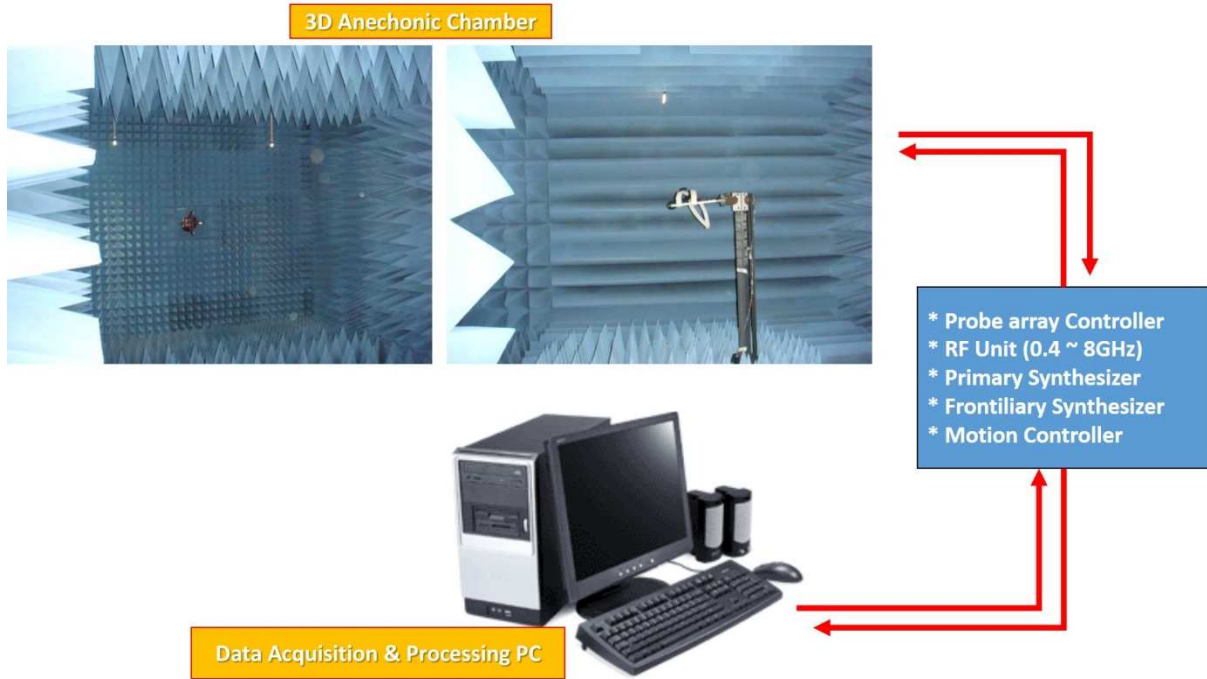


# Regulatory WLAN Antenna Information

Platform information										
Brand	ODM		RMN	Intel platform (ex: Yes, No or NA)		Platform type (ex: regular NB, convertible PC, AIO...etc)		*SAR minimum separation (mm)		
HP Inc.	Quanta Corporation		TPN-217	Yes		Notebook PC		186.08		
Antenna information										
Vendor		Type		Antenna Part number (Main/Tx1)			Antenna Part number (Aux/Tx2)			
1		PIFA		DQ60ACQD021 (0ACQD018012N)			DQ60ACQD021 (0ACQD018012N)			
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
<b>Main</b>	1.03	-1.48	-1.57	-0.93	-1.14	-1.88	N/A	N/A	N/A	N/A
<b>Aux</b>	1.35	-1.84	-1.84	-1.68	-1.54	-1.24	N/A	N/A	N/A	N/A
Module Information										
Model		Form factor and suffixes								
RTL8852BE (Cava2)		Realtek Wi-Fi 6 RTL8852BE+ BT5.2 (802.11ax 2x2, MU-MIMO supported, supporting gigabit data rate)								

### 1. Applicable test methods

The radiation pattern of antenna is measured in both horizontal polarization and vertical polarization. The radiation pattern measurements are performed in the three-dimensional anechoic chamber. The chamber provides less than  $-30\text{dB}$  reflectivity from  $800\text{MHz}$  through  $8\text{GHz}$ . The chamber is calibrated using both standard dipole antenna and horn antenna. The Gain here is expressed as  $\text{dBi}$  that standardizes the isotropic antenna. The Gain measurements and antenna radiation pattern are also performed in the same chamber described previously. Figure 2 shows the schematic diagram for measuring radiation pattern and Gain.



