

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

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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
2.4GWIFI ANT1	802.11g & 2437	14±1	15	31.6228	1.9634 (2.93dBi)	0.01236	1	Pass
2.4GWIFI ANT2	802.11g & 2437	14±1	15	31.6228	1.9634 (2.93dBi)	0.01236	1	Pass
5.2GWIFI ANT1	802.11a c20&5200	11±1	12	15.8489	2.4946 (3.97dBi)	0.0079	1	Pass
5.2GWIFI ANT2	802.11a c20&5200	11±1	12	15.8489	2.4946 (3.97dBi)	0.0079	1	Pass
5.8GWIFI ANT1	802.11a c20&5745	11±1	12	15.8489	2.7479 (4.39dBi)	0.0087	1	Pass
5.8GWIFI ANT2	802.11a &5825	11±1	12	15.8489	2.7479 (4.39dBi)	0.0087	1	Pass

Technology	Tune up Produce power(dBm)		Maximum Tune-up (dBm)		Antenna Gain(ANT 1/ANT 2) (numeric)	Power Density (S) (mW/cm ²)		MPE Limit (mW/cm ²)	Σ MPE Ratio	Σ MPE Ratio Limit	Result
	ANT 1	ANT 2	ANT 1	ANT 2		ANT 1	ANT 2				
2.4G WIFI MIMO	15 ±1	15 ±1	16	16	1.9634 (2.93dBi)	0.01236	0.01236	1	0.0247	1	Pass

Technology	Tune up Produce power(dBm)		Maximum Tune-up (dBm)		Antenna Gain(ANT 1/ANT 2) (numeric)	Power Density (S) (mW/cm ²)		MPE Limit (mW/cm ²)	Σ MPE Ratio	Σ MPE Ratio Limit	Result
	ANT 1	ANT 2	ANT 1	ANT 2		ANT 1	ANT 2				
5G WIFI MIMO	11 ±1	11 ±1	12	12	2.7479 (4.39dBi)	0.0087	0.0087	1	0.0174	1	Pass