

AP750NRe
Antenna PCB-000017-000-D
Radiation Pattern & Gain
Specifications
(Release)

Version: A

Table of Contents

1	Overview	4
1.1	Preface.....	4
1.2	Contributors.....	5
1.3	Revision History	5
1.4	Applicable PCB Part Numbers	5
1.5	Antenna Measurements	5
1.5.1	<i>Measurement methods:</i>	5
1.5.2	<i>Measurement equipment:</i>	5
1.5.3	<i>Measurement setup:</i>	5
1.6	Photos of PCB-000017-000-D	6
1.6.1	<i>Front:</i>	6
1.6.2	<i>Back:</i>	6
1.7	AUT Descriptions and Summary	6
2	PCA-000017-000-D Antenna Pattern and Gain in U-NII-3	7
2.1	Port R1-1 (Vertical polarization)	7
2.1.1	<i>R1-1 Radiation Pattern in Elevation at 5785 MHz:</i>	7
2.1.2	<i>Port R1-1 Gain table at 5785 MHz – Vertical Polarization</i>	8
2.2	Port R1-2 (Horizontal polarization)	9
2.2.1	<i>Port R1-2 Radiation Pattern in Elevation at 5785 MHz</i>	9
2.2.2	<i>Port R1-2 Gain table at 5785 MHz – Horizontal Polarization</i>	10
2.3	Maximum Gain versus Frequency.....	11
2.3.1	<i>Port R1-1 (Vertical Polarization) and Port R1-2 (Horizontal Polarization)</i>	11
3	References	11

1 Overview

1.1 Preface

This document describes the radiation pattern and gain specifications for the PCB-000017-000-D, which operates in the 5 GHz UNII-3 band (5725 MHz to 5850 MHz)

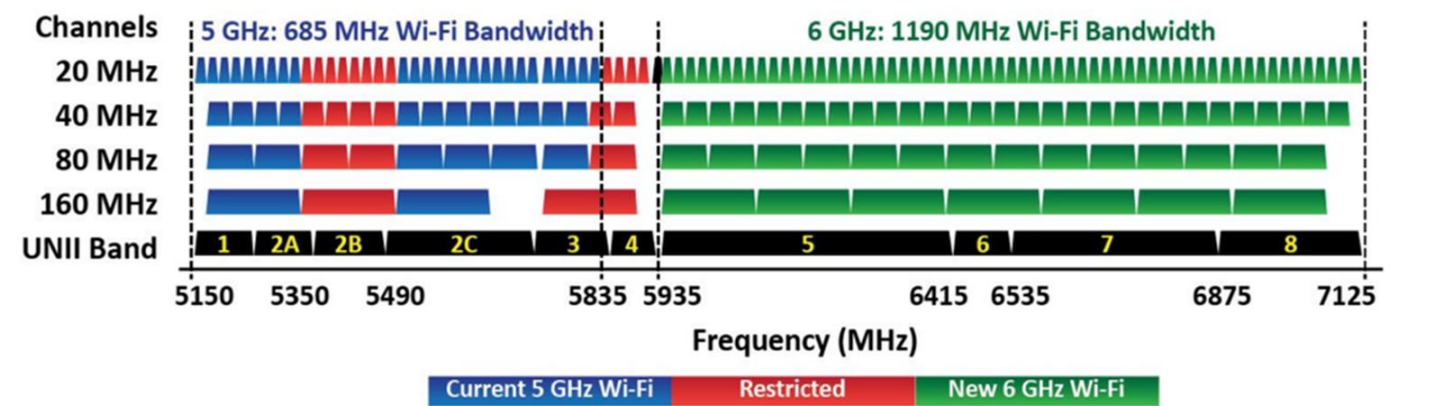
The PCB-000017-000-D, has been certified to be compliant when operated with the Everest Networks 4-Radio Narrow Directional Outdoor Wi-Fi 7 Access Point AP750NRe:

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
Rectangular shape, Narrow, U-NII-3 band	PCB-000017-000-D
	PCB-000017-xxx-x

1.5 Antenna Measurements

1.5.1 Measurement methods:

Measurement is performed over the air in a shielded 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-000017-000-D*

1.6.1 **Front**

1.6.2 **Back**

1.7 *AUT Descriptions and Summary*

The PCB-000017-000-D consists of a dual-polarized (vertical and horizontal polarizations) directional antenna array of 4x8 in the front and electronically controlled feeding networks in the back. The directional antenna array operates in the U-NII-3 band. The feeding networks compose of quadrature matrices and switches, resulting in switched and orthogonal radiated beams in each polarization.

Table 0: RF chains’ connection to U-NII-3

	U-NII-3	
	Vertical Pol.	Horizontal Pol.
Chain 0	R1-1	
Chain 1		R1-2
Chain 2		R1-3
Chain 3	R1-4	

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

	U-NII-3 band	
	Vertical Pol.	Horizontal Pol.
Max. Gain	11.76 dBi	8.88 dBi
Directional Gain (DG)	0 dB	0 dB
Max. Tested Antenna Gain	11.5 dBi	
Certified net antenna gain (Cable and switch loss)	9.0 dBi	

2 PCA-000017-000-D Antenna Pattern and Gain in U-NII-3

2.1 Port R1-1 (Vertical polarization)

2.1.1 R1-1 Radiation Pattern in Elevation at 5785 MHz

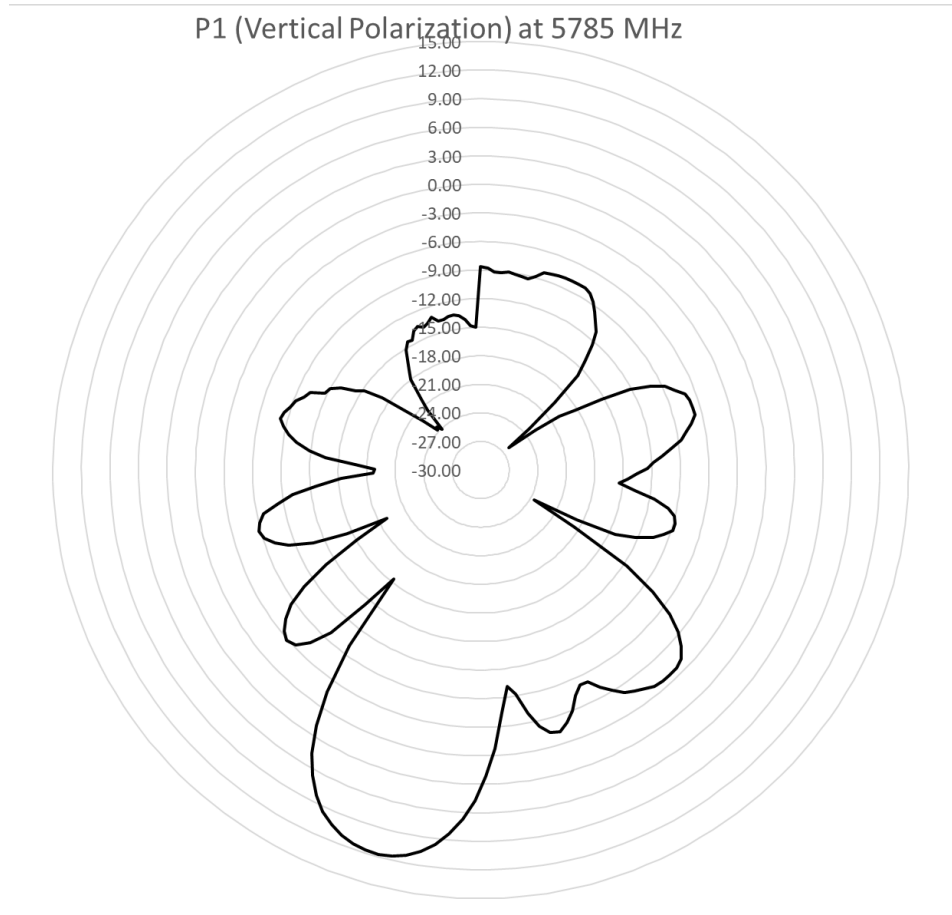


Figure 1 - Port R1-1, Vertical polarization, Elevation cut at 5785.00 MHz

2.1.2 Port R1-1 Gain table at 5785 MHz – Vertical Polarization

Angle	Gain	Angle	Gain	Angle	Gain	Angle	Gain
1	-8.66	46	-12.48	91	2.15	136	-18.69
2	-8.80	47	-13.62	92	4.72	137	-18.83
3	-9.12	48	-14.49	93	6.73	138	-16.80
4	-9.12	49	-15.40	94	8.38	139	-13.59
