NE1-23026_UBN2309
Antenna 2/5Gx4,WiFi6Ex4

Version: ***NE1-23026_UBN2309***
Released Date: ***2023/06/14***
Test Date: ***2023/06/14***
Test Personnel: ***wei***
Prepared By: ***wei***
Reviewed By: ***Tim Cheng***

M.gear
WHA YU INDUSTRIAL CO., LTD.
TEL : 886-3-5714225 FAX : 886-3-5713853 / 5723600
Website : www.whayu.com
E-mail : market@whayu.com

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Revision History

Released Date	Version	Record
2022/07/18	V2.01	Antenna Testing Report
2022/07/25	V2.02	Antenna Testing Report
2022/08/03	V2.03	Antenna Testing Report(Change ANT8 Layout ，ANT8 without wire groove, ANT7 changed wire length 70mm)
2022/08/10	V2.04	Antenna Testing Report (PCBA update, Cable Routing update, DB3 without wire groove)
2022/08/11	V2.04_1	Add (Average gain, Average efficiency, Average cable loss Calibrated)
2022/08/11	V2.04_2	Add 2D V Pol/H Pol
2022/08/19	V2.04_3	Antenna Testing Report(Change ANT3 changed wire length 186mm)
2022/08/23	V2.04_4	Antenna Testing Report(Change ANT1 changed wire length 293mm)
2022/09/06	V2.04_5	Antenna Testing Report(Change ANT2&ANT3&ANT5& ANT7)
2022/09/30	V2.04_6	Antenna Testing Report(Factory Sample)
2023/02/02	V2.04_7	Antenna Testing Report(6G6 turn 90 degrees to place & 6G5 bus length 147mm)

Revision History

2023/04/25	V2.04_8	Antenna Testing Report(6G7 turn 90 degrees and move to corner-Add 6.4mm EVA Sponge)
2023/05/25	V2.04_9	Antenna Testing Report(Update DB2-DB4 Gain)
2023/06/14	V2.04_10	Antenna Testing Report with 06/09 Golden DUT

Specification

Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
DB	4	2400 ~ 2500 MHz & 5050~5825 MHz	
6G	4	5925 ~ 7125 MHz	

Requirements of Measurement

Test Item	Specification	Remark
Return Loss	> 10dB	
Isolation	> 25dB	
Peak gain	2.4 GHz: <3.5 dBi(dual band) ; 5 GHz: <4 dBi(dual band); 6 GHz: <3.5 dBi(single band)	
Efficiency	N/A	
Radiation pattern	Scale: +10 ~ 40dBi, Angle step size: 2 degree	

Antenna Placement & Solution

Cable Loss				
ANT#	2G(dB)	5G(dB)	6G(dB)	Cable length(mm)
DB1	0.73	1.12	-	293
DB2	0.55	0.88	-	220
DB3	0.47	0.74	-	186
DB4	0.13	0.20	-	51
6G5	-	-	0.79	147
6G6	-	-	0.45	83
6G7	-	-	0.38	60
6G8	-	-	1.15	213

Test Setup for S-parameter Measurement

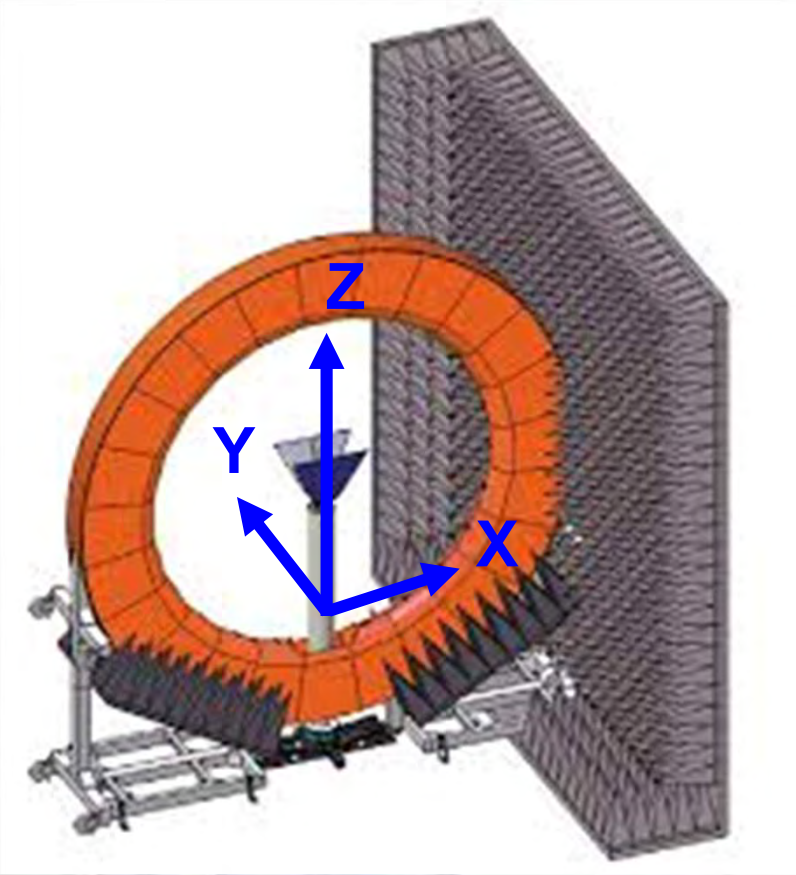
Equipment	Brand	Model	S/N
Network Analyzer	Keysight	E5063A	MY54705934

Calibration date: 2022.07.04
Calibration due date: 2024.07.04

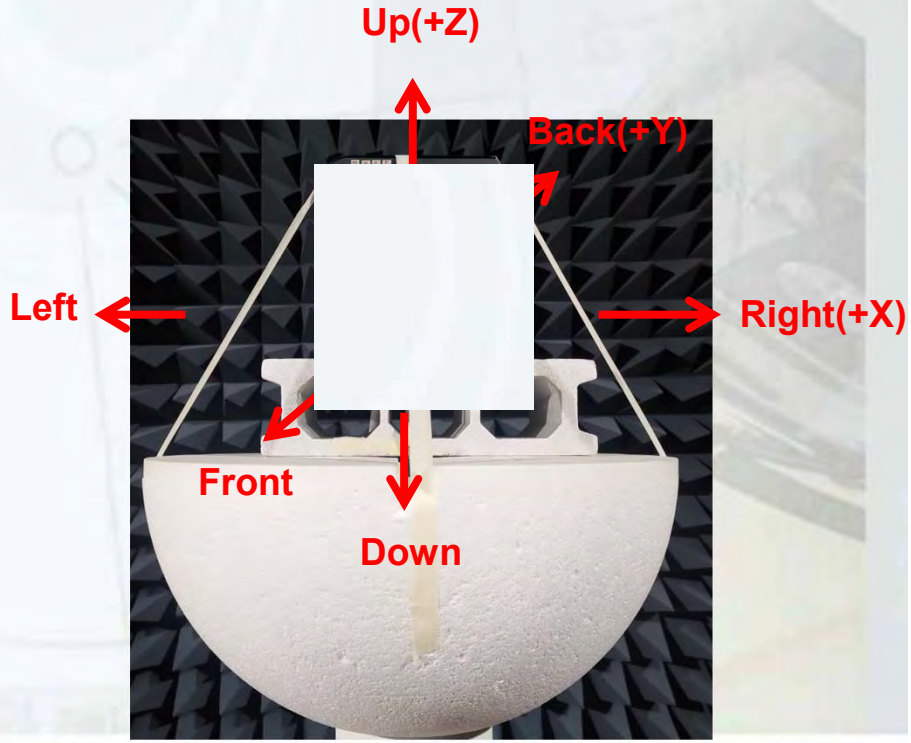
Antenna — **RF Cable with I-PEX conn.** — **Network Analyzer**

Test Setup for Radiation Pattern Measurement

Chamber Information



- SATIMO SG-24L Multi-Probe Antenna Measurement System
  - Angle between probes: 15°
  - Frequency range: 400 MHz – 8.5 GHz
  - Chamber Room Size: 5m L x 5m W x 5m H
  - Software: Wave Studio
  - Calibration date: 2023.04.28
  - Calibration due date: 2024.05.28



WHA YU INDUSTRIAL CO., LTD.
No. 326, Sec. 2, Gongdao 5th Rd.,
Hsinchu City 300043, Taiwan
TEL: +886-3-5714225 FAX: +886-3-5713853
web: www.whayu.com

Test Setup for S-parameter Measurement

Step 1
Configure the Network Analyzer

- Turn on the network analyzer
- Perform initialization
- Setting the appropriate frequency range and measurement parameters.

Step 2
Calibrate the Network

- Before starting the test, calibrate to eliminate the inherent response of the test system.
- Perform full open, full short, and full load calibration, as well as calibration of the reference plane.

Step 3
Set the Test Parameters

- Set the desired test parameters on the network analyzer. This typically includes selecting the desired S-parameter type (e.g., S11, S21, etc.), frequency range, and power level.

Step 4
Connect the Antenna

- Properly connect the antenna to the test port of the network analyzer.
- Ensure a secure connection and use suitable adapters and cables to minimize signal loss.

Step 5
Perform the Test

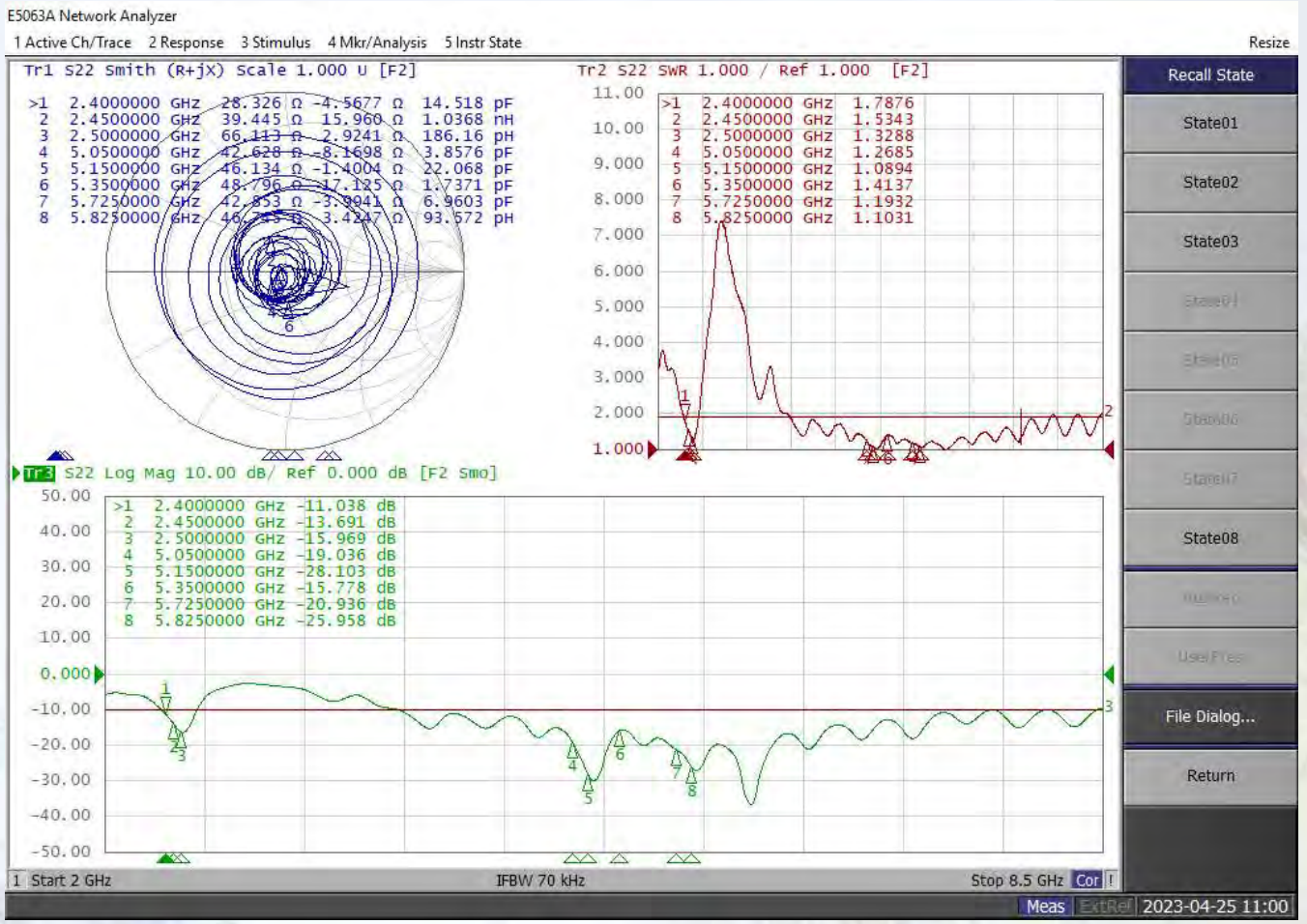
- Begin the S-parameter test of the antenna. This will measure the reflection and transmission characteristics of the antenna within the selected frequency range.

Step 6
Record the Results

- Once the test is completed, record the measurement results. These results are usually presented in the form of graphs or tables for further analysis and comparison.

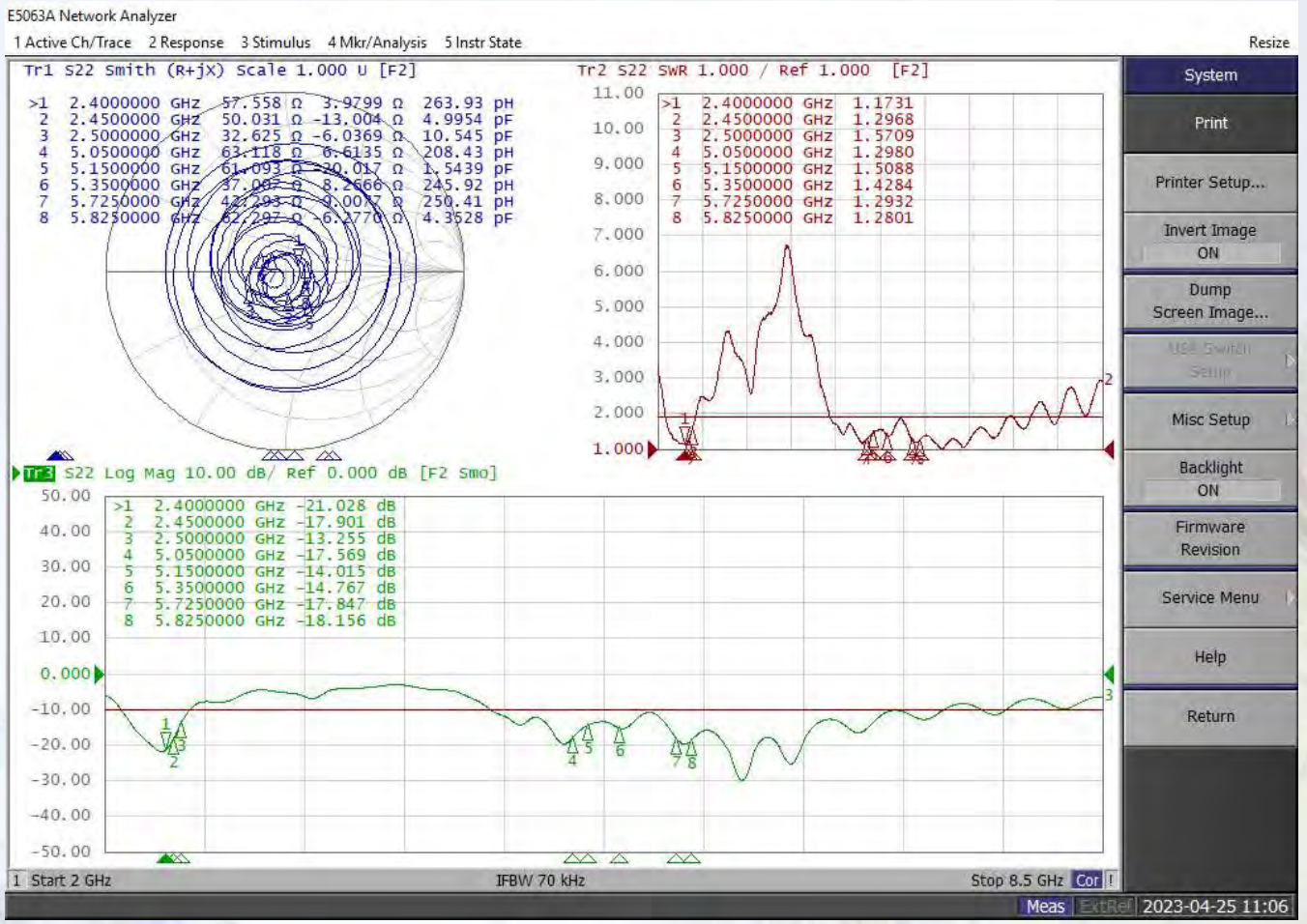
Return Loss Results

DB1 (2400MHz – 2500MHz; 5050MHz – 5825MHz)



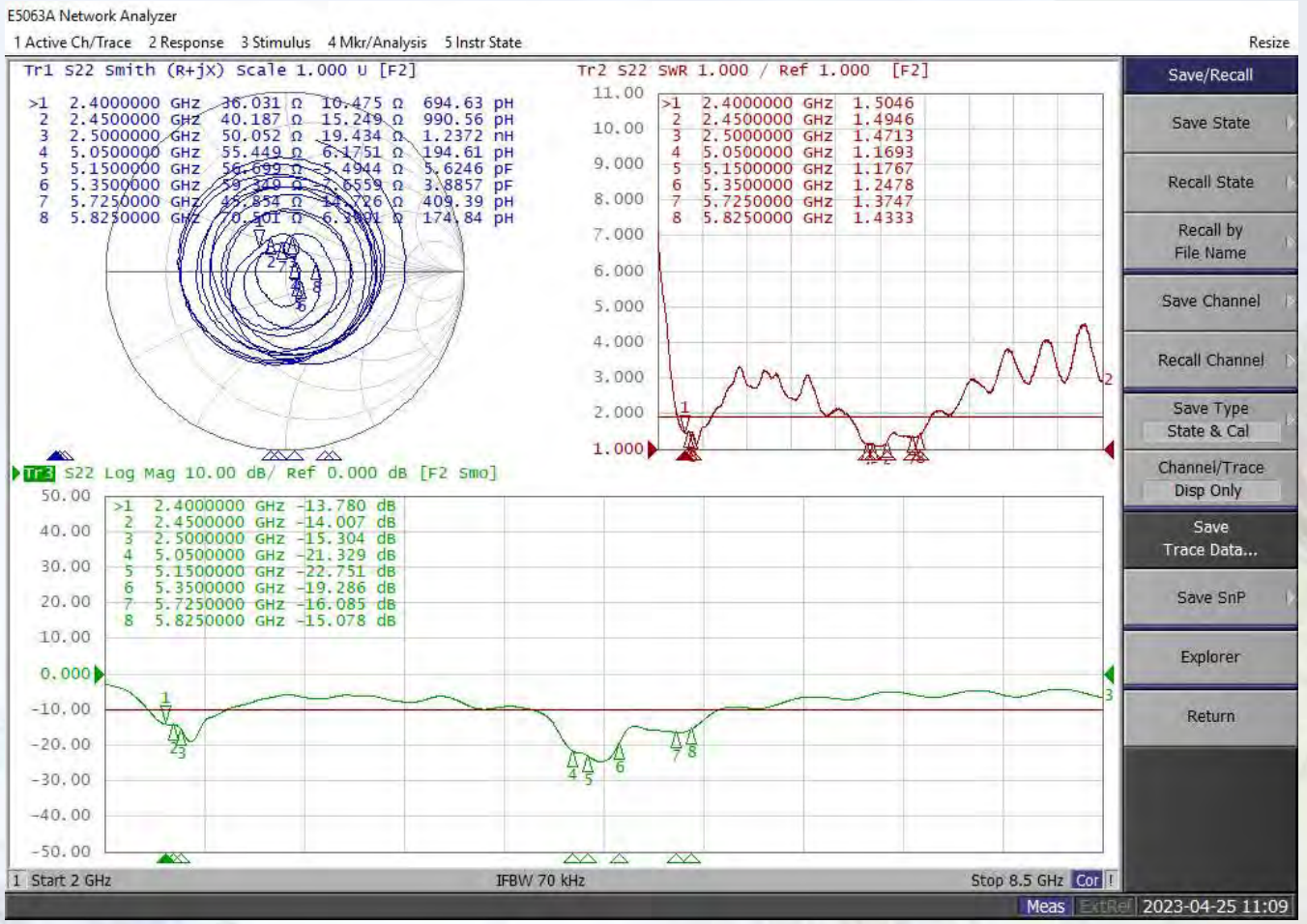
Return Loss Results

DB2 (2400MHz – 2500MHz; 5050MHz – 5825MHz)



