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To: Qwik Source LLC

Date : 8/21/2014

|                |
|----------------|
| Approval Sheet |
|----------------|

Description : EHN-201 Cellular Antenna

Model No :

Part No : 9-AM-US0083-000023

|                        |
|------------------------|
| Received & Approved by |
|------------------------|

|                                   |
|-----------------------------------|
| ON ____ date ____ month ____ year |
|-----------------------------------|



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|-------------|------------|-----------|--|
|             |            |           |  |

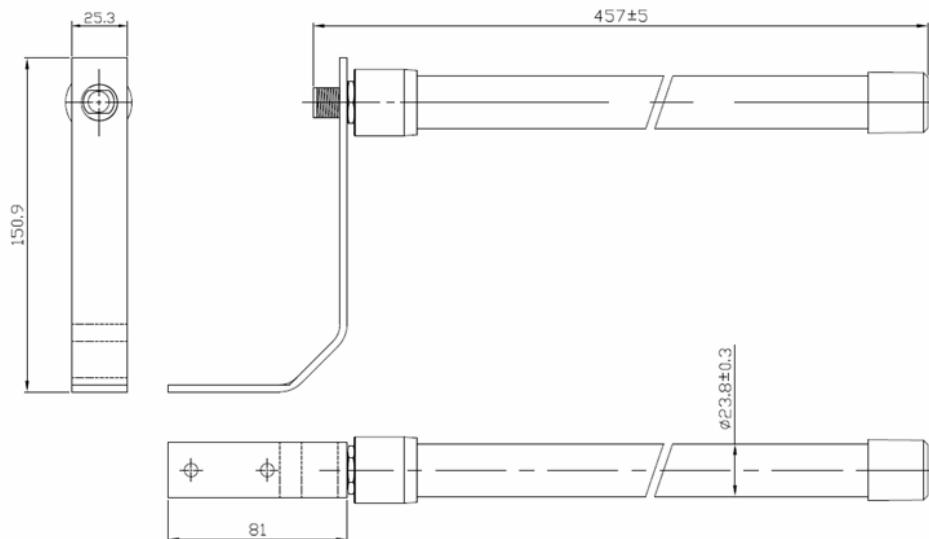
表單編號 : FM-RD-012 A1

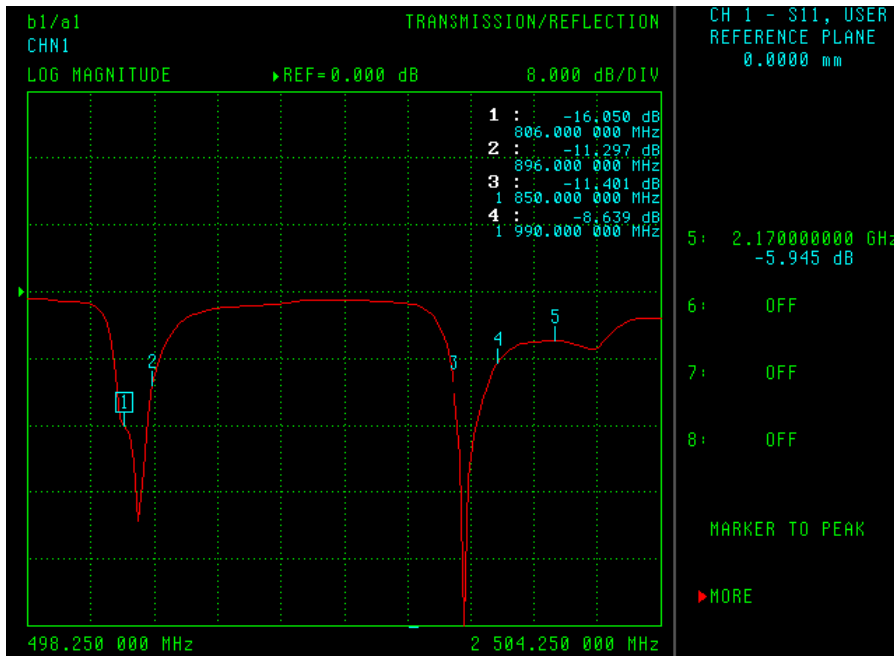
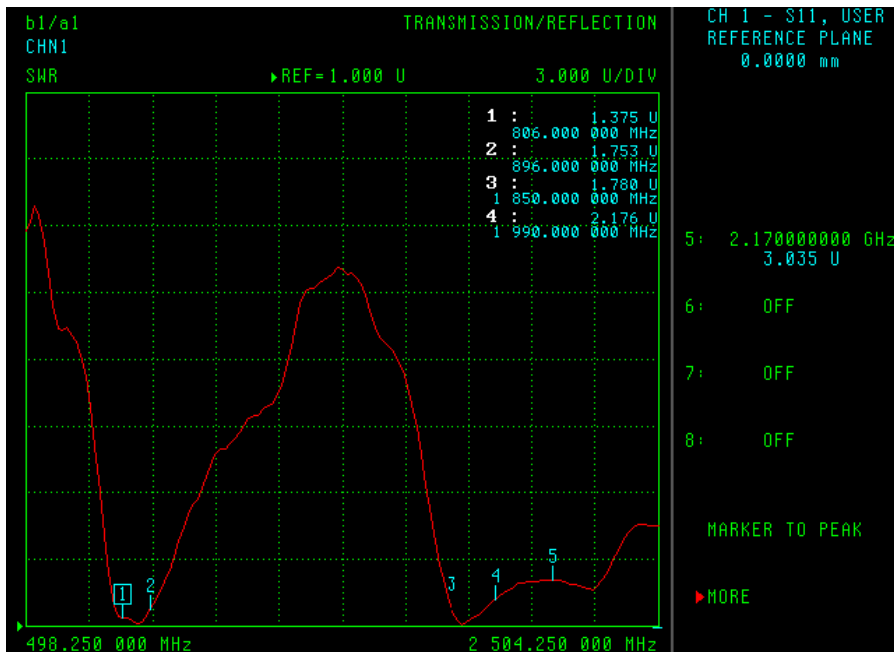
**SPECIFICATION**

