

Products Specifications

AC10246-01A, AC10246-01B

Embedded Omni-directional Dual-Band 2G/5G Antenna System for Wi-Fi Routers

April 2023

Rev. 0.8

Revision History

Date	Rev.	Summary of Changes
05 September 2022	0.1	First version of Preliminary Product Specification
10 November 2022	0.2	Cable length corrected
24 November 2022	0.3	Antenna specifications and ordering information updated
28 February 2023	0.4	Test equipment information added
21 March 2023	0.5	Details of end device removed for confidentiality reasons Pk gain of individual antennas added (table 1) 2D and 3D radiation patterns updated Test equipment specifications updated Company address added (last page of the document)
12 April 2023	0.6	Individual pk gain changed into aggregated pk gain
17 April 2023	0.7	Figure 1 were updated, the tolerances were modified Aggregated gain values updated
19 April 2023	0.8	Aggregated gain values updated

Table of Contents

1	DUAL BAND WI-FI ANTENNAS	4
1.1	Scope and purpose.....	4
1.2	AC10246-01 features	4
1.3	Antenna specifications	4
1.4	Radiation pattern.....	7
1.5	Test Equipment	14
2	PRODUCT HANDLING & ORDERING INFORMATION.....	16
2.1	Packaging.....	16
2.2	Product Marking.....	16
2.3	Ordering Information.....	17

List of Figures

FIGURE 1: AC10246-01A/B FRONT AND SIDE VIEW WITH DIMENSIONS (MM).....	5
FIGURE 2: TEST SETUP USED FOR THE ANTENNA RADIATION PATTERN MEASUREMENTS	14
FIGURE 3: BLOC DIAGRAM OF THE MVG ANTENNA MEASUREMENT SYSTEM	15

List of Tables

TABLE 1: AC10246-01, RF SPECIFICATIONS	4
TABLE 2: AGGREGATED PEAK GAIN VALUES.....	5
TABLE 3: AC10246-01, PHYSICAL SPECIFICATIONS.....	6
TABLE 4: AC10246-01, ENVIRONMENTAL SPECIFICATIONS.....	6
TABLE 5: AC10246-01, 2D RADIATION PATTERNS EVALUATED AT 2.4 – 2.48GHZ.....	7
TABLE 6: AC10246-01, 2D RADIATION PATTERNS EVALUATED AT 5.15 – 5.25GHZ.....	8
TABLE 7: AC10246-01, 2D RADIATION PATTERNS EVALUATED AT 5.25 – 5.35GHZ.....	8
TABLE 8: AC10246-01, 2D RADIATION PATTERNS EVALUATED AT 5.47 – 5.725GHZ.....	9
TABLE 9: AC10246-01, 2D RADIATION PATTERNS EVALUATED AT 5.725 – 5.85GHZ.....	10
TABLE 10: AC10246-01, 2D RADIATION PATTERNS EVALUATED AT 5.85 – 5.895GHZ	11
TABLE 11: AC10246-01A, EVALUATED ANTENNA SYSTEM 3D RADIATION PATTERNS AT:	12
TABLE 12: AC10246-01B, EVALUATED ANTENNA SYSTEM 3D RADIATION PATTERNS AT:.....	13
TABLE 13: TEST EQUIPMENT SPECIFICATIONS.....	14
TABLE 14: AC10246-01, MARKING SPECIFICATIONS.....	16
TABLE 15: AC10246-01, ORDERING INFORMATION.....	17

1 Dual Band Wi-Fi antennas

1.1 Scope and purpose

This document describes the AC10246-01 antenna system and its specifications. It is intended for antenna design engineers and OEM/ODMs who wish to integrate these products. The antenna system has been optimized for configuration in a dual-band Wi-Fi router and has been designed for excellent coverage in indoor environments.

1.2 AC10246-01 features

- Quasi-omnidirectional dual band 2GHz/5GHz Wi-Fi antenna system.
- Implemented on rigid PCB with 1.37mm thick coaxial cables.
- Suitable for integration on non-conductive surfaces.

1.3 Antenna specifications

Table 1: AC10246-01, RF specifications

Parameter	AC10246-01A		AC10246-01B	
	2G	5G	2G	5G
Frequency band support	2400 – 2485MHz	5150 – 5850MHz	2400 – 2485MHz	5150 – 5850MHz
Radiation pattern	Quasi-omnidirectional		Quasi-omnidirectional	
VSWR (Return Loss)	< 2:1		< 2:1	
Input impedance	50Ω		50Ω	
Typical Efficiency	>70%		>70%	
Antenna type	Dipole		Dipole	

Table 2: Aggregated peak gain values

Freq Range GHz	AC10246-01A	AC10246-01B
	Aggregated peak Gain (dB)	
2.4 – 2.48	2.5	
5.15 – 5.25	3.5	
5.25 – 5.35	3.5	
5.47 – 5.725	3.5	
5.725 – 5.85	3.5	
5.85 – 5.895	3.5	

Notes:

- The characterization is performed with the antennas mounted inside the end-product.
- The end-product is tested in free-space.

