

## Regulatory WLAN Antenna Information

Platform	
Platform Owner	Hewlett-Packard Company
Brand Name	Hewlett-Packard Company
Model Name	Dogwood
ODM	Compal Electronics, Inc.
Target Launch Date	2013/8/28
Antenna	
Brand Name	<b><i>Shanghai Amphenol Airwave Communication Electronics Co., Ltd.</i></b>
Part Number	■ WLAN Main antenna: HP4589-12-000-C (DC33001FV30)
	■ WLAN Aux antenna: HP4590-12-000-C (DC33001FV40)
	<b>*Dogwood BT and WLAN Main share the WLAN Main Antenna.</b>
Module	
With WLAN Module	
(Check Box)	

**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	<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)
Main antenna HP4589-12-000-C	<b>Shanghai Amphenol Airwave Communication Electronics Co. Ltd</b>	PIFA	1) cable p/n: shenyu, SY113/50-055	2400-2500 MHz -0.34 dBi (peak)	2400-2500MHz -0.04dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz 0.3 dBi (peak)
			2) O,D. 1.13mm 50 ohm coaxial cable	5150-5350 MHz 0.56 dBi (peak)	5150-5350MHz 1.06dBi (peak)	5150-5350MHz 2.0 max	5150-5350MHz 0.5 dBi (peak)
			3) length: 171.5 mm	5470-5725 MHz 0.56 dBi (peak)	5470-5725 MHz 1.08dBi (peak)	5470-5725MHz 2.0 max	5470-5725MHz 0.52 dBi (peak)
			4) Connector P/N: I-PEX MHF A13 20428-001R	5725-5850 MHz -0.04 dBi (peak)	5725-5850MHz 0.51 dBi (peak)	5725-5850 MHz 2.0 max	5725-5850MHz 0.55 dBi (peak)
Aux antenna HP4590-12-000-C	<b>Shanghai Amphenol Airwave Communication Electronics Co. Ltd</b>	PIFA	1) cable p/n: shenyu, SY113/50-063	2400-2500 MHz -1.94 dBi (peak)	2400-2500MHz -1.34 dBi (peak)	2400-2500MHz 2.0 max	2400-2500MHz 0.6 dBi (peak)
			2) O,D. 1.13mm 50 ohm coaxial cable	5150-5350 MHz -0.35 dBi (peak)	5150-5350MHz 0.65 dBi (peak)	5150-5350MHz 2.0 max	5150-5350MHz 1.0 dBi (peak)
			3) length: 259mm	5470-5725 MHz 0.27 dBi (peak)	5470-5725 MHz 1.33 dBi (peak)	5470-5725MHz 2.0 max	5470-5725MHz 1.06 dBi (peak)
			4) Connector P/N: I-PEX MHF A13 20428-001R	5725-5850 MHz -0.04dBi (peak)	5725-5850MHz 1.06dBi (peak)	5725-5850 MHz 2.0 max	5725-5850MHz 1.1 dBi (peak)

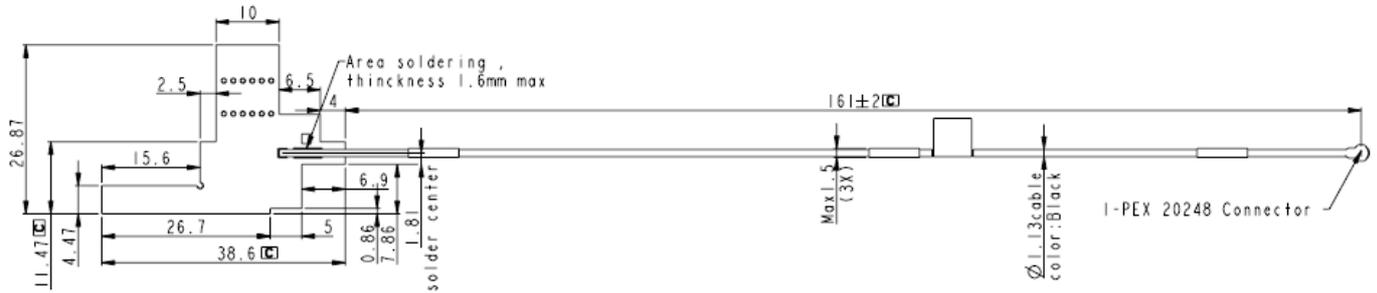
**Antenna Peak Gain Table:**

	Tx1 antenna		Tx2 antenna	
Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
2400	-5.23	-1.31	-1.94	-3.59
2450	-5.65	-0.34	-2.05	-3.25
2500	-5.82	-0.79	-2.49	-2.55
5150	-2.97	-0.73	-0.94	-1.04
5250	-2.9	-0.93	-0.51	-1.46
5350	-3.55	0.56	-0.35	-2.07
5470	-3.79	0.56	0.27	-1.46
5600	-3.85	-0.55	-1.19	-3.0
5725	-4.05	-0.11	-1.04	-4.03
5785	-3.55	-0.04	-0.04	-3.11
5850	-4.53	-0.48	-0.82	-4.12

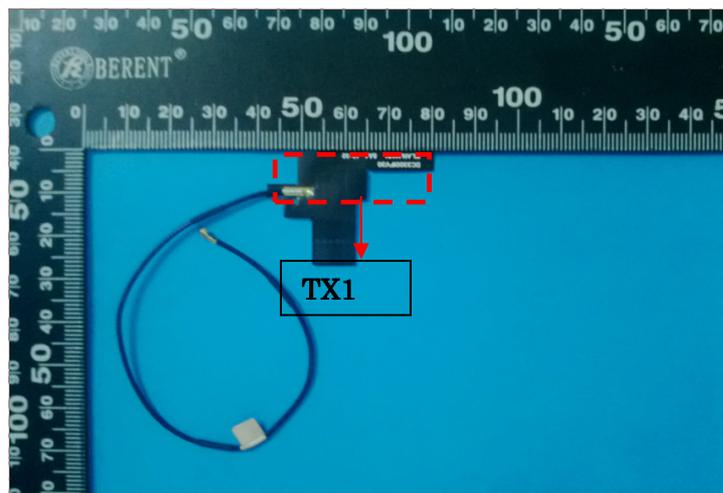
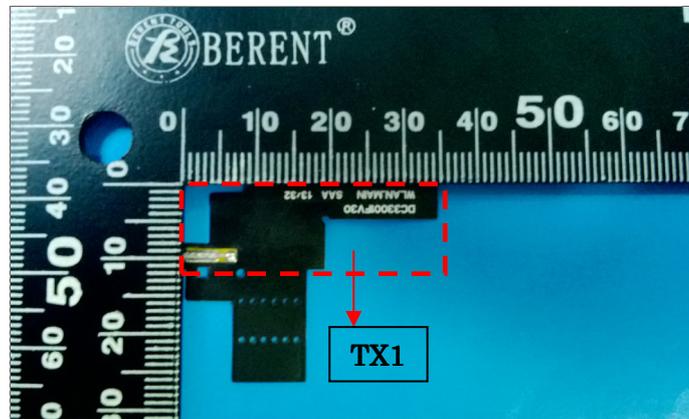
## Section 2. Dimensioned Photos or Drawings of Antennas

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

### Tx1 Antenna Dimensioned Drawing:

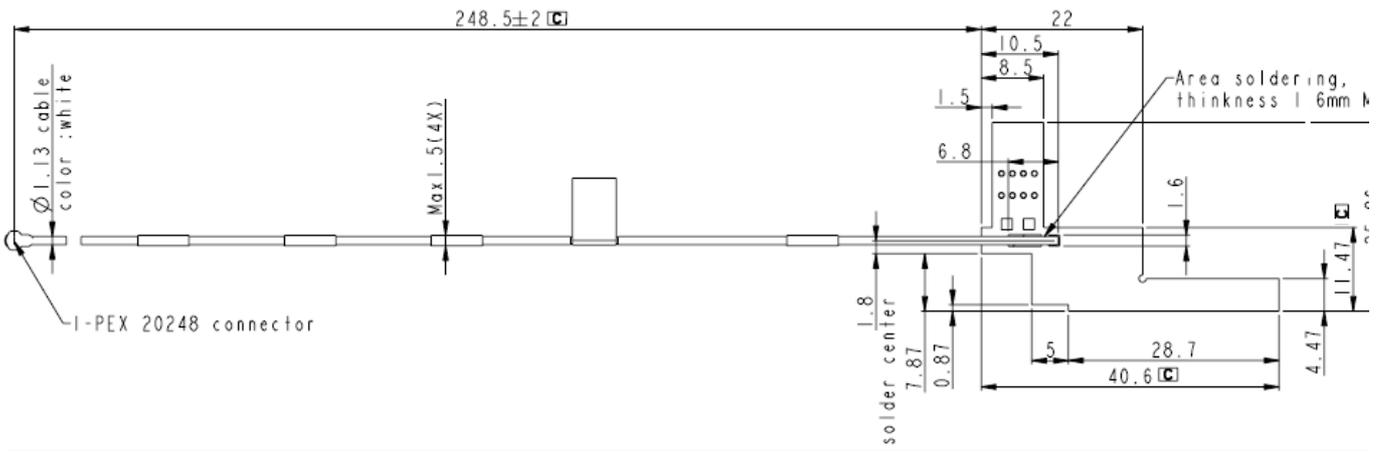


### Tx1 Antenna Photo:

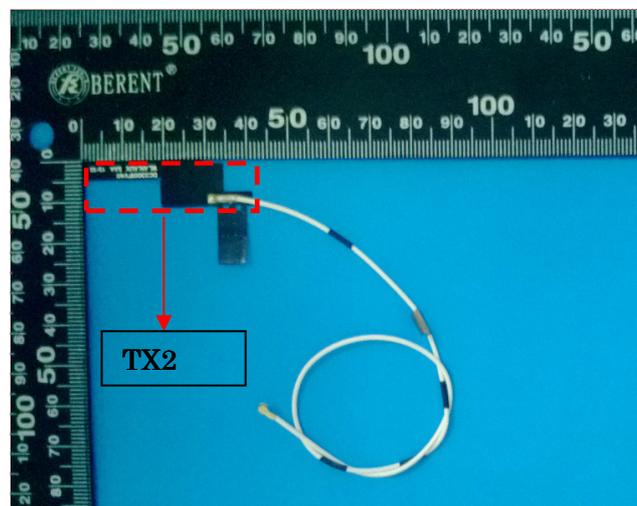
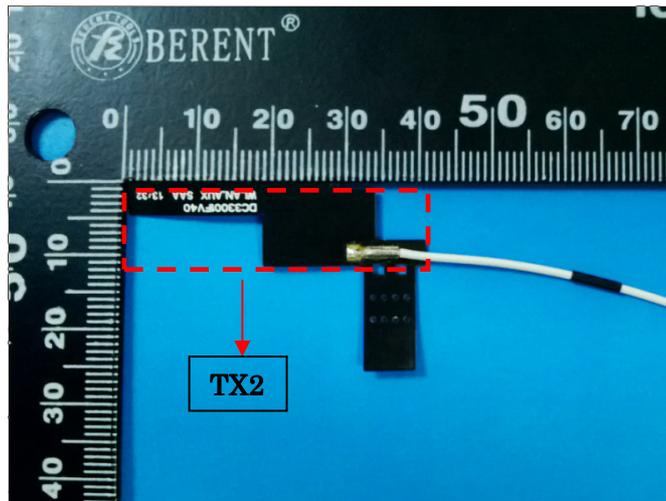


Include a dimensioned photo and dimensioned drawing of Tx2 (or Rx2) antenna here.

**Tx2 (or Rx2) Antenna Dimensioned Drawing:**

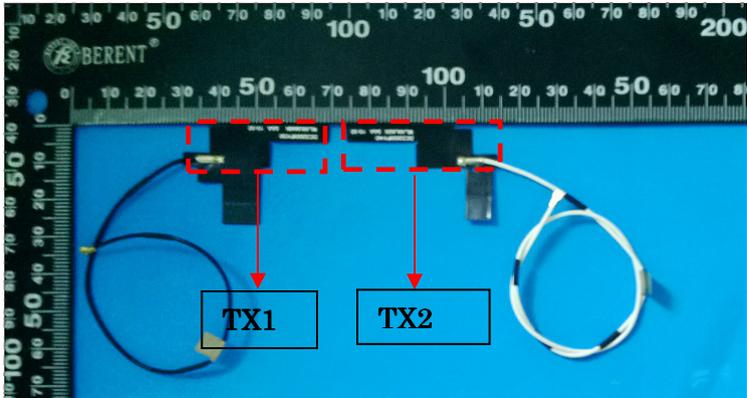


**Tx2 (or Rx2) Antenna Photo:**



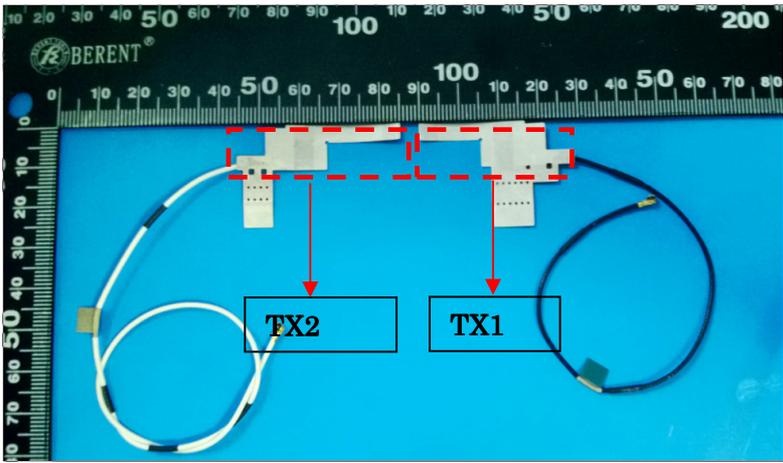
Include front view photo of all 2 antennas here.

