# Maximum Permissible Exposure Evaluation

## *FCC ID: 2AUEN-MS1200*

## 1. Client Information

| | | |
|---|---|---|
| **Applicant** | : | Shenzhen COMNECT Technology Co., Ltd. |
| **Address** | : | G Zone, 3/F, Building 1, Baisha High-Tech Park, No. 3011, Shahe Road West, XiLi Street, Nanshan District, Shenzhen, China |
| **Manufacturer** | : | Shenzhen COMNECT Technology Co., Ltd. |
| **Address** | : | G Zone, 3/F, Building 1, Baisha High-Tech Park, No. 3011, Shahe Road West, XiLi Street, Nanshan District, Shenzhen, China |

## 2. General Description of EUT

| | | | |
|---|---|---|---|
| **EUT Name** | : | AC1200 Dual Band Whole Mesh WiFi System | |
| **Models No.** | : | AR-M405, MS1200S, M1200S, EMESH2200, EMESH3300, InFi S3 | |
| **Model Different** | : | All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial. | |
| **Product Description** | : | Operation Frequency: | 802.11b/g/n(HT20): 2412MHz~2462MHz<br>802.11n(HT40): 2422MHz~2452MHz<br>U-NII-1: 5180MHz~5240MHz<br>U-NII-3: 5745MHz~5825MHz |
| **Power Rating** | : | Adapter(RD1201000-C55-35MGD):<br>Input: AC 100-240V, 50/60Hz, 0.6A max<br>Output: DC 12V, 1A | |
| **Software Version** | : | N/A | |
| **Hardware Version** | : | V1.0 | |
| **Connecting I/O Port(S)** | : | Please refer to the User's Manual | |



1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, China
*Tel: +86 75526509301 Fax: +86 75526509195*

# MPE Calculations for WIFI

## 1. Antenna Gain:

PCB Antenna: 3dBi.

## 2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

## 3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

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

## 4. Test Result:

**Worst Maximum MPE Result**

| Mode | $N_{TX}$ | Freq. (MHz) | Conducted Power(max) (dBm) [P] | | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/ cm$^2$) [S] | | | Power Density Limit (mW/ cm$^2$) | Result |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ant a | Ant b | | | Ant 1 | Ant 2 | Sum | | |
| 802.11b | 1 | 2412 | 13.36 | 13.11 | 3 | 20 | 0.0086 | 0.0081 | --- | 1.000 | PASS |
| | | 2437 | 12.90 | 12.52 | 3 | 20 | 0.0077 | 0.0071 | --- | | |
| | | 2462 | 12.20 | 11.69 | 3 | 20 | 0.0066 | 0.0059 | --- | | |
| 802.11g | 1 | 2412 | 19.49 | 21.41 | 3 | 20 | 0.0353 | 0.0549 | --- | | |
| | | 2437 | 19.88 | 21.69 | 3 | 20 | 0.0386 | 0.0586 | --- | | |
| | | 2462 | 19.41 | 20.46 | 3 | 20 | 0.0347 | 0.0441 | --- | | |
| 802.11n (HT20) | 2 | 2412 | 18.67 | 20.56 | 3 | 20 | 0.0292 | 0.0452 | 0.0744 | | |
| | | 2437 | 19.28 | 20.72 | 3 | 20 | 0.0336 | 0.0469 | 0.0805 | | |
| | | 2462 | 18.59 | 19.61 | 3 | 20 | 0.0287 | 0.0363 | 0.0650 | | |
| 802.11n (HT40) | 2 | 2422 | 17.62 | 20.18 | 3 | 20 | 0.0229 | 0.0414 | 0.0643 | | |
| | | 2437 | 17.72 | 20.62 | 3 | 20 | 0.0235 | 0.0458 | 0.0693 | | |
| | | 2452 | 17.47 | 20.12 | 3 | 20 | 0.0222 | 0.0408 | 0.0630 | | |

Note:
(1) $N_{TX}$= Number of Transmit Antennas
(2) RF Output power specifies that Maximum Conducted Peak Output Power.

