

**§1.1310& §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

**Applicable Standard**

According to subpart 15.247(i) and subpart §1.1310, 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>(B) Limits for General Population/Uncontrolled Exposure</b>				
<b>Frequency Range (MHz)</b>	<b>Electric Field Strength (V/m)</b>	<b>Magnetic Field Strength (A/m)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>	<b>Averaging Time (minutes)</b>
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;

According to §1.1310 and §2.1091 RF exposure is calculated.

**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);

**Calculated Data:****5G Wi-Fi(worst case):**

Mode	Frequency Range (MHz)	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)			
802.11a	5150~5250	19.0	79.43	17.00	50.12	20	0.7919	1.0
	5725~5850	19.0	79.43	17.00	50.12	20	0.7919	1.0
802.11ac20	5150~5250	19.0	79.43	14.00	25.12	20	0.3969	1.0
	5725~5850	19.0	79.43	14.00	25.12	20	0.3969	1.0
802.11n20	5150~5250	19.0	79.43	14.00	25.12	20	0.3969	1.0
	5725~5850	19.0	79.43	14.00	25.12	20	0.3969	1.0
802.11ac40	5150~5250	19.0	79.43	14.00	25.12	20	0.3969	1.0
	5725~5850	19.0	79.43	14.00	25.12	20	0.3969	1.0
802.11n40	5150~5250	19.0	79.43	14.00	25.12	20	0.3969	1.0
	5725~5850	19.0	79.43	14.00	25.12	20	0.3969	1.0
802.11ac80	5150~5250	19.0	79.43	14.00	25.12	20	0.3969	1.0
	5725~5850	19.0	79.43	13.50	22.39	20	0.3538	1.0

**Note:** For the above tune up power were declared by the manufacturer.

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