



Antenna Datasheet

Product OC: YEMN210J1AH

Version: 1.0

Date: 2024-07-29

Status: Released

Product Name: 5G & Wi-Fi 2in1 Screw Combo Antenna

Key Features:

Frequency Band: 600–960 MHz & 1400–6000 MHz & 2400–2500 MHz

Dimensions: Φ 40.6 mm $\times$ 104 mm

Efficiency: Up to 81.8 %

RoHS and REACH Compliant

IP67

IP69K

IK10

Overview

YEMN210J1AH is a 5G & Wi-Fi 2in1 combo antenna measuring $\Phi 40.6 \text{ mm} \times 104 \text{ mm}$. This ultra-wide-band combo antenna provides broad coverage from 700–960 MHz, 1400–6000 MHz whilst offering backward-compatibility to support 4G/3G and 2G networks as well as LTE Cat-M and narrowband IoT (NB-IoT). The antenna is available with connection via 2 cable lengths from 300–5,000 mm (Compatible with ECE-R118 cables), terminated with SMA Male connectors. This low profile, screw mount omni-directional antenna, ideal for applications where the antenna is required to be discrete, is easy to install with maximum durability assured thanks to its IP67 & IP69K and IK10 rated enclosure. It is compatible with Quectel's RM520x Series modules.

YEMN210J1AH has 1 × 5G LMH antenna and 1 × Wi-Fi antenna. It allows high efficiency, stable signal transmission and reception for Wi-Fi from 2400–2500 MHz, and 5G band from 600–960 MHz & 1400–6000 MHz. In the meantime, this product also offers high isolation between antennas to avoid self-interference. All in all, this unique product is designed to provide stable and high-speed data connection to 5G & Wi-Fi applications. YEMN210J1AH can be used in harsh environments thanks to its robust UV resistant (UL 746c f1) and flame resistant (UL 94 HB) enclosure.

Typical applications include:

- Public safety
- HD Video Streaming
- Utilities and Smart Cities
- Fleet Management
- Agricultural
- Industrial

Quectel provides comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs. We have regional R & D centers to offer quick response to meet your requirements. Please contact our sales & FAEs if you have any requests.

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1 Specification

Test Condition: On 300 × 300 mm metal plane

1.1. Electrical

Electrical Specifications		
Frequency Range	5G	700–960 MHz, 1400–6000 MHz
	Wi-Fi	2400–2500 MHz
Radiation Pattern		Omni-directional
Polarization		Linear
Impedance		50 Ω
Isolation		≤ -5.0 dB

1.1.1. 5G

Electrical – Detail													
SPEC	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
	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		7.5	3.1	1.2	1.5	1.7	2.0	2.2	2.2	1.5	2.2	2.0	
Max. Return Loss (dB)		-2.3	-5.8	-21.8	-14.4	-11.5	-9.7	-8.6	-8.6	-14.2	-8.7	-9.5	
AVG Eff. (%)		31.6	64.9	75.9	53.9	42.9	48.4	51.6	57.5	60.3	50.3	55.0	
AVG AVG Gain (dB)		-5.0	-1.9	-1.2	-2.7	-3.7	-3.1	-2.9	-2.4	-2.2	-3.0	-2.6	
Max. Peak Gain (dBi)		-1.3	2.6	3.2	3.2	2.2	2.6	2.8	3.6	5.7	5.9	5.7	
VSWR		≤ 7.5											
Return Loss		≤ -2.3 dB											
Peak Gain		≤ 5.9 dBi											

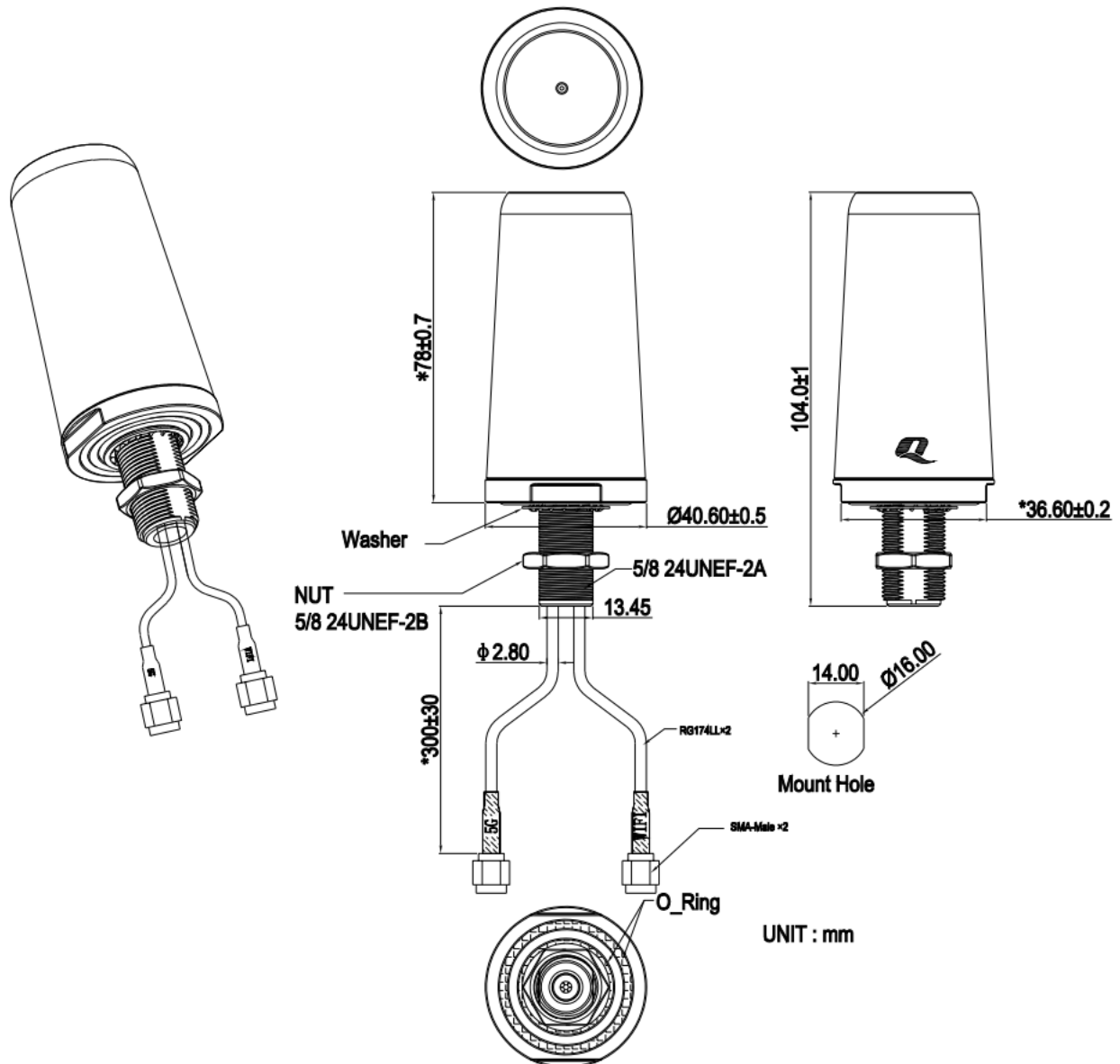
1.1.2. Wi-Fi

SPEC	Band	Band	Wi-Fi 2G	Wi-Fi 5G	Wi-Fi 7G
	Freq. (MHz)		2400–2500	5150–5850	5925–7125
Max. VSWR			1.6	-	-
Max. Return Loss (dB)			-13.1	-	-
AVG Eff. (%)			58.6	-	-
AVG AVG Gain (dB)			-2.3	-	-
Max. Peak Gain (dBi)			4.4	-	-
VSWR			≤ 1.6		
Return Loss			≤ -13.1 dB		
Peak Gain			≤ 4.4 dBi		

1.2. Mechanical & Environmental

Mechanical		
Antenna Dimensions		Φ 40.6 mm × 104 mm
Antenna Material & Color		ASA & Black
Cable Type & Color & Length	5G	RG174LL Black & 300 mm
	Wi-Fi	RG174LL Black & 300 mm
Connector Type		SMA Male (The current state of the SMA connector is not waterproof. If a waterproof connector is required, it can be customized.)
Weight		Typ. 200 g
Mounting Type		Screw
Environmental		
Operation Temperature		-40 °C to +85 °C
Storage Temperature		-40 °C to +85 °C
Ingress Protection (IP) Rating		IP67 (After Installation) IP69K (After Installation)
Impact Protection (IK) Rating		IK10
Housing UV Resistant		UL 746c f1
RoHS & REACH Compliant		Yes

