

R670 Antenna Gains

Engineer	Manager
Jim Jervis	Anand Krishnamachari
03 Nov 2023	03 Nov 2023

Ruckus Wireless Inc.
350 West Java Dr.

Sunnyvale, CA 94089, USA

Tel: (650) 265-4200

Fax: (408) 738-2065

This document provides the azimuth cuts containing the maximum antenna gain at the listed frequency bands

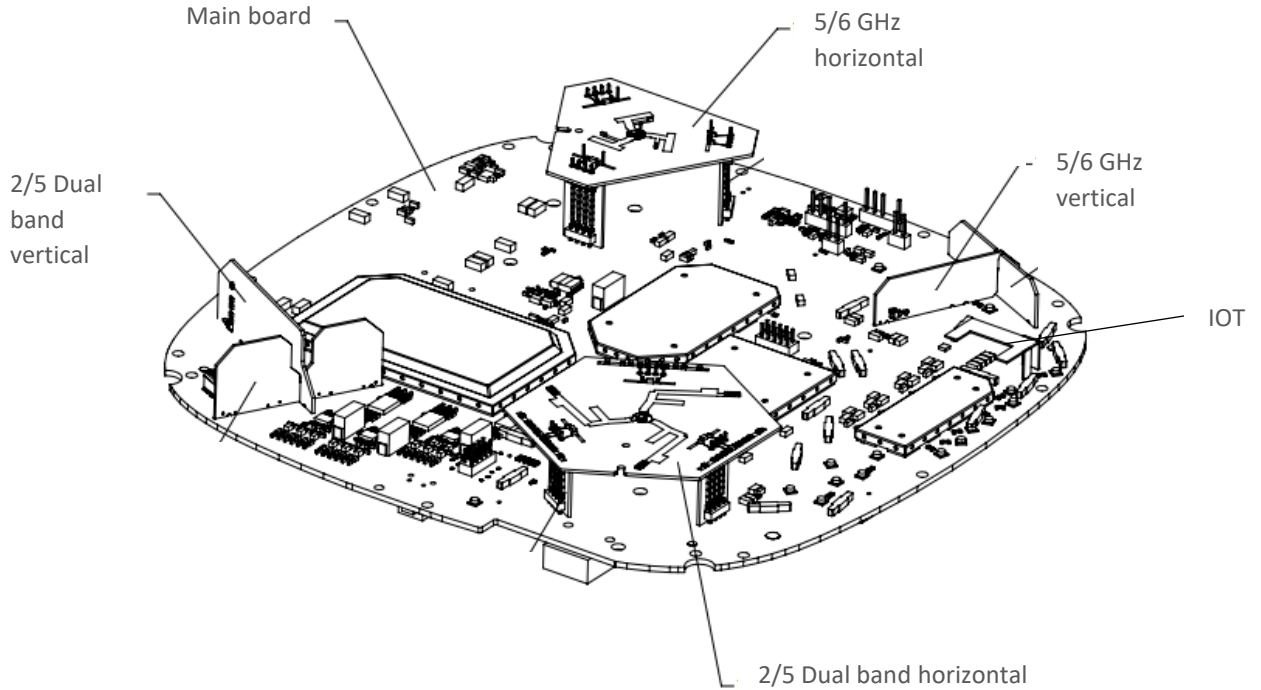
Frequency Bands

No	Operational Band	Center Freq.	Designator
1	2400 - 2483.5 MHz	2.45 GHz	ISM
2	5150 - 5250 MHz	5.15 GHz	UNII-1
3	5250 – 5725 MHz	5.5 GHz	UNII-2
4	5725 – 5850 MHz	5.8 GHz	UNII-3
5		5.9 GHz	UNII-4 (Not used; data not provided)
6	5925 – 6425 MHz	6.2 GHz	UNII-5
7	6425 – 6525 MHz	6.5 GHz	UNII-6
8	6525 – 6875 MHz	6.65 GHz	UNII-7
9	6875 – 7125 MHz	7 GHz	UNII-8

All antennas of access point R670 were measured in a Satimo Starlab quasi-nearfield range with Jim Jervis as operator. Each antenna was measured over the 2.4 GHz band and over each of the UNII bands. The maximum gain was taken from the measurements and is listed in the table on the following page. All antennas are omni-directional and are integrated within the product. The product is in development and therefore the test unit has no serial number.

The product has 5 transmitting antennas: one horizontally polarized dual-band 2.4/5 GHz antenna, one horizontally polarized 6 GHz antenna, one vertically polarized 6 GHz antenna, a vertically polarized dual-band antenna for 2.4/5 GHz, and one 2.4 GHz IOT antenna, dominantly vertically polarized.

