



WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)

DONGGUAN AEON TECH CO.,LTD.(CHINA)



SPECIFICATION FOR APPROVAL

CUSTOMER: 鴻海科技股份有限公司

PART NAME: RF Antenna Assembly

PART NO.:

REVISION:

W. Y. P/NO.: C107-692076-A(SRF20222137)

REV.: XI

	MANUFACTURER	CUSTOMER
		SIGNATURE
APPROVED BY :		
DATE :		

WHA YU GROUP

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RF Antenna Assembly

Specification

1. Electrical Properties : With housing/With Cable loss(Ant.1)

- 1.1 Frequency Range..... 3.55~3.70 GHz
- 1.2 Impedance 50Ω Nominal
- 1.3 VSWR 2.0 : 1 Max.
- 1.4 Return Loss..... 9.5 dB Min.
- 1.5 Radiation Omni-Directional
- 1.6 Peak Gain..... >5dBi
- 1.7 Cable Loss..... 1.0 Max.
- 1.8 Polarization..... Linear, Horizontal
- 1.9 Cable..... 1.37 Low loss Coaxial Cable ; Color Black
- 1.10 Connector..... I-PEX MHF Connector
- 1.11 Core..... N/A

2. Physical Properties :

- 2.1 Operating Temp. -10°C ~ +60°C
- 2.2 Storage Temp. -10°C ~ +70°C

RF Antenna Assembly

Specification

1. Electrical Properties : With housing/With Cable loss(Ant.2)

- 1.1 Frequency Range..... 3.55~3.70 GHz
- 1.2 Impedance 50Ω Nominal
- 1.3 VSWR 2.0 : 1 Max.
- 1.4 Return Loss..... 9.5 dB Min.
- 1.5 Radiation Omni-Directional
- 1.6 Peak Gain..... >5dBi
- 1.7 Cable Loss..... 0.86 Max.
- 1.8 Polarization..... Linear, Horizontal
- 1.9 Cable..... 1.37 Low loss Coaxial Cable ; Color Gray
- 1.10 Connector..... I-PEX MHF Connector
- 1.11 Core..... N/A

2. Physical Properties :

- 2.1 Operating Temp. -10°C ~ +60°C
- 2.2 Storage Temp. -10°C ~ +70°C

RF Antenna Assembly

Specification

1. Electrical Properties : With housing/With Cable loss(Ant.3)

- 1.1 Frequency Range..... 3.55~3.70 GHz
- 1.2 Impedance 50Ω Nominal
- 1.3 VSWR 2.0 : 1 Max.
- 1.4 Return Loss..... 9.5 dB Min.
- 1.5 Radiation Omni-Directional
- 1.6 Peak Gain..... >5dBi
- 1.7 Cable Loss..... 0.3 Max.
- 1.8 Polarization..... Linear, Horizontal
- 1.9 Cable..... 1.37 Low loss Coaxial Cable ; Color White
- 1.10 Connector..... I-PEX MHF Connector
- 1.11 Core..... N/A

2. Physical Properties :

- 2.1 Operating Temp. -10°C ~ +60°C
- 2.2 Storage Temp. -10°C ~ +70°C

RF Antenna Assembly

Specification

1. Electrical Properties : With housing/With Cable loss(Ant.4)

- 1.1 Frequency Range..... 3.55~3.70 GHz
- 1.2 Impedance 50Ω Nominal
- 1.3 VSWR 2.0 : 1 Max.
- 1.4 Return Loss..... 9.5 dB Min.
- 1.5 Radiation Omni-Directional
- 1.6 Peak Gain..... >5dBi
- 1.7 Cable Loss..... 0.79 Max.
- 1.8 Polarization..... Linear, Horizontal
- 1.9 Cable..... 1.37 Low loss Coaxial Cable ; Color Blue
- 1.10 Connector..... I-PEX MHF Connector
- 1.11 Core..... N/A

2. Physical Properties :

- 2.1 Operating Temp. -10°C ~ +60°C
- 2.2 Storage Temp. -10°C ~ +70°C

RF Antenna Assembly

Specification

1. Electrical Properties : With housing/With Cable loss(Ant.5)

- 1.1 Frequency Range..... 3.55~3.70 GHz
- 1.2 Impedance50Ω Nominal
- 1.3 VSWR 2.0 : 1 Max.
- 1.4 Return Loss.....9.5 dB Min.
- 1.5 Radiation Omni-Directional
- 1.6 Peak Gain..... >5dBi
- 1.7 Cable Loss..... 0.38 Max.
- 1.8 Polarization..... Linear, Horizontal
- 1.9 Cable..... 1.37 Low loss Coaxial Cable ; Color Red
- 1.10 Connector..... I-PEX MHF Connector
- 1.11 Core..... N/A

2. Physical Properties :

- 2.1 Operating Temp. -10°C ~ +60°C
- 2.2 Storage Temp. -10°C ~ +70°C

RF Antenna Assembly

Specification

1. Electrical Properties : With housing/With Cable loss(Ant.6)

- 1.1 Frequency Range..... 3.55~3.70 GHz
- 1.2 Impedance 50Ω Nominal
- 1.3 VSWR 2.0 : 1 Max.
- 1.4 Return Loss..... 9.5 dB Min.
- 1.5 Radiation Omni-Directional
- 1.6 Peak Gain..... >5dBi
- 1.7 Cable Loss..... 0.86 Max.
- 1.8 Polarization..... Linear, Horizontal
- 1.9 Cable..... 1.37 Low loss Coaxial Cable ; Color Yellow
- 1.10 Connector..... I-PEX MHF Connector
- 1.11 Core..... N/A

2. Physical Properties :

- 2.1 Operating Temp. -10°C ~ +60°C
- 2.2 Storage Temp. -10°C ~ +70°C

RF Antenna Assembly

Specification

1. Electrical Properties : With housing/With Cable loss(Ant.7)

- 1.1 Frequency Range..... 3.55~3.70 GHz
- 1.2 Impedance50Ω Nominal
- 1.3 VSWR 2.0 : 1 Max.
- 1.4 Return Loss.....9.5 dB Min.
- 1.5 Radiation Omni-Directional
- 1.6 Peak Gain..... >5dBi
- 1.7 Cable Loss..... 0.86 Max.
- 1.8 Polarization..... Linear, Horizontal
- 1.9 Cable..... 1.37 Low loss Coaxial Cable ; Color Green
- 1.10 Connector..... I-PEX MHF Connector
- 1.11 Core.....N/A

2. Physical Properties :

- 2.1 Operating Temp. -10°C ~ +60°C
- 2.2 Storage Temp. -10°C ~ +70°C

Foxconn_CBRS_internal_B48_7port_ plane omni_6dBi Antenna test report

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Prepared By: Anton

Reviewed By: J.H.

Contents

- Revised History
- Specification
- Antenna Placement & Solution
- VSWR Results
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- Test Setup for Radiation Pattern Measurement
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- 3D Radiation Pattern Results
- Results Summary (peak gain, efficiency)

Revision History

Released Date	Version	Revised Record
2022/12/14	1.00	Initial version_(7 port)



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Specification

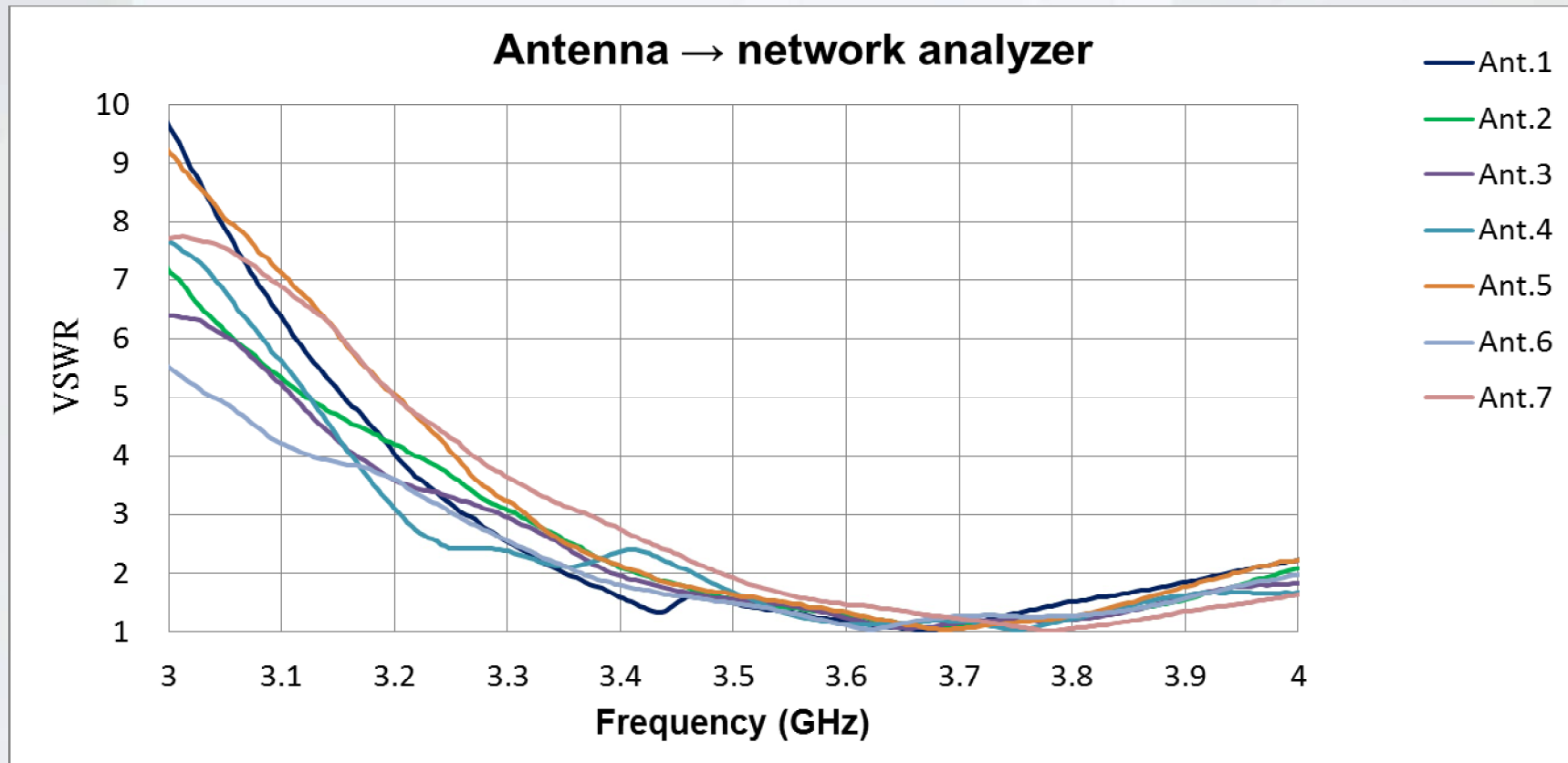
Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
B48	1_7	3550~3700 MHz	

Requirements of Measurement

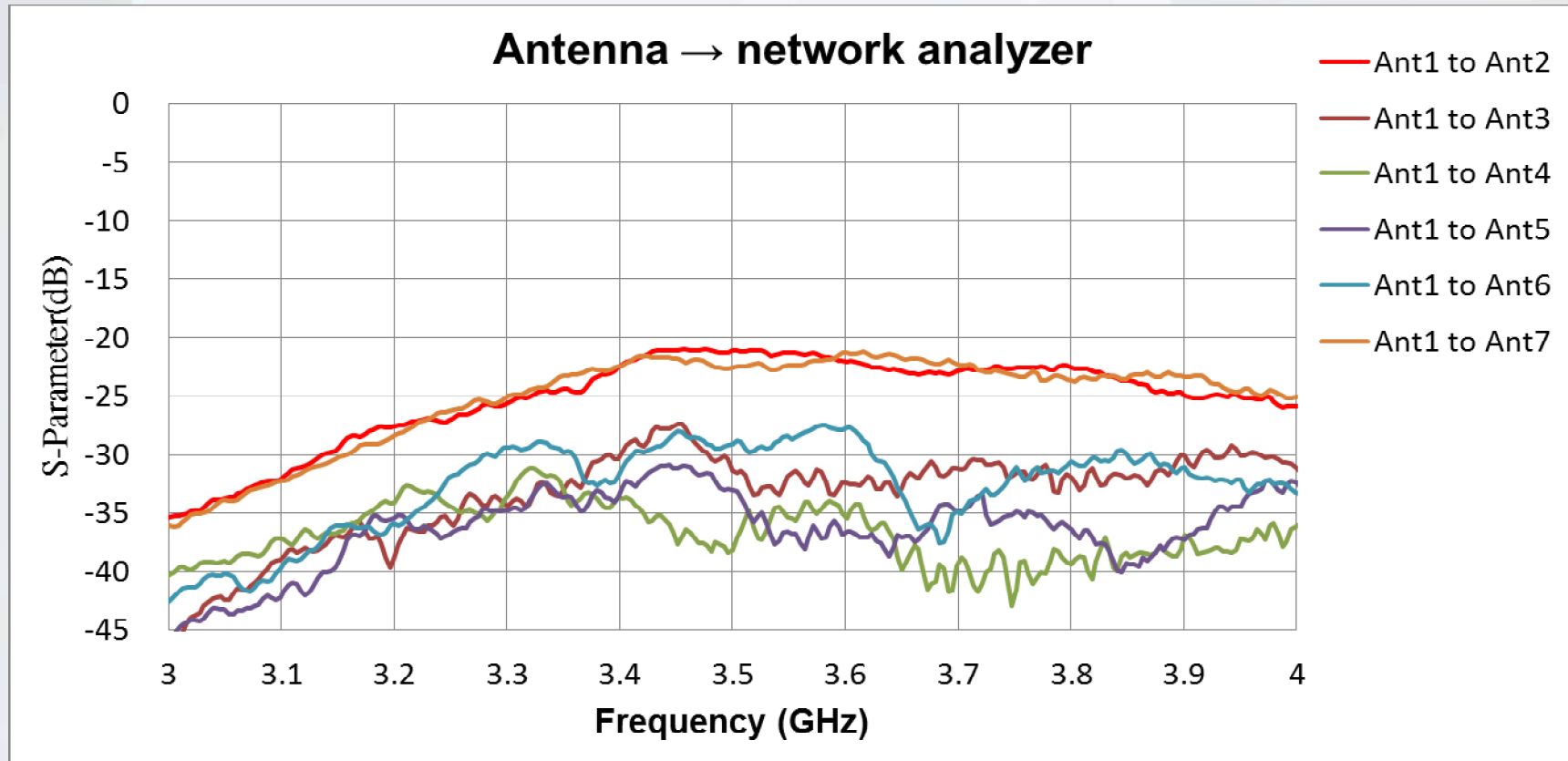
Test Item	Specification	Remark
VSWR	2 Max.	
Isolation	>20dB	
Polarization	Horizontal	
Peak gain	>5dBi	
Efficiency	>60%	
Radiation pattern	Scale: +10~ -20dBi	

