

The top half of the page features a photograph of a white, cylindrical external whip antenna standing in the center of an anechoic chamber. The chamber's walls are covered with white, pyramid-shaped electromagnetic wave absorbers. A thin black horizontal line is drawn across the middle of the image, passing through the base of the antenna. A red horizontal bar is located at the bottom of this image section.

Antenna Datasheet

Product OC: YAR00A0EA

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 80%

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	≤ -17 dB

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	-	1.7	1.9	-	1.7	1.4	-	1.6	-	-	-	-
Max. Return Loss (dB)	-	-12.6	-10	-	-12.2	-14.5	-	-12.9	-	-	-	-
AVG Eff. (%)	-	71.61	52.42	-	64.64	64.65	-	57.75	-	-	-	-
AVG AVG Gain (dB)	-	-1.47	-2.83	-	2.08	-1.90	-	-2.39	-	-	-	-
Max. Peak Gain (dBi)	-	1.99	-0.14	-	-1.91	1.91	-	1.45	-	-	-	-
VSWR	≤ 3											
Return Loss	≤ -5											
Peak Gain	≤ 3.5											

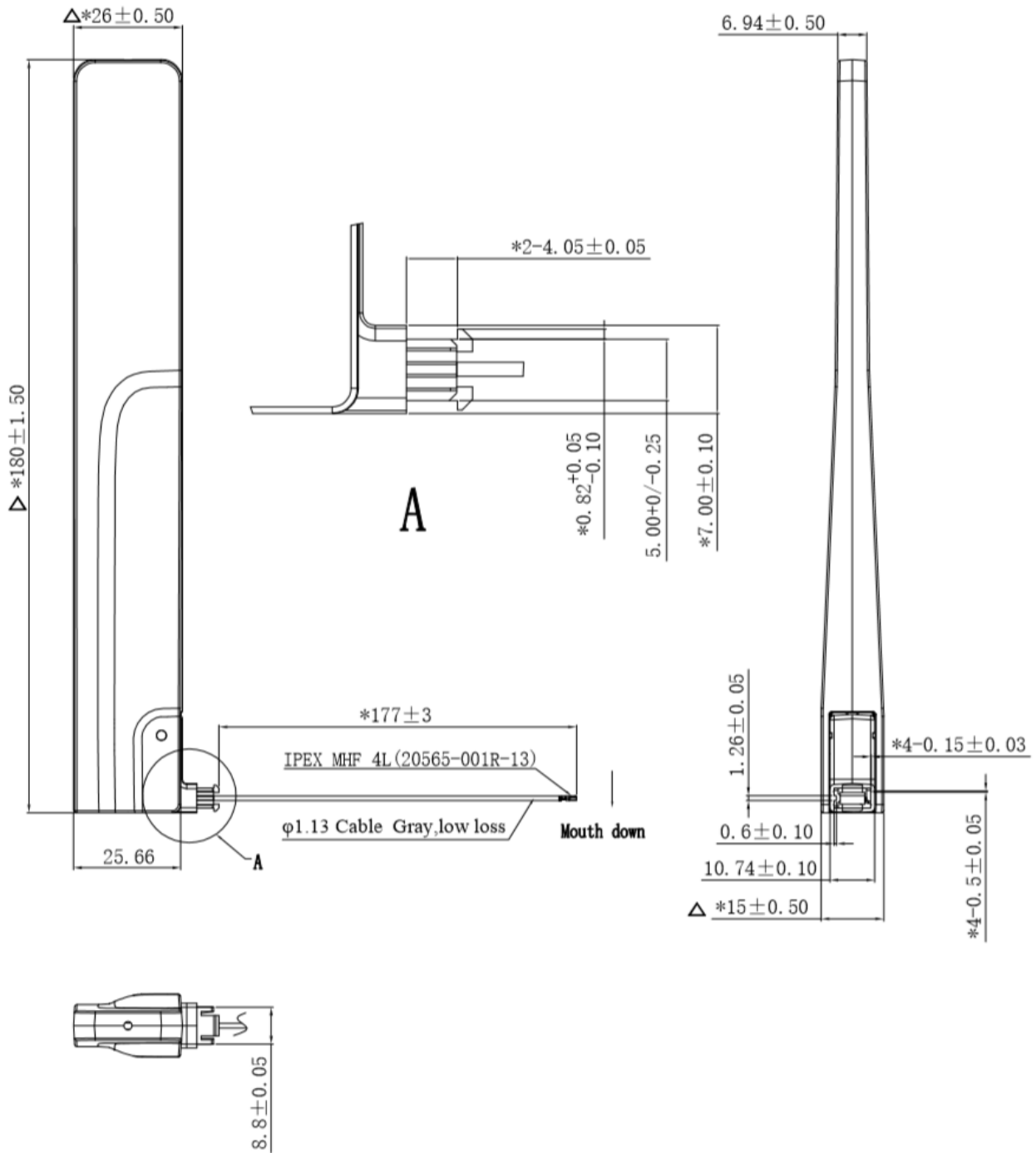
1.2. Mechanical, Environmental & Storage

Mechanical	
Antenna Dimensions	180 * 26 * 15 mm
Casing Material & Color	PC & White
Cable Type & Color & Length	Φ 1.13 & Gray & 177mm
Connector Type	IPEX MHF 4L
Mounting Type	Buckle
Weight	Typ. 31.9 g
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



