



WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)  
 DONGGUAN AEON TECH CO.,LTD.(CHINA)  
 SUZHOU AEON TECH CO.,LTD.(CHINA)  
 AEON TECH (SHANGHAI) CO.,LTD(CHINA)  
 DONGGUAN PARNER TECH CO.,LTD.(CHINA)

## SPECIFICATION FOR APPROVAL

**CUSTOMER:** ASUS

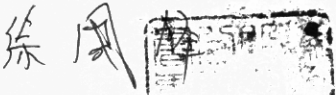
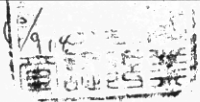
**PART NAME:** RF Antenna Assembly

**PART NO:**

**REVISION:**

**W. Y. P/NO:** C660-510333-A(SRF20141699)

**REV:** X1

|                  | MANUFACTURER<br>SIGNATURE   | CUSTOMER<br>SIGNATURE |
|------------------|---|-----------------------|
| APPROVED<br>BY : |    |                       |
| DATE :           |  |                       |

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| 3. ....     | 測試報告               | ..... 3~16  |

# RF Antenna Assembly

## Specification (單天線)

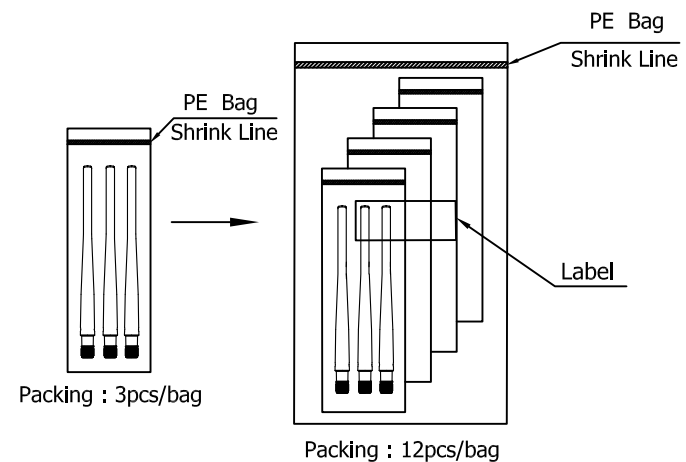
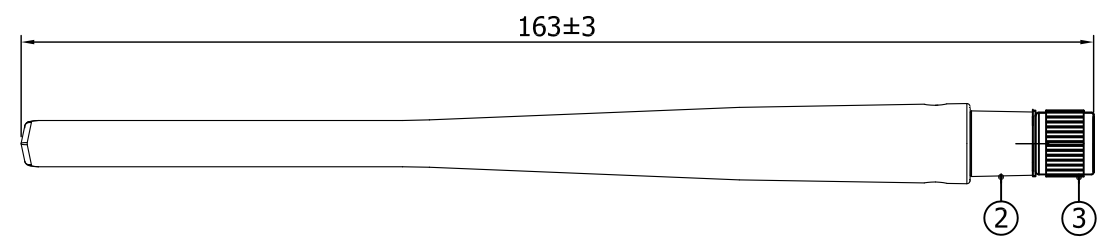
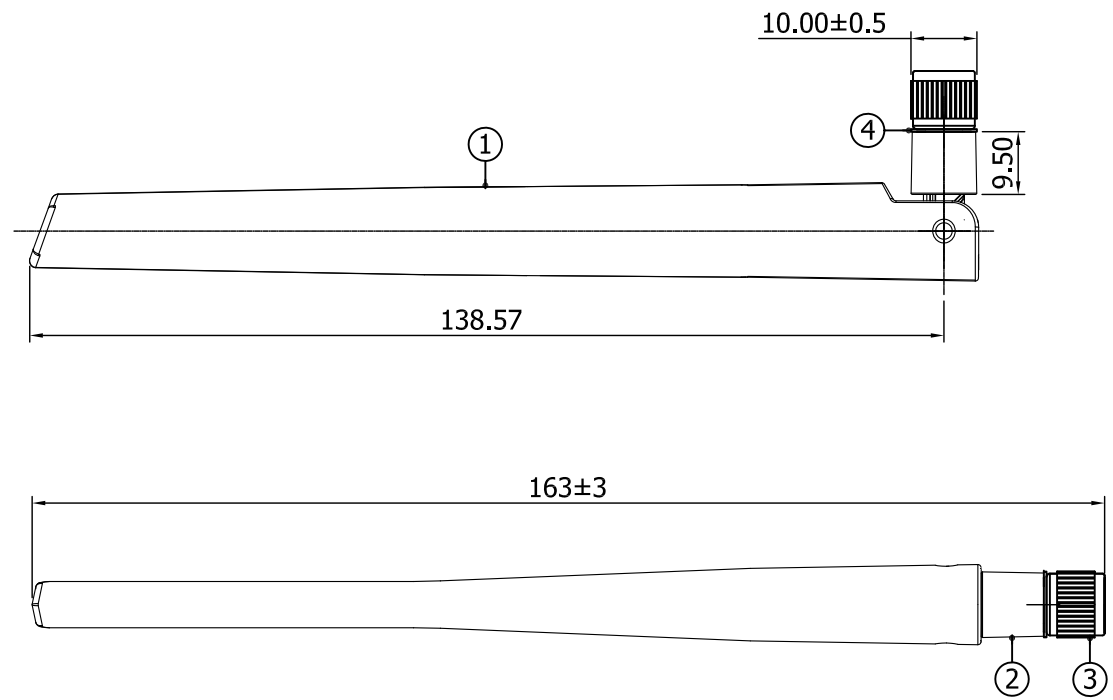
### 1. Electrical Properties :

