

Regulatory WLAN Antenna Information

(English Language Required for Intel Regulatory Review / Approval)

Platform	
Platform Owner	
Brand Name	
Model Name	Hanks-MLK
ODM	Quanta
Target Launch Date	
Antenna	
Brand Name	ACON
Part Number	■ Tx1 Antenna: APP8P-700087
	■ Tx2 Antenna: APP8P-700087
	■ Tx3 (or Rx3) Antenna : APP8P-700086
Module	
With WLAN Module	☐ WM3B2200BG
(Check Box)	☐ WM3B2915ABG
	☐ WM3945ABG
	☐ 4965AGN
	☐ 4965AG_
	☐ 533ANX Family
	☐ 512ANX Family
	☐ 533AN Family
	☐ 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 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 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)
Tx1 Antenna APP6P-700087 Main White	ACON Corporation	PIFA	1) cable p/n: /GBE RF113WL5 2) O.D. 1.13mm 50 ohm coaxial cable 3) length: 698mm 4) Connector P/N:I-PEX-MHF 20278-112R-13	2400-2500MHz 0.70 dBi (peak)	2400-2500MHz 2.67 dBi (peak)	2400-2500MHz 3.0 max	2400-2500MHz 1.97dBi (peak)
				2500-2700MHz 1.26 dBi (peak)	2500-2700MHz 3.31 dBi (peak)	2500-2700MHz 3.0 max	2500-2700MHz 2.05dBi (peak)
				5150-5350MHz -0.50dBi (peak)	5150-5350MHz 2.11 dBi (peak)	5150-5350MHz 3.0 max	5150-5350MHz 2.61dBi (peak)
				5470-5725MHz -0.90 dBi (peak)	5470-5725MHz 1.83 dBi (peak)	5470-5725MHz 3.0 max	5470-5725MHz 2.73dBi (peak)
				5725-5850MHz -1.88 dBi (peak)	5725-5850MHz 0.93 dBi (peak)	5725-5850MHz 3.0 max	5725-5850MHz 2.81dBi (peak)
Tx2 antenna APP6P-700087 Aux black	ACON Corporation	PIFA	1) cable p/n: /GBE RF113BL5 2) O.D. 1.13mm 50 ohm coaxial cable 3) length: 758mm 4) Connector P/N:I-PEX-MHF 20278-112R-13	2400-2500MHz 0.86 (peak) *	2400-2500MHz 2.99 dBi (peak) *	2400-2500MHz 3.0 max *	2400-2500MHz 2.13dBi (peak) *
				2500-2700MHz 1.43 dBi (peak) *	2500-2700MHz 3.61dBi (peak) *	2500-2700MHz 3.0 max *	2500-2700MHz 2.18dBi (peak) *
				5150-5350MHz 0.09 dBi (peak) *	5150-5350MHz 2.91 dBi (peak) *	5150-5350MHz 3.0 max *	5150-5350MHz 2.82dBi (peak) *
				5470-5725MHz -0.03 dBi (peak) *	5470-5725MHz 2.90 dBi (peak) *	5470-5725MHz 3.0 max *	5470-5725MHz 2.93dBi (peak) *
				5725-5850MHz -0.03 dBi (peak) *	5725-5850MHz 3.14 dBi (peak) *	5725-5850MHz 3.0 max *	5725-5850MHz 3.17dBi (peak) *
Tx3 antenna APP6P-700086 MIMO Gray	ACON Corporation	PIFA	1) cable p/n: /GBE RF113GL5 2) O.D. 1.13mm 50 ohm coaxial cable 3) length:638.5mm 4) Connector P/N:I-PEX-MHF 20278-112R-13	2400-2500MHz -0.46 dBi (peak) *	2400-2500MHz 1.33 dBi (peak)	2400-2500MHz 3.0 max *	2400-2500MHz 1.79dBi (peak) *
				5150-5350MHz 1.89 dBi (peak) *	5150-5350MHz 4.27dBi (peak) *	5150-5350MHz 3.0 max *	5150-5350MHz 2.38dBi (peak) *
				5470-5725MHz 2.11 dBi (peak) *	5470-5725MHz 4.68 dBi (peak) *	5470-5725MHz 3.0 max *	5470-5725MHz 2.57dBi (peak) *
				5725-5850MHz 2.11 dBi (peak) *	5725-5850MHz 4.78 dBi (peak) *	5725-5850MHz 3.0 max *	5725-5850MHz 2.67dBi (peak) *

NOTE:

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

Antenna Peak Gain Table:

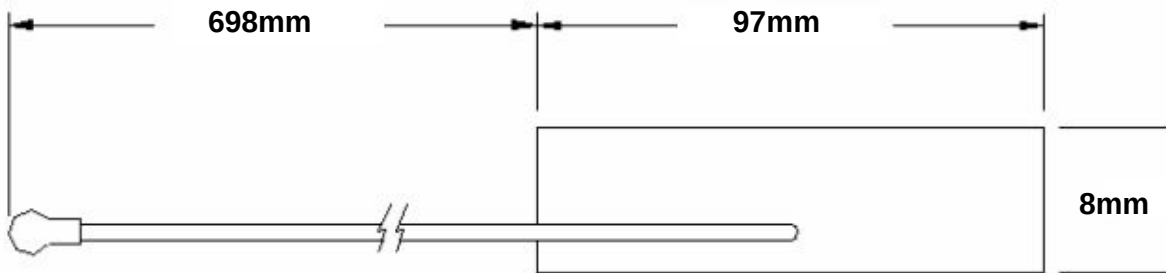
	Tx1 antenna		Tx2 (or Rx2) Antenna		Tx3 (or Rx3) Antenna	
Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
2400	-2.50	-1.40	0.86	-0.75	-0.46	-2.41
2442	-0.54	-0.54	-0.05	-0.94	-0.27	-1.50
2484	0.50	0.70	0.46	-0.54	-0.69	-0.60
2500	-0.03	-0.07	0.96	-0.22	X	X
2525	-0.70	-0.31	1.43	0.50	X	X
2550	-0.19	0.71	1.19	0.49	X	X
2575	-0.23	0.93	0.67	0.18	X	X
2600	0.18	-0.27	0.20	-0.24	X	X
2625	-0.42	-0.18	-0.54	-1.60	X	X
2650	-0.93	0.03	-0.80	-1.82	X	X
2675	-0.97	0.22	-0.10	-0.58	X	X
2700	0.78	1.26	0.06	-0.51	X	X
5150	-0.50	-1.37	0.09	-0.60	1.81	1.63
5350	-1.09	-1.68	0.02	-0.02	0.73	1.89
5470	-0.90	-1.73	-0.08	-0.32	0.39	1.39
5725	-2.51	-1.88	-0.03	-1.31	1.30	2.11
5875	-2.03	-2.89	-0.37	-1.58	1.50	1.88

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

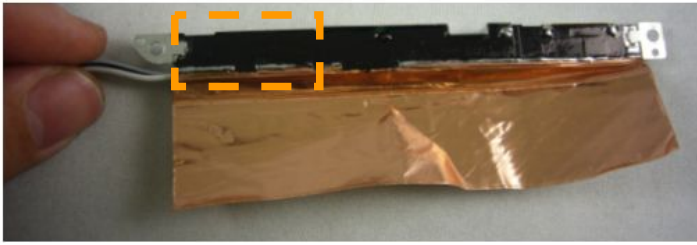
Include a dimensioned photo and dimensioned drawing of Tx1 antenna here.

