




## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 1 of 92

# TEST REPORT

**Application No.:** KSCR2404000738AU  
**FCC ID:** 2BBDIVBK30C21  
**Applicant:** Wuxi Auto-link world Information Technology Co., Ltd.  
**Address of Applicant:** No. 2, Gaokai Road, Economic Development Zone, Wuxi City, Jiangsu Province, China  
**Manufacturer:** Wuxi Auto-link world Information Technology Co., Ltd.  
**Address of Manufacturer:** No. 2, Gaokai Road, Economic Development Zone, Wuxi City, Jiangsu Province, China  
**Factory:** Wuxi Auto-link world Information Technology Co., Ltd.  
**Address of Factory:** No. 2, Gaokai Road, Economic Development Zone, Wuxi City, Jiangsu Province, China  
**Equipment Under Test (EUT):**  
**EUT Name:** Telematics Headunit  
**Model No.:** 30C21  
**Trade Mark:**   
**Standard(s) :** 47 CFR Part 15, Subpart C 15.247  
**Date of Receipt:** 2024-04-28  
**Date of Test:** 2024-04-29 to 2024-05-29  
**Date of Issue:** 2024-05-30

**Test Result:**

**Pass\***

\* In the configuration tested, the EUT complied with the standards specified above.

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Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 2 of 92

Revision Record			
Version	Description	Date	Remark
00	Original	2024-05-30	/

Authorized for issue by:				
Tested By		Maker Qi		
		Maker Qi /Project Engineer		
Approved By		Terry Hou		
		Terry Hou /Reviewer		

## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	N/A

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass

### 3 Contents

	Page
<b>1 COVER PAGE.....</b>	<b>1</b>
<b>2 Test Summary .....</b>	<b>3</b>
<b>3 Contents .....</b>	<b>4</b>
<b>4 General Information .....</b>	<b>5</b>
4.1 Details of E.U.T. ....	5
4.2 Description of Support Units .....	5
4.3 Power level setting using in test .....	5
4.4 Measurement Uncertainty .....	6
4.5 Test Location .....	7
4.6 Test Facility .....	7
4.7 Deviation from Standards .....	7
4.8 Abnormalities from Standard Conditions .....	7
<b>5 Equipment List.....</b>	<b>8</b>
<b>6 Radio Spectrum Technical Requirement .....</b>	<b>9</b>
6.1 Antenna Requirement .....	9
<b>7 Radio Spectrum Matter Test Results .....</b>	<b>10</b>
7.1 Radiated Emissions which fall in the restricted bands.....	10
7.2 Radiated Spurious Emissions Below 1GHz .....	22
7.3 Radiated Spurious Emissions Above 1GHz.....	26
7.4 Conducted Peak Output Power.....	40
7.5 Minimum 6dB Bandwidth .....	42
7.6 Power Spectrum Density .....	43
7.7 Conducted Band Edges Measurement.....	44
7.8 Conducted Spurious Emissions .....	46
<b>8 Test Setup Photo .....</b>	<b>47</b>
<b>9 EUT Constructional Details (EUT Photos) .....</b>	<b>47</b>
<b>10 Appendix .....</b>	<b>48</b>

## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	DC 12V
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11
Channel Spacing:	5MHz
Antenna Type:	Internal antenna
Antenna Gain:	2.79dBi (Provided by the manufacturer)

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
DC power supply	Agilent	E3632A	/
Notebook	LENOVO	K27	EB24537645

### 4.3 Power level setting using in test

Channel	802.11b	802.11g	802.11n
	Ant 1	Ant 1	Ant 1
1	13	13	13
6	13	13	13
11	13	13	13

## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 6 of 92

### 4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$8.4 \times 10^{-8}$
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%
Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.		

## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 7 of 92

### 4.5 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).
3. Sample source: sent by customer.

### 4.6 Test Facility

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

#### • A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

#### • FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

#### • ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

#### • VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

### 4.7 Deviation from Standards

None

### 4.8 Abnormalities from Standard Conditions

None



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 8 of 92

### 5 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
<b>Conducted Emission at Mains Terminals</b>						
1	EMI Test Receive	R&S	ESCI	KS301101	01/15/2024	01/14/2025
2	LISN	R&S	ENV216	KS301197	01/15/2024	01/14/2025
3	LISN	Schwarzbeck	NNLK 8129	KS301091	01/15/2024	01/14/2025
4	Pulse Limiter	R&S	ESH3-Z2	KUS1902E001	01/15/2024	01/14/2025
5	CE test Cable	Thermax	/	CZ301102	01/15/2024	01/14/2025
6	Test Software	Farad	EZ-EMC	/	N.C.R	N.C.R
<b>RF Conducted Test</b>						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	08/24/2023	08/23/2024
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	08/24/2023	08/23/2024
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/15/2024	01/14/2025
4	Signal Generator	R&S	SMBV100B	KSEM032	03/19/2024	03/18/2025
5	Signal Generator	R&S	SMW200A	KSEM020-1	08/24/2023	08/23/2024
6	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/24/2023	08/23/2024
7	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	08/24/2023	08/23/2024
8	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	03/19/2024	03/18/2025
9	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	08/24/2023	08/23/2024
10	Switcher	TST	FY562	KUS2001M001-4	01/15/2024	01/14/2025
11	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R
12	DC Power Supply	Agilent	E3632A	KS301180	N.C.R	N.C.R
13	Conducted Test Cable	Thermax	RF01-RF04	CZ301111- CZ301120	01/15/2024	01/14/2025
14	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	08/24/2023	08/23/2024
15	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	03/19/2024	03/18/2025
16	Software	BST	TST-PASS	/	NCR	NCR
<b>RF Radiated Test</b>						
1	Spectrum Analyzer	R&S	FSV40	KUS1806E003	08/24/2023	08/23/2024
2	Universal Radio Communication Tester	R&S	CMW500	KSEM009-1	03/19/2024	03/18/2025
3	Signal Generator	Agilent	E8257C	KS301066	08/24/2023	08/23/2024
4	Loop Antenna	COM-POWER	AL-130R	KUS1806E001	03/18/2023	03/17/2025
5	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E005	06/29/2023	06/28/2025
6	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E006	03/19/2024	03/18/2025
7	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	KS301079	08/24/2023	08/23/2024
8	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	KS301186	04/07/2023	04/06/2025
9	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	CZ301058	01/07/2024	01/06/2026
10	Amplifier(30MHz~18GHz)	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-1	01/15/2024	01/14/2025
11	Amplifier(18~40GHz)	PANSHAN TECHNOLOGY	LNA180400G40	KSEM038	08/24/2023	08/23/2024
12	RE Test Cable	REBES MICROWAVE	/	CZ301097	08/24/2023	08/23/2024
13	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-4	03/19/2024	03/18/2025
14	Software	Faratronic	EZ_EMV-3A1	/	NCR	NCR
15	Software	ESE	E3_V 6.111221a	/	NCR	NCR



## **6 Radio Spectrum Technical Requirement**

### **6.1 Antenna Requirement**

#### **6.1.1 Test Requirement:**

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

#### **6.1.2 Conclusion**

Standard Requirement:

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, 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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.79dBi.

Antenna location: Refer to internal photo.

## 7 Radio Spectrum Matter Test Results

### 7.1 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 20.5 °C

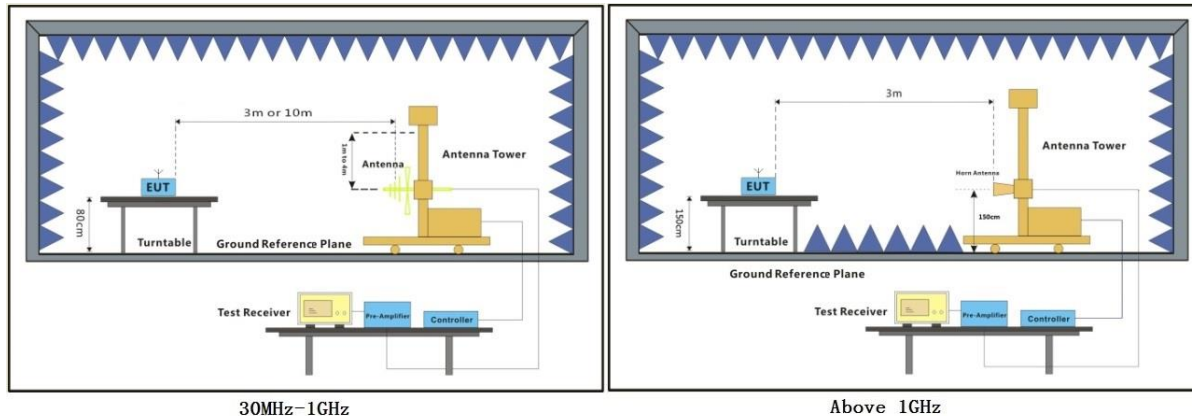
Humidity: 50.5 % RH

Atmospheric Pressure: 1010 mbar

#### 7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

### 7.1.3 Test Setup Diagram



### 7.1.4 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

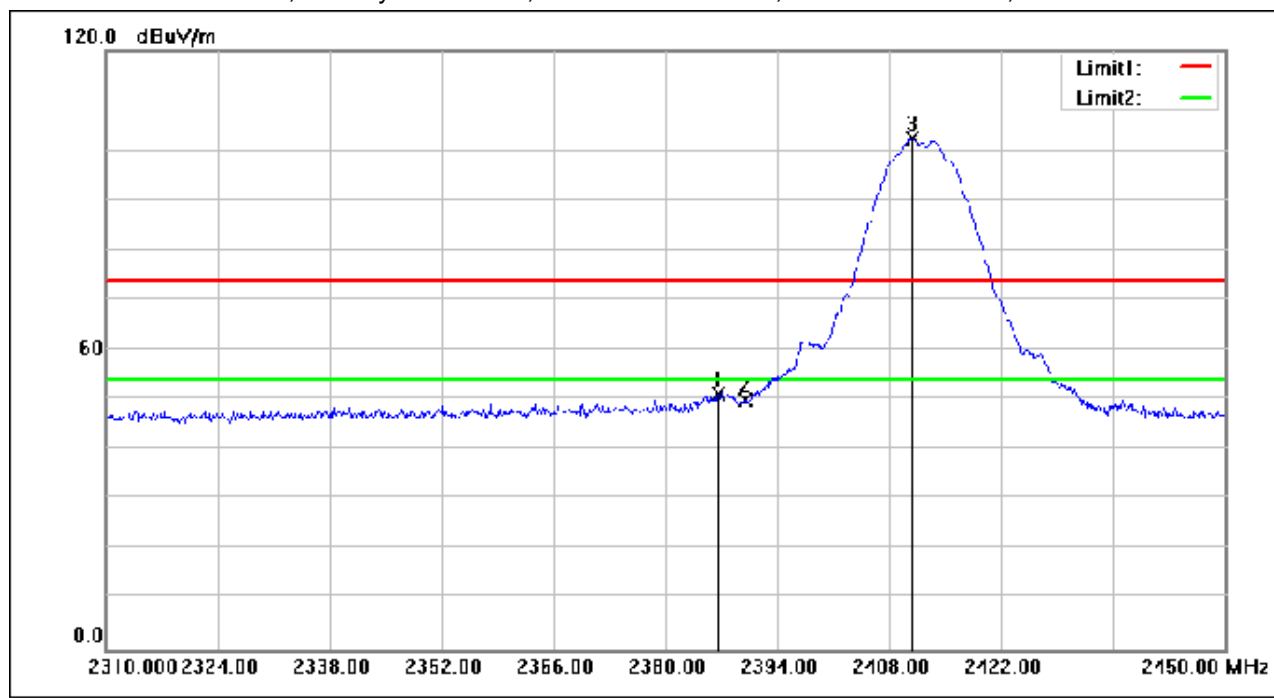
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 12 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.580	74.54	-23.40	51.14	74.00	-22.86	peak
2	2390.000	73.35	-23.39	49.96	74.00	-24.04	peak
3	2410.940	125.68	-23.37	102.31	74.00	28.31	peak

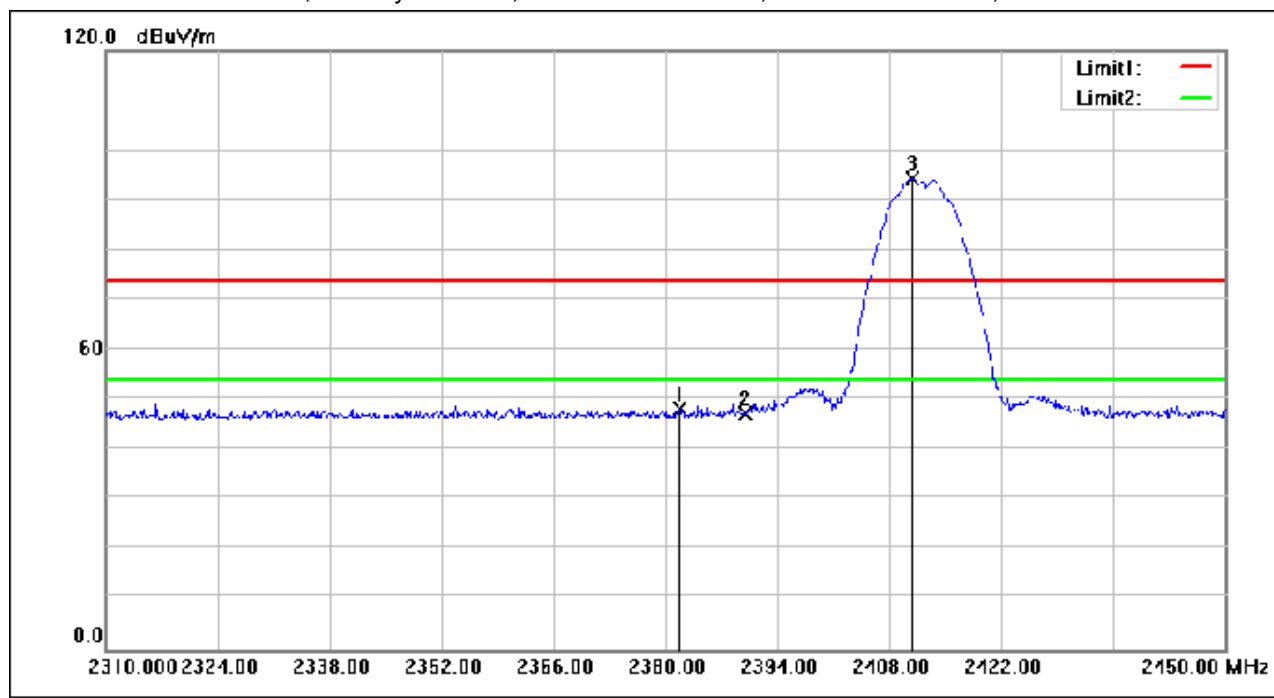
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 13 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2381.820	71.44	-23.40	48.04	74.00	-25.96	peak
2	2390.000	70.63	-23.39	47.24	74.00	-26.76	peak
3	2410.800	117.84	-23.37	94.47	74.00	20.47	peak

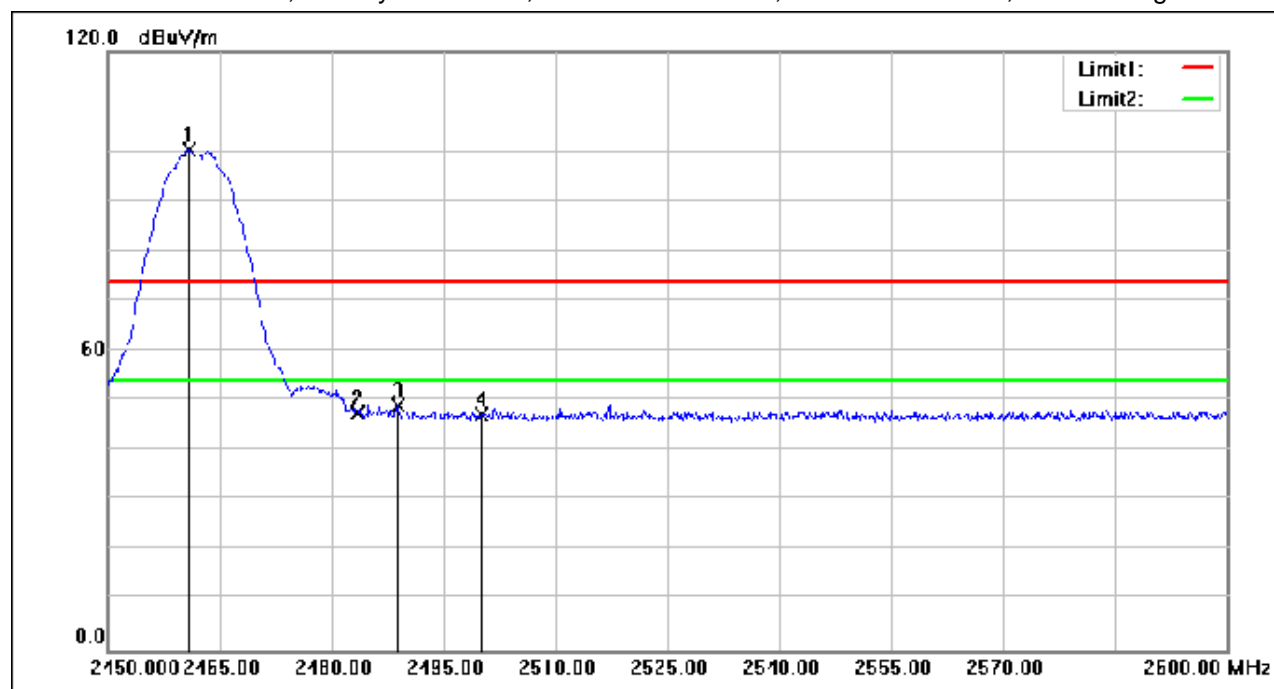
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 14 of 92

Test Mode: 00; Polarity: Horizontal; Modulation: 802.11b; Bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.800	123.56	-23.33	100.23	74.00	26.23	peak
2	2483.500	70.91	-23.36	47.55	74.00	-26.45	peak
3	2488.850	72.44	-23.36	49.08	74.00	-24.92	peak
4	2500.000	70.57	-23.37	47.20	74.00	-26.80	peak

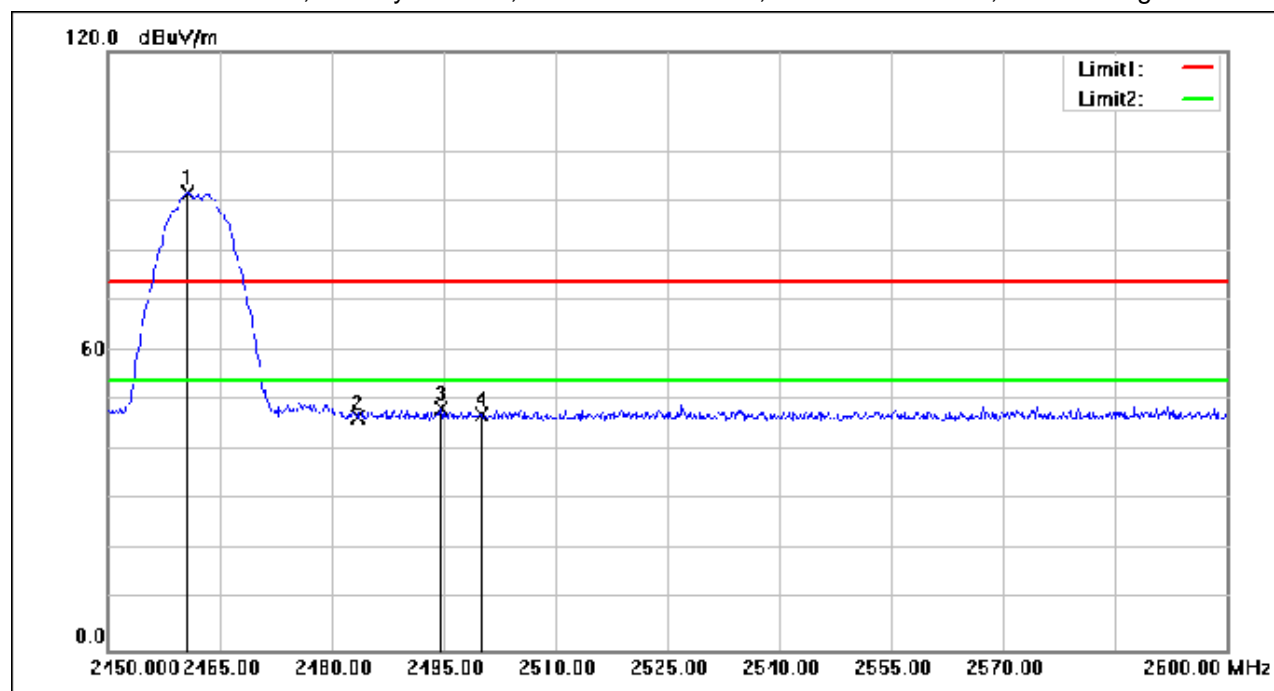
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 15 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.650	115.01	-23.33	91.68	74.00	17.68	peak
2	2483.500	70.14	-23.36	46.78	74.00	-27.22	peak
3	2494.700	71.88	-23.36	48.52	74.00	-25.48	peak
4	2500.000	70.54	-23.37	47.17	74.00	-26.83	peak