- 1.1 Frequency Range..... 2.412GHz ~ 2.472GHz / 5.180GHz ~ 5.825GHz
- 1.2 Impedance ..... 50Ω Nominal
- 1.3 VSWR ..... 2.1:1 Max.
- 1.4 Return Loss..... -8.99 dB Max.
- 1.5 Radiation ..... Omni-directional
- 1.6 Gain(peak)..... 2.4GHz (1.51dBi) / 5GHz (3.29dBi)
- 1.7 Cable Loss..... 2.4G(0.14dB)/5G(0.25dB)
- 1.8 Polarization..... Linear ; Vertical
- 1.9 Admitted Power..... 1W
- 1.10 Cable..... RG-178 Coaxial Cable
- 1.11 Connector..... SMA

### 2. Physical Properties :

- 2.1 Operating Temp. .... -10°C ~ +60°C
- 2.2 Storage Temp. .... -10°C ~ +70°C

| REV | DATE       | DESCRIPTION |
|-----|------------|-------------|
| X1  | 10/07-2014 | New Issue   |



| NO | DESCRIPTION  | Q'TY | REMARK                         |
|----|--------------|------|--------------------------------|
| 4  | 辨識圈          | 1    | POM;Pantone.Cool Gray 8C       |
| 3  | Connector    | 1    | SMA Plug Reverse               |
| 2  | Antenna Base | 1    | (CD-718)PC/PBT ; Color : Black |
| 1  | Antenna Cap  | 1    | (CD-717)PC/ABS ; Color : Black |

|                      |      |                   |                   |                               |             |
|----------------------|------|-------------------|-------------------|-------------------------------|-------------|
| CUSTOMER'S SINGATURE | XX.  | ± 3.0             | APPROVED          | CUSTOMER: ASUS                |             |
|                      | X.   | ± 2.0             | 羅家鎮<br>2014.10.07 |                               | PART NO :   |
|                      | .X   | ± 1.0             | CHECKED           | PARTNAME: RF Antenna Assembly |             |
|                      | .XX  | ± 0.5             | 林凱元<br>2014.10.07 | W.Y P/NO : C660-510333-A      |             |
|                      | .XXX | ± 0.1             | DRAWING           | REV                           | UNIT        |
|                      |      | 徐筱惠<br>2014.10.07 | X1                | m/m                           | SHEET : 1/1 |

**M.gear** Wha Yu Group

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# Antenna Design For

## NE3-14098

### 單天線測試

V1.03

|                                     |                  |
|-------------------------------------|------------------|
| <b>Document Number</b>              | <b>NE3-14098</b> |
| <b>1<sup>st</sup> Released Date</b> | <b>06/30/14</b>  |
| <b>Last Released Date</b>           | <b>08/19/14</b>  |
| <b>Author</b>                       | <b>ANDY-yuan</b> |
| <b>Review by</b>                    | <b>SKY</b>       |

## Revised History

| Date     | Version | Revised Record             |
|----------|---------|----------------------------|
| 06/30/14 | 1.00    | ● 1 <sup>st</sup> released |
| 08/18/14 | 1.01    | 天線調整測試                     |
| 08/18/18 | 1.02    | 天線調整測試                     |
| 08/18/19 | 1.03    | 天線調整測試                     |
|          |         |                            |
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## Specification

