HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

April 30, 2024

Intellian Technologies USA Inc
Christopher Goodman
2600 Tower Oaks Boulevard, Suite 400
Rockville, MD 20852

Dear Christopher Goodman,

Enclosed is the EMC Wireless test report for compliance testing of the Intellian Technologies USA Inc, CNX-WiFi with 450 Watt AC Adapter as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Title 47 of the CFR, Part 15.407, Subpart E (UNII 1).

Thank you for using the services of Eurofins Electrical and Electronic Testing NA, Inc. If you have any questions regarding these results or if Eurofins Electrical and Electronic Testing NA, Inc. can be of further service to you, please feel free to contact me.

Sincerely yours,
EUROFINS ELECTRICAL AND ELECTRONIC TESTING NA, INC.

Michelle Tawmging

Michelle Tawmging
Documentation Department

Reference: (\Intellian Technologies USA Inc\ WIR128375-FCC407 UNII 1 Rev. 3)

ACCREDITED
TESTING CERT #0591.01

Certificates and reports shall not be reproduced except in full, without the written permission of Eurofins Electrical and Electronic Testing NA, Inc. While use of the A2LA logo in this report reflects Eurofins Electrical and Electronic Testing NA, Inc. accreditation under these programs, the report must not be used by the client to claim product certification, approval, or endorsement by A2LA, or any agency of the Federal Government. This letter of transmittal is not a part of the attached report.

Eurofins Electrical and Electronic Testing NA, Inc. is part of the Eurofins Electrical & Electronics (E&E) global compliance network.

HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

Electromagnetic Compatibility Criteria
Test Report

for the

Intellian Technologies USA Inc
Model CNX-WiFi with 450 Watt AC Adapter

Tested under
The FCC Certification Rules
contained in
Title 47 of the CFR
15.407 Subpart E

Report: WIR128375-FCC407 UNII 1 Rev. 3

April 30, 2024

Prepared For:

Intellian Technologies USA Inc
2600 Tower Oaks Boulevard, Suite 400
Rockville, MD 20852

Prepared By:
Eurofins Electrical and Electronic Testing NA, Inc.
914 W. Patapsco Avenue
Baltimore, MD 21230

HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

Electromagnetic Compatibility Criteria
Test Report

for the

Intellian Technologies USA Inc
Model CNX-WiFi with 450 Watt AC Adapter

Tested under
The FCC Certification Rules
contained in
Title 47 of the CFR
15.407 Subpart E

Donald Salguero
Wireless Laboratory Engineer

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, the equipment tested is capable of operation in accordance with the requirements of Parts 15B, 15.407, of the FCC Rules under normal use and maintenance.

Michael Griffiths
Manager, Wireless Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	January 23, 2024	Initial Issue
1	February 22, 2024	Updated EUT name throughout; Updated Section A; Updated Section E.
2	April 3, 2024	Removed MPE section.
3	April 30, 2024	Updated Table 4; Updated Table 5.

Table of Contents

I. Executive Summary 1
A. Purpose of Test 1
B. Executive Summary 1
II. Equipment Configuration 2
A. Overview 2
B. References 2
C. Test Site 3
D. Measurement Uncertainty 3
E. Equipment Overview and Test Configuration 4
F. Modifications 12
a) Modifications to EUT 12
b) Modifications to Test Standard 12
G. Disposition of EUT 12
III. Electromagnetic Compatibility Criteria for Intentional Radiators 13
§ 15.203 Antenna Requirement 13
§ 15.403 26dB Bandwidth 14
Duty Cycle 16
§15.407(a)(1)(ii) Maximum Conducted Output Power 17
§15.407(a)(1)(ii) Maximum Power Spectral Density 20
§15.407(b)(1) & (9 - 10) Undesirable Emissions 22
Conducted Emissions - 15.207 25
IV. Test Equipment 27

List of Tables

Table 1. Executive Summary of EMC Part 15.407 ComplianceTesting 1
Table 2. EUT Summary 2
Table 3. References 2
Table 4. Uncertainty Calculations Summary 3
Table 5. Equipment Details 6
Table 6. EUT List 6
Table 7. Ports and Cabling 6
Table 8. Support Equipment 6
Table 9. UNII1, Occupied Bandwidth - Test Results 15
Table 10. UNII1, Duty Cycle - Test Results 16
Table 11. UNII1, Conducted Output Power - Test Results 18
Table 12. UNII1, EIRP - Test Results 19
Table 13. UNII1, PSD - Test Results 21
Table 14. UNII1, Band Edges - AVG Test Results 23
Table 15. UNII1, Band Edges - PK Test Results 23
Table 16. UNII1, -27dBm Band Edges - Test Results 24
Table 17. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a) 25
Table 18. Conducted Emissions - 15.207, Line Data 26
Table 19. Conducted Emissions - 15.207, Neutral Data 26
Table 20. CEV Test Equipment List 27
Table 21. Test Equipment List 27

Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Intellian Technologies USA Inc CNX-WiFi with 450 Watt AC Adapter, with the requirements of Part 15, §15.407. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the CNX-WiFi with 450 Watt AC Adapter. Intellian Technologies USA Inc should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the CNX-WiFi with 450 Watt AC Adapter, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.407, in accordance with Intellian Technologies USA Inc, purchase order number 4200001300. All tests were conducted using measurement procedure ANSI C63.10-2013.

