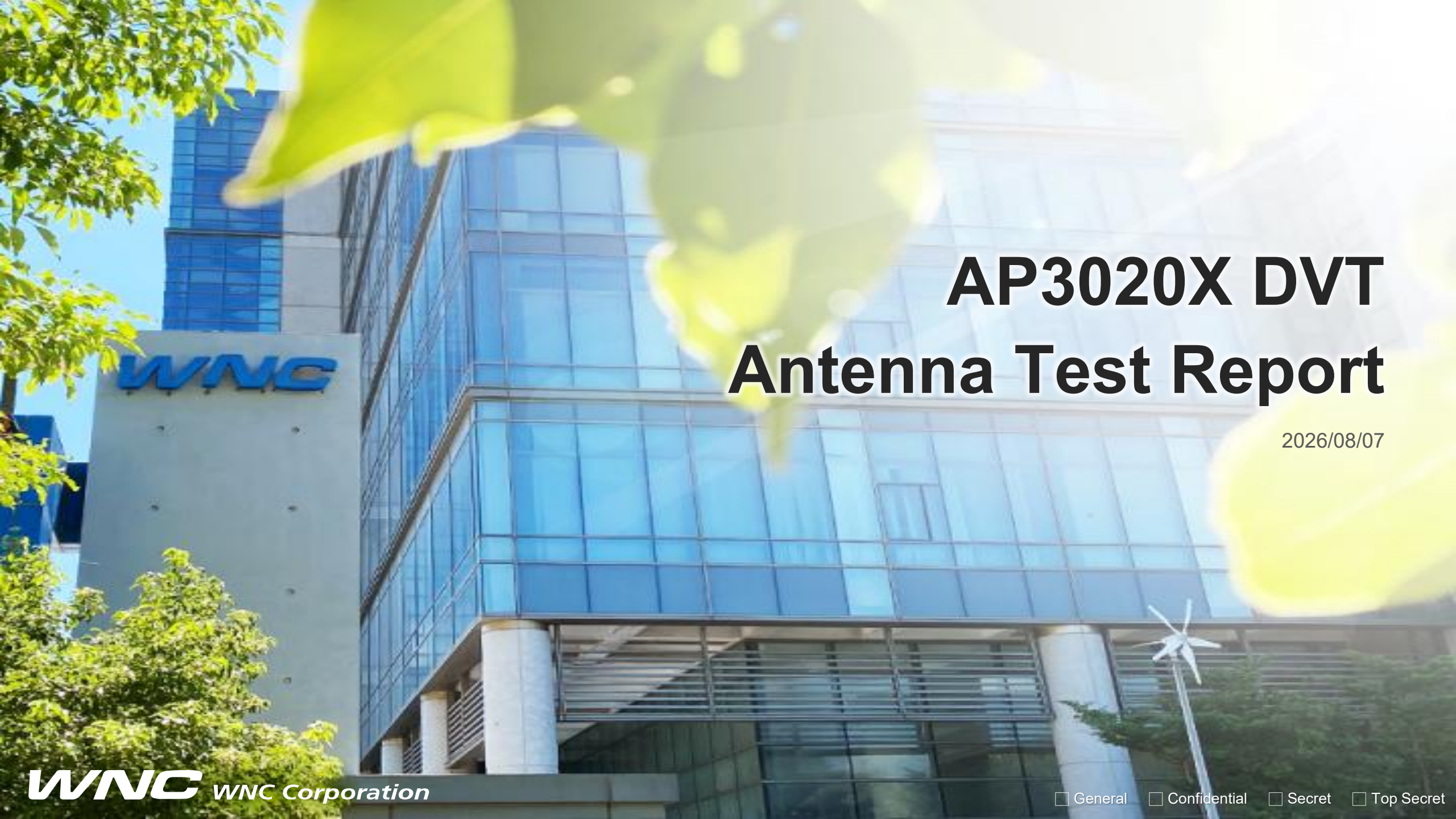




# AP3020X DVT Antenna Test Report

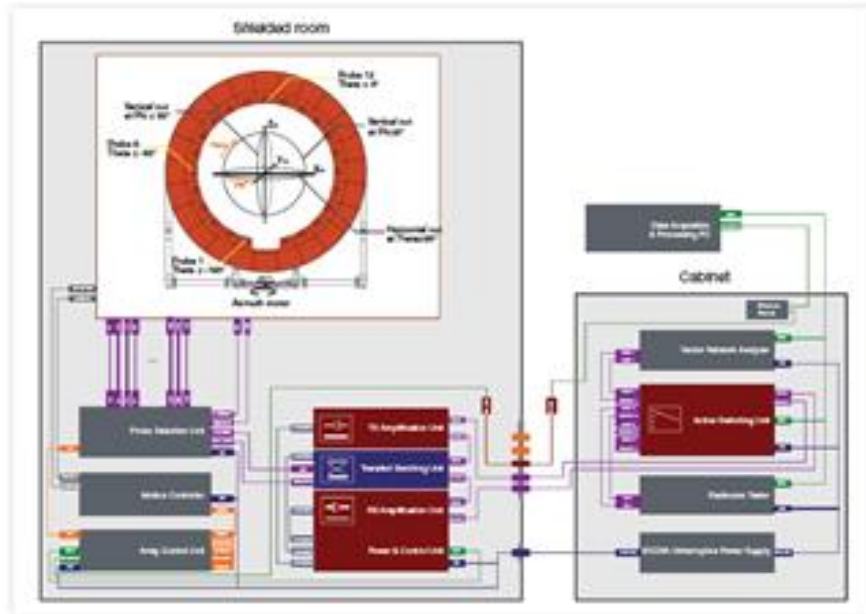
2026/08/07

# Contents **AP3020X DVT**

- Chamber Information
  - Test Equipment
  - Test Procedure
- Antenna P/N
- Peak Gain Table
- Summary
- Antenna Test Results
  - Radiation Pattern

# Chamber Information

- Antenna Vendor : WNC
- Test Date : 2026/06/11
- Test Engineer : Jack TJ Liu
