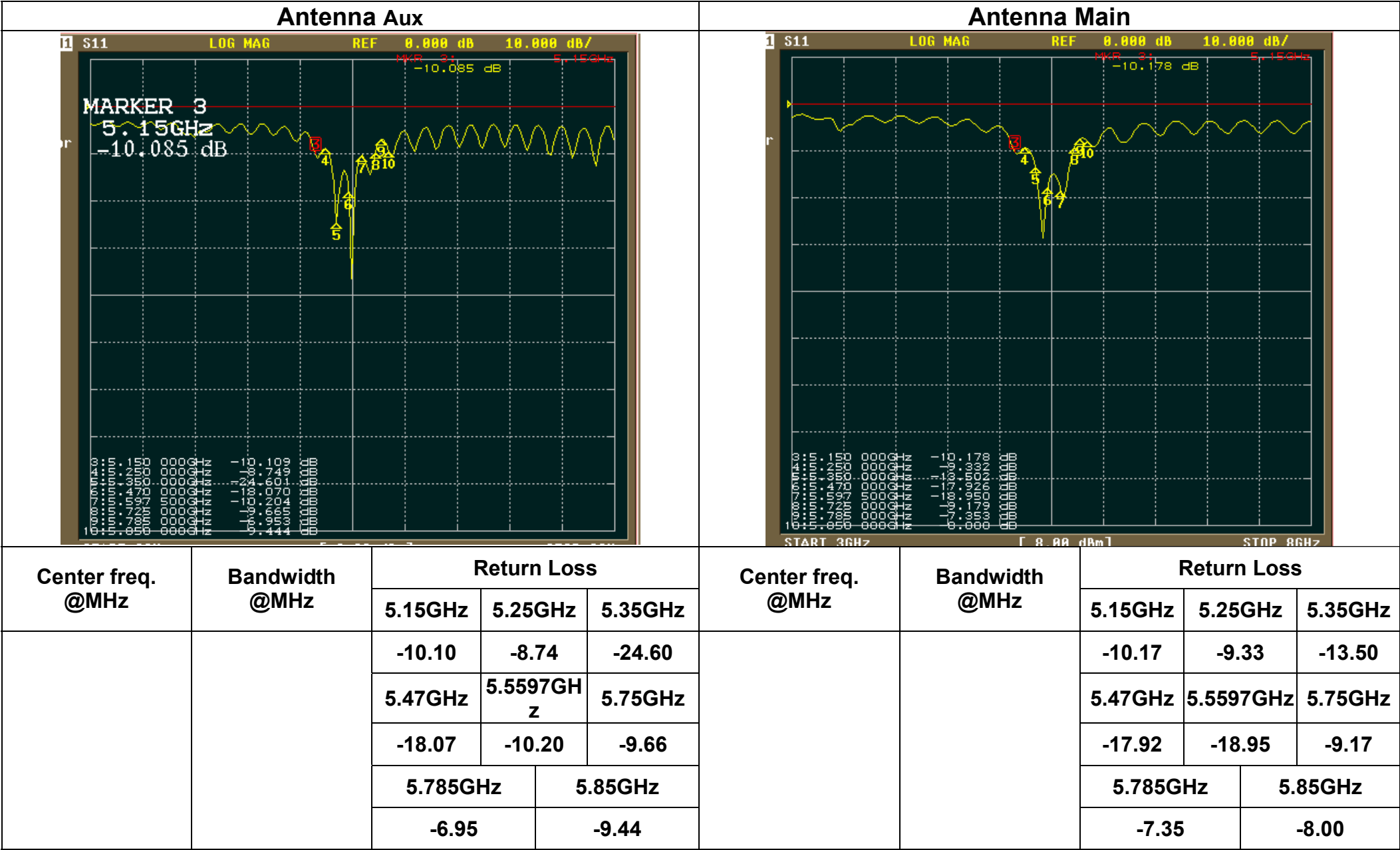
5.1 Return Loss 2.4GHz ~ 2.5GHz



Return Loss 2.4GHz ~ 2.5GHz



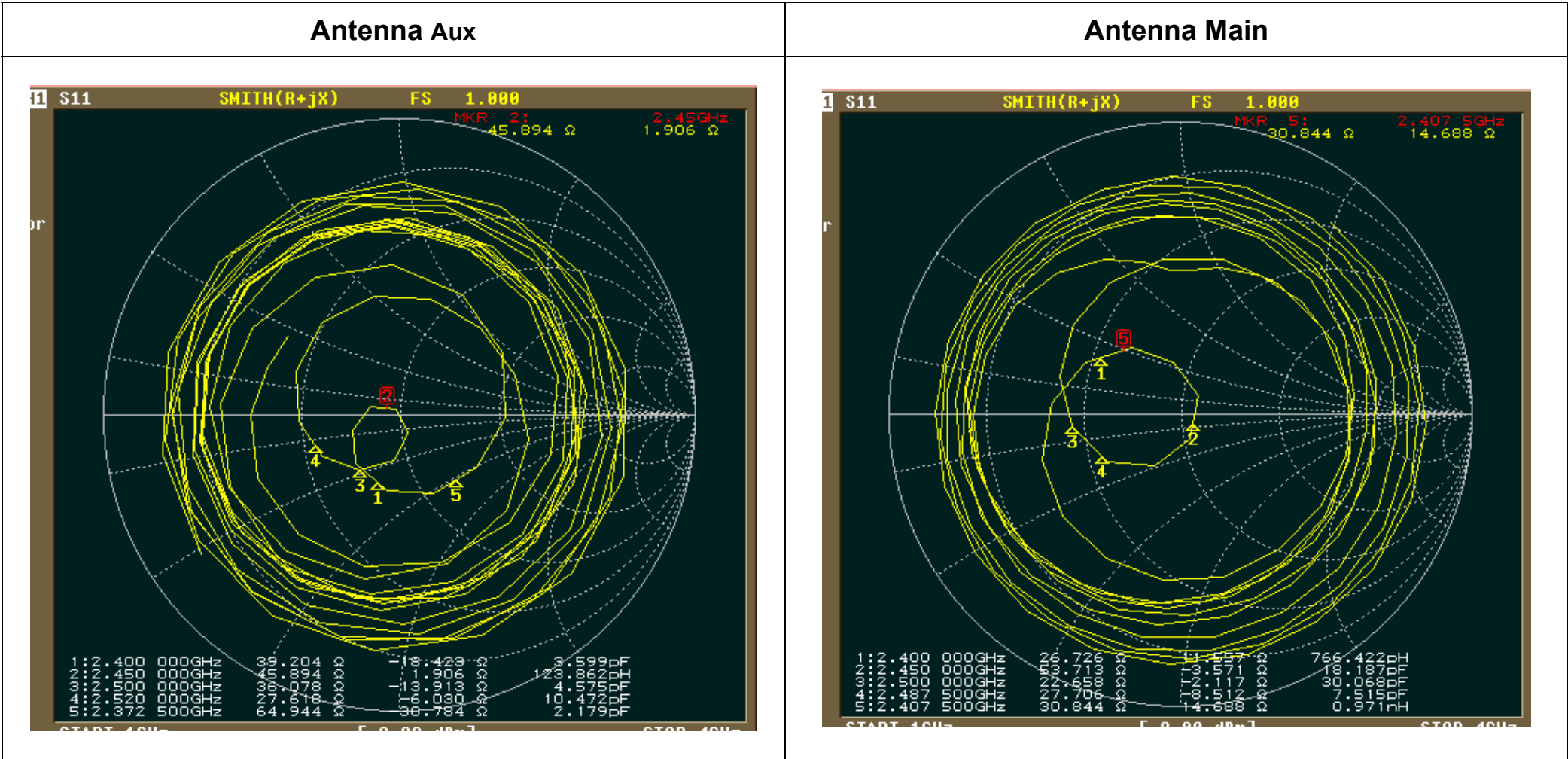
5.2 Return Loss 5.15GHz ~ 5.85GHz



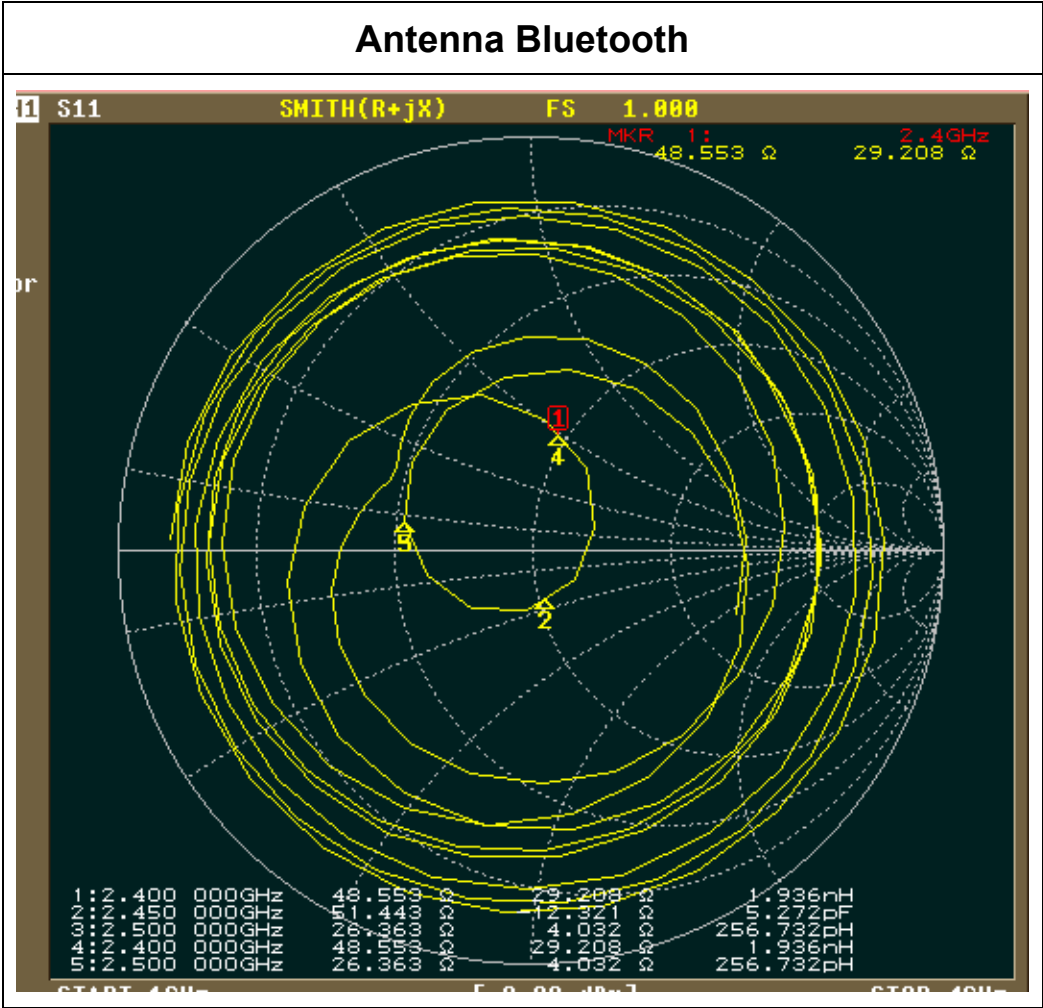
Center freq. @MHz	Bandwidth @MHz	Return Loss		
		5.15GHz	5.25GHz	5.35GHz
		-10.10	-8.74	-24.60
		5.47GHz	5.5597GHz	5.75GHz
		-18.07	-10.20	-9.66
		5.785GHz	5.85GHz	
		-6.95	-9.44	

