

# Regulatory WLAN Antenna Information

(English Language Required for Intel Regulatory Review / Approval)

<b>Platform</b>	
Platform Owner	Lenovo(Beijing) Limited
Brand Name	Lenovo(Beijing) Limited
Model Name	ThinkPad Edge E545
ODM	Compal
Target Launch Date	2013/05/05
<b>Antenna</b>	
Brand Name	Wistron Neweb Corporation
Part Number	■ Tx1 Antenna: 81.EKG15.G38
	■ Tx2 Antenna: 81.EKG15.G37
<b>Module</b>	
With WLAN Module (Check Box)	■ RTL8188EE

## 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)
<b>Main Antenna</b>  Antenna P/N : <b>81.EKG15.G38</b>  customer P/N : <b>DC33000Z220</b>	<b>Wistron Neweb Corporation</b>	<b>PIFA</b>	<b>P/N: 60.EKG0C.002</b>  <b>50 ohm Coaxial.</b>  length: <b>614</b> mm diameter: <b>1.37</b> mm  Connector: <b>IPEX</b>	2400 - 2500 MHz	2400 - 2500 MHz	2400 - 2500 MHz	2400 - 2500 MHz
				<b>0.18</b> dBi (peak)	<b>1.94</b> dBi (peak)	<b>2.0</b> max	<b>1.76</b> dBi (peak)
				5150 - 5350 MHz	5150 - 5350 MHz	5150 - 5350 MHz	5150 - 5350 MHz
				<b>0.72</b> dBi (peak)	<b>3.10</b> dBi (peak)	<b>2.0</b> max	<b>2.38</b> dBi (peak)
				5470 - 5725 MHz	5470 - 5725 MHz	5470 - 5725 MHz	5470 - 5725 MHz
<b>1.61</b> dBi (peak)	<b>4.13</b> dBi (peak)	<b>2.0</b> max	<b>2.52</b> dBi (peak)				
5725 - 5850 MHz	5725 - 5850 MHz	5725 - 5850 MHz	5725 - 5850 MHz				
<b>1.92</b> dBi (peak)	<b>4.48</b> dBi (peak)	<b>2.0</b> max	<b>2.56</b> dBi (peak)				
<b>Aux Antenna</b>  Antenna P/N : <b>81.EKG15.G37</b>  customer P/N : <b>DC33000Z230</b>	<b>Wistron Neweb Corporation</b>	<b>PIFA</b>	<b>P/N:60.EKG0C.001</b>  <b>50 ohm Coaxial.</b>  length: <b>733</b> mm diameter: <b>1.37</b> mm  Connector: <b>IPEX</b>	2400 - 2500 MHz	2400 - 2500 MHz	2400 - 2500 MHz	2400 - 2500 MHz
				<b>0.60</b> dBi (peak)	<b>2.66</b> dBi (peak)	<b>2.0</b> max	<b>2.06</b> dBi (peak)
				5150 - 5350 MHz	5150 - 5350 MHz	5150 - 5350 MHz	5150 - 5350 MHz
				<b>0.03</b> dBi (peak)	<b>2.83</b> dBi (peak)	<b>2.0</b> max	<b>2.80</b> dBi (peak)
				5470 - 5725 MHz	5470 - 5725 MHz	5470 - 5725 MHz	5470 - 5725 MHz
<b>0.49</b> dBi (peak)	<b>3.45</b> dBi (peak)	<b>2.0</b> max	<b>2.96</b> dBi (peak)				
5725 - 5850 MHz	5725 - 5850 MHz	5725 - 5850 MHz	5725 - 5850 MHz				
<b>1.50</b> dBi (peak)	<b>4.51</b> dBi (peak)	<b>2.0</b> max	<b>3.01</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:

	Main antenna			Aux antenna	
Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)	Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)
2400	0.18	-3.56	2400	0.60	-0.53
2450	-1.00	-4.96	2450	-1.30	-1.22
2500	-1.54	-3.81	2500	0.28	-0.80
5150	0.72	-1.14	5150	0.03	-2.94
5250	0.20	-1.28	5250	-0.61	-4.03
5350	-0.68	-2.65	5350	-0.97	-3.42
5470	1.61	-2.39	5470	-1.20	-3.52
5600	0.54	-2.13	5600	0.49	-2.14
5725	-0.76	-2.46	5725	0.06	-3.38
5785	0.64	-0.91	5785	1.50	-3.76
5850	1.92	-3.21	5850	0.69	-3.20

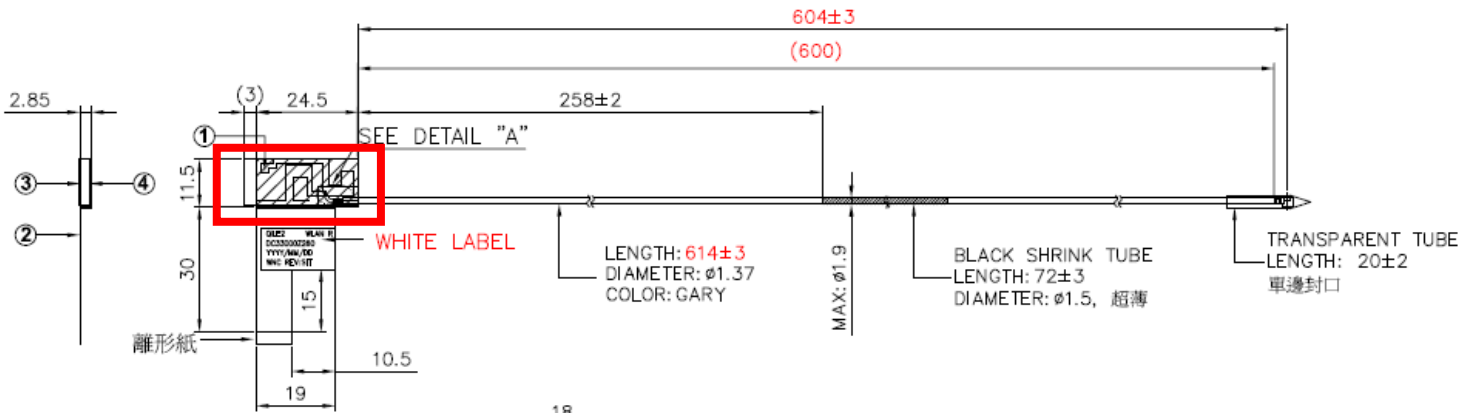
Antenna Peak Gain required being test in system basis.

- 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

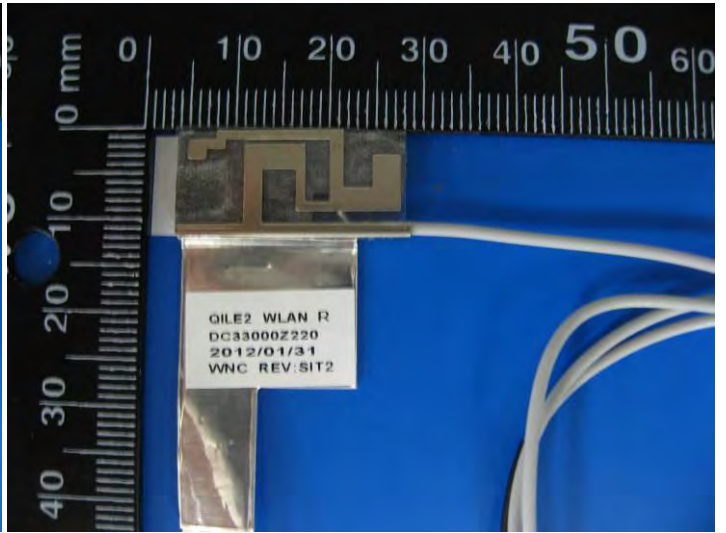
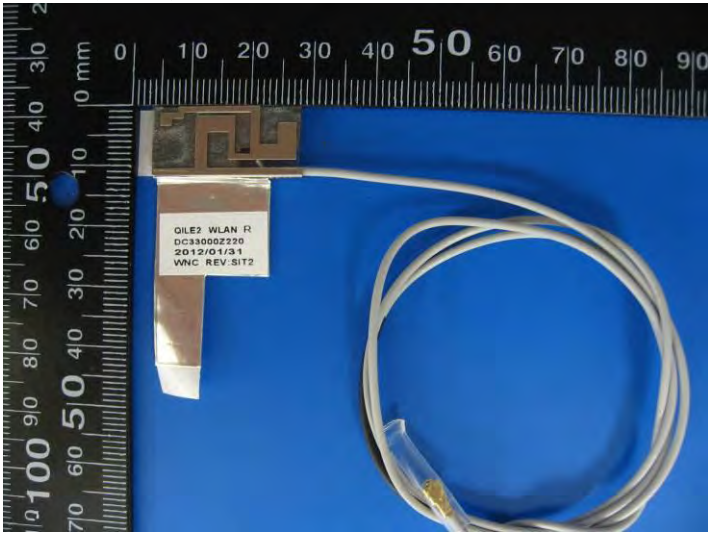
Include a dimensioned photo and dimensioned drawing of Tx1 antenna here.

### WLAN Main Antenna Dimensioned Drawing:

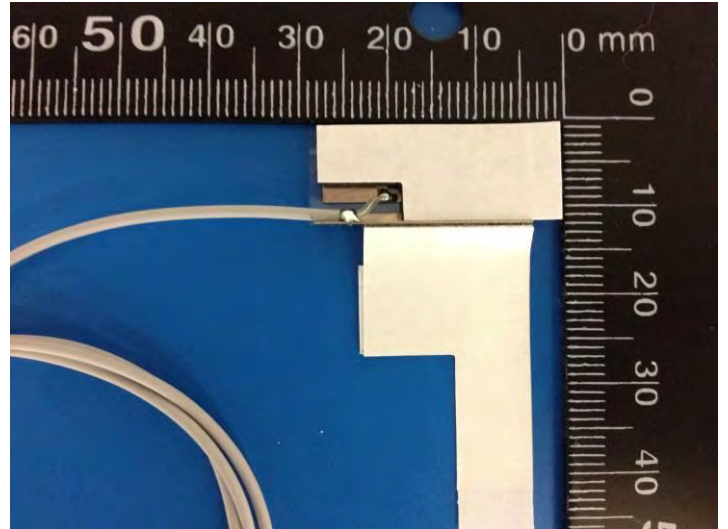
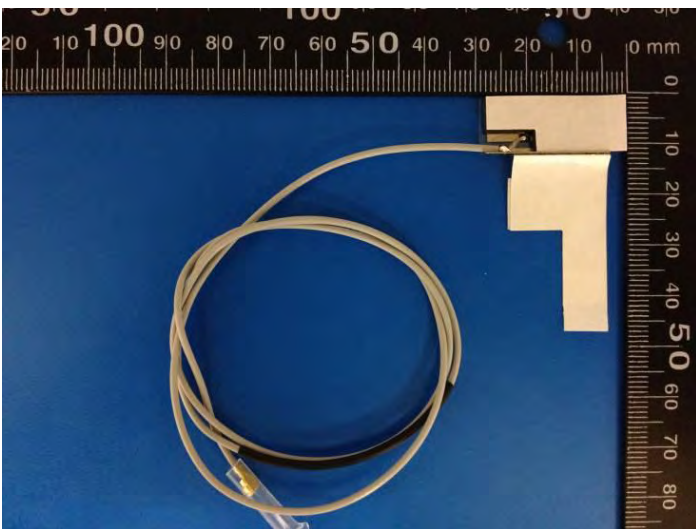


### WLAN Main Antenna Photo:

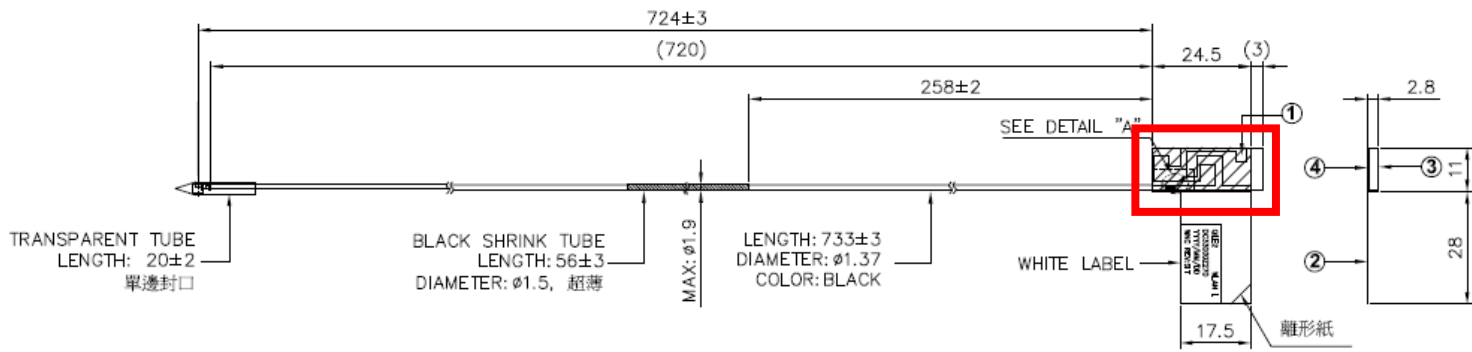
Main(Front)



Main(Back)

