

Regulatory WLAN Antenna Information 2.4/5GHz

DELL Latitude 2000 Multiple Band Antenna with Cable and Connector for IEEE 802.11a/g/n

Platform	
Platform Owner	DELL
Brand Name	DELL
Model Name	Latitude 2000
ODM	Quanta
Target Launch Date	2009/05/30
Antenna	
Brand Name	Auden Techno Corp.
Part Number	■ Tx1 Antenna: 220143-09
	■ Tx2 Antenna: 220143-09
Module	
	■ Intel 5100 AG
	■ Intel 5100 AN
	■ Intel 5300 AN

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. <u>(S. Korea requires photographs of antennas for approval submission). 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

NOTE:

(*) if 3rd 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: 220143-09) Tx1 (Main WLAN) antenna	Auden Techno Corp.	PIFA	(P/N: GBE RF 137XR4) 50 ohm Coaxial. length: 415mm diameter: 1.37mm Connector: IPEX	2300-2400MHz 0.55 dBi (peak)	2300-2400MHz 1.53 dBi (peak)	2300-2400MHz 1.94 max	2300-2400MHz 0.98 dBi (peak)
				2400-2500MHz 0.2 dBi (peak)	2400-2500MHz 1.22 dBi (peak)	2400-2500MHz 1.94 max	2400-2500MHz 1.02 dBi (peak)
				2500-2700MHz 1.04 dBi (peak)	2500-2700MHz 2.12 dBi (peak)	2500-2700MHz 2.87 max	2500-2700MHz 1.08 dBi (peak)
				5150-5350MHz 1.54 dBi (peak)	5150-5350MHz 3.73 dBi (peak)	5150-5350MHz 1.58 max	5150-5350MHz 2.19 dBi (peak)
				5470-5725MHz 1.29 dBi (peak)	5470-5725MHz 3.61 dBi (peak)	5470-5725MHz 2.07 max	5470-5725MHz 2.32 dBi (peak)
				5825-5875MHz 1.17 dBi (peak)	5825-5875MHz 3.58 dBi (peak)	5825-5875MHz 1.59 max	5825-5875MHz 2.41 dBi (peak)
(P/N: 220143-09) Tx2 (Aux WLAN) antenna	Auden Techno Corp.	PIFA	(P/N: GBE RF 137XR4) 50 ohm Coaxial. length: 460mm diameter: 1.37mm Connector: IPEX	2300-2400MHz 3.23 dBi (peak)	2300-2400MHz 4.31 dBi (peak)	2300-2400MHz 2.35 max	2300-2400MHz 1.08 dBi (peak)
				2400-2500MHz 3.10 dBi (peak)	2400-2500MHz 4.23 dBi (peak)	2400-2500MHz 1.43 max	2400-2500MHz 1.13 dBi (peak)
				2500-2700MHz 2.55 dBi (peak)	2500-2700MHz 3.75 dBi (peak)	2500-2700MHz 2.38 max	2500-2700MHz 1.2 dBi (peak)
				5150-5350MHz 0.69 dBi (peak)	5150-5350MHz 3.11 dBi (peak)	5150-5350MHz 1.7 max	5150-5350MHz 2.42 dBi (peak)
				5470-5725MHz 1.34 dBi (peak)	5470-5725MHz 3.92 dBi (peak)	5470-5725MHz 1.51 max	5470-5725MHz 2.58 dBi (peak)
				5825-5875MHz 0.91 dBi (peak)	5825-5875MHz 3.59 dBi (peak)	5825-5875MHz 1.73 max	5825-5875MHz 2.67 dBi (peak)

NOTE:
(*) If Rx3 only (3rd antenna receives only, e.g. for 4965AGN) then the information marked with * is not required

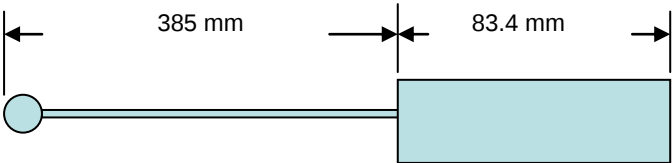
Antenna Peak Gain Table:

Frequency (MHz)	Tx1 (main WLAN) antenna		Tx2 (aux WLAN) Antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
2300	-1.71	-1.06	-1.92	2.07
2350	-2.68	-0.91	-3.57	1.11
2400	-1.91	-0.88	-2.49	1.67
2450	-2.52	-1.35	-2.01	2.12
2500	-2.25	-1.46	-3.08	1.8
2600	-2.2	-1.09	-1.95	-1.04
2700	-2.46	-0.72	-3.61	-0.53
5150	-2.1	-0.41	-2.77	-0.58
5350	-3.01	0.27	-1.55	-1.12
5470	-2.87	-0.14	-1.79	-0.31
5725	-3.42	-1.84	-1.28	0.43
5825	-3.35	-1.63	-0.71	0.16
5875	-2.43	-0.78	-0.54	-0.59

