

# Antenna Regulatory Information

|  |                       |
|--|-----------------------|
| • <b>Product type</b>                              | • <b>WLAN antenna</b> |
| • <b>Model number</b>                              | • <b>Diaz</b>         |
| • <b>Revision</b>                                  | • <b>X02</b>          |
| • <b>Manufacturer Part No. : Main / Aux / MIMO</b> | • <b>C-2023816-1</b>  |
| • <b>Dell Part No. : Main / Aux / MIMO</b>         | •                     |

**Tyco Holdings(Bermuda)V II Ltd. Taiwan Branch**  
**3F,No.45, Dongsing Road, Taipei 11070 Taiwan R.O.C.**

Template Revision 092006

# 1. Specifications

## Antenna Specifications

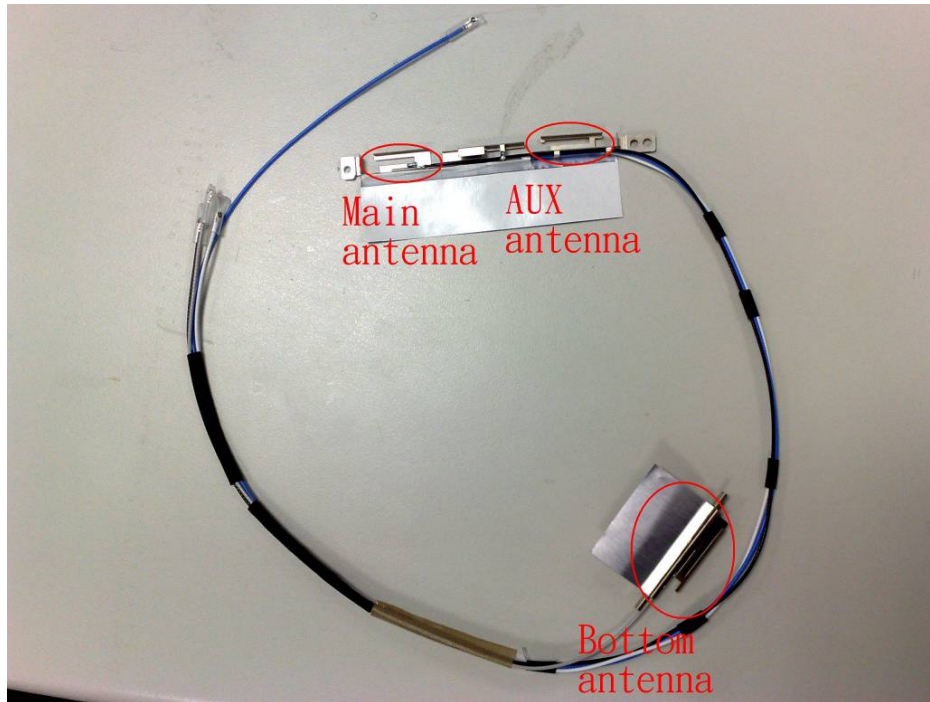
|   |   |
|---|---|
| Antenna Type (Material, Technology)       | PIFA  |
| Antenna Model Number                      | Diaz  |
| Operating Frequency Range(s)              | 2.412GHz ~ 2.7GHz and 5.15GHz ~ 5.875GHz  |
| Peak Gain (802.11b/g / 2.4GHz Band) (dBi) | Main: 2.412GHz -2.30dBi; 2.437GHz -1.07dBi; 2.462GHz -0.08dBi;<br>2.50GHz 0.51dBi; 2.60GHz 0.86dBi; 2.70GHz 2.32dBi |
|   | Aux: 2.412GHz -0.24dBi; 2.437GHz 0.46dBi; 2.462GHz 0.67dBi;<br>2.50GHz 0.84dBi; 2.60GHz 0.04dBi; 2.70GHz 0.03dBi    |
|   | MIMO: 2.412GHz 2.33dBi; 2.437GHz 2.44dBi; 2.462GHz 2.36dBi  |
| Peak Gain (802.11a / 5GHz Band) (dBi)     | Main: 5.15GHz -0.53dBi; 5.35GHz -0.10dBi; 5.47GHz 0.03dBi;<br>5.725GHz 0.02dBi; 5.875GHz 0.42dBi                    |
|   | Aux: 5.15GHz -0.94dBi; 5.35GHz -0.07dBi; 5.47GHz 0.81dBi;<br>5.725GHz 1.58dBi; 5.875GHz 0.82dBi                     |
|   | MIMO: 5.15GHz -1.15dBi; 5.35GHz -0.67dBi; 5.47GHz -0.58dBi;<br>5.725GHz 0.34dBi; 5.875GHz 2.16dBi                   |
| Radio Connector Type                      | Hirose U.FL connector   |
| Mid-Line Connector Type (If Applicable)   | N/A   |