FCC Reference	Description	Results
§15.203	Antenna Requirement	Compliant
§15.403	26dB Occupied Bandwidth	Compliant
N/A	Duty Cycle	Completed
§15.407 (a)(1)	Maximum Conducted Output Power	Compliant
§15.407 (a)(1)	Maximum Power Spectral Density	Compliant
§15.407 (b)(1)& (9 - 10)	Undesirable Emissions	Compliant
Conducted Emissions - 15.207	Conducted Emission Limits	Compliant

Table 1. Executive Summary of EMC Part 15.407 ComplianceTesting

Equipment Configuration

A. Overview

Eurofins Electrical and Electronic Testing NA, Inc. was contracted by Intellian Technologies USA Inc to perform testing on the CNX-WiFi with 450 Watt AC Adapter, under Intellian Technologies USA Inc's purchase order number 4200001300.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Intellian Technologies USA Inc CNX-WiFi with 450 Watt AC Adapter.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	CNX-WiFi with 450 Watt AC Adapter	
Model(s) Covered:	CNX-WiFi with 450 Watt AC Adapter	
EUT Specifications:	Primary Power: 100-240 VAC	
	Type of Modulations:	BPSK,QPSK,DBPSK,DQPS
	Equipment Code:	NII
	Max. RF Output Power:	22.64 dBm; 0.184 W
	EUT Frequency Ranges:	5180 – 5240 MHz; 5190 – 5230 MHz; 5210 MHz; 5250MHz straddle channel
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35º C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Type of Filing:	Original	
Evaluated by:	Donald Salguero	
Report Date(s):	April 30, 2024	

Table 2. EUT Summary

B. References

CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2017	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
789033 D02 General UNII Test Procedures New Rules v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

Table 3. References

C. Test Site

All testing was performed at Eurofins Electrical and Electronic Testing NA, Inc., 914 W. Patapsco Avenue, Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 3 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at Eurofins Electrical and Electronic Testing NA, Inc.

D. Measurement Uncertainty

Test Method	Typical Expanded Uncertainty	K	Confidence Level
Radiated Emissions, (30 MHz – 1 GHz)	±3.20	2	95%
Radiated Emissions, (1 GHz – 6 GHz)	±2.52	2	95%
Conducted Emission Voltage	±2.03	2	95%
RF Frequencies	±4.52 Hz	2	95%
RF Power Conducted Emissions	±2.32 dB	2	95%
RF Power Conducted Spurious Emissions	±2.25 dB	2	95%
RF Power Radiated Emissions	±3.01 dB	2	95%

Table 4. Uncertainty Calculations Summary

E. Equipment Overview and Test Configuration

Name of EUT/Model:	CNX-WiFi with 450 Watt AC Adapter
Description of EUT and Intended Use:	CNX (Customer Network Exchange) is an integral component of a OneWeb User Terminal (UT) that provides the network interface, WiFi and Ethernet, for connecting User Devices to the OneWeb Network. CNX also provides power to the OneWeb UT using a coax cable that multiplexes power and data.
Selected Operation Mode(s):	CNX Bridged Mode • CNX operates as a Layer-2 device • SSID: APN1 and SSID: APN_2 are disabled • Devices connected to LAN port MGNT obtain IP addresses via DHCP from the SSM • Devices connected to SSID: Intellian obtain IP addresses via DHCP from the SSM
Rational for the selection of the Operation Mode(s):	Intellian SSID/MGMT port for Management - data load testing between client and server
Susceptibility Criteria:	iPerf traffic loss for data load CNX-WifI reboot due to excessive current draw by electronic load
Monitoring Method(s):	Performing as intended: • The CNX-WiFi functioning with an electronic load of 56VDC at 7.5A Failure conditions: • CNX reboot due to excessive current draw by electronic load
Emissions Class Declaration:	Class B
Configurations:	Please refer to Testing document.
Rated Power Input	
Input Voltage Range:	100-240 VAC
AC or DC:	AC
Voltage Frequency:	50-60 HZ
Number of Phases:	1
Current:	5.3 A Max
Uses an external AC/DC Adapter:	True
Manufacturer:	Adapter Technology Co Ltd