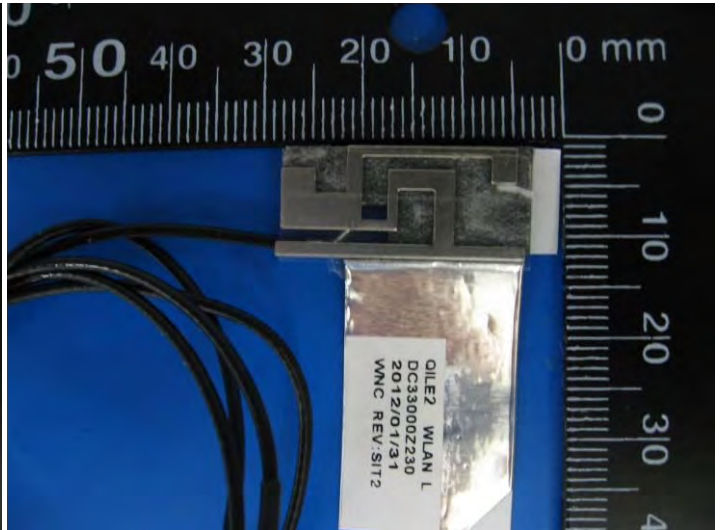


**WLAN Aux Antenna Dimensioned Drawing:**

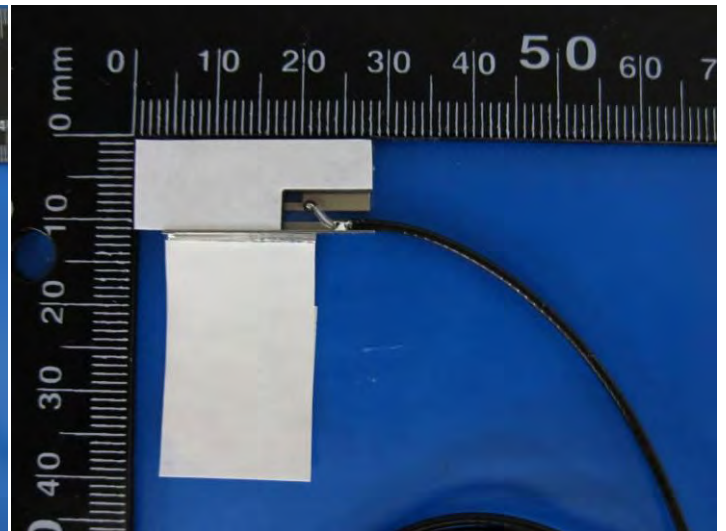
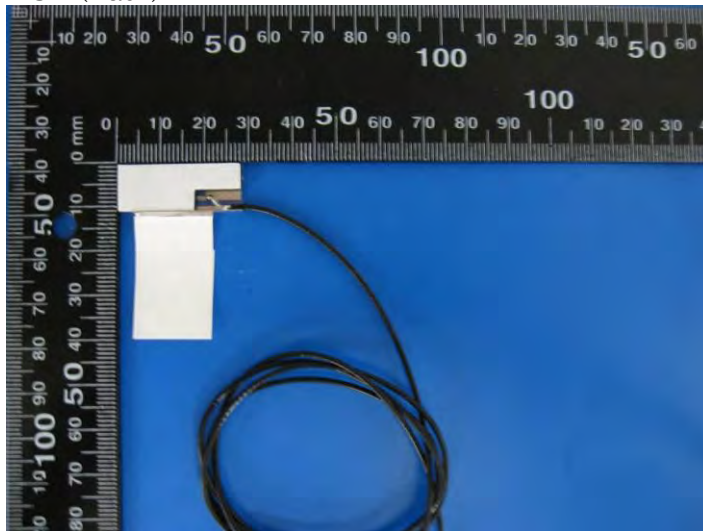


**WLAN Aux Antenna Photo:**

AUX(Front)



AUX (Back)



**Include front view photo of all 2 antennas here.**

WLAN Main/Aux Antenna Manufacturer: Wistron Neweb Corporation

WLAN Main/Aux Antenna Part Number: DC33000Z220 (Tx1), DC33000Z230 (Tx2)



**Include back view photo of all 2 antennas here.**

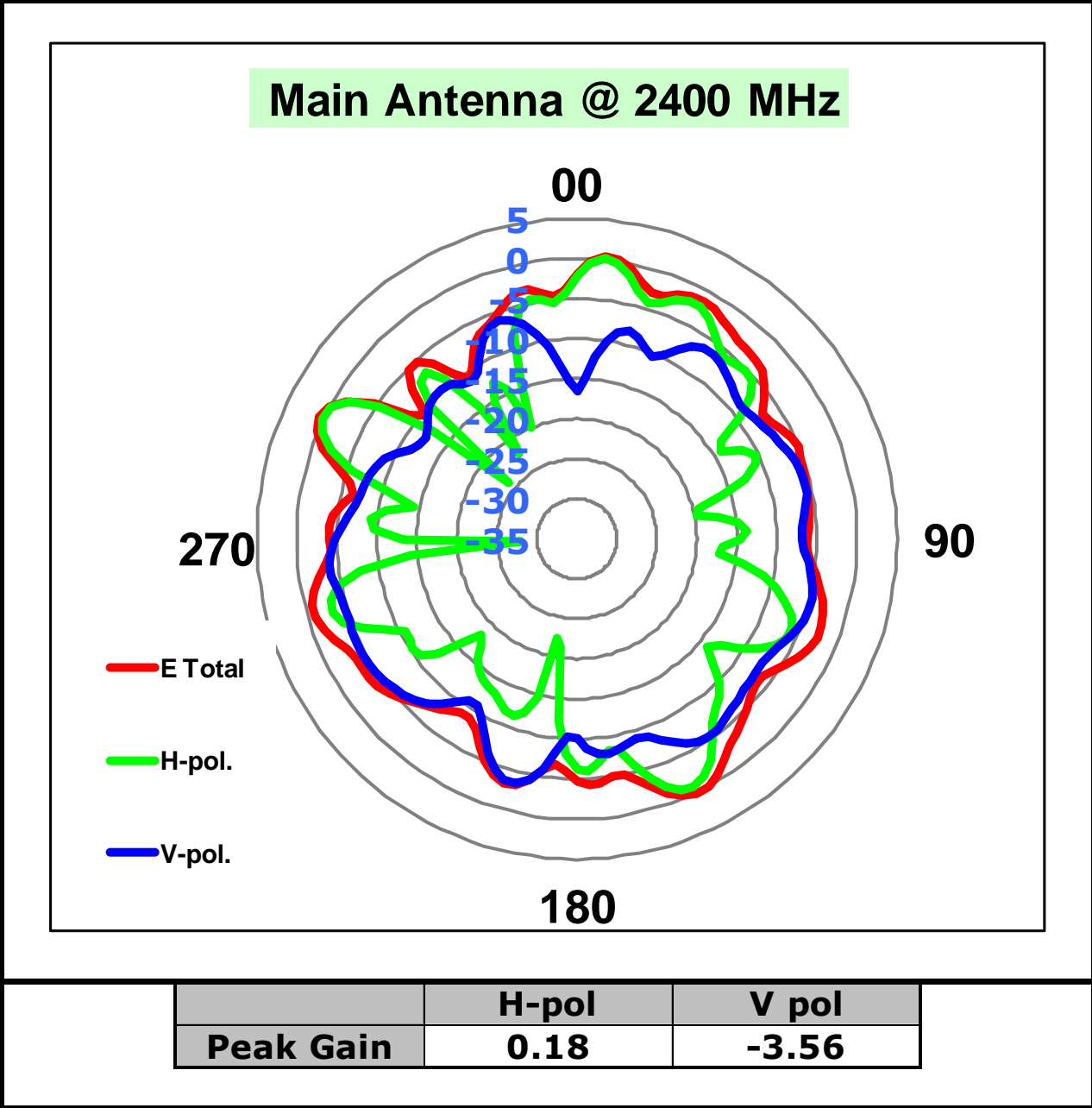
WLAN Main/Aux Antenna Manufacturer: Wistron Neweb Corporation

WLAN Main/Aux Antenna Part Number: DC33000Z220 (Tx1), DC33000Z230 (Tx2)

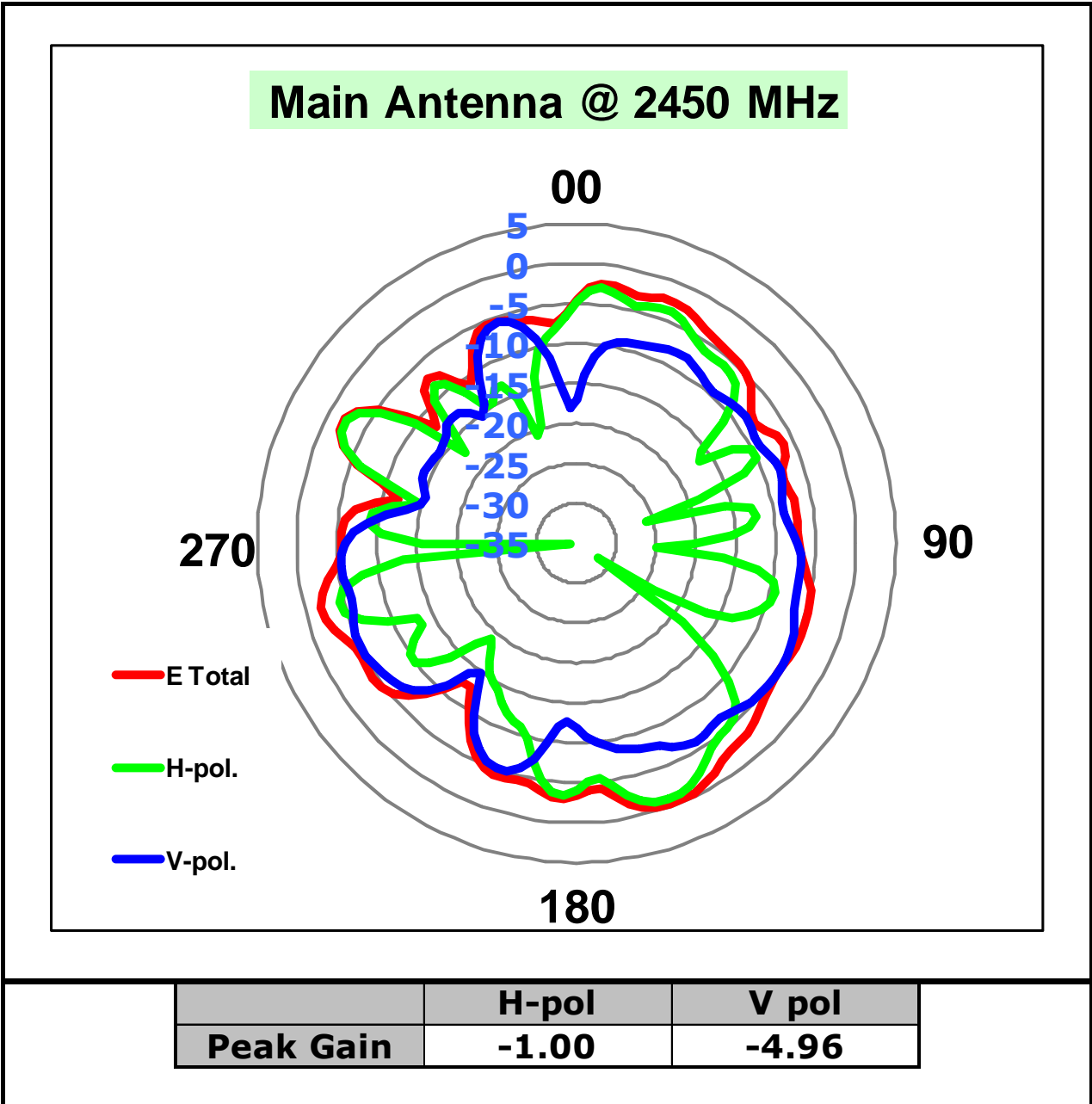
Section 3. Radiation characteristics of antennae Loaded in Host Platform