Antenna Part Number : HP4589-12-000-C (TX1), HP4590-12-000-C (TX2)



Include back view photo of all 2 antennas here.

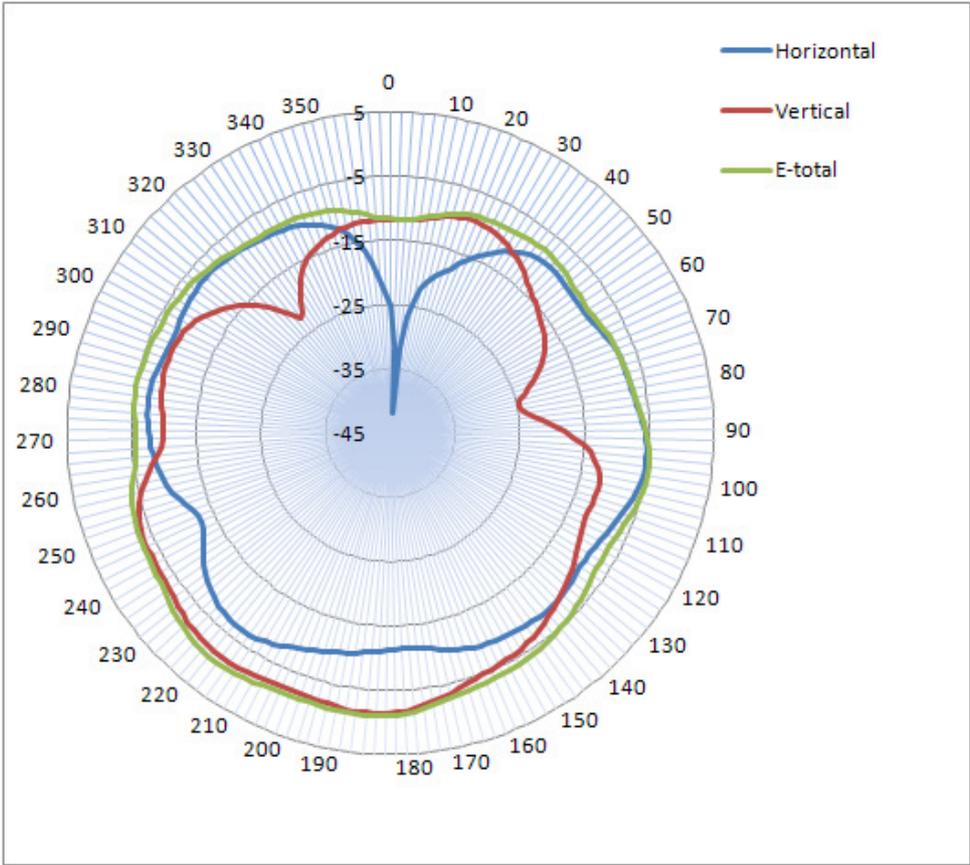
Antenna Part Number : HP4589-12-000-C (TX1), HP4590-12-000-C (TX2)



Section 3. Radiation characteristics of antennae Loaded in Host Platform

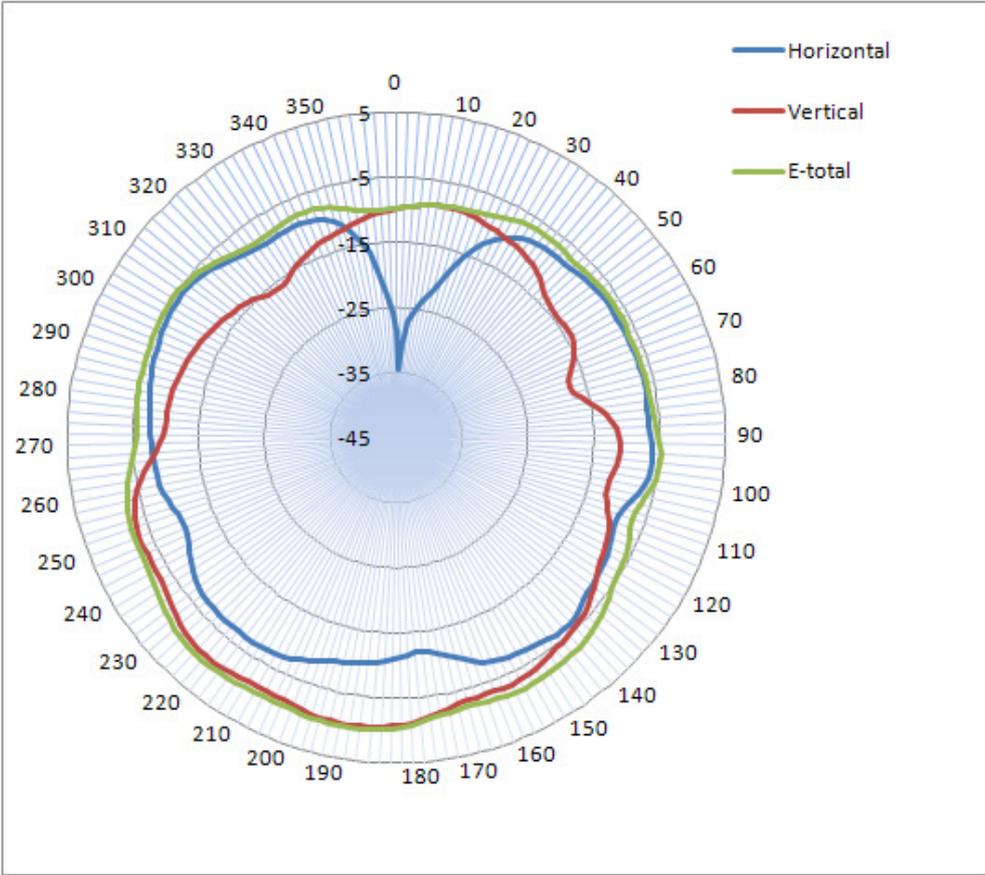
2400-2500 MHz radiation characteristic

Tx1 antenna: 2400 MHz



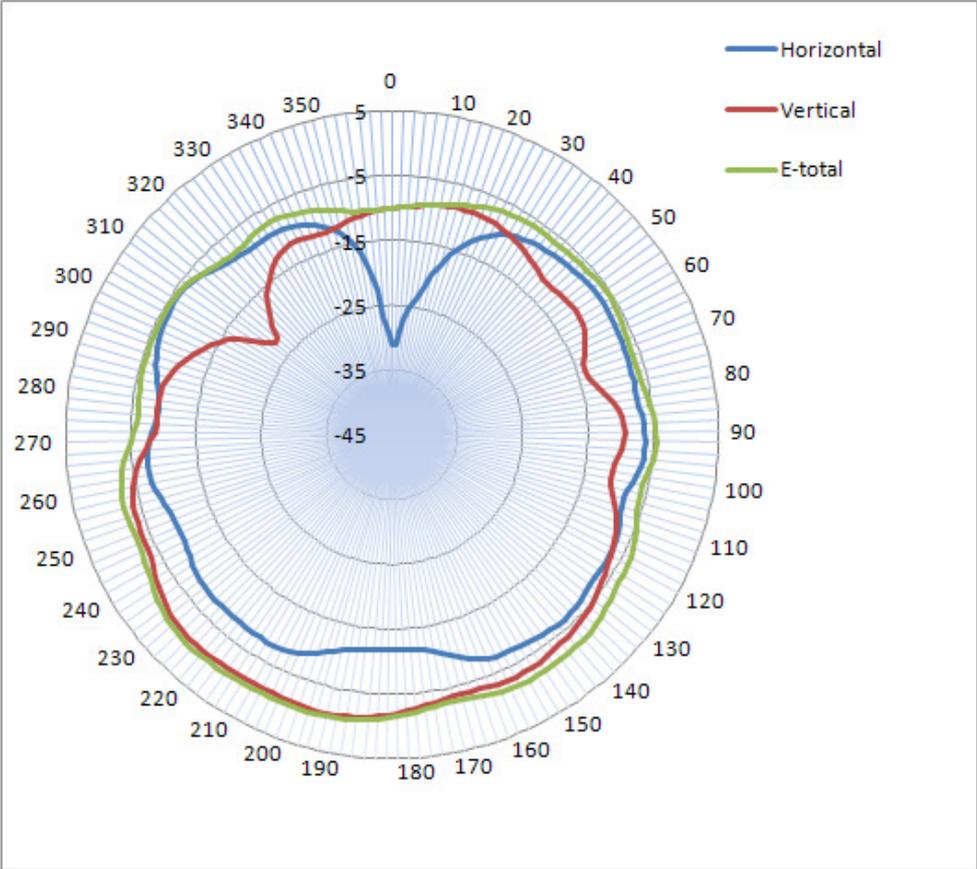
Center Frequency	<b>2400MHz</b>
Horizontal (dBi) peak	<b>-5.23</b>
Vertical (dBi) peak	<b>-1.31</b>

Tx1 antenna: 2450 MHz



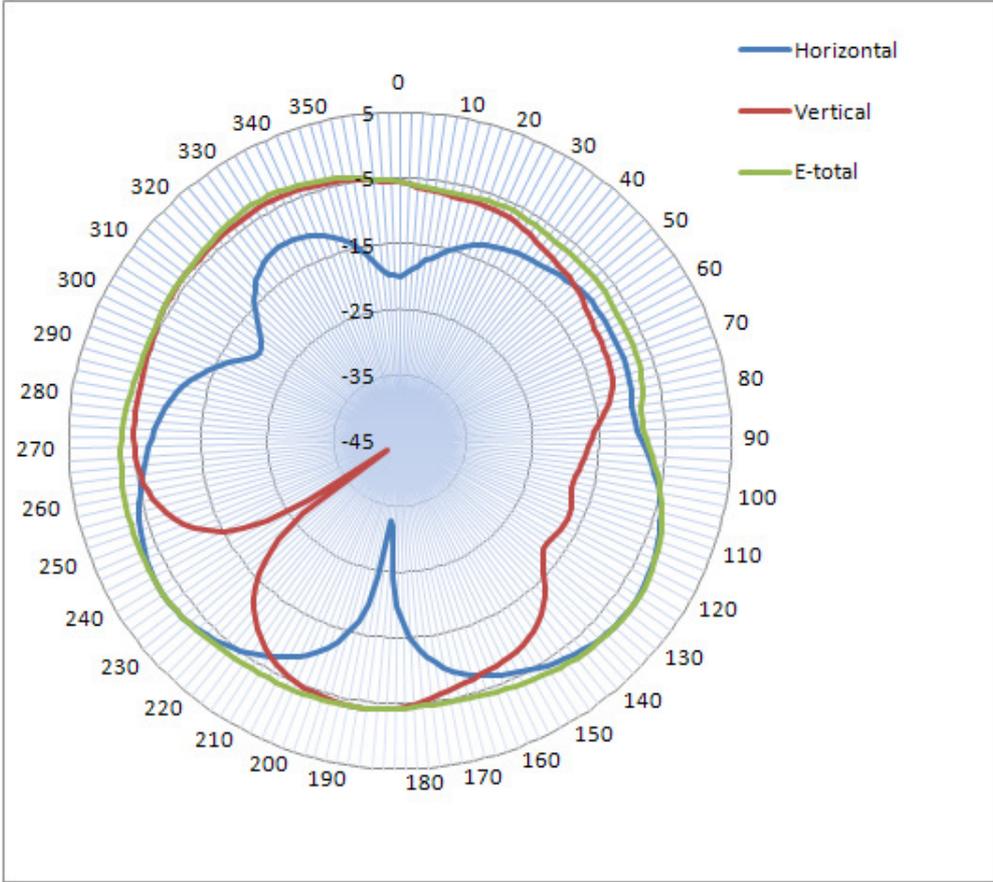
Center Frequency	<b>2450MHz</b>
Horizontal (dBi) peak	<b>-5.65</b>
Vertical (dBi) peak	<b>-0.34</b>

