Antenna Datasheet

Product OC (Antenna Only)**:** YFMP200WWA
Product OC (Antenna + Rectangular EVB)**:** YFMP200WWAEVB
Version: 1.0
Date: 2024-03-22
Status: Released

Product Name: Wi-Fi & GNSS 2-in-1 SMT Mount Combo Antenna
Key Features:
Frequency band: Wi-Fi: 2400–2500 MHz
GNSS: 1560–1580 MHz
Efficiency: Up to 73.1 %
Dimensions: 3.2 mm × 1.6 mm × 0.6 mm
RoHS and REACH Compliant

Overview

Quectel YFMP200WWA is a compact form factor combo SMT mount antenna for Wi-Fi & GNSS Dual bands' applications. Due to the dimensions of 3.2 mm × 1.6 mm × 0.6 mm, it is designed for very small space requirements for GPS, GLONASS, BEIDOU, Wi-Fi, WLAN, BT, Zigbee and 802.11 terminals. YFMP200WWA is a ground-depended PIFA antenna, uses main PCB as its ground plane. It is delivered on tape and reel.

YFMP200WWA is a combo antenna, which can be mounted on super compact space require terminals. Despite of this small factor, it has -12.1 dB isolation in Wi-Fi & GNSS working bands. This antenna is developed on an 80 × 40 mm evaluation board. If the devices have different ground sizes, matching circuit can be used to tune the resonant frequency correctly. We also offer gerber file, 2D & 3D documents for PCB layout.

YFMP200WWA allows high efficiency, stable signal transmission and reception for WIFI working bands in 2400–2500 MHz, and GNSS working bands in 1560–1580 MHz.

Typical applications include:

- Storage Temperature
- Small sized automotive navigation
- Position tracking systems
- Hand-held devices
- Bluetooth earphone systems
- Hand-held devices when Bluetooth/Wi-Fi functions are needed, e.g., Smart phone.
- IEEE802.11 b/g/n
- ZigBee
- Wireless PCMCIA cards or USB dongle

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.

Contents

1 Specification

Test Condition: Assembled On 80 mm × 40 mm EVB

1.1. Electrical

Electrical Specifications		
Frequency Range	**Wi-Fi**	2400–2500 MHz
	GPS	1560–1580 MHz
Radiation Pattern	**Wi-Fi**	Omni-directional
	GPS	Omni-directional
Polarization	**Wi-Fi**	Linear
	GPS	Linear
Impedance		50 Ω
Isolation	**Wi-Fi - GPS**	≤ -12.1 dB

1.1.1. Wi-Fi

Electrical - Detail		
Band / **SPEC**	**Band**	**Wi-Fi 2.4 G**
	Freq. (MHz)	**2400–2500**
Max VSWR		3.0
Max Return Loss (dB)		-6.0
AVG Eff. (%)		62.2
AVG AVG Gain(dB)		-2.0
Max Peak Gain (dBi)		1.3
VSWR		≤ 3.0
Return Loss		≤ -6.0 dB
Peak Gain		≤ 1.3 dBi

1.1.2. GPS

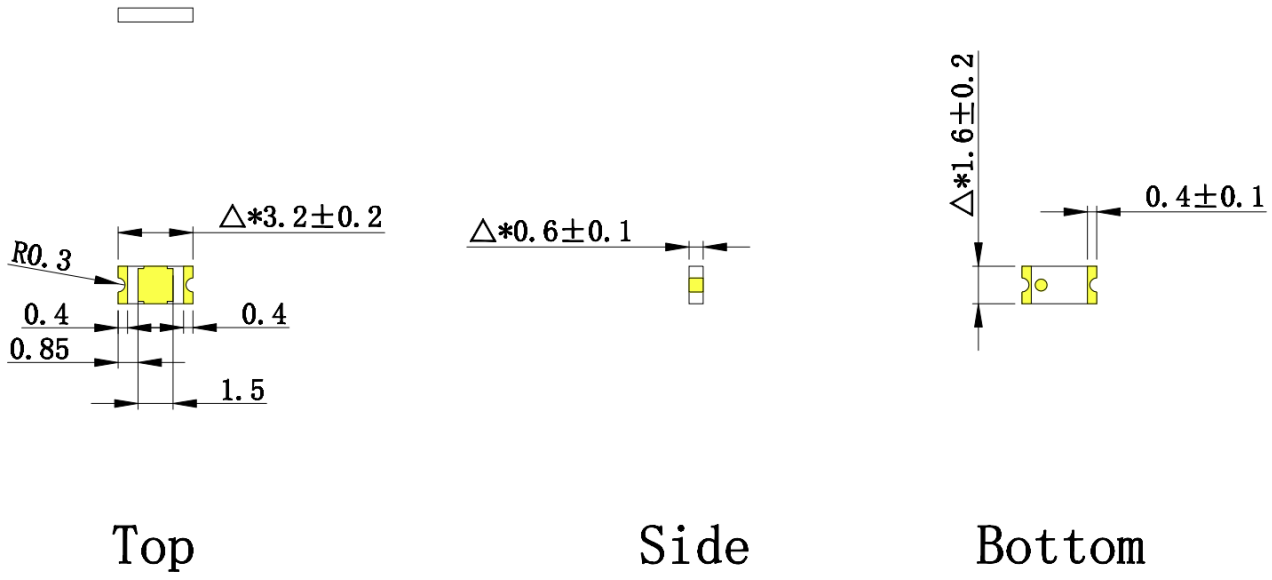
Electrical - Detail		
SPEC / Band	Band	GPS L1
	Freq. (MHz)	1560-1580
Max VSWR		2.1
Max Return Loss (dB)		-9.0
AVG Eff. (%)		52.6
AVG AVG Gain (dB)		-2.8
Max Peak Gain (dBi)		1.5
VSWR		≤ 2.1
Return Loss		≤ -9.0 dB
Peak Gain		≤ 1.5 dBi

1.2. Mechanical & Environmental

Mechanical	
Antenna Size	3.2 mm × 1.6 mm × 0.6 mm
Material & Color	PCB & Black
Mounting Type	SMD
Antenna Weight	Typ. 0.01 g
Recommended EVB Size	80 mm × 40 mm × 0.6 mm
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