Center freq. @MHz	Bandwidth @MHz	Return Loss		
		5.15GHz	5.25GHz	5.35GHz
		-10.17	-9.33	-13.50
		5.47GHz	5.5597GHz	5.75GHz
		-17.92	-18.95	-9.17
		5.785GHz	5.85GHz	
		-7.35	-8.00	

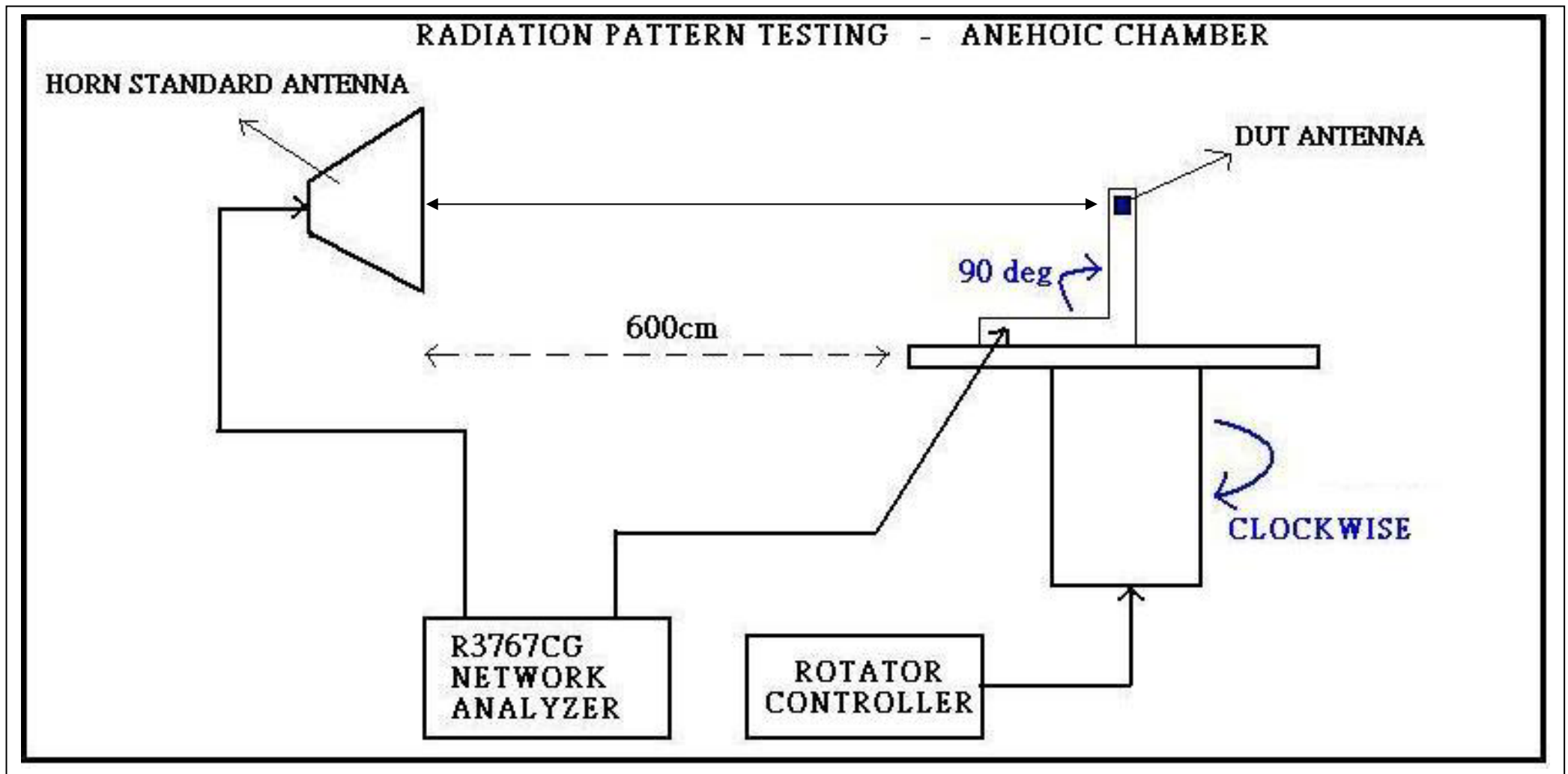
6. Smith Chart



Smith Chart



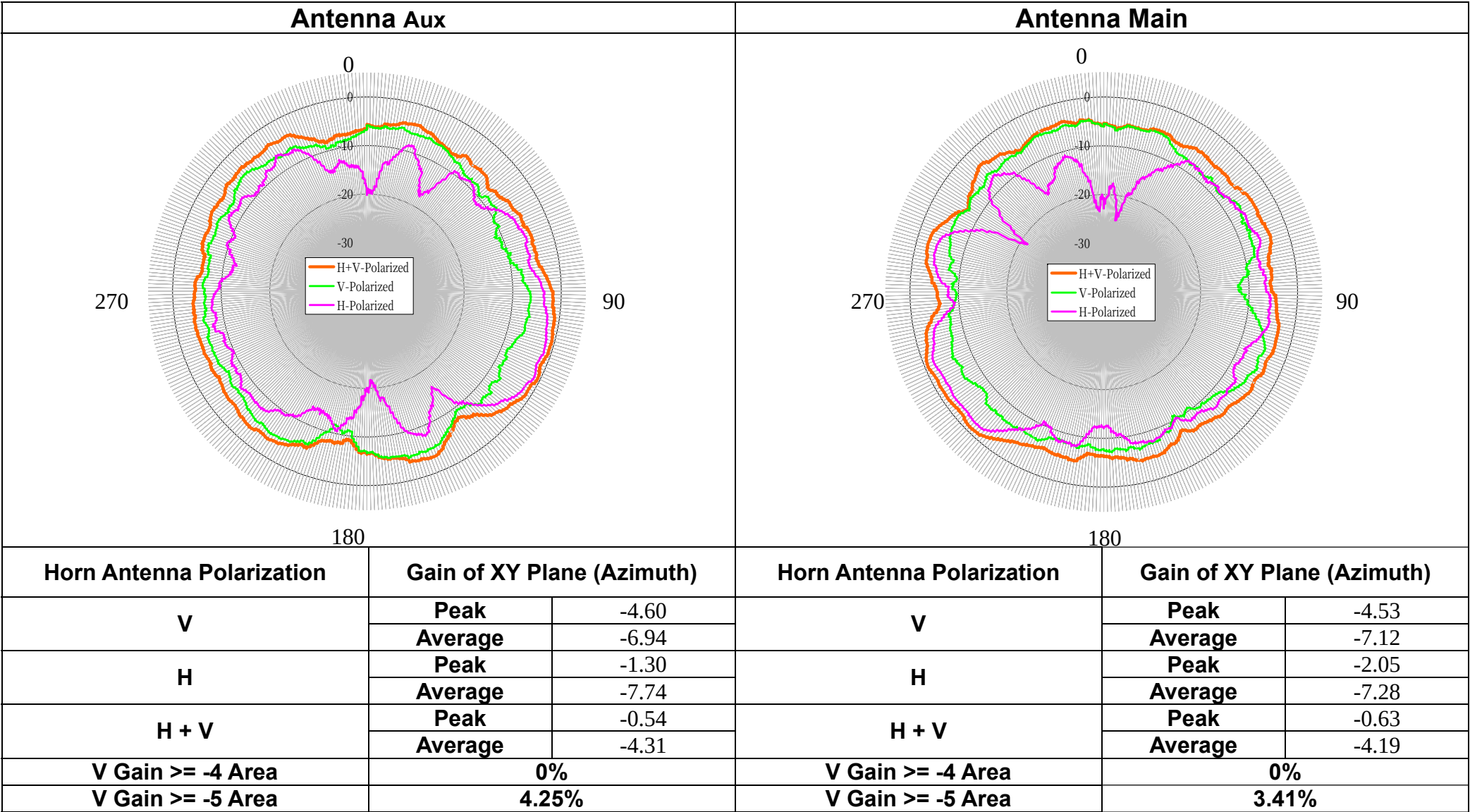
7. Antenna Radiation Pattern Testing Set Up