- Measurement System : SATIMO SG24-L
- Software Name : Wave Studio
- Software Version : 22.5.6



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

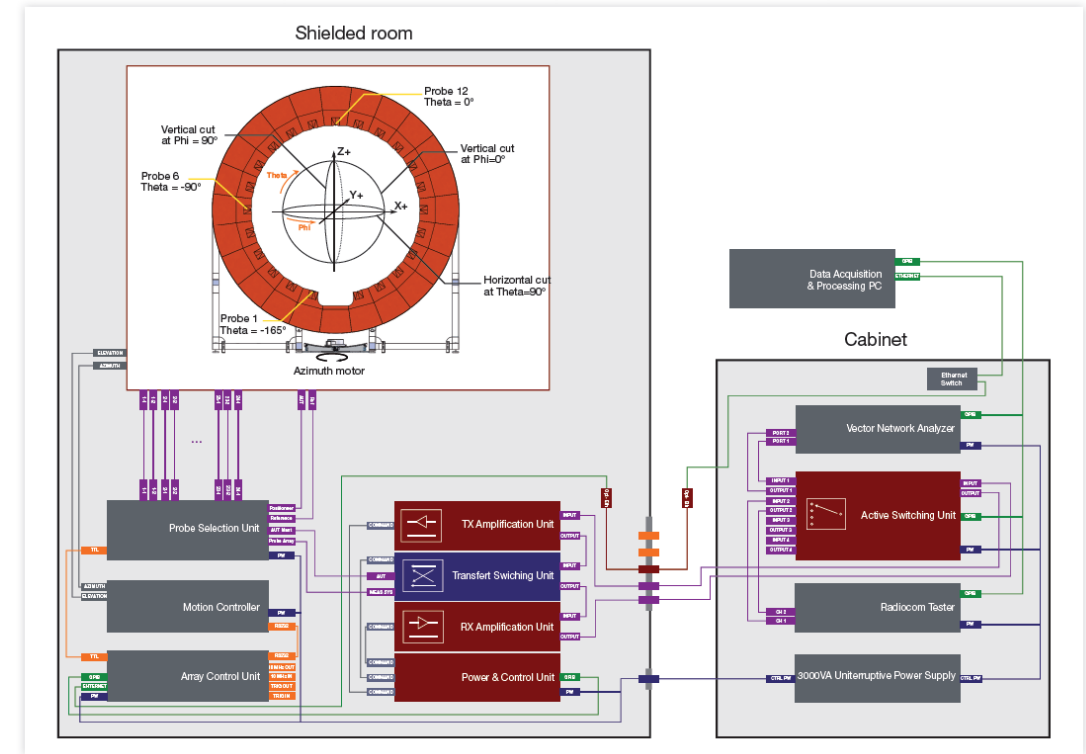
# Test Equipment

## ■ Measurement System : SATIMO SG24-L Chamber

## ■ Measurement Setup

- pattern & gain measurement
  - SATIMO chamber (SG24-L)
  - SATIMO program (wave studio)
  - System overview
- Test item
  - antenna passive test 400MHz~9GHz

