

ANTENNA INFORMATION

OEM	Dell
ODM	Compal
Platform model name	P190G
Intel platform (ex: Yes, No or NA)	No
Platform type (ex: regular NB, convertible PC, AIO...etc)	Regular NB
SAR minimum separation (mm)	5.1mm (w/bumper) 4.2mm (w/o bumper)

Antenna manufacturer	Speed Wireless Technology CO.,LTD.	
Address	25F, No.95, Xinpu 6th St., Taoyuan Dist., Taoyuan City 33044, Taiwan.	
Antenna Part number	Main: F-0G-FH-6175-001-00 (DC33002XW0L)	Aux: F-0G-FH-6175-001-00 (DC33002XW0L)
Antenna type (ex: PIFA, Dipole...etc)	Main: PIFA	Aux: Monopole

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	2.85	2.93	2.93	2.56	2.60	2.96	3.41	3.89	3.89	3.68
Aux	2.74	2.90	2.90	2.81	2.81	2.52	3.38	2.79	2.31	2.96

Cable Assembly Part Number and Information					
	Cable PN	Cable length(mm)	Cable diameter(mm)	Impedance(ohm)	Connector type
Main	SY113L/50-143	152.5	1.13	50	MHF-B13L-N-01
Aux	SY113L/50-118	140.5	1.13	50	MHF-B13L-N-01

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

Table of Contents

Cover page	1
1. Test & System Description	
1.1 Measurement Method and System.....	3
1.2 Test setup.....	3
1.3 Equipment list.....	4
2. Radiation characteristics of antenna loaded in Host Platform	5
Annex A. Photographs	
A.1 Setup Photo.....	15
A.2 Test sample.....	16
Annex B. Antenna Location	
B.1 Antenna Host Platform Location Information.....	18
B.2 Antenna dimensional information for SAR evaluation.....	19
Annex C. Antenna Information	
C.1 Antenna Assembly Specifications.....	20

1. Test & System Description

1.1 Measurement Method and System

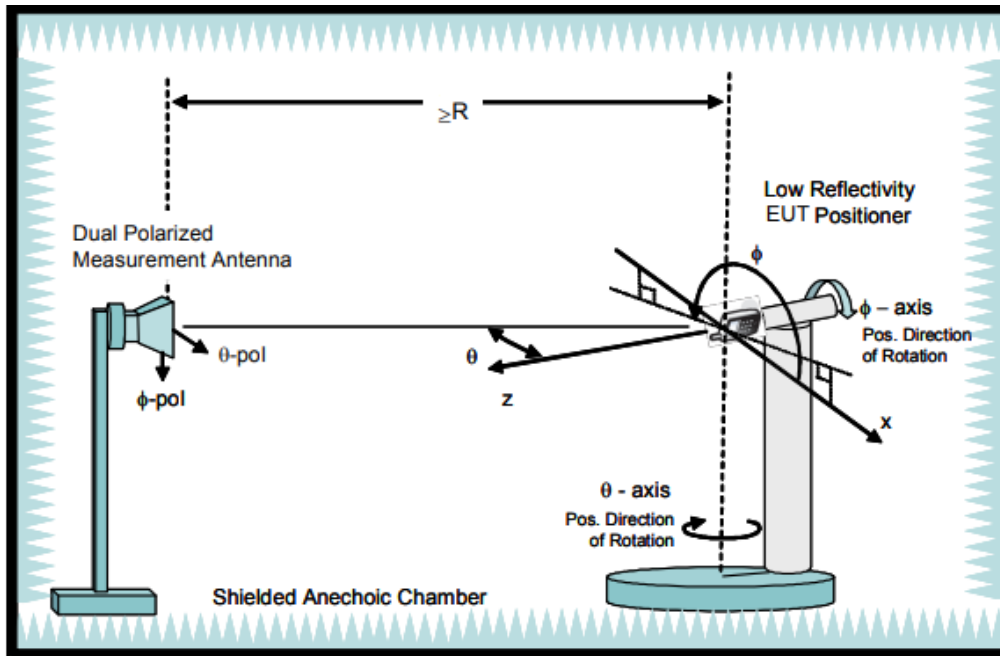
The gain measurement shall follow by following conditions:

- It is required that all the antenna gain to be measured spherically and computed by spatial average be computed of the resultant gain.
- During gain measurement, all other antennas not under test should be terminated by 50 Ohm load in end of cable.
- Space points of 3D gain measurement are increase by specific steps from Theta 0~180 degrees, and Phi, 0~360 degrees, as figure below. The increments steps are different steps are different by antenna functions.

Theta Start	0 degree	Phi Start	0 degree
Theta Stop	165 degree	Phi Stop	345 degree
Theta Increment	15 degree	Phi Increment	15 degree

1.2 Test setup

The testing of antenna gain should be made at a CTIA qualified lab with an RF anechoic chamber with at least 3-meter separation from the receive antenna to the antenna under test. The antenna gain report from unqualified lab can't be referenced a passing. Besides, all test equipment including horn antennas, adapters, cables, network analyzers, and receivers shall be calibrated per manufacturer's minimum calibration requirements.



