

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

FCC ID: 2BFIZ-X1AR

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	Maximu m peak output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm2)	Limit (mW / cm2)	Result
BLE:1M	GFSK &2440	2±1	3	1.9953	0.6516 (-1.86dBi)	0.00026	1	Pass
BLE:2M	GFSK &2440	2±1	3	1.9953	0.6516 (-1.86dBi)	0.00026	1	Pass
EDR	8DPSK &2441	2±1	3	1.9953	0.6516 (-1.86dBi)	0.00026	1	Pass
2.4GWIFI	802.11n(H T40) &2437	14±1	15	31.6228	0.5023 (-2.99dBi)	0.00316	1	Pass
5.2GWIFI	802.11ac2 0&5240	15±1	16	39.8107	2.2387 (3.5dBi)	0.01774	1	Pass
5.8GWIFI	802.11ac2 0&5825	12±1	13	19.9526	2.7416 (4.38dBi)	0.01089	1	Pass

BT+WIFI supported simultaneous transmission:

BT+2.4GWIFI: Σ MPE Ratio =0.00026/1+0.00316/1=0.00342≤1,

BT+5GWIFI: Σ MPE Ratio =0.00026/1+0.01774/1=0.018≤1,

So passed.