XLE WiFi Antenna Test Report

WNC Wistron NeWeb Corp.

☐ Normal ☐ Internal Use ■ Confidential ☐ Restricted Confidential

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- Test Setup
  - Diagram
  - Equipment
  - Procedure

- Test Result
  - Summary
  - WiFi 2G
  - WiFi 5G Low
  - WiFi 5G High
  - Isolation among Radio

General Info

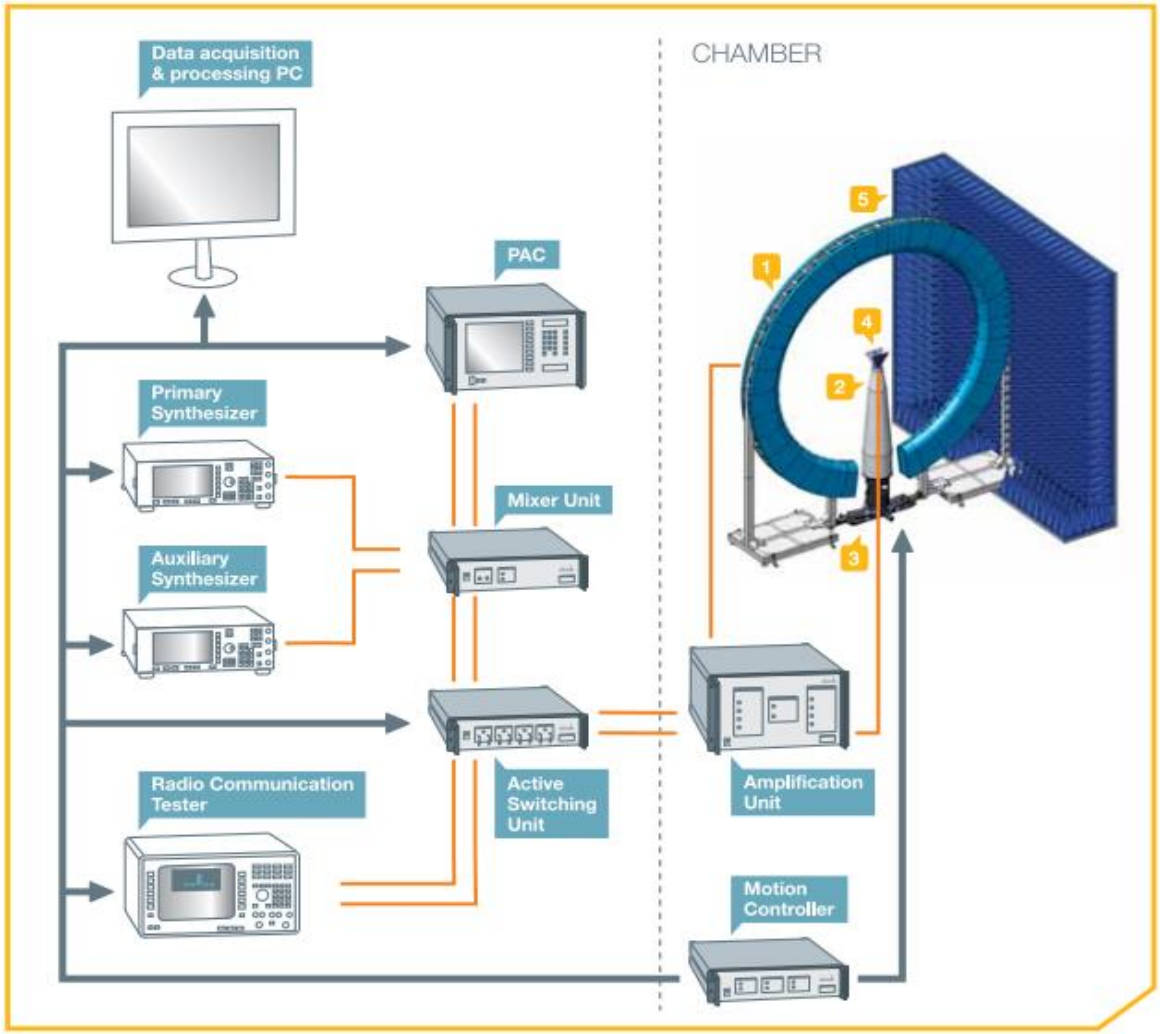
- Antenna Information:

  - Brand: WNC

  - Antenna Type:
    Wi-Fi Antenna is Dipole.
    BT Antenna is PCB Antenna

  - Test Date and Member
    Date: 2022/ 08/ 23
    Member: Chikang Su

Test Setup Diagram



SG 64 uses analog RF signal generators to emit EM waves from the probe array to the antenna under test (AUT) or vice versa.

It uses the NPAC as an RF receiver for antenna measurements. The NPAC also drives the electronic scanning of the probe array.

The NPAC includes the fastest and most accurate sources and receivers on the market.

Equipment

Device	Type/Model	Serial#	Manufacturer	Calibrated Date	Calibrated Until
SG64 Chamber	Standard	SG64	MVG	2022/03/30	2023/03/30
Turn Table	Customization	-	Machinery Dept.	2022/03/30	2023/03/30
New Probe Array Controller	N/A	1102341-4535	MVG	2022/03/30	2023/03/30
Power Supply Unit	N/A	1103211-13204	MVG	2022/03/30	2023/03/30
Activve Switching Unit	N/A	1102347-7214	MVG	2022/03/30	2023/03/30
TX Amplification Unit	N/A	1102527-5909	MVG	2022/03/30	2023/03/30
RX Amplification Unit	N/A	1102536-3823	MVG	2022/03/30	2023/03/30
Transfer Swittching Unit	N/A	1102183-3351	MVG	2022/03/30	2023/03/30
Mixer Unit	N/A	1102545-7208	MVG	2022/03/30	2023/03/30
Power And Control Unit	N/A	1102706-7209	MVG	2022/03/30	2023/03/30
Antenna Probe	DP 400-6000	-	MVG	2022/03/30	2023/03/30
Cable 13.7m - 400MHz to 18GHz	SS402	00100A1F5A1XXS	Woken	2022/03/30	2023/03/30
Temperature & Humidity Meter	HTC-01	-	Metravi	2022/03/30	2023/03/30

Note:

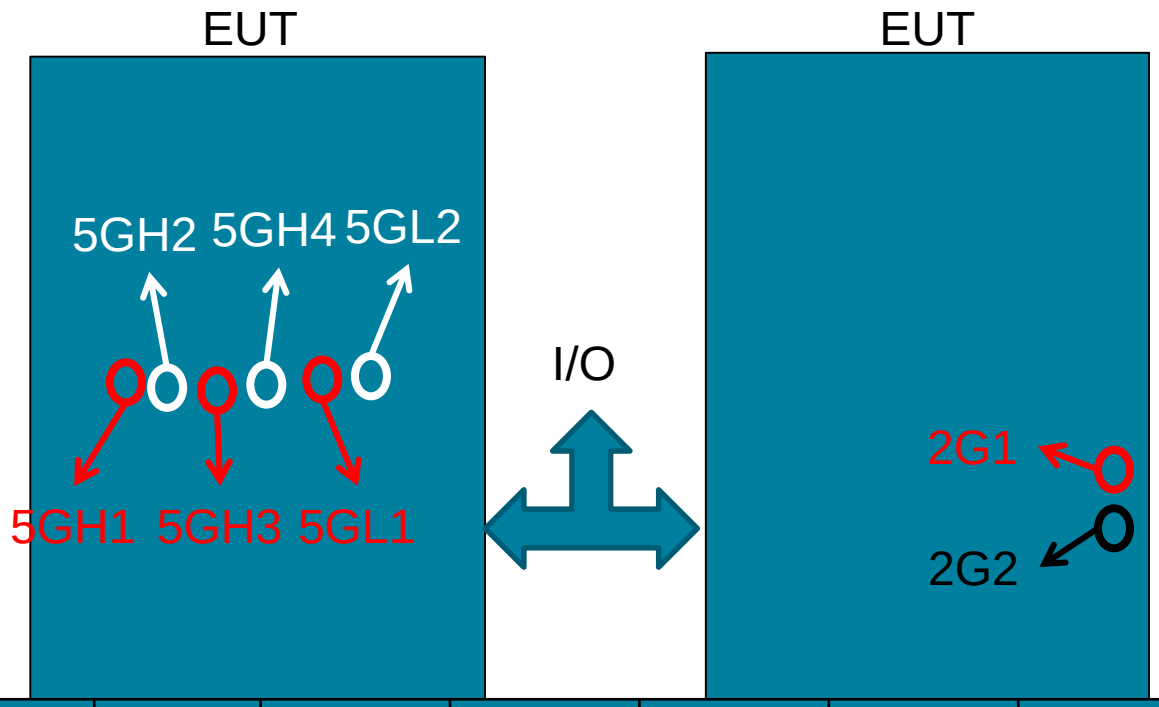
1. There are 63 set ANT probes in WNC’s SG64 Chamber.

