

# Siberia Antenna

## Regulatory WLAN Antenna Information

(English Language Required for Intel Regulatory Review / Approval)

Brand Name	<i>WISTRON for Dell</i>
Model Name	<i>Siberia (DS1)</i>
Antenna Vendor	<i>FOXCONN</i>
Antenna Part Number	<input type="checkbox"/> Main/Aux/Mimo Antenna:60.4Q612.011
With WLAN Module (Check Box)	<input type="checkbox"/> TBD

## Antenna Sample / Antenna Data Requirements for worldwide regulatory approval

Section	Description of Required OEM / ODM Antenna Information	US / IC	EU	Japan	Taiwan	S.Korea
1A	Part Number for Antenna only	Required	Required	Required	Required	Required
1B	Antenna Manufacturer Name	Required	Required	Required	Required	Required
1C	Description of Antenna Type	Required	N/A	N/A	N/A	N/A
1D	Part number of Antenna Assembly / cable impedance, length & diameter.	Required	Desired	Desired	Desired	Desired
1E	Main & Aux antenna (Peak Gain W/ cable loss)	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Main & Aux antenna (Peak Gain only)	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Main & Aux antenna (Cable loss W/ connector)	Required	Required	Required	Required	Required
2	Dimensioned Photographs <b>and</b> Drawings of main & auxiliary antennas	Required	Required	Required	Required	Required
3	Radiation patterns of antennas loaded in the host platform.	Required	Desired	Required	N/A	Required
4	Platform model name / number - correlated to antenna manufacturer and antenna part number	Required	Required	Desired	Required	Desired
5	Photograph(s) or Drawings showing location of antennas in platform. <b>(S. Korea requires photographs of antennas for approval submission). Taiwan requires pictures of each antenna type shown in the system.</b>	Required	Required	Desired	Required <b>(Photos)</b>	Required <b>(Photos)</b>
6	Mech. drawings / photos with dimensions of antenna locations and distance from end-user (For evaluation of SAR testing requirement).	Required	N/A	N/A	N/A	N/A
7	Photograph(s) or Drawings showing the location of all antennas (WLAN, BT, other) and distance between those transmitting antennas. Information will be used to evaluate whether co-location testing is required.	Required	N/A	N/A	N/A	N/A
8	Local representative contact information for LMA/ PARS process.	Required	N/A	N/A	N/A	N/A

# Antenna Information

## Section 1. Antenna Assembly Specifications

### Antenna Assembly Summary:

1A Antenna Part Number	1B Manufacture	1C Antenna Type	1D Cable Assembly Part Number and Information	1E Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G VSWR	1H Cable Loss (dBi)
(P/N: WDAN-DWDS1 001-DF) Main antenna	HON HAI PRECISION IND. CO.,LTD.	PIFA	1. Cable P/N: FOXCONN:703-3009-215 2. Cable type: 30 AWG 3. O.D. 1.37 mm 50 ohm coaxial cable 4. Cable length: 717 mm 5. Connector P/N: FOXCONN: SGX0003-02	2400-2500MHz -0.94 dBi (peak)	2400-2500MHz 0.767 dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz -1.541 dBi (peak)
				4900-5350MHz 0.53 dBi (peak)	4900-5350MHz 3.086 dBi (peak)	4900-5350MHz 2.5 max	4900-5350MHz -2.661 dBi (peak)
				5470-5875MHz 0.83 dBi (peak)	5470-5875MHz 3.718 dBi (peak)	5470-5875MHz 2.5 max	5470-5875MHz -3.084 dBi (peak)
(P/N: WDAN-DWDS1 001-DF) Auxiliary antenna	HON HAI PRECISION IND. CO.,LTD.	PIFA	1. Cable P/N: FOXCONN:703-3000-215 2. Cable type: 30 AWG 3. O.D. 1.37 mm 50 ohm coaxial cable 4. Cable length: 315 mm 5. Connector P/N: FOXCONN:SGX0003-02	2400-2500MHz 1.53 dBi (peak)	2400-2500MHz 2.207 dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz -0.677 dBi (peak)
				4900-5350MHz 2.53 dBi (peak)	4900-5350MHz 3.699 dBi (peak)	4900-5350MHz 2.5 max	4900-5350MHz -1.169 dBi (peak)
				5470-5875MHz 0.83 dBi (peak)	5470-5875MHz 2.185 dBi (peak)	5470-5875MHz 2.5 max	5470-5875MHz -1.355 dBi (peak)
(P/N: WDAN-DWDS1 001-DF) 3 <sup>rd</sup> MIMO antenna	HON HAI PRECISION IND. CO.,LTD.	PIFA	1. Cable P/N: FOXCONN:703-3008-215 2. Cable type: 30 AWG 3. O.D. 1.37 mm 50 ohm coaxial cable 4. Cable length: 350 mm 5. Connector P/N: FOXCONN:SGX0003-02	2400-2500MHz 1.08 dBi (peak)	2400-2500MHz 1.832 dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz -0.752 dBi (peak)
				4900-5350MHz -0.77 dBi (peak)	4900-5350MHz 0.529 dBi (peak)	4900-5350MHz 2.5 max	4900-5350MHz -1.299 dBi (peak)
				5470-5875MHz -0.45 dBi (peak)	5470-5875MHz 1.055 dBi (peak)	5470-5875MHz 2.5 max	5470-5875MHz -1.505 dBi (peak)

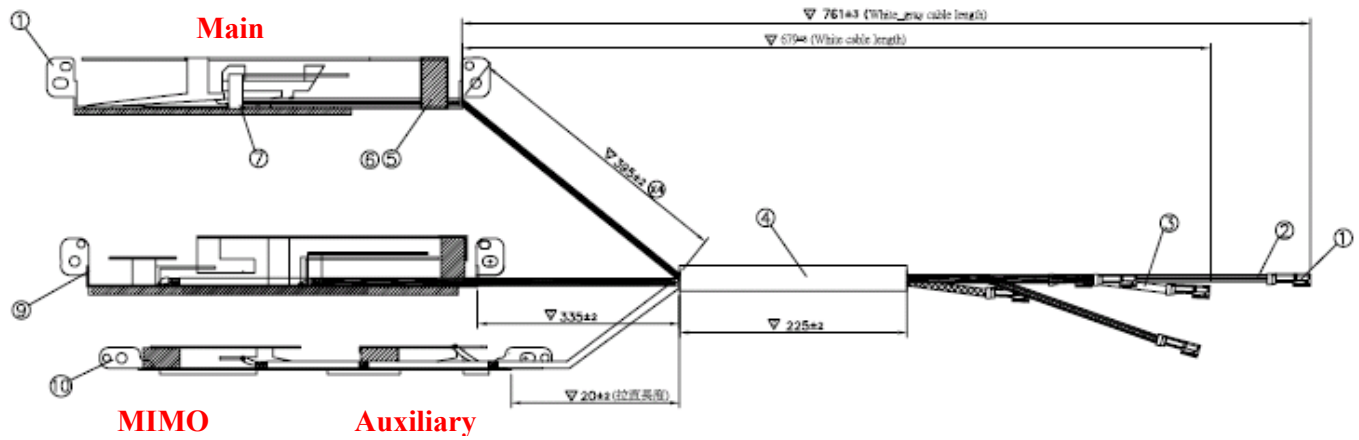
### Antenna Peak Gain Table:

Frequency (MHz)	Main Antenna		Aux Antenna		MIMO Antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
2412	0.36	2.67	-1.896	1.535	1.083	1.015
2437	-0.94	-2.58	-2.440	1.376	0.768	0.256
2462	-0.96	-2.31	-2.950	-0.704	0.771	-0.331
4900	-0.35	-0.68	-5.474	1.669	-8.400	-1.195
5150	-0.30	-0.24	-3.962	0.876	-5.684	-0.947
5350	-1.30	0.53	-5.563	2.532	-6.866	-0.770
5470	-0.59	0.83	-5.376	0.833	-6.318	-0.453
5725	-1.75	0.15	-3.872	-0.366	-6.144	-1.963
5875	-3.24	-0.85	-3.675	-0.095	-7.002	-0.665

- Antenna Peak Gain required being test in system basis.
- 1E frame contend absolutely peak antenna gain include H/ V/ H+V.

