

5 FCC §2.1091, §1.1307 (b) - RF Exposure

5.1 Applicable Standards

According to FCC §2.1091, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* (100)	30
1.34-30	824/f	2.19/f	* (180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

According to FCC §1.1307(b)(1),

(i) With respect to the limits on human exposure to RF provided in [§ 1.1310 of this chapter](#), applicants to the Commission for the grant or modification of construction permits, licenses or renewals thereof, temporary authorities, equipment authorizations, or any other authorizations for radiofrequency sources must either:

(A) Determine that they qualify for an exemption pursuant to [§ 1.1307\(b\)\(3\)](#);

(B) Prepare an evaluation of the human exposure to RF radiation pursuant to [§ 1.1310](#) and include in the application a statement confirming compliance with the limits in [§ 1.1310](#); or

(C) Prepare an Environmental Assessment if those RF sources would cause human exposure to levels of RF radiation in excess of the limits in [§ 1.1310](#).

(ii) Compliance with these limits for fixed RF source(s) may be accomplished by use of mitigation actions, as provided in [§ 1.1307\(b\)\(4\)](#). Upon request by the Commission, the party seeking or holding such authorization must electronically submit technical information showing the basis for such compliance, either by exemption or evaluation. Notwithstanding the preceding requirements, in the event that RF sources cause human exposure to levels of RF radiation in excess of the limits in [§ 1.1310 of this chapter](#), such RF exposure exemptions and evaluations are not deemed sufficient to show that there is no significant effect on the quality of the human environment or that the RF sources are categorically excluded from environmental processing.

5.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Or

$$S = EIRP/4\pi R^2$$

Where: EIRP= Equivalent (or effective) Isotopically Radiated Power

R = distance to the center of radiation of the antenna

5.3 MPE Results

Radio	Tuned-up Power (dBm)	Max EIRP (dBm)	Worst-Case Exposure Level (mW/cm ²)	Limit (mW/cm ²)	Worst-Case Percentages	Sum of Percentages	Limit
Worst Case							
2.4GHz Wi-Fi	27	30.42	0.219	1.0	21.9%	42.74%	100%
BT	9	10.8	0.0024	1.0	0.24%		
LTE	25	26.49	0.089	0.4437	20.6%		

Note: 2.4GHz Wi-Fi Antenna gain is 3.42dBi

Note: BT Antenna gain is 1.8 dBi

Note: LTE Antenna gain is 1.49 dBi

Note: Evaluated Distance is 20 cm

Note: BT and 2.4 GHz Wi-Fi Power (dBm) are referenced from report with FCC ID: 2BBC6-BLUHUBMK3

Note: LTE Power (dBm) is referenced from from report with FCC ID: XMR2023EG915QNA

Note: LTE limit determined form the worst case margin per the original report.