



Antenna Test Report for Fortinet _FAP-221K/RANQ-FN312 (DVT Sample)

Dec. 24. 2025

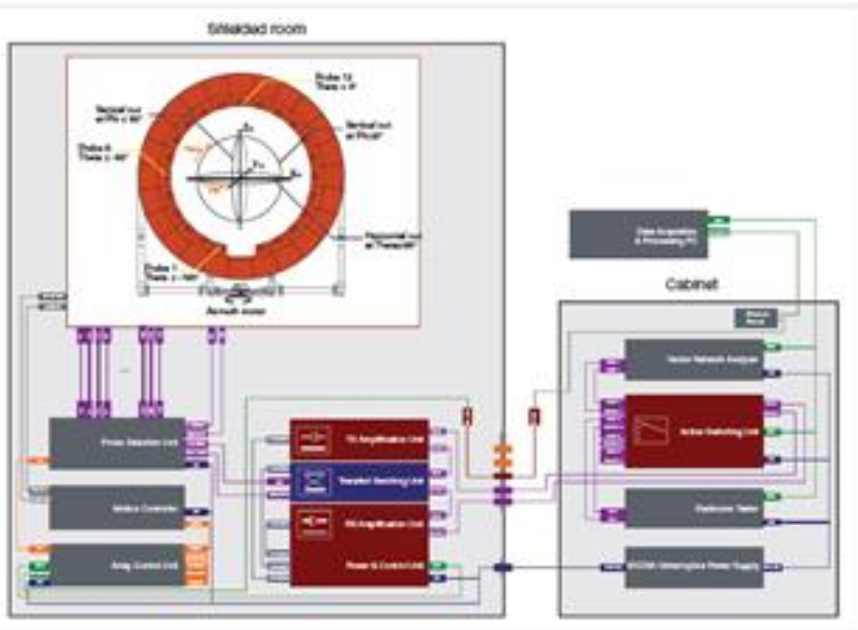
Ver.02

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- Chamber Info.
- Name and address of the antenna manufacture
- Summary
- VSWR
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- Efficiency and Peak Gain
- 2D Radiation Pattern
- 3D Radiation Pattern

Chamber Info.

- Antenna Vendor : WNC
- Test Date : 20251021
- Test Engineer : Eason
- Measurement System : SATIMO SG24L
- Software Name : Wave Studio
- Software Version : 24.2.6.0



1. This ant. test chamber is located in WNC which address is :
Add: 20 Park Avenue II (or Yuanchiu 2nd Rd.), Hsinchu Science Park, Hsinchu 300, Taiwan
Tel: +886-3-666-7799

Chamber Info.

- Measurement System: SATIMO SG24 Chamber

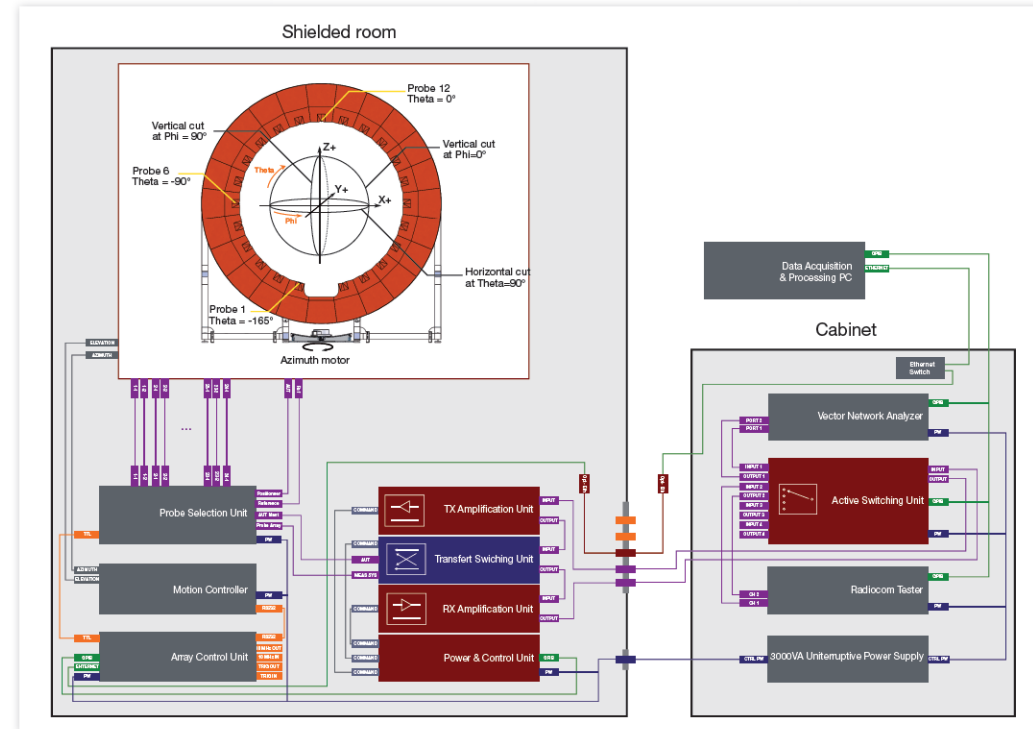
Measurement setup:

- pattern & gain measurement

- 1.satimo chamber (SG24L)
- 2.satimo program (wave studio)
- 3.system overview :

- test item

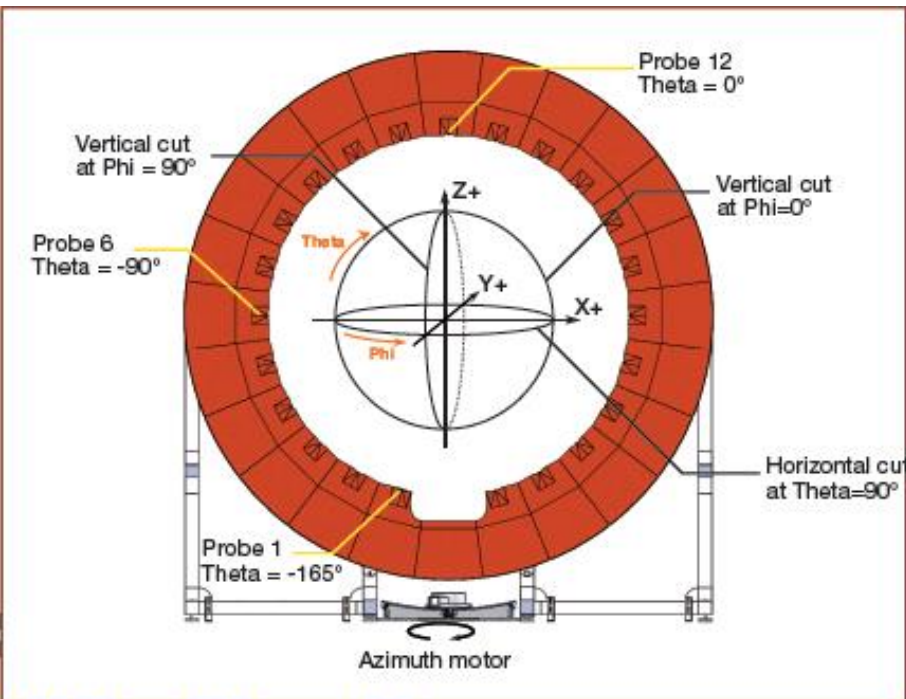
- 1.antenna passive test 400MHz~9GHz



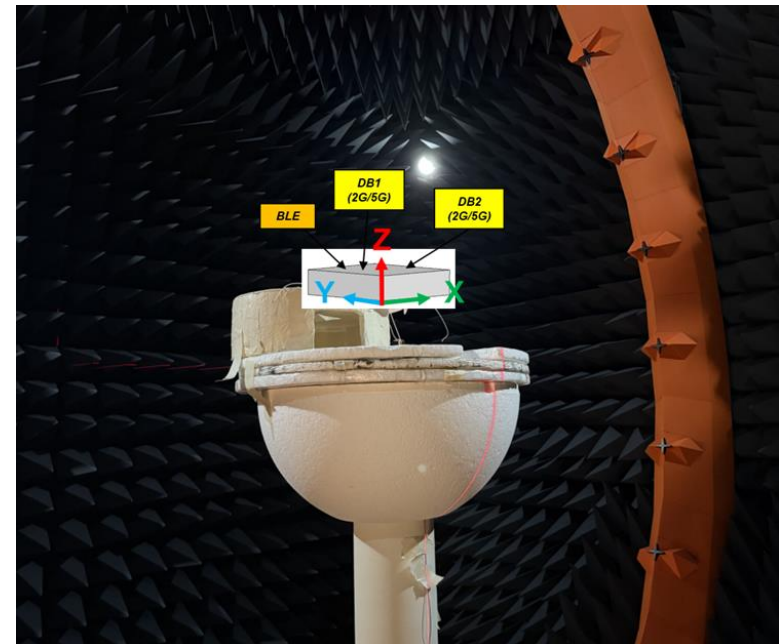
- Calibration Information

Device	Type / Model	Serial #	Manufacture	Cal. Date
Antenna Measurement System	SG24-L	HKG1669S	MVG-SATIMO	2025-11-19
Network Analyzer	Keysight E5080B	MY59203136	Keysight	2025-11-12

Chamber Info.



1. Place the device to be tested on the fixture and align it with the center of the chamber.
2. Connect the antenna cable to the RF connector of the chamber.
3. Use the SW to configure parameters (antenna name, frequency points, measurement angles, antenna dimension), and then run the test SW (wave studio).
4. By phi from 0° to 360° and theta from 0° to 180° with a step size of 2 degrees, get the 3D data, including efficiency, peak gain, 2D and 3D radiation patterns.
5. This is far field test for antenna verification.
6. This is passive measurement, which means the device is off and not in any operating mode.



Name and address of the antenna manufacture



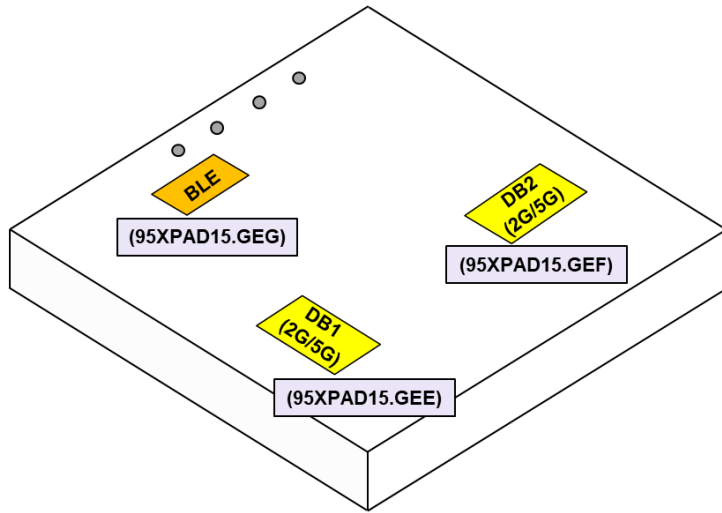
WebCom Communication (Kunshan) Corporation - Kunshan Plant

- No. 6, 88 Central Avenue, Kunshan City, Jiangsu Province, P.R.C.
- +86-512-5772-2688
- +86-512-5772-3168

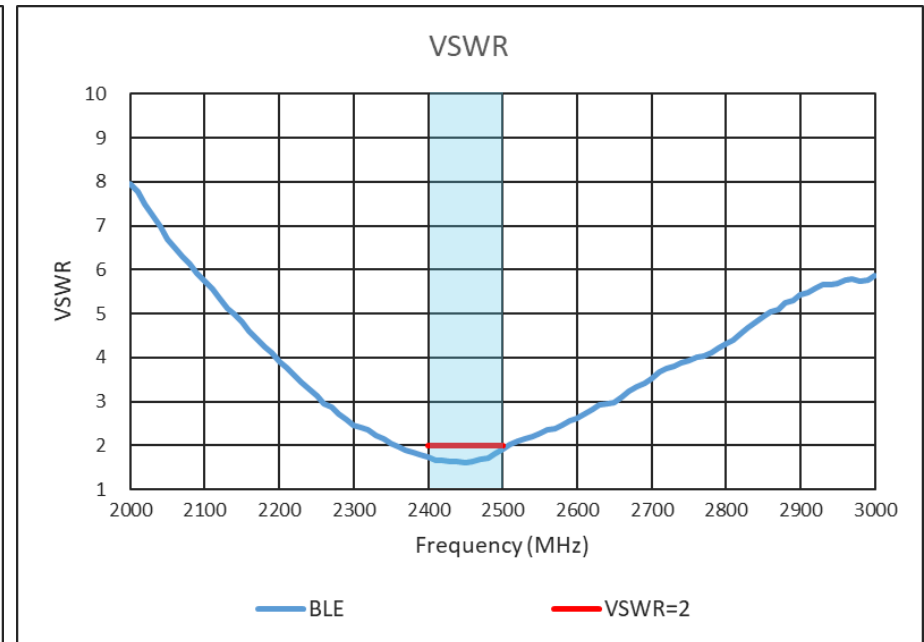
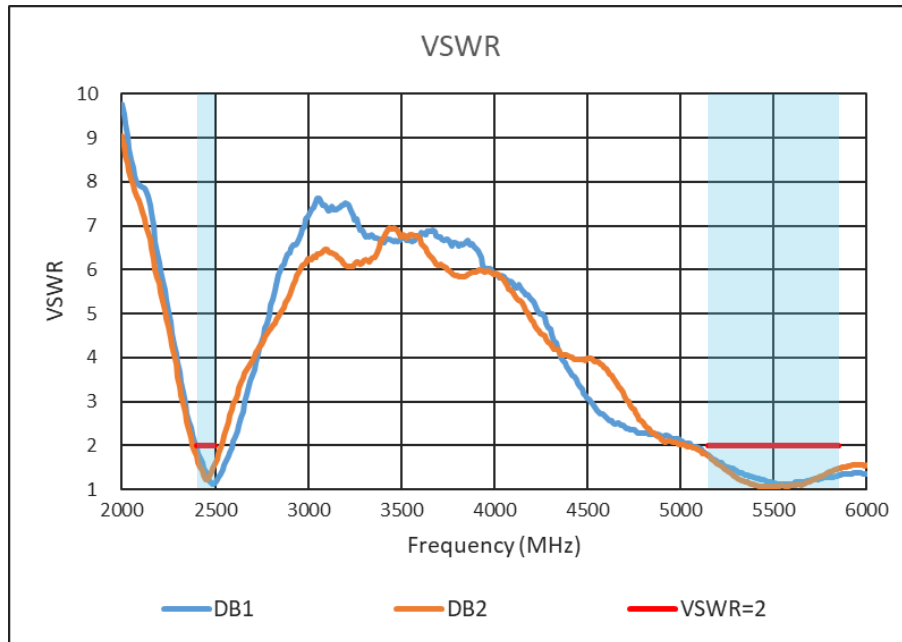
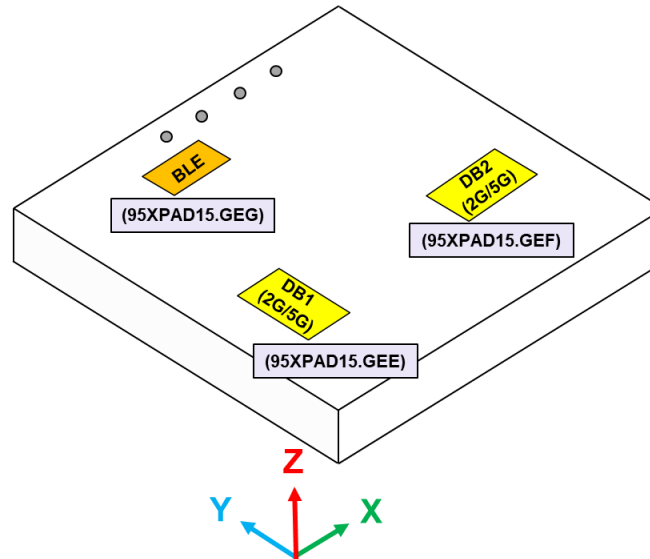
Summary

ANT	VSWR	Efficiency (%)	Peak Gain (dBi) (max value)	Isolation (dB) (within radio)	Isolation (dB) (among radio)
Dual Band_2G	< 2	61% ~ 71%	5.76	> 20.8	✓ BLE to Wi-Fi_2G: > 20.1
Dual Band_5G	< 2	62% ~ 71%	5.99	> 29.6	
BLE	< 2	63% ~ 67%	3.57	-	

Antenna Placement for DVT Sample

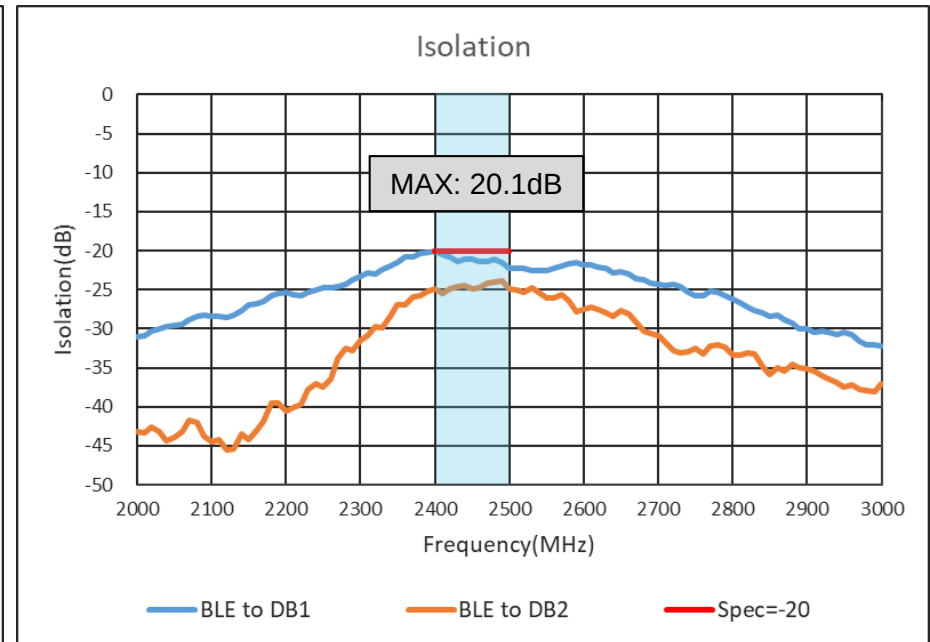
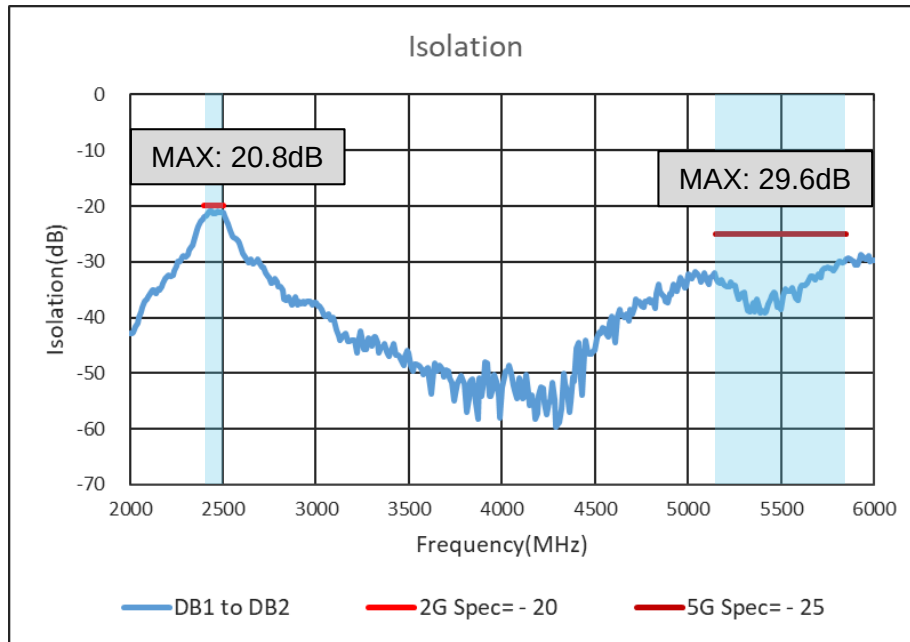
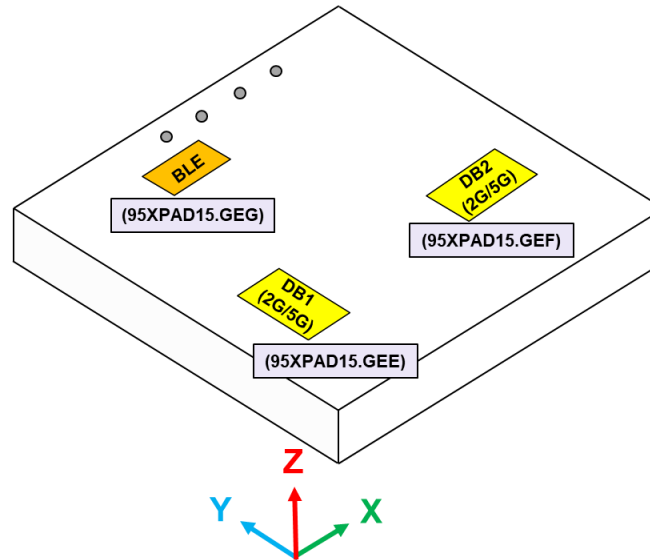


	Radio	Size
	DB1	31.1*12.1*8.0 mm Metal Antenna
	DB2	30.6*12.1*8.0 mm Metal Antenna
	BLE	31.1*12.1*8.0 mm Metal Antenna



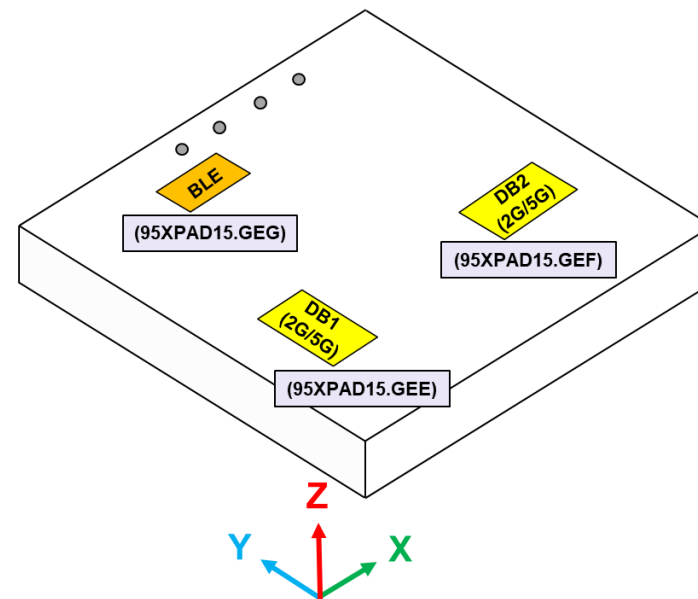
Isolation

Test date: 2025/12/24
Test personnel : Eason Chen



Efficiency and Peak Gain

Test date: 2025/12/24
Test personnel : Eason Chen



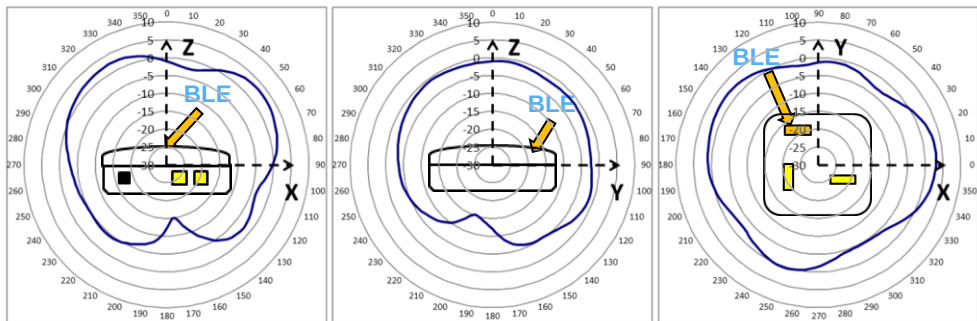
BLE	2400	2450	2500	avg.
Eff.	63.0%	67.7%	66.4%	65.7%
Eff. dB	-2.01	-1.69	-1.78	
Peak Gain	3.57	2.63	2.70	

DB1	2400	2450	2500	avg.	5150	5350	5550	5750	5850	5900	avg.
Eff.	61.4%	68.9%	71.4%	67.2%	67.4%	71.1%	69.5%	69.2%	68.2%	65.9%	68.6%
Eff. dB	-2.12	-1.62	-1.46		-1.71	-1.48	-1.58	-1.60	-1.66	-1.81	
Peak Gain	4.45	5.29	5.76		5.99	5.46	4.39	4.85	4.86	4.76	
DB2	2400	2450	2500	avg.	5150	5350	5550	5750	5850	5900	avg.
Eff.	61.1%	67.8%	68.5%	65.8%	63.1%	68.1%	67.9%	66.3%	64.0%	62.8%	65.4%
Eff. dB	-2.14	-1.69	-1.64		-2.00	-1.67	-1.68	-1.79	-1.94	-2.02	
Peak Gain	3.02	2.96	3.47		4.41	4.31	4.54	4.35	3.88	3.83	

2D Radiation Pattern for BLE

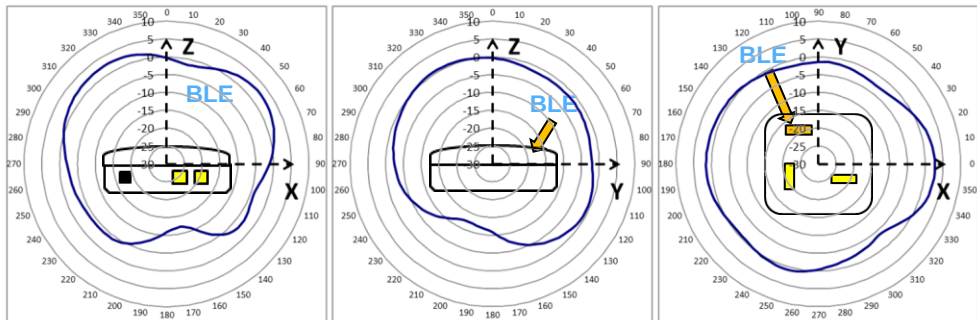
**2400 MHz
Radiation Pattern**

— BLE



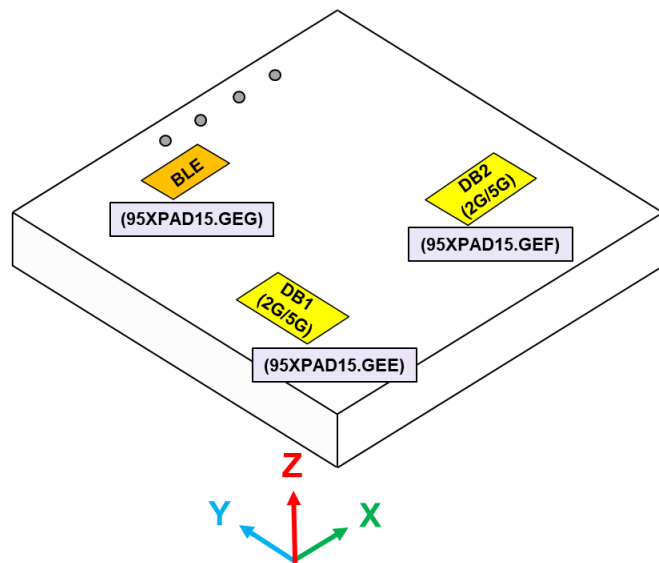
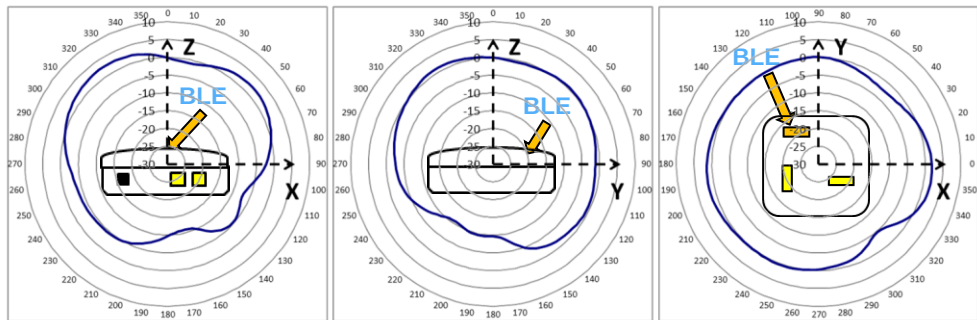
**2450 MHz
Radiation Pattern**

— BLE



**2500 MHz
Radiation Pattern**

— BLE



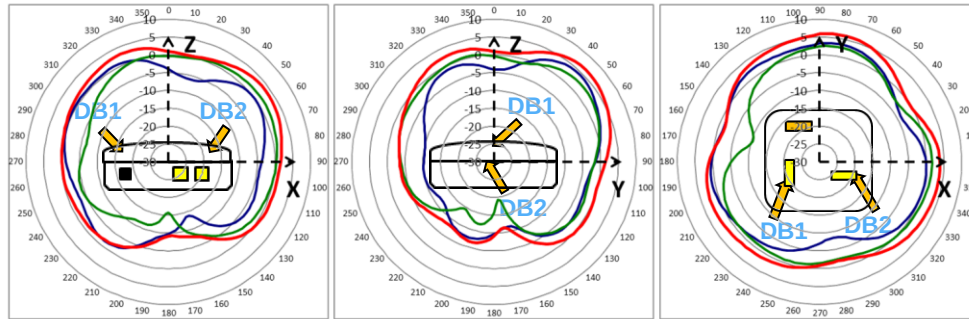
Test date: 2025/12/24
Test personnel : Eason Chen

2D Radiation Pattern for DB1 & 2(Wi-Fi_2G)

2400 MHz

Radiation Pattern

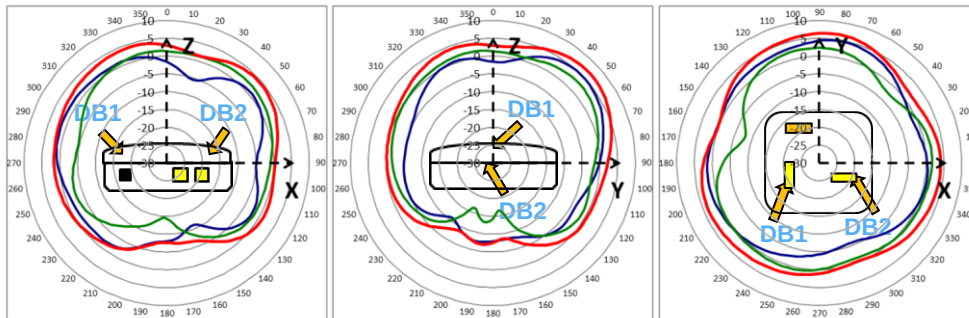
— Directional Gain
— DB1
— DB2



2450 MHz

Radiation Pattern

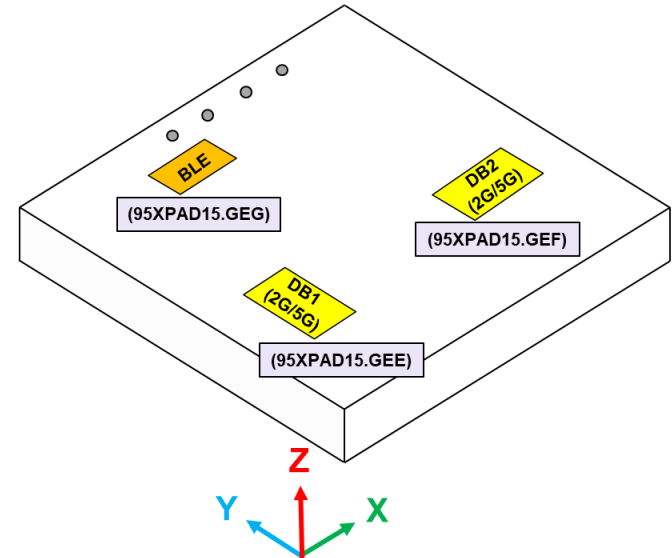
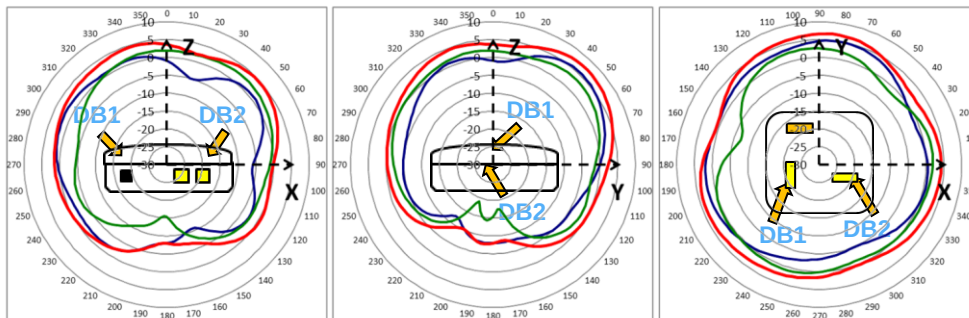
— Directional Gain
— DB1
— DB2



2500 MHz

Radiation Pattern

— Directional Gain
— DB1
— DB2

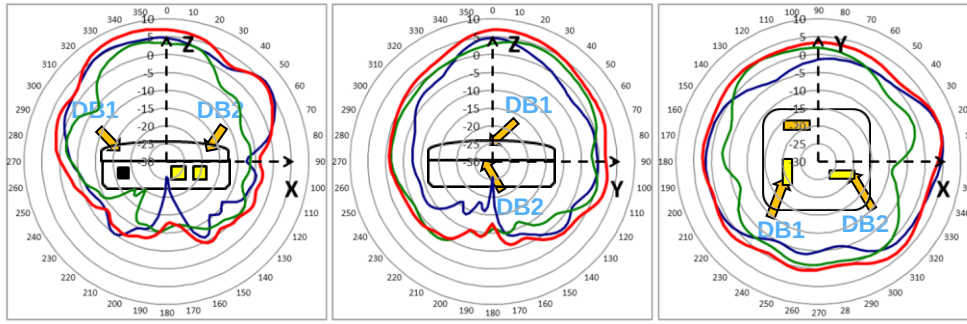


Test date: 2025/12/24
Test personnel : Eason Chen

2D Radiation Pattern for DB1 & 2(Wi-Fi_5G)

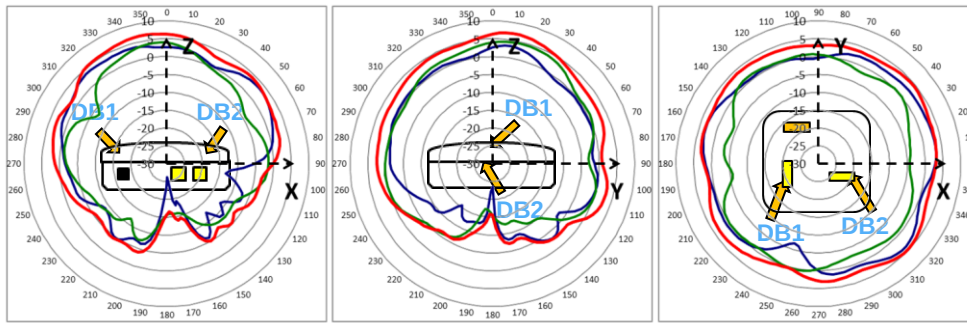
5150 MHz
Radiation Pattern

— Directional Gain
— DB1
— DB2



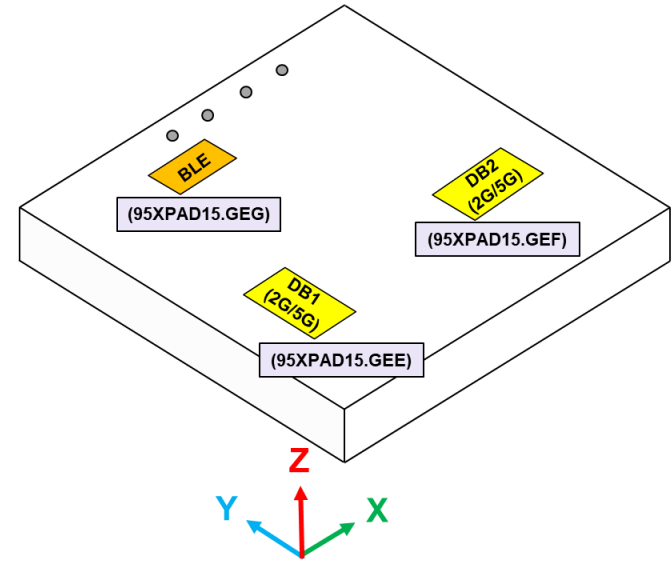
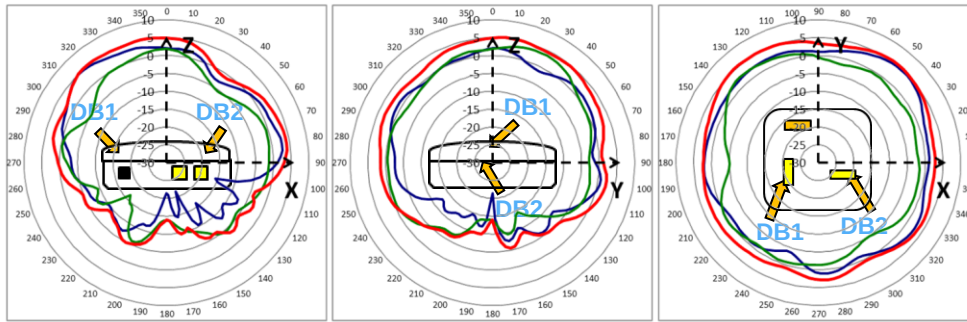
5550 MHz
Radiation Pattern

— Directional Gain
— DB1
— DB2



5850 MHz
Radiation Pattern

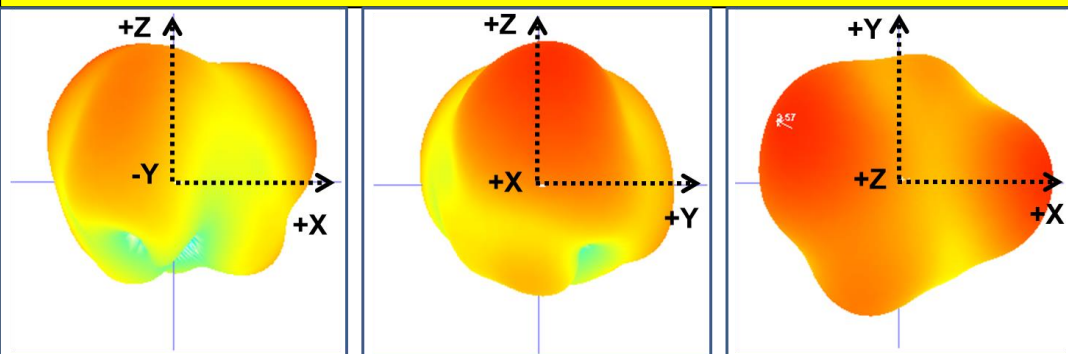
— Directional Gain
— DB1
— DB2



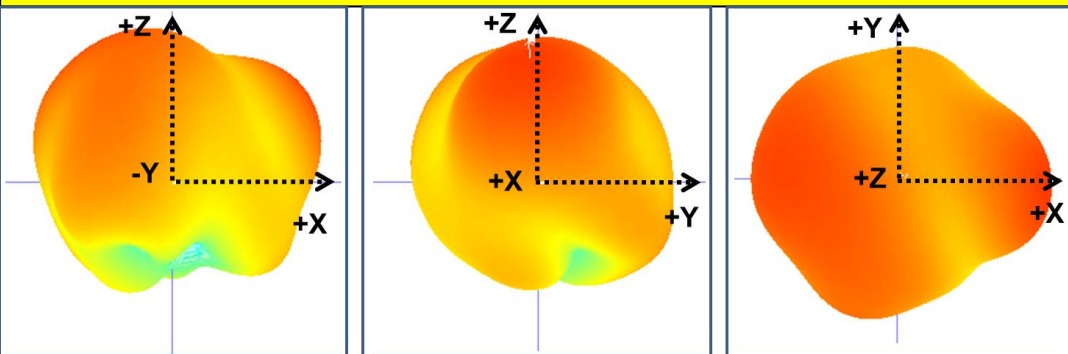
Test date: 2025/12/24
Test personnel : Eason Chen

3D Radiation Pattern for BLE

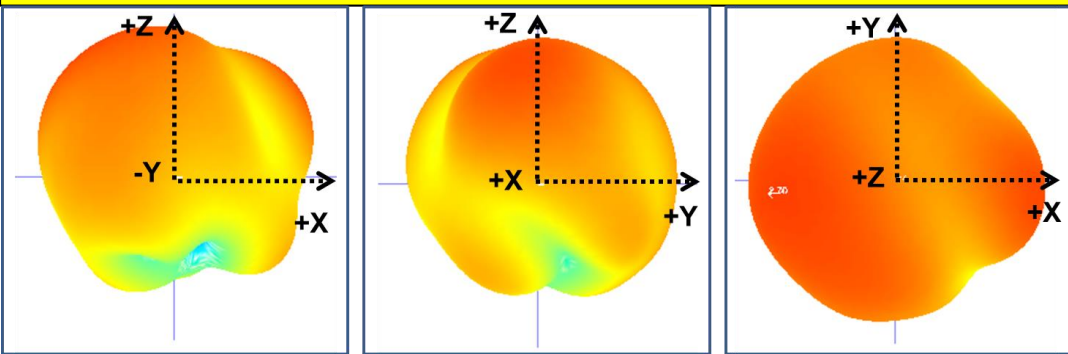
BLE @ 2400MHz



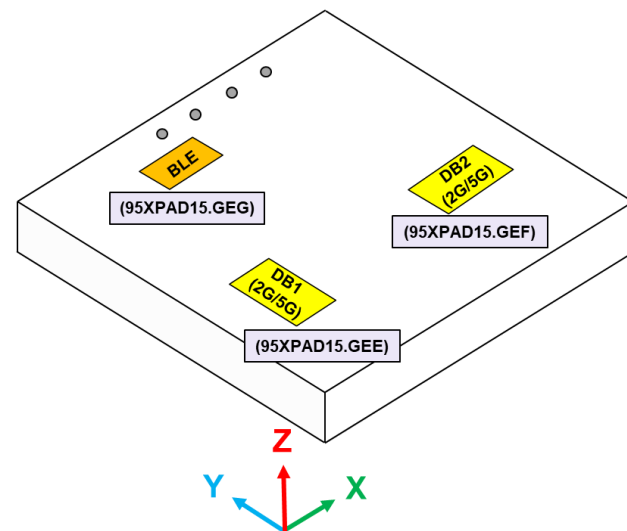
BLE @ 2450MHz



BLE @ 2500MHz



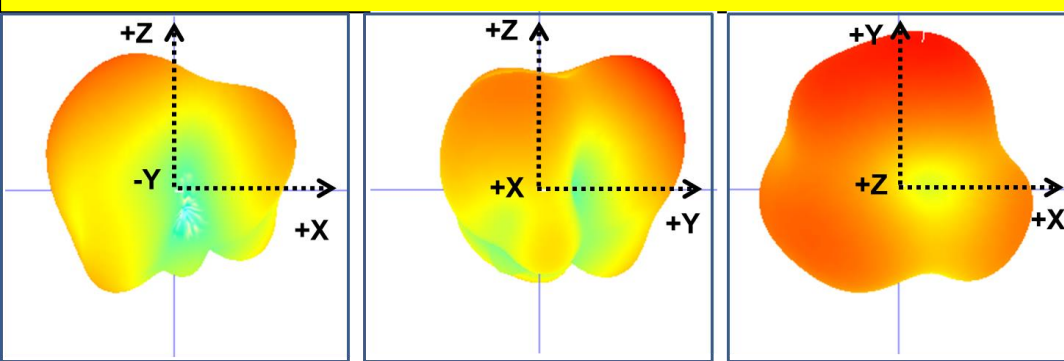
dB



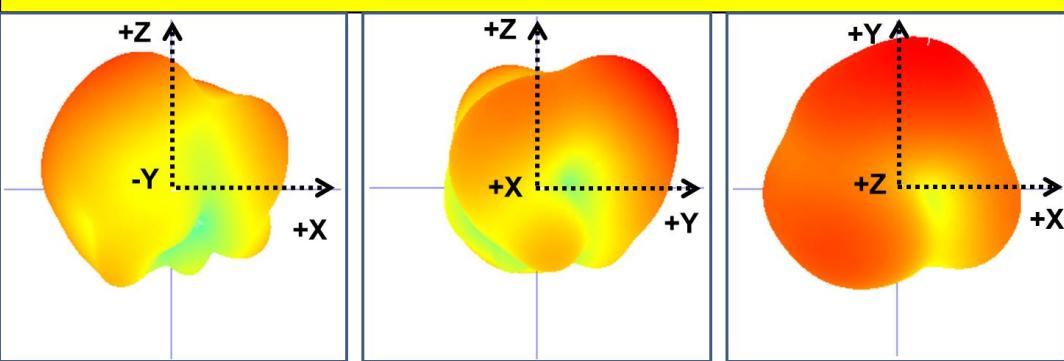
Test date: 2025/12/24
Test personnel : Eason Chen

3D Radiation Pattern for DB1(Wi-Fi_2G)

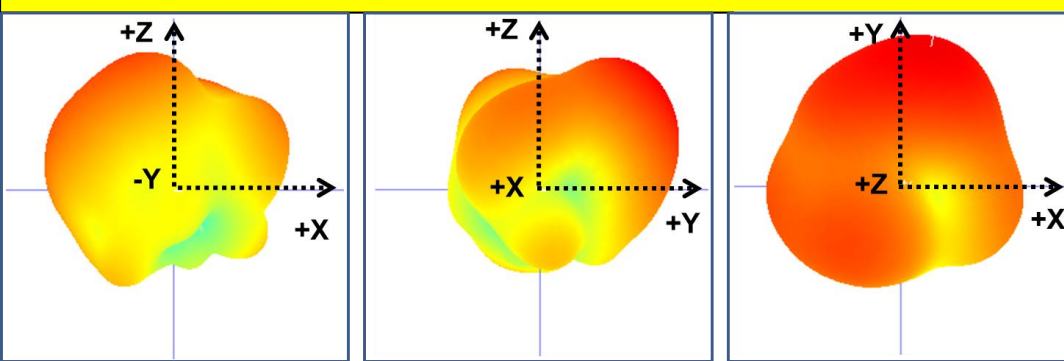
DB1 @ 2400MHz



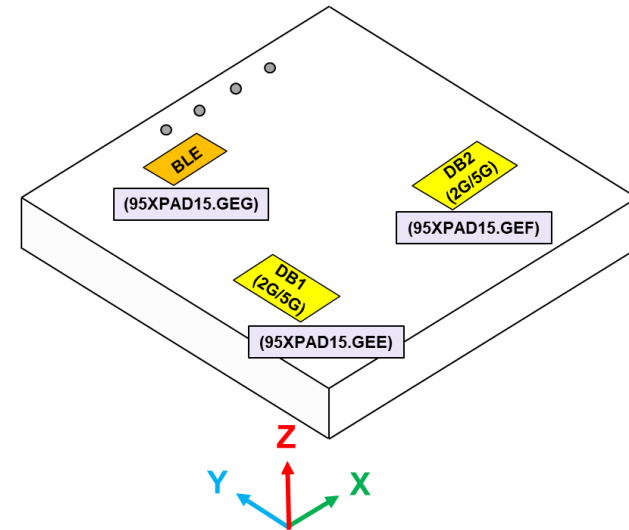
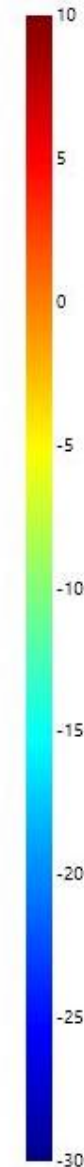
DB1 @ 2450MHz