VSWR Results



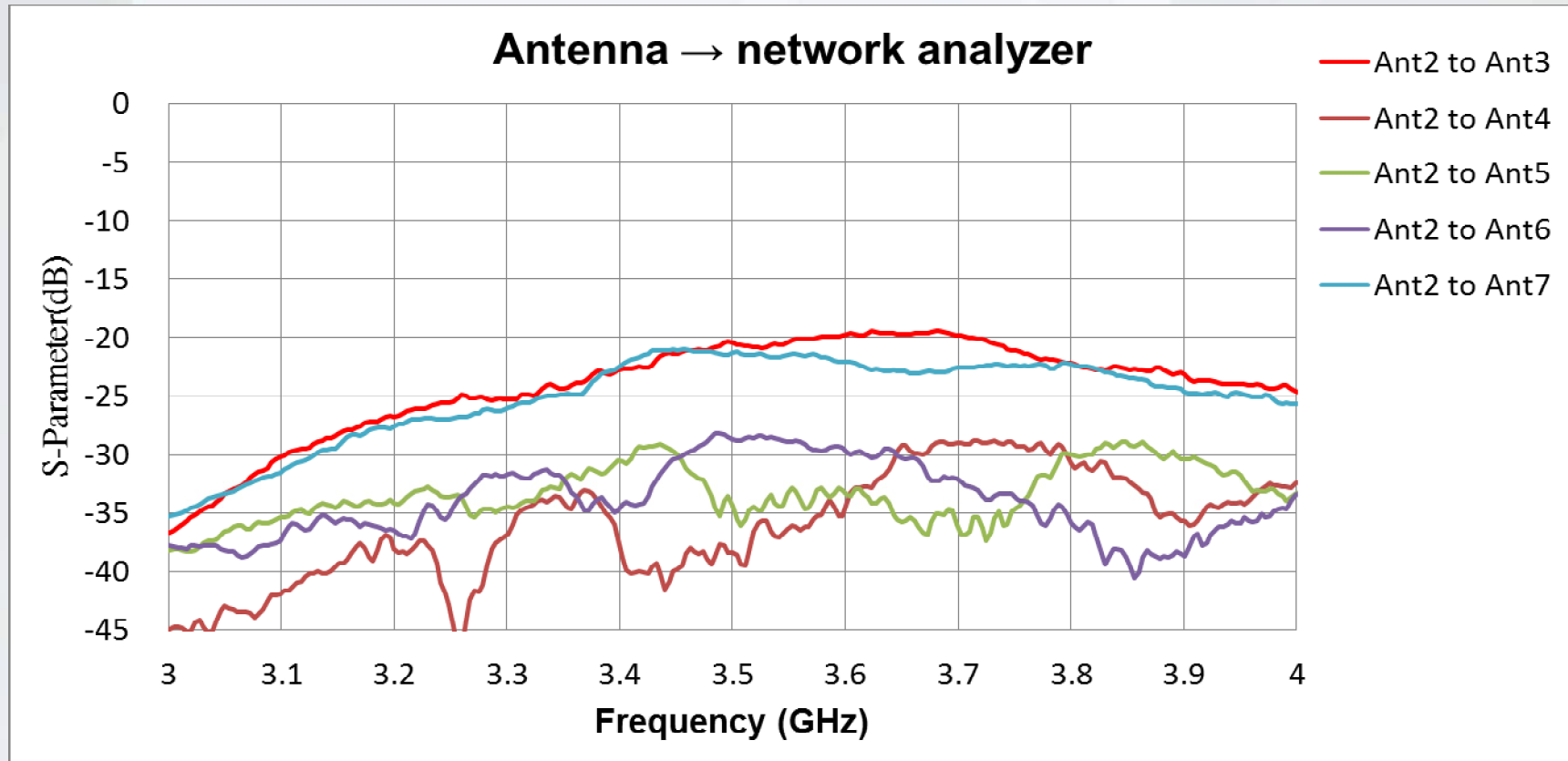
Isolation Results

Ant1 to ALL



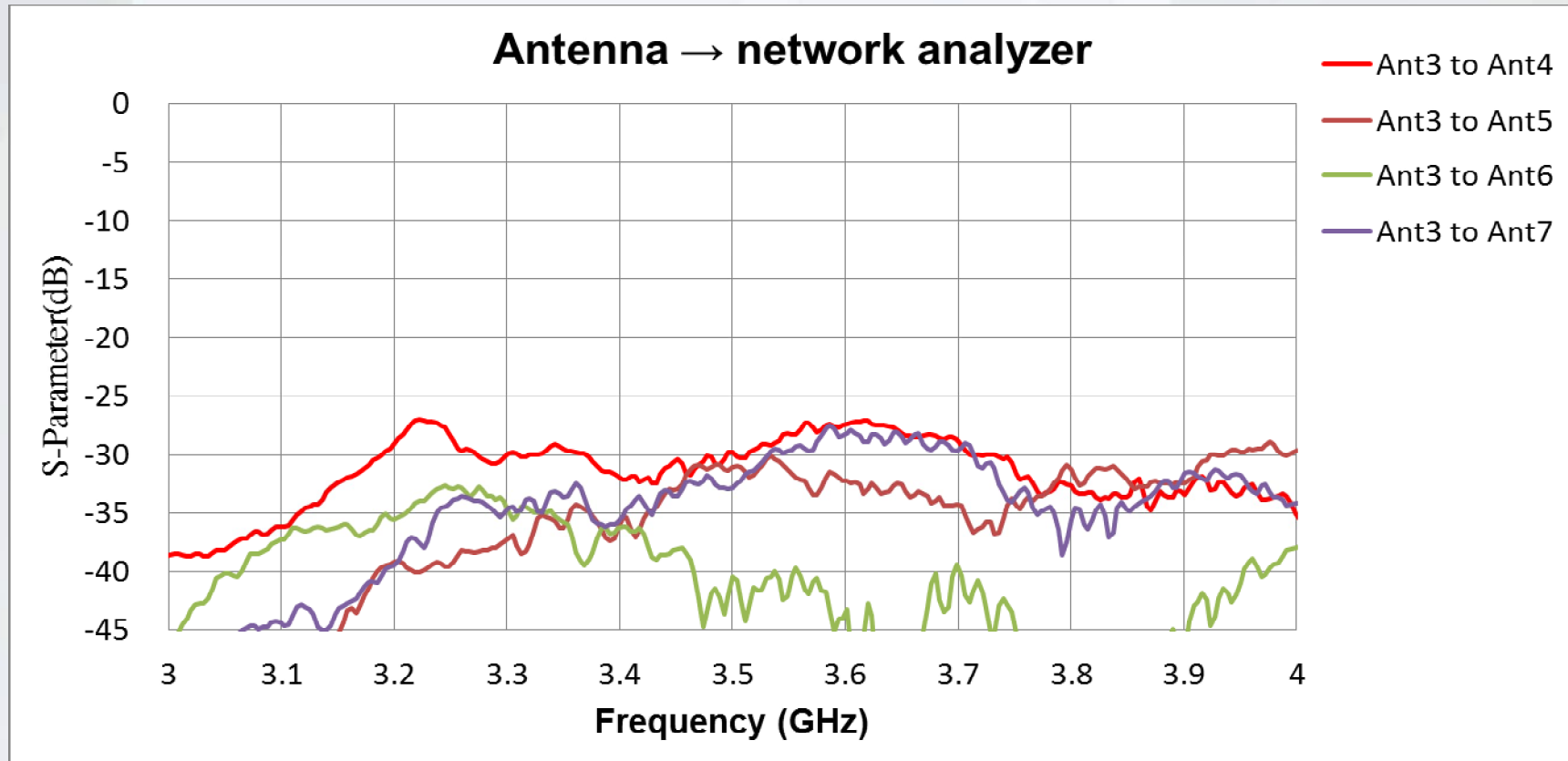
Isolation Results

Ant2 to ALL



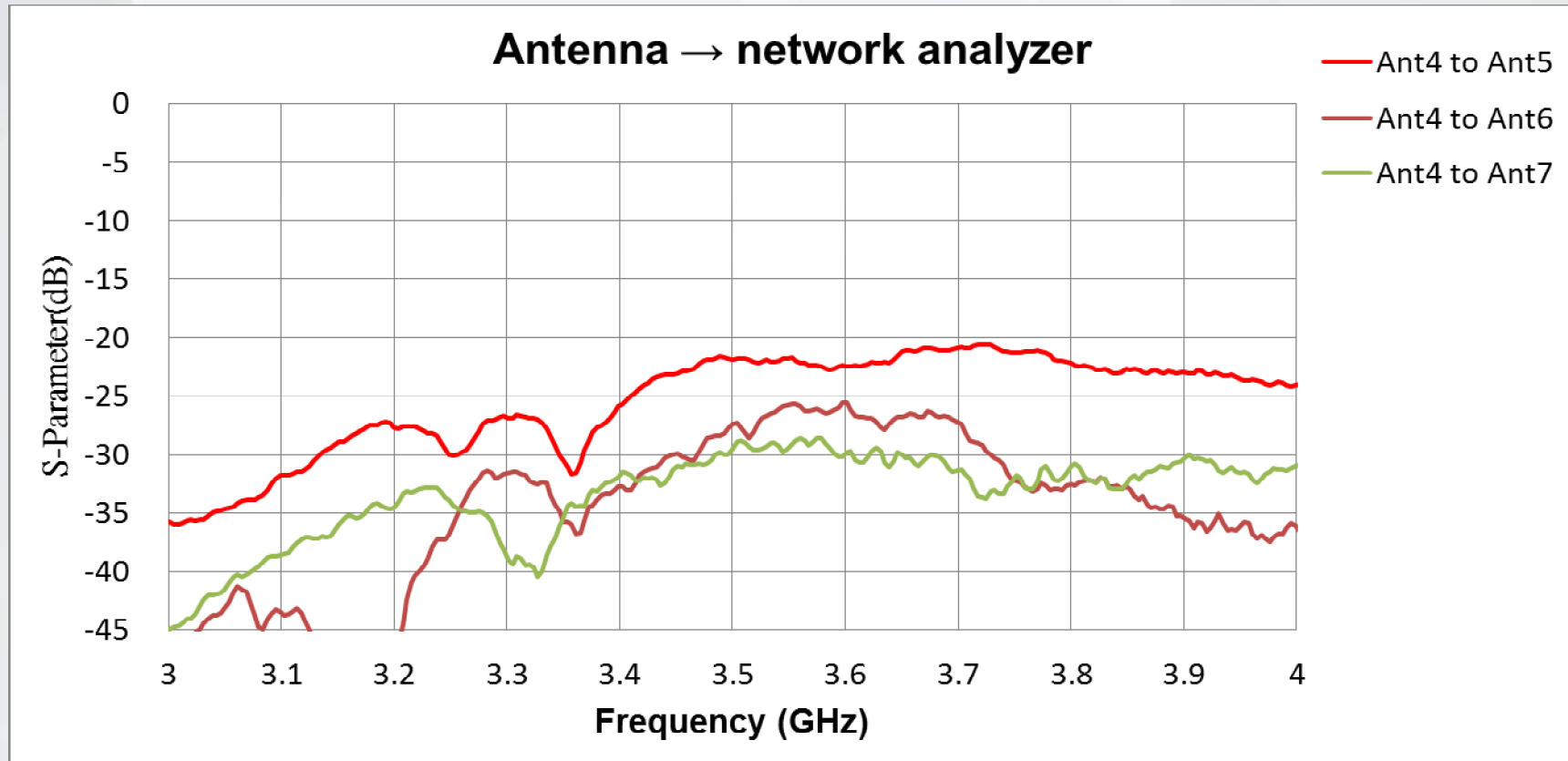
Isolation Results

Ant3 to ALL



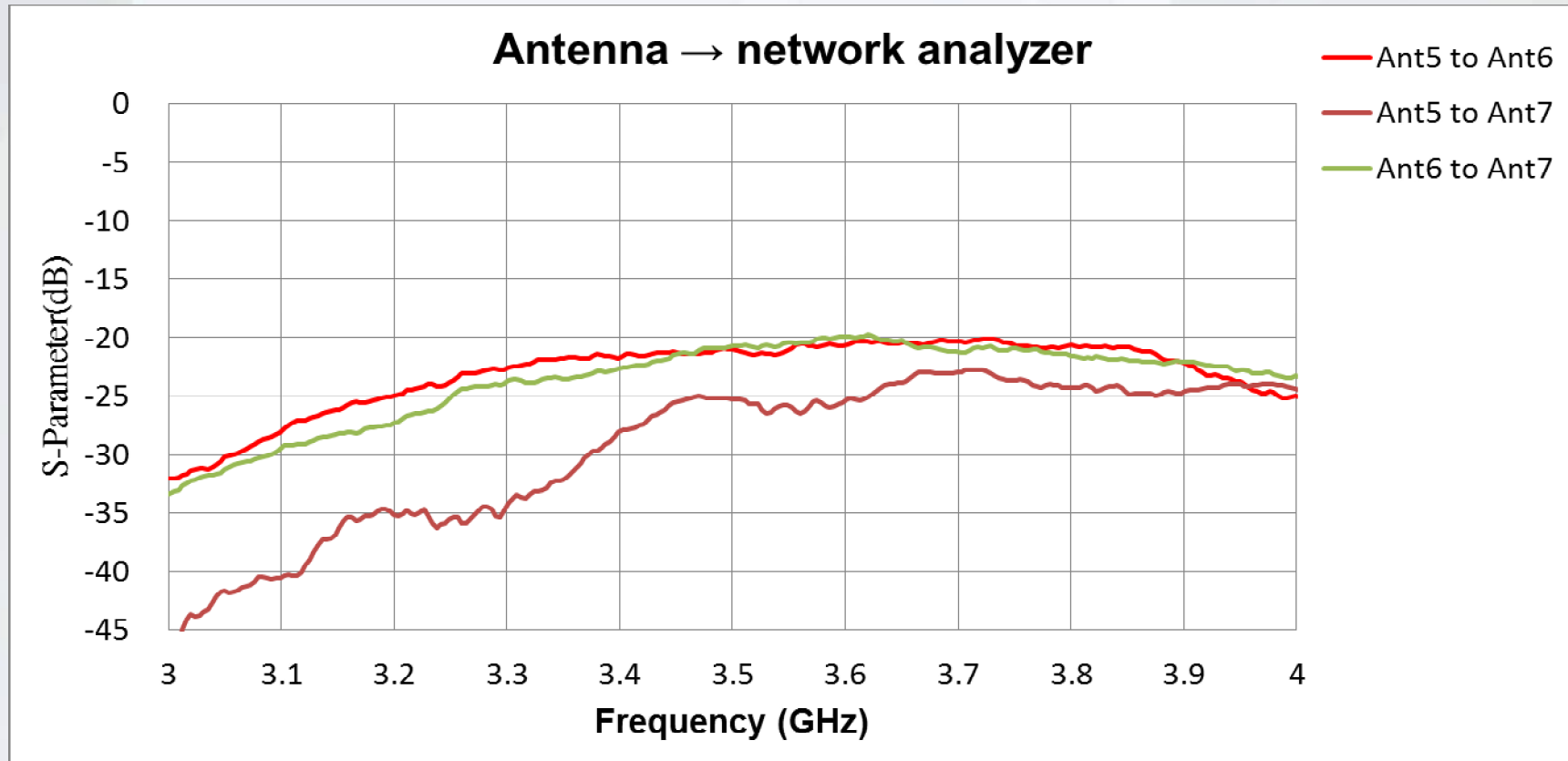
Isolation Results

Ant4 to ALL



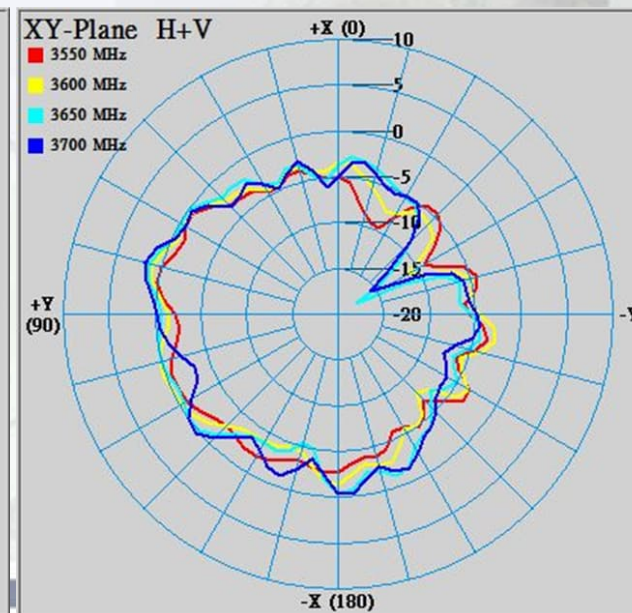
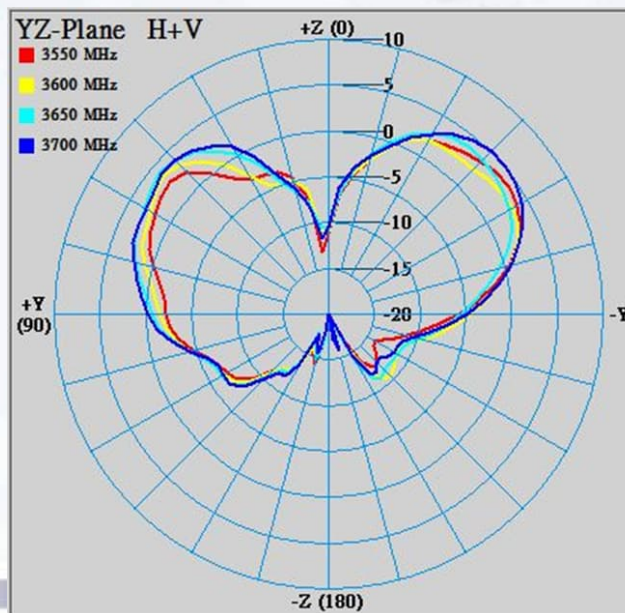
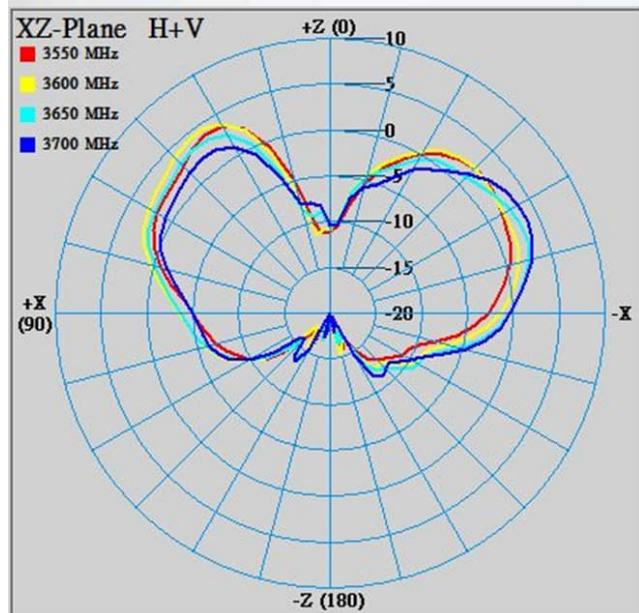
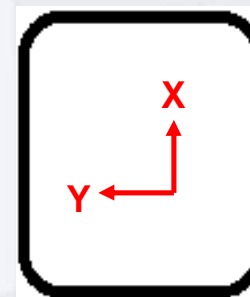
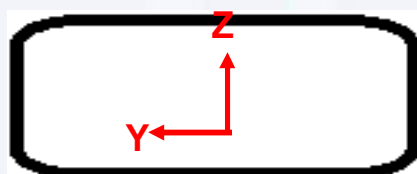
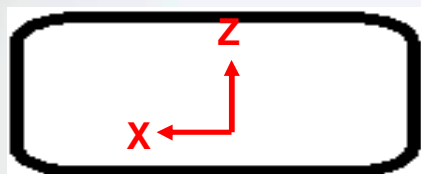
Isolation Results

Ant5 、 Ant6&Ant7



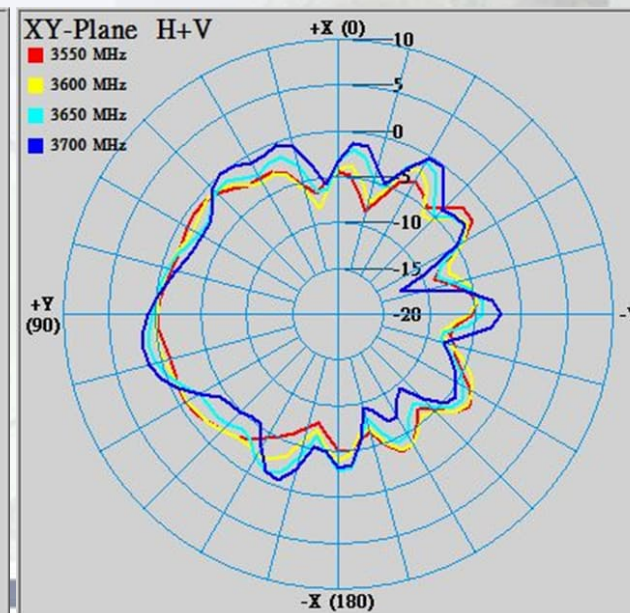
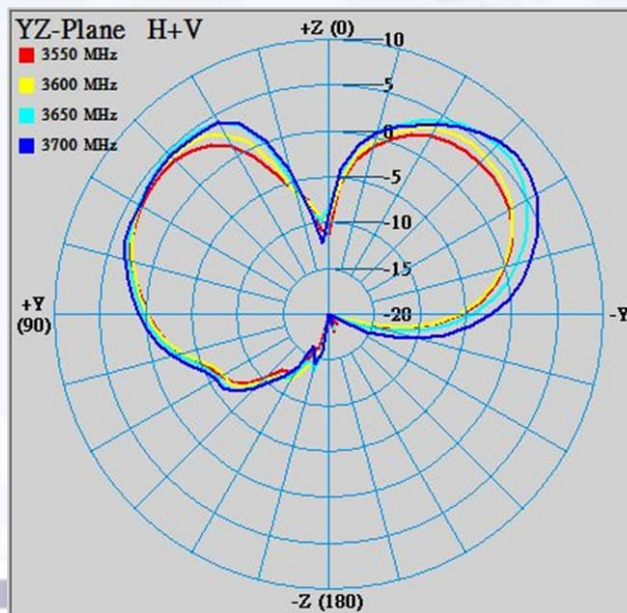
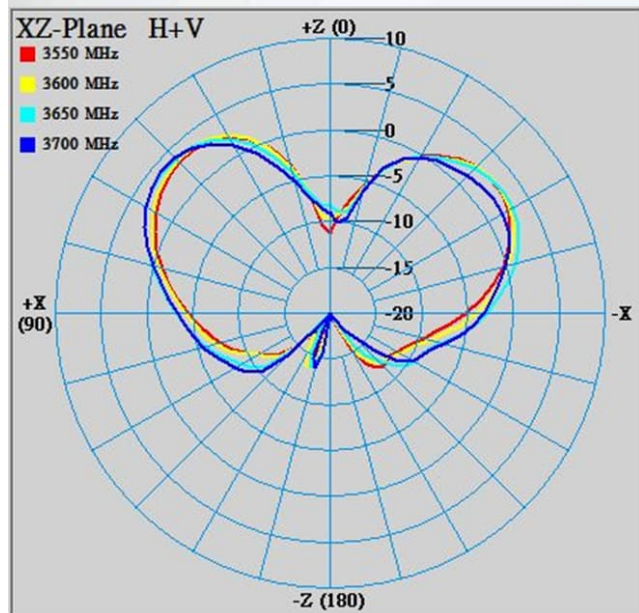
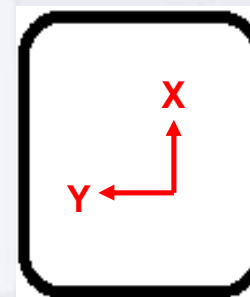
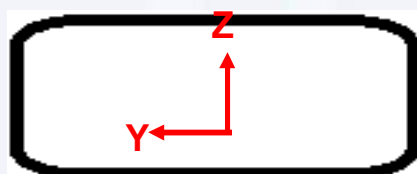
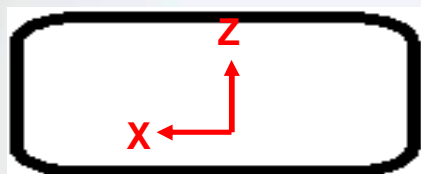
2D Radiation Pattern Results (Antenna → Network Analyzer)

Ant1 : 3550-3700 MHz



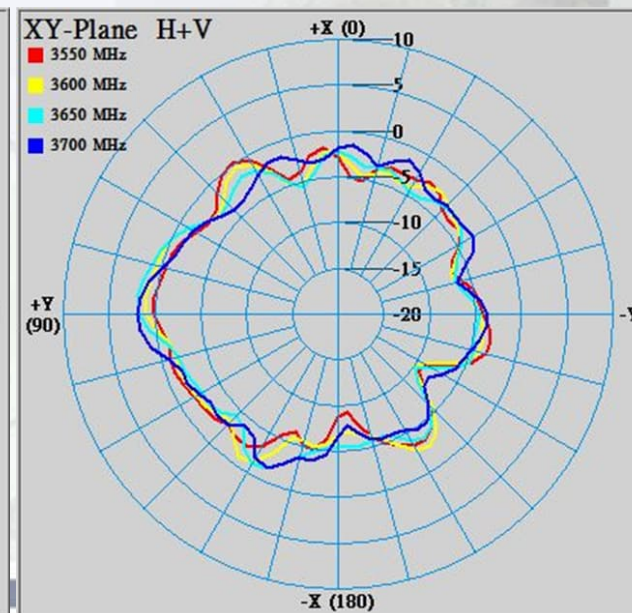
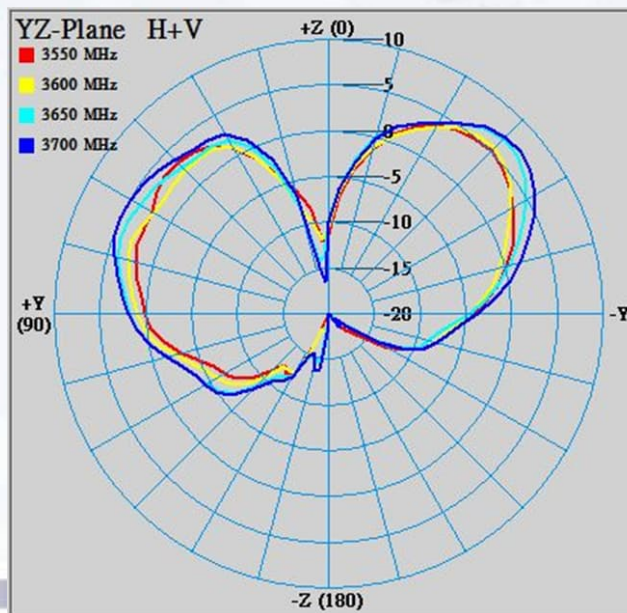
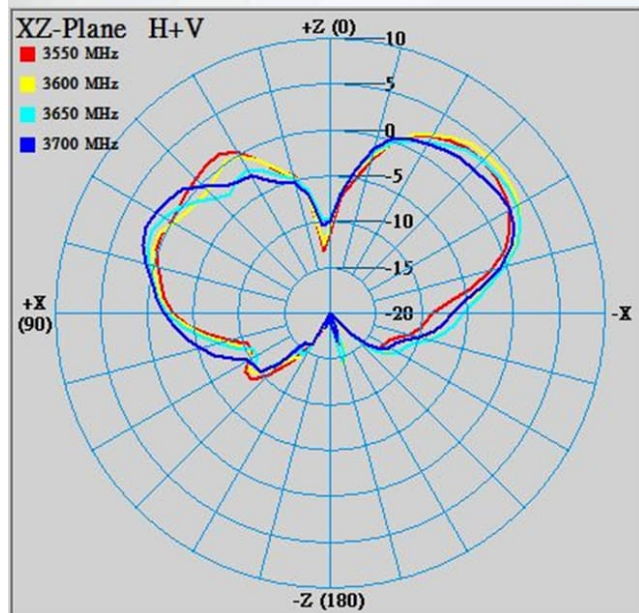
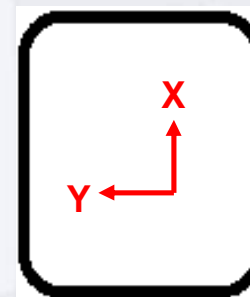
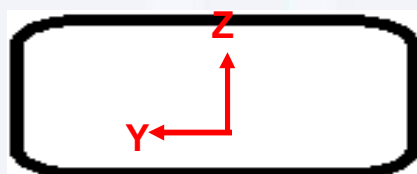
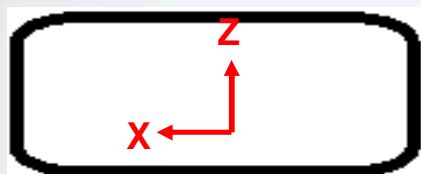
2D Radiation Pattern Results (Antenna → Network Analyzer)

