

# Regulatory WLAN Antenna Information 2.45/5GHz Multiple Band Antennas with Cable & Connector For IEEE802.11b/g/a, UNII

(English Language Required for Intel Regulatory Review / Approval)

<b>Platform</b>	
Platform Owner	HP
Brand Name	HP
Model Name	GALILEO
ODM	Inventec
Target Launch Date	(YYYY/ MM/ DD)
<b>Antenna</b>	
Owner (Check Box)	<input checked="" type="checkbox"/> Manufacturer
	<input type="checkbox"/> Customer
Brand Name	
Part Number	<input checked="" type="checkbox"/> Tx1 Antenna: CAN4313671012501B
	<input checked="" type="checkbox"/> Tx2 Antenna: CAN4313671022501B
	<input type="checkbox"/> Tx3 (or Rx3) Antenna:
<b>Module</b>	
With WLAN Module	<input type="checkbox"/> WM3B2200BG
(Check Box)	<input type="checkbox"/> WM3B2915ABG
	<input type="checkbox"/> WM3945ABG
	<input type="checkbox"/> 4965AGN

## 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	Tx1, Tx2 & Tx3 antenna (Peak Gain W/ cable loss) *	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Tx1, Tx2 & Tx3 antenna (Peak Gain only) *	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Tx1, Tx2 & Tx3 antenna (Cable loss W/ connector) *	Required	Required	Required	Required	Required
2	Dimensioned Photographs and Drawings of Tx1, Tx2, and Tx3 (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 photographs of antennas for approval submission). Taiwan requires pictures of each antenna type shown in the system.	Required	Required	Desired	Required (Photos)	Required (Photos)
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 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: CAN4313 671 012501B Tx1 Antenna	Yageo Corporation	PIFA	Connector: (Hirose U.FL-LP) (Iplex MHF) 50 ohm Coaxial. Length: 385mm diameter: 1.37mm	2400-2500MHz 2.09 dBi (peak)	2400-2500MHz 3.11 dBi (peak)	2400-2500MHz 1.70 max	2400-2500MHz 1.02 dBi (peak)
				5150-5350MHz 2.45 dBi (peak)	5150-5350MHz 4.01 dBi (peak)	5150-5350MHz 1.54 max	5150-5350MHz 1.56 dBi (peak)
				5470-5725MHz 2.37 dBi (peak)	5350-5725MHz 3.99 dBi (peak)	5470-5725MHz 1.54 max	5470-5725MHz 1.62 dBi (peak)
				5725-5850MHz 2.30 dBi (peak)	5725-5850MHz 3.94 dBi (peak)	5725-5850MHz 1.54 max	5725-5850MHz 1.64 dBi (peak)
P/N: CAN4313 671 022501B Tx2 Antenna	Yageo Corporation	PIFA	Connector: (Hirose U.FL-LP) (Iplex MHF) 50 ohm Coaxial. Length: 550mm diameter: 1.37mm	2400-2500MHz 0.75 dBi (peak)	2400-2500MHz 2.21 dBi (peak)	2400-2500MHz 1.70 max	2400-2500MHz 1.46 dBi (peak)
				5150-5350MHz 1.78 dBi (peak)	5150-5350MHz 4.01 dBi (peak)	5150-5350MHz 1.54 max	5150-5350MHz 2.23 dBi (peak)
				5470-5725MHz 2.86 dBi (peak)	5470-5725MHz 5.18 dBi (peak)	5470-5725MHz 1.54 max	5470-5725MHz 2.32 dBi (peak)
				5725-5850MHz 1.43 dBi (peak)	5725-5850MHz 3.78 dBi (peak)	5725-5850MHz 1.54 max	5725-5850MHz 2.35 dBi (peak)

#### NOTE:d

(1) 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:

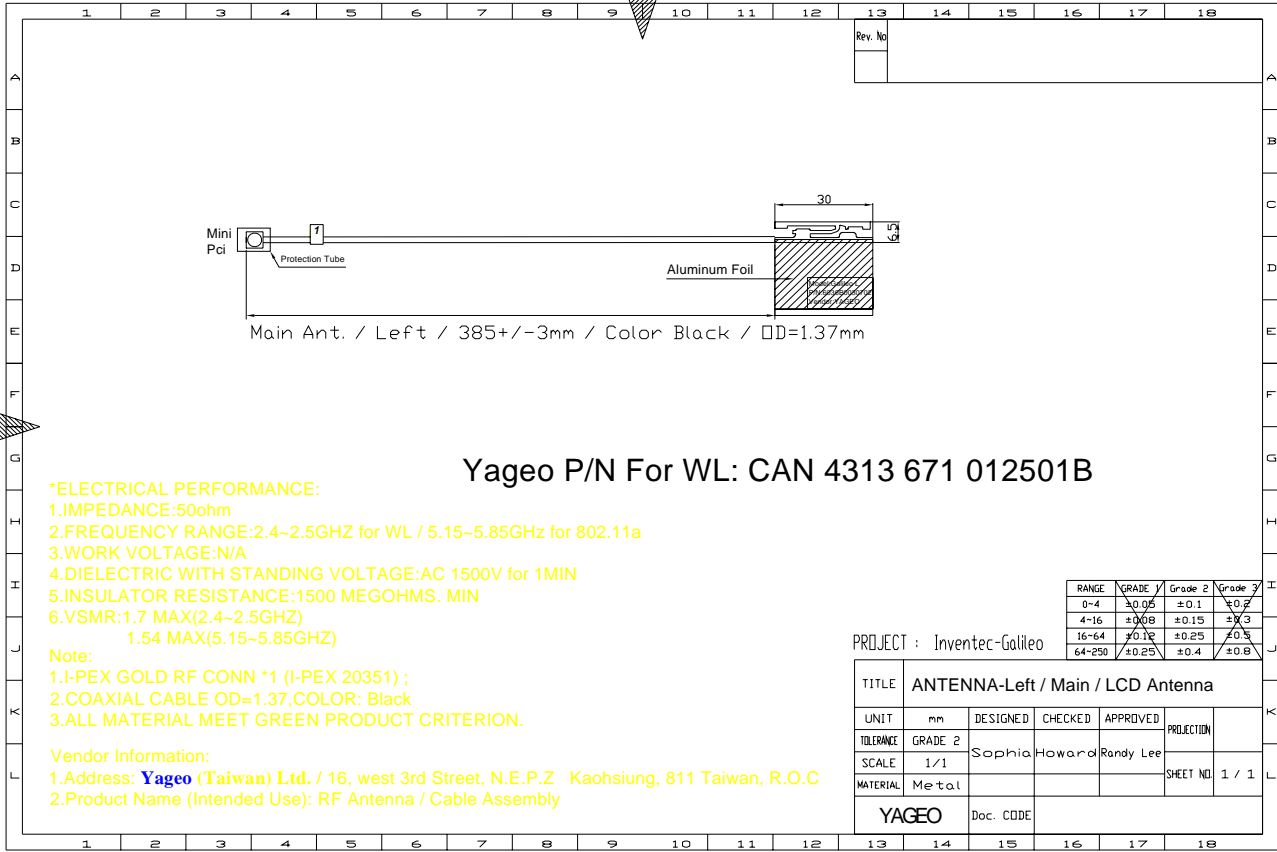
Frequency (MHz)	Tx1 antenna			Tx2 antenna			Tx3 (or Rx3) Antenna		
	Horizontal (dBi)	Vertical (dBi)	H+V (dBi)	Horizontal (dBi)	Vertical (dBi)	H+V (dBi)	Horizontal (dBi)	Vertical (dBi)	H+V (dBi)
2400	0.43	-0.95	1.41	0.65	0.56	2.47			
2450	1.67	-0.94	2.5	0.75	-0.85	2.62			
2500	2.09	-0.19	2.75	0.71	-1.09	2.84			
5150	-1.67	2.45	2.53	-2.68	0.68	0.9			
5250	-1.14	1.26	1.26	-2.75	0.81	1.37			
5350	-1.21	1.1	1.27	-2.11	1.78	2.14			
5470	-0.99	1.12	1.95	-1.8	2.18	2.75			
5600	-0.15	2.37	3.12	-1.67	2.86	3.54			
5725	-1.51	1.02	1.71	-1.26	0.3	0.69			
5785	-0.33	2.3	2.55	-1.22	1.43	1.78			
5850	0.11	2.13	2.31	-1.1	-0.45	0.97			

- 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.

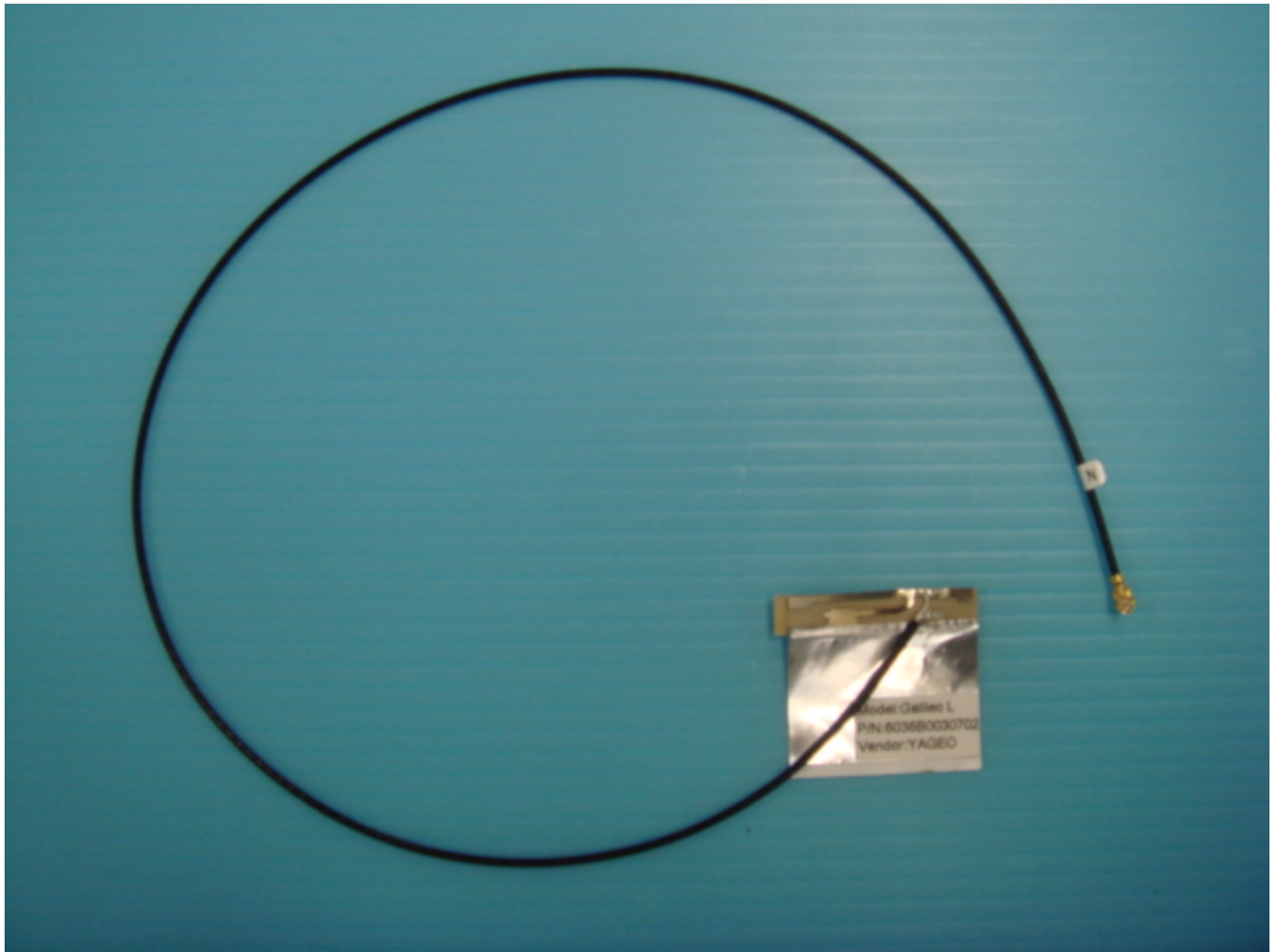
## Section 2. Dimensioned Photos or Drawings of Antennas

### Tx1 Antenna Dimensioned Drawing:

This drawing is property of SEC. Use or copy of this drawing without proper permission of the appropriate technical-document managing department is prohibited.

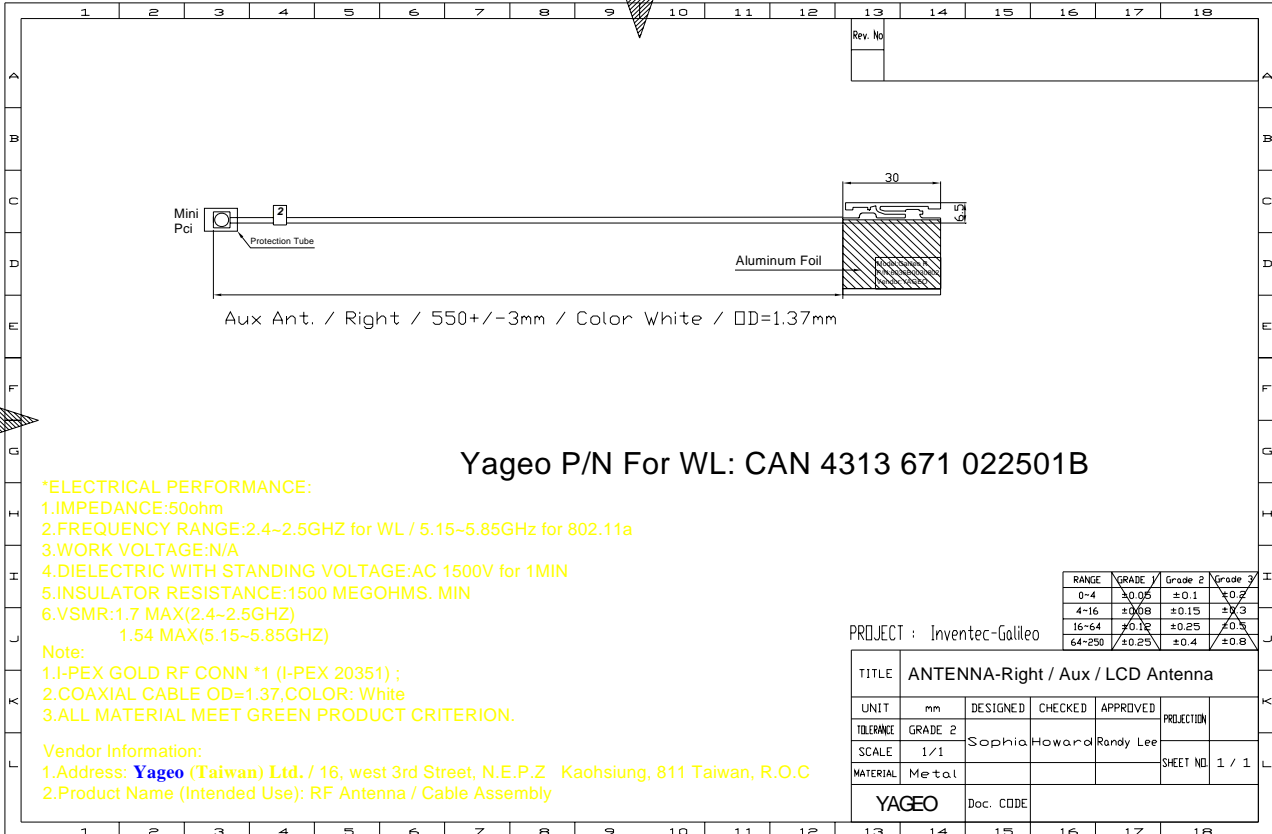


**Tx1 Antenna Photo:**



**Tx2 Antenna Dimensioned Drawing:**

This drawing is property of SEC. Use or copy of this drawing without proper permission of the appropriate technical-document managing department is prohibited.