| Worst Maximum MPE Result | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mode | $N_{TX}$ | Freq. (MHz) | Conducted Power(max) (dBm) [P] | | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/ $cm^2$) [S] | | | Power Density Limit (mW/ $cm^2$) | Result |
| | | | Ant a | Ant b | | | Ant 1 | Ant 2 | Sum | | |
| 802.11a | 1 | 5180 | 18.94 | 19.23 | 3 | 20 | 0.0311 | 0.0332 | --- | 1.000 | PASS |
| | | 5200 | 19.04 | 19.31 | 3 | 20 | 0.0318 | 0.0339 | --- | | |
| | | 5240 | 19.25 | 19.35 | 3 | 20 | 0.0334 | 0.0342 | --- | | |
| 802.11n (HT20) | 2 | 5180 | 16.10 | 14.70 | 3 | 20 | 0.0162 | 0.0117 | 0.0279 | | |
| | | 5200 | 16.13 | 15.00 | 3 | 20 | 0.0163 | 0.0126 | 0.0289 | | |
| | | 5240 | 16.39 | 15.23 | 3 | 20 | 0.0173 | 0.0132 | 0.0305 | | |
| 802.11ac (VHT20) | 2 | 5180 | 15.61 | 14.43 | 3 | 20 | 0.0144 | 0.0110 | 0.0254 | | |
| | | 5200 | 15.58 | 14.18 | 3 | 20 | 0.0143 | 0.0104 | 0.0247 | | |
| | | 5240 | 15.79 | 14.67 | 3 | 20 | 0.0151 | 0.0116 | 0.0267 | | |
| 802.11n (HT40) | 2 | 5190 | 15.97 | 16.67 | 3 | 20 | 0.0157 | 0.0184 | 0.0341 | | |
| | | 5230 | 16.37 | 17.05 | 3 | 20 | 0.0172 | 0.0201 | 0.0373 | | |
| 802.11ac (VHT40) | 2 | 5190 | 17.23 | 16.68 | 3 | 20 | 0.0210 | 0.0185 | 0.0395 | | |
| | | 5230 | 15.76 | 16.44 | 3 | 20 | 0.0150 | 0.0175 | 0.0325 | | |
| 802.11ac (VHT80) | 2 | 5210 | 16.27 | 14.79 | 3 | 20 | 0.0168 | 0.0120 | 0.0288 | | |

| Worst Maximum MPE Result | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mode | $N_{TX}$ | Freq. (MHz) | Conducted Power(max) (dBm) [P] | | ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/ $cm^2$) [S] | | | Power Density Limit (mW/ $cm^2$) | Result |
| | | | Ant a | Ant b | | | Ant 1 | Ant 2 | Sum | | |
| 802.11a | 1 | 5745 | 20.19 | 22.98 | 3 | 20 | 0.0415 | 0.0788 | --- | 1.000 | PASS |
| | | 5785 | 21.56 | 23.59 | 3 | 20 | 0.0569 | 0.0907 | --- | | |
| | | 5825 | 21.64 | 21.14 | 3 | 20 | 0.0579 | 0.0516 | --- | | |
| 802.11n (HT20) | 2 | 5745 | 20.53 | 23.01 | 3 | 20 | 0.0448 | 0.0794 | 0.1242 | | |
| | | 5785 | 21.91 | 24.03 | 3 | 20 | 0.0616 | 0.1004 | 0.1620 | | |
| | | 5825 | 21.96 | 21.52 | 3 | 20 | 0.0623 | 0.0563 | 0.1186 | | |
| 802.11ac (VHT20) | 2 | 5745 | 22.76 | 23.72 | 3 | 20 | 0.0749 | 0.0935 | 0.1684 | | |
| | | 5785 | 22.29 | 24.22 | 3 | 20 | 0.0673 | 0.1049 | 0.1722 | | |
| | | 5825 | 22.47 | 21.73 | 3 | 20 | 0.0701 | 0.0591 | 0.1292 | | |
| 802.11n (HT40) | 2 | 5755 | 20.13 | 22.58 | 3 | 20 | 0.0409 | 0.0719 | 0.1128 | | |
| | | 5795 | 21.59 | 23.39 | 3 | 20 | 0.0572 | 0.0866 | 0.1438 | | |
| 802.11ac (VHT40) | 2 | 5755 | 21.41 | 22.51 | 3 | 20 | 0.0549 | 0.0708 | 0.1257 | | |
| | | 5795 | 21.61 | 23.46 | 3 | 20 | 0.0575 | 0.0881 | 0.1456 | | |
| 802.11ac (VHT80) | 2 | 5775 | 20.47 | 21.66 | 3 | 20 | 0.0442 | 0.0582 | 0.1024 | | |

Note:
(1) $N_{TX}$= Number of Transmit Antennas
(2) RF Output power specifies that Maximum Conducted AVG Output Power.

## 5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

**Limits for General Population/ Uncontrolled Exposure**

| Frequency Range (MHz) | Power density ($mW/cm^2$) |
|---|---|
| 300-1,500 | F/1500 |
| 1,500-100,000 | 1.0 |

For 802.11a/b/g/n/ac
MPE limit S: $1mW/cm^2$
**Because the 2.4G WiFi and 5G WiFi can be operated simultaneously, So the worst MPE is calculated as** ***$(0.0805+0.1722)mW/cm^2=0.2527mW/cm^2$ < limit $1mW/cm^2$***.
So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

**Note:**

For a more detailed features description, please refer to the RF Test Report.

**-----END OF REPORT-----**