5	-8.96	50	-13.62	95	9.65	140	-11.85
6	-9.10	51	-11.48	96	10.54	141	-10.38
7	-9.19	52	-9.85	97	11.22	142	-9.45
8	-9.27	53	-9.06	98	11.60	143	-8.76
9	-8.89	54	-8.83	99	11.76	144	-8.24
10	-8.23	55	-8.84	100	11.72	145	-8.49
11	-8.16	56	-9.59	101	11.45	146	-8.91
12	-7.98	57	-10.58	102	11.03	147	-9.20
13	-7.93	58	-12.19	103	10.41	148	-9.92
14	-7.93	59	-14.29	104	9.49	149	-10.28
15	-7.92	60	-18.62	105	8.29	150	-11.73
16	-7.95	61	-23.57	106	6.65	151	-12.03
17	-8.21	62	-18.54	107	4.60	152	-12.94
18	-8.74	63	-11.62	108	1.96	153	-14.46
19	-9.51	64	-7.83	109	-1.63	154	-15.21
20	-10.28	65	-5.04	110	-6.97	155	-17.12
21	-11.08	66	-3.16	111	-15.37	156	-19.92
22	-12.34	67	-1.90	112	-11.39	157	-22.05
23	-14.07	68	-1.08	113	-6.75	158	-23.80
24	-15.80	69	-0.78	114	-4.53	159	-23.51
25	-19.47	70	-0.67	115	-3.25	160	-24.11
26	-23.25	71	-0.72	116	-2.87	161	-21.59
27	-26.25	72	-0.81	117	-3.25	162	-20.30
28	-22.86	73	-1.29	118	-4.23	163	-17.94
29	-19.98	74	-1.70	119	-5.58	164	-17.08
30	-18.18	75	-2.16	120	-7.76	165	-16.10
31	-15.31	76	-3.06	121	-10.96	166	-15.15
32	-12.15	77	-3.95	122	-15.10	167	-14.48
33	-10.20	78	-5.05	123	-18.91	168	-14.60
34	-8.69	79	-5.18	124	-14.45	169	-13.81
35	-7.94	80	-4.30	125	-10.78	170	-13.54
36	-7.03	81	-2.89	126	-8.36	171	-13.81
37	-6.83	82	-1.97	127	-7.06	172	-13.58
38	-6.76	83	-1.31	128	-6.12	173	-13.15
39	-6.77	84	-1.52	129	-5.76	174	-13.72
40	-7.33	85	-2.41	130	-6.06	175	-13.74
41	-8.08	86	-3.99	131	-6.71	176	-13.55
42	-8.72	87	-6.16	132	-8.35	177	-13.42
43	-9.86	88	-7.10	133	-10.05	178	-13.64
44	-10.91	89	-4.45	134	-12.66	179	-14.10
45	-11.77	90	-0.71	135	-15.29	180	-14.81

Table 1 - Port R1-1 Gain table at 5785 MHz – Vertical Polarization [1°-180°]

