1. RF Exposure Requirements

1.1 General Information

Client Information	
Applicant:	FLARM Technology AG
Address of applicant:	Industriestrasse 49, 6300 Zug, Zug, Switzerland
Manufacturer:	FLARM Technology AG
Address of manufacturer:	Industriestrasse 49, 6300 Zug, Zug, Switzerland
General Description of EUT:	
Product Name:	PowerFLARM Flex Pure
Trade Name:	/
Model No.:	FLAFLY10W
Adding Model(s):	/
Rated Voltage:	DC Port: DC5V Battery:DC3.7V
Battery Capacity:	/
Power Adapter:	/
FCC ID:	2AXJM-FLAFLY10W
Equipment Type:	Mobile device
Technical Characteristics of EUT:	
Frequency Range:	902.6-927.4MHz
RF Output Power:	1.14dBm (Conducted)
Modulation:	FSK
Quantity of Channels:	63
Channel Separation:	400kHz
Type of Antenna:	Internal FLARM Antenna
Antenna Gain:	1.80dBi

1.2 RF Exposure Exemption

According to §1.1307(b)(3) and KDB 447498 D04 Interim General RF Exposure Guidance v01, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Option A: FCC Rule Part 1.1307 (b)(3)(i)(A):The available maximum time-averaged power is no more than 1mW, regardless of separation distance.

Option B: FCC Rule Part 1.1307 (b)(3)(i)(B): The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the

following formula. P_{th} is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\,cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\,cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\,cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

Option C: FCC Rule Part 1.1307 (b)(3)(i)(C): The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. R must be at least λ/2π, where λ is the free-space operating wavelength in meters.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2
1.34-30	3,450 R^2/f^2
30-300	3.83 R^2
300-1,500	0.0128 R^2f
1,500-100,000	19.2R^2

For Multiple RF sources: FCC Rule Part 1.1307(b)(3)(ii):

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).

(B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

1.3 Calculated Result

Radio Access Technology	Prediction Frequency (MHz)	Output Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	Tune-Up Time-Averaged Power (dBm)	ERP (dBm)
SRD	902.6	1.14	1.80	100	2.00	1.65
Wi-Fi	2412	25.27	4.54	100	26.00	28.39
Bluetooth	2402	10.31	4.54	100	11.00	13.39

Frequency (MHz)	Option	Min. Distance (cm)	Max. Power (dBm)	Max. Power (mW)	Exposure Limit (mW)	Ratio	Result Pass/Fail
902.6	C	20.00	1.65	1.46	462.13	0.01	Pass
2412	C	20.00	28.39	690.24	768.00	0.90	Pass
2402	C	20.00	13.39	21.83	768.00	0.03	Pass

*Note: 1. Time-Averaged Power=Output Power * Duty Cycle; ERP= Time-Averaged Power+ Antenna gain-2.15dB*

2. Option A, B and C refers as clause 1.2.

3. For option B, Max (time-averaged power, effective radiated power (ERP)) converts to Max. Power. For option C, ERP converts to Max. Power;

4. For option B, P_{th} (mW) converts to Exposure Limit (mW); For option C, ERP (W) converts to Exposure Limit (mW).

5. Ratio= Tune-Up ERP (mW)/ Exposure Limit (mW)

Mode for Simultaneous Multi-band Transmission:

Radio Access Technology	Ratio 1	Ratio 2	Simultaneous Ratio	Limit	Result Pass/Fail
SRD + Wi-Fi	0.01	0.90	0.91	1	Pass
SRD + Bluetooth	0.01	0.03	0.04	1	Pass

Note:

1) For 2.4GHz Wi-Fi & BT IoT Module (FCC ID: 2AC7Z-ESPS3MINI1; the issue date: 02/28/2022)
Bluetooth Maximum peak output power (dBm):10.31; Antenna Gain (dBi):4.54
Wi-Fi (2.4G) Maximum peak output power (dBm):25.27; Antenna Gain (dBi):4.54
2) BT and Wi-Fi can't transmit at the same time.

Result: Pass