

Sagemcom F5667_Vertical _Antenna Passive Test Report

V1.3

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Reviewed: deng wen
Approved: deng wen

date: 2026.01.16
date : 2026.01.16
date : 2026.01.16

Report change list

Version	Change description	Author	date
V1.0	First version.	Li mingjun	2025.12.24
V1.1	1. The tilt angles of the DB1 and DB2 antennas have been increased from 30° to 45°. 2. Update the test images. 3. Correction of the X-Y plane coordinates.	Li mingjun	2025.12.31
V1.2	1. Update single-antenna 2D H&V polarization. 2. Update antenna combination gain 2D H&V polarization.	Tom	2026.01.13
V1.3	Based on the design from version 1.2, antennas DB1 and DB2 are tilted relative to each other by 30° along the X-axis direction (i.e., DB1 and DB2 are cross-tilted).	Tom	2026.01.16

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- ◆ **DUT Antenna**
- ◆ **Return Loss and Isolation**
- ◆ **2D&3D Radiation Pattern**
- ◆ **Peak Gain and Efficiency**
- ◆ **Summary**

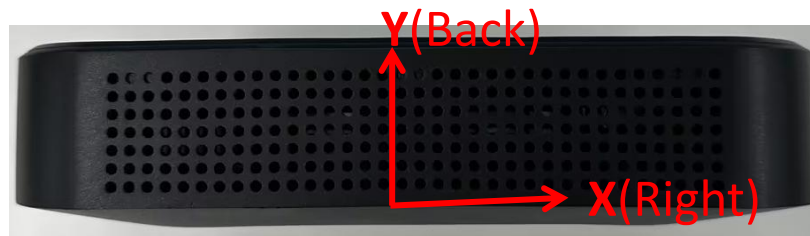
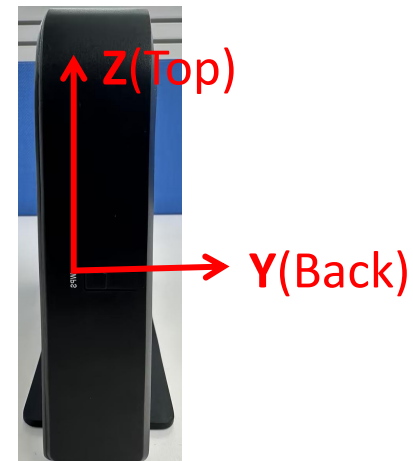
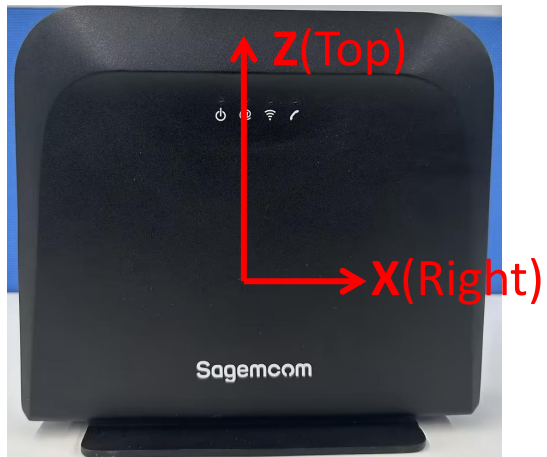
Purpose

- Meet the electrical performance index ;
- Confirm the antenna scheme to meet the design requirements;

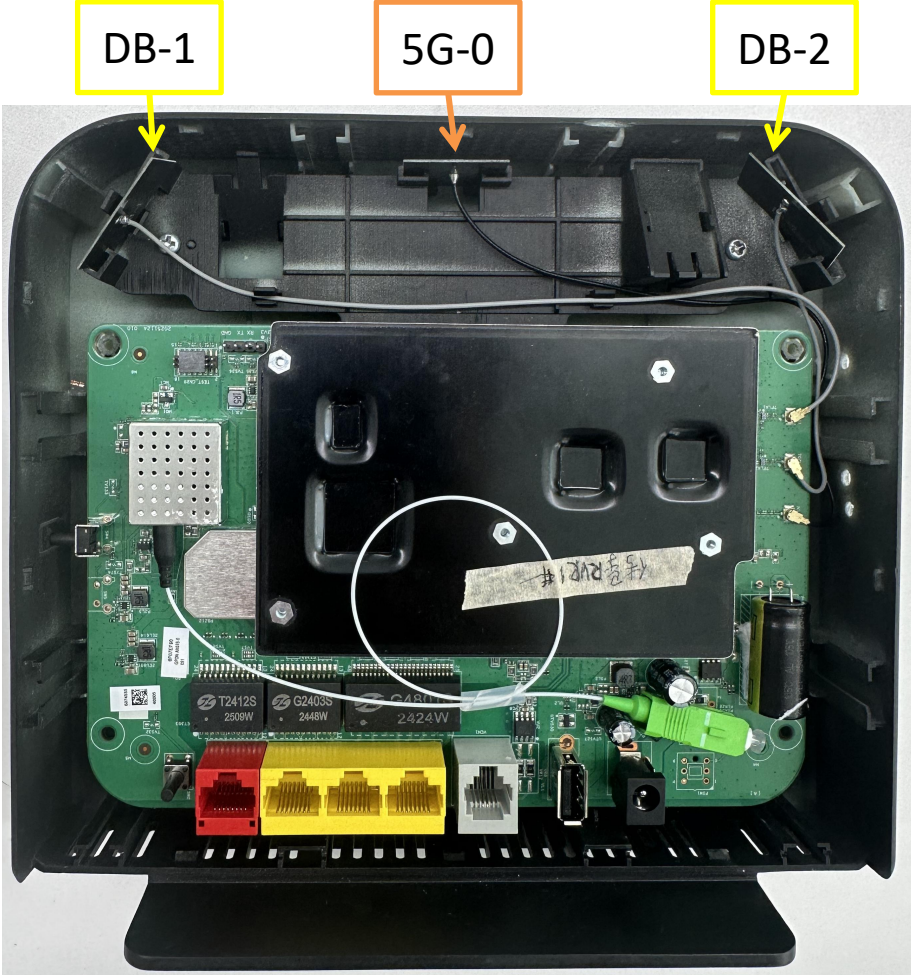
Environment

- Test Condition: the network analyzer(E5071C) and SATIMO microwave anechoic chamber
- Passive measurement results are presented
- mock up

Antenna Model



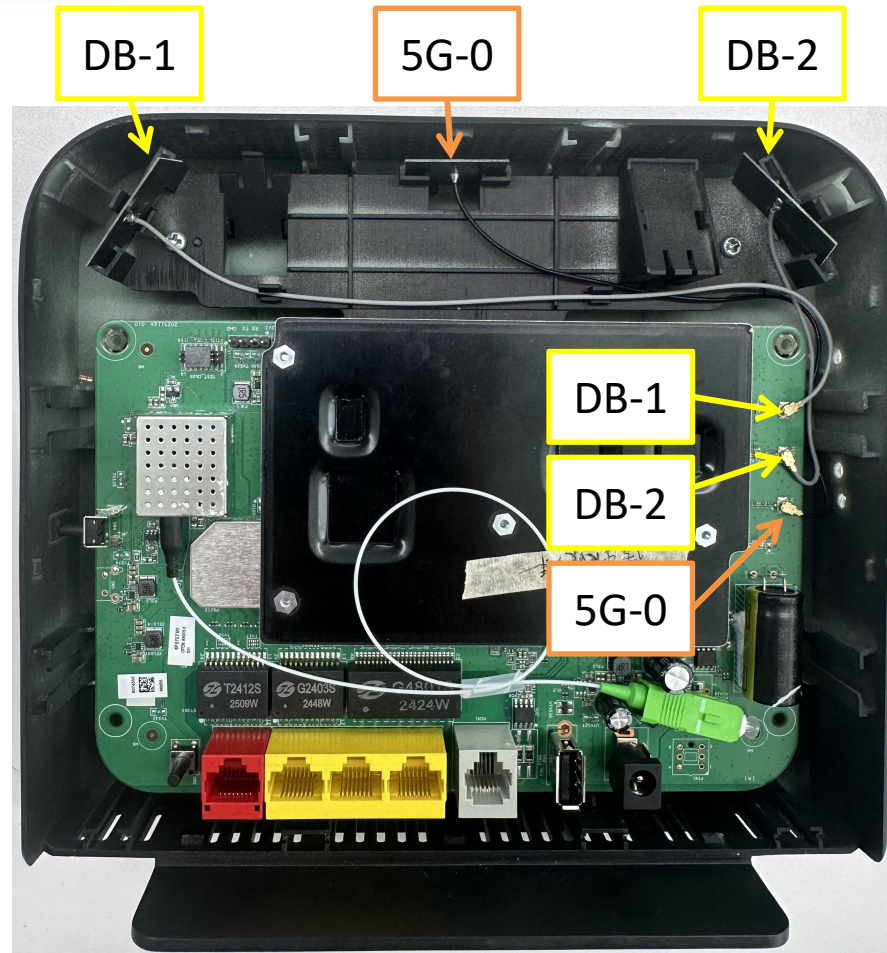
Antenna Model



Antenna information	
Manufacturer	Dongguan Renfeng Electronic Technology Co., Ltd
Manufacturer address	Dongguan Address: Building A, B, and C, No.1 Sankeng Industrial Zone, Qinghutou Community, Tangxia Town, Dongguan City
Model number	DB-1
	DB-2
	5G-0

ANT	Frequency (GHz)	Type
DB-1	2.4-2.5 / 5.15-5.85	dipole
DB-2	2.4-2.5 / 5.15-5.85	dipole
5G-0	5.15-5.85	dipole

Antenna routing diagram



Antenna wire length information:

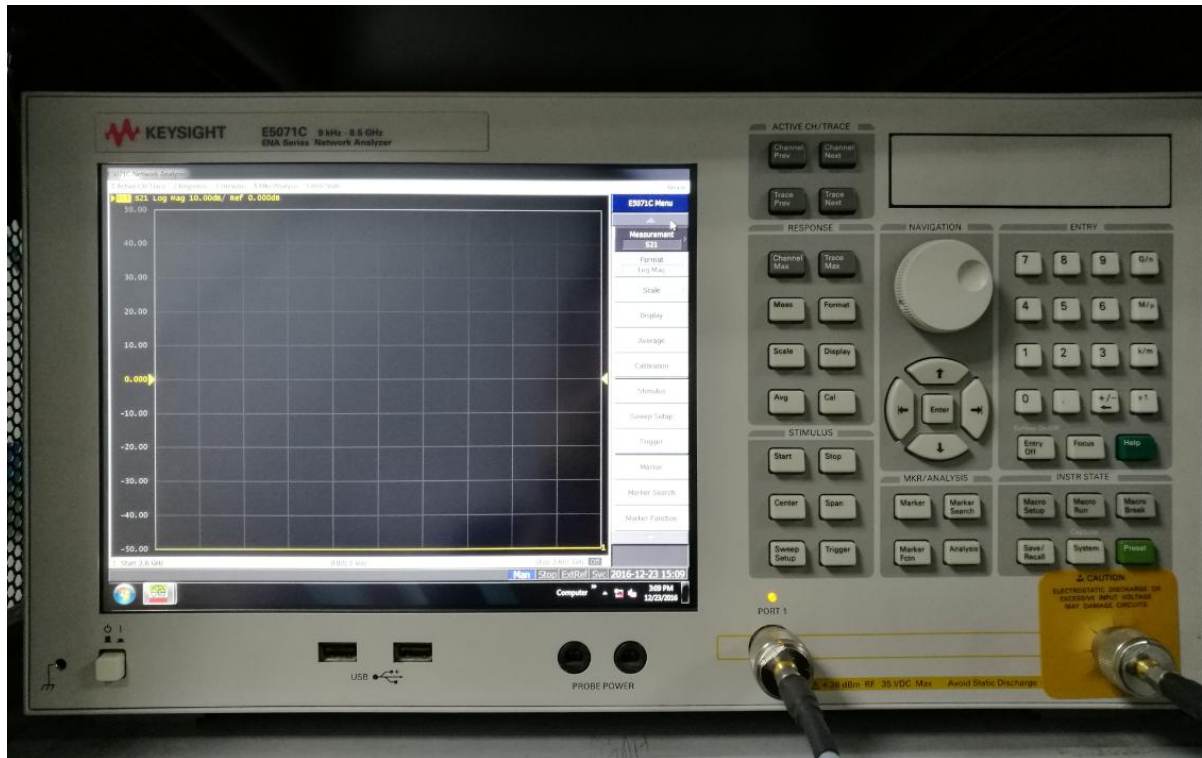
DB1 L=210mm RF113 Gray

DB2 L=90mm RF113 Gray

5G0 L=170mm RF113 Black

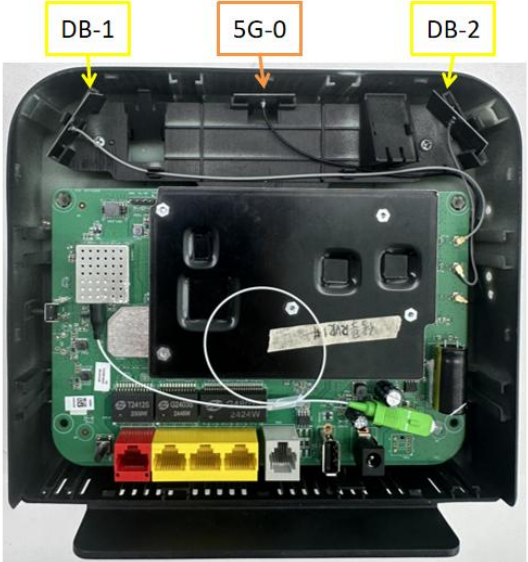
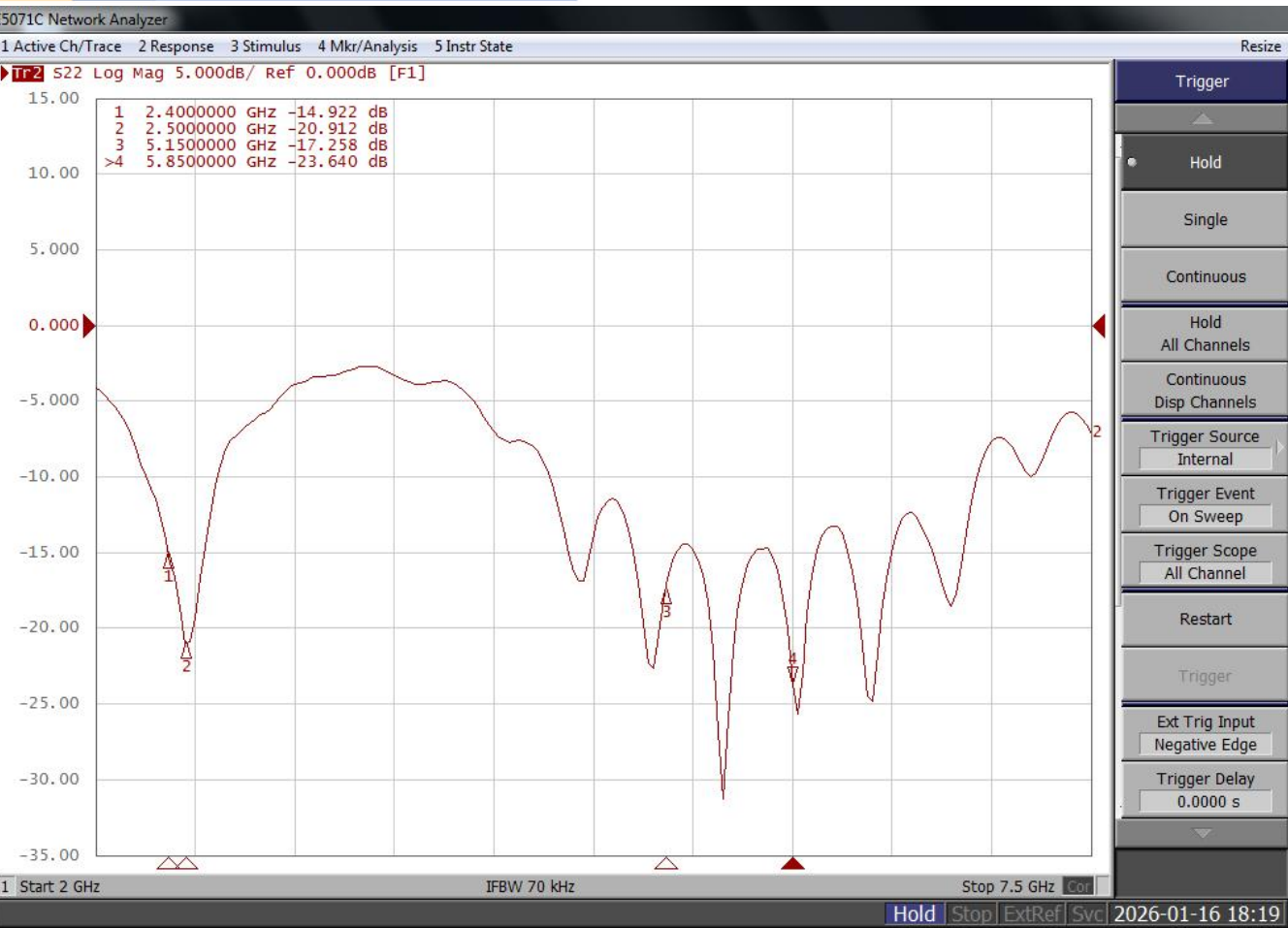
Return Loss and Isolation

Measurement Condition



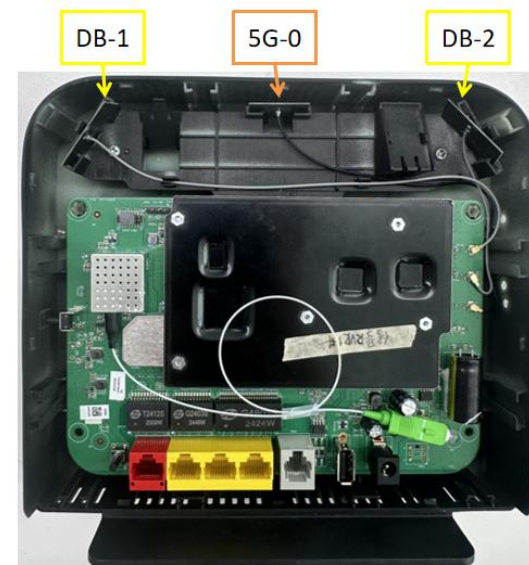
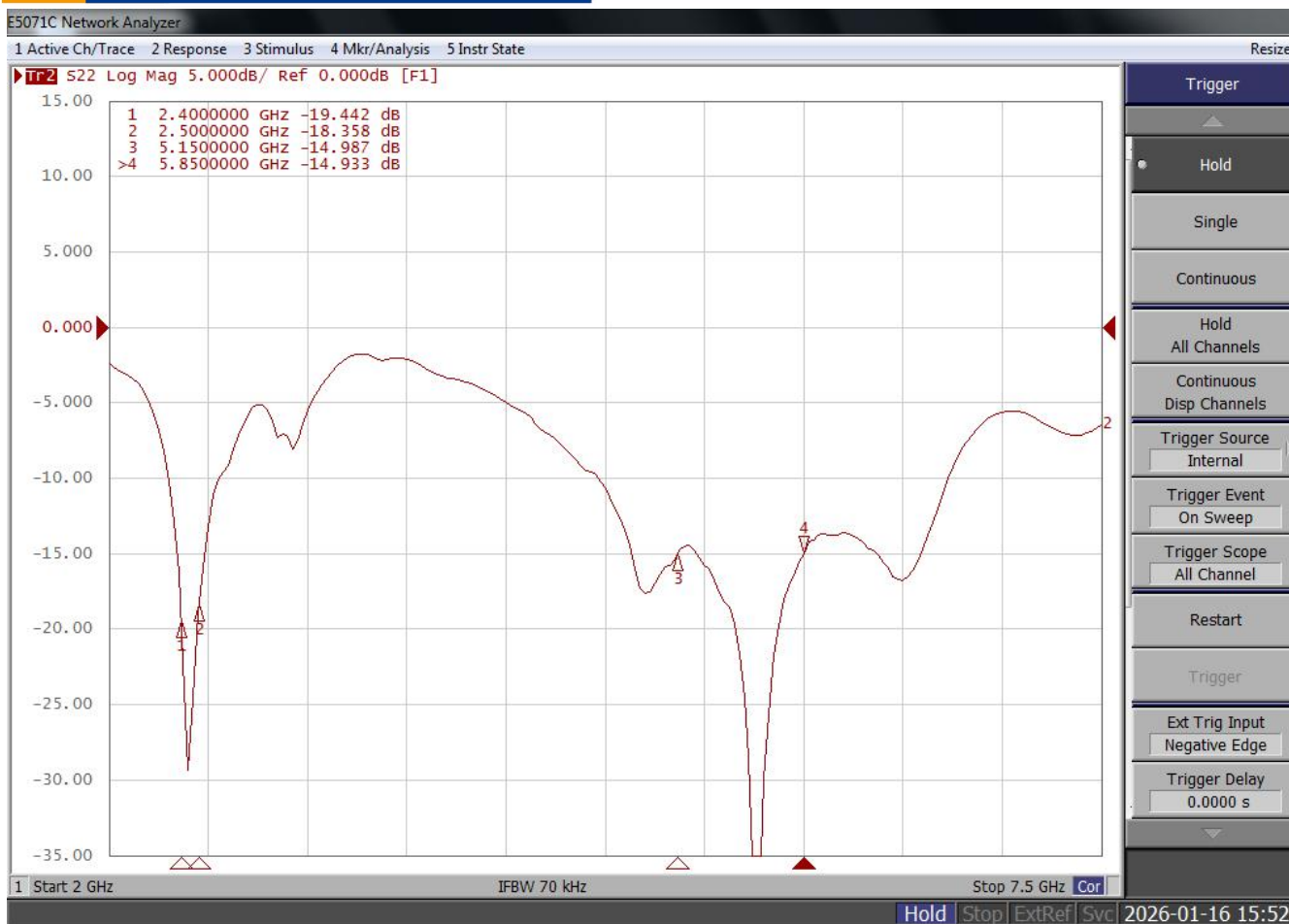
The network Analyzer

WIFI DB-1 Return Loss



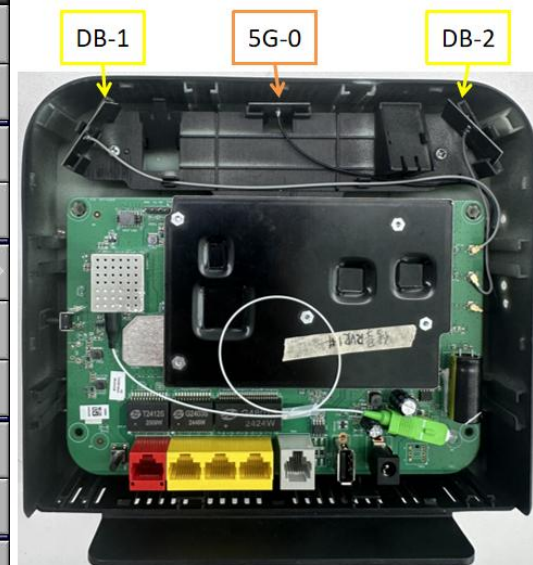
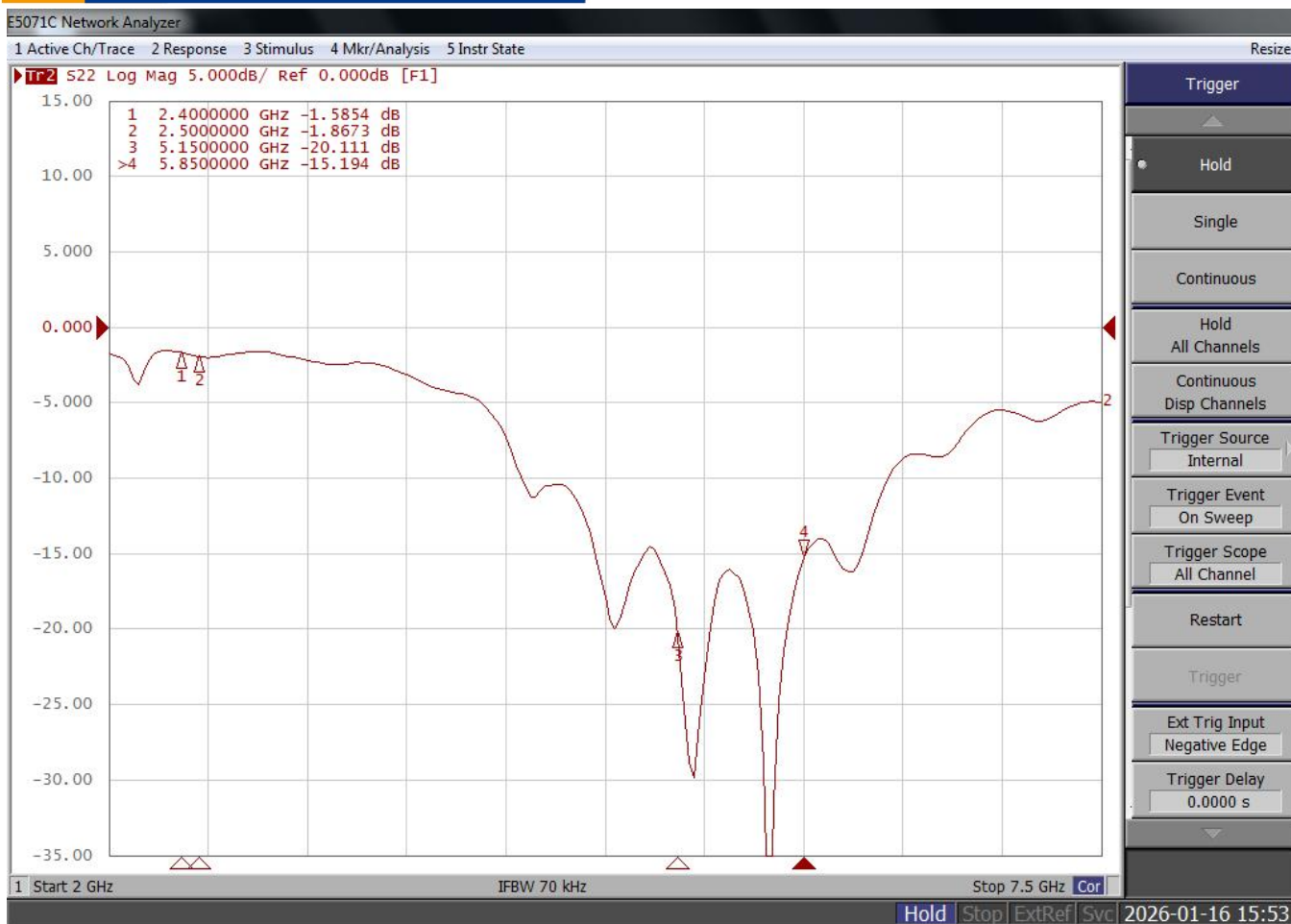
DB-1 Return loss: $< -14\text{dB}$

