

## Regulatory WLAN Antenna Information

(English Language Required for Intel Regulatory Review / Approval)

<b>Platform</b>	
Platform Owner	Compal Corporation
Brand Name	Lenovo
Model Name	20017(4186)
ODM	Compal Corporation
Target Launch Date	2009/08/21
<b>Antenna</b>	
Brand Name	WNC
Part Number	<input checked="" type="checkbox"/> Tx1 (Main Antenna):81.EJS15.001
	<input checked="" type="checkbox"/> Tx2 (AUX Antenna):81.EJS15.001
	<input checked="" type="checkbox"/> Tx3 (MIMO Antenna):81.EJS15.001
<b>Module</b>	
With WLAN Module	<input type="checkbox"/> 512AN MMW
(Check Box)	<input type="checkbox"/> 533AN MMW
	<input type="checkbox"/> WM3945ABG
	<input checked="" type="checkbox"/> 622AN Family
	<input checked="" type="checkbox"/> 633AN Family _
	<input checked="" type="checkbox"/> 622ANX Family
	<input checked="" type="checkbox"/> 512ANX Family
	<input checked="" type="checkbox"/> 533AN Family
	<input checked="" 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	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 <u>and</u> 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 <u>photographs of antennas for approval submission</u> ). Taiwan requires pictures of each antenna type shown in the system.	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 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)
TX1 (WLAN Main) (WNC P/N:81.EJS15.001) (customer P/N:DC33000HS00)	Wistron Neweb Corporation	PIFA	P/N: 57.EJS15.001  50 ohm Coaxial. length: 658 mm diameter: 1.37 mm Connector: IPEX	2400-2500MHz <b>1.79</b> dBi (peak)	2400-2500MHz <b>3.40</b> dBi (peak)	2400-2500MHz <b>2.0</b> max	2400-2500MHz <b>1.61</b> dBi (peak)
				5150-5350MHz <b>0.02</b> dBi (peak)	5150-5350MHz <b>2.56</b> dBi (peak)	5150-5350MHz <b>2.0</b> max	5150-5350MHz <b>2.54</b> dBi (peak)
				5470-5725MHz <b>-0.07</b> dBi (peak)	5470-5725MHz <b>2.62</b> dBi (peak)	5470-5725MHz <b>2.0</b> max	5470-5725MHz <b>2.68</b> dBi (peak)
				5725-5825MHz <b>-0.02</b> dBi (peak)	5725-5825MHz <b>2.71</b> dBi (peak)	5725-5825MHz <b>2.0</b> max	5725-5825MHz <b>2.72</b> dBi (peak)
TX2 (WLAN AUX) (WNC P/N:81.EJS15.001) (customer P/N:DC33000HS00)	Wistron Neweb Corporation	PIFA	P/N: 57.EJS15.001  50 ohm Coaxial. length: 747 mm diameter: 1.37 mm Connector: IPEX	2400-2500MHz <b>1.46</b> dBi (peak)	2400-2500MHz <b>3.26</b> dBi (peak)	2400-2500MHz <b>2.0</b> max	2400-2500MHz <b>1.80</b> dBi (peak)
				5150-5350MHz <b>0.28</b> dBi (peak)	5150-5350MHz <b>3.12</b> dBi (peak)	5150-5350MHz <b>2.0</b> max	5150-5350MHz <b>2.85</b> dBi (peak)
				5470-5725MHz <b>-1.02</b> dBi (peak)	5470-5725MHz <b>1.99</b> dBi (peak)	5470-5725MHz <b>2.0</b> max	5470-5725MHz <b>3.01</b> dBi (peak)
				5725-5825MHz <b>-0.42</b> dBi (peak)	5725-5825MHz <b>2.64</b> dBi (peak)	5725-5825MHz <b>2.0</b> max	5725-5825MHz <b>3.06</b> dBi (peak)
TX3 (MIMO) (WNC P/N:81.EJS15.001) (customer P/N:DC33000HS00)	Wistron Neweb Corporation	PIFA	P/N: 57.EJS15.001  50 ohm Coaxial. length: 328 mm diameter: 1.37 mm Connector: IPEX	2400-2500MHz <b>-2.04</b> dBi (peak)	2400-2500MHz <b>-1.14</b> dBi (peak)	2400-2500MHz <b>2.0</b> max	2400-2500MHz <b>0.90</b> dBi (peak)
				5150-5350MHz <b>-1.11</b> dBi (peak)	5150-5350MHz <b>0.27</b> dBi (peak)	5150-5350MHz <b>2.0</b> max	5150-5350MHz <b>1.38</b> dBi (peak)
				5470-5725MHz <b>-0.01</b> dBi (peak)	5470-5725MHz <b>1.45</b> dBi (peak)	5470-5725MHz <b>2.0</b> max	5470-5725MHz <b>1.46</b> dBi (peak)
				5725-5825MHz <b>-0.37</b> dBi (peak)	5725-5825MHz <b>1.11</b> dBi (peak)	5725-5825MHz <b>2.0</b> max	5725-5825MHz <b>1.48</b> dBi (peak)

#### NOTE:

(\* If Rx2/Rx3 only (2<sup>nd</sup> or 3<sup>rd</sup> antenna receives only, e.g. for 512 family & 4965AGN) then the information marked with \* is not required

**Antenna Peak Gain Table:**

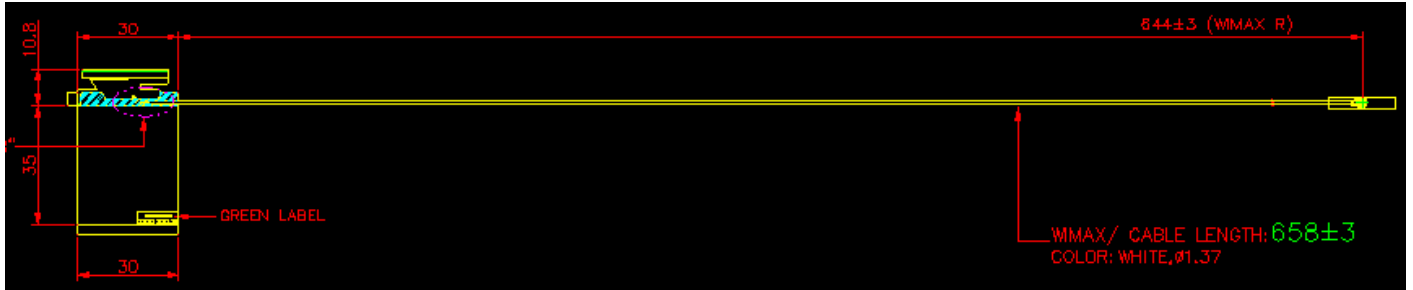
Frequency (MHz)	TX1 (WLAN Main)		TX2 (WLAN AUX)		TX3 (MIMO)	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
2400	0.84	-0.38	1.46	-0.55	-4.05	-2.17
2450	0.67	-1.20	0.54	-1.23	-3.72	-2.04
2500	1.79	-0.01	0.40	-0.45	-3.14	-2.25
5150	-0.08	-0.50	0.28	-1.59	-1.54	-1.53
5250	0.02	-0.13	0.08	-1.76	-2.37	-1.64
5350	-1.22	-1.04	-0.88	-1.57	-1.71	-1.11
5470	-2.58	-2.58	-2.15	-3.07	-0.31	-0.18
5600	-1.68	-1.10	-3.56	-1.41	-0.01	-1.15
5725	-1.78	-0.07	-1.02	-1.25	-0.40	-1.19
5785	-3.47	-0.08	-2.03	-0.65	-0.37	-1.29
5850	-3.74	-0.02	-1.44	-0.42	-0.95	-0.85

- Antenna Peak Gain required being test in system ba sis.
- 1E frame contend absolutely peak antenna gain include H/V
- If Rx2 only (2<sup>nd</sup> antenna receives only, e.g. for 512 family) then the information is not required for Rx2.
- 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 Tx1 (WLAN Main) here.

### Tx1 (WIMAX Main) Dimensioned Drawing:

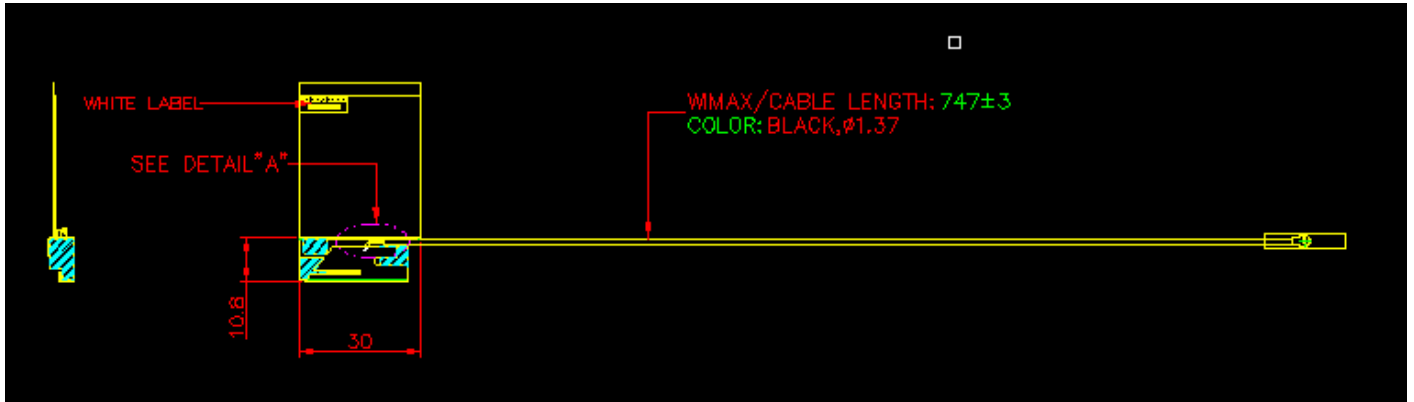


### Tx1 (WIMAX Main) Photo:



Include a dimensioned photo and dimensioned drawing of Tx2 (WLAN AUX) here.

Tx2 (WIMAX AUX) Dimensioned Drawing:

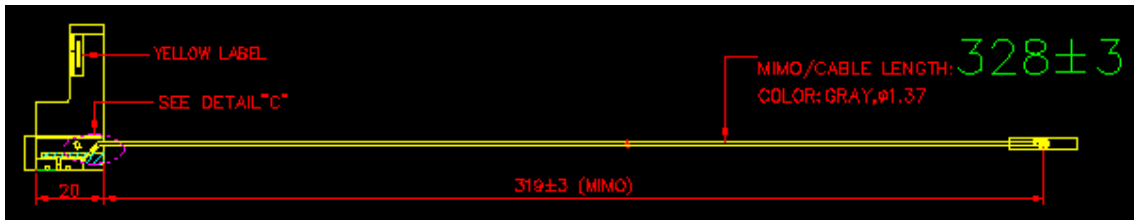


Tx2 (WIMAX AUX) Photo:



Include a dimensioned photo and dimensioned drawing of Tx3 (MIMO) here.

**Tx3 (MIMO)WLAN Antenna Dimensioned Drawing:**

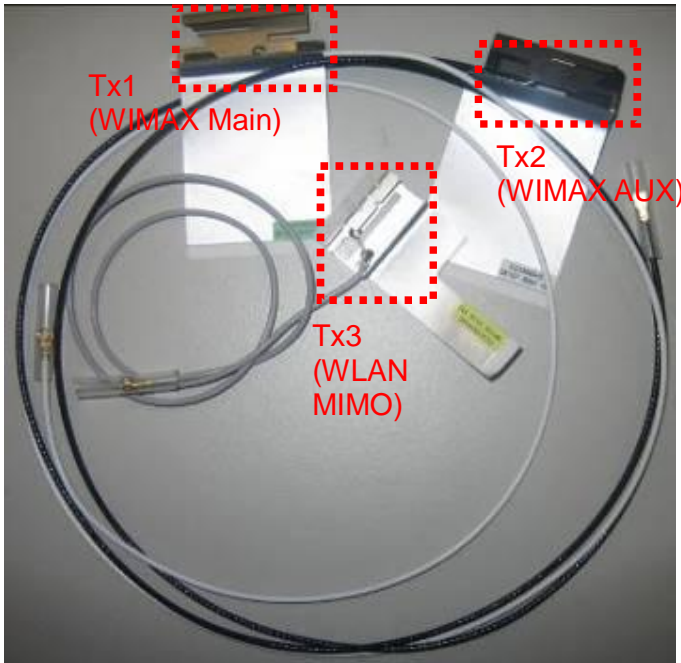


**Tx3 (MIMO)WLAN Antenna Photo:**



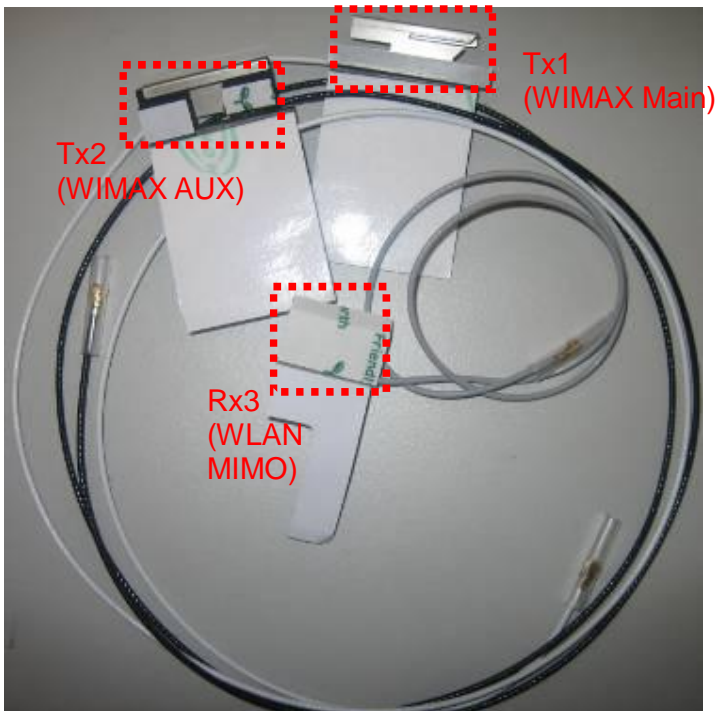
**Include front view photo of all 3 antennas here.**

Antenna Manufacturer: WLAN  
Antenna Part Number: 81.EJS15.001 Tx1 (WIMAX Main), 81.EJS15.001 Tx2 (WIMAX AUX),  
81.EJS15.001 Tx3 (WLAN MIMO)



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

Antenna Manufacturer: WLAN  
Antenna Part Number: 81.EJS15.001 Tx1 (WIMAX Main), 81.EJS15.001 Tx2 (WIMAX AUX),  
81.EJS15.001 Tx3 (WLAN MIMO)

