

LYNwave Technology

Antenna & Thermal solution provider

Antenna Test Report

Product Name : AXE5400 Tri-Band WiFi 6E Mesh System

Model: WSQ65

Brand: ZYXEL

Product Name : WiFi Mesh System

Model: WSQ63

Brand: ZYXEL

Product Name : Security Router

Model: SCR 50AXE

Brand: ZYXEL

| Date | Owner | Revision |
|------------|--------------|--|
| 2022/01/24 | Alex Huang | 1. Report for CST simulation |
| 2022/02/25 | Michael Chen | 1. Report for CST simulation |
| 2022/03/09 | Michael Chen | 1. Report for CST simulation |
| 2022/03/24 | Michael Chen | 1. Report for CST simulation |
| 2022/04/11 | Jamie Su | 1. Report for antenna S-parameter and 3D passive measurement |
| 2022/05/11 | Alon Cai | 1. Report for antenna S-parameter and 3D passive measurement 2. Change cable length |
| 2022/05/13 | Alon Cai | 1. Add Combine Pattern |
| 2022/08/02 | Jamie Su | 1. Report for antenna S-parameter and 3D passive measurement |
| 2022/08/09 | Jamie Su | 1. Project name correction |
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Client Request

- Return loss
 - All antennas < -10dB in operating band
- Gain :No limit
- Efficiency : More than 50%
- Isolation
 - Common module> 18dB
 - Cross Isolation > 25dB

Antenna Placement

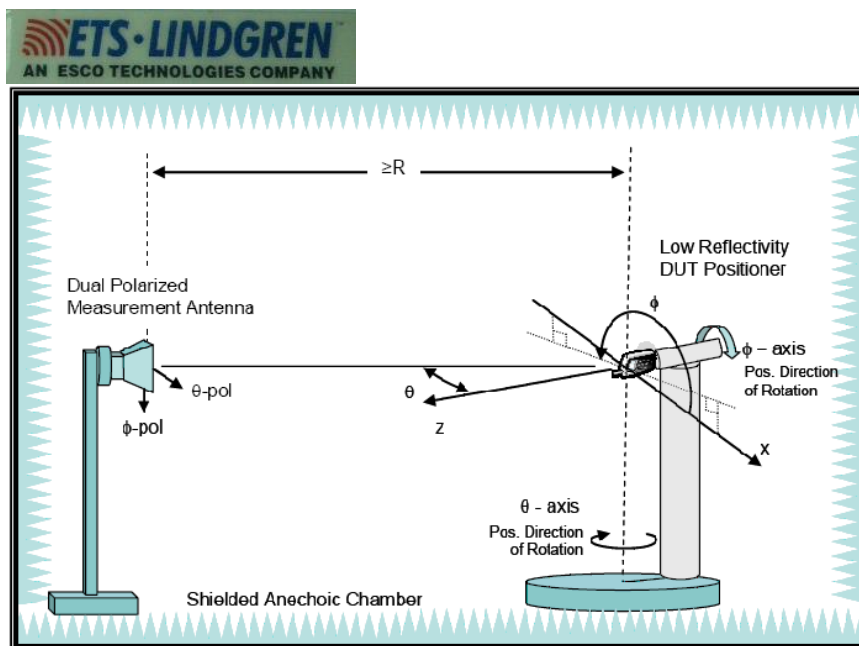
| Ant. | Model | Brand | Frequenc y (MHz) | Cable Length with IPEX (mm) | Antenna Size (mm) | Cable Type | Connector |
|--------|------------------|---------|--------------------------|-----------------------------------|----------------------|-------------------|--------------------|
| ANT. 1 | ALX22P-221AA4-00 | LYNwave | 2400-2500 / 5150-5825 | 201 | 28x8.9x0.6 | φ1.37 Low loss | MHF1 compatible |
| ANT. 2 | ALX22P-221AA4-01 | LYNwave | | 216 | 28x8.9x0.6 | | |
| ANT. 3 | ALX22P-161AA1-00 | LYNwave | 5925-7125 | 48 | 18x15.4x0.6 | | |
| ANT. 4 | ALX22P-161AA2-00 | LYNwave | | 115 | 18x10.4x0.6 | | |

Note.