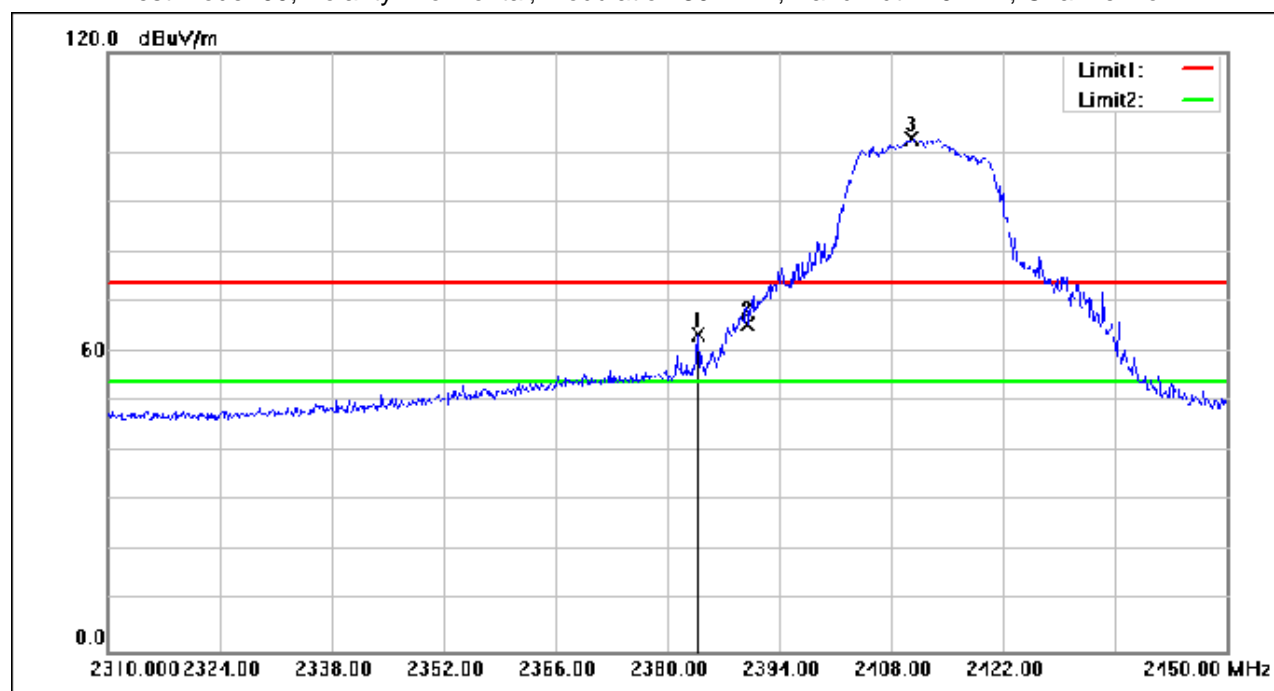
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 16 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2383.780	86.92	-23.40	63.52	74.00	-10.48	peak
2	2390.000	88.87	-23.39	65.48	74.00	-8.52	peak
3	2410.520	126.15	-23.37	102.78	74.00	28.78	peak



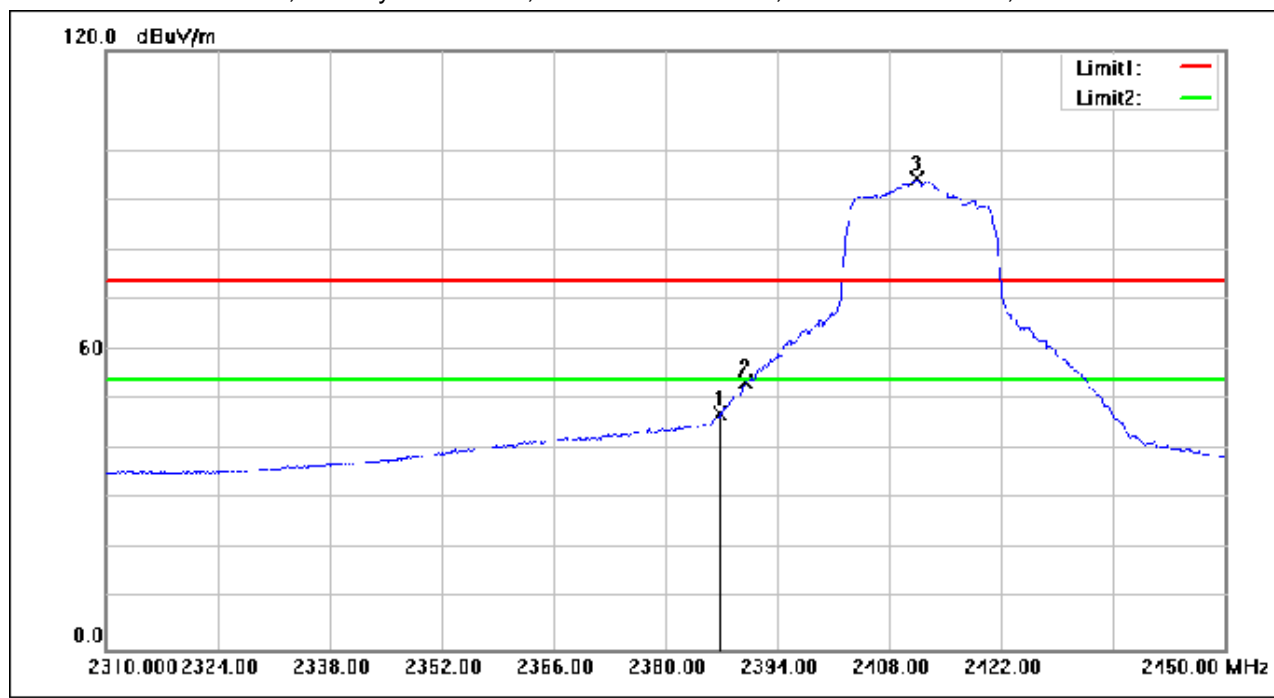
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 17 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.860	70.52	-23.40	47.12	54.00	-6.88	AVG
2	2390.000	76.98	-23.39	53.59	54.00	-0.41	AVG
3	2411.500	117.58	-23.37	94.21	54.00	40.21	AVG

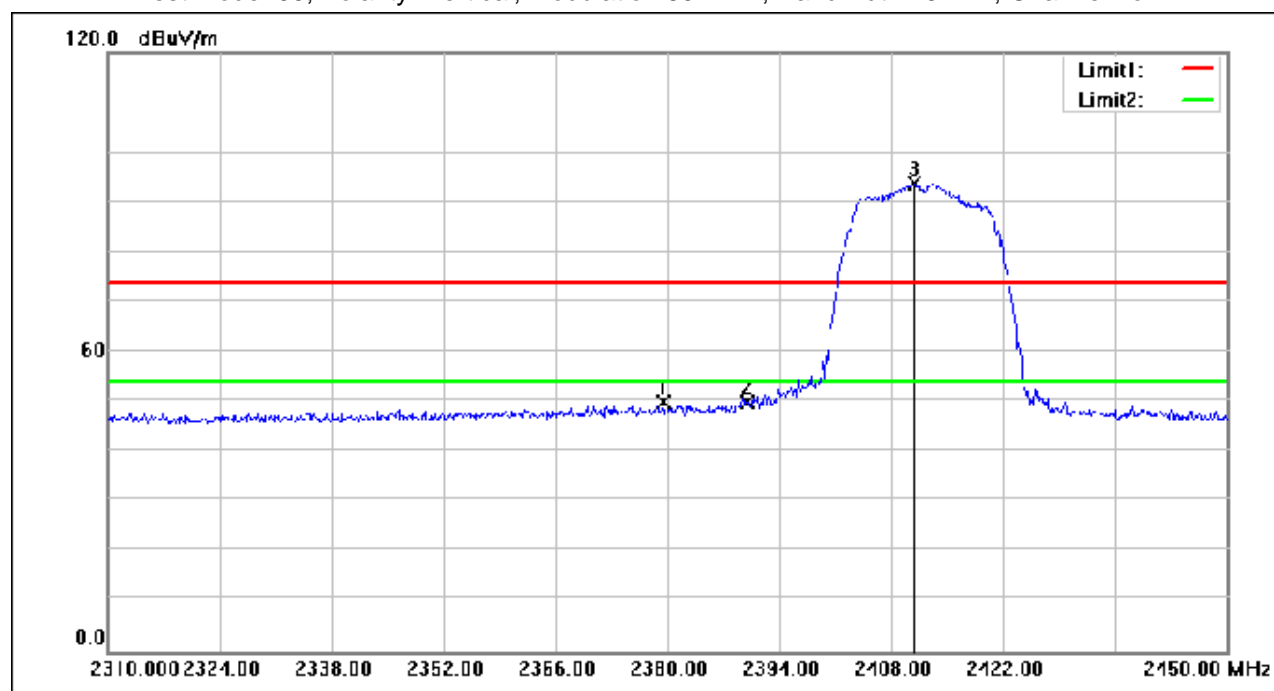
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 18 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2379.580	73.42	-23.41	50.01	74.00	-23.99	peak
2	2390.000	73.29	-23.39	49.90	74.00	-24.10	peak
3	2410.940	117.22	-23.37	93.85	74.00	19.85	peak

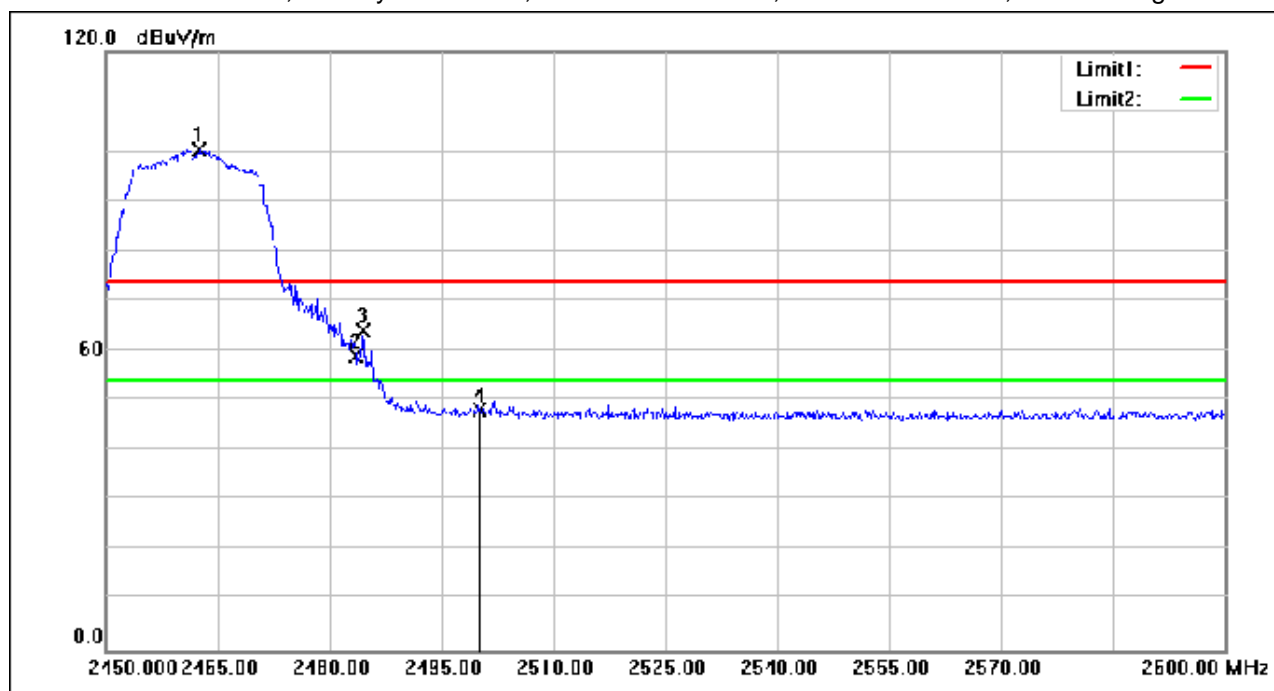
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 19 of 92

Test Mode: 00; Polarity: Horizontal; Modulation: 802.11n; Bandwidth: 20MHz; Channel: High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.450	123.63	-23.33	100.30	74.00	26.30	peak
2	2483.500	82.41	-23.36	59.05	74.00	-14.95	peak
3	2484.500	87.28	-23.35	63.93	74.00	-10.07	peak
4	2500.000	71.41	-23.37	48.04	74.00	-25.96	peak

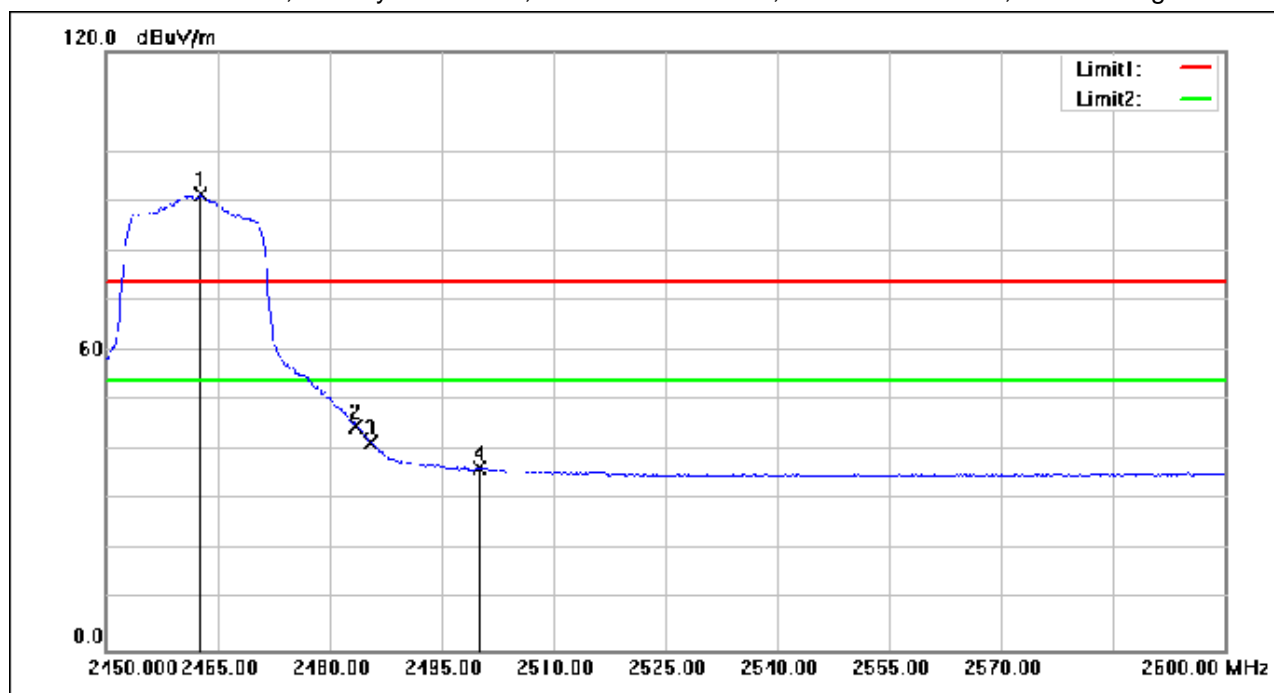
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 20 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.750	114.60	-23.34	91.26	54.00	37.26	AVG
2	2483.500	68.35	-23.36	44.99	54.00	-9.01	AVG
3	2485.550	64.97	-23.35	41.62	54.00	-12.38	AVG
4	2500.000	59.70	-23.37	36.33	54.00	-17.67	AVG

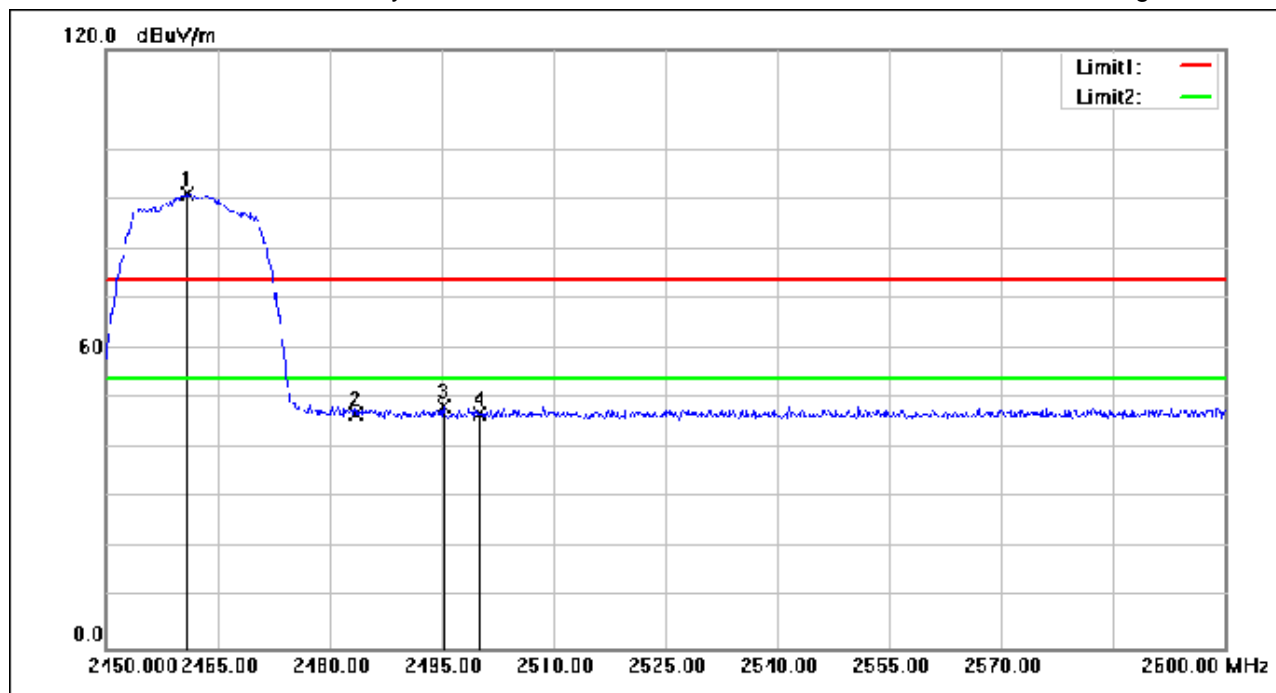
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 21 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.950	114.44	-23.33	91.11	74.00	17.11	peak
2	2483.500	70.28	-23.36	46.92	74.00	-27.08	peak
3	2495.300	71.70	-23.36	48.34	74.00	-25.66	peak
4	2500.000	70.28	-23.37	46.91	74.00	-27.09	peak

### 7.2 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
960-1000	500	3

#### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 20.5 °C

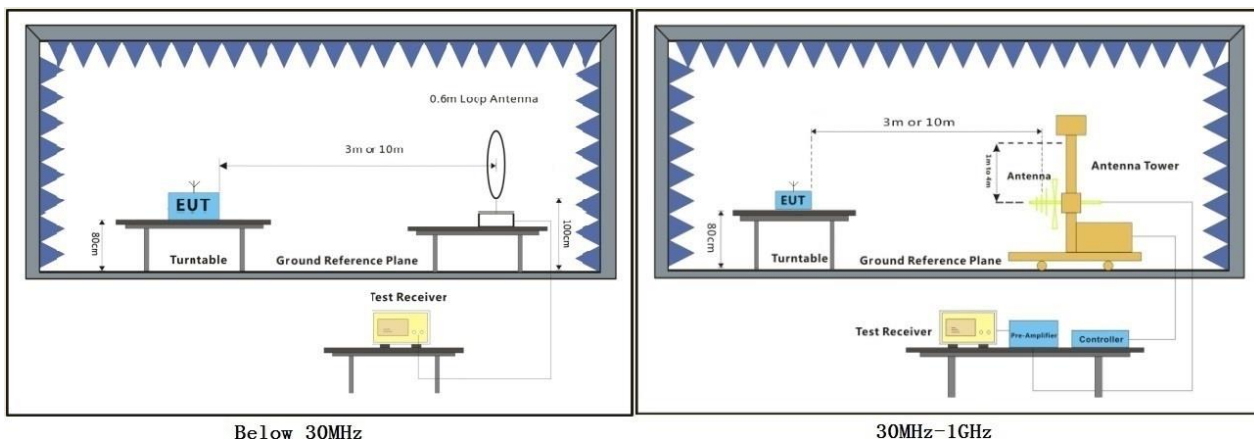
Humidity: 50.5 % RH

Atmospheric Pressure: 1010 mbar

#### 7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.2.3 Test Setup Diagram



## 7.2.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1.  $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamplifier Factor}$
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 24 of 92

Test Mode: 00; Polarity: Horizontal

70.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	32.7486	2.38	25.11	27.49	40.00	-12.51	100	86	QP
2	153.7385	12.29	17.73	30.02	43.50	-13.48	100	334	QP
3	169.0054	15.83	17.06	32.89	43.50	-10.61	100	67	QP
4	357.9287	10.43	22.10	32.53	46.00	-13.47	100	110	QP
5	437.1199	11.27	23.97	35.24	46.00	-10.76	100	334	QP
6	492.4685	13.13	25.64	38.77	46.00	-7.23	100	1	QP



