

## Regulatory WLAN Antenna Information

### Yageo WLAN Antennae exclusively for DELL AMG (Tablet Mode) Platform

<b>Platform</b>	
Platform Owner	DELL Corporation
Brand Name	DELL
Model Name	AMG (Tablet Mode)
ODM	Wistron Corporation
Target Launch Date	2008/ 09/ 19
<b>Antenna</b>	
Brand Name	Yageo
Part Number	<input checked="" type="checkbox"/> WLAN_Main Antenna: CAN4313792012501B
	<input checked="" type="checkbox"/> WLAN_Aux Antenna: CAN4313792022501B
	<input checked="" type="checkbox"/> MIMO Antenna : CAN4313792022501B
<b>Module</b>	
With WLAN Module	<input checked="" type="checkbox"/> Intel 5100
(Check Box)	<input checked="" type="checkbox"/> Intel 5300
	<input type="checkbox"/> WM3B2200BG
	<input type="checkbox"/> WM3B2915ABG
	<input type="checkbox"/> WM3945ABG
	<input type="checkbox"/> 4965AGN
	<input type="checkbox"/> 4965AG_
	<input type="checkbox"/> 533ANX Family
	<input type="checkbox"/> 512ANX Family
	<input type="checkbox"/> 533AN Family
	<input type="checkbox"/> 512AN Family

## 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	WLAN_Main Antenna, WLAN_Aux Antenna & MIMO Antenna antenna (Peak Gain W/ cable loss) *	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	WLAN_Main Antenna, WLAN_Aux Antenna & MIMO Antenna antenna (Peak Gain only) *	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	WLAN_Main Antenna, WLAN_Aux Antenna & MIMO Antenna antenna (Cable loss W/ connector) *	Required	Required	Required	Required	Required
2	Dimensioned Photographs <u>and</u> Drawings of WLAN_Main Antenna, WLAN_Aux Antenna, and MIMO Antenna (or Rx3) 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. (S. Korea requires <u>photographs of antennas for approval submission</u> ). <u>Taiwan requires pictures of each antenna type shown in the system.</u>	Required	Required	Desired	<u>Required (Photos)</u>	<u>Required (Photos)</u>
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, 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

**NOTE:**

(\*) if 3<sup>rd</sup> antenna is Rx only (e.g. receive only for 4965AGN) then peak gain and cable loss not required

# Antenna Information

## Section 1. Antenna Assembly Specifications

### Antenna Assembly Summary:

1A Antenna Part Number	1B Manufacturer	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)
CAN4313792012501B  WLAN_Main antenna	YAGEO	PIFA	50 ohm Coaxial length: 44.9 cm diameter: 1.13 mm Connector: Hirose U.FL-LP IPEX MHF or equivalent	2400-2500MHz 0.39 dBi (peak)	2400-2500MHz 1.51 dBi (peak)	2400-2500MHz 3.00 max	2400-2500MHz 1.12 dBi (peak)
				2496-2690MHz -0.27 dBi (peak)	2496-2690MHz 0.88 dBi (peak)	2496-2690MHz 3.00 max	2496-2690MHz 1.15 dBi (peak)
				5150-5350MHz 1.01 dBi (peak)	5150-5350MHz 2.77 dBi (peak)	5150-5350MHz 3.00 max	5150-5350MHz 1.76 dBi (peak)
				5470-5725MHz -0.66 dBi (peak)	5470-5725MHz 1.18 dBi (peak)	5470-5725MHz 3.00 max	5470-5725MHz 1.84 dBi (peak)
				5725-5850MHz 0.62 dBi (peak)	5725-5850MHz 2.50 dBi (peak)	5725-5850MHz 3.00 max	5725-5850MHz 1.88 dBi (peak)
CAN4313792022501B  WLAN_Aux antenna	YAGEO Corporation	PIFA	50 ohm Coaxial length: 45.5 cm diameter: 1.13 mm Connector: Hirose U.FL-LP IPEX MHF or equivalent	2400-2500MHz -0.17 dBi (peak)	2400-2500MHz 0.97 dBi (peak)	2400-2500MHz 3.00 max	2400-2500MHz 1.14 dBi (peak)
				2496-2690MHz -0.96 dBi (peak)	2496-2690MHz 0.21 dBi (peak)	2496-2690MHz 3.00 max	2496-2690MHz 1.17 dBi (peak)
				5150-5350MHz 1.52 dBi (peak)	5150-5350MHz 3.30 dBi (peak)	5150-5350MHz 3.00 max	5150-5350MHz 1.78 dBi (peak)
				5470-5725MHz -0.69 dBi (peak)	5470-5725MHz 1.18 dBi (peak)	5470-5725MHz 3.00 max	5470-5725MHz 1.87 dBi (peak)
				5725-5850MHz -0.50 dBi (peak)	5725-5850MHz 1.41 dBi (peak)	5725-5850MHz 3.00 max	5725-5850MHz 1.91 dBi (peak)
CAN4313792022501B  MIMO antenna	YAGEO Corporation	PIFA	50 ohm Coaxial length: 47.7 cm diameter: 1.13 mm Connector: Hirose U.FL-LP IPEX MHF or equivalent	2400-2500MHz -1.11 dBi (Peak)	2400-2500MHz 0.08 dBi (peak)	2400-2500MHz 3.00 max	2400-2500MHz 1.19 dBi (peak)
				2496-2690MHz -0.38 dBi (Peak)	2496-2690MHz 0.85 dBi (peak)	2496-2690MHz 3.00 max	2496-2690MHz 1.23 dBi (peak)
				5150-5350MHz 0.79 dBi (Peak)	5150-5350MHz 2.66 dBi (peak)	5150-5350MHz 3.00 max	5150-5350MHz 1.87 dBi (peak)
				5470-5725MHz -1.16 dBi (Peak)	5470-5725MHz 0.80 dBi (peak)	5470-5725MHz 3.00 max	5470-5725MHz 1.96 dBi (peak)
				5725-5850MHz -1.02 dBi (peak)	5725-5850MHz 0.98 dBi (peak)	5725-5850MHz 3.00 max	5725-5850MHz 2.00 dBi (peak)

#### NOTE:

(\* ) If Rx3 only (3<sup>rd</sup> antenna receives only, e.g. for 4965AGN) then the information marked with \* is not required

**Antenna Peak Gain Table:**

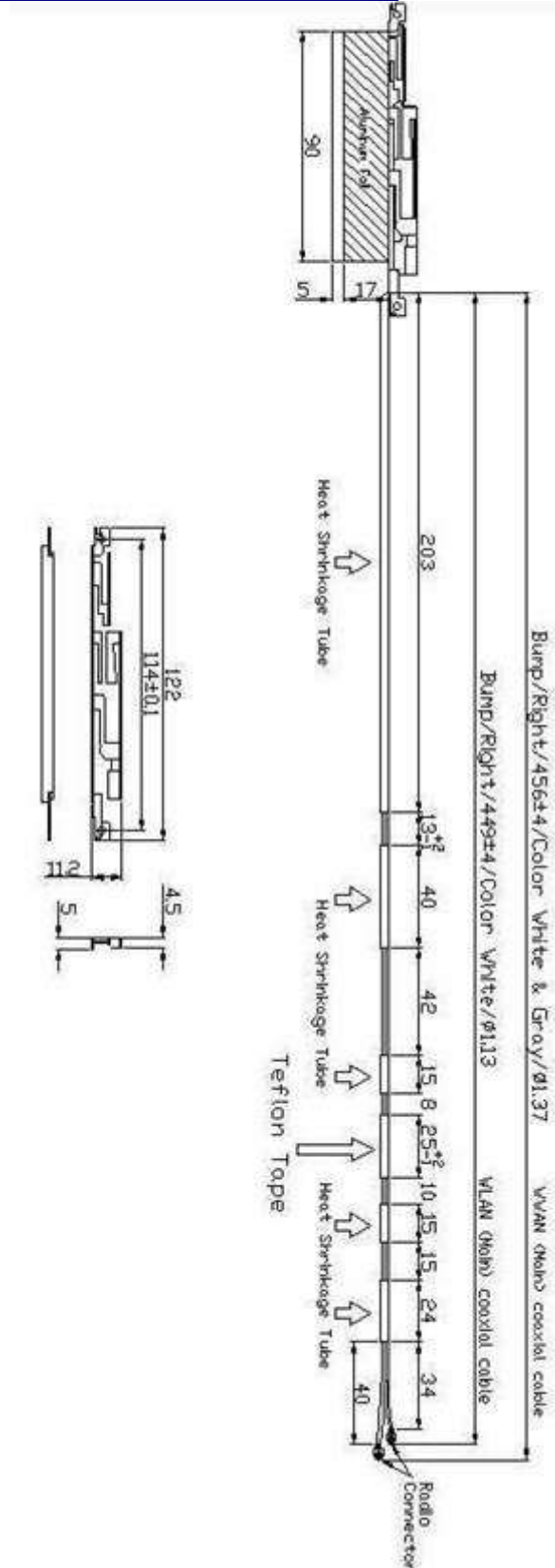
Frequency (MHz)	WLAN_Main Antenna		WLAN_Aux Antenna		MIMO Antenna	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
	(dBi)	(dBi)	(dBi)	(dBi)	(dBi)	(dBi)
2400	0.39	-1.26	-2.91	-0.17	-3.14	-1.11
2450	-3.97	-0.15	-1.21	-4.15	-3.09	-3.57
2500	-2.94	-0.62	-0.88	-1.86	-2.46	-2.79
2501	-3.96	-1.65	-1.93	-2.81	-2.47	-2.85
2593	-5.77	-1.26	-1.96	-3.81	-3.53	-0.38
2685	-4.87	-0.27	-0.96	-1.29	-4.90	-3.12
5150	1.01	0.64	-1.11	1.52	-6.23	0.77
5250	-0.29	0.86	-0.77	1.11	-4.26	0.79
5350	-1.48	0.16	-2.44	-0.44	-4.35	-0.54
5470	-2.17	-0.66	-4.21	-1.03	-4.29	-1.79
5600	-1.86	-1.77	-4.01	-0.69	-4.84	-1.50
5725	-1.59	-3.30	-4.02	-1.12	-5.47	-1.16
5785	0.62	-2.86	-2.53	-0.50	-5.96	-1.02
5850	-1.75	-4.33	-2.93	-1.37	-7.80	-2.62

- Antenna Peak Gain required being test in system basis.
- 1E frame contend absolutely peak antenna gain include H/V
- If Rx3 only (3<sup>rd</sup> antenna receives only, e.g. for 4965AGN) then the information is not required for Rx3.

## Section 2. Dimensioned Photos or Drawings of Antennas

Include a dimensioned photo and dimensioned drawing of WLAN\_Main Antenna antenna here.

### WLAN Main Antenna Antenna Dimensioned Drawing:

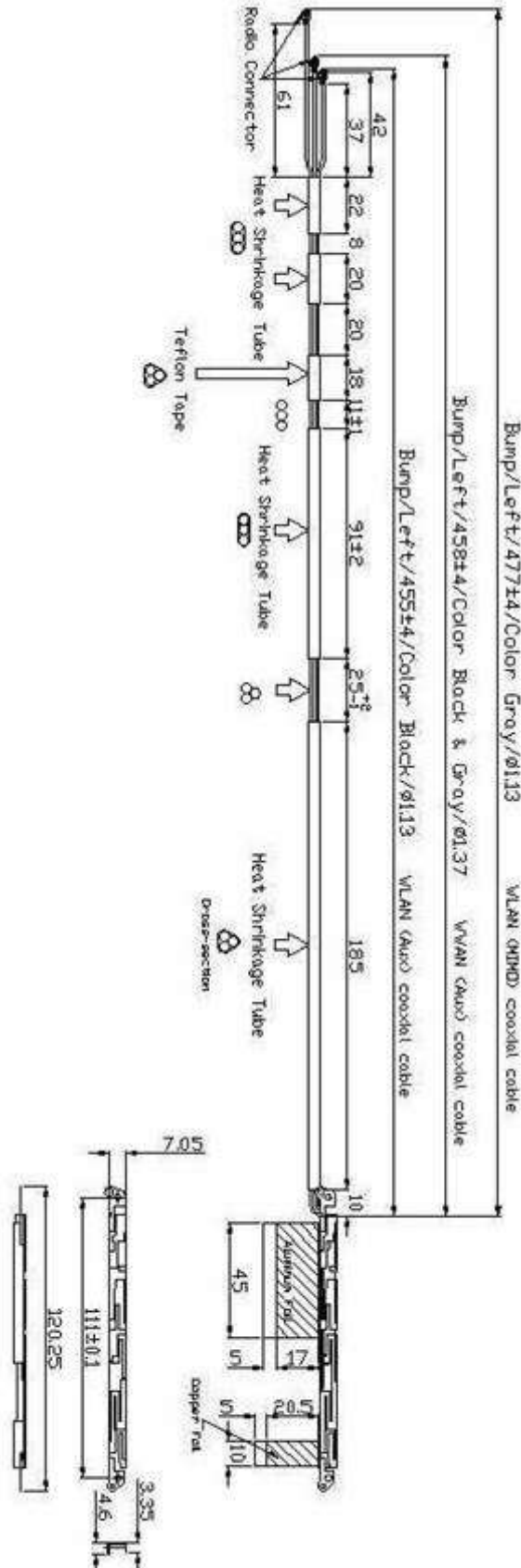


WLAN Main Antenna Photo:



Include a dimensioned photo and dimensioned drawing of WLAN\_Aux Antenna antenna here.

WLAN Aux Antenna Dimensioned Drawing:



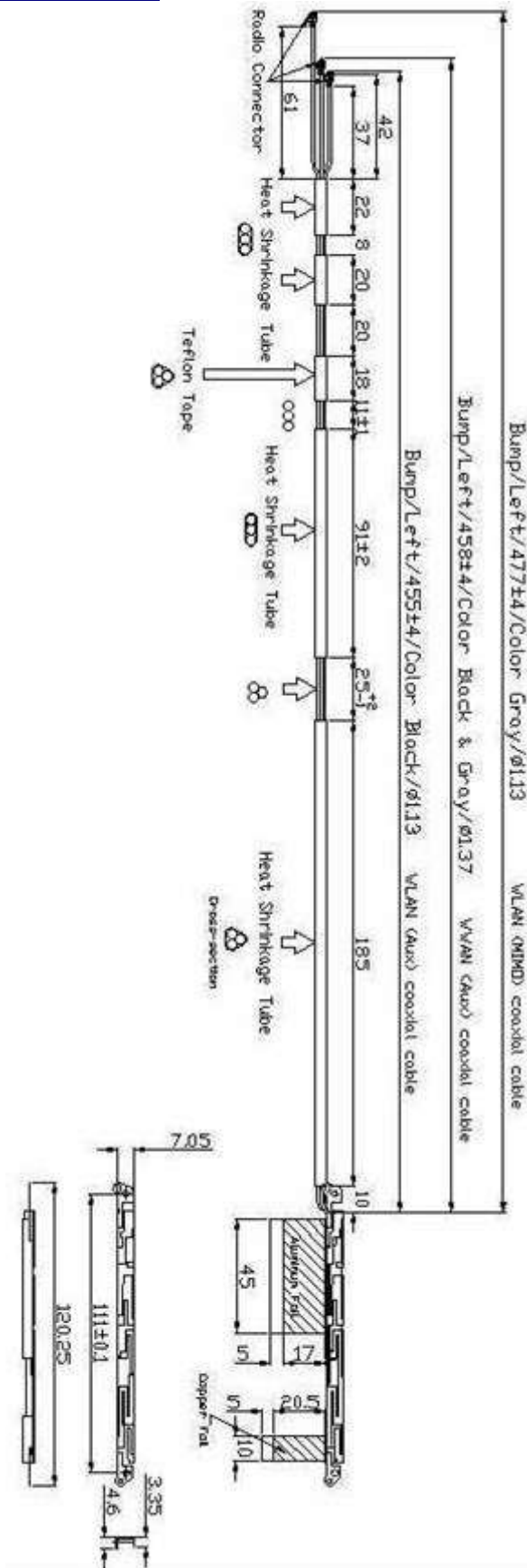
**WLAN Aux Antenna Photo:**



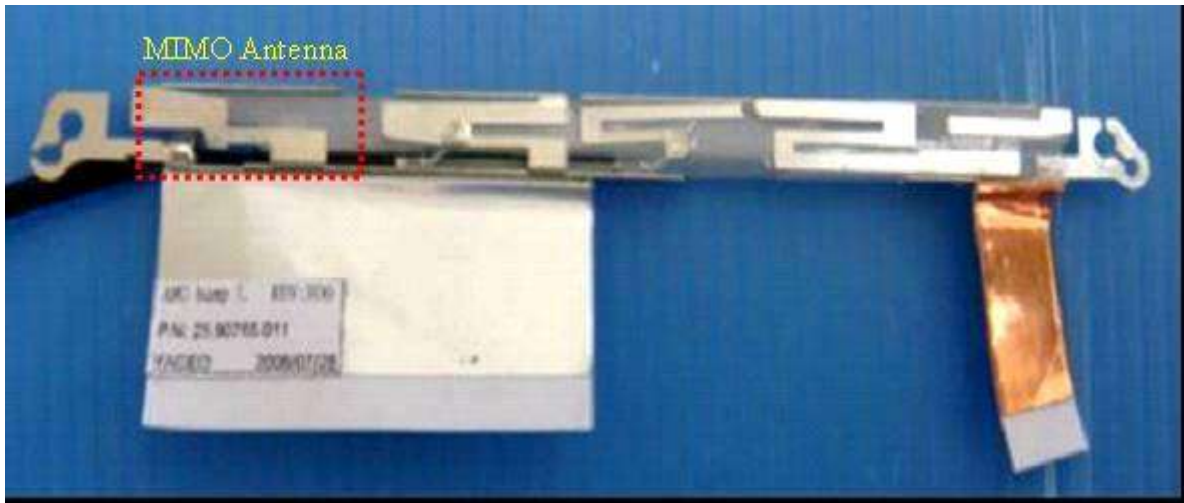


Include a dimensioned photo and dimensioned drawing of MIMO Antenna (or Rx3) antenna here.

**MIMO Antenna Dimensioned Drawing:**



**MIMO Antenna Photo:**



**Include front view photo of all 3 antennas here.**

Antenna Manufacturer: Yageo Corporation  
Antenna Part Number: CAN4313792012501B (WLAN\_Main),  
CAN4313792022501B (WLAN\_Aux),  
CAN4313792022501B (MIMO)



**Include back view photo of all 3 antennas here.**

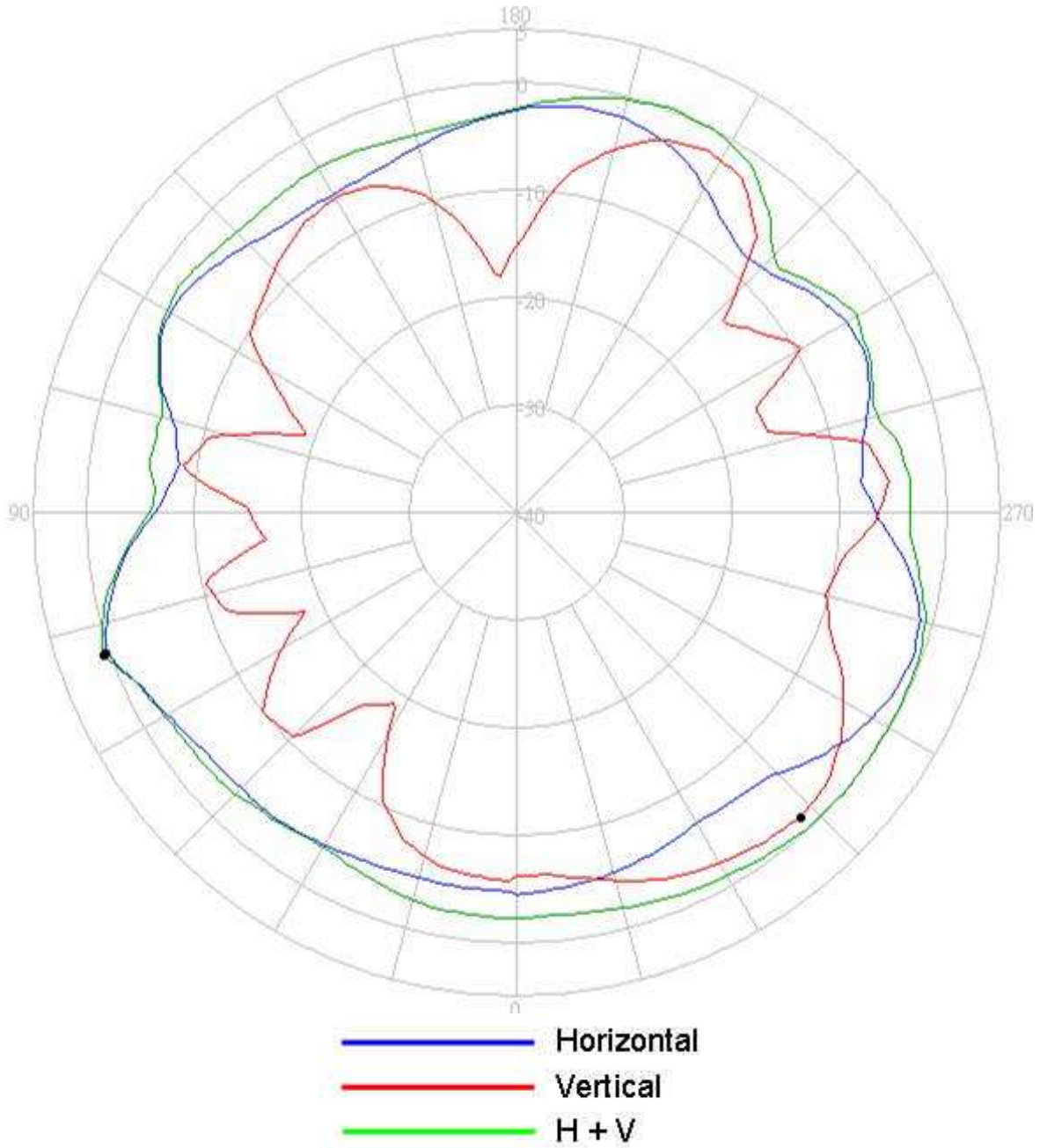
Antenna Manufacturer: Yageo Corporation  
Antenna Part Number: CAN4313792012501B (WLAN\_Main),  
CAN4313792022501B (WLAN\_Aux),  
CAN4313792022501B (MIMO)



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

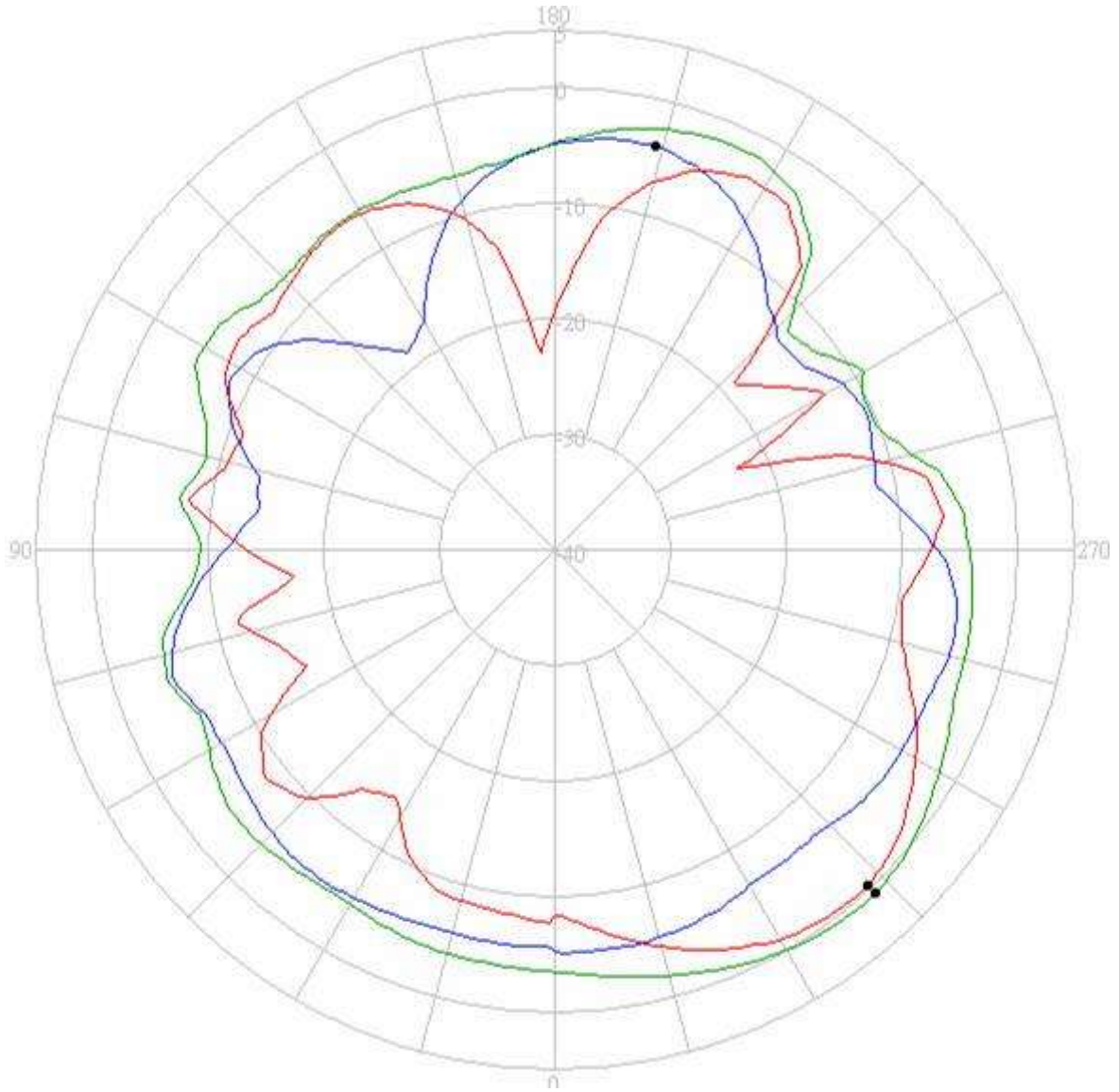
### 2400-2500MHz radiation characteristic

