AP750NRe

Antenna PCB-000048-001-A Radiation Pattern & Gain Specifications

(Release)

Version: A

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Table of Contents

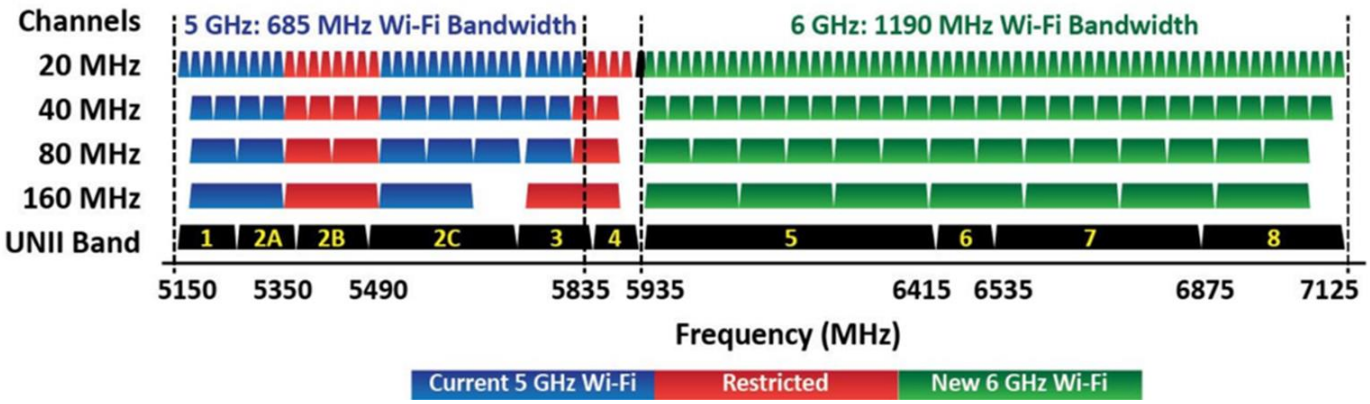
1 Overview

1.1 Preface

This document describes the radiation pattern and gain specifications for the PCB-000048-001-A, which operates in the 6 GHz UNII-5 band (5935 MHz to 6415 MHz)

The PCB-000017-000-D, has been certified to be compliant when operated with the Everest Networks 4-Radio Narrow Directional Outdoor Wi-Fi 7 Access Point AP750NRe:

Model Number: AP750NRe
HW Version: v1.x
FCCID: 2AGMR-AP750NRE
IC: ..... TBD



1.2 Contributors

Name	Role
Van Hoang Nguyen	Director of Engineering

1.3 Revision History

Version	Change Summery	Author	Date
0.1 (Draft)	Document Created	Van Hoang Nguyen	Feb. 13, 2024
1.0 Release	First release	Van Hoang Nguyen	July 12, 2024

1.4 Applicable PCB Part Numbers

Description	PCB Part Numbers
Square shape, Narrow, U-NII-5 band	PCB-000048-001-A
	PCB-000048-xxx-x

1.5 Antenna Measurements

1.5.1 Measurement methods:

Measurement is performed over the air in a shieled anechoic chamber (NSI-MI compact range 4-110GHz) and the Antenna Under Test (AUT) is operating in radiated mode.

1.5.2 Measurement equipment

Equipment	Manufacturer	Model & Serial number	Last calibration
Standard Feed Horn 1-18GHz	ETS-Lindren	#3115 / #6532	n/a
Signal source	NSI-MI	ELE-SRC-DS(1010279) / 006	November 15, 2021
Vector Field Analyser	NSI-MI	ELE-VFA-S01 (100675-S01)/034	November 29, 2021

1.5.3 Measurement setup

1.6 Photos of PCB-000048-001-A

1.6.1 Front

1.6.2 Back

1.7 AUT Descriptions and Summary

The PCB-000048-001-A consists of a dual-polarized (vertical and horizontal polarizations) directional antenna array of 4x4 microstrip patch antenna. The directional antenna array operates in the U-NII-5 band. The feeding networks compose of quadrature matrices, resulting in orthogonal radiated beams in each polarization.

Table 0: RF chains' connection to PCB-000048-001-A antenna ports.