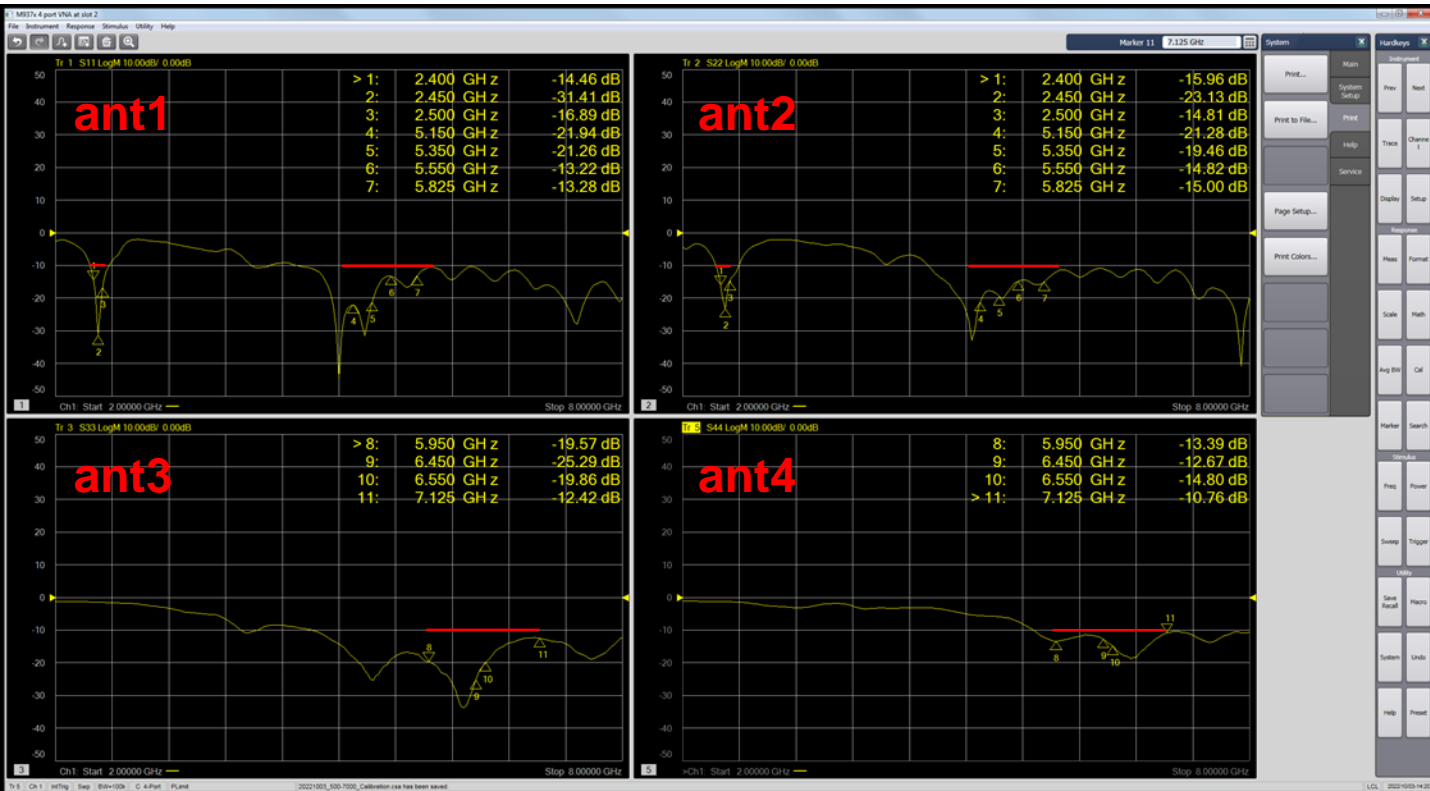
ANT. 1 / ANT. 2: cross-polarized

ANT. 3 / ANT. 4: cross-polarized

Equipment : ETS Chamber



S-Parameter



Isolation



Gain Table

| Ant.1 | | | | | | | |
|-----------------|------|------|------|------|------|------|------|
| Frequency (MHz) | 2400 | 2450 | 2500 | 5150 | 5350 | 5550 | 5825 |
| Efficiency(%) | 64 | 64 | 61 | 60 | 63 | 63 | 63 |
| Peak Gain(dBi) | 1.8 | 2.0 | 1.5 | 2.3 | 2.9 | 2.6 | 2.0 |
| Directivity(dB) | 3.7 | 3.9 | 3.6 | 4.5 | 5.0 | 4.6 | 4.0 |
| Ant.2 | | | | | | | |
| Frequency (MHz) | 2400 | 2450 | 2500 | 5150 | 5350 | 5550 | 5825 |
| Efficiency(%) | 60 | 63 | 62 | 60 | 61 | 63 | 62 |
| Peak Gain(dBi) | 1.5 | 2.0 | 1.8 | 2.8 | 3.2 | 2.9 | 2.5 |
| Directivity(dB) | 3.7 | 4.0 | 3.9 | 5.0 | 5.3 | 4.9 | 4.6 |
| Ant.3 | | | | | | | |
| Frequency (MHz) | | | | 5950 | 6450 | 6550 | 7125 |
| Efficiency(%) | | | | 63 | 60 | 62 | 63 |
| Peak Gain(dBi) | | | | 3.0 | 4.7 | 3.5 | 3.2 |
| Directivity(dB) | | | | 5.0 | 5.7 | 5.6 | 5.2 |
| Ant.4 | | | | | | | |
| Frequency (MHz) | | | | 5950 | 6450 | 6550 | 7125 |
| Efficiency(%) | | | | 63 | 67 | 63 | 60 |
| Peak Gain(dBi) | | | | 3.5 | 3.3 | 3.4 | 3.0 |
| Directivity(dB) | | | | 5.5 | 5.0 | 5.4 | 5.2 |