Tx1 Antenna Dimensioned Drawing:



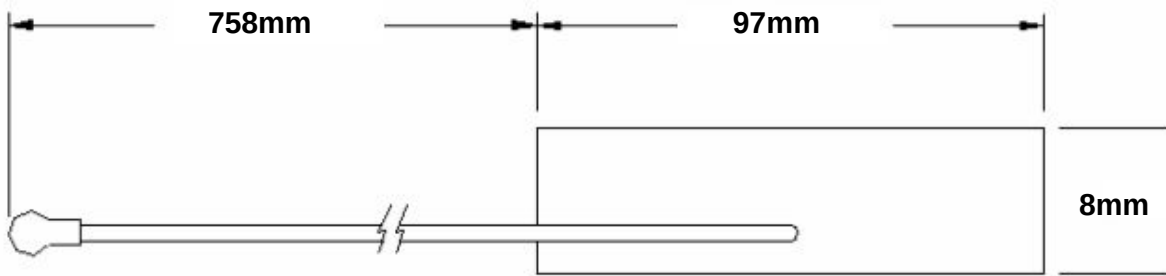
Tx1 Antenna Photo:

TX1 Ant.



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

Tx2 (or Rx2) Antenna Dimensioned Drawing:

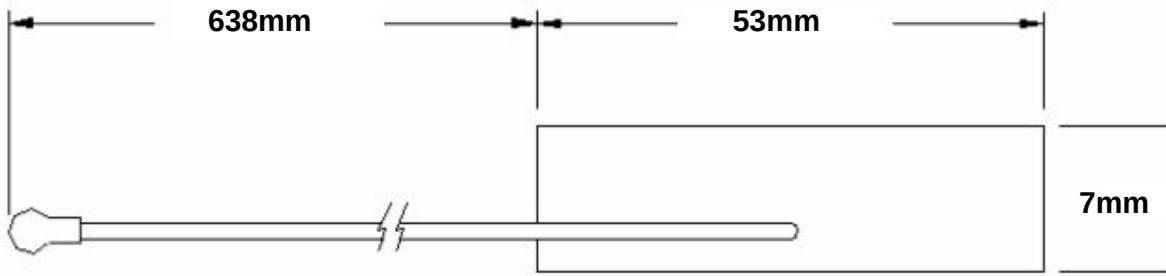


Tx2 (or Rx2) Antenna Photo:



Include a dimensioned photo and dimensioned drawing of Tx3 (or Rx3) antenna here.

Tx3 (or Rx3) Antenna Dimensioned Drawing:



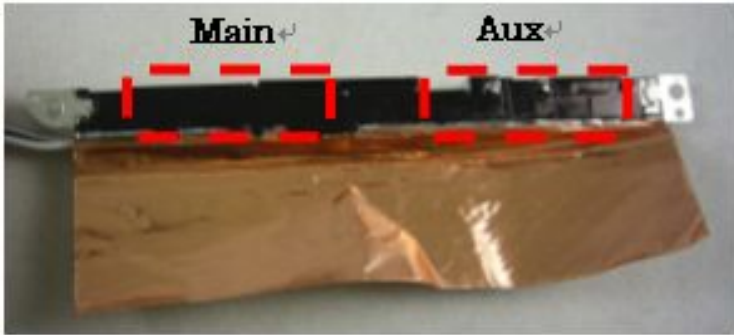
Tx3 (or Rx3) Antenna Photo:



Include front view photo of all 3 antennas here.

Antenna Manufacturer: ACON

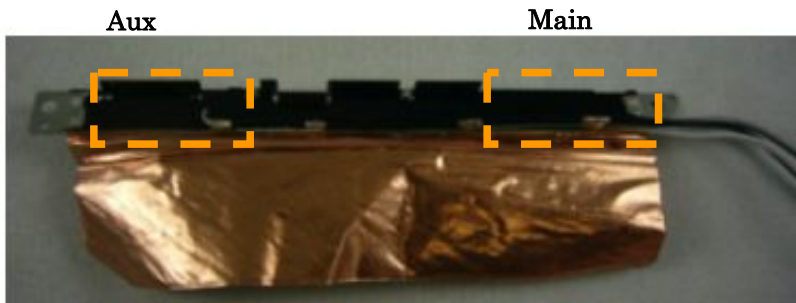
Antenna Part Number: APP6P-700087 (Main), APP6P-700087 (Aux), APP6P-700086 (MIMO)



Include back view photo of all 3 antennas here.

Antenna Manufacturer: ACON

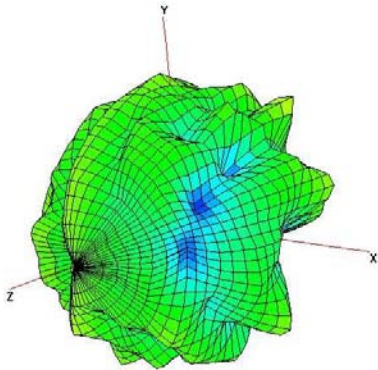
Antenna Part Number: APP6P-700087 (Main), APP6P-700087 (Aux), APP6P-700086 (MIMO)



