Regulatory WLAN Antenna Information (TB mode)

Platform information				
Brand	**ODM**	**Platform model name (RMN)**	**Platform type (ex: Notebook PC, convertible PC, AIO…etc)**	**SAR minimum separation (mm)**
HP Inc.	COMPAL	TPN-C161	Convertible PC	2.03

Antenna information			
Vendor	**Type**	**Antenna Part number (Main/TX2)**	**Antenna Part number (Aux/ TX1)**
HTK	**PIFA**	219HCTN12195	219HCTN12196

Peak gain w/ cable loss (dBi)							
2.4GHz 2400-2500MHz	**5.2&5.3GHz** 5150-5350MHz	**5.5GHz** 5470-5725MHz	**5.8GHz** 5725-5850MHz	**6.2GHz** 5925-6425MHz	**6.5GHz** 6425-6525MHz	**6.7GHz** 6525-6875MHz	**6.9GHz** 6875-7125MHz
-0.36	2.42	1.40	0.83	0.69	0.98	1.51	1.45

Module information	
Model	**Form factor and suffixes (NGW/ HMW AND AN/ NB/ BN….)**
AX211NGW (Garfield Peak 2)	Intel Garfield Peak 2 AX211 Wi-Fi 6e +Bluetooth 5.2 M.2 2230 160MHz CNVi WW WLAN

Notes (marked with *)

*** SAR minimum separation (mm)**
- Regular NB: Minimum antenna-to-body (from antenna bottom to the bottom of the device)
- Tablet / Convertible PC: Minimum antenna-to-edge (5 sides of the device)
- Mini-tablet: Minimum antenna-to-edge (6 sides of the device)

*** 3D Peak Antenna gain should be equal or greater than -2 dBi**
- If a host integrator plans to use a lower gain antenna of the same type, additional CBP(FCC)/EDT(EU) testing need to be performed while the module is installed in the host.

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

Antenna Information

Section 1. Antenna Assembly Specifications

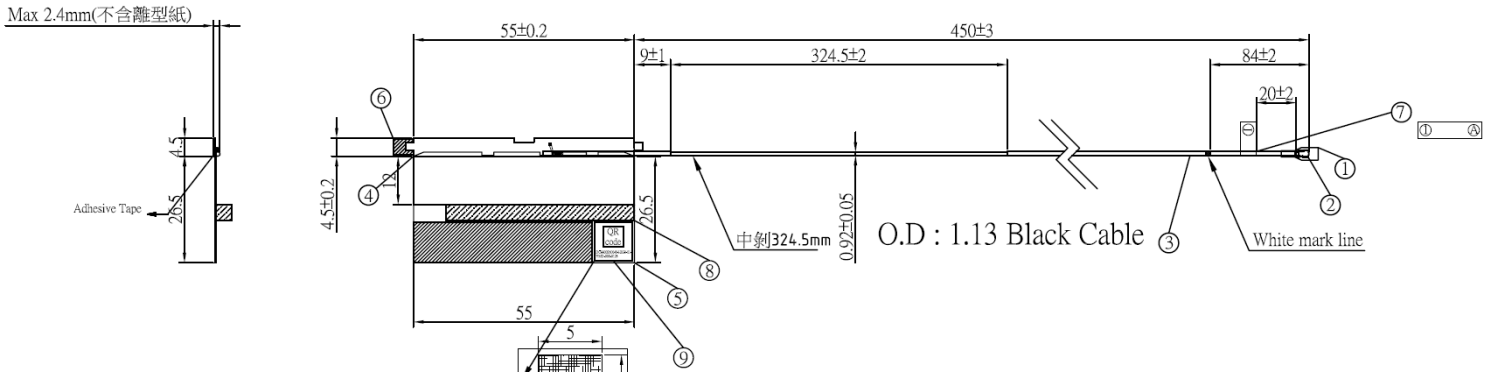
1A Antenna Part Number	1B Manu-facturer	1C Antenna Type	1D Cable Assembly Part Number and Information	Freq Range MHz	1E *Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G Max VSWR	1H Cable Loss (dB)
(P/N: 219HCTN12195) Tx2/ Rx2 Antenna	High-Tek Electronics Co., Ltd	PIFA	Connector: CaiMei 958-C413-W-B-Bu-A0 50 Ohm Coaxial Cable Length: 353mm Diameter:1.13mm	2400-2500	-0.99 dBi (peak)	0.08 dBi (peak)	2400-2500MHz 3.00 max	1.07 dB (peak)
				5150-5250	0.83 dBi (peak)	2.35 dBi (peak)	5150-5350MHz 3.00 max	1.52 dB (peak)
				5250-5350	0.02 dBi (peak)	1.54 dBi (peak)	5150-5350MHz 3.00 max	1.52 dB (peak)
				5470-5725	1.4 dBi (peak)	3.03 dBi (peak)	5470-5725MHz 3.00 max	1.63 dB (peak)
				5725-5850	0.83 dBi (peak)	2.48 dBi (peak)	5725-5850MHz 3.00 max	1.65 dB (peak)
				5925-6425	-0.45 dBi (peak)	1.28 dBi (peak)	5925-6425MHz 3.00 max	1.73 dB (peak)
				6425-6525	-1.15 dBi (peak)	0.6 dBi (peak)	6425-6525MHz 3.00 max	1.75 dB (peak)
				6525-6875	1.51 dBi (peak)	3.3 dBi (peak)	6525-6875MHz 3.00 max	1.79 dB (peak)
				6875-7125	-1.01 dBi (peak)	0.88 dBi (peak)	6875-7125MHz 3.00 max	1.89 dB (peak)
(P/N: 219HCTN12196) Tx1/ Rx1 Antenna	High-Tek Electronics Co., Ltd	PIFA	Connector: CaiMei 958-C413-W-B-Bu-A0 50 Ohm Coaxial Cable Length: 450mm Diameter:1.13mm	2400-2500	-0.36 dBi (peak)	1 dBi (peak)	2400-2500MHz 3.00 max	1.36 dB (peak)
				5150-5250	2.42 dBi (peak)	4.36 dBi (peak)	5150-5350MHz 3.00 max	1.94 dB (peak)
				5250-5350	1.13 dBi (peak)	3.07 dBi (peak)	5150-5350MHz 3.00 max	1.94 dB (peak)
				5470-5725	-0.55 dBi (peak)	1.53 dBi (peak)	5470-5725MHz 3.00 max	2.08 dB (peak)
				5725-5850	-1.07 dBi (peak)	1.04 dBi (peak)	5725-5850MHz 3.00 max	2.11 dB (peak)
				5925-6425	0.69 dBi (peak)	2.89 dBi (peak)	5925-6425MHz 3.00 max	2.2 dB (peak)
				6425-6525	0.98 dBi (peak)	3.2 dBi (peak)	6425-6525MHz 3.00 max	2.22 dB (peak)
				6525-6875	0.98 dBi (peak)	3.26 dBi (peak)	6525-6875MHz 3.00 max	2.28 dB (peak)
				6875-7125	1.45 dBi (peak)	3.86 dBi (peak)	6875-7125MHz 3.00 max	2.41 dB (peak)

