

T670 Antenna Gains

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This document provides the azimuth cuts containing the maximum antenna gain at the listed frequency bands and elevation cuts of radiation at >30 degrees above the horizon.

Frequency Bands

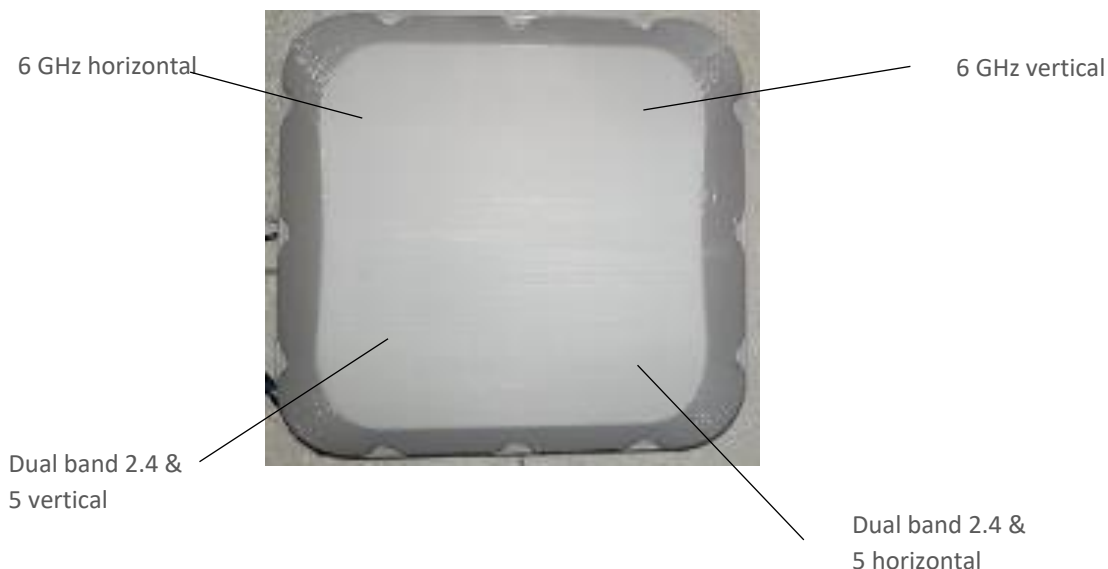
No	Operational Band	Center Freq.	Designator
1	2400 - 2483.5 MHz	2.45 GHz	ISM
2	5150 - 5250 MHz	5.15 GHz	UNII-1
3	5250 – 5725 MHz	5.5 GHz	UNII-2
4	5725 – 5850 MHz	5.8 GHz	UNII-3
5		5.9 GHz	UNII-4 (Not used; data not provided)
6	5925 – 6425 MHz	6.2 GHz	UNII-5
7	6425 – 6525 MHz	6.5 GHz	UNII-6
8	6525 – 6875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

All antennas of access point T670 were measured in a Satimo Stargate 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 4 transmitting antennas: one horizontally polarized dual-band 2.4/5 GHz antenna, one horizontally polarized dual-band 5/6 GHz antenna, one vertically polarized dual-band 5/6 GHz antenna, a vertically polarized dual-band antenna for 2.4/5 GHz.

Location of antennas are shown below:

Top - Radome



This product deploys a 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.

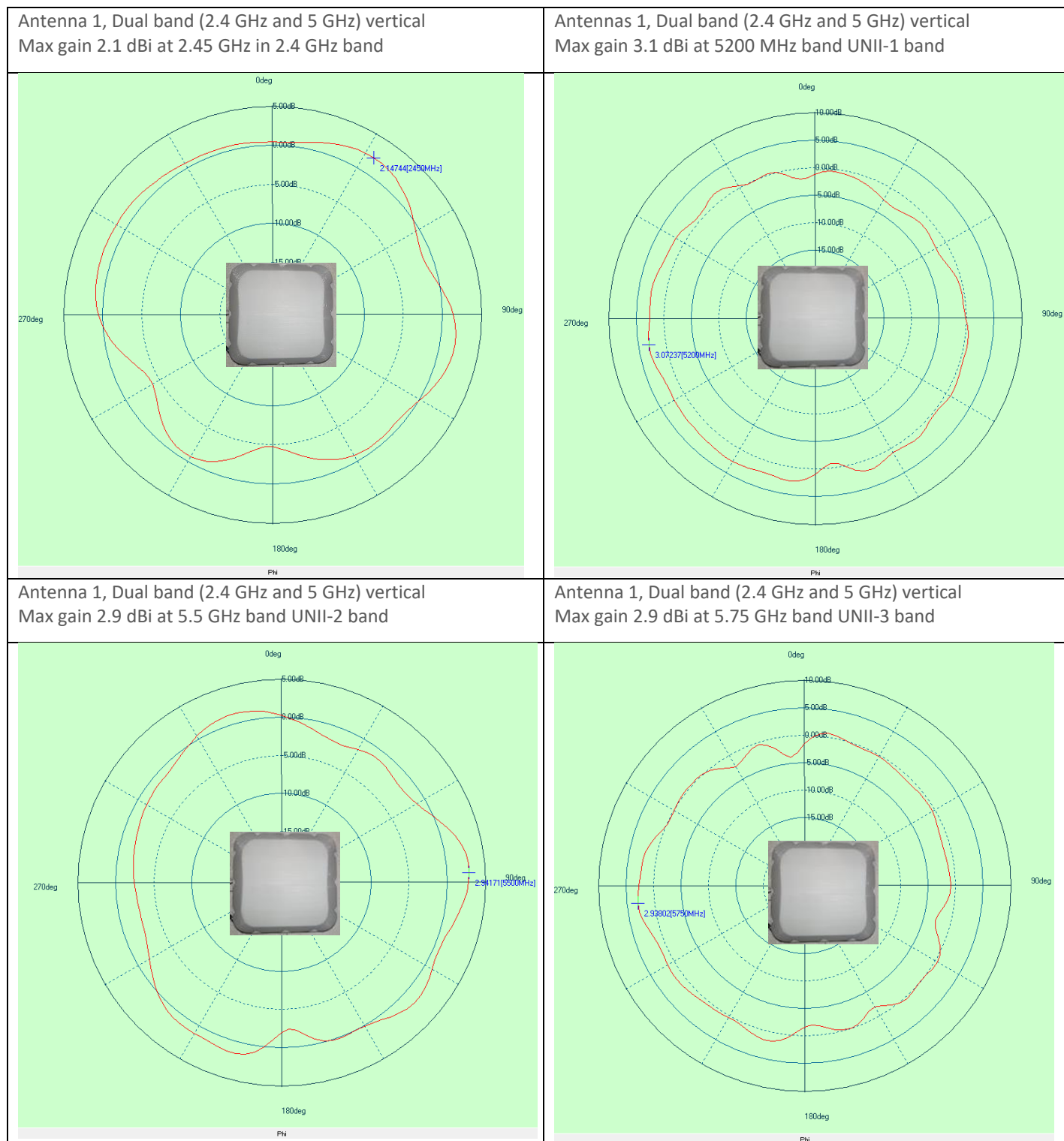
Antenna Gain Table			
Antenna	Function	Frequency band	Max Gain (dBi)
1	2.4/5 GHz dual-band vertical	2.4 GHz	2.1
1	2.4/5 GHz dual-band vertical	UNII-1	3.1
1	2.4/5 GHz dual-band vertical	UNII-2	2.9
1	2.4/5 GHz dual-band vertical	UNII-3	2.9
3	2.4/5 GHz dual-band horizontal	2.4 GHz	2.0
3	2.4/5 GHz dual-band horizontal	UNII-1	1.1
3	2.4/5 GHz dual-band horizontal	UNII-2	1.5
3	2.4/5 GHz dual-band horizontal	UNII-3	2.2
4	5/6 GHz vertical	UNII-1	2.1
4	5/6 GHz vertical	UNII-2	1.7
4	5/6 GHz vertical	UNII-3	1.5
4	5/6 GHz vertical	UNII-5	2.4
4	5/6 GHz vertical	UNII-6	1.6
4	5/6 GHz vertical	UNII-7	2.5
4	5/6 GHz vertical	UNII-8	2.2
2	5/6 GHz horizontal	UNII-1	1.3
2	5/6 GHz horizontal	UNII-2	2.7
2	5/6 GHz horizontal	UNII-3	1.3
2	5/6 GHz horizontal	UNII-5	1.9
2	5/6 GHz horizontal	UNII-6	2.2
2	5/6 GHz horizontal	UNII-7	1.7
2	5/6 GHz horizontal	UNII-8	3.2