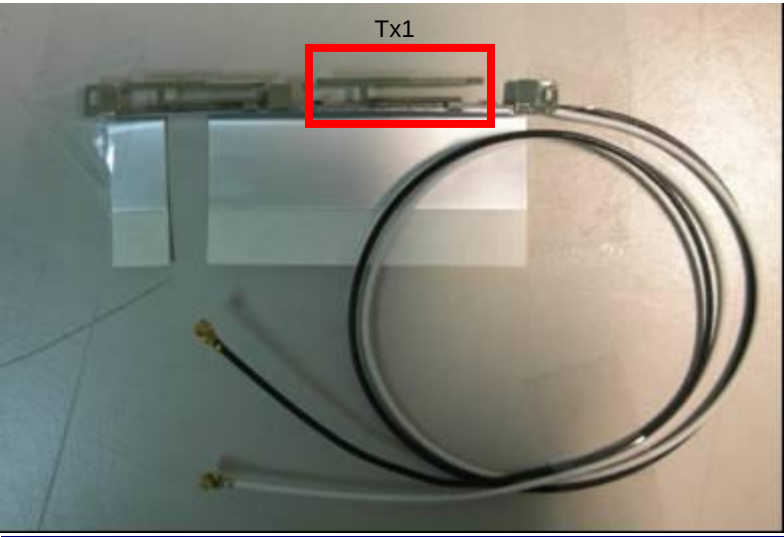
- Antenna Peak Gain required being test in system basis.
- 1E frame contend absolutely peak antenna gain include H/V
- If Rx3 only (3rd antenna receives only, e.g. for 4965AGN) then the information is not required for Rx3.

Section 2. Dimensioned Photos or Drawings of Antennas

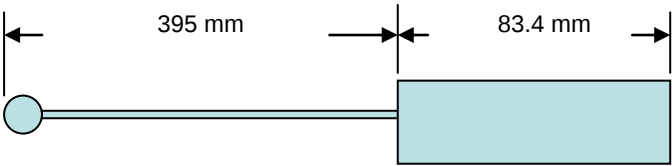
Include a dimensioned photo and dimensioned drawing of Tx1 (main WLAN) antenna here.



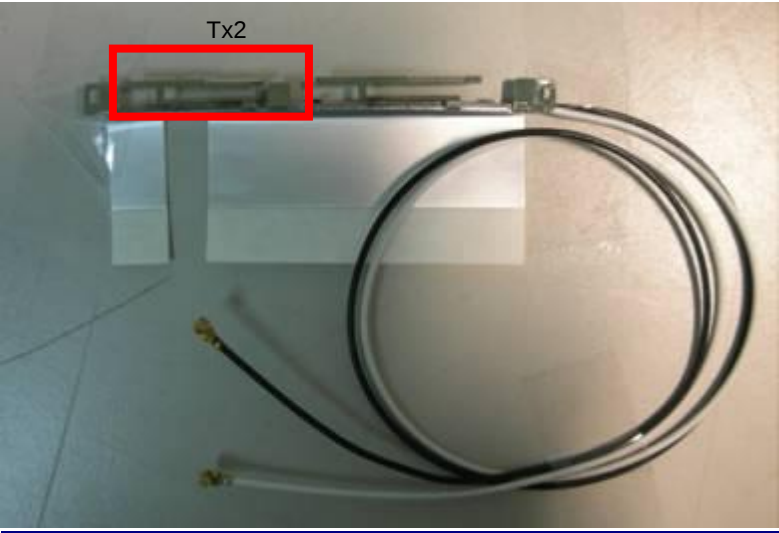
Tx1 WLAN Main Antenna Photo



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



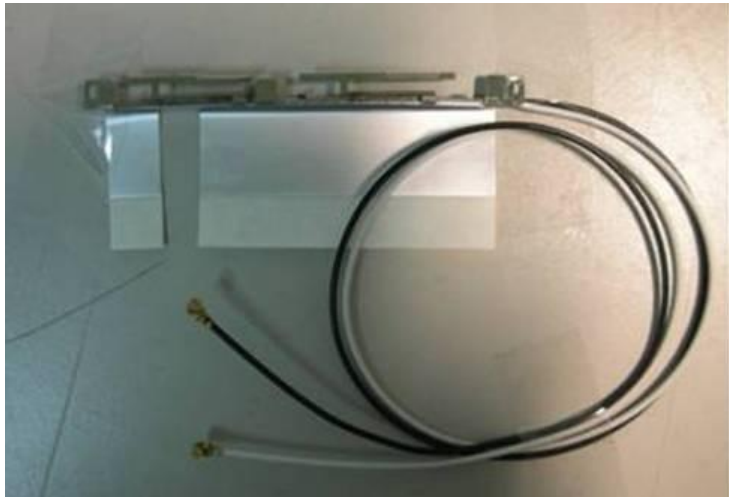
Tx2 WLAN AUX Antenna Photo



Include front view photo of all 2 antennas here.

Antenna Manufacturer: Auden

Antenna Part Number: 220143-09 (Tx1/WLAN Main), 220143-09 (Tx2 /WLAN AUX)



Include back view photo of all 2 antennas here.