2 Drawing



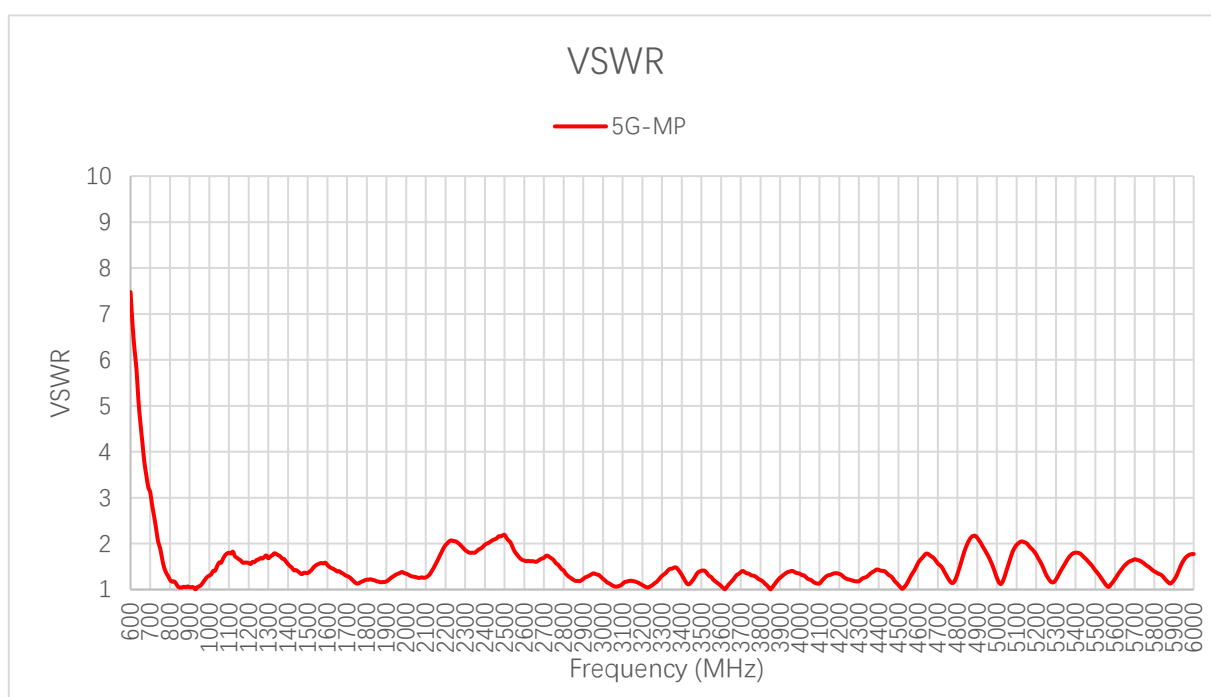
Caution: If you find the silicon seal ring dropping out of the groove when opening the package, it's a normal phenomenon due to its special structure design. Please assemble the silicon seal ring into groove before you assemble antenna on the device, thanks!



3 Detailed Performance

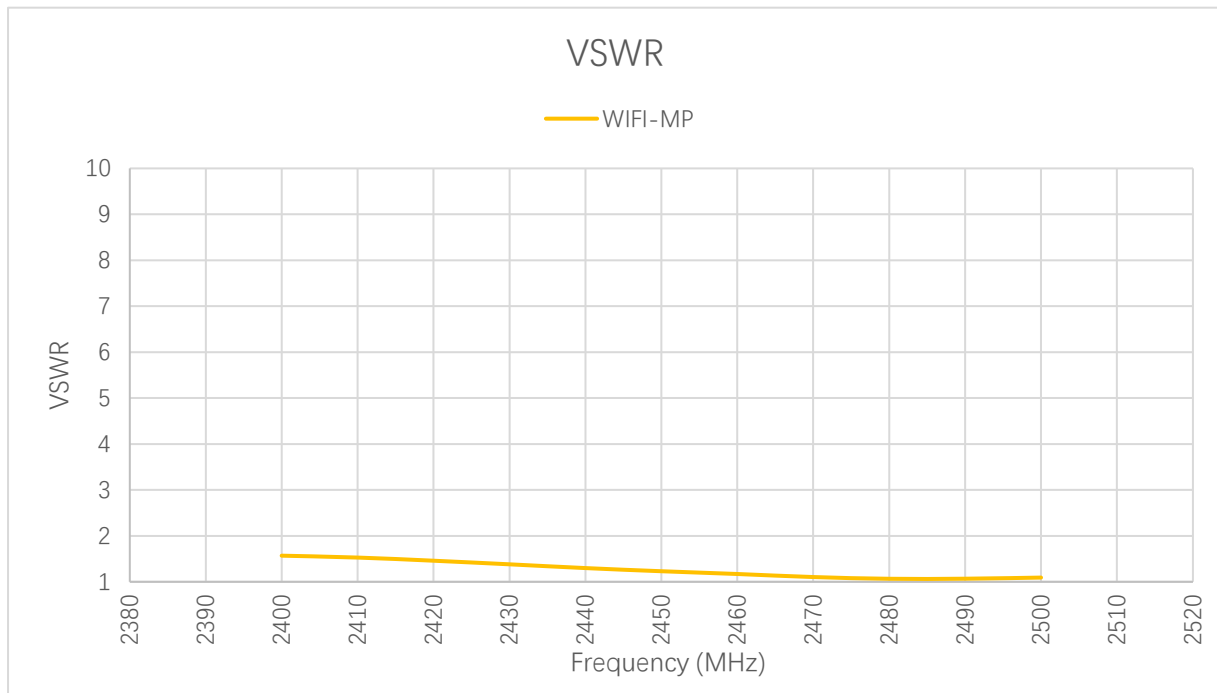
3.1. S-Parameter Test

3.1.1. VSWR



VSWR – 5G

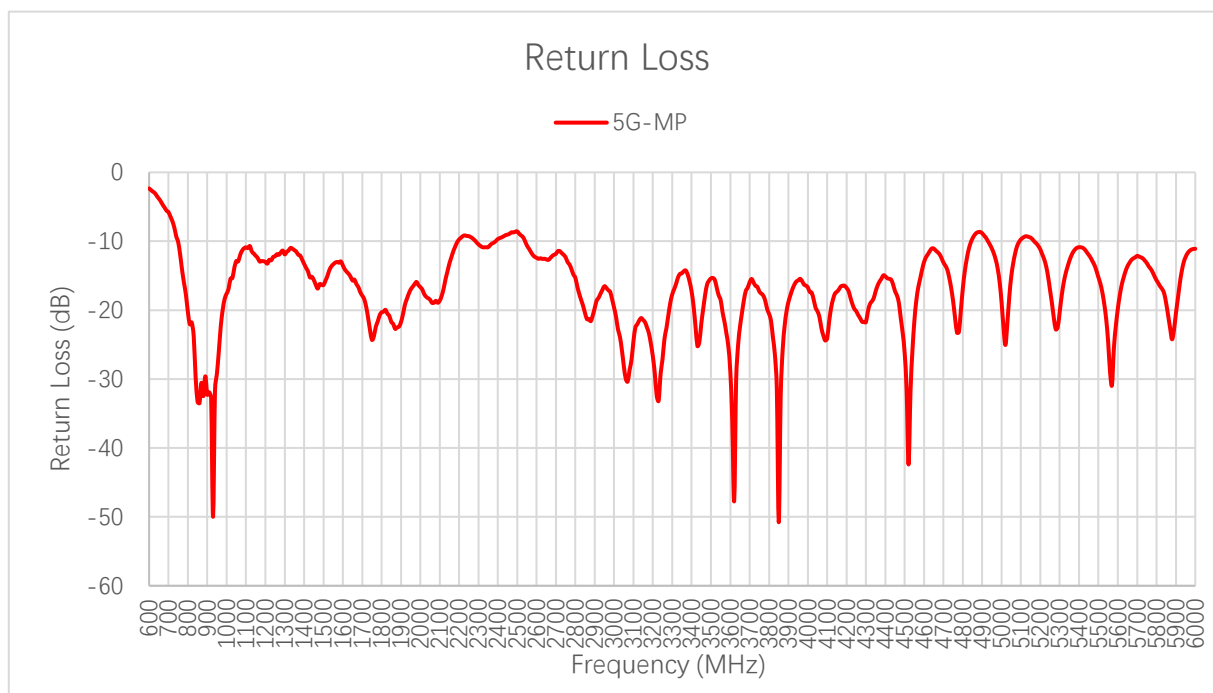
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
VSWR	7.5	5.8	2.8	1.1	1.0	1.1	1.4	1.3	1.2	1.2
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
VSWR	1.3	1.5	1.8	2.1	1.6	1.1	1.6	1.3	1.4	1.8



