

APPROVAL SHEET

Customer Name: VeriFone

Date: Sep. 14, 2022

Verifone P/N	ANT571-003-01-A
DCT P/N	F-VF0159-03-H
Description	ANTENNA, V660P WIFI
Version	DVT

Prepared by	Signed by	Approved by Customer
RF Engineer	<i>Jack Li</i>	
ME Engineer	<i>Robin Xiao</i>	
Reviewed by	Signed by	
RF Manager	<i>Jaynu Gu</i>	
ME Manager	<i>Denny Xiao</i>	
Project Manager	<i>Scott Zhang</i>	

Project: V660P	Author : Jack Li Robin Xiao	File Name:
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	V660P WIFI Antenna Approval Sheet
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

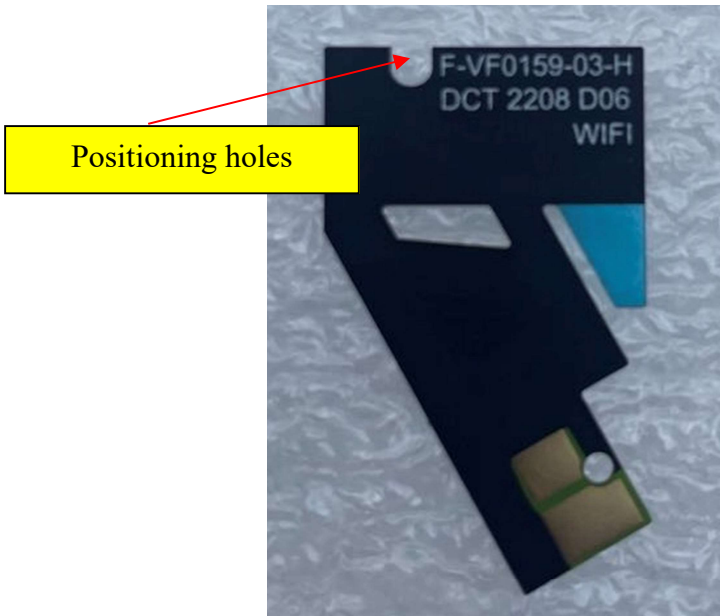
1 Antenna Description

1.1 Location of WiFi antenna in test fixture



WiFi antenna location

1.2 Picture of the WIFI antenna



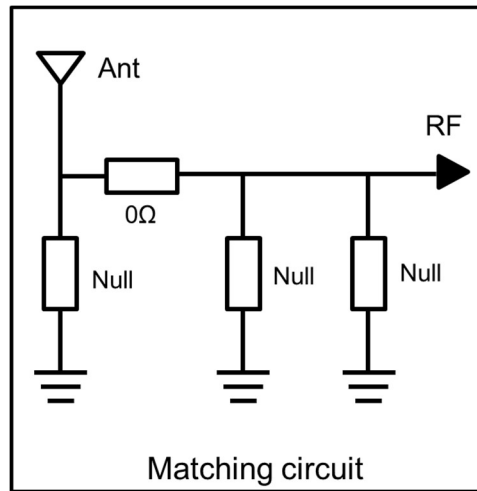
Top View

Project: V660P	Author : Jack Li Robin Xiao	File Name:
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	V660P WIFI Antenna Approval Sheet
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

1.3 Type of antenna

The type of the WIFI antenna is PIFA

1.4 Matching Circuit



2 Product Specification

2.1 S11 (Return Loss)

The S11 over the frequencies stated in Table 1 below shall be measured at the connector end of the cable for each antenna assembly. The S11 are measured with the antennas installed on platform. The S11 shall be 100% tested in production.

WIFI Antenna

Test Parameter	698 MHz to 960 MHz	1710 MHz to 2690 MHz
S11:	-5dB Max	-5dB Max

Project: V660P	Author : Jack Li Robin Xiao	File Name:
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	V660P WIFI Antenna Approval Sheet
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		



S-parameter test

2.2 Test environment

The radiation pattern and antenna gain shall be tested either with a conventional far field anechoic chamber or a near field anechoic chamber such as a Satimo SG24-L.

For a far field anechoic chamber, the gain measurements shall be made within an RF anechoic chamber with at least 3-meter separation from the receive antenna to the antenna under test (AUT). The RF anechoic chamber must be lined with absorptive material rated as a minimum frequency range from 400MHz to 10GHz. The notebook with the antenna assemblies installed shall be placed on a non-conductive structure at a sufficient height to be in the ‘quiet zone’ of the chamber. All test equipment including horn antennas, adapters, cables, network analyzers, and receivers shall be calibrated per manufacturer’s minimum calibration requirements.

For a near field anechoic chamber, the AUT test must be place in the center (and within the admissible offset) of the probe array elements. The RF anechoic chamber must be lined with absorptive material rated as a minimum frequency range from 400MHz to 10GHz. The notebook with the antenna assemblies installed shall be placed on a non-conductive structure.

2.3 Antenna radiation measurement

In order to ensure compliance with network carrier specifications, it is required to measure a 3-D gain measurement for WIFI Antenna.

