FCC §1.1310 & §2.1091 – MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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 λ 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);

Test Result

For worst case:

Mode	Frequency Range (MHz)	Tune-up Output Power (dBm)	Tune-up Output Power (mW)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (mW)	Evaluation Distance (cm)	MPE-Based Exemption Threshold (mW)
BLE	2402-2480	6.5	4.47	2.5	0.35	6.85	4.84	20	768

Note 1: The tune-up power was declared by the applicant.
Note 2: 0dBd=2.15dBi.

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

Result: Compliant.