Section 3. Radiation characteristics of antennae Loaded in Host Platform

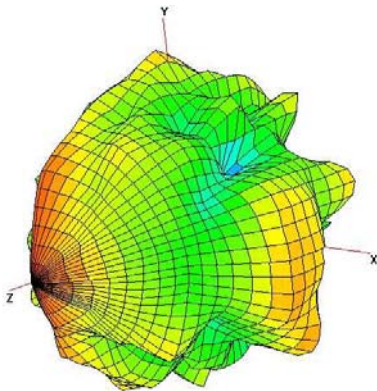
2400-2500MHz radiation characteristic

Tx1 antenna: 2400 MHz

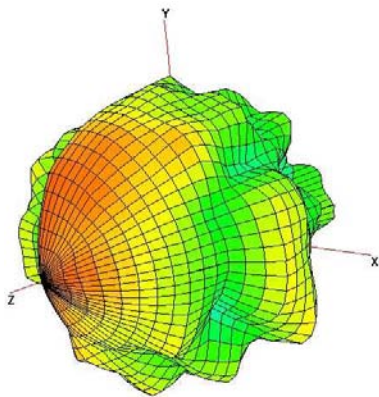


Center Frequency	2400 MHz
Horizontal (dBi) peak	-2.50
Vertical (dBi) peak	-1.40

Tx1 antenna: 2442 MHz

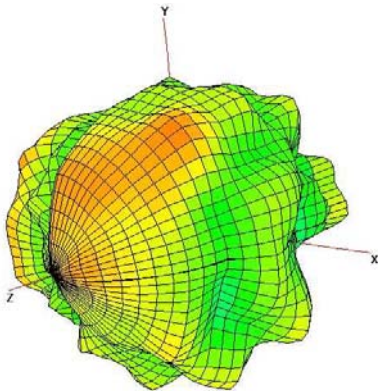


Center Frequency	2442 MHz
Horizontal (dBi) peak	-0.54
Vertical (dBi) peak	-0.54



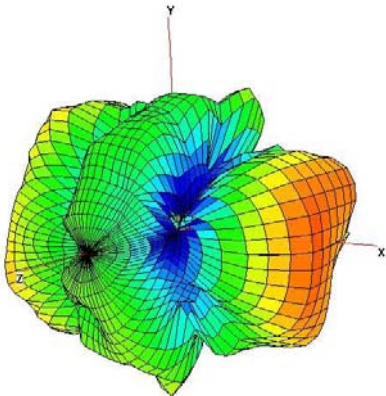
Center Frequency	2484 MHz
Horizontal (dBi) peak	0.50
Vertical (dBi) peak	0.70

Tx1 antenna: 2500 MHz



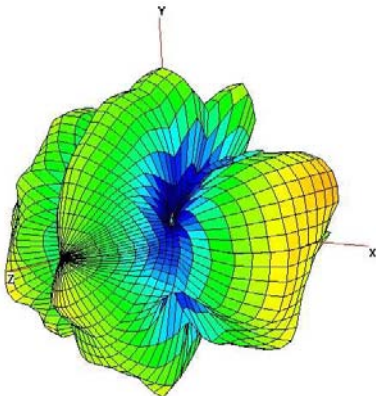
Center Frequency	2500MHz
Horizontal (dBi) peak	-0.03
Vertical (dBi) peak	-0.07

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



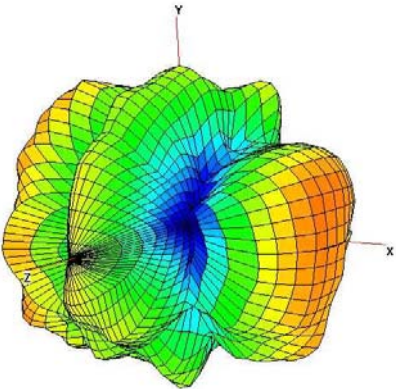
Center Frequency	2400 MHz
Horizontal (dBi) peak	0.86
Vertical (dBi) peak	-0.75

Tx2 (or Rx2) antenna: 2442 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



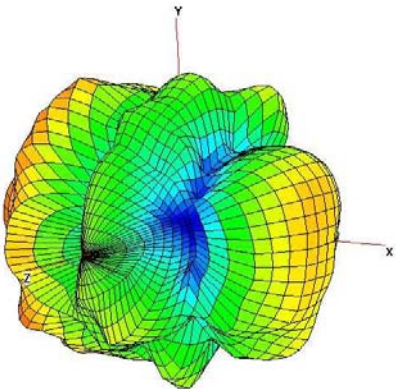
Center Frequency	2442 MHz
Horizontal (dBi) peak	-0.05
Vertical (dBi) peak	-0.94

Tx2 (or Rx2) antenna: 2484 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



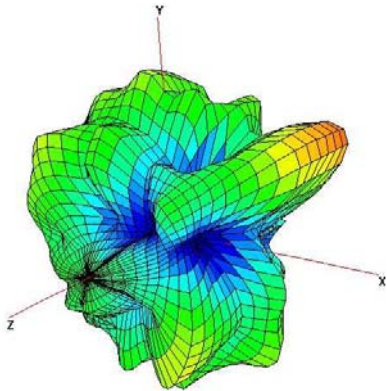
Center Frequency	2484 MHz
Horizontal (dBi) peak	0.46
Vertical (dBi) peak	-0.54

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



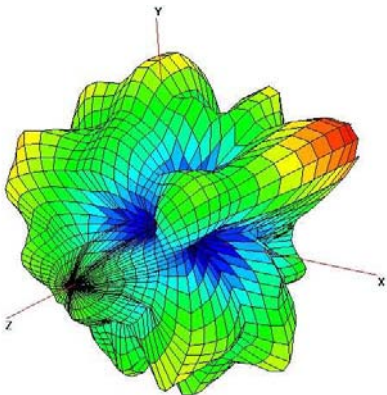
Center Frequency	2500 MHz
Horizontal (dBi) peak	0.96
Vertical (dBi) peak	-0.22

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



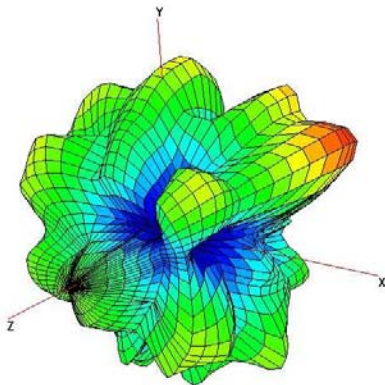
Center Frequency	2400 MHz
Horizontal (dBi) peak	-0.46
Vertical (dBi) peak	-2.41

Tx3 (or Rx3) antenna: 2442 MHz (Plot is not required if 3rd Antenna is receive only e.g. Rx3 for 4965AGN)



Center Frequency	2442 MHz
Horizontal (dBi) peak	-0.27
Vertical (dBi) peak	-1.50

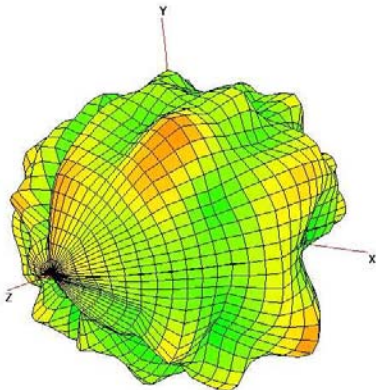
Tx3 (or Rx3) antenna: 2484 MHz (Plot is not required if 3rd Antenna is receive only e.g. Rx3 for 4965AGN)



