



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

FCC ID: 2AYHE-2403D

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

According to the calculation formula of power:

$$dBm = dBuV/m - 95.2$$

Modulation	Channel Freq. (MHz)	Output Power (dBuV/m)	Output Power (dBm)
LoRa	915	91.89	-3.31

	Tune up Produce power	Maximum output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm ²)	Limit (mW / cm ²)	Result
2.4G WIFI	12±1	13	19.953	1.80(2.55dBi)	0.007147	1	Pass
5.1G WIFI	10±1	11	12.59	2.86(4.57dBi)	0.007165	1	Pass
5.3G WIFI	11±1	12	15.85	2.86(4.57dBi)	0.009021	1	Pass
5.6G WIFI	12±1	13	19.95	2.86(4.57dBi)	0.011354	1	Pass
5.8G WIFI	11±1	12	15.85	2.86(4.57dBi)	0.009021	1	Pass
LORA	-4±1	-3	0.50	1.20(0.8dBi)	0.00012	0.61	Pass

For the Max simultaneous transmission:

2.4G WIFI+5G WIFI+LORA

$$\text{Simultaneous transmitting} = 0.007147 / 1 + 0.011354 / 1 + 0.00012 / 0.61 = 0.0187 \leq 1.0$$

For the max result : $0.0187 \leq 1.0$, compliance with FCC's RF Exposure