**2. Test & System Description**

a. Test setup

**1. Frequency Range**

2400~2500MHz, for WLAN application.

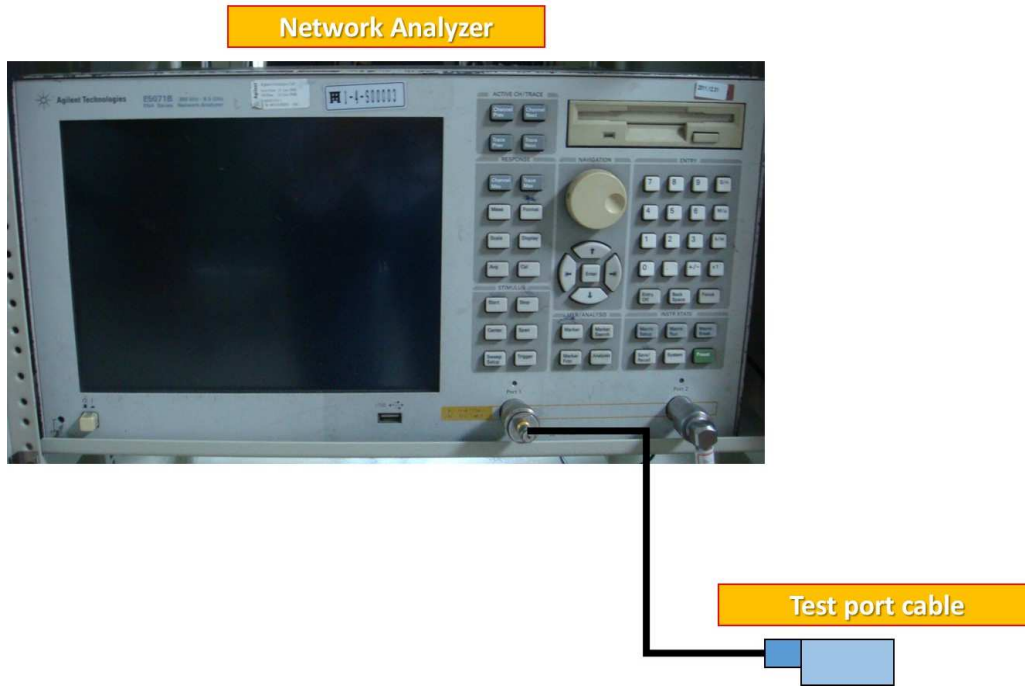
5150~5895MHz, for WLAN application

**2. Antenna Configuration**

The antenna basically has two parts; the stamping and the cable assembly with the connector on one side. The detailed drawing is attached.

**3. VSWR**

The VSWR is measured with network analyzer that support up to 8GHz. All the measurements are performed with the customer provided fixture. Figure 1 shows the typical schematic diagram for measuring VSWR.



**Figure 1. The schematic diagram for measuring VSWR**

## b. Equipment list

**Test Equipment**

The equipment for the antenna measurement we used is as follows:

- A. Network Analyzer, support up to 8GHz, to measure the VSWR and input impedance of antenna.
- B. Three-dimensional anechoic chamber to measure antenna gain and radiation pattern(Standard horn antenna was used to calibrate the chamber)
- C. Digital caliper to measure the dimensions.
- D. Climatic chamber for mechanical tests.
- E.