2400-2500MHz radiation characteristic

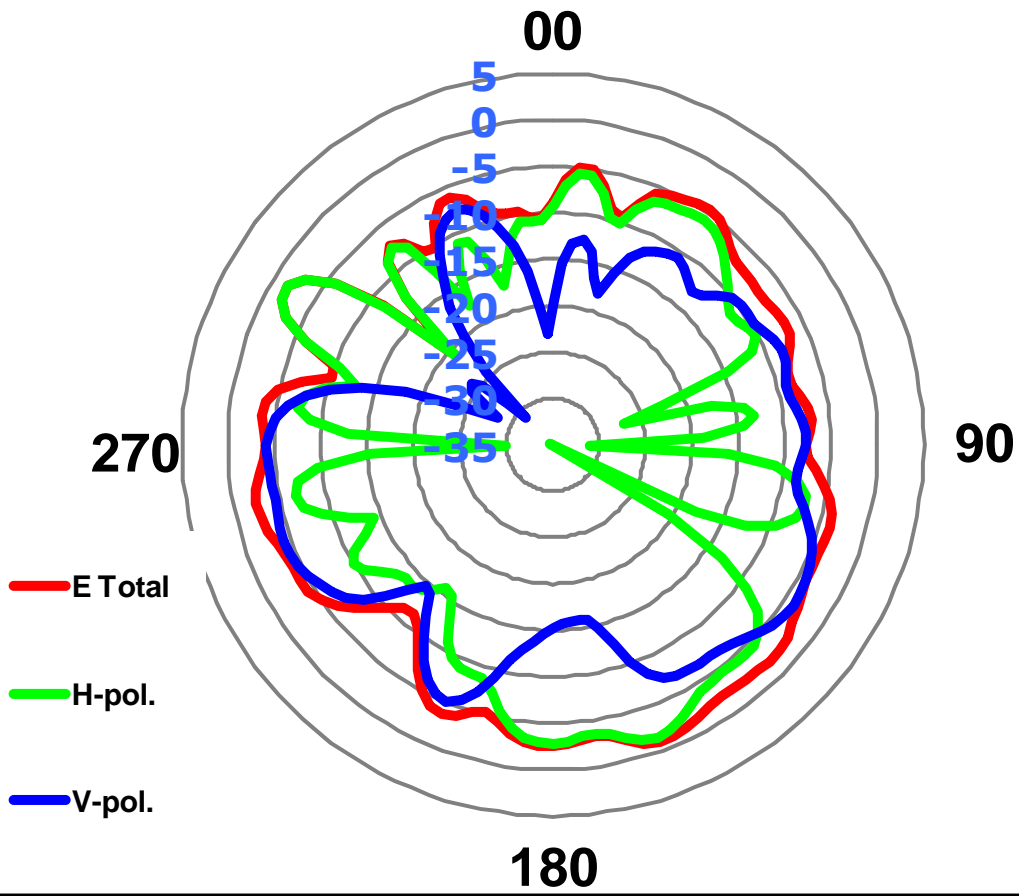
Tx1 antenna: 2400 MHz



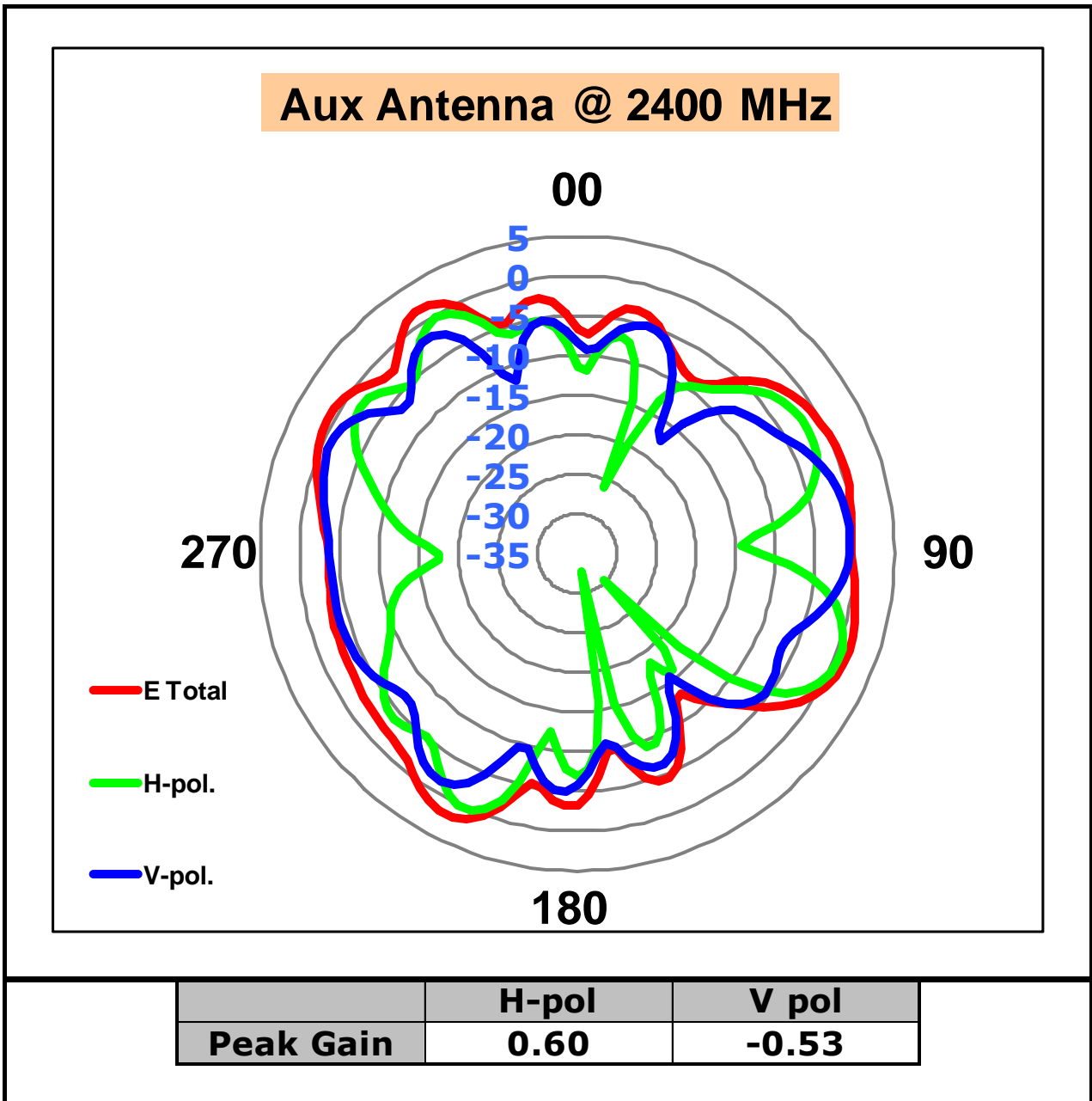


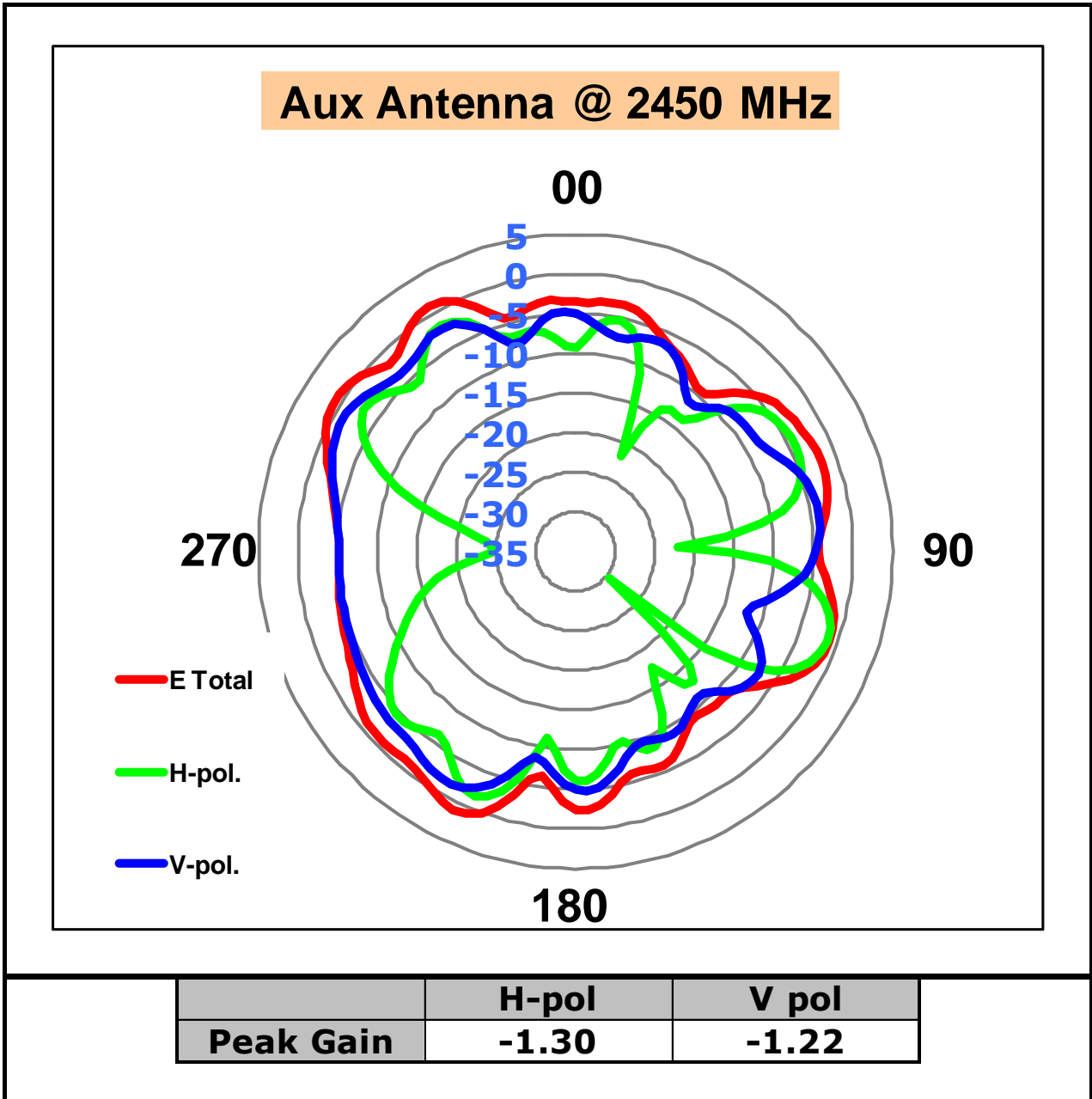


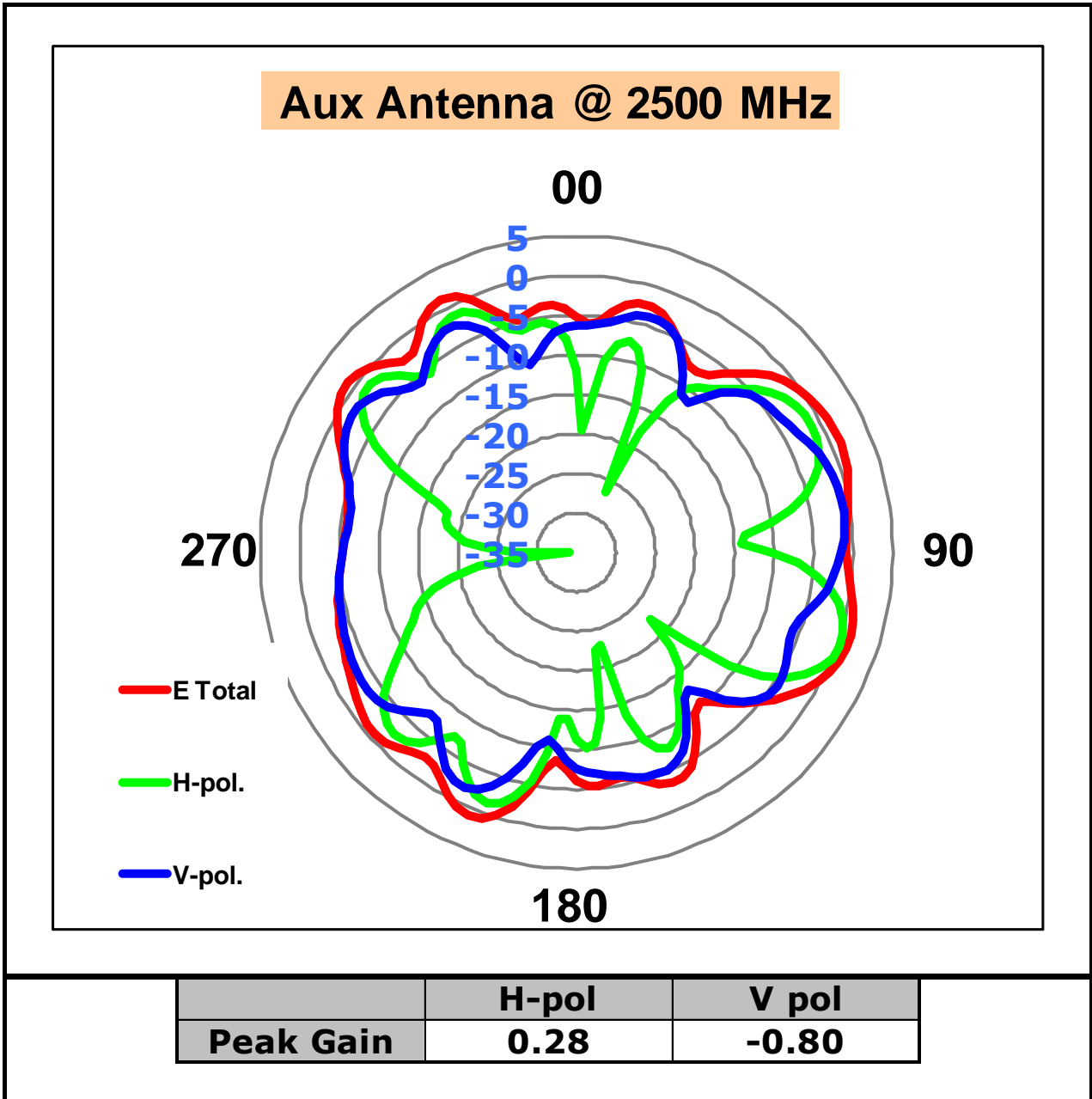
### Main Antenna @ 2500 MHz



	H-pol	V pol
