

ANTENNA INFORMATION

OEM	ASUS
ODM	HUAQIN
Platform model name	PM3406CKA/PM3406CKAZ
Intel platform (ex: Yes, No or NA)	
Platform type (ex: regular NB, convertible PC, AIO...etc)	Regular NB
SAR minimum separation (mm)	FCC (1g) ISED (1g) ISED (10g)

Antenna manufacturer	Company name	INNOWAVE
	Address	Building H, No. 55, Shengchuang Road, Yushan Town, Kunshan City, Jiangsu Province
Test location	Company name	INNOWAVE
	Address	Building H, No. 55, Shengchuang Road, Yushan Town, Kunshan City, Jiangsu Province
Test Personnel	Name(Full name)	Sunny Ye
	E-mail	yexiangyang@innowave.cn
	Tel/Mobile	17603761603
Testing date		2025/05/06

Antenna Part number	Main	F001K5213191000
	Aux	F001K5213191000
Antenna type (ex: PIFA, Dipole...etc)		PIFA Antenna

Antenna Peak gain w/ cable loss (dBi)*										
	2.4GHz 2400-2483.5 MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.6GHz 5470-5725MHz	5.8GHz 5725-5850MHz	5.9GHz 5850-5895MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	7.0 GHz 6875-7125MHz
Main	2.52	2.78	3.01	3.13	3.13	3.21	3.21	3.11	3.46	3.99
Aux	2.55	2.49	2.89	3.06	3.06	3.25	3.22	3.88	3.01	3.76

Cable Assembly Part Number and Information					
	Cable PN	Cable length(mm)	Cable diameter(mm)	Impedance(ohm)	Connector type
Main	S001K5202111000	221.75	1.13	50Ω	IPEX fourth generation terminals
Aux	S001K5202531000	290.86	1.13	50Ω	IPEX fourth generation terminals

* 3D Antenna Peak Gain required being test in system basis.

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1. Intel Reference Gain and Type

Antenna Peak gain w/ cable loss (dBi)											
Band/Frequency		2.4GHz 2400-2483.5 MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.6GHz 5470-5725MHz	5.8GHz 5725-5850MHz	5.9GHz 5850-5895MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	7.0 GHz 6875-7125MHz
Design	EU/UK	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
PIFA	For WiFi 6E and earlier	3.24	3.64	3.73	4.77	4.97	4.72	4.83	4.30	5.37	5.59
	From WiFi 7	2.95	5.11	4.55	5.15	5.13	4.45	5.02	5.02	4.96	4.96
Dipole	For WiFi 6E and earlier	2.89	2.92	3.19	4.41	4.22	4.22	4.83	4.30	4.49	5.34
	From WiFi 7	2.95	4.03	4.11	5.15	5.13	4.45	5.02	4.71	4.49	4.96
Monopole	From WiFi 7	2.83	4.57	4.44	4.95	4.95	4.43	4.87	4.91	4.91	4.79

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.

2. Document Revision History

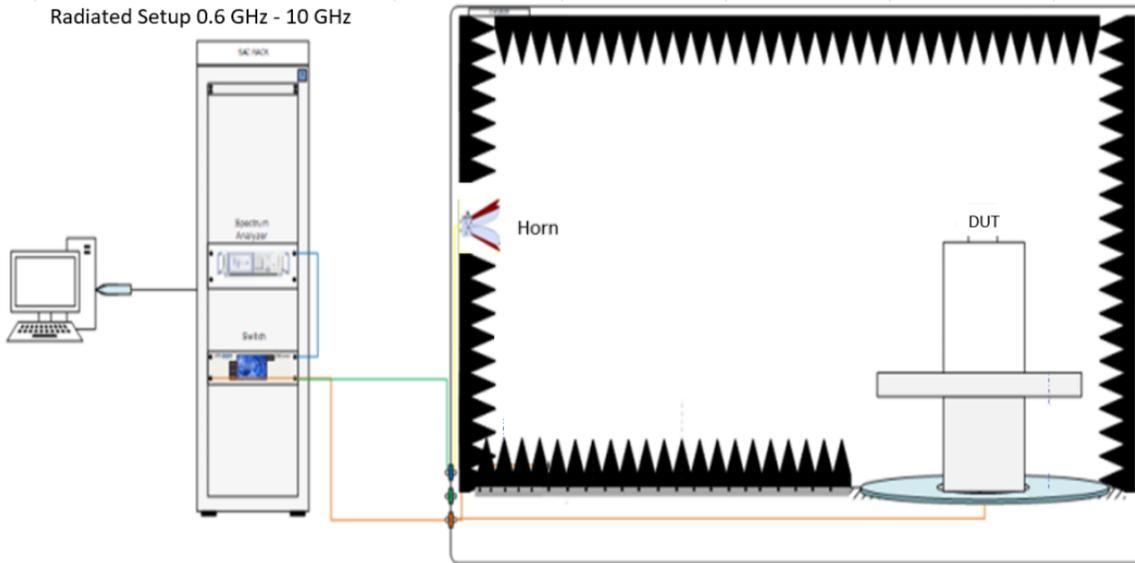
Revision #	Revision Details	Issued Date
Rev. 00	First Issue	2024.11.01

3. Test & System Description

3.1 Measurement Method and System

This test report is prepared for host antenna testing under a Full Anechoic Chamber

