

# FCC RF Exposure Report

**FCC ID** : I88XMG3512-B10A  
**Equipment** : Dual-Band Wireless AC/N VDSL2 Bonding Gateway with USB  
**Model No.** : XMG3512-B10A  
**Brand Name** : ZYXEL  
**Applicant** : Zyxel Communications Corporation  
**Address** : No.2 Industry East RD. IX, Hsinchu Science Park, Hsinchu 30075, Taiwan, R.O.C  
**Standard** : 47 CFR FCC Part 2.1091  
**Received Date** : May 10, 2016  
**Tested Date** : Jun. 01 ~ Sep. 08, 2016

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

  
Along Chen / Assistant Manager

Approved by:

  
Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FA651003	Rev. 01	Initial issue	Oct. 18, 2016

# 1 MPE EVALUATION OF MOBILE DEVICES

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

## 1.1 LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

Frequency Range (MHz)	Power Density (mW /cm <sup>2</sup> )	Averaging Time (minutes)
300~1500	F/1500	30
1500~100000	1.0	30

## 1.2 MPE EVALUATION FORMULA

$$Pd = \frac{Pt}{4 * \pi * R^2}$$

Where

Pd= Power density in mW/cm<sup>2</sup>

Pt= EIRP in mW

π= 3.1416

R= Measurement distance

### 1.3 MPE EVALUATION RESULTS

#### MPE Evaluation of Single Transmission

##### *Non-beamforming mode*

Frequency Range (MHz)	Modulation Mode	Channel	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412~2462	HT20	6	26.98	2.9	20	0.194	1
5180~5240	VHT40	46	25.95	-0.54	20	0.069	1
5745~5825	VHT80	155	26.98	-0.56	20	0.087	1

##### *Beamforming mode*

Frequency Range (MHz)	Modulation Mode	Channel	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180~5240	VHT40	46	26.05	5.48	20	0.283	1
5745~5825	VHT40	151	26.25	5.46	20	0.295	1

##### Note:

For 5150~5250 MHz band

Directional gain =  $-0.54 + 10 \cdot \log(4/1) = 5.48$  dBi

For 5745~5850 MHz band

Directional gain =  $-0.56 + 10 \cdot \log(4/1) = 5.46$  dBi

#### MPE Evaluation of Simultaneous Transmission

2.4 and 5GHz can transmit at the same time, MPE evaluation is as below formula

$PD1 / \text{Limit1} + PD2 / \text{Limit 2} + \dots < 1$ , PD = Power density

##### *Non-beamforming mode*

MPE Evaluation = Maximum MPE of 2.4GHz + Maximum MPE of 5 GHz =  $0.194 / 1 + 0.087 / 1 = 0.281 < 1$

##### *Beamforming mode*

MPE Evaluation = Maximum MPE of 2.4GHz + Maximum MPE of 5 GHz =  $0.194 / 1 + 0.295 / 1 = 0.489 < 1$

#### Conclusion

MPE evaluations of single and simultaneous transmission meet the requirement of standard.

## 2 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

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