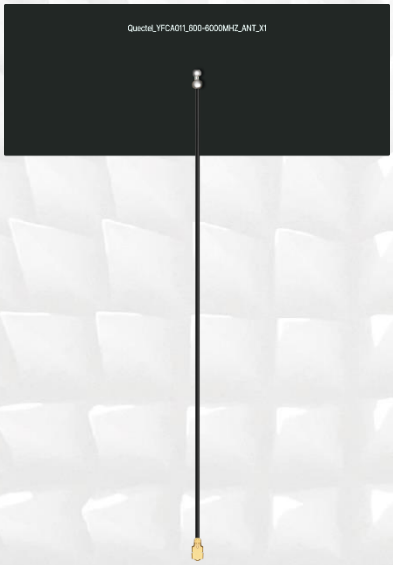
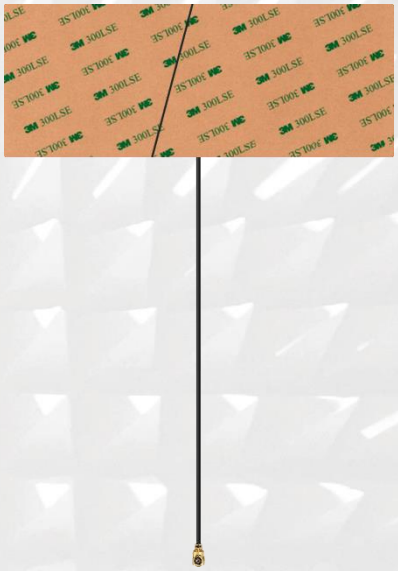




Antenna Datasheet

Product OC: YFCA011AA
Version: 1.1
Date: 2024-06-07
Status: Released
Product Name: 5G/NTN FPC Antenna
Key Features:
Frequency Band: 600–960 MHz, 1520–6000 MHz
Dimensions: 120 × 47 mm
Efficiency: Up to 85.71 % (5G Bands)
RoHS and REACH Compliant

Overview

This Quectel embedded 5G/NTN FPC antenna covers 5G NR Sub-6 GHz frequency bands and is compatible with 4G/3G/2G/LPWA bands, NTN bands. Ground plane independent, it's designed to be mounted directly to the underside of either a plastic or non-metallic enclosure. Ease of integration with a cable and connector which can be customized to meet your product design and RF module. Used with other 5G antennas, it can achieve MIMO (multiple input, multiple output) antenna technology for wireless communications in which multiple antennas are used at both the source (transmitter) and the destination (receiver).

Contents

1 Specification

Test Condition: Stick on 2 mm thick ABS Board

1.1. Electrical

Electrical	
Frequency Range	600–960 MHz, 1520–6000 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

Electrical - Detail

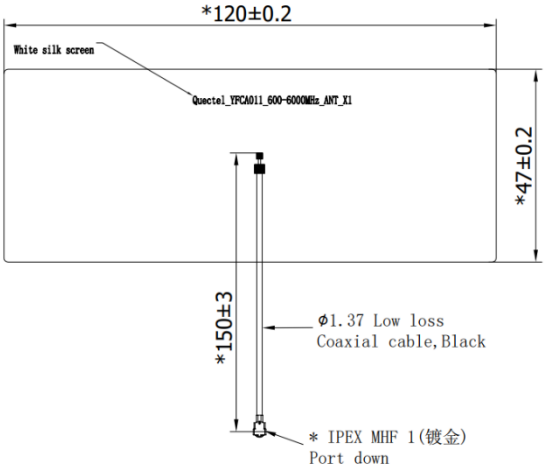
Band / Band	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
SPEC Freq. (MHz)	**600–700**	**700–810**	**820–960**	**1420–1520**	**1700–2170**	**2300–2400**	**2400–2500**	**2500–2690**	**3300–4200**	**4400–5000**	**5150–5850**
Max. VSWR	3.1	1.8	1.8	-	1.8	1.7	2.1	2.1	1.9	2.4	1.5
Max. Return Loss (dB)	-5.9	-10.5	-11.1	-	-10.6	-11.4	-9.1	-8.8	-10.0	-7.8	-13.9
AVG Eff. (%)	40.6	78.4	71.6	-	66.5	62.1	70.6	68.2	65.3	66.4	61.8
AVG AVG Gain (dB)	-4.1	-1.1	-1.5	-	-1.8	-2.1	-1.5	-1.7	-1.9	-1.8	-2.1
Max. Peak Gain (dBi)	-0.2	2.3	2.4	-	3.5	4.1	5.1	5.1	5.7	5.2	7.5
Upper Hemisphere Efficiency (dB)	3.1	1.8	1.8	-	1.8	1.7	2.1	2.1	1.9	2.4	1.5
VSWR	≤ 3.1										
Return Loss	≤ -5.9 dB										
Gain	≤ 7.5 dBi										

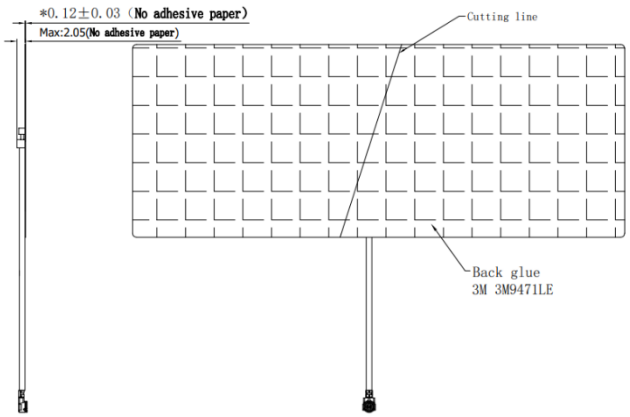
Electrical - NTN Bands					
Band / **SPEC**	**L Band**	**L Band**	**L Band**	**B256/B23**	**B256/B23**
	1518-1559	**1620-1665**	**1668-1675**	**1980-2020**	**2170-2200**
Max. VSWR	2.8	1.5	1.5	1.3	1.8
Max. Return Loss (dB)	-6.3	-14.7	-14.4	-17.6	-10.9
AVG Eff. (%)	53.9	65.3	63.3	74.9	73.5
AVG AVG Gain (dB)	-2.7	-1.8	-2.0	-1.3	-1.3
Max. Peak Gain (dBi)	1.4	1.9	1.8	3.5	2.9
Upper Hemisphere Efficiency (dB)	-7.4	-6.2	-6.4	-5.1	-5.1
VSWR	≤ 2.8				
Return Loss	≤ -6.3 dB				
Peak Gain	≤ 3.5 dBi				

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	120 × 47 mm
Material & Color	FPC & Black
Cable Type & Color & Length	Φ 1.37 & Black & 150 mm
Connector Type	IPEX MHF 1
Mounting Type	Adhesive
Weight	Typ. 2.43 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