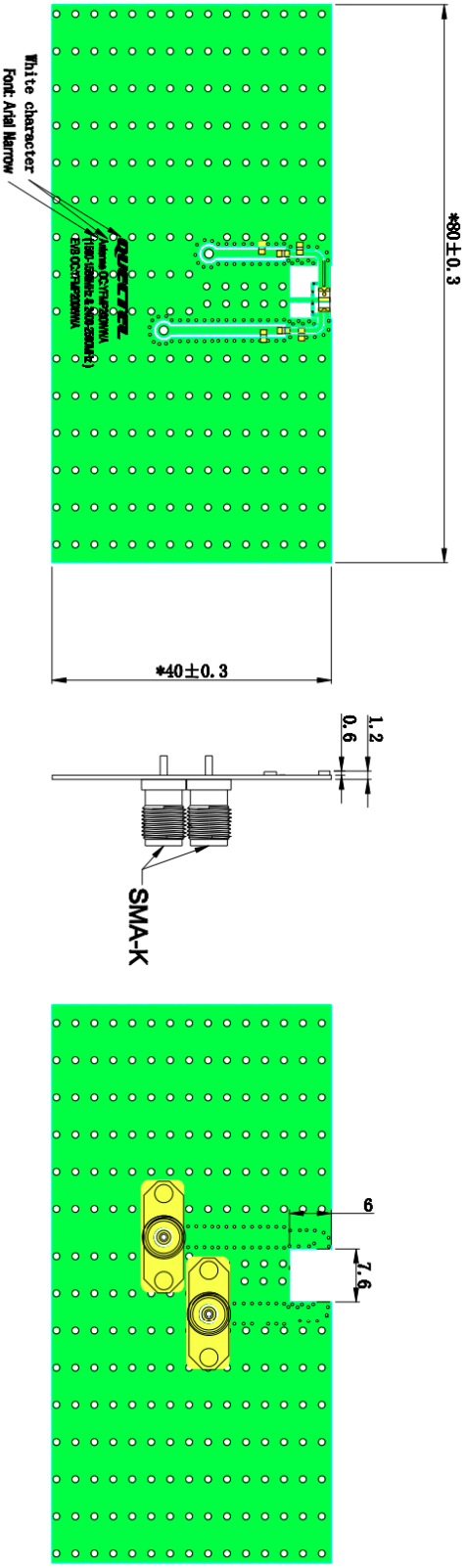
2 Drawing

2.1. Antenna



All dimensions are in mm

2.2. Rectangular EVB

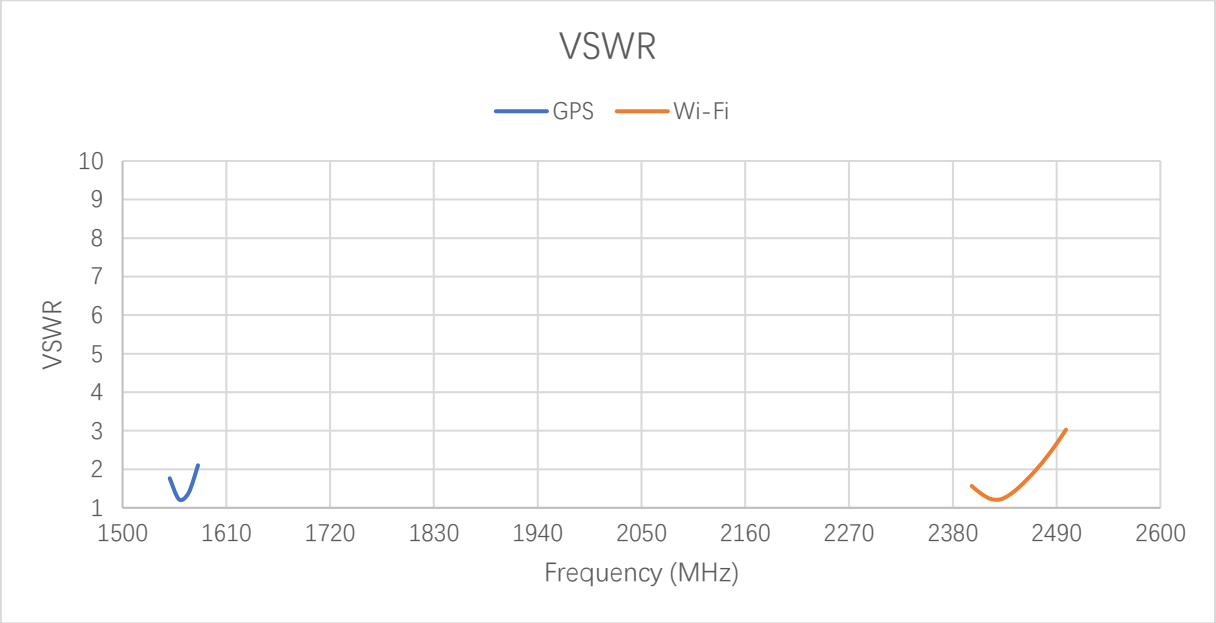


All dimensions are in mm.

