FCC §15.247 (i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Report No.: RSZ200716006-00A

Limits for General Population/Uncontrolled Exposure										
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (Minutes)						
0.3-1.34	614	1.63	*(100)	30						
1.34-30	824/f	2.19/f	$*(180/f^2)$	30						
30-300	27.5	0.073	0.2	30						
300-1500	/	/	f/1500	30						
1500-100,000	/	/	1.0	30						

f = frequency in MHz

* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm2)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_{i} \frac{S_{i}}{S_{Limit,i}} \le 1$$

FCC Part 15.247 Page 11 of 38

Mode	Frequency (MHz)	Antenna Gain		Tune up conducted power		Evaluation Distance	Power Density	MPE Limit
Mode		(dBi)	(numeri c)	(dBm)	(mW)	(cm)	(mW/cm ²)	(mW/cm ²)
Lora(125k)	902.3-914.9	3.0	2	16	39.81	20	0.016	0.60
Lora(500k)	903-914.2	3.0	2	16	39.81	20	0.016	0.602
BT	2402-2480	2.23	1.67	4.5	2.82	20	0.001	1

Report No.: RSZ200716006-00A

Note:

- 1) To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.
- 2) Bluetooth and Lora can transmit simultaneously for this device.
- 3) Simultaneous transmitting consideration:

The ratio=MPE_{BLE}/limit+MPE_{Lora}/limit=0.001/1+0.016/0.60=0.028 \leq 1.0, so it comply with simultaneous exposure requirement.

Result: Pass

FCC Part 15.247 Page 12 of 38