

Regulatory WLAN Antenna Information

<u>Platform</u>	Notebook
<u>Platform Owner</u>	LC Future Center
<u>Brand Name</u>	Lenovo
<u>Model Name</u>	Lenovo ideapad Y700-15ACZ Lenovo ideapad Y700 Touch-15ISK Lenovo ideapad Y700-15ISK
<u>ODM</u>	LC Future Center
<u>Target Launch Date</u>	2015Q3
<u>Antenna</u>	
<u>Manufacturer</u>	Speed Wireless Technical Co., LTD.
<u>Part Number</u>	■ Tx/ Rx1 Antenna :DC33001DU00
	■ Tx/ Rx2 Antenna :DC33001DU10
<u>Module</u>	
<u>With WLAN Module</u>	■ Cbt BCM43162 1x1AC+BT4.0 PCIE M.2 WLAN V2
	■ Cbt RTL8821AE 1x1AC+BT4.0 PCIE M.2 WLAN
	■ Ltn NFA435 1x1AC+BT4.0 PCIE M.2 WLAN
	■ Ltn BCM4350 2x2AC+BT4.0 PCIE M.2 WLAN
	■ Fxn BCM4350 2x2AC+BT4.0 PCIE M.2 WLAN
	■ Cbt BCM4352 2x2AC+BT4.0 PCIE M.2 WLAN
	■ Intel 3165 1x1AC+BT PCIE M.2 WLAN QS
	■ Intel 8260 2x2AC+BT PCIE M.2 WLAN NV ES

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>). <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

Antenna Information

Section 1. Antenna Assembly Specifications

1A	1B	1C	1D	1E	1F	1G	1H
Antenna Part Number	Manufacturer	Antenna Type	Cable Assembly Part Number and Information	*Peak Gain W/ Cable loss (dBi)	Peak Gain w/o Cable Loss (dBi)	VSWR	Cable Loss (dBi)
(DC33001DU00) TX1 Main Antenna Black	Speed Wireless Technical Co., LTD.	PIFA Type Antenna	(Cable: ShenYu (M-Z4-SD-0113-102-KA) 50 ohm Coaxial length:125mm diameter: 1.13mm Connector:C87P115 (M-Z1-GC-0113-042-0A) or equivalent	2400-2500MHz <u>1.75</u> dBi(peak)	2400-2500MHz <u>2.19</u> dBi (peak)	2400-2500MHz 2 max	2400-2500MHz <u>0.44</u> dBi (peak)
				5150-5350MHz <u>-0.10</u> dBi (peak)	5150-5350MHz <u>0.60</u> dBi (peak)	5150-5350MHz 2 max	5150-5350MHz <u>0.70</u> dBi (peak)
				5470-5725MHz <u>-0.21</u> dBi (peak)	5470-5725MHz <u>0.52</u> dBi (peak)	5470-5725MHz 2max	5470-5725MHz <u>0.73</u> dBi (peak)
				5785-5850MHz <u>0.21</u> dBi (peak)	5785-5850MHz <u>0.95</u> dBi (peak)	5785-5850MHz 2 max	5785-5850MHz <u>0.74</u> dBi (peak)
(DC33001DU10) TX2 Aux Antenna Grey	Speed Wireless Technical Co., LTD.	PIFA Type Antenna	(Cable: ShenYu (M-Z4-SD-0113-102-GA) 50 ohm Coaxial length:556mm diameter: 1.13mm Connector:C87P115 (M-Z1-GC-0113-042-0A) or equivalent	2400-2500MHz <u>-1.03</u> dBi (peak)	2400-2500MHz <u>0.60</u> dBi (peak)	2400-2500MHz 2 max	2400-2500MHz <u>1.63</u> dBi (peak)
				5150-5350MHz <u>0.52</u> dBi (peak)	5150-5350MHz <u>2.95</u> dBi (peak)	5150-5350MHz 2 max	5150-5350MHz <u>2.43</u> dBi (peak)
				5470-5725MHz <u>0.86</u> dBi (peak)	5470-5725MHz <u>3.40</u> dBi (peak)	5470-5725MHz 2 max	5470-5725MHz <u>2.54</u> dBi (peak)
				5785-5850MHz <u>-0.66</u> dBi (peak)	5785-5850MHz <u>1.92</u> dBi (peak)	5785-5850MHz 2 max	5785-5850MHz <u>2.58</u> dBi (peak)

- Antenna Peak Gain required being test in system basis.
- 1E frame contend absolutely peak antenna gain include H/V

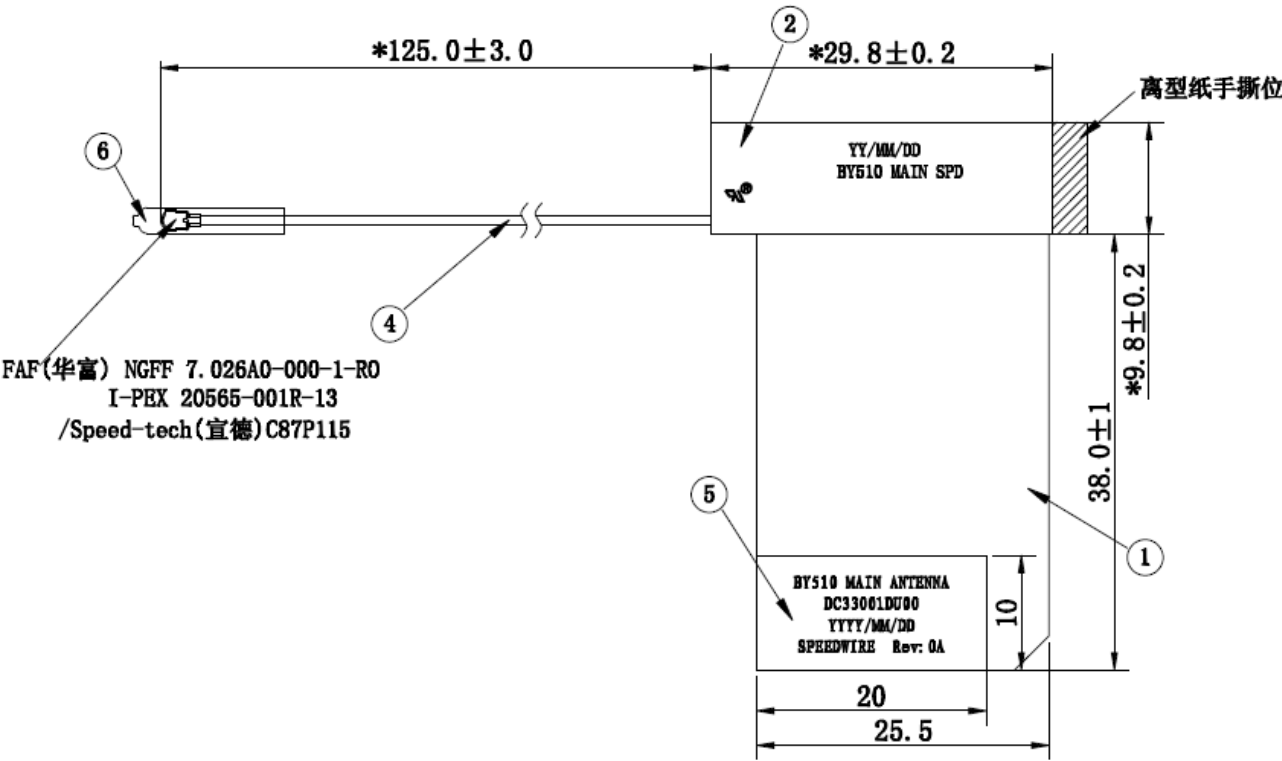
Antenna Peak Gain Table:

	Main antenna		Aux Antenna	
Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
2400	0.64	1.12	-4.50	-1.03
2450	0.53	1.60	-2.47	-1.25
2500	0.71	1.75	-1.34	-2.60
5150	-1.76	-1.46	-0.09	0.38
5250	-0.97	-0.33	-0.07	0.52
5350	-0.10	-1.63	-0.21	0.34
5470	-0.79	-1.03	-0.30	-0.39
5600	-1.39	-0.21	-0.11	0.86
5725	-1.73	-0.26	-0.70	-0.54
5785	-2.26	0.21	-1.40	-0.66
5850	-2.15	-0.24	-0.92	-0.80

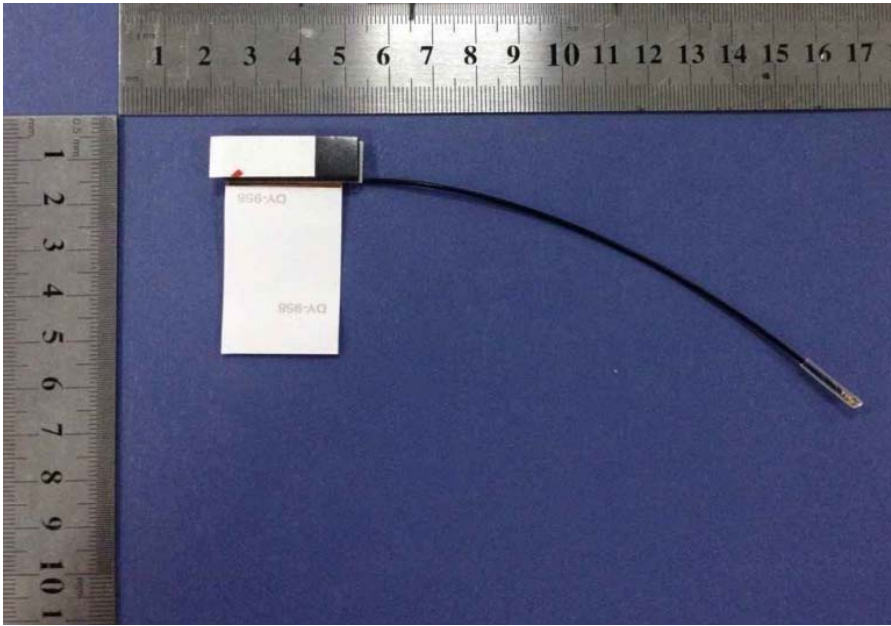
Section 2. Dimensioned Photos or Drawings of Antennas

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

Tx1 Antenna Dimensioned Drawing:

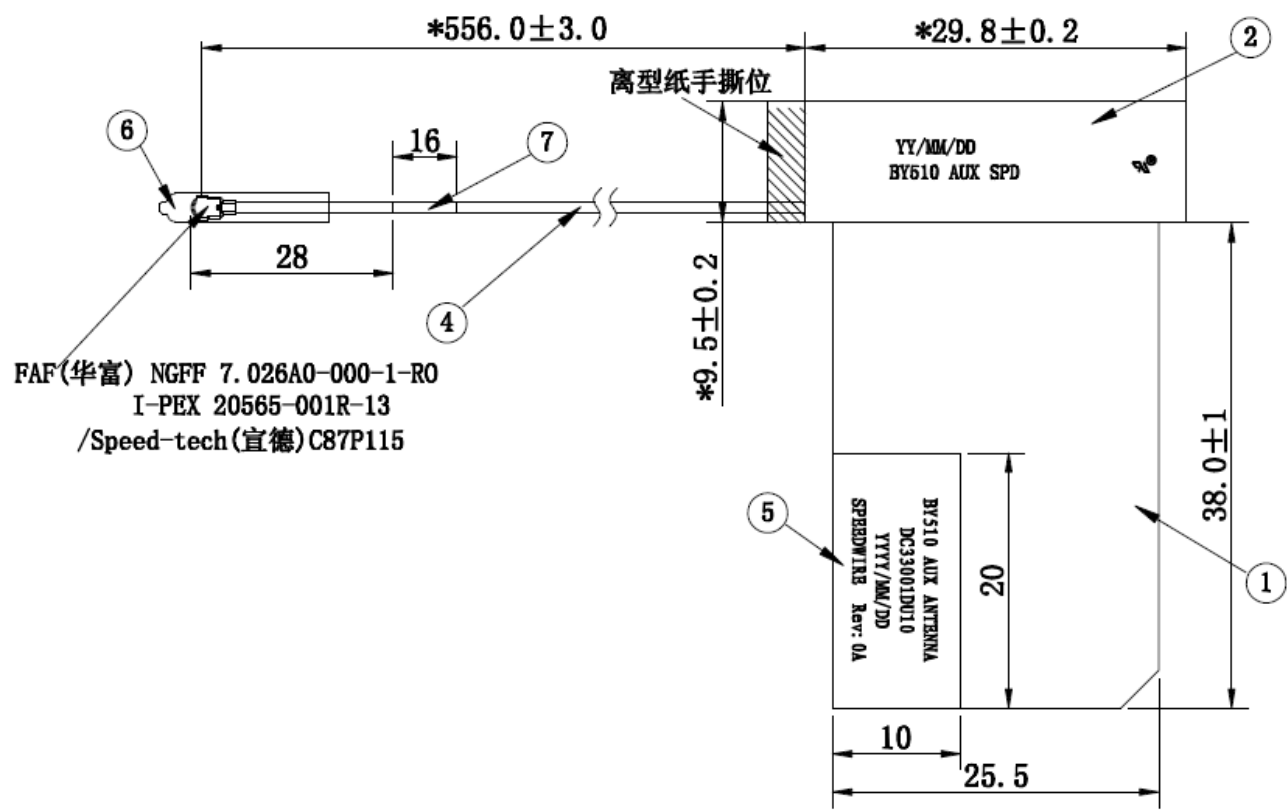


Tx1 Antenna Photo:

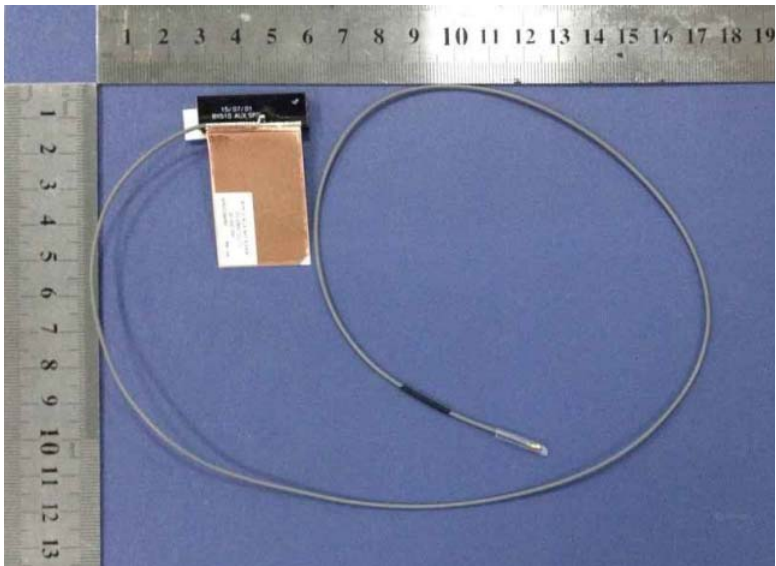


Include a dimensioned photo and dimensioned drawing of Tx2 (or Rx2) antenna here.

Tx2 (or Rx2) Antenna Dimensioned Drawing:



Tx2 (or Rx2) Antenna Photo:



Include front view photo of all 2 antennas here.

Antenna Manufacturer: Speed Wireless Technical Co., LTD.

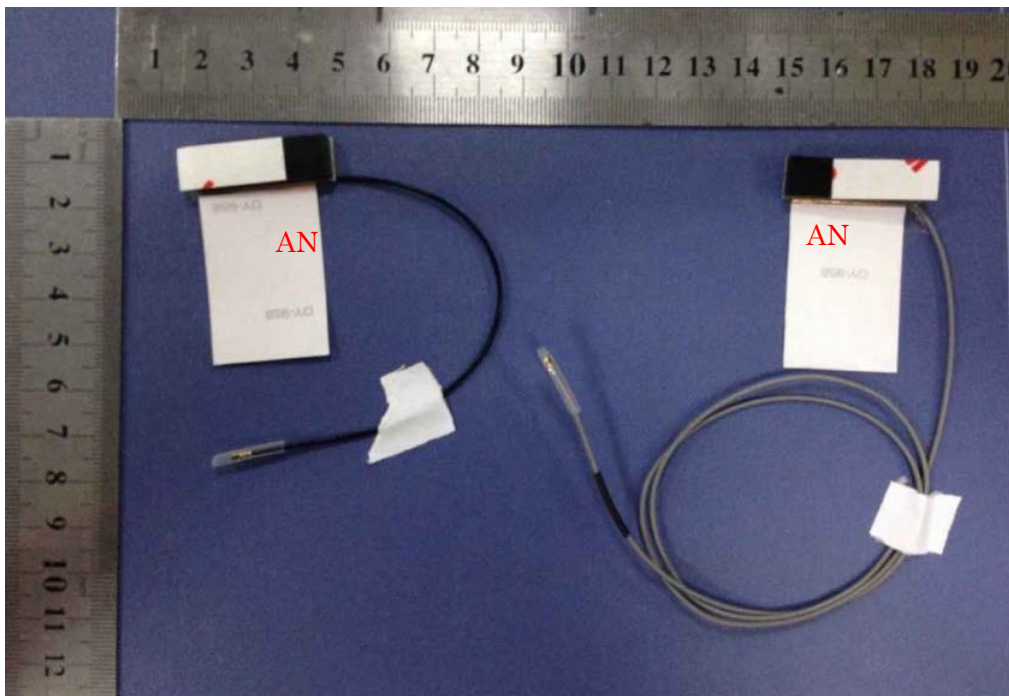
Antenna Part Number: DC33001DU00 (Tx1), DC33001DU10 (Tx2 or Rx2)



Include back view photo of all 2 antennas here.

Antenna Manufacturer: Speed Wireless Technical Co., LTD.

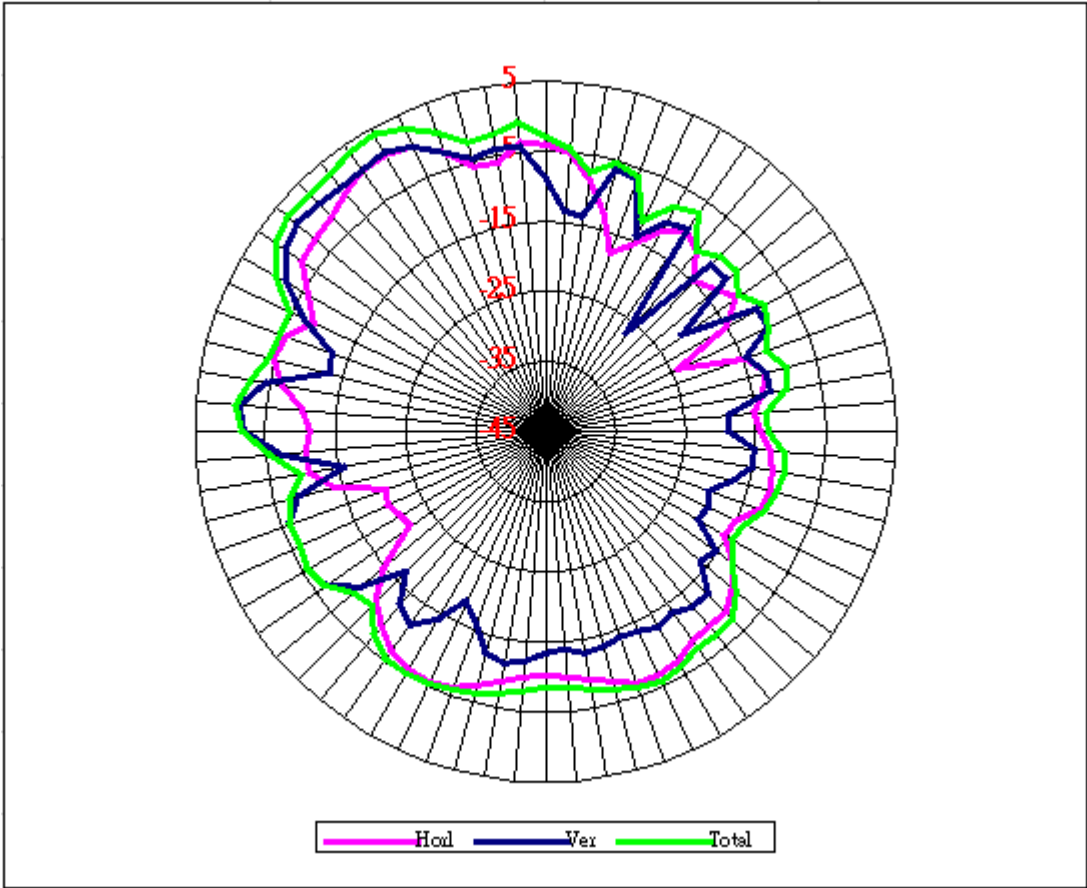
Antenna Part Number: DC33001DU00 (Tx1), DC33001DU10 (Tx2 or Rx2)