Tx1 antenna: 2500 MHz



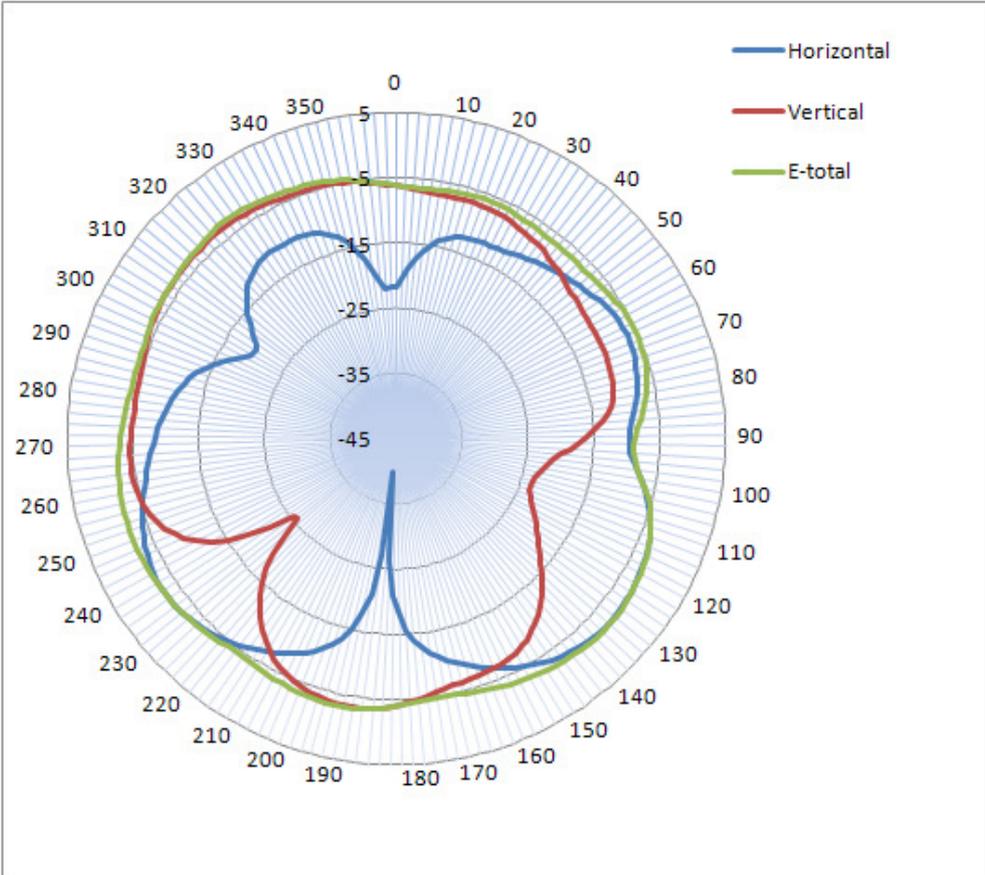
Center Frequency	<b>2500MHz</b>
Horizontal (dBi) peak	<b>-5.82</b>
Vertical (dBi) peak	<b>-0.79</b>

Tx2 antenna: 2400 MHz



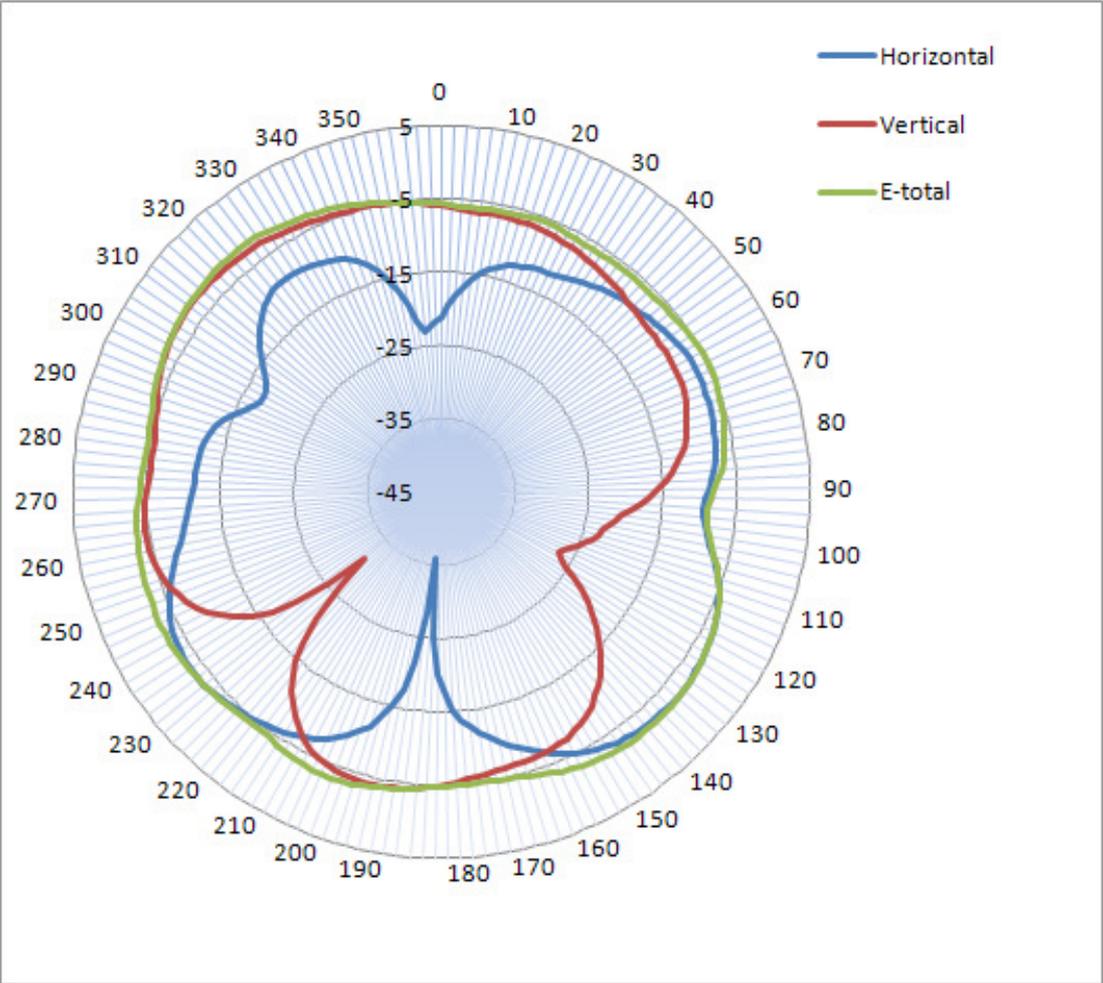
Center Frequency	<b>2400MHz</b>
Horizontal (dBi) peak	<b>-1.94</b>
Vertical (dBi) peak	<b>-3.59</b>

Tx2 antenna: 2450 MHz



Center Frequency	<b>2450MHz</b>
Horizontal (dBi) peak	<b>-2.05</b>
Vertical (dBi) peak	<b>-3.25</b>

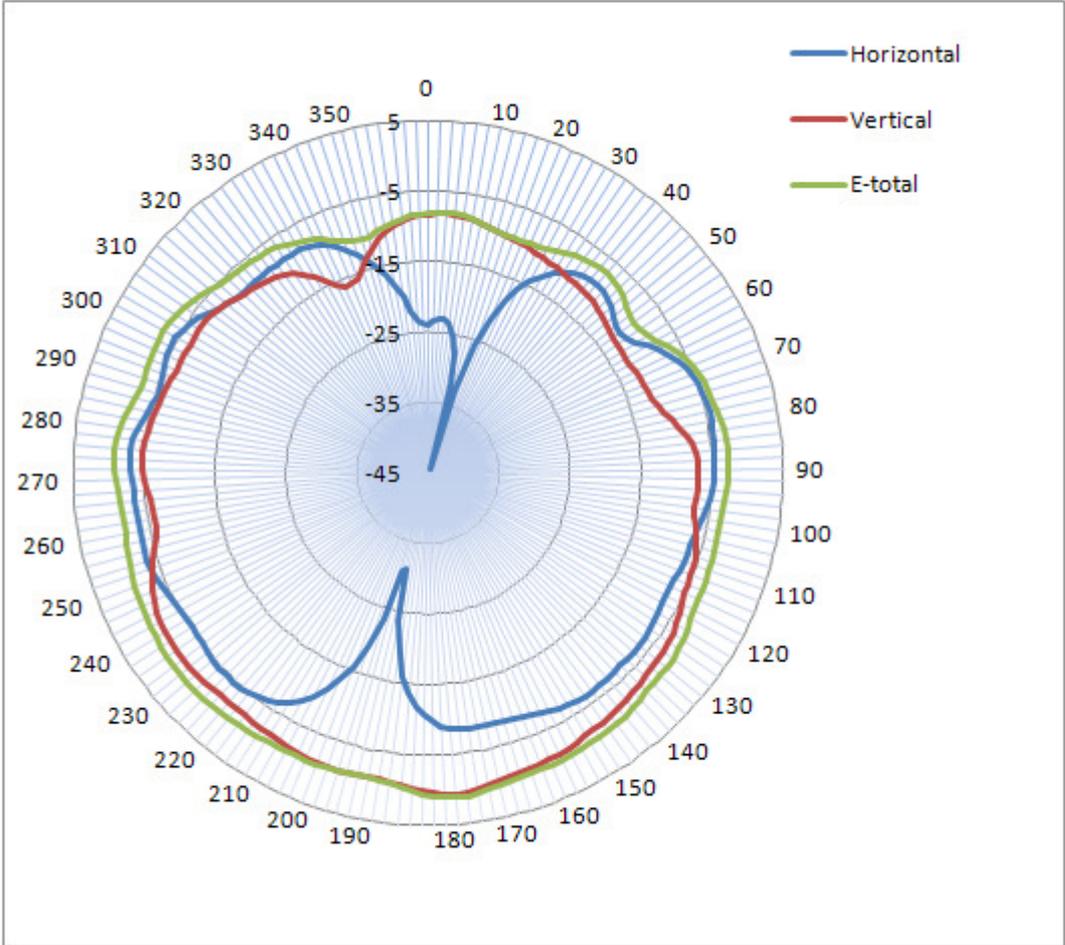
Tx2 antenna: 2500 MHz



Center Frequency	<b>2500MHz</b>
Horizontal (dBi) peak	<b>-2.49</b>
Vertical (dBi) peak	<b>-2.55</b>