Test Setup and Procedure

- Place the device at the center of the chamber.
- Connect the antenna cable to RF cable of the chamber
- Run Satimo test SW (**NPAC Spherical Measurement, v1.5.4 (GIT-E6965664))**
- Get 3D data in 2.8125 degree step from phi 0°~360°and theta -90°~ +90°, including efficiency, peak gain, 2D & 3D radiation pattern.
- This is far field test for XLE Wi-Fi antenna verification.
- This is passive measurement, which means the device is off and not in any operating mode.
- Please refer Exhibit Test Setup Photo (Antenna Spec)

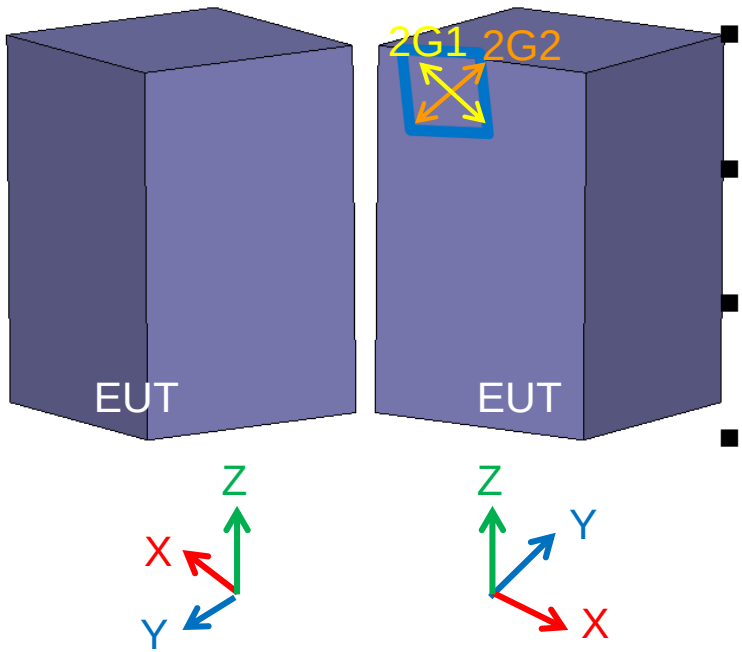
Summary

Frequency combination		Return Loss	Efficiency	Peak Gain (dBi)	Isolation (within radio)	Isolation (among radio)
2G ANT	2.4~2.5GHz	> 10dB	58%	< 4.0	> 18dB	***WiFi5GL to WiFi5GH:*** *>25dB @ 5.15-5.85GHz*
5GL ANT	5.15~5.35GHz	> 10dB	63%	< 4.7	> 28dB	
5GH ANT	5.47~5.85GHZ	> 10dB	64%	< 5.0	> 25dB	
BLE ANT	2.4~2.5GHz	>8dB	51%	<4.1	-	



Antenna	2G1	2G2	5GH1	5GH2	5GH3	5GH4	5GL1	5GL2	BLE
Peak Gain (dBi)	3.2	4.0	4.8	5.0	4.5	4.9	4.7	4.6	4.1
Chain	2G Ch.1	2G Ch.0	5GH Ch.3	5GH Ch.2	5GH Ch.1	5GH Ch.0	5GL Ch.1	5GL Ch.0	

Wi-Fi 2G

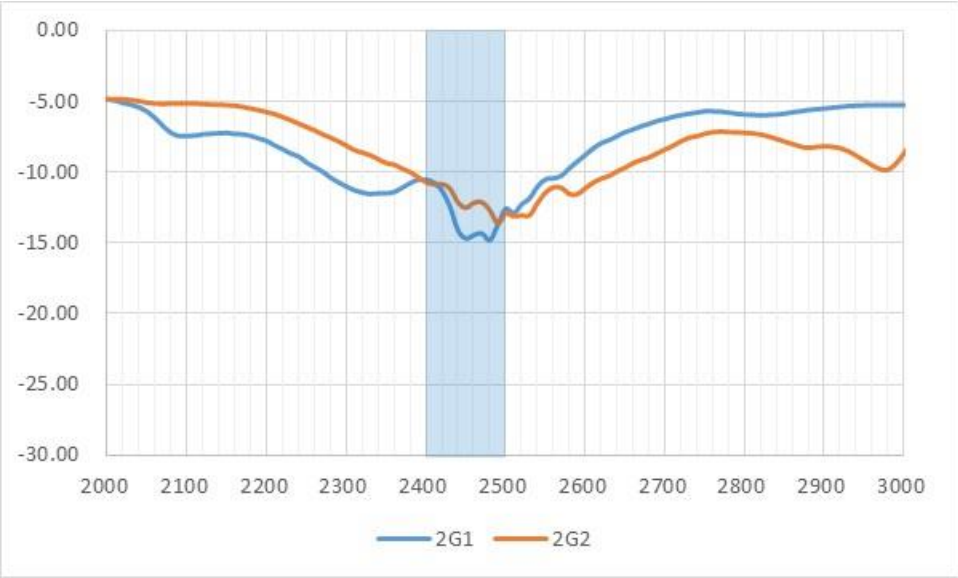


- **Return Loss**
  - above 10dB on 2.4GHz
- **Isolation**
  - above 18dB on 2.4GHz
- **Average Efficiency**
  - ~58% on 2.4GHz
- **Peak Gain**
  - 4.0dBi on 2.4GHz

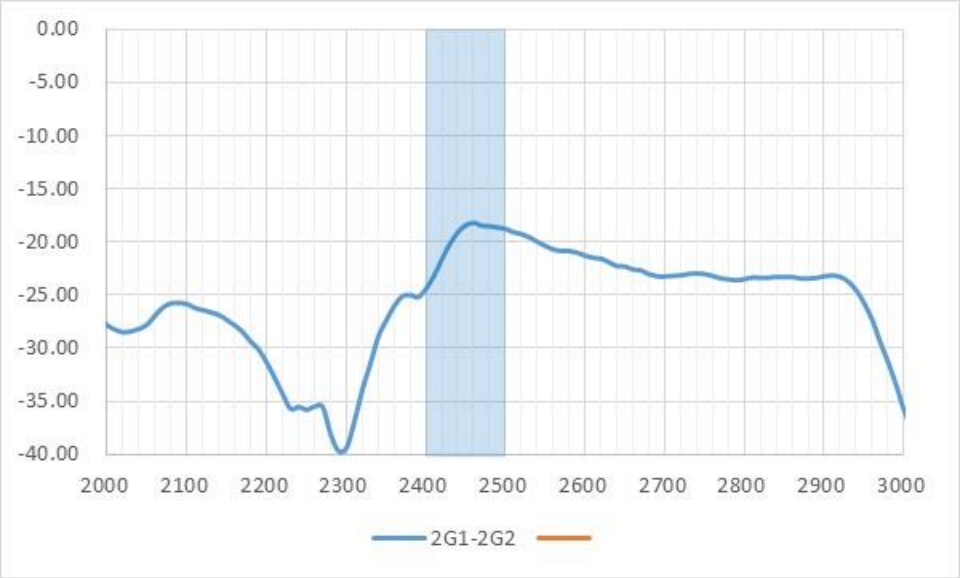
Note
The polarization of 2G1 ANT and 2G2 ANT is orthogonal to each other.