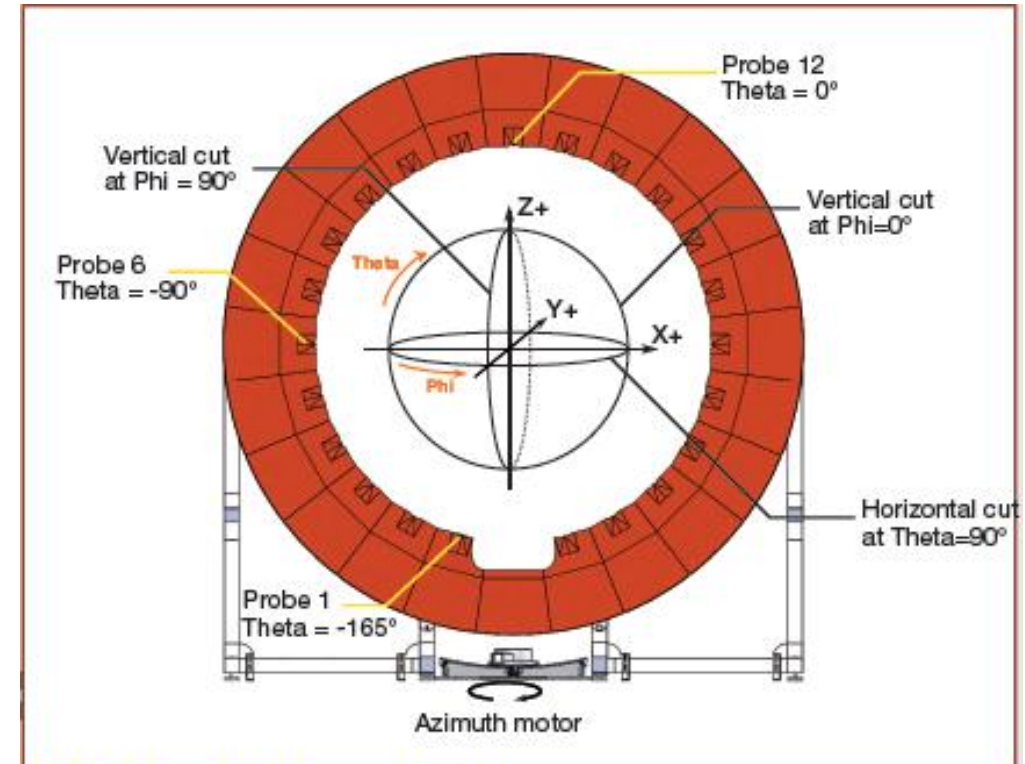
## ■ Calibration Information



| Device                     | Type / Model    | Serial #   | Manufacture | Cal. Date  | Cal. Until |
|----------------------------|-----------------|------------|-------------|------------|------------|
| Antenna Measurement System | SG24-L          | HKG1669S   | MVG-SATIMO  | 2025-10-17 | 2026-10-16 |
| Network Analyzer           | Keysight E5080B | MY59203136 | Keysight    | 2025-10-17 | 2026-10-16 |

# Test Procedure

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  $0^\circ$  to  $360^\circ$  and theta from  $0^\circ$  to  $180^\circ$  with a step size of 3 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.



# Antenna P/N

| Brand | Antenna                | WNC P/N      | Antenna Type |
|-------|------------------------|--------------|--------------|
| WNC   | 2/5G 0                 | 95XPAM15.GAA | Dipole       |
|       | 2/5G 1                 | 95XPAM15.GAA | Dipole       |
|       | 5GL/6G 0               | 95XPAM15.G98 | Dipole       |
|       | 5GL/6G 1               | 95XPAM15.G99 | Dipole       |
|       | BLE Core 0(802.15.4)   | 95XPAM15.G97 | PIFA         |
|       | BLE Core 1-1(802.15.4) | 95XPAM15.G95 | Dipole       |
|       | BLE Core 1-2(802.15.4) | 95XPAM15.G96 | PIFA         |