Location of antennas are shown below:



This product deploys distinct MIMO system where dual RF outputs for each WiFi radio are connected each to linearly cross polarized antennas which are mounted on Main board as indicated in Exhibits - Internal pictures.

Horizontal and Vertical internal antennas are cross-polarized to ensure transmitting outputs are orthogonally polarized replicas of each other and the phase centers of the two antennas are co-located.

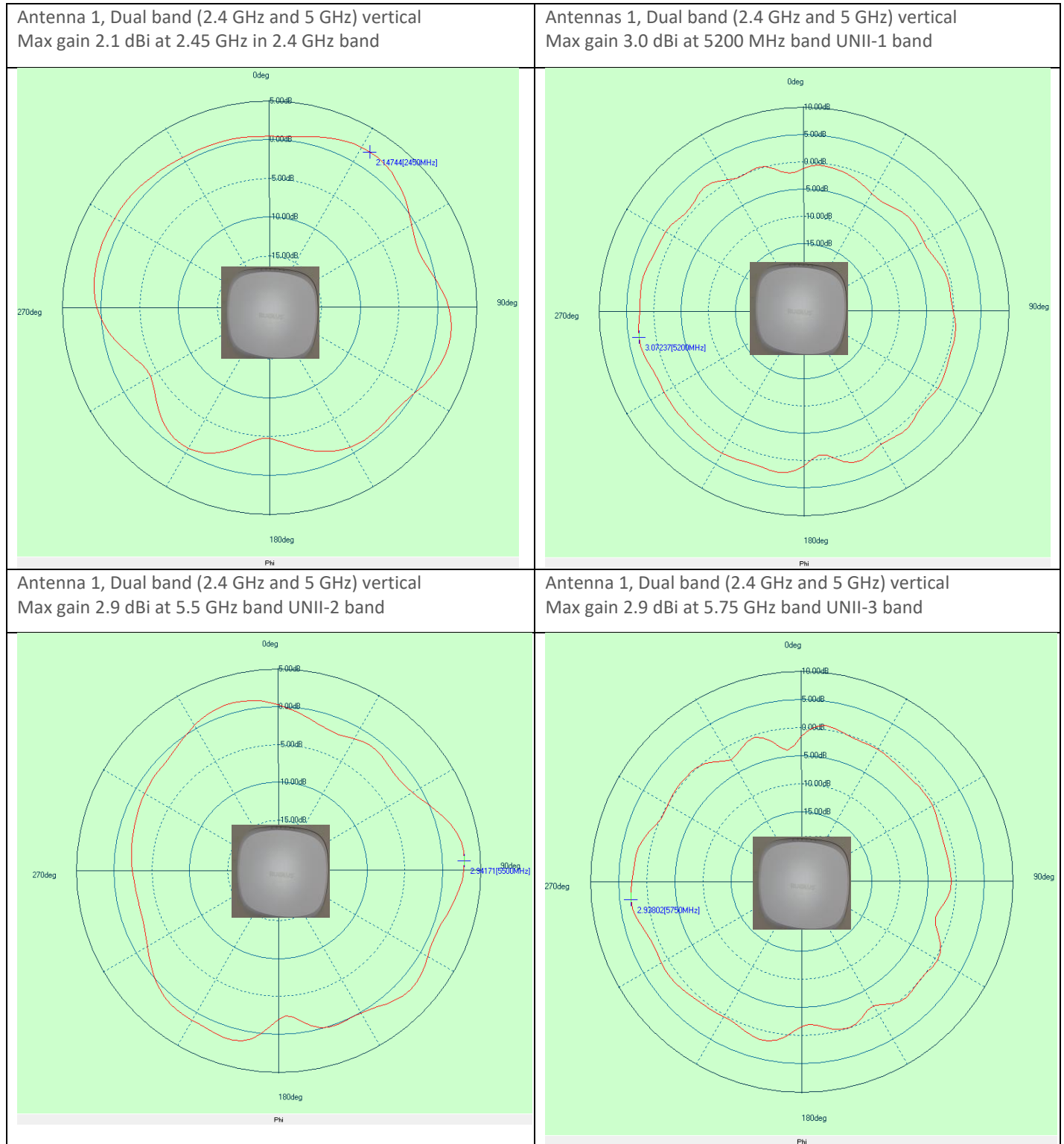
Test Equipment List and details:

Test Equipment	Model	Brand	Serial No	Calibration date	Calibration due date
MVG StarLab near-field range	SL6	MVG	ATL2087S	5/14/2024	5/14/2025
Rx Antennas build in the MVG StarLab system	NA	NA	NA	Part of MVG StarLab system Calibration	Part of MVG StarLab system Calibration
Copper Mountain Vector Network Analyzer	S5180	Copper Mountain	22030001	8/21/2023	8/21/2024