## Section 2. Dimensioned Photos or Drawings of Antennas

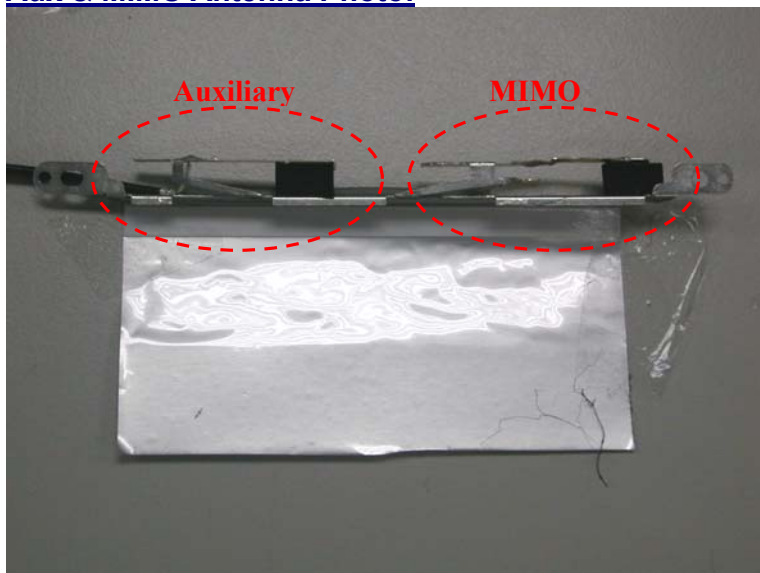
### Main Antenna Dimensioned Drawing:



### Main Antenna Photo:



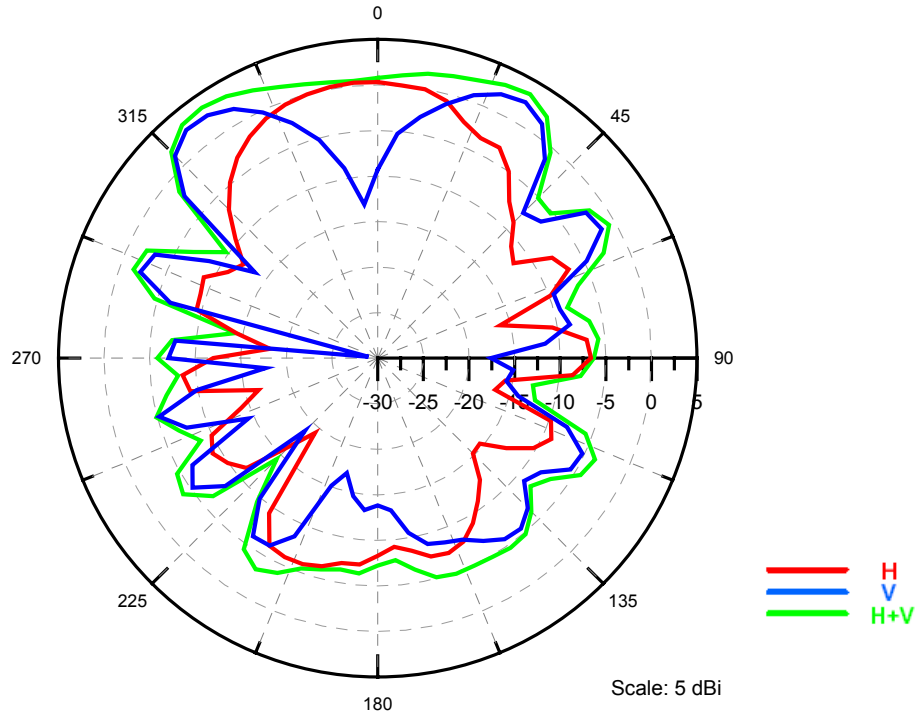
### Aux & MIMO Antenna Photo:



## Section 3. Radiation characteristics of antenna Loaded in Host Platform

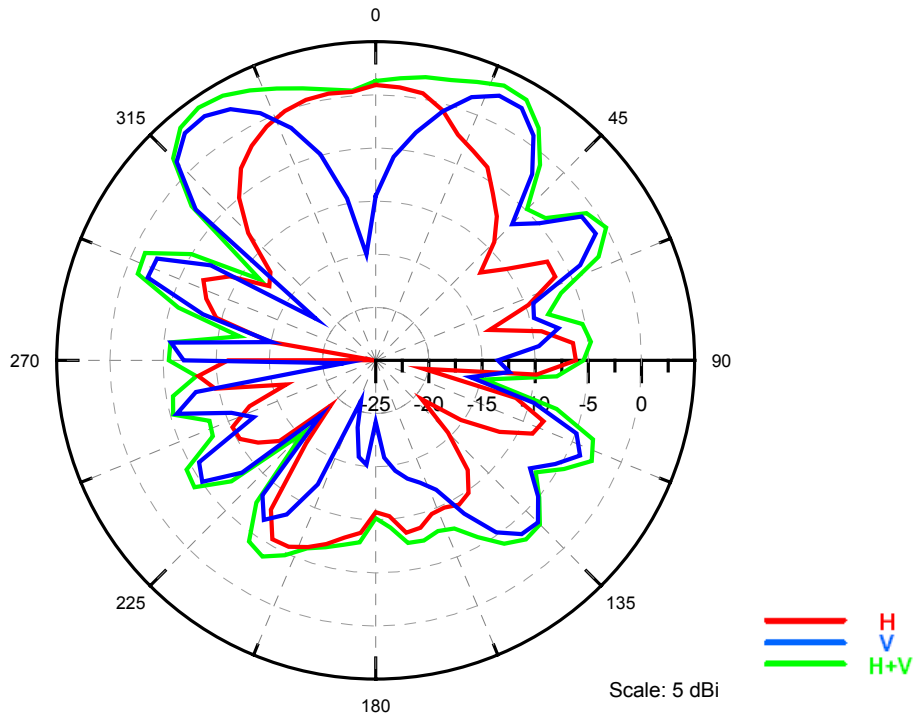
### 2400-2500MHz radiation characteristic

Main antenna: 2412 MHz



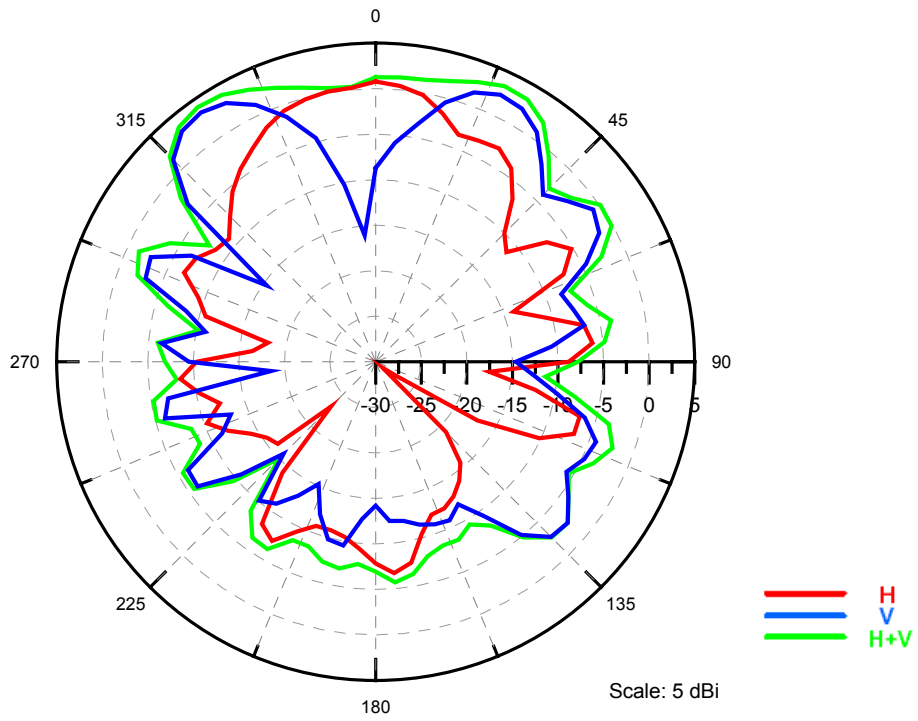
Center Frequency	<b>2412 MHz</b>
Horizontal (dBi) peak	<b>0.36</b>
Vertical (dBi) peak	<b>2.67</b>
Horz+Vert (dBi) peak	<b>3.58</b>

Main antenna: 2437 MHz



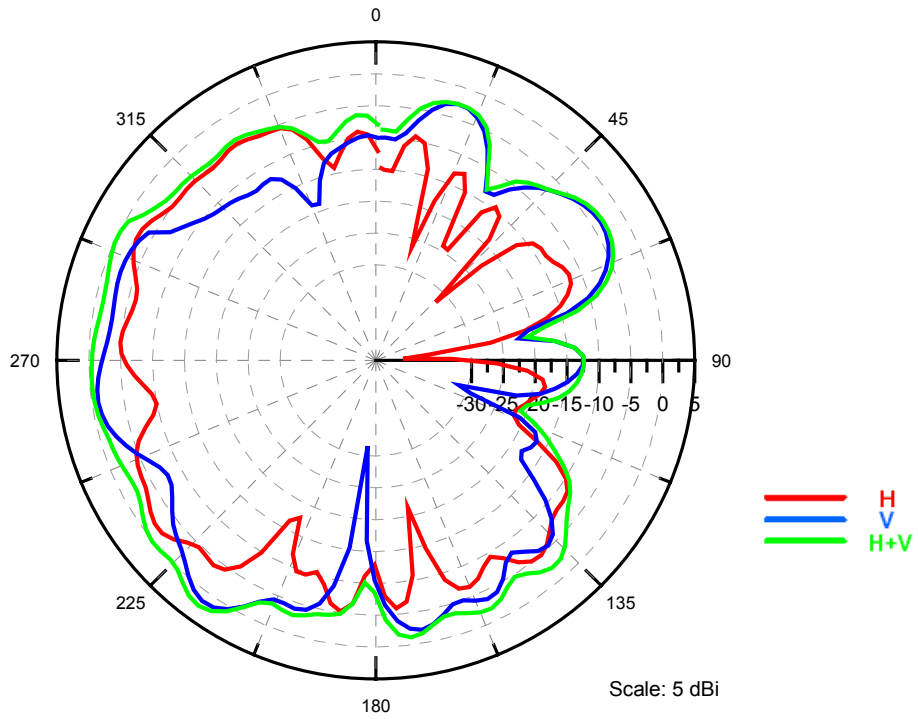
Center Frequency	<b>2437 MHz</b>
Horizontal (dBi) peak	<b>0.93</b>
Vertical (dBi) peak	<b>3.0</b>
Horz+Vert (dBi) peak	<b>4.04</b>

