A Test Lab Techno Corp.

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MPE Report

Test Report No.	：	1510FS14
Applicant	：	Ubiquiti Networks,Inc.
Manufacturer	：	Ubiquiti Networks,Inc.
Product Type	：	Access Point
Trade Name	：	UBIQUITI
Model Number	：	UAP-AC-PRO
Date of Received	：	Apr. 08, 2015
Test Period	：	Jul. 09, 2015
Date of Issued	：	Nov. 04, 2015
Test Specification	：	IEEE Std. 1528-2013
		47 CFR § 2.1091
		47 CFR §1.1310
		ANSI / IEEE Std.C95.1-1992
Location of Test Lab.	：	Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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4. This document may be altered or revised by A Test Lab Techno. Corp. personnel only, and shall be noted in the revision section of the document.

Approved By ： (Bill Hu)　　Tested By ： (Sky Chou)

Contents

1. Description of Equipment under Test (EUT)

Applicant	Ubiquiti Networks,Inc. 2580 Orchard Parkway,San Jose,California,United States,95131
Manufacturer	Ubiquiti Networks,Inc. 2580 Orchard Parkway,San Jose,California,United States,95131
Product Type	Access Point
Trade Name	UBIQUITI
Model Number	UAP-AC-PRO
FCC ID	SWX-UAPACPRO
Class II Permissive Change	Add U-NII Band II function by software control. The change reference Class II Permissive Change Letter in detail.
Frequency Range	IEEE 802.11a Band II-A : 5260 ~ 5320 MHz IEEE 802.11a Band II-C : 5500 ~ 5700 MHz IEEE 802.11n 5GHz 20MHz Band II-A : 5260 ~ 5320 MHz IEEE 802.11n 5GHz 20MHz Band II-C : 5500 ~ 5700 MHz IEEE 802.11n 5GHz 40MHz Band II-A : 5270 ~ 5310 MHz IEEE 802.11n 5GHz 40MHz Band II-C : 5510 ~ 5670 MHz IEEE 802.11ac 80MHz Band II-A : 5290 MHz IEEE 802.11ac 80MHz Band II-C : 5530 ~ 5610 MHz
Transmit Power (conducted power)	IEEE 802.11a Band II-A : 0.148 W / 21.72 dBm IEEE 802.11a Band II-C : 0.186 W / 22.69 dBm IEEE 802.11n 5GHz 20MHz Band II-A : 0.184 W / 22.64 dBm IEEE 802.11n 5GHz 20MHz Band II-C : 0.187 W / 22.72 dBm IEEE 802.11n 5GHz 40MHz Band II-A : 0.061 W / 17.82 dBm IEEE 802.11n 5GHz 40MHz Band II-C : 0.158 W / 21.98 dBm IEEE 802.11ac 80MHz Band II-A : 0.068 W / 18.32 dBm IEEE 802.11ac 80MHz Band II-C : 0.088 W / 19.44 dBm
Antenna Type	Dual-Band Antennas
Max. Antenna Gain	3 dBi
Antenna Delivery	3TX + 3RX
Temperature Range	-10 ~ 70 ℃
RF Evaluation	0.85 W/m^2

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 & 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties

2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR §1.1310 titled “Radiofrequency radiation exposure limits”, generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as “a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter’s radiating structure(s) and the body of the user or nearby persons. ” This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: “IMPORTANT: To meet the FCC’s RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna”. Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a “mobile device” as defined in section § 2.1091 paragraph (b).

Exposure evaluation
$$S = \frac{PG}{4\pi R^2}$$ Where S: power density P: power input to the antenna G: power gain of the antenna in the direction of interest relative to an isotropic radiator. R: distance to the center of radiation of the antenna.

