



## **Unlicensed Band Antenna Gain**

**Model : SM-S721U**

**FCC ID : A3LSMS721U**

Radiation Patterns (Peak. Gain)

**A3LSMS721U BT WIFI #1 (SUB4)**

| Freq. [Hz]       | Peak. [dBi] |
|------------------|-------------|
| 2,400,000,000 Hz | -1.41 dBi   |
| 2,412,000,000 Hz | -1.59 dBi   |
| 2,437,000,000 Hz | -1.58 dBi   |
| 2,442,000,000 Hz | -1.72 dBi   |
| 2,450,000,000 Hz | -1.67 dBi   |
| 2,462,000,000 Hz | -2.09 dBi   |
| 2,472,000,000 Hz | -2.52 dBi   |
| 2,484,000,000 Hz | -2.55 dBi   |
| 2,500,000,000 Hz | -2.53 dBi   |
| 5,150,000,000 Hz | -3.95 dBi   |
| 5,200,000,000 Hz | -2.54 dBi   |
| 5,220,000,000 Hz | -2.24 dBi   |
| 5,250,000,000 Hz | -2.2 dBi    |
| 5,280,000,000 Hz | -1.84 dBi   |
| 5,300,000,000 Hz | -2.26 dBi   |
| 5,350,000,000 Hz | -1.97 dBi   |
| 5,400,000,000 Hz | -2.14 dBi   |
| 5,500,000,000 Hz | -2.59 dBi   |
| 5,600,000,000 Hz | -2.48 dBi   |
| 5,700,000,000 Hz | -2.72 dBi   |
| 5,785,000,000 Hz | -2.99 dBi   |
| 5,800,000,000 Hz | -2.65 dBi   |
| 5,805,000,000 Hz | -2.71 dBi   |
| 5,850,000,000 Hz | -2.35 dBi   |
| 5,885,000,000 Hz | -3.58 dBi   |
| 5,895,000,000 Hz | -3.88 dBi   |
| 5,925,000,000 Hz | -4.79 dBi   |
| 6,025,000,000 Hz | -4.35 dBi   |
| 6,125,000,000 Hz | -4.05 dBi   |
| 6,225,000,000 Hz | -3.93 dBi   |
| 6,325,000,000 Hz | -3.82 dBi   |
| 6,425,000,000 Hz | -4.35 dBi   |
| 6,525,000,000 Hz | -5.47 dBi   |
| 6,625,000,000 Hz | -5.53 dBi   |
| 6,725,000,000 Hz | -6.59 dBi   |
| 6,825,000,000 Hz | -6.42 dBi   |
| 6,925,000,000 Hz | -6.48 dBi   |
| 7,025,000,000 Hz | -5.48 dBi   |
| 7,125,000,000 Hz | -4.93 dBi   |

**A3LSMS721U BT WIFI #2 (SUB6/SUB1)**

| <b>Freq. [Hz]</b>       | <b>Peak. [dBi]</b> |
|-------------------------|--------------------|
| <b>2,400,000,000 Hz</b> | <b>-5.04 dBi</b>   |
| <b>2,412,000,000 Hz</b> | <b>-4.79 dBi</b>   |
| <b>2,437,000,000 Hz</b> | <b>-5.01 dBi</b>   |
| <b>2,442,000,000 Hz</b> | <b>-5.23 dBi</b>   |
| <b>2,450,000,000 Hz</b> | <b>-5.86 dBi</b>   |
| <b>2,462,000,000 Hz</b> | <b>-5.09 dBi</b>   |
| <b>2,472,000,000 Hz</b> | <b>-6.11 dBi</b>   |
| <b>2,484,000,000 Hz</b> | <b>-6.54 dBi</b>   |
| <b>2,500,000,000 Hz</b> | <b>-6.87 dBi</b>   |
| <b>5,150,000,000 Hz</b> | <b>-2.34 dBi</b>   |
| <b>5,200,000,000 Hz</b> | <b>-3.01 dBi</b>   |
| <b>5,220,000,000 Hz</b> | <b>-3.55 dBi</b>   |
| <b>5,250,000,000 Hz</b> | <b>-4.41 dBi</b>   |
| <b>5,280,000,000 Hz</b> | <b>-3.56 dBi</b>   |
| <b>5,300,000,000 Hz</b> | <b>-4.33 dBi</b>   |
| <b>5,350,000,000 Hz</b> | <b>-4.02 dBi</b>   |
| <b>5,400,000,000 Hz</b> | <b>-5.13 dBi</b>   |
| <b>5,500,000,000 Hz</b> | <b>-3.70 dBi</b>   |
| <b>5,600,000,000 Hz</b> | <b>-4.02 dBi</b>   |
| <b>5,700,000,000 Hz</b> | <b>-4.04 dBi</b>   |
| <b>5,785,000,000 Hz</b> | <b>-3.95 dBi</b>   |
| <b>5,800,000,000 Hz</b> | <b>-3.88 dBi</b>   |
| <b>5,805,000,000 Hz</b> | <b>-4.71 dBi</b>   |
| <b>5,850,000,000 Hz</b> | <b>-4.08 dBi</b>   |
| <b>5,885,000,000 Hz</b> | <b>-4.73 dBi</b>   |
| <b>5,895,000,000 Hz</b> | <b>-5.11 dBi</b>   |
| <b>5,925,000,000 Hz</b> | <b>-5.72 dBi</b>   |
| <b>6,025,000,000 Hz</b> | <b>-5.85 dBi</b>   |
| <b>6,125,000,000 Hz</b> | <b>-6.31 dBi</b>   |
| <b>6,225,000,000 Hz</b> | <b>-6.76 dBi</b>   |
| <b>6,325,000,000 Hz</b> | <b>-7.36 dBi</b>   |
| <b>6,425,000,000 Hz</b> | <b>-7.09 dBi</b>   |
| <b>6,525,000,000 Hz</b> | <b>-6.85 dBi</b>   |
| <b>6,625,000,000 Hz</b> | <b>-7.22 dBi</b>   |
| <b>6,725,000,000 Hz</b> | <b>-6.94 dBi</b>   |
| <b>6,825,000,000 Hz</b> | <b>-7.31 dBi</b>   |
| <b>6,925,000,000 Hz</b> | <b>-8.06 dBi</b>   |
| <b>7,025,000,000 Hz</b> | <b>-7.63 dBi</b>   |
| <b>7,125,000,000 Hz</b> | <b>-7.85 dBi</b>   |

