

FCC RF EXPOSURE EVALUATION REPORT

Product Name: Android BOX
Trade Mark: Newline
Model No.: X10D
Report Number: 180228003RFC-3
Test Standards: FCC 47 CFR Part 1 Subpart I
FCC ID: 2APNX-X10D
Test Result: PASS
Date of Issue: June 5, 2018

Prepared for:

Newline Interactive Inc.
101 East Park Blvd. Suite 807 Plano TX 75074 USA

Prepared by:

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Date: June 5, 2018


Shenzhen UnionTrust Quality and Technology Co., Ltd.

Version

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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Newline Interactive Inc.
Address of Applicant:	101 East Park Blvd. Suite 807 Plano TX 75074 USA
Manufacturer:	Newline Interactive Inc.
Address of Manufacturer:	101 East Park Blvd. Suite 807 Plano TX 75074 USA
Factory:	Shenzhen Zidoo Technology Co., Ltd
Address of Factory:	Room 12 D,Block A Central Great Searchings,Xixiang Ave,BaoAn District,Shenzhen.

1.2 EUT INFORMATION

Product Name:	Android BOX		
Model No.:	X10D		
Trade Mark:	Newline		
DUT Stage:	Identical Prototype		
EUT Supports Function:	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
	5 GHz U-NII Bands:	5 150 MHz to 5 250 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
Sample Received Date:	March 19, 2018		
Sample Tested Date:	March 20, 2018 to March 28, 2018		

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

For 2.4 GHz ISM Band of Wi-Fi	
Frequency Range:	2400 MHz to 2483.5 MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20, IEEE 802.11n-HT40
Type of Modulation:	IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n-HT40: OFDM(64-QAM, 16-QAM, QPSK, BPSK)
Data Rate:	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS7(64 Mbps) IEEE 802.11n-HT40: Up to MCS7(135 Mbps)
Number of Channels:	IEEE 802.11b: 11 IEEE 802.11g: 11 IEEE 802.11n-HT20: 11 IEEE 802.11n-HT40: 7
Channel Separation:	5 MHz
Antenna Type:	FPCB Antenna
Antenna Gain:	2 dBi
Maximum Peak Power:	IEEE 802.11b: 19.95 dBm IEEE 802.11g: 21.97 dBm IEEE 802.11n-HT20: 21.55 dBm IEEE 802.11n-HT40: 21.83 dBm

For 5 GHz U-NII Bands of Wi-Fi			
Frequency Range:	5150 MHz to 5250 MHz		
	5725 MHz to 5850 MHz		
Support Standards:	IEEE 802.11a/n/ac		
TPC Function:	Not Support		
DFS Operational mode:	Slave without radar Interference detection function		
Type of Modulation:	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)		
	IEEE 802.11n: OFDM(64QAM, 16QAM, QPSK, BPSK)		
	IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)		
Channel Spacing:	IEEE 802.11a/n-HT20/ac-VHT20: 20 MHz		
	IEEE 802.11n-HT40/ac-VHT40: 40 MHz		
	IEEE 802.11ac-VHT80/: 80 MHz		
Data Rate:	IEEE 802.11a: Up to 54 Mbps		
	IEEE 802.11n-HT20: Up to MCS7		
	IEEE 802.11n-HT40: Up to MCS7		
	IEEE 802.11ac-VHT20: Up to MCS8		
	IEEE 802.11ac-VHT40: Up to MCS9		
	IEEE 802.11ac-VHT80: Up to MCS9		
Number of Channels:	5150 MHz to 5250 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40)/ac-VHT40 1 for IEEE 802.11acVHT80		
	5725 MHz to 5850 MHz: 5 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11ac-VHT80		
Antenna Type:	FPCB Antenna		
Antenna Gain:	5150 MHz to 5250 MHz	2 dBi	
	5725 MHz to 5850 MHz	2 dBi	
Maximum Conducted Output Power (dBm):	Mode	U-NII-1	U-NII-3
	IEEE 802.11a	15.00	16.07
	IEEE 802.11n-HT20	14.84	16.02
	IEEE 802.11n-HT40	10.82	15.15
	IEEE 802.11ac-VHT20	14.82	15.51
	IEEE 802.11ac-VHT40	10.72	15.68
	IEEE 802.11ac-VHT80	10.44	15.88

1.4 OTHER INFORMATION

Test channels for 2.4 GHz ISM Band of Wi-Fi				
Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11b	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11g	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT20	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT40	2422 MHz to 2452 MHz	Channel 3	Channel 7	Channel 9
		2422 MHz	2437 MHz	2452 MHz

Test channels for 5 GHz U-NII Bands of Wi-Fi				
Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11a IEEE 802.11n-HT20 IEEE 802.11ac-VHT20	5150 MHz to 5250 MHz	Channel 36	Channel 44	Channel 48
		5180 MHz	5220 MHz	5240 MHz
	5725 MHz to 5850 MHz	Channel 149	Channel 157	Channel 161
		5745 MHz	5785 MHz	5805 MHz
IEEE 802.11n-HT40 IEEE 802.11ac-VHT40	5150 MHz to 5250 MHz	Channel 38	--	Channel 46
		5190 MHz	--	5230 MHz
	5725 MHz to 5850 MHz	Channel 151	--	Channel 159
		5755 MHz	--	5795 MHz
IEEE 802.11ac-HT80	5150 MHz to 5250 MHz	--	Channel 42	--
		--	5210 MHz	--
	5725 MHz to 5850 MHz	--	Channel 155	--
		--	5775 MHz	--

1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC 47 CFR Part 1 Subpart I

All test items have been performed and recorded as per the above standards

1.6 TEST LOCATION

All tests were performed at:

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109
 Telephone: +86 (0) 755 2823 0888
 Fax: +86 (0) 755 2823 0886

Shenzhen UnionTrust Quality and Technology Co., Ltd.