At 30 degrees above horizon for ceiling mount

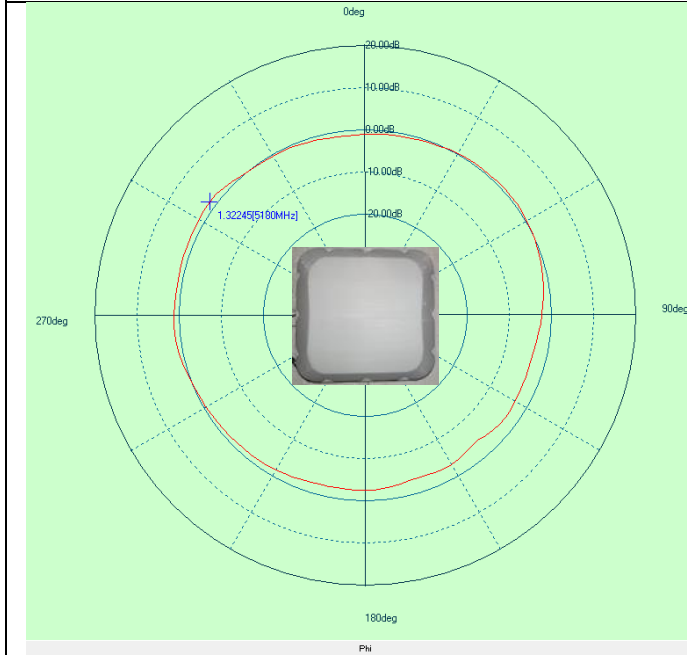


Antenna	Description	Band	Gain (dBi)
1	2.4/5 GHz dual-band vertical	UNII-1	-5.6
2	5/6 GHz horizontal	UNII-1	-12.6
3	2.4/5 GHz dual-band horizontal	UNII-1	-7.2
4	5/6 GHz vertical	UNII-1	-9.8
2	5/6 GHz horizontal	UNII-5	-10.5
4	5/6 GHz vertical	UNII-5	-11.8
2	5/6 GHz horizontal	UNII-7	-7.4
4	5/6 GHz vertical	UNII-7	-8.2

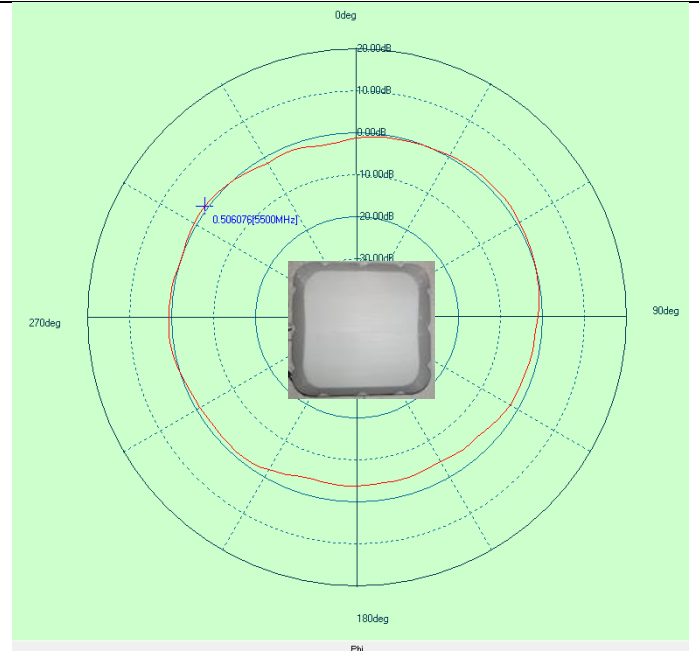
Antenna Patterns:



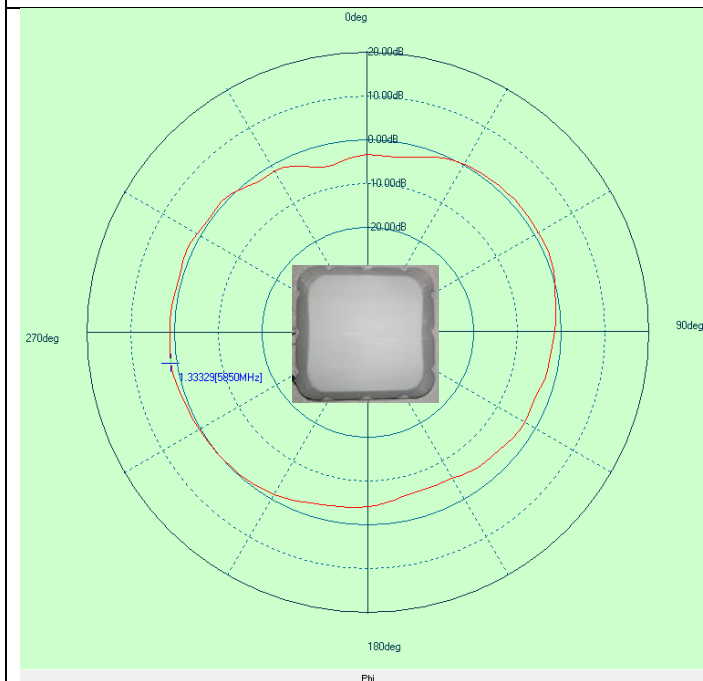
Antenna 2, 5/6 GHz horizontal
Max gain 1.3 dBi in UNII-1 band