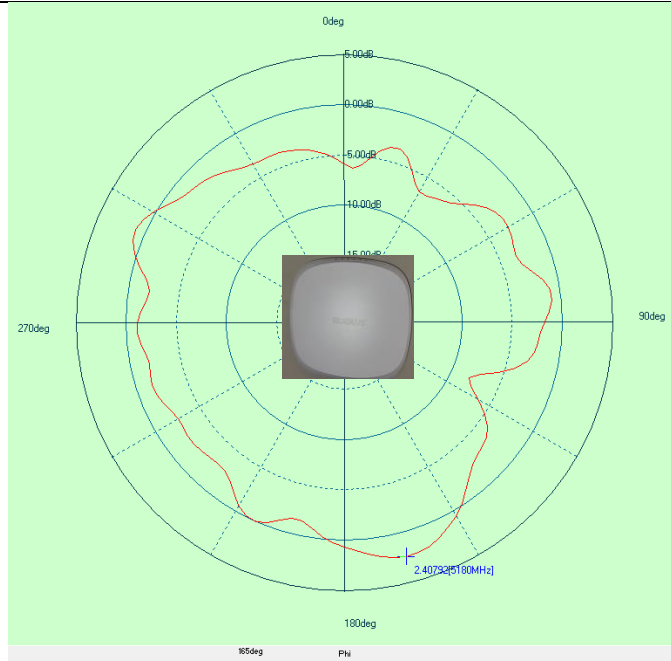
Antenna Gain Table

Antenna	Frequency band	Max Gain (dBi)
2/5 Dual-band vertical	2.4 GHz	2.1
2/5 Dual-band vertical	UNII-1	3.0
2/5 Dual-band vertical	UNII-2	2.9
2/5 Dual-band vertical	UNII-3	2.9
2/5 Dual-band horizontal	2.4 GHz	2.0
2/5 Dual-band horizontal	UNII-1	4.4
2/5 Dual-band horizontal	UNII-2	3.4
2/5 Dual-band horizontal	UNII-3	3.3
5/6 GHz vertical	UNII-1	2.4
5/6 GHz vertical	UNII-2	2.9
5/6 GHz vertical	UNII-3	2.7
5/6 GHz vertical	UNII-5	3.5
5/6 GHz vertical	UNII-6	4.4
5/6 GHz vertical	UNII-7	3.4
5/6 GHz vertical	UNII-8	2.9
5/6 GHz horizontal	UNII-1	1.8
5/6 GHz horizontal	UNII-2	2.1
5/6 GHz horizontal	UNII-3	1.7
5/6 GHz horizontal	UNII-5	3.3
5/6 GHz horizontal	UNII-6	3.4
5/6 GHz horizontal	UNII-7	3.9
6 GHz horizontal	UNII-8	4.3
IOT antenna	2.4 GHz	2.5

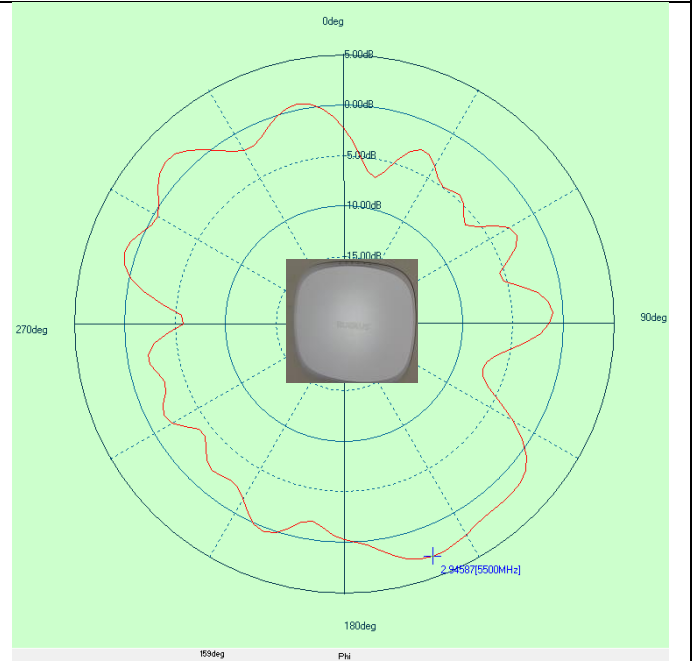
Antenna Patterns:



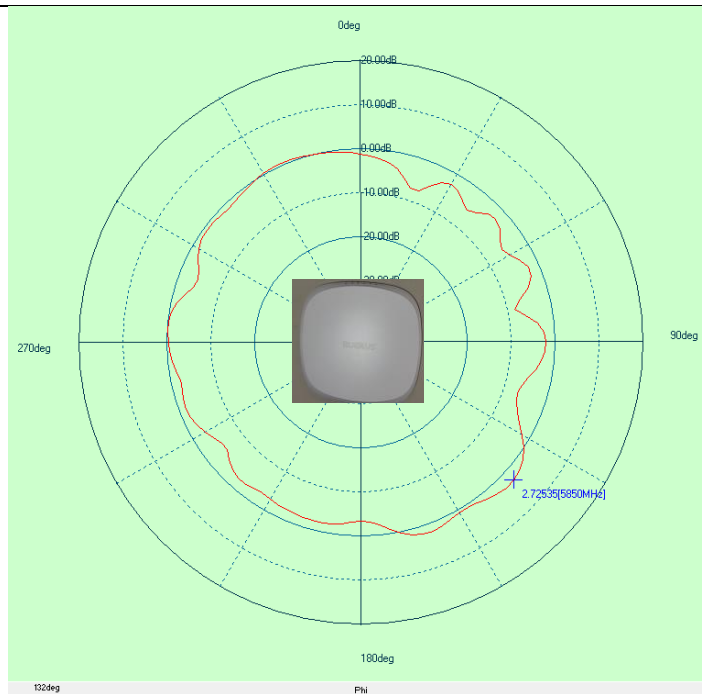
Antenna 2, 5/6 GHz horizontal
Max gain 2.4 dBi at 5200 MHz UNII-1 band



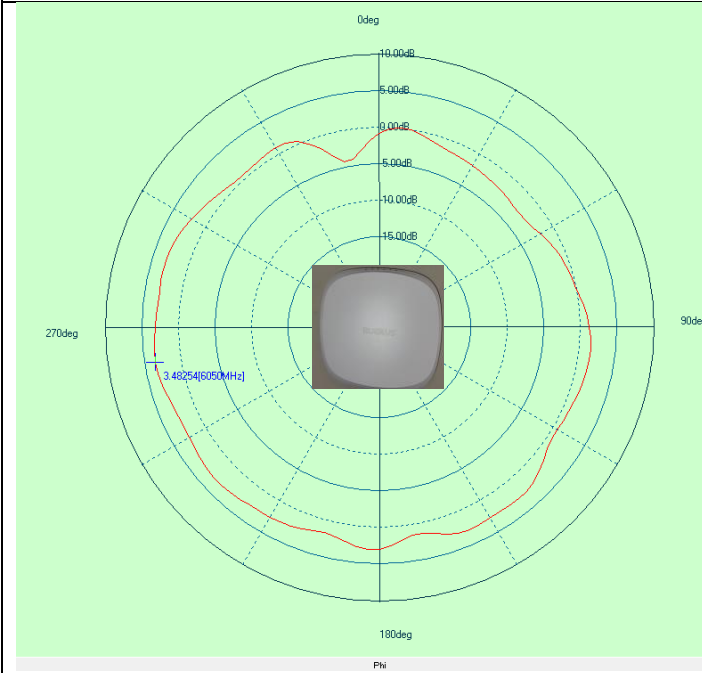
Antenna 2, 5/6 GHz horizontal
Max gain 2.9 dBi at 5500 MHz UNII-2 band



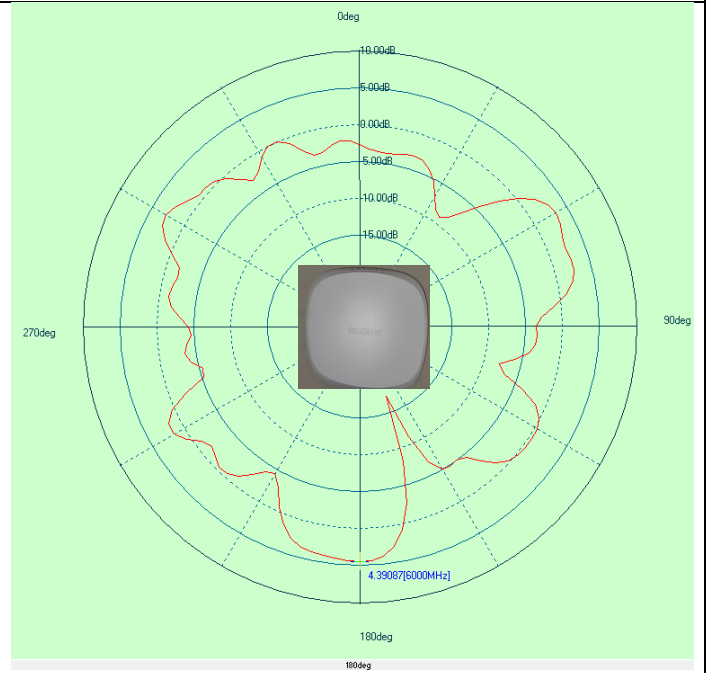
Antenna 2, 5/6 GHz horizontal
Max gain 2.7 dBi at 5800 MHz UNII-3 band