Main antenna: 2462 MHz



Center Frequency	<b>2462 MHz</b>
Horizontal (dBi) peak	<b>0.28</b>
Vertical (dBi) peak	<b>2.92</b>
Horz+Vert (dBi) peak	<b>3.62</b>

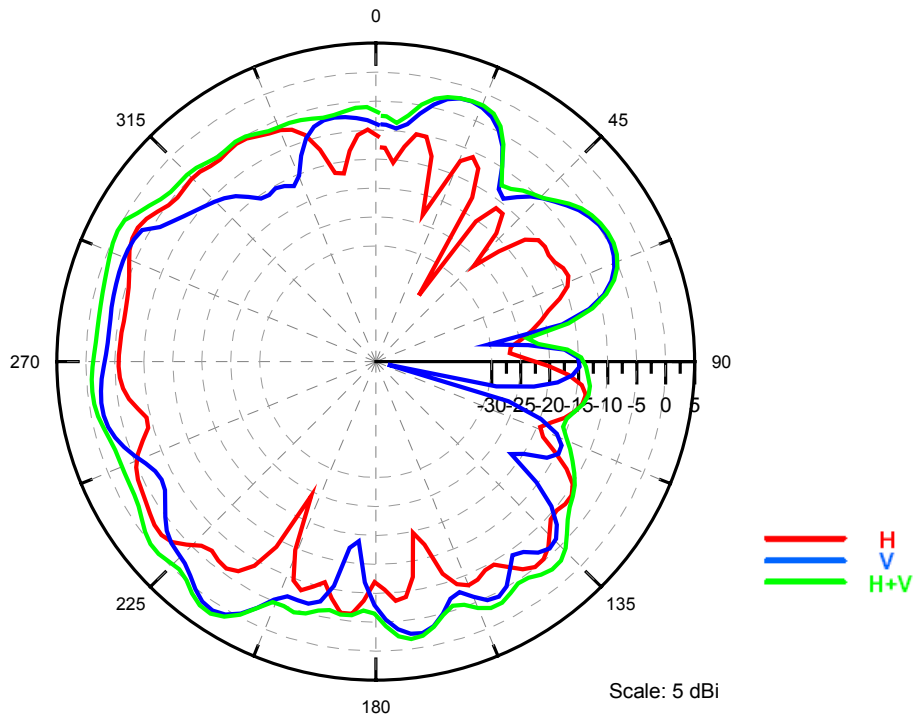
Auxiliary antenna: 2412 MHz



Center Frequency	<b>2412 MHz</b>
Horizontal (dBi) peak	<b>-1.896</b>
Vertical (dBi) peak	<b>1.535</b>
Horz+Vert (dBi) peak	<b>2.500</b>

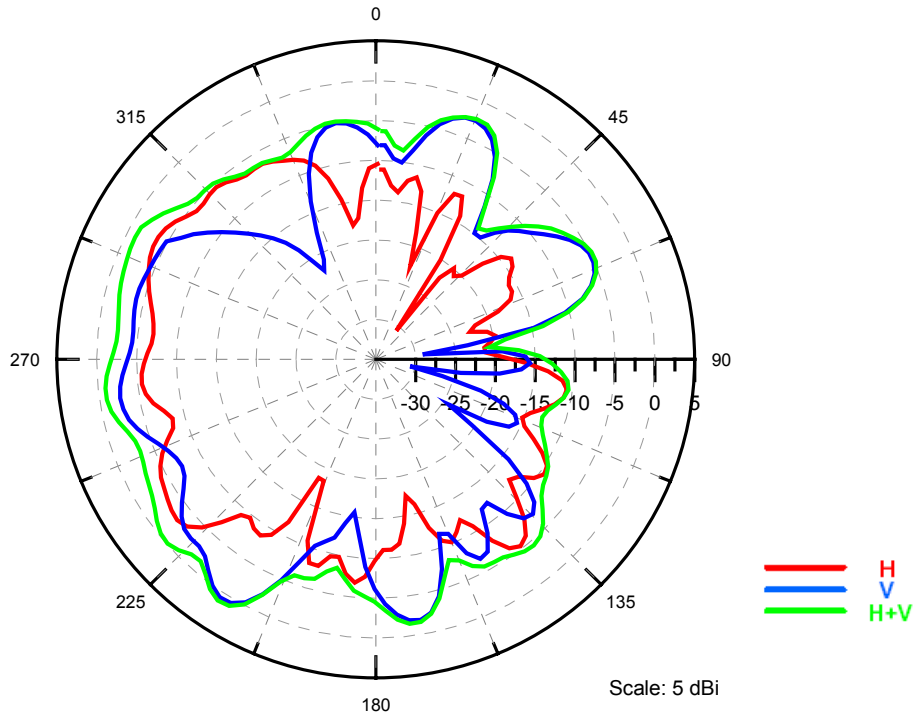


Auxiliary antenna: 2437 MHz



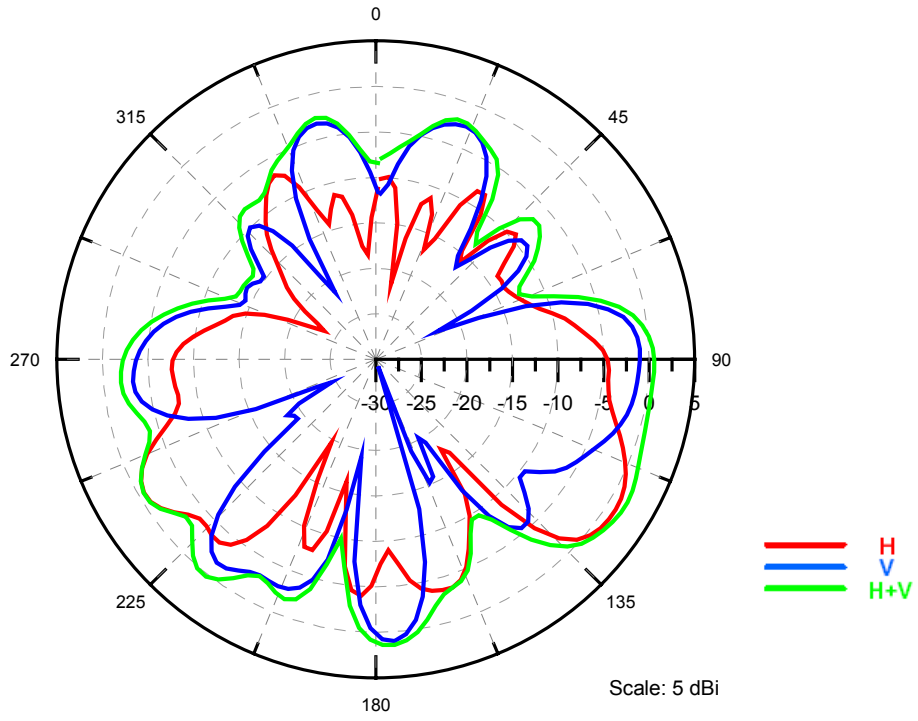
Center Frequency	<b>2437 MHz</b>
Horizontal (dBi) peak	<b>-2.44</b>
Vertical (dBi) peak	<b>1.376</b>
Horz+Vert (dBi) peak	<b>2.000</b>

### Auxiliary antenna: 2462 MHz



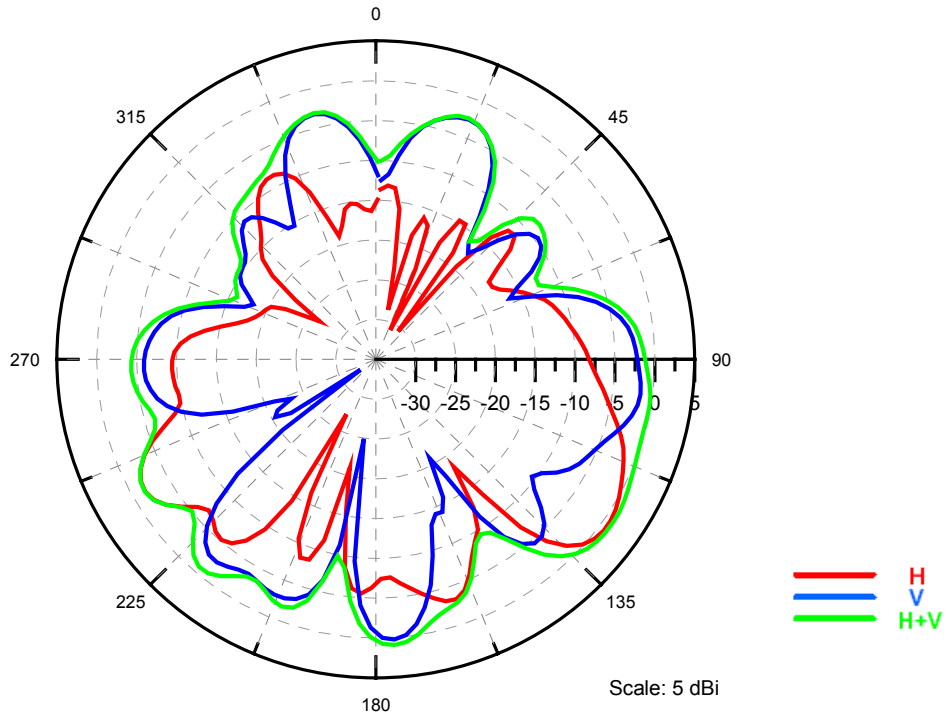
Center Frequency	<b>2462 MHz</b>
Horizontal (dBi) peak	<b>-2.950</b>
Vertical (dBi) peak	<b>-0.704</b>
Horz+Vert (dBi) peak	<b>1.190</b>

