

## 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                 | $0.0128 R^2 f$ .      |
| 1,500-100,000             | $19.2 R^2$ .          |

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 (MHz)   | Tune up conducted power* | Antenna Gain |       | ERP   |       | Evaluation Distance (m) | MPE-Based Exemption Threshold (mW) |
|-----------|-------------------|--------------------------|--------------|-------|-------|-------|-------------------------|------------------------------------|
|           |                   | (dBm)                    | (dBi)        | (dBd) | (dBm) | (mW)  |                         |                                    |
| Bluetooth | 2402-2480         | 5.0                      | 0            | -2.15 | 2.85  | 1.93  | 0.2                     | 768                                |
| DECT      | 1921.536-1928.448 | 20.5                     | 0            | -2.15 | 18.35 | 68.39 | 0.2                     | 768                                |

Note 1: The tune-up power 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=  $ERP_{DECT}/limit + ERP_{BT}/limit = 68.39/768 + 1.93/768 = 0.09 < 1.0$

**Result: Compliant.**