3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



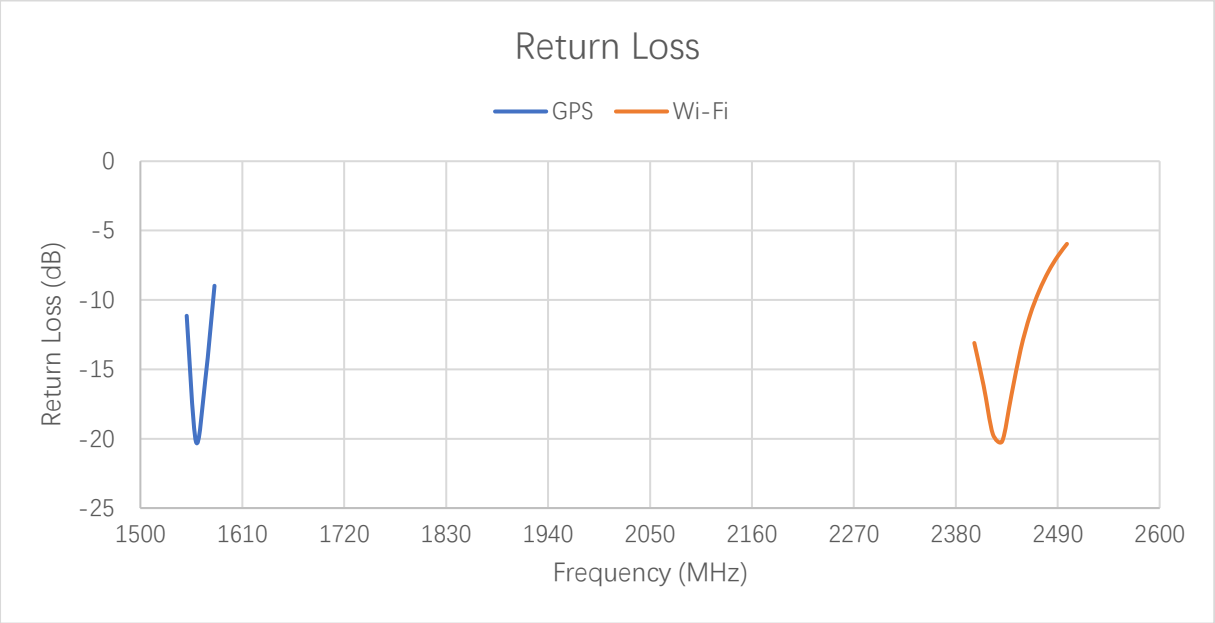
VSWR- Wi-Fi

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
VSWR	1.6	1.5	3.0	-	-	-	-	-	-	-

VSWR- GPS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-	1.2	1.7	-

3.1.2. Return Loss



Return Loss (dB) - Wi-Fi

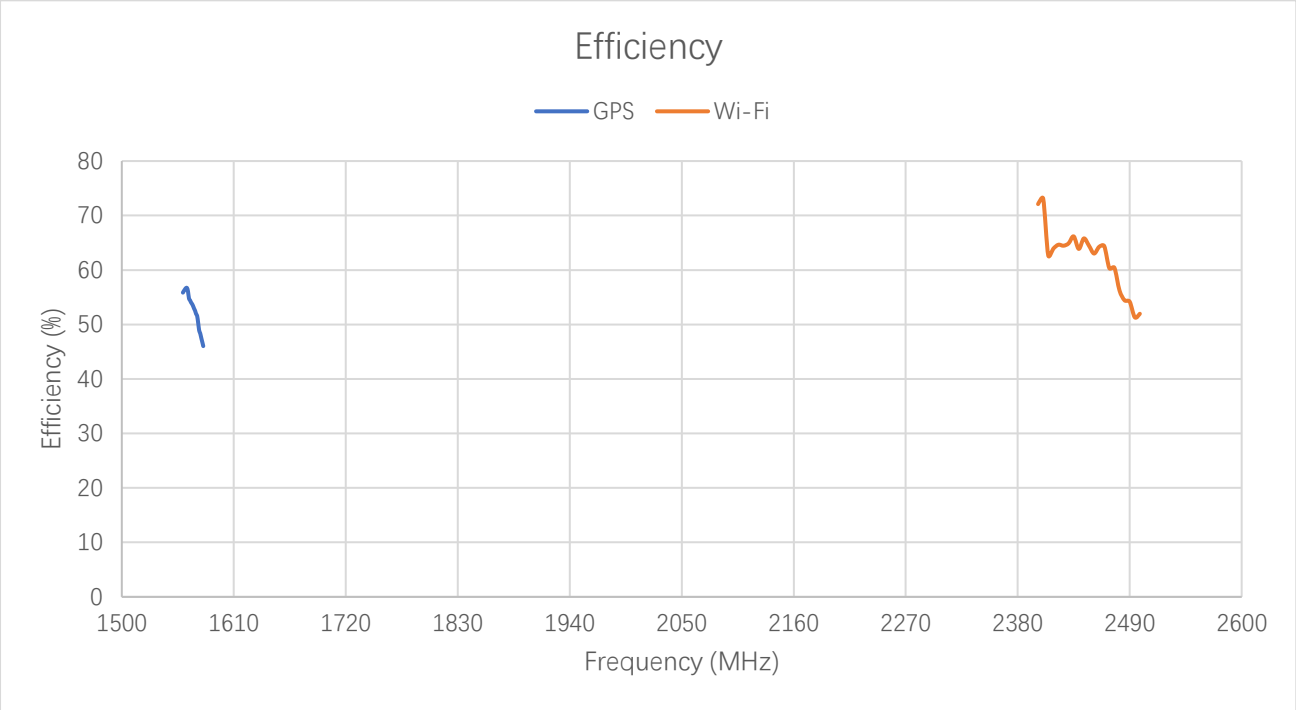
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Return Loss (dB)	-13.1	-13.6	-6.0	-	-	-	-	-	-	-

Return Loss (dB) - GPS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-	-	-	-	-	-20.2	-12.0	-

