

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-F1305001B
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:

Title 47 CFR FCC Part 15 Subpart C
ANSI C63.10:2020
KDB 558074 D01 DTS Meas Guidance v05r02

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 C section 15.247 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.

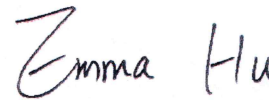
This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Wujiang) Co., Ltd. EMC Dept.

Date of Test: Dec.23~25, 2023

Date of Report: Jan.03, 2024

Prepared by

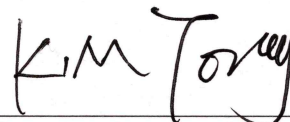
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(Emma Hu/Assistant Administrator)

Approved & Authorized Signer

:



(K.M Tong/Assistant Manager)



1. DESCRIPTION OF VERSION

Edition No.	Date of Rev.	Summary	Report No.
0	May 10, 2013	Original Report.	ACWE-F1305001
Rev. A	Apr.23, 2016	Update the standard from ANSI C63.10-2009 to ANSI C63.10-2013	ACWE-F1305001A
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-F1305001B

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
15.247(d)/ 15.205	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(2)	6dB Bandwidth	N/A
15.247(b)(3)	Maximum Output Power	PASS
15.247(d)	Conducted Band Edges and Conducted Spurious Emission	N/A
15.247 (e)	Peak Power Spectral Density	N/A
15.203	Antenna Requirement	Compliance
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/b/g/n HT20
Fundamental Range	:	2412MHz -2462MHz 5180MHz~5240MHz 5745MHz~5825MHz
Tested Frequency	:	2412MHz (Channel 1) 2437MHz (Channel 6) 2462MHz (Channel 11)
Date of Receipt of Sample	:	Dec.11, 2023

Remark for Rev. B

1. This report is based on the version ACWE-F1305001&F1305001A.
2. This report updates the version of chip and name of manufacturer. The results of Radiated Band Edge and Radiated Spurious Emission& Maximum Output Power will be affected, so we retest these items. Please refer to the original report F1305001A 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.

3.5. 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 = $k_{uc}(y)$

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 = $k_{uc}(y)$

4. RADIATED EMISSION MEASUREMENT

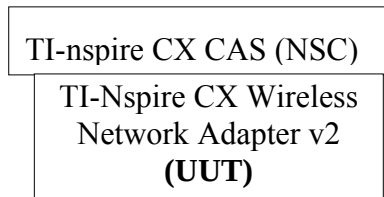
4.1. Test Equipment

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

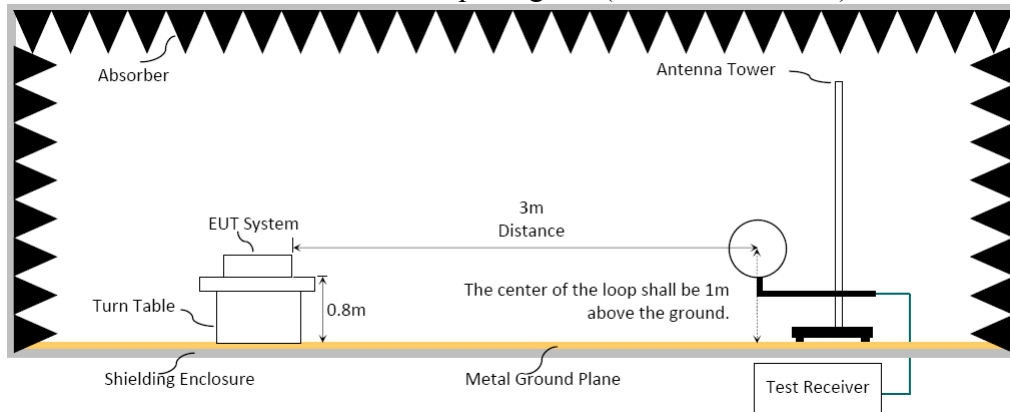
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Period
1.	Preamplifier	Agilent	8447D	2944A10922	2023-03-25	1 Year
2.	PXA signal analyzer	Agilent	N9030A	MY53120367	2023-07-12	1 Year
3.	Bi-log Antenna	SCHWARZBECK	VULB 9168	706	2023-03-12	1 Year
4.	Horn Antenna	ETS	3117	00218586	2023-03-13	1 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

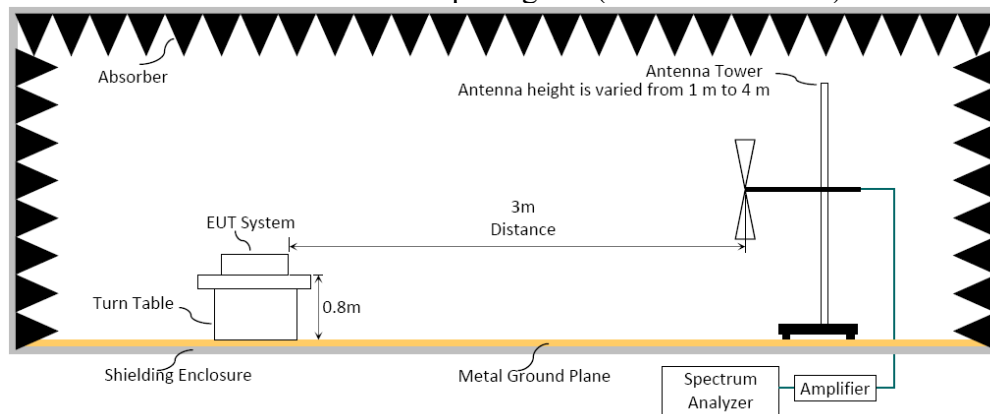
4.2.1. Block Diagram of Test Setup between EUT and simulators



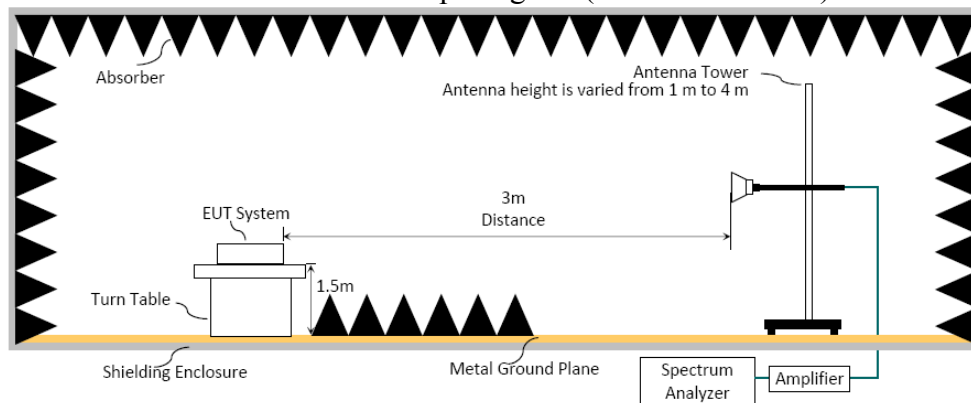
4.2.2. No. 2 3m Semi-Anechoic Chamber Setup Diagram (Test distance: 3m) for 9kHz-30MHz



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

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified as below.

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.