Table 3: AC10246-01, Physical specifications

Parameter	AC10246-01A	AC10246-01B
Size (length x width)	28.62 x 14.2 mm	28.62 x 14.2 mm
Cable length (L) ¹	145 ±0.5 mm	215 ±1 mm
Cable diameter	1.37mm	1.37mm
Cable color	black	black
Connector	Micro-coaxial	Micro-coaxial

Notes:

- 1- The reported cable length includes the connector.
- 2- For the outer PCB dimensions (length x width) a tolerance of ±0.15 mm is applicable. AC10246-01A cable length tolerance is ±0.5mm and AC10246-01B cable length tolerance is ±1mm. For other dimensions, the ISO 2768-mK standard is followed.

Table 4: AC10246-01, Environmental specifications

Parameter	AC10246-01A	AC10246-01B
Operational temperature	-20°C to +85°C	-20°C to +85°C
RoHS	Yes	Yes

1.4 Radiation pattern

The table below shows the typical measured radiation pattern of the AC10246-01 antenna system, when operating in the end-device, along the XZ, YZ and XY planes.

Table 5: AC10246-01, 2D radiation patterns evaluated at 2.4 – 2.48GHz

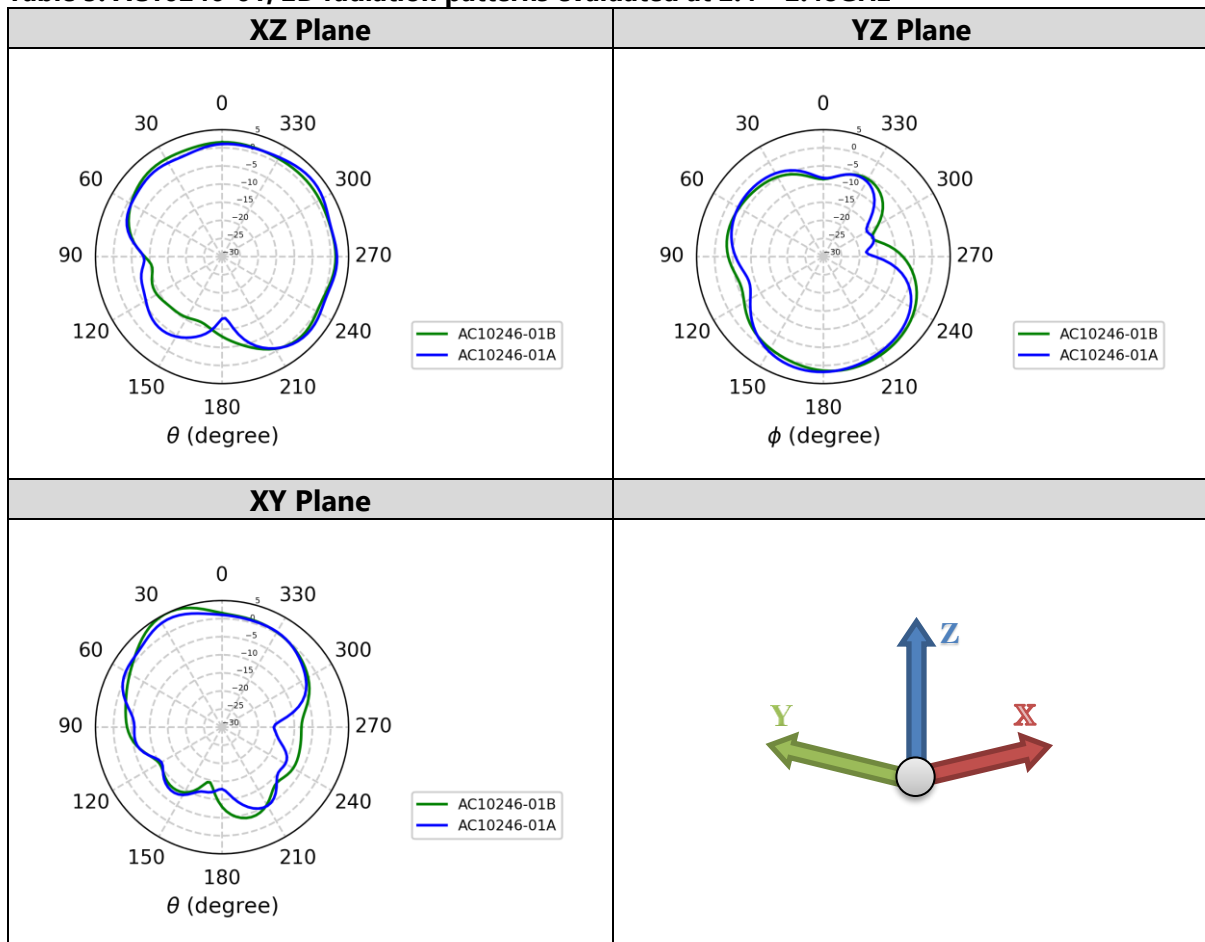


Table 6: AC10246-01, 2D radiation patterns evaluated at 5.15 – 5.25GHz

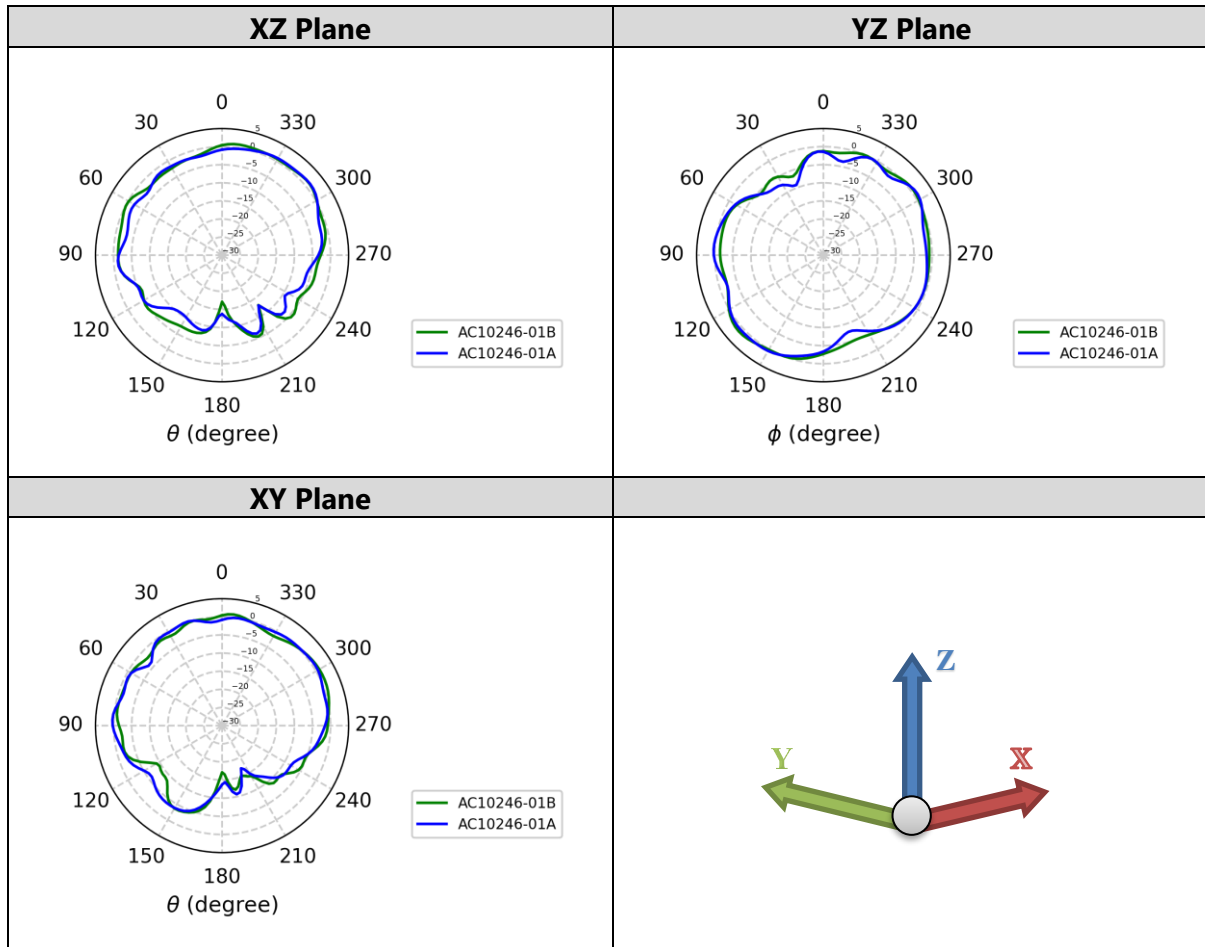
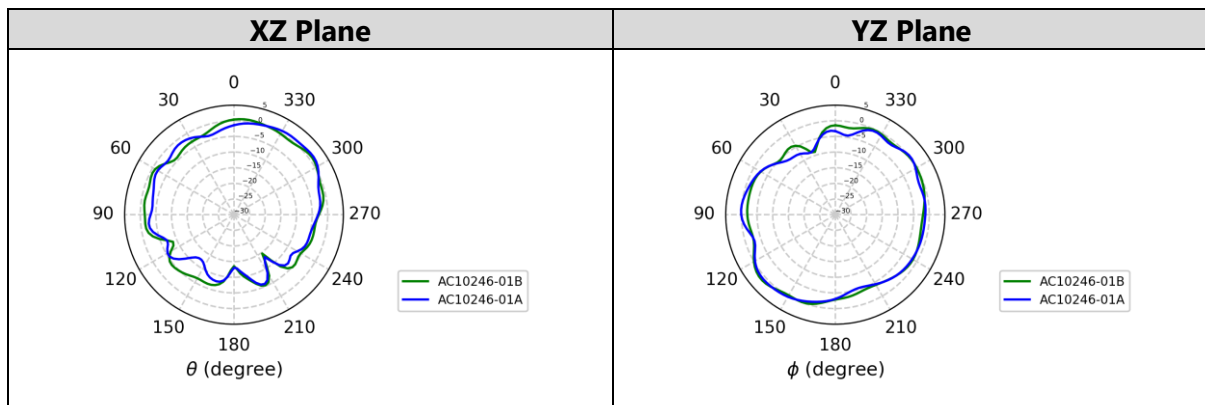