1.3 Equipment list

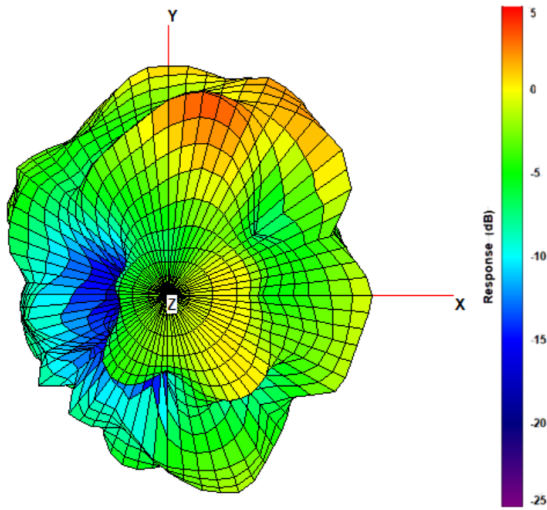
Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
Anechoic Chamber	AMS8500	-	ETS-Lindgren	22-Jun-22	10-Jul-24
Turn Table	2117-7200	SN00231447	ETS-Lindgren	22-Jun-22	10-Jul-24
Switch & Positioning systems	EMCenter	SN00242606	ETS-Lindgren	22-Jun-22	10-Jul-24
Measurement SW	EMQuest V1.15 build 27347	SN1802	ETS-Lindgren	22-Jun-22	10-Jul-24
Horn antenna	3164-10	SN00246202	ETS-Lindgren	22-Jun-22	10-Jul-24
Vector Network Analyzer	E5071C	PN5188-4462	Keysight	30-May-23	30-Nov-24
Cable 7.5m 400MHz to 18GHz(H-pol)	SS402	00100A1F5A1XXS	WOKEN	22-Jun-22	10-Nov-24
Cable 7.5m 400MHz to 18GHz(V-pol)	SS402	00100A1F5A1XXS	WOKEN	22-Jun-22	10-Nov-24
Cable 14m 400MHz to 18GHz	SS402	00100A1F5A1XXS	WOKEN	22-Jun-22	10-Nov-24
Temp & Humidity Logger	830	SN84972	PROVA	16-Jul-23	10-Jul-24

2. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

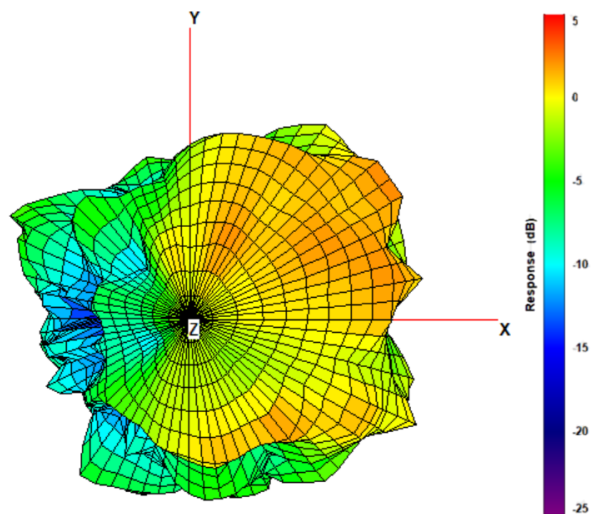
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2452	2.85



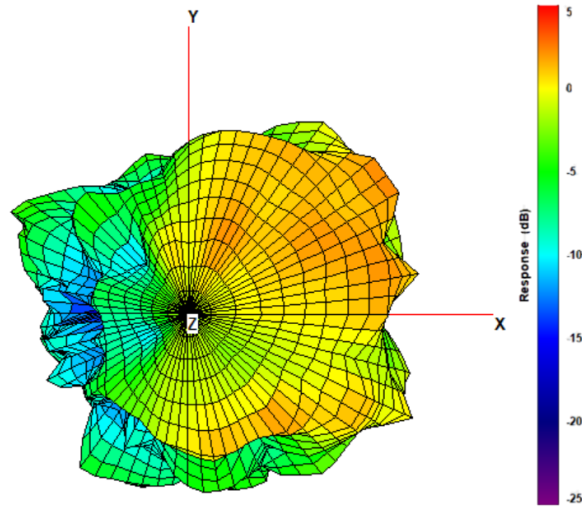
Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250	2.93



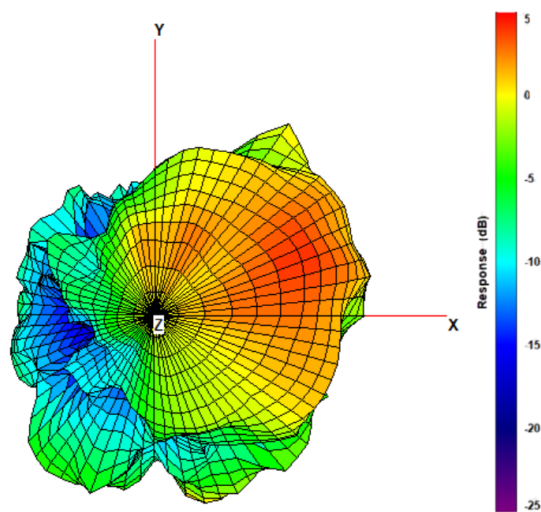
Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250	2.93



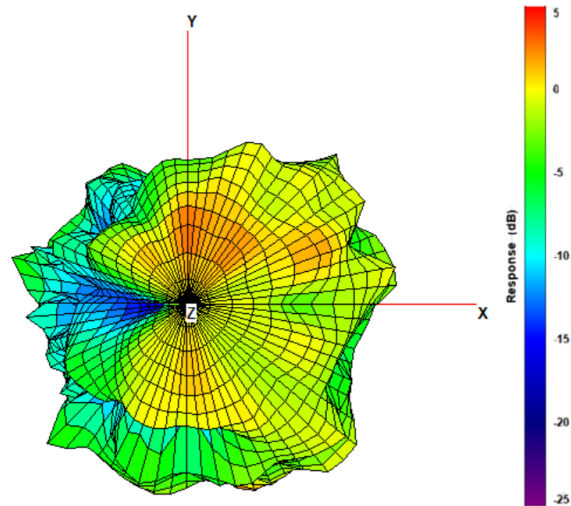
Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470	2.56



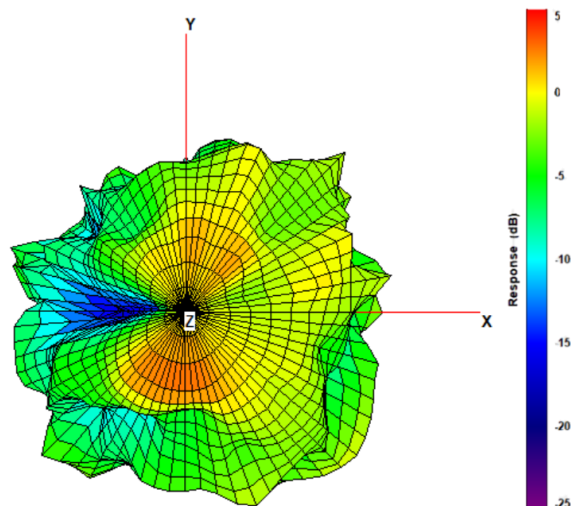
Max Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725	2.60



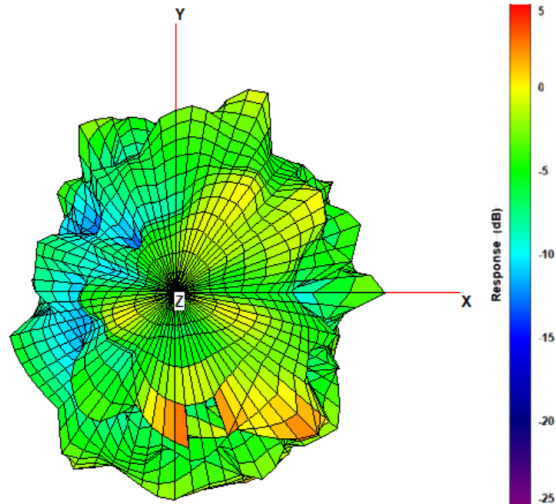
Max Antenna 3D Radiation Pattern 5850-5895 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5875	2.96



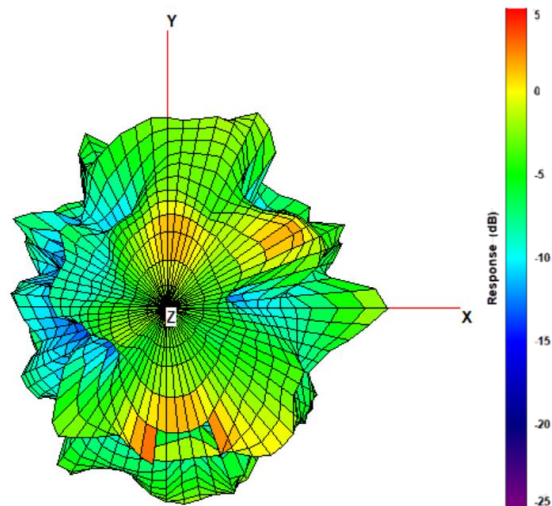
Max Antenna 3D Radiation Pattern 5925-6425 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6215	3.41



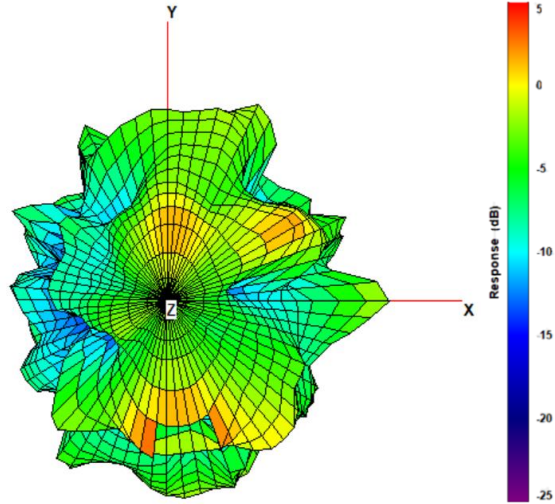
Max Antenna 3D Radiation Pattern 6425-6525 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6525	3.89



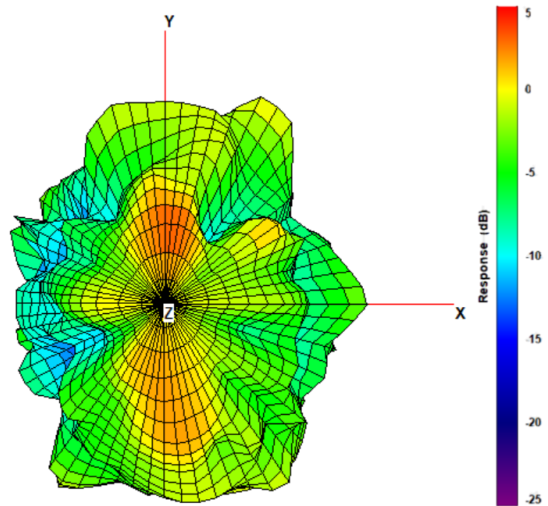
Max Antenna 3D Radiation Pattern 6525-6875 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6525	3.89



Max Antenna 3D Radiation Pattern 6875-7125 MHz

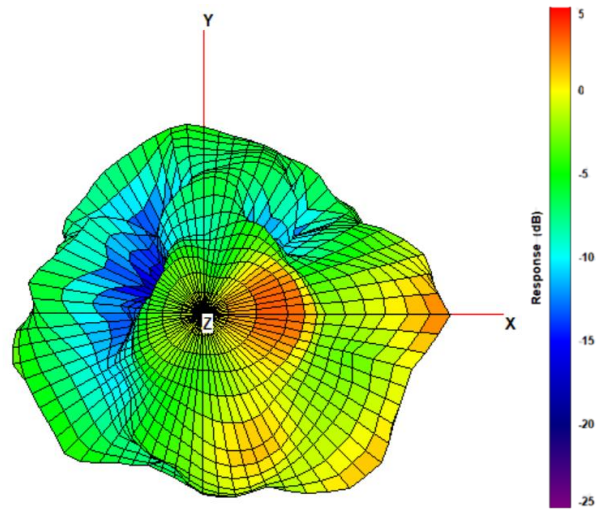
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6875	3.68