4.4. 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 ~ 25GHz:

The EUT setup on the turn table which has 80 cm (for 30-1000 MHz) 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 25GHz):

Peak Dector:

- (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(25GHz) are checked, and the emission (9kHz~30MHz,18GHz~25GHz)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 2.4G					
Frequency (MHz)	Antenna Polarization	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Conclusion
105.993	H	33.76	43.50	9.74	PASS
140.580	H	32.46	43.50	11.04	PASS
211.390	H	32.57	43.50	10.93	PASS
700.270	H	33.10	46.00	12.90	PASS
800.180	H	33.39	46.00	12.61	PASS
944.170	H	35.87	46.00	10.13	PASS
105.999	V	37.86	43.50	5.64	PASS
140.852	V	31.40	43.50	12.10	PASS
246.421	V	28.70	46.00	17.30	PASS
281.656	V	30.36	46.00	15.64	PASS
766.451	V	26.88	46.00	19.12	PASS
800.240	V	30.78	46.00	15.22	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 802.11b 2412MHz					
Frequency (MHz)	Antenna Polarization	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Conclusion
11693.000	H	48.84	74.00	25.16	PASS
11694.200	H	40.41	54.00	13.59	PASS
14243.000	H	49.51	74.00	24.49	PASS
14244.530	H	42.96	54.00	11.04	PASS
16554.160	H	38.51	54.00	15.49	PASS
16555.000	H	50.76	74.00	23.24	PASS
7341.000	V	49.04	74.00	24.96	PASS
7342.360	V	40.36	54.00	13.64	PASS
7477.000	V	48.37	74.00	25.63	PASS
7479.240	V	37.70	54.00	16.30	PASS
9959.000	V	51.02	74.00	22.98	PASS
9961.230	V	41.78	54.00	12.22	PASS
Test Mode: TX 802.11b 2462MHz					
12390.000	H	49.41	74.00	24.59	PASS
12391.240	H	39.84	54.00	14.16	PASS
14838.000	H	49.78	74.00	24.22	PASS
14839.240	H	42.07	54.00	11.93	PASS
17065.000	H	49.79	74.00	24.21	PASS
17066.350	H	43.73	54.00	10.27	PASS
5993.260	V	36.60	54.00	17.40	PASS
5998.000	V	44.67	74.00	29.33	PASS
10433.160	V	38.70	54.00	15.30	PASS
10435.000	V	47.54	74.00	26.46	PASS
16230.190	V	43.17	54.00	10.83	PASS
16232.000	V	50.32	74.00	23.68	PASS
Test Mode: TX 802.11g 2412MHz					
11897.000	H	48.63	74.00	25.37	PASS
11898.430	H	40.68	54.00	13.32	PASS
12594.000	H	49.98	74.00	24.02	PASS
12596.320	H	41.87	54.00	12.13	PASS
16283.000	H	51.00	74.00	23.00	PASS
16284.230	H	43.54	54.00	10.46	PASS
7494.000	V	47.33	74.00	26.67	PASS
7495.270	V	38.68	54.00	15.32	PASS
9959.000	V	49.91	74.00	24.09	PASS
9961.250	V	39.12	54.00	14.88	PASS
12577.000	V	49.91	74.00	24.09	PASS
12578.210	V	42.26	54.00	11.74	PASS

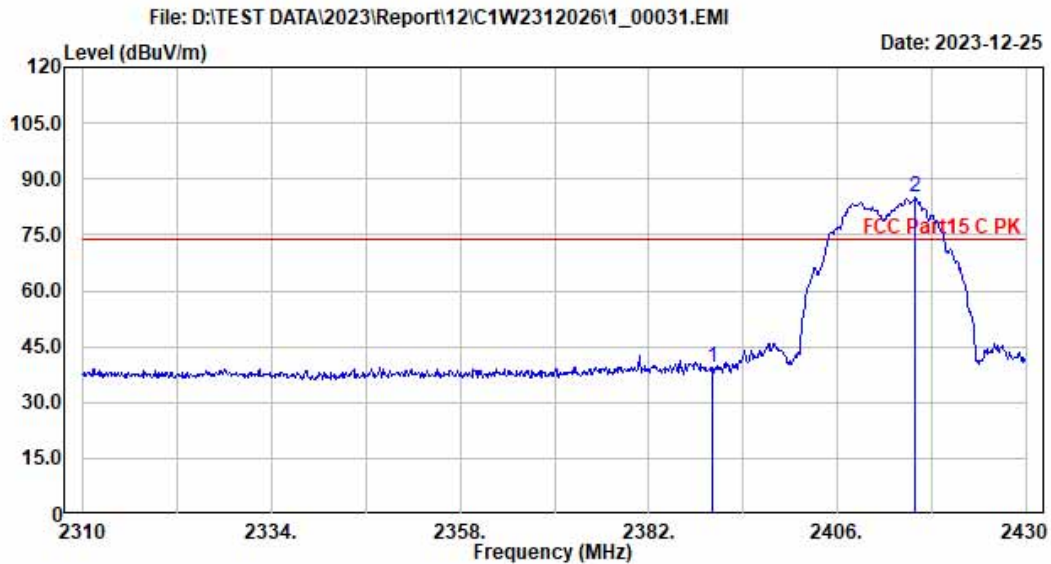
Test Mode: TX 802.11g 2462MHz					
Frequency (MHz)	Antenna Polarization	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Conclusion
12390.000	H	49.41	74.00	24.59	PASS
12391.240	H	39.84	54.00	14.16	PASS
14838.000	H	49.78	74.00	24.22	PASS
14839.240	H	42.07	54.00	11.93	PASS
17065.000	H	49.79	74.00	24.21	PASS
17065.350	H	43.73	54.00	10.27	PASS
11064.000	V	48.49	74.00	25.51	PASS
11065.260	V	40.84	54.00	13.16	PASS
12339.000	V	49.33	74.00	24.67	PASS
12341.120	V	41.47	54.00	12.53	PASS
16657.000	V	49.83	74.00	24.17	PASS
16658.460	V	43.83	54.00	10.17	PASS
Test Mode: TX 802.11nHT20 2412MHz					
12475.000	H	49.19	74.00	24.81	PASS
12476.350	H	39.94	54.00	14.06	PASS
12917.000	H	49.45	74.00	24.55	PASS
12918.430	H	42.04	54.00	11.96	PASS
15059.000	H	49.46	74.00	24.54	PASS
15061.250	H	42.94	54.00	11.06	PASS
7494.000	V	47.69	74.00	26.31	PASS
7495.230	V	37.53	54.00	16.47	PASS
12985.000	V	49.26	74.00	24.74	PASS
12986.480	V	42.75	54.00	11.25	PASS
15008.000	V	50.20	74.00	23.80	PASS
15009.280	V	41.96	54.00	12.04	PASS
Test Mode: TX 802.11nHT20 2462MHz					
6423.000	H	45.59	74.00	28.41	PASS
6424.260	H	36.99	54.00	17.01	PASS
12815.000	H	48.62	74.00	25.38	PASS
12816.320	H	42.48	54.00	11.52	PASS
17354.000	H	49.89	74.00	24.11	PASS
17355.620	H	43.76	54.00	10.24	PASS
11693.000	V	48.30	74.00	25.70	PASS
11694.520	V	41.50	54.00	12.50	PASS
12628.000	V	49.19	74.00	24.81	PASS
12629.630	V	41.13	54.00	12.87	PASS
16334.000	V	49.99	74.00	24.01	PASS
16335.270	V	43.90	54.00	10.10	PASS

4.5.3. Spurious Emission Measurement Results in Band Edge Emission

Mode	802.11b	Frequency	TX 2412MHz
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Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:31
 Instrument 1 : Spectrum N9030A(367)
 Instrument 2 : Preamplifier 8449B(232)|000
 Dis. / Ant. : 3117-586-2304
 Limit : FCC Part15 C PK
 Env. / Ins. : 20.8°C & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11b 2412MHz
 Memo :

Engineer : Zhaolin

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
2390.000	32.13	3.10	39.56	35.27	39.52	74.00	34.48	Peak
2415.960	32.15	3.13	85.00	35.24	85.04	74.00	-11.04	Peak