**Yageo P/N For WL: CAN 4313 671 022501B**

**\*ELECTRICAL PERFORMANCE:**

- 1.IMPEDANCE:50ohm
- 2.FREQUENCY RANGE:2.4~2.5GHZ for WL / 5.15~5.85GHZ for 802.11a
- 3.WORK VOLTAGE:N/A
- 4.DIELECTRIC WITH STANDING VOLTAGE:AC 1500V for 1MIN
- 5.INSULATOR RESISTANCE:1500 MEGOHMS. MIN
- 6.VSMR:1.7 MAX(2.4~2.5GHZ)  
1.54 MAX(5.15~5.85GHZ)

**Note:**

- 1.I-PEX GOLD RF CONN \*1 (I-PEX 20351) ;
- 2.COAXIAL CABLE OD=1.37,COLOR: White
- 3.ALL MATERIAL MEET GREEN PRODUCT CRITERION.

**Vendor Information:**

- 1.Address: **Yageo (Taiwan) Ltd.** / 16, west 3rd Street, N.E.P.Z Kaohsiung, 811 Taiwan, R.O.C
- 2.Product Name (Intended Use): RF Antenna / Cable Assembly

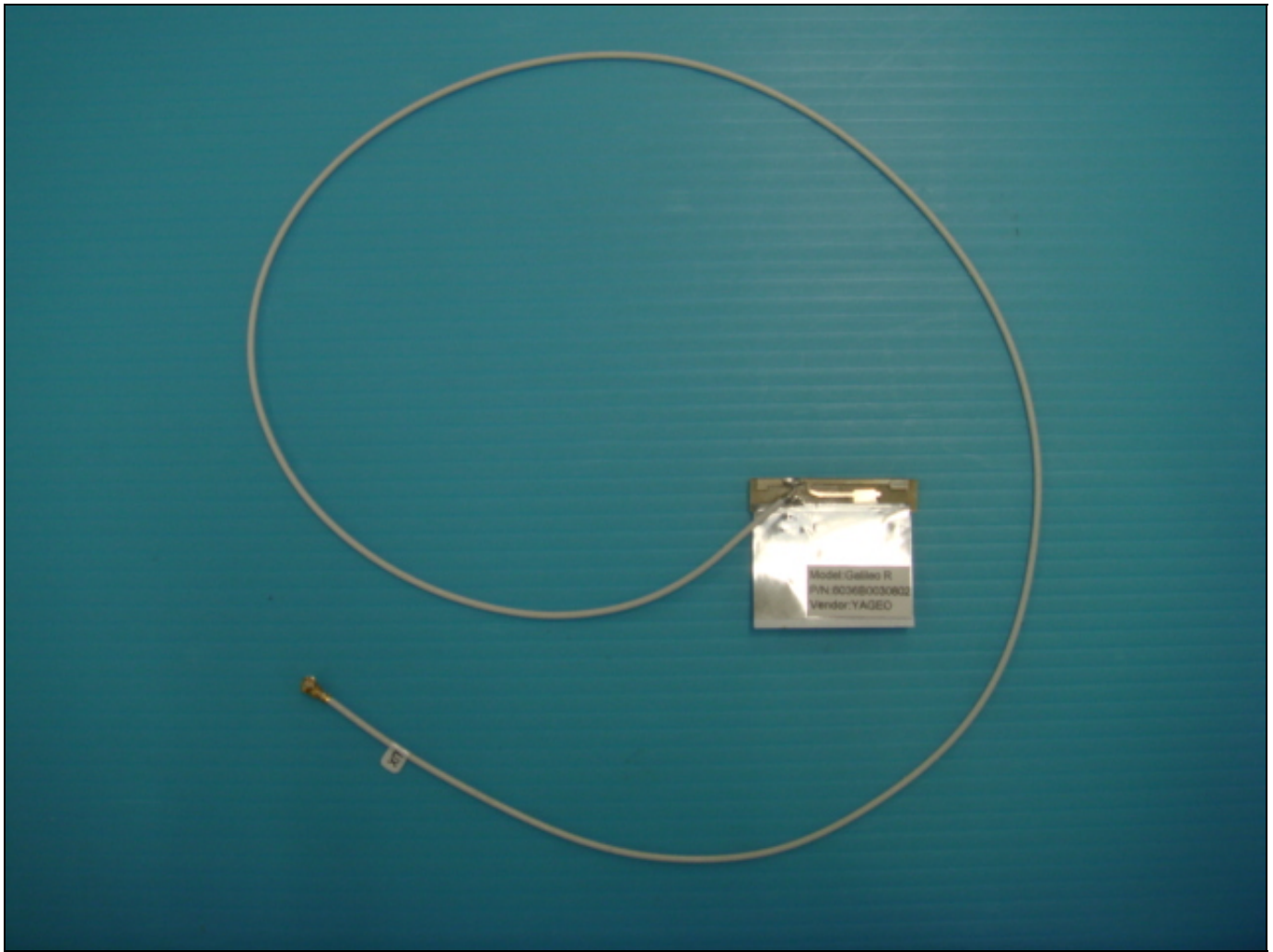
RANGE	GRADE 1	Grade 2	Grade 3
0~4	±0.05	±0.1	±0.2
4~16	±0.08	±0.15	±0.3
16~64	±0.12	±0.25	±0.5
64~250	±0.25	±0.4	±0.8

PROJECT : Inventec-Galileo

TITLE	ANTENNA-Right / Aux / LCD Antenna				
UNIT	mm	DESIGNED	CHECKED	APPROVED	PROJECTION
TOLERANCE	GRADE 2	Sophia	Howard	Randy Lee	
SCALE	1/1				SHEET NO. 1 / 1
MATERIAL	Metal				
<b>YAGEO</b>		Doc. CODE			

A3<420X297>

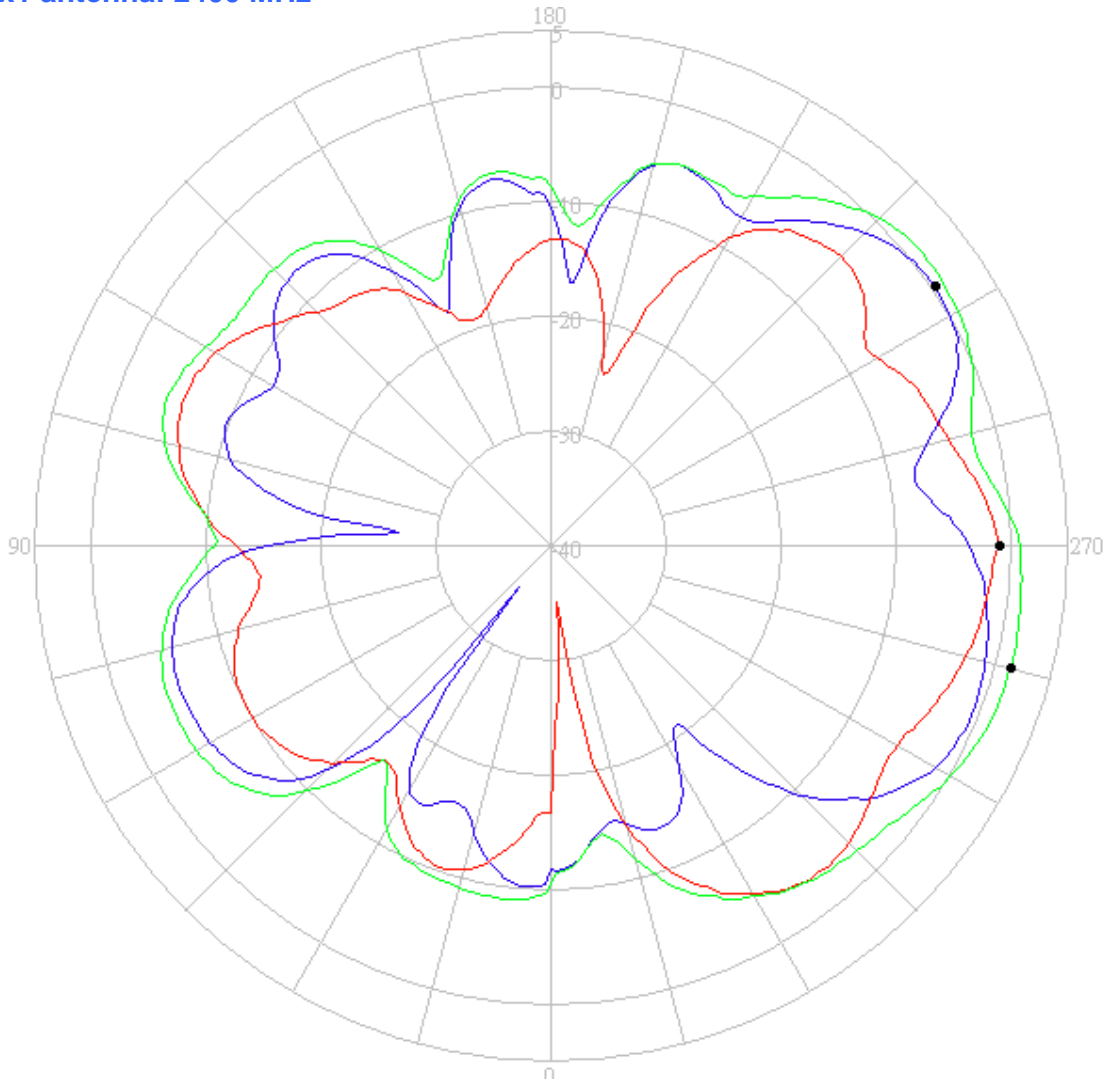
**Tx2 Antenna Photo:**



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

### 2400-2500MHz radiation characteristic

#### Tx1 antenna: 2400 MHz

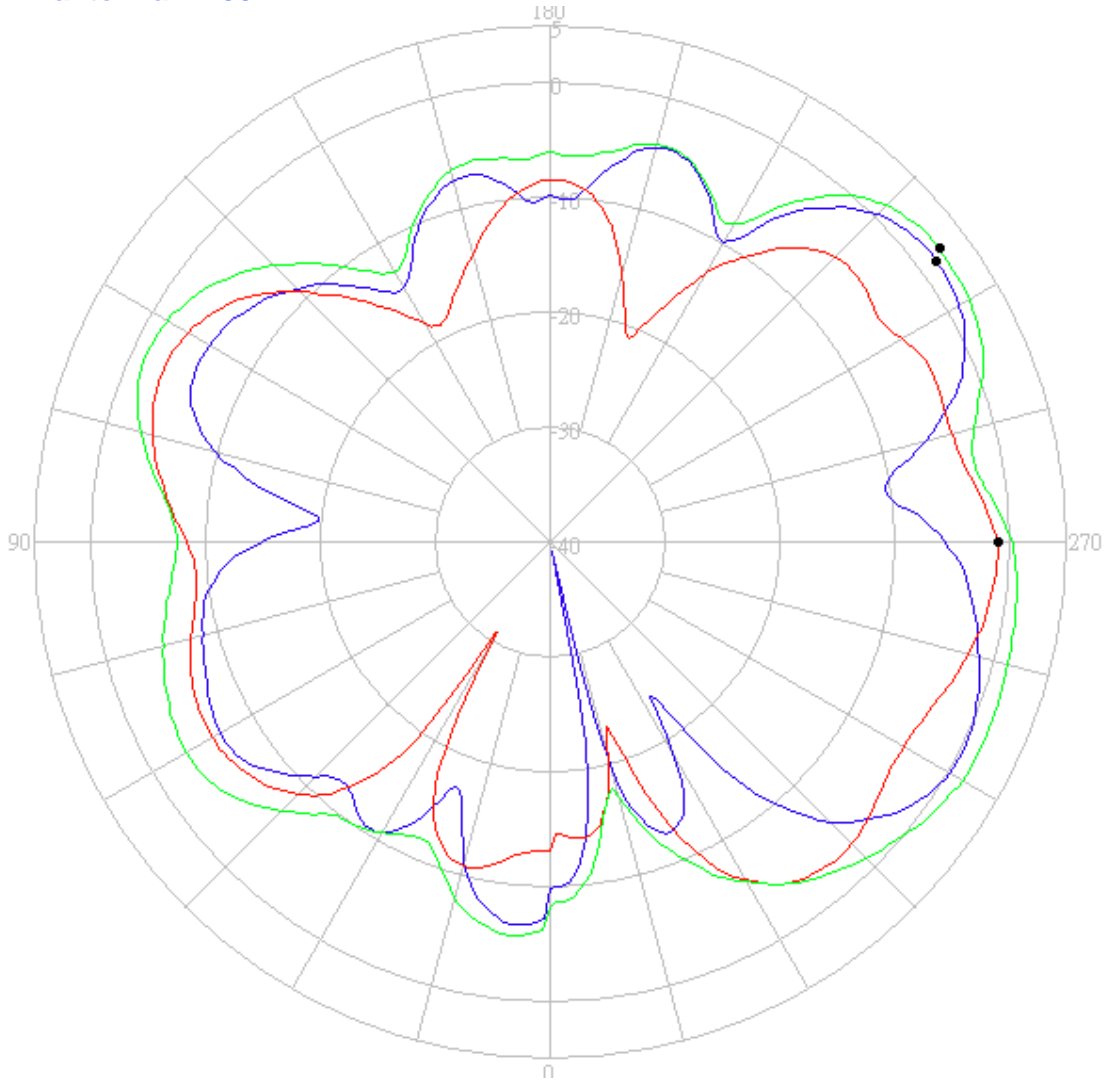


2.40GHz

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>2400 MHz</b>
Horizontal (dBi) peak	0.43
Vertical (dBi) peak	-0.95
Horz+Vert (dBi) peak	1.41