Model #:	ATM450A2-P560
Part #:	Not Applicable
Serial #:	Not Applicable
The EUT can be battery powered:	False
Power Input Under Test	
Input Voltage:	230 VAC
Frequency:	50 Hz
Physical Description	
EUT Arrangement:	Table Top
System with Multiple Chassis?	False
Size (HxWxD) inches:	8.3x6.8x3.1
Weight (lbs.):	1.5
Highest Internal Frequency (MHz):	5.95
Other Info	
EUT Software (Internal to EUT):	MoCA version 2.20.5
Support Software (used by support PC to exercise EUT):	iPerf Version 2.0.9, QDART, Windows 11
Firmware:	Version 13
Transmitter Parameters	
Description of your unit:	OFDM, OFDMA
Modulation Type:	BPSK,QPSK,DBPSK,DQPS
Number of Channels:	20
Frequency Range (MHz):	2412 – 2462; 5180 – 5240; 5260 – 5320; 5500 -5720; 5745 – 5825
Antenna Type:	MU-MIMO
Antenna Gain (dB):	2
PMN:	CNX-WiFi
HVIN:	V 04
FVIN:	420.204.1-009
HMN:	CNX-WiFi
Data Rates:	20 MHz -1xSS: MCS0 - MCS11 2xSS: MCS0 - MCS11 | 40MHZ -1xSS: MCS0 - MCS11 2xSS: MCS0 - MCS11
Expected Power Level:	23 dBm
Number of Antenna:	4

Number of Intentional Transmitters:	4
Number of Certified Intentional Transmitter Modules:	0
FCC ID:	XXZ-BL5008
IC ID:	26236-BL5008

Table 5. Equipment Details

Name/Description	Model Number	Part Number	Serial Number	Rev. #
CNX Wi-Fi	BL5008	N/A	5008232900005	V 0.4
450 Watt AC Adapter	ATM450A2-P560	N/A	N/A	N/A

Table 6. EUT List

Port Name on EUT	Cable Desc. or reason for none	3 Meters or Longer	Length as tested (m)	Max Length (m)	Shielded?	Termination Box ID & Port Name
MGMT	Ethernet Cable	Yes	3.048	100	No	Laptop
COAX	For Power and Ethernet	Yes	3.048	80	Yes	SSM
Power	Integrated Power Cable	No	1	1	No	450W PSU
LAN 3	Disabled	No	N/A	N/A	No	N/A
LAN 2	Not needed for testing	No	N/A	N/A	No	N/A
LAN 1	Not needed for testing	No	N/A	N/A	No	N/A

Table 7. Ports and Cabling

Name/Description	Manufacturer	Model Number	Serial Number	*Customer Supplied Calibration Data
Laptop	Dell	N/A	N/A	N/A
DC Load	BK Precision	8510B	N/A	N/A
Test Jig	Intellian	N.A.	N/A	N/A

Table 8. Support Equipment

Photograph 1. CNX-WiFi, Front Side

Photograph 2. CNX-WiFi, Right Side

Photograph 3. CNX-WiFi, Left Side

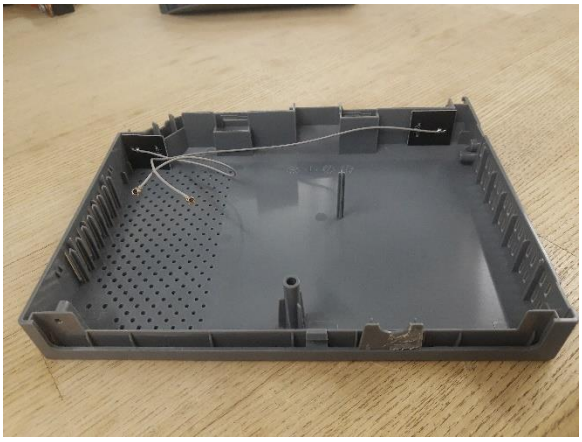
Photograph 4. CNX-WiFi, Rear Side

Photograph 5. CNX-WiFi, Top Side

Photograph 6. CNX-WiFi, Bottom Side

Photograph 7. CNX-WiFi, Internal Board, Side 1

Photograph 8. CNX-WiFi, Internal Board, Side 2



Photograph 9. CNX-WiFi, Internal 2.4 GHz Antenna Position

Photograph 10. CNX-WiFi, Internal 5 GHz Antenna Position

Photograph 11. 450 Watt AC Adapter

F. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

G. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Intellian Technologies USA Inc upon completion of testing.