- **Antenna Peak Gain required being test in system basis.**
- **1E frame contend absolutely peak antenna gain include H/V**
- **The antenna gain was measured in Anechoic Chamber**

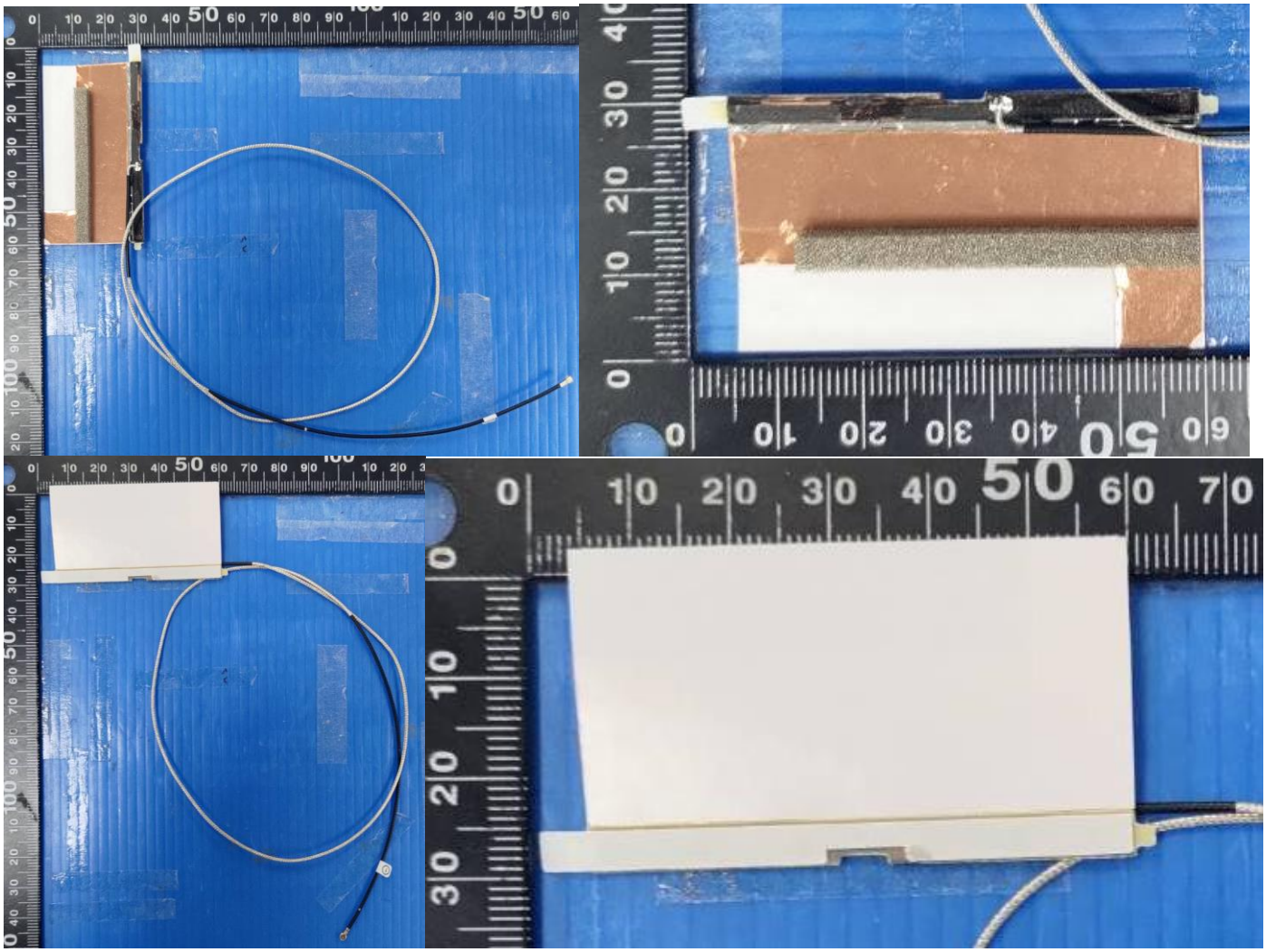
Section 2. Dimensioned Photos or Drawings of Antennas

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

Tx1 Antenna Dimensioned Drawing:

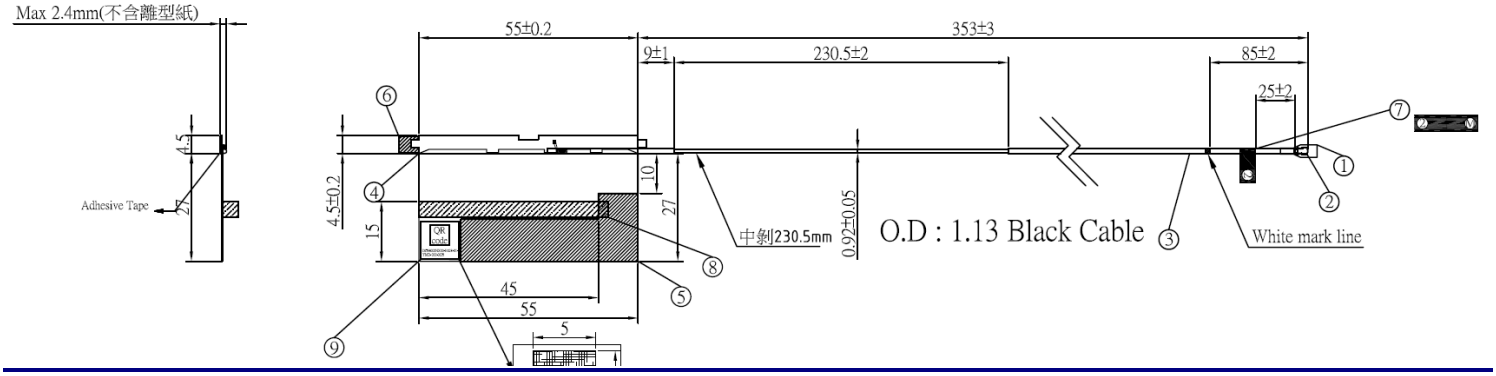


Tx1 Antenna Photo:

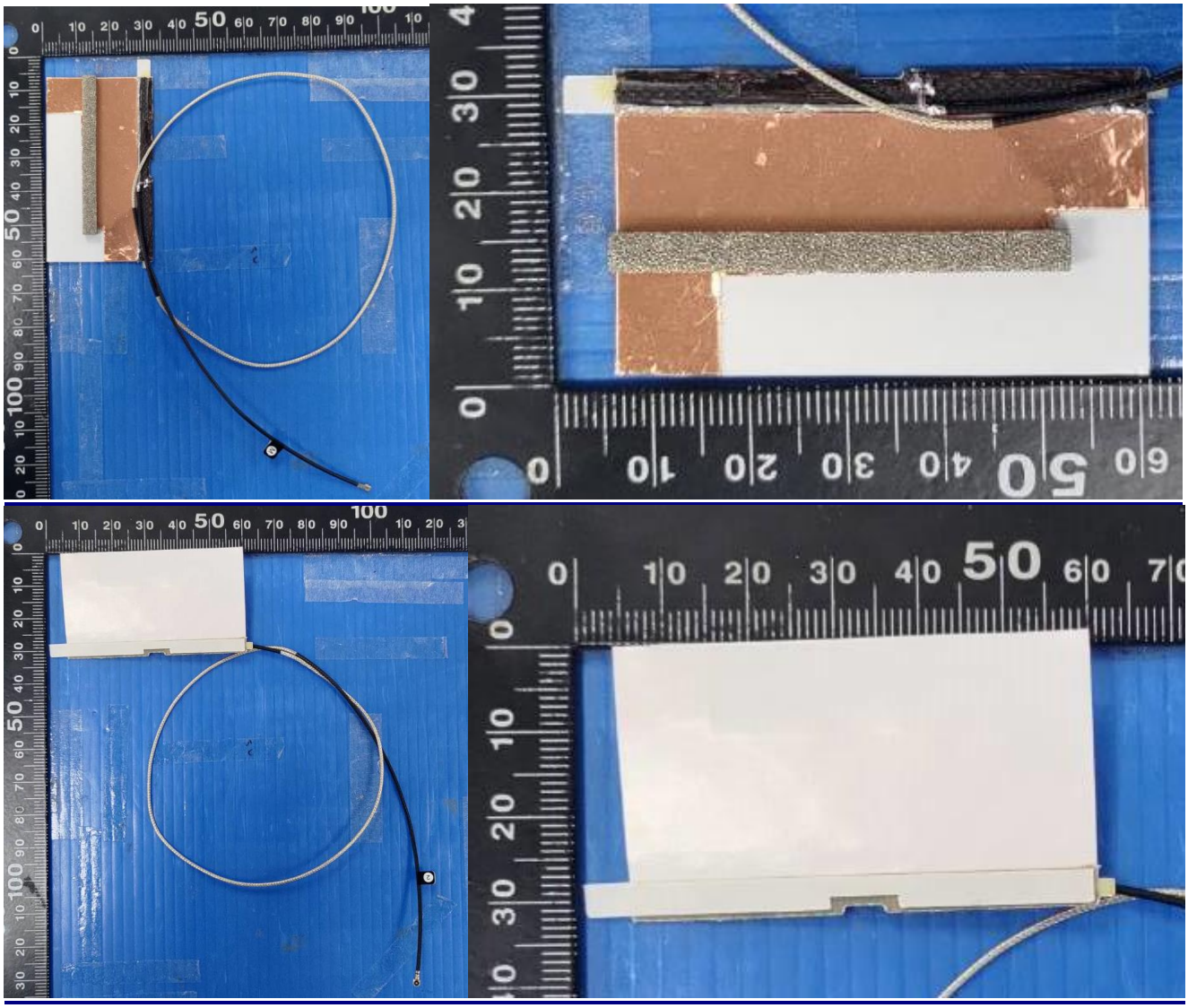


Include a dimensioned photo and dimensioned drawing of Tx2 (or Rx2) antenna here.

Tx2 (or Rx2) Antenna Dimensioned Drawing:



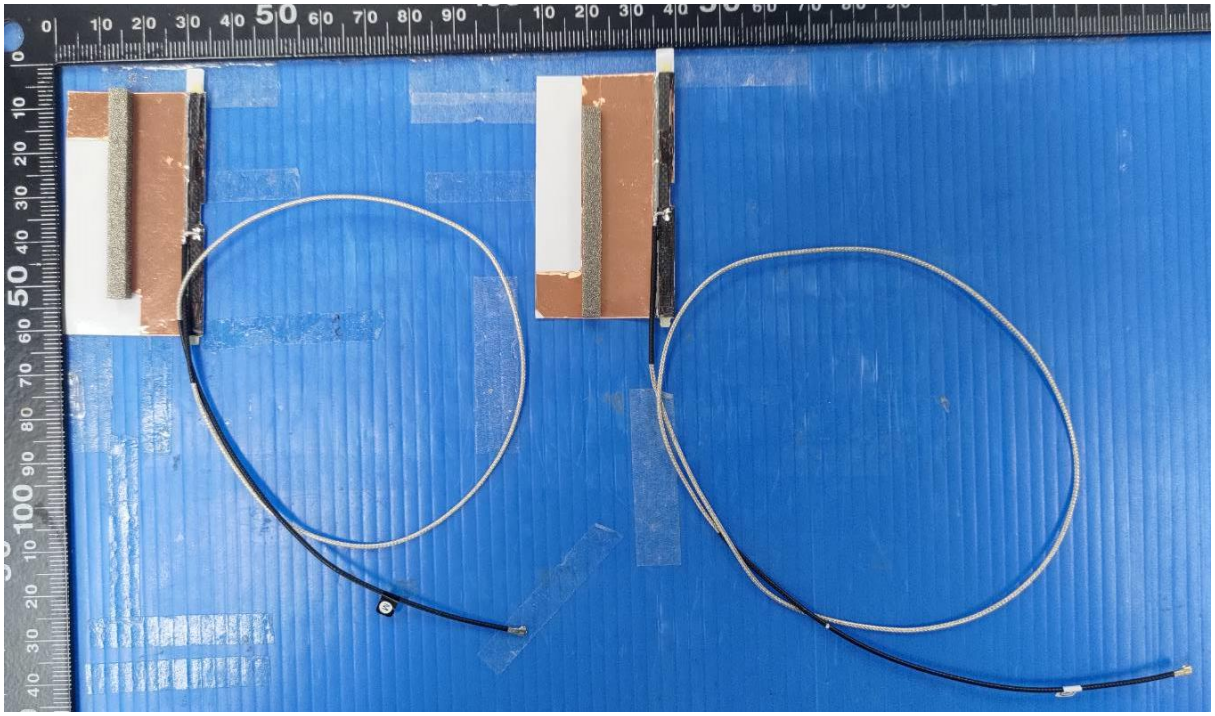
Tx2 (or Rx2) Antenna Photo:



Note: antenna photo should include L type ruler

Include front view photo of all 2 antennas here.

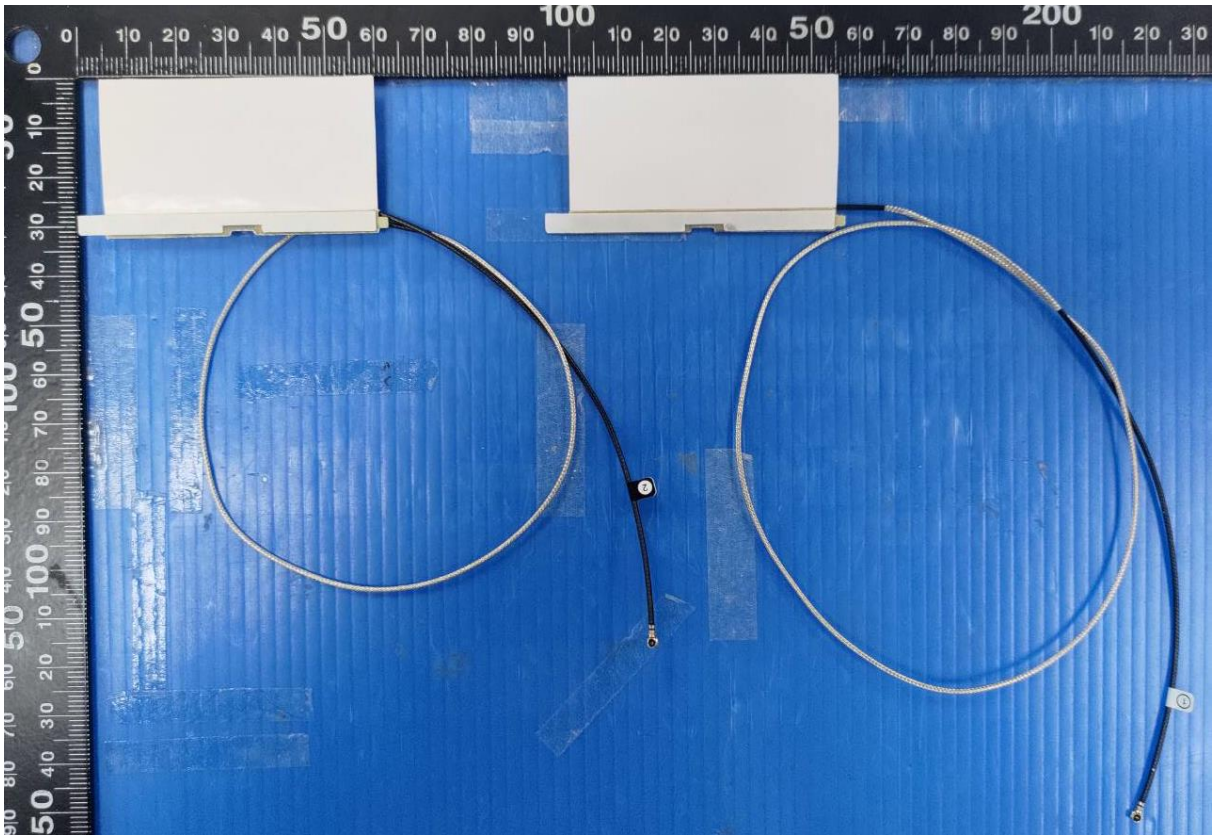
Antenna Manufacturer: High-Tek Electronics Co., Ltd
Antenna Part Number: 219HCTN12196 (Tx1), 219HCTN12195 (Tx2 or Rx2)



Note: antenna photo should include L type ruler

Include back view photo of all 2 antennas here.