3.2. Radiation Performance Test

3.2.1. Efficiency



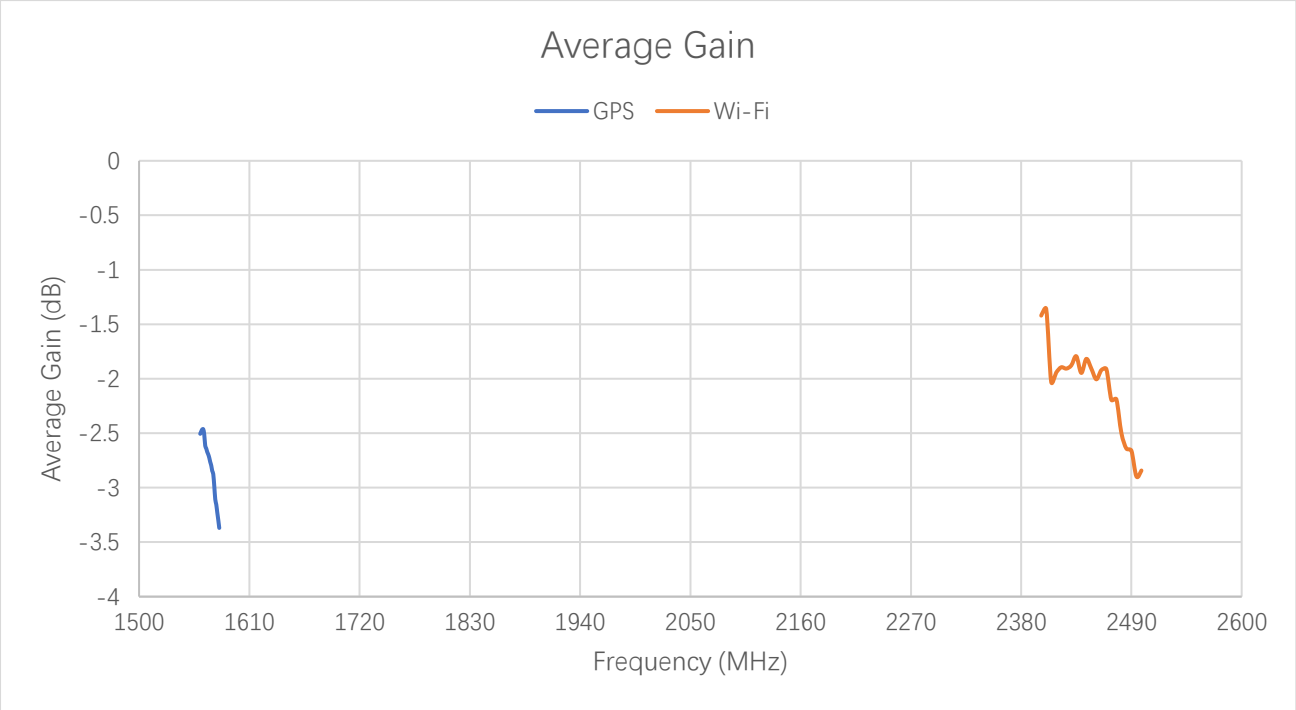
Efficiency (%) - Wi-Fi

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Efficiency (%)	72.1	64.5	52.0	-	-	-	-	-	-	-

Efficiency (%) - GPS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	-	-	-	-	-	55.9	50.3	-

3.2.2. Average Gain



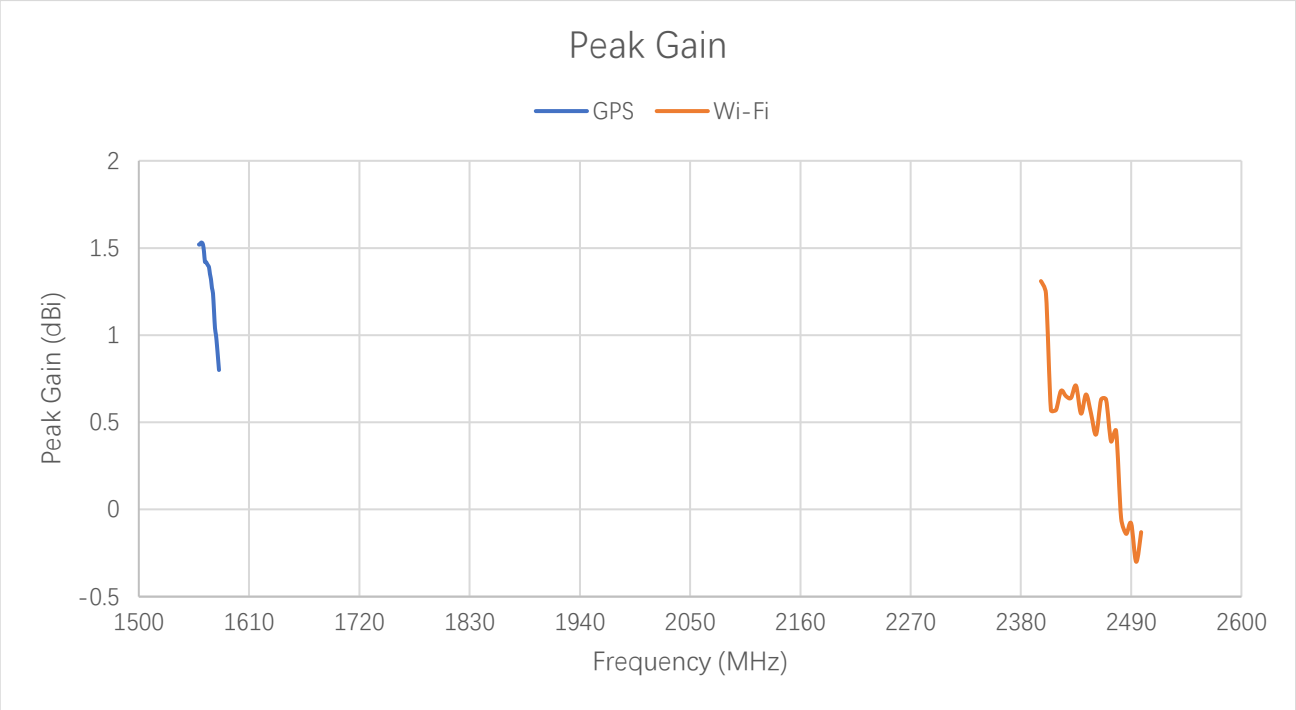
Average Gain (dB) - Wi-Fi

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Average Gain (dB)	-1.4	-1.9	-2.8	-	-	-	-	-	-	-

Average Gain (dB) - GPS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Average Gain (dB)	-	-	-	-	-	-2.5	-3.0	-