Antenna Manufacturer: Auden

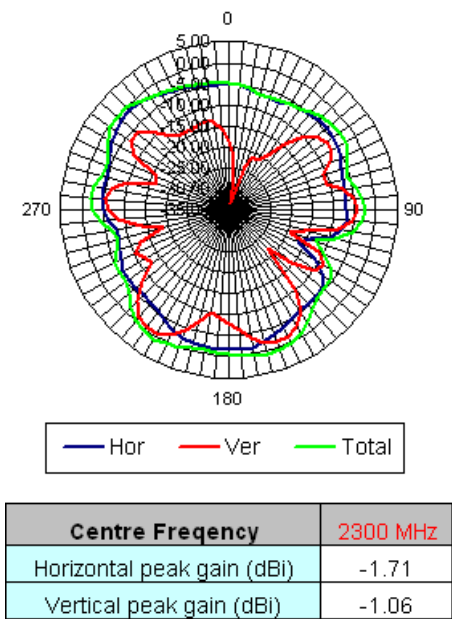
Antenna Part Number: 220143-09 (Tx1/WLAN Main), 220143-09 (Tx2 /WLAN AUX)



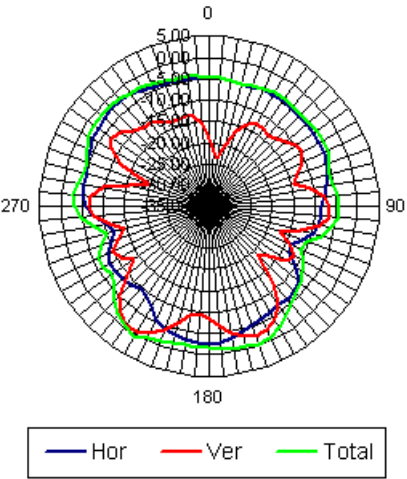
Section 3. Radiation characteristics of antennae Loaded in Host Platform

2300-2400MHz radiation characteristic

Tx1 antenna: 2300 MHz

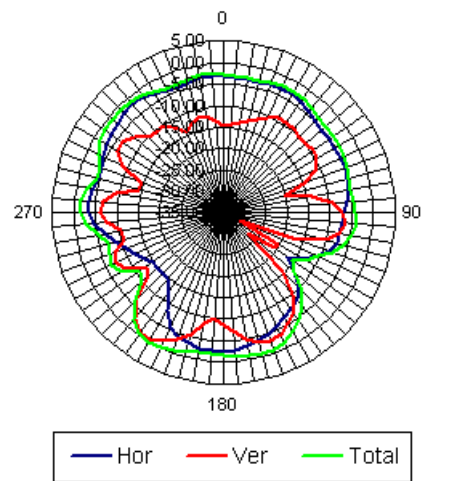


Tx1 antenna: 2350 MHz



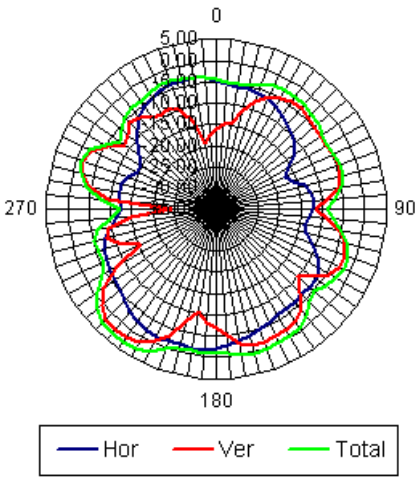
Centre Frequency	2350 MHz
Horizontal peak gain (dBi)	-2.68
Vertical peak gain (dBi)	-0.91

Tx1 antenna: 2400 MHz



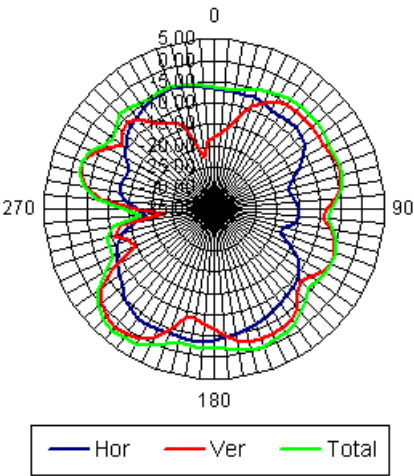
Centre Frequency	2400 MHz
Horizontal peak gain (dBi)	-1.91
Vertical peak gain (dBi)	-0.88

Tx2 antenna: 2300 MHz



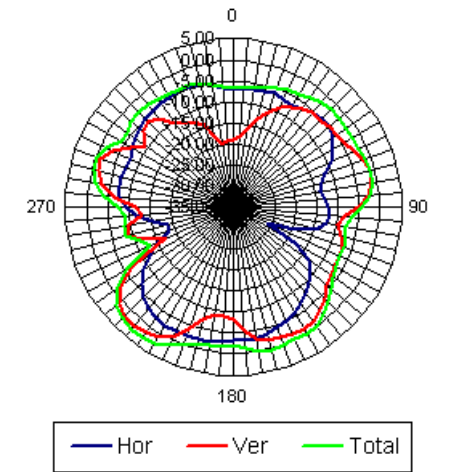
Centre Frequency	2300 MHz
Horizontal peak gain (dBi)	-1.92
Vertical peak gain (dBi)	2.07

Tx2 antenna: 2350 MHz



Centre Frequency	2350 MHz
Horizontal peak gain (dBi)	-3.57
Vertical peak gain (dBi)	1.11

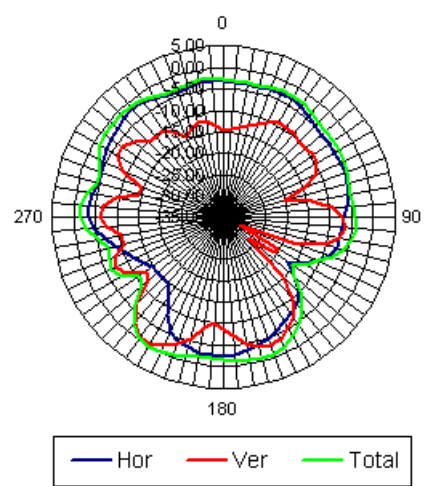
Tx2 antenna: 2400 MHz



Centre Frequency	2400 MHz
Horizontal peak gain (dBi)	-2.49
Vertical peak gain (dBi)	1.67