WIFI DB-2 Return Loss



DB-2 Return loss: $< -14\text{dB}$

WIFI 5G-0 Return Loss



5G-1 Return loss: $< -15\text{dB}$

Return loss

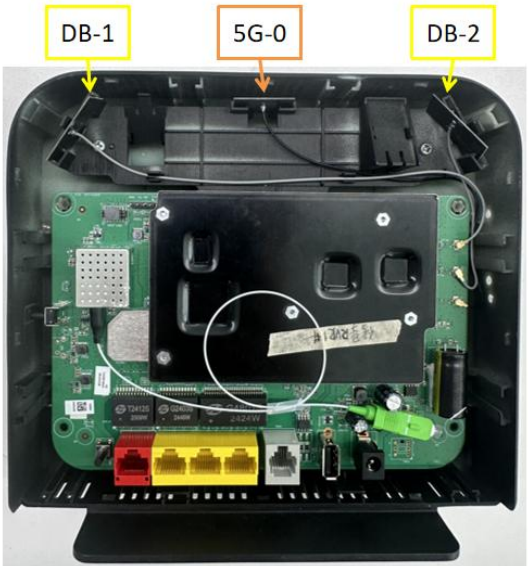


Test result

	Return loss	
Frequency (GHz)	2.4-2.5	5.15-5.85
DB1	<-14dB	
DB2		
5G0		

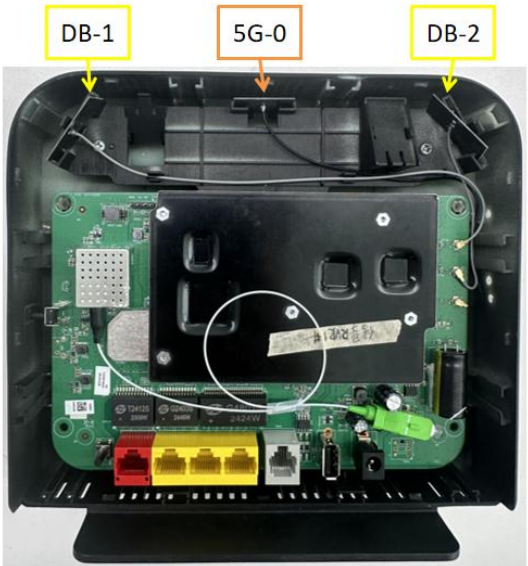
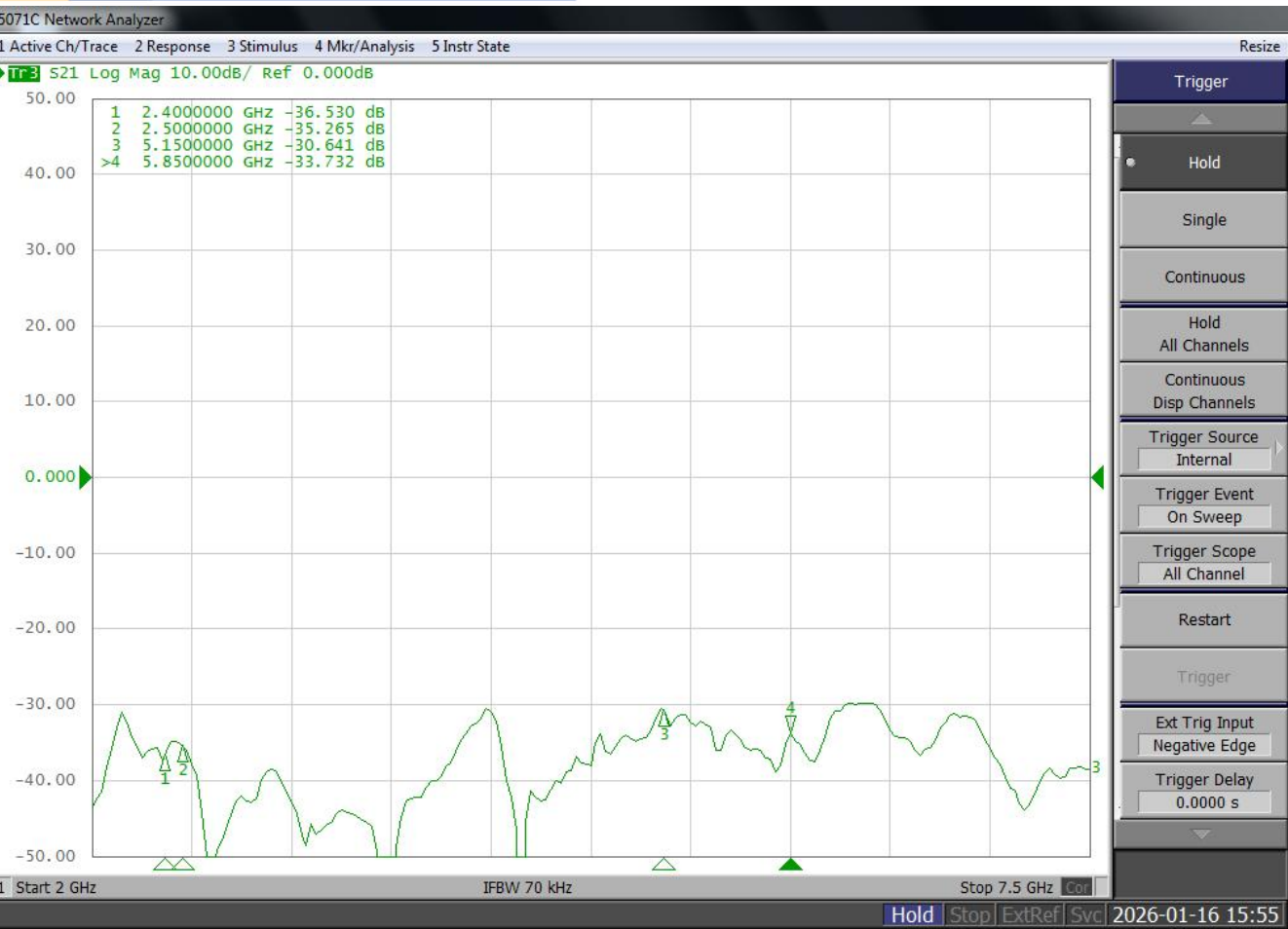
The WIFI 2.4G antenna's Return loss < -14dB;
The WIFI 5G antenna's Return loss < -14dB.

DB-1&DB-2 Isolation



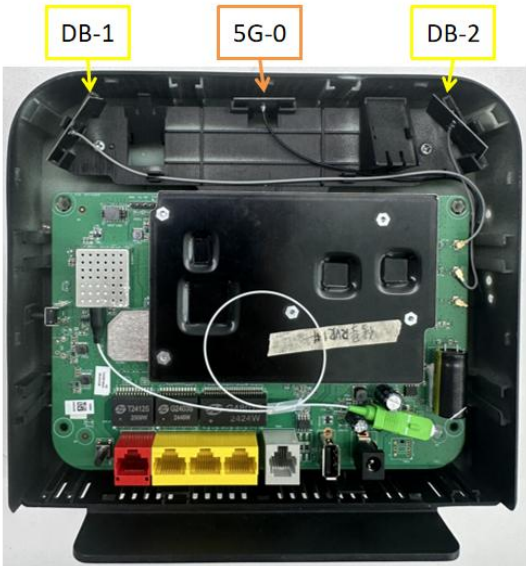
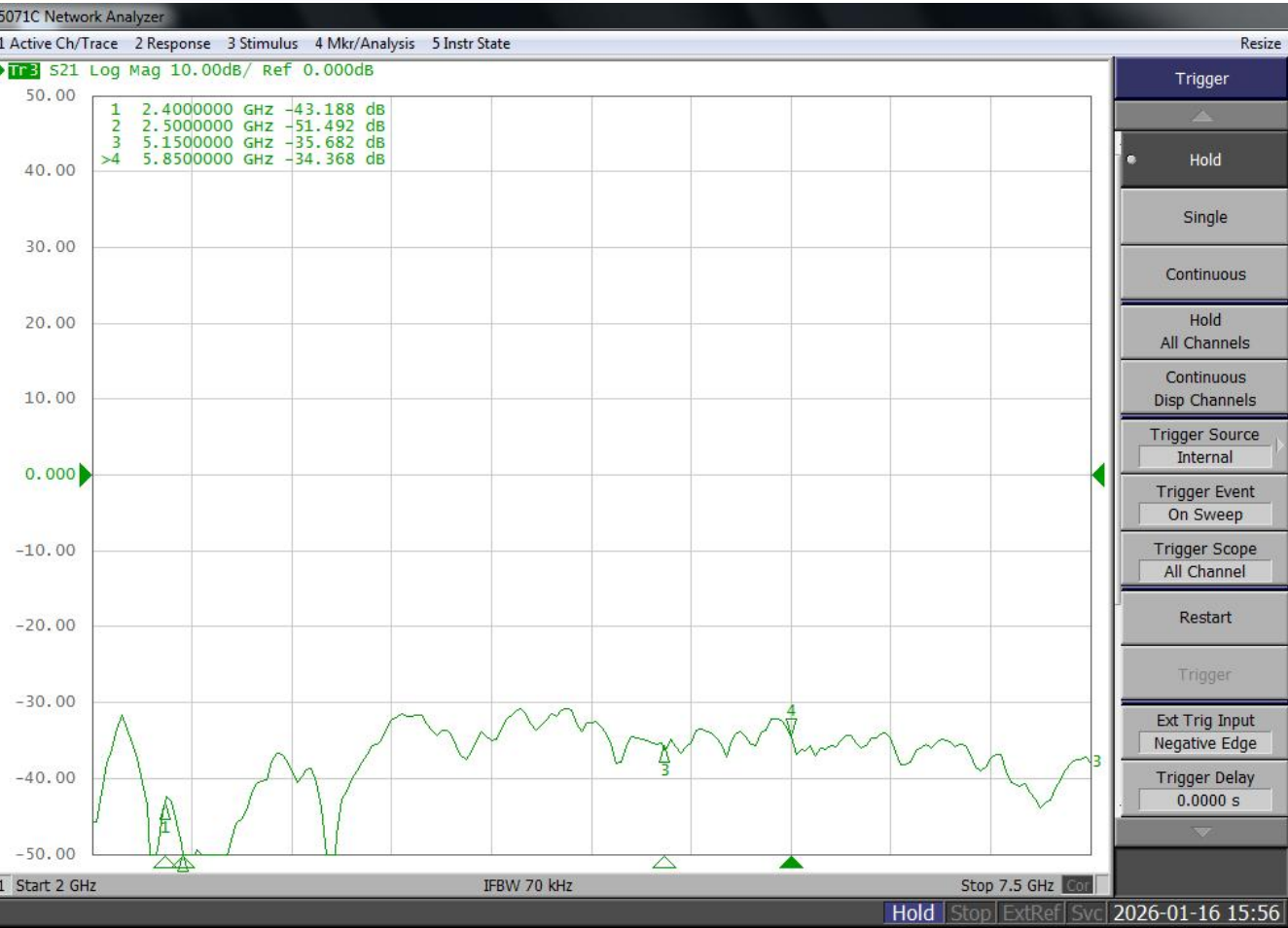
DB-1 & DB-2 2.4GIsolation:<-25dB
5GIsolation:<-30dB

DB-1&5G-0 Isolation



DB-1 & 5G-0 Isolation: <-30dB

DB-2&5G-0 Isolation



DB-2 & 5G-0 Isolation: < -30dB

Test result

	2.4G	5G
2.4G	<-25dB	<-30dB
5G	<-30dB	<-30dB

The Isolation between 2.4G antennas < - 25dB

The Isolation between 5G antennas < - 30dB.