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.203 Antenna Requirement

Test Requirement: **§ 15.203:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

a.) Antenna must be permanently attached to the unit.

b.) Antenna must use a unique type of connector to attach to the EUT.

c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Test Results: The EUT was **compliant** with the requirements of this section. EUT uses internal antennas with U.FL connectors.

Ant0: 4.65dBi @ 5150MHz
Ant1: 4.63dBi @ 5150MHz

Test Engineer(s): Donald Salguero

Test Date(s): September 26, 2023

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15. 403 26dB Bandwidth

Test Requirements: **§ 15.403:** Emission bandwidth. For purposes of this subpart the emission bandwidth is determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier.

Test Procedure: The transmitter was set to low, mid, and high operating frequencies at the highest output power and connected to the spectrum analyzer through an attenuator.

The emission bandwidth of the fundamental frequency was measured with the spectrum analyzer using a RBW approximately equal to 1-5% of the total emission bandwidth, VBW ≥ 3xRBW. The 26 dB Bandwidth was measured and recorded.

Test Results: The EUT was **compliant** with the requirements of this section.

Test Engineer(s): Donald Salguero

Test Date(s): September 7, 2023

Mode	Center Frequency (MHz)	-26dB Bandwidth (MHz)		99% Bandwidth (MHz)	
		Chain0	Chain1	Chain0	Chain1
802.11a	5180	19.433	19.913	16.5774	16.4969
	5200	19.489	19.952	16.6059	16.5542
	5240	19.686	19.991	16.6453	16.4606
802.11n HT20	5180	19.984	20.309	17.7142	17.7418
	5200	20.129	20.399	17.7282	17.6979
	5240	20.148	20.480	17.7023	17.7126
802.11ac VHT20	5180	20.289	20.695	17.7285	17.7455
	5200	20.423	20.439	17.7418	17.7615
	5240	20.331	20.407	17.7295	17.7779
802.11ax HE20	5180	21.148	21.386	19.0331	18.9925
	5200	21.419	21.128	19.0003	18.9955
	5240	20.949	21.110	18.9745	18.9120
802.11n HT40	5190	40.266	40.587	36.0599	36.1540
	5230	40.433	40.224	36.1232	36.1412
802.11ac VHT40	5190	40.427	40.451	36.1515	36.2224
	5230	40.198	40.195	36.0314	36.2795
802.11ax HE40	5190	41.072	41.215	37.6142	37.7408
	5230	40.945	41.018	37.6760	37.8281
802.11 ac VHT80	5210	82.324	82.337	74.8716	74.9720
802.11 ax HE80	5210	82.911	83.424	76.7708	76.7616
802.11 ax HE160	5250	165.858	165.936	154.9642	154.9767

Table 9. UNII1, Occupied Bandwidth - Test Results

Electromagnetic Compatibility Criteria for Intentional Radiators

Duty Cycle

Test Procedure: The EUT was connected to a spectrum analyzer and was ran at the maximum achievable duty cycle for all modes. The duty cycle was measured in accordance with section 11.6 of ANSI C63.10-2013.

Test Results: The EUT was **compliant** with the requirements of this section.

Test Engineer(s): Donald Salguero

Test Date(s): September 26, 2023

Mode	On Time (mS)	Period (mS)	Duty Cycle (%)	DCCF	1/T (Hz)
802.11a	0.9917	1.283	77.30	1.12	779
802.11n HT20	5.425	6.000	90.42	0.44	167
802.11ac VHT20	5.425	5.900	91.95	0.36	169
802.11ax HE20	5.425	6.025	90.04	0.46	166
802.11n HT40	5.350	5.800	92.24	0.35	172
802.11ac VHT40	5.375	5.725	93.89	0.27	175
802.11ax HE40	5.400	5.725	94.32	0.25	175
802.11ac VHT80	5.350	5.750	93.04	0.31	174
802.11ax HE80	5.400	5.800	93.10	0.31	172
802.11ax HE160	5.400	5.725	94.32	0.25	175

Table 10. UNII1, Duty Cycle - Test Results

Electromagnetic Compatibility Criteria for Intentional Radiators

§15. 407(a)(1)(ii) Maximum Conducted Output Power

Test Requirements:

§15.407(a)(1)(ii): For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.
If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Procedure: The EUT was connected to a spectrum analyzer through a cable and attenuator. Measurements were taken with the EUT set to transmit continuously on its low, mid, and high channels. Its power was measured according to measurement method SA-2, as described in 789033 D02 General UNII Test Procedures v02r01.

MIMO directional gain, 2 antenna with unequal gain (correlated):
$10\log[(10^{4.65/20}+10^{4.63/20})^2/2] = 7.65\text{dBi}$

Test Results: The EUT was **compliant** with the requirements of this section.