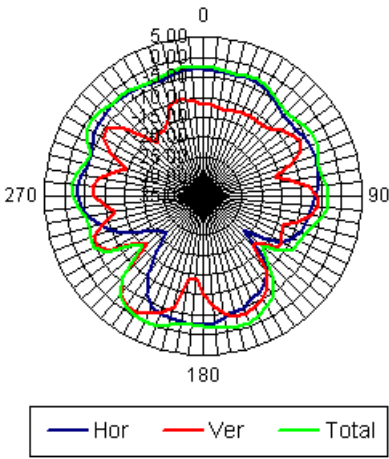
2400-2500MHz radiation characteristic

Tx1antenna: 2400MHz



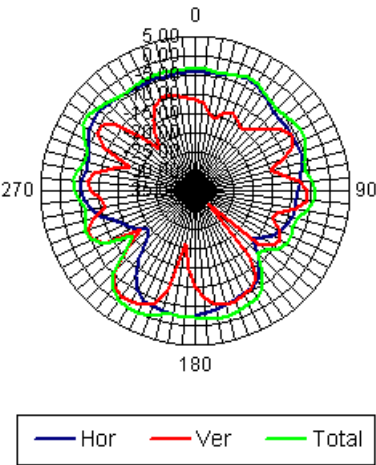
Centre Frequency	2400 MHz
Horizontal peak gain (dBi)	-1.91
Vertical peak gain (dBi)	-0.88

Tx1 antenna: 2450MHz



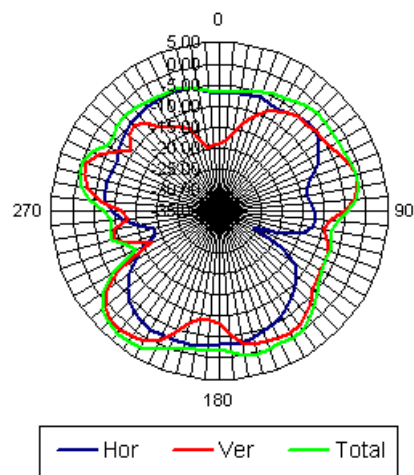
Centre Frequency	2450 MHz
Horizontal peak gain (dBi)	-2.52
Vertical peak gain (dBi)	-1.35

Tx1 antenna: 2500 MHz



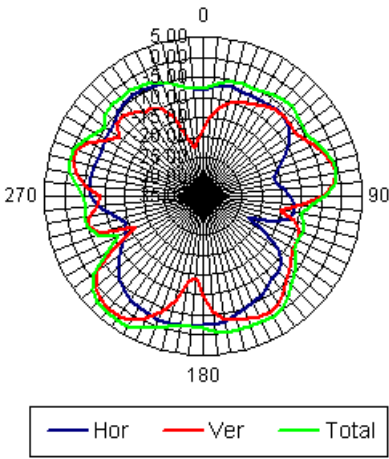
Centre Frequency	2500 MHz
Horizontal peak gain (dBi)	-2.25
Vertical peak gain (dBi)	-1.46

Tx2 antenna: 2400MHz



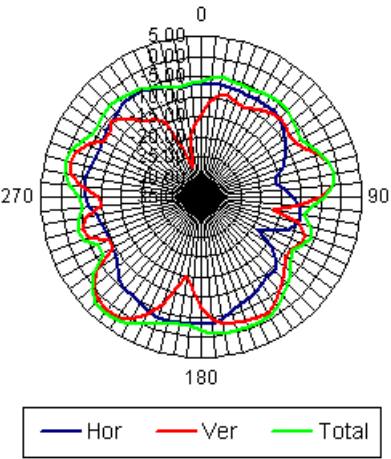
Centre Frequency	2400 MHz
Horizontal peak gain (dBi)	-2.49
Vertical peak gain (dBi)	1.67

Tx2 antenna: 2450MHz



Centre Frequency	2450 MHz
Horizontal peak gain (dBi)	-2.01
Vertical peak gain (dBi)	2.12

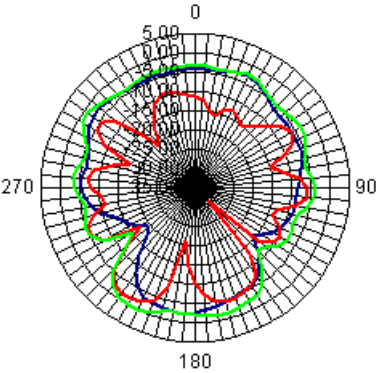
Tx2 antenna: 2500 MHz



Centre Frequency	2500 MHz
Horizontal peak gain (dBi)	-3.08
Vertical peak gain (dBi)	1.80

