

## RF EXPOSURE EVALUATION

### MPE-Based Exemption

#### Applicable Standard

According to subpart 15.247 (i) and subpart 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.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power(ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(3)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

| RF Source frequency (MHz) | Threshold ERP (watts) |
|---------------------------|-----------------------|
| 0.3-1.34                  | $1,920 R^2$ .         |
| 1.34-30                   | $3,450 R^2/f^2$ .     |
| 30-300                    | $3.83 R^2$ .          |
| 300-1,500                 | $0.0128 R^2 f$ .      |
| 1,500-100,000             | $19.2 R^2$ .          |

R is the minimum separation distance in meters

f = frequency in MHz

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

**Result**

| Mode       | Frequency (MHz) | Tune up Conducted Power <sup>#</sup> (dBm) | Antenna Gain <sup>#</sup> |       | ERP   |        | Evaluation Distance (m) | ERP Limit (mW) |
|------------|-----------------|--------------------------------------------|---------------------------|-------|-------|--------|-------------------------|----------------|
|            |                 |                                            | (dBi)                     | (dBd) | (dBm) | (mW)   |                         |                |
| BT         | 2402-2480       | 8.5                                        | 2.27                      | 0.12  | 8.62  | 7.28   | 0.2                     | 768            |
| BLE        | 2402-2480       | 3.0                                        | 2.27                      | 0.12  | 3.12  | 2.05   | 0.2                     | 768            |
| 2.4G Wi-Fi | 2412-2462       | 23.5                                       | 5.29                      | 3.14  | 26.64 | 461.32 | 0.2                     | 768            |
| 5.2G Wi-Fi | 5180-5240       | 19.0                                       | 5.49                      | 3.34  | 22.34 | 171.40 | 0.2                     | 768            |
| 5.8G Wi-Fi | 5745-5825       | 19.5                                       | 5.49                      | 3.34  | 22.84 | 192.31 | 0.2                     | 768            |

Note:

- 1) The tune up conducted power and antenna gain was declared by the applicant.
- 2) For Wi-Fi, the antenna gain should be the directional gain.
- 3) The BT and Wi-Fi can transmit at same time, the 2.4G and 5G Wi-Fi cannot transmit at same time

Simultaneous transmitting consideration (worst case):

The ratio=  $ERP_{BT}/limit + ERP_{2.4G\ Wi-Fi}/limit = 7.28/768 + 461.32/768 = 0.610 < 1.0$

So simultaneous exposure is compliant.

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

**Result: Compliant**