Test Engineer(s): Donald Salguero

Test Date(s): September 26, 2023

Mode	Center Frequency (MHz)	Conducted Power (dBm)			Duty Cycle	Corrected OP (dBm)	Limit (dBm)	Margin (dB)
		Chain0	Chain1	Sum				
802.11a	5180	17.78	18.32	21.07	1.12	22.19	28.35	-6.16
	5200	18.10	18.16	21.14	1.12	22.26	28.35	-6.09
	5240	18.01	17.65	20.84	1.12	21.96	28.35	-6.39
802.11n HT20	5180	19.15	19.29	22.23	0.44	22.67	28.35	-5.68
	5200	18.28	18.86	21.59	0.44	22.03	28.35	-6.32
	5240	16.80	18.05	20.48	0.44	20.92	28.35	-7.43
802.11ac VHT20	5180	18.06	18.91	21.52	0.36	21.88	28.35	-6.47
	5200	17.84	17.23	20.56	0.36	20.92	28.35	-7.43
	5240	17.29	17.79	20.56	0.36	20.92	28.35	-7.43
802.11ax HE20	5180	18.93	19.37	22.17	0.46	22.63	28.35	-5.72
	5200	19.04	19.29	22.18	0.46	22.64	28.35	-5.71
	5240	18.25	17.94	21.11	0.46	21.57	28.35	-6.78
802.11n HT40	5190	17.87	18.43	21.17	0.35	21.52	28.35	-6.83
	5230	17.07	17.16	20.13	0.35	20.48	28.35	-7.87
802.11ac VHT40	5190	17.38	18.30	20.87	0.27	21.14	28.35	-7.21
	5230	16.13	17.41	19.83	0.27	20.10	28.35	-8.25
802.11ax HE40	5190	17.02	17.04	20.04	0.25	20.29	28.35	-8.06
	5230	16.07	16.60	19.35	0.25	19.60	28.35	-8.75
802.11 ac VHT80	5210	15.35	15.72	18.55	0.31	18.86	28.35	-9.49
802.11 ax HE80	5210	15.89	15.35	18.64	0.31	18.95	28.35	-9.40
802.11 ax HE160	5250	16.29	16.17	19.24	0.25	19.49	28.35	-8.86

Table 11. UNII1, Conducted Output Power - Test Results

Mode	Center Frequency (MHz)	Corrected OP (dBm)	Directional Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.11a	5180	22.19	7.65	29.84	36.00	-6.16
	5200	22.26	7.65	29.91	36.00	-6.09
	5240	21.96	7.65	29.61	36.00	-6.39
802.11n HT20	5180	22.67	7.65	30.32	36.00	-5.68
	5200	22.03	7.65	29.68	36.00	-6.32
	5240	20.92	7.65	28.57	36.00	-7.43
802.11ac VHT20	5180	21.88	7.65	29.53	36.00	-6.47
	5200	20.92	7.65	28.57	36.00	-7.43
	5240	20.92	7.65	28.57	36.00	-7.43
802.11ax HE20	5180	22.63	7.65	30.28	36.00	-5.72
	5200	22.64	7.65	30.29	36.00	-5.71
	5240	21.57	7.65	29.22	36.00	-6.78
802.11n HT40	5190	21.52	7.65	29.17	36.00	-6.83
	5230	20.48	7.65	28.13	36.00	-7.87
802.11ac VHT40	5190	21.14	7.65	28.79	36.00	-7.21
	5230	20.10	7.65	27.75	36.00	-8.25
802.11ax HE40	5190	20.29	7.65	27.94	36.00	-8.06
	5230	19.60	7.65	27.25	36.00	-8.75
802.11 ac VHT80	5210	18.86	7.65	26.51	36.00	-9.49
802.11 ax HE80	5210	18.95	7.65	26.60	36.00	-9.40
802.11 ax HE160	5250	19.49	7.65	27.14	36.00	-8.86

Table 12. UNII1, EIRP - Test Results

Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(a)(1)(ii) Maximum Power Spectral Density

Test Requirements: **§15.407(a)(1)(ii):** In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Procedure: The EUT was connected to a spectrum analyzer through a cable and attenuator. Measurements were taken with the EUT set to transmit continuously on its low, mid, and high channels. Its power was measured according KDB 789033 D02 General UNII Test Procedures v02r01.

Test Results: The EUT was **compliant** with the requirements of this section.