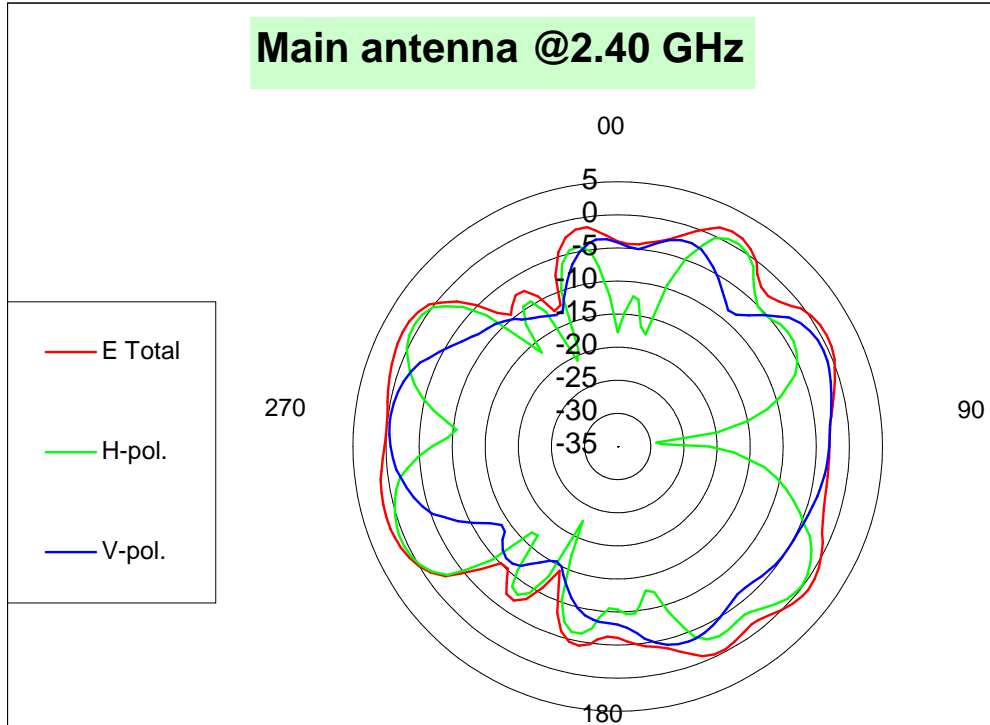




## Section 3. Radiation characteristics of antennae Loaded in Host Platform

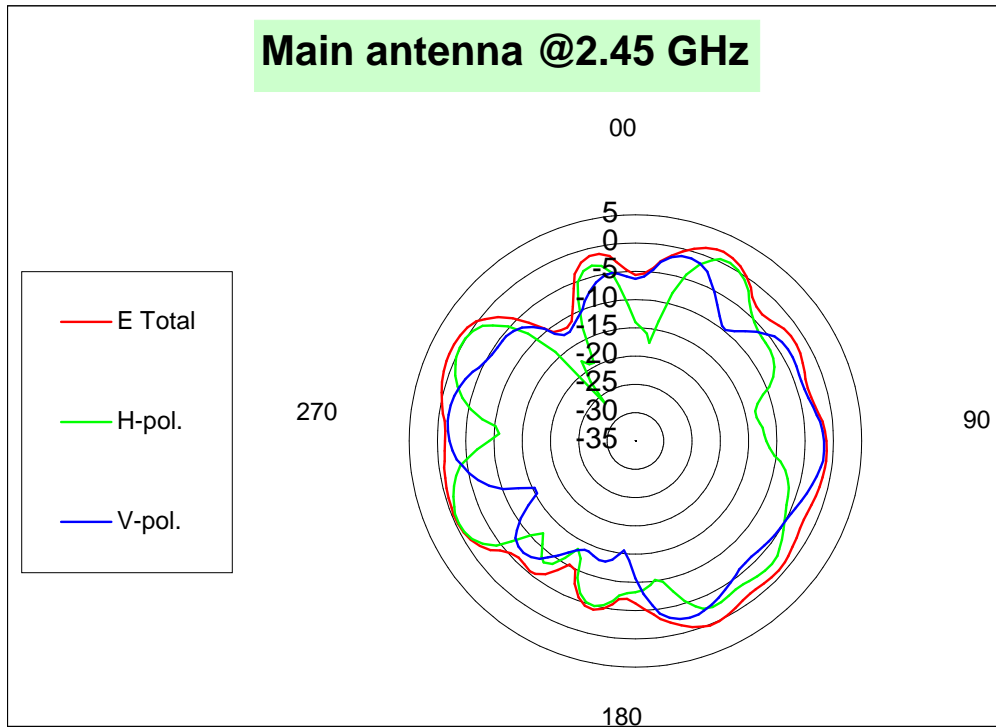
### 2400-2500MHz radiation characteristic

Tx1 antenna: 2400 MHz



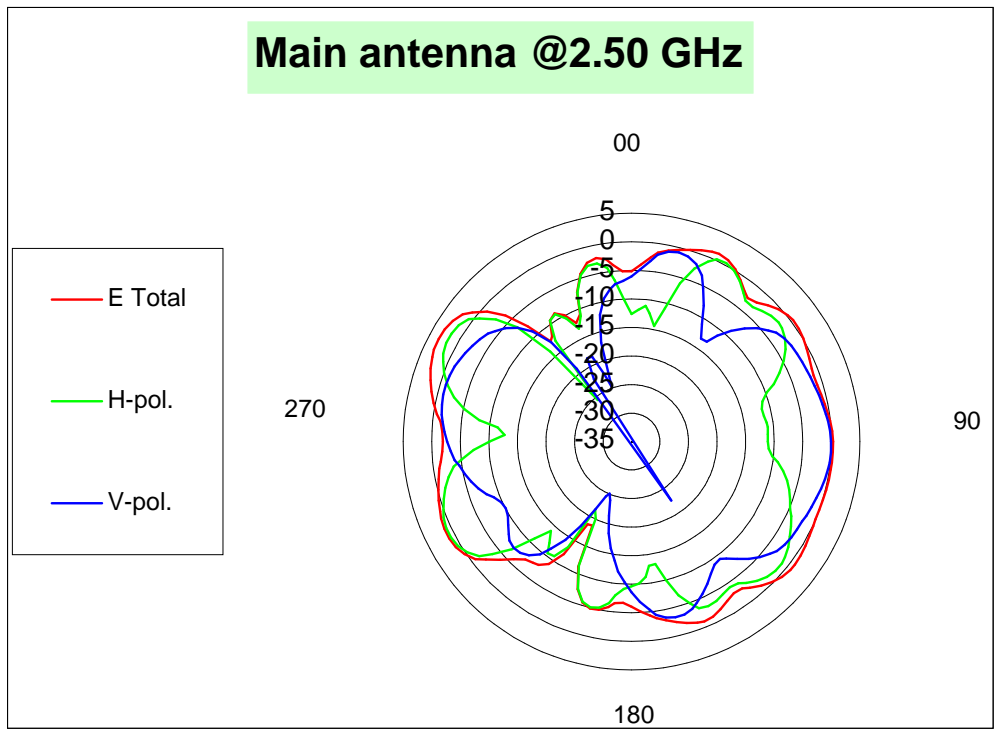
	H-pol	V pol
<b>Peak Gain</b>	<b>0.84</b>	<b>-0.38</b>

**Tx1 antenna: 2450 MHz**



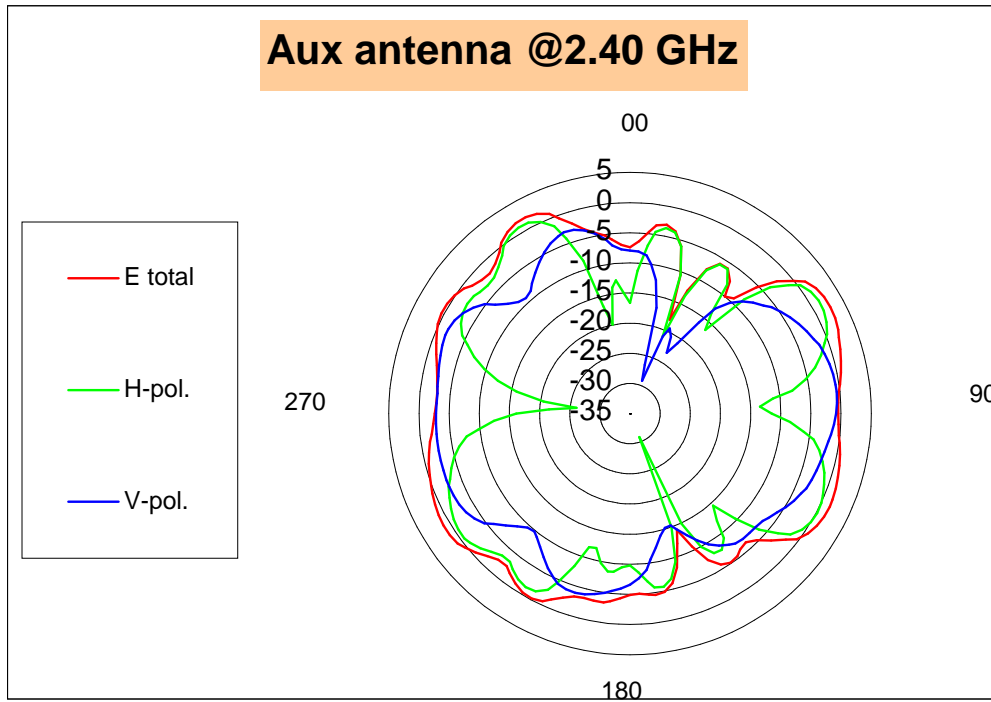
	H-pol	V pol
Peak Gain	0.67	-1.20

**Tx1 antenna: 2500 MHz**



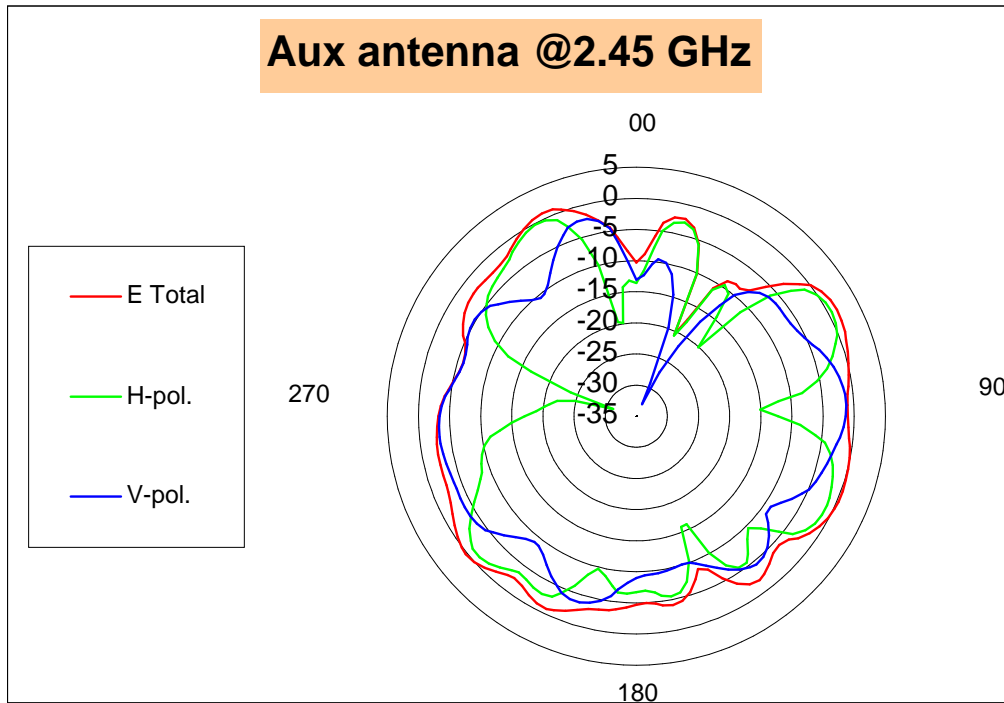
	H-pol	V pol
<b>Peak Gain</b>	<b>1.79</b>	<b>-0.01</b>

**Tx2 (or Rx2) antenna: 2400 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



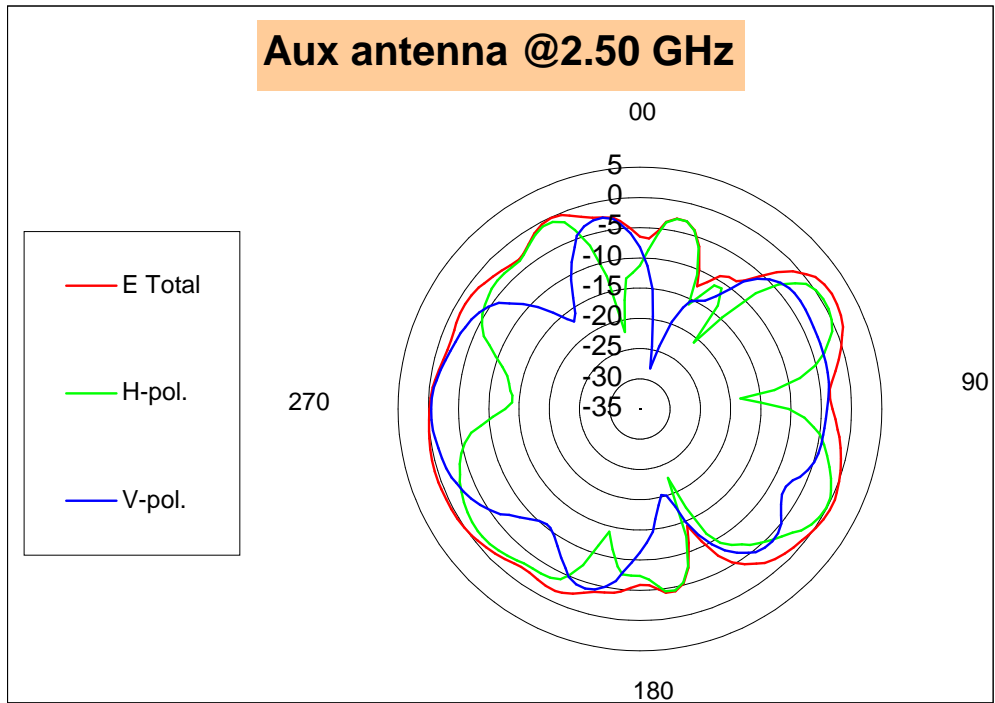
	H-pol	V pol
<b>Peak Gain</b>	<b>1.46</b>	<b>-0.55</b>

