

Antenna Datasheet

Product OC: YAR00A0BA

Version: 1.0

Date: 2023-02-02

Status: Preliminary

Product Name: 4G External Whip Antenna

Key Features:

Frequency Band: 700-2690 MHz

Dimensions: 180 * 26 * 15 mm

Efficiency: Up to 79%

RoHS and REACH Compliant

Overview

To meet customers' requirements for the high performance, high integration, and integrated appearance of their products, Quectel provides a combined internal antenna series. The internal antenna series can integrate a variety of antennas, such as 5G, 4G, GNSS, Wi-Fi antennas, to achieve communication functions of 5G MIMO, 4G, GNSS, and Wi-Fi. These internal antenna series can be mounted inside the devices, supports multiple connector types and cable lengths. It is a more flexible and reliable high-performance antenna solution for the applications need internal antennas.

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1 Specification

- Test Condition: Assembled in test device

1.1. Electrical

Electrical Specifications	
Frequency Range	700–960 MHz, 1710–2690 MHz
Radiation Pattern	Omni-directional
Polarization	Linear
Impedance	50 Ω
Isolation	≤ -17dB

Electrical - Detail												
SPEC	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
	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	-	-	2.2	1.6	-	1.5	1.9	-	1.9	-	-	-
Max. Return Loss (dB)	-	-	-8.7	-13.6	-	-13.1	-10.2	-	-9.6	-	-	-
AVG Eff. (%)	-	-	66.79	42.63	-	68.01	68.70	-	62.19	-	-	-
AVG AVG Gain (dB)	-	-	-1.82	-3.72	-	-1.69	-1.64	-	-2.07	-	-	-
Max. Peak Gain (dBi)	-	-	1.99	-0.14	-	2	1.91	-	1.45	-	-	-
VSWR	≤ 3											
Return Loss	≤ -5											
Gain	≤ 3											

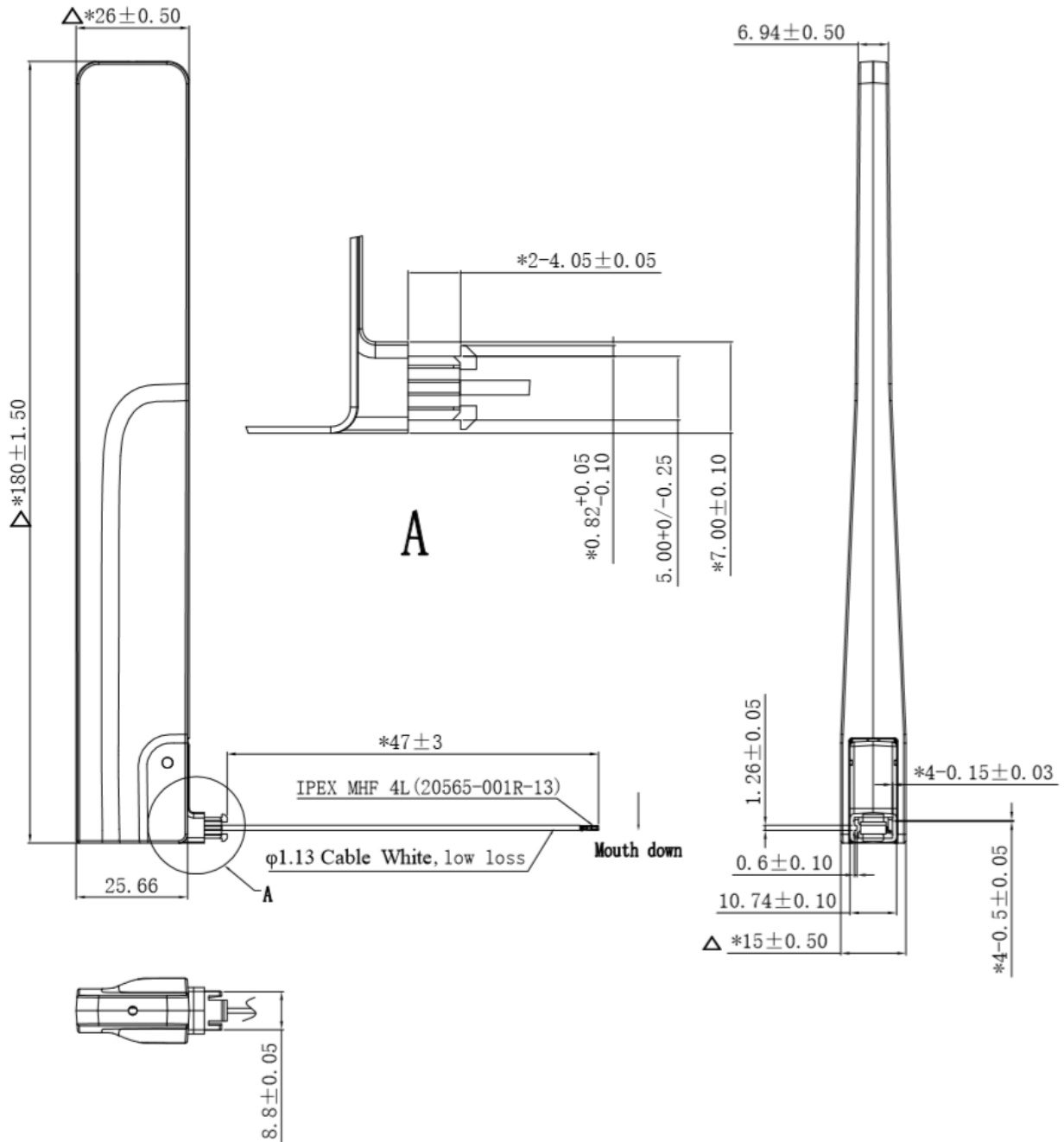
1.2. Mechanical, Environmental & Storage

