

Products Specifications

AC10204-01A
AC10204-01B

**Single Band Embedded Omni-directional 2G
Wi-Fi Antenna for Wi-Fi Tri-Bands Router**

25 September 2023

Rev. 0.4

Revision History

Date	Rev.	Summary of Changes
16 June 2023	0.1	First version of Product Specification
15 August 2023	0.2	Updated Antenna Visuals, Added assembly instructions
20 September 2023	0.3	Antenna specifications updated for certification
25 September 2023	0.4	Modify individual peak gain to aggregated peak gain

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1 Single Band Wi-Fi antennas

1.1 Scope and purpose

This document describes the AC10204-01A, AC10204-01B antenna and its specifications. It is intended for antenna design engineers and OEM/ODMs who wish to integrate these products. The antenna has been optimized for configuration in a Wi-Fi Tri-Bands router and has been designed for excellent coverage in indoor environments.

1.2 AC10204-01 features

- Quasi-omnidirectional single band 2.4GHz Wi-Fi or BLE antenna.
- Implemented on rigid PCB with 1.37mm coaxial cable.
- Suitable for integration on non-conductive surfaces.
- Attached with double sided adhesive 3M 9495LE tape to the plastic housing of the end-product.

1.3 Antenna specifications

Table 1: AC10204-01A, AC10204-01B, RF specifications

Parameter	AC10204-01A	AC10204-01B
Frequency band support	2400 – 2485MHz	2400 – 2485MHz
Radiation pattern	Quasi-omnidirectional	Quasi-omnidirectional
VSWR (Return Loss)	< 2:1	< 2:1
Input impedance	50Ω	50Ω
Typical Efficiency	>71%	>74%
*Peak Aggregated Realized Gain Max(Dg(θ, φ)), θ=0~360, φ=0~360	4.3dBi (@ θ=305°, φ=65°)	

Notes:

- The characterization is performed with the antennas mounted inside the end-product.
- The end-product is tested in free-space.
- Peak Aggregated Realized Gain:

$$\text{Max}(Dg(\theta, \phi)) = 10 \log \left[\left(10^{\left(\frac{\text{Ant1Gain}(\theta, \phi)}{20} \right)} + 10^{\left(\frac{\text{Ant2Gain}(\theta, \phi)}{20} \right)} + \dots + 10^{\left(\frac{\text{AntNGain}(\theta, \phi)}{20} \right)} \right)^2 / N_{ant} \right],$$

θ=0~360, φ=0~360. Maximum aggregated antenna gain for all gain values of θ, φ

Table 2: AC10204-01A,AC10204-01B, physical specifications

Parameter	AC10204-01A	AC10204-01B
Size (length x width)	20.0 x 18.5 mm ²	20.0 x 18.5 mm ²
Cable length ¹	120mm	216mm
Cable diameter	1.37mm	1.37mm
Cable color	black	White
Connection	CM	CM
Connector Orientation ³	Down	Down

Notes:

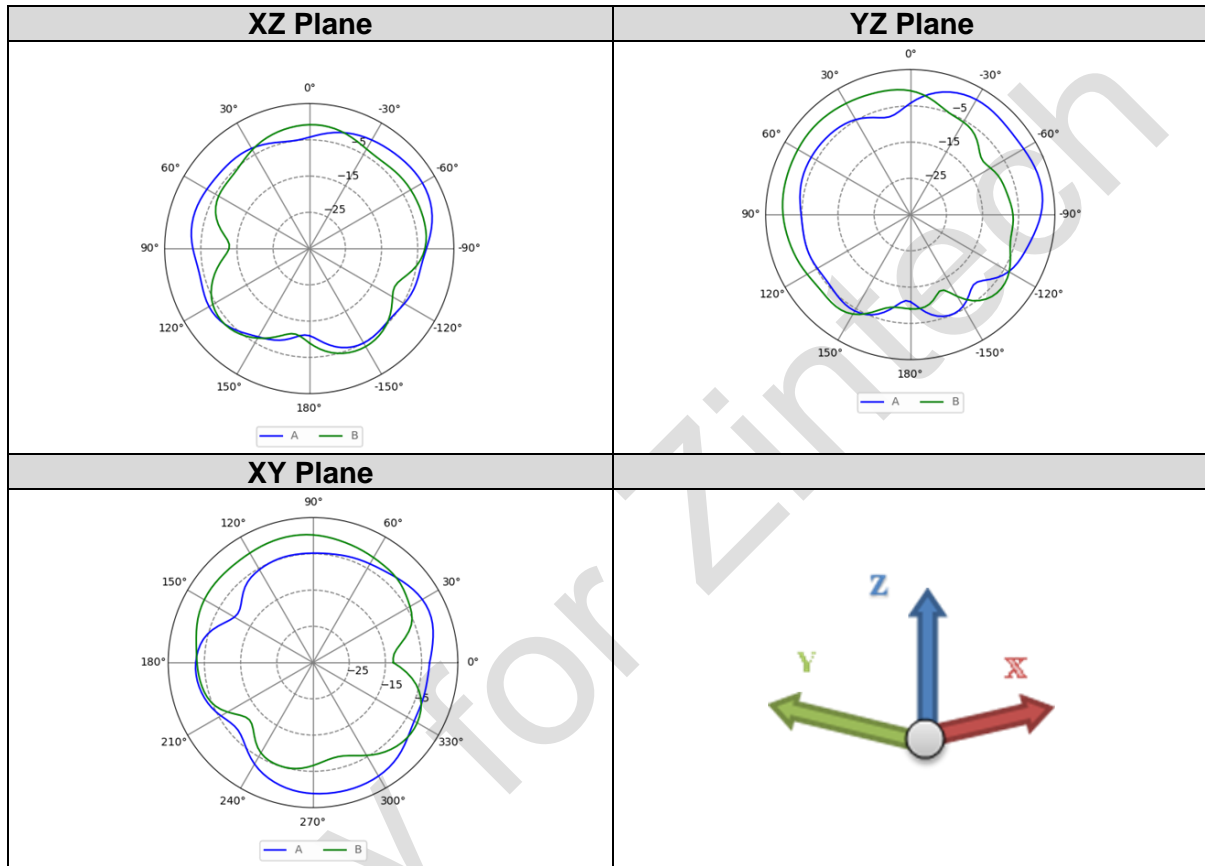
- 1- The reported cable length includes the connector.
- 2- For all dimensions, the ISO 2768-mK standard is followed. For the outer dimensions this means a tolerance of ± 0.1 mm is applicable
- 3- Connector orientation is seen from the top side of the antenna.

Table 3: AC10204-01A, AC10204-01B, environmental specifications

Parameter	AC10204-01A, AC10204-01B
Operational temperature	-20°C to +85°C
RoHS	Yes