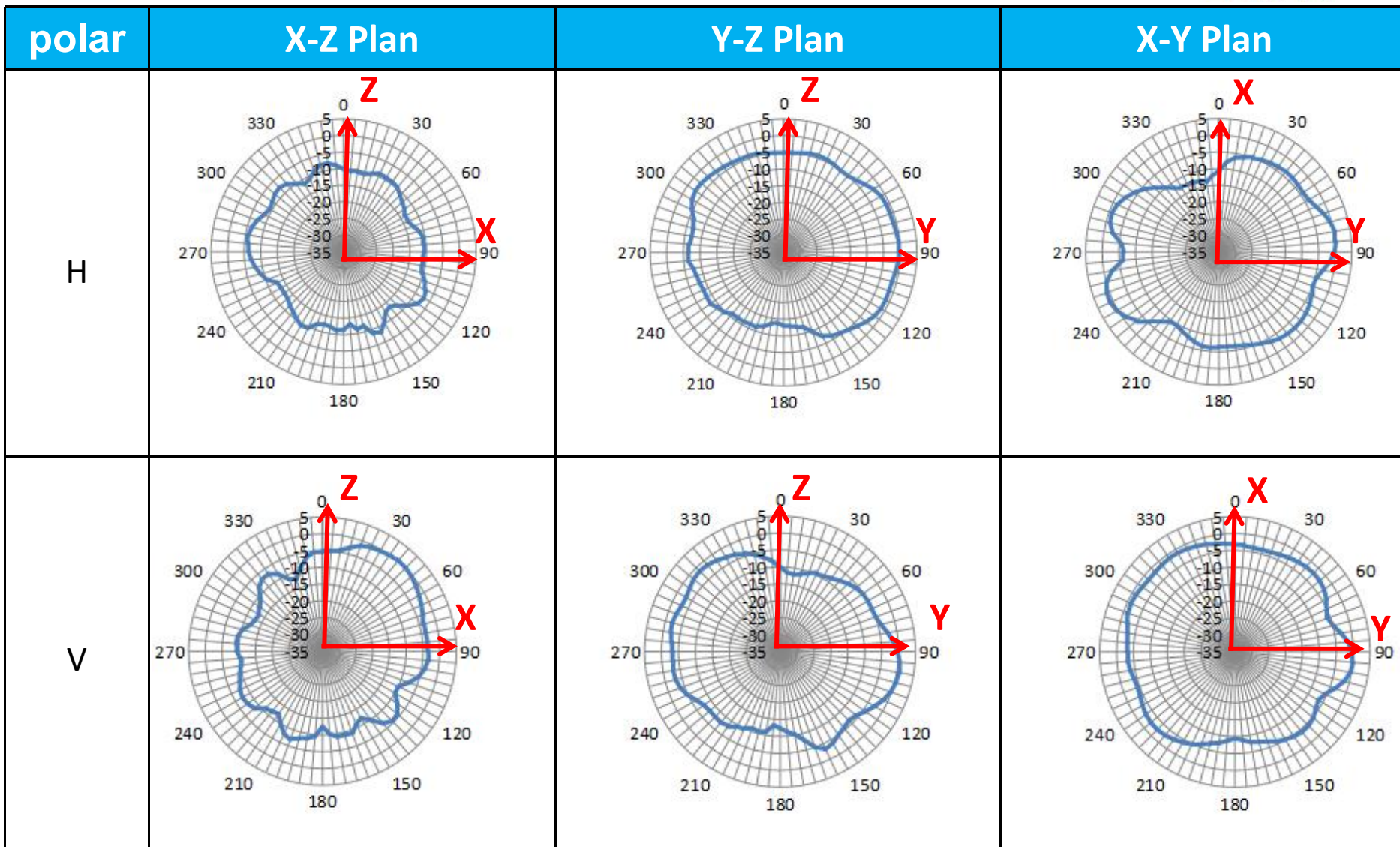
2D/3D Radiation pattern

Measurement Condition

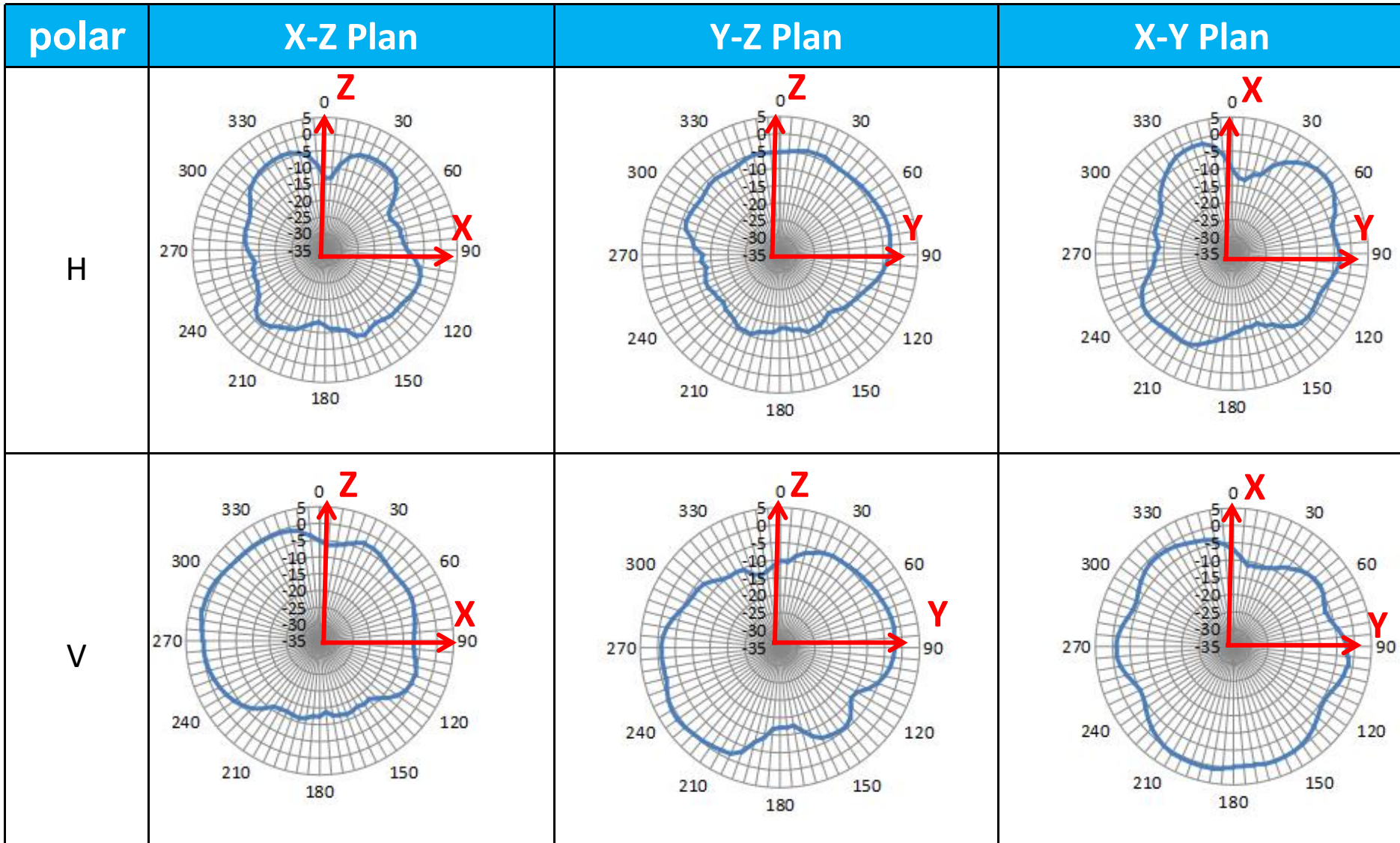


Microwave anechoic chamber

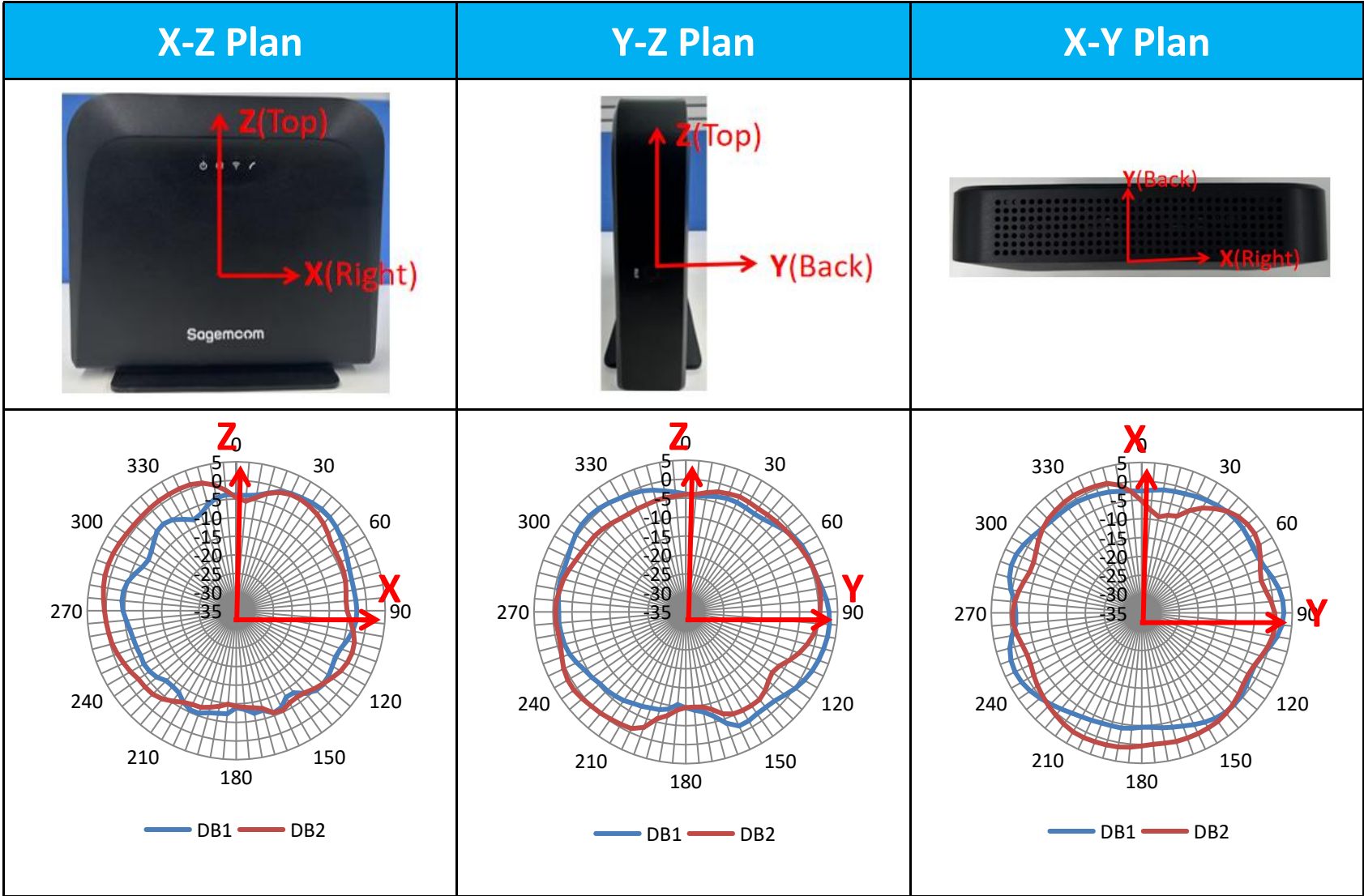
2D H&V-polar : DB1 WIFI_2.45GHz



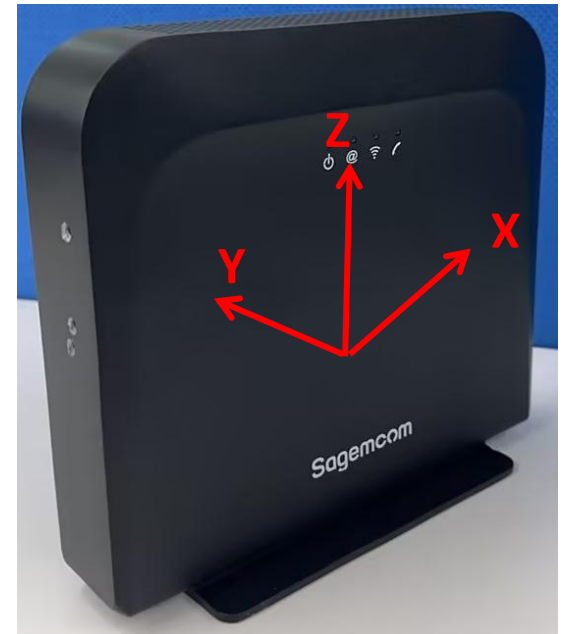
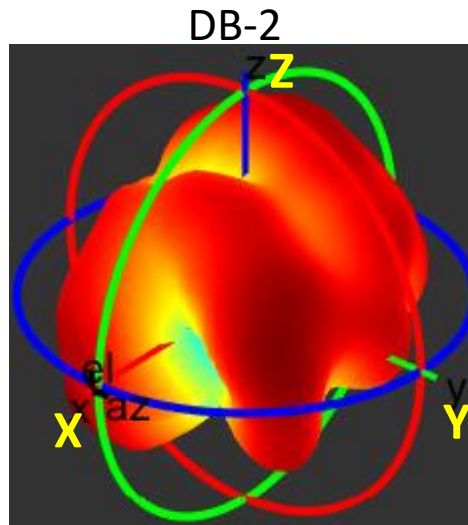
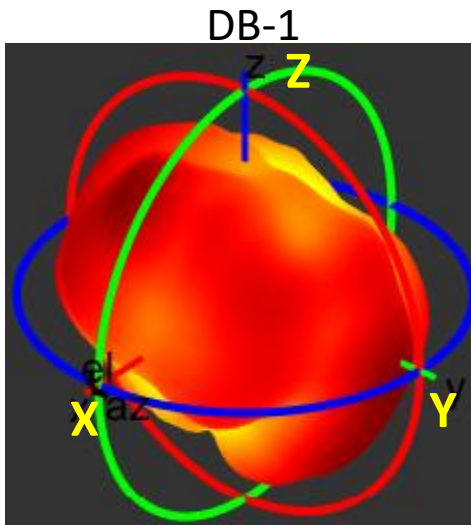
2D H&V-polar : DB2 WIFI_2.45GHz



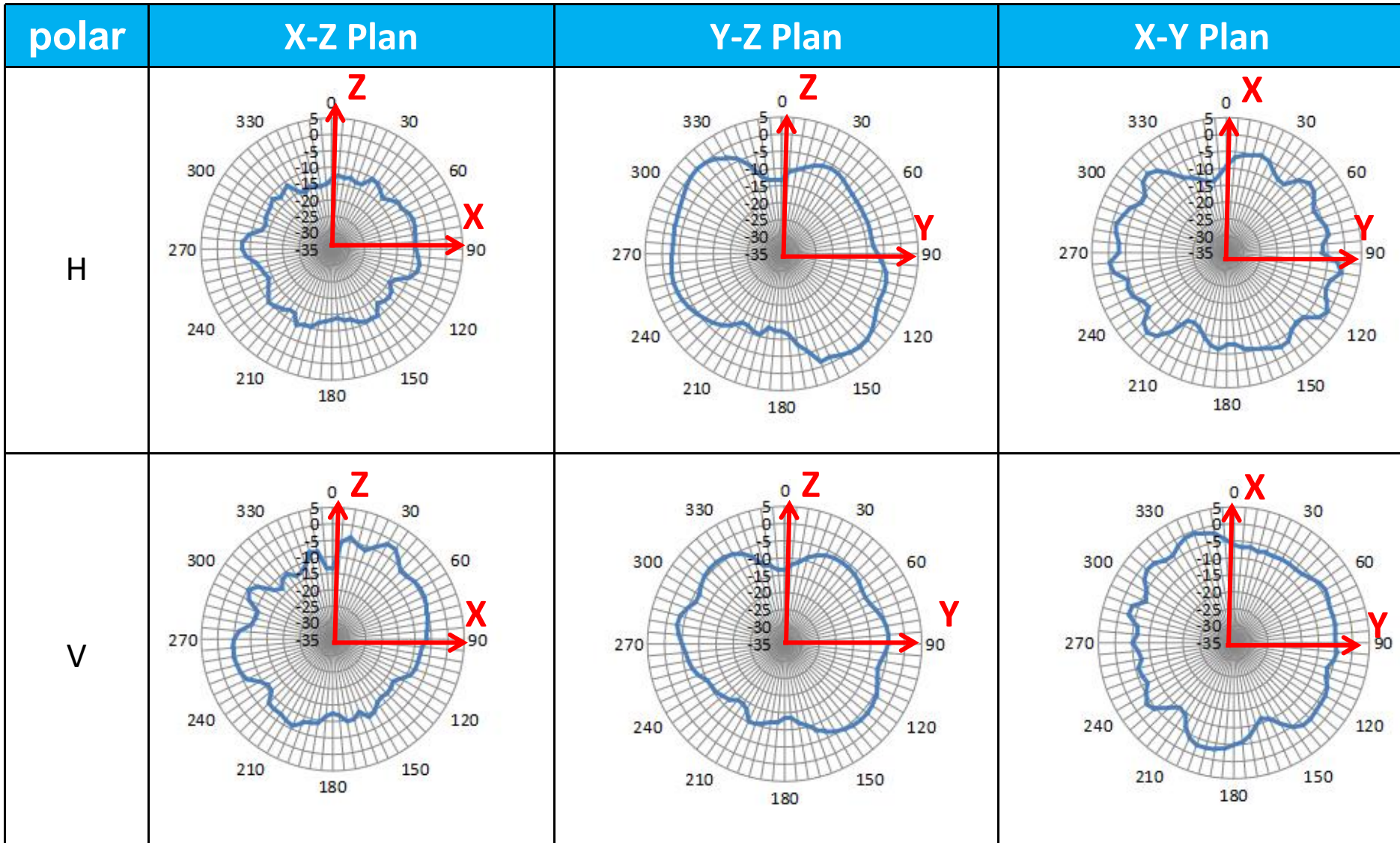
2D Total Radiation pattern: WIFI_2.45GHz