Mechanical	
Antenna Dimensions	180 * 26 * 15 mm
Casing Material & Color	PC & White
Cable Type & Color & Length	Φ 1.13 & White & 47mm
Connector Type	IPEX MHF 4L
Mounting Type	Typ. 31.2 g
Mounting Type	Buckle
Environmental	
Operation Temperature	-40 °C to +70 °C
Ingress Protection (IP) Rating	-
RoHS & REACH Compliant	Yes
Storage	
Storage Temperature	15°C to +30 °C
Humidity	30%-70% RH
Storage Place	Away from corrosive gas and direct sunlight
Packaging	Antennas should be stored in unopened sealed manufacturer's plastic packaging.

1.3. Antenna Assembly



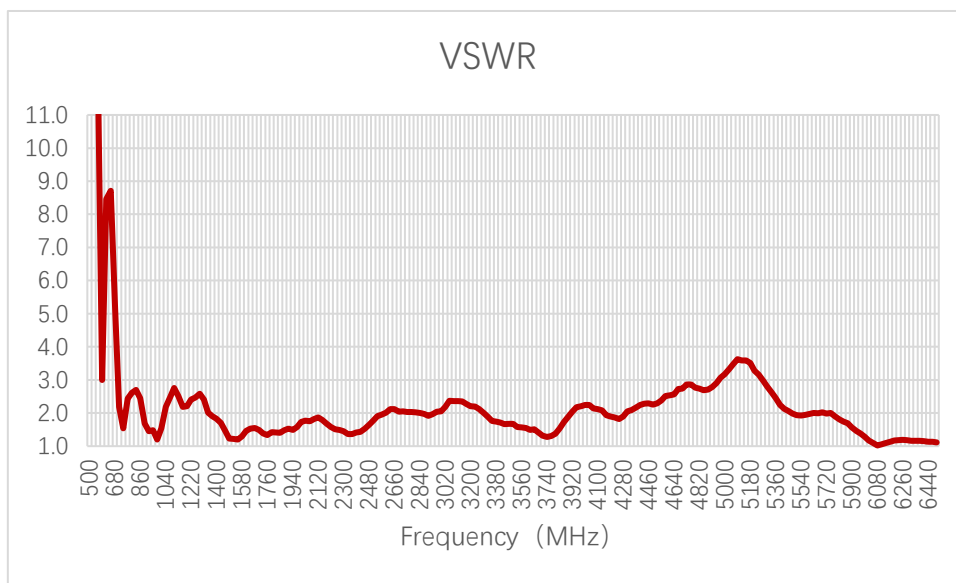
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

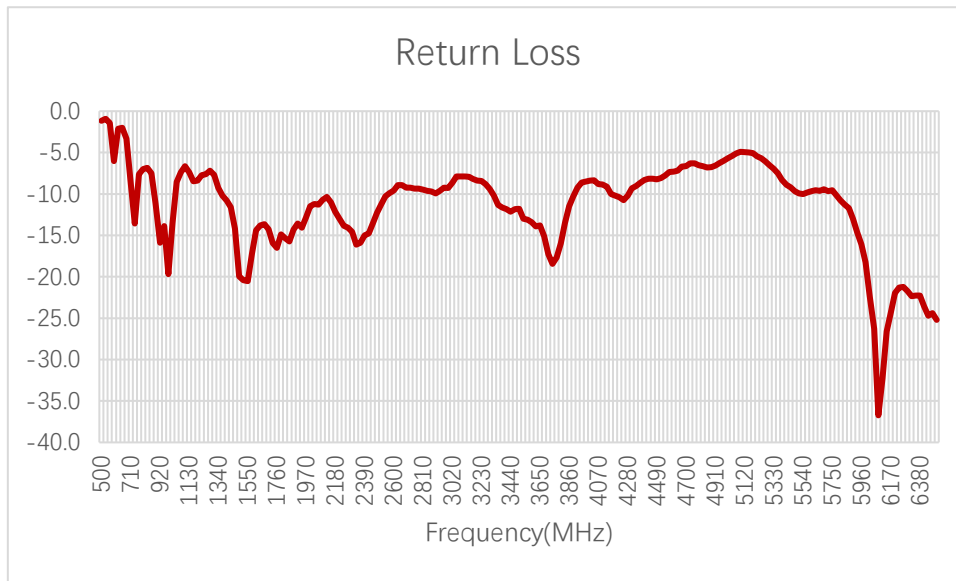
3.1.1. VSWR



VSWR - 4G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
VSWR	-	-	2.19	2.7	1.6	1.2	-	1.4	1.3	1.4
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
VSWR	1.4	1.7	1.3	1.5	2	-	-	-	-	-