| Rough description       |   |                                  |
|-------------------------|---|----------------------------------|
| Item                    | Initial Specification                   | Final Specification              |
| <b>Dimensions</b>       | None                                    |                                  |
| <b>Impedance</b>        | 50Ω                                     |                                  |
| <b>Test environment</b> | With Housing                            |                                  |
| <b>Application</b>      | None                                    |                                  |
| <b>Freq. Range</b>      | 2.412GHz~2.472GHz/<br>5.180GHz~5.825GHz |                                  |
| <b>Antenna type</b>     | DIPOLE                                  |                                  |
| <b>GAIN (Peak Gain)</b> | ANT1                                    | 2.4GHz(1.51dBi)<br>5GHz(3.29dBi) |
| <b>VSWR</b>             | 2.1:1                                   |                                  |
| <b>Radiation</b>        | None                                    |                                  |
| <b>Polarization</b>     | Linear                                  |                                  |
| <b>HPBW / H</b>         | None                                    |                                  |
| <b>HPBW / E</b>         | None                                    |                                  |
| <b>Connector type</b>   | SMA                                     |                                  |
| <b>Cable type</b>       | RG-178                                  |                                  |
| <b>Cable Loss</b>       | 2.4GHz(0.25dB) / 5GHz(0.28dB)           |                                  |