**Remark:** Peak Gains include all system losses (connector, cable, etc)

## Cable Specifications

| Cable Parameters                                | Main  |           |               | Aux  |           |               | MIMO  |           |               |
|---|---|-----------|---------------|--|-----------|---------------|---|-----------|---------------|
|   | LCD Side  | Base Side | Total         | LCD Side   | Base Side | Total         | LCD Side  | Base Side | Total         |
| Length (mm)                                     | 270mm   | 205mm     | 475mm         | 270mm  | 205mm     | 475mm         | 60mm  | 215mm     | 275mm         |
| Loss (Including Connectors) (dB, 2.4GHz / 5GHz) |   |           | 0.87/<br>1.52 |  |           | 0.87/<br>1.52 |   |           | 0.52/<br>0.88 |
| Description (Color, Diameter, Manufacturer)     | Color: White<br>OD: 1.1 3 mm<br>Sumitomo, Kurabe, GBE or equivalent |           |               | Color: Black<br>OD: 1.13 mm<br>Sumitomo, Kurabe, GBE or equivalent |           |               | Color: Gray<br>OD: 1.13 mm<br>Sumitomo, Kurabe, GBE or equivalent |           |               |

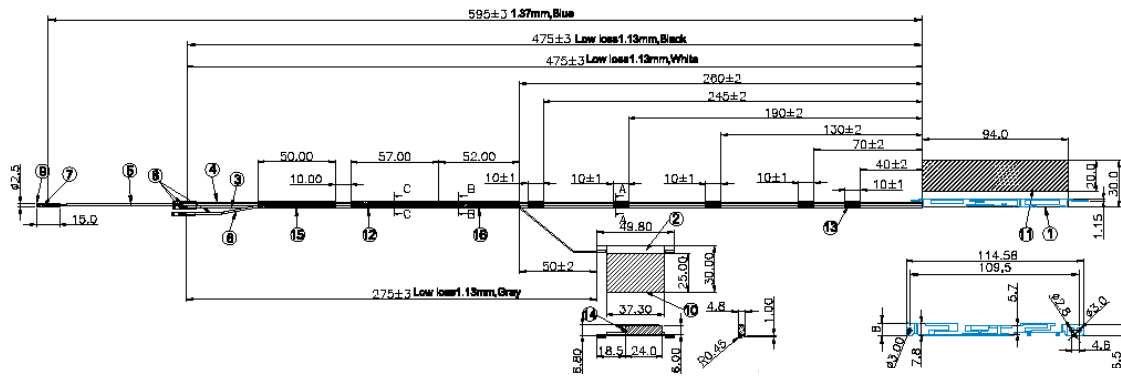
## 2. Antenna Assembly



## 3. Antenna Assembly Installed in The Notebook



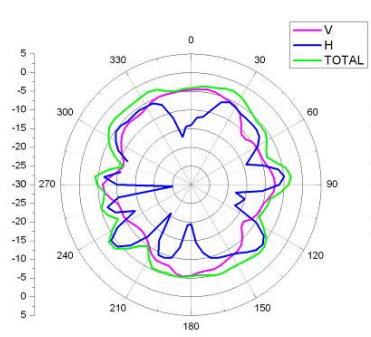
## 4. Mechanical Drawing of Antennas



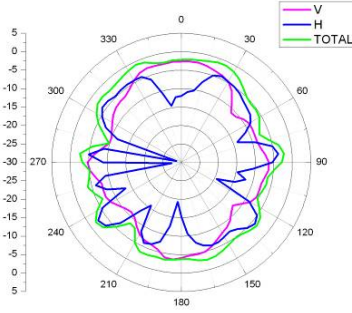
# 5. Gain Patterns

- Main Antenna

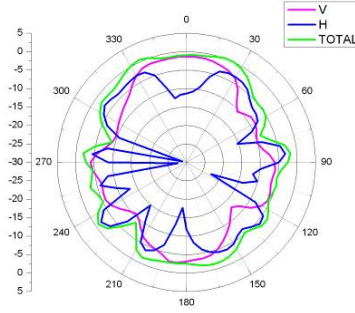
2412MHz



2437MHz



2462MHz

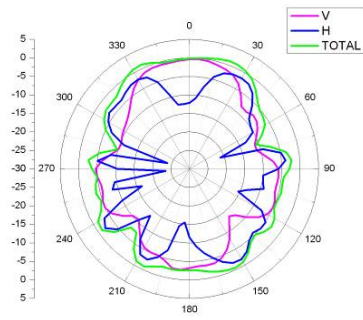


|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2412 MHz</b> |