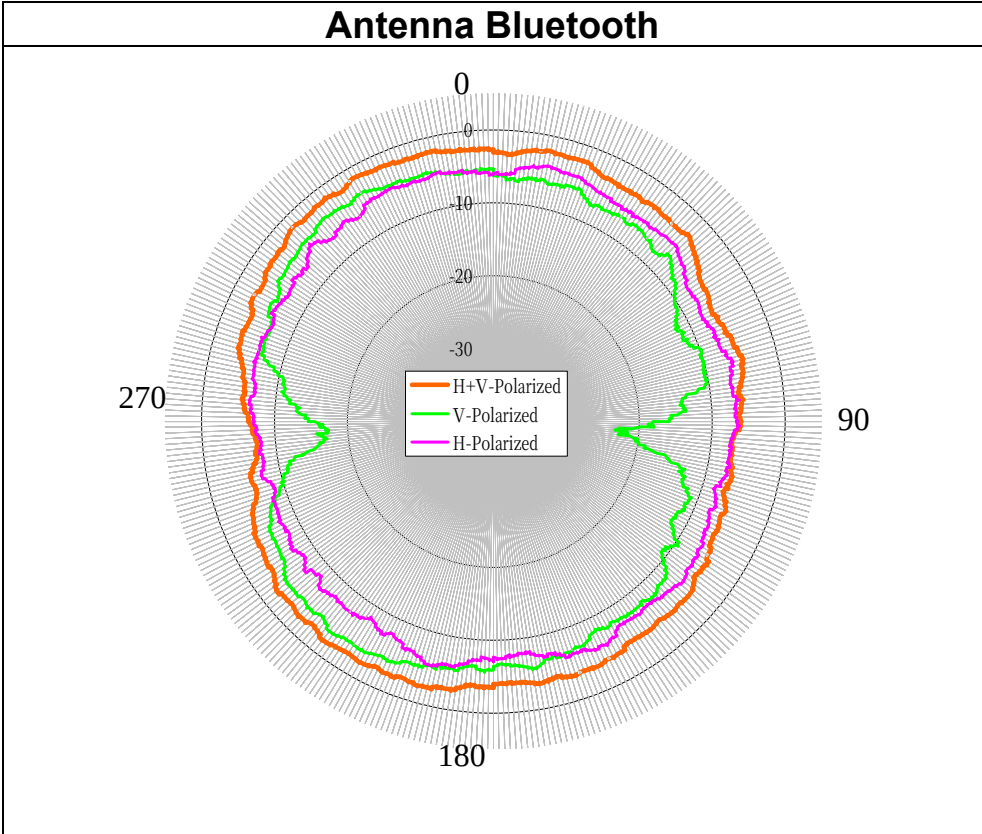
include a complete display and display plastics.

8. Radiation Pattern of XY Plane Testing Result

8.1 2.4 GHz

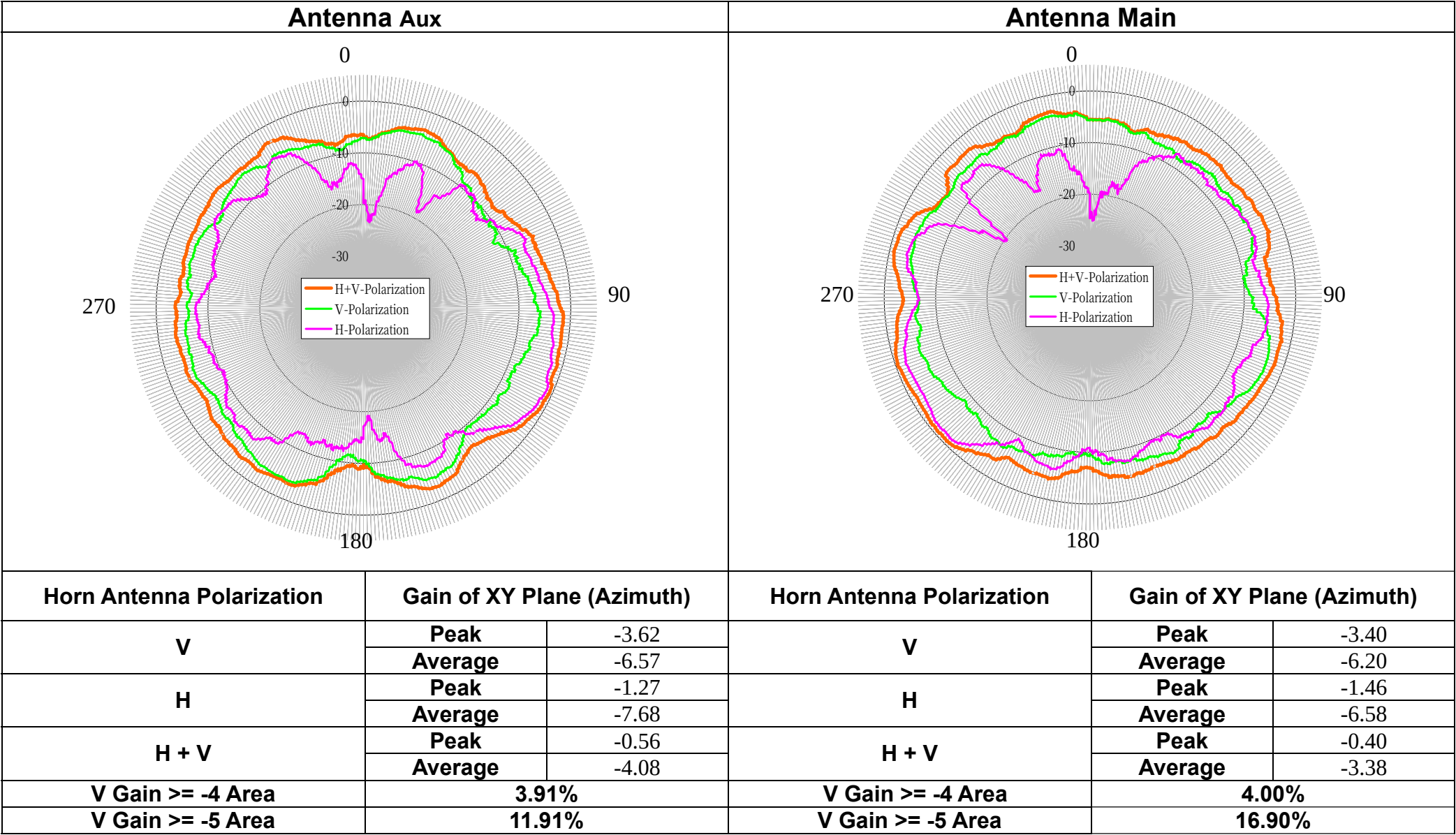


2.4 GHz



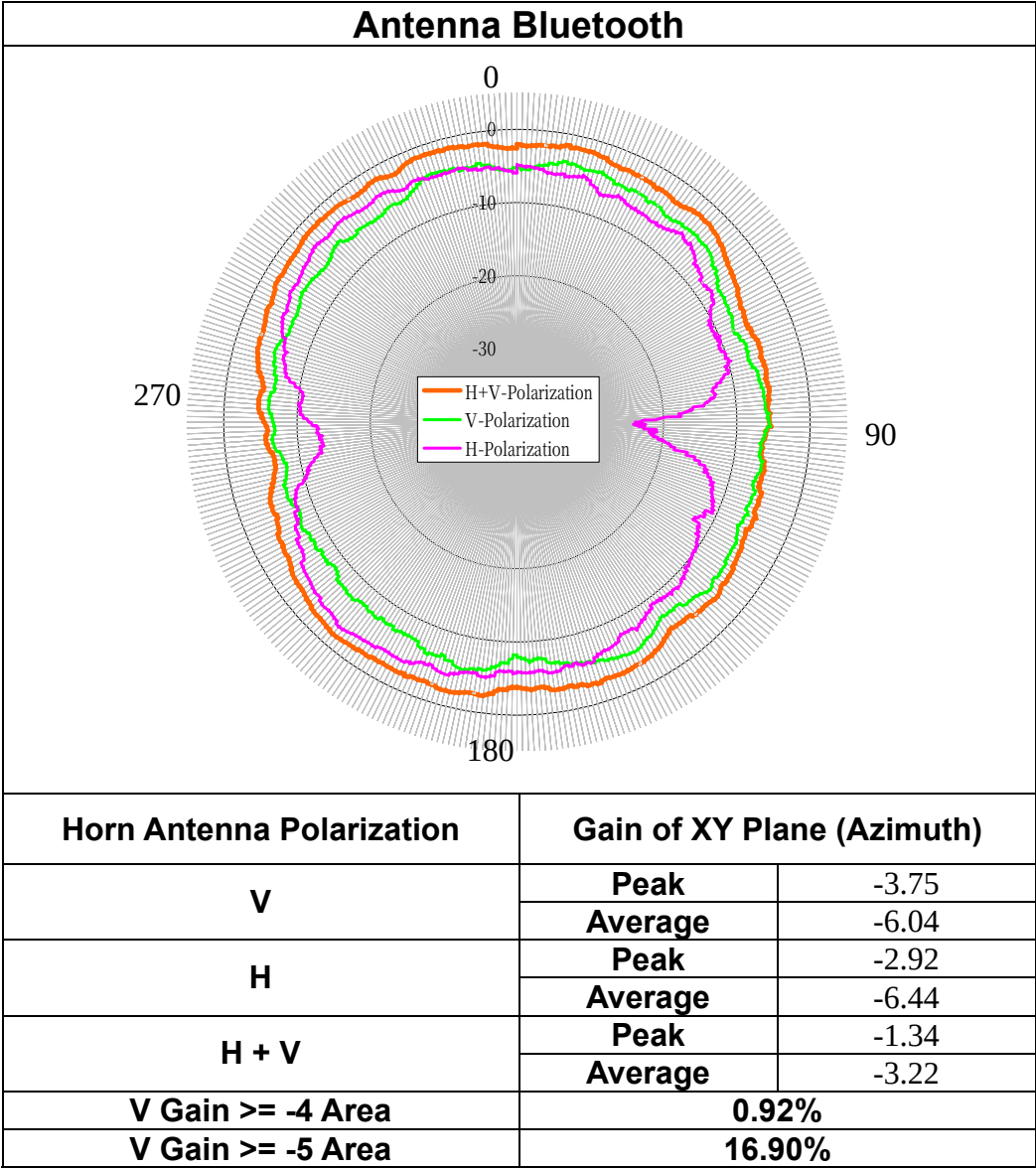
Horn Antenna Polarization		Gain of XY Plane (Azimuth)	
V	Peak	-3.42	
	Average	-6.85	
H	Peak	-4.18	
	Average	-6.55	
H + V	Peak	-1.47	
	Average	-3.69	
V Gain >= -4 Area		5.91%	
V Gain >= -5 Area		22.73%	