#### WLAN\_Main Antenna antenna: 2400 MHz



Center Frequency	2400 MHz
Horizontal (dBi) Peak	0.39
Vertical (dBi) Peak	-1.26

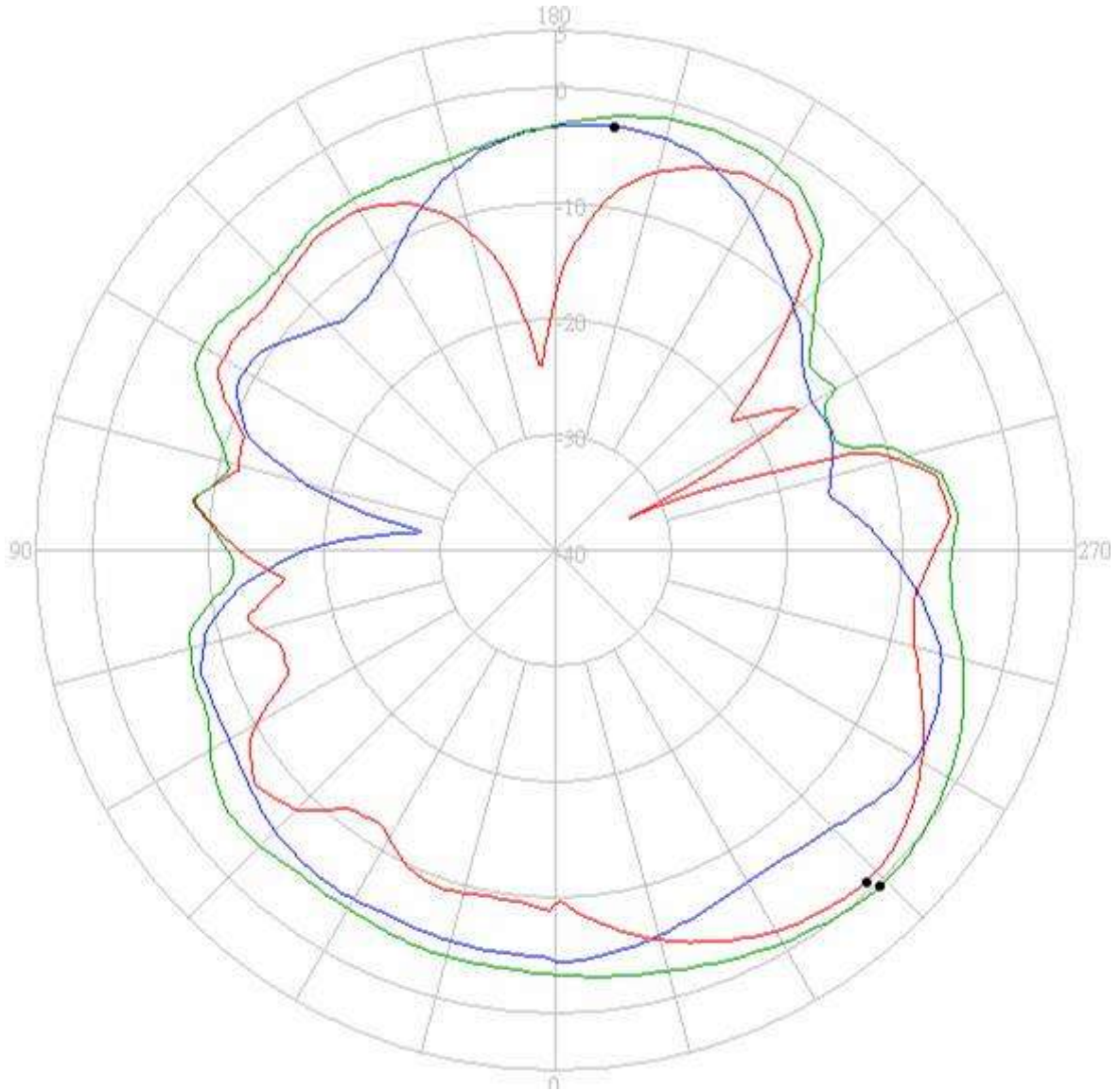
WLAN\_Main Antenna antenna: 2450 MHz



- Horizontal
- Vertical
- H + V

Center Frequency	2450 MHz
Horizontal (dBi) Peak	-3.97
Vertical (dBi) Peak	-0.15

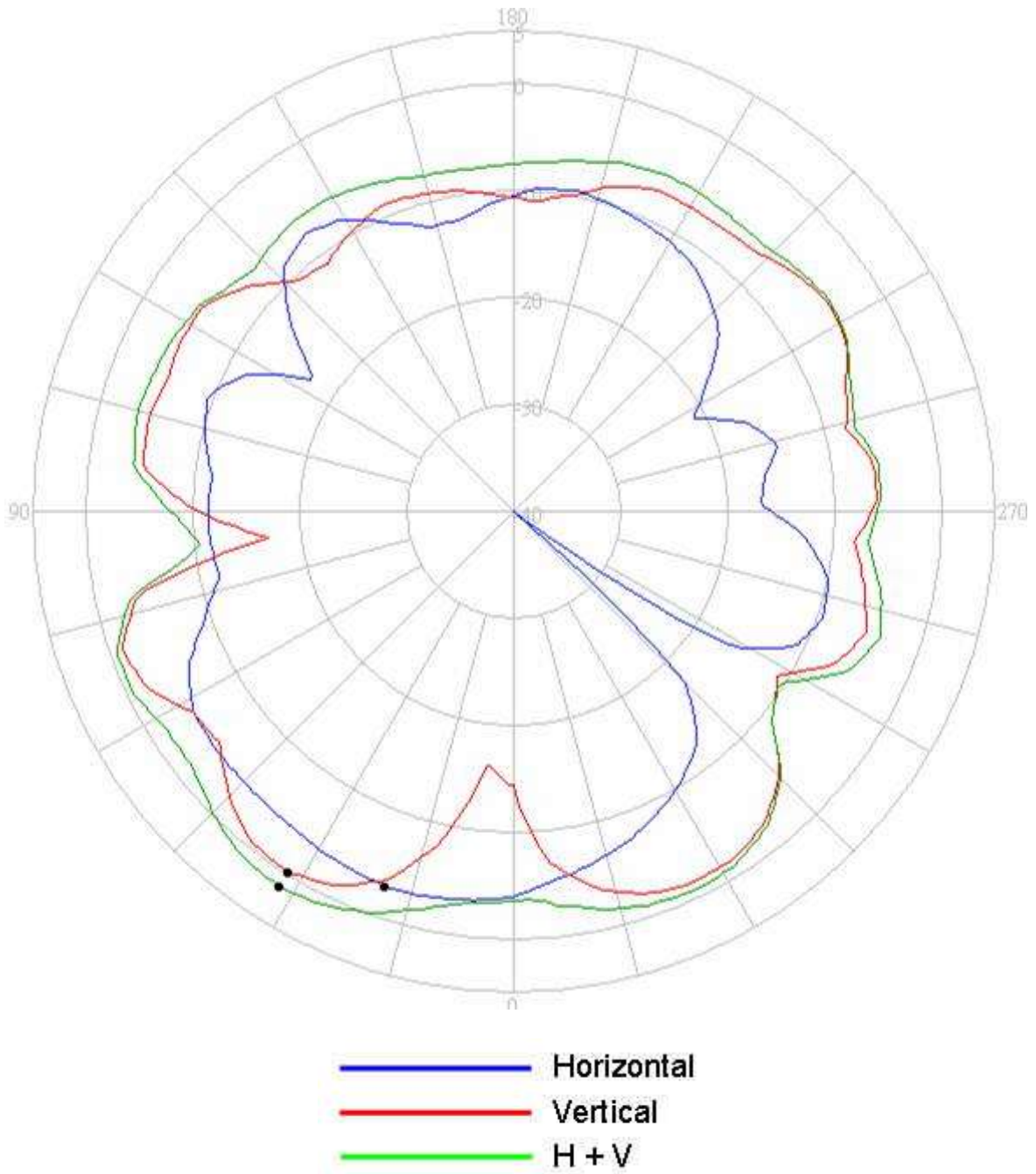
### WLAN\_Main Antenna antenna: 2500 MHz



- Horizontal
- Vertical
- H + V

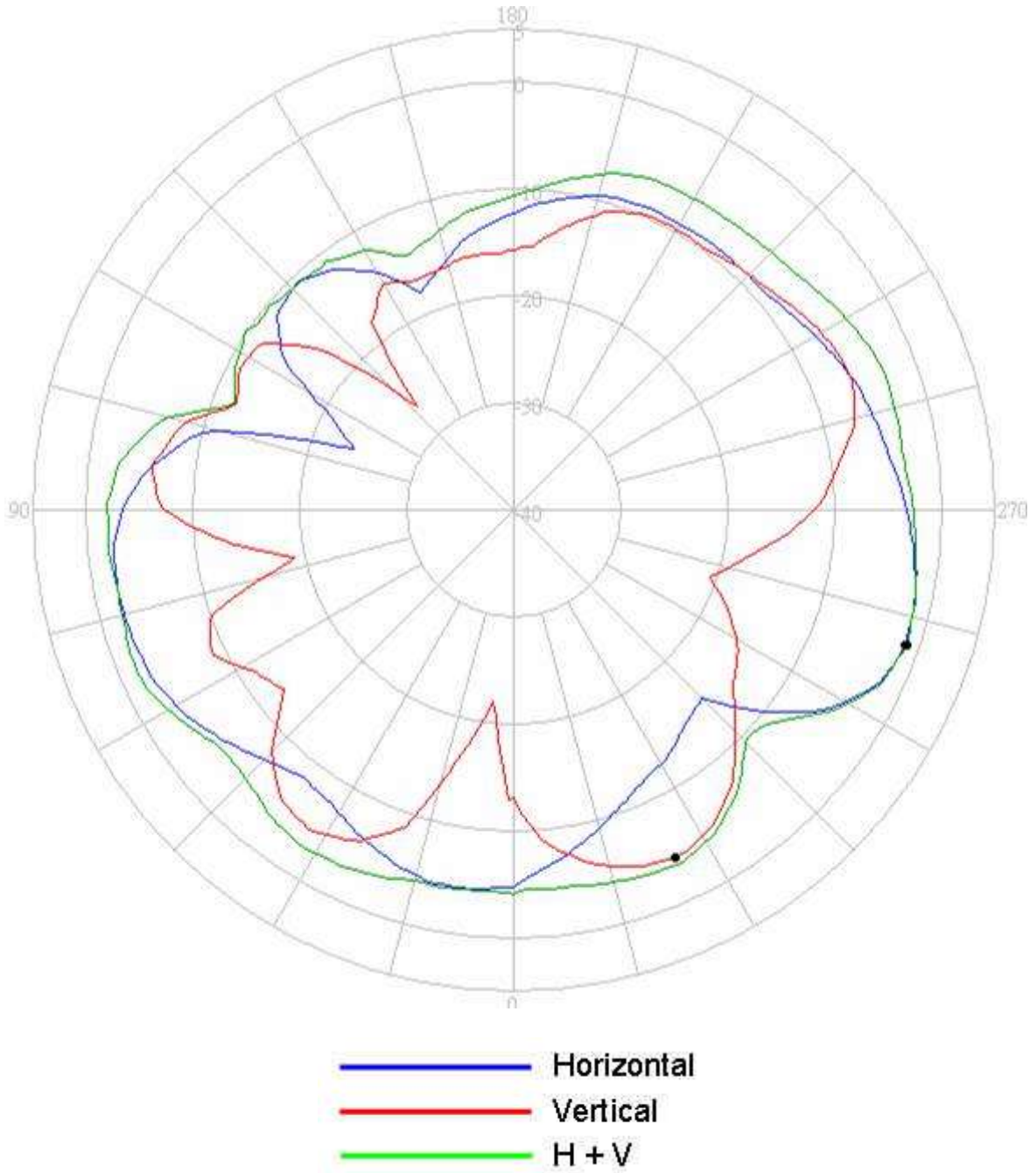
Center Frequency	<b>2500 MHz</b>
Horizontal (dBi) Peak	<b>-2.94</b>
Vertical (dBi) Peak	<b>-0.62</b>

WLAN\_Aux Antenna antenna: 2400 MHz



Center Frequency	<b>2400 MHz</b>
Horizontal (dBi) Peak	<b>-2.91</b>
Vertical (dBi) Peak	<b>-0.17</b>

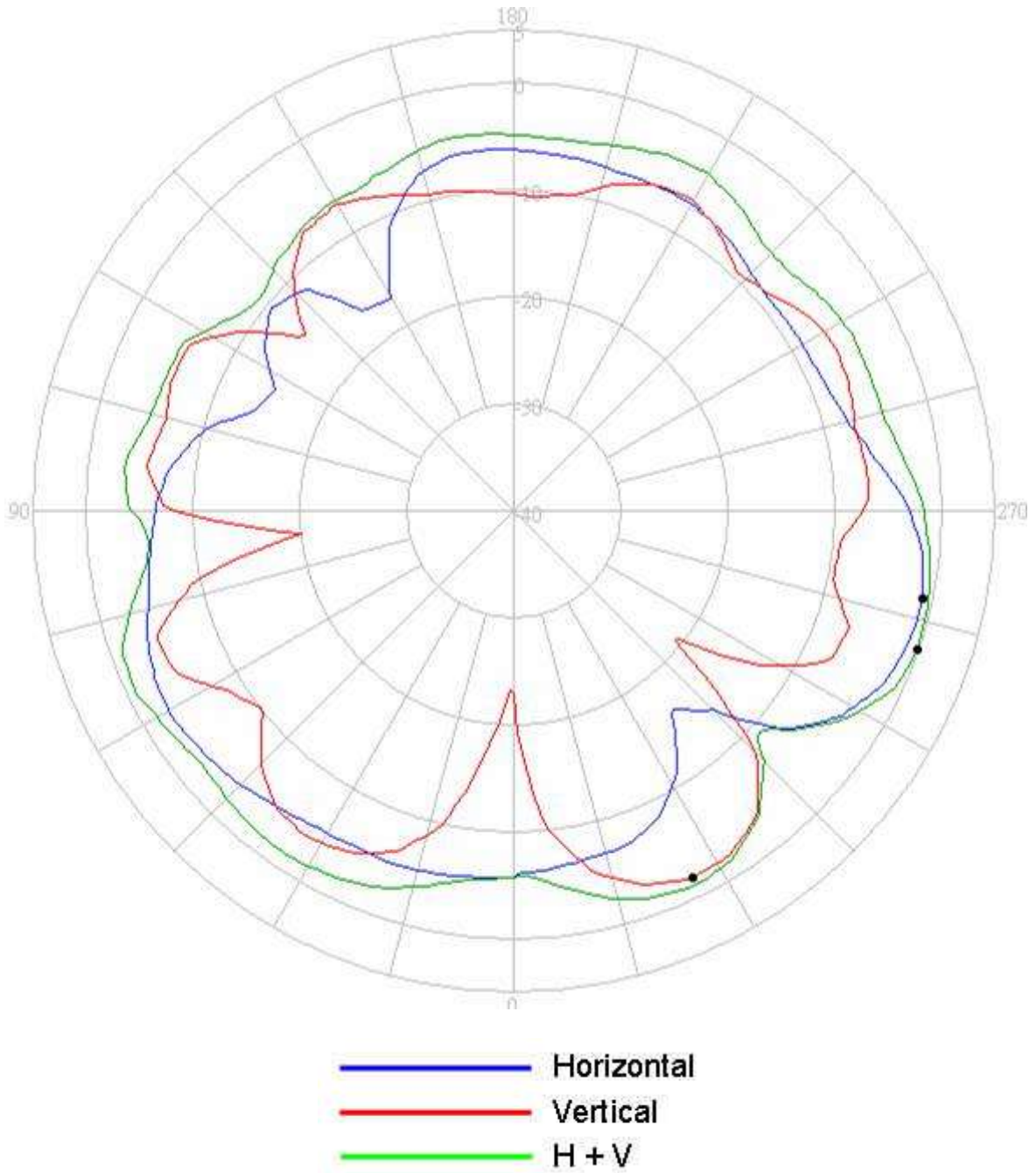
### WLAN\_Aux Antenna antenna: 2450 MHz



Center Frequency	2450 MHz
Horizontal (dBi) Peak	-1.21
Vertical (dBi) Peak	-4.15

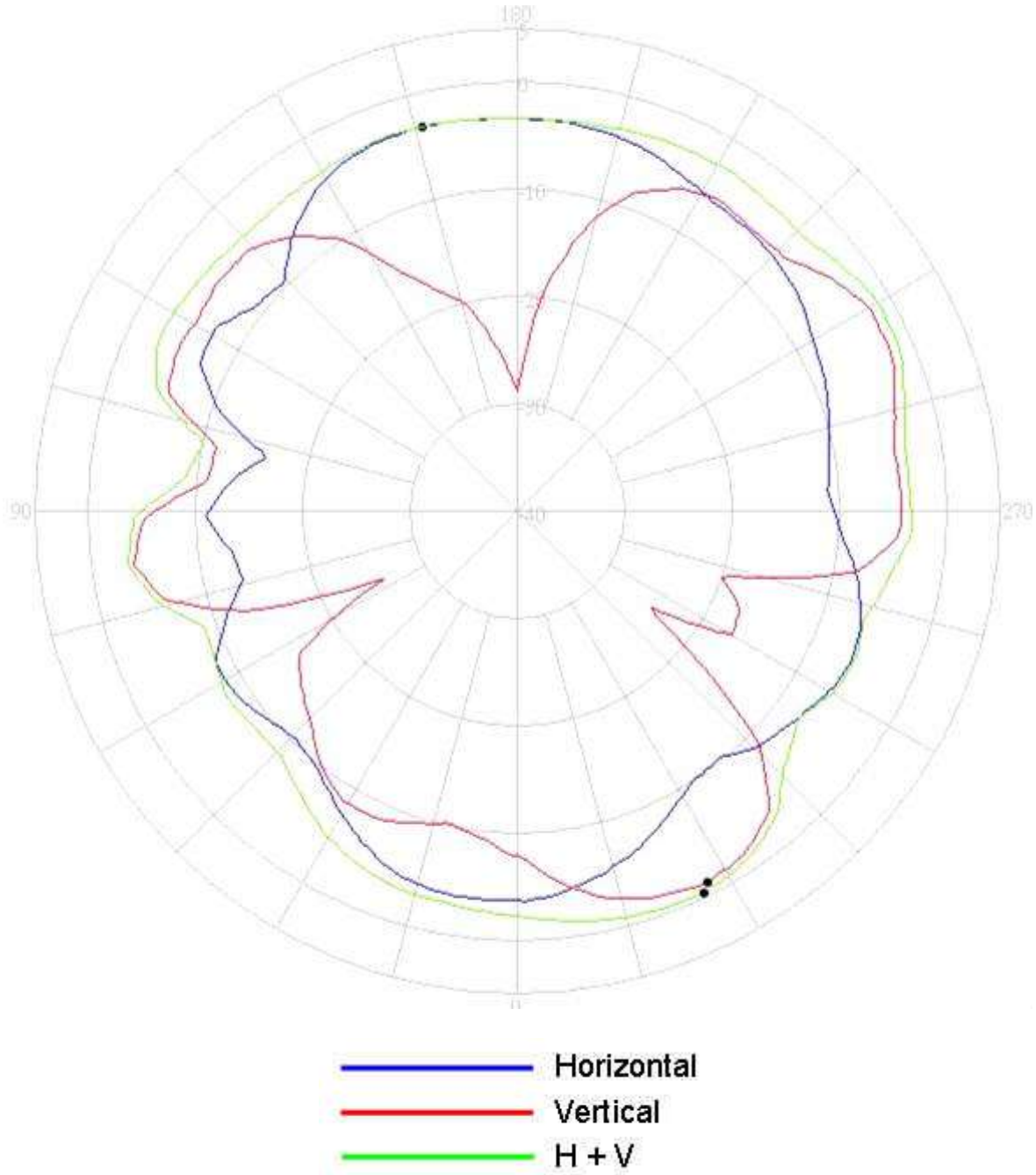


### WLAN\_Aux Antenna antenna: 2500 MHz



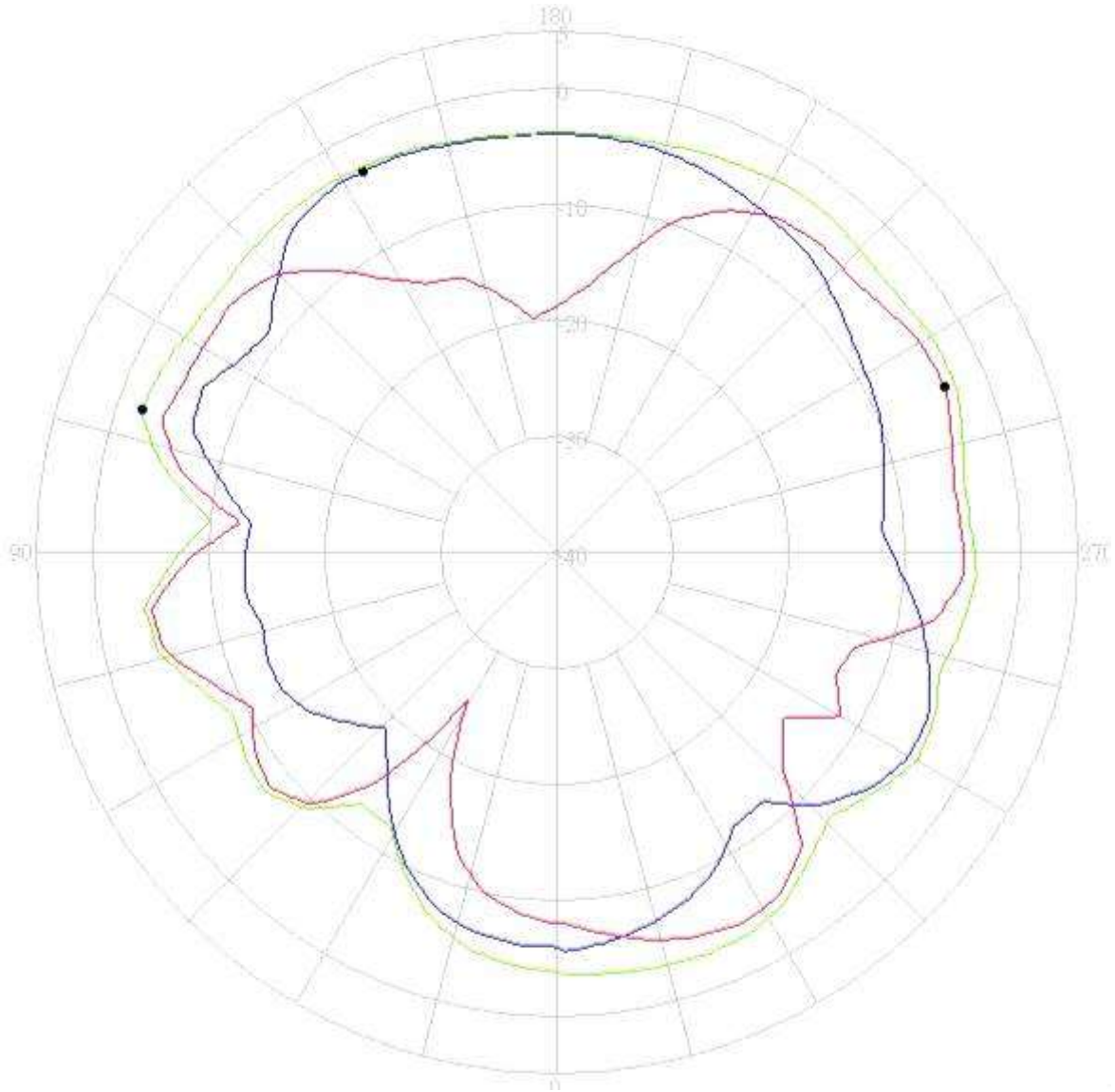
Center Frequency	<b>2500 MHz</b>
Horizontal (dBi) Peak	<b>-0.88</b>
Vertical (dBi) Peak	<b>-1.86</b>