**MIMO antenna: 2412 MHz**



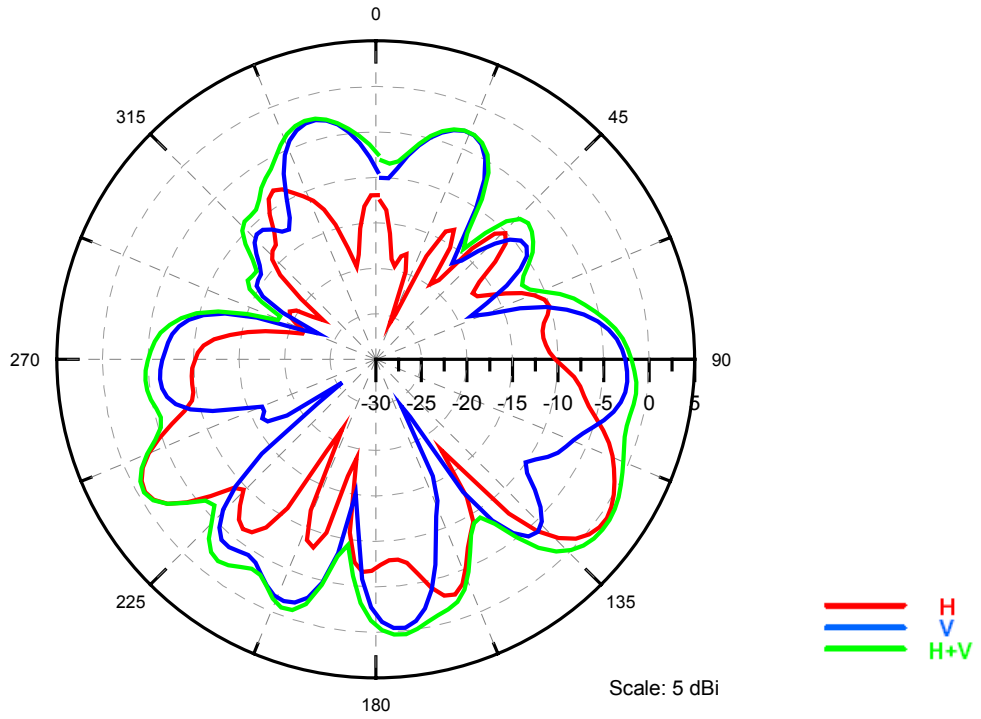
Center Frequency	<b>2412 MHz</b>
Horizontal (dBi) peak	<b>1.083</b>
Vertical (dBi) peak	<b>1.015</b>
Horz+Vert (dBi) peak	<b>1.782</b>

**MIMO antenna: 2437 MHz**



Center Frequency	<b>2437 MHz</b>
Horizontal (dBi) peak	<b>0.768</b>
Vertical (dBi) peak	<b>0.256</b>
Horz+Vert (dBi) peak	<b>1.119</b>

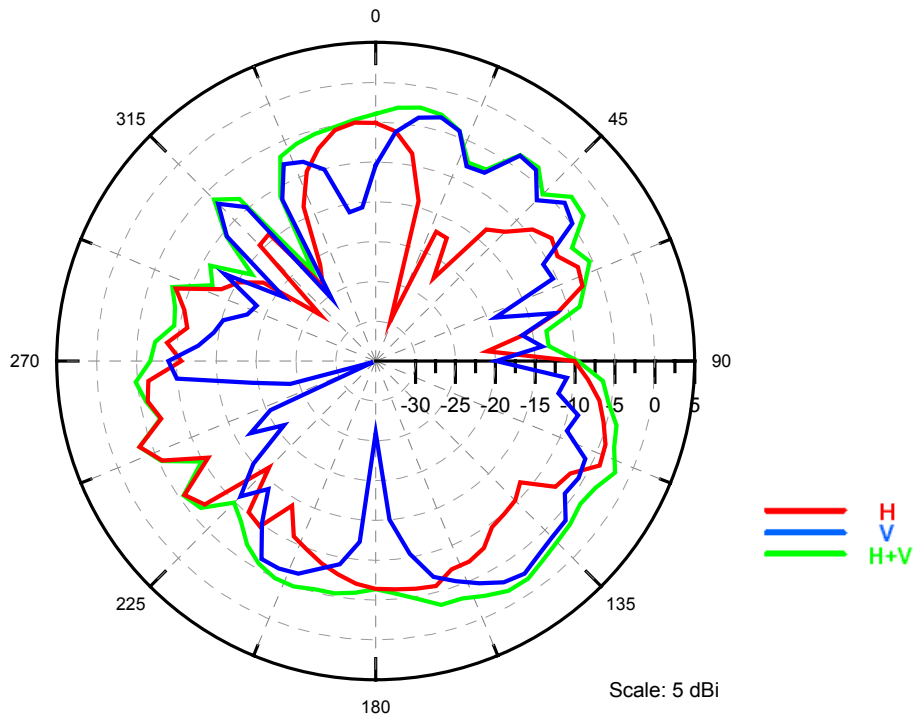
**MIMO antenna: 2462 MHz**



Center Frequency	<b>2462 MHz</b>
Horizontal (dBi) peak	<b>0.771</b>
Vertical (dBi) peak	<b>-0.331</b>
Horz+Vert (dBi) peak	<b>1.121</b>

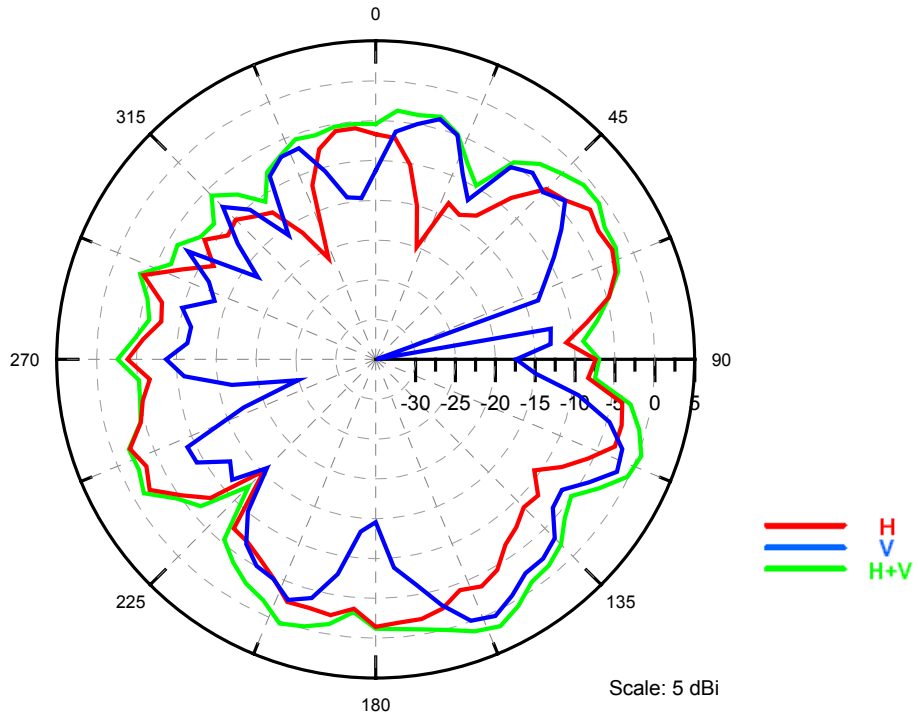
## 4900-5350 MHz radiation characteristic

### Main antenna: 4900 MHz



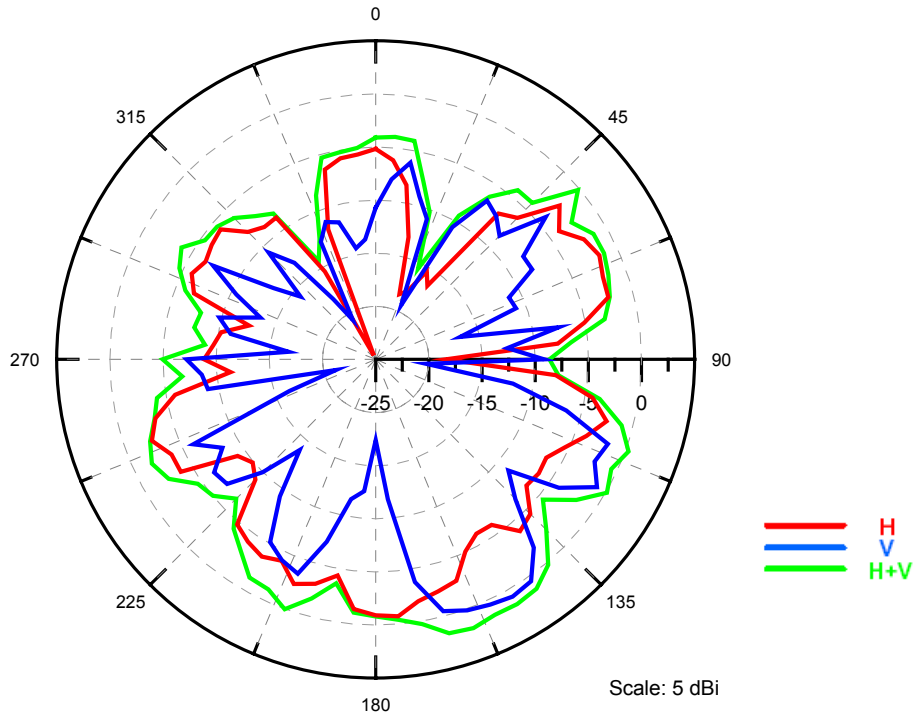
Center Frequency	<b>4900 MHz</b>
Horizontal (dBi) peak	<b>-3.48</b>
Vertical (dBi) peak	<b>-2.45</b>
Horz+Vert (dBi) peak	<b>-1.68</b>