Center Frequency	2484 MHz
Horizontal (dBi) peak	-0.69
Vertical (dBi) peak	-0.60

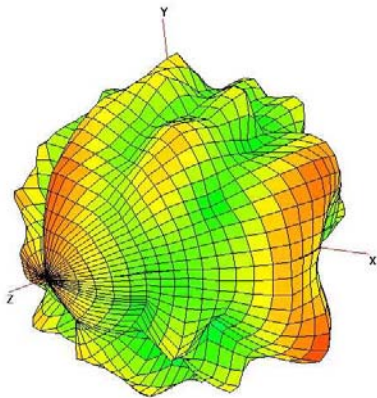
2525-2700MHz radiation characteristic

Tx1antenna: 2525MHz



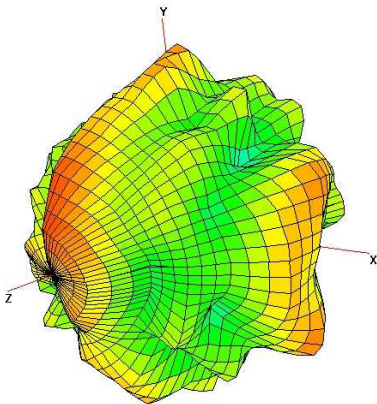
Center Frequency	2525MHz
Horizontal (dBi) peak	-0.70
Vertical (dBi) peak	-0.31

Tx1 antenna: 2550MHz

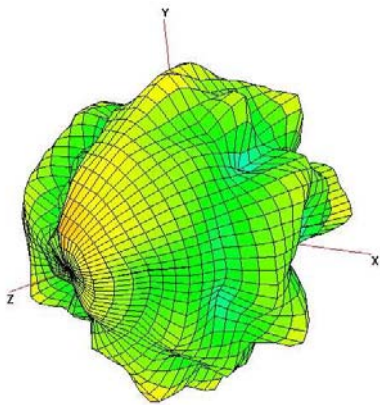


Center Frequency	2550 MHz
Horizontal (dBi) peak	-0.19
Vertical (dBi) peak	0.71

Tx1 antenna: 2575 MHz

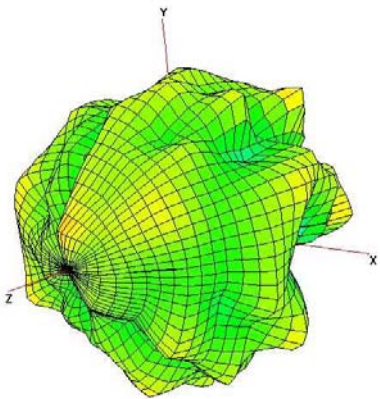


Center Frequency	2575 MHz
Horizontal (dBi) peak	-0.23
Vertical (dBi) peak	0.93



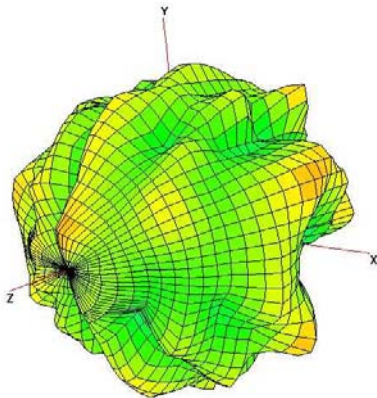
Center Frequency	2600 MHz
Horizontal (dBi) peak	0.18
Vertical (dBi) peak	-0.27

Tx1 antenna: 2625 MHz



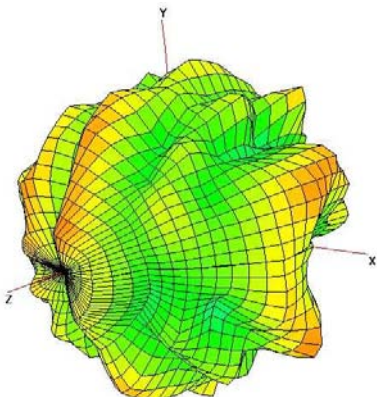
Center Frequency	2625 MHz
Horizontal (dBi) peak	-0.42
Vertical (dBi) peak	-0.18

Tx1 antenna: 2650 MHz



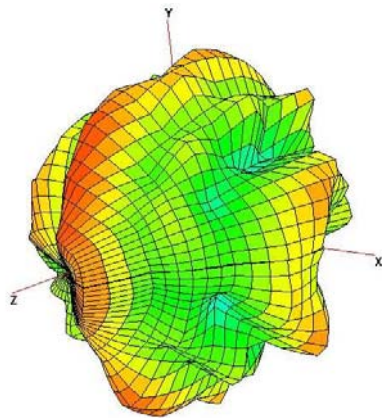
Center Frequency	2650 MHz
Horizontal (dBi) peak	-0.93
Vertical (dBi) peak	0.03

Tx1 antenna: 2675 MHz



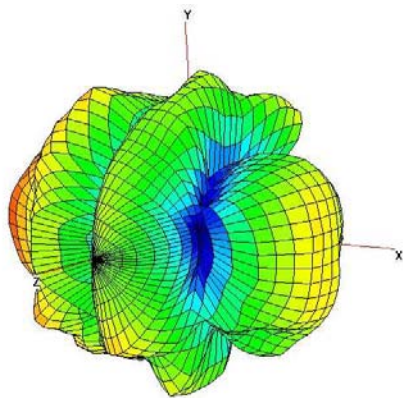
Center Frequency	2675 MHz
Horizontal (dBi) peak	-0.97
Vertical (dBi) peak	0.22

Tx1 antenna: 2700 MHz



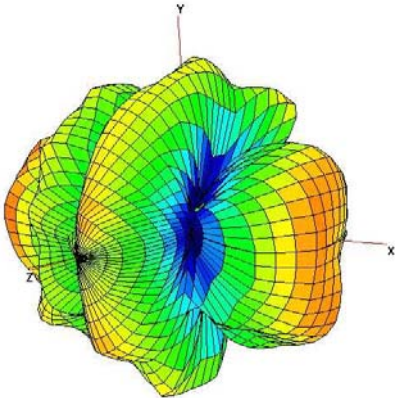
Center Frequency	2700 MHz
Horizontal (dBi) peak	0.78
Vertical (dBi) peak	1.26

Tx2 (or Rx2) antenna: 2525MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



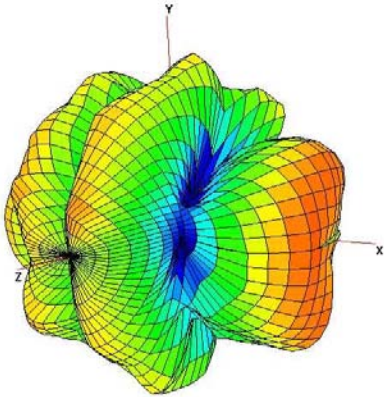
Center Frequency	2525 MHz
Horizontal (dBi) peak	1.43
Vertical (dBi) peak	0.50

Tx2 (or Rx2) antenna: 2550MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



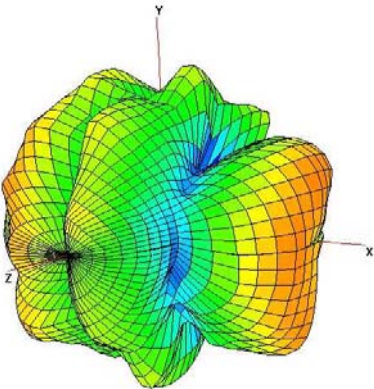
Center Frequency	2550 MHz
Horizontal (dBi) peak	1.19
Vertical (dBi) peak	0.49