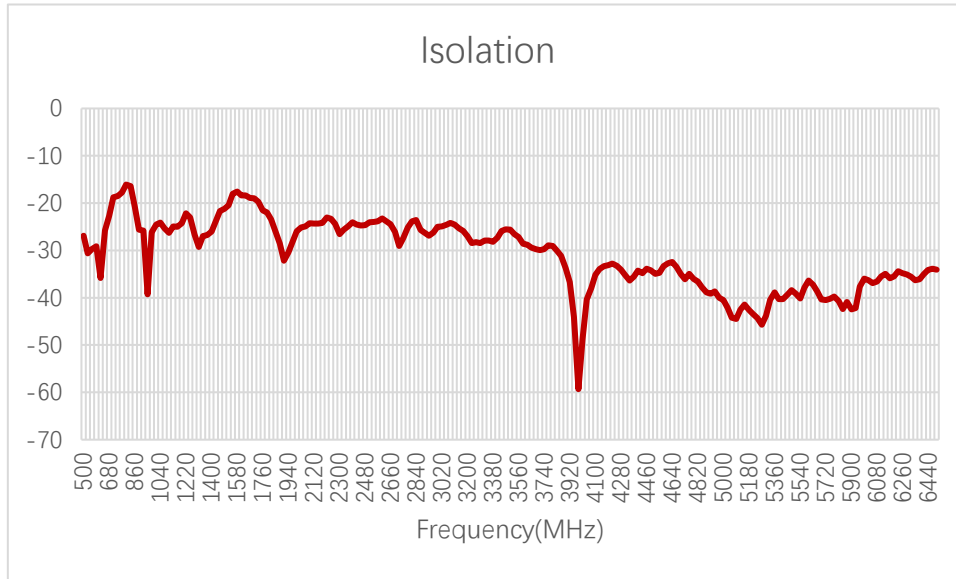
3.1.2. Return Loss



Return Loss (dB) – 4G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	-	-	-8.5	-6.9	-12	-13.9	-	-14.3	-15.9	-14.3
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Return Loss (dB)	-14.1	-11	-15.9	-13.5	-9.6	-	-	-	-	-

3.1.3. Isolation



Max Isolation (dB)

	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
	Freq. (MHz)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850
Isolation (dB)		-25	-17.5	-25	-	-24.9	-25	-	-24	-	-	-

3.2. OTA Test Data

- Test Condition: Assembled in test device (Dual antenna test)

Band		Channel	TRP (dBm)	Channel	TIS (dBm)
LTE	B1 (10M)	18050	21.98	50	-98.2
		18300	21.7	300	-98.4
		18550	21.79	550	-99
	B2 (10M)	18650	20.93	650	-97.5
		18900	21.35	900	-98
		19150	21.98	1150	-98.2
	B3 (10M)	19250	21.81	1250	-97
		19575	22.39	1575	-97.5
		19900	22.24	1900	-98.2
	B4 (10M)	20000	21.8	2000	-98.9
		20175	21.52	2175	-99.1
		20350	22.31	2350	-99.2
	B5 (10M)	20450	20.41	2450	-97.8
		20525	20.52	2525	-98
		20600	21.08	2600	-98.2
	B7 (20M)	20800	21.62	2800	-98
		21100	21.64	3100	-98.4
		21400	21.61	3400	-98.8
	B8 (10M)	21500	22.28	3500	-97.8
		21625	22.13	3625	-98.4
		21750	21.73	3750	-98.2