### MIMO Antenna antenna: 2400 MHz



Center Frequency	2400 MHz
Horizontal (dBi) Peak	-3.14
Vertical (dBi) Peak	-1.11

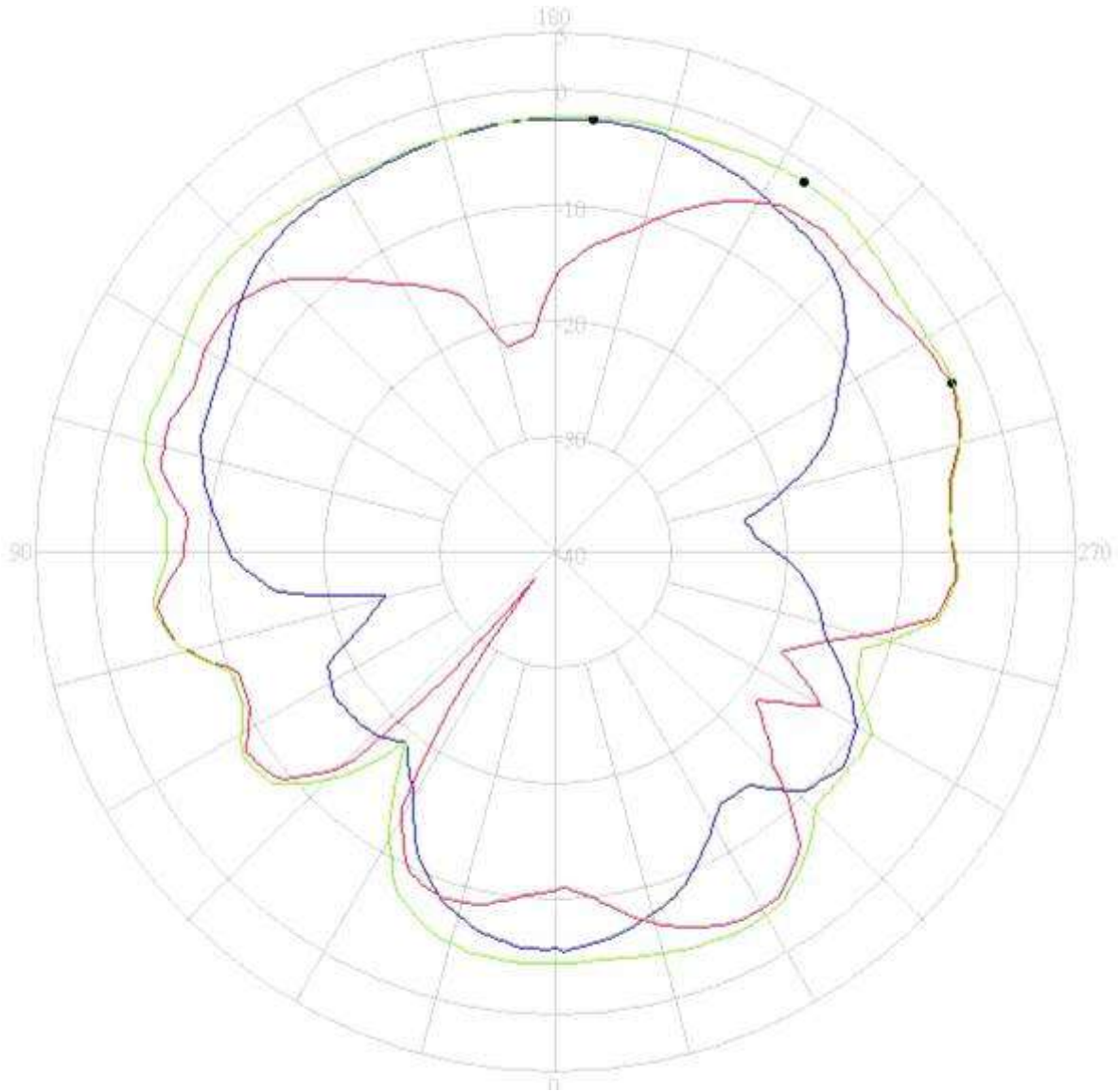
### MIMO Antenna antenna: 2450 MHz



- Horizontal
- Vertical
- H + V

Center Frequency	<b>2450 MHz</b>
Horizontal (dBi) Peak	<b>-3.09</b>
Vertical (dBi) Peak	<b>-3.57</b>

### MIMO Antenna antenna: 2500 MHz

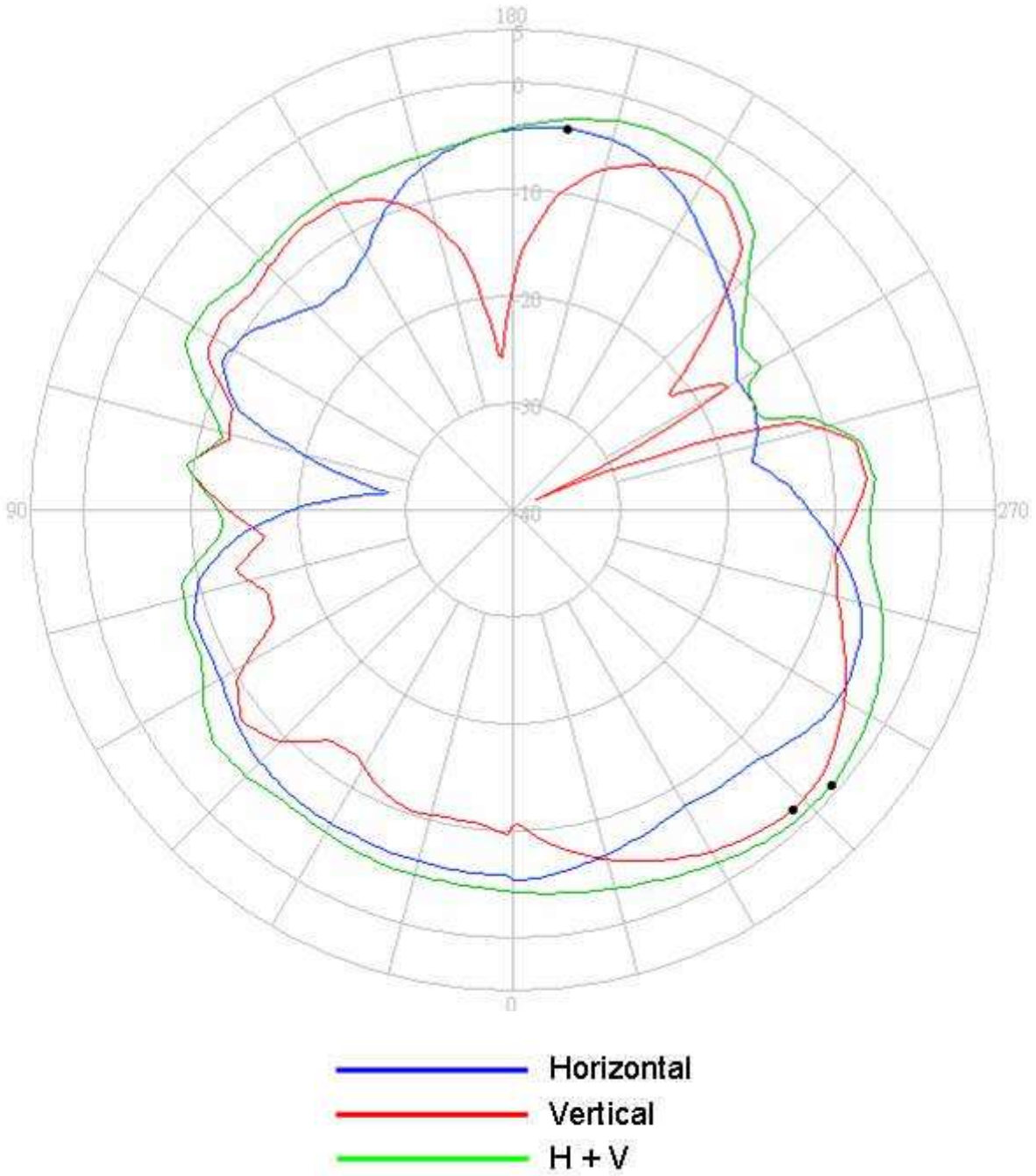


- Horizontal
- Vertical
- H + V

Center Frequency	<b>2500 MHz</b>
Horizontal (dBi) Peak	<b>-2.46</b>
Vertical (dBi) Peak	<b>-2.79</b>

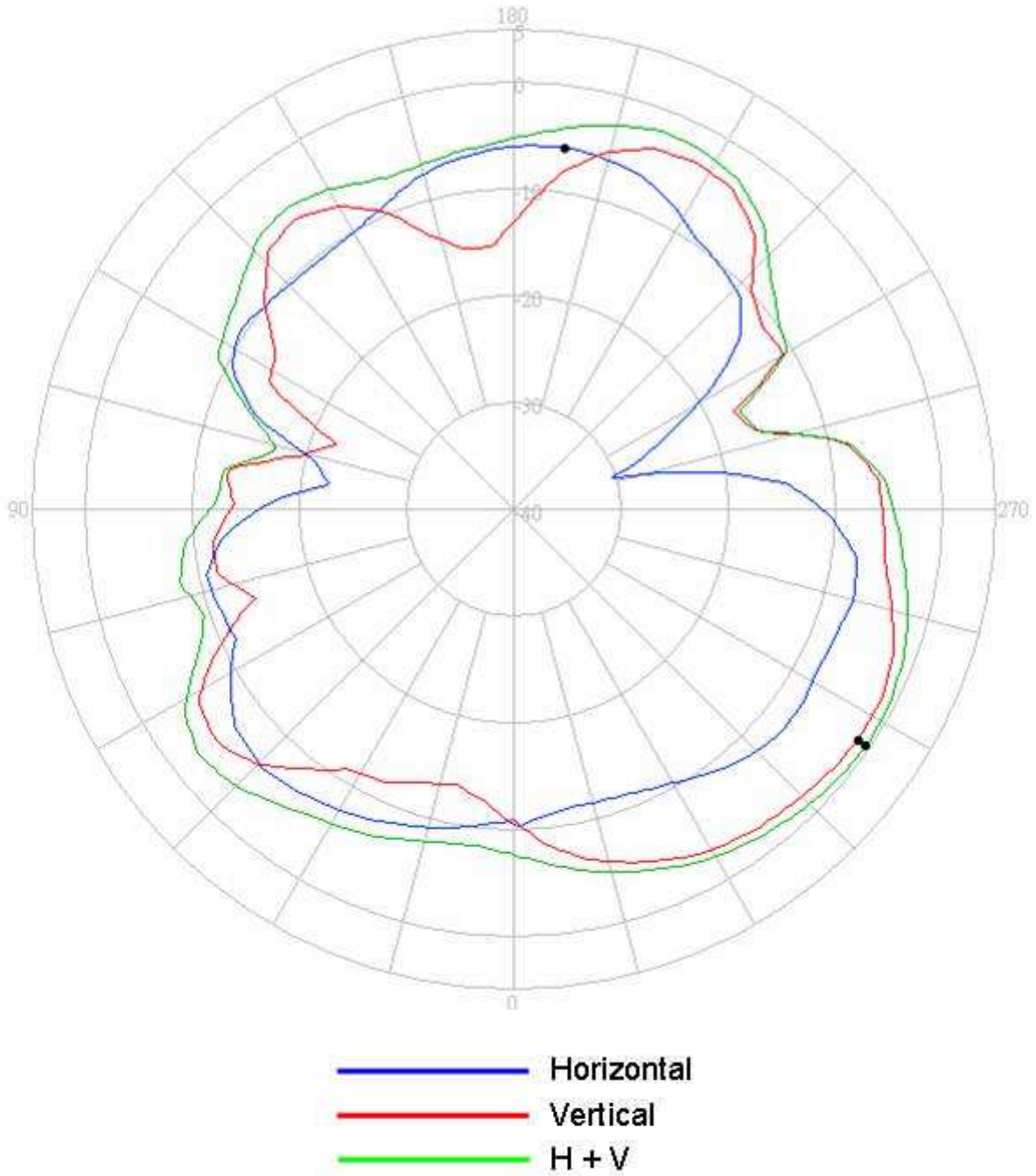
2490-2700MHz radiation characteristic

WLAN\_Main Antenna antenna: 2501MHz



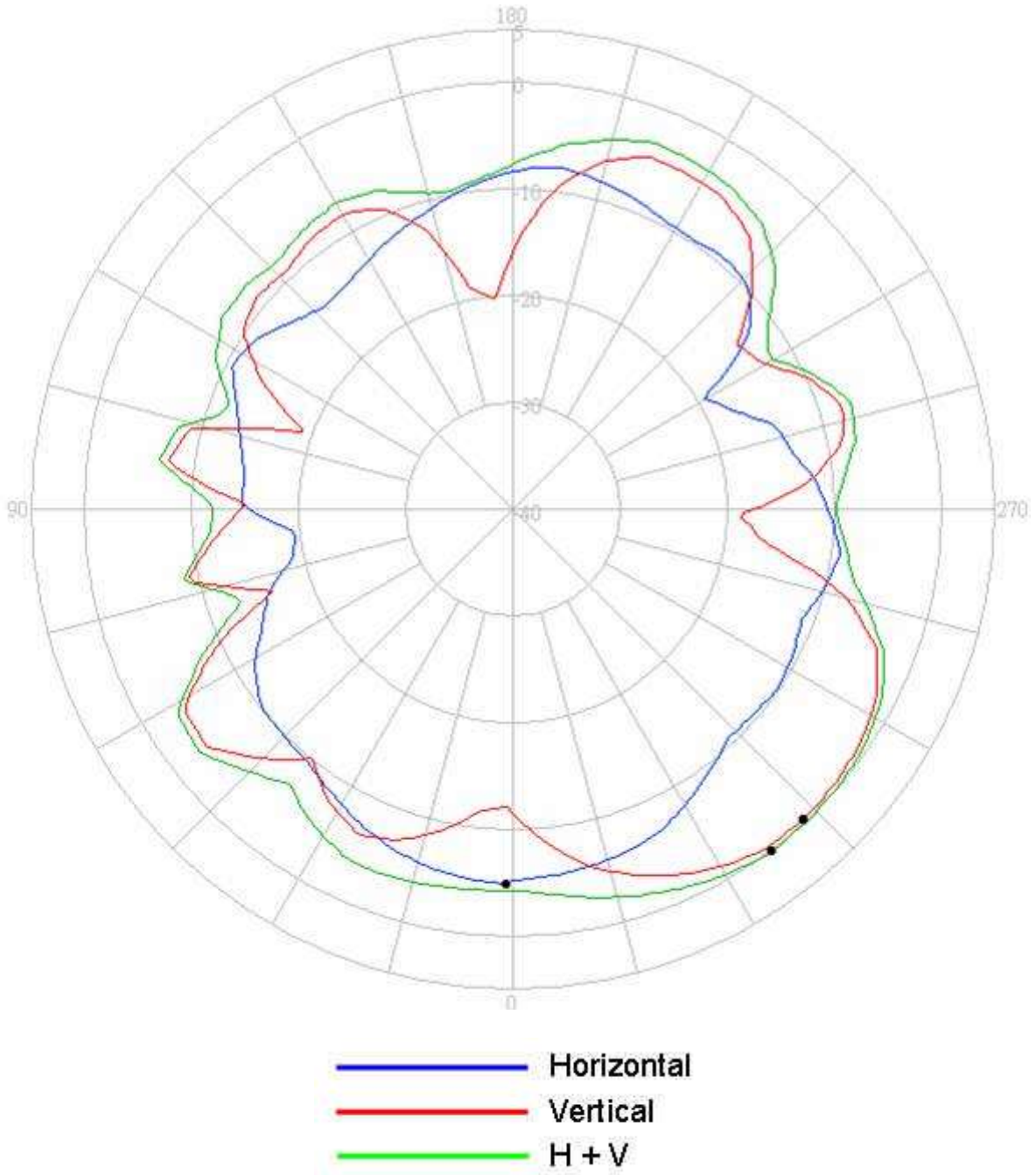
Center Frequency	2501 MHz
Horizontal (dBi) Peak	-3.96
Vertical (dBi) Peak	-1.65

WLAN\_Main Antenna antenna: 2593MHz



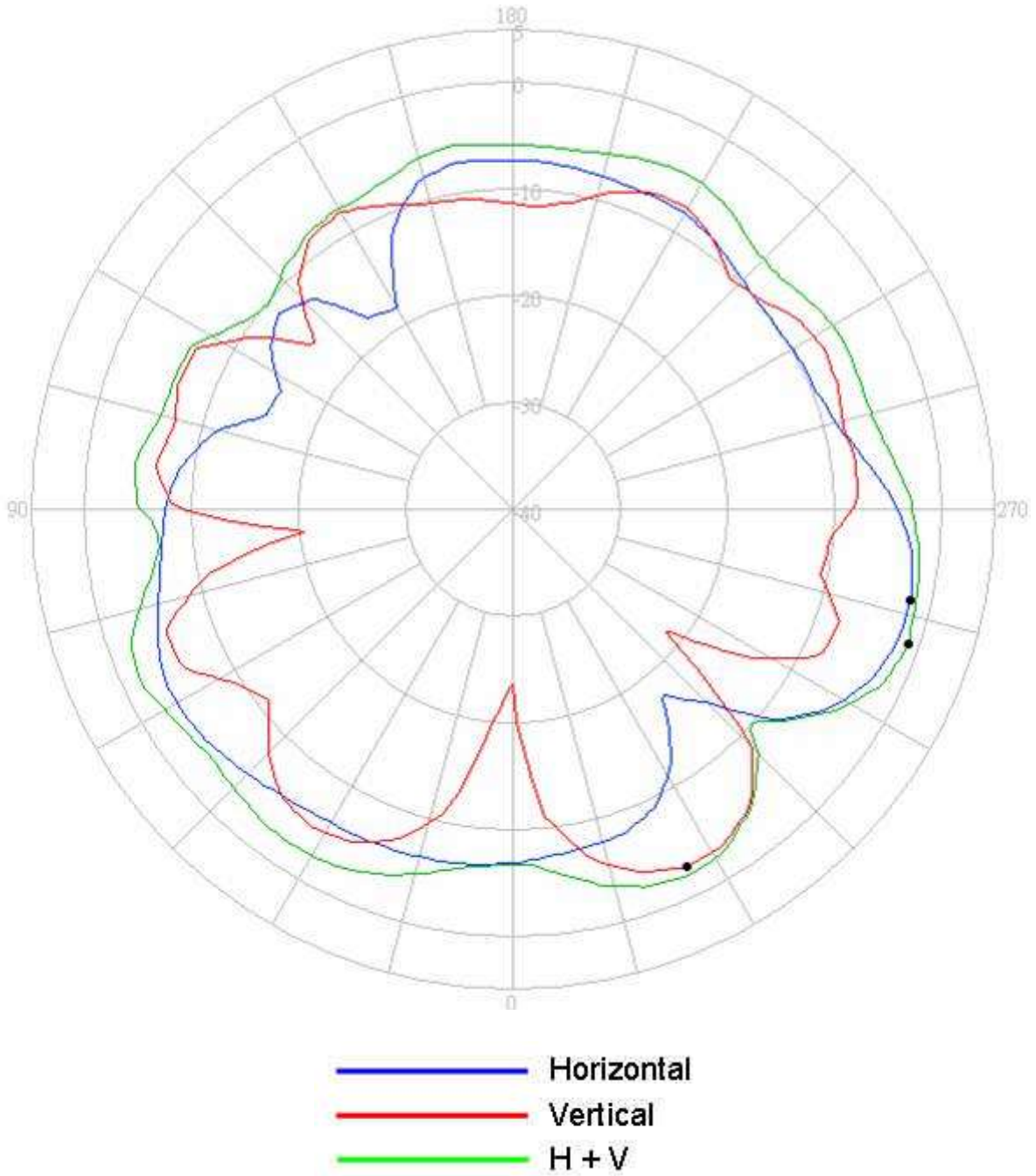
Center Frequency	2593 MHz
Horizontal (dBi) Peak	-5.77
Vertical (dBi) Peak	-1.26