S Parameters for Wi-Fi 2G Antennas

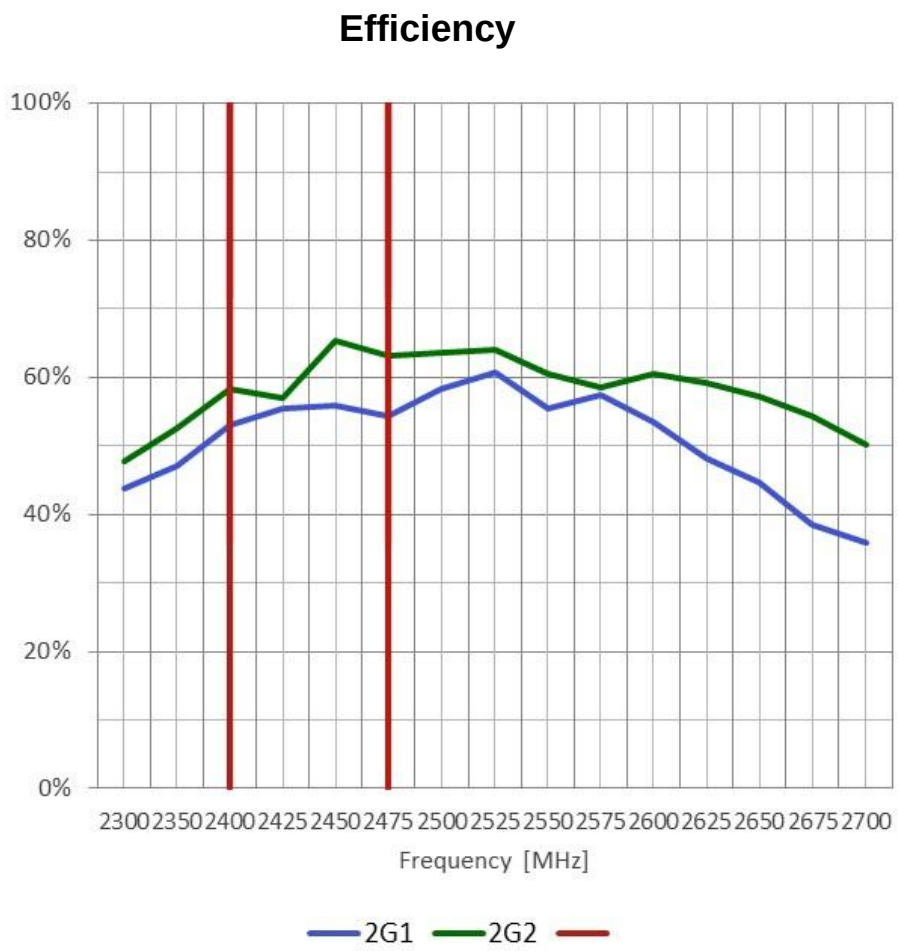
Return Loss

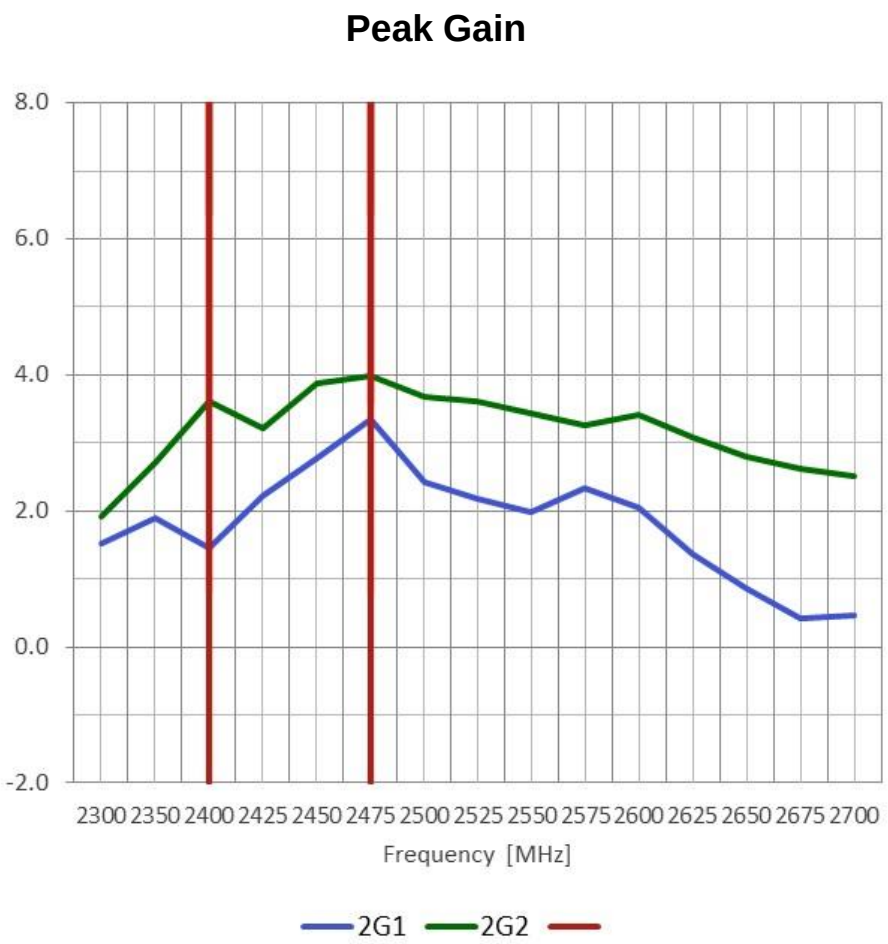


Isolation

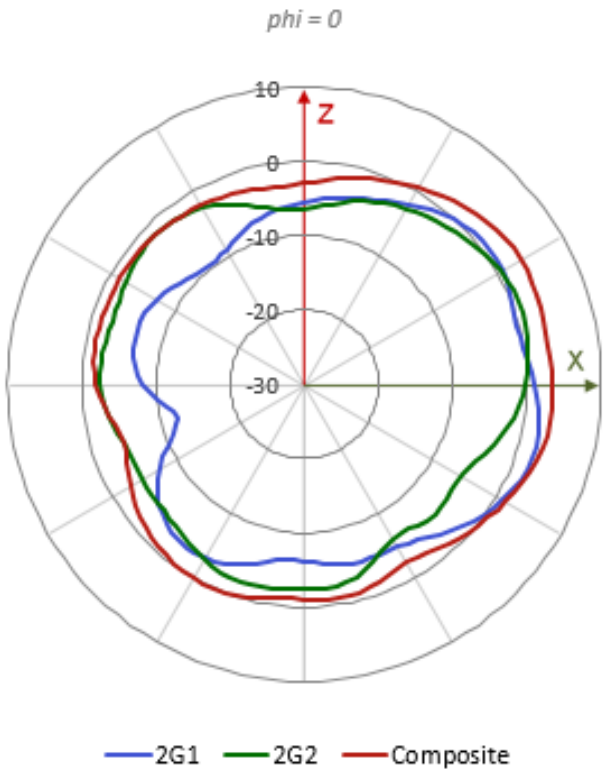


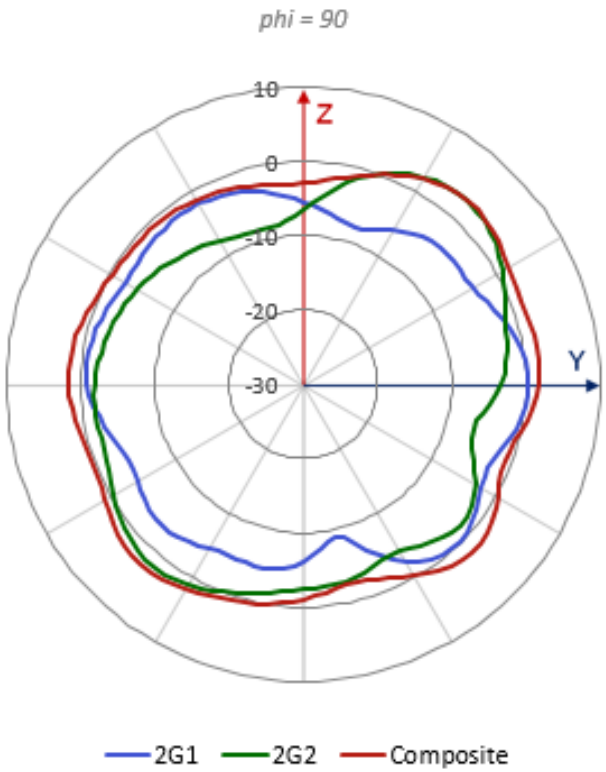
Efficiency and Peak Gain for Wi-Fi 2G Antennas