|                              |                                    |
|------------------------------|------------------------------------|
| 1.Description                | 850/1900/2100MHz stick antenna     |
| 2.Part Number                | <a href="#">9-AM-US0083-000023</a> |
| 3.Mechanical Characteristics | Page 4                             |
| Dimension                    | 457mm (L) x 25.3mm(Dia.)           |
| Connector Type               | N jack in base                     |
| Cable                        | No cable                           |
| 3M Tape                      | No tape                            |
| All Material                 | RoHS Compliant                     |
| 4.Electrical Characteristics | Page 5~11                          |
| Polarization                 | Linear                             |
| Operating Frequency          | 806~896MHz; 1,850MHz~2,170MHz      |
| 3D Gain                      | See Page 6                         |
| Impedance                    | 50ohm                              |
| VSWR                         | 3.0 Max.                           |
| Antenna Type                 | Dipole                             |
| 5.Operating Temperature      | -30°C -80°C                        |
| 6.Storage Temperature        | -40°C -85°C                        |

**ELECTRICAL CHARACTERISTICS 電氣特性**

| <b>ITEM</b> |                            | <b>TEST CONDITION</b>  | <b>SPECIFICATION</b> |
|-------------|----------------------------|--|----------------------|
| 項目          |                            | 測試環境   | 規格                   |
| 1           | <b>RETURN LOSS</b><br>反射損耗 | Using Anritsu Network Analyzer MS-4623B to Measure Antenna S11 Return loss Characteristics<br>使用 Anritsu 網路分析儀 MS-4623B 測量天線 S11 之返回損耗參數 | See Fig-1            |
| 2           | <b>VSWR</b><br>電壓駐波比       | Using Anritsu Network Analyzer MS-4623B to Measure Antenna S11 VSWR Characteristics<br>使用 Anritsu 網路分析儀 MS-4623B 測量天線 S11 之電壓駐波參數        | See Fig-2            |