Section 3. Radiation characteristics of antennae Loaded in Host Platform

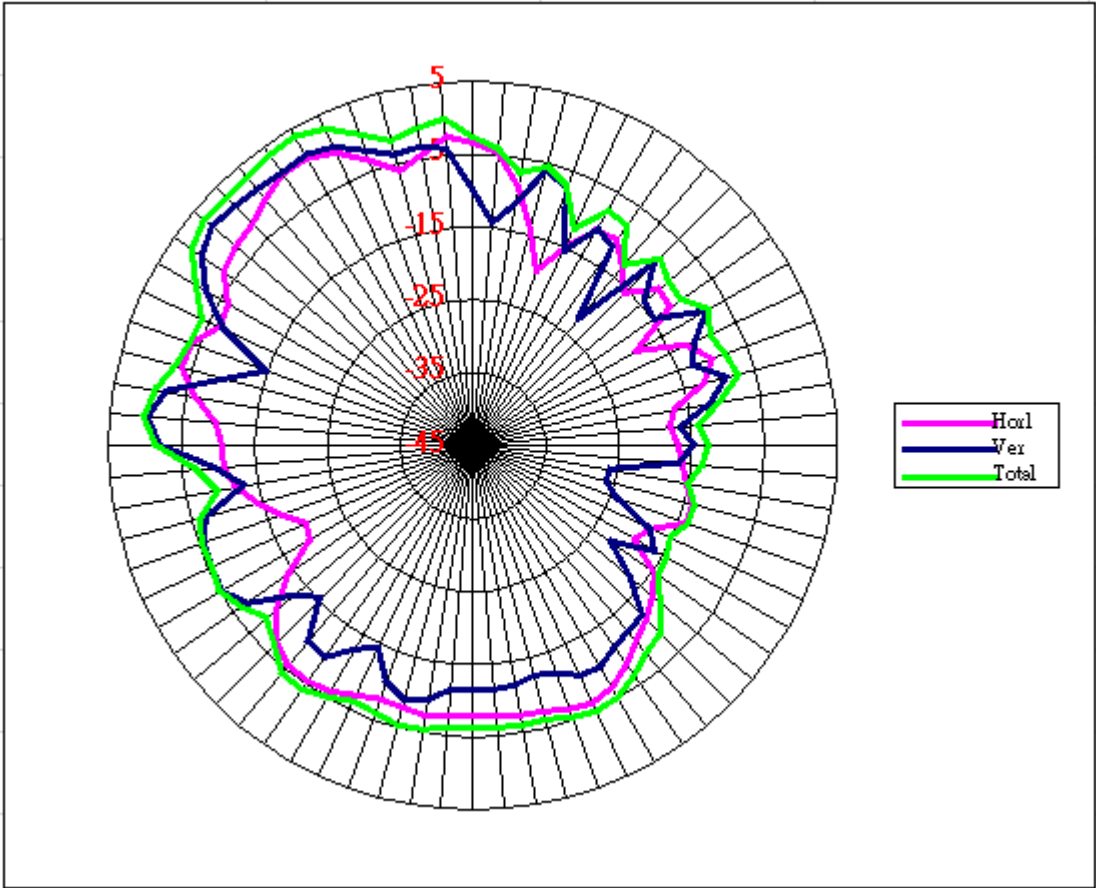
2400-2500MHz radiation characteristic

Tx1 antenna: 2400 MHz



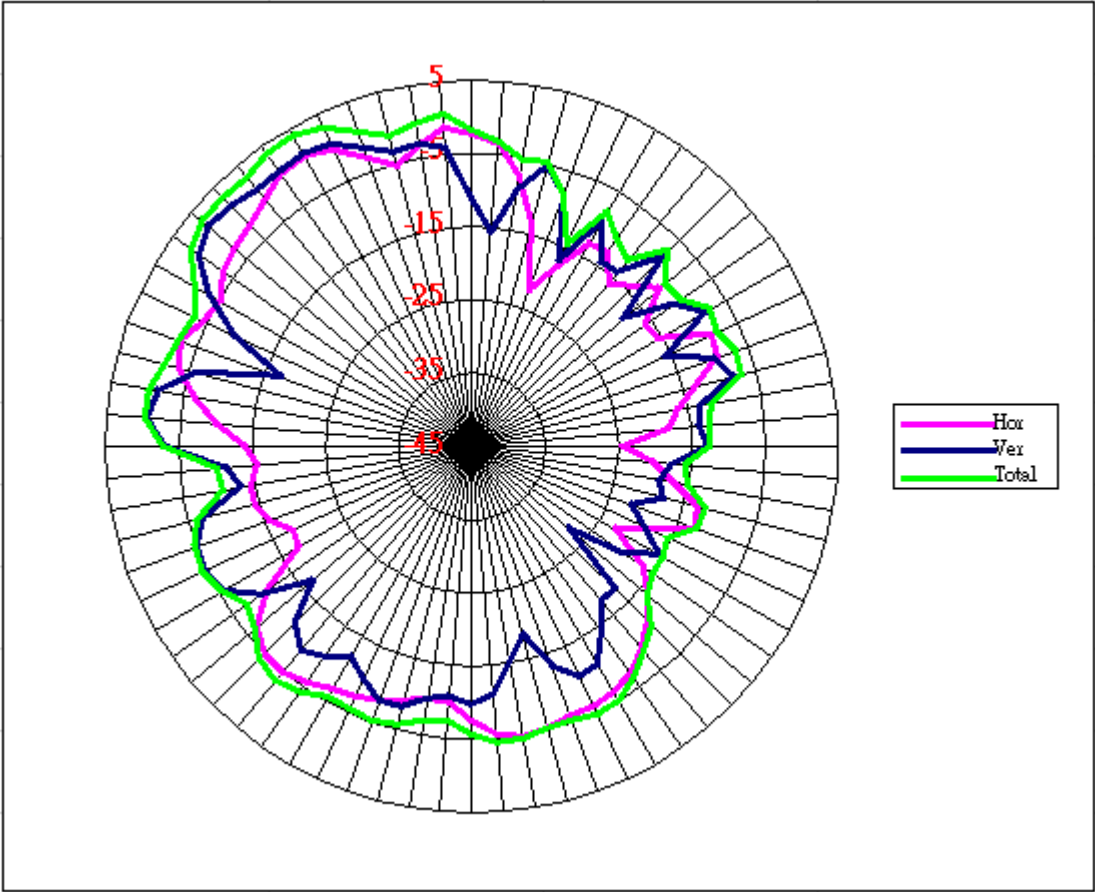
Center Frequency	2400 MHz
Horizontal (dBi) peak	0.64
Vertical (dBi) peak	1.12

Tx1 antenna: 2450 MHz



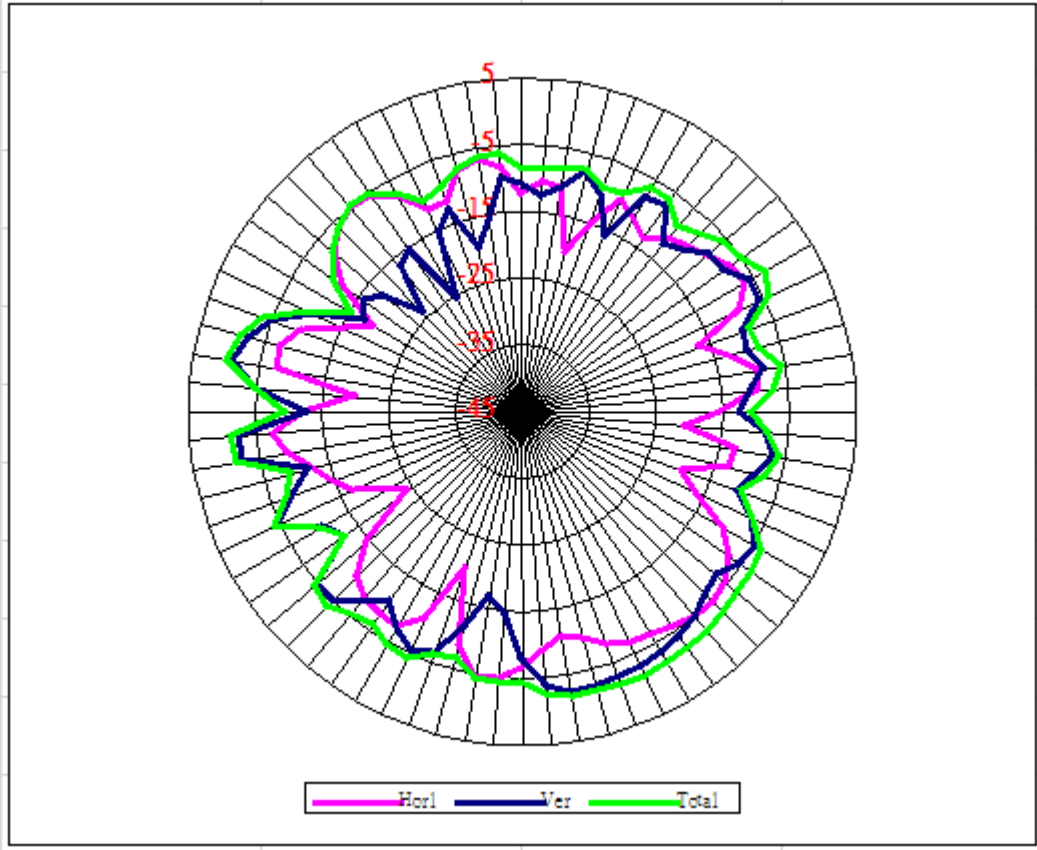
Center Frequency	2450 MHz
Horizontal (dBi) peak	0.53
Vertical (dBi) peak	1.60

Tx1 antenna: 2500 MHz



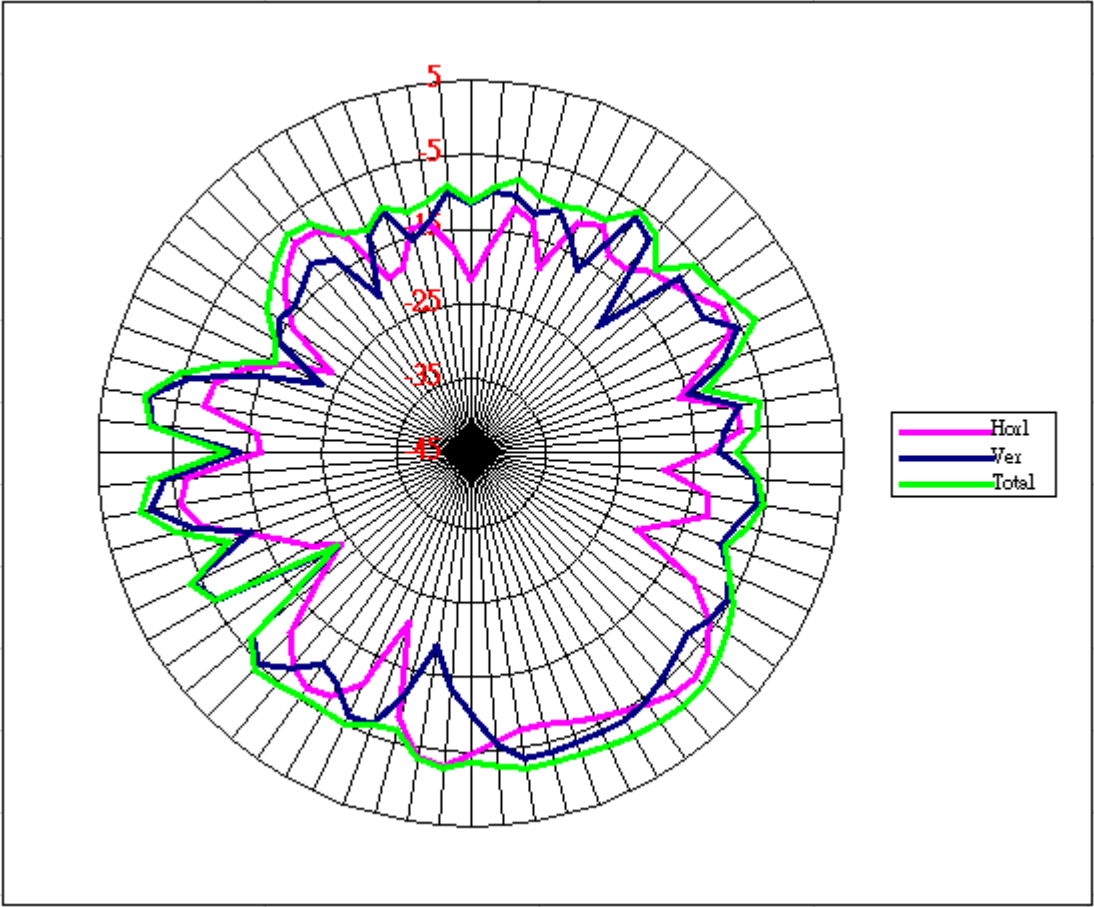
Center Frequency	2500 MHz
Horizontal (dBi) peak	0.71
Vertical (dBi) peak	1.75

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



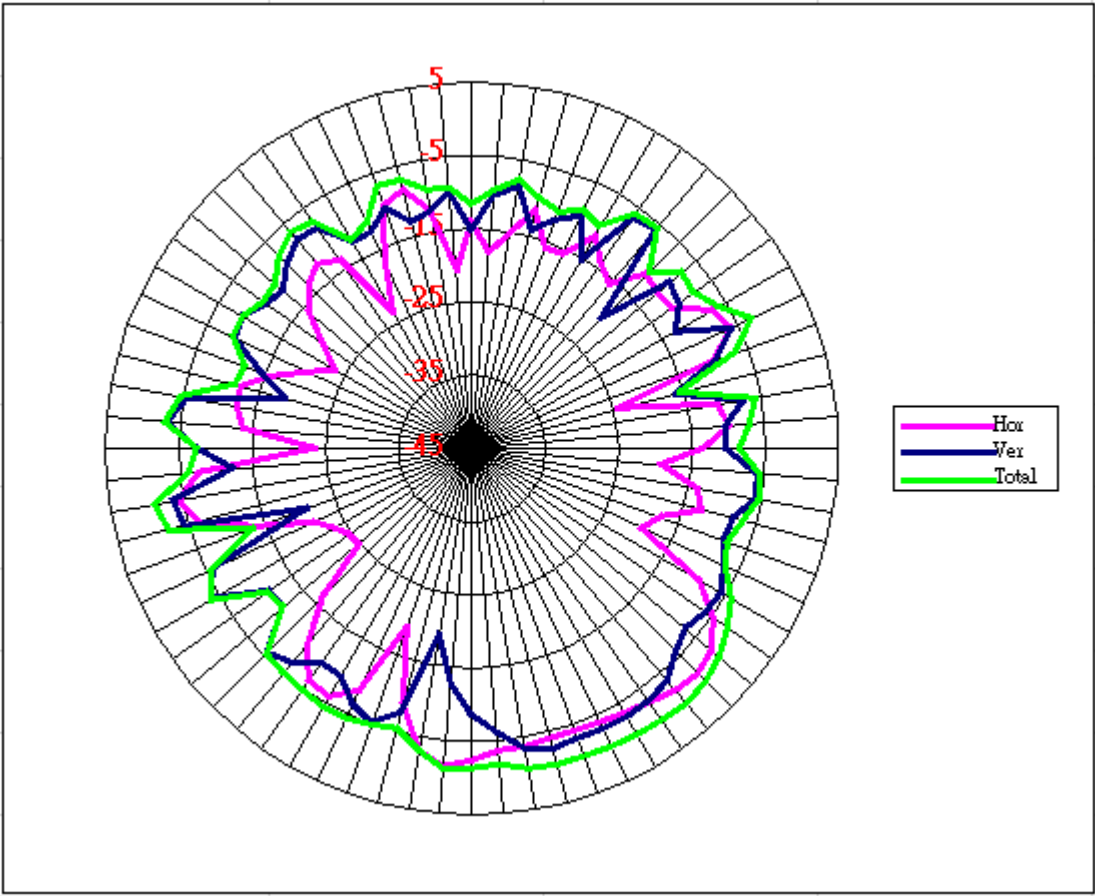
Center Frequency	2400 MHz
Horizontal (dBi) peak	-4.50
Vertical (dBi) peak	-1.03