Peak Gain	-1.54	-3.81

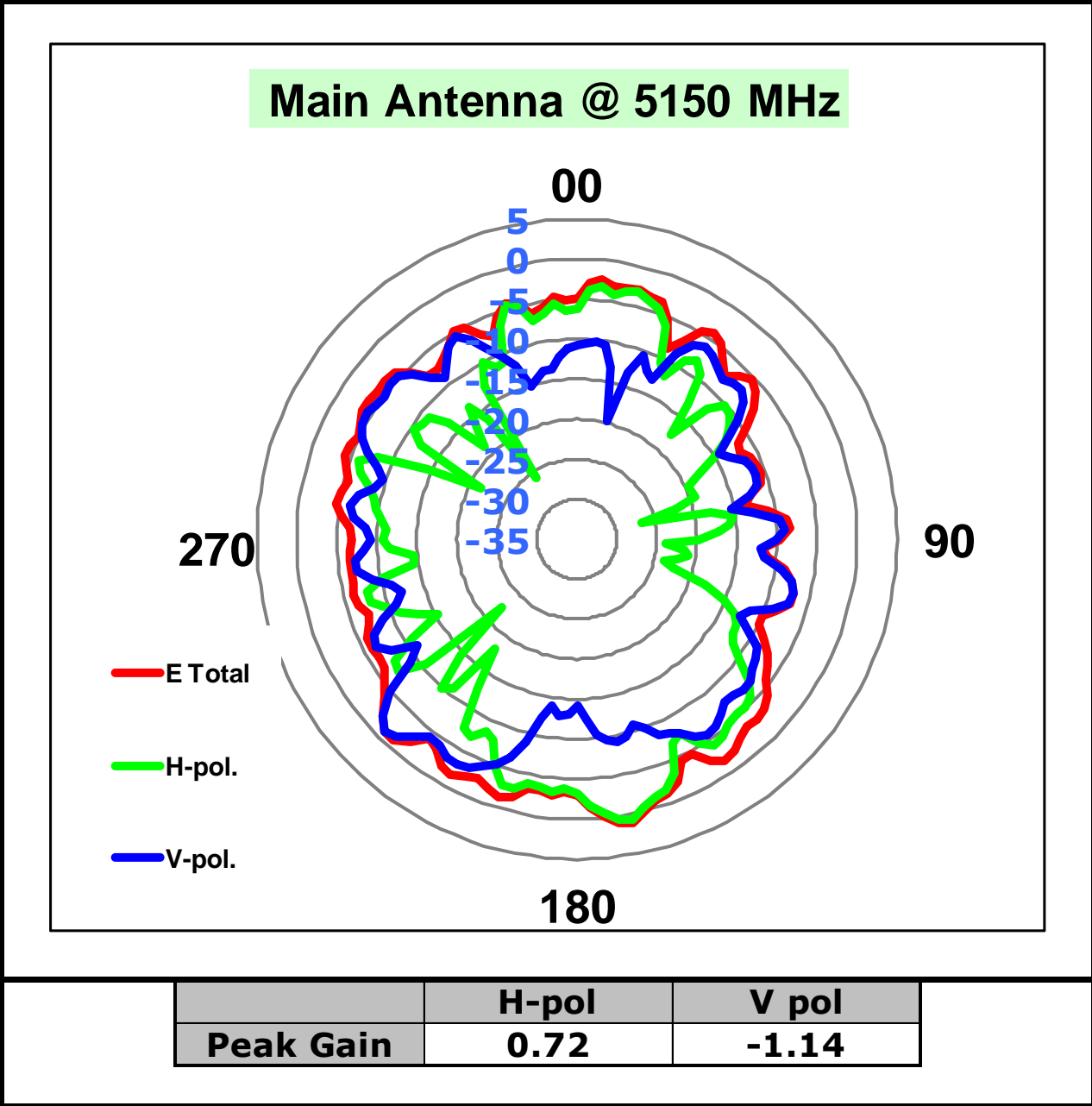


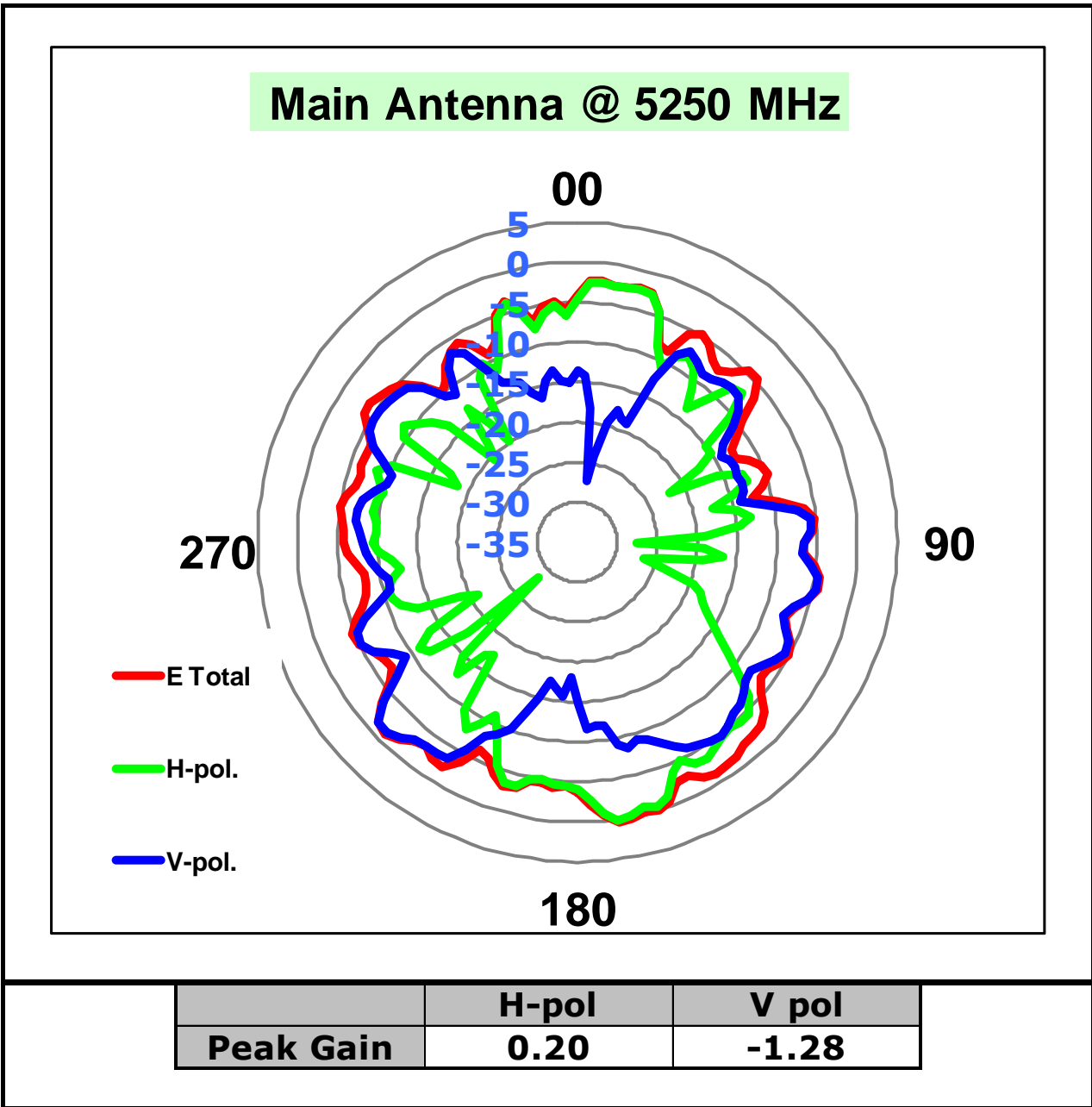


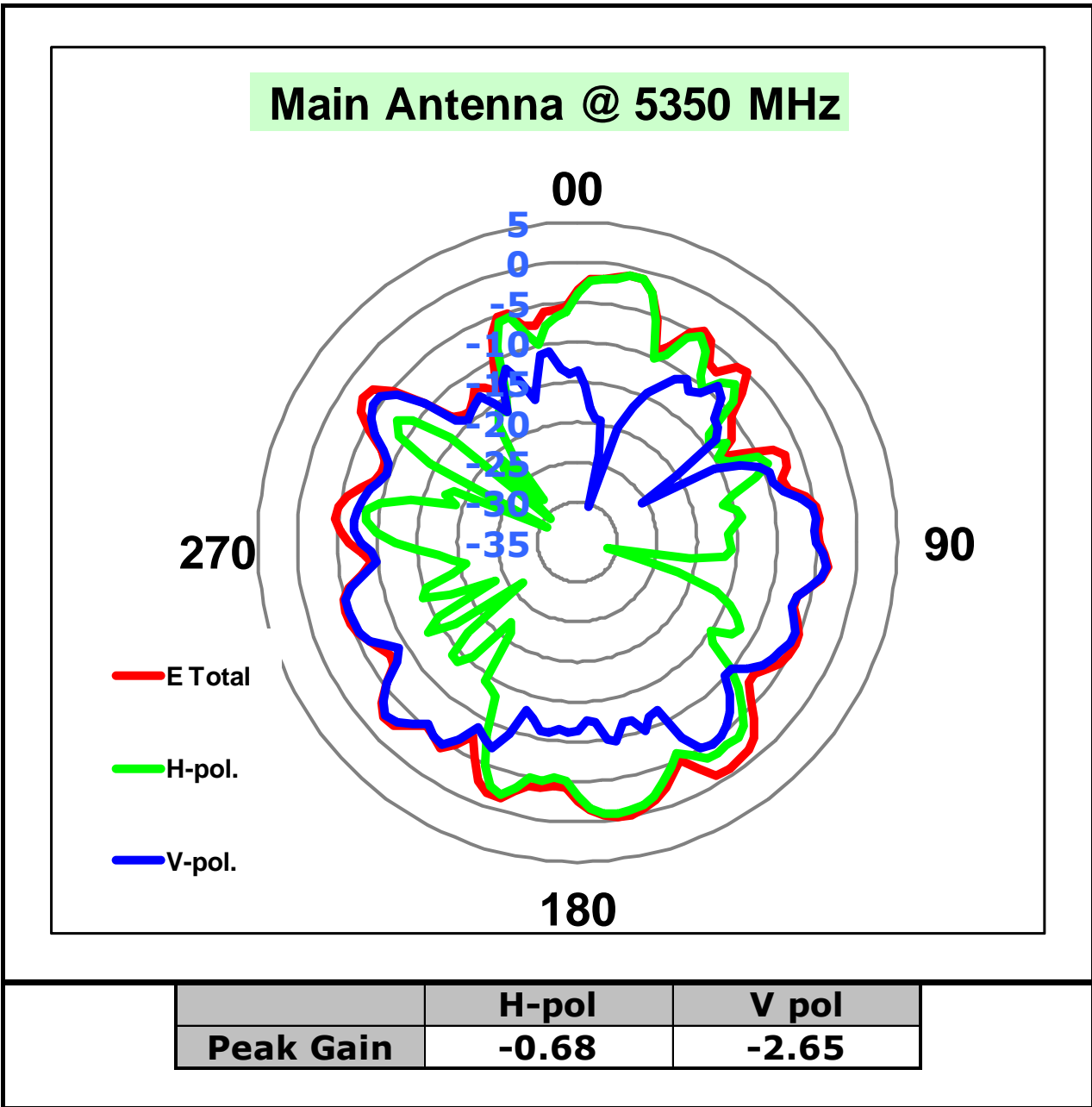


5150-5350 MHz radiation characteristic

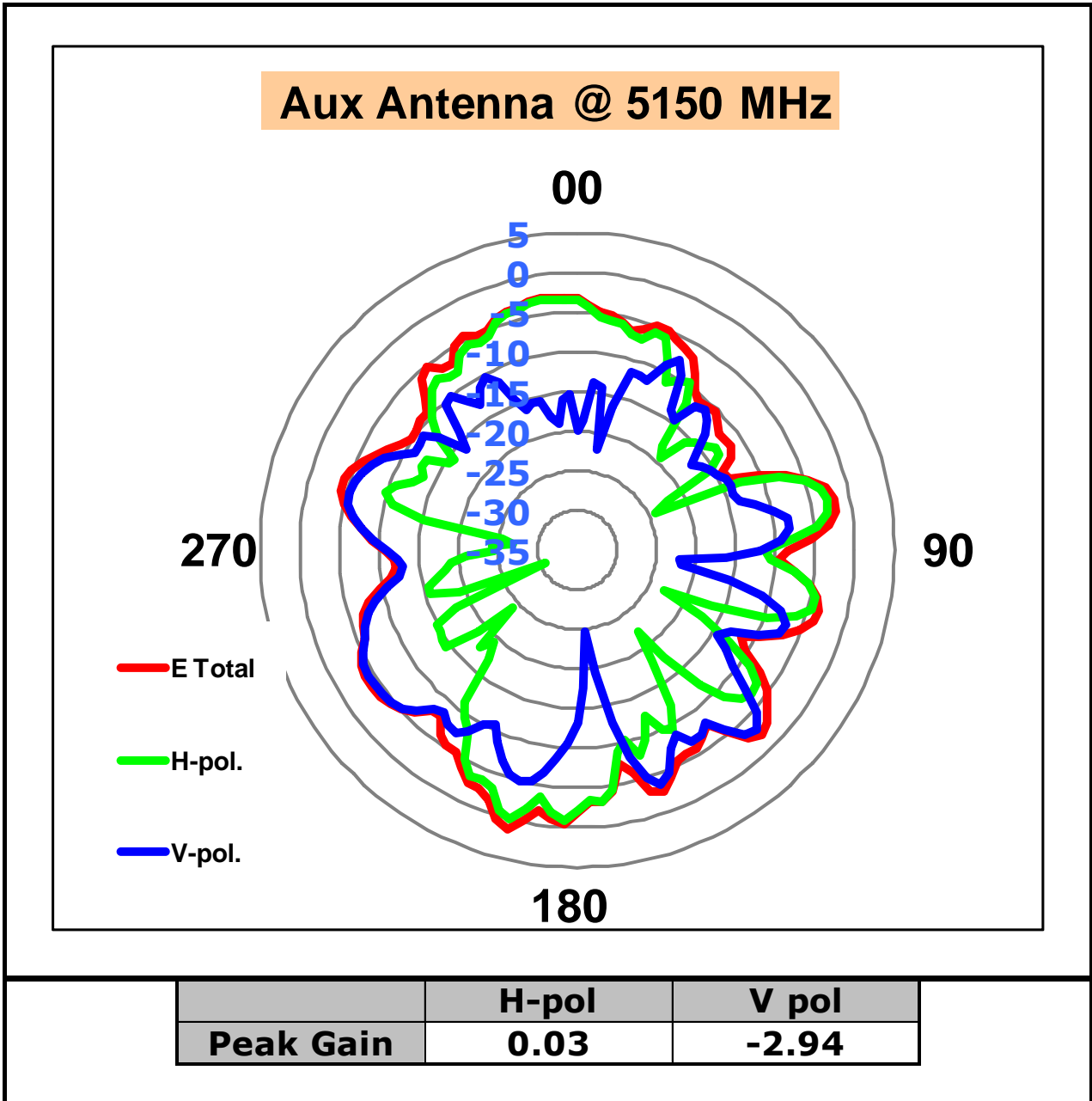
Tx1 antenna: 5150 MHz

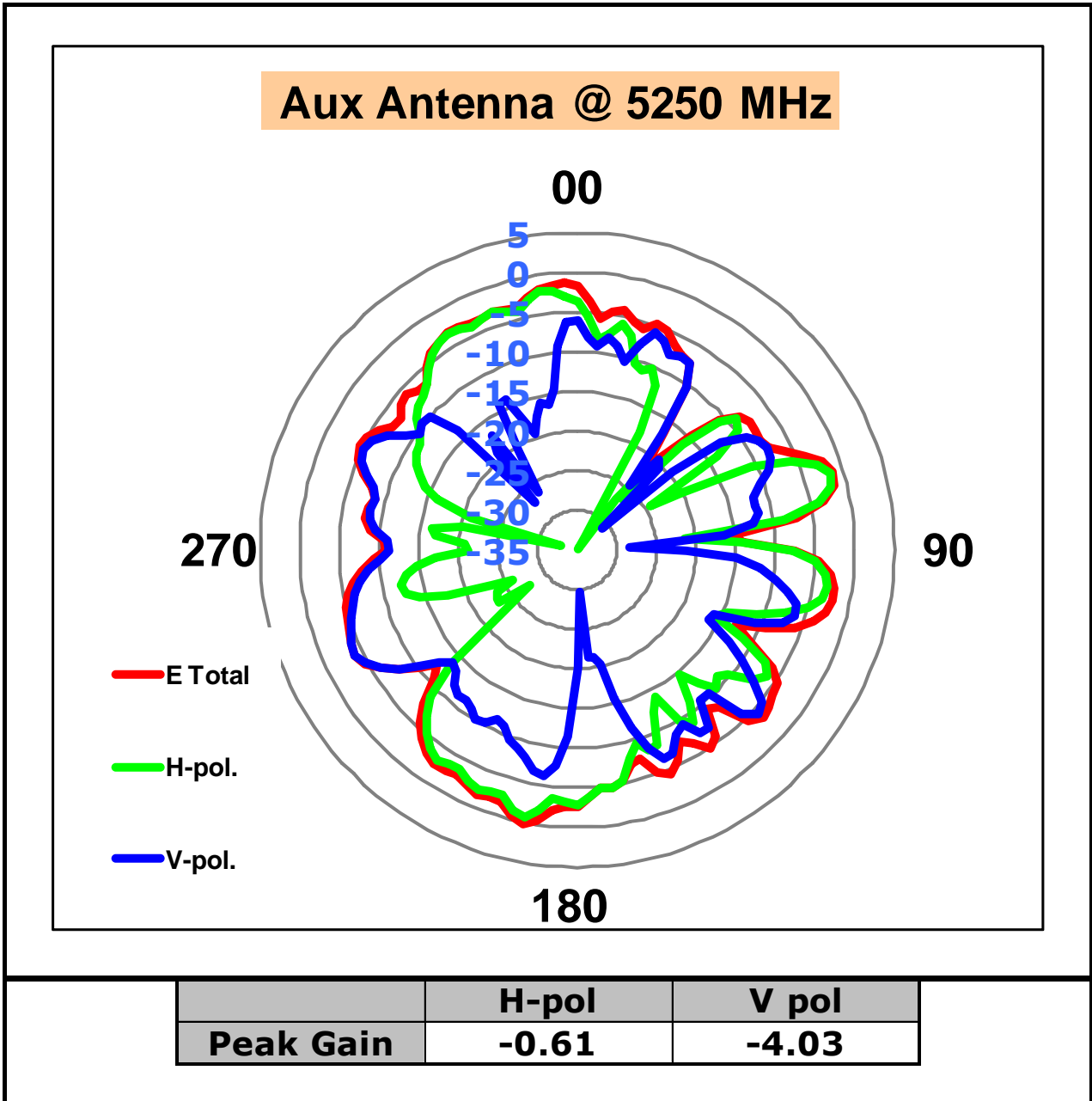