The antenna characteristics

- Return loss
 - All antennas < -10dB in operating band
- Gain
 - WiFi Dualband 1.5 ~ 3.2dBi
 - WiFi 6E Band 3.0 ~ 4.7dBi
- Efficiency
 - Ant.1 – Ant.4 > 60 %
- Isolation
 - WiFi Dualband > 18dB
 - WiFi 6E > 18dB
 - Cross Isolation > 25dB

Ant.1_2.4GHz 2D.3D Radiation Pattern

Frequency(MHz) : 2D. 2400~2500

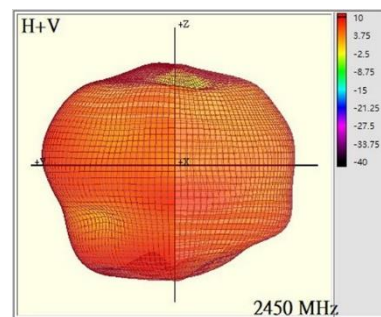
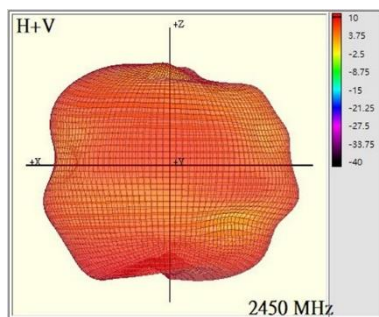
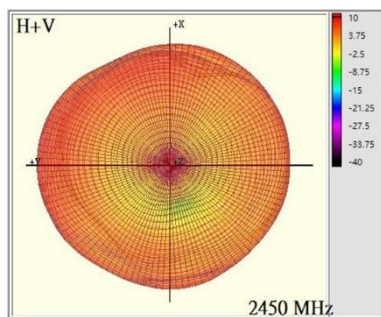
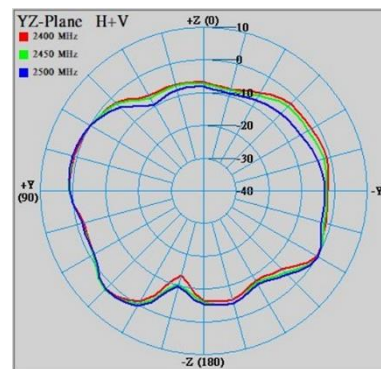
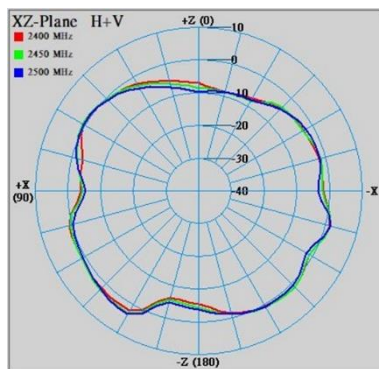
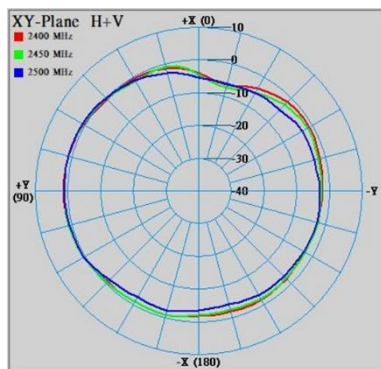
3D. 2450

Radiation Pattern :

