FCC Spot Check Test Report

FCC ID	:	**I88WAC6303D-S**
Equipment	:	**802.11ac Wave 2 Dual-Radio Unified Pro Access Point**
Model No.	:	**WAC6303D-S**
Multiple Listing	:	**Refer to item 1.1.1 for more details**
Brand Name	:	**ZYXEL**
Applicant	:	**Zyxel Communications Corporation**
Address	:	**No.2 Industry East RD. IX, Hsinchu Science Park, Hsinchu 30075, Taiwan, R.O.C.**
Standard	:	**47 CFR FCC Part 15.247** **47 CFR FCC Part 15.407**
Received Date	:	**Jun. 22, 2017**
Tested Date	:	**Oct. 23, 2017**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: **Approved by:**

Along Chen / Assistant Manager **Gary Chang / Manager**

Testing Laboratory 2732

Table of Contents

Release Record

Report No.	Version	Description	Issued Date
FR762203	Rev. 01	Initial issue	Nov. 13, 2017

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name
ZYXEL	WAC6303D-S	802.11ac Wave 2 Dual-Radio Unified Pro Access Point
	NWA1123-AC SHD	802.11ac Wave 2 Dual-Radio Nebula Cloud Managed Access Point

- ✦ All models are electrically identical, different model names are for marketing purpose.
- ✦ The above models, model **WAC6303D-S** was selected as a representative one for the final test and only its data was recorded in this report.

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**Data Rate / MCS**
2400-2483.5	b	2412-2462	1-11 [11]	2	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	2	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	MCS 0-15
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	MCS 0-15

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.
Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation..
Note 4: 802.11n supports beamforming function.

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**Data Rate / MCS**
5150-5250	a	5180-5240	36-48 [4]	3	6-54 Mbps
5150-5250	n (HT20)	5180-5240	36-48 [4]	3	MCS 0-23
5150-5250	n (HT40)	5190-5230	38-46 [2]	3	MCS 0-23
5150-5250	ac (VHT20)	5180-5240	36-48 [4]	3	MCS 0-9
5150-5250	ac (VHT40)	5190-5230	38-46 [2]	3	MCS 0-9
5150-5250	ac (VHT80)	5210	42 [1]	3	MCS 0-9
Note 1: RF output power specifies that Maximum Conducted Output Power. Note 2: 802.11a/n/ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation. Note 3: 802.11n/ac supports beamforming function.					

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**Data Rate / MCS**
5725-5850	a	5745-5825	149-165 [5]	3	6-54 Mbps
5725-5850	n (HT20)	5745-5825	149-165 [5]	3	MCS 0-23
5725-5850	n (HT40)	5755-5795	151-159 [2]	3	MCS 0-23
5725-5850	ac (VHT20)	5745-5825	149-165 [5]	3	MCS 0-9
5725-5850	ac (VHT40)	5755-5795	151-159 [2]	3	MCS 0-9
5725-5850	ac (VHT80)	5775	155 [1]	3	MCS 0-9
Note 1: RF output power specifies that Maximum Conducted Output Power. Note 2: 802.11a/n/ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation. Note 3: 802.11n/ac supports beamforming function.					

1.1.3 Antenna Details

Model	**Type**	**Connector**	**Operating Frequencies (MHz) / Antenna Gain (dBi)**		
			2400~2483.5	**5150~5250**	**5725~5850**
AD32	Direction	UFL	1.12	---	---
AD32	Direction	UFL	---	1.29	1.07

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	From AC adapter: 12Vdc From PoE: 54Vdc

1.1.5 Accessories

N/A

1.1.6 Channel List

Frequency band (MHz)		2400~2483.5	
802.11 b / g / n HT20		802.11n HT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447	---	---
9	2452	---	---
10	2457	---	---
11	2462	---	---

For Frequency band 5150-5250 MHz			
802.11 a / HT20 / VHT20		HT40 / VHT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	VHT80	
48	5240	42	5210

For Frequency band 5725~5850 MHz			
802.11 a / HT20 / VHT20		HT40 / VHT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
149	5745	151	5755
153	5765	159	5795
157	5785	VHT80	
161	5805	155	5775
165	5825	---	---

2 Referencing Test Data

2.1 Introduction

The variant model (FCC ID: I88WAC6303D-S) references the test data of original model (FCC ID: I88NWA5123-ACHD).

Reference FCC ID	Equipment Class	Frequency bands	Reference Report Title
I88NWA5123-ACHD	NII	5180-5240 MHz 5745-5825 MHz	FR762202AN
	DTS	2412-2462 MHz	FR762202AC

FCC ID: I88NWA5123-ACHD / I88WAC6303D-S use the same internal printed circuit board

Applicant takes full responsibility that the test data as referenced below represents compliance for the FCC ID: I88WAC6303D-S.

2.2 Difference

Difference between FCC ID: I88NWA5123-ACHD / I88WAC6303D-S is only Bluetooth Low Energy function by population / depopulation of components without PCB layout modification and antenna of Wi-Fi function. Other parts are identical to each other.

Characteristic		FCC ID: I88WAC6303D-S	FCC ID: I88NWA5123-ACHD
Wireless function	Frequency band	2412-2462 MHz 5180-5240 MHz 5745-5825 MHz	2412-2462 MHz 5180-5240 MHz 5745-5825 MHz
	Antenna	Direction: 2.4GHz Direction: 5GHz	PIFA: 2.4GHz Monopole: 5GHz
	Operation modes	11a/b/g/n/ac	11a/b/g/n/ac
	Channel Bandwidth	20 / 40 / 80	20 / 40 / 80
Bluetooth Low energy (2402-2480 MHz)		O	X
Wired function	WAN	O	O
	LAN	O	O

2.3 Spot Check Verification Data

Test Item	Mode	FCC ID: I88NWA5123-ACHD	FCC ID: I88WAC6303D-S	Difference (dB)
Average Conducted Power (dBm)	802.11b	28.73	28.53	0.20
	802.11g	29.89	29.72	0.17
	802.11n HT20	29.87	29.71	0.16
	802.11n HT40	28.60	29.01	-0.41
Average Conducted Power (dBm)	802.11a	28.02	28.03	-0.01
	802.11n HT20	27.96	27.90	0.06
	802.11n HT40	28.05	28.16	-0.11
	802.11ac VHT20	28.04	27.97	0.07
	802.11ac VHT40	28.13	28.26	-0.13
	802.11ac VHT80	25.52	25.78	-0.26

2.4 Reference

Equipment Class	Reference FCC ID	Type Grant	Reference application	Reference Report Title
NII	I88NWA5123-ACHD	Original	I88WAC6303D-S	FR762202AN*
DTS	I88NWA5123-ACHD	Original	I88WAC6303D-S	FR762202AC*

Note: Antenna port measurement test results are re-used.

2.5 The Equipment List

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Mar. 15, 2017	Mar. 14, 2018
Power Meter	Anritsu	ML2495A	1241002	Oct. 16, 2017	Oct. 15, 2018
Power Sensor	Anritsu	MA2411B	1207366	Oct. 16, 2017	Oct. 15, 2018
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 28, 2016	Oct. 27, 2017
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

3 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

==END==