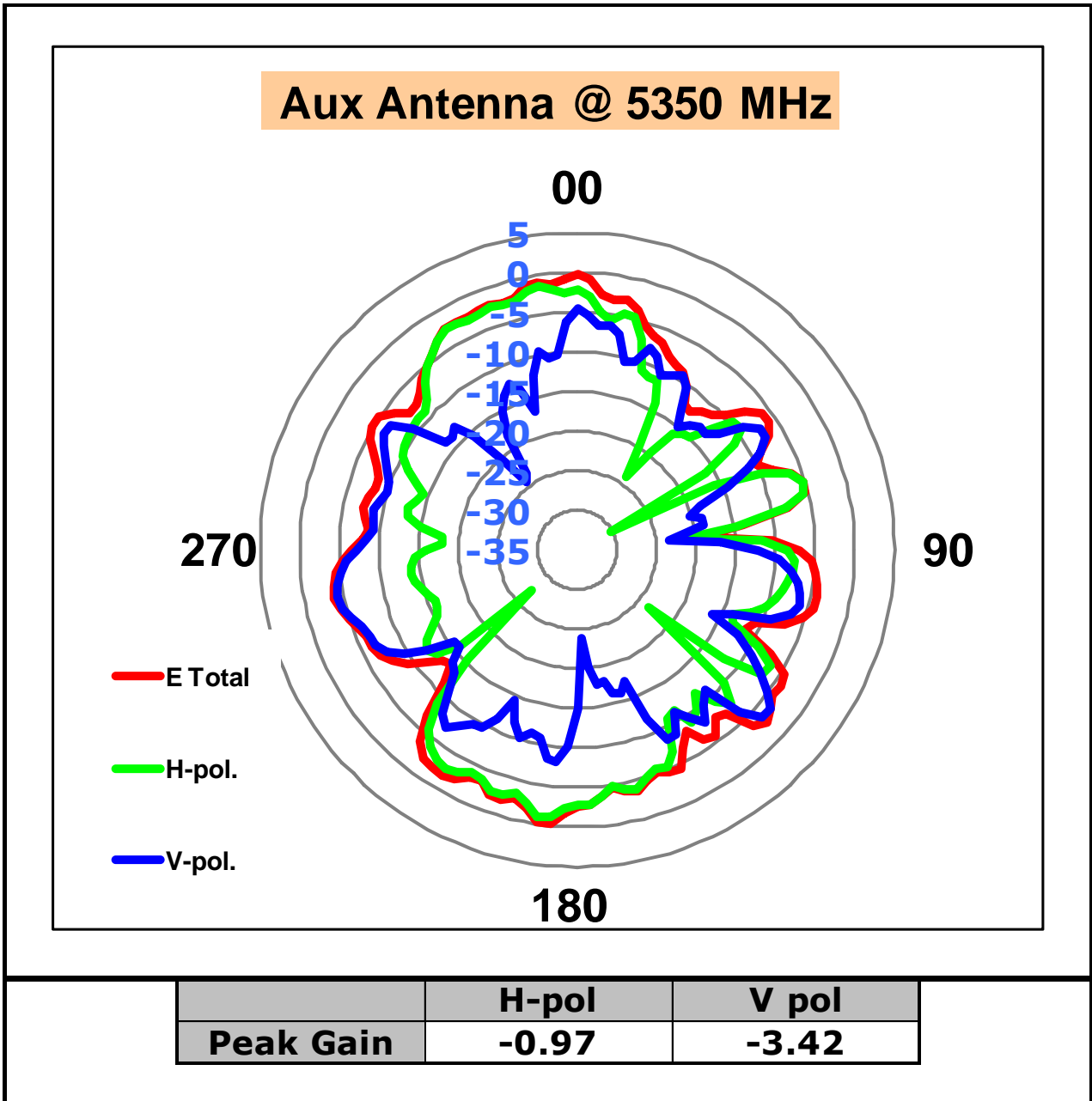






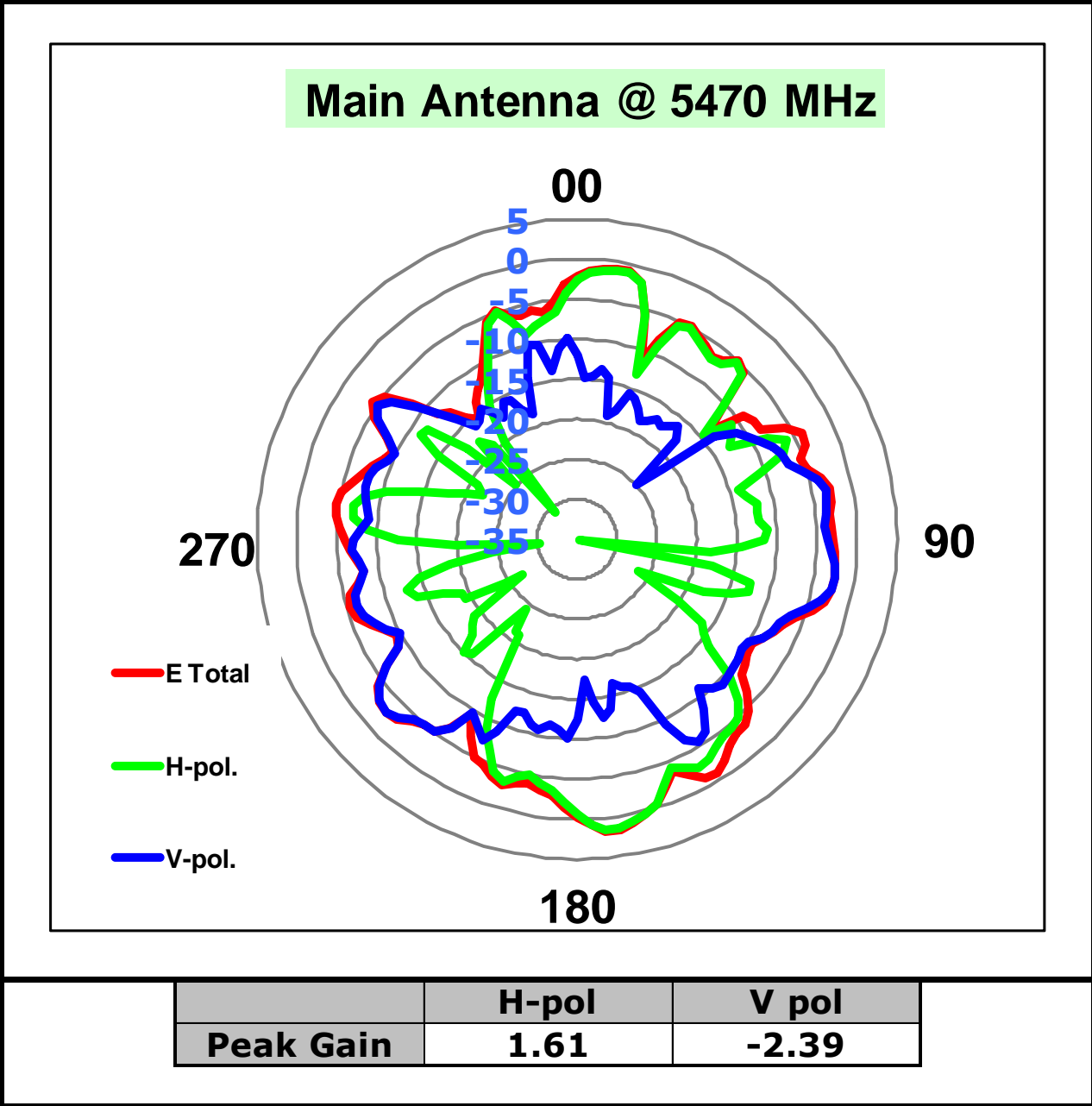


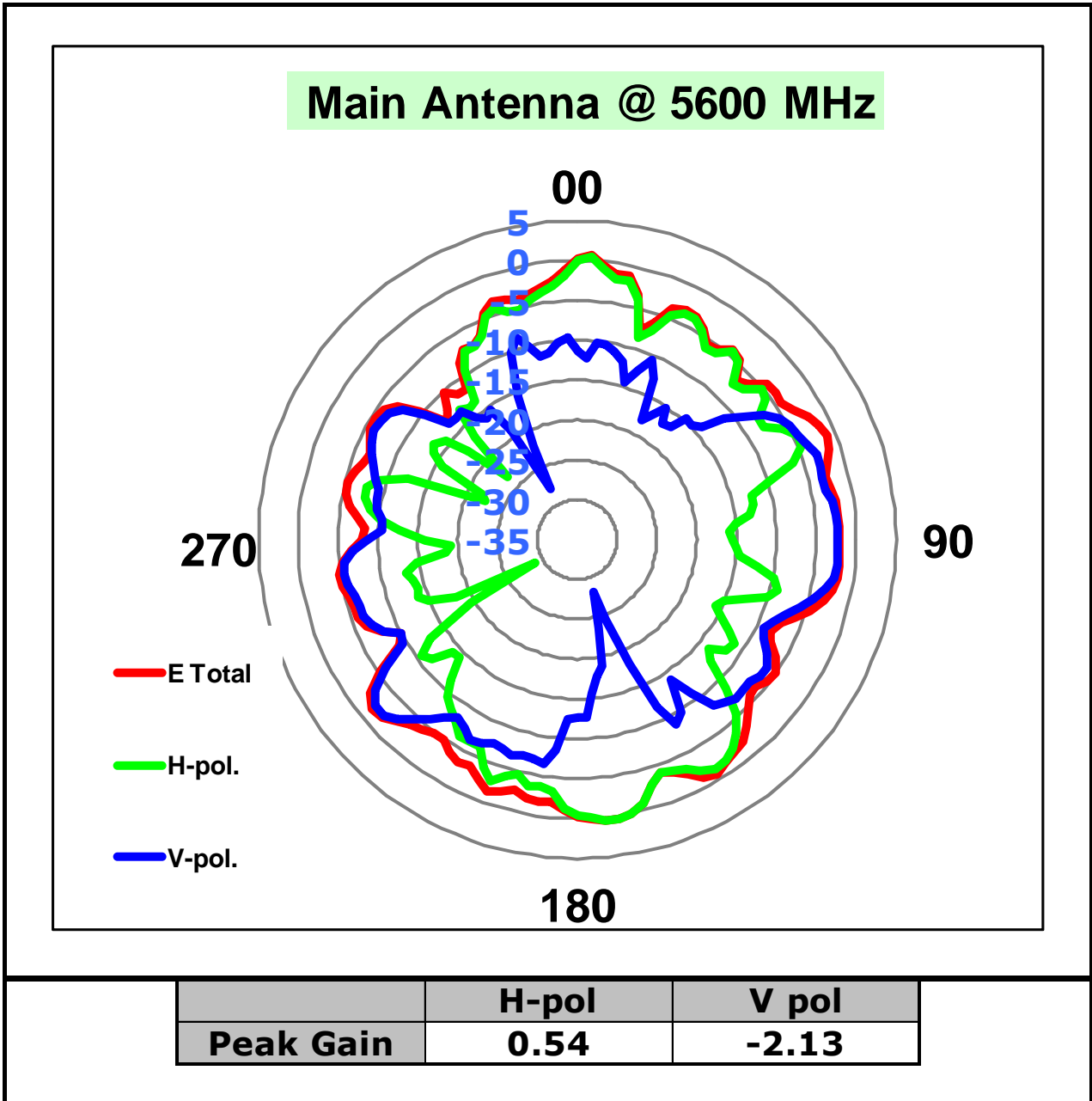




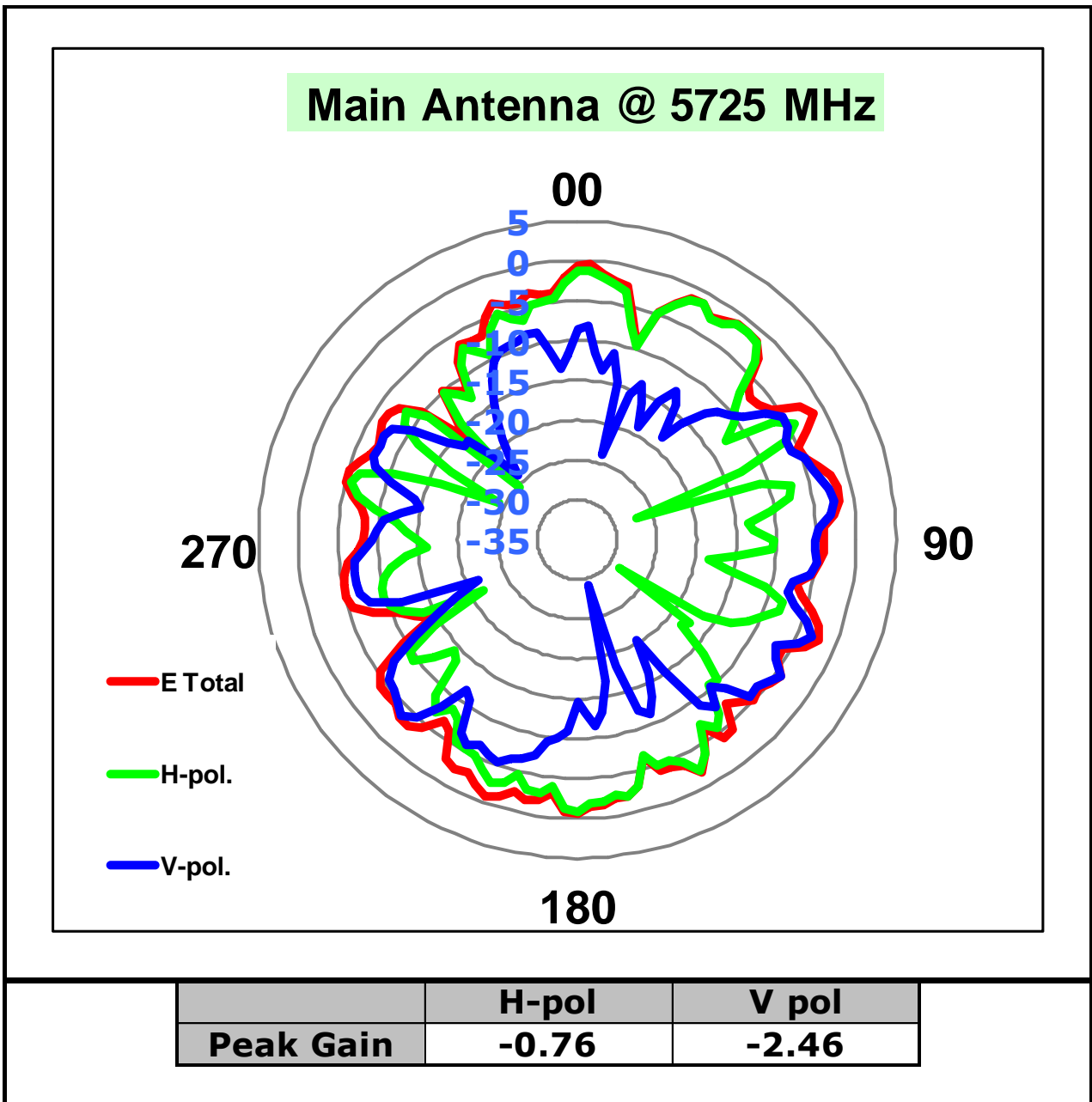
5470-5725MHz radiation characteristic

Tx1 antenna: 5470 MHz



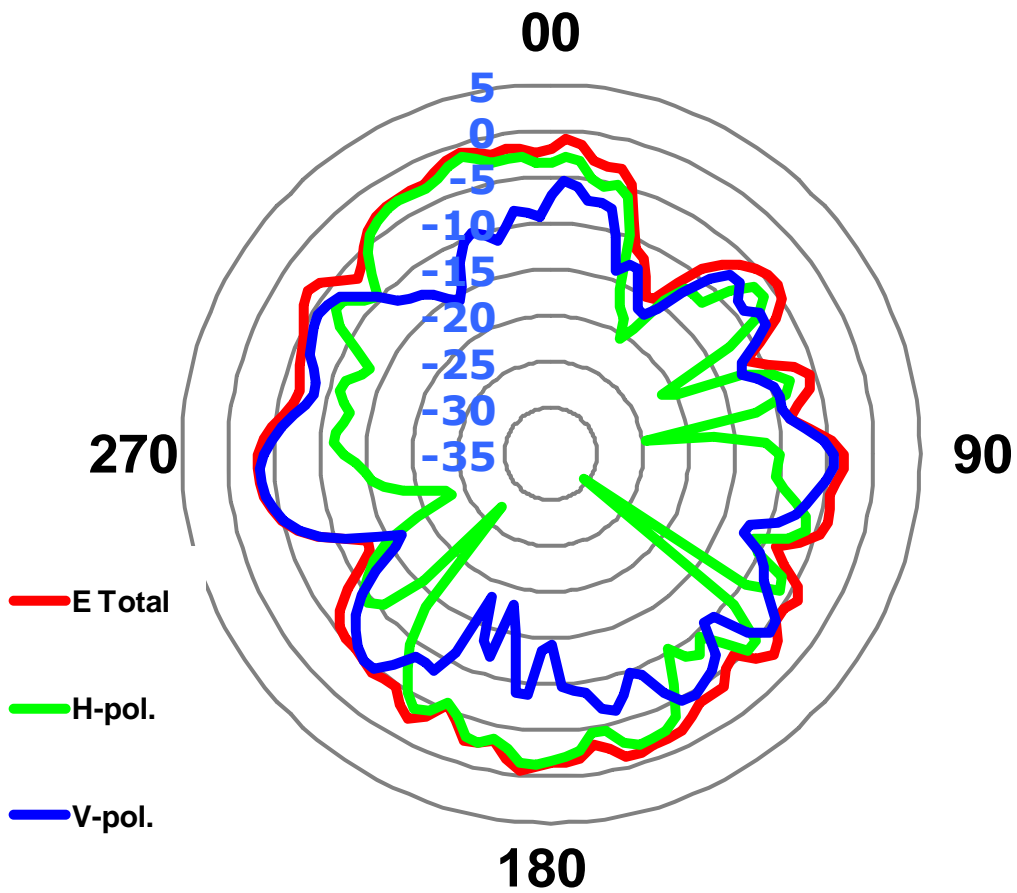