3.2 Test setup



3.3 Equipment list

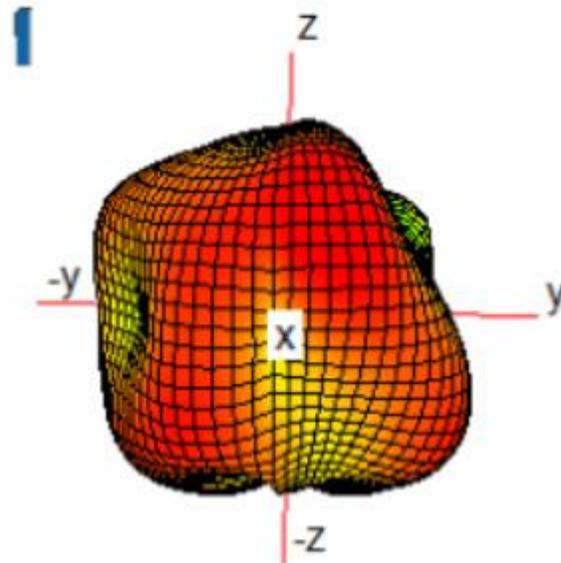
Number	Device	Type/Model	Serial	Manufacturer	Cal. Date	Cal. due. Date
1	Chamber	FATC3	5720	ETS-Lindgren	2024/12/25	2025/12/24
2	Turn table control box	ETS	-	ETS-Lindgren	N/A	N/A
3	Turn table control computer	Desktop	LPTPTOP-JQTTOKRA	LENOVO	N/A	N/A
4	Network Analyzer	5071C	5071C	Keysight	2024/12/25	2025/12/24
5	Hron Antenna	3117	E00157734	Bwant	2024/12/23	2025/12/22
6	Test system host	EMC Center	159757	ETS-Lindgren	N/A	N/A
7	RF Line TX	UFA147A-0-0480-200200	MFR64639223720	Micro-coax	2024/12/20	2025/12/19
8	RF Line RX	UFA147A-0-0480-200200	MFR64639223720	Micro-coax	2024/12/20	2025/12/19
9	Cable 2m 1GHz-8.5GHz	UFA147A-0-0480-200200	MFR64639223720	Micro-coax	2024/12/20	2025/12/19
10	Optical fiber line	RXY-00727-1603	-	Jmtt	N/A	N/A
11	Cable 2.5m 1GHz-8.5GHz	UFA147A-0-0480-200200	MFR64639223720	Micro-coax	2024/12/21	2025/12/20
12	Cable 1.2m 1GHz-8.5GHz	UFA147A-0-0480-200200	MFR64639223720	Micro-coax	2024/12/21	2025/12/20
13	Cable 1m 1GHz-8.5GHz	UFA147A-0-0480-200200	MFR64639223720	Micro-coax	2024/12/21	2025/12/20
14	Cable 2m 1GHz-8.5GHz	UFA147A-0-0480-200200	MFR64639223720	Micro-coax	2024/12/21	2025/12/20
15	Cable 1m 1GHz-8.5GHz	UFA147A-0-0480-200200	MFR64639223720	Micro-coax	2024/12/13	2025/12/12
16	Temp&Humidity Logger	RA12E-TH1-RAS	RA12-DOEB1A	Avtech	2024/12/20	2025/12/19

4. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

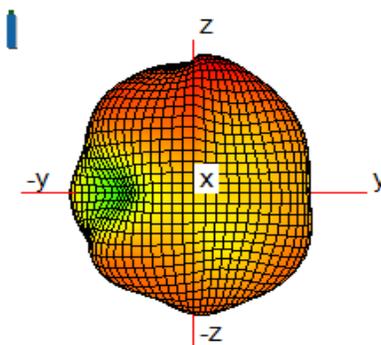
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2400-2483.5	2.52



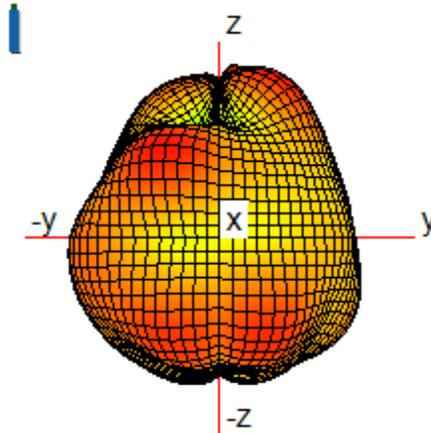
Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5150-5250	2.78



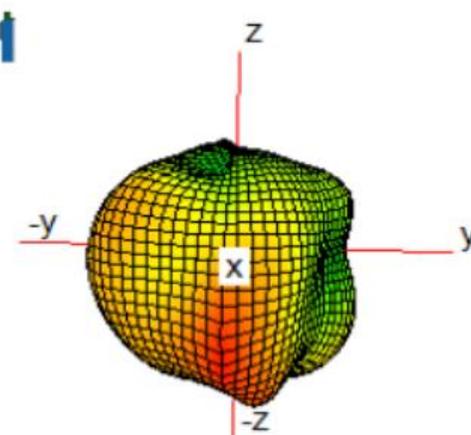
Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250-5350	3.01



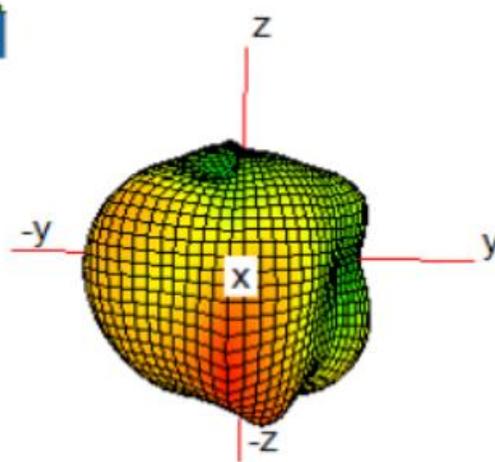
Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470-5725	3.13



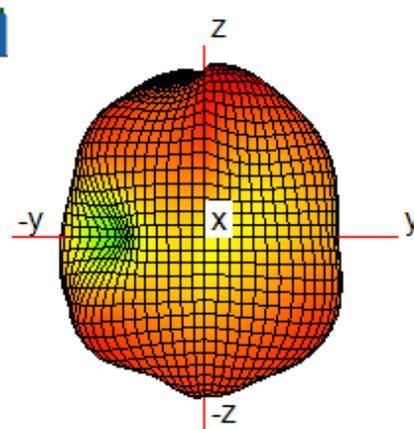
Max Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725-5850	3.13



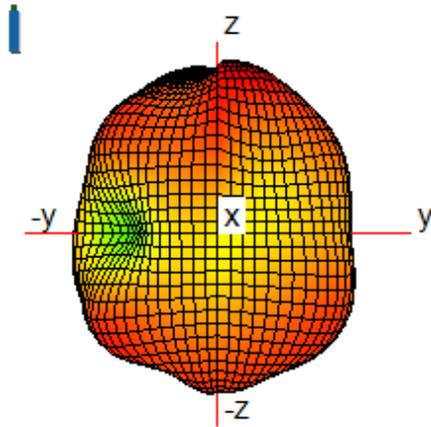
Max Antenna 3D Radiation Pattern 5850-5895 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5850-5895	3.21