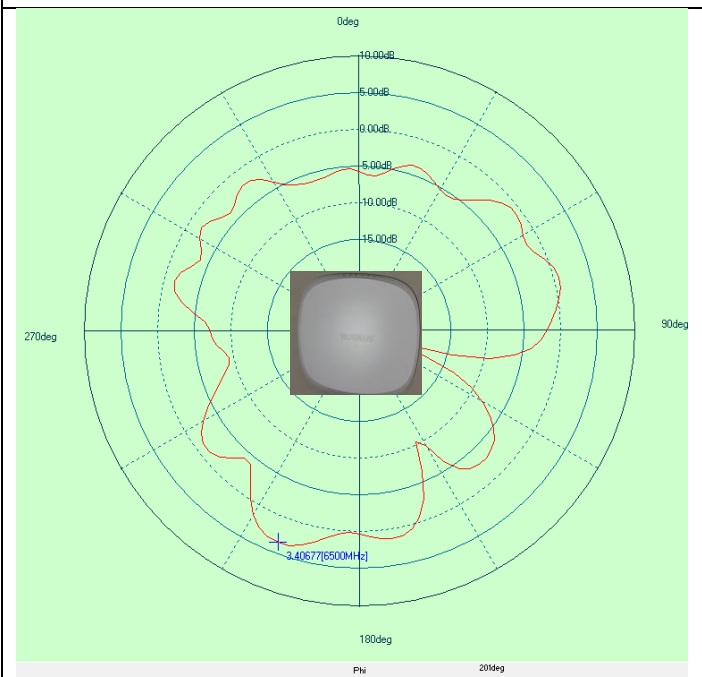
Antenna 2, 5/6 GHz horizontal
 Max gain 3.5 dBi at 6.05 GHz UNII-5 band



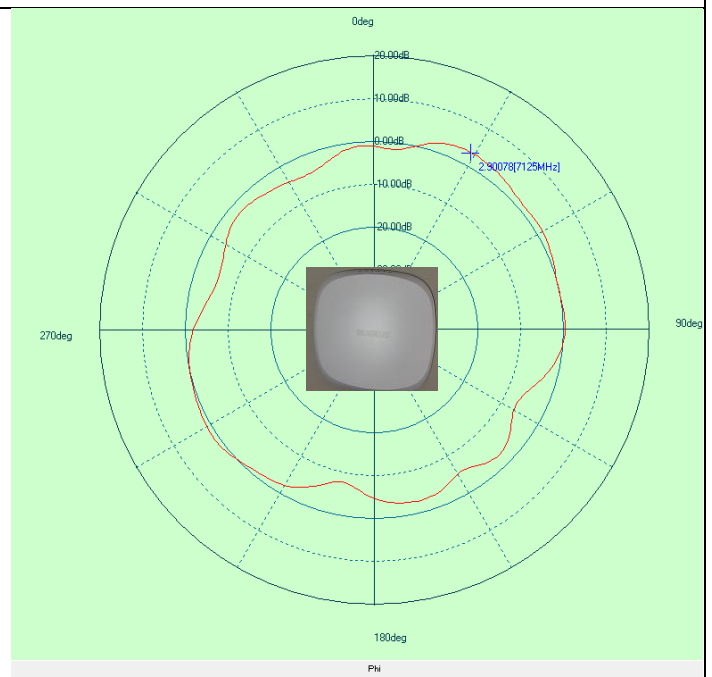
Antenna 2, 5/6 GHz horizontal
 Max gain 4.4 dBi at 6.5 GHz UNII-6 band



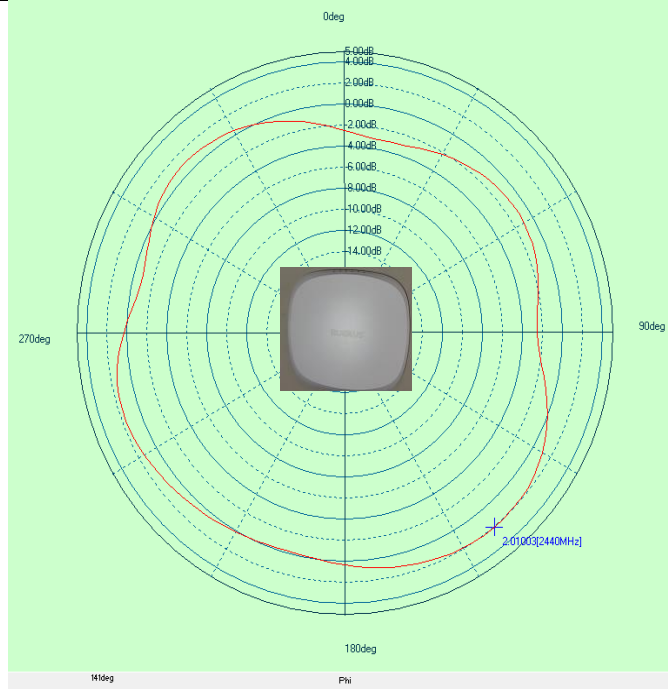
Antenna 2, 5/6 GHz horizontal
 Max gain 3.4 dBi at 6.7 GHz UNII-7 band