## Radiation Pattern Test

Antennas tested for Gain and Efficiency must be assembled into the enclosure and tested in the fully assembled and operating SM-S721U handset. The antenna is tested in free space in the anechoic chamber in the H, E1 and, E2 planes. The radiation patterns are measured at the center of transmit and receive bands.

Figure 1: Geometry for SM-S721U for Radiation patterns.

## Chamber Information

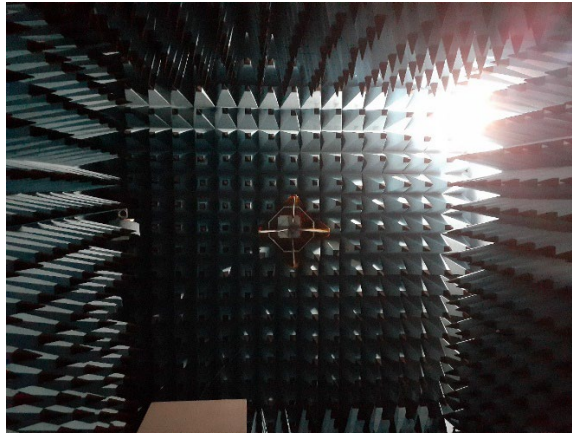
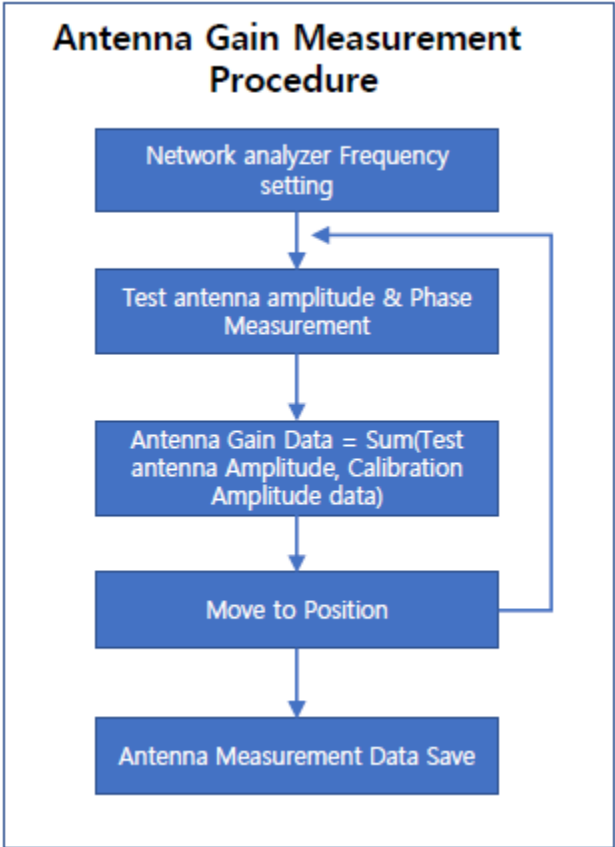


Figure 2: Geometry of Anechoic Chamber for Radiation patterns.

