

# WWAN Antenna Information

## ThinkPad T16 Gen 3

### [Speed antenna]

| Platform                                 |                            |                                                   |
|------------------------------------------|----------------------------|---------------------------------------------------|
| Platform owner                           | Lenovo Japan LLC           |                                                   |
| Platform name                            | ThinkPad T16 Gen 3         |                                                   |
| Regulatory Model name<br>(Compliance ID) | TP00160A                   |                                                   |
| ODM                                      | LCFC                       |                                                   |
| Target Launch Date                       | 2024/4/1                   |                                                   |
|                                          |                            |                                                   |
| Tx Antenna                               |                            |                                                   |
| Brand name                               | SPEEDWIRE                  |                                                   |
| Parts Number<br>5G SKU                   | Main Antenna:              | DC330022J10                                       |
|                                          | Auxiliary Antenna:         | DC330022J20 (LTE B20/n20 TX)                      |
|                                          | MIMO1 Antenna              | DC330022J10 (Rx only)                             |
|                                          | MIMO2 Antenna              | DC330022J20                                       |
| Parts Number<br>4G SKU                   | Main Antenna:              | DC330022J60                                       |
|                                          | Auxiliary Antenna:         | DC330022J60 (Rx only)                             |
|                                          |                            |                                                   |
| Transmitter Module                       |                            |                                                   |
| WWAN Module                              | Model A: Quectel RM520N-GL | FCC ID: XMR2022RM520NGL<br>IC: 10224A-022RM520NGL |
|                                          | Model B: Quectel EM061K-GL | FCC ID: XMR2023EM061KGL<br>IC: 10224A-23EM061KGL  |
|                                          |                            |                                                   |

#### Revision history

| Revision number | Date         | Description        |
|-----------------|--------------|--------------------|
| 1               | 2020/ 11/ 18 | Initial release    |
| 2               | 2023/08/23   | Update CS24 module |

## Section 1. Antenna Assembly Specifications

Module A = RM520N-GL  
Module B = EM061K-GL

### Main Antenna

| Antenna Part Number | Manufacturer | Antenna Type | Cable Assembly Part Number and Information                                                                                                  | Frequency (MHz)                                                                |         | Cable Loss (dB) | Peak Gain (including cable loss) |                |
|---------------------|--------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------|-----------------|----------------------------------|----------------|
|                     |              |              |                                                                                                                                             |                                                                                |         |                 | Horizontal (dBi)                 | Vertical (dBi) |
| DC330022J10         | SPEEDWIRE    | PIFA         | 1. Cable P/N: 1.13LL<br>2. Diameter: 1.13mm<br>50 ohm coaxial cable<br>3. Cable length: 157.5 mm<br>4. Connector P/N: C87P115 or equivalent | UMTS/HSPA (UMTS 2100, Band 1) (UE-UTRA, Band 1, n1) Module:A,B,C,D             | 1920.00 | 0.34            | -6.34                            | -2.69          |
|                     |              |              |                                                                                                                                             |                                                                                | 1950.00 | 0.34            | -7.87                            | -2.46          |
|                     |              |              |                                                                                                                                             |                                                                                | 1980.00 | 0.34            | -7.2                             | -3.65          |
|                     |              |              |                                                                                                                                             | UMTS/HSPA/EVDO (UMTS1900, Band 2) (UE-UTRA, Band 2, n2) Module:A,B,C,          | 1850.00 | 0.33            | -3.81                            | -4             |
|                     |              |              |                                                                                                                                             |                                                                                | 1880.00 | 0.33            | -4.54                            | -3.69          |
|                     |              |              |                                                                                                                                             |                                                                                | 1910.00 | 0.34            | -5.69                            | -2.96          |
|                     |              |              |                                                                                                                                             | GSM/GPRS/EDGE (GSM 1800, Band 3) (UE-UTRA, Band 3, n3) Module:A,B,C,D          | 1710.00 | 0.32            | -0.06                            | -2.73          |
|                     |              |              |                                                                                                                                             |                                                                                | 1747.50 | 0.32            | -2.46                            | -2.93          |
|                     |              |              |                                                                                                                                             |                                                                                | 1785.00 | 0.33            | -5.18                            | -3.2           |
|                     |              |              |                                                                                                                                             | UMTS(AWS) / HSPA (UMTS, Band 4) (UE-UTRA, Band 4) Module:A,B,C                 | 1710.00 | 0.32            | -0.06                            | -2.73          |
|                     |              |              |                                                                                                                                             |                                                                                | 1732.50 | 0.32            | -1.72                            | -3.25          |
|                     |              |              |                                                                                                                                             |                                                                                | 1755.00 | 0.32            | -2.99                            | -3.11          |
|                     |              |              |                                                                                                                                             | GSM/GPRS/EDGE (GSM 850) (UMTS850, Band 5) (UE-UTRA, Band 5, n5) Module:A,B,C,D | 824.00  | 0.23            | -1.96                            | -3.7           |
|                     |              |              |                                                                                                                                             |                                                                                | 836.50  | 0.24            | -1.59                            | -3.07          |
|                     |              |              |                                                                                                                                             |                                                                                | 849.00  | 0.24            | -2.09                            | -2.84          |
|                     |              |              |                                                                                                                                             | (UMTS, Band 6) Module:B,C                                                      | 830.00  | 0.23            | -1.68                            | -3.21          |
|                     |              |              |                                                                                                                                             |                                                                                | 835.00  | 0.23            | -1.6                             | -3.08          |
|                     |              |              |                                                                                                                                             |                                                                                | 840.00  | 0.24            | -1.65                            | -3.01          |
|                     |              |              |                                                                                                                                             | FCC Part 27 (UE-UTRA, Band 7, n7) Module:A,B,C                                 | 2500.00 | 0.39            | -4.43                            | -2.97          |
|                     |              |              |                                                                                                                                             |                                                                                | 2535.00 | 0.39            | -5.42                            | -3.07          |
|                     |              |              |                                                                                                                                             |                                                                                | 2570.00 | 0.39            | -4.04                            | -3.81          |
|                     |              |              |                                                                                                                                             | UMTS/HSPA (UMTS 900, Band 8) (UE-UTRA, Band 8, n8) Module:A,B,C,D              | 880.00  | 0.24            | -3.52                            | -1.9           |
|                     |              |              |                                                                                                                                             |                                                                                | 897.50  | 0.24            | -5.51                            | -1.89          |
|                     |              |              |                                                                                                                                             |                                                                                | 915.00  | 0.24            | -6.31                            | -2.03          |
| DC330022J60         | SPEEDWIRE    | PIFA         | 1. Cable P/N: 1.13LL<br>2. Diameter: 1.13mm<br>50 ohm coaxial cable<br>3. Cable length: 164 mm<br>4. Connector P/N: C87P115 or equivalent   | (WCDMA, Band 9)                                                                | 1844.9  |                 |                                  |                |
|                     |              |              |                                                                                                                                             |                                                                                | 1862.5  |                 |                                  |                |
|                     |              |              |                                                                                                                                             |                                                                                | 1879.9  |                 |                                  |                |
|                     |              |              |                                                                                                                                             | (UE-UTRA, Band 12, n12) Module:A,B,C                                           | 699.00  | 0.22            | -1                               | -2.82          |
|                     |              |              |                                                                                                                                             |                                                                                | 707.50  | 0.22            | -1.54                            | -2.84          |
|                     |              |              |                                                                                                                                             |                                                                                | 716.00  | 0.22            | -1.23                            | -2.81          |
|                     |              |              |                                                                                                                                             | (UE-UTRA, Band 13) Module:A,B,C                                                | 777.00  | 0.23            | -3.31                            | -3.76          |
|                     |              |              |                                                                                                                                             |                                                                                | 782.00  | 0.23            | -3.62                            | -3.8           |
|                     |              |              |                                                                                                                                             |                                                                                | 787.00  | 0.23            | -4                               | -3.95          |
|                     |              |              |                                                                                                                                             | (UE-UTRA, Band 14) Module:A,B,C                                                | 788.00  | 0.23            | -4.08                            | -3.93          |
|                     |              |              |                                                                                                                                             |                                                                                | 793.00  | 0.23            | -4.44                            | -3.93          |
|                     |              |              |                                                                                                                                             |                                                                                | 798.00  | 0.23            | -4.72                            | -3.98          |
|                     |              |              |                                                                                                                                             | (UE-UTRA, Band 17) Module :A,B,C                                               | 704.00  | 0.22            | -1.51                            | -2.84          |
|                     |              |              |                                                                                                                                             |                                                                                | 710.00  | 0.22            | -1.47                            | -2.82          |
|                     |              |              |                                                                                                                                             |                                                                                | 716.00  | 0.22            | -1.23                            | -2.81          |
|                     |              |              |                                                                                                                                             | (UE-UTRA, Band 18) Module :A,B,C                                               | 815.00  | 0.23            | -2.83                            | -4.29          |
|                     |              |              |                                                                                                                                             |                                                                                | 822.50  | 0.23            | -2.04                            | -3.79          |
|                     |              |              |                                                                                                                                             |                                                                                | 830.00  | 0.23            | -1.68                            | -3.21          |
|                     |              |              |                                                                                                                                             | (UMTS, Band 19) (UE-UTRA, Band 19) Module :A,B,C                               | 830.00  | 0.23            | -1.68                            | -3.21          |
|                     |              |              |                                                                                                                                             |                                                                                | 837.50  | 0.24            | -1.6                             | -3.06          |
|                     |              |              |                                                                                                                                             |                                                                                | 845.00  | 0.24            | -1.77                            | -2.91          |

| Antenna Part Number | Manufacturer | Antenna Type | Cable Assembly Part Number and Information | Frequency (MHz)                                                  |         | Cable Loss (dB) | Peak Gain (including cable loss) |                |
|---------------------|--------------|--------------|--------------------------------------------|------------------------------------------------------------------|---------|-----------------|----------------------------------|----------------|
|                     |              |              |                                            |                                                                  |         |                 | Horizontal (dBi)                 | Vertical (dBi) |
|                     |              |              |                                            | (UE-UTRA, Band 20, n20)<br>Module :A,B,C                         | 832.00  | 0.23            | -1.63                            | -3.11          |
|                     |              |              |                                            |                                                                  | 847.00  | 0.24            | -1.93                            | -2.88          |
|                     |              |              |                                            |                                                                  | 862.00  | 0.24            | -2.73                            | -2.48          |
|                     |              |              |                                            | (UE-UTRA, Band 25, n25)<br>Module:A,B,C                          | 1850.00 | 0.33            | -3.81                            | -4             |
|                     |              |              |                                            |                                                                  | 1882.50 | 0.33            | -4.63                            | -3.54          |
|                     |              |              |                                            |                                                                  | 1915.00 | 0.34            | -5.99                            | -2.88          |
|                     |              |              |                                            | (UE-UTRA, Band 26)<br>Module:A,B,C<br>(CDMA2000 BC0)<br>Module:D | 814.00  | 0.23            | -2.97                            | -4.32          |
|                     |              |              |                                            |                                                                  | 831.50  | 0.23            | -1.64                            | -3.14          |
|                     |              |              |                                            |                                                                  | 849.00  | 0.24            | -2.09                            | -2.84          |
|                     |              |              |                                            | (UE-UTRA, Band 28, n28)<br>Module:A,B,C                          | 703.00  | 0.22            | -1.48                            | -2.84          |
|                     |              |              |                                            |                                                                  | 725.50  | 0.22            | -1.2                             | -2.66          |
|                     |              |              |                                            |                                                                  | 748.00  | 0.23            | -1.35                            | -2.66          |
|                     |              |              |                                            | (UE-UTRA, Band 29)<br>* Down link only<br>Module:A,B,C           | 717.00  | 0.22            | -1.17                            | -2.77          |
|                     |              |              |                                            |                                                                  | 722.50  | 0.22            | -1.17                            | -2.6           |
|                     |              |              |                                            |                                                                  | 728.00  | 0.22            | -1.23                            | -2.73          |
|                     |              |              |                                            | (UE-UTRA, Band 30, n30)<br>Module:A,B,C                          | 2305.00 | 0.37            | 0.73                             | -1.23          |
|                     |              |              |                                            |                                                                  | 2310.00 | 0.37            | 0.53                             | -1.15          |
|                     |              |              |                                            |                                                                  | 2315.00 | 0.37            | 0.37                             | -0.92          |
|                     |              |              |                                            | (LTE, Band 32)<br>* Down link only<br>Module:A,B,C               | 1452.00 | 0.29            | -2.73                            | -8.57          |
|                     |              |              |                                            |                                                                  | 1474.00 | 0.30            | -2.27                            | -6.79          |
|                     |              |              |                                            |                                                                  | 1496.00 | 0.30            | -1.95                            | -5.41          |
|                     |              |              |                                            | (LTE Band 34)<br>Module:A,B,D                                    | 2010.00 | 0.35            | -4.61                            | -5.74          |
|                     |              |              |                                            |                                                                  | 2017.50 | 0.35            | -3.94                            | -6.52          |
|                     |              |              |                                            |                                                                  | 2025.00 | 0.35            | -3.41                            | -6.16          |
|                     |              |              |                                            | (UE-UTRA, Band 38, n38)<br>Module:A,B,C,D                        | 2570.00 | 0.39            | -4.04                            | -3.81          |
|                     |              |              |                                            |                                                                  | 2595.00 | 0.40            | -3.39                            | -5.85          |
|                     |              |              |                                            |                                                                  | 2620.00 | 0.40            | -3.71                            | -7.42          |
|                     |              |              |                                            | (TD-SCDMA, Band 39)<br>Module:A,B,C,D                            | 1880.00 | 0.33            | -4.54                            | -3.69          |
|                     |              |              |                                            |                                                                  | 1900.00 | 0.34            | -5.06                            | -3.18          |
|                     |              |              |                                            |                                                                  | 1920.00 | 0.34            | -6.34                            | -2.69          |
|                     |              |              |                                            | (UE-UTRA, Band 40, n40)<br>Module:A,B,C,D                        | 2300.00 | 0.37            | 0.91                             | -1.46          |
|                     |              |              |                                            |                                                                  | 2350.00 | 0.38            | -1.89                            | -1.36          |
|                     |              |              |                                            |                                                                  | 2400.00 | 0.38            | -2.71                            | -3.27          |
|                     |              |              |                                            | (UE-UTRA, Band 41, n41)<br>Module:A,B,C,D                        | 2496.00 | 0.39            | -4.42                            | -2.79          |
|                     |              |              |                                            |                                                                  | 2593.00 | 0.40            | -3.35                            | -5.74          |
|                     |              |              |                                            |                                                                  | 2690.00 | 0.40            | -0.82                            | -3.18          |
|                     |              |              |                                            | (LTE Band 42)<br>Module:A,C                                      | 3400.00 | 0.46            | 0.86                             | -2.77          |
|                     |              |              |                                            |                                                                  | 3500.00 | 0.47            | 0.46                             | -1.44          |
|                     |              |              |                                            |                                                                  | 3600.00 | 0.48            | 0.95                             | -1.71          |
|                     |              |              |                                            | (LTE Band 43)<br>Module:A,C                                      | 3600.00 | 0.48            | 0.95                             | -1.71          |
|                     |              |              |                                            |                                                                  | 3700.00 | 0.49            | -2                               | -4.33          |
|                     |              |              |                                            |                                                                  | 3800.00 | 0.49            | -1.98                            | -4.48          |
|                     |              |              |                                            | (LTE Band 46)<br>TD Unlicensed, LAA<br>RCV only<br>Module:A,C    | 5150.00 | 0.58            | -4.84                            | -8             |
|                     |              |              |                                            |                                                                  | 5537.00 | 0.60            | -4.7                             | -3.87          |
|                     |              |              |                                            |                                                                  | 5925.00 | 0.61            | -9.95                            | -9.64          |
|                     |              |              |                                            | (LTE Band 48, n48)<br>Module:A,C                                 | 3550.00 | 0.47            | 0.83                             | -0.25          |
|                     |              |              |                                            |                                                                  | 3625.00 | 0.48            | 0.81                             | -2.14          |
|                     |              |              |                                            |                                                                  | 3700.00 | 0.49            | -2                               | -4.33          |
|                     |              |              |                                            | (LTE, Band 66, n66)<br>Module:A,B,C                              | 1710.00 | 0.32            | -0.06                            | -2.73          |
|                     |              |              |                                            |                                                                  | 1745.00 | 0.32            | -2.31                            | -2.9           |
|                     |              |              |                                            |                                                                  | 1780.00 | 0.32            | -5.23                            | -3.34          |
|                     |              |              |                                            | (LTE Band 71, n71)<br>Module:A,B                                 | 663.00  | 0.22            | -1.12                            | -3.74          |
|                     |              |              |                                            |                                                                  | 680.50  | 0.22            | -0.41                            | -2.8           |
|                     |              |              |                                            |                                                                  | 698.00  | 0.22            | -0.93                            | -2.78          |

| Antenna Part Number | Manufacturer | Antenna Type | Cable Assembly Part Number and Information | Frequency (MHz)                   |         | Cable Loss (dB) | Peak Gain (including cable loss) |                |
|---------------------|--------------|--------------|--------------------------------------------|-----------------------------------|---------|-----------------|----------------------------------|----------------|
|                     |              |              |                                            |                                   |         |                 | Horizontal (dBi)                 | Vertical (dBi) |
|                     |              |              |                                            | (5G NR Band 75) RCV only Module:A | 1432.0  | 0.29            | -3.05                            | -8.99          |
|                     |              |              |                                            |                                   | 1474.5  | 0.30            | -2.26                            | -6.76          |
|                     |              |              |                                            |                                   | 1517.0  | 0.30            | -1.83                            | -4.34          |
|                     |              |              |                                            | (5G NR Band 76) RCV only Module:A | 1427    | 0.29            | -3.10                            | -8.85          |
|                     |              |              |                                            |                                   | 1429.5  | 0.29            | -3.08                            | -8.92          |
|                     |              |              |                                            |                                   | 1432    | 0.29            | -3.05                            | -8.99          |
|                     |              |              |                                            | (5G NR Band 77) Module:A          | 3300.00 | 0.45            | -0.1                             | -1.79          |
|                     |              |              |                                            |                                   | 3750.00 | 0.49            | -2.3                             | -4.04          |
|                     |              |              |                                            |                                   | 4200.00 | 0.52            | -2.49                            | -5.84          |
|                     |              |              |                                            | (5G NR Band 78) Module:A          | 3300.00 | 0.45            | -0.1                             | -1.79          |
|                     |              |              |                                            |                                   | 3550.00 | 0.47            | 0.83                             | -0.25          |
|                     |              |              |                                            |                                   | 3800.00 | 0.49            | -1.98                            | -4.48          |
|                     |              |              |                                            | (5G NR Band 79) Module:A          | 4400.00 | 0.53            | -3.91                            | -5.14          |
|                     |              |              |                                            |                                   | 4700.00 | 0.55            | -2.40                            | -4.16          |
|                     |              |              |                                            |                                   | 5000.00 | 0.57            | -6.95                            | -6.65          |
|                     |              |              |                                            | 5G NR mmWave n257                 | 26500   |                 |                                  |                |
|                     |              |              |                                            |                                   | 28000   |                 |                                  |                |
|                     |              |              |                                            |                                   | 29500   |                 |                                  |                |
|                     |              |              |                                            | 5G NR mmWave n258                 | 24250   |                 |                                  |                |
|                     |              |              |                                            |                                   | 25875   |                 |                                  |                |
|                     |              |              |                                            |                                   | 27500   |                 |                                  |                |
|                     |              |              |                                            | 5G NR mmWave n260                 | 37900   |                 |                                  |                |
|                     |              |              |                                            |                                   | 38500   |                 |                                  |                |
|                     |              |              |                                            |                                   | 40000   |                 |                                  |                |
|                     |              |              |                                            | 5G NR mmWave n261                 | 27500   |                 |                                  |                |
|                     |              |              |                                            |                                   | 27925   |                 |                                  |                |
|                     |              |              |                                            |                                   | 28350   |                 |                                  |                |
|                     |              |              |                                            | Japan (UE-UTRA, Band 21)          | 1477.90 |                 |                                  |                |
|                     |              |              |                                            |                                   | 1455.40 |                 |                                  |                |
|                     |              |              |                                            |                                   | 1462.90 |                 |                                  |                |
|                     |              |              |                                            | Japan J-CDMA                      | 815.00  |                 |                                  |                |
|                     |              |              |                                            |                                   | 824.70  |                 |                                  |                |
|                     |              |              |                                            |                                   | 836.52  |                 |                                  |                |
|                     |              |              |                                            |                                   | 848.31  |                 |                                  |                |
|                     |              |              |                                            |                                   | 870.00  |                 |                                  |                |
|                     |              |              |                                            |                                   | 880.20  |                 |                                  |                |
|                     |              |              |                                            |                                   | 897.60  |                 |                                  |                |
|                     |              |              |                                            |                                   | 914.80  |                 |                                  |                |
|                     |              |              |                                            |                                   | 925.00  |                 |                                  |                |
|                     |              |              |                                            |                                   | 940.00  |                 |                                  |                |
|                     |              |              |                                            | Japan J-CDMA                      | 1922.40 |                 |                                  |                |
|                     |              |              |                                            |                                   | 1950.00 |                 |                                  |                |
|                     |              |              |                                            |                                   | 1977.60 |                 |                                  |                |

MIMO Antenna

| Antenna Part Number | Manufacturer | Antenna Type | Cable Assembly Part Number and Information                                                                                                           | Frequency (MHz)                                                                                              |         | Cable Loss (dB) | Peak Gain (including cable loss) |                |
|---------------------|--------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------|-----------------|----------------------------------|----------------|
|                     |              |              |                                                                                                                                                      |                                                                                                              |         |                 | Horizontal (dBi)                 | Vertical (dBi) |
| DC330022J20         | SPEEDWIRE    | PIFA         | 1. Cable P/N:<br>1.13LL<br>2. Diameter: 1.13mm<br>50 ohm coaxial cable<br>3. Cable length:<br>267.5 mm<br>4. Connector P/N:<br>C87P115 or equivalent | UMTS/HSPA<br>(UMTS 2100, Band 1)<br>(UE-UTRA, Band 1, n1)<br>Module:A,B,C,D                                  | 1920.00 | 0.59            | -0.04                            | 1.99           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1950.00 | 0.59            | -0.63                            | 1.84           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1980.00 | 0.60            | -0.68                            | 1.75           |
|                     |              |              |                                                                                                                                                      | GSM/GPRS/EDGE<br>(GSM 1900)<br>UMTS/HSPA/EVDO<br>(UMTS1900, Band 2)<br>(UE-UTRA, Band 2, n2)<br>Module:A,B,C | 1850.00 | 0.58            | -0.76                            | 1.93           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1880.00 | 0.58            | 0.34                             | 1.7            |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1910.00 | 0.59            | -0.15                            | 1.67           |
|                     |              |              |                                                                                                                                                      | GSM/GPRS/EDGE<br>(GSM 1800, Band 3)<br>(UE-UTRA, Band 3, n3)<br>Module:A,B,C,D                               | 1710.00 | 0.56            | 1.04                             | 1.81           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1747.50 | 0.56            | 0.03                             | 1.72           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1785.00 | 0.57            | -0.80                            | 0.86           |
|                     |              |              |                                                                                                                                                      | UMTS(AWS) / HSPA<br>(UMTS, Band 4)<br>(UE-UTRA, Band 4)<br>Module:A,B,C                                      | 1710.00 | 0.56            | 1.04                             | 1.81           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1732.50 | 0.56            | 0.52                             | 1.91           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1755.00 | 0.56            | -0.27                            | 1.54           |
|                     |              |              |                                                                                                                                                      | GSM/GPRS/EDGE<br>(GSM 850)<br>(UMTS850, Band 5)<br>(UE-UTRA, Band 5, n5)<br>Module:A,B,C,D                   | 824.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 836.50  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 849.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UMTS, Band 6)<br>Module:B,C                                                                                 | 830.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 835.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 840.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UE-UTRA, Band 7, n7)<br>Module:A,B,C                                                                        | 2500.00 | 0.68            | -0.29                            | 0.87           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 2535.00 | 0.68            | 0.19                             | 0.73           |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 2570.00 | 0.69            | 1.01                             | 0.17           |
|                     |              |              |                                                                                                                                                      | UMTS/HSPA<br>(UMTS 900, Band 8)<br>(UE-UTRA, Band 8, n8)<br>Module:A,B,C,D                                   | 880.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 897.50  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 915.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (WCDMA, Band 9)                                                                                              | 1844.9  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1862.5  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 1879.9  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UE-UTRA, Band 12, n12)<br>Module:A,B,C                                                                      | 699.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 707.50  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 716.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UE-UTRA, Band 13)<br>Module:A,B,C                                                                           | 777.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 782.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 787.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UE-UTRA, Band 14)<br>Module:A,B,C                                                                           | 788.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 793.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 798.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UE-UTRA, Band 17)<br>Module:A,B,C                                                                           | 704.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 710.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 716.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UE-UTRA, Band 18)<br>Module:A,B,C                                                                           | 815.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 822.50  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 830.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UMTS, Band 19)<br>(UE-UTRA, Band 19)<br>Module:A,B,C                                                        | 830.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 837.50  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 845.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      | (UE-UTRA, Band 20, n20)                                                                                      | 832.00  |                 |                                  |                |
|                     |              |              |                                                                                                                                                      |                                                                                                              | 847.00  |                 |                                  |                |

| Antenna Part Number | Manufacturer | Antenna Type | Cable Assembly Part Number and Information | Frequency (MHz)                                               | Cable Loss (dB) | Peak Gain (including cable loss) |                |
|---------------------|--------------|--------------|--------------------------------------------|---------------------------------------------------------------|-----------------|----------------------------------|----------------|
|                     |              |              |                                            |                                                               |                 | Horizontal (dBi)                 | Vertical (dBi) |
|                     |              |              |                                            | Module:A,B,C                                                  | 862.00          |                                  |                |
|                     |              |              |                                            | (UE-UTRA, Band 25, n25)<br>Module:A,B,C                       | 1850.00         | 0.58                             | -0.76          |
|                     |              |              |                                            |                                                               | 1882.50         | 0.58                             | 0.26           |
|                     |              |              |                                            |                                                               | 1915.00         | 0.59                             | -0.09          |
|                     |              |              |                                            | (UE-UTRA, Band 26)<br>Module:A,B,C                            | 814.00          |                                  |                |
|                     |              |              |                                            |                                                               | 834.50          |                                  |                |
|                     |              |              |                                            |                                                               | 849.00          |                                  |                |
|                     |              |              |                                            | (UE-UTRA, Band 28, n28)<br>Module:A,B,C                       | 703.00          |                                  |                |
|                     |              |              |                                            |                                                               | 725.50          |                                  |                |
|                     |              |              |                                            |                                                               | 748.00          |                                  |                |
|                     |              |              |                                            | (UE-UTRA, Band 29)<br>* Down link only<br>Module:A,B,C        | 717.00          |                                  |                |
|                     |              |              |                                            |                                                               | 722.50          |                                  |                |
|                     |              |              |                                            |                                                               | 728.00          |                                  |                |
|                     |              |              |                                            | (UE-UTRA, Band 30, n30)<br>Module:A,B,C                       | 2305.00         | 0.65                             | -0.86          |
|                     |              |              |                                            |                                                               | 2310.00         | 0.65                             | -0.89          |
|                     |              |              |                                            |                                                               | 2315.00         | 0.65                             | -0.87          |
|                     |              |              |                                            | (LTE, Band 32)<br>* Down link only<br>Module:A,B,C            | 1452.00         | 0.51                             | 2.36           |
|                     |              |              |                                            |                                                               | 1474.00         | 0.52                             | 2.59           |
|                     |              |              |                                            |                                                               | 1496.00         | 0.52                             | 2.34           |
|                     |              |              |                                            | (LTE Band 34)<br>Module:A,B,D                                 | 2010.00         | 0.60                             | -0.83          |
|                     |              |              |                                            |                                                               | 2017.50         | 0.61                             | -1.02          |
|                     |              |              |                                            |                                                               | 2025.00         | 0.61                             | -1.21          |
|                     |              |              |                                            | (UE-UTRA, Band 38, n38)<br>Module:A,B,C,D                     | 2570.00         | 0.69                             | 1.01           |
|                     |              |              |                                            |                                                               | 2595.00         | 0.69                             | 0.68           |
|                     |              |              |                                            |                                                               | 2620.00         | 0.70                             | 0.18           |
|                     |              |              |                                            | (TD-SCDMA, Band 39)<br>Module:A,B,C,D                         | 1880.00         | 0.58                             | 0.34           |
|                     |              |              |                                            |                                                               | 1900.00         | 0.59                             | -0.05          |
|                     |              |              |                                            |                                                               | 1920.00         | 0.59                             | -0.04          |
|                     |              |              |                                            | (UE-UTRA, Band 40, n40)<br>Module:A,B,C,D                     | 2300.00         | 0.65                             | -0.82          |
|                     |              |              |                                            |                                                               | 2350.00         | 0.66                             | -0.75          |
|                     |              |              |                                            |                                                               | 2400.00         | 0.66                             | -4.66          |
|                     |              |              |                                            | (UE-UTRA, Band 41, n41)<br>Module:A,B,C,D                     | 2496.00         | 0.68                             | -0.47          |
|                     |              |              |                                            |                                                               | 2593.00         | 0.69                             | 0.72           |
|                     |              |              |                                            |                                                               | 2690.00         | 0.71                             | -0.31          |
|                     |              |              |                                            | (LTE Band 42)<br>Module:A,C                                   | 3400.00         | 0.81                             | 0.43           |
|                     |              |              |                                            |                                                               | 3500.00         | 0.82                             | -0.27          |
|                     |              |              |                                            |                                                               | 3600.00         | 0.84                             | -1.62          |
|                     |              |              |                                            | (LTE Band 43)<br>Module:A,C                                   | 3600.00         | 0.84                             | -1.62          |
|                     |              |              |                                            |                                                               | 3700.00         | 0.85                             | 0.22           |
|                     |              |              |                                            |                                                               | 3800.00         | 0.86                             | -0.31          |
|                     |              |              |                                            | (LTE Band 46)<br>TD Unlicensed, LAA<br>RCV only<br>Module:A,C | 5150.00         | 1.01                             | -1.77          |
|                     |              |              |                                            |                                                               | 5537.00         | 1.04                             | -2.55          |
|                     |              |              |                                            |                                                               | 5925.00         | 1.07                             | -2.83          |
|                     |              |              |                                            | (LTE Band 48, n48)<br>Module:A,C                              | 3550.00         | 0.83                             | -2.56          |
|                     |              |              |                                            |                                                               | 3625.00         | 0.84                             | -0.60          |
|                     |              |              |                                            |                                                               | 3700.00         | 0.85                             | 0.22           |
|                     |              |              |                                            | (LTE, Band 66, n66)<br>Module:A,B,C                           | 1710.00         | 0.56                             | 1.04           |
|                     |              |              |                                            |                                                               | 1745.00         | 0.56                             | 0.13           |
|                     |              |              |                                            |                                                               | 1780.00         | 0.57                             | -0.83          |
|                     |              |              |                                            | (LTE Band 71, n71)<br>Module:A,B                              | 663.00          |                                  |                |
|                     |              |              |                                            |                                                               | 680.50          |                                  |                |
|                     |              |              |                                            |                                                               | 698.00          |                                  |                |
|                     |              |              |                                            | (5G NR Band 77)<br>Module:A                                   | 3300.00         | 0.79                             | -0.22          |
|                     |              |              |                                            |                                                               | 3750.00         | 0.85                             | -1.46          |

| Antenna Part Number | Manufacturer | Antenna Type | Cable Assembly Part Number and Information | Frequency (MHz)             |         | Cable Loss (dB) | Peak Gain (including cable loss) |                |
|---------------------|--------------|--------------|--------------------------------------------|-----------------------------|---------|-----------------|----------------------------------|----------------|
|                     |              |              |                                            |                             |         |                 | Horizontal (dBi)                 | Vertical (dBi) |
|                     |              |              |                                            | (5G NR Band 78)<br>Module:A | 4200.00 | 0.91            | -0.44                            | -9.21          |
|                     |              |              |                                            |                             | 3300.00 | 0.79            | -0.22                            | -0.19          |
|                     |              |              |                                            |                             | 3550.00 | 0.83            | -2.56                            | 0.22           |
|                     |              |              |                                            |                             | 3800.00 | 0.86            | -0.31                            | -0.78          |
|                     |              |              |                                            | (5G NR Band 79)<br>Module:A | 4400.00 | 0.93            | -2.13                            | -6.31          |
|                     |              |              |                                            |                             | 4700.00 | 0.97            | -2.28                            | -1.45          |
|                     |              |              |                                            |                             | 5000.00 | 1.00            | 0.44                             | -3.63          |
|                     |              |              |                                            | Japan<br>(UE-UTRA, Band 21) | 1477.90 |                 |                                  |                |
|                     |              |              |                                            |                             | 1455.40 |                 |                                  |                |
|                     |              |              |                                            |                             | 1462.90 |                 |                                  |                |
|                     |              |              |                                            | Japan<br>J-CDMA             | 815.00  |                 |                                  |                |
|                     |              |              |                                            |                             | 824.70  |                 |                                  |                |
|                     |              |              |                                            |                             | 836.52  |                 |                                  |                |
|                     |              |              |                                            |                             | 848.31  |                 |                                  |                |
|                     |              |              |                                            |                             | 870.00  |                 |                                  |                |
|                     |              |              |                                            |                             | 880.20  |                 |                                  |                |
|                     |              |              |                                            |                             | 897.60  |                 |                                  |                |
|                     |              |              |                                            |                             | 914.80  |                 |                                  |                |
|                     |              |              |                                            |                             | 925.00  |                 |                                  |                |
|                     |              |              |                                            |                             | 940.00  |                 |                                  |                |
|                     |              |              |                                            | Japan<br>J-CDMA             | 1922.40 |                 |                                  |                |
|                     |              |              |                                            |                             | 1950.00 |                 |                                  |                |
|                     |              |              |                                            |                             | 1977.60 |                 |                                  |                |

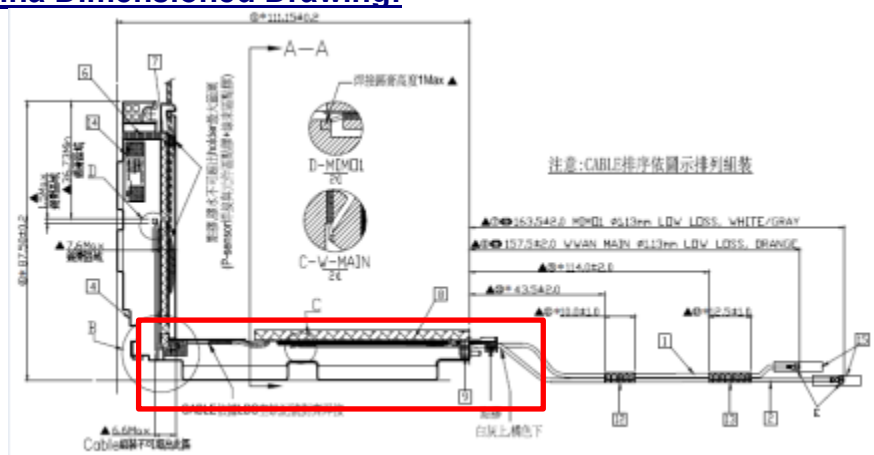
Auxiliary Antenna

| Antenna Part Number | Manufacturer | Antenna Type | Cable Assembly Part Number and Information                                                                                                     | Frequency (MHz)                 |     | Cable Loss (dB) | Peak Gain (including cable loss) |                |
|---------------------|--------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----|-----------------|----------------------------------|----------------|
|                     |              |              |                                                                                                                                                |                                 |     |                 | Horizontal (dBi)                 | Vertical (dBi) |
| DC330022J20         | SPEEDWIRE    | PIFA         | 1. Cable P/N:<br>1.13LL<br>2. Diameter: 1.13mm 50 ohm coaxial cable<br>3.Cable length:<br>275 mm<br>4. Connector P/N:<br>C87P115 or equivalent | LTE Band 20, 5G n20<br>Module:A | 832 | 0.40            | -1.94                            | -6.68          |
|                     |              |              |                                                                                                                                                |                                 | 847 | 0.40            | -1.26                            | -5.87          |
|                     |              |              |                                                                                                                                                |                                 | 862 | 0.40            | -0.96                            | -5.43          |

## **Section 2. Dimensioned Photos or Drawings of Antennas**

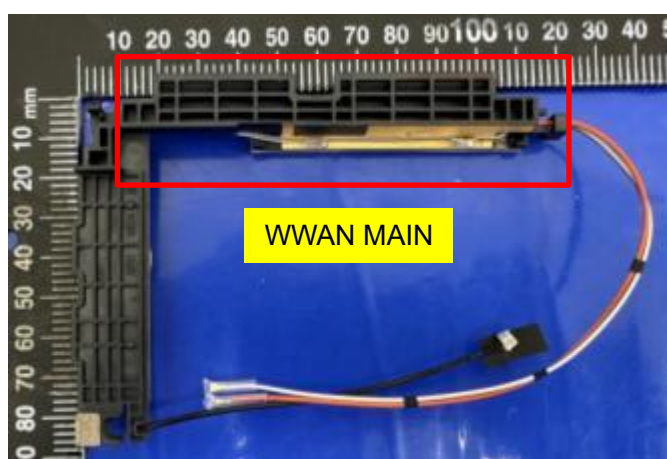
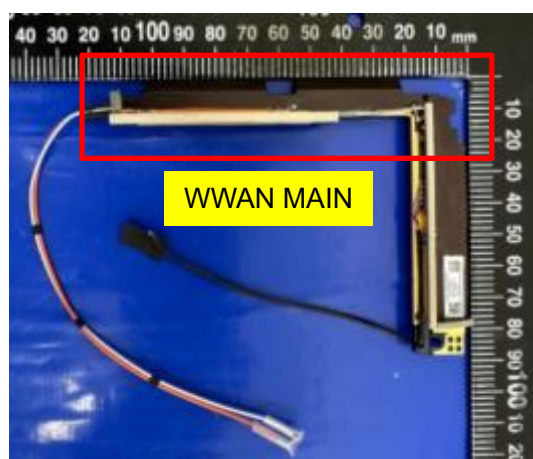
**5G sku**

### Main Antenna Dimensioned Drawing:

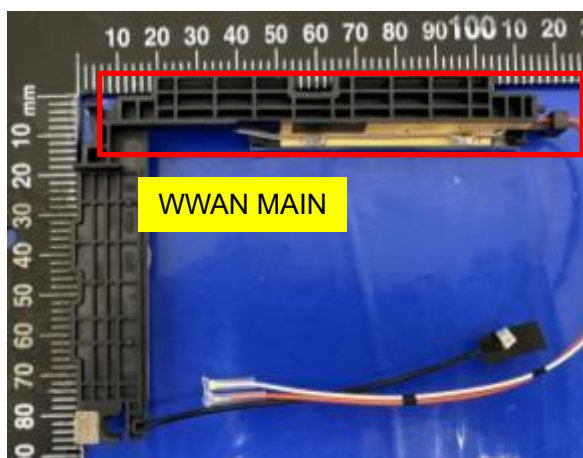
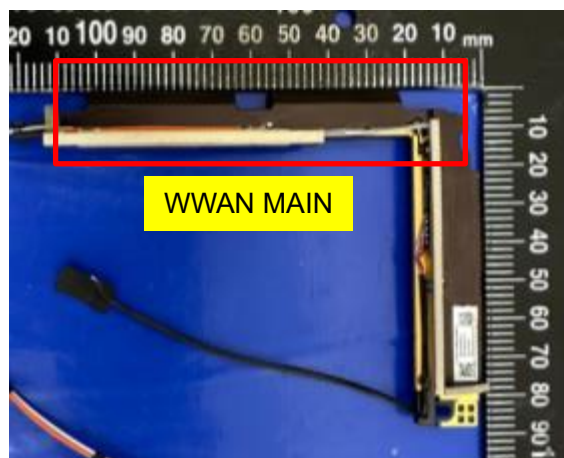