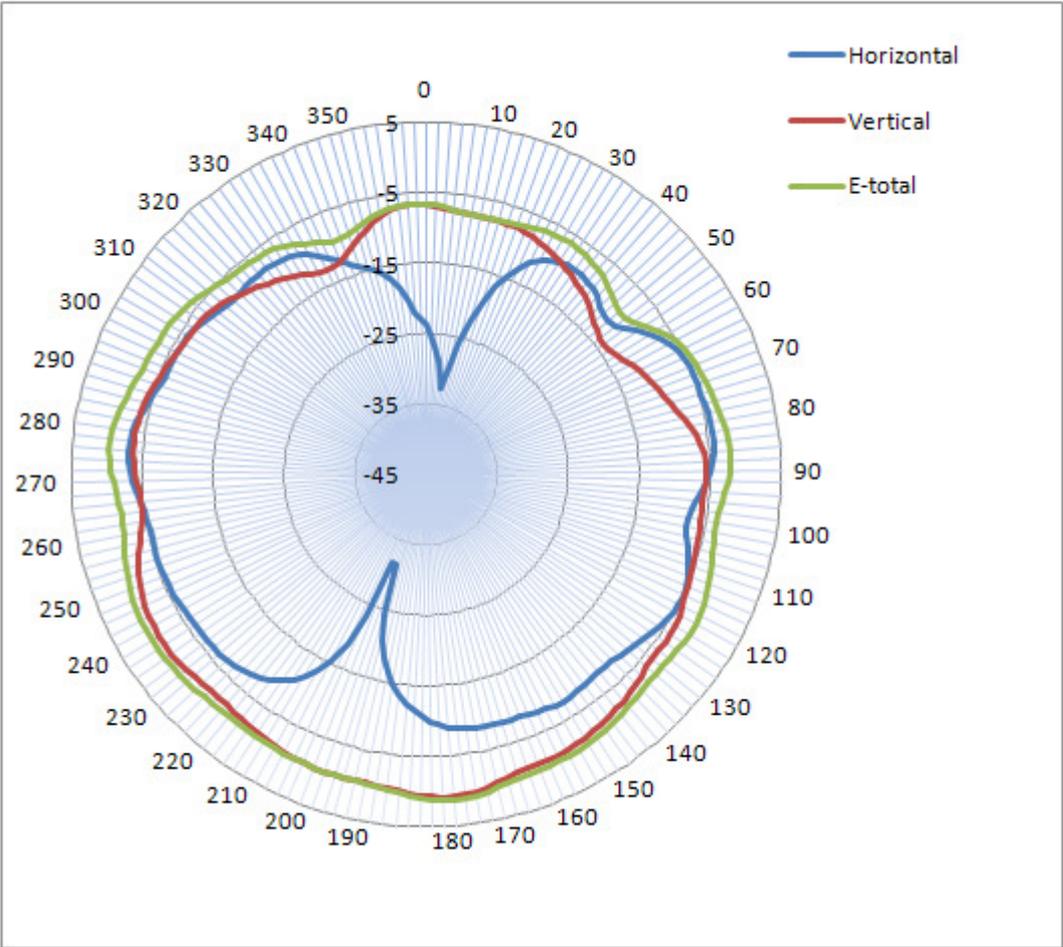
5150-5350 MHz radiation characteristic

Tx1 antenna: 5150 MHz



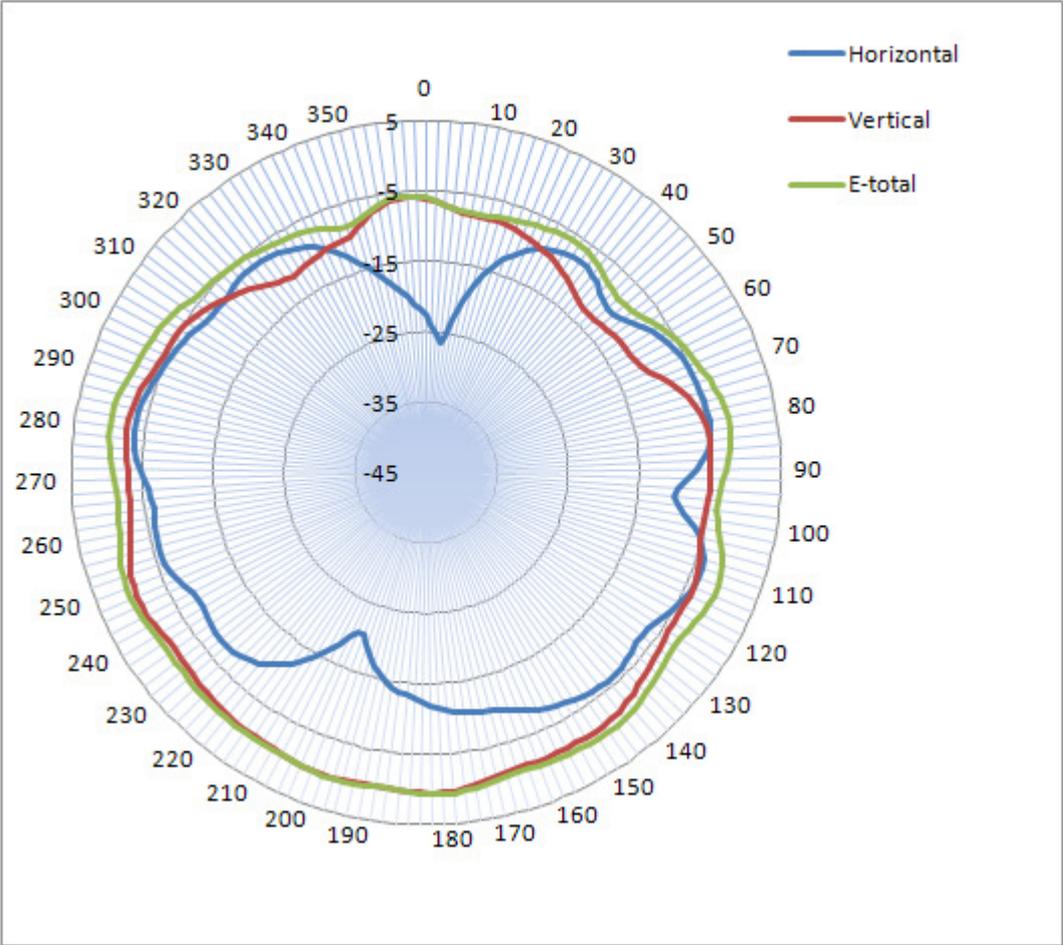
Center Frequency	<b>5150MHz</b>
Horizontal (dBi) peak	<b>-2.97</b>
Vertical (dBi) peak	<b>-0.73</b>

Tx1 antenna: 5250 MHz



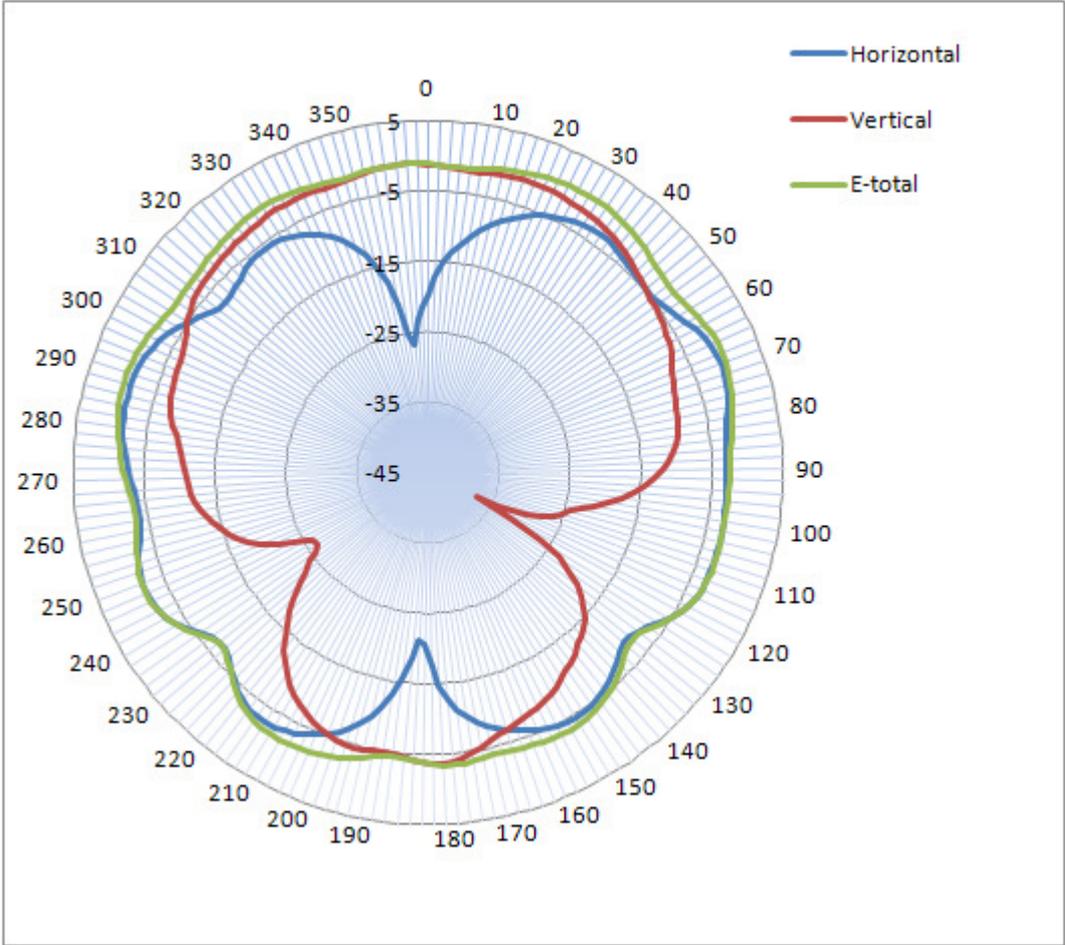
Center Frequency	<b>5250MHz</b>
Horizontal (dBi) peak	<b>-2.9</b>
Vertical (dBi) peak	<b>-0.93</b>

Tx1 antenna: 5350 MHz



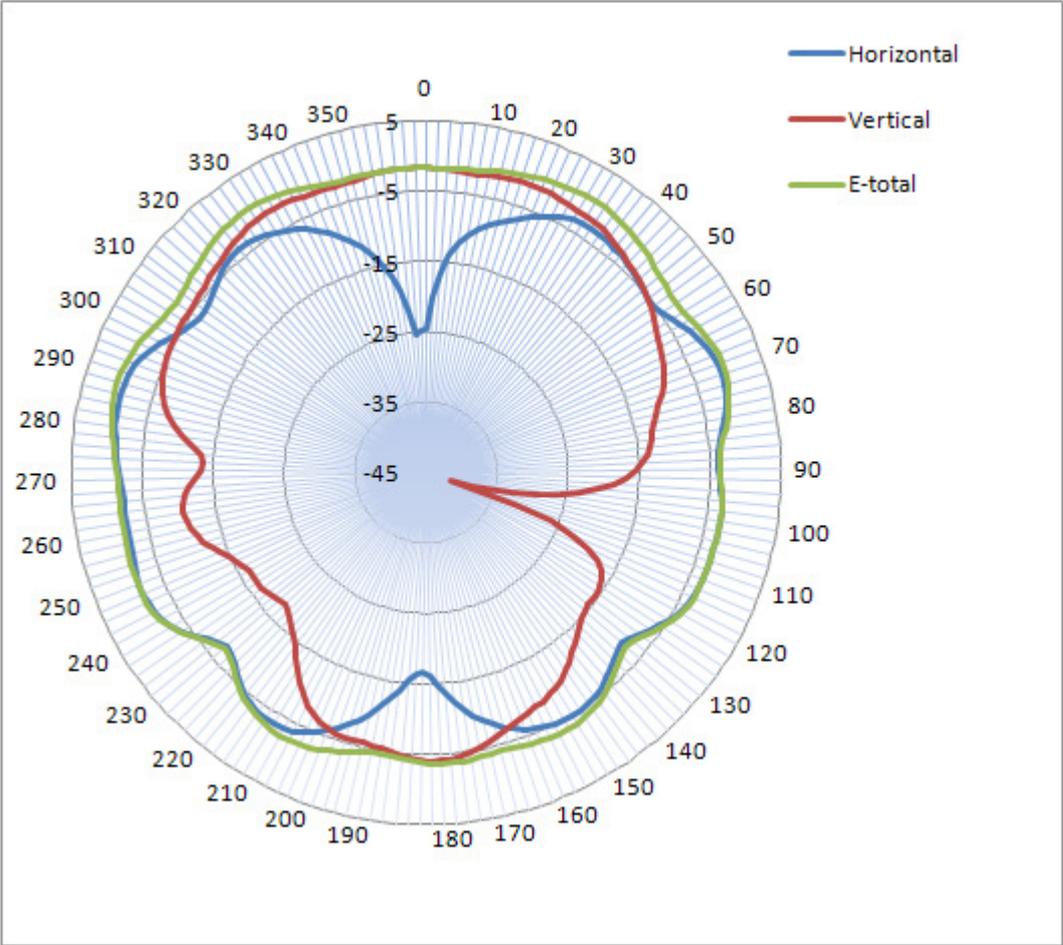
Center Frequency	<b>5350MHz</b>
Horizontal (dBi) peak	<b>-3.55</b>
Vertical (dBi) peak	<b>0.56</b>

Tx2 antenna: 5150 MHz



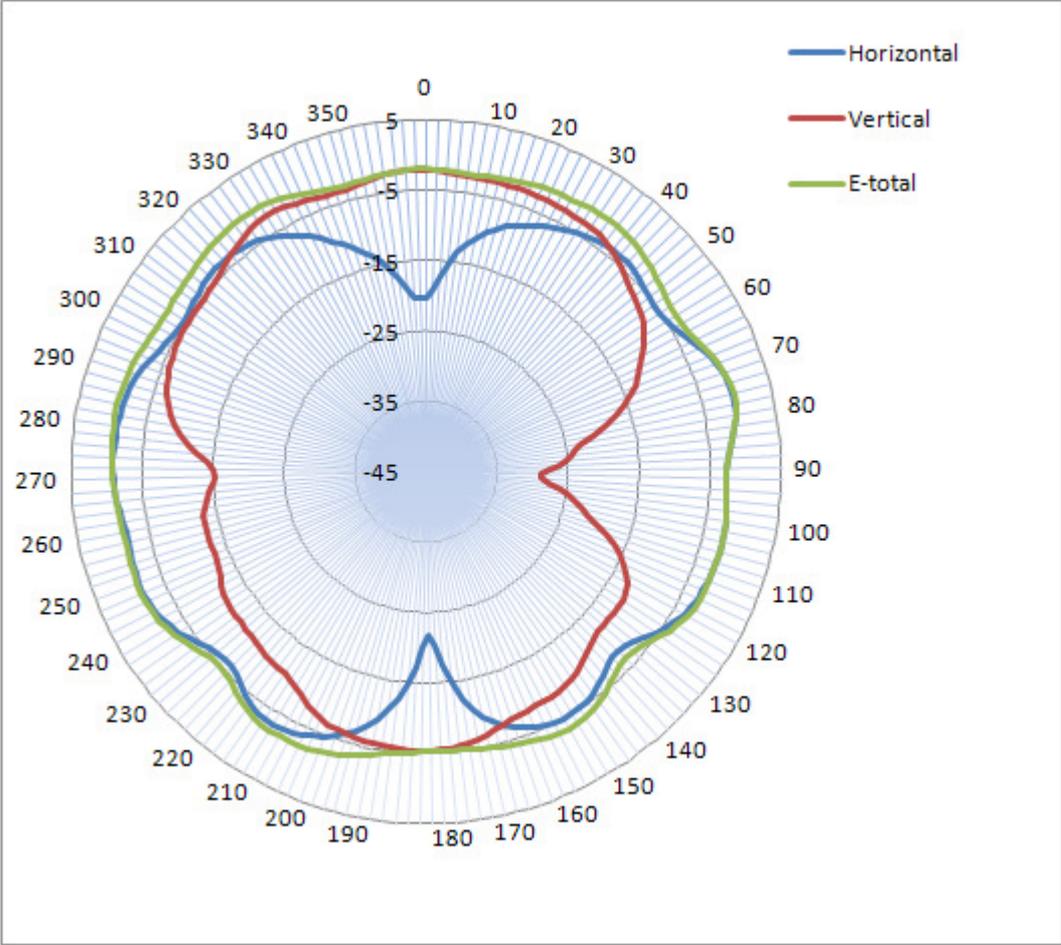
Center Frequency	<b>5150MHz</b>
Horizontal (dBi) peak	<b>-0.94</b>
Vertical (dBi) peak	<b>-1.04</b>