Table 7: AC10246-01, 2D radiation patterns evaluated at 5.25 – 5.35GHz



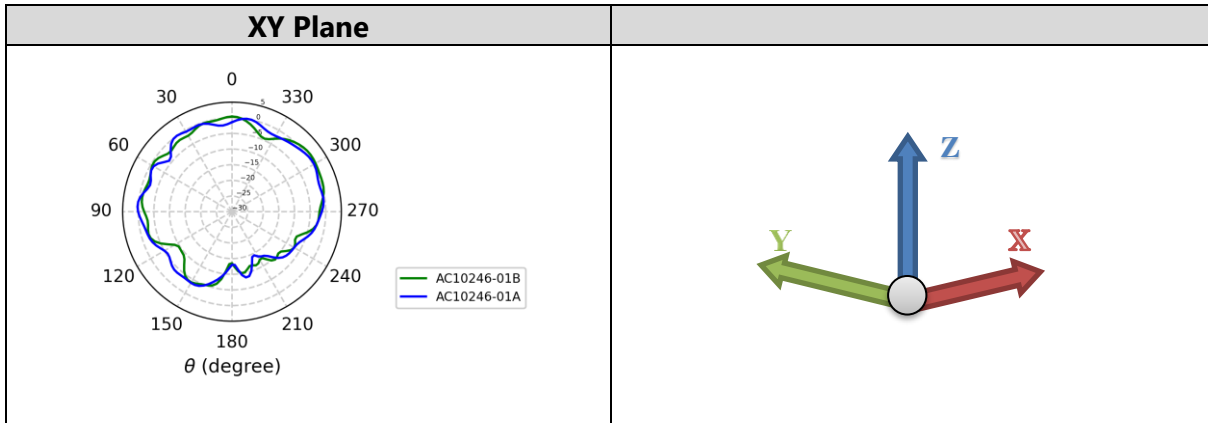


Table 8: AC10246-01, 2D radiation patterns evaluated at 5.47 – 5.725GHz

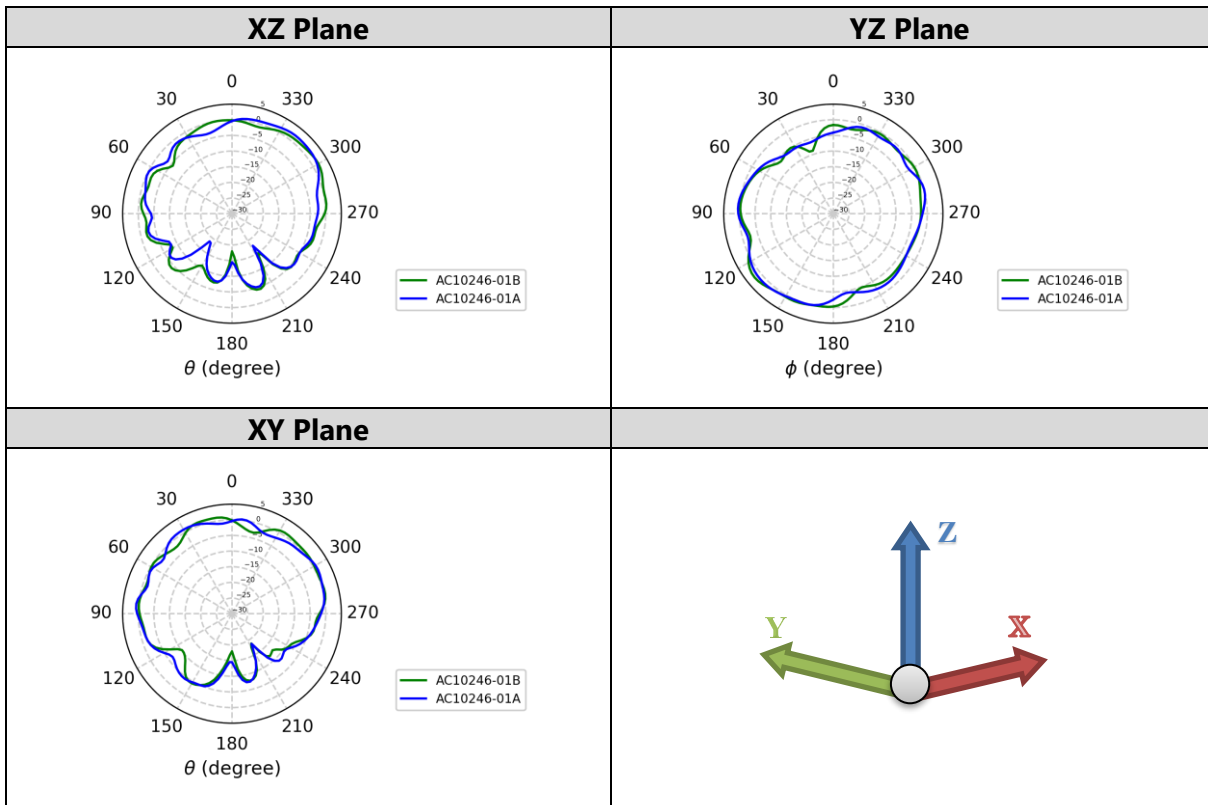