VSWR – Wi-Fi

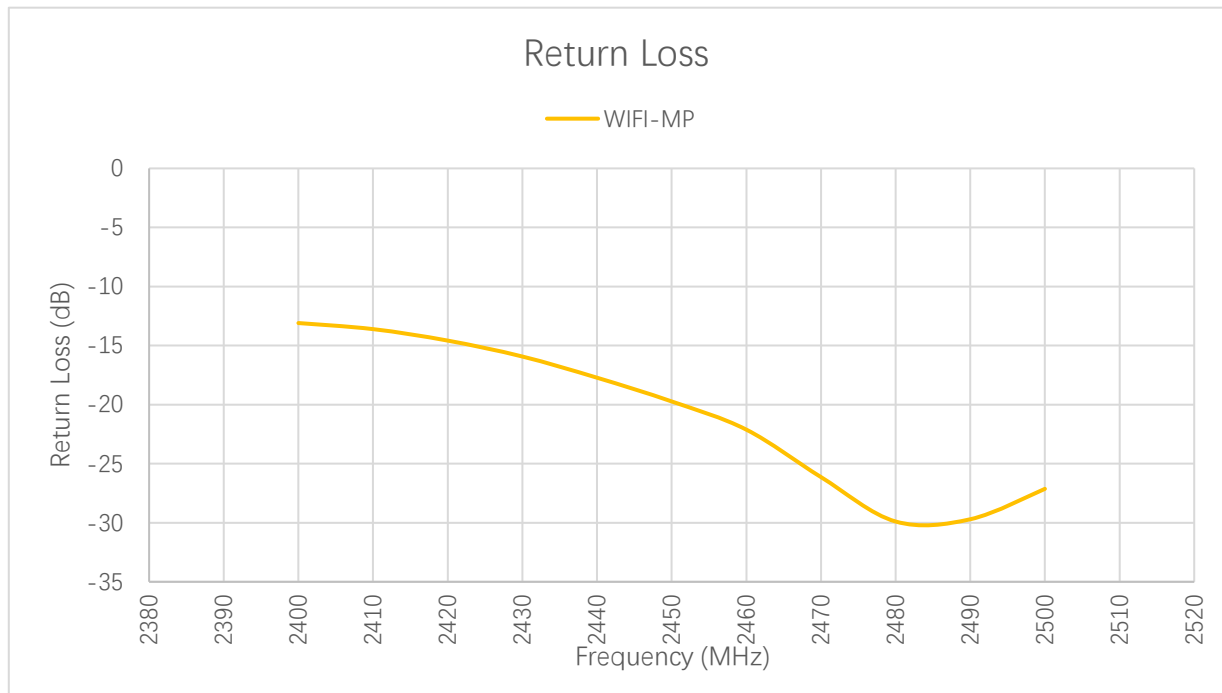
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
VSWR	1.6	1.2	1.1	-	-	-	-	-	-	-

3.1.2. Return Loss



Return Loss (dB) – 5G

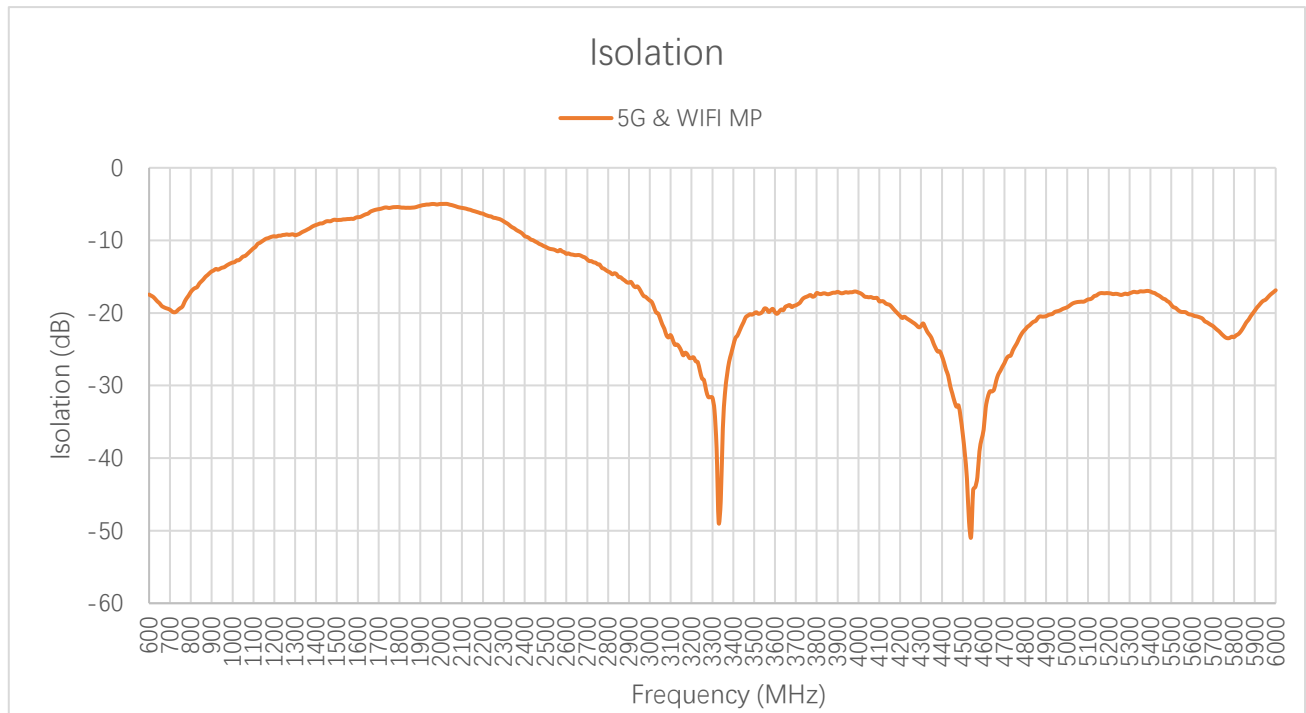
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	-2.3	-3.0	-6.4	-23.7	-32.3	-25.9	-15.2	-18.4	-22.9	-22.5
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Return Loss (dB)	-17.0	-14.4	-10.9	-9.0	-12.4	-28.9	-13.1	-18.8	-15.2	-11.1



Return Loss – Wi-Fi

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Return Loss (dB)	-13.1	-19.7	-27.1	-	-	-	-	-	-	-

3.1.3. Isolation

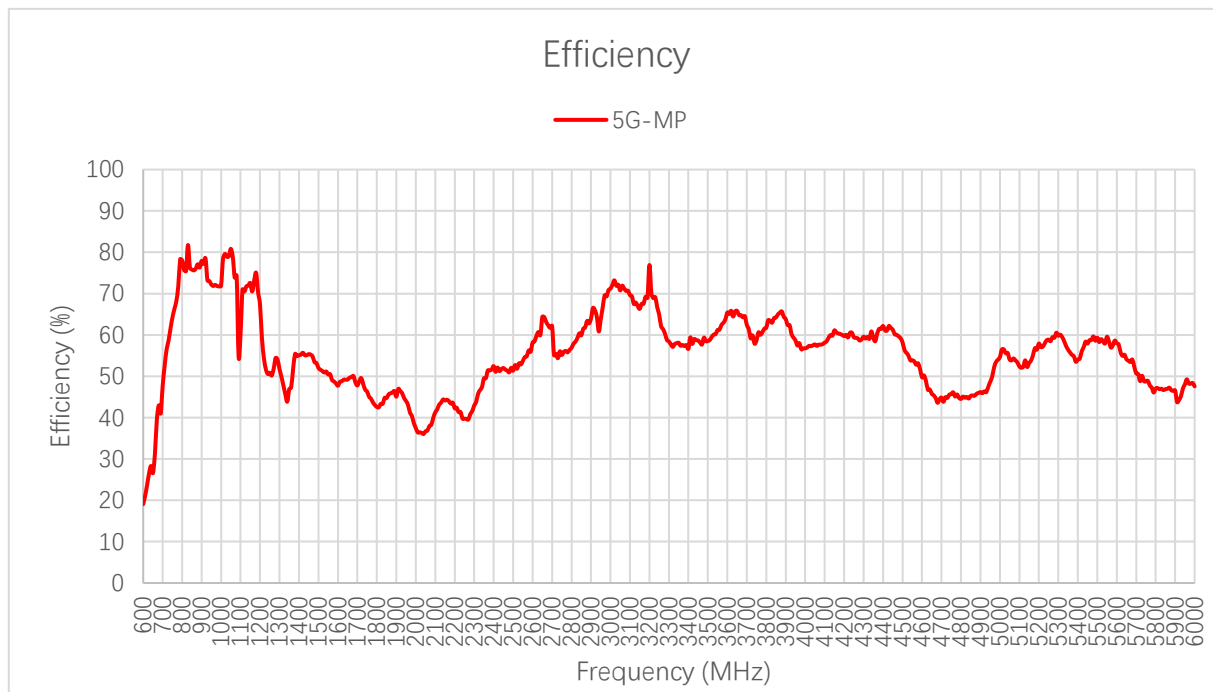


Max Isolation (dB)