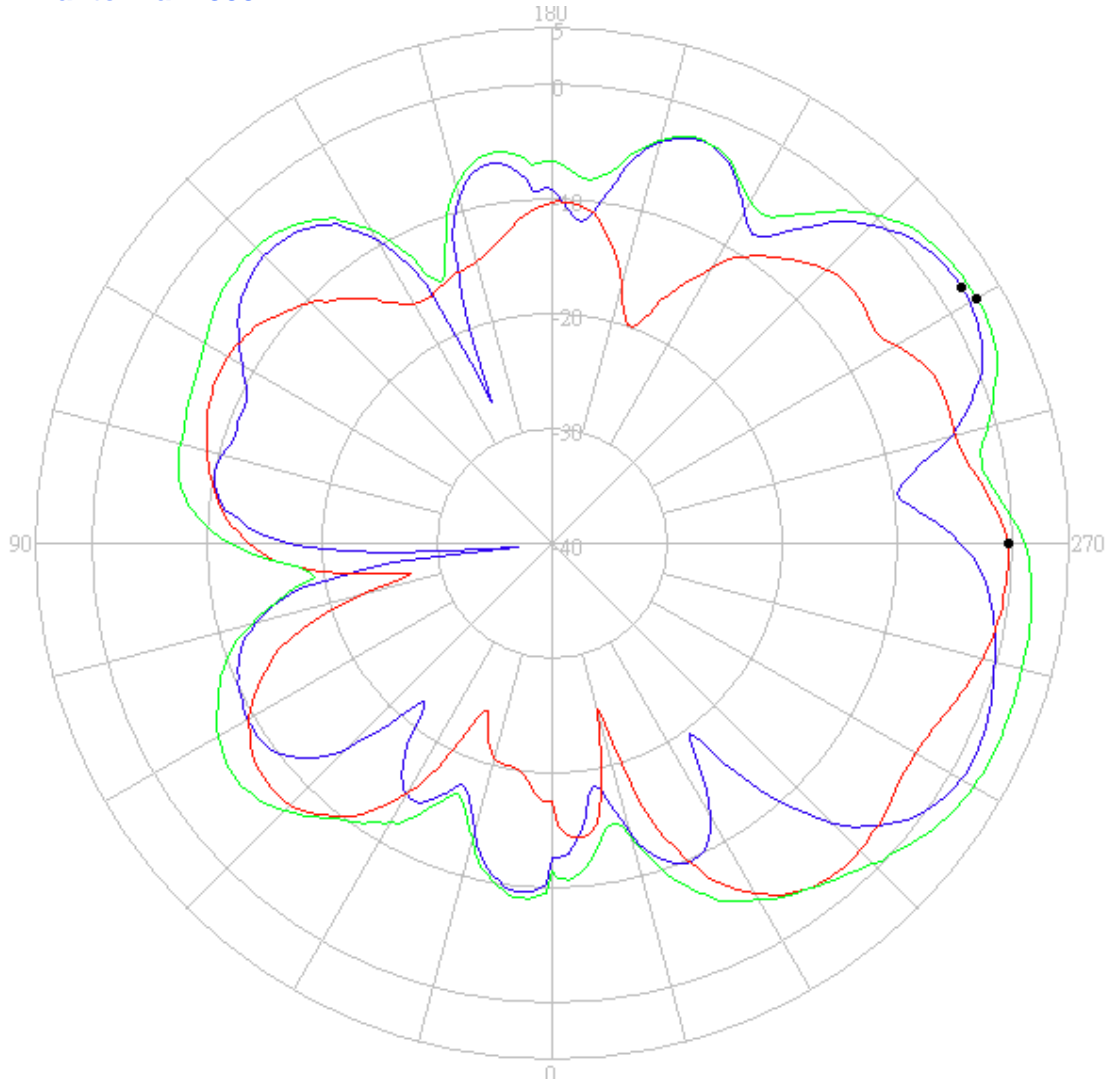




**2.45GHz**

- **Horizontal**
- **Vertical**
- **H+V**

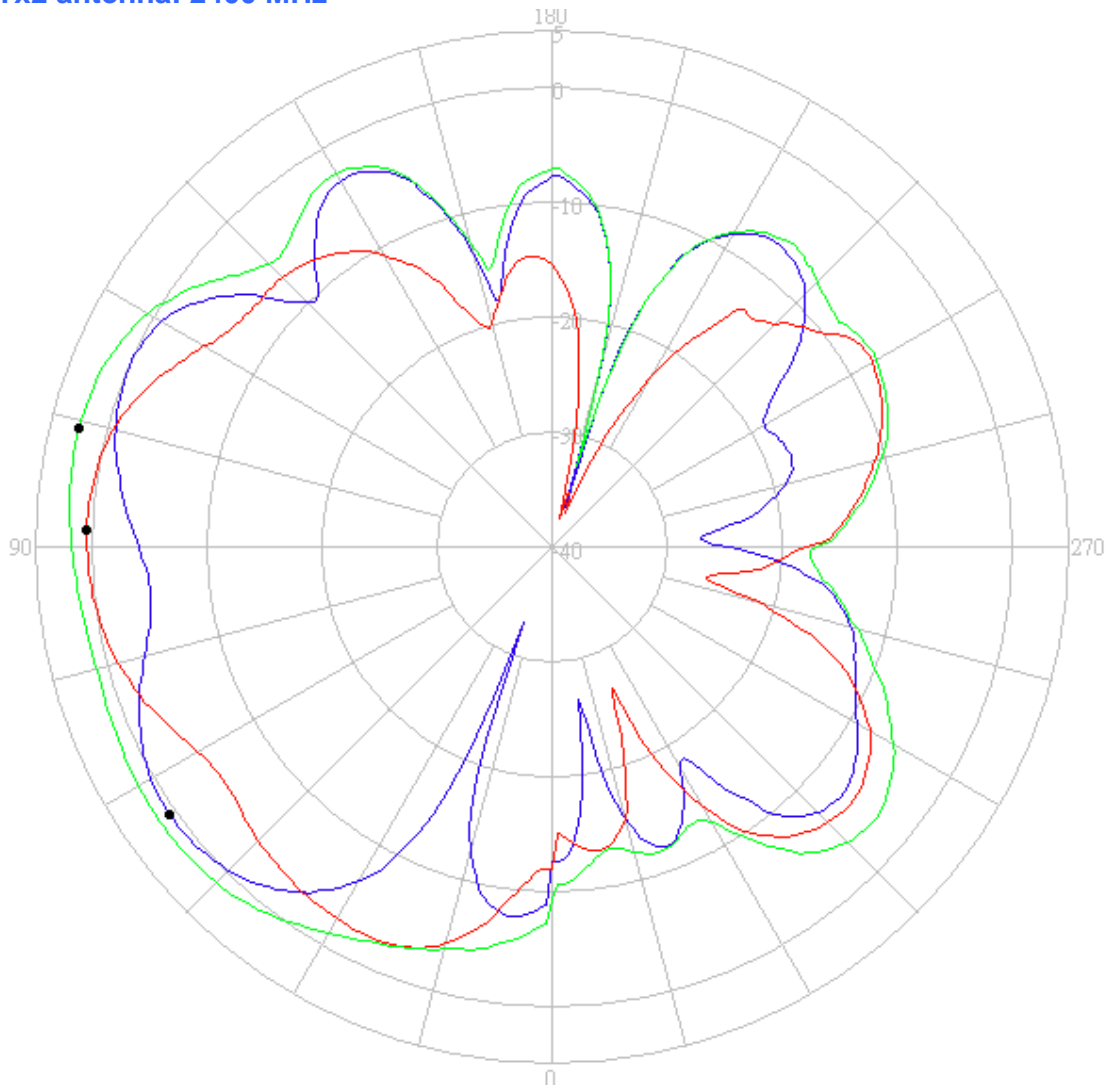
Center Frequency	<b>2450 MHz</b>
Horizontal (dBi) peak	1.67
Vertical (dBi) peak	-0.94
Horz+Vert (dBi) peak	2.5



**2.50GHz**

- **Horizontal**
- **Vertical**
- **H+V**

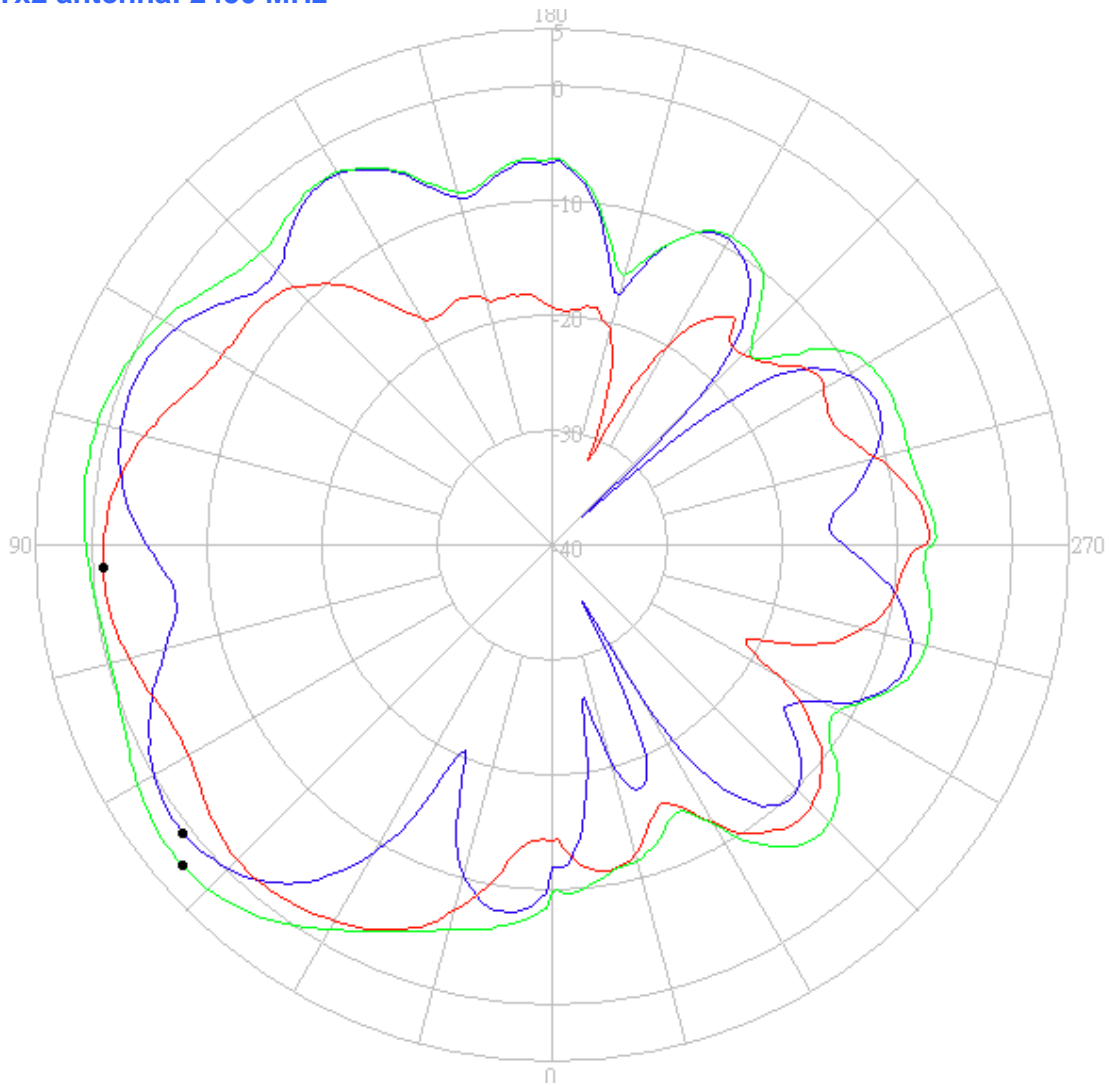
Center Frequency	<b>2500 MHz</b>
Horizontal (dBi) peak	2.09
Vertical (dBi) peak	-0.19
Horz+Vert (dBi) peak	2.75



**2.40GHz**

- **Horizontal**
- **Vertical**
- **H+V**

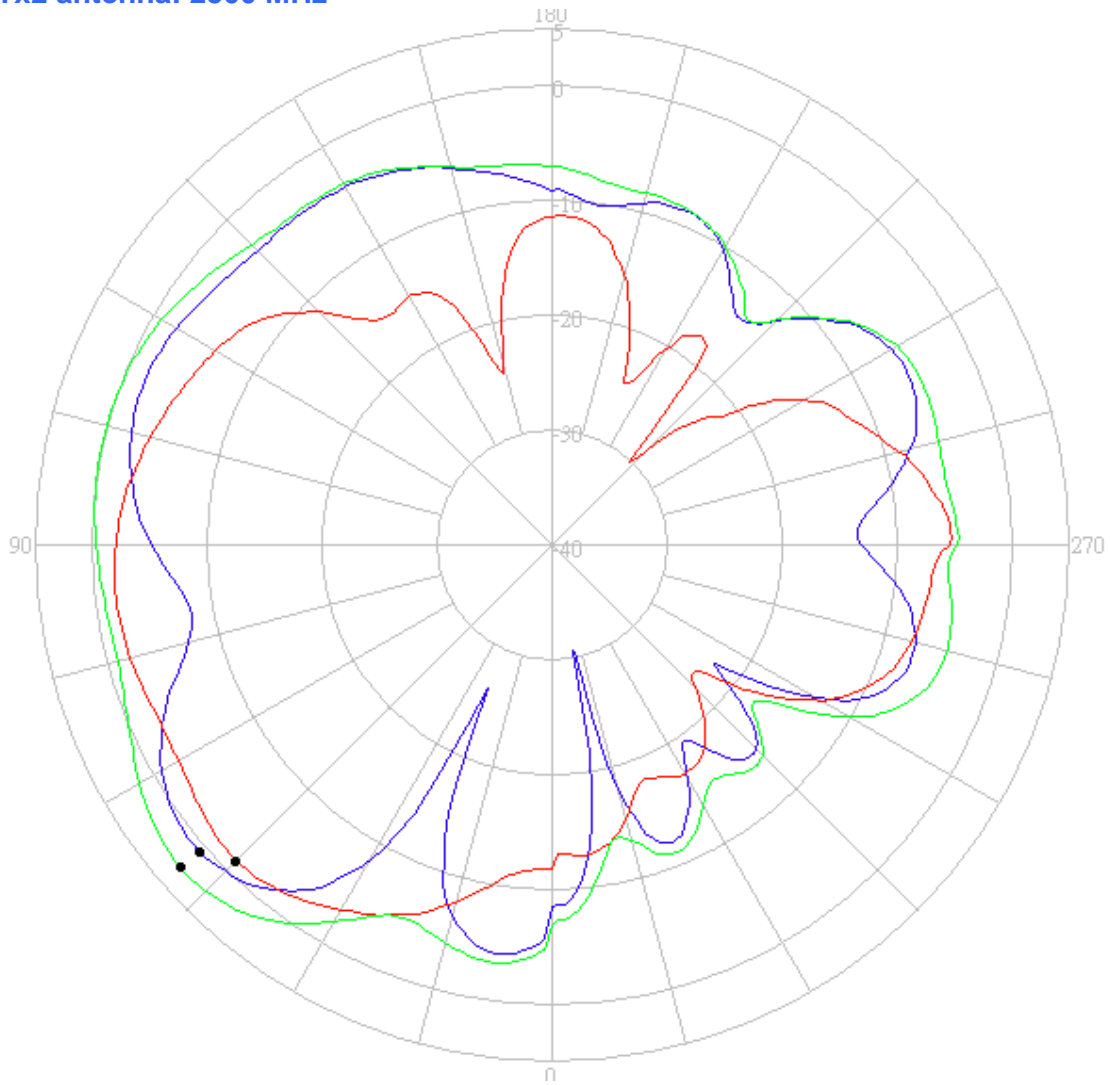
Center Frequency	<b>2400 MHz</b>
Horizontal (dBi) peak	0.65
Vertical (dBi) peak	0.56
Horz+Vert (dBi) peak	2.47



**2.450GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>2450MHz</b>
Horizontal (dBi) peak	0.75
Vertical (dBi) peak	-0.85
Horz+Vert (dBi) peak	2.62



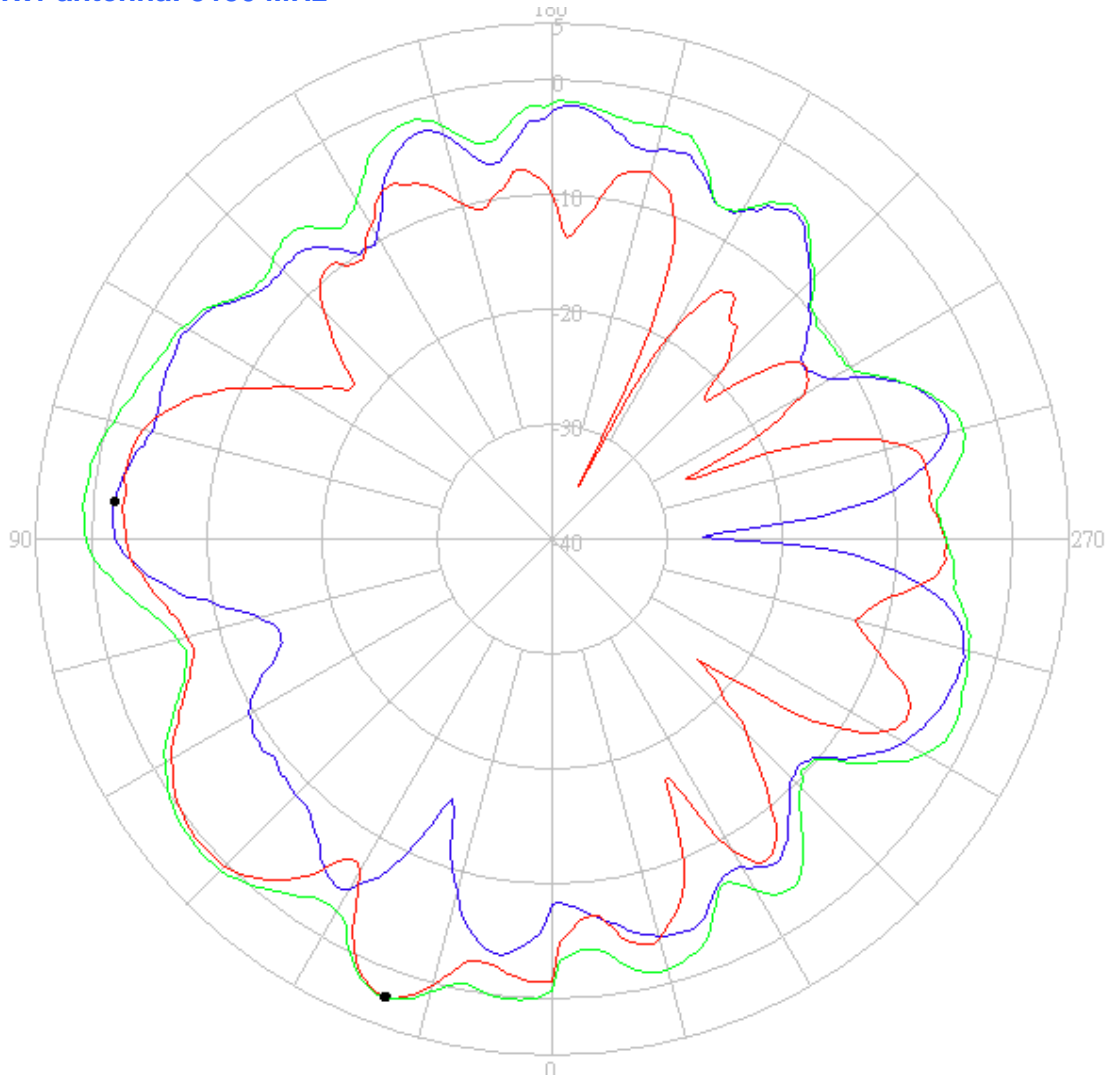
**2.50GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>2500 MHz</b>
Horizontal (dBi) peak	0.71
Vertical (dBi) peak	-1.09
Horz+Vert (dBi) peak	2.84