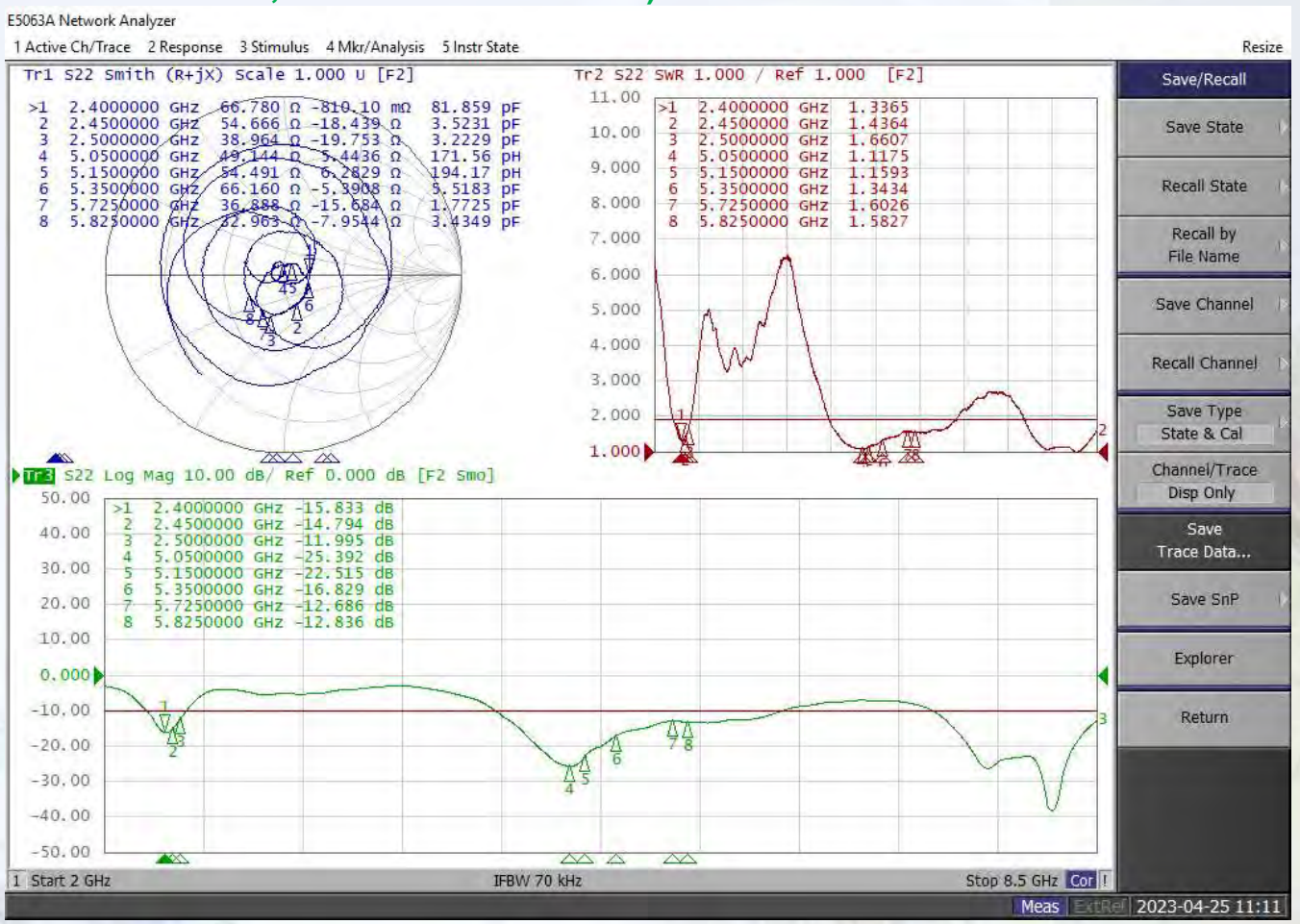
Return Loss Results

DB3 (2400MHz – 2500MHz; 5050MHz – 5825MHz)



Return Loss Results

DB4 (2400MHz – 2500MHz; 5050MHz – 5825MHz)



Return Loss Results

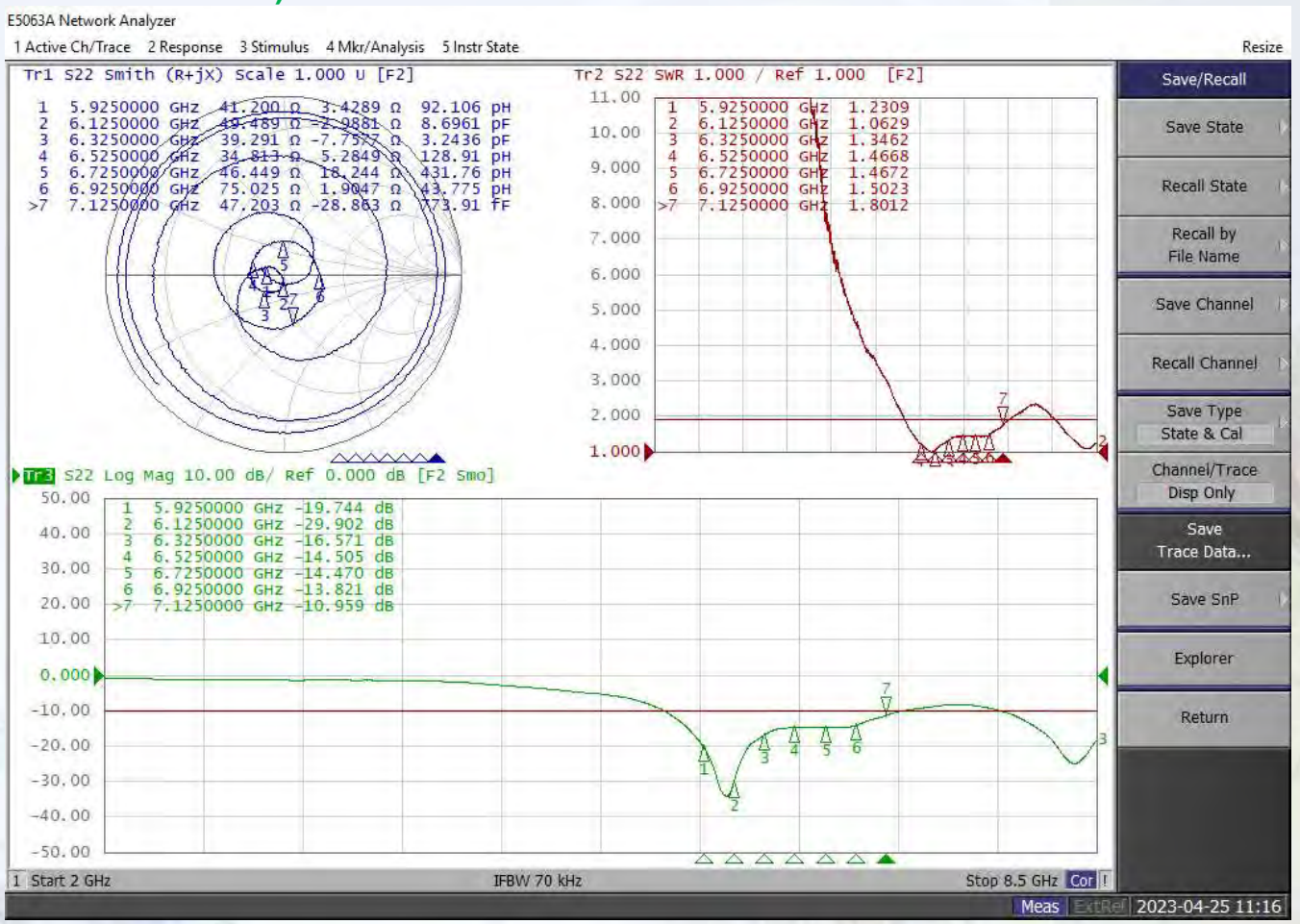
6G5 (5925MHz – 7125MHz)

Return Loss Results

6G6 (5925MHz – 7125MHz)

Return Loss Results

6G7 (5925MHz – 7125MHz)

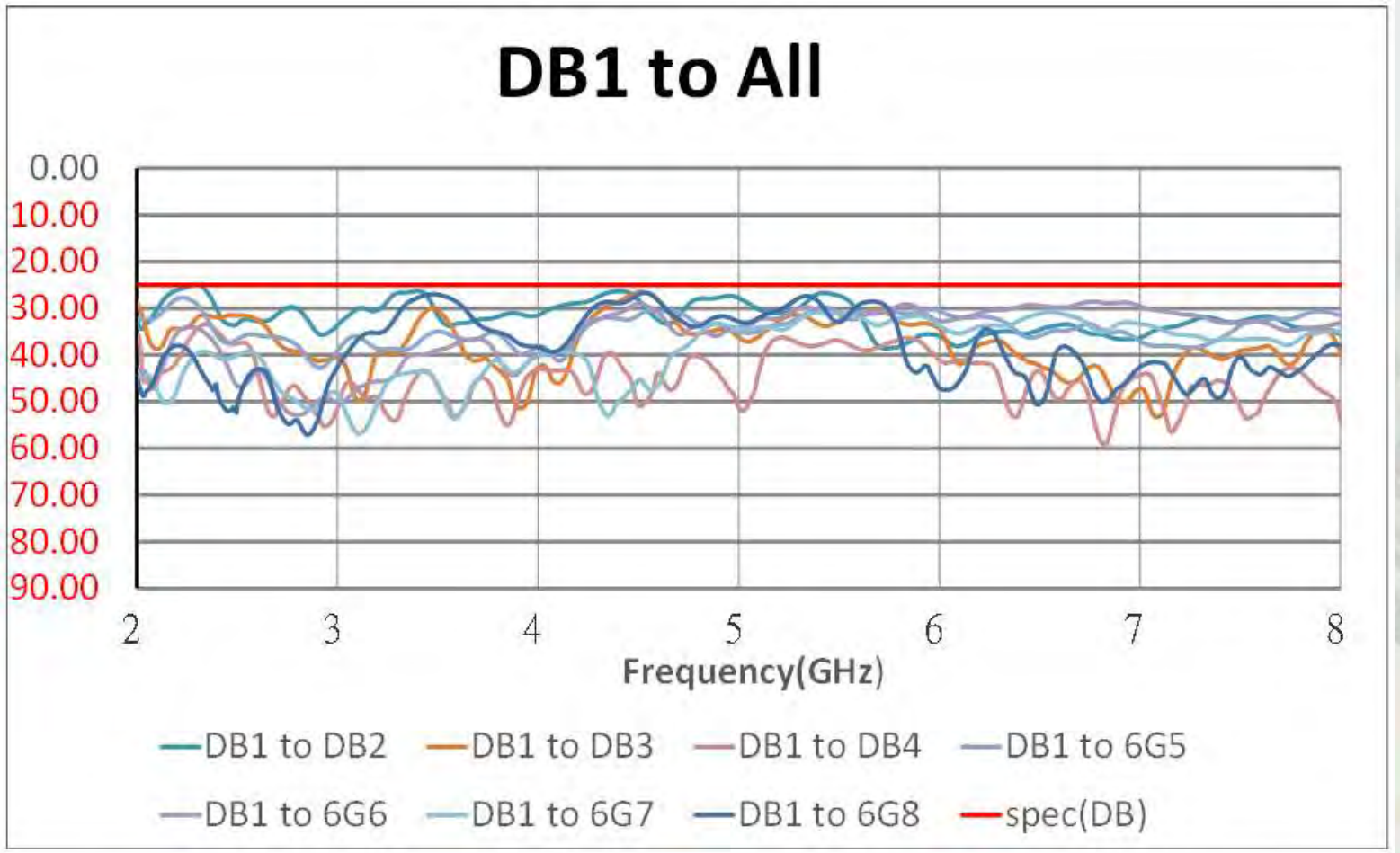


Return Loss Results

6G8 (5925MHz – 7125MHz)

Isolation Results

DB1



WHA YU INDUSTRIAL CO., LTD.
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Website : www.whayu.com
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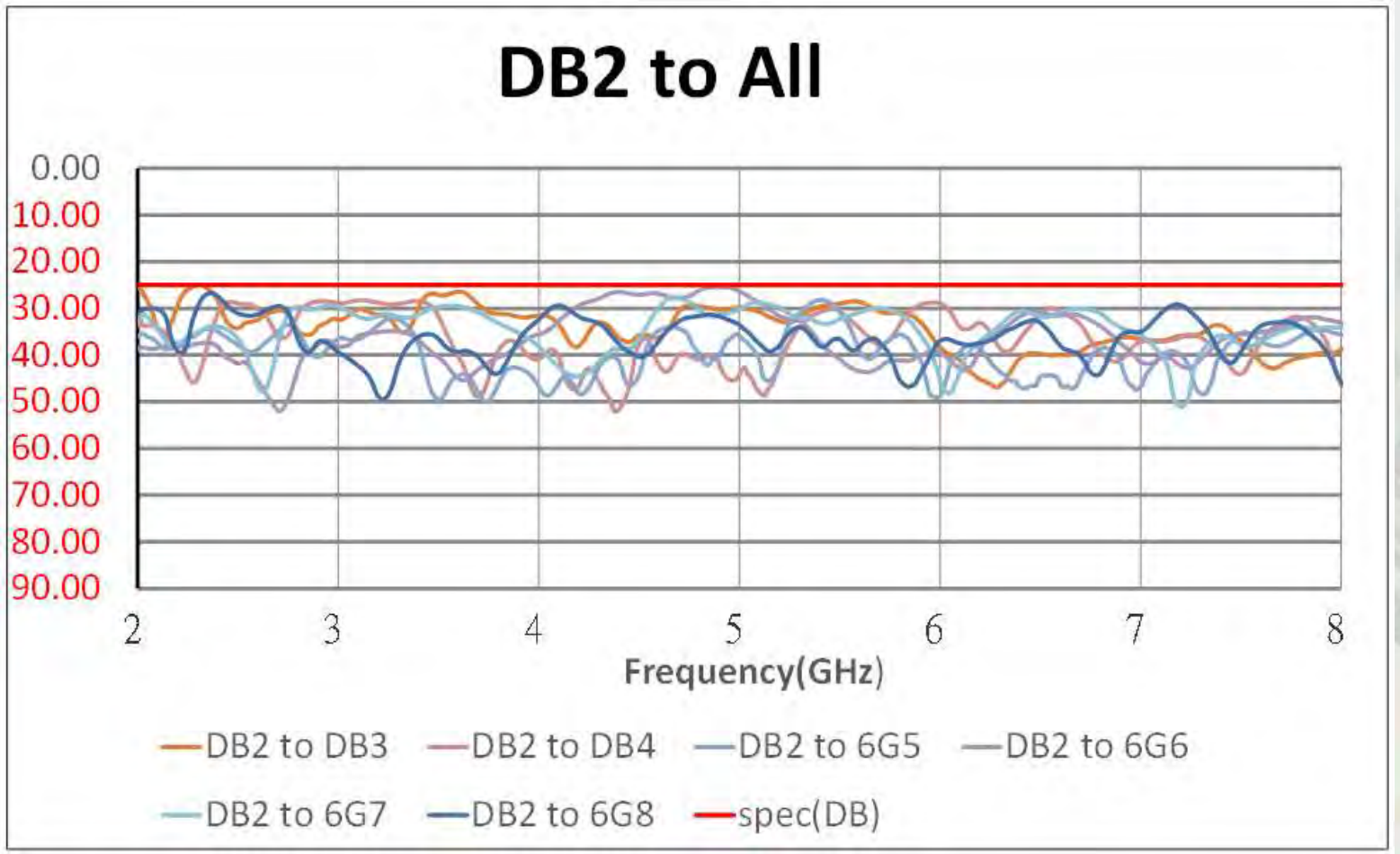
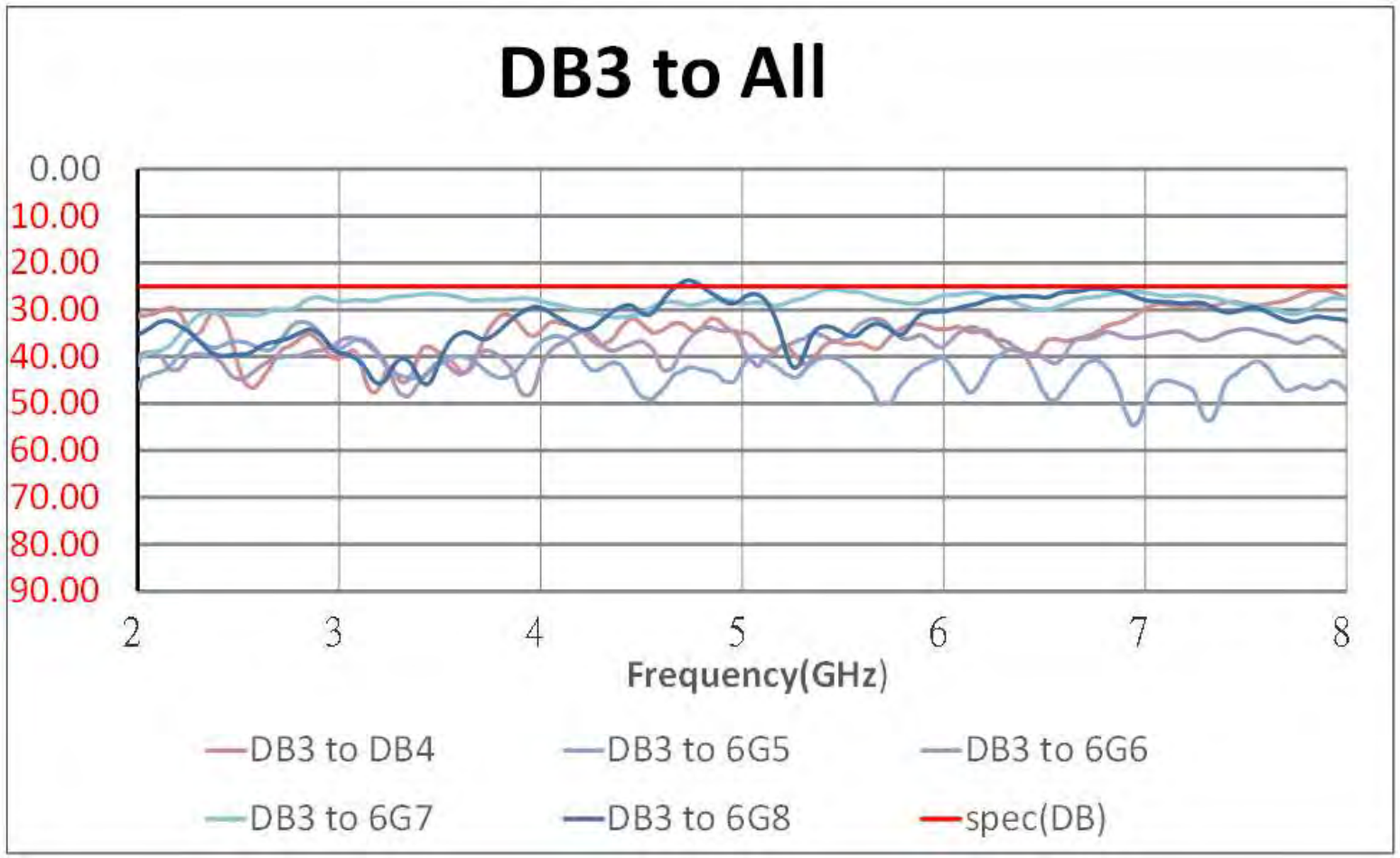
Isolation Results

