

FCC §1.1307 (b) (1) & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 1.1307 (b)(1), 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 Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minutes)
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 §1.1310 and §2.1091 RF exposure is calculated.

RF Exposure Evaluations

Predication of MPE limit at a given distance

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

Where S= power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = Antenna Gain in linear scale

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Maximum Permissible Exposure (MPE) Calculations

Frequency (MHz)	Max Ant. Gain (dBi)	Max Conducted Output Power (dBm)	Duty Cycle	Evaluation Distance (cm)	Power Density (mW/cm²)	MPE Limit (mW/cm²)	Results
824	7	33	25%	20	0.498	0.549	Pass
1850	3	30	25%	20	0.099	1.0	Pass

Note: FCC Part 22H Limit = 7 Watts = 38.45 dBm (ERP), Part 24E Limit =2 Watts = 33 dBm (EIRP)

Conclusion: Based on FCC §1.1310 and §1.1091, the EUT will comply with FCC rules on RF exposure for mobile devices if the antenna gain does not exceed 7 dBi in cellular band and 3 dBi in PCS band. An appropriate RF exposure compliance statement will be placed in the user’s guide.