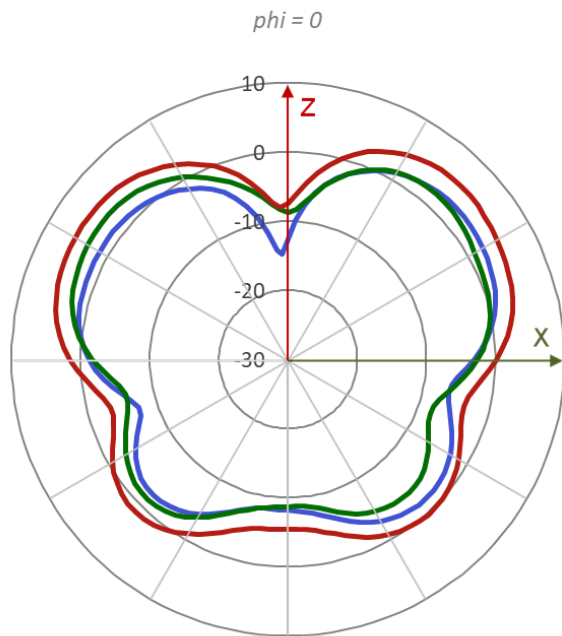
# Peak Gain Table

| Antenna                 | Frequency (GHz)          | Peak Gain            | Antenna Polarization | Position of Peak Gain ( $\theta$ , $\phi$ )                                          |
|-------------------------|--------------------------|----------------------|----------------------|--------------------------------------------------------------------------------------|
| BLE Core 0 (802.15.4)   | 2.4-2.48                 | 3.21 dBi             | V-Pol                | $\theta = 69^\circ$ , $\phi = 57^\circ$                                              |
| BLE Core 1-1 (802.15.4) | 2.4-2.48                 | 5.81 dBi             | H-Pol                | $\theta = 0^\circ$ , $\phi = 42^\circ$                                               |
| BLE Core 1-2 (802.15.4) | 2.4-2.48                 | 3.28 dBi             | V-Pol                | $\theta = 48^\circ$ , $\phi = 15^\circ$                                              |
| 2/5G 0                  | 2.4-2.48<br>5.15-5.85    | 4.39 dBi<br>5.35 dBi | V-Pol                | $\theta = 63^\circ$ , $\phi = 69^\circ$<br>$\theta = 81^\circ$ , $\phi = 12^\circ$   |
| 2/5G 1                  | 2.4-2.48<br>5.15-5.85    | 5.10 dBi<br>4.63 dBi | V-Pol                | $\theta = 45^\circ$ , $\phi = 162^\circ$<br>$\theta = 84^\circ$ , $\phi = 201^\circ$ |
| 5GL/6G 0                | 5.15-5.35<br>5.925-7.125 | 4.47 dBi<br>5.30 dBi | V-Pol                | $\theta = 84^\circ$ , $\phi = 165^\circ$<br>$\theta = 72^\circ$ , $\phi = 165^\circ$ |
| 5GL/6G 1                | 5.15-5.35<br>5.925-7.125 | 4.51 dBi<br>5.90 dBi | V-Pol                | $\theta = 81^\circ$ , $\phi = 357^\circ$<br>$\theta = 75^\circ$ , $\phi = 156^\circ$ |

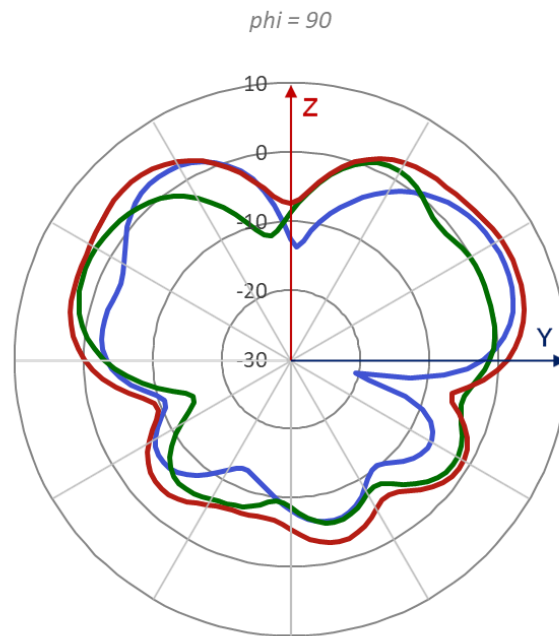
# Antenna Performance Summary

| Antenna                 | Frequency (GHz)          | VSWR  | Peak Gain            |
|-------------------------|--------------------------|-------|----------------------|
| BLE Core 0 (802.15.4)   | 2.4-2.48                 | < 2.0 | 3.21 dBi             |
| BLE Core 1-1 (802.15.4) | 2.4-2.48                 | < 2.0 | 5.81 dBi             |
| BLE Core 1-2 (802.15.4) | 2.4-2.48                 | < 2.0 | 3.28 dBi             |
| 2/5G 0                  | 2.4-2.48<br>5.15-5.85    | < 2.0 | 4.39 dBi<br>5.35 dBi |
| 2/5G 1                  | 2.4-2.48<br>5.15-5.85    | < 2.0 | 5.10 dBi<br>4.63 dBi |
| 5GL/6G 0                | 5.15-5.35<br>5.925-7.125 | < 2.0 | 4.47 dBi<br>5.30 dBi |
| 5GL/6G 1                | 5.15-5.35<br>5.925-7.125 | < 2.0 | 4.51 dBi<br>5.90 dBi |