2 Drawing

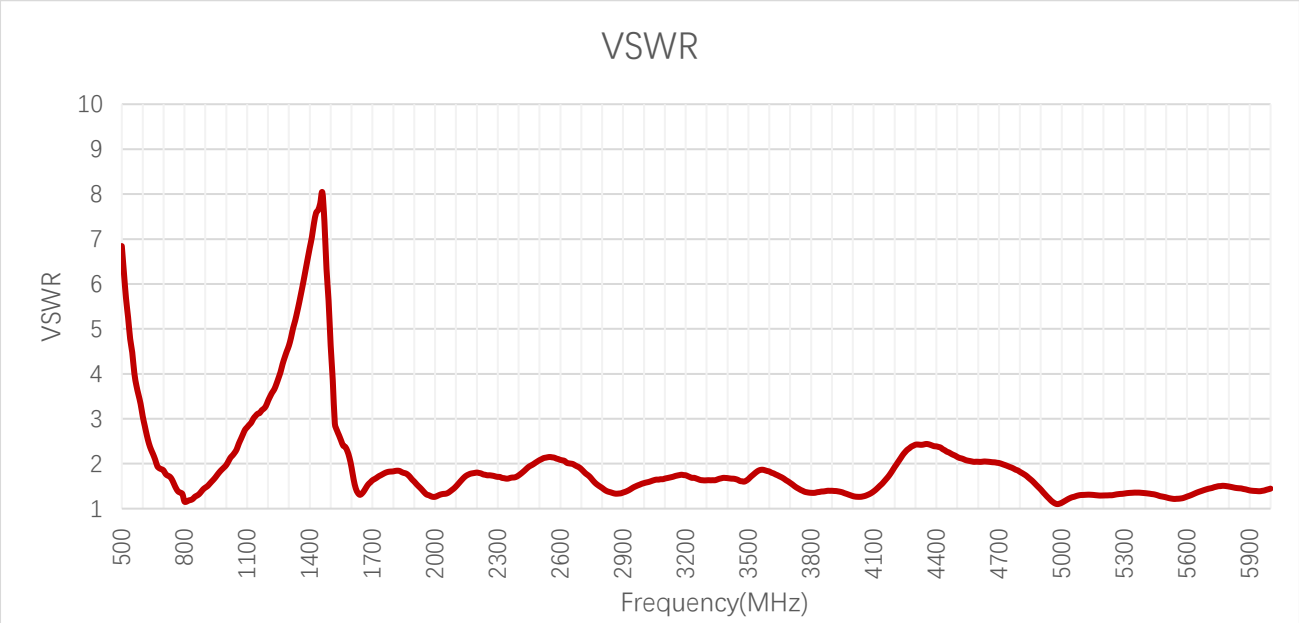

*120±0.2
White silk screen
Quectel_YFCA011_600-6000MHz_ANT_X1
*47±0.2
*150±3
Φ1.37 Low loss
Coaxial cable,Black
* IPEX MHF I(镀金)
Port down


*0.12±0.03 (No adhesive paper)
Max:2.05(No adhesive paper)
Cutting line
Back glue
3M 3M9471LE

3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



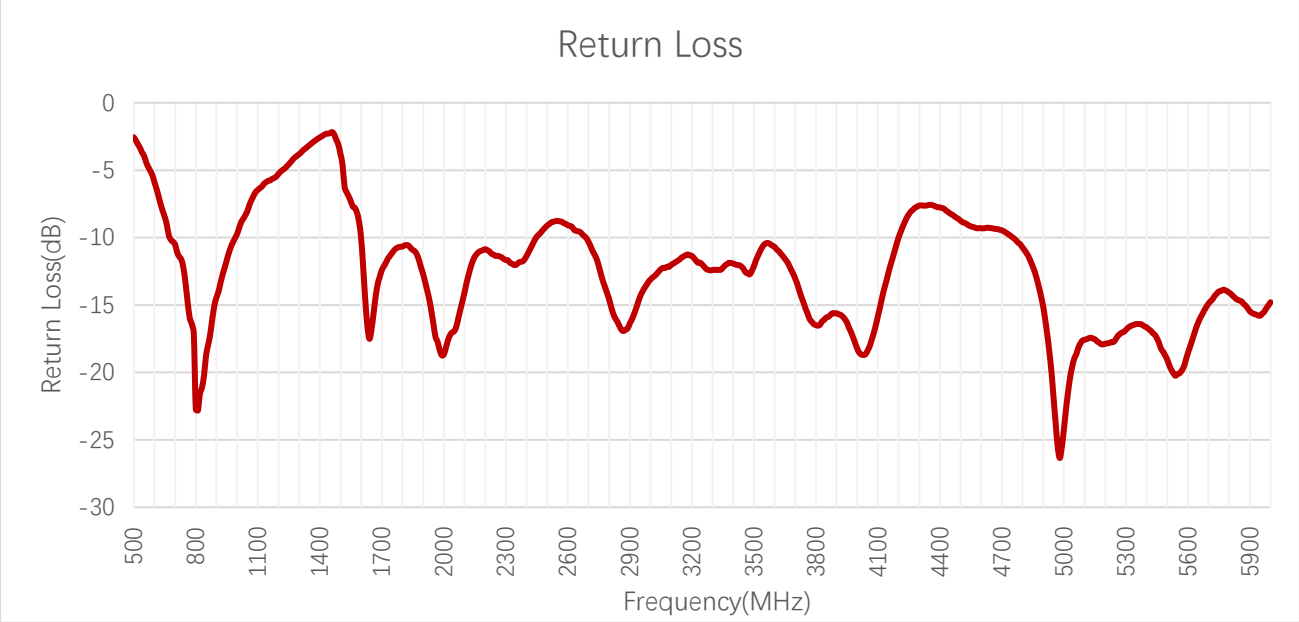
VSWR

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
VSWR	3.1	2.4	1.8	1.2	1.5	1.8	-	1.7	1.7	1.7
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4000**	**4700**	**5500**	**6000**
VSWR	1.4	1.7	1.7	1.9	2.1	1.8	1.3	2.0	1.3	1.4

VSWR - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
VSWR	2.8	2.4	1.4	1.5	1.3	1.8

3.1.2. Return Loss



Return Loss (dB)

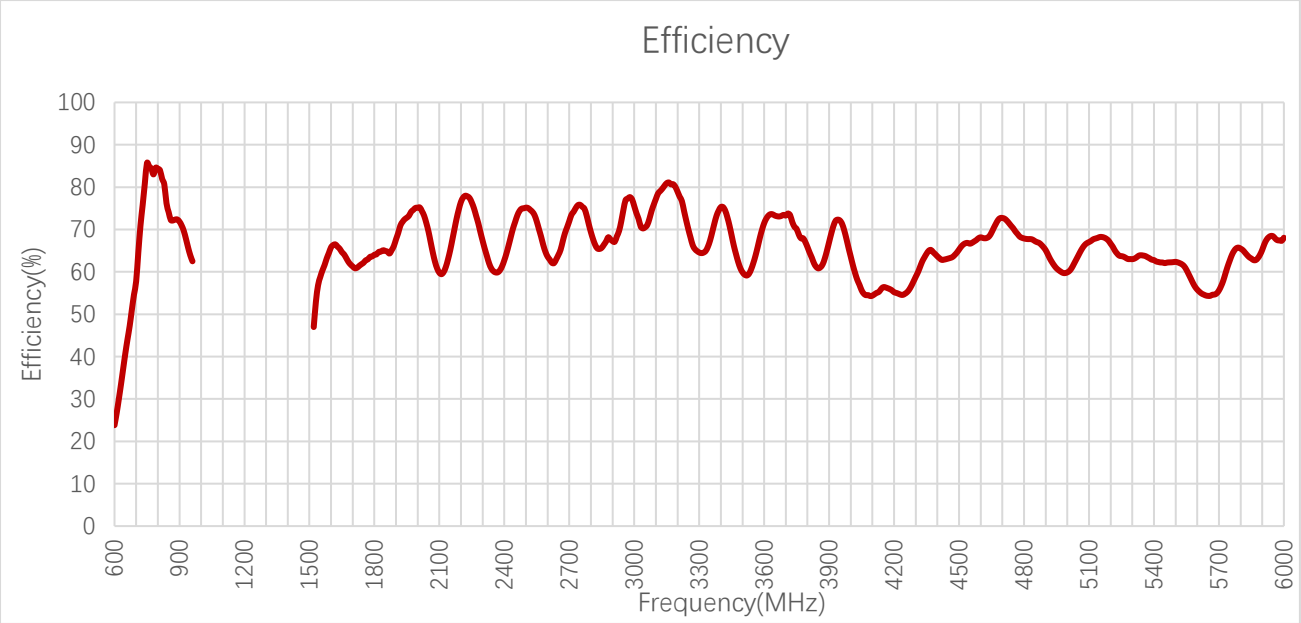
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	-5.9	-7.5	-11.1	-21.1	-14.4	-11.1	-	-12.1	-11.3	-11.7
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4000**	**4700**	**5500**	**6000**
Return Loss (dB)	-16.5	-11.7	-12.0	-9.9	-9.1	-10.7	-18.2	-9.5	-19.0	-14.8