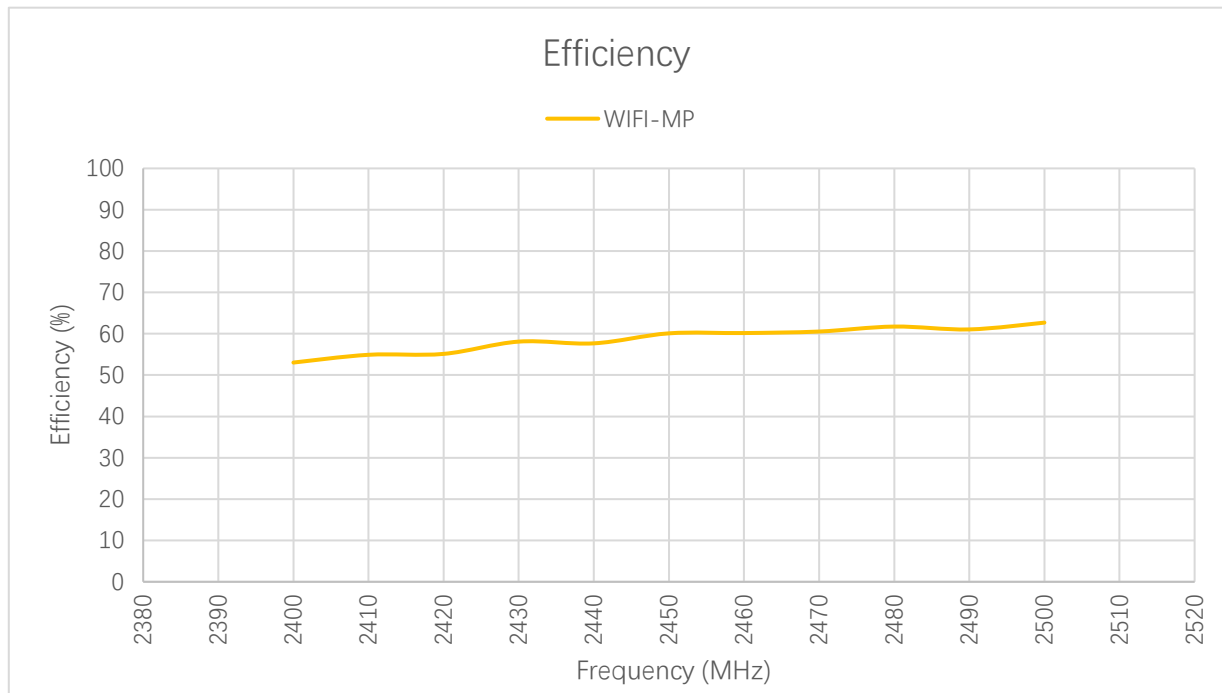
Band	B71	B12/ B13/ B28	B5/ B8/ B26	n74/ n75/ n76	B1/ B2/ B3	B40	Wi-Fi 2G	B38/ B41	B42/ B48/ n77	n79	Wi-Fi 5G
Freq. (MHz)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850
Isolation (dB)	-17.5	-16.8	-13.7	-7.2	-5.0	-7.4	-9.4	-10.9	-17.1	-19.2	-17.0

3.2. Radiation Performance Test

3.2.1. Efficiency



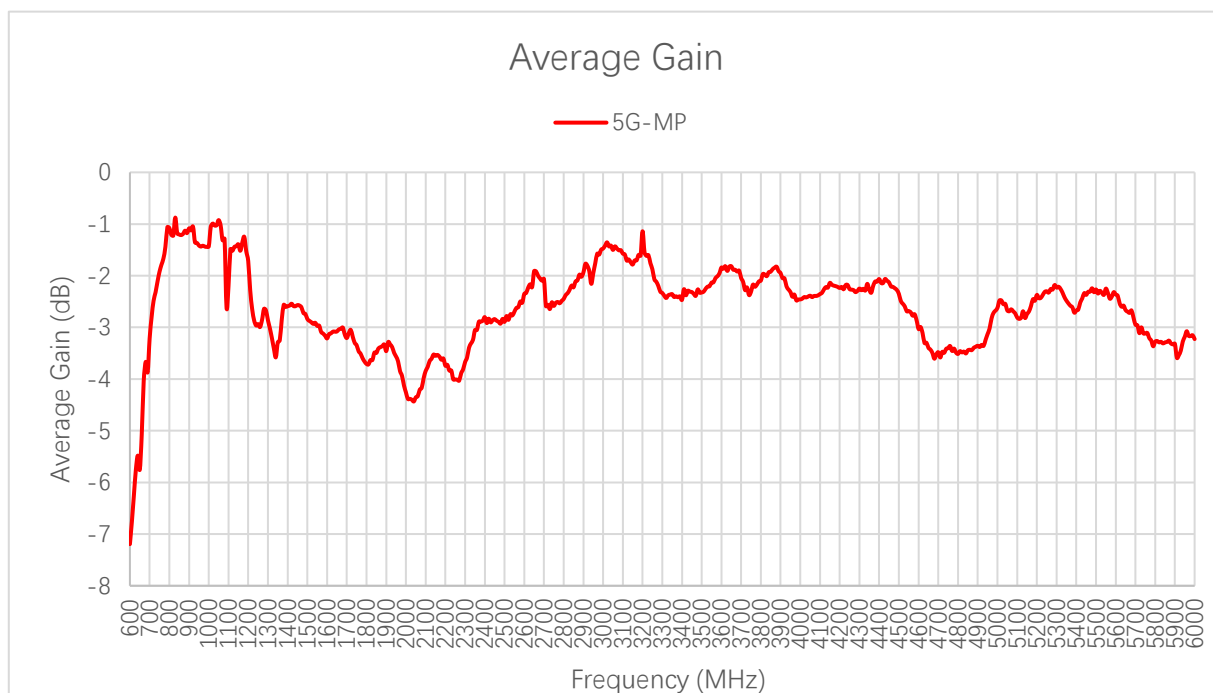
Efficiency (%) – 5G										
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	19.1	26.5	52.5	81.8	77.9	71.9	55.4	48.8	46.8	46.1
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Efficiency (%)	44.0	44.4	49.5	52.0	58.2	65.4	44.9	54.7	59.4	47.6



Efficiency (%) – Wi-Fi

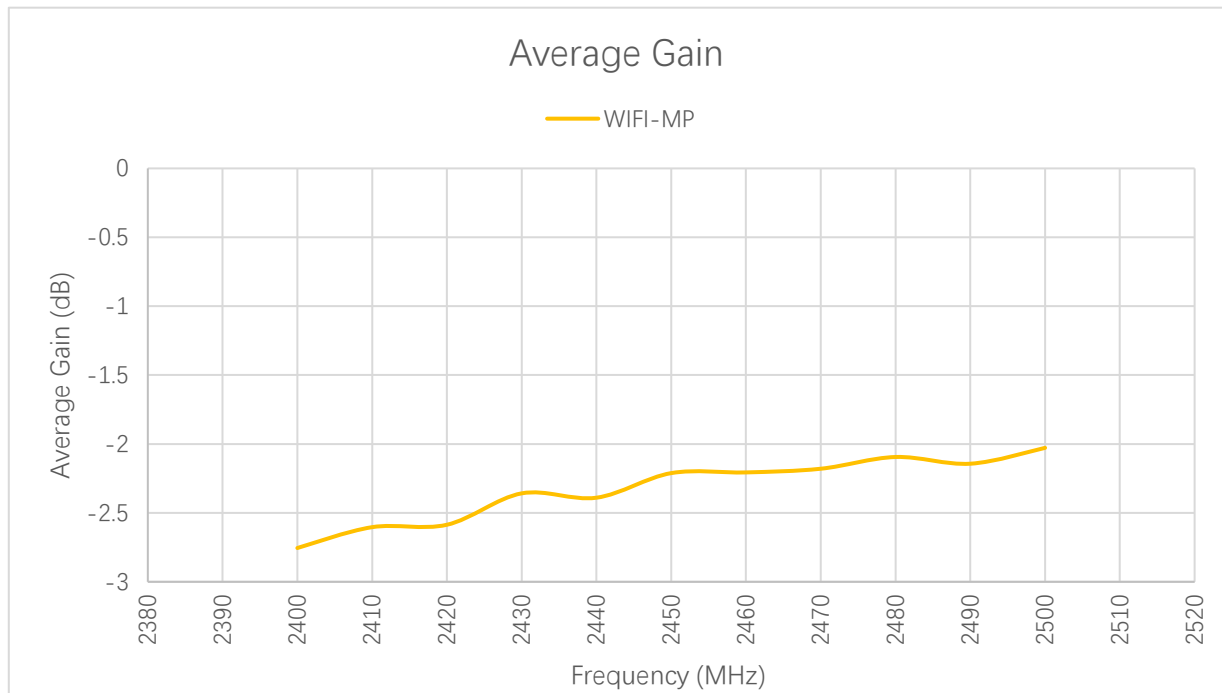
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Efficiency (%)	53.0	60.1	62.7	-	-	-	-	-	-	-