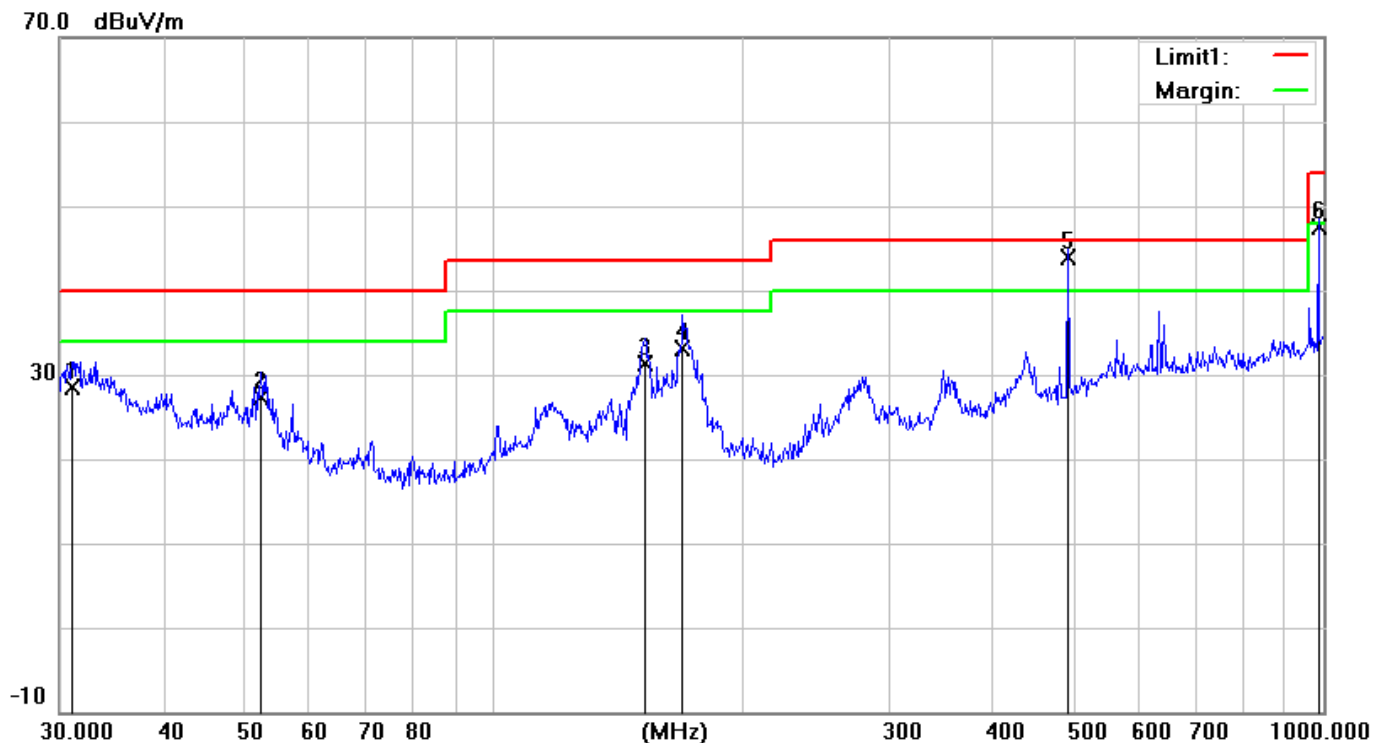
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 25 of 92

Test Mode: 00; Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	31.0706	3.34	25.19	28.53	40.00	-11.47	100	193	QP
2	52.3913	10.35	16.96	27.31	40.00	-12.69	100	125	QP
3	152.1297	13.56	17.79	31.35	43.50	-12.15	100	21	QP
4	169.0054	16.13	17.06	33.19	43.50	-10.31	100	57	QP
5	492.4685	18.29	25.64	43.93	46.00	-2.07	100	14	QP
6	986.0717	17.43	29.99	47.42	54.00	-6.58	100	157	QP

### 7.3 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.6

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 20.5 °C

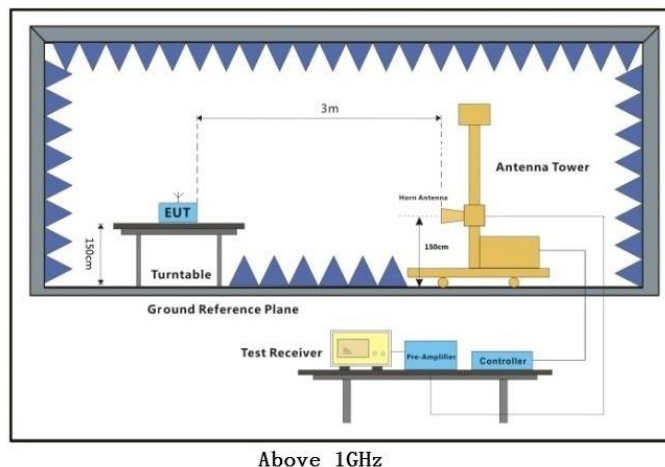
Humidity: 50.5 % RH

Atmospheric Pressure: 1010 mbar

#### 7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.3.3 Test Setup Diagram



**7.3.4 Measurement Procedure and Data**

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1.  $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamplifier Factor}$
2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

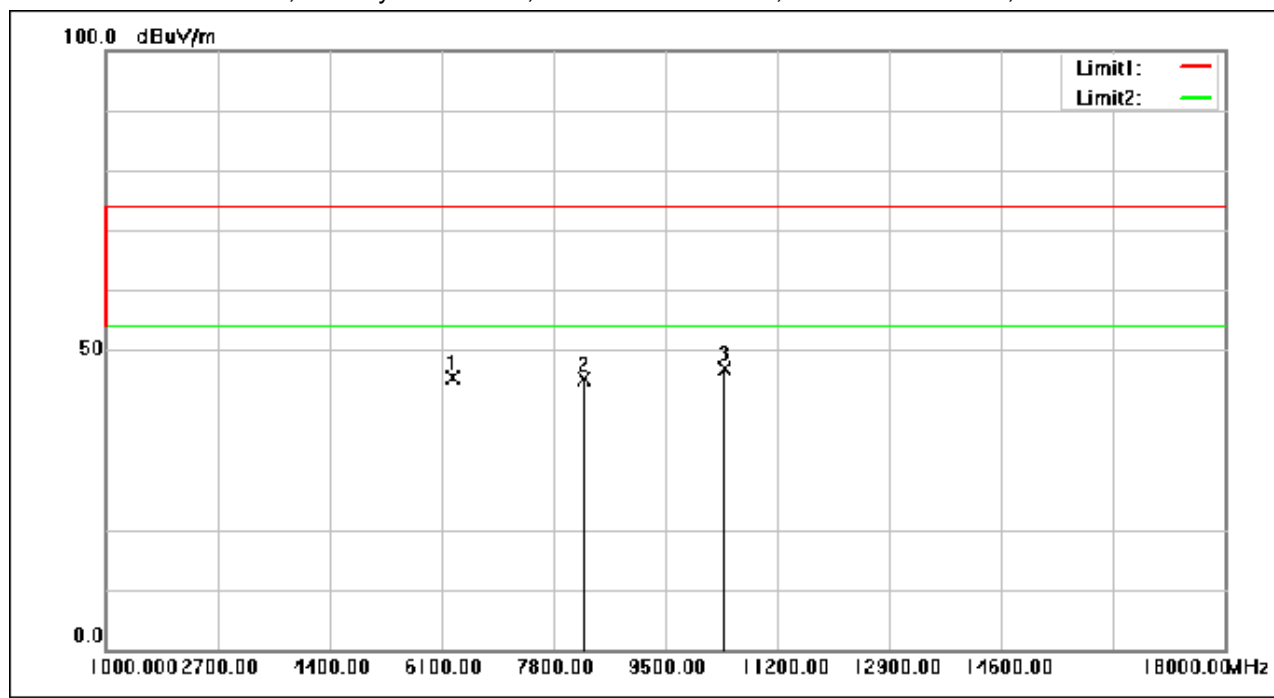
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 28 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6274.291	60.33	-15.00	45.33	74.00	-28.67	peak
2	8273.571	56.38	-11.26	45.12	74.00	-28.88	peak
3	10400.696	55.27	-8.27	47.00	74.00	-27.00	peak

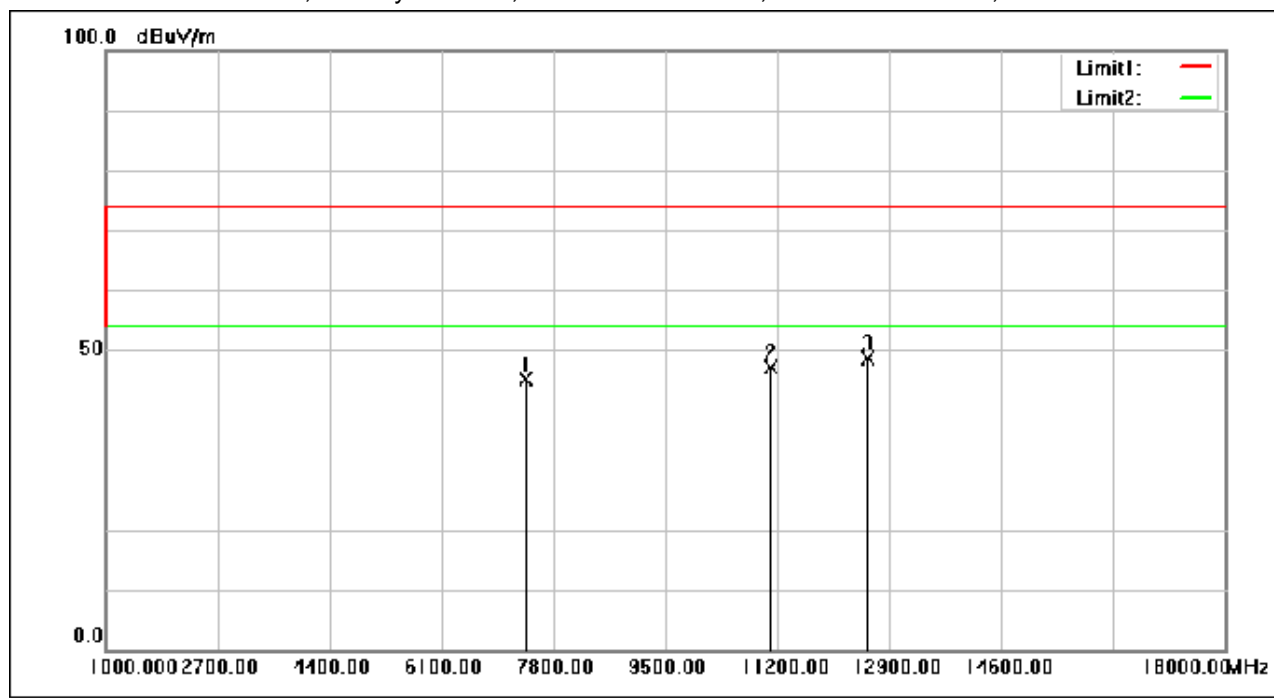
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 29 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7384.775	56.02	-10.96	45.06	74.00	-28.94	peak
2	11091.604	54.55	-7.44	47.11	74.00	-26.89	peak
3	12576.103	56.22	-7.52	48.70	74.00	-25.30	peak

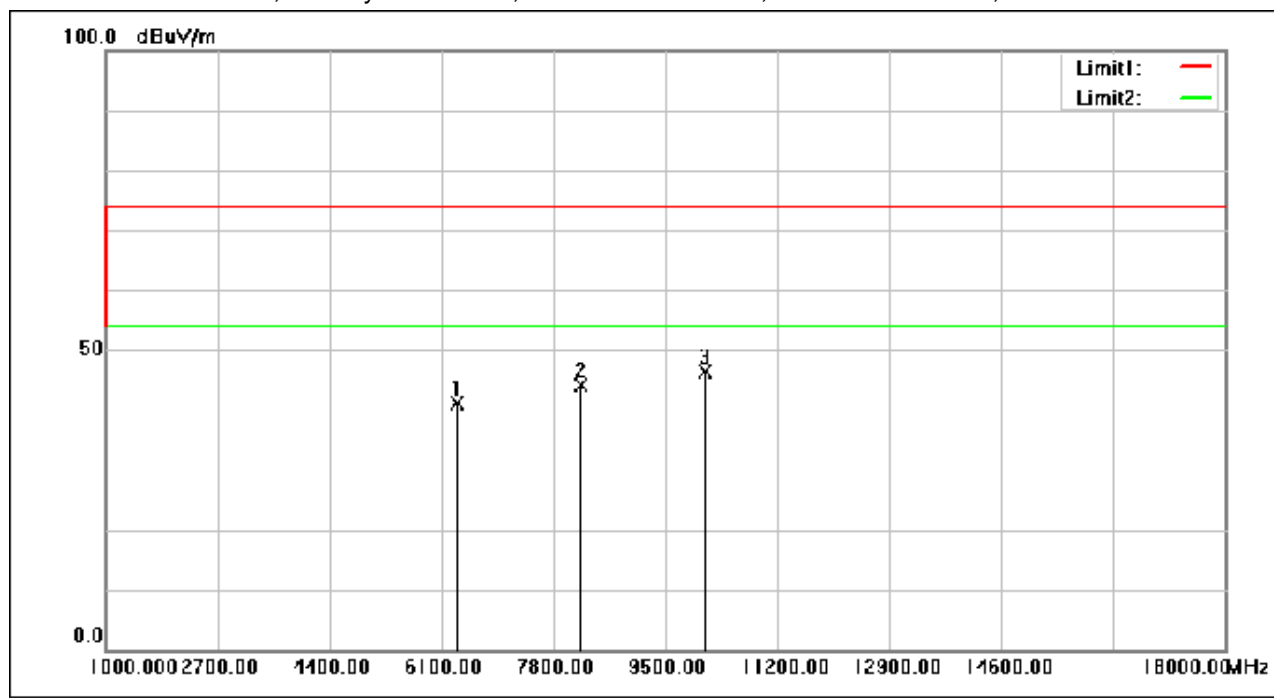
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 30 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6336.173	55.90	-14.81	41.09	74.00	-32.91	peak
2	8217.809	55.55	-11.33	44.22	74.00	-29.78	peak
3	10096.724	55.18	-8.78	46.40	74.00	-27.60	peak

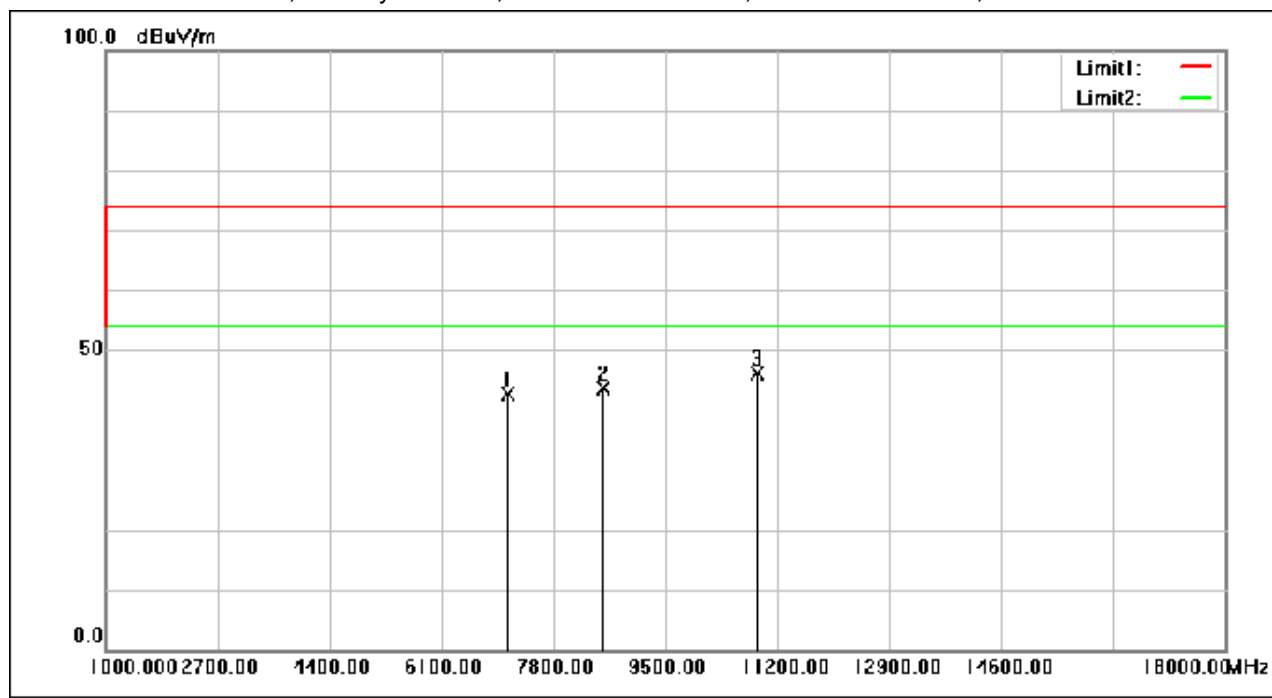
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 31 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7108.004	54.67	-12.09	42.58	74.00	-31.42	peak
2	8569.383	54.52	-10.84	43.68	74.00	-30.32	peak
3	10888.956	53.68	-7.47	46.21	74.00	-27.79	peak

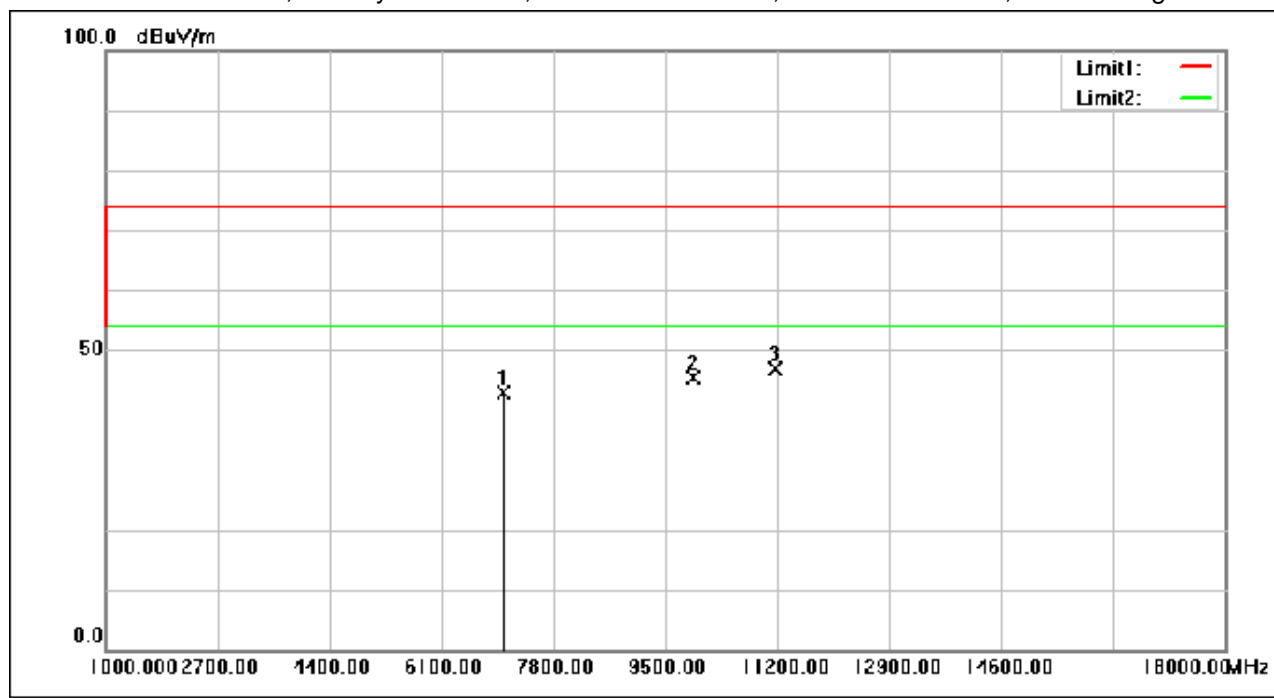
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 32 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7048.842	55.25	-12.33	42.92	74.00	-31.08	peak
2	9930.117	54.54	-9.04	45.50	74.00	-28.50	peak
3	11156.886	54.37	-7.39	46.98	74.00	-27.02	peak



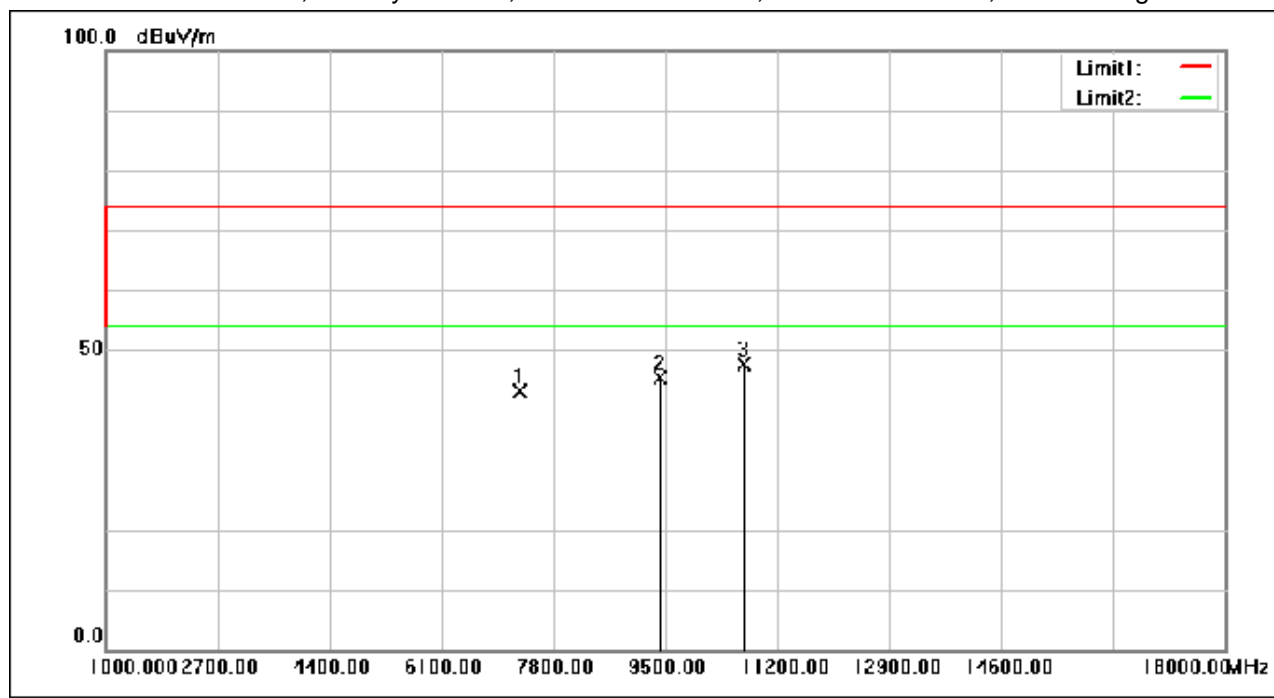
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 33 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7298.412	54.32	-11.31	43.01	74.00	-30.99	peak
2	9418.737	55.09	-9.61	45.48	74.00	-28.52	peak
3	10689.028	55.44	-7.74	47.70	74.00	-26.30	peak