Ant2 : 3550-3700 MHz



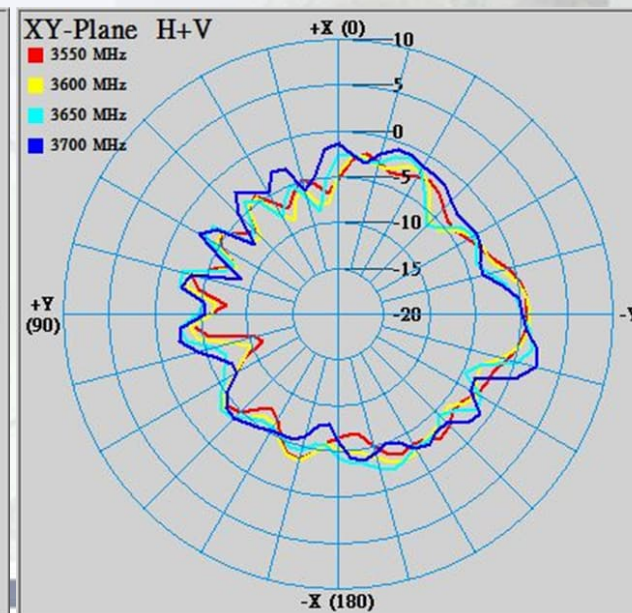
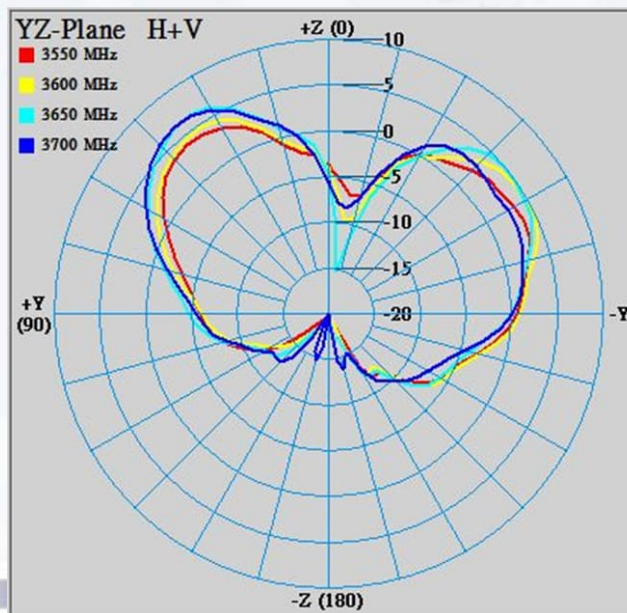
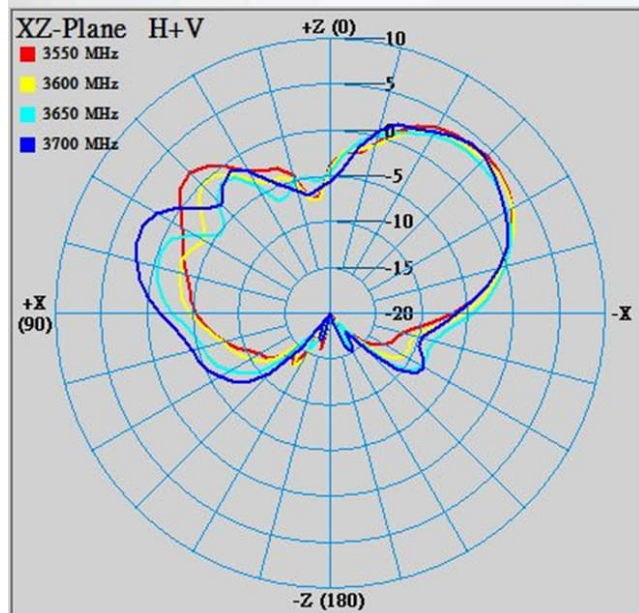
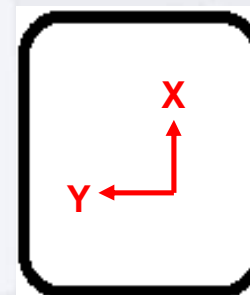
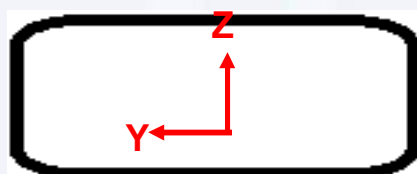
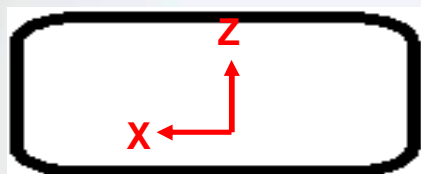
2D Radiation Pattern Results (Antenna → Network Analyzer)

Ant3 : 3550-3700 MHz



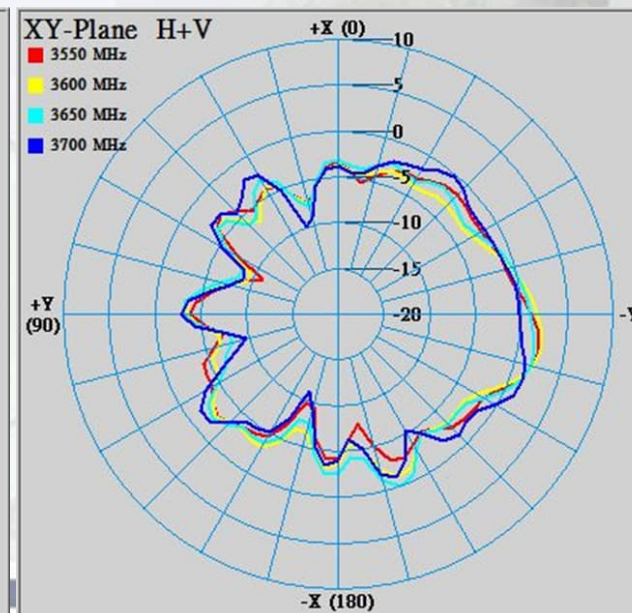
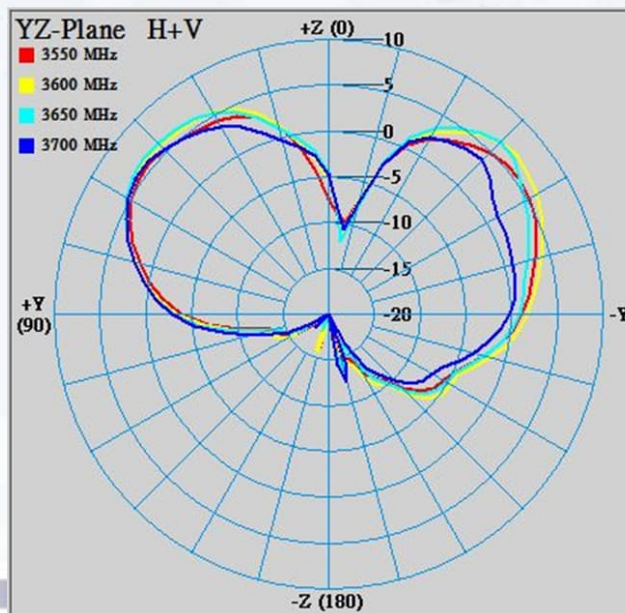
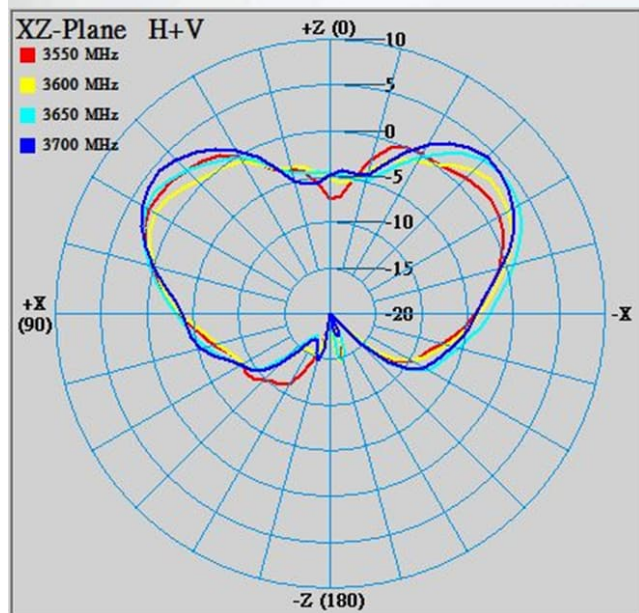
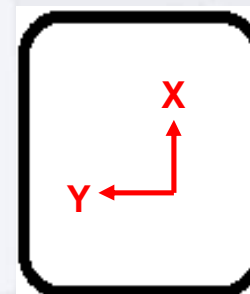
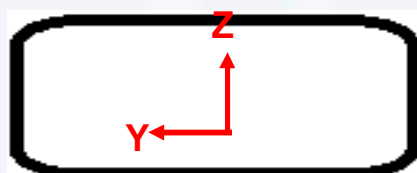
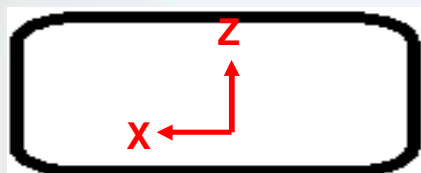
2D Radiation Pattern Results (Antenna → Network Analyzer)

Ant4 : 3550-3700 MHz



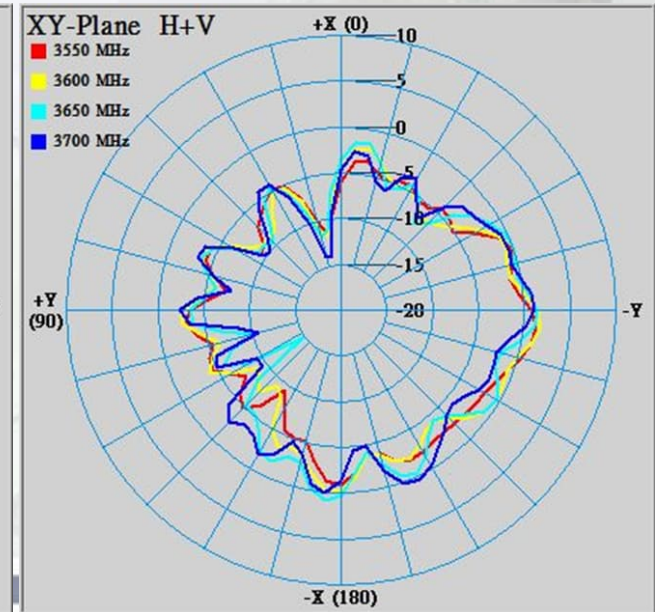
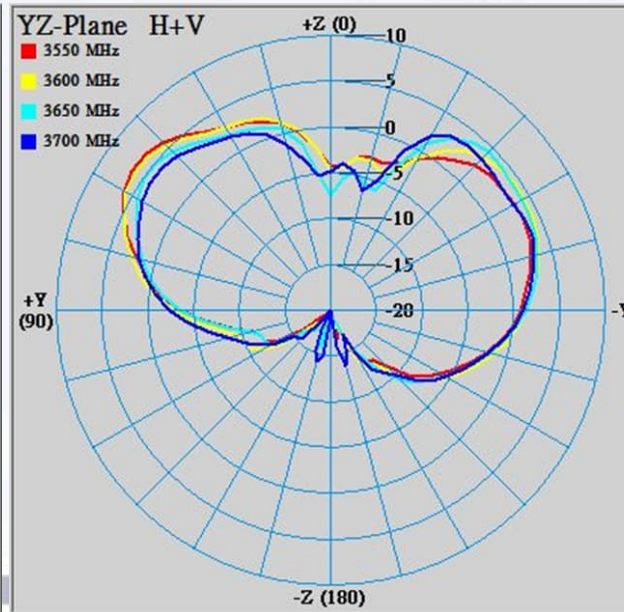
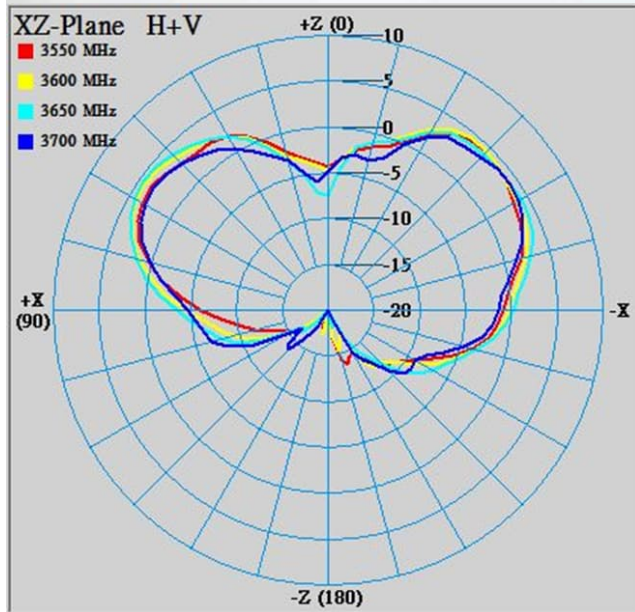
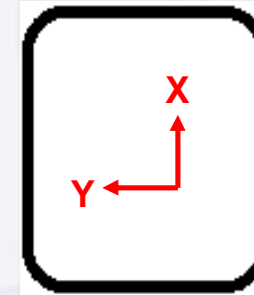
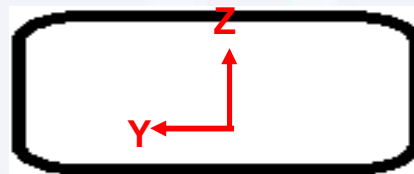
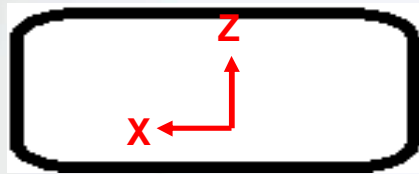
2D Radiation Pattern Results (Antenna → Network Analyzer)

Ant5 : 3550-3700 MHz



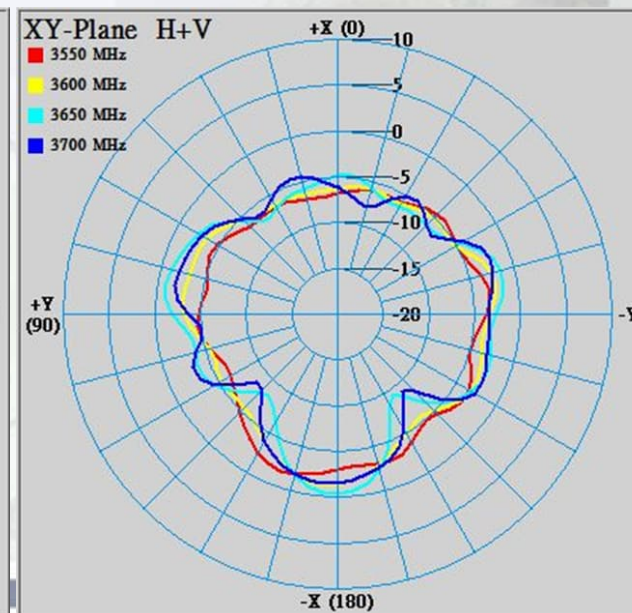
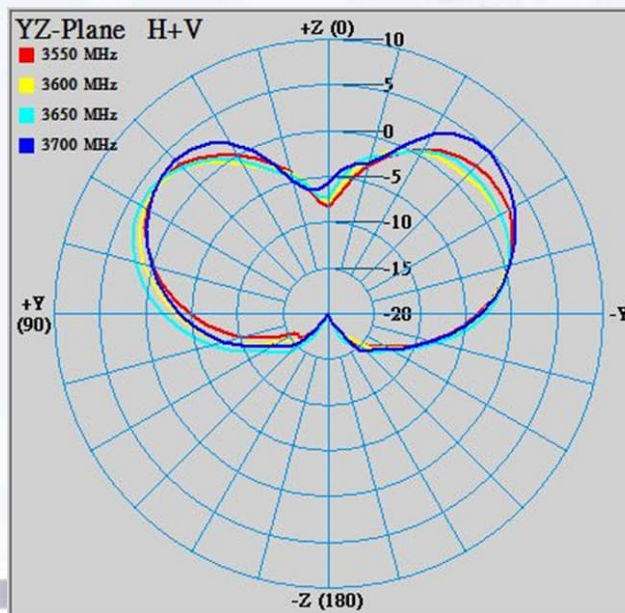
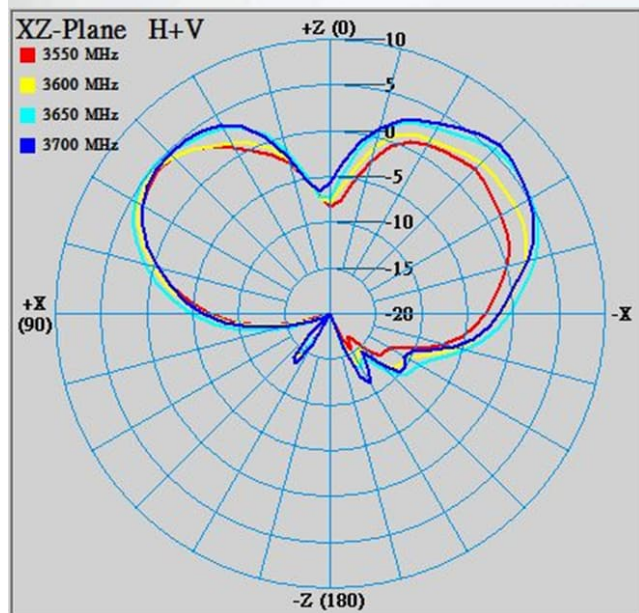
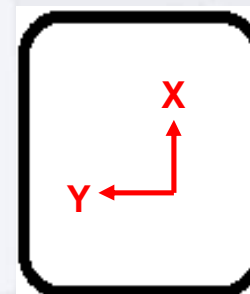
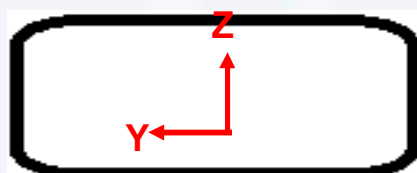
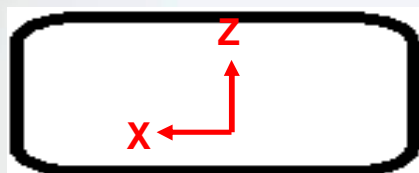
2D Radiation Pattern Results (Antenna → Network Analyzer)

Ant6 : 3550-3700 MHz



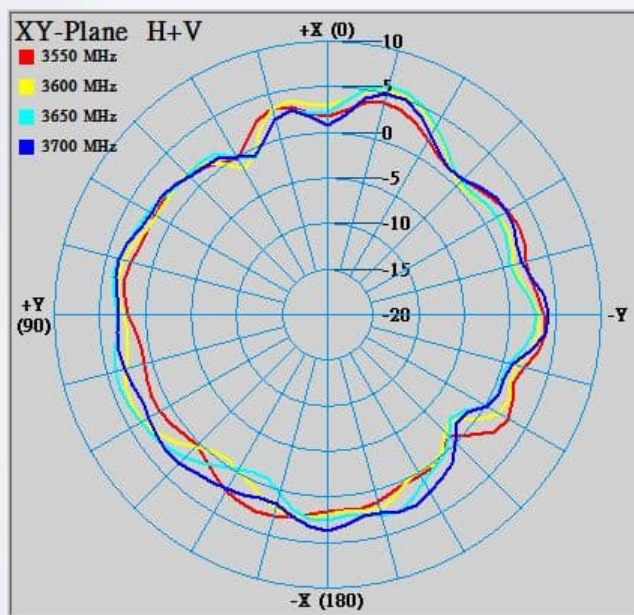
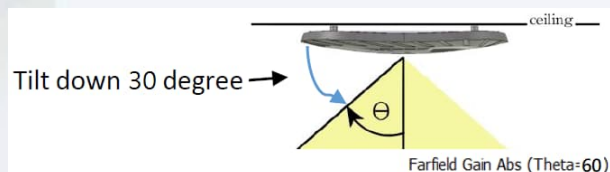
2D Radiation Pattern Results (Antenna → Network Analyzer)