Return Loss (dB) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Return Loss (dB)	-6.3	-7.7	-16.5	-13.4	-18.7	-10.9

3.2. Radiation Performance Test

3.2.1. Efficiency



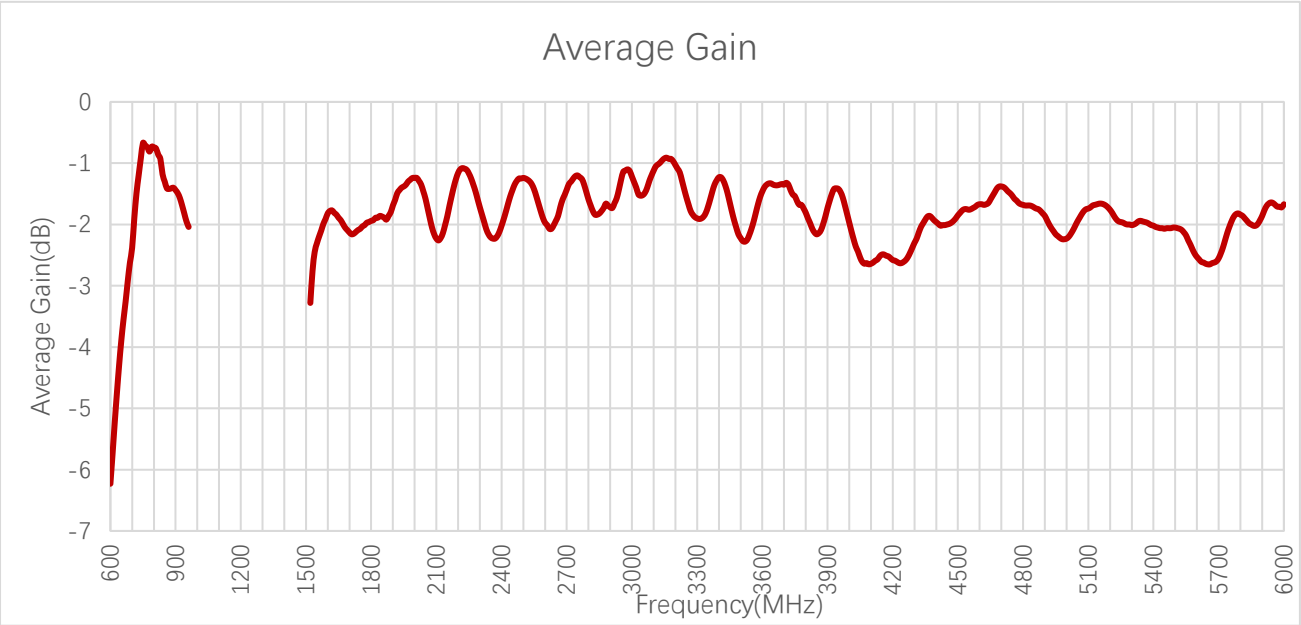
Efficiency (%) - 5G Bands

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	23.8	33.5	64.6	80.6	71.9	62.5	-	60.9	61.8	65.1
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4000**	**4700**	**5500**	**6000**
Efficiency (%)	72.8	62.9	60.2	71.8	63.6	71.5	63.6	72.7	62.4	68.1

Efficiency (%) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Efficiency (%)	47.0	60.3	66.0	62.4	75.1	76.5

3.2.2. Average Gain



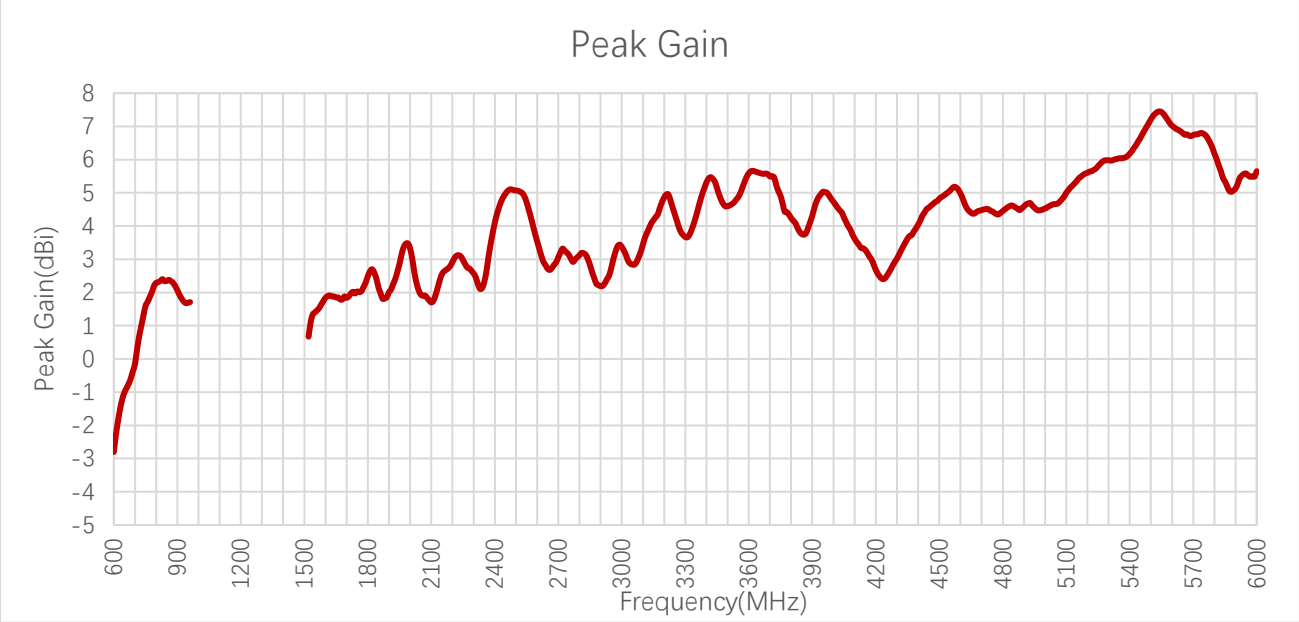
Average Gain (dB) - 5G Bands

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	-6.2	-4.8	-1.9	-0.9	-1.4	-2.0	-	-2.2	-2.1	-1.9
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4000**	**4700**	**5500**	**6000**
Average Gain (dB)	-1.4	-2.0	-2.2	-1.4	-2.0	-1.5	-2.0	-1.4	-2.1	-1.7

Average Gain (dB) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Average Gain (dB)	-3.3	-2.2	-1.8	-2.1	-1.2	-1.2