8.2 2.45 GHz



Horn Antenna Polarization	Gain of XY Plane (Azimuth)		Horn Antenna Polarization	Gain of XY Plane (Azimuth)	
V	Peak	-3.62	V	Peak	-3.40
	Average	-6.57		Average	-6.20
H	Peak	-1.27	H	Peak	-1.46
	Average	-7.68		Average	-6.58
H + V	Peak	-0.56	H + V	Peak	-0.40
	Average	-4.08		Average	-3.38
V Gain >= -4 Area	3.91%		V Gain >= -4 Area	4.00%	
V Gain >= -5 Area	11.91%		V Gain >= -5 Area	16.90%	

2.45 GHz



Horn Antenna Polarization

Gain of XY Plane (Azimuth)

V

Peak

-3.75

Average

-6.04

H

Peak

-2.92

Average

-6.44

H + V

Peak

-1.34

Average

-3.22

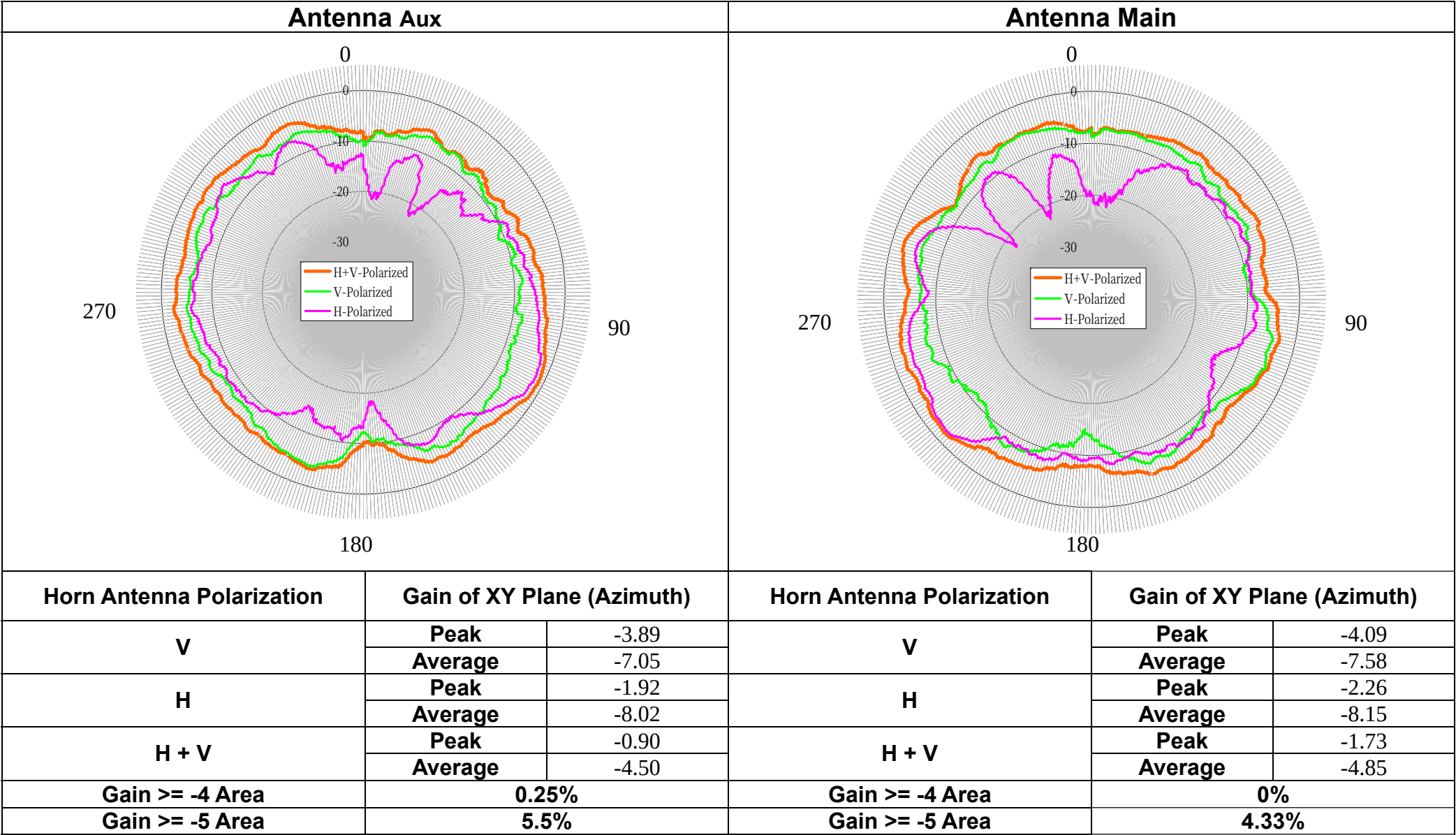
V Gain >= -4 Area

0.92%

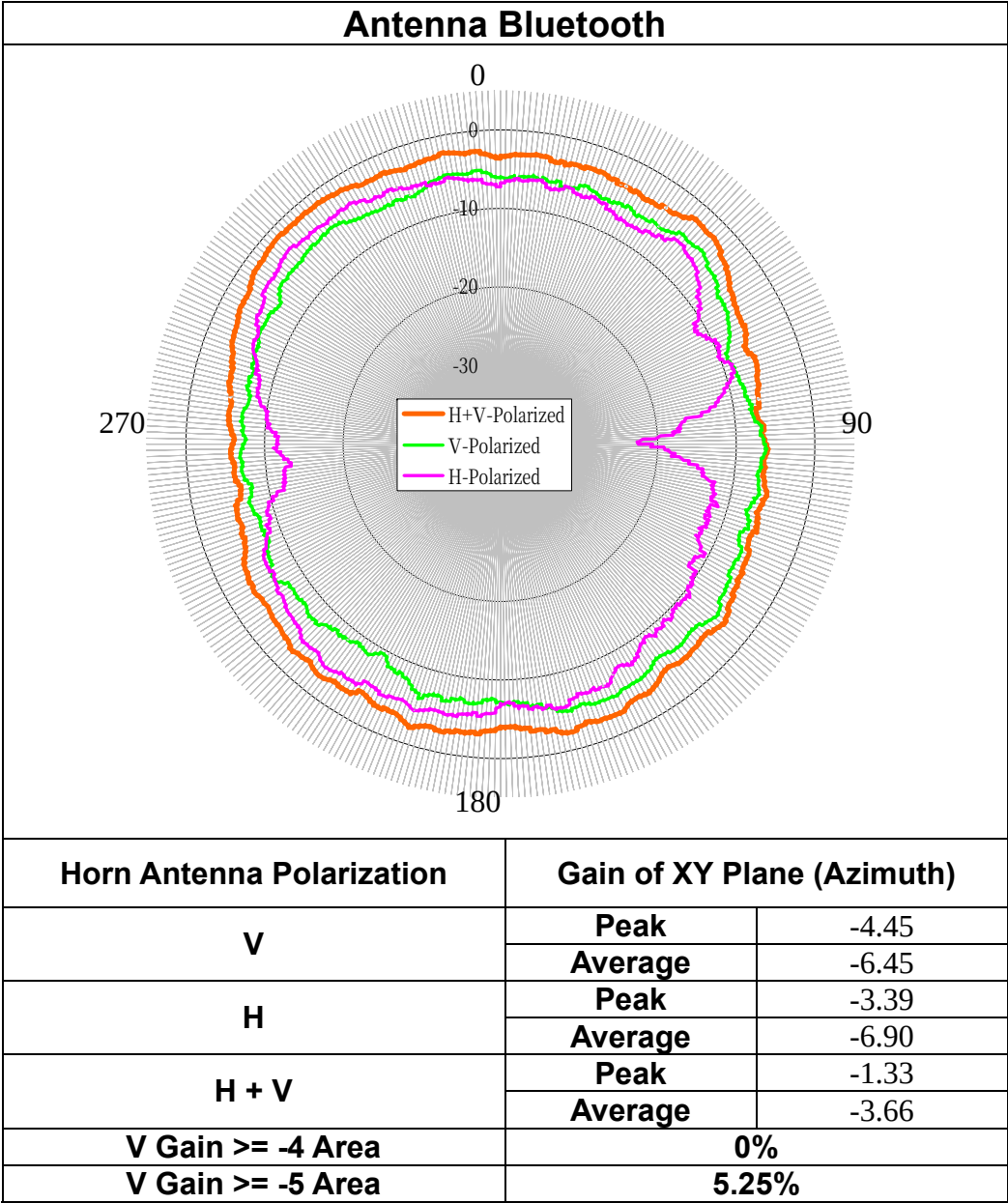
V Gain >= -5 Area

16.90%

8.3 2.5 GHz



2.5 GHz



Horn Antenna Polarization

Gain of XY Plane (Azimuth)