Tx1 antenna: 5725 MHz

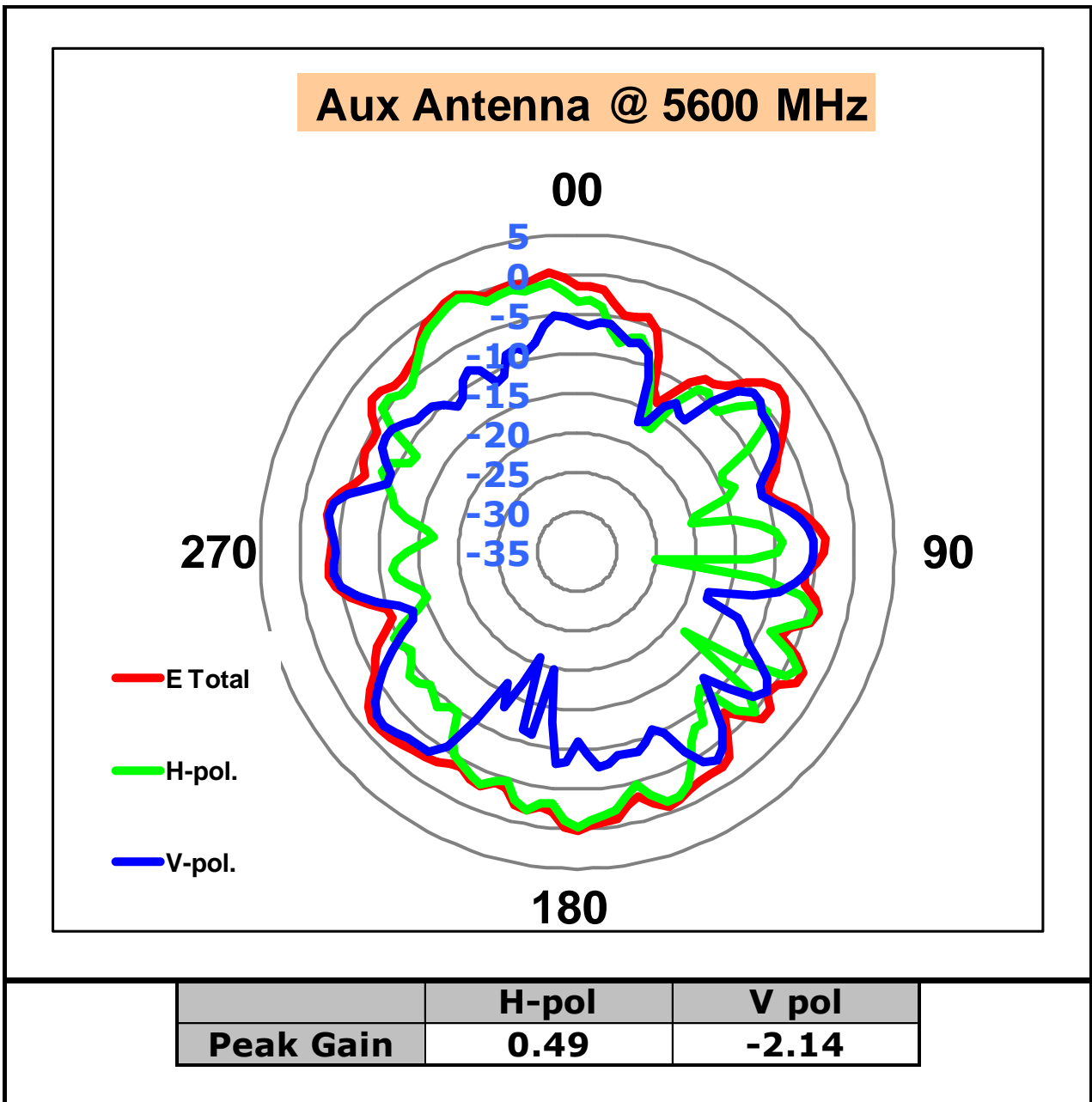


Tx2 antenna: 5470 MHz

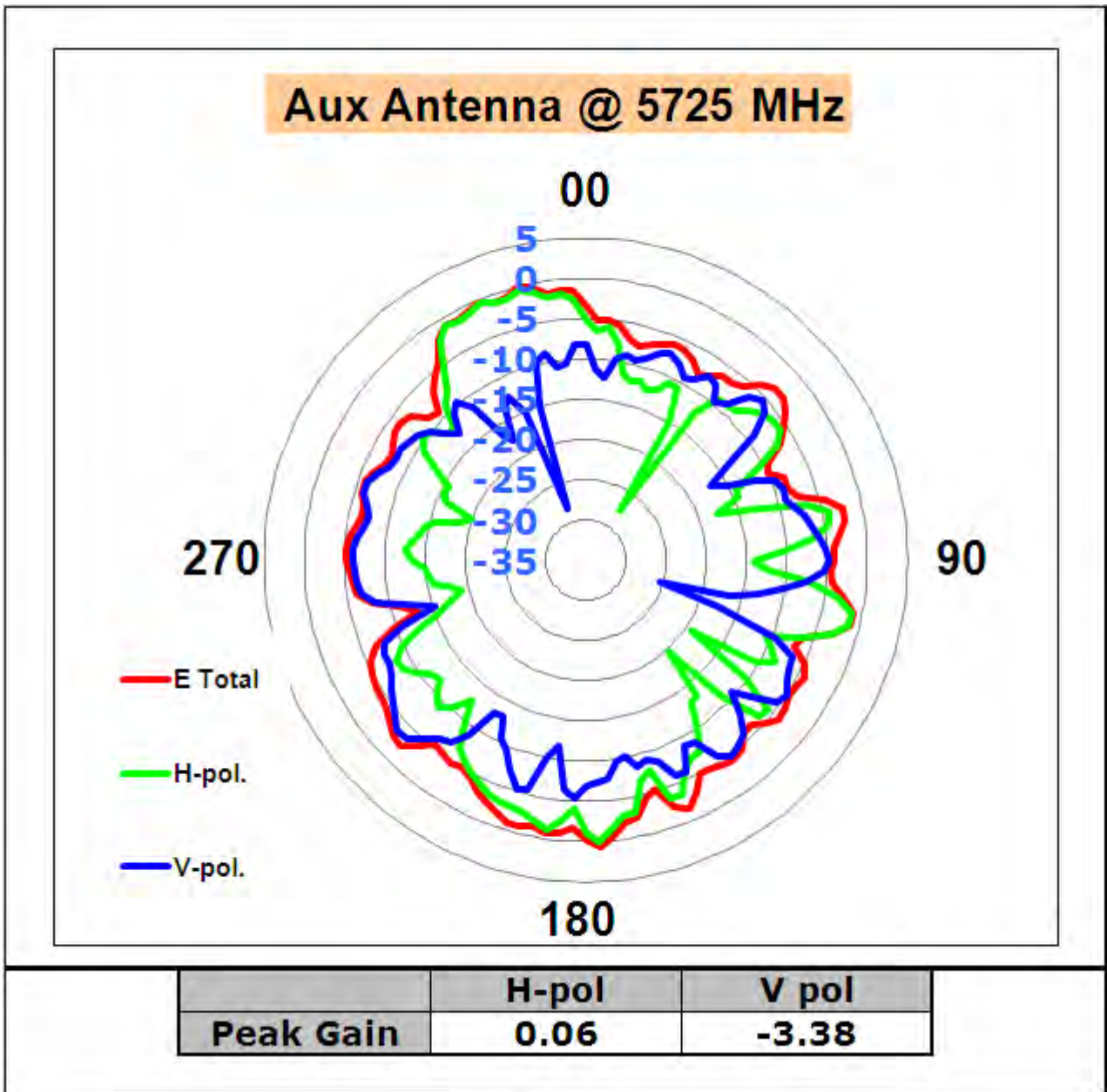
## Aux Antenna @ 5470 MHz



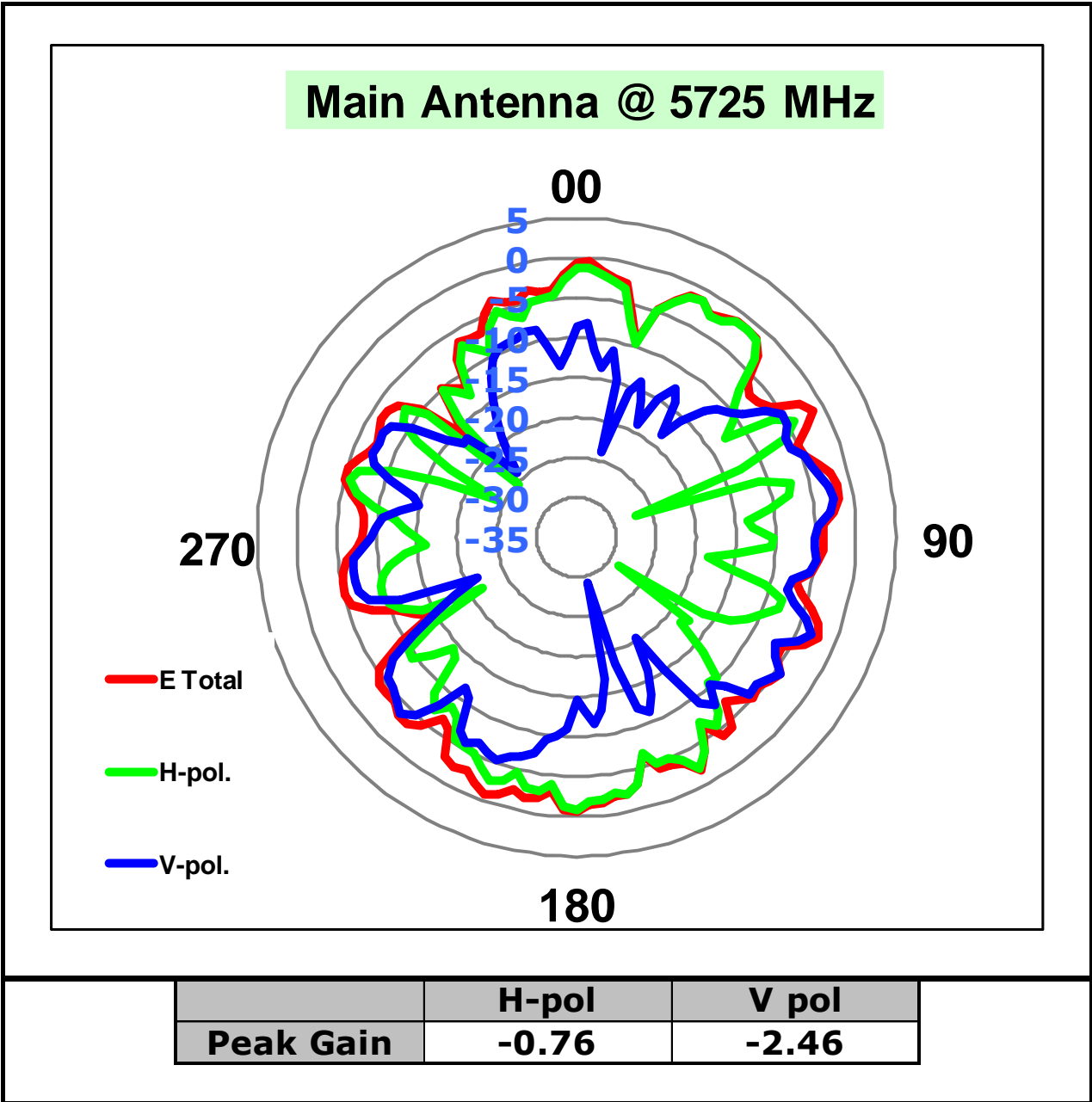
	H-pol	V pol
<b>Peak Gain</b>	<b>-1.20</b>	<b>-3.52</b>