| Horizontal (dBi) peak | <b>-3.81</b>    |
| Vertical (dBi) peak   | <b>-4.16</b>    |
| Horz+Vert (dBi) peak  | <b>-2.50</b>    |
| Horz+Vert (dBi) avg   | <b>-4.92</b>    |

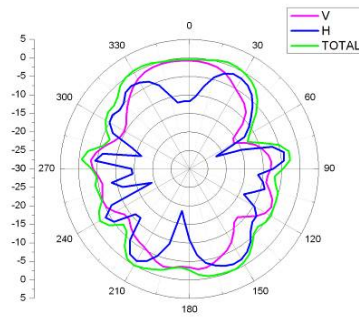
|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2437 MHz</b> |
| Horizontal (dBi) peak | <b>-2.55</b>    |
| Vertical (dBi) peak   | <b>-2.54</b>    |
| Horz+Vert (dBi) peak  | <b>-0.82</b>    |
| Horz+Vert (dBi) avg   | <b>-3.58</b>    |

|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2462 MHz</b> |
| Horizontal (dBi) peak | <b>-1.78</b>    |
| Vertical (dBi) peak   | <b>-1.28</b>    |
| Horz+Vert (dBi) peak  | <b>0.57</b>     |
| Horz+Vert (dBi) avg   | <b>-2.61</b>    |

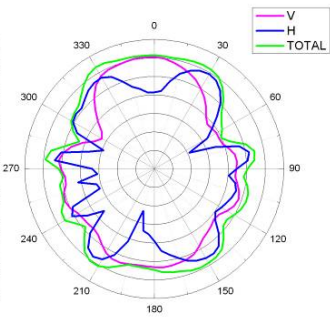
2500MHz



2600MHz



2700MHz

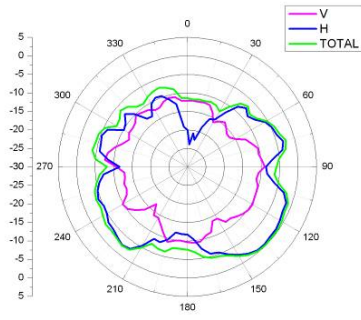


|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2500 MHz</b> |
| Horizontal (dBi) peak | <b>-1.70</b>    |
| Vertical (dBi) peak   | <b>-0.26</b>    |
| Horz+Vert (dBi) peak  | <b>1.10</b>     |
| Horz+Vert (dBi) avg   | <b>-2.23</b>    |

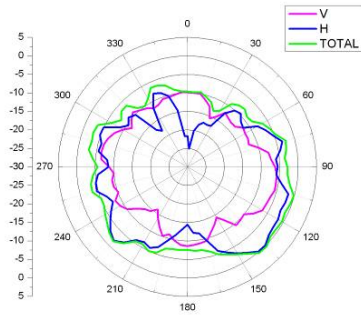
|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2600 MHz</b> |
| Horizontal (dBi) peak | <b>-1.33</b>    |
| Vertical (dBi) peak   | <b>-0.54</b>    |
| Horz+Vert (dBi) peak  | <b>0.62</b>     |
| Horz+Vert (dBi) avg   | <b>-2.26</b>    |

|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2700 MHz</b> |
| Horizontal (dBi) peak | <b>-0.39</b>    |
| Vertical (dBi) peak   | <b>0.30</b>     |
| Horz+Vert (dBi) peak  | <b>1.72</b>     |
| Horz+Vert (dBi) avg   | <b>-1.83</b>    |

