

## FCC §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### Applicable Standard

According to subpart 15.247 (i) and subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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

### Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

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

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

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

For simultaneously transmit system, the calculated power density should comply with:

**Calculated Data (worst case):**

Mode	Frequency (MHz)	Maximum Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412-2462	1.0	1.26	18.50	70.79	20	0.0177	1.0
802.11g		1.0	1.26	17.50	56.23	20	0.0141	1.0
802.11n-HT20		1.0	1.26	16.50	44.67	20	0.0112	1.0
802.11n-HT40	2422-2452	1.0	1.26	16.50	44.67	20	0.0112	1.0
BLE(1Mbps)	2402-2480	1.0	1.26	-1.50	0.71	20	0.0002	1.0
BLE(2Mbps)	2402-2480	1.0	1.26	0	1.00	20	0.0003	1.0

**Note:**

1. The tune up conducted power was declared by the manufacturer.
2. Wi-Fi&BLE cannot transmit simultaneously.

**Conclusion:** The device meets MPE at distance 20cm.