**Tx2 (or Rx2) antenna: 2450 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



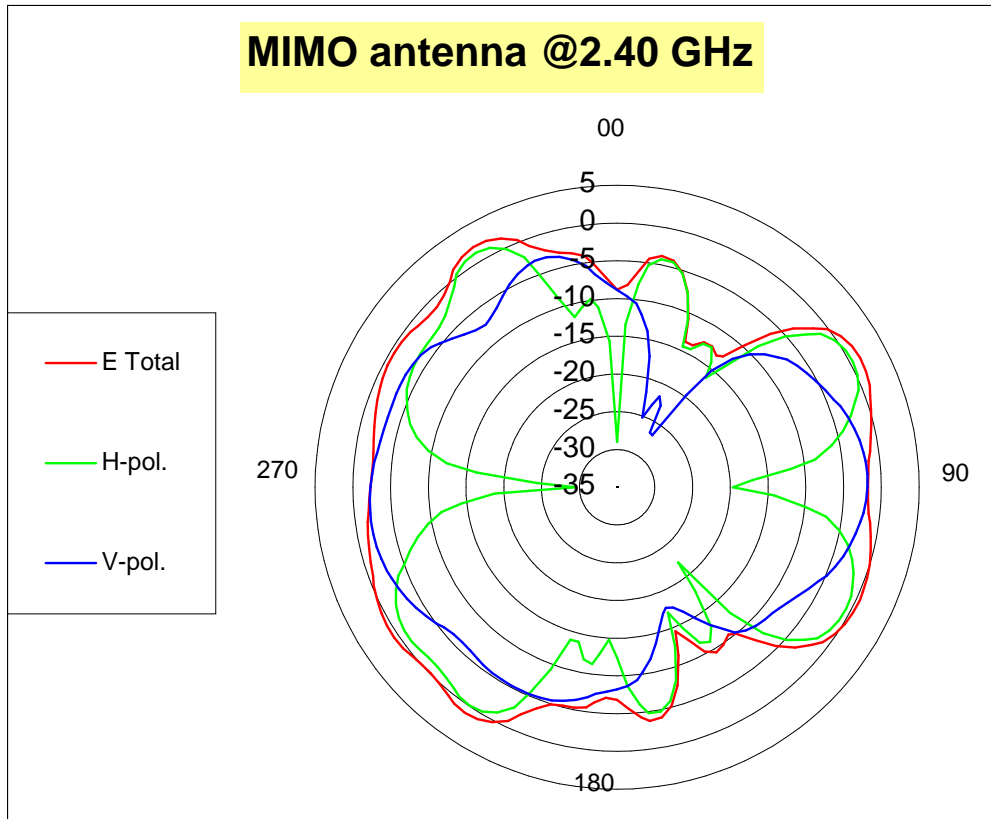
	H-pol	V pol
<b>Peak Gain</b>	<b>0.54</b>	<b>-1.23</b>

**Tx2 (or Rx2) antenna: 2500 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



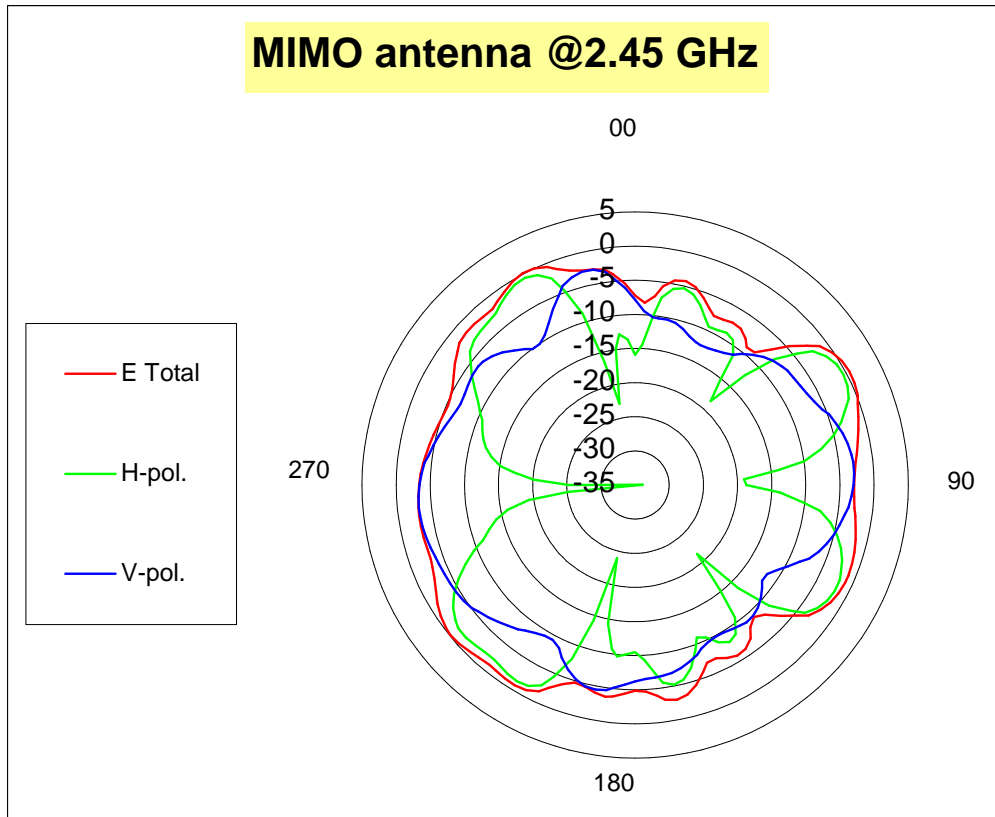
	H-pol	V pol
<b>Peak Gain</b>	<b>0.40</b>	<b>-0.45</b>

**Tx3 (or Rx3) antenna: 2400 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)**



	H-pol	V pol
Peak Gain	-4.05	-2.17

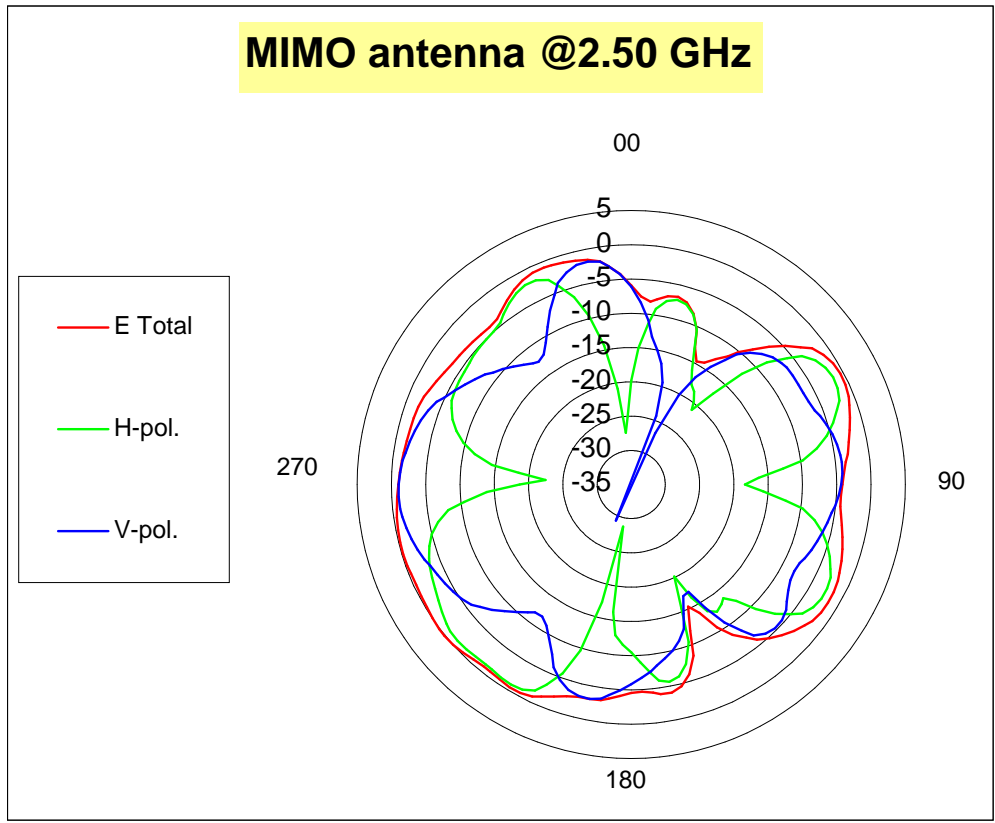
**Tx3 (or Rx3) antenna: 2450 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-3.72</b>	<b>-2.04</b>



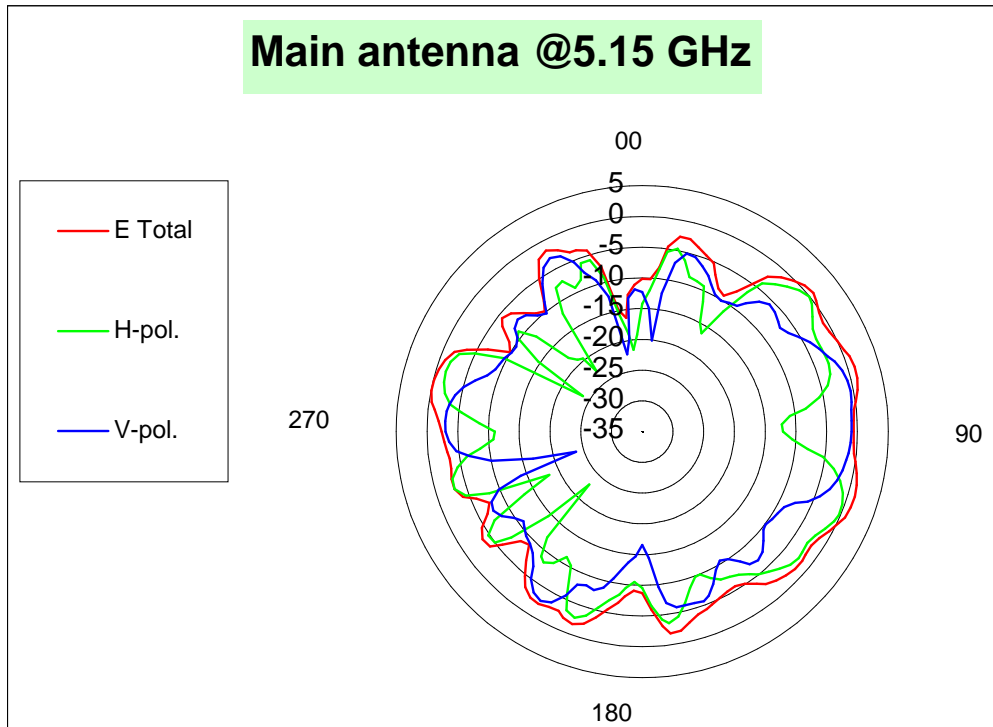
**Tx3 (or Rx3) antenna: 2500 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-3.14</b>	<b>-2.25</b>

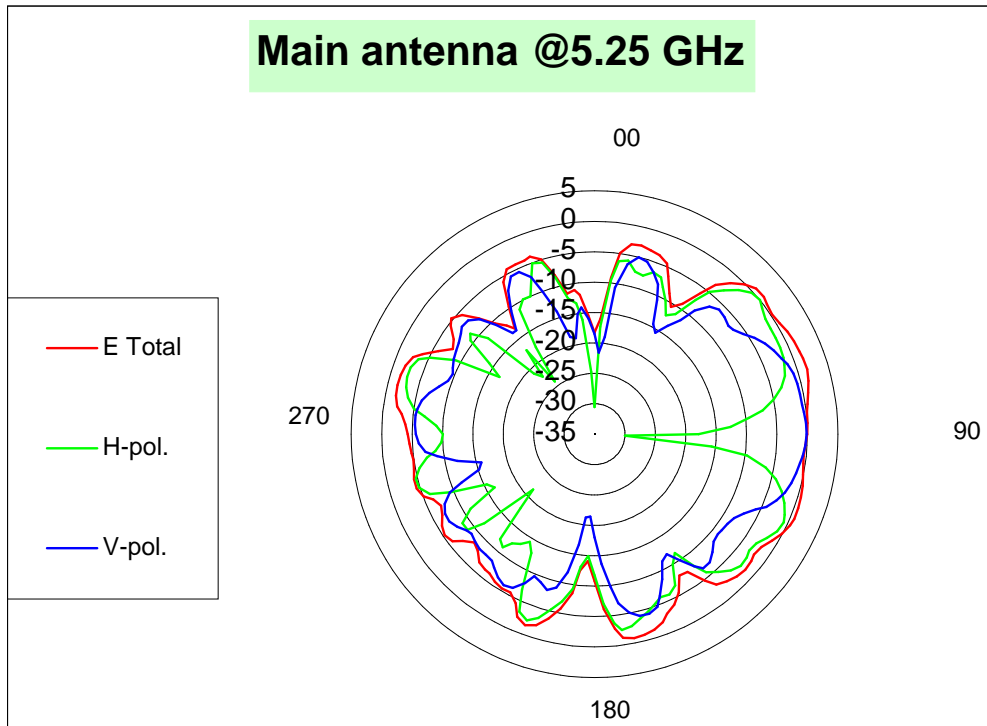
**5150-5350 MHz radiation characteristic**