### WLAN\_Main Antenna antenna: 2685 MHz



Center Frequency	2685 MHz
Horizontal (dBi) Peak	-4.87
Vertical (dBi) Peak	-0.27

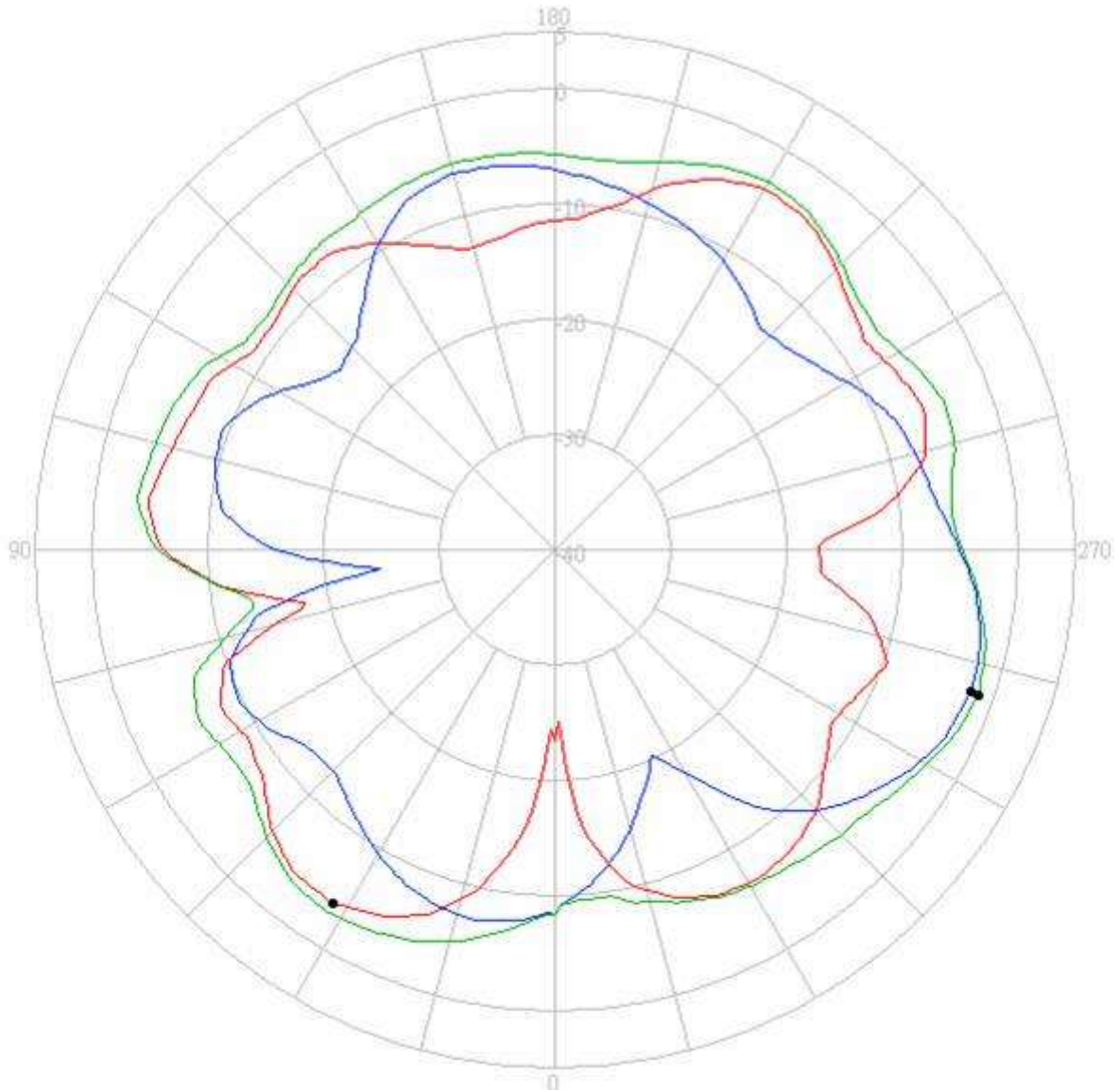
### WLAN\_Aux Antenna antenna: 2501MHz



Center Frequency	2501 MHz
Horizontal (dBi) Peak	-1.93
Vertical (dBi) Peak	-2.81



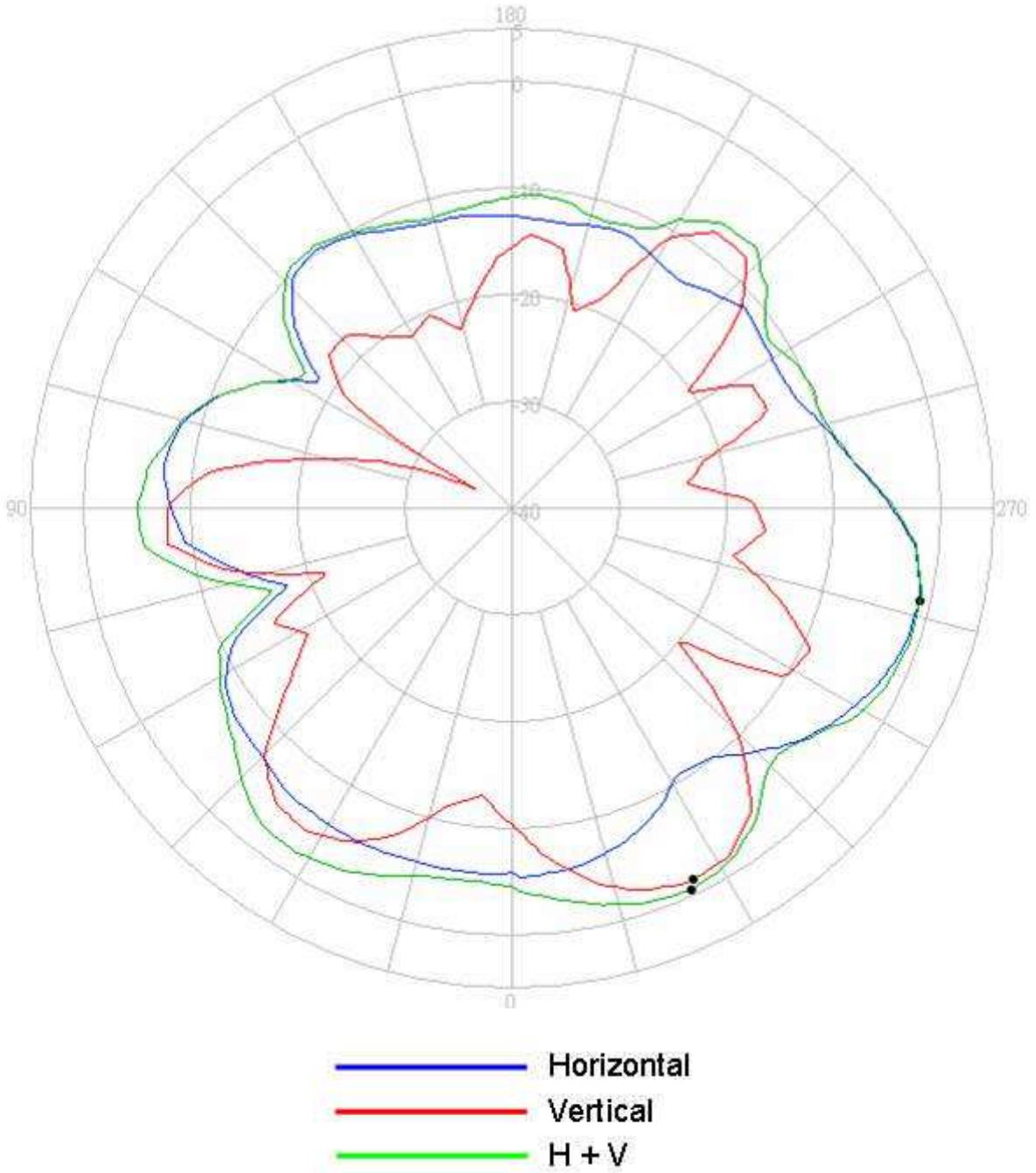
### WLAN\_Aux Antenna antenna: 2593MHz



- Horizontal
- Vertical
- H + V

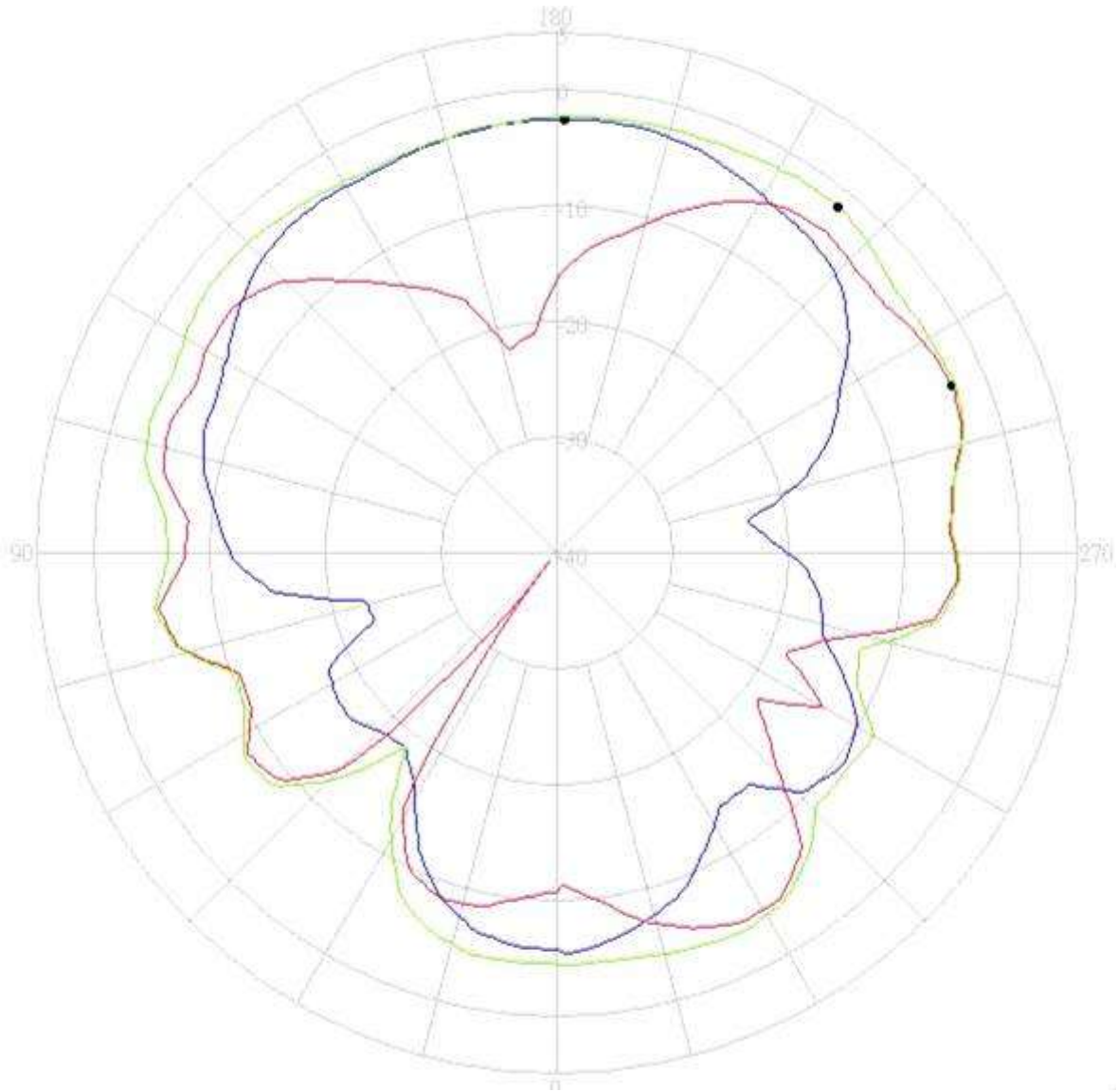
Center Frequency	<b>2593 MHz</b>
Horizontal (dBi) Peak	<b>-1.96</b>
Vertical (dBi) Peak	<b>-3.81</b>

WLAN\_Aux Antenna antenna: 2685 MHz



Center Frequency	2685 MHz
Horizontal (dBi) Peak	-0.96
Vertical (dBi) Peak	-1.29

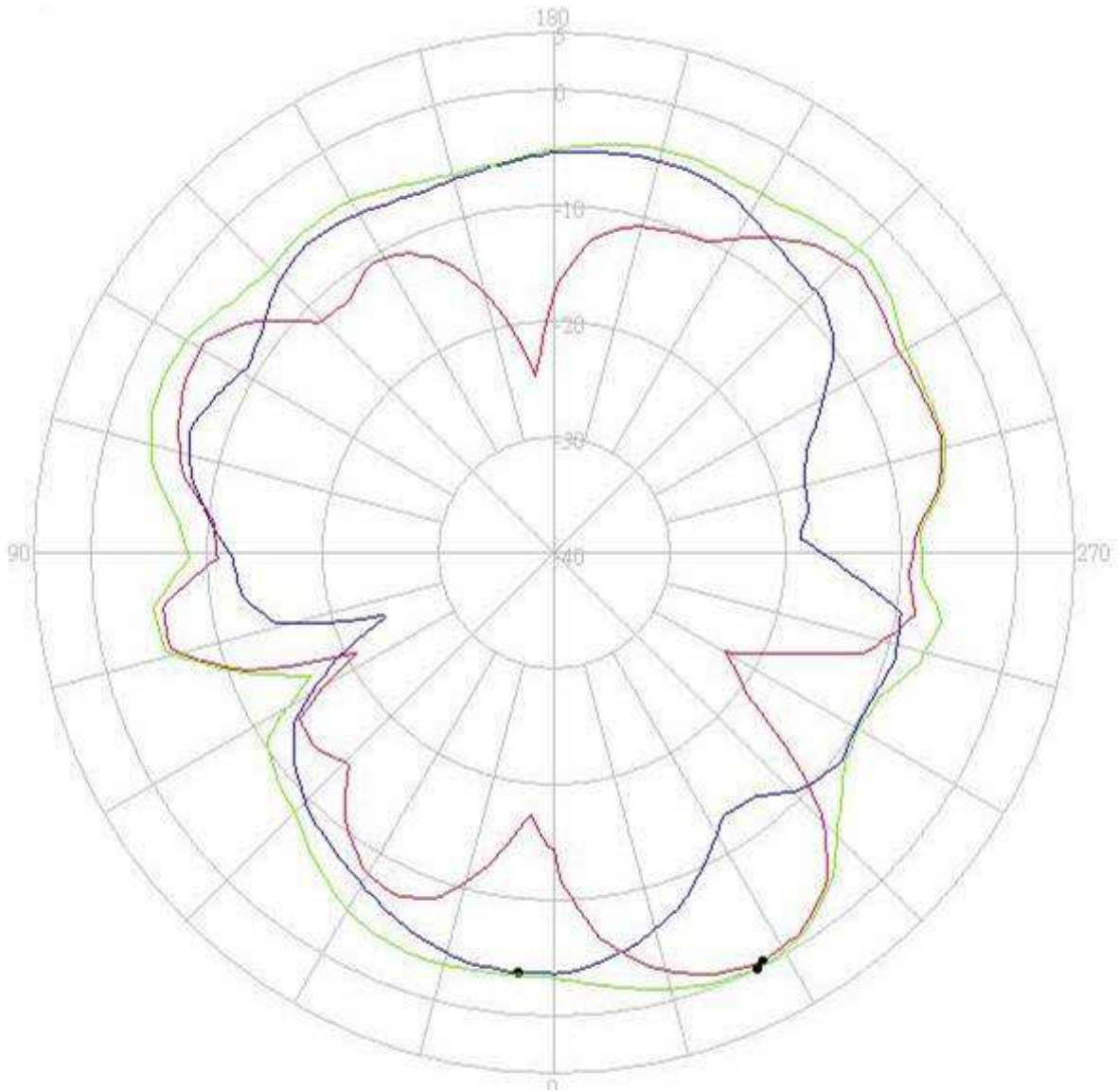
### MIMO Antenna antenna: 2501MHz



- Horizontal
- Vertical
- H + V

Center Frequency	2501 MHz
Horizontal (dBi) Peak	-2.47
Vertical (dBi) Peak	-2.85

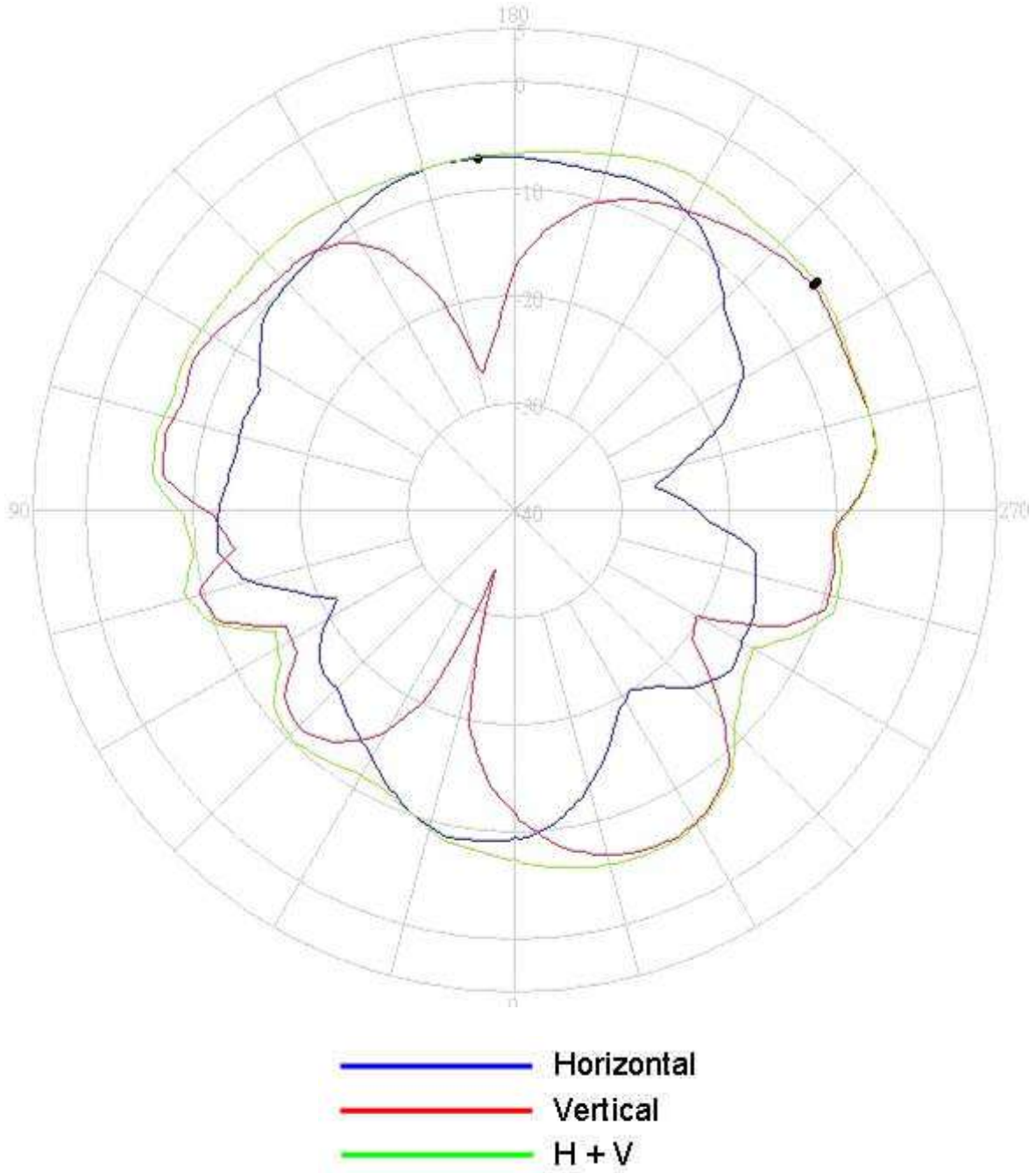
### MIMO Antenna antenna: 2593MHz



- Horizontal
- Vertical
- H + V

Center Frequency	<b>2593 MHz</b>
Horizontal (dBi) Peak	<b>-3.53</b>
Vertical (dBi) Peak	<b>-0.38</b>

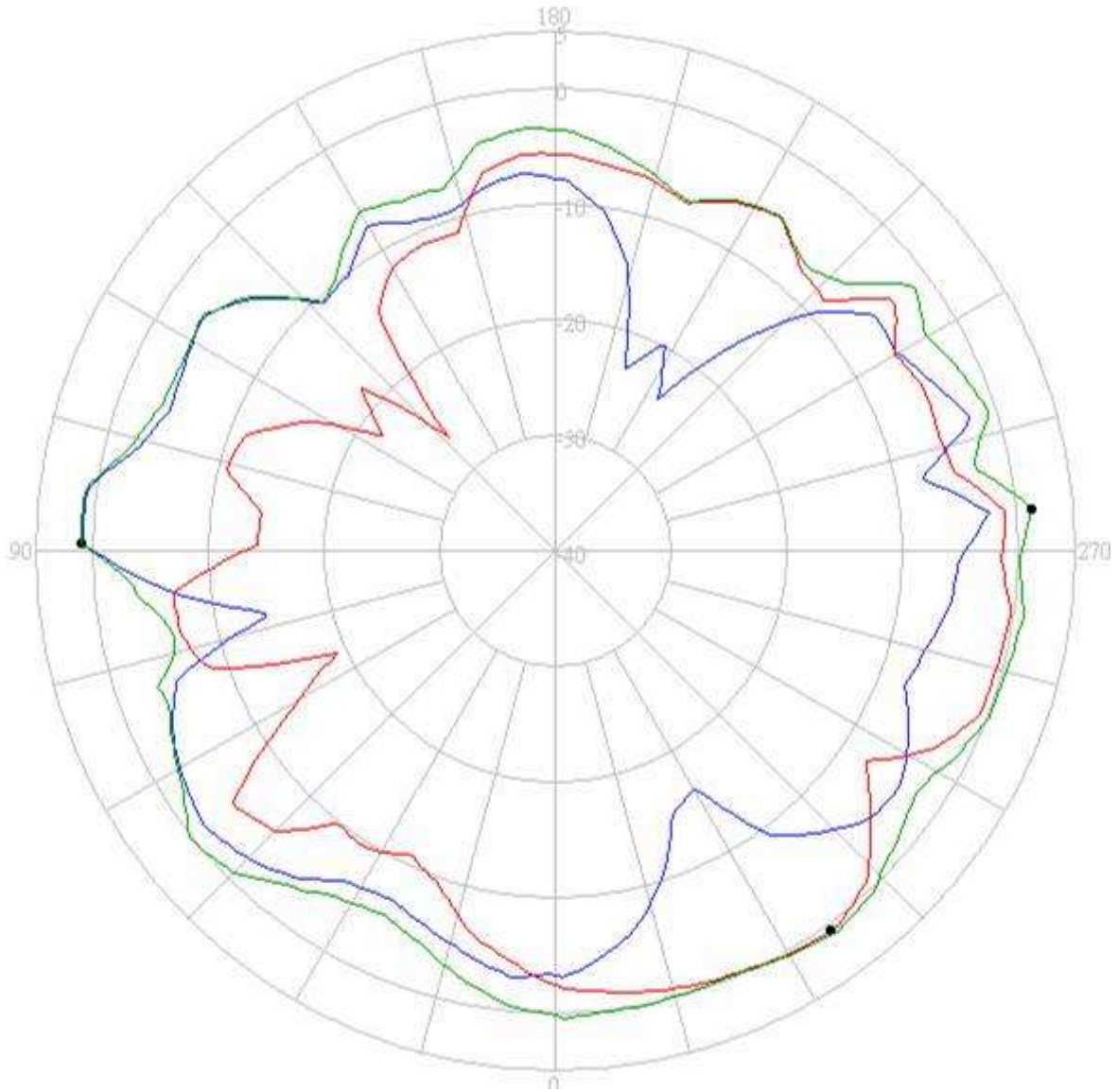
### MIMO Antenna antenna: 2685MHz



Center Frequency	2685 MHz
Horizontal (dBi) Peak	-4.90
Vertical (dBi) Peak	-3.12

### 5150-5350 MHz radiation characteristic

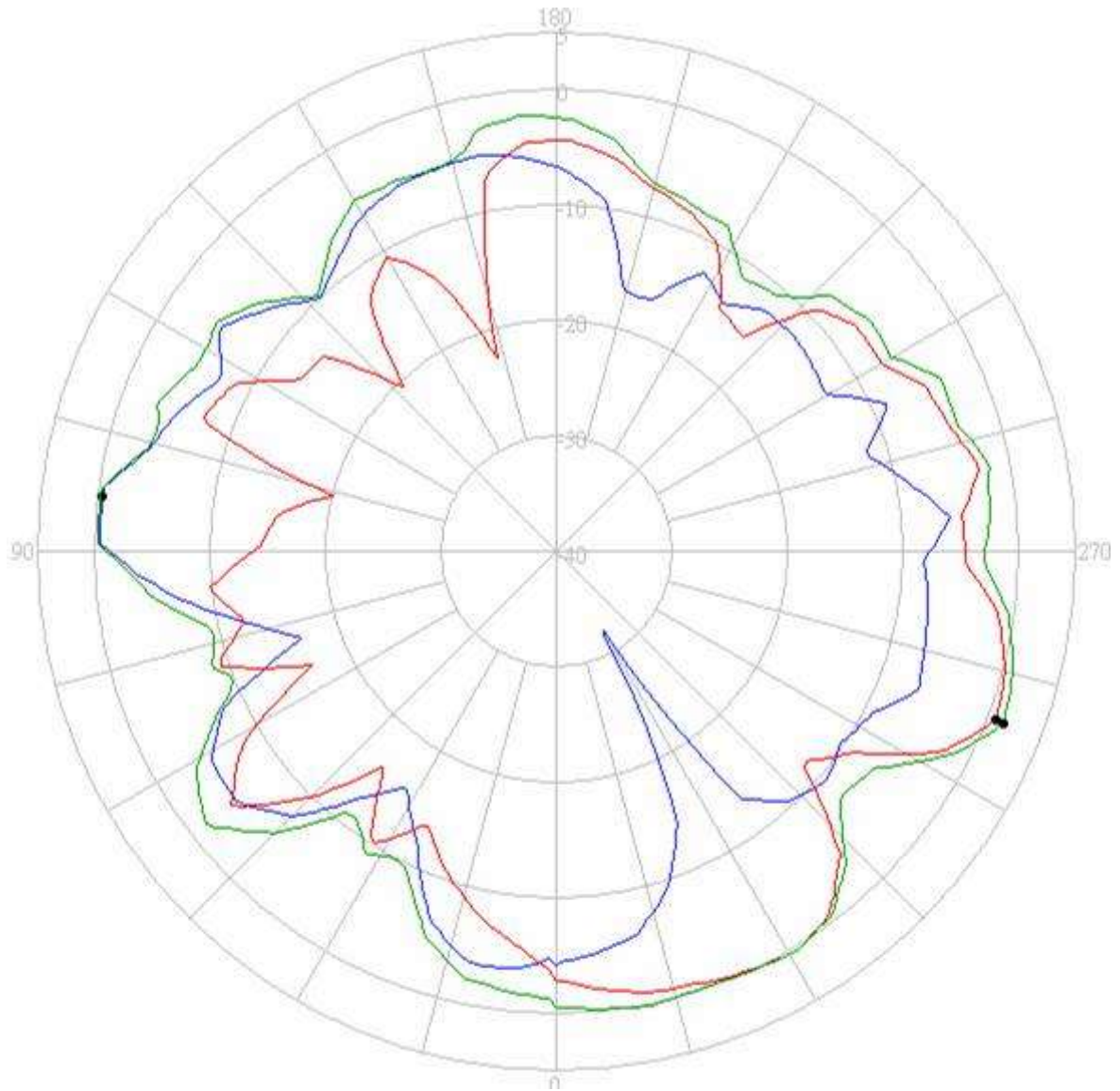
#### WLAN\_Main Antenna antenna: 5150 MHz



- Horizontal
- Vertical
- H + V

Center Frequency	<b>5150 MHz</b>
Horizontal (dBi) Peak	<b>1.01</b>
Vertical (dBi) Peak	<b>0.64</b>

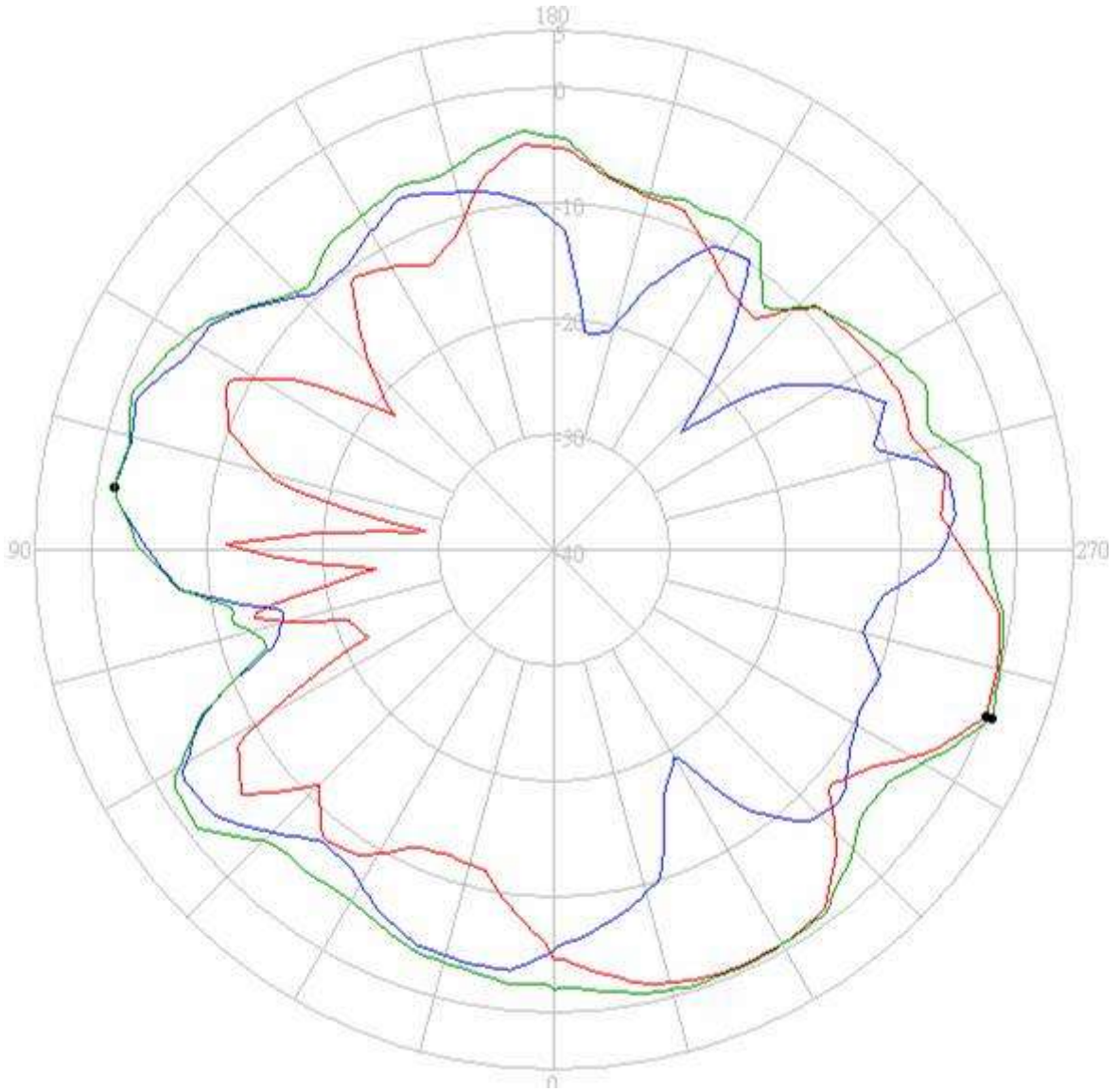
### WLAN\_Main Antenna antenna: 5250 MHz