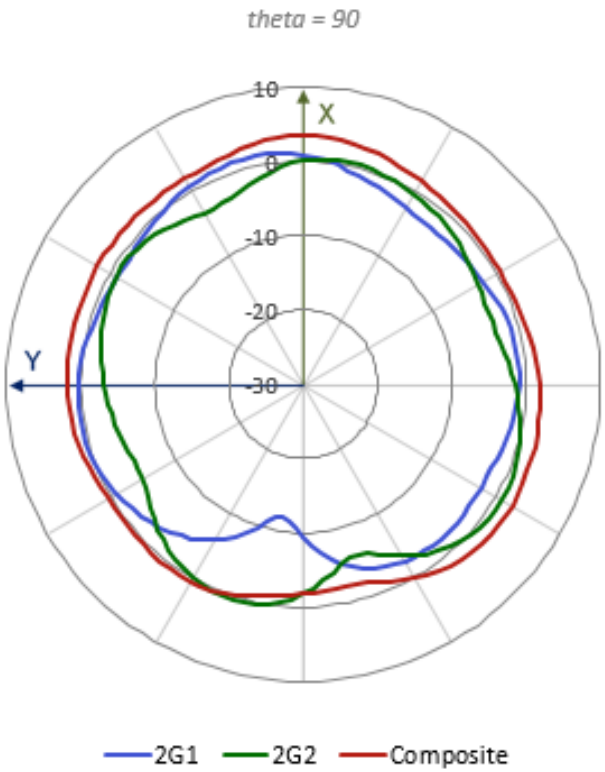




Radiation Pattern for Wi-Fi 2G Antennas

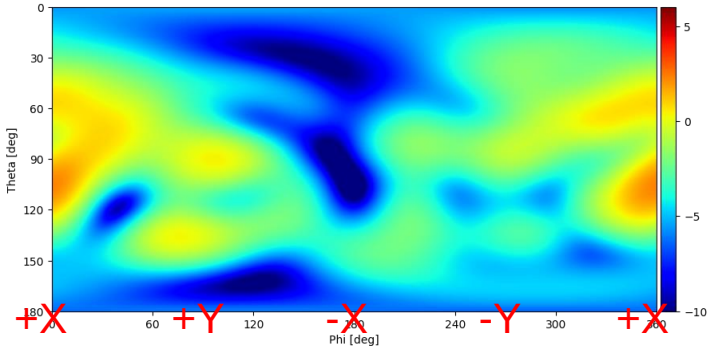




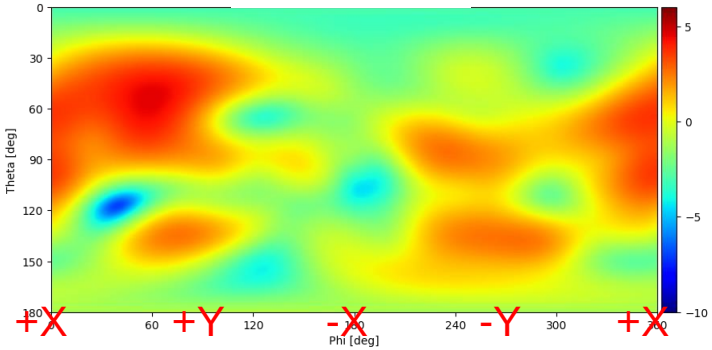


Heat Map for Wi-Fi 2G Antennas

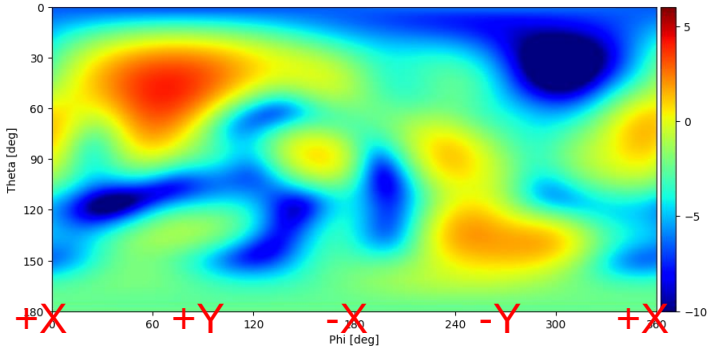
2G1



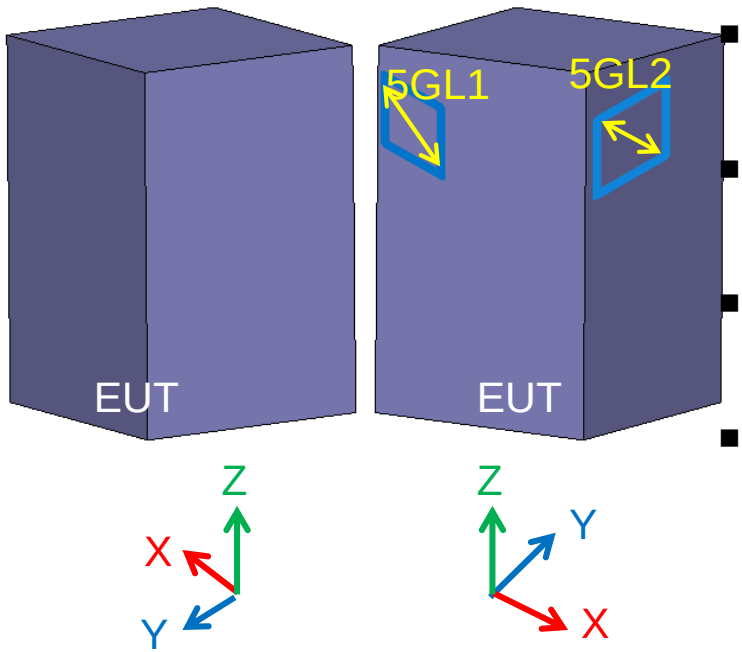
Composite



2G2



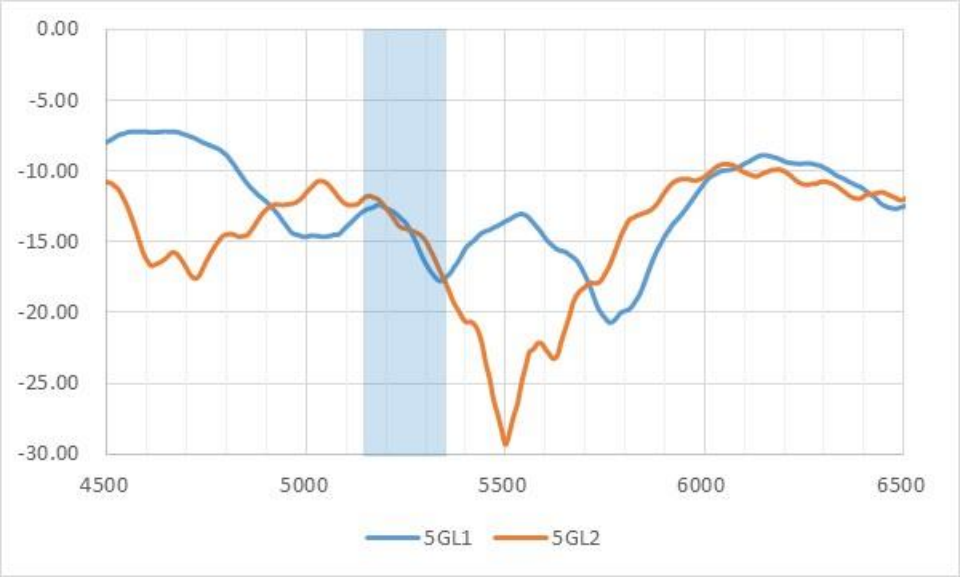
Wi-Fi 5GL



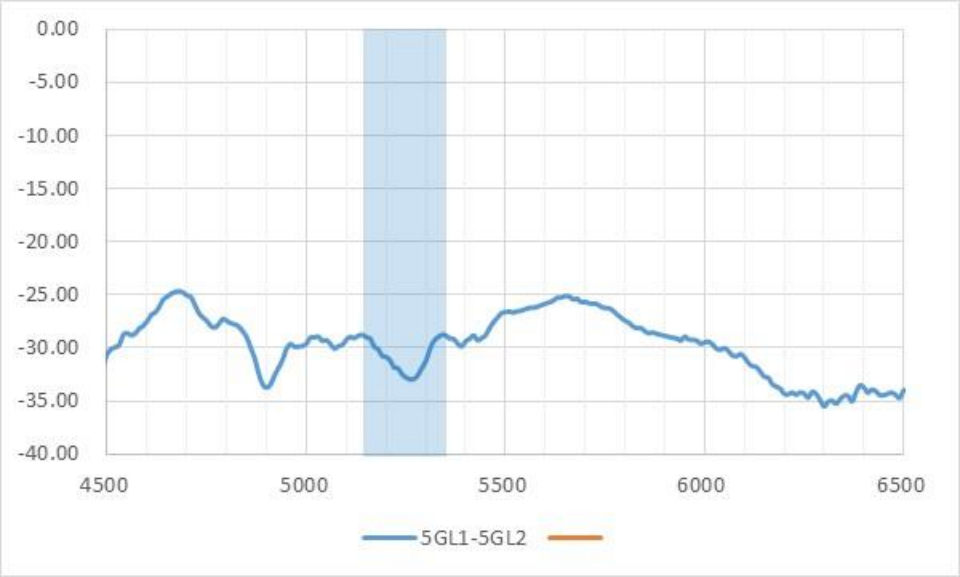
- **Return Loss**
  - above 10dB on 5GHz
- **Isolation**
  - above 28dB on 5GHz
- **Average Efficiency**
  - ~63% on 5GHz
- **Peak Gain**
  - 4.7dBi on 5GHz