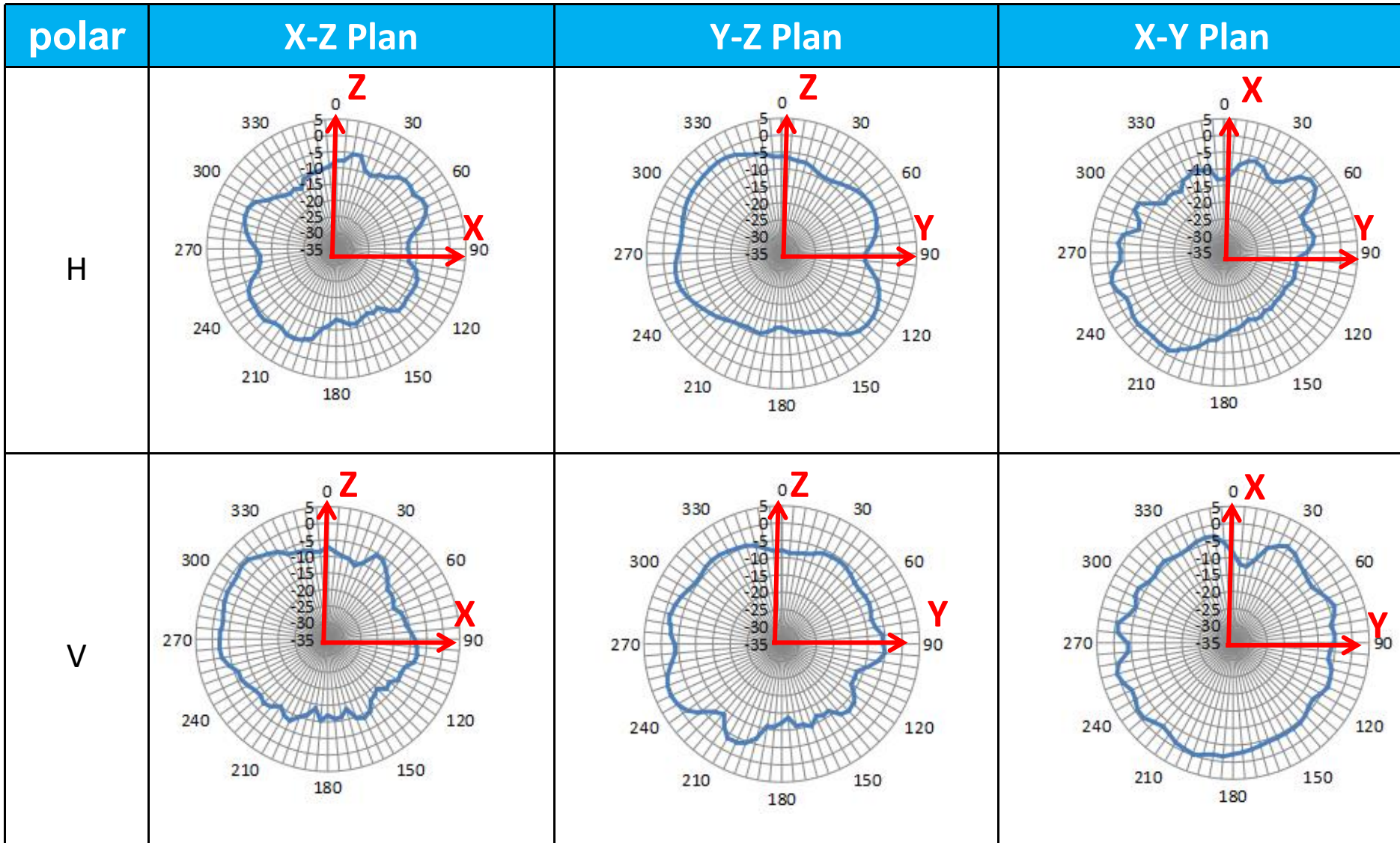
3D Radiation pattern : WIFI_2.45GHz



2D H&V-polar : DB1 WIFI_5.5GHz

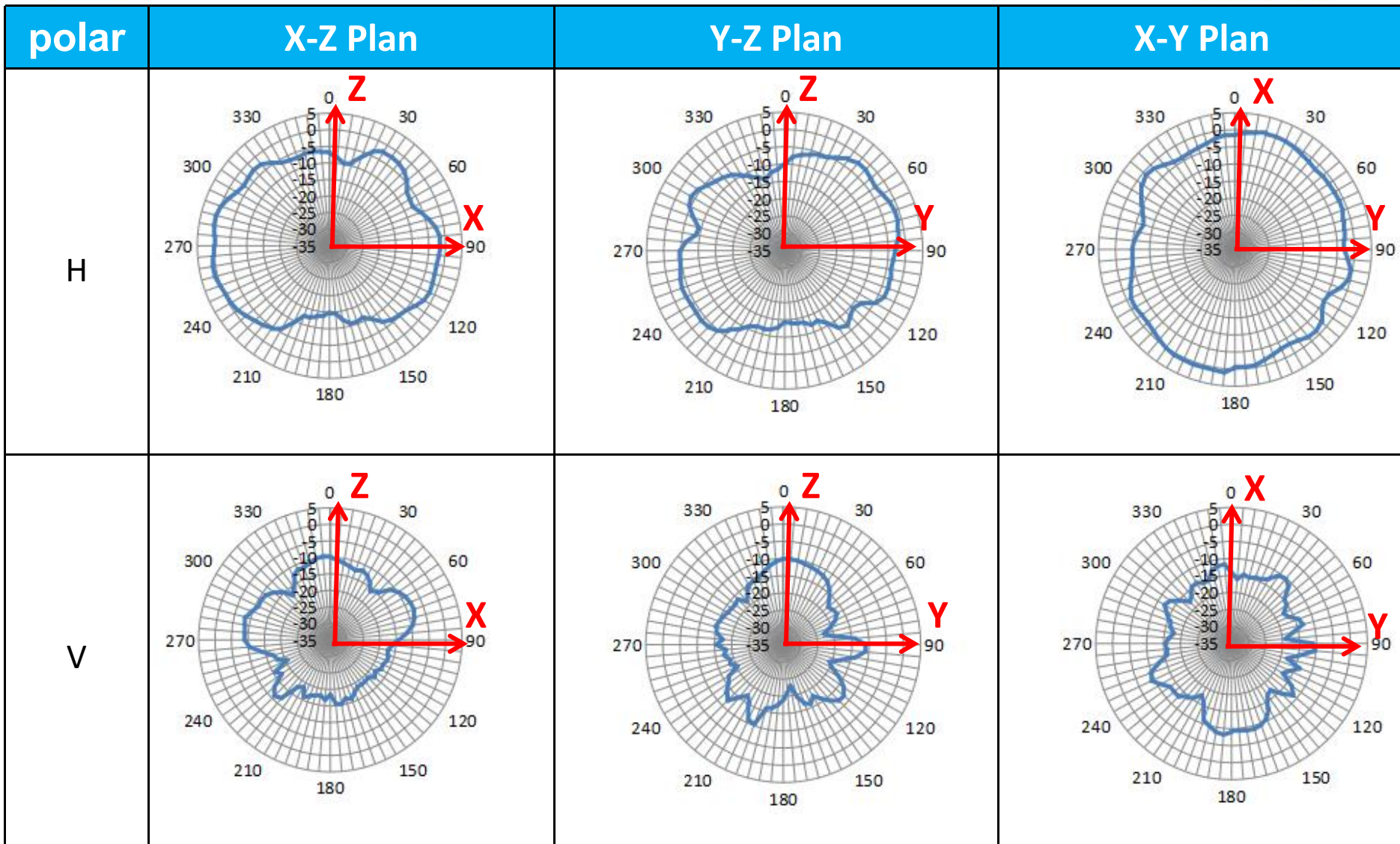


2D H&V-polar : DB2 WIFI_5.5GHz

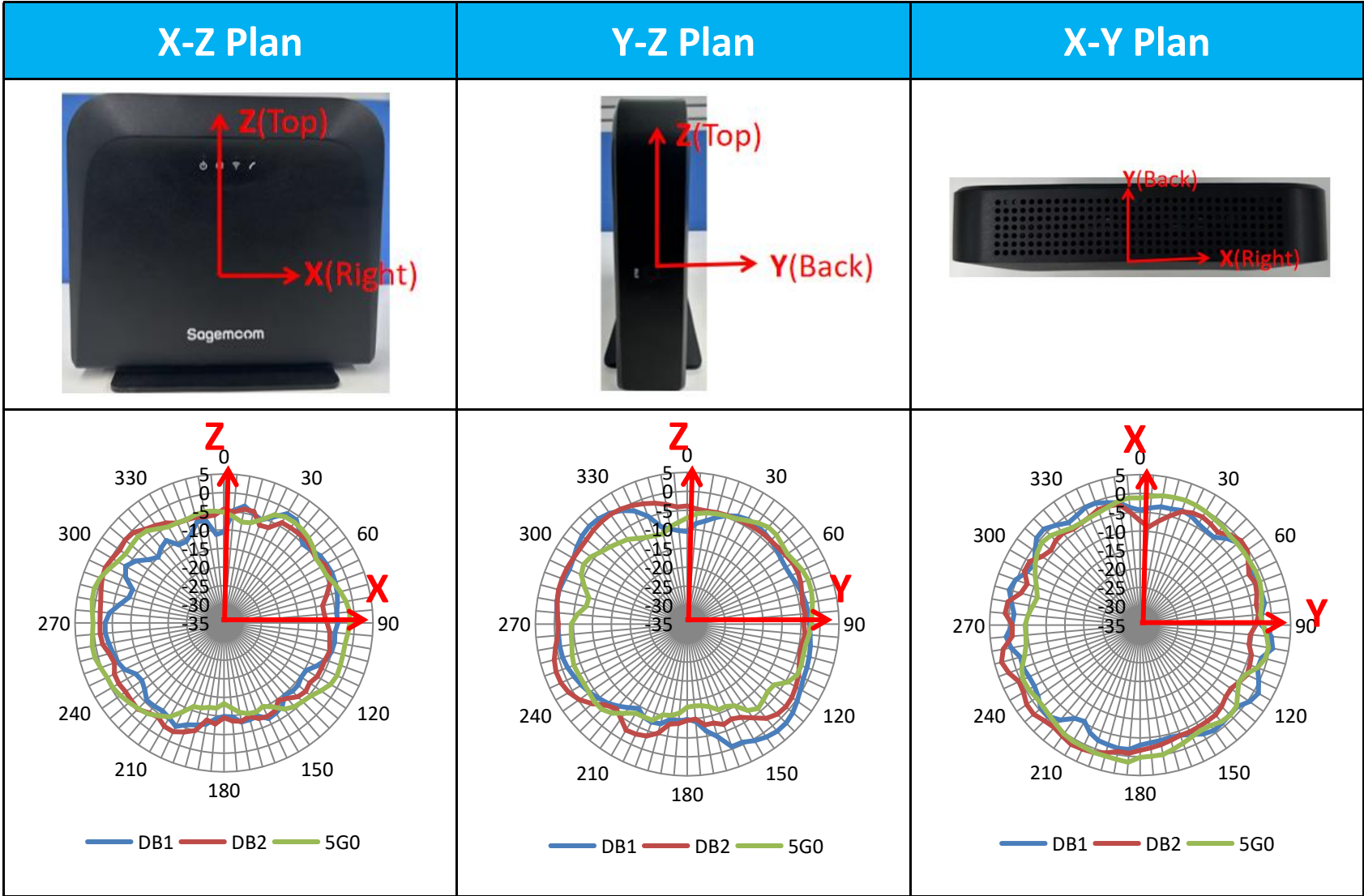


2D H&V-polar : 5G0 WIFI_5.5GHz

T&W

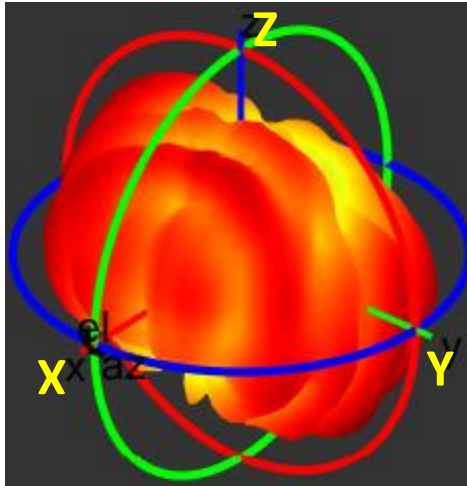


2D Total Radiation pattern: WIFI_5.5GHz

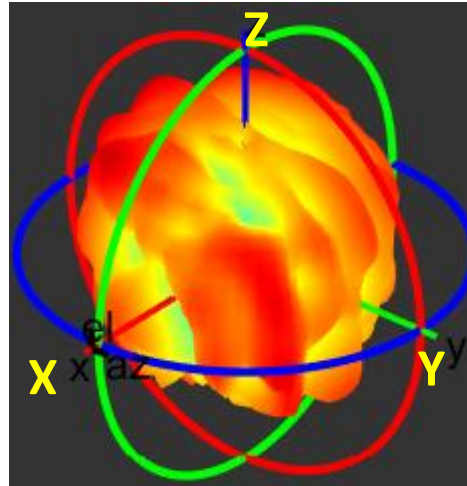


3D Radiation pattern : WIFI_5.5GHz

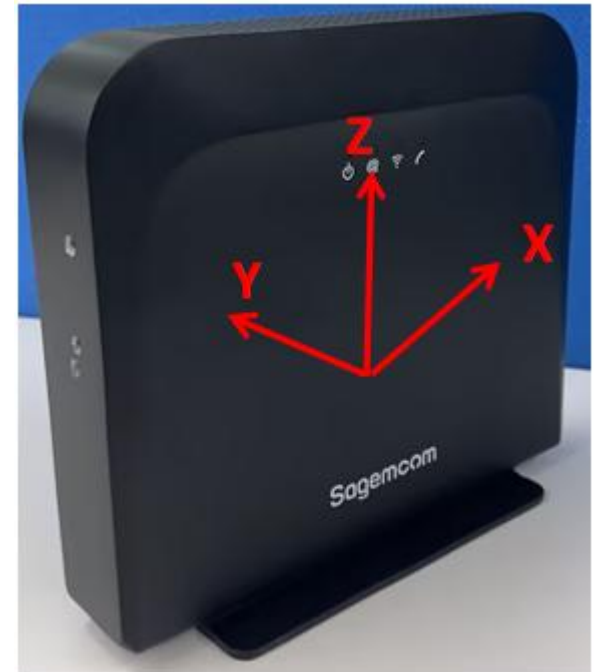
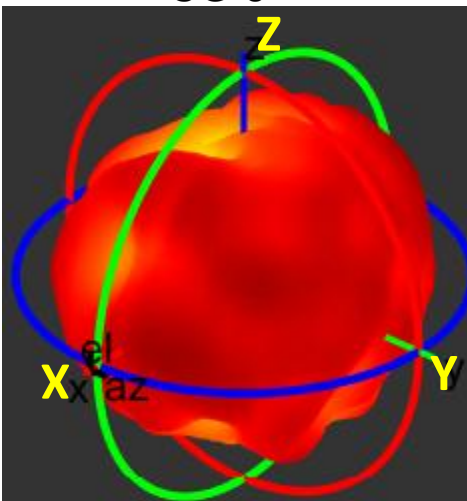
DB-1