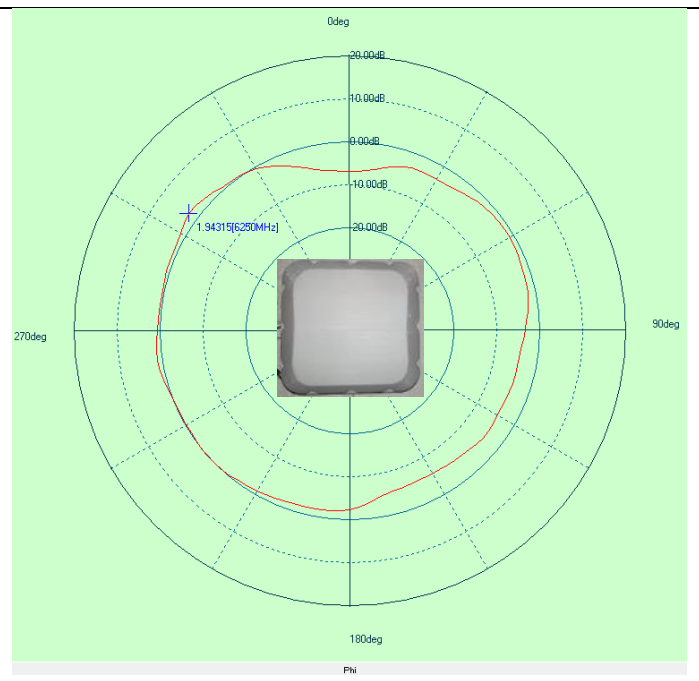
Antenna 2, 5/6 GHz horizontal
Max gain 2.7 dBi in UNII-2 band



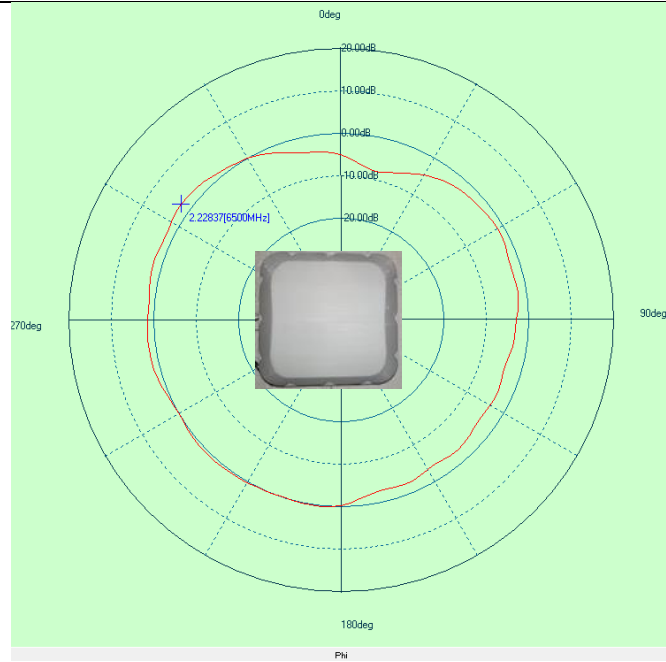
Antenna 2, 5/6 GHz horizontal
Max gain 1.3 dBi in UNII-3 band



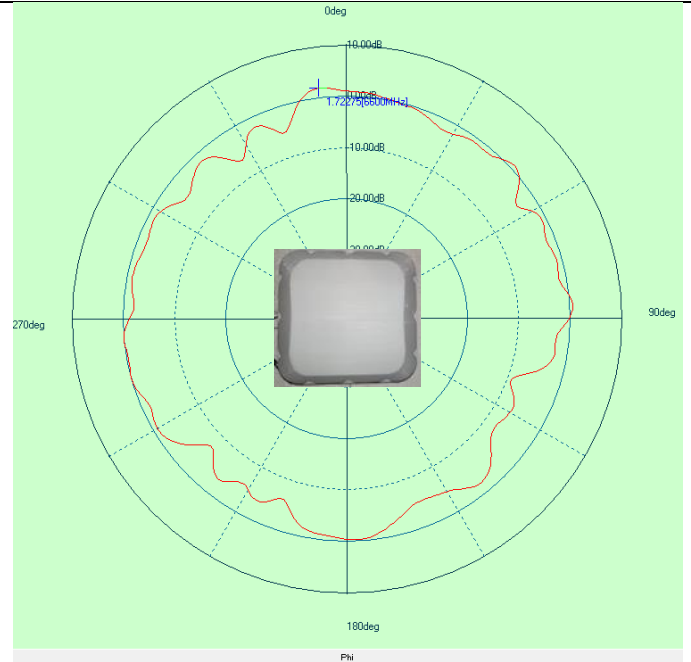
Antenna 2, 5/6 GHz horizontal
Max gain 1.9 dBi in UNII-5 band



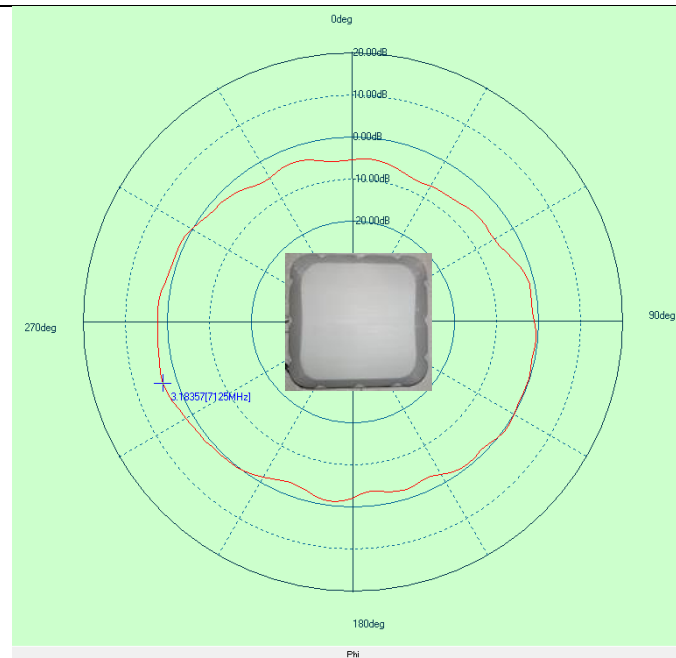
Antenna 2, 5/6 GHz horizontal
Max gain 2.2 dBi in UNII-6 band



