

# HX-CSX306A Measurement Antenna Performance Test Report

Model:HX-CSX306A

Company:Harxon Corporation

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## Antenna Performance Test Items

| Test Items         | requirement       |
|--------------------|-------------------|
| GNSS antenna gain  | max gain 5.56 dBi |
| Antenna axis ratio | 2.46 dB           |
| 4G antenna gain    | max gain 4.50 dBi |
| WIFI/BT gain       | max gain 0.32 dBi |

## 1 Antenna characteristics

| Frequency<br>(MHz) | Normal (dBi) | 20-degree low elevation<br>gain(dBi) | Axis<br>ratio (dB) |
|--------------------|--------------|--------------------------------------|--------------------|
| 1176               | 3.69         | -2.19                                | 1.09               |
| 1179               | 3.86         | -2.00                                | 1.02               |
| 1182               | 3.96         | -1.89                                | 0.96               |
| 1185               | 4.08         | -1.77                                | 0.87               |
| 1188               | 4.24         | -1.62                                | 0.80               |
| 1191               | 4.46         | -1.41                                | 0.73               |
| 1194               | 4.63         | -1.26                                | 0.68               |
| 1197               | 4.72         | -1.20                                | 0.65               |
| 1200               | 4.79         | -1.15                                | 0.62               |
| 1203               | 4.90         | -1.07                                | 0.61               |
| 1206               | 5.02         | -0.98                                | 0.62               |
| 1209               | 5.08         | -0.94                                | 0.65               |
| 1212               | 5.14         | -0.92                                | 0.70               |
| 1215               | 5.21         | -0.88                                | 0.76               |
| 1218               | 5.32         | -0.81                                | 0.84               |
| 1221               | 5.41         | -0.78                                | 0.94               |
| 1224               | 5.43         | -0.83                                | 1.03               |
| 1227               | 5.43         | -0.91                                | 1.13               |
| 1230               | 5.44         | -0.98                                | 1.23               |
| 1233               | 5.44         | -1.06                                | 1.32               |
| 1236               | 5.42         | -1.18                                | 1.42               |
| 1239               | 5.37         | -1.32                                | 1.52               |
| 1242               | 5.35         | -1.43                                | 1.61               |
| 1245               | 5.35         | -1.52                                | 1.69               |
| 1248               | 5.38         | -1.58                                | 1.77               |

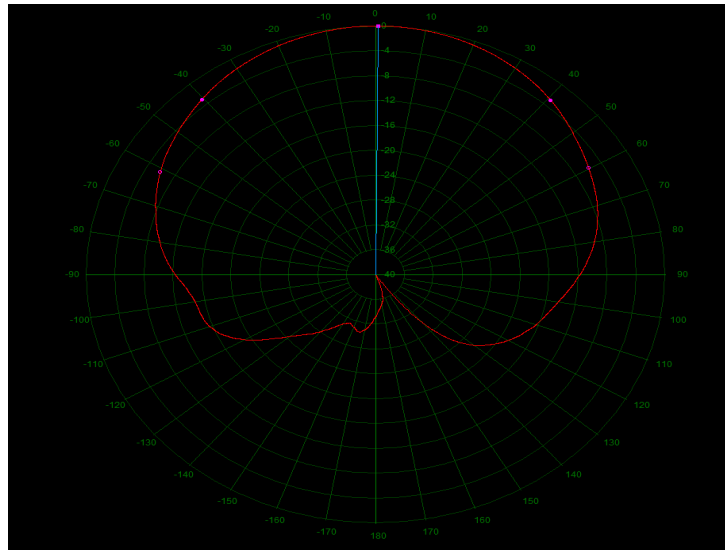
|      |      |       |      |
|------|------|-------|------|
| 1251 | 5.37 | -1.65 | 1.85 |
| 1254 | 5.34 | -1.73 | 1.92 |
| 1257 | 5.31 | -1.81 | 1.99 |
| 1260 | 5.26 | -1.89 | 2.05 |
| 1263 | 5.17 | -2.00 | 2.12 |
| 1266 | 5.09 | -2.10 | 2.19 |
| 1269 | 5.09 | -2.12 | 2.26 |
| 1272 | 5.09 | -2.12 | 2.34 |
| 1275 | 5.03 | -2.17 | 2.40 |
| 1278 | 4.93 | -2.26 | 2.46 |