2500-2700 MHz radiation characteristic

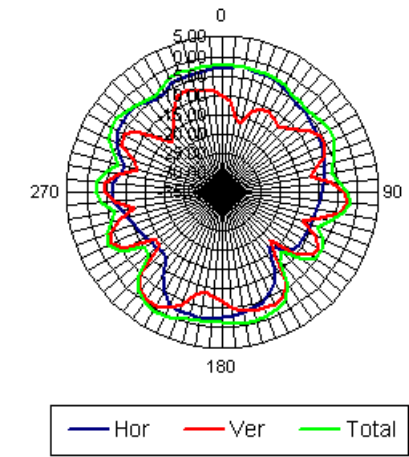
Tx1 antenna: 2500 MHz



— Hor — Ver — Total

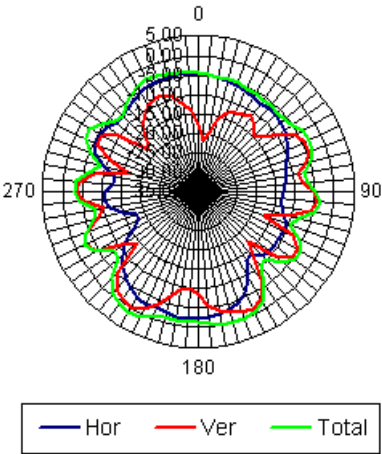
Centre Frequency	2500 MHz
Horizontal peak gain (dBi)	-2.25
Vertical peak gain (dBi)	-1.46

Tx1 antenna: 2600 MHz



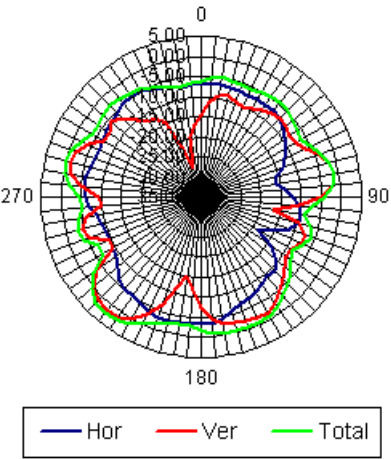
Centre Frequency	2600 MHz
Horizontal peak gain (dBi)	-2.20
Vertical peak gain (dBi)	-1.09

Tx1 antenna: 2700 MHz



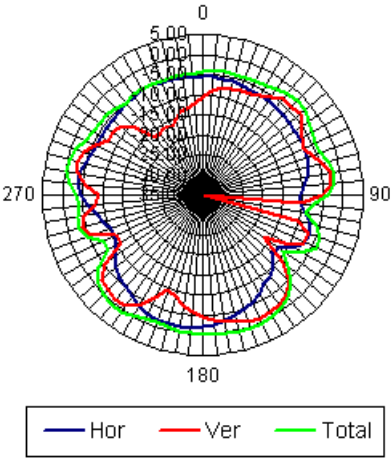
Centre Frequency	2700 MHz
Horizontal peak gain (dBi)	-2.46
Vertical peak gain (dBi)	-0.72

Tx2 antenna: 2500 MHz



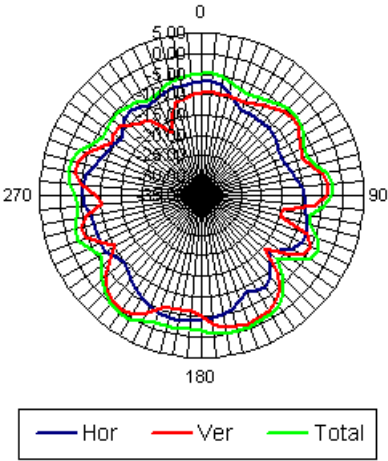
Centre Frequency	2500 MHz
Horizontal peak gain (dBi)	-3.08
Vertical peak gain (dBi)	1.80

Tx2 antenna: 2600 MHz



Centre Frequency	2600 MHz
Horizontal peak gain (dBi)	-1.95
Vertical peak gain (dBi)	-1.04

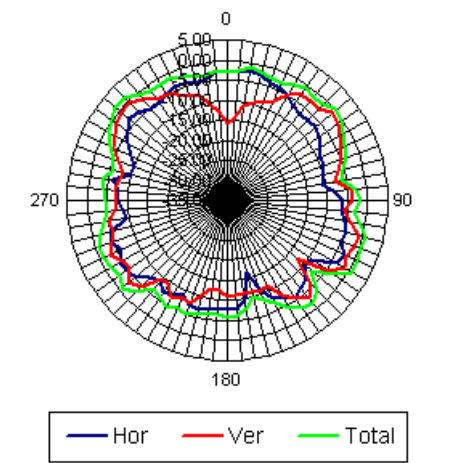
Tx2 antenna: 2700 MHz



Centre Frequency	2700 MHz
Horizontal peak gain (dBi)	-3.61
Vertical peak gain (dBi)	-0.53

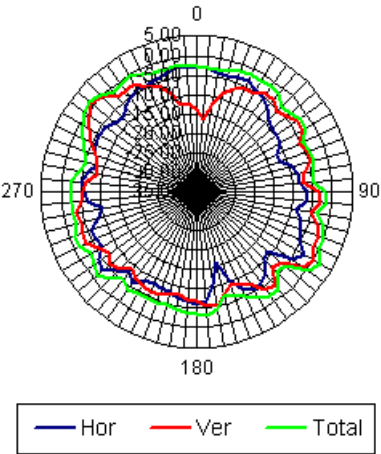
5150-5350MHz radiation characteristic

Tx1 antenna: 5150 MHz



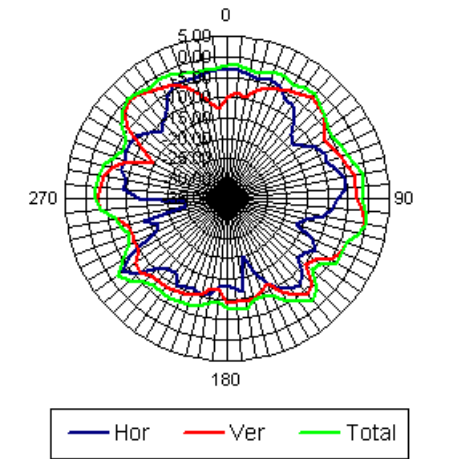
Centre Frequency	5150 MHz
Horizontal peak gain (dBi)	-2.10
Vertical peak gain (dBi)	-0.41