### Main Antenna Photo:

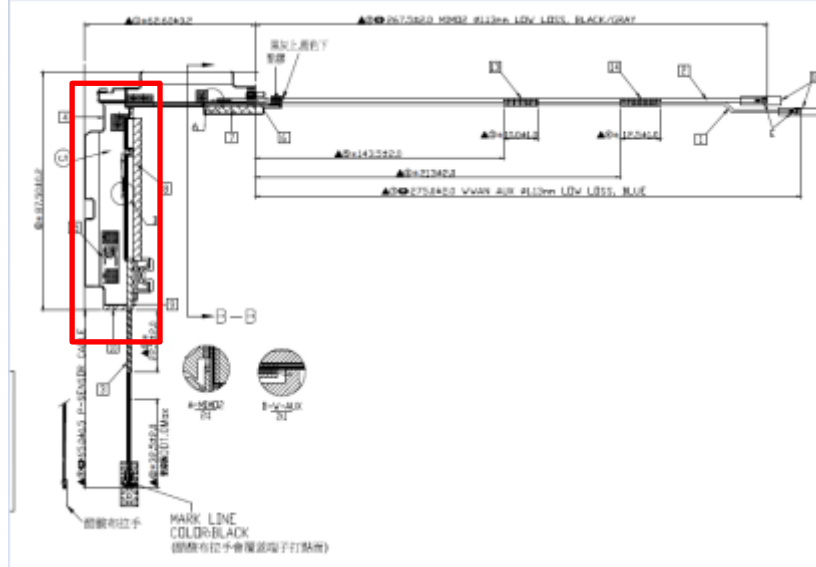
## Overall view



### Close-up view

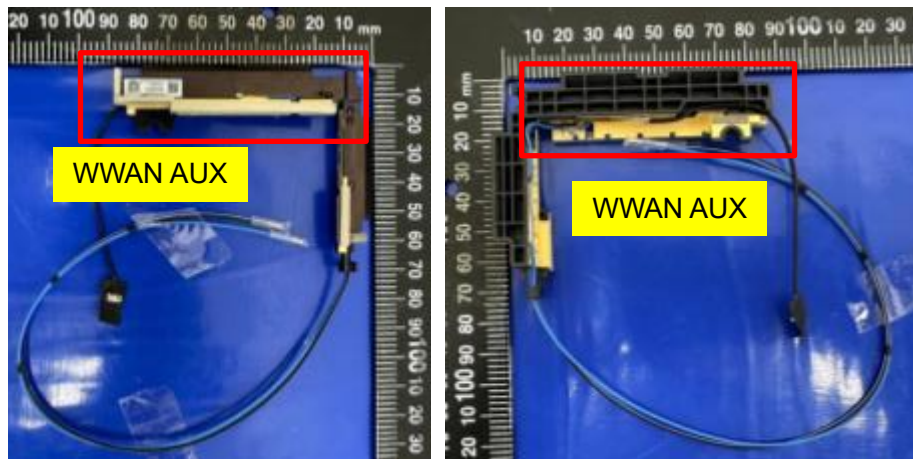


### Aux Antenna Dimensioned Drawing:

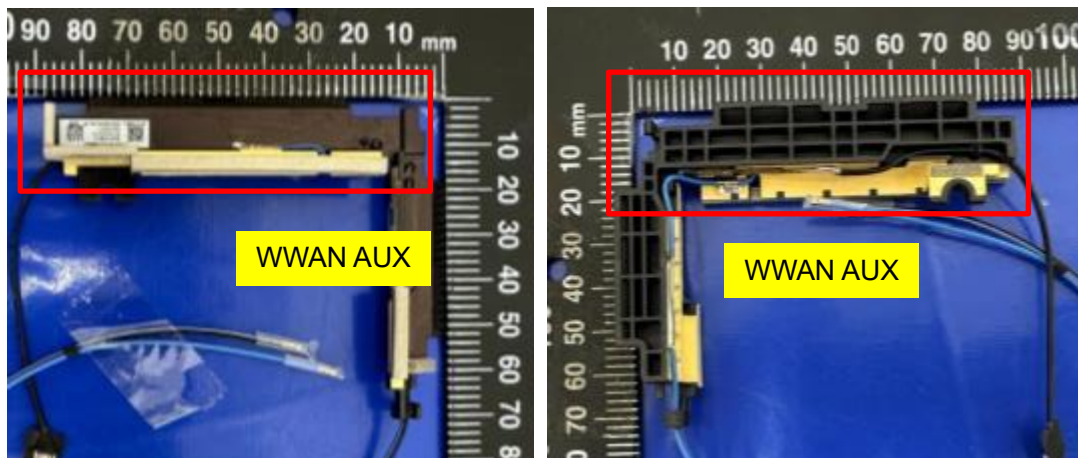


### Aux Antenna Photo:

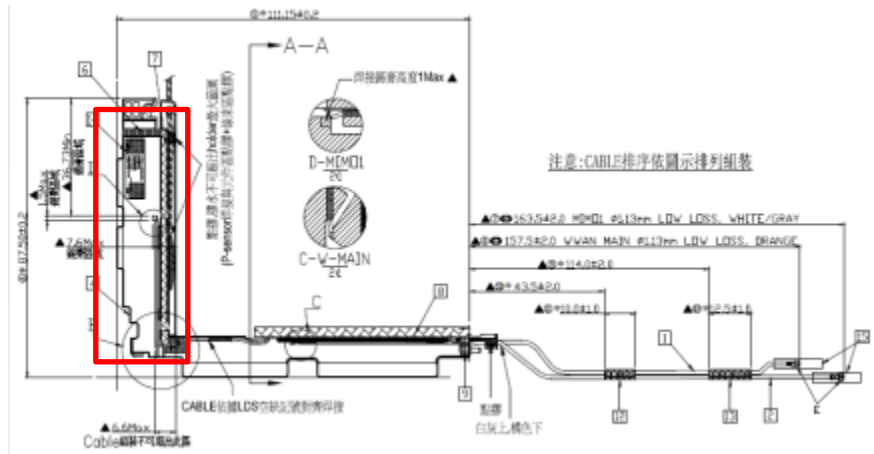
#### Overall view



#### Close-up view

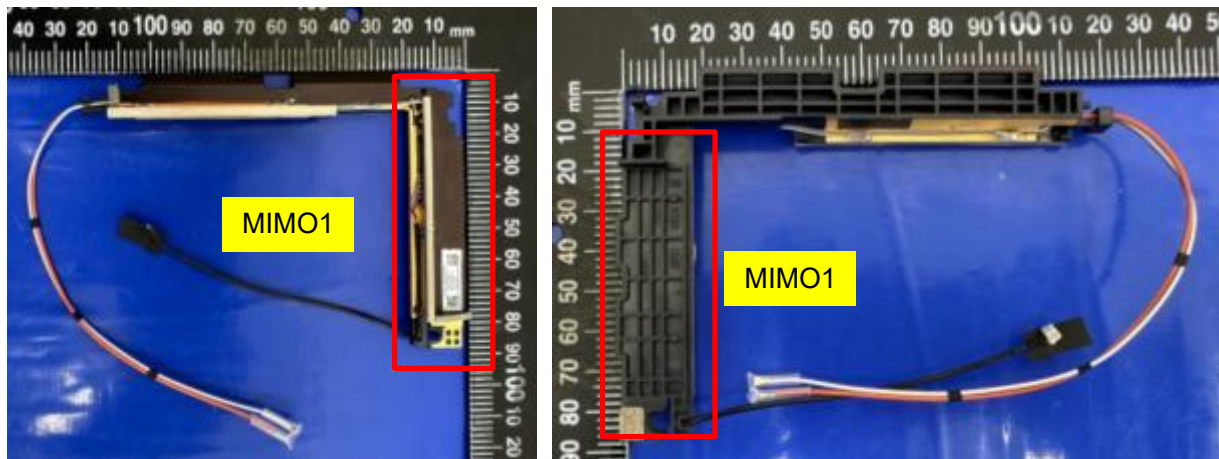


### MIMO1 Antenna Dimensioned Drawing:

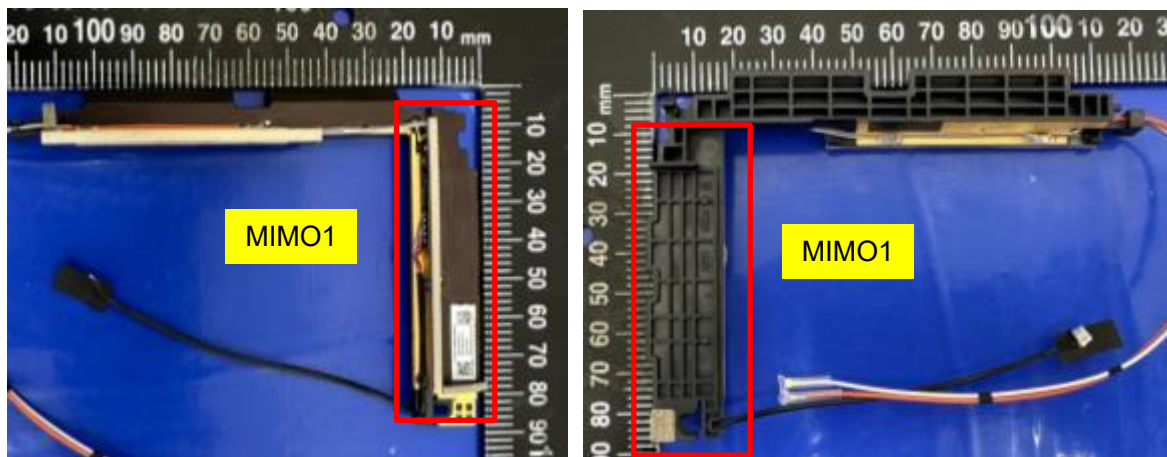


### MIMO1 Antenna Photo:

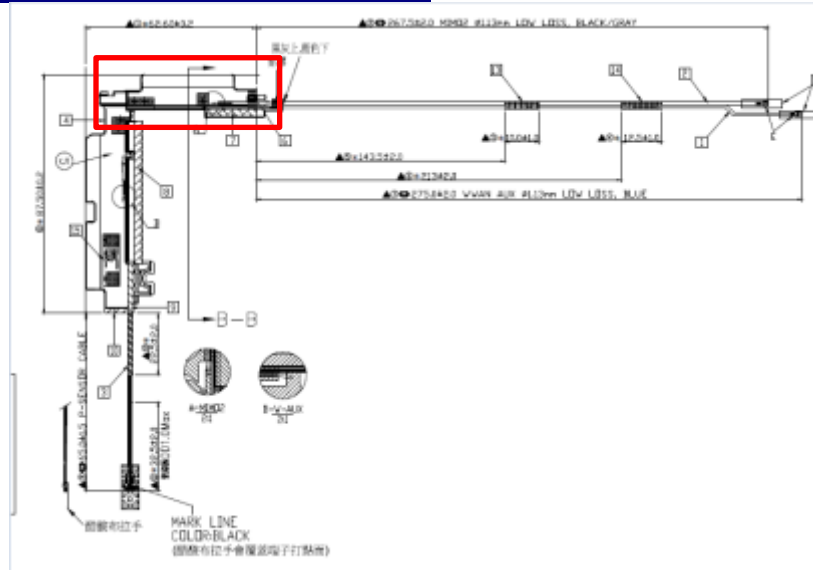
## Overall view



### Close-up view

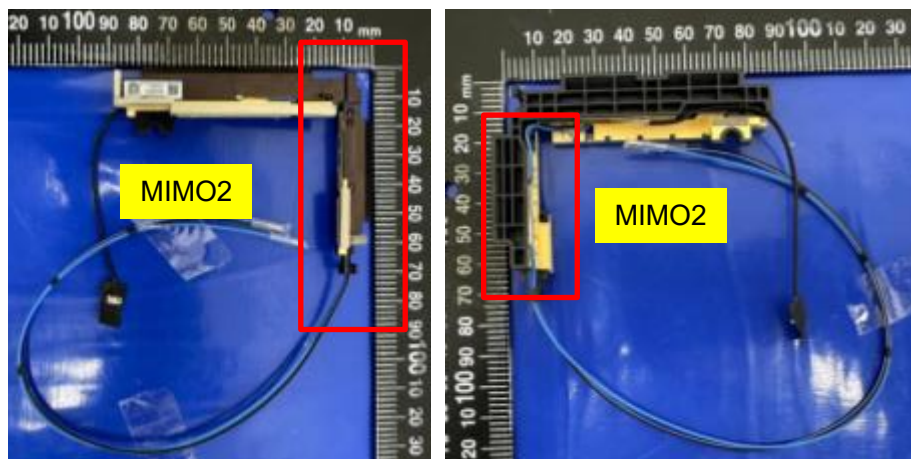


### MIMO2 Antenna Dimensioned Drawing:

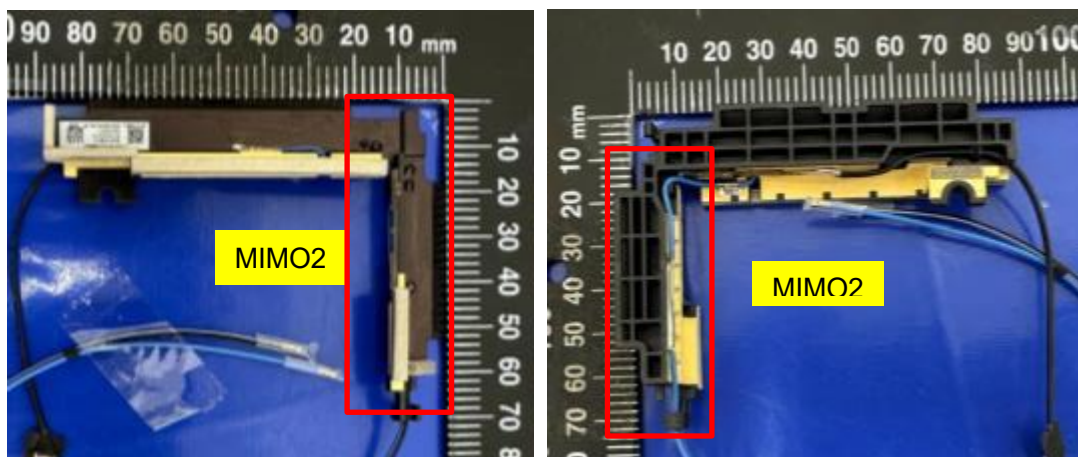


### MIMO2 Antenna Photo:

Overall view



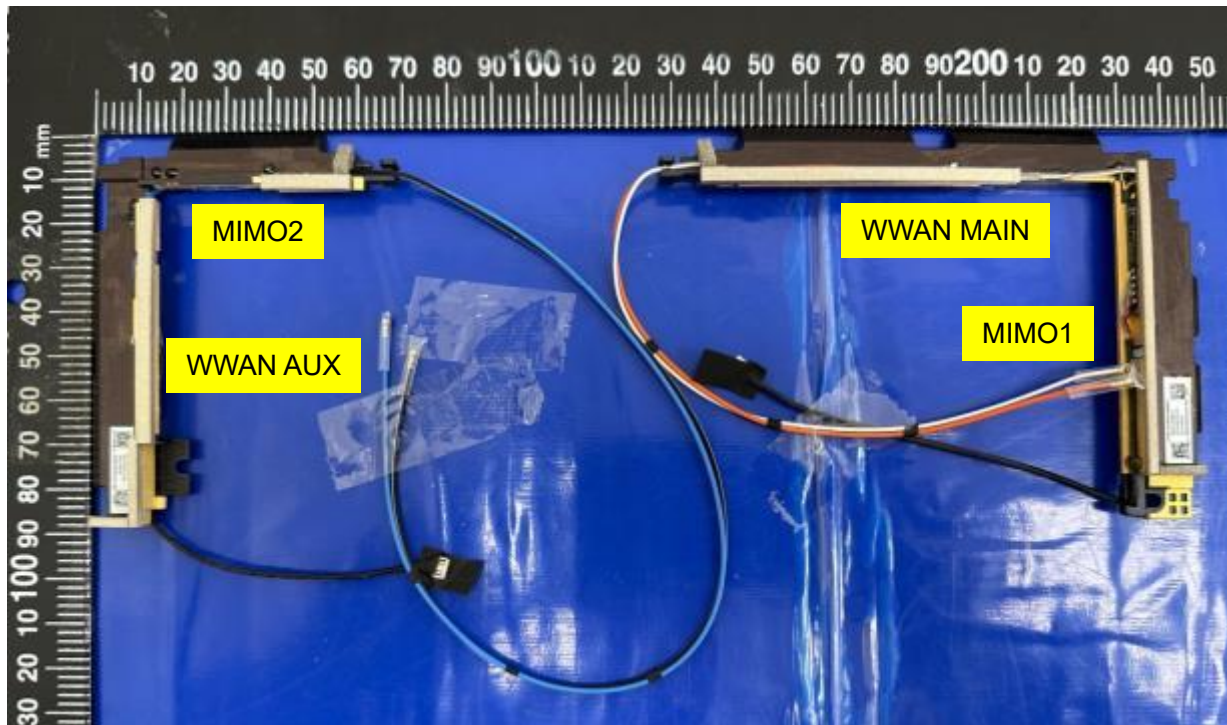
Close-up view



Trade Name: SPEEDWIRE

Model No.: DC33022J10 (WWAN MAIN / MIMO1) / DC33022J20 (WWAN AUX / MIMO2)

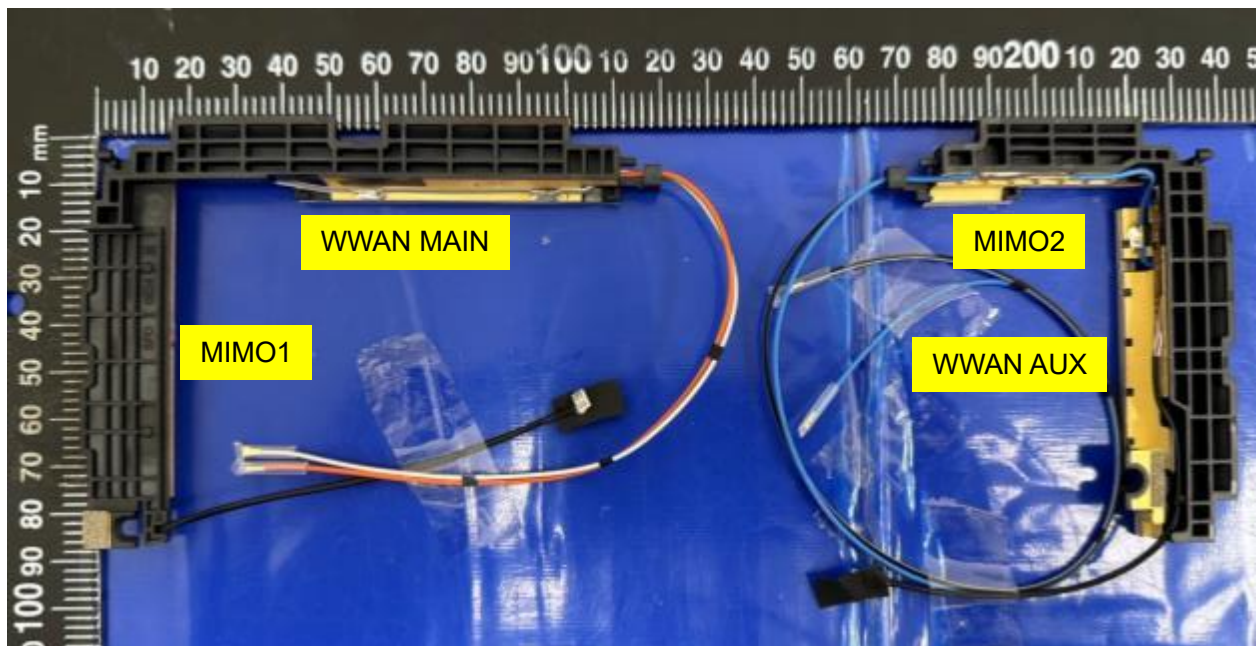
Front view



Trade Name: SPEEDWIRE

Model No.: DC33022J10(WWAN MAIN / MIMO1) / DC33022J20(WWAN AUX / MIMO2)

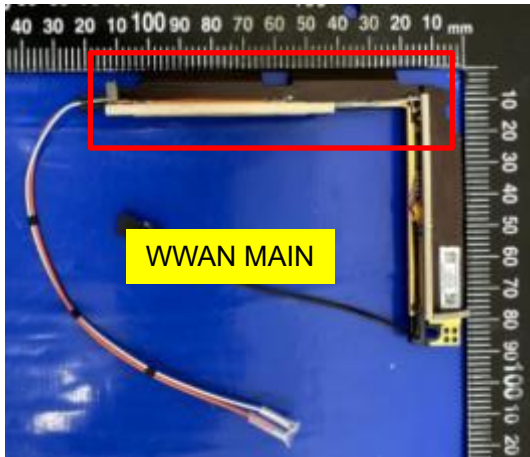
Back view



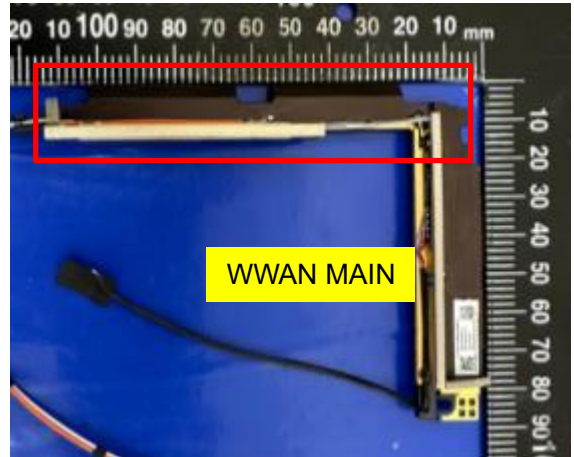
<Front View>

Trade Name: SPEEDWIRE  
Model No.: DC33022J10

Front view – Far

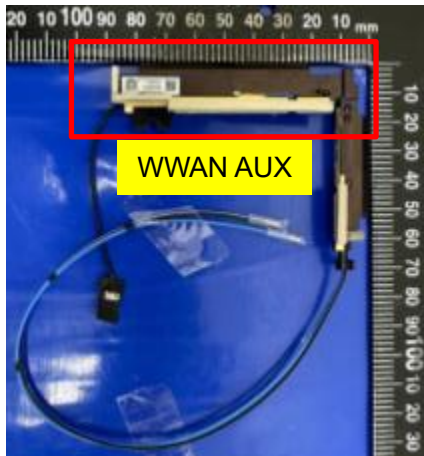


Front view – Near

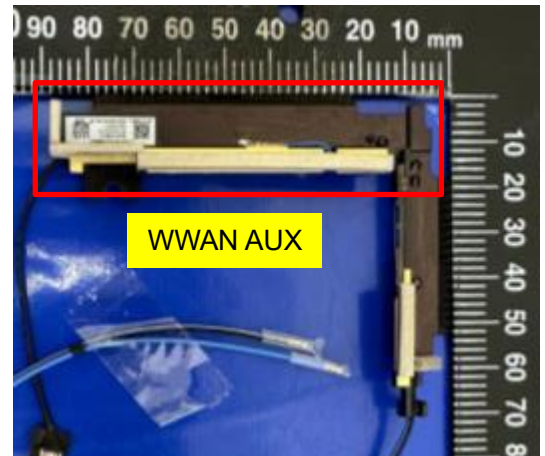


Model No.: DC33022J20

Front view – Far

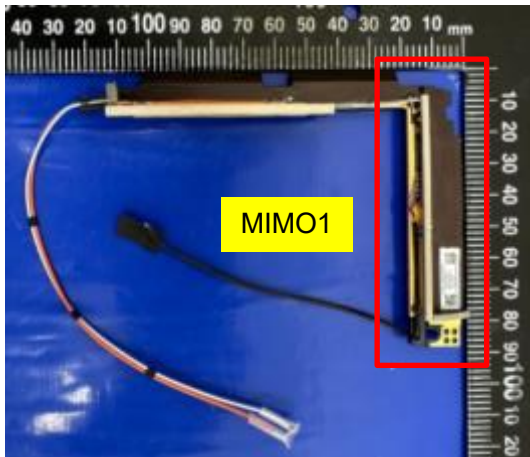


Front view – Near

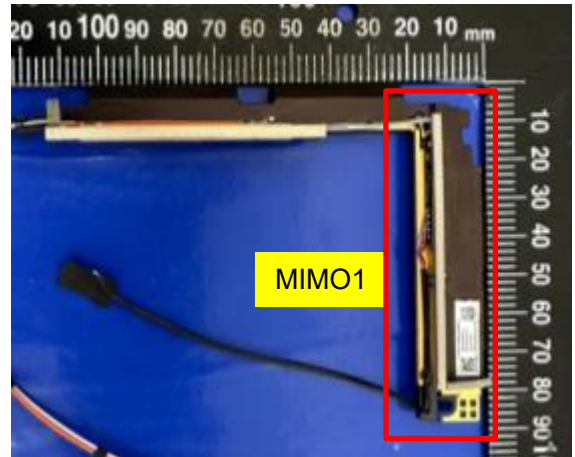


Trade Name: SPEEDWIRE  
Model No.: DC33022J10

Front view – Far

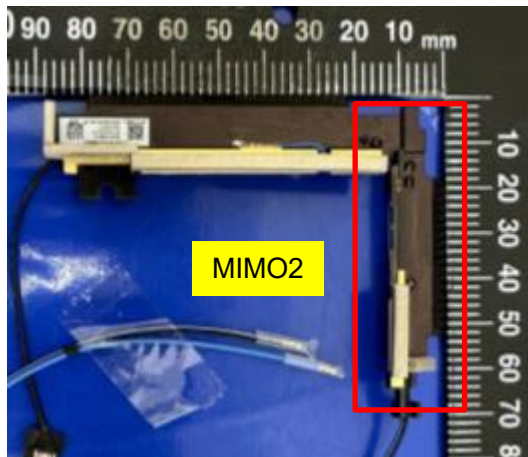


Front view – Near

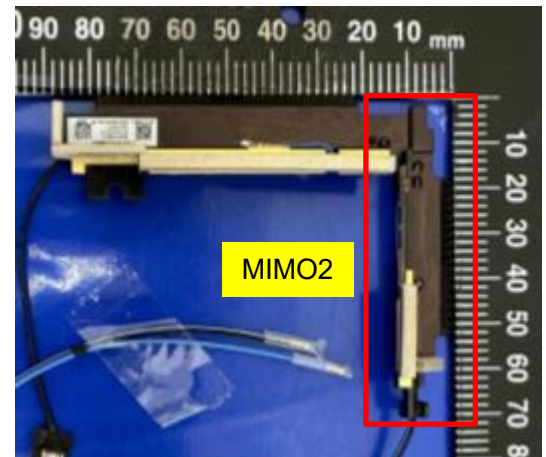


Model No.: DC33022J20

Front view – Far



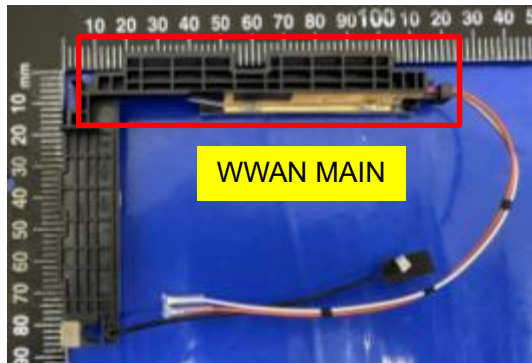
Front view – Near



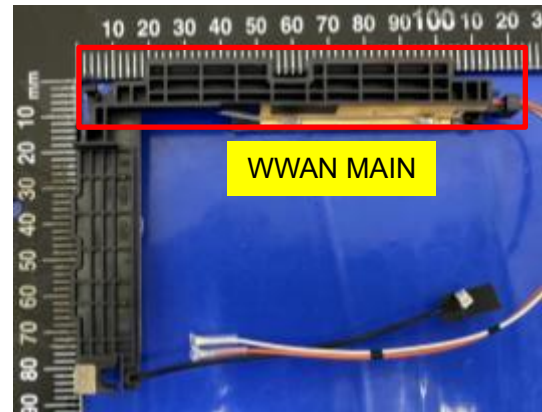
<Back View>

Trade Name: SPEEDWIRE  
Model No.: DC33022J10

Back view – Far

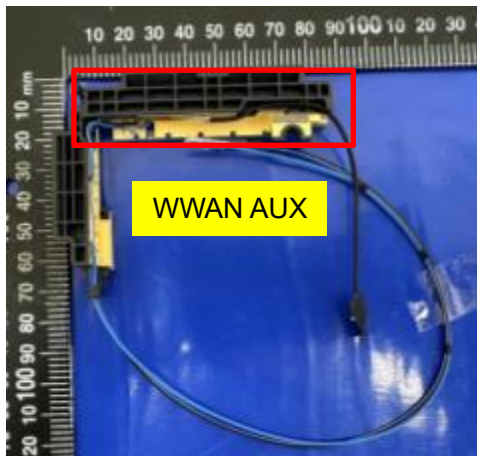


Back view – Near

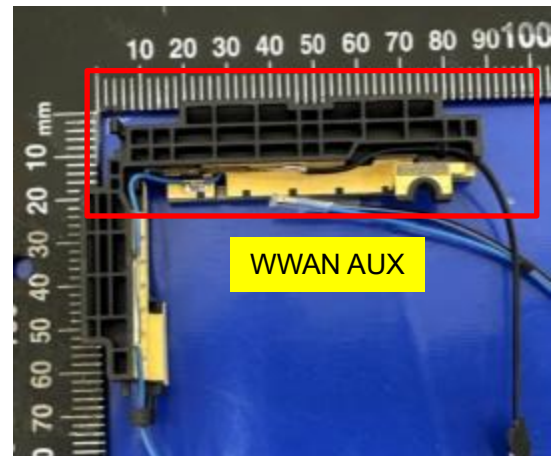


Model No.: DC33022J20

Back view – Far

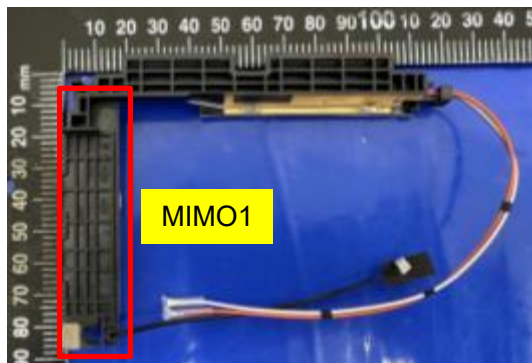


Back view – Near

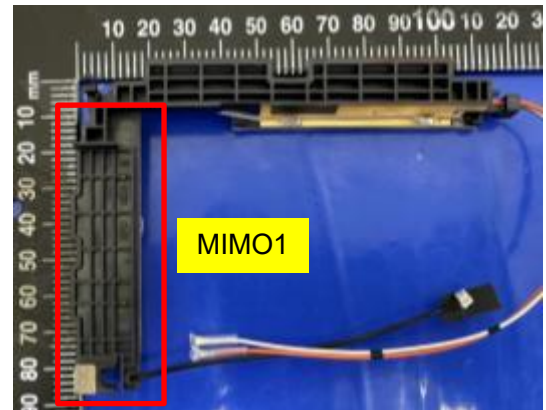


Trade Name: SPEEDWIRE  
Model No.: DC33022J10

Back view – Far

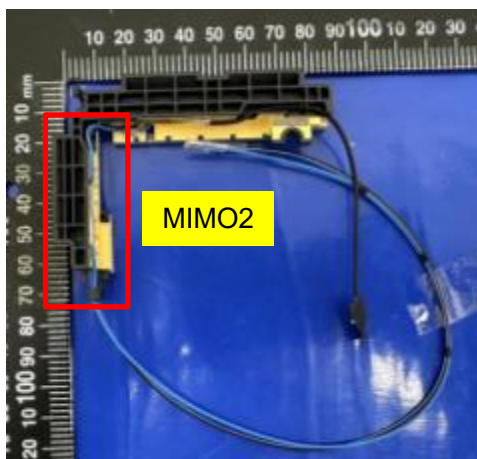


Back view – Near

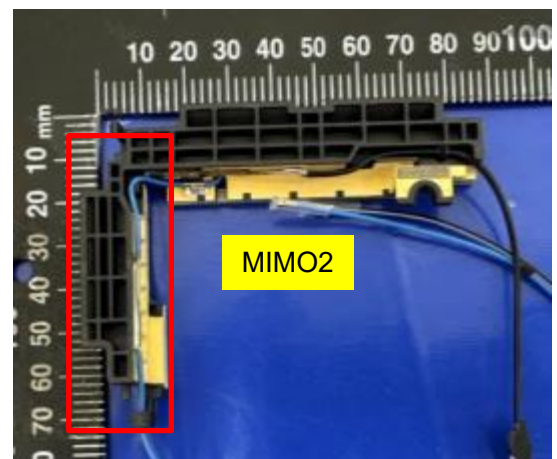


Model No.: DC33022J20

Back view – Far

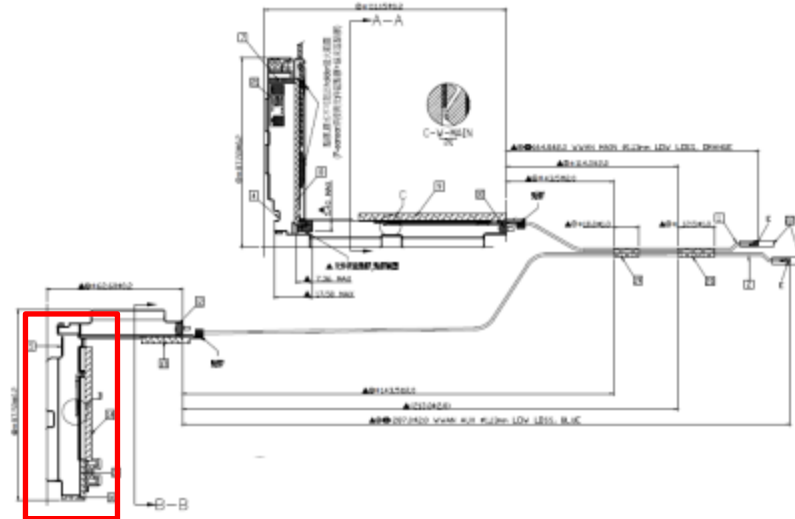


Back view – Near



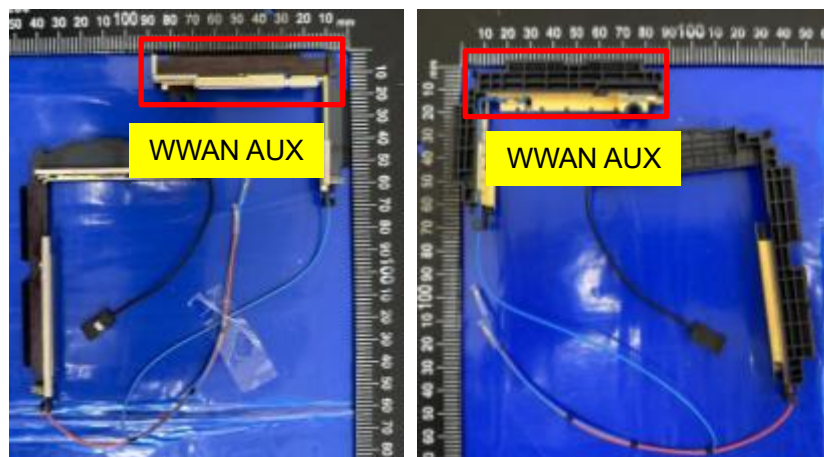


### Aux Antenna Dimensioned Drawing:

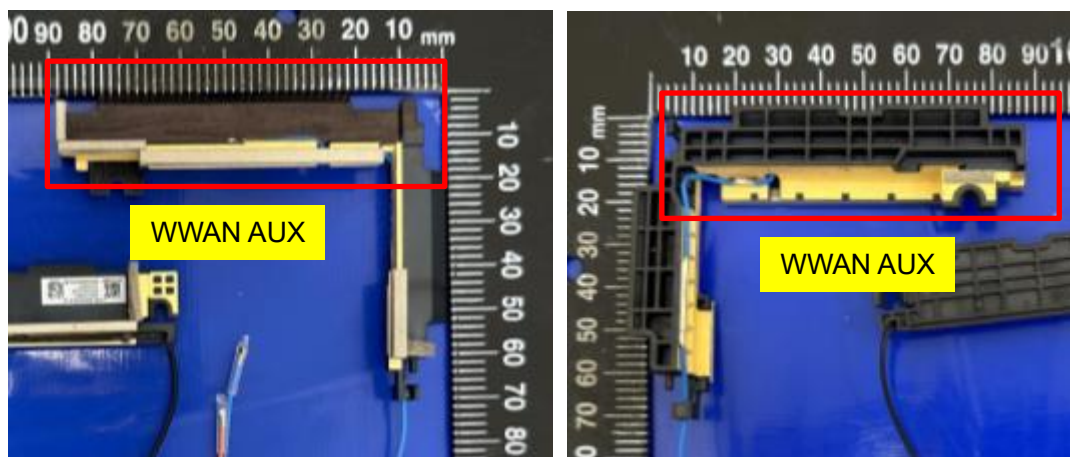


### Aux Antenna Photo:

## Overall view

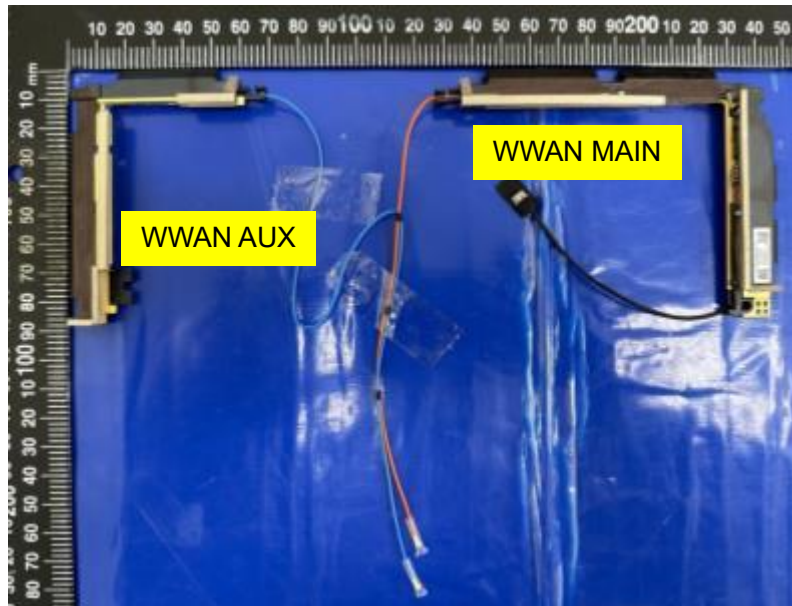


### Close-up view



Trade Name: SPEEDWIRE  
Model No.: DC33022J60

Front view



Trade Name: SPEEDWIRE  
Model No.: DC33022J60

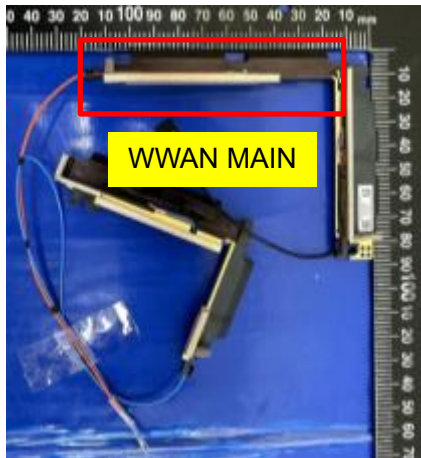
Back view



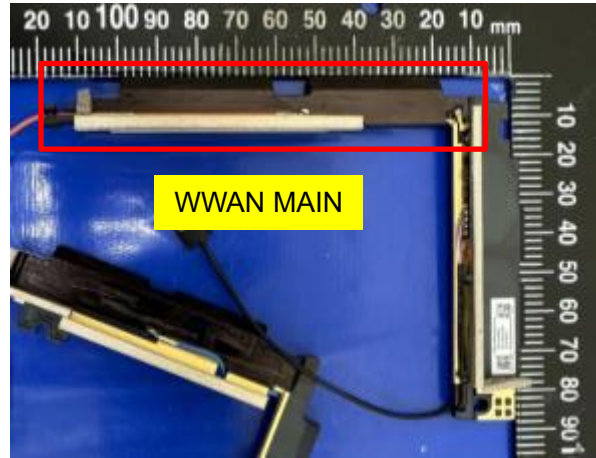
<Front View>

Trade Name: SPEEDWIRE  
Model No.: DC33022J60

Front view – Far

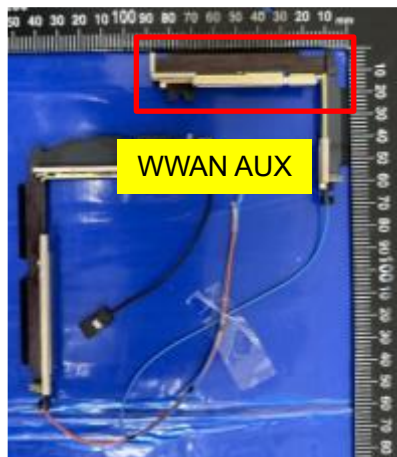


Front view – Near

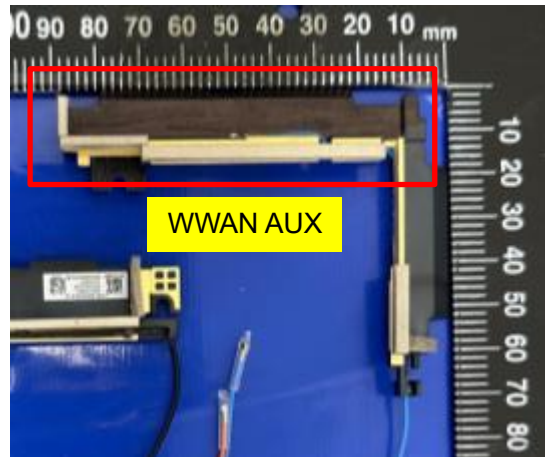


Model No.: DC33022J60

Front view – Far



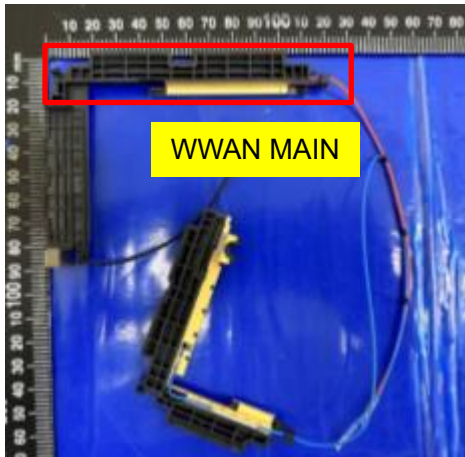
Front view – Near



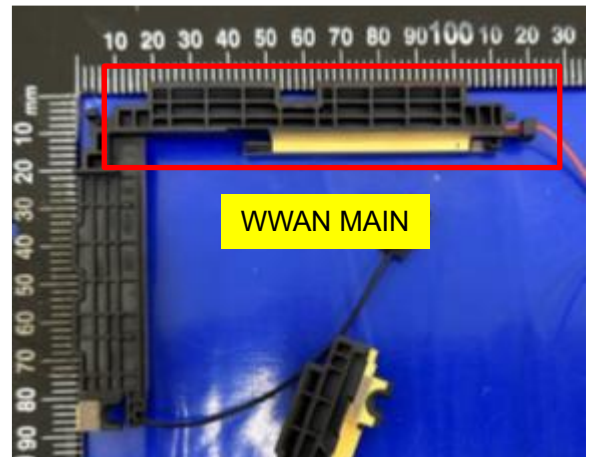
<Back View>

Trade Name: SPEEDWIRE  
Model No.: DC33022J60

Back view – Far

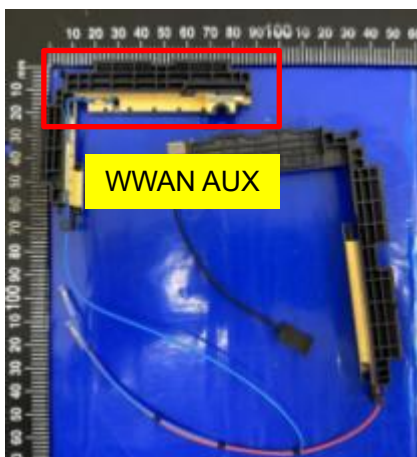


Back view – Near

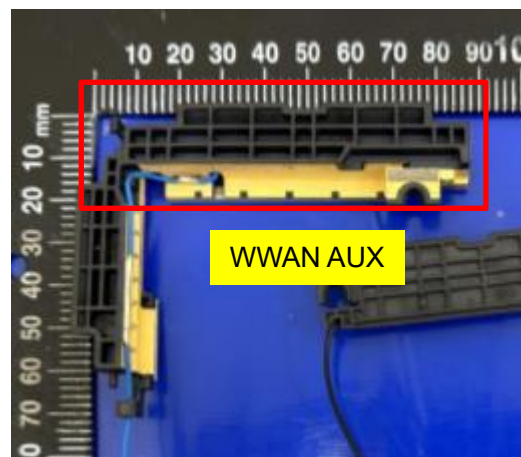


Model No.: DC33022J60

Back view – Far

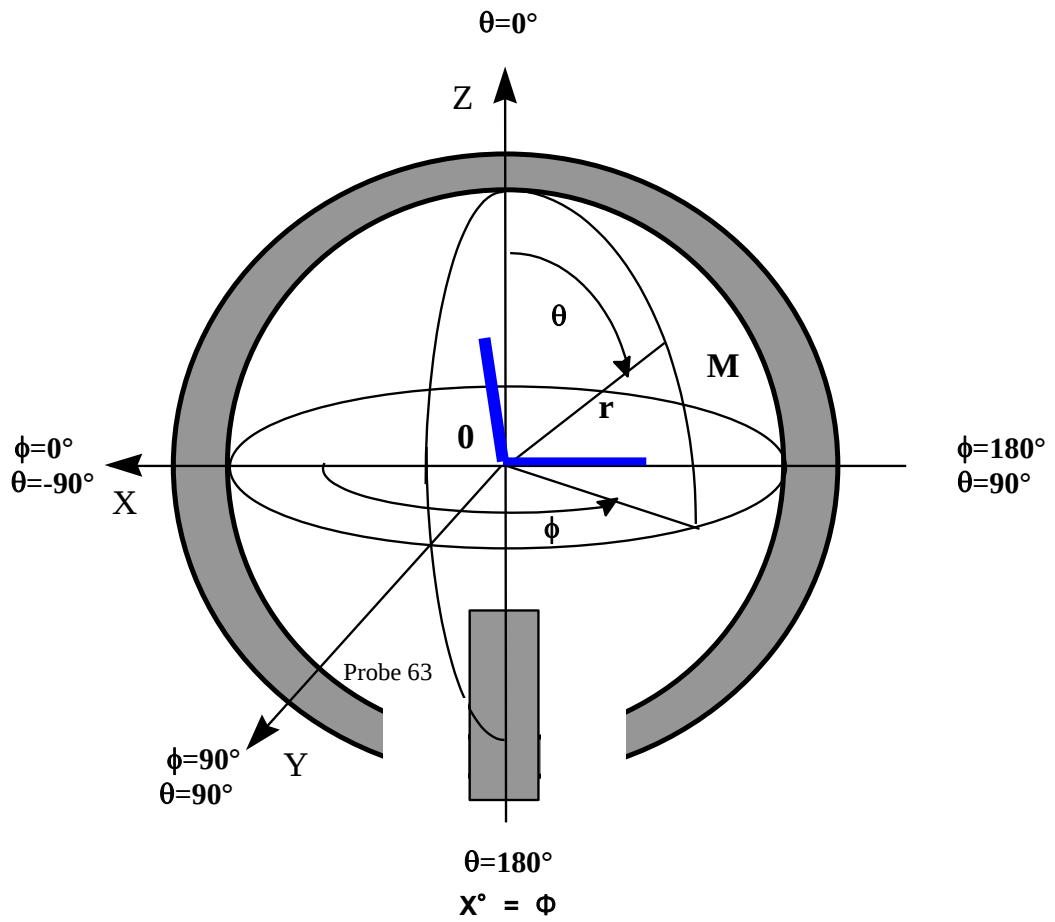


Back view – Near



## Section 3. Radiation characteristics of antenna

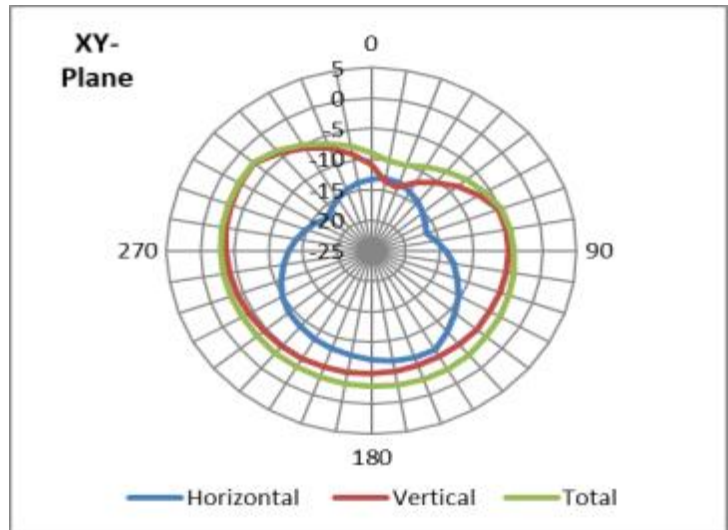
### Antenna Gain and Radiation Pattern Measuring Structure Diagram