| Frequency<br>(MHz) | Normal (dBi) | 20-degree low elevation<br>gain(dBi) | Axis<br>ratio (dB) |
|--------------------|--------------|--------------------------------------|--------------------|
| 1559               | 5.01         | -2.39                                | 1.54               |
| 1562               | 5.03         | -2.41                                | 1.62               |
| 1565               | 5.08         | -2.40                                | 1.69               |
| 1568               | 5.18         | -2.34                                | 1.76               |
| 1571               | 5.22         | -2.34                                | 1.81               |
| 1574               | 5.21         | -2.39                                | 1.86               |
| 1577               | 5.27         | -2.37                                | 1.90               |
| 1580               | 5.35         | -2.32                                | 1.92               |
| 1583               | 5.43         | -2.28                                | 1.94               |
| 1586               | 5.44         | -2.31                                | 1.95               |
| 1589               | 5.47         | -2.31                                | 1.95               |
| 1592               | 5.56         | -2.26                                | 1.95               |
| 1595               | 5.56         | -2.27                                | 1.93               |
| 1598               | 5.48         | -2.39                                | 1.92               |
| 1601               | 5.39         | -2.51                                | 1.90               |
| 1604               | 5.34         | -2.59                                | 1.89               |
| 1607               | 5.35         | -2.61                                | 1.87               |
| 1610               | 5.29         | -2.71                                | 1.84               |

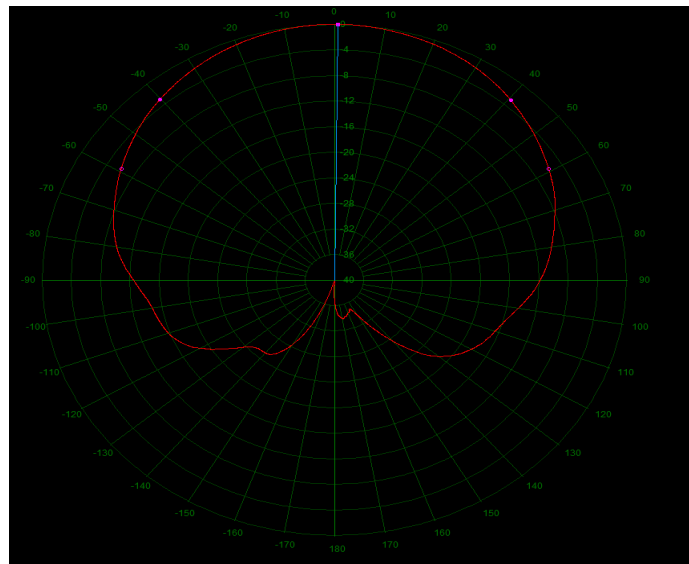
### 1.3 Antenna pattern

#### 1.3.1 GNSS actual antenna

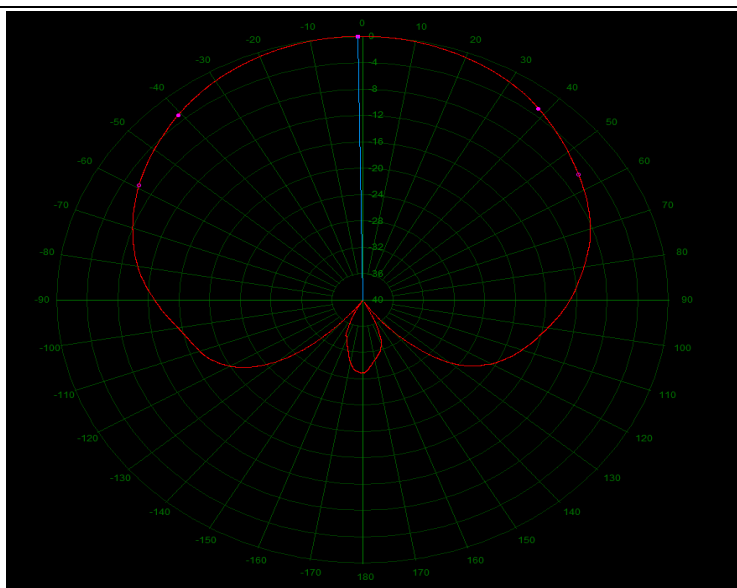
directional pattern comparison is  
as follows: :