**Tx1 antenna: 5150 MHz**



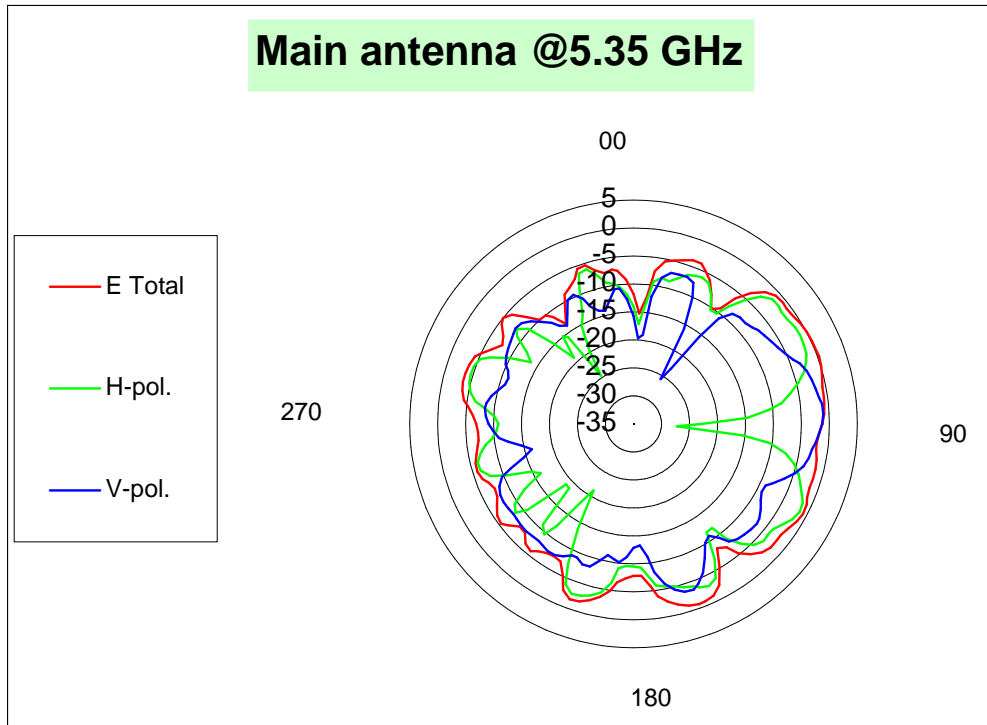
	H-pol	V pol
Peak Gain	-0.08	-0.50

**Tx1 antenna: 5250 MHz**



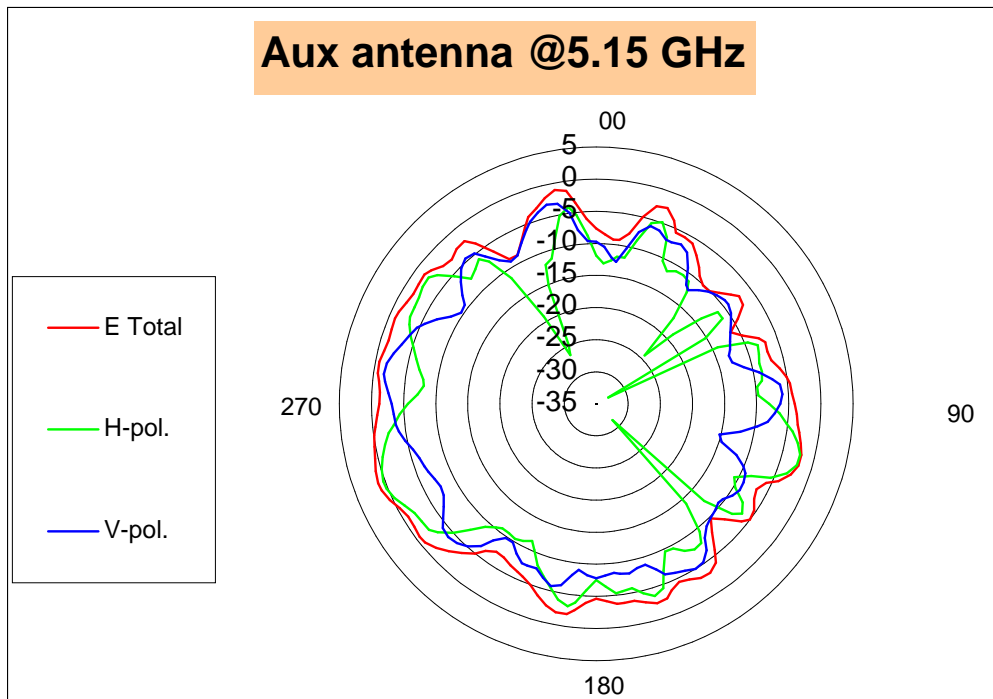
	H-pol	V pol
<b>Peak Gain</b>	<b>0.02</b>	<b>-0.13</b>

**Tx1 antenna: 5350 MHz**



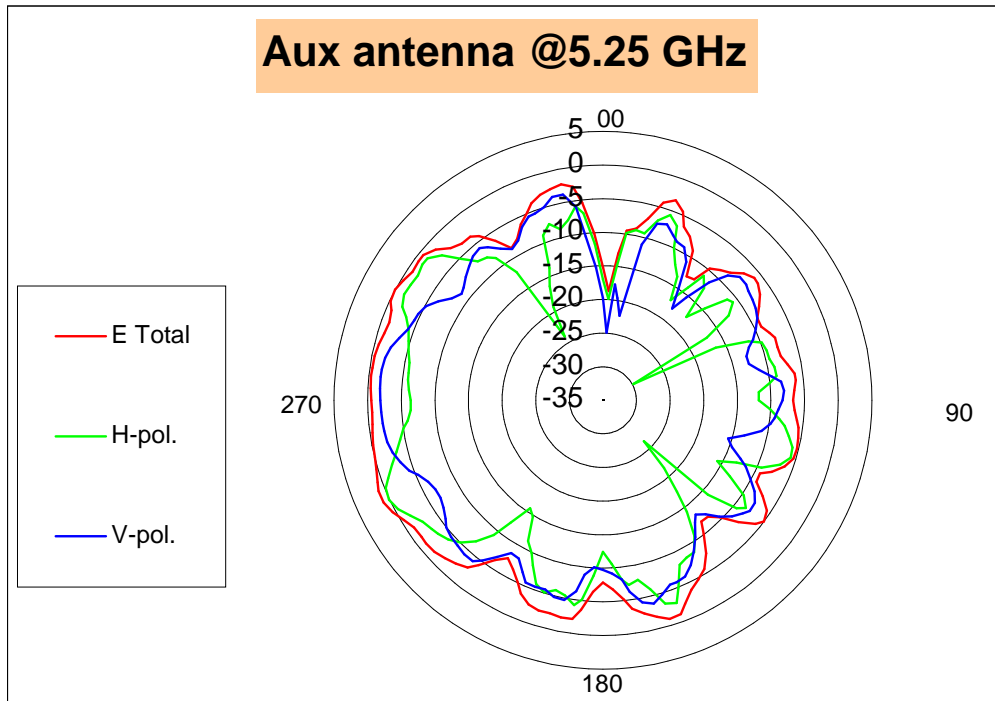
	H-pol	V pol
Peak Gain	-1.22	-1.04

**Tx2 (or Rx2) antenna: 5150 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



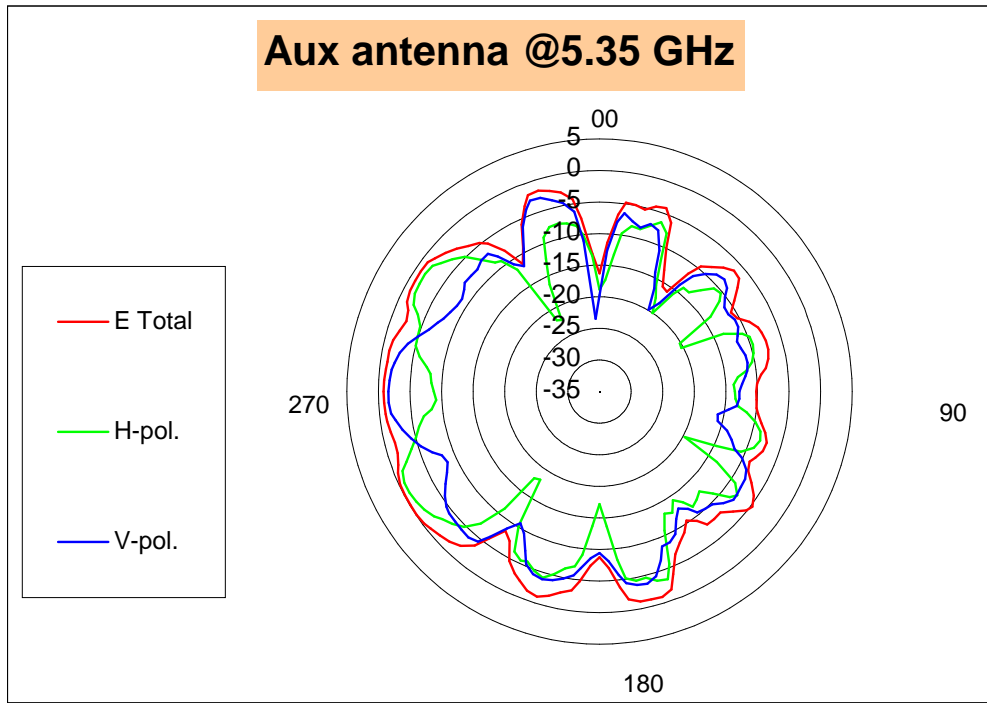
	H-pol	V pol
Peak Gain	0.28	-1.59

**Tx2 (or Rx2) antenna: 5250 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



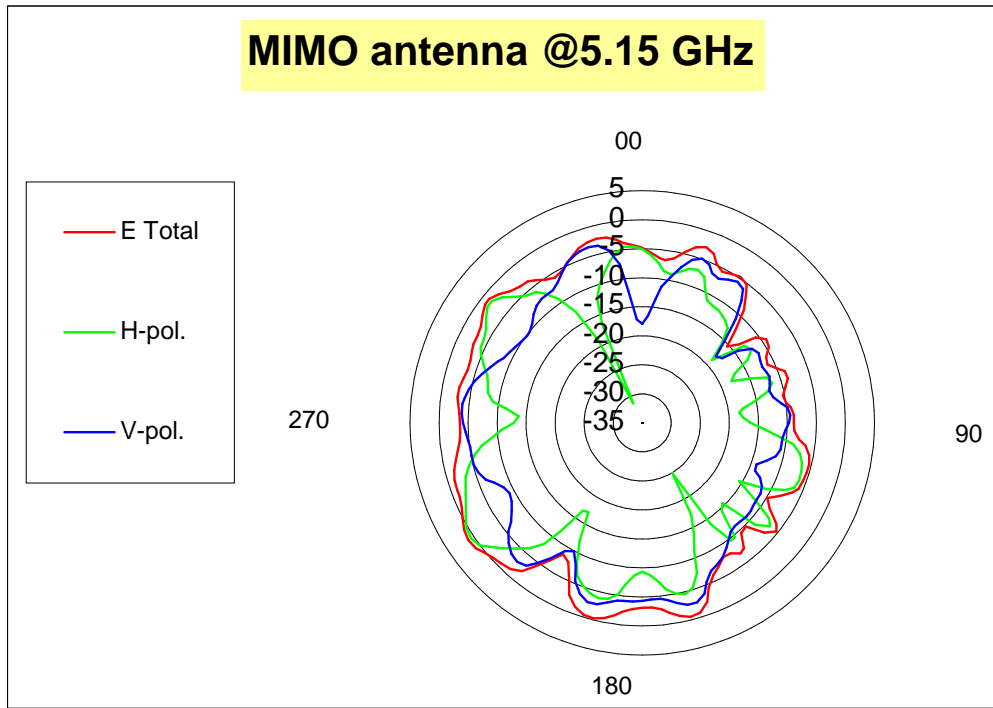
	H-pol	V pol
<b>Peak Gain</b>	<b>0.08</b>	<b>-1.76</b>

**Tx2 (or Rx2) antenna: 5350 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-0.88</b>	<b>-1.57</b>

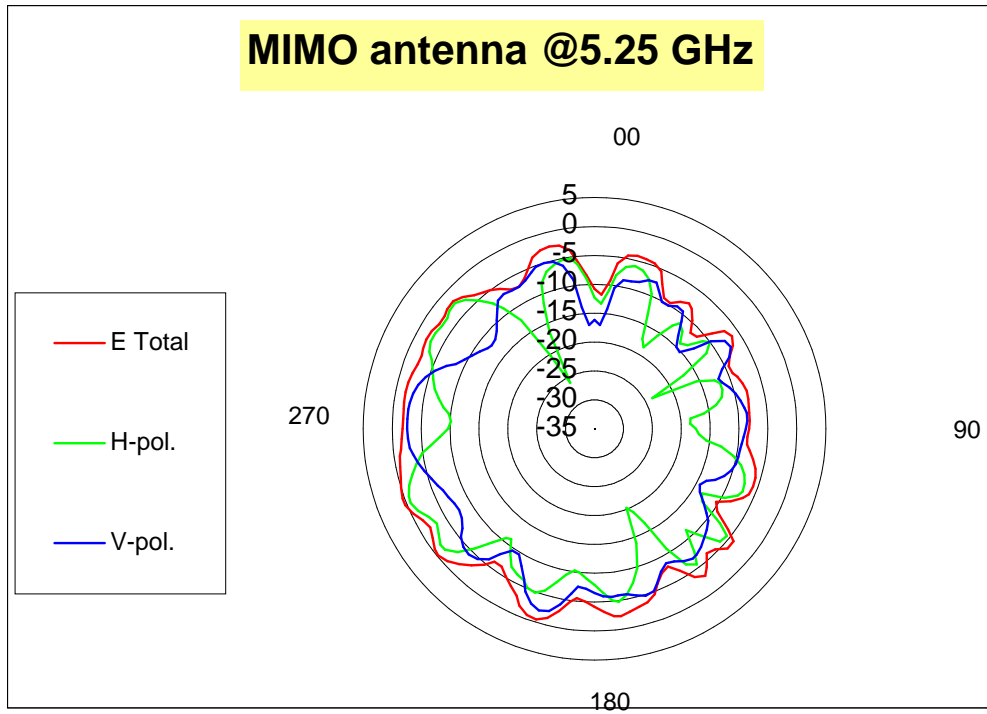
**Tx3 (or Rx3) antenna: 5150 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-1.54</b>	<b>-1.53</b>