- Horizontal
- Vertical
- H + V

Center Frequency	5250 MHz
Horizontal (dBi) Peak	-0.29
Vertical (dBi) Peak	0.86

### WLAN\_Main Antenna antenna: 5350 MHz

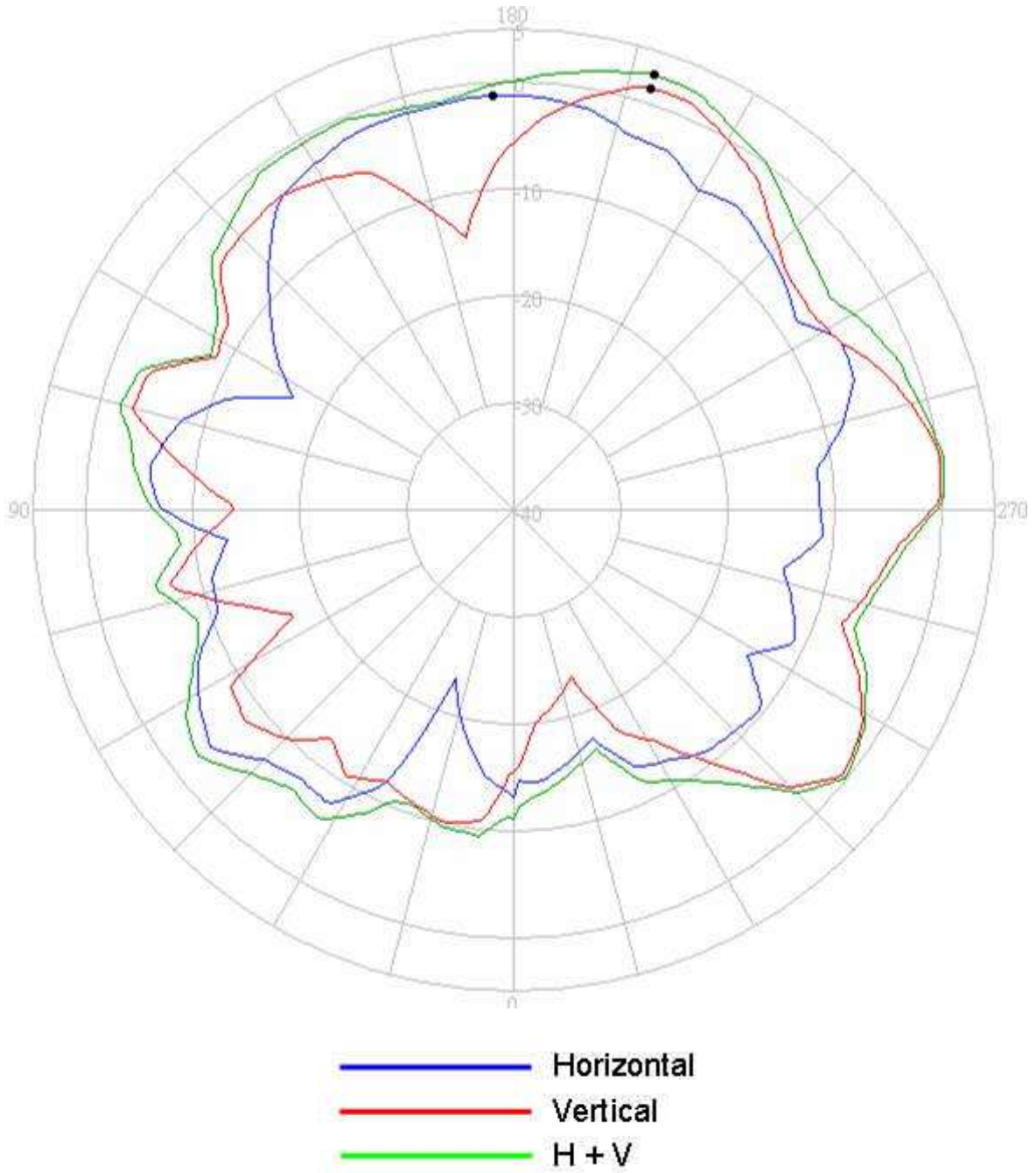


- Horizontal
- Vertical
- H + V

Center Frequency	<b>5350 MHz</b>
Horizontal (dBi) Peak	<b>-1.48</b>
Vertical (dBi) Peak	<b>0.16</b>

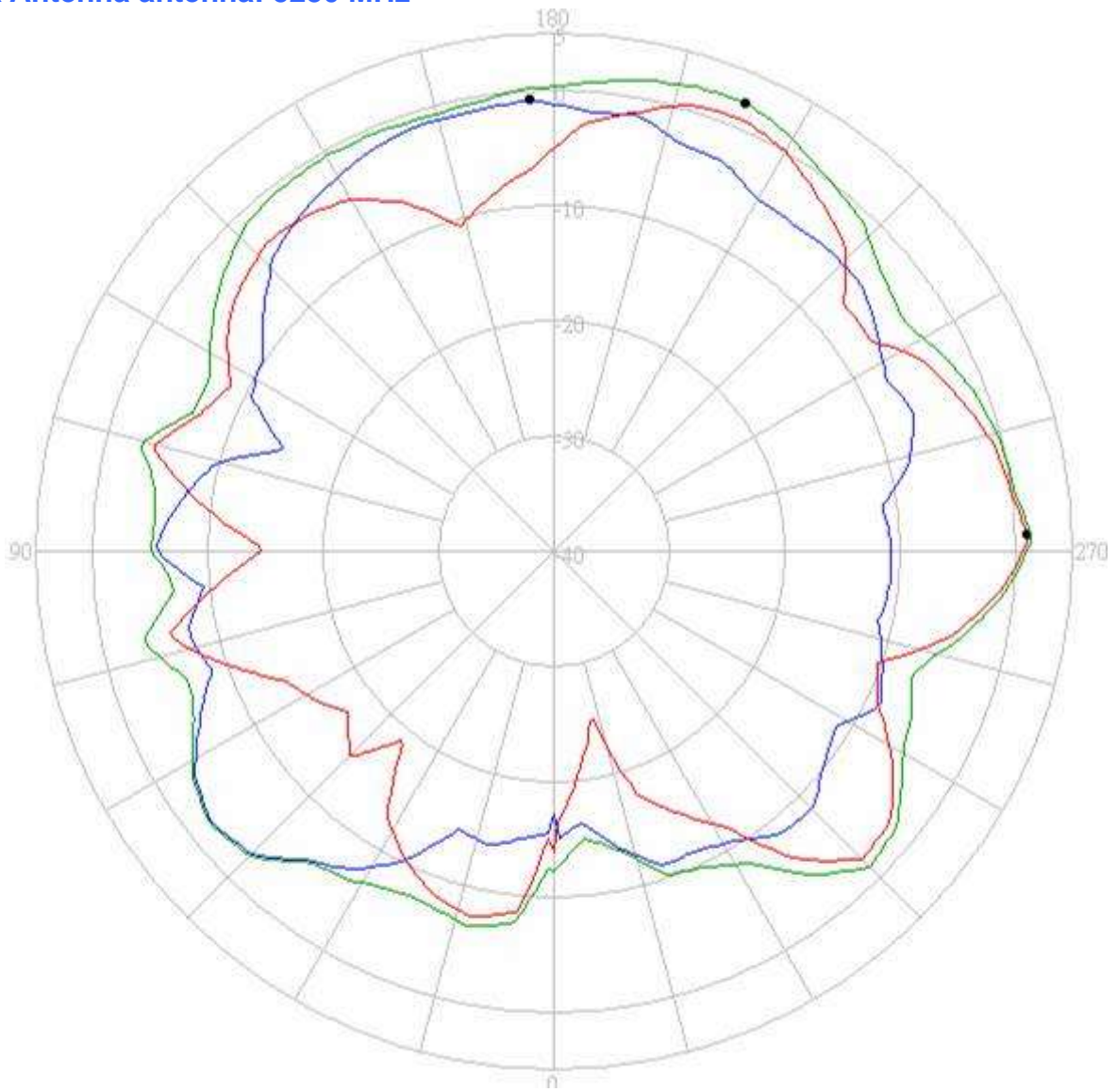


### WLAN\_Aux Antenna antenna: 5150 MHz



Center Frequency	5150 MHz
Horizontal (dBi) Peak	-1.11
Vertical (dBi) Peak	1.52

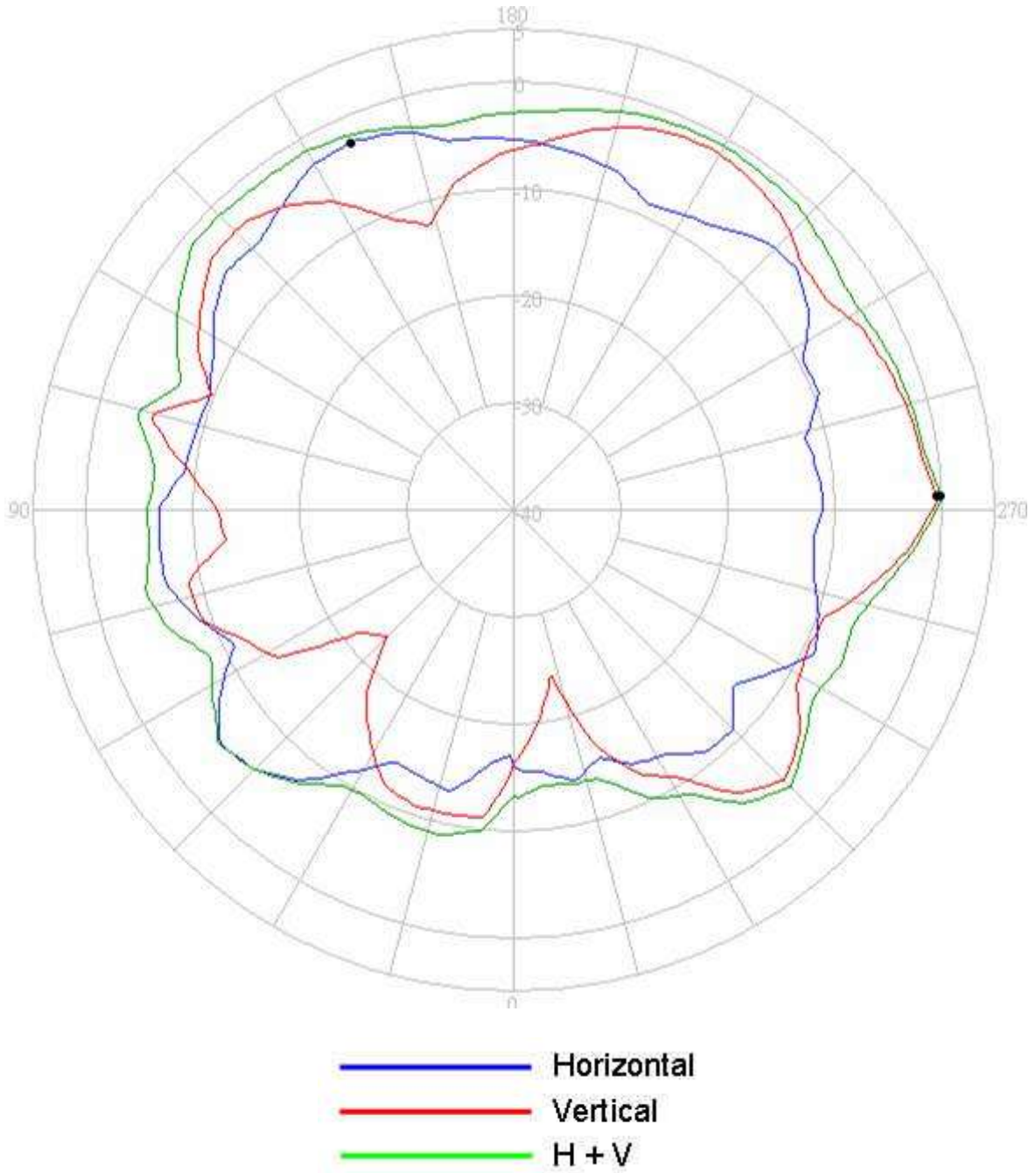
WLAN\_Aux Antenna antenna: 5250 MHz



- Horizontal
- Vertical
- H + V

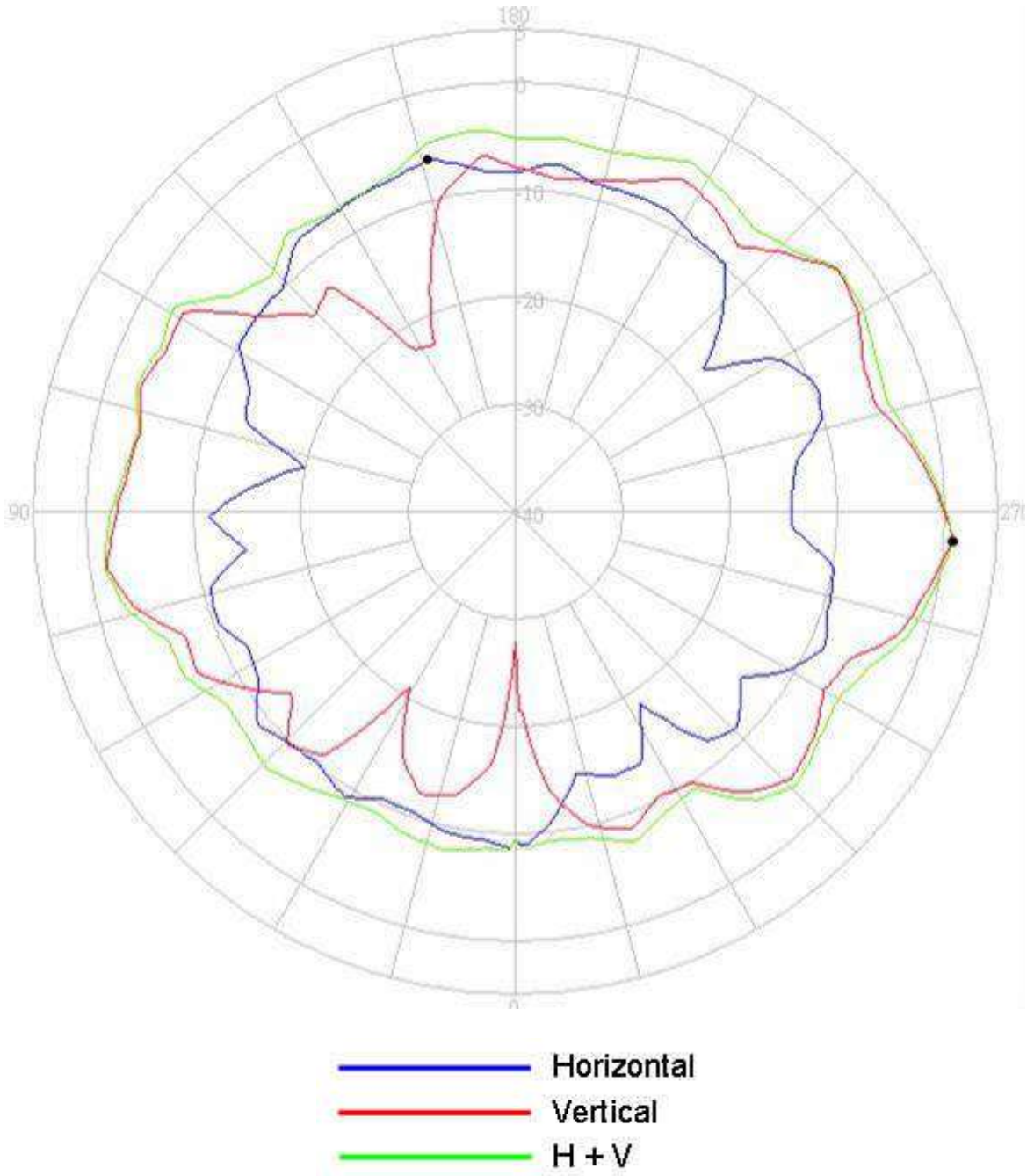
Center Frequency	5250 MHz
Horizontal (dBi) Peak	-0.77
Vertical (dBi) Peak	1.11

### WLAN\_Aux Antenna antenna: 5350 MHz



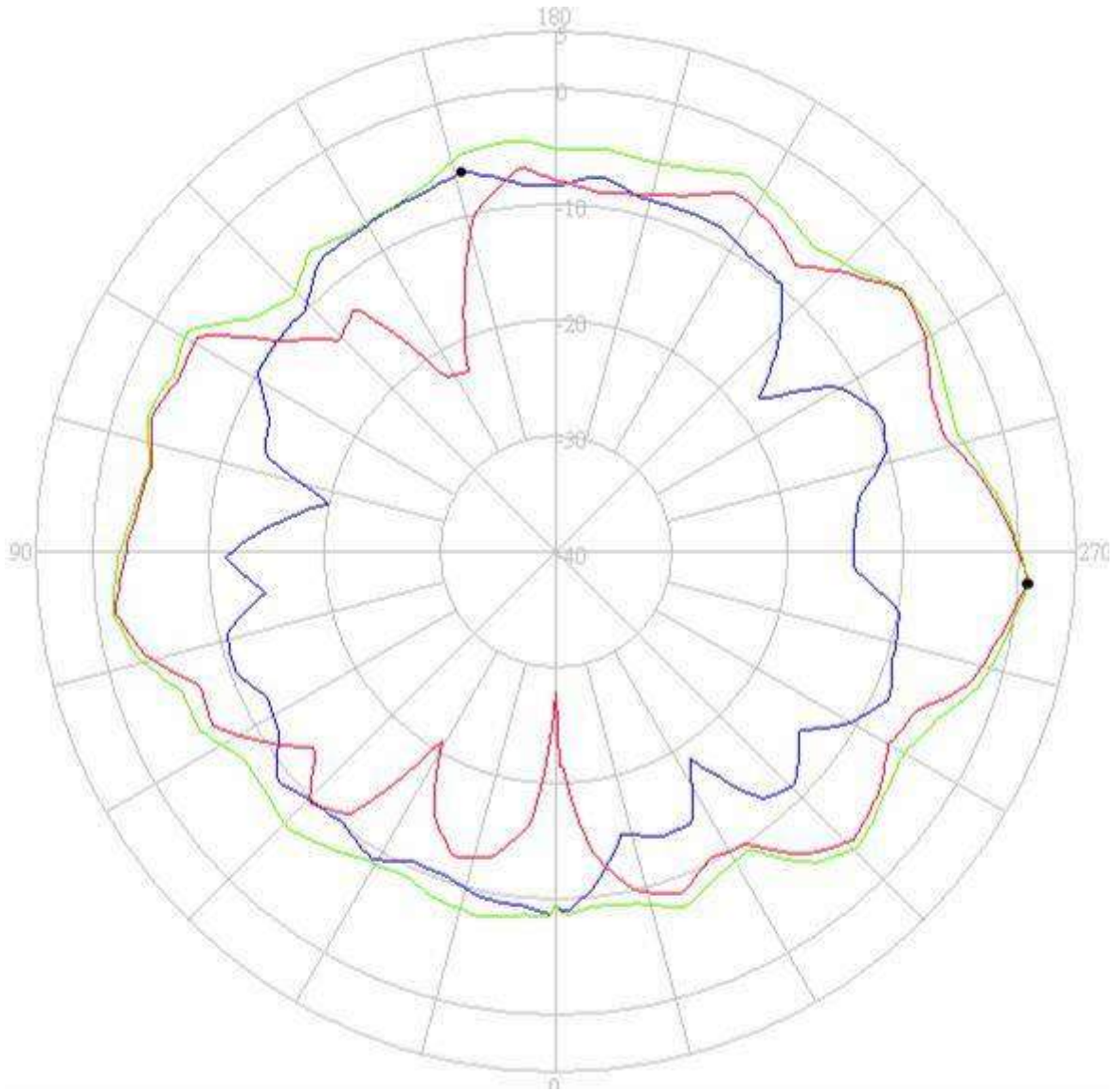
Center Frequency	5350 MHz
Horizontal (dBi) Peak	-2.44
Vertical (dBi) Peak	-0.44

**MIMO Antenna antenna: 5150 MHz**



Center Frequency	<b>5150 MHz</b>
Horizontal (dBi) Peak	<b>-6.23</b>
Vertical (dBi) Peak	<b>0.77</b>

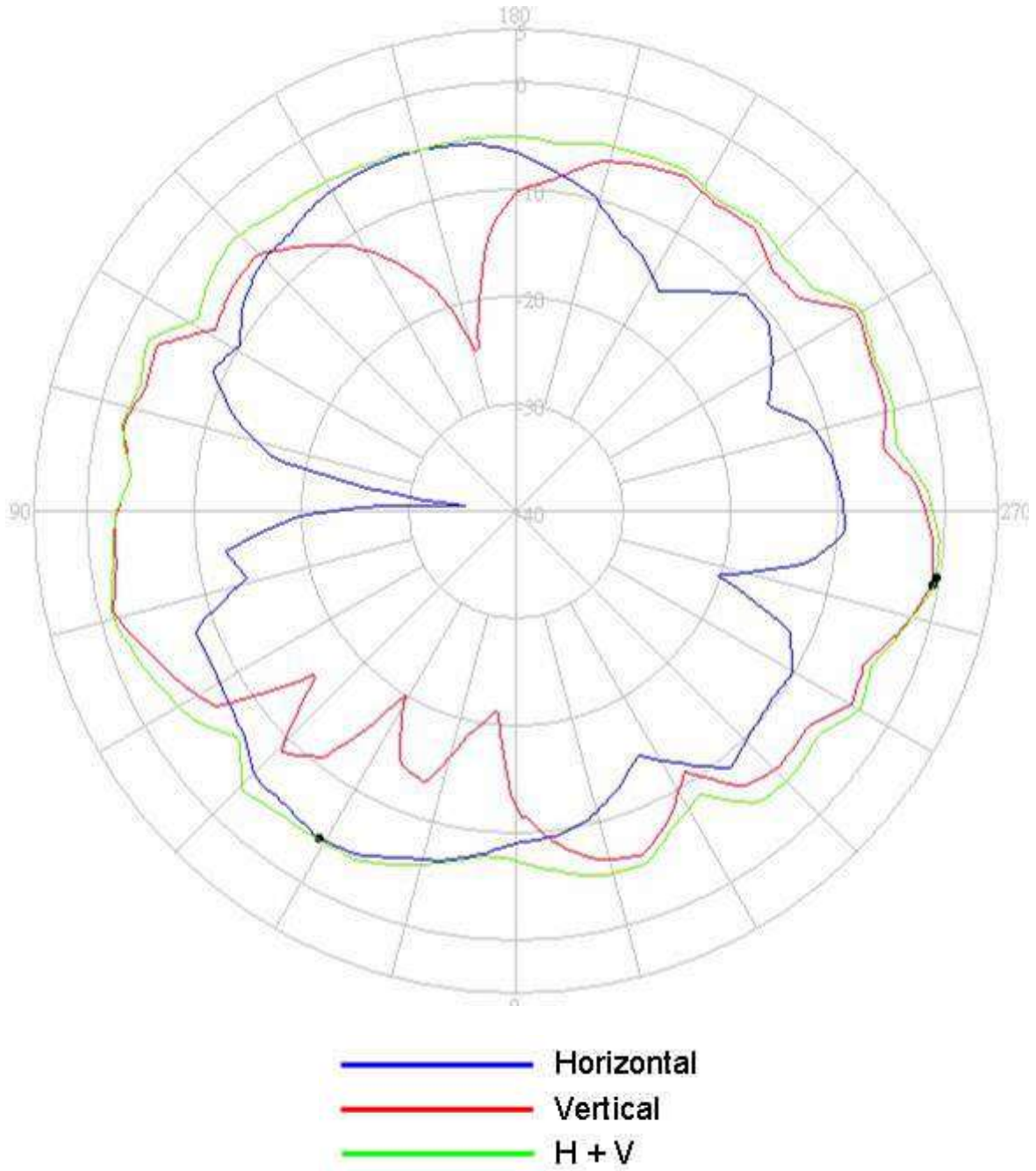
**MIMO Antenna antenna: 5250 MHz**



- Horizontal
- Vertical
- H + V

Center Frequency	<b>5250 MHz</b>
Horizontal (dBi) Peak	<b>-4.26</b>
Vertical (dBi) Peak	<b>0.79</b>

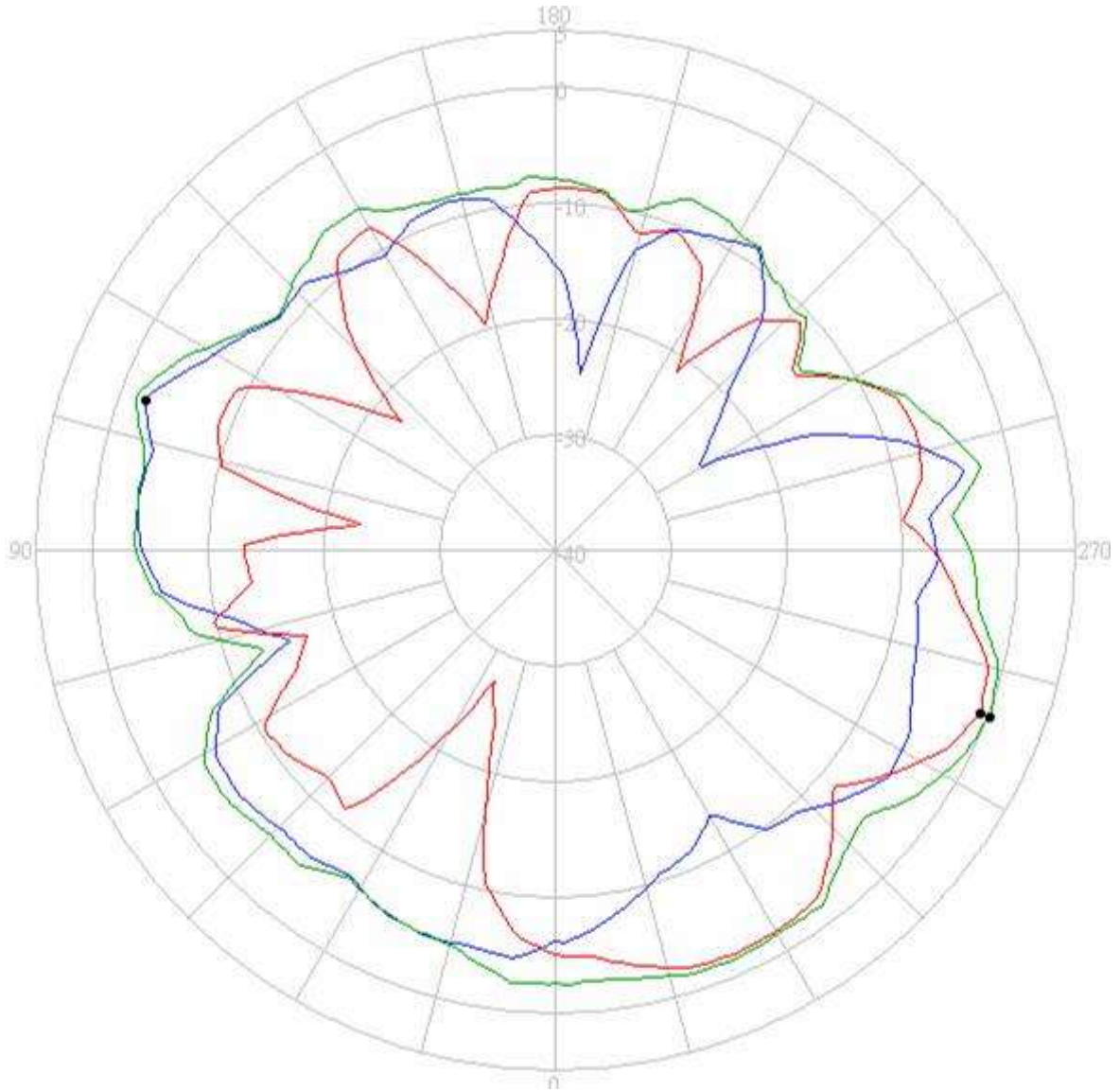
**MIMO Antenna antenna: 5350 MHz**



Center Frequency	<b>5350 MHz</b>
Horizontal (dBi) Peak	<b>-4.35</b>
Vertical (dBi) Peak	<b>-0.54</b>