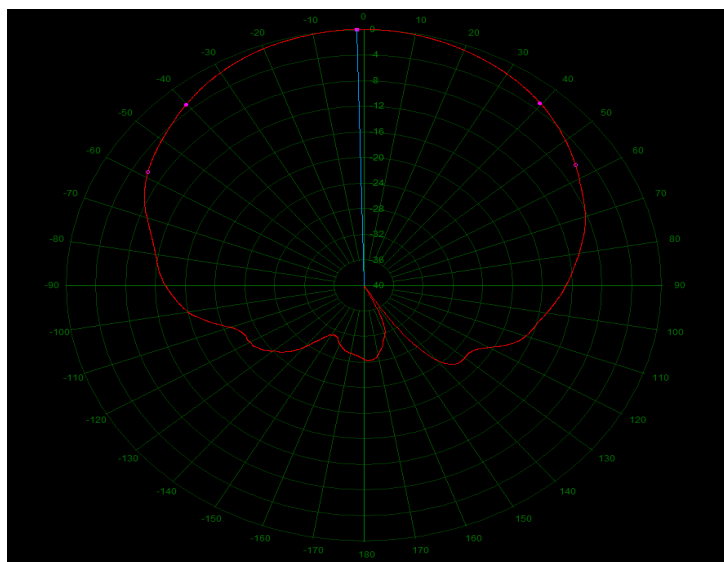
1176MHz



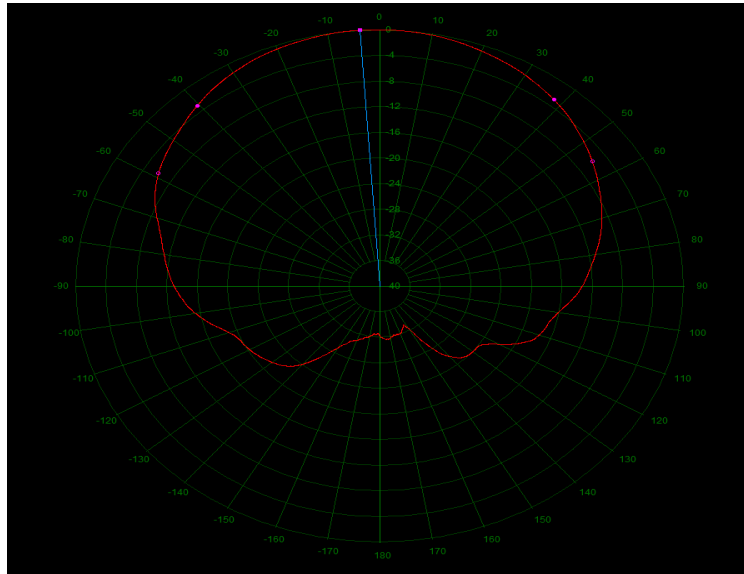
1227MHz



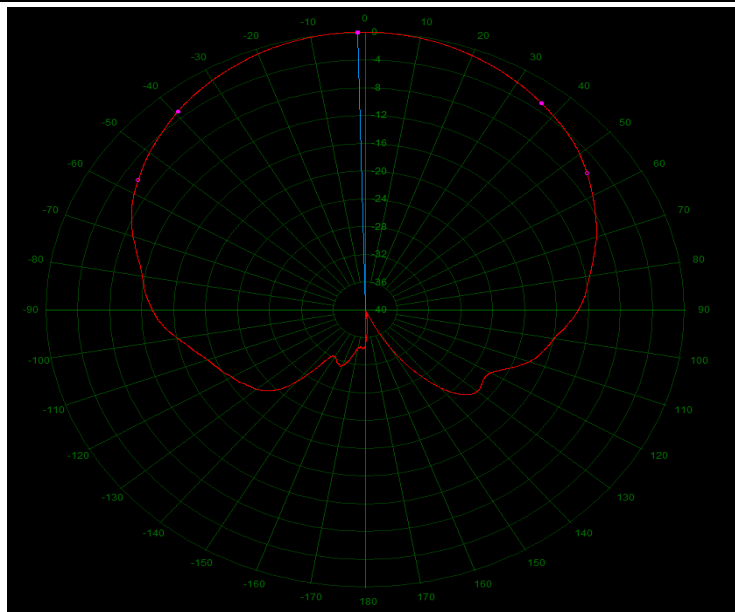
1278MHz



1559MHz



1574MHz



1610MHz

## 1.2 4G actual antenna directional pattern comparison

is as follows: : 4G1 the main antenna data

|      | gain (dBi) | efficiency (%) |
|------|------------|----------------|
