

APPLICATION FOR CERTIFICATION

On Behalf of

Texas Instruments Incorporated

TI-Nspire CX Wireless Network Adapter v2

Model No. : TINAVWNA2

Brand : TEXAS INSTRUMENTS

FCC ID : V7R-TINAVWNA2

Prepared for

Texas Instruments Incorporated

12500 TI Boulevard Dallas, TX 75243-4136 USA

Prepared by

Audix Technology (Wujiang) Co., Ltd. EMC Dept.

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Report Number : ACWE-F1305005B

Date of Test : Dec.23~25, 2023

Date of Report : Jan.03, 2024

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TEST REPORT CERTIFICATION

Applicant : Texas Instruments Incorporated
Manufacturer : Texas Instruments Incorporated
EUT Description : TI-Nspire CX Wireless Network Adapter v2
FCC ID : V7R-TINAVWNA2
(A) Model No. : TINAVWNA2
(B) Brand : TEXAS INSTRUMENTS
(C) Power Supply : DC 3.7V (Supplied by NSC)
(D) Test Voltage : DC 3.7V

Applicable Standards:

47CFR FCC Part 15 Subpart E
ANSI C63.10:2020
KDB 789033 D02 General UNII Test Procedures New Rules v02r01

The device described above was tested by Audix Technology (Wujiang) Co., Ltd. EMC Dept. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart E section 15.207, 15.205, 15.209&15.407 limits.

The measurement results are contained in this test report and Audix Technology (Wujiang) Co., Ltd. EMC Dept. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC limits.

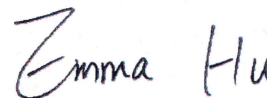
This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Wujiang) Co., Ltd. EMC Dept.

Date of Test: Dec.23~25, 2023

Date of Report: Jan.03, 2024

Prepared by

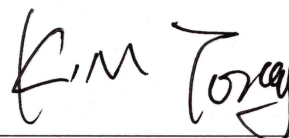
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(Emma Hu/Assistant Administrator)

Approved & Authorized Signer

:



(K.M Tong/Assistant Manager)



1. DESCRIPTION OF VERSION

Edition No.	Date of Rev.	Summary	Report No.
0	May 13, 2013	Original Report.	ACWE-F1305005
Rev. A	Apr.28, 2016	1.Update the standard from ANSI C63.10-2009 to ANSI C63.10-2013 2. Update the standard from FCC RULES AND REGULATIONS PART 15 SUBPART E, Oct. 2012 to FCC RULES AND REGULATIONS PART 15 SUBPART E(Section 15.407)	ACWE-F1305005A
Rev. B	Jan.03, 2024	1.Update the version of chip. 2.Change the name of manufacturer from Inventec Appliances(Pudong) Corporation to Texas Instruments Incorporated.	ACWE-F1305005B

2. SUMMARY OF MEASUREMENTS AND RESULTS

The EUT have been tested according to the applicable standards as referenced below.

Rule	Description	Results
15.207	Conducted Emission	N/A
15.205/15.209	Radiated Band Edge and Radiated Spurious Emission	PASS
15.407(a)(5)/15.407(e)	Emission Bandwidth Measurement	N/A
15.407(a)	Maximum Output Power	PASS
15.407(b)	Conducted Band Edges and Conducted Spurious Emission	N/A
15.407(a)	Power Spectral Density	N/A
15.203	Antenna Requirement	Compliance
15.407	Frequency Stability	N/A

Note:

N/A is an abbreviation for Not Applicable.

3. GENERAL INFORMATION

3.1. Description of Device (EUT)

Description	:	TI-Nspire CX Wireless Network Adapter v2
Model No.	:	TINAVWNA2
FCC ID	:	V7R-TINAVWNA2
Brand	:	TEXAS INSTRUMENTS
Applicant	:	Texas Instruments Incorporated 12500 TI Boulevard Dallas, TX 75243-4136 USA
Manufacturer	:	Texas Instruments Incorporated 12500 TI Boulevard Dallas, TX 75243-4136 USA
Radio Technology	:	DSSS & OFDM
Type of Network	:	IEEE 802.11a/n HT20
Fundamental Range	:	5180MHz -5240MHz 5745MHz~5825MHz
Tested Frequency	:	5180MHz (Channel 36) 5220MHz (Channel 44) 5240MHz (Channel 48) 5745MHz (Channel 149) 5785MHz (Channel 157) 5825MHz (Channel 165)
Date of Receipt of Sample	:	Dec.11, 2023

Remark for Rev. B

1. This report is based on the version ACWE-F1305005&F1305005A.
2. This report updates the version of chip and name of manufacturer. The results of Radiated Emission & Band Edge & Output Power will be affected, so we retest these items. Please refer to the original report F1305005A if you want to check the original data.

3.2. Antenna Information

Manufacturer	Type	Antenna Gain
ACON	Coupling	3.79dBi at 2.4GHz band
	Ceramics	2.24dBi for 5GHz band I
	Chip Antenna	3.29dBi for 5GHz band III

3.3. UUT's Configuration

Test UUT : UUT×1

I/O Ports : I/O port×1

3.4. Operating Condition of EUT

3.4.1. Set up the EUT as test setup diagram.

3.4.2. For all test measurement items, keep the EUT be powered by NSC, Drive the test software “TI-Nspire Computer Link Software v1.1.9182 ”, let the EUT operate wireless TX activity under measurement.

3.4.3. Let the EUT operate wireless TX & RX activity under measurement.

3.5. Tested Supporting System Details

3.5.1. TI-nspire CX CAS (NSC)

Manufacturer : TI

Brand : TEXAS INSTRUMENTS

3.5.2. TI-nspire CX Navigator Access point

Manufacturer : TI

Brand : TEXAS INSTRUMENTS

Model No. : TINAVAP3-2

3.5.3. Laptop Computer

Manufacturer : DELL

Model Number : PP26L

Serial Number : JX193A01

FCC ID : FCC By DoC

Power Cord : Unshielded, Detachable, 1.5 m

AC Adapter : M/N: LA65NS1-00

Brand: DELL

Input: AC 100-240V, 50-60Hz, 1.5A

Output: DC 19.5V,3.34A

DC Cord: Unshielded, Undetachable,
2.0m, 1 ferrite core.