Auxiliary Antenna

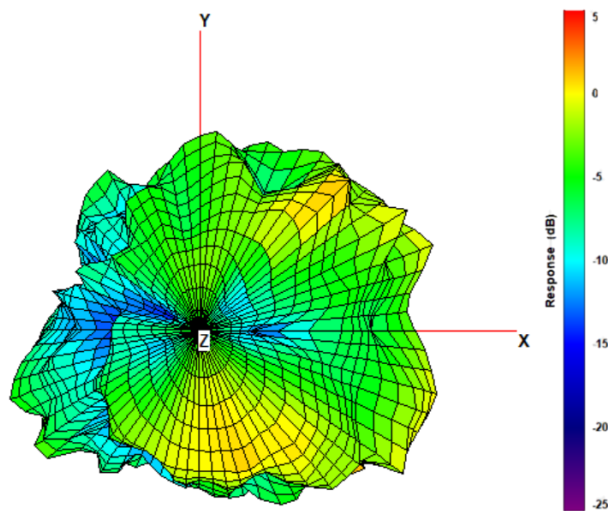
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2452	2.74



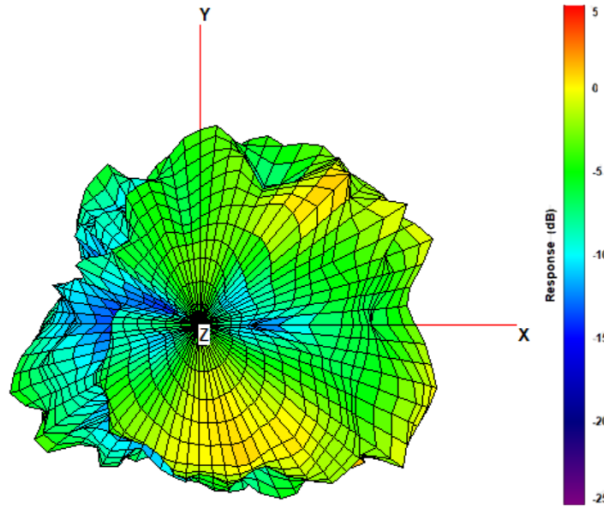
Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250	2.90



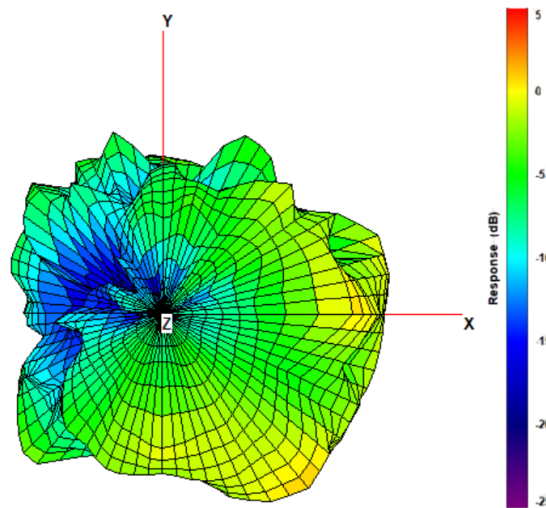
Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250	2.90



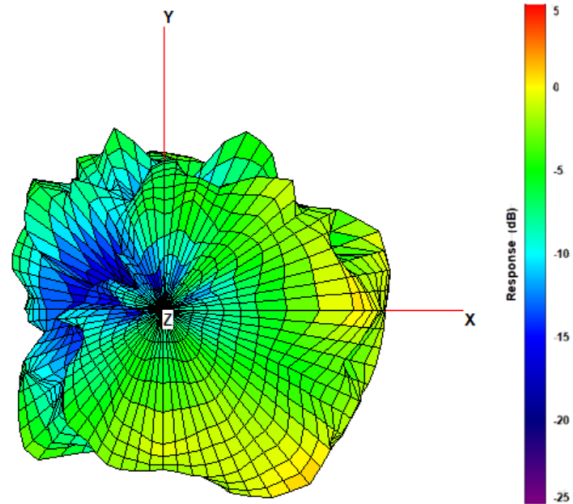
Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725	2.81



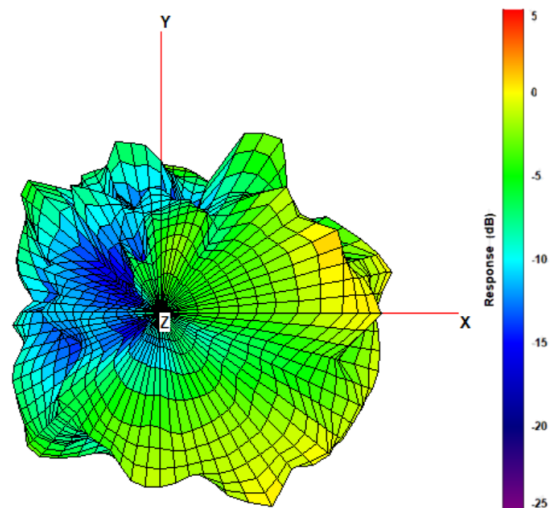
Max Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725	2.81



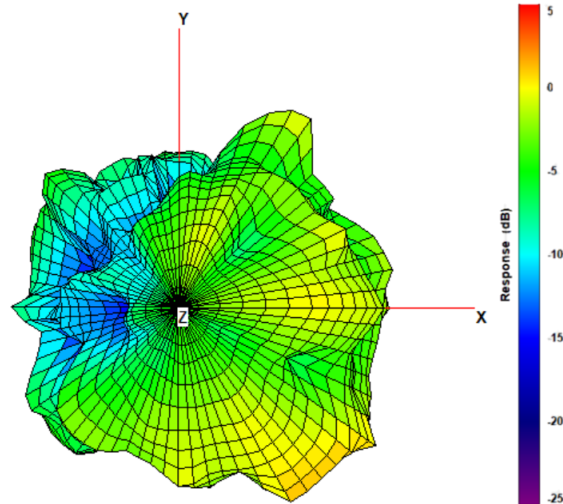
Max Antenna 3D Radiation Pattern 5850-5895 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5875	2.52



