

RF Exposure Report

Report No.: SA190218E04

FCC ID: I88VMG9827-B50A

Test Model: VMG9827-B50A, VMG3927-B50B

Series Model: EMG8726-B10A

Received Date: Feb. 18, 2019

Test Date: Mar. 05, 2019

Issued Date: June 06, 2019

Applicant: Zyxel Communications Corporation

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022

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Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 RF Exposure	5
2.1 Limits for Maximum Permissible Exposure (MPE)	5
2.2 MPE Calculation Formula	5
2.3 Classification	5
2.4 Antenna Gain	6
2.5 Calculation Result of Maximum Conducted Power	7

Release Control Record

Issue No.	Description	Date Issued
SA190218E04	Original release.	June 06, 2019

1 Certificate of Conformity

Product: Wireless AC2400 VDSL Gateway with VoIP,
Wireless AC Gigabit Ethernet Gateway with VoIP,
Dual Band Wireless AC/N VDSL2 Gateway

Brand: ZYXEL

Test Model: VMG9827-B50A, VMG3927-B50B

Series Model: EMG8726-B10A

Sample Status: ENGINEERING SAMPLE

Applicant: Zyxel Communications Corporation

Test Date: Mar. 05, 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:** June 06, 2019
Claire Kuan / Specialis

Approved by :  , **Date:** June 06, 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/cm²

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 22cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

2.4GHz Band						
Frequency	3D Peak gain (dBi)			Directional Antenna Gain (dBi)	Connector Type	
	ANT0	ANT1	ANT2			
2400MHz	2.47	1.27	1.50	4.28	NA	
2450MHz	2.24	1.16	1.83	4.53		
2500MHz	2.44	1.02	2.90	5.25		
2.4G Max gain	2.47	1.27	2.90	5.25		
5GHz Band						
Frequency	3D Peak gain (dBi)				Directional Antenna Gain (dBi)	Connector Type
	ANT0	ANT1	ANT2	ANT3		
5150MHz	3.63	2.45	3.57	2.55	6.48	i-PEX(MHF)
5350MHz	4.00	2.73	4.24	2.01	6.78	
5470MHz	4.27	2.19	3.70	2.08	6.10	
5725MHz	3.45	2.23	3.84	2.33	6.37	
5850MHz	2.65	3.55	2.91	2.93	6.34	
Note: More detailed information, please refer to operating description.						

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	530.899	5.25	22	0.29239	1
WLAN 5GHz (U-NII-1)	5230	785.887	6.48	22	0.57452	1
WLAN 5GHz (U-NII-3)	5795	944.104	6.37	22	0.67292	1

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

$WLAN\ 2.4GHz + WLAN\ 5GHz = 0.29239 / 1 + 0.67292 / 1 = 0.96531$

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

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