|  |              |   |          |  |  |
|--|--------------|---|----------|--|--|
|  |              | 發行日期: 8/21/2014   | A1.0     |  |  |
|  |              | 修正日期:   |          |  |  |
|  |              | 受控日期  |          |  |  |
| 品名: 800/1900/2100MHz Stick Antenna   |              | 客戶: Qwik Source LLC.  | 規格       |  |  |
|  |              | Operating Frequency :<br>806~896MHz<br>1850~2170MHz<br><br>Impedance:50ohm<br><br>Connector: N(SBJ) |          |  |  |
| 檢驗項目   | 品質要求         | 檢驗方式  | 檢驗標準     |  |  |
| 外觀   |              | 目視(亮度<br>100Lux, 正常<br>視力, 視距<br>30cm, 視角<br>30°-80°)   | 參照<br>樣品 |  |  |
| 尺寸   | 尺寸如示意圖       | 1. 游標卡尺<br>2. 捲尺  | 承認書      |  |  |
| 機械性能   |              | 1. 拉力計<br>2. 高斯計  | 承認書      |  |  |
| 電氣性能   | Transmission | 1. 網路分析儀  | 承認書      |  |  |

**Antenna Return Loss:**

**Fig-1**
**Antenna VSWR:**

**Fig-2**

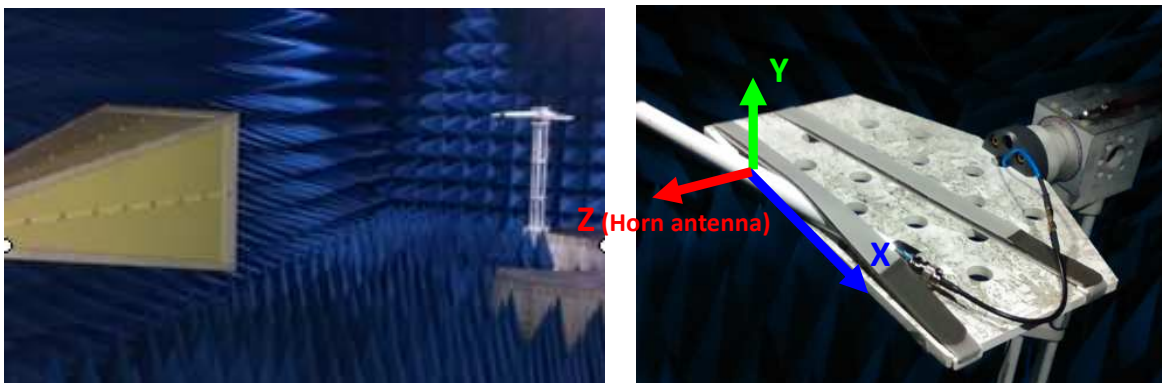
**Antenna 3D Gain:**

3D Gain and Efficiency Report are scanned in SANAV 3D anechoic chamber, under CTIA regulation.

| Frequency (MHz)      | 806    | 851    | 896    | 1850   | 1880   | 1910   | 1930   | 1960   | 1990   | 2170   |
|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Tot. Rad. Pwr. (dBm) | 0.22   | -1.63  | -0.49  | -0.39  | -0.84  | -1.33  | -1.23  | -1.08  | -1.79  | -2.78  |
| Peak EIRP (dBm)      | 5.19   | 4.57   | 5.05   | 5.26   | 4.98   | 4.79   | 4.62   | 3.63   | 2.47   | 0.64   |
| Directivity (dBi)    | 4.97   | 6.2    | 5.54   | 5.65   | 5.82   | 6.12   | 5.85   | 4.71   | 4.26   | 3.42   |
| Efficiency (dB)      | 0.22   | -1.63  | -0.49  | -0.39  | -0.84  | -1.33  | -1.23  | -1.08  | -1.79  | -2.78  |
| Efficiency (%)       | 97.33  | 68.75  | 89.34  | 91.46  | 82.45  | 73.69  | 75.3   | 77.95  | 66.25  | 52.77  |
| Gain (dBi)           | 5.19   | 4.57   | 5.05   | 5.26   | 4.98   | 4.79   | 4.62   | 3.63   | 2.47   | 0.64   |
| Boresight Phi (°)    | 60     | 315    | 345    | 195    | 195    | 210    | 195    | 195    | 195    | 180    |
| Boresight Th. (°)    | 135    | 105    | 150    | 120    | 120    | 120    | 135    | 135    | 135    | 135    |
| Maximum Power (dBm)  | 5.19   | 4.57   | 5.05   | 5.26   | 4.98   | 4.79   | 4.62   | 3.63   | 2.47   | 0.64   |
| Minimum Power (dBm)  | -17.83 | -19.58 | -11.71 | -12.28 | -18.21 | -19.24 | -14.95 | -16.94 | -19.52 | -16.76 |
| Average Power (dBm)  | -0.53  | -3.14  | -1.53  | -1.38  | -1.84  | -2.66  | -2.11  | -1.37  | -1.84  | -3.63  |
| Max/Min Ratio (dB)   | 23.02  | 24.15  | 16.76  | 17.54  | 23.18  | 24.03  | 19.57  | 20.56  | 21.99  | 17.4   |
| Max/Avg Ratio (dB)   | 4.97   | 6.2    | 5.54   | 5.65   | 5.82   | 6.12   | 5.85   | 4.71   | 4.26   | 3.42   |
| Min/Avg Ratio (dB)   | -18.05 | -17.95 | -11.22 | -11.89 | -17.37 | -17.91 | -13.72 | -15.86 | -17.73 | -13.98 |
| Average Gain (dB)    | -0.15  | -1.63  | -0.49  | -0.39  | -0.84  | -1.33  | -1.23  | -1.08  | -1.79  | -2.78  |
| Upper Hem. PRP (dBm) | -2.47  | -5.28  | -4.46  | -2.86  | -3.31  | -3.73  | -3.65  | -3.59  | -4.21  | -4.95  |
| Lower Hem. PRP (dBm) | -1.74  | -2.95  | -1.9   | -2.96  | -3.51  | -4.3   | -4.14  | -3.63  | -4.34  | -5.78  |
| Efficiency (%)       | 105.22 | 68.75  | 89.34  | 91.46  | 82.45  | 73.69  | 75.3   | 77.95  | 66.25  | 52.77  |