DB2



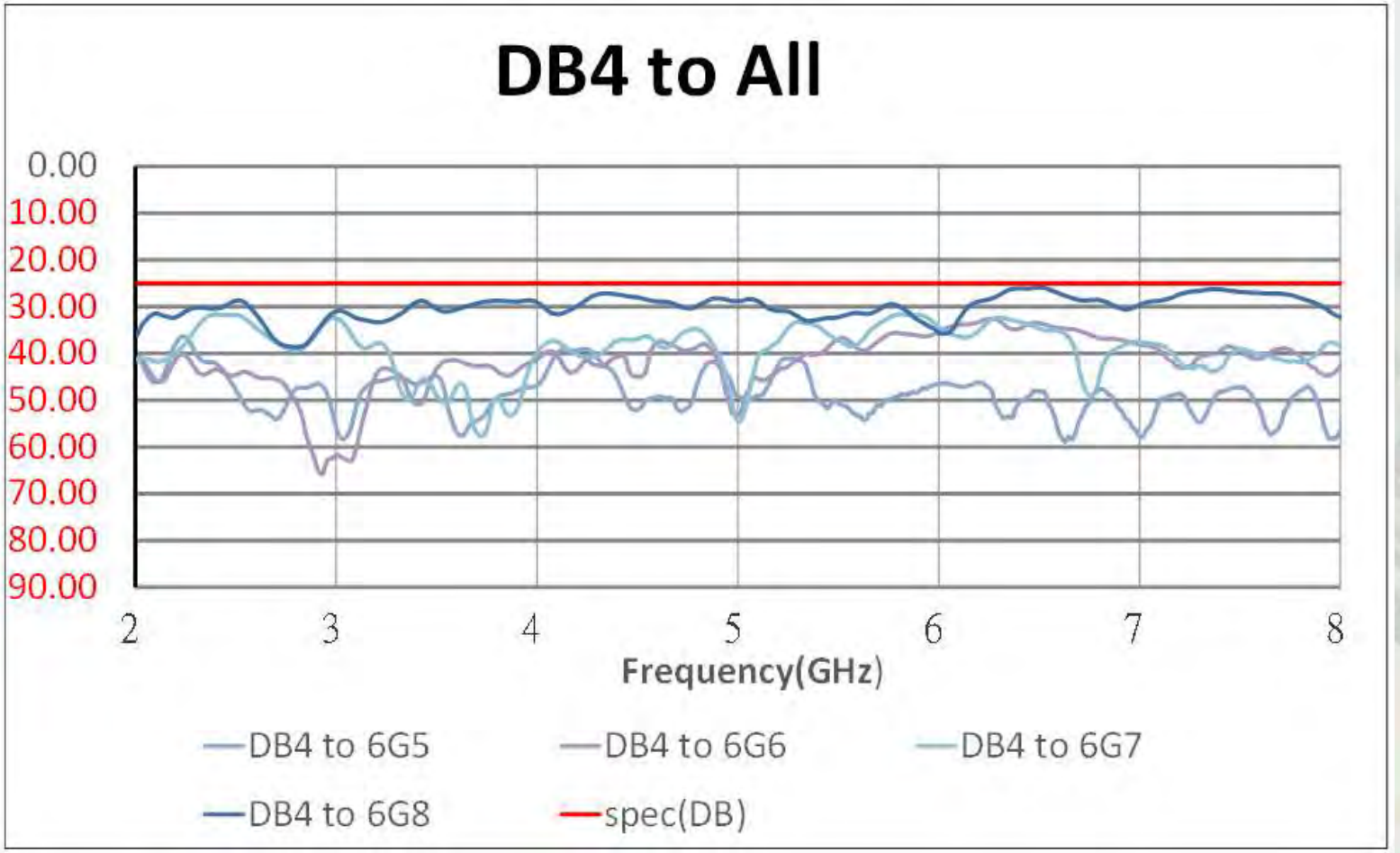
Isolation Results

DB3



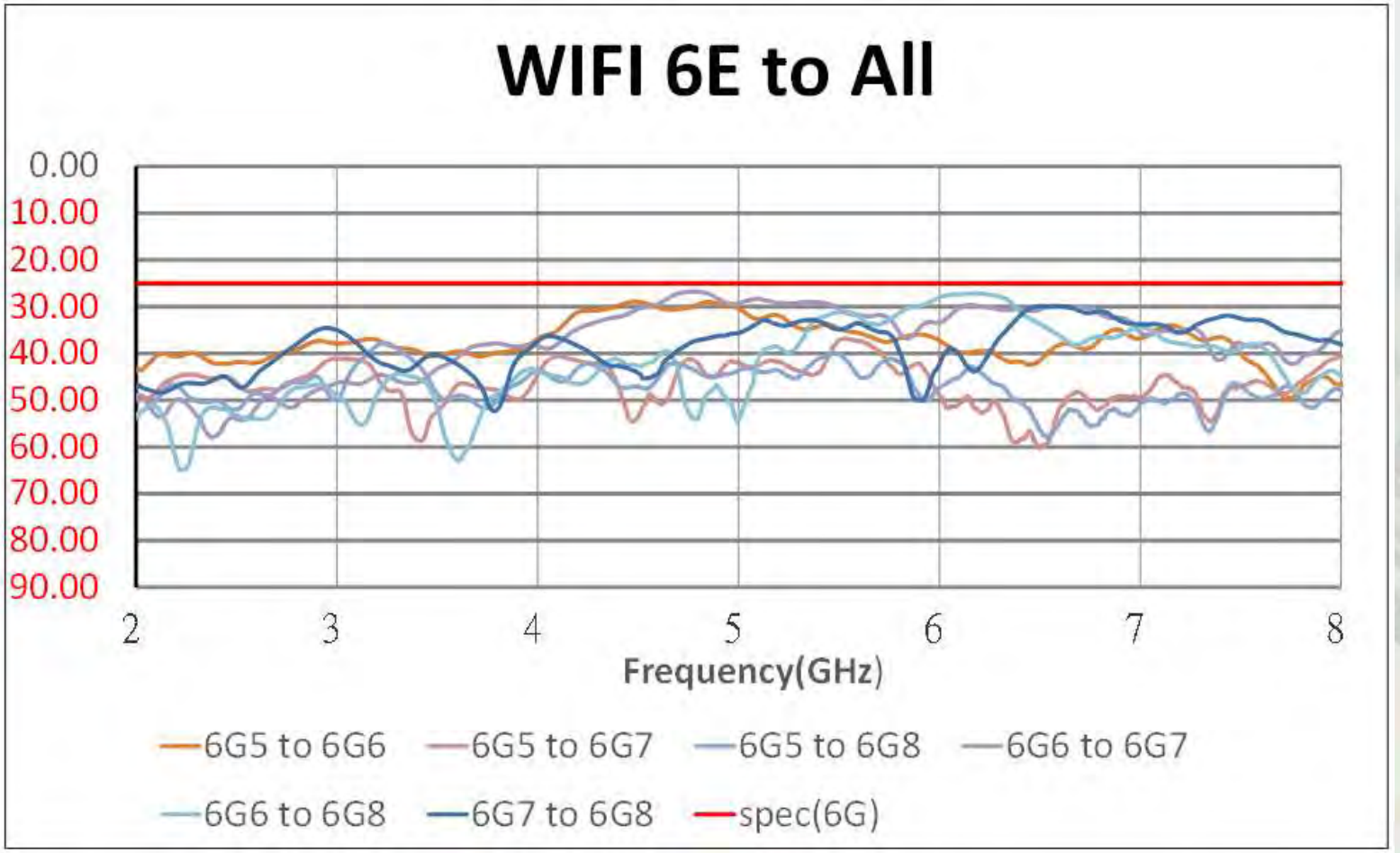
Isolation Results

DB4



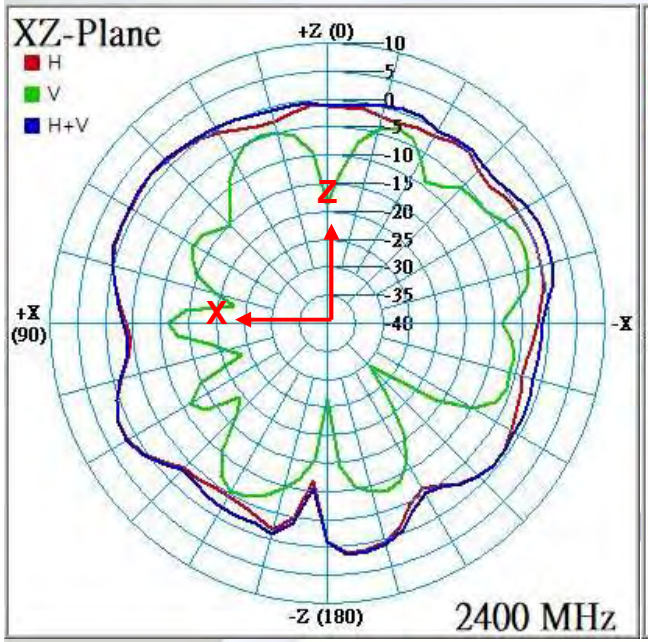
Isolation Results

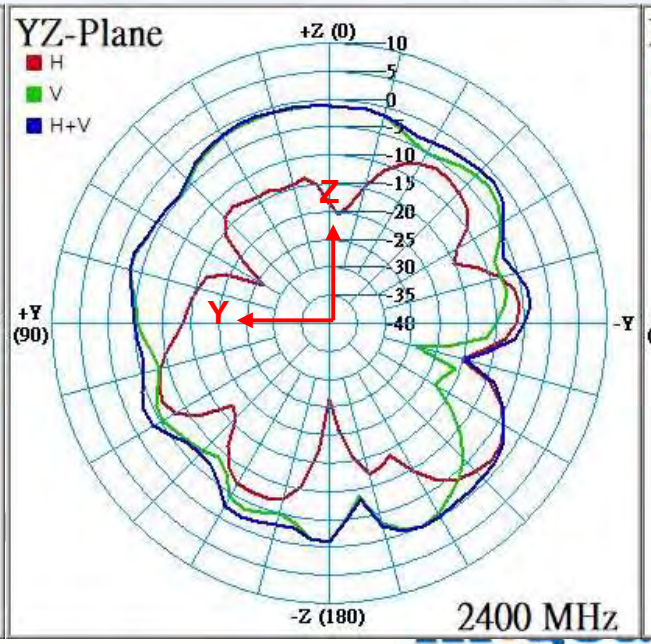
WIFI 6E

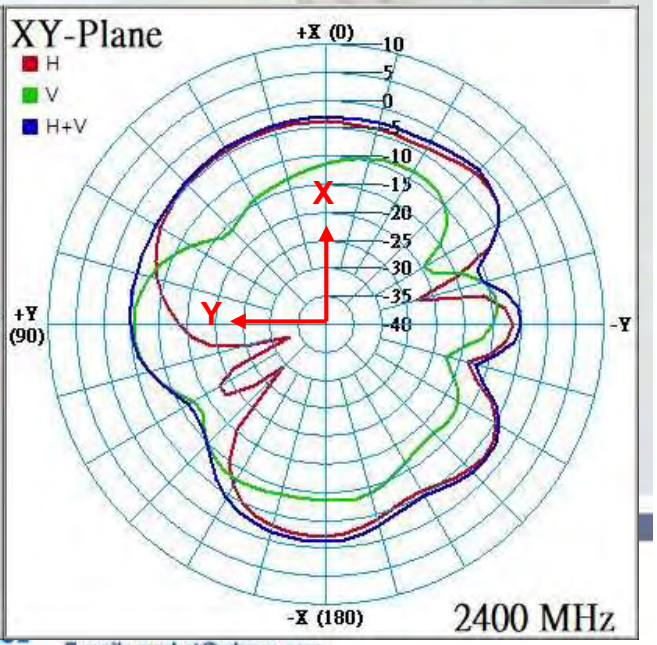


2D Radiation Pattern Results

DB1 (2400 MHz)







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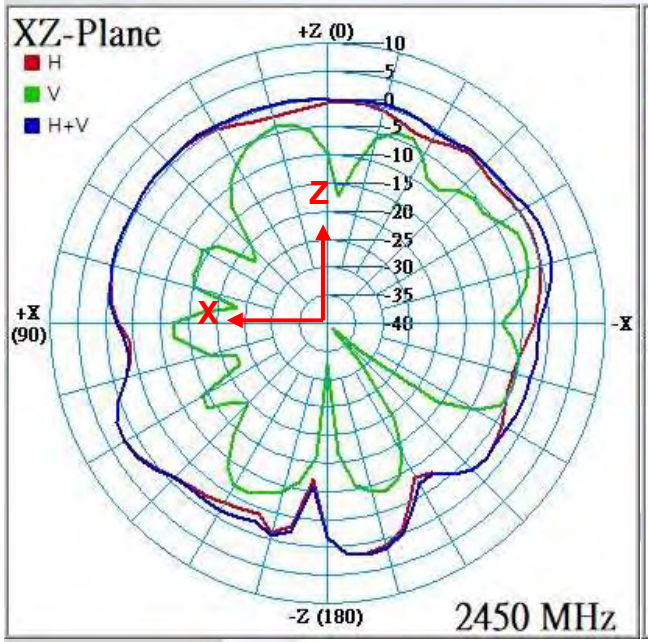
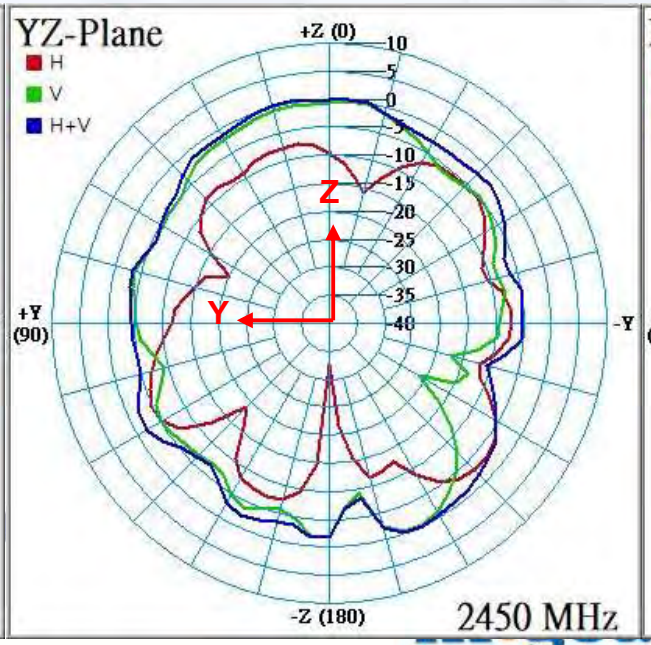
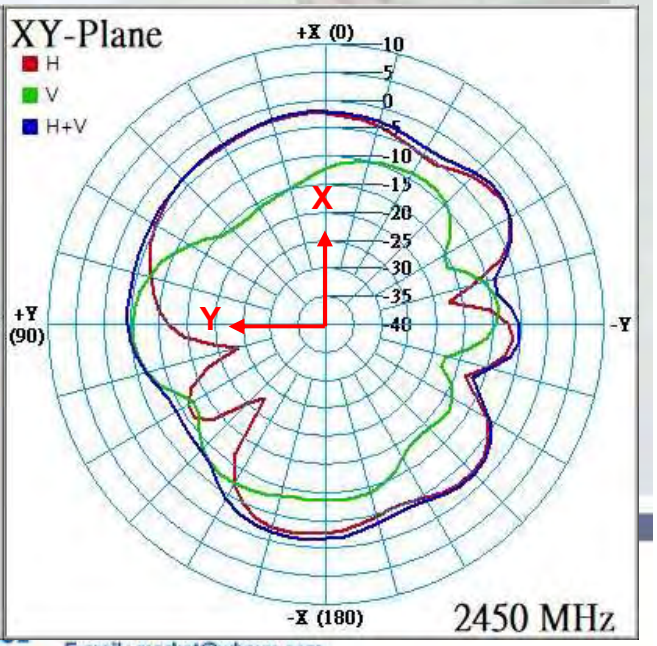
2D Radiation Pattern Results

DB1 (2450 MHz)







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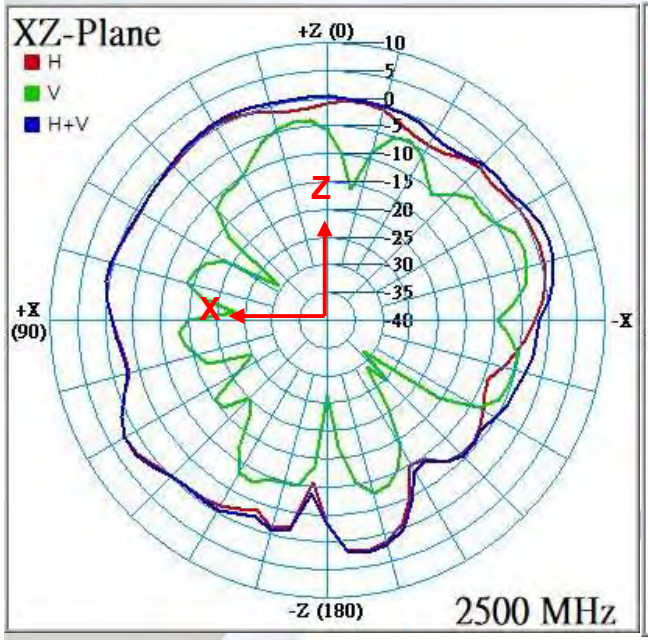
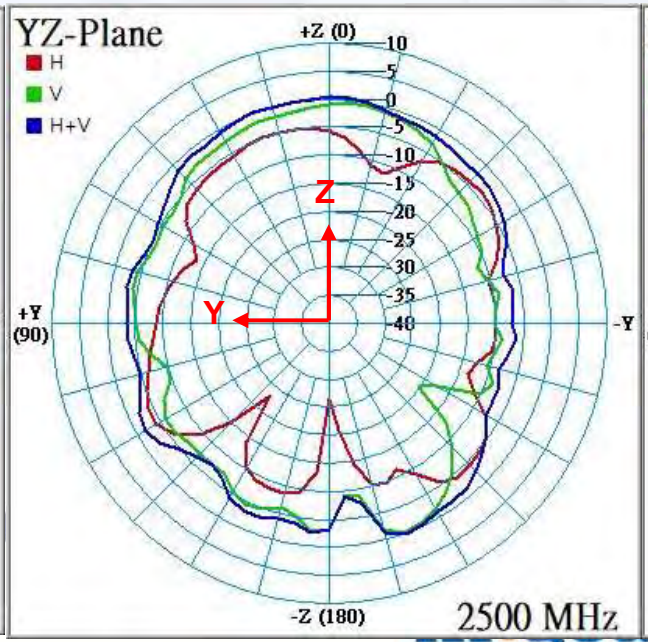
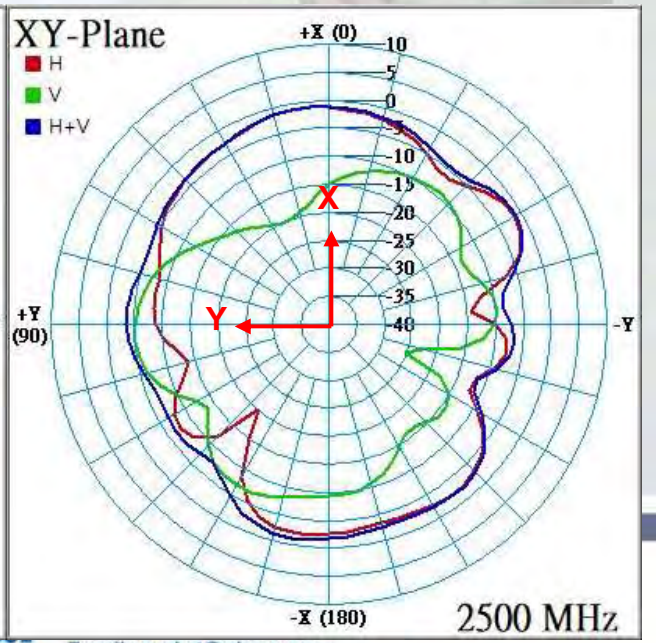
2D Radiation Pattern Results

DB1 (2500 MHz)







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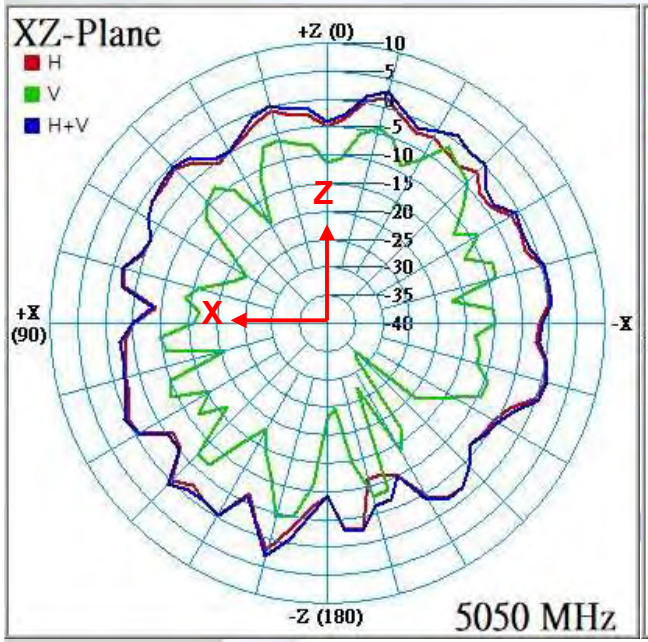
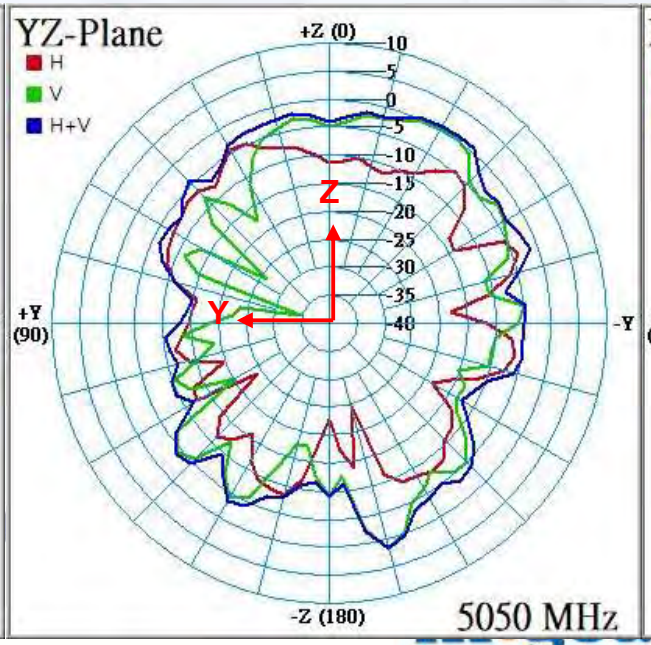
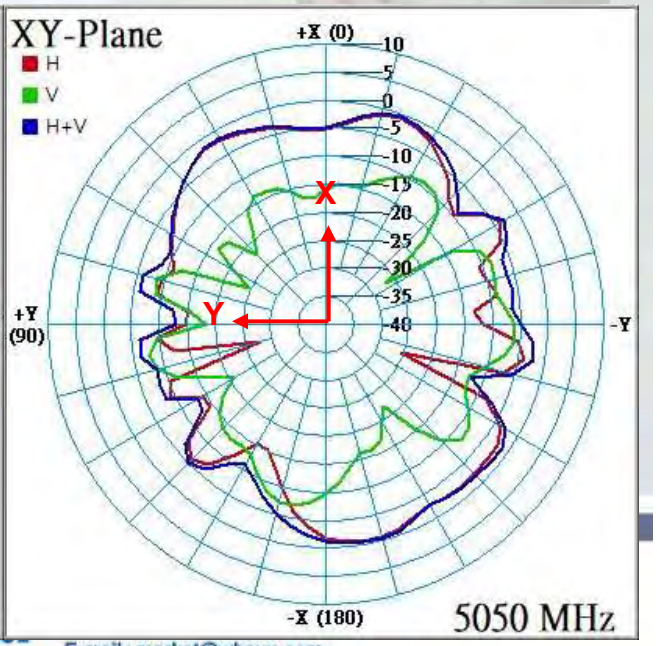
2D Radiation Pattern Results