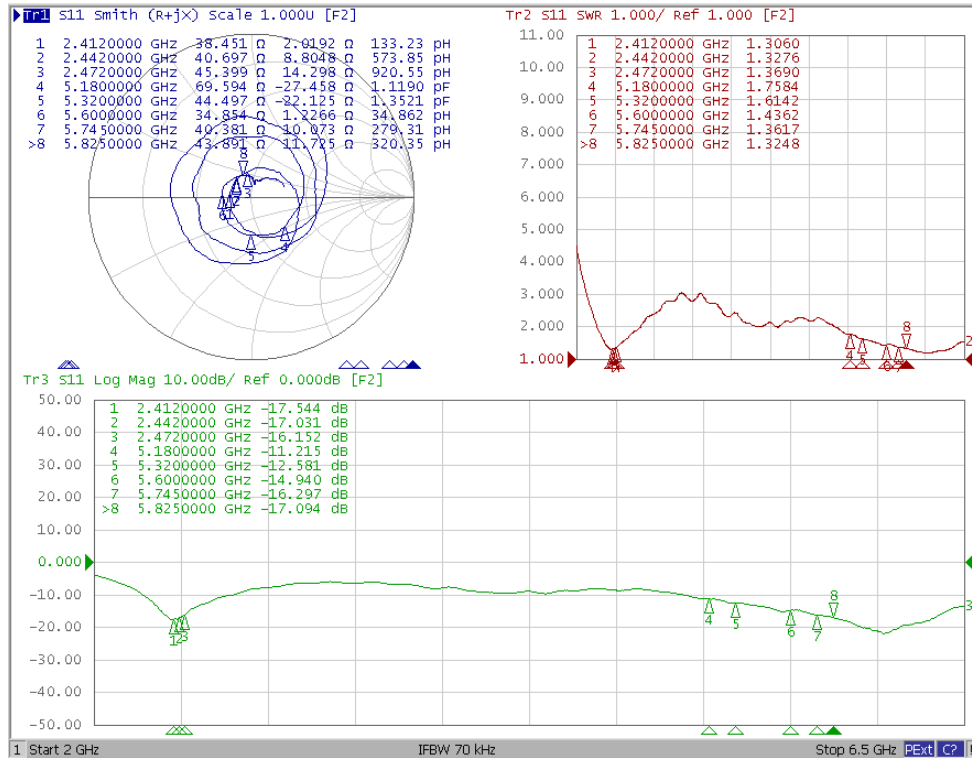
## 1 Antenna Introduction





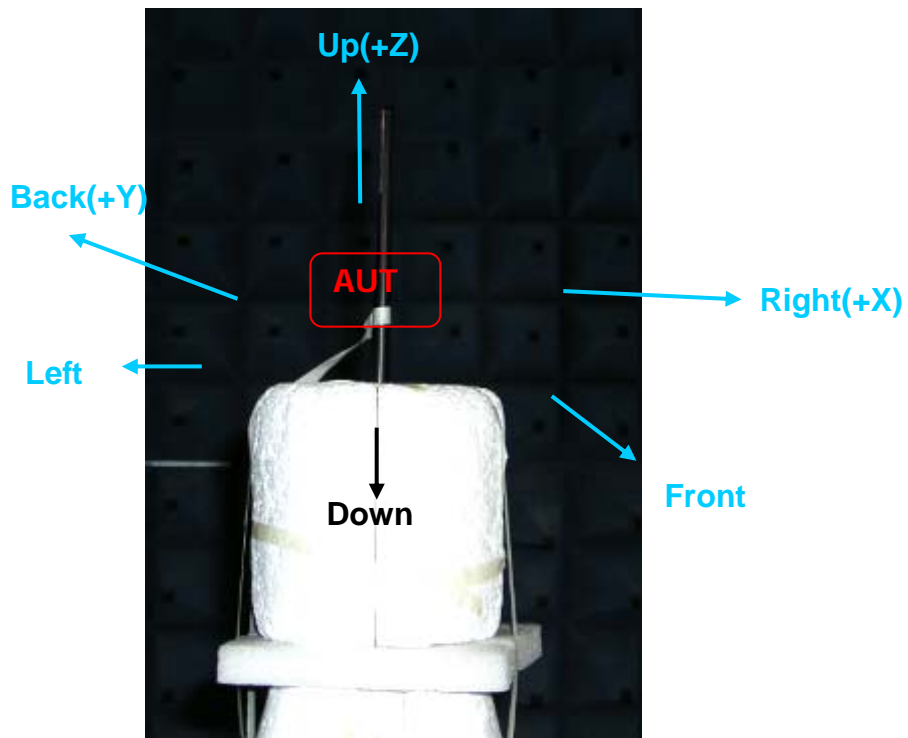
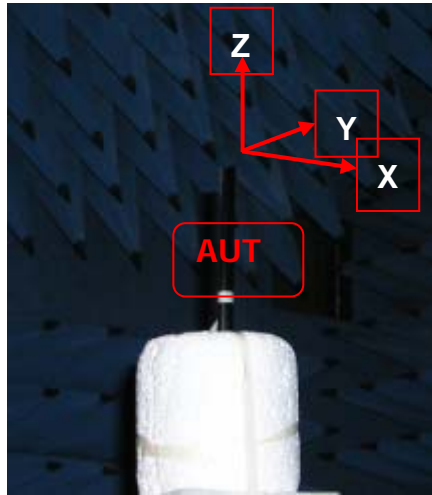
## 2 S11 test results

