

RF Exposure information

The Allegro IoT is classified as mobile.

The Allegro IoT includes BLE, LoRa transmitters operating according to FCC part 15 subpart C section 15.247 (DTS and FHSS).

The RF technologies: LoRaWAN, GMSK, BLE is not transmitting simultaneously.

The FCC power density limit for general population/uncontrolled exposure is 1 mW/cm² for 2.4 GHz for BLE transmitter.

Limit for power density for general population/uncontrolled exposure is 1 mW/cm² for 1500 -100000 MHz frequency range.

The FCC power density limit for general population/uncontrolled exposure is 0.609 mW/cm² for 914.9 MHz for LoRa transmitter.

Limit for power density for general population/uncontrolled exposure is $f/1500$ mW/cm² for 300-1500 MHz frequency range.

The power density $P \text{ (mW/cm}^2\text{)} = P_T / 4\pi r^2$

BLE transmitter

P_T is the transmitted power, which is equal to the peak transmitter output power -1.8 dBm plus maximum antenna gain 2.5 dBi, the maximum equivalent isotopically radiated power EIRP is

$$P_T = -1.8 \text{ dBm} + 2.5 \text{ dBi} = 0.7 \text{ dBm} = 1.17 \text{ mW}.$$

The power density at 20 cm (minimum safe distance, required for mobile devices), calculated as follows:

$$1.17 \text{ mW} / 4\pi (20 \text{ cm})^2 = 0.00023 \text{ mW/cm}^2 \ll 1 \text{ mW/cm}^2$$

General public cannot be exposed to dangerous RF level.

LoRa transmitter

P_T is the transmitted power, which is equal to the peak transmitter output power 27.93 dBm plus maximum antenna gain 0 dBi, the maximum equivalent isotropically radiated power EIRP is

$$P_T = 27.93 \text{ dBm} + 0 \text{ dBi} = 27.93 \text{ dBm} = 620.9 \text{ mW}.$$

The power density at 20 cm (minimum safe distance, required for mobile devices), calculated as follows:

$$620.9 \text{ mW} / 4\pi (20 \text{ cm})^2 = 0.123 \text{ mW/cm}^2 \ll 0.609 \text{ mW/cm}^2$$

General public cannot be exposed to dangerous RF level.