

**§1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

**Applicable Standard**

According to subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

| Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
|---|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| Frequency Range (MHz)                               | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Averaging Time (Minutes) |
| 0.3-1.34  | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34-30   | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 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

\* = Plane-wave equivalent power density

**Result**

**Calculated Formulary:**

Predication of MPE limit at a given distance

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

S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

| Frequency (MHz) | Antenna Gain |           | Tune up conducted power |        | Evaluation Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | MPE Limit (mW/cm <sup>2</sup> ) |
|-----------------|--------------|-----------|-------------------------|--------|--------------------------|-------------------------------------|---------------------------------|
|                 | (dBi)        | (numeric) | (dBm)                   | (mW)   |                          |                                     |                                 |
| 2412-2462       | 3.5          | 2.24      | 30                      | 1000   | 20                       | 0.446                               | 1                               |
| 5250-5350       | 6.5          | 4.47      | 20                      | 100    | 20                       | 0.089                               | 1                               |
| 5470-5725       | 6.5          | 4.47      | 21                      | 125.89 | 20                       | 0.112                               | 1                               |
| 5150-5250       | 6.5          | 4.47      | 19                      | 79.43  | 20                       | 0.071                               | 1                               |
| 5725-5850       | 6.5          | 4.47      | 21                      | 125.89 | 20                       | 0.112                               | 1                               |

- Note: 1. the tune up conducted power was declared by the applicant  
 2. the 2.4G Wi-Fi can transmit at the same time with the 5G Wi-Fi.  
 3. For the 5G Wi-Fi, as it can support the beam-forming function, so the antenna gain should add the  $10\lg 2$ ,  $3.5\text{dBi}+10\lg 2=6.5\text{dBi}$ .  
 4. Please refer to the DTS report of the original FCC ID for the 2.4G Wi-Fi output power.  
 5. Simultaneous transmitting consideration:

The ratio= $\text{MPE}_{\text{DTS}}/\text{limit}+\text{MPE}_{\text{NII}}/\text{limit}=0.446+0.112=0.558<1.0$ , so simultaneous exposure is not required.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

**Result: Compliance**