3.6. Description of Test Facility

Name of Firm : **Audix Technology (Wujiang) Co., Ltd. EMC Dept.**

Site Location : No.1289 Jiangxing East Road, the Eastern Part of Wujiang Economic Development Zone Jiangsu China 215200

Test Facilities : **No.2 3m Semi-anechoic Chamber
RF Fully Chamber**

NVLAP Lab Code : 200786-0
Valid until on Sep.30, 2024
(NVLAP is a signatory member of ILAC MRA)
Remark: This report shall not be imply endorsement, certification or approval by NVLAP, NIST, or any agency of the U.S. Federal Government.

3.7. Measurement Uncertainty

Test Item	Range Frequency	Uncertainty
No.1 Conducted Disturbance Measurement	0.15MHz ~ 30MHz	$\pm 2.65\text{dB}$
Radiated Disturbance Measurement (At 3m Chamber)	300MHz ~ 1GHz	$\pm 4.80\text{dB}$
	1GHz ~ 6GHz	$\pm 4.60\text{dB}$
	6GHz ~ 18GHz	$\pm 4.52\text{dB}$

Remark: Uncertainty = $ku_c(y)$

Test Item	Uncertainty
6 dB Bandwidth	$\pm 0.16\text{ MHz}$
Maximum Peak Output Power	$y(\text{dBm}) \pm U = y(\text{dBm}) \pm 0.98$
Band Edges	$\pm 0.38\text{dB}$
Power Spectral Density	$\pm 0.38\text{dB}$
Emission Limitations	$\pm 0.38\text{dB}$

Remark: Uncertainty = $ku_c(y)$

4. RADIATED EMISSION MEASUREMENT

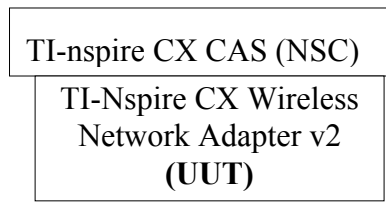
4.1. Test Equipment

The following test equipment was used during the radiated emission measurement:
At 3m Semi-Anechoic Chamber

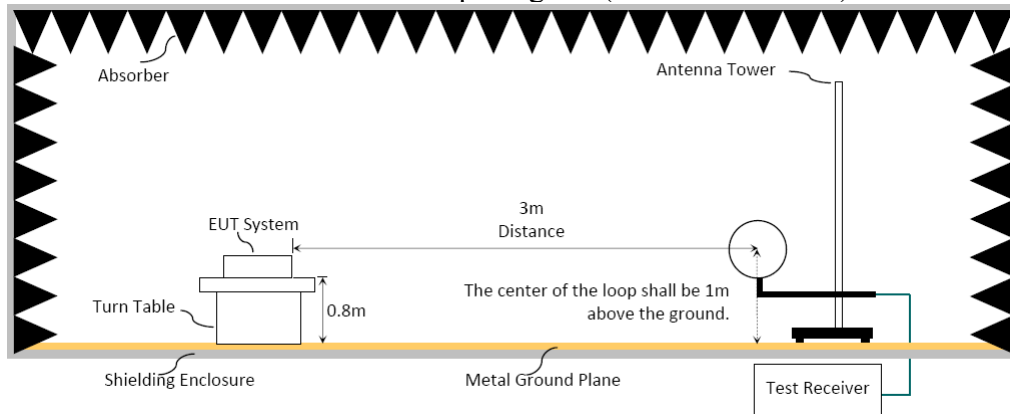
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Period
1.	Preamplifier	Agilent	8447D	2944A10922	2023-03-25	1 Year
2.	PXA signal analyzer	Agilent	N9030A	MY53120367	2023-07-12	1 Year
3.	Bi-log Antenna	SCHWARZBECK	VULB 9168	706	2023-03-12	1 Year
4.	Horn Antenna	ETS	3117	00218586	2023-03-13	1 Year
5.	Microwave Preamplifier	Agilent	8449B	3008A02234	2023-03-25	1 Year
6.	EMI Test Receiver	R&S	ESR7	101956	2023-03-25	1 Year
7.	RF Cable	Chengyi+Shengxuan	NM500+RO S400	190945+6000+3000	2023-07-12	1 Year
8.	RF Cable	Chengyi	EMC104-SF-SM-8000/NM-1000	190938+190942	2023-07-11	1 Year
9.	Software	Audix /e3 (210616)				

4.2. Block Diagram of Test Setup

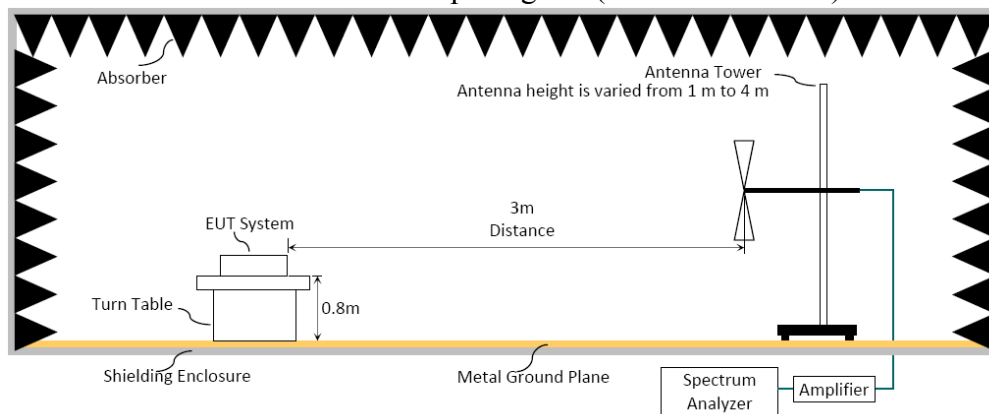
4.2.1. Block Diagram of Test Setup between EUT and simulators



