

## RF Exposure Report

**Report No.:** SA170913E07

**FCC ID:** I88EMG2881-T20A

**Test Model:** EMG2881-T20A

**Received Date:** Sep. 13, 2017

**Test Date:** Oct. 03 to 04, 2017

**Issued Date:** Jan. 09, 2018

**Applicant:** Zyxel Communications Corporation

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

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### Release Control Record

Issue No.	Description	Date Issued
SA170913E07	Original release.	Jan. 09, 2018

## 1 Certificate of Conformity

**Product:** Dual Band Wireless AC1300 Gigabit Ethernet Gateway

**Brand:** ZYXEL

**Test Model:** EMG2881-T20A

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Zyxel Communications Corporation

**Test Date:** Oct. 03 to 04, 2017

**Standards:** FCC Part 2 (Section 2.1091)

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.

**Prepared by :**

*Cindy Hsin*

**Date:**

Jan. 09, 2018

Cindy Hsin / Specialist

**Approved by :**

*May Chen*

**Date:**

Jan. 09, 2018

May Chen / Manager

## 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 <sup>2</sup> )	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 <sup>2</sup> )*	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

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

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 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 23cm away from the body of the user.

So, this device is classified as **Mobile Device**.

### 2.4 Antenna Gain

Transmitter Circuit.	Brand	Model	Antenna Gain(dBi) Including cable loss	Frequency range	Antenna Type	Connector Type	Cable Length
Chain 0	CINGXIN	A176-17042802	2.97	2.4~2.4835GHz	PCB	i-pex(MHF)	60mm
			2.99	5.15~5.85GHz			
Chain 1	CINGXIN	A176-17042801	2.75	2.4~2.4835GHz	PCB	i-pex(MHF)	150mm
			2.97	5.15~5.85GHz			

## 2.5 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	579.966	5.87	23	0.33708	1
5180-5240	880.11	5.99	23	0.52586	1
5745-5825	684.156	5.99	23	0.40878	1

NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.87\text{dBi}$

5GHz: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.99\text{dBi}$

### Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

$\text{WLAN 2.4GHz} + \text{WLAN 5GHz} = 0.33708 / 1 + 0.52586 / 1 = 0.86294$

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

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