3.2.2. Average Gain



Average Gain (dB) – 5G

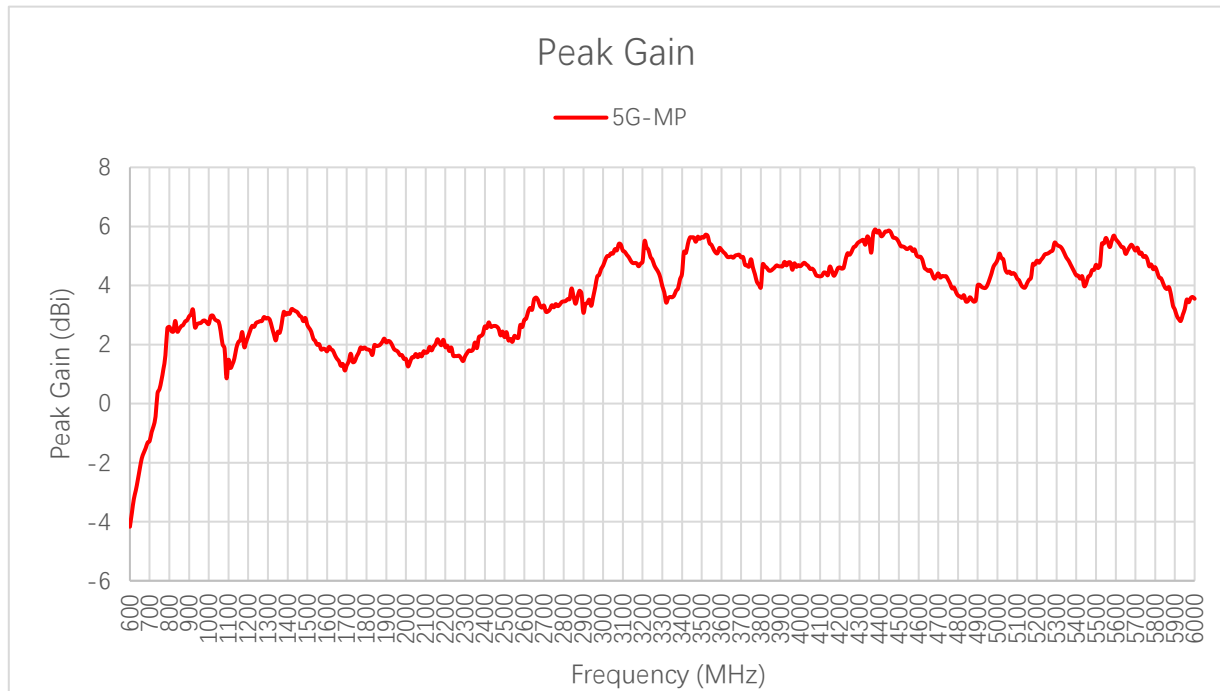
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	-7.2	-5.8	-2.8	-0.9	-1.1	-1.4	-2.6	-3.1	-3.3	-3.4
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Average Gain (dB)	-3.6	-3.5	-3.1	-2.8	-2.4	-1.8	-3.5	-2.6	-2.3	-3.2



Average Gain (dB) – Wi-Fi

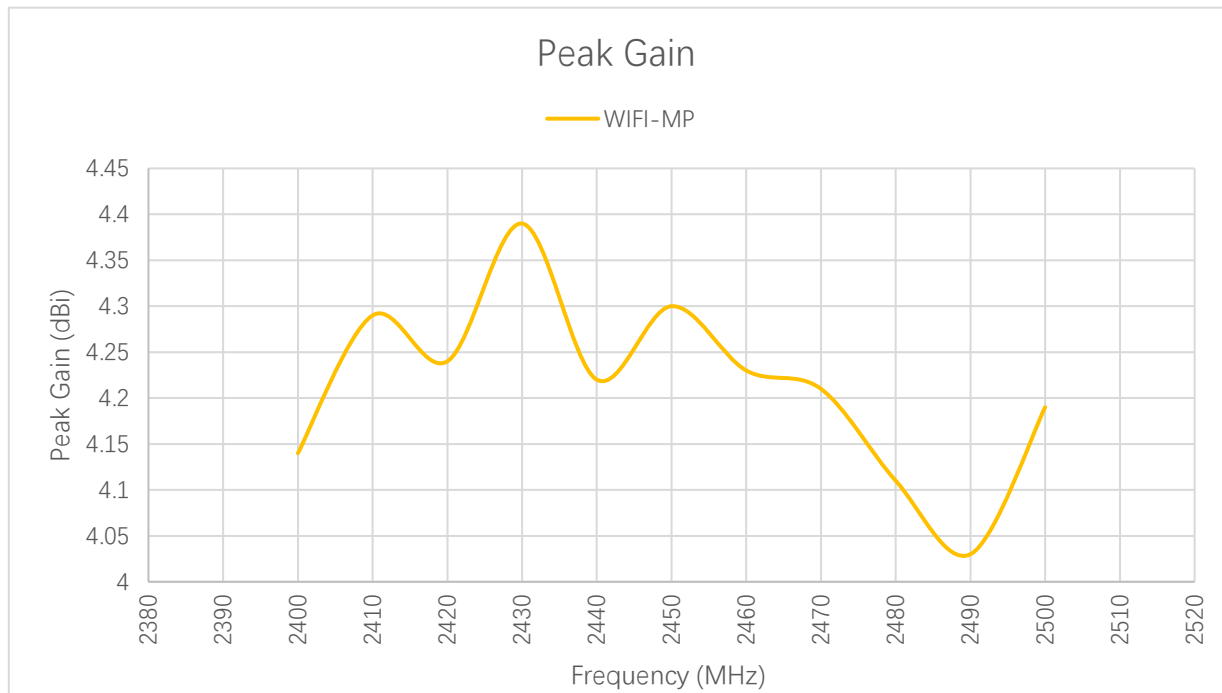
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Average Gain (dB)	-2.8	-2.2	-2.0	-	-	-	-	-	-	-

3.2.3. Peak Gain



Peak Gain (dBi) – 5G

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	-4.2	-2.9	-1.0	2.8	3.0	2.7	3.1	1.4	1.4	2.1
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Peak Gain (dBi)	1.8	1.9	2.1	2.6	2.8	5.2	4.4	4.9	4.7	3.6

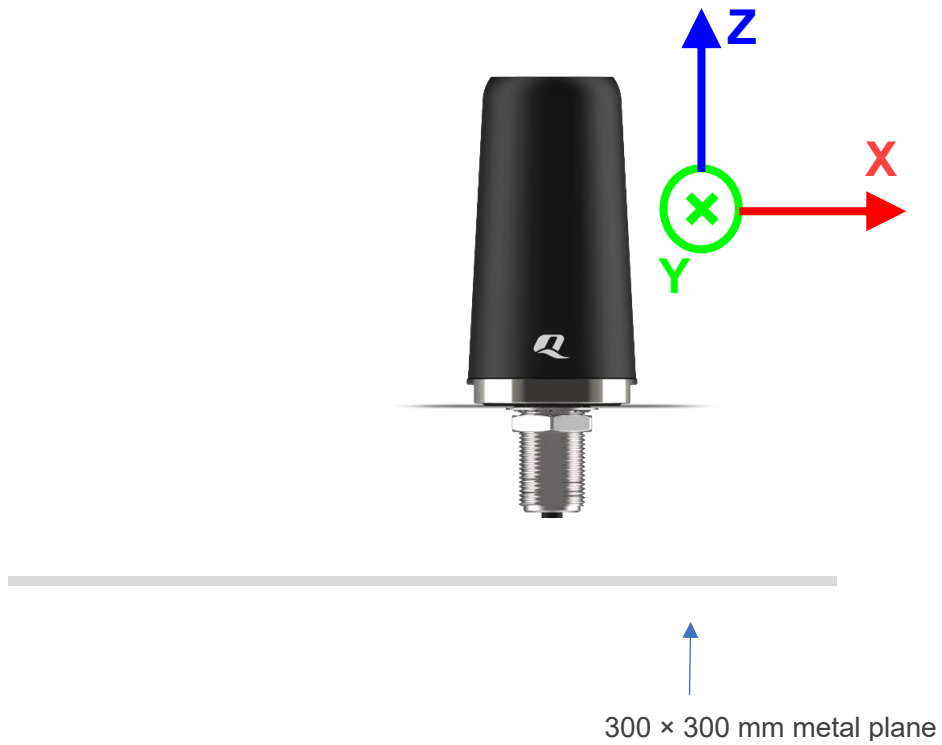


Peak Gain (dBi) – Wi-Fi

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Peak Gain (dBi)	4.1	4.3	4.2	-	-	-	-	-	-	-

3.2.4. 3D & 2D Radiation Pattern

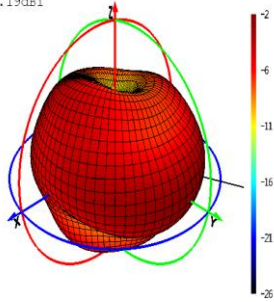
- Test Condition: On 300×300 mm metal plane
- Test Chamber: FS-S-1