## Radiated Setup

Item	Device	Type/Model	manufacturer	Cal. Date	Cal. Due Date
1	Anechoic Chamber	AMS-8500	ETS-Lindgren	2021/12/20	2022/12/20
2	Turn Table	ETS	ETS-Lindgren	N/A	N/A
3	Measurement SW	EMQuest1.08	ETS-Lindgren	N/A	N/A
4	Vector Network Analyzer	Agilent E5071B	Agilent	2021/12/17	2022/12/17
5	Receive Antenna Absorber Nested Dual- Polarized Dual-Vivaldi Array Antenna 700MHz to 6GHz	EMCO 3164-08	ETS-Lindgren	N/A	N/A
6	Multi Axis Positioning System (MAPS™)	EMCO 2115CR	ETS-Lindgren	N/A	N/A
7	MAPS™ Controller	MECO 2090	ETS-Lindgren	N/A	N/A
8	Horn antenna	3164-08	ETS-Lindgren	2021/12/15	2022/12/15
9	Cable 0.5m - 700MHz~10GHz	RG316	Senyu	2021/12/21	2022/12/21

N/A: Not Applicable

Note: Chamber calibration included full set of implement.

Test personnel: Mars Sung

Test date: 2022/10/11

# Antenna Information

## Section 1. Antenna Assembly Specifications

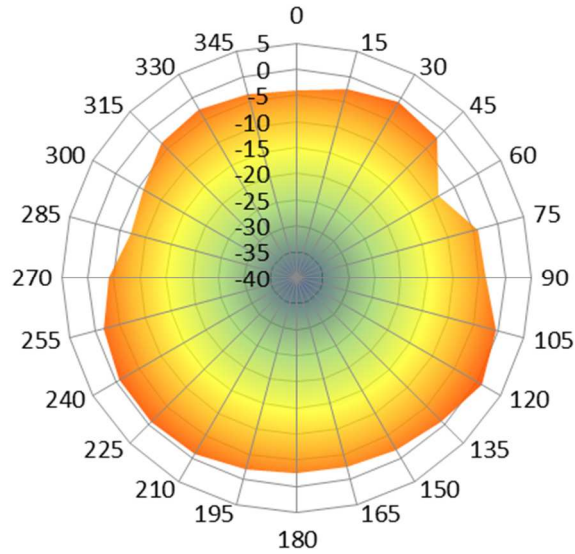
1A Antenna Part Number	1B Manufacturer	1C Antenna Type	1D Cable Assembly Part Number and Information	Freq Range MHz	1E * Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G Max VSWR	1H Cable Loss (dB)
P/N: DQ60ACQD021 (0ACQD018012N) Main Tx1/ Rx1 Antenna Ant 1	1	PIFA	50 ohm Coaxial Length: 295 mm Diameter:1.13 mm Connector Type: IPEX MHF-4L P/N: 958-C413-W-B-Bu-A0	2400-2495	1.03	2.14	3.00	1.11
				5150-5250	-1.48	0.13	3.00	1.61
				5250-5350	-1.57	0.05	3.00	1.62
				5470-5725	-0.93	0.74	3.00	1.67
				5725-5850	-1.14	0.58	3.00	1.72
				5850-5895	-1.88	-0.15	3.00	1.73
				5925-6425	N/A	N/A	N/A	N/A
				6425-6525	N/A	N/A	N/A	N/A
				6525-6875	N/A	N/A	N/A	N/A
P/N: DQ60ACQD021 (0ACQD018012N) Aux Tx2/ Rx2 Antenna Ant 2	1	PIFA	50 ohm Coaxial Length: 495 mm Diameter:1.13 mm Connector Type: IPEX MHF-4L P/N: 958-C413-W-B-Bu-A0	2400-2495	1.35	3.21	3.00	1.86
				5150-5250	-1.84	0.86	3.00	2.70
				5250-5350	-1.84	0.87	3.00	2.71
				5470-5725	-1.68	1.11	3.00	2.79
				5725-5850	-1.54	1.31	3.00	2.85
				5850-5895	-1.24	1.61	3.00	2.85
				5925-6425	N/A	N/A	N/A	N/A
				6425-6525	N/A	N/A	N/A	N/A
				6525-6875	N/A	N/A	N/A	N/A
6875-7125	N/A	N/A	N/A	N/A				