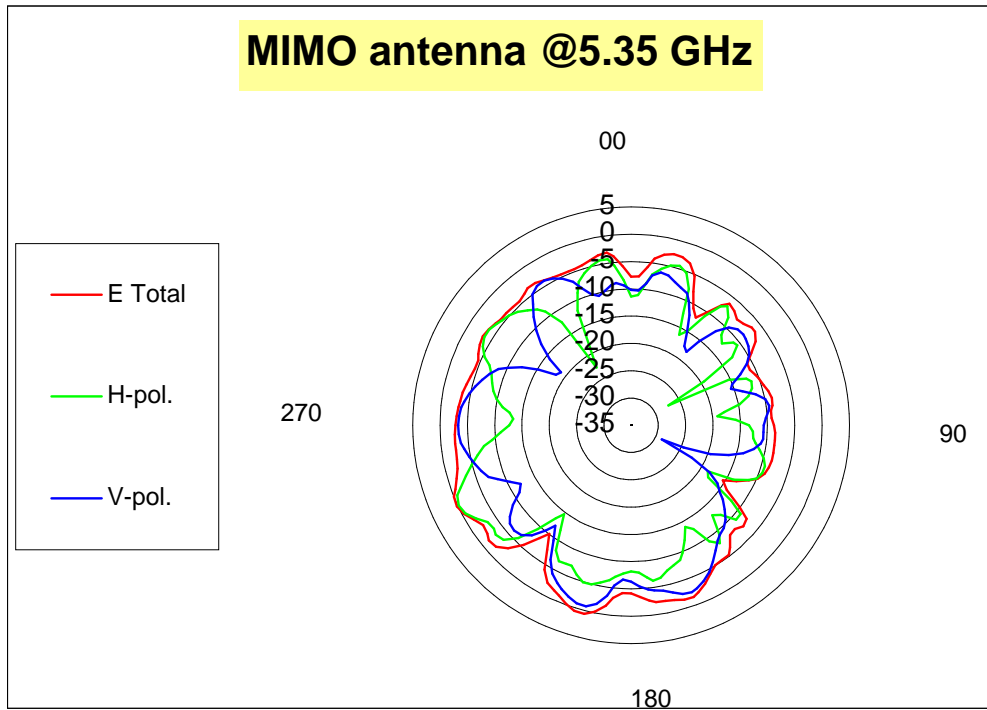


**Tx3 (or Rx3) antenna: 5250 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-2.37</b>	<b>-1.64</b>

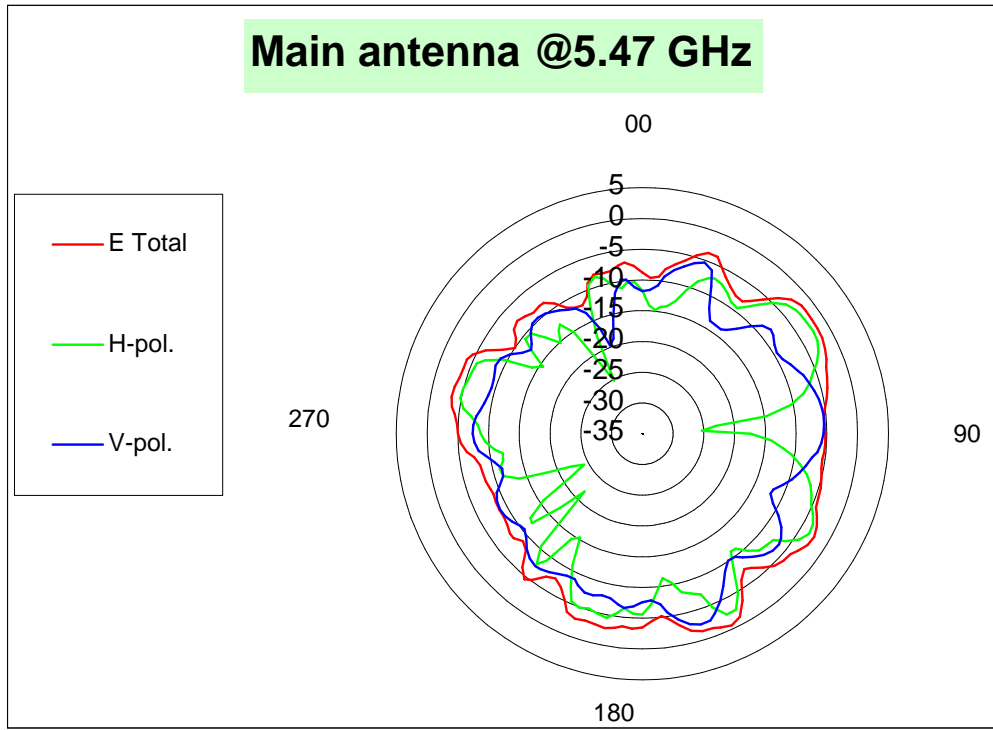
Tx3 (or Rx3) antenna: 5350 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)



	H-pol	V pol
<b>Peak Gain</b>	<b>-1.71</b>	<b>-1.11</b>

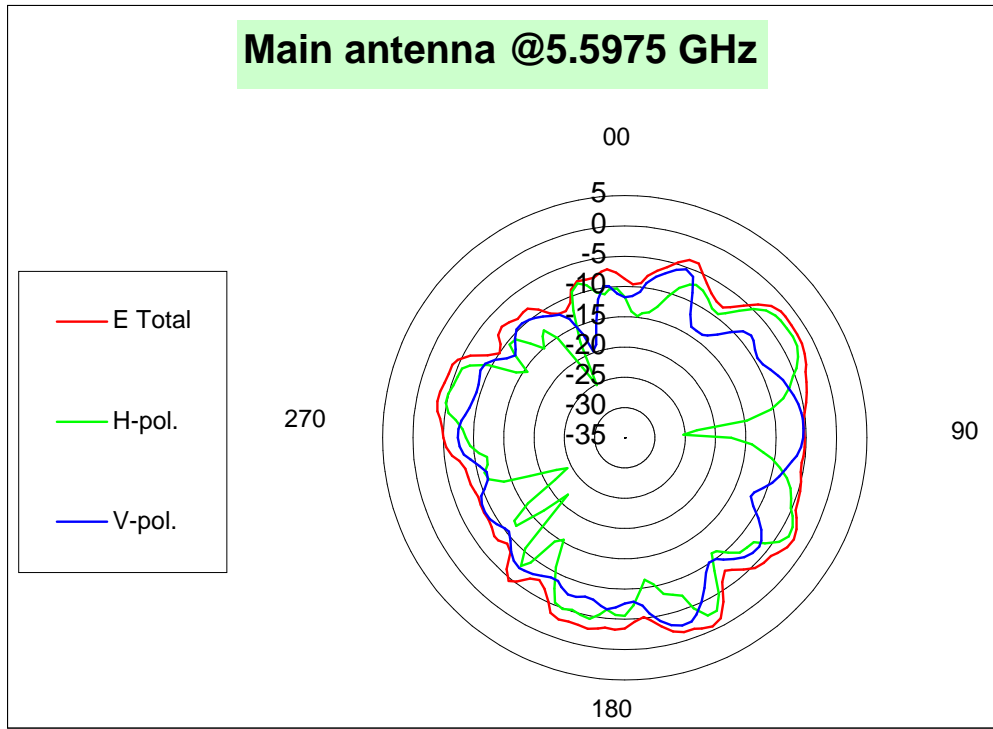
5470-5725MHz radiation characteristic

Tx1 antenna: 5470 MHz



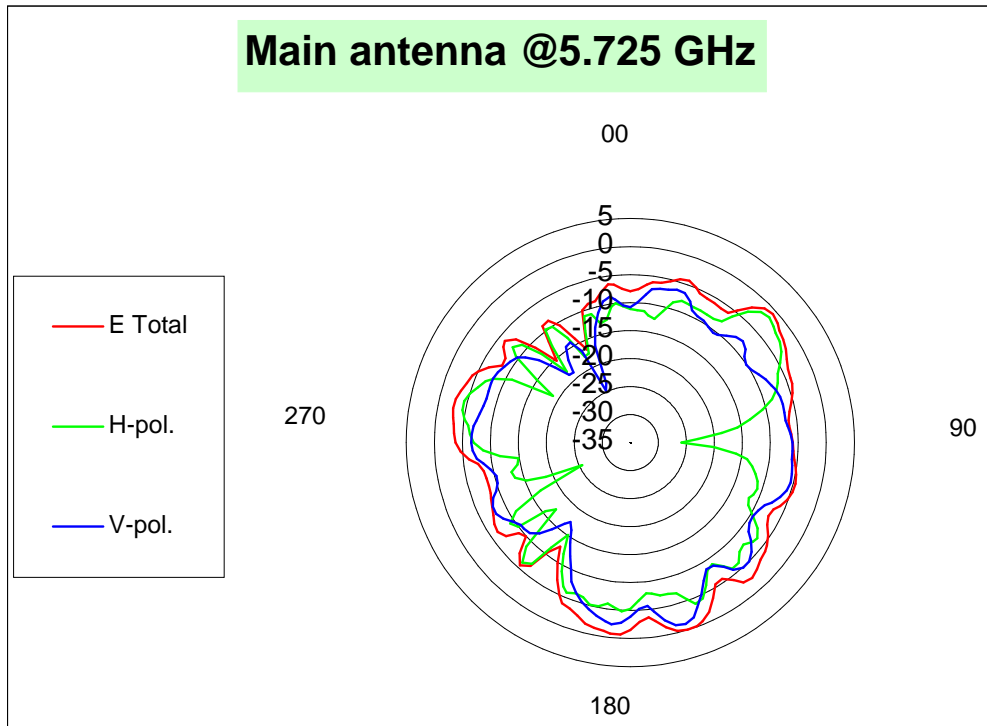
	H-pol	V pol
<b>Peak Gain</b>	<b>-2.58</b>	<b>-2.58</b>

**Tx1 antenna: 5597.5 MHz**



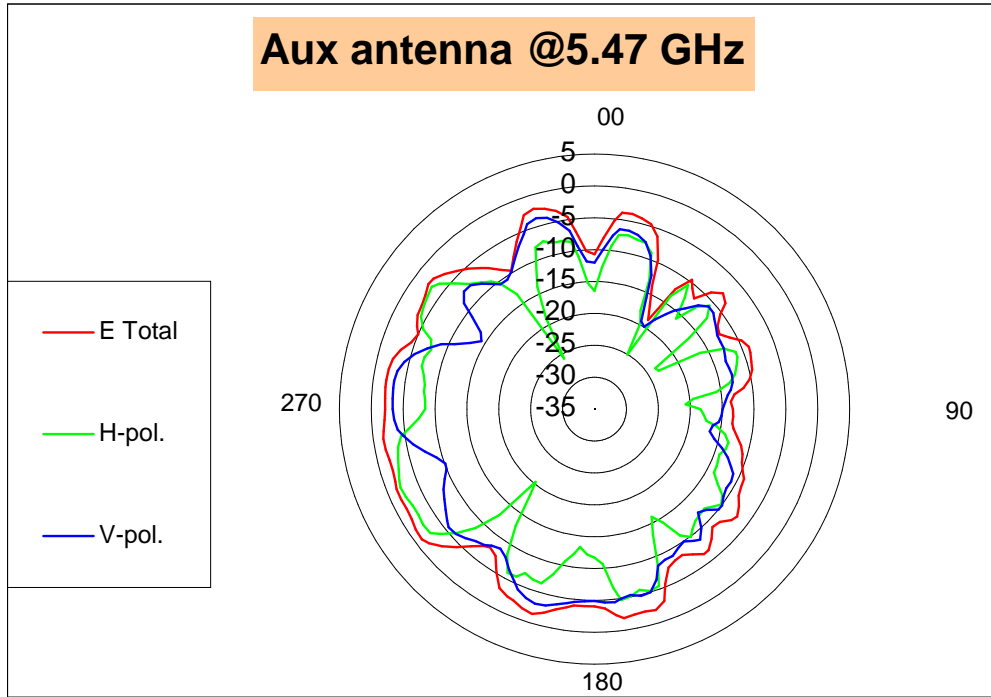
	H-pol	V pol
<b>Peak Gain</b>	<b>-1.68</b>	<b>-1.10</b>

**Tx1 antenna: 5725 MHz**



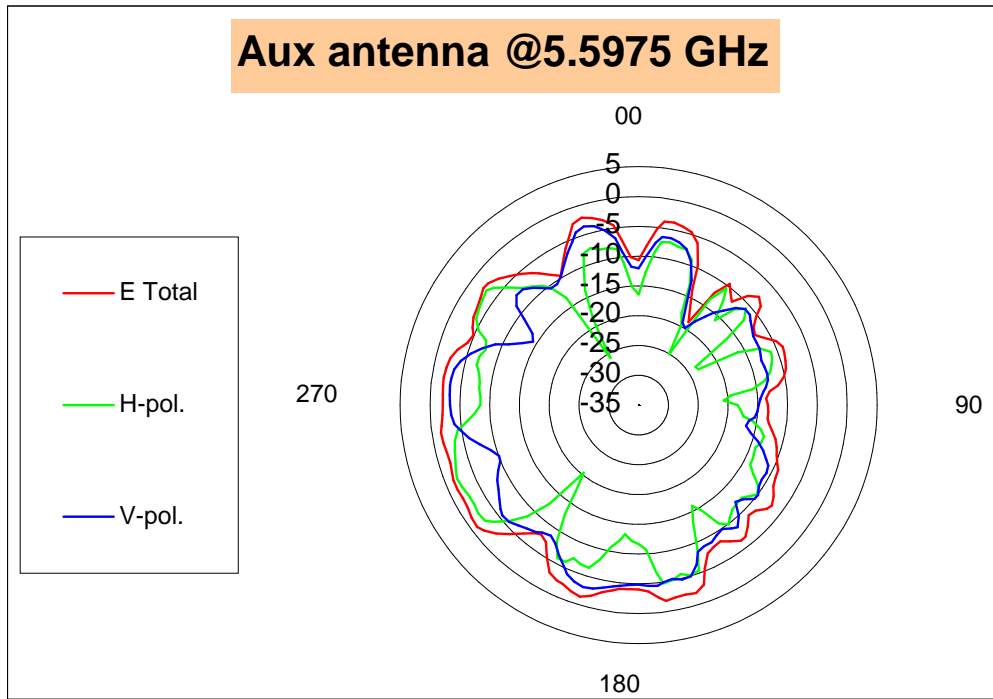
	H-pol	V pol
<b>Peak Gain</b>	<b>-1.78</b>	<b>-0.07</b>