3.2.3. Peak Gain



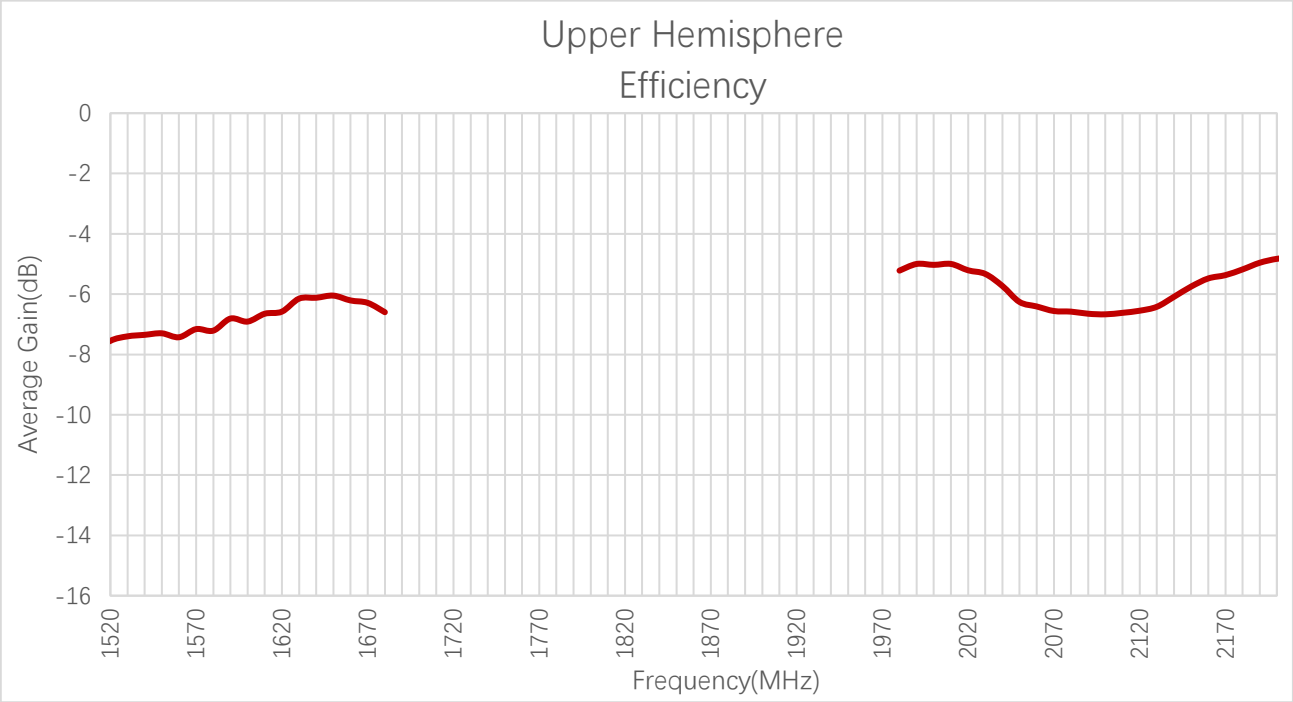
Peak Gain (dBi) - 5G Bands

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	-2.8	-1.5	0.3	2.4	2.1	1.7	-	1.9	2.0	1.8
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4000**	**4700**	**5500**	**6000**
Peak Gain (dBi)	2.9	2.4	2.3	5.0	3.5	5.6	4.7	4.5	7.2	5.7

Peak Gain (dBi) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Peak Gain (dBi)	0.7	1.5	1.9	1.8	3.3	2.9

3.2.4. Upper Hemisphere Efficiency

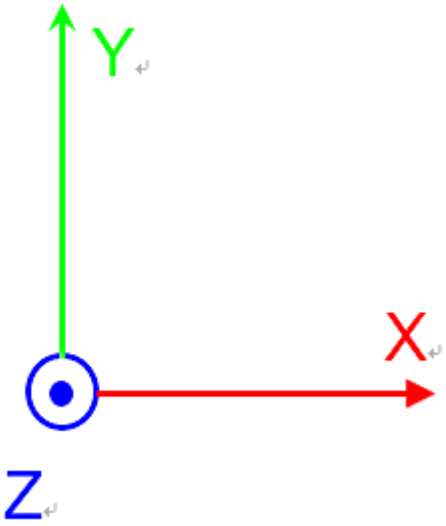


Upper Hemisphere Efficiency (dB) - NTN Bands

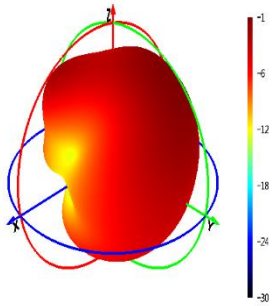
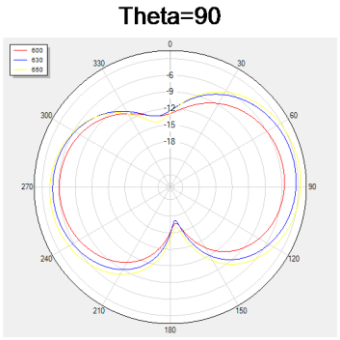
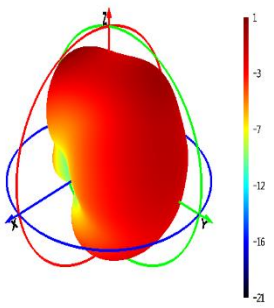
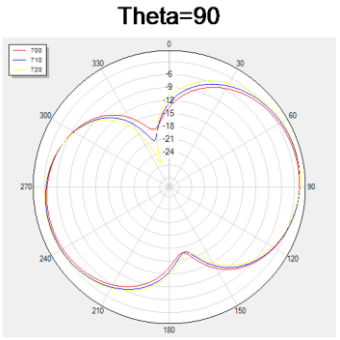
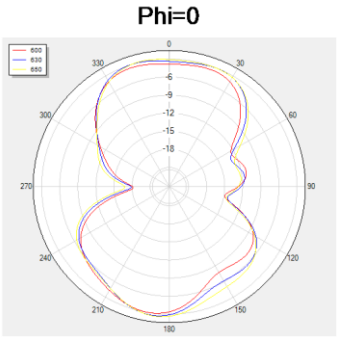
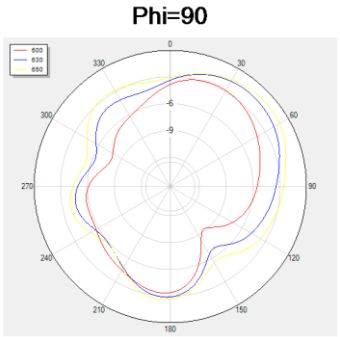
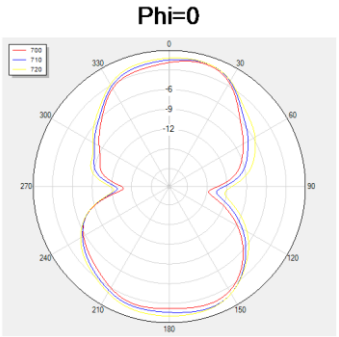
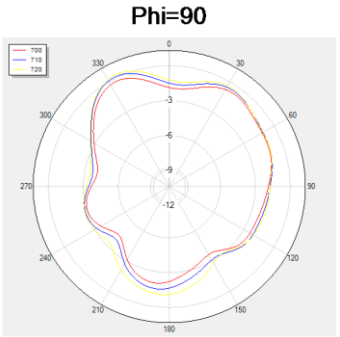
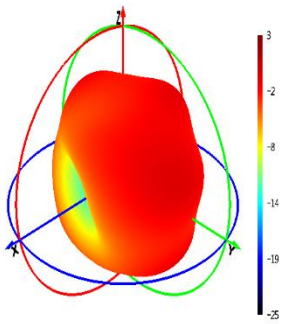
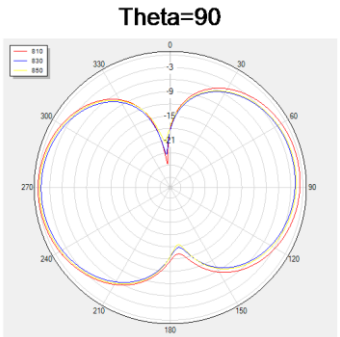
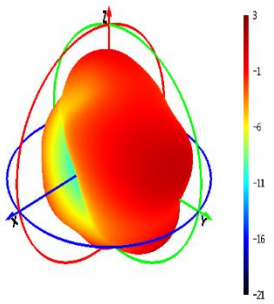
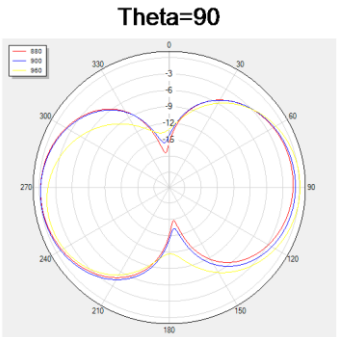
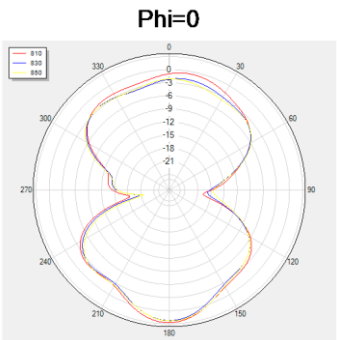
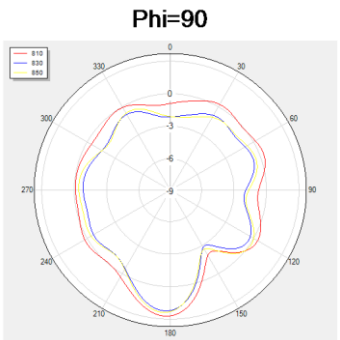
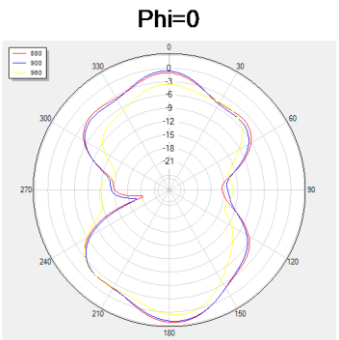
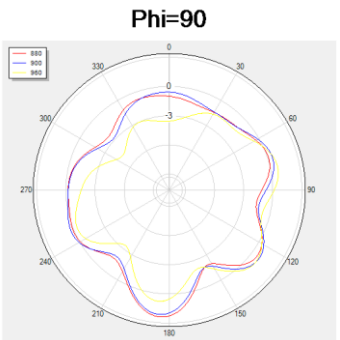
Frequency (MHz)	1520	1560	1630	1680	2000	2200
Upper Hemisphere Efficiency (dB)	-7.5	-7.4	-6.2	-6.6	-5.0	-4.8