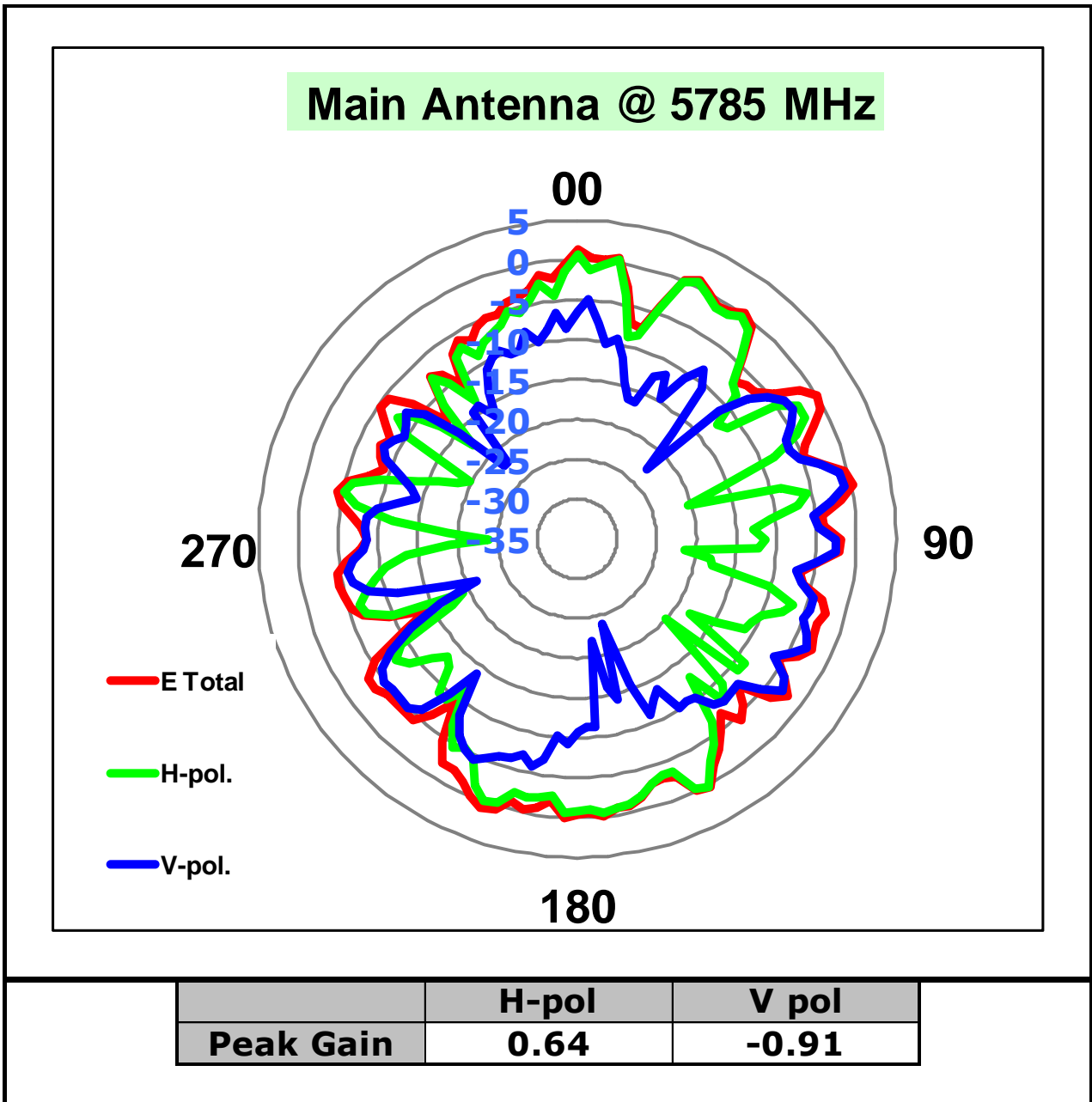




[5725-5850 MHz radiation characteristic](#)