Ant7 : 3550-3700 MHz



2D Radiation Pattern Results (Antenna → Network Analyzer)

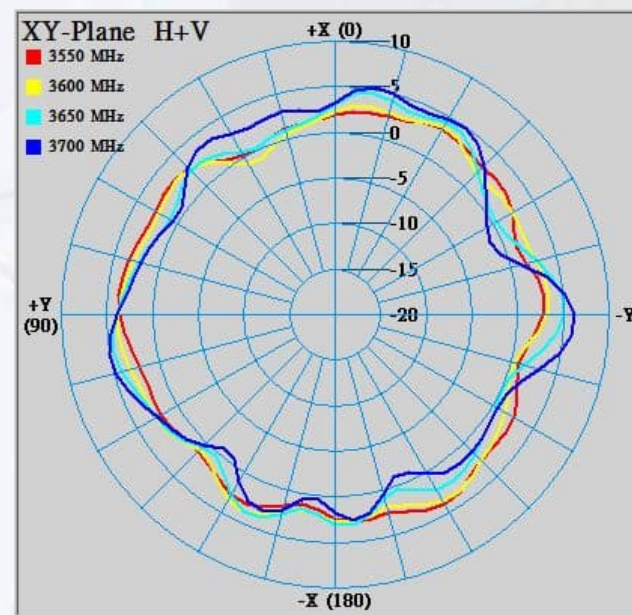
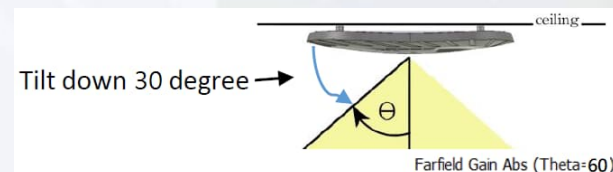
Port1



Theta=60deg

	Peak gain(dBi)
3550	4.08
3600	5.46
3650	5.9
3700	5.08

Port2

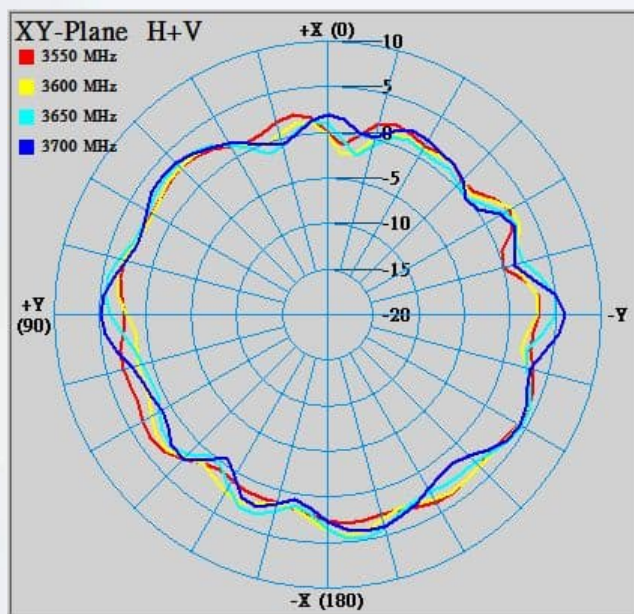
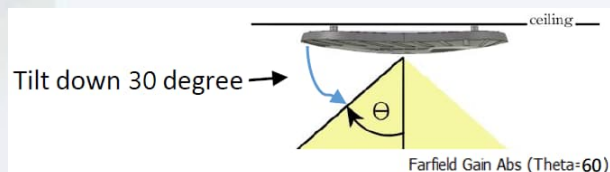


Theta=60deg

	Peak gain(dBi)
3550	4.06
3600	3.85
3650	5.03
3700	6.18

2D Radiation Pattern Results (Antenna → Network Analyzer)

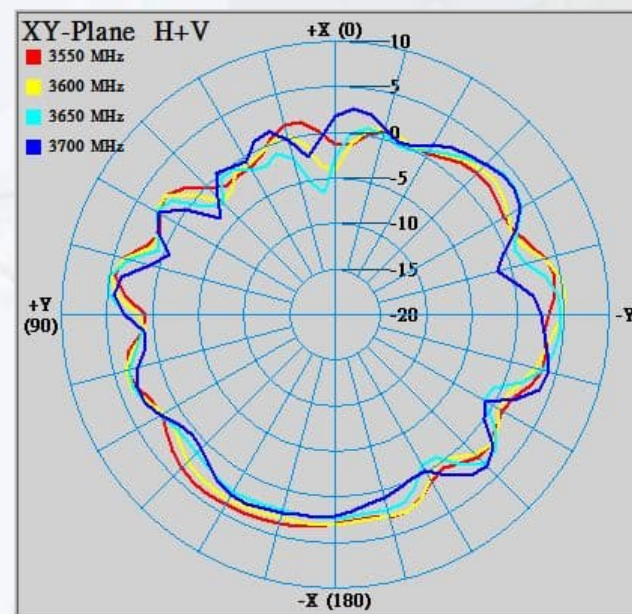
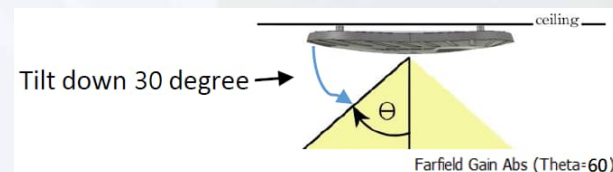
Port3



Theta=60deg

	Peak gain(dBi)
3550	4.35
3600	4.3
3650	5.06
3700	6

Port4

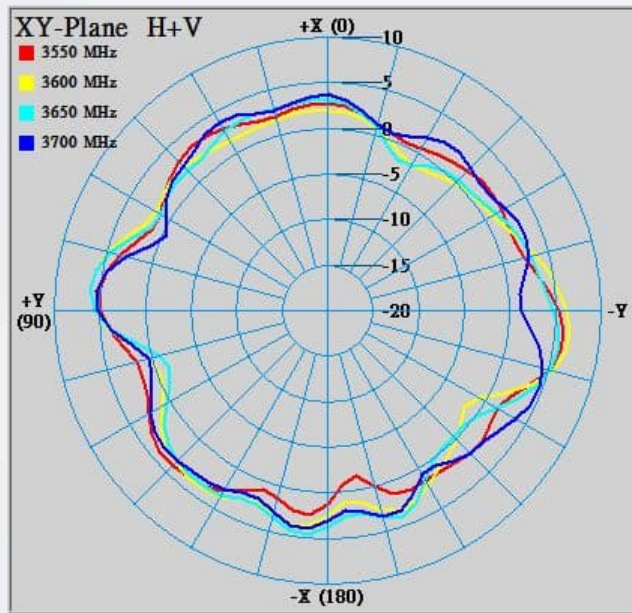
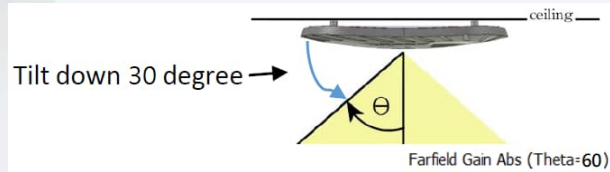


Theta=60deg

	Peak gain(dBi)
3550	4.44
3600	5.34
3650	5.08
3700	4.36

2D Radiation Pattern Results (Antenna → Network Analyzer)

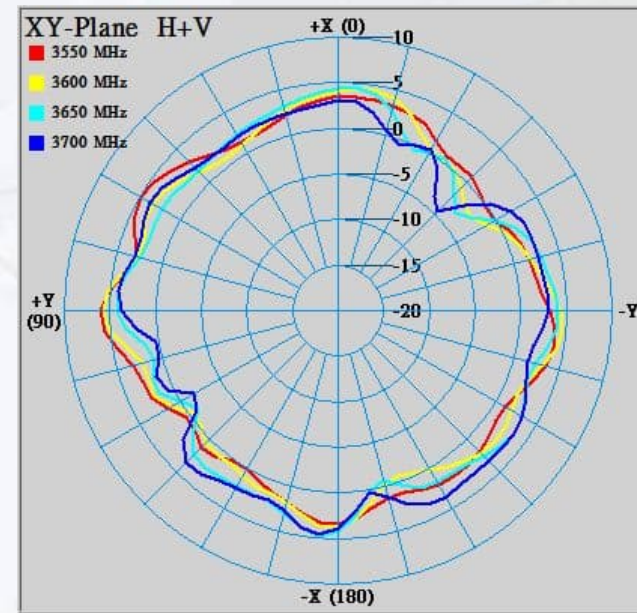
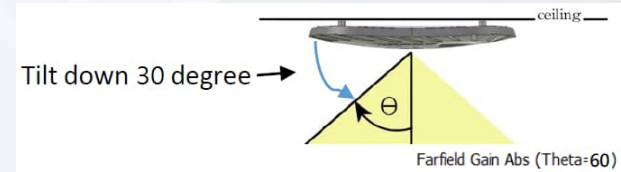
Port5



Theta=60deg

	Peak gain(dBi)
3550	6
3600	6.59
3650	6.13
3700	5.46

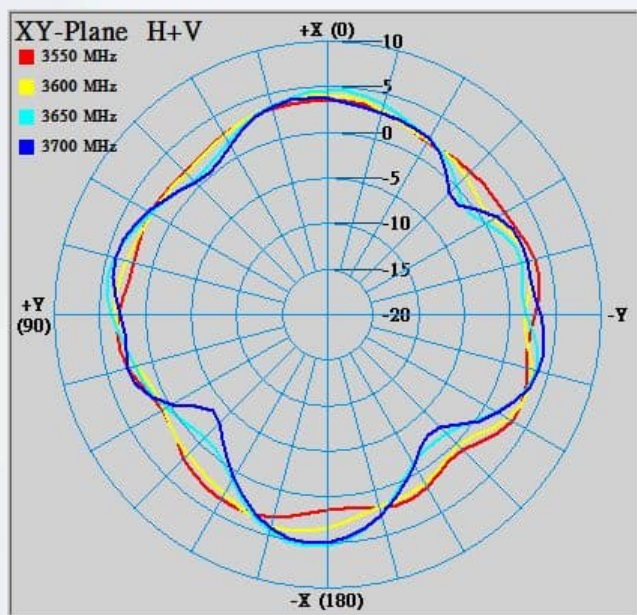
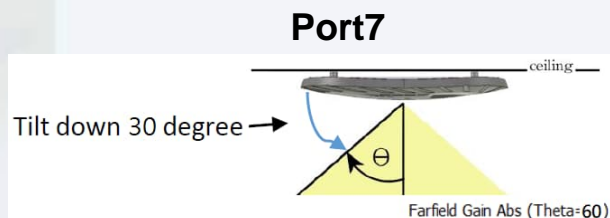
Port6



Theta=60deg

	Peak gain(dBi)
3550	5.98
3600	5.79
3650	4.75
3700	4.66

2D Radiation Pattern Results (Antenna → Network Analyzer)

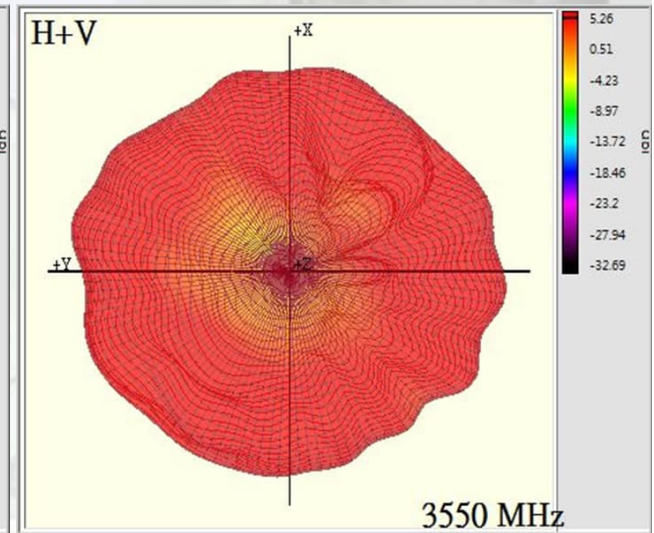
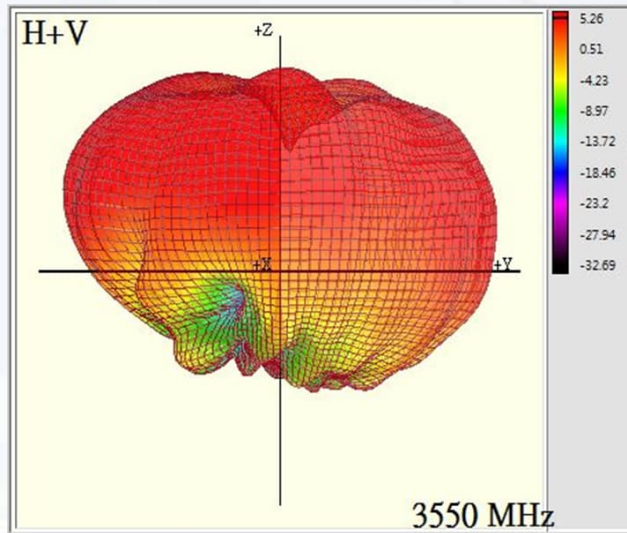
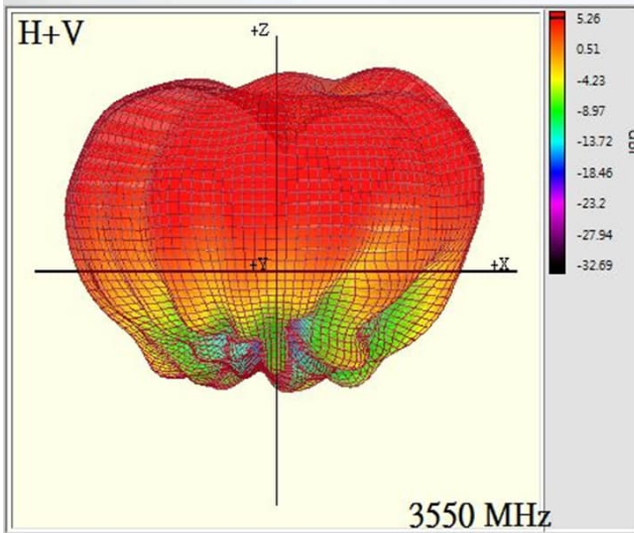
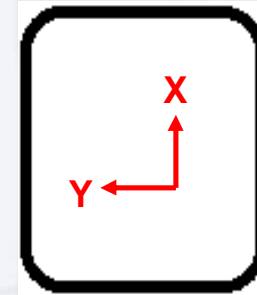
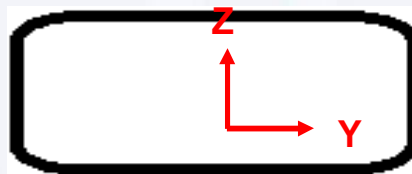
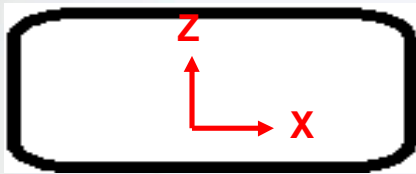


Theta=60deg

	Peak gain(dBi)
3550	3.61
3600	4.13
3650	5.5
3700	5.23

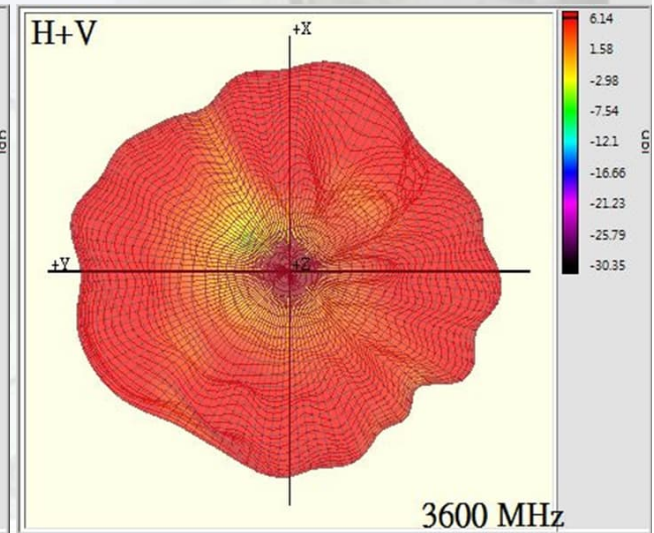
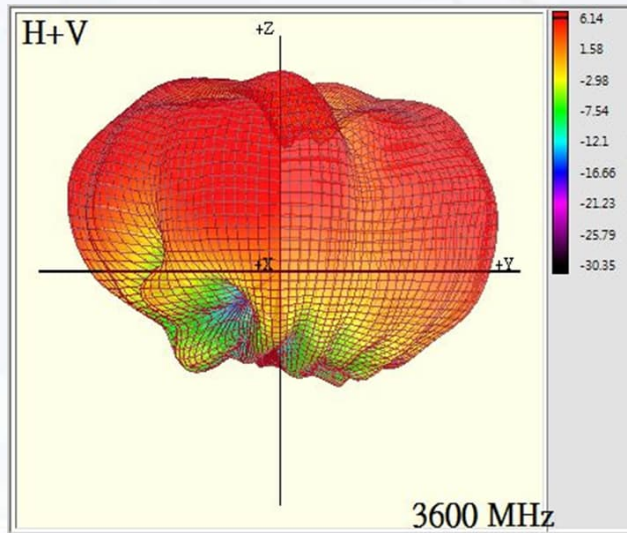
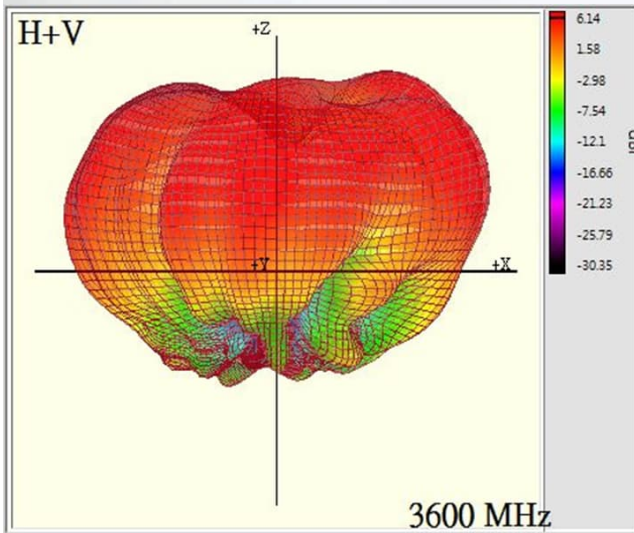
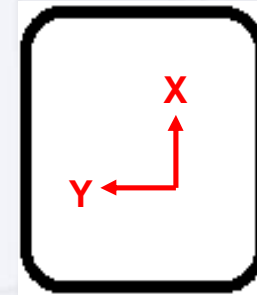
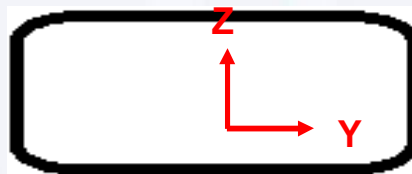
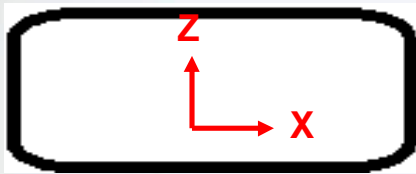
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant1 : 3550MHz