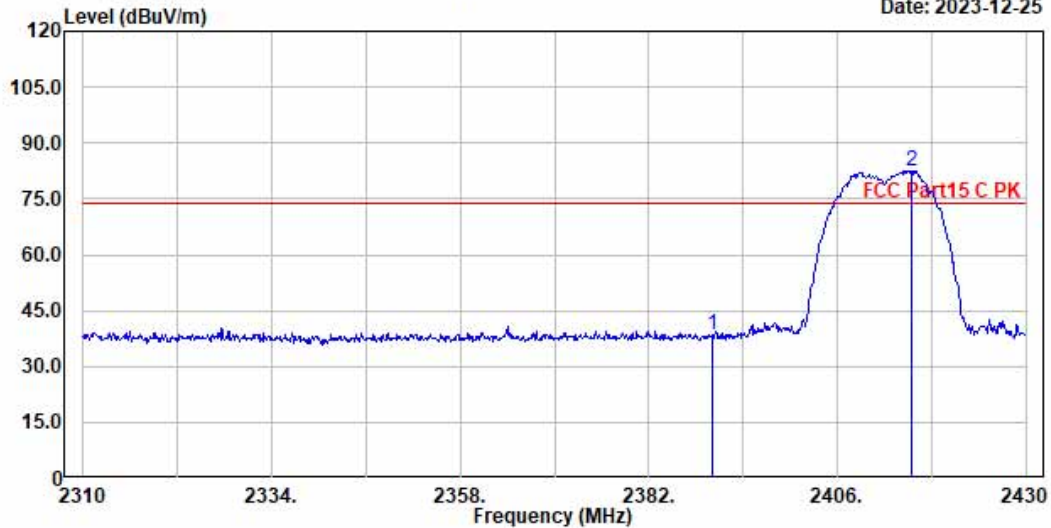
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00029.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:29
 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 11b 2412MHz
 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
2390.000	32.13	3.10	38.66	35.27	38.62	74.00	35.38	Peak
2415.480	32.15	3.13	82.49	35.24	82.53	74.00	-8.53	Peak

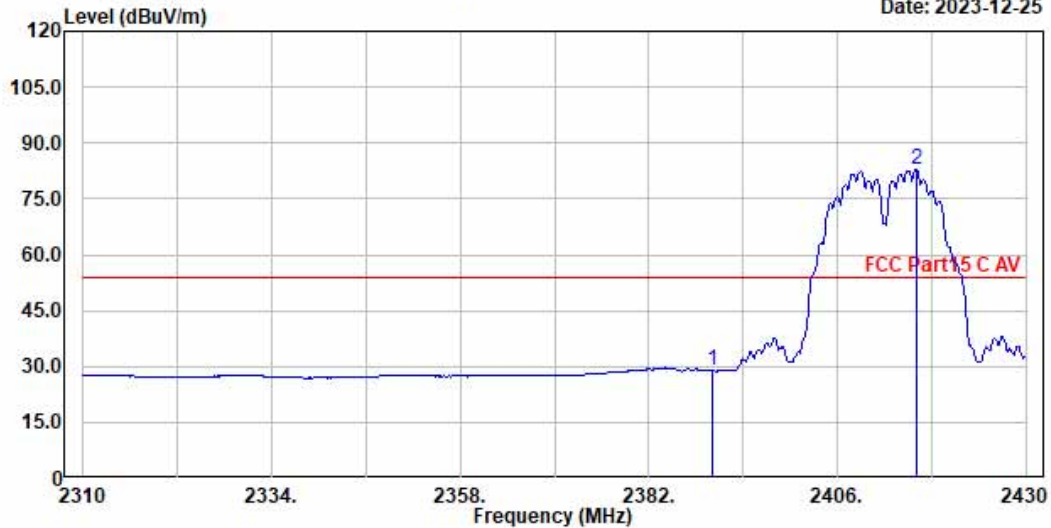
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00032.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:32
 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 11b 2412MHz
 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
2390.000	32.13	3.10	29.03	35.27	28.99	54.00	25.01	Average
2416.080	32.15	3.13	82.61	35.24	82.65	54.00	-28.65	Average

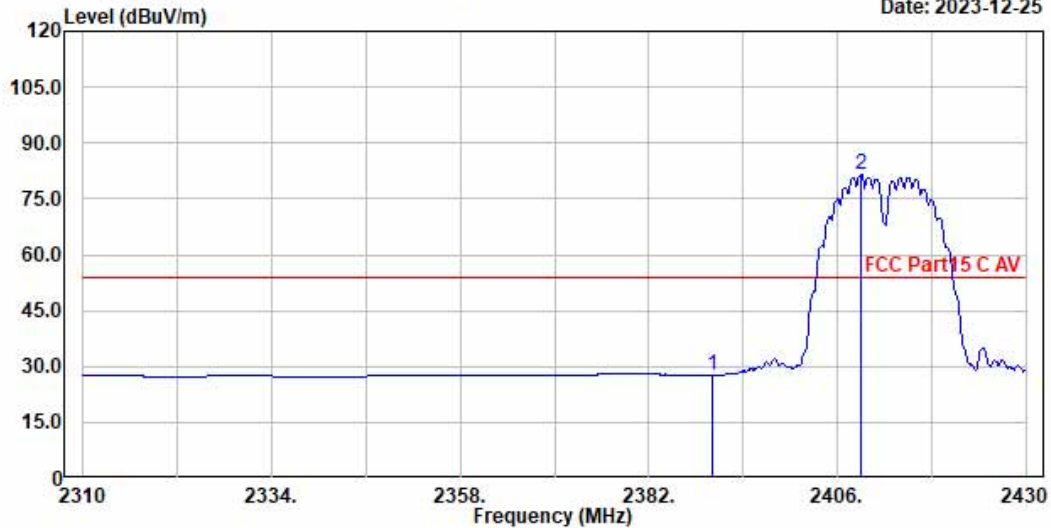
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00030.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:30
 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 11b 2412MHz
 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
2390.000	32.13	3.10	27.75	35.27	27.71	54.00	26.29	Average
2409.000	32.15	3.12	81.61	35.25	81.63	54.00	-27.63	Average

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

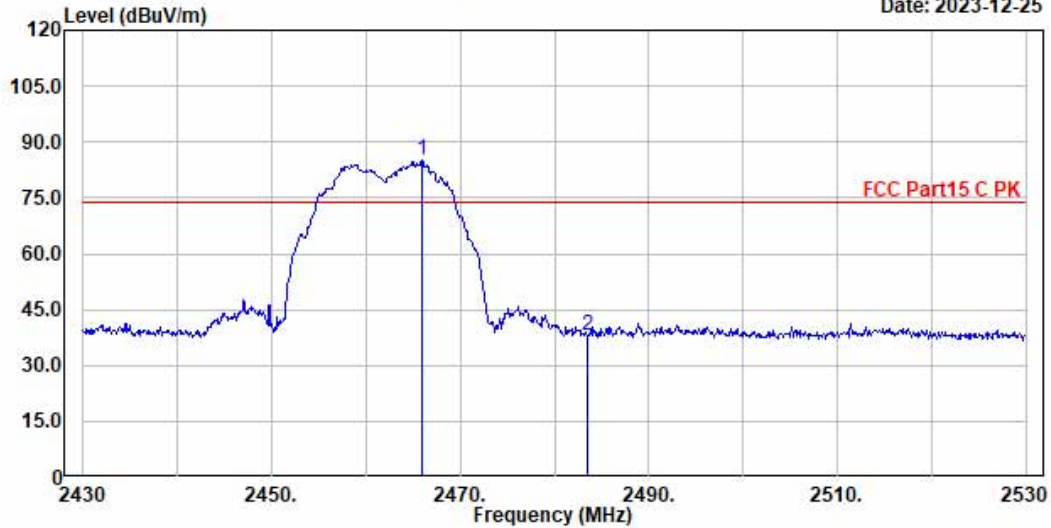
Mode	802.11b	Frequency	TX 2462MHz
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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00033.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:33
 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 11b 2462MHz
 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
2466.000	32.18	3.18	84.98	35.19	85.15	74.00	-11.15	Peak
2483.500	32.19	3.19	37.62	35.18	37.82	74.00	36.18	Peak