**5470-5725MHz radiation characteristic**

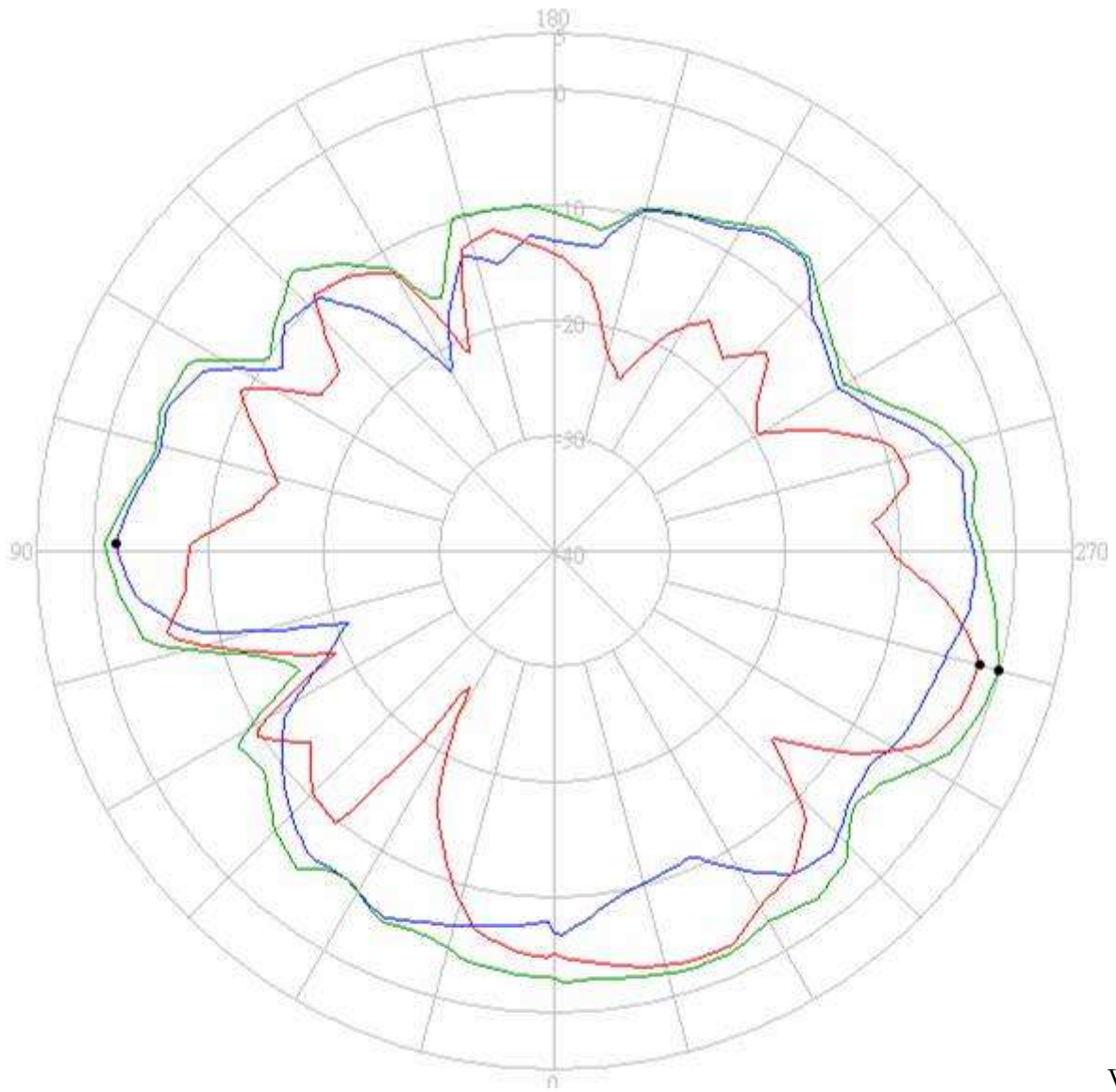
**WLAN\_Main Antenna antenna: 5470 MHz**



- Horizontal
- Vertical
- H + V

Center Frequency	<b>5470 MHz</b>
Horizontal (dBi) Peak	<b>-2.17</b>
Vertical (dBi) Peak	<b>-0.66</b>

**WLAN\_Main Antenna antenna: 5600 MHz**



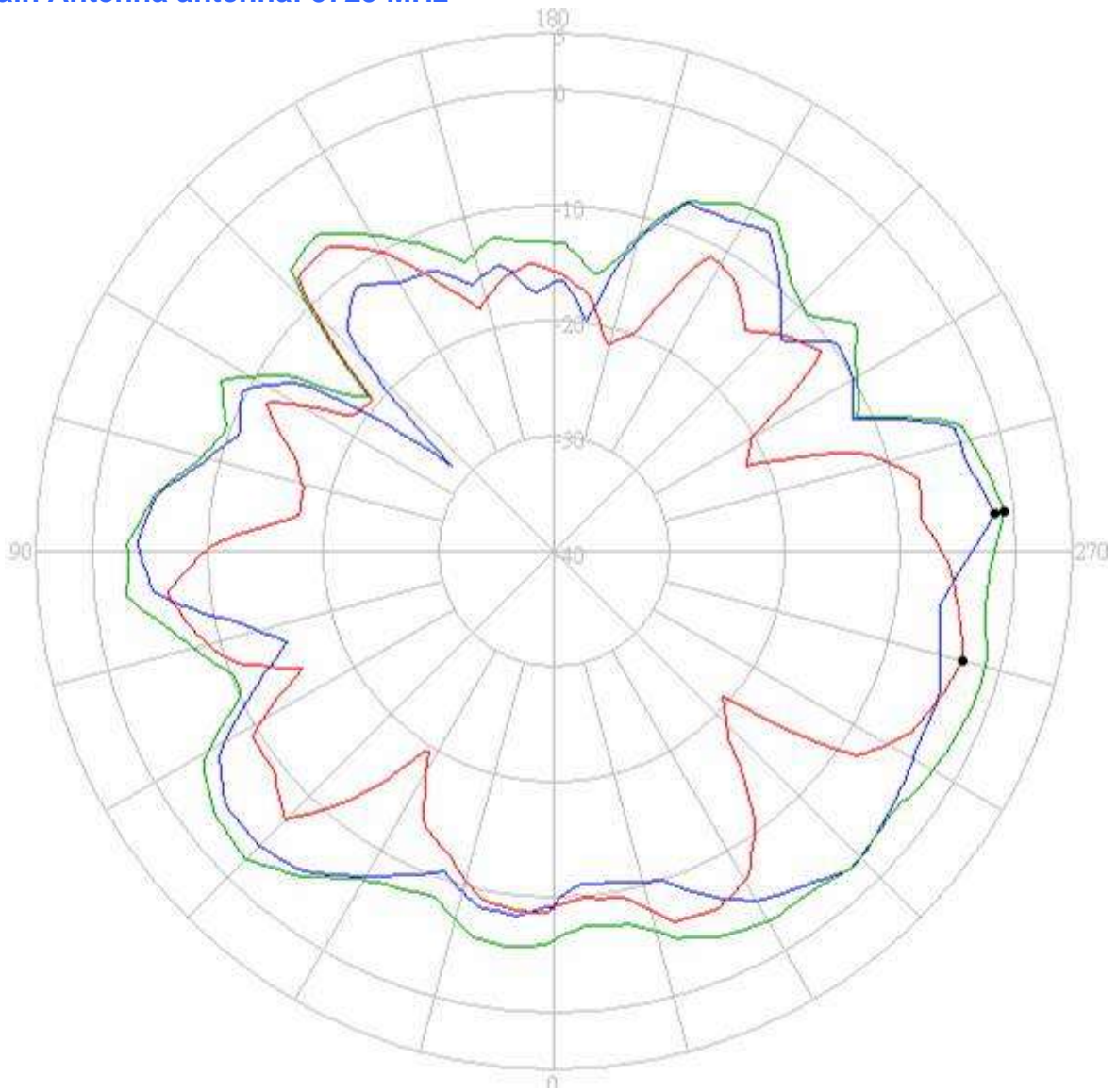
V

- Horizontal
- Vertical
- H + V

Center Frequency	<b>5600 MHz</b>
Horizontal (dBi) Peak	<b>-1.86</b>
Vertical (dBi) Peak	<b>-1.77</b>



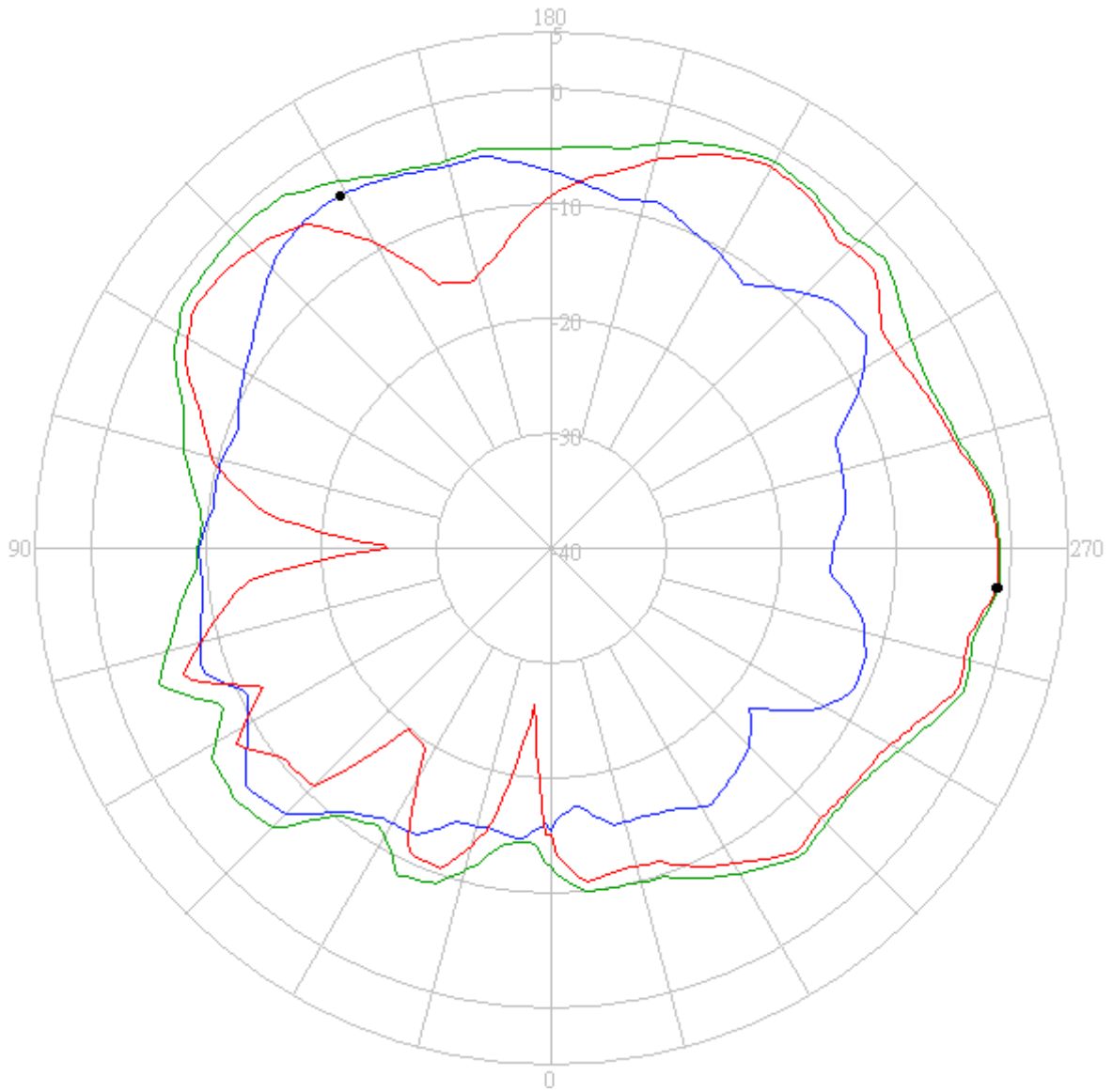
**WLAN\_Main Antenna antenna: 5725 MHz**



- Horizontal
- Vertical
- H + V

Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) Peak	<b>-1.59</b>
Vertical (dBi) Peak	<b>-3.30</b>

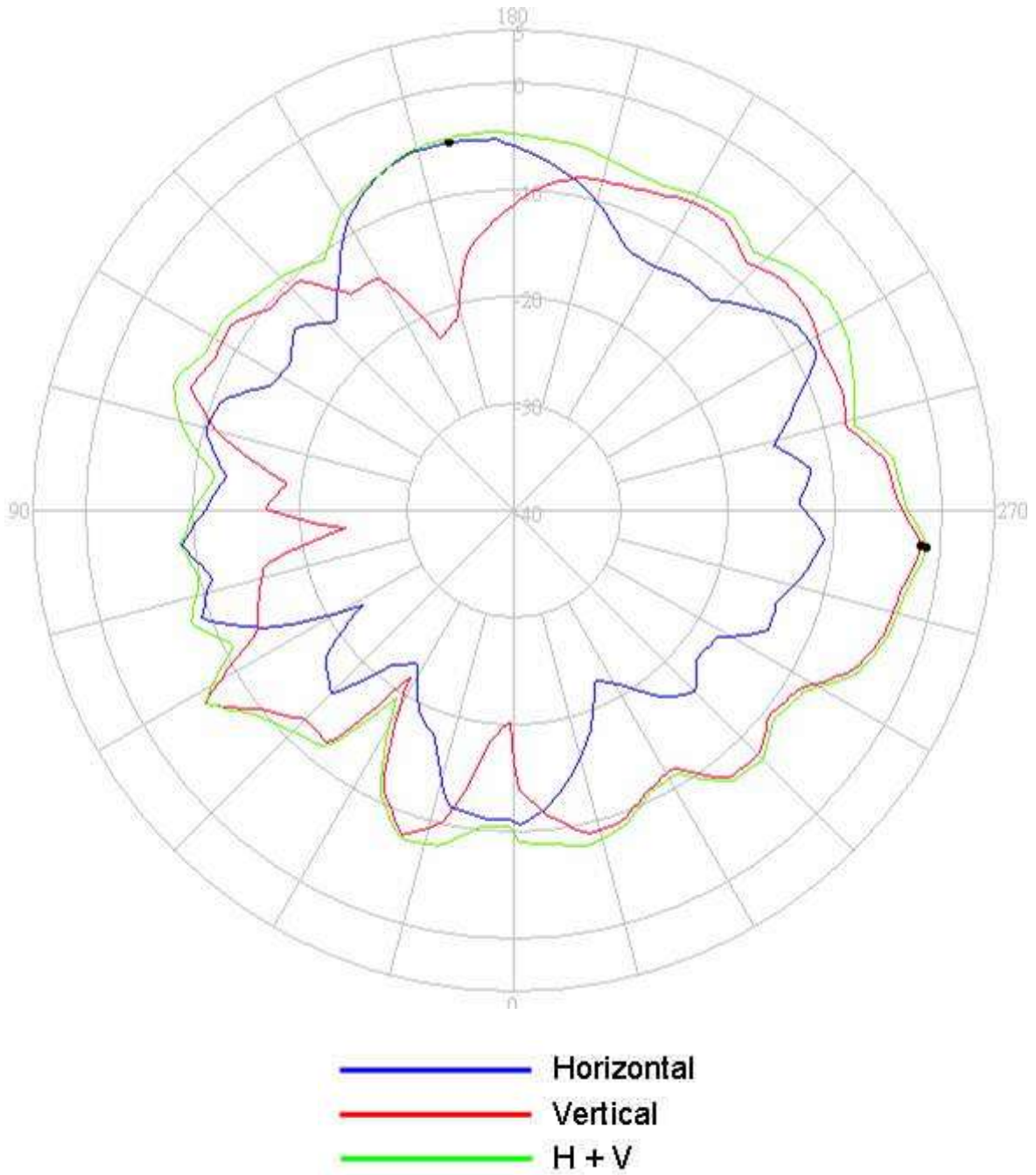
### WLAN\_Aux Antenna antenna: 5470 MHz



- Horizontal
- Vertical
- H + V

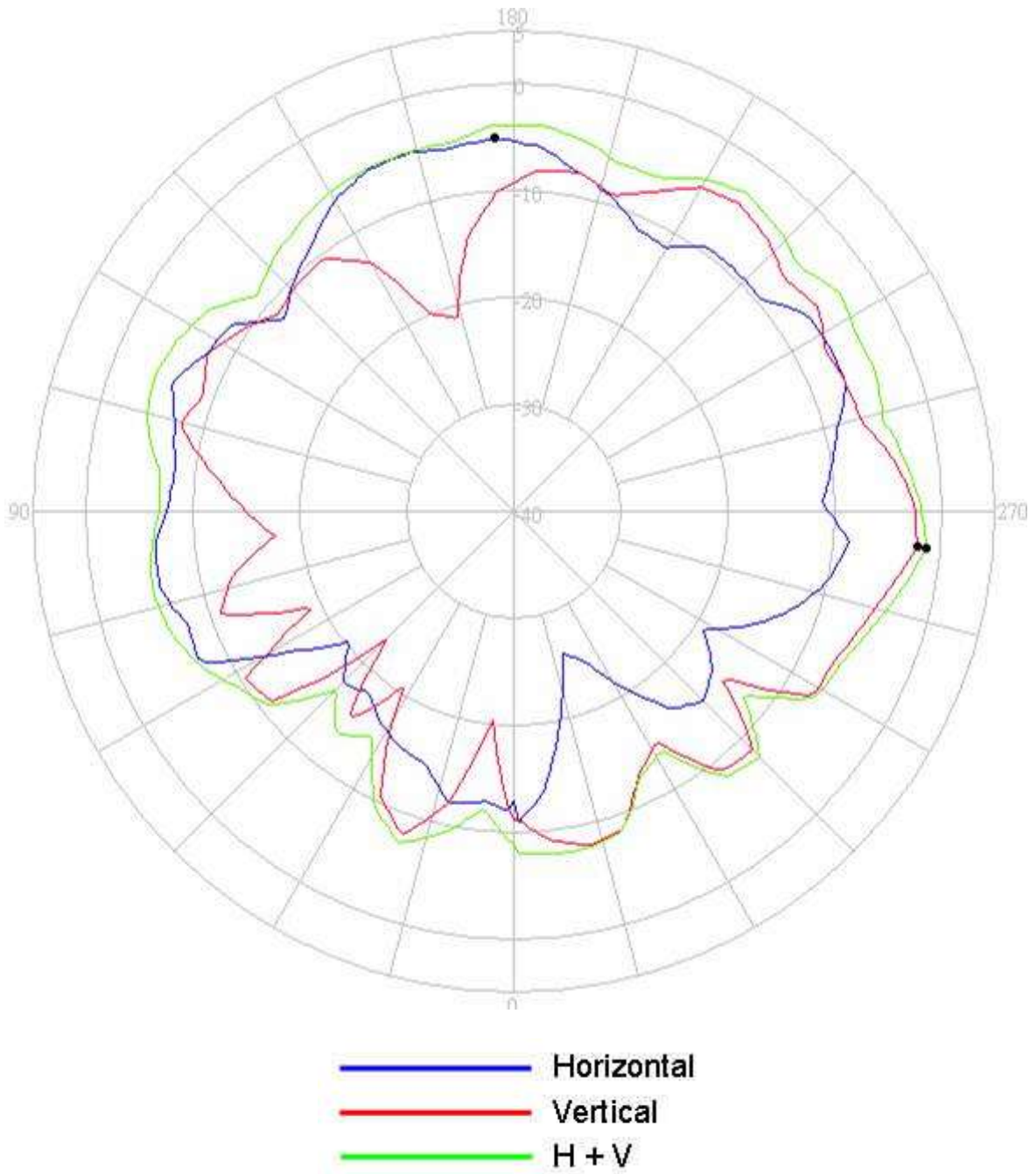
Center Frequency	5470 MHz
Horizontal (dBi) Peak	-4.21
Vertical (dBi) Peak	-1.03

### WLAN\_Aux Antenna antenna: 5600 MHz



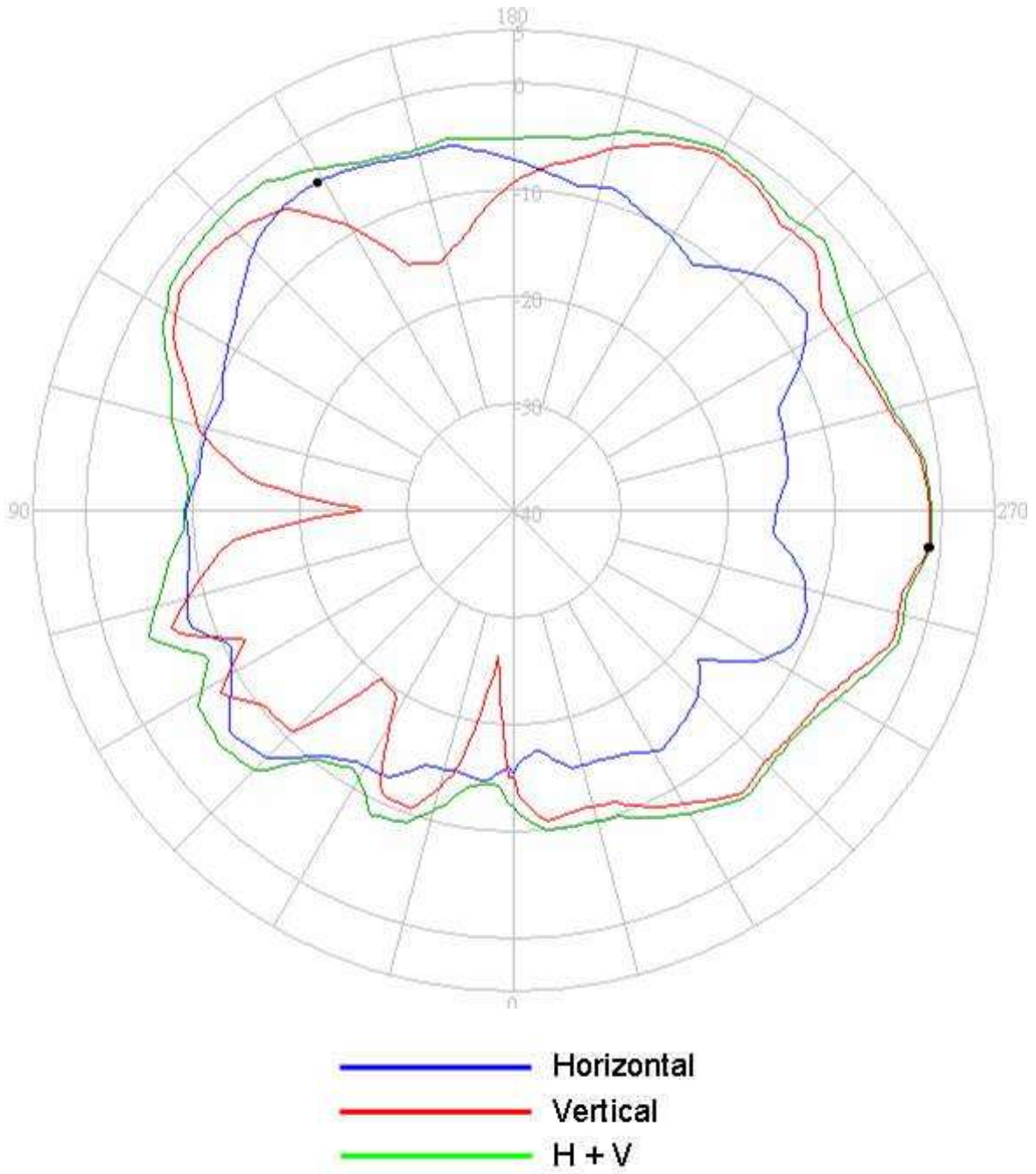
Center Frequency	5600 MHz
Horizontal (dBi) Peak	-4.01
Vertical (dBi) Peak	-0.69