Tx1 antenna: 5350 MHz



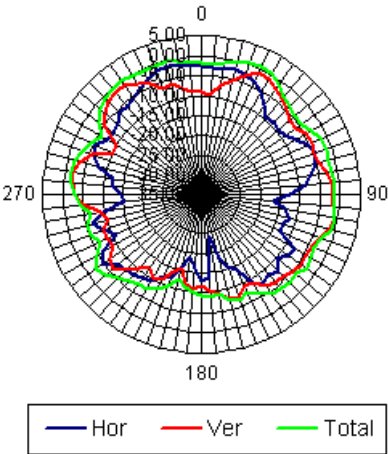
Centre Frequency	5350MHz
Horizontal peak gain (dBi)	-3.01
Vertical peak gain (dBi)	0.27

Tx2 antenna: 5150 MHz



Centre Frequency	5150 MHz
Horizontal peak gain (dBi)	-2.77
Vertical peak gain (dBi)	-0.58

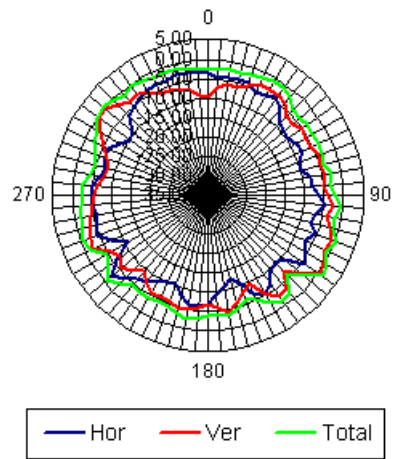
Tx2 antenna: 5350 MHz



Centre Frequency	5350 MHz
Horizontal peak gain (dBi)	-1.55
Vertical peak gain (dBi)	-1.12

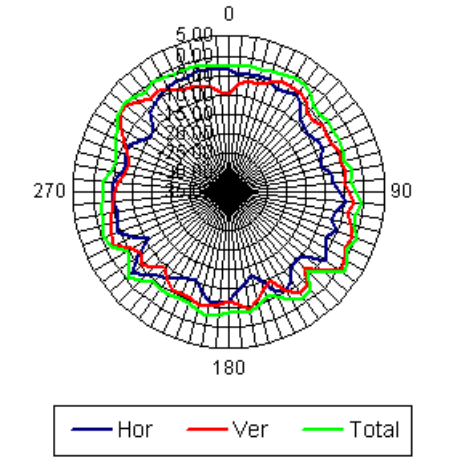
5470-5725 MHz radiation characteristic

Tx1 antenna: 5470 MHz



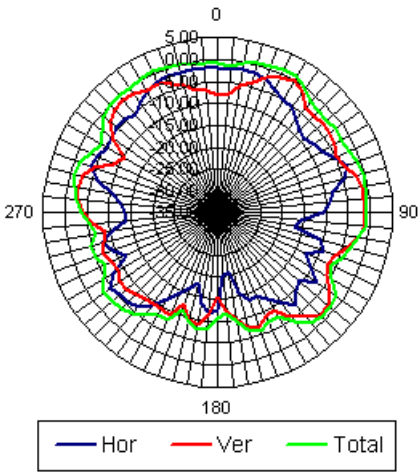
Centre Frequency	5470 MHz
Horizontal peak gain (dBi)	-2.87
Vertical peak gain (dBi)	-0.14

Tx1 antenna: 5725 MHz



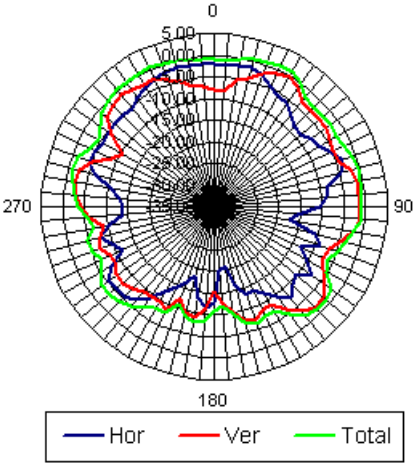
Centre Frequency	5725 MHz
Horizontal peak gain (dBi)	-3.42
Vertical peak gain (dBi)	-1.84

Tx2 antenna: 5470 MHz



Centre Frequency	5470 MHz
Horizontal peak gain (dBi)	-1.79
Vertical peak gain (dBi)	-0.31

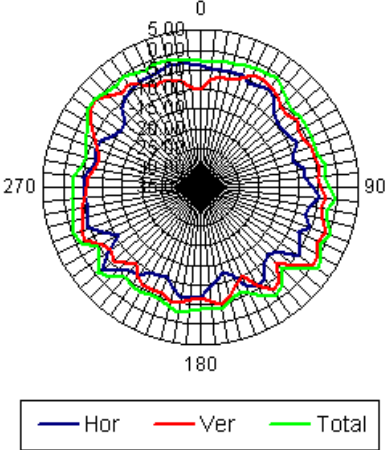
Tx2 antenna: 5725 MHz



Centre Frequency	5725 MHz
Horizontal peak gain (dBi)	-1.28
Vertical peak gain (dBi)	0.43