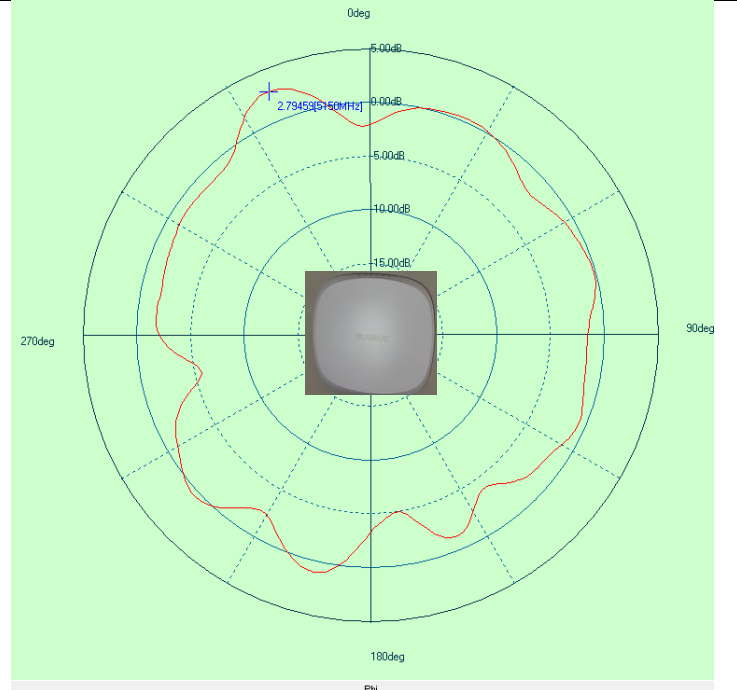
Antenna 2, 5/6 GHz horizontal
 Max gain 2.9 dBi at 7.0 GHz UNII-8 band



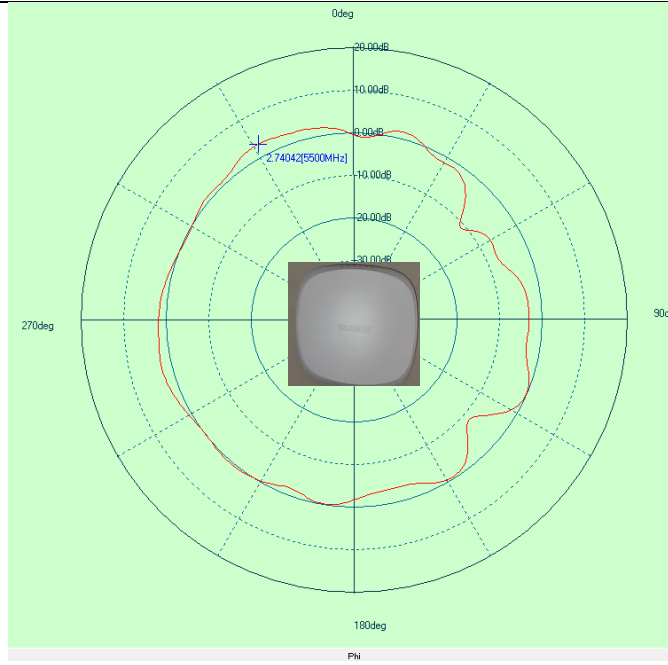
Antenna 3, dual band (2.4 and 5 GHz) horizontal
 Max gain 2.0 dBi i at GHz 2.44