S Parameters for Wi-Fi 5GL Antennas

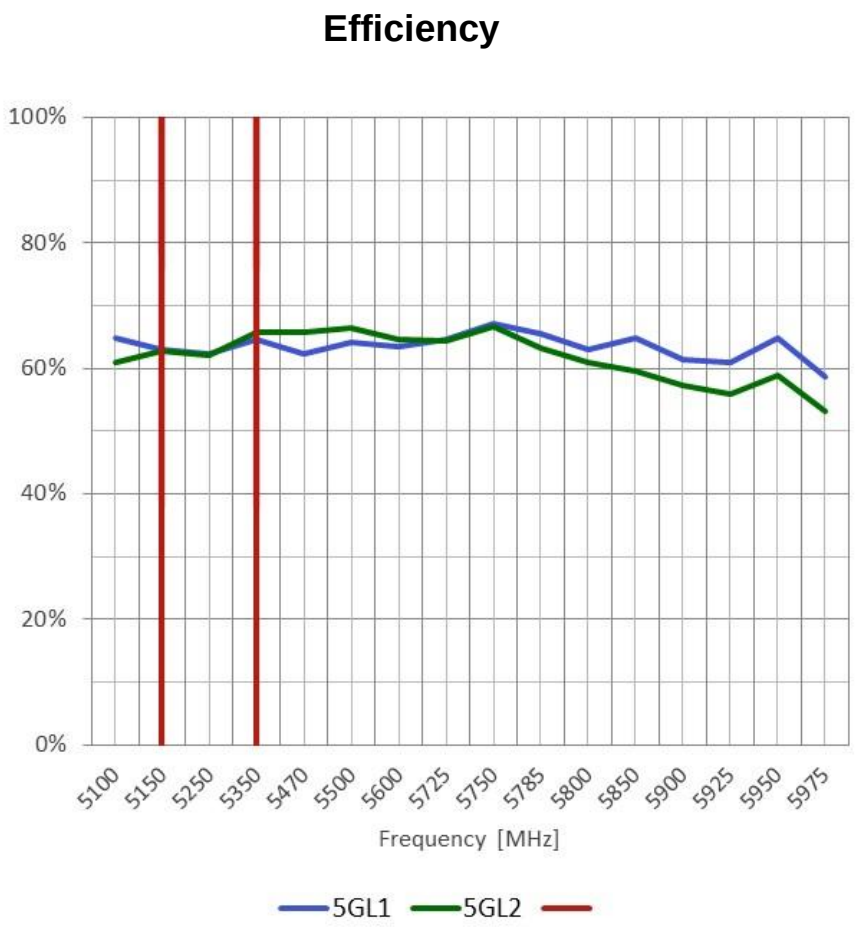
Return Loss

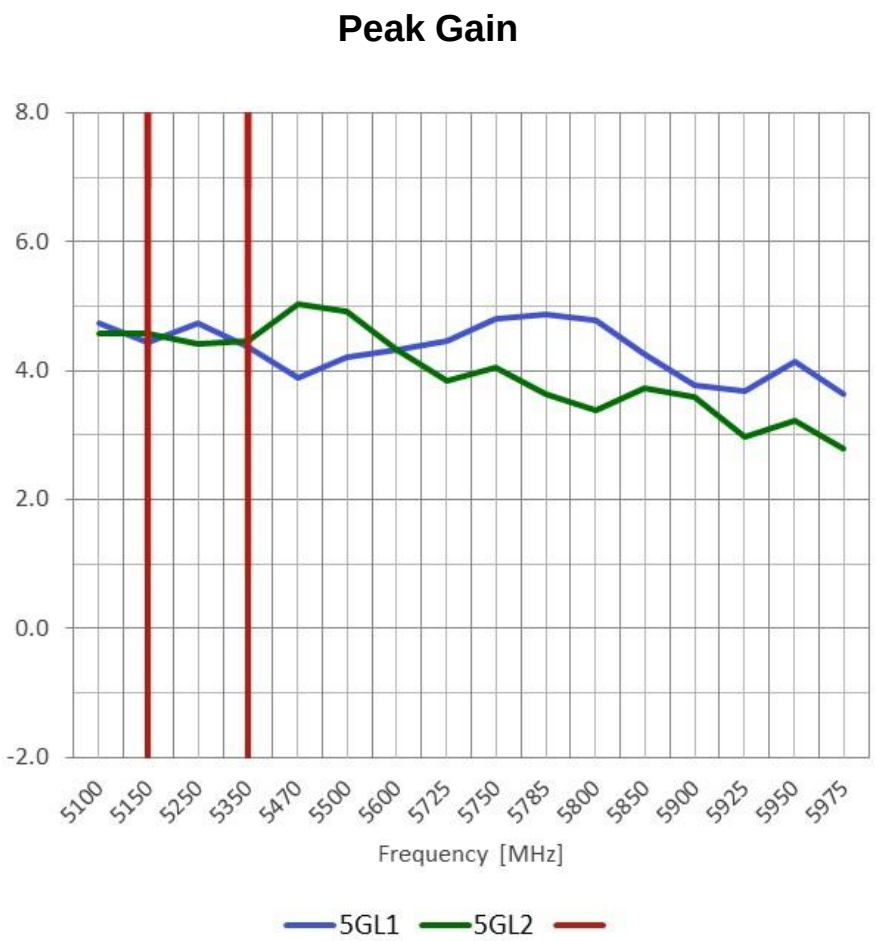


Isolation

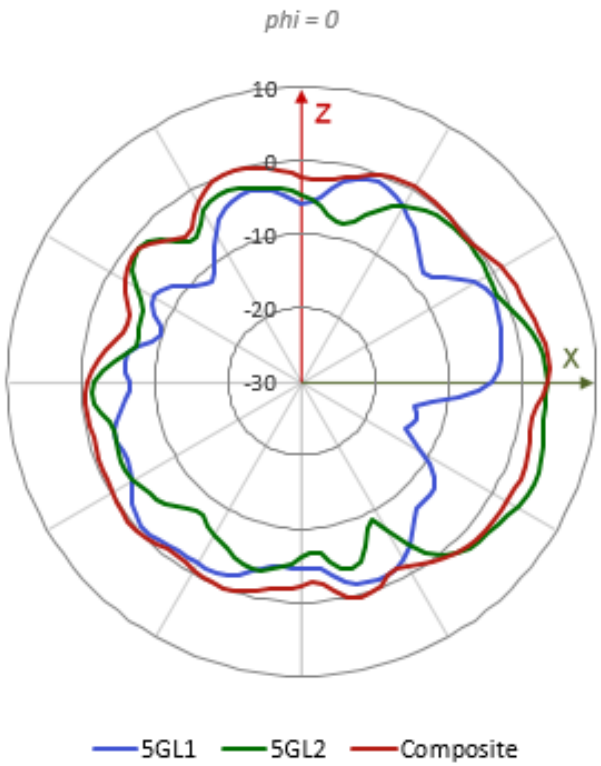


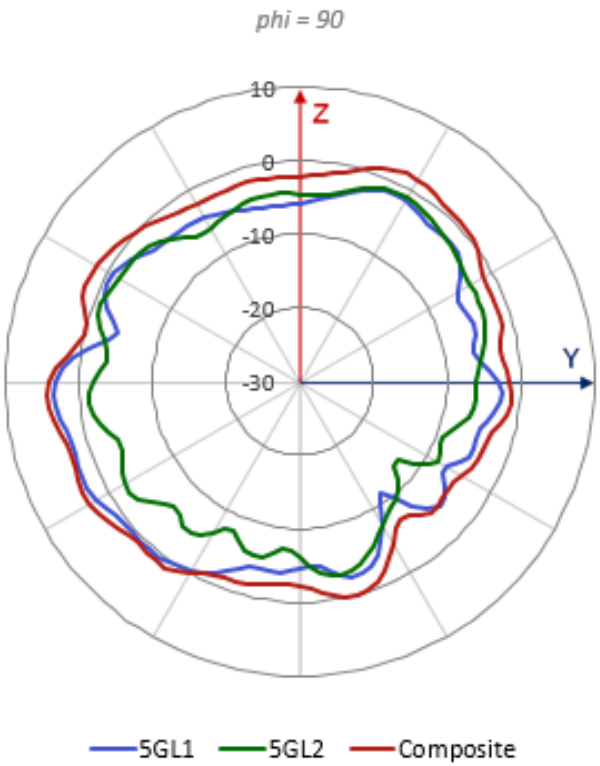
Efficiency and Peak Gain for Wi-Fi 5GL Antennas

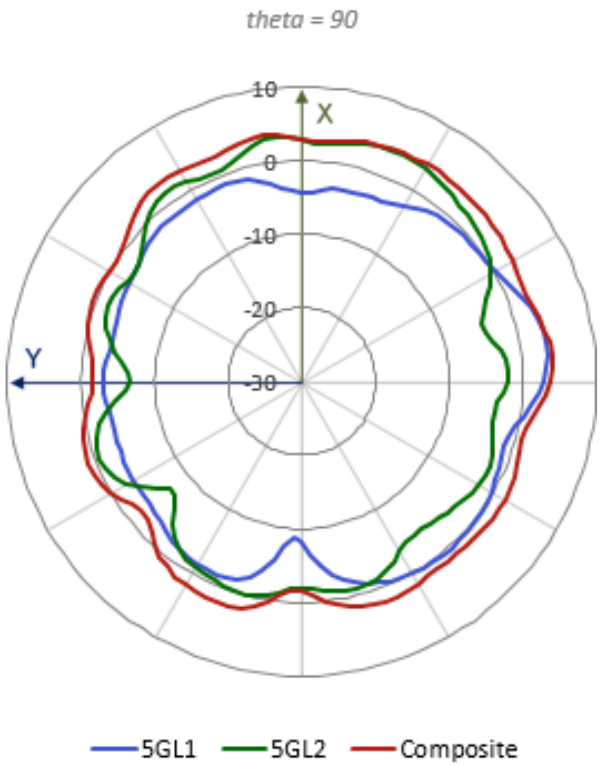




Radiation Pattern for Wi-Fi 5GL Antennas

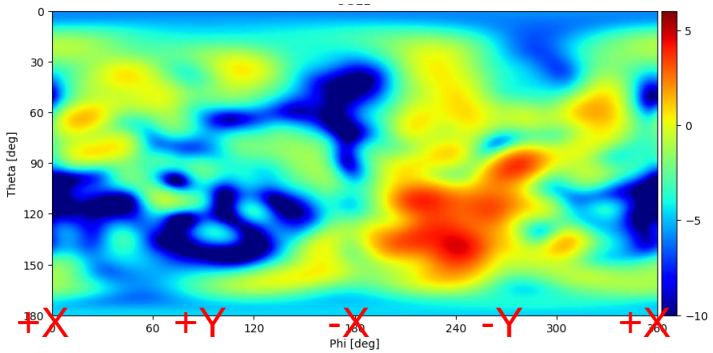




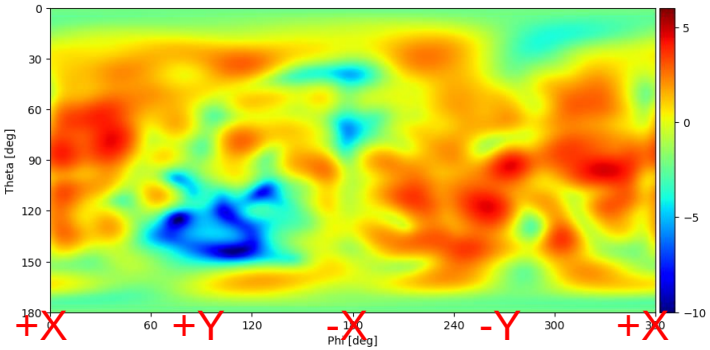


Heat Map for Wi-Fi 5GL Antennas

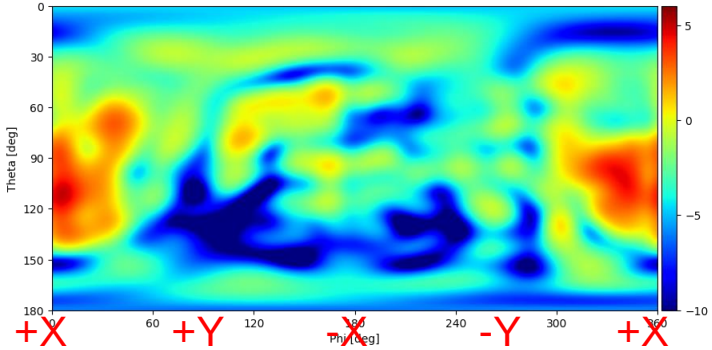
5G1



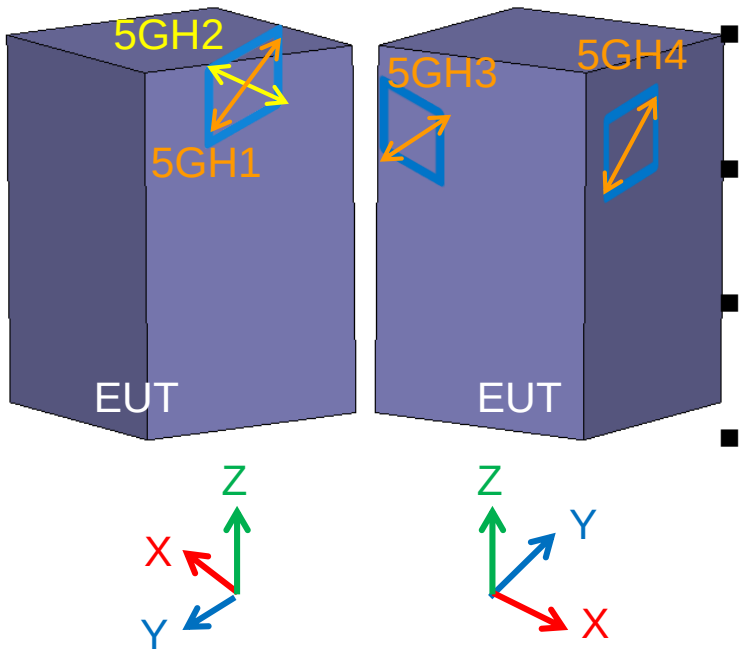
Composite



5G2



Wi-Fi 5GH



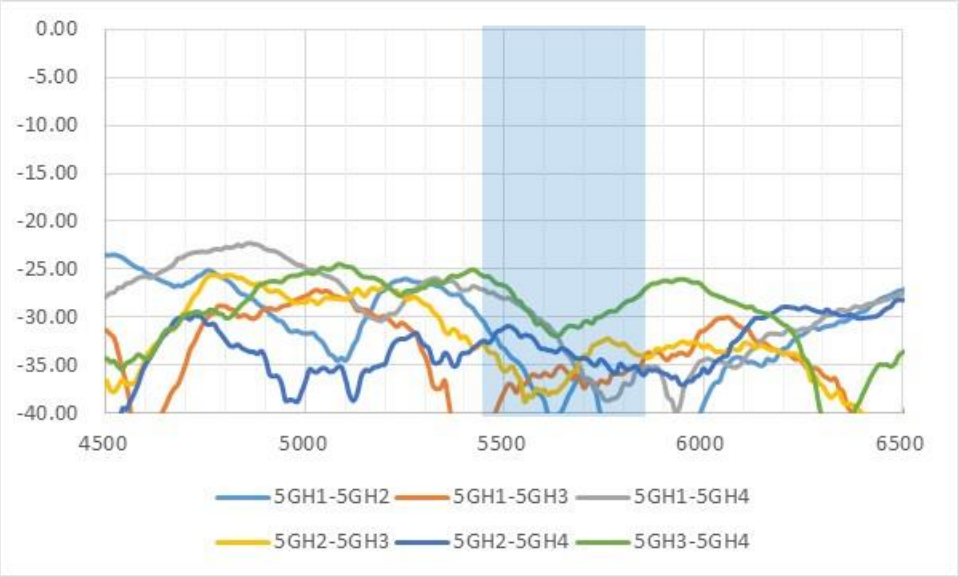
- **Return Loss**
  - above 10dB on 5GHz
- **Isolation**
  - above 25dB on 5GHz
- **Average Efficiency**
  - ~64% on 5GHz
- **Peak Gain**
  - 5.0dBi on 5GHz

Note
The polarization of 5GH1 ANT and 2GH2 ANT is orthogonal to each other.