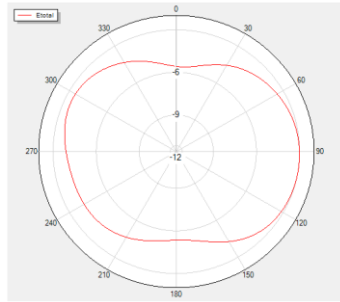
● **5G**

630 MHz

MAX:-2.94dBi
MIN:-27.19dBi

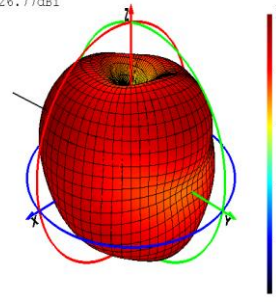


Theta=90 Freq=630MHz

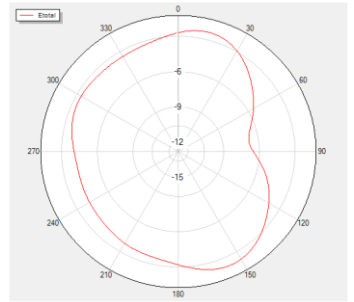


710 MHz

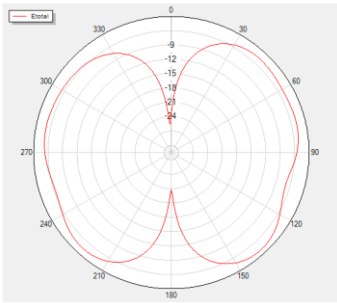
MAX:-0.97dBi
MIN:-26.77dBi



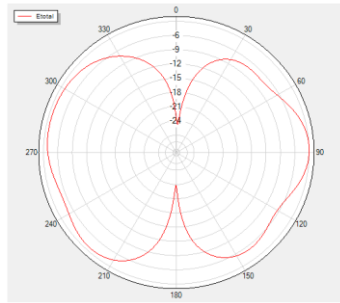
Theta=90 Freq=710MHz



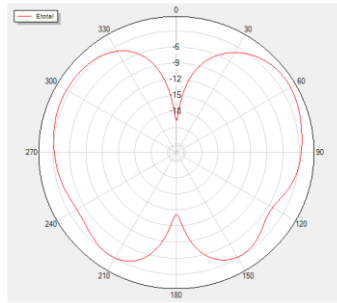
Phi=0 Freq=630MHz



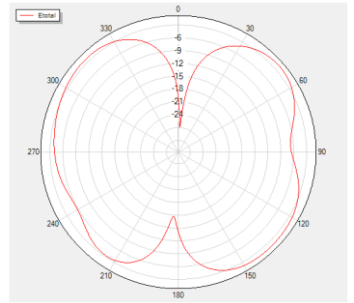
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Phi=0 Freq=710MHz

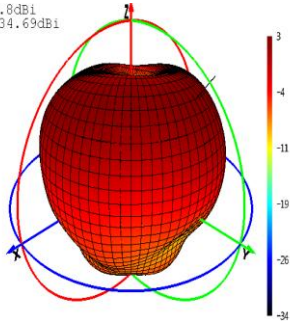


Phi=90 Freq=710MHz

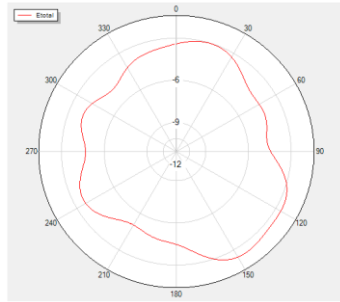


830 MHz

MAX:2.8dBi
MIN:-34.69dBi

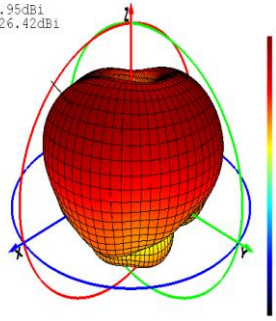


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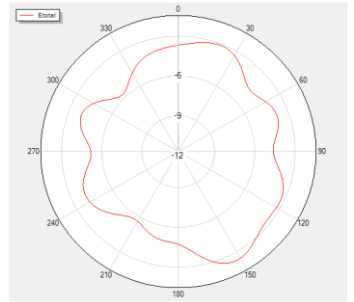


900 MHz

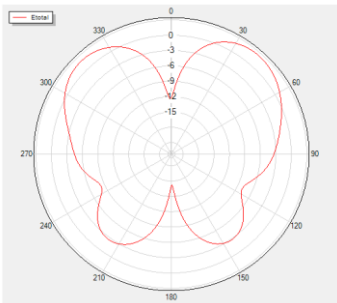
MAX:2.95dBi
MIN:-26.42dBi



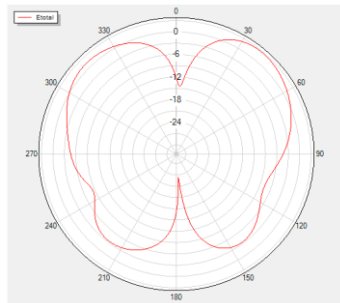
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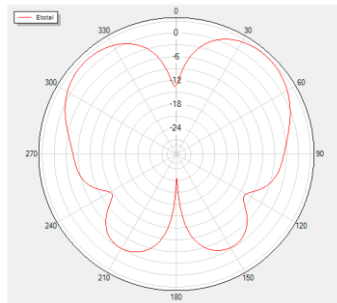
Phi=0 Freq=830MHz



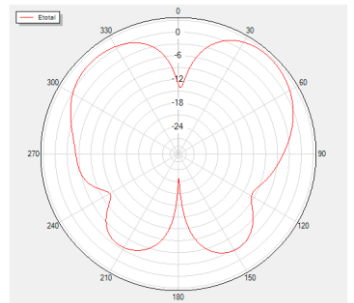
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Phi=0 Freq=900MHz