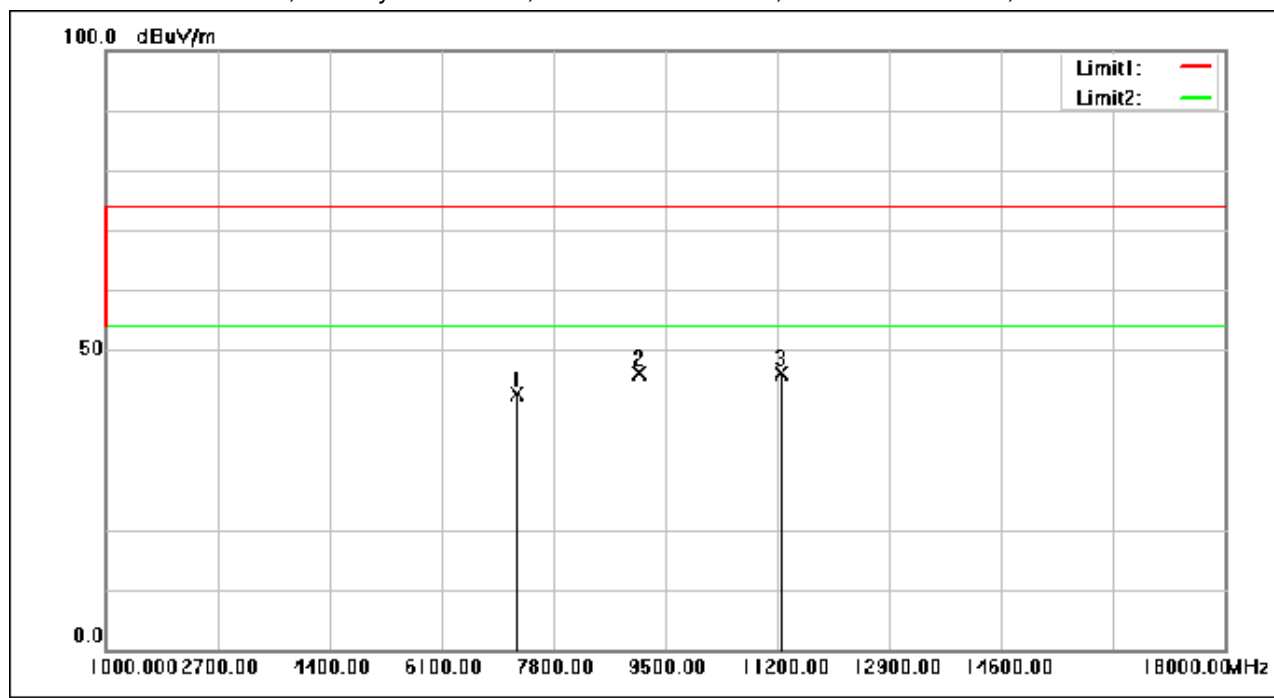
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 34 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7242.650	54.06	-11.54	42.52	74.00	-31.48	peak
2	9108.644	56.05	-9.87	46.18	74.00	-27.82	peak
3	11259.570	53.43	-7.34	46.09	74.00	-27.91	peak

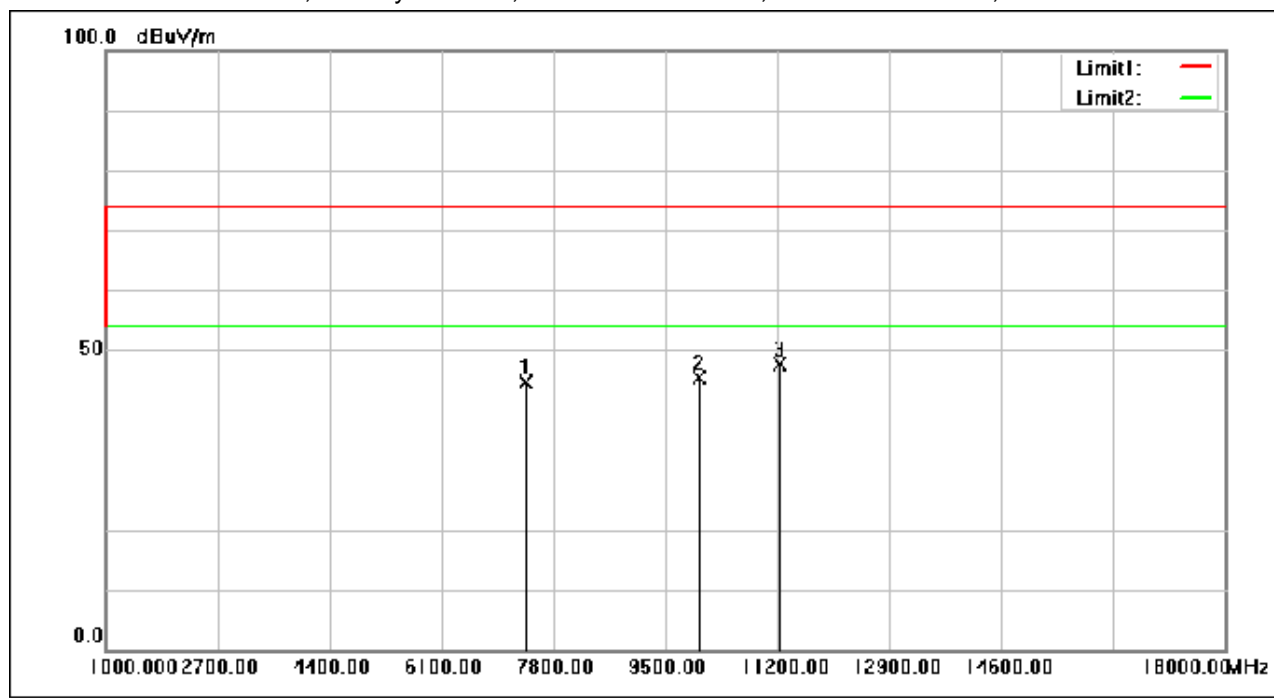
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 35 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7382.735	55.68	-10.97	44.71	74.00	-29.29	peak
2	10009.000	54.39	-8.92	45.47	74.00	-28.53	peak
3	11239.170	54.95	-7.35	47.60	74.00	-26.40	peak

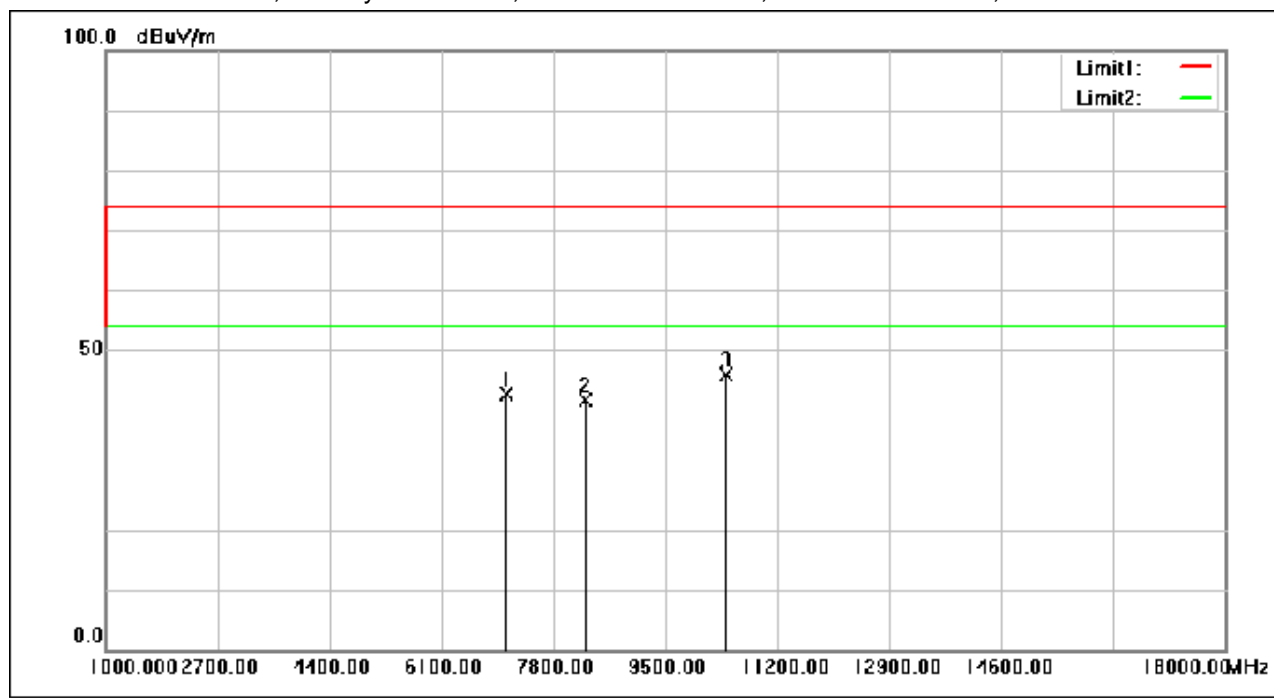
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 36 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7102.564	54.62	-12.11	42.51	74.00	-31.49	peak
2	8296.012	52.77	-11.23	41.54	74.00	-32.46	peak
3	10422.457	54.09	-8.23	45.86	74.00	-28.14	peak

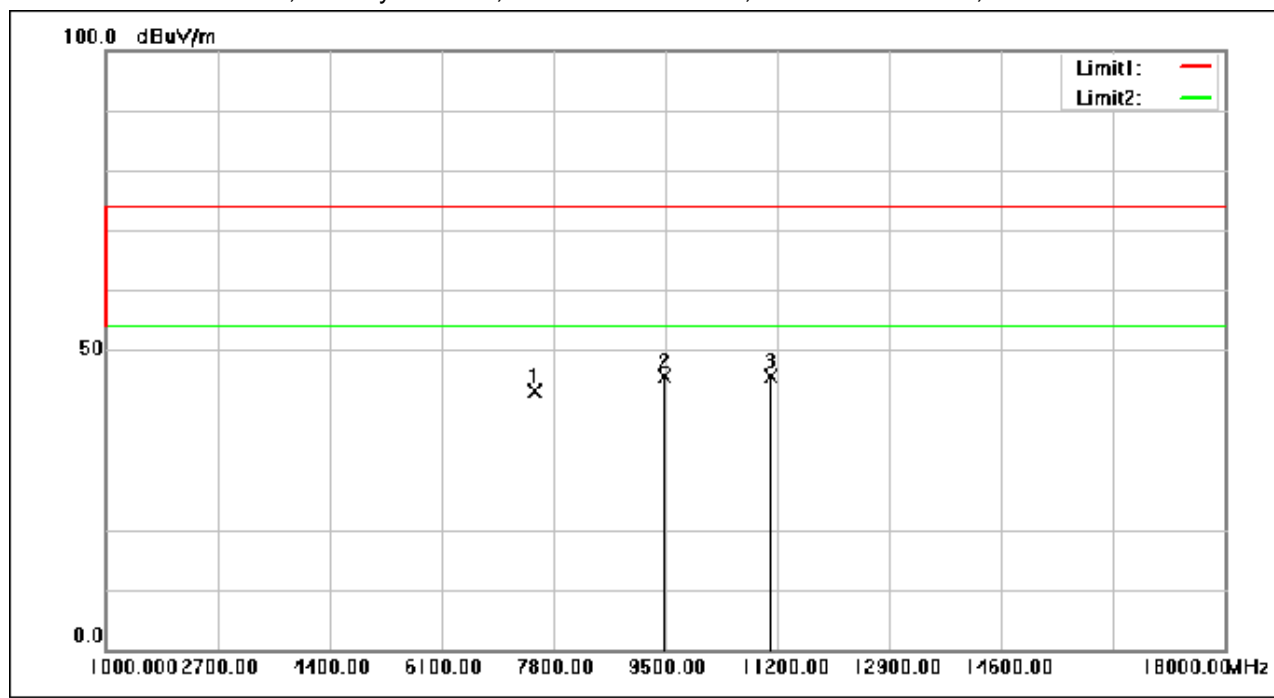
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 37 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7526.221	53.91	-10.88	43.03	74.00	-30.97	peak
2	9484.019	55.11	-9.54	45.57	74.00	-28.43	peak
3	11107.924	53.10	-7.42	45.68	74.00	-28.32	peak

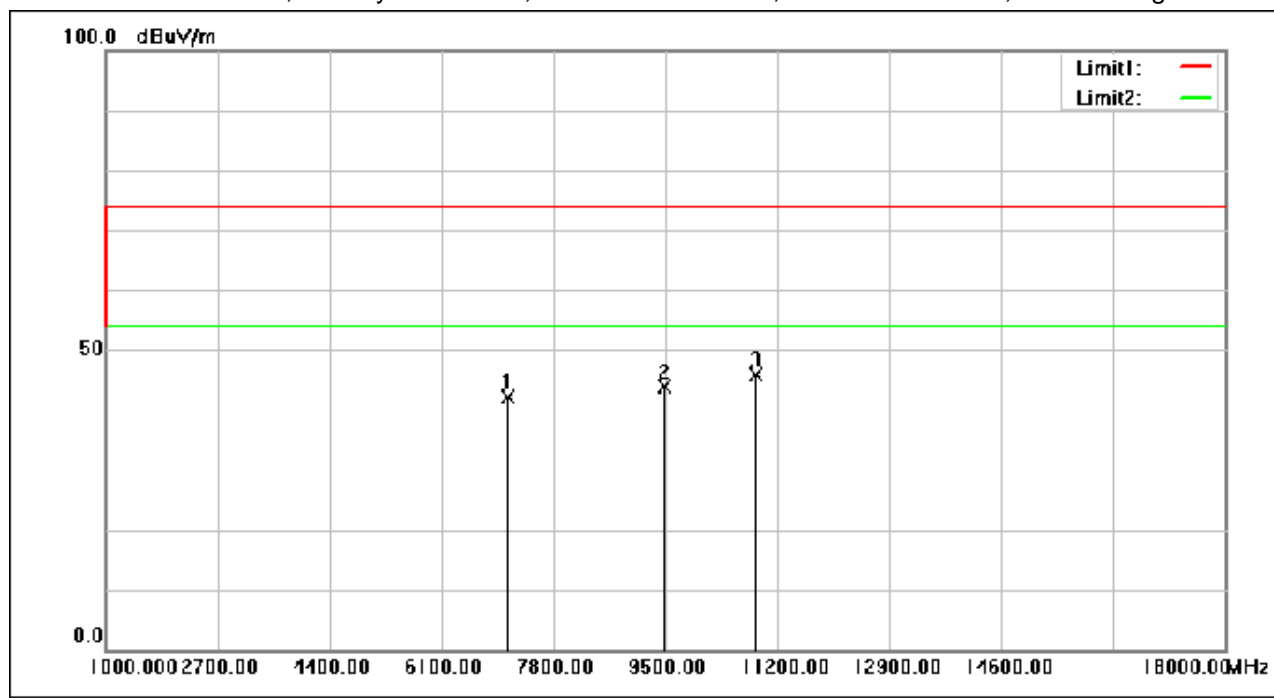
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 38 of 92

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7118.205	54.25	-12.05	42.20	74.00	-31.80	peak
2	9480.619	53.35	-9.55	43.80	74.00	-30.20	peak
3	10881.475	53.36	-7.47	45.89	74.00	-28.11	peak

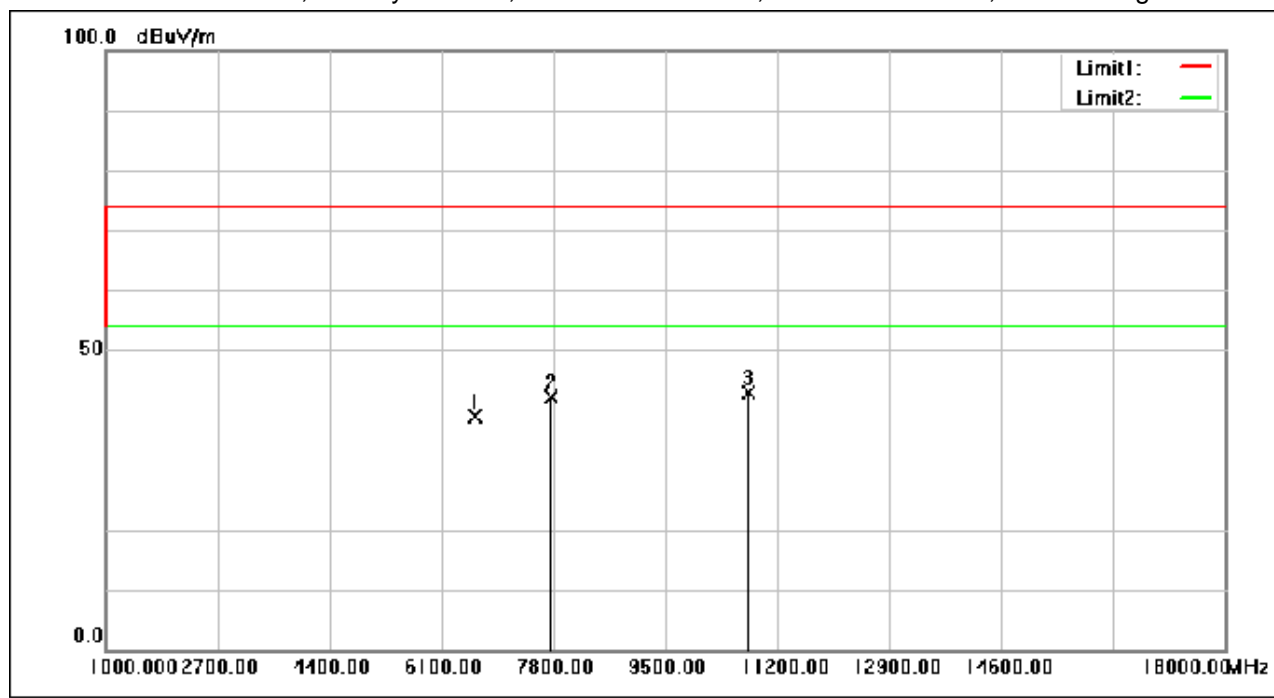
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 39 of 92

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6621.105	52.68	-13.91	38.77	74.00	-35.23	peak
2	7771.711	53.42	-11.18	42.24	74.00	-31.76	peak
3	10754.990	50.42	-7.62	42.80	74.00	-31.20	peak

### 7.4 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2013) Section 11.9.2

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for $\geq 50$ hopping channels
	0.25 for $25 \leq$ hopping channels $< 50$
	1 for digital modulation
2400-2483.5	1 for $\geq 75$ non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

#### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

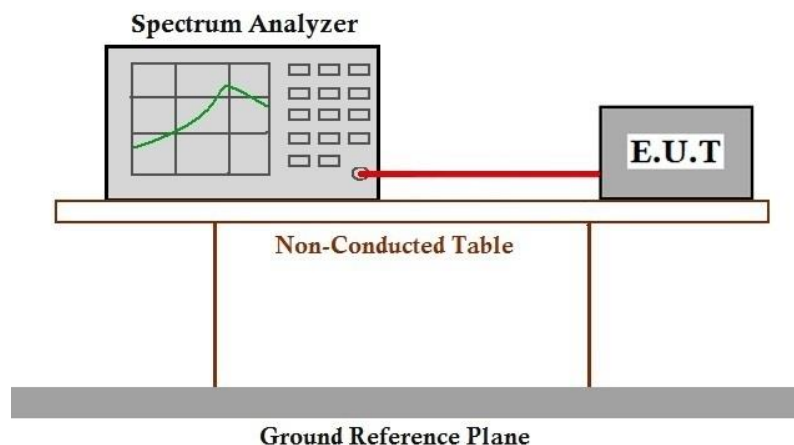
Humidity: 52 % RH

Atmospheric Pressure: 1010 mbar

#### 7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.4.3 Test Setup Diagram







## **Compliance Certification Services (Kunshan) Inc.**

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 41 of 92

### **7.4.4 Measurement Procedure and Data**

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.