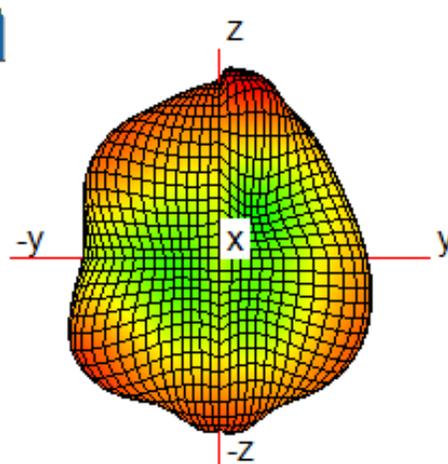
Max Antenna 3D Radiation Pattern 5925-6425 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5925-6425	3.21



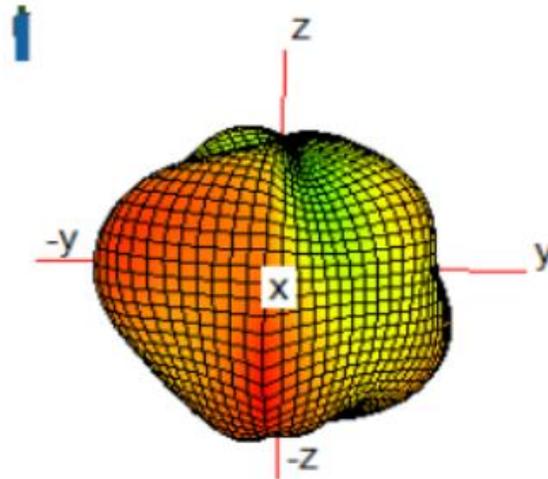
Max Antenna 3D Radiation Pattern 6425-6525 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6425-6525	3.11



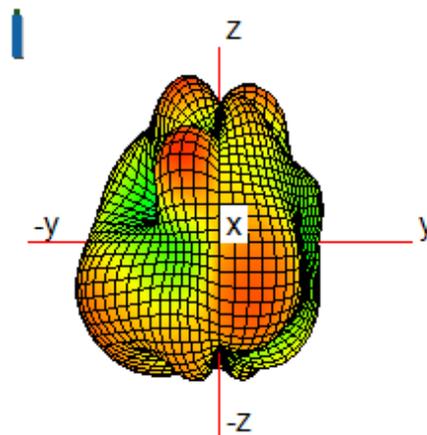
Max Antenna 3D Radiation Pattern 6525-6875 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6525-6875	3.46



Max Antenna 3D Radiation Pattern 6875-7125 MHz

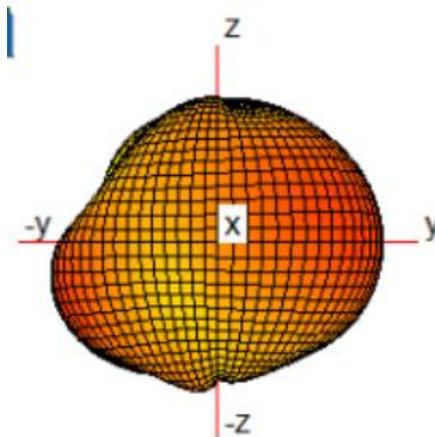
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6875-7125	3.99



Auxiliary Antenna

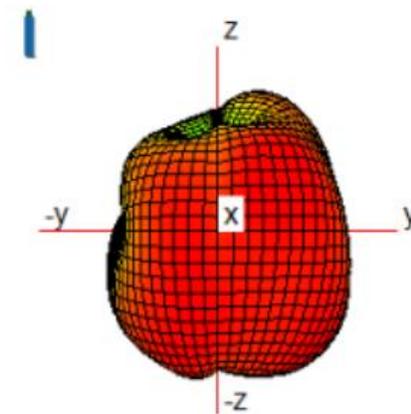
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2400-2483.5	2.55



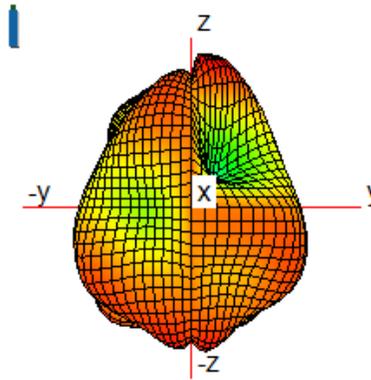
Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5150-5250	2.49



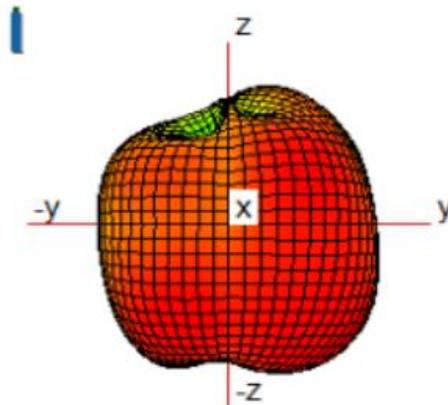
Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250-5350	2.89



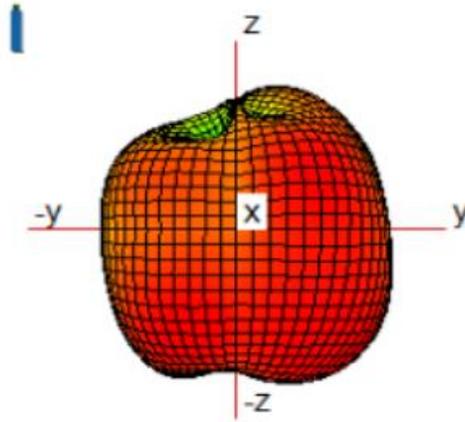
Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470-5725	3.06



