

RF Exposure Report

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FCC ID: I88EX3510-B0

Test Model: EX3510-B0

Received Date: Apr. 22, 2020

Test Date: May 21, 2020

Issued Date: June 20, 2020

Applicant: Zyxel Communications Corporation

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**FCC Registration /
Designation Number:** 723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA200420E01A	Original release.	June 20, 2020

1 Certificate of Conformity

Product: AX5700 WiFi6 Gigabit Ethernet Gateway

Brand: ZYXEL

Test Model: EX3510-B0

Sample Status: ENGINEERING SAMPLE

Applicant: Zyxel Communications Corporation

Test Date: May 21, 2020

Standards: FCC Part 2 (Section 2.1091)

IEEE C95.3 -2002

References Test Guidance: KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

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2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 27cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

2	Frequency Range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
	2.4~2.4835	5.27	Dipole	None
	5.15 ~ 5.25	8.09		i-pex(MHF)
	5.25 ~ 5.35	7.66		
	5.47 ~ 5.725	7.86		
	5.725 ~ 5.85	7.98		

Note: More detailed information, please refer to antenna specification.

2.5 Calculation Result

For 2.4GHz and 5GHz (U-NII-1 and U-NII-3 band) datas were copied from the original test report (Report No.: SA200420E01)

Operation Mode	Evaluation Frequency (MHz)	Max AV. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN 2.4GHz	2412~2462	686.935	5.27	27	0.25234	1
WLAN 5GHz U-NII-1	5180~5240	777.956	8.09	27	0.54704	1
WLAN 5GHz U-NII-2A	5260~5320	223.137	7.66	27	0.14211	1
WLAN 5GHz U-NII-2C	5500~5720	220.594	7.86	27	0.15124	1
WLAN 5GHz U-NII-3	5745~5825	887.947	7.98	27	0.60876	1

NOTE:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: The directional gain = 5.27 dBi
- 5GHz:
 - U-NII-1: The directional gain = 8.09 dBi
 - U-NII-2A: The directional gain = 7.66 dBi
 - U-NII-2C: The directional gain = 7.86 dBi
 - U-NII-3: The directional gain = 7.98 dBi

Conclusion:

The formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

$$WLAN\ 2.4GHz + WLAN\ 5GHz = 0.25234 / 1 + 0.60876 / 1 = 0.86110$$

Therefore the maximum calculations of above situations are less than the “1” limit.

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