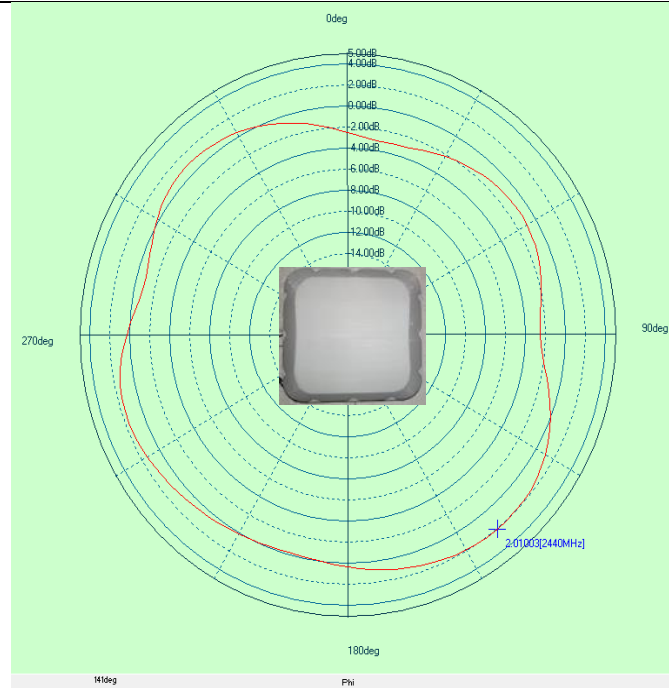
Antenna 2, 5/6 GHz horizontal
Max gain 1.7 dBi at 6.0 GHz UNII-7 band



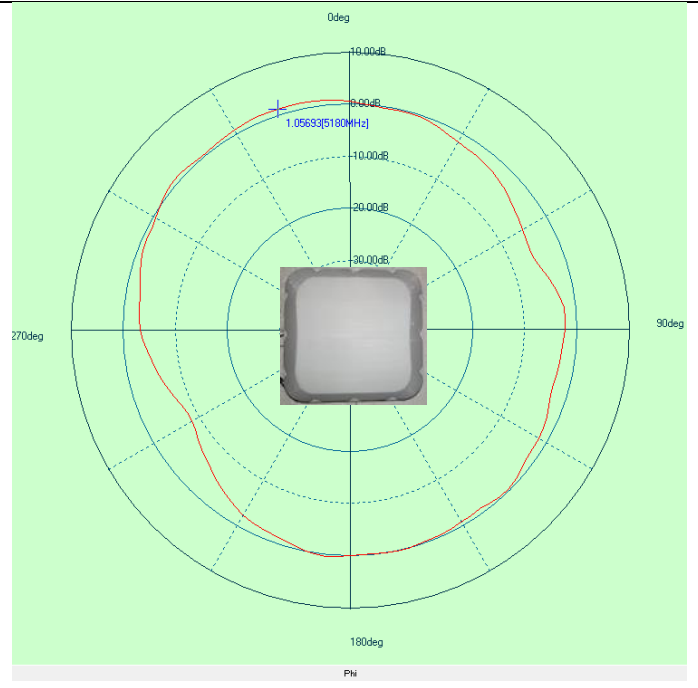
Antenna 2, 5/6 GHz horizontal
Max gain 3.2 dBi in UNII-8 band



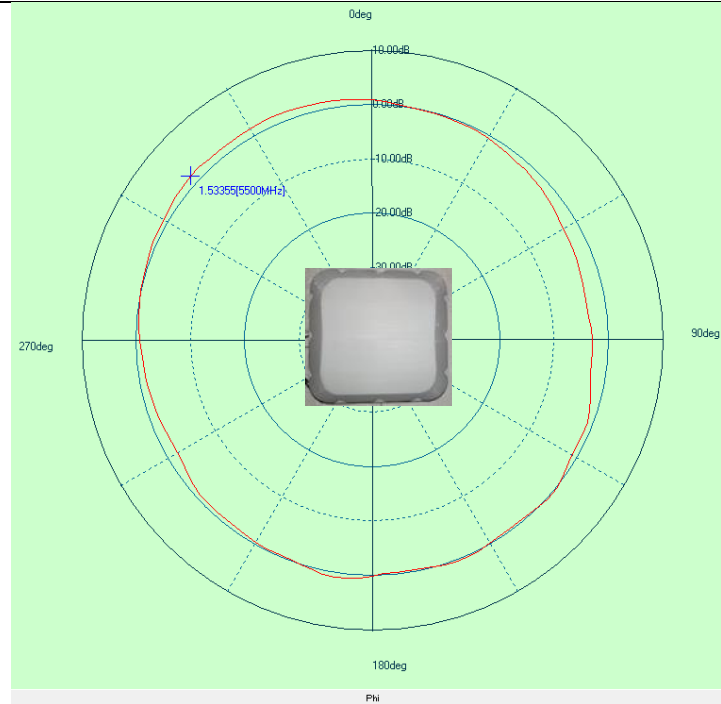
Antenna 3, dual band (2.4 and 5 GHz) horizontal
Max gain 2.0 dBi i at GHz 2.44



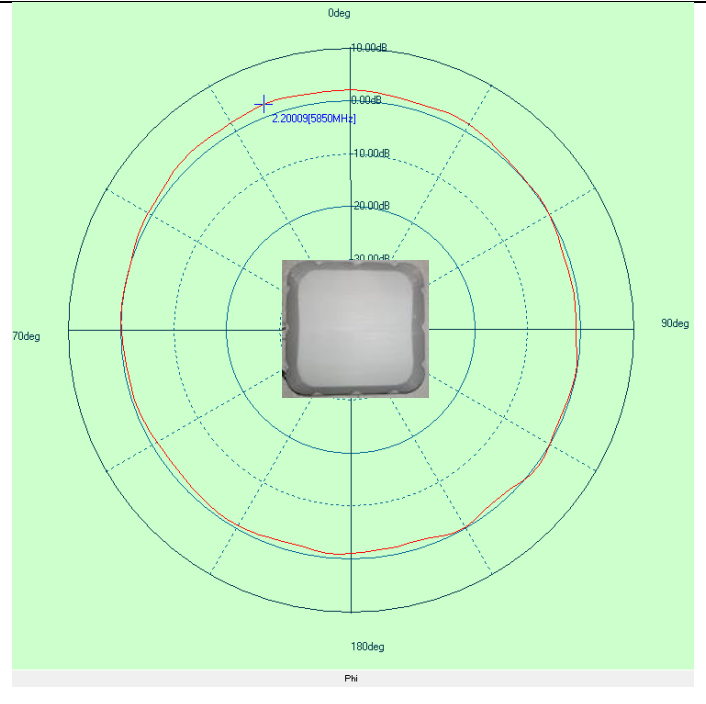
Antenna 3, dual band (2.4 and 5 GHz) horizontal
Max gain 1.1 dBi in UNII-1 band