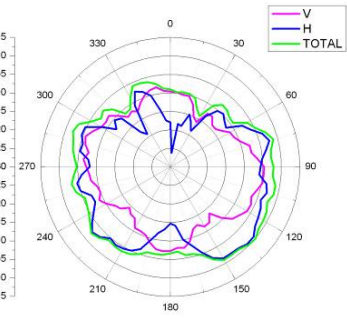
5150MHz



5350MHz



5470MHz

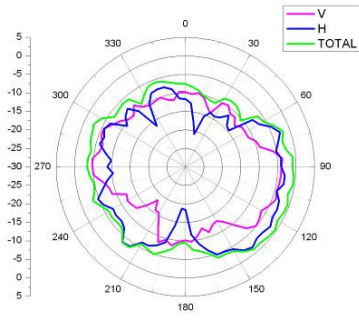


|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>5150 MHz</b> |
| Horizontal (dBi) peak | <b>-0.47</b>    |
| Vertical (dBi) peak   | <b>-7.58</b>    |
| Horz+Vert (dBi) peak  | <b>-0.10</b>    |
| Horz+Vert (dBi) avg   | <b>-4.64</b>    |

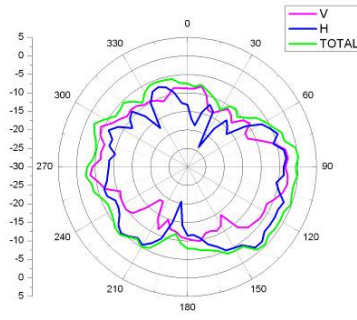
|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>5350 MHz</b> |
| Horizontal (dBi) peak | <b>-0.07</b>    |
| Vertical (dBi) peak   | <b>-5.49</b>    |
| Horz+Vert (dBi) peak  | <b>0.36</b>     |
| Horz+Vert (dBi) avg   | <b>-4.33</b>    |

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|-----------------------|-----------------|
| Center Frequency      | <b>5470 MHz</b> |
| Horizontal (dBi) peak | <b>-0.57</b>    |
| Vertical (dBi) peak   | <b>-4.65</b>    |
| Horz+Vert (dBi) peak  | <b>0.11</b>     |
| Horz+Vert (dBi) avg   | <b>-4.12</b>    |

5725MHz



5875MHz



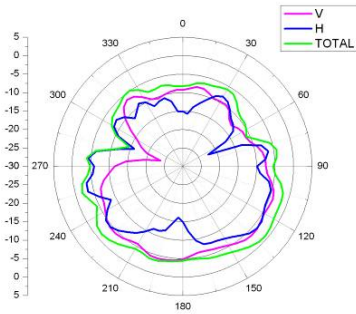
|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>5725 MHz</b> |
| Horizontal (dBi) peak | <b>-1.65</b>    |
| Vertical (dBi) peak   | <b>-3.60</b>    |
| Horz+Vert (dBi) peak  | <b>-0.35</b>    |
| Horz+Vert (dBi) avg   | <b>-4.19</b>    |

|                       |                |
|-----------------------|----------------|
| Center Frequency      | <b>5875MHz</b> |
| Horizontal (dBi) peak | <b>-1.42</b>   |
| Vertical (dBi) peak   | <b>-2.55</b>   |
| Horz+Vert (dBi) peak  | <b>0.11</b>    |
| Horz+Vert (dBi) avg   | <b>-4.25</b>   |