	U-NII-5 band	
	Vertical Pol.	Horizontal Pol.
Chain 0	R4-17	
Chain 1		R4-19
Chain 2		R4-18
Chain 3	R4-20	

The maximum gain for vertical polarization, horizontal polarization and directional gain has been measured and summarized in the below table:

	U-NII-5 band	
	Vertical Pol.	Horizontal Pol.
Max. Gain	12.05 dBi	13.30 dBi
Directional Gain (DG)	0 dB	0 dB
Max. **Tested Antenna Gain**	13.3 dBi	
Certified net antenna gain (Cable and switch loss)	**11.0 dBi**	

2 PCA-000048-001-A Antenna Pattern and Gain in U-NII-5

2.1 Port R4-17 (Vertical polarization)

2.1.1 R4-17 Radiation Pattern in Elevation at 5975 MHz

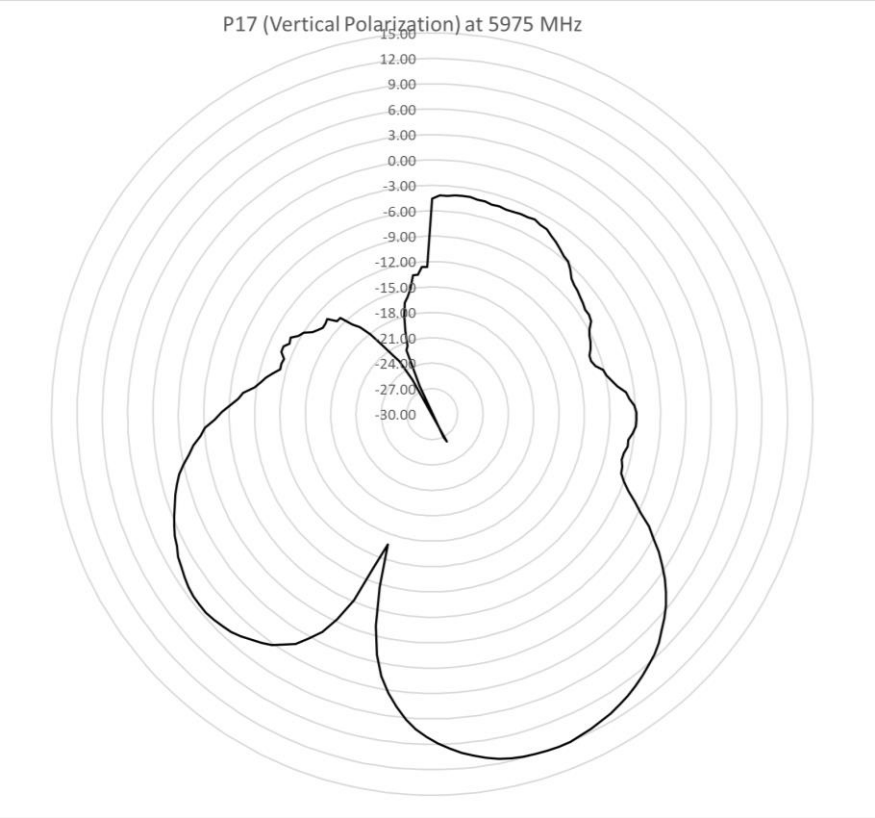


Figure 1 - Port R4-17, Vertical polarization, Elevation cut at 5975.00 MHz

2.1.2 Port R4-17 Gain table at 5975 MHz – Vertical Polarization

Angle	Gain	Angle	Gain	Angle	Gain	Angle	Gain
1	-4.56	46	-5.84	91	8.91	136	-4.24
2	-4.16	47	-5.83	92	8.16	137	-5.12
3	-4.19	48	-5.86	93	7.25	138	-6.06
4	-4.04	49	-6.18	94	6.18	139	-6.97
5	-4.01	50	-6.61	95	4.86	140	-7.50
6	-4.01	51	-6.57	96	3.35	141	-8.76
7	-4.15	52	-6.89	97	1.55	142	-9.35
8	-4.12	53	-6.97	98	-0.83	143	-9.90
9	-4.25	54	-6.71	99	-4.08	144	-10.57
10	-4.23	55	-6.58	100	-8.63	145	-11.30
11	-4.32	56	-5.97	101	-13.72	146	-11.17
12	-4.29	57	-5.10	102	-10.64	147	-11.29
13	-4.14	58	-3.93	103	-6.17	148	-10.67
14	-4.14	59	-2.68	104	-3.30	149	-10.67
15	-4.04	60	-1.12	105	-1.20	150	-11.19
16	-4.27	61	0.01	106	0.28	151	-10.99
17	-4.33	62	1.40	107	1.59	152	-11.67
18	-4.65	63	2.51	108	2.35	153	-12.04
19	-5.00	64	3.70	109	3.19	154	-12.84
20	-5.32	65	4.76	110	3.72	155	-13.22
21	-5.71	66	5.69	111	4.19	156	-13.51
22	-5.86	67	6.51	112	4.66	157	-13.44
23	-6.38	68	7.29	113	5.01	158	-13.26
24	-7.02	69	8.03	114	5.23	159	-14.30
25	-7.36	70	8.67	115	5.42	160	-14.31
26	-7.48	71	9.17	116	5.60	161	-15.79
27	-7.69	72	9.65	117	5.53	162	-16.65
28	-7.90	73	10.13	118	5.52	163	-18.07
29	-8.13	74	10.52	119	5.30	164	-20.17
30	-8.07	75	10.83	120	5.03	165	-21.72
31	-8.24	76	11.16	121	4.72	166	-22.65
32	-8.90	77	11.43	122	4.47	167	-25.32
33	-9.23	78	11.64	123	3.98	168	-33.64
34	-9.42	79	11.83	124	3.66	169	-33.02
35	-9.75	80	12.01	125	3.20	170	-26.35
36	-10.19	81	12.05	126	2.78	171	-21.86
37	-10.18	82	12.04	127	2.29	172	-21.44
38	-9.86	83	11.98	128	1.80	173	-19.66
39	-9.16	84	11.89	129	1.28	174	-17.91
40	-8.88	85	11.70	130	0.78	175	-16.41
41	-8.40	86	11.44	131	-0.01	176	-15.90
42	-7.87	87	11.07	132	-0.86	177	-15.07
43	-6.96	88	10.63	133	-1.51	178	-13.46
44	-6.61	89	10.13	134	-2.44	179	-13.45
45	-6.11	90	9.55	135	-3.05	180	-12.58

