

## RF EXPOSURE EVALUATION

### MPE-Based Exemption

#### Applicable Standard

According to 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 v01 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                 | $0.0128 R^2f$ .       |
| 1,500-100,000             | $19.2R^2$ .           |

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)  |                         |                |
| BLE   | 2402-2480       | 10.0                                       | 3.79                      | 1.64  | 11.64 | 14.59 | 0.2                     | 768            |
| Wi-Fi | 2412-2472       | 15.5                                       | 3.85                      | 1.70  | 17.20 | 52.48 | 0.2                     | 768            |

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.

2. 0dBd=2.15dBi

3. The BLE and Wi-Fi can transmit at same time.

Simultaneous transmitting consideration (worst case):

The ratio=  $ERP_{BLE} / \text{limit} + ERP_{Wi-Fi} / \text{limit} = 14.59/768 + 52.48/768 = 0.087 < 1.0$

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**