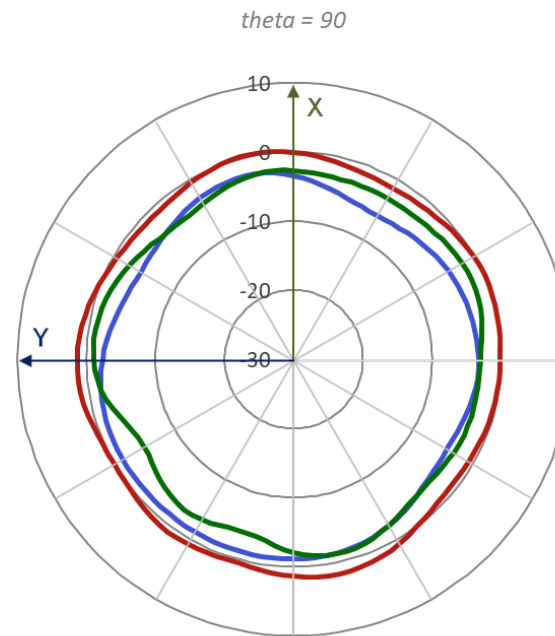
# Realized Gain Pattern 2G



— 2/5G 0 — 2/5G 1 — Composite

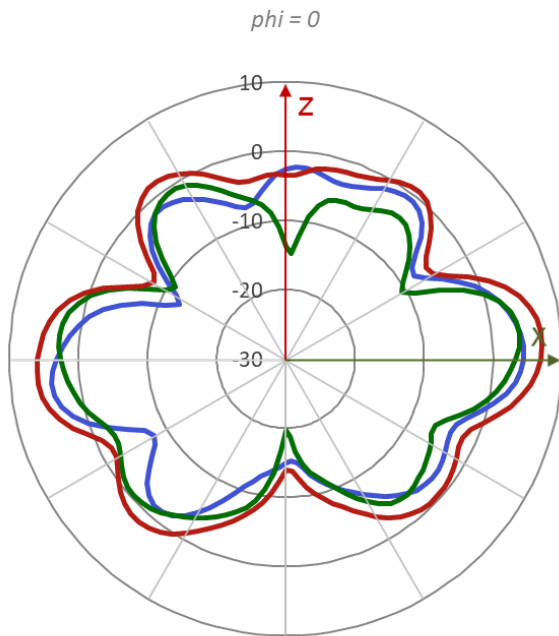


— 2/5G 0 — 2/5G 1 — Composite

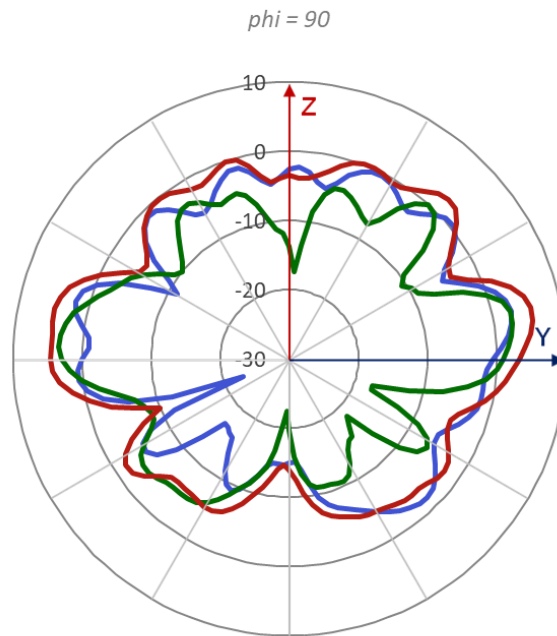


— 2/5G 0 — 2/5G 1 — Composite

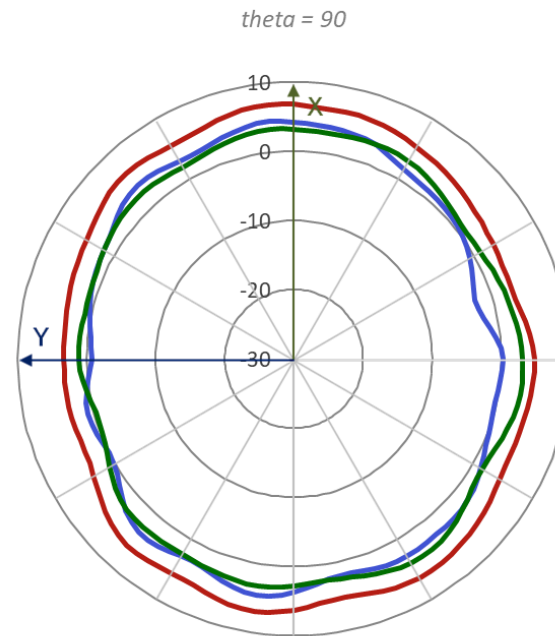
# Realized Gain Pattern 5G



— 2/5G 0 — 2/5G 1 — Composite