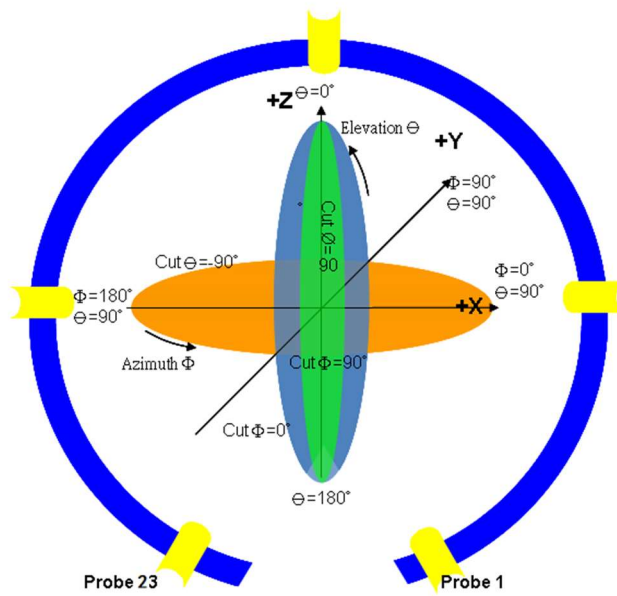
Table below specifies the details of the 3-D gain measurement points

Theta Start: 0°	Phi Start: 0°
Theta Stop: 165°	Phi Stop: 345°
Theta increment: 15°	Phi Increment: 15°

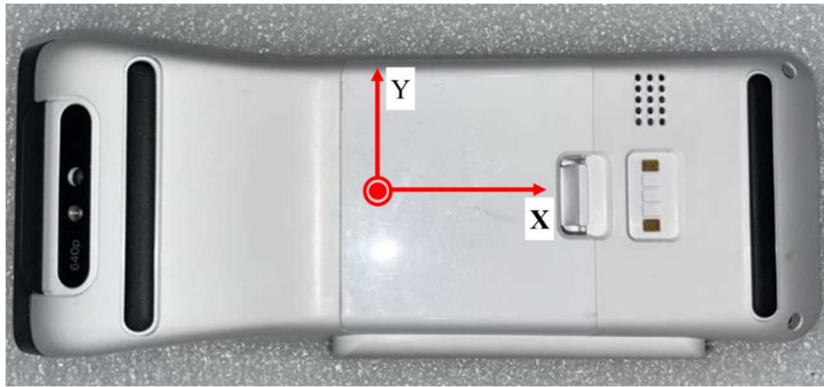
The table above specifies the minimum 23 measurement points (x2 polarizations) for each measurement frequency.

The axis and AUT orientation for gain measurements are outlined in below Figures.

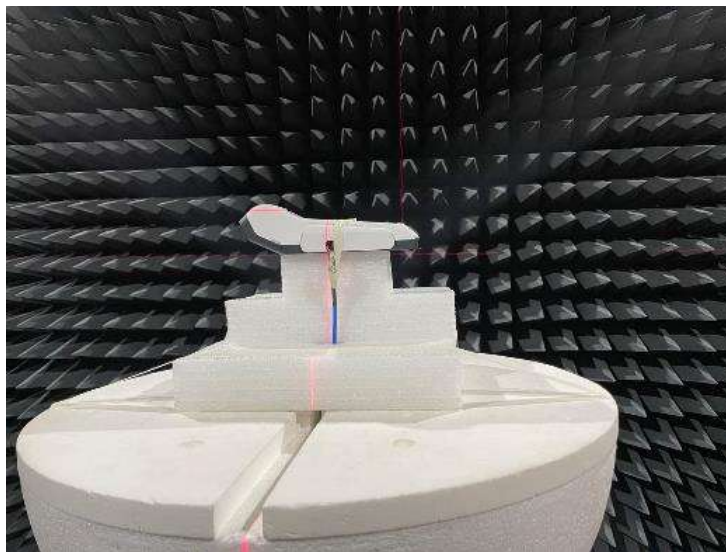
Project: V660P	Author : Jack Li Robin Xiao	File Name:
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	V660P WIFI Antenna Approval Sheet
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		