## Radiation characteristic in 1920MHz ~ 1980MHz (UMTS/HSDPA, Band 1, n1)

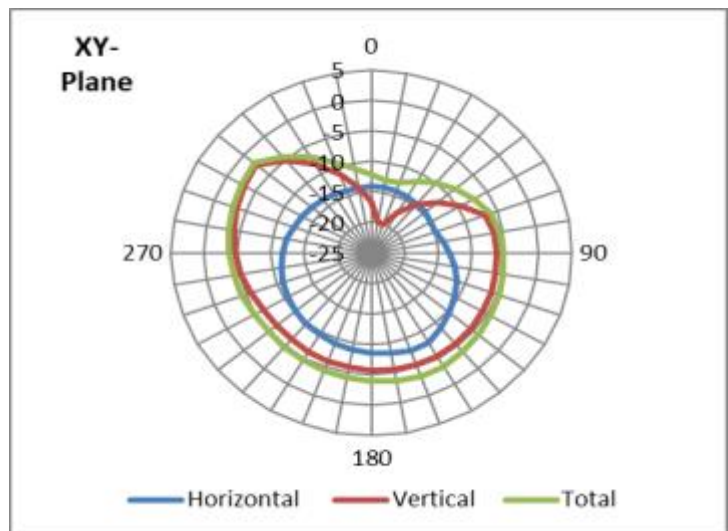
### Main antenna: 1920.00 MHz

| 1920.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -6.34 | 150 deg |
| Vertical Peak(dBi)    | -2.69 | 70 deg  |



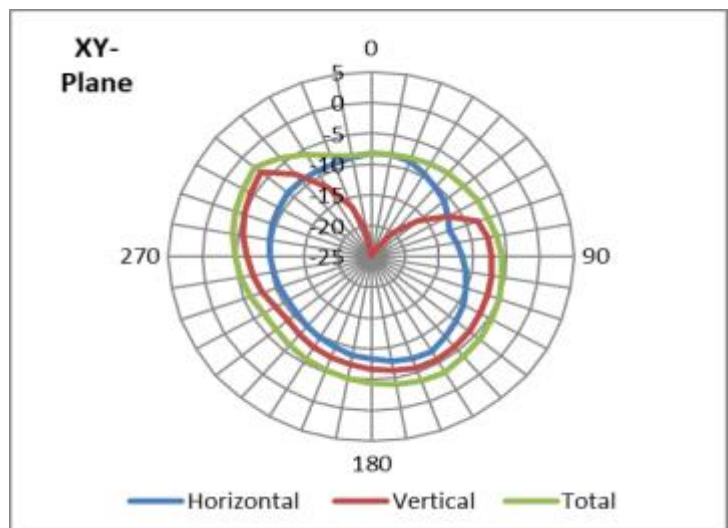
### Main antenna: 1950.00 MHz

| 1950.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -7.87 | 150 deg |
| Vertical Peak(dBi)    | -2.46 | 70 deg  |



### Main antenna: 1980.00 MHz

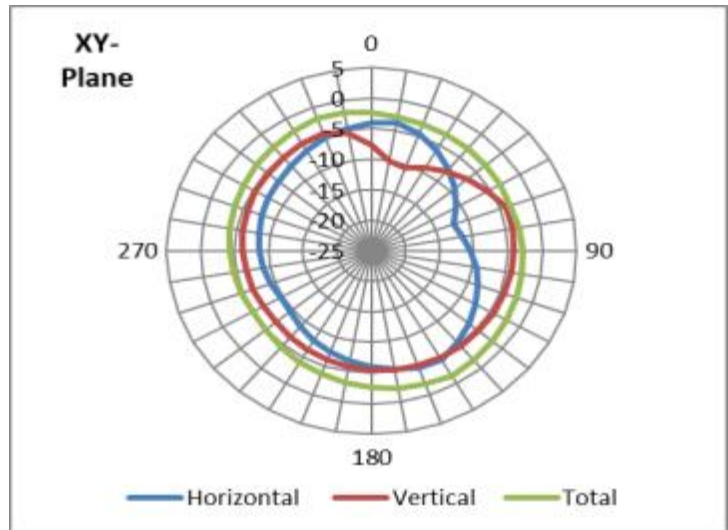
| 1980.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -7.2  | 10 deg  |
| Vertical Peak(dBi)    | -3.65 | 310 deg |



## Radiation characteristic in 1850MHz ~ 1910MHz (PCS, Band 2, n2)

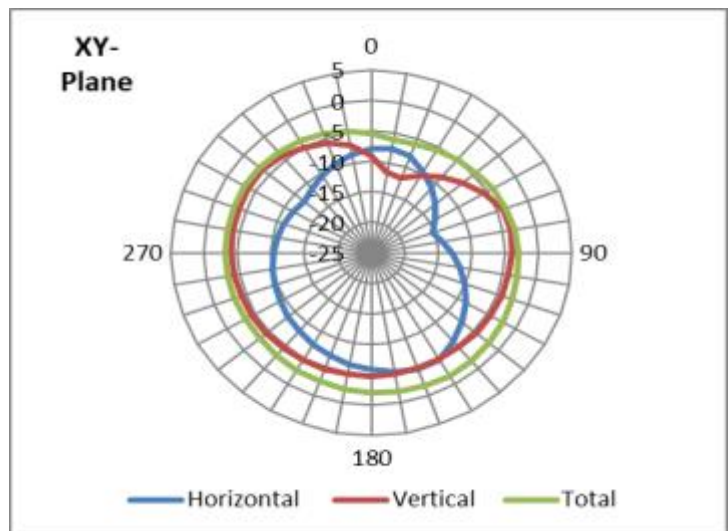
### Main antenna: 1850.00 MHz

| 1850.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.81 | 150 deg |
| Vertical Peak(dBi)    | -4    | 70 deg  |



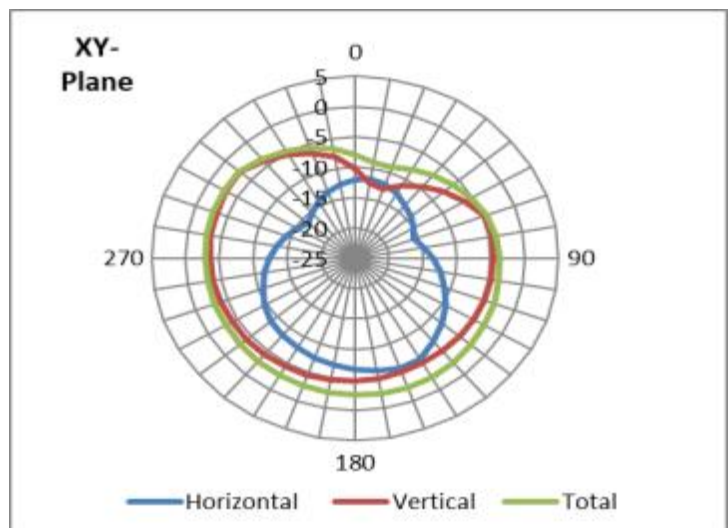
### Main antenna: 1880.00 MHz

| 1880.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.54 | 150 deg |
| Vertical Peak(dBi)    | -3.69 | 70 deg  |



### Main antenna: 1910.00 MHz

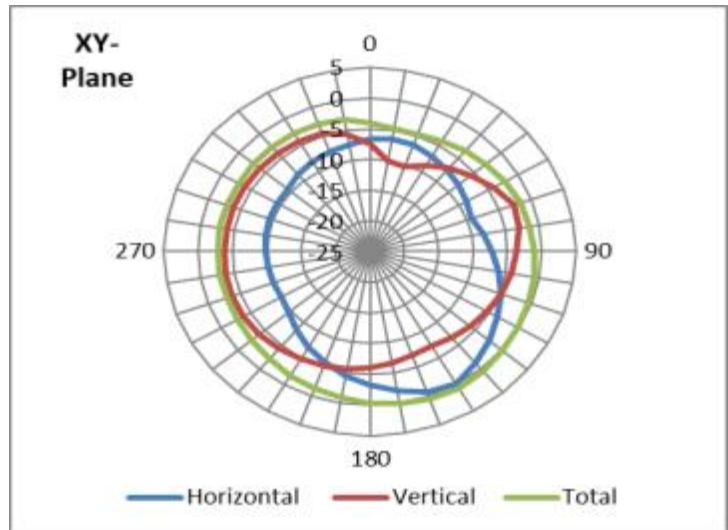
| 1910.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -5.69 | 150 deg |
| Vertical Peak(dBi)    | -2.96 | 70 deg  |



## Radiation characteristic in 1710MHz ~ 1785MHz ( UE-UTRA, Band 3, n3)

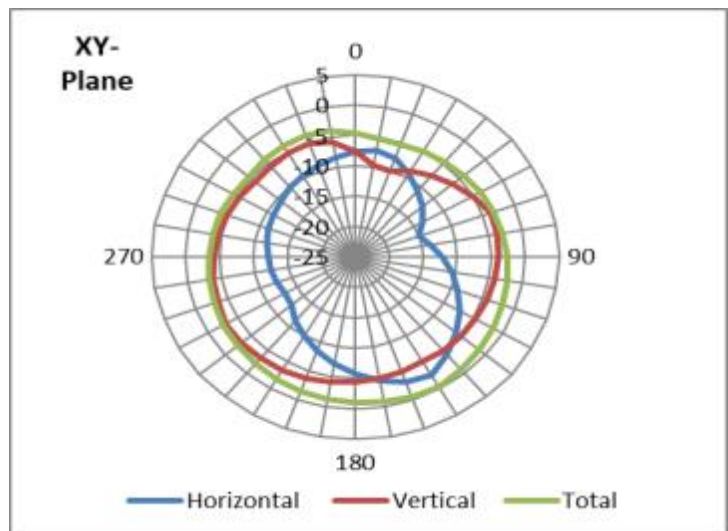
### Main antenna: 1710.00 MHz

| 1710.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.06 | 150 deg |
| Vertical Peak(dBi)    | -2.73 | 70 deg  |



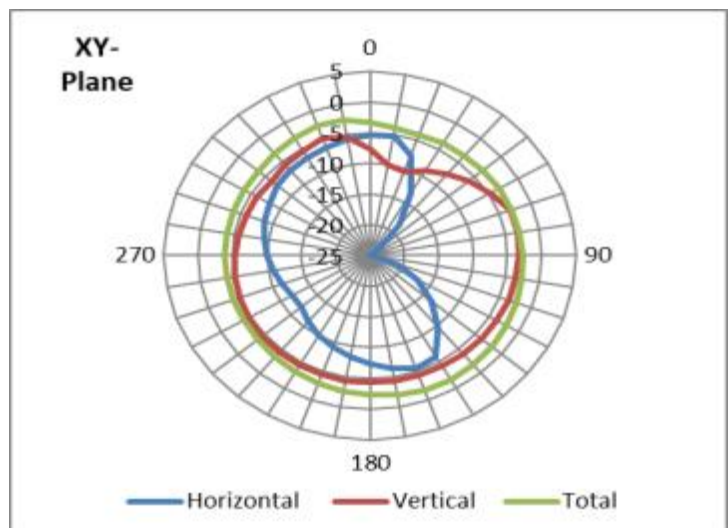
### Main antenna: 1747.50 MHz

| 1747.50 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.46 | 150 deg |
| Vertical Peak(dBi)    | -2.93 | 70 deg  |



### Main antenna: 1785.00 MHz

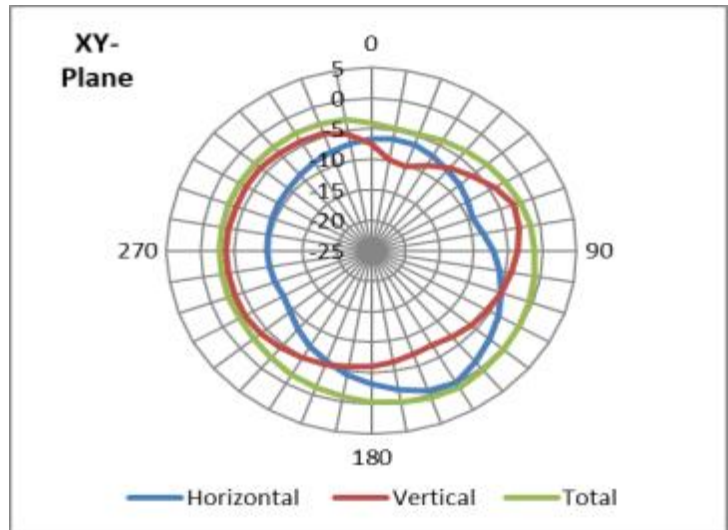
| 1785.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -5.18 | 150 deg |
| Vertical Peak(dBi)    | -3.2  | 70 deg  |



## Radiation characteristic in 1710MHz ~ 1755MHz ( UMTS(AWS), Band 4)

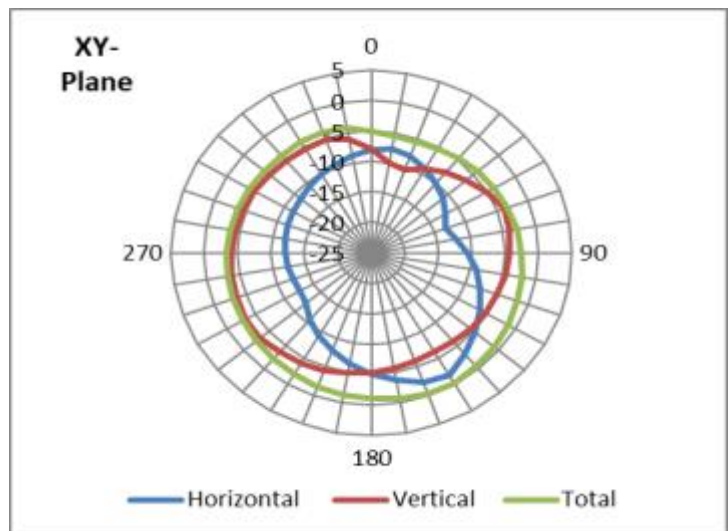
### Main antenna: 1710.00 MHz

| 1710.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.06 | 150 deg |
| Vertical Peak(dBi)    | -2.73 | 70 deg  |



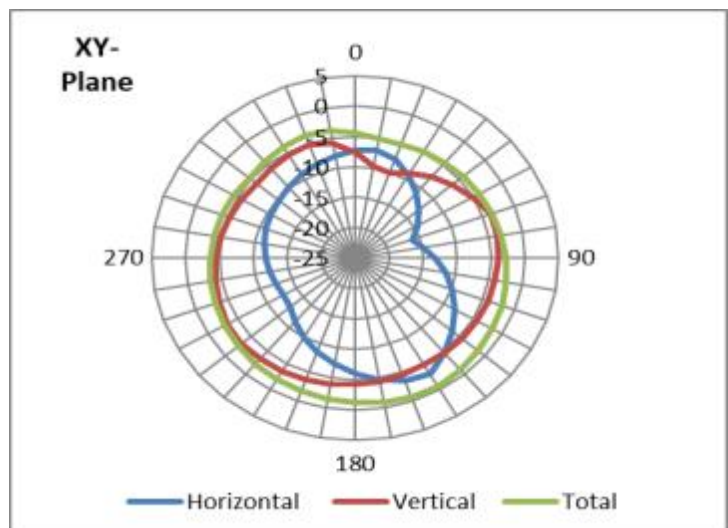
### Main antenna: 1732.50 MHz

| 1732.50 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.72 | 150 deg |
| Vertical Peak(dBi)    | -3.25 | 70 deg  |



### Main antenna: 1755.00 MHz

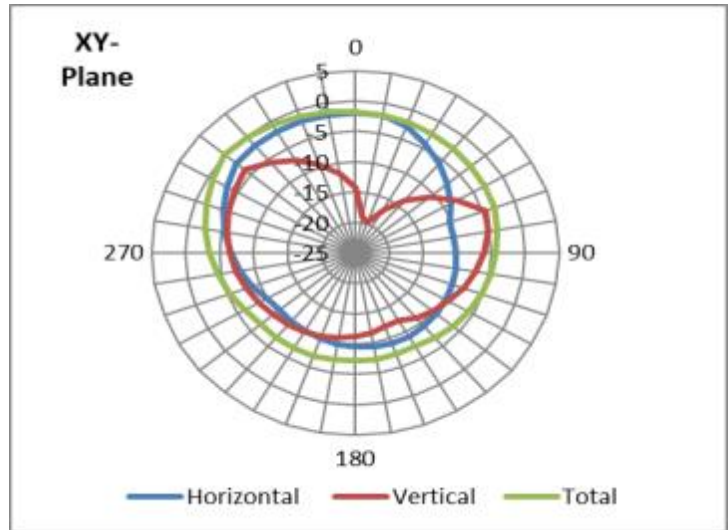
| 1755.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.99 | 150 deg |
| Vertical Peak(dBi)    | -3.11 | 70 deg  |



## Radiation characteristic in 824MHz ~ 849MHz (Cellular, Band 5, n5)

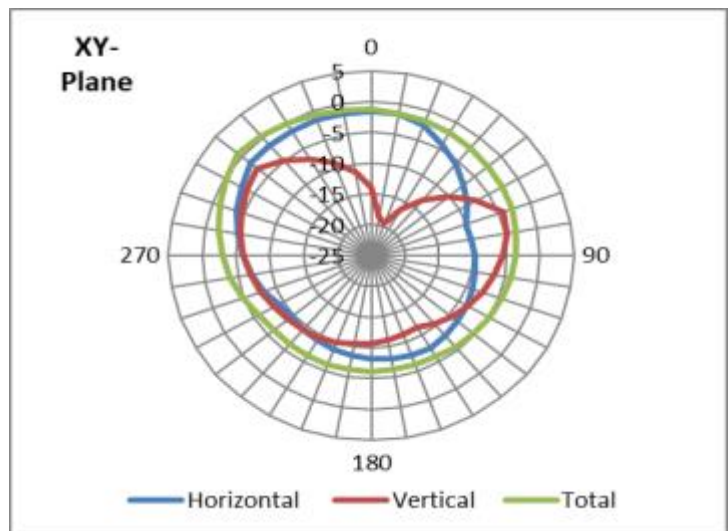
### Main antenna: 824.00 MHz

| 824.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.96 | 350 deg |
| Vertical Peak(dBi)    | -3.7  | 310 deg |



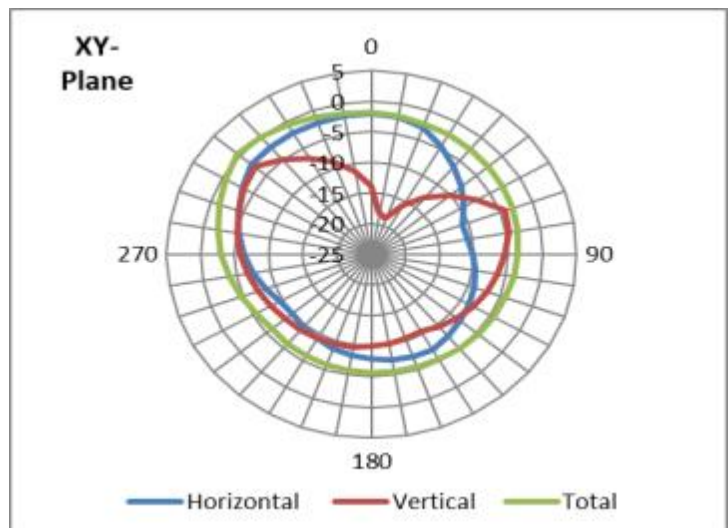
### Main antenna: 836.50 MHz

| 836.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.59 | 350 deg |
| Vertical Peak(dBi)    | -3.07 | 310 deg |



### Main antenna: 849.0 MHz

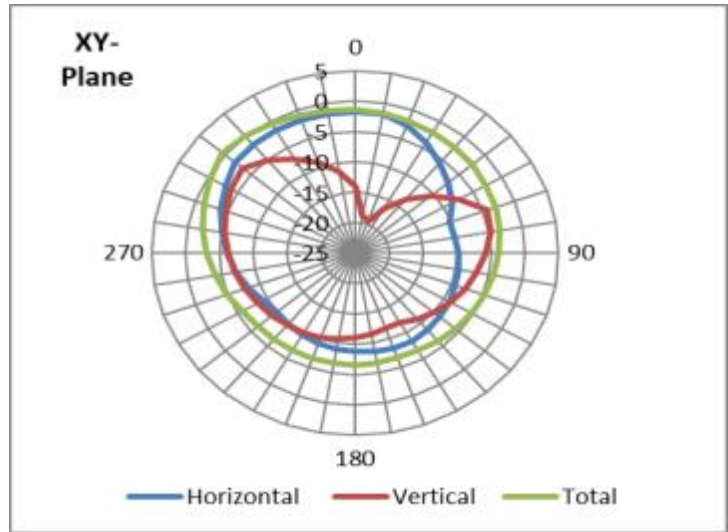
| 849.0 MHz             |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.09 | 350 deg |
| Vertical Peak(dBi)    | -2.84 | 310 deg |



## Radiation characteristic in 830MHz ~ 840MHz (Band 6)

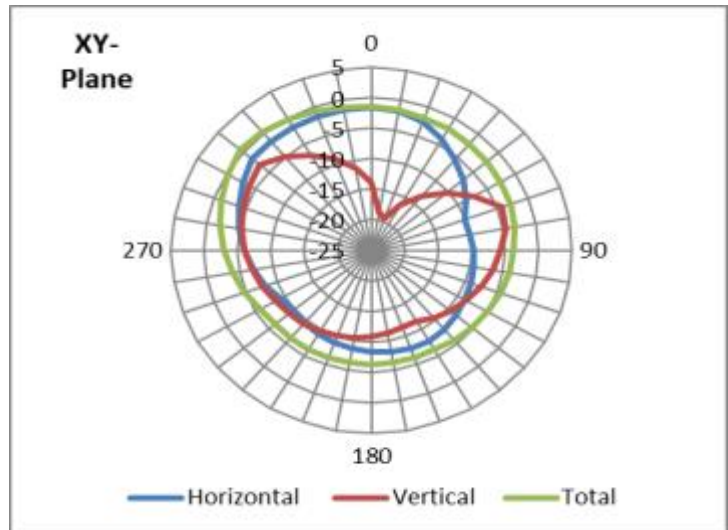
### Main antenna: 830.00 MHz

| 830.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.68 | 350 deg |
| Vertical Peak(dBi)    | -3.21 | 310 deg |



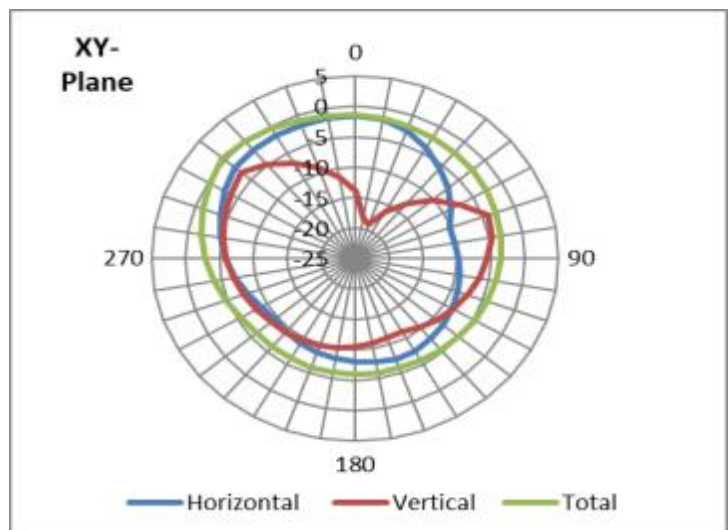
### Main antenna: 835.00 MHz

| 835.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.6  | 350 deg |
| Vertical Peak(dBi)    | -3.08 | 310 deg |



### Main antenna: 840.00 MHz

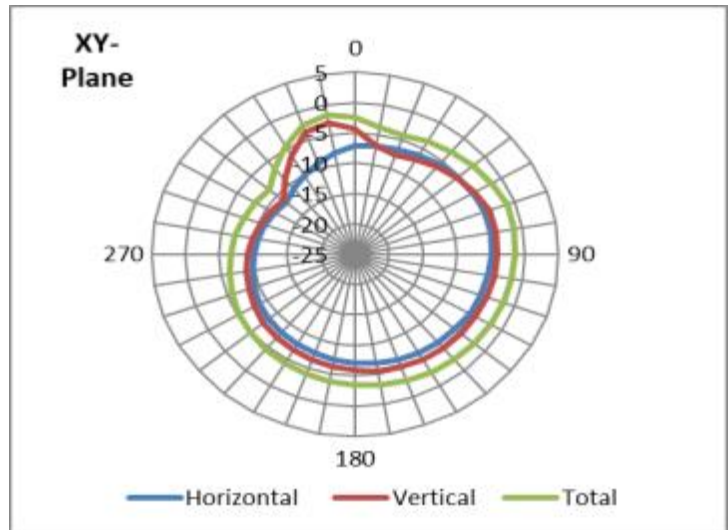
| 840.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.65 | 350 deg |
| Vertical Peak(dBi)    | -3.01 | 310 deg |



## Radiation characteristic in 2500MHz ~ 2570MHz (UE-UTRA, Band 7, n7)

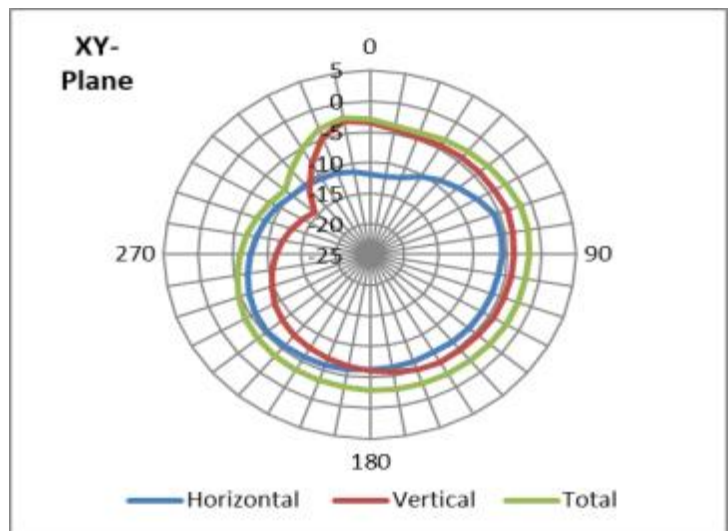
### Main antenna: 2500.00 MHz

| 2500.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.43 | 50 deg  |
| Vertical Peak(dBi)    | -2.97 | 350 deg |



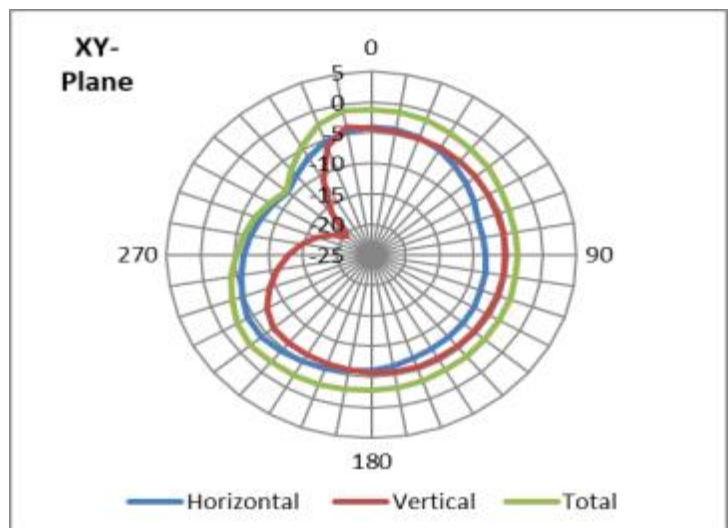
### Main antenna: 2535.00 MHz

| 2535.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -5.42 | 200 deg |
| Vertical Peak(dBi)    | -3.07 | 350 deg |



### Main antenna: 2570.00 MHz

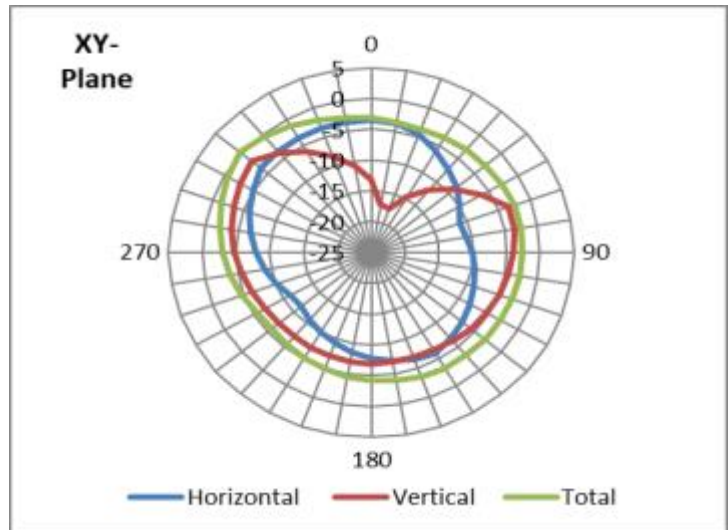
| 2570.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.04 | 200 deg |
| Vertical Peak(dBi)    | -3.81 | 90 deg  |



## Radiation characteristic in 880MHz ~ 915MHz (Band 8, n8)

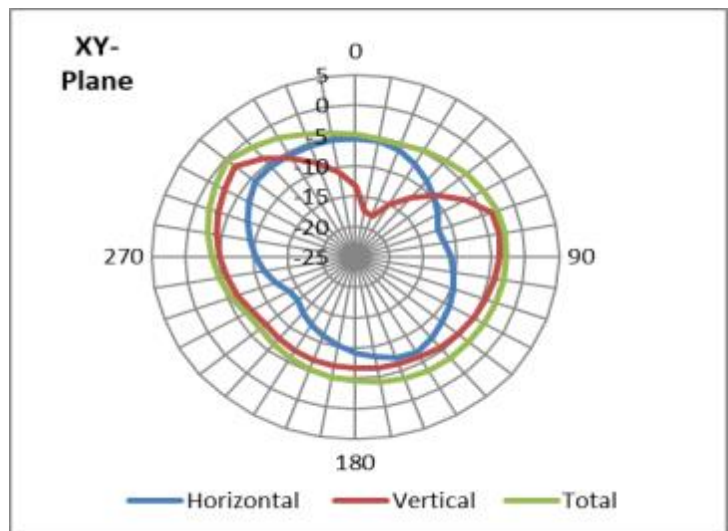
### Main antenna: 880.00 MHz

| 880.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.52 | 350 deg |
| Vertical Peak(dBi)    | -1.9  | 310 deg |



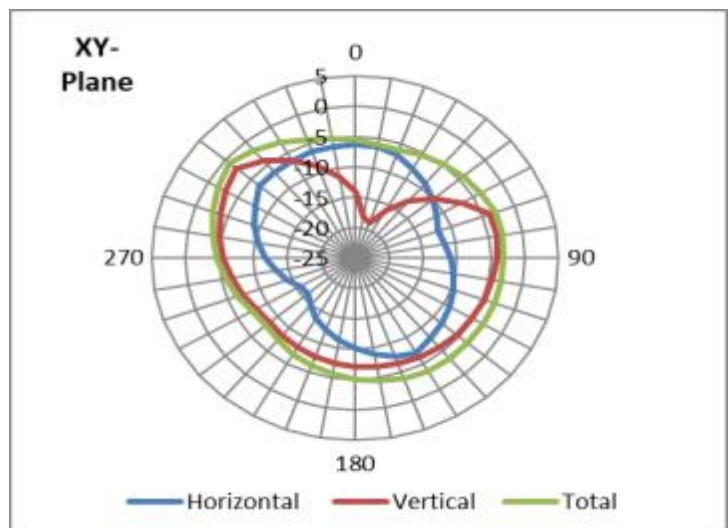
### Main antenna: 897.50 MHz

| 897.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -5.51 | 350 deg |
| Vertical Peak(dBi)    | -1.89 | 310 deg |



### Main antenna: 915.00 MHz

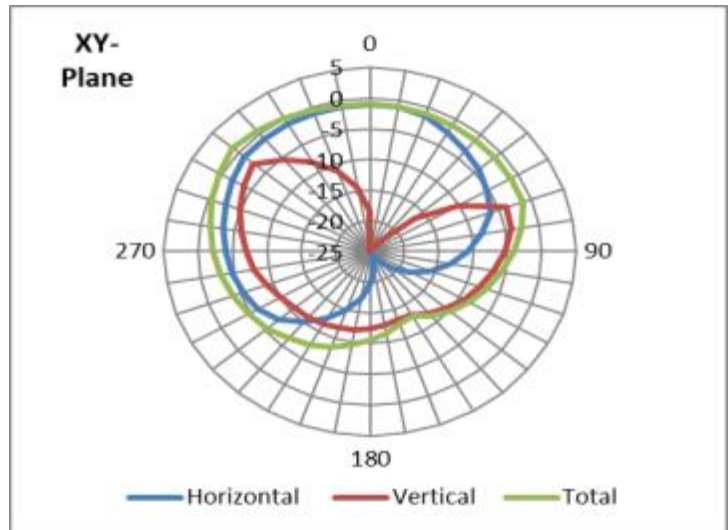
| 915.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -6.31 | 350 deg |
| Vertical Peak(dBi)    | -2.03 | 310 deg |



## Radiation characteristic in 699MHz ~ 716MHz (UE-UTRA, Band 12, n12)

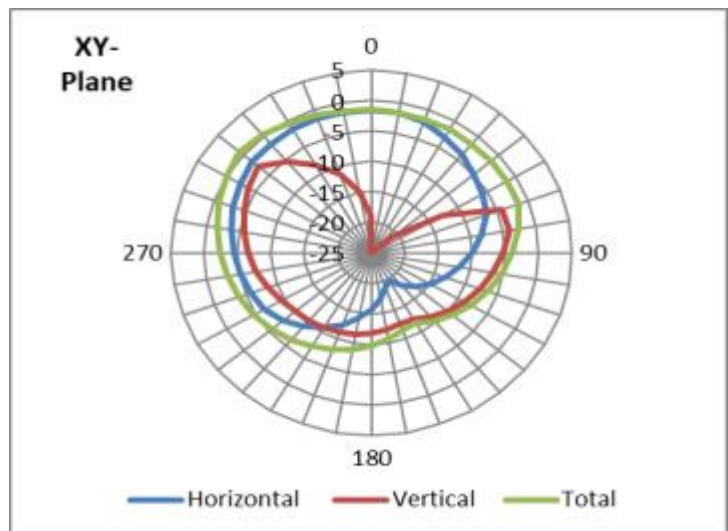
### Main antenna: 699.00 MHz

| 699.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1    | 350 deg |
| Vertical Peak(dBi)    | -2.82 | 310 deg |



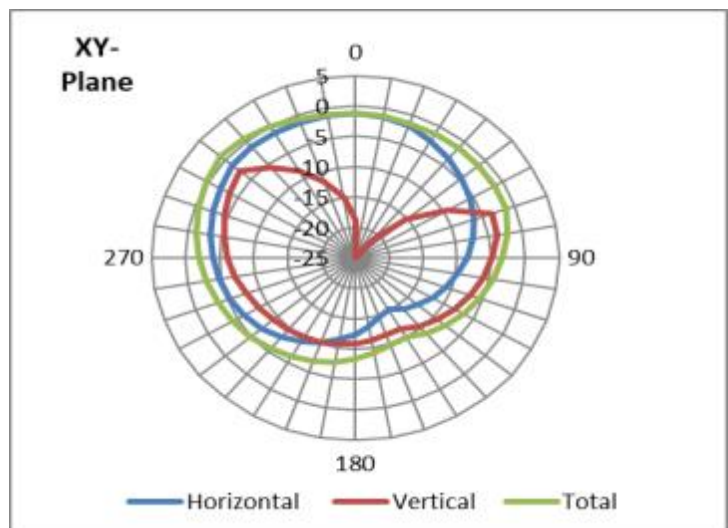
### Main antenna: 707.50 MHz

| 707.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.54 | 350 deg |
| Vertical Peak(dBi)    | -2.84 | 310 deg |



### Main antenna: 716.00 MHz

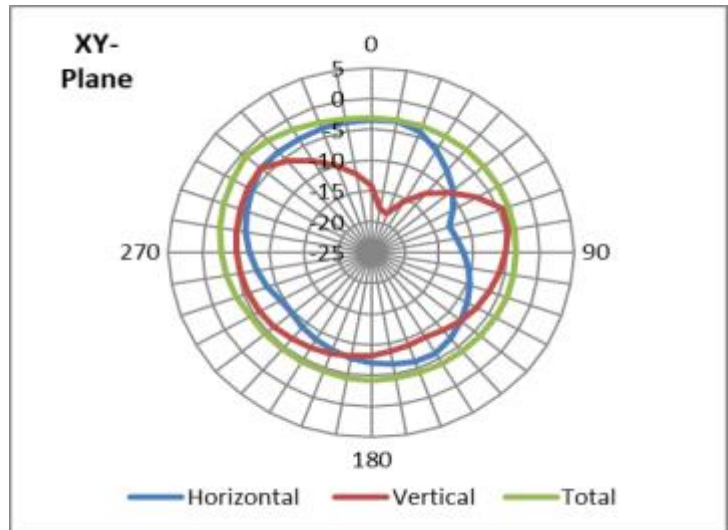
| 716.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.23 | 350 deg |
| Vertical Peak(dBi)    | -2.81 | 310 deg |



## Radiation characteristic in 776MHz ~ 787MHz (UE-UTRA, Band 13)

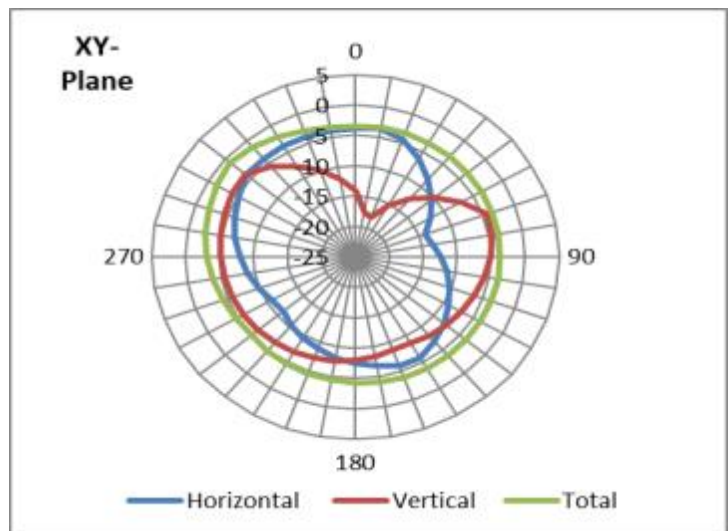
### Main antenna: 777.00 MHz

| 777.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.31 | 350 deg |
| Vertical Peak(dBi)    | -3.76 | 310 deg |