**Fig-3**

**Testing Setup:**



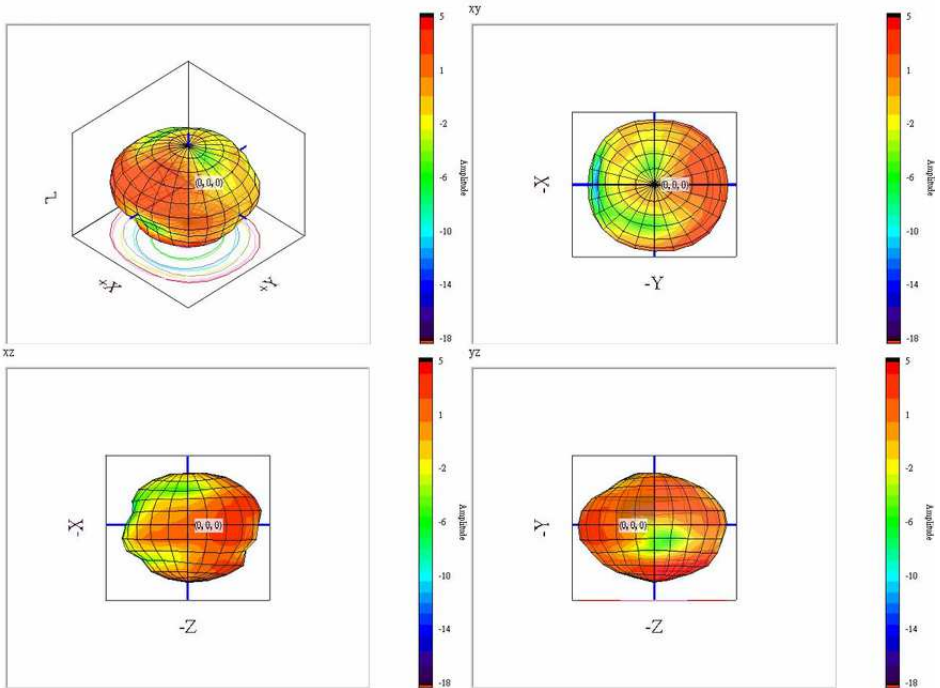
1. The location of horn antenna and rotation table.
2. 3 axis of antenna on the rotation table