1.7 TEST FACILITY

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

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

IC-Registration No.: 21600-1

The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.8 DEVIATION FROM STANDARDS

None.

1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

2. EQUIPMENT LIST

Please refer to the RF test report.

3. MPE EVALUATION

3.1 REFERENCE DOCUMENTS FOR EVALUATION

No.	Identity	Document Title
1	FCC 47 CFR Part 1 Subpart I	PROCEDURES IMPLEMENTING THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969
2	KDB 447498 D01 General RF Exposure Guidance v06	RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES

3.2 MPE COMPLIANCE REQUIREMENT

3.2.1 Limits

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz; * = Plane-wave equivalents power density.

3.2.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3.3 MPE CALCULATION METHOD

$$S = PG/4\pi R^2 = EIRP/4\pi R^2$$

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 (in appropriate units, e.g., cm)

3.4 MPE CALCULATION RESULTS

Note: For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.4.1 For WLAN

For Wi-Fi function, operating at 2412MHz to 2462 MHz for IEEE802.11b/g/n and operating at 5150 MHz to 5250 MHz for IEEE802.11a/n/ac and operating at 5725 MHz to 5850 MHz for IEEE802.11a/n/ac.

3.4.1.1 Antenna Type:

Chain 0: Integral Antenna

3.4.1.2 Antenna Gain:

Chain 0: 2412MHz to 2462 MHz: 2 dBi
 5150 MHz to 5250 MHz: 2 dBi
 5725 MHz to 5850 MHz: 2 dBi

3.4.1.3 Results for WLAN

Operating Mode	Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value
	(MHz)	(dBm)		(dBi)	(dBm)	(mW)	(mw/cm ²)	
IEEE 802.11b	2412	17.00	1.5	2	20.5	112.2018	1	0.0223
	2437	17.00	1.5	2	20.5	112.2018	1	0.0223
	2462	17.00	1.5	2	20.5	112.2018	1	0.0223
IEEE 802.11g	2412	12.00	1.5	2	15.5	35.4813	1	0.0071
	2437	12.00	1.5	2	15.5	35.4813	1	0.0071
	2462	12.00	1.5	2	15.5	35.4813	1	0.0071
IEEE 802.11n-HT20	2412	11.00	1.5	2	14.5	28.1838	1	0.0056
	2437	11.00	1.5	2	14.5	28.1838	1	0.0056
	2462	11.00	1.5	2	14.5	28.1838	1	0.0056
IEEE 802.11n-HT40	2422	12.00	1.5	2	15.5	35.4813	1	0.0071
	2437	12.00	1.5	2	15.5	35.4813	1	0.0071
	2452	12.00	1.5	2	15.5	35.4813	1	0.0071
IEEE 802.11a	5180	15.00	1.5	2	18.5	70.7946	1	0.0141
	5220	15.00	1.5	2	18.5	70.7946	1	0.0141
	5240	15.00	1.5	2	18.5	70.7946	1	0.0141
	5745	15.00	1.5	2	18.5	70.7946	1	0.0141
	5785	15.00	1.5	2	18.5	70.7946	1	0.0141
	5805	15.00	1.5	2	18.5	70.7946	1	0.0141
IEEE 802.11n-HT20 IEEE 802.11ac-VHT20	5180	15.00	1.5	2	18.5	70.7946	1	0.0141
	5220	15.00	1.5	2	18.5	70.7946	1	0.0141
	5240	15.00	1.5	2	18.5	70.7946	1	0.0141
	5745	15.00	1.5	2	18.5	70.7946	1	0.0141
	5785	15.00	1.5	2	18.5	70.7946	1	0.0141
	5805	15.00	1.5	2	18.5	70.7946	1	0.0141
IEEE 802.11n-HT40 IEEE 802.11ac-VHT40	5190	10.00	1.5	2	13.5	22.3872	1	0.0045
	5230	10.00	1.5	2	13.5	22.3872	1	0.0045
	5755	15.00	1.5	2	18.5	70.7946	1	0.0141
	5795	15.00	1.5	2	18.5	70.7946	1	0.0141
IEEE 802.11ac-VHT80	5210	10.00	1.5	2	13.5	22.3872	1	0.0045
	5775	15.00	1.5	2	18.5	70.7946	1	0.0141

Antenna 0

APPENDIX 1 PHOTOS OF TEST SETUP

N/A

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

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