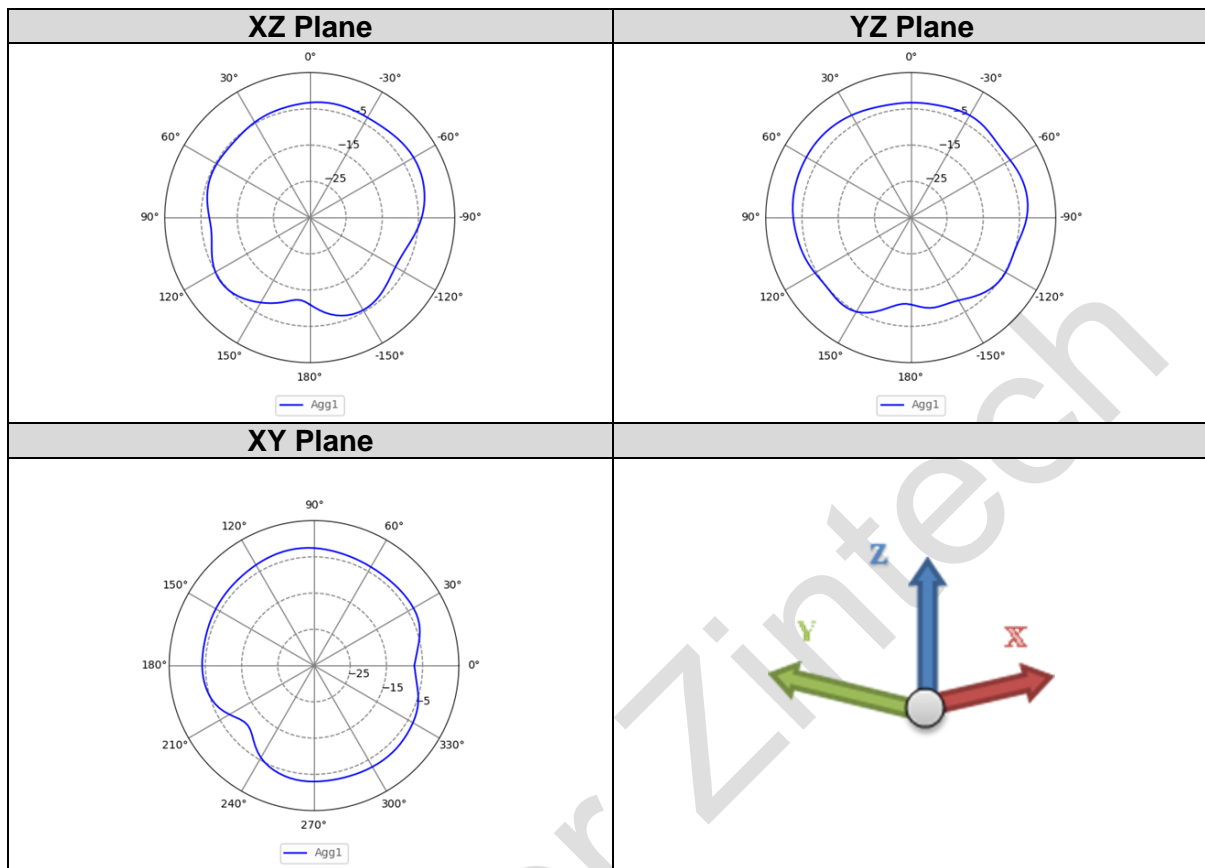
1.4 Radiation pattern

The table below shows the typical measured radiation pattern of the AC10204-01A, AC10204-01B antennas, when operating in the end-device, along the XZ, YZ and XY planes.



The AC10204-01A, AC10204-01B, antennas can be used in a 2x2 MIMO configuration. The corresponding aggregated radiation pattern is depicted in table 5.

Table 5: AC10204-01A,AC10204-01B, Aggregated Wi-Fi System Radiation Pattern at 2.44GHz




1.5 Test Equipment

The radiation properties of the antenna are measured in a MVG system with 0.65-18GHz probes mounted on a circular arc. The system specifications are summarized in the table below.

Figure 2: Test setup used for the antenna radiation pattern measurements

Table 13: Test equipment specifications

Name	Manufacturer	Type/Model	Serial num.	Cal. Date	Cal. Due Date
Chamber	MVG	StarLab	1102163-001	9/28/2022	9/28/2023
VNA	Agilent Technologies	E5071C	MY46417538	22/092020	9/22/2023
TX Amplification Unit	SATIMO	N/A	1101252-0002	NCR	NCR
RX Amplification Unit	SATIMO	N/A	1101238-0002	NCR	NCR
Transfer Switching Unit	SATIMO	N/A	1101248-0002	NCR	NCR
Power Unit Control	SATIMO	N/A	1101225-0050	NCR	NCR
Reference Horn Antenna	MVG	SH600-51	N/A	NCR	NCR
Satimo Passive Measurements	MVG	V1.11.1	N/A	N/A	N/A
Antenna Test Engineer		Tester's Signature			
Fabio Barcelos					

