

## FCC §1.1307 (B) & §2.1091- 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 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)(1)(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<br>(MHz) | Tune up<br>conducted power <sup>#</sup> | Antenna Gain <sup>#</sup> |       | ERP   |      | Evaluation<br>Distance<br>(m) | ERP<br>Limit<br>(mW) |
|------|--------------------|-----------------------------------------|---------------------------|-------|-------|------|-------------------------------|----------------------|
|      |                    | (dBm)                                   | (dBi)                     | (dBd) | (dBm) | (mW) |                               |                      |
| UHF  | 917-922.2          | 12.0                                    | -1.75                     | -3.90 | 8.10  | 6.46 | 0.2                           | 470                  |
| BLE  | 2402-2480          | -3.0                                    | 0.82                      | -1.33 | -4.33 | 0.37 | 0.2                           | 768                  |

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.  
 2. The BLE and UHF can transmit at same time.  
 3. 0dBd=2.15dBi

Simultaneous transmitting consideration (worst case):

The ratio= $ERP_{UHF}/limit + ERP_{BLE}/limit = 6.46/470 + 0.37/768 = 0.014 < 1.0$ ,  
 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.**