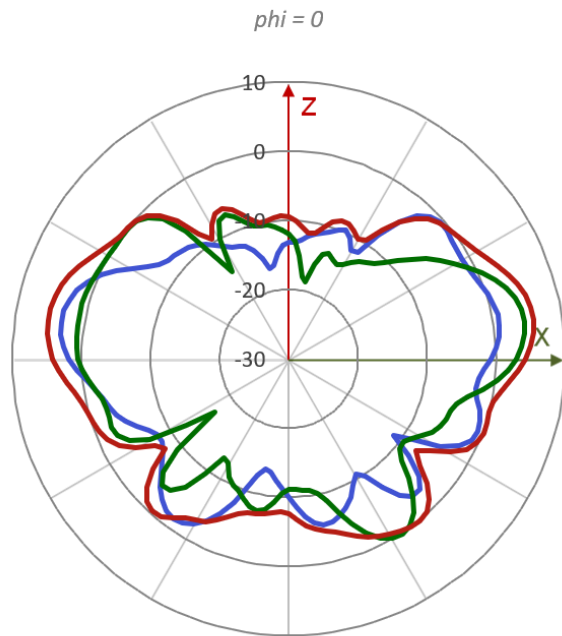


— 2/5G 0 — 2/5G 1 — Composite

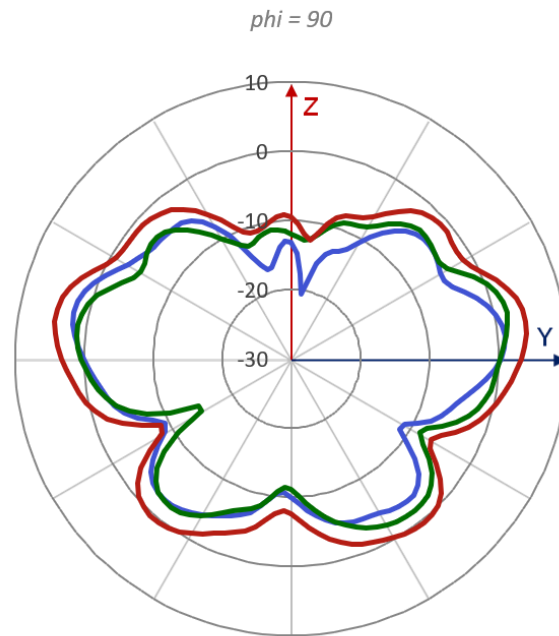


— 2/5G 0 — 2/5G 1 — Composite

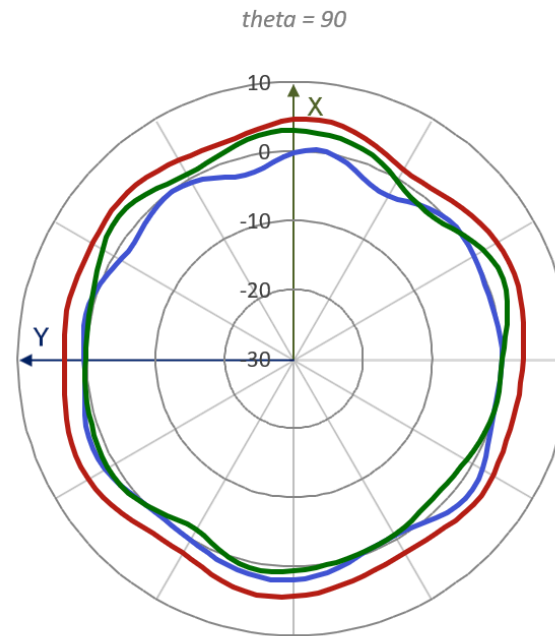
# Realized Gain Pattern 5GL



— 5GL/6G 0 — 5GL/6G 1 — Composite

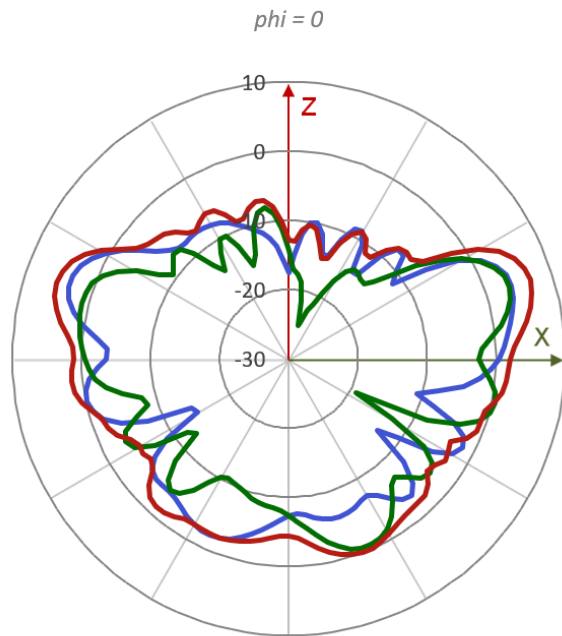


— 5GL/6G 0 — 5GL/6G 1 — Composite