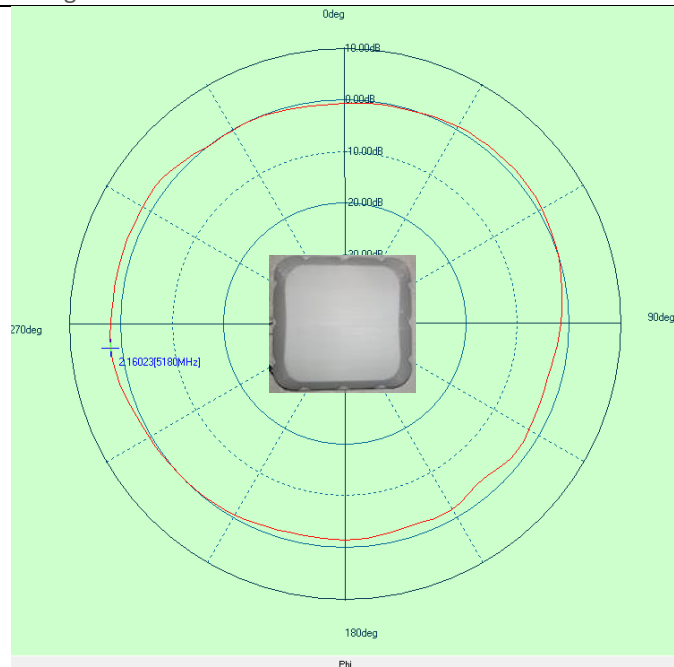
Antenna 3, dual band (2.4 and 5 GHz) horizontal
Max gain 1.5 dBi at 5.5 GHz UNII-2 band



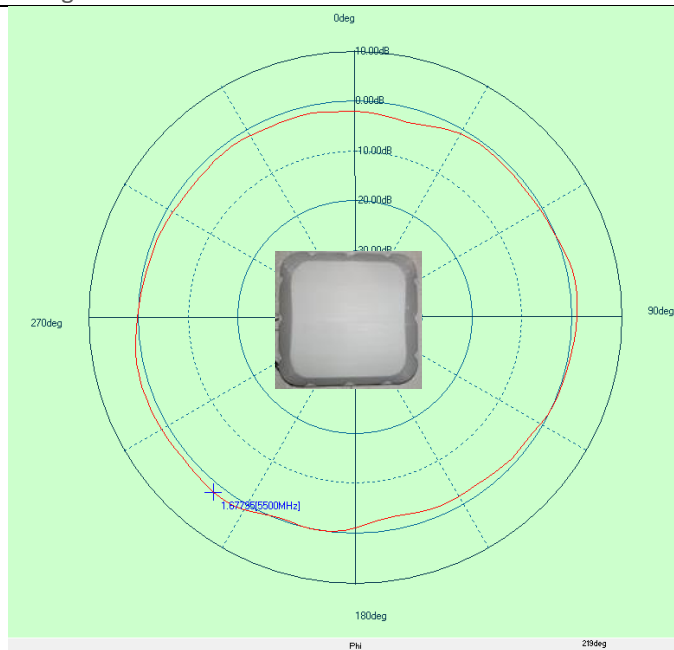
Antenna 3, dual band (2.4 and 5 GHz) horizontal
Max gain 2.2 dBi at 5.85 GHz UNII-3 band



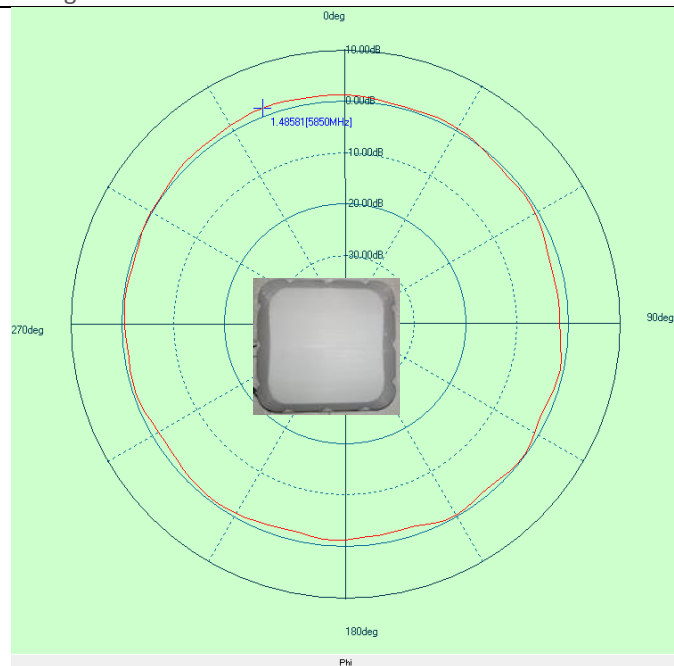
Antenna 4 5/6 vertical;
Max gain 2.1 dBi in UNII-1 band



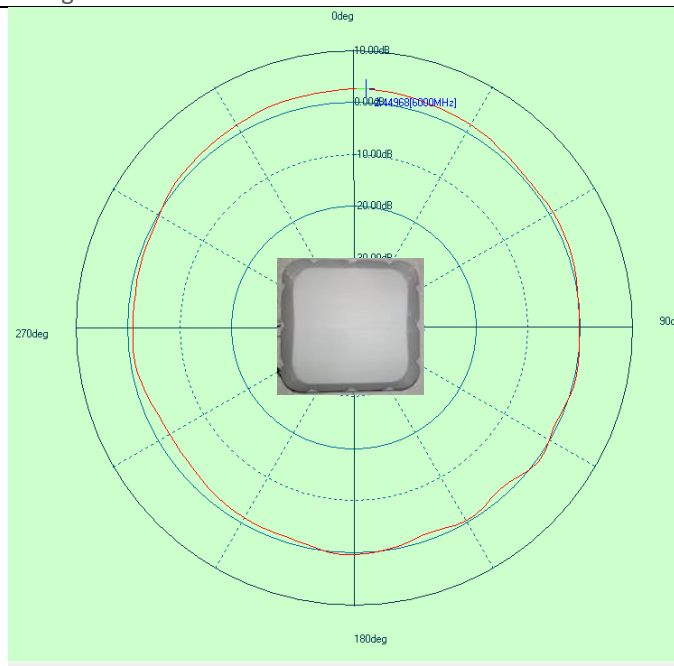
Antenna 4 5/6 vertical;
Max gain 1.7 dBi in UNII-2 band