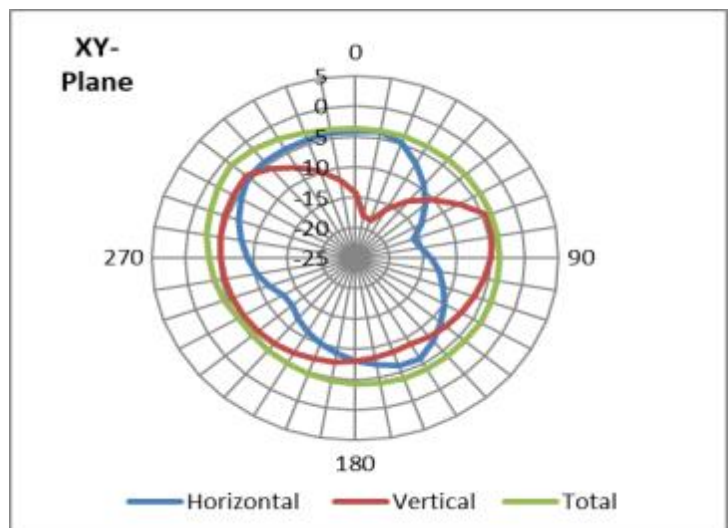
### Main antenna: 782.00 MHz

| 782.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.62 | 350 deg |
| Vertical Peak(dBi)    | -3.8  | 310 deg |



### Main antenna: 787.00 MHz

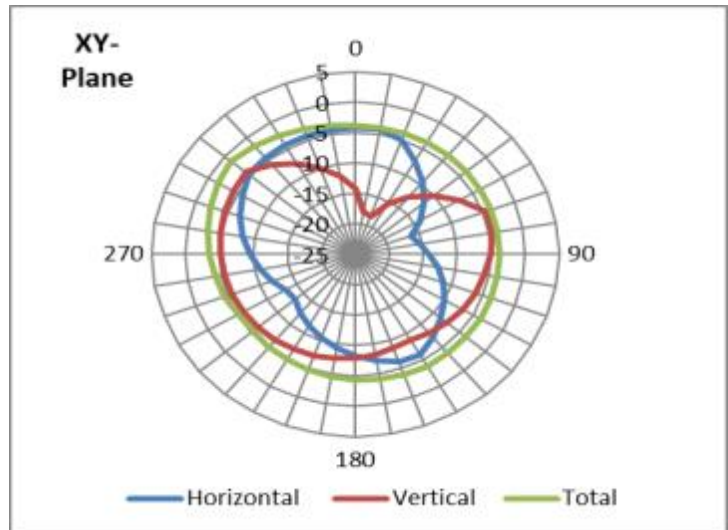
| 787.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4    | 350 deg |
| Vertical Peak(dBi)    | -3.95 | 310 deg |



## Radiation characteristic in 788MHz ~ 798MHz (UE-UTRA, Band 14)

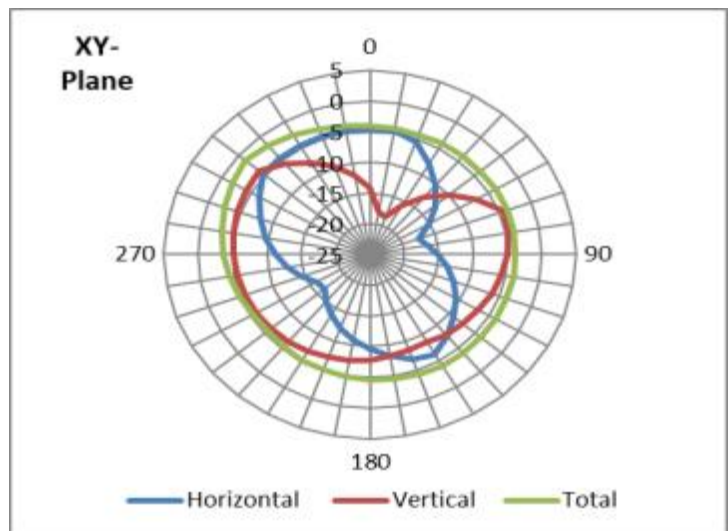
### Main antenna: 788.00 MHz

| 788.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.08 | 350 deg |
| Vertical Peak(dBi)    | -3.93 | 310 deg |



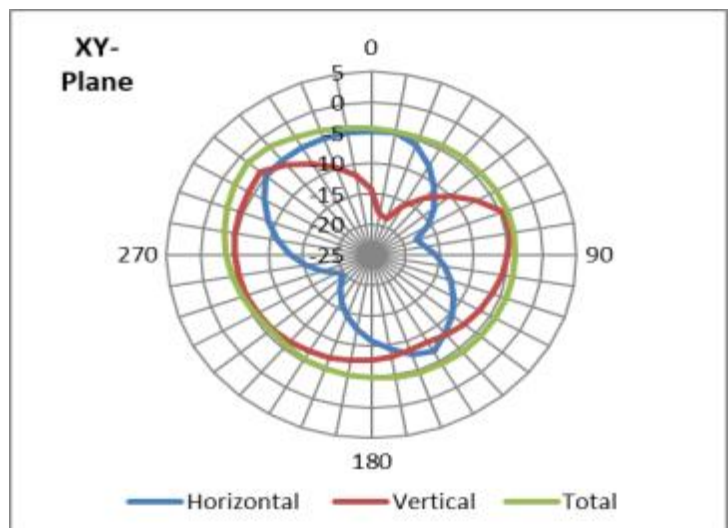
### Main antenna: 793.00 MHz

| 793.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.44 | 350 deg |
| Vertical Peak(dBi)    | -3.93 | 310 deg |



### Main antenna: 798.00 MHz

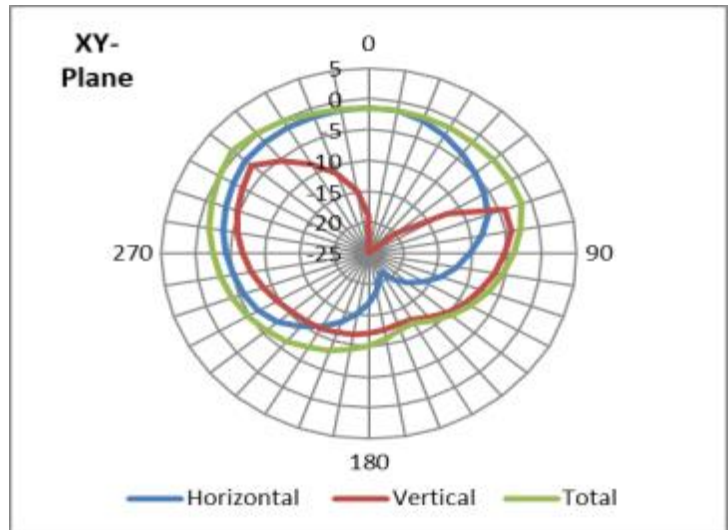
| 798.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.72 | 350 deg |
| Vertical Peak(dBi)    | -3.98 | 310 deg |



## Radiation characteristic in 704MHz ~ 716MHz (UE-UTRA, Band 17)

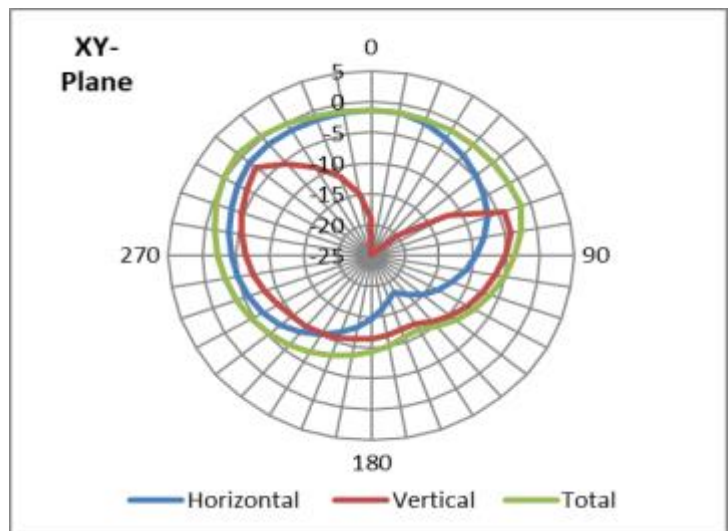
### Main antenna: 704.00 MHz

| 704.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.51 | 350 deg |
| Vertical Peak(dBi)    | -2.84 | 310 deg |



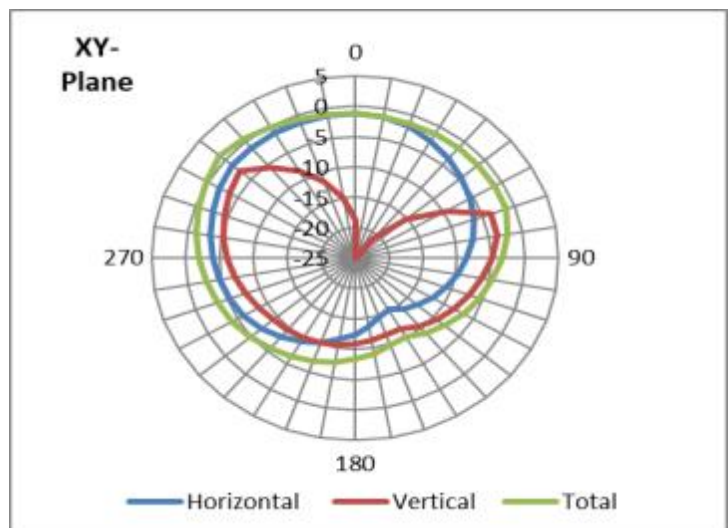
### Main antenna: 710.00 MHz

| 710.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.47 | 350 deg |
| Vertical Peak(dBi)    | -2.82 | 310 deg |



### Main antenna: 716.00 MHz

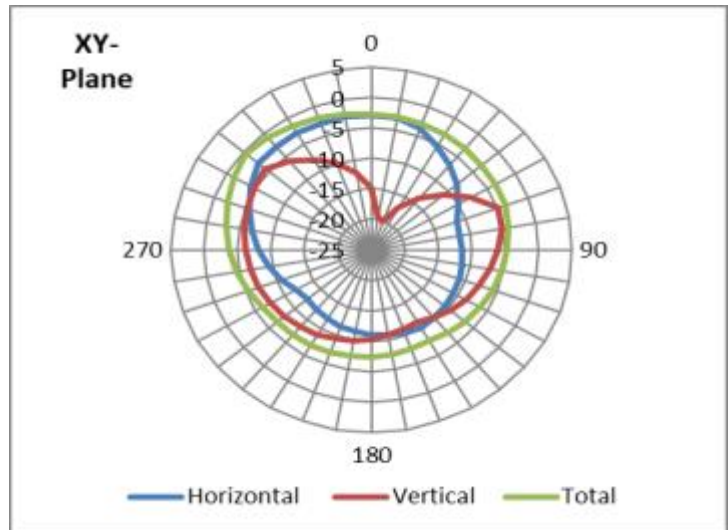
| 716.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.23 | 350 deg |
| Vertical Peak(dBi)    | -2.81 | 310 deg |



## Radiation characteristic in 815MHz ~ 830MHz (Band 18)

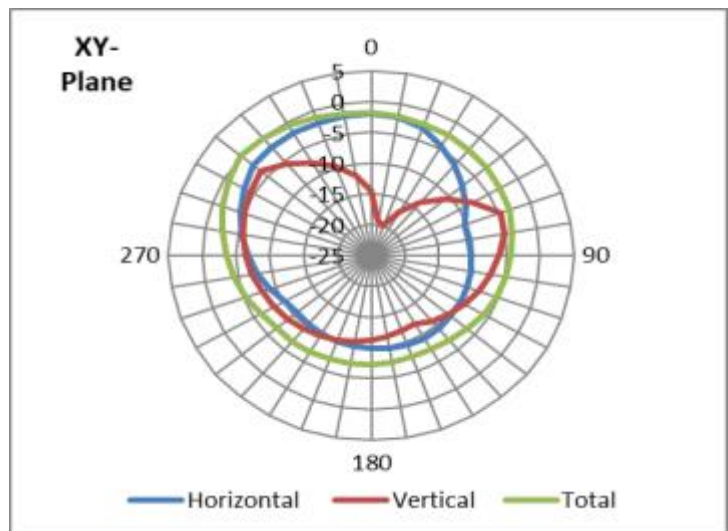
### Main antenna: 815.00 MHz

| 815.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.83 | 350 deg |
| Vertical Peak(dBi)    | -4.29 | 310 deg |



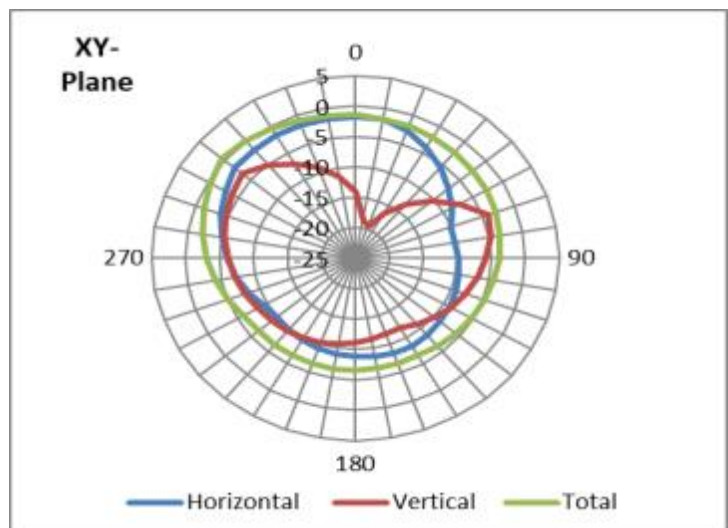
### Main antenna: 822.50 MHz

| 822.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.04 | 350 deg |
| Vertical Peak(dBi)    | -3.79 | 310 deg |



### Main antenna: 830.00 MHz

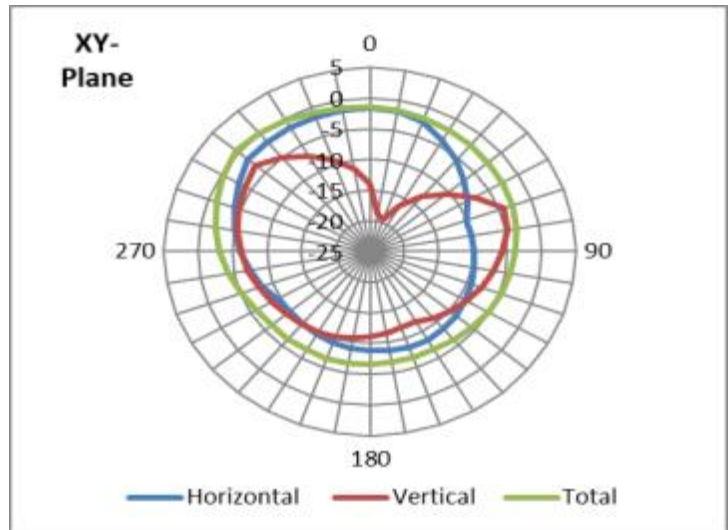
| 830.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.68 | 350 deg |
| Vertical Peak(dBi)    | -3.21 | 310 deg |



## Radiation characteristic in 830MHz ~ 845MHz (Band 19)

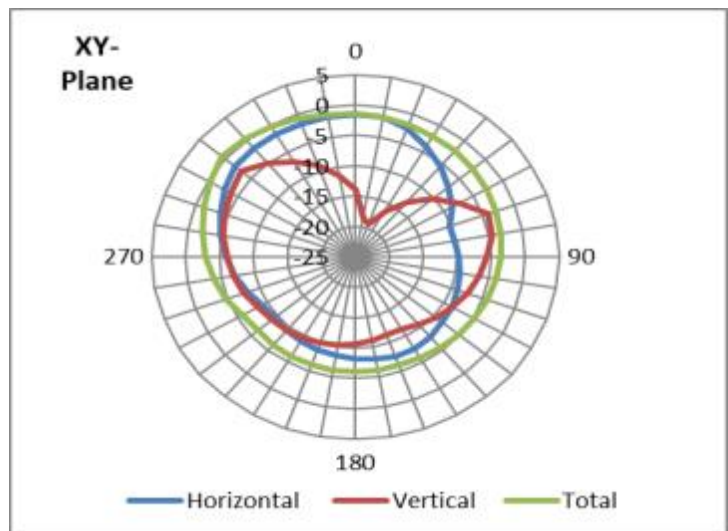
### Main antenna: 830.00 MHz

| 830.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.68 | 350 deg |
| Vertical Peak(dBi)    | -3.21 | 310 deg |



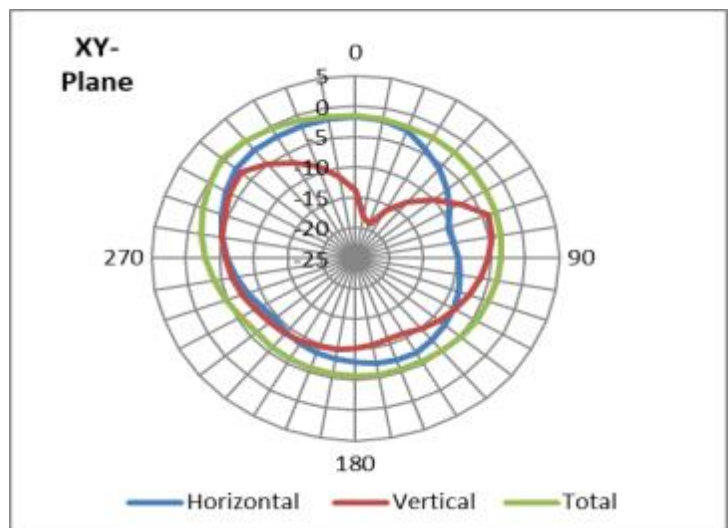
### Main antenna: 837.50 MHz

| 837.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.6  | 350 deg |
| Vertical Peak(dBi)    | -3.06 | 310 deg |



### Main antenna: 845.00 MHz

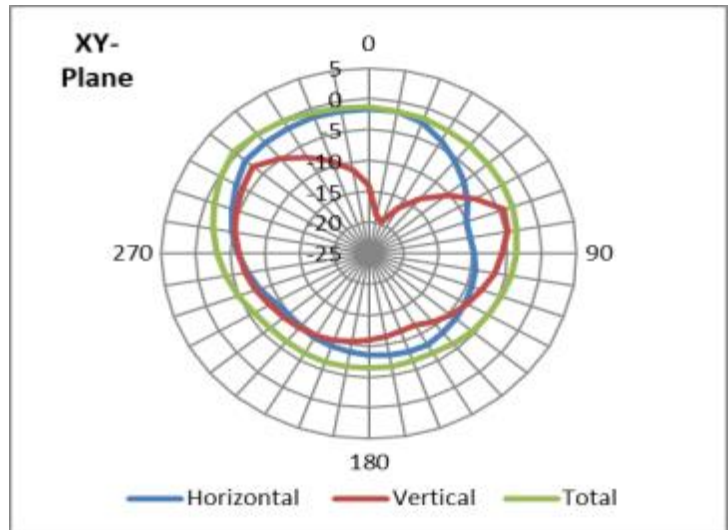
| 845.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.77 | 350 deg |
| Vertical Peak(dBi)    | -2.91 | 310 deg |



## Radiation characteristic in 832MHz ~ 862MHz (UE-UTRA,Band 20, n20)

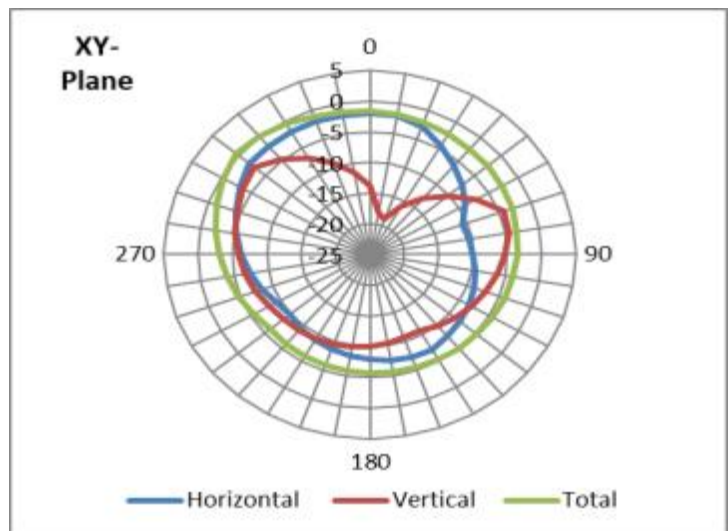
### Main antenna: 832.00 MHz

| 832.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.63 | 350 deg |
| Vertical Peak(dBi)    | -3.11 | 310 deg |



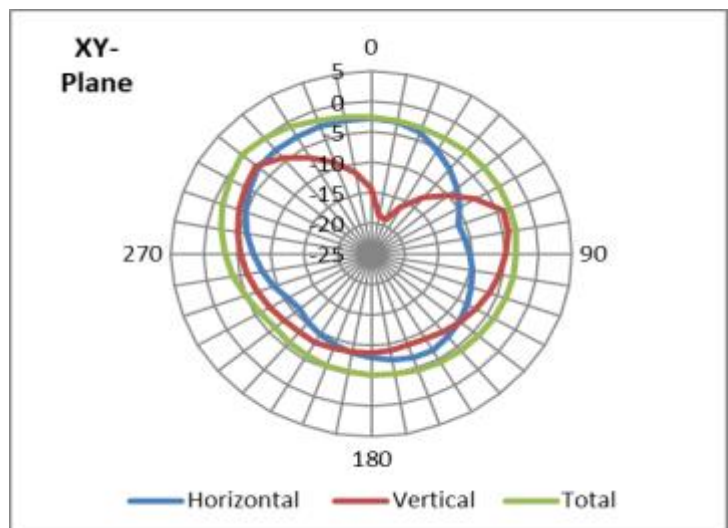
### Main antenna: 847.00 MHz

| 847.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.93 | 350 deg |
| Vertical Peak(dBi)    | -2.88 | 310 deg |



### Main antenna: 862.00 MHz

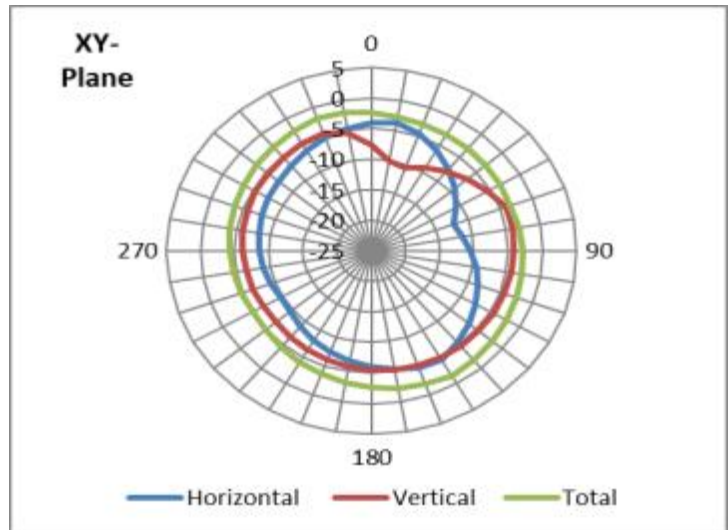
| 862.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.73 | 350 deg |
| Vertical Peak(dBi)    | -2.48 | 310 deg |



## Radiation characteristic in 1850MHz ~ 1915MHz ( UE-UTRA, Band 25)

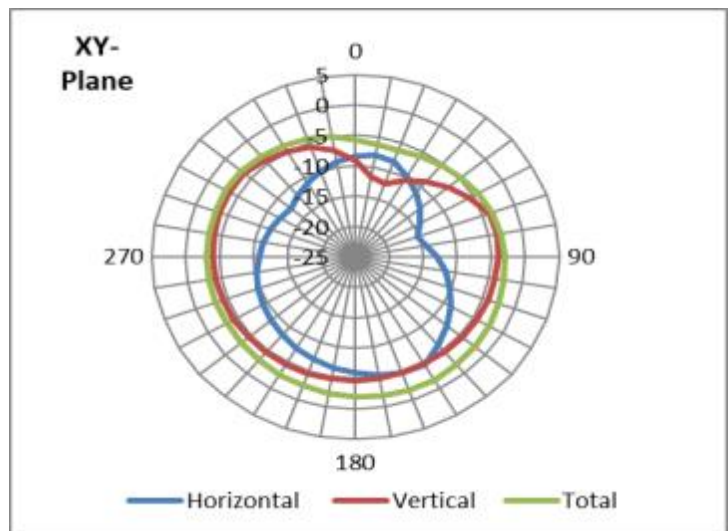
### Main antenna: 1850.00 MHz

| 1850.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.81 | 150 deg |
| Vertical Peak(dBi)    | -4    | 70 deg  |



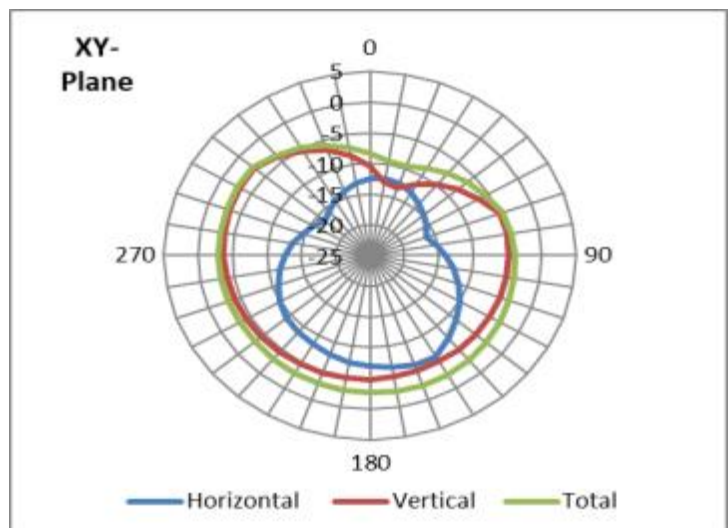
### Main antenna: 1882.50 MHz

| 1882.50 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.63 | 150 deg |
| Vertical Peak(dBi)    | -3.54 | 70 deg  |



### Main antenna: 1915.00 MHz

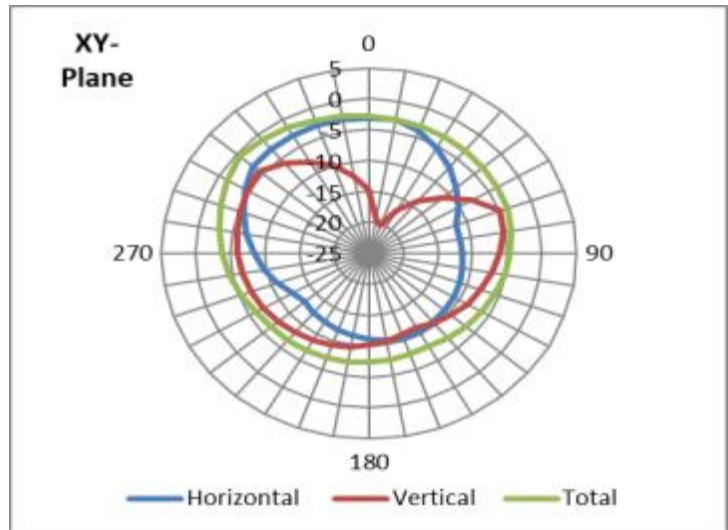
| 1915.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -5.99 | 150 deg |
| Vertical Peak(dBi)    | -2.88 | 70 deg  |



## Radiation characteristic in 814MHz ~ 849MHz (UE-UTRA, Band 26)

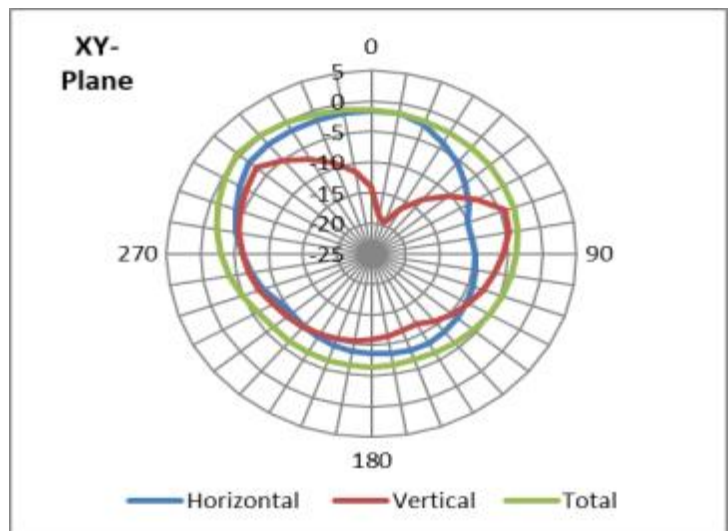
### Main antenna: 814.00 MHz

| 814.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.97 | 350 deg |
| Vertical Peak(dBi)    | -4.32 | 310 deg |



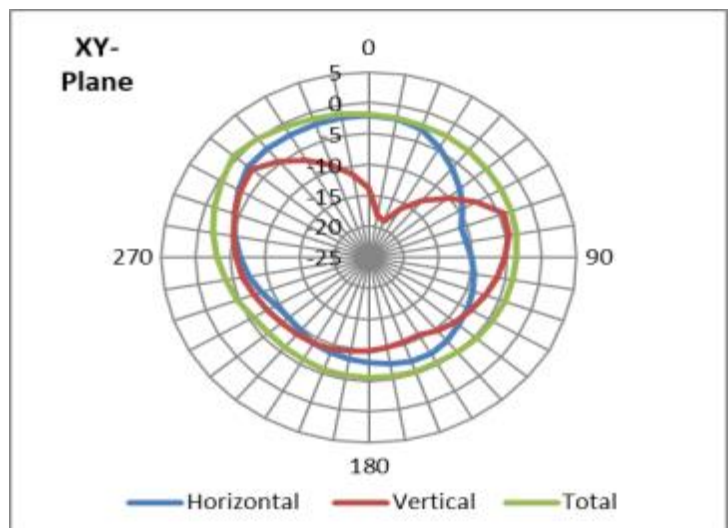
### Main antenna: 831.50 MHz

| 831.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.64 | 350 deg |
| Vertical Peak(dBi)    | -3.14 | 310 deg |



### Main antenna: 849.00 MHz

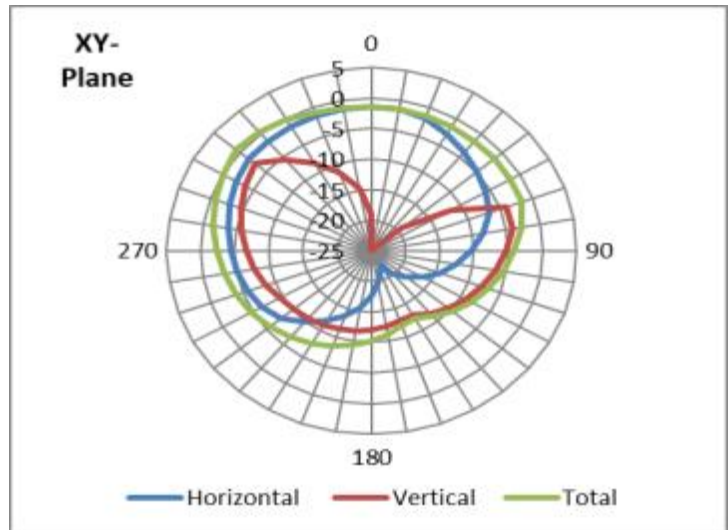
| 849.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.09 | 350 deg |
| Vertical Peak(dBi)    | -2.84 | 310 deg |



## Radiation characteristic in 703MHz ~ 748MHz (UE-UTRA, Band 28, 28)

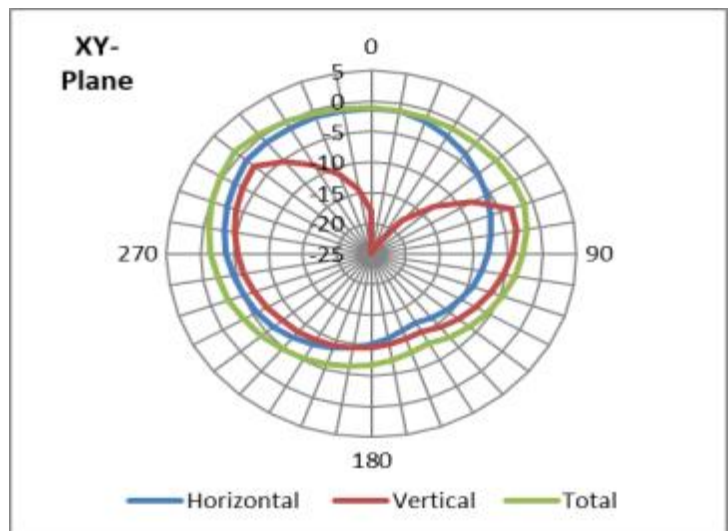
### Main antenna: 703.00 MHz

| 703.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.48 | 350 deg |
| Vertical Peak(dBi)    | -2.84 | 310 deg |



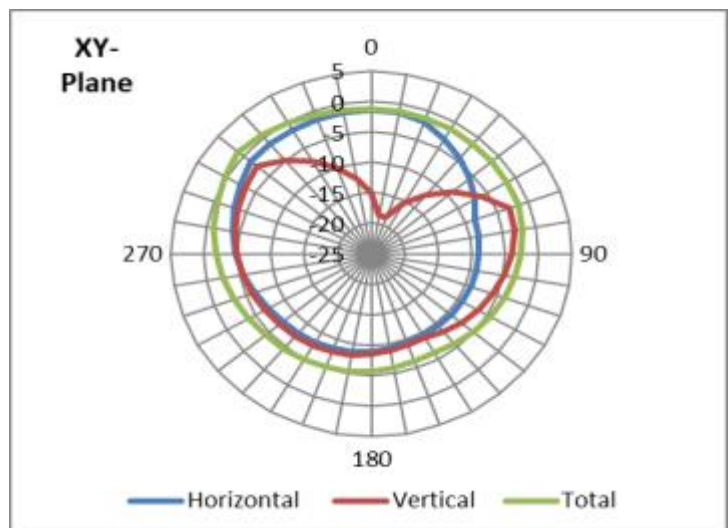
### Main antenna: 725.50 MHz

| 725.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.2  | 350 deg |
| Vertical Peak(dBi)    | -2.66 | 310 deg |



### Main antenna: 748.00 MHz

| 748.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.35 | 350 deg |
| Vertical Peak(dBi)    | -2.66 | 310 deg |

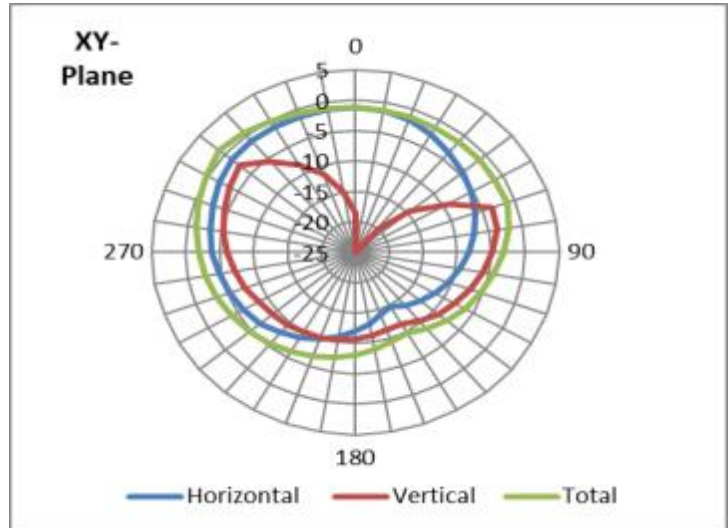


## Radiation characteristic in 717MHz ~ 728MHz (UE-UTRA, Band 29)

\* Down link only

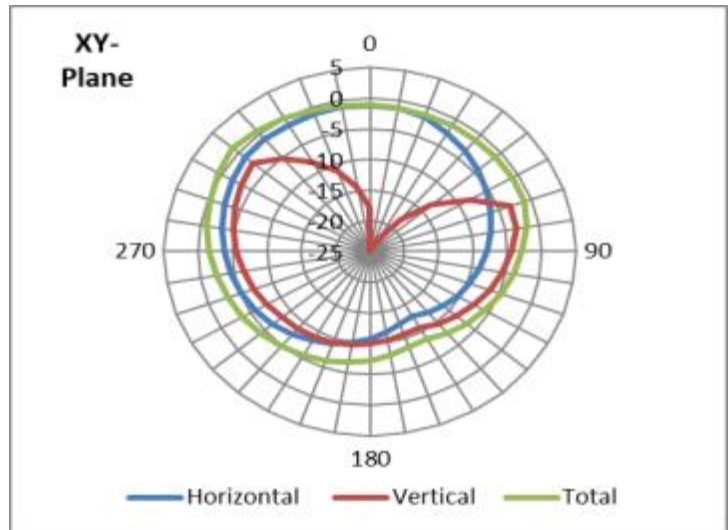
### Main antenna: 717.00 MHz

| 717.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.17 | 350 deg |
| Vertical Peak(dBi)    | -2.77 | 310 deg |



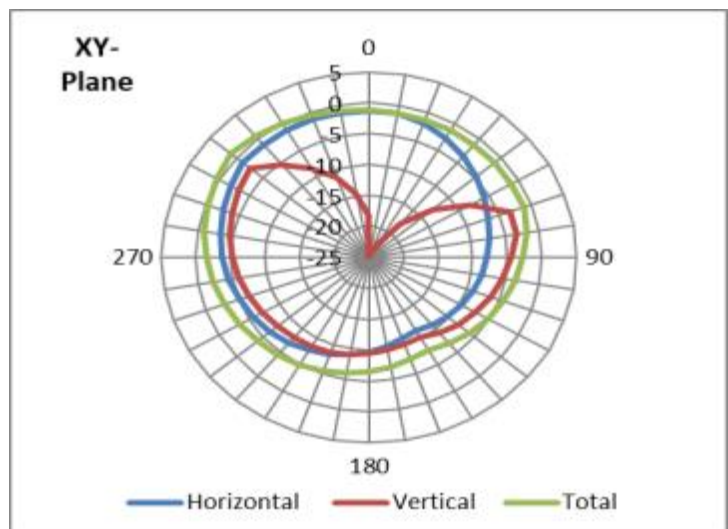
### Main antenna: 722.50 MHz

| 722.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.17 | 350 deg |
| Vertical Peak(dBi)    | -2.6  | 310 deg |



### Main antenna: 728.00 MHz

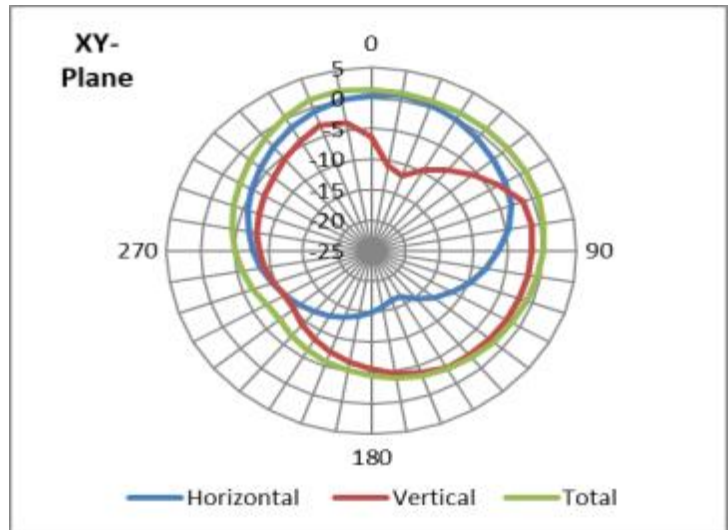
| 728.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.23 | 350 deg |
| Vertical Peak(dBi)    | -2.73 | 310 deg |



## Radiation characteristic in 2305MHz ~ 2315MHz (UE-UTRA, Band 30)

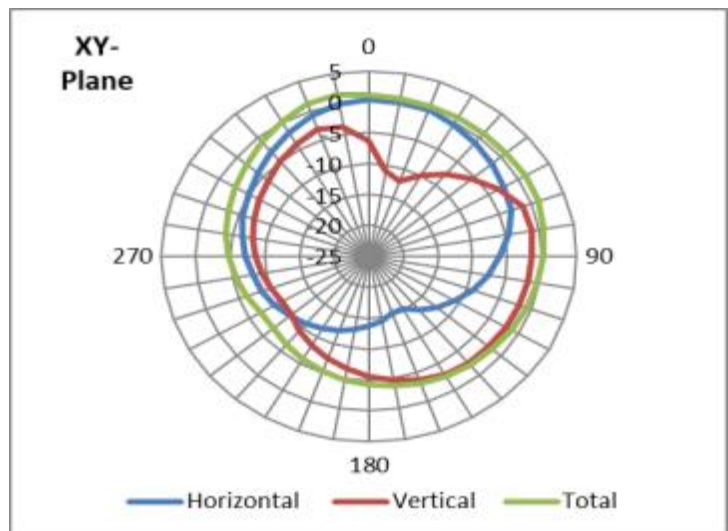
### Main antenna: 2305.00 MHz

| 2305.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.73  | 15 deg  |
| Vertical Peak(dBi)    | -1.23 | 110 deg |



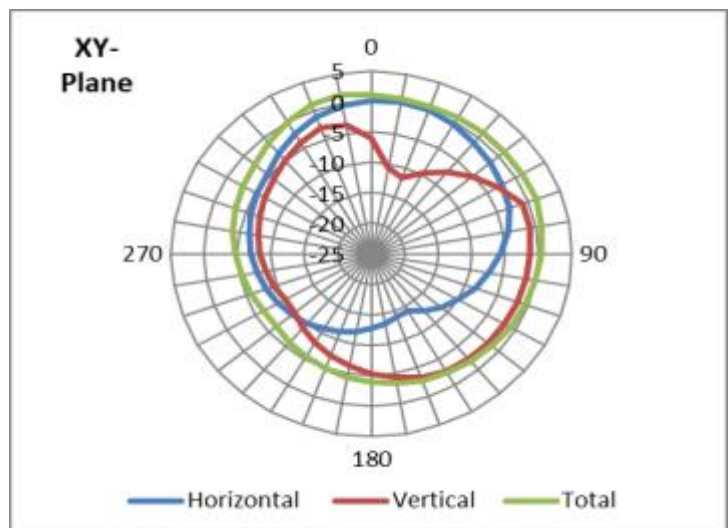
### Main antenna: 2310.00 MHz

| 2310.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.53  | 15 deg  |
| Vertical Peak(dBi)    | -1.15 | 110 deg |



### Main antenna: 2315.00 MHz

| 2315.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.37  | 15 deg  |
| Vertical Peak(dBi)    | -0.92 | 110 deg |

