RF Exposure Report (FCC)

Report No.:	WIR117437 -FCC-RF Exposure
Test Model:	Lat-Lon X15500
Received Date:	05 /03 /2022
Test Date:	05 /04/ 2022 – 05 /28 /2022
Issued Date:	06/ 23/ /2022
Applicant:	Lat-Lon, LLC
Address:	2300 S. Jason St, Denver, CO 90223
Issued By:	Eurofins Electrical and Electronic Testing NA, Inc.
Lab Address:	3162 Belick St. Santa Clara CA, 95054

A2LA ACCREDITED
TESTING CERT #0591.02

1. Certificate of Conformity

Product: Lat-Lon X15500
Brand: Lat-Lon, LLC
Test Model: X15500
Series Model: 22319-5—J117437
Sample Status: Engineering Sample
Applicant: Lat-Lon, LLC
Test Date: 05 /02/ 2022 – 05 /28 /2022
Standard: 47 CFR FCC Part 2.1093

Alberto Silvider

Alberto Saldiver
Test Engineer, Wireless Laboratory

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made.

Gary Chou

Gary Chou
Wireless Engineering Manager, Wireless Laboratory

Revision	Report Date	Reason for Revision
∅	June 23, 2022	Initial Issue.

2. RF Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
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

2.1 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.2 Antenna Gain

Cellular:
Antenna Type: Flexible PCB Antenna
698 MHz -798 MHz : 3.5 dBi
824 MHz - 960 MHz : 3.5 dBi
1710 MHz - 2170 MHz : 3.8dBi
2300 MHz - 2400 MHz : 4.5 dBi
2500 MHz – 2690 MHz : 4.5 dBi

BLE:
Antenna Type: Embedded chip antenna
Antenna Gain: 1.86 dBi

ZigBee:
Antenna Type: Embedded chip antenna
Antenna Gain: 1.7 dBi

2.3 Calculation Result of Maximum Conducted Power

Type/ Band	Frequency Band (MHz)	Max Power (tune up) (dBm)	Max Power (tune up) (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
LTE CAT-M Band 2	1850.7	24	251.1886	3.8	20	0.119936	1
LTE CAT-M Band 12	699.0	24	251.1886	3.5	20	0.111931	0.466
BLE	2404	9.8	9.5499	1.86	20	0.002917	1
ZigBee	2745	9.26	8.4333	1.7	20	0.002483	1

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. This device contains

TYPE	Model No.	FCC ID	Note
Cellular	ME910C1-NA	RI7ME910C1NA	-
BLE	BGM220P	QOQ-GM220P	-
ZigBee	ETERNA2	SJC-ETERNA2	-

3. Conclusion

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Worse case (LTE+BLE+ZigBee)

Total MPE Percentage for

t = 0.262773391< 1

Therefore, the maximum calculations of above situations are less than the "1" limit.
The SAR evaluation is not required.