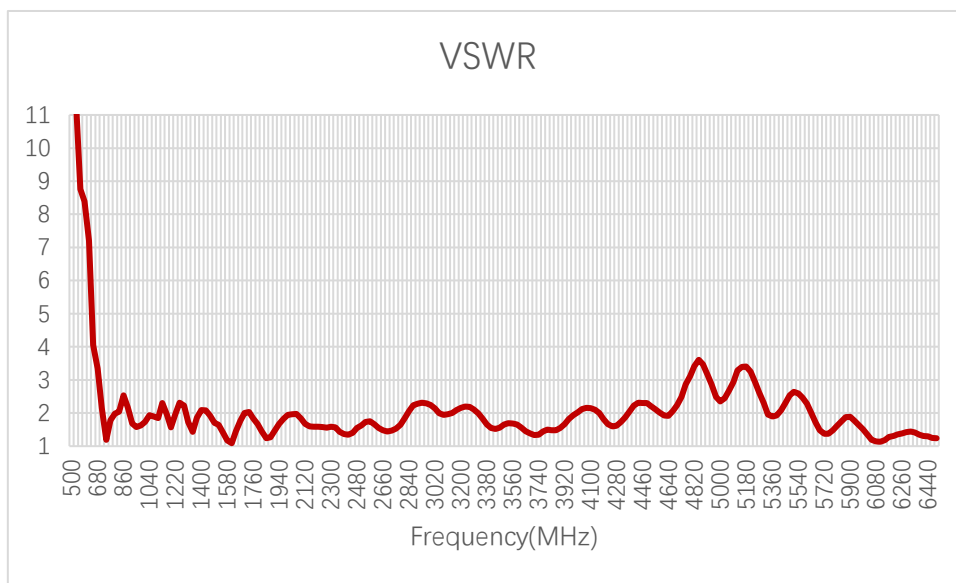
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

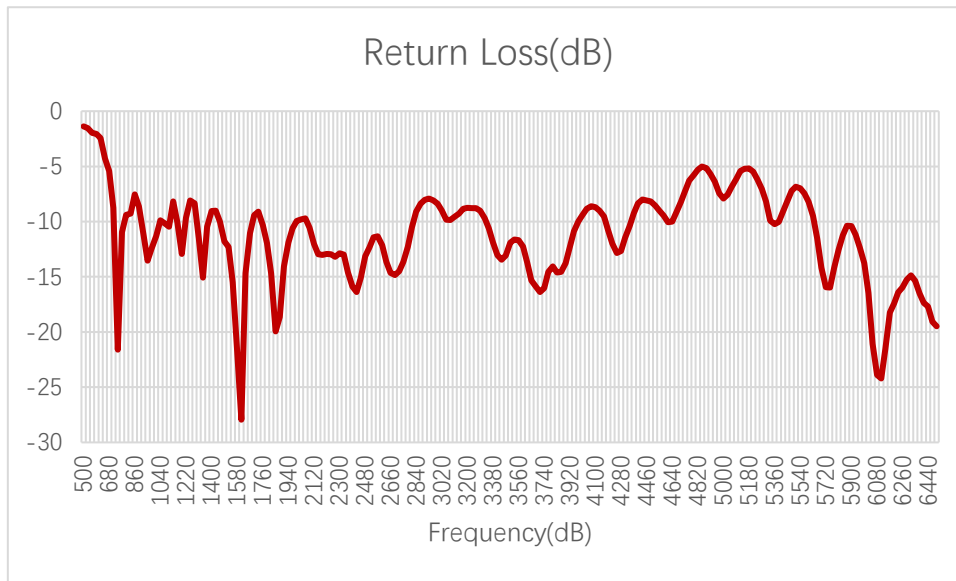
3.1.1. VSWR



VSWR - 4G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
VSWR	-	-	2.1	2	1.8	1.5	-	2	2	1.2
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
VSWR	1.7	1.5	1.4	1.4	1.6	-	-	-	-	-

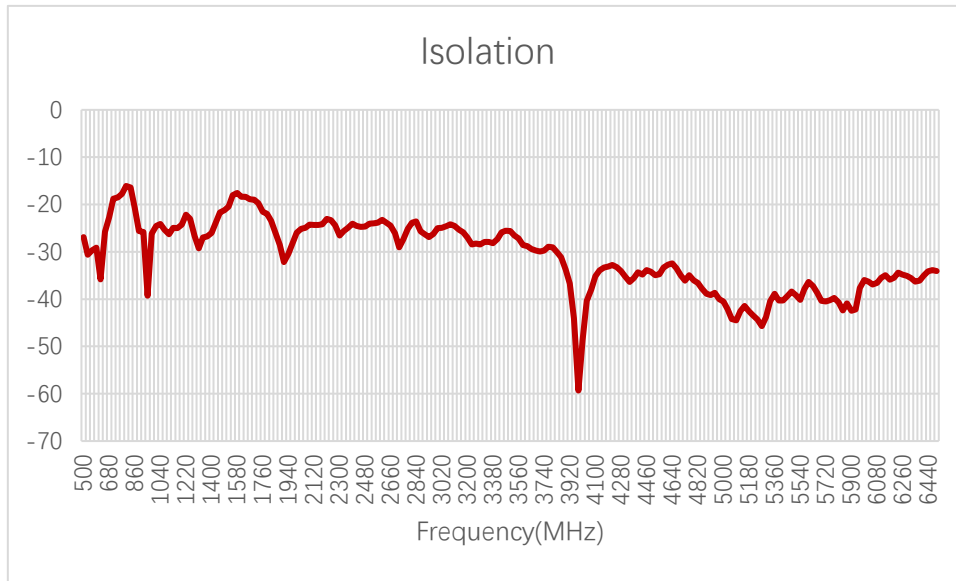
3.1.2. Return Loss



Return Loss (dB) – 4G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	-	-	-8.7	-9.2	-8.6	-13	-	-9.4	-9.1	-18.6
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Return Loss (dB)	-11.8	-12.9	-14.6	-15.1	-12.1	-	-	-	-	-