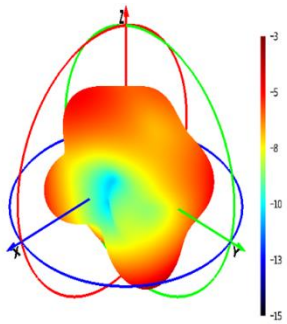
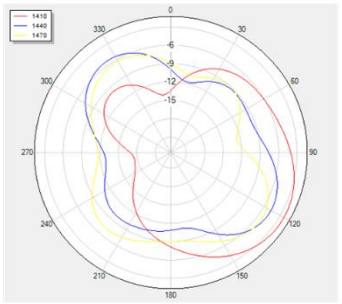
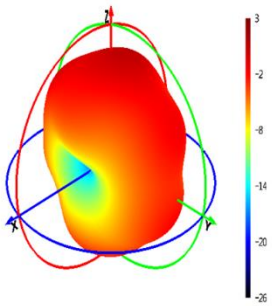
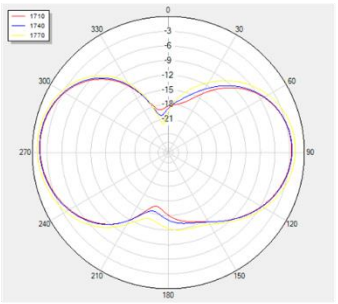
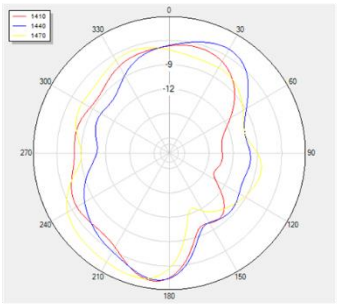
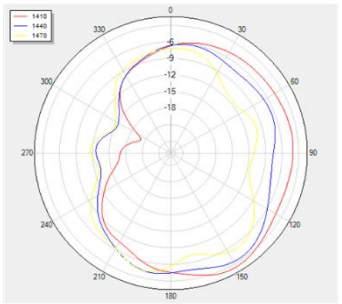
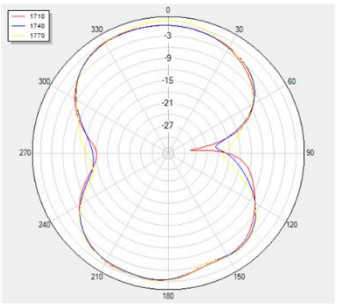
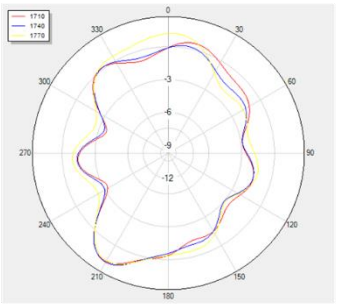
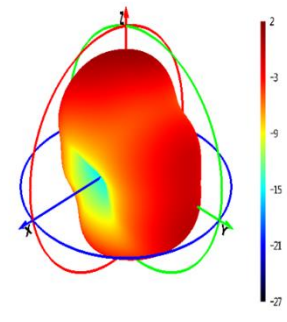
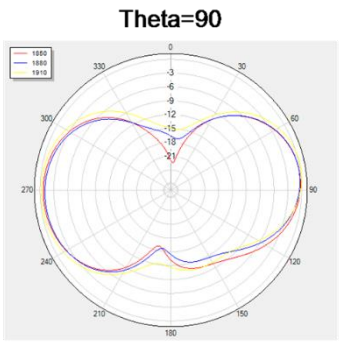
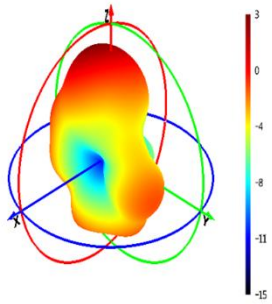
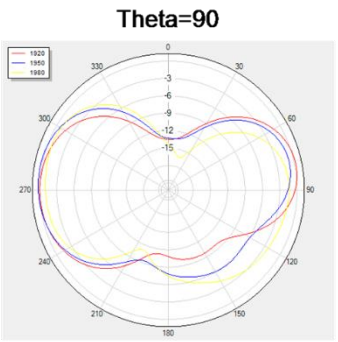
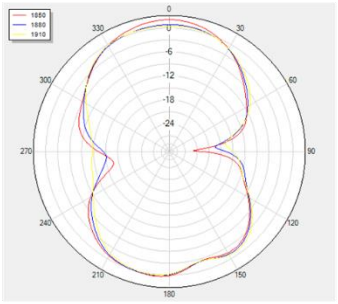
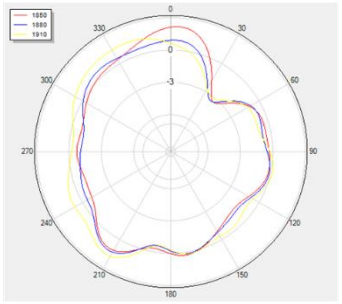
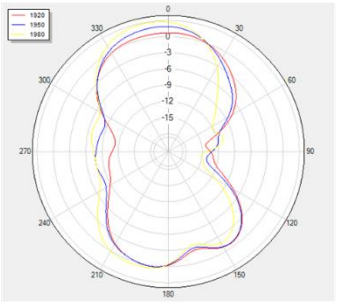
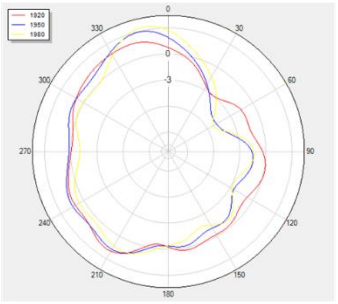
3.2.5. 3D & 2D Radiation Pattern

