5. RF EXPOSURE EVALUATION

5.1 Applicable Standard

FCC §15.247 (i) and subpart §1.1307

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.

5. 2 Procedure

According to §1.1307(b)(3)(i)

(C) Or using Table 1 and 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. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - 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.

5.3 Measurement Result

Operation Modes	Frequency (MHz)	λ/2π (mm)	Distance (mm)	Exemption ERP		Maximum Conducted Power including Tune-up Tolerance (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	MPE-Based Exemption
				(mW)	(dBm)					
Lora-FHSS	902.3-927.6	52.94	200	462	26.65	6	-1.74	2.11	1.63	Compliant
Lora-DTS	903-926.9	52.90	200	462	26.65	6	-1.74	2.11	1.63	Compliant
WiFi	2412-2462	19.80	200	768	28.85	18	-0.64	15.21	33.19	Compliant

Note: The Maximum Conducted Power including Tune-up Tolerance was declared by manufacturer.

Simultaneous transmission:

The Lora-FHSS and Lora-DTS can`t transmit simultenuously. WiFi and Lora can transmit simultaneously:

$$\sum_{i=1}^{a}\left(\frac{P_i}{P_{th_i}}\right)+\sum_{j=1}^{b}\left(\frac{ERP_j}{ERP_{th_j}}\right)+\sum_{k=1}^{c}\left(\frac{Evaluated_k}{Exposure\ Limit_k}\right)$$

= $ERP_{-WiFi}/RRP_{th-WiFi}+ERP_{-Lora}/ERP_{th-Lora}$
=33.19/768+1.63/462
=0.05

Result: The device compliant the MPE-Based Exemption at 20cm distances.

===== END OF REPORT ====