Antenna Radiation Pattern

Tested in SANAV Anechoic Chamber by 3D Mode

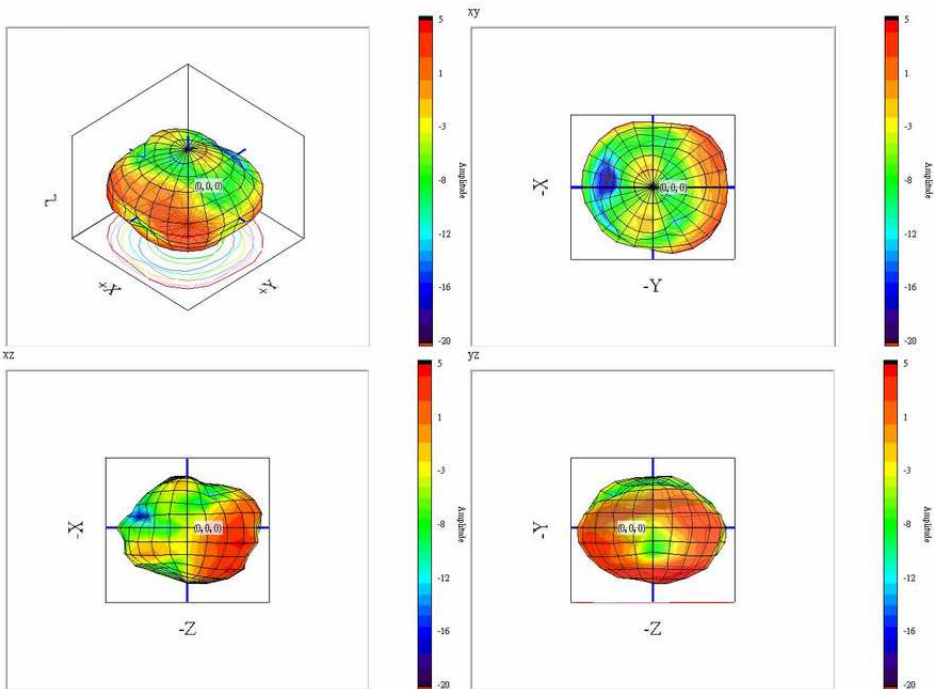
- 806MHz

806CH



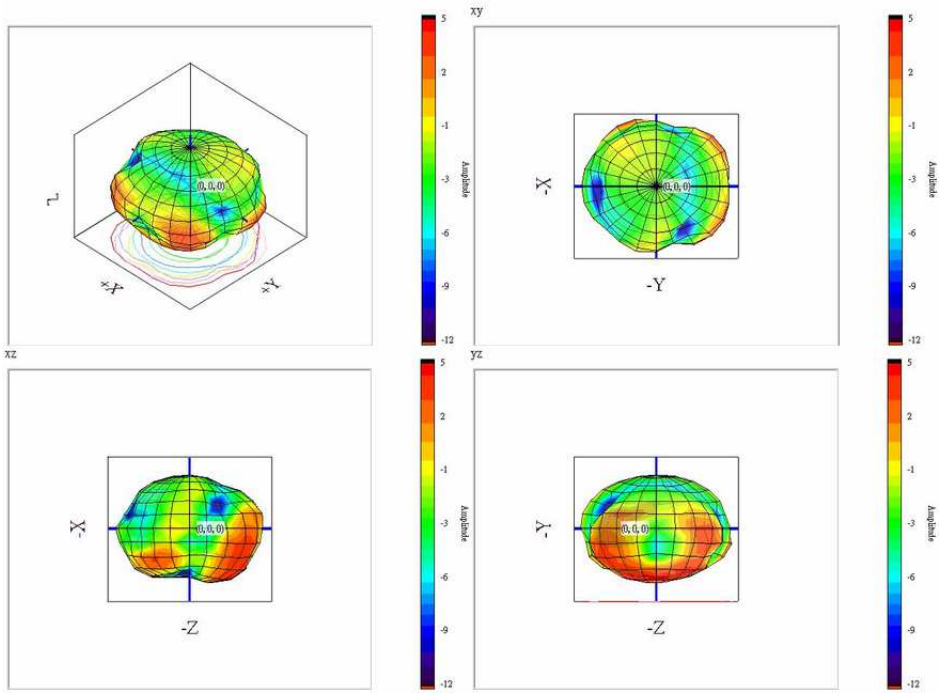