Azimuth Plane

Elevation Plane
phi = 0

Elevation Plane
phi = 90



Ant.1_5GHz 2D.3D Radiation Pattern

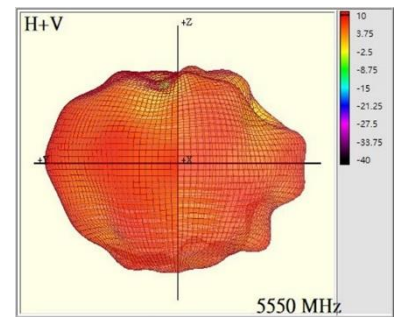
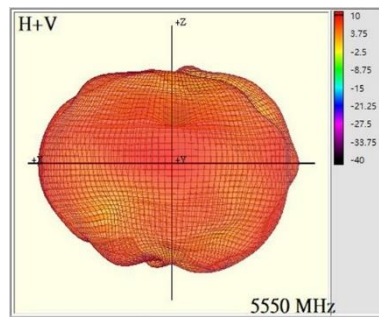
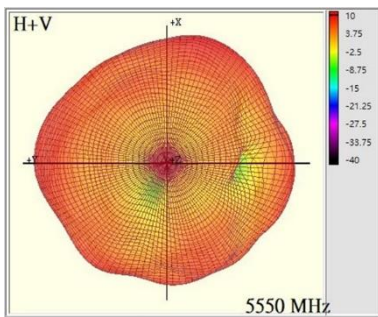
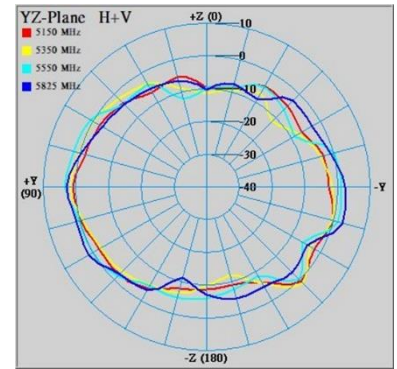
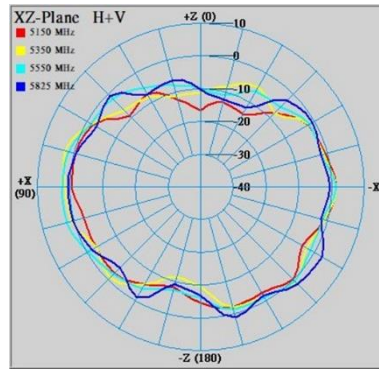
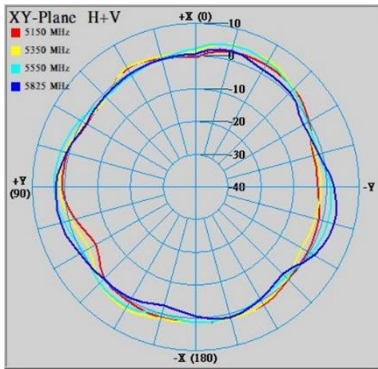
Frequency(MHz) : 2D. 5180~5825
3D. 5550

Radiation Pattern :

Azimuth Plane

Elevation Plane
phi = 0

Elevation Plane
phi = 90

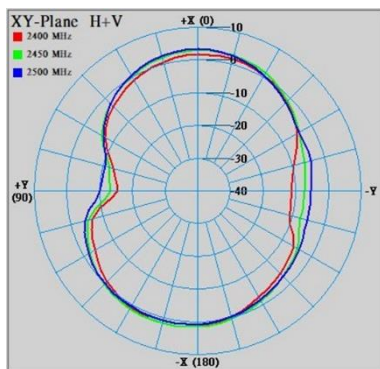


Ant.2_2.4GHz 2D.3D Radiation Pattern

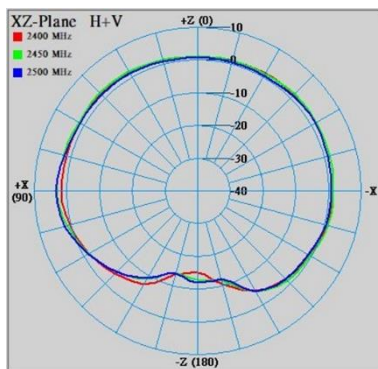
Frequency(MHz) : 2D. 2400~2500
3D. 2450

Radiation Pattern :

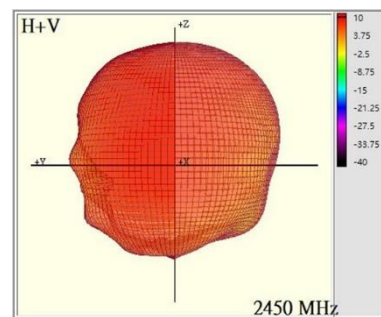
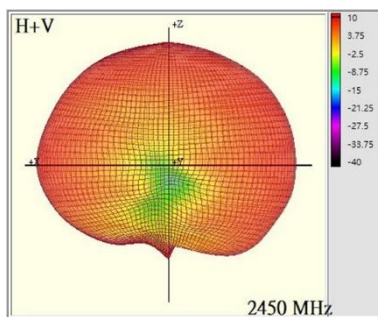
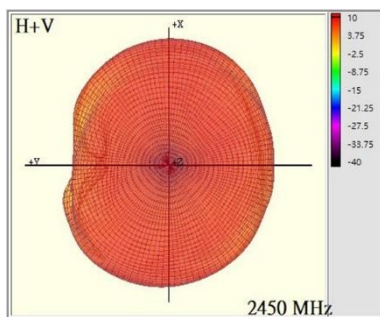
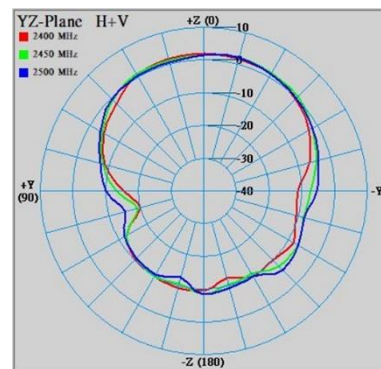
Azimuth Plane