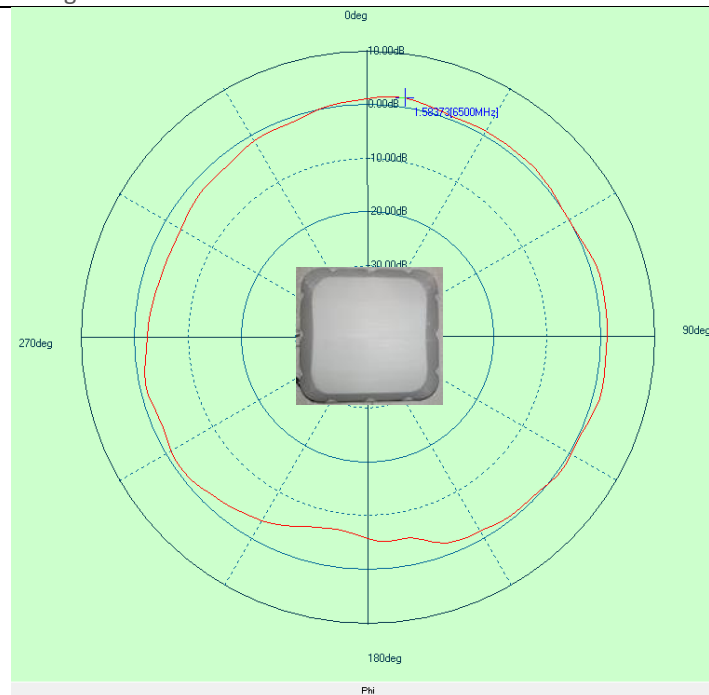
Antennas 4, 5/6 GHz vertical
Max gain 1.5 dBi in UNII-3 band



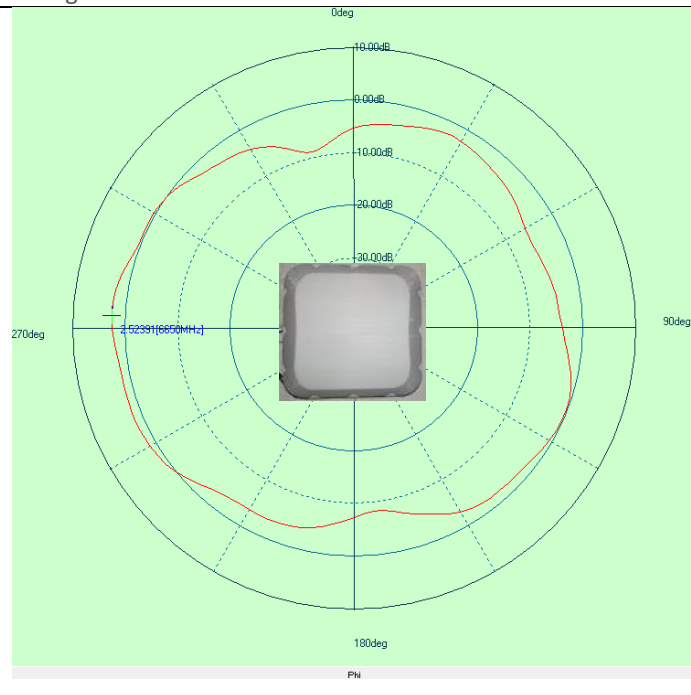
Antennas 4, 5/6 GHz vertical
Max gain 2.4 dBi in UNII-5 band



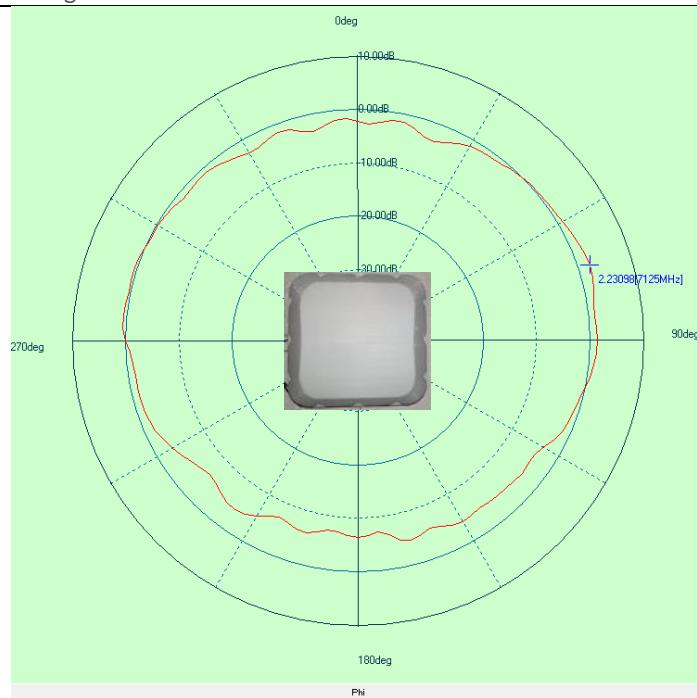
Antenna 4 5/6 vertical;
Max gain 1.6 dBi at 6500 MHz in UNII-6 band



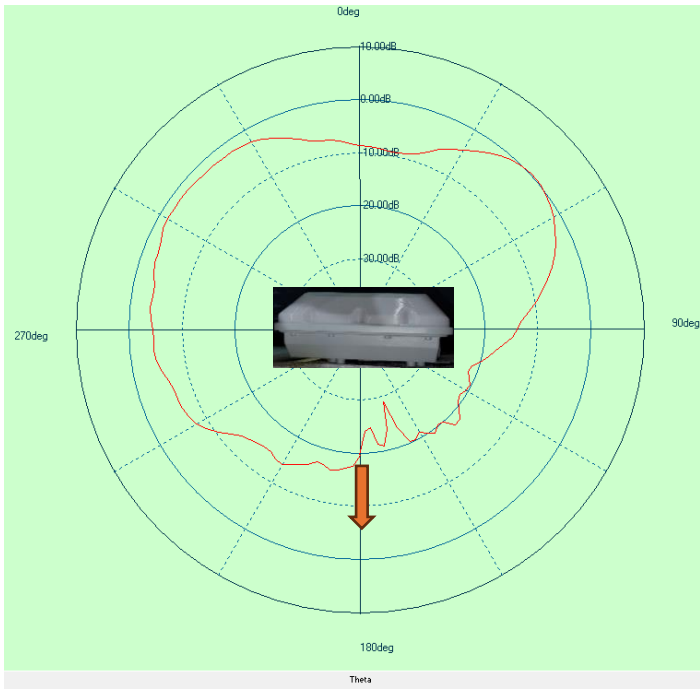
Antenna 4 5/6 vertical;
Max gain 2.5 dBi at 6650 MHz in UNII-7 band