3. RF Output Power

Freq. Band	Data Rate	Frequency (MHz)	Average Conducted Power							
			Antenna 0		Antenna 1		Antenna 2		Antenna 0+1+2	
			(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
IEEE 802.11a	6M	5260.0	16.32	0.043	16.27	0.042	15.64	0.037	20.86	0.122
		5280.0	16.64	0.046	16.39	0.044	15.77	0.038	21.05	0.127
		5300.0	16.95	0.050	16.80	0.048	16.12	0.041	21.41	0.138
		5320.0	17.18	0.052	17.15	0.052	16.47	0.044	21.72	0.148
		5500.0	18.02	0.063	18.01	0.063	17.71	0.059	22.69	0.186
		5520.0	17.84	0.061	17.54	0.057	17.36	0.054	22.36	0.172
		5540.0	17.60	0.058	17.45	0.056	17.35	0.054	22.24	0.167
		5560.0	17.40	0.055	17.33	0.054	17.27	0.053	22.10	0.162
		5580.0	17.23	0.053	17.22	0.053	16.97	0.050	21.91	0.155
		5600.0	17.08	0.051	17.05	0.051	16.80	0.048	21.75	0.150
		5620.0	16.92	0.049	16.87	0.049	16.64	0.046	21.58	0.144
		5640.0	16.76	0.047	16.67	0.046	16.61	0.046	21.45	0.140
		5660.0	17.10	0.051	16.87	0.049	16.75	0.047	21.68	0.147
		5680.0	17.20	0.052	16.85	0.048	16.84	0.048	21.74	0.149
		5700.0	17.66	0.058	17.13	0.052	16.87	0.049	22.00	0.159
	54M	5260.0	16.22	0.042	15.80	0.038	15.34	0.034	20.57	0.114
		5280.0	16.04	0.040	15.92	0.039	15.26	0.034	20.52	0.113
		5300.0	16.39	0.044	16.26	0.042	15.78	0.038	20.92	0.124
		5320.0	16.75	0.047	16.63	0.046	15.93	0.039	21.22	0.133
		5500.0	17.65	0.058	17.62	0.058	17.32	0.054	22.30	0.170
		5520.0	17.48	0.056	17.25	0.053	17.04	0.051	22.03	0.160
		5540.0	17.06	0.051	17.02	0.050	16.96	0.050	21.78	0.151
		5560.0	16.93	0.049	16.87	0.049	16.80	0.048	21.64	0.146
		5580.0	16.79	0.048	16.63	0.046	16.58	0.045	21.44	0.139
		5600.0	16.69	0.047	16.65	0.046	16.48	0.044	21.38	0.137
		5620.0	16.48	0.044	16.43	0.044	16.16	0.041	21.13	0.130
		5640.0	16.31	0.043	16.22	0.042	15.97	0.040	20.94	0.124
		5660.0	16.66	0.046	16.43	0.044	16.11	0.041	21.18	0.131
		5680.0	16.71	0.047	16.39	0.044	16.38	0.043	21.27	0.134
		5700.0	17.22	0.053	16.67	0.046	16.58	0.045	21.60	0.145