Please Refer to Appendix for Details

### 7.5 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)

Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit:

≥500 kHz

#### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

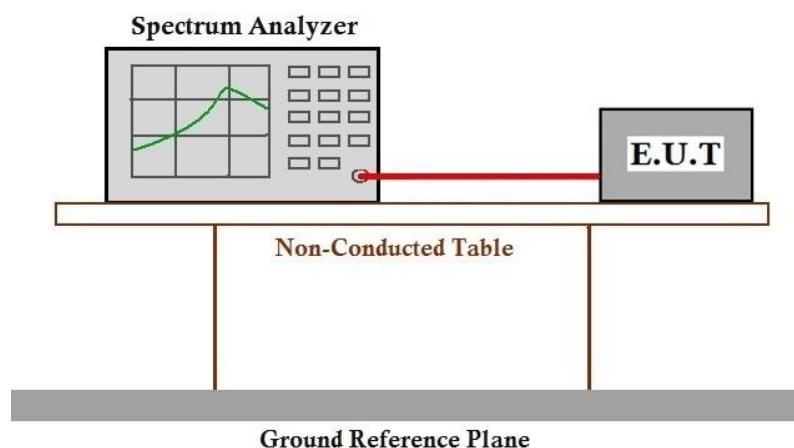
Humidity: 52 % RH

Atmospheric Pressure: 1010 mbar

#### 7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.5.3 Test Setup Diagram



#### 7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

### 7.6 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)  
 Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:  
 ≤8dBm in any 3 kHz band during any time interval of continuous transmission

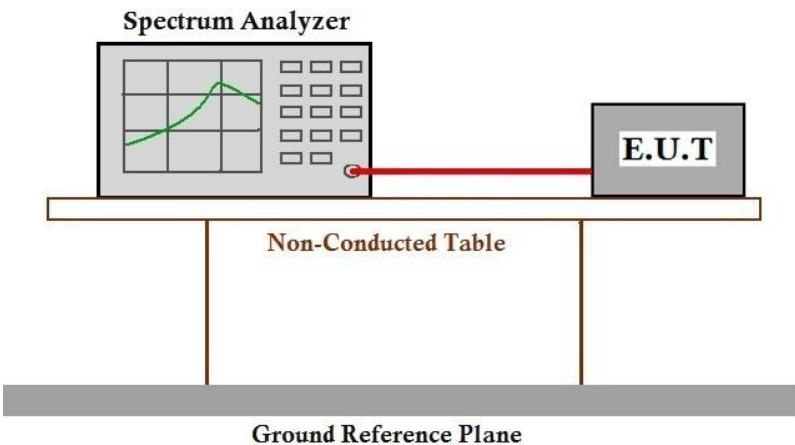
#### 7.6.1 E.U.T. Operation

Operating Environment:  
 Temperature: 24 °C Humidity: 52 % RH Atmospheric Pressure: 1010 mbar

#### 7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.6.3 Test Setup Diagram



#### 7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details

## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 44 of 92

### 7.7 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.13.3.2

#### Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. 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)).

#### 7.7.1 E.U.T. Operation

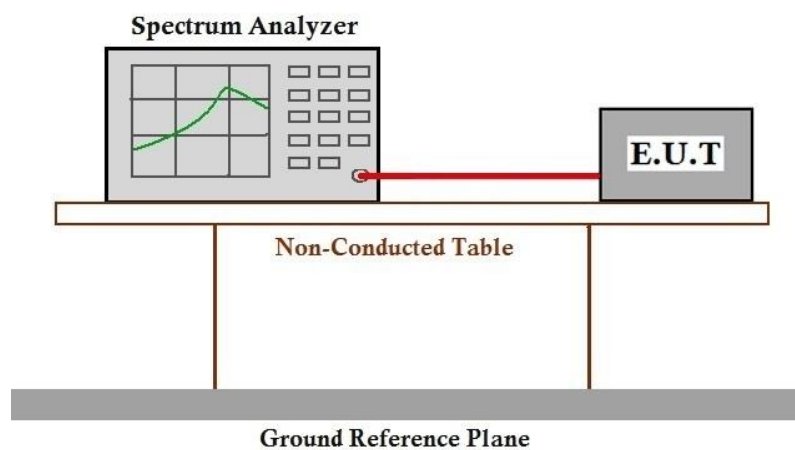
Operating Environment:

Temperature: 24 °C Humidity: 52 % RH Atmospheric Pressure: 1010 mbar

#### 7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

### 7.7.3 Test Setup Diagram



### 7.7.4 Measurement Procedure and Data

Please Refer to Appendix for Details

### 7.8 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. 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)).

#### 7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

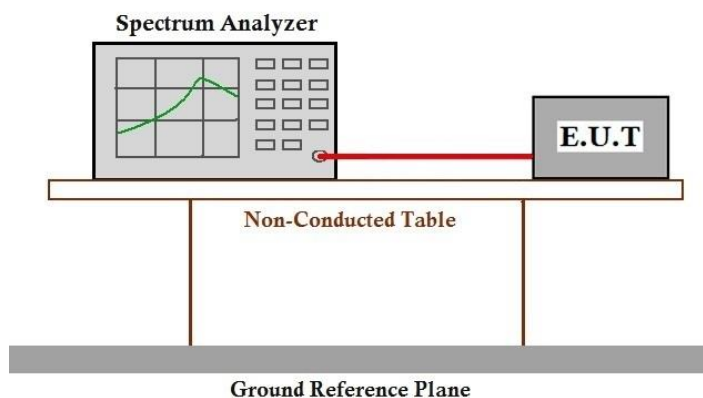
Humidity: 52 % RH

Atmospheric Pressure: 1010 mbar

#### 7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.8.3 Test Setup Diagram



#### 7.8.4 Measurement Procedure and Data

Please Refer to Appendix for Details



## **Compliance Certification Services (Kunshan) Inc.**

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 47 of 92

### **8 Test Setup Photo**

Refer to Appendix - Test Setup Photo for KSCR2404000738AU

### **9 EUT Constructional Details (EUT Photos)**

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2404000738AU

## 10 Appendix

### 1. Duty Cycle

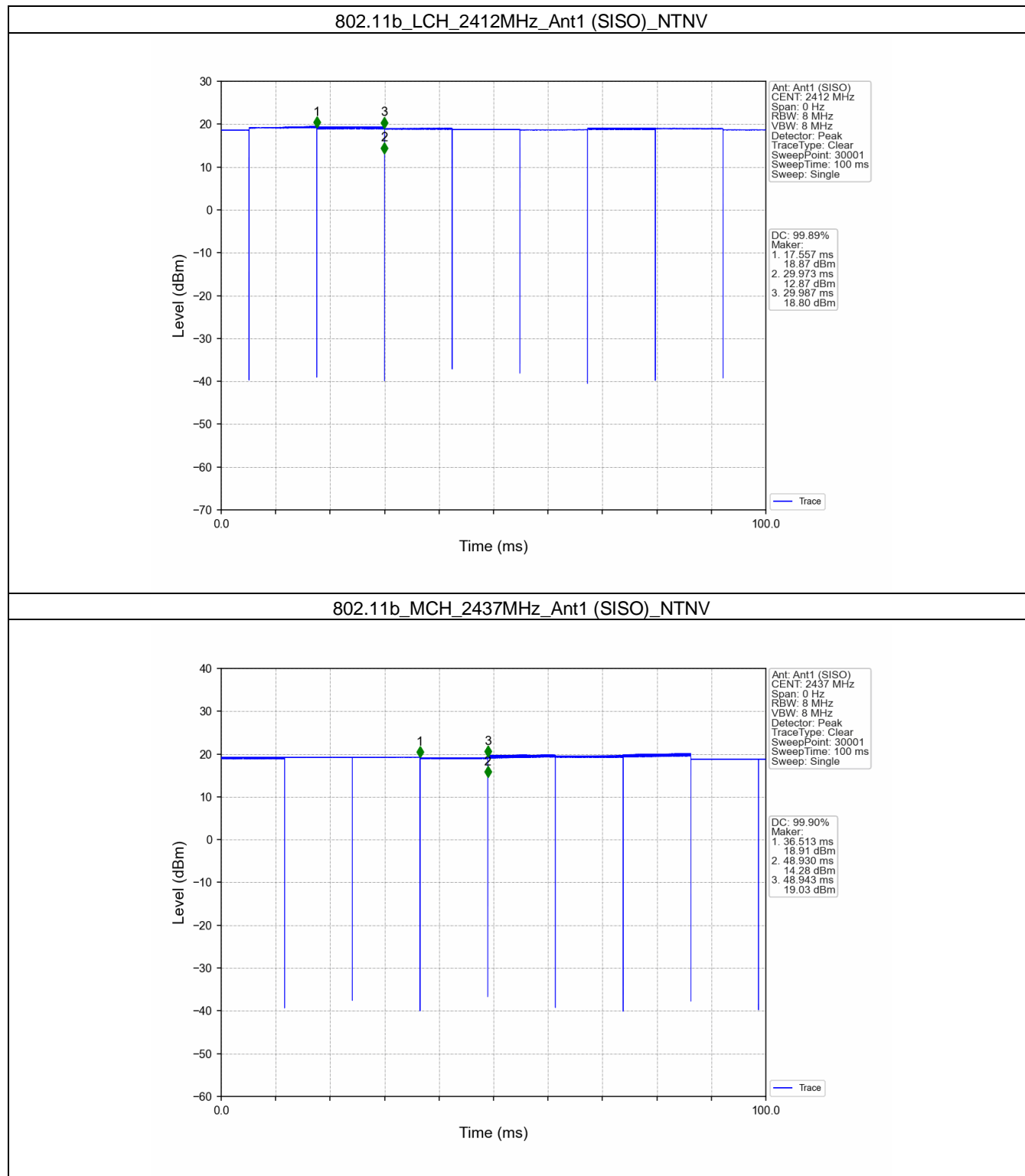
#### 1.1 Ant1

##### 1.1.1 Test Result

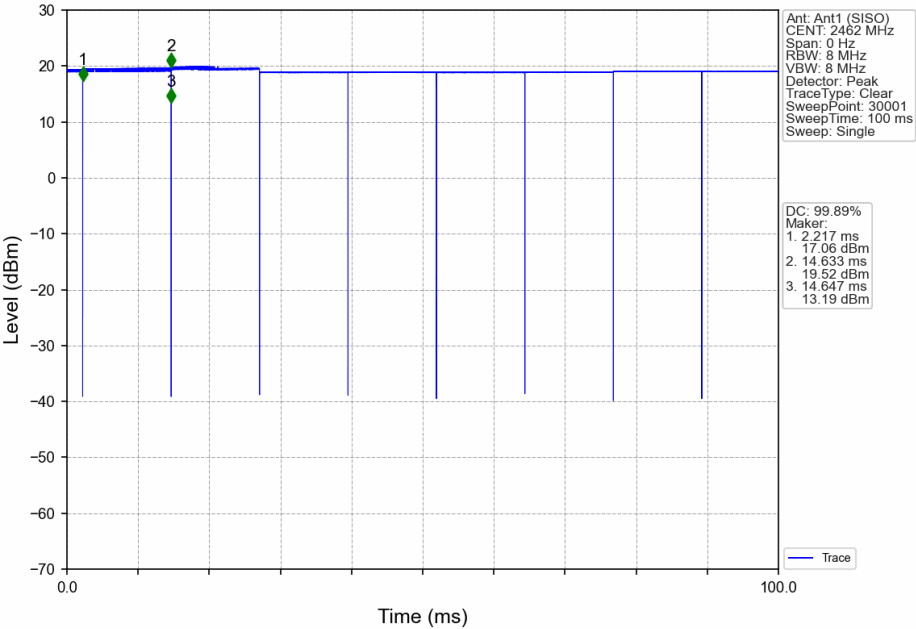
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	12.416	12.430	99.89	0.00	0.00
		2437	12.417	12.430	99.90	0.00	0.03
		2462	12.416	12.430	99.89	0.00	0.03
802.11g	SISO	2412	12.417	12.430	99.90	0.00	0.03
		2437	12.417	12.430	99.90	0.00	0.03
		2462	12.416	12.430	99.89	0.00	0.00
802.11n (HT20)	SISO	2412	0.230	0.249	92.37	0.34	0.08
		2437	0.230	0.249	92.37	0.34	0.11
		2462	0.230	0.249	92.37	0.34	0.08



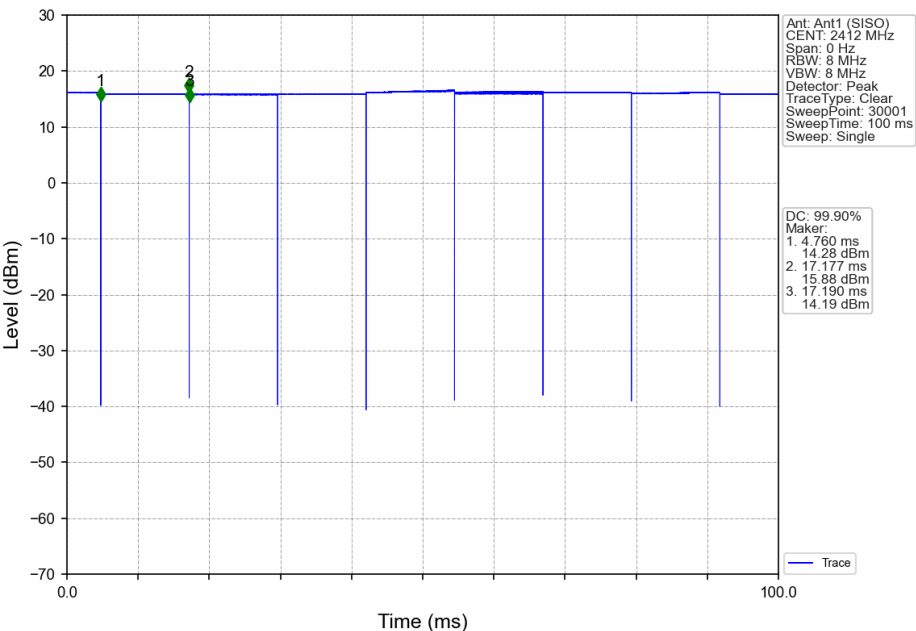
### 1.1.2 Test Graph



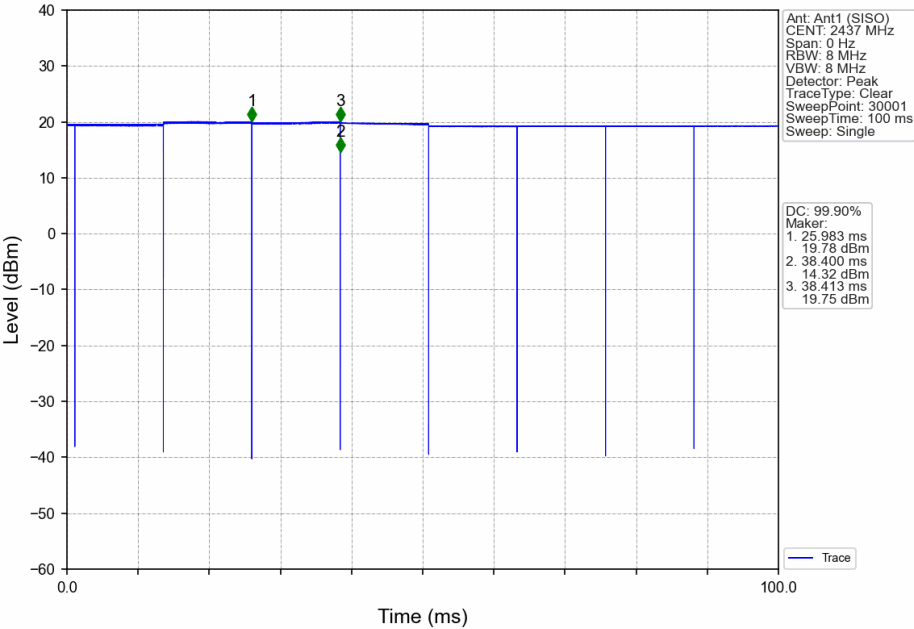
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



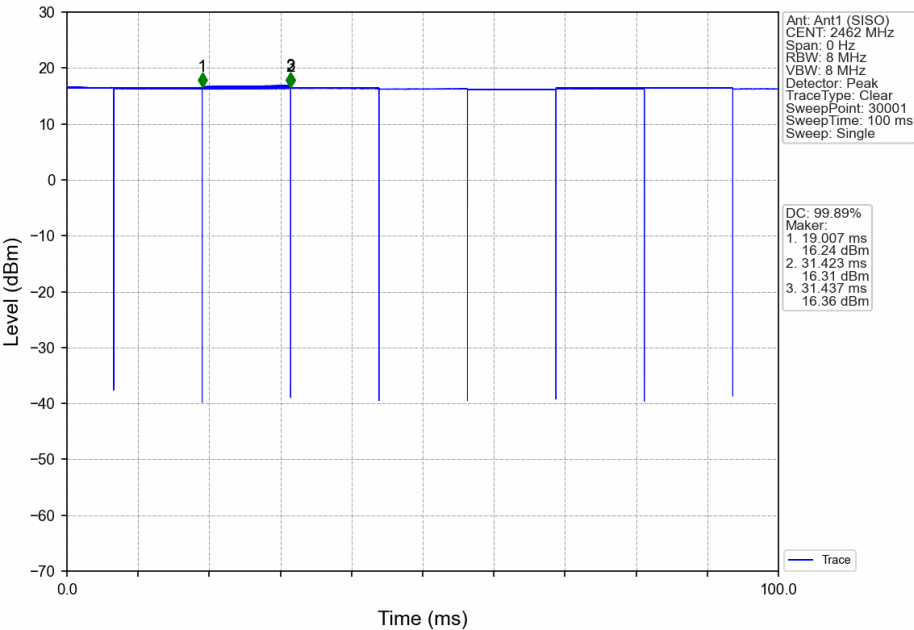
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



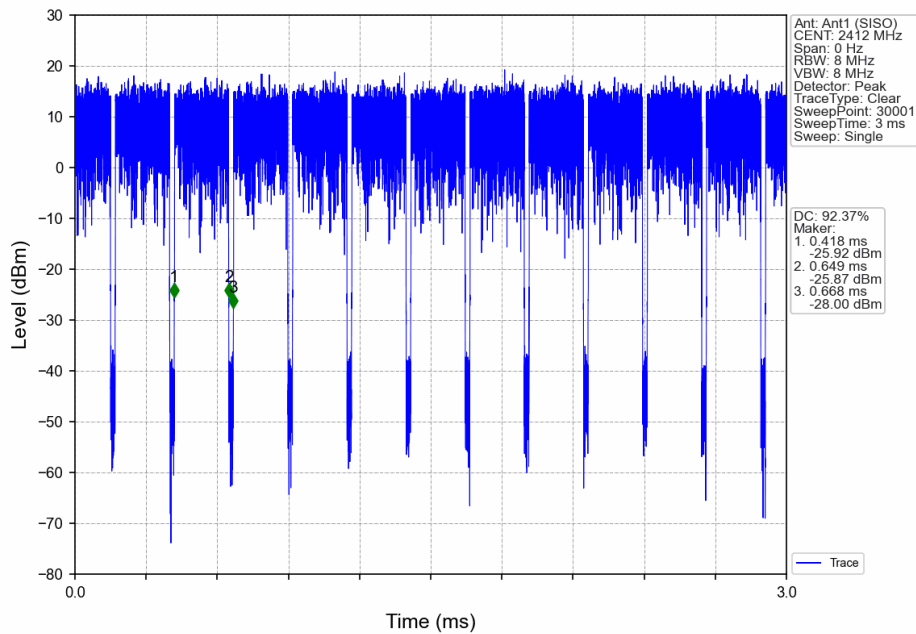
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



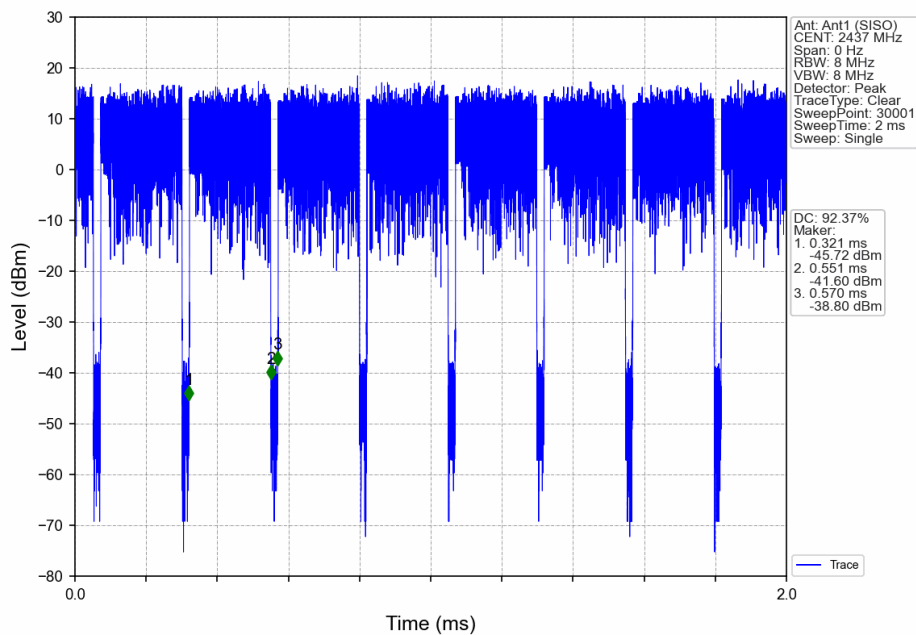
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



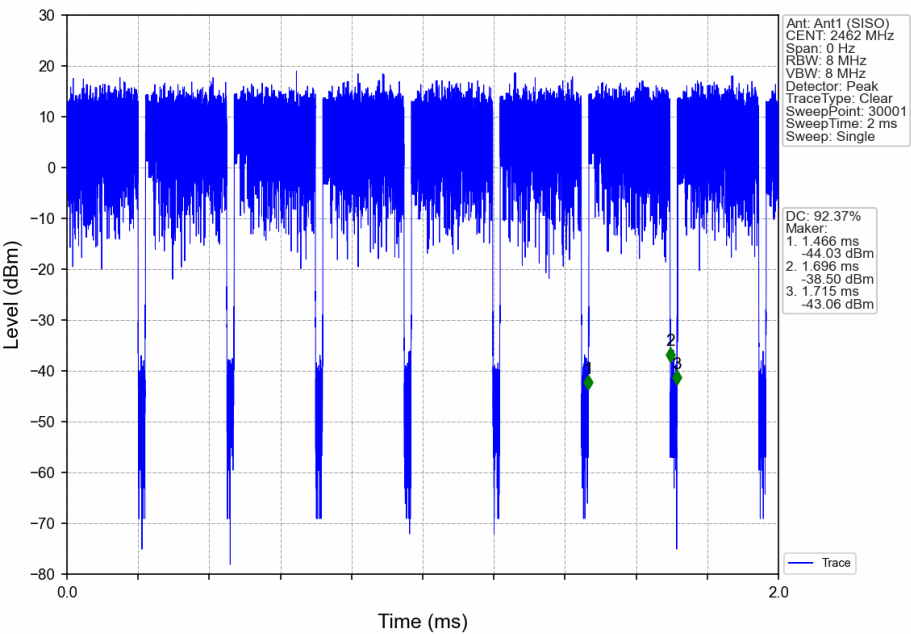
802.11n(HT20) LCH\_2412MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20) MCH\_2437MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV





Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 54 of 92

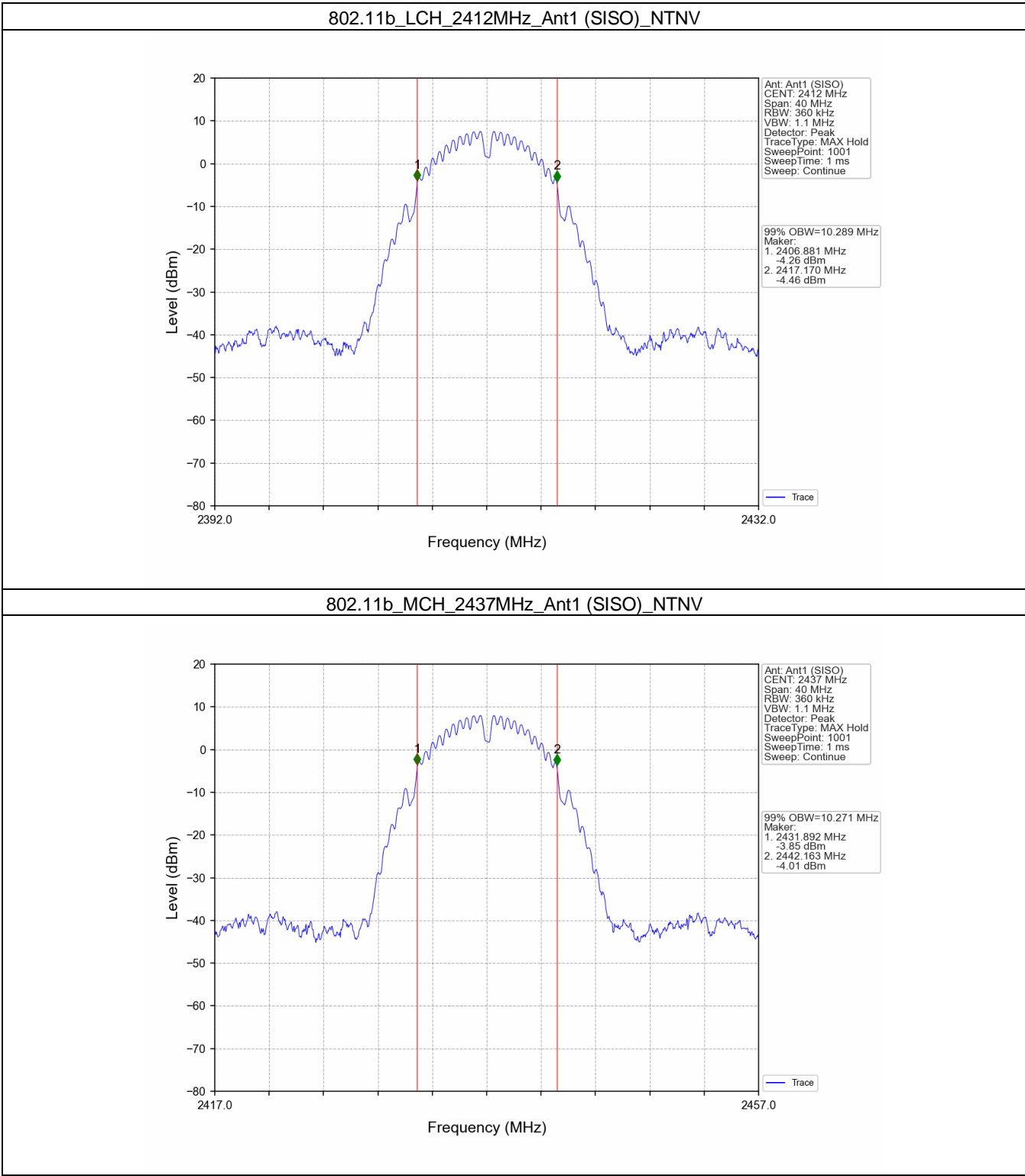
2. Bandwidth

2.1 OBW

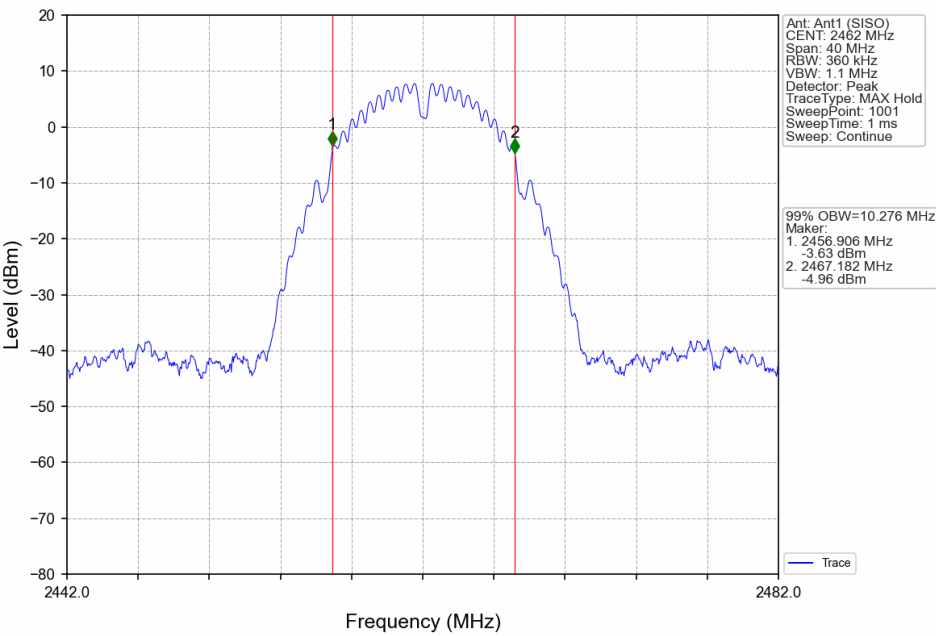
2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	10.289	/	Pass
		2437	1	10.271	/	Pass
		2462	1	10.276	/	Pass
802.11g	SISO	2412	1	10.738	/	Pass
		2437	1	10.650	/	Pass
		2462	1	10.710	/	Pass
802.11n (HT20)	SISO	2412	1	18.587	/	Pass
		2437	1	18.563	/	Pass
		2462	1	18.589	/	Pass

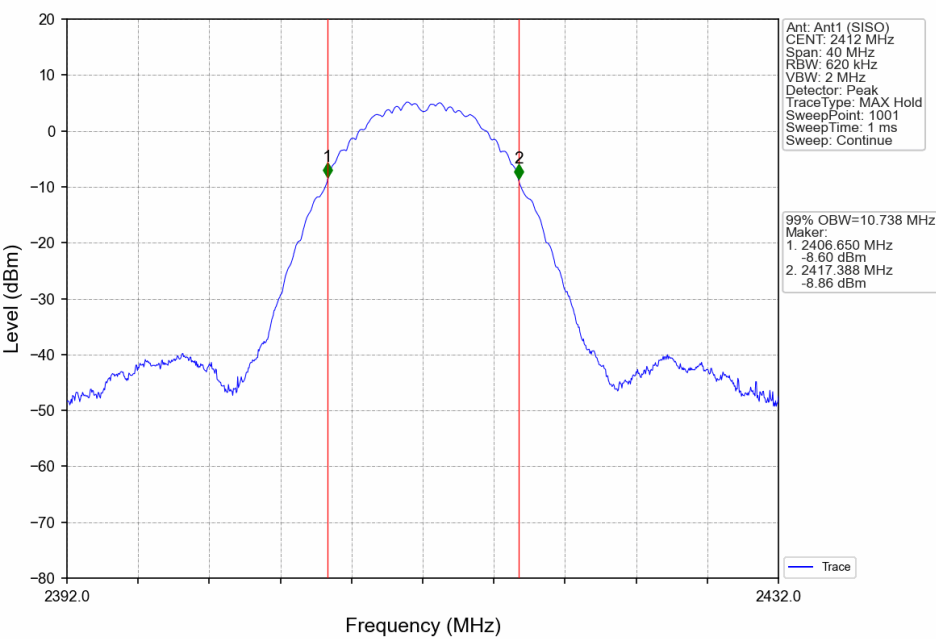
### 2.1.2 Test Graph



802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV

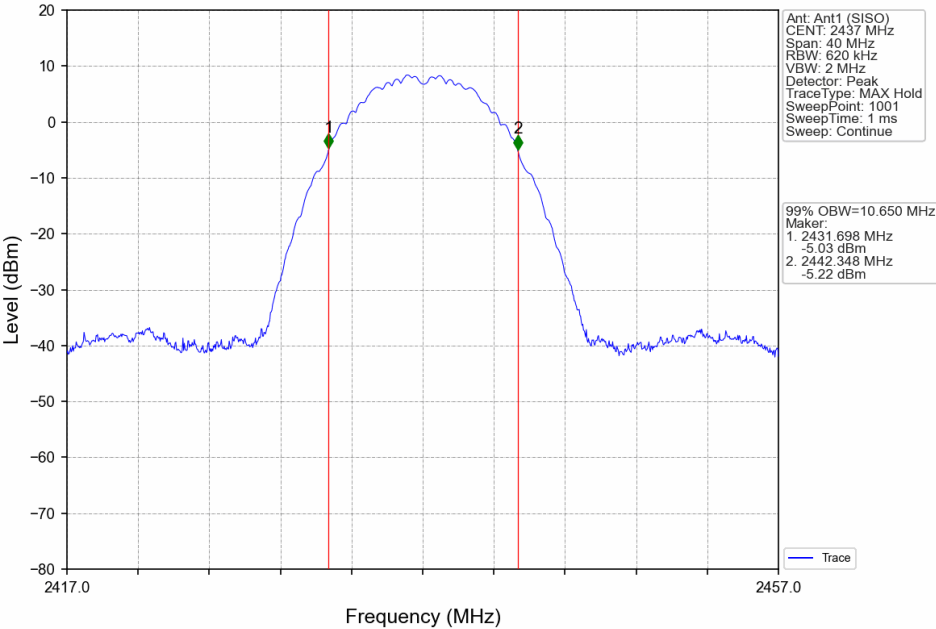


802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

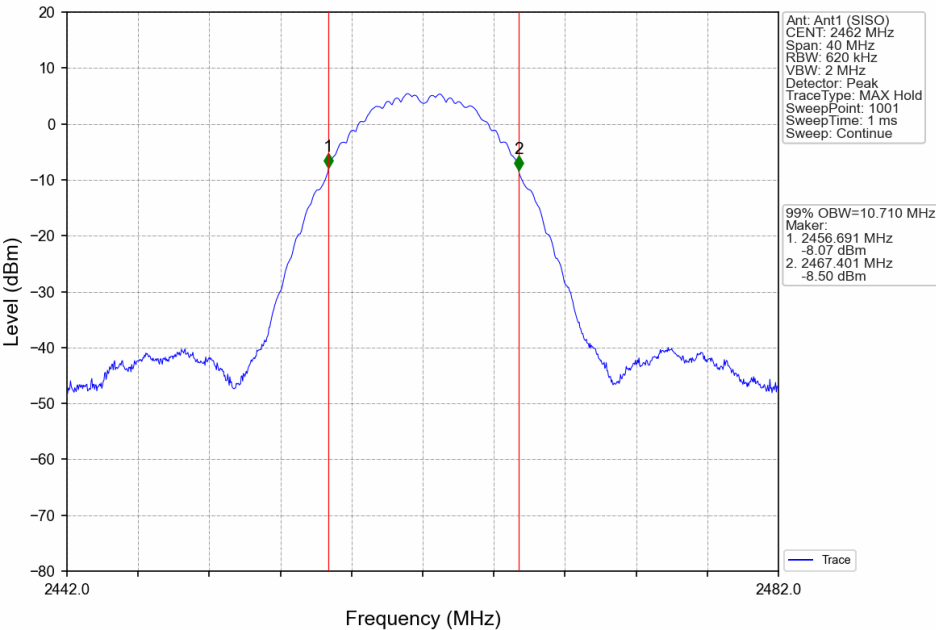




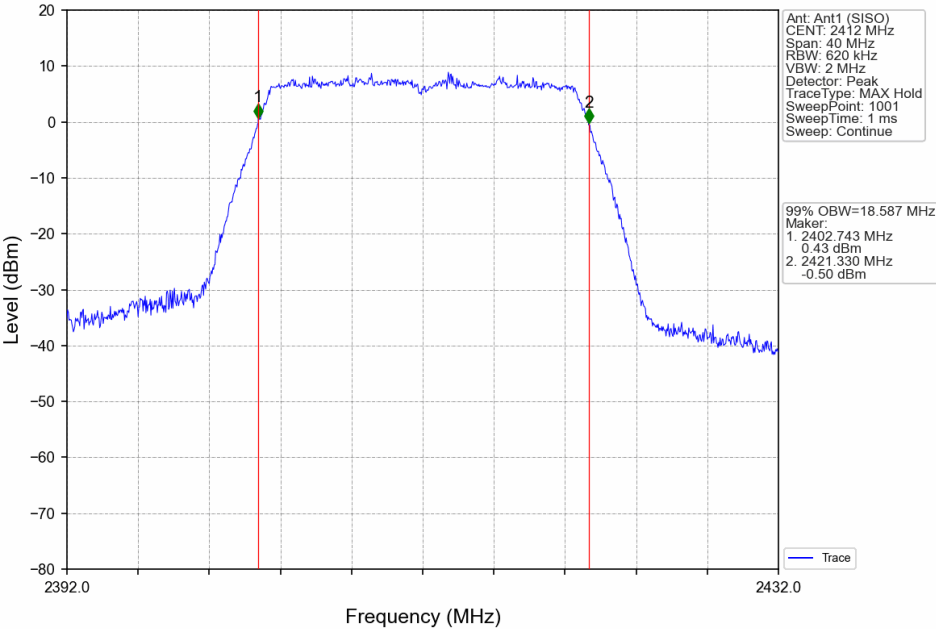
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



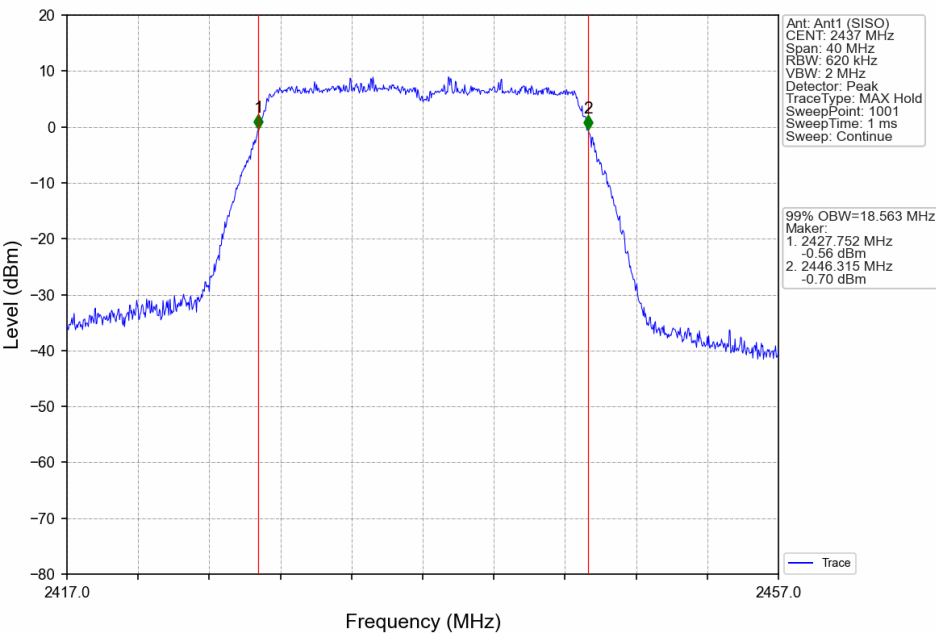
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



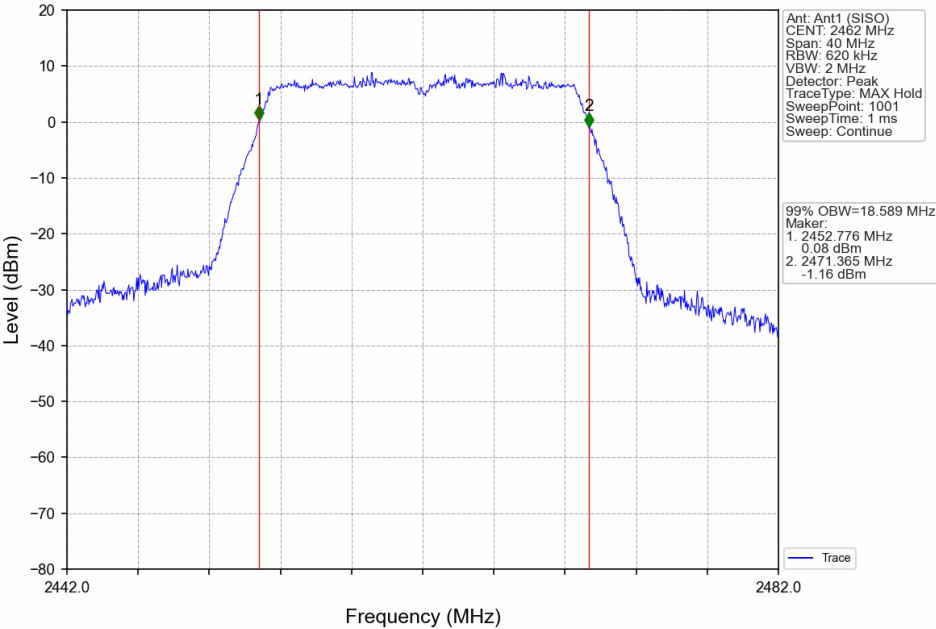
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 59 of 92