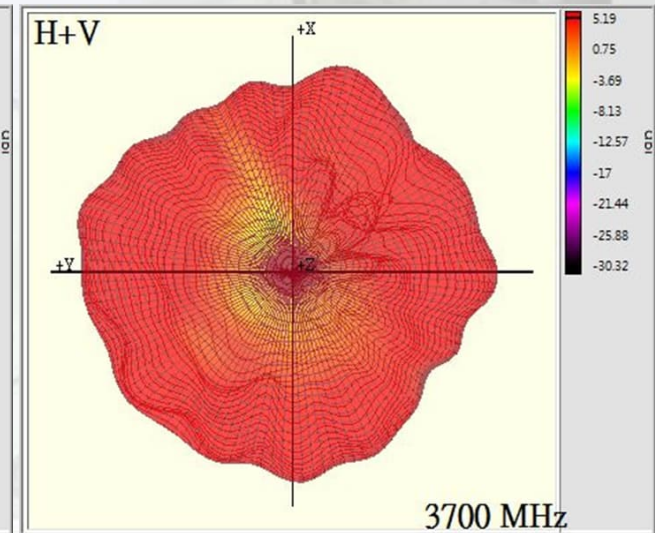
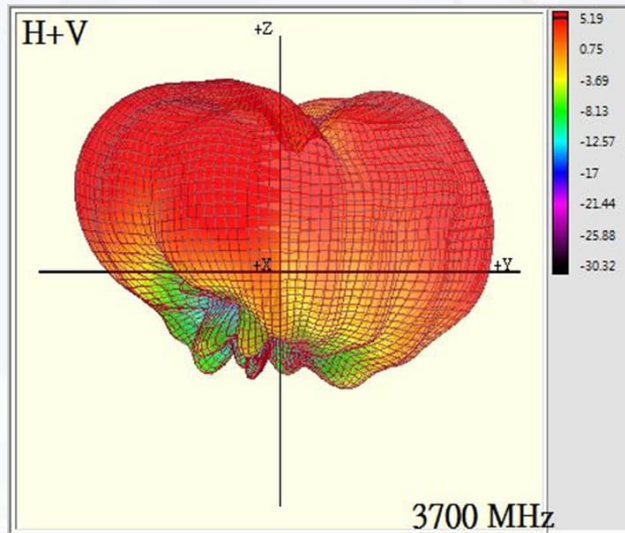
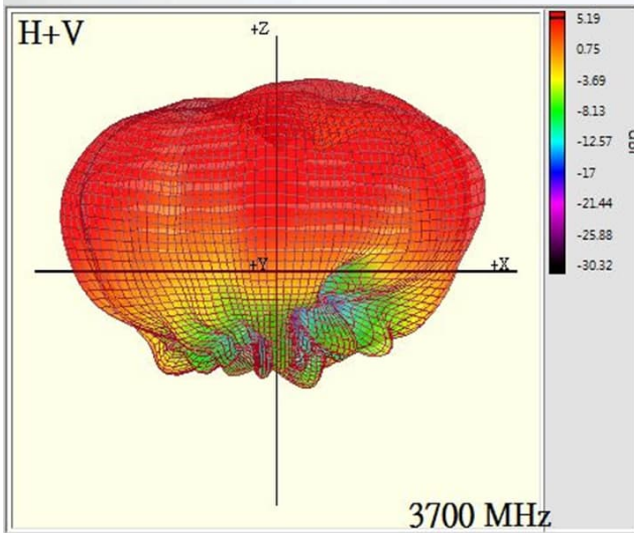
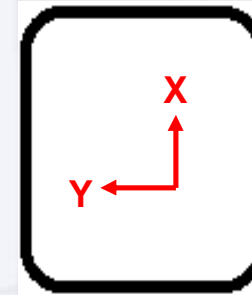
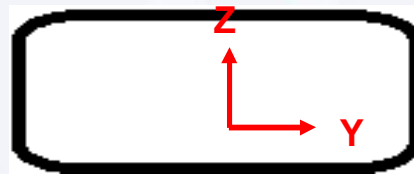
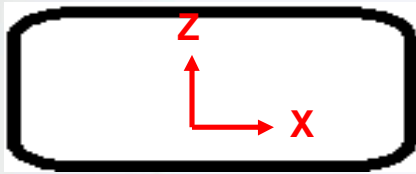
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant1 : 3600MHz



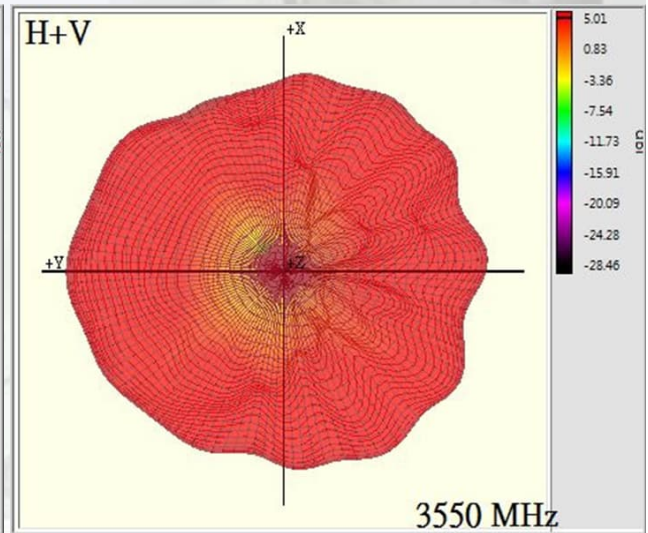
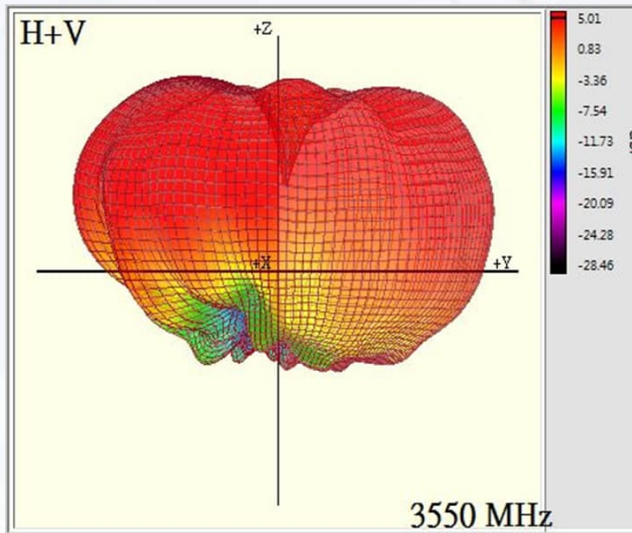
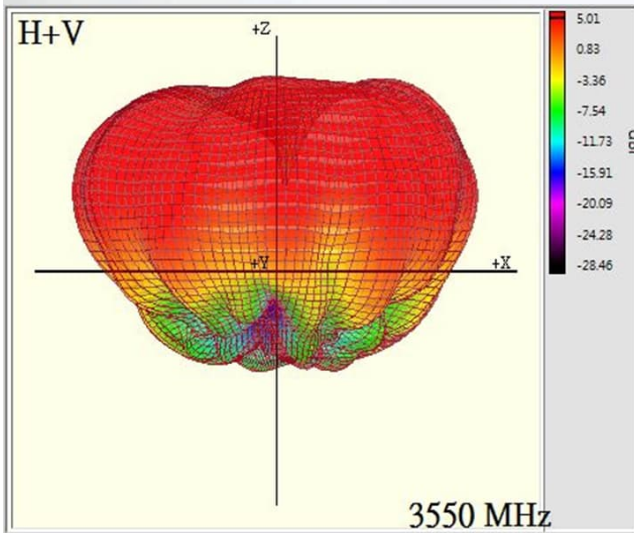
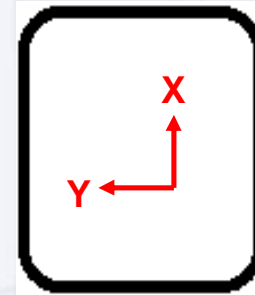
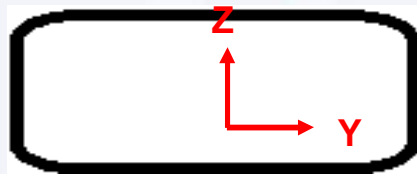
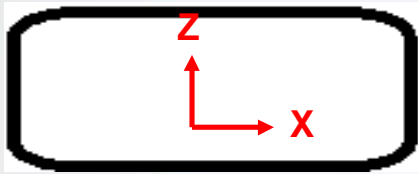
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant1 : 3700MHz



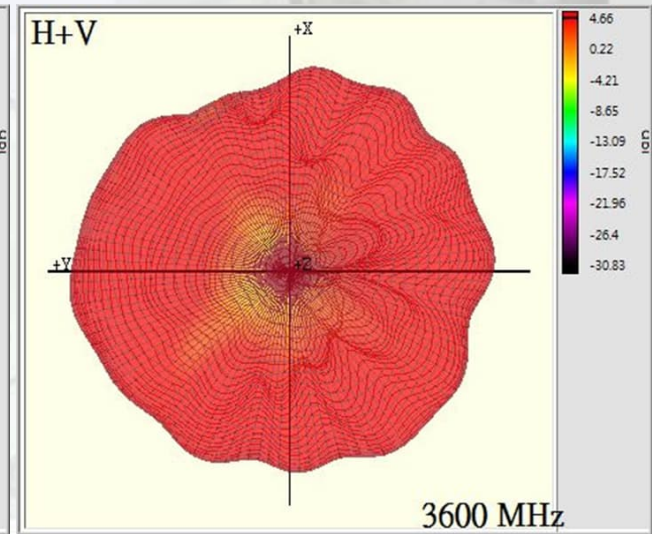
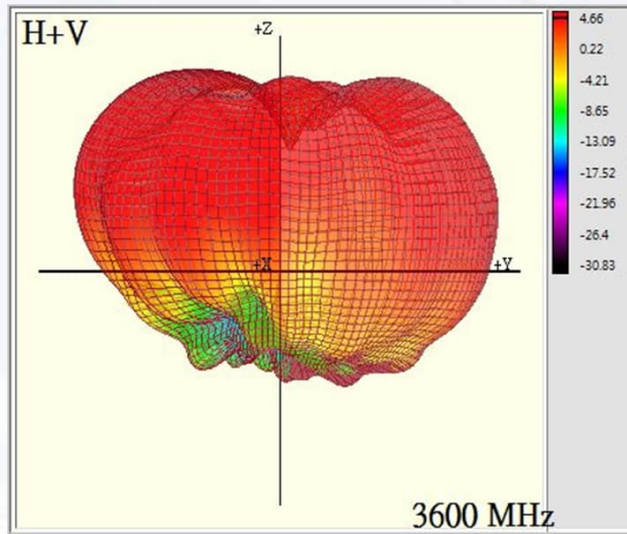
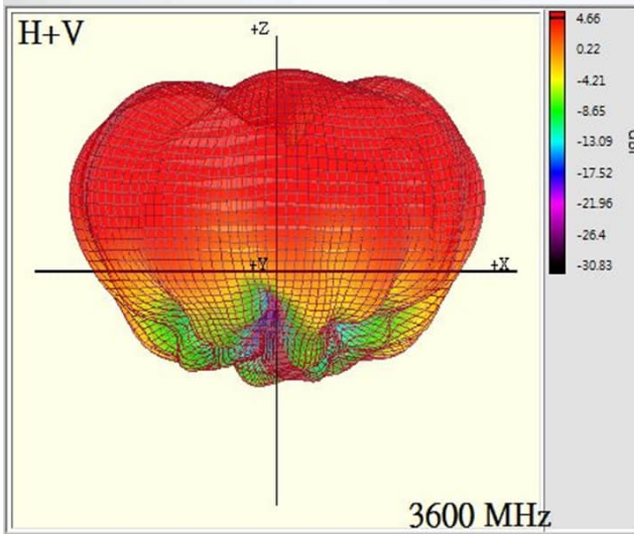
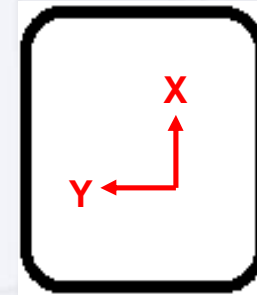
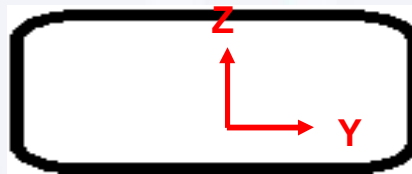
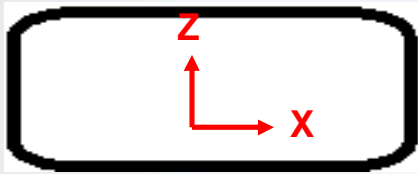
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant2 : 3550MHz



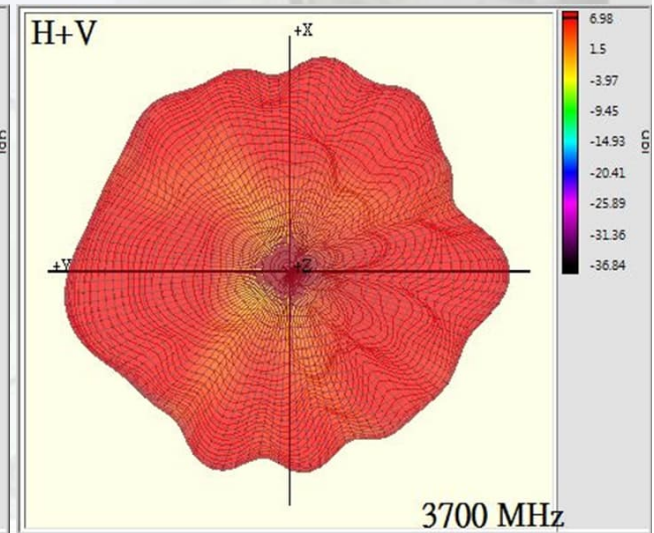
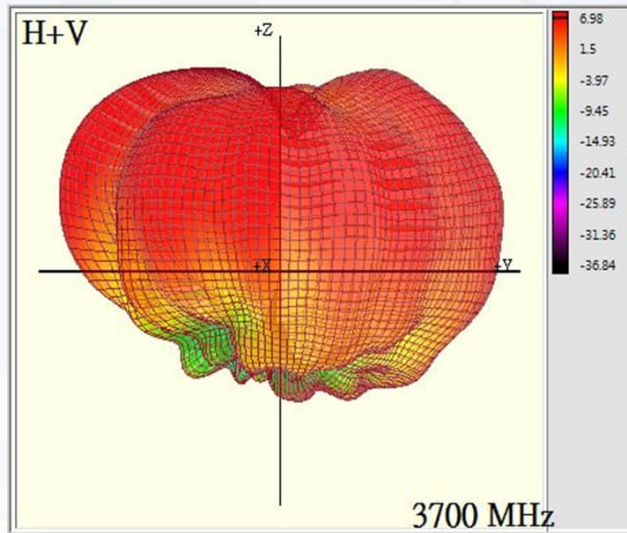
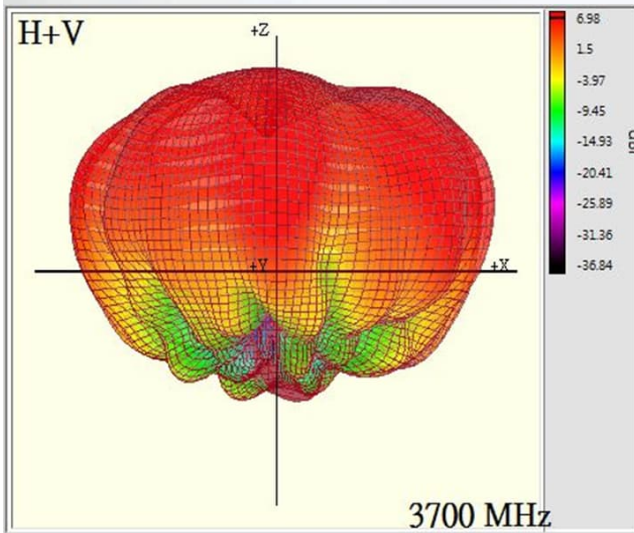
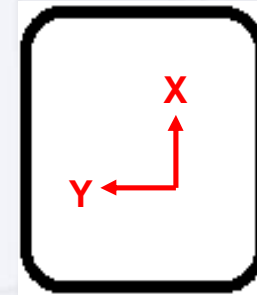
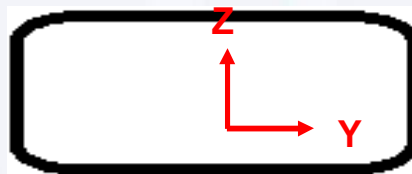
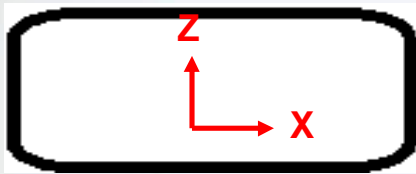
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant2 : 3600MHz



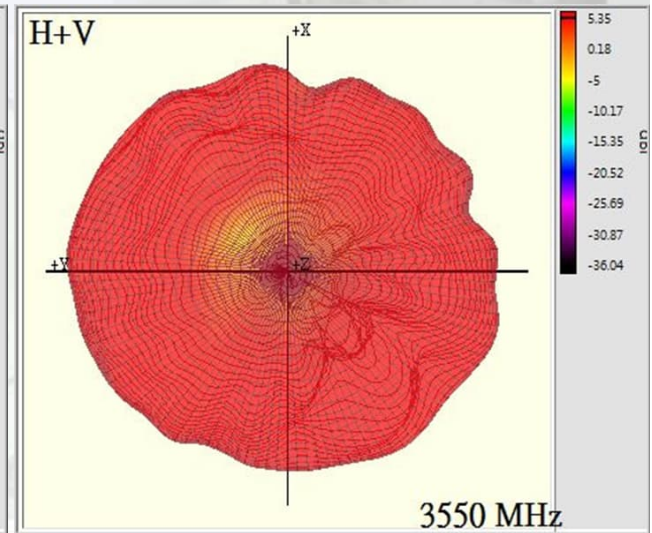
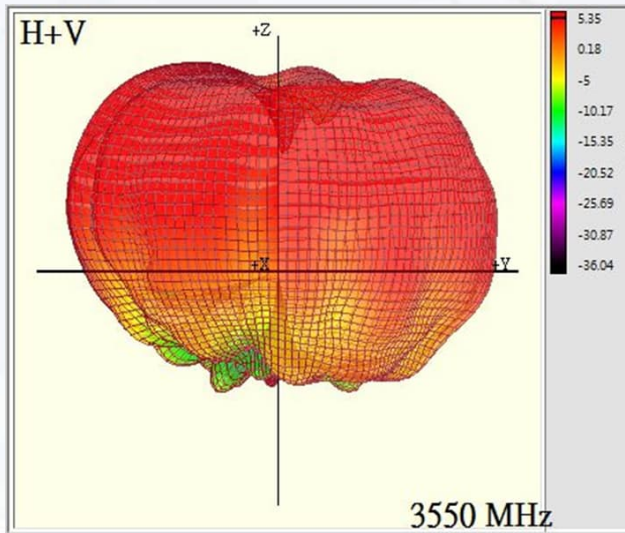
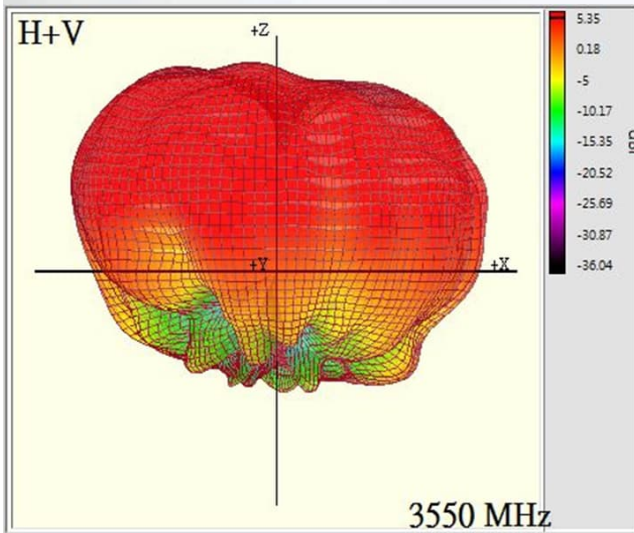
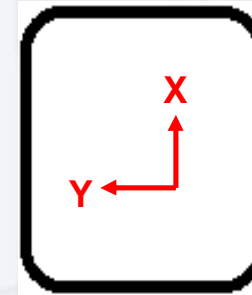
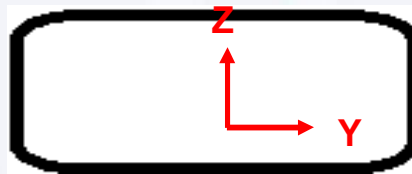
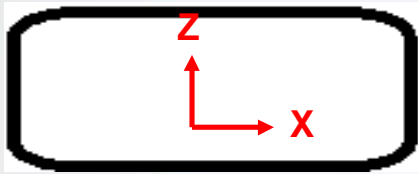
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant2 : 3700MHz



3D Radiation Pattern Results (Antenna → Network Analyzer)