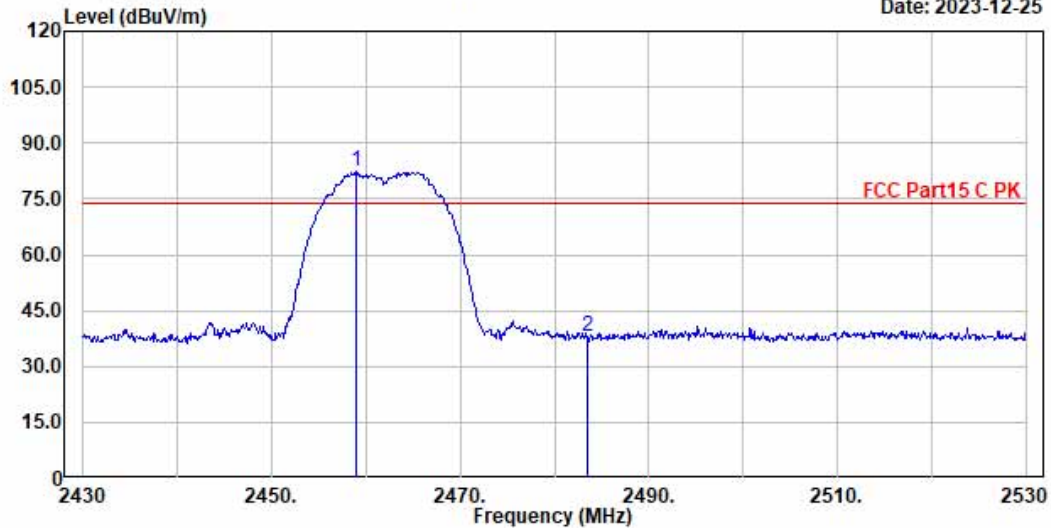
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00035.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:35
 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°C & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11b 2462MHz
 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
2459.000	32.18	3.17	82.19	35.20	82.34	74.00	-8.34	Peak
2483.500	32.19	3.19	37.98	35.18	38.18	74.00	35.82	Peak

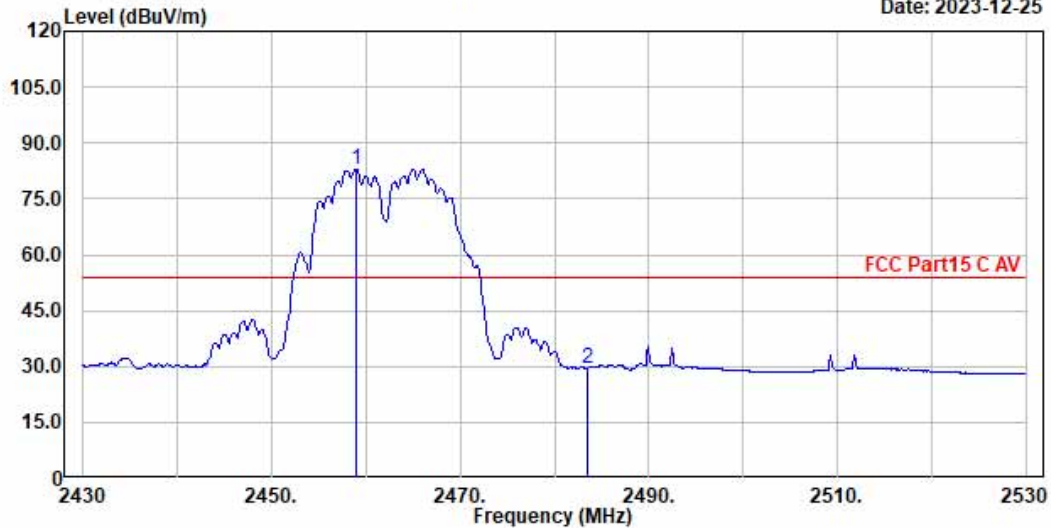
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00034.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:34
 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 11b 2462MHz
 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
2459.000	32.18	3.17	82.92	35.20	83.07	54.00	-29.07	Average
2483.500	32.19	3.19	29.40	35.18	29.60	54.00	24.40	Average

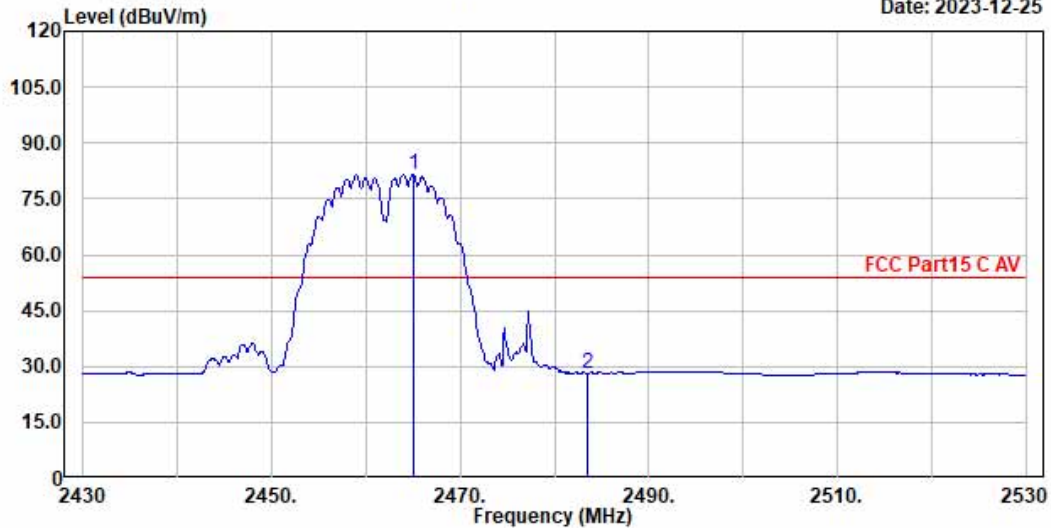
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00036.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:36
 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 11b 2462MHz
 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
2465.000	32.18	3.17	81.31	35.19	81.47	54.00	-27.47	Average
2483.500	32.19	3.19	28.00	35.18	28.20	54.00	25.80	Average

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

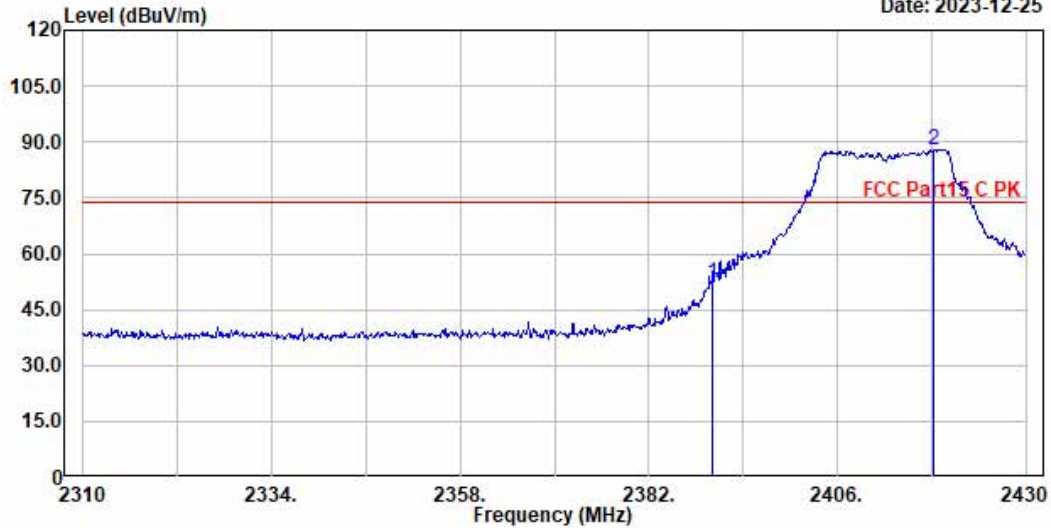
Mode	802.11g	Frequency	TX 2412MHz
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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00039.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:39
 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 11g 2412MHz
 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
2390.000	32.13	3.10	52.13	35.27	52.09	74.00	21.91	Peak
2418.240	32.15	3.13	87.99	35.24	88.03	74.00	-14.03	Peak