## Section 2. Radiation characteristics of antenna loaded in Host Platform

### Main Antenna

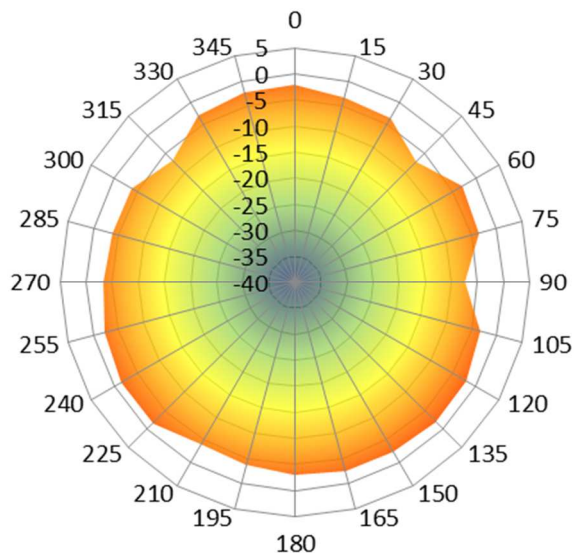
#### Max Antenna 2D Radiation Pattern 2400 – 2495 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
2400-2495	1.03



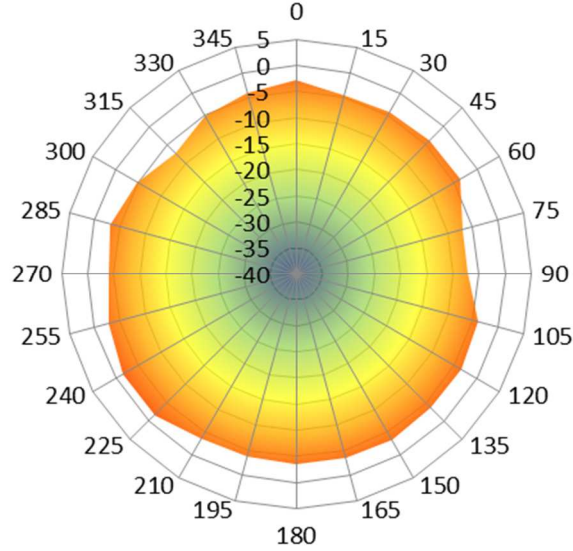
#### Max Antenna 2D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5150-5250	-1.48



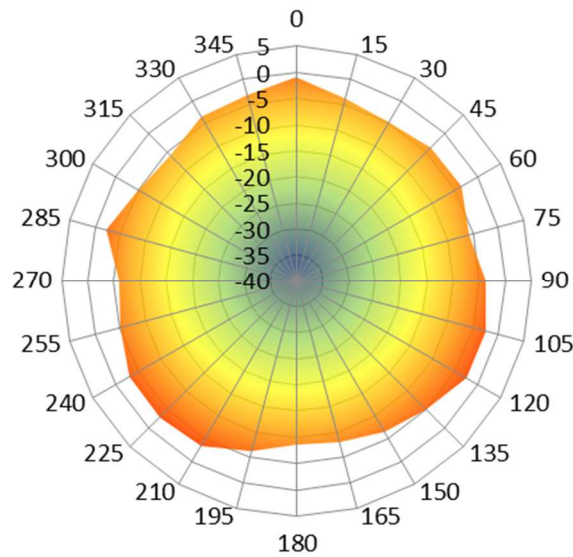
### Max Antenna 2D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5250-5350	-1.57