**WLAN\_Aux Antenna antenna: 5725 MHz**



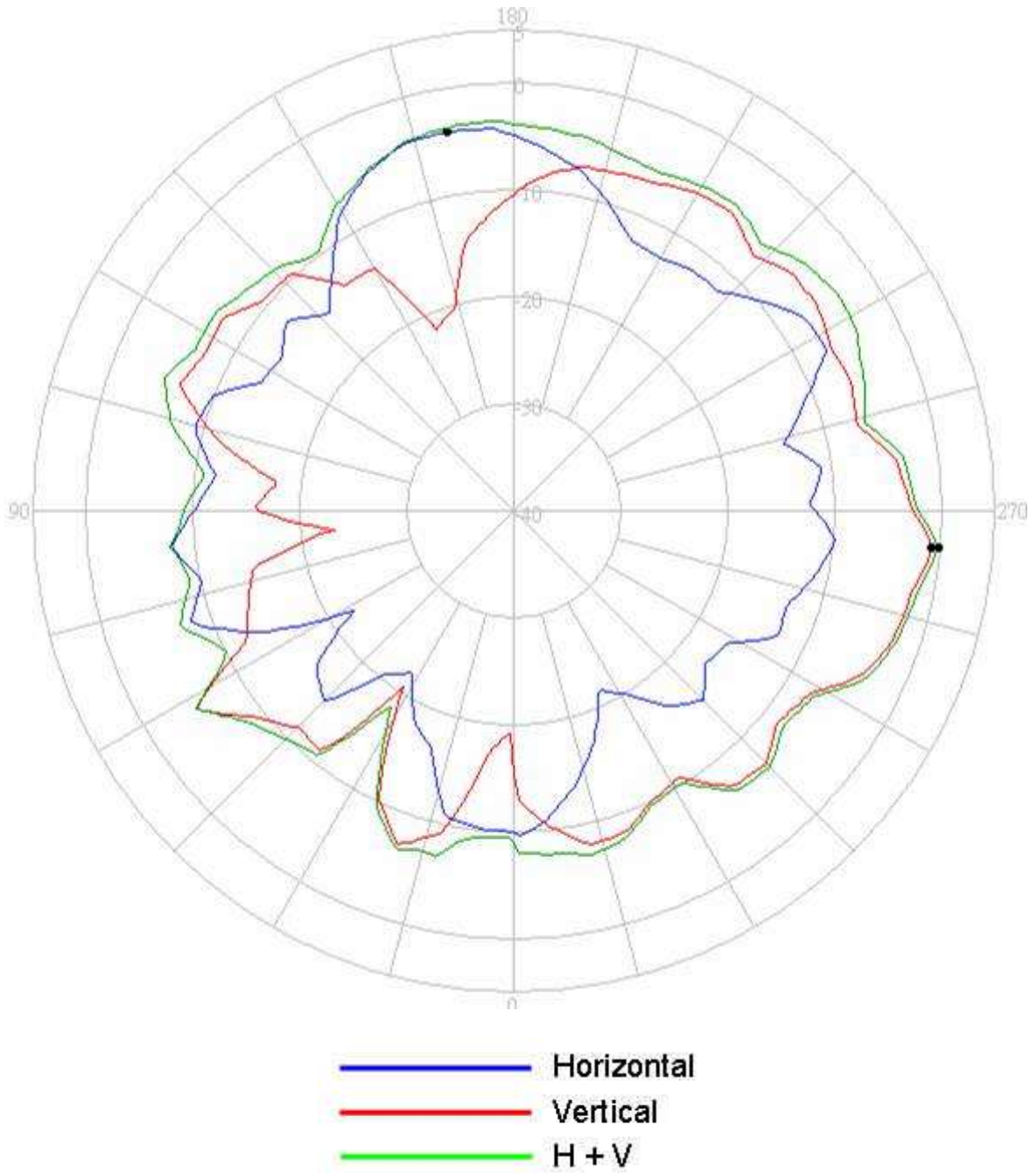
Center Frequency	5725 MHz
Horizontal (dBi) Peak	-4.02
Vertical (dBi) Peak	-1.12

**MIMO Antenna antenna: 5470 MHz**



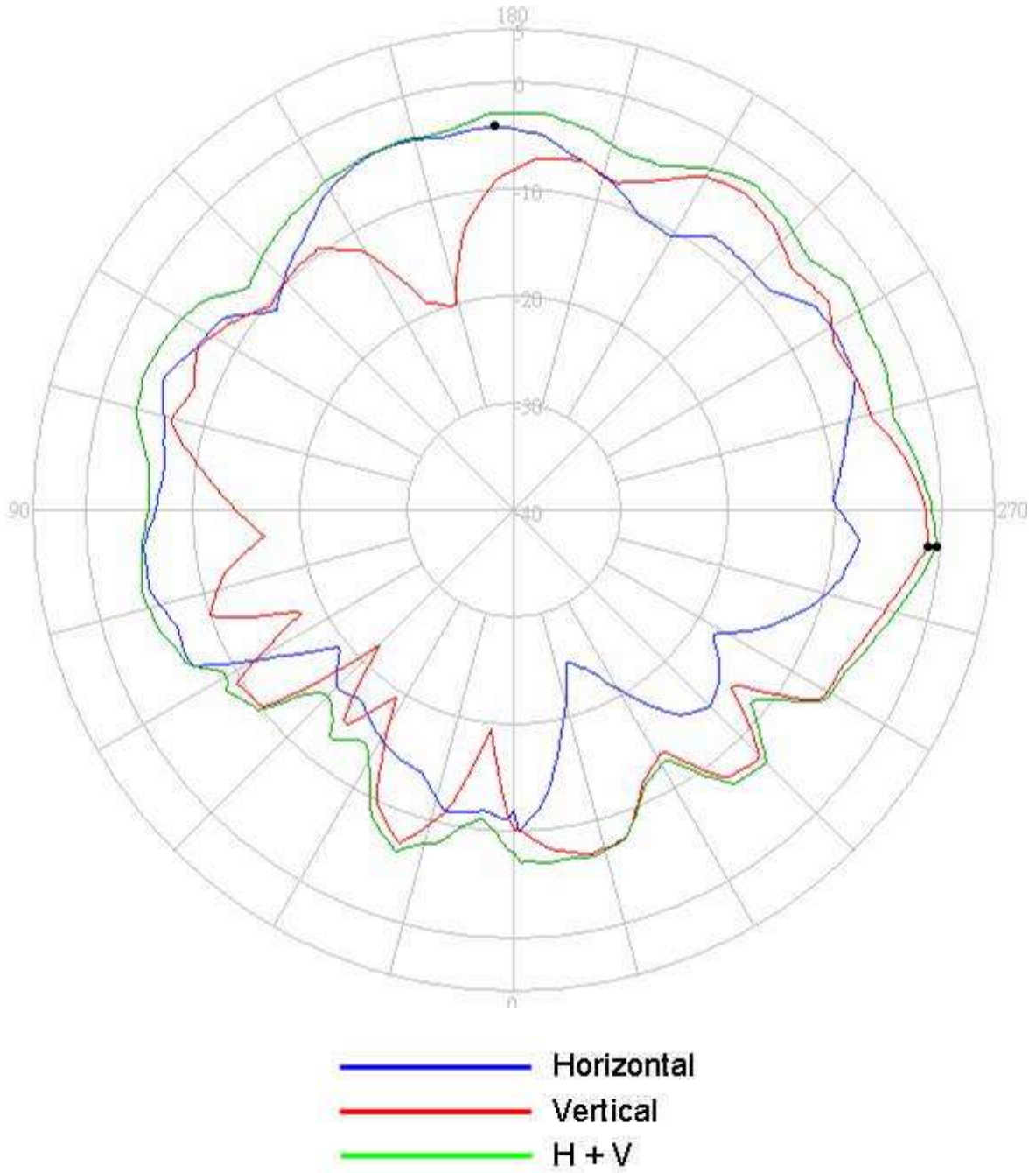
Center Frequency	<b>5470 MHz</b>
Horizontal (dBi) Peak	<b>-4.29</b>
Vertical (dBi) Peak	<b>-1.79</b>

**MIMO Antenna antenna: 5600 MHz**



Center Frequency	<b>5600 MHz</b>
Horizontal (dBi) Peak	<b>-4.84</b>
Vertical (dBi) Peak	<b>-1.50</b>

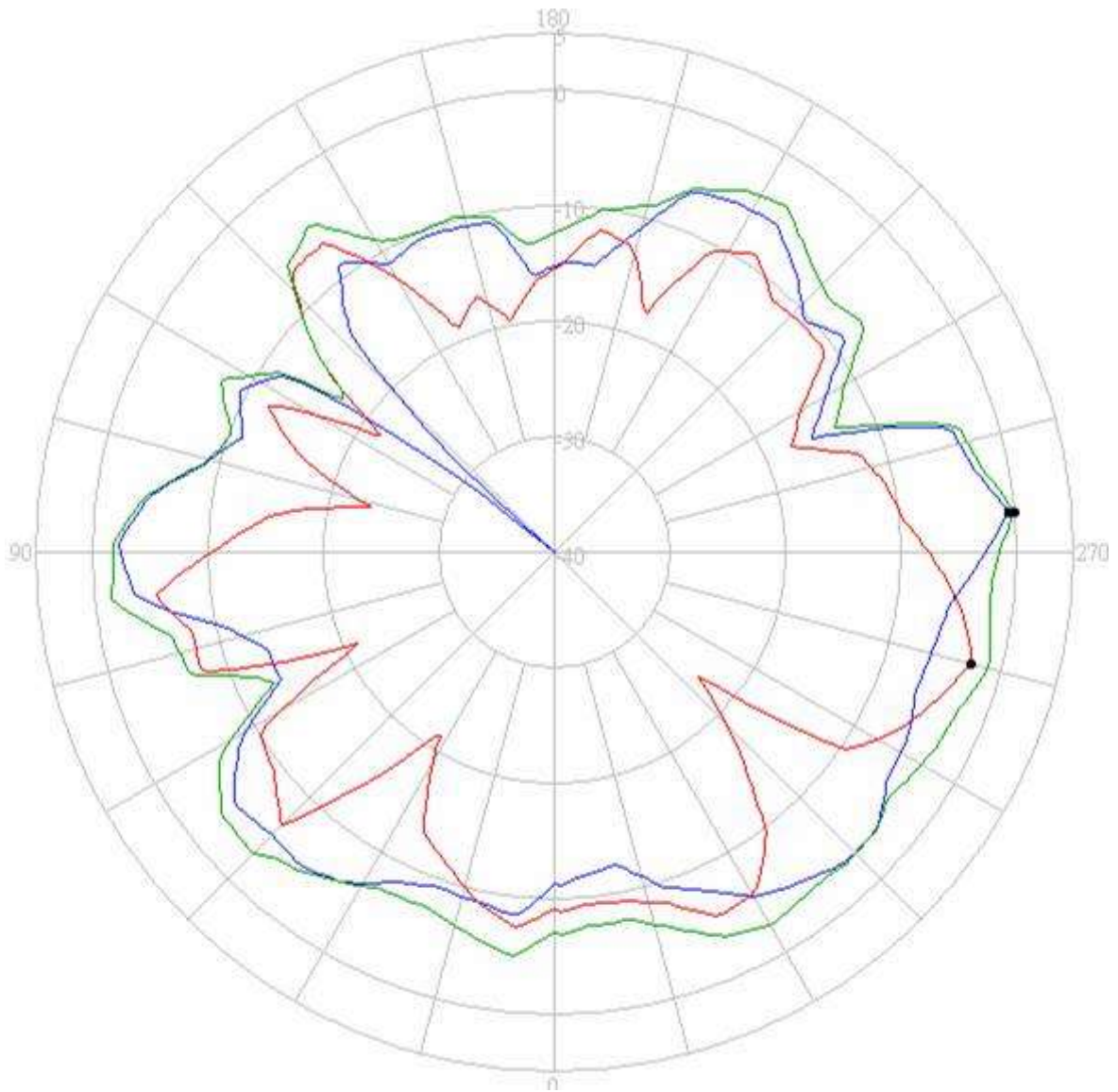
### MIMO Antenna antenna: 5725 MHz



Center Frequency	5725 MHz
Horizontal (dBi) Peak	-5.47
Vertical (dBi) Peak	-1.16

5725-5850 MHz radiation characteristic

WLAN\_Main Antenna antenna: 5725 MHz

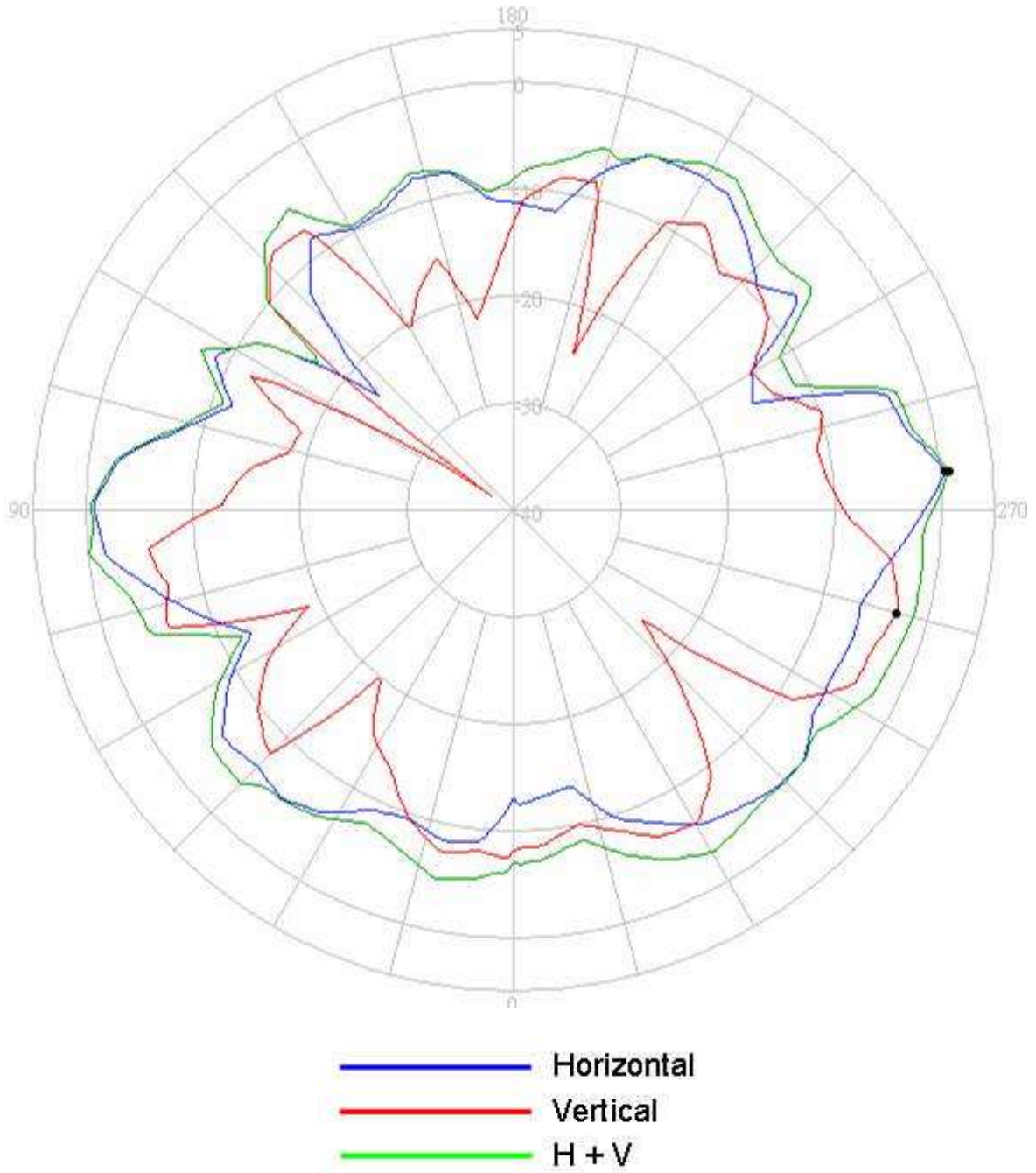


- Horizontal
- Vertical
- H + V

Center Frequency	5725 MHz
Horizontal (dBi) Peak	-1.59
Vertical (dBi) Peak	-3.30

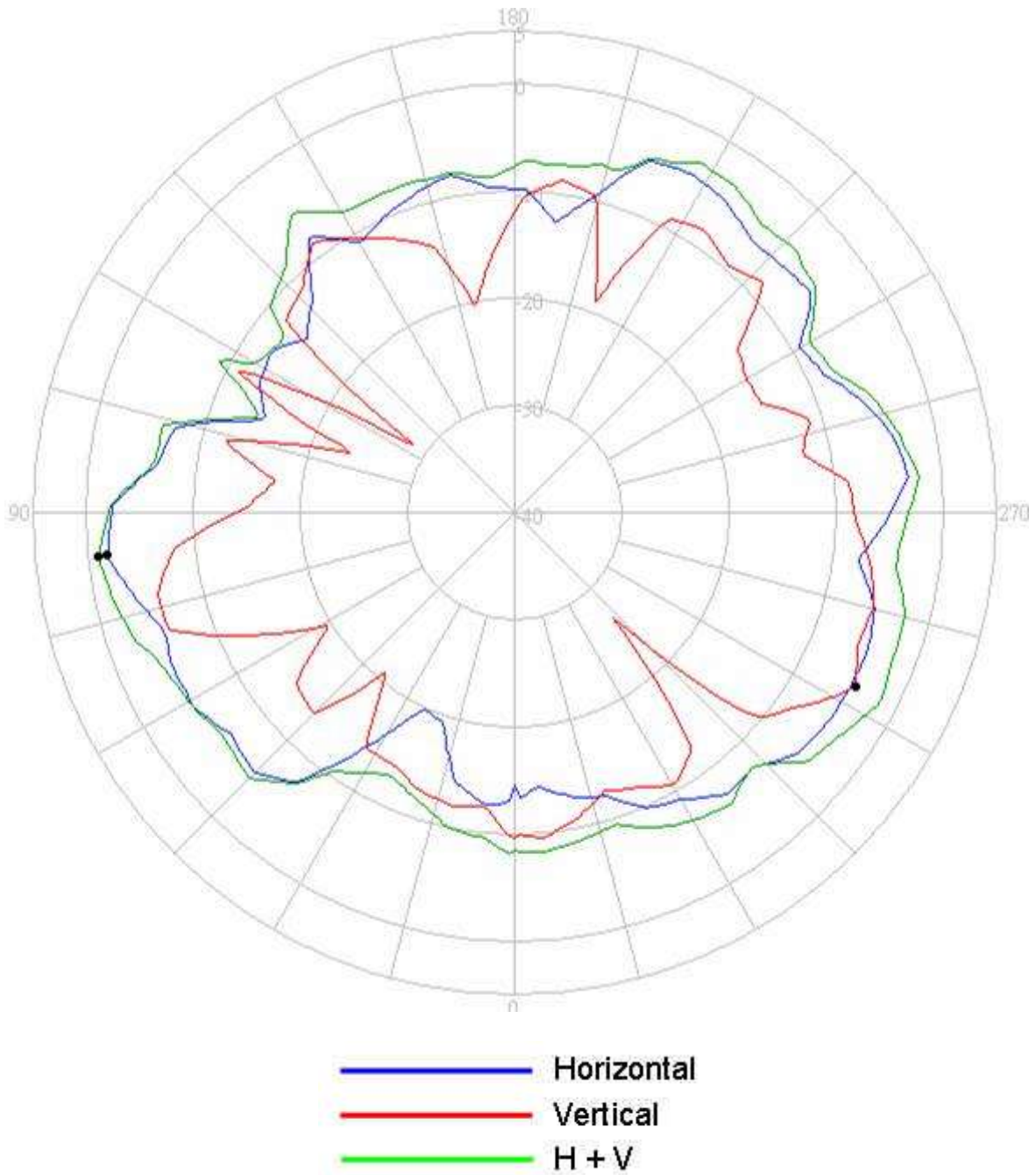


### WLAN\_Main Antenna antenna: 5785 MHz



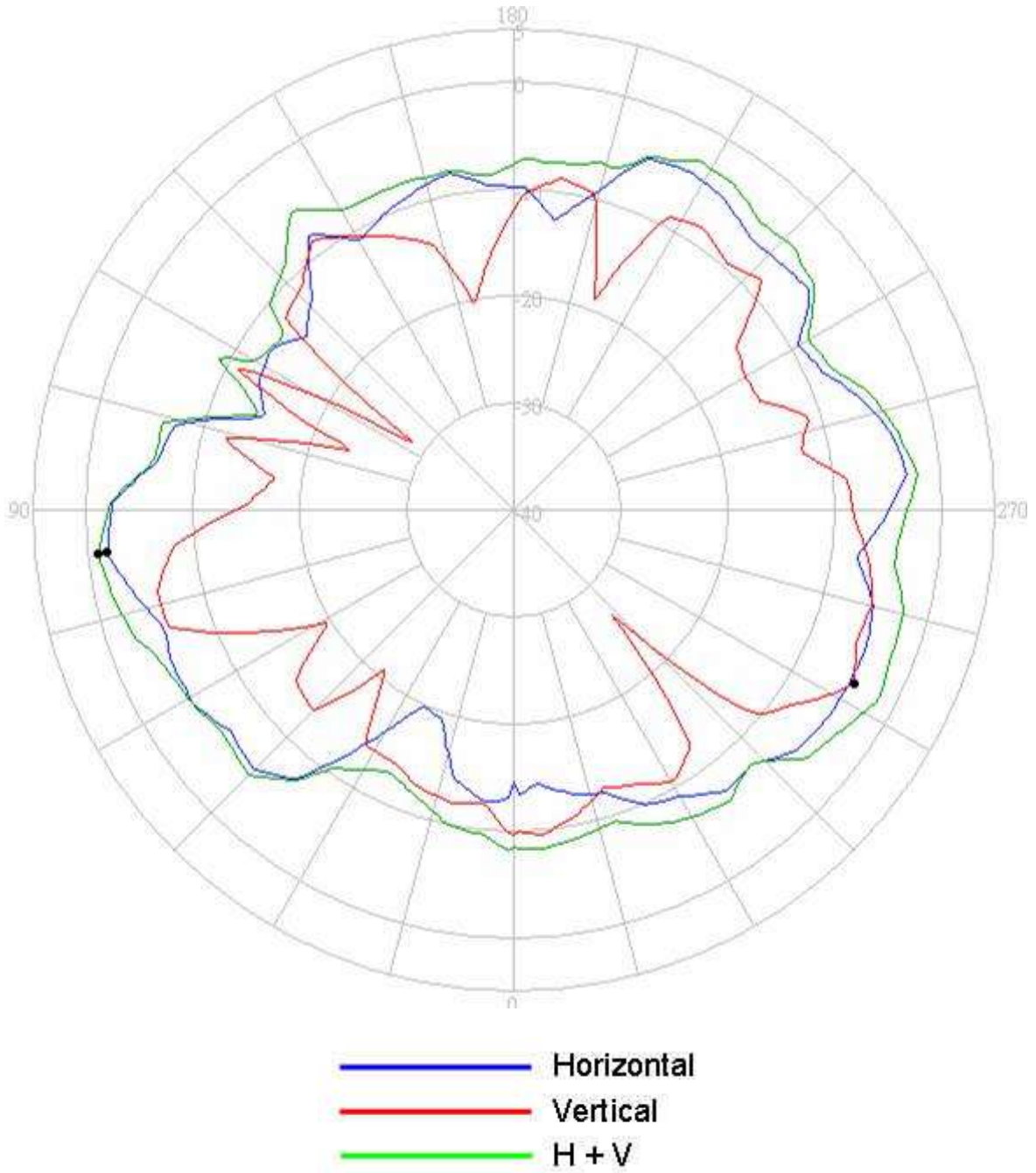
Center Frequency	5785 MHz
Horizontal (dBi) Peak	-0.47
Vertical (dBi) Peak	-2.60

### WLAN\_Main Antenna antenna: 5850 MHz



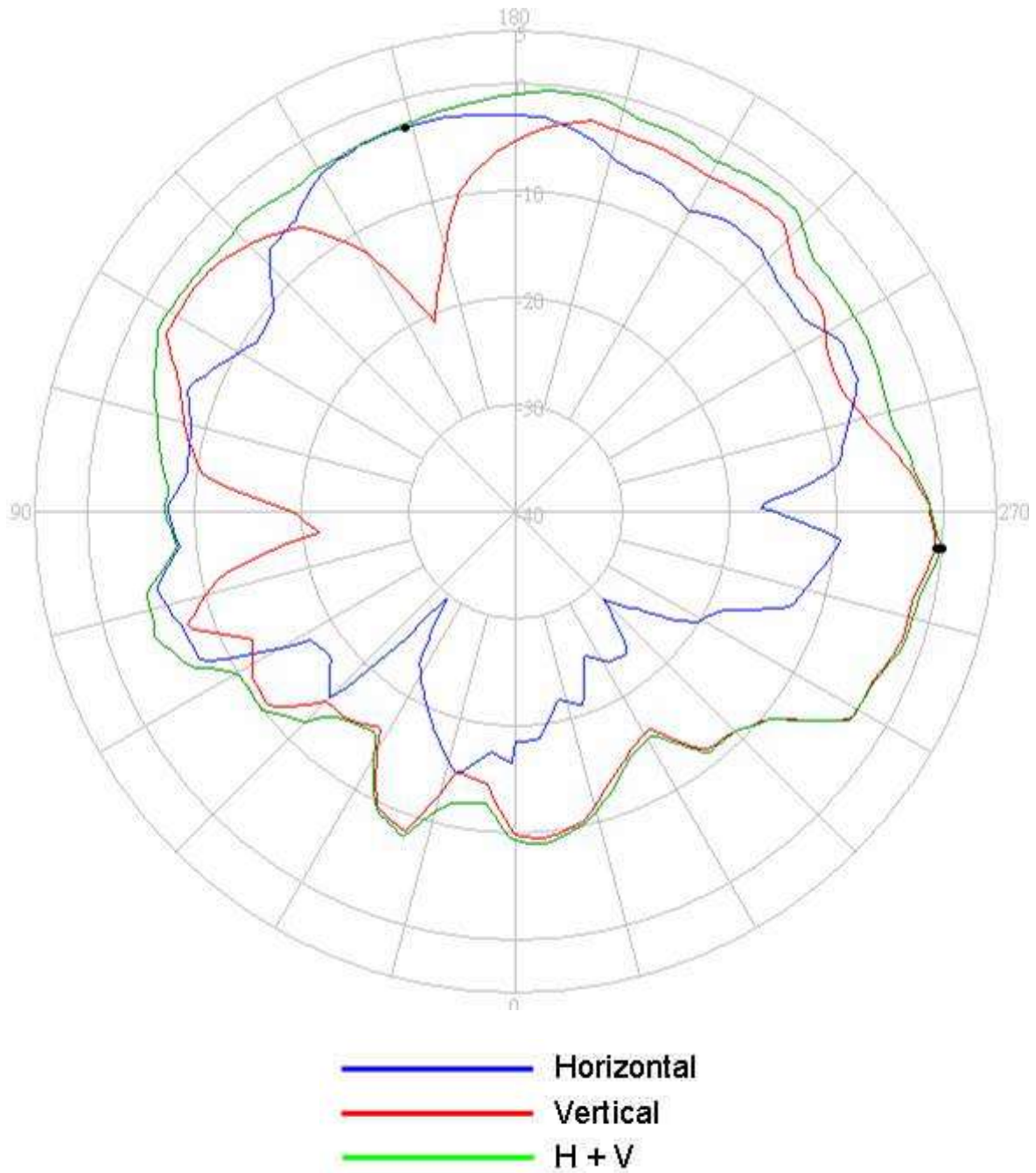
Center Frequency	5850 MHz
Horizontal (dBi) Peak	0.62
Vertical (dBi) Peak	-2.86