DB-2



5G-0



Efficiency and Peak Gain

Test Result

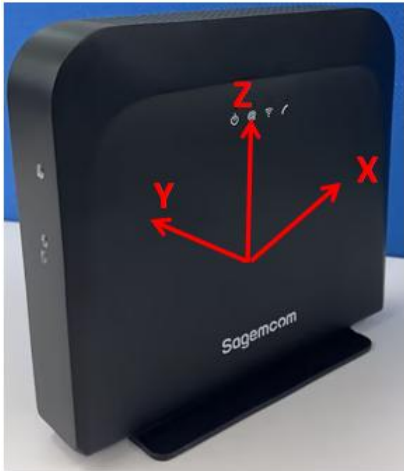
ANT	Frequency (GHz)	Gain (dBi)	Efficiency
DB-1	2.45	2.83	70.61%
DB-2	2.45	2.23	74.25%
DB-1	5.5	2.54	63.16%
DB-2	5.5	3.45	65.91%
5G-0	5.5	2.17	63.85%

Uncorrelated Directional Gain H (2.45G 2S2T)

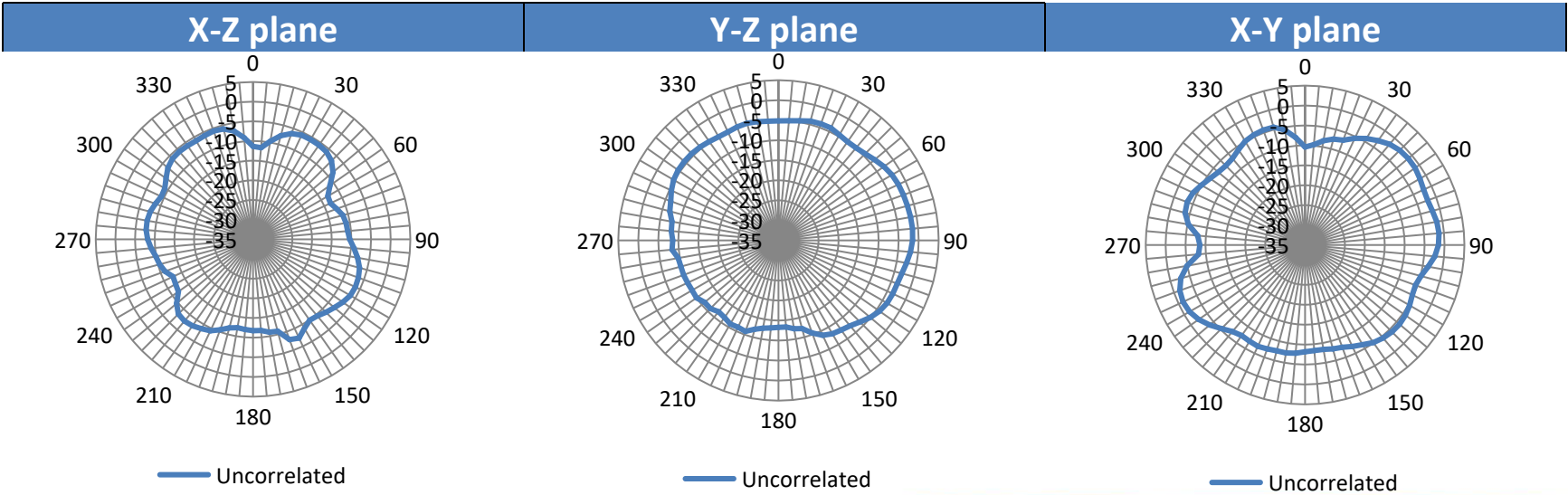


Uncorrelated Directional Gain H (2S2T)@2.45GHz

	Peak Gain(dBi)
H Unco_DG (2S2T)	0.01



2D Radiation Pattern H-polar:



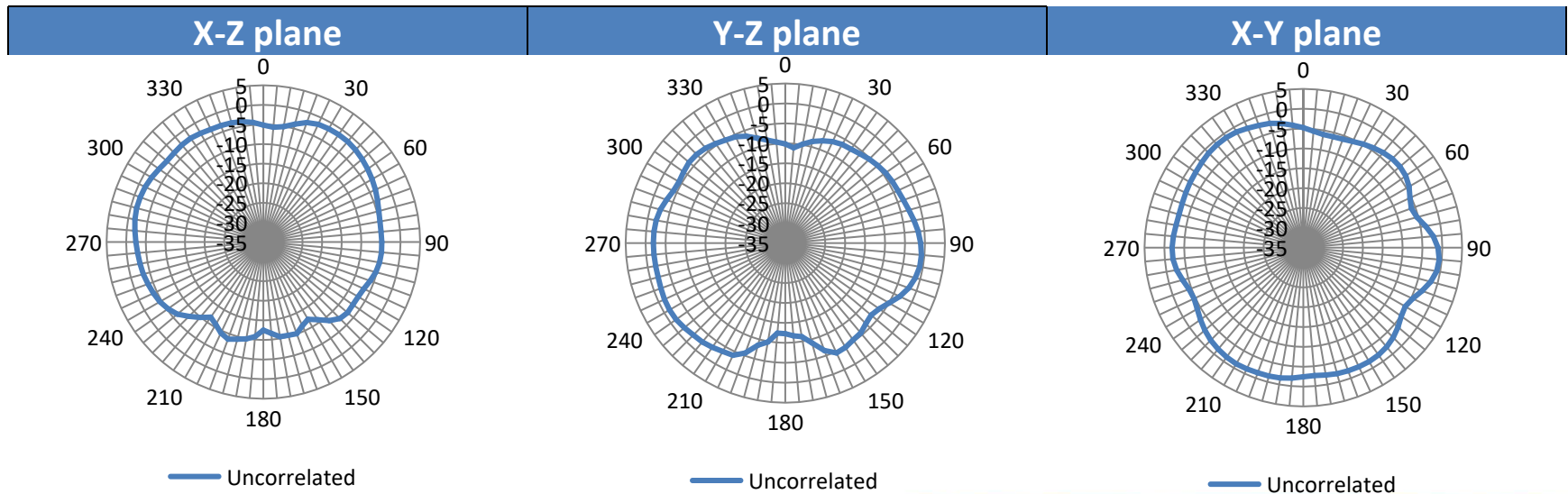
Uncorrelated Directional Gain V (2.45G 2S2T)

Uncorrelated Directional Gain V (2S2T)@2.45GHz

	Peak Gain(dBi)
V Unco_DG (2S2T)	0.85



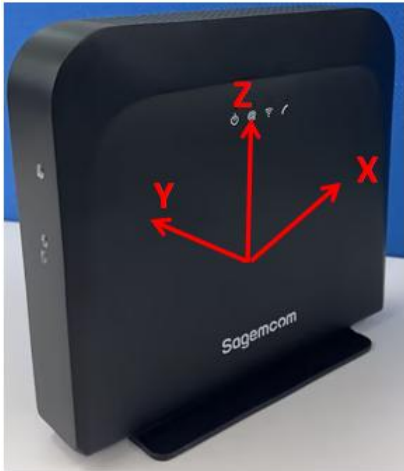
2D Radiation Pattern V-polar:



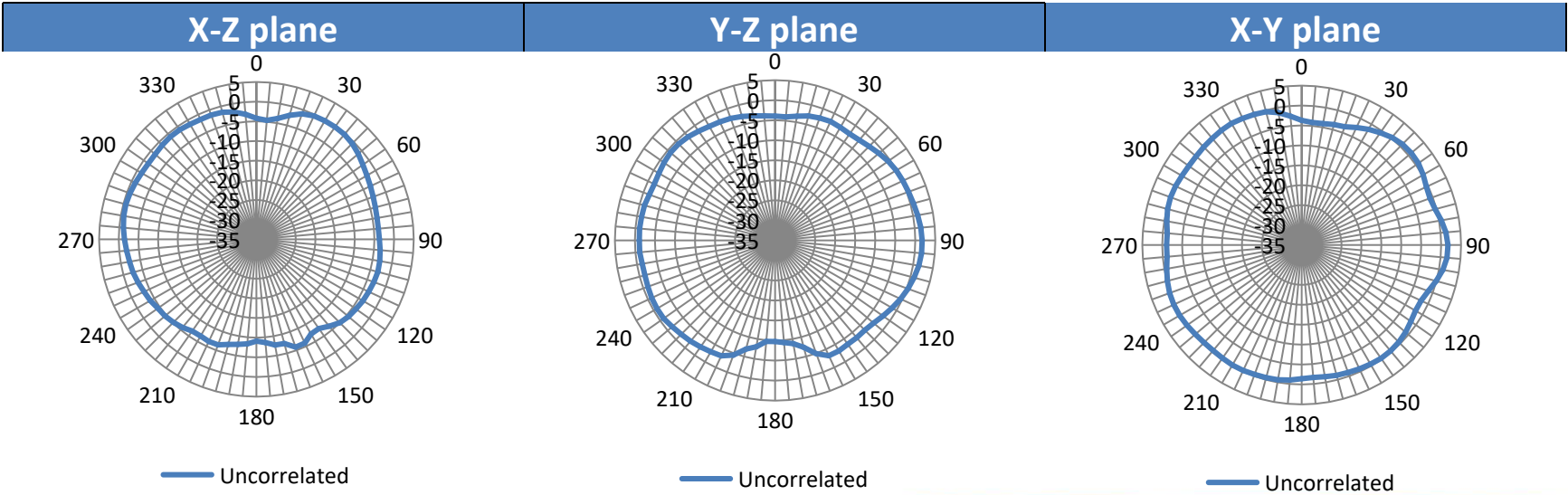
Uncorrelated Directional Gain Total(2.45G 2S2T)T&W

Uncorrelated Directional Gain(2S2T)@2.45GHz

	Peak Gain(dBi)
Total Unco_DG (2S2T)	1.72



2D Radiation Pattern Total:

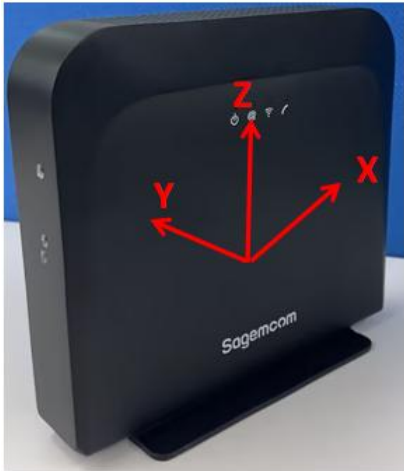


Correlated Directional Gain H (2.45G 1S2T)

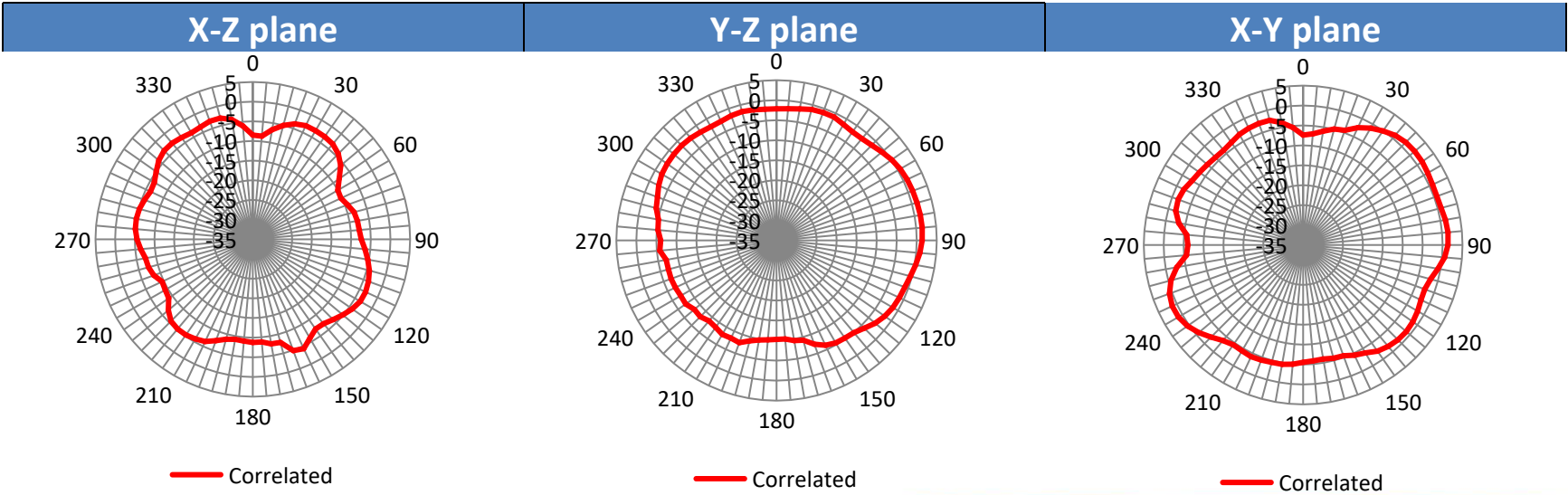


Correlated Directional Gain H (1S2T)@2.45GHz

	Peak Gain(dBi)
H Co_DG(1S2T)	3.0



2D Radiation Pattern H-polar:

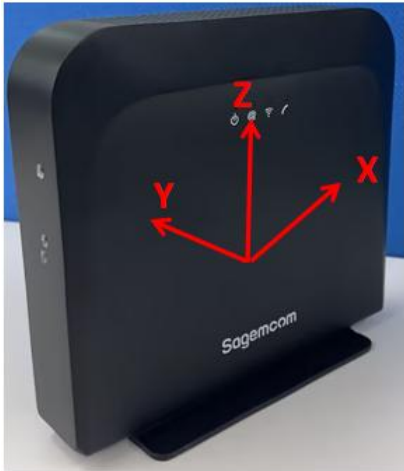


Correlated Directional Gain V (2.45G 1S2T)

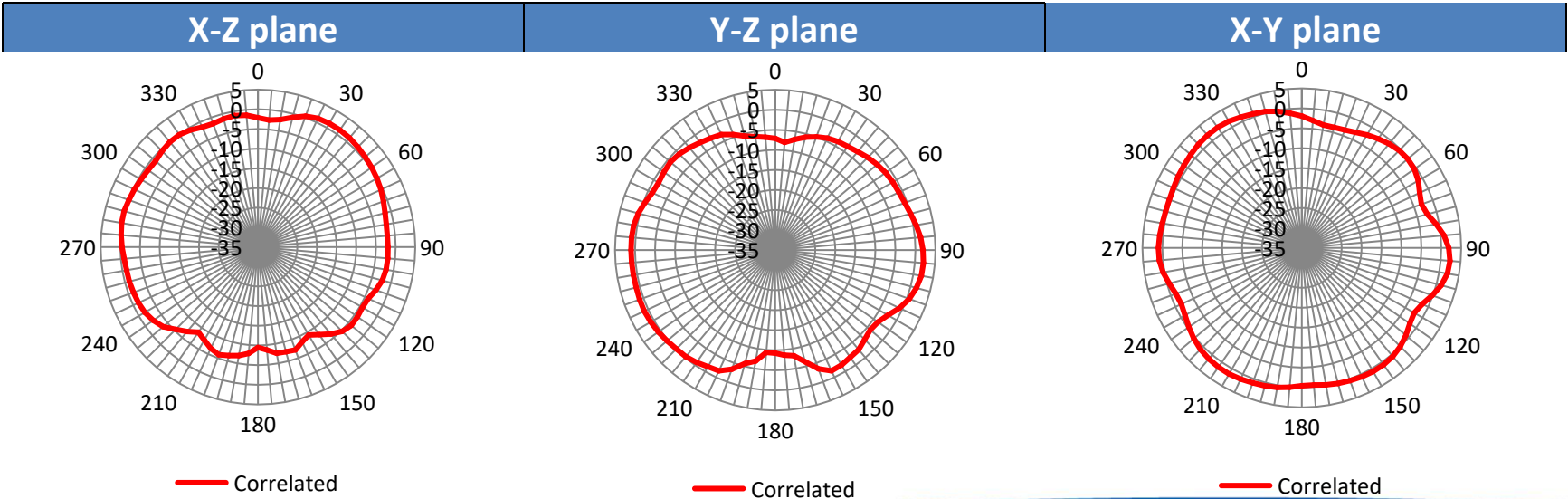


Correlated Directional Gain V (1S2T)@2.45GHz

	Peak Gain(dBi)
V Co_DG(1S2T)	3.59



2D Radiation Pattern V-polar:

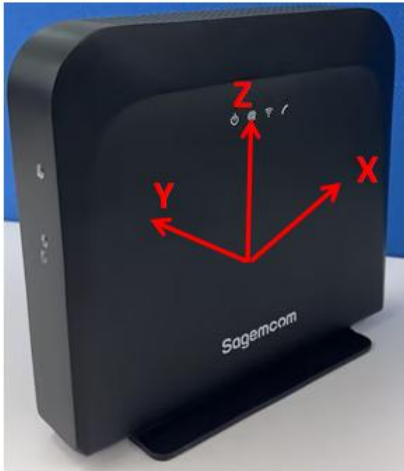


Correlated Directional Gain Total(2.45G 1S2T)

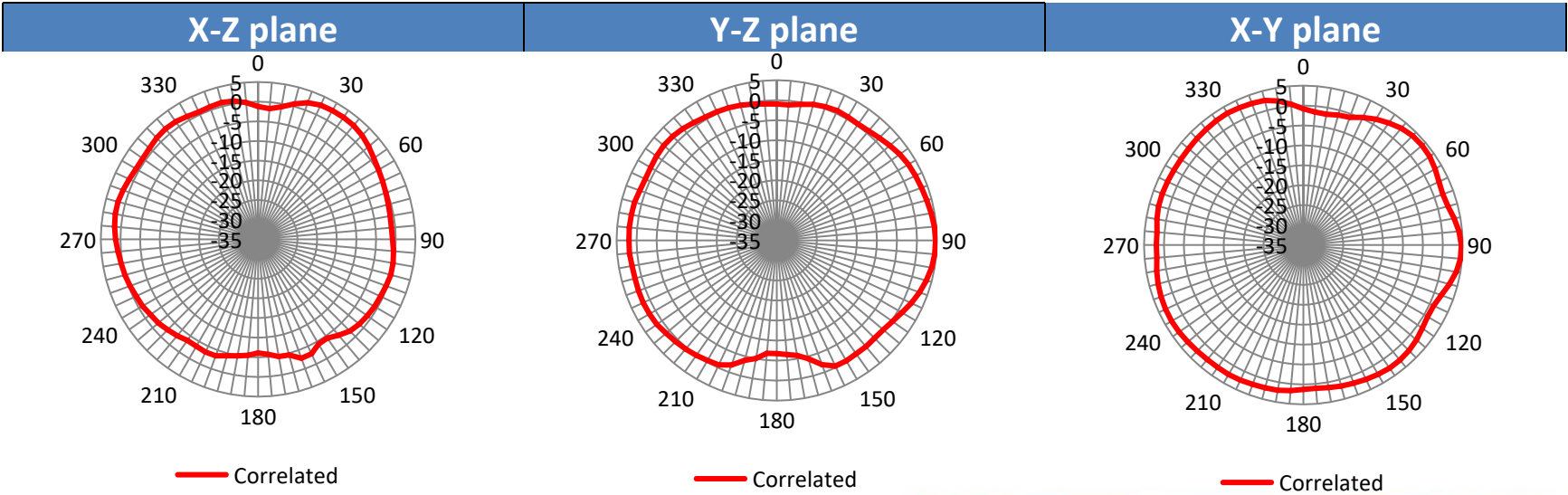


Correlated Directional Gain(1S2T)@2.45GHz

	Peak Gain(dBi)
Total Co_DG (1S2T)	4.64



2D Radiation Pattern Total:



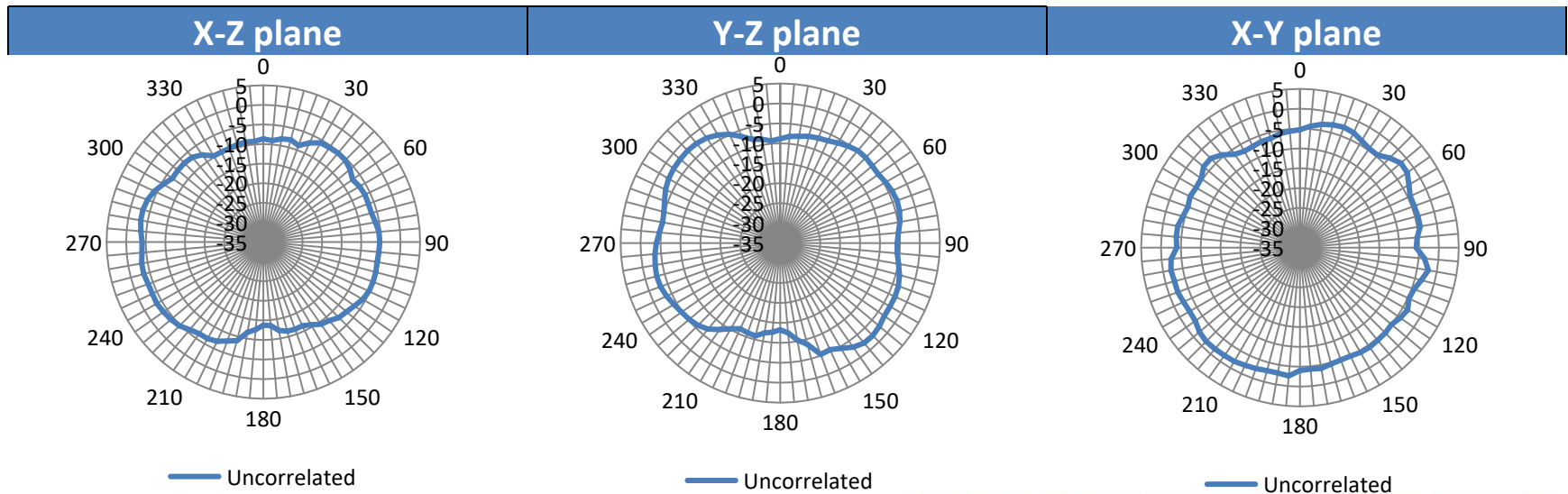
Uncorrelated Directional Gain H (5.5G 3S3T)

Uncorrelated Directional Gain H (3S3T)@5.5GHz

	Peak Gain(dBi)
H Unco_DG (3S3T)	-1.13



2D Radiation Pattern H-polar:

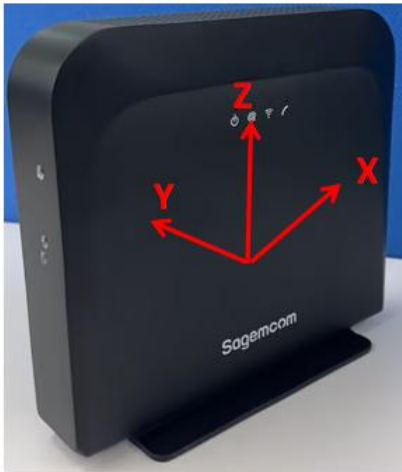


Uncorrelated Directional Gain V (5.5G 3S3T)

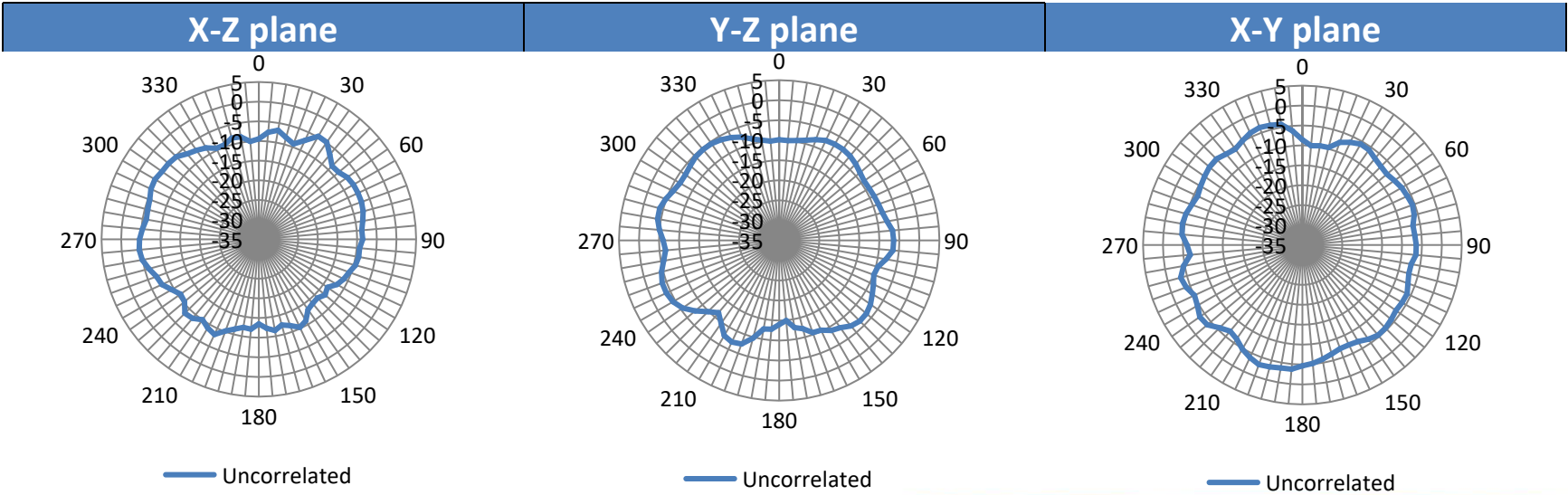


Uncorrelated Directional Gain V (3S3T)@5.5GHz

	Peak Gain(dBi)
V Unco_DG (3S3T)	-1.59



2D Radiation Pattern V-polar:

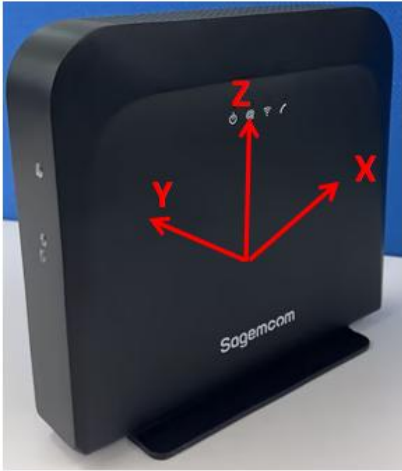


Uncorrelated Directional Gain Total(5.5G 3S3T)