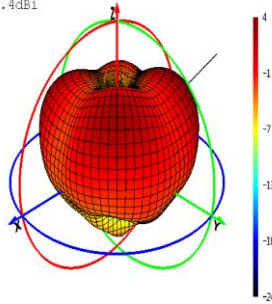


Phi=90 Freq=900MHz

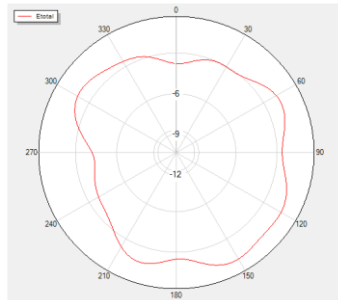


1440 MHz

MAX:3.13dBi
MIN:-25.4dBi

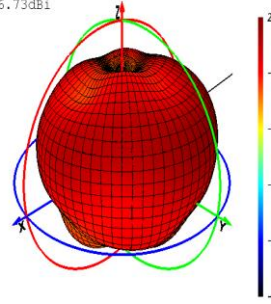


Theta=90 Freq=1440MHz

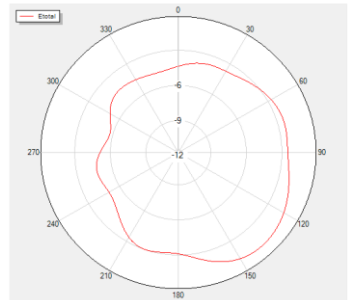


1740 MHz

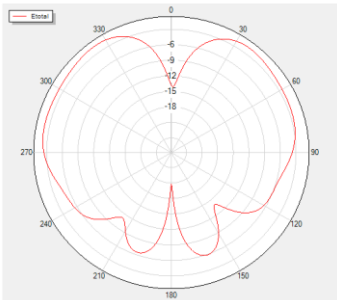
MAX:1.43dBi
MIN:-36.73dBi



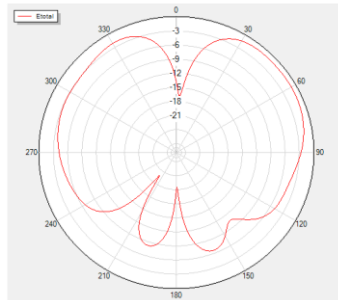
Theta=90 Freq=1740MHz



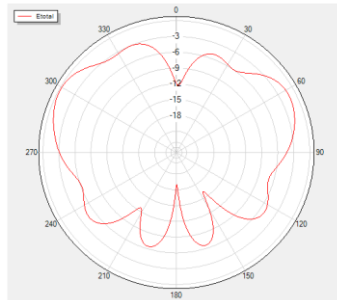
Phi=0 Freq=1440MHz



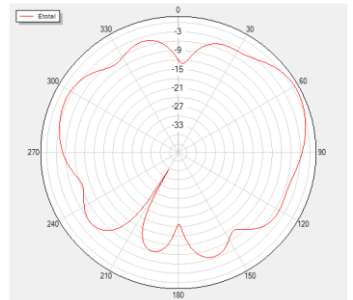
Phi=90 Freq=1440MHz



Phi=0 Freq=1740MHz

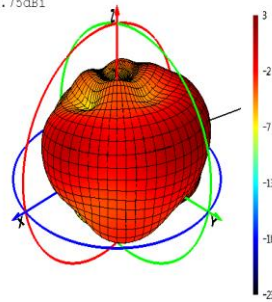


Phi=90 Freq=1740MHz

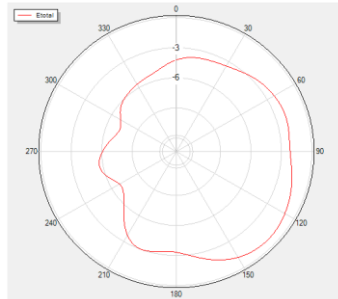


1880 MHz

MAX:2.09dBi
MIN:-24.75dBi

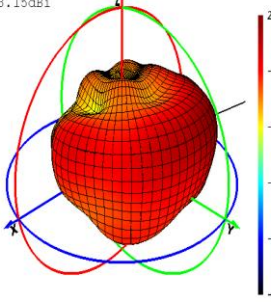


Theta=90 Freq=1880MHz

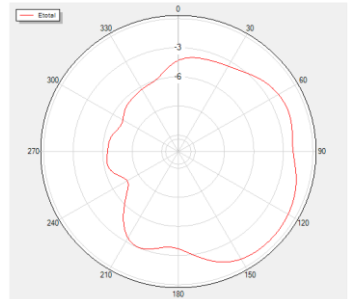


1950 MHz

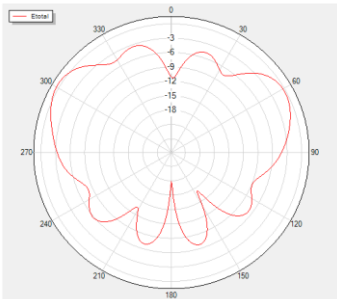
MAX:1.8dBi
MIN:-23.15dBi



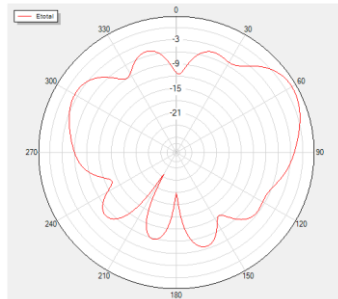
Theta=90 Freq=1950MHz



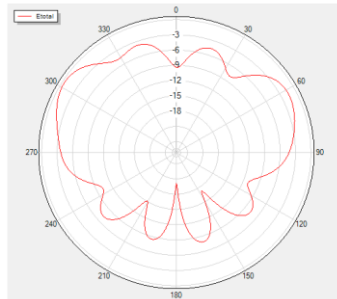
Phi=0 Freq=1880MHz



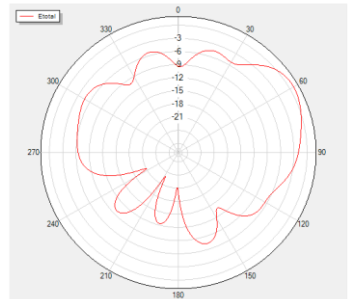
Phi=90 Freq=1880MHz



Phi=0 Freq=1950MHz

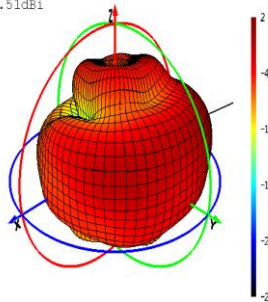


Phi=90 Freq=1950MHz

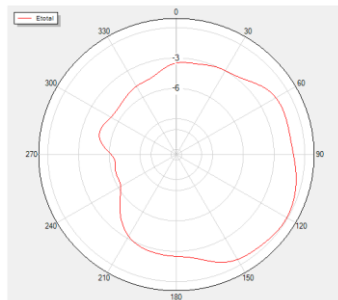


2140 MHz

MAX:1.93dBi
MIN:-29.51dBi

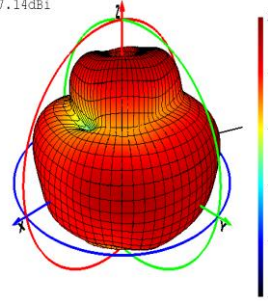


Theta=90 Freq=2140MHz

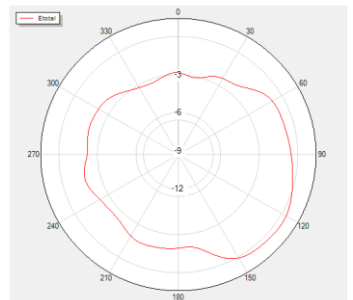


2350 MHz

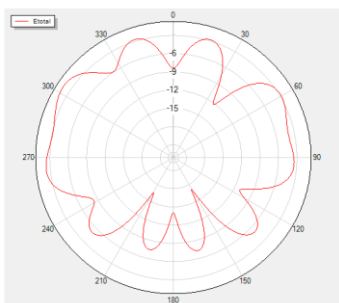
MAX:2.07dBi
MIN:-37.14dBi



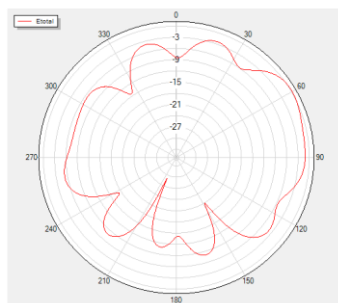
Theta=90 Freq=2350MHz



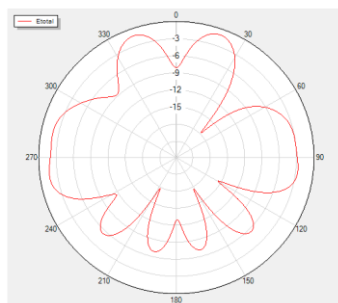
Phi=0 Freq=2140MHz



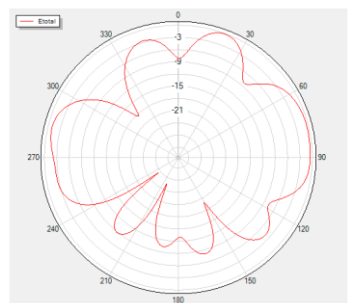
Phi=90 Freq=2140MHz



Phi=0 Freq=2350MHz

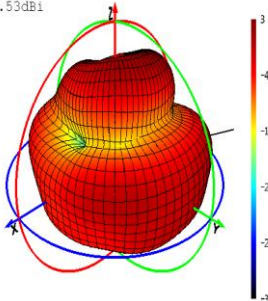


Phi=90 Freq=2350MHz

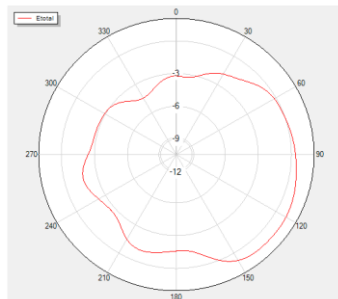


2450 MHz

MAX:2.63dBi
MIN:-36.53dBi

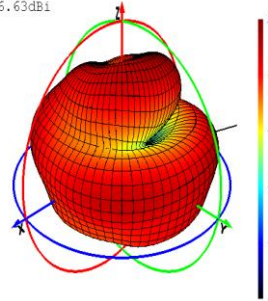


Theta=90 Freq=2450MHz

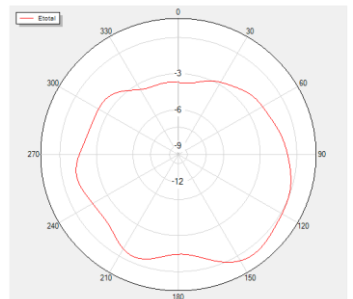


2600 MHz

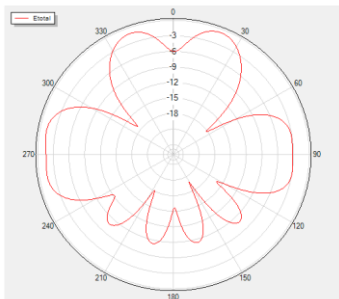
MAX:2.83dBi
MIN:-36.63dBi



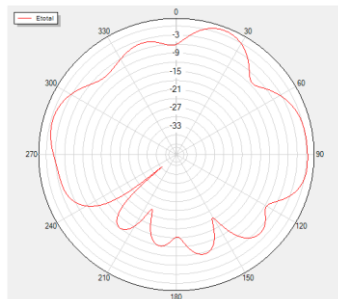
Theta=90 Freq=2600MHz



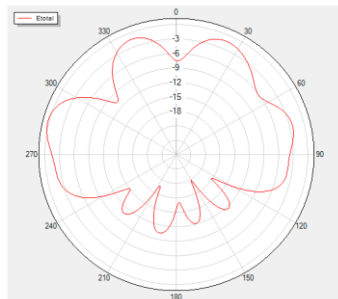
Phi=0 Freq=2450MHz



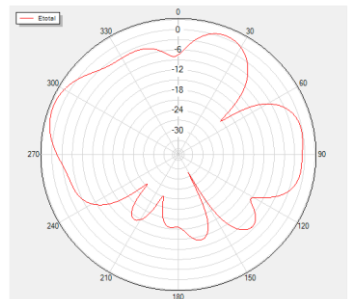
Phi=90 Freq=2450MHz



Phi=0 Freq=2600MHz

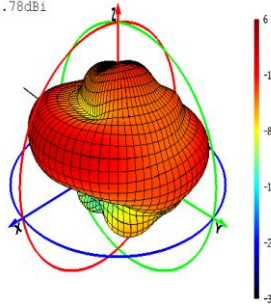


Phi=90 Freq=2600MHz

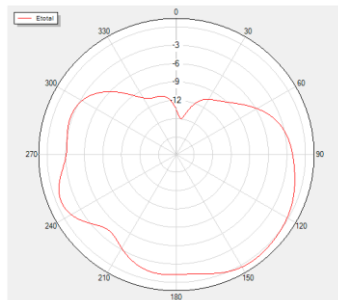


3600 MHz

MAX:5.21dBi
MIN:-31.78dBi

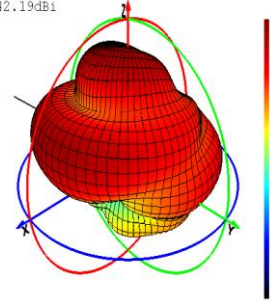


Theta=90 Freq=3600MHz

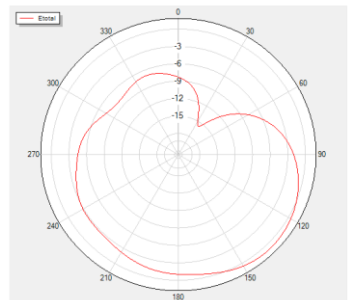


4000 MHz