### WLAN\_Aux Antenna antenna: 5725 MHz



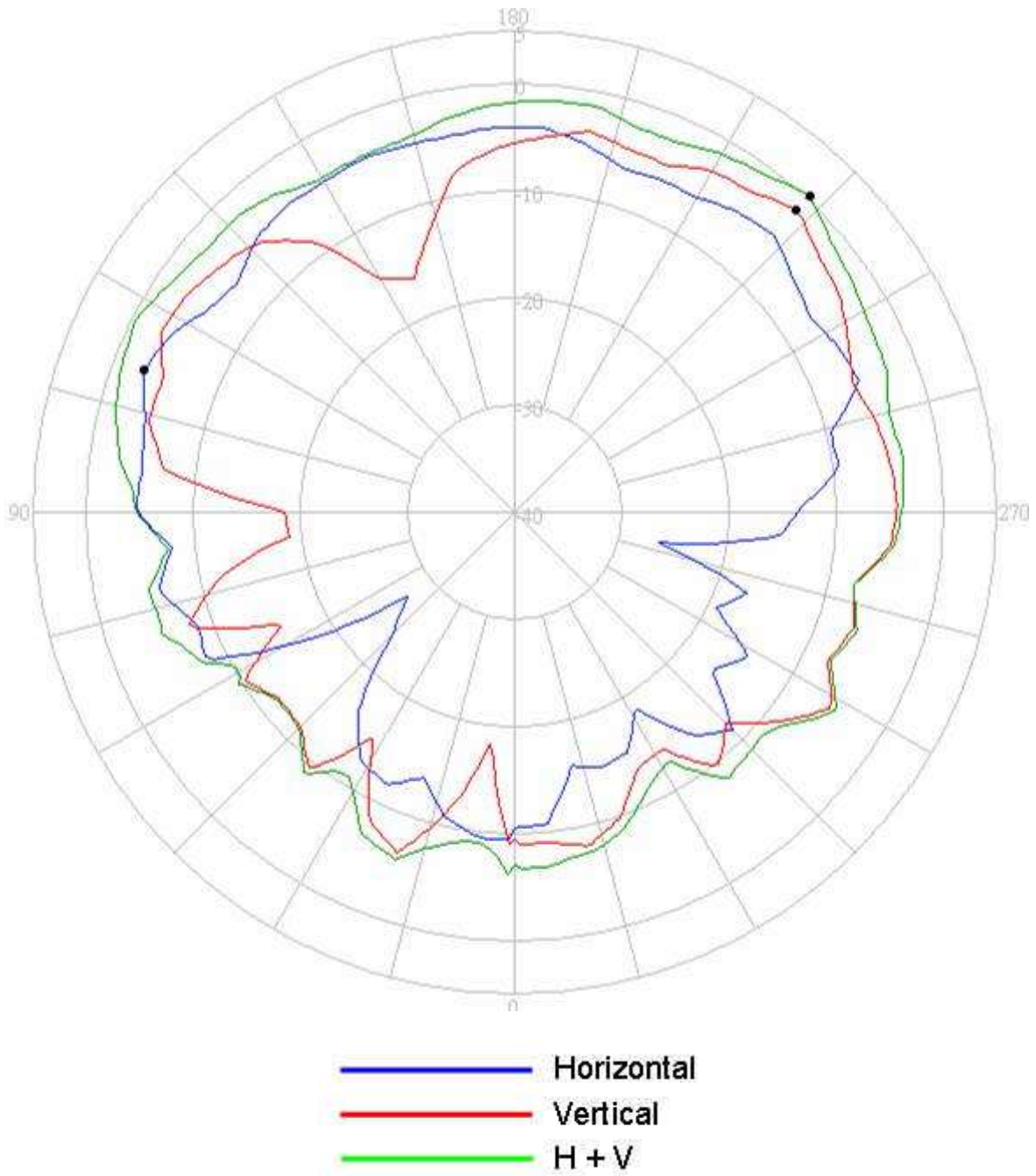
Center Frequency	5725 MHz
Horizontal (dBi) Peak	-4.02
Vertical (dBi) Peak	-1.12

**WLAN\_Aux Antenna antenna: 5785 MHz**



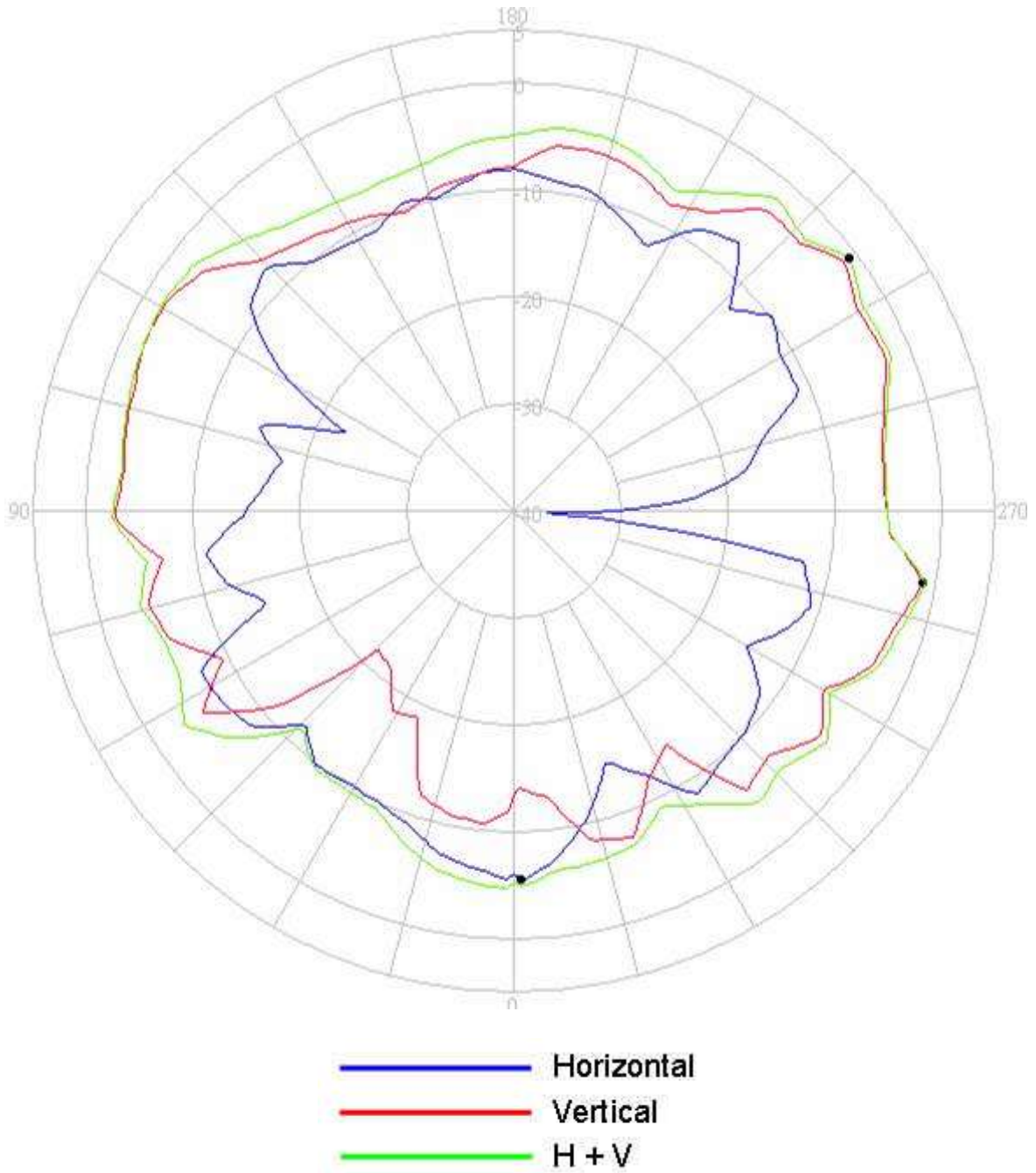
Center Frequency	5785 MHz
Horizontal (dBi) Peak	-2.53
Vertical (dBi) Peak	-0.50

**WLAN\_Aux Antenna antenna: 5850 MHz**



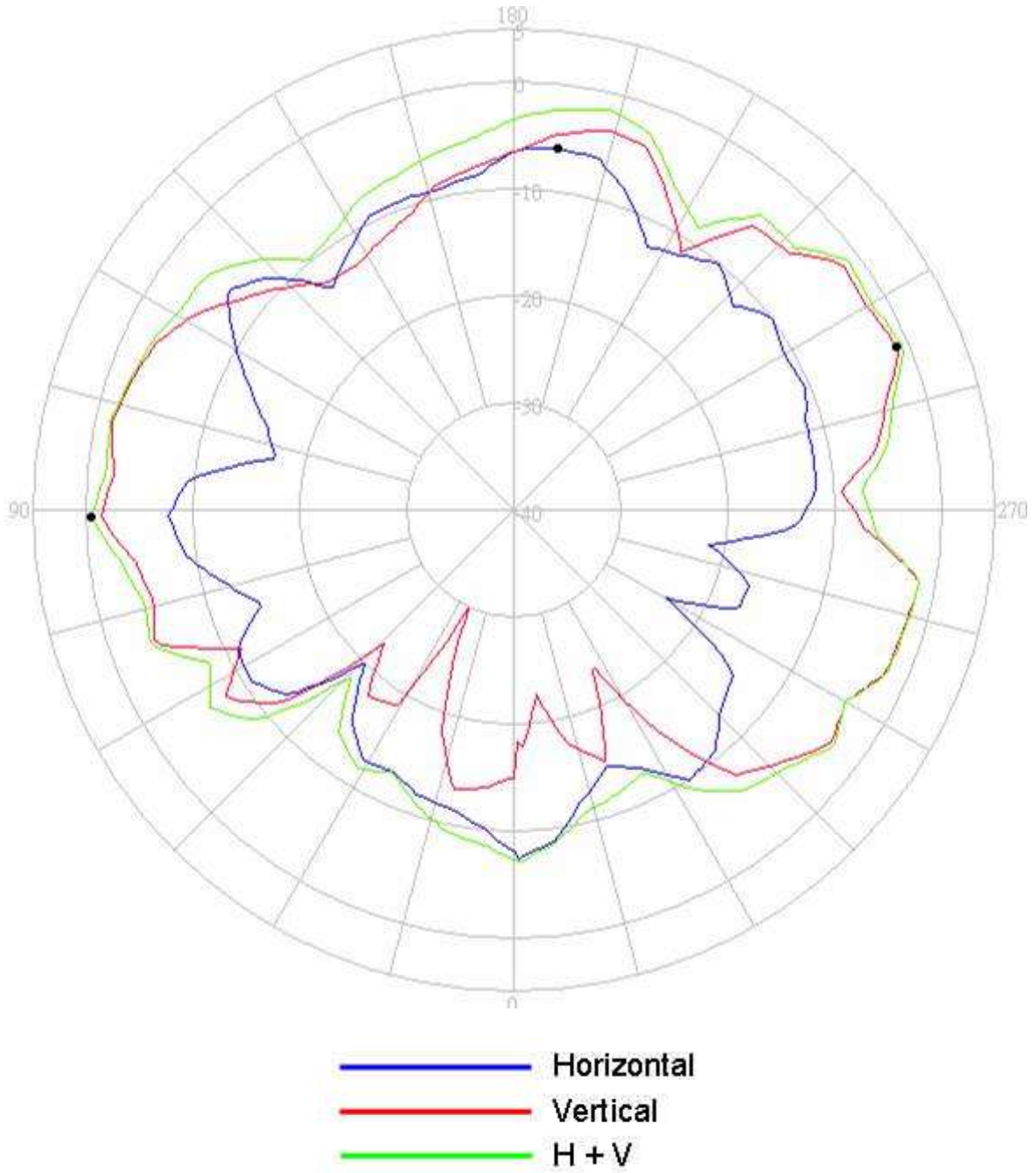
Center Frequency	<b>5850 MHz</b>
Horizontal (dBi) Peak	<b>-2.93</b>
Vertical (dBi) Peak	<b>-1.37</b>

**MIMO Antenna antenna: 5725 MHz**

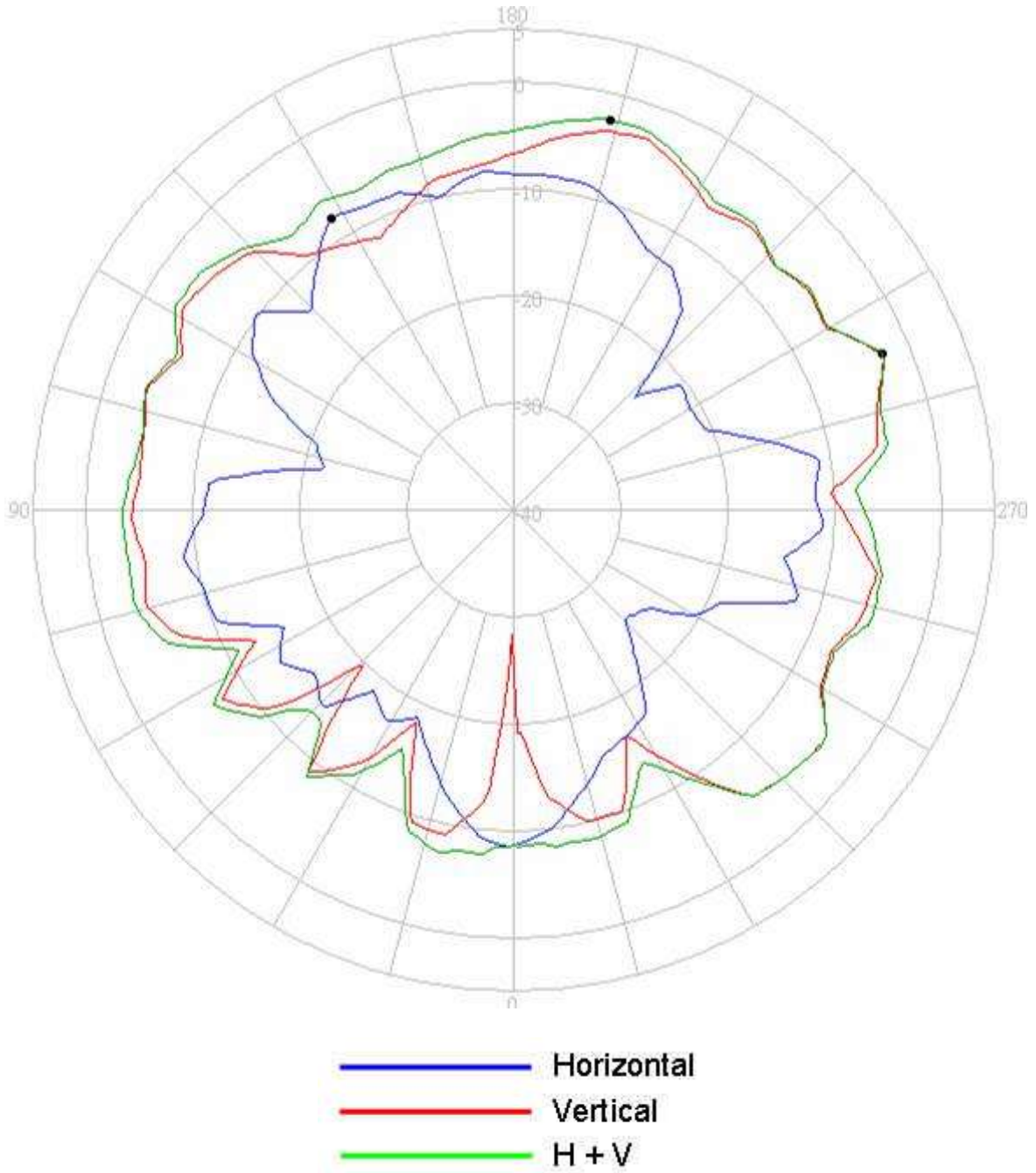


Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) Peak	<b>-5.47</b>
Vertical (dBi) Peak	<b>-1.16</b>

### MIMO Antenna antenna: 5785 MHz



### MIMO Antenna antenna: 5850 MHz



Center Frequency	5850 MHz
Horizontal (dBi) Peak	-7.80
Vertical (dBi) Peak	-2.62



## Section 4. Host Platform Information

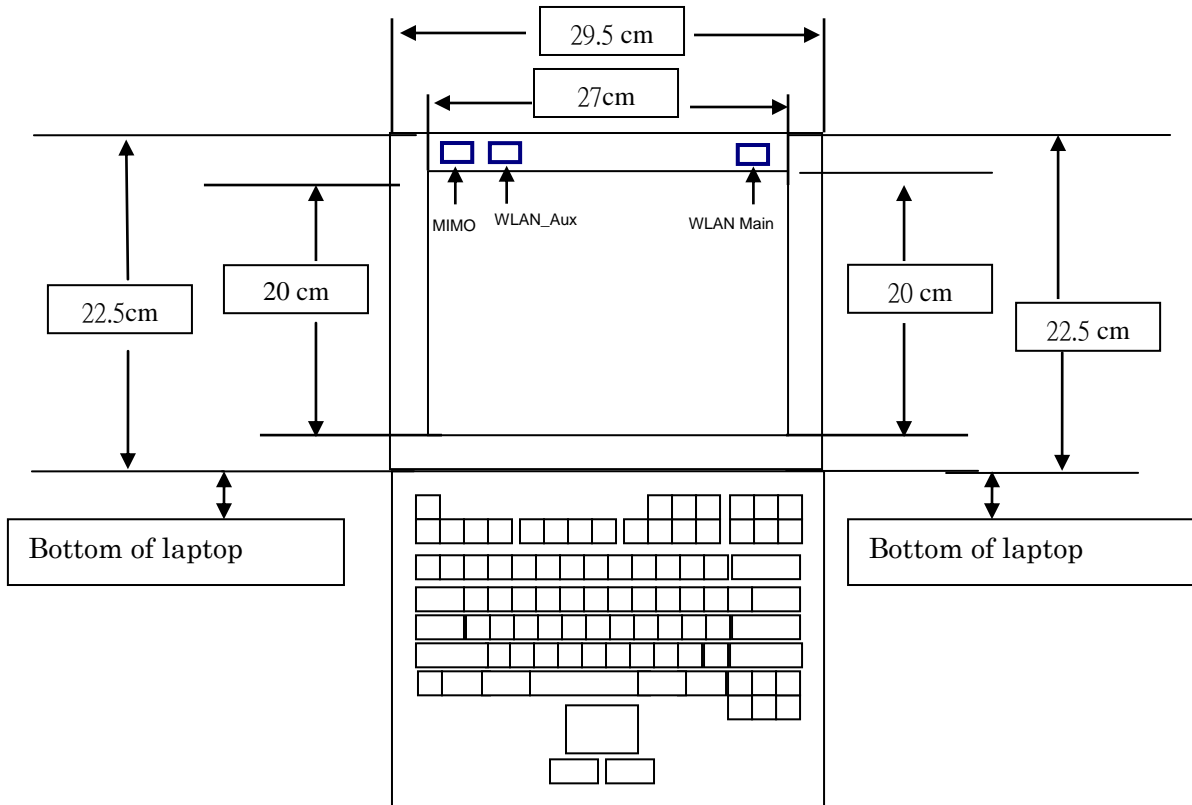
OEM / ODM Host platform: AMG (Tablet Mode) platform correlated to antenna data

Rating Label Photo:

## Section 5. Antenna Host Platform Location Information

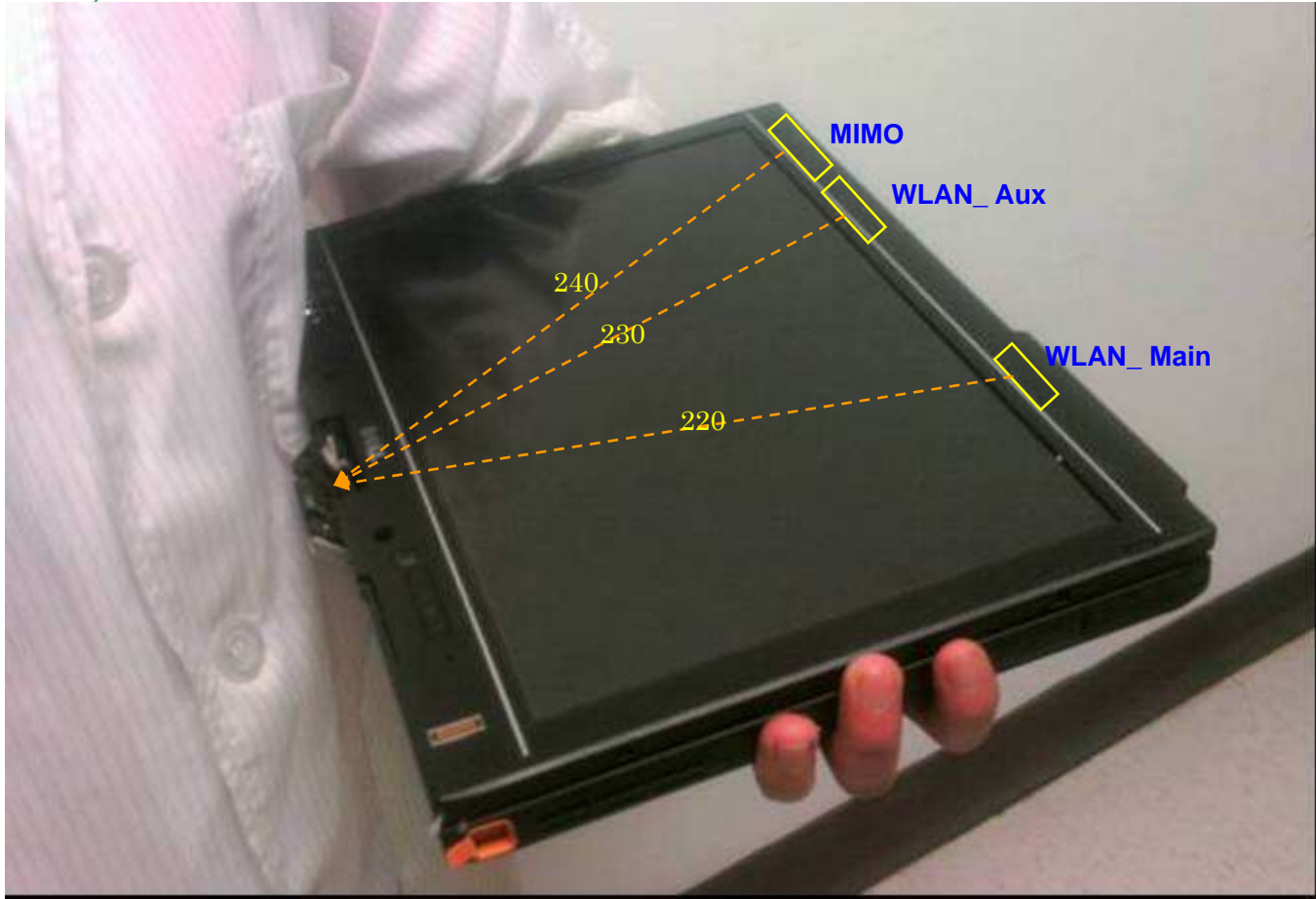
Include a **dimensioned photo** or **dimensioned drawing** of WLAN\_Main Antenna, WLAN\_Aux Antenna and MIMO Antenna placements (measurements are not required for receive-only antenna).

Any antenna that transmits must show dimensions to bottom of laptop.



## Section 6. Antenna dimensional information for SAR evaluation

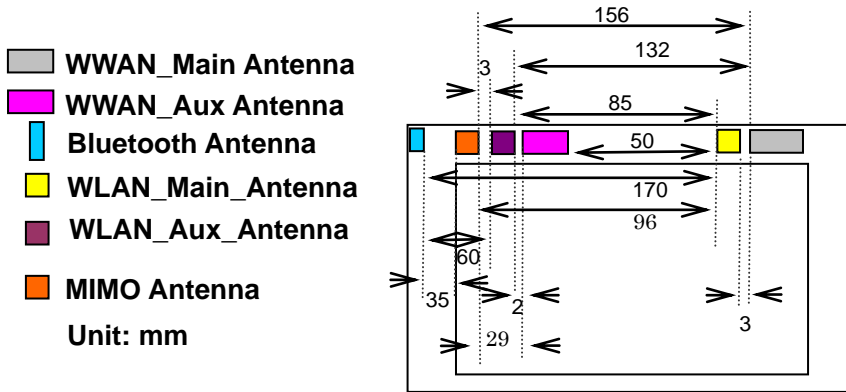
Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between the transmit antennas and the user (excluding hands, wrist, feet, lap/ thigh, and ankle)



## Section 7. Diagram Example of Co-Location Antenna Separation

Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between all WLAN transmit antennas and other co-located radiator transmit antenna such as Bluetooth, WWAN,..

(Note: Due to the evolving rules regarding co-location, each platform will need to be reviewed on a case by case basis)



## Section 8. Local representative contact information

Local representative contact information is required for regulatory support for target countries below.

	Local company name	Contact name	Phone number	FAX Number	e-Mail Address	Notes
Argentina						
Brazil						
Indonesia						
Israel						
Malaysia						
Mexico						
Singapore						Telecommunication Equipment Dealer License Required
South Africa						
USA, Canada						