Test Engineer(s): Donald Salguero

Test Date(s): September 26, 2023

Mode	Center Frequency (MHz)	Conducted PSD (dBm)			Duty Cycle	Corrected PSD (dBm)	Limit (dBm)	Margin (dB)
		Chain0	Chain1	Sum				
802.11a	5180	8.981	8.519	11.77	1.12	12.89	15.35	-2.46
	5200	8.899	8.838	11.88	1.12	13.00	15.35	-2.35
	5240	7.926	7.560	10.76	1.12	11.88	15.35	-3.47
802.11n HT20	5180	9.080	9.217	12.16	0.44	12.60	15.35	-2.75
	5200	8.835	8.909	11.88	0.44	12.32	15.35	-3.03
	5240	6.894	8.297	10.66	0.44	11.10	15.35	-4.25
802.11ac VHT20	5180	8.521	9.052	11.80	0.36	12.16	15.35	-3.19
	5200	7.947	8.394	11.19	0.36	11.55	15.35	-3.80
	5240	7.544	7.642	10.60	0.36	10.96	15.35	-4.39
802.11ax HE20	5180	9.494	9.304	12.41	0.46	12.87	15.35	-2.48
	5200	9.274	9.269	12.28	0.46	12.74	15.35	-2.61
	5240	8.447	8.745	11.61	0.46	12.07	15.35	-3.28
802.11n HT40	5190	5.101	5.415	8.27	0.35	8.62	15.35	-6.73
	5230	4.550	4.736	7.65	0.35	8.00	15.35	-7.35
802.11ac VHT40	5190	4.658	5.255	7.98	0.27	8.25	15.35	-7.10
	5230	3.609	4.717	7.21	0.27	7.48	15.35	-7.87
802.11ax HE40	5190	4.196	4.197	7.21	0.25	7.46	15.35	-7.89
	5230	3.255	3.719	6.50	0.25	6.75	15.35	-8.60
802.11 ac VHT80	5210	0.308	0.201	3.27	0.31	3.58	15.35	-11.77
802.11 ax HE80	5210	0.672	0.646	3.67	0.31	3.98	15.35	-11.37
802.11 ax HE160	5250	-1.954	-1.845	1.11	0.25	1.36	15.35	-13.99

Table 13. UNII1, PSD - Test Results

Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(b)(1) & (9 – 10) Undesirable Emissions

Test Requirements:

§ 15.407(b)(1): For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

§ 15.407(b)(9): Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.

§ 15.407(b)(10): The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Test Procedure:

Unwanted emissions measurements were performed at the antenna port as conducted measurements plus cabinet emissions measurements in a radiated setup. Guidance from section G in FCC KDB 789033 D02 General UNII Test Procedure New Rules v02r01 were followed.

For cabinet emissions measurements, the EUT was placed on a non-conducting stand on a turntable in a chamber. To find the maximum emission the EUT was set to transmit on low, mid, and high channels. Additionally, the turntable was rotated 360 degrees, the EUT was oriented through its three orthogonal axes, and the receive antenna height was varied in order to maximize emissions.

For frequencies from 30 MHz to 1 GHz, measurements were first made using a peak detector with a 100 kHz resolution bandwidth. Emissions which exceeded the limits were re-measured using a quasi-peak detector with a 120 kHz resolution bandwidth.

Above 1 GHz, measurements were made pursuant the method described in FCC KDB 789033 D02 General UNII Test Procedure New Rules v02r01. The equation, **EIRP= E + 20 log D – 104.8** was used to convert field strength to EIRP (**E** = field strength (dBµV/m) and **D** = Reference measurement distance**).**

For emissions above 1 GHz and in restricted bands, measurements of the field strength were made with a peak detector and an average detector and compared with the limits of 15.209.

Test Results:

For below 1 GHz, the EUT was **compliant** with the requirements of this section. Measured emissions were below applicable limits.

For above 1 GHz, the EUT was **compliant** with the requirements of this section. Measured emissions were below applicable limits.

Test Engineer(s): Donald Salguero

Test Date(s): September 26, 2023 (Conducted Emissions)
October 3, 2023 – October 27, 2023 (Cabinet Emissions)

Mode	Channel Frequency (MHz)	Band Edge Frequency (MHz)	Band Edge Amplitude (dBuV)			AVG Limit (dBuV)	Margin (dB)
			Chain0	Chain1	Sum		
802.11a	5180	5150	46.44	40.97	47.52	54	-6.48
802.11n HT20	5180	5150	46.04	45.5	48.79	54	-5.21
802.11ac VHT20	5180	5150	49.64	35.67	49.81	54	-4.19
802.11ax HE20	5180	5150	48.27	45.58	50.14	54	-3.86
802.11n HT40	5190	5150	51.26	50.24	53.79	54	-0.21
802.11ac VHT40	5190	5150	49.43	50.62	53.08	54	-0.92
802.11ax HE40	5190	5150	49.79	50.21	53.02	54	-0.98
802.11ac VHT80	5210	5150	50.11	48.48	52.38	54	-1.62
802.11ax HE80	5210	5150	50.45	51.12	53.81	54	-0.19
802.11ax HE160	5250	5150	50.48	49.37	52.97	54	-1.03
	5250	5350	44.51	45.03	47.79	54	-6.21

