

FCC §15.247 (i), §2.1091 – RF Exposure

FCC ID: 2BPW8-M31

Applied procedures / limit

According to FCC §15.247(i) and §1.1307(b)(1), 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 Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

Note: *f* is frequency in MHz

* = Power density limit is applicable at frequencies greater than 100 MHz

Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: *f* = frequency in MHz

* = Plane-wave equivalent power density

MPE PREDICTION

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna, R=20cm

Test Result of RF Exposure Evaluation

	Modes & Channel Freq. (MHz)	Tune up Produce power	Maximum peak output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/cm ²)	Limit (mW/cm ²)	Result
BLE	GFSK & LCH	3±1	4	2.5119	2.1380 (3.3dBi)	0.0011	1	Pass
EDR	GFSK & LCH	4±1	5	3.1623	2.1380 (3.3dBi)	0.0013	1	Pass
2.4G WIFI	802.11g & 2412	18±1	19	79.4328	2.1380 (3.3dBi)	0.0338	1	Pass
5.8GWIFI	802.11a & 5825	16±1	17	50.1187	2.1380 (3.3dBi)	0.0213	1	Pass

BT+WIFI supported simultaneous transmission:

BT+2.4GWIFI: Σ MPE Ratio = 0.0013/1 + 0.0338/1 = 0.0351 ≤ 1,

BT+5GWIFI: Σ MPE Ratio = 0.0013/1 + 0.0213/1 = 0.0226 ≤ 1,

So passed.