Tx2 (or Rx2) antenna: 2575 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



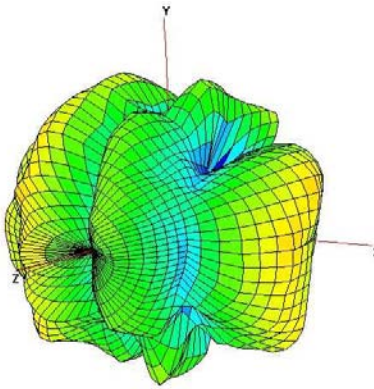
Center Frequency	2575 MHz
Horizontal (dBi) peak	0.67
Vertical (dBi) peak	0.18

Tx2 (or Rx2) antenna: 2600 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



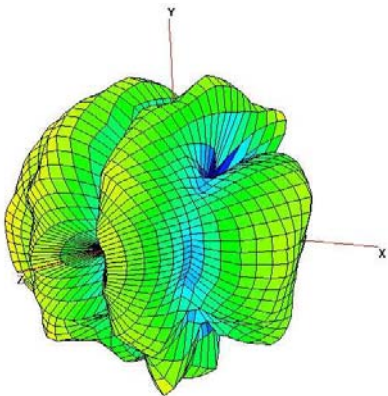
Center Frequency	2600 MHz
Horizontal (dBi) peak	0.20
Vertical (dBi) peak	-0.24

Tx2 (or Rx2) antenna: 2625 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



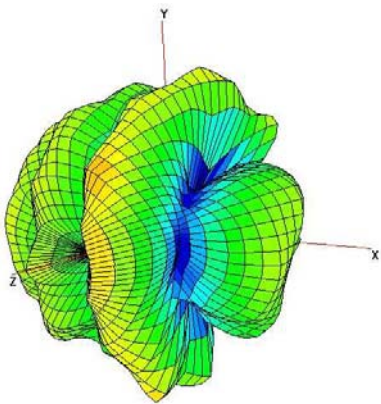
Center Frequency	2625 MHz
Horizontal (dBi) peak	-0.54
Vertical (dBi) peak	-1.60

Tx2 (or Rx2) antenna: 2650 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



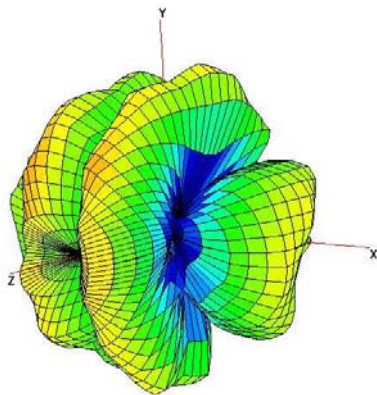
Center Frequency	2650 MHz
Horizontal (dBi) peak	-0.80
Vertical (dBi) peak	-1.82

Tx2 (or Rx2) antenna: 2675 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



Center Frequency	2675 MHz
Horizontal (dBi) peak	-0.10
Vertical (dBi) peak	-0.58

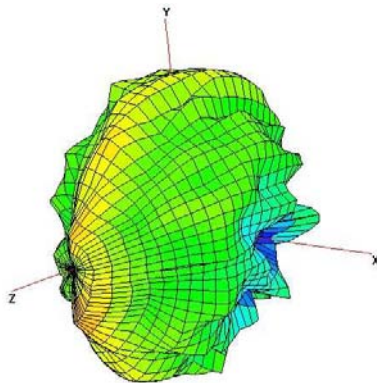
Tx2 (or Rx2) antenna: 2700 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



Center Frequency	2700 MHz
Horizontal (dBi) peak	0.06
Vertical (dBi) peak	-0.51

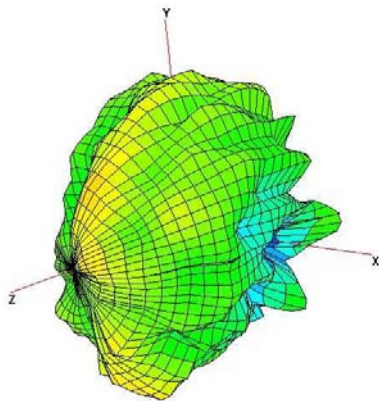
5150-5350 MHz radiation characteristic

Tx1 antenna: 5150 MHz



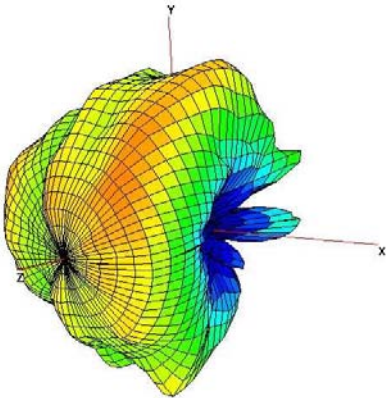
Center Frequency	5150 MHz
Horizontal (dBi) peak	-0.50
Vertical (dBi) peak	-1.37

Tx1 antenna: 5350 MHz



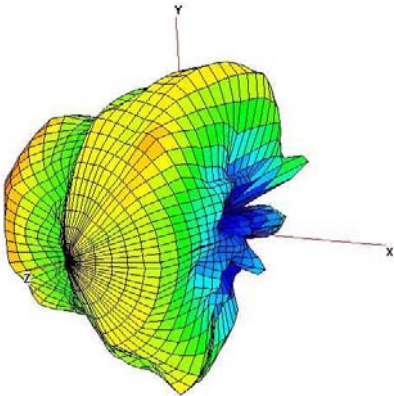
Center Frequency	5350 MHz
Horizontal (dBi) peak	-1.09
Vertical (dBi) peak	-1.68

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



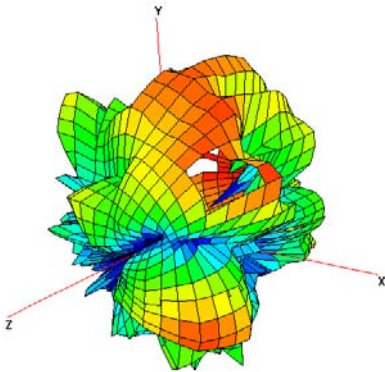
Center Frequency	5150 MHz
Horizontal (dBi) peak	0.09
Vertical (dBi) peak	-0.60