Main antenna: 5150 MHz



Center Frequency	<b>5150 MHz</b>
Horizontal (dBi) peak	<b>-1.43</b>
Vertical (dBi) peak	<b>0.51</b>
Horz+Vert (dBi) peak	<b>1.94</b>

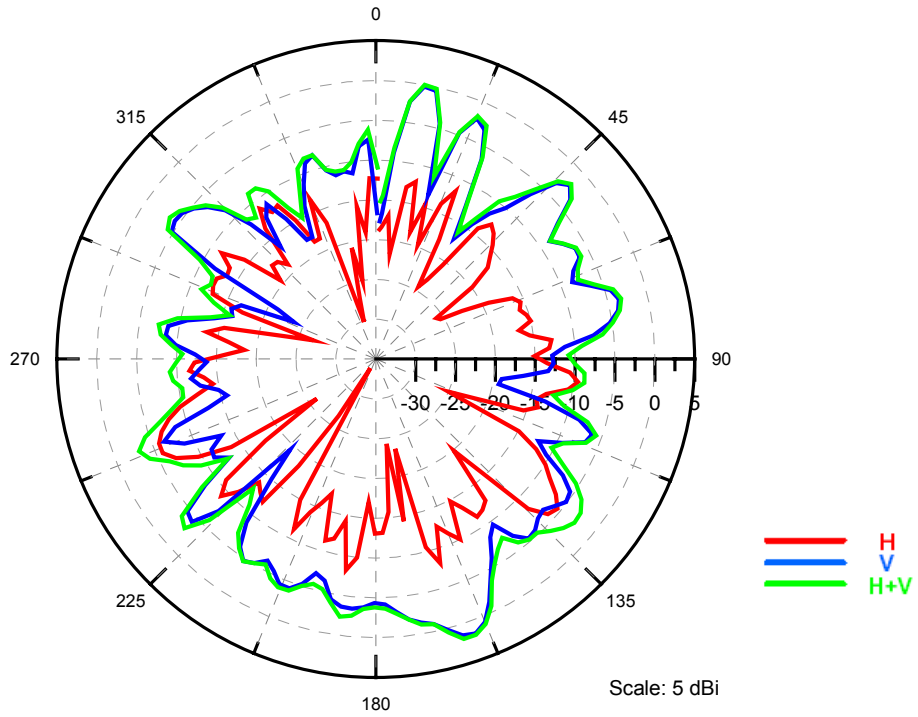
### Main antenna: 5350 MHz



Center Frequency	<b>5350 MHz</b>
Horizontal (dBi) peak	<b>-0.73</b>
Vertical (dBi) peak	<b>0.78</b>
Horz+Vert (dBi) peak	<b>1.92</b>

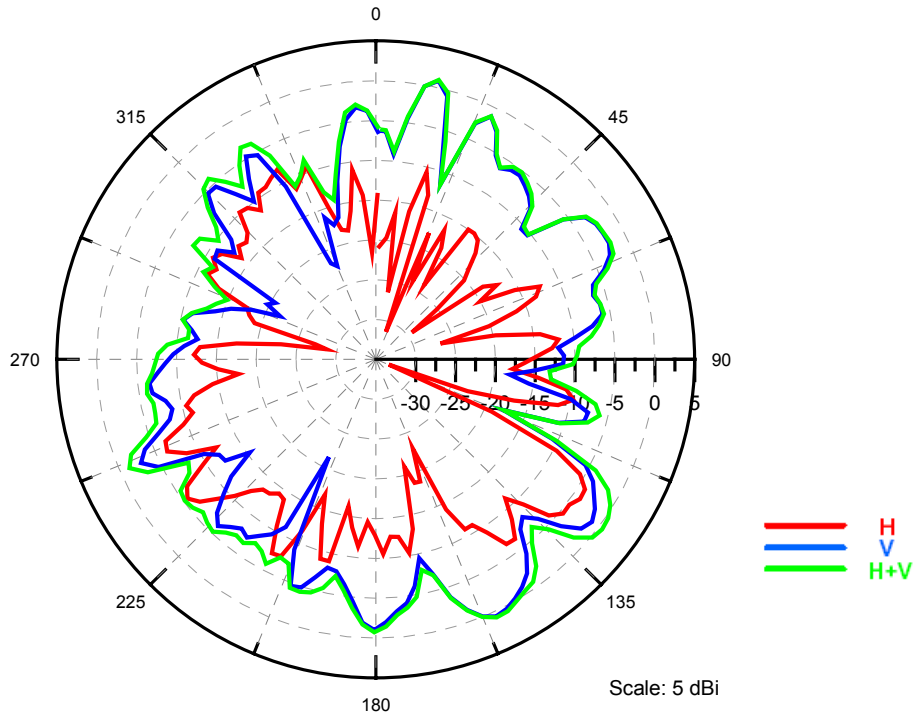


### Auxiliary antenna: 4900 MHz



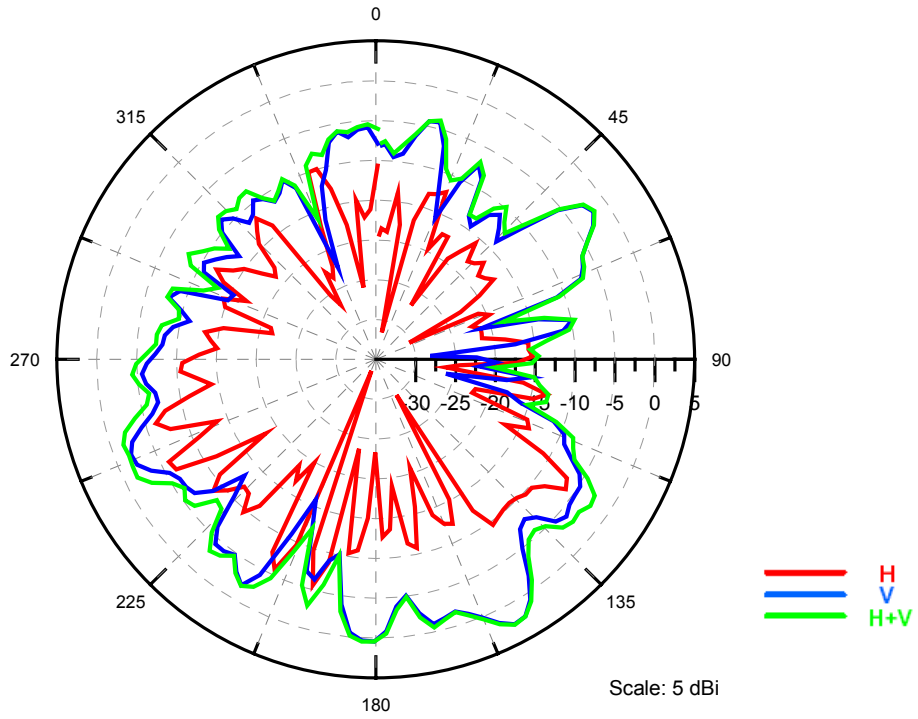
Center Frequency	<b>4900 MHz</b>
Horizontal (dBi) peak	<b>-5.474</b>
Vertical (dBi) peak	<b>1.669</b>
Horz+Vert (dBi) peak	<b>1.852</b>