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		50	-98.2
		18300		300	-98.4
		18550		550	-99
	B2 (10M)	18650		650	-97.5
		18900		900	-98
		19150		1150	-98.2
	B3 (10M)	19250		1250	-97
		19575		1575	-97.5
		19900		1900	-98.2
	B4 (10M)	20000		2000	-98.9
		20175		2175	-99.1
		20350		2350	-99.2
	B5 (10M)	20450		2450	-97.8
		20525		2525	-98
		20600		2600	-98.2
	B7 (20M)	20800		2800	-98
		21100		3100	-98.4
		21400		3400	-98.8
	B8 (10M)	21500		3500	-97.8
		21625		3625	-98.4
		21750		3750	-98.2

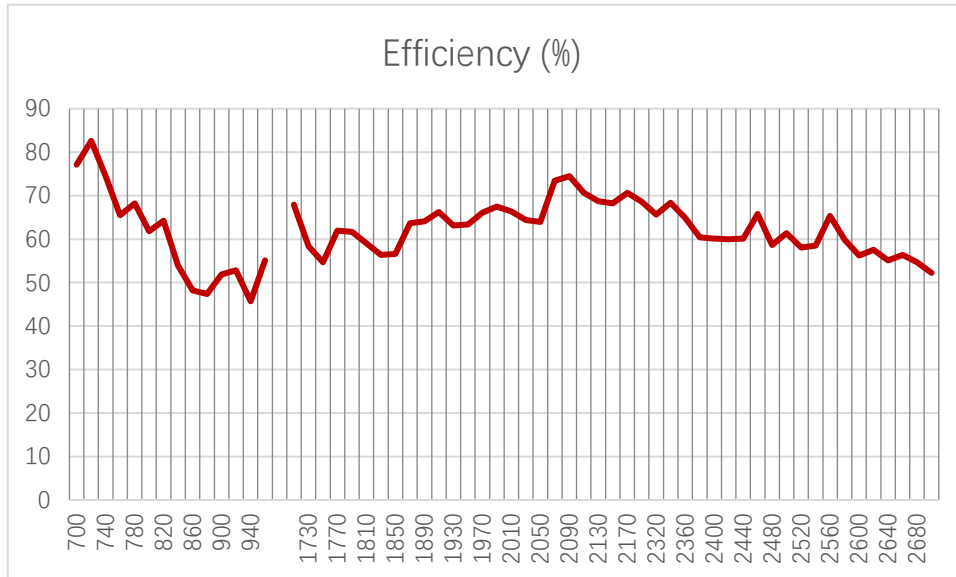
Band		Channel	TRP (dBm)	Channel	TIS (dBm)
LTE	B9 (10M)	21850		3850	-97.6
		21975		3975	-98
		22100		4100	-98.5
	B12 (5M)	23035		5035	-99.8
		23095		5095	-99.9
		23155		5155	-100.8
	B13 (10M)	23230		5230	-96.9
	B14 (10M)	23330		5330	-95.5
	B18 (10M)	23900		5900	-97.8
		23925		5925	-98
		23950		5950	-98.4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

Band		Channel	TRP (dBm)	Channel	TIS (dBm)
LTE	B21 (10M)	24500		6500	-95.5
		24525		6525	-96.1
		24550		6550	-96.1
	B25 (5M)	26065		8065	-99.4
		26365		8365	-100
		26665		8665	-100.6
	B26 (5M)	26715		8715	-99.9
		26865		8865	-100
		27015		9015	-100.8
	B28 (10M)	27260		9260	-97.6
		27435		9410	-97.9
		27610		9610	-98.2
	B30 (10M)	27710		9820	-98.63
	B38 (20M)	37850		37850	-95.4
		38000		38000	-95.7
		38150		38150	-95.8
	B39 (20M)	38350		38350	-94.6
		38450		38450	-94.8
		38550		38550	-95.4