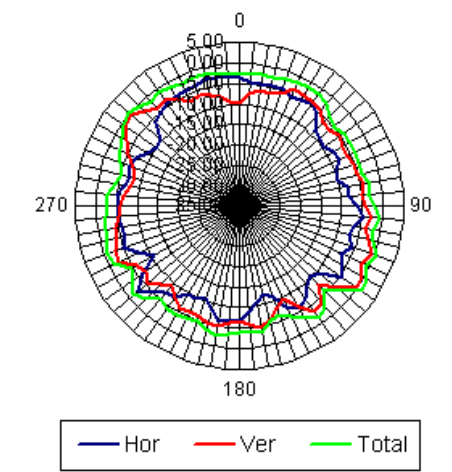
5825-5875 MHz radiation characteristic

Tx1 antenna: 5825 MHz



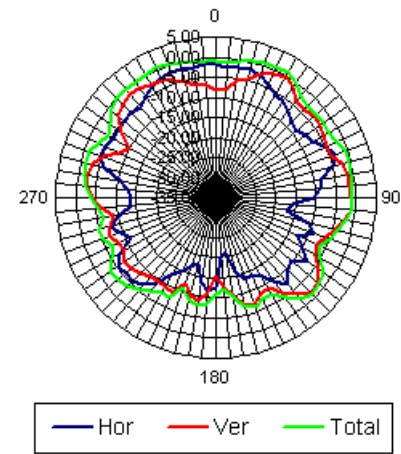
Centre Frequency	5825 MHz
Horizontal peak gain (dBi)	-3.35
Vertical peak gain (dBi)	-1.63

Tx1 antenna: 5875 MHz



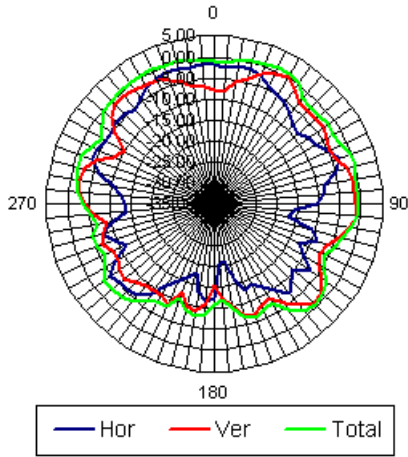
Centre Frequency	5875 MHz
Horizontal peak gain (dBi)	-2.43
Vertical peak gain (dBi)	-0.78

Tx2 antenna: 5825 MHz



Centre Frequency	5825 MHz
Horizontal peak gain (dBi)	-0.71
Vertical peak gain (dBi)	0.16

