

RF Exposure Report

Report No.: MFBHAT-WTW-P21060603

FCC ID: R68E213W

Test Model: E213F102S

Received Date: Oct. 14, 2021

Date of Evaluation: Jul. 04, 2022

Issued Date: Sep. 30, 2022

Applicant: Lantronix

Address: 7535 Irvine Center Drive, Suite 100, Irvine, CA 92618 USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, TAIWAN

FCC Registration / 788550 / TW0003
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
MFBHAT-WTW-P21060603	Original Release	Sep. 30, 2022

1 Certificate of Conformity

Product: E210 Series

Brand: LANTRONIX

Test Model: E213F102S

Sample Status: Identical Prototype

Applicant: Lantronix

Date of Evaluation: Jul. 04, 2022

FCC Rule Part: FCC Part 2 (Section 2.1091)

Standards: KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Vera Huang, **Date:** Sep. 30, 2022
Vera Huang / Specialist

Approved by : Jeremy Lin, **Date:** Sep. 30, 2022
Jeremy Lin / Project Engineer

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

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

2.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

3 Calculation Result of Maximum Conducted Power

Band	Max AV Power (dBm)	Duty Cycle	Time-Average Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
GPRS 850	33.5	25%	27.48	1	20	0.140	0.55
GPRS 1900	30.5	25%	24.48	3	20	0.111	1.00
LTE B2	24.5	100%	24.5	6	20	0.223	1.00
LTE B4	24.5	100%	24.5	6	20	0.223	1.00
LTE B5	24.5	100%	24.5	4	20	0.141	0.55
LTE B12	24.5	100%	24.5	3	20	0.112	0.46
LTE B13	24.5	100%	24.5	3	20	0.112	0.52
LTE B25	24.5	100%	24.5	6	20	0.223	1.00
LTE B26	24.5	100%	24.5	4	20	0.141	0.54

Band	Max AV Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN 2.4G	17.32	3.32	20	0.023	1

Note:

1. The maximum source-based time-averaged power was used for GPRS, and that it supports up to 2 - Slot, maximum duty cycle 25%.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
3. The EUT contains certified WWAN module with FCC ID: R68E213.
4. Refer to SIERRA module report (model: HL7802) for conducted power.
5. Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

Conclusion:

The formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

The simultaneous operation mode was determined by client.

$$WWAN + WLAN = 0.141/0.54 + 0.023/1 = 0.284$$

Therefore the maximum calculations of above situations are less than the "1" limit.

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