Freq. Band	Data Rate	Frequency (MHz)	Average Conducted Power							
			Antenna 0		Antenna 1		Antenna 2		Antenna 0+1+2	
			(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
IEEE 802.11n 5GHz 20MHz	19.5M	5260.0	17.37	0.055	17.23	0.053	16.54	0.045	21.83	0.153
		5280.0	17.84	0.061	17.59	0.057	16.98	0.050	22.26	0.168
		5300.0	17.91	0.062	17.82	0.061	17.05	0.051	22.38	0.173
		5320.0	18.16	0.065	18.08	0.064	17.32	0.054	22.64	0.184
		5500.0	18.04	0.064	17.97	0.063	17.84	0.061	22.72	0.187
		5520.0	17.78	0.060	17.59	0.057	17.55	0.057	22.41	0.174
		5540.0	17.58	0.057	17.52	0.056	17.48	0.056	22.30	0.170
		5560.0	17.46	0.056	17.27	0.053	17.09	0.051	22.05	0.160
		5580.0	17.33	0.054	17.15	0.052	17.06	0.051	21.95	0.157
		5600.0	17.20	0.052	16.89	0.049	16.60	0.046	21.67	0.147
		5620.0	16.91	0.049	16.71	0.047	16.64	0.046	21.53	0.142
		5640.0	16.96	0.050	16.63	0.046	16.54	0.045	21.48	0.141
		5660.0	16.84	0.048	16.76	0.047	16.74	0.047	21.55	0.143
		5680.0	17.20	0.052	17.05	0.051	16.98	0.050	21.85	0.153
		5700.0	17.59	0.057	17.35	0.054	17.23	0.053	22.16	0.165
	195M	5260.0	16.90	0.049	16.80	0.048	16.17	0.041	21.41	0.138
		5280.0	17.44	0.055	16.89	0.049	16.49	0.045	21.73	0.149
		5300.0	17.39	0.055	17.23	0.053	16.64	0.046	21.87	0.154
		5320.0	17.93	0.062	17.65	0.058	17.30	0.054	22.41	0.174
		5500.0	17.65	0.058	17.53	0.057	17.43	0.055	22.31	0.170
		5520.0	17.43	0.055	17.20	0.052	16.91	0.049	21.96	0.157
		5540.0	17.22	0.053	17.14	0.052	17.04	0.051	21.91	0.155
		5560.0	17.04	0.051	16.96	0.050	16.67	0.046	21.66	0.147
		5580.0	16.92	0.049	16.72	0.047	16.63	0.046	21.53	0.142
		5600.0	16.80	0.048	16.43	0.044	16.31	0.043	21.29	0.135
		5620.0	16.51	0.045	16.39	0.044	16.31	0.043	21.18	0.131
		5640.0	16.53	0.045	16.42	0.044	16.15	0.041	21.14	0.130
		5660.0	16.35	0.043	16.26	0.042	16.13	0.041	21.02	0.126
		5680.0	16.70	0.047	16.38	0.043	16.24	0.042	21.22	0.132
		5700.0	17.26	0.053	17.01	0.050	16.93	0.049	21.84	0.153

Freq. Band	Data Rate	Frequency (MHz)	Average Conducted Power							
			Antenna 0		Antenna 1		Antenna 2		Antenna 0+1+2	
			(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
IEEE 802.11n 5GHz 40MHz	40.5M	5270.0	12.78	0.019	12.67	0.018	11.93	0.016	17.25	0.053
		5310.0	13.40	0.022	13.22	0.021	12.48	0.018	17.82	0.061
		5510.0	17.37	0.055	17.25	0.053	17.01	0.050	21.98	0.158
		5550.0	16.97	0.050	16.89	0.049	16.81	0.048	21.66	0.147
		5590.0	16.71	0.047	16.66	0.046	16.43	0.044	21.37	0.137
		5630.0	16.34	0.043	16.28	0.042	16.14	0.041	21.03	0.127
		5670.0	16.35	0.043	16.25	0.042	16.18	0.041	21.03	0.127
	405M	5270.0	12.32	0.017	12.26	0.017	11.53	0.014	16.82	0.048
		5310.0	13.03	0.020	12.73	0.019	12.04	0.016	17.39	0.055
		5510.0	16.86	0.049	16.78	0.048	16.58	0.045	21.51	0.142
		5550.0	16.48	0.044	16.42	0.044	16.33	0.043	21.18	0.131
		5590.0	16.11	0.041	16.03	0.040	15.87	0.039	20.78	0.120
		5630.0	15.73	0.037	15.64	0.037	15.61	0.036	20.43	0.110
		5670.0	15.82	0.038	15.75	0.038	15.72	0.037	20.53	0.113

Freq. Band	Data Rate	Frequency (MHz)	Average Conducted Power							
			Antenna 0		Antenna 1		Antenna 2		Antenna 0+1+2	
			(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
IEEE 802.11ac 80MHz	87.9M	5270.0	13.86	0.024	13.76	0.024	12.99	0.020	18.32	0.068
		5310.0	14.69	0.029	14.67	0.029	14.65	0.029	19.44	0.088
		5510.0	14.25	0.027	14.20	0.026	14.17	0.026	18.98	0.079
	1170M	5270.0	13.66	0.023	13.43	0.022	12.64	0.018	18.04	0.064
		5310.0	14.48	0.028	14.34	0.027	14.30	0.027	19.15	0.082
		5510.0	14.15	0.026	13.74	0.024	13.66	0.023	18.63	0.073