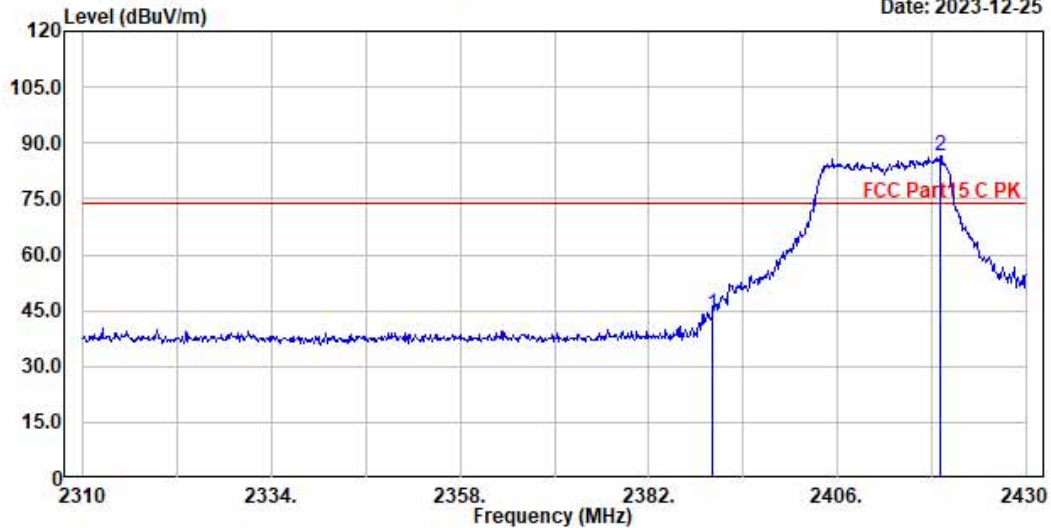
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00037.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:37
 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°C & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11g 2412MHz
 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
2390.000	32.13	3.10	44.03	35.27	43.99	74.00	30.01	Peak
2419.080	32.15	3.13	86.31	35.24	86.35	74.00	-12.35	Peak

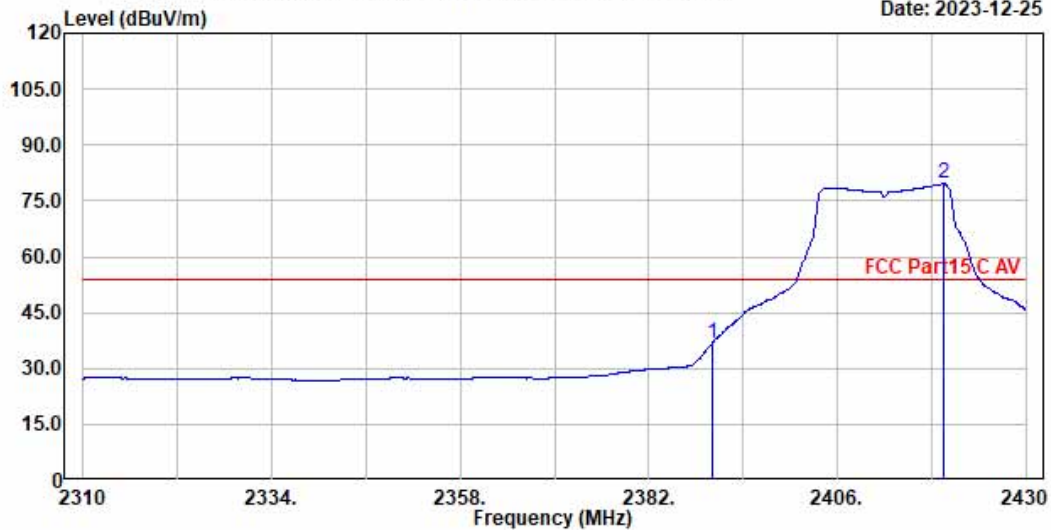
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00040.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:40
 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 11g 2412MHz
 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
2390.000	32.13	3.10	36.66	35.27	36.62	54.00	17.38	Average
2419.560	32.15	3.13	79.55	35.24	79.59	54.00	-25.59	Average

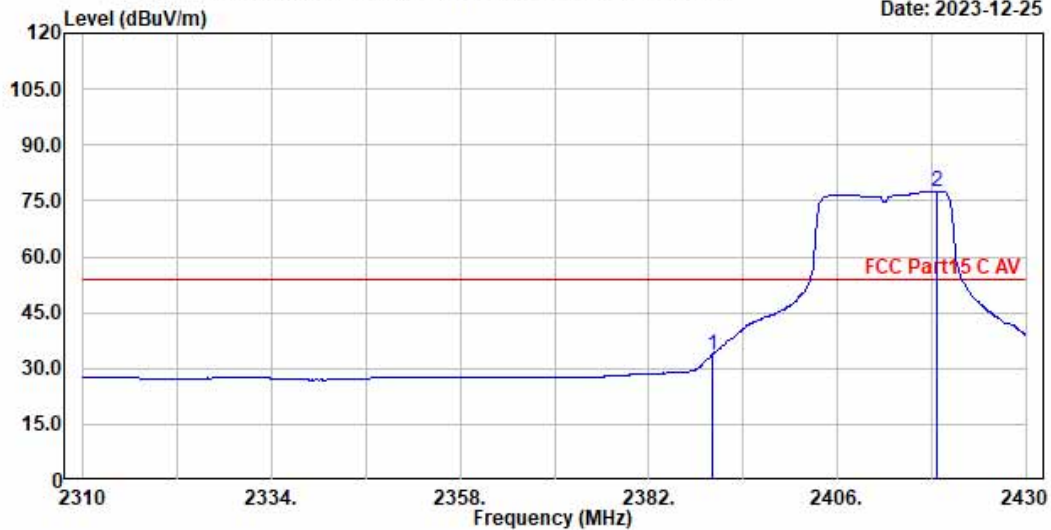
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\1W2312026\1_00038.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:38
 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 11g 2412MHz
 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
2390.000	32.13	3.10	33.65	35.27	33.61	54.00	20.39	Average
2418.600	32.15	3.13	77.60	35.24	77.64	54.00	-23.64	Average

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

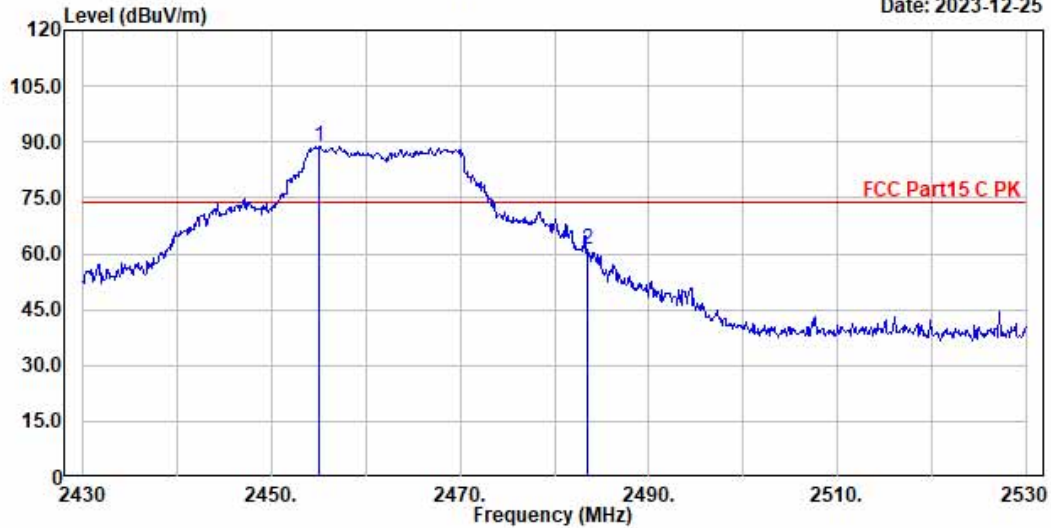
Mode	802.11g	Frequency	TX 2462MHz
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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00041.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:41
 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 11g 2462MHz
 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
2455.100	32.17	3.17	88.54	35.20	88.68	74.00	-14.68	Peak
2483.500	32.19	3.19	60.74	35.18	60.94	74.00	13.06	Peak