Tx2 antenna: 5875 MHz

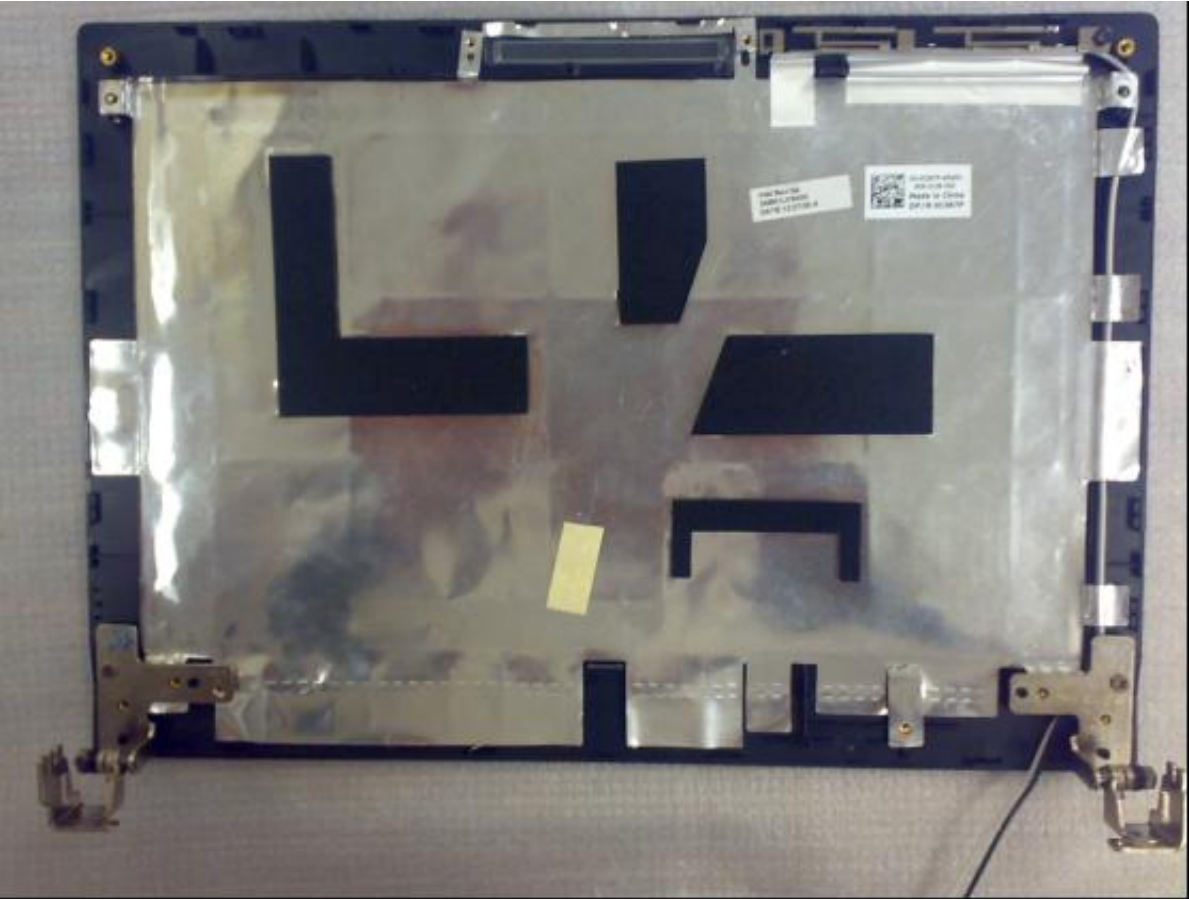


Centre Frequency	5875 MHz
Horizontal peak gain (dBi)	-0.54
Vertical peak gain (dBi)	-0.59

Section 4. Host Platform Information

OEM / ODM Host platform: (DELL Latitude 2000) platform correlated to antenna data
Rating Label Photo:

WLAN(Aux) WLAN(main)



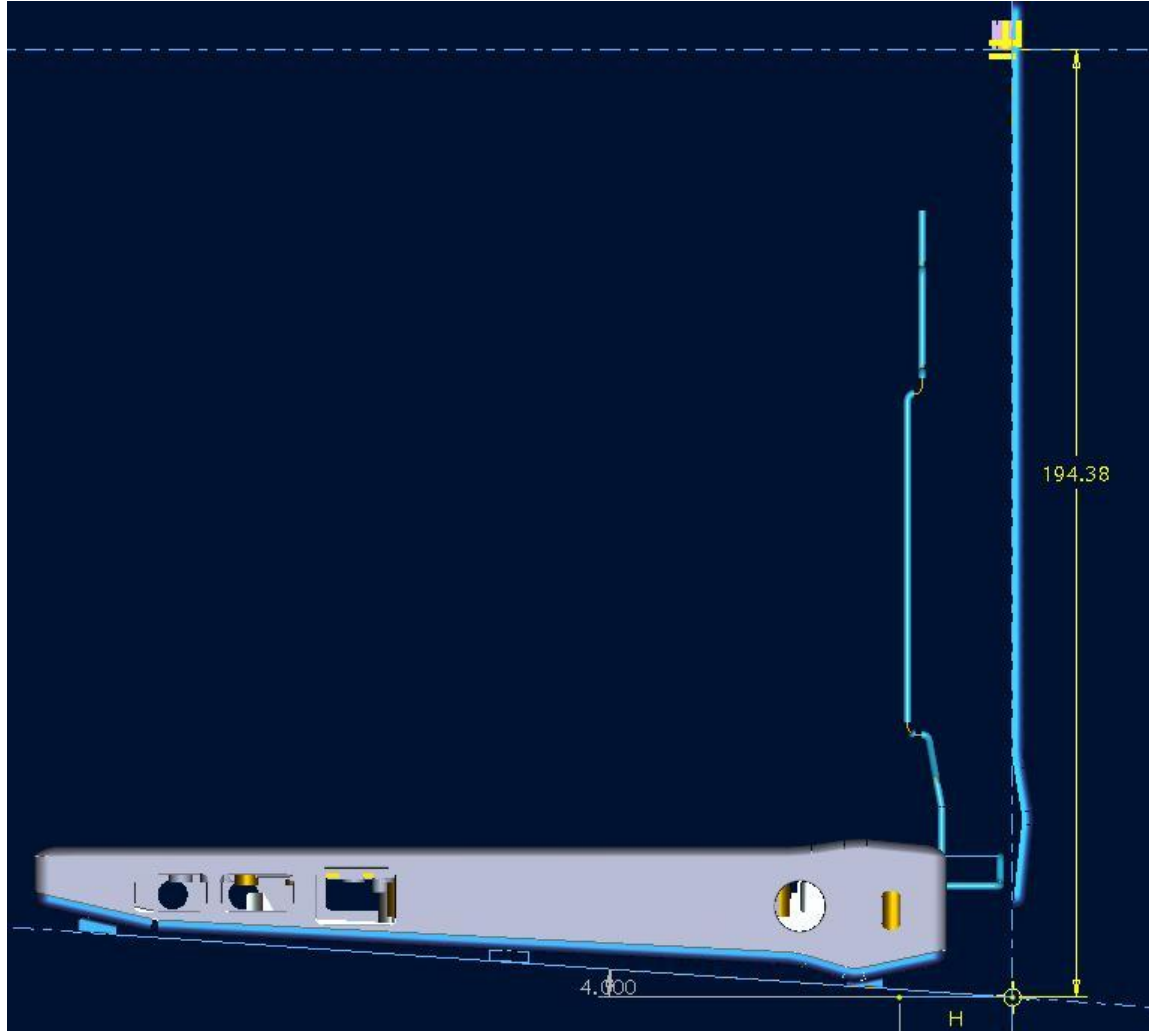
Section 5. Antenna Host Platform Location Information

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, 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
Taiwan						
Argentina						
Brazil						
Indonesia						
Israel						
Malaysia						
Mexico						
Singapore						Telecommunication Equipment Dealer License Required
South Africa						
USA, Canada						