

FCC § 15.247 (I) §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/cm²)	Averaging Time (minutes)
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
300-1500	/		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/cm²);

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:

Mode	Frequency Range (MHz)	Maximum Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412-2462	7.0	5.01	24.50	281.84	20	0.2809	1.0
802.11g		7.0	5.01	22.50	177.83	20	0.1772	1.0
802.11n-HT20		7.0	5.01	22.00	158.49	20	0.1579	1.0
802.11n-HT40	2422-2452	7.0	5.01	21.00	125.89	20	0.1255	1.0
802.11a	5150~5250	9.0	7.94	12.00	15.85	20	0.0250	1.0
	5725~5850	9.0	7.94	15.50	35.48	20	0.0561	1.0
802.11ac20	5150~5250	9.0	7.94	12.00	15.85	20	0.0250	1.0
	5725~5850	9.0	7.94	18.00	63.10	20	0.0997	1.0
802.11n-HT20	5150~5250	9.0	7.94	12.00	15.85	20	0.0250	1.0
	5725~5850	9.0	7.94	18.00	63.10	20	0.0997	1.0
802.11ac40	5150~5250	9.0	7.94	12.00	15.85	20	0.0250	1.0
	5725~5850	9.0	7.94	17.50	56.23	20	0.0889	1.0
802.11n-HT40	5150~5250	9.0	7.94	12.00	15.85	20	0.0250	1.0
	5725~5850	9.0	7.94	17.50	56.23	20	0.0889	1.0
802.11ac80	5210	9.0	7.94	12.00	15.85	20	0.0250	1.0
	5775	9.0	7.94	17.00	50.12	20	0.0792	1.0

Note:

- (1) The tune-up output power was declared by the manufacturer.
 (2) 2.4G Wi-Fi and 5G Wi-Fi cannot transmit simultaneously.

Result: The device meets FCC MPE at 20 cm distance.