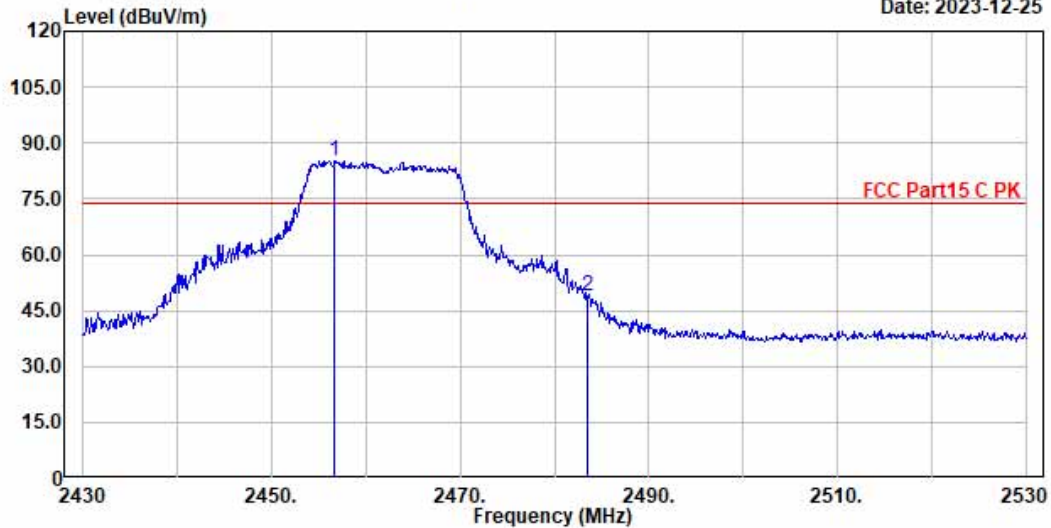
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00042.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:42
 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°C & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11g 2462MHz
 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
2456.700	32.17	3.17	85.22	35.20	85.36	74.00	-11.36	Peak
2483.500	32.19	3.19	48.60	35.18	48.80	74.00	25.20	Peak

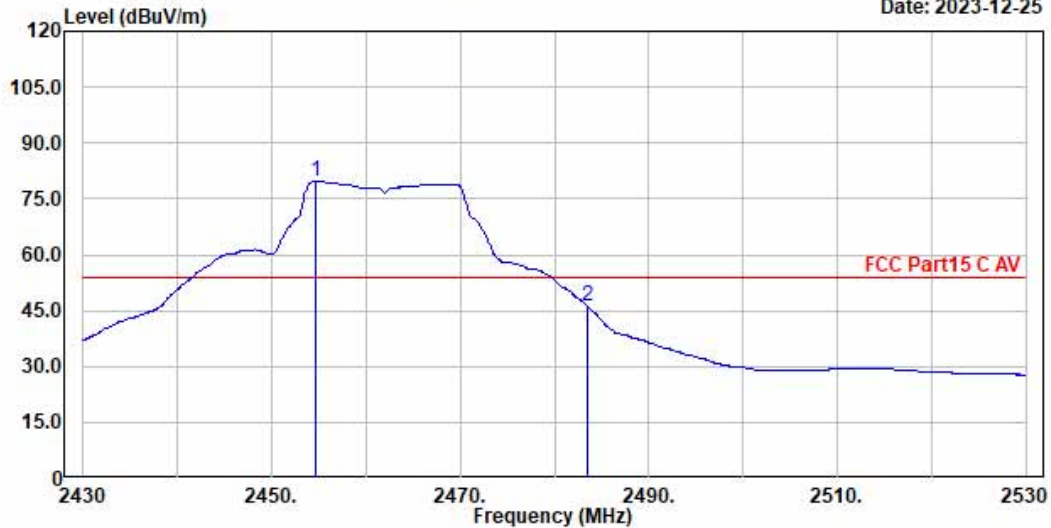
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00044.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:44
 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 11g 2462MHz
 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
2454.700	32.17	3.16	79.61	35.20	79.74	54.00	-25.74	Average
2483.500	32.19	3.19	46.03	35.18	46.23	54.00	7.77	Average

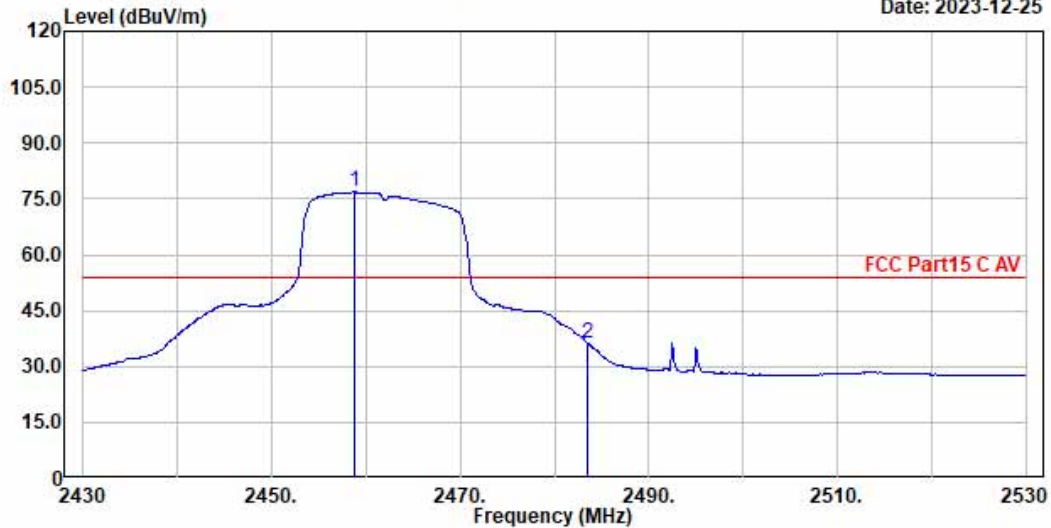
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00043.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:43
 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 11g 2462MHz
 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
2458.800	32.18	3.17	76.63	35.20	76.78	54.00	-22.78	Average
2483.500	32.19	3.19	36.23	35.18	36.43	54.00	17.57	Average

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

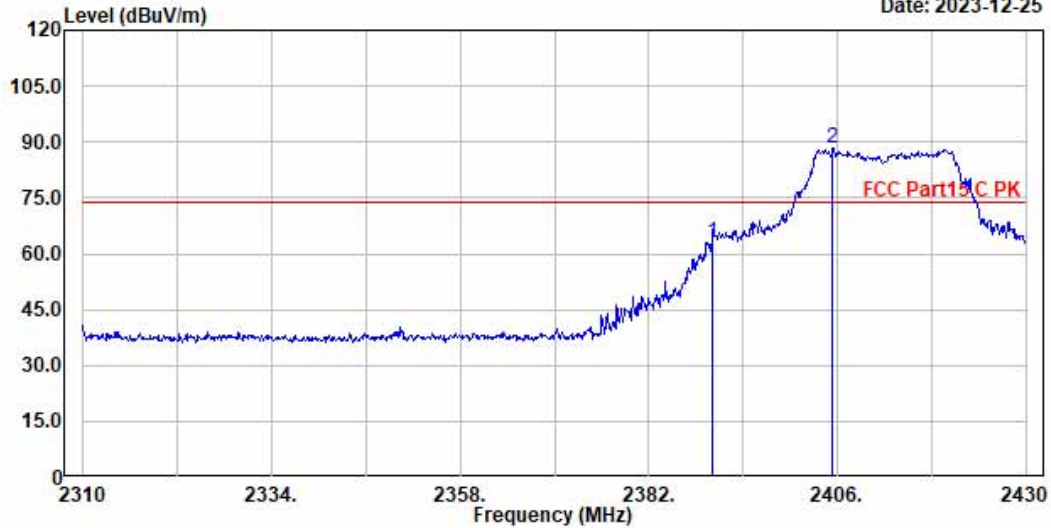
Mode	802.11nHT20	Frequency	TX 2412MHz
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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00045.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:45
 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 2412MHz
 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
2390.000	32.13	3.10	63.09	35.27	63.05	74.00	10.95	Peak
2405.400	32.14	3.12	88.45	35.25	88.46	74.00	-14.46	Peak