| 763  | -3.24      | 17.47          |
| 796  | -0.78      | 31.78          |
| 930  | -3.22      | 15.94          |
| 1810 | 1.79       | 47.36          |
| 2115 | 4.50       | 64.03          |

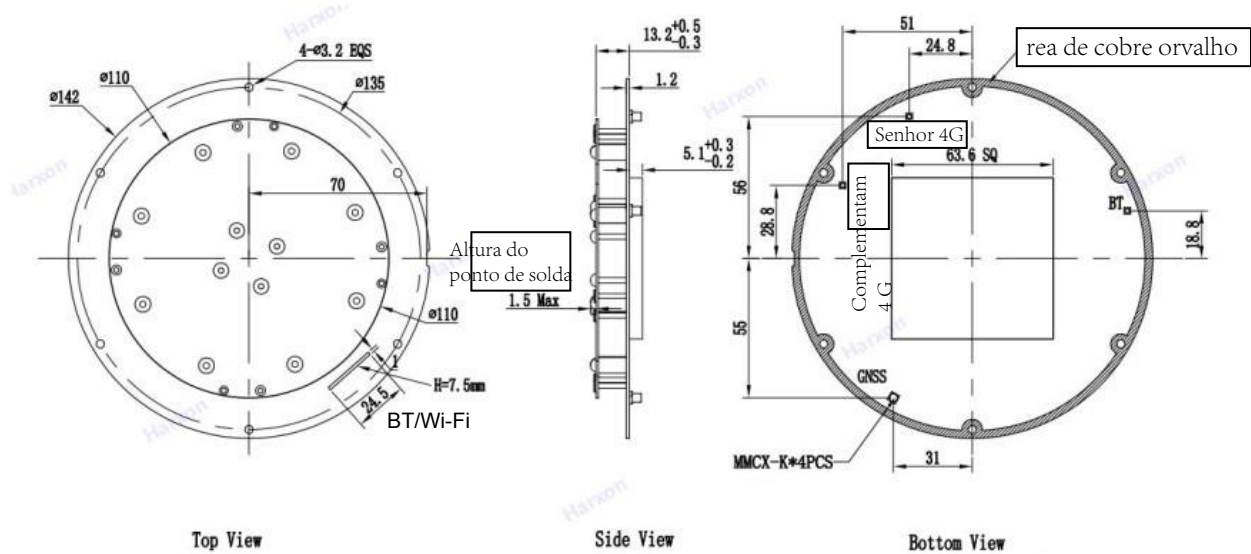
|      |      |       |
|------|------|-------|
| 2350 | 1.53 | 43.89 |
| 2580 | 3.37 | 57.73 |
| 2593 | 3.13 | 55.93 |
| 2625 | 2.58 | 46.60 |