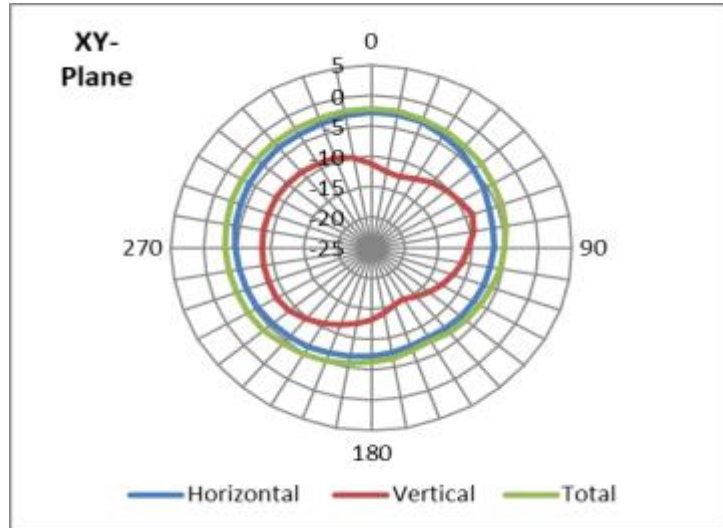


## Radiation characteristic in 1452MHz ~ 1496MHz (LTE, Band 32)

\* Down link only

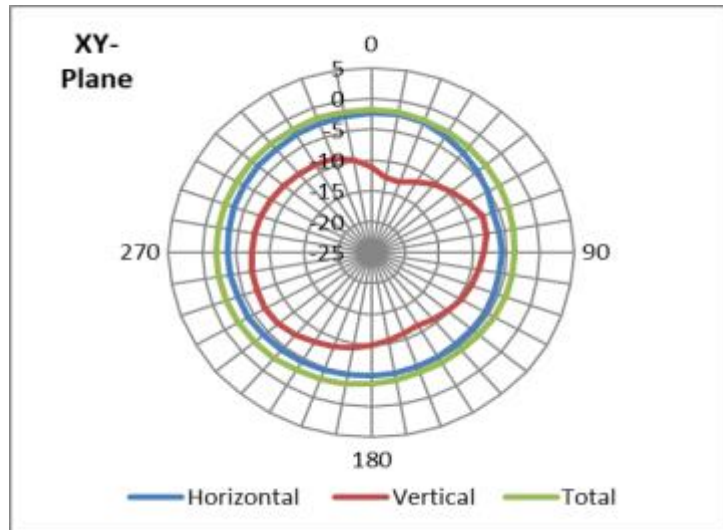
### Main antenna: 1452.00 MHz

| 1452.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.73 | 10 deg  |
| Vertical Peak(dBi)    | -8.57 | 240 deg |



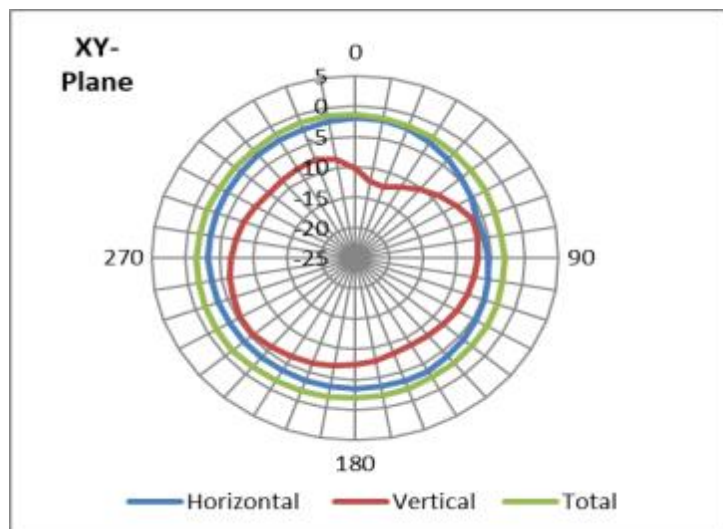
### Main antenna: 1474.00 MHz

| 1474.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.27 | 10 deg  |
| Vertical Peak(dBi)    | -6.79 | 240 deg |



### Main antenna: 1496.00 MHz

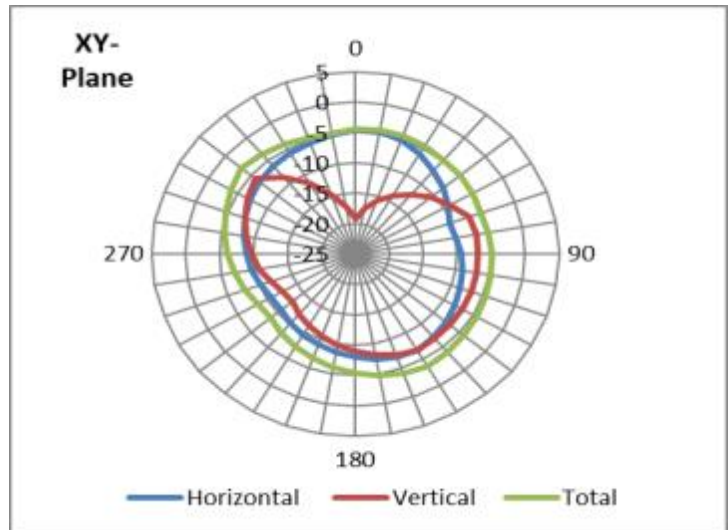
| 1496.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.95 | 10 deg  |
| Vertical Peak(dBi)    | -5.41 | 240 deg |



## Radiation characteristic in 2010MHz ~ 2025MHz (LTE, Band 34)

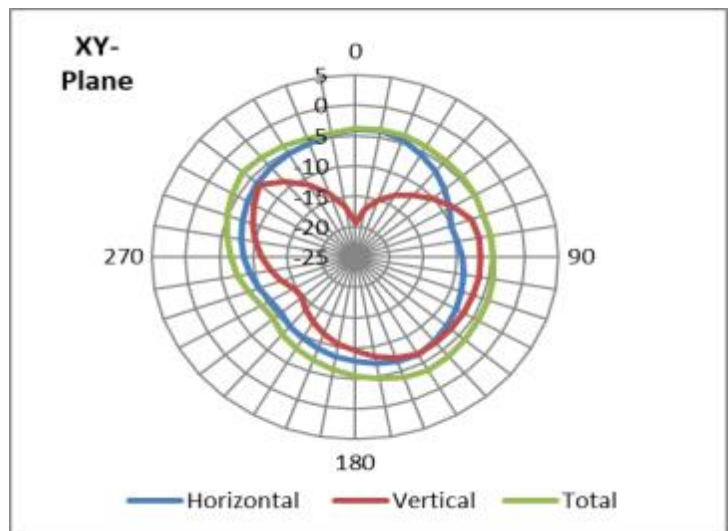
### Main antenna: 2010.00 MHz

| 2010.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.61 | 10 deg  |
| Vertical Peak(dBi)    | -5.74 | 310 deg |



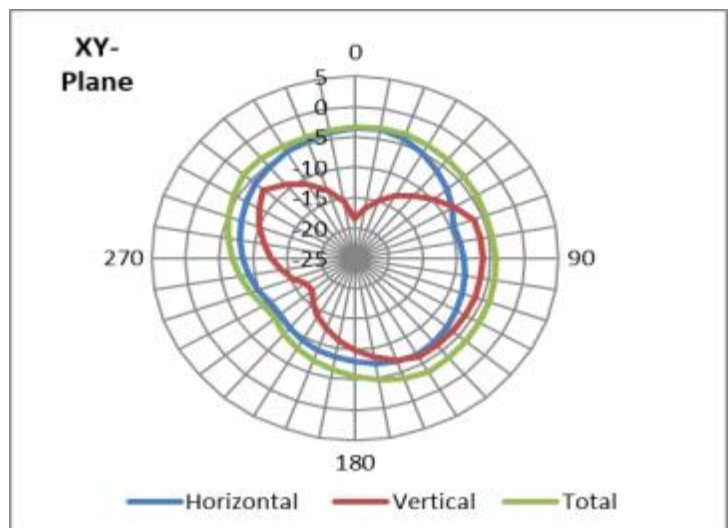
### Main antenna: 2017.50 MHz

| 2017.50 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.94 | 10 deg  |
| Vertical Peak(dBi)    | -6.52 | 310 deg |



### Main antenna: 2025.00 MHz

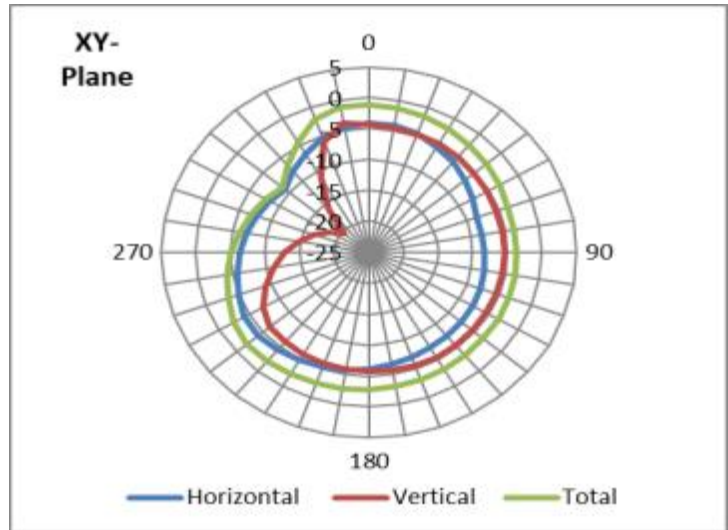
| 2025.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.41 | 10 deg  |
| Vertical Peak(dBi)    | -6.16 | 310 deg |



# Radiation characteristic in 2570MHz ~ 2620MHz (UE-UTRA, Band 38, n38)

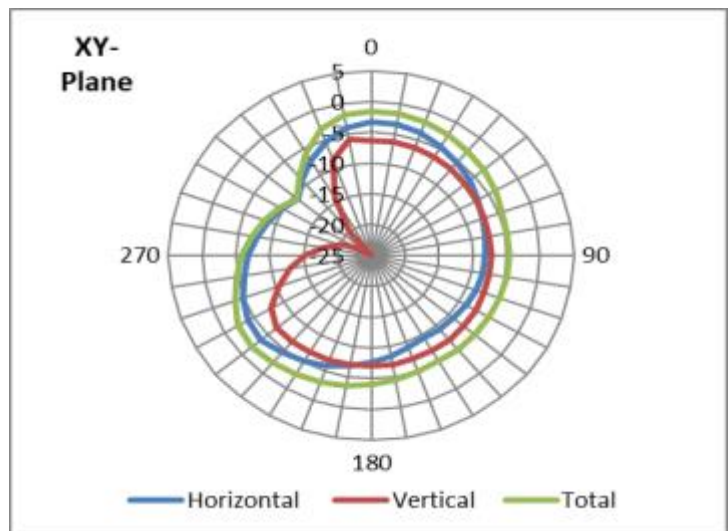
## Main antenna: 2570.00 MHz

| 2570.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.04 | 200 deg |
| Vertical Peak(dBi)    | -3.81 | 90 deg  |



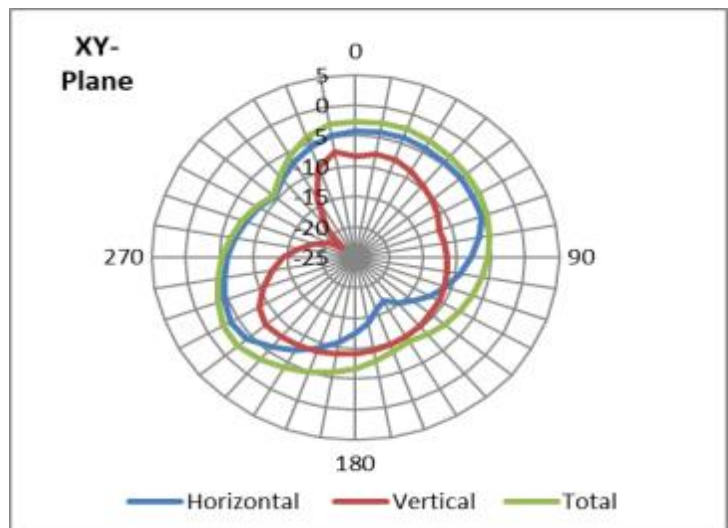
## Main antenna: 2595.00 MHz

| 2595.00 MHz           |       |        |
|-----------------------|-------|--------|
| Horizontal Peak (dBi) | -3.39 | 10 deg |
| Vertical Peak(dBi)    | -5.85 | 90 deg |



## Main antenna: 2620.00 MHz

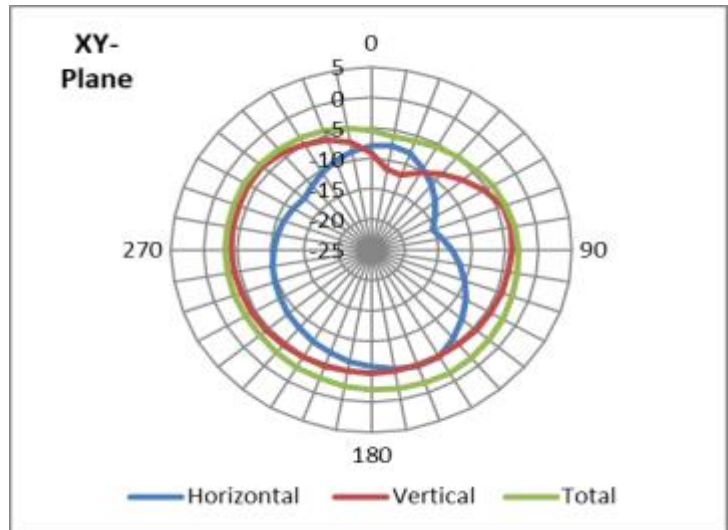
| 2620.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.71 | 230 deg |
| Vertical Peak(dBi)    | -7.42 | 350 deg |



## Radiation characteristic in 1880MHz ~ 1920MHz (TD-SCDMA, Band 39)

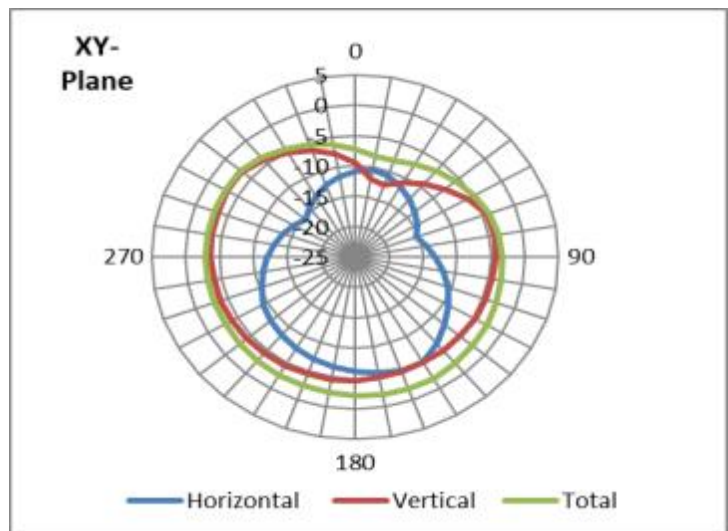
### Main antenna: 1880.00 MHz

| 1880.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.54 | 150 deg |
| Vertical Peak(dBi)    | -3.69 | 70 deg  |



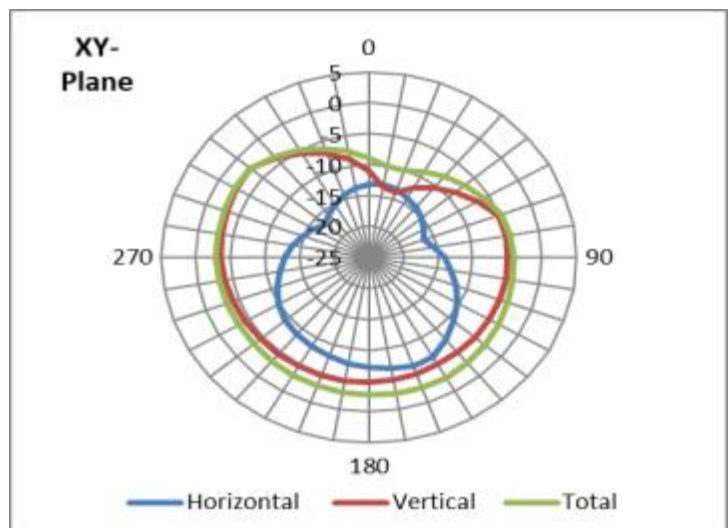
### Main antenna: 1900.00 MHz

| 1900.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -5.06 | 150 deg |
| Vertical Peak(dBi)    | -3.18 | 70 deg  |



### Main antenna: 1920.00 MHz

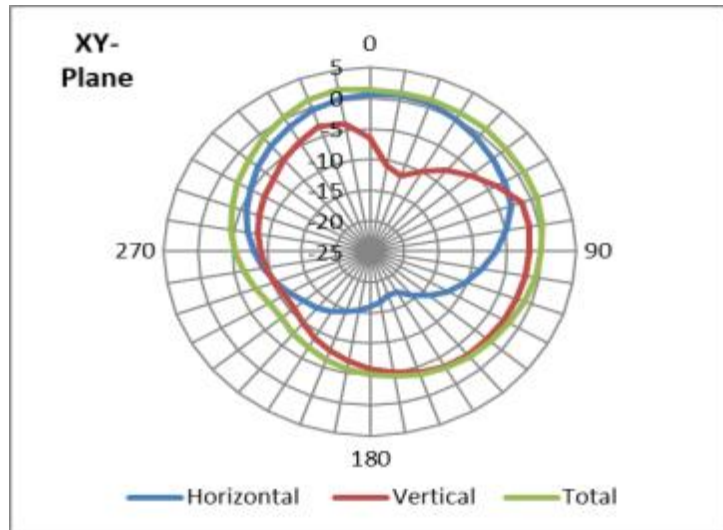
| 1920.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -6.34 | 150 deg |
| Vertical Peak(dBi)    | -2.69 | 70 deg  |



## Radiation characteristic in 2300MHz ~ 2400MHz (UE-UTRA, Band 40)

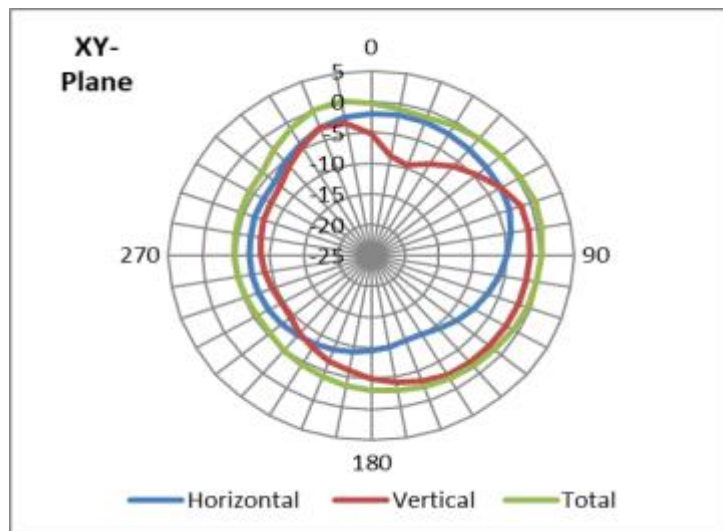
### Main antenna: 2300.00 MHz

| 2300.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.91  | 15 deg  |
| Vertical Peak(dBi)    | -1.46 | 110 deg |



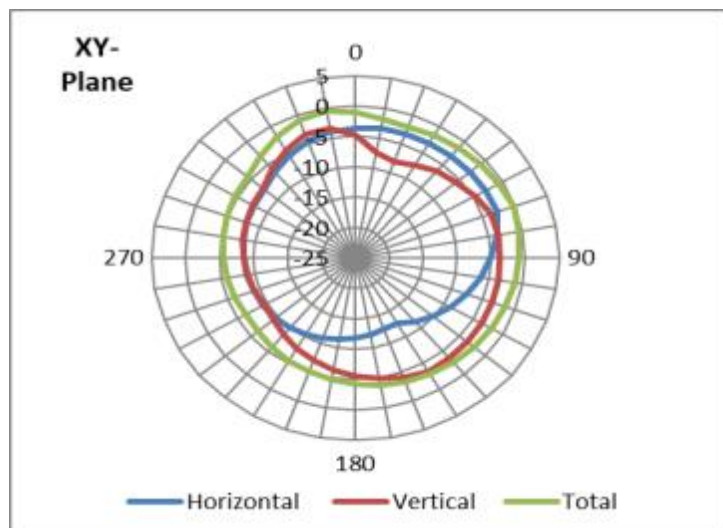
### Main antenna: 2350.00 MHz

| 2350.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.89 | 15 deg  |
| Vertical Peak(dBi)    | -1.36 | 110 deg |



### Main antenna: 2400.00 MHz

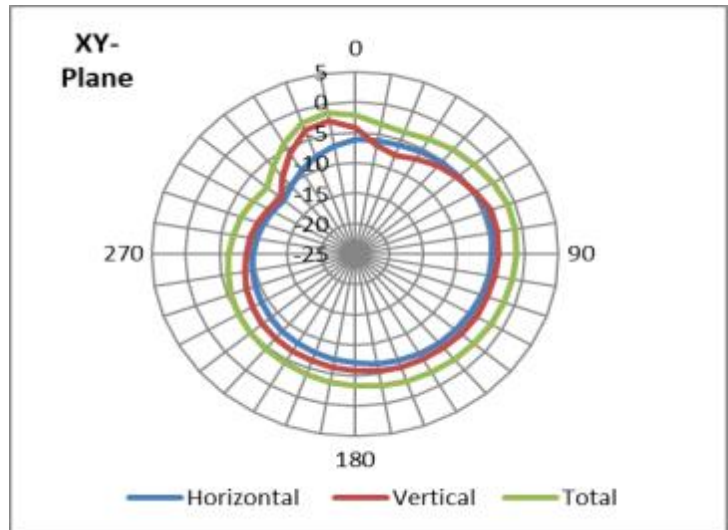
| 2400.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.71 | 15 deg  |
| Vertical Peak(dBi)    | -3.27 | 110 deg |



## Radiation characteristic in 2496MHz ~ 2690MHz (UE-UTRA, Band 41, n41)

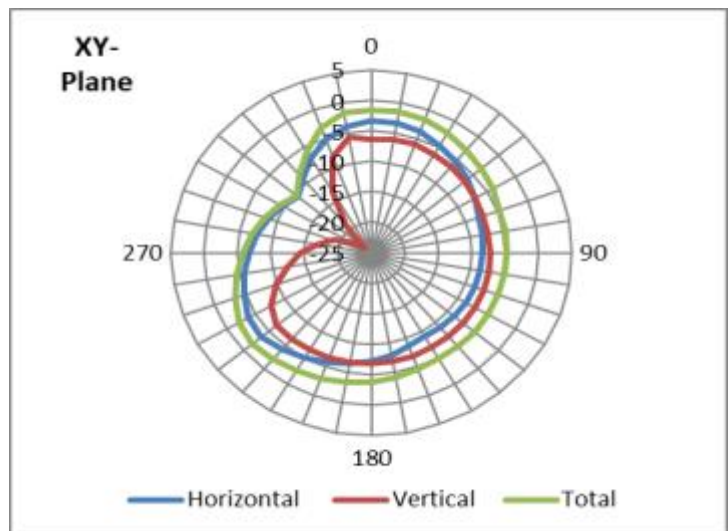
### Main antenna: 2496.00 MHz

| 2496.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.42 | 50 deg  |
| Vertical Peak(dBi)    | -2.79 | 350 deg |



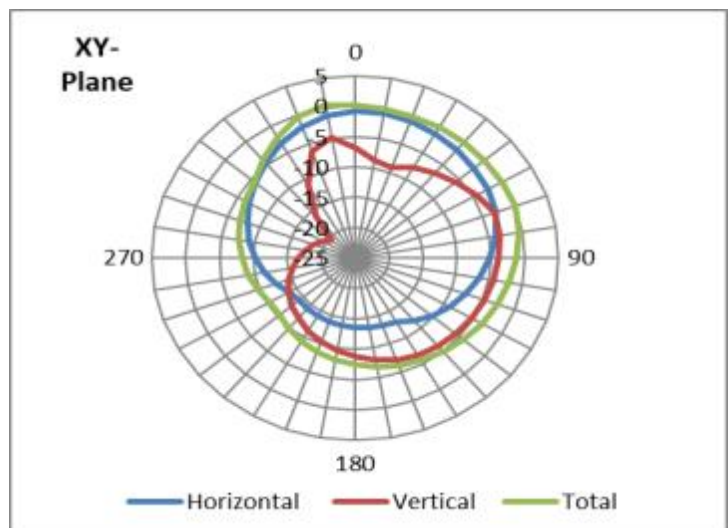
### Main antenna: 2593.00 MHz

| 2593.00 MHz           |       |        |
|-----------------------|-------|--------|
| Horizontal Peak (dBi) | -3.35 | 10 deg |
| Vertical Peak(dBi)    | -5.74 | 90 deg |



### Main antenna: 2690.00 MHz

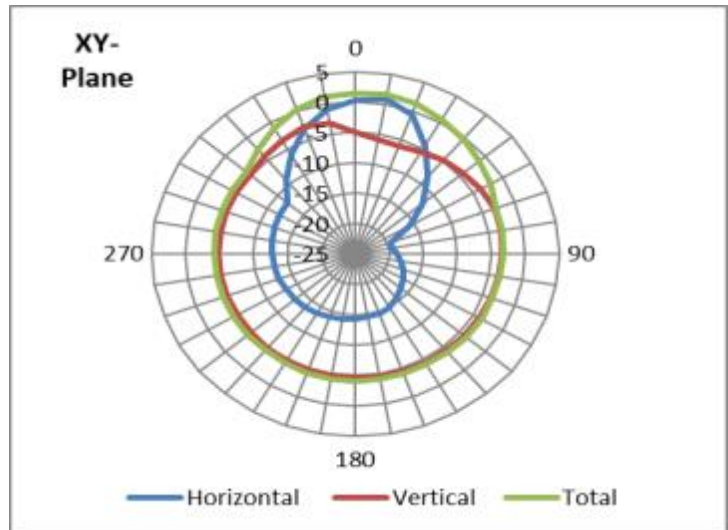
| 2690.00 MHz           |       |        |
|-----------------------|-------|--------|
| Horizontal Peak (dBi) | -0.82 | 20 deg |
| Vertical Peak(dBi)    | -3.18 | 70 deg |



## Radiation characteristic in 3400MHz ~ 3600MHz (LTE Band 42)

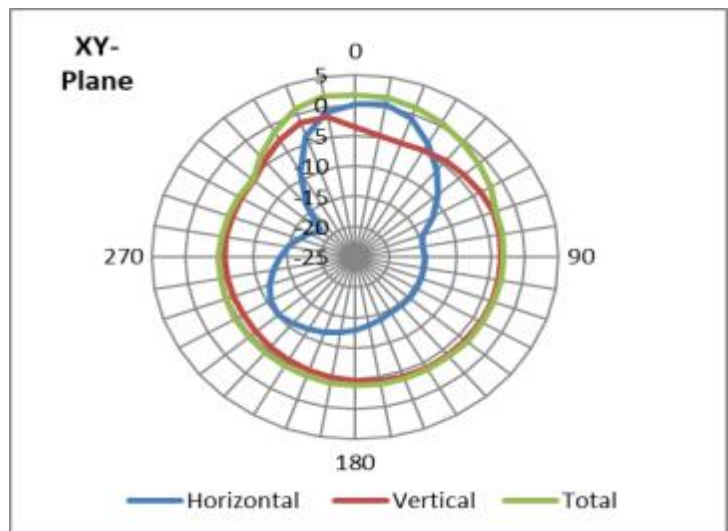
### Main antenna: 3400.00 MHz

| 3400.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.86  | 20 deg  |
| Vertical Peak(dBi)    | -2.77 | 350 deg |



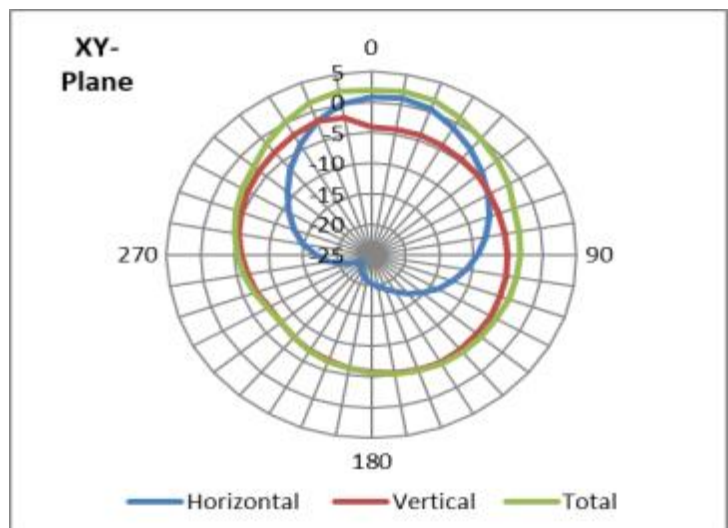
### Main antenna: 3500.00 MHz

| 3500.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.46  | 20 deg  |
| Vertical Peak(dBi)    | -1.44 | 350 deg |



### Main antenna: 3600.00 MHz

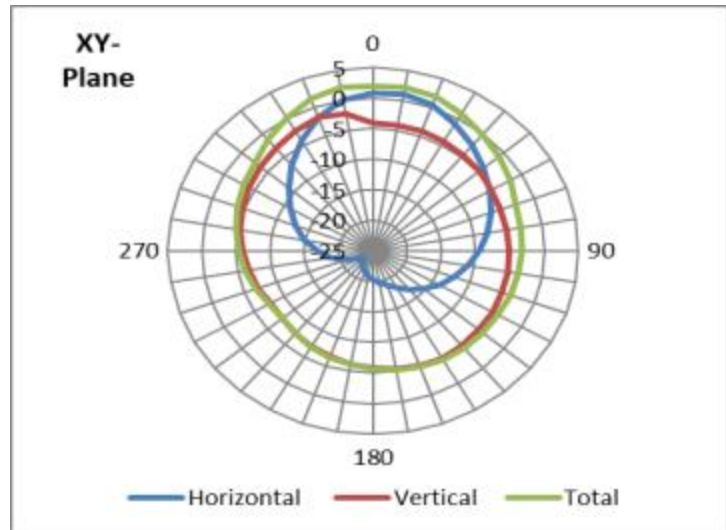
| 3600.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.95  | 10 deg  |
| Vertical Peak(dBi)    | -1.71 | 350 deg |



## Radiation characteristic in 3600MHz ~ 3800MHz (LTE Band 43)

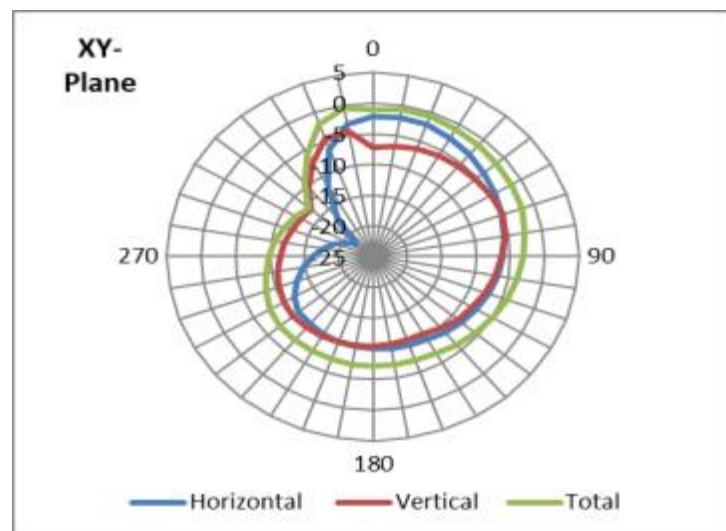
### Main antenna: 3600.00 MHz

| 3600.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.95  | 10 deg  |
| Vertical Peak(dBi)    | -1.71 | 350 deg |



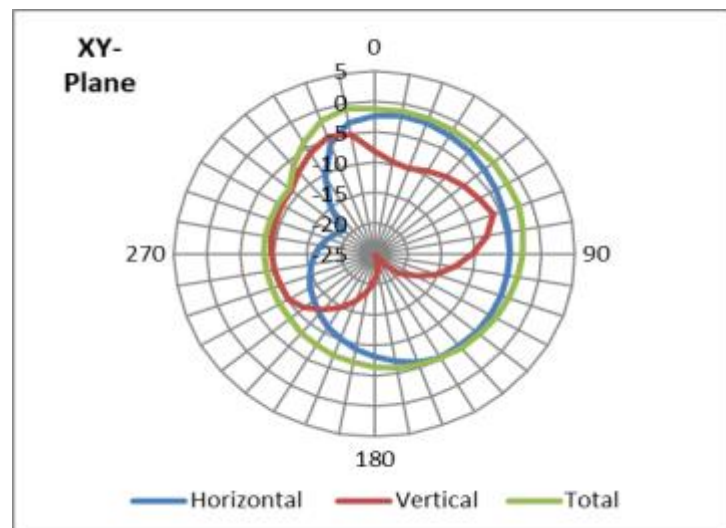
### Main antenna: 3700.00 MHz

| 3700.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2    | 20 deg  |
| Vertical Peak(dBi)    | -4.33 | 350 deg |



### Main antenna: 3800.00 MHz

| 3800.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.98 | 20 deg  |
| Vertical Peak(dBi)    | -4.48 | 350 deg |

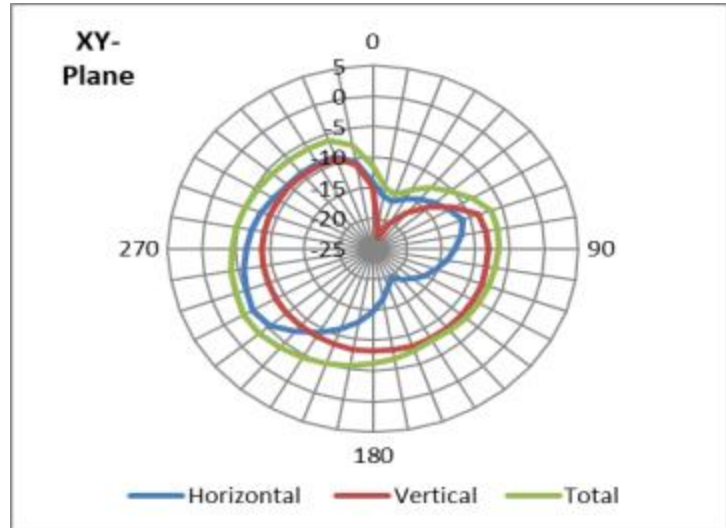


## Radiation characteristic in 5150MHz ~ 5925MHz (LTE Band 46)

\* TD Unlicensed, LAA RCV only

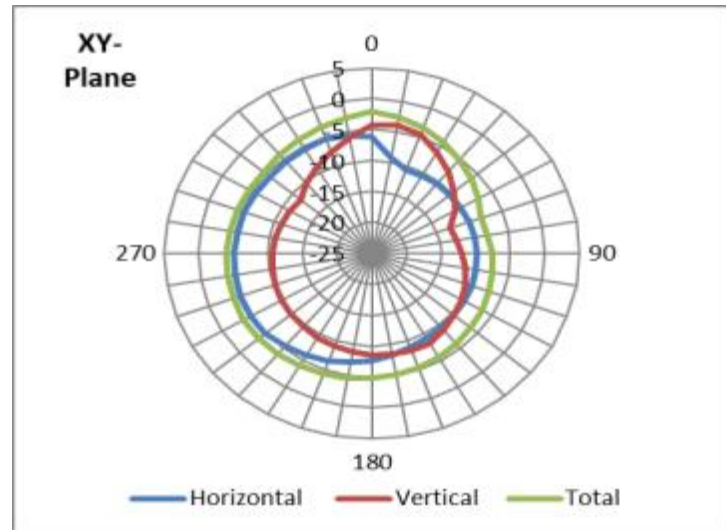
### Main antenna: 5150.00 MHz

| 5150.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.84 | 250 deg |
| Vertical Peak(dBi)    | -8    | 130 deg |



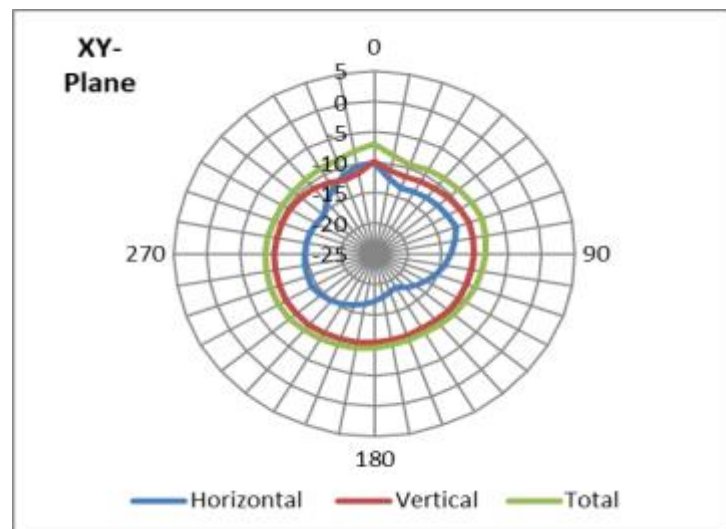
### Main antenna: 5537.00 MHz

| 5537.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.7  | 260 deg |
| Vertical Peak(dBi)    | -3.87 | 20 deg  |



### Main antenna: 5925.00 MHz

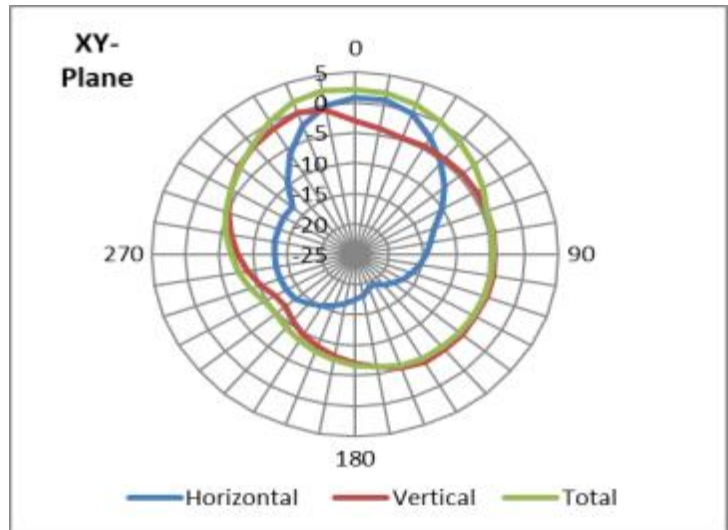
| 5925.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -9.95 | 350 deg |
| Vertical Peak(dBi)    | -9.64 | 350 deg |



## Radiation characteristic in 3550MHz ~ 3700MHz (LTE Band 48)

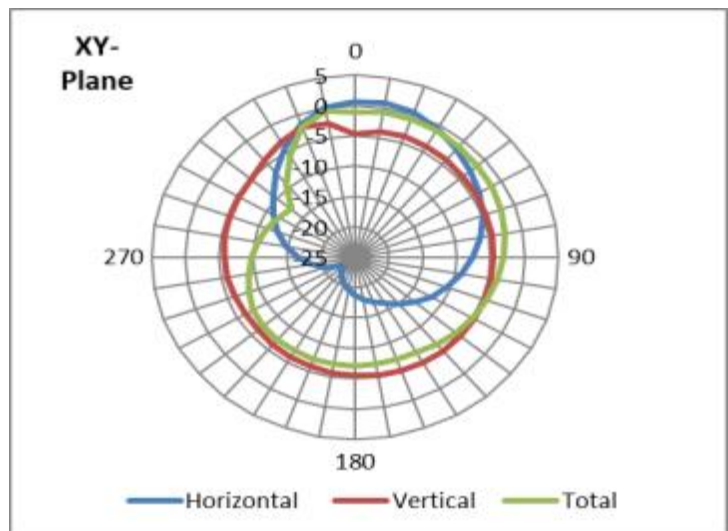
### Main antenna: 3550.00 MHz

| 3550.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.83  | 10 deg  |
| Vertical Peak(dBi)    | -0.25 | 340 deg |



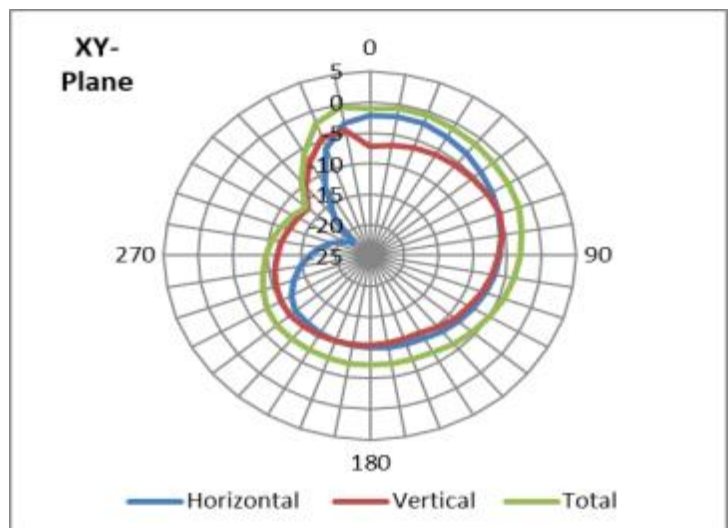
### Main antenna: 3625.00 MHz

| 3625.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.81  | 20 deg  |
| Vertical Peak(dBi)    | -2.14 | 350 deg |



### Main antenna: 3700.00 MHz

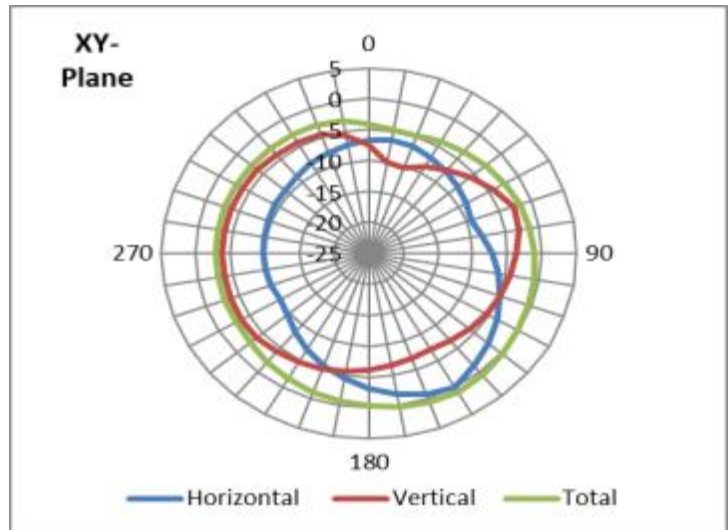
| 3700.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2    | 20 deg  |
| Vertical Peak(dBi)    | -4.33 | 350 deg |



