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

FCC ID: HHOJHR-N855R

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

TEST RESULTS

2.4G:

TX 802.11b Mode						
Test Channe	Frequency (MHz)	Peak output power. Antenna A(B) port (dBm)	Antenna Gain A(B) dBi	EIRP A(B) dBm	Total Power dBm	LIMIT dBm
CH01	2412	13.58(12.72)	7.0	20.58(19.72)	23.18	22.98
CH06	2437	13.25(12.35)	7.0	20.25(19.35)	22.83	22.98
CH11	2462	13.50(12.42)	7.0	20.50(19.42)	23.00	22.98
TX 802.11g Mode						
CH01	2412	12.86(11.56)	7.0	19.86(18.56)	22.27	22.98
CH06	2437	12.26(11.64)	7.0	19.26(18.64)	21.97	22.98
CH11	2462	12.57(11.38)	7.0	19.57(18.38)	22.03	22.98
TX 802.11n/20M Mode						
CH01	2412	11.34(10.68)	7.0	18.34(17.68)	21.03	22.98
CH06	2437	11.05(10.16)	7.0	18.05(17.16)	20.60	22.98
CH11	2462	11.24(10.43)	7.0	18.24(17.43)	20.86	22.98
TX 802.11n/40M Mode						
CH03	2422	12.78(11.76)	7.0	19.78(18.76)	22.31	22.98
CH06	2437	12.39(11.45)	7.0	19.39(18.45)	21.96	22.98
CH09	2452	13.02(11.25)	7.0	20.02(18.25)	22.23	22.98

Mode	Maximum peak output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm^2)	Limit of Power Density (S) (mW/ cm^2)	Result
802.11b	13.58	22.80	5.01(7.0dBi)	0.0227	1	Pass
802.11g	12.86	19.32	5.01(7.0dBi)	0.0193	1	Pass
802.11n-HT20	11.34	13.61	5.01(7.0dBi)	0.0136	1	Pass
802.11n-HT40	13.02	20.04	5.01(7.0dBi)	0.0200	1	Pass

Frequency (MHz)	Maximum peak output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm^2)	Limit of Power Density (S) (mW/ cm^2)	Result
2412-2462	16.18	41.50	5.01(7.0dBi)	0.0414	1	Pass

5.8G:

TX 802.11a Mode						
Test Channe	Frequency	Peak output power. Antenna A(C,D) port	Antenna Gain A(C,D)	EIRP A(C,D)	Total Power	LIMIT
	(MHz)	(dBm)	dBi	dBm	dBm	dBm
CH149	5745	12.09(12.01,11.83)	5.0	17.09(17.01,16.83)	21.75	24.98
CH157	5785	12.54(12.35,12.04)	5.0	17.54(17.35,17.04)	22.09	24.98
CH165	5825	11.80(11.56,11.12)	5.0	16.80(16.56,16.12)	21.27	24.98
TX 802.11n20/5G Mode						
CH149	5745	11.79(11.48,11.23)	5.0	16.79(16.48,16.23)	21.28	24.98
CH157	5785	11.22(11.03,11.20)	5.0	16.22(16.03,16.20)	20.92	24.98
CH165	5825	11.45(11.25,11.04)	5.0	16.45(16.25,16.04)	21.02	24.98
TX 802.11n40/5G Mode						
CH151	5755	10.09(10.42,10.21)	5.0	15.09(15.42,15.21)	20.01	24.98
CH159	5795	9.89(10.12,10.04)	5.0	14.89(15.12,15.04)	19.79	24.98

Mode	Maximum peak output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm^2)	Limit of Power Density (S) (mW/ cm^2)	Result
802.11a	12.54	17.95	3.16(5.0dBi)	0.0113	1	Pass
802.11n (20)	11.79	15.10	3.16(5.0dBi)	0.0095	1	Pass
802.11n(40)	10.42	11.02	3.16(5.0dBi)	0.0069	1	Pass

Frequency (MHz)	Maximum peak output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm^2)	Limit of Power Density (S) (mW/ cm^2)	Result
5745-5825	17.09	51.12	3.16(5.0dBi)	0.0322	1	Pass