3.2.3. Peak Gain



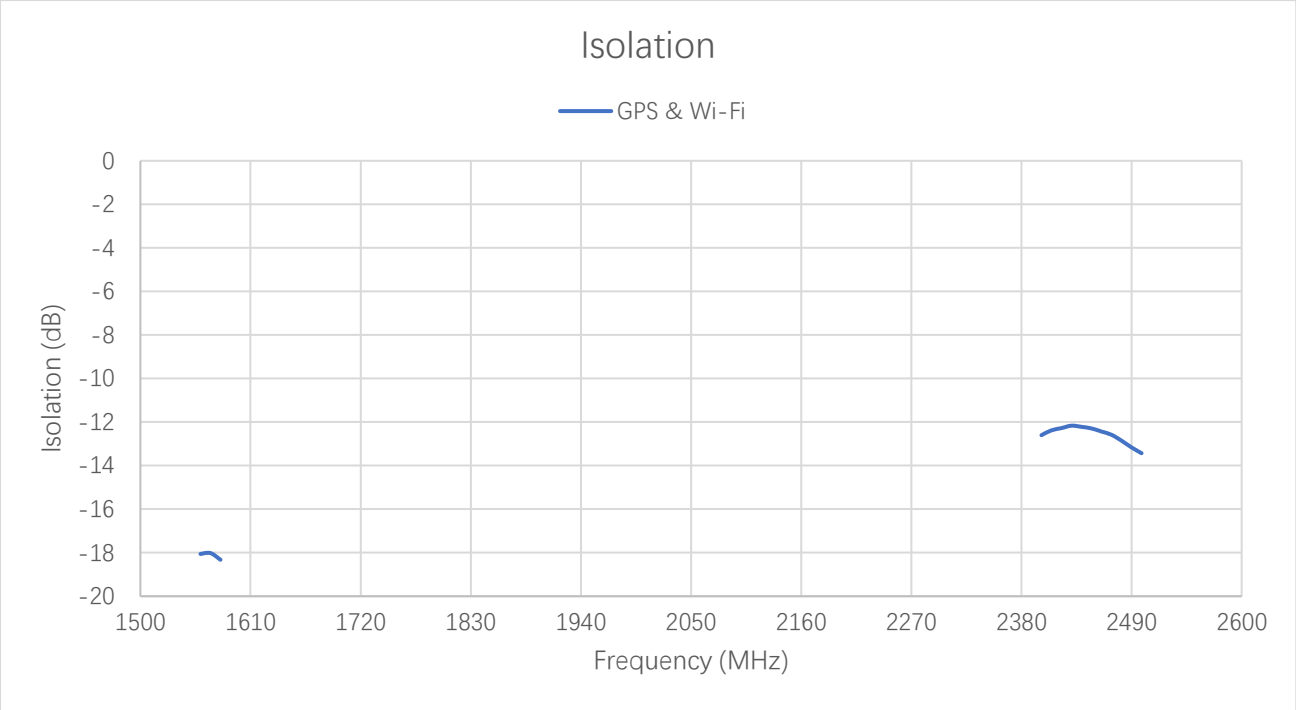
Peak Gain (dBi) - Wi-Fi

Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6325	6725	7125
Peak Gain (dBi)	1.3	0.6	-0.1	-	-	-	-	-	-	-

Peak Gain (dBi) - GPS

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-	-	-	-	-	1.5	1.1	-

3.2.4. Isolation

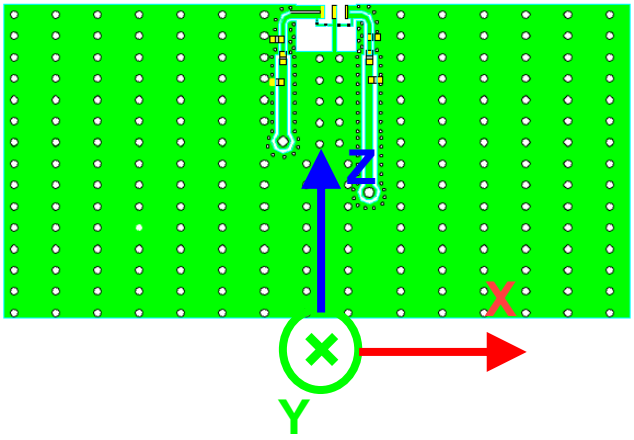


Max Isolation (dB)

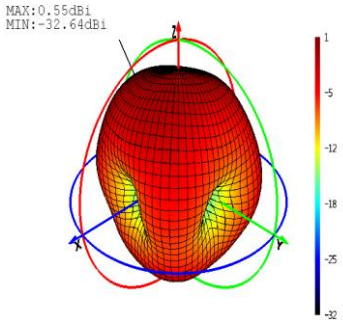
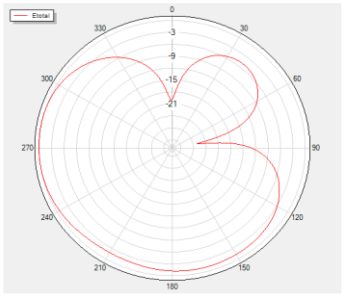
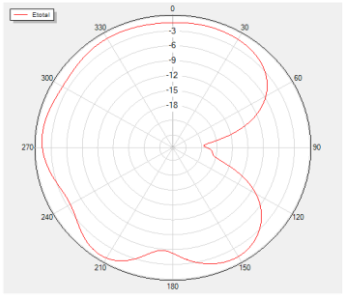
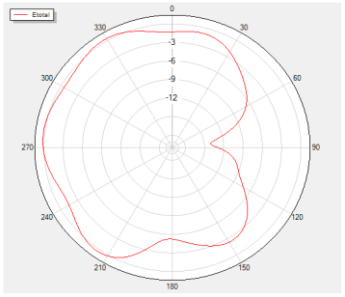
Band	B71	B12/ B13/ B28	B5/ B8/ B26	n74/ n75/ n76	B1/ B2/ B3	B40	Wi-Fi 2G	B38/ B41	Wi-Fi 5G	BEIDOU B1I	GPS L1
Freq. (MHz)	600–700	700–810	820–960	1420–1520	1700–2170	2300–2400	2400–2500	2500–2690	5150–5850	1559-1564	1565-1586
Isolation (dB)	-	-	-	-	-	-	-12.1	-	-	-	-18.0