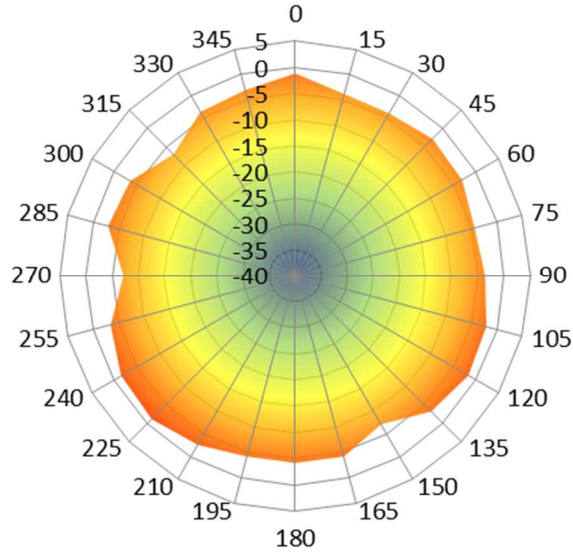
### Max Antenna 2D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5470-5725	-0.93



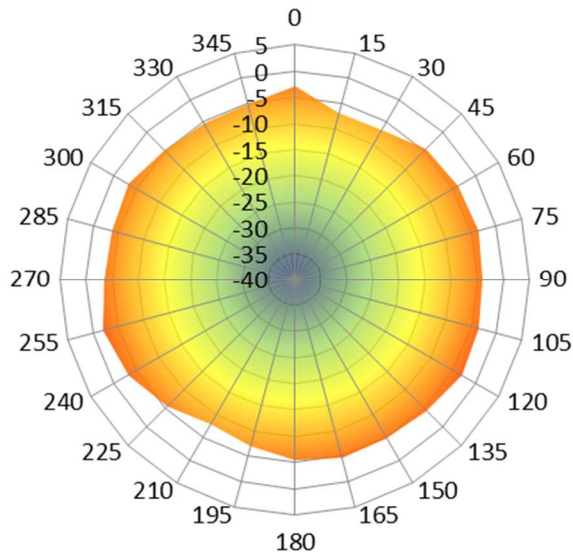
### Max Antenna 2D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5725-5850	-1.14



### Max Antenna 2D Radiation Pattern 5850-5895 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5850-5895	-1.88

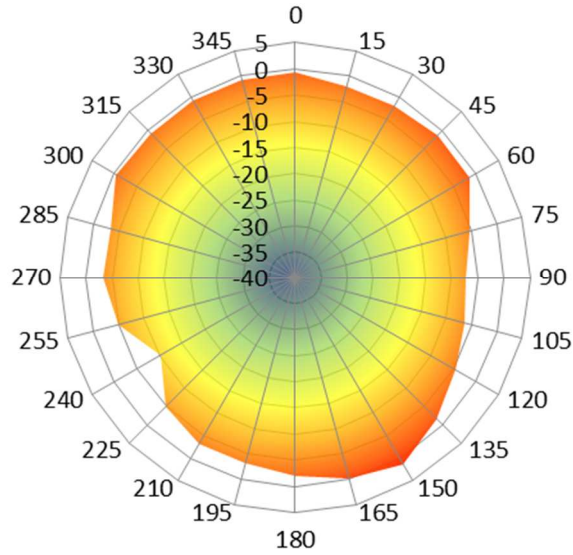




## Auxiliary Antenna

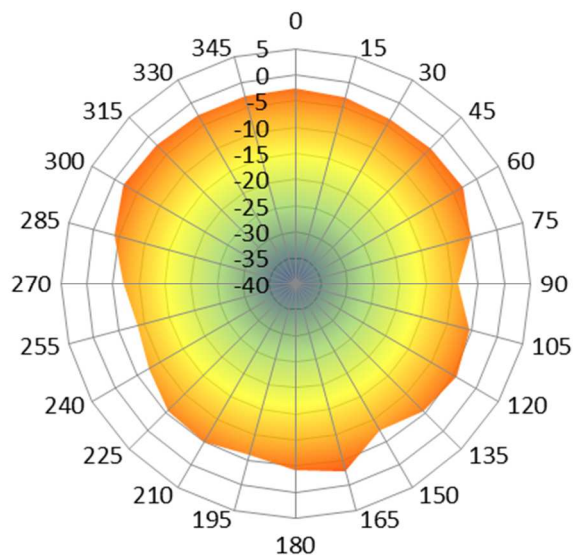
### Aux Antenna 2D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
2400-2483.5	1.35