- 851MHz

851CH



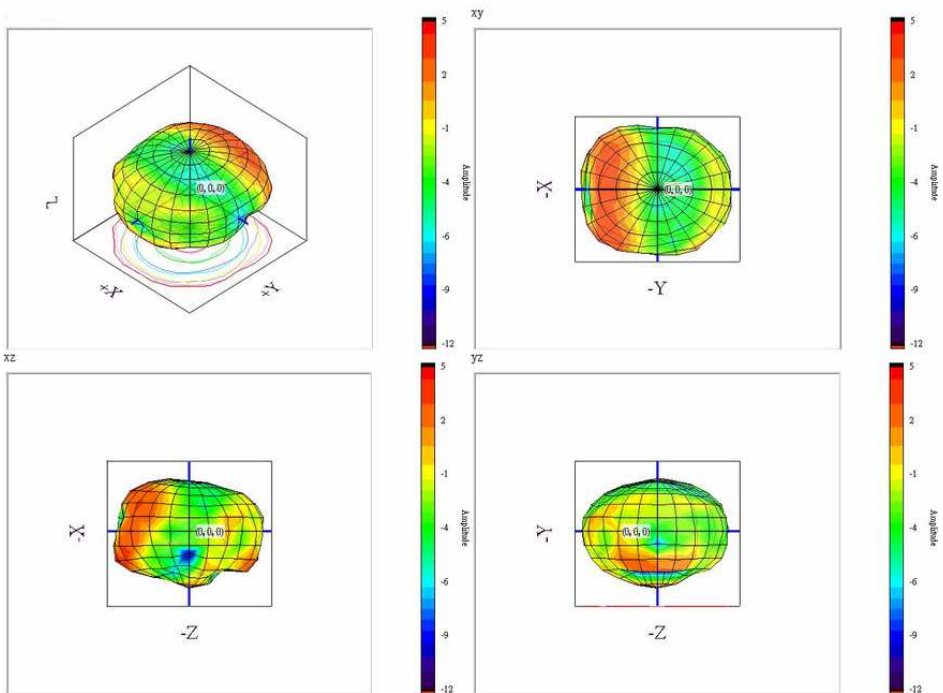
— 896MHz

896CH



— 1850MHz

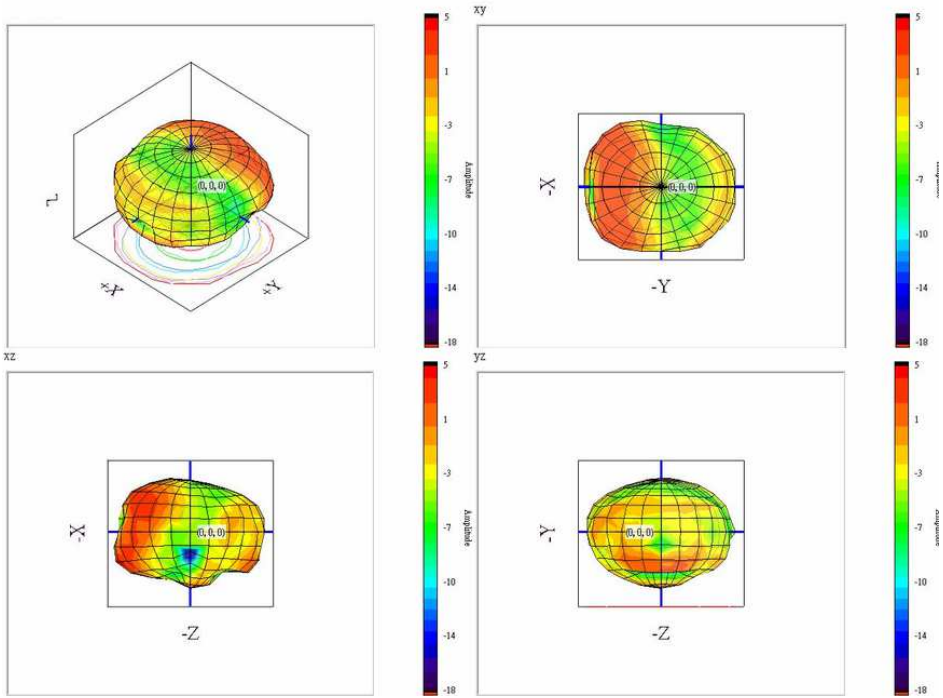