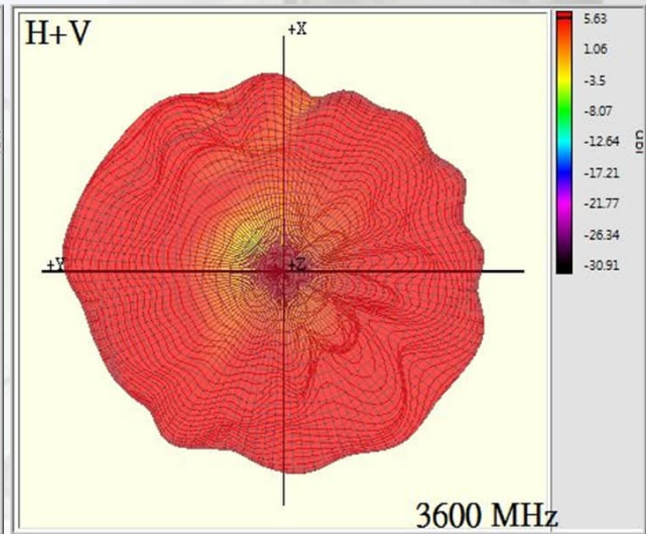
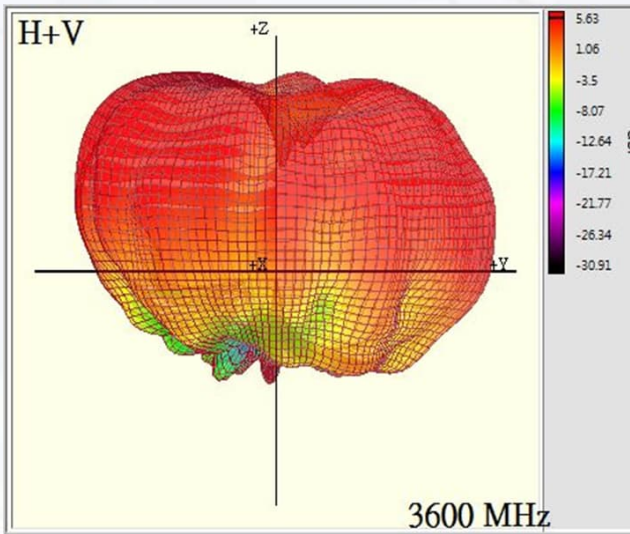
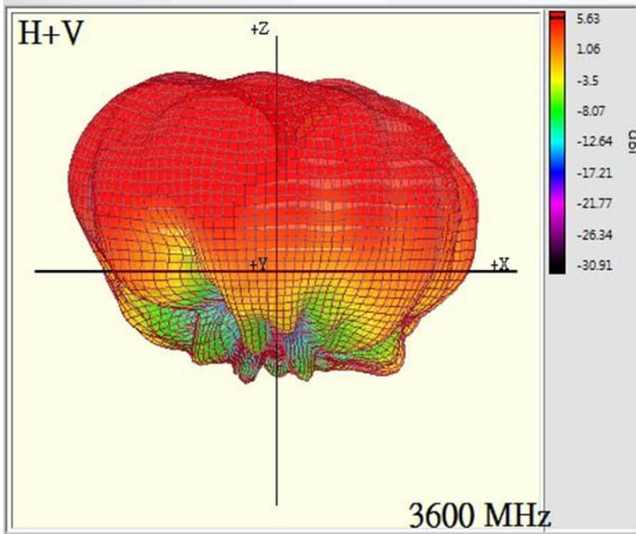
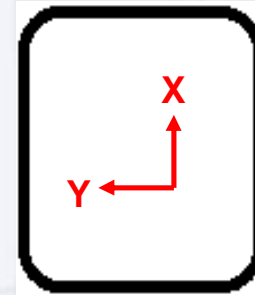
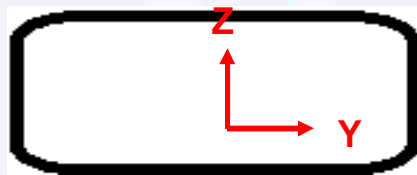
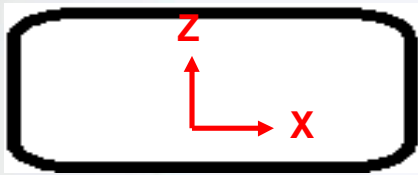
Ant3 : 3550MHz



3D Radiation Pattern Results

(Antenna → Network Analyzer)

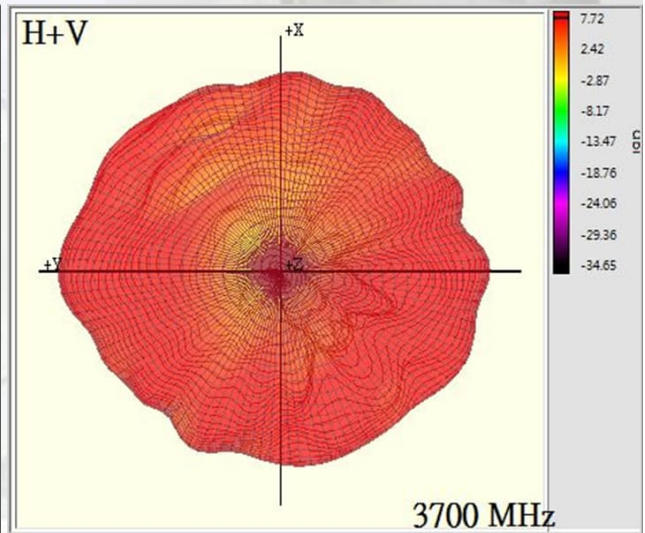
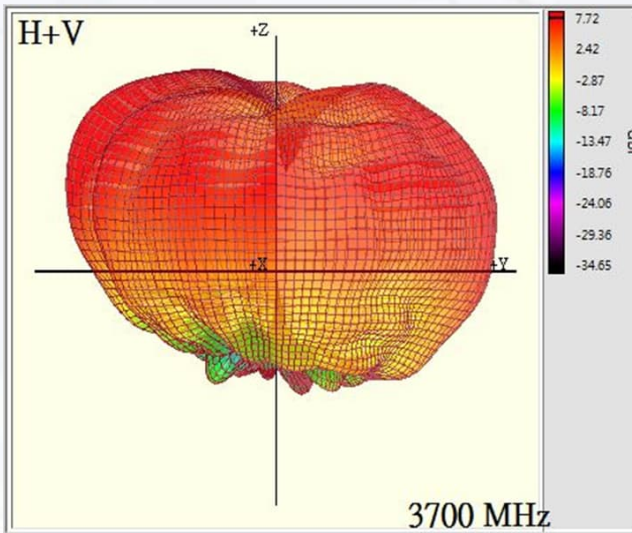
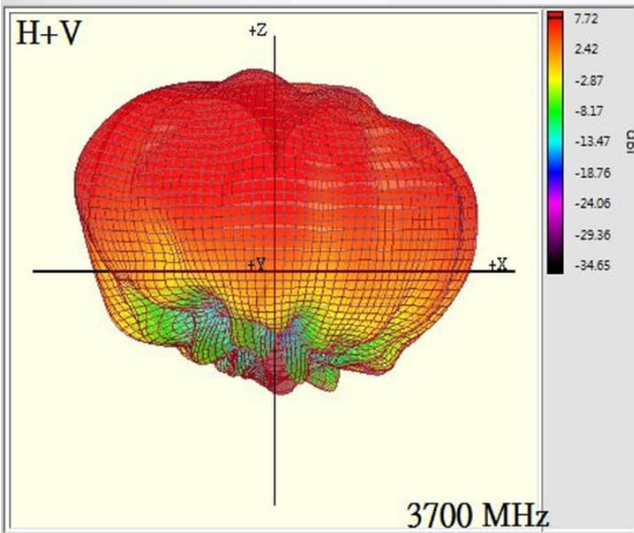
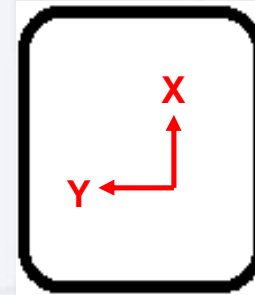
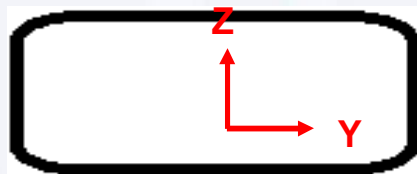
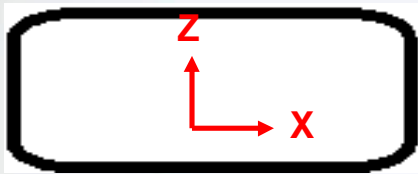
Ant3 : 3600MHz



3D Radiation Pattern Results

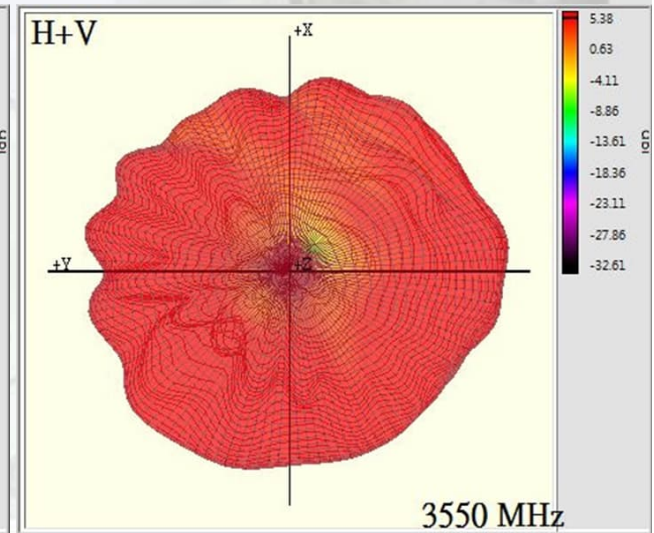
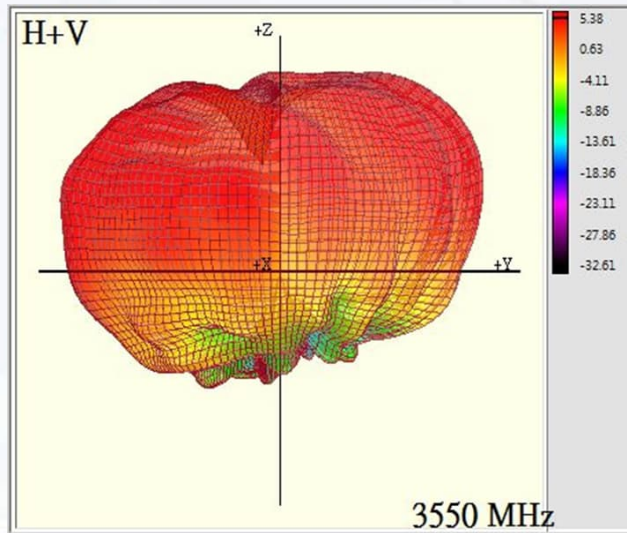
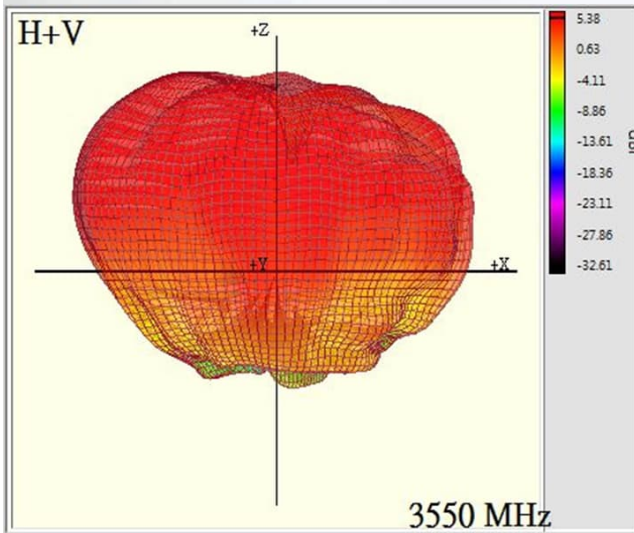
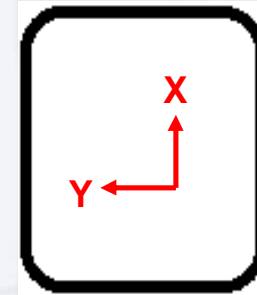
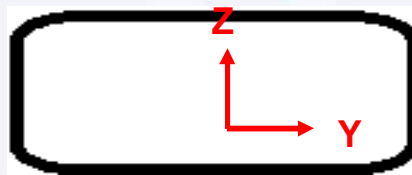
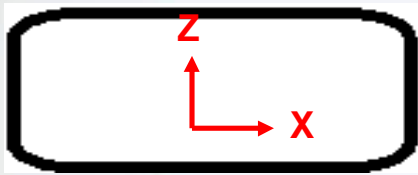
(Antenna → Network Analyzer)

Ant3 : 3700MHz



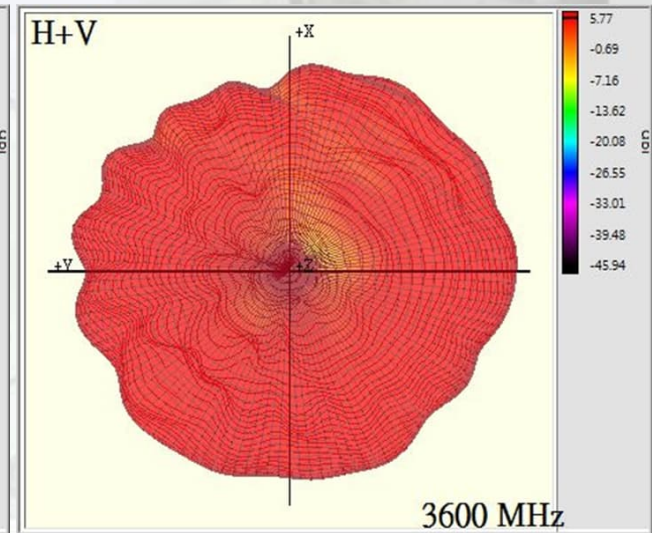
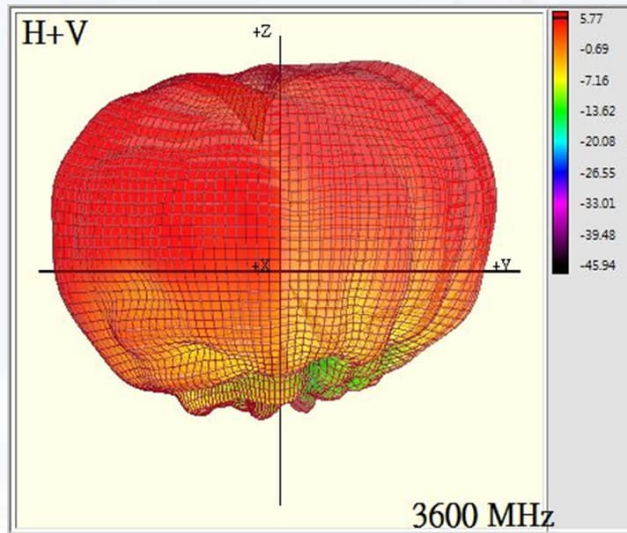
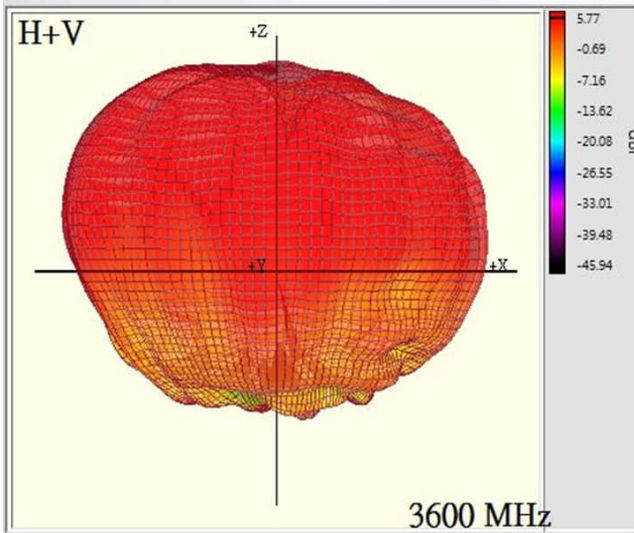
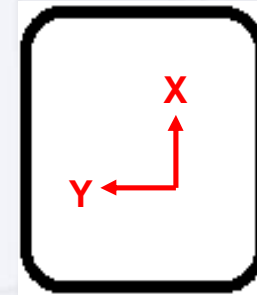
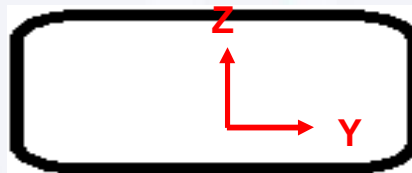
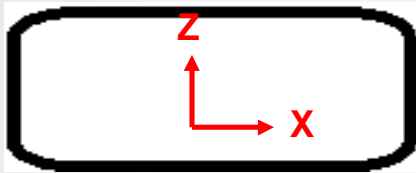
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant4 : 3550MHz



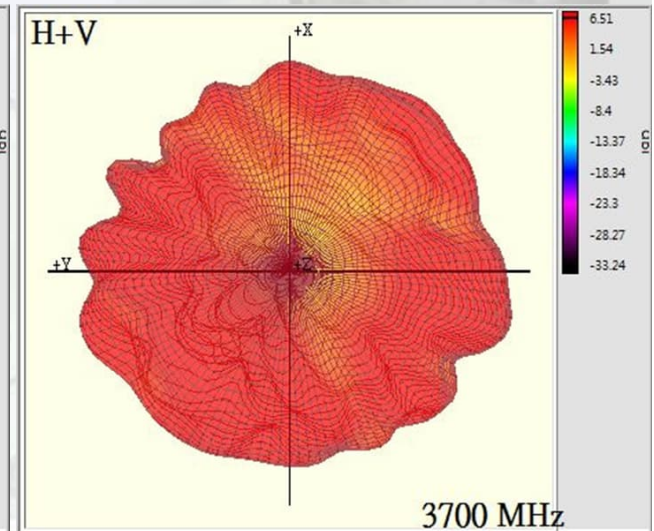
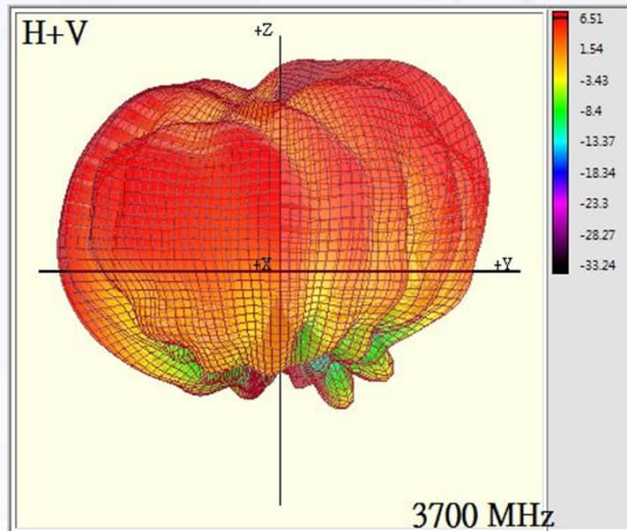
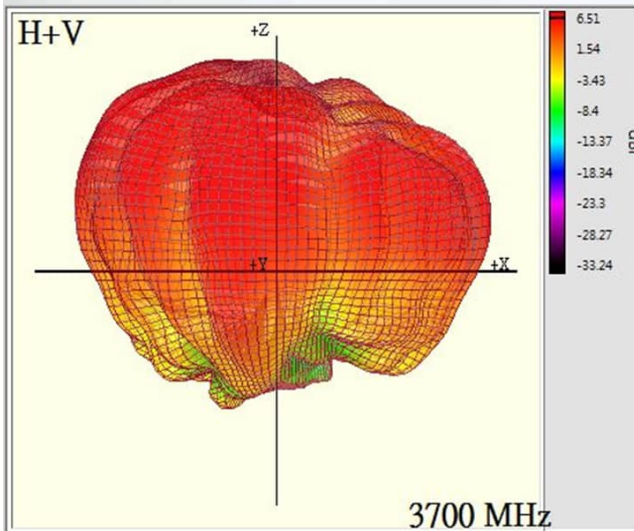
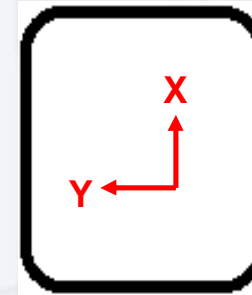
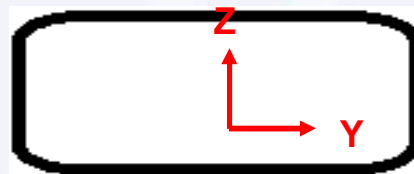
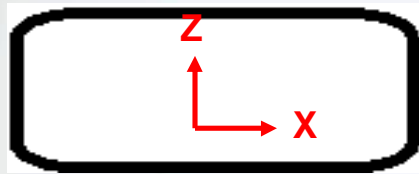
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant4 : 3600MHz