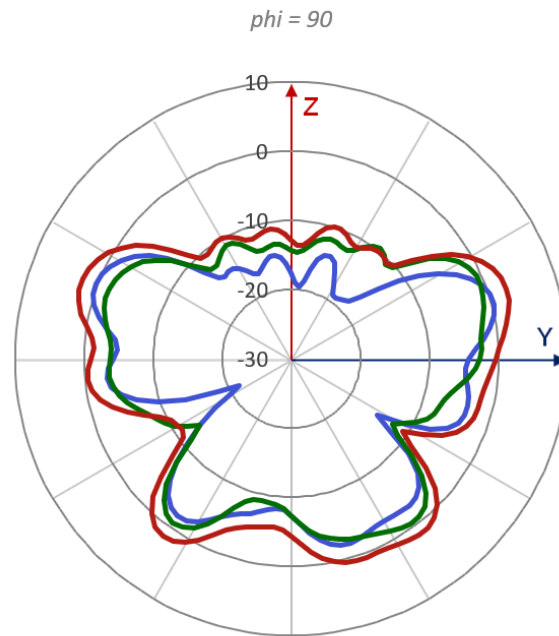


— 5GL/6G 0 — 5GL/6G 1 — Composite

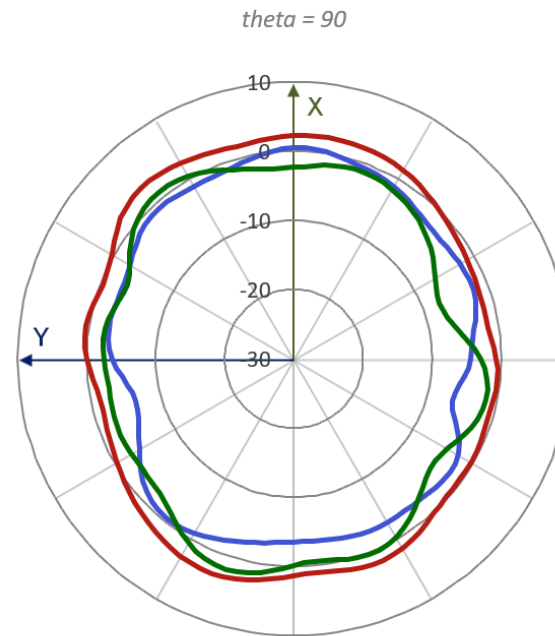
# Realized Gain Pattern 6G



— 5GL/6G 0 — 5GL/6G 1 — Composite

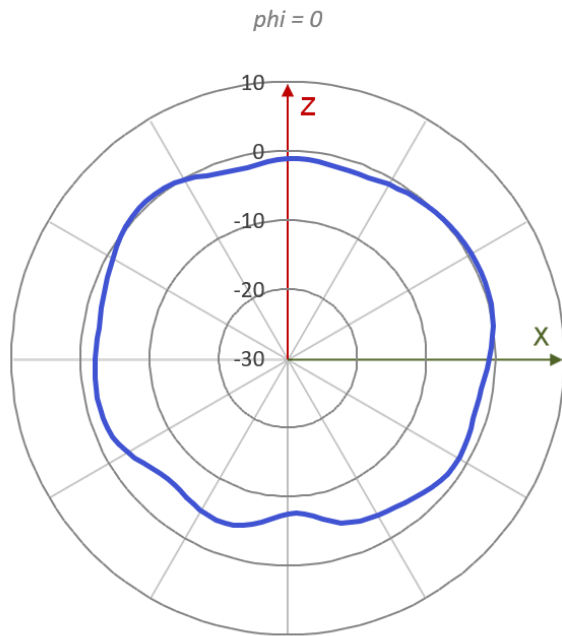


— 5GL/6G 0 — 5GL/6G 1 — Composite

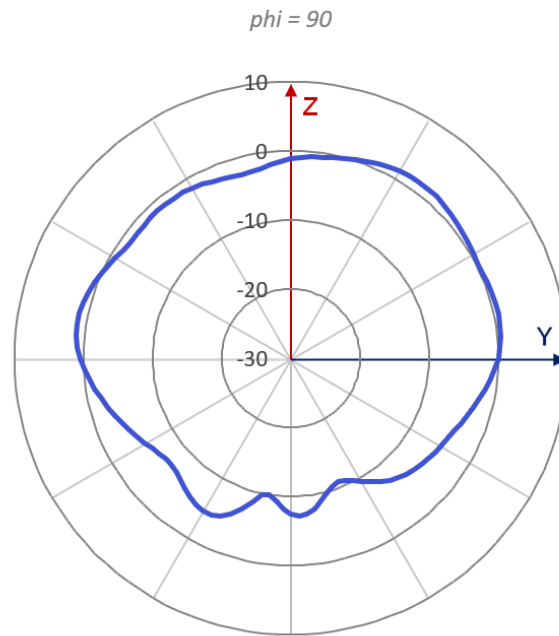


— 5GL/6G 0 — 5GL/6G 1 — Composite