The axis definition



DUT orientation

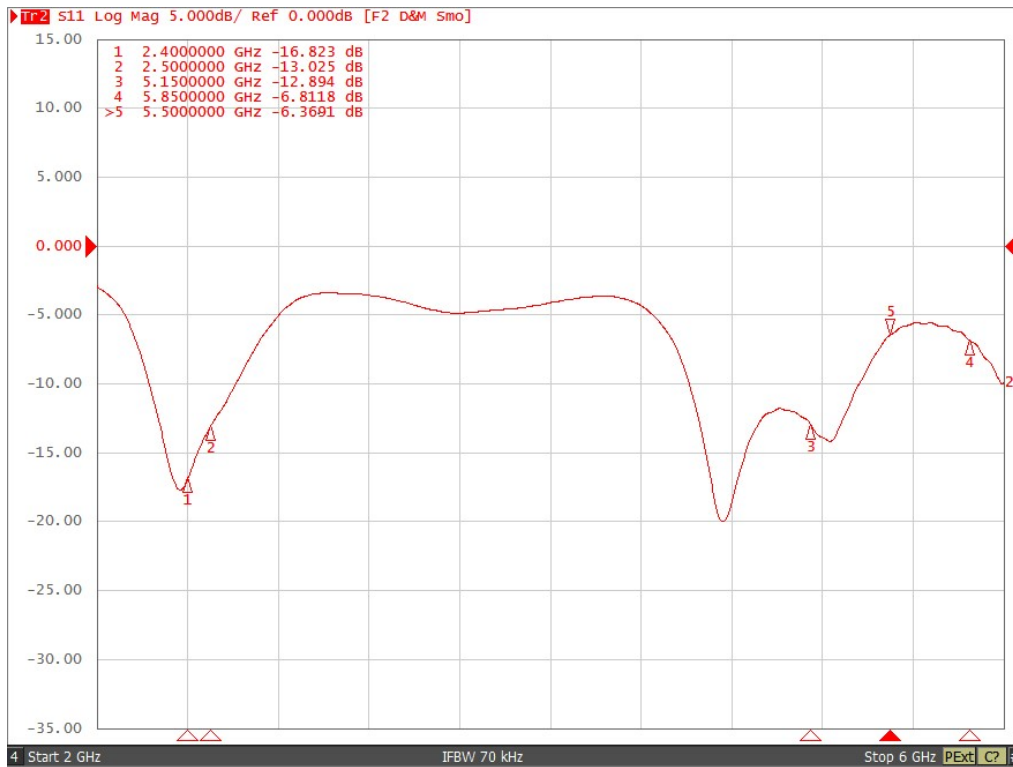


Device test environment

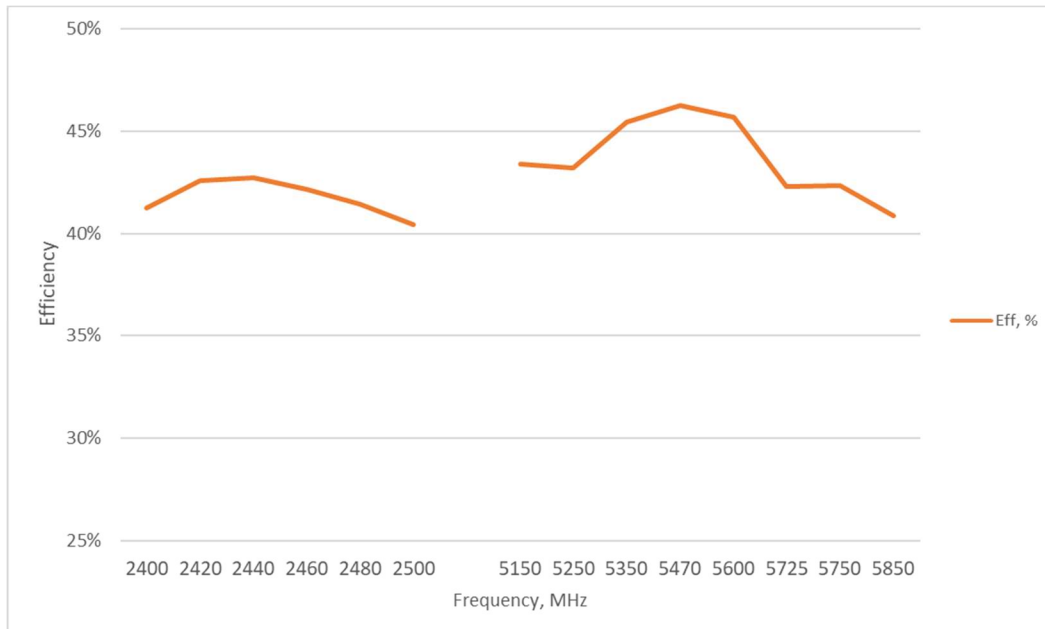
Project: V660P	Author : Jack Li Robin Xiao	File Name:
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	V660P WIFI Antenna Approval Sheet
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

3 Antenna Performance Test

3.1 S11 of WIFI Antenna



3.2 Antenna Radiated Efficiency



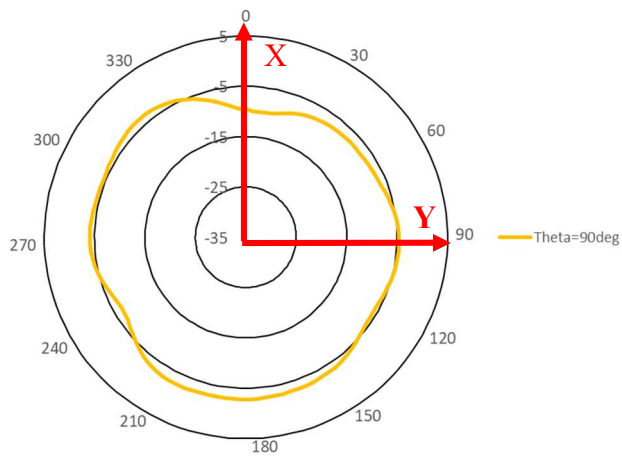
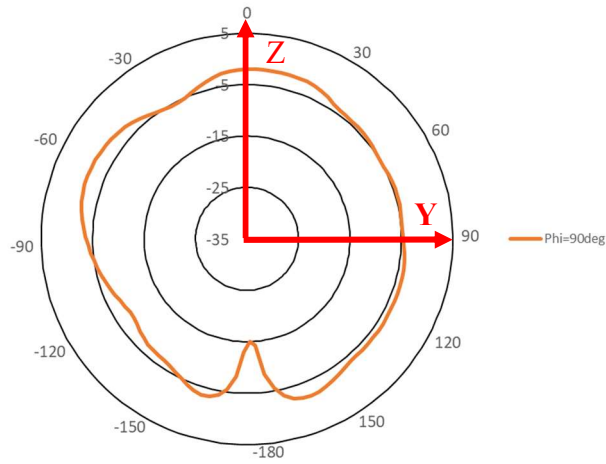
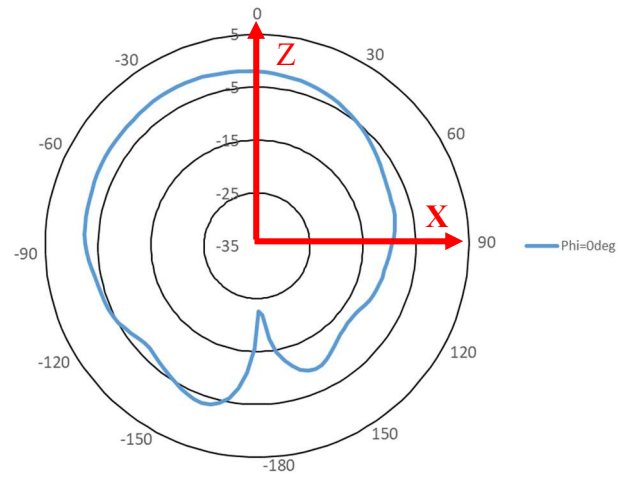
Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

