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
Address:	No.2 Industry East RD. IX, Hsinchu Science Park, Hsinchu 30075, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

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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 : , **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^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

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = 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	Connecter 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^2)	Limit (mW/cm^2)
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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.87$dBi
5GHz: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.99$dBi

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + 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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