1850CH





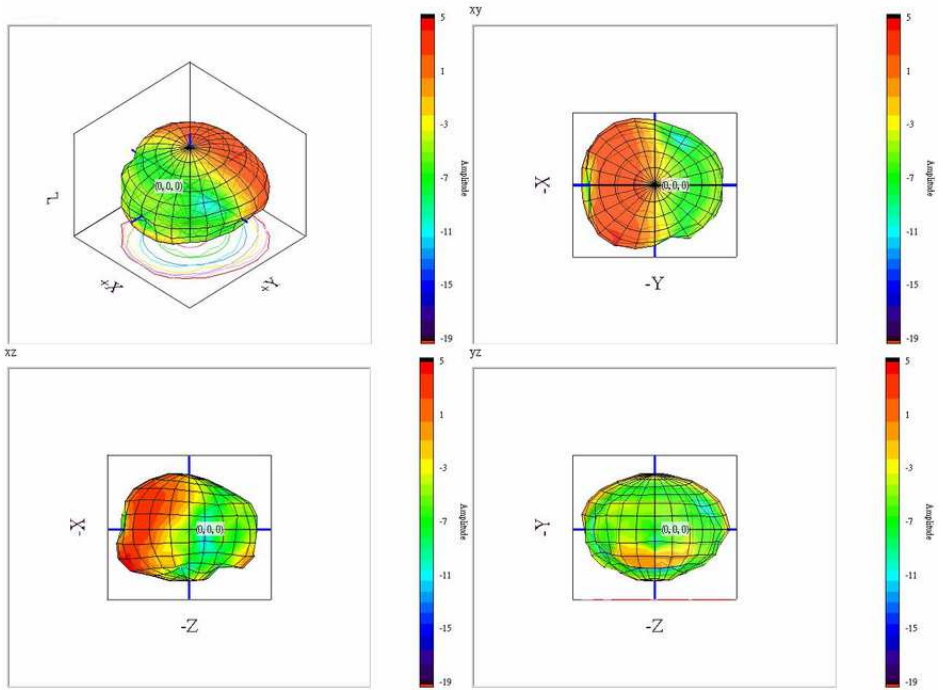
— 1880MHz

1880CH



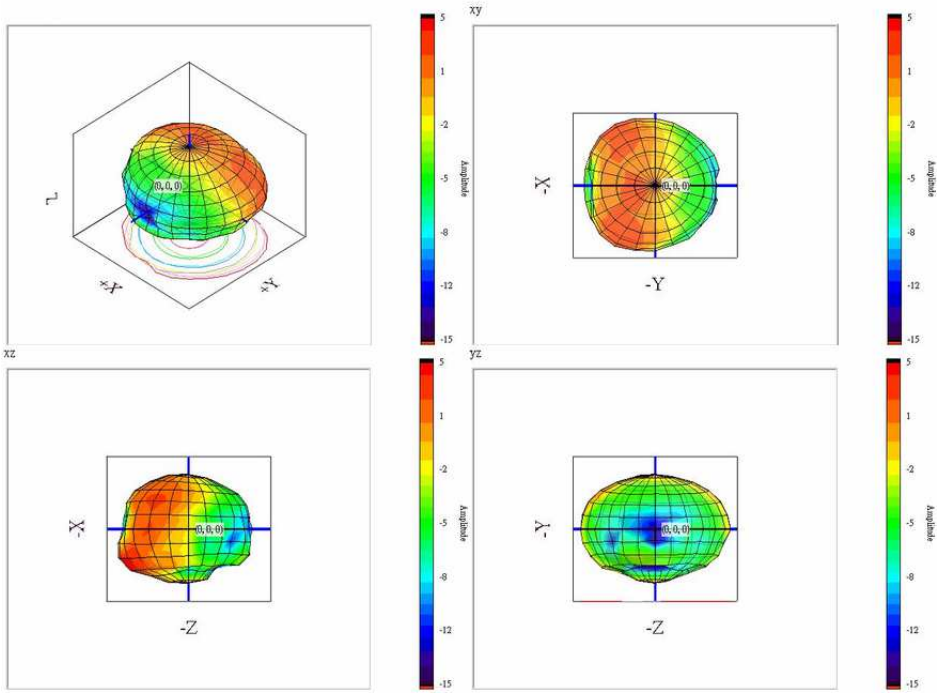
— 1910MHz

1910CH

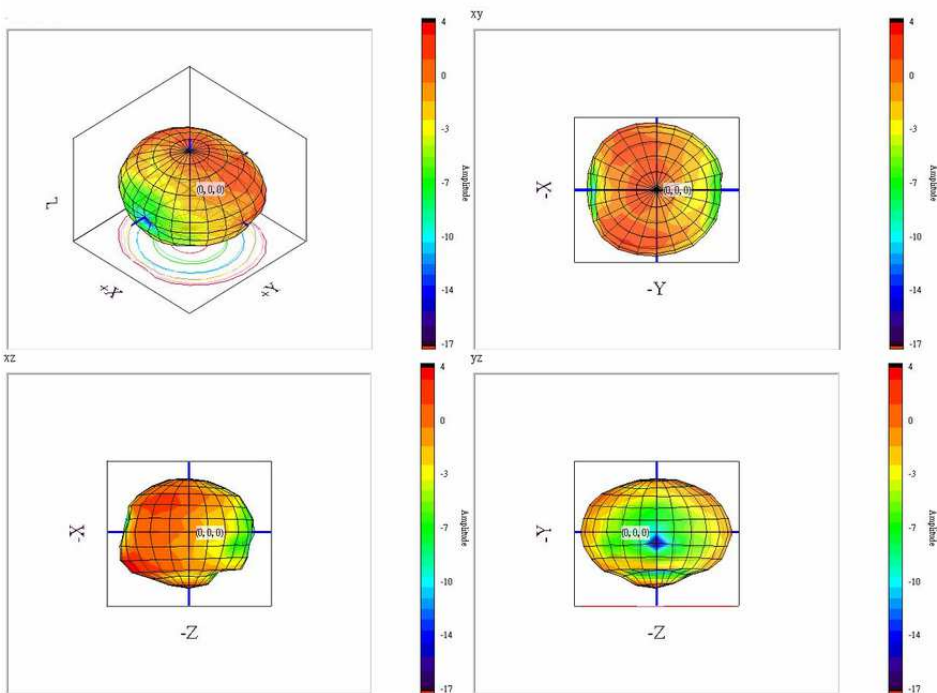