**5150-5350 MHz radiation characteristic**

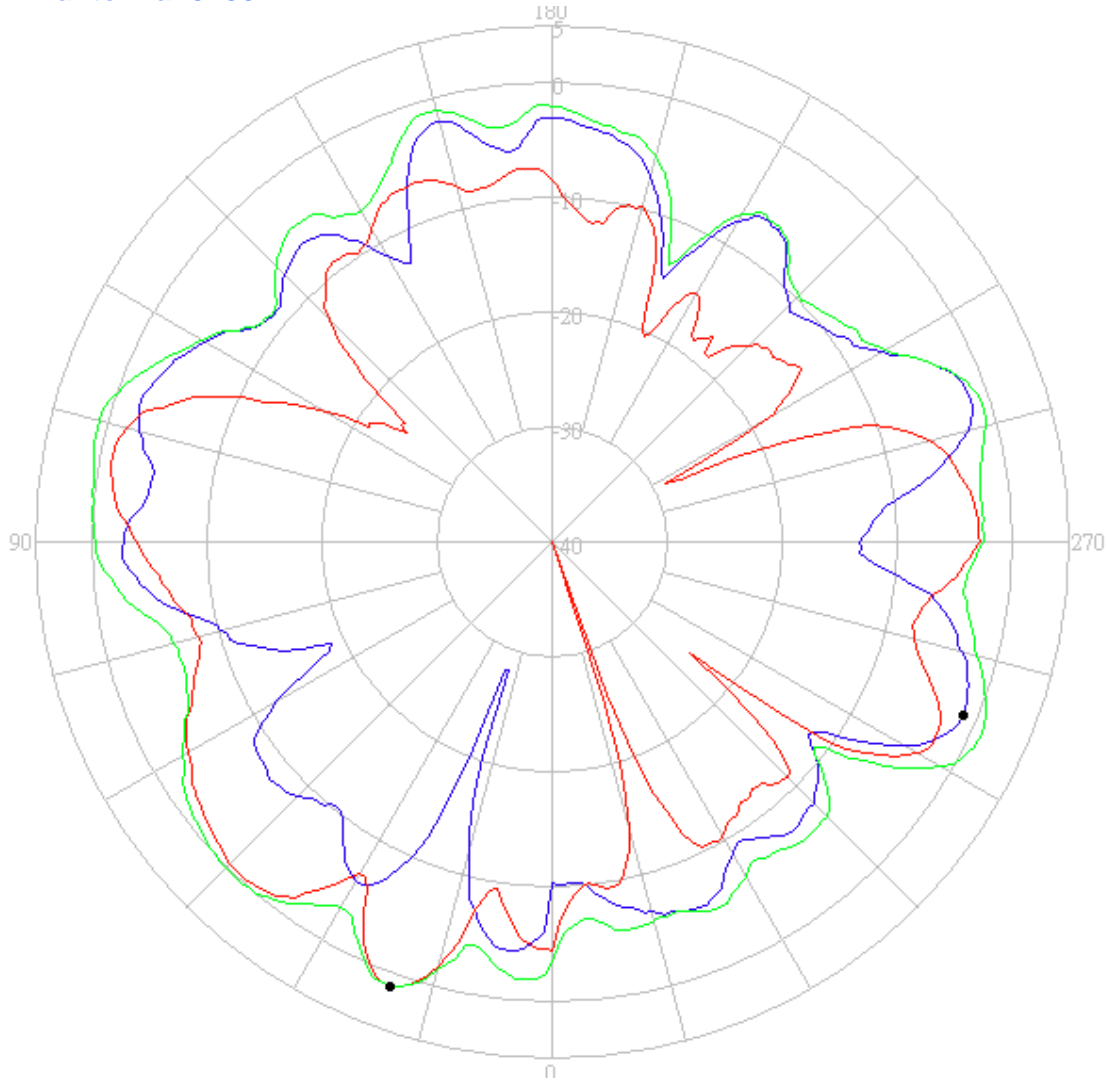
**Tx1 antenna: 5150 MHz**



**5.15GHz**

- Horizontal**
- Vertical**
- H+V**

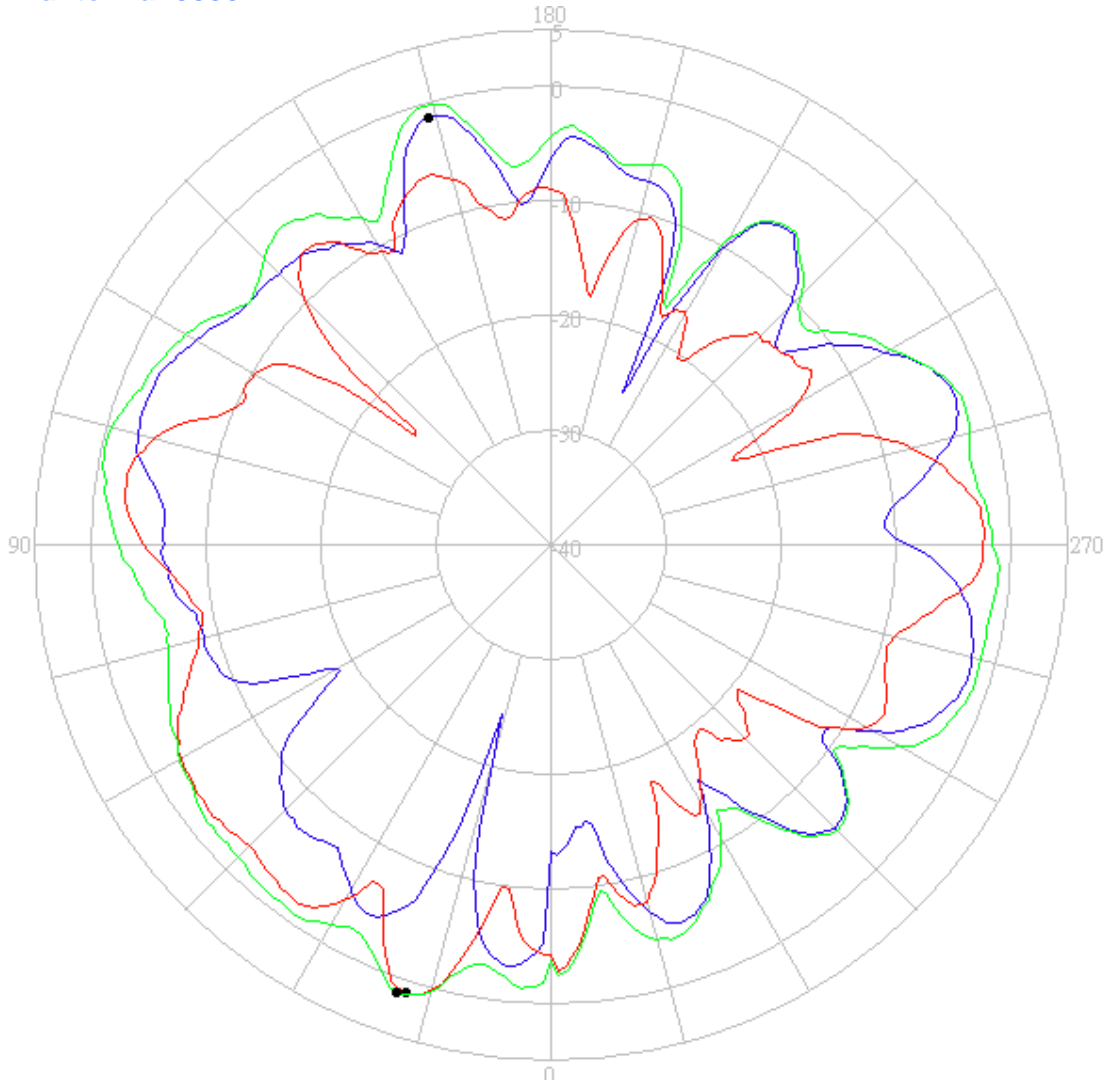
Center Frequency	<b>5150 MHz</b>
Horizontal (dBi) peak	-1.67
Vertical (dBi) peak	2.45
Horz+Vert (dBi) peak	2.53



**5.25GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>5250 MHz</b>
Horizontal (dBi) peak	-1.14
Vertical (dBi) peak	1.26
Horz+Vert (dBi) peak	1.26

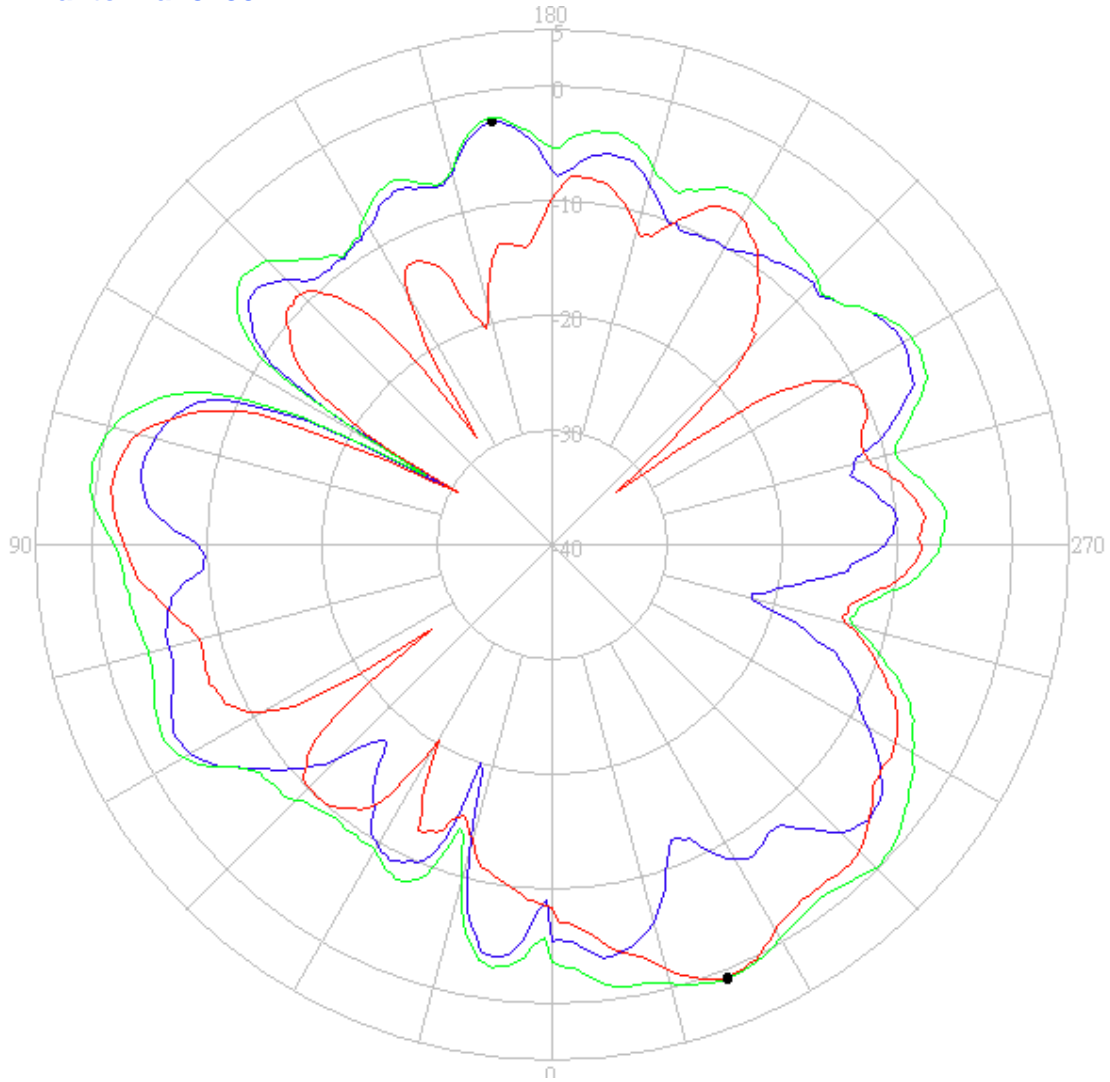


**5.35GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>5350 MHz</b>
Horizontal (dBi) peak	-1.21
Vertical (dBi) peak	1.1
Horz+Vert (dBi) peak	1.27

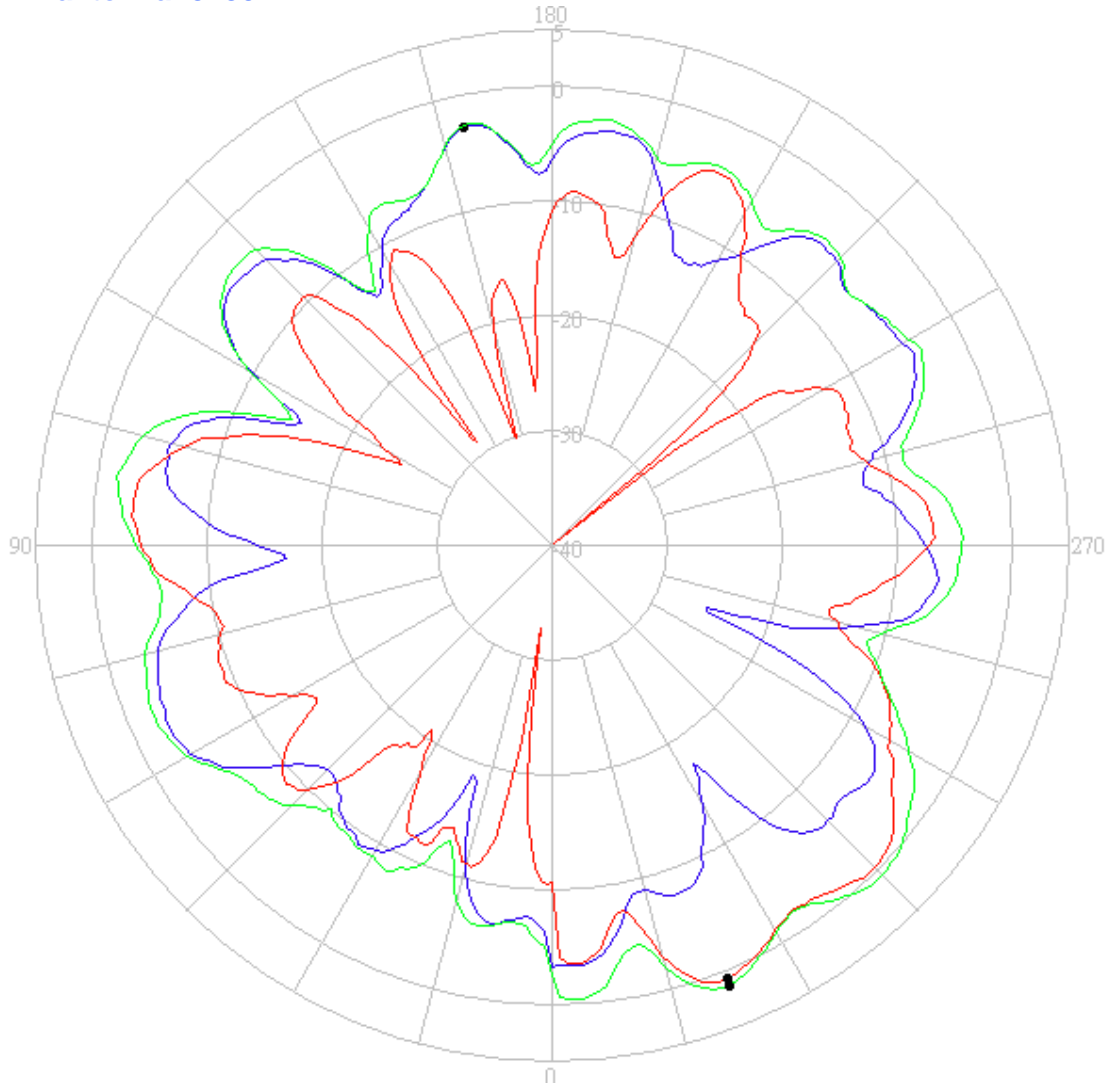




**5.15GHz**

- **Horizontal**
- **Vertical**
- **H+V**

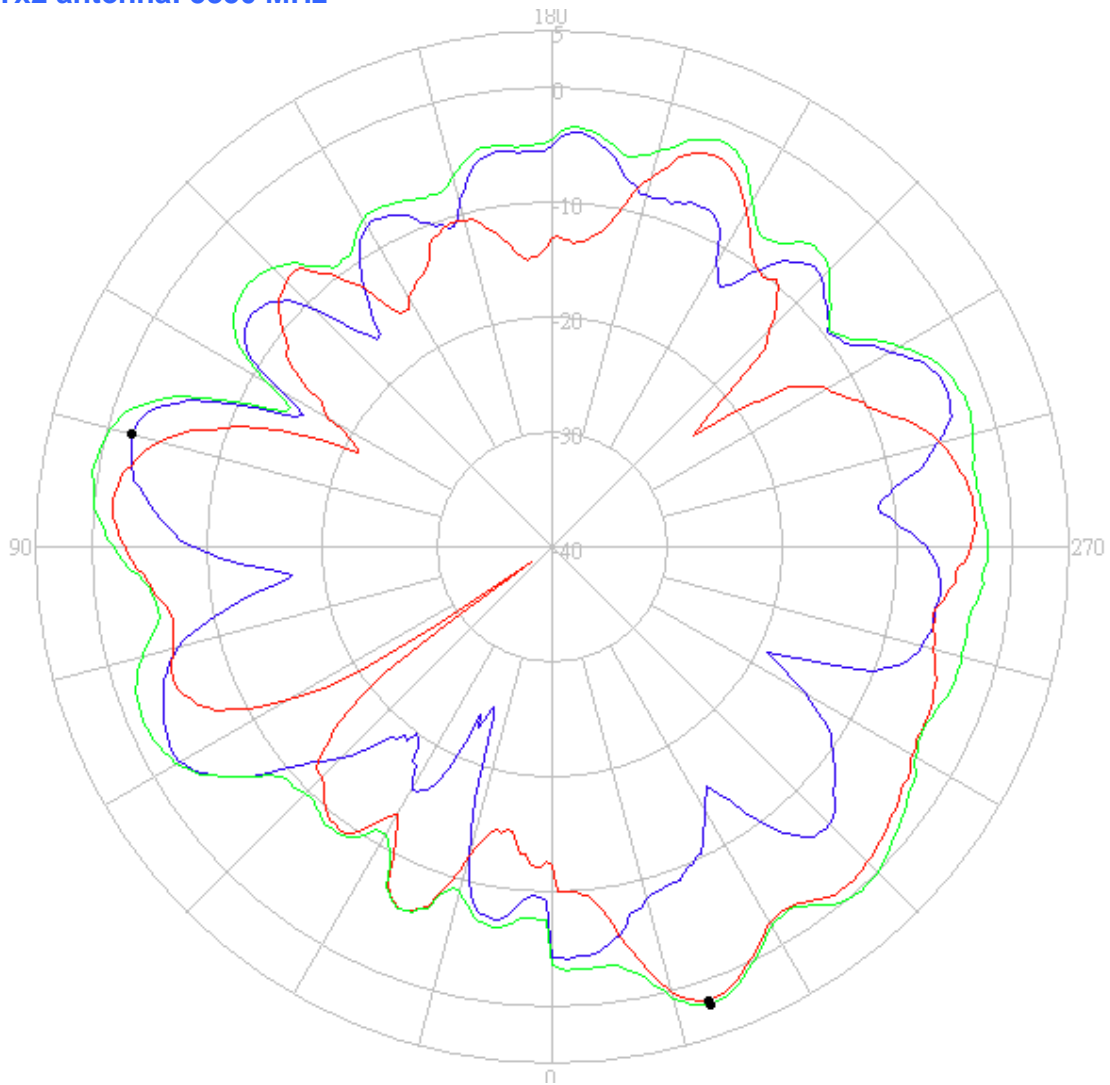
Center Frequency	<b>5150 MHz</b>
Horizontal (dBi) peak	-2.68
Vertical (dBi) peak	0.68
Horz+Vert (dBi) peak	0.9



**5.250GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>5250MHz</b>
Horizontal (dBi) peak	-2.75
Vertical (dBi) peak	0.81
Horz+Vert (dBi) peak	1.37



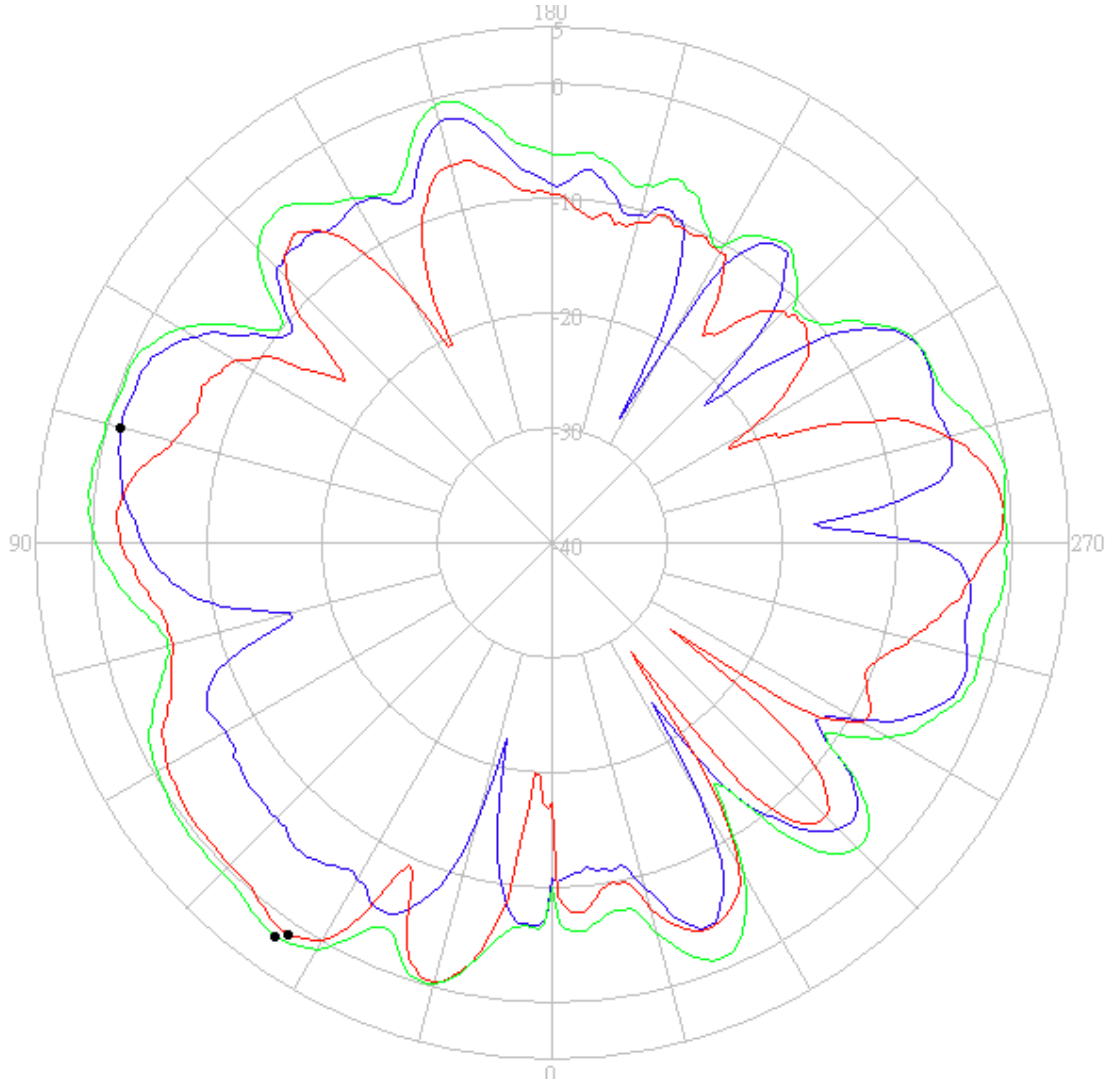
**5.35GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>5350 MHz</b>
Horizontal (dBi) peak	-2.11
Vertical (dBi) peak	1.78
Horz+Vert (dBi) peak	2.14

**5470-5725MHz radiation characteristic**

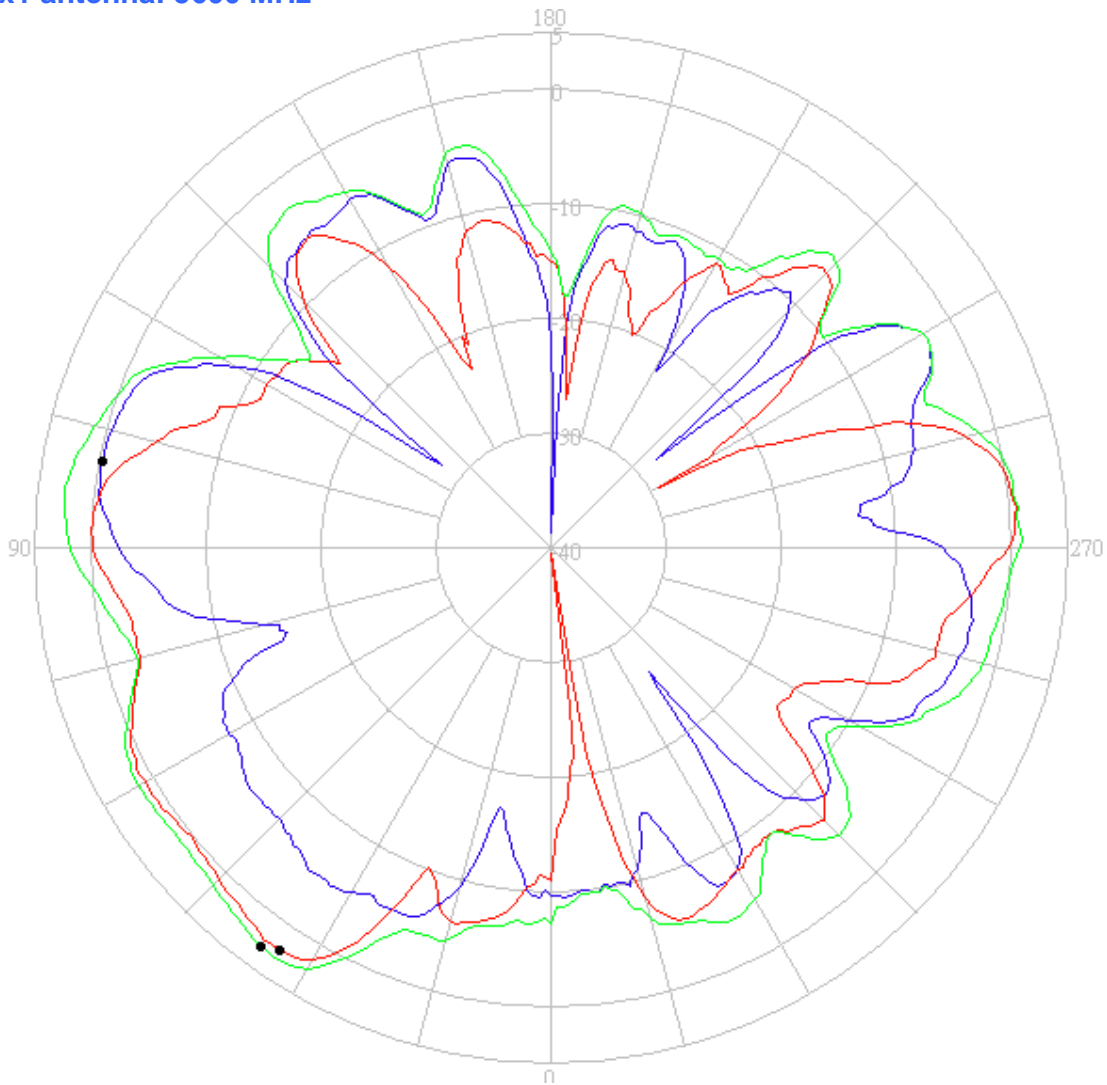
**Tx1 antenna: 5470 MHz**



**5.47GHz**

- Horizontal**
- Vertical**
- H+V**

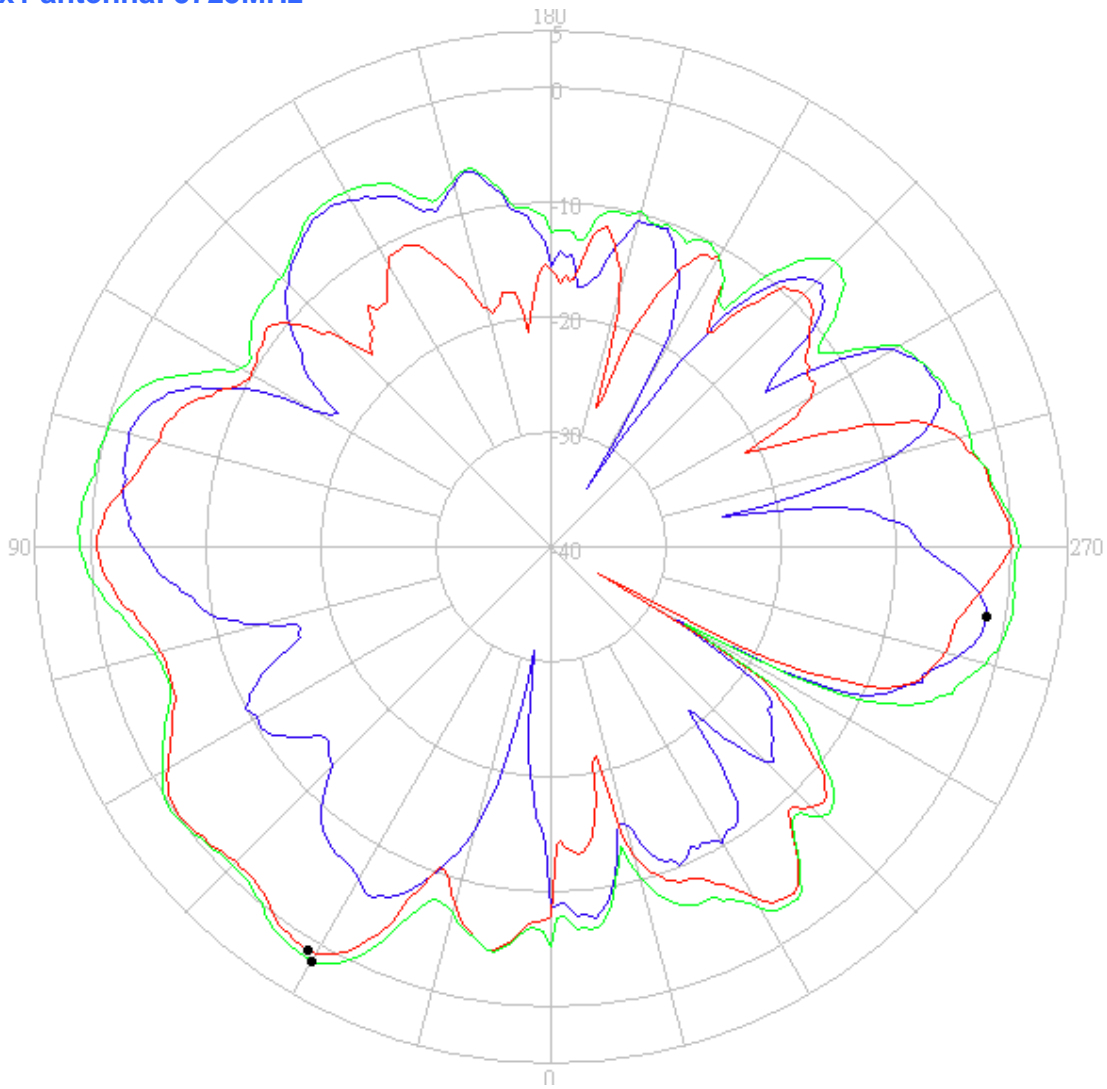
Center Frequency	<b>5470 MHz</b>
Horizontal (dBi) peak	-0.99
Vertical (dBi) peak	1.12
Horz+Vert (dBi) peak	1.95



**5.60GHz**

- **Horizontal**
- **Vertical**
- **H+V**

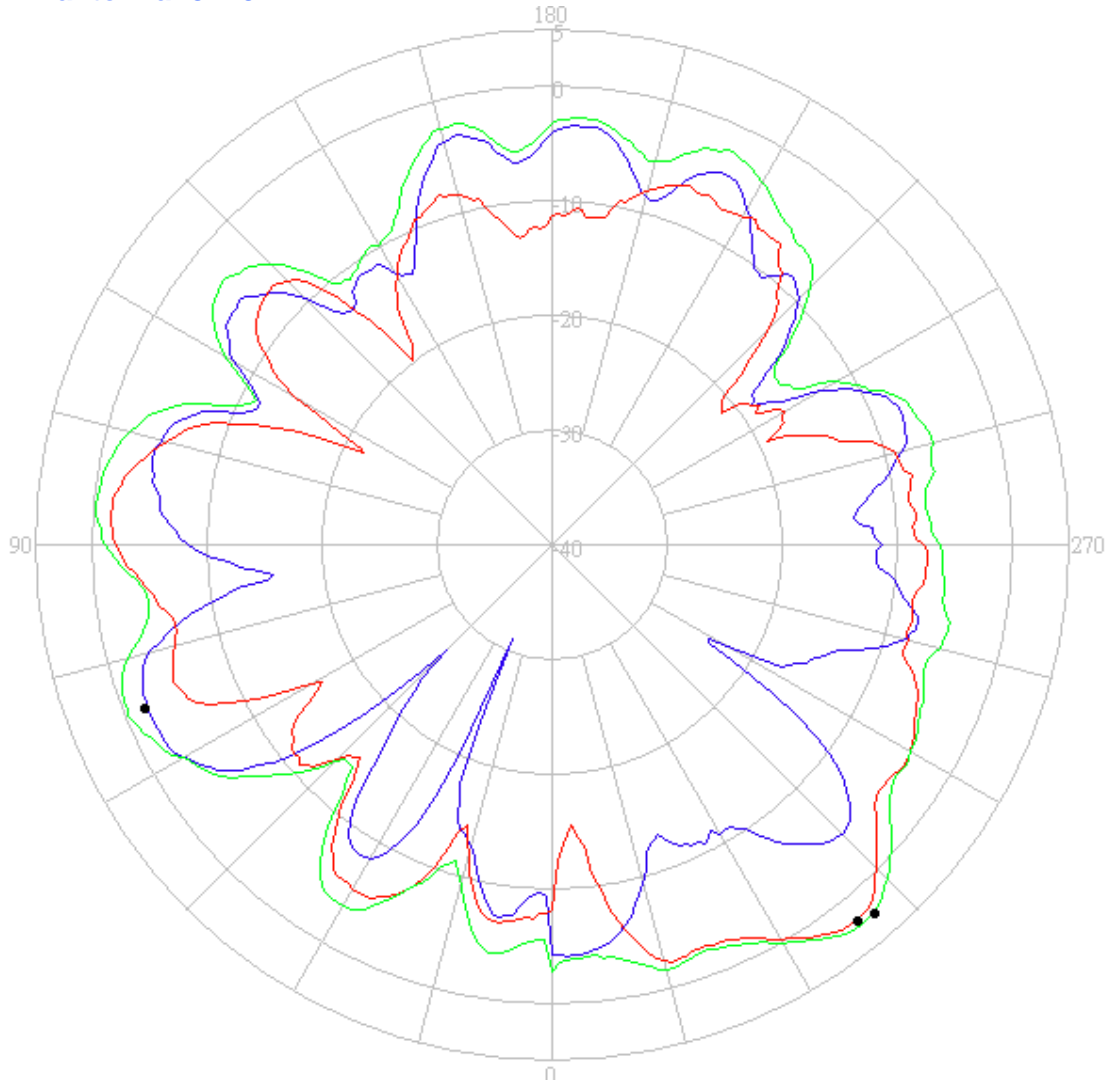
Center Frequency	<b>5600MHz</b>
Horizontal (dBi) peak	-0.15
Vertical (dBi) peak	2.37
Horz+Vert (dBi) peak	3.12



**5.725GHz**

- **Horizontal**
- **Vertical**
- **H+V**

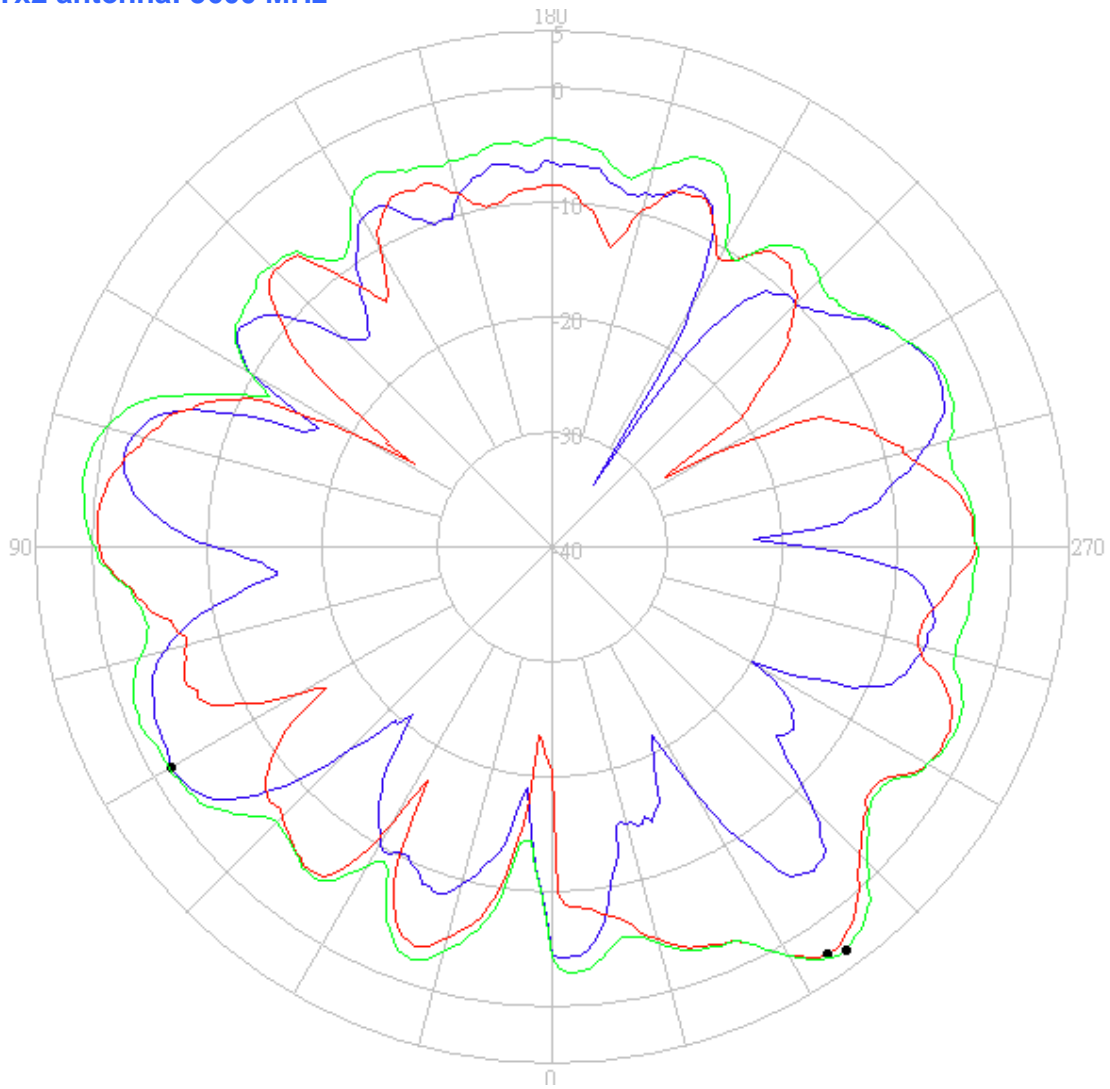
Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) peak	-1.51
Vertical (dBi) peak	1.02
Horz+Vert (dBi) peak	1.71



**5.47GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>5470 MHz</b>
Horizontal (dBi) peak	-1.8
Vertical (dBi) peak	2.18
Horz+Vert (dBi) peak	2.75

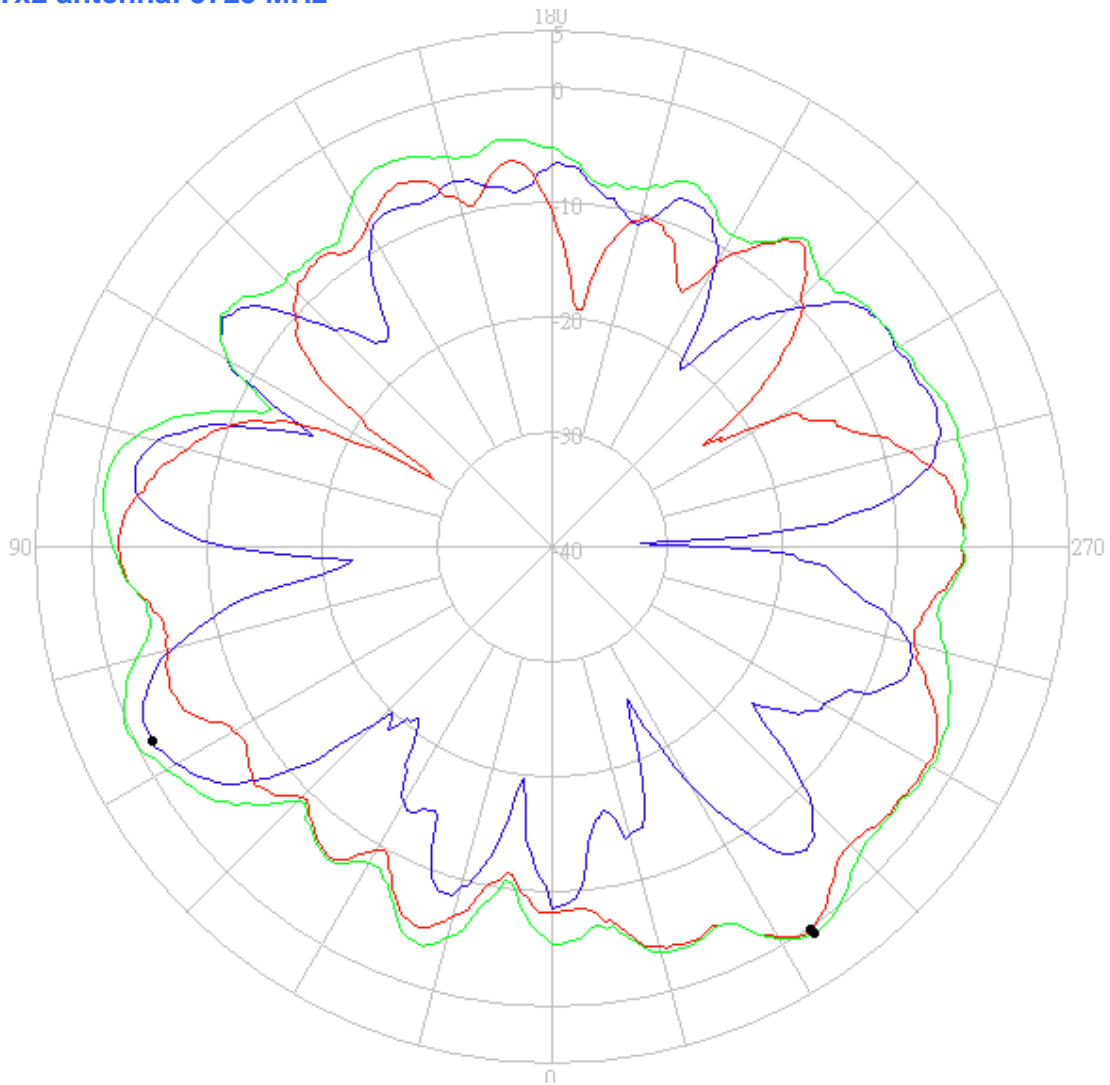


**5.60GHz**

- Horizontal**
- Vertical**
- H+V**

Center Frequency	<b>5600MHz</b>
Horizontal (dBi) peak	-1.67
Vertical (dBi) peak	2.86
Horz+Vert (dBi) peak	3.54





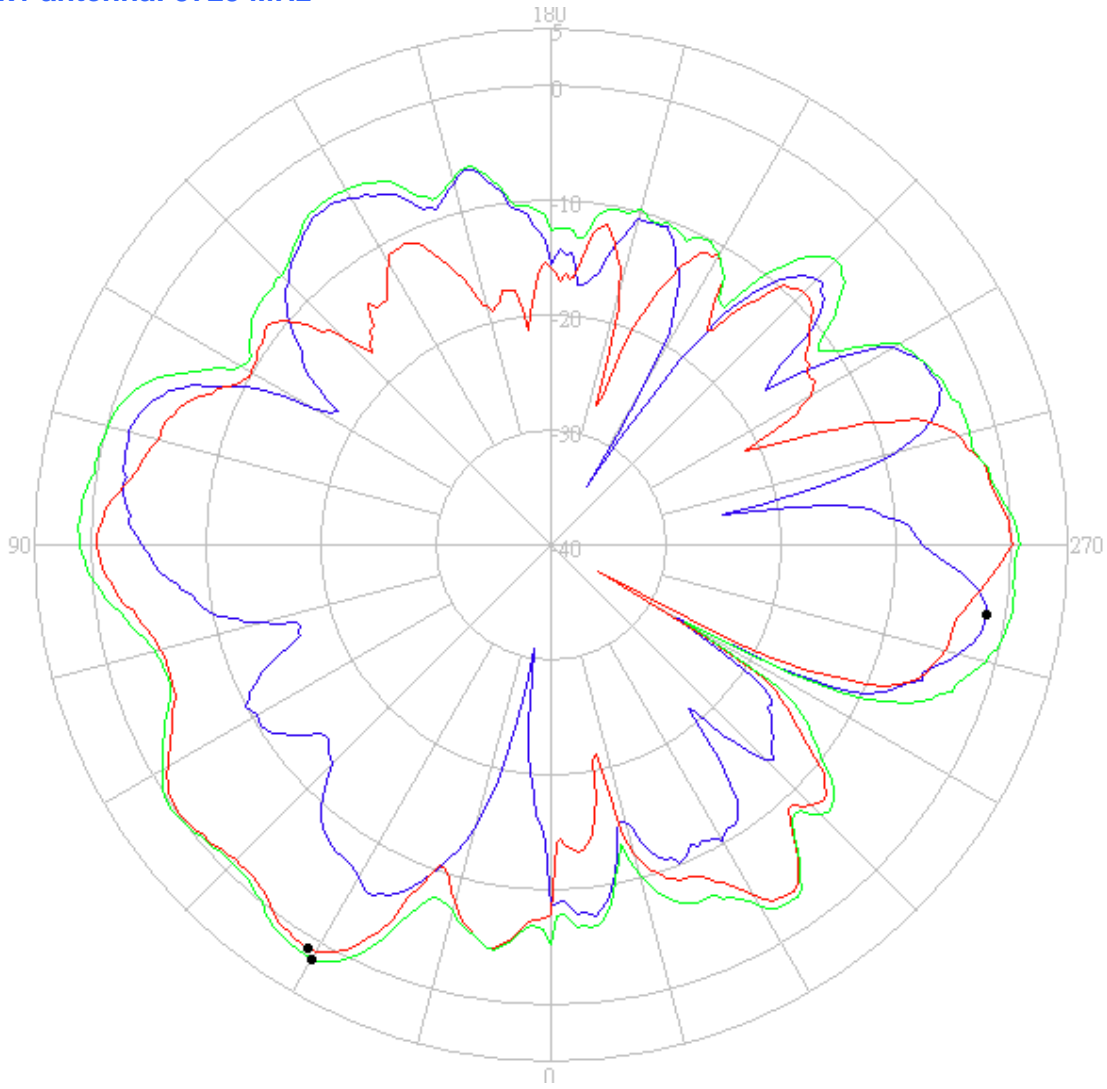
**5.725GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) peak	-1.26
Vertical (dBi) peak	0.3
Horz+Vert (dBi) peak	0.69