**Tx2 (or Rx2) antenna: 5470 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



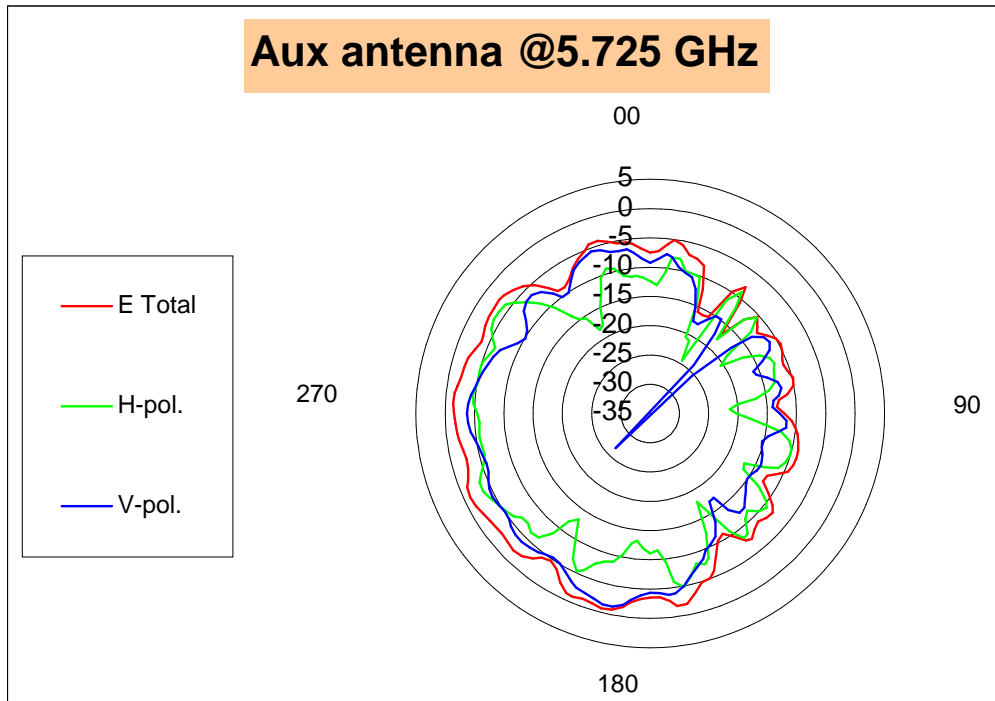
	H-pol	V pol
Peak Gain	-2.15	-3.07

**Tx2 (or Rx2) antenna: 5597.5 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



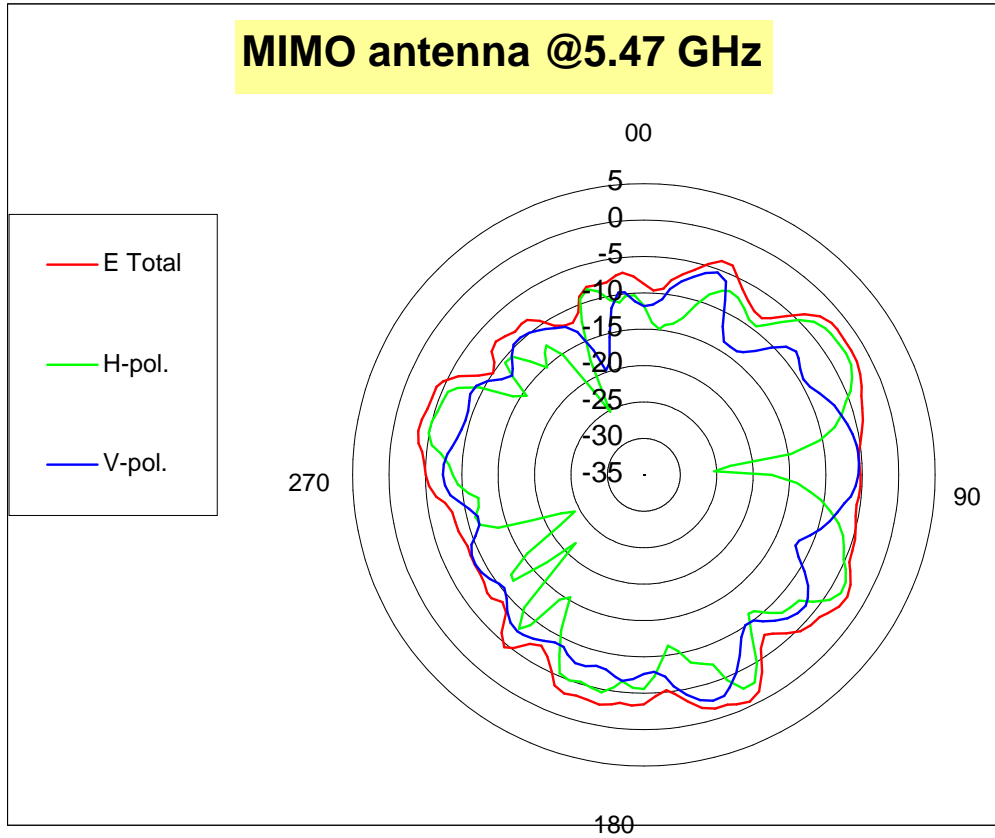
	H-pol	V pol
<b>Peak Gain</b>	<b>-3.56</b>	<b>-1.41</b>

**Tx2 (or Rx2) antenna: 5725 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



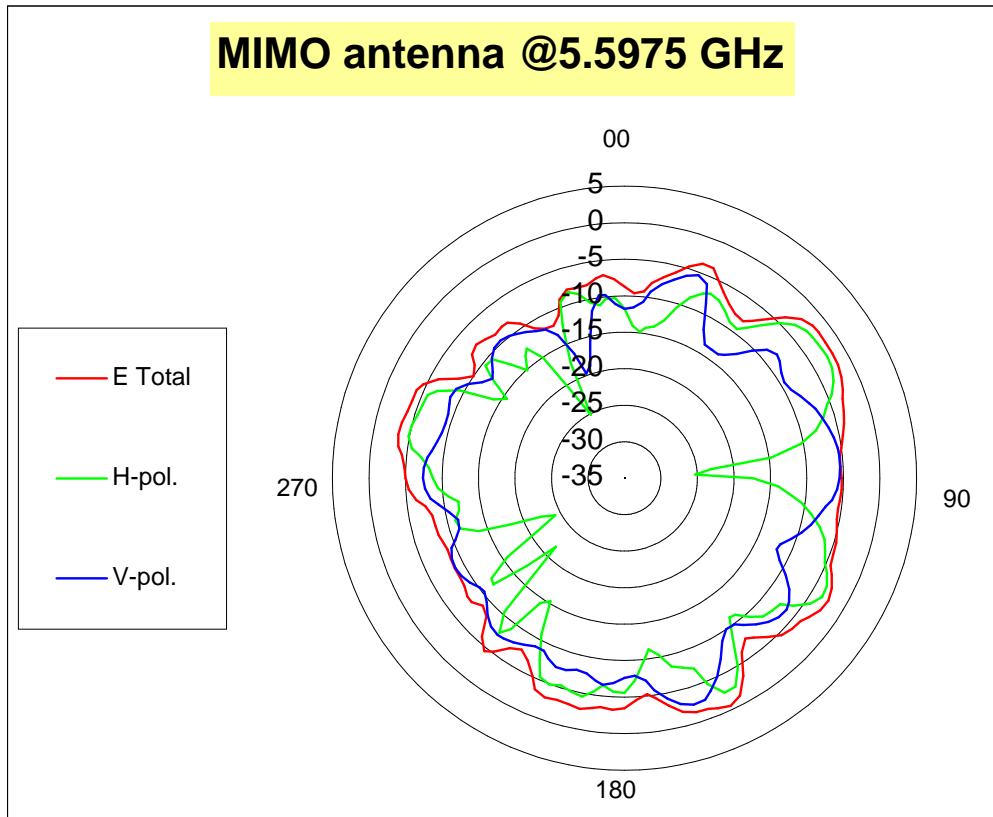
	H-pol	V pol
<b>Peak Gain</b>	<b>-1.02</b>	<b>-1.25</b>





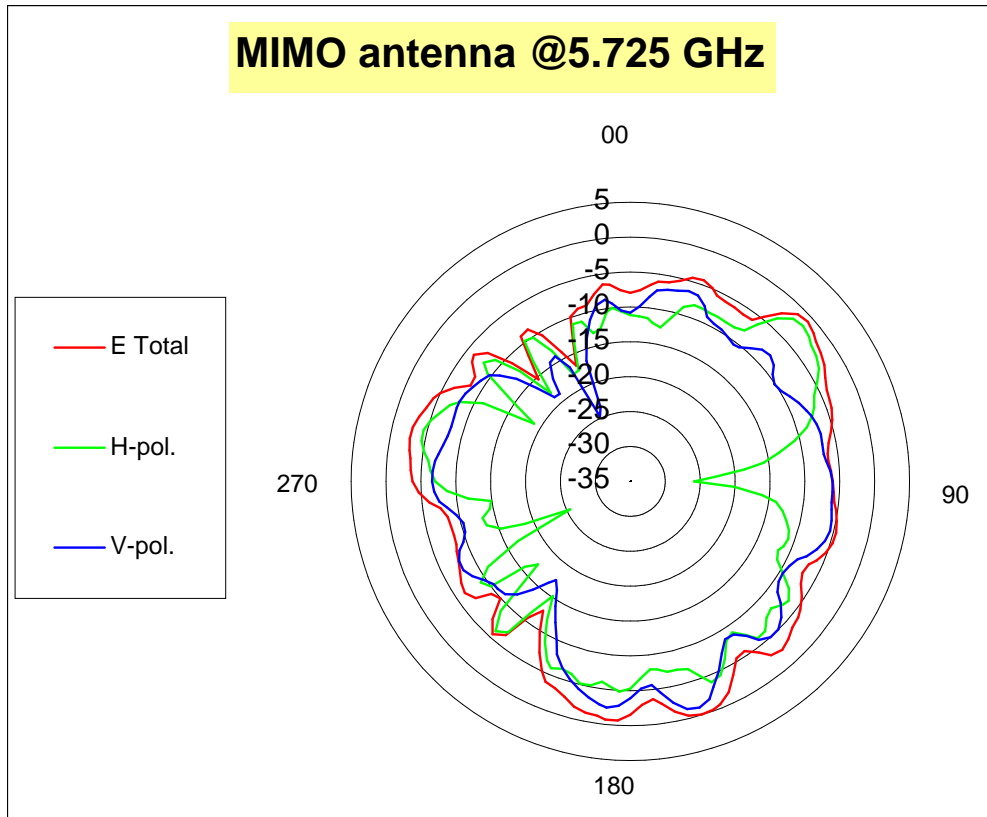
	H-pol	V pol
Peak Gain	-0.31	-0.18

**Tx3 (or Rx3) antenna: 5597.5 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-0.01</b>	<b>-1.15</b>

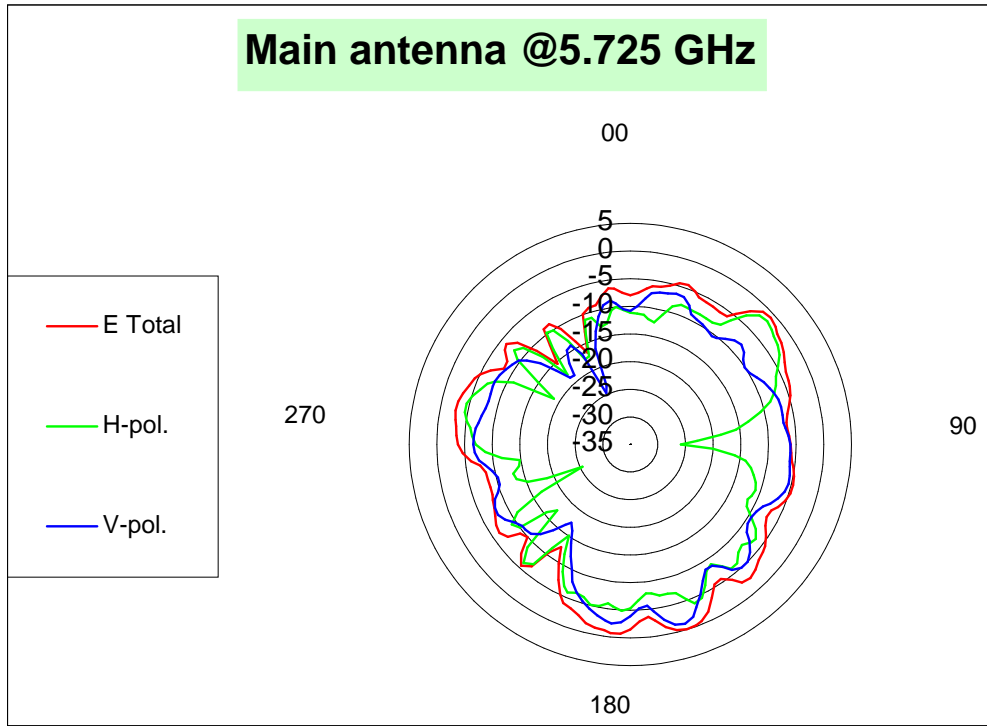
Tx3 (or Rx3) antenna: 5725 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)



