

FCC RF Exposure Report

FCC ID : I8803891
Equipment : AXE5400 Tri-Band WiFi 6E Mesh System
(Please refer to section 1.1.1 for more details)
Model No. : WSQ65
(Please refer to section 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
Standard : 47 CFR FCC Part 2.1091
Received Date : Sep. 13, 2022
Tested Date : Sep. 23 ~ Oct. 25, 2022

We, International Certification Corporation, 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 shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:

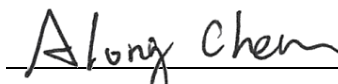
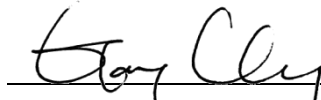

Along Chen / Assistant Manager
Gary Chang / Manager

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Release Record

Report No.	Version	Description	Issued Date
FA291302	Rev. 01	Initial issue	Dec. 02, 2022

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Product Name	Model	Description					
		DDR			Flash		
		Brand	Type	Size	Brand	Type	Size
AXE5400 Tri-Band WiFi 6E Mesh System	WSQ65	Kingston	D2516ECMD XGJD	512MB	MXIC	MX35UF1G2 4AD-Z4I	128MB
WiFi Mesh System	WSQ63						
Security Router	SCR 50AXE	ESMT	M15T8G1651 2A-DEBG2S	1024MB	Winbond	W25N02KW ZEIR	256MB
Note 1: The variation of WSQ65 and WSQ63 is for strategy of marketing. The circuit of each model is identical. Model WSQ65 was selected as a representative for the final test and only its data was recorded in this report. Note 2: CPU Model No: IPQ5018 2.4G Chip Model: IPQ5018 5G Chip Model: QCN6102 6G Chip Model: QCN6122							

2 RF Exposure Test Exemptions

2.1 1-mW Test Exemption

Available maximum time-averaged power is no more than 1 mW.

2.2 SAR-Based Exemption

This exemption is applicable to the frequency range between 300 MHz and 6 GHz, with test separation distances between 0.5 cm and 40 cm, and for all RF sources in fixed, mobile, and portable device exposure conditions.

The maximum time-averaged power or effective radiated power (ERP), whichever is greater, $\leq P_{th}$

$$P_{th} \text{ (mW)} = ERP_{20cm}(d/20)^x \quad d \leq 20cm$$

$$P_{th} \text{ (mW)} = ERP_{20cm} \quad 20 \text{ cm} < d \leq 40cm$$

Where $x = -\log_{10}\left(\frac{60}{ERP_{20cm}\sqrt{f}}\right)$

$$P_{th} \text{ (mW)} = ERP_{20cm} \text{ (mW)} = 2040f \quad 0.3GHz \leq f < 1.5 \text{ GHz}$$

$$P_{th} \text{ (mW)} = ERP_{20cm} \text{ (mW)} = 3060 \quad 1.5GHz \leq f < 6 \text{ GHz}$$

Frequency (MHz)	Power Thresholds	
	mW	dBm
663	1353	31.31
699	1426	31.54
704	1436	31.57
777	1585	32.00
824	1681	32.26
902	1840	32.65
1500 ~ 6000	3060	34.86

2.3 MPE-Based Exemption

For a much wider frequency range, from 300 kHz to 100 GHz, applicable for separation distances greater or equal to $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.

Radio Source Frequency			Minimum Distance			Threshold ERP
F_L MHz		F_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	-	1.34	159 m	-	35.6 m	$1920 R^2$
1.34	-	30	35.6 m	-	1.6 m	$3450 R^2/f^2$
30	-	300	1.6 m	-	159 mm	$3.83 R^2$
300	-	1500	159 mm	-	31.8 mm	$0.0128 R^2f$
1500	-	100000	31.8 mm	-	0.5 mm	$19.2 R^2$

Note: R is the antenna-person separation distance.

2.4 Reference Guidance

447498 D04 Interim General RF Exposure Guidance v01

2.5 Deviation from Test Standard and Measurement Procedure

None

2.6 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$)).

Parameters	Uncertainty
Conducted power	± 0.808 dB

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

2.7 Exemption Calculation

Non-beamforming mode

Frequency Range (MHz)	Maximum Conducted Power (dBm)	Rated Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	SAR-Based Exemption Thresholds (dBm)	Ratio	Pass/Fail
2412-2462	24.27	24.5	2	26.50	24.35	34.86	0.089	Pass
5180-5240	25.02	25.5	2.8	28.30	26.15	34.86	0.135	Pass
5260-5320	23.57	24.0	3.2	27.20	25.05	34.86	0.104	Pass
5500-5720	23.60	24.0	2.9	26.90	24.75	34.86	0.097	Pass
5745-5825	26.64	27.0	2.5	29.50	27.35	34.86	0.177	Pass
5925-6425	20.51	21.0	3.5	24.50	22.35	34.86	0.056	Pass
6425-6525	19.11	19.5	4.7	24.20	22.05	34.86	0.052	Pass
6525-6875	20.35	20.5	3.5	24.00	21.85	34.86	0.050	Pass
6875-7125	20.45	20.5	3.2	23.70	21.55	34.86	0.047	Pass

Beamforming mode

Frequency Range (MHz)	Maximum Conducted Power (dBm)	Rated Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	SAR-Based Exemption Thresholds (dBm)	Ratio	Pass/Fail
2412-2462	20.95	21.0	2	23.00	20.85	34.86	0.040	Pass
5180-5240	22.01	22.5	2.8	25.30	23.15	34.86	0.067	Pass
5260-5320	20.56	21.0	3.2	24.20	22.05	34.86	0.052	Pass
5500-5720	20.59	21.0	2.9	23.90	21.75	34.86	0.049	Pass
5745-5825	22.88	23.0	2.5	25.50	23.35	34.86	0.071	Pass
5925-6425	17.50	17.5	3.5	21.00	18.85	34.86	0.025	Pass
6425-6525	16.10	16.5	4.7	21.20	19.05	34.86	0.026	Pass
6525-6875	17.34	17.5	3.5	21.00	18.85	34.86	0.025	Pass
6875-7125	17.44	17.5	3.2	20.70	18.55	34.86	0.023	Pass

Note:

Minimum separation distance = 20 cm.

2.8 MPE Evaluation of Simultaneous Transmission

Non-beamforming mode

Mode	Max Ratio of Each Mode
WLAN 2.4GHz	0.089
WLAN 5GHz	0.177
WLAN 6GHz	0.056
Sum	0.322
Limit	1
Pass / Fail	Pass

Beamforming mode

Mode	Max Ratio of Each Mode
WLAN 2.4GHz	0.040
WLAN 5GHz	0.071
WLAN 6GHz	0.026
Sum	0.137
Limit	1
Pass / Fail	Pass

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 Corporation (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

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan
(R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)
No.2-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd
St., Kwei Shan Dist., 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: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

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