DB1 (5050 MHz)







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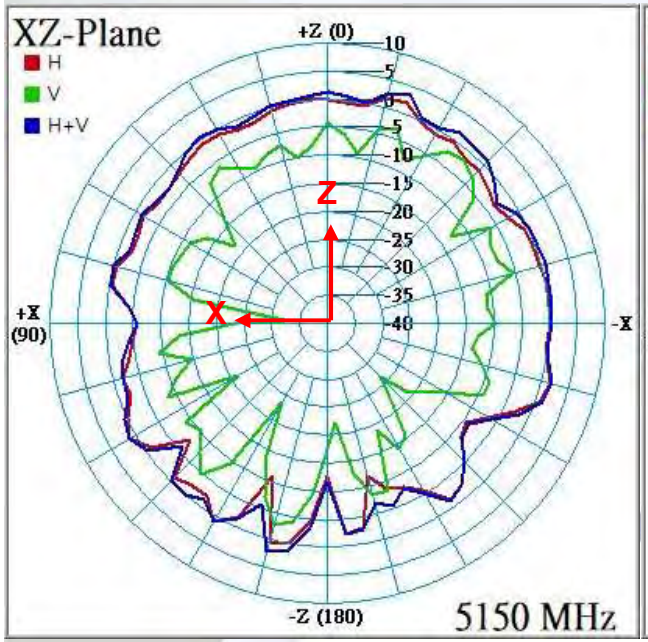
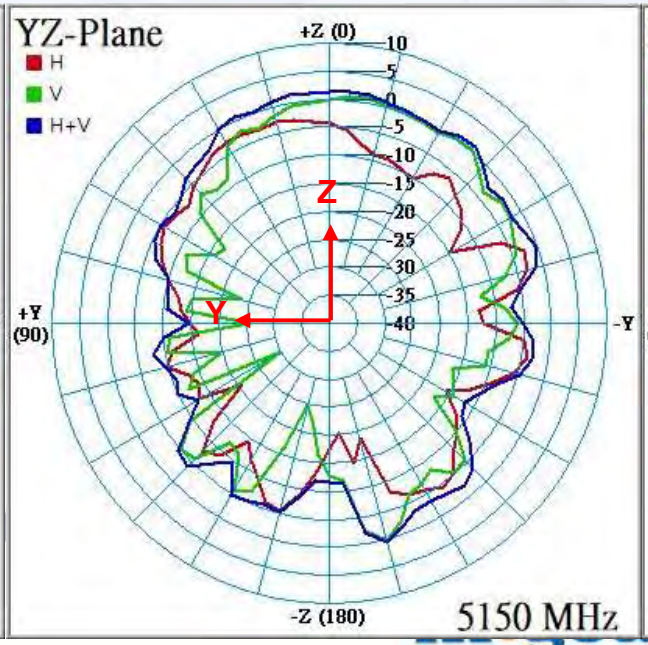
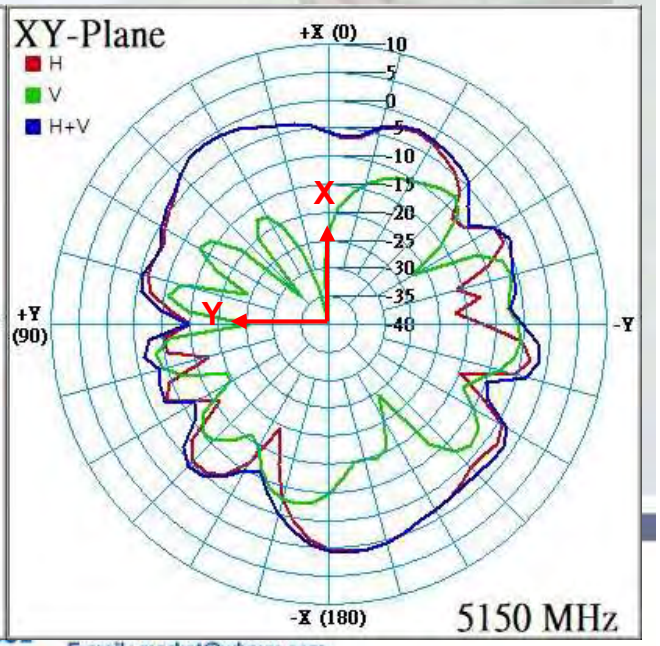
2D Radiation Pattern Results

DB1 (5150 MHz)







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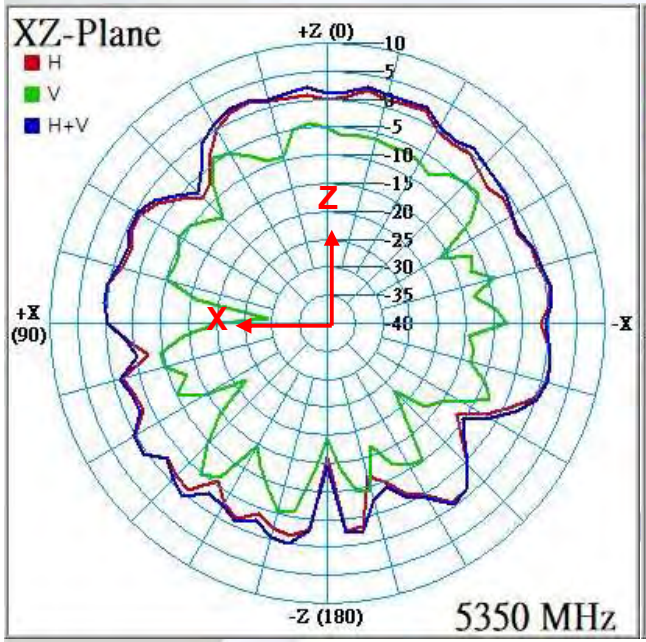
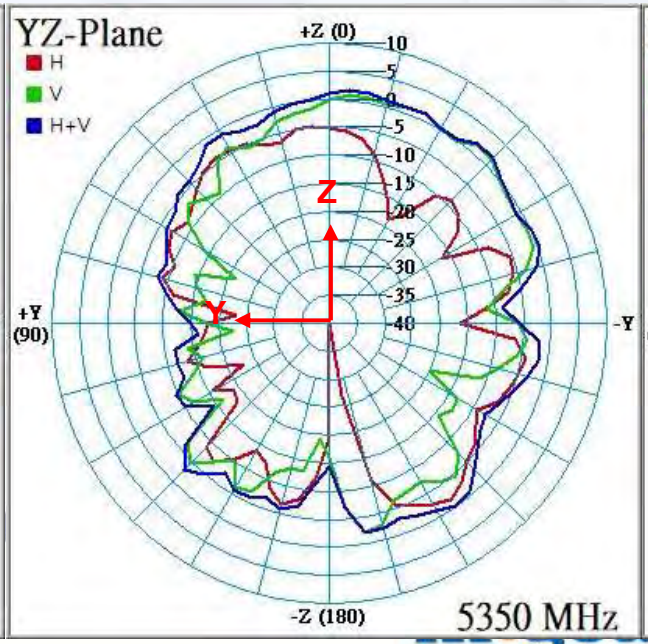
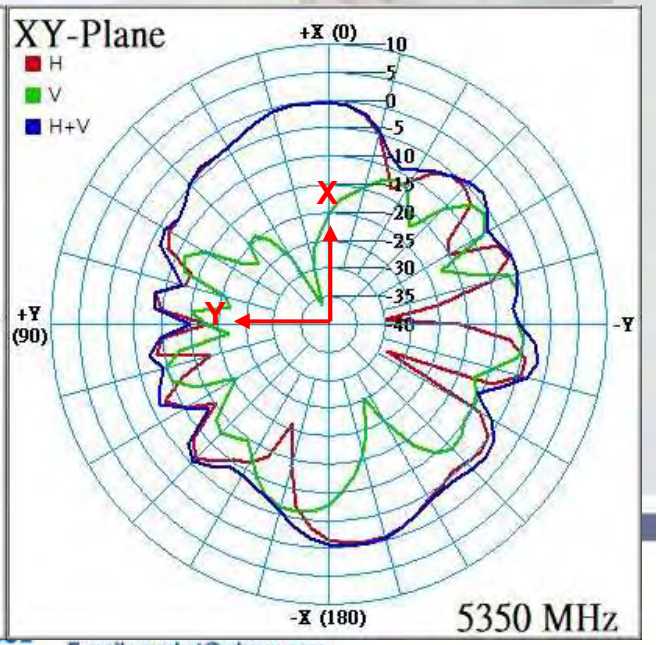
2D Radiation Pattern Results

DB1 (5350 MHz)







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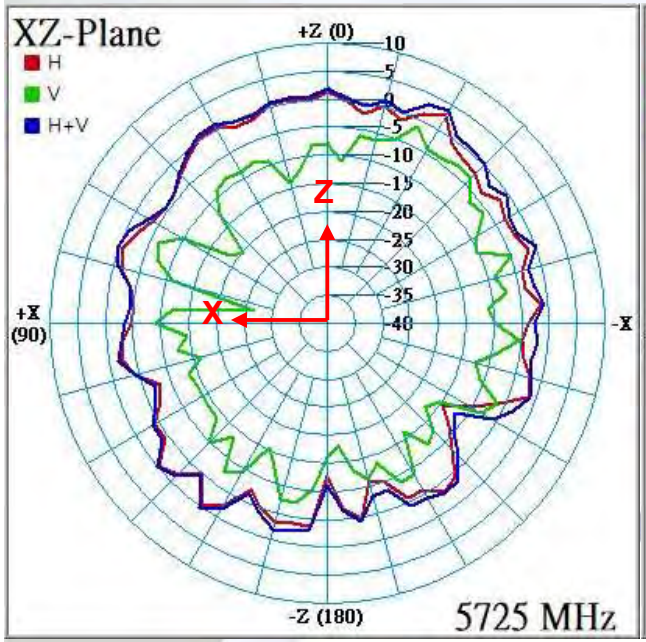
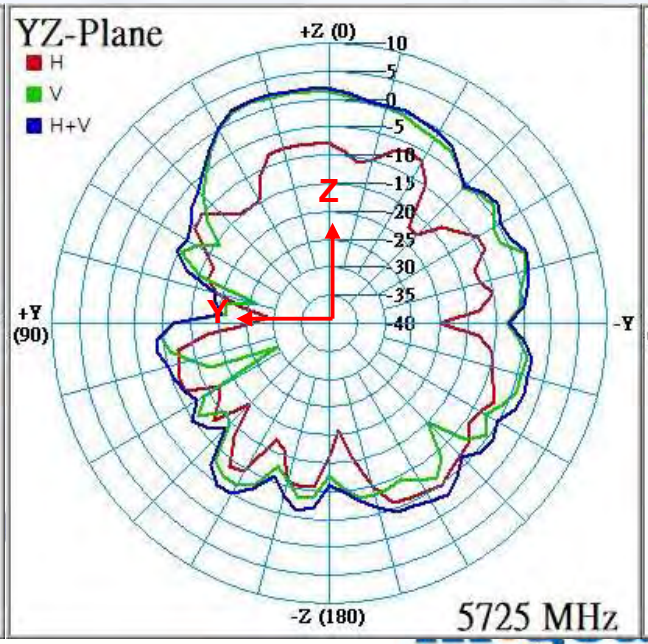
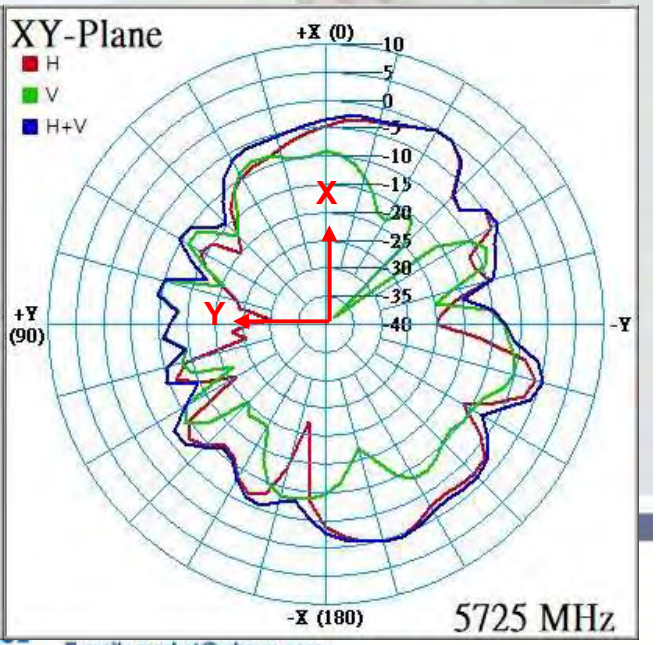
2D Radiation Pattern Results

DB1 (5725 MHz)







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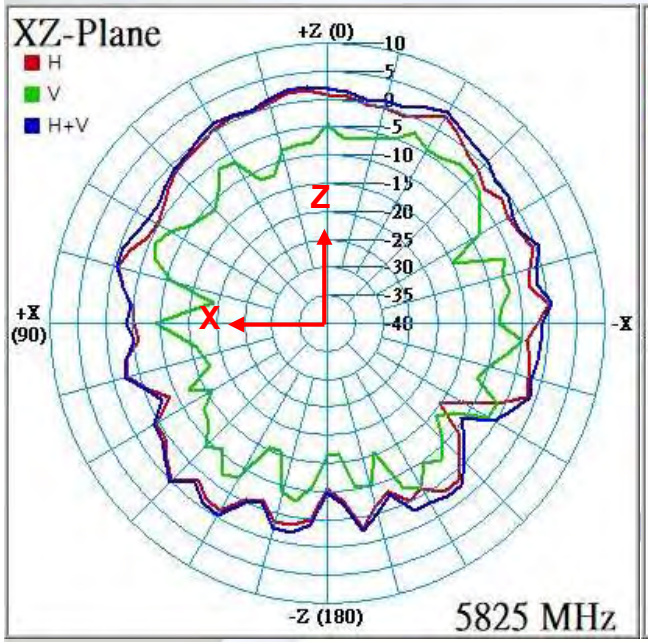
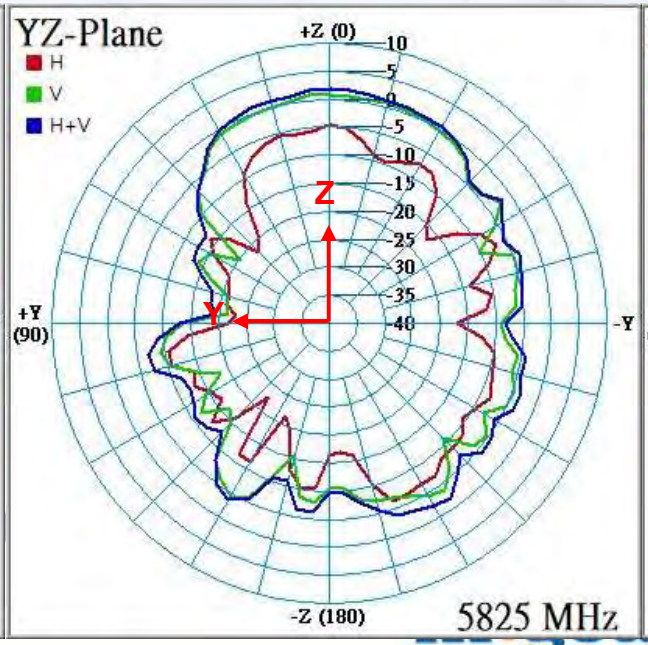
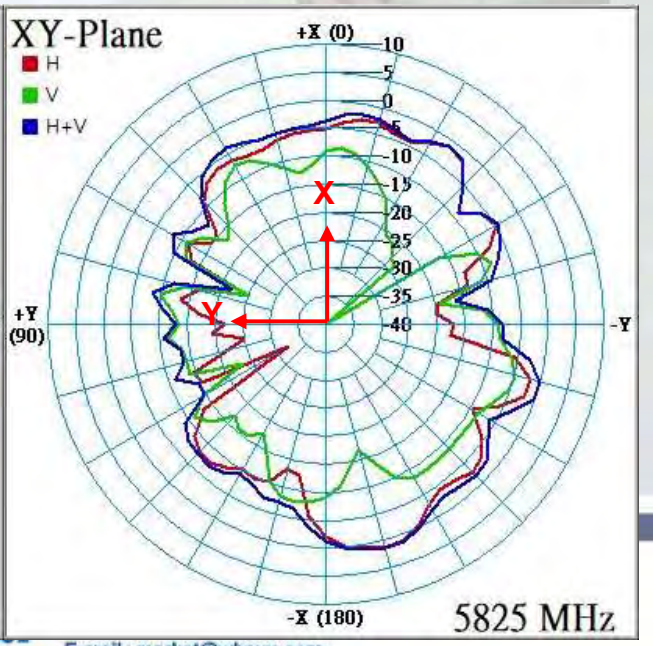
2D Radiation Pattern Results

DB1 (5825 MHz)







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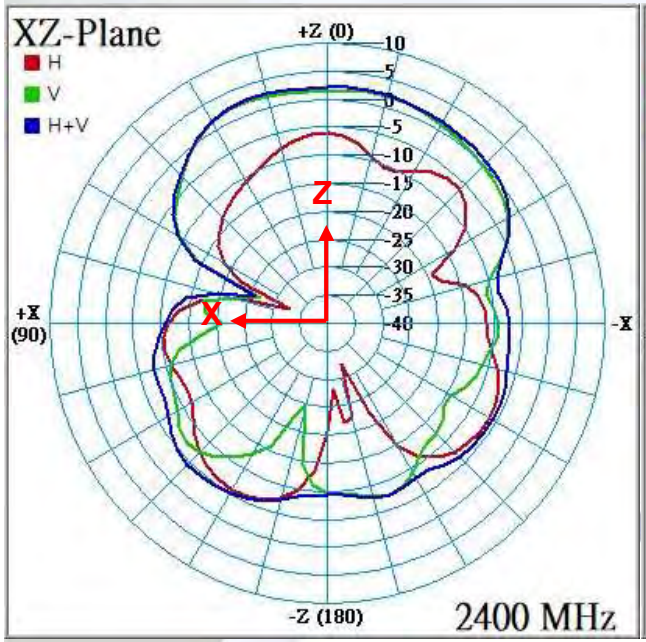
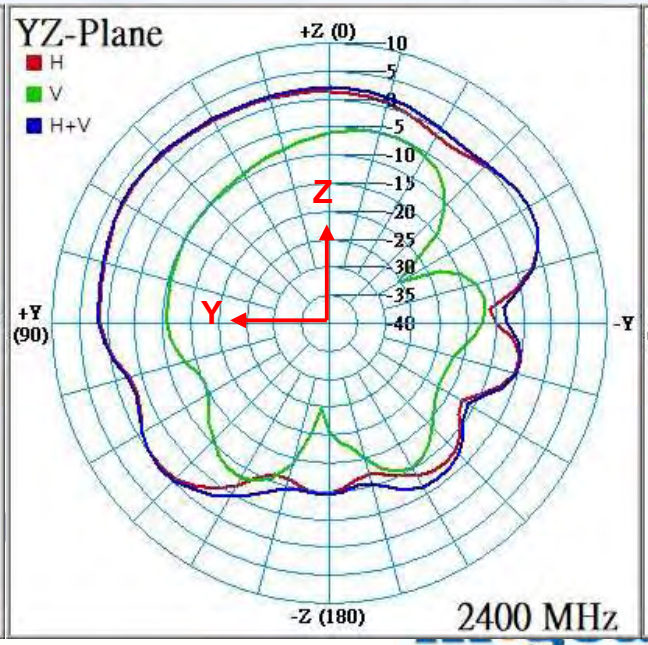
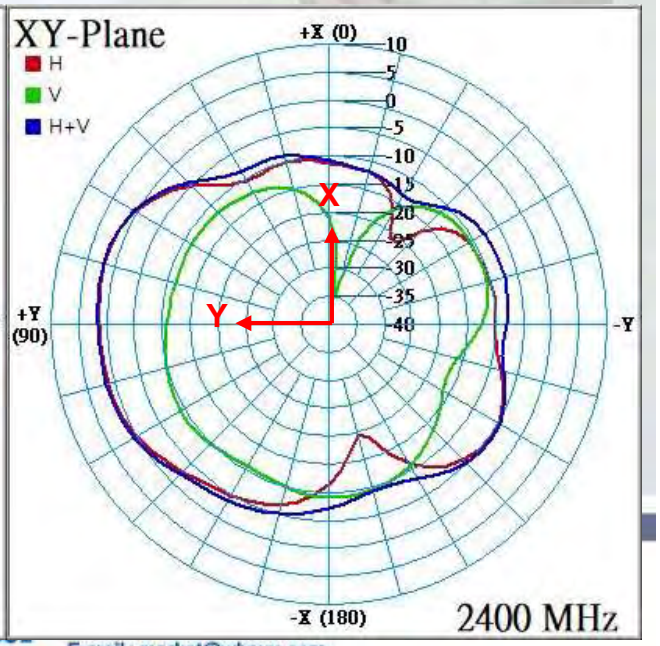
2D Radiation Pattern Results