**5725-5850 MHz radiation characteristic**

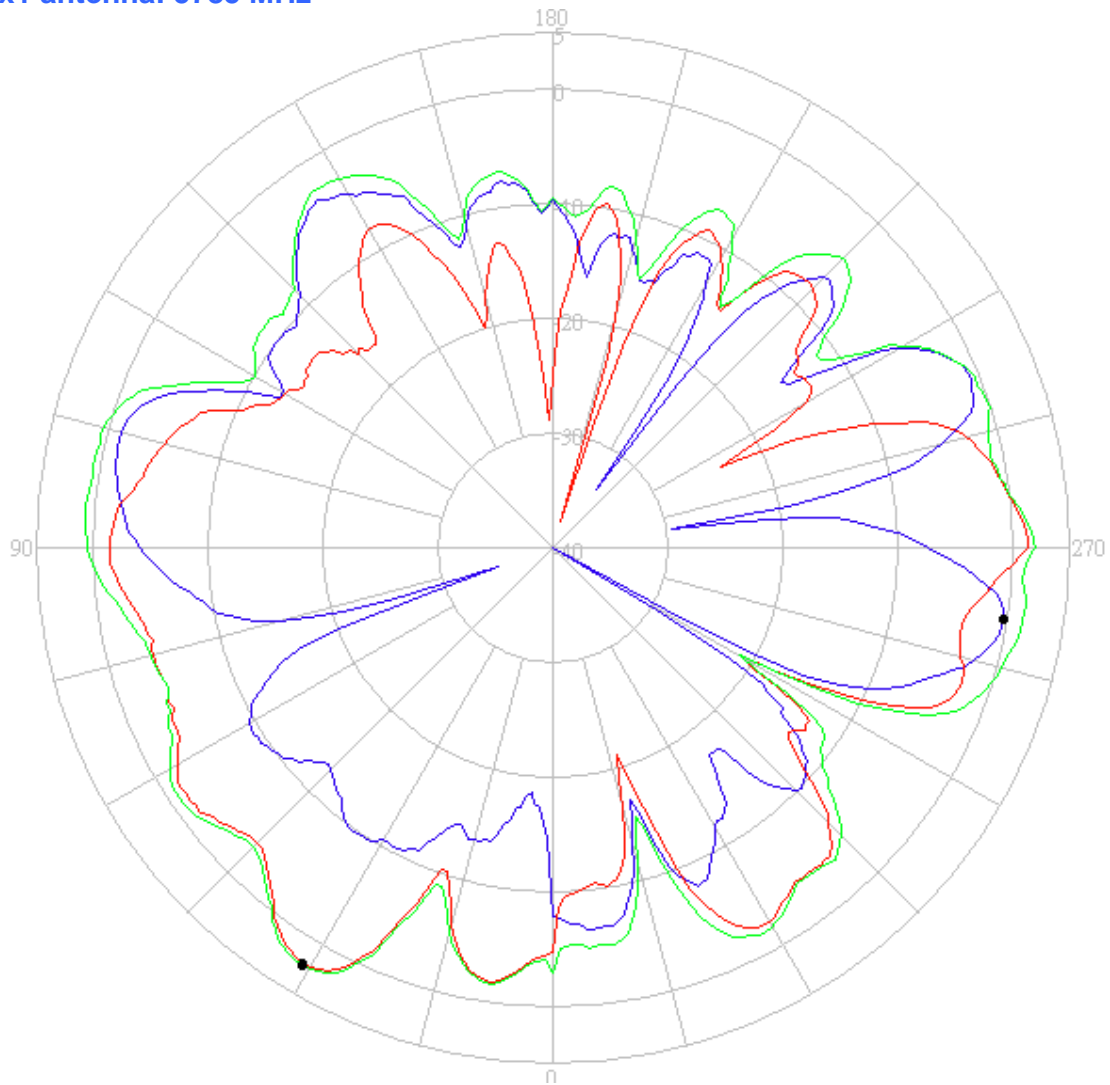
**Tx1 antenna: 5725 MHz**



**5.725GHz**

- Horizontal**
- Vertical**
- H+V**

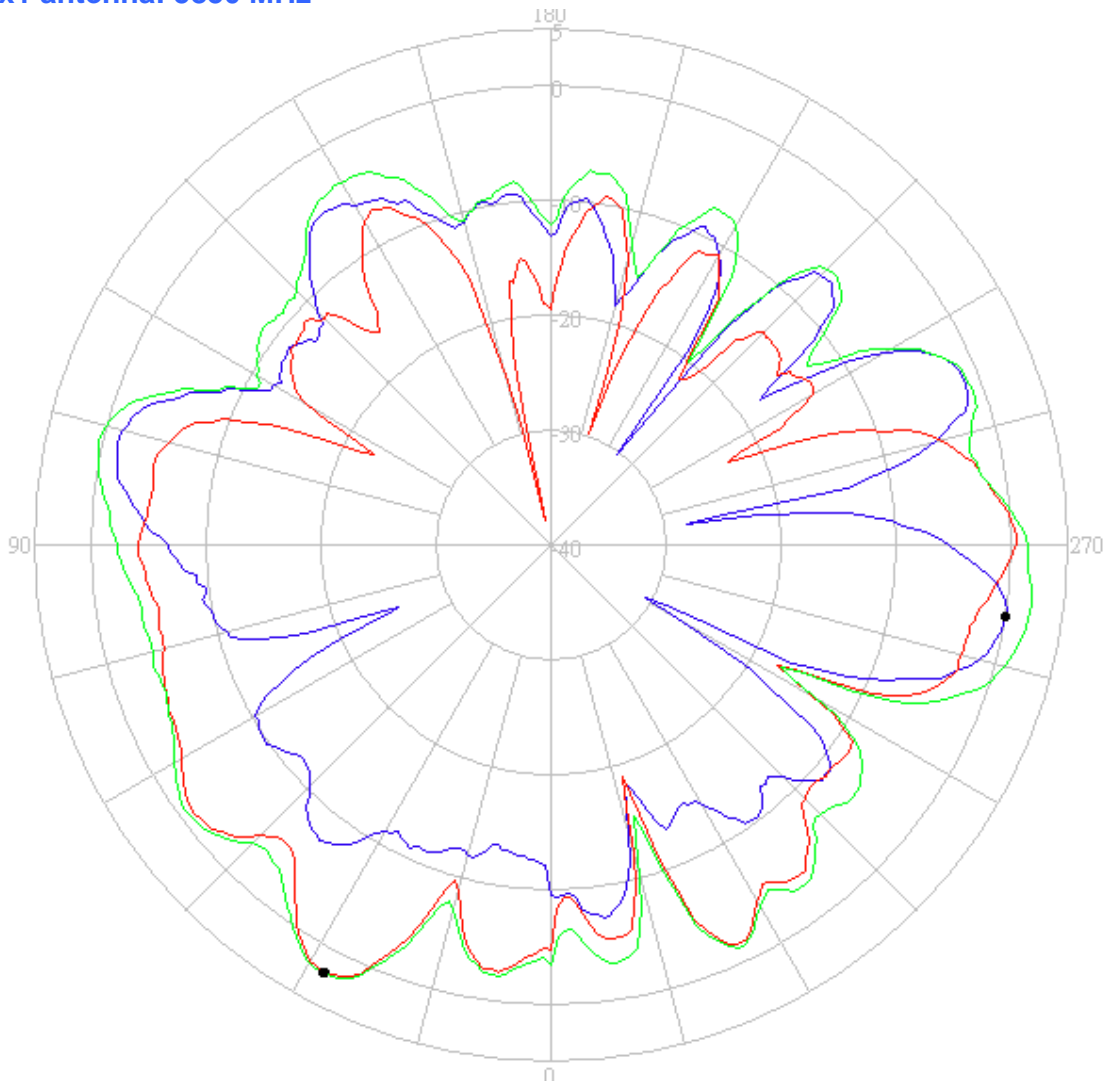
Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) peak	-1.51
Vertical (dBi) peak	1.02
Horz+Vert (dBi) peak	1.71



**5.785GHz**

- **Horizontal**
- **Vertical**
- **H+V**

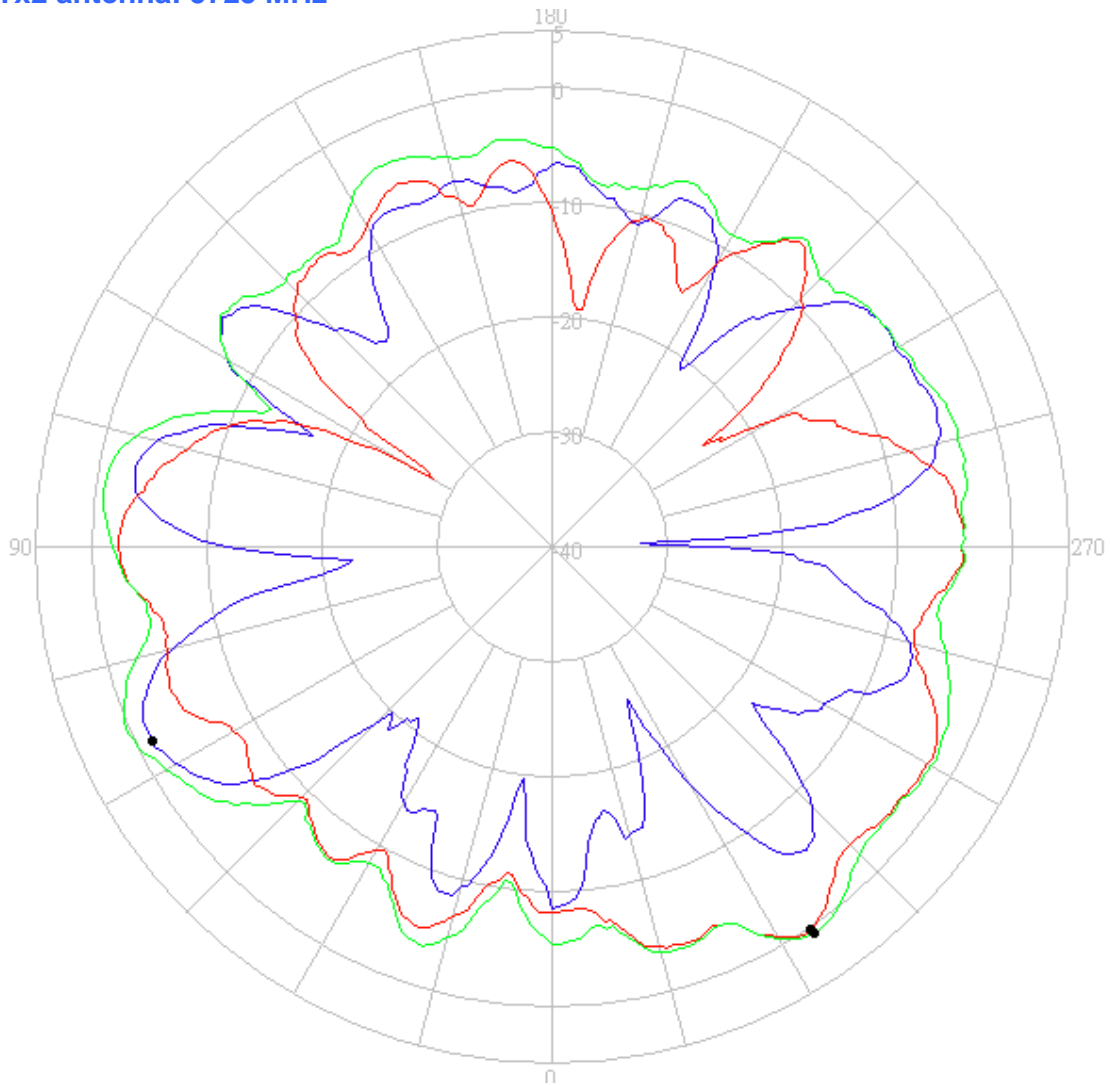
Center Frequency	<b>5785MHz</b>
Horizontal (dBi) peak	-0.33
Vertical (dBi) peak	2.3
Horz+Vert (dBi) peak	2.55



**5.85GHz**

- **Horizontal**
- **Vertical**
- **H+V**

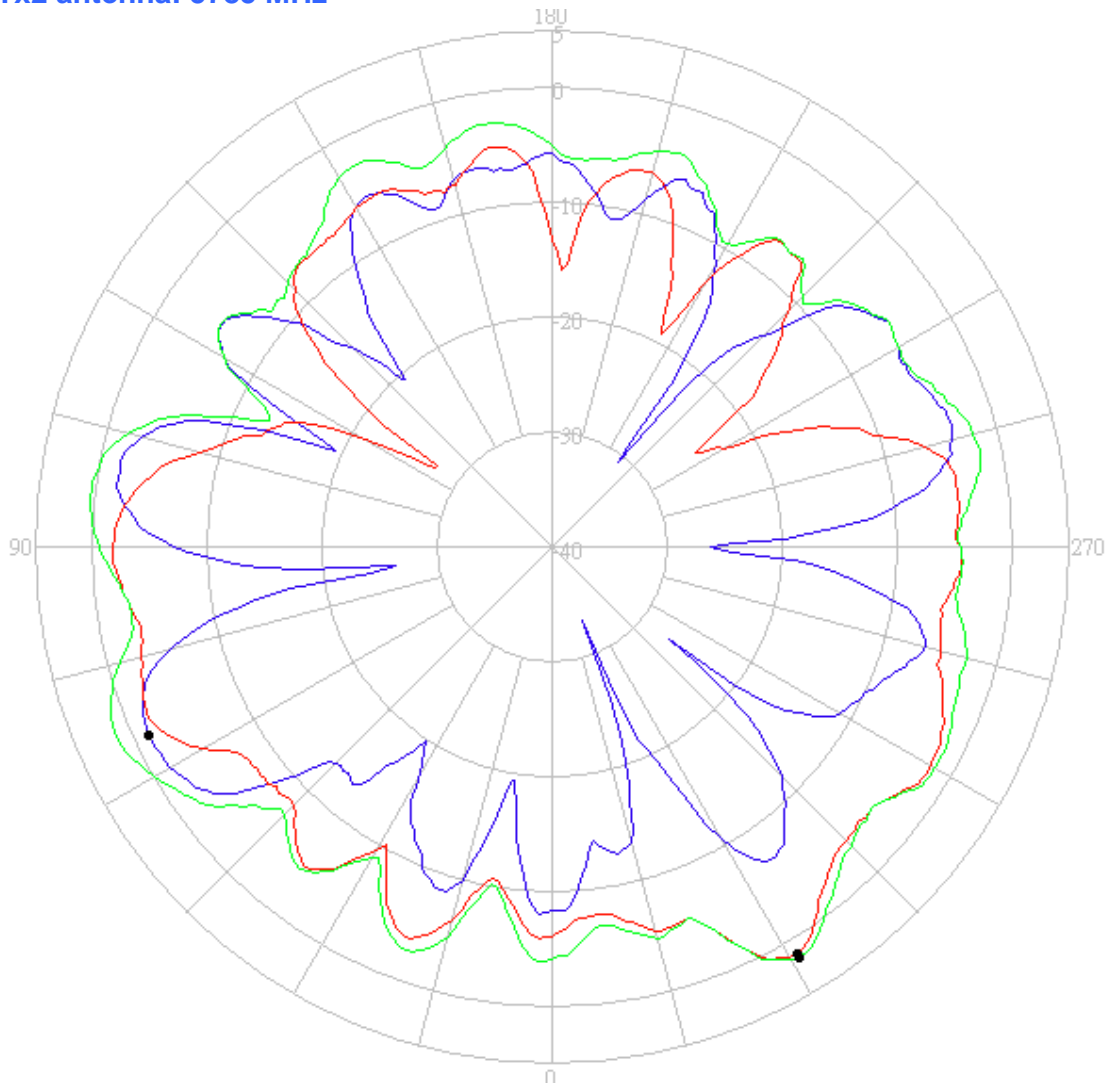
Center Frequency	<b>5850 MHz</b>
Horizontal (dBi) peak	0.11
Vertical (dBi) peak	2.13
Horz+Vert (dBi) peak	2.31