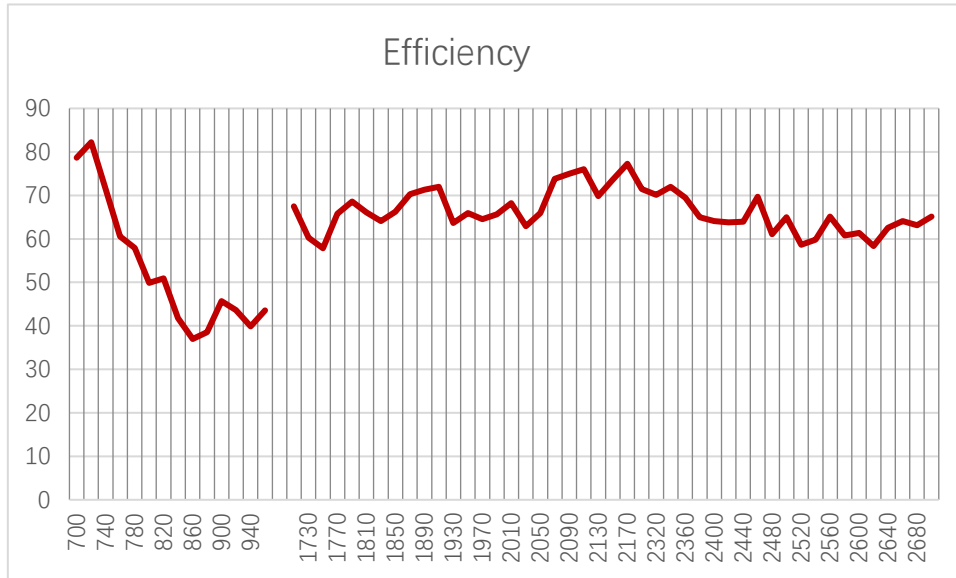
Band		Channel	TRP (dBm)	Channel	TIS (dBm)
LTE	B9 (10M)	21850	22.51	3850	-97.6
		21975	22	3975	-98
		22100	22.03	4100	-98.5
	B12 (5M)	23035	21.86	5035	-99.8
		23095	21.87	5095	-99.9
		23155	21.36	5155	-100.8
	B13 (10M)	23230	19.77	5230	-96.9
	B14 (10M)	23330	20.32	5330	-95.5
	B18 (10M)	23900	21.32	5900	-97.8
		23925	21.41	5925	-98
		23950	21.37	5950	-98.4
	B19 (10M)	24050	21.48	6050	-97.7
		24075	21.39	6075	-97.7
		24100	21.63	6100	-97.9
	B20 (10M)	24200	21.39	6200	-96.8
		24300	22.01	6300	-98.2
		24400	22.08	6400	-98.4

Band		Channel	TRP (dBm)	Channel	TIS (dBm)
LTE	B21 (10M)	24500	21.18	6500	-95.5
		24525	20.59	6525	-96.1
		24550	20.31	6550	-96.1
	B25 (5M)	26065	20.96	8065	-99.4
		26365	21.31	8365	-100
		26665	21.93	8665	-100.6
	B26 (5M)	26715	21.06	8715	-99.9
		26865	21.28	8865	-100
		27015	22.01	9015	-100.8
	B28 (10M)	27260	22.11	9260	-97.6
		27435	21.09	9410	-97.9
		27610	21.02	9610	-98.2
	B30 (10M)				
		27710	21.35	9820	-98.63
	B38 (20M)	37850	21.53	37850	-95.4
		38000	22.03	38000	-95.7
		38150	22.18	38150	-95.8
	B39 (20M)	38350	21.3	38350	-94.6
		38450	21.32	38450	-94.8
		38550	21.89	38550	-95.4

Band		Channel	TRP (dBm)	Channel	TIS (dBm)
LTE	B40 (20M)	38750	21.55	38750	-96.6
		39150	21.47	39150	-96.7
		39550	21.86	39550	-96.8
	B41 (20M)	39750	21.74	39750	-94.5
		40620	22.07	40620	-95.1
		41490	21.33	41490	-95.7
	B66 (20M)	132022	21.86	66486	-98.9
		132322	22.01	66886	-99.1
		132622	22.11	67086	-99.4

3.3. Radiation Performance Test

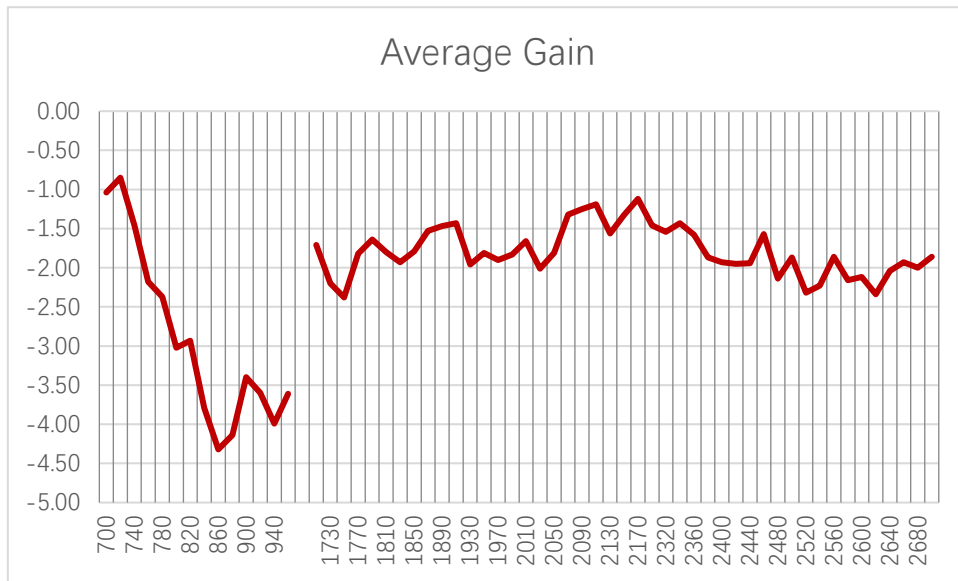
3.3.1. Efficiency



Efficiency (%) - 4G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	-	-	79.1	50.93	45.71	43.55	-	67.45	64.2	70.1
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Efficiency (%)	65.92	69.82	71.94	63.97	65.16	-	-	-	-	-