DB2 (2400 MHz)







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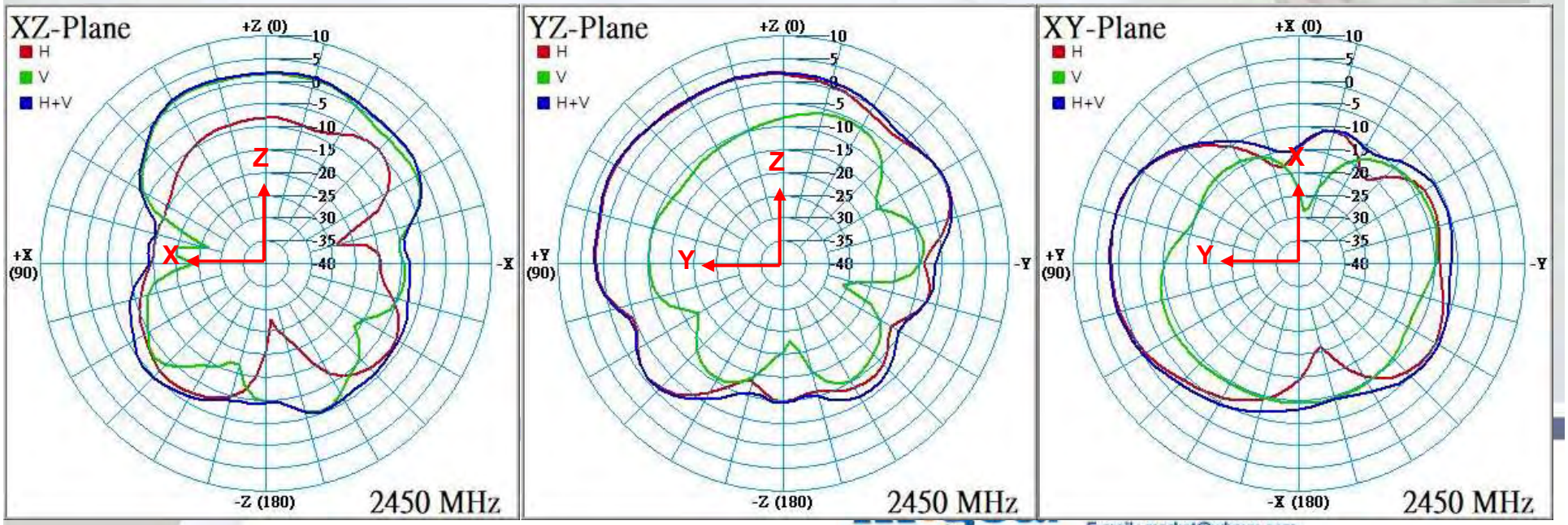
2D Radiation Pattern Results

DB2 (2450 MHz)



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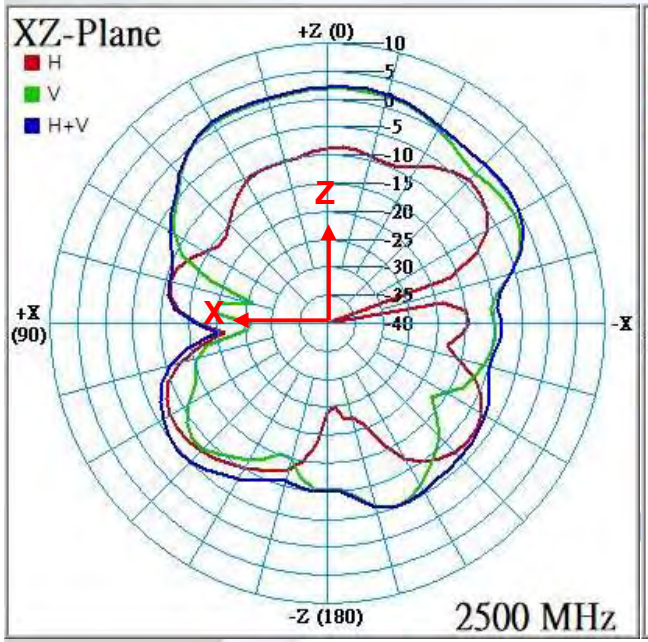
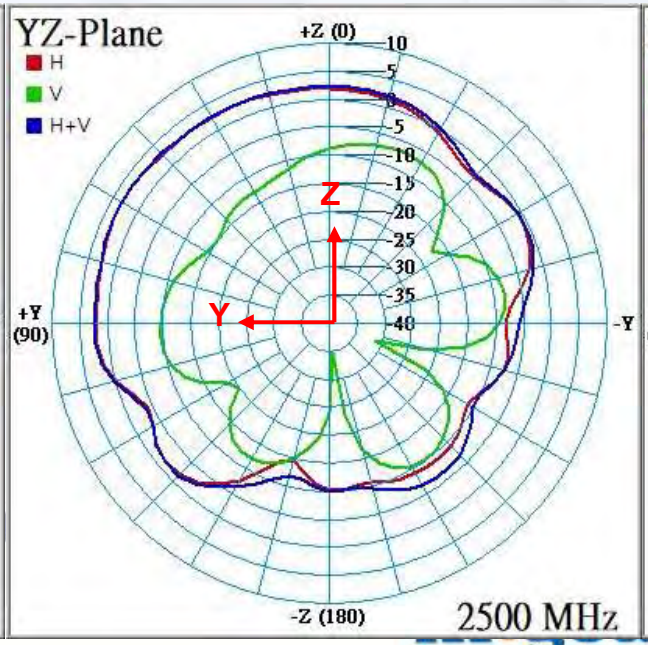
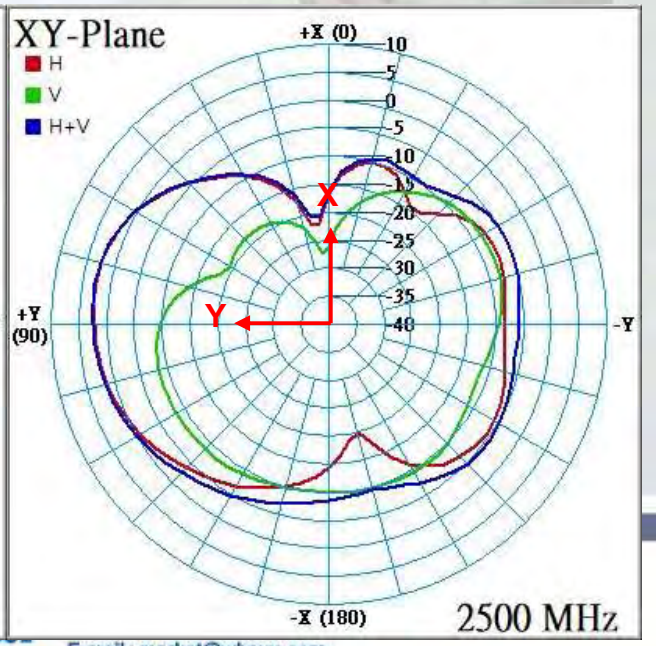
2D Radiation Pattern Results

DB2 (2500 MHz)







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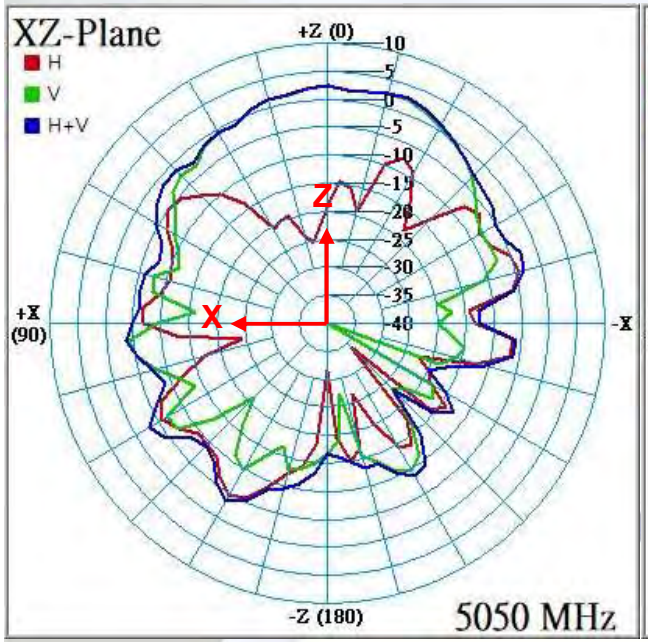
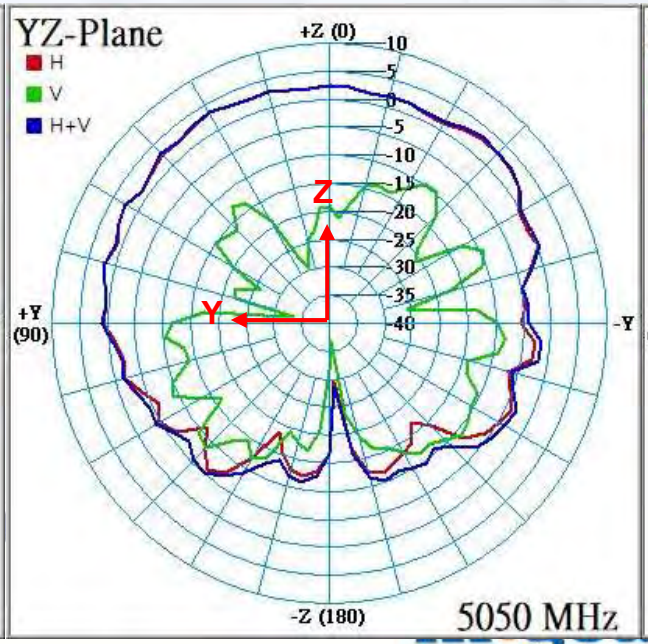
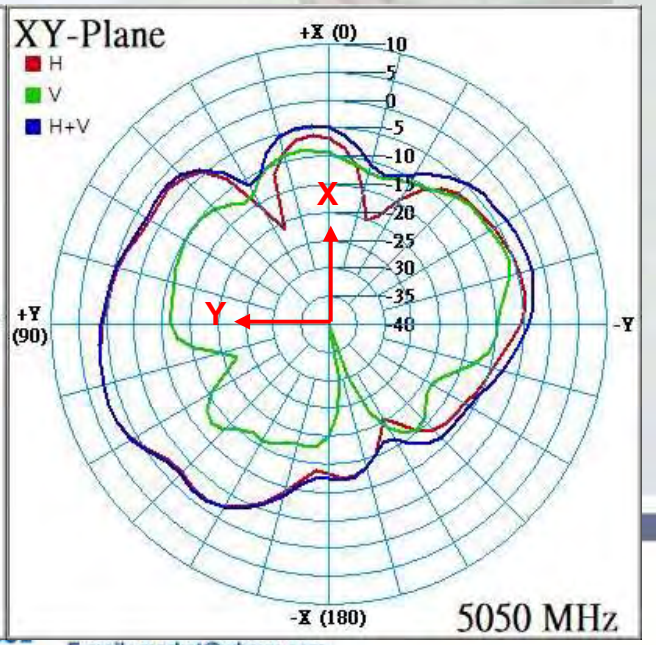
2D Radiation Pattern Results

DB2 (5050 MHz)







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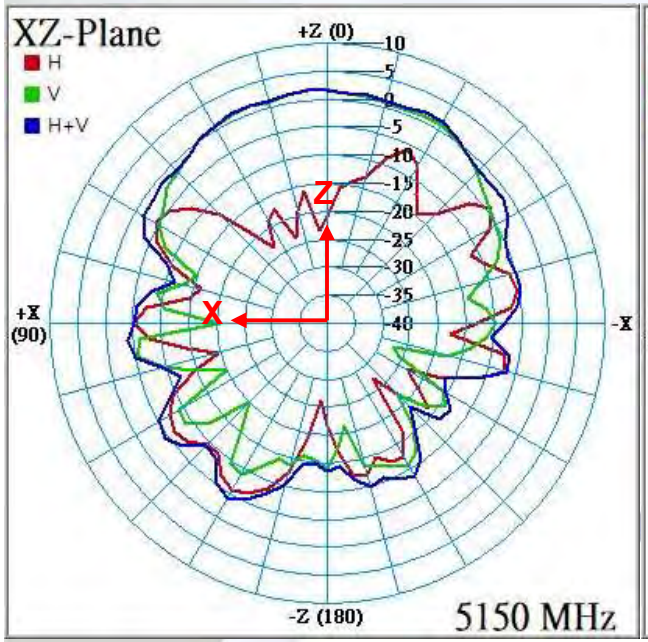
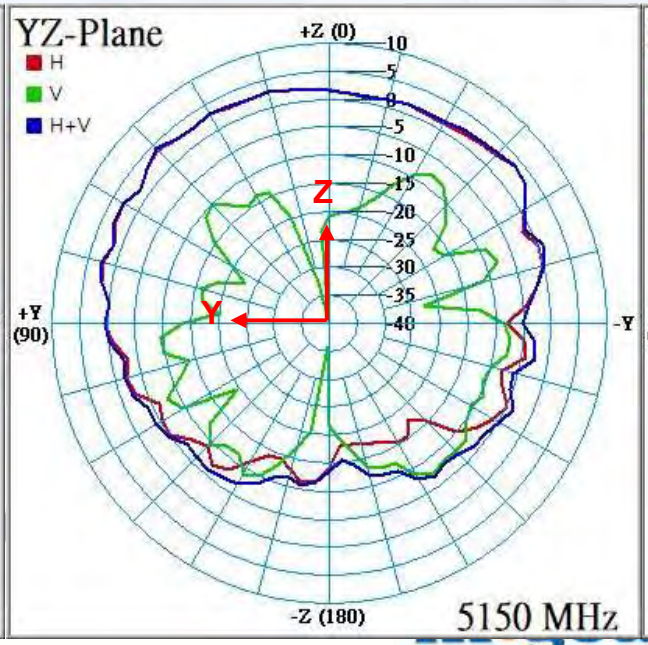
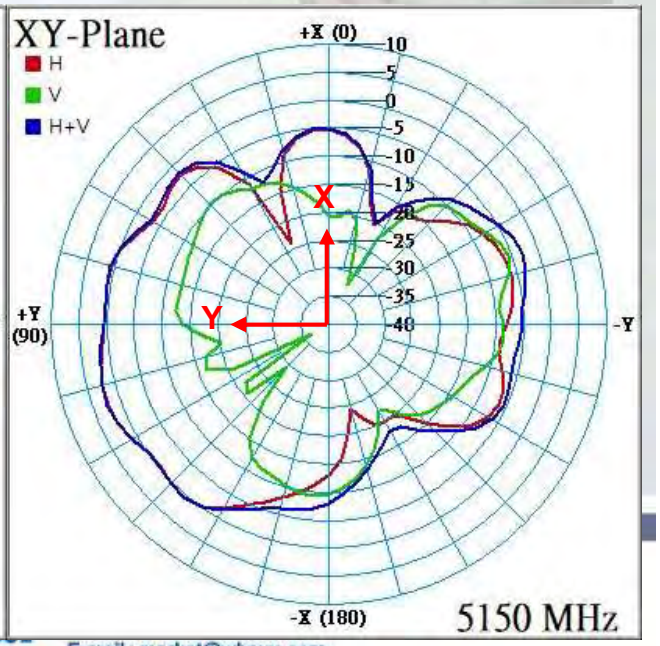
2D Radiation Pattern Results

DB2 (5150 MHz)







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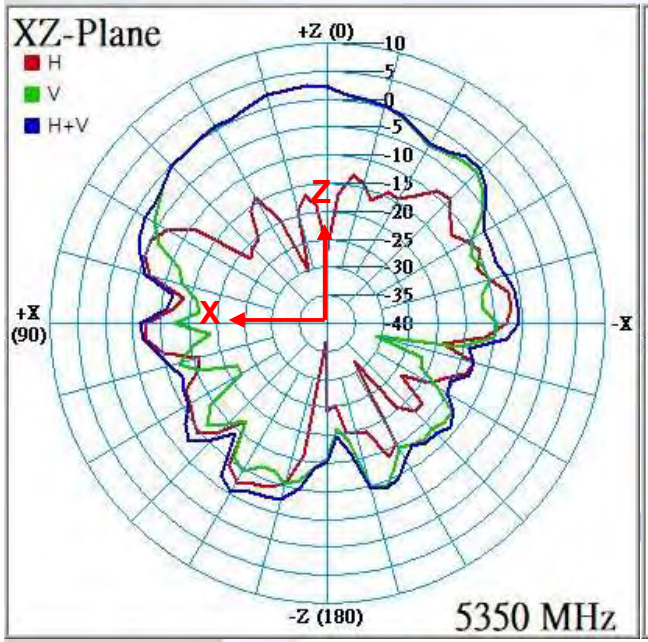
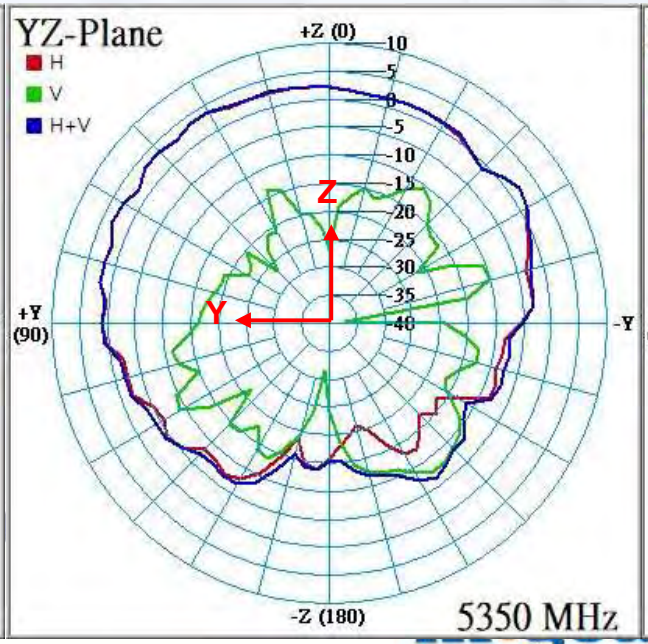
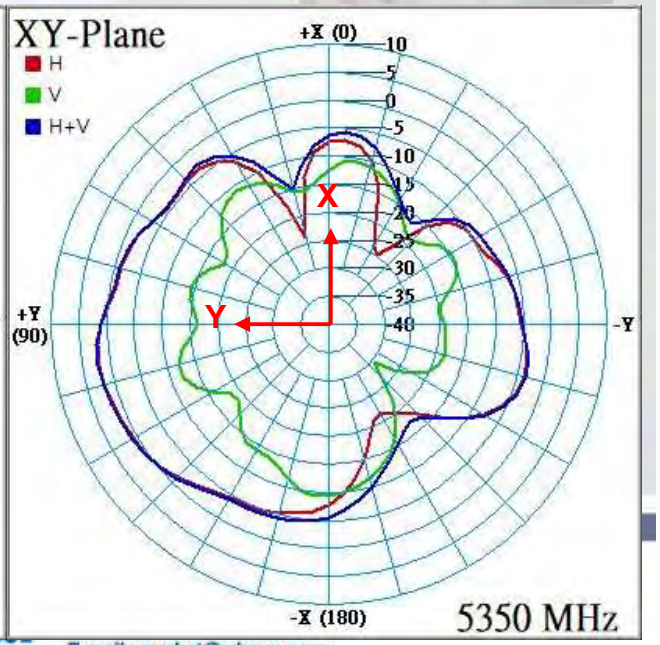
2D Radiation Pattern Results

DB2 (5350 MHz)