#### 4G2 Diversity antenna data

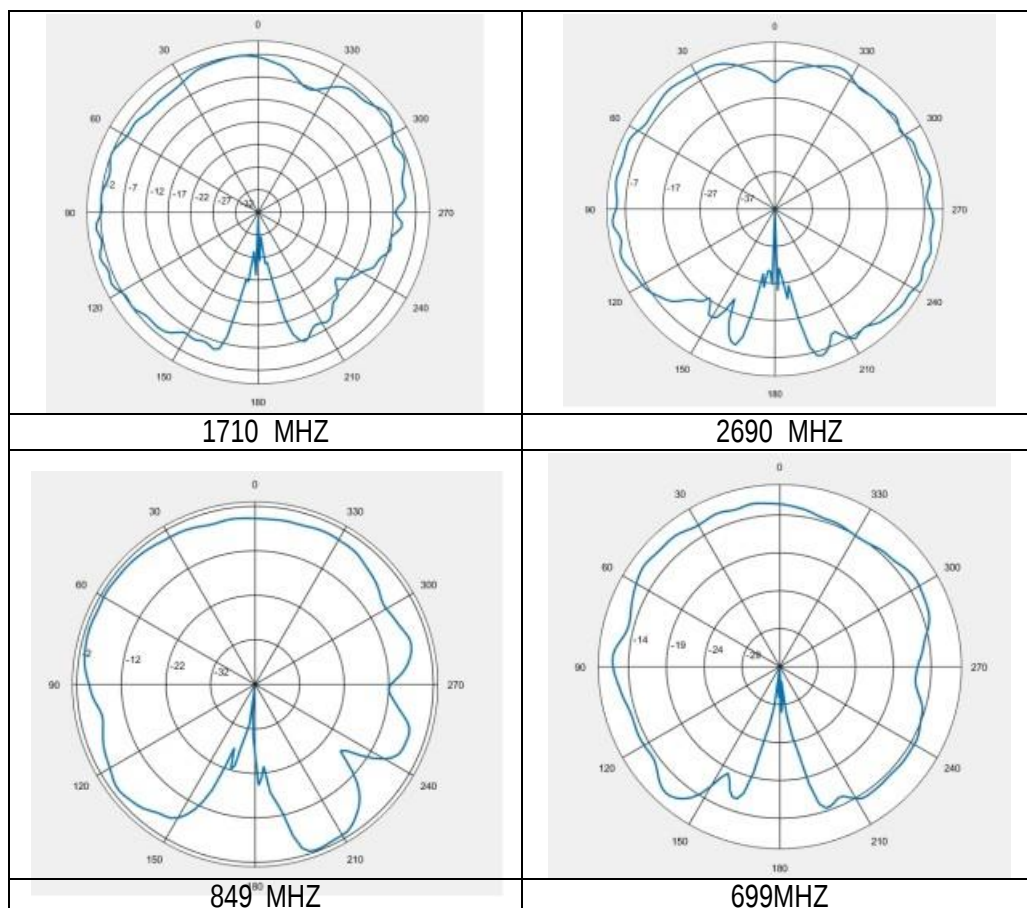
|      | gain (dBi) | efficiency (%) |
|------|------------|----------------|
| 763  | -6.94      | 5.39           |
| 796  | -2.92      | 18.04          |
| 930  | -2.11      | 18.41          |
| 1810 | 1.02       | 25.98          |
| 2115 | 0.88       | 32.62          |
| 2350 | 3.26       | 43.71          |
| 2580 | 2.26       | 28.04          |
| 2593 | 2.70       | 32.90          |
| 2625 | 1.77       | 29.66          |