DB1 @ 2500MHz



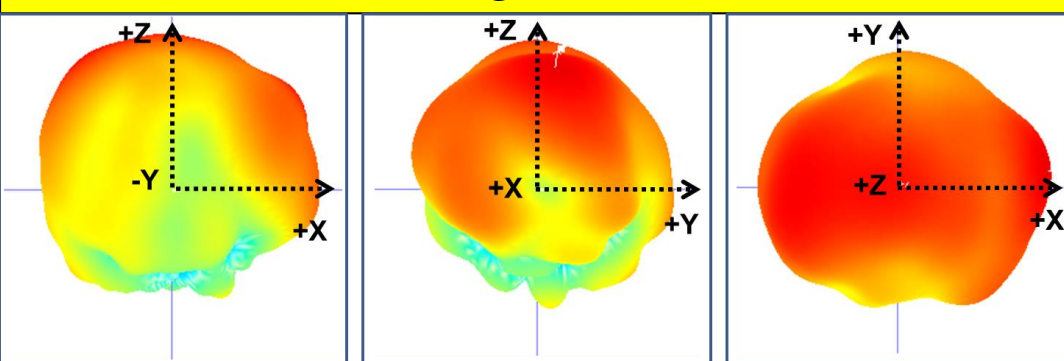
dB



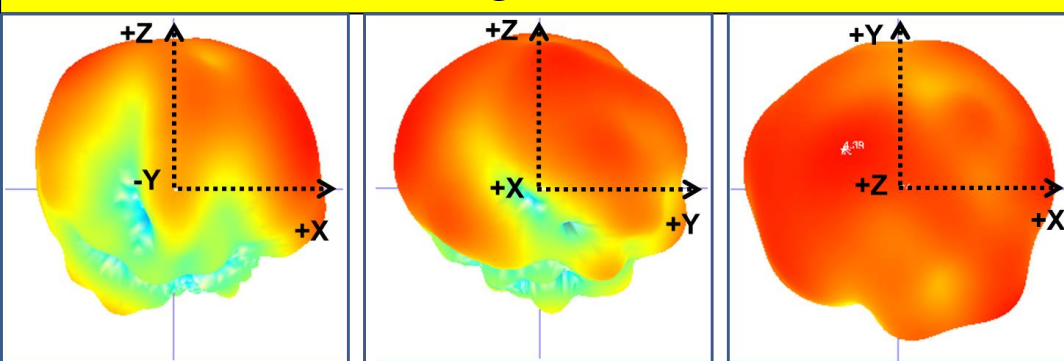
Test date: 2025/12/24
Test personnel : Eason Chen

3D Radiation Pattern for DB1(Wi-Fi_5G)

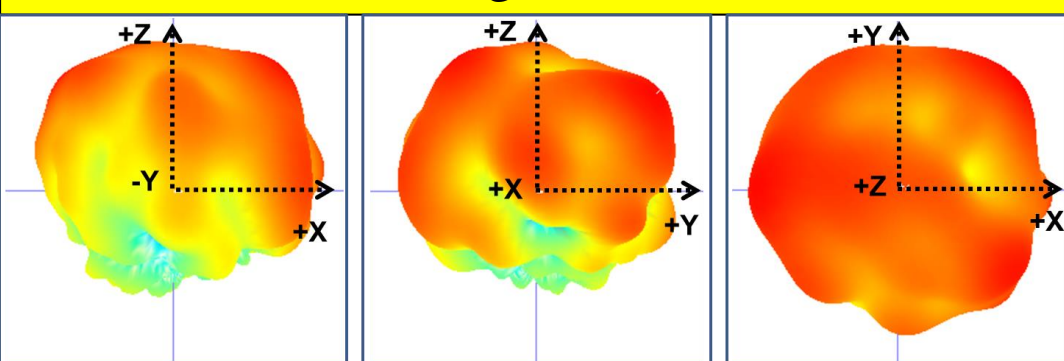
DB1 @ 5150MHz



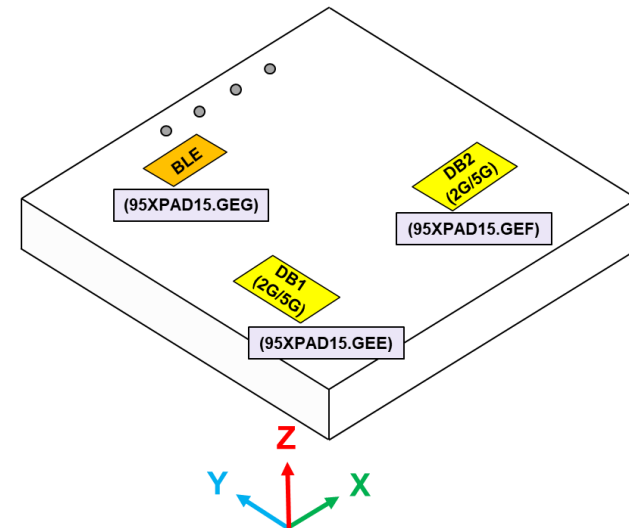
DB1 @ 5550MHz



DB1 @ 5850MHz



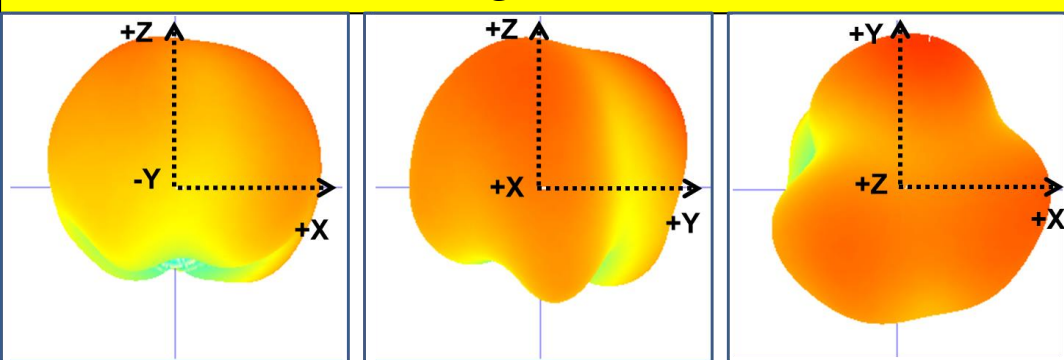
dB



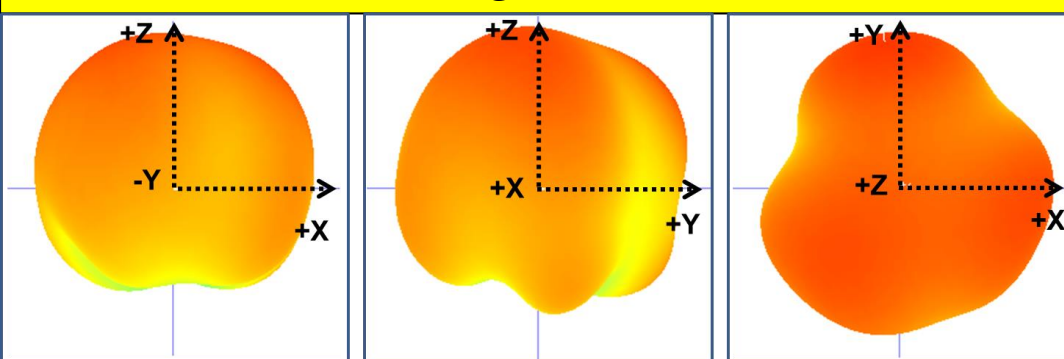
Test date: 2025/12/24
Test personnel : Eason Chen

