RF exposure

According to FCC part 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in § 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength(V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Average time
(A) Limits for Occupational / Control Exposures				
300 – 1 500	--	--	f/300	6
1 500 - 100000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300 – 1 500	--	--	f/1500	6
1 500 – 100 000	--	--	1	30

f= frequency in MHz

Friis transmission formula: $Pd = (Pout \times G)/(4 \times pi \times R^2)$
  Where,
  Pd = power density in mW/cm²
  Pout = output power to antenna in mW
  G = gain of antenna in linear scale
  Pi = 3.1416
  R = distance between observation point and center of the radiator in cm
  Pd the limit of MPE, f/1500 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Results

- UFL type PCB antenna

Operation mode / Data Rate	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm²)	Limit (mW/cm²)
802.11g / 6Mbps	2 412	19.32	2.50	0.042 53	1
802.11g / 6Mbps	2 437	18.76	2.50	0.037 38	1
802.11g / 6Mbps	2 462	18.86	2.50	0.038 25	1

- PCB antenna

Operation mode / Data Rate	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm²)	Limit (mW/cm²)
802.11g / 6Mbps	2 412	20.15	4.15	0.085 46	1
802.11g / 6Mbps	2 437	20.14	4.15	0.085 27	1
802.11g / 6Mbps	2 462	19.86	4.15	0.079 94	1