V

Peak

-4.45

Average

-6.45

H

Peak

-3.39

Average

-6.90

H + V

Peak

-1.33

Average

-3.66

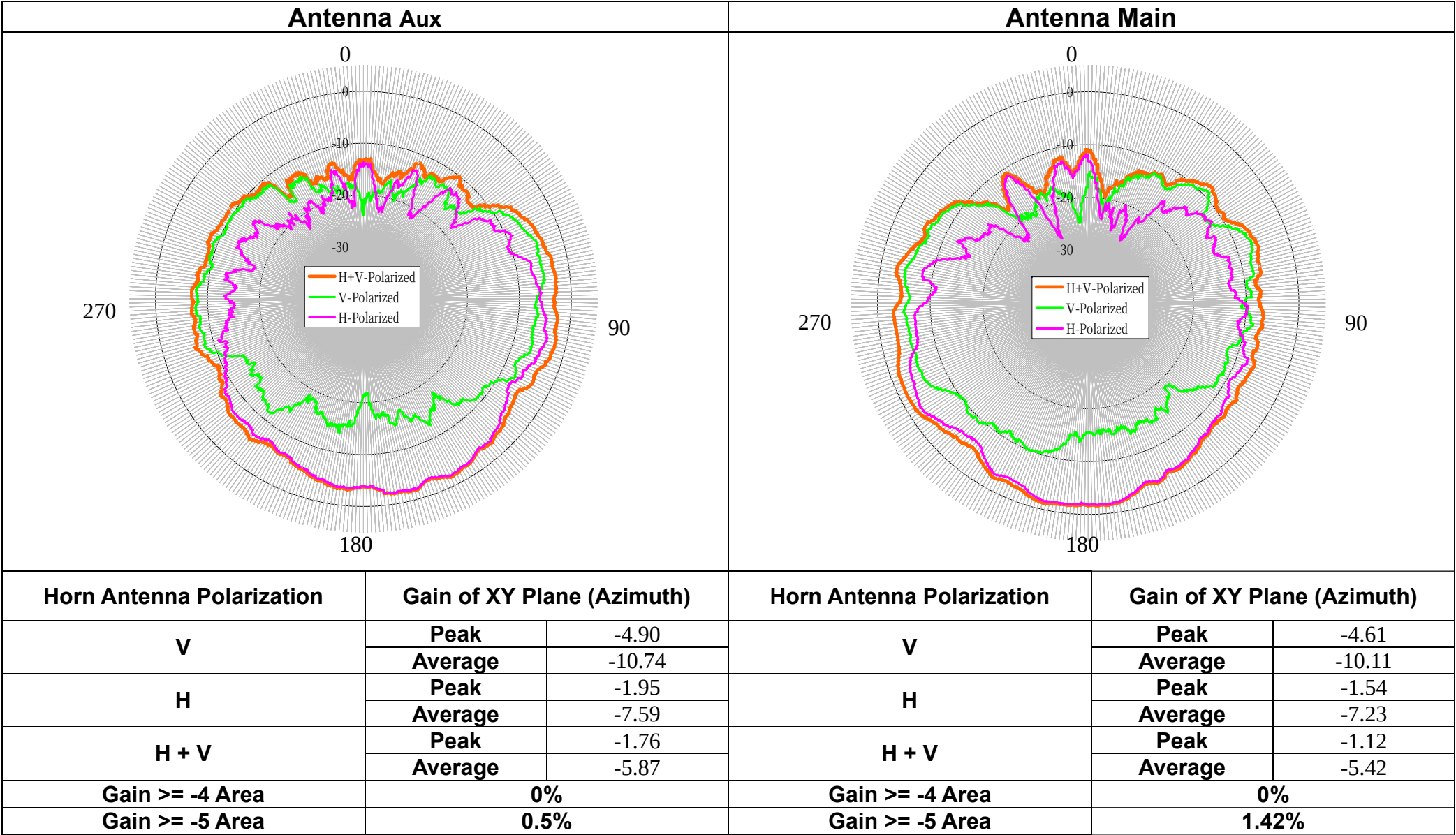
V Gain >= -4 Area

0%

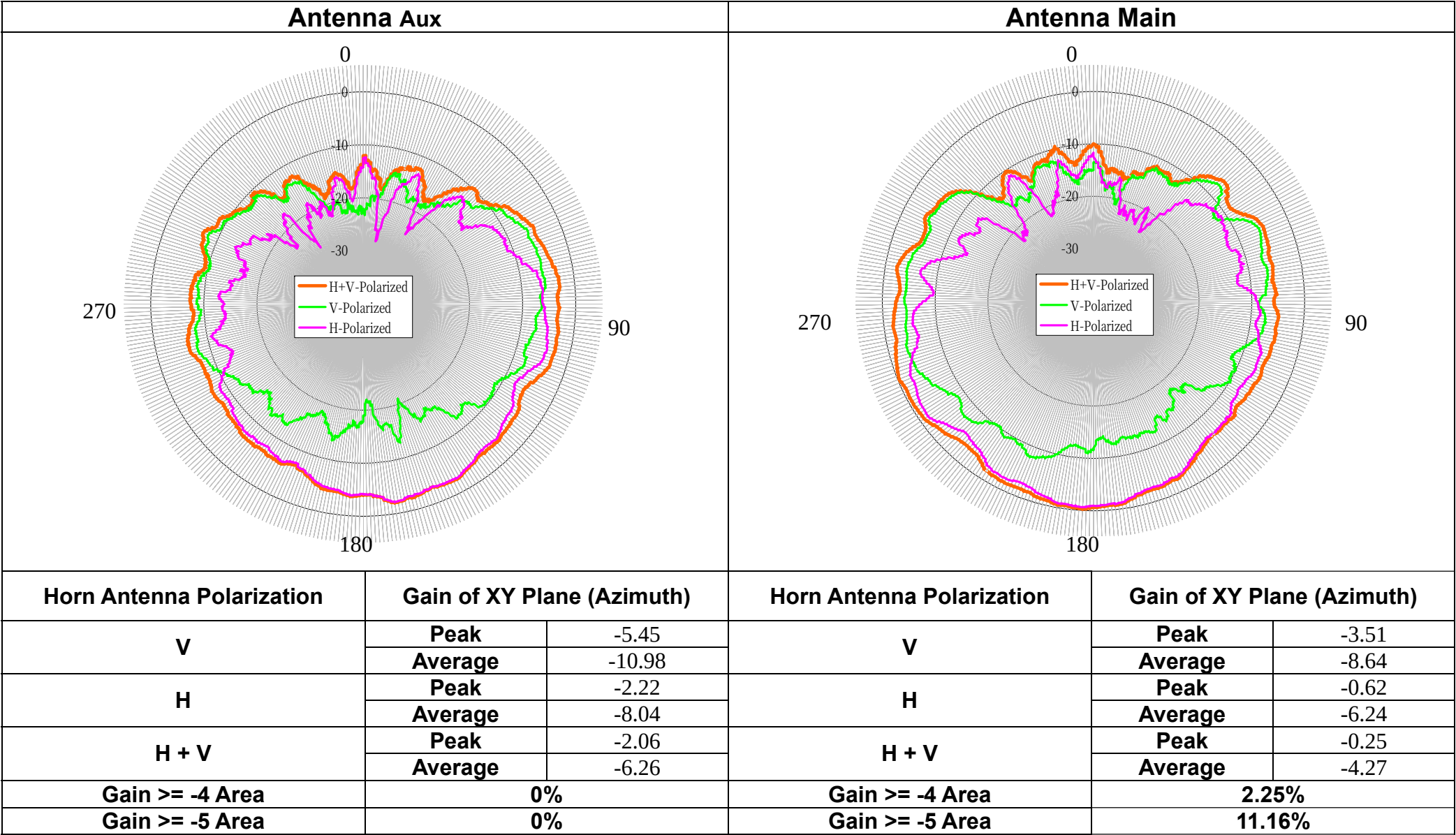
V Gain >= -5 Area

5.25%

8.4 5.075 GHz

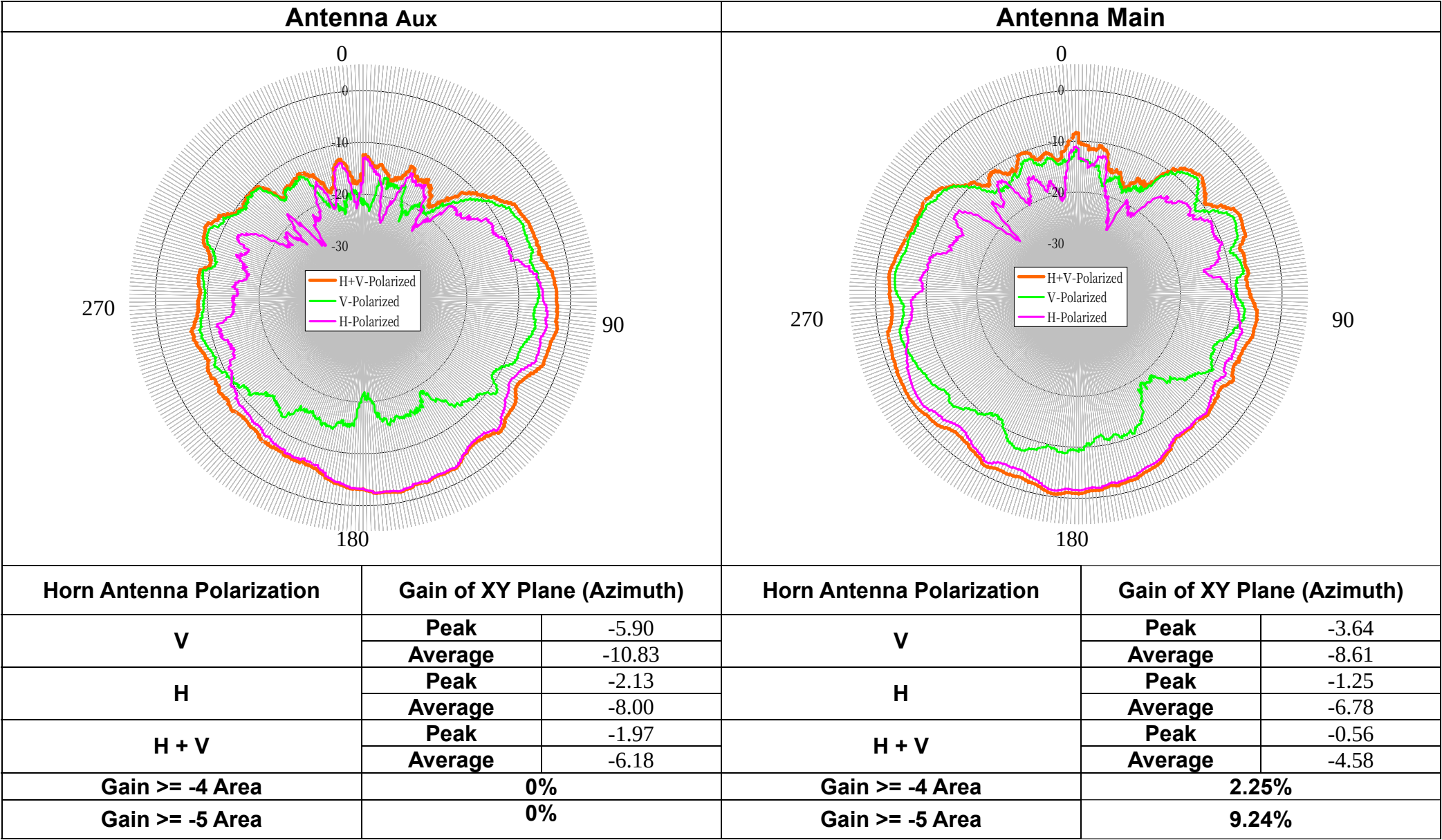


8.5 5.15 GHz

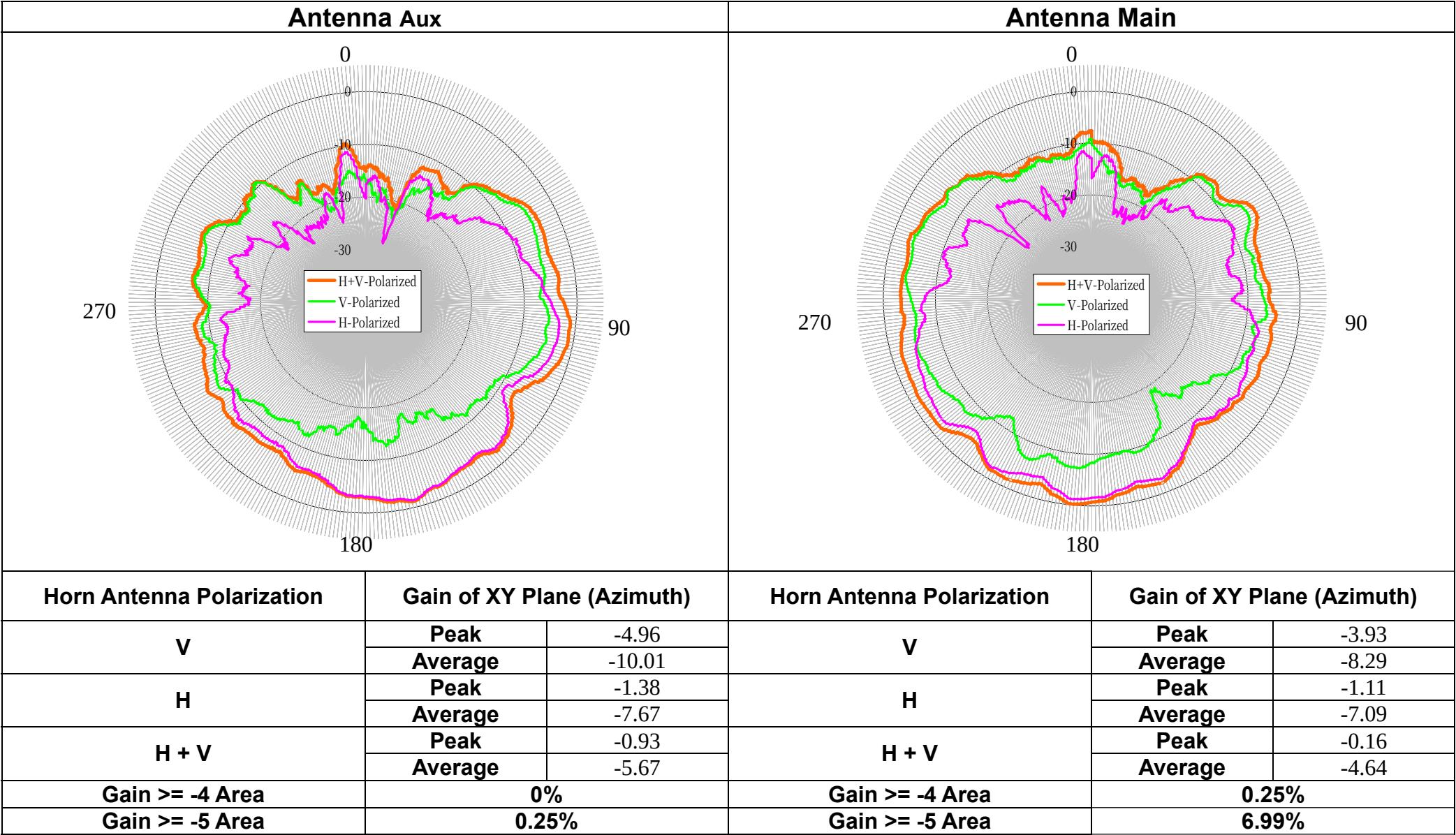


Horn Antenna Polarization	Gain of XY Plane (Azimuth)		Horn Antenna Polarization	Gain of XY Plane (Azimuth)	
V	Peak	-5.45	V	Peak	-3.51
	Average	-10.98		Average	-8.64
H	Peak	-2.22	H	Peak	-0.62
	Average	-8.04		Average	-6.24
H + V	Peak	-2.06	H + V	Peak	-0.25
	Average	-6.26		Average	-4.27
Gain >= -4 Area	0%		Gain >= -4 Area	2.25%	
Gain >= -5 Area	0%		Gain >= -5 Area	11.16%	