Elevation Plane
phi = 0



Elevation Plane
phi = 90



Ant.2_5GHz 2D.3D Radiation Pattern

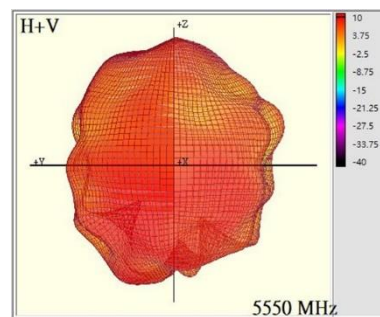
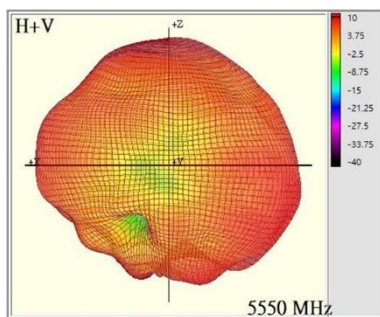
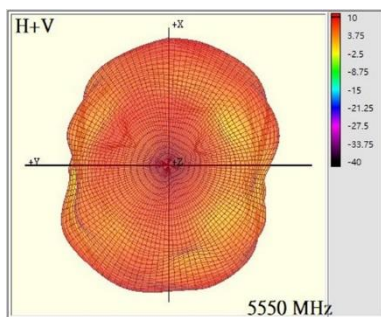
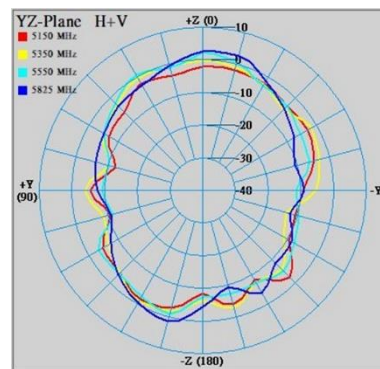
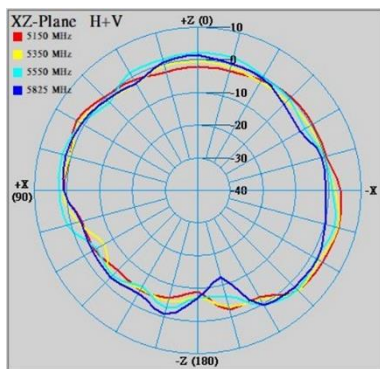
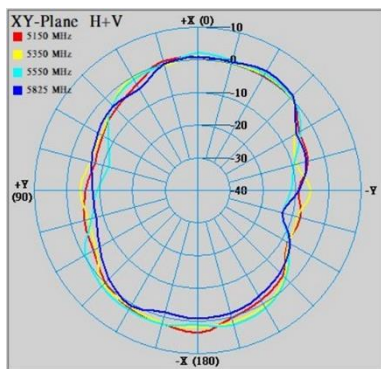
Frequency(MHz) : 2D. 5180~5825
3D. 5550

Radiation Pattern :