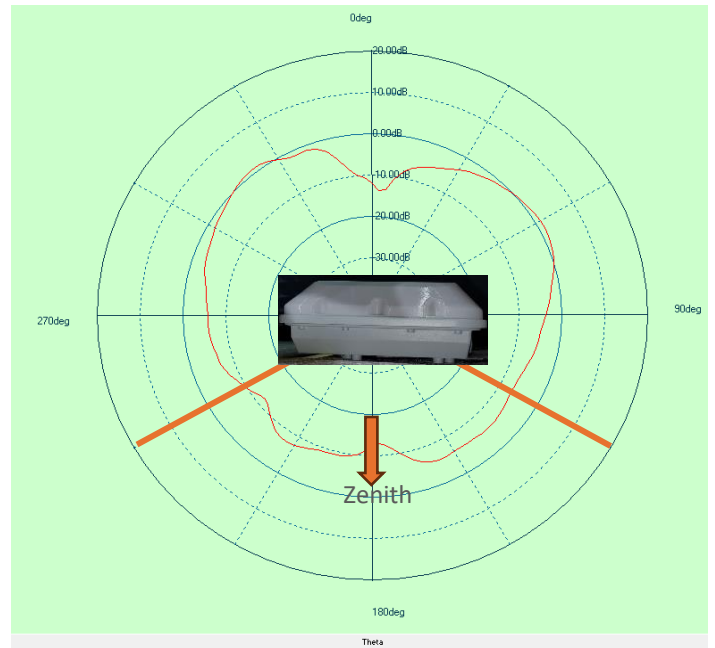
Antennas 4, 5/6 GHz vertical
Max gain 2.2 dBi at 7125 MHz in UNII-8 band



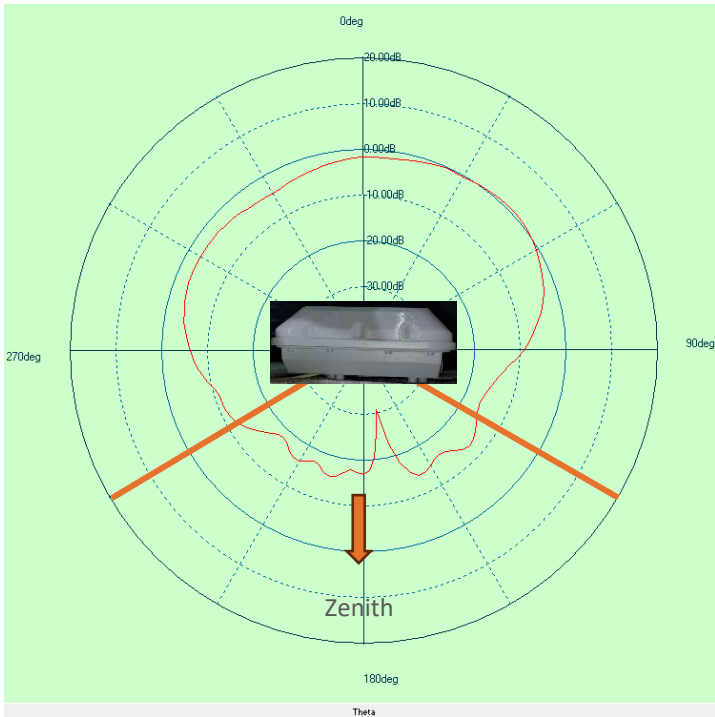
Antenna 4, Elevation, Max gain above 30 degrees above horizon in UNII-7 band -8.2 dBi; ceiling mount; shown upside down



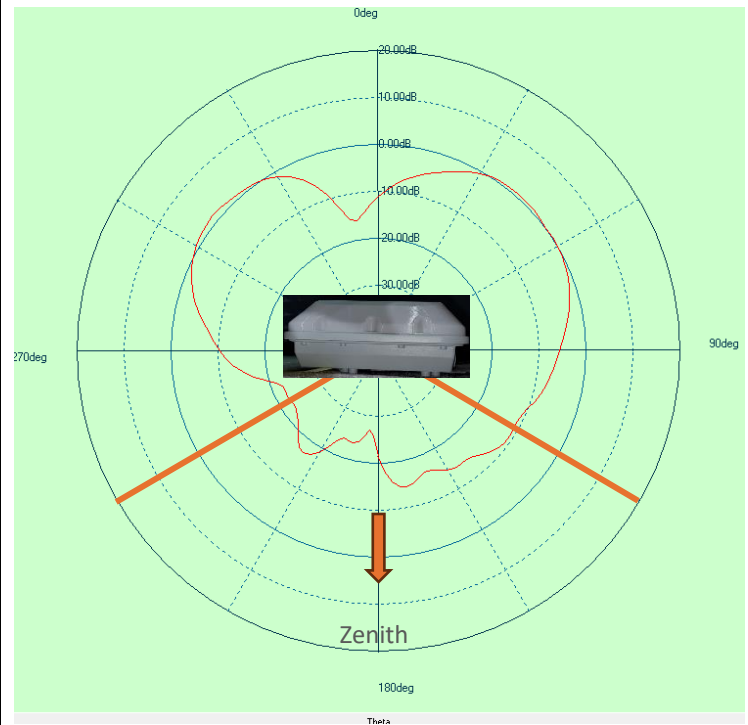
Antenna 1, Elevation, Max gain above 30 degrees above horizon in UNII-1 band -5.6 dBi; ceiling mount; shown upside down