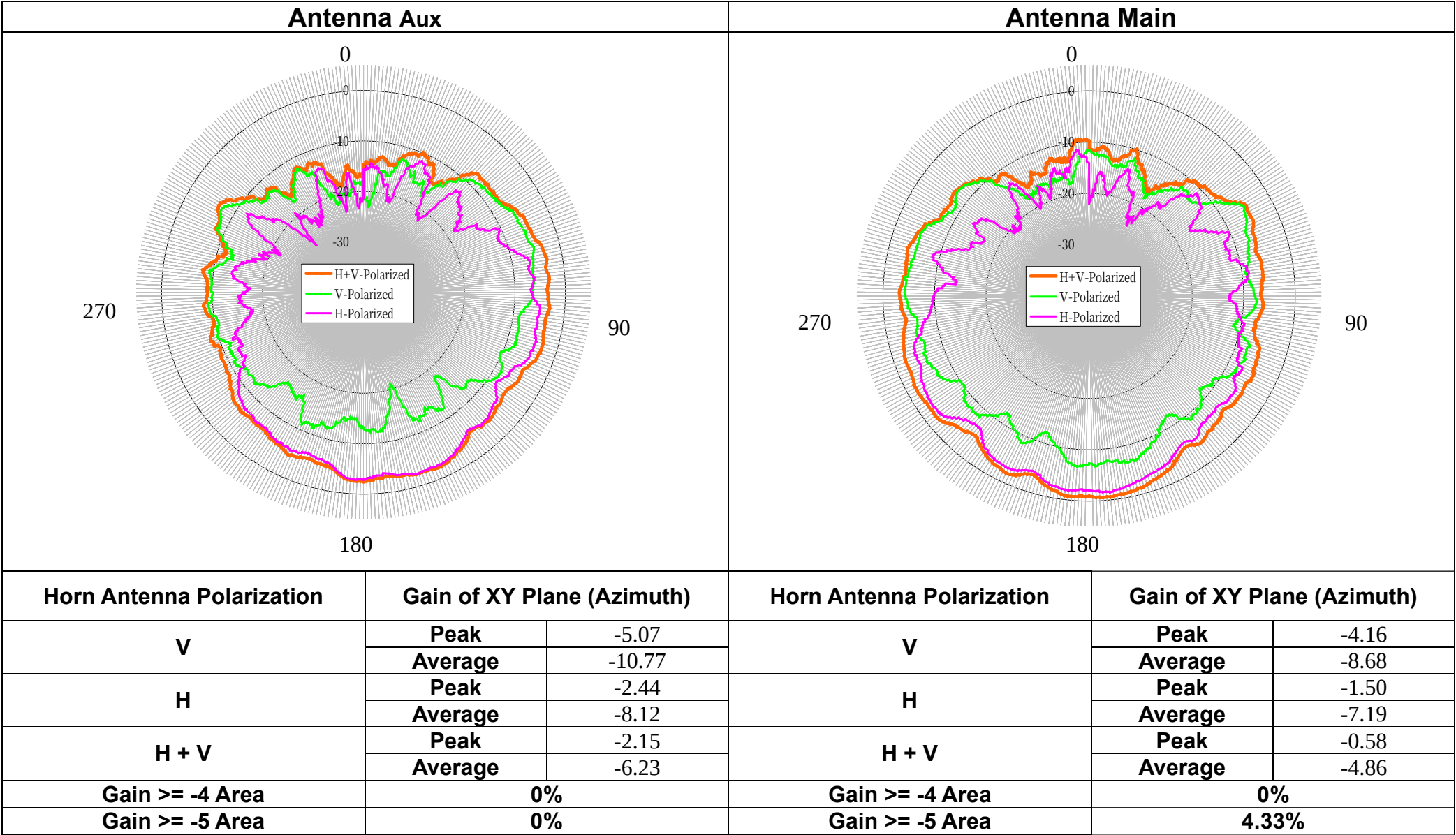
8.6 5.25 GHz



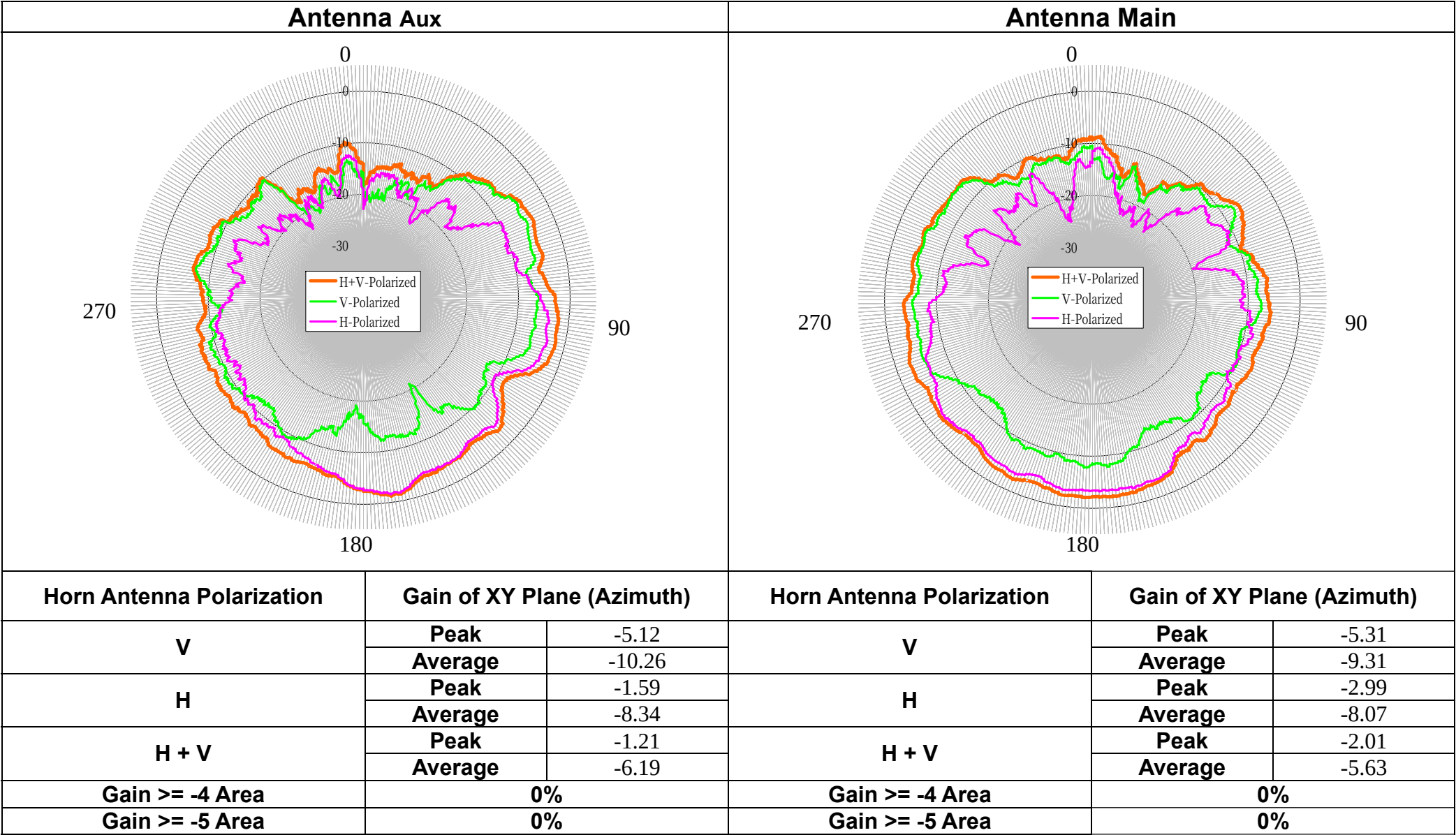
8.7 5.35 GHz



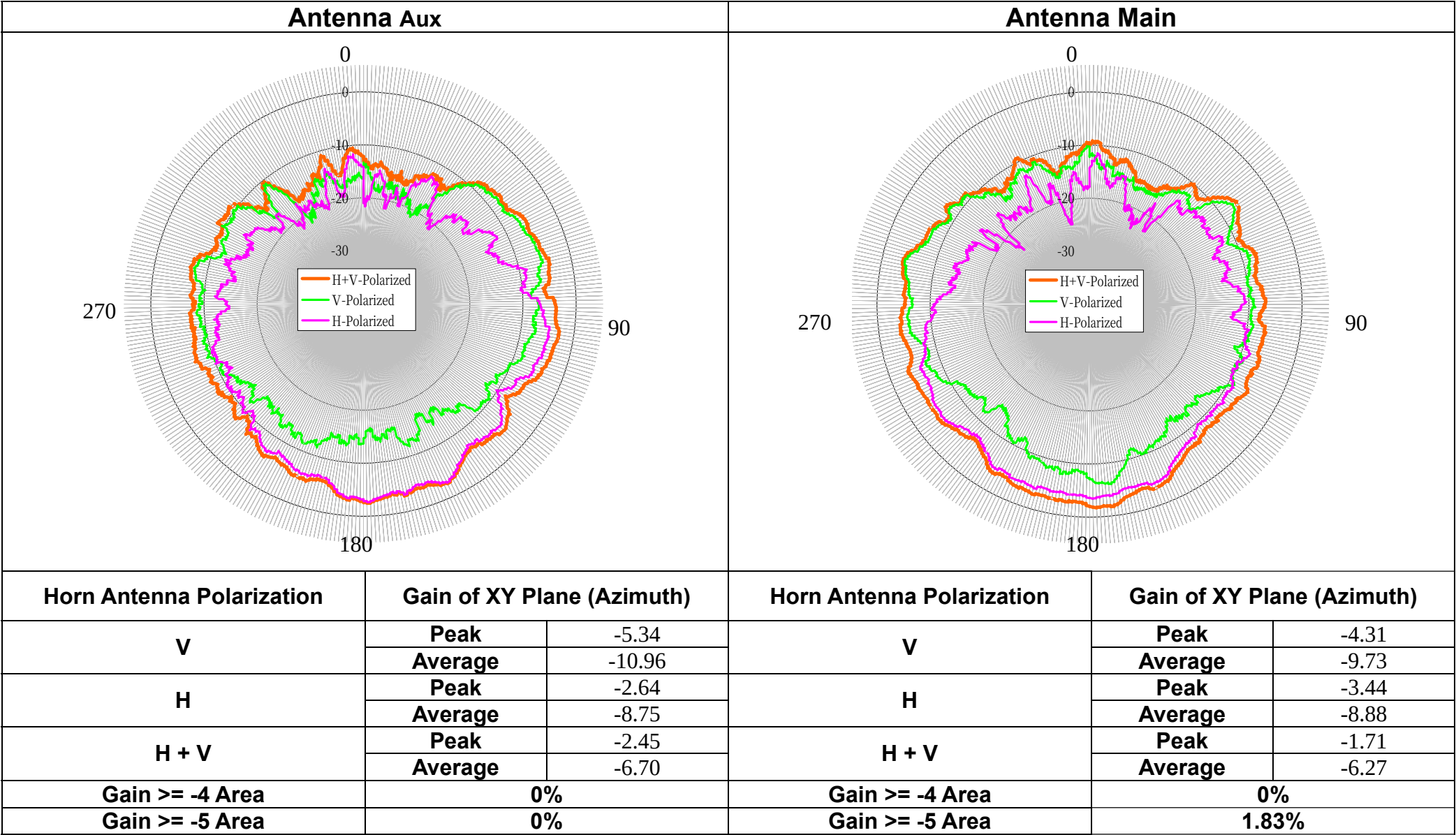
8.8 5.47 GHz



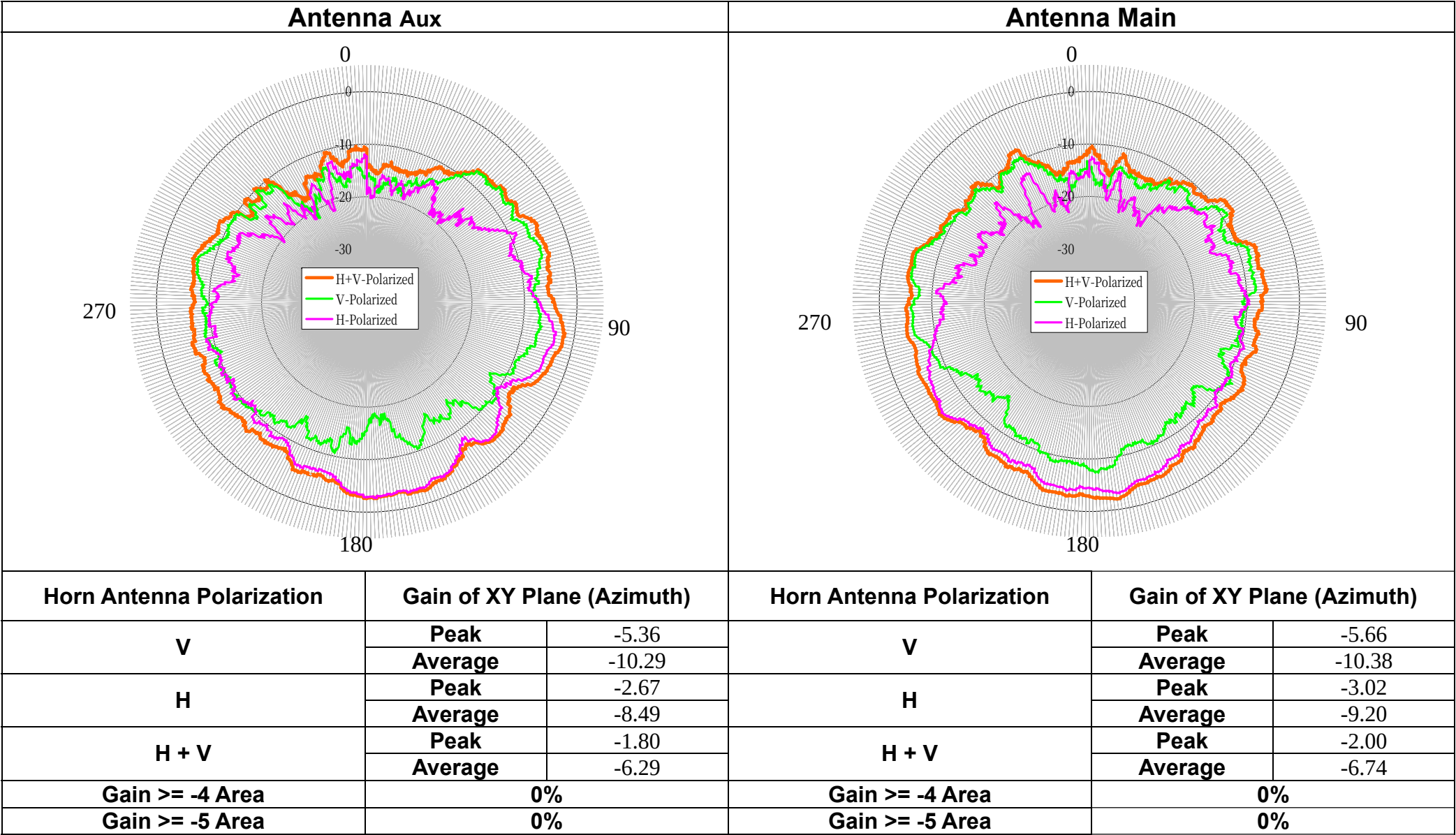
8.9 5.5975 GHz



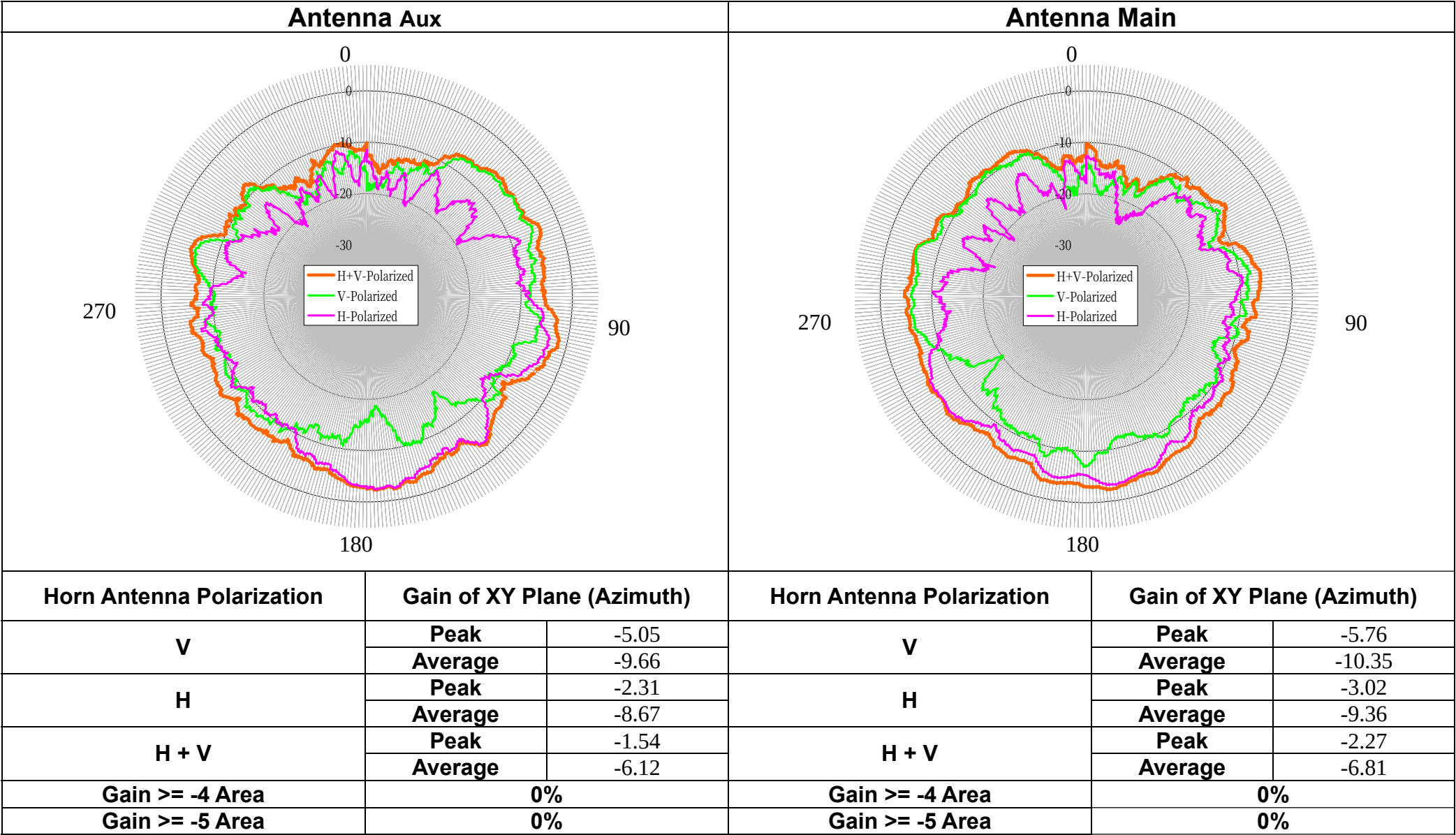
8.10 5.725 GHz



8.11 5.785 GHz



8.12 5.85 GHz



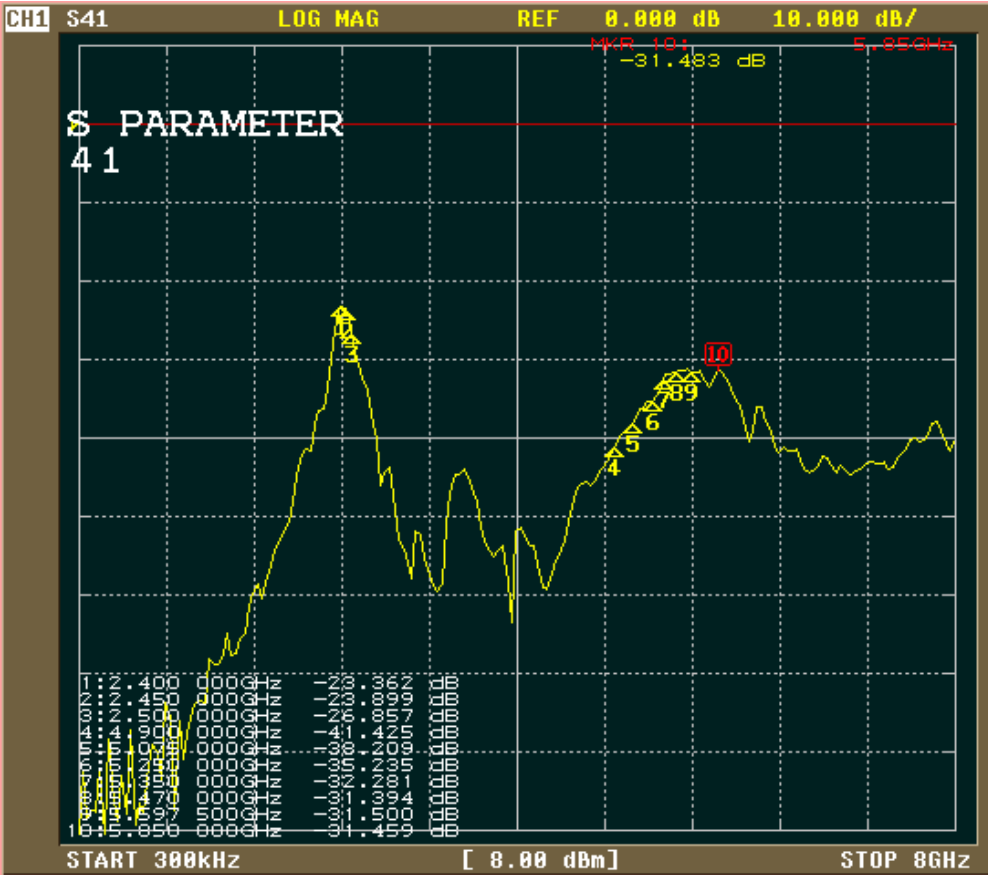
9. Isolation

Isolation is measured between the two antenna connectors with the platform opening 90 degrees. If there are only WLAN main and aux. antenna, we don't need to measure the isolation of