Table 1 - Port R4-17 Gain table at 5975 MHz – Vertical Polarization [1º-180º]

2.2 Port R4-19 (Horizontal polarization)

2.2.1 Port R4-19 Radiation Pattern in Elevation at 6095 MHz

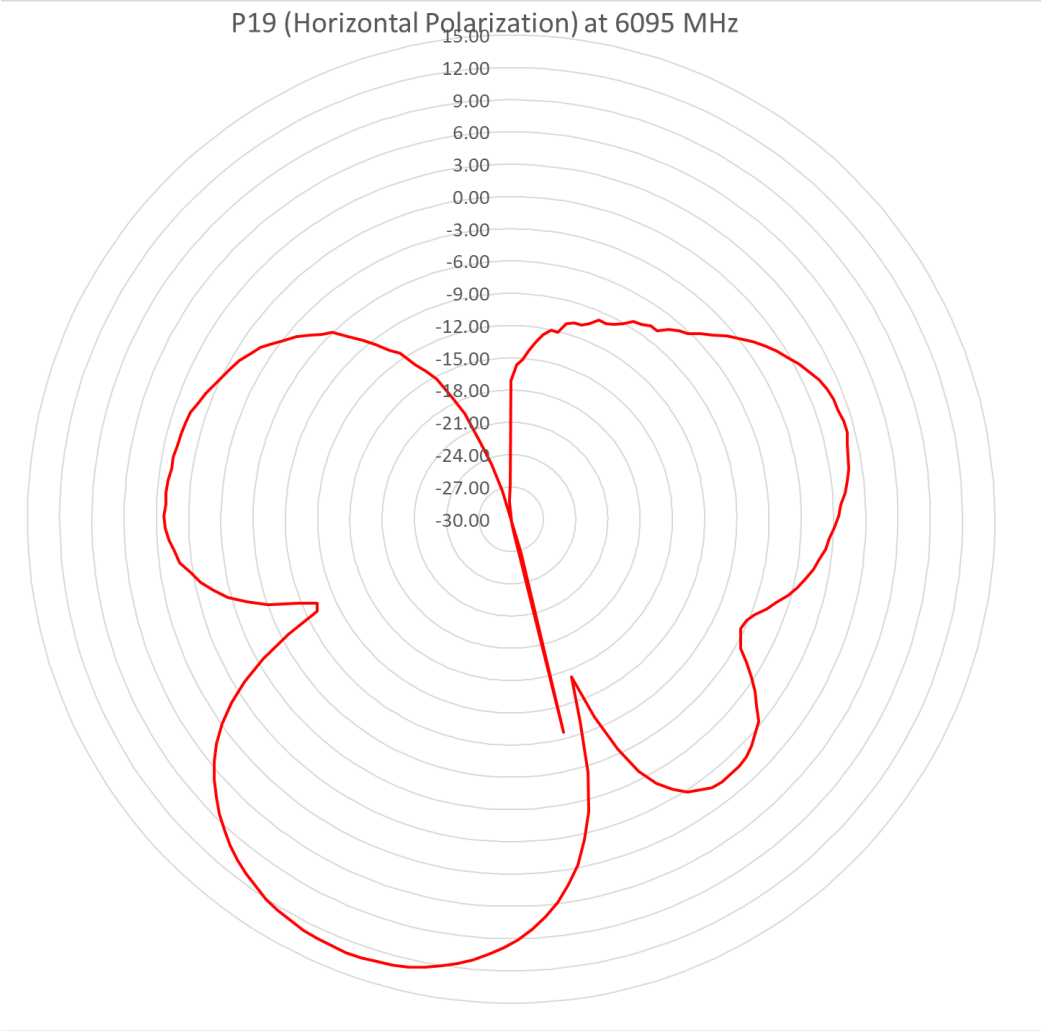


Figure 2 - Port R4-19, Horizontal polarization, Elevation cut at 6095.00 MHz

2.2.2 Port R4-19 Gain table at 6095 MHz – Horizontal Polarization

Table 2 - Port R1-2 Gain table at 5785 MHz – Horizontal Polarization [1º-180º]