Table 9: AC10246-01, 2D radiation patterns evaluated at 5.725 – 5.85GHz

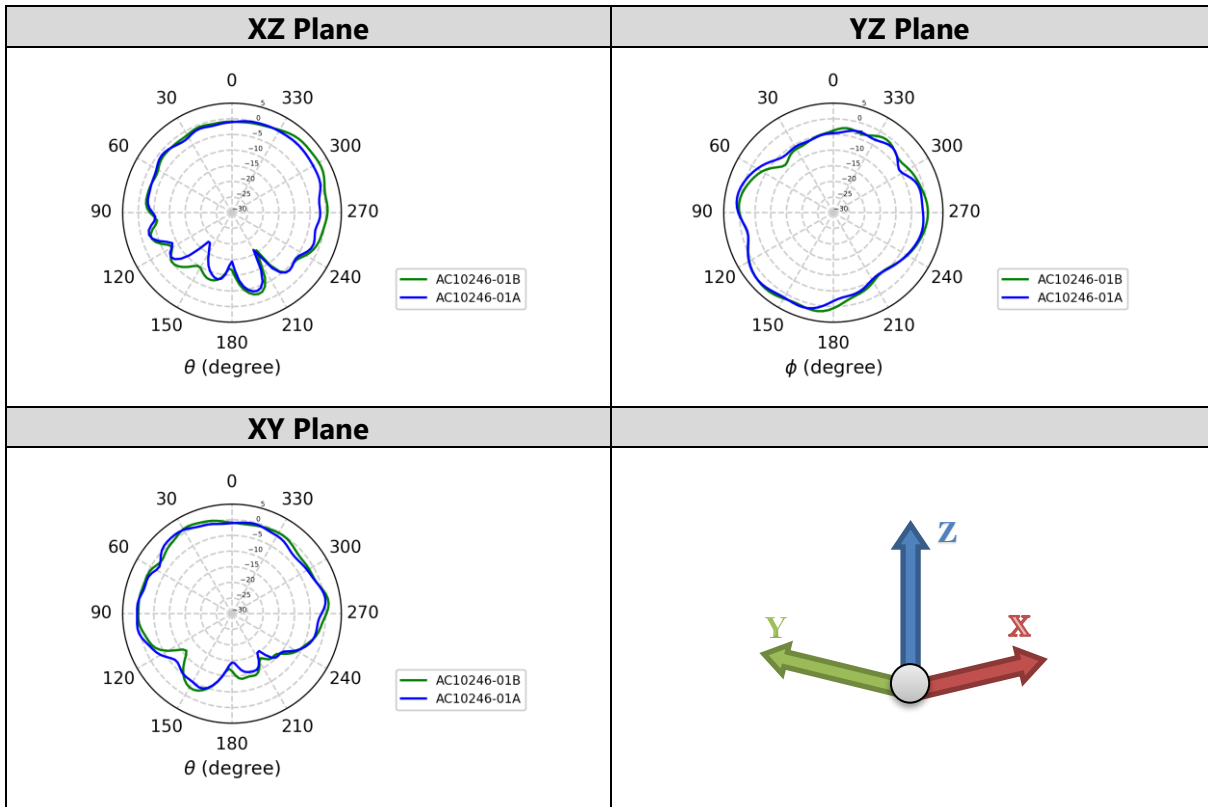
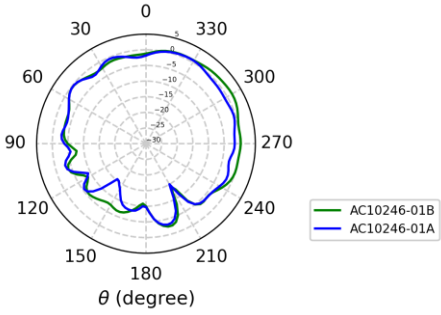
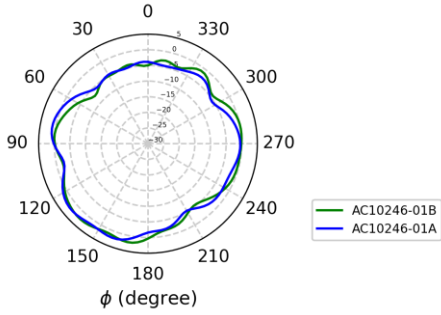
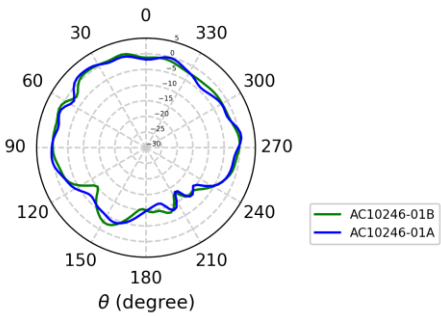
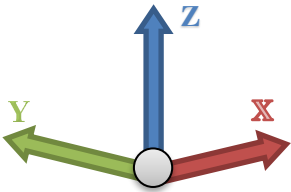