#### WIFI/BT antenna data

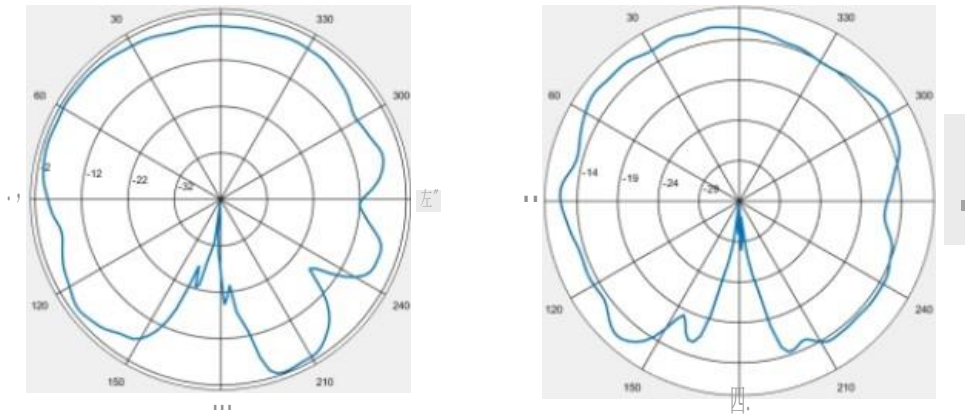
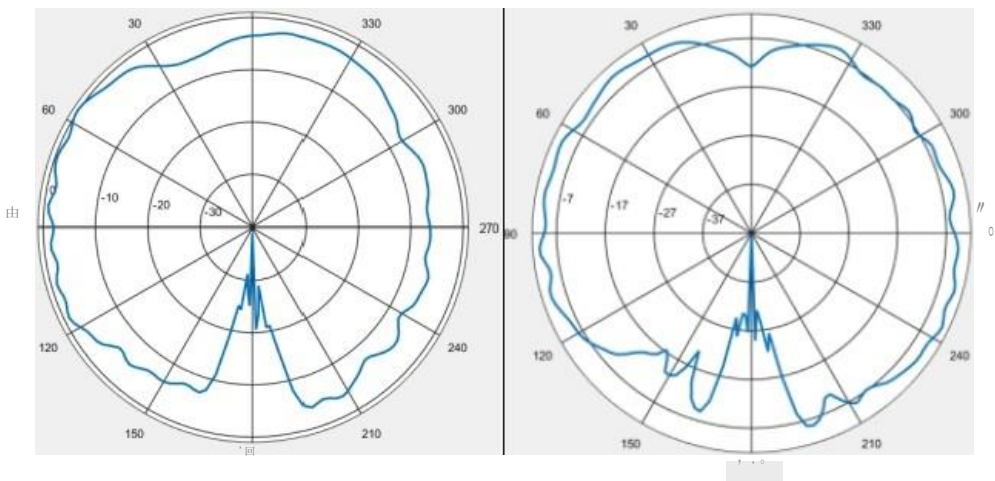
|      | gain (dBi) | efficiency (%) |
|------|------------|----------------|
| 2410 | -2.19      | 19.91          |
| 2420 | -1.21      | 25.29          |
| 2430 | -0.39      | 30.12          |
| 2440 | 0.23       | 35.37          |
| 2450 | 0.32       | 36.60          |
| 2460 | 0.12       | 35.03          |
| 2470 | -0.26      | 32.74          |
| 2480 | -0.82      | 29.93          |
| 2490 | 0.35       | 32.36          |
| 2500 | 1.13       | 33.35          |
| 5100 | -0.85      | 10.77          |
| 5200 | -0.12      | 13.34          |
| 5300 | 0.59       | 16.32          |
| 5400 | 1.08       | 21.14          |
| 5500 | 1.53       | 24.38          |
| 5600 | 1.36       | 24.91          |
| 5700 | 0.14       | 20.32          |
| 5800 | -0.12      | 18.68          |



## 4G1 antenna data(LTE Main Antenna)



4G2 antenna data(LTE Diversity Antenna)



WIFI/BT antenna data