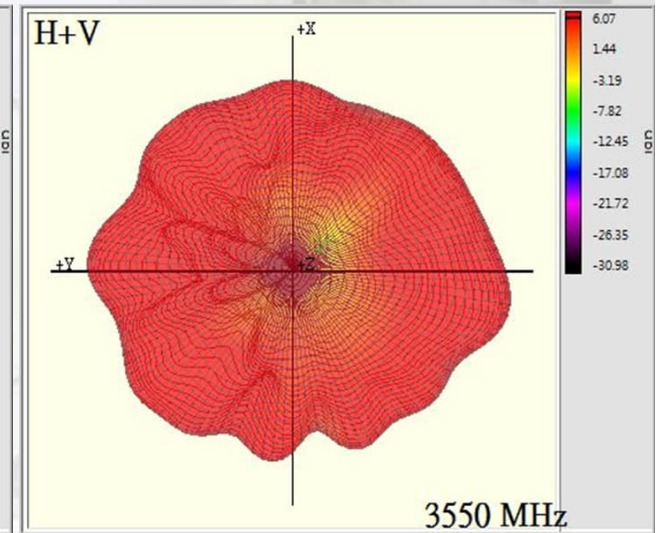
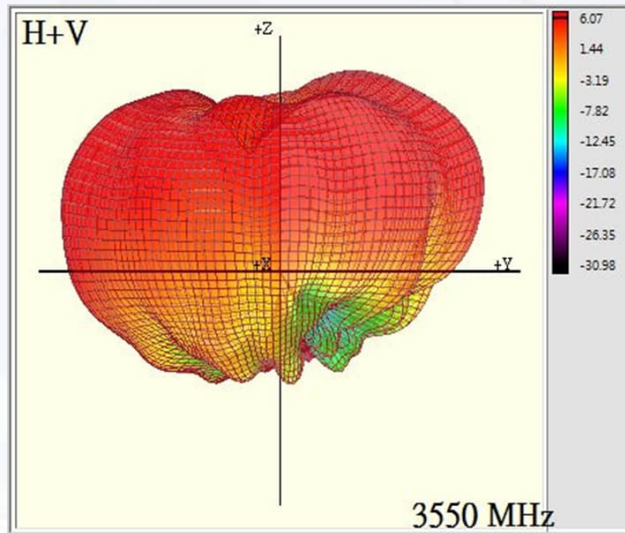
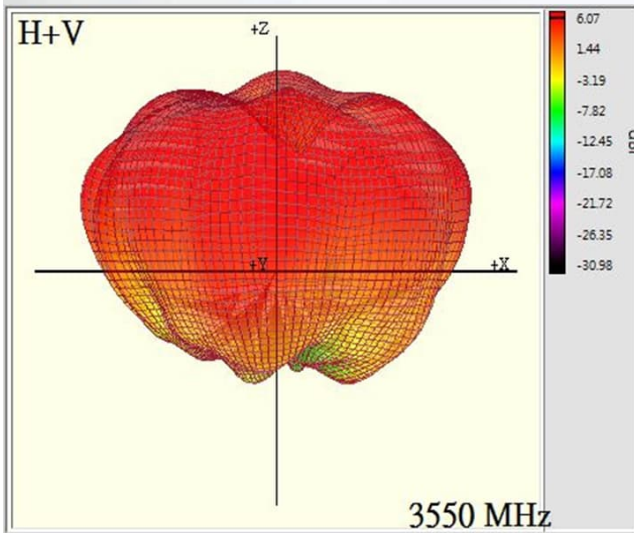
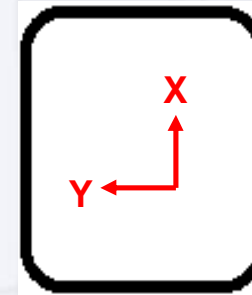
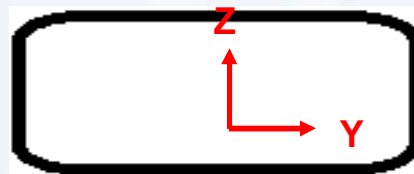
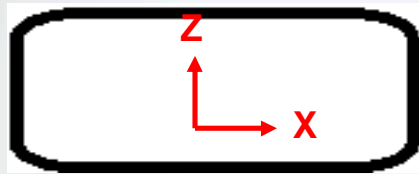
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant4 : 3700MHz



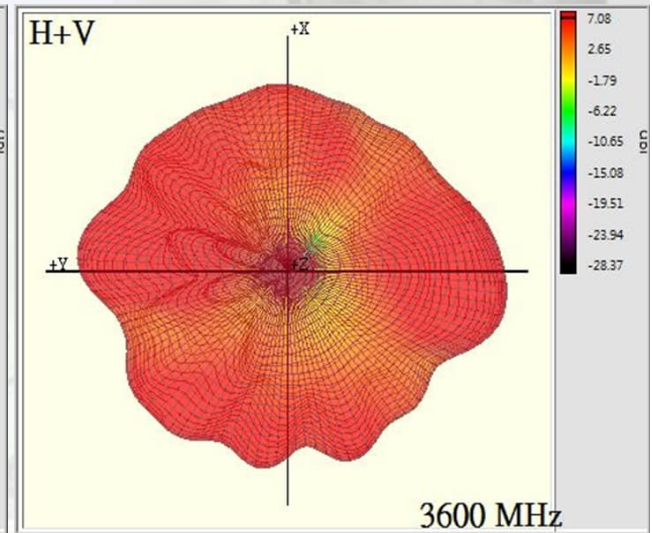
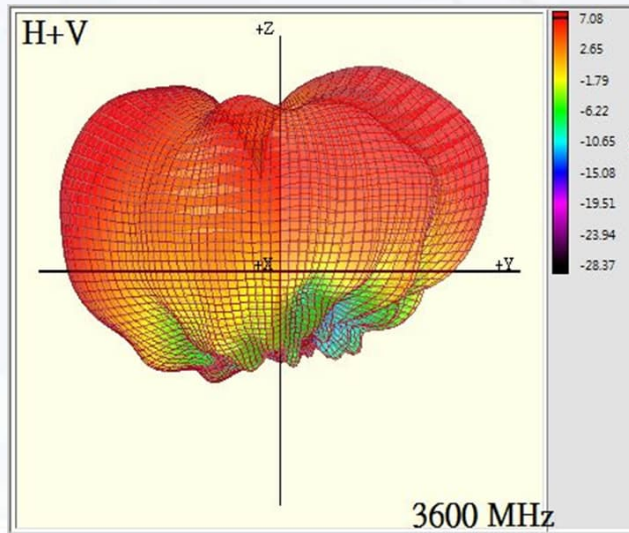
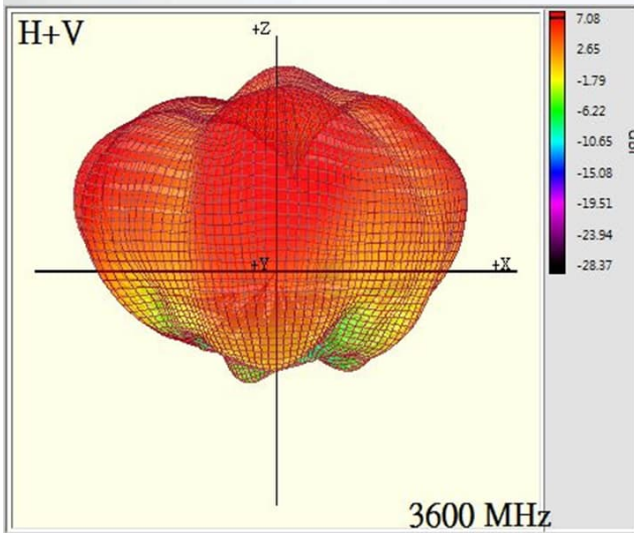
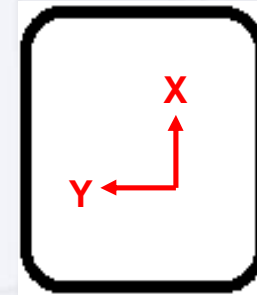
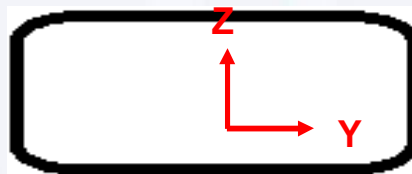
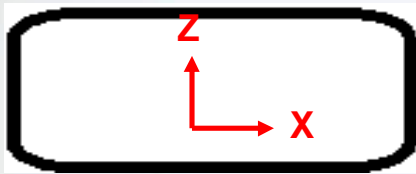
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant5 : 3550MHz



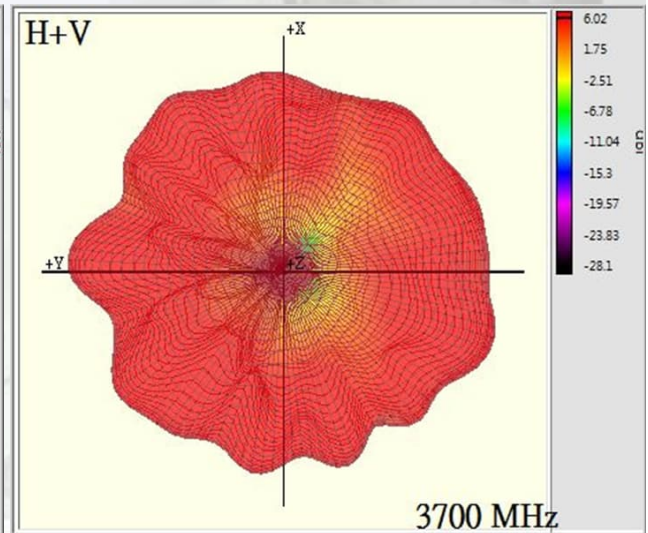
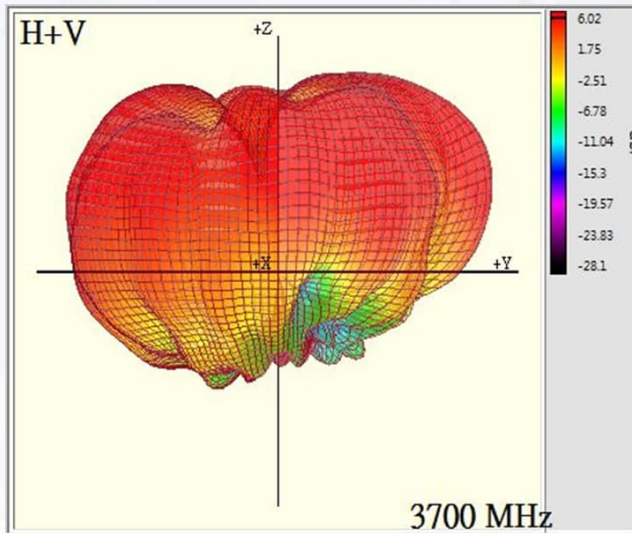
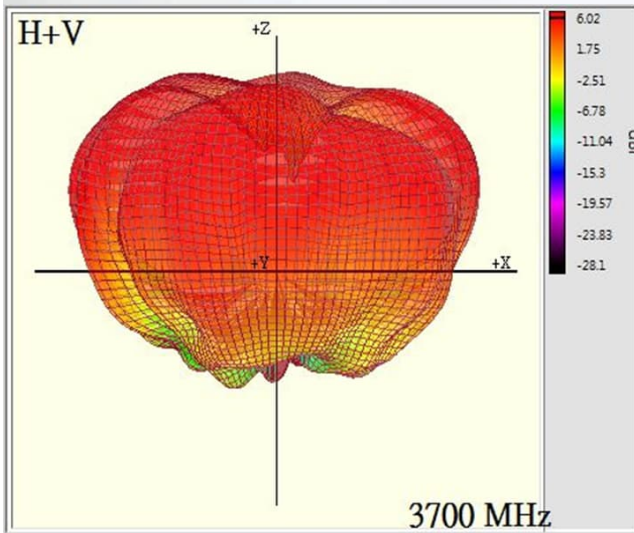
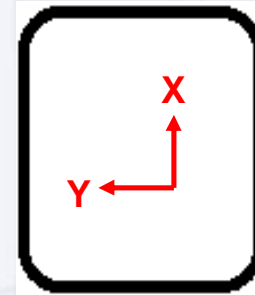
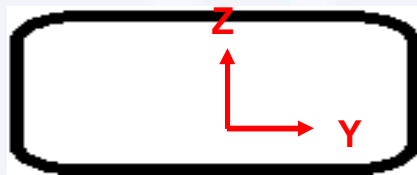
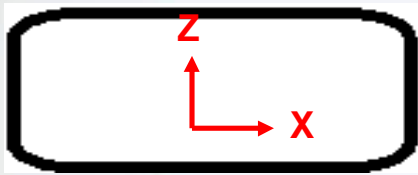
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant5 : 3600MHz



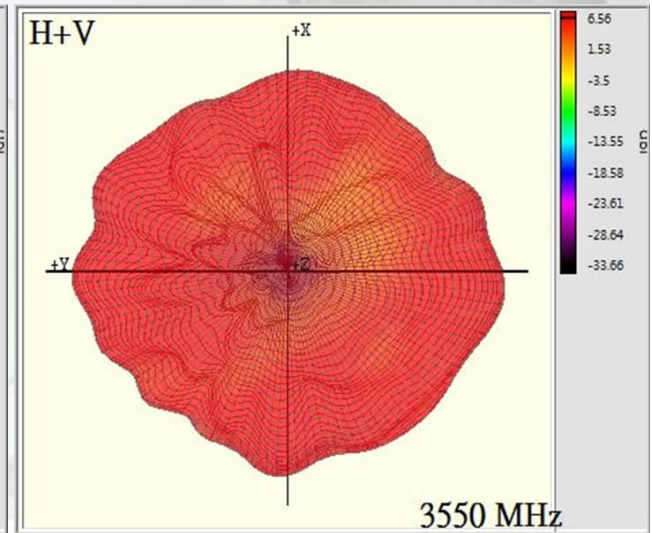
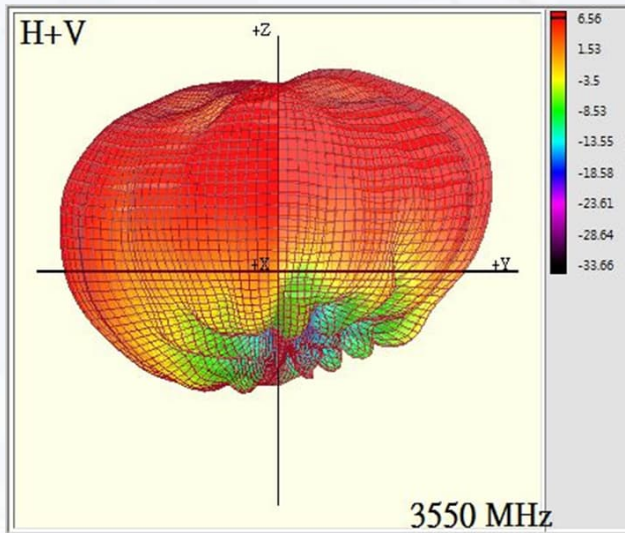
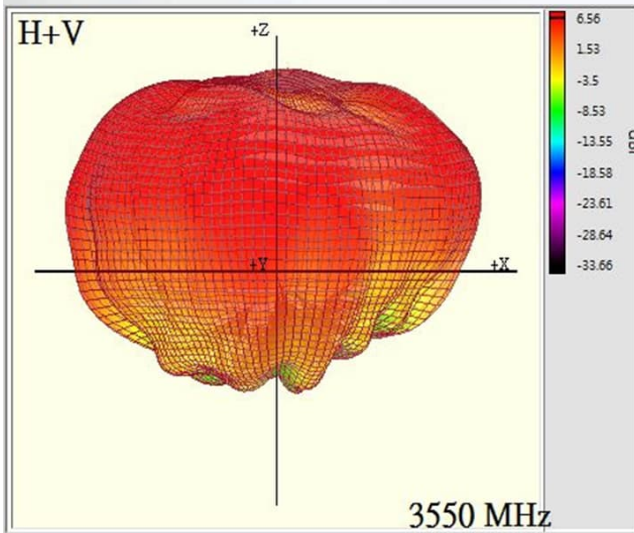
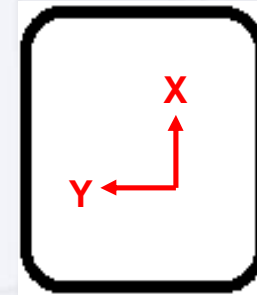
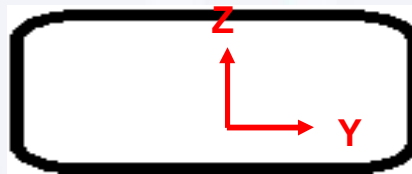
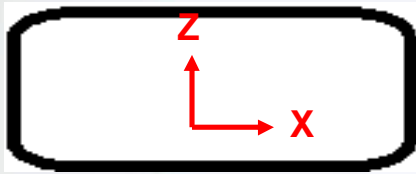
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant5 : 3700MHz



3D Radiation Pattern Results (Antenna → Network Analyzer)

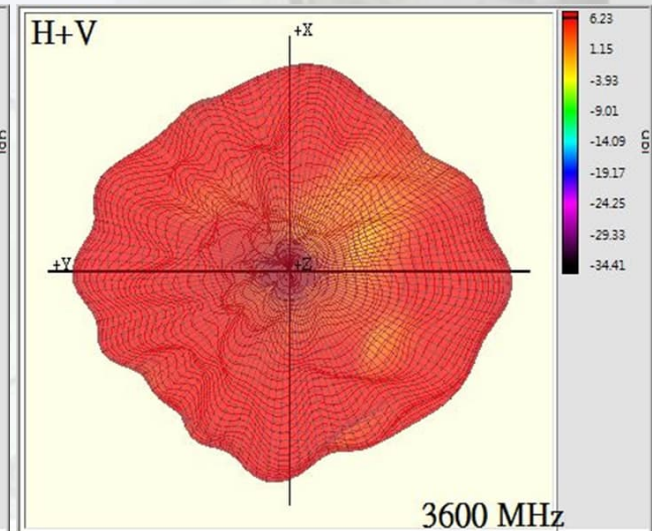
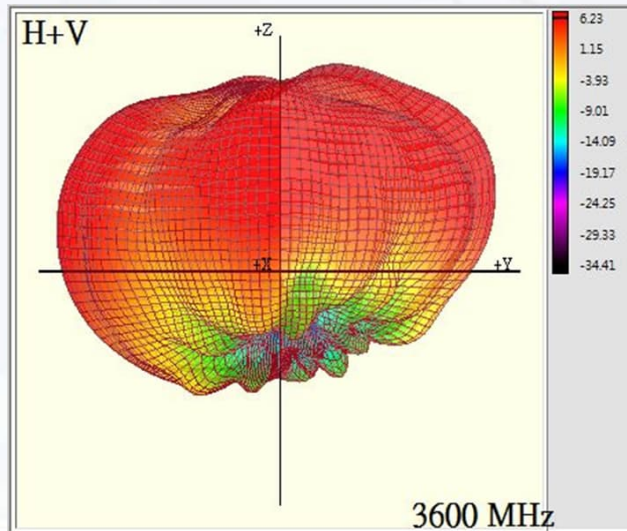
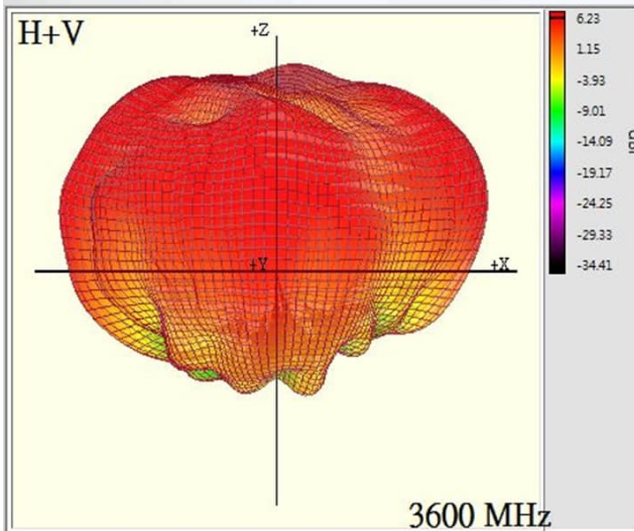
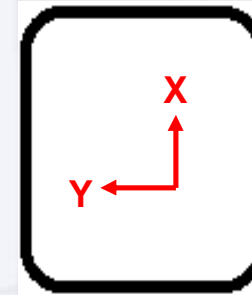
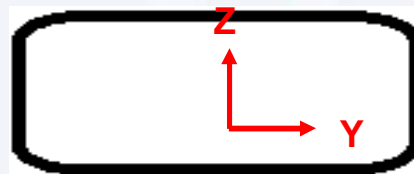
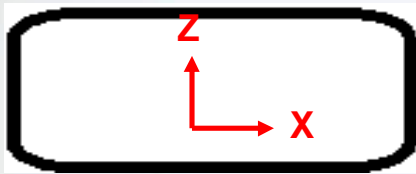
Ant6 : 3550MHz