Azimuth Plane

Elevation Plane
phi = 0

Elevation Plane
phi = 90



Ant.3_6E 2D.3D Radiation Pattern

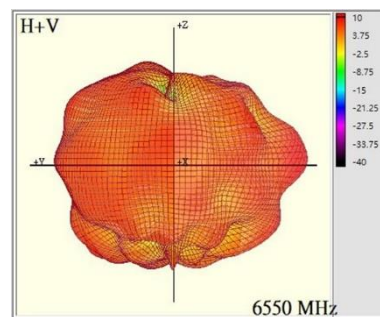
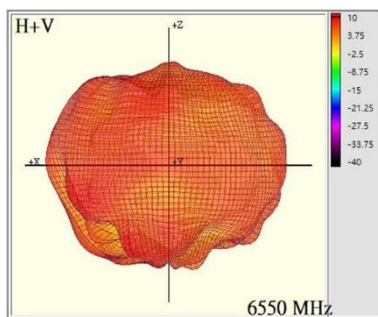
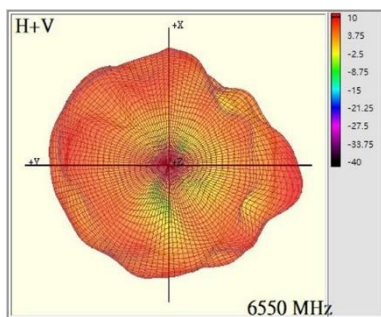
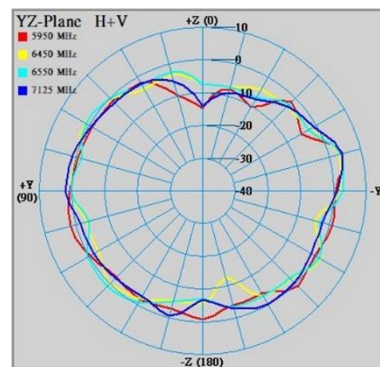
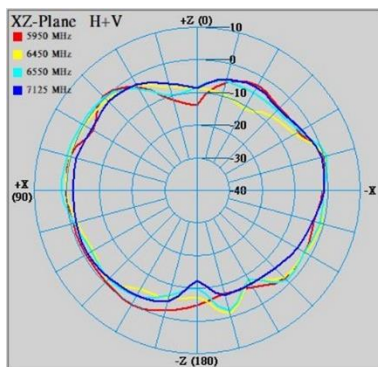
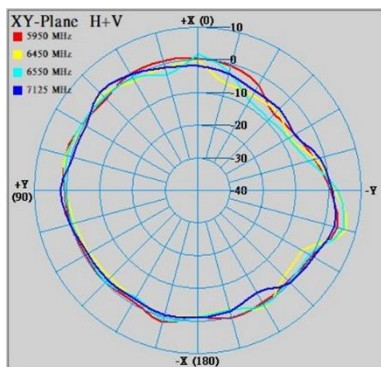
Frequency(MHz) : 2D. 5950~7125
3D. 6550

Radiation Pattern :

Azimuth Plane

Elevation Plane
phi = 0

Elevation Plane
phi = 90



Ant.4_6E 2D.3D Radiation Pattern

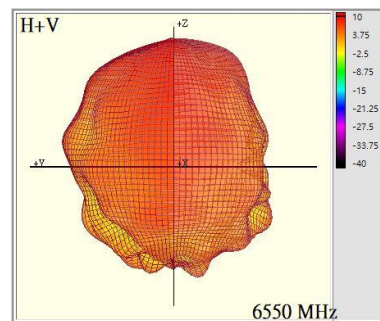
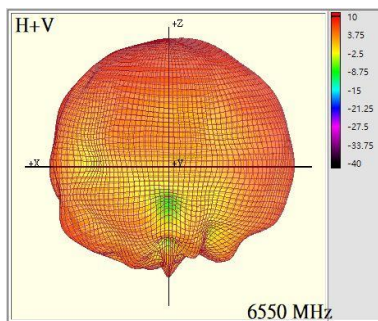
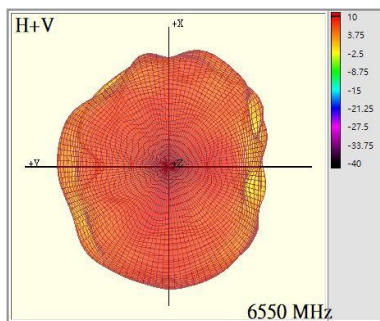
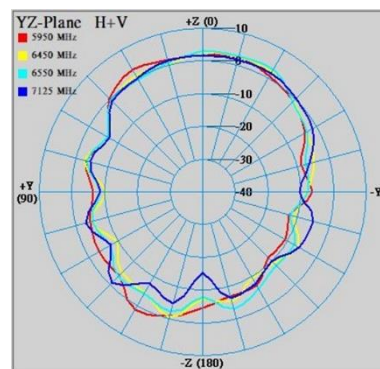
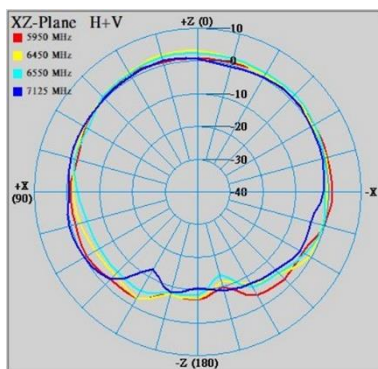
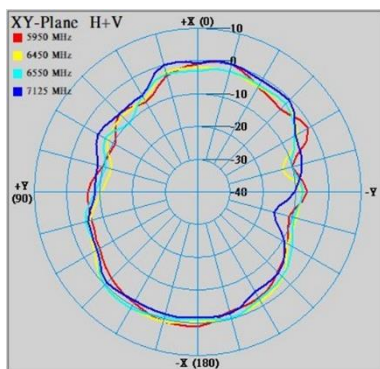
Frequency(MHz) : 2D. 5950~7125
3D. 6550

