

FCC RF Exposure Report

FCC ID : I88EMG3415-B10A
Equipment : Dual-Band Wireless AC/N Gigabit Ethernet Gateway
Model No. : EMG3415-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 : Jun. 17, 2016
Tested Date : Jun. 17, 2016 ~ May 17, 2017

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 |
|-------------|---------|-------------------|---------------|
| FA651003-02 | Rev. 01 | Initial issue | Jun. 16, 2017 |
| FA651003-02 | Rev. 02 | Updated signature | Jul. 07, 2017 |

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 ²) | 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/cm²

Pt= EIRP in mW

Pi= 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 ²) | Limit (mW/cm ²) |
|-----------------------|-----------------|---------|-------------------------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 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 ²) | Limit (mW/cm ²) |
|-----------------------|-----------------|---------|-------------------------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 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

$PD1 / \text{Limit}1 + PD2 / \text{Limit} 2 + \dots < 1$, 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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