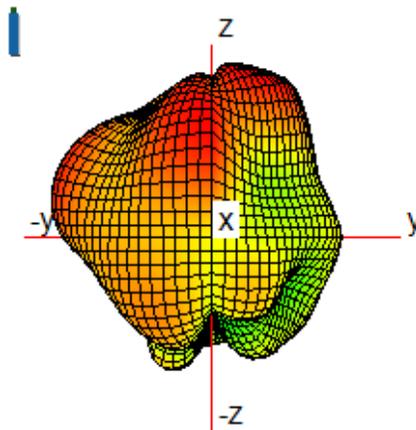
Max Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725-5850	3.06



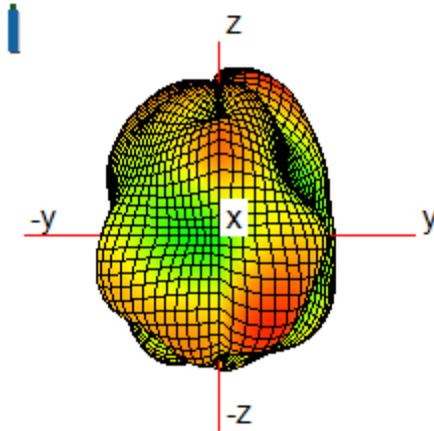
Max Antenna 3D Radiation Pattern 5850-5895 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5850-5895	3.25



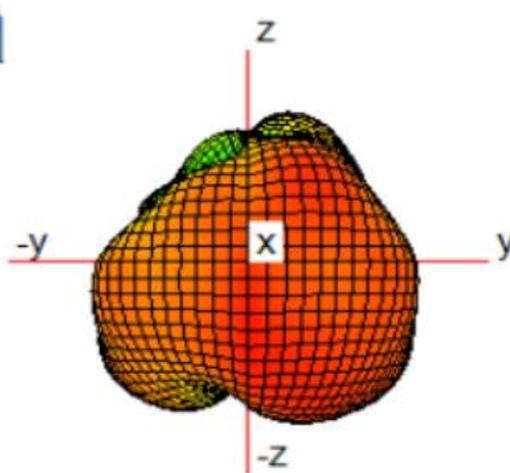
Max Antenna 3D Radiation Pattern 5925-6425 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5925-6425	3.22



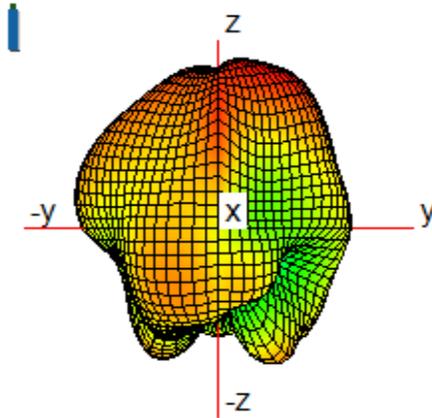
Max Antenna 3D Radiation Pattern 6425-6525 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6425-6525	3.88



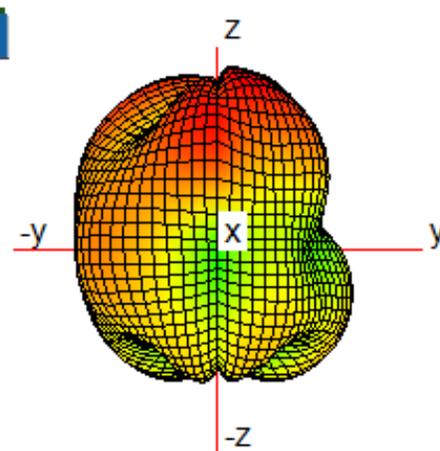
Max Antenna 3D Radiation Pattern 6525-6875 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6525-6875	3.01



Max Antenna 3D Radiation Pattern 6875-7125 MHz

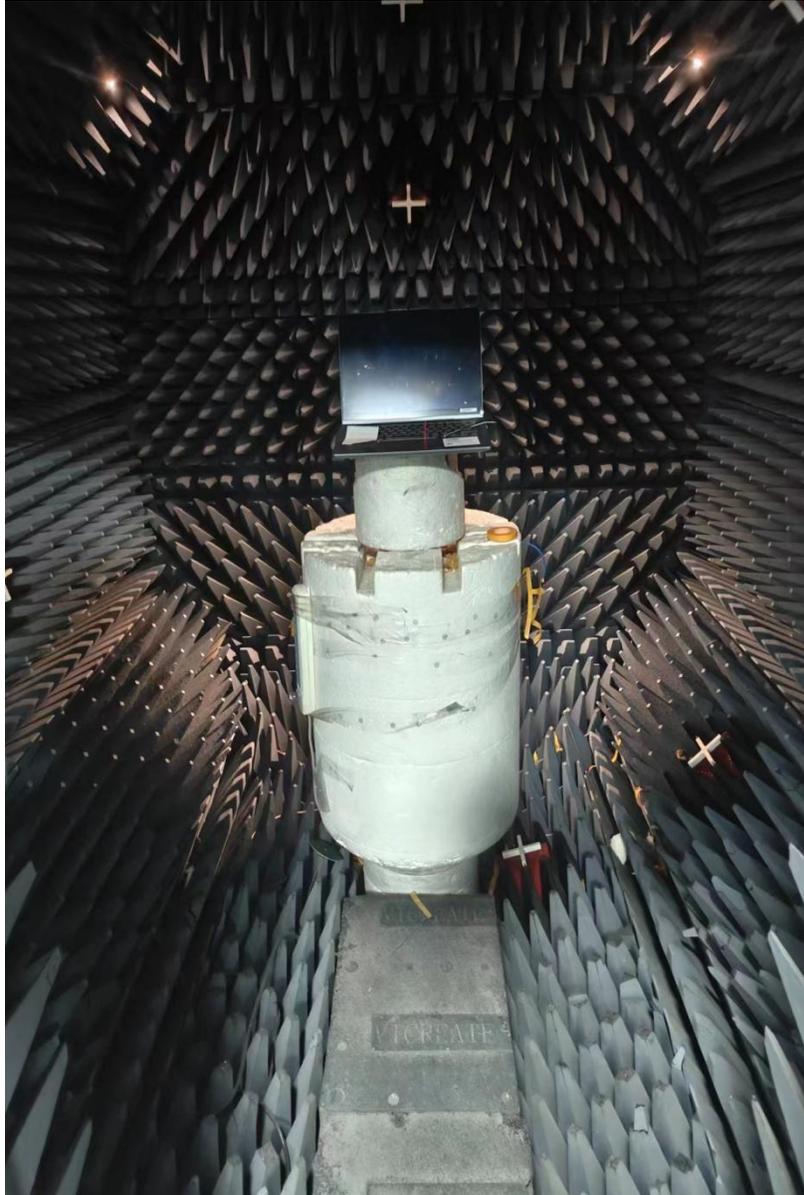
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6875-7125	3.76