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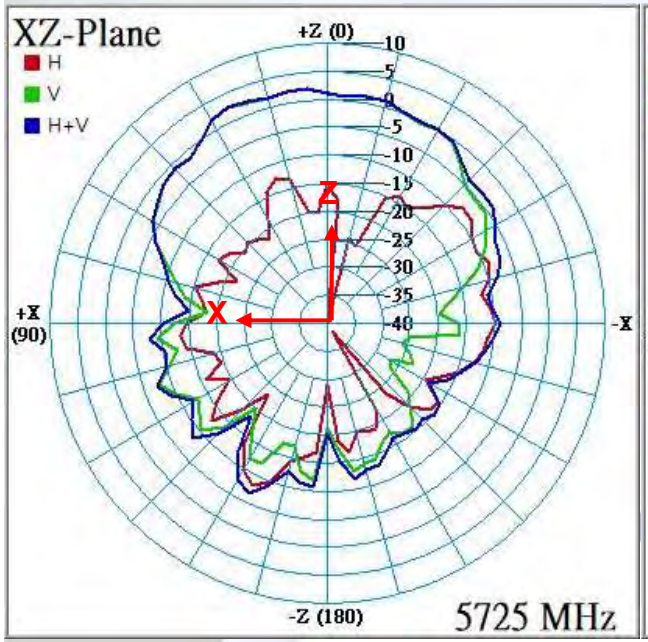
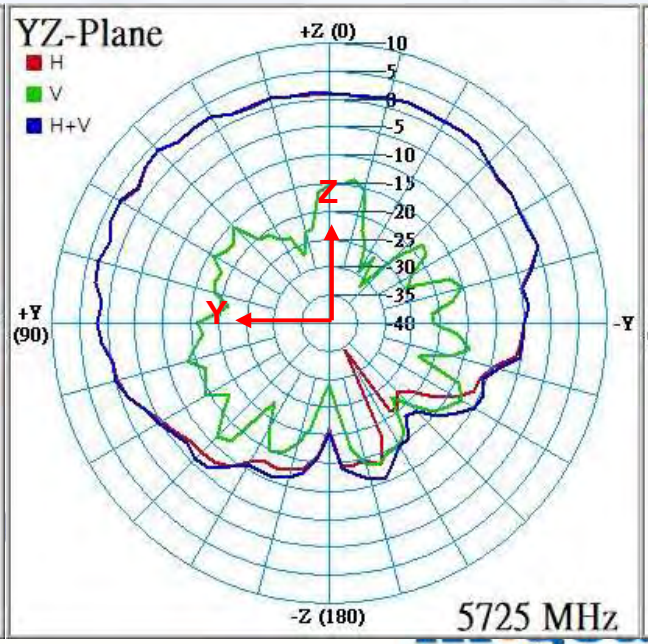
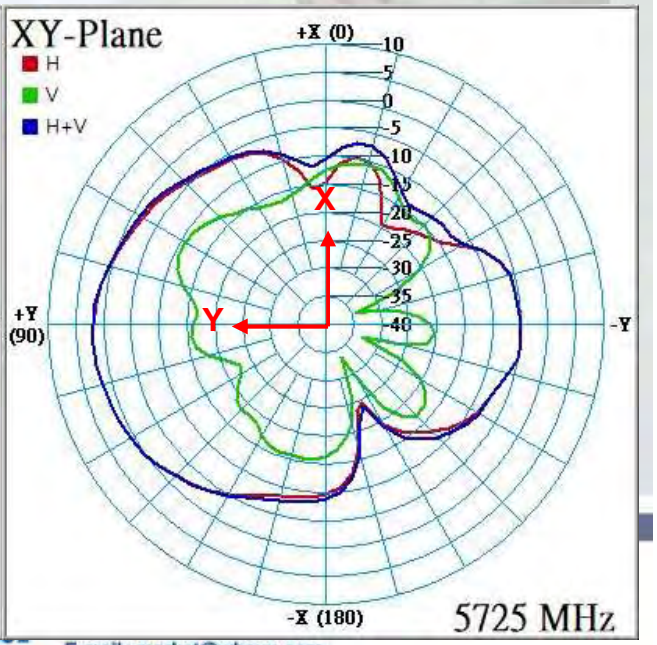
2D Radiation Pattern Results

DB2 (5725 MHz)







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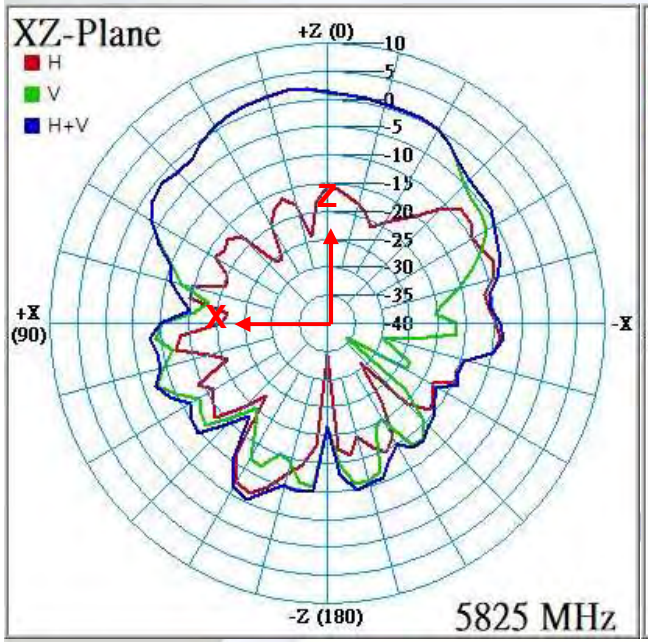
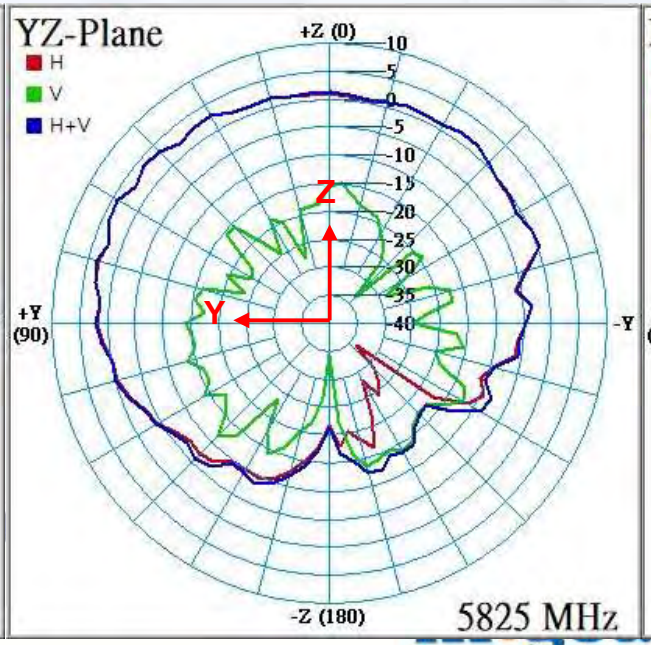
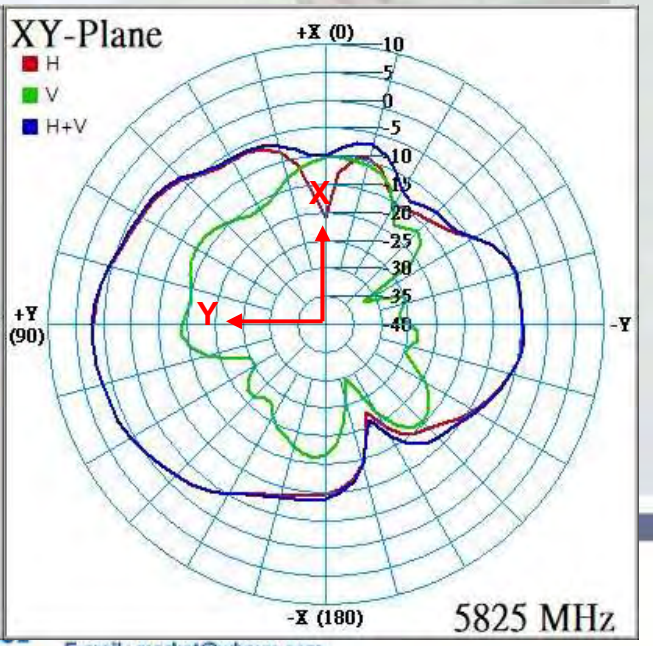
2D Radiation Pattern Results

DB2 (5825 MHz)







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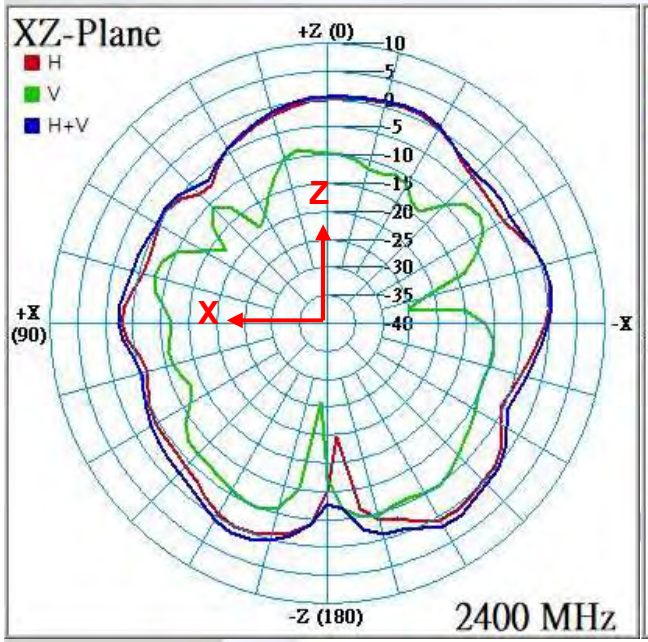
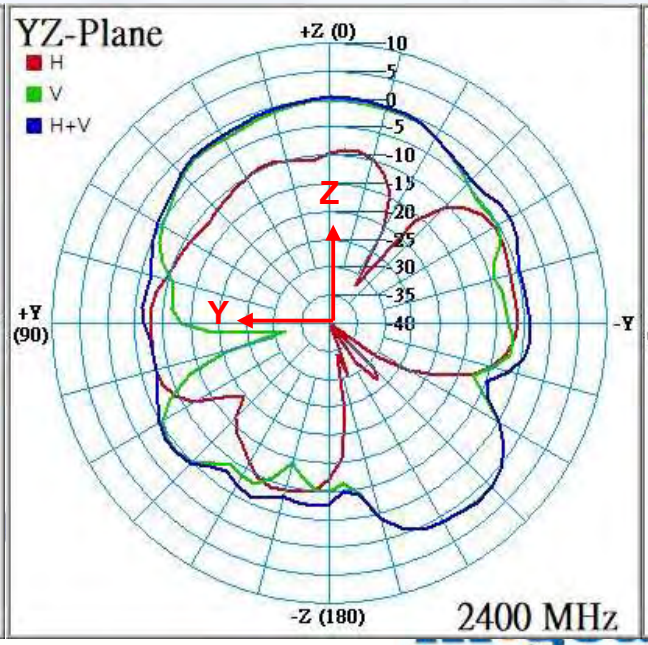
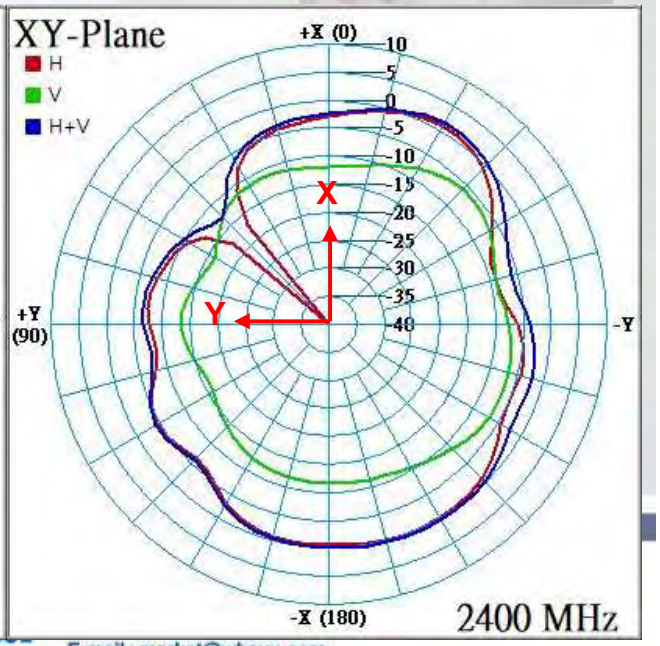
2D Radiation Pattern Results

DB3 (2400 MHz)







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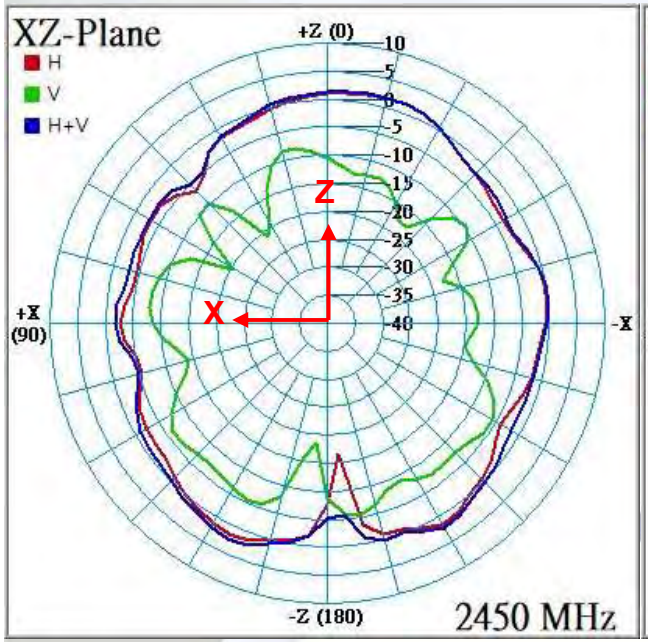
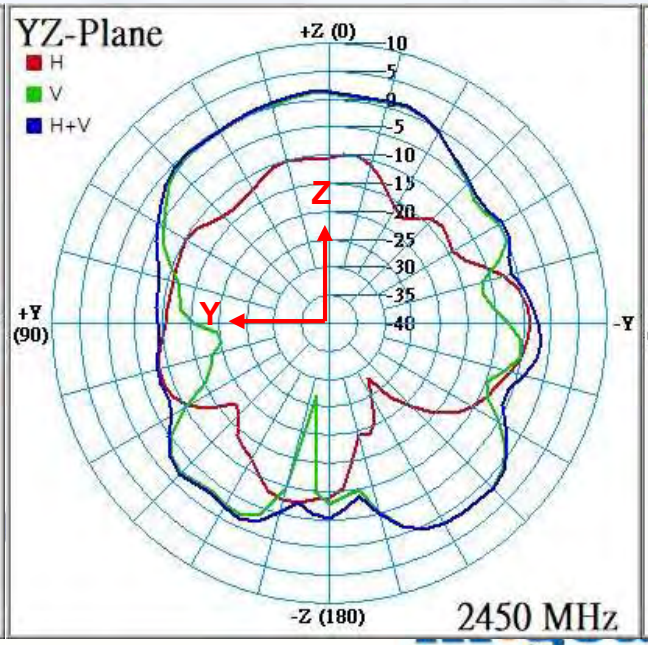
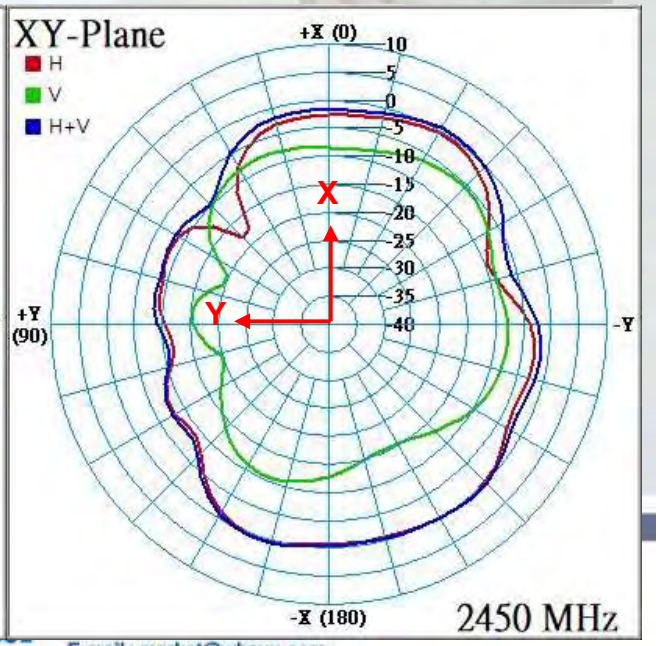
2D Radiation Pattern Results

DB3 (2450 MHz)







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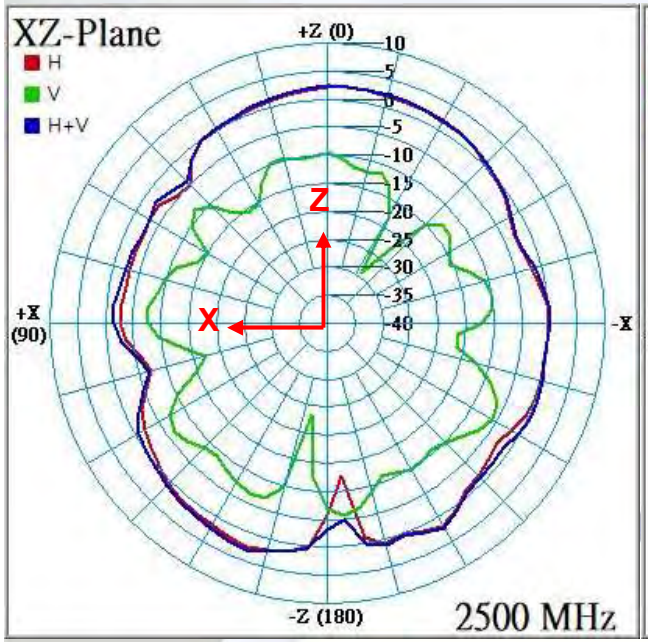
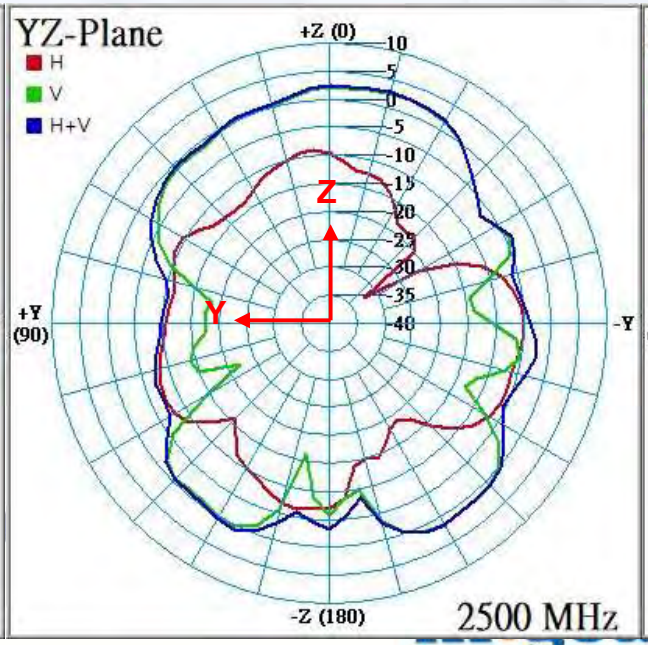
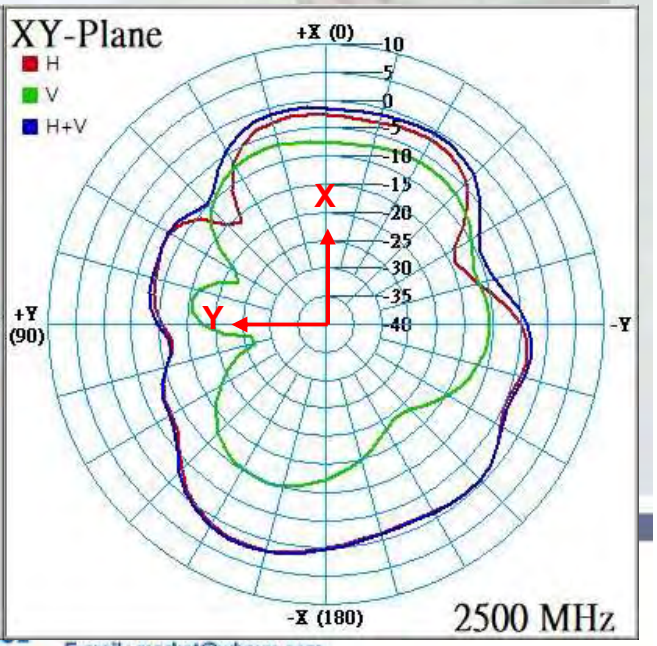
2D Radiation Pattern Results

DB3 (2500 MHz)