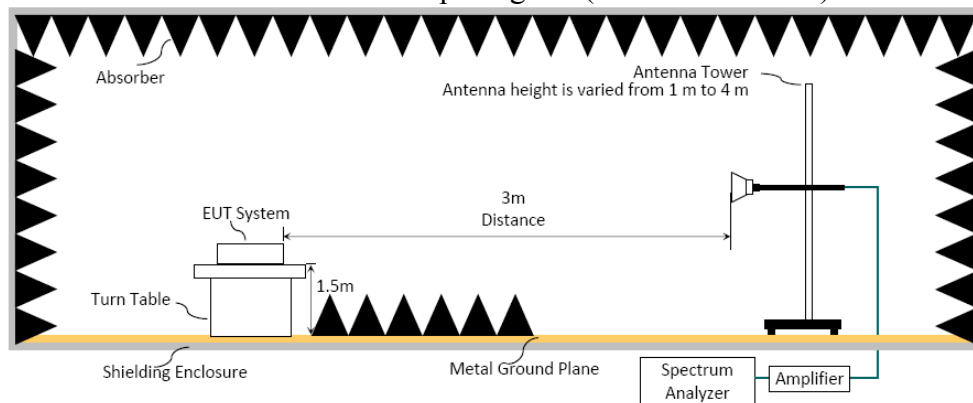
4.2.2. No. 2 3m Semi-Anechoic Chamber Setup Diagram (Test distance: 3m) for 9kHz-30MHz



4.2.3. No. 2 3m Semi-Anechoic Chamber Setup Diagram (Test distance: 3m) for 30MHz-1GHz



4.2.4. No. 2 3m Semi-Anechoic Chamber Setup Diagram (Test distance: 3m) for Above 1GHz



4.3. Radiated Emission Limits

Radiated emissions fall in restricted bands, as defined in Section 15.205 must be in compliance with the radiated emission limits specified in 15.209 as below.

4.3.1. General Limit

Frequency (MHz)	Distance (m)	Limits	
		dB μ V/m	μ V/m
0.009 - 0.490	300	67.6-20 log f(kHz)	2400/f kHz
0.490 - 1.705	30	87.6-20 log f(kHz)	24000/f kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dB μ V/m (Peak) 54.0 dB μ V/m (Average)	

Remark: (1) dB μ V/m = 20 log (μ V/m)

(2)The tighter limit applies to the edge between two frequency bands.

(3)Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

(4)Fundamental and emission fall within operation band are exempted from this section.

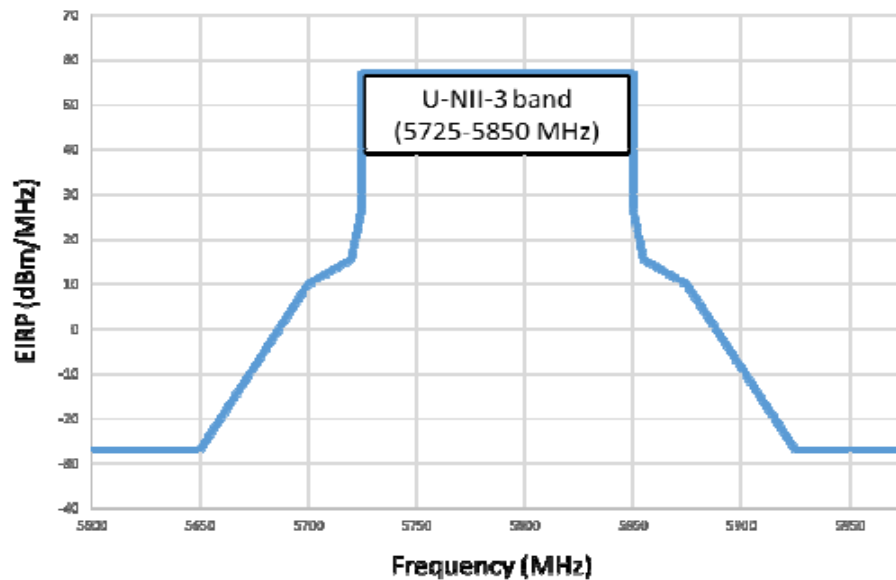
(5)Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

4.3.2. Limit for non-restricted frequency above 1 GHz

Frequency Band (MHz)	E.I.R.P. Limit	Field Strength Limit at 3 m
5150 to 5250	-27 dBm	68.2
5250 to 5350		68.2
5470 to 5725		68.2

Note: Field Strength at 3 m= E.I.R.P. + 95.2 dB

Frequency Band (MHz)	Field Strength Limit at 3 m	
5725 to 5850	☒	15.407(b)(4)(i) All emissions shall be limited to a level of 68.2 dB μ V/m at 75 MHz or more above or below the band edge increasing linearly to 105.2dB μ V/m at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 110.8 dB μ V/m at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 68.2 dB μ V/m at the band edge.
	☐	15.407(b)(4)(ii), compliance with the emission limits in § 15.247(d) Shall be at least 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power,. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))



4.4. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level.

In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

- (1) RBW = 9kHz with peak and average detector.
- (2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 40GHz:

The EUT setup on the turn table which has 80cm (for 30-1000MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

Frequency below 1 GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1) RBW = 120KHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required, otherwise using Q.P. for final measurement.

Frequency above 1GHz to 10th harmonic (up to 40GHz):

Peak Detector:

- (1) RBW = 1MHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the average detector is not required, otherwise using average detector for final measurement.

4.5. Measurement Results

PASSED

The EUT was tested in restricted bands and all the test results are listed in next page.