Table 14. UNII1, Band Edges - AVG Test Results

Mode	Channel Frequency (MHz)	Band Edge Frequency (MHz)	Band Edge Amplitude (dBuV)			PK Limit (dBuV)	Margin (dB)
			Chain0	Chain1	Sum		
802.11a	5180	5150	58.94	54.33	60.23	74	-13.77
802.11n HT20	5180	5150	58.54	59.05	61.81	74	-12.19
802.11ac VHT20	5180	5150	64.8	53.92	65.14	74	-8.86
802.11ax HE20	5180	5150	62.26	57.97	63.63	74	-10.37
802.11n HT40	5190	5150	63.4	63.43	66.43	74	-7.57
802.11ac VHT40	5190	5150	59.54	63.86	65.23	74	-8.77
802.11ax HE40	5190	5150	61.72	62.47	65.12	74	-8.88
802.11ac VHT80	5210	5150	63.11	61.04	65.21	74	-8.79
802.11ax HE80	5210	5150	62.98	64.78	66.98	74	-7.02
802.11ax HE160	5250	5150	61.7	62.8	65.3	74	-8.7
	5250	5350	56.49	59.43	61.21	74	-12.79

Table 15. UNII1, Band Edges - PK Test Results

Mode	Channel Frequency (MHz)	Band Edge Frequency (MHz)	Band Edge Amplitude (dBm)			Limit (dBm)	Margin (dB)
			Chain0	Chain1	Sum		
802.11a	5180	5150	-35.42	-37.76	-33.42	-27	-6.42
802.11n HT20	5180	5150	-32.04	-32.35	-29.18	-27	-2.18
802.11ac VHT20	5180	5150	-30.31	-38.48	-29.69	-27	-2.69
802.11ax HE20	5180	5150	-31.98	-36.81	-30.75	-27	-3.75
802.11n HT40	5190	5150	-30.2	-31.4	-27.75	-27	-0.75
802.11ac VHT40	5190	5150	-32.39	-30.88	-28.56	-27	-1.56
802.11ax HE40	5190	5150	-32.18	-32.21	-29.18	-27	-2.18
802.11ac VHT80	5210	5150	-31.27	-31.08	-28.16	-27	-1.16
802.11ax HE80	5210	5150	-31.41	-31.75	-28.57	-27	-1.57
802.11ax HE160	5250	5150	-30.38	-32	-28.1	-27	-1.1
	5250	5350	-35.65	-33.35	-31.34	-27	-4.34

Table 16. UNII1, -27dBm Band Edges - Test Results

Electromagnetic Compatibility Criteria for Intentional Radiators

Conducted Emissions - 15.207

Test Requirement(s): **§ 15.407 (b)(6):** Any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

§ 15.207 (a): For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 Σ line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency range (MHz)	§ 15.207(a), Conducted Limit (dBµV)	
	Quasi-Peak	Average
* 0.15- 0.45	66 – 56	56 - 46
0.45 - 0.5	56	46
0.5 - 30	60	50

Table 17. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)

Test Procedure: The EUT was placed on a non-metallic table inside a screen room. The EUT was situated such that the back of the EUT was 0.4 m from one wall of the vertical ground plane, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface. The EUT was powered from a 50 Ω/50 µH Line Impedance Stabilization Network (LISN). The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with *ANSI C63.4-2013.* Scans were performed with the transmitter on.

Test Results: The EUT was **compliant** with the requirements of this section.

Test Engineer(s): Donald Salguero

Test Date(s): October 19, 2023

Conducted Emissions Datasheet			
METrak Number	128375	Test Specification	FCC Part 15, Subpart B, Section 15.107; ICES-003, Section 3.2.1
Customer	Intellian Technologies USA Inc	Equipment Class	B
EUT Name	CNX-WiFi	Engineer	Donald Salguero
Model/Part Number	BL5008	Test Date(s)	10/19/2023
Serial Number	5008232900005	Temperature	19.4°C
Mode of Operation	Active	Relative Humidity	54%
Notes:120V60Hz			
Start Frequency	150 kHz	Stop Frequency	30 MHz
Line Under Test	Line		