3.2.5. 3D & 2D Radiation Pattern

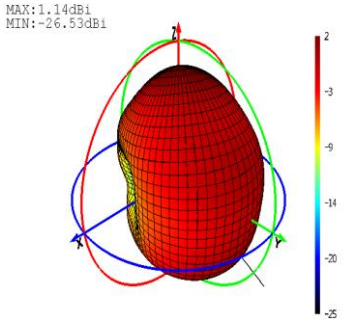
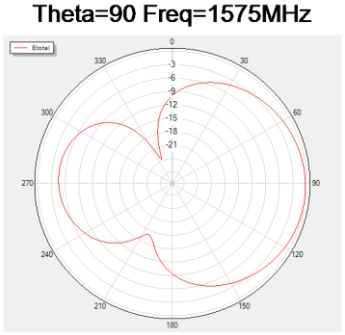
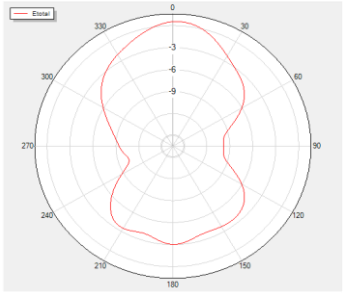
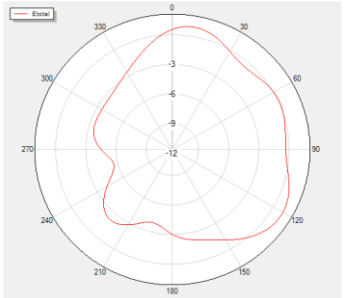
- Test Status: Assembled on 80 mm × 40 mm EVB
- Test Chamber: FS-S-1



- Wi-Fi

2450 MHz	
	
	

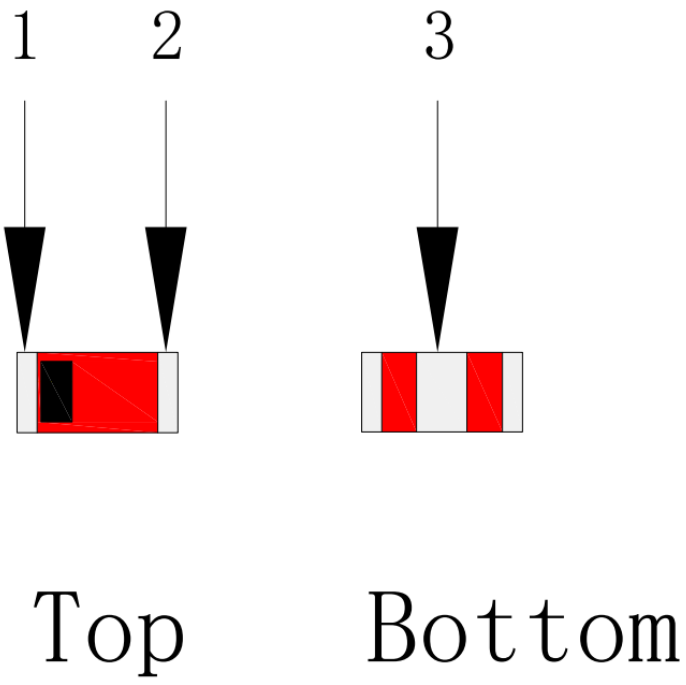
- GPS

1575 MHz	
	
	

4 Schematic Symbol and Pin Definition

- The pin assignment for the antenna is as follows.
- The circuit symbol for the antenna is shown below. The antenna has 3 pins, all of which are working.

Pin	Description
1, 2	Feed
3	Return / GND



5 Transmission Line

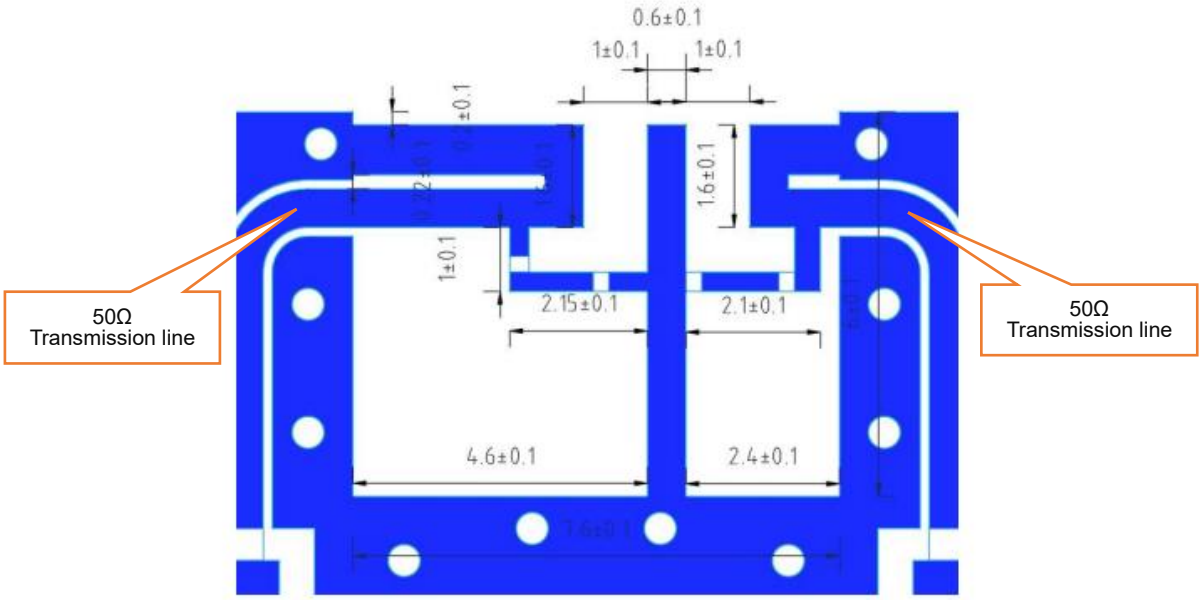
The characteristic impedance of all transmission lines shall be designed as 50 Ω.

