



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

FCC ID: ZNPWD-R1201U

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=0.2m

TEST RESULTS

MIMO Mode

	ANT	Tune up Produce power	Maximu m peak output power (dBm)	Output power to antenn a (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm2)	Total Power Density (S) (mW/ cm2)	Limit (mW / cm2)	Result
802.11n 20 (2.4G Hz WIFI)	A	15±1	16	39.81	2.123 (3.27dBi)	0.01681	0.03363	1	Pass
	B	15±1	16	39.81	2.123 (3.27dBi)	0.01681			
802.11a c20 (U-NII-1)	A	16±1	17	50.12	2.123 (3.27dBi)	0.02117	0.04234	1	Pass
	B	16±1	17	50.12	2.123 (3.27dBi)	0.02117			
802.11n 20 (U-NII-3)	A	15±1	16	39.81	2.123 (3.27dBi)	0.01681	0.03798	1	Pass
	B	16±1	17	50.12	2.123 (3.27dBi)	0.02117			



SISO Mode

	ANT	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
802.11b (2.4G Hz WIFI)	A	16±1	17	50.12	2.123 (3.27dBi)	0.02117	1	Pass
	B	17±1	18	63.10	2.123 (3.27dBi)	0.02665	1	Pass
802.11a (U-NII-1)	A	16±1	17	50.12	2.123 (3.27dBi)	0.02117	1	Pass
	B	16±1	17	50.12	2.123 (3.27dBi)	0.02117	1	Pass
802.11a (U-NII-3)	A	16±1	17	50.12	2.123 (3.27dBi)	0.02117	1	Pass
	B	16±1	17	50.12	2.123 (3.27dBi)	0.02117	1	Pass

For the Max simultaneous transmission MPE:

	Power Density (S) (mW/ cm ²)	Total Power Density (S) (mW/ cm ²)	Limit (mW/ cm ²)	Result
2.4GHz WIFI	0.03363	0.07597	1	Pass
5GHz WIFI	0.04234			