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



Center Frequency	2450 MHz
Horizontal (dBi) peak	-2.47
Vertical (dBi) peak	-1.25

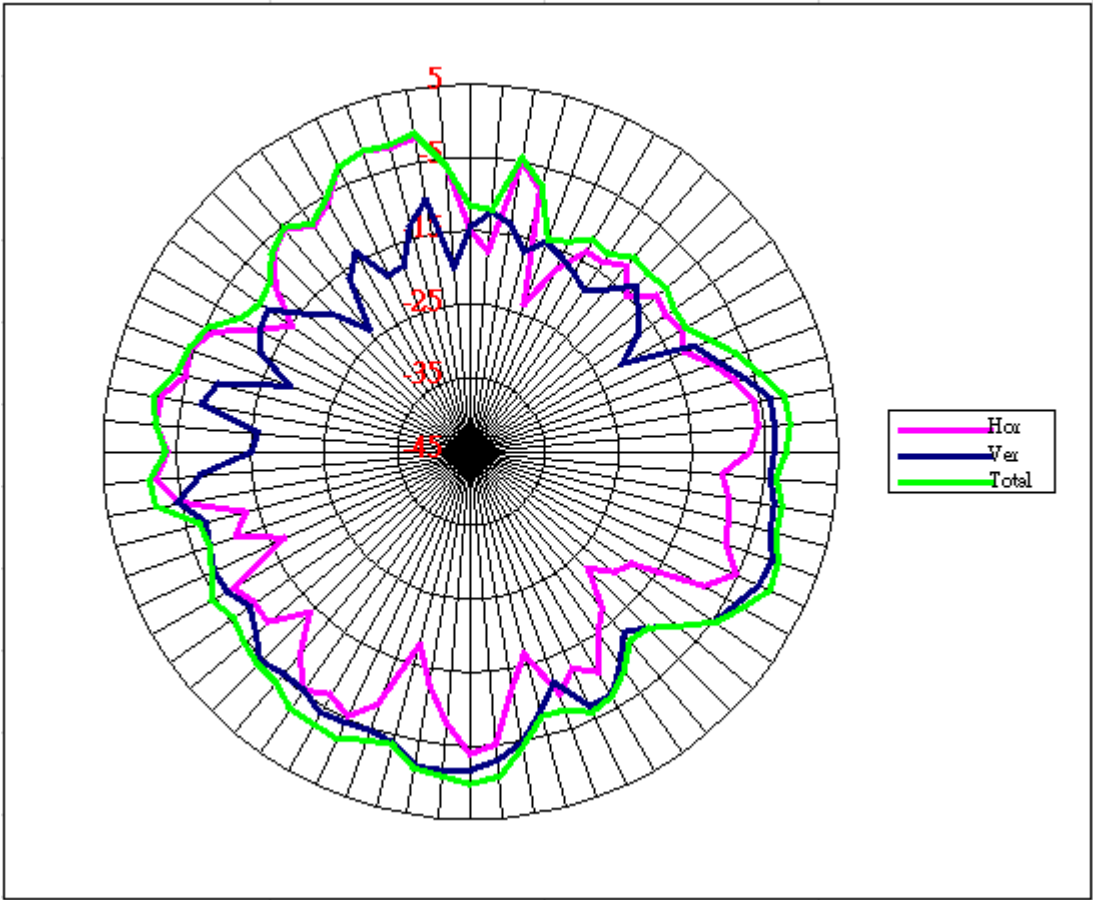
Tx2 (or Rx2) antenna: 2500 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



Center Frequency	2500 MHz
Horizontal (dBi) peak	-1.34
Vertical (dBi) peak	-2.60

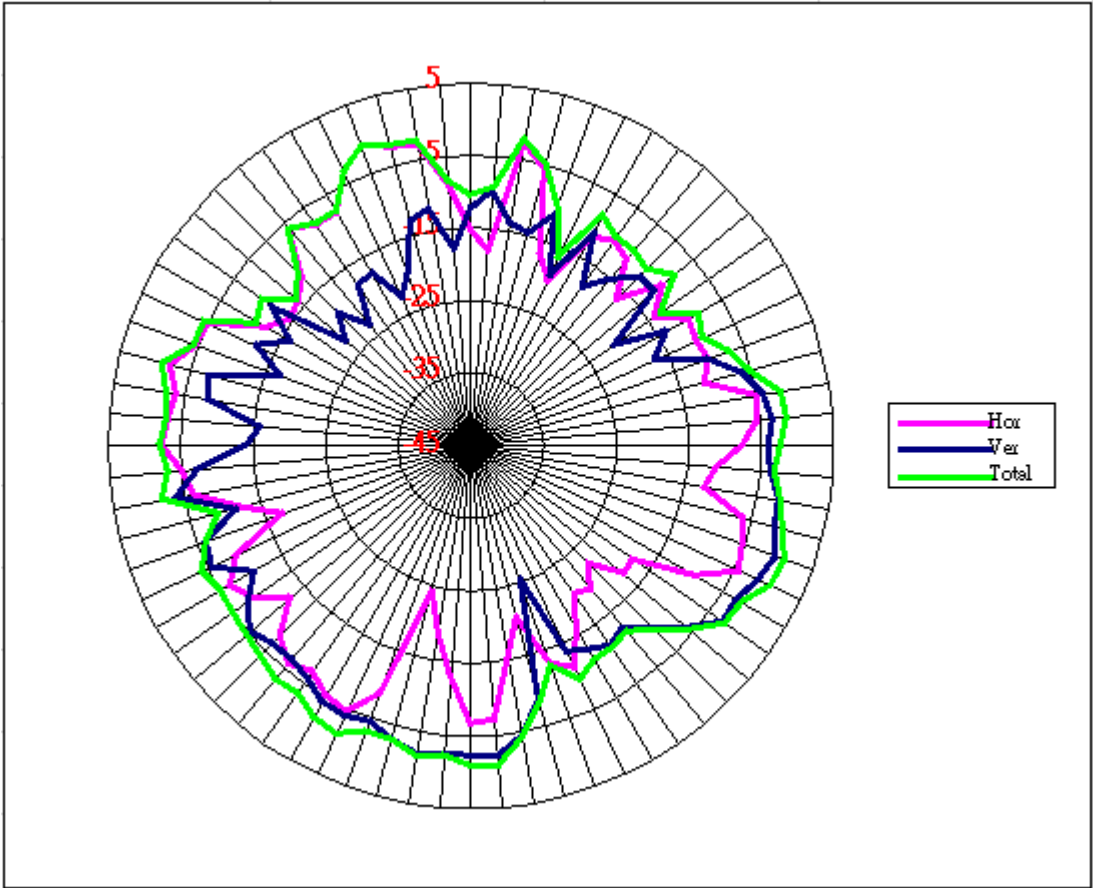
5150-5350 MHz radiation characteristic

Tx1 antenna: 5150 MHz



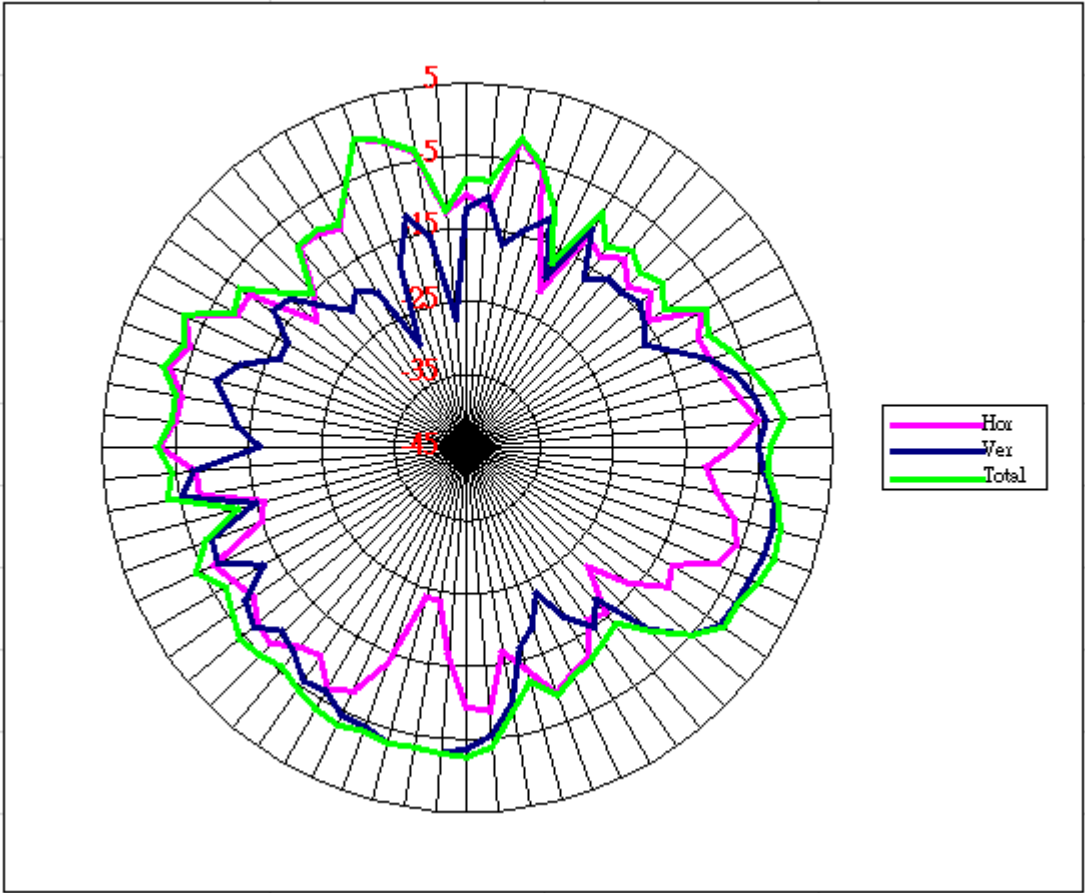
Center Frequency	5150 MHz
Horizontal (dBi) peak	-1.76
Vertical (dBi) peak	-1.46

Tx1 antenna: 5250 MHz



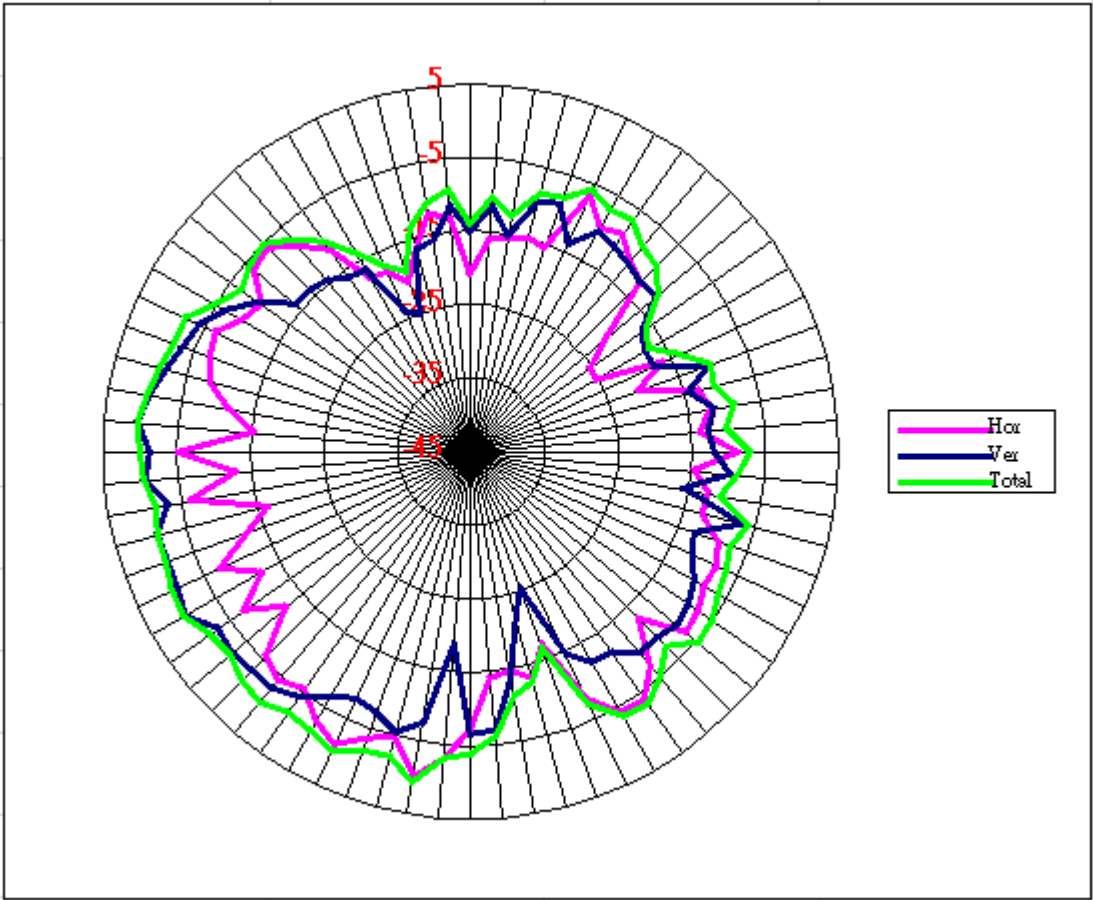
Center Frequency	5250 MHz
Horizontal (dBi) peak	-0.97
Vertical (dBi) peak	-0.33