## Radiation characteristic in 1710MHz ~ 1780MHz (LTE, Band 66, n66)

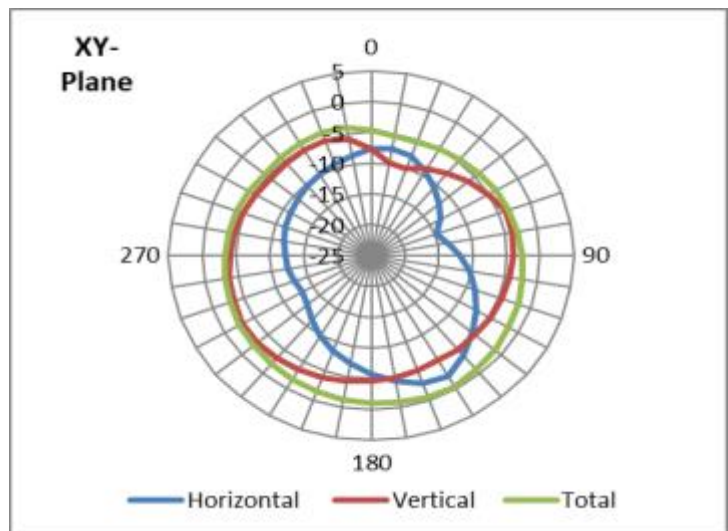
### Main antenna: 1710.00 MHz

| 1710.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.06 | 150 deg |
| Vertical Peak(dBi)    | -2.73 | 70 deg  |



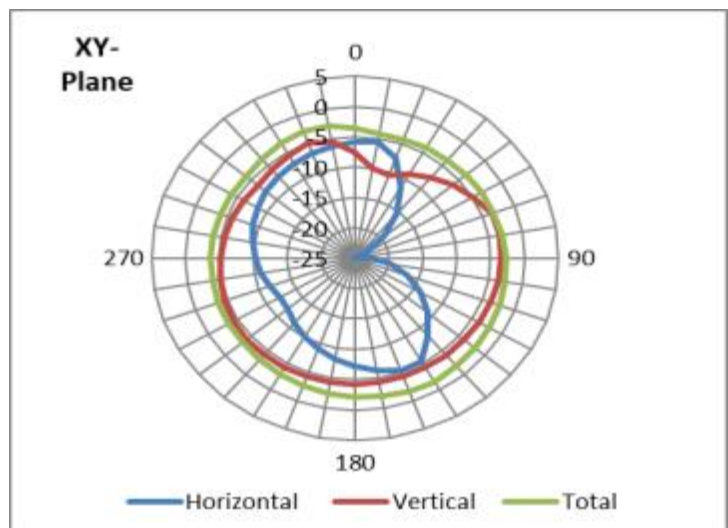
### Main antenna: 1745.00 MHz

| 1745.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.31 | 150 deg |
| Vertical Peak(dBi)    | -2.9  | 70 deg  |



### Main antenna: 1780.00 MHz

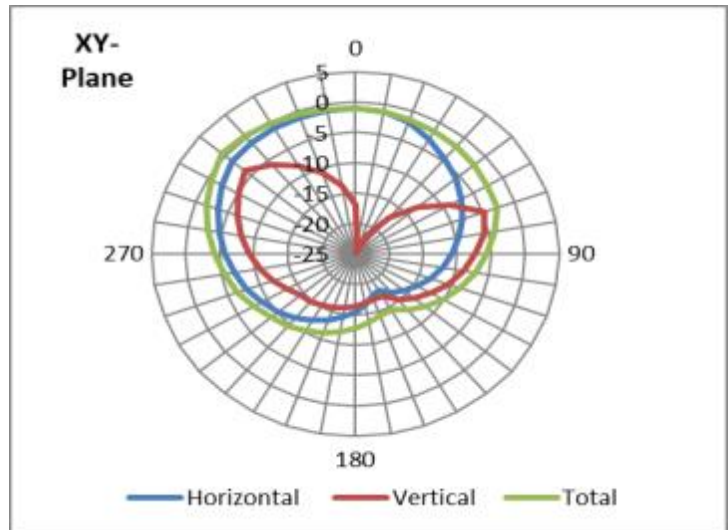
| 1780.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -5.23 | 150 deg |
| Vertical Peak(dBi)    | -3.34 | 70 deg  |



## Radiation characteristic in 663MHz ~ 698MHz (LTE, Band 71, n71)

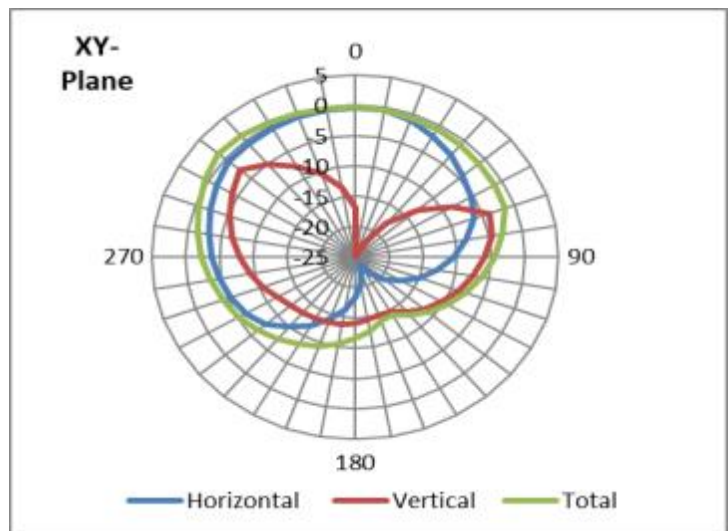
### Main antenna: 663.00 MHz

| 663.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.12 | 350 deg |
| Vertical Peak(dBi)    | -3.74 | 310 deg |



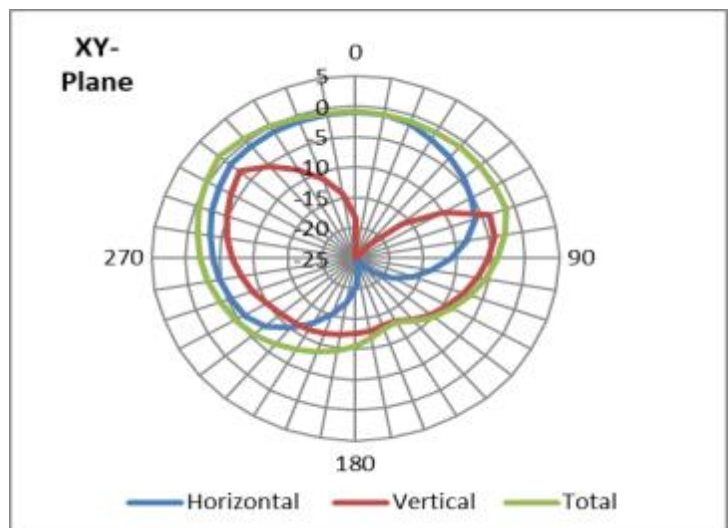
### Main antenna: 680.50 MHz

| 680.50 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.41 | 355 deg |
| Vertical Peak(dBi)    | -2.8  | 310 deg |



### Main antenna: 698.00 MHz

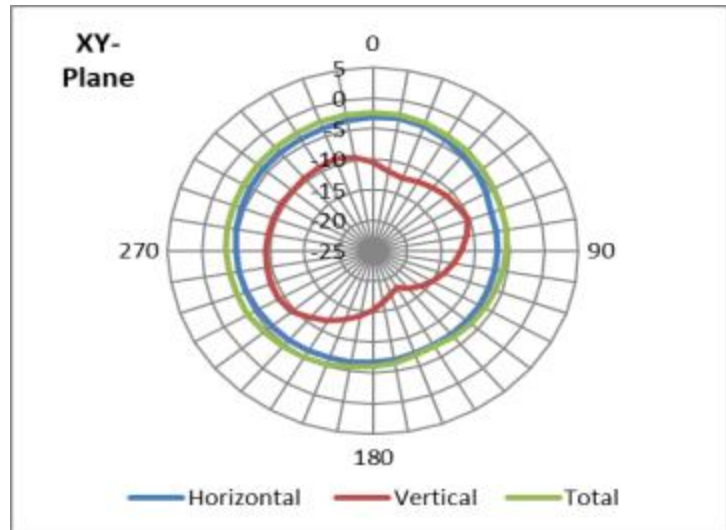
| 698.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.93 | 350 deg |
| Vertical Peak(dBi)    | -2.78 | 310 deg |



## Radiation characteristic in 1432MHz ~ 1517MHz (LTE, Band 75, n75)

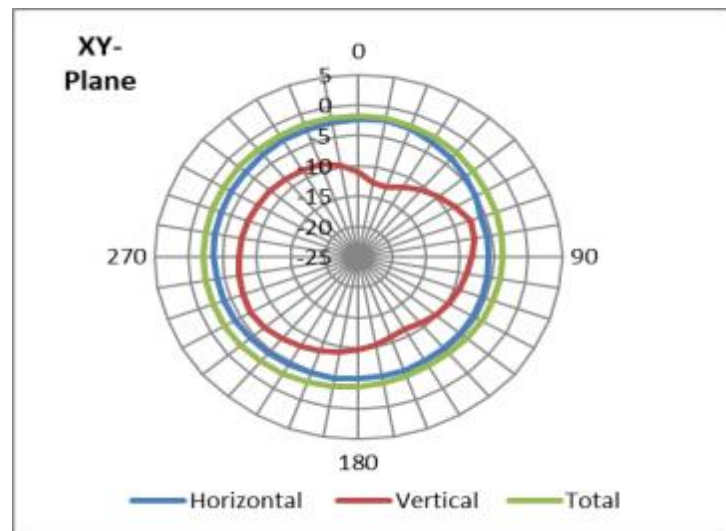
### Main antenna: 1432.00 MHz

| 1432.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.05 | 10 deg  |
| Vertical Peak(dBi)    | -8.99 | 240 deg |



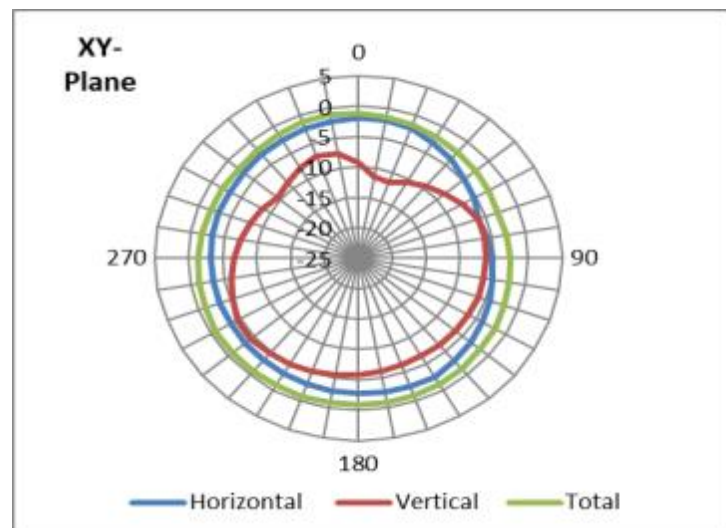
### Main antenna: 1474.50 MHz

| 1474.50 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.26 | 10 deg  |
| Vertical Peak(dBi)    | -6.76 | 240 deg |



### Main antenna: 1517.00 MHz

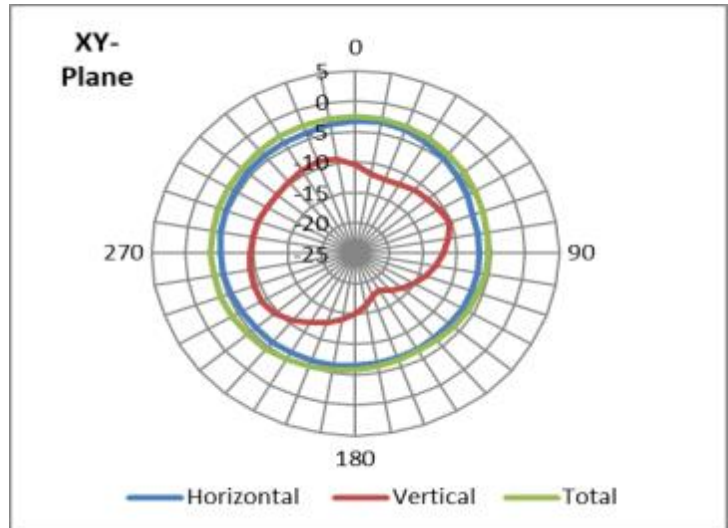
| 1517.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.83 | 10 deg  |
| Vertical Peak(dBi)    | -4.34 | 240 deg |



# Radiation characteristic in 1427MHz ~ 1432MHz (LTE, Band 76, n76)

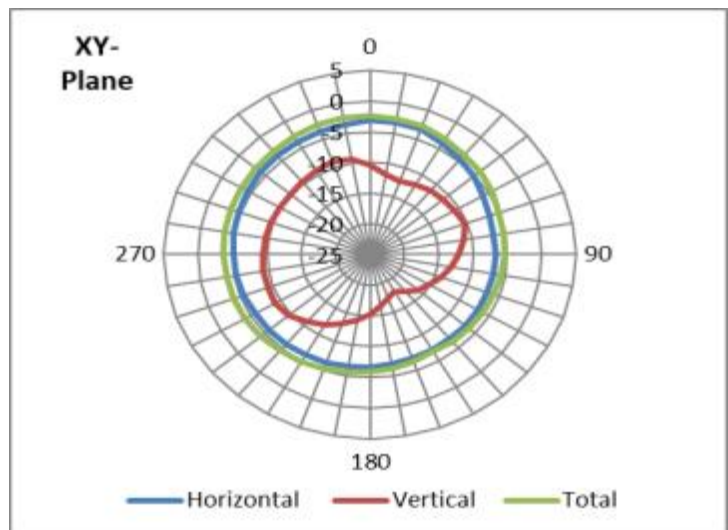
## Main antenna: 1427.00 MHz

| 1427.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.10 | 10 deg  |
| Vertical Peak(dBi)    | -8.85 | 240 deg |



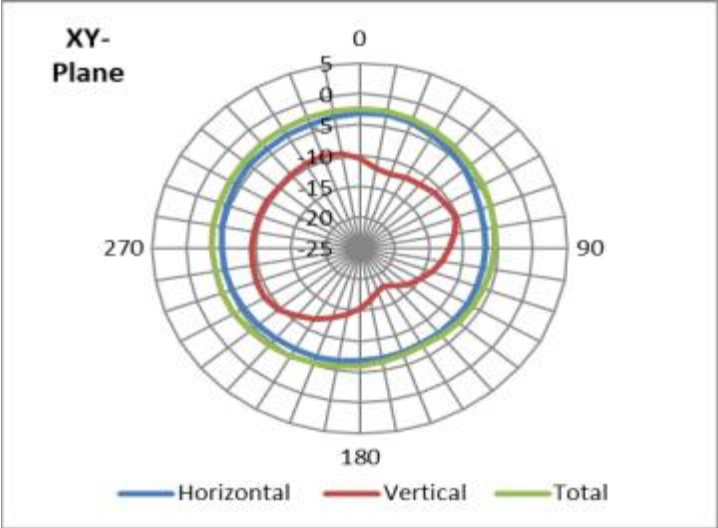
## Main antenna: 1429.50 MHz

| 1429.50 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.08 | 10 deg  |
| Vertical Peak(dBi)    | -8.92 | 240 deg |



## Main antenna: 1432.00 MHz

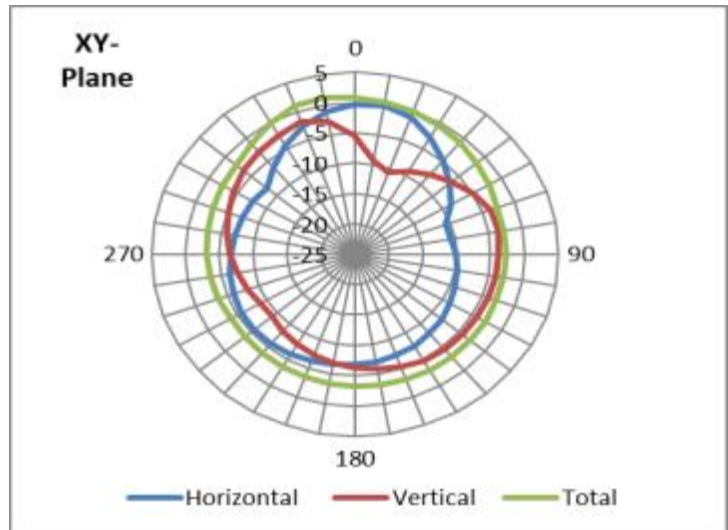
| 1432.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.05 | 10 deg  |
| Vertical Peak(dBi)    | -8.99 | 240 deg |



## Radiation characteristic in 3300MHz ~ 4200MHz (5G NR Band 77)

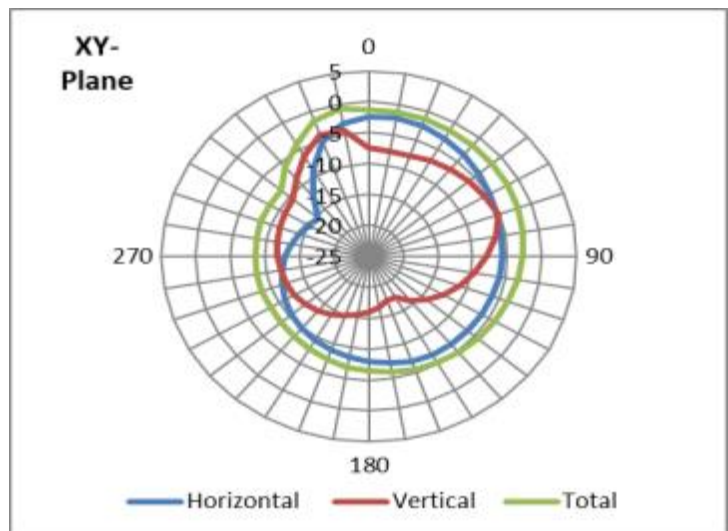
### Main antenna: 3300.00 MHz

| 3300.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.1  | 20 deg  |
| Vertical Peak(dBi)    | -1.79 | 340 deg |



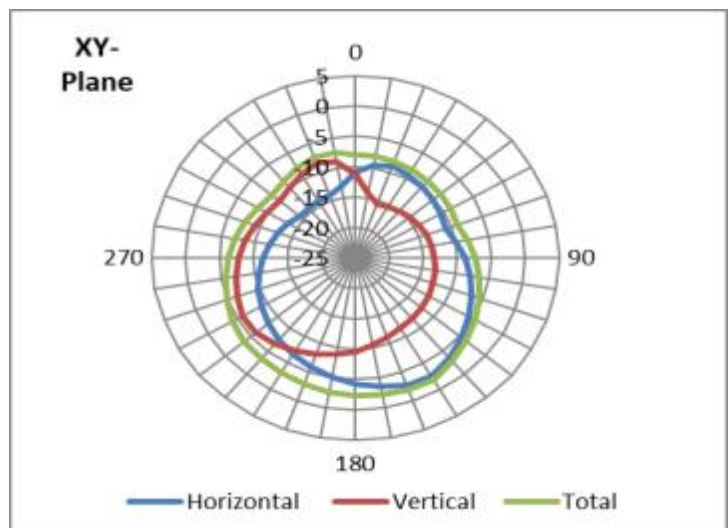
### Main antenna: 3750.00 MHz

| 3750.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.3  | 20 deg  |
| Vertical Peak(dBi)    | -4.04 | 350 deg |



### Main antenna: 4200.00 MHz

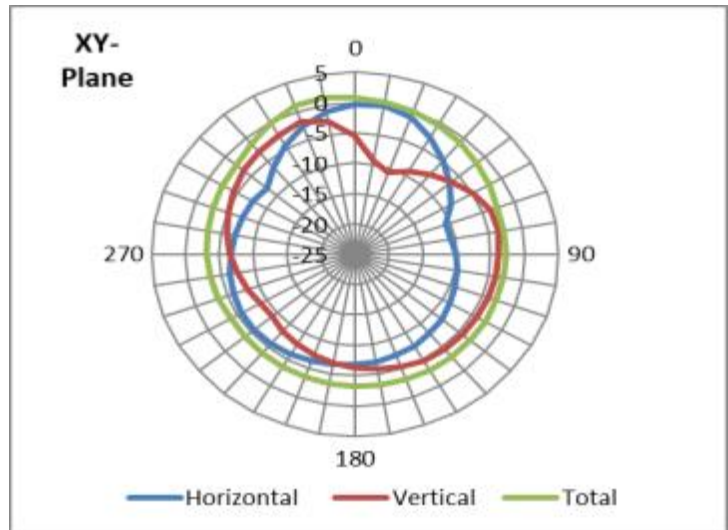
| 4200.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.49 | 150 deg |
| Vertical Peak(dBi)    | -5.84 | 240 deg |



## Radiation characteristic in 3300MHz ~ 3800MHz (5G NR Band 78)

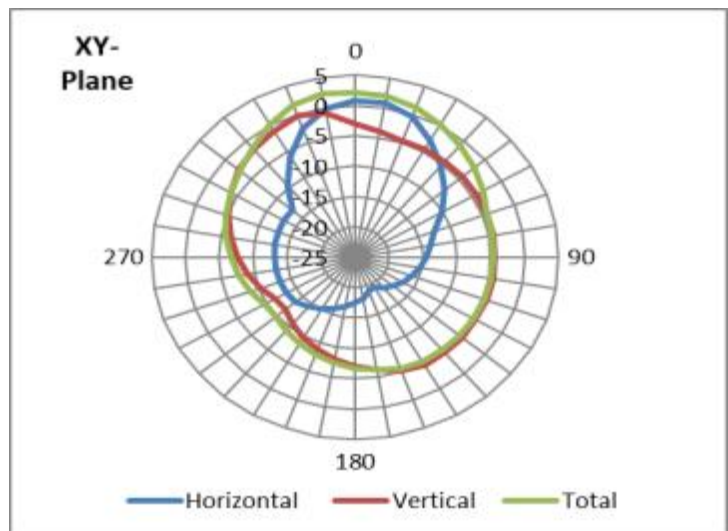
### Main antenna: 3300.00 MHz

| 3300.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.1  | 20 deg  |
| Vertical Peak(dBi)    | -1.79 | 340 deg |



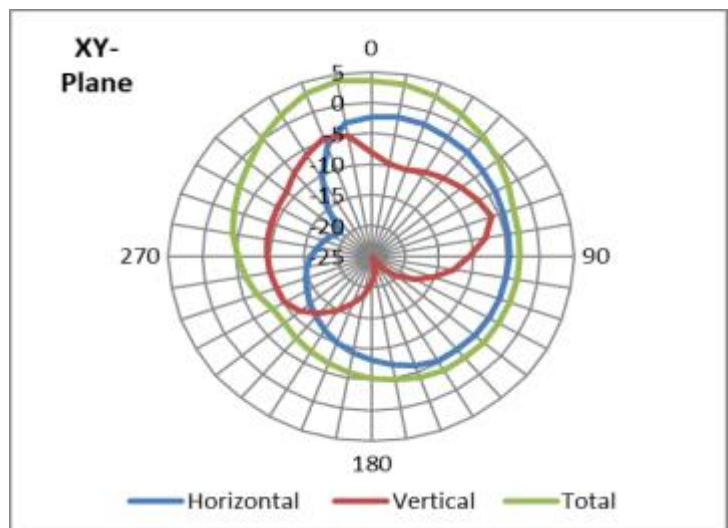
### Main antenna: 3550.00 MHz

| 3550.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.83  | 10 deg  |
| Vertical Peak(dBi)    | -0.25 | 340 deg |



### Main antenna: 3800.00 MHz

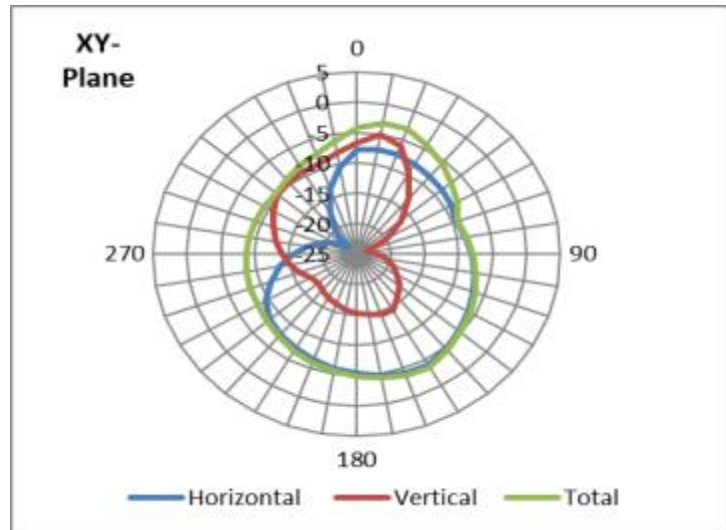
| 3800.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.98 | 20 deg  |
| Vertical Peak(dBi)    | -4.48 | 350 deg |



## Radiation characteristic in 4400MHz ~ 5000MHz (5G NR Band 79)

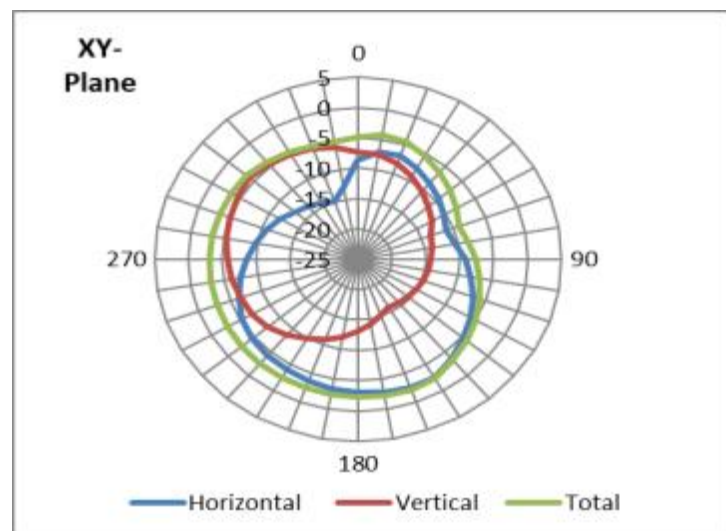
### Main antenna: 4400.00 MHz

| 4400.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -3.91 | 150 deg |
| Vertical Peak(dBi)    | -5.14 | 10 deg  |



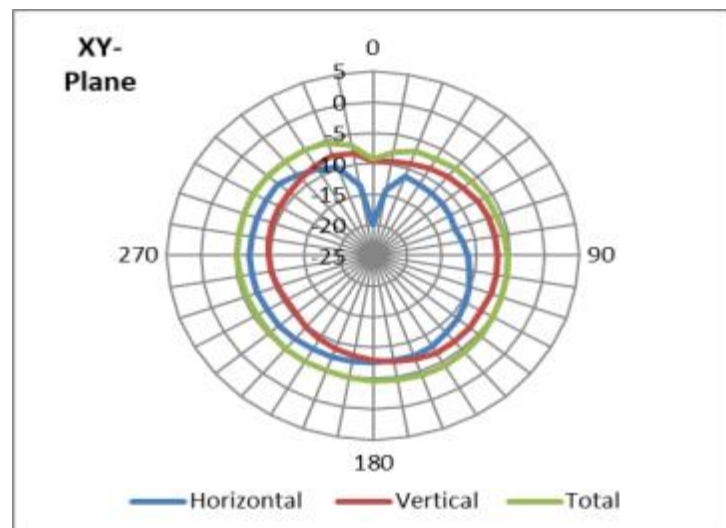
### Main antenna: 4700.00 MHz

| 4700.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.40 | 150 deg |
| Vertical Peak(dBi)    | -4.16 | 300 deg |



### Main antenna: 5000.00 MHz

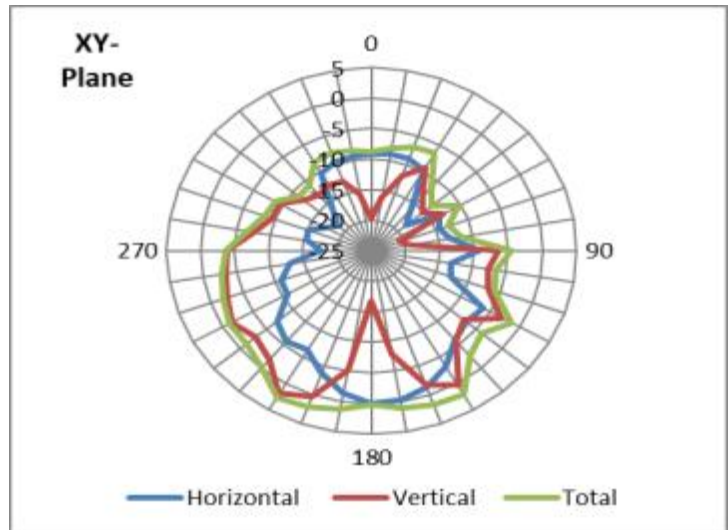
| 5000.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -6.95 | 260 deg |
| Vertical Peak(dBi)    | -6.65 | 90 deg  |



## Radiation characteristic in 1920MHz ~ 1980MHz (UMTS/HSDPA, Band 1, n1)

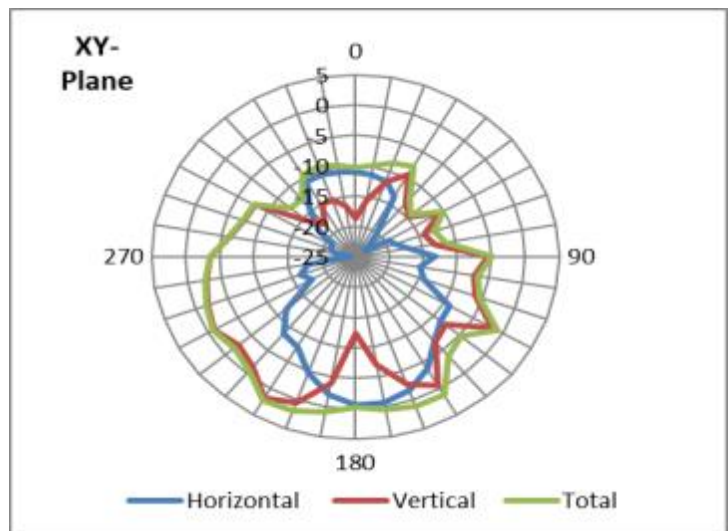
### MIMO antenna: 1920.00 MHz

| 1920.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.04 | 180 deg |
| Vertical Peak(dBi)    | 1.99  | 210 deg |



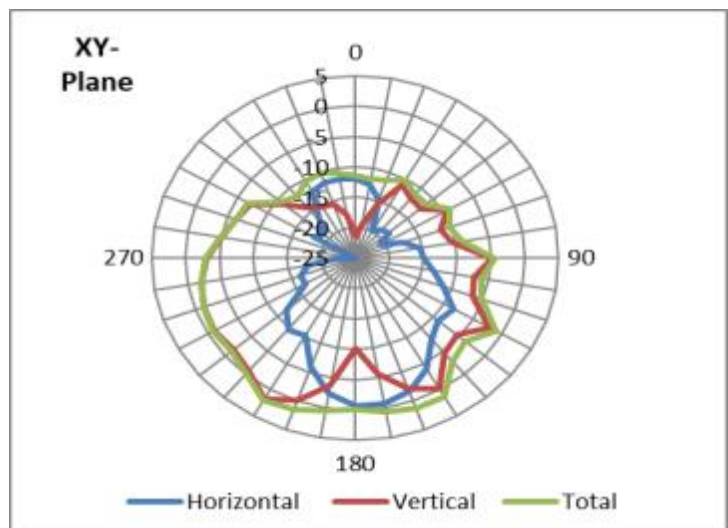
### MIMO antenna: 1950.00 MHz

| 1950.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.63 | 180 deg |
| Vertical Peak(dBi)    | 1.84  | 210 deg |



### MIMO antenna: 1980.00 MHz

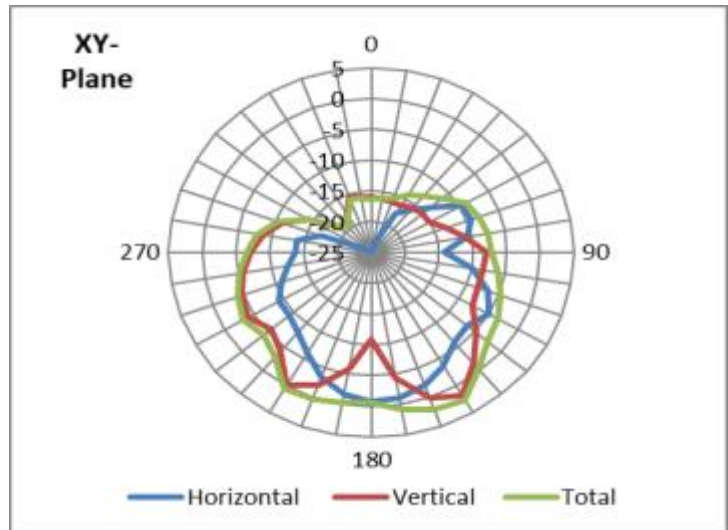
| 1980.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.68 | 180 deg |
| Vertical Peak(dBi)    | 1.75  | 210 deg |



## Radiation characteristic in 1850MHz ~ 1910MHz (PCS, Band 2, n2)

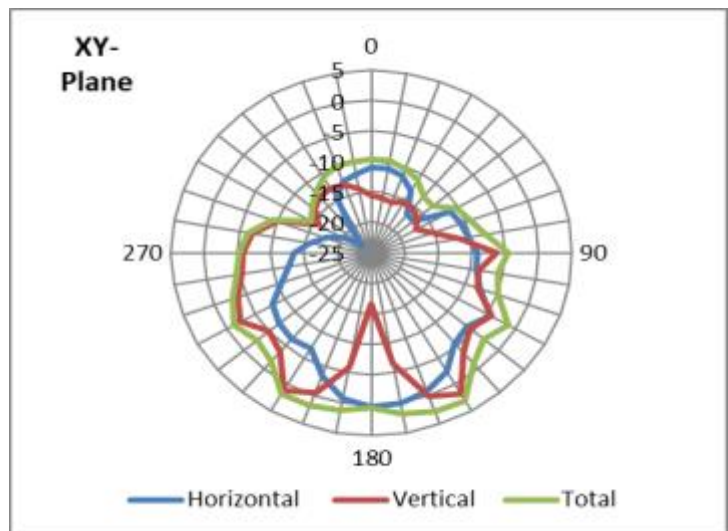
### MIMO antenna: 1850.00 MHz

| 1850.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.76 | 180 deg |
| Vertical Peak(dBi)    | 1.93  | 150 deg |



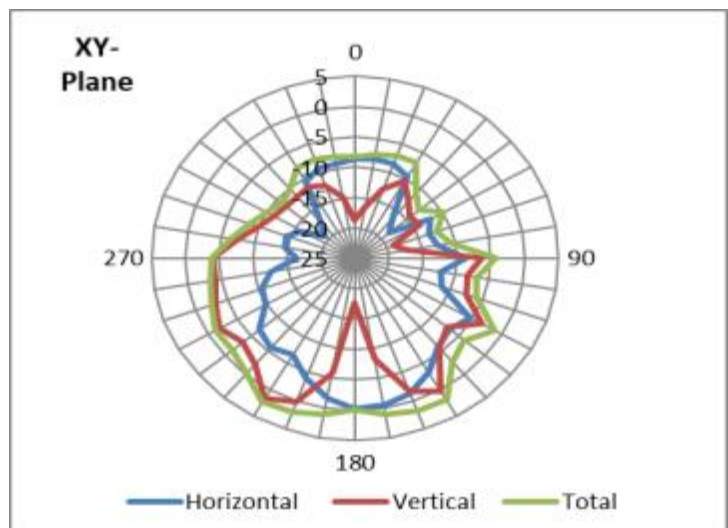
### MIMO antenna: 1880.00 MHz

| 1880.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.34 | 180 deg |
| Vertical Peak(dBi)    | 1.7  | 150 deg |



### MIMO antenna: 1910.00 MHz

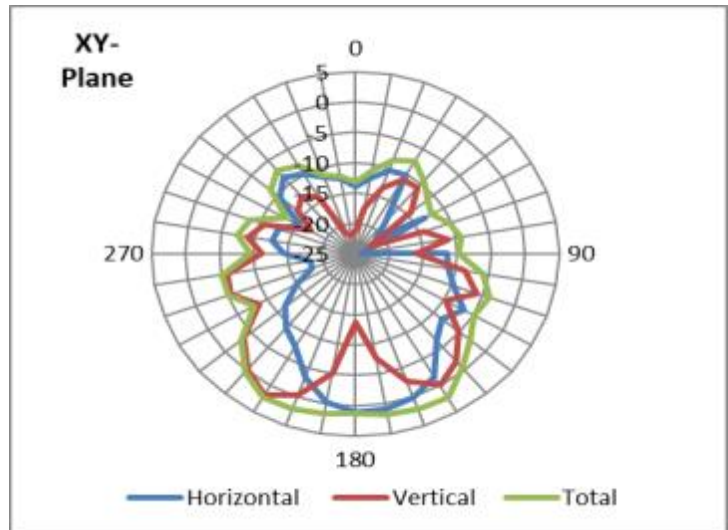
| 1910.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.15 | 180 deg |
| Vertical Peak(dBi)    | 1.67  | 210 deg |



## Radiation characteristic in 1710MHz ~ 1785MHz (UE-UTRA, Band 3, n3)

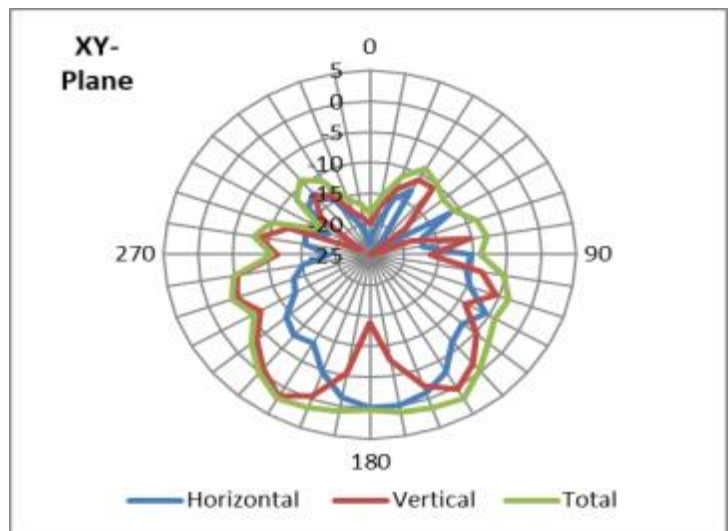
### MIMO antenna: 1710.00 MHz

| 1710.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 1.04 | 180 deg |
| Vertical Peak(dBi)    | 1.81 | 210 deg |



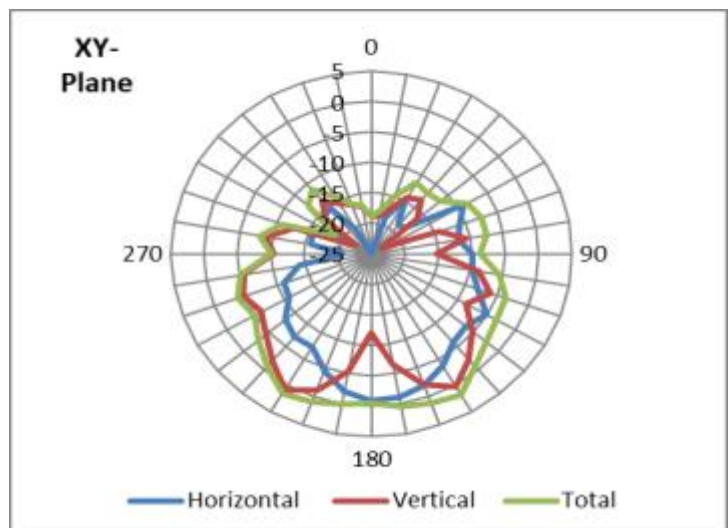
### MIMO antenna: 1747.50 MHz

| 1747.50 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.03 | 180 deg |
| Vertical Peak(dBi)    | 1.72 | 210 deg |



### MIMO antenna: 1785.00 MHz

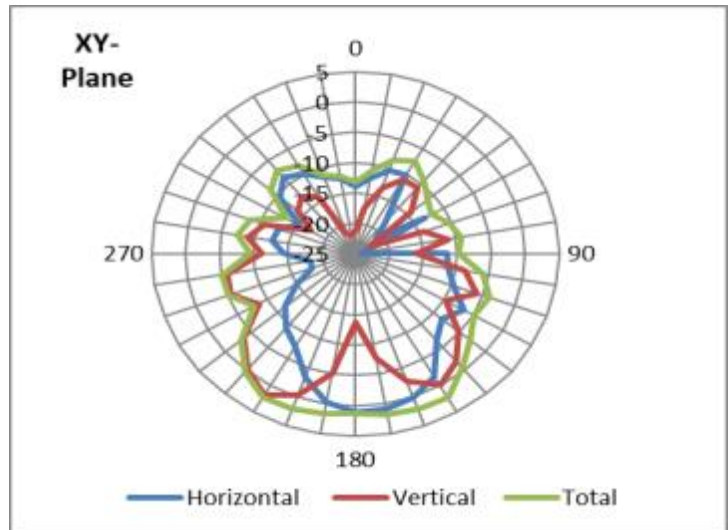
| 1785.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.80 | 180 deg |
| Vertical Peak(dBi)    | 0.86  | 210 deg |



## Radiation characteristic in 1710MHz ~ 1755MHz (UMTS(AWS), Band 4)

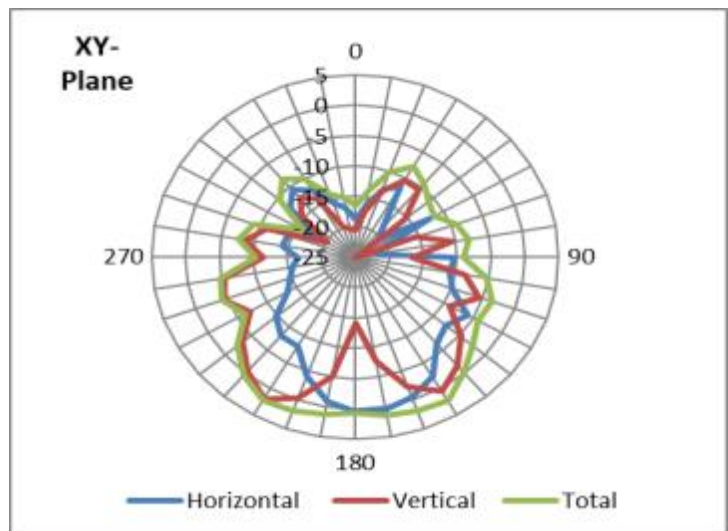
### MIMO antenna: 1710.00 MHz

| 1710.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 1.04 | 180 deg |
| Vertical Peak(dBi)    | 1.81 | 210 deg |