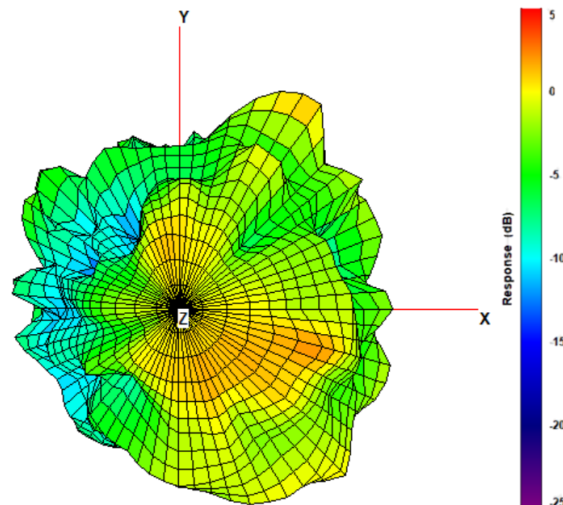
Max Antenna 3D Radiation Pattern 5925-6425 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6015	3.38



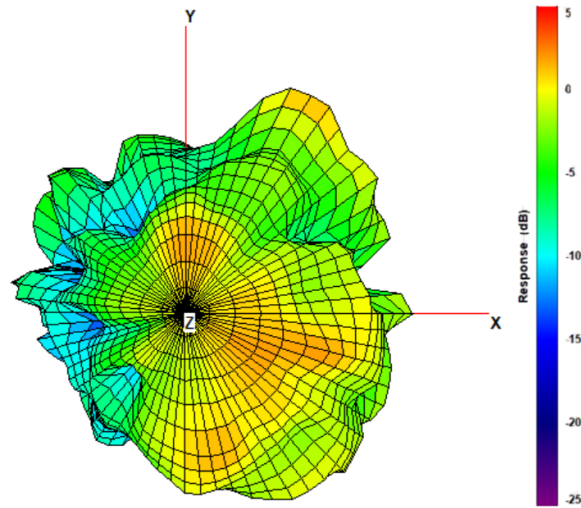
Max Antenna 3D Radiation Pattern 6425-6525 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6425	2.79



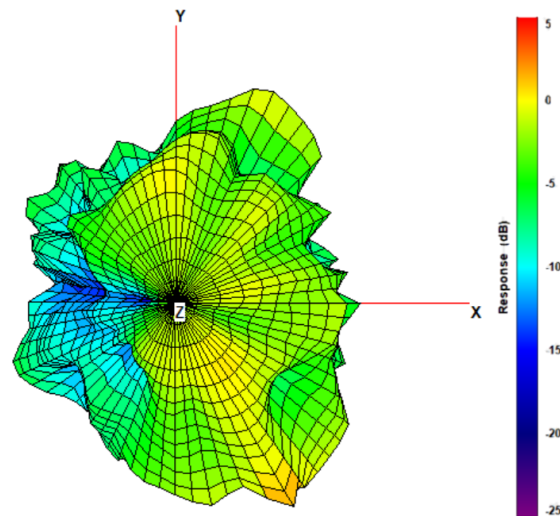
Max Antenna 3D Radiation Pattern 6525-6875 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6535	2.31



Max Antenna 3D Radiation Pattern 6875-7125 MHz

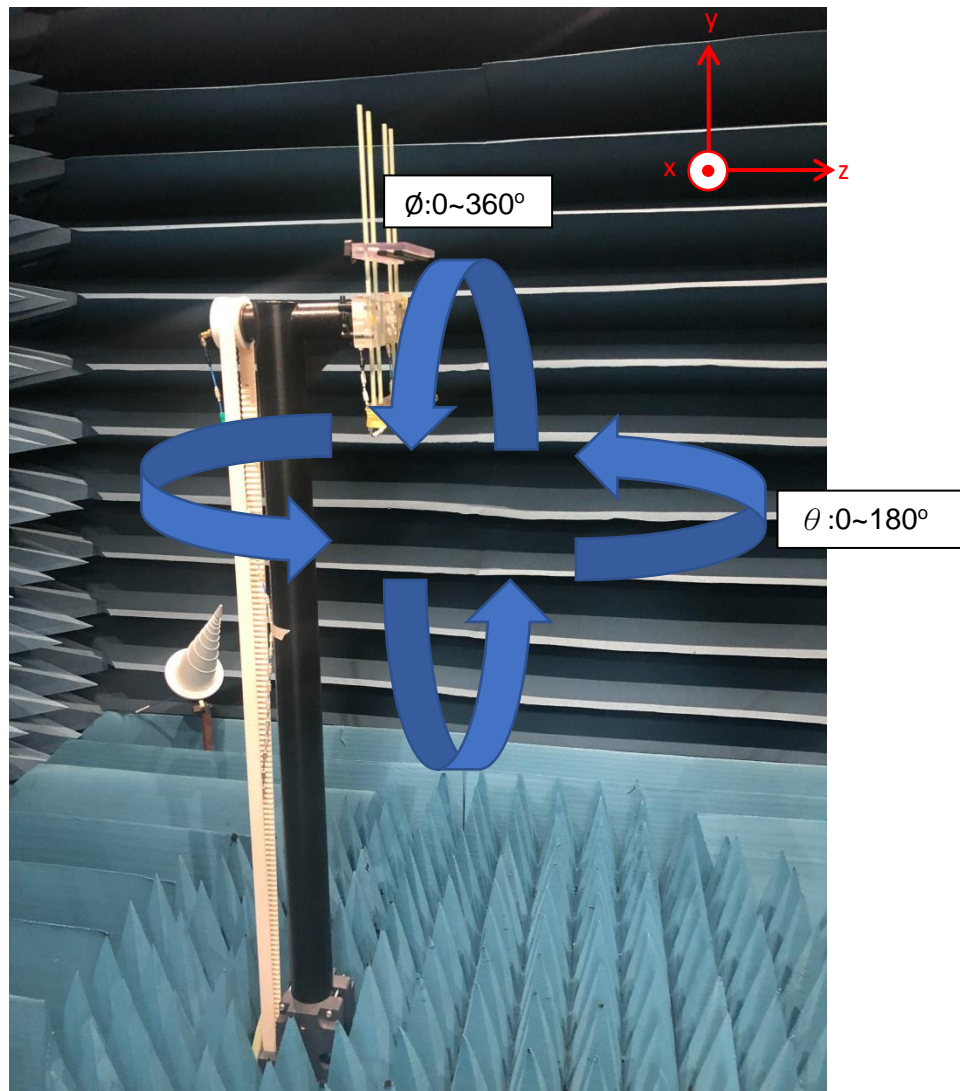
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
7095	2.96



