RF Exposure Report

Report No.:	SA181219E02
FCC ID:	I88EMG3435Q20B
Test Model:	EMG3435-Q20A
Series Model:	SoMA5200
Received Date:	Dec. 19, 2018
Test Date:	Jan. 22, 2019
Issued Date:	Mar. 12, 2019
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.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA181219E02	Original release.	Mar. 12, 2019

1 Certificate of Conformity

Product:	Dual-Band Wireless AC2600 Gigabit Ethernet Gateway
Brand:	ZYXEL
Test Model:	EMG3435-Q20A
Series Model:	SoMA5200
Sample Status:	ENGINEERING SAMPLE
Applicant:	Zyxel Communications Corporation
Test Date:	Jan. 22, 2019
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 : _____ , **Date:** Mar. 12, 2019

Claire Kuan / Specialist

Approved by : _____ , **Date:** Mar. 12, 2019

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 41cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna No.	Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency range (GHz)	Antenna type	Connector Type
1	Chain 0	WHA YU	C107-511211-A	3.5	2.4~2.4835	Dipole	N type
	Chain 3			6.0	5.15~5.25		
				5.3	5.725~5.85		
2	Chain 1	WHA YU	C107-511211-A	3.5	2.4~2.4835		
	Chain 2			6.0	5.15~5.25		
				5.3	5.725~5.85		
3	Chain 2	WHA YU	C107-511211-A	3.5	2.4~2.4835		
	Chain 1			6.0	5.15~5.25		
				5.3	5.725~5.85		
4	Chain 3	WHA YU	C107-511211-A	3.5	2.4~2.4835		
	Chain 0			6.0	5.15~5.25		
				5.3	5.725~5.85		

2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN 2.4GHz	2437	628.549	9.52	41	0.26642	1
WLAN 5GHz (U-NII-1)	5240	244.893	12.02	41	0.18459	1
WLAN 5GHz (U-NII-3)	5785	985.078	11.32	41	0.63196	1

Note:
2.4GHz: Directional gain = 3.5dBi + 10log(4) = 9.52dBi
5GHz(U-NII-1): Directional gain = 6.0dBi + 10log(4) = 12.02dBi
5GHz(U-NII-3): Directional gain = 5.3dBi + 10log(4) = 11.32dBi

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 = 0.26642 / 1 + 0.63196 / 1 = 0.89838

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

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