Tx2 antenna: 5250 MHz



Center Frequency	<b>5250MHz</b>
Horizontal (dBi) peak	<b>-0.51</b>
Vertical (dBi) peak	<b>-1.46</b>

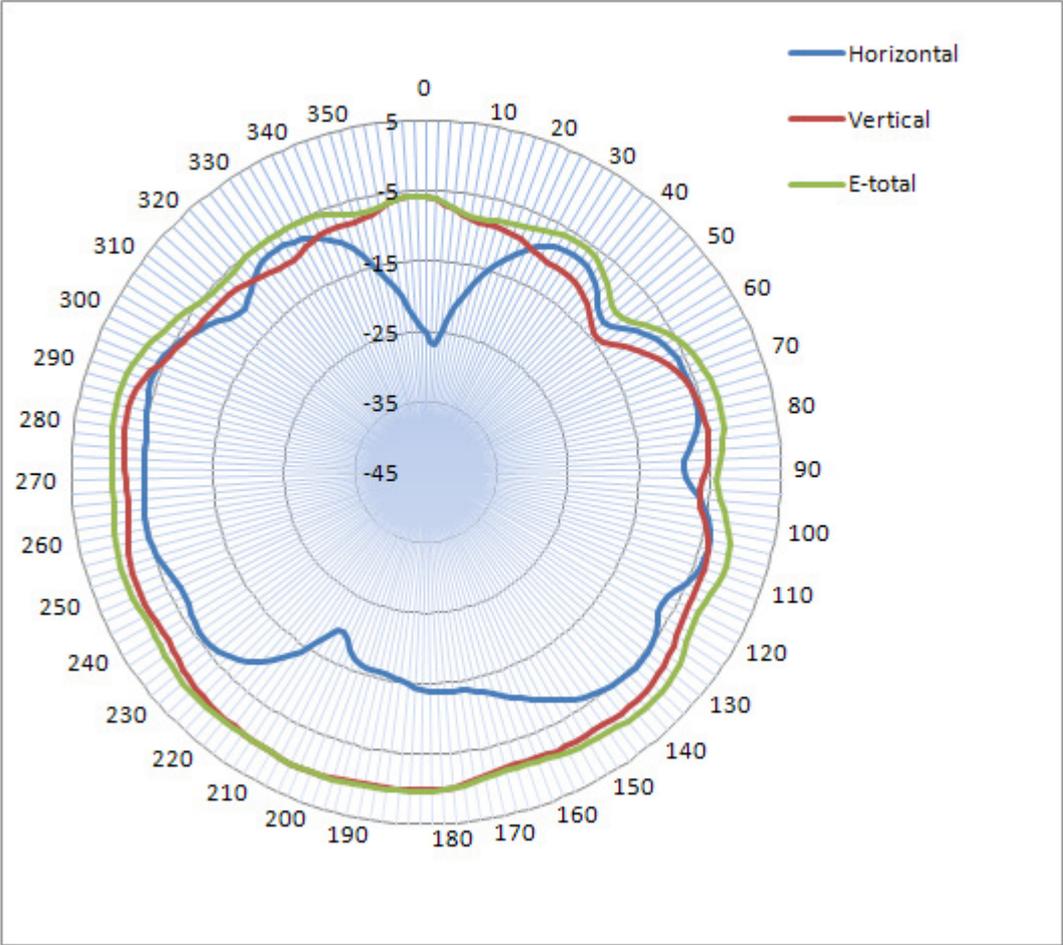
Tx2 antenna: 5350 MHz



Center Frequency	<b>5350MHz</b>
Horizontal (dBi) peak	<b>-0.35</b>
Vertical (dBi) peak	<b>-2.07</b>

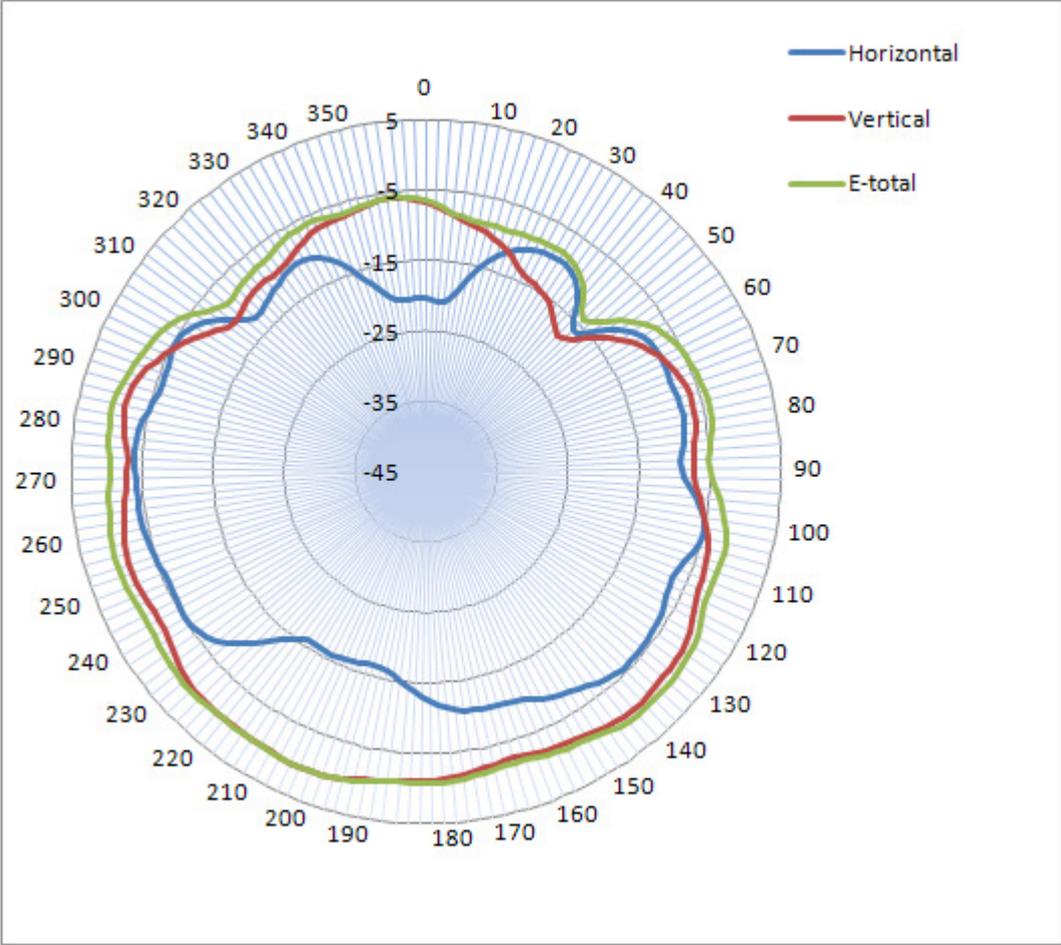
5470-5725 MHz radiation characteristic

Tx1 antenna: 5470 MHz



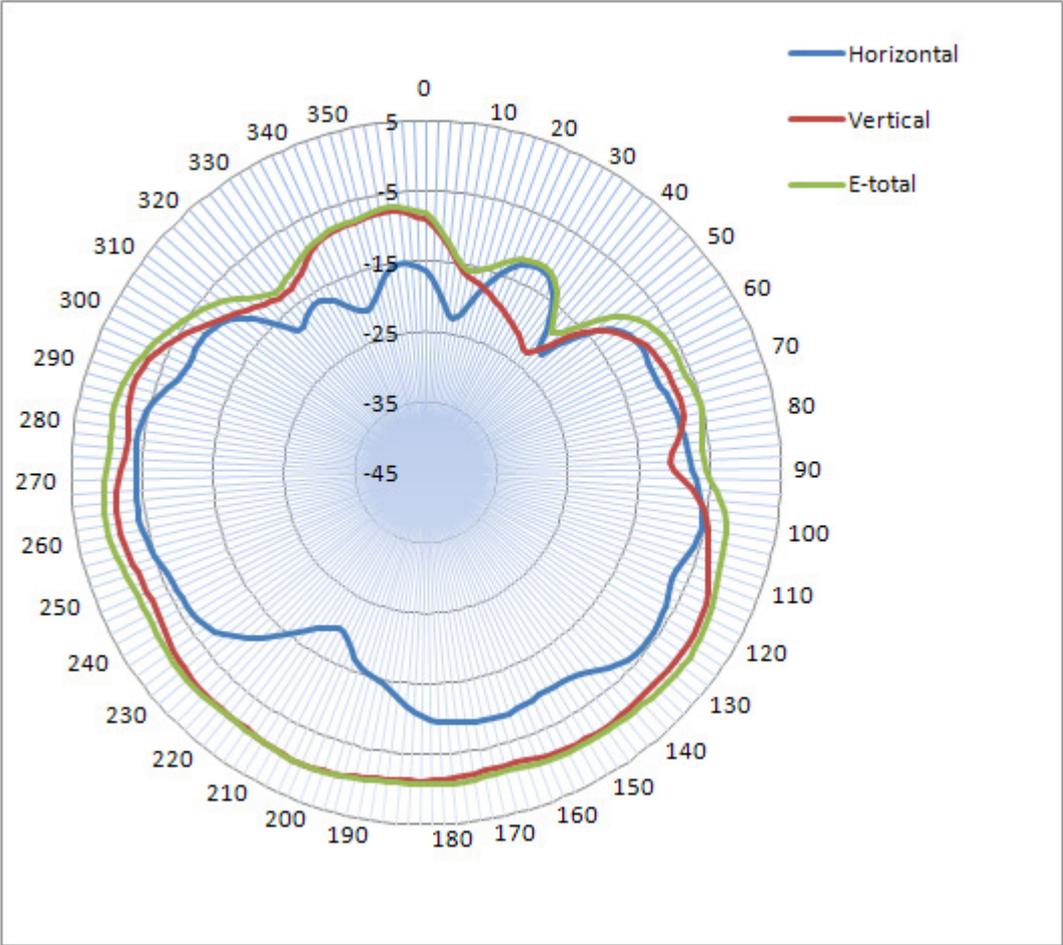
Center Frequency	<b>5470MHz</b>
Horizontal (dBi) peak	<b>-3.79</b>
Vertical (dBi) peak	<b>0.56</b>