Table 10: AC10246-01, 2D radiation patterns evaluated at 5.85 – 5.895GHz

XZ Plane	YZ Plane
 <p>The XZ Plane radiation pattern plot shows gain in dBS versus angle θ in degrees. The plot includes two curves: a green line for AC10246-01B and a blue line for AC10246-01A. The x-axis is labeled θ (degree) and ranges from 0 to 330 in increments of 30. The y-axis represents gain in dBS, with concentric circles at 0, -5, -10, -15, -20, -25, and -30. Both curves show a main lobe centered at 180 degrees and side lobes at approximately 30, 90, 210, and 270 degrees.</p>	 <p>The YZ Plane radiation pattern plot shows gain in dBS versus angle ϕ in degrees. The plot includes two curves: a green line for AC10246-01B and a blue line for AC10246-01A. The x-axis is labeled ϕ (degree) and ranges from 0 to 330 in increments of 30. The y-axis represents gain in dBS, with concentric circles at 0, -5, -10, -15, -20, -25, and -30. Both curves show a main lobe centered at 180 degrees and side lobes at approximately 30, 90, 210, and 270 degrees.</p>
XY Plane	
 <p>The XY Plane radiation pattern plot shows gain in dBS versus angle θ in degrees. The plot includes two curves: a green line for AC10246-01B and a blue line for AC10246-01A. The x-axis is labeled θ (degree) and ranges from 0 to 330 in increments of 30. The y-axis represents gain in dBS, with concentric circles at 0, -5, -10, -15, -20, -25, and -30. Both curves show a main lobe centered at 180 degrees and side lobes at approximately 30, 90, 210, and 270 degrees.</p>	 <p>A 3D coordinate system diagram showing the X, Y, and Z axes. The Z-axis is a blue arrow pointing upwards. The X-axis is a red arrow pointing to the right. The Y-axis is a green arrow pointing to the left. The origin is marked with a small grey circle.</p>

The table below shows the typical measured 3D radiation pattern of the AC10246-01 antenna system, when operating in the end-device.

Table 11: AC10246-01A, Evaluated antenna system 3D Radiation Patterns at:

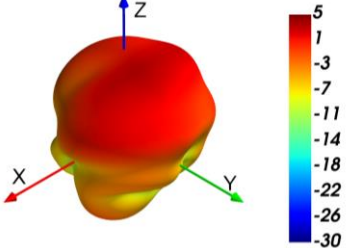
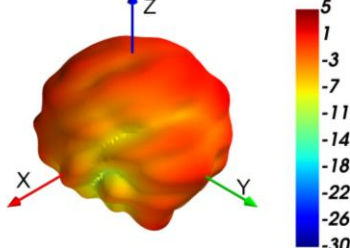
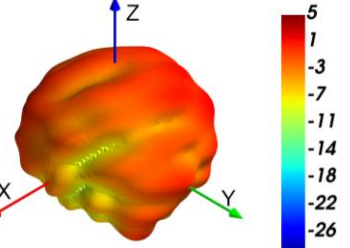
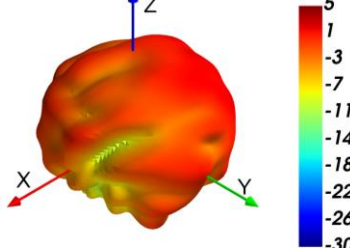
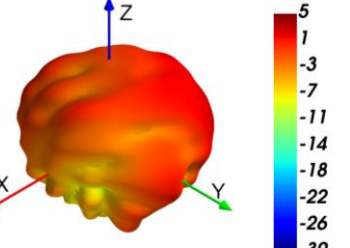
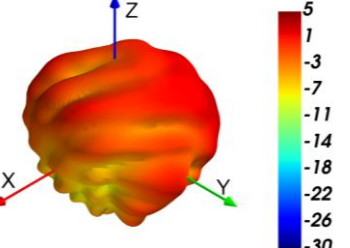
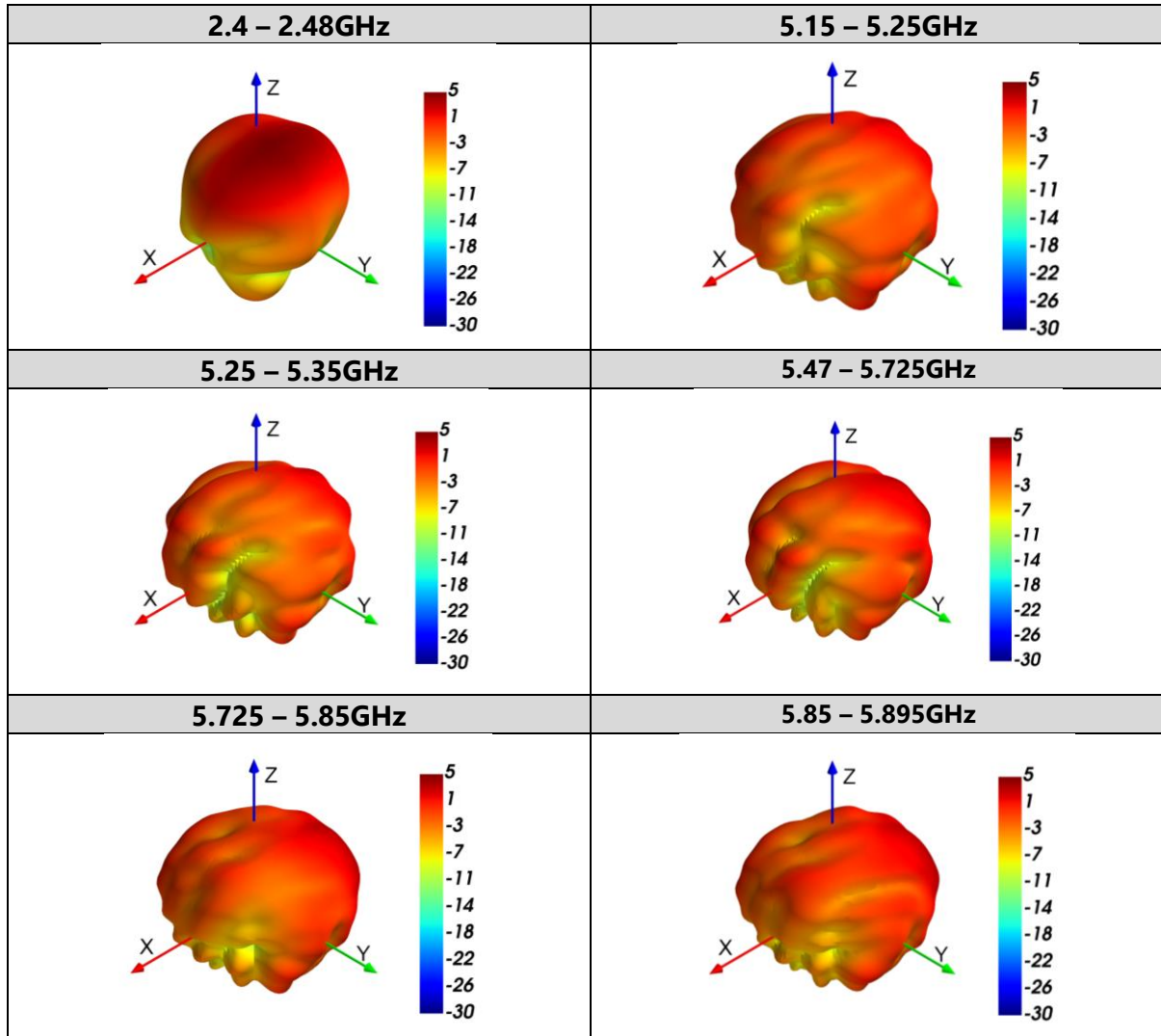
2.4 – 2.48GHz	5.15 – 5.25GHz
	
5.25 – 5.35GHz	5.47 – 5.725GHz
	
5.725 – 5.85GHz	5.85 – 5.895GHz
	


Table 12: AC10246-01B, Evaluated antenna system 3D Radiation Patterns at:



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 bloc diagram of the antenna measurement system is shown in below figure. The system specifications are summarized in the table below.