Annex A. Photographs

A.1 Setup Photo

<insert test diagram here for test site utilized>



A.2 Test sample

Main Antenna

Antenna Drawing

Confidential

Version	Marking	Change the content	Signature	Date
T01		Original Antenna	Ma Yunfei	2025.05.07
T02		Update the PCB and add test electrical testing	Ma Yunfei	2025.05.09
T03		Change the RF connector to V1, update the view of the connector, add all dimensions, and remove the hole drilling	Ma Yunfei	2025.05.17
V01		Production Design	Ma Yunfei	2025.05.16

The coding principles are as follows (26people, HQ260060008N04928xxxxRX01) :

: HQ260060008N0 Customer part number
 4 : Denote the tail code for the year 2024
 9 :In September, October, November and December, use A/C/D respectively.
 28:Production date
 XXXXX: Flow code, specification SN ranges from 00000 to 99999
 RX:The factory code is fixed as "RX"
 01:Version number: 2 digits, T01 is 01, T02 is 02

Deformation range: 0 - 1.9mm. No S-shaped or W-shaped local deformation is allowed.

9	Acetic acid	M001K5250191000	10X5 T=0.08mm	1
8	QR code	T0530001	Copperplate paper 6x6mm	1
7	Anti-proof sleeve (top)	M0029632090001	Transparency L=20mm Φ=1.9mm	2
6	Ground copper foil AUX	M001K5246591000	20x15mm (Welding)	1
5	Ground copper foil MAIN	M001K5246191000	15x39m (Welding)	1
4	Adhesive backing	M001K5219191000	RF-2510 109.6x6x1.1mm	1
3	PCB	M001K5238111000	FR4 Single-panel T=0.4mm	1
2	Coxial cable	S001K5202631000	60dby low-loss wire diameter 1.13MM, 67AWG; 179X fourth-generation terminals	1
1	Coxial cable	S001K5202111000	60dby low-loss wire diameter 1.13MM, black; 179X fourth-generation terminals	1

Serial Number: Name: Material Number: Description: Quantity:

Machine type	Name	Design	Ma Yunfei	Date	2025. 05. 16
	KK52(NB7688A)	RF	Ye Xiangyang	Date	2025. 05. 16
	KK52-Antenna finished product	Review and Approval	Li Shihui	Date	2025. 05. 16

Tolerance Table

Dimension	Tolerance	Unit
>200	± 0.20	mm
100-200	± 0.15	mm
50-100	± 0.12	mm
10-50	± 0.10	mm
0-10	± 0.05	mm

ANGLES: ± 1°

Proportion: FIT Third-person perspective

1. "★" Size is the key dimension. With "☒" The required dimensions for CPK calculation, "☒" For reference dimensions, "△" For design changes;

2. The solder joints should be smooth without protrusions or burrs, and there should be no cases of incomplete soldering, bridging, short circuits, etc.;

3. The dimensions of the drawing are used to verify the shape function and assembly.

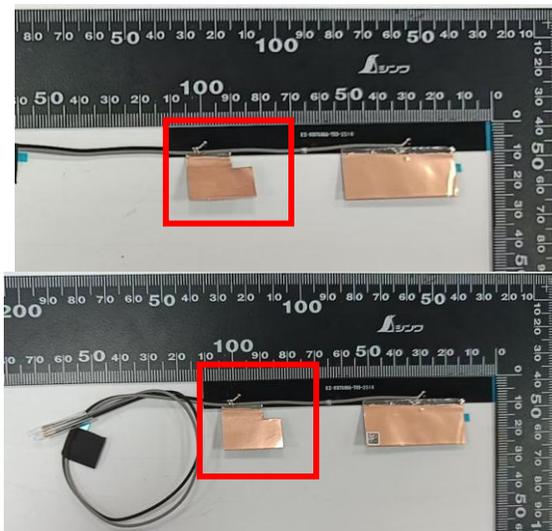
4. Meet the salt spray test / self-test and other reliability tests related requirements. Follow our company's internal RX-WI-QAC-014 reliability test standards. All materials must comply with our company's RX-WI-QAC-008 Product Environmental Substance Prohibition Management Standard. All materials must meet the requirements of HF, halogen-free, RoHS 2.0 and Reach.

5. The packaging is done in accordance with the packaging requirements provided by Ruixiang Engineering.

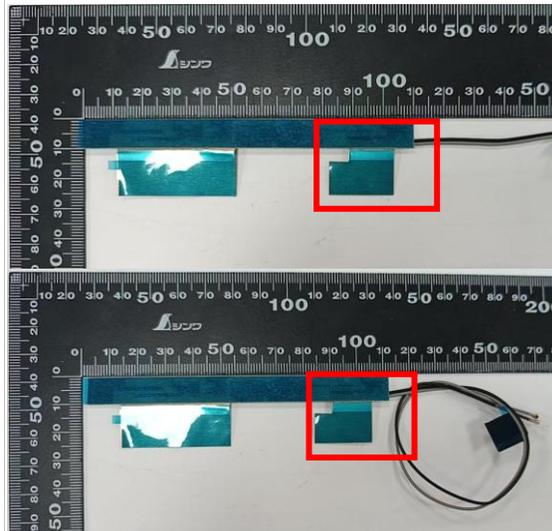
6. This file is a commercial secret and is restricted to the designated individuals or organizations only. Without permission, it must not be disclosed to any third party.