Tx1 antenna: 5350 MHz



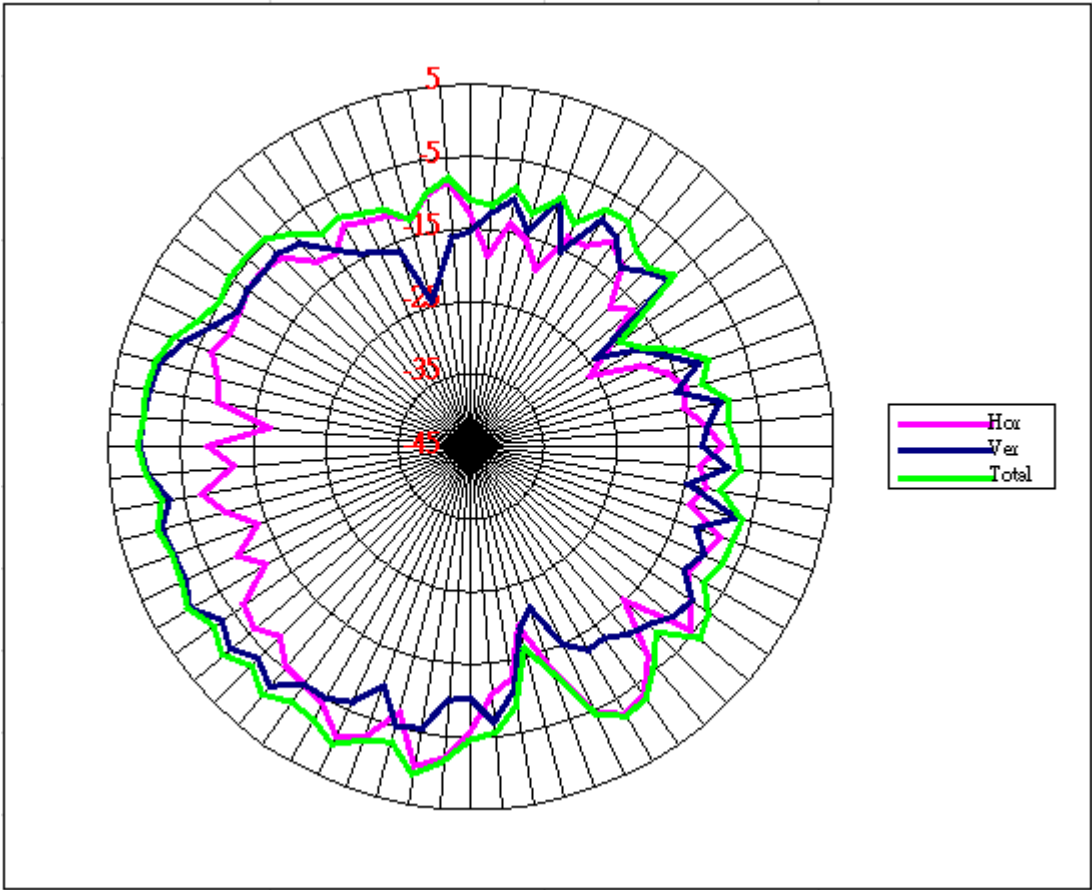
Center Frequency	5350 MHz
Horizontal (dBi) peak	-0.10
Vertical (dBi) peak	-1.63

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



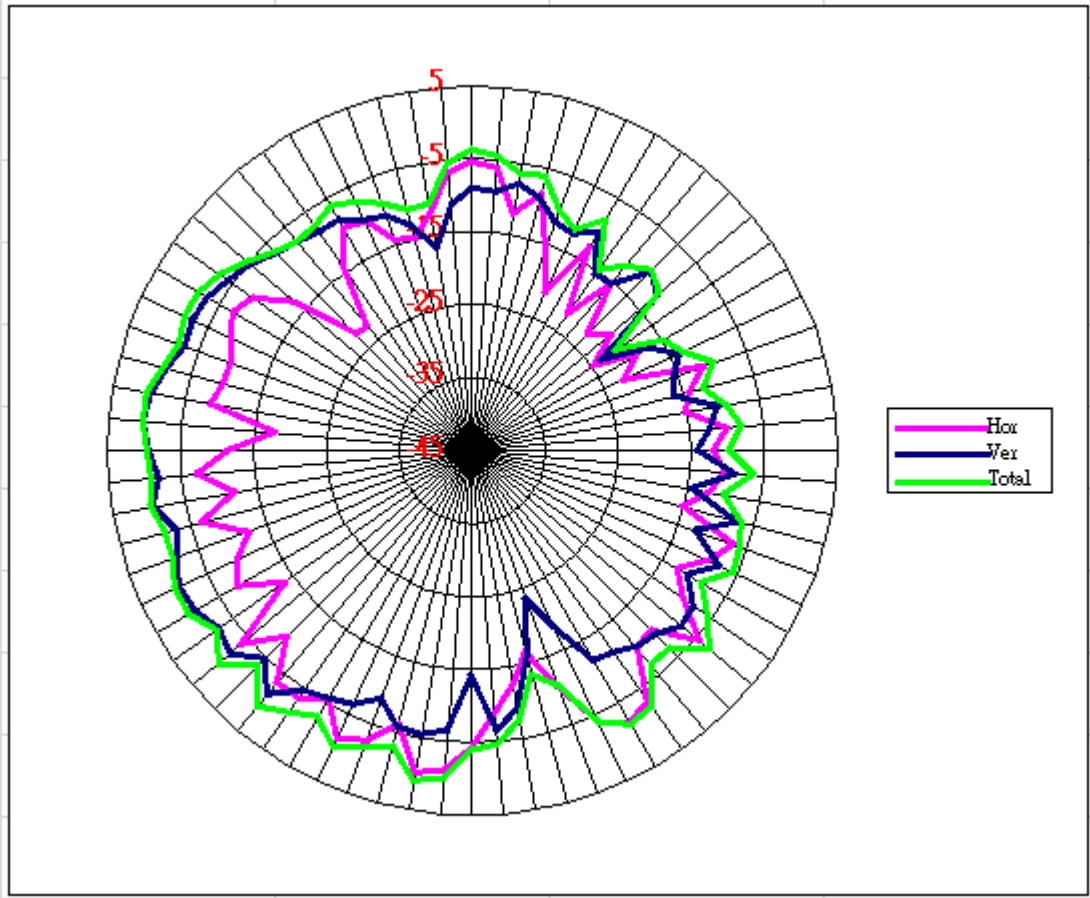
Center Frequency	5150 MHz
Horizontal (dBi) peak	-0.09
Vertical (dBi) peak	0.38

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



Center Frequency	5250 MHz
Horizontal (dBi) peak	-0.07
Vertical (dBi) peak	0.52

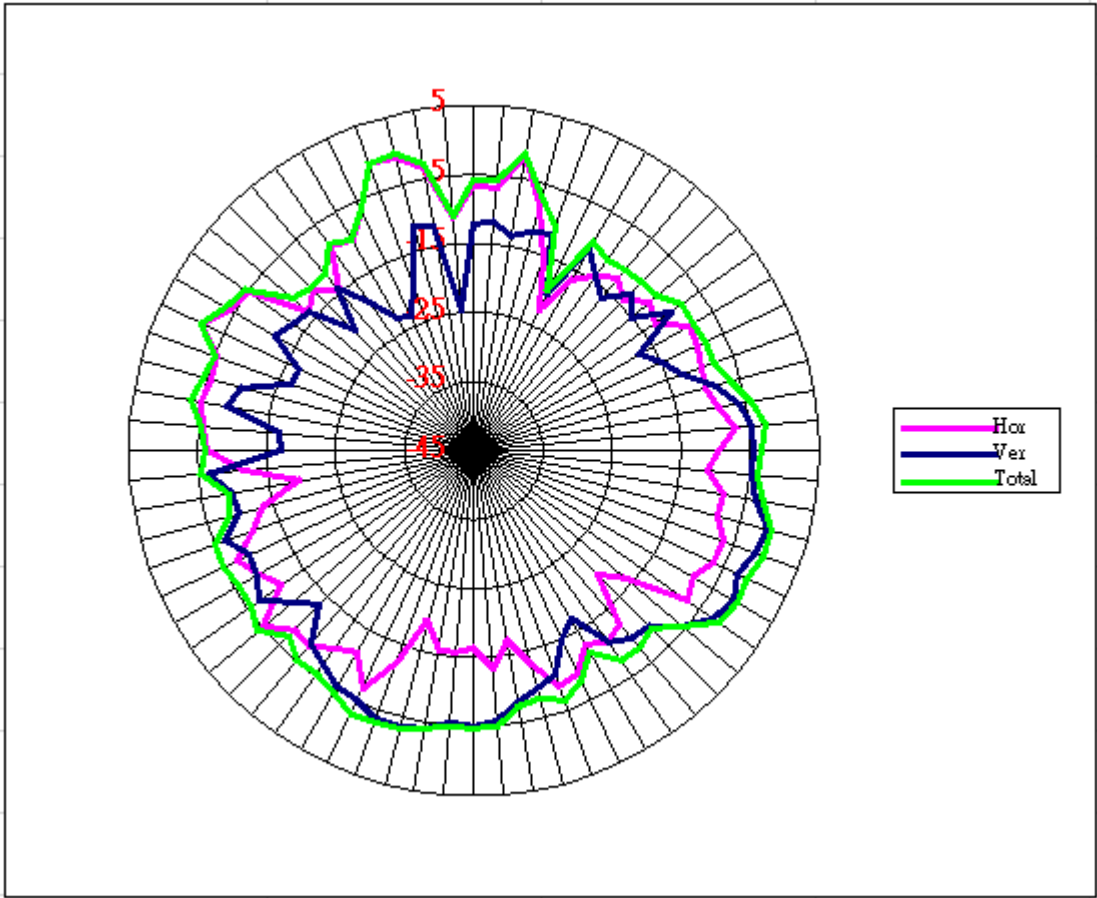
Tx2 (or Rx2) antenna: 5350 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



