

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

FCC ID: LNQSBWD60A

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:

Test Channel	Frequency	Maximum output power. Antenna port				Total Power		Maximum output power (AV)
		(PK) (dBm)		(AV) (dBm)			(AV)	
	(MHz)	ANT A	ANT B	ANT A	ANT B	dBm	dBm	mW
TX 802.11b Mode								
CH01	2412	9.65	9.13	6.43	6.11	12.41	9.28	8.47
CH06	2437	9.76	9.42	6.55	6.18	12.55	9.32	8.55
CH11	2462	9.34	9.47	6.31	6.02	12.42	9.18	8.28
TX 802.11g Mode								
CH01	2412	8.85	8.32	5.82	5.26	11.60	8.56	7.18
CH06	2437	8.74	8.48	5.69	5.42	11.68	8.63	7.29
CH11	2462	8.72	8.50	5.65	5.33	11.62	8.50	7.08
TX 802.11n/20M Mode								
CH01	2412	7.94	7.79	5.07	4.89	10.88	7.99	6.30
CH06	2437	7.90	7.61	5.16	4.93	10.79	8.01	6.32
CH11	2462	7.98	7.75	5.25	4.99	10.88	8.13	6.50
TX 802.11n/40M Mode								
CH03	2422	6.83	6.69	4.33	3.68	9.77	7.03	5.05
CH06	2437	6.67	6.64	4.29	3.56	9.75	6.97	4.98
CH09	2452	6.74	6.49	4.17	3.55	9.63	6.88	4.88

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	12.55	17.99	6.05 (4.03dBi)	0.0144	1	Pass
802.11g	11.68	14.72	6.05 (4.03dBi)	0.0118	1	Pass
802.11n-HT20	10.88	12.25	6.05 (4.03dBi)	0.0098	1	Pass
802.11n-HT40	9.77	9.48	6.05 (4.03dBi)	0.0076	1	Pass

5.8G:

Test Channel	Frequency	Maximum output power. Antenna port				Total Power		Maximum output power (AV)
		(PK) (dBm)		(AV) (dBm)			(AV)	
	(MHz)	ANT A	ANT B	ANT A	ANT B	dBm	dBm	mW
TX 802.11a Mode								
CH149	5745	10.16	9.63	7.25	6.85	12.91	10.06	10.14
CH157	5785	10.21	9.63	7.37	6.74	12.91	10.01	10.02
CH165	5825	10.09	9.59	7.28	6.72	12.86	10.02	10.05
TX 802.11 n20 Mode								
CH149	5745	9.12	8.65	6.38	5.42	11.90	8.94	7.83
CH157	5785	9.13	8.57	6.43	5.53	11.86	8.99	7.93
CH165	5825	9.17	8.42	6.29	5.44	11.82	8.90	7.76
TX 802.11 n40 Mode								
CH151	5755	8.16	7.77	5.27	4.23	10.98	7.79	6.01
CH159	5795	8.08	7.53	5.13	4.37	10.87	7.85	6.10

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	12.91	19.54	6.05 (4.03dBi)	0.0157	1	Pass
802.11n (20)	11.90	15.49	6.05 (4.03dBi)	0.0124	1	Pass
802.11n(40)	10.98	12.53	6.05 (4.03dBi)	0.0100	1	Pass

5.2G

Test Channel	Frequency	Maximum output power. Antenna port				Total Power		Maximum output power (AV)
		(PK) (dBm)		(AV) (dBm)			(AV)	
	(MHz)	ANT A	ANT B	ANT A	ANT B	dBm	dBm	mW
TX 802.11a Mode								
CH36	5180	9.69	8.87	6.38	5.63	12.31	9.03	8.00
CH40	5200	9.53	8.75	6.26	5.77	12.26	9.10	8.13
CH48	5240	9.72	8.71	6.11	5.56	12.25	8.85	7.67
TX 802.11 n20M Mode								
CH36	5180	8.52	7.86	5.54	4.35	11.21	8.00	6.31
CH40	5200	8.48	7.82	5.83	4.27	11.19	7.96	6.25
CH48	5240	8.61	7.79	5.35	4.39	11.23	7.91	6.18
TX 802.11 n40M Mode								
CH38	5190	7.52	6.88	4.11	3.72	10.22	6.93	4.93
CH46	5230	7.63	6.93	4.17	3.81	10.25	6.97	4.98

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	12.31	17.02	6.05 (4.03dBi)	0.0136	1	Pass
802.11n (20)	11.23	13.27	6.05 (4.03dBi)	0.0106	1	Pass
802.11n(40)	10.25	10.59	6.05 (4.03dBi)	0.0085	1	Pass

Note: This device 5GHz and 2.4GHz can not transmit simultaneously, don't have to assess exposure when transmit simultaneously.