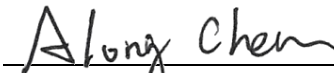


# FCC Spot Check Test Report

**FCC ID** : I88WSQ60  
**Equipment** : Multy X AC3000 Tri-Band WiFi System  
**Model No.** : WSQ50  
**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** : Jan. 31, 2018  
**Tested Date** : Mar. 07 ~ Mar. 31, 2018

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:

  
\_\_\_\_\_  
Along Chen / Assistant Manager

Approved by:

  
\_\_\_\_\_  
Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FR760801-02	Rev. 01	Initial issue	Jun. 15, 2018

# 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	Description
ZYLXEL	WSQ50	Multy X AC3000 Tri-Band WiFi System	For marketing different
	WSQ60	Multy Plus AC3000 Tri-Band WiFi System	
<p>✦ All models are electrically identical, different model names are for marketing purpose.</p> <p>✦ The above models, model <b>WSQ50</b> was selected as a representative one for the final test and only its data was recorded in this report.</p>			

### 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 <sub>TX</sub> )	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
<p>Note 1: RF output power specifies that Maximum Peak Conducted Output Power.</p> <p>Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.</p> <p>Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation..</p>					

RF General Information				
Frequency Range (MHz)	Bluetooth Mode	Ch. Freq. (MHz)	Channel Number	Data Rate
2400-2483.5	V4.1 LE	2402-2480	0-39 [40]	1 Mbps
<p>Note 1: Bluetooth LE (Low energy) uses GFSK modulation.</p>				

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N <sub>TX</sub> )	Data Rate / MCS
5150-5250	a	5180-5240	36-48 [4]	2	6-54 Mbps
5150-5250	n (HT20)	5180-5240	36-48 [4]	2	MCS 0-15
5150-5250	n (HT40)	5190-5230	38-46 [2]	2	MCS 0-15
5150-5250	ac (VHT20)	5180-5240	36-48 [4]	2	MCS 0-9
5150-5250	ac (VHT40)	5190-5230	38-46 [2]	2	MCS 0-9
5150-5250	ac (VHT80)	5210	42 [1]	2	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: 802.11ac does not support beamforming function.

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N <sub>TX</sub> )	Data Rate / MCS
5725-5850	a	5745-5825	149-165 [5]	4	6-54 Mbps
5725-5850	n (HT20)	5745-5825	149-165 [5]	4	MCS 0-31
5725-5850	n (HT40)	5755-5795	151-159 [2]	4	MCS 0-31
5725-5850	ac (VHT20)	5745-5825	149-165 [5]	4	MCS 0-9
5725-5850	ac (VHT40)	5755-5795	151-159 [2]	4	MCS 0-9
5725-5850	ac (VHT80)	5775	155 [1]	4	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: 802.11ac supports beamforming function.

### 1.1.3 Main Chipset / RF Chipset

Function	Model No.
Main Chipset	IPQ4019
2.4G	IPQ4019
5G 2T2R	IPQ4019
5G 4T4R	QCA9984
Bluetooth LE	CSR8811

### 1.1.4 Antenna Details

Wi-Fi antenna

Ant. No.	Model	Type	Connector	Operating Frequency (MHz) / Gain (dBi)		
				2400~2483.5	5150~5250	5725~5850
1	ALX17P-051XXB-00	PCB dipole	UFL	0	0	0
2	ALX17P-051XXC-00	PCB dipole	UFL	0	0	0
3	ALX17P-091XX5-00	PCB dipole	UFL	0	0	0
4	ALX17P-091XX6-00	PCB dipole	UFL	0	0	0
5	ALX17P-091XX7-00	PCB dipole	UFL	0	0	0
6	ALX17P-091XX8-00	PCB dipole	UFL	0	0	0
7	ALX17P-091XX9-00	PCB dipole	UFL	0	0	0
8	ALX17P-091XXA-00	PCB dipole	UFL	0	0	0

Bluetooth antenna

Ant. No.	Model	Type	Connector	Gain (dBi)
1	ALX17P-051XXD-00	PCB dipole	UFL	3.41

### 1.1.5 Power Supply Type of Equipment under Test (EUT)

<b>Power Supply Type</b>	From AC adapter: 12Vdc
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### 1.1.6 Accessories

N/A

### 1.1.7 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	<b>VHT80</b>	
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	<b>VHT80</b>	
161	5805	155	5775
165	5825	---	---

## 2 Referencing Test Data

### 2.1 Introduction

The variant model (FCC ID: I88WSQ60) references the test data of original model (FCC ID: I88WSQ50).

Reference FCC ID	Equipment Class	Frequency bands	Reference Report Title
I88WSQ50	NII	5180-5240 MHz 5745-5825 MHz	FR760801AN
	DTS	2412-2462 MHz	FR760801AC
	DTS	2402-2480 MHz	FR760801AE

FCC ID: I88WSQ50 / I88WSQ60 use the same internal printed circuit board

Applicant takes full responsibility that the test data as referenced below represents compliance for the FCC ID: I88WSQ60.

### 2.2 Difference

Difference between FCC ID: I88WSQ50 / I88WSQ60 is only antenna. Other parts are identical to each other.

Characteristic		FCC ID: I88WSQ60	FCC ID: I88WSQ50
Wireless function	Frequency band	2412-2462 MHz 5180-5240 MHz 5745-5825 MHz	2412-2462 MHz 5180-5240 MHz 5745-5825 MHz
	Antenna	PCB dipole	PIFA
	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)		○	○
Wired function	WAN	○	○
	LAN	○	○



## 2.3 Spot Check Verification Data

Test Item	Frequency band(GHz)	Mode	FCC ID: I88WSQ50	FCC ID: I88WSQ60	Difference (dB)
Average Conducted Power (dBm)	2.4	Bluetooth LE	4.05	3.84	0.21
	2.4	802.11b	29.52	29.44	0.07
		802.11g	27.92	27.65	0.27
		802.11n HT20	27.85	27.71	0.15
		802.11n HT40	24.27	24.04	0.23
	5.15 ~ 5.25	802.11ac VHT40	21.22	21.12	0.10
		802.11ac VHT80	20.01	20.00	0.01
	5.725~5.85	802.11a	29.81	29.65	0.16
		802.11an HT20	29.58	29.43	0.15
		802.11an HT40	29.60	29.43	0.17
		802.11ac VHT20	29.67	29.51	0.16
		802.11ac VHT40	29.67	29.35	0.32

## 2.4 Reference

Equipment Class	Reference FCC ID	Type Grant	Reference application	Reference Report Title
NII	I88WSQ50	Original	I88WSQ60	FR760801AN <sup>Note1</sup>
DTS	I88WSQ50	Original	I88WSQ60	FR760801AC <sup>Note2</sup>
DTS	88WSQ50	Original	I88WSQ60	FR760801AE <sup>Note2</sup>

Note:

1. Antenna port measurement test results are re-used but not all modes.
2. Antenna port measurement test results are re-used for all modes.

## 2.5 The Equipment List

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
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>.

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#### **Kwei Shan Site II**

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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.

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