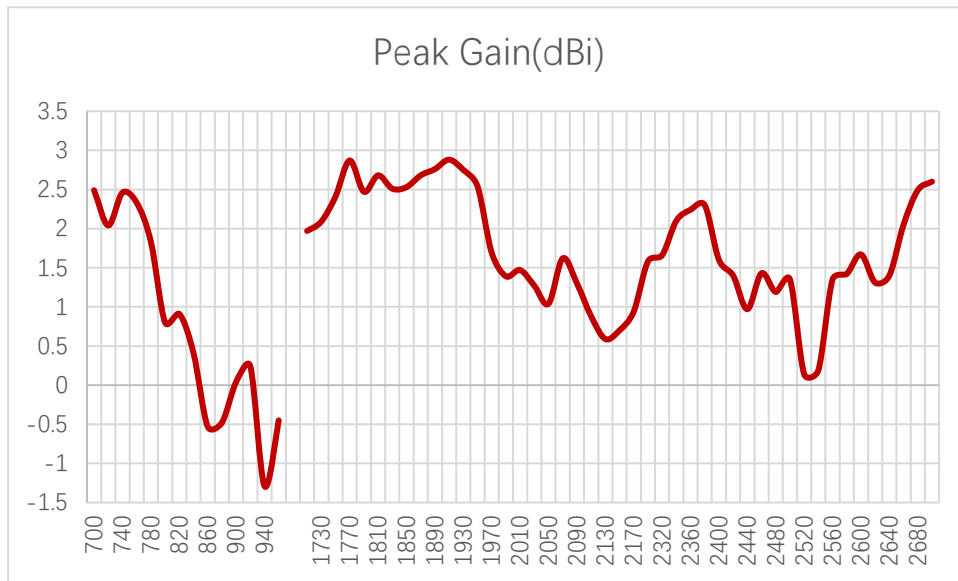
3.3.2. Average Gain



Average Gain (dB) - 4G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	-	-	-1.04	-3.79	-3.40	-3.61	-	-1.71	-2.38	-1.53
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Average Gain (dB)	-1.81	-1.33	-1.43	-1.94	-2.10	-	-	-	-	-