Center Frequency	5350 MHz
Horizontal (dBi) peak	-0.21
Vertical (dBi) peak	0.34

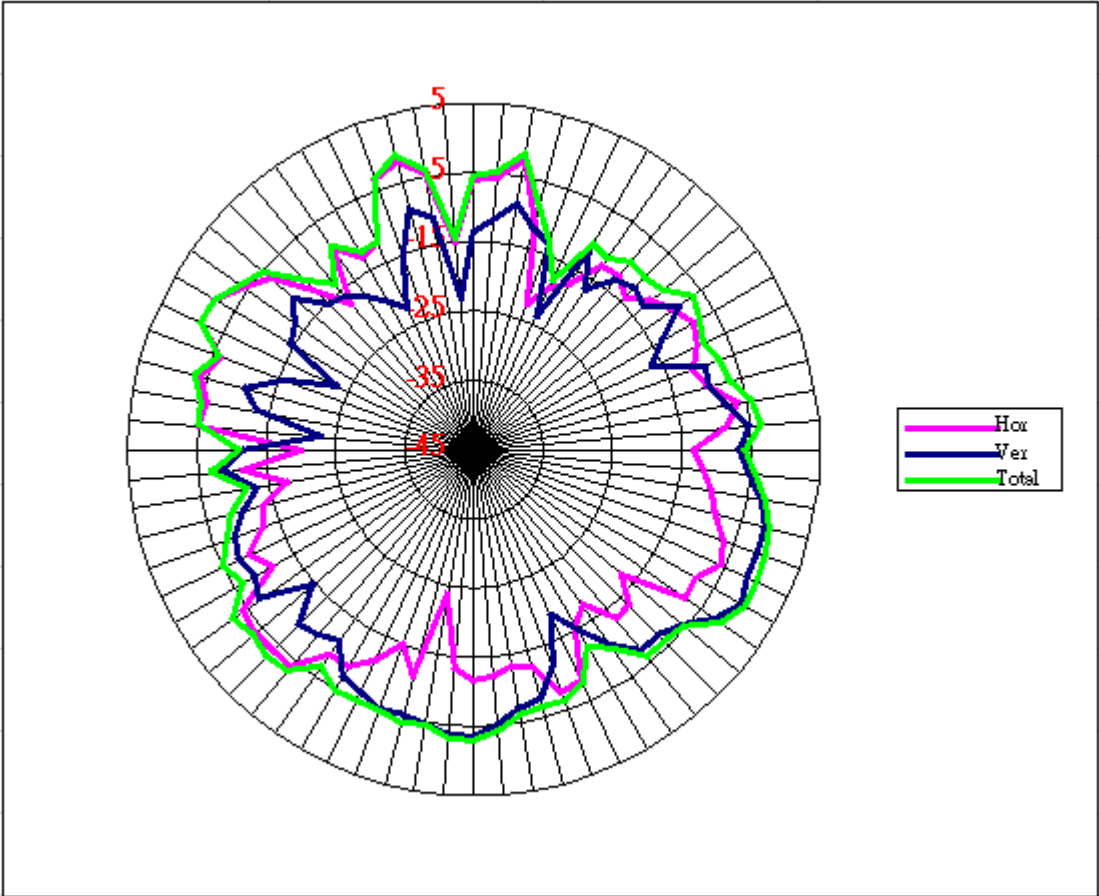
5470-5725MHz radiation characteristic

Tx1 antenna: 5470 MHz



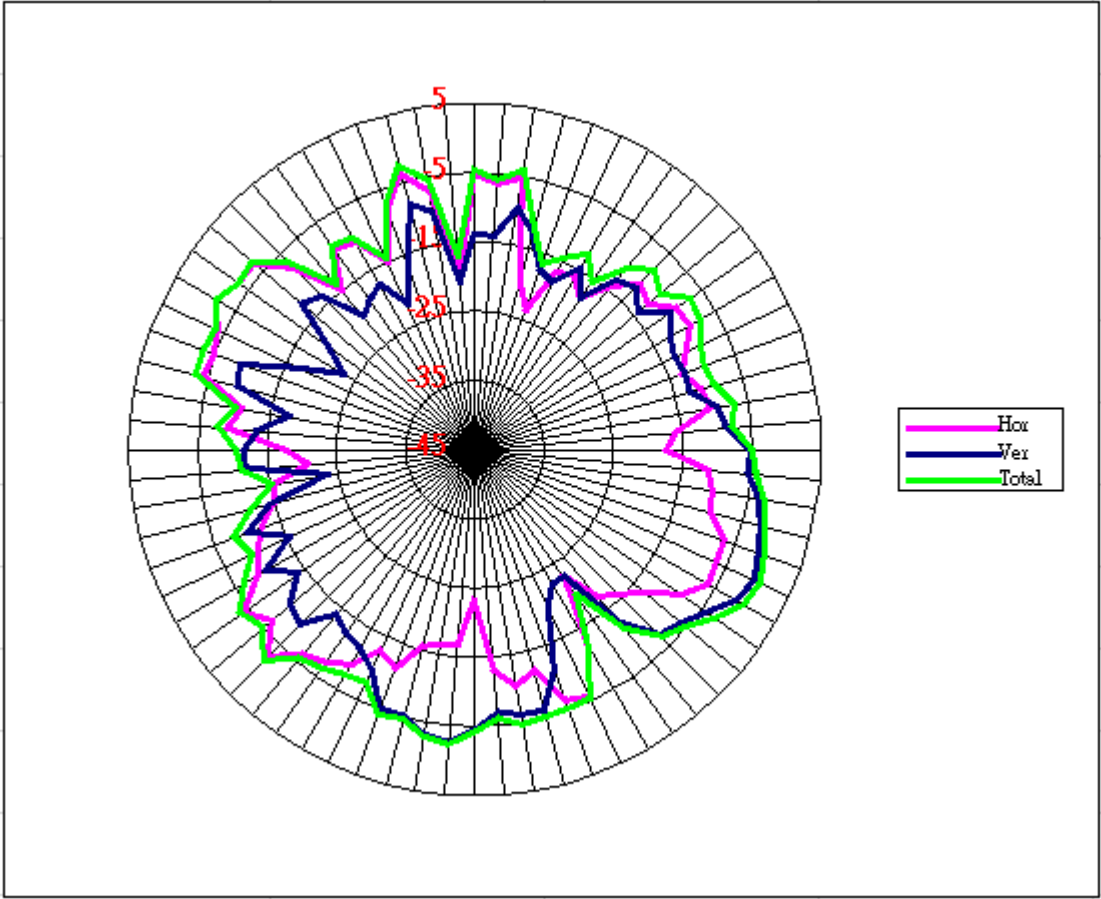
Center Frequency	5470 MHz
Horizontal (dBi) peak	-0.79
Vertical (dBi) peak	-1.03

Tx1 antenna: 5600 MHz



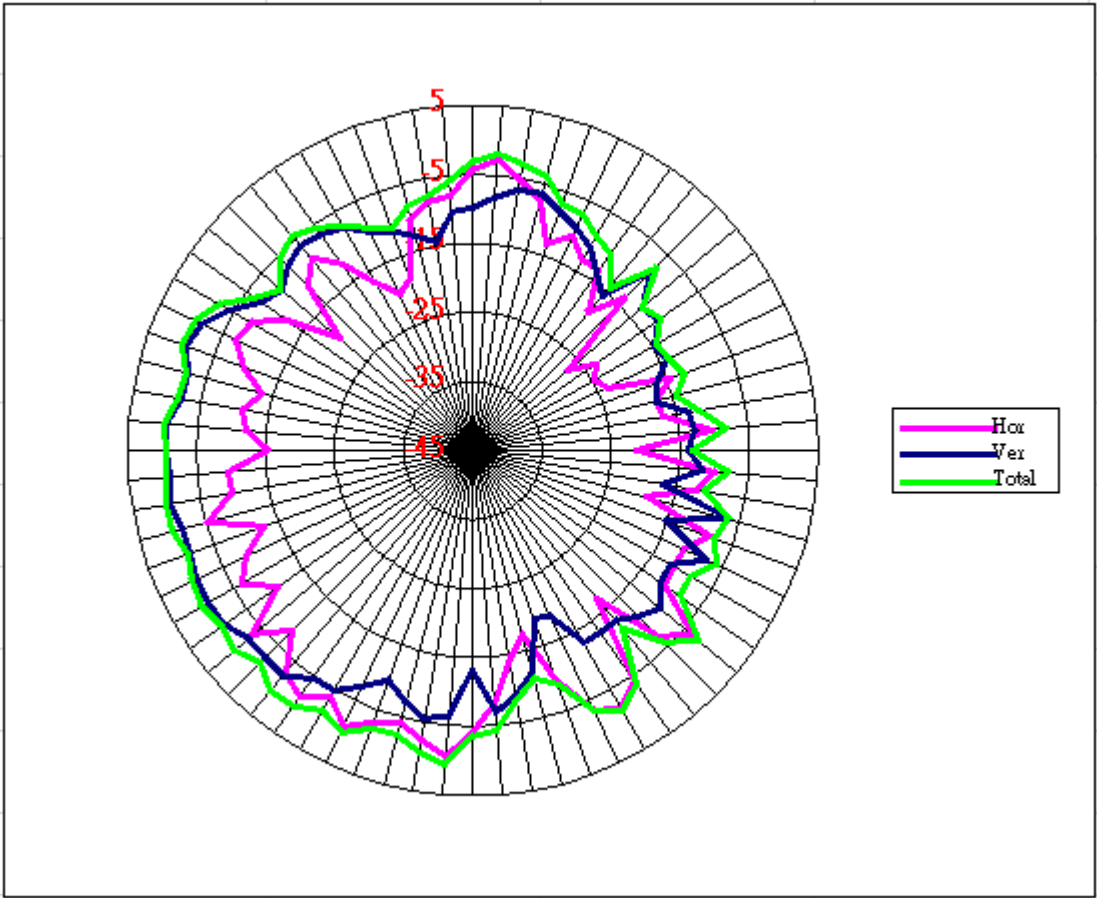
Center Frequency	5600 MHz
Horizontal (dBi) peak	-1.39
Vertical (dBi) peak	-0.21

Tx1 antenna: 5725 MHz



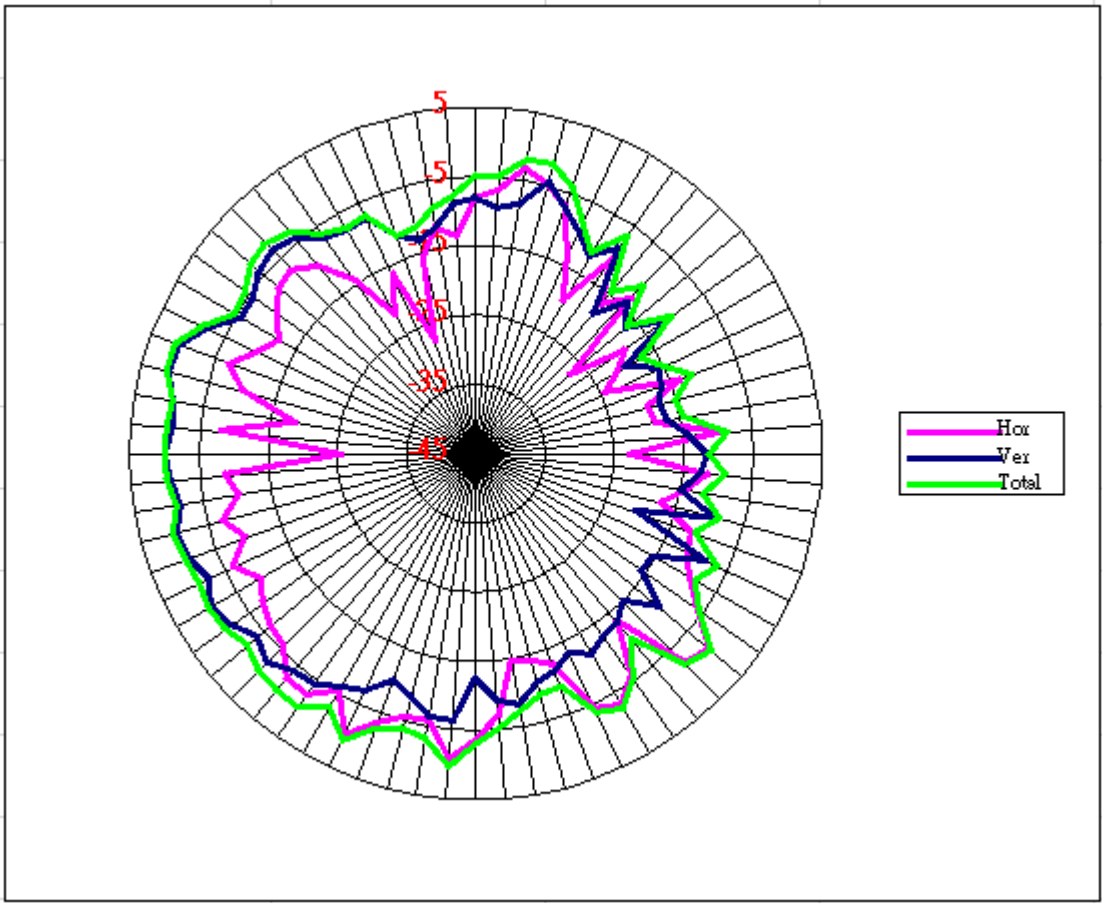
Center Frequency	5725 MHz
Horizontal (dBi) peak	-1.73
Vertical (dBi) peak	-0.26

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



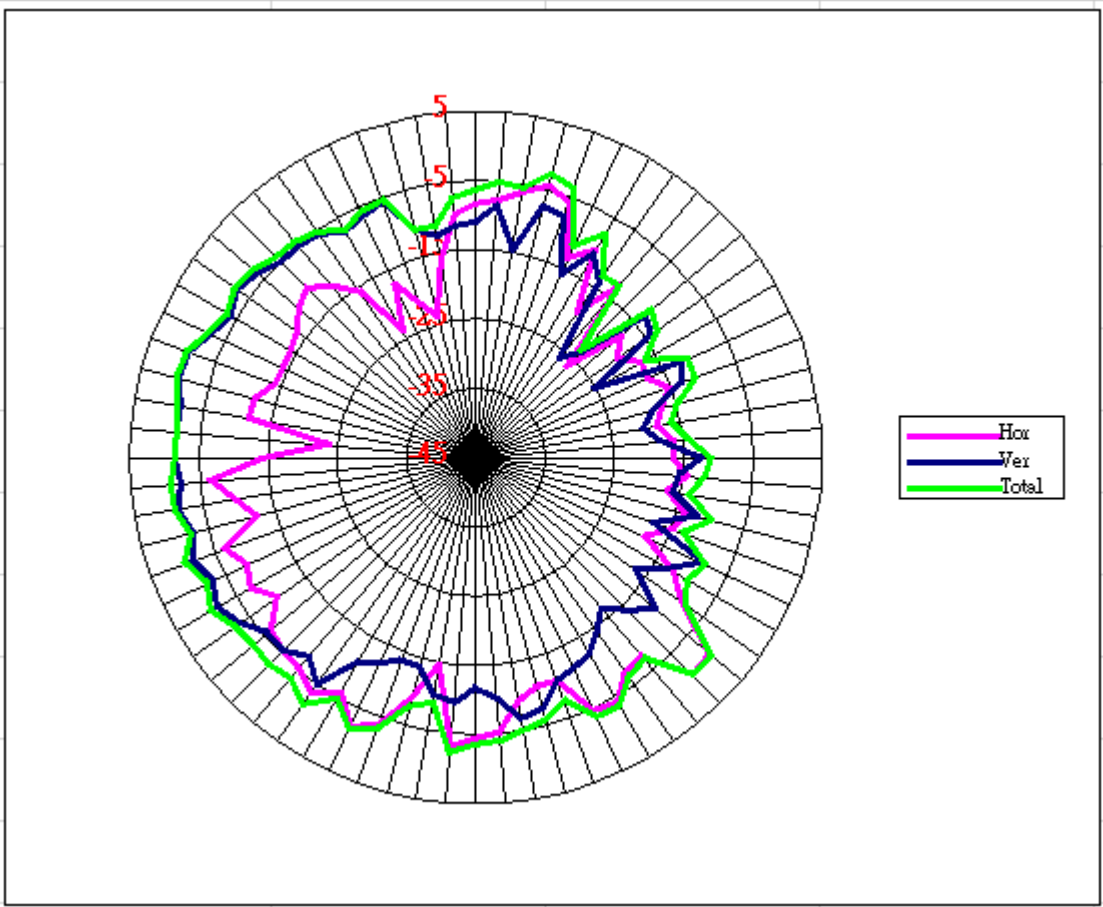
Center Frequency	5470 MHz
Horizontal (dBi) peak	-0.30
Vertical (dBi) peak	-0.39

