# FCC RF EXPOSURE REPORT

## FCC ID: YHI-NW121

**Project No.** : **1605089A**
**Equipment** : **3x3 11ac/n/a 5GHz WiFi Module**
**Model** : **NW-121**
**Applicant** : **NEXCOM International Co., Ltd**
**Address** : **9F., No.920, Chung-Cheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan**

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

**Technical Manager** : _____
(Jeff Yang)


**BTL INC.**
B1, No. 37, Lane 365, Yang-Guang St.,
Nei-Hu District, Taipei City 114, Taiwan.
TEL: +886-2-2657-3299 FAX: +886-2-2657-3331

# MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

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

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

Table for Filed Antenna
Band 2-3

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) | Note |
|---|---|---|---|---|---|---|
| 1 | WIESON | GY121L049S-010 | Dipole | SMA Male | 1.99 | TX/RX |
| 2 | WIESON | GY121L049S-010 | Dipole | SMA Male | 1.99 | TX/RX |
| 3 | WIESON | GY121L049S-010 | Dipole | SMA Male | 1.99 | TX/RX |

Note: The EUT incorporates a MIMO function. Physically, the EUT provides three completed three transmitters and receivers (3T3R) the EUT with CDD function, then, Direction gain = $G_{ANT}$+Array Gain, the Array gain=10log($N_{ANT}/N_{SS}$). that is Array gain=10log(3/1)=4.77, Directional gain=1.99+4.77=6.76.

# Calculation:

| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
|---|---|---|---|
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2A/TX A Mode_Total /CH52, CH60, CH64 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 18.17 | 65.6145 | 0.02065144 | 1 | Complies |
| 1.99 | 1.5812 | 17.59 | 57.4116 | 0.01806968 | 1 | Complies |
| 1.99 | 1.5812 | 11.45 | 13.9637 | 0.00439491 | 1 | Complies |

| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
|---|---|---|---|
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2A/TX N20 Mode_Total /CH52, CH60, CH64 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 17.58 | 57.2796 | 0.01802812 | 1 | Complies |
| 1.99 | 1.5812 | 17.56 | 57.0164 | 0.01794529 | 1 | Complies |
| 1.99 | 1.5812 | 12.27 | 16.8655 | 0.00530824 | 1 | Complies |

| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
|---|---|---|---|
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2A/TX N40 Mode_Total /CH54, CH62 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 16.34 | 43.0527 | 0.01355035 | 1 | Complies |
| 1.99 | 1.5812 | 10.21 | 10.4954 | 0.00330332 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2C/TX A Mode_Total /CH110, CH116, CH140 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 11.71 | 14.8252 | 0.00466606 | 1 | Complies |
| 1.99 | 1.5812 | 13.67 | 23.2809 | 0.00732741 | 1 | Complies |
| 1.99 | 1.5812 | 11.37 | 13.7088 | 0.00431470 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2C/TX N20 Mode_Total /CH110, CH116, CH140 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 11.56 | 14.3219 | 0.00450765 | 1 | Complies |
| 1.99 | 1.5812 | 13.85 | 24.2661 | 0.00763748 | 1 | Complies |
| 1.99 | 1.5812 | 11.18 | 13.1220 | 0.00413000 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2C/TX N40 Mode_Total /CH102, CH110, CH134 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 8.06 | 6.3973 | 0.00201349 | 1 | Complies |
| 1.99 | 1.5812 | 13.36 | 21.6770 | 0.00682261 | 1 | Complies |
| 1.99 | 1.5812 | 13.41 | 21.9280 | 0.00690161 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2A/TX AC20 Mode_Total /CH52, CH60, CH64 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 17.90 | 61.6595 | 0.01940664 | 1 | Complies |
| 1.99 | 1.5812 | 17.90 | 61.6595 | 0.01940664 | 1 | Complies |
| 1.99 | 1.5812 | 12.68 | 18.5353 | 0.00583378 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2A/TX AC40 Mode_Total /CH54, CH62 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 16.32 | 42.8549 | 0.01348809 | 1 | Complies |
| 1.99 | 1.5812 | 9.79 | 9.5280 | 0.00299882 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2A/TX AC80 Mode_Total /CH55 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 5.66 | 3.6813 | 0.00115864 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2C/TX AC20 Mode_Total /CH110, CH116, CH140 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 11.92 | 15.5597 | 0.00489723 | 1 | Complies |
| 1.99 | 1.5812 | 14.14 | 25.9418 | 0.00816489 | 1 | Complies |
| 1.99 | 1.5812 | 11.33 | 13.5831 | 0.00427514 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2C/TX AC40 Mode_Total /CH102, CH110, CH134 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 8.05 | 6.3826 | 0.00200886 | 1 | Complies |
| 1.99 | 1.5812 | 13.30 | 21.3796 | 0.00672900 | 1 | Complies |
| 1.99 | 1.5812 | 13.38 | 21.7771 | 0.00685410 | 1 | Complies |

| | | | |
|---|---|---|---|
| EUT: | 3x3 11ac/n/a 5GHz WiFi Module | Model Name : | NW-121 |
| Temperature: | 25 ℃ | Relative Humidity: | 55 % |
| Test Voltage : | AC 120V/60Hz | | |
| Test Mode : | UNII-2C/TX AC80 Mode_Total /CH106, CH122 | | |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) ($mW/cm^2$) | Limit of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| 1.99 | 1.5812 | 13.32 | 21.4783 | 0.00676006 | 1 | Complies |
| 1.99 | 1.5812 | 13.35 | 21.6272 | 0.00680692 | 1 | Complies |

Note: the calculated distance is 20 cm.