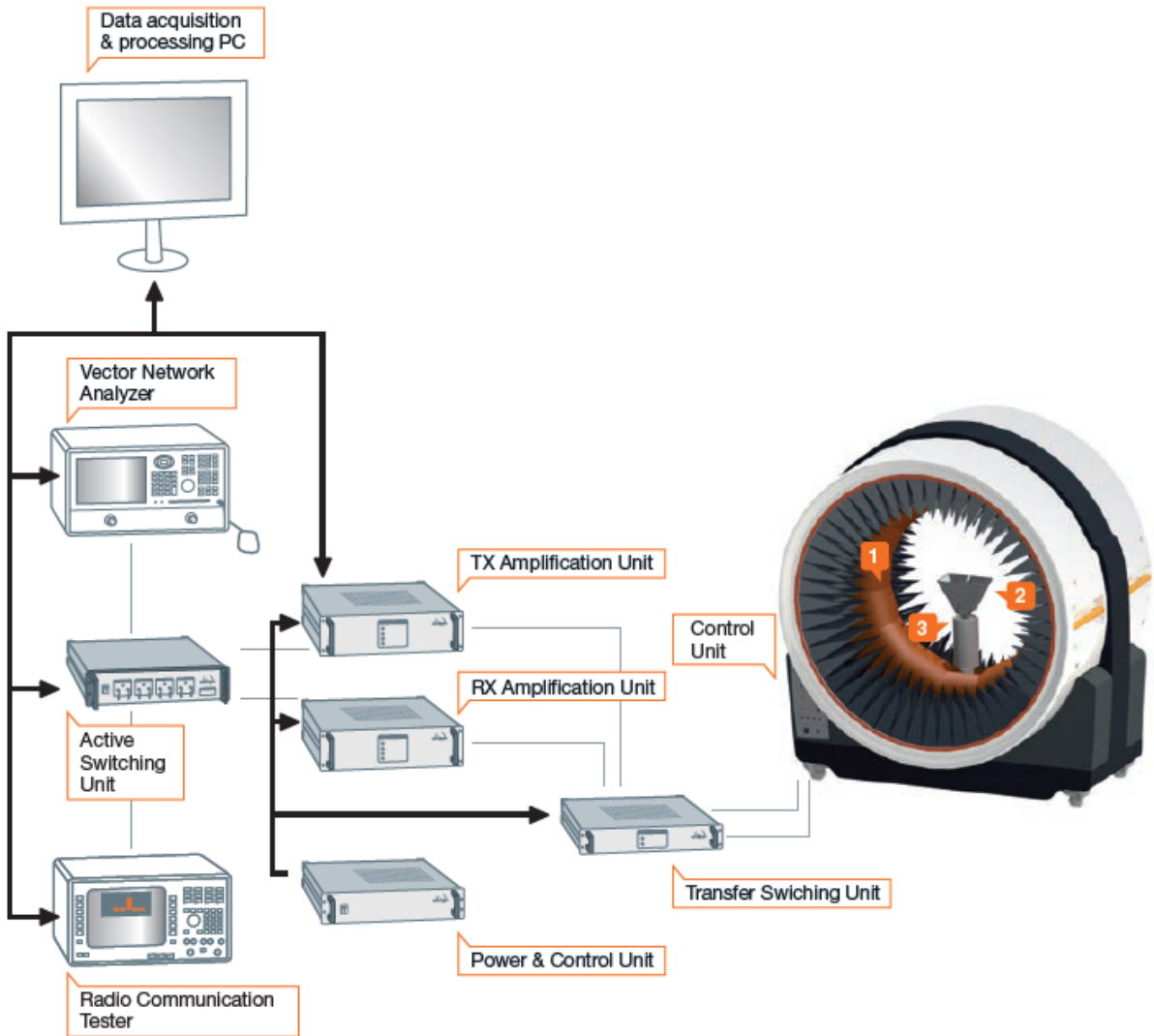


Figure 3: bloc diagram of the MVG antenna measurement system

2 Product Handling & Ordering Information

2.1 Assembly Recommendation

the AC10204-01A, AC10204-01B antenna can be used in combination with the AC10506-01 broadband 5G antenna and the AC10507-01 broadband 5G antenna.

1-Surface Preparation: Make sure that the surface of the antenna carrier is clean, dry, and free from any oil, dirt, or dust. The typical surface cleaning solvent is isopropyl alcohol.

2- Environmental condition: Ideal application temperature range is 21°C to 38°C (70°F to 100°F). Initial application at temperatures below 10°C (50°F) is not recommended.

3- Applied pressure: During application, it is necessary to provide a firm pressure of at least 1 Bar (15 Psi) to achieve a strong bond. This pressure can be achieved by applying heavy pressure with the thumb along the length of the antenna or by using a J-Roller or other pressure system

4- Curing time: Allow the bond to develop without stress. After application, the bond strength will increase as the adhesive bonds with the surface. At room temperature, approximately 50% of the ultimate strength will be achieved after 20 minutes, 90% after 24 hours and 100% after 72 hours.

5- Route the cable

2.2 Product Marking

Every antenna contains the part number, PCB number, revision number and production date code for easy tracking.

Table 6: AC10204-01A, AC10204-01B Marking Specifications

Text on Antenna	Explanation
AC10204 -01A or AC10204 -01B	AC Type Number
175-00085	PCB Number
0.02	Revision Number
	Production Date and Supplier Code

The Antenna Company International N.V. Proprietary

AC10244-01 Single Band Embedded 2G Wi-Fi and BLE Antenna

Rev. 0.4

Y = J	2021
Y = K	2022
Y = L	2023

2.3 Packaging

The AC10204-01A, AC10204-01B will be delivered in a carton box containing a total of 2500 pcs. The carton box will consist of 5 inner carton boxes. Each inner box will be filled with 10 plastic polyethylene (PE) bags of 50 pcs.

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