Frequency	Quasi-Peak Measurement	Correction Factor	Corrected Measurement	Quasi-Peak Limit	Margin	Result
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail
0.154	36.48	10.48	46.96	65.88	-18.92	PASS
0.63	36.6	10.03	46.63	56	-9.37	PASS
0.809	36.99	10.03	47.01	56	-8.99	PASS
0.989	36.75	10.02	46.77	56	-9.23	PASS
1.168	36.31	10.02	46.33	56	-9.67	PASS
1.351	35.79	10.02	45.81	56	-10.19	PASS
Frequency	**Average Measurement**	**Correction Factor**	**Corrected Measurement**	**Average Limit**	**Margin**	**Result**
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail
0.154	27.18	10.48	37.66	55.88	-18.22	PASS
0.2	23.53	10.26	33.79	54.57	-20.775	PASS
0.45	22.51	10.05	32.56	47.42	-14.858	PASS
0.63	23.95	10.03	33.98	46	-12.019	PASS
0.813	23.12	10.03	33.15	46	-12.85	PASS
18.243	22.1	10.23	32.33	50	-17.668	PASS

Table 18. Conducted Emissions - 15.207, Line Data

Conducted Emissions Datasheet			
METrak Number	128375	Test Specification	FCC Part 15, Subpart B, Section 15.107; ICES-003, Section 3.2.1
Customer	Intellian Technologies USA Inc	Equipment Class	B
EUT Name	CNX-WiFi	Engineer	Donald Salguero
Model/Part Number	BL5008	Test Date(s)	10/19/2023
Serial Number	5008232900005	Temperature	19.4°C
Mode of Operation	Active	Relative Humidity	54%
Notes:120V60Hz			
Start Frequency	150 kHz	Stop Frequency	30 MHz
Line Under Test	Neutral		

Frequency	Quasi-Peak Measurement	Correction Factor	Corrected Measurement	Quasi-Peak Limit	Margin	Result
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail
0.634	37.18	10.07	47.25	56	-8.753	PASS
0.755	36.77	10.06	46.83	56	-9.173	PASS
0.813	37.67	10.06	47.72	56	-8.277	PASS
0.997	37.51	10.03	47.54	56	-8.46	PASS
1.176	37.23	10.04	47.27	56	-8.728	PASS
1.36	36.77	10.05	46.82	56	-9.184	PASS
Frequency	**Average Measurement**	**Correction Factor**	**Corrected Measurement**	**Average Limit**	**Margin**	**Result**
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail
0.154	29.7	10.51	40.21	55.88	-15.669	PASS
0.45	25.67	10.09	35.76	47.42	-11.663	PASS
0.588	24.88	10.08	34.95	46	-11.045	PASS
0.63	26.65	10.07	36.72	46	-9.275	PASS
0.813	26.28	10.06	36.34	46	-9.66	PASS
0.993	25.06	10.04	35.09	46	-10.906	PASS

Table 19. Conducted Emissions - 15.207, Neutral Data

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Conducted Emissions Equipment List						
Asset Number	**Description**	**Manufacturer**	**Model Number**	**Serial Number**	**Calibration Date**	**Calibration Due Date**
1T9989	Thermometer/Hygrometer	Fisher Scientific	06-662-4, 11725843	210843361	10/1/2021	10/1/2023
1T9572	EMI Receiver	Gauss Instruments	TDEMI X40	1902001	10/13/2021	10/31/2023
1T8910	LISN	Com-Power	LI-150A	201123	10/17/2022	4/30/2024
1T4795	LISN	Com-Power	LI-150A	201065	10/17/2022	4/30/2024
1T7450	Transient Limiter	Com-Power	LIT-153A	22010020	FVR	FVR
1T8834	Conducted Comb Generator	Com-Power	CGC-255E	311358	5/1/2023	5/31/2024
4T7208	ELECTRIC SWITCH	LEVITRON	N/A	N/A	FVR	FVR
4T7311	Precision Resistive Circuit	MET	N/A	N/A	FVR	FVR

Table 20. CEV Test Equipment List

Asset Number	Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
1T4751	Antenna - Bilog	Sunol Sciences	JB6	A101910	6/1/2022	1/1/2024
1T4757	Antenna; Horn	ETS-Lindgren	3117	123516	7/24/2023	1/31/2025
1T4744	Antenna, Horn	ETS-Lindgren	3116	126519	12/16/2022	6/16/2024
1T8743	Preamplifier	A.H. Systems, Inc.	PAM-0118P	419	Func Verify	Func Verify
1T4752	Pre-Amplifier	Miteq	JS44-18004000-35-8P	1594792	Func Verify	Func Verify
1T4300	SEMI-ANECHOIC CHAMBER (NSA)	EMC TEST SYSTEMS	NONE	NONE	8/31/2023	8/31/2025
1T4771	PSA Spectrum Analyzer	Agilent Technologies	E4446A	MY51100015	11/2/2023	5/31/2025
1T8744	Spectrum Analyzer (PSA)	Agilent Technologies	E4440A	US40420612	5/2/2023	5/2/2024

Table 21. Test Equipment List

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

End of Report