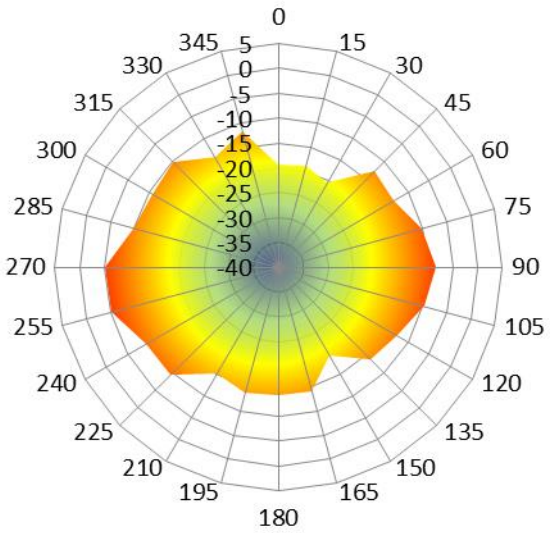
Antenna Manufacturer: High-Tek Electronics Co., Ltd
Antenna Part Number: 219HCTN12196 (Tx1), 219HCTN12195 (Tx2)



Section 3. Radiation characteristics of antennae Loaded in Host Platform

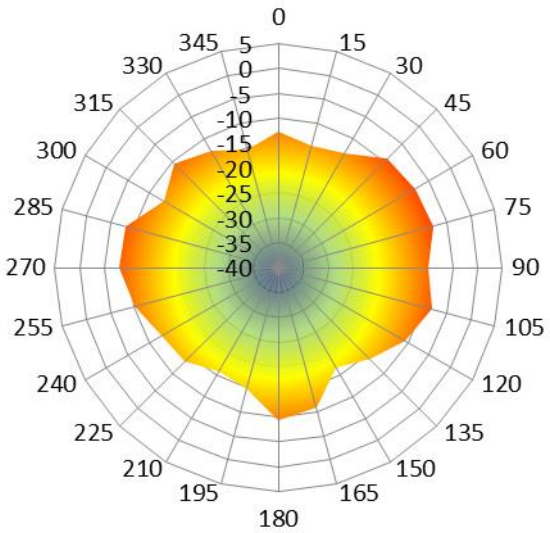
2400-2500MHz radiation characteristic (1E Peak Gain W/ Cable loss (dBi))

Main antenna:



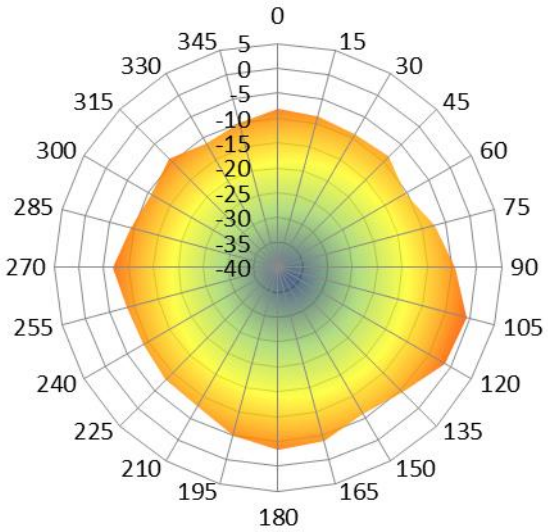
Center Frequency	**2400-2500 MHz**
Horizontal+ Vertical (dBi) peak	-0.99

Aux antenna:



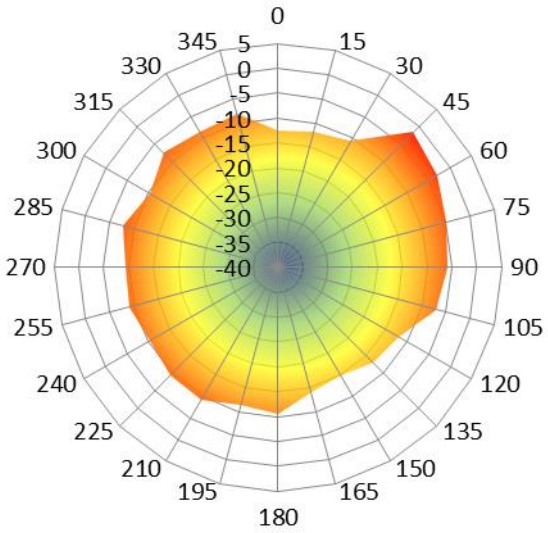
Center Frequency	**2400-2500 MHz**
Horizontal+ Vertical (dBi) peak	-0.36

5150-5250MHz radiation characteristic
Main antenna:



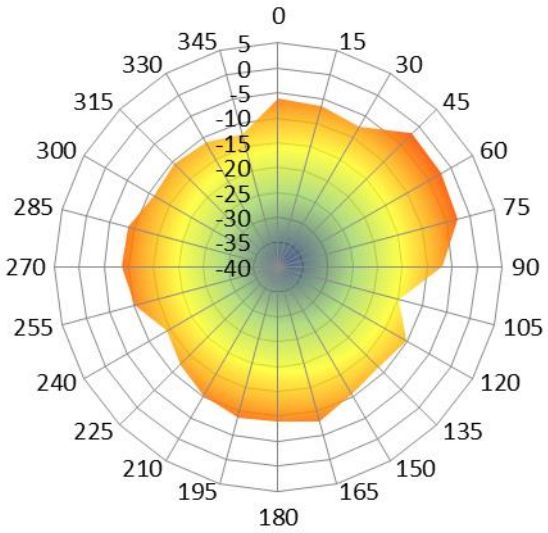
Horizontal+ Vertical (dBi) peak	0.83

Aux antenna:



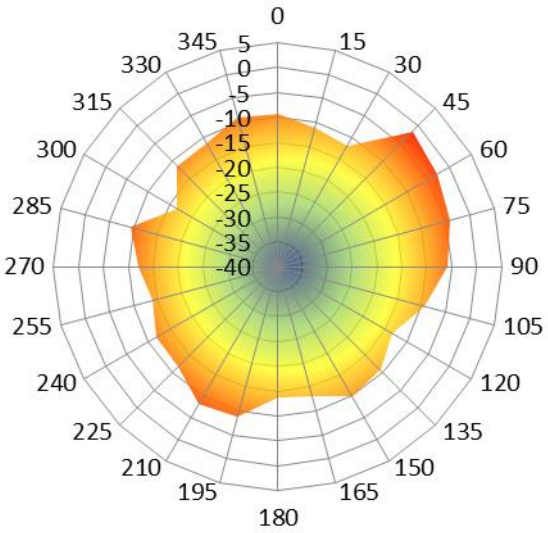
Horizontal+ Vertical (dBi) peak	2.42

5250-5350MHz radiation characteristic
Main antenna:



Horizontal+ Vertical (dBi) peak	0.02

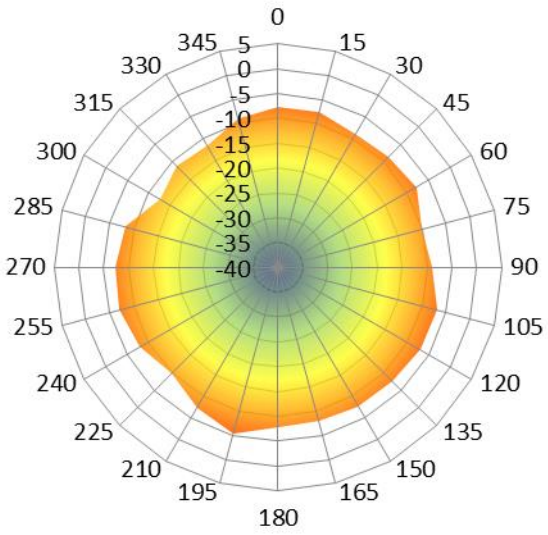
Aux antenna:



Horizontal+ Vertical (dBi) peak	1.13

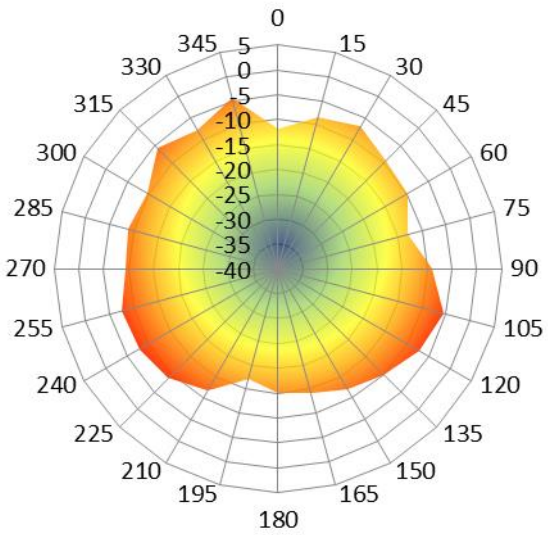
5470-5725MHz radiation characteristic(1E Peak Gain W/ Cable loss (dBi))

Main antenna:



Horizontal+ Vertical (dBi) peak	1.40

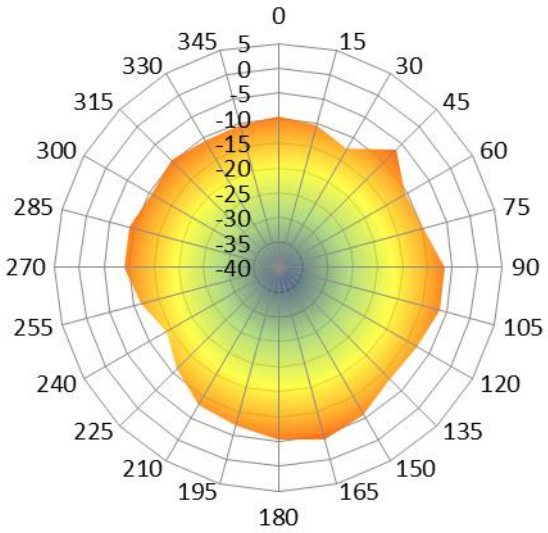
Aux antenna:



Horizontal+ Vertical (dBi) peak	-0.55

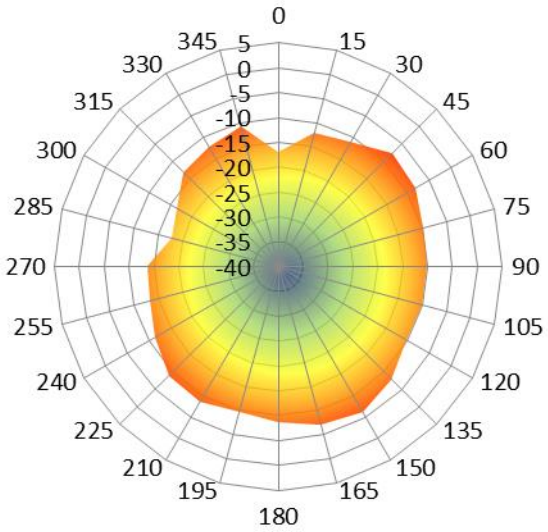
5725-5850MHz radiation characteristic(1E Peak Gain W/ Cable loss (dBi))

Main antenna:



Horizontal+ Vertical (dBi) peak	0.83

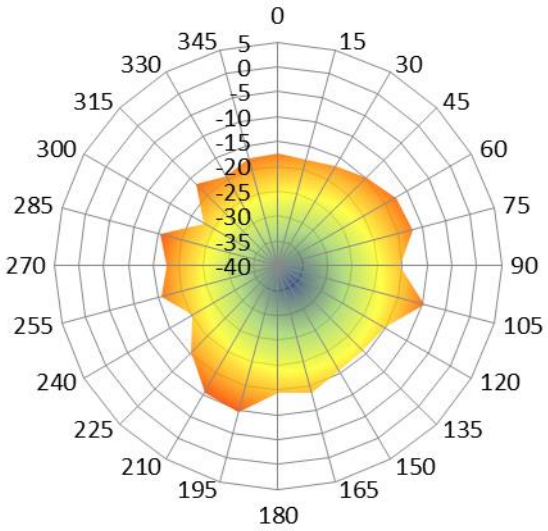
Aux antenna:



Horizontal+ Vertical (dBi) peak	-1.07

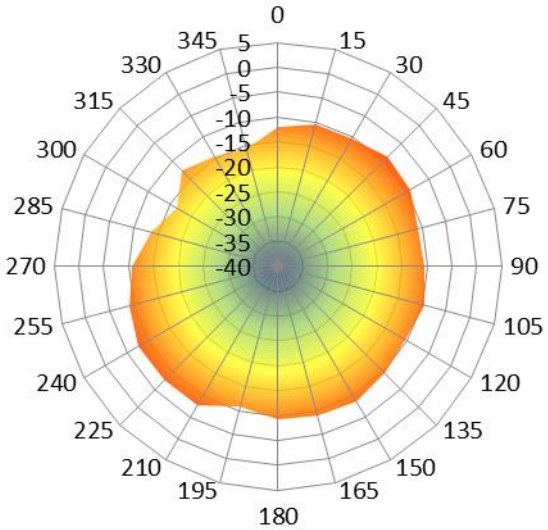
5925-6425MHz radiation characteristic(1E Peak Gain W/ Cable loss (dBi))