802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

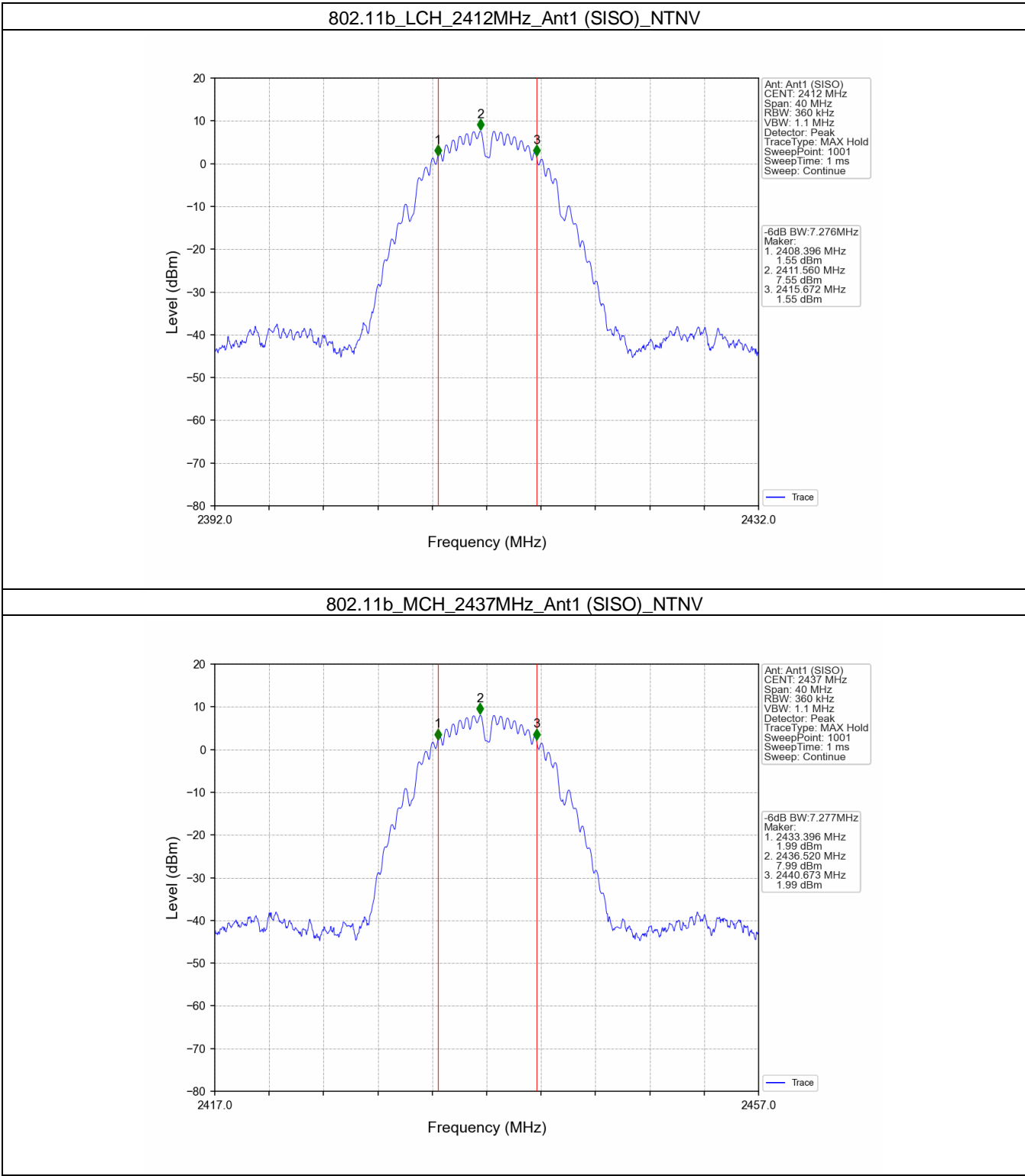
Page: 60 of 92

## 2.2 6dB BW

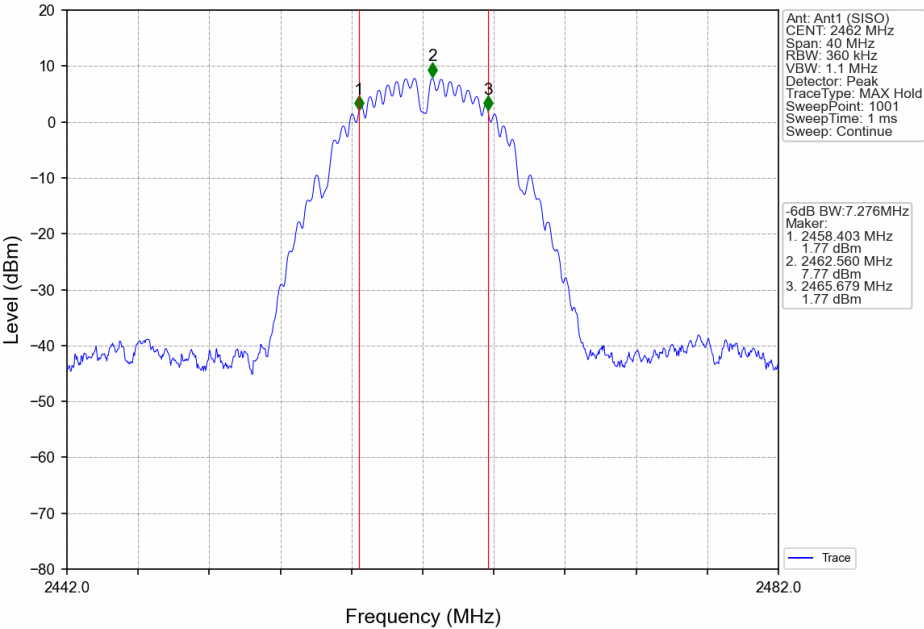
### 2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	7.276	$\geq 0.5$	Pass
		2437	1	7.277	$\geq 0.5$	Pass
		2462	1	7.276	$\geq 0.5$	Pass
802.11g	SISO	2412	1	7.449	$\geq 0.5$	Pass
		2437	1	7.446	$\geq 0.5$	Pass
		2462	1	7.456	$\geq 0.5$	Pass
802.11n (HT20)	SISO	2412	1	17.909	$\geq 0.5$	Pass
		2437	1	17.858	$\geq 0.5$	Pass
		2462	1	17.850	$\geq 0.5$	Pass

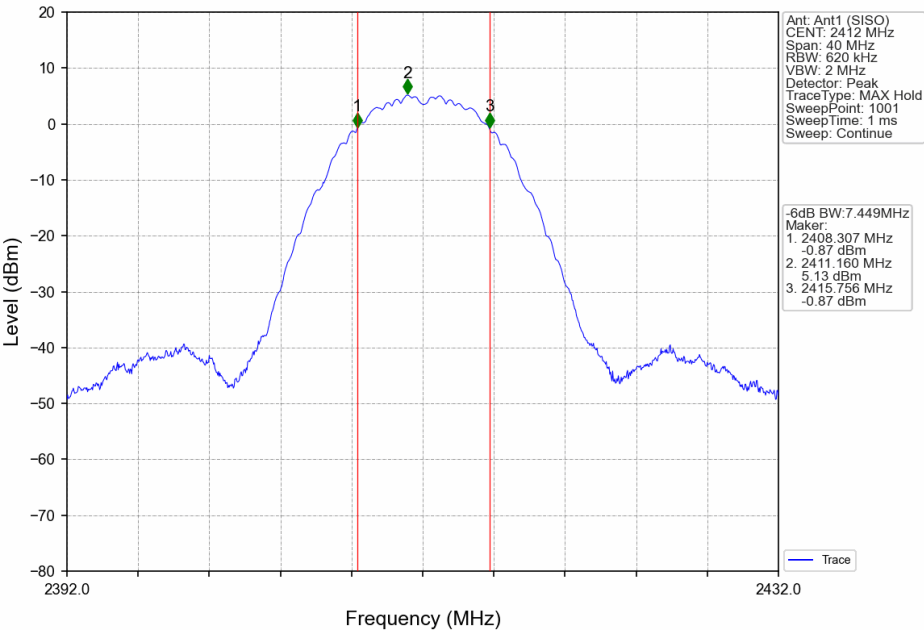
### 2.2.2 Test Graph



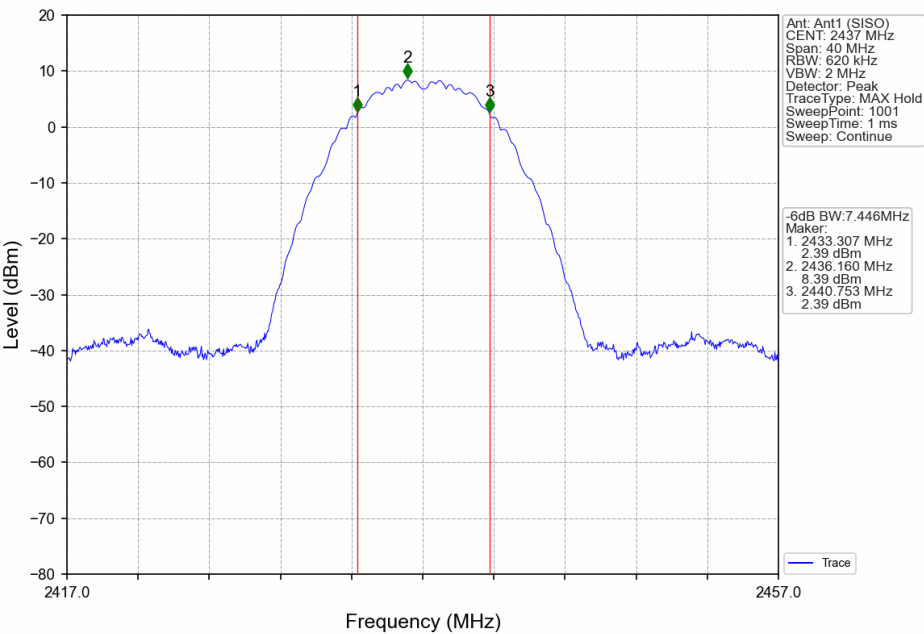
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



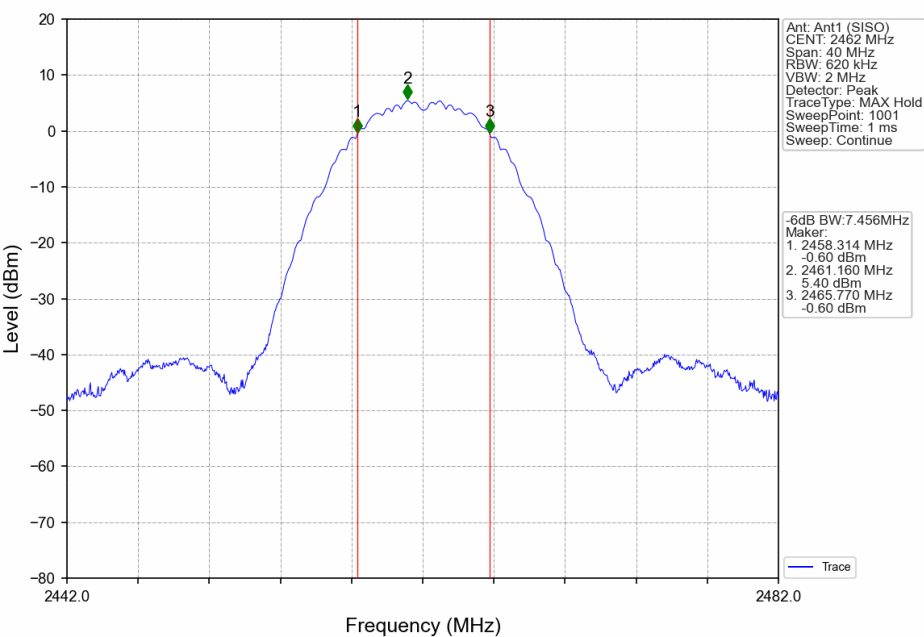
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



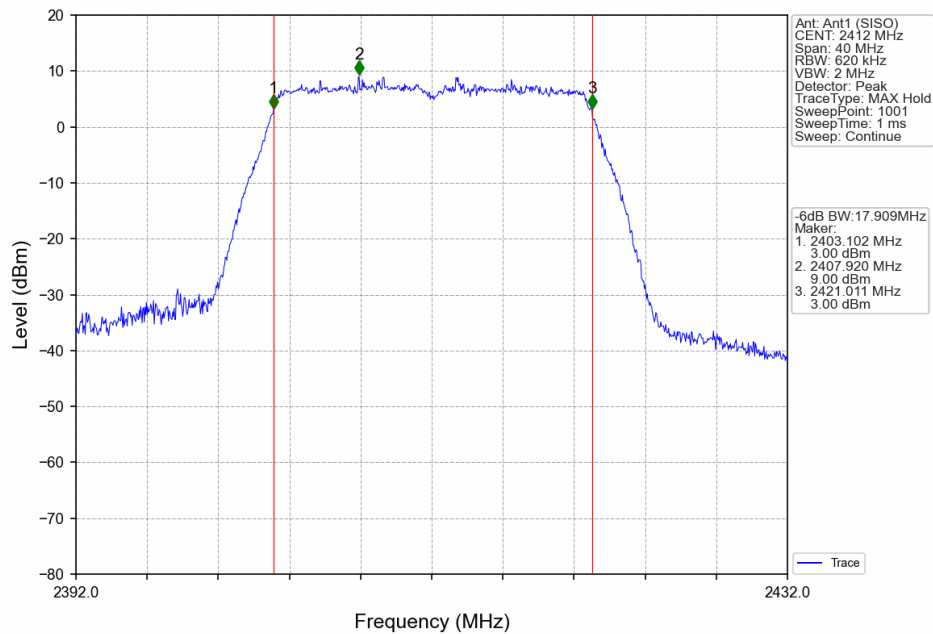
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



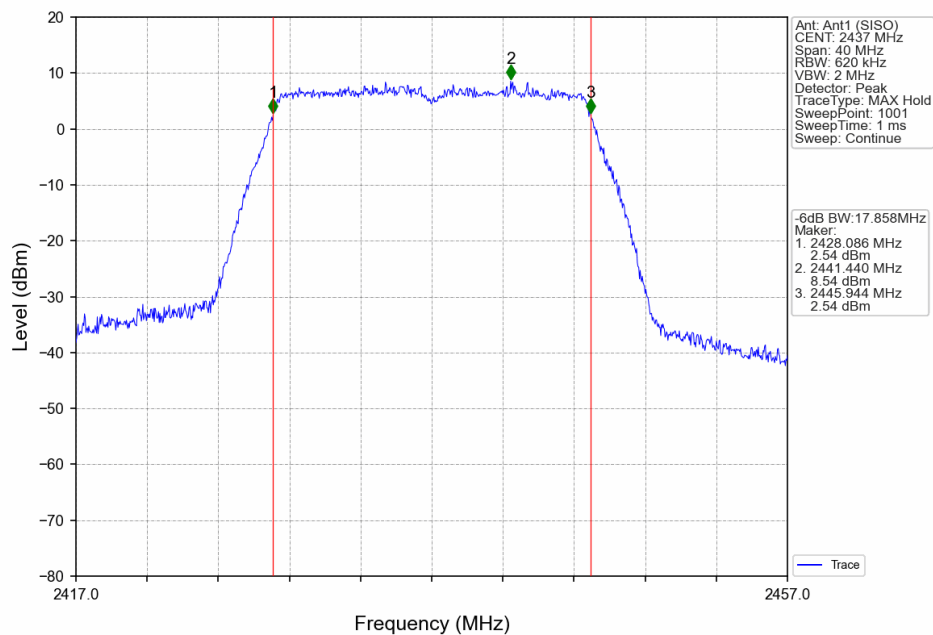
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20) LCH\_2412MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20) MCH\_2437MHz\_Ant1 (SISO)\_NTNV





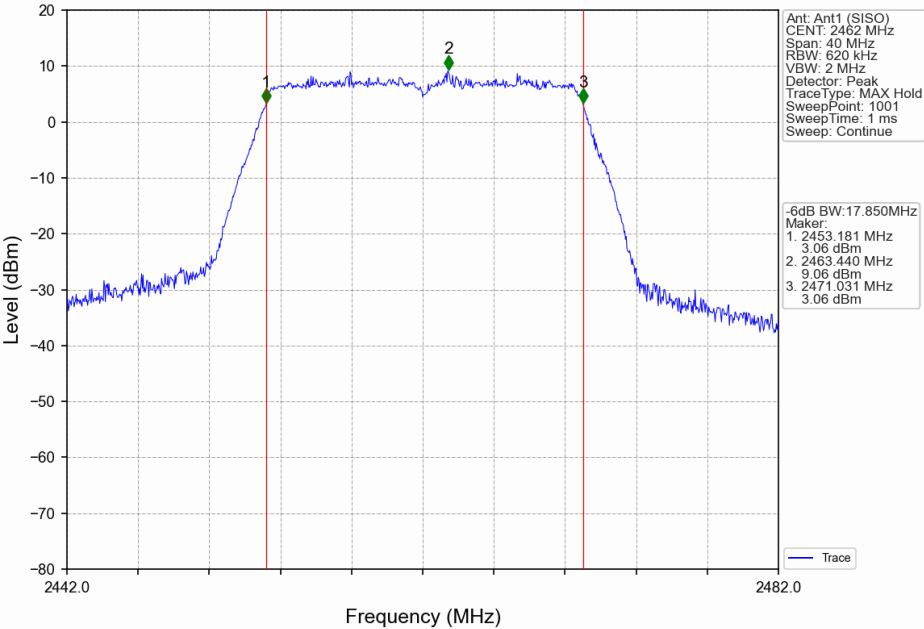
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 65 of 92

802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 66 of 92

## 3. Maximum Conducted Output Power

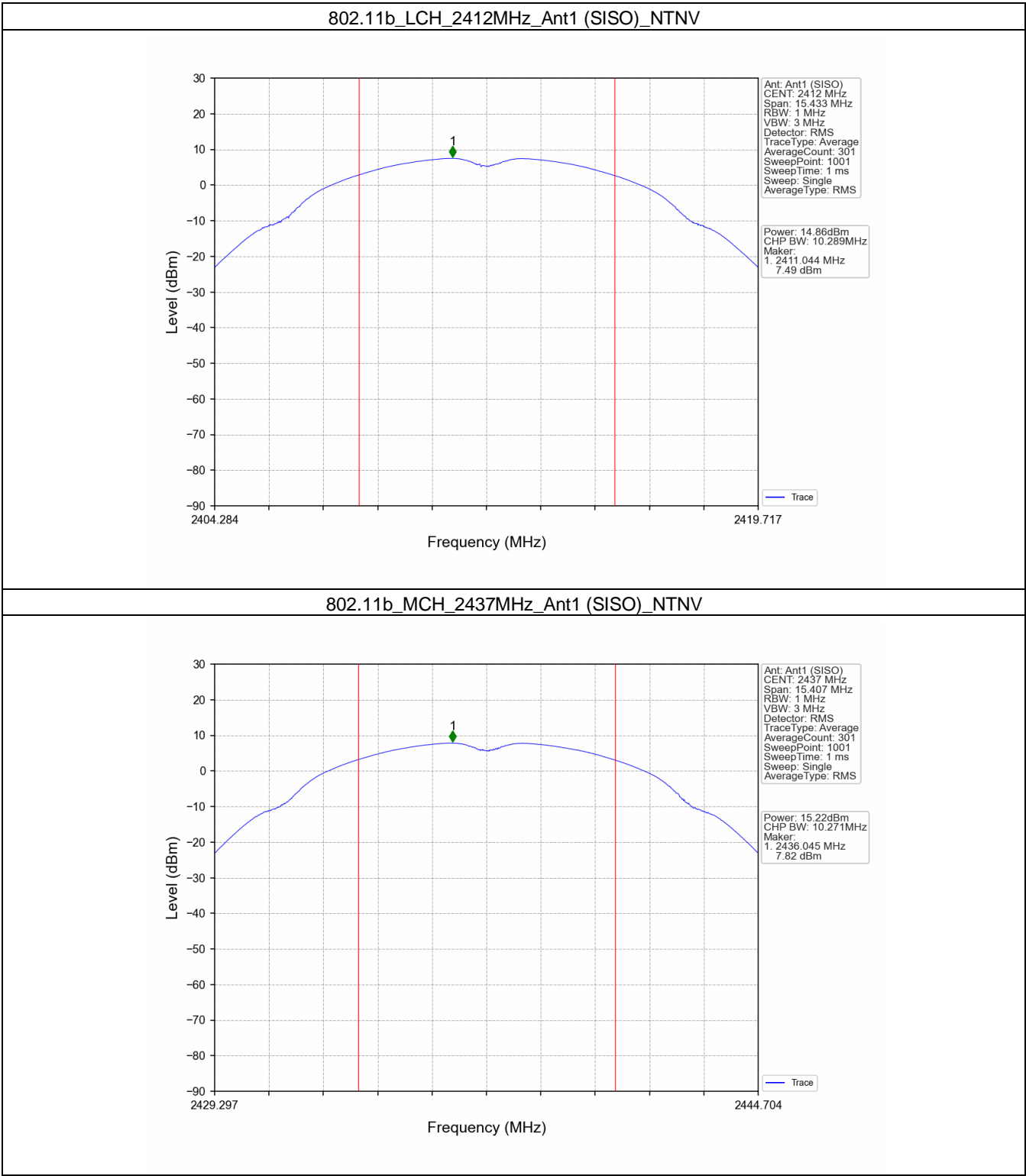
### 3.1 Power

#### 3.1.1 Test Result

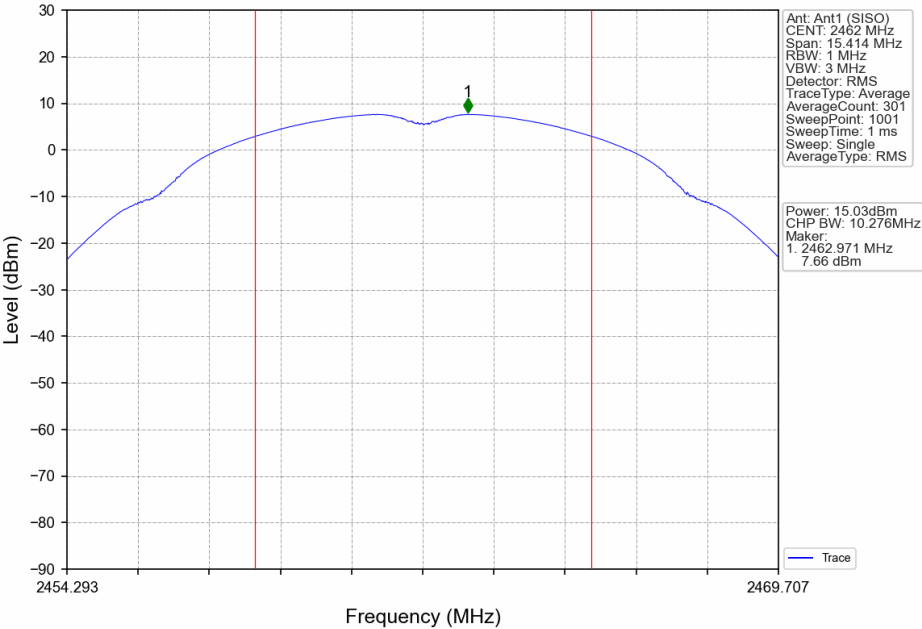
Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	14.86	<=30	Pass
		2437	15.22	<=30	Pass
		2462	15.03	<=30	Pass
802.11g	SISO	2412	12.01	<=30	Pass
		2437	15.24	<=30	Pass
		2462	12.25	<=30	Pass
802.11n (HT20)	SISO	2412	12.44	<=30	Pass
		2437	12.49	<=30	Pass
		2462	12.55	<=30	Pass