3.3.3. Peak Gain

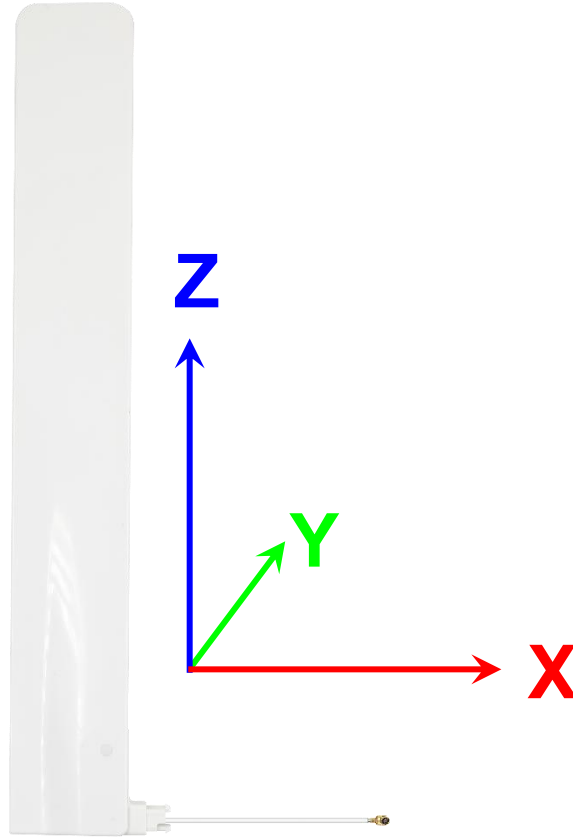


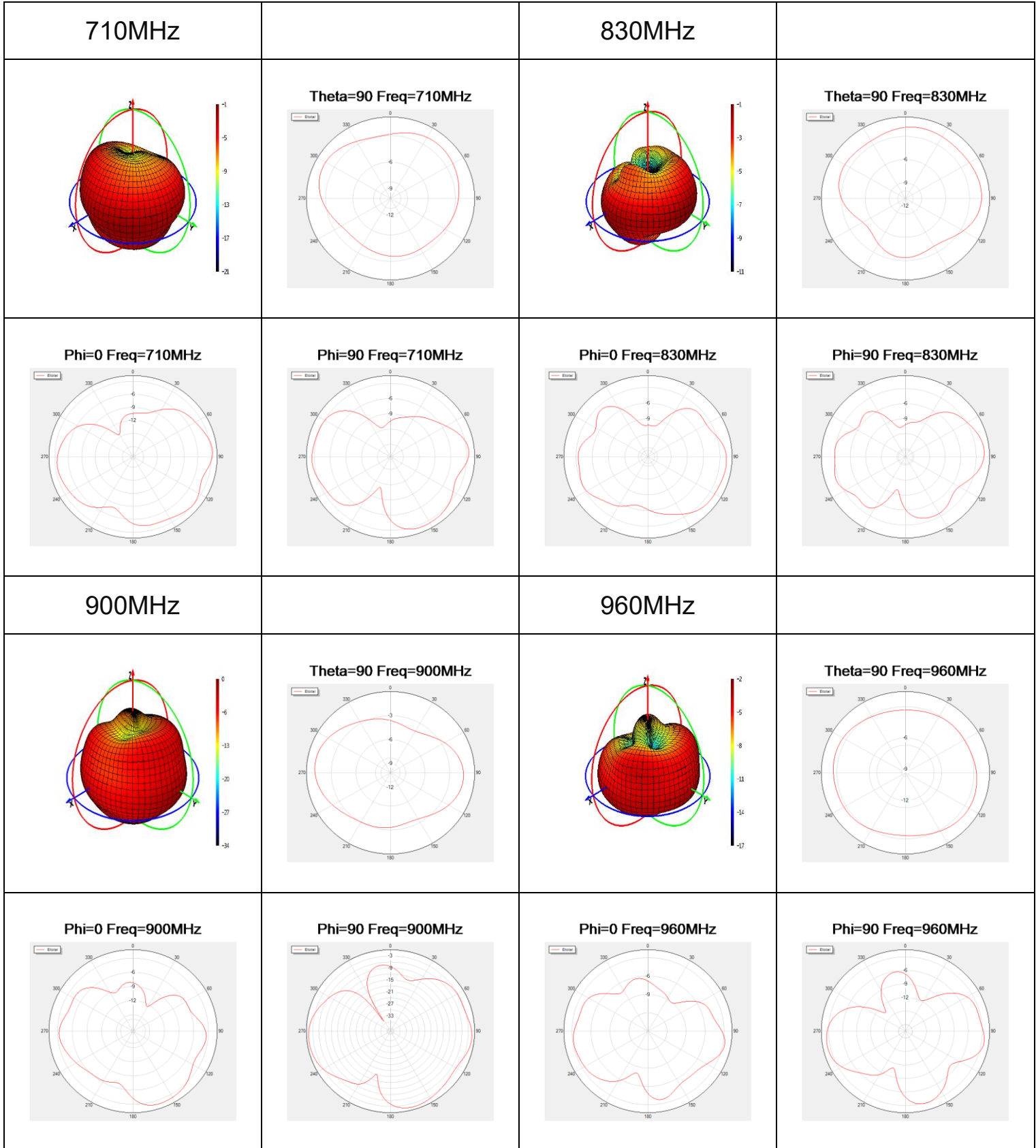
Peak Gain (dBi) - 4G

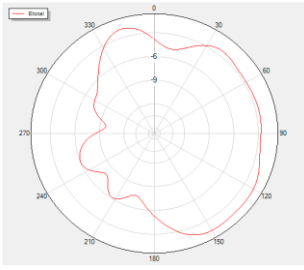
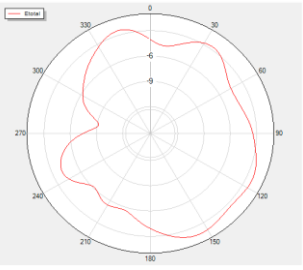
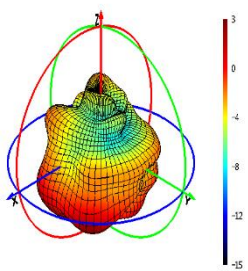
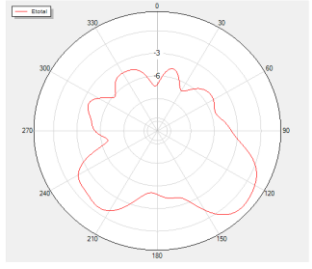
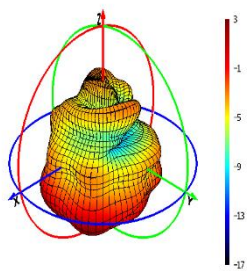
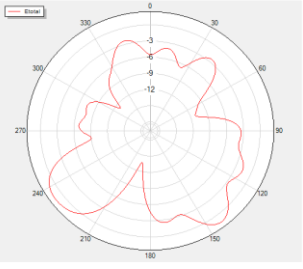
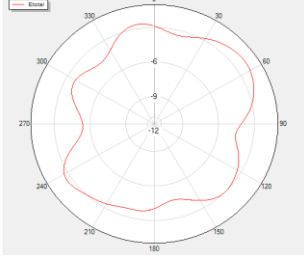
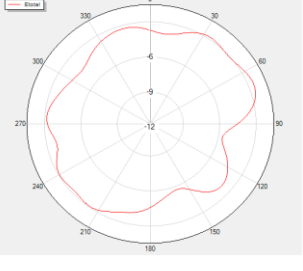
