

## FCC §1.1307(b) & §2.1091 – RF EXPOSURE EVALUATION

### Applicable Standard

According to KDB 447498 D04 Interim General RF Exposure Guidance v01, clause 2.1.4 –MPE-Based Exemption:

An alternative to the SAR-based exemption is provided in § 1.1307(b)(3)(i)(C), for a much wider frequency range, from 300 kHz to 100 GHz, applicable for separation distances greater or equal to  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power. For this case, a RF source is an RF exempt device if its ERP (watts) is no more than a frequency-dependent value, as detailed tabular form in Appendix B. These limits have been derived based on the basic specifications on Maximum Permissible Exposure (MPE) considered for the FCC rules in § 1.1310(e)(1).

Table 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             | $19.2R^2$ .           |

f = frequency in MHz;

R = minimum separation distance from the body of a nearby person (appropriate units, e.g., m);

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<br>power <sup>#</sup> | Antenna Gain <sup>#</sup> |       | ERP   |       | Evaluation<br>Distance<br>(m) | MPE-Based<br>Exemption<br>Threshold<br>(mW) |
|------|-----------------------|--------------------------------------------|---------------------------|-------|-------|-------|-------------------------------|---------------------------------------------|
|      |                       | (dBm)                                      | (dBi)                     | (dBd) | (dBm) | (mW)  |                               |                                             |
| DECT | 1921.536-<br>1928.448 | 20.0                                       | 0                         | -2.15 | 17.85 | 60.95 | 0.2                           | 768                                         |
| BT   | 2402-2480             | 7.0                                        | -1.0                      | -3.15 | 3.85  | 2.43  | 0.2                           | 768                                         |

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

Note 2: 0dBd=2.15dBi.

Note 3: The DECT function can transmit at the same time with the Bluetooth function.

Simultaneous transmitting consideration (worst case):

The ratio=  $ERP_{DECT}/limit + ERP_{BT}/limit = 60.95/768 + 2.43/768 = 0.083 < 1.0$

**Result: Compliant**