two WLAN antennas. We just need to make sure that the distance between two WLAN antennas is over a half wave-length. The following is the minimum isolation requirements between the antennas of the two radios.

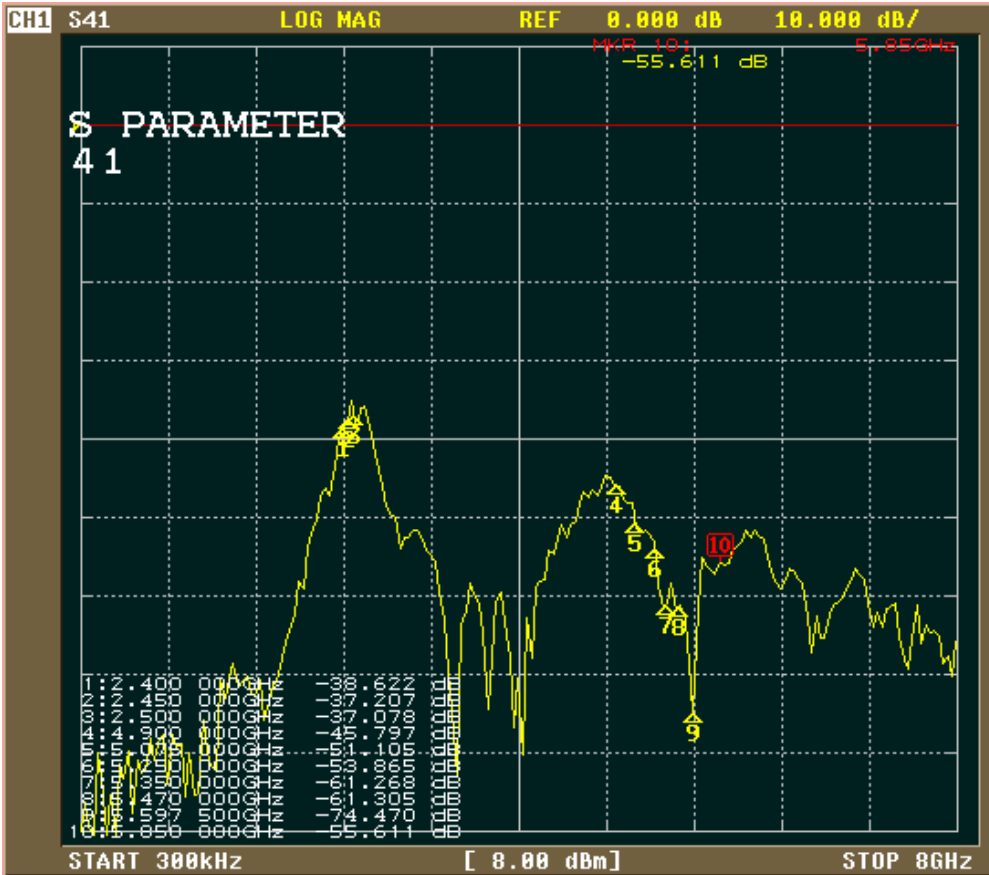
	Minimum Isolation Requirments			
	Receiver			
Transmitter	Bluetooth	802.11a WLAN	802.11b WLAN	WWAN GPRS or CDMA
Bluetooth	n/a	20 dB	40 dB	20 dB
802.11a WLAN	20 dB	n/a	n/a	20 dB
802.11b WLAN	40 dB	n/a	n/a	30 dB
WWAN GPRS or CDMA	20 dB	20 dB	20 dB	n/a

9.1 Isolation test result

Main→Aux



Main→B/T



Aux→B/T