Antenna Photo

Front



Back



Note: antenna photo should include L type ruler

Aux Antenna

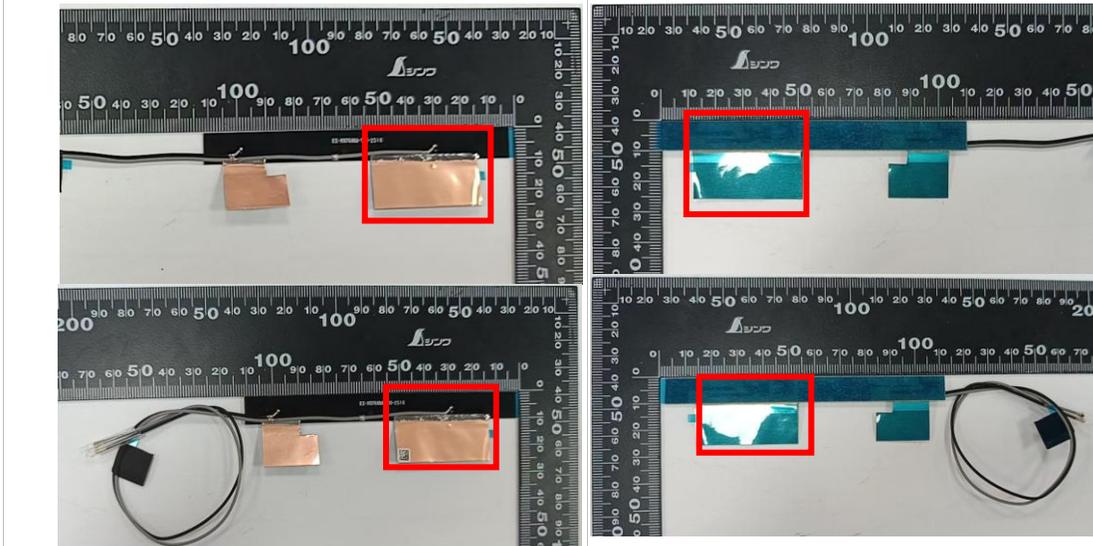
Antenna Drawing

1	2	3	4	5	6	7	8																																																		
Confidential						<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Version</th> <th>Marking</th> <th>Change the content</th> <th>Signature</th> <th>Date</th> </tr> <tr> <td>T01</td> <td></td> <td>Original draft drawing</td> <td>Ma Yunfei</td> <td>2025.05.07</td> </tr> <tr> <td>T02</td> <td></td> <td>Added the PCB and wire bond details</td> <td>Ma Yunfei</td> <td>2025.05.09</td> </tr> <tr> <td>T03</td> <td></td> <td>Added the HF, halogen-free, RoHS 2.0 and Reach</td> <td>Ma Yunfei</td> <td>2025.05.17</td> </tr> <tr> <td>V01</td> <td></td> <td>Production drawing</td> <td>Ma Yunfei</td> <td>2025.05.18</td> </tr> </table>		Version	Marking	Change the content	Signature	Date	T01		Original draft drawing	Ma Yunfei	2025.05.07	T02		Added the PCB and wire bond details	Ma Yunfei	2025.05.09	T03		Added the HF, halogen-free, RoHS 2.0 and Reach	Ma Yunfei	2025.05.17	V01		Production drawing	Ma Yunfei	2025.05.18																									
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<p>QR code</p> <p>The coding principles are as follows (26people, HQ260060008N04928xxxxRX01) :</p> <p>HQ260060008N0 Customer part number</p> <p>4 : Denote the tail code for the year 2024</p> <p>9 :In September, October, November and December, use A/C/D respectively.</p> <p>28:Production date</p> <p>XXXXX: Flow code, specification SN ranges from 00000 to 9999</p> <p>RX:The factory code is fixed as "RX"</p> <p>01:Version number: 2 digits, T01 is 01, T02 is 02</p> <p>Technical requirements:</p> <ol style="list-style-type: none"> "★" Size is the key dimension, with "CPK" The required dimensions for CPK calculation, "()" For reference dimensions, "△" For design changes; The solder joints should be smooth without protrusions or burrs, and there should be no cases of incomplete soldering, bridging, short circuits, etc.; The dimensions of the drawing are used to verify the shape function and assembly. Meet the salt spray test / self-test and other reliability tests related requirements,Follow our company's internal RX-WI-QAC-014 reliability test standards,All materials must comply with our company's RX-WI-QAC-008Product Environmental Substance Prohibition Management Standard.All materials must meet the requirements of HF, halogen-free, RoHS 2.0 and Reach. The packaging is done in accordance with the packaging requirements provided by Ruixiang Engineering. This file is a commercial secret and is restricted to the designated individuals or organizations only.Without permission, it must not be disclosed to any third party. <p>Deformation range: 0 - 1.9mm. No S-shaped or W-shaped local deformation is allowed.</p>						<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Serial Number</th> <th>Name</th> <th>Material Number</th> <th>Description</th> <th>Quantity</th> </tr> <tr> <td>9</td> <td>Acetic acid</td> <td>M00183250191000</td> <td>10X5 T=0.08mm</td> <td>1</td> </tr> <tr> <td>8</td> <td>QR code</td> <td>T050001</td> <td>Copperplate paper 6x6mm</td> <td>1</td> </tr> <tr> <td>7</td> <td>Insulation sleeve</td> <td>M00290320990001</td> <td>Transparency L=20mm φ=1.9mm</td> <td>2</td> </tr> <tr> <td>6</td> <td>Ground copper foil AUX</td> <td>M00183246591000</td> <td>20x15mm (Welding)</td> <td>1</td> </tr> <tr> <td>5</td> <td>Ground copper foil MAIN</td> <td>M00183246191000</td> <td>15x39m (Welding)</td> <td>1</td> </tr> <tr> <td>4</td> <td>Adhesive backing</td> <td>M00183219191000</td> <td>HF-DS10 109.6x3.6x0.1mm</td> <td>1</td> </tr> <tr> <td>3</td> <td>PCB</td> <td>M0018328111000</td> <td>FR4 Single-panel T=0.4mm</td> <td>1</td> </tr> <tr> <td>2</td> <td>Cosial cable</td> <td>S0018320231000</td> <td>Coaxial low-loss wire diameter 1.13MM, grey; 1P2P Fourth-generation standard</td> <td>1</td> </tr> <tr> <td>1</td> <td>Cosial cable</td> <td>S0018320211000</td> <td>Coaxial low-loss wire diameter 1.13MM, black; 1P2P Fourth-generation standard</td> <td>1</td> </tr> </table>		Serial Number	Name	Material Number	Description	Quantity	9	Acetic acid	M00183250191000	10X5 T=0.08mm	1	8	QR code	T050001	Copperplate paper 6x6mm	1	7	Insulation sleeve	M00290320990001	Transparency L=20mm φ=1.9mm	2	6	Ground copper foil AUX	M00183246591000	20x15mm (Welding)	1	5	Ground copper foil MAIN	M00183246191000	15x39m (Welding)	1	4	Adhesive backing	M00183219191000	HF-DS10 109.6x3.6x0.1mm	1	3	PCB	M0018328111000	FR4 Single-panel T=0.4mm	1	2	Cosial cable	S0018320231000	Coaxial low-loss wire diameter 1.13MM, grey; 1P2P Fourth-generation standard	1	1	Cosial cable	S0018320211000	Coaxial low-loss wire diameter 1.13MM, black; 1P2P Fourth-generation standard	1
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<p>Machine type: KK52(NB7688A) Design: Ma Yunfei Date: 2025. 05. 16</p> <p>Name: KK52-Antenna finished product R F: Ye Xiangyang Date: 2025. 05. 16</p> <p>Material Number: F001K5213191000 Review and Approval: Li Shihui Date: 2025. 05. 16</p>						<p>Version: V01 Frame: A4</p> <p>Proportion: FIT</p> <p>Unit: mm</p> <p>Third-person perspective</p> <p style="text-align: center;">INNOVAVE</p> <p style="text-align: center;">Kunshan Innovave Communication Technology Co., LTD.</p>																																																			
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Antenna Photo