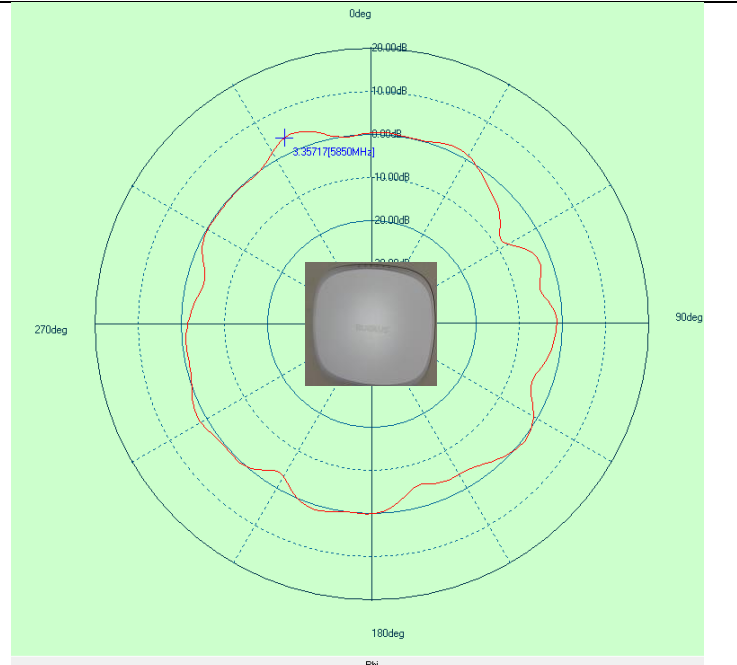
Antenna 3, dual band (2.4 and 5 GHz) horizontal
 Max gain 2.8 dBi at 5.15 GHz UNII-1 band