3D Radiation Pattern Results

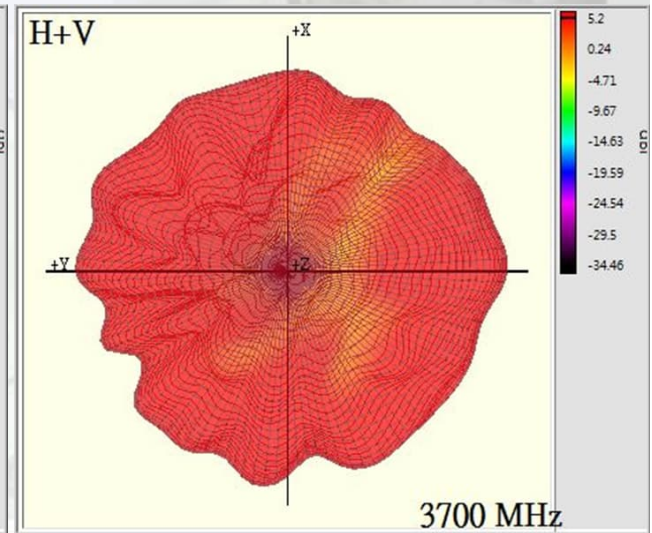
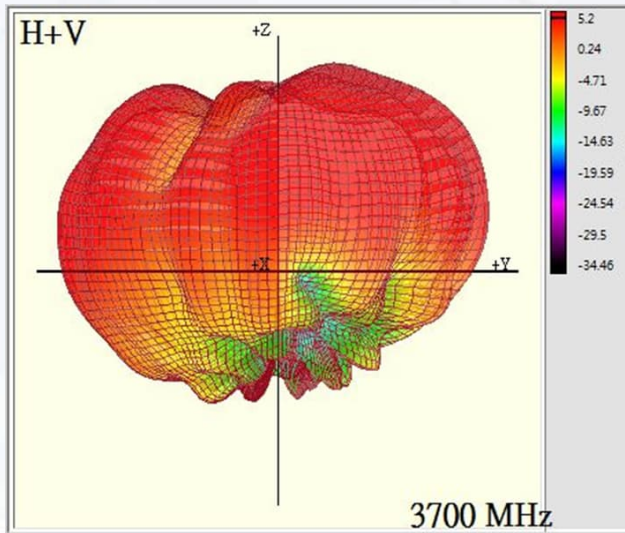
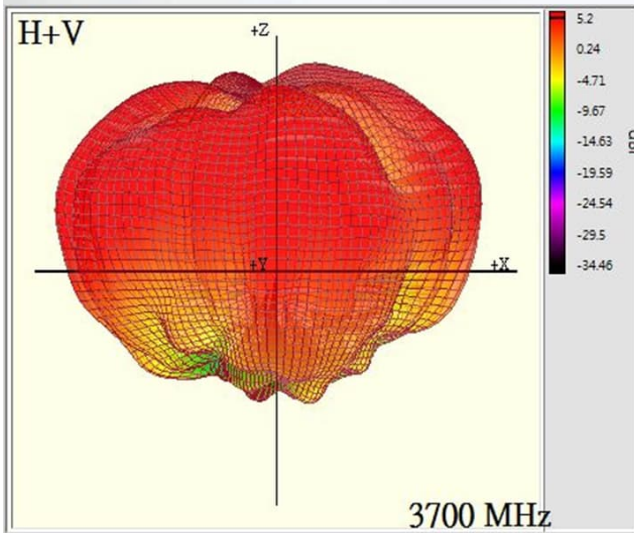
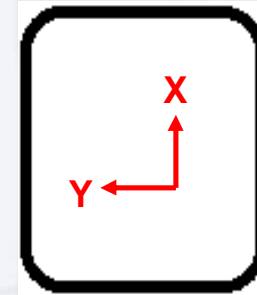
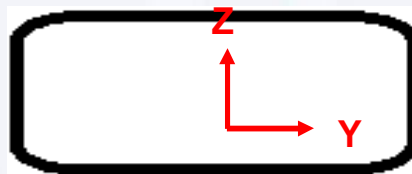
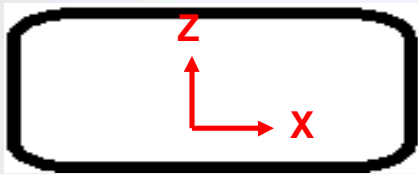
(Antenna → Network Analyzer)

Ant6 : 3600MHz



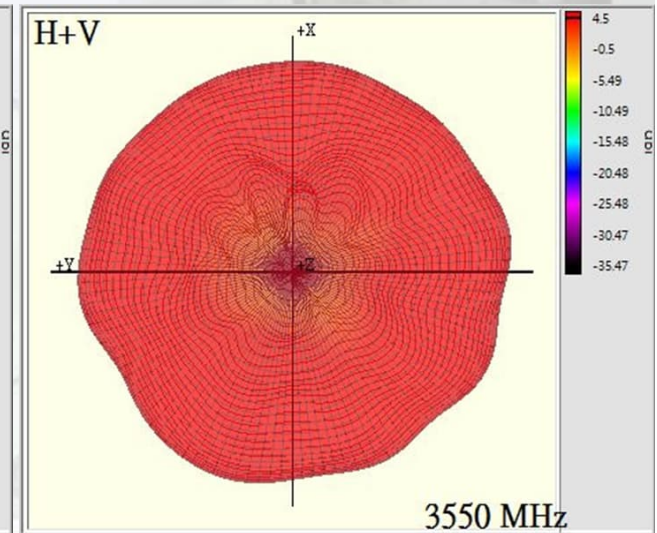
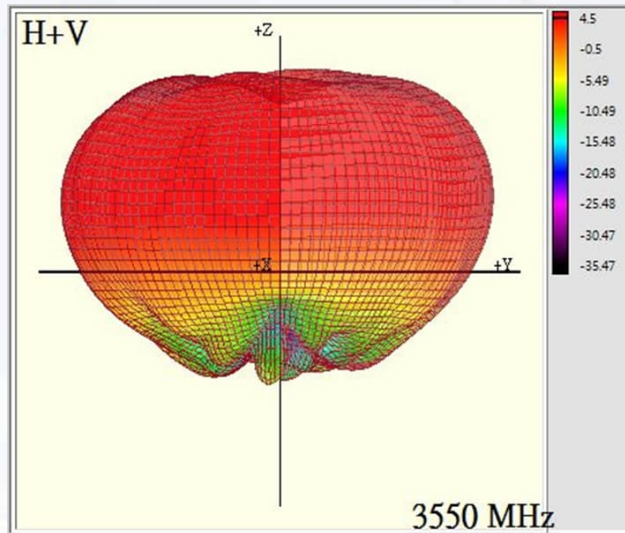
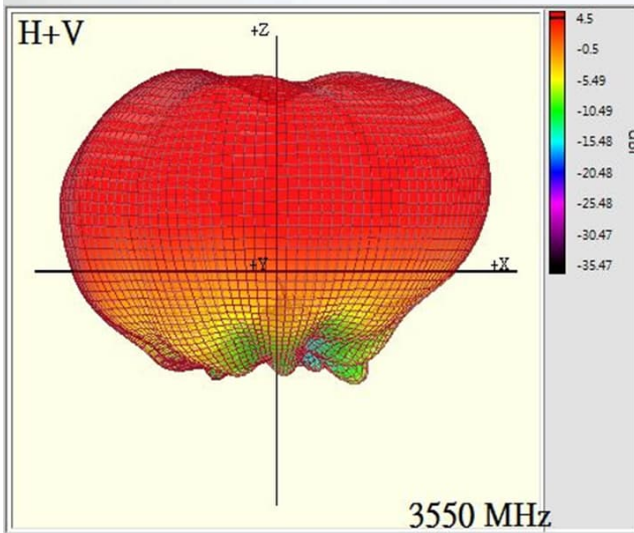
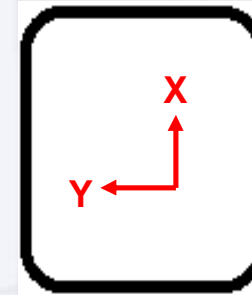
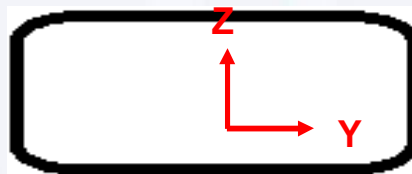
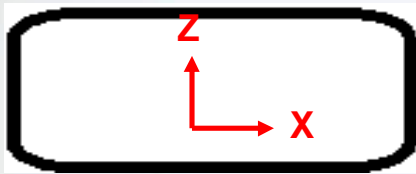
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant6 : 3700MHz



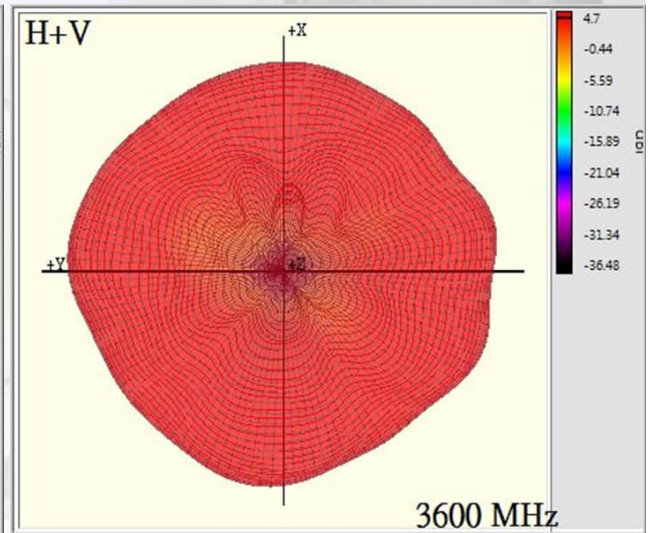
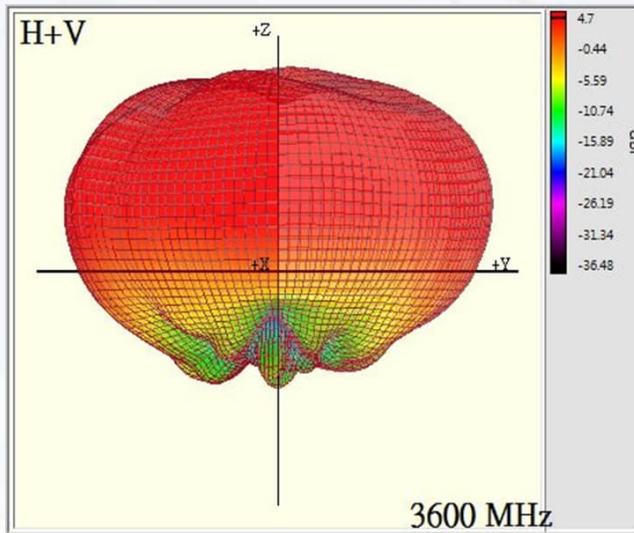
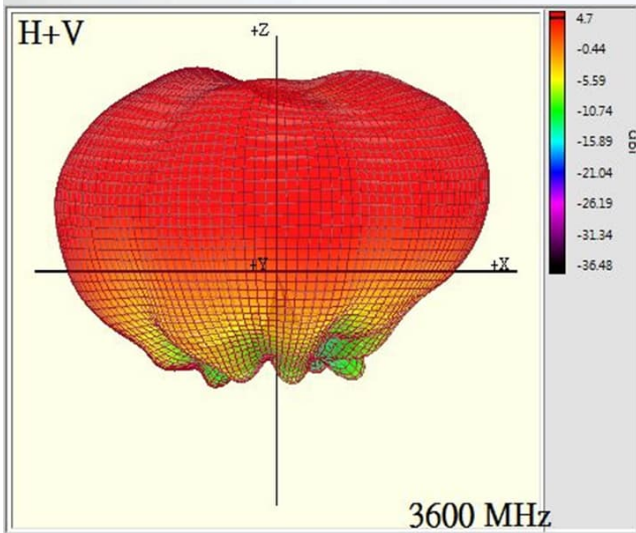
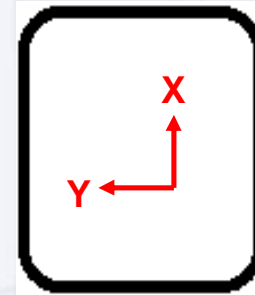
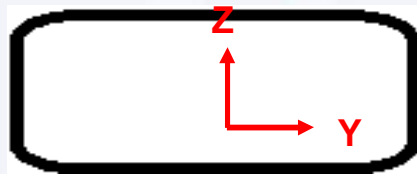
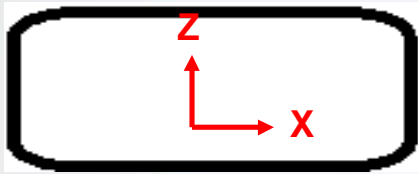
3D Radiation Pattern Results (Antenna → Network Analyzer)

Ant7 : 3550MHz



3D Radiation Pattern Results (Antenna → Network Analyzer)

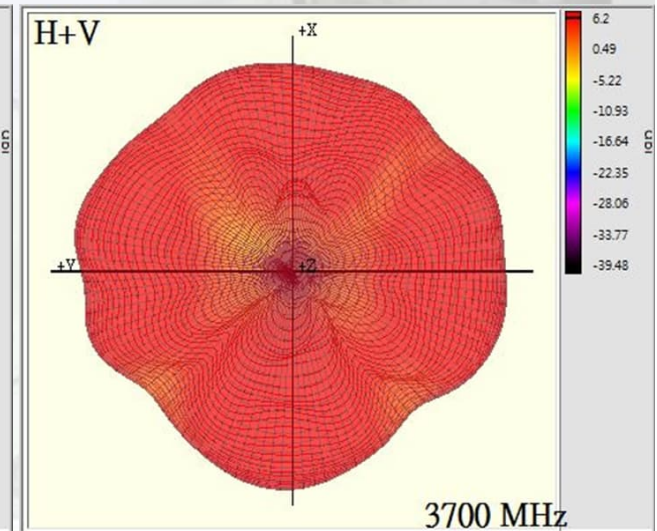
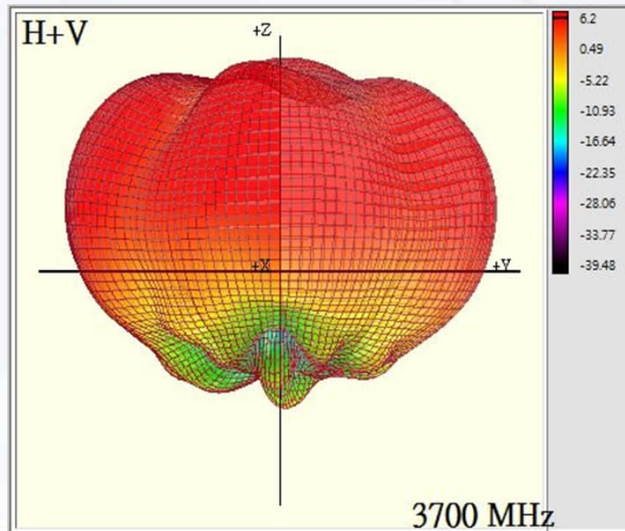
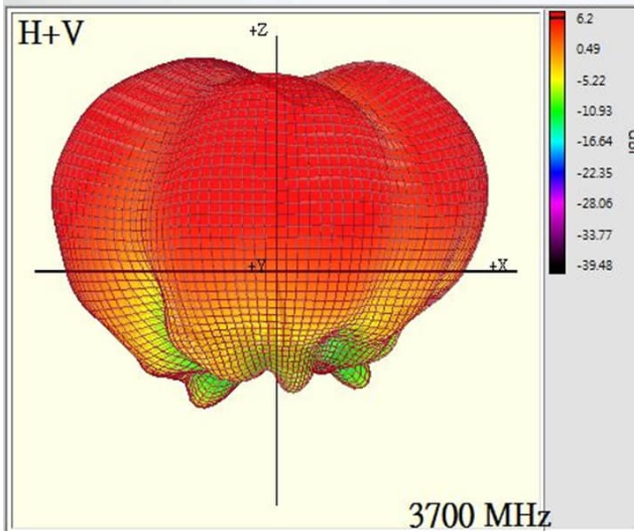
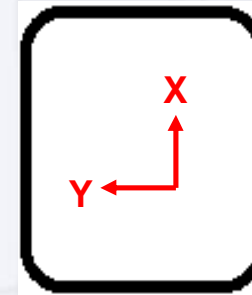
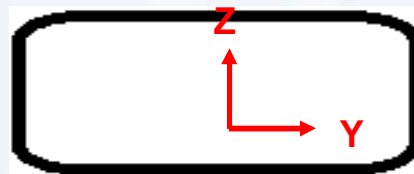
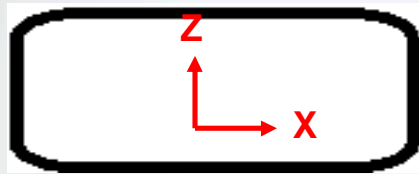
Ant7 : 3600MHz



3D Radiation Pattern Results

(Antenna → Network Analyzer)

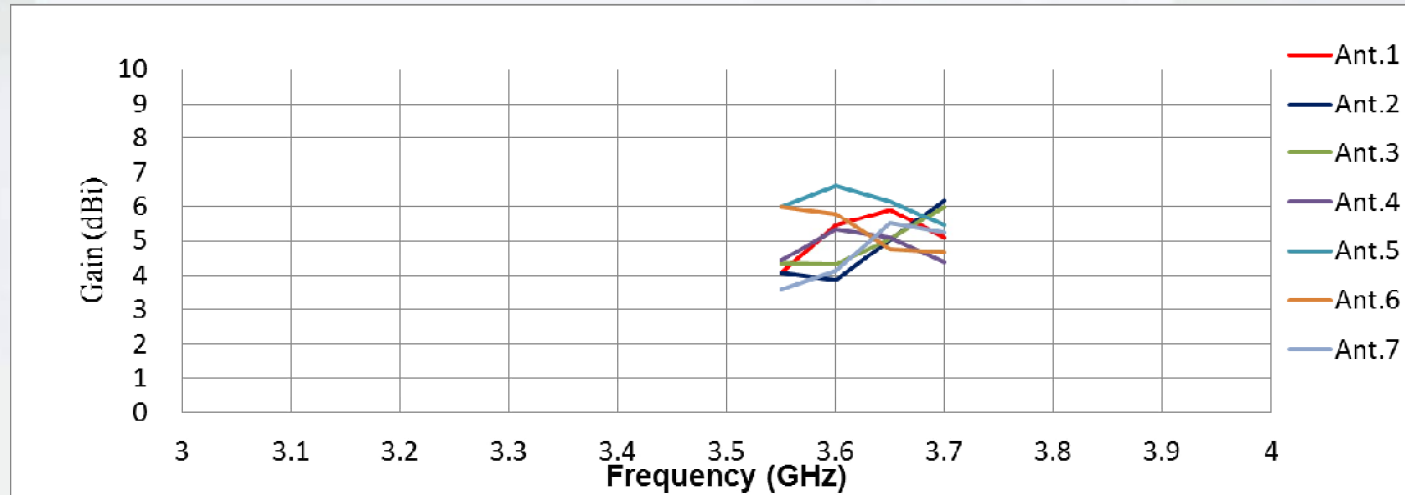
Ant7 : 3700MHz



Results Summary

(Antenna → Network Analyzer)

Peak gain

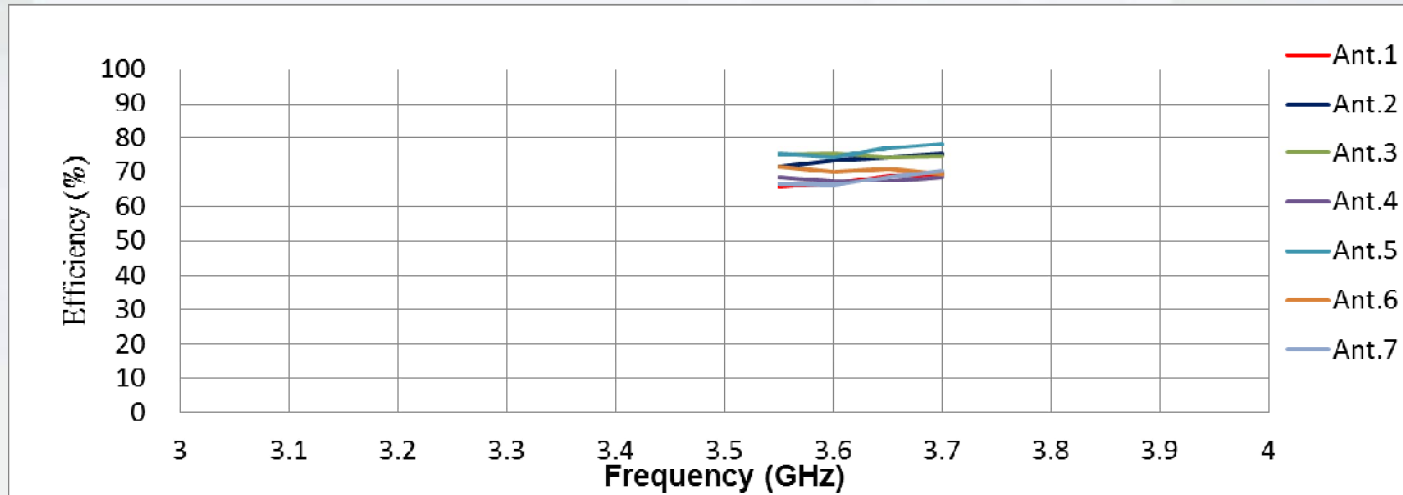


Frequency (MHz)	Ant1 Peak Gain (dBi)	Ant2 Peak Gain (dBi)	Ant3 Peak Gain (dBi)	Ant4 Peak Gain (dBi)	Ant5 Peak Gain (dBi)	Ant6 Peak Gain (dBi)	Ant7 Peak Gain (dBi)
3550	4.08	4.06	4.35	4.44	6.00	5.98	3.61
3600	5.46	3.85	4.30	5.34	6.59	5.79	4.13
3650	5.90	5.03	5.06	5.08	6.13	4.75	5.50
3700	5.08	6.18	6.00	4.36	5.46	4.66	5.23

Results Summary

(Antenna → Network Analyzer)

Efficiency



Frequency (MHz)	Ant1 Efficiency (%)	Ant2 Efficiency (%)	Ant3 Efficiency (%)	Ant4 Efficiency (%)	Ant5 Efficiency (%)	Ant6 Efficiency (%)	Ant7 Efficiency (%)
3550	65	71	75	69	75	71	67
3600	67	73	75	67	74	70	66
3650	69	74	74	67	77	71	68
3700	69	75	74	68	78	70	70