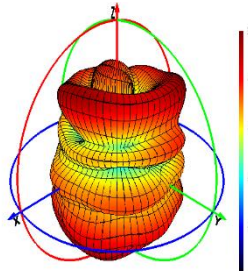
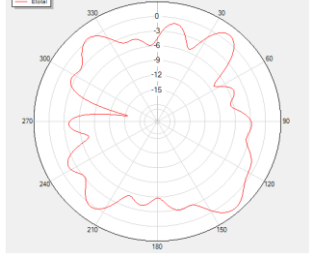
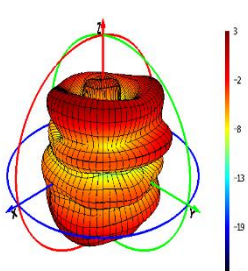
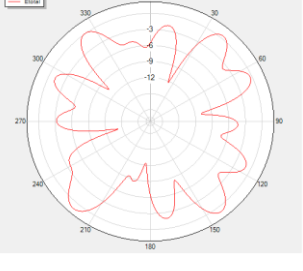
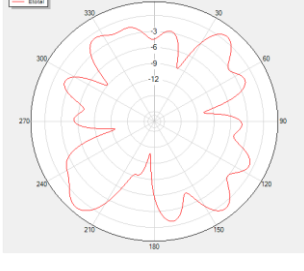
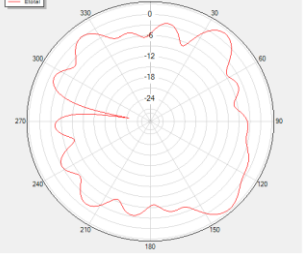
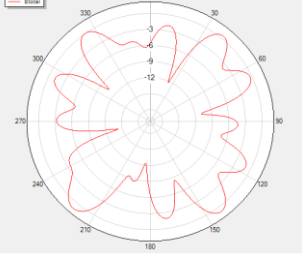
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	-	-	2.49	0.91	0.04	-0.45	-	2	2.3	2.7
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Peak Gain (dBi)	2.53	0.59	2.1	1.43	1.6	-	-	-	-	-