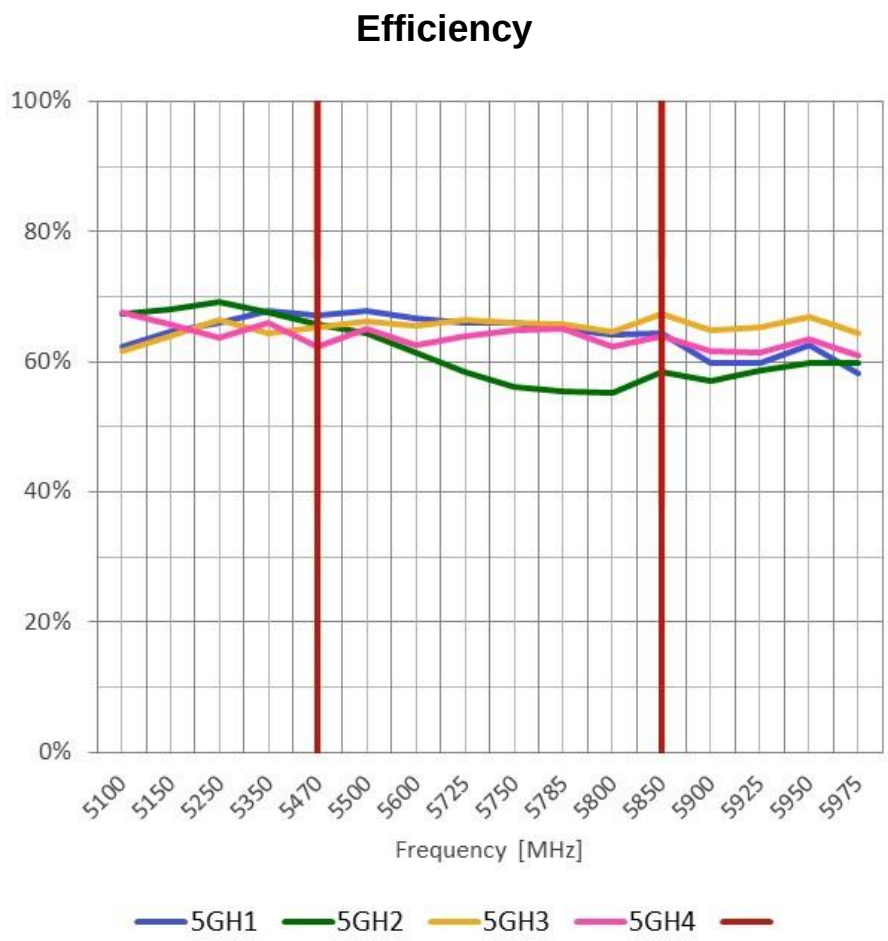
S Parameters for Wi-Fi 5GH Antennas

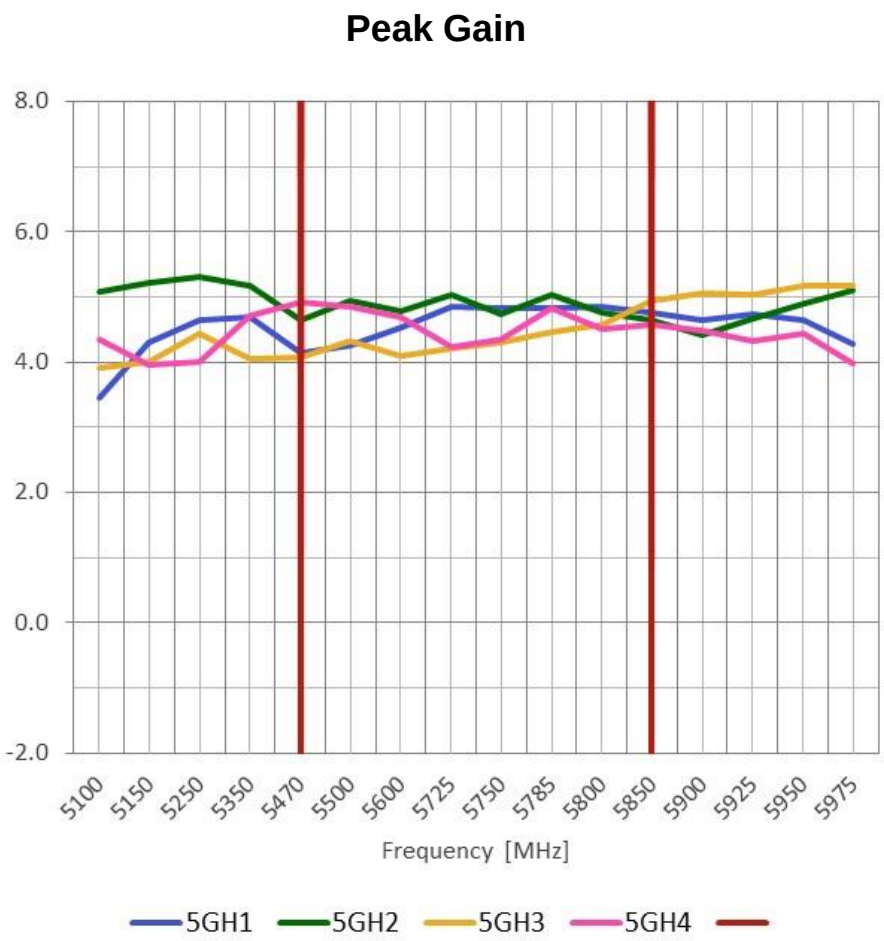
Return Loss

Isolation

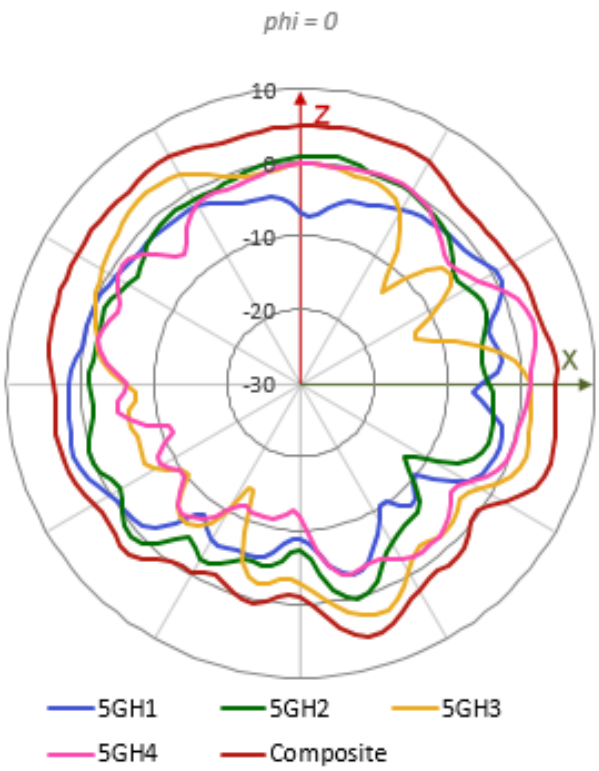


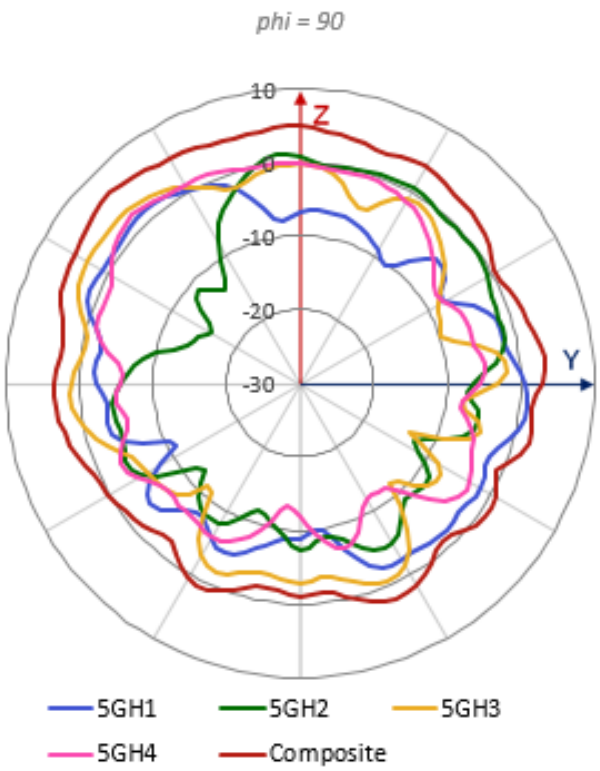
Efficiency and Peak Gain for Wi-Fi 5GH Antennas