The frequency range from 9kHz to 10th harmonic(40GHz) are checked, and the emission (9kHz~30MHz,18GHz~40GHz)not reported for there is no emission be found.

4.5.1. Emission Measurement Results (For Below 1GHz)

EUT: TI-Nspire CX Wireless Network Adapter v2
M/N: TINAVWNA2
Test Site: No.2 3m Chamber

Test Mode: TX 5G					
Frequency (MHz)	Antenna Polarization	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Conclusion
140.844	H	37.46	43.50	6.04	PASS
247.280	H	36.45	46.00	9.55	PASS
400.020	H	34.06	46.00	11.94	PASS
780.780	H	34.93	46.00	11.07	PASS
799.981	H	35.35	46.00	10.65	PASS
944.710	H	35.88	46.00	10.12	PASS
45.190	V	34.42	40.00	5.58	PASS
106.024	V	35.79	43.50	7.71	PASS
140.844	V	3.97	43.50	9.53	PASS
211.420	V	32.24	43.50	11.26	PASS
399.650	V	35.50	46.00	10.50	PASS
800.190	V	32.91	46.00	13.09	PASS

4.5.2. Emission Measurement Results (For Above 1GHz)

EUT: TI-Nspire CX Wireless Network Adapter v2
M/N: TINAVWNA2
Test Site: No.2 3m Chamber

Test Mode: TX 802.11a 5180MHz					
Frequency (MHz)	Antenna Polarization	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Conclusion
4910.000	H	50.77	74.00	23.23	PASS
4910.436	H	33.92	54.00	20.08	PASS
10350.000	H	51.00	74.00	23.00	PASS
10351.360	H	39.95	54.00	14.05	PASS
17677.000	H	55.09	74.00	18.91	PASS
17679.320	H	43.94	54.00	10.06	PASS
12220.000	V	49.91	74.00	24.09	PASS
12222.530	V	43.31	54.00	10.69	PASS
17201.000	V	53.50	74.00	20.50	PASS
17203.260	V	43.95	54.00	10.05	PASS
17891.530	V	43.76	54.00	10.24	PASS
17898.000	V	55.08	74.00	18.92	PASS
Test Mode: TX 802.11a 5240MHz					
5245.689	H	44.21	54.00	9.79	PASS
5250.000	H	51.52	54.00	22.48	PASS
16946.000	H	52.99	74.00	21.01	PASS
16948.210	H	43.55	54.00	10.45	PASS
17932.000	H	55.41	74.00	18.59	PASS
17935.140	H	43.94	54.00	10.06	PASS
5245.460	V	41.81	54.00	12.19	PASS
5250.000	V	49.85	74.00	24.15	PASS
16640.000	V	52.51	74.00	21.49	PASS
16642.160	V	43.77	54.00	10.23	PASS
17694.000	V	54.40	74.00	19.60	PASS
17696.340	V	44.35	54.00	9.65	PASS
Test Mode: TX 802.11a 5745MHz					
5741.103	H	43.68	54.00	10.32	PASS
5743.000	H	50.57	74.00	23.43	PASS
9976.000	H	49.42	74.00	24.58	PASS
9977.260	H	40.07	54.00	13.93	PASS
17813.000	H	54.51	74.00	19.49	PASS
17815.230	H	43.58	54.00	10.42	PASS
1949.750	V	29.60	54.00	24.40	PASS
1952.000	V	47.30	74.00	26.70	PASS
5743.000	V	51.81	74.00	22.19	PASS
5746.494	V	44.71	54.00	9.29	PASS
17711.000	V	54.56	74.00	19.44	PASS
17713.250	V	43.89	54.00	10.11	PASS

Test Mode: TX 802.11a 5825MHz					
Frequency (MHz)	Antenna Polarization	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Conclusion
3890.000	H	45.65	74.00	28.35	PASS
3891.230	H	36.62	54.00	17.38	PASS
5828.000	H	49.32	74.00	24.68	PASS
5830.942	H	41.34	54.00	12.66	PASS
17711.000	H	54.12	74.00	19.88	PASS
17713.250	H	43.82	54.00	10.18	PASS
5823.630	V	40.21	54.00	13.79	PASS
5828.000	V	47.80	74.00	26.20	PASS
9993.000	V	49.36	74.00	24.64	PASS
9995.260	V	39.85	54.00	14.15	PASS
17796.000	V	54.28	74.00	19.72	PASS
17798.230	V	43.26	54.00	10.74	PASS
Test Mode: TX 802.11nHT20 5180MHz					
12917.000	H	51.32	74.00	22.68	PASS
12918.430	H	43.66	54.00	10.34	PASS
14430.000	H	51.60	74.00	22.40	PASS
14431.540	H	43.68	54.00	10.32	PASS
17745.000	H	54.71	74.00	19.29	PASS
17747.360	H	43.80	54.00	10.20	PASS
7494.000	V	49.31	74.00	24.69	PASS
7495.240	V	39.32	54.00	14.68	PASS
16623.000	V	53.10	74.00	20.90	PASS
16624.530	V	43.82	54.00	10.18	PASS
17524.000	V	54.51	74.00	19.49	PASS
17527.310	V	43.32	54.00	10.68	PASS
Test Mode: TX 802.11nHT20 5240MHz					
5233.000	H	51.45	74.00	22.55	PASS
5234.725	H	44.25	54.00	9.75	PASS
16232.000	H	53.13	74.00	20.87	PASS
16234.250	H	43.98	54.00	10.02	PASS
17745.000	H	53.88	74.00	20.12	PASS
17747.350	H	44.12	54.00	9.88	PASS
5233.000	V	47.80	74.00	26.20	PASS
5234.230	V	41.72	54.00	12.28	PASS
7477.000	V	47.52	74.00	26.48	PASS
7478.260	V	37.38	54.00	16.62	PASS
17677.000	V	54.32	74.00	19.68	PASS
17679.260	V	43.45	54.00	10.55	PASS

