

RF Exposure Report

Report No.: SABFBE-WTW-P21070660

FCC ID: I88C3000Z

Test Model: VMG4927-B50A

Series Model: C3000Z, EMG6726-B10A

Received Date: 2021/7/19

Test Date: 2021/8/24

Issued Date: 2021/10/8

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

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan

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



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

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
SABFBE-WTW-P21070660	Original release.	2021/10/8

1 Certificate of Conformity

Product: Dual-Band Wireless AC/N VDSL2 Bonding Gateway;
WiFi-N VDSL2 4-port Combo WAN CPE;
Dual-Band Wireless AC/N Gigabit Ethernet Gateway

Brand: ZYXEL

Test Model: VMG4927-B50A

Series Model: C3000Z, EMG6726-B10A

Sample Status: Engineering sample

Applicant: Zyxel Communications Corporation

Test Date: 2021/8/24

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 : Phoenix Huang, **Date:** 2021/10/8
Phoenix Huang / Specialist

Approved by : Clark Lin, **Date:** 2021/10/8
Clark Lin / Technical 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

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

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

2.4 Antenna Gain

Original								
2.4GHz Antenna								
Antenna No.	PCB No.	Brand	Model	Antenna Gain (dBi) <Including cable loss>	Frequency Range (GHz)	Antenna Type	Antenna Connector	Cable Length (mm)
1	WJ1	Airgain	65-031-049008B	4.5	2.4~2.4835	Dipole	None	295
2	WJ0	Airgain	65-031-049007B	4.1	2.4~2.4835	Dipole	None	320
3	WJ2	Airgain	65-031-049009B	3.1	2.4~2.4835	Dipole	None	270
5GHz Antenna								
Antenna No.	PCB No.	Brand	Model	Antenna Gain (dBi) <Including cable loss>	Frequency Range (GHz)	Antenna Type	Antenna Connector	Cable Length (mm)
1	JC2	Airgain	65-031-049003B	4.4	5.15~5.85	Dipole	i-pex(MHF)	50
2	JC3	Airgain	65-031-049004B	4.8	5.15~5.85	Dipole	i-pex(MHF)	85
3	JC1	Airgain	65-031-049005B	4.4	5.15~5.85	Dipole	i-pex(MHF)	50
4	JC0	Airgain	65-031-049006B	4.4	5.15~5.85	Dipole	i-pex(MHF)	65
Newly								
2.4GHz Antenna								
Antenna No.	PCB No.	Brand	Model	Antenna Gain (dBi) <Including cable loss>	Frequency Range (GHz)	Antenna Type	Antenna Connector	Cable Length (mm)
1	WJ1	be-comfortable	56-001-000106Z	3.42	2.4~2.4835	Dipole	None	295
2	WJ0	be-comfortable	56-001-000108Z	3.31	2.4~2.4835	Dipole	None	320
3	WJ2	be-comfortable	56-001-000107Z	3.25	2.4~2.4835	Dipole	None	270
5GHz Antenna								
Antenna No.	PCB No.	Brand	Model	Antenna Gain (dBi) <Including cable loss>	Frequency Range (GHz)	Antenna Type	Antenna Connector	Cable Length (mm)
1	JC2	be-comfortable	56-001-000109Z	3.83	5.15~5.85	Dipole	i-pex(MHF)	50
2	JC3	be-comfortable	56-001-000111Z	3.73	5.15~5.85	Dipole	i-pex(MHF)	85
3	JC1	be-comfortable	56-001-000109Z	3.74	5.15~5.85	Dipole	i-pex(MHF)	50
4	JC0	be-comfortable	56-001-000110Z	3.66	5.15~5.85	Dipole	i-pex(MHF)	85
Note: Max. gain was selected for the RF exposure evaluation.								

2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN (2.4GHz)	2412~2462	913.738	8.69	40	0.33612	1
WLAN (U-NII-1)	5180~5240	686.264	10.52	40	0.38473	1
WLAN (U-NII-2A)	5260~5320	167.795	10.52	40	0.09407	1
WLAN (U-NII-2C)	5500~5720	227.301	10.52	40	0.12743	1
WLAN (U-NII-3)	5745~5825	869.167	10.52	40	0.48727	1

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 2.4GHz: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2 / 3] = 8.69 \text{ dBi}$
3. 5GHz: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.52 \text{ dBi}$

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

$WLAN \ 2.4GHz + WLAN \ 5GHz = 0.33612 / 1 + 0.48727 / 1 = 0.82339$

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

--- END ---