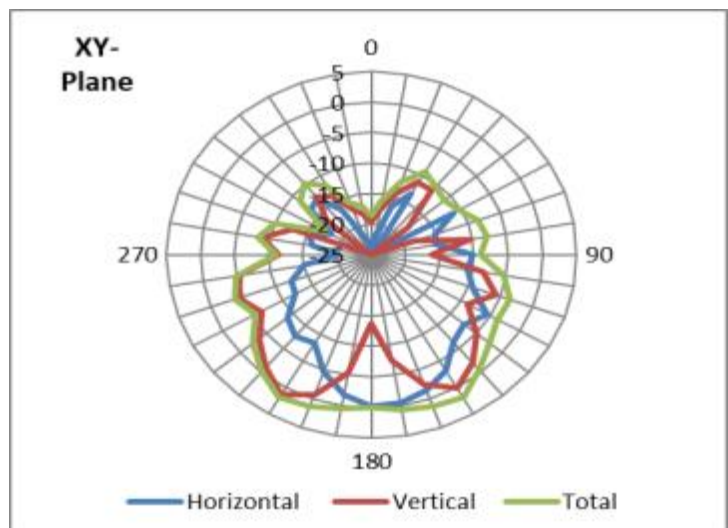
### MIMO antenna: 1732.50 MHz

| 1732.50 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.52 | 180 deg |
| Vertical Peak(dBi)    | 1.91 | 210 deg |



### MIMO antenna: 1755.00 MHz

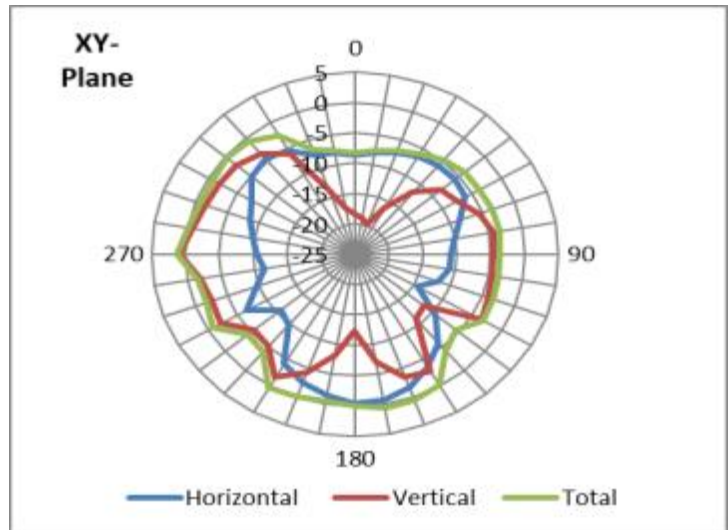
| 1755.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.27 | 180 deg |
| Vertical Peak(dBi)    | 1.54  | 210 deg |



## Radiation characteristic in 2500MHz ~ 2570MHz (UE-UTRA, Band 7, n7)

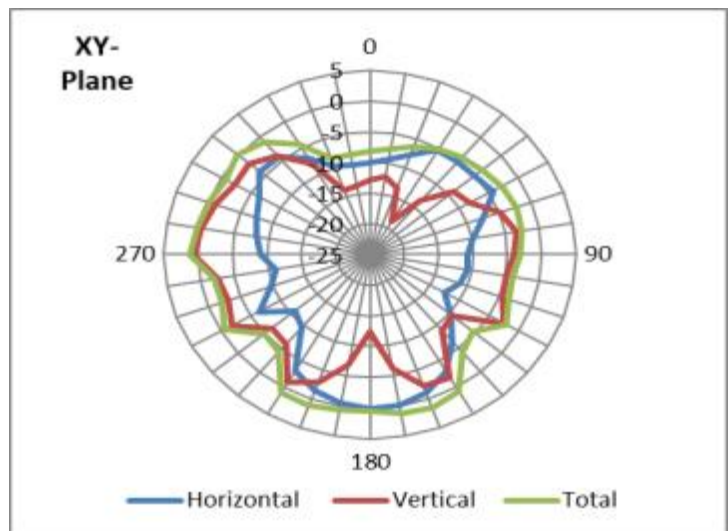
### MIMO antenna: 2500.00 MHz

| 2500.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.29 | 180 deg |
| Vertical Peak(dBi)    | 0.87  | 270 deg |



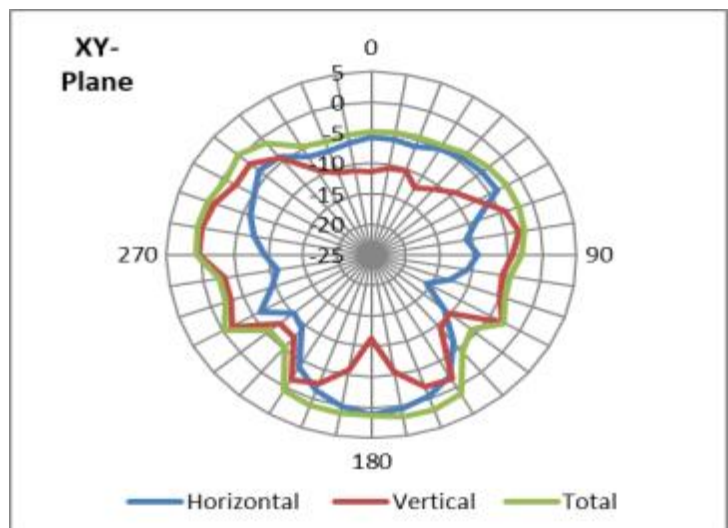
### MIMO antenna: 2535.00 MHz

| 2535.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.19 | 180 deg |
| Vertical Peak(dBi)    | 0.73 | 270 deg |



### MIMO antenna: 2570.00 MHz

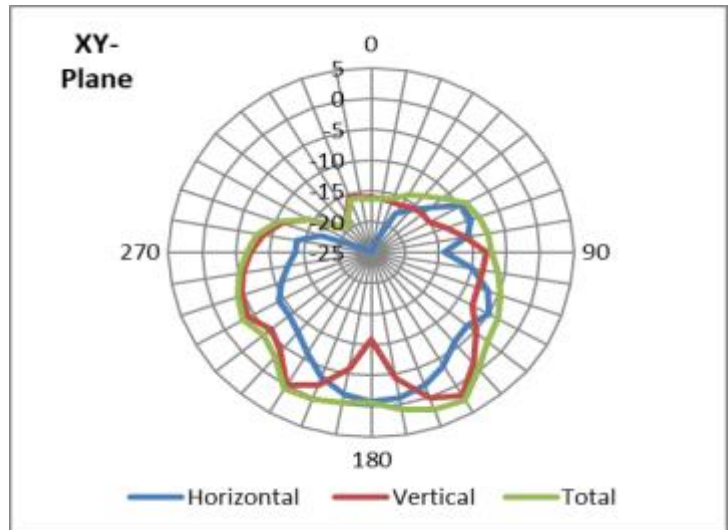
| 2570.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 1.01 | 180 deg |
| Vertical Peak(dBi)    | 0.17 | 270 deg |



## Radiation characteristic in 1850MHz ~ 1915MHz (UE-UTRA, Band 25)

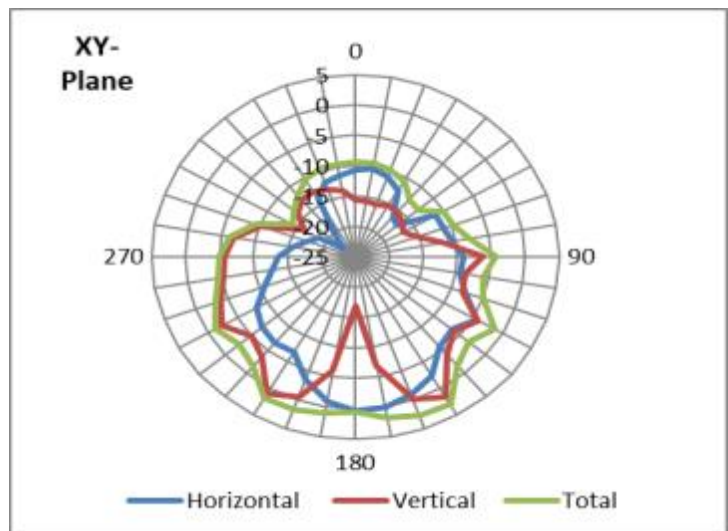
### MIMO antenna: 1850.00 MHz

| 1850.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.76 | 180 deg |
| Vertical Peak(dBi)    | 1.93  | 150 deg |



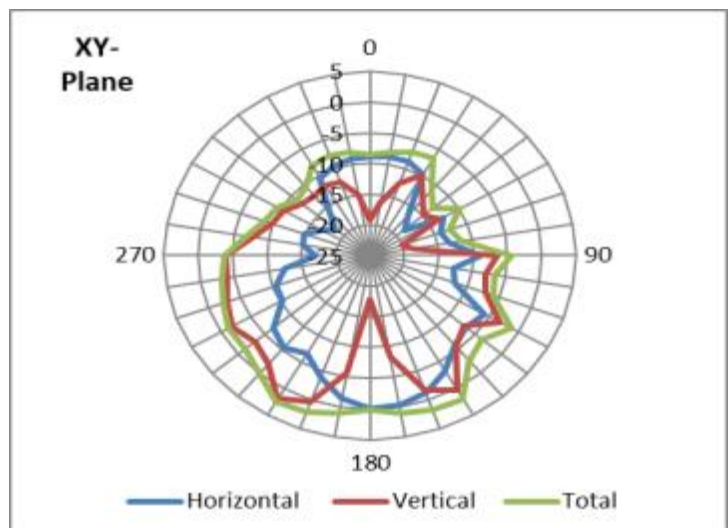
### MIMO antenna: 1882.50 MHz

| 1882.50 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.26 | 180 deg |
| Vertical Peak(dBi)    | 1.51 | 150 deg |



### MIMO antenna: 1915.00 MHz

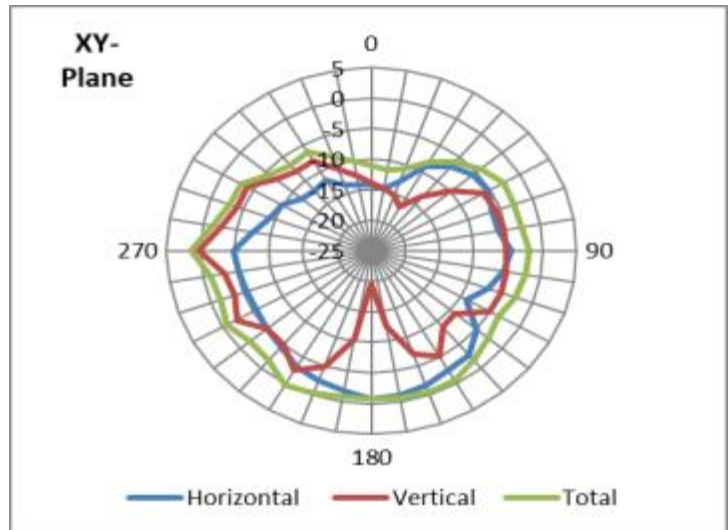
| 1915.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.09 | 180 deg |
| Vertical Peak(dBi)    | 1.87  | 210 deg |



## Radiation characteristic in 2305MHz ~ 2315MHz (UE-UTRA, Band 30)

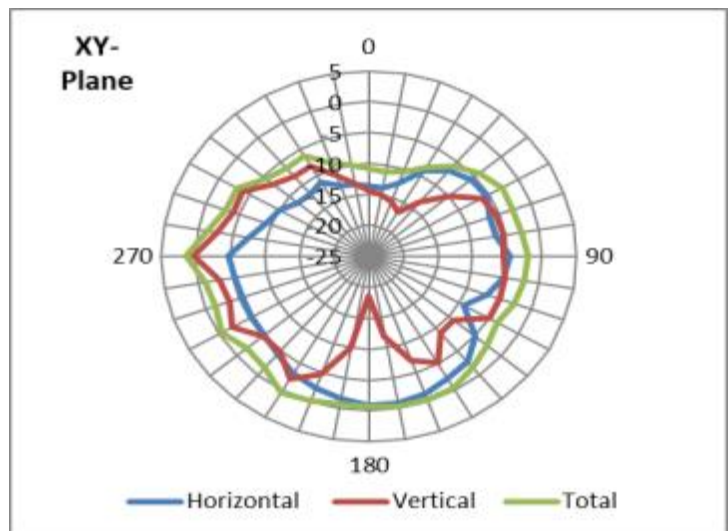
### MIMO antenna: 2305.00 MHz

| 2305.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.86 | 180 deg |
| Vertical Peak(dBi)    | 0.13  | 270 deg |



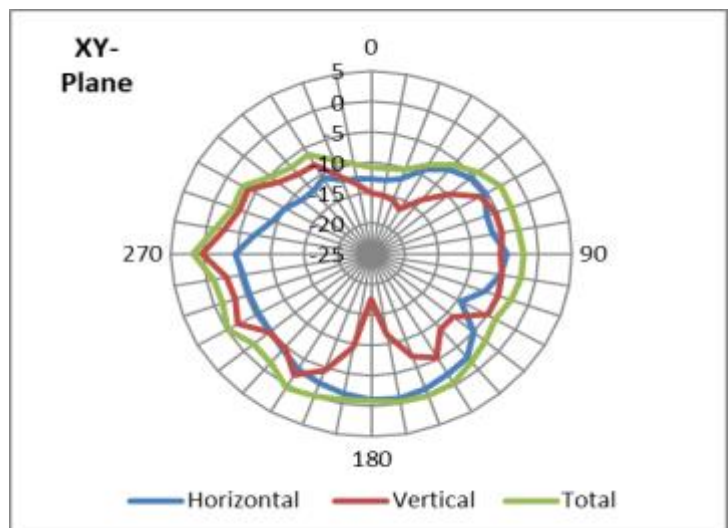
### MIMO antenna: 2310.00 MHz

| 2310.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.89 | 180 deg |
| Vertical Peak(dBi)    | 0.27  | 270 deg |



### MIMO antenna: 2315.00 MHz

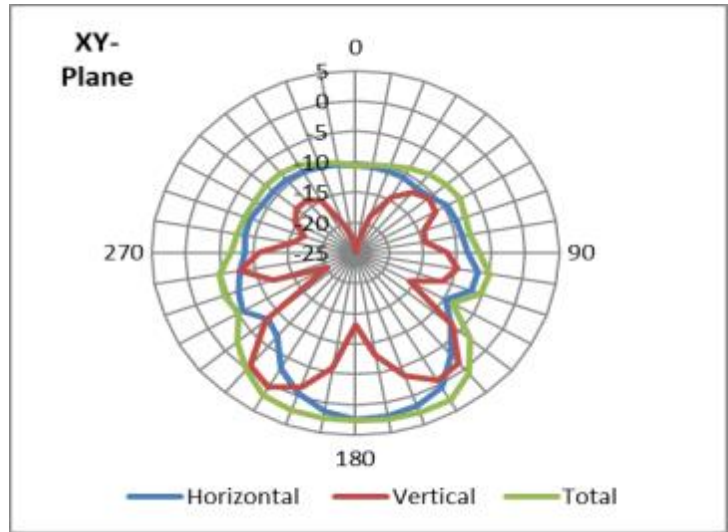
| 2315.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.87 | 180 deg |
| Vertical Peak(dBi)    | 0.41  | 270 deg |



## Radiation characteristic in 1452MHz ~ 1496MHz (UE-UTRA, Band 32)

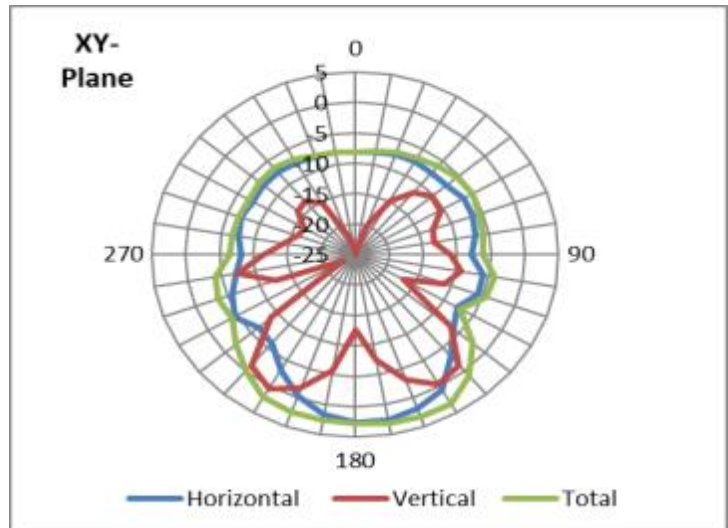
### MIMO antenna: 1452.00 MHz

| 1452.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 2.36 | 180 deg |
| Vertical Peak(dBi)    | 0.51 | 210 deg |



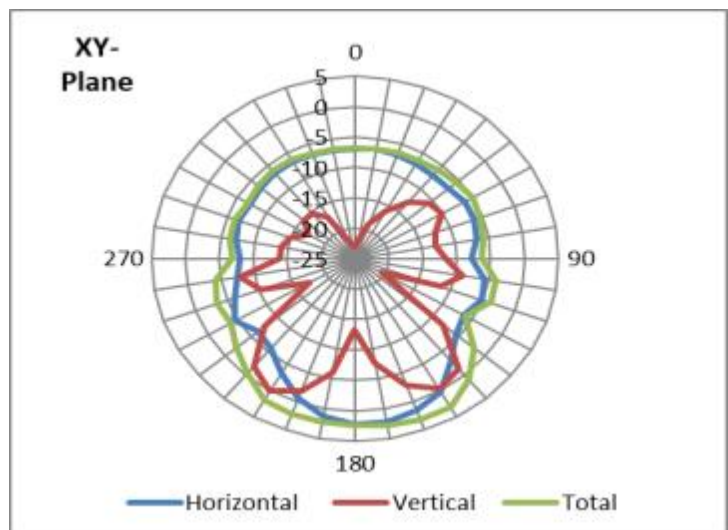
### MIMO antenna: 1474.00 MHz

| 1474.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 2.59 | 180 deg |
| Vertical Peak(dBi)    | 0.43 | 210 deg |



### MIMO antenna: 1496.00 MHz

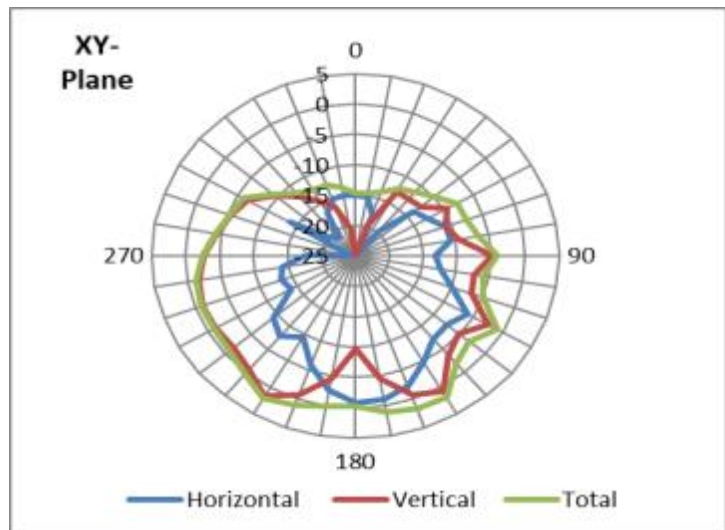
| 1496.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 2.34 | 180 deg |
| Vertical Peak(dBi)    | 0.21 | 210 deg |



## Radiation characteristic in 2010MHz ~ 2025MHz (UE-UTRA, Band 34)

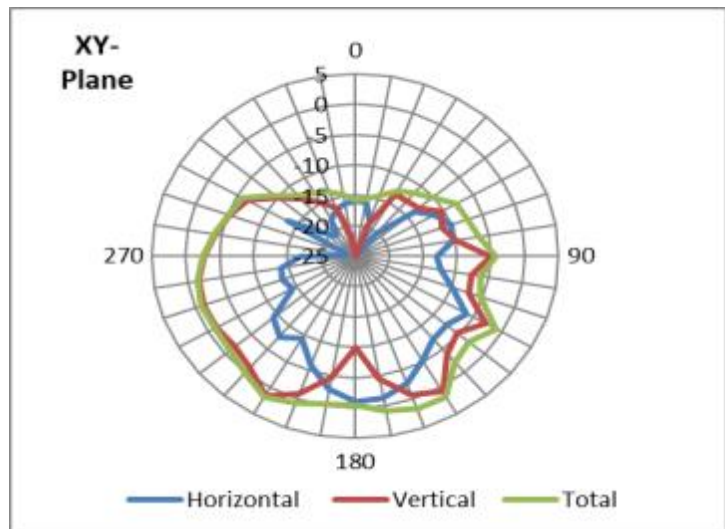
### MIMO antenna: 2010.00 MHz

| 2010.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.83 | 180 deg |
| Vertical Peak(dBi)    | 1.68  | 210 deg |



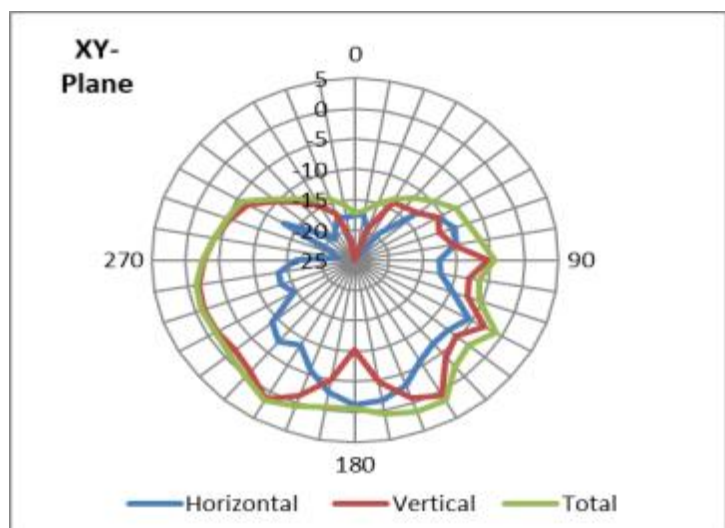
### MIMO antenna: 2017.50 MHz

| 2017.50 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.02 | 180 deg |
| Vertical Peak(dBi)    | 1.46  | 210 deg |



### MIMO antenna: 2025.00 MHz

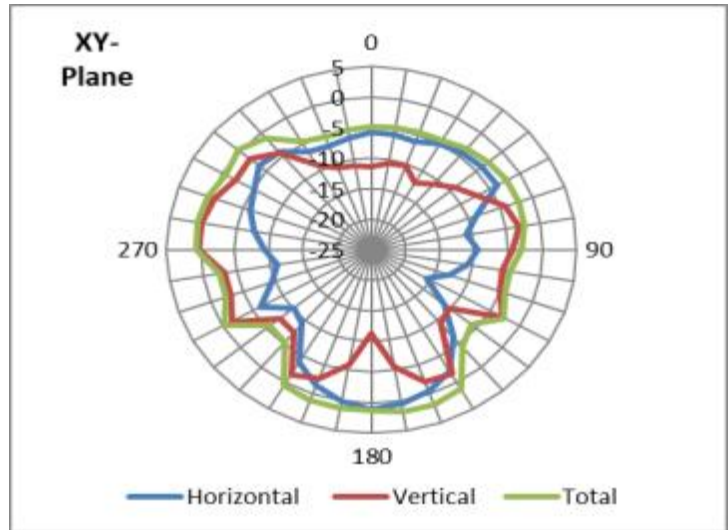
| 2025.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.21 | 180 deg |
| Vertical Peak(dBi)    | 1.35  | 210 deg |



# Radiation characteristic in 2570MHz ~ 2620MHz (UE-UTRA, Band 38, n38)

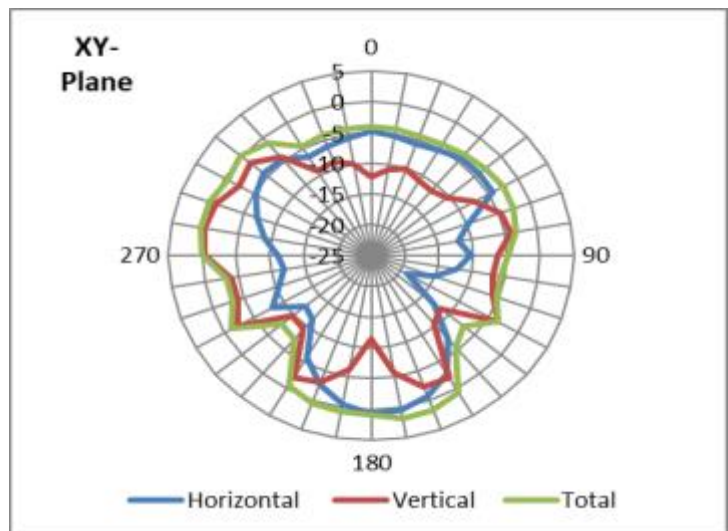
## MIMO antenna: 2570.00 MHz

| 2570.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 1.01 | 180 deg |
| Vertical Peak(dBi)    | 0.17 | 270 deg |



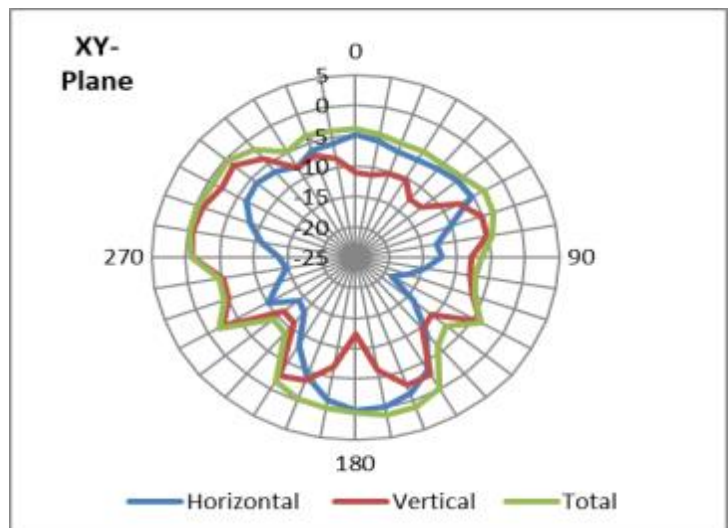
## MIMO antenna: 2595.00 MHz

| 2595.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.68 | 180 deg |
| Vertical Peak(dBi)    | 0.09 | 280 deg |



## MIMO antenna: 2620.00 MHz

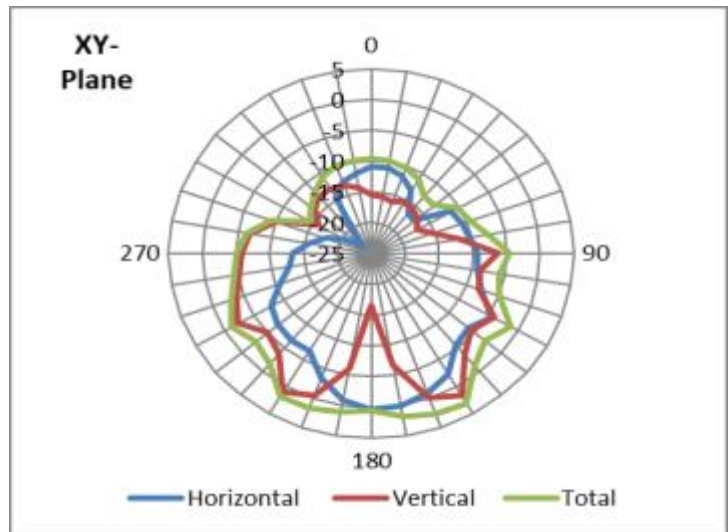
| 2620.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.18 | 180 deg |
| Vertical Peak(dBi)    | -0.6 | 280 deg |



## Radiation characteristic in 1880MHz ~ 1920MHz (UE-UTRA, Band 39, n39)

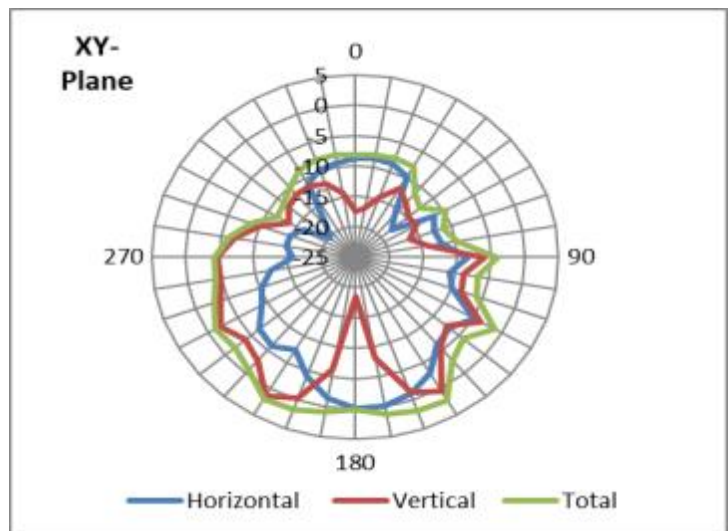
### MIMO antenna: 1880.00 MHz

| 1880.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.34 | 180 deg |
| Vertical Peak(dBi)    | 1.7  | 150 deg |



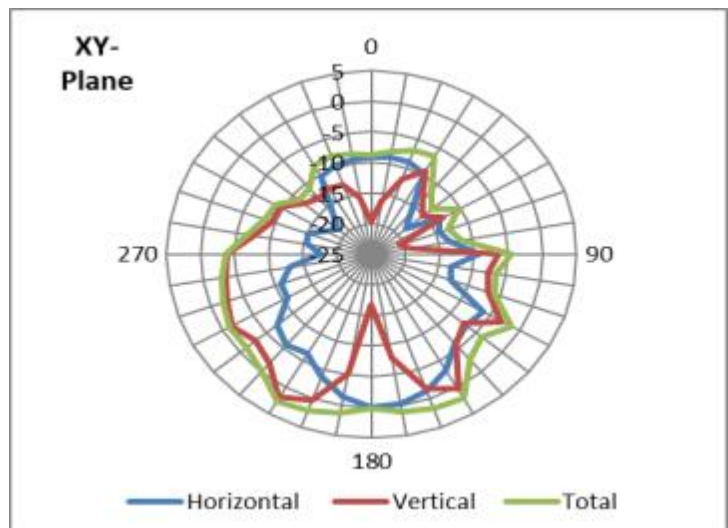
### MIMO antenna: 1900.00 MHz

| 1900.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.05 | 180 deg |
| Vertical Peak(dBi)    | 1.32  | 210 deg |



### MIMO antenna: 1920.00 MHz

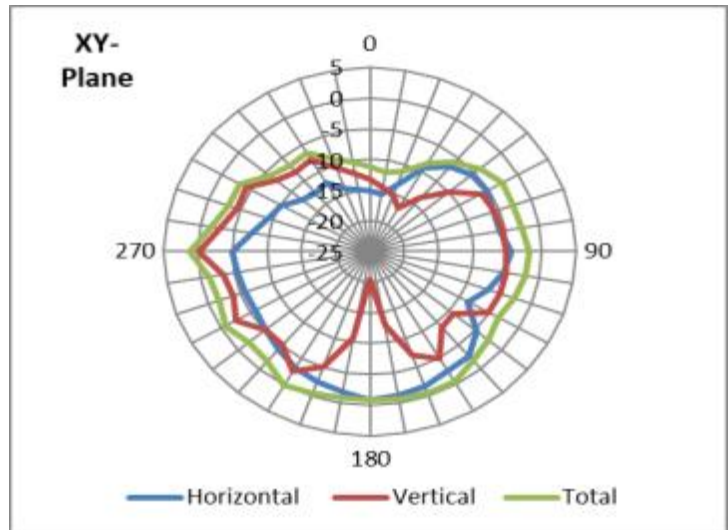
| 1920.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.04 | 180 deg |
| Vertical Peak(dBi)    | 1.99  | 210 deg |



## Radiation characteristic in 2300MHz ~ 2400MHz (UE-UTRA, Band 40)

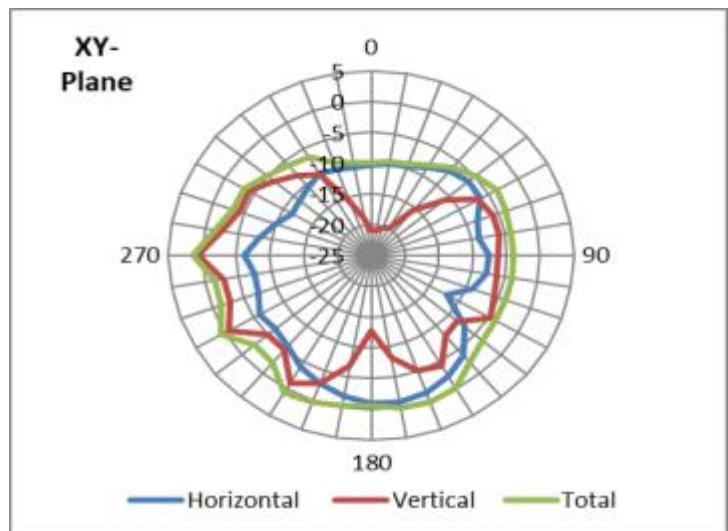
### MIMO antenna: 2300.00 MHz

| 2300.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.82 | 180 deg |
| Vertical Peak(dBi)    | 0     | 270 deg |



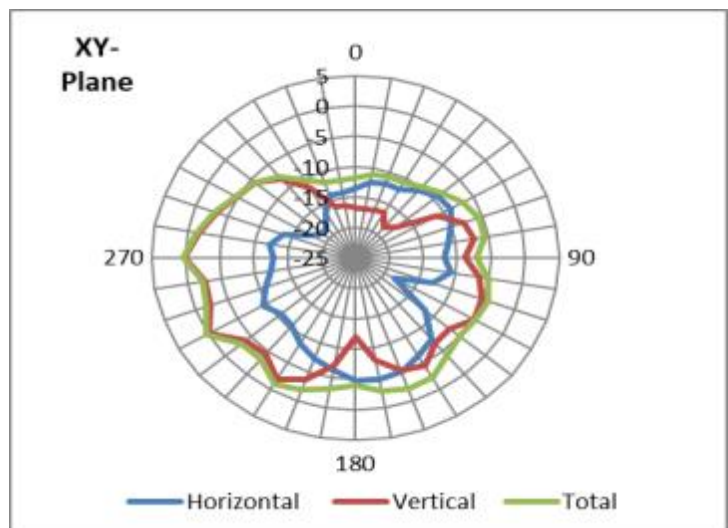
### MIMO antenna: 2350.00 MHz

| 2350.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.75 | 180 deg |
| Vertical Peak(dBi)    | 0.54  | 270 deg |



### MIMO antenna: 2400.00 MHz

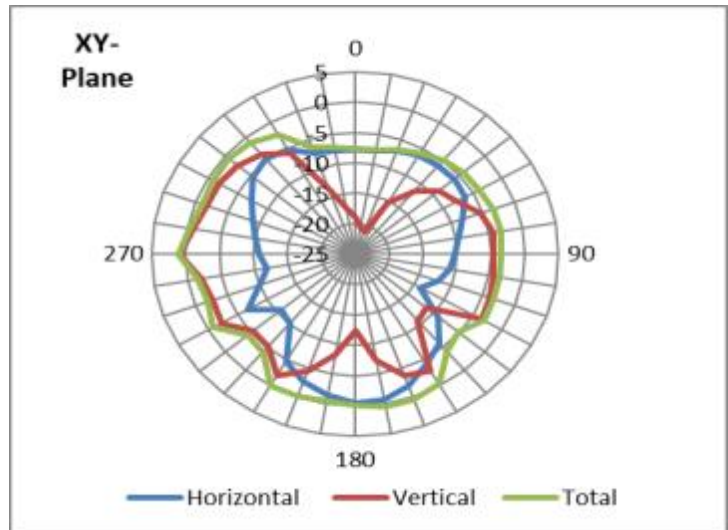
| 2400.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -4.66 | 180 deg |
| Vertical Peak(dBi)    | 0.23  | 270 deg |



## Radiation characteristic in 2496MHz ~ 2690MHz (UE-UTRA, Band 41, n41)

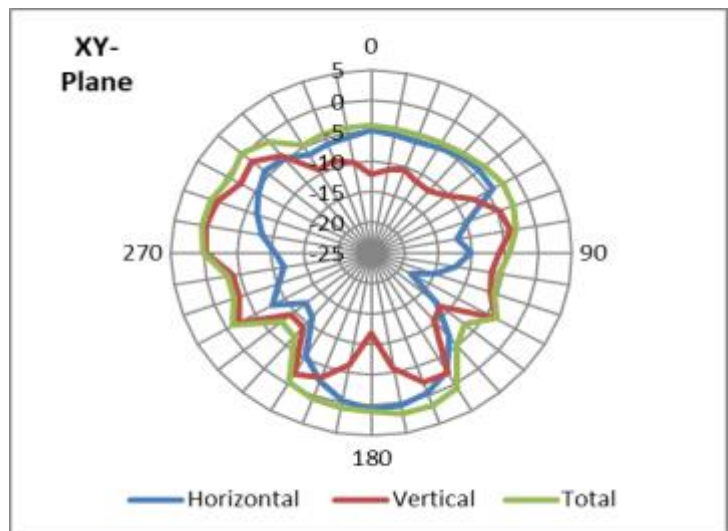
### MIMO antenna: 2496.00 MHz

| 2496.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.47 | 180 deg |
| Vertical Peak(dBi)    | 0.87  | 270 deg |



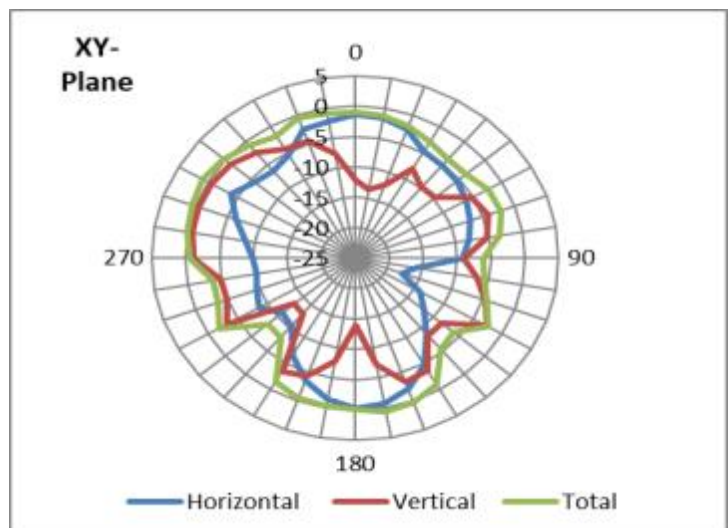
### MIMO antenna: 2593.00 MHz

| 2593.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.72 | 180 deg |
| Vertical Peak(dBi)    | 0.12 | 270 deg |



### MIMO antenna: 2690.00 MHz

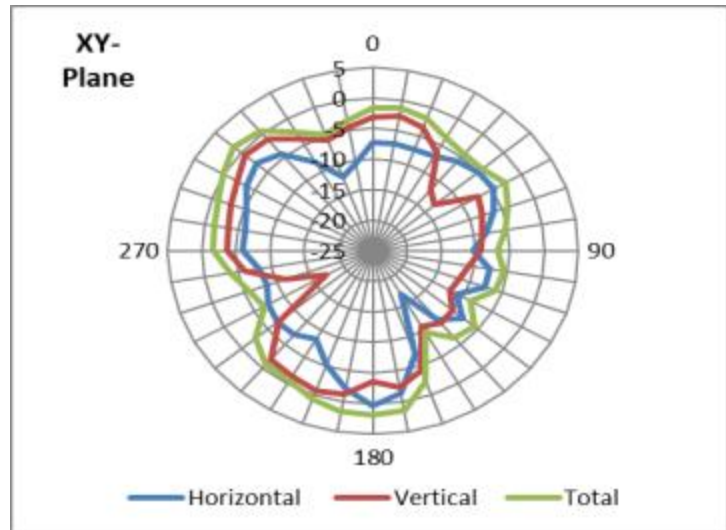
| 2690.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.31 | 180 deg |
| Vertical Peak(dBi)    | -0.49 | 280 deg |



## Radiation characteristic in 3400MHz ~ 3600MHz (LTE Band 42)

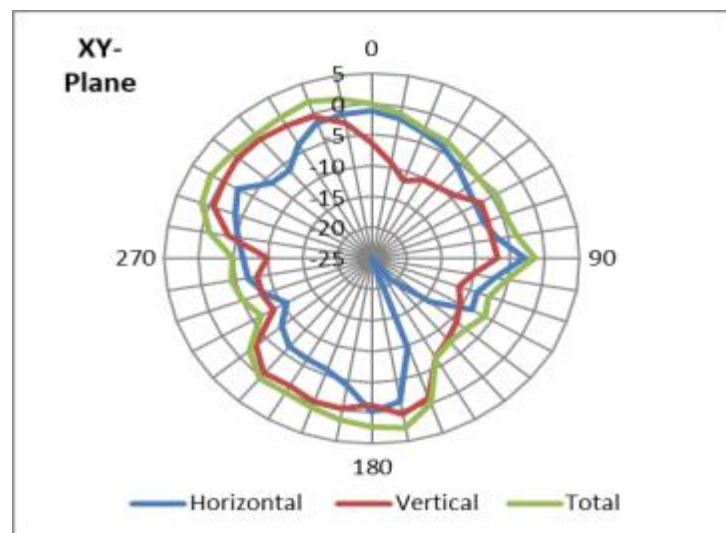
### MIMO antenna: 3400.00 MHz

| 3400.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.43  | 180 deg |
| Vertical Peak(dBi)    | -0.55 | 320 deg |



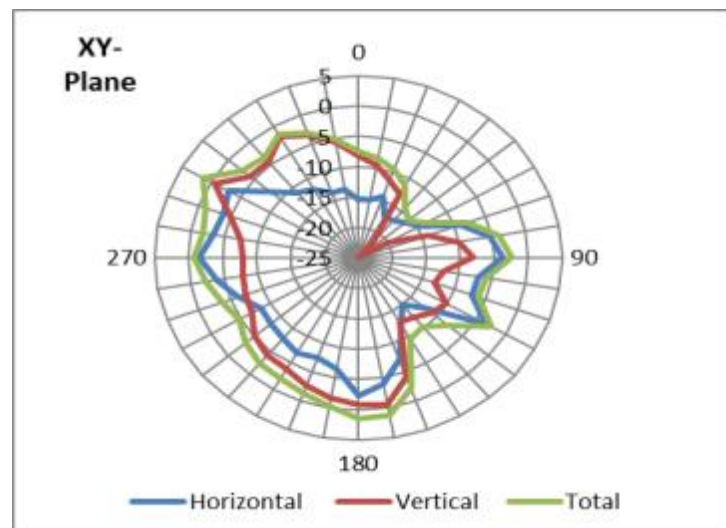
### MIMO antenna: 3500.00 MHz

| 3500.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.27 | 180 deg |
| Vertical Peak(dBi)    | 0.51  | 320 deg |