Annex A. Photographs

A.1 Setup Photo

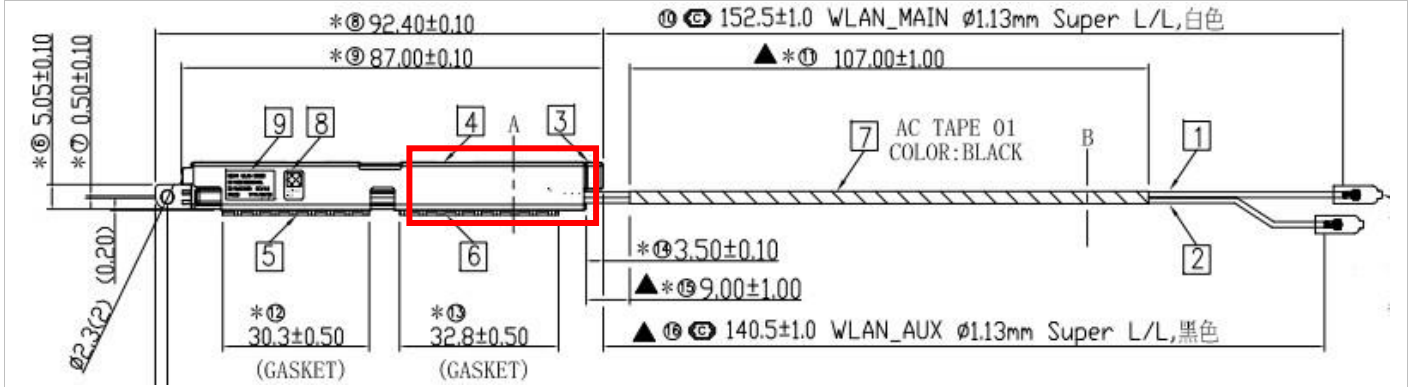
Test Conditions
NB under test placed on a non-conductive structure at sufficient height to be in the 'quiet zone' of the chamber
The NB under test must be fully populated with a power, motherboard, hard drive, disk drives, etc... The purpose is to characterize the antennas on a fully populated customer deliverable unit.
NB's panel should be parallel with XY-plane and face to Y-axle, see diagram below.



A.2 Test sample

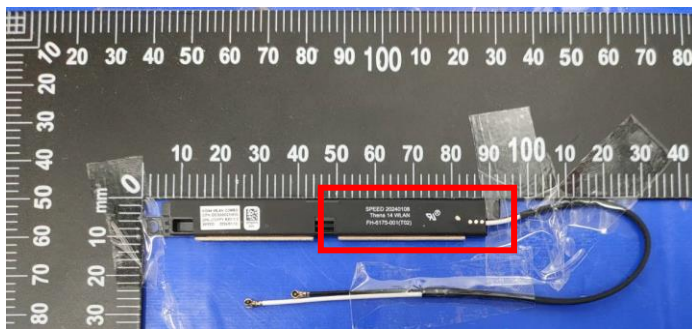
Main Antenna

Antenna Drawing

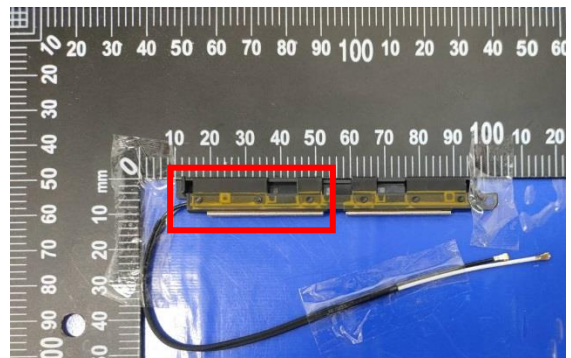
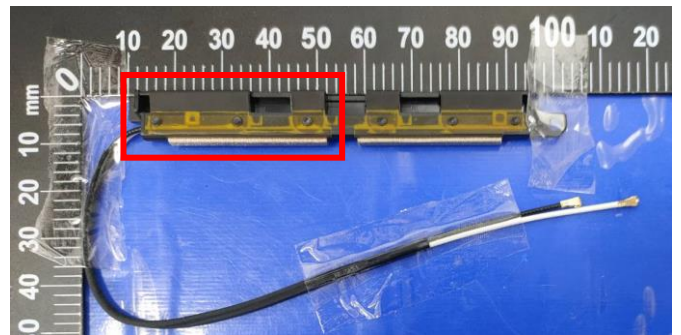


