

5 FCC §15.247(i), §1.1310, §2.1091 - Maximum Permissible Exposure (MPE)

5.1 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) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	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);

5.2 RF Exposure Evaluation Result

MPE evaluation:

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
WIFI 5G Band 1	5150-5250	4.4	2.754	19.8	95.499	20	0.0523	1
WIFI 5G Band 2	5250-5350	4.4	2.754	20.0	100.000	20	0.0548	1
WIFI 5G Band 3	5470-5725	4.38	2.742	21.2	131.826	20	0.0719	1
WIFI 5G Band 4	5725-5850	4.92	3.105	21.4	138.038	20	0.0853	1
WIFI 2.4G	2412-2462	4.42	2.767	29.5	891.25	20	0.4906	1
BLE	2402-2480	6.08	4.055	1.5	1.413	20	0.0011	1

Mode	Frequency Range (MHz)	EIRP including Tune-up Tolerance		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBm)	(mW)			
WIFI 6E	5925-6425	18.5	70.79	20	0.014	1
WIFI 6E	6425-6525	18.5	70.79	20	0.014	1
WIFI 6E	6525-6875	19.0	79.43	20	0.016	1
WIFI 6E	6875-7125	18.5	70.79	20	0.014	1

Note: The Tune-up output power was declared by the Applicant.

Wi-Fi and BLE can't transmit simultaneously.

Result: The device compliant RF Exposure at 20cm distances.