	H-pol	V pol
<b>Peak Gain</b>	<b>-0.40</b>	<b>-1.19</b>

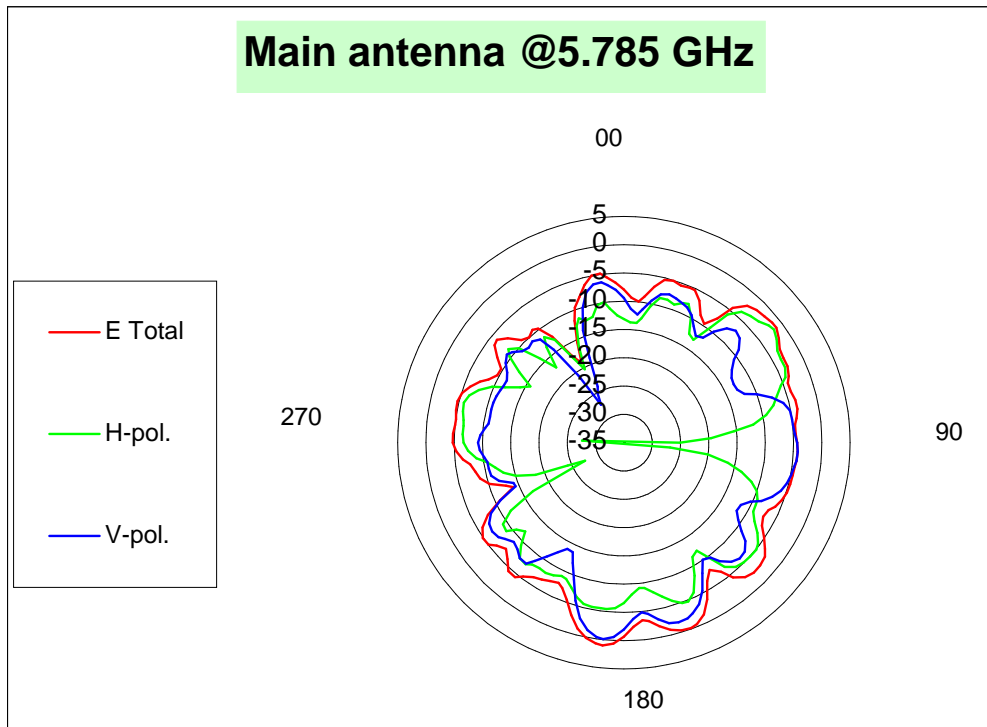
5725-5850 MHz radiation characteristic

Tx1 antenna: 5725 MHz



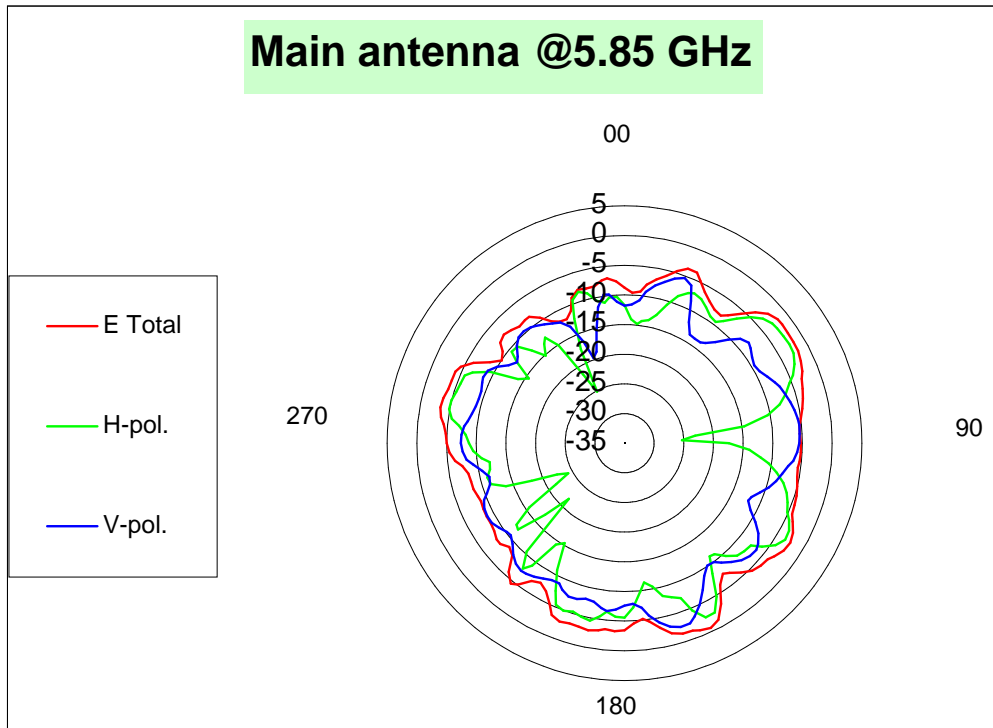
	H-pol	V pol
Peak Gain	-1.78	-0.07

**Tx1 antenna: 5785 MHz**



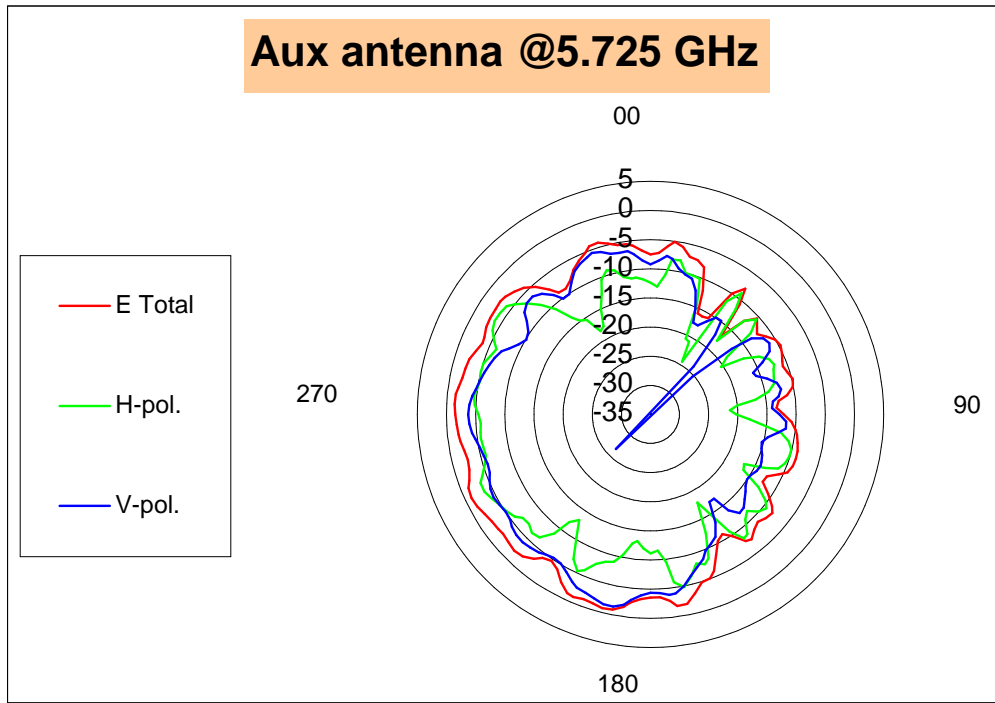
	H-pol	V pol
<b>Peak Gain</b>	<b>-3.47</b>	<b>-0.08</b>

**Tx1 antenna: 5850 MHz**



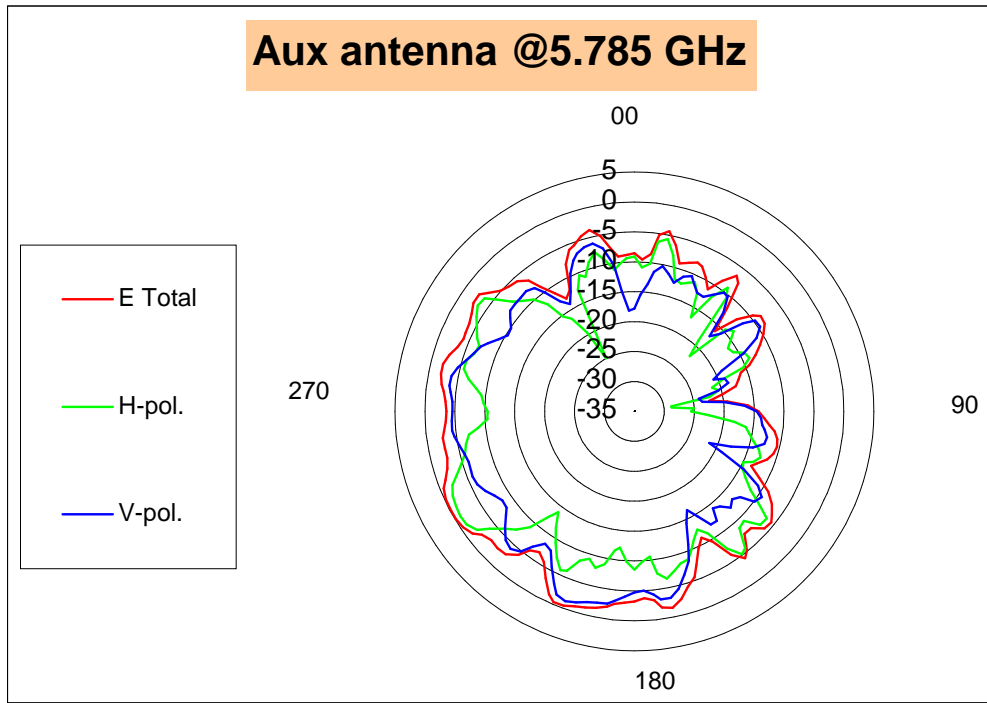
	H-pol	V pol
Peak Gain	-3.74	-0.02

**Tx2 (or Rx2) antenna: 5725 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-1.02</b>	<b>-1.25</b>

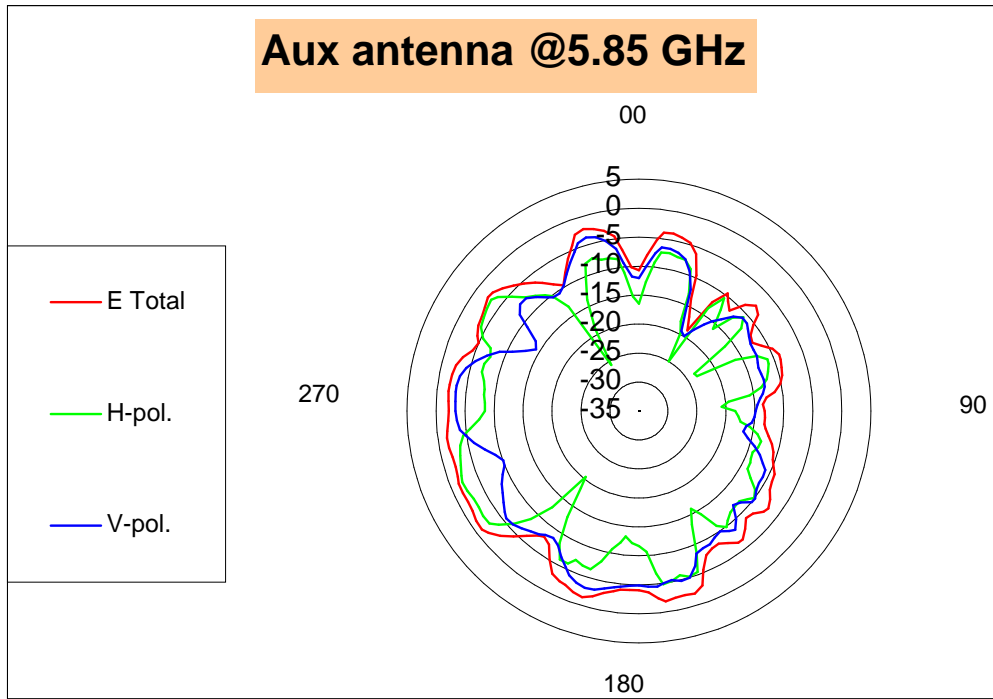
**Tx2 (or Rx2) antenna: 5785 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-2.03</b>	<b>-0.65</b>

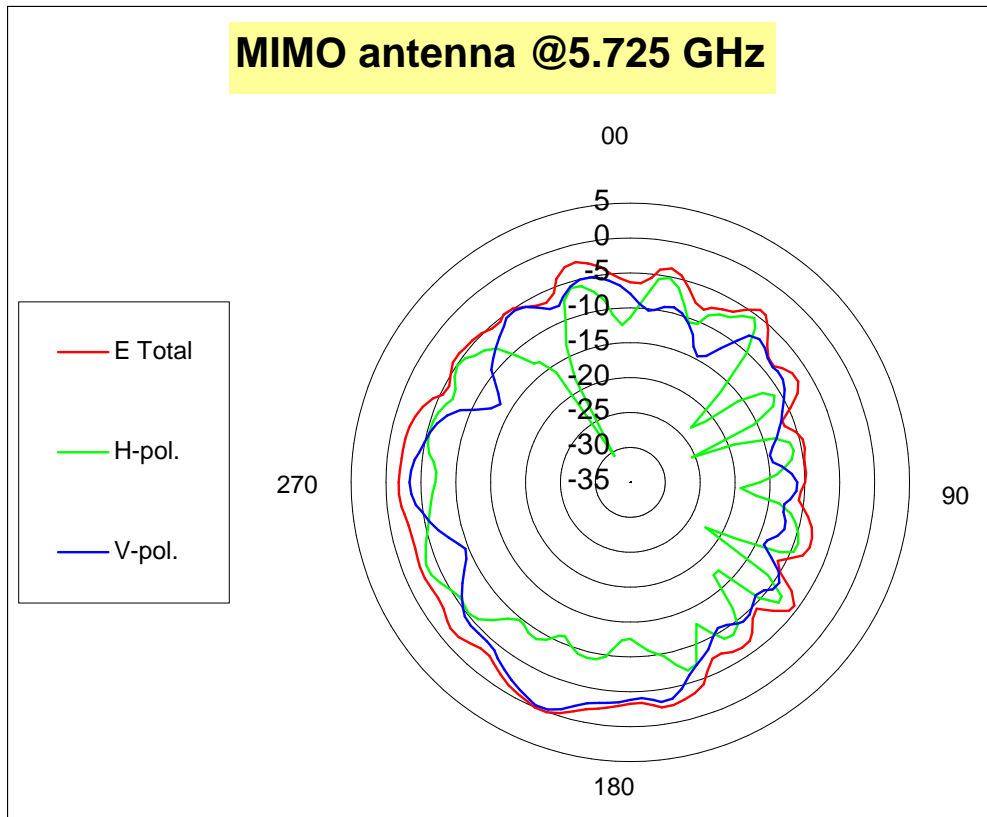


**Tx2 (or Rx2) antenna: 5850 MHz (Plot is not required if 2<sup>nd</sup> Antenna is receive only e.g. Rx2 for 512 family)**



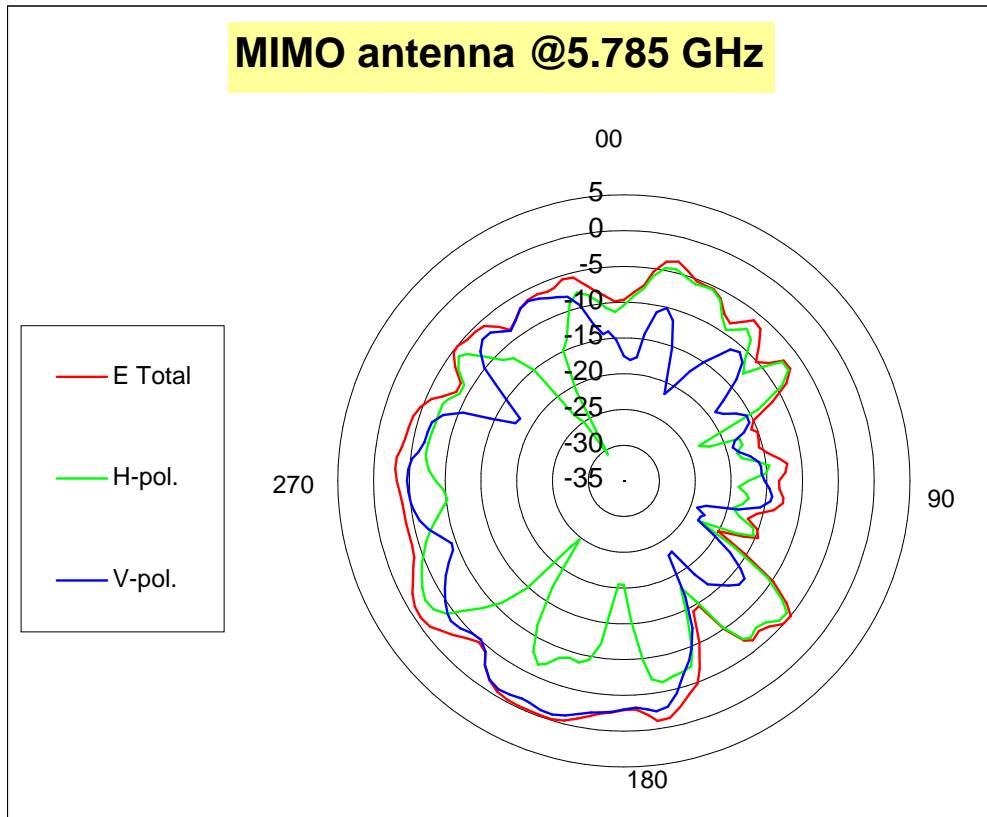
	H-pol	V pol
<b>Peak Gain</b>	<b>-1.44</b>	<b>-0.42</b>

Tx3 (or Rx3) antenna: 5725 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)