Antenna Photo

Front



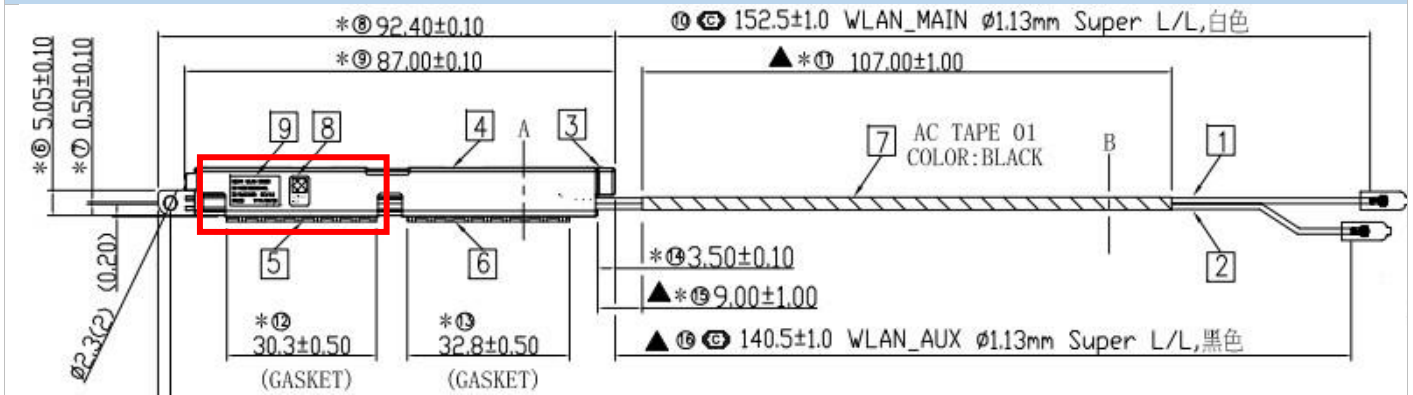
Back



Note: antenna photo should include L type ruler

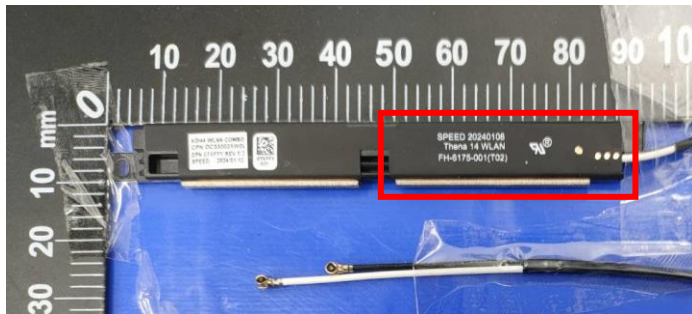
Aux Antenna

Antenna Drawing

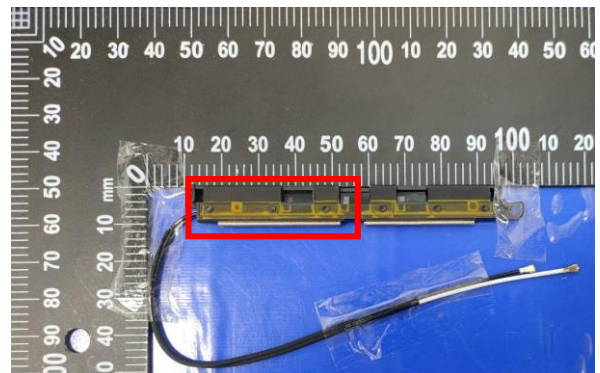
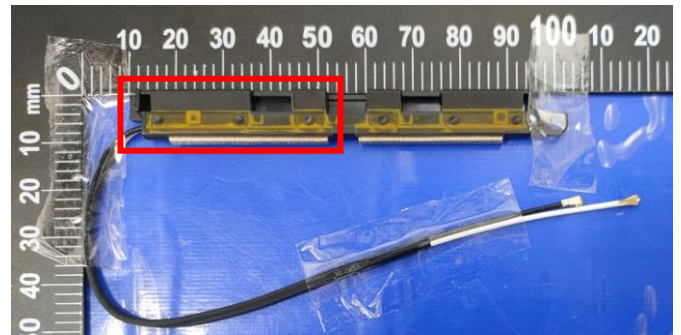


Antenna Photo

Front



Back



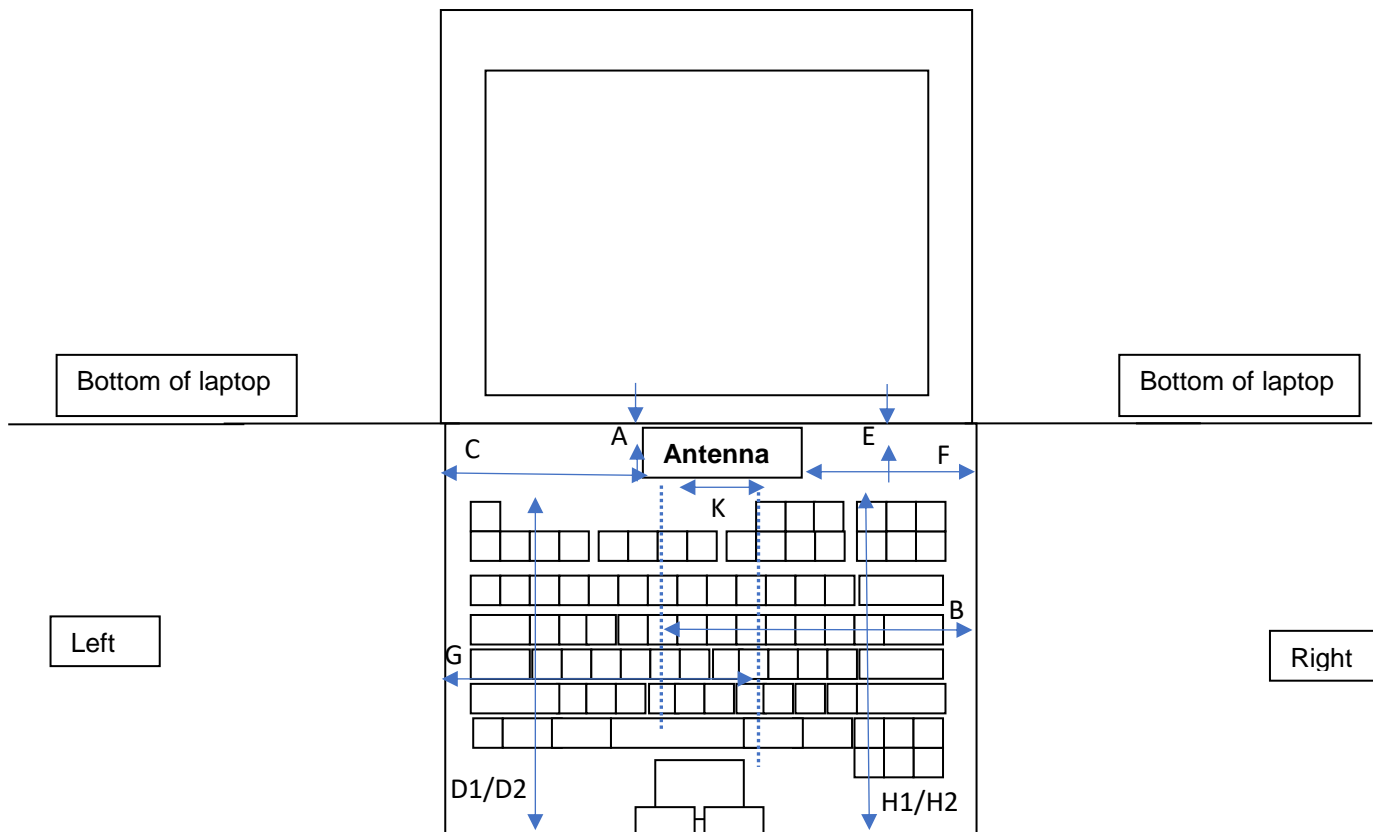
Note: antenna photo should include L type ruler