Auxiliary antenna: 5150 MHz



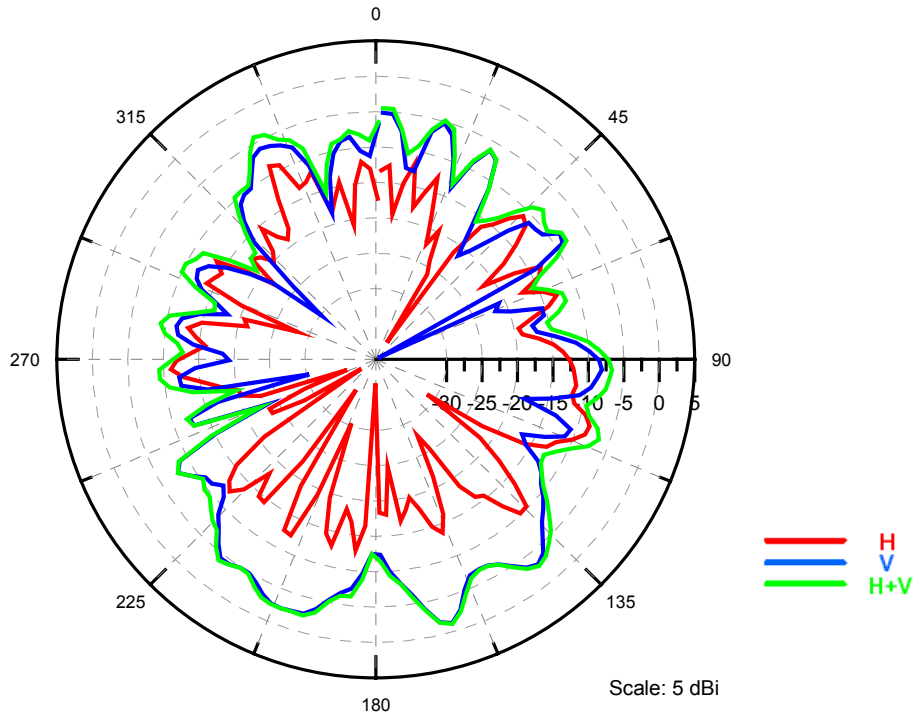
Center Frequency	<b>5150 MHz</b>
Horizontal (dBi) peak	<b>-3.962</b>
Vertical (dBi) peak	<b>0.876</b>
Horz+Vert (dBi) peak	<b>0.965</b>

### Auxiliary antenna: 5350 MHz



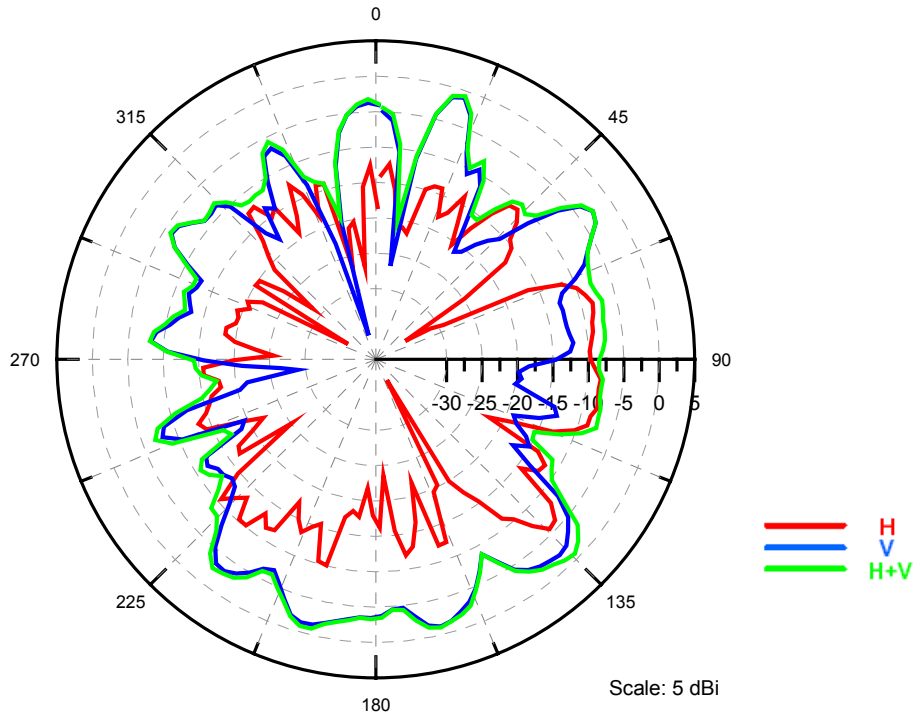
Center Frequency	<b>5350 MHz</b>
Horizontal (dBi) peak	<b>-5.563</b>
Vertical (dBi) peak	<b>2.532</b>
Horz+Vert (dBi) peak	<b>2.606</b>

**MIMO antenna: 4900 MHz**



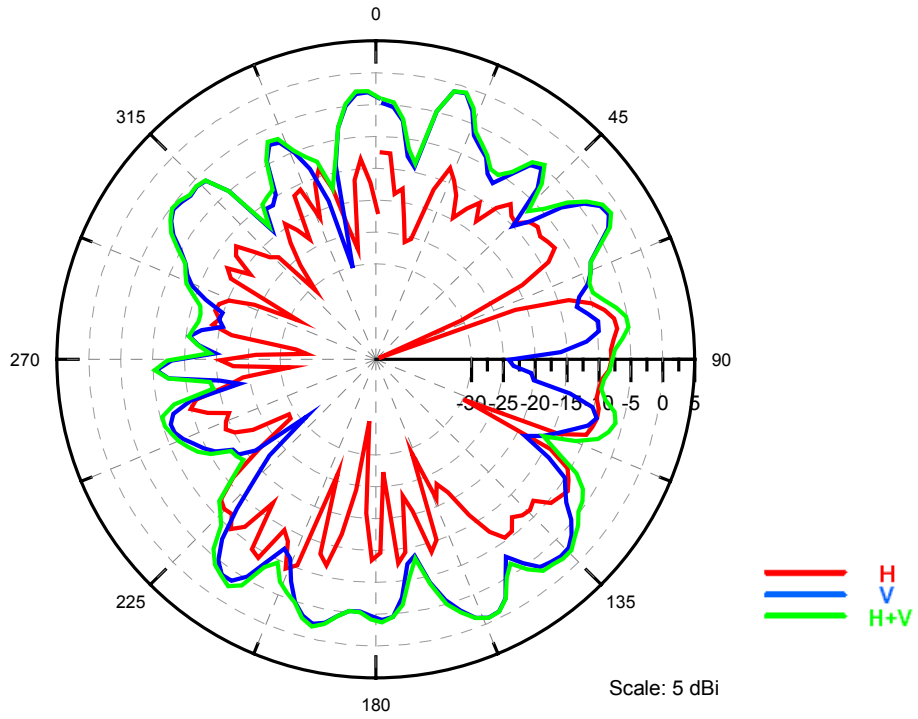
Center Frequency	<b>4900 MHz</b>
Horizontal (dBi) peak	<b>-8.400</b>
Vertical (dBi) peak	<b>-1.195</b>
Horz+Vert (dBi) peak	<b>-1.105</b>

**MIMO antenna: 5150 MHz**



Center Frequency	<b>5150 MHz</b>
Horizontal (dBi) peak	<b>-5.684</b>
Vertical (dBi) peak	<b>-0.947</b>
Horz+Vert (dBi) peak	<b>-0.706</b>

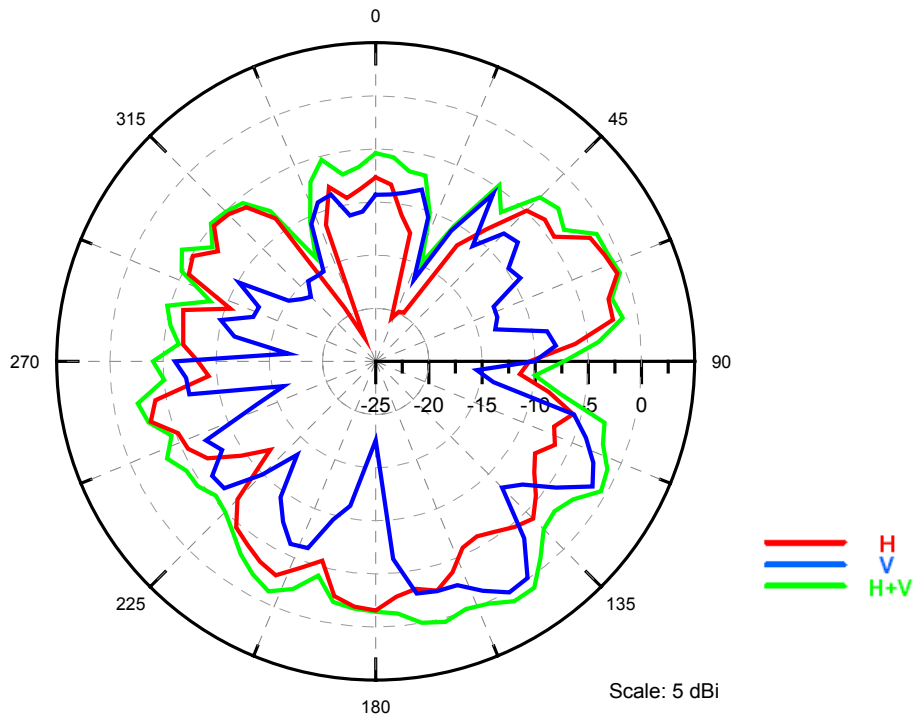
**MIMO antenna: 5350 MHz**



Center Frequency	<b>5350 MHz</b>
Horizontal (dBi) peak	<b>-6.866</b>
Vertical (dBi) peak	<b>-0.770</b>
Horz+Vert (dBi) peak	<b>-0.730</b>