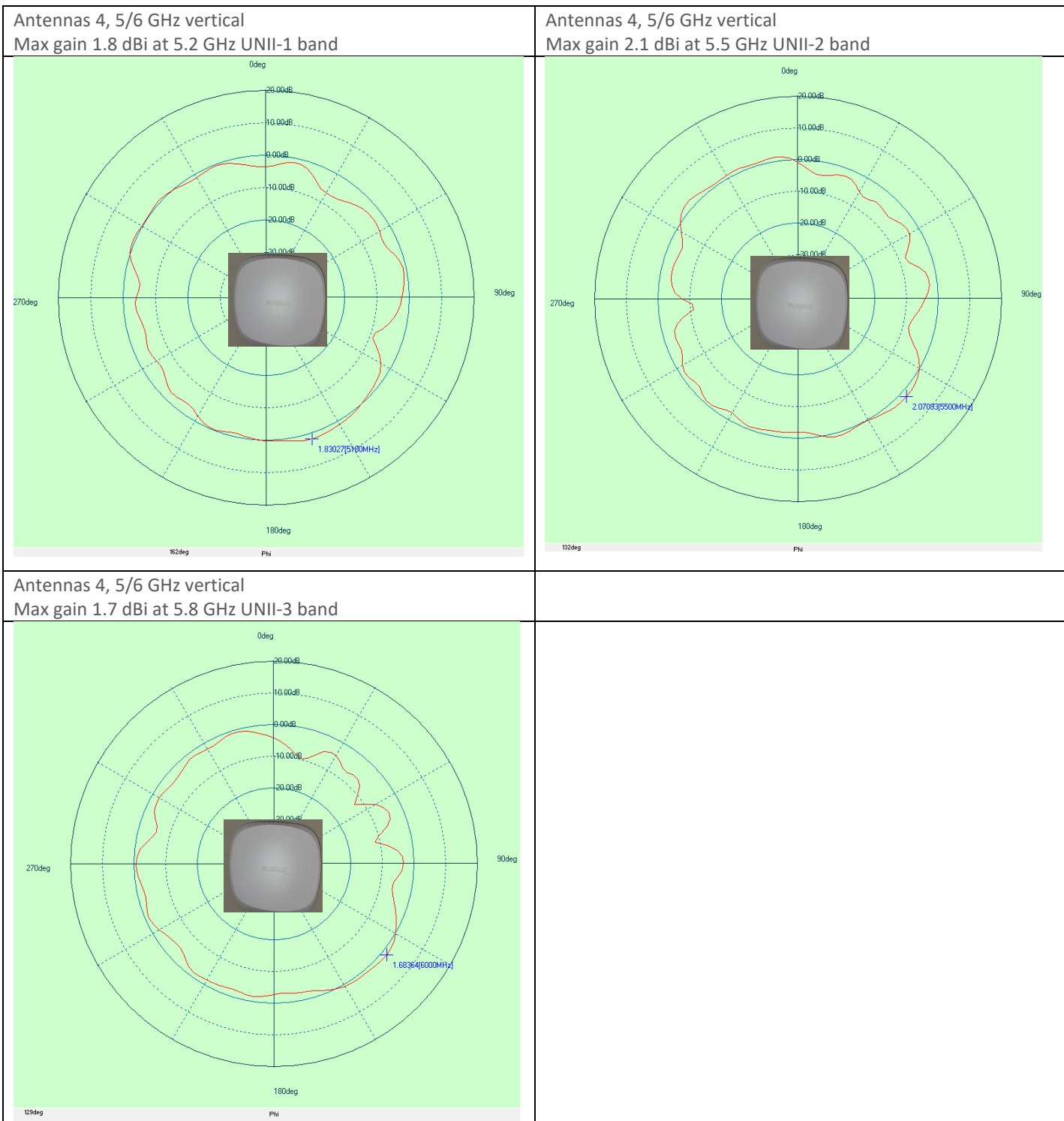


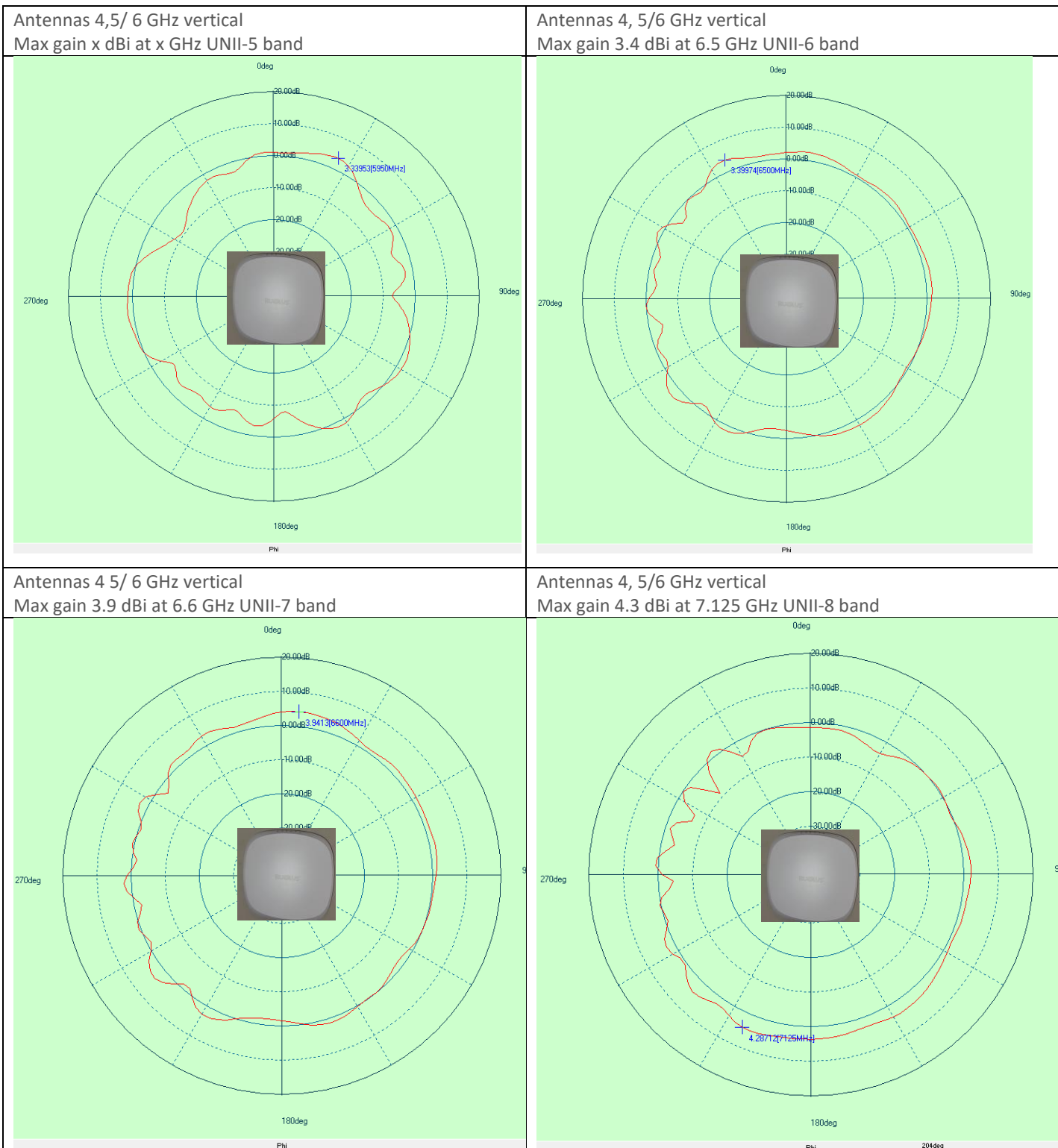
Antenna 3, dual band (2.4 and 5 GHz) horizontal
 Max gain 2.7 dBi at 5.5 GHz UNII-2 band



Antenna 3, dual band (2.4 and 5 GHz) horizontal
 Max gain 3.4 dBi at 5.85 GHz UNII-3 band







IOT (2) antennas, 2.4 GHz IOT antenna
Max Gain 2.5 dBi at 2.45 GHz