2.2 Port R1-2 (Horizontal polarization)

2.2.1 Port R1-2 Radiation Pattern in Elevation at 5785 MHz

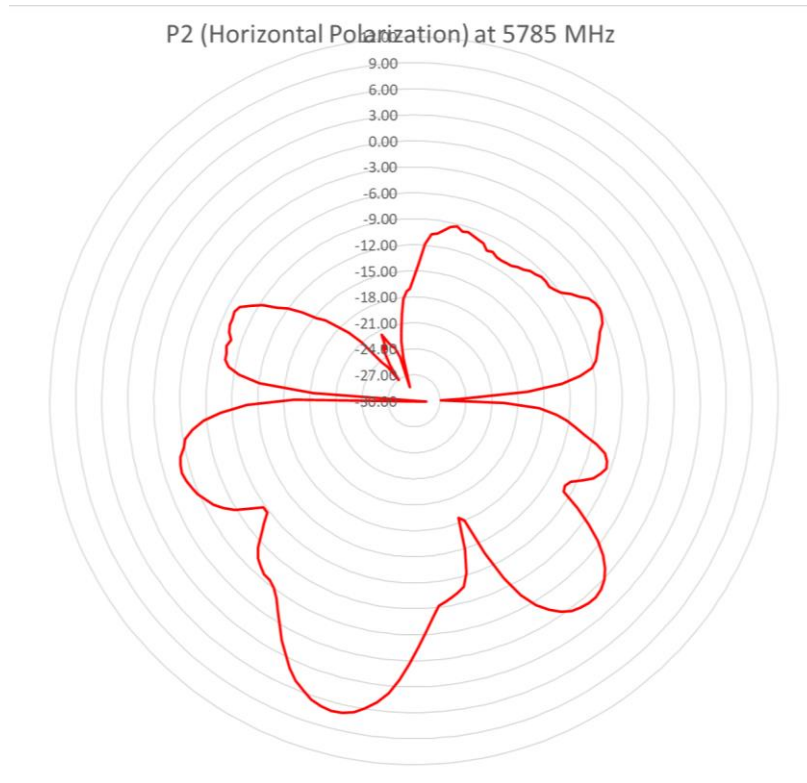


Figure 2 - Port R1-2, Horizontal polarization, Elevation cut at 5785.00 MHz

2.2.2 Port R1-2 Gain table at 5785 MHz – Horizontal Polarization

Angle	Gain	Angle	Gain	Angle	Gain	Angle	Gain
1	-15.79	46	-26.91	91	-1.54	136	-10.73
2	-13.99	47	-19.60	92	0.43	137	-16.18
3	-11.87	48	-15.54	93	2.26	138	-31.41
4	-10.65	49	-13.49	94	3.84	139	-18.36
5	-10.53	50	-12.24	95	5.03	140	-12.06
6	-9.99	51	-11.02	96	5.93	141	-9.61
7	-9.49	52	-9.91	97	6.62	142	-8.23
8	-9.24	53	-8.36	98	6.94	143	-7.74
9	-9.69	54	-7.18	99	7.03	144	-7.71
10	-9.54	55	-6.65	100	6.84	145	-7.50
11	-9.79	56	-6.45	101	6.46	146	-7.74
12	-9.99	57	-6.93	102	5.81	147	-7.24
13	-10.16	58	-7.45	103	5.05	148	-7.03
14	-10.70	59	-8.57	104	4.05	149	-7.02
15	-10.52	60	-9.62	105	2.84	150	-6.86
16	-10.84	61	-10.03	106	1.59	151	-7.16
17	-10.94	62	-9.81	107	0.23	152	-8.24
18	-10.82	63	-7.43	108	-1.09	153	-9.37
19	-10.80	64	-5.31	109	-2.23	154	-10.92
20	-10.48	65	-3.31	110	-3.01	155	-11.95
21	-10.27	66	-1.86	111	-3.47	156	-13.53
22	-9.93	67	-0.70	112	-3.52	157	-15.30
23	-9.75	68	0.12	113	-3.96	158	-16.12
