

# FCC RF EXPOSURE REPORT

**FCC ID: RRK-WMCAC15**

**Project No.** : 1805H003A  
**Equipment** : Wifi Card  
**Test Model** : WMC-AC15  
**Series Model** : N/A  
**Applicant** : Alpha  
**Address** : No. 8, Li-shing 7th Road, Science-based Industrial Park,  
Hsinchu, Taiwan, R.O.C.

**According:** :FCC Guidelines for Human Exposure IEEE C95.1  
& FCC Part 2.1091

## **B T L I N C .**

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Certificate # 5123. 03

## 1. CERTIFICATION

Equipment : Wifi Card  
Brand Name : Alpha  
Test Model : WMC-AC15  
Series Model : N/A  
Applicant : Alpha  
Date of Test : Oct. 19, 2018~Oct. 31, 2018  
Test Sample : Engineering Sample No.: B180800106  
Standards : FCC Title 47 Part 2.1091, OET Bulletin 65 Supplement C

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-5-1805H003A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

## 2. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi^2} = \frac{EIRP}{4\pi^2}$$

where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Table for Filed Antenna:

### For 2.4G

| Ant. | Brand                              | Model Name | Antenna Type | Connector | Gain (dBi) | Note |
|------|------------------------------------|------------|--------------|-----------|------------|------|
| 1    | CIU<br>ANTENNE<br>WIFI DUAL<br>A01 | 296242441  | PCB          | N/A       | 0          | N/A  |
| 2    | CIU<br>ANTENNE<br>WIFI DUAL<br>A01 | 296242441  | PCB          | N/A       | 0          | N/A  |

Note: This EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain =  $G_{ANT} + 10\log(N)$  dBi, that is Directional gain =  $0 + 10\log(2)$  dBi = 3.01

### For 5G

| Ant. | Manufacturer                 | Model Name | Antenna Type | Connector | Gain (dBi) | Note |
|------|------------------------------|------------|--------------|-----------|------------|------|
| 1    | CIU ANTENNE<br>WIFI DUAL A01 | 296242441  | PCB          | N/A       | -2         | N/A  |
| 2    | CIU ANTENNE<br>WIFI DUAL A01 | 296242441  | PCB          | N/A       | -2         | N/A  |

Note:

(1) This EUT supports MIMO 2X2, any transmit signals are correlated with each other and the Beamforming Gain is 3.0dBi, so Directional gain =  $3 + (-2) = 1$ .

### 3. TEST RESULTS

#### 2.4G WIFI

| Antenna Gain (dBi) | Antenna Gain (numeric) | Max Output Power (dBm) | AVG Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|--------------------|------------------------|------------------------|-----------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 3.01               | 1.9999                 | 28.95                  | 785.2356              | 0.31257                                 | 1                                                | Complies    |

#### 5G Band UNII-1

| Antenna Gain (dBi) | Antenna Gain (numeric) | Max Output Power (dBm) | Max Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|--------------------|------------------------|------------------------|-----------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 1                  | 1.2589                 | 25.92                  | 390.8409              | 0.09794                                 | 1                                                | Complies    |

#### 5G Band UNII-2A

| Antenna Gain (dBi) | Antenna Gain (numeric) | Max Output Power (dBm) | Max Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|--------------------|------------------------|------------------------|-----------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 1                  | 1.2589                 | 22.89                  | 194.5360              | 0.04875                                 | 1                                                | Complies    |

#### 5G Band UNII-2C

| Antenna Gain (dBi) | Antenna Gain (numeric) | Max Output Power (dBm) | Max Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|--------------------|------------------------|------------------------|-----------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 1                  | 1.2589                 | 23.22                  | 469.8941              | 0.05260                                 | 1                                                | Complies    |

#### 5G Band UNII-3

| Antenna Gain (dBi) | Antenna Gain (numeric) | Max Output Power (dBm) | Max Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|--------------------|------------------------|------------------------|-----------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 1                  | 1.2589                 | 26.72                  | 469.8941              | 0.11775                                 | 1                                                | Complies    |

#### For the max simultaneous transmission MPE:

| Power Density (S) (mW/cm <sup>2</sup> ) | Power Density (S) (mW/cm <sup>2</sup> ) | Total (mW/cm <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|-----------------------------------------|-----------------------------------------|-----------------------------|--------------------------------------------------|-------------|
| 2.4G                                    | 5G                                      |                             |                                                  |             |
| 0.31257                                 | 0.11775                                 | 0.43032                     | 1                                                | Complies    |

Note: the calculated distance is 20 cm.