Tx2 (or Rx2) antenna: 5600 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



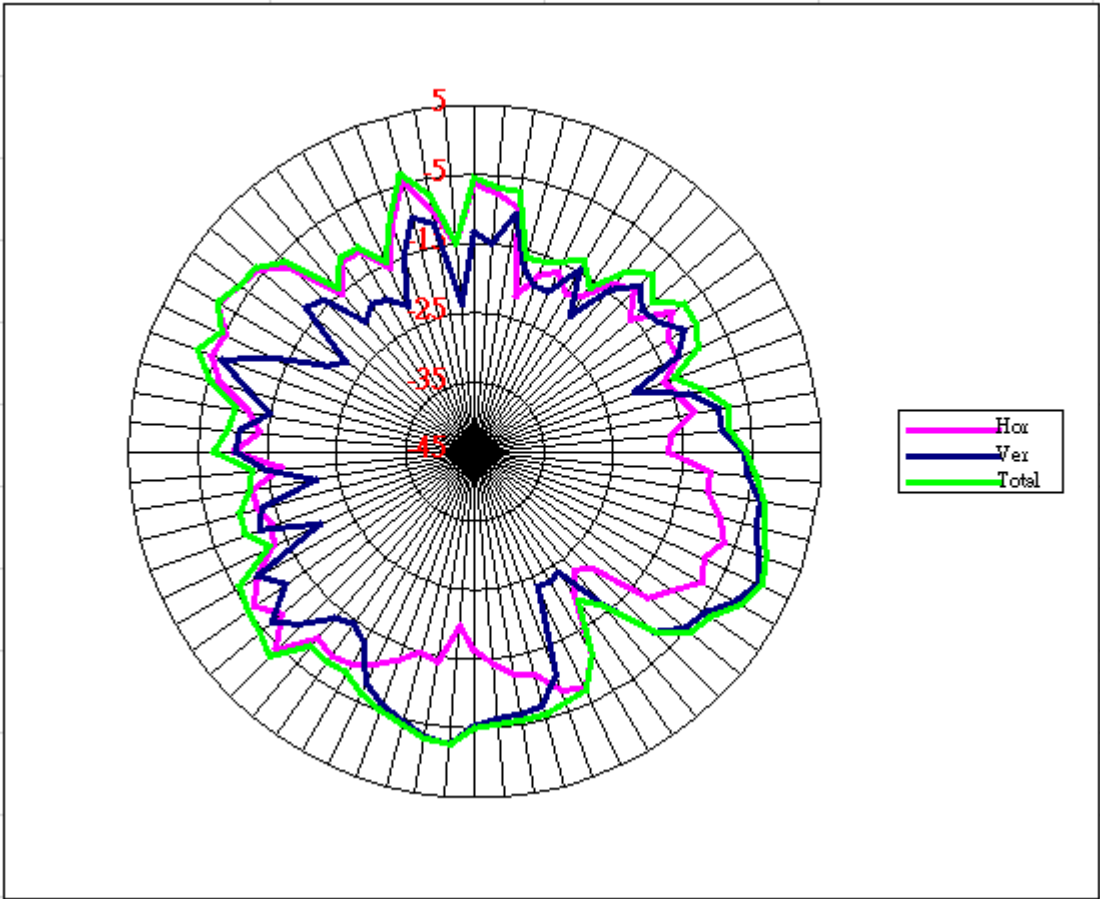
Center Frequency	5600 MHz
Horizontal (dBi) peak	-0.11
Vertical (dBi) peak	0.86

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



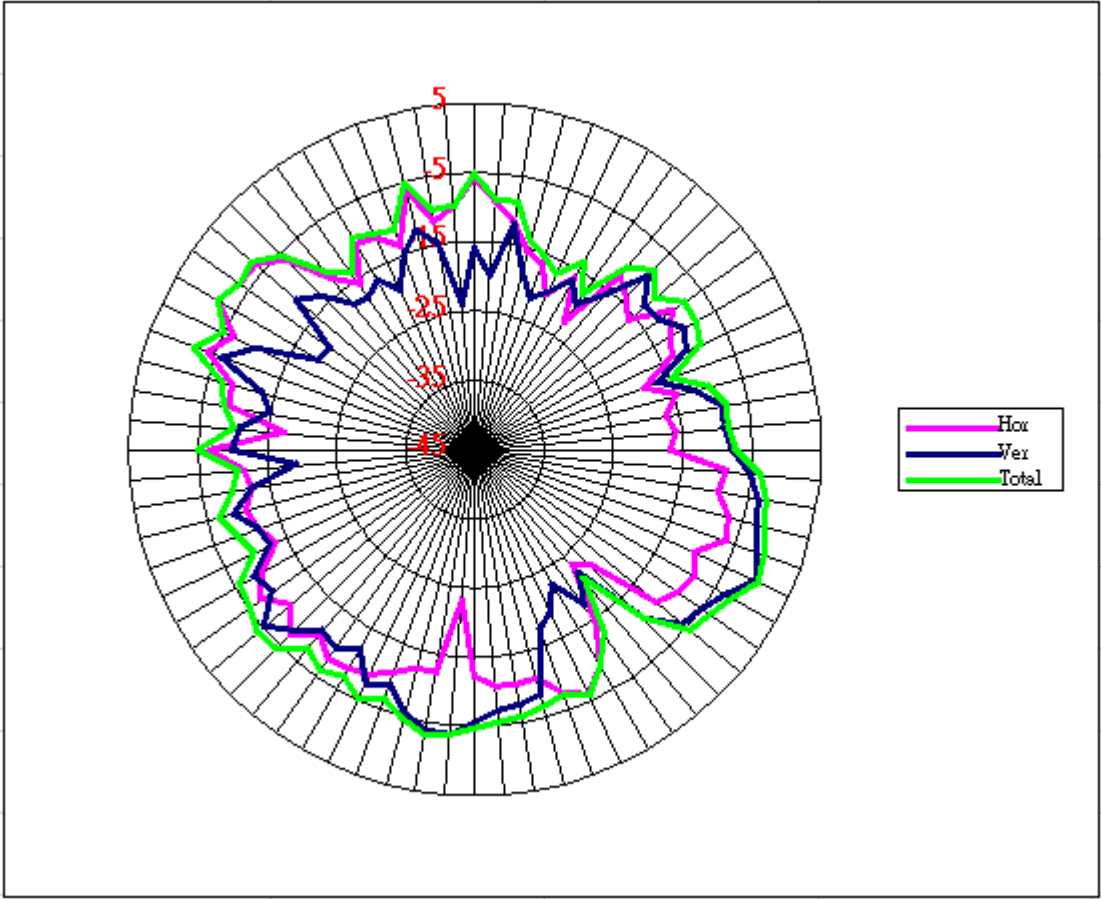
Center Frequency	5725 MHz
Horizontal (dBi) peak	-0.70
Vertical (dBi) peak	-0.54

Tx1 antenna: 5785 MHz



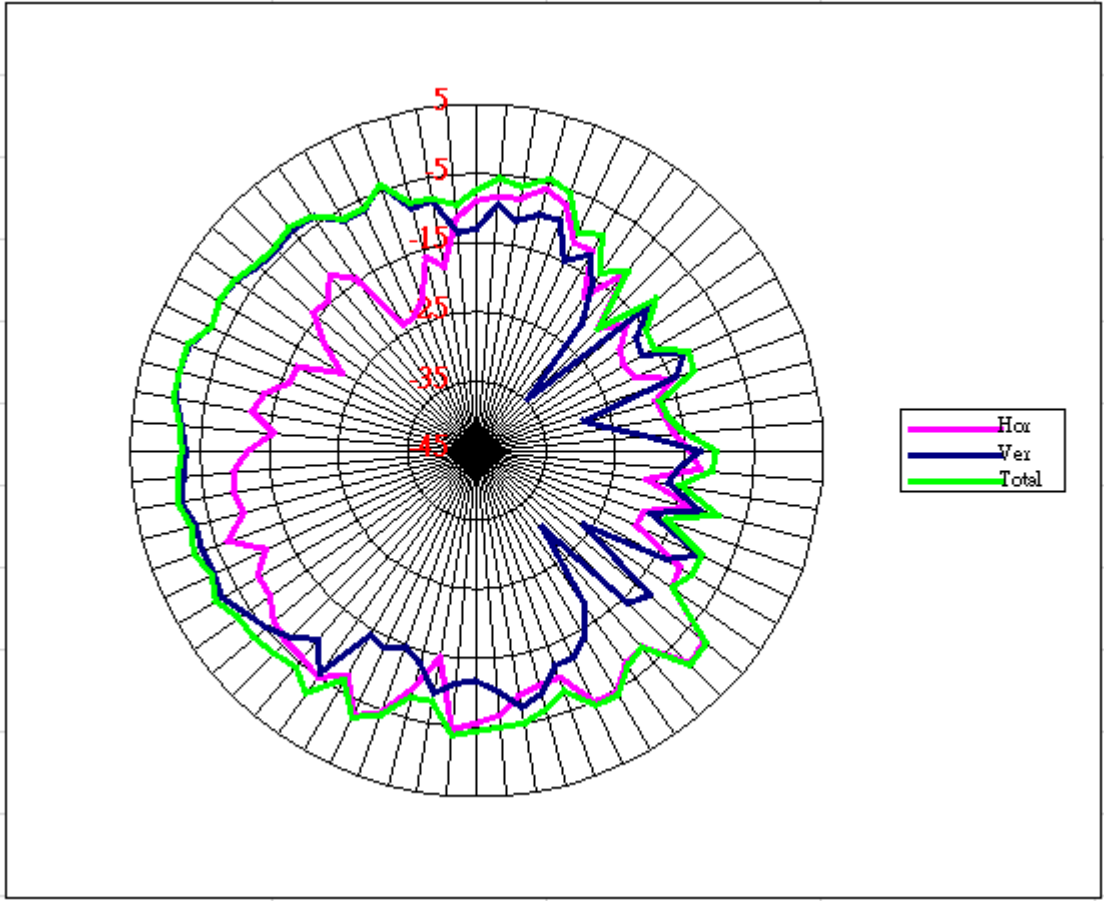
Center Frequency	5785 MHz
Horizontal (dBi) peak	-2.26
Vertical (dBi) peak	0.21