### MIMO antenna: 3600.00 MHz

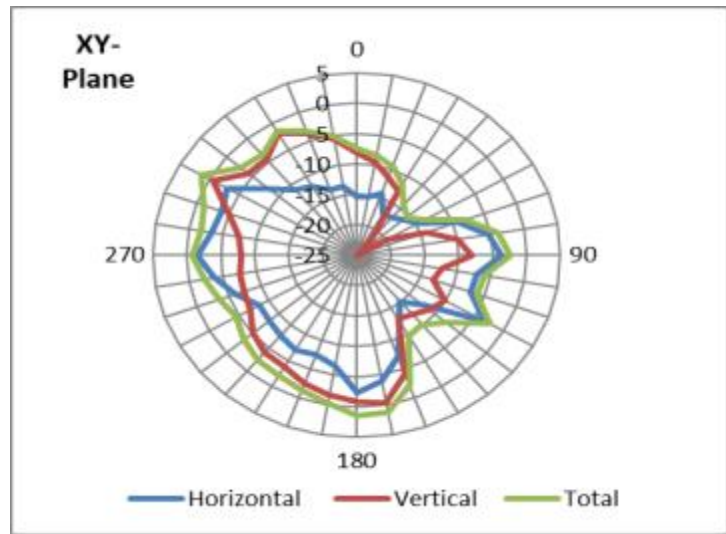
| 3600.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.62 | 270 deg |
| Vertical Peak(dBi)    | -0.36 | 300 deg |



## Radiation characteristic in 3600MHz ~ 3800MHz (LTE Band 43)

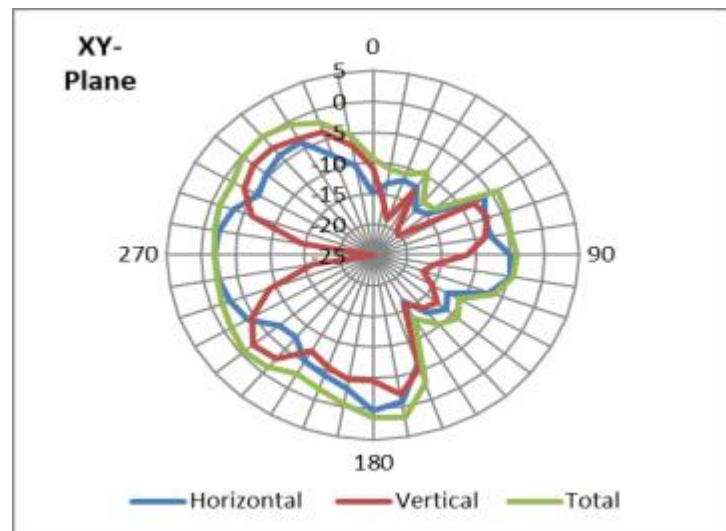
### MIMO antenna: 3600.00 MHz

| 3600.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.62 | 270 deg |
| Vertical Peak(dBi)    | -0.36 | 300 deg |



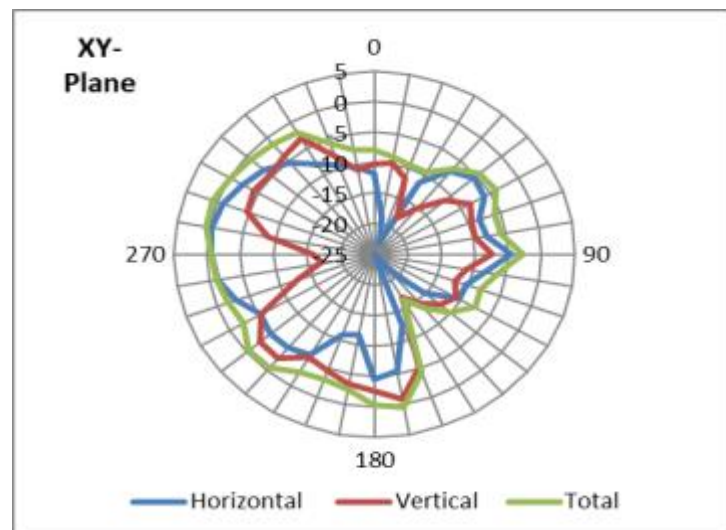
### MIMO antenna: 3700.00 MHz

| 3700.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.22  | 180 deg |
| Vertical Peak(dBi)    | -1.93 | 230 deg |



### MIMO antenna: 3800.00 MHz

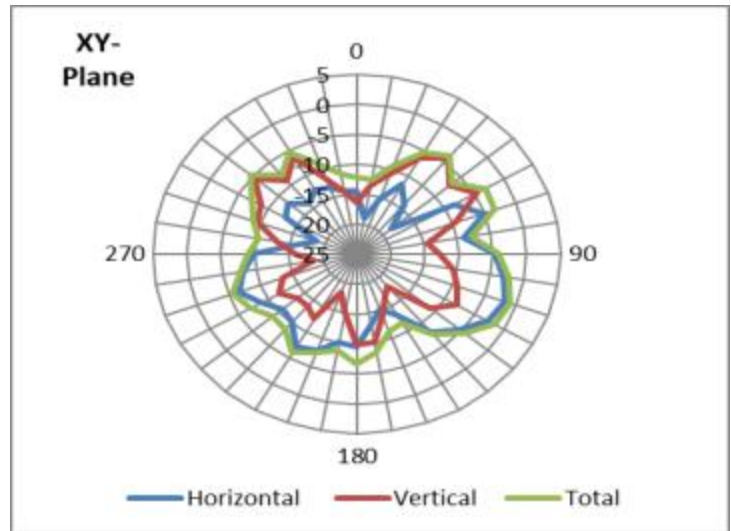
| 3800.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.31 | 270 deg |
| Vertical Peak(dBi)    | -0.78 | 170 deg |



# Radiation characteristic in 5150MHz ~ 5925MHz (LTE Band 46)

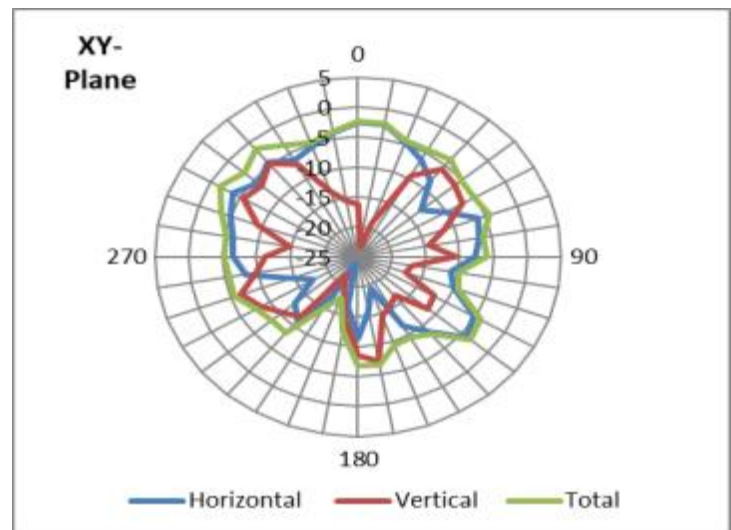
## MIMO antenna: 5150.00 MHz

| 5150.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.77 | 110 deg |
| Vertical Peak(dBi)    | -4.08 | 40 deg  |



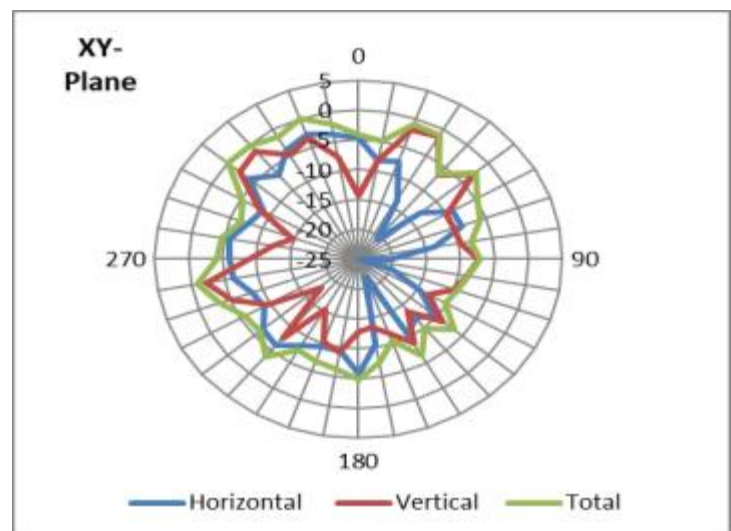
## MIMO antenna: 5537.00 MHz

| 5537.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.55 | 10 deg  |
| Vertical Peak(dBi)    | -4.74 | 320 deg |



## MIMO antenna: 5925.00 MHz

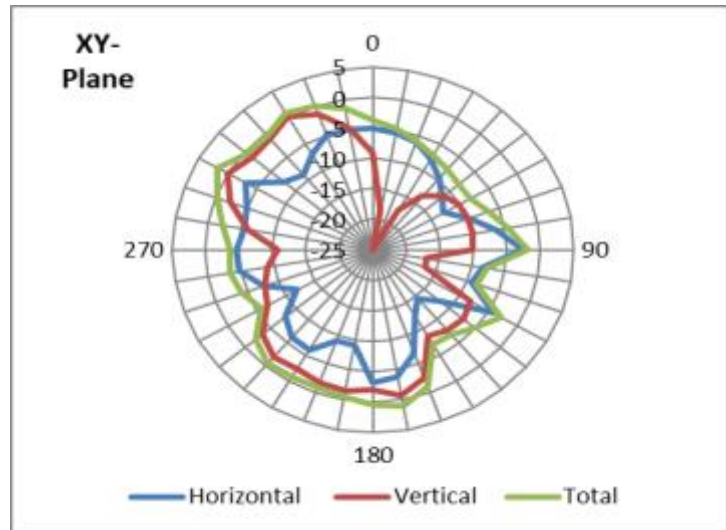
| 5925.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.83 | 340 deg |
| Vertical Peak(dBi)    | -1.41 | 260 deg |



## Radiation characteristic in 3550MHz ~ 3700MHz (LTE Band 48)

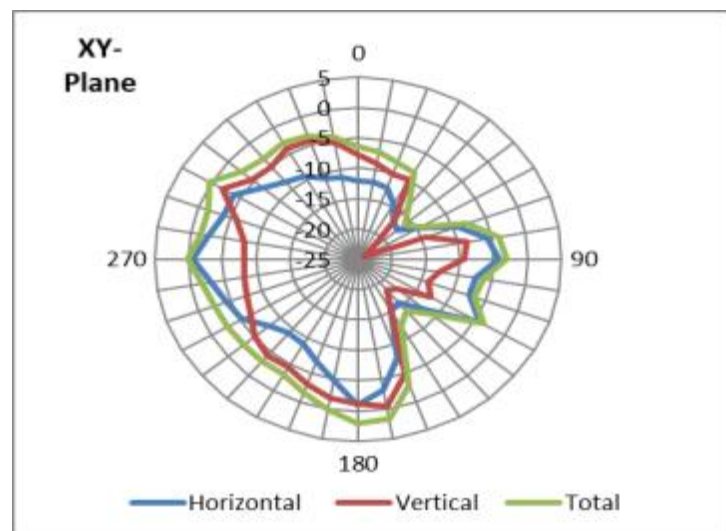
### MIMO antenna: 3550.00 MHz

| 3550.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.56 | 180 deg |
| Vertical Peak(dBi)    | 0.22  | 320 deg |



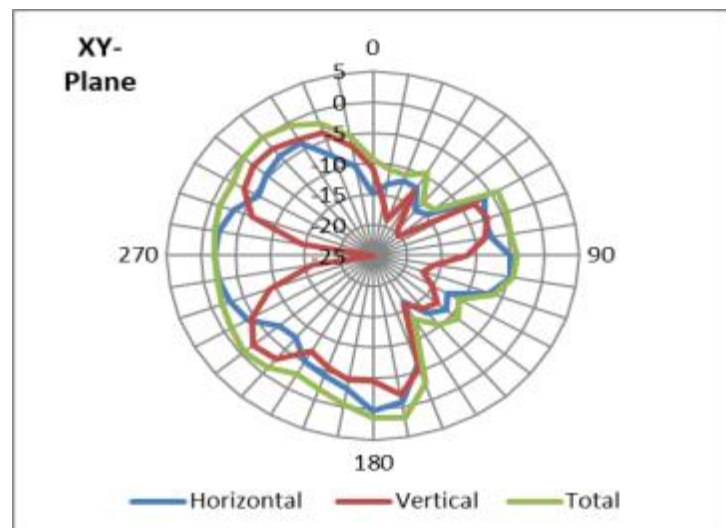
### MIMO antenna: 3625.00 MHz

| 3625.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.60 | 270 deg |
| Vertical Peak(dBi)    | -0.33 | 170 deg |



### MIMO antenna: 3700.00 MHz

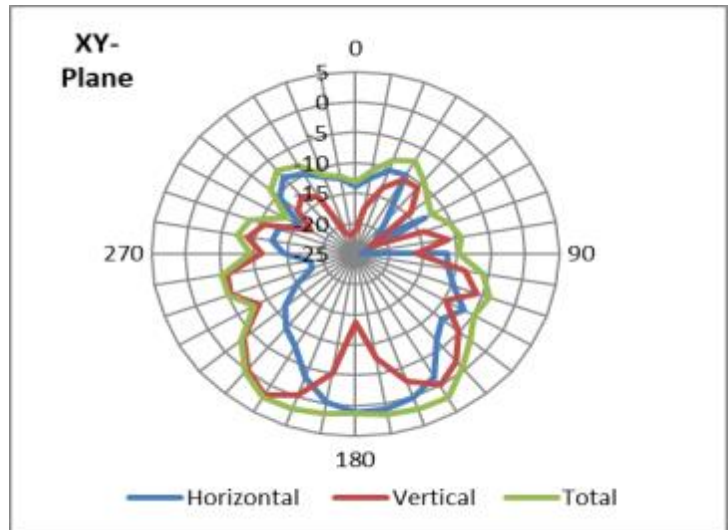
| 3700.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.22  | 180 deg |
| Vertical Peak(dBi)    | -1.93 | 230 deg |



## Radiation characteristic in 1710MHz ~ 1780MHz (Band 66, n66)

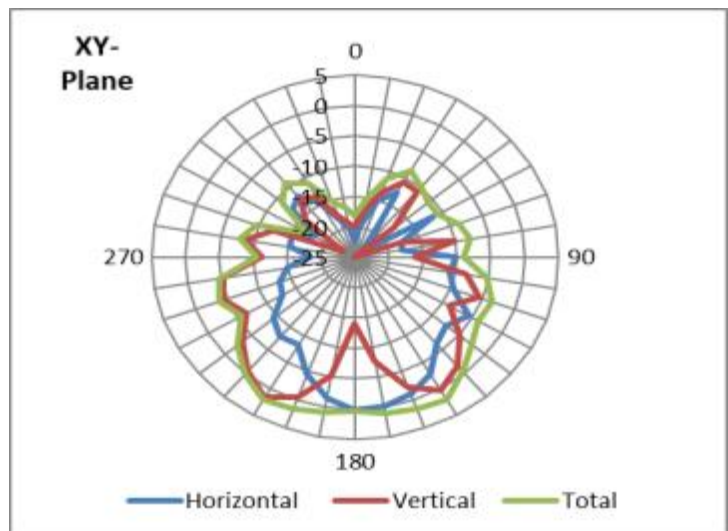
### MIMO antenna: 1710.00 MHz

| 1710.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 1.04 | 180 deg |
| Vertical Peak(dBi)    | 1.81 | 210 deg |



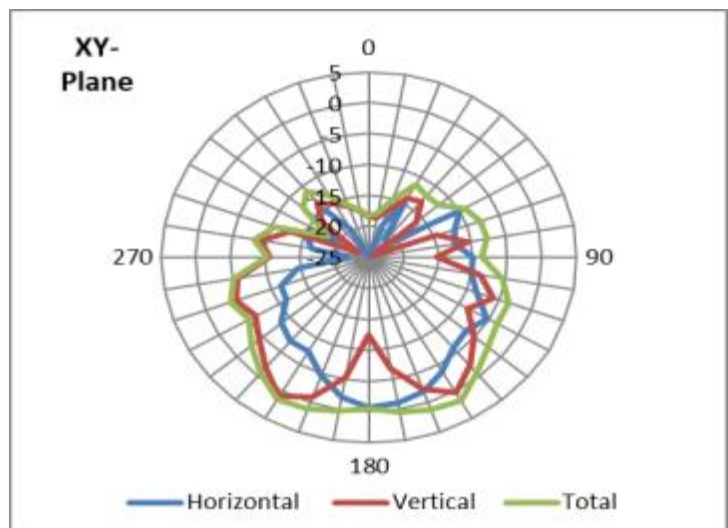
### MIMO antenna: 1745.00 MHz

| 1745.00 MHz           |      |         |
|-----------------------|------|---------|
| Horizontal Peak (dBi) | 0.13 | 180 deg |
| Vertical Peak(dBi)    | 1.77 | 210 deg |



### MIMO antenna: 1780.00 MHz

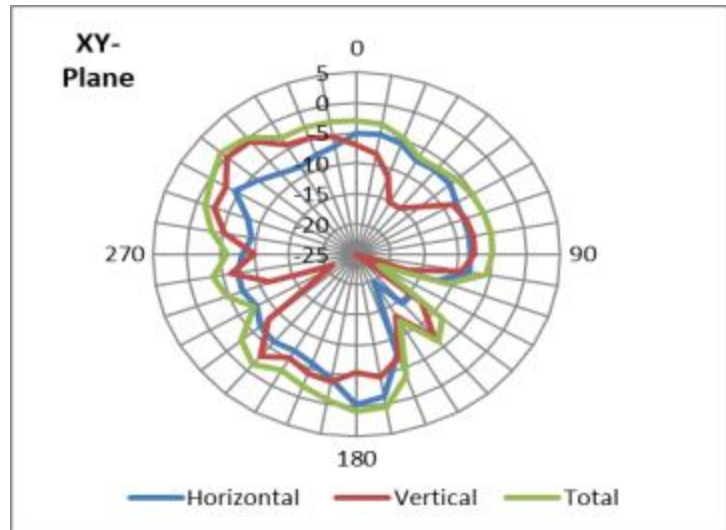
| 1780.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.83 | 180 deg |
| Vertical Peak(dBi)    | 0.97  | 210 deg |



## Radiation characteristic in 3300MHz ~ 4200MHz (5G NR Band 77)

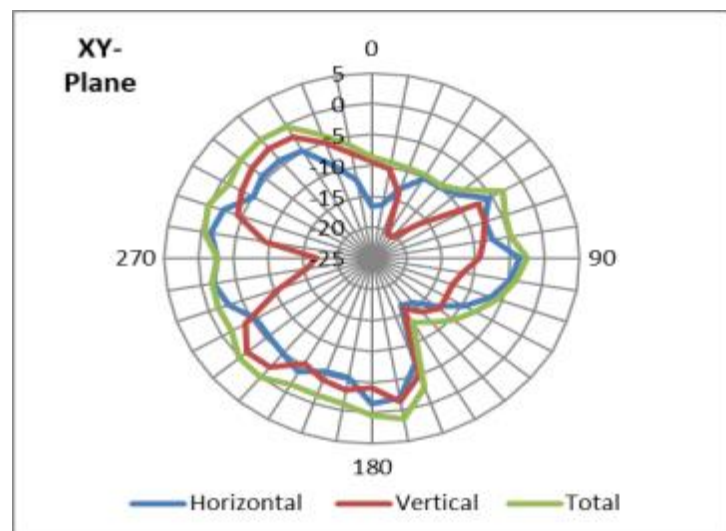
### MIMO antenna: 3300.00 MHz

| 3300.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.22 | 180 deg |
| Vertical Peak(dBi)    | -0.19 | 320 deg |



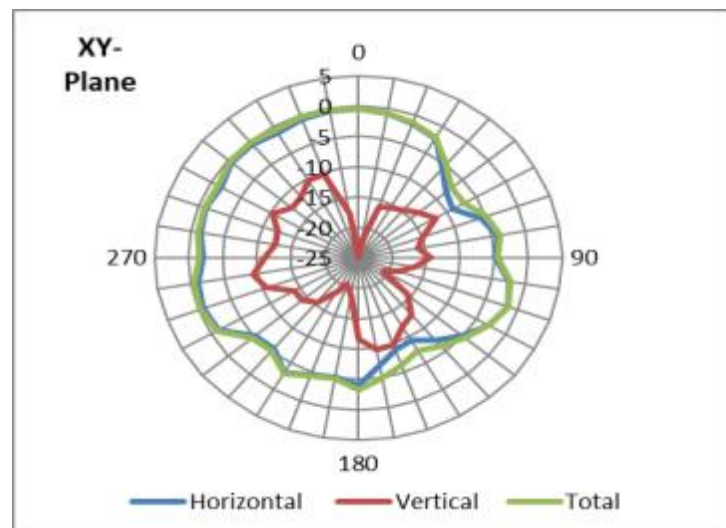
### MIMO antenna: 3750.00 MHz

| 3750.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.46 | 180 deg |
| Vertical Peak(dBi)    | -1.47 | 230 deg |



### MIMO antenna: 4200.00 MHz

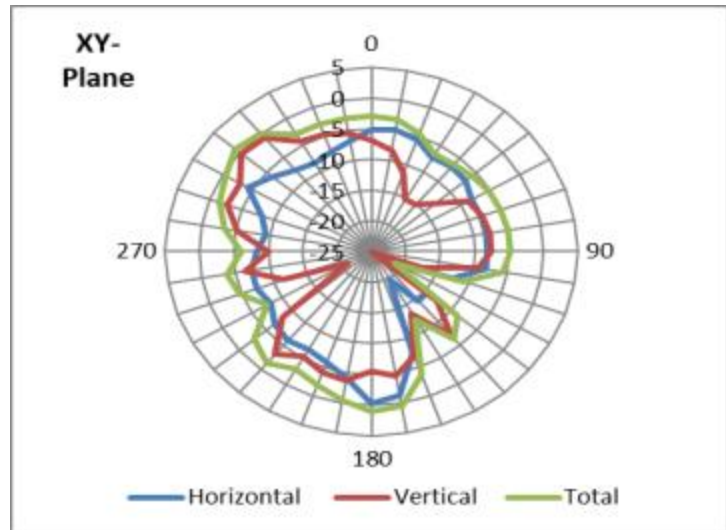
| 4200.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.44 | 310 deg |
| Vertical Peak(dBi)    | -9.21 | 170 deg |



## Radiation characteristic in 3300MHz ~ 3800MHz (5G NR Band 78)

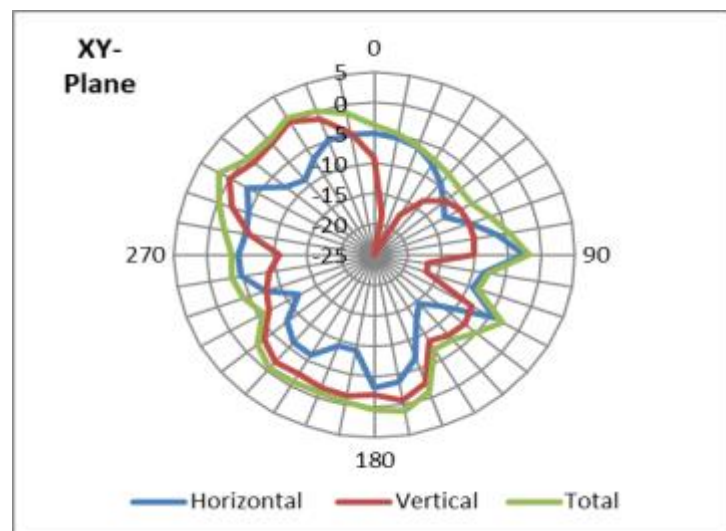
### MIMO antenna: 3300.00 MHz

| 3300.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.22 | 180 deg |
| Vertical Peak(dBi)    | -0.19 | 320 deg |



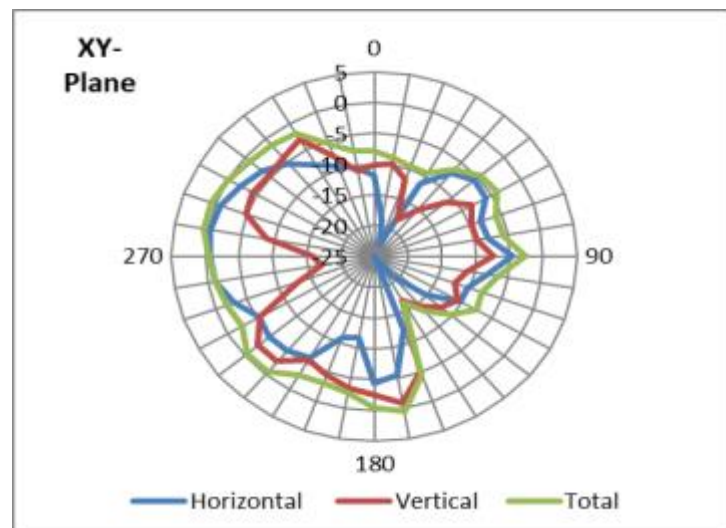
### MIMO antenna: 3550.00 MHz

| 3550.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -2.56 | 180 deg |
| Vertical Peak(dBi)    | 0.22  | 320 deg |



### MIMO antenna: 3800.00 MHz

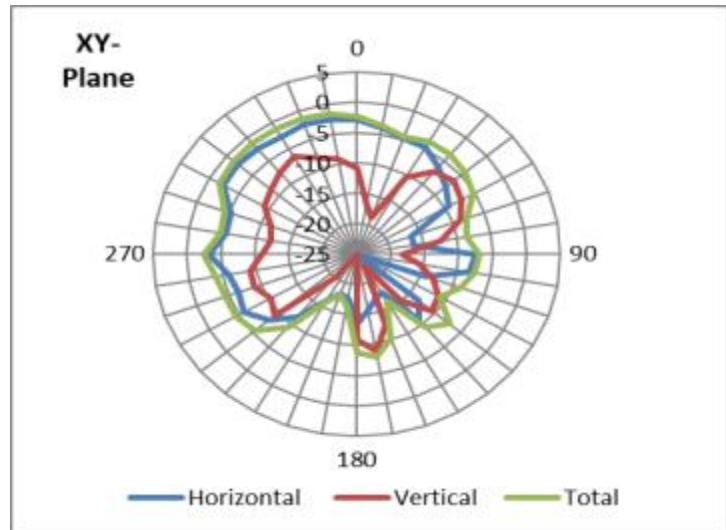
| 3800.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.31 | 270 deg |
| Vertical Peak(dBi)    | -0.78 | 170 deg |



## Radiation characteristic in 4400MHz ~ 5000MHz (5G NR Band 79)

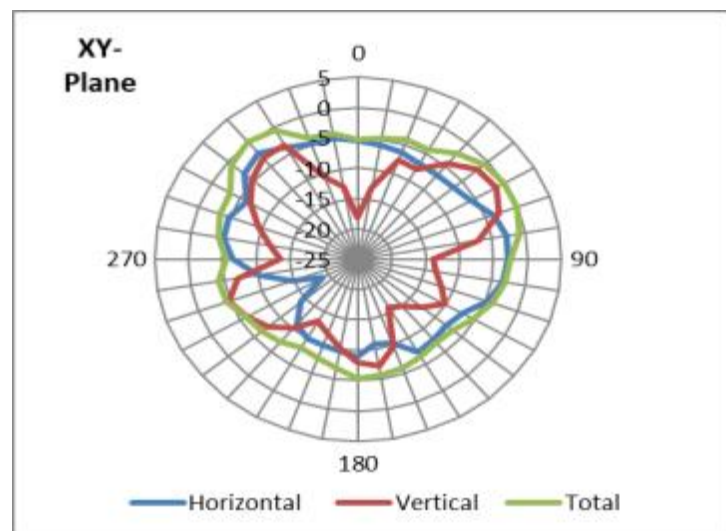
### MIMO antenna: 4400.00 MHz

| 4400.00 MHz           |       |        |
|-----------------------|-------|--------|
| Horizontal Peak (dBi) | -2.13 | 310deg |
| Vertical Peak(dBi)    | -6.31 | 50 deg |



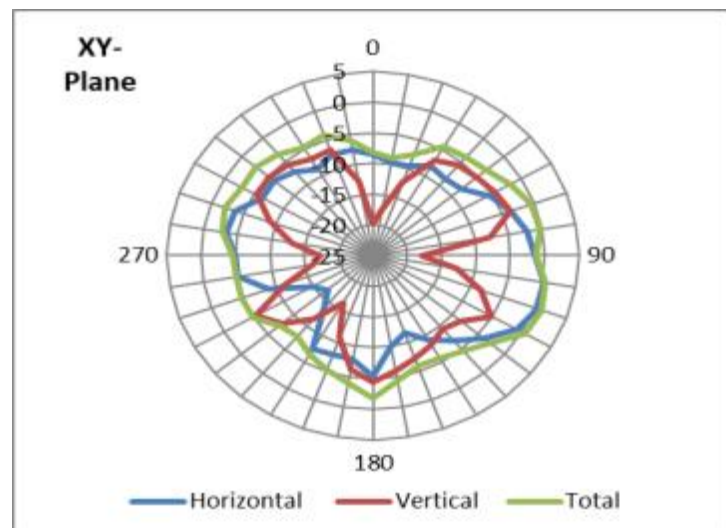
### MIMO antenna: 4700.00 MHz

| 4700.00 MHz           |       |        |
|-----------------------|-------|--------|
| Horizontal Peak (dBi) | -2.28 | 90 deg |
| Vertical Peak(dBi)    | -1.45 | 50 deg |



### MIMO antenna: 5000.00 MHz

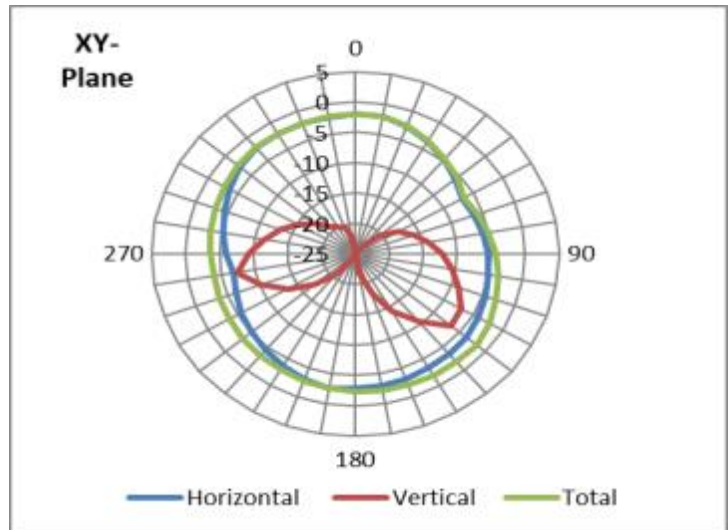
| 5000.00 MHz           |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | 0.44  | 110 deg |
| Vertical Peak(dBi)    | -3.63 | 70 deg  |



## Radiation characteristic in 832MHz ~ 862MHz (UE-UTRA,Band 20, n20)

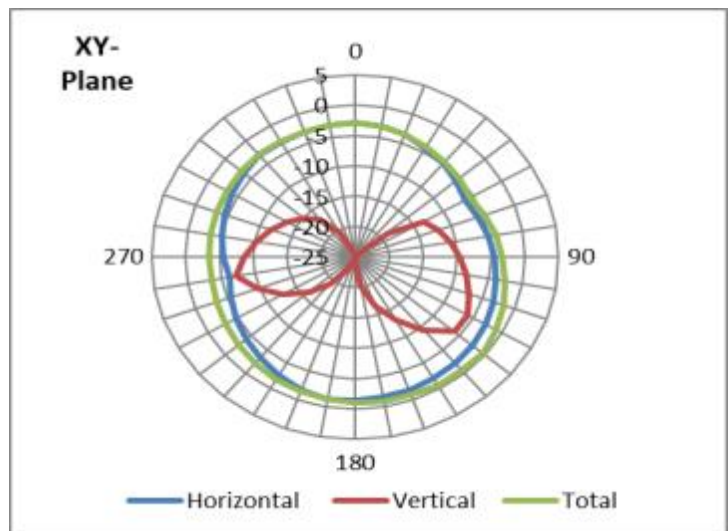
### Auxiliary antenna: 832.00 MHz

| 832.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.94 | 360 deg |
| Vertical Peak(dBi)    | -6.68 | 130 deg |



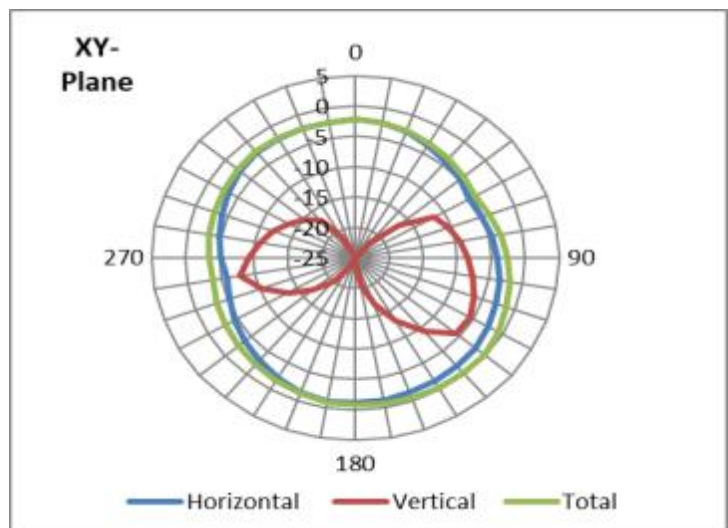
### Auxiliary antenna: 847.00 MHz

| 847.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -1.26 | 190 deg |
| Vertical Peak(dBi)    | -5.87 | 120 deg |



### Auxiliary antenna: 862.00 MHz

| 862.00 MHz            |       |         |
|-----------------------|-------|---------|
| Horizontal Peak (dBi) | -0.96 | 190 deg |
| Vertical Peak(dBi)    | -5.43 | 120 deg |

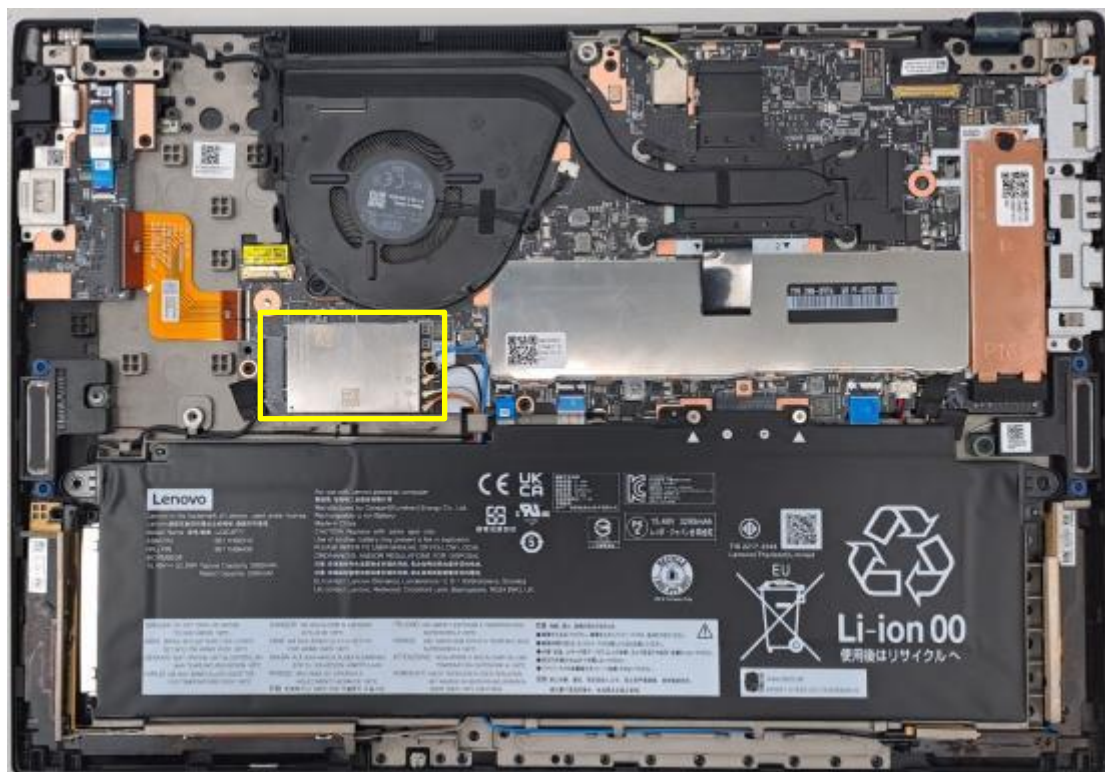


## Section 4. Host Platform Information

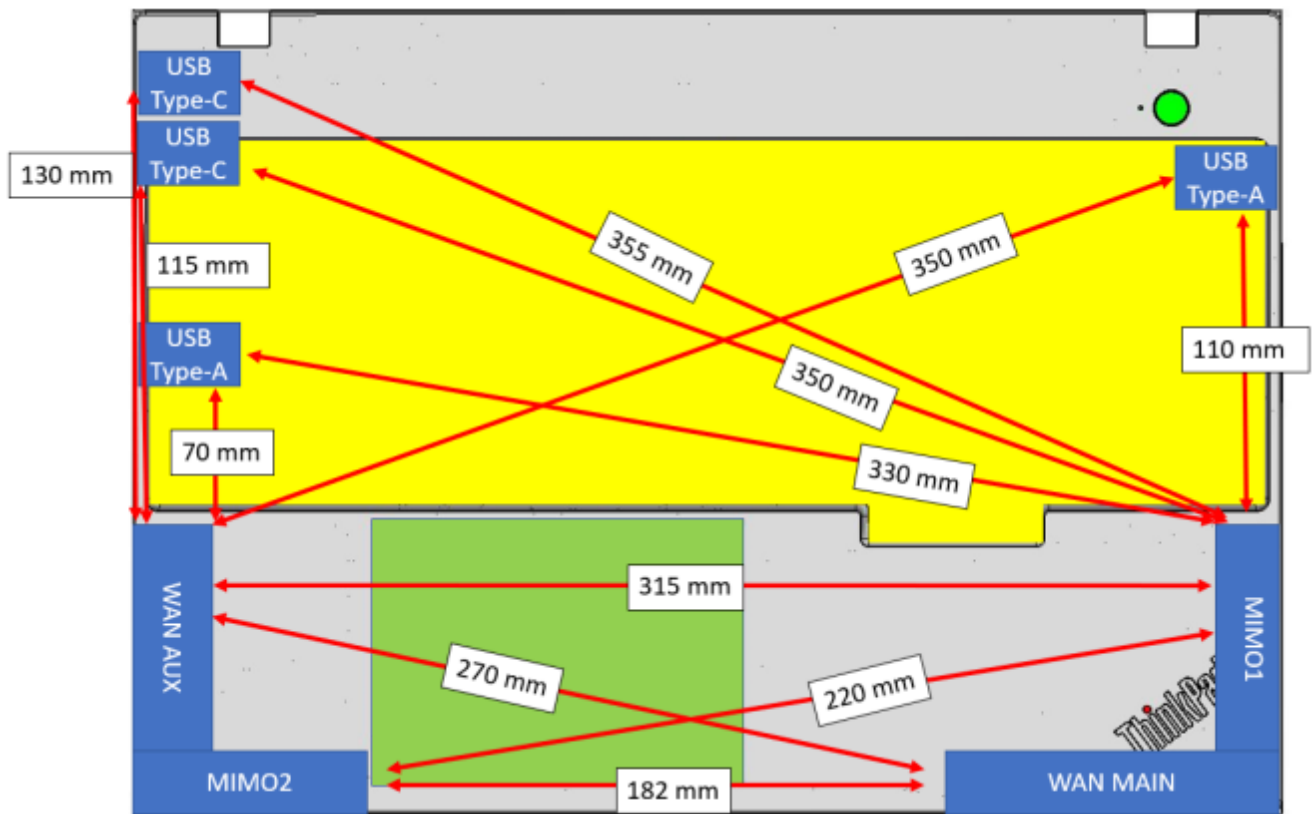
### WWAN Antenna Location



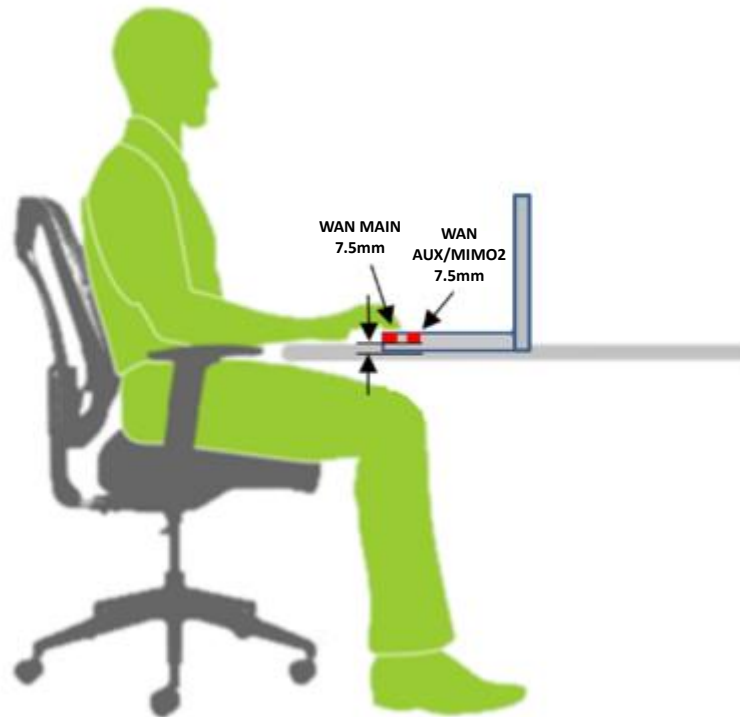
### WWAN card Location



## Section 5. Antenna Host Platform Location Information



## Section 6. Antenna dimensional information for SAR evaluation



## Section 7. Co-Location Antenna Separation

### WWAN - Bluetooth:

The output power of Bluetooth device is 3.06mW ( $\leq 60/f(\text{GHz})$ ) and the antenna-to-antenna distance is  $\geq 5 \text{ cm}$ , so the Bluetooth device is not required SAR evaluation in accordance with Table-2 of KDB616217.

### WWAN - USB:

The USB ports are located with more than 5cm of separation distance from the all WLAN/WiMAX and WWAN Tx antennas. Therefore these are compliant with the section 2) of "Supplement to FCC KDB 616217".

### WWAN - WLAN:

The WWAN main (Tx) antenna and WLAN (or WiMAX) antennas co-locate with at least 5.0 mm of separation distance, and both devices transmit RF simultaneously.

Any WWAN features (antenna and transmitter module) won't be incorporated in the host PC system nor shipped associated with the applying WLAN transmitter device, unless the relevant certification process completes for the simultaneous transmission.

## Section 8. Host PC labeling

|                |
|----------------|
| Clamshell mode |
|----------------|