BCTC

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

FCC ID: 2AYHE-2403B

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**	**90.39**	**-4.81**

	Tune up Produce power	Maximum output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm2)	Limit (mW / cm2)	Result
2.4G WIFI	9±1	10	10	2.86(4.57dBi)	0.005691	1	Pass
5.1G WIFI	10±1	11	12.59	3.20(5.05dBi)	0.008017	1	Pass
5.3G WIFI	10±1	11	12.59	3.20(5.05dBi)	0.008017	1	Pass
5.6G WIFI	9±1	10	10	3.20(5.05dBi)	0.006368	1	Pass
5.8G WIFI	6±1	7	5.01	3.20(5.05dBi)	0.003190	1	Pass
LORA	**-5±1**	-4	0.40	/	0.00008	0.61	Pass

For the Max simultaneous transmission:

2.4G WIFI+5G WIFI+LORA

Simultaneous transmitting =0.005691/1+0.008017/1+0.00008/0.61=0.0138≤ 1.0

For the max result : 0.0139≤ 1.0, compliance with FCC's RF Exposure