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



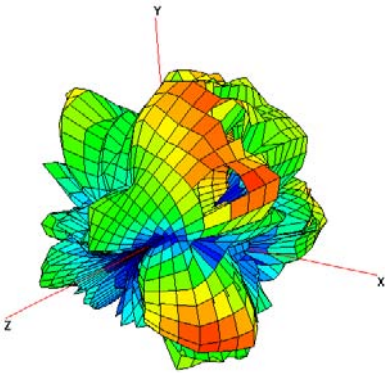
Center Frequency	5350 MHz
Horizontal (dBi) peak	0.02
Vertical (dBi) peak	-0.02

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



Center Frequency	5150 MHz
Horizontal (dBi) peak	1.81
Vertical (dBi) peak	1.63

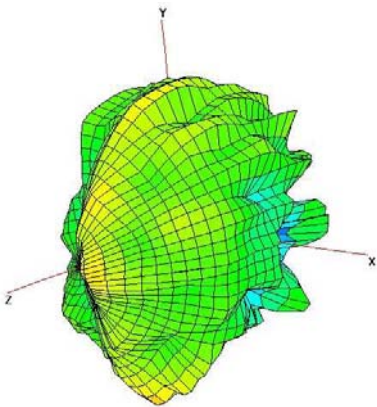
Tx3 (or Rx3) antenna: 5350 MHz (Plot is not required if 3rd Antenna is receive only e.g. Rx3 for 4965AGN)



Center Frequency	5350 MHz
Horizontal (dBi) peak	0.73
Vertical (dBi) peak	1.89

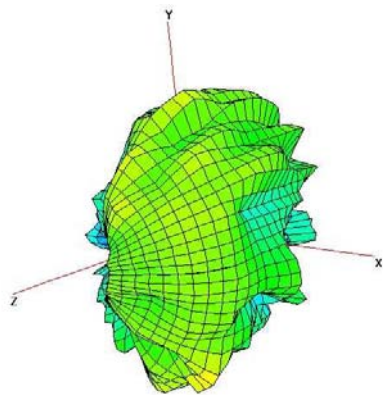
5470-5725MHz radiation characteristic

Tx1 antenna: 5470 MHz



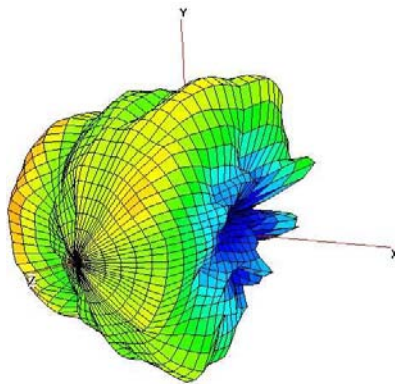
Center Frequency	5470 MHz
Horizontal (dBi) peak	-0.90
Vertical (dBi) peak	-1.73

Tx1 antenna: 5725 MHz



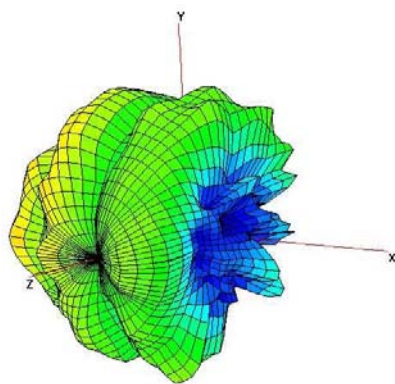
Center Frequency	5725 MHz
Horizontal (dBi) peak	-2.51
Vertical (dBi) peak	-1.88

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



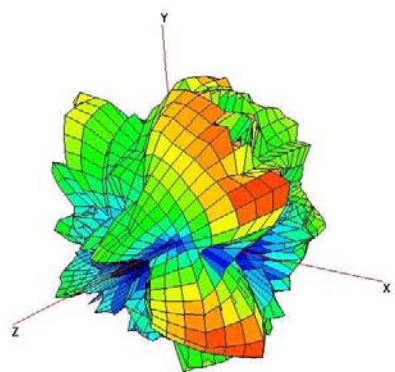
Center Frequency	5470 MHz
Horizontal (dBi) peak	-0.08
Vertical (dBi) peak	-0.32

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



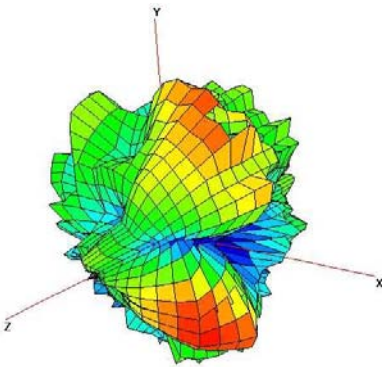
Center Frequency	5725 MHz
Horizontal (dBi) peak	-0.03
Vertical (dBi) peak	-1.31

Tx3 (or Rx3): 5470 MHz (Plot is not required if 3rd Antenna is receive only e.g. Rx3 for 4965AGN)



Center Frequency	5470 MHz
Horizontal (dBi) peak	0.39
Vertical (dBi) peak	1.39

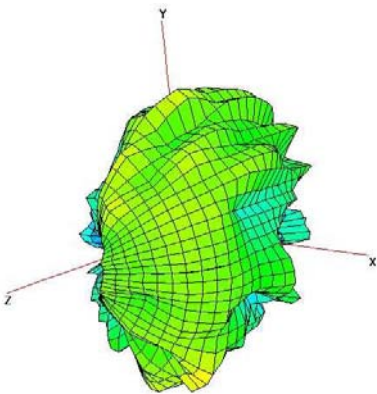
Tx3 (or Rx3) antenna: 5725 MHz (Plot is not required if 3rd Antenna is receive only e.g. Rx3 for 4965AGN)



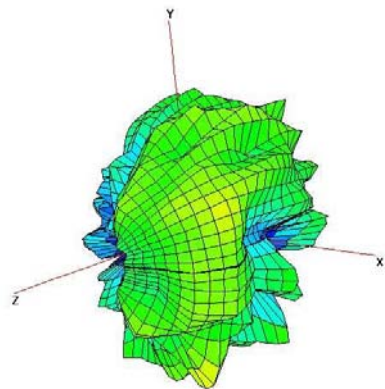
Center Frequency	5725 MHz
Horizontal (dBi) peak	1.30
Vertical (dBi) peak	2.11

5725-5875 MHz radiation characteristic

Tx1 antenna: 5725 MHz

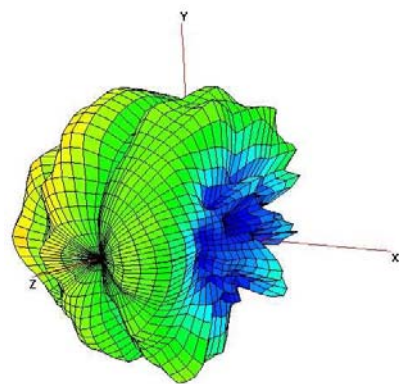


Center Frequency	5725 MHz
Horizontal (dBi) peak	-2.51
Vertical (dBi) peak	-1.88



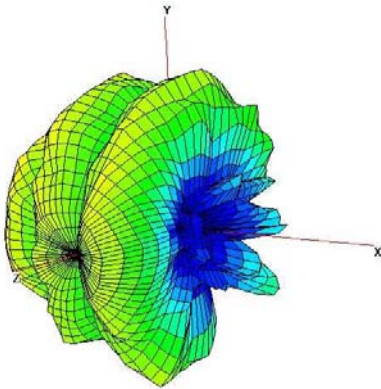
Center Frequency	5875 MHz
Horizontal (dBi) peak	-2.03
Vertical (dBi) peak	-2.89

