MPE Evaluation

FCC

Maximum exposure limits from CFR 47, FCC Part 1.1310:

Table 1—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f^2	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) 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
300-1,500			f/1500	30
1,500-100,000			1.0	30

Table 2 – Power Density Calculations, FCC

Occupational/Controlled	0
General Population/uncontrolled	1

Transmitter	Frequency	Antenna Gain	Power (conducted)	Power (conducted) +10% for tolerance	Power Density	Limit at specified distance	% of limit	Highest	Total
	MHz	numerical	mW	mW	mW/cm^2	mW/cm^2			
1	2412	2.09	92.2600	101.4860	0.04222	1.00	4.2218%		
1	2437	2.09	107.4000	118.1400	0.04915	1.00	4.9147%	1	4.9147%
1	2462	2.09	90.3600	99.3960	0.04135	1.00	4.1349%		
								TOTAL	4.9147%

Distance	20	cm

EXEDMPT?	YES

Note: The user's manual will stipulate that a 20cm distance from the user is to be maintained.

The power density is calculated as shown below:

$$S = (P \times G)/(4 \times \pi \times d^2) - \textit{used to calculate exposure at 20 cm}$$

$$d = \sqrt{(S/(P \times G) \times 4 \times \pi)} - \textit{used to calculate minimum distance to meet limits}$$

S= power density
P = transmitter conducted power (in mW)
G = antenna numeric gain
D = distance to radiation center (20 cm)