Front

Back



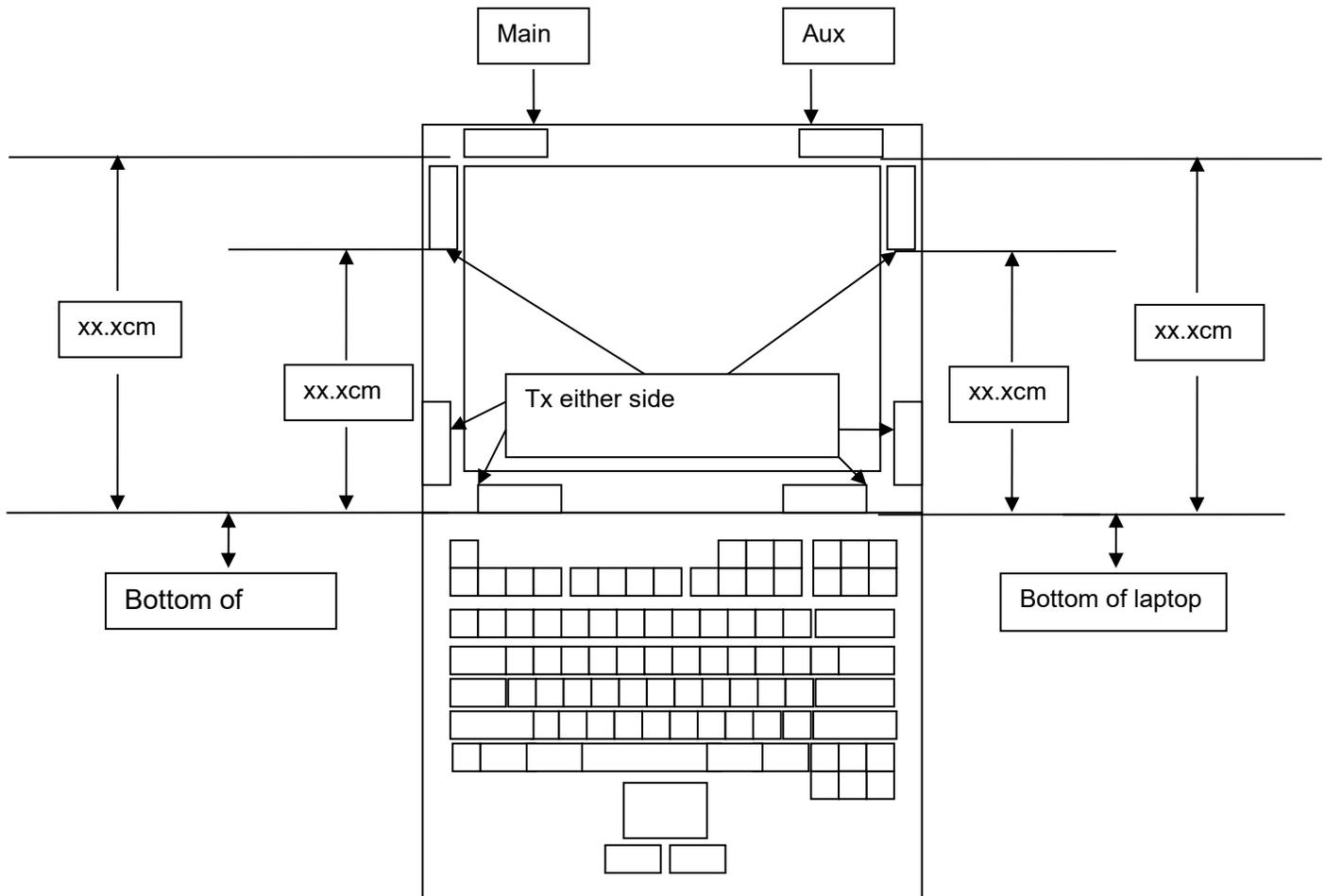
Note: antenna photo should include L type ruler

Annex B. Antenna Location

B.1 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).