- ✓ Location : Samsung R&D Center R5 bld.
- ✓ Size : 4m x 2.5 x 2.5m (L x W x H)
- ✓ Frequency : 600 MHz -18GHz
- ✓ TX Antenna : 2GHz –18GHz Dual Polarization
- ✓ Quiet zone : 22cm @ 6GHz (Far-Field Length 2m)
- ✓ 2-axis DUT positioner -360°continuous rotation

Antenna Gain Measurement Procedure



Detail antenna description

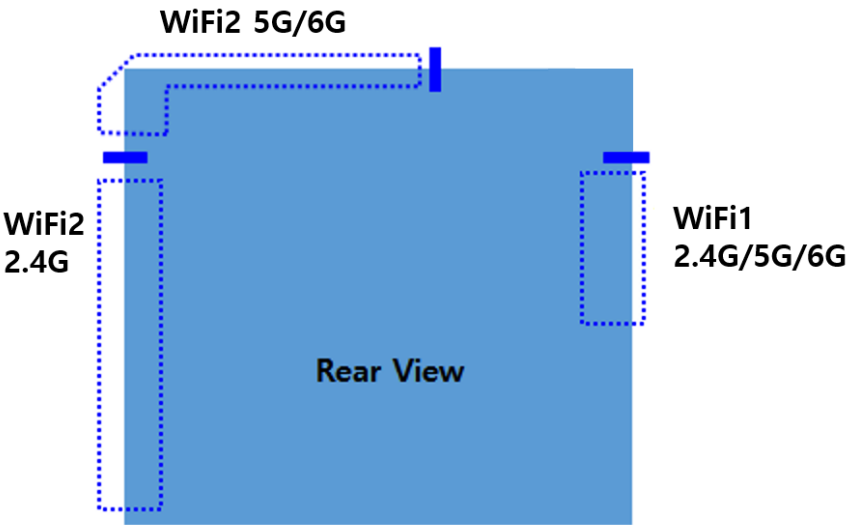
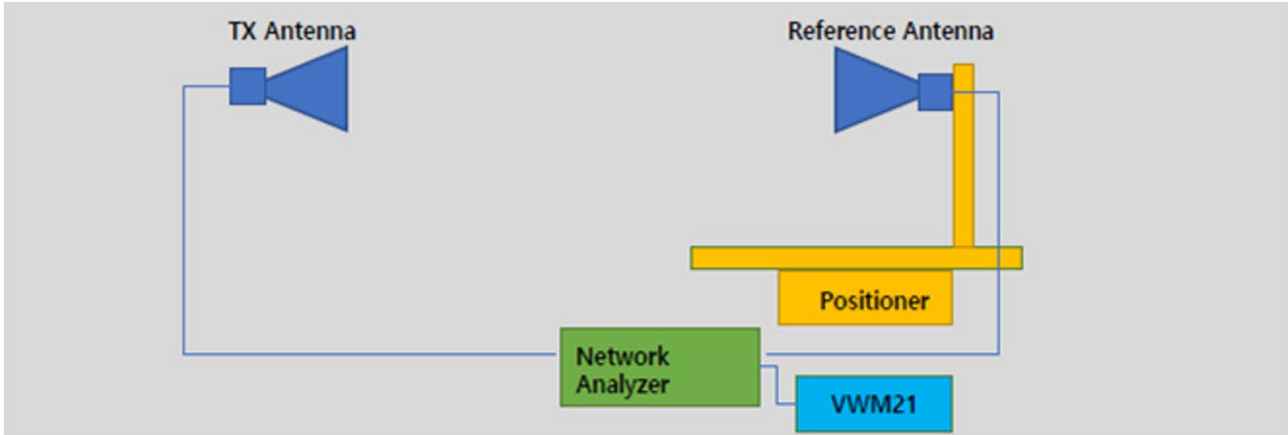


Table of calibrated equipment



| Part                 | Model Name    | Specification     | Cal date                                                                                    | Serial number |
|----------------------|---------------|-------------------|---------------------------------------------------------------------------------------------|---------------|
| Tx Antenna           | QRH-006M-006G | 600MHz to 6GHz    | Calibrated date :2024.3.15 / Cal. Due : 2026.01.31                                          | -             |
|                      | QRH-002G-018G | 2GHz to 18GHz     | Calibrated date :2024.3.15 / Cal. Due : 2026.01.31                                          | -             |
| Reference Antenna    | BBHA9120LFA   | 680MHz to 6500MHz | Calibration Frequency(680MHzto 6GHz)<br>Calibrated date :2024.3.15 / Cal. Due : 2026.01.31  | 9120LF-365    |
|                      | BBHA9120C     | 2GHz to 18GHz     | Calibration Frequency(2GHz to 8.5GHz)<br>Calibrated date :2024.3.15 / Cal. Due : 2026.01.31 | BBHA9120C#714 |
| Network Analyzer     | Agilent 5071B | 300KHz to 8.5GHz  | Calibrated date :2024.3.15 / Cal. Due : 2026.01.31                                          | C000026236    |
| Measurement Software | VWM21         |                   | MTG Visual Wave-Mobile(Ver.2.1)                                                             | -             |

Test dates

2024.05.03 ~ 2024.06.08

Names of test personnel

YoungSung Lee

Names of commercial test software being used

MTG Visual Wave-Mobile (Ver.2.1)

Test setup photos (test setup photo appears to be generic)

Radiation plots for max gain plane (3D)