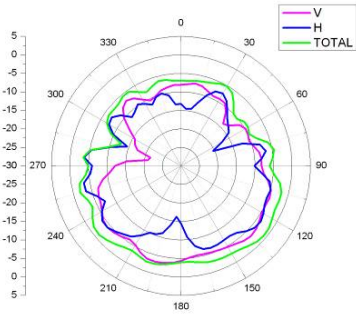


**-Aux Antenna**

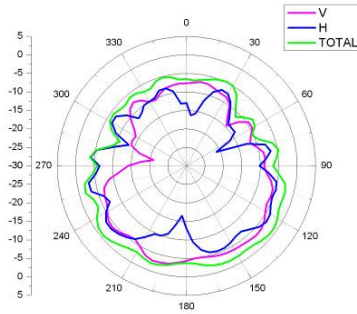
2412MHz



2437MHz



2462MHz

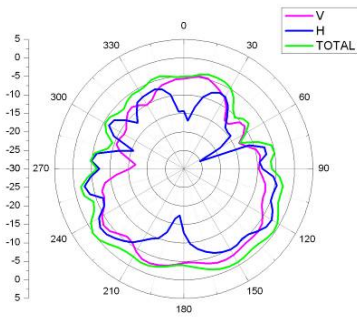


|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2412 MHz</b> |
| Horizontal (dBi) peak | <b>-3.46</b>    |
| Vertical (dBi) peak   | <b>-3.59</b>    |
| Horz+Vert (dBi) peak  | <b>-0.76</b>    |
| Horz+Vert (dBi) avg   | <b>-4.42</b>    |

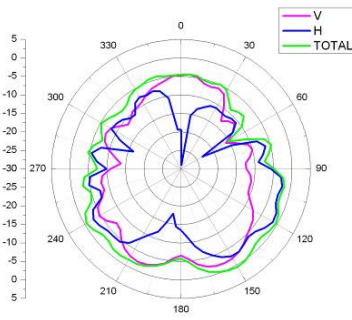
|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2437 MHz</b> |
| Horizontal (dBi) peak | <b>-3.35</b>    |
| Vertical (dBi) peak   | <b>-3.22</b>    |
| Horz+Vert (dBi) peak  | <b>-0.70</b>    |
| Horz+Vert (dBi) avg   | <b>-4.10</b>    |

|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2462 MHz</b> |
| Horizontal (dBi) peak | <b>-3.08</b>    |
| Vertical (dBi) peak   | <b>-2.80</b>    |
| Horz+Vert (dBi) peak  | <b>-0.66</b>    |
| Horz+Vert (dBi) avg   | <b>-3.93</b>    |

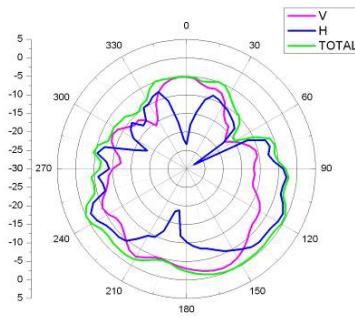
2500MHz



2600MHz



2700MHz

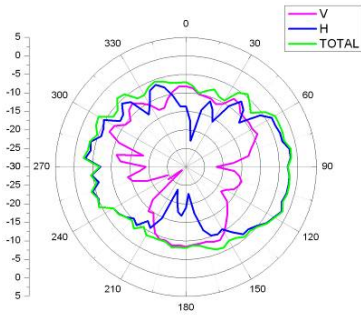


|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2500 MHz</b> |
| Horizontal (dBi) peak | <b>-2.36</b>    |
| Vertical (dBi) peak   | <b>-2.91</b>    |
| Horz+Vert (dBi) peak  | <b>0.12</b>     |
| Horz+Vert (dBi) avg   | <b>-3.54</b>    |

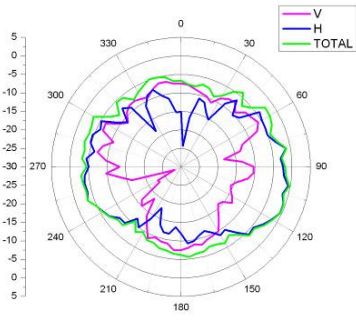
|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2600 MHz</b> |
| Horizontal (dBi) peak | <b>-1.33</b>    |
| Vertical (dBi) peak   | <b>-1.94</b>    |
| Horz+Vert (dBi) peak  | <b>0.58</b>     |
| Horz+Vert (dBi) avg   | <b>-3.45</b>    |

|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>2700 MHz</b> |
| Horizontal (dBi) peak | <b>-1.19</b>    |
| Vertical (dBi) peak   | <b>-1.42</b>    |
| Horz+Vert (dBi) peak  | <b>0.14</b>     |
| Horz+Vert (dBi) avg   | <b>-3.46</b>    |

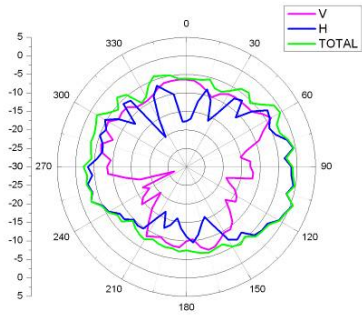
5150MHz



5350MHz



5470MHz

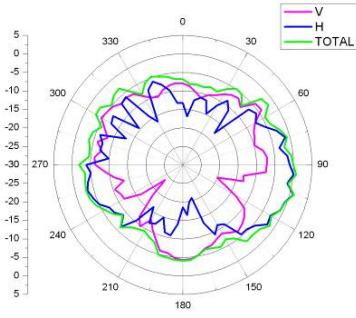


| Center Frequency      | 5150 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | -1.64    |
| Vertical (dBi) peak   | -7.40    |
| Horz+Vert (dBi) peak  | -1.48    |
| Horz+Vert (dBi) avg   | -5.05    |

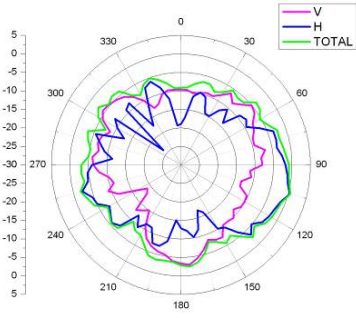
| Center Frequency      | 5350 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | -0.50    |
| Vertical (dBi) peak   | -5.89    |
| Horz+Vert (dBi) peak  | -0.24    |
| Horz+Vert (dBi) avg   | -4.50    |

| Center Frequency      | 5470 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | 0.65     |
| Vertical (dBi) peak   | -3.52    |
| Horz+Vert (dBi) peak  | 0.71     |
| Horz+Vert (dBi) avg   | -3.96    |

5725MHz



5875MHz

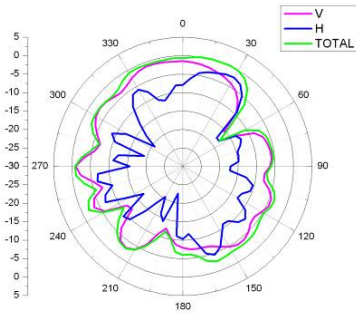


| Center Frequency      | 5725 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | 1.04     |
| Vertical (dBi) peak   | -3.99    |
| Horz+Vert (dBi) peak  | 1.21     |
| Horz+Vert (dBi) avg   | -3.84    |

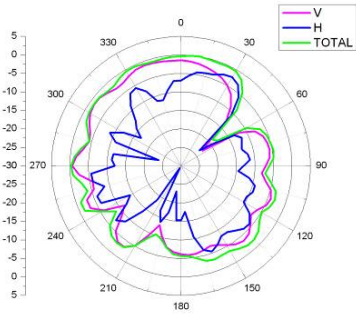
| Center Frequency      | 5875MHz |
|-----------------------|---------|
| Horizontal (dBi) peak | 0.39    |
| Vertical (dBi) peak   | -2.91   |
| Horz+Vert (dBi) peak  | 0.58    |
| Horz+Vert (dBi) avg   | -4.12   |

**-Bottom Antenna**

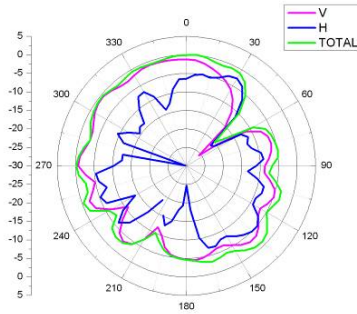
2412MHz



2437MHz



2462MHz

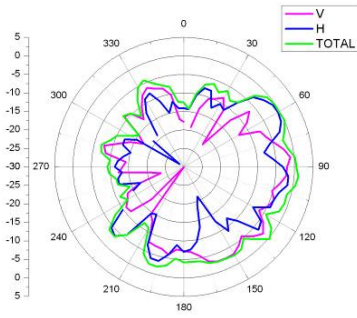


| Center Frequency      | 2412 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | -2.21    |
| Vertical (dBi) peak   | -0.96    |
| Horz+Vert (dBi) peak  | 0.15     |
| Horz+Vert (dBi) avg   | -3.22    |