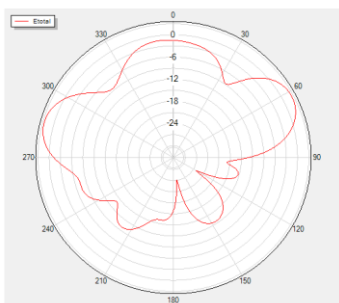
MAX:4.65dBi
MIN:-42.19dBi



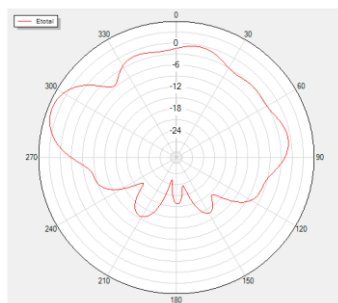
Theta=90 Freq=4000MHz



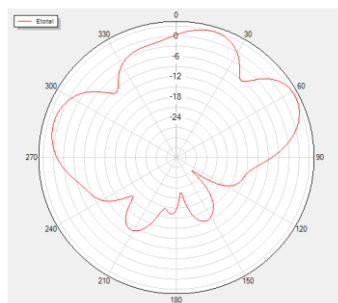
Phi=0 Freq=3600MHz



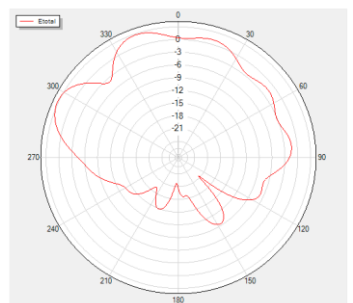
Phi=90 Freq=3600MHz



Phi=0 Freq=4000MHz

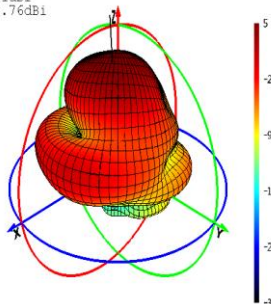


Phi=90 Freq=4000MHz

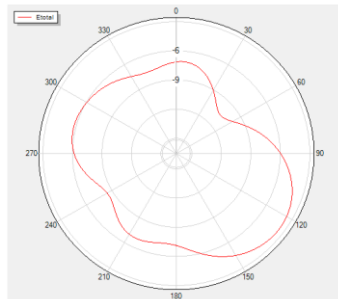


4700 MHz

MAX:4.41dBi
MIN:-32.76dBi

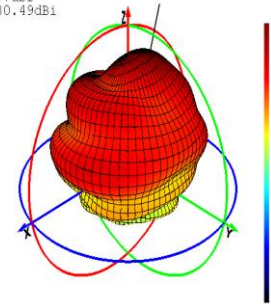


Theta=90 Freq=4700MHz

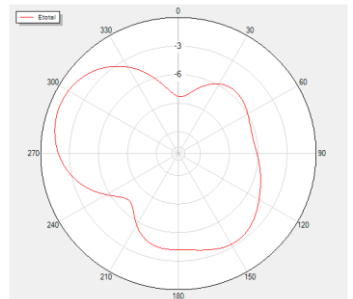


5500 MHz

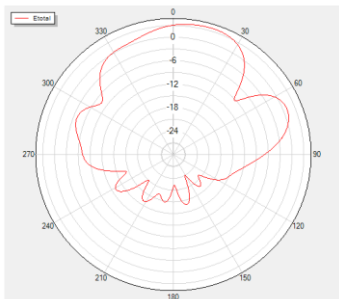
MAX:4.7dBi
MIN:-30.49dBi



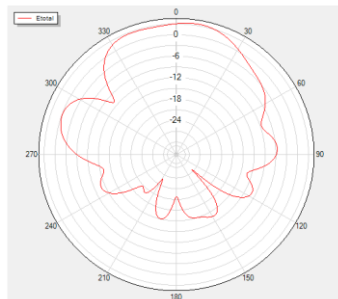
Theta=90 Freq=5500MHz



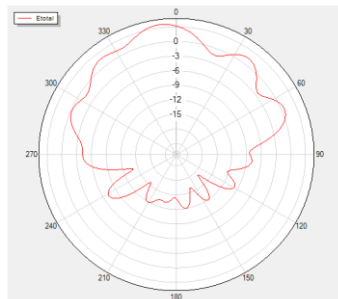
Phi=0 Freq=4700MHz



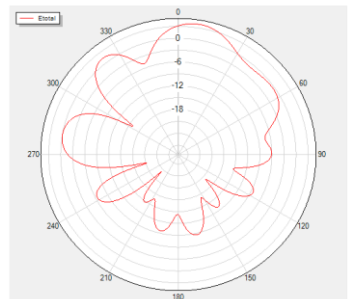
Phi=90 Freq=4700MHz



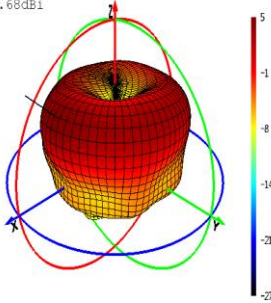
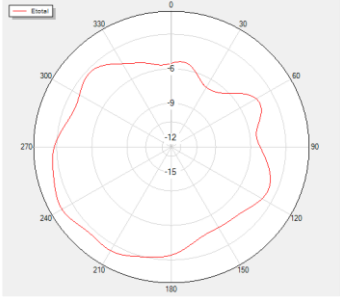
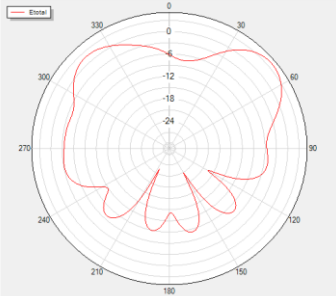
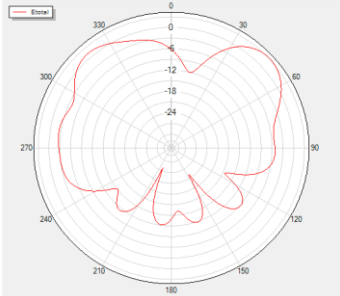
Phi=0 Freq=5500MHz



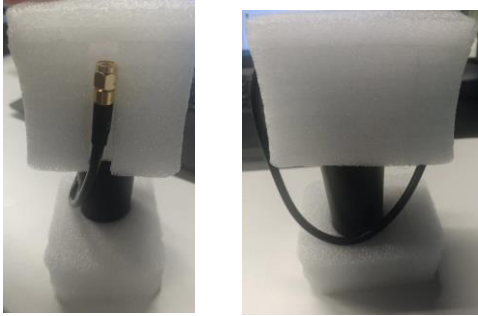
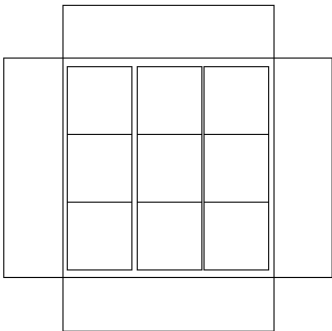
Phi=90 Freq=5500MHz

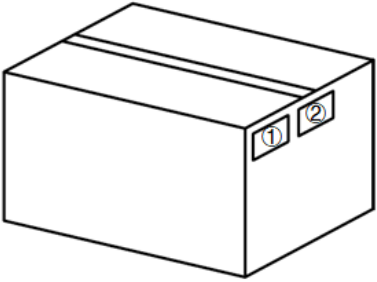
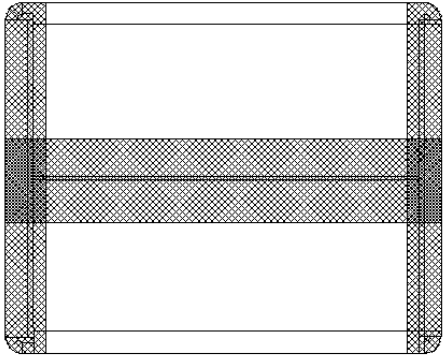


● **Wi-Fi**

2450 MHz			
MAX: 4.3dBi MIN: -28.68dBi 	Theta=90 Freq=2450MHz 		
Phi=0 Freq=2450MHz 	Phi=90 Freq=2450MHz 		

4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		The bottom and the top of the product are both inside the pearl cotton liner. The wiring harness is stuck in the pearl cotton slot.
2		(1 PC Antenna / Inner Box)
3		(9 Inner Boxes / Carton Box) (9 PCS Antennas / Carton Box) <u>Carton Size:</u> <u>L × W × H = 300 × 250 × 200 mm</u>

4		Position for Attaching Labels ① Carton Label ② Quality Label
5		Sealing Cartons “工” type sealing cartons

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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Email: info@quectel.com

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

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

For technical support, or to report documentation errors, please visit:

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

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Revision History

Version	Date	Author	Note
-	2024-07-29	Mordecai LIU/ Lance SUN/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-07-29	Mordecai LIU/ Lance SUN/ David LIU/ Rainey LIAO	First official release



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