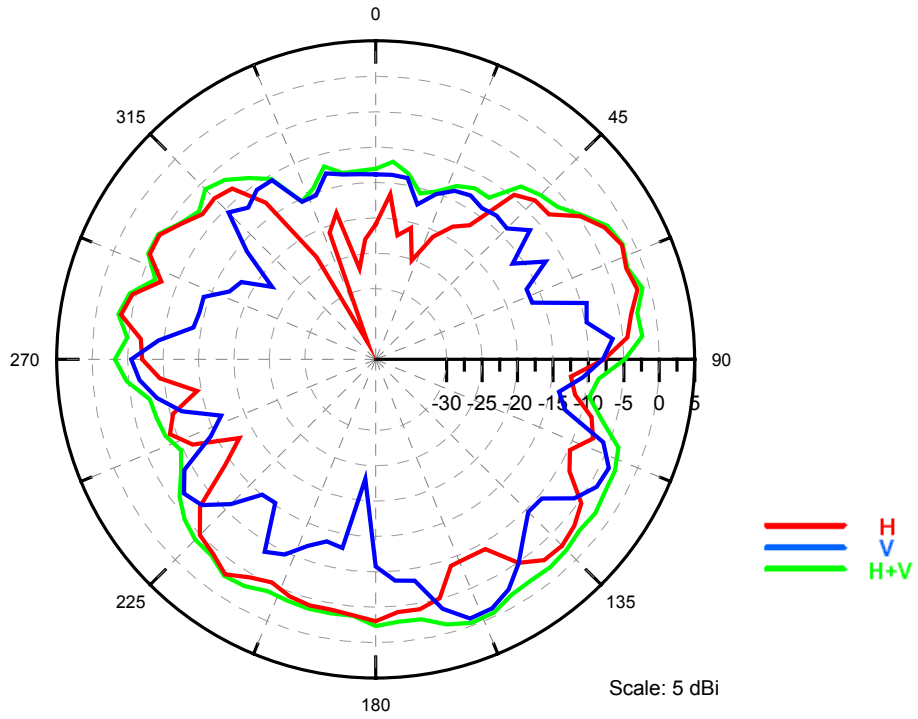
## 5470-5875MHz radiation characteristic

### Main antenna: 5470 MHz



Center Frequency	<b>5470 MHz</b>
Horizontal (dBi) peak	<b>-0.83</b>
Vertical (dBi) peak	<b>0.12</b>
Horz+Vert (dBi) peak	<b>1.07</b>

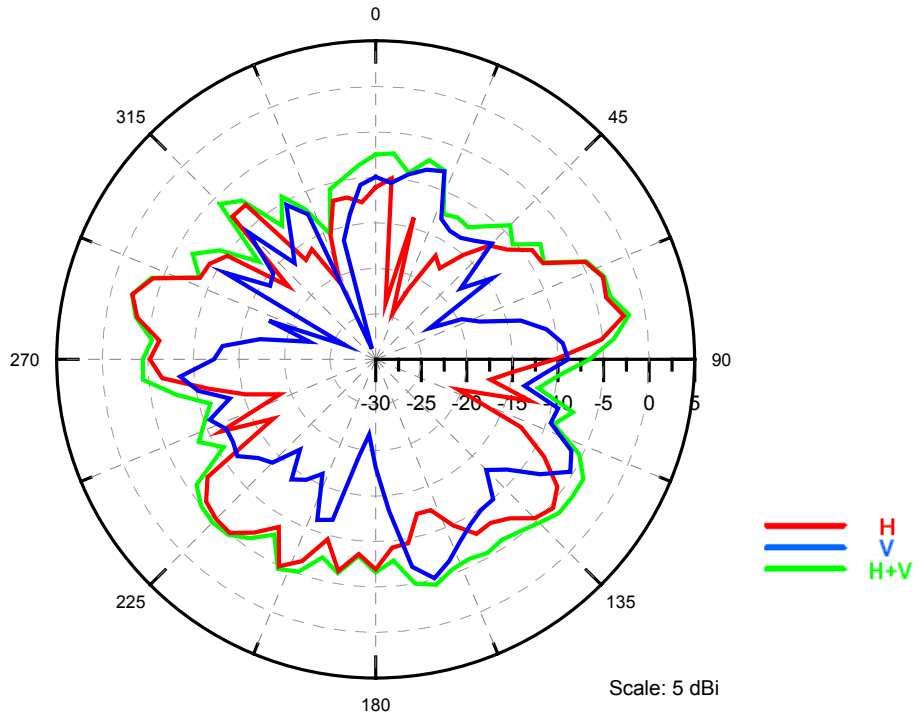
### Main antenna: 5725 MHz



Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) peak	<b>-1.68</b>
Vertical (dBi) peak	<b>-1.06</b>
Horz+Vert (dBi) peak	<b>-0.42</b>

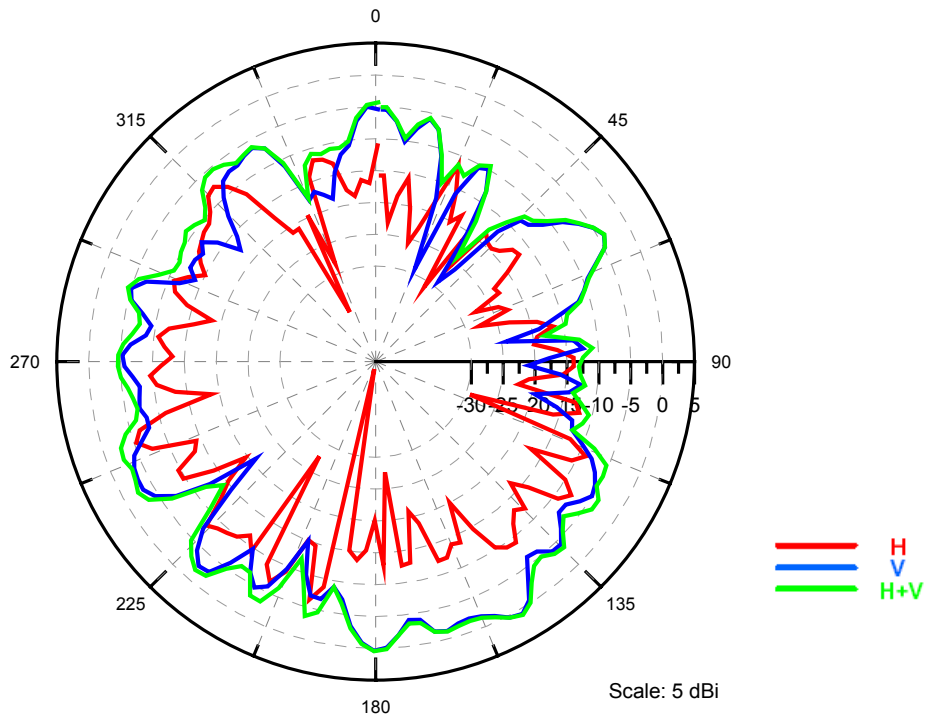


### Main antenna: 5875 MHz



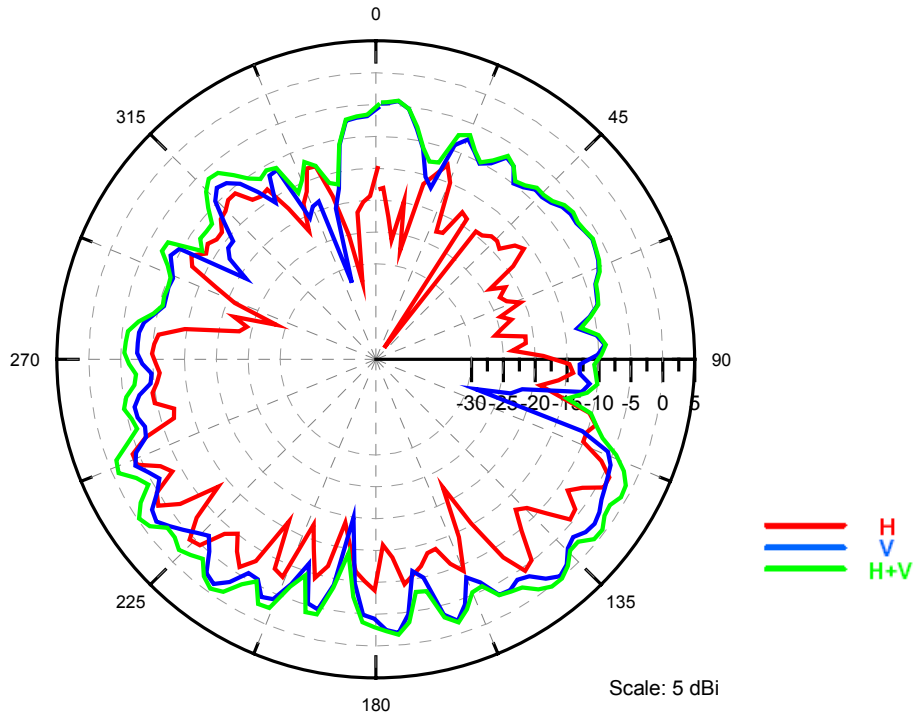
Center Frequency	<b>5875 MHz</b>
Horizontal (dBi) peak	<b>-2.35</b>
Vertical (dBi) peak	<b>-5.13</b>
Horz+Vert (dBi) peak	<b>-1.79</b>