Radiation Pattern :

Azimuth Plane

Elevation Plane
 $\phi = 0$

Elevation Plane
 $\phi = 90$



Combine_2G 2D.3D Radiation Pattern

Frequency(MHz) : 2D. 2400~2500

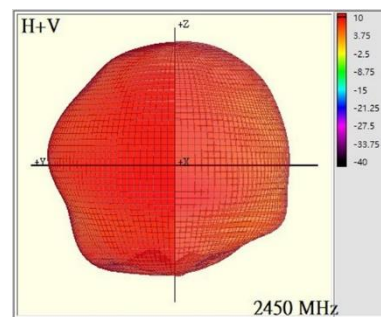
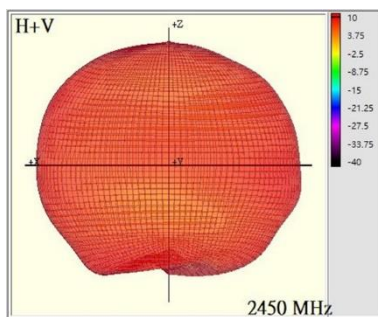
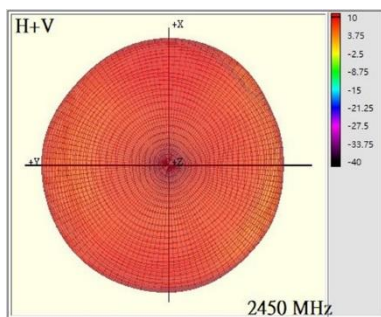
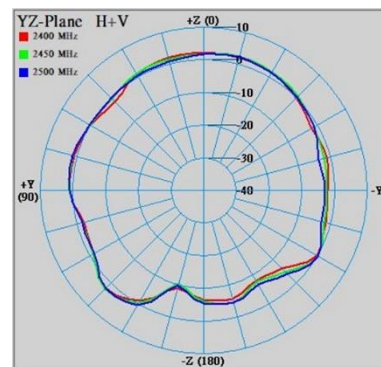
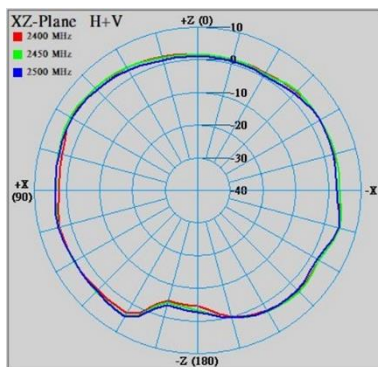
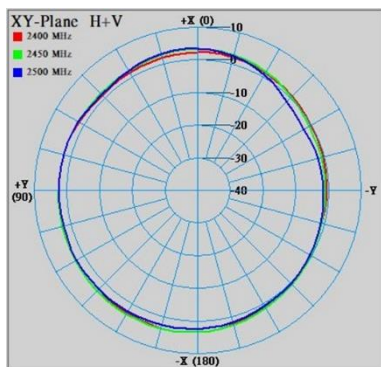
3D. 2450

Radiation Pattern :