3D Radiation Pattern for DB2(Wi-Fi_2G)

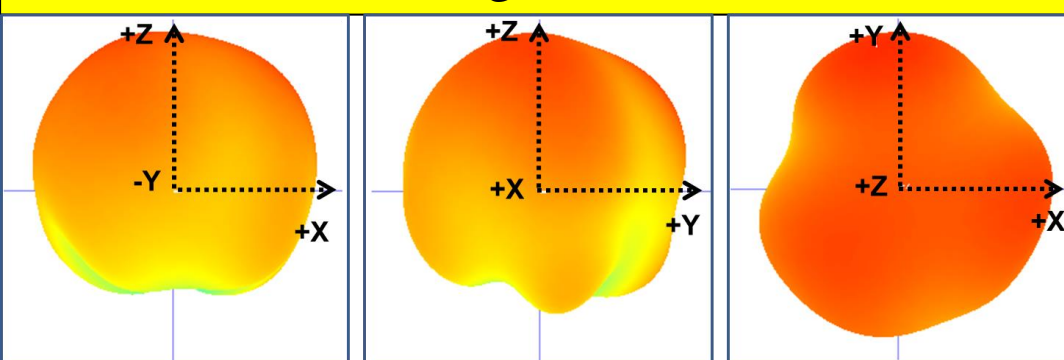
DB2 @ 2400MHz



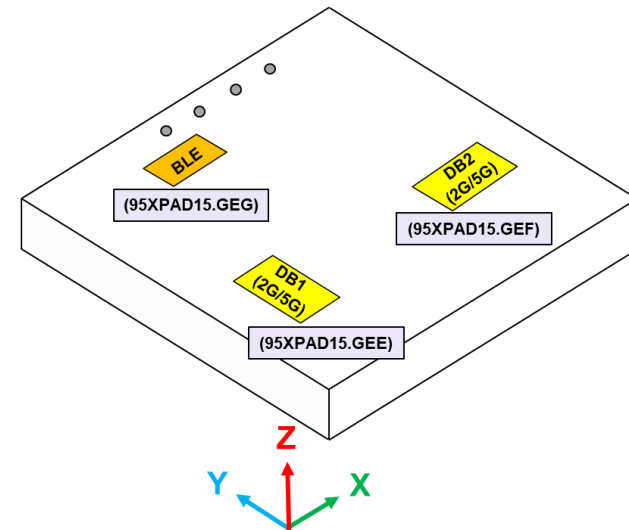
DB2 @ 2450MHz



DB2 @ 2500MHz



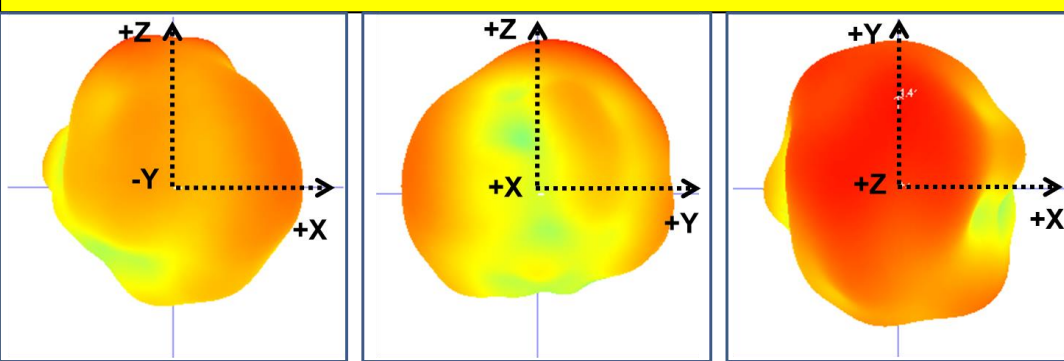
dB



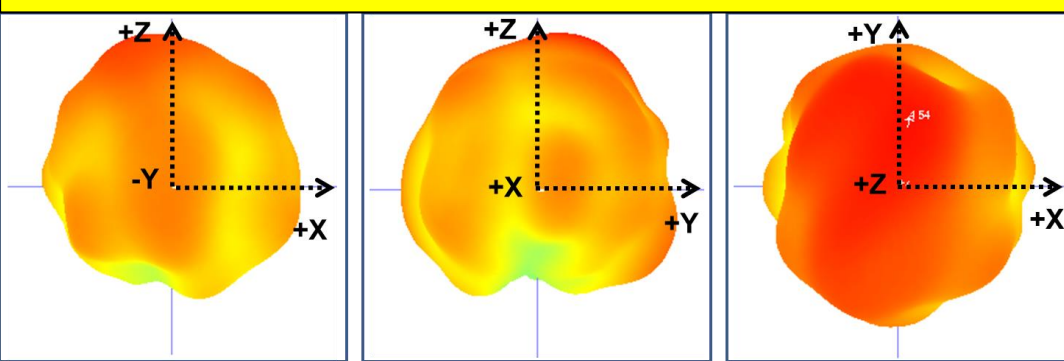
Test date: 2025/12/24
Test personnel : Eason Chen

3D Radiation Pattern for DB2(Wi-Fi_5G)

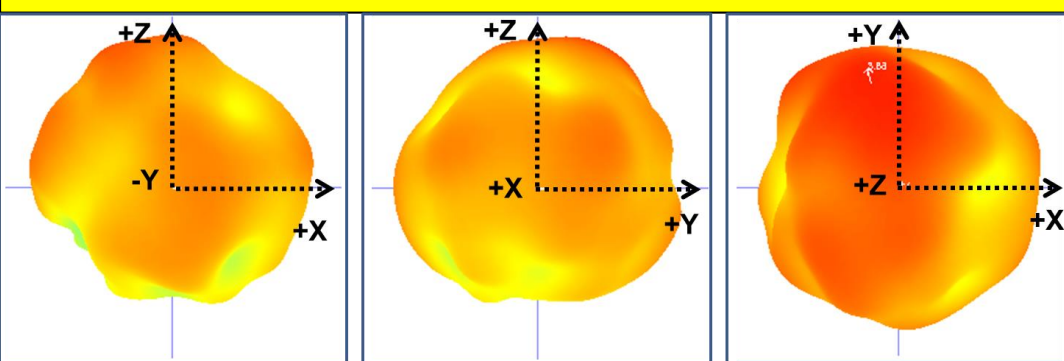
DB2 @ 5150MHz



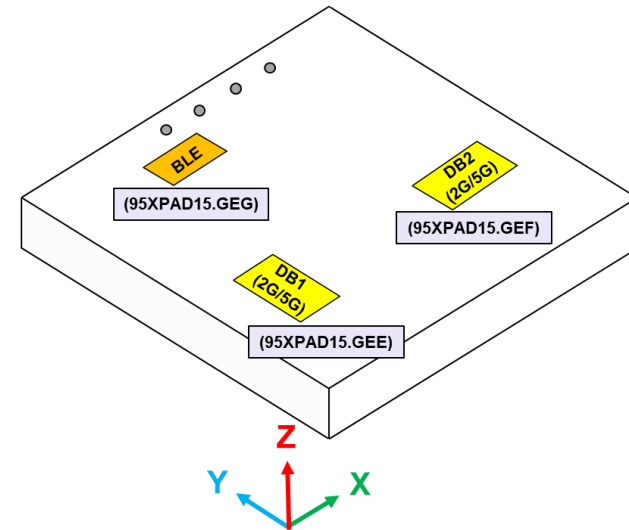
DB2 @ 5550MHz



DB2 @ 5850MHz



dB



Test date: 2025/12/24
Test personnel : Eason Chen

The logo for WNC Corporation, featuring the letters 'WNC' in a bold, blue, italicized sans-serif font.

WNC

WNC Corporation

Thank You!