### 2.1 ANT 1.

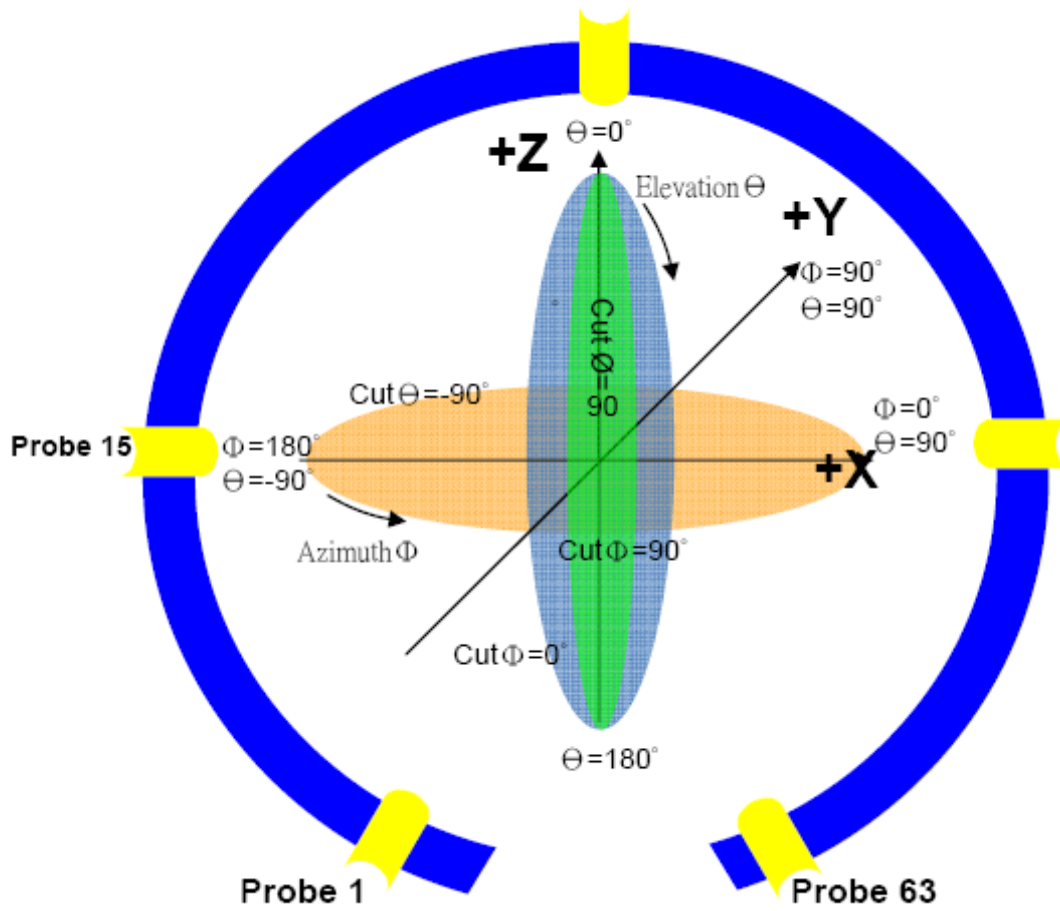


3 Gain & Patterns test results

3.1 Measurement setting



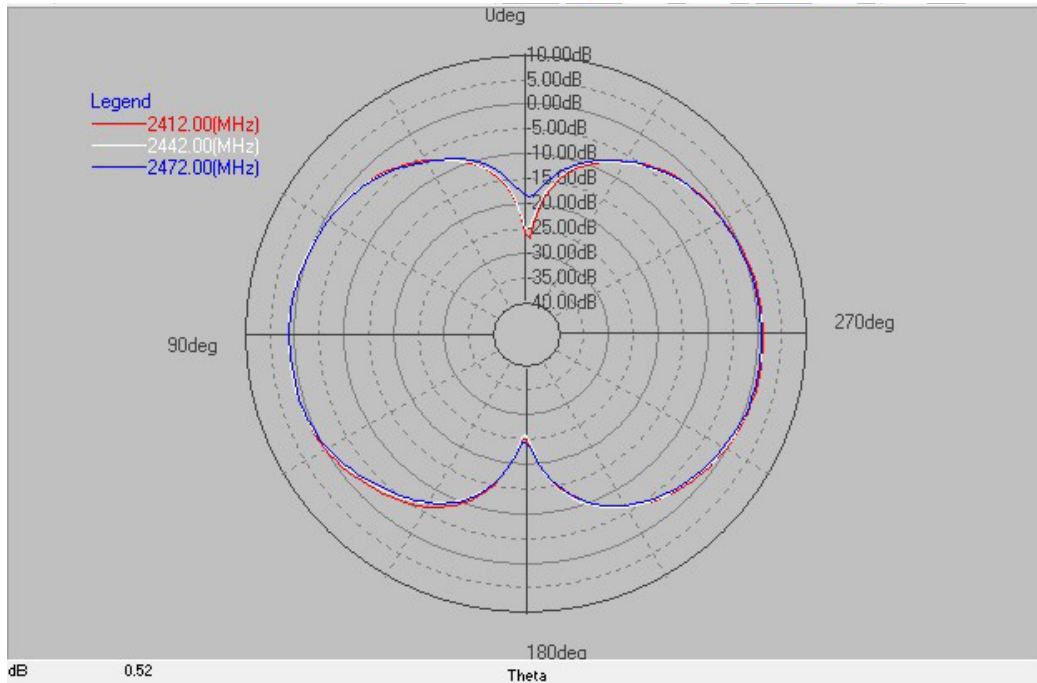
|      | XY    | YZ    | XZ    |
|------|-------|-------|-------|
| 0°   | Right | Up    | Up    |
| 90°  | Back  | Back  | Right |
| 180° | Left  | Down  | Down  |
| 270° | Front | Front | Left  |



|                               | $\theta$ | $\phi$ |
|-------------------------------|----------|--------|
| Total angle                   | 175°     | 360°   |
| How many angle scan one point | 5°       | 5°     |
| Total scan point              | 36       | 73     |