2.3 Maximum Gain versus Frequency

2.3.1 Port R4-17 (Vertical Polarization) and Port R4-19 (Horizontal Polarization)

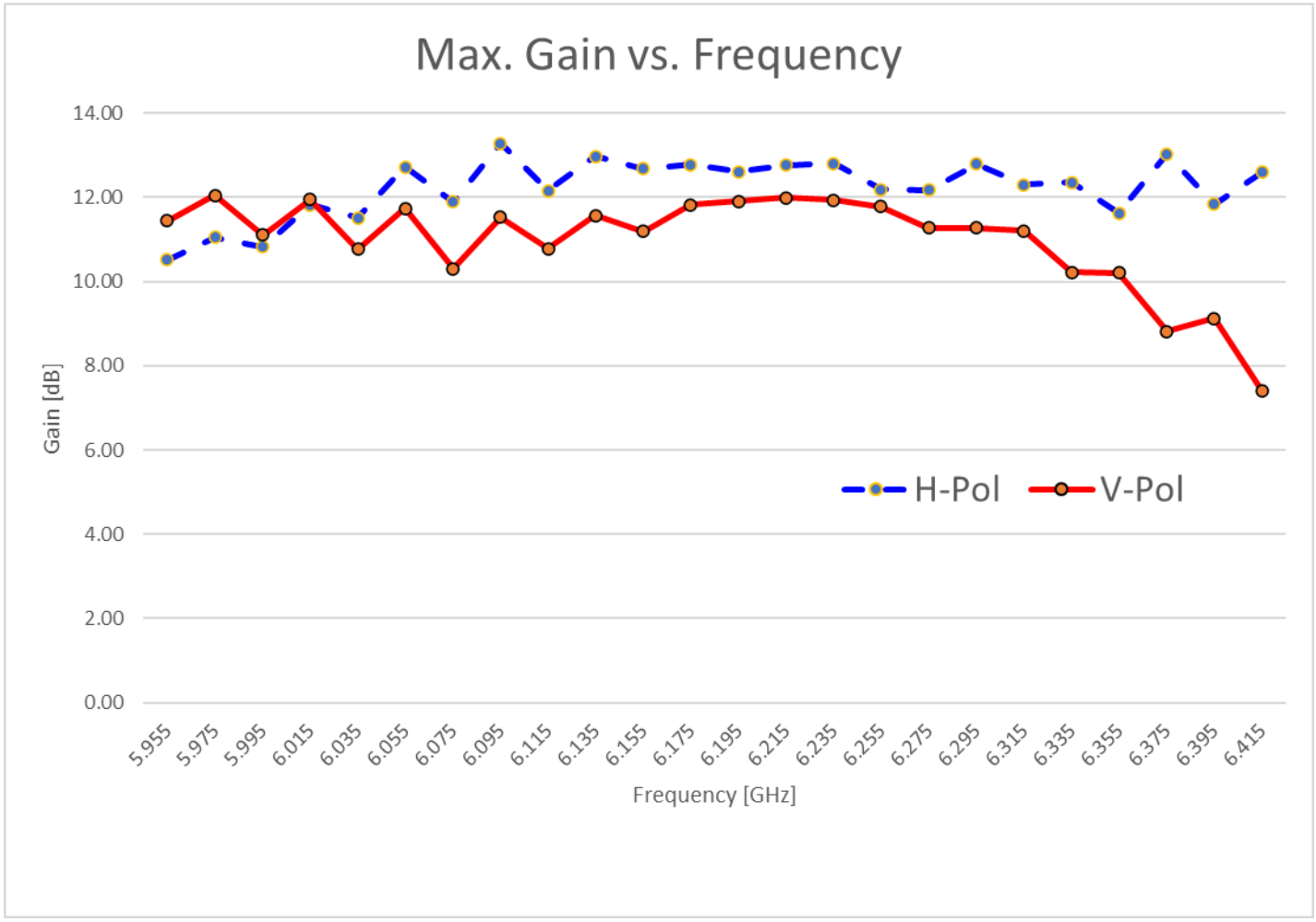


Figure 3 – Maximum Gain versus Frequency of port R4-17 (Vertical) and port R4-19 (Horizontal)

3 References

[1] FCC document KDB 662911 D01 Multiple Transmitter Output v02r01, October 31, 2013

[2] AP 10.4 Programmer's Guide, March 16, 2016