**— 1930MHz**

1930CH

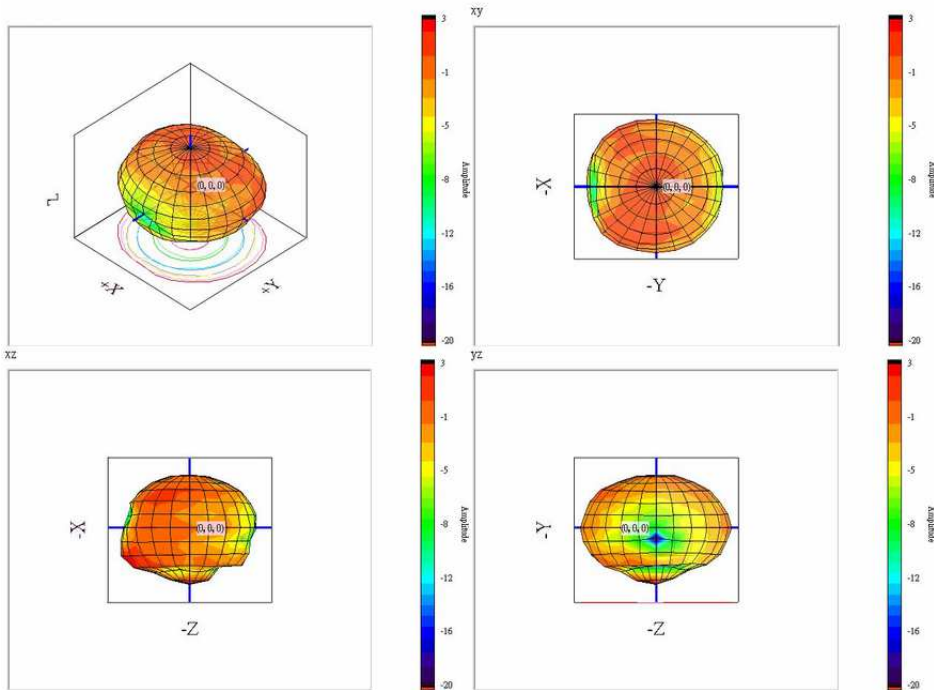

**— 1960MHz**

1960CH



**— 1990MHz**

1990CH


**— 2170MHz**

2170CH