Auxiliary antenna: 5470 MHz



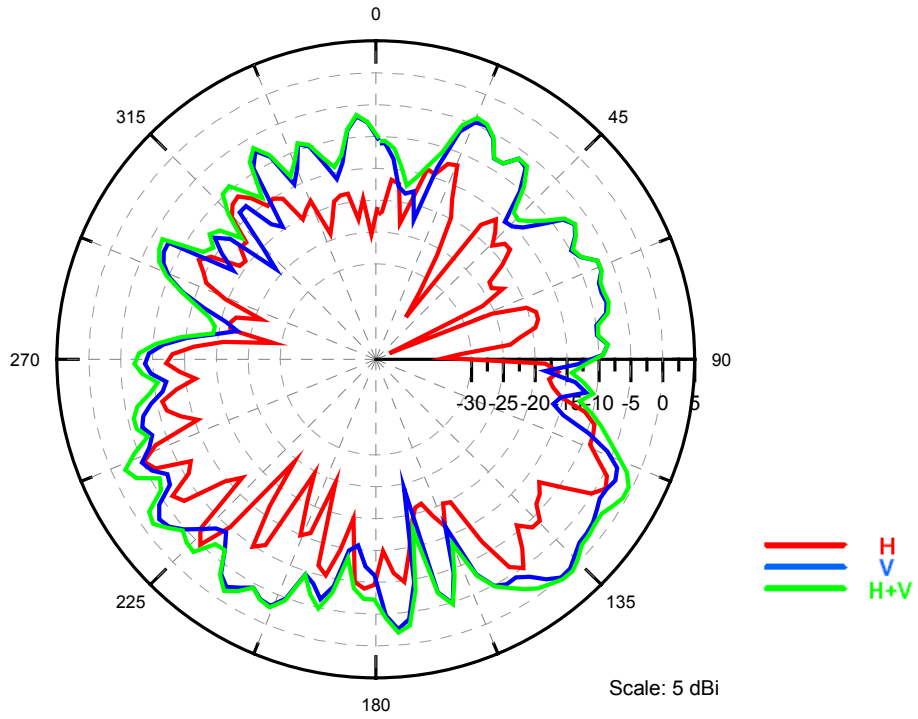
Center Frequency	<b>5470 MHz</b>
Horizontal (dBi) peak	<b>-5.376</b>
Vertical (dBi) peak	<b>0.833</b>
Horz+Vert (dBi) peak	<b>0.956</b>

**Auxiliary antenna: 5725 MHz**



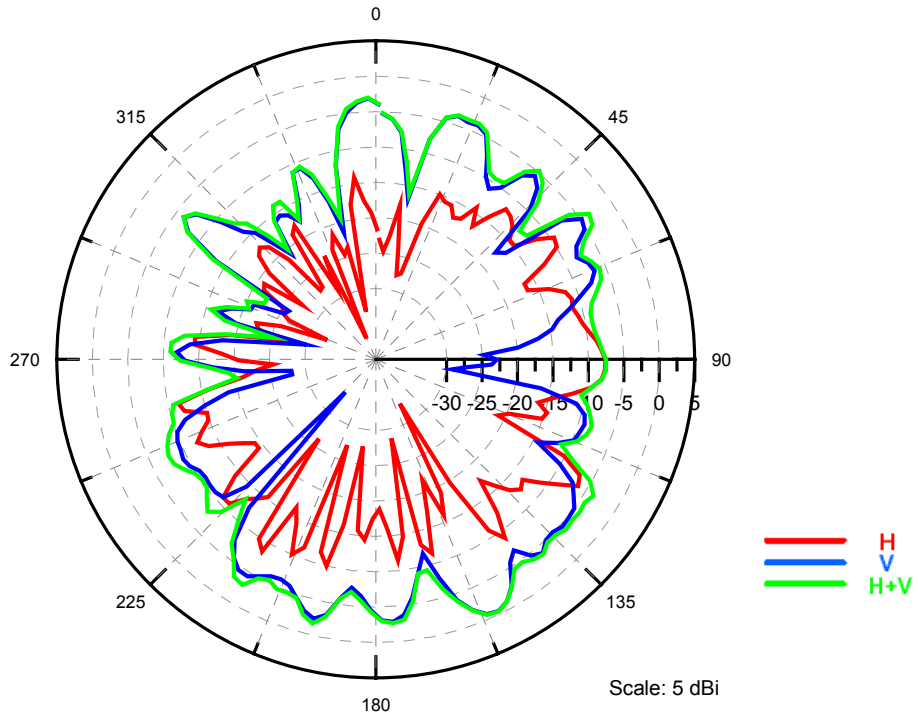
Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) peak	<b>-3.872</b>
Vertical (dBi) peak	<b>-0.366</b>
Horz+Vert (dBi) peak	<b>0.117</b>

Auxiliary antenna: 5875 MHz



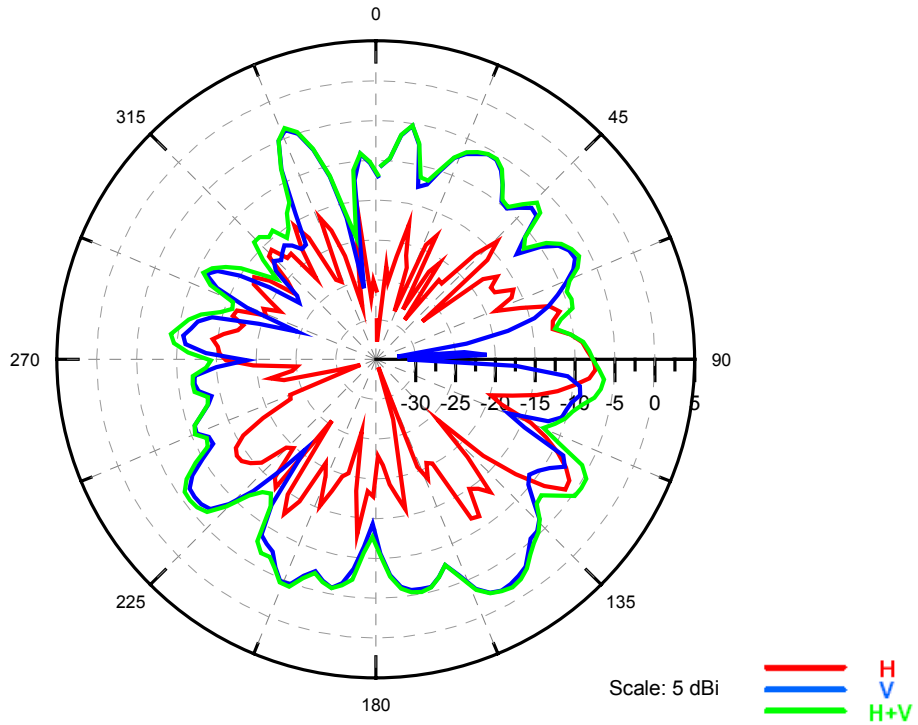
Center Frequency	<b>5875 MHz</b>
Horizontal (dBi) peak	<b>-3.675</b>
Vertical (dBi) peak	<b>-0.095</b>
Horz+Vert (dBi) peak	<b>0.336</b>

### MIMO antenna: 5470 MHz



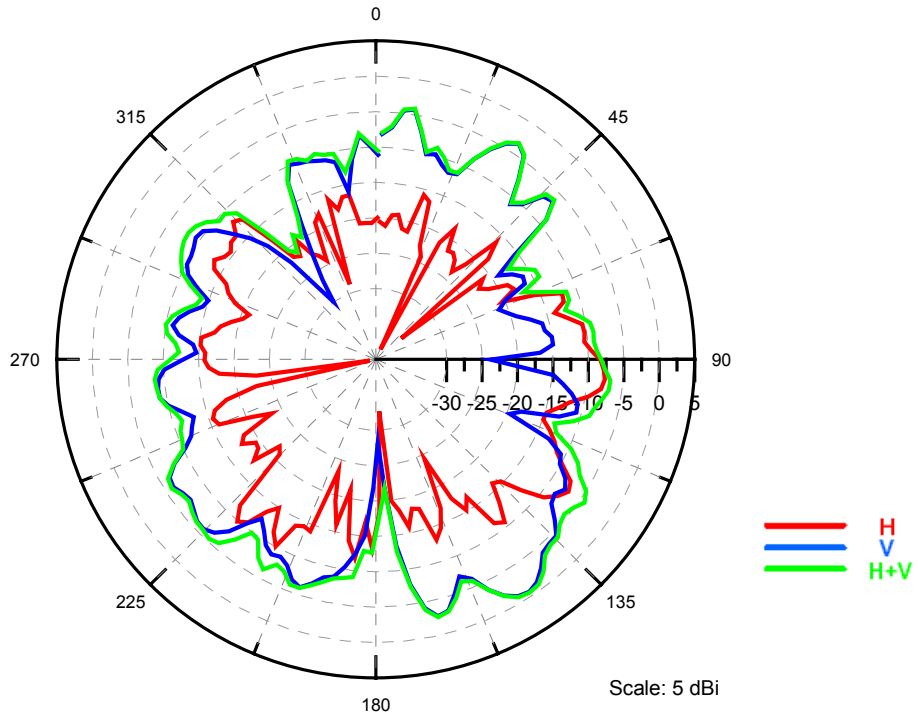
Center Frequency	<b>5470 MHz</b>
Horizontal (dBi) peak	<b>-6.318</b>
Vertical (dBi) peak	<b>-0.453</b>
Horz+Vert (dBi) peak	<b>-0.393</b>

**MIMO antenna: 5725 MHz**



Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) peak	<b>-6.144</b>
Vertical (dBi) peak	<b>-1.963</b>
Horz+Vert (dBi) peak	<b>-1.656</b>

**MIMO antenna: 5875 MHz**



Center Frequency	<b>5875 MHz</b>
Horizontal (dBi) peak	<b>-7.002</b>
Vertical (dBi) peak	<b>-0.665</b>
Horz+Vert (dBi) peak	<b>-0.558</b>