### 3.2 ANT 1.

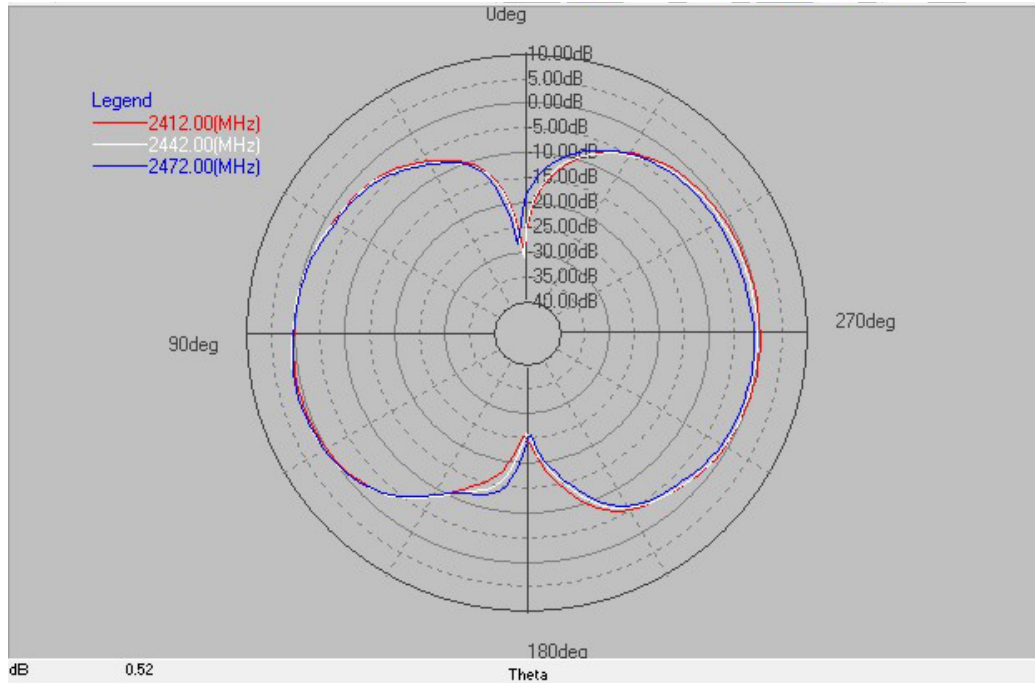
2412 MHz~2472 MHz



X-Z Plane (E-total)

| Frequency | Max Value | Average  |
|-----------|-----------|----------|
| 2412MHz   | 1.15 dB   | -3.33 dB |
| 2442MHz   | 1.21 dB   | -3.47 dB |
| 2472MHz   | 1.06 dB   | -3.55 dB |

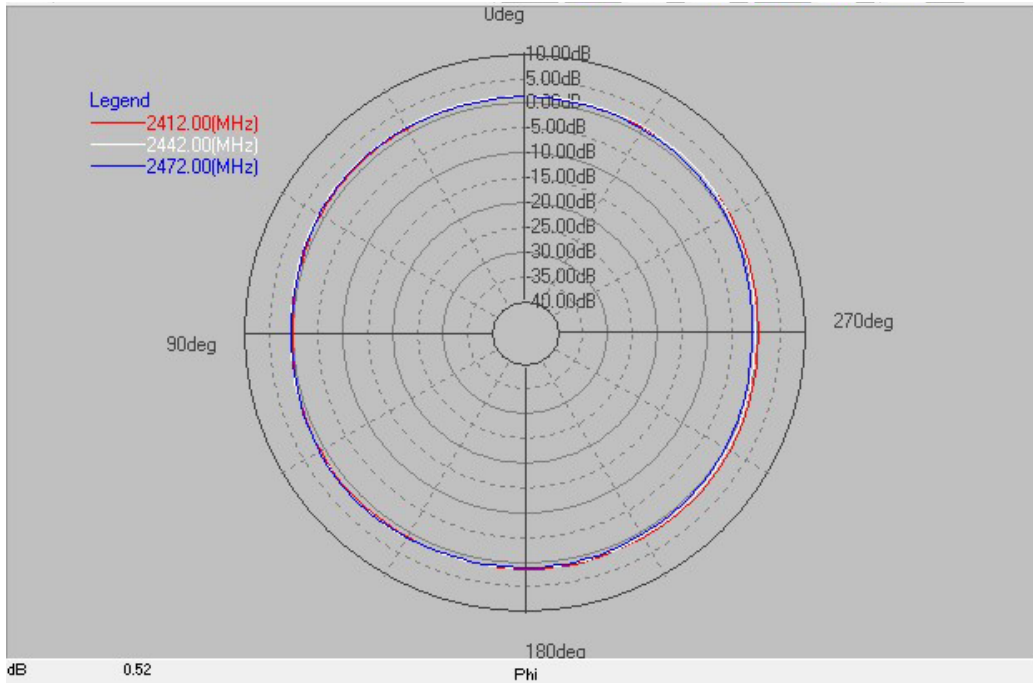
2412 MHz~2472 MHz



Y-Z Plane (E-total)

| Frequency | Max Value | Average  |
|-----------|-----------|----------|
| 2412MHz   | 0.79 dB   | -3.64 dB |
| 2442MHz   | 1.27 dB   | -3.78 dB |
| 2472MHz   | 1.23 dB   | -4.09 dB |

