

RF Exposure Evaluation Report

Applicant: Neutron Holdings, Inc.

Address of Applicant: 85 2nd St, San Francisco, CA 94105 USA

Equipment Under Test (EUT)

Product Name: Central controller

Model No.: Lime-V3-US

Trade mark: Lime

FCC ID: 2APB2-LIME30US

Applicable standards: FCC CFR Title 47 Part 2 Subpart J Section 2.1091

Date of sample receipt: 21 Feb., 2021

Date of Test: 21 Feb., to 30 Mar., 2021

Date of report issue: 31 Mar., 2021

Test Result: PASS*

Authorized Signature:



Bruce Zhang
Laboratory Manager



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	31 Mar., 2021	Original

Tested by: YT Yang
Test Engineer

Date: 31 Mar., 2021

Reviewed by: Winner Zhang
Project Engineer

Date: 31 Mar., 2021

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4 General Information

4.1 Client Information

Applicant:	Neutron Holdings, Inc.
Address:	85 2nd St, San Francisco, CA 94105 USA
Manufacturer/Factory:	MeiG Smart Technology Co., Ltd.
Address:	1/2/3F A, Building A, B, No.5 Lingxia Road, 4th Fenghuang Industrial Park, Fuyong Street, Baoan District, Shenzhen, Guangdong, China

4.2 General Description of E.U.T.

Product Name:	Central controller
Model No.:	Lime-V3-US
Operation Frequency:	WCDMA Band V: 826.4MHz-846.6MHz WCDMA Band II: 1852.4 MHz-1907.6 MHz WCDMA Band IV : 1712.4 MHz-1752.6 MHz LTE Band 2: TX: 1850MHz-1910MHz RX: 1930MHz-1990MHz LTE Band 4: TX: 1710MHz-1755MHz RX: 2110MHz-2155MHz LTE Band 5: TX: 824MHz-849MHz RX: 869MHz-894MHz LTE Band 12: TX: 699MHz-716MHz RX: 729MHz-746MHz LTE Band 13: TX: 777 MHz-787 MHz RX: 746 MHz-756 MHz BLE: TX: 2402MHz - 2480 MHz RX : 2402MHz - 2480 MHz
Modulation technology:	WCDMA: QPSK,16QAM LTE: QPSK,16QAM, 64QAM BLE : GFSK
Antenna Type:	Internal Antenna
Antenna gain:	WCDMA Band V: 1.72 dBi, WCDMA Band II: 3.82 dBi, WCDMA Band IV: 4.64 LTE Band 2: 3.82 dBi, LTE Band 4: 4.64 dBi, LTE Band 5: 1.72 dBi LTE Band 12: -2.12 dBi, LTE Band 13: 0.47 dBi BLE: 2.32dBi
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

4.3 Operating Modes

Operating mode	Detail description
WCDMA mode	Keep the EUT in continuously transmitting in WCDMA mode
LTE mode	Keep the EUT in continuously transmitting in LTE mode
BLE mode	Keep the EUT in continuously transmitting in BLE mode

4.4 Additions to, deviations, or exclusions from the method

No

4.5 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

4.6 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

5 Technical Requirements Specification in FCC CFR Title 47 Part 2.1091

5.1 Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) 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

5.2 Test Procedure

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna

5.3 Result

Frequency (MHz)	Maximum Output power (dBm)	Maximum Output power (mW)	Antenna Gain (dBi)	Antenna Gain (numeric)	Distance (cm)	Result (mW/cm ²)	Limits for General Population/ Uncontrolled Exposure (mW/cm ²)
WCDMA 850							
836.60	22.68	185.35	1.72	1.49	20.00	0.055	0.56
WCDMA 1700							
1713.40	22.36	172.19	4.64	2.91	20.00	0.099	1.0
WCDMA 1900							
1880.00	22.34	171.40	3.82	2.40	20.00	0.082	1.0
LTE Band 2							
1880	22.89	194.54	3.82	2.40	20.00	0.093	1.0
LTE Band 4							
1732.50	22.87	193.64	4.64	2.91	20.00	0.112	1.0
LTE Band 5							
825.50	22.89	194.54	1.72	1.49	20.00	0.058	0.55
LTE Band 12							
707.50	22.71	186.64	-2.12	0.61	20.00	0.023	0.47
LTE Band 13							
779.50	23.01	199.99	0.47	1.11	20.00	0.044	0.52
BLE							
2402.00	-1.85	0.6531	2.32	1.70	20	0.00022	1.00

BLE Result/Limits + LTE band 2 Result/Limit < 1.0

$0.00022/1 + 0.093/1 = 0.09322 < 1.0$

Note: Just the worst case mode was shown in report.

5.4 Conclusion

The device is exempt from the RF exposure evaluation.

-----End of report-----