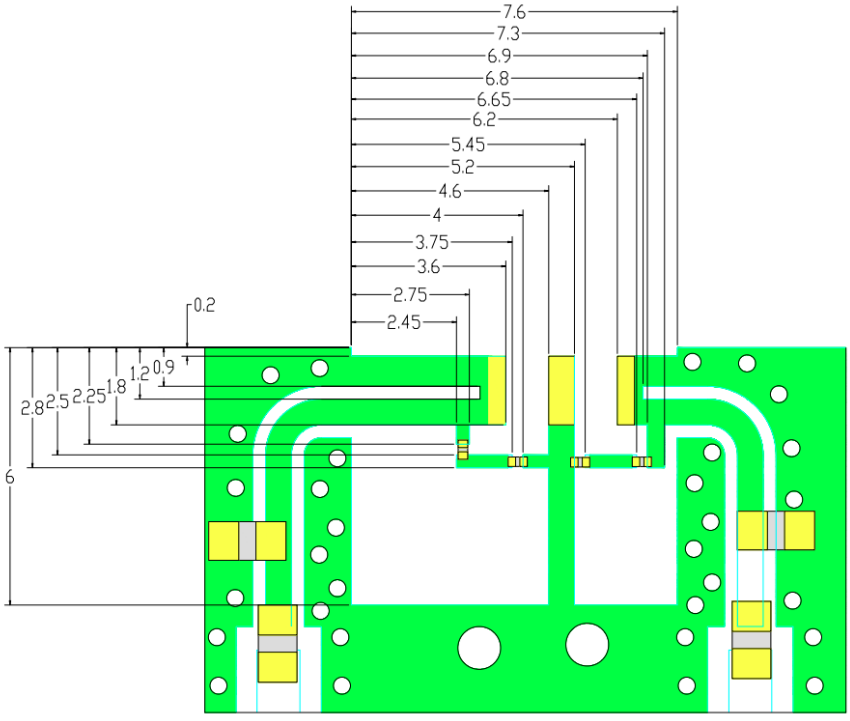
- The length of the transmission lines should be kept as short as possible.
- Any other part of the RF system, such as transceiver, power amplifiers, etc., shall also be designed with an impedance of 50 Ω.

Once the material for the PCB has been chosen (PCB thickness and dielectric constant), a coplanar transmission line can easily be designed using any of the commercial software packages for transmission line design. For the chosen PCB thickness, copper thickness and substrate dielectric constant, the program will calculate the appropriate transmission line width and gaps on either side of the track so the characteristic impedance of the coplanar transmission is 50 Ω.

6 Recommended PCB Layout

The host PCB must be designed using the PCB footprint shown with the correct clearances. An example of the PCB layout shows the antenna footprint. Please note this clearance area is critical to the performance of the antenna and must be applied through all layers of the PCB.

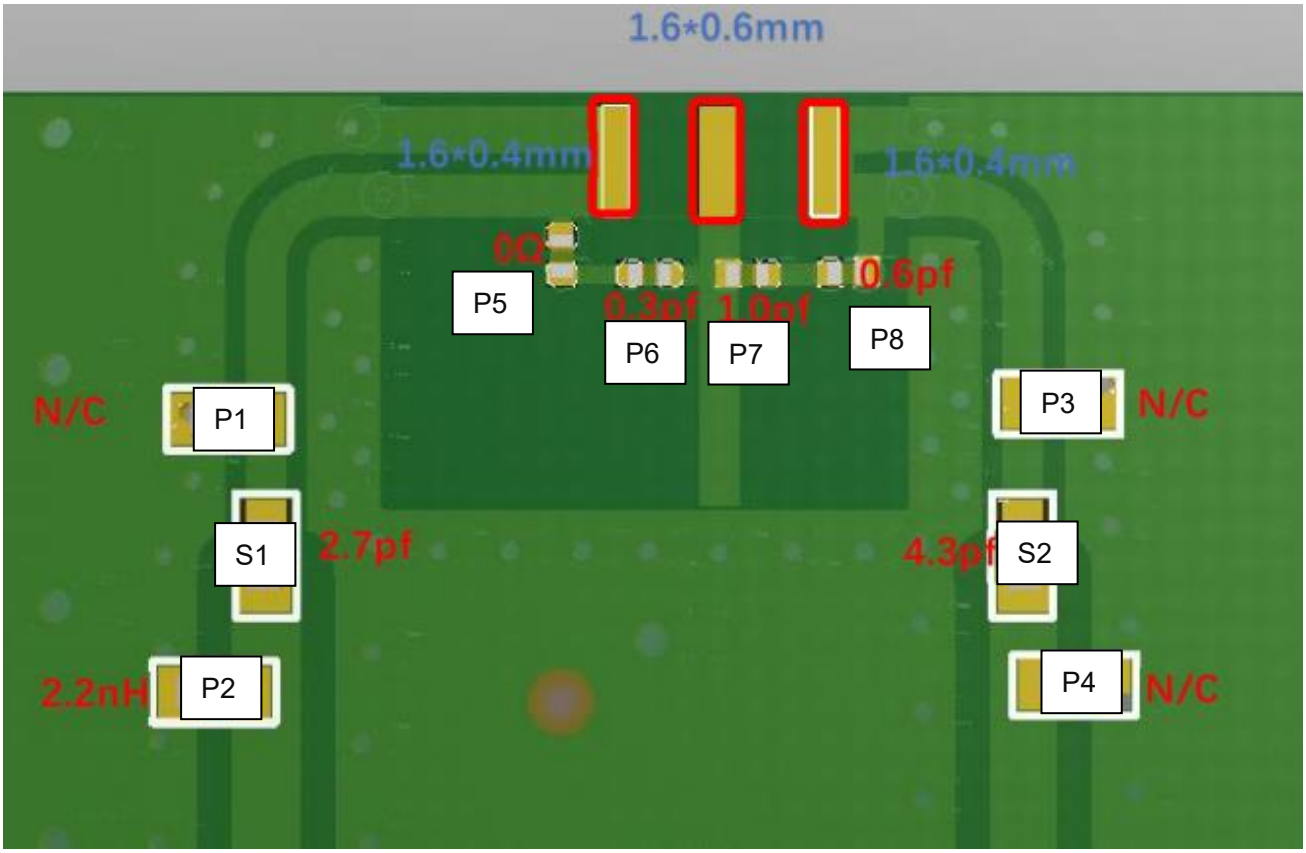




All dimensions are in mm.