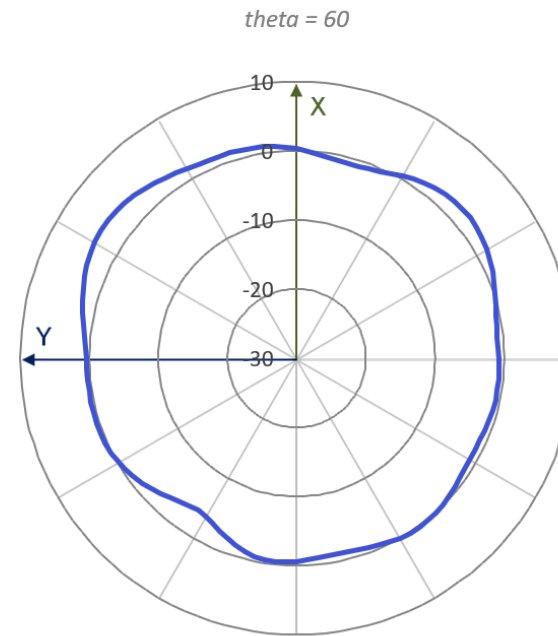
# Realized Gain Pattern BLE Core 0(802.15.4)



— BLE Core 0(802.15.4)

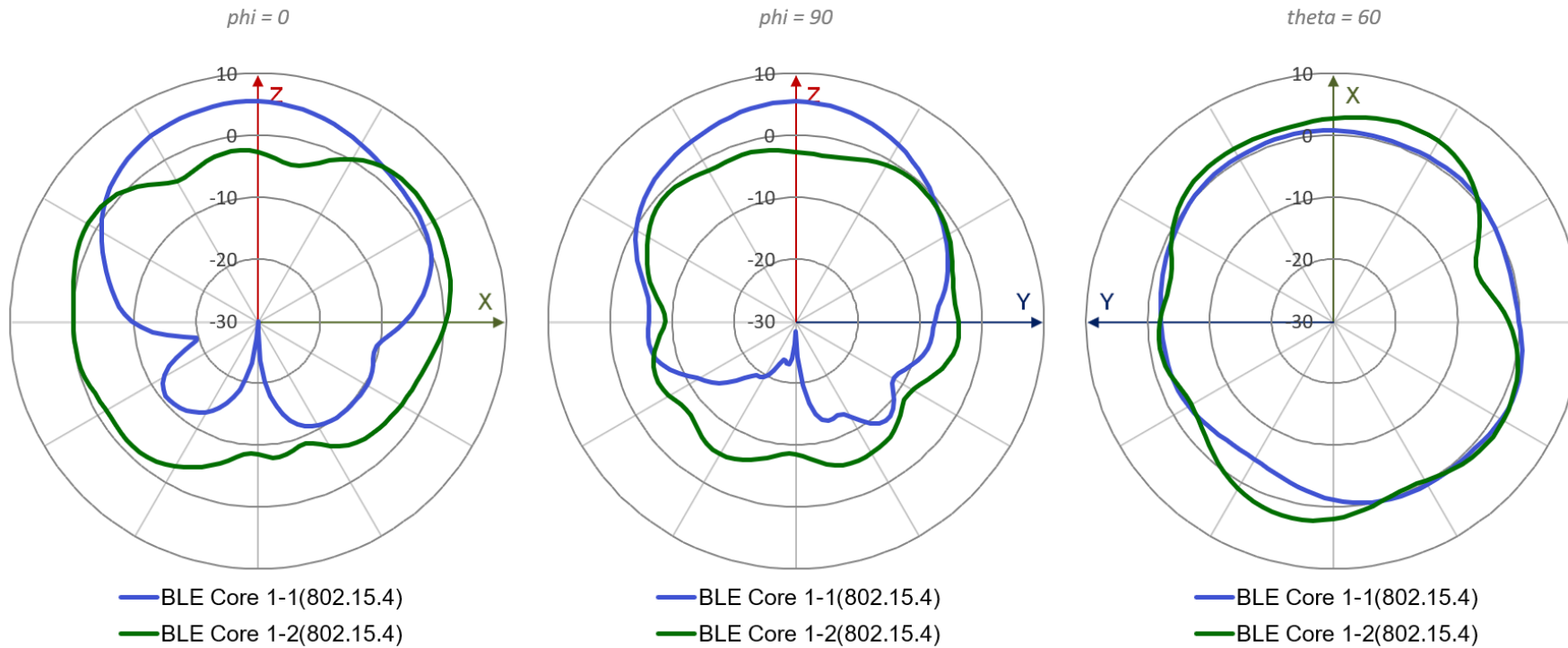


— BLE Core 0(802.15.4)



— BLE Core 0(802.15.4)

# Realized Gain Pattern BLE Core 1-1/1-2(802.15.4)



***WNC***

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