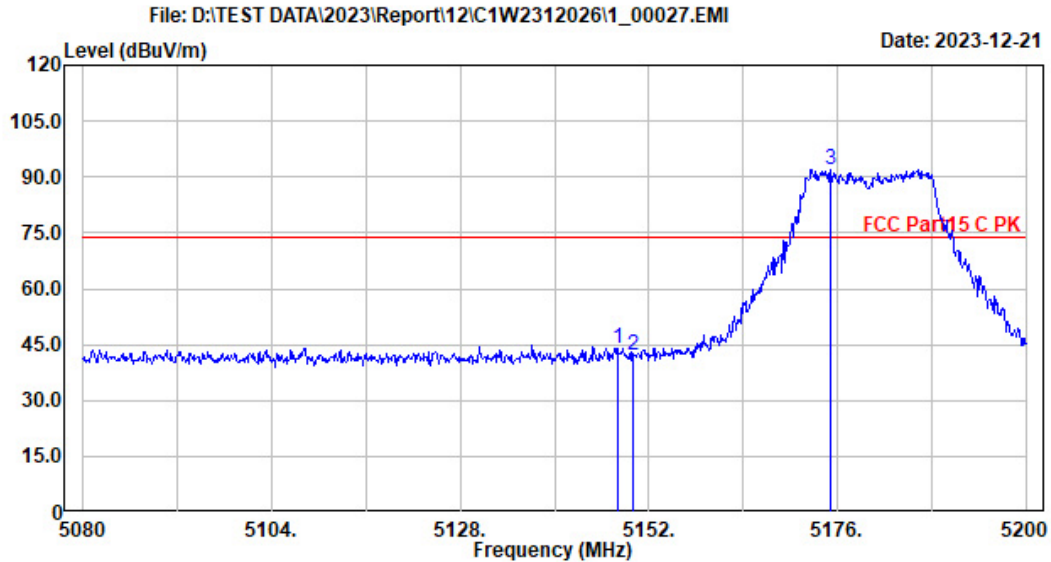
Test Mode: TX 802.11nHT20 5745MHz					
Frequency (MHz)	Antenna Polarization	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Conclusion
2496.000	H	45.31	74.00	28.69	PASS
2497.260	H	36.48	54.00	17.52	PASS
5743.000	H	49.96	74.00	24.04	PASS
5745.240	H	41.09	54.00	12.91	PASS
17660.000	H	54.03	74.00	19.97	PASS
17662.160	H	44.12	54.00	9.88	PASS
5743.000	V	49.48	74.00	24.52	PASS
5746.530	V	41.55	54.00	12.45	PASS
12526.000	V	50.10	74.00	23.90	PASS
12527.460	V	42.33	54.00	11.67	PASS
17694.000	V	53.88	74.00	20.12	PASS
17696.240	V	43.58	54.00	10.42	PASS
Test Mode: TX 802.11nHT20 5825MHz					
2562.160	H	31.65	54.00	22.35	PASS
2564.000	H	50.13	74.00	23.87	PASS
5828.000	H	47.56	74.00	26.44	PASS
5829.620	H	35.10	54.00	18.90	PASS
16776.000	H	53.78	74.00	20.22	PASS
16778.160	H	43.94	54.00	10.66	PASS
5823.250	V	40.15	54.00	13.85	PASS
5828.000	V	47.04	74.00	26.96	PASS
12934.000	V	50.46	74.00	23.54	PASS
12936.280	V	41.04	54.00	12.96	PASS
17761.190	V	42.30	54.00	11.70	PASS
17762.000	V	53.64	74.00	20.36	PASS

4.5.3. Spurious Emission Measurement Results in Band Edge Emission

Mode	802.11a	Frequency	TX 5180MHz
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Audix Technology (Wu Jiang) Co.,Ltd
 No.1289,Jiang Xing East Road,The Eastern Part of WuJiang
 Economic Development Zone,JiangSu,China
 Tel : (0512) 63403993 Fax: (0512) 63403339



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:27
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304 Engineer : Zhaolin
 Limit : FCC Part15 C PK
 Env. / Ins. : 20.8℃ & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11a 5180MHz
 Memo :

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
5148.040	34.12	4.64	39.07	33.76	44.07	74.00	29.93	Peak
5149.960	34.12	4.64	37.21	33.76	42.21	74.00	31.79	Peak
5175.040	34.14	4.68	86.91	33.76	91.97	74.00	-17.97	Peak

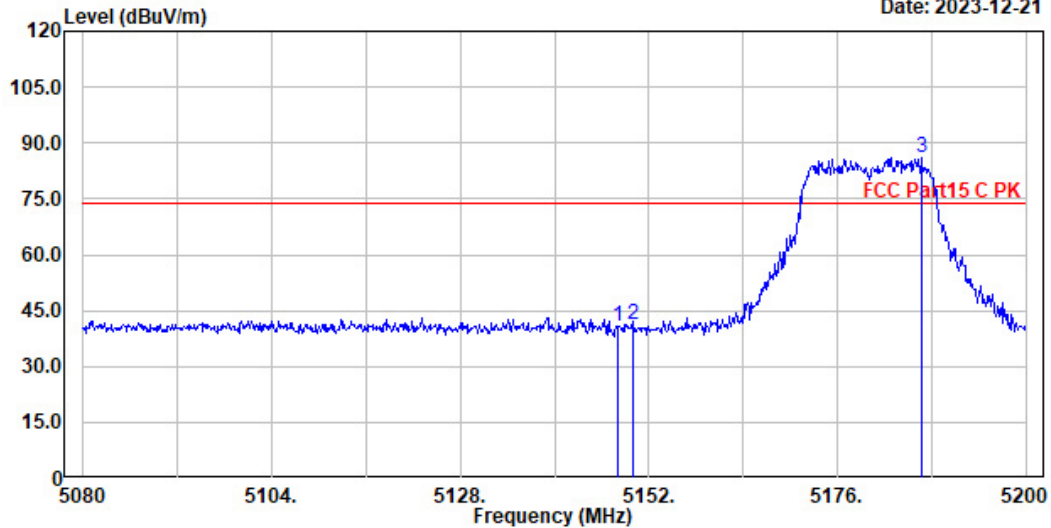
Remarks: Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00025.EMI