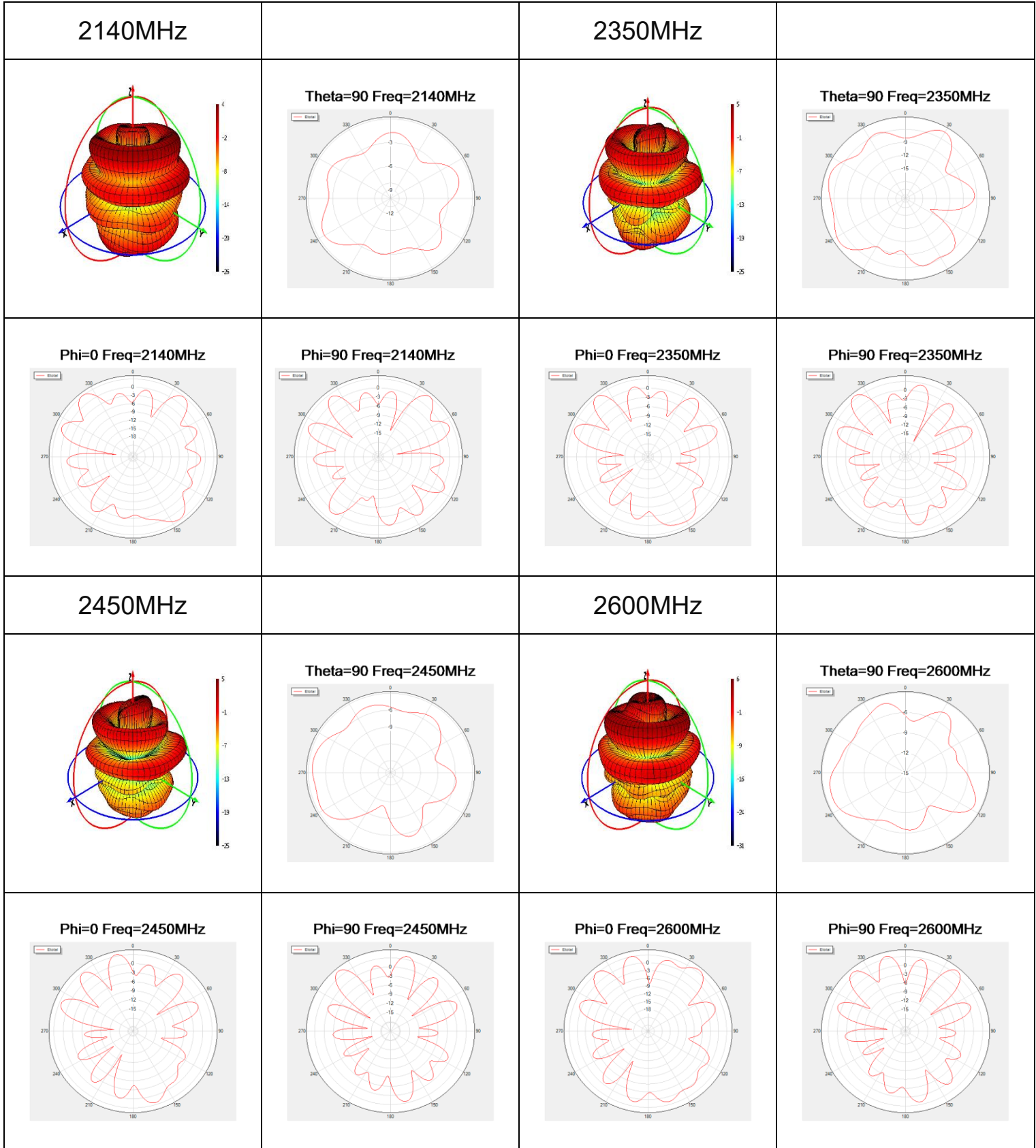
3.3.4. 3D & 2D Radiation Pattern

- Test Status: Assembled in test device
- Test Chamber:SH-S-1

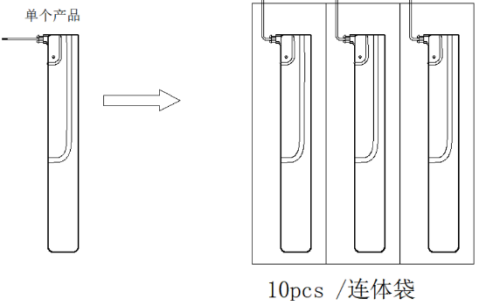
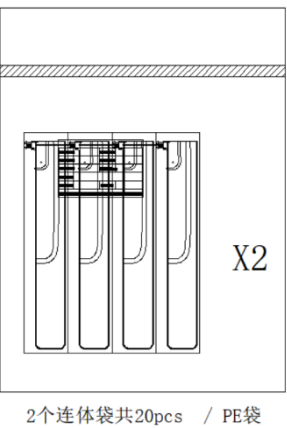
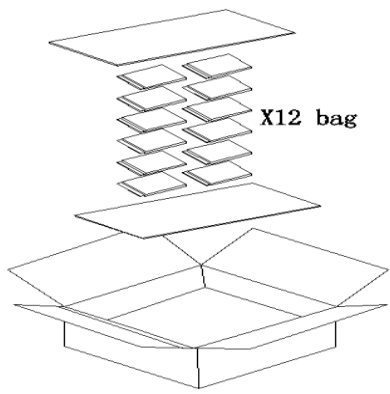


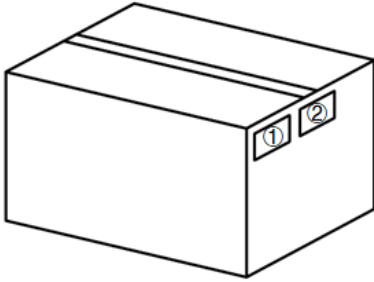
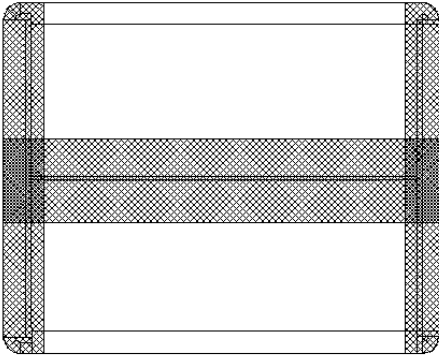


<p>1710MHz</p>	<p>Theta=90 Freq=1710MHz</p> 	<p>1740MHz</p>	<p>Theta=90 Freq=1740MHz</p> 
	<p>Phi=0 Freq=1710MHz</p> 		<p>Phi=90 Freq=1740MHz</p> 
<p>1880MHz</p>	<p>Theta=90 Freq=1880MHz</p> 	<p>1950MHz</p>	<p>Theta=90 Freq=1950MHz</p> 
	<p>Phi=0 Freq=1880MHz</p> 		<p>Phi=90 Freq=1950MHz</p> 
<p>Phi=90 Freq=1880MHz</p> 	<p>Phi=0 Freq=1950MHz</p> 	<p>Phi=90 Freq=1950MHz</p> 	



4 Packaging

Step	Packaging picture / 2D picture	Description
1		<p>10pcs Antenna products in a One-piece bag 10 pcs Antenna / Per One-piece bag</p> <p>One-piece bag Size $L*W*THK = 500*220*0.08$ mm</p>
2		<p>20pcs Antenna products in a PE bags; (20pcs Antenna / Per PE Bag)</p> <p>Pe bag Size: $L*W*THK=330*220*0.06$mm</p>
3		<p>Place a clapboard at the bottom and top, 12 Big PE Bags / Per Carton Box) (240 pcs Antenna / Per Carton Box)</p> <p>Carton Size: $L*W*H=325*325*200$mm</p>

4	 A 3D perspective drawing of a rectangular carton. On the front face, there are two small rectangular labels. The left label is marked with a circled '1' and the right label is marked with a circled '2'.	<p>Position for Attaching Labels---</p> <ul style="list-style-type: none">① Carton Label② Quality Label
5	 A 3D perspective drawing of a rectangular carton. The top and bottom edges are reinforced with a textured, mesh-like material. A horizontal band of the same textured material runs across the front and back faces, connecting the top and bottom edges.	<p>Sealing Cartons---</p> <p>“工” type sealing cartons</p>

Contact US

At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

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Revision History

Version	Date	Author	Note
-	2023-02-02	Alex Hang Kenny Yin David Liu Aria Chu	Creation of the document
1.0	2023-02-02	Alex Hang Kenny Yin David Liu Aria Chu	First official release

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