



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

# FCC ID: 2AYHE-2403A

**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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> 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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> 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	102.06	6.86

	Tune up Produce power	Maximum output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
2.4G WIFI	13±1	14	25.12	4.59(6.62dBi)	0.022945	1	Pass
5.1G WIFI	13±1	14	25.12	4.97(6.98dBi)	0.024844	1	Pass
5.3G WIFI	13±1	14	25.12	4.97(6.98dBi)	0.024844	1	Pass
5.6G WIFI	14±1	15	31.62	4.97(6.98dBi)	0.031273	1	Pass
5.8G WIFI	13±1	14	25.12	4.97(6.98dBi)	0.024844	1	Pass
LORA	6±1	7	5.01	1.66(2.21dBi)	0.00166	0.61	Pass

**For the Max simultaneous transmission:**

2.4G WIFI+5G WIFI+LORA

$$\text{Simultaneous transmitting} = 0.022945/1 + 0.031273/1 + 0.00166/0.61 = 0.0569 \leq 1.0$$

For the max result : 0.0569 ≤ 1.0, compliance with FCC's RF Exposure