Date: 2023-12-21



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:25
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304 Engineer : Zhaolin
 Limit : FCC Part15 C PK
 Env. / Ins. : 20.8℃ & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11a 5180MHz
 Memo :

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
5148.040	34.12	4.64	35.66	33.76	40.66	74.00	33.34	Peak
5149.960	34.12	4.64	36.04	33.76	41.04	74.00	32.96	Peak
5186.680	34.15	4.70	81.11	33.76	86.20	74.00	-12.20	Peak

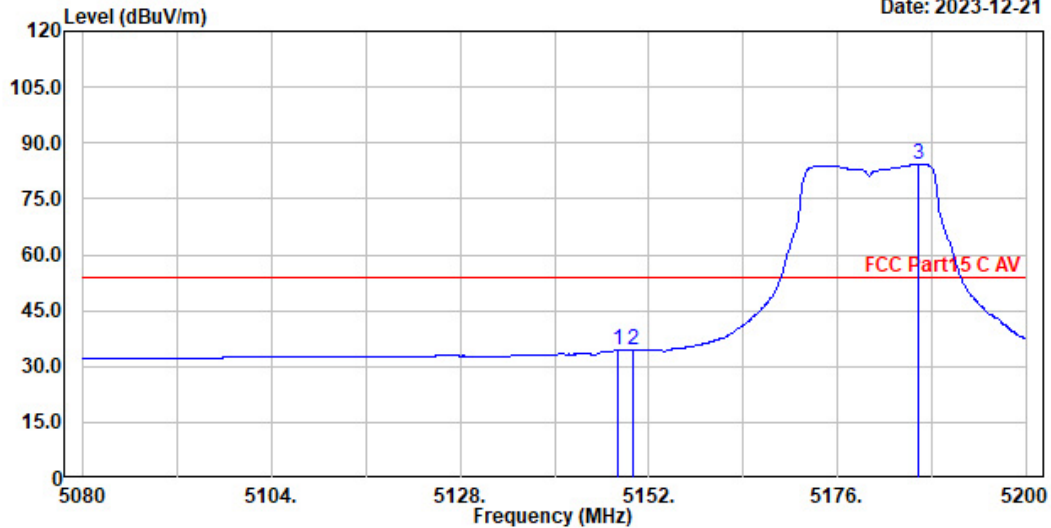
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\IC1W2312026\1_00028.EMI

Date: 2023-12-21



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:28
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304 Engineer : Zhaolin
 Limit :
 Env. / Ins. : 20.8°C & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11a 5180MHz
 Memo :

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
5148.040	34.12	4.64	29.34	33.76	34.34	54.00	19.66	Average
5149.960	34.12	4.64	29.28	33.76	34.28	54.00	19.72	Average
5186.320	34.15	4.70	79.04	33.76	84.13	54.00	-30.13	Average

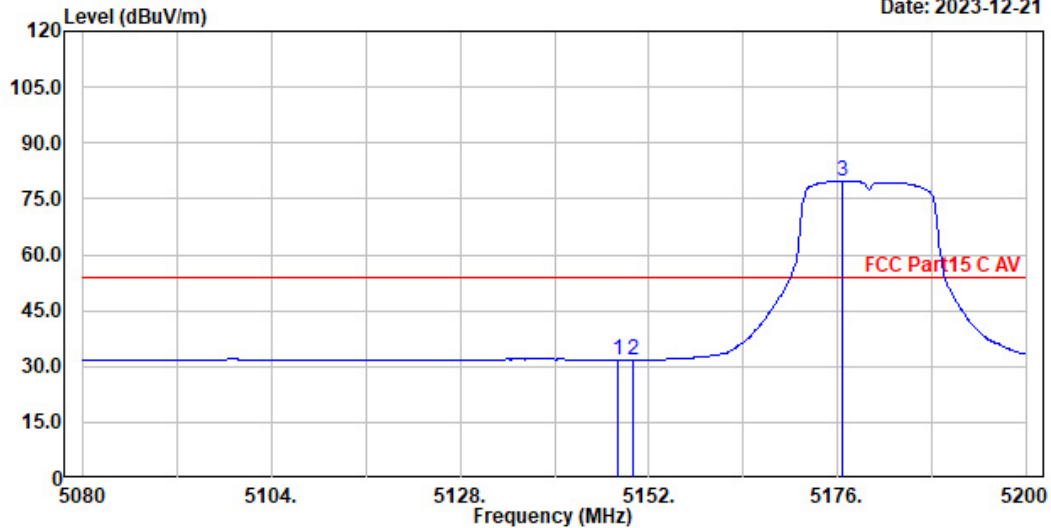
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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Date: 2023-12-21



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:26
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304 Engineer : Zhaolin
 Limit :
 Env. / Ins. : 20.8°C & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11a 5180MHz
 Memo :