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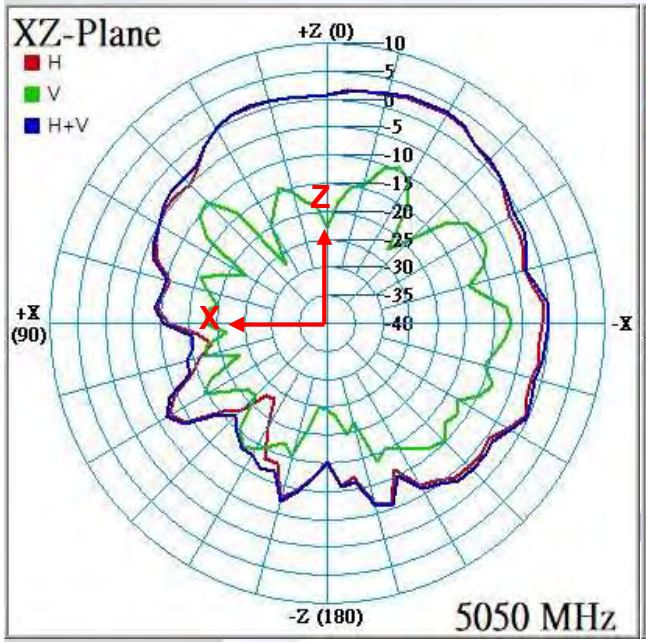
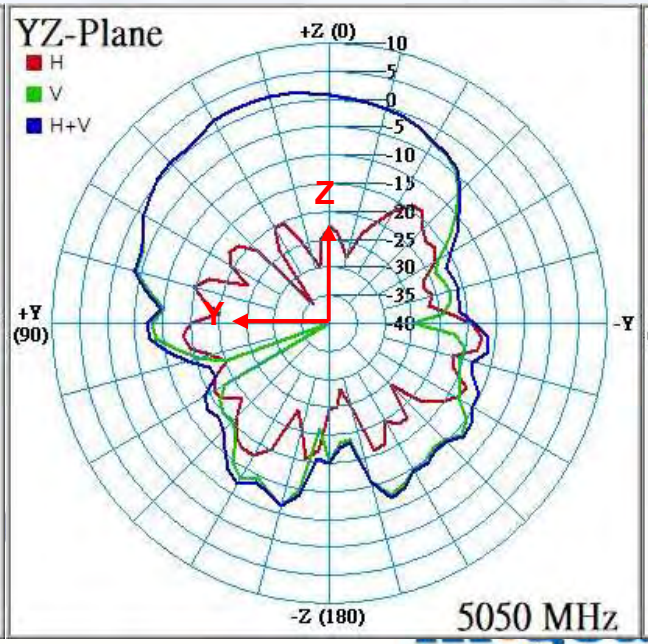
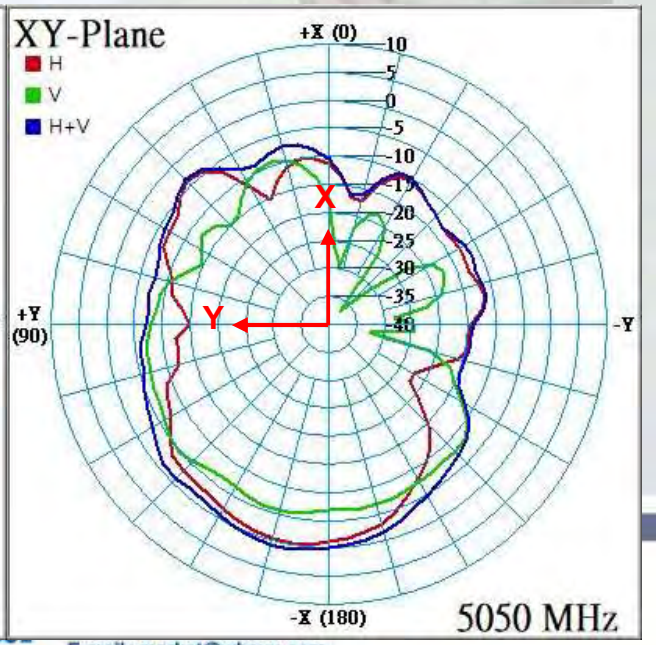
2D Radiation Pattern Results

DB3 (5050 MHz)







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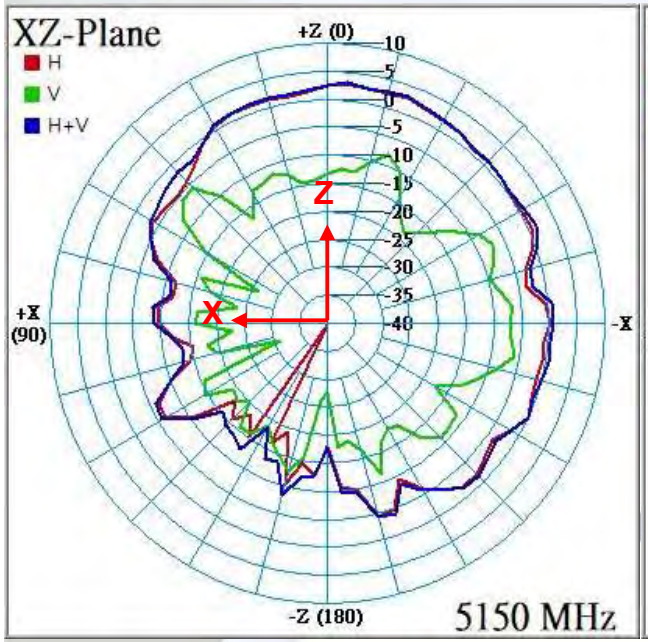
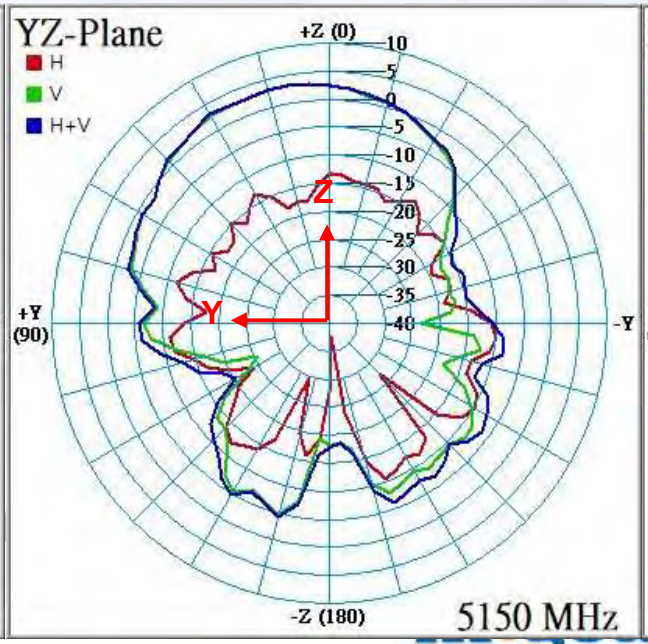
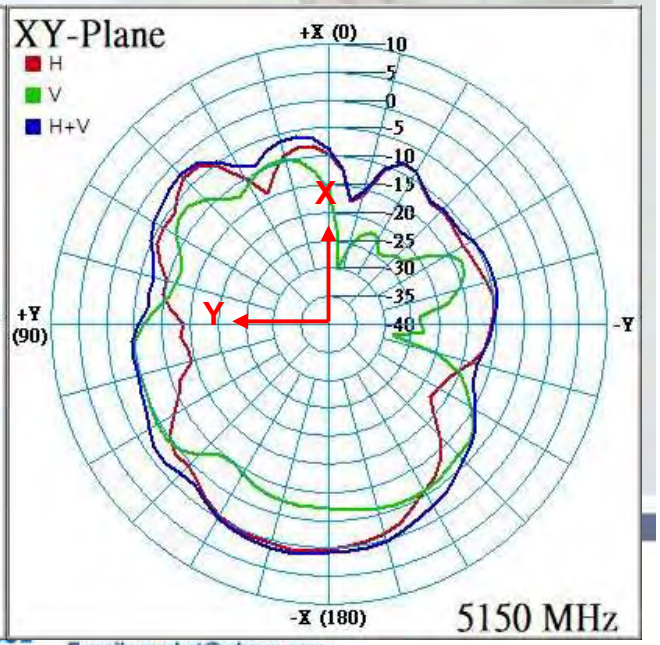
2D Radiation Pattern Results

DB3 (5150 MHz)







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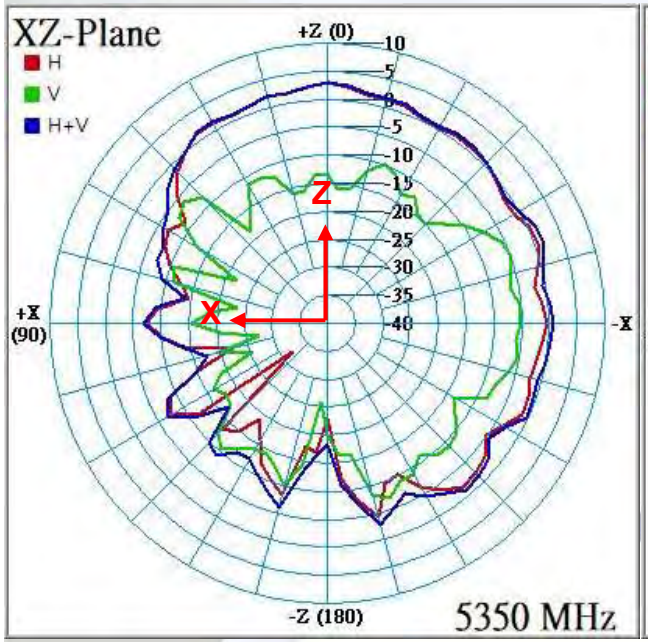
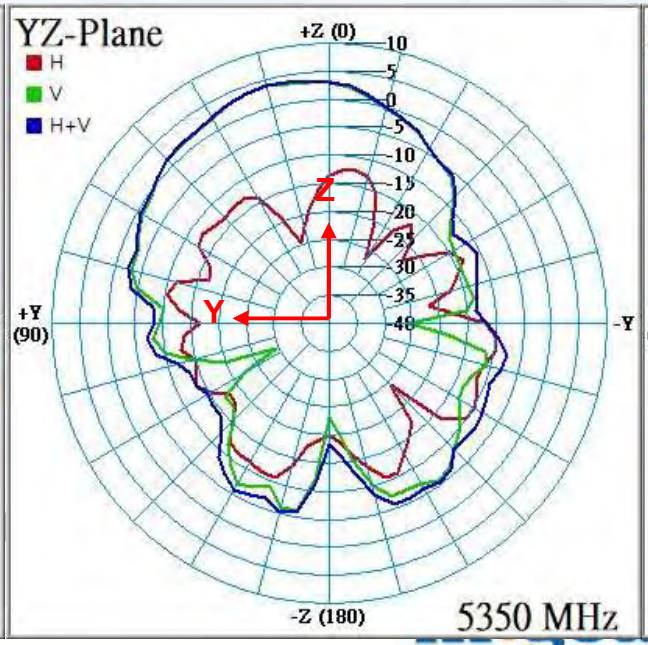
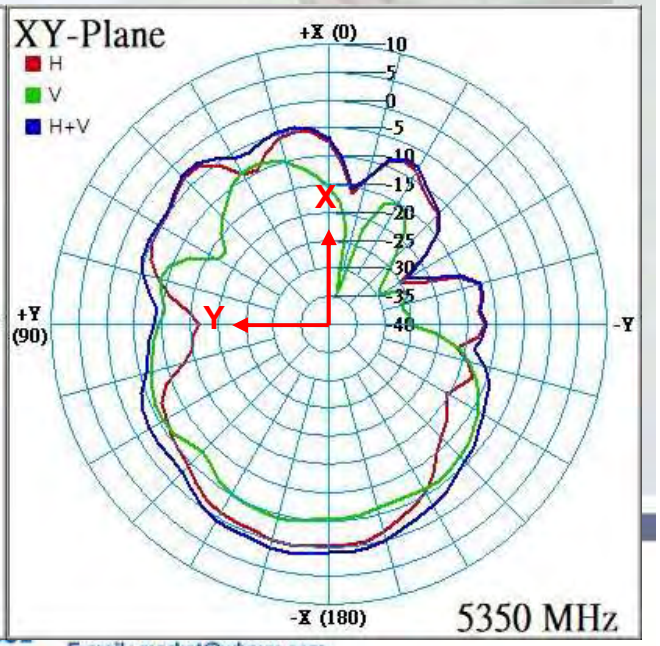
2D Radiation Pattern Results

DB3 (5350 MHz)







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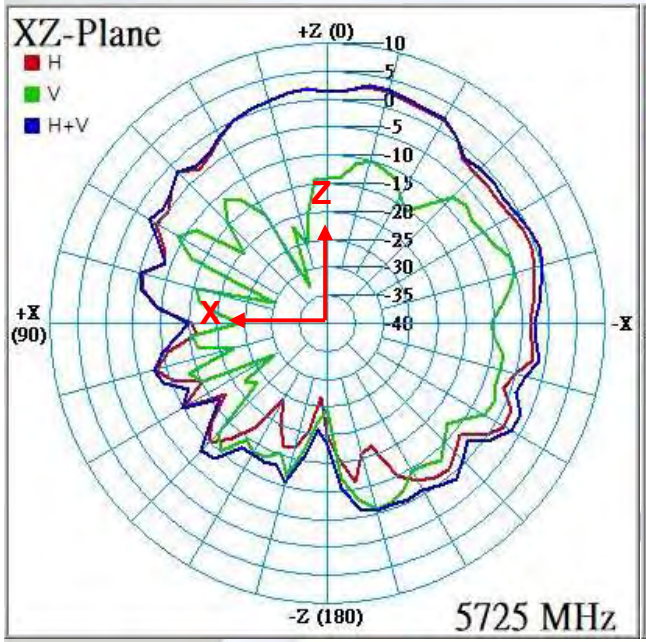
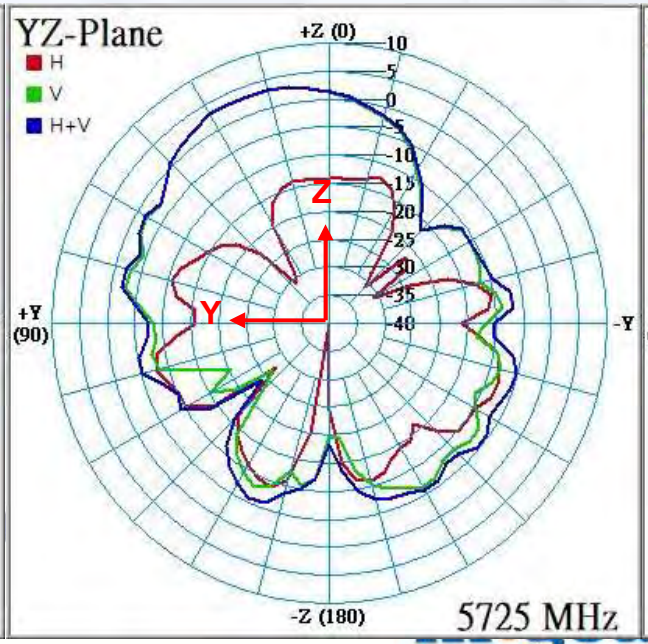
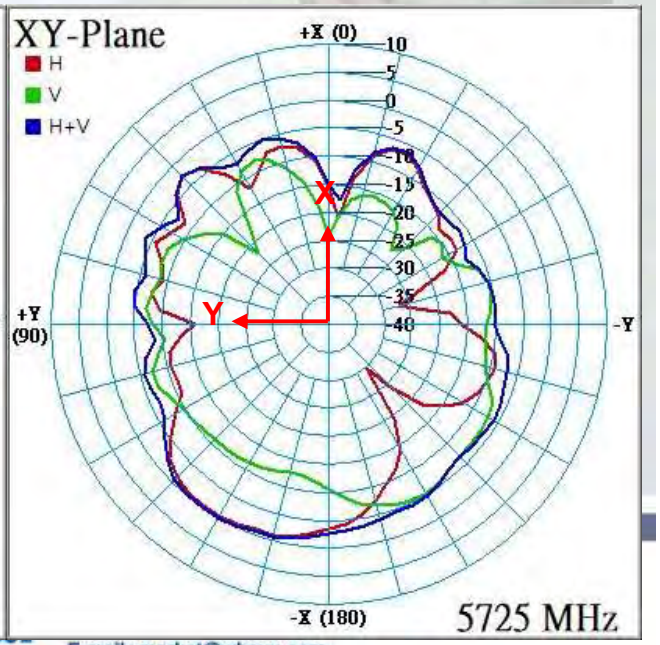
2D Radiation Pattern Results

DB3 (5725 MHz)







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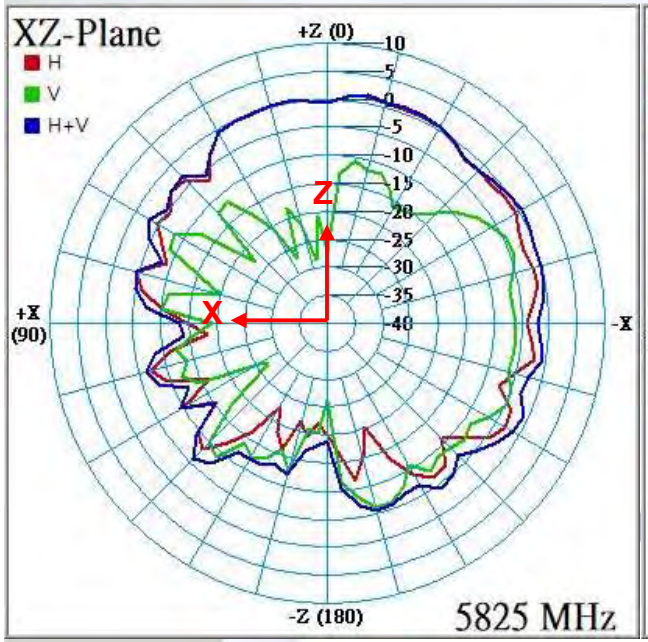
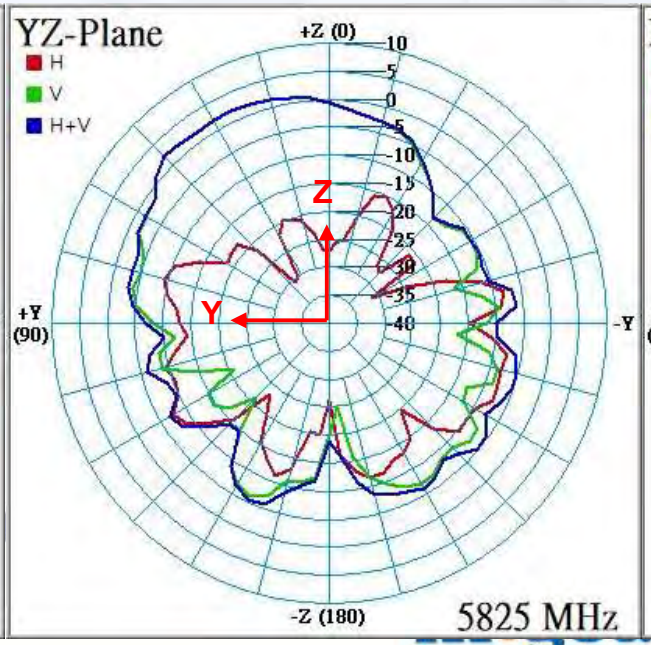
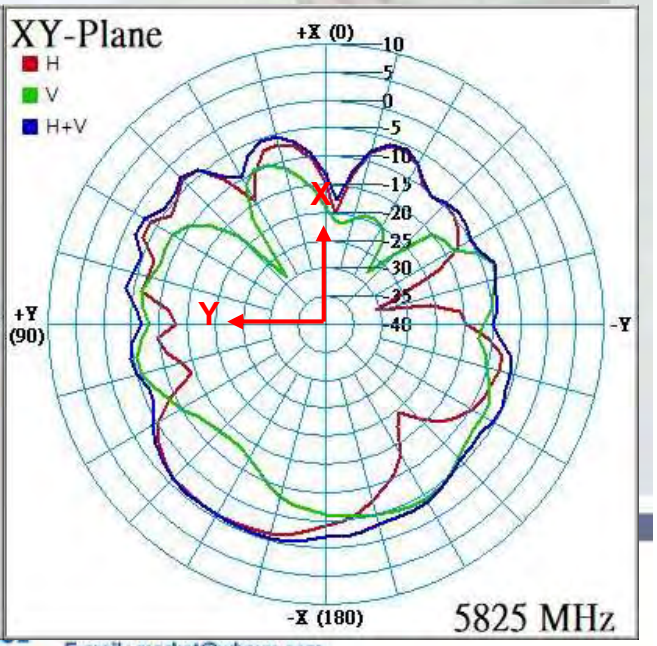
2D Radiation Pattern Results

DB3 (5825 MHz)







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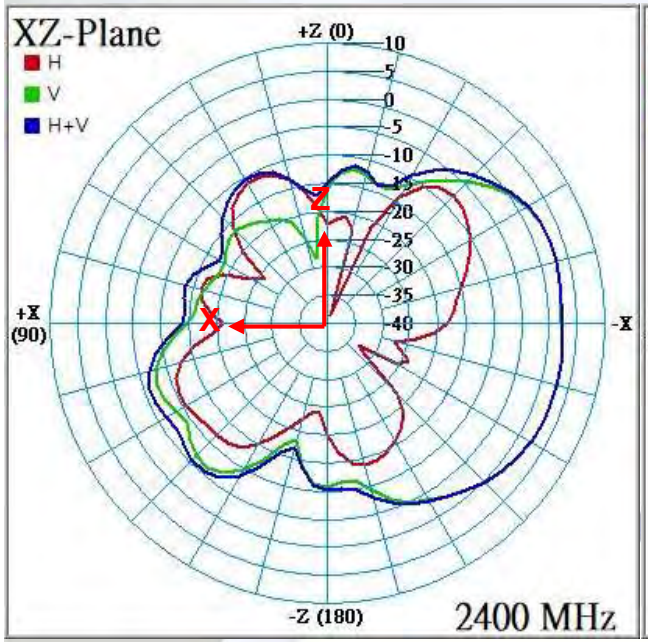
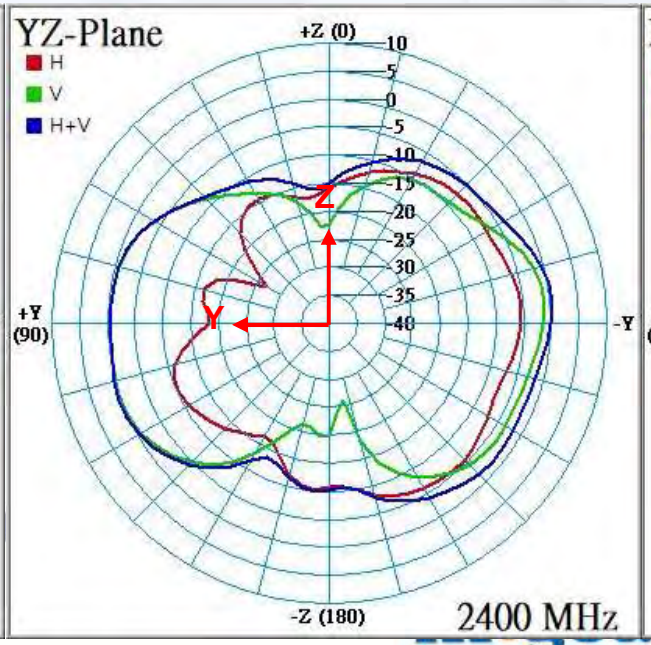
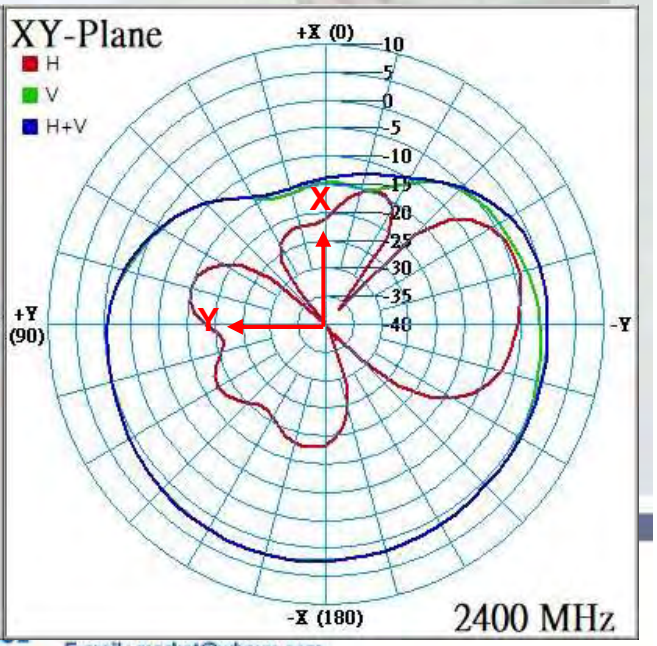
2D Radiation Pattern Results

