



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

FCC ID: 2BK78-NL13

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

	Tune up Produce power	Maximum peak output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm2)	Limit (mW/ cm2)	Result
WIFI	11±1	12	15.85	1.56 (1.93dBi)	0.00492	1	Pass

	Maximum Conducted Output Power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm2)	Limit (mW/ cm2)	Result
WCDMA II	25.00	316.23	2.88 (4.6dBi)	0.18119	1	Pass
WCDMA IV	25.00	316.23	2.88 (4.6dBi)	0.18119	1	Pass
WCDMA V	25.00	316.23	0.69 (-1.6dBi)	0.04341	0.55	Pass
LTE Band 2	25.00	316.23	2.88 (4.6dBi)	0.18119	1	Pass
LTE Band 4	25.00	316.23	2.88 (4.6dBi)	0.18119	1	Pass
LTE Band 5	25.00	316.23	0.69 (-1.6dBi)	0.04341	0.55	Pass
LTE Band 12	25.00	316.23	0.5 (-3dBi)	0.03146	0.47	Pass

LTE Band 13	25.00	316.23	0.5 (-3dBi)	0.03146	0.52	Pass
LTE Band 14	25.00	316.23	0.5 (-3dBi)	0.03146	0.53	Pass
LTE Band 66	25.00	316.23	2.88 (4.6dBi)	0.18119	1	Pass
LTE Band 71	25.00	316.23	0.5 (-3dBi)	0.03146	0.45	Pass

Simultaneous transmitting evaluation:

WCDMA II and 2.4G WIFI (The Worst data)

Mode	Power Density (S) (mW/ cm2)	Total (mW/ cm2)	Limit (mW/ cm2)
WIFI 2.4G	0.00492	0.00492/1+0.18119/1=0.18611	1
WCDMA II	0.18119		

Conclusion:

For the max result, compliance with FCC's RF Exposure