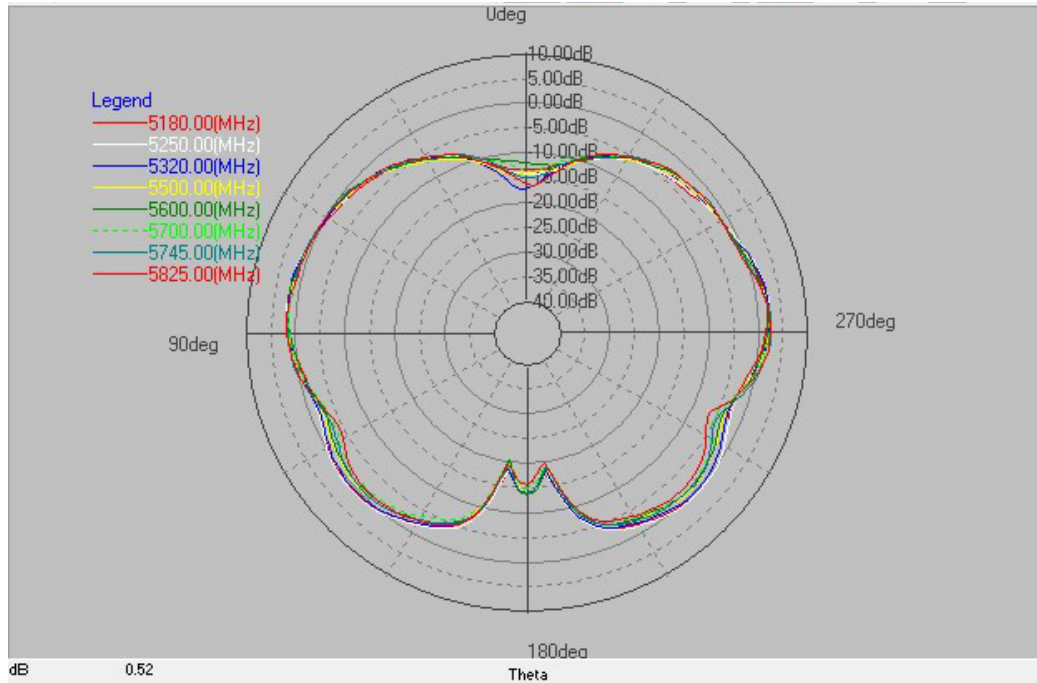
2412 MHz~2472 MHz



X-Y Plane (E-total)

| Frequency | Max Value | Average |
|-----------|-----------|---------|
| 2412MHz   | 1.31 dB   | 0.93 dB |
| 2442MHz   | 1.51 dB   | 0.94 dB |
| 2472MHz   | 1.46 dB   | 0.65 dB |

5180 MHz~5825 MHz

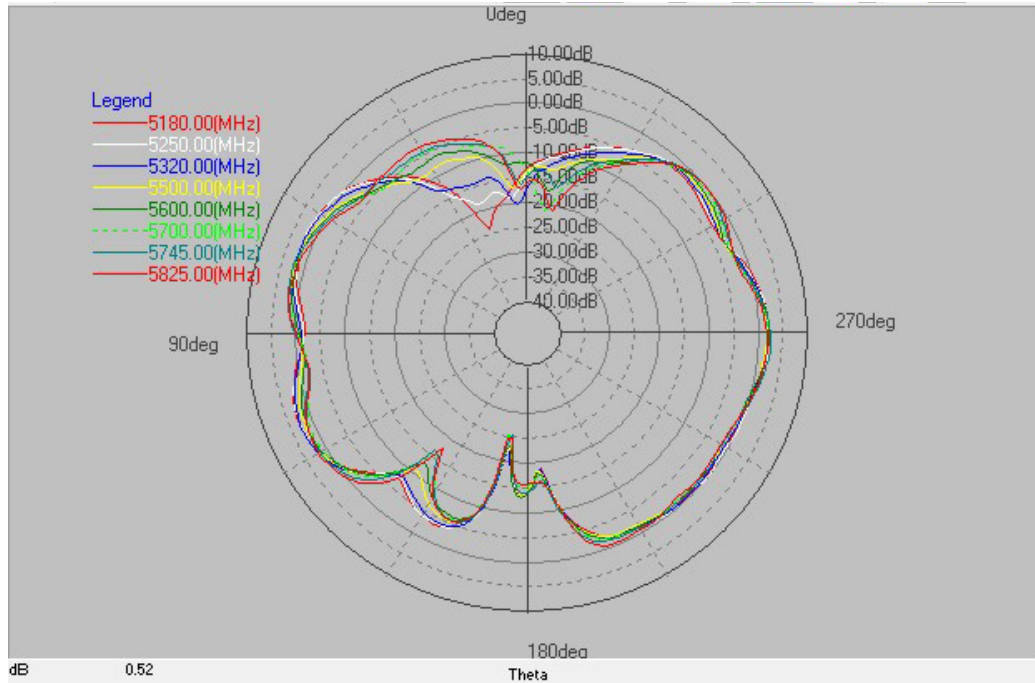


X-Z Plane (E-total)

| Frequency | Max Value | Average  |
|-----------|-----------|----------|
| 5180MHz   | 2.06 dB   | -2.68 dB |
| 5250MHz   | 2.53 dB   | -2.46 dB |
| 5320MHz   | 2.38 dB   | -2.68 dB |
| 5500MHz   | 2.12 dB   | -3.05 dB |
| 5600MHz   | 2.07 dB   | -3.01 dB |
| 5700MHz   | 2.29 dB   | -3.21 dB |
| 5745MHz   | 2.56 dB   | -2.92 dB |
| 5825MHz   | 2.44 dB   | -3.27 dB |