Tx1 antenna: 5850 MHz



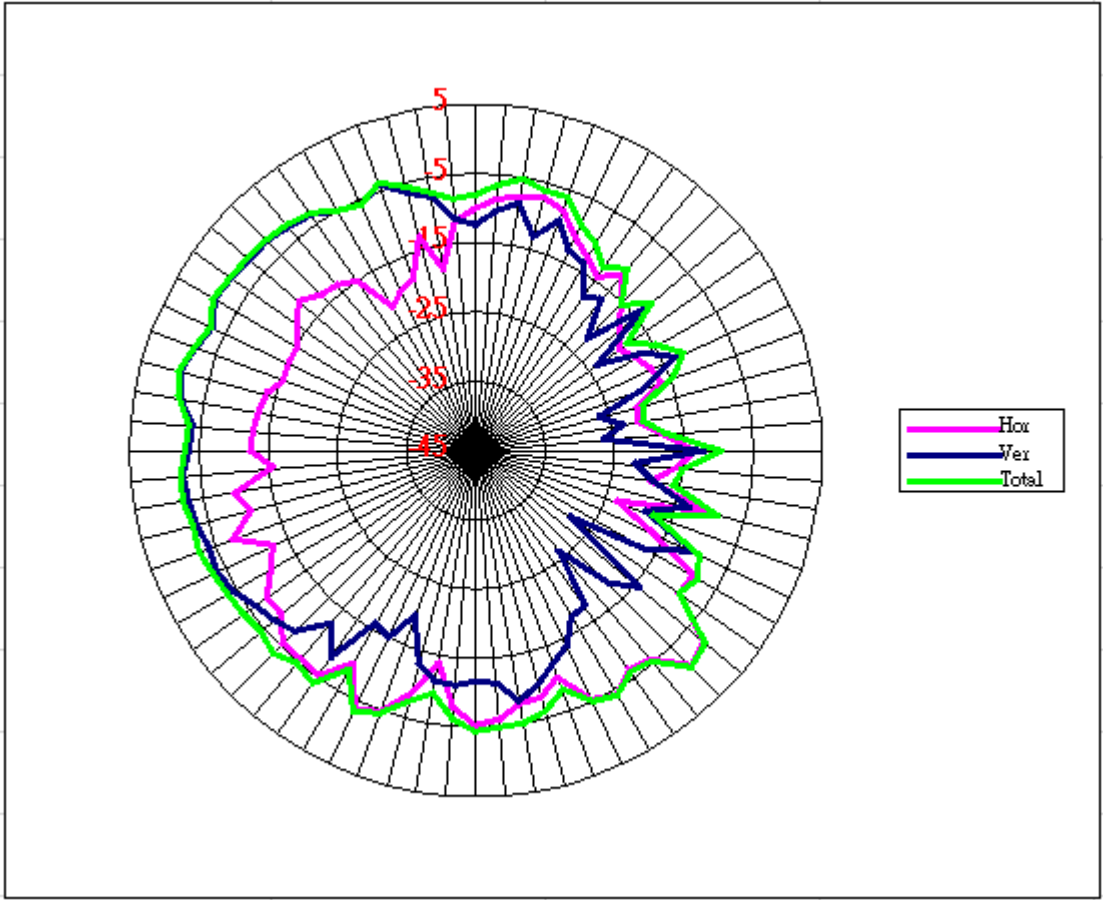
Center Frequency	5850 MHz
Horizontal (dBi) peak	-2.15
Vertical (dBi) peak	-0.24

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



Center Frequency	5785 MHz
Horizontal (dBi) peak	-1.40
Vertical (dBi) peak	-0.66

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



Center Frequency	5850 MHz
Horizontal (dBi) peak	-0.92
Vertical (dBi) peak	-0.80

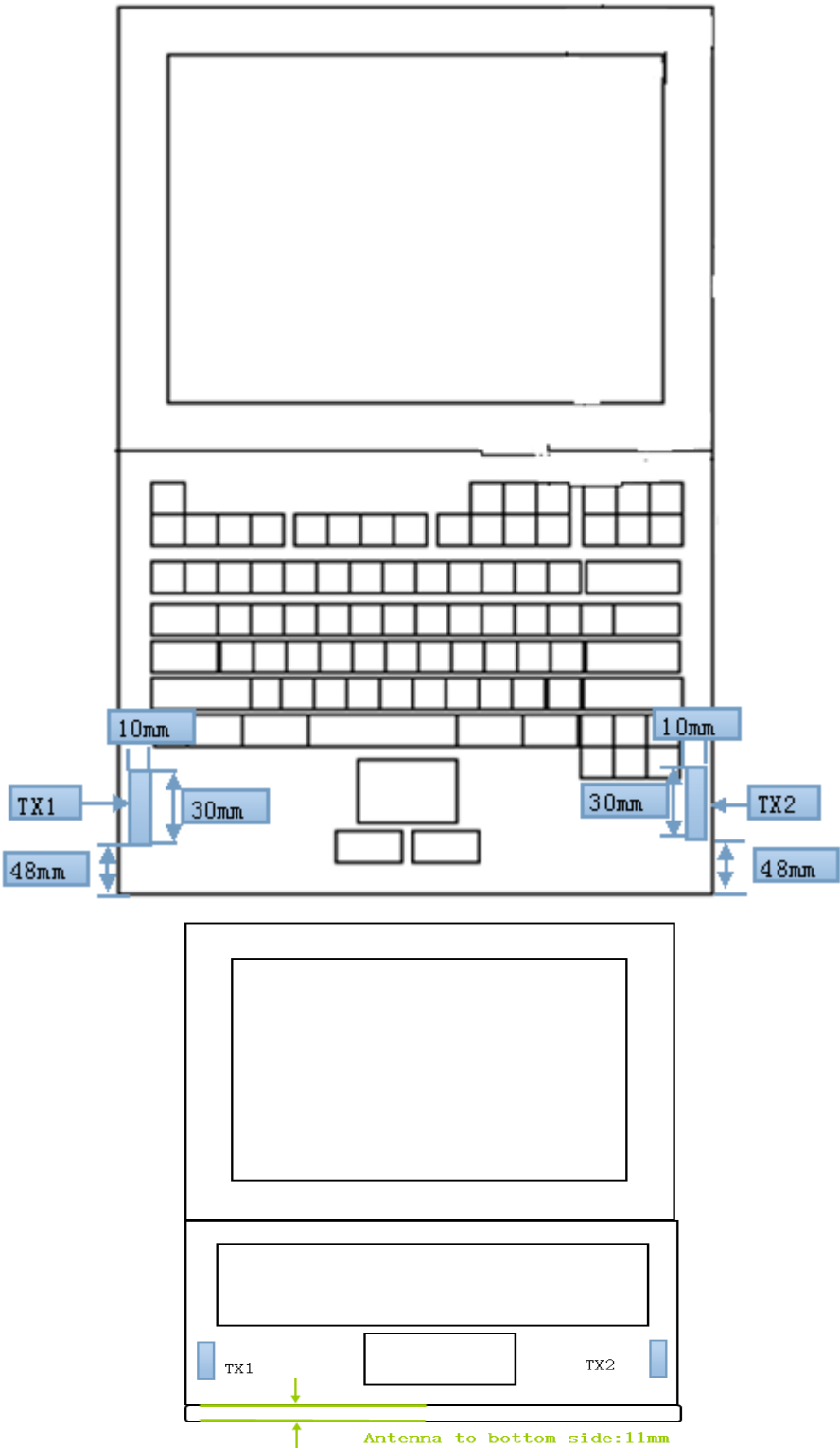
Section 4. Host Platform Information

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



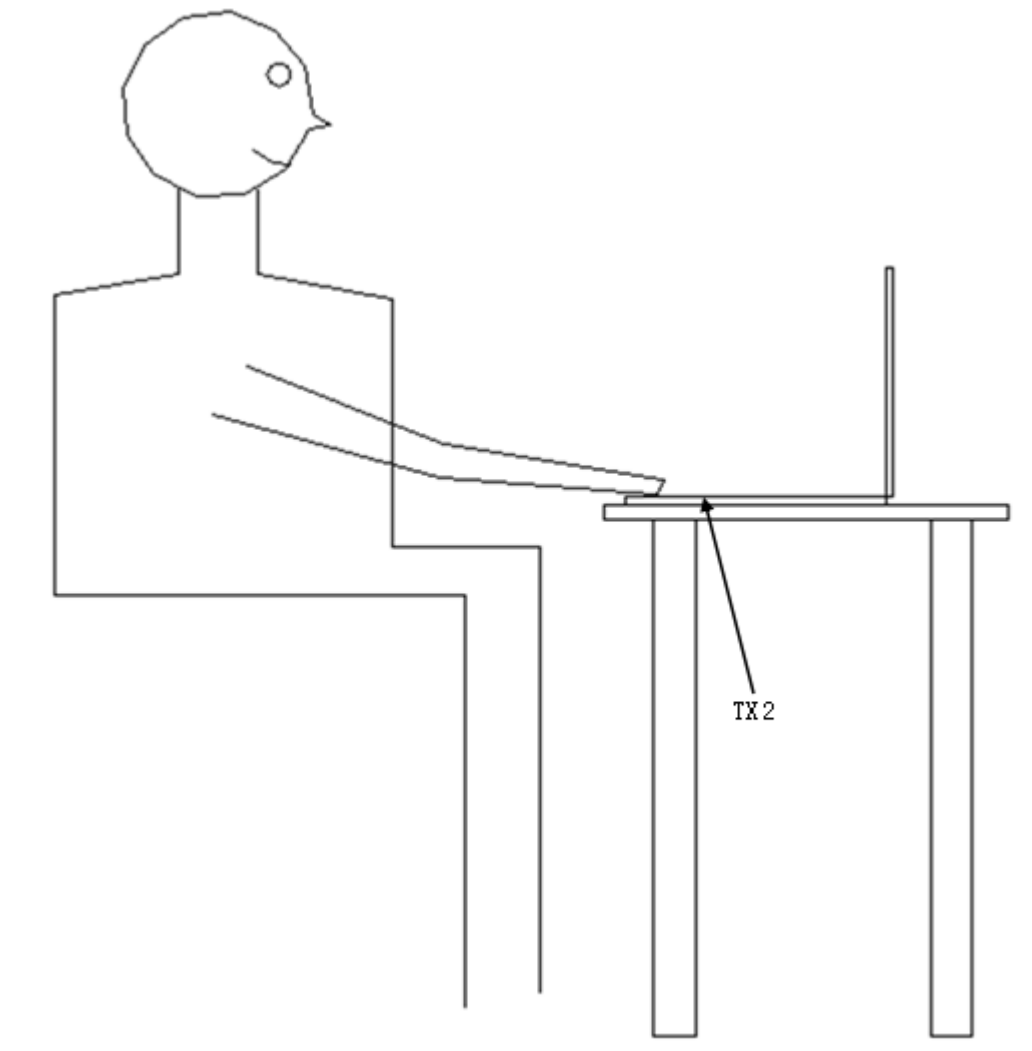
Section 5. Antenna Host Platform Location Information

Include a **dimensioned photo(s) or dimensioned drawing(s)** of Tx1, Tx2 antenna placements (measurements are not required for receive-only antenna). Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.



Section 6. Antenna dimensional information for SAR evaluation

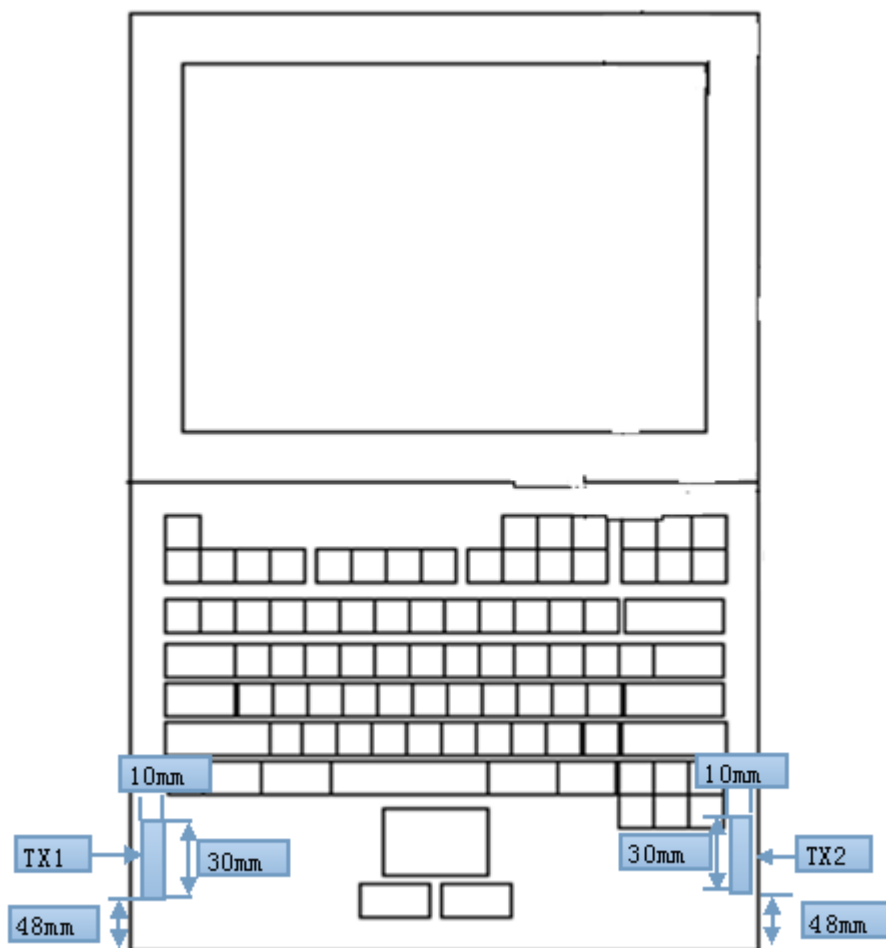
Include a **dimensioned photo(s) or dimensioned drawing(s)** showing the distance (mm) between the transmit antennas and the user (excluding hands, wrist, feet, and ankle). For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary landscape positions. Include a description of any proximity sensors or power throttling implementations that limit or exclude use of any host orientation.



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						
Indonesia						
Israel						
Malaysia						
Philippines						
Singapore						Telecommunication Equipment Dealer License Required
South Africa						
USA, Canada						
Vietnam						