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

3.3. Radiation Performance Test

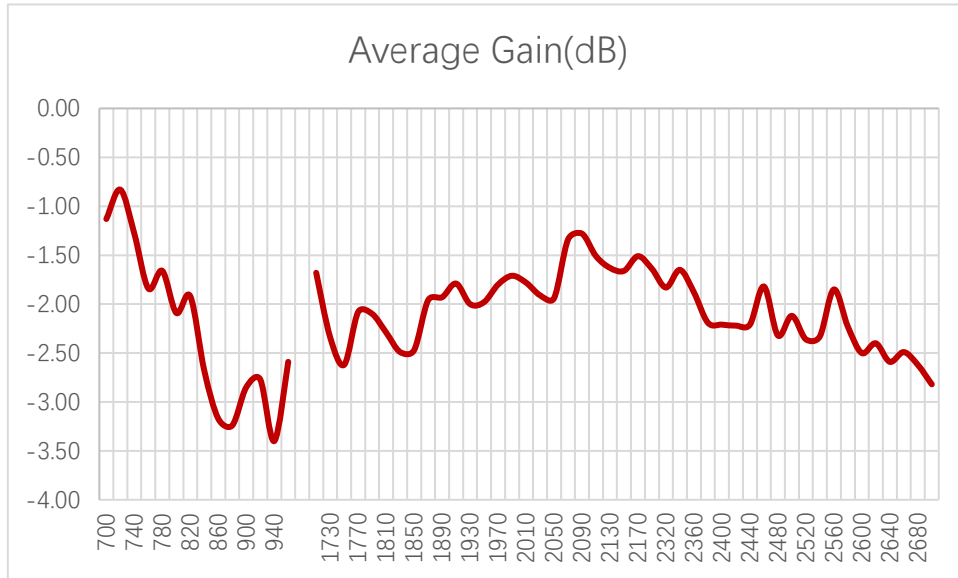
3.3.1. Efficiency



Efficiency (%) - 4G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	-	-	80.1	64.27	51.88	55.08	-	67.92	60.26	70.31
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Efficiency (%)	63.39	68.71	68.39	60.12	52.24	-	-	-	-	-

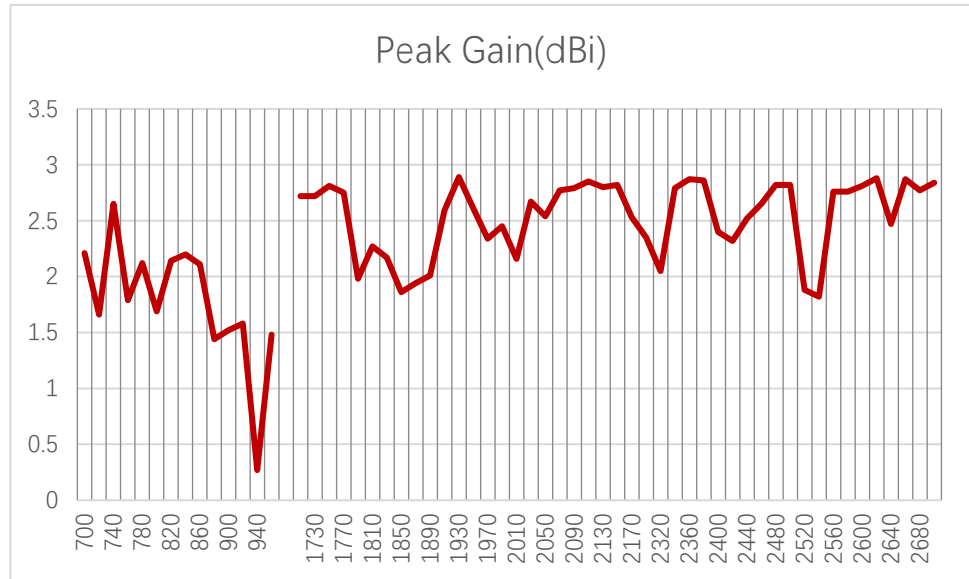
3.3.2. Average Gain



Average Gain (dB) - 4G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	-	-	-1.13	-2.68	-2.85	-2.59	-	-1.68	-2.62	-1.9
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Average Gain (dB)	-1.98	-1.63	-1.65	-1.82	-2.50	-	-	-	-	-