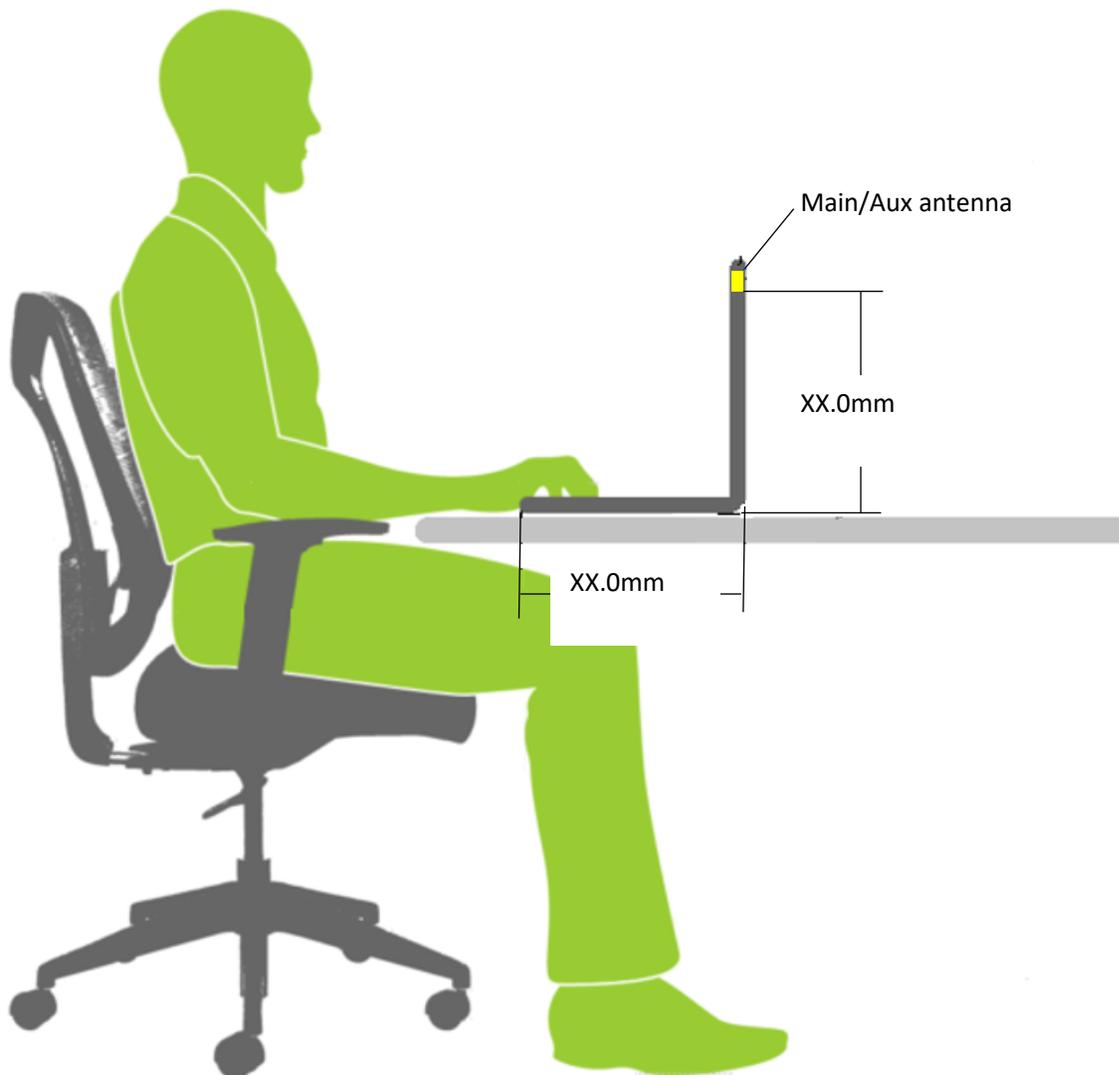
Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.



B.2 Antenna dimensional information for SAR evaluation

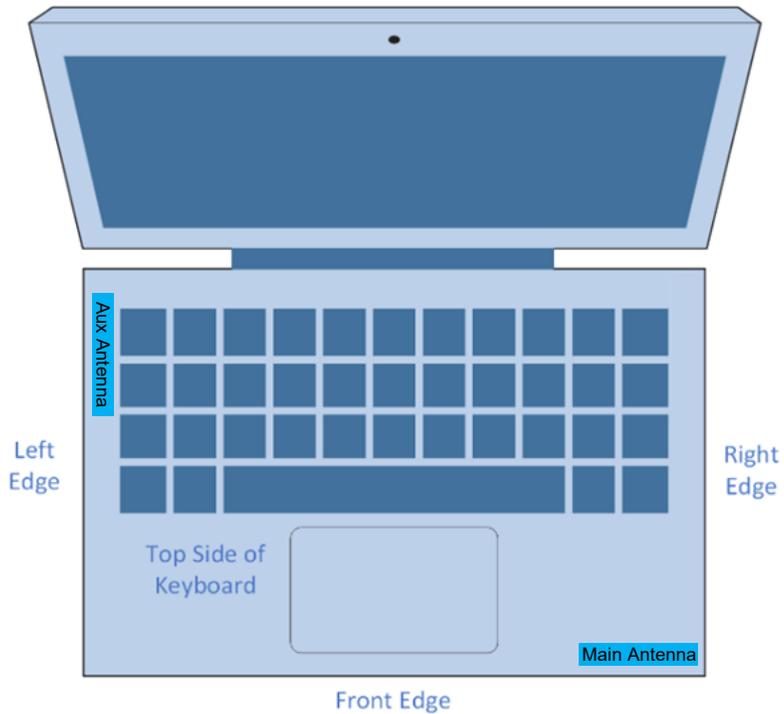
Include a dimensioned photo(s) or dimensioned drawing(s) showing the distance (mm) between the transmit antennas and the user. For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary landscape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

Antennas on the panel section



Measuring Surface	Antenna	Separation Distance(antenna-to- Surface)(mm)	1g SAR
Bottom Side	Main		FCC/ISED
	Aux		FCC/ISED

Antennas on the keyboard section



Measuring Surface	Antenna	Separation Distance(antenna-to-Surface)(mm)	1g or 10g SAR
Bottom Side	Main		1g (FCC/ISED)
	Aux		1g (FCC/ISED)
Front Edge	Main		1g (ISED)
	Aux		1g (ISED)
Left Edge	Main		10g (ISED)
	Aux		10g (ISED)
Right Edge	Main		10g (ISED)
	Aux		10g (ISED)
Top side of Keyboard	Main		10g (ISED)
	Aux		10g (ISED)