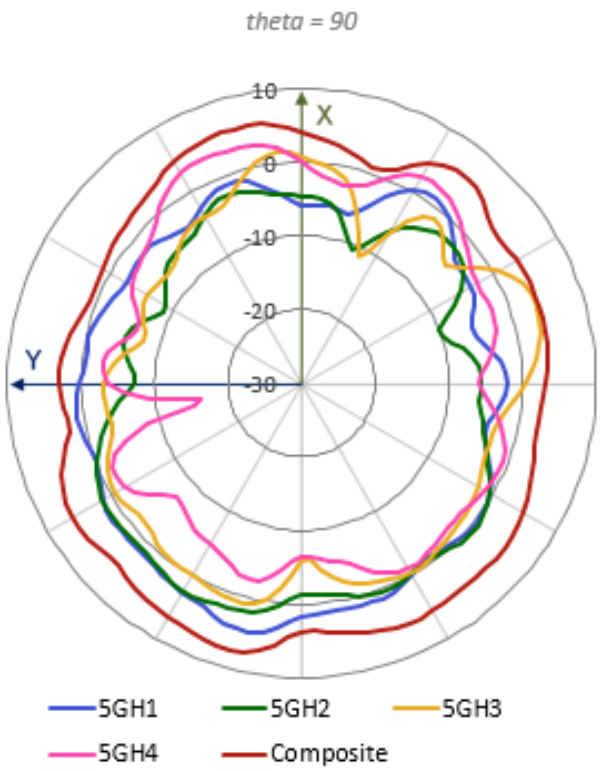




Radiation Pattern for Wi-Fi 5GH Antennas

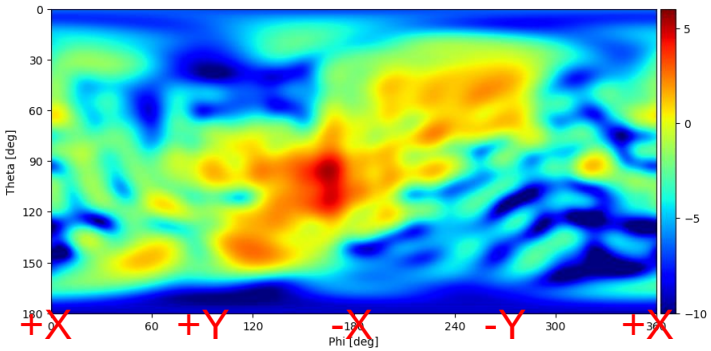




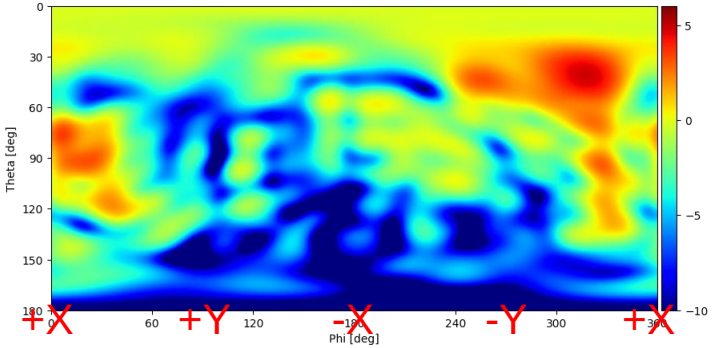


Heat Map for Wi-Fi 5GH Antennas

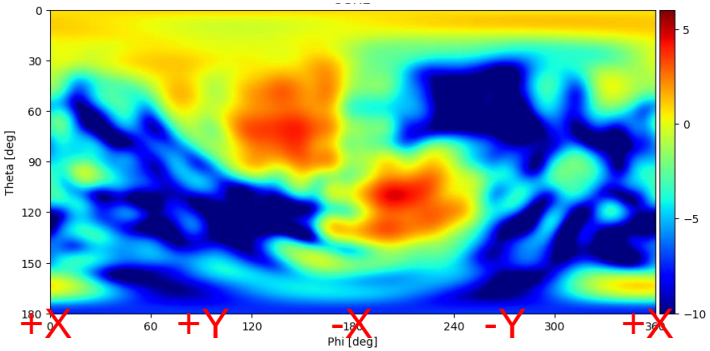
5GH1



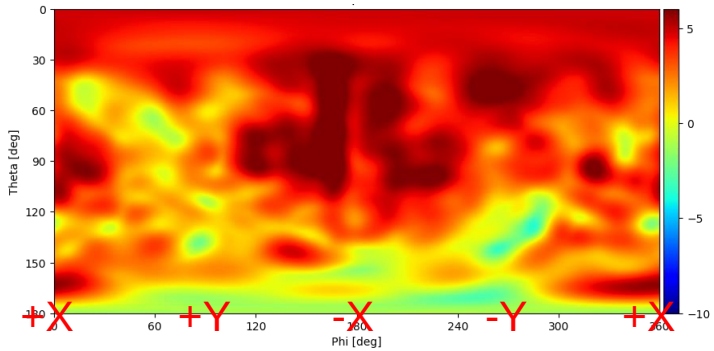
5GH4



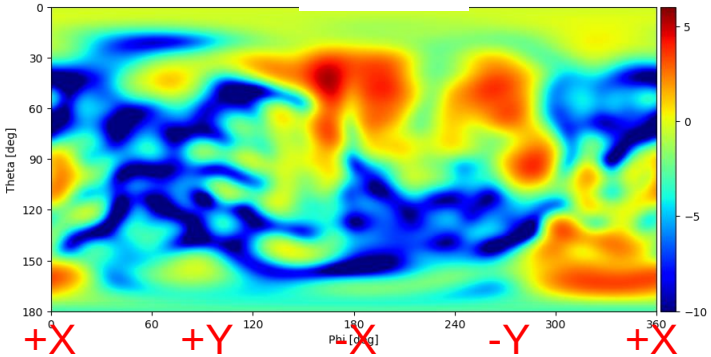
5GH2



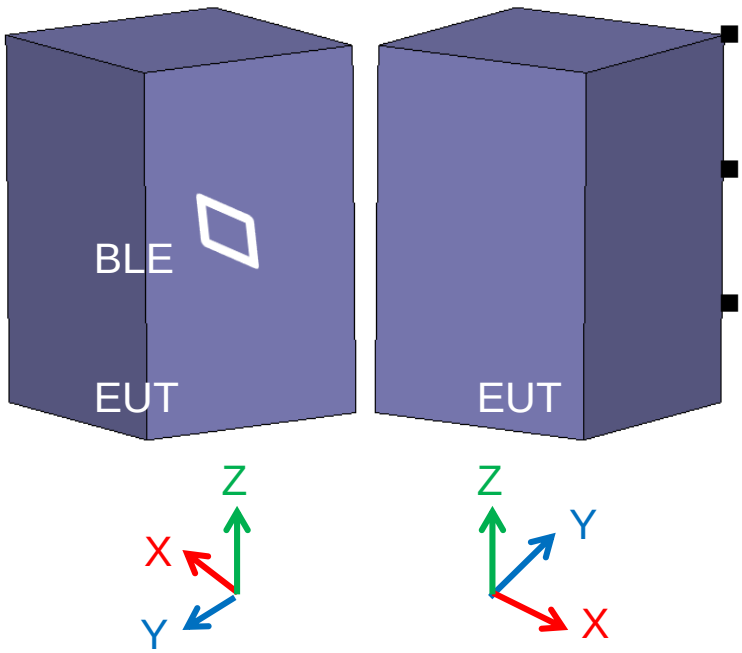
Composite



5GH3



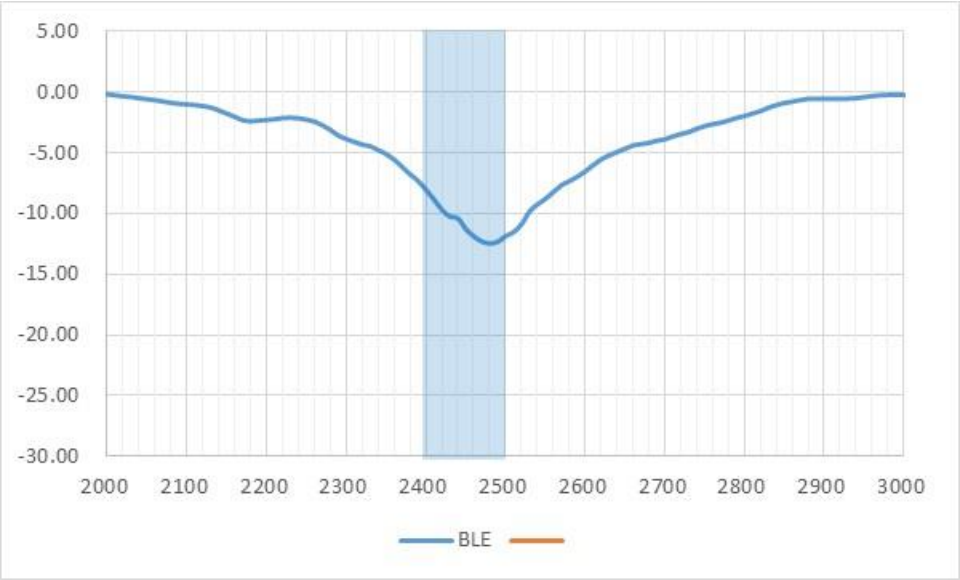
BLE ANT



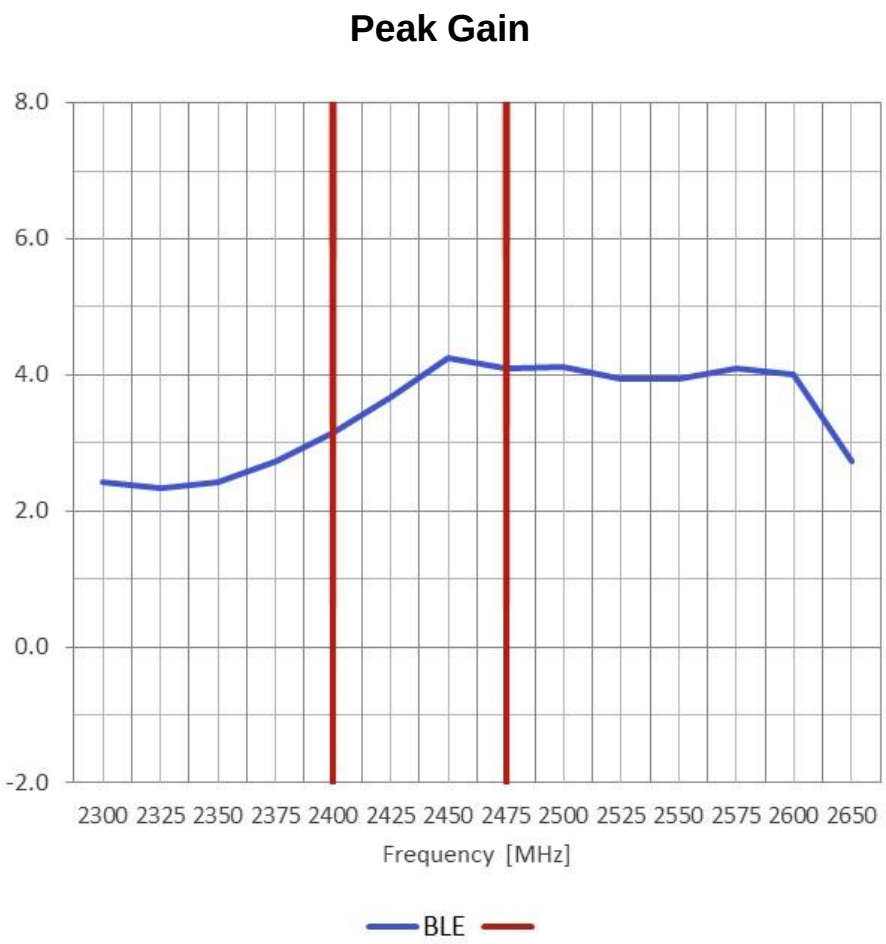
- **Return Loss**
  - above 8dB on 2.4GHz
- **Average Efficiency**
  - ~51% on 2.4GHz
- **Peak Gain**
  - 4.1dBi on 2.4GHz