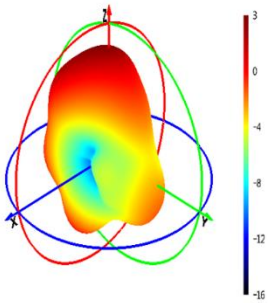
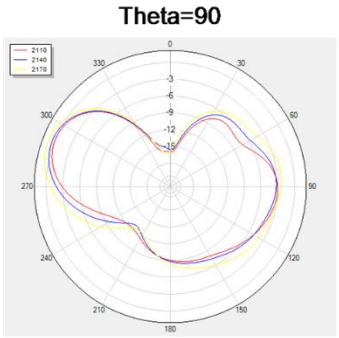
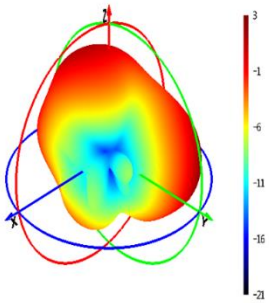
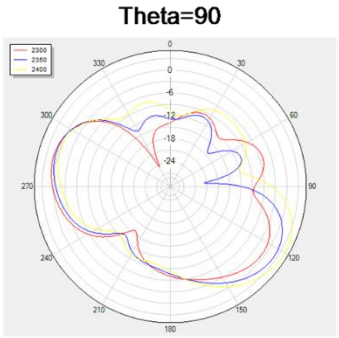
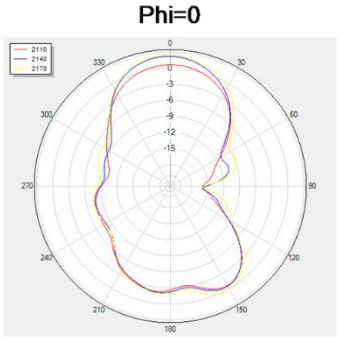
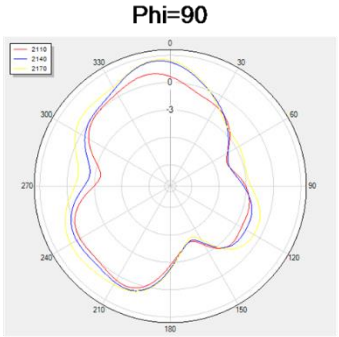
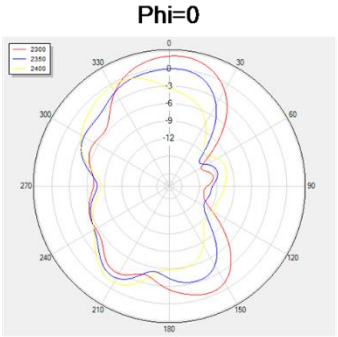
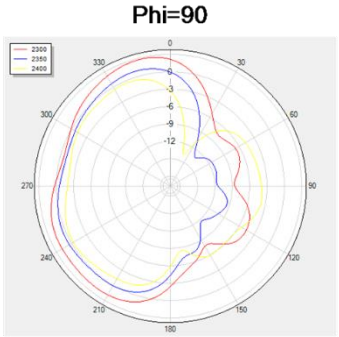
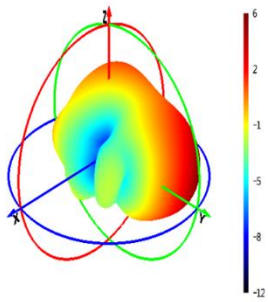
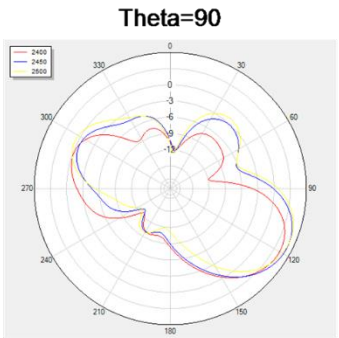
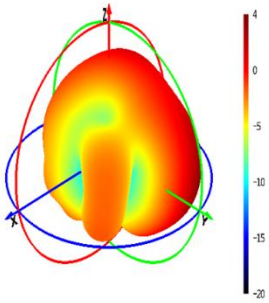
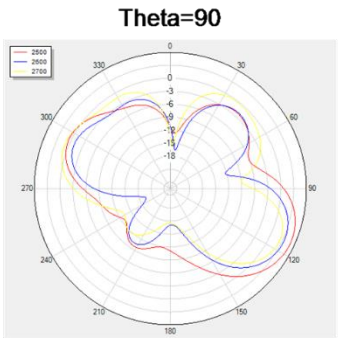
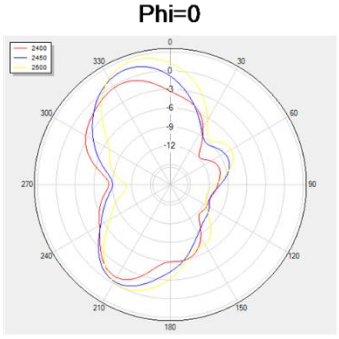
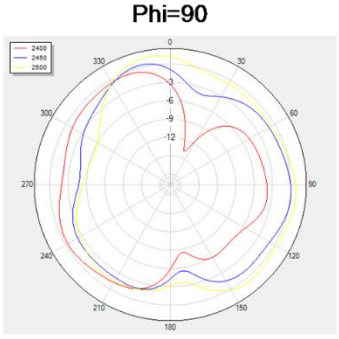
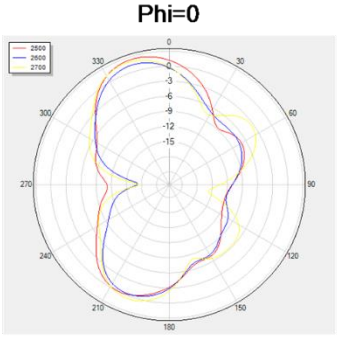
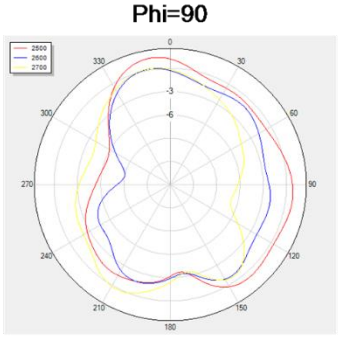
- Test Condition: Stick on 2 mm thick ABS Board
- Test Chamber: GL-S-1