Main antenna:



Horizontal+ Vertical (dBi) peak	-0.45

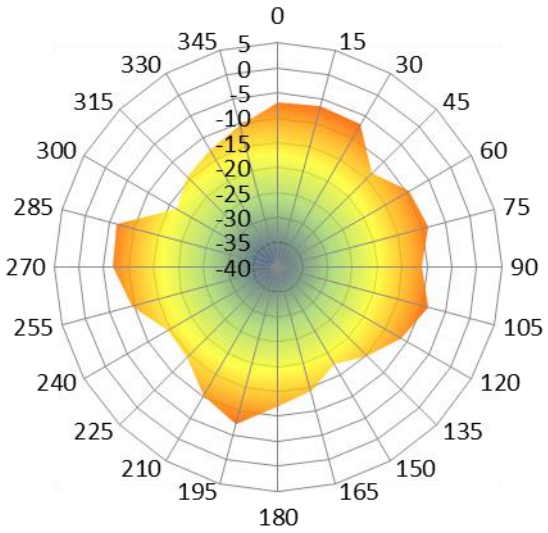
Aux antenna:



Horizontal+ Vertical (dBi) peak	0.69

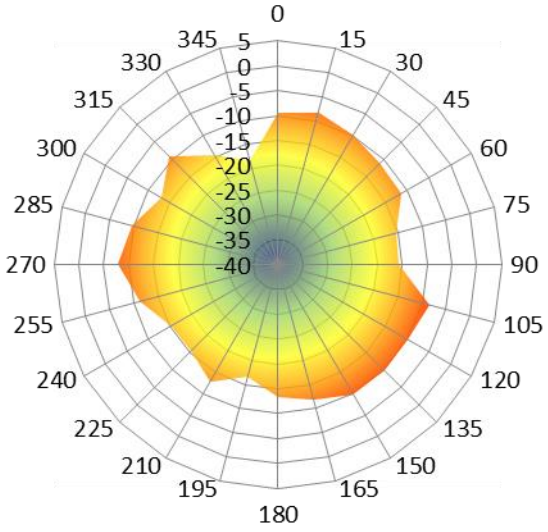
6425-6525MHz radiation characteristic (1E Peak Gain W/ Cable loss (dBi))

Main antenna:



Horizontal+ Vertical (dBi) peak	-1.15

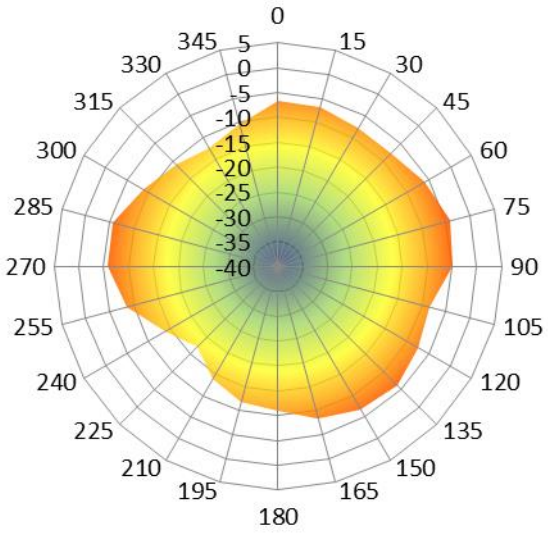
Aux antenna:



Horizontal+ Vertical (dBi) peak	0.98

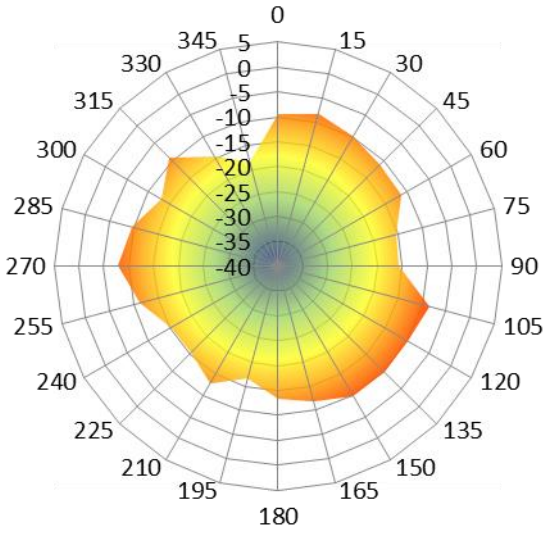
6525-6875MHz radiation characteristic(1E Peak Gain W/ Cable loss (dBi))

Main antenna:



Horizontal+ Vertical (dBi) peak	1.51

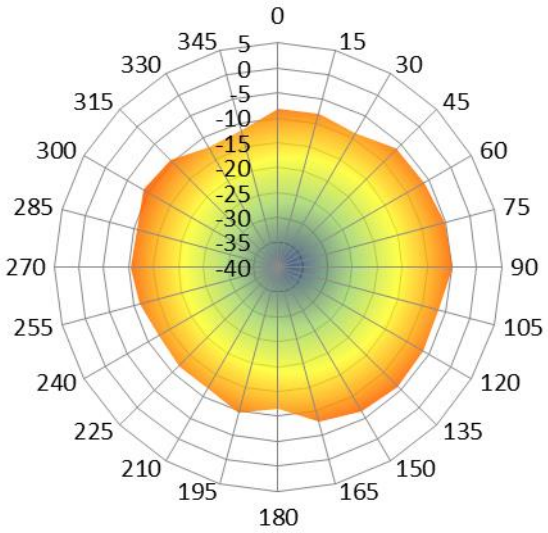
Aux antenna:



Horizontal+ Vertical (dBi) peak	0.98

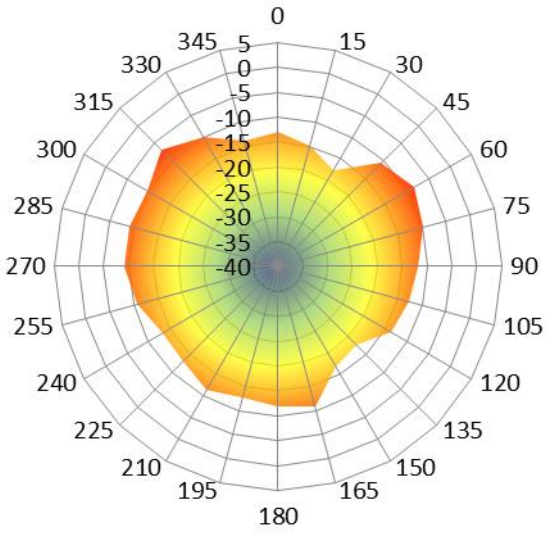
6875-7125MHz radiation characteristic(1E Peak Gain W/ Cable loss (dBi))

Main antenna:



Horizontal+ Vertical (dBi) peak	-1.01

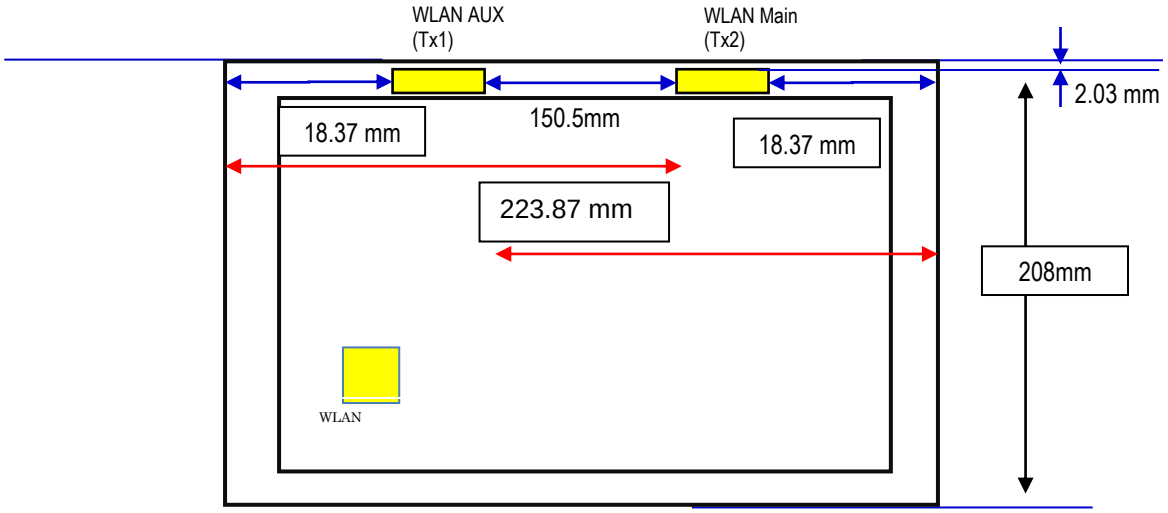
Aux antenna:



Horizontal+ Vertical (dBi) peak	1.45

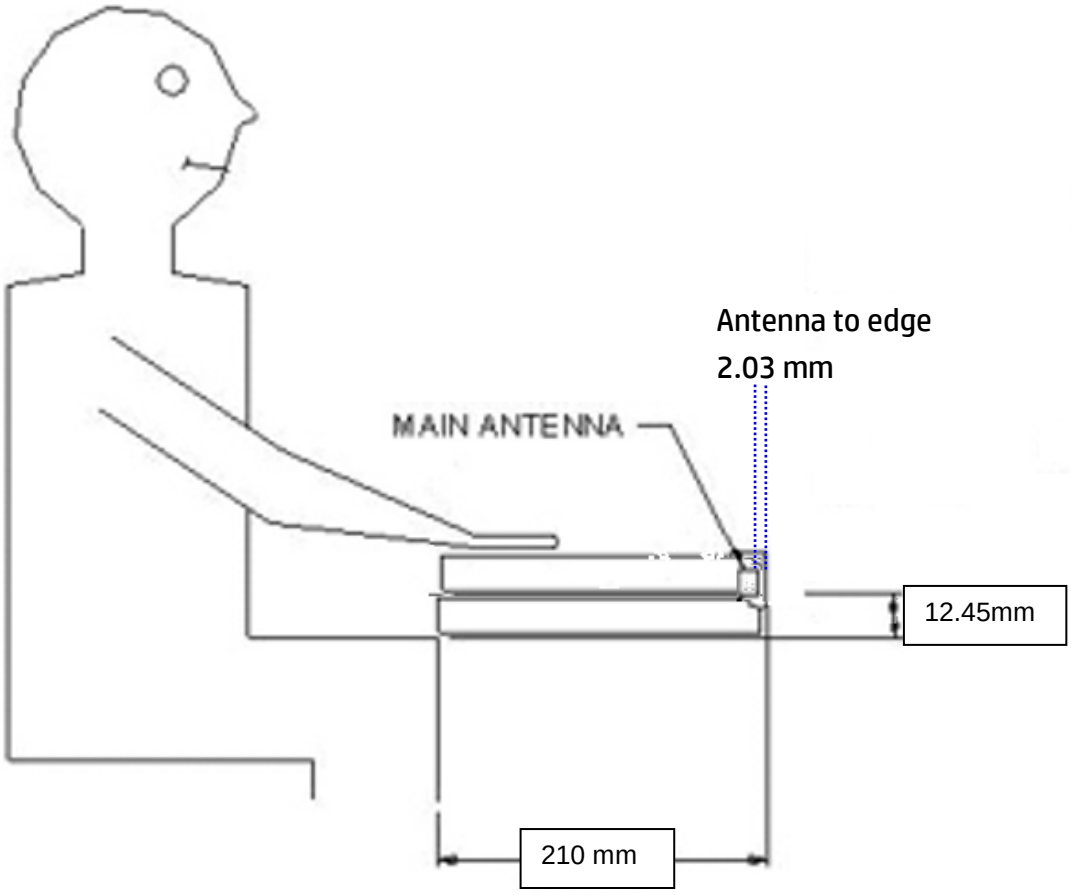
Section 4. Antenna Host Platform Location Information

Include a **dimensioned photo(s) or dimensioned drawing(s)** of Main and Aux 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 5. 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. 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 6. 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)