5180 MHz~5825 MHz

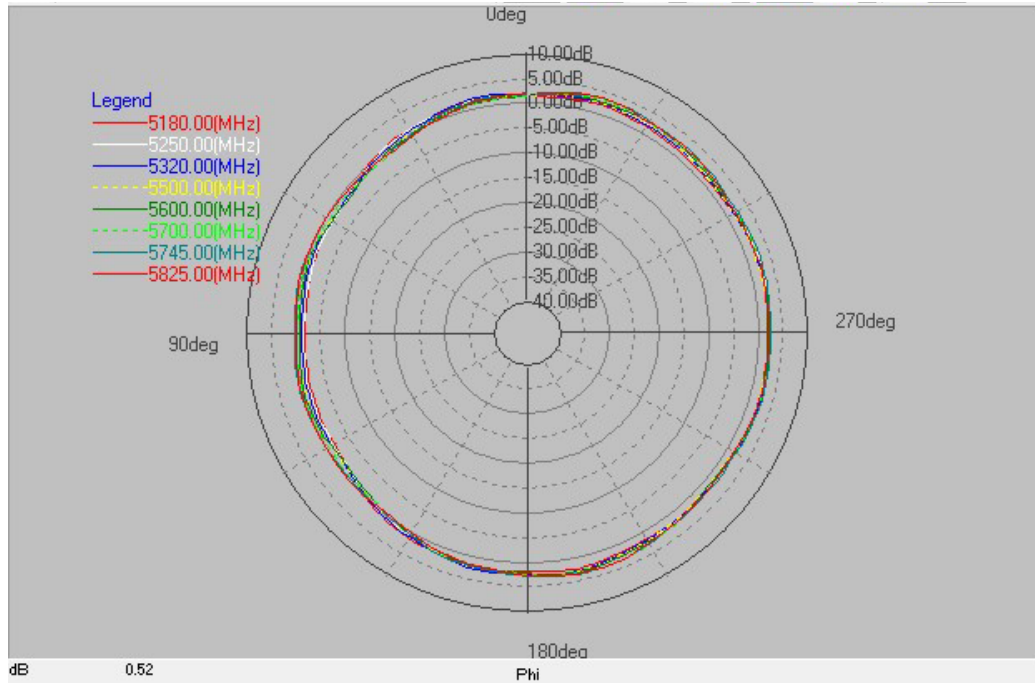


Y-Z Plane (E-total)

| Frequency | Max Value | Average  |
|-----------|-----------|----------|
| 5180MHz   | 2.76 dB   | -2.74 dB |
| 5250MHz   | 2.63 dB   | -2.63 dB |
| 5320MHz   | 2.64 dB   | -2.81 dB |
| 5500MHz   | 2.00 dB   | -3.06 dB |
| 5600MHz   | 2.22 dB   | -3.05 dB |
| 5700MHz   | 2.21 dB   | -3.07 dB |
| 5745MHz   | 2.59 dB   | -2.70 dB |
| 5825MHz   | 1.90 dB   | -2.86 dB |



5180 MHz~5825 MHz



X-Y Plane (E-total)

| Frequency | Max Value | Average |
|-----------|-----------|---------|
| 5180MHz   | 2.46 dB   | 0.88 dB |
| 5250MHz   | 2.57 dB   | 1.08 dB |
| 5320MHz   | 2.58 dB   | 1.07 dB |
| 5500MHz   | 2.66 dB   | 1.01 dB |
| 5600MHz   | 2.76 dB   | 1.06 dB |
| 5700MHz   | 3.12 dB   | 1.21 dB |
| 5745MHz   | 3.29 dB   | 1.59 dB |
| 5825MHz   | 3.18 dB   | 1.35 dB |

#### 4.0 Return Loss

| Frequency | Ant 1.<br>(dB) |
|-----------|----------------|
| 2412MHz   | -17.5          |
| 2442MHz   | -17.0          |
| 2472MHz   | -16.1          |
| 5180MHz   | -11.2          |
| 5320MHz   | -12.5          |
| 5600MHz   | -14.9          |
| 5745MHz   | -16.2          |
| 5825MHz   | -17.0          |