

RF Exposure information

The FPX3 Gateway is classified as mobile.

The FPX3 Gateway model includes 2 transmitters operating according to FCC part 15 subpart C section 15.247 in frequency range 902.5-927.5 MHz and according to FCC part 15 subpart H section 22 in 824-849 MHz.

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

$$P = 902.5/1500 = 0.6 \text{ mW/cm}^2$$

P_T is the transmitted power, which is equal to the peak transmitter output power in LoRa modulation mode of 8.75 dBm plus maximum antenna gain 3.5 dBi, the maximum equivalent isotropically radiated power EIRP is

$$P_T = 8.75 \text{ dBm} + 3.5 \text{ dBi} = 12.25 \text{ dBm} = 16.78 \text{ mW}.$$

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

$$16.78 \text{ mW} / 4\pi (20 \text{ cm})^2 \approx 0.0033 \text{ mW/cm}^2 < 0.6 \text{ mW/cm}^2$$

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

$$P = 826.4/1500 = 0.55 \text{ mW/cm}^2$$

P_T is the transmitted power, which is equal to the peak transmitter output power in WCDMA band V of 24.89 dBm (FCC ID: UDV-201709) plus maximum antenna gain 0.91 dBi, the maximum equivalent isotropically radiated power EIRP is

$$P_T = 24.89 \text{ dBm} + 0.91 \text{ dBi} = 25.8 \text{ dBm} = 380.1 \text{ mW}.$$

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

$$380.1 \text{ mW} / 4\pi (20 \text{ cm})^2 \approx 0.075 \text{ mW/cm}^2 < 0.55 \text{ mW/cm}^2$$

Summation

When all the antennas are at least 20 cm away from the user but individual antennas cannot be separated by 20 cm from each other, the following equation shall be fulfilled

$$\begin{aligned} S1/\text{Limit} + S2/\text{Limit} &< 1, \text{ i.e.} \\ 0.0033\text{mW}/\text{cm}^2 / 0.6\text{mW}/\text{cm}^2 + 0.075\text{mW}/\text{cm}^2 / 0.55\text{mW}/\text{cm}^2 &= 0.0055 + 0.136 = \\ &= 0.1418 < 1 \end{aligned}$$

General public cannot be exposed to dangerous RF level.