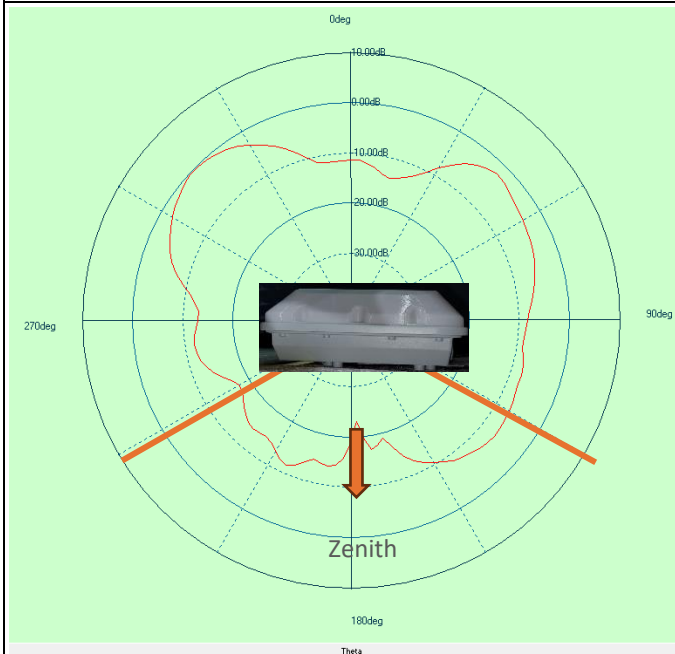
Antenna 2, Elevation, Max gain above 30 degrees above horizon in UNII-1 band -12.6 dBi; ceiling mount; shown upside down



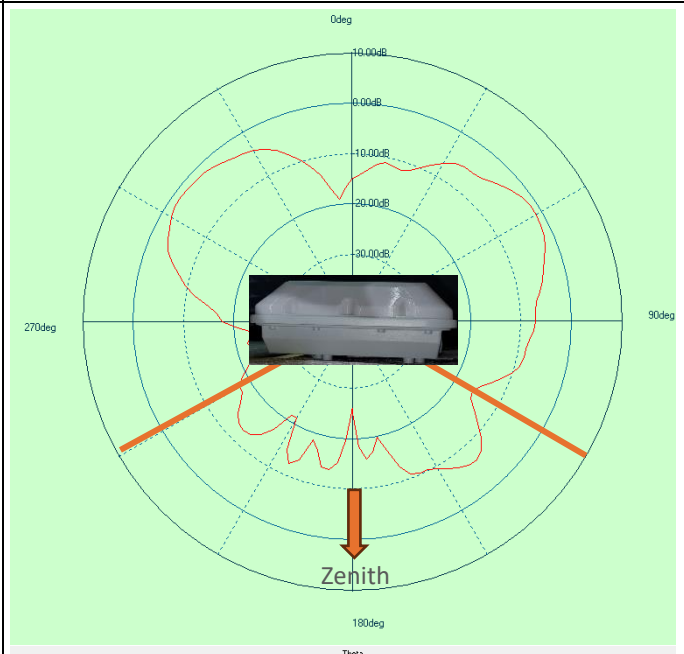
Antenna 2, Elevation, Max gain above 30 degrees above horizon in UNII-5 band -10.5 dBi; ceiling mount; shown upside down



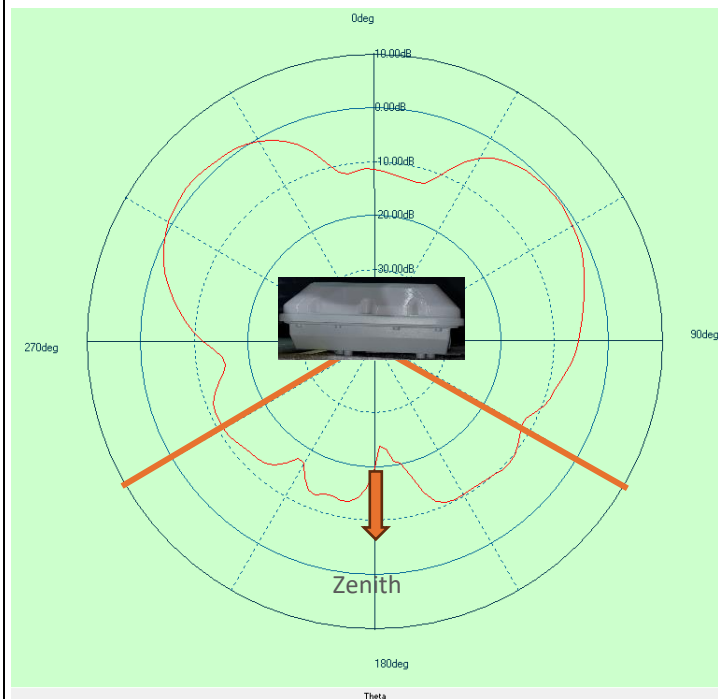
Antenna 2, Elevation, Max gain above 30 degrees above horizon in UNII-7 band -7.4 dBi; ceiling mount; shown upside down



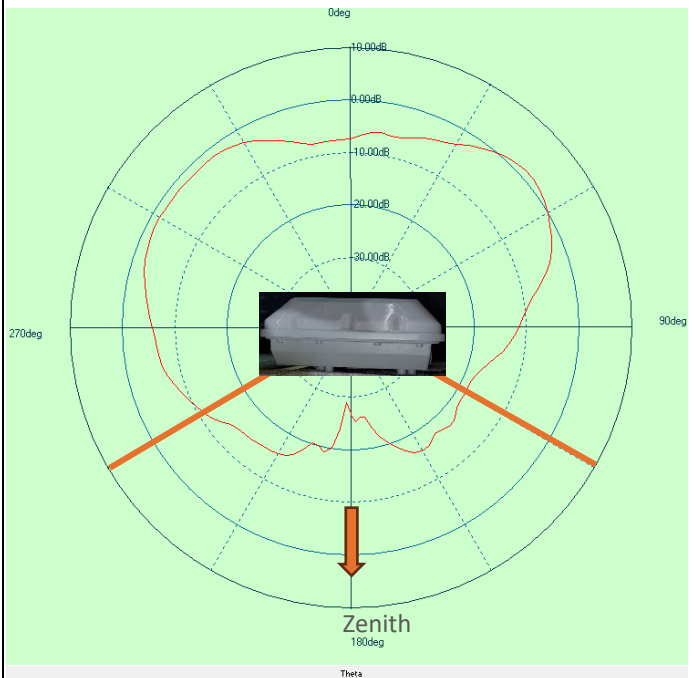
Antenna 3, Elevation, Max gain above 30 degrees above horizon in UNII-1 band -7.2 dBi; ceiling mount; shown upside down



Antenna 4, Elevation, Max gain above 30 degrees above horizon in UNII-1 band -9.8 dBi; ceiling mount; shown upside down



Antenna 4, Elevation, Max gain above 30 degrees above horizon in UNII-5 band -11.8 dBi; ceiling mount; shown upside down



Test setup pictures - MIMO anechoic chamber