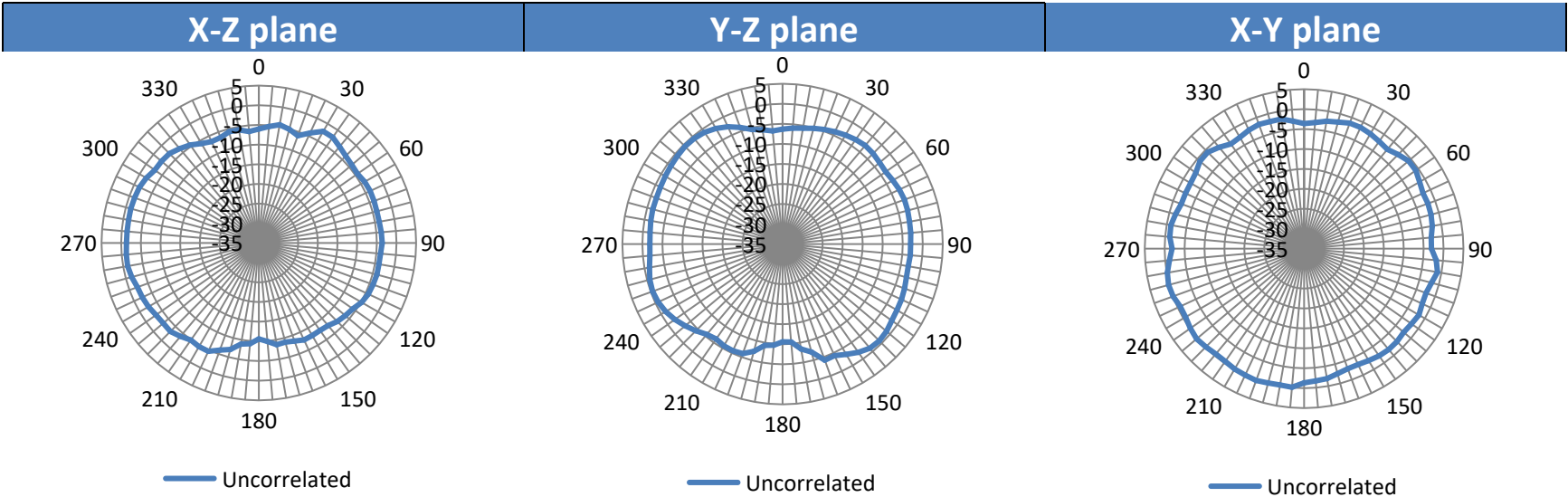
T&W

Uncorrelated Directional Gain(3S3T)@5.5GHz

	Peak Gain(dBi)
Total Unco_DG (3S3T)	0.95



2D Radiation Pattern Total:

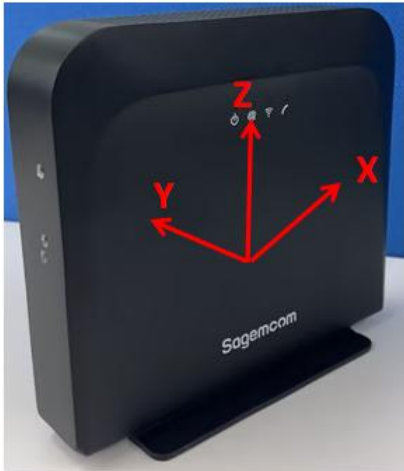


Correlated Directional Gain H (5.5G 1S3T)

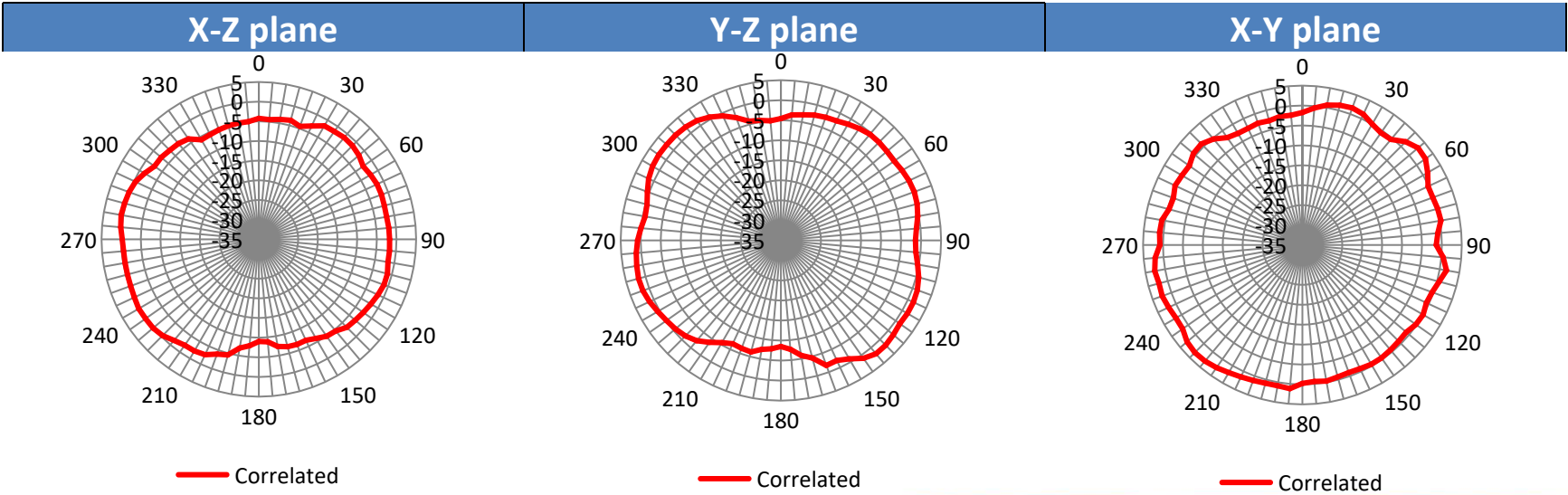


Correlated Directional Gain H (1S3T)@5.5GHz

	Peak Gain(dBi)
H Co_DG(1S3T)	3.6



2D Radiation Pattern H-polar:

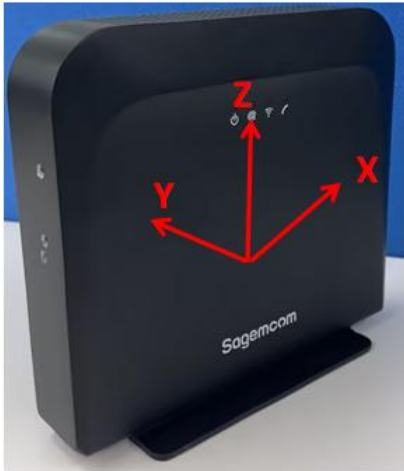


Correlated Directional Gain V (5.5G 1S3T)

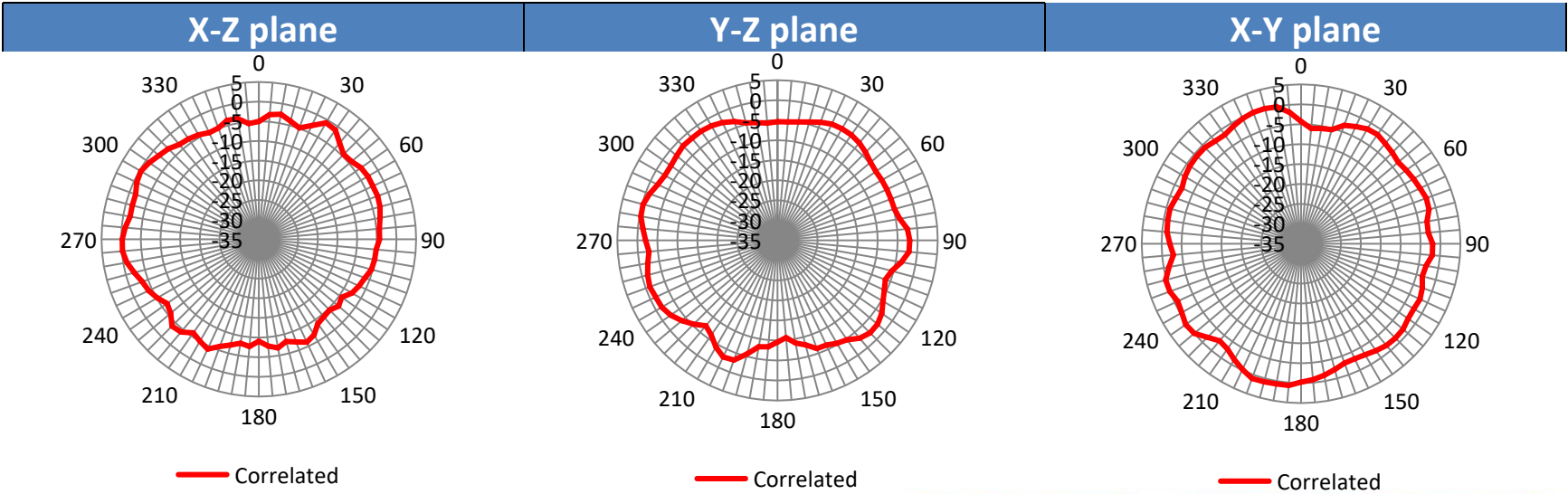


Correlated Directional Gain V (1S3T)@5.5GHz

	Peak Gain(dBi)
V Co_DG(1S3T)	2.67



2D Radiation Pattern V-polar:

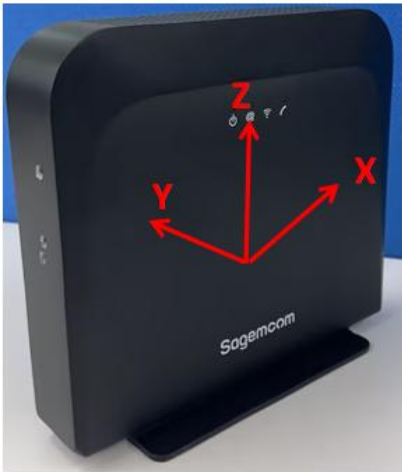


Correlated Directional Gain Total(5.5G 1S3T)

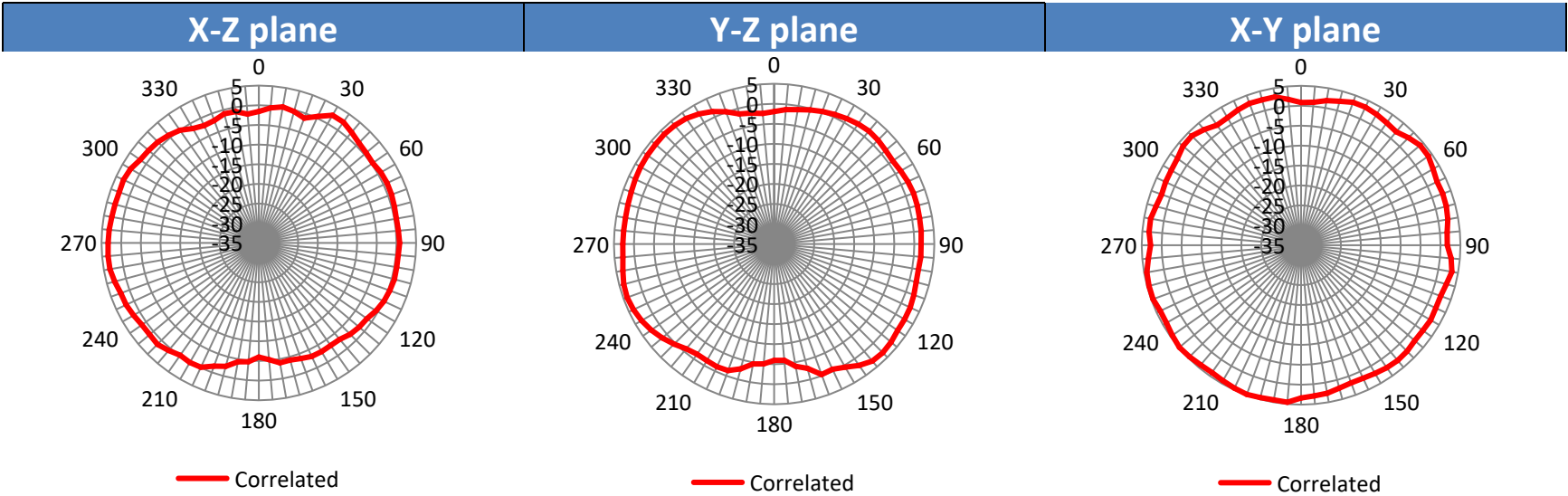


Correlated Directional Gain(1S3T)@5.5GHz

	Peak Gain(dBi)
Total Co_DG (1S3T)	5.32



2D Radiation Pattern Total:



- **Return loss**

2.4G&5G Return loss are $\leq -14\text{dB}$.

- **Isolation**

2.4G antennas isolation are $< -25\text{dB}$

5G antennas isolation are $< -30\text{dB}$.

- **Efficiency**

$> 70\% @ 2.4\text{G}$ 、 $> 62.5\% @ 5\text{G}$.

- **Peak Gain**

$2.0 \sim 3.0\text{dBi} @ 2.4\text{G}$ 、 $2.0 \sim 3.5\text{dBi} @ 5\text{G}$.

- **Uncorrelated Total Directional Gain**

$1.72\text{dBi} @ 2.4\text{G}$ (2×2) 、 $0.95\text{dBi} @ 5\text{G}$ (3×3) .

- **Correlated Total Directional Gain**

$4.64\text{dBi} @ 2.4\text{G}$ (2×2) 、 $5.32\text{dBi} @ 5\text{G}$ (3×3) .

- Based on the test data, most of them meet the RFQ performance requirements.
- This update is mainly aimed at improving the coverage of the antenna signals on the XZ and YZ surfaces. Therefore, based on version 1.2, the placement of DB1 and DB2 antennas has been optimized, making them intersect and tilt at 30° along the X-axis direction.
- The subsequent optimization directions are as follows:
 1. For the 2.4 GHz frequency band, adjust the tilt angles of the DB1 and DB2 antennas along the X-axis to 45°.
 2. For the 5G frequency band, replace the omnidirectional horizontally polarized antenna with a horizontally placed dipole antenna, orienting its primary radiation field toward the sky.

Thanks!