4. Test Result

Freq. Band	Data Rate	Frequency (MHz)	Limit (mw/cm^2)	Distance (cm) [R]	Max Tune-up power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G] (dBi)	Duty Cycle	[P] x [G] With Duty Cycle (mW) [TP]	Power Density [S] (mw/cm^2)
IEEE 802.11a (MIMO)	6M	5260	1	20	22.8	3	2	1	381.09	0.076
		5280	1	20	22.8	3	2	1	381.09	0.076
		5300	1	20	22.8	3	2	1	381.09	0.076
		5320	1	20	22.8	3	2	1	381.09	0.076
		5500	1	20	22.8	3	2	1	381.09	0.076
		5520	1	20	22.8	3	2	1	381.09	0.076
		5540	1	20	22.8	3	2	1	381.09	0.076
		5560	1	20	22.8	3	2	1	381.09	0.076
		5580	1	20	22.8	3	2	1	381.09	0.076
		5600	1	20	22.8	3	2	1	381.09	0.076
		5620	1	20	22.8	3	2	1	381.09	0.076
		5640	1	20	22.8	3	2	1	381.09	0.076
		5660	1	20	22.8	3	2	1	381.09	0.076
		5680	1	20	22.8	3	2	1	381.09	0.076
		5700	1	20	22.8	3	2	1	381.09	0.076
IEEE 802.11n 5GHz 20MHz (MIMO)	19.5M	5260	1	20	23.0	3	2	1	399.05	0.079
		5280	1	20	23.0	3	2	1	399.05	0.079
		5300	1	20	23.0	3	2	1	399.05	0.079
		5320	1	20	23.0	3	2	1	399.05	0.079
		5500	1	20	23.0	3	2	1	399.05	0.079
		5520	1	20	23.0	3	2	1	399.05	0.079
		5540	1	20	23.0	3	2	1	399.05	0.079
		5560	1	20	23.0	3	2	1	399.05	0.079
		5580	1	20	23.0	3	2	1	399.05	0.079
		5600	1	20	23.0	3	2	1	399.05	0.079
		5620	1	20	23.0	3	2	1	399.05	0.079
		5640	1	20	23.0	3	2	1	399.05	0.079
		5660	1	20	23.0	3	2	1	399.05	0.079
		5680	1	20	23.0	3	2	1	399.05	0.079
		5700	1	20	23.0	3	2	1	399.05	0.079

Note: The Numeric Gain calculated by $10^{(\text{ant. Gain(dBi)} /10)}$.

Freq. Band	Data Rate	Frequency (MHz)	Limit (mw/cm^2)	Distance (cm) [R]	Max Tune-up power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G] (dBi)	Duty Cycle	[P] x [G] With Duty Cycle (mW) [TP]	Power Density [S] (mw/cm^2)
IEEE 802.11n 5GHz 40MHz (MIMO)	40.5M	5270	1	20	19.0	3	2	1	158.87	0.032
		5310	1	20	19.0	3	2	1	158.87	0.032
		5510	1	20	22.5	3	2	1	355.66	0.071
		5550	1	20	22.5	3	2	1	355.66	0.071
		5590	1	20	22.5	3	2	1	355.66	0.071
		5630	1	20	22.5	3	2	1	355.66	0.071
		5670	1	20	22.5	3	2	1	355.66	0.071
IEEE 802.11ac 80MHz (MIMO)	87.9M	5290	1	20	20.0	3	2	1	200	0.040
		5530	1	20	20.0	3	2	1	200	0.040
		5610	1	20	20.0	3	2	1	200	0.040

Note: The Numeric Gain calculated by $10^{(\text{ant. Gain(dBi) /10})}$.

Simultaneous Transmitting:

Simultaneous MPE = 2.4GHz MPE (Original) + 5GHz MPE (U-NII Band II) =

0.006+0.079 = 0.085 mW/ $cm^{\wedge 2}$ < 1 $mw/cm^{\wedge 2}$