24	-9.54	69	0.64	114	-4.42	159	-17.88
25	-9.49	70	0.86	115	-5.35	160	-19.15
26	-9.60	71	0.86	116	-6.61	161	-20.95
27	-9.30	72	0.63	117	-7.70	162	-24.18
28	-8.93	73	0.29	118	-8.74	163	-25.05
29	-8.10	74	-0.35	119	-8.72	164	-26.99
30	-7.48	75	-1.26	120	-7.28	165	-25.06
31	-6.64	76	-2.50	121	-5.85	166	-23.96
32	-6.29	77	-4.39	122	-4.74	167	-22.68
33	-6.10	78	-7.05	123	-3.92	168	-23.23
34	-6.25	79	-10.60	124	-3.38	169	-21.49
35	-6.52	80	-15.03	125	-2.83	170	-22.66
36	-7.15	81	-15.53	126	-2.48	171	-23.23
37	-7.53	82	-11.78	127	-2.20	172	-23.49
38	-7.86	83	-9.24	128	-1.98	173	-24.65
39	-8.17	84	-7.82	129	-2.04	174	-28.35
40	-8.52	85	-7.26	130	-2.30	175	-24.89
41	-9.11	86	-6.88	131	-2.90	176	-22.97
42	-10.63	87	-6.52	132	-3.27	177	-21.71
43	-12.84	88	-6.17	133	-4.21	178	-19.88
44	-16.86	89	-4.91	134	-5.63	179	-18.19
45	-24.71	90	-3.35	135	-7.65	180	-17.36

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

2.3 Maximum Gain versus Frequency

2.3.1 Port R1-1 (Vertical Polarization) and Port R1-2 (Horizontal Polarization)

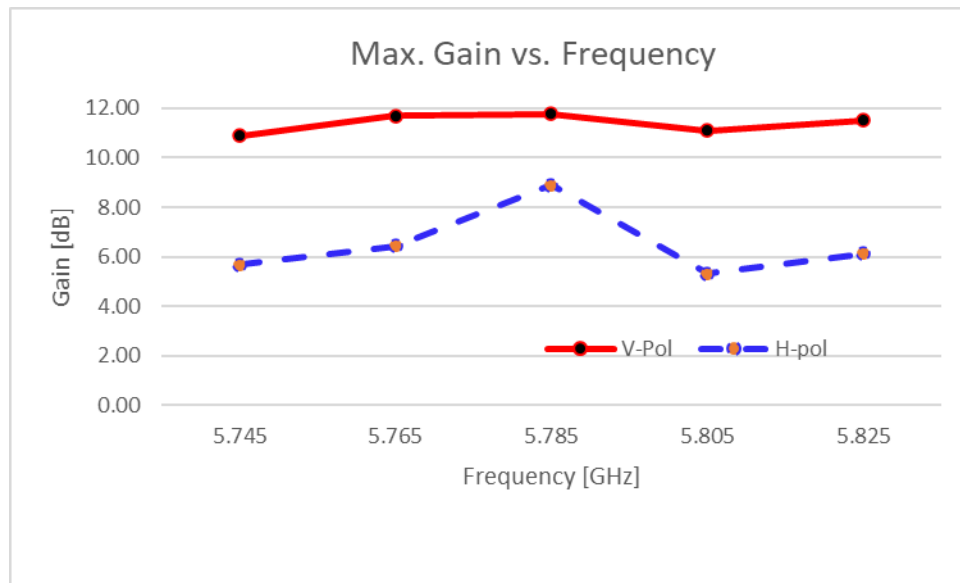


Figure 3 – Maximum Gain versus Frequency of port R1-1 (Vertical) and port R1-2 (Horizontal)

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