**5.725GHz**

- **Horizontal**
- **Vertical**
- **H+V**

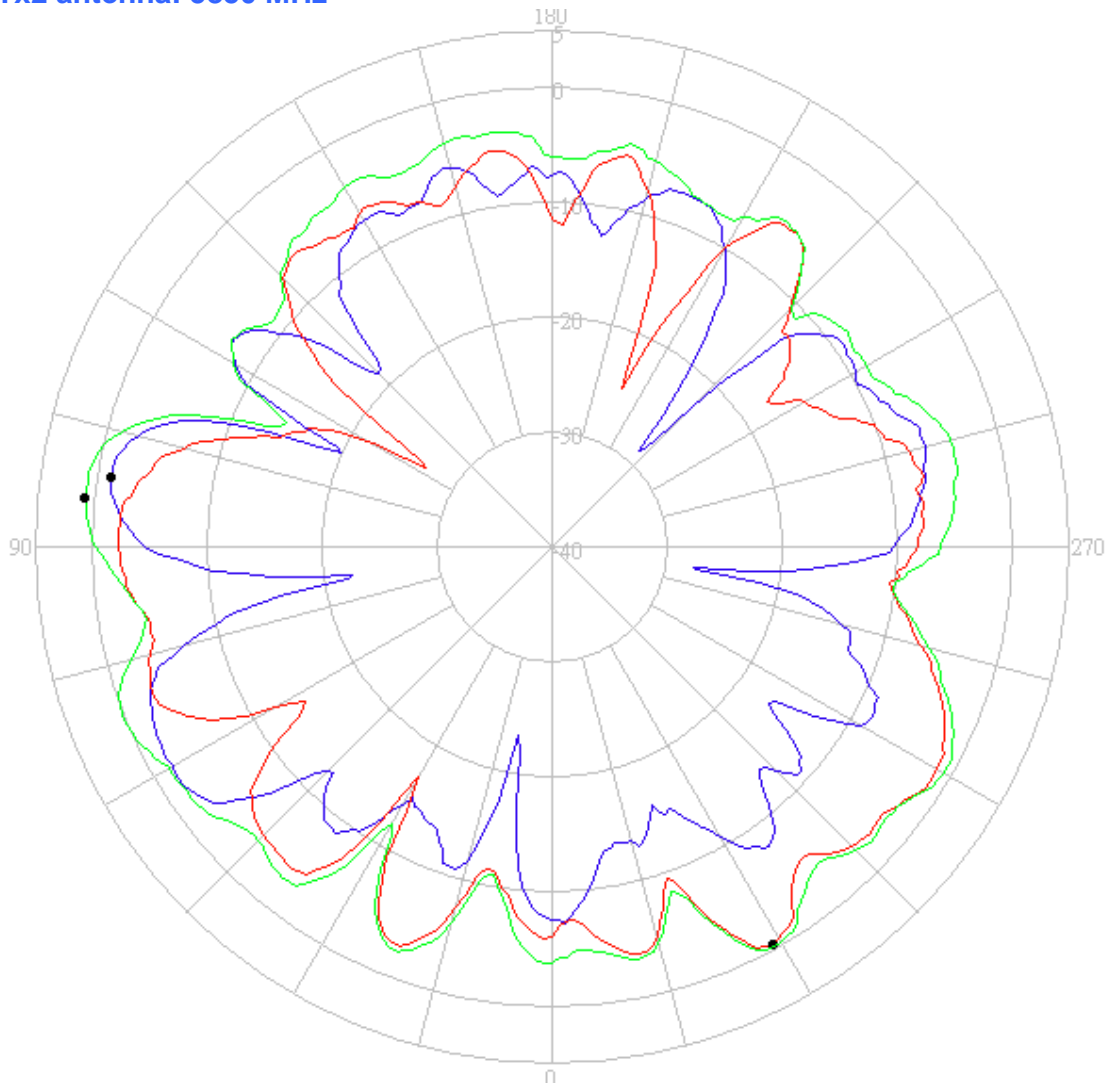
Center Frequency	<b>5725 MHz</b>
Horizontal (dBi) peak	-1.26
Vertical (dBi) peak	0.3
Horz+Vert (dBi) peak	0.69



**5.785GHz**

- **Horizontal**
- **Vertical**
- **H+V**

Center Frequency	<b>5785MHz</b>
Horizontal (dBi) peak	-1.22
Vertical (dBi) peak	1.43
Horz+Vert (dBi) peak	1.78



**5.85GHz**

- **Horizontal**
- **Vertical**
- **H+V**

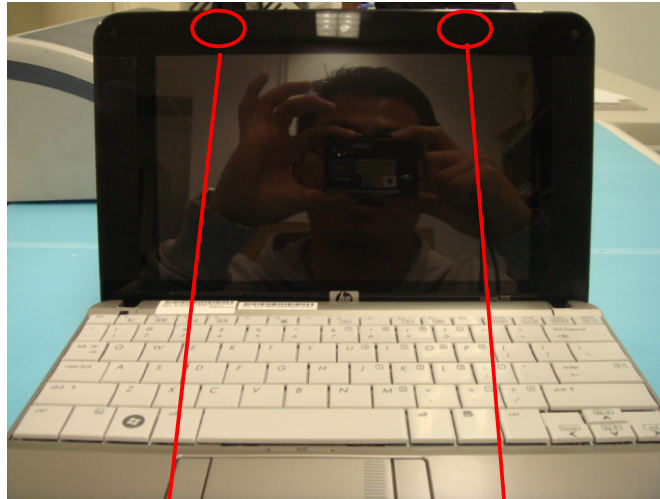
Center Frequency	<b>5850 MHz</b>
Horizontal (dBi) peak	-1.1
Vertical (dBi) peak	-0.45
Horz+Vert (dBi) peak	0.97

## Section 4. Host Platform Information

OEM / ODM Host platform: Inventec GALILEO Platform

## Section 5. Antenna Host Platform Location Information

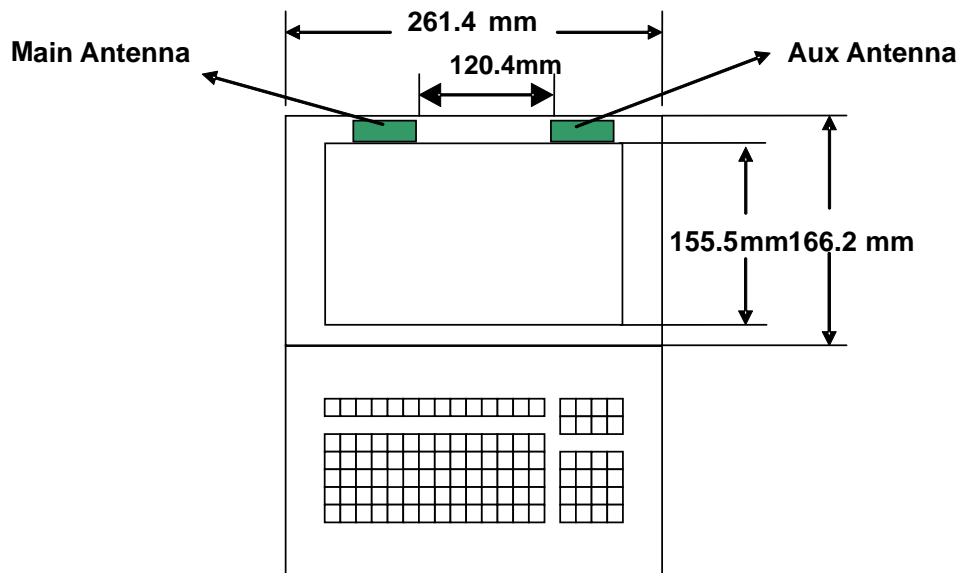
Include a dimensioned photos or dimensioned drawings of main and auxiliary antenna placements.



**L-Main**



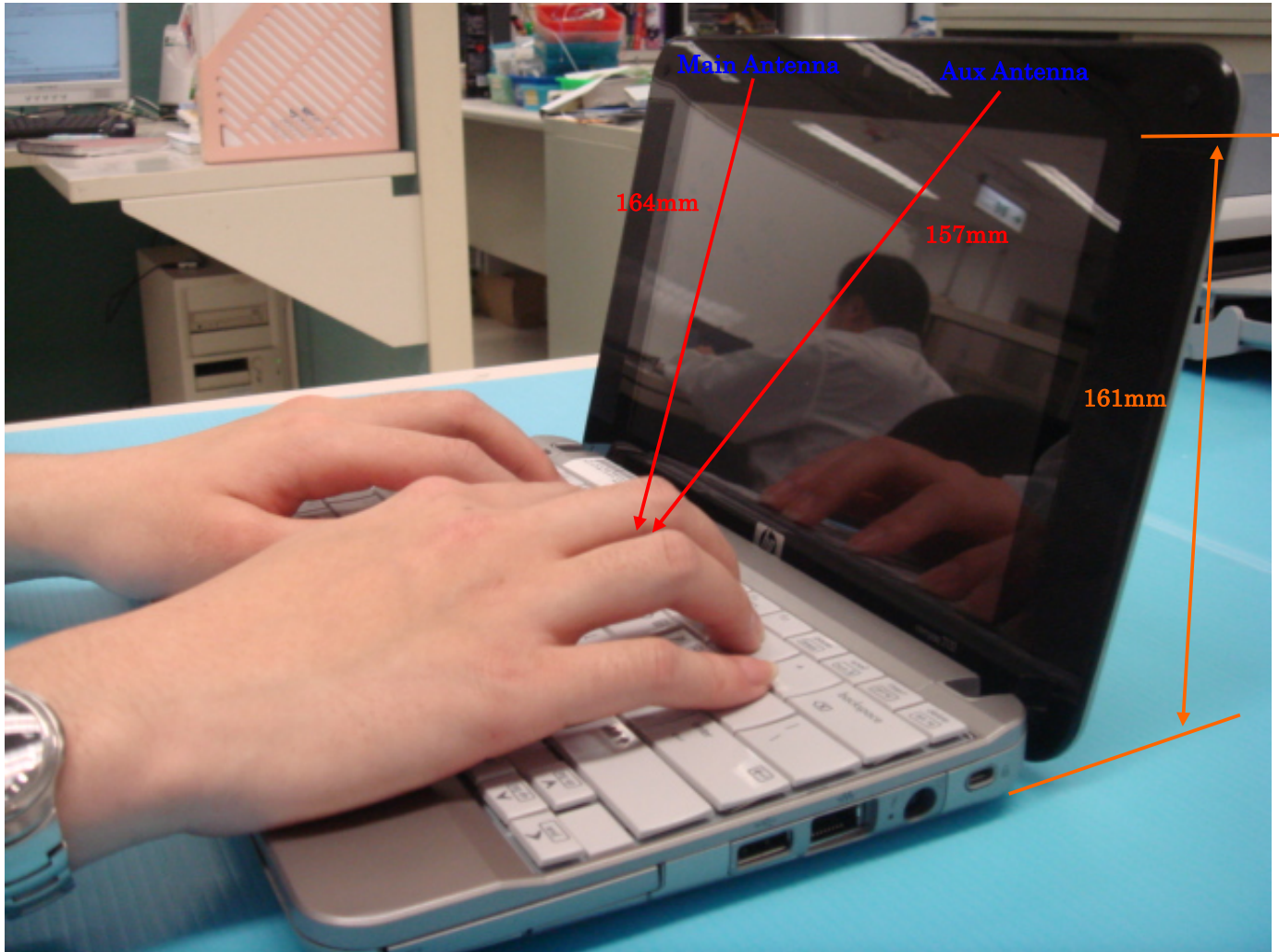
**R-Aux**





## Section 6. Antenna dimensional information for SAR evaluation

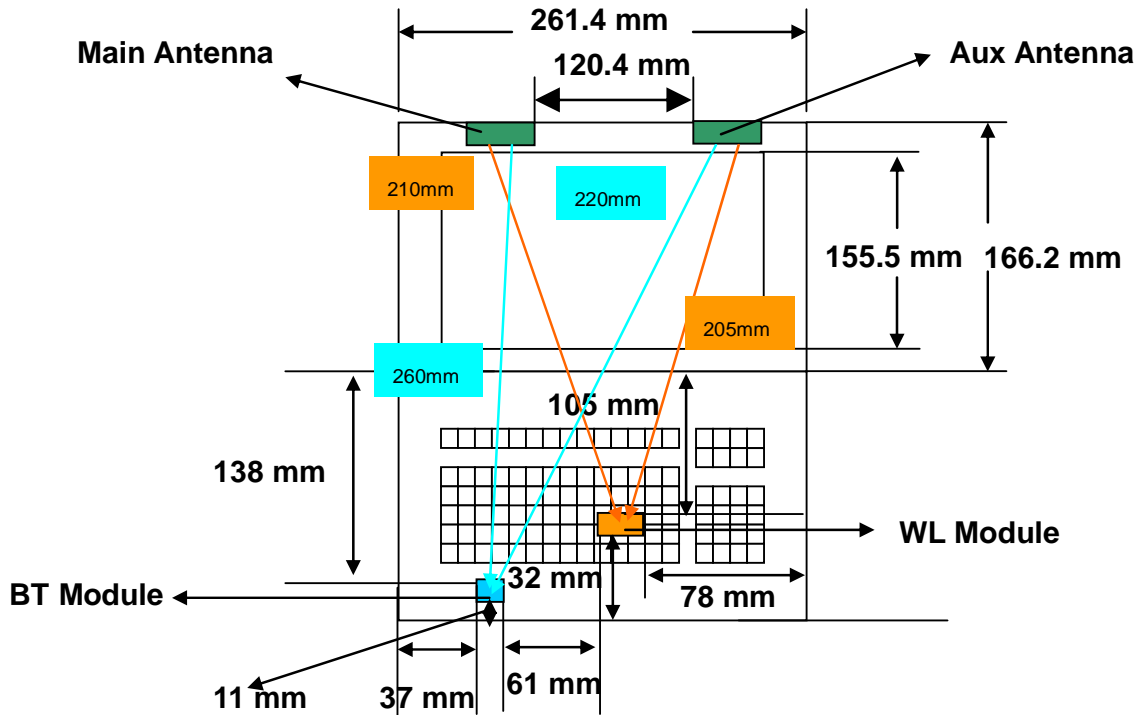
Include a dimensioned photos or dimensioned drawings showing the distance (mm) between the transmit (main) antenna and the user (excluding hands, wrist, feet, and ankle)



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

Indicate distance between WLAN module antennas and Bluetooth/other radio antenna element.

(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
<b>Argentina</b>						
<b>Brazil</b>						
<b>Indonesia</b>						
<b>Israel</b>						
<b>Malaysia</b>						
<b>Mexico</b>						
<b>Singapore</b>						Telecommunication Equipment Dealer License Required
<b>USA, Canada</b>						