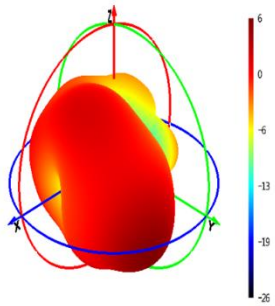
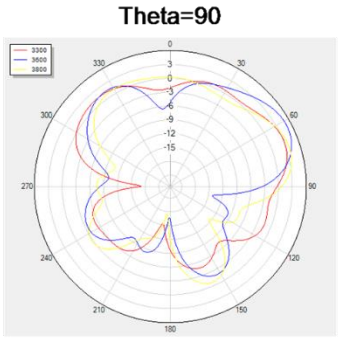
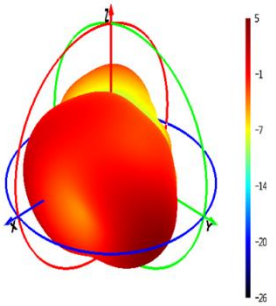
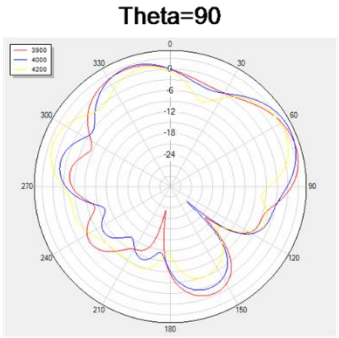
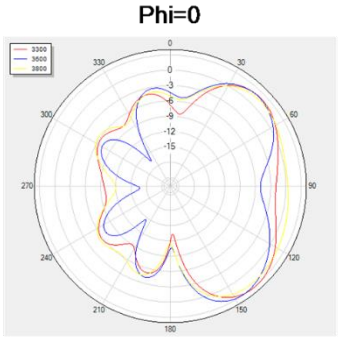
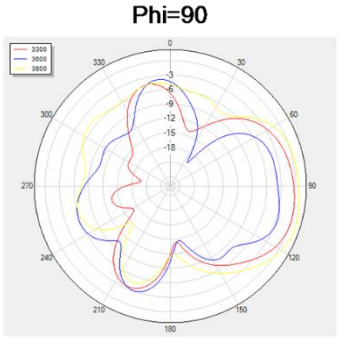
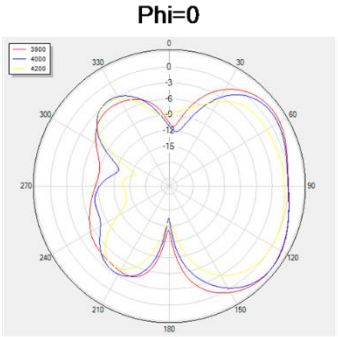
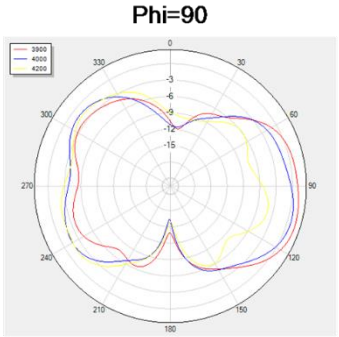
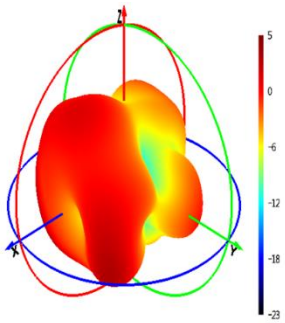
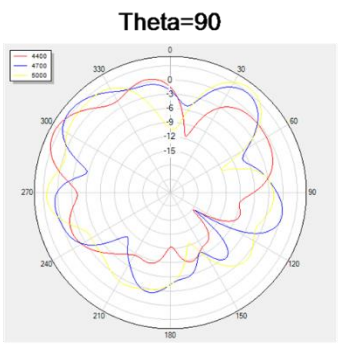
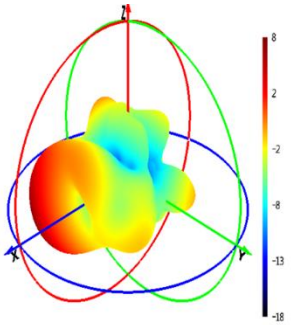
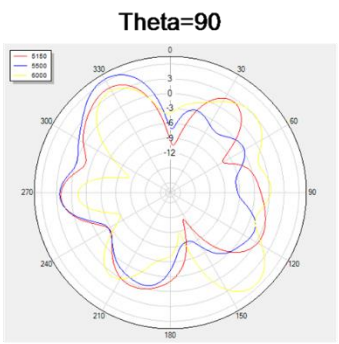
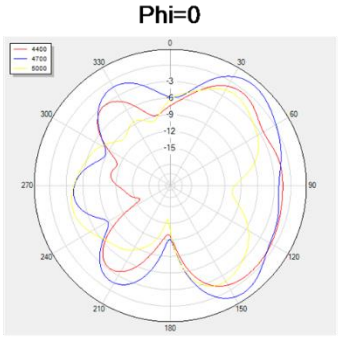
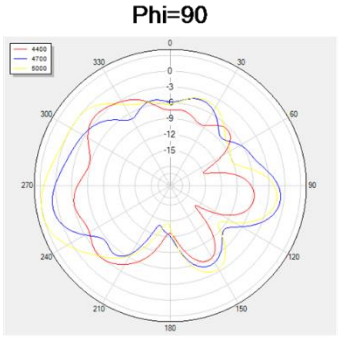
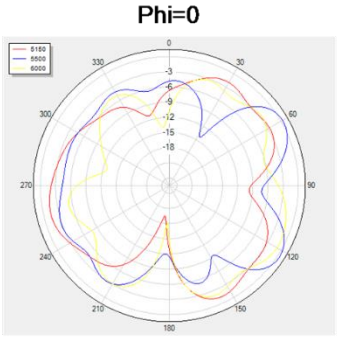
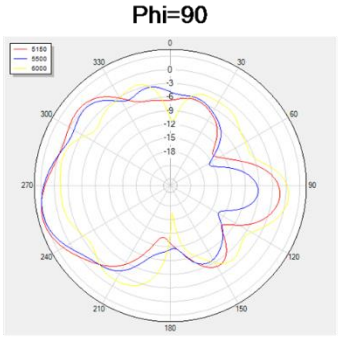


- 5G Bands

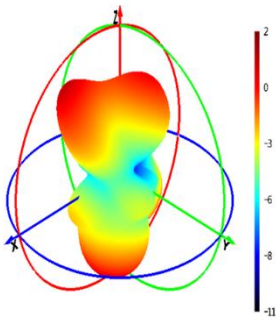
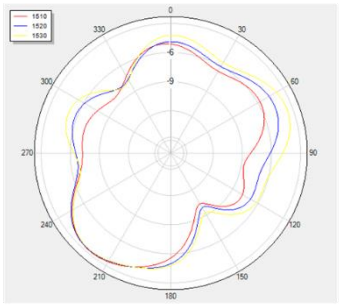
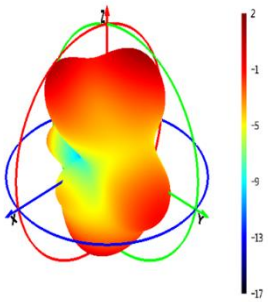
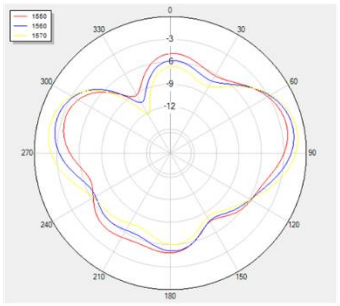
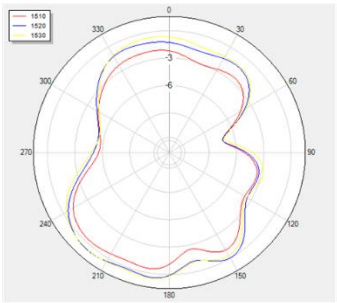
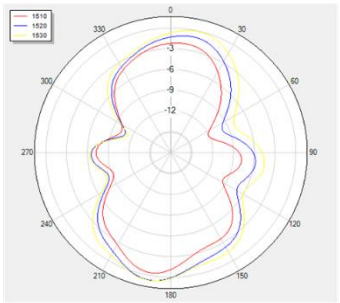
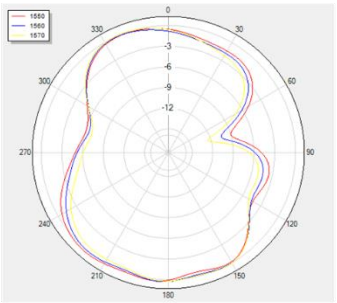
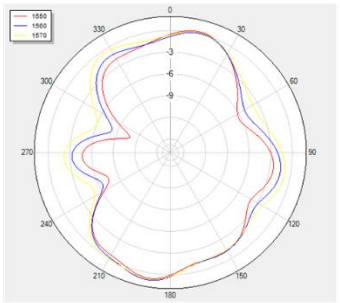
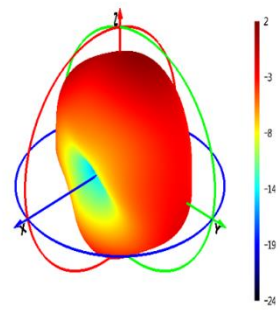
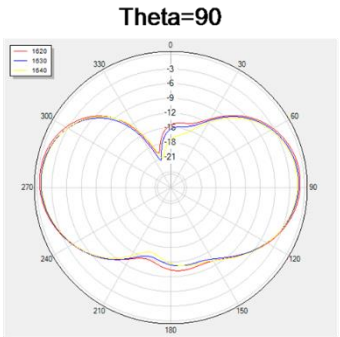
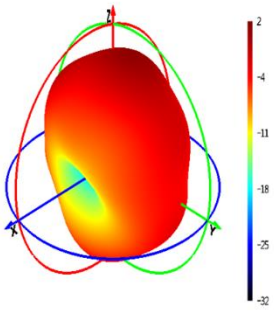
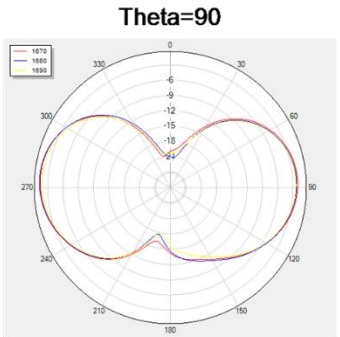
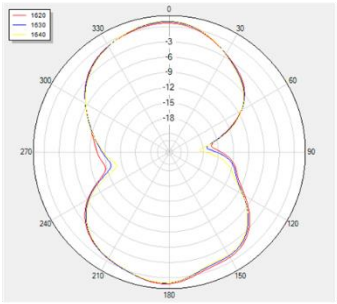
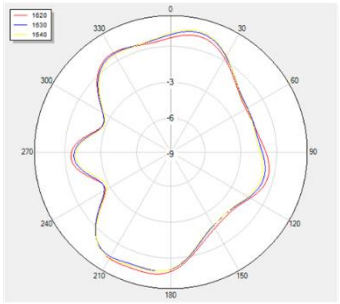
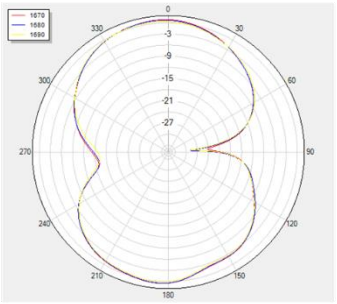
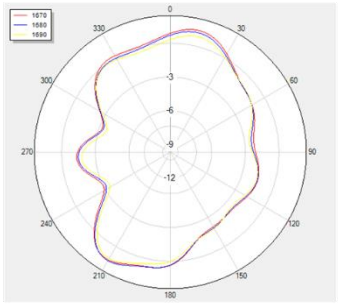
630 MHz		710 MHz	
			