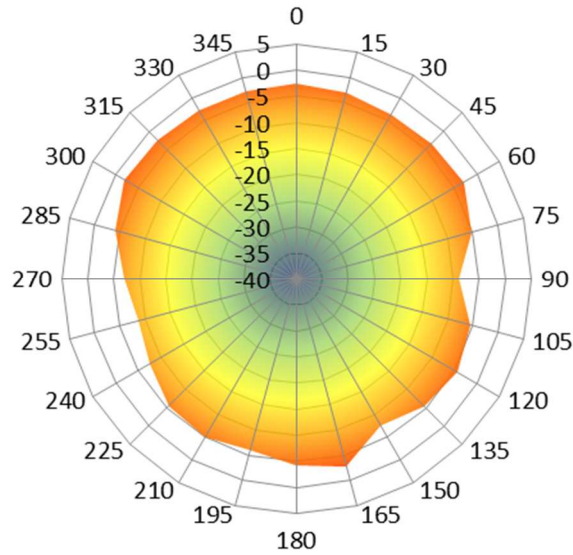
### Aux Antenna 2D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5150-5250	-1.84



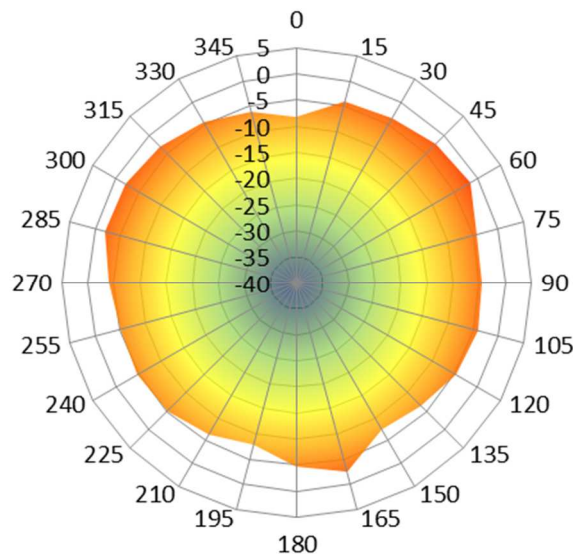
### Aux Antenna 2D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5250-5350	-1.84



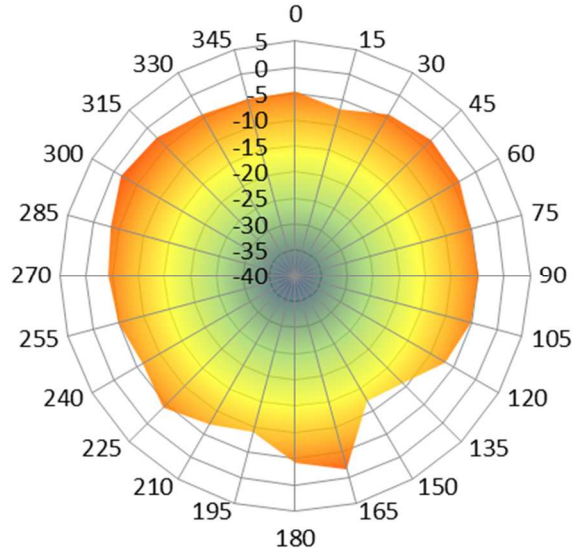
### Aux Antenna 2D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5470-5725	-1.68



### Aux Antenna 2D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5725-5850	-1.54



### Aux Antenna 2D Radiation Pattern 5850-5895 MHz

Frequency (MHz)	Horizontal+ Vertical (dBi) peak (dBi)
5850-5895	-1.24