Azimuth Plane

Elevation Plane
phi = 0

Elevation Plane
phi = 90



Combine_5G 2D.3D Radiation Pattern

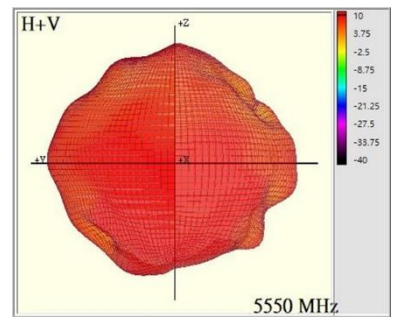
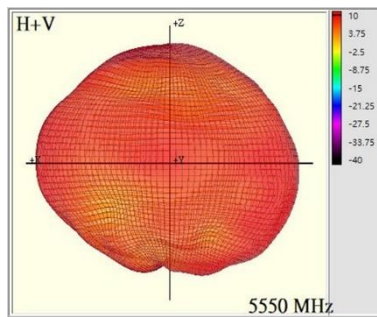
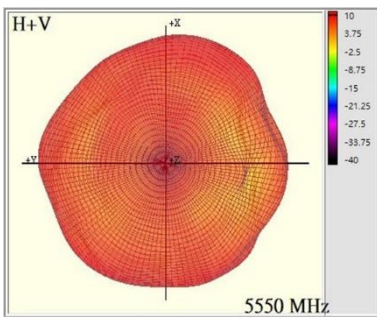
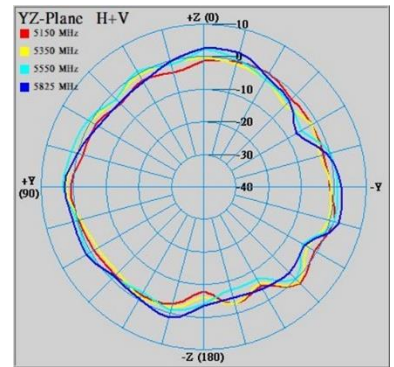
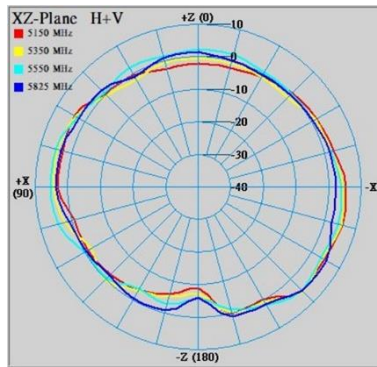
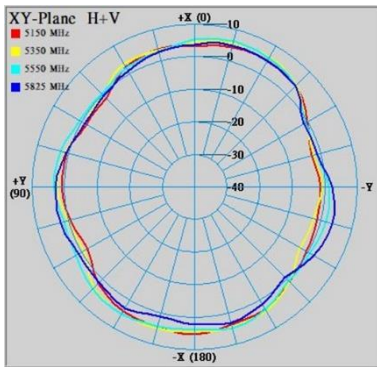
Frequency(MHz) : 2D. 5150~5825
3D. 5550

Radiation Pattern :

Azimuth Plane

Elevation Plane
phi = 0

Elevation Plane
phi = 90



Combine_6E 2D.3D Radiation Pattern

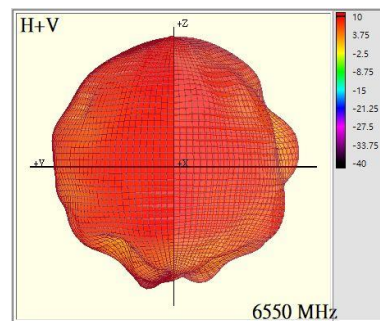
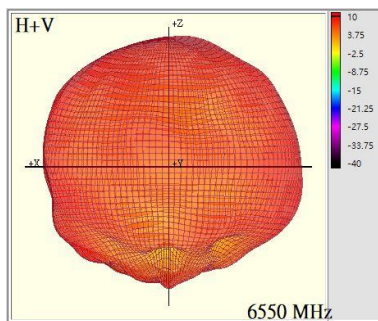
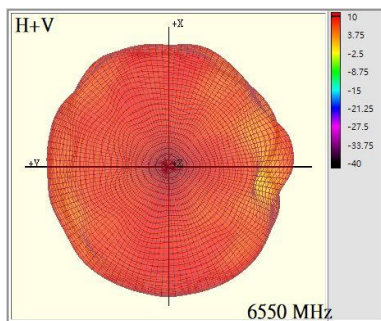
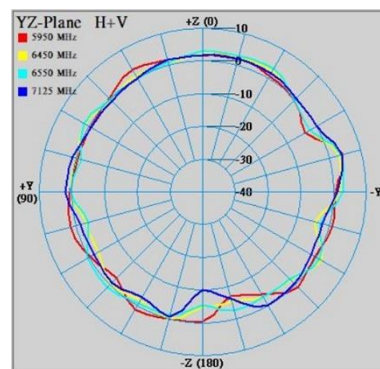
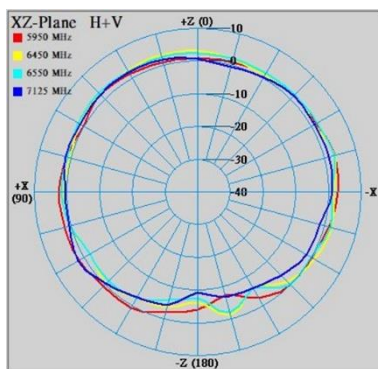
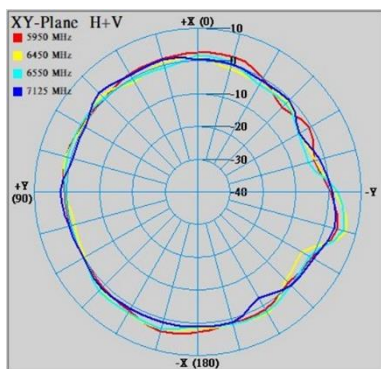
Frequency(MHz) : 2D. 5950~7125
3D. 6550

Radiation Pattern :

Azimuth Plane

Elevation Plane
 $\phi = 0$

Elevation Plane
 $\phi = 90$



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