RF Exposure Evaluation for FCC ID: YCPGS-HF1

Refer user manual this device is a LoRa™ HF band gateway, and this device was designed used in portable devices that the minimum distance between human's body is **5mm.** Based on the 47CFR 2.1093, this device belongs to portable device. The definition of the category as following:

Portable Derives:

CFR Title 47 §2.1093(b)

(b) For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

FCC KDB 447498 D01 General RF Exposure Guidance v06 Limit

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√ f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

Where

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and

for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Test data

LoRa			
Mode	GFSK (BLE)		
	Low Channel	Middle Channel	High Channel
Frequency (MHz)	902.5	915	927.5
Peak Power (dBm)	**5.32**	5.31	5.31
Note: This report listed the worst case peak power value, please refer to RF test report for more details.			

Turn-up power

Mode	Range (dBm)
LoRa	5.00-6.00

The LoRa™ HF band gateway work frequency range used is 902 MHz ~ 928 MHz, the result close to the limit by the above formula, so we select 902.5 MHz to calculate the exclusion power threshold.

FCC exclusion condition= [4 mW/5 mm] · [√0.9025 GHz] = 0.8 ＜ 3.0

Conclusion:

RF exposure Evaluation Results: **Compliance**