FCC ID: 2A2PW134041

## RF Exposure Evaluation

### Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density ($mW/cm^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| (A) Limits for Occupational/Controlled Exposures | | | | |
| 0.3–3.0 | 614 | 1.63 | *(100) | 6 |
| 3.0–30 | 1842/f | 4.89/f | *($900/f^2$) | 6 |
| 30–300 | 61.4 | 0.163 | 1.0 | 6 |
| 300–1500 | | | f/300 | 6 |
| 1500–100,000 | | | 5 | 6 |
| (B) Limits for General Population/Uncontrolled Exposure | | | | |
| 0.3–1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34–30 | 824/f | 2.19/f | *($180/f^2$) | 30 |
| 30–300 | 27.5 | 0.073 | 0.2 | 30 |
| 300–1500 | | | f/1500 | 30 |
| 1500–100,000 | | | 1.0 | 30 |

f = frequency in MHz

Friis transmission formula: **$Pd = (Pout*G)/(4*pi*r^2)$**

Where

**Pd** = power density in $mW/cm^2$, **Pout** = output power to antenna in mW;

**G** = gain of antenna in linear scale, **Pi** = 3.1416;

**R** = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 $mW/cm^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

### Test Procedure

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

**Test Result of RF Exposure Evaluation**

WIFI 2.4GHz（Worst case）

Antenna gain=5dBi, Directional gain=8.01dBi

| Test Frequency （MHz） | Minimum Separation Distance (cm) | Output Power (dBm) | Target power (dBm) | Target power (mW) | Antenna Gain (Numeric) | Power Density Limit ($mW/cm^2$) | Power Density At 20 cm ($mW/cm^2$) | Test Results |
|---|---|---|---|---|---|---|---|---|
| 2412 | 20.00 | 19.418 | 20±1 | 125.893 | 6.3241 | 1.000 | 0.1584 | Pass |
| 2422 | 20.00 | 18.945 | 19±1 | 100.00 | 6.3241 | 1.000 | 0.1258 | Pass |
| 2437 | 20.00 | 19.408 | 20 ±1 | 125.893 | 6.3241 | 1.000 | 0.1584 | Pass |
| 2452 | 20.00 | 19.12 | 20 ±1 | 125.83 | 6.3241 | 1.000 | 0.1584 | Pass |
| 2462 | 20.00 | 19.771 | 20 ±1 | 125.893 | 6.3241 | 1.000 | 0.1584 | Pass |

WIFI 5GHz（Worst case）

Antenna gain=5dBi, Directional gain=8.01dBi

| Test Frequency （MHz） | Minimum Separation Distance (cm) | Output Power (dBm) | Target power (dBm) | Target power (mW) | Antenna Gain (Numeric) | Power Density Limit ($mW/cm^2$) | Power Density At 20 cm ($mW/cm^2$) | Test Results |
|---|---|---|---|---|---|---|---|---|
| 5180 | 20.00 | 21.442 | 22±1 | 199.526 | 6.3241 | 1.000 | 0.2510 | Pass |
| 5190 | 20.00 | 21.257 | 22±1 | 199.526 | 6.3241 | 1.000 | 0.2510 | Pass |
| 5210 | 20.00 | 21.813 | 22±1 | 199.526 | 6.3241 | 1.000 | 0.2510 | Pass |
| 5230 | 20.00 | 21.314 | 22±1 | 199.526 | 6.3241 | 1.000 | 0.2510 | Pass |
| 5240 | 20.00 | 21.104 | 22 ±1 | 199.526 | 6.3241 | 1.000 | 0.2510 | Pass |

For the max simultaneous transmission MPE:

| Power Density ($mW/cm^2$) | Power Density ($mW/cm^2$) | Total | Power Density Limit ($mW/cm^2$) | Test Results |
|---|---|---|---|---|
| 2.4GHz | 5GHz | 0.4094 | 1.000 | Pass |
| 0.1584 | 0.2510 | | | |

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure.