# 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 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 | 19.2$R^2$. |

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# (dBm) | Antenna Gain# | | ERP | | Evaluation Distance (m) | ERP Limit (W) |
|---|---|---|---|---|---|---|---|---|
| | | | (dBi) | (dBd) | (dBm) | (W) | | |
| BT | 2402-2480 | 0.50 | -3 | -5.15 | -4.65 | 0.00034277 | 0.2 | 0.768 |
| Note: The tune up conducted power# and antenna gain# were declared and provided by the applicant. | | | | | | | | |

| Mode | Frequency (MHz) | Maximum E-Field (dBuV/m@3m) | Maximum EIRP (dBm) | Tune up EIRP (dBm) | ERP | | Evaluation Distance (m) | ERP Limit (W) |
|---|---|---|---|---|---|---|---|---|
| | | | | | (dBm) | (W) | | |
| FM | 88.1-107.9 | 57.82 | -37.38 | -37.00 | -39.15 | 0.00000012 | 0.2 | 0.153 |
| Note:<br>The Tune up EIRP # was declared and provided by the applicant.<br>EIRP = E-Field – 95.2 @3m, ERP=EIRP-2.15 | | | | | | | | |

Simultaneous transmitting consideration (worst case):

The FM and BLE can transmit simultaneously,

The ratio= $ERP_{BT}$/limit+ $ERP_{FM}$/limit= 0.00034277/0.768+0.00000012/0.153=0.000447<1.0

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

**Result: Compliant**