Note1: Antenna Gain: Ant1: 2.79dBi;

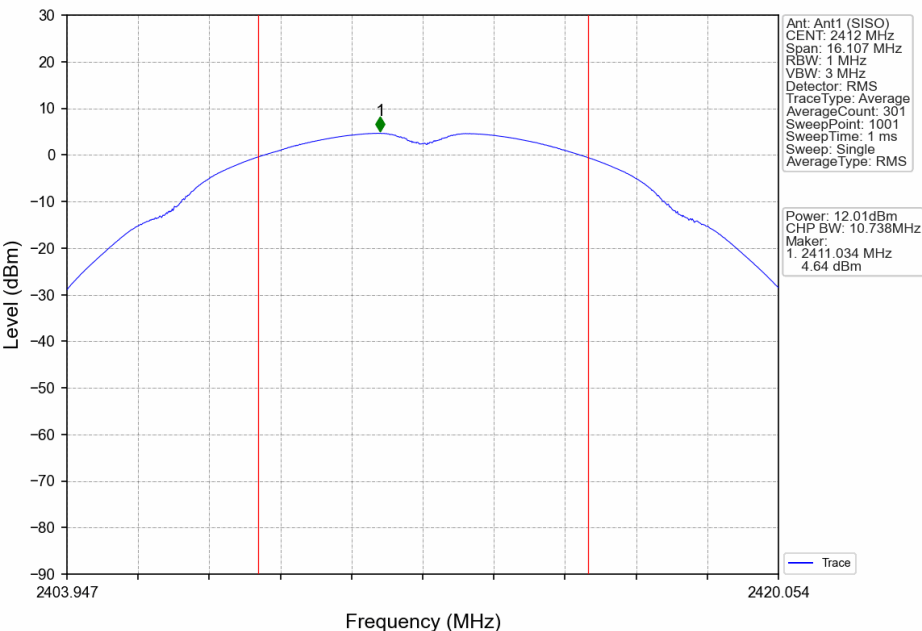
### 3.1.2 Test Graph



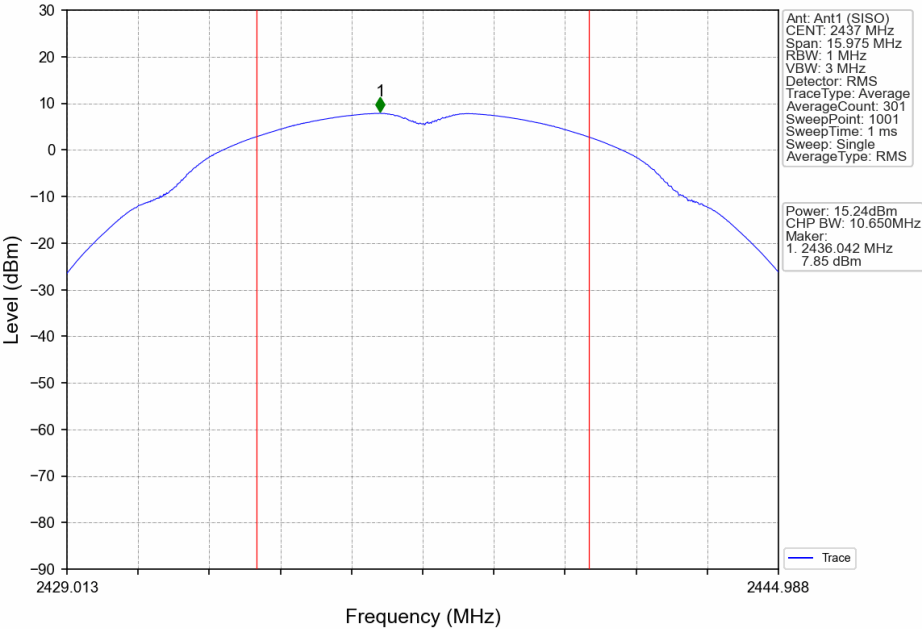
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



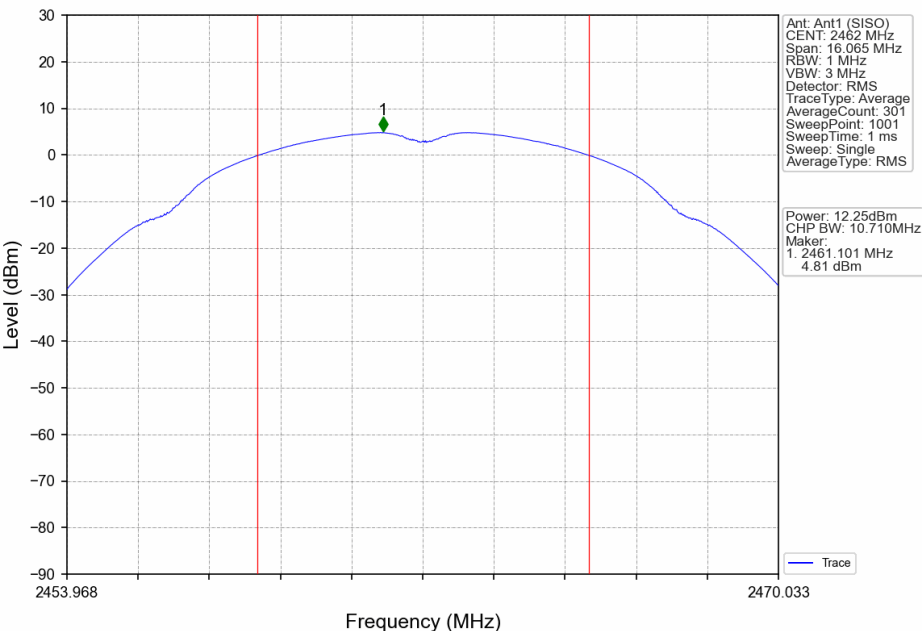
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



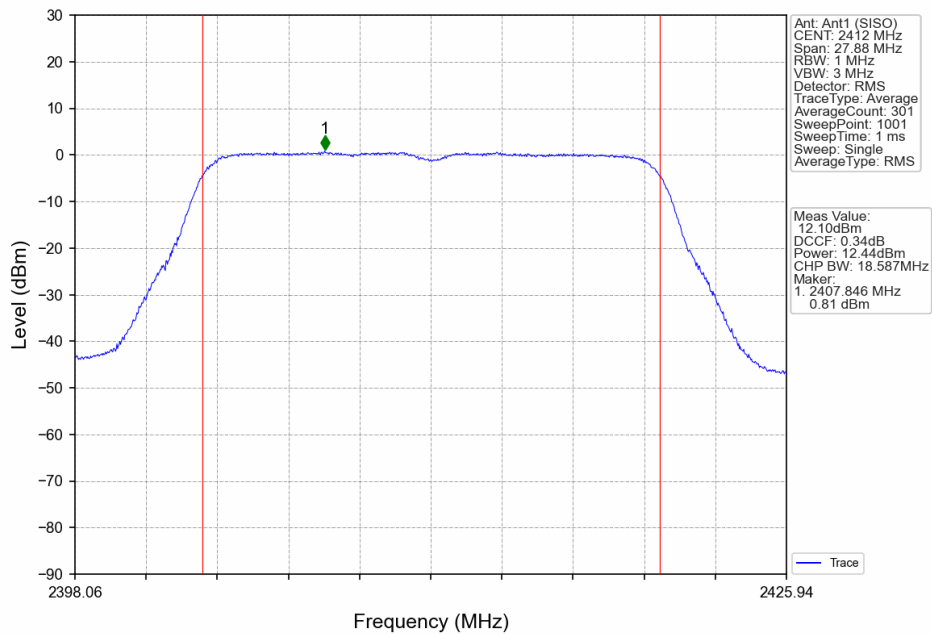
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



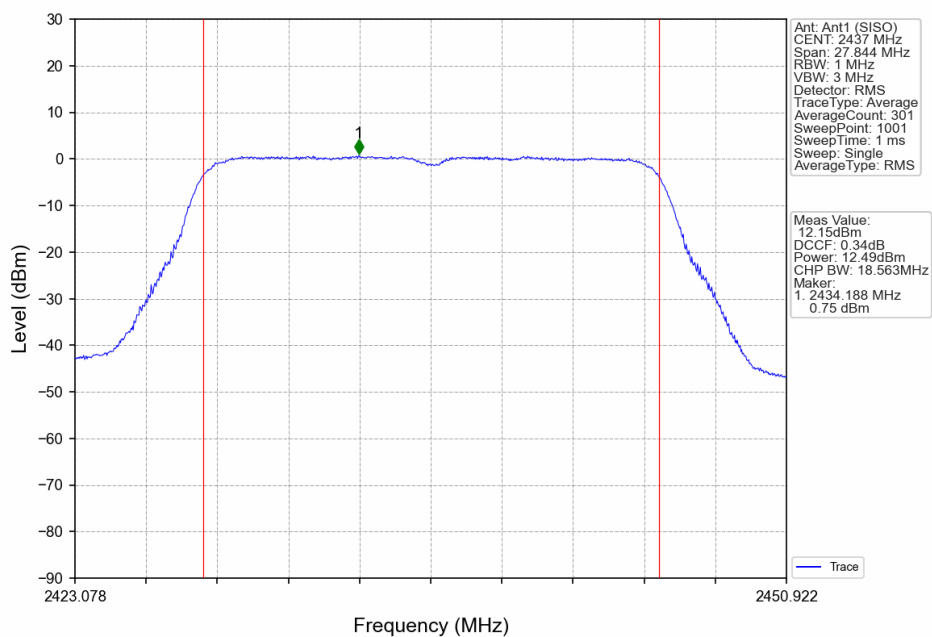
802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV

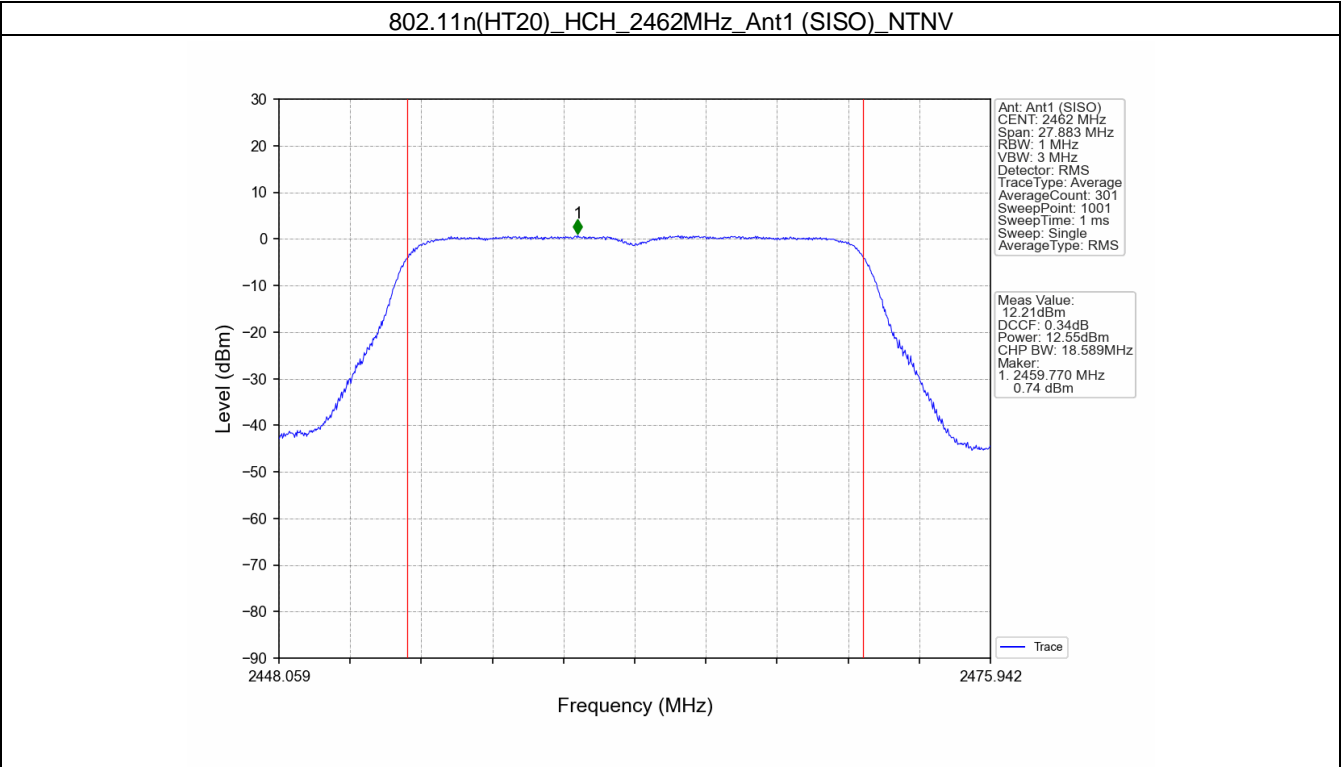


802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV







Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 72 of 92

4. Maximum Power Spectral Density

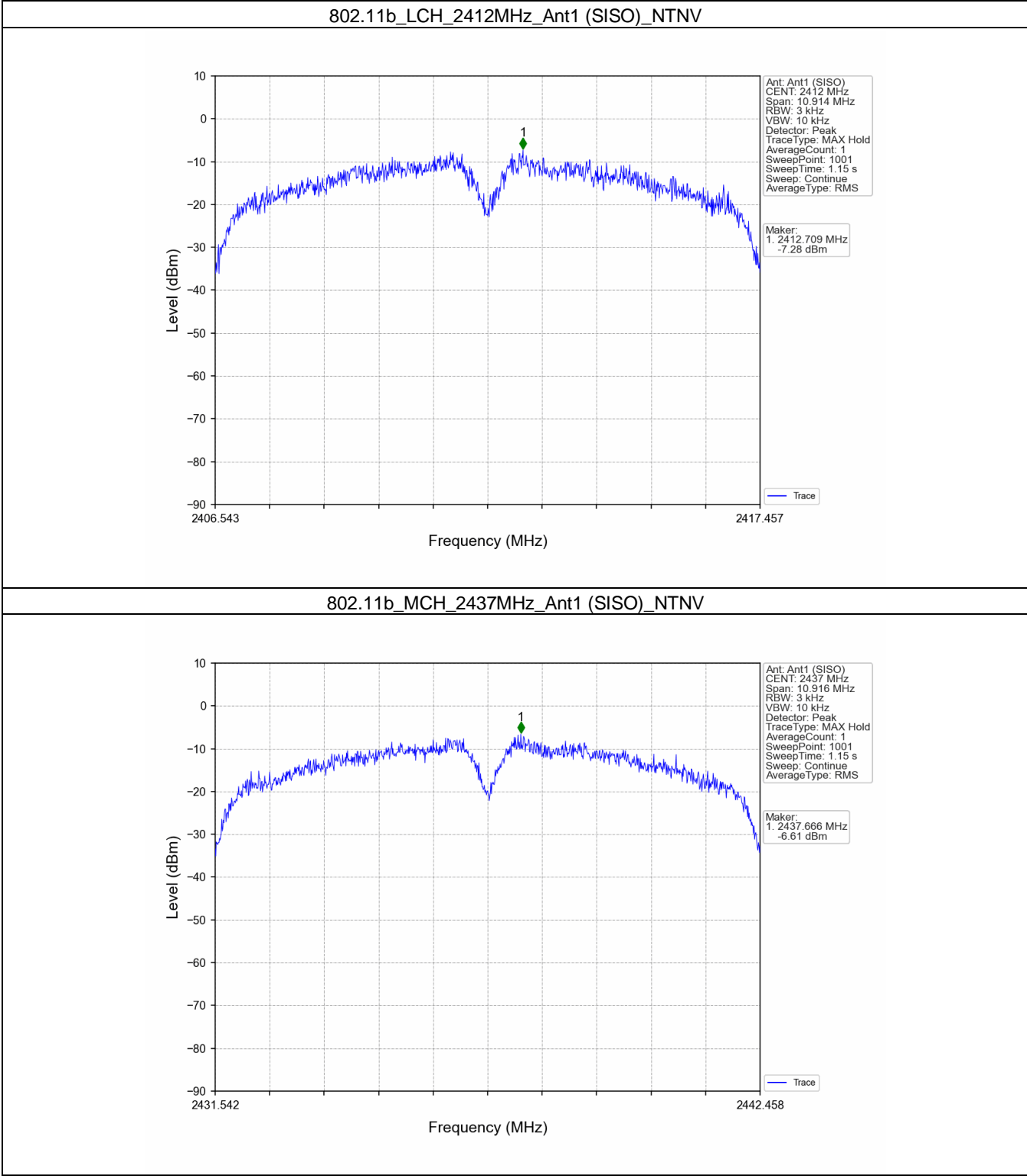
4.1 PSD

4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-7.28	<=8	Pass
		2437	-6.61	<=8	Pass
		2462	-7.75	<=8	Pass
802.11g	SISO	2412	-10.13	<=8	Pass
		2437	-7.29	<=8	Pass
		2462	-9.04	<=8	Pass
802.11n (HT20)	SISO	2412	-12.60	<=8	Pass
		2437	-13.28	<=8	Pass
		2462	-13.04	<=8	Pass
Note1: Antenna Gain: Ant1: 2.79dBi;					



### 4.1.2 Test Graph



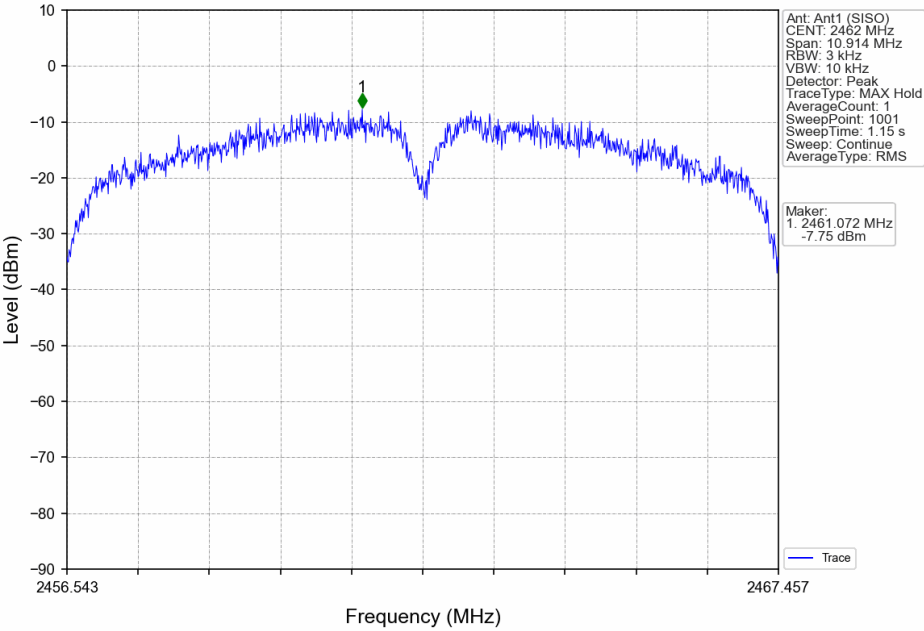
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

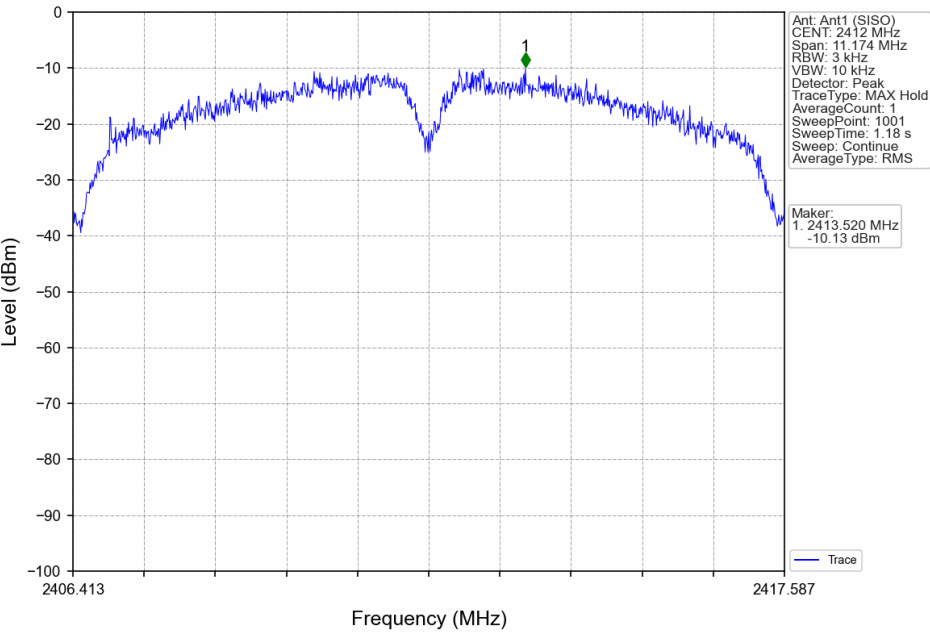
Report No.: KSCR240400073803

Page: 74 of 92

802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