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					

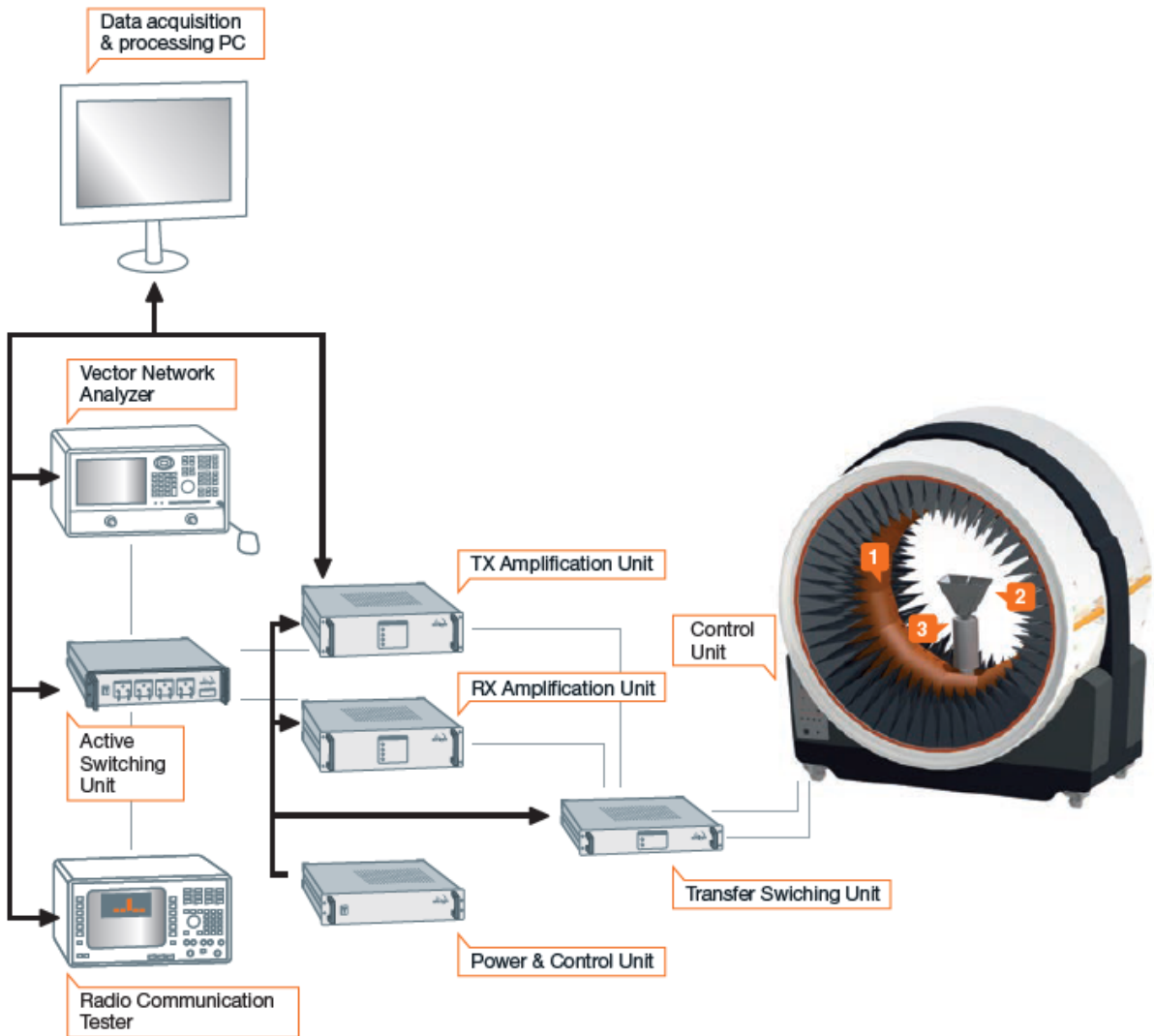


Figure 3: bloc diagram of the MVG antenna measurement system

2 Product Handling & Ordering Information

2.1 Packaging

The AC10246-01 will be delivered in plastic polyethylene (PE) bags of 100 pcs. The PE bags will be packed in a carton box.

2.2 Product Marking

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

Table 14: AC10246-01, Marking specifications

Text on Antenna	Explanation
AC10246-01X	AC Type Number
175-00036	PCB Number
0.03	Revision Number
	Production Date and Supplier Code
Y = K	2022
Y = L	2023
Y = M	2024

2.3 Ordering Information

Orders should be placed at orders@antennacompany.com.

For purchase orders please state: part number, description, quantity, and price

Table 15: AC10246-01, Ordering Information

Part number	Description	Minimum Order Quantity [pcs]	Order multiple [pcs]
AC10246-01A	Dual Band Embedded Wi-Fi Antenna	5000	5000
AC10246-01B	Dual Band Embedded Wi-Fi Antenna	5000	5000

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