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



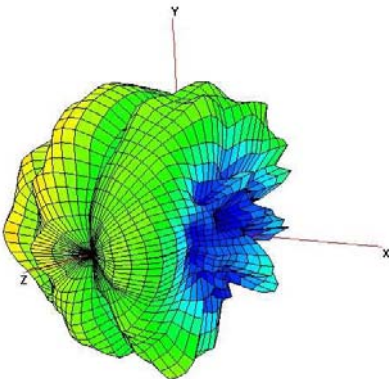
Center Frequency	5725 MHz
Horizontal (dBi) peak	-0.03
Vertical (dBi) peak	-1.31

Tx2 (or Rx2) antenna: 5875 MHz (Plot is not required if 2nd Antenna is receive only e.g. Rx2 for 512 family)



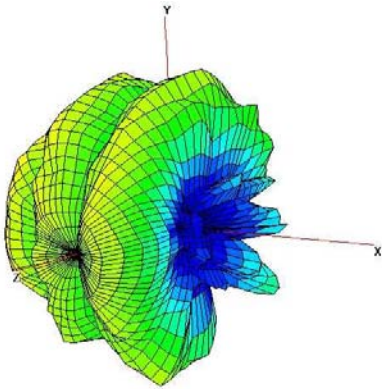
Center Frequency	5875 MHz
Horizontal (dBi) peak	-0.37
Vertical (dBi) peak	-1.58

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



Center Frequency	5725 MHz
Horizontal (dBi) peak	1.30
Vertical (dBi) peak	2.11

Tx3 (or Rx3) antenna: 5875 MHz (Plot is not required if 3rd Antenna is receive only e.g. Rx 3 for 4965AGN)



Center Frequency	5875 MHz
Horizontal (dBi) peak	1.50
Vertical (dBi) peak	1.88

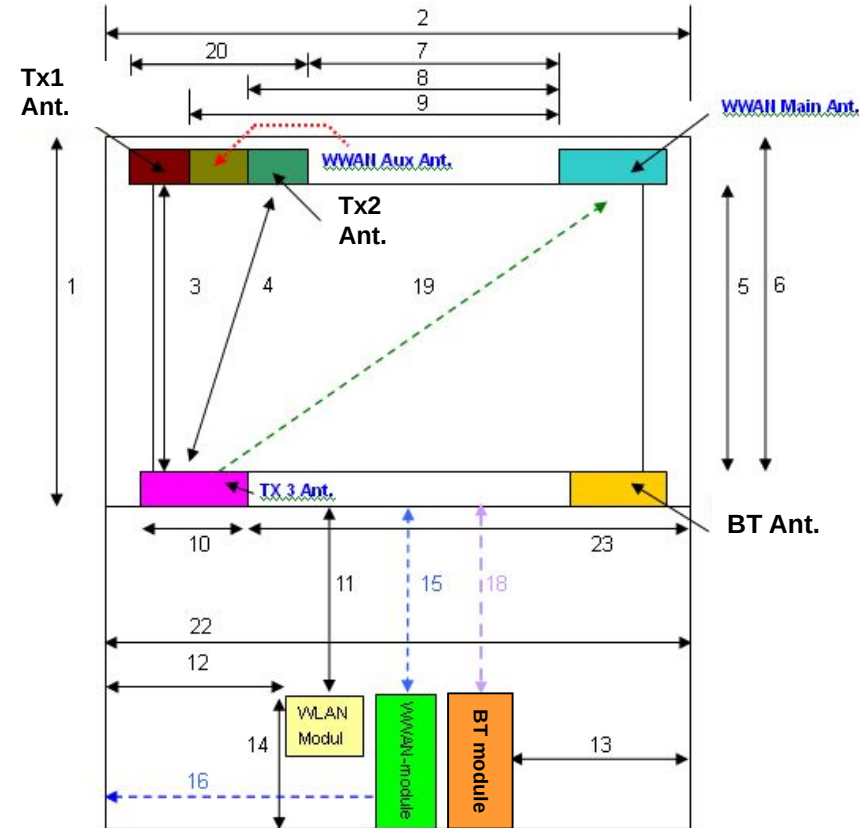
Section 4. Host Platform Information

OEM / ODM Host platform: (DELL) 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.



Antenna placement
 Tx1 Antenna : WLAN main
 Tx2 Antenna : WLAN Aux
 Tx3 Antenna : MIMO

Antenna distance

- ①:250mm
- ②:370mm
- ③:220mm
- ④:230mm
- ⑤:215mm
- ⑥:232mm
- ⑦:131mm
- ⑧:165mm
- ⑨:207mm
- ⑩:320mm
- ⑪:275mm