S Parameters for BLE Antenna

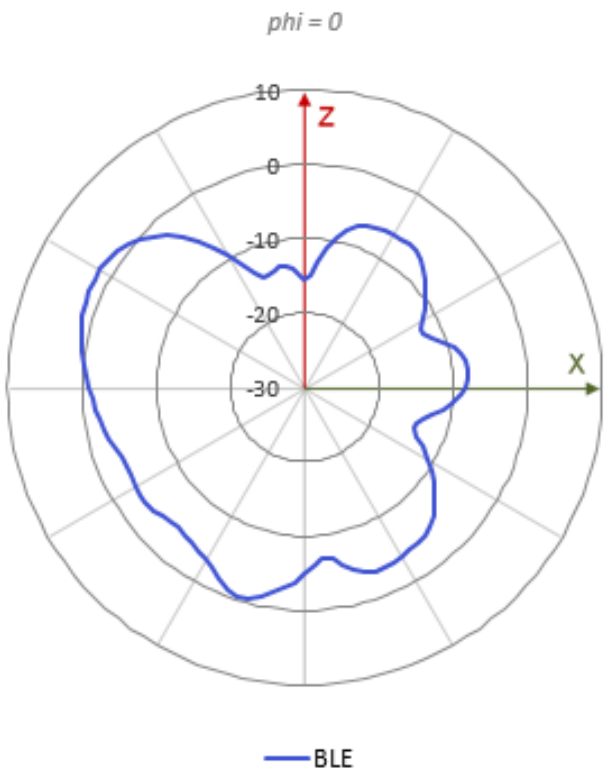
Return Loss

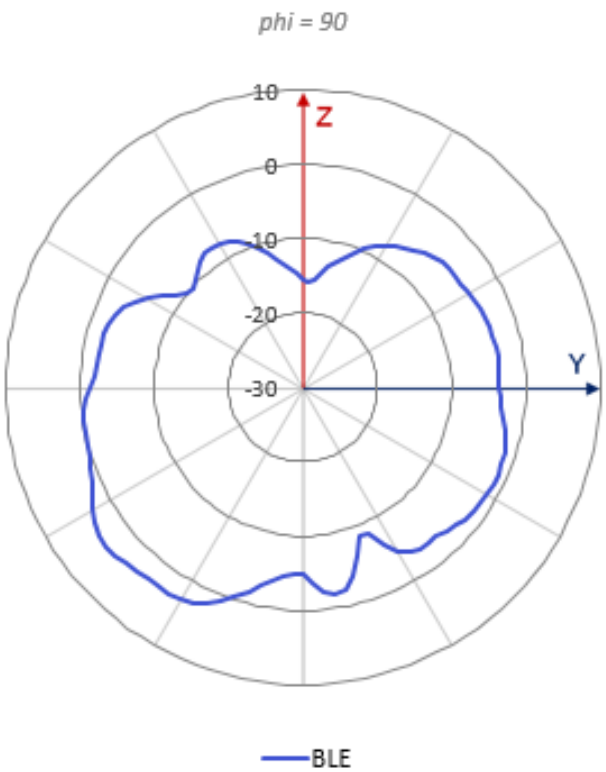


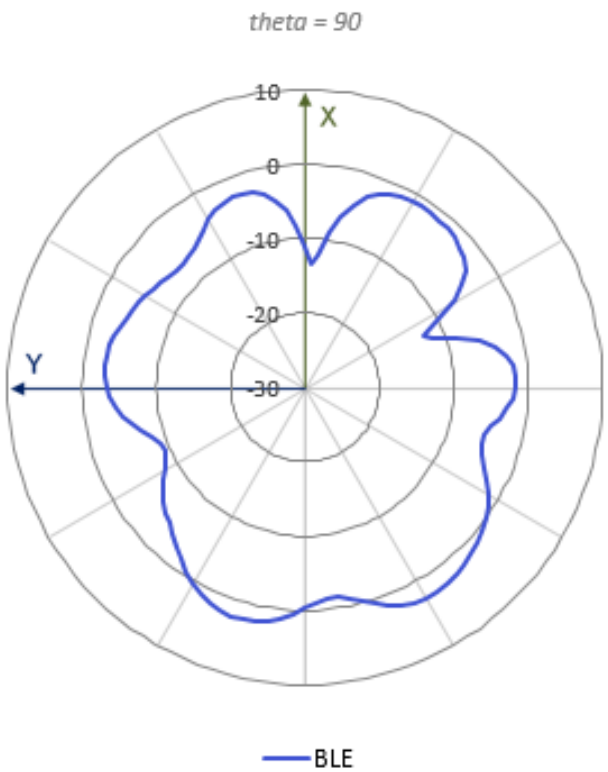
Efficiency and Peak Gain for BLE Antenna



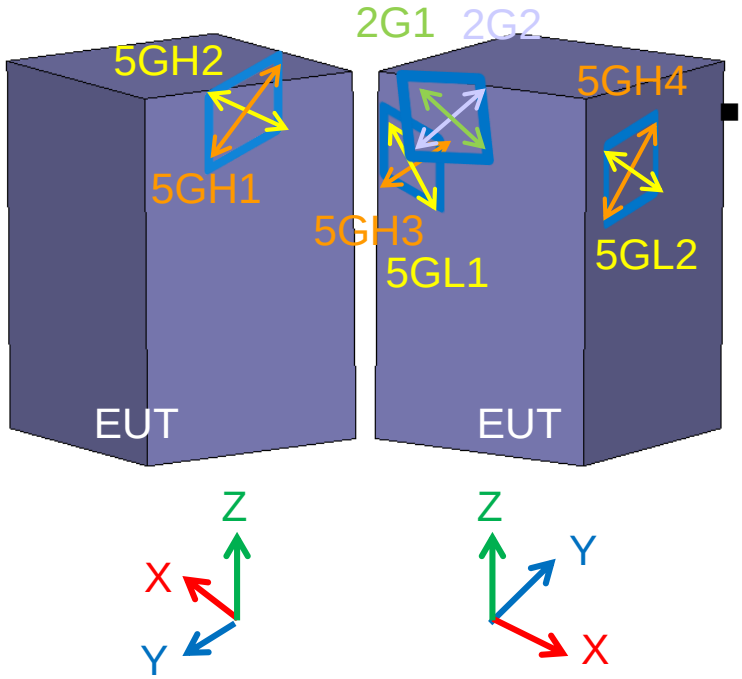
Radiation Pattern for BLE Antenna





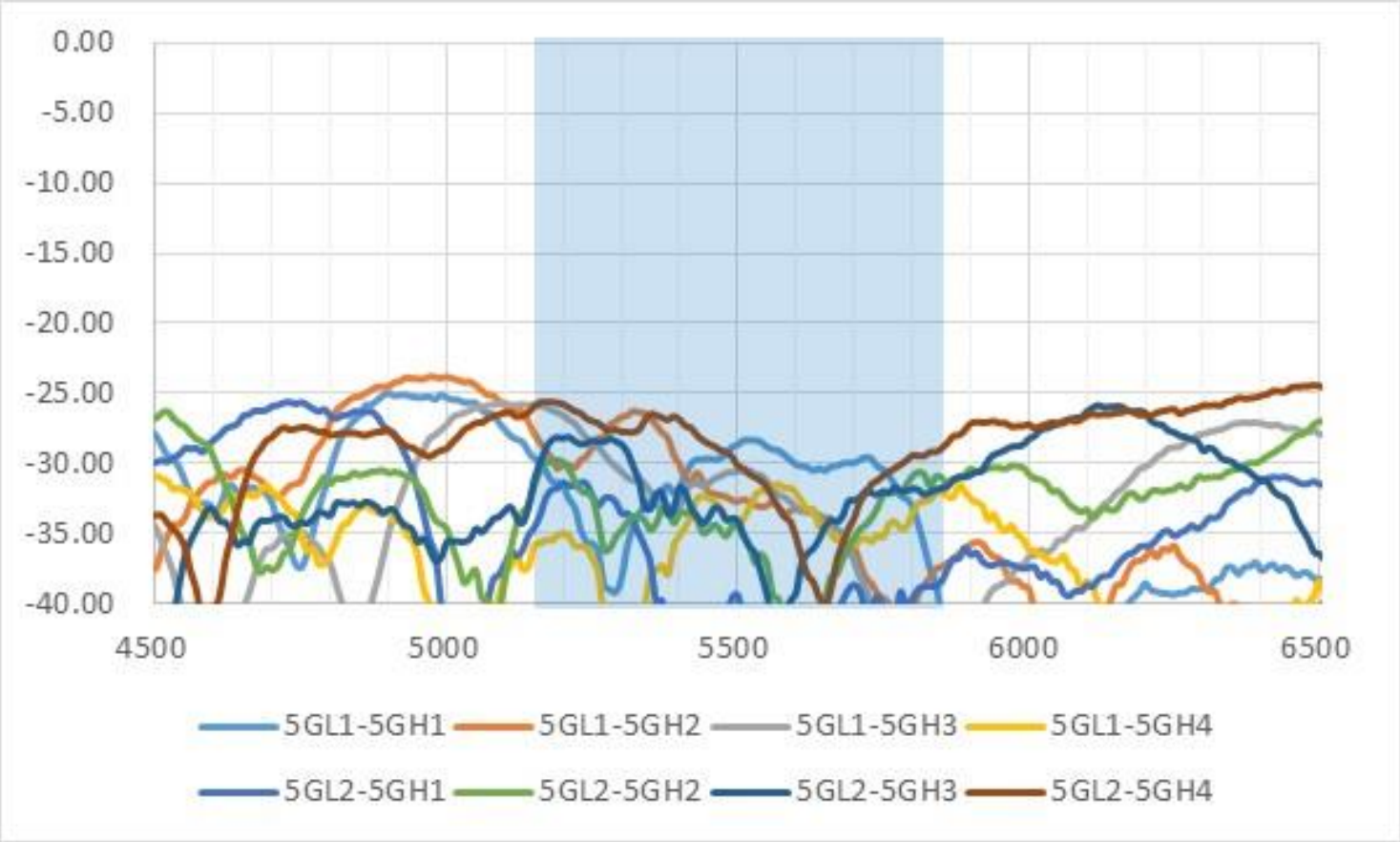


Isolation among Radios



- **Wi-Fi 5GL to Wi-Fi 5GH**
  - above 25dB on 5GHz

Isolation among Wi-Fi 5GL and Wi-Fi 5GH



WNC

Wistron NeWeb Corp.