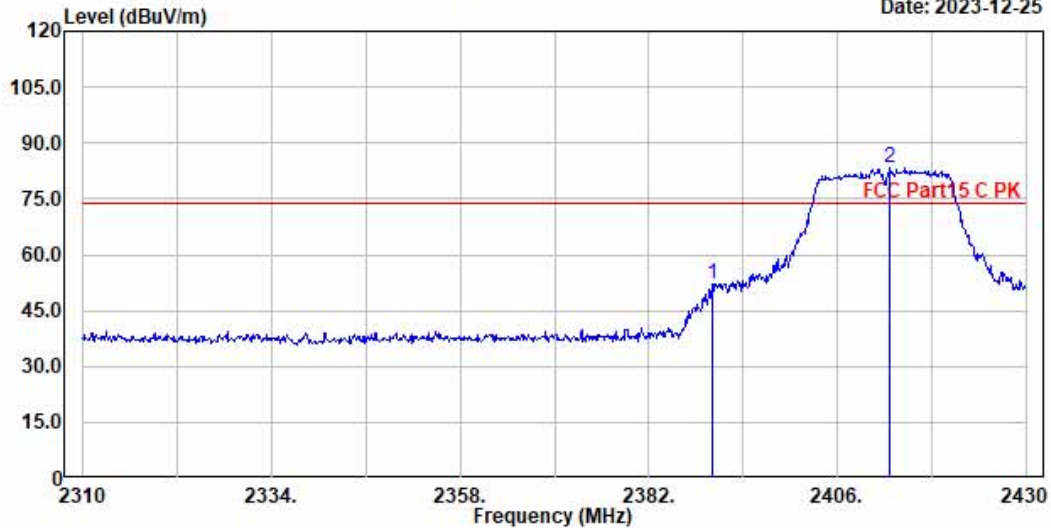
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00046.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:46
 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°C & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11nHT20 2412MHz
 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
2390.000	32.13	3.10	52.00	35.27	51.96	74.00	22.04	Peak
2412.720	32.15	3.12	83.11	35.24	83.14	74.00	-9.14	Peak

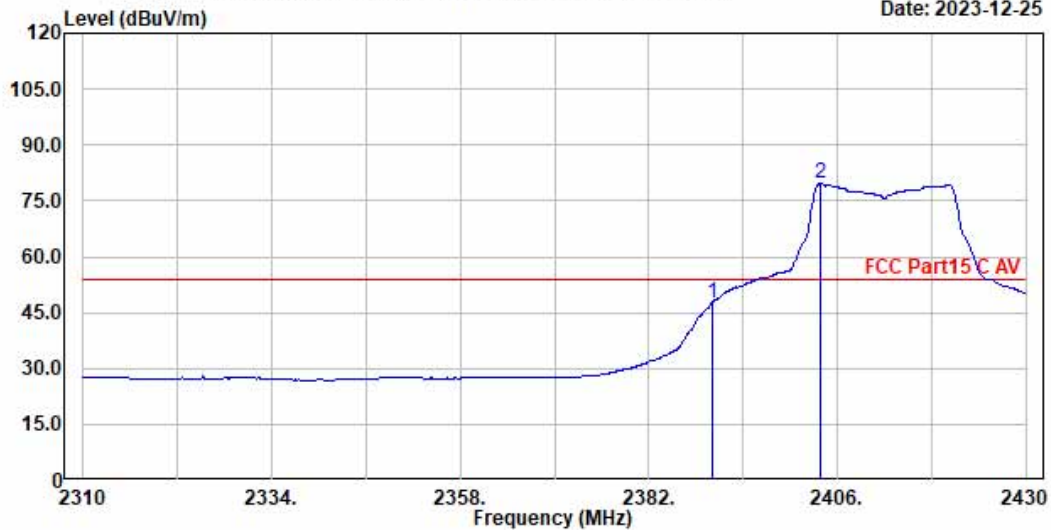
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00048.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:48
 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 11nHT20 2412MHz
 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
2390.000	32.13	3.10	47.77	35.27	47.73	54.00	6.27	Average
2403.840	32.14	3.11	79.57	35.25	79.57	54.00	-25.57	Average

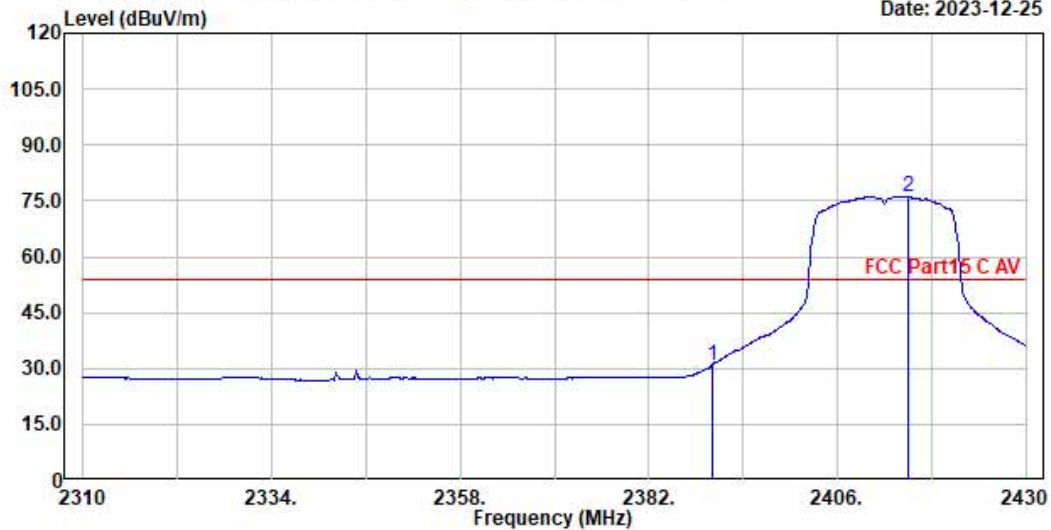
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00047.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:47
 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 11nHT20 2412MHz
 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
2390.000	32.13	3.10	30.82	35.27	30.78	54.00	23.22	Average
2415.000	32.15	3.12	76.10	35.24	76.13	54.00	-22.13	Average

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

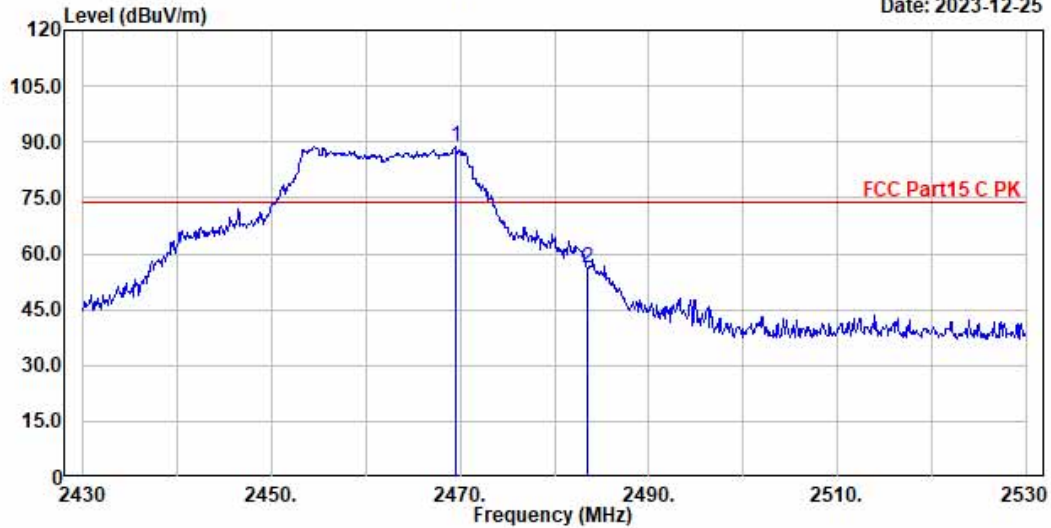
Mode	802.11nHT20	Frequency	TX 2462MHz
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File: D:\TEST DATA\2023\Report\12\1C1W2312026\1_00049.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:49
 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 2462MHz
 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
2469.500	32.18	3.18	88.49	35.19	88.66	74.00	-14.66	Peak
2483.500	32.19	3.19	55.95	35.18	56.15	74.00	17.85	Peak