Tx1 antenna: 5600 MHz



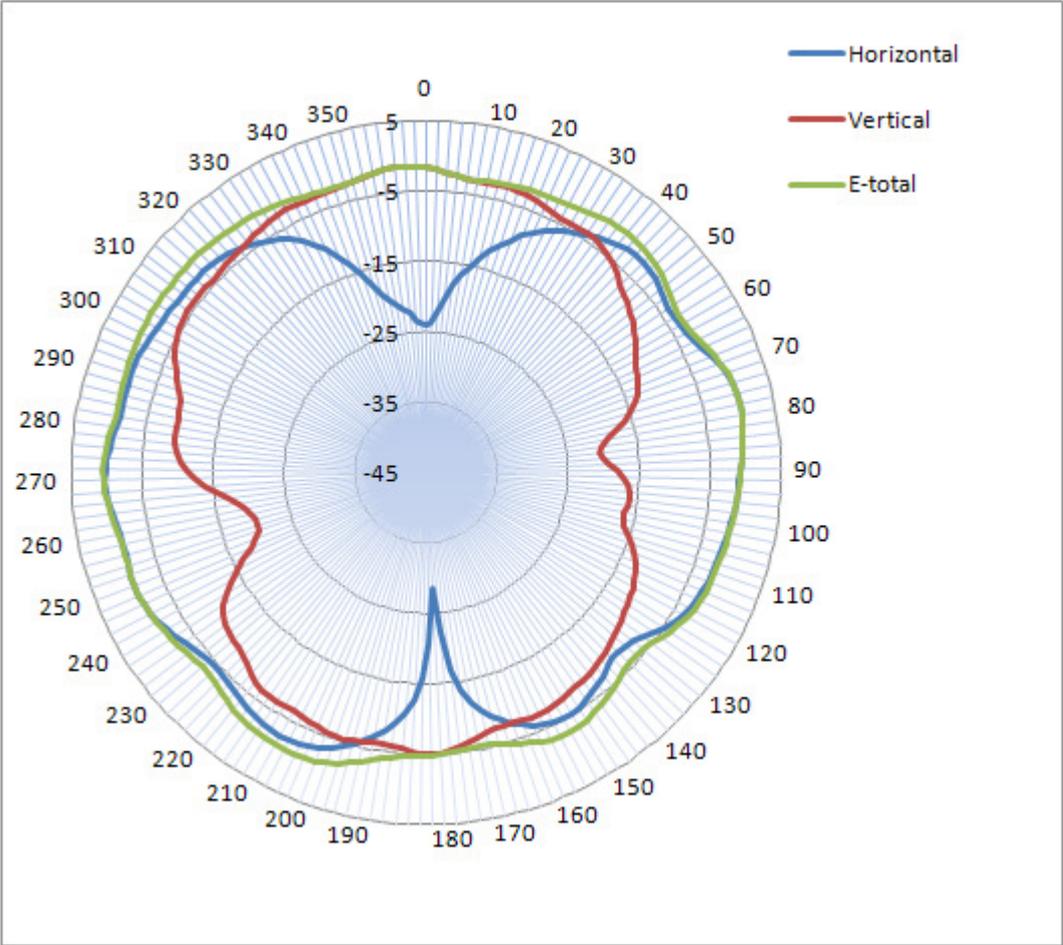
Center Frequency	<b>5600MHz</b>
Horizontal (dBi) peak	<b>-3.85</b>
Vertical (dBi) peak	<b>-0.55</b>

Tx1 antenna: 5725 MHz



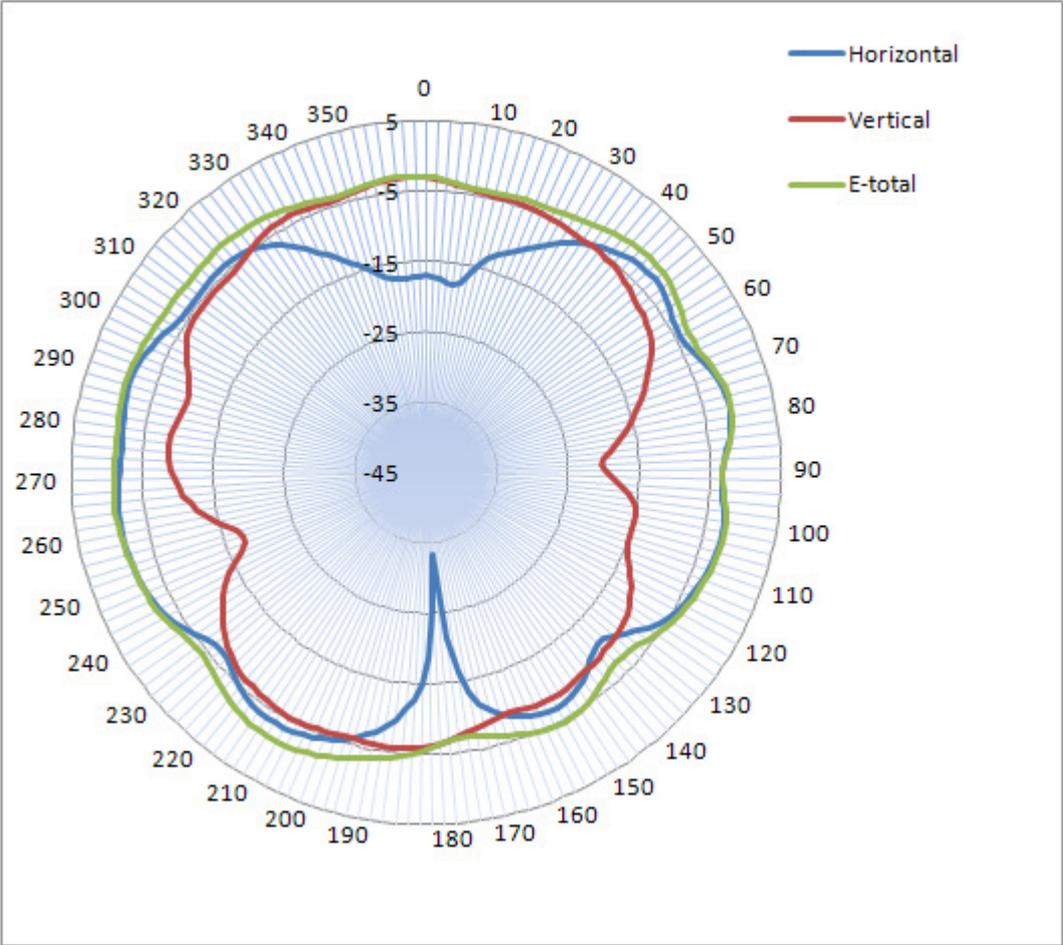
Center Frequency	<b>5725MHz</b>
Horizontal (dBi) peak	<b>-4.05</b>
Vertical (dBi) peak	<b>-0.11</b>

Tx2 antenna: 5470 MHz



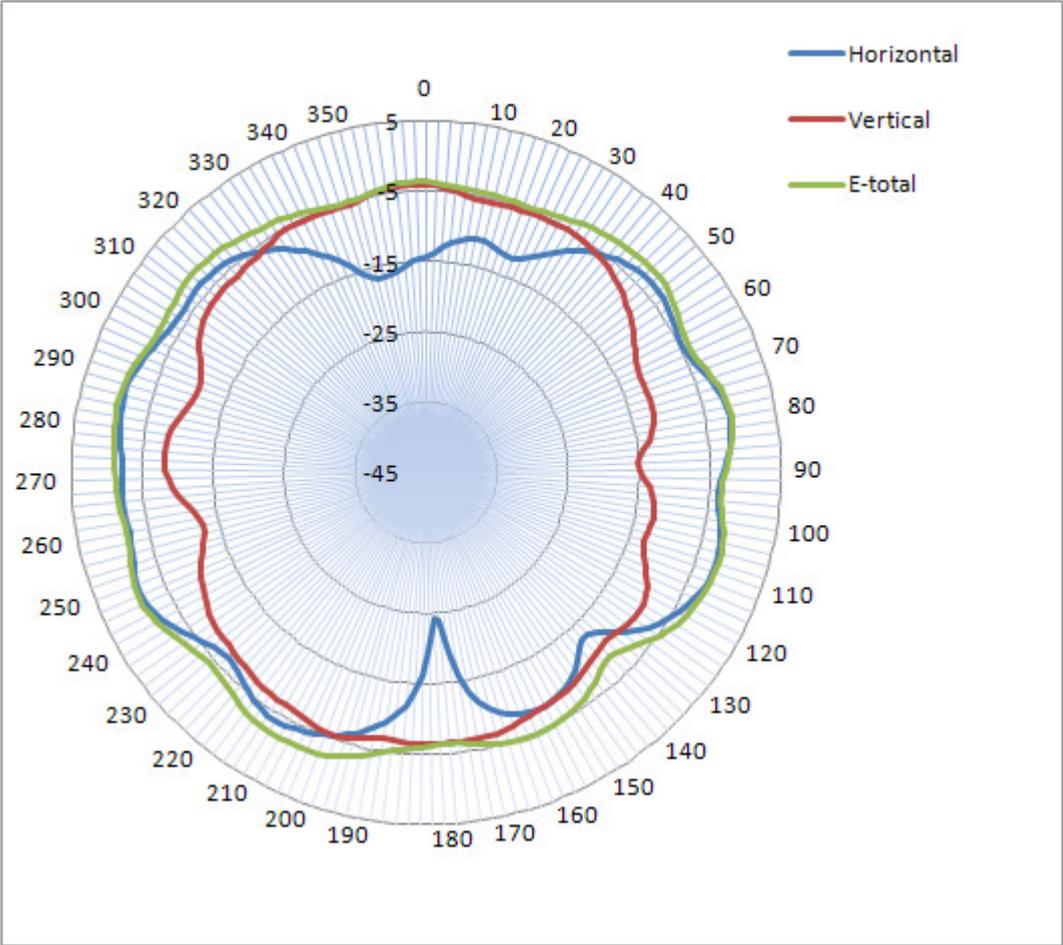
Center Frequency	<b>5470MHz</b>
Horizontal (dBi) peak	<b>0.27</b>
Vertical (dBi) peak	<b>-1.46</b>

Tx2 antenna: 5600 MHz



Center Frequency	<b>5600MHz</b>
Horizontal (dBi) peak	<b>-1.19</b>
Vertical (dBi) peak	<b>-3.0</b>

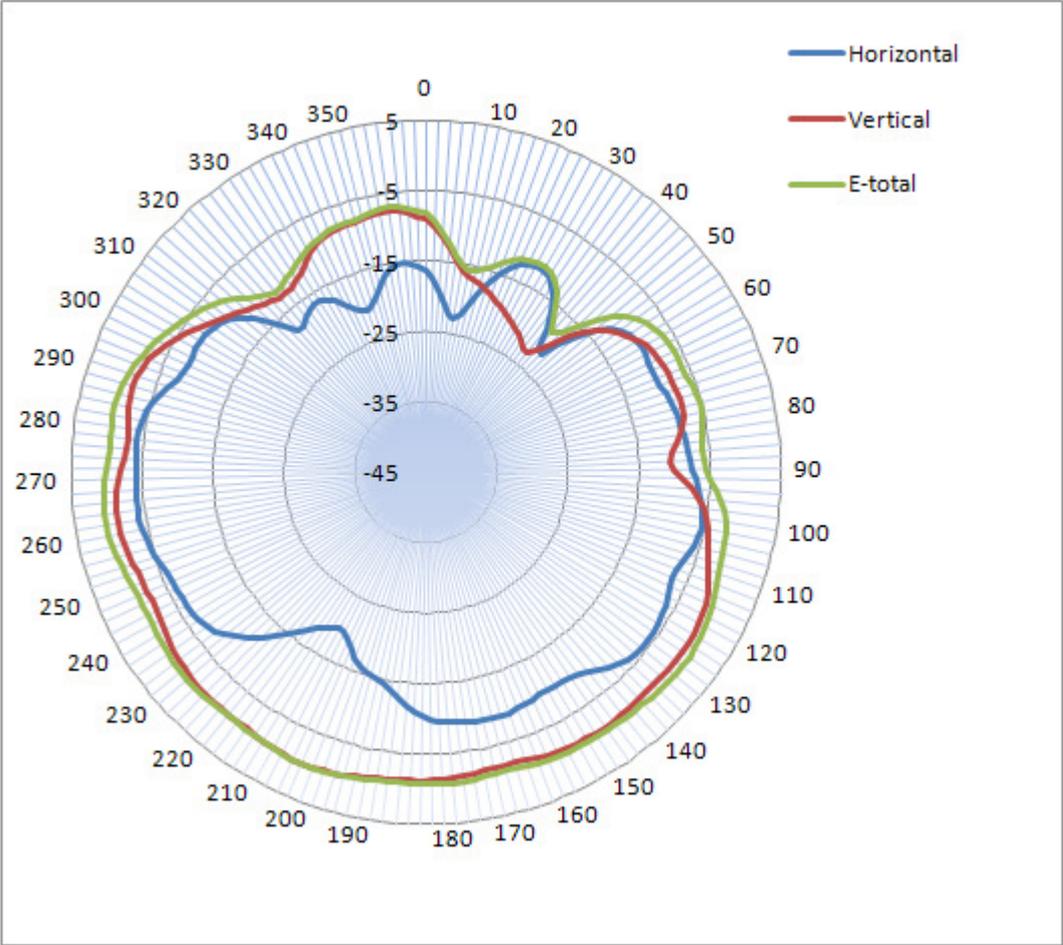
Tx2 antenna: 5725 MHz



Center Frequency	<b>5725MHz</b>
Horizontal (dBi) peak	<b>-1.04</b>
Vertical (dBi) peak	<b>-4.03</b>