7 Matching Circuit

Demo Board Top View



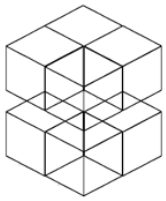
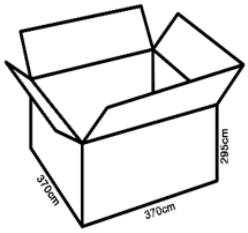
	P1	S1	P2	P3	S2
Default Matching	N/A	2.7 pF	2.2 nH	N/A	4.3 pF
Tolerance	N/A	±0.05 pF	±0.1 nH	N/A	±0.05 pF
	P4	**P5**	**P6**	**P7**	**P8**
Default Matching	N/A	0 Ω	0.3 pF	1.0 pF	0.6 pF
Tolerance	N/A	/	±0.05 pF	±0.05 pF	±0.05 pF

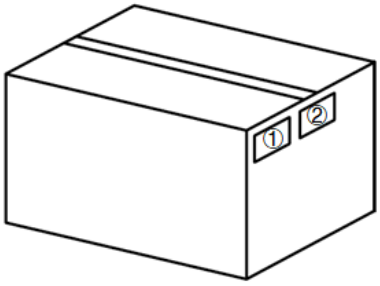
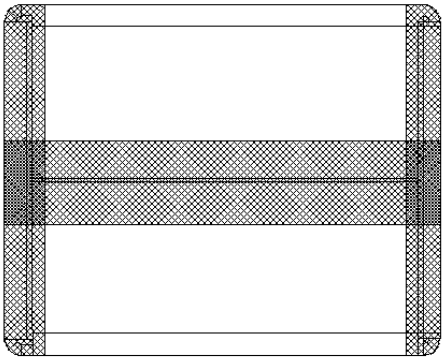
8 Soldering Temperature

Channels	Name	Heating time 150.0-200.0°C	Above temp 217.0°C	Top temp	Heating slope 150.0-180.0°C	Cooling slope 180.0-150.0°C
1	Pin1	73"	82"	248.7	0.97	-2.92
Refrence value		70.0-95.0s	70.0-90.0s	240.0-250.0°C	0.0-3.0°C/s	-4.0--1.0°C/s

9 Reflow Profile

10 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Reel
2		(3000 PCS Antenna Products / Reel) 8 volumes in one inner box.
3	 	(8 inner box / Carton Box) (192000 PCS Antennas / Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. Carton Size: L × W × H = 370 × 370 × 295 mm

4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** "工" type sealing cartons
Note	The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.	

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:

Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
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.
Or email us at: support@quectel.com.

Legal Notices

We offer information as a service to you. The provided information is based on your requirements and we make every effort to ensure its quality. You agree that you are responsible for using independent analysis and evaluation in designing intended products, and we provide reference designs for illustrative purposes only. Before using any hardware, software or service guided by this document, please read this notice carefully. Even though we employ commercially reasonable efforts to provide the best possible experience, you hereby acknowledge and agree that this document and related services hereunder are provided to you on an “as available” basis. We may revise or restate this document from time to time at our sole discretion without any prior notice to you.

Use and Disclosure Restrictions

License Agreements

Documents and information provided by us shall be kept confidential, unless specific permission is granted. They shall not be accessed or used for any purpose except as expressly provided herein.

Copyright

Our and third-party products hereunder may contain copyrighted material. Such copyrighted material shall not be copied, reproduced, distributed, merged, published, translated, or modified without prior written consent. We and the third party have exclusive rights over copyrighted material. No license shall be granted or conveyed under any patents, copyrights, trademarks, or service mark rights. To avoid ambiguities, purchasing in any form cannot be deemed as granting a license other than the normal non-exclusive, royalty-free license to use the material. We reserve the right to take legal action for noncompliance with abovementioned requirements, unauthorized use, or other illegal or malicious use of the material.

Trademarks

Except as otherwise set forth herein, nothing in this document shall be construed as conferring any rights to use any trademark, trade name or name, abbreviation, or counterfeit product thereof owned by Quectel or any third party in advertising, publicity, or other aspects.

Third-Party Rights

This document may refer to hardware, software and/or documentation owned by one or more third parties (“third-party materials”). Use of such third-party materials shall be governed by all restrictions and obligations applicable thereto.

We make no warranty or representation, either express or implied, regarding the third-party materials, including but not limited to any implied or statutory, warranties of merchantability or fitness for a particular purpose, quiet enjoyment, system integration, information accuracy, and non-infringement of any third-party intellectual property rights with regard to the licensed technology or use thereof. Nothing herein constitutes a representation or warranty by us to either develop, enhance, modify, distribute, market, sell, offer for sale, or otherwise maintain production of any our products or any other hardware, software, device, tool, information, or product. We moreover disclaim any and all warranties arising from the course of dealing or usage of trade.

Privacy Policy

To implement module functionality, certain device data are uploaded to Quectel's or third-party's servers, including carriers, chipset suppliers or customer-designated servers. Quectel, strictly abiding by the relevant laws and regulations, shall retain, use, disclose or otherwise process relevant data for the purpose of performing the service only or as permitted by applicable laws. Before data interaction with third parties, please be informed of their privacy and data security policy.

Disclaimer

a) We acknowledge no liability for any injury or damage arising from the reliance upon the information.
b) We shall bear no liability resulting from any inaccuracies or omissions, or from the use of the information contained herein.
c) While we have made every effort to ensure that the functions and features under development are free from errors, it is possible that they could contain errors, inaccuracies, and omissions. Unless otherwise provided by valid agreement, we make no warranties of any kind, either implied or express, and exclude all liability for any loss or damage suffered in connection with the use of features and functions under development, to the maximum extent permitted by law, regardless of whether such loss or damage may have been foreseeable.
d) We are not responsible for the accessibility, safety, accuracy, availability, legality, or completeness of information, advertising, commercial offers, products, services, and materials on third-party websites and third-party resources.

Revision History

Version	Date	Author	Note
-	2024-03-22	Mordecai LIU/ Hart HU/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-03-22	Mordecai LIU/ Hart HU/ David LIU/ Rainey LIAO	First official release

www.quectel.com