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).

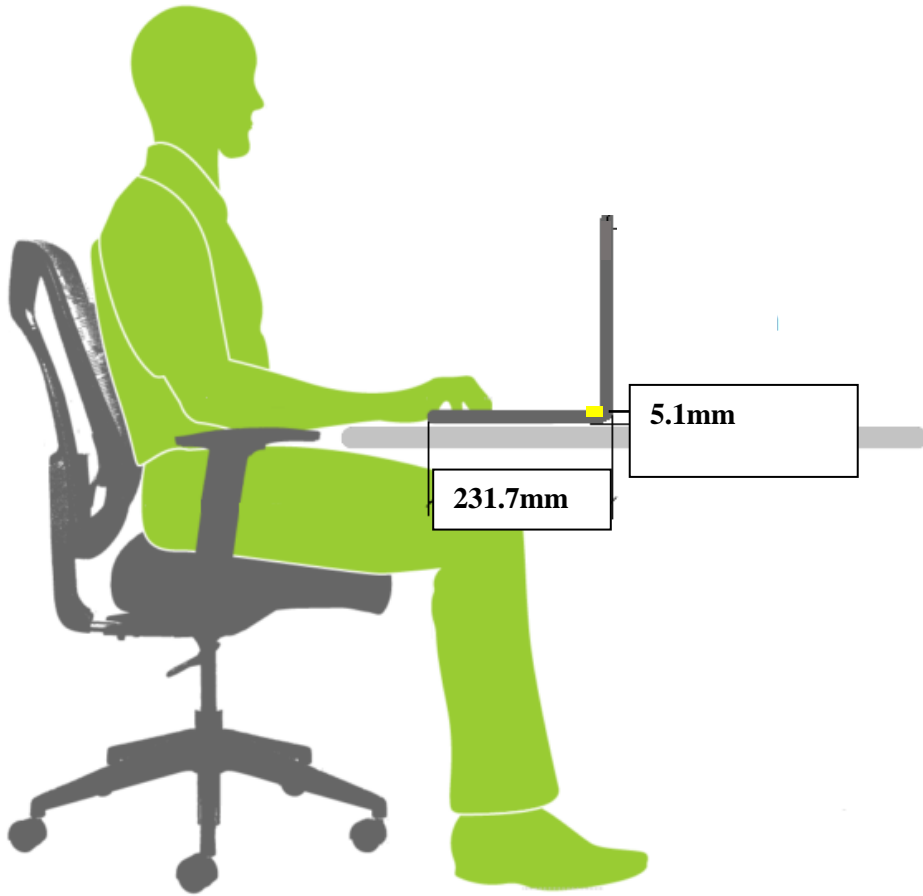
Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.



Minimum Separation Distance			
Item	Antenna	Position	Distance (mm)
A	WLAN-Main	to Top	4.2
B	WLAN-Main	to Right	149
C	WLAN-Main	to Left	84.5
D-1	WLAN-Main	to Bottom of Laptop (Include Bumper)	5.1
D-2	WLAN-Main	to Bottom of Laptop (NOT include Bumper)	4.2
E	WLAN-Aux	to Top	4.2
F	WLAN-Aux	to Right	149
G	WLAN-Aux	to Left	84.5
H-1	WLAN-Aux	to Bottom of Laptop (Include Bumper)	5.1
H-1	WLAN-Aux	to Bottom of Laptop (NOT include Bumper)	4.2
K	WLAN Main	to WLAN Aux	33.8

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.



Annex C. Antenna Information

C.1 Antenna Assembly Specifications

1A	1B	1C	1D	Freq Range MHz	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)	Max VSWR	Cable Loss (dB)
F-0G-FH-6175-001-00 DC33002XW0L	SPEED	PIFA	50 ohm Coaxial length: 152.5 mm diameter: 1.13mm SLL Connector: Kangshuo	2.4GHz	2.85	3.25	3	0.40
				5.2GHz	2.93	3.56	3	0.63
				5.3GHz	2.93	3.56	3	0.63
				5.6GHz	2.56	3.2	3	0.64
				5.8GHz	2.60	3.26	3	0.66
				5.9GHz	2.96	3.63	3	0.67
				6.2GHz	3.41	4.1	3	0.69
				6.5GHz	3.89	4.6	3	0.71
				6.7GHz	3.89	4.6	3	0.71
				7.0GHz	3.68	4.42	3	0.74
F-0G-FH-6175-001-00 DC33002XW0L	SPEED	Monopole	50 ohm Coaxial length: 140.5 mm diameter: 1.13mm SLL Connector: Kangshuo	2.4GHz	2.74	3.27	3	0.53
				5.2GHz	2.90	3.71	3	0.81
				5.3GHz	2.90	3.71	3	0.81
				5.6GHz	2.81	3.67	3	0.86
				5.8GHz	2.81	3.67	3	0.86
				5.9GHz	2.52	3.39	3	0.87
				6.2GHz	3.38	4.26	3	0.88
				6.2GHz	2.79	3.71	3	0.92
				6.7GHz	2.31	3.24	3	0.93
				7.0GHz	2.96	3.94	3	0.98