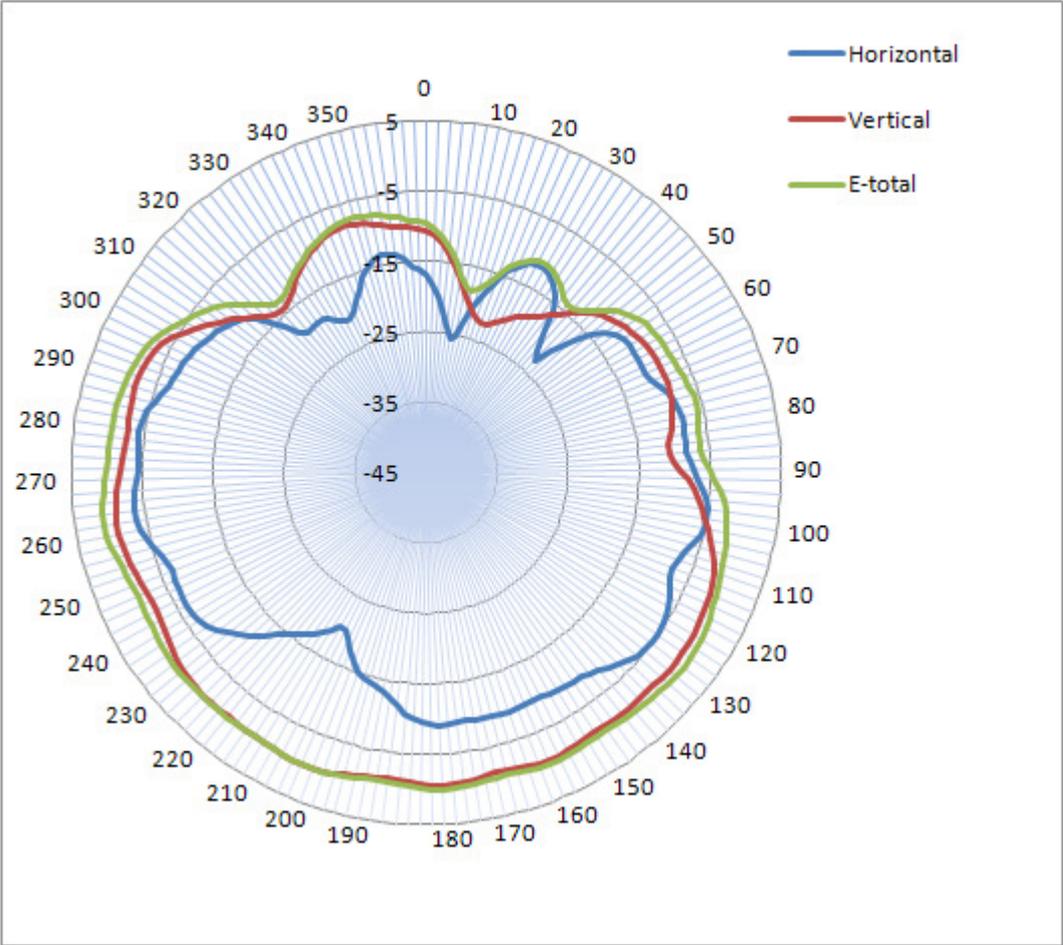
5725-5850 MHz radiation characteristic

Tx1 antenna: 5725 MHz



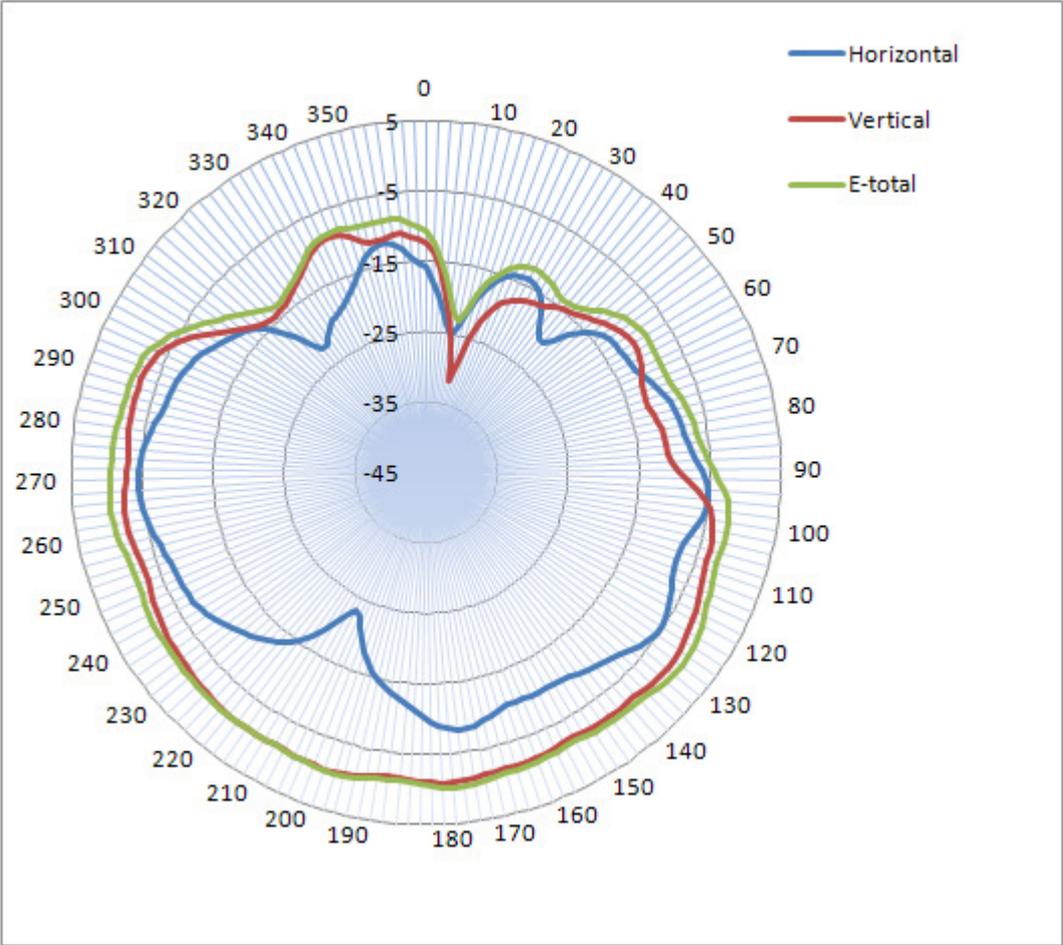
Center Frequency	<b>5725MHz</b>
Horizontal (dBi) peak	<b>-4.05</b>
Vertical (dBi) peak	<b>-0.11</b>

Tx1 antenna: 5785 MHz



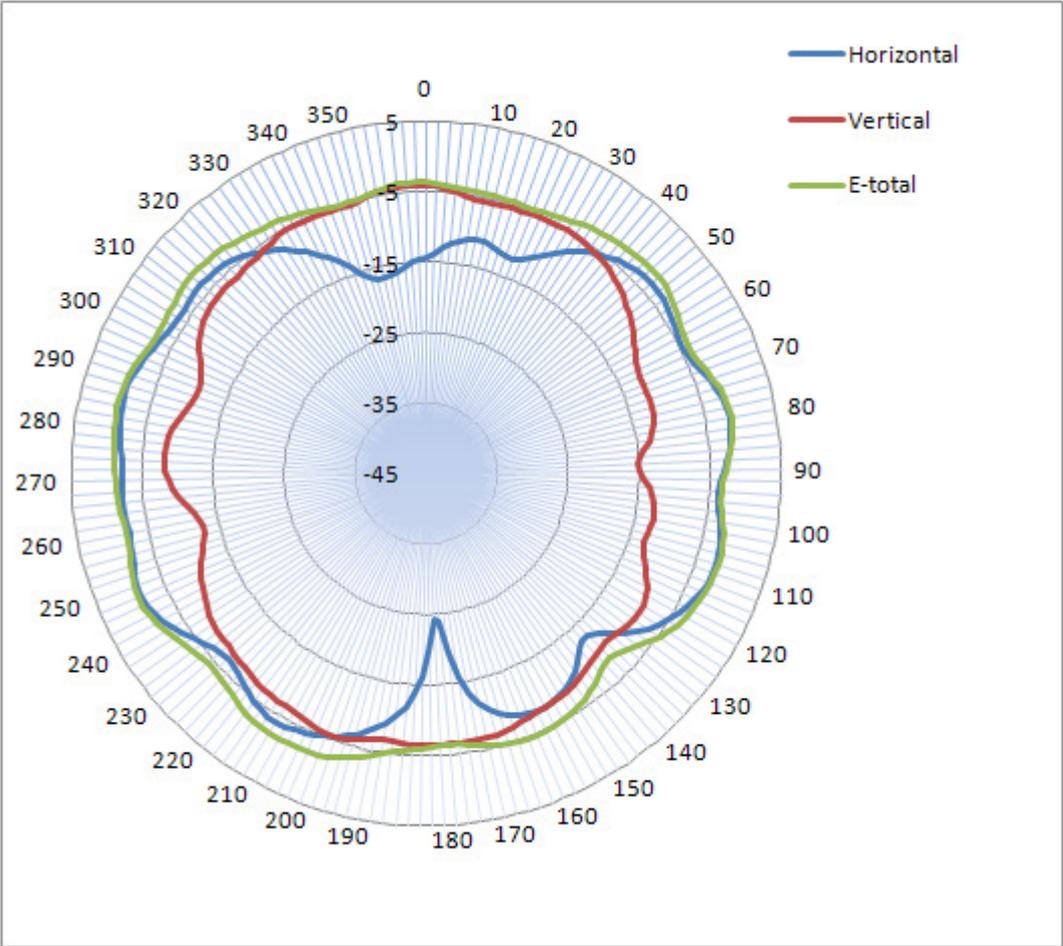
Center Frequency	<b>5785MHz</b>
Horizontal (dBi) peak	<b>-3.55</b>
Vertical (dBi) peak	<b>-0.04</b>

Tx1 antenna: 5850 MHz



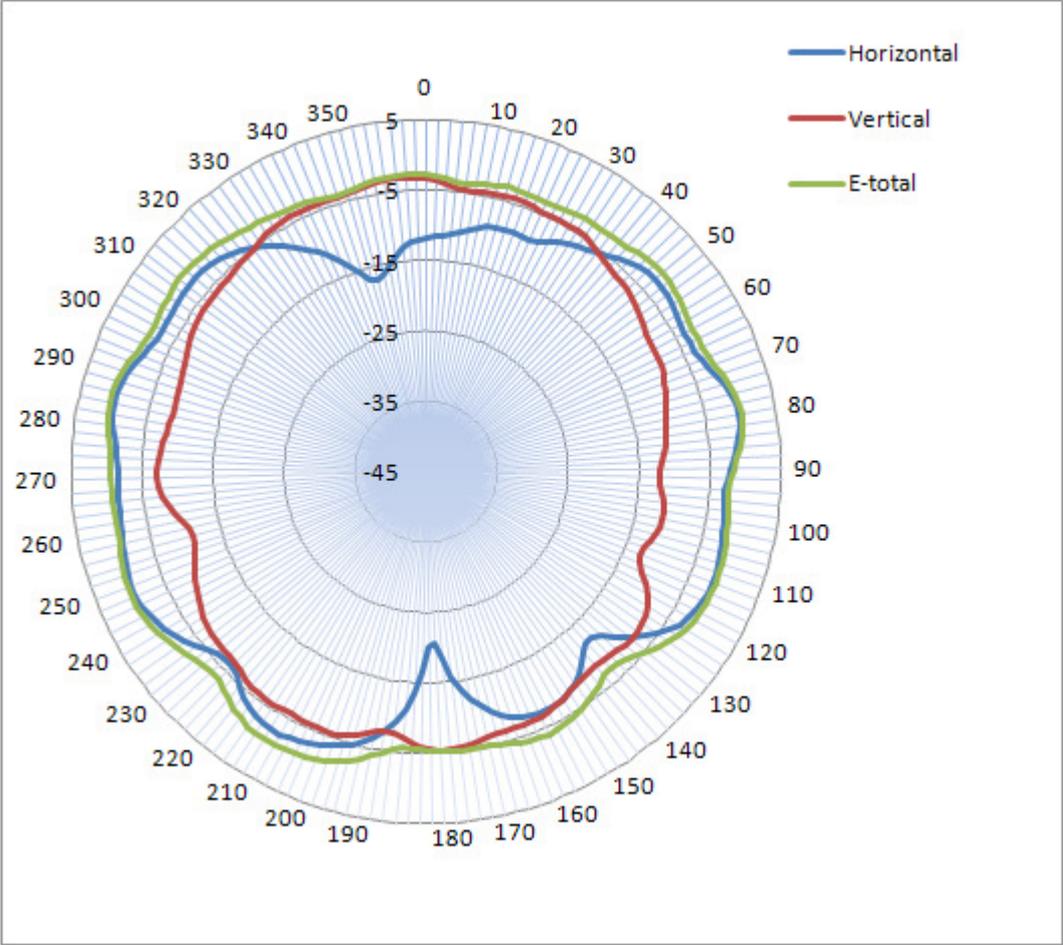
Center Frequency	<b>5850MHz</b>
Horizontal (dBi) peak	<b>-4.53</b>
Vertical (dBi) peak	<b>-0.48</b>