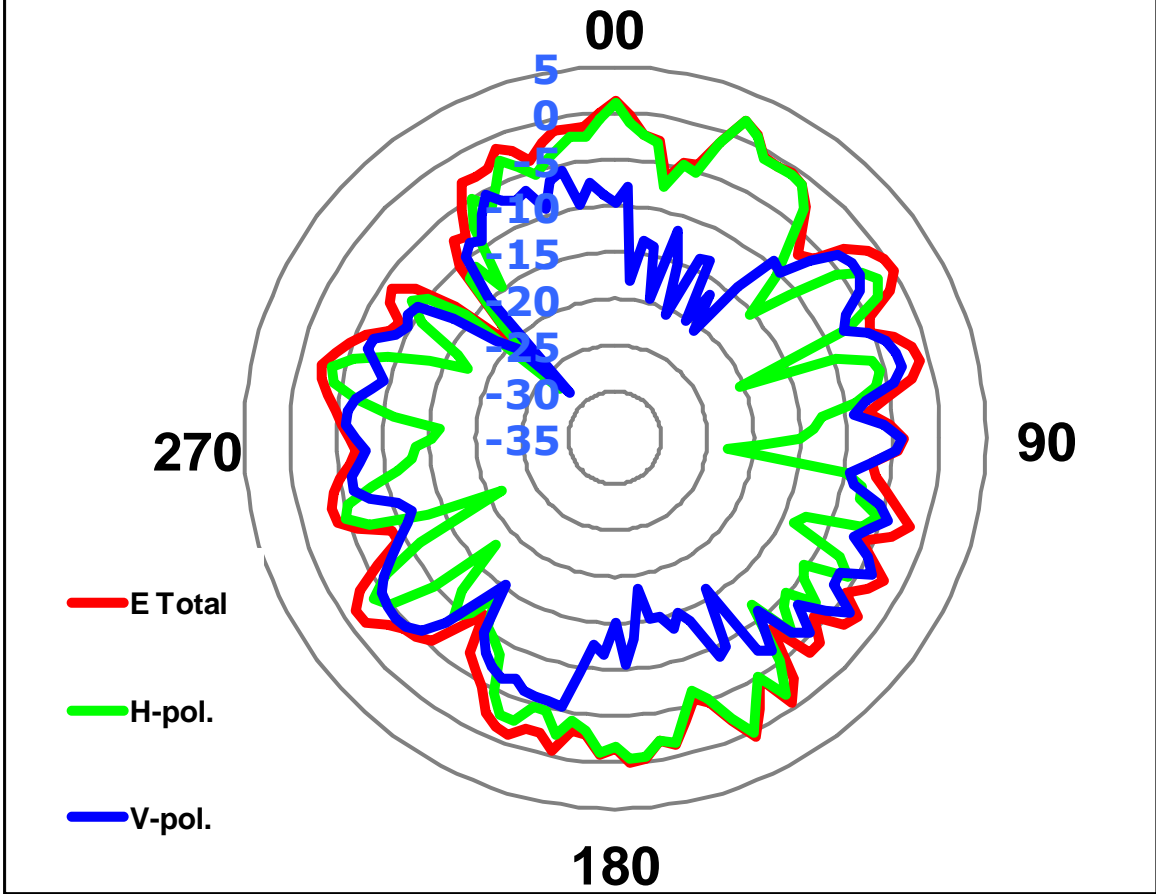


Tx1 antenna: 5785 MHz



Tx1 antenna: 5850 MHz

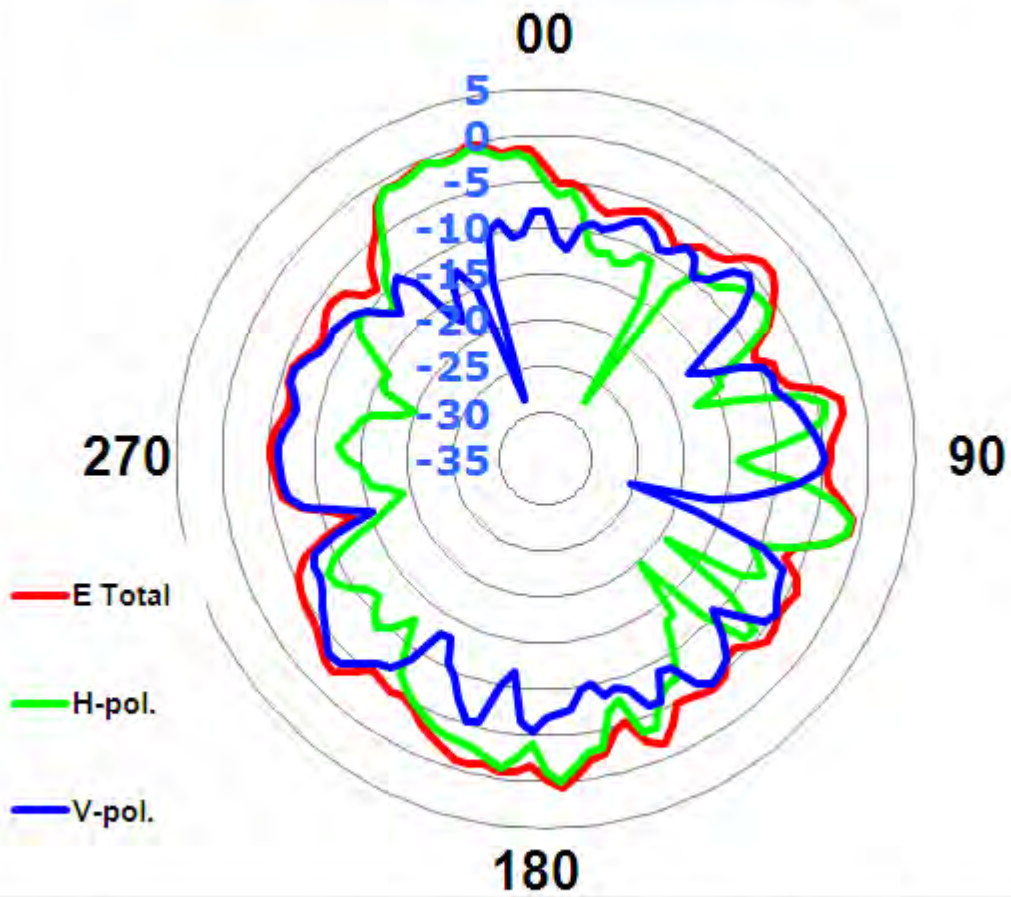
## Main Antenna @ 5850 MHz



	H-pol	V pol
Peak Gain	1.92	-3.21

Tx2 antenna: 5725 MHz

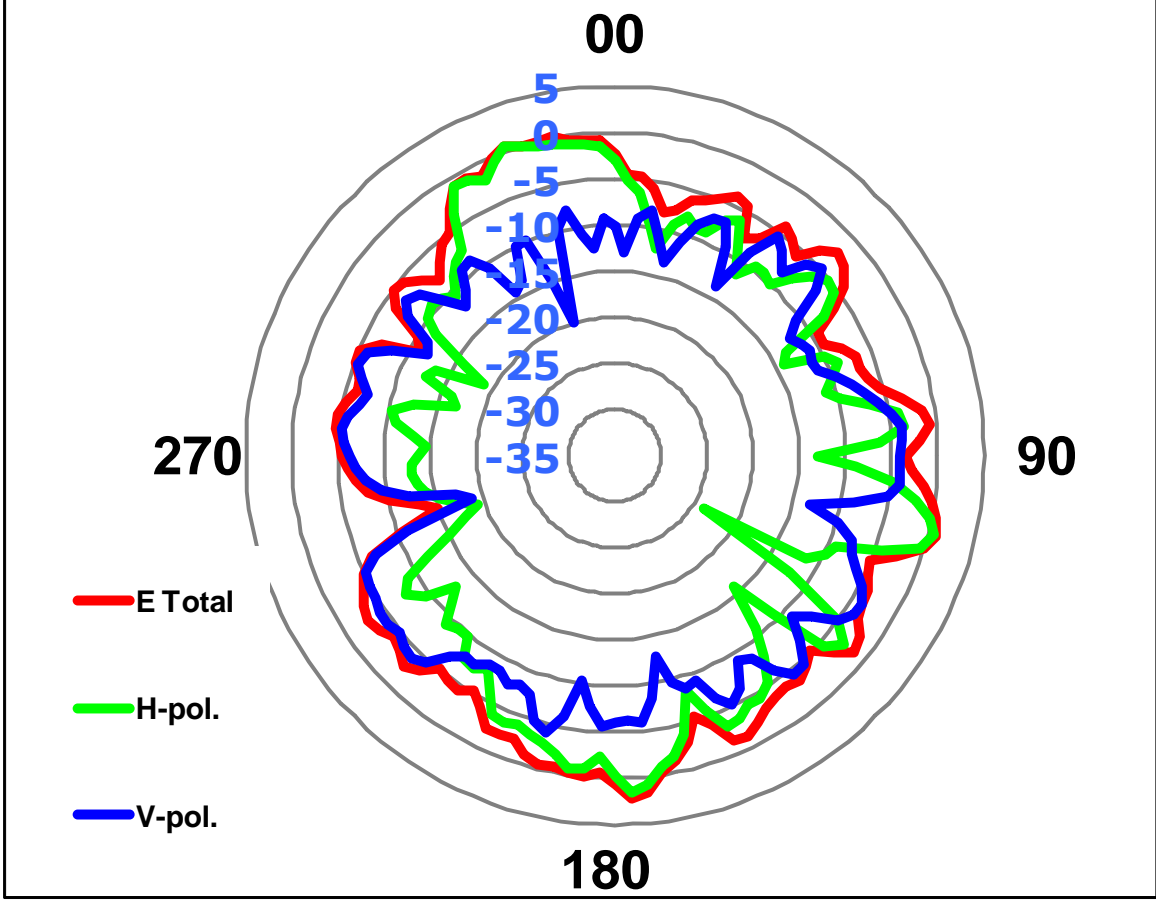
### Aux Antenna @ 5725 MHz



	H-pol	V pol
Peak Gain	0.06	-3.38

Tx2 antenna: 5785 MHz

## Aux Antenna @ 5785 MHz

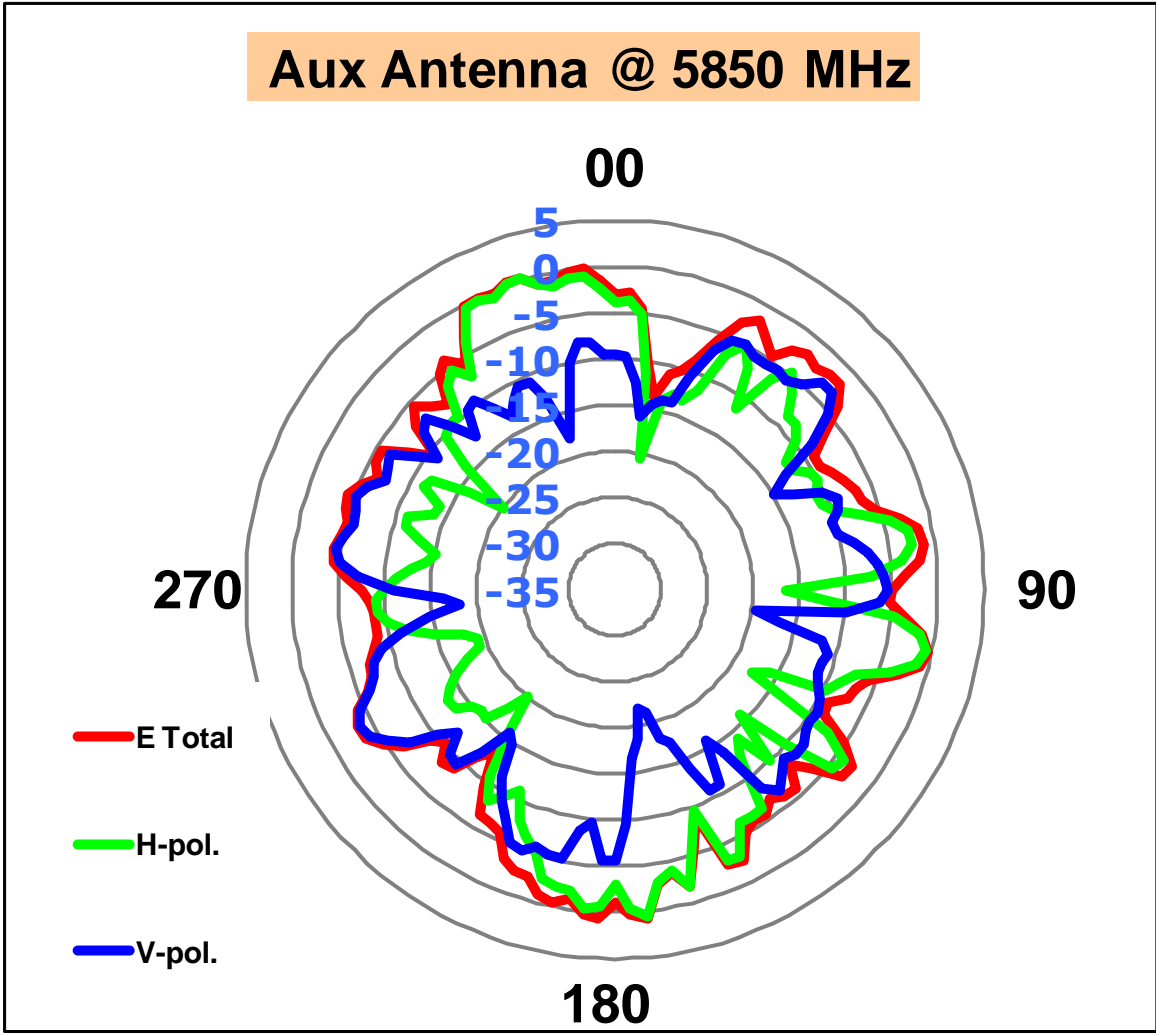


- E Total
- H-pol.
- V-pol.

	H-pol	V pol
<b>Peak Gain</b>	<b>1.50</b>	<b>-3.76</b>

Tx2 antenna: 5850 MHz

## Aux Antenna @ 5850 MHz



— E Total  
— H-pol.  
— V-pol.

	H-pol	V pol
Peak Gain	0.69	-3.20

### [Section 4. Host Platform Information](#)

OEM / ODM Host platform: (QILE2) platform correlated to antenna data

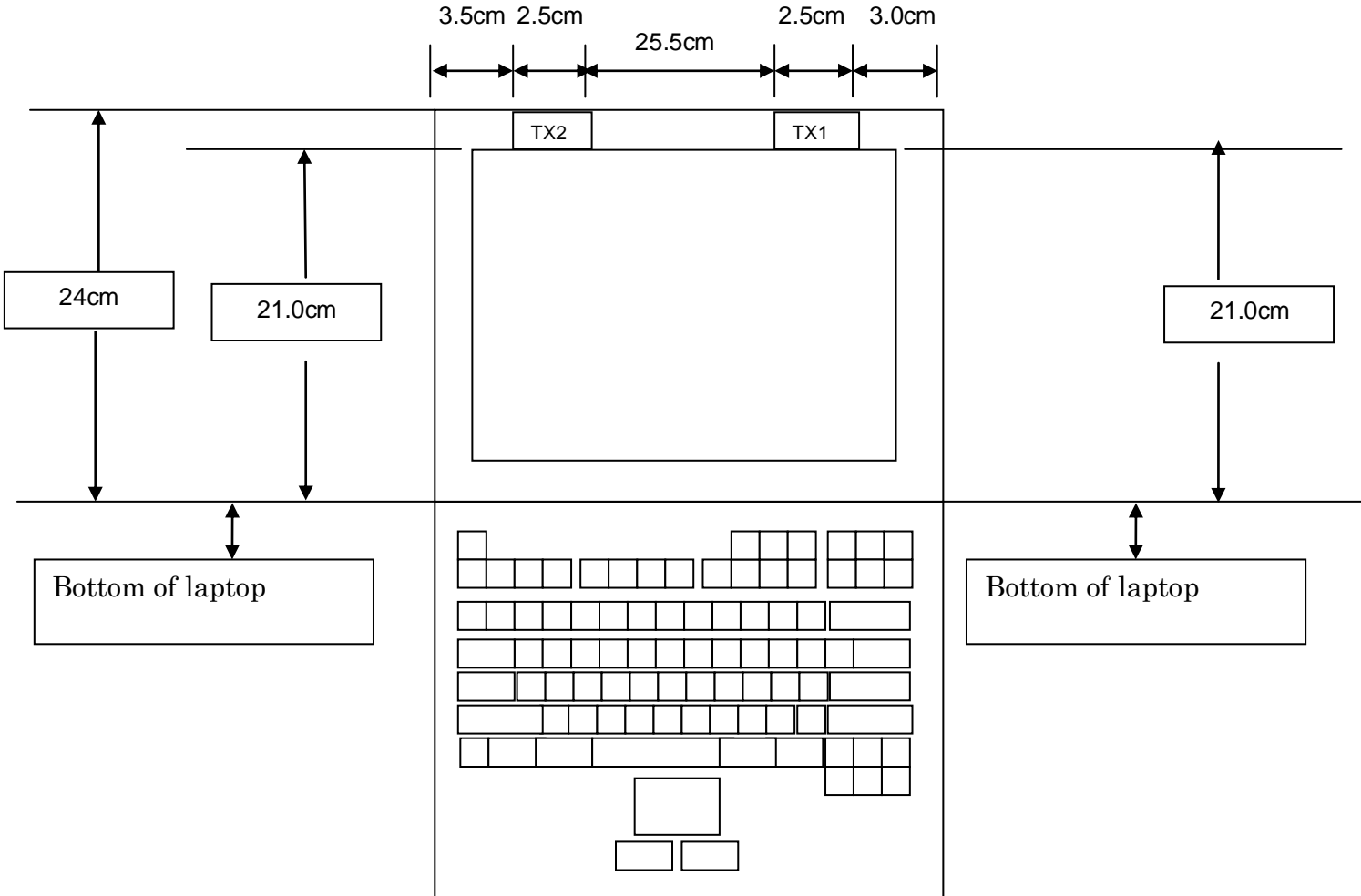
Rating Label Photo:





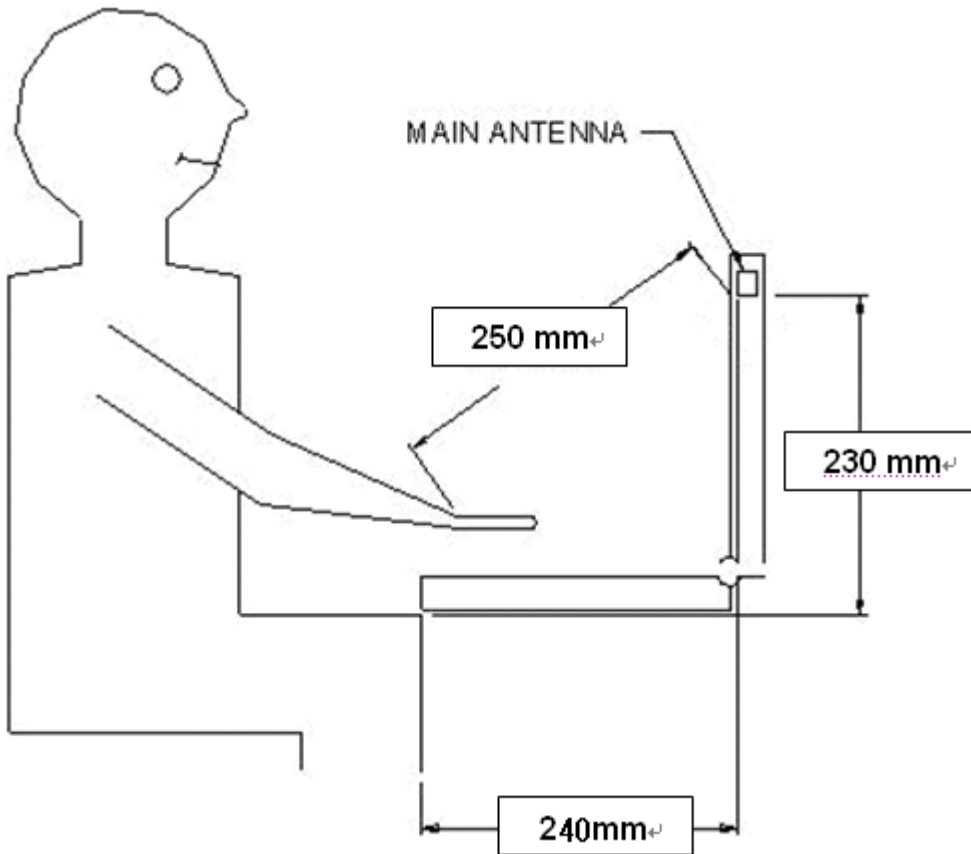
# Section 5. Antenna Host Platform Location Information

Include a **dimensioned photo or dimensioned drawing** of Tx1, Tx2 and Tx3 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

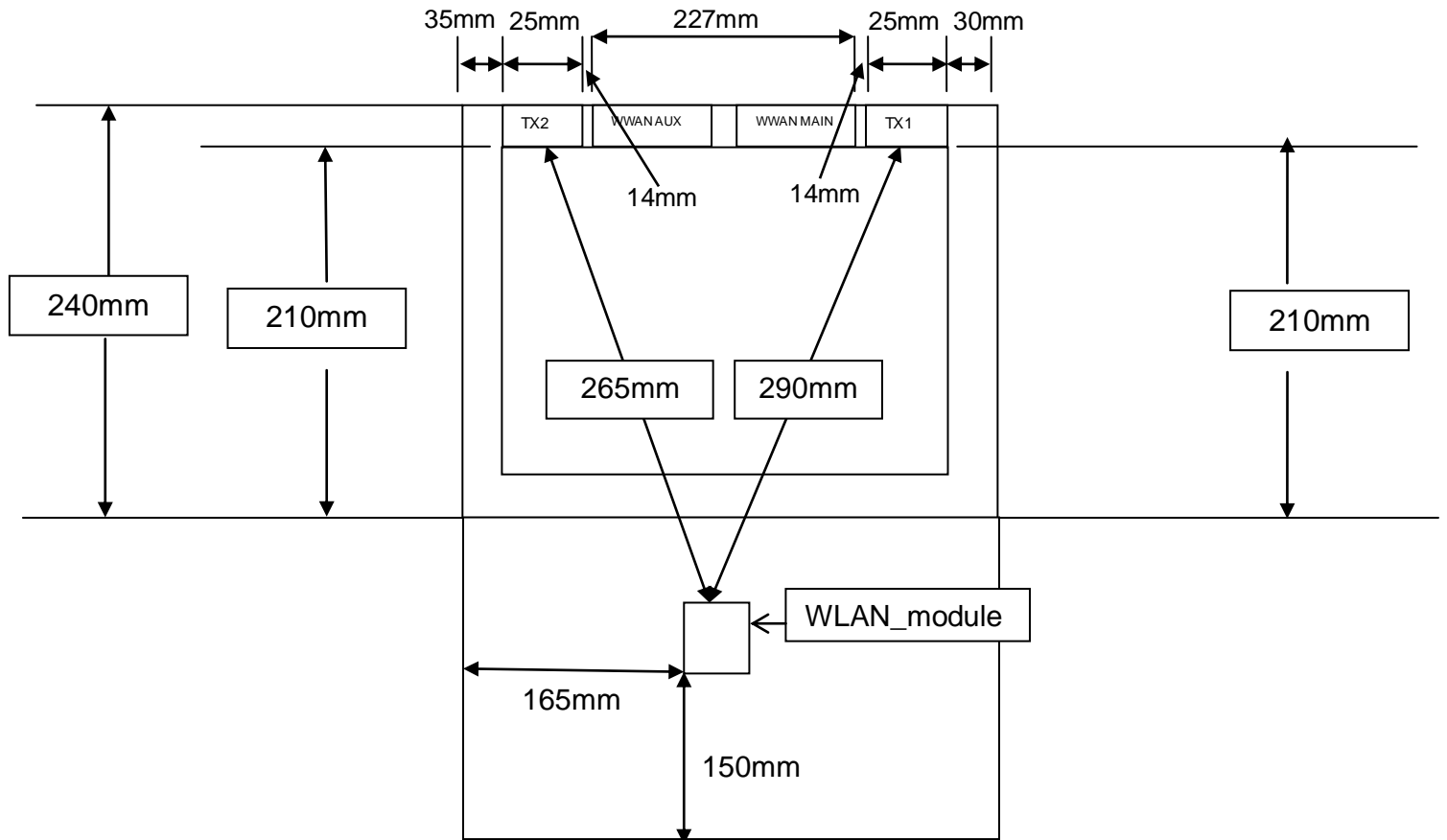
Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between the transmit antennas and the user (excluding hands, wrist, feet, and ankle)



## 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						
South Africa						
USA, Canada						