3.3.3. Peak Gain

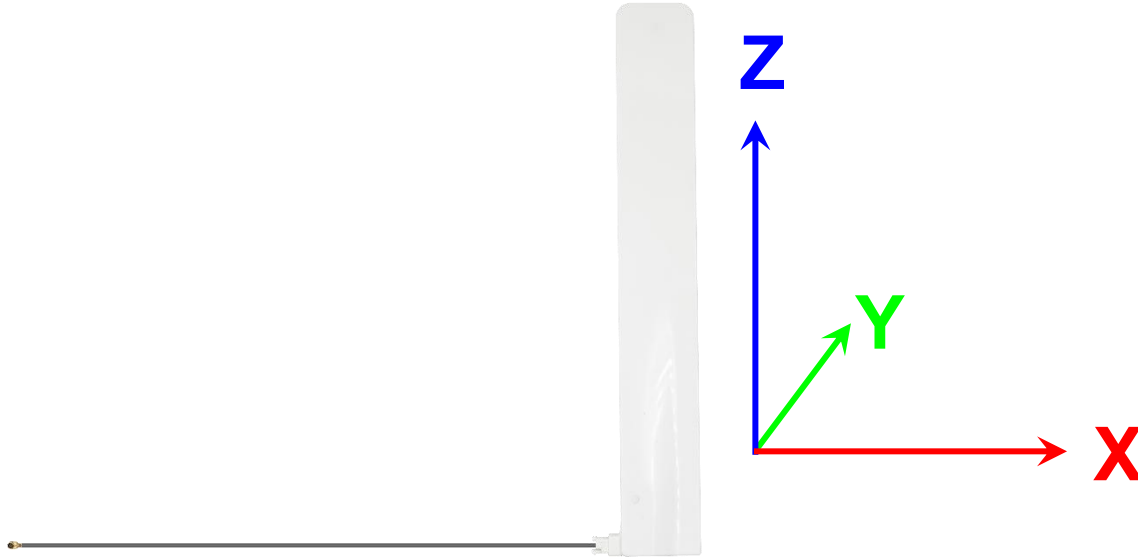


Peak Gain (dBi) - 4G

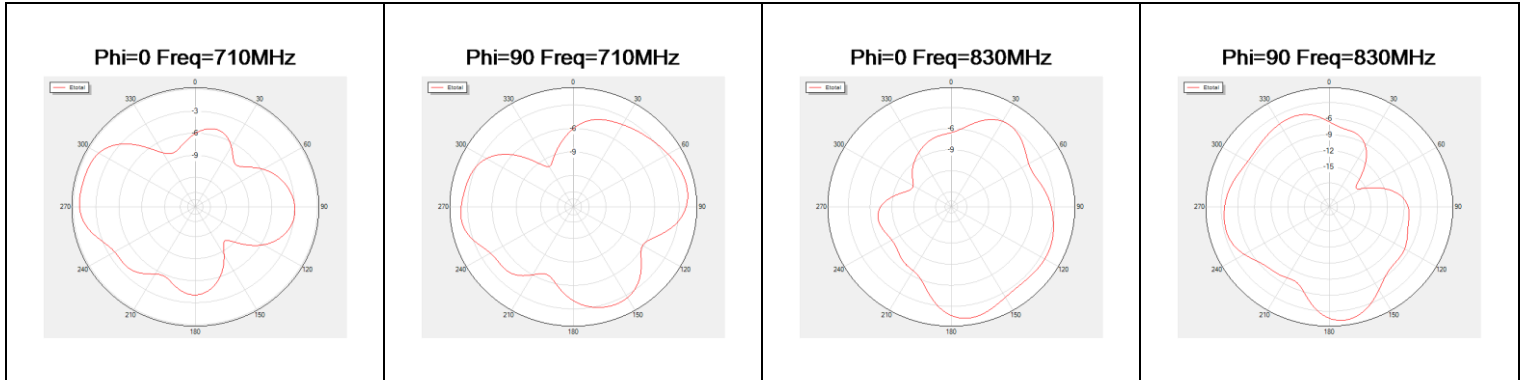
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	-	-	2.2	2.14	1.52	1.48	-	2.8	2.7	1.9
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Peak Gain (dBi)	2.6	2.9	2.79	2.65	2.8		-	-	-	-