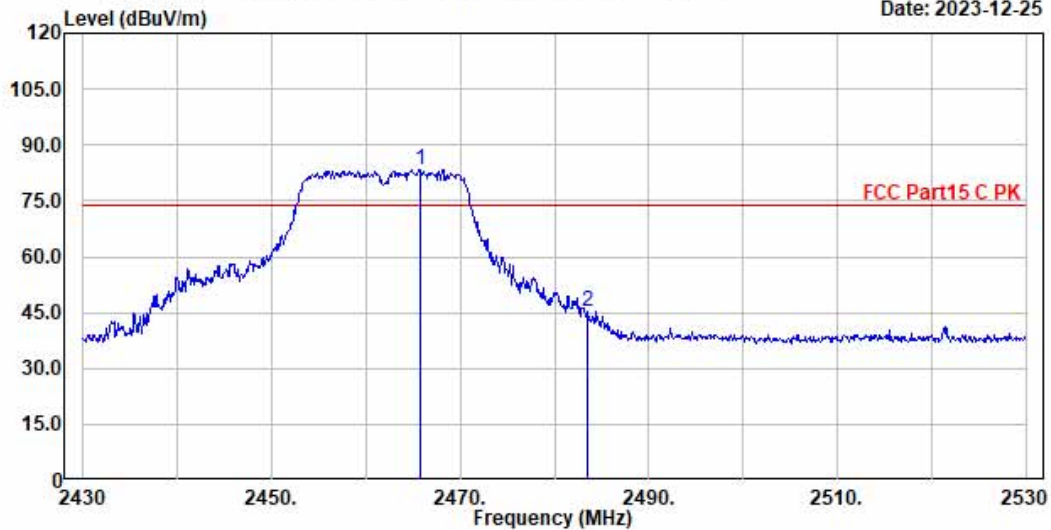
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00050.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:50
 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°C & 42 %
 EUT : TI-Nspire CX Wireless Network Adapter v2
 M/N : TINAVWNA2
 Power Rating : DC 5V
 Test Mode : TX 11nHT20 2462MHz
 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
2465.700	32.18	3.18	83.23	35.19	83.40	74.00	-9.40	Peak
2483.500	32.19	3.19	44.93	35.18	45.13	74.00	28.87	Peak

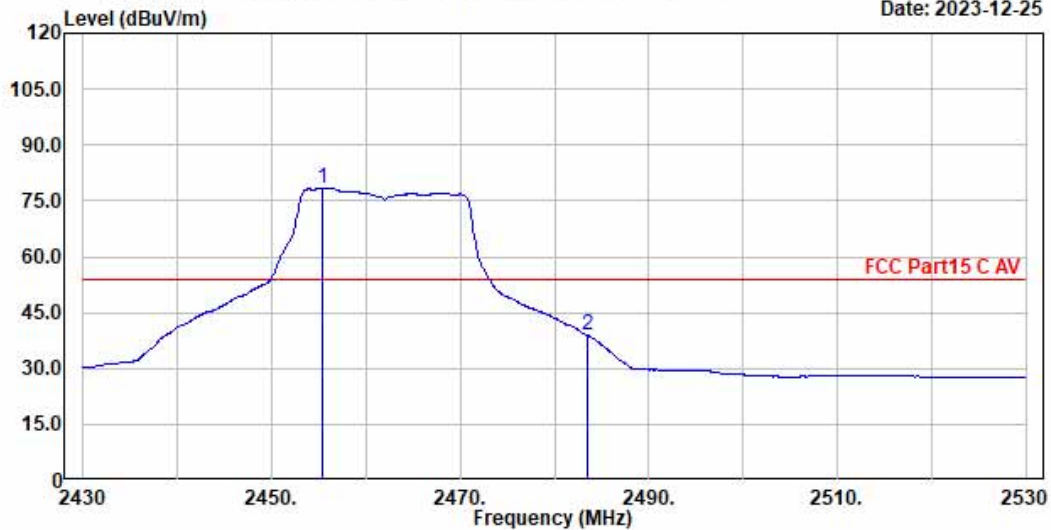
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00052.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Horizontal Data NO.:52
 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 11nHT20 2462MHz
 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
2455.400	32.17	3.17	78.17	35.20	78.31	54.00	-24.31	Average
2483.500	32.19	3.19	38.63	35.18	38.83	54.00	15.17	Average

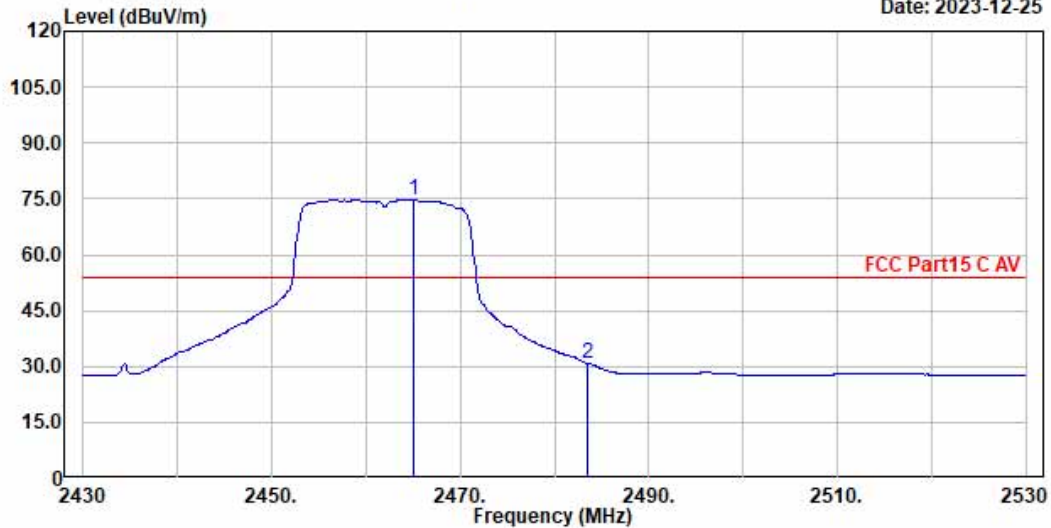
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor



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File: D:\TEST DATA\2023\Report\12\C1W2312026\1_00051.EMI

Date: 2023-12-25



Site NO. : NO.2 3M Chamber Ant. pol.: Vertical Data NO.:51
 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 11nHT20 2462MHz
 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
2465.100	32.18	3.18	74.61	35.19	74.78	54.00	-20.78	Average
2483.500	32.19	3.19	30.63	35.18	30.83	54.00	23.17	Average

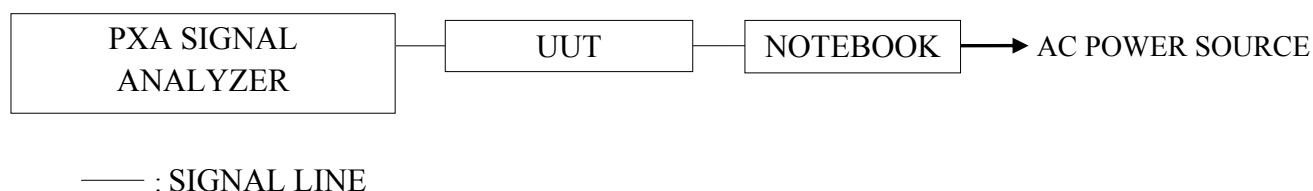
Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor

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 (§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm), and E.I.R.P.: 4Watt (36dBm)

5.4. Test Procedure

Following measurement procedure is reference to KDB 558074 D01 DTS Meas Guidance v05:

☐ Method AVGSA-2 (Spectrum channel power)

- (1) Set span to at least 1.5 times the OBW
- (2) Set RBW = 1 -5% of OBW
- (3) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- (4) Detector = RMS.
- (5) Trace mode = trace average at least 100 traces
- (6) Sweep = auto couple.
- (7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
- (8) Duty cycle factor is added when duty cycle presented in chapter3.5 is $< 98\%$.

5.5. Test Results

PASSED.

Mode	Frequency	Duty Cycle Factor	Reading (dBm)	Average Output Power(dBm)	Limit (dBm)
11b	2412	0	11.49	11.49	30
	2437		11.26	11.26	
	2462		11.22	11.22	
11g	2412	0	9.86	9.86	
	2437		10.85	10.85	
	2462		10.01	10.01	
11nHT20	2412	0	8.12	8.12	
	2437		10.52	10.52	
	2462		7.67	7.67	

6. DEVIATION TO TEST SPECIFICATIONS

【NONE】