DB4 (2400 MHz)







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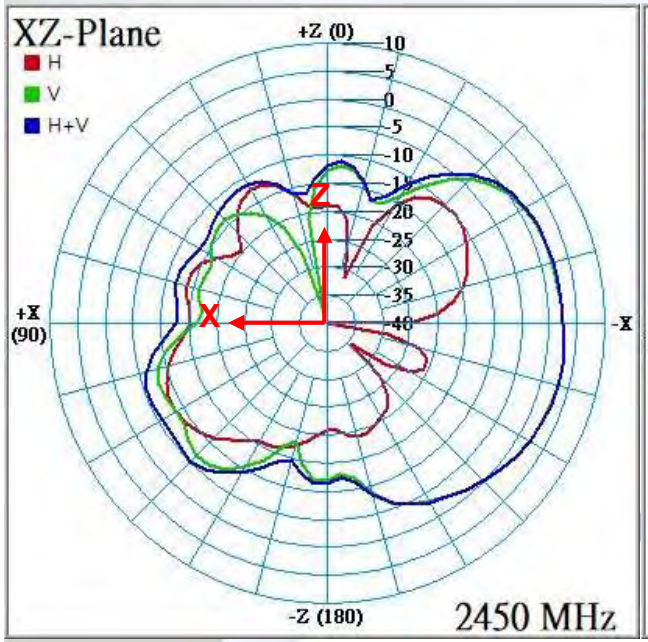
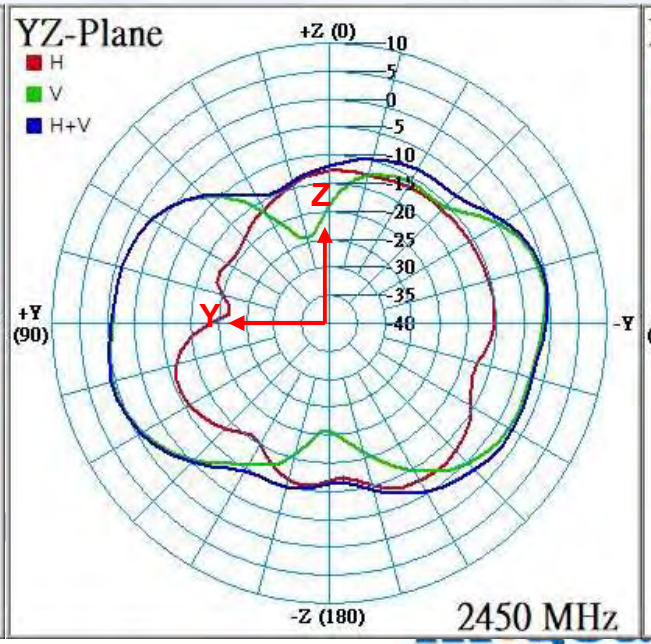
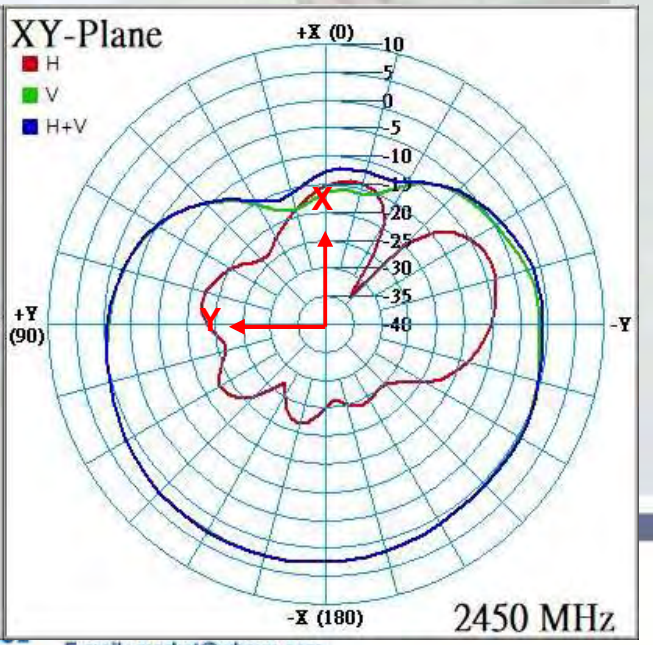
2D Radiation Pattern Results

DB4 (2450 MHz)







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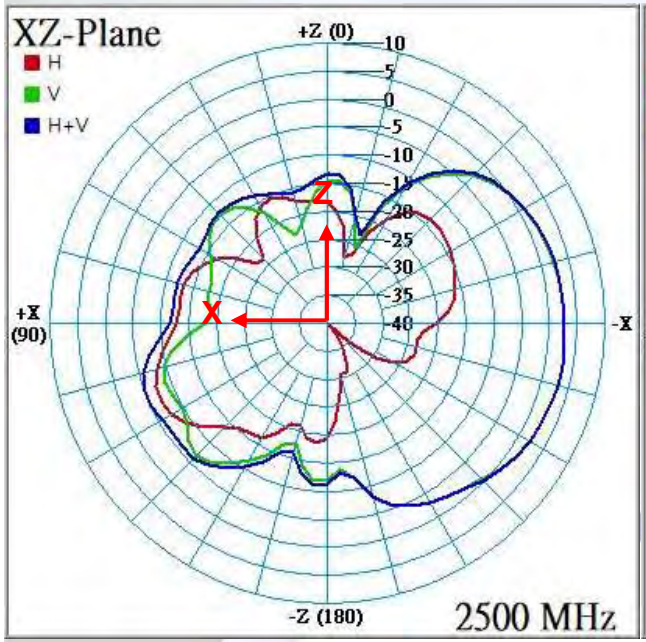
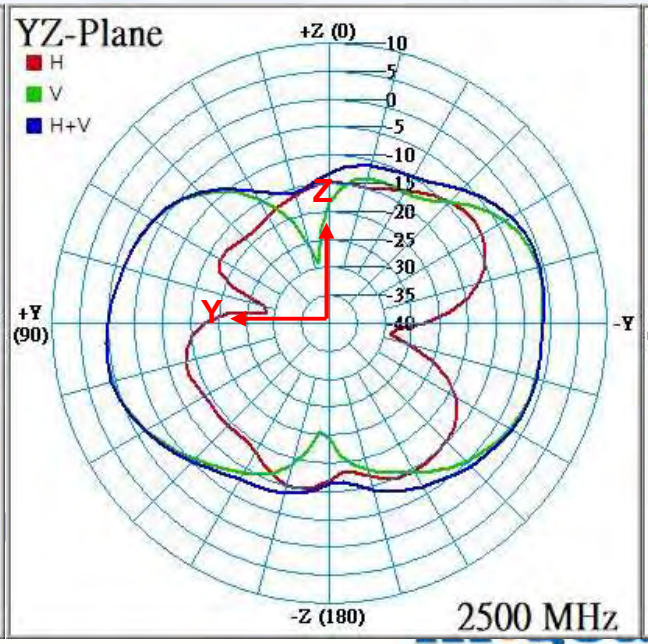
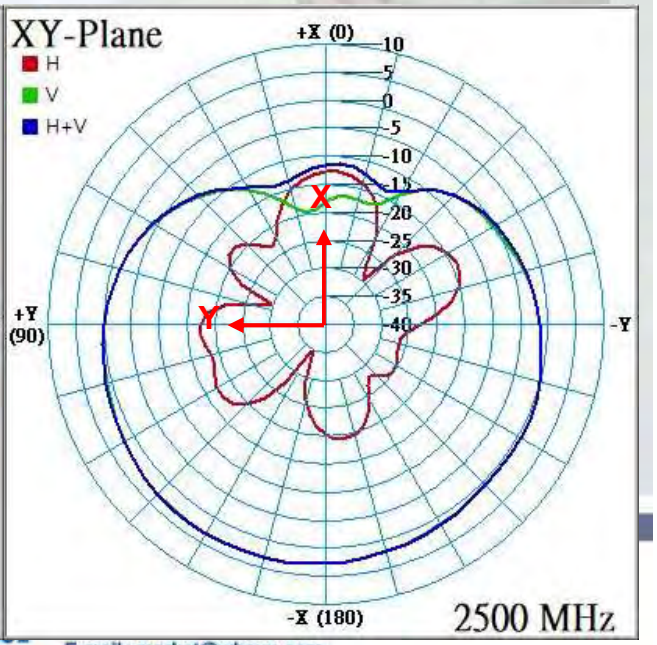
2D Radiation Pattern Results

DB4 (2500 MHz)







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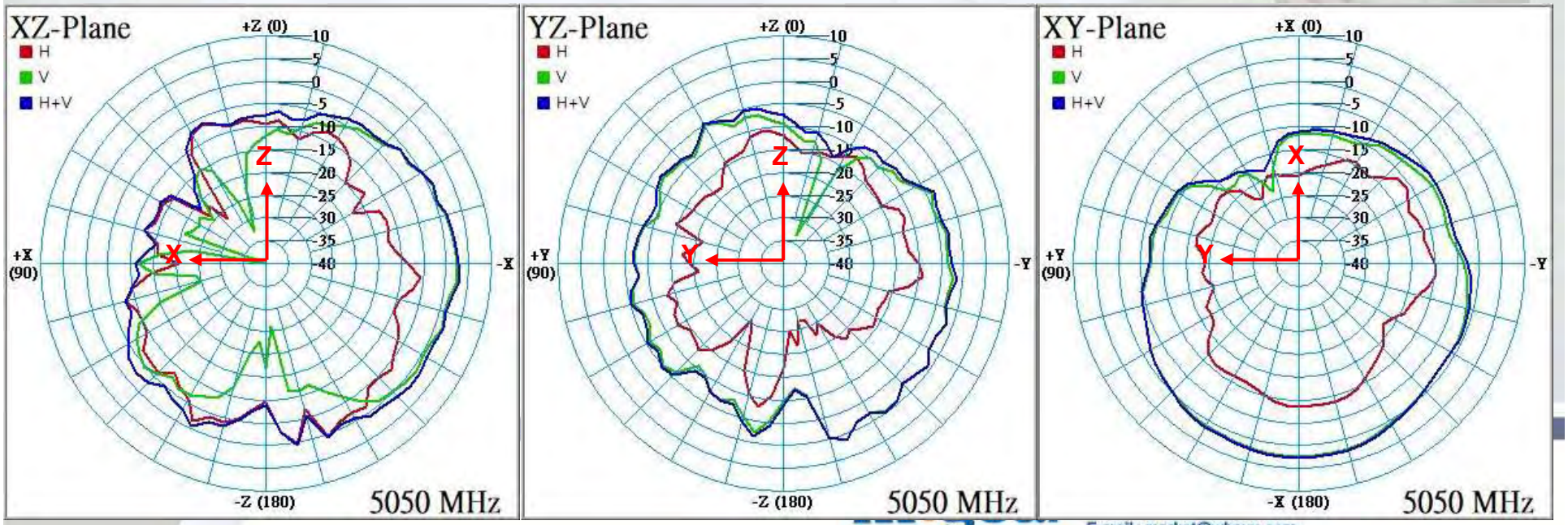
2D Radiation Pattern Results

DB4 (5050 MHz)



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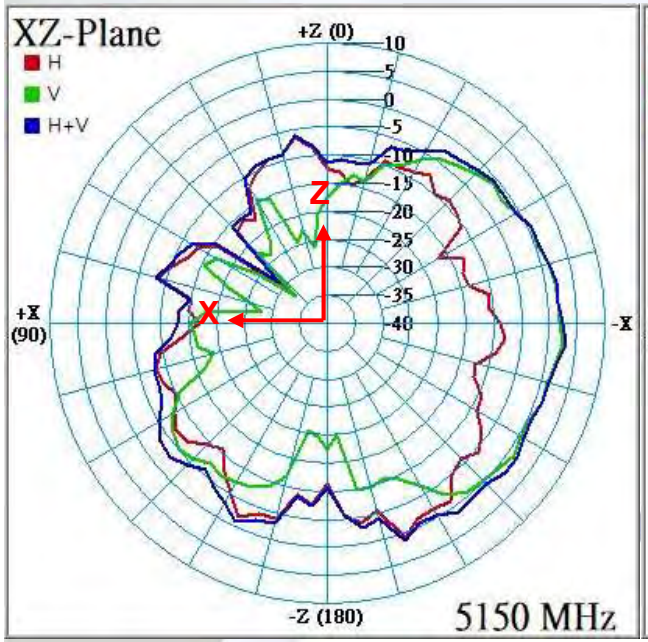
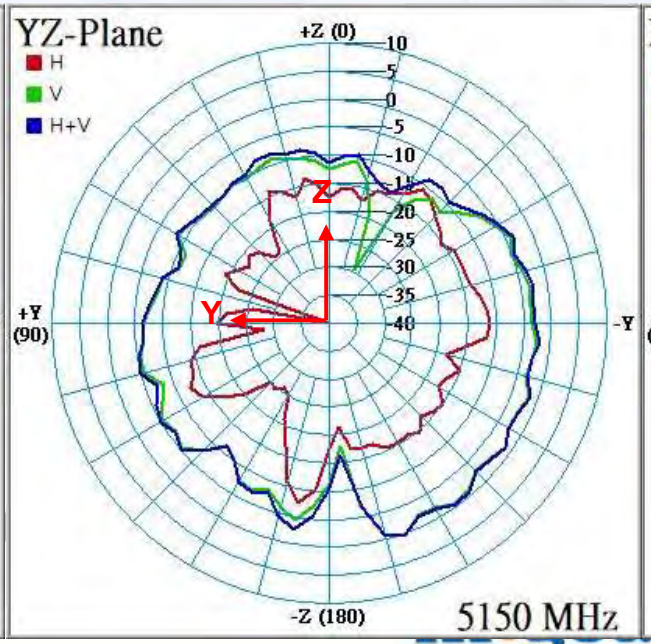
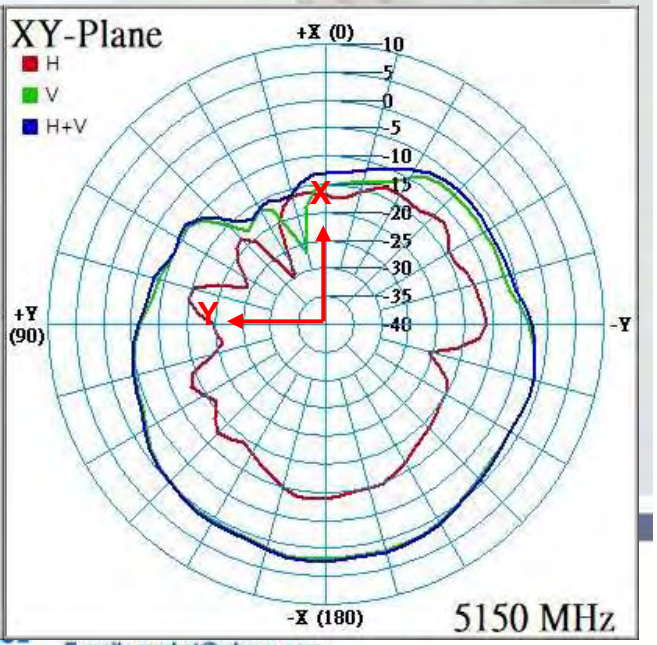
2D Radiation Pattern Results

DB4 (5150 MHz)







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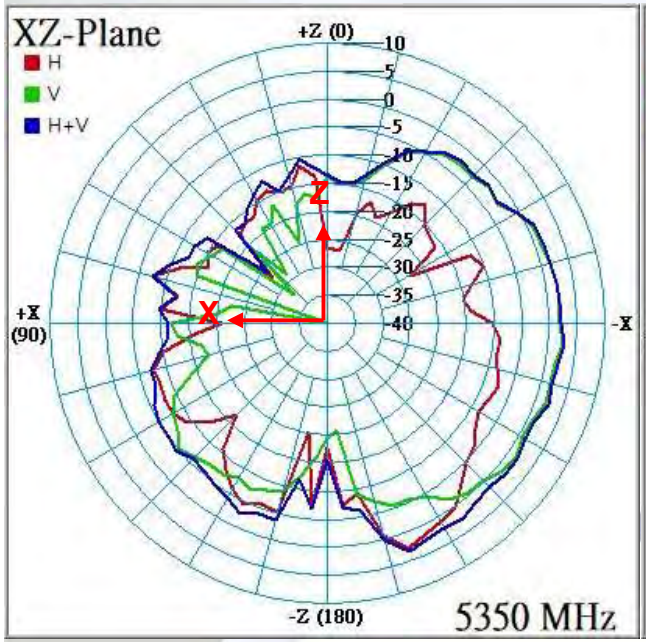
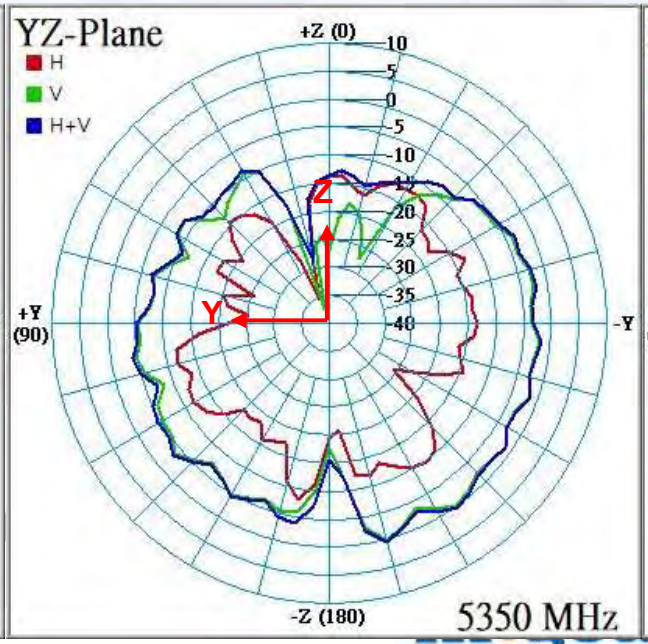
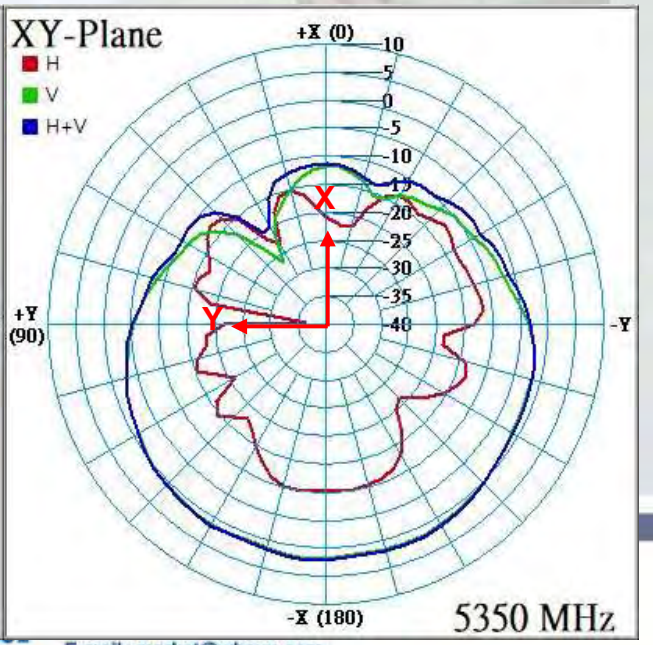
2D Radiation Pattern Results

DB4 (5350 MHz)







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