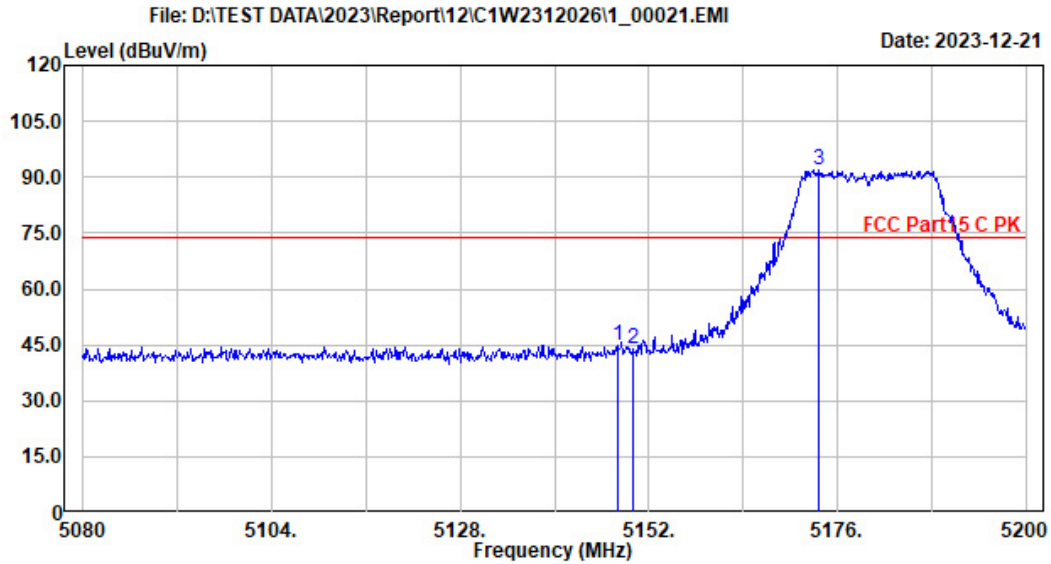
Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
5148.040	34.12	4.64	26.73	33.76	31.73	54.00	22.27	Average
5149.960	34.12	4.64	26.69	33.76	31.69	54.00	22.31	Average
5176.720	34.14	4.68	74.59	33.76	79.65	54.00	-25.65	Average

Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor

Mode	802.11nHT20	Frequency	TX 5180MHz
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Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:21
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304 Engineer : Zhaolin
 Limit : FCC Part15 C PK
 Env. / Ins. : 20.8℃ & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11nHT20 5180MHz
 Memo :

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
5148.040	34.12	4.64	39.72	33.76	44.72	74.00	29.28	Peak
5149.960	34.12	4.64	38.99	33.76	43.99	74.00	30.01	Peak
5173.600	34.14	4.68	87.04	33.76	92.10	74.00	-18.10	Peak

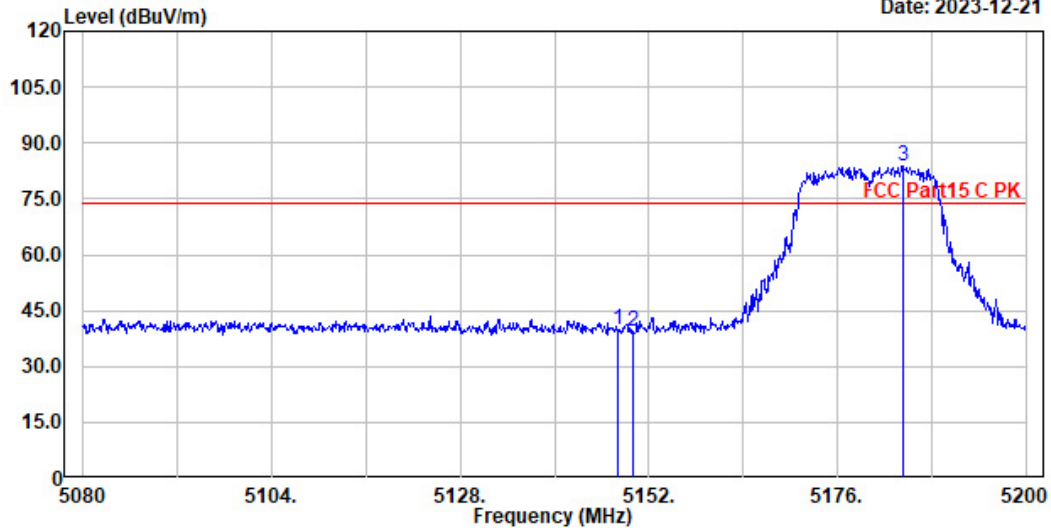
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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Date: 2023-12-21



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:23
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304 Engineer : Zhaolin
 Limit : FCC Part15 C PK
 Env. / Ins. : 20.8℃ & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11nHT20 5180MHz
 Memo :

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
5148.040	34.12	4.64	34.78	33.76	39.78	74.00	34.22	Peak
5149.960	34.12	4.64	34.59	33.76	39.59	74.00	34.41	Peak
5184.280	34.15	4.69	78.83	33.76	83.91	74.00	-9.91	Peak

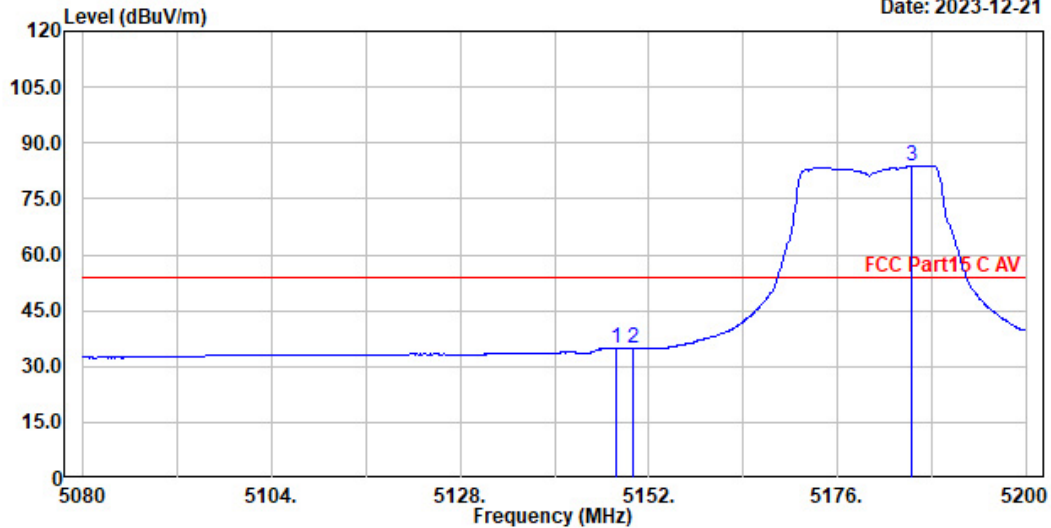
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00022.EMI