Freq.MHz	Effi.%	Effi.dB	Peak Gain.dB
2400	41%	-3.8	-0.1
2420	43%	-3.7	0.2
2440	43%	-3.7	0.2
2460	42%	-3.8	0.1
2480	41%	-3.8	-0.1
2500	40%	-3.9	-0.3
5150	43%	-3.6	2.2
5250	43%	-3.6	2.2
5350	45%	-3.4	2.7
5470	46%	-3.3	2.6
5600	46%	-3.4	2.5
5725	42%	-3.7	1.9
5750	42%	-3.7	1.8
5850	41%	-3.9	1.6

Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

3.3 Radiation Pattern

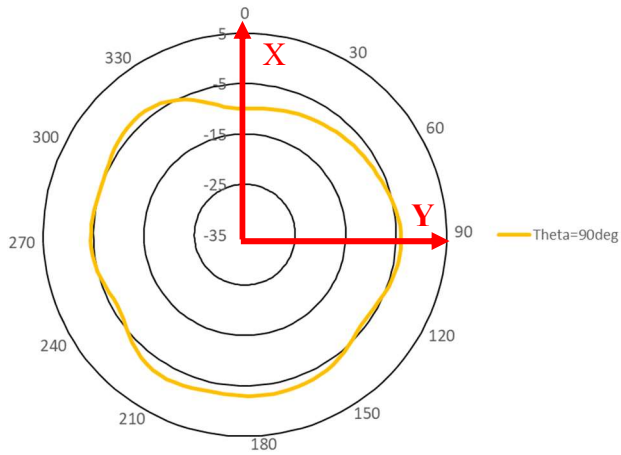
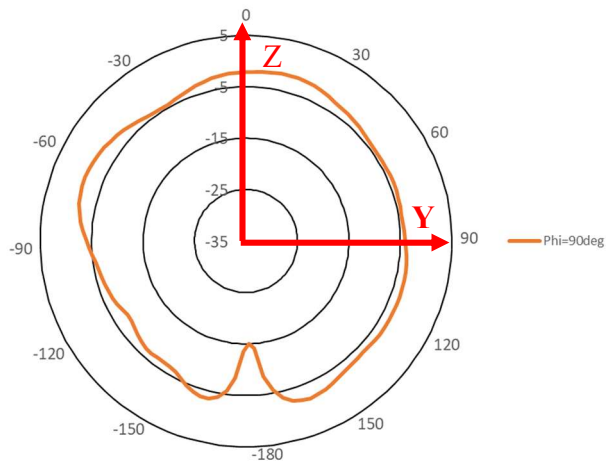
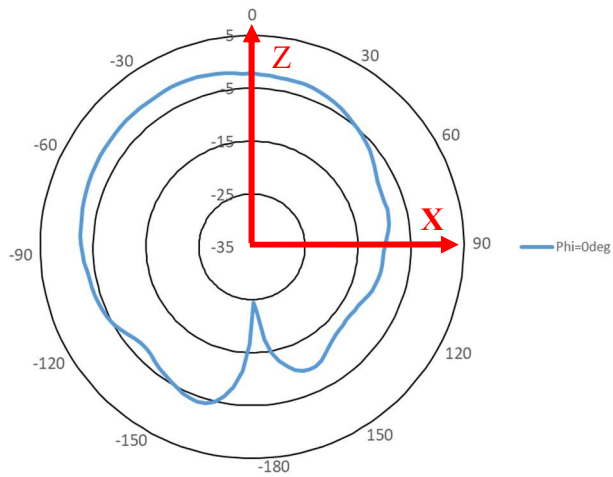
WiFi antenna: 2400MHz



2400MHz		
Phi=0deg Peak (dBi)	-1.35	-27 deg
Phi=90deg Peak (dBi)	-1.71	-66 deg
Theta=90deg Peak(dBi)	-2.7	207 deg

Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

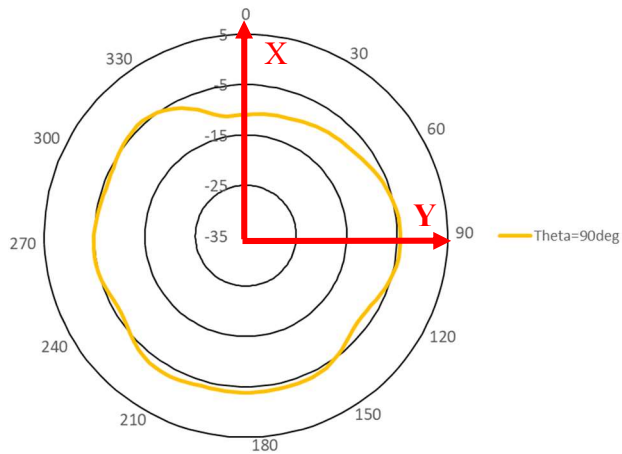
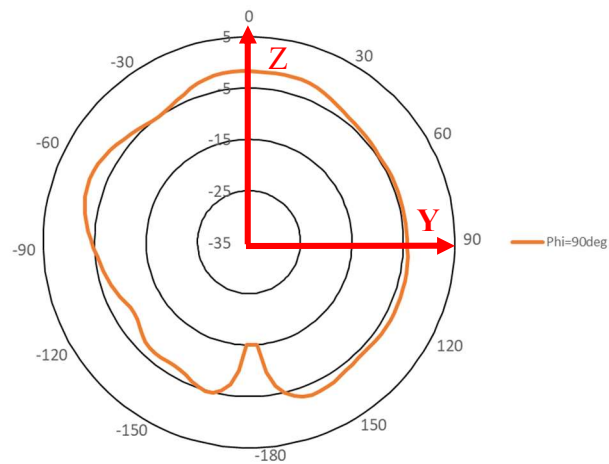
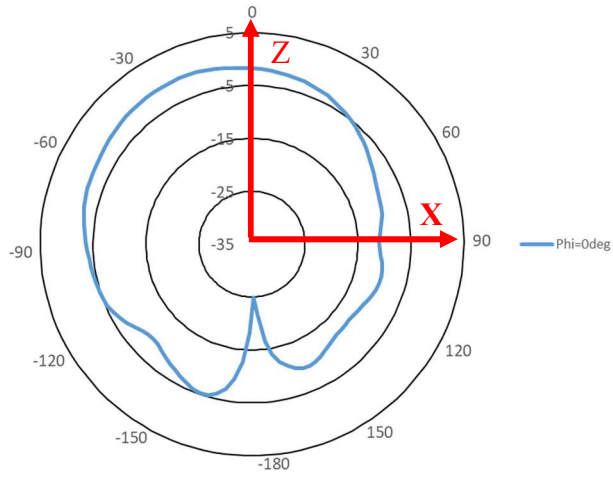
WiFi antenna: 2440MHz



2440MHz		
Phi=0deg Peak (dBi)	-1.19	-24 deg
Phi=90deg Peak (dBi)	-1.36	-66 deg
Theta=90deg Peak(dBi)	-2.44	210 deg

Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

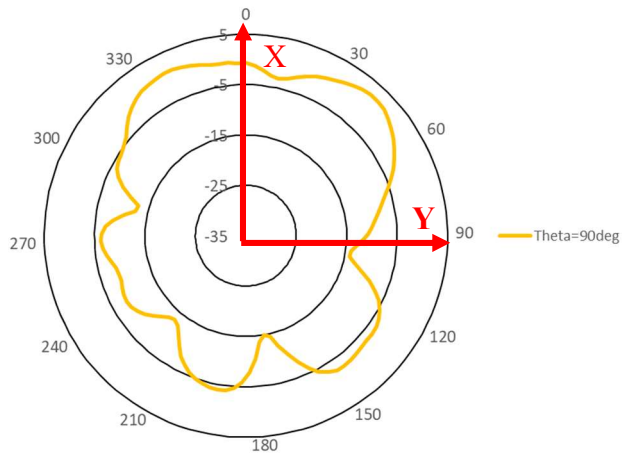
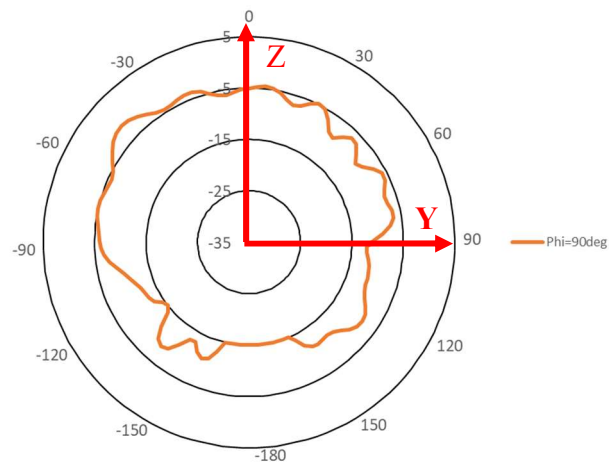
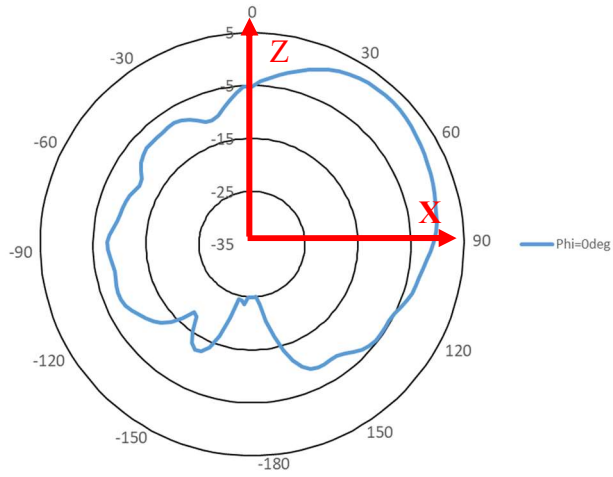
WiFi antenna: 2500MHz



2500MHz		
Phi=0deg Peak (dBi)	-0.73	-21 deg
Phi=90deg Peak (dBi)	-1.68	-3 deg
Theta=90deg Peak(dBi)	-3.25	213 deg

Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

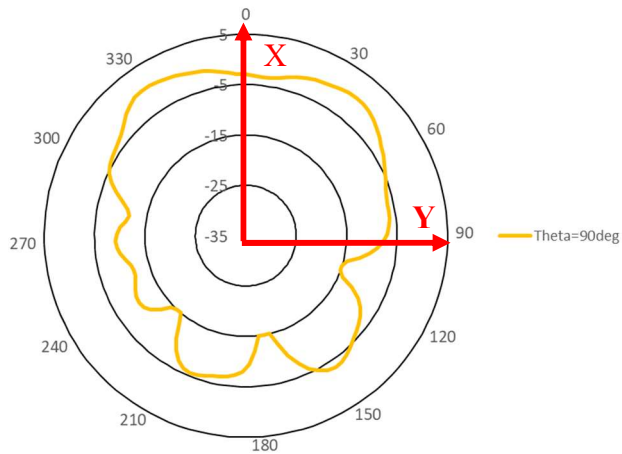
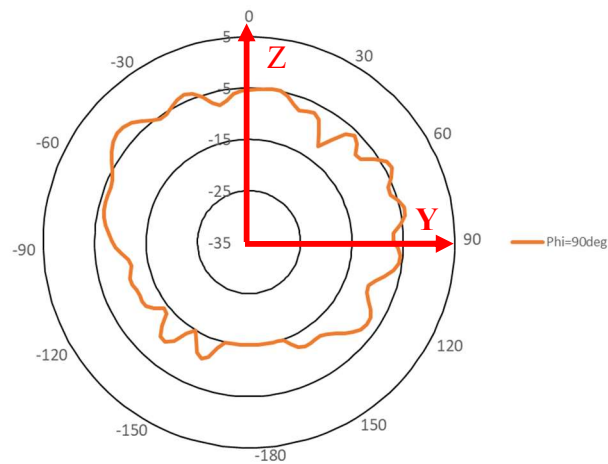
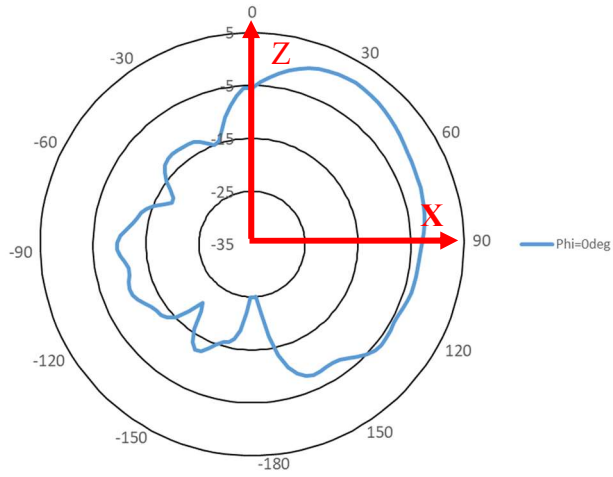
WiFi antenna: 5150MHz



5150MHz		
Phi=0deg Peak (dBi)	2.78	45 deg
Phi=90deg Peak (dBi)	-1.43	-45 deg
Theta=90deg Peak(dBi)	2.39	42 deg

Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

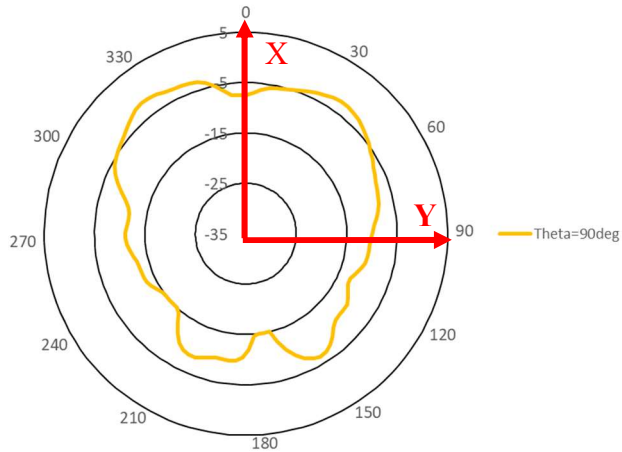
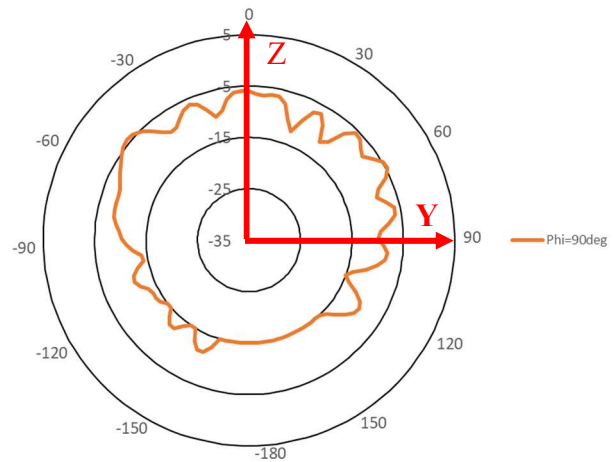
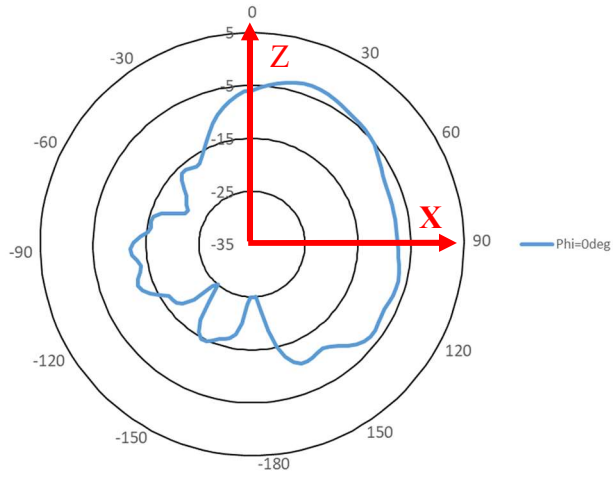
WiFi antenna: 5350MHz



5350MHz		
Phi=0deg Peak (dBi)	1.19	33 deg
Phi=90deg Peak (dBi)	-1.71	-48 deg
Theta=90deg Peak(dBi)	0.44	330 deg

Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

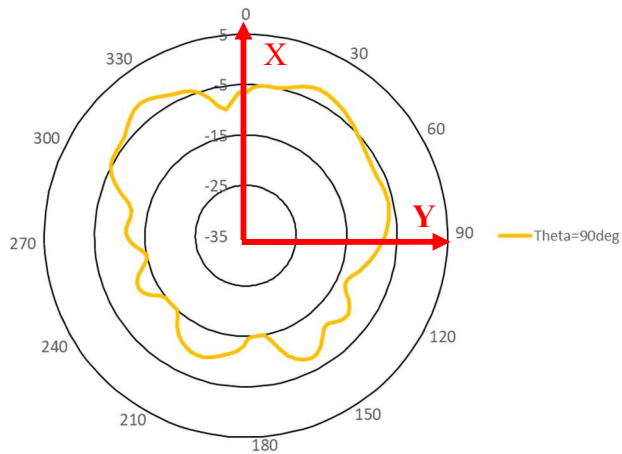
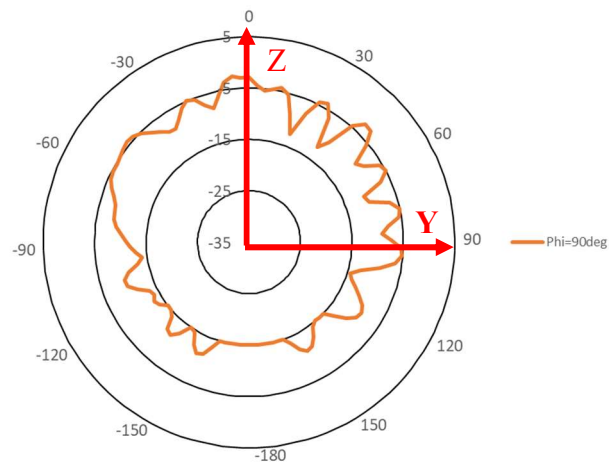
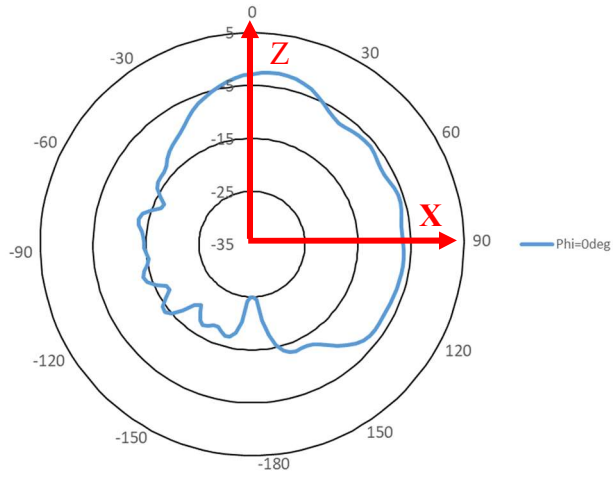
WiFi antenna: 5600MHz



5600MHz		
Phi=0deg Peak (dBi)	-3	21 deg
Phi=90deg Peak (dBi)	-4.3	-48 deg
Theta=90deg Peak(dBi)	-1.81	324 deg

Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

WiFi antenna: 5850MHz

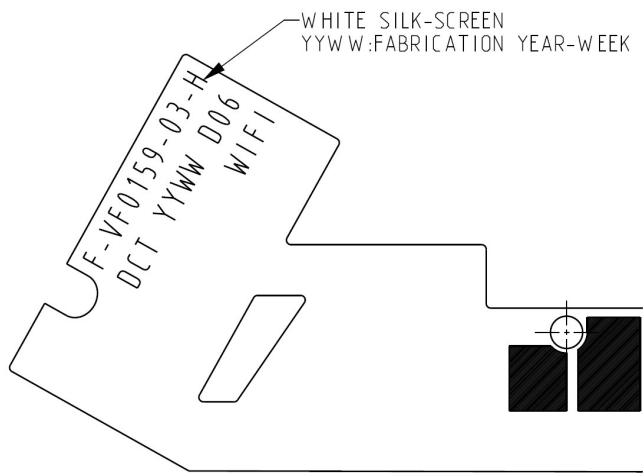
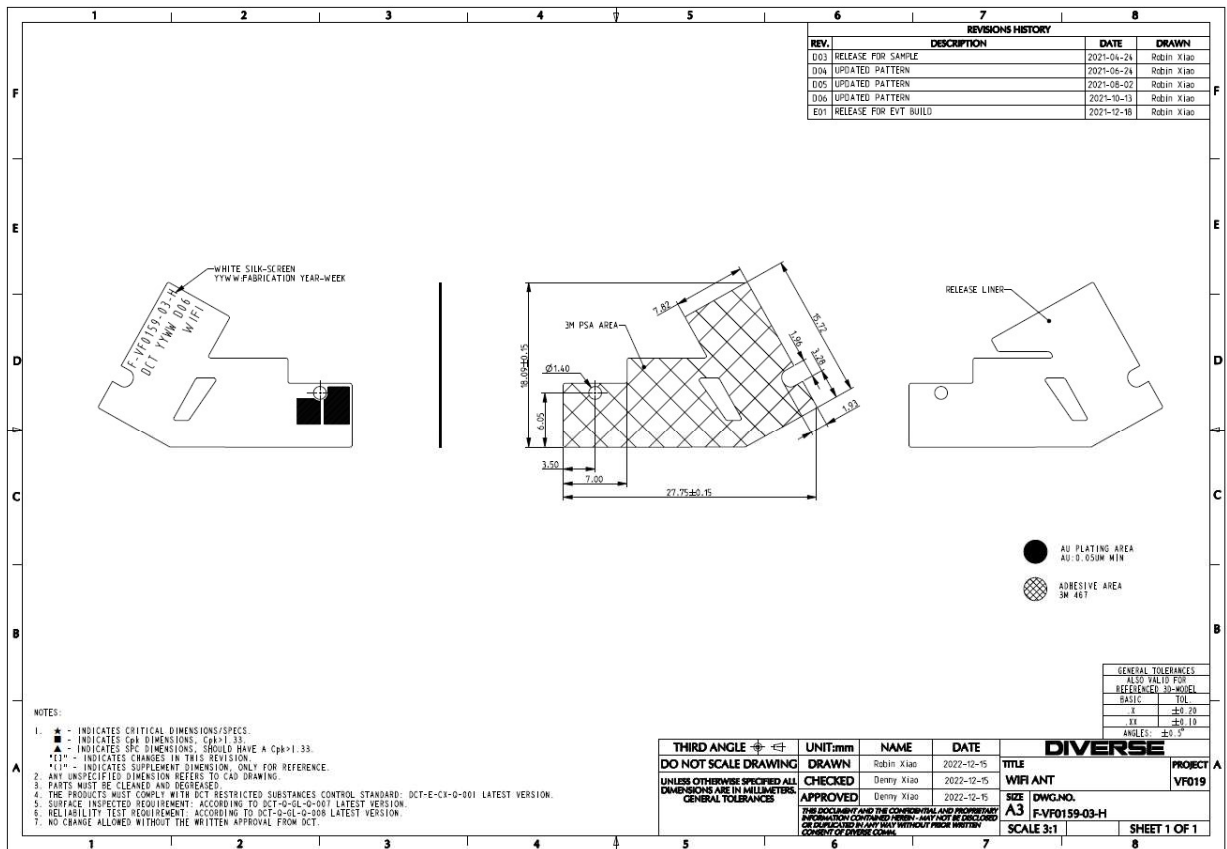


5850MHz		
Phi=0deg Peak (dBi)	-2.36	9 deg
Phi=90deg Peak (dBi)	-2.53	-3 deg
Theta=90deg Peak(dBi)	-1.41	324 deg

Project: V660P	Author : Jack Li Robin Xiao	File Name: V660P WIFI Antenna Approval Sheet
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		

4 Mechanical description

4.1 Drawings



Silkscreen detail view

Project: V660P	Author : Jack Li Robin Xiao	File Name:
Date: Sep. 14, 2022		
Language: English	Check : Jaynu Gu Denny Xiao	V660P WIFI Antenna Approval Sheet
Document No.: F-VF0159-03-H		
Zhejiang Diverse Communication Technology Co., Ltd		