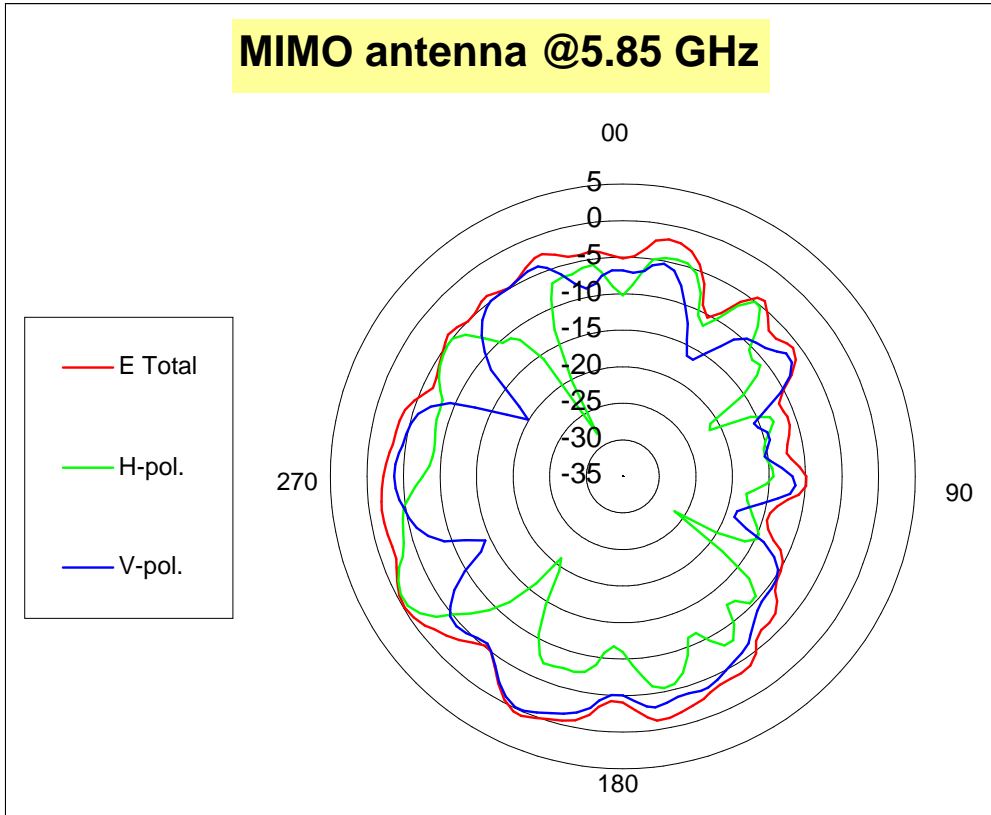
	H-pol	V pol
<b>Peak Gain</b>	<b>-0.40</b>	<b>-1.19</b>

**Tx3 (or Rx3) antenna: 5785 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx3 for 4965AGN)**



	H-pol	V pol
<b>Peak Gain</b>	<b>-0.37</b>	<b>-1.29</b>

**Tx3 (or Rx3) antenna: 5850 MHz (Plot is not required if 3<sup>rd</sup> Antenna is receive only e.g. Rx 3 for 4965AGN)**



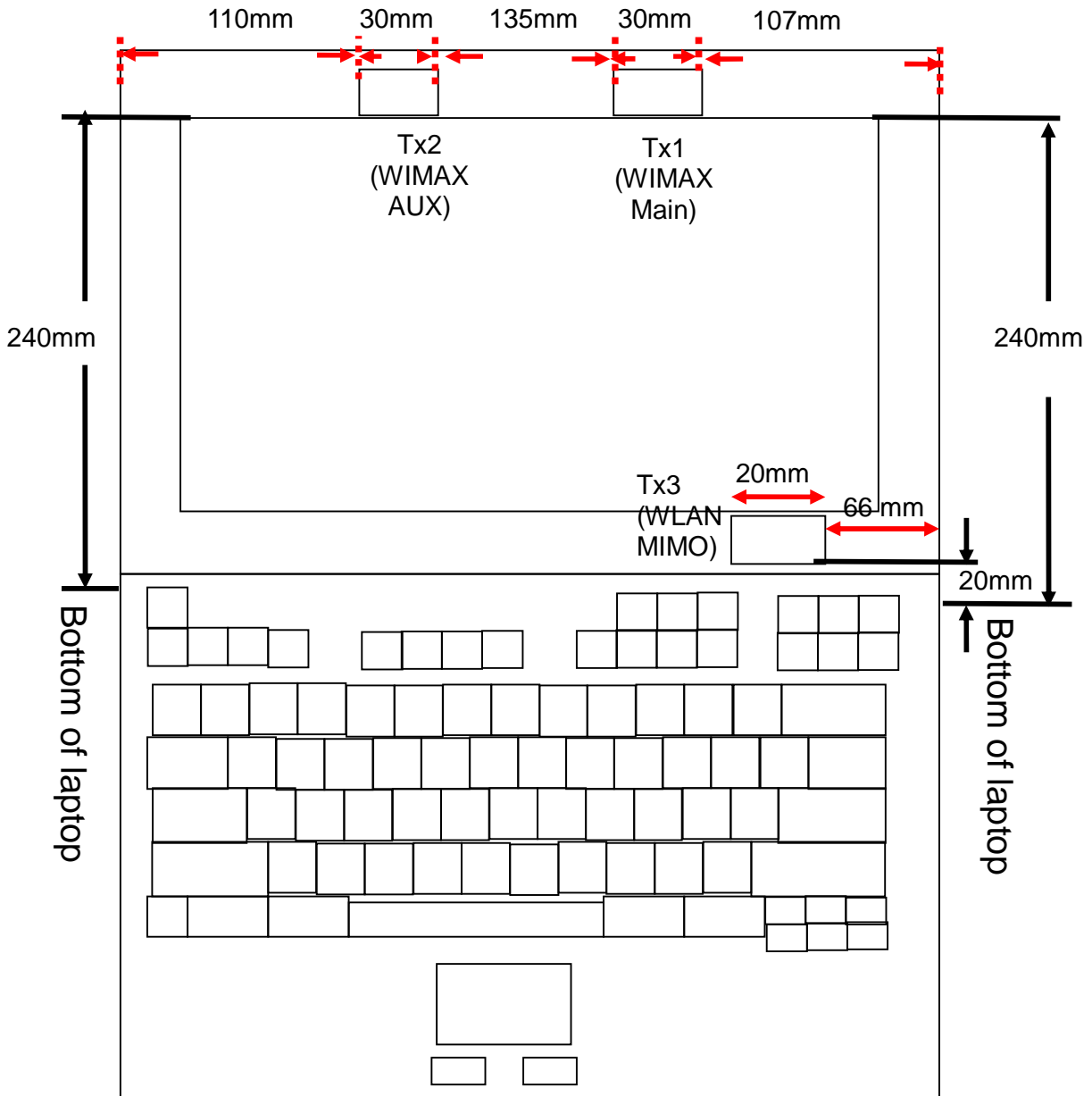
	H-pol	V pol
<b>Peak Gain</b>	<b>-0.95</b>	<b>-0.85</b>

## Section 4. Host Platform Information

OEM / ODM Host platform: (XXXXXXX) platform correlated to antenna data  
Rating Label Photo:

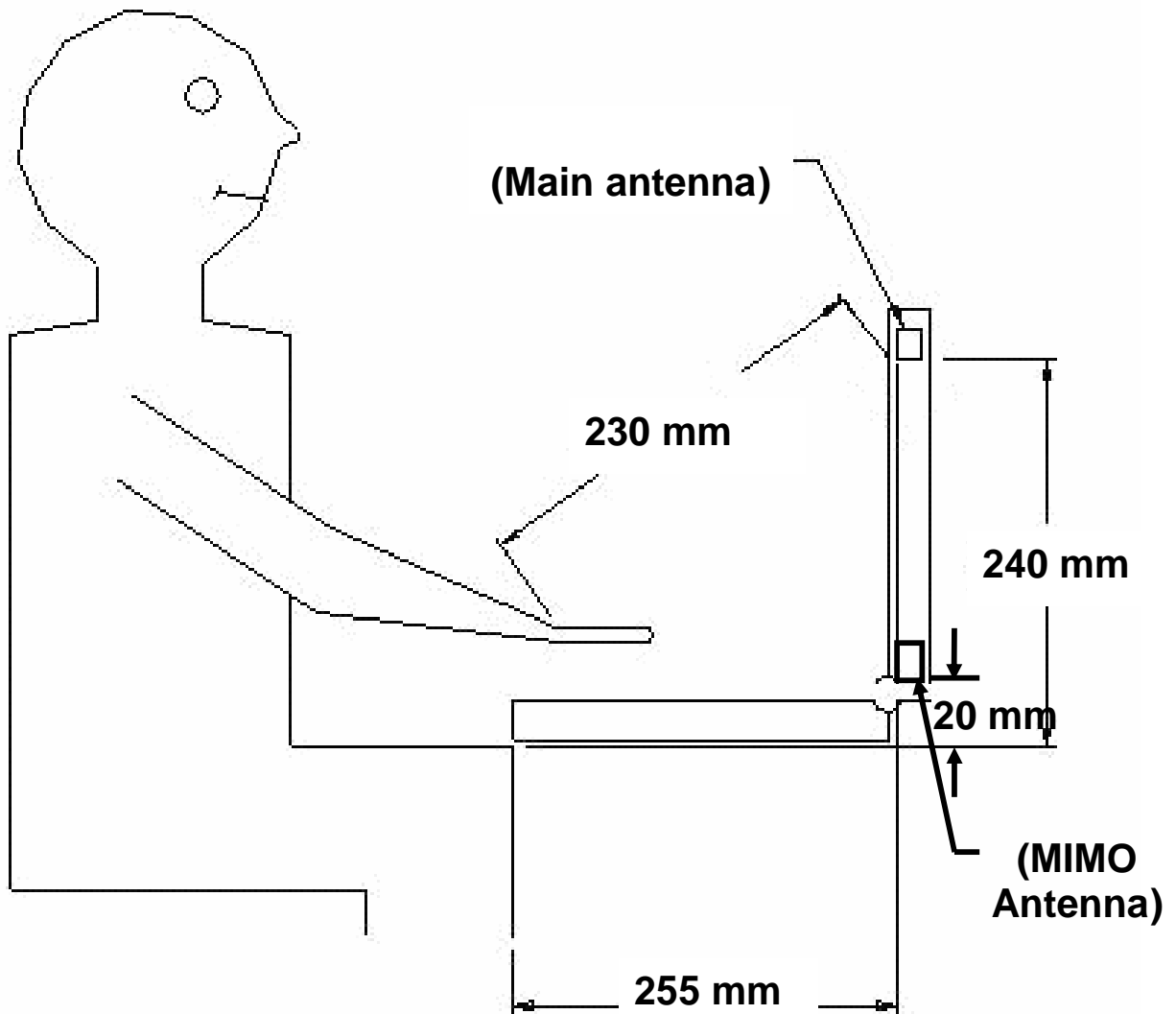
## Section 5. Antenna Host Platform Location Information

Include a **dimensioned photo or dimensioned drawing** of Tx1 (WLAN Main), Tx2 (WLAN AUX) and Tx3 (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

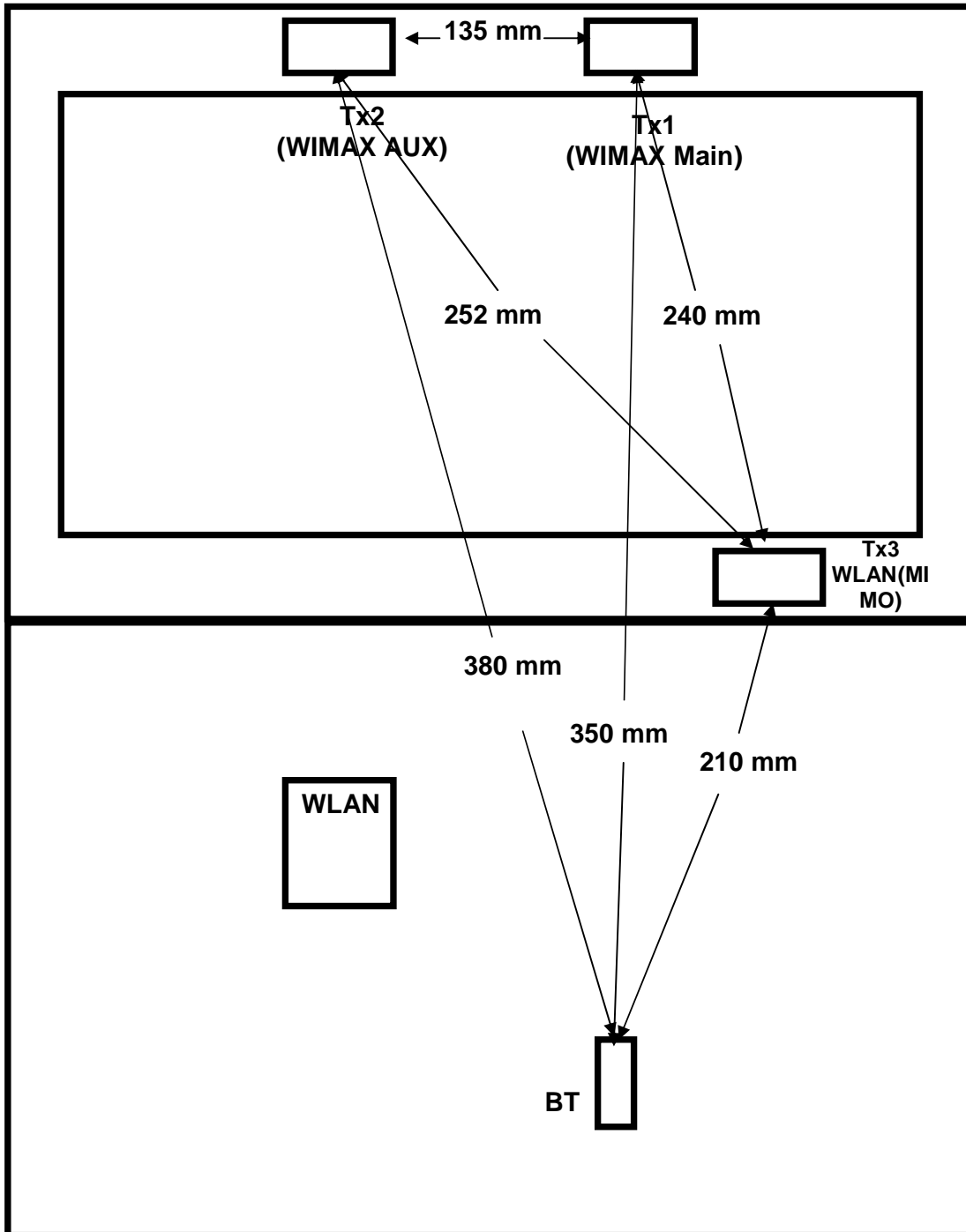
Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between the transmit antennas and the user (excluding hands, wrist, feet, lap/ thigh, and ankle)



## 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						