Date: 2023-12-21



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:22
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304 Engineer : Zhaolin
 Limit : FCC Part15 C AV
 Env. / Ins. : 20.8℃ & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11nHT20 5180MHz
 Memo :

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
5147.920	34.12	4.64	30.01	33.76	35.01	54.00	18.99	Average
5149.960	34.12	4.64	29.97	33.76	34.97	54.00	19.03	Average
5185.360	34.15	4.70	78.91	33.76	84.00	54.00	-30.00	Average

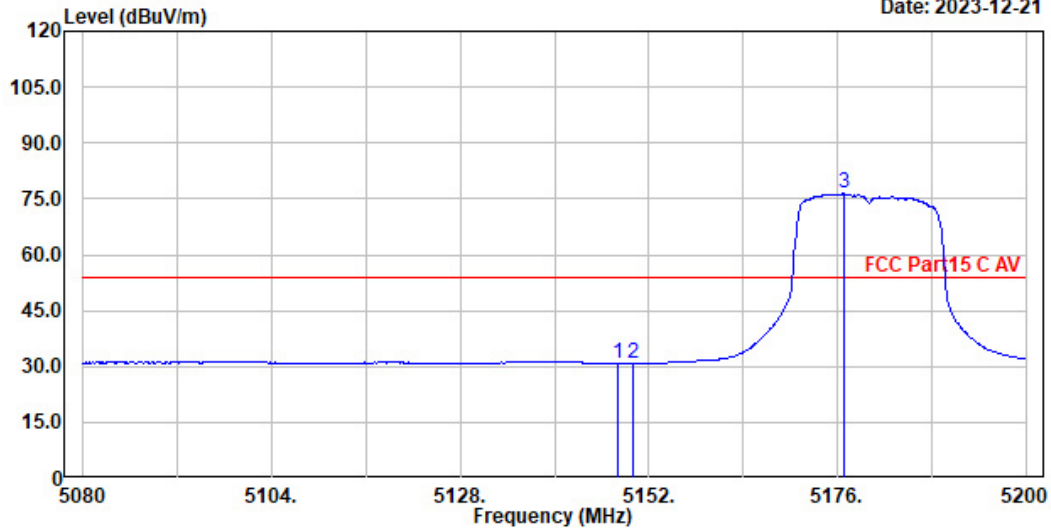
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00024.EMI

Date: 2023-12-21



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:24
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304 Engineer : Zhaolin
 Limit : FCC Part15 C AV
 Env. / Ins. : 20.8℃ & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11nHT20 5180MHz
 Memo :

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
5148.040	34.12	4.64	25.84	33.76	30.84	54.00	23.16	Average
5149.960	34.12	4.64	25.76	33.76	30.76	54.00	23.24	Average
5176.840	34.14	4.68	71.27	33.76	76.33	54.00	-22.33	Average

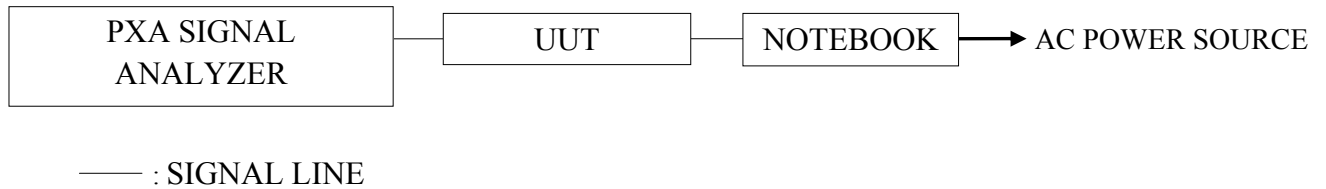
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor

5. OUTPUT POWER MEASUREMENT

5.1. Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Period
1.	PXA signal analyzer	Agilent	N9030A	MY53120217	2023-03-25	1 Year

5.2. Block Diagram of Test Setup



5.3. Specification Limits

Frequency Band (MHz)	Category	Limit
5150 to 5250	Outdoor Access Point	1 W(30 dBm)/ Max e.i.r.p. ≤ 125 mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon
	Fixed point-to-point Access Point	1 W(30 dBm)
	Indoor Access Point	1 W(30 dBm)
	Mobile and Portable client device	250 mW(24 dBm)
5250 to 5350	N/A	250 mW or 11 dBm + 10 log B ^{Note1}
5470 to 5725		250 mW or 11 dBm + 10 log B ^{Note1}
5725 to 5850		1 W(30 dBm)

Note 1: B is the 26 dB emission bandwidth, which presented in Chapter 6.

5.4. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v02r01:

■ Method AVGSA-2

- (i) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (ii) Set RBW = 1 MHz.
- (iii) Set VBW $\geq$ 3 MHz.
- (iv) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- (v) Sweep time = auto.
- (vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
- (vii) Do not use sweep triggering. Allow the sweep to “free run.”
- (viii) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
- (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (x) Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

5.5. Test Results

PASSED. All the test results are attached in next pages.

Mode		Frequency	Duty Cycle Factor	Reading (dBm)	Average Output Power (dBm)	Limit (dBm)
802.11a	I	5180	0	8.26	8.26	24
		5200		8.52	8.52	
		5240		8.99	8.99	
	III	5745	0	11.26	11.26	30
		5785		11.87	11.87	
		5825		11.62	11.62	
802.11nHT20	I	5180	0	8.25	8.25	24
		5200		8.26	8.26	
		5240		8.74	8.74	
	III	5745	0	11.68	11.68	30
		5785		10.71	10.71	
		5825		10.52	10.52	

6. DEVIATION TO TEST SPECIFICATIONS

【NONE】