3.3.4. 3D & 2D Radiation Pattern

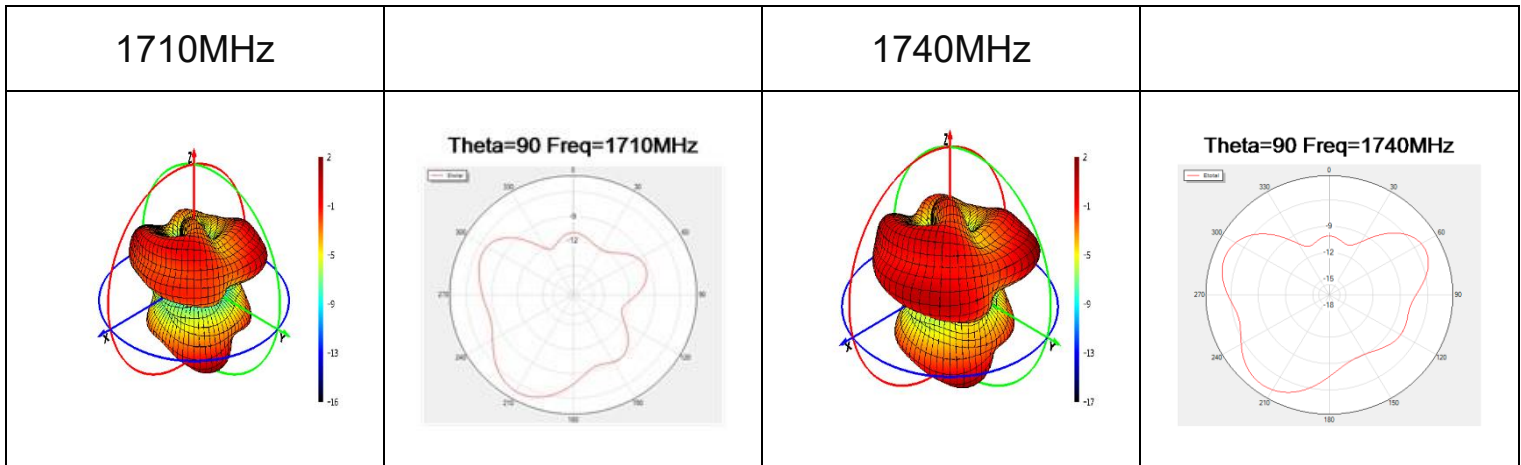
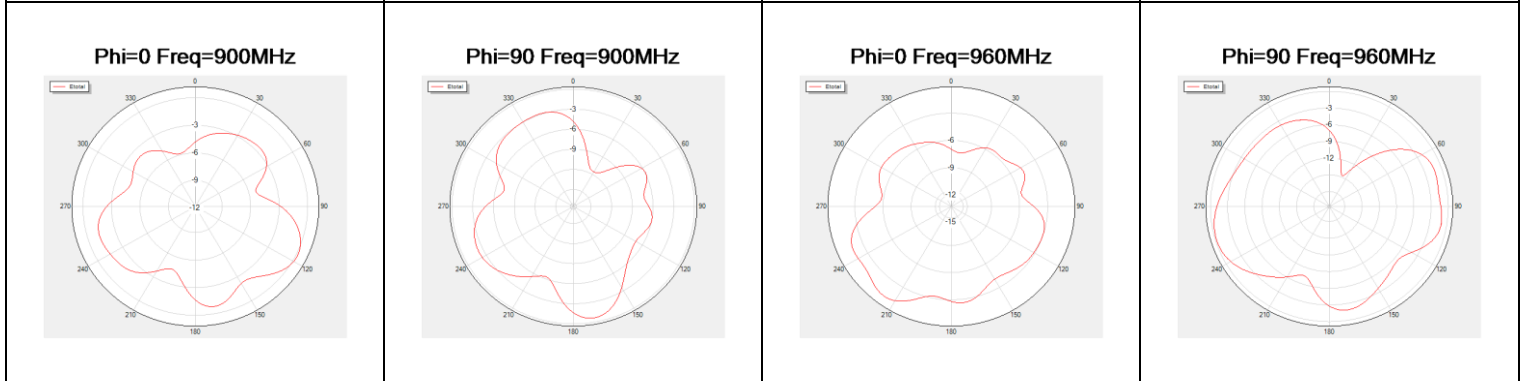
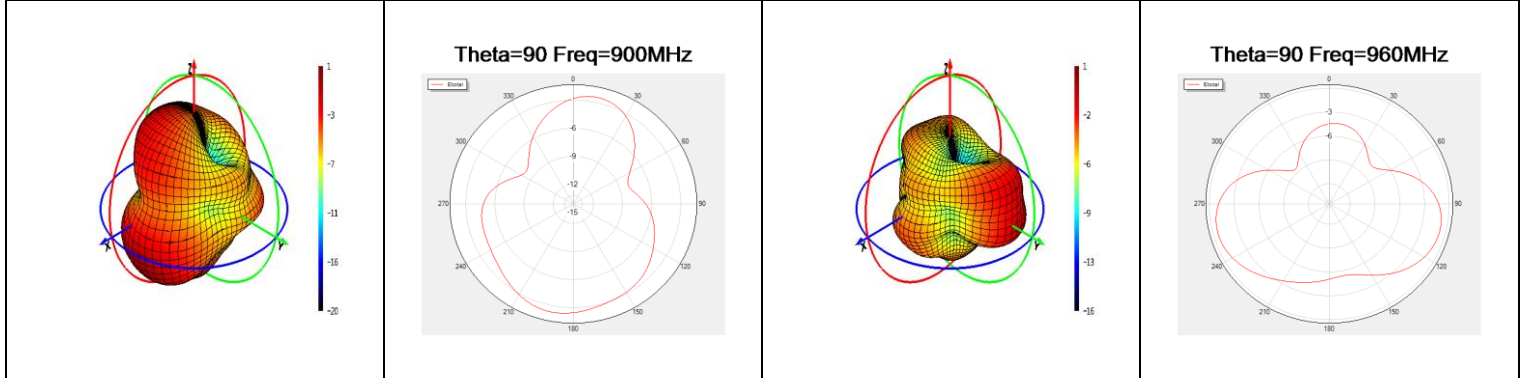
- Test Status: Assembled in test device
- Test Chamber: SH-S-1

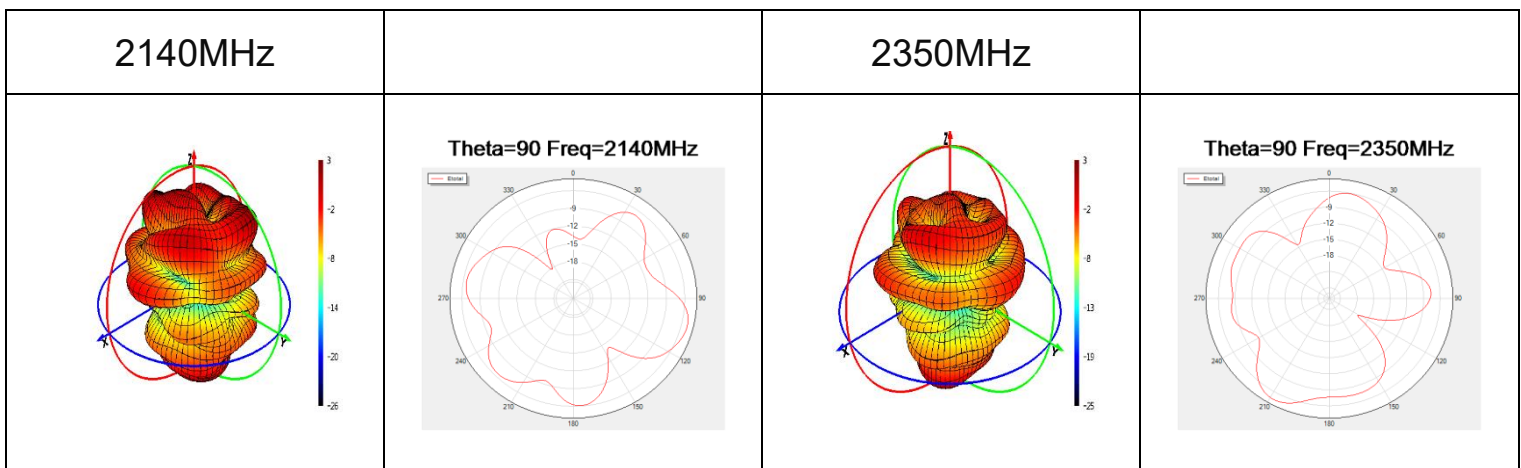
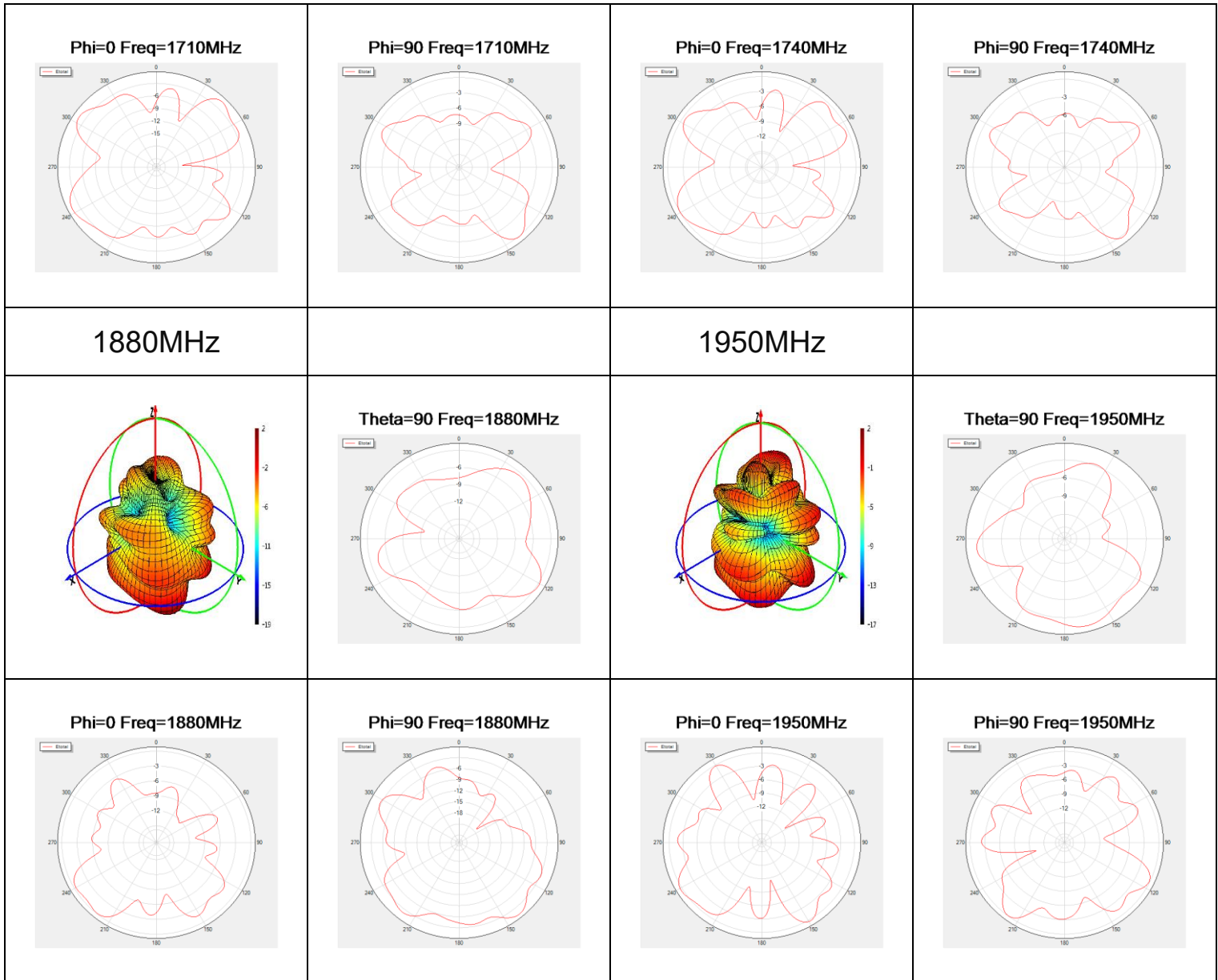