Antenna size

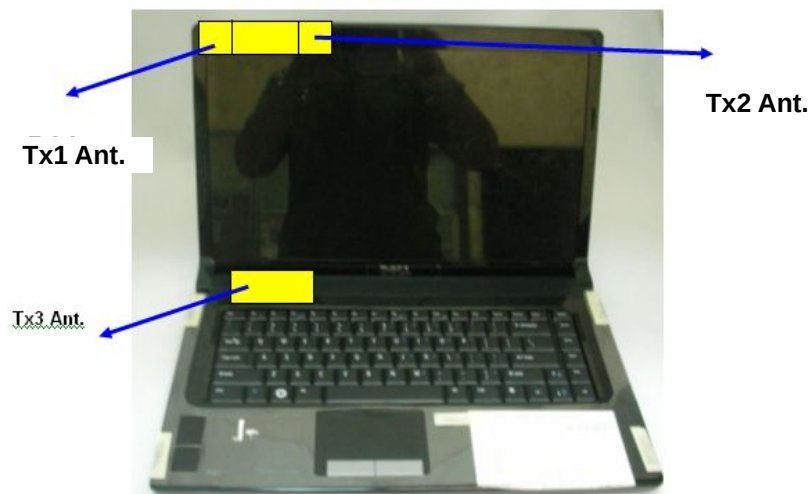
- ⑩:70mm
- ⑪:105mm

Module to base distance

- ⑪:165mm
- ⑫:140mm
- ⑬:143mm
- ⑭:75mm
- ⑮:153mm
- ⑯:157mm
- ⑰:153mm

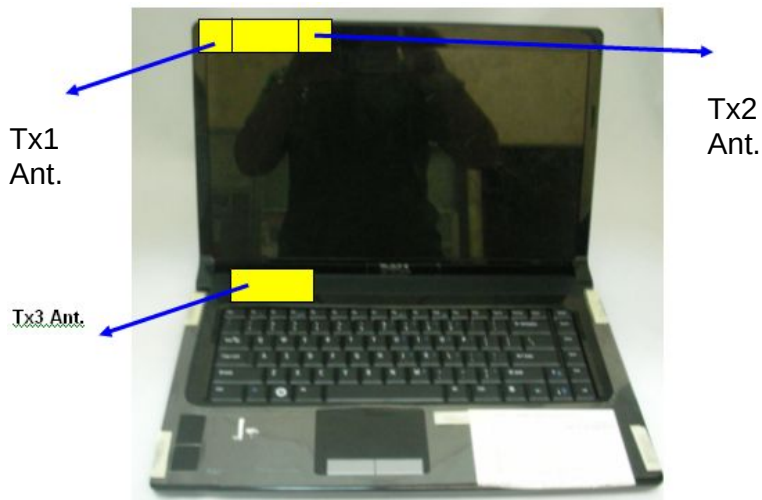
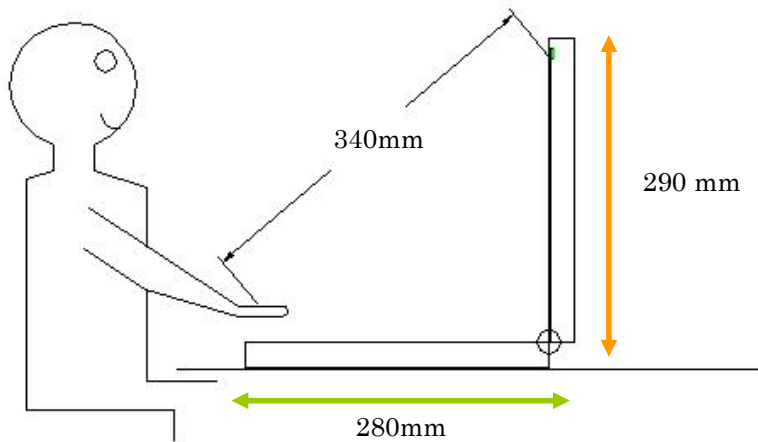
Base size

- ⑰:250mm
- ⑱:370mm



Section 6. Antenna dimensional information for SAR evaluation

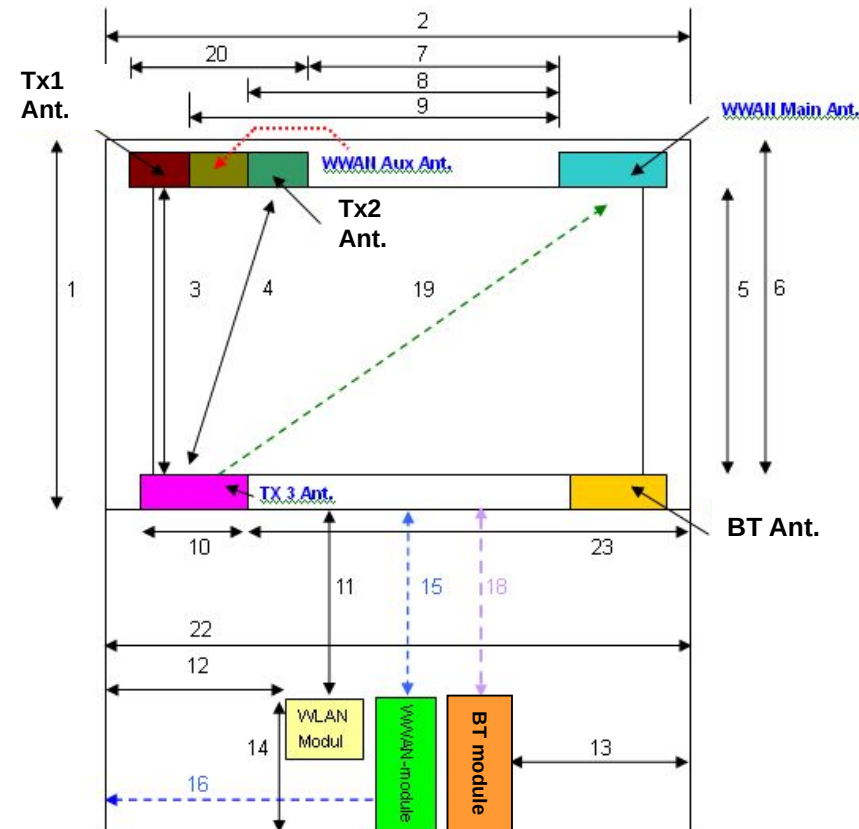
Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between the transmit antennas and the user (excluding hands, wrist, feet, lap/ thigh, and ankle)



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)



Antenna placement
 Tx1 Antenna : WLAN main
 Tx2 Antenna : WLAN Aux
 Tx3 Antenna : MIMO

Antenna distance

- ①:250mm
- ②:370mm
- ③:220mm
- ④:230mm
- ⑤:215mm
- ⑥:232mm
- ⑦:131mm
- ⑧:165mm
- ⑨:207mm
- ⑩:320mm
- ⑪:275mm

Antenna size

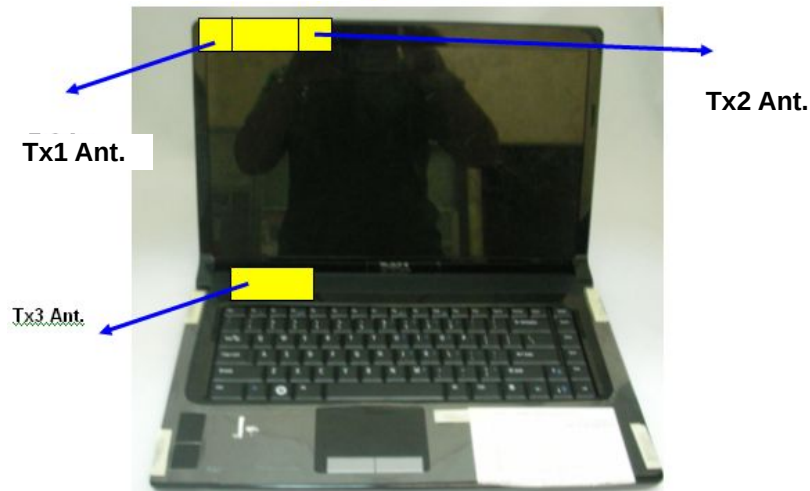
- ⑩:70mm
- ⑪:105mm

Module to base distance

- ⑪:165mm
- ⑫:140mm
- ⑬:143mm
- ⑭:75mm
- ⑮:153mm
- ⑯:157mm
- ⑰:153mm

Base size

- ⑰:250mm
- ⑱:370mm



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						