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×G)/(4×pi×R^2)
  Where,
  Pd = power density
  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

Operation mode / Data Rate	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm²)	Limit (mW/cm²)
Bluetooth / 1 Mbps	2 402	-1.80	-4.54	0.0000 5	1
Bluetooth / 2 Mbps	2 402	-3.07	-4.54	0.0000 3	1
Bluetooth / 3 Mbps	2 402	-2.85	-4.54	0.0000 4	1

Result: The power density does NOT exceed the limit