			
830 MHz		900 MHz	
			
			

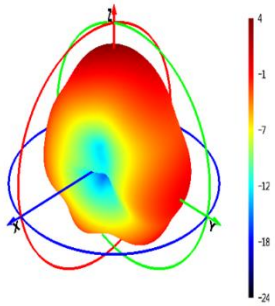
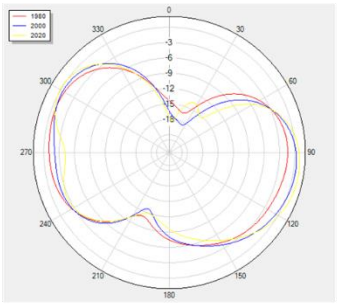
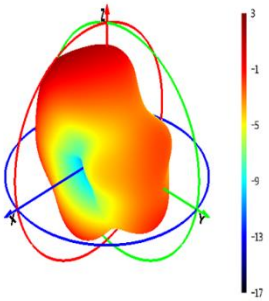
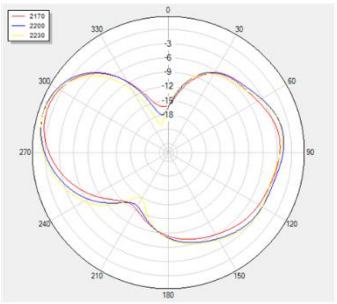
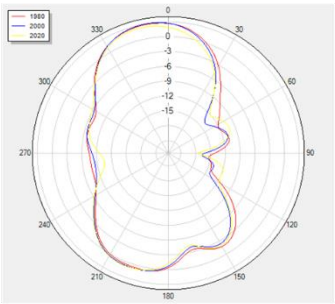
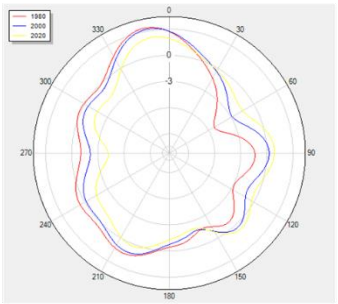
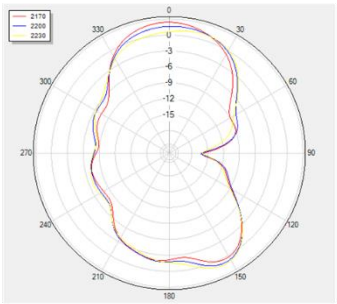
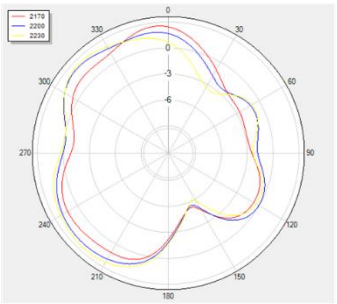
1440 MHz		1740 MHz	
			
			
1880 MHz		1950 MHz	
			
			

2140 MHz		2350 MHz	
			
			
2450MHz		2600MHz	
			
			

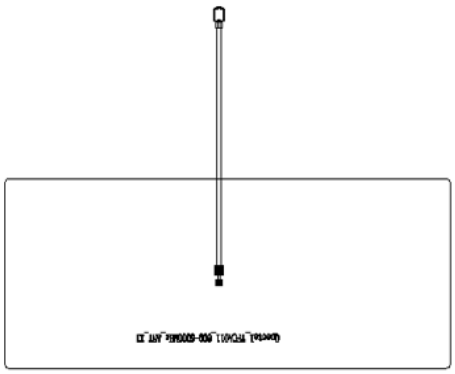
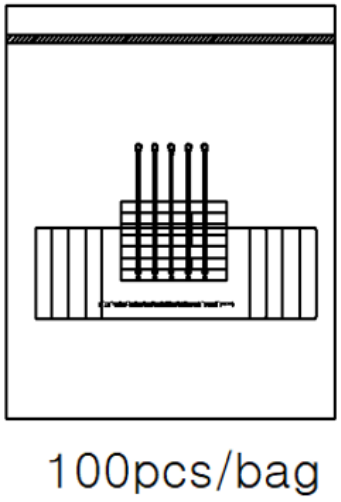
3600 MHz		4000 MHz	
			
			
4700 MHz		5500 MHz	
			
			

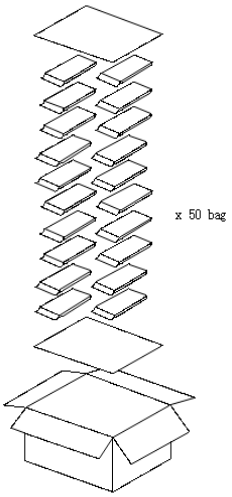
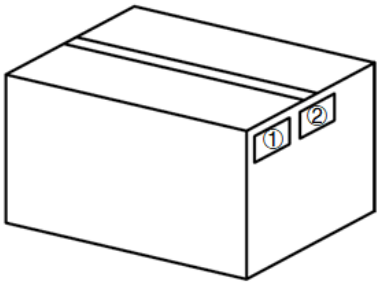
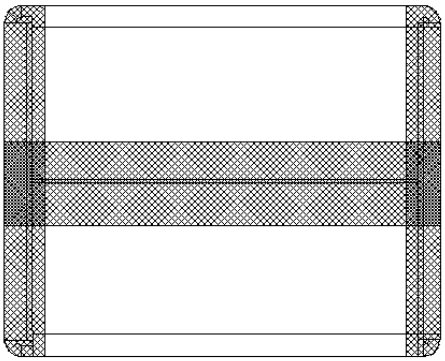
- NTN Bands

1520 MHz		1560 MHz	
			
			
1630 MHz		1680 MHz	
			
			

2000 MHz		2200 MHz	
	Theta=90 		Theta=90 
Phi=0 	Phi=90 	Phi=0 	Phi=90 

4 Packaging

Step	Packaging picture / 2D picture	Description
1		Product drawing
2		100 pcs Antenna products in a PE bag; (100 pcs Antenna / per PE bag) Per bag Size: L × W = 250 × 150 mm

3		Place a clapboard at the bottom and top. 50 PE Bags / carton box (5000 pcs Antenna / carton box) Estimated quantity Carton Size: L × W × H = 325 × 325 × 200 mm
4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** "工" type sealing cartons

Contact Us

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Or our local offices. For more information, please visit:
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Revision History

Version	Date	Author	Note
-	2023-05-08	Joyful HUANG/ Lucky FENG/ David LIU/ Bunny ZHANG	Creation of the document
1.0	2023-06-08	Joyful HUANG/ Lucky FENG/ David LIU/ Bunny ZHANG	First official release
1.1	2024-06-07	Lucky FENG	1. Updated the antenna picture. 2. Added the storage temperature (Chapter 1.2). 3. Updated the drawing (Chapter 2).

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