The Device is a home automation gateway that bridges the communication wireless devices in a Levven controls network to the Internet and smart phone apps. Gateway is designed to be used as indoor equipment for home.

Gateway evaluated for RF radiation exposure according to the provisions of FCC §2.1091, MPE guidelines identified in FCC §1.1310 and FCC KDB 447498:2015.

Limits for General Population/Uncontrolled Exposure: 47 CFR 1.1310 Table 1 (B)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

Where *f* is in MHz

The worst-case scenario at 903 MHz is **S = 0.602 mW/cm^2**, for uncontrolled exposure

The worst-case scenario at 2400 MHz is **S = 1 mW/cm^2**, for uncontrolled exposure

The table below is reporting the worst-case transmitting power reported during certification of each product.

Radio	Frequency (MHz)	Tune-up Conducted power (dBm)	Antenna gain (dBi)	EIRP 100% Duty Cycle (dBm)	EIRP 100% Duty Cycle (mW)
Levven FCC ID: 2AA9N-LCQ2 Report: l22e19a241-DTS_FCC R1	**903 – 927**	**20.43**	**0**	**20.43**	**110.4**
*Wi-Fi FCC ID: 2AC7Z-ESP32WROVERB Report: RSHA180425002-00A	**2412 - 2462**	**24**	**3.74**	**27.74**	**594.3**
*BT FCC ID: 2AC7Z-ESP32WROVERB Report: RSHA180425002-00B	2402 - 2480	5.5	3.74	9.24	8.4

* Embedded Pre-Certified Module only operated either in Wi-Fi or Bluetooth mode with Levven radio.

Using worst case scenario, the highest measured EIRP value for the transmitters are:
110.4 mW (900MHz radio) and **594.3mW (2400MHz radio)**.

The following equation provide the power density and its ratio of power density at 20cm for both radio (900MHz and 2400MHz):

$$S = EIRP / (4 \pi R^2)$$

Where: S, power density in 'mW/cm^2' (we use the value for the LoRa band of 0.60153 W/m^2)
EIRP, Effective Isotropic Radiated Power in 'mW'
R, distance to the center of the radiation of the antenna in 'cm'

900MHz power density: **0.022 mW/cm^2** = (110.4mW) / (4 x π x 20^2)

900MHz ratio of maximum power density: **4 %=** 0.022 mW/cm^2 / 0.602 mW/cm^2 (max limit)

2400MHz power density: **0.118 mW/cm^2** = (594.3mW) / (4 x π x 20^2)

2400Mhz ratio of maximum power density: **12 %=** 0.118 mW/cm^2 / 1 mW/cm^2 (max limit)

The combined RF power density of both radios is the sum of each ratio of power density. The resulting value is below the 100% RF power density allowed.

Total power density ratio from maximum permissible exposure:

16 % = 4% (900MHz radio)+ 12% (2400MHz radio)

The manufacturer manual specified a minimum safe distance of **20cm**.