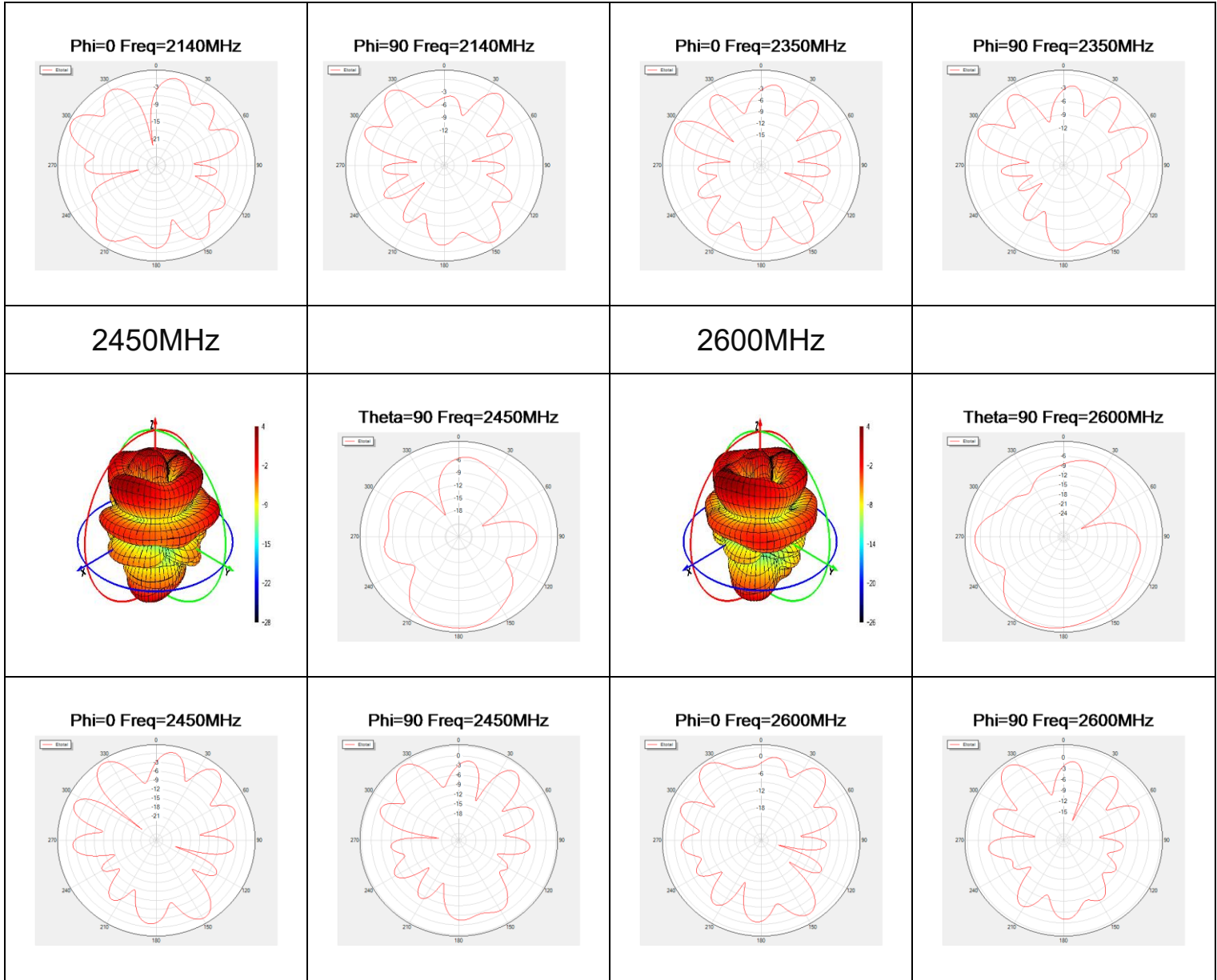
710MHz		830MHz	
	<p>Theta=90 Freq=710MHz</p>		<p>Theta=90 Freq=830MHz</p>



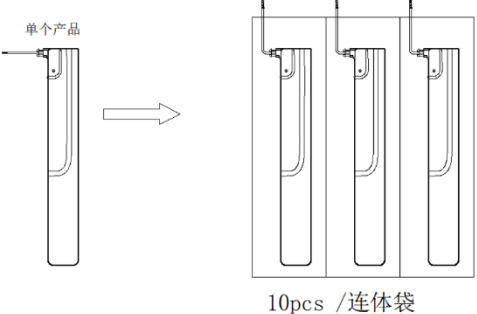
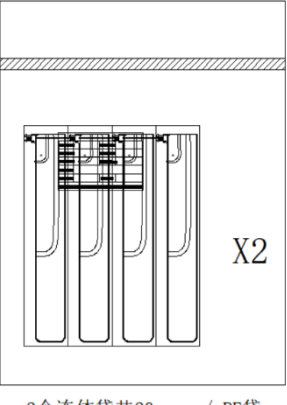
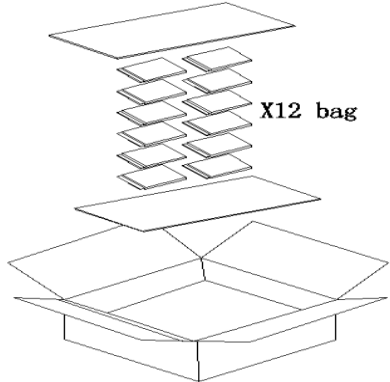
900MHz		960MHz	
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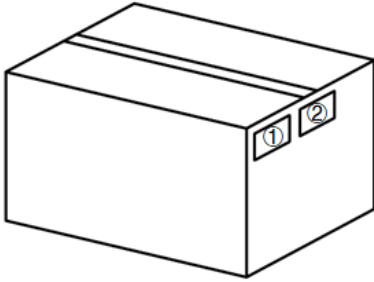
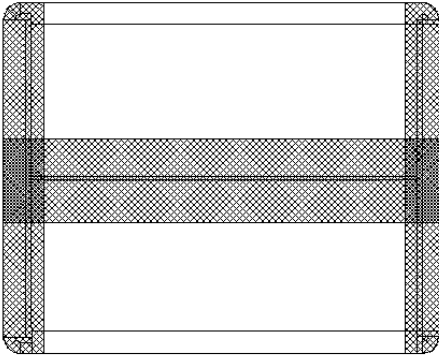






4 Packaging

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		<p>Position for Attaching Labels---</p> <ul style="list-style-type: none">① Carton Label② Quality Label
5		<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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Or our local offices. For more information, please visit:

<http://www.quectel.com/support/sales.htm>.

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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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