Tx2 antenna: 5725 MHz



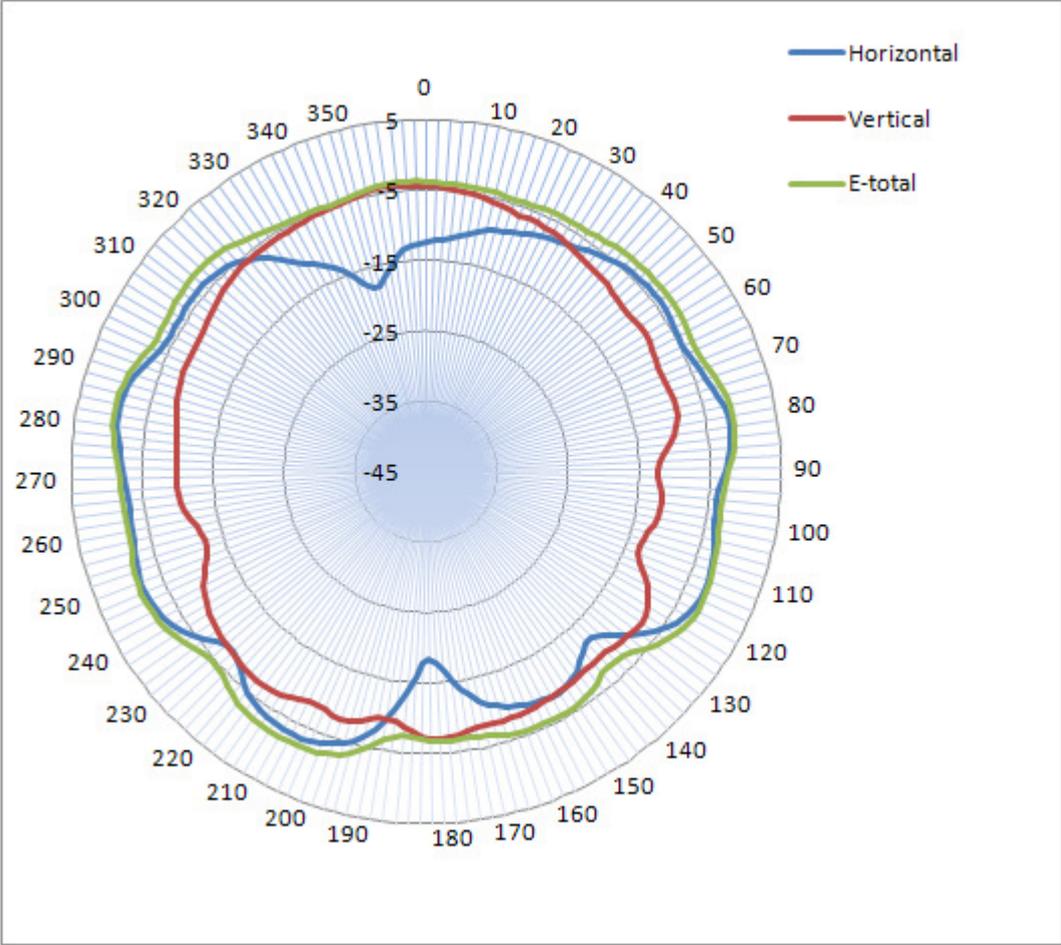
Center Frequency	<b>5725MHz</b>
Horizontal (dBi) peak	<b>-1.04</b>
Vertical (dBi) peak	<b>-4.03</b>

Tx2 antenna: 5785 MHz



Center Frequency	<b>5785MHz</b>
Horizontal (dBi) peak	<b>-0.04</b>
Vertical (dBi) peak	<b>-3.11</b>

Tx2 antenna: 5850 MHz

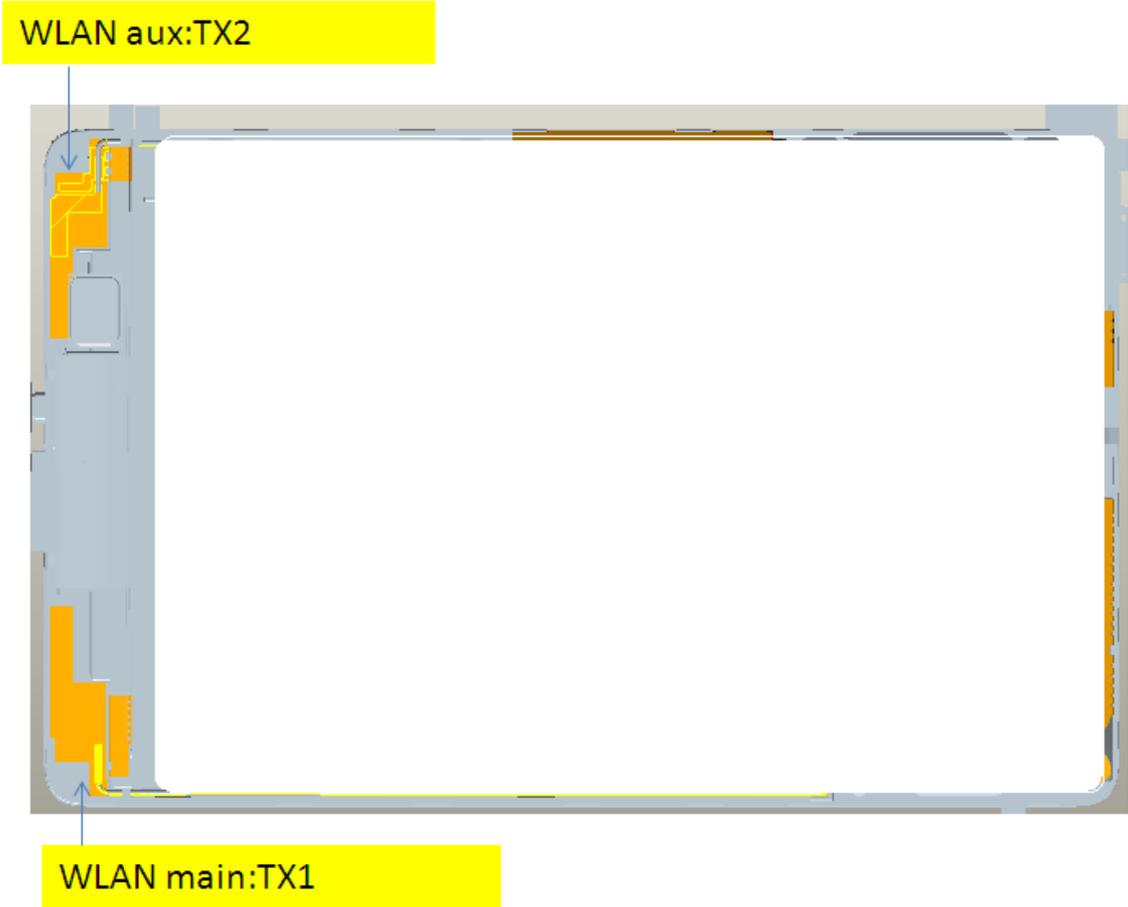


Center Frequency	<b>5850MHz</b>
Horizontal (dBi) peak	<b>-0.82</b>
Vertical (dBi) peak	<b>-4.12</b>

**Section 4. Host Platform Information**

OEM / ODM Host platform: platform correlated to antenna data

**Rating Label Photo:**



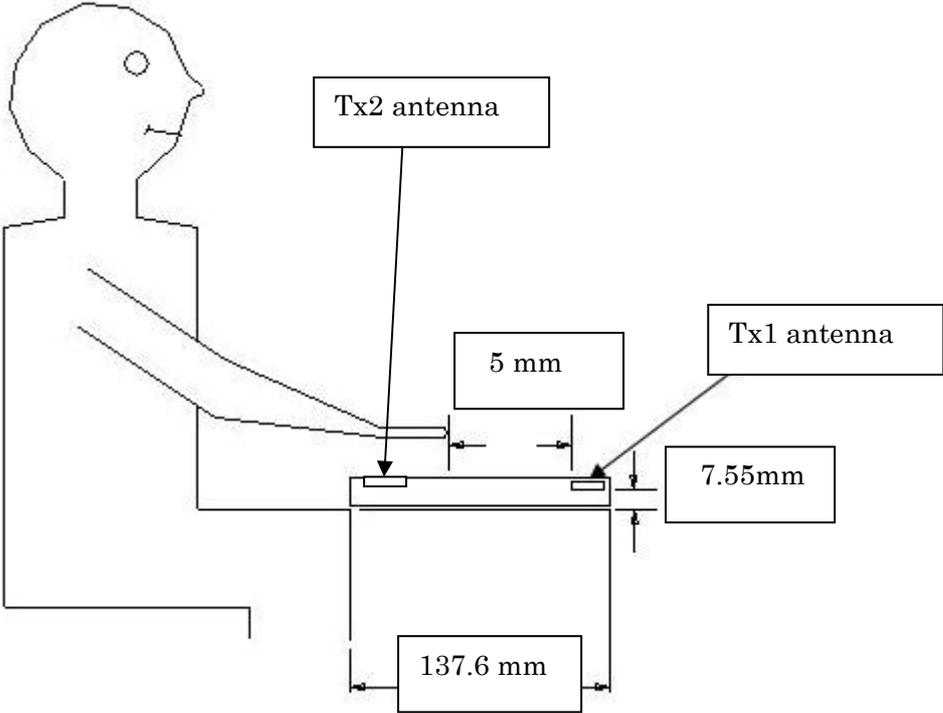
**Section 5. Antenna Host Platform Location Information**

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

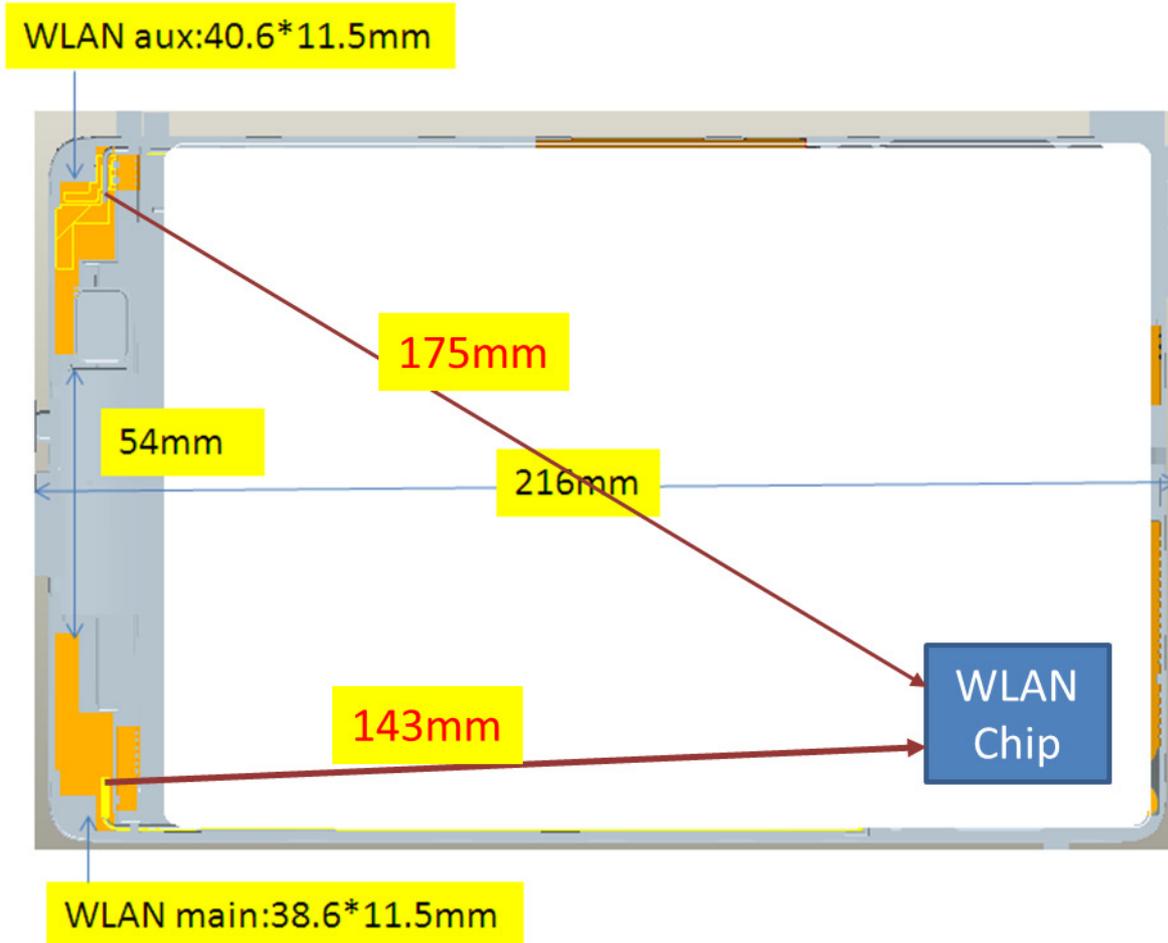
Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between the transmit antennas and the user (excluding hands, wrist, feet, and ankle)



## 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						
Azerbaijan						
Cambodia						
Canada						
Croatia						
Indonesia						
Israel						
Malaysia						
Moldova						
Philippines						
Singapore						Telecommunication Equipment Dealer License Required
South Africa						
Taiwan						
USA						
Vietnam						