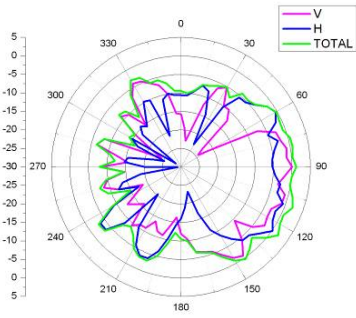
| Center Frequency      | 2437 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | -2.31    |
| Vertical (dBi) peak   | -0.59    |
| Horz+Vert (dBi) peak  | 0.01     |
| Horz+Vert (dBi) avg   | -2.85    |

| Center Frequency      | 2462 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | -2.66    |
| Vertical (dBi) peak   | -0.66    |
| Horz+Vert (dBi) peak  | 0.11     |
| Horz+Vert (dBi) avg   | -2.66    |

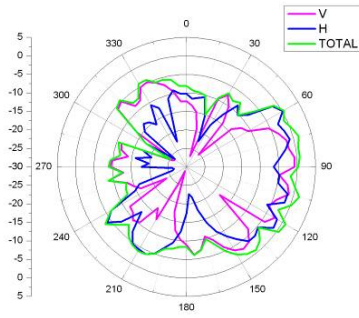
5150MHz



5350MHz



5470MHz

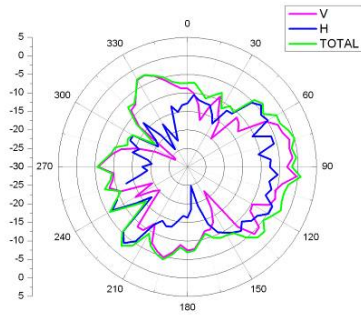


| Center Frequency      | 5150 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | -0.47    |
| Vertical (dBi) peak   | -1.02    |
| Horz+Vert (dBi) peak  | 1.12     |
| Horz+Vert (dBi) avg   | -3.99    |

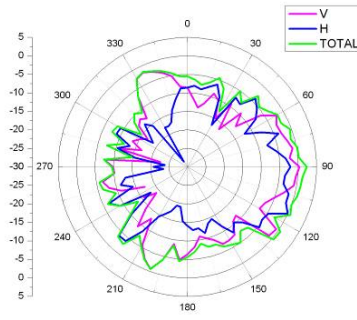
| Center Frequency      | 5350 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | 0.19     |
| Vertical (dBi) peak   | 0.02     |
| Horz+Vert (dBi) peak  | 2.15     |
| Horz+Vert (dBi) avg   | -3.48    |

| Center Frequency      | 5470 MHz |
|-----------------------|----------|
| Horizontal (dBi) peak | 0.10     |
| Vertical (dBi) peak   | -0.57    |
| Horz+Vert (dBi) peak  | 1.56     |
| Horz+Vert (dBi) avg   | -3.99    |

5725MHz



5875MHz



|                       |                 |
|-----------------------|-----------------|
| Center Frequency      | <b>5725 MHz</b> |
| Horizontal (dBi) peak | <b>-3.16</b>    |
| Vertical (dBi) peak   | <b>-0.34</b>    |
| Horz+Vert (dBi) peak  | <b>0.83</b>     |
| Horz+Vert (dBi) avg   | <b>-5.18</b>    |

|                       |                |
|-----------------------|----------------|
| Center Frequency      | <b>5875MHz</b> |
| Horizontal (dBi) peak | <b>-0.03</b>   |
| Vertical (dBi) peak   | <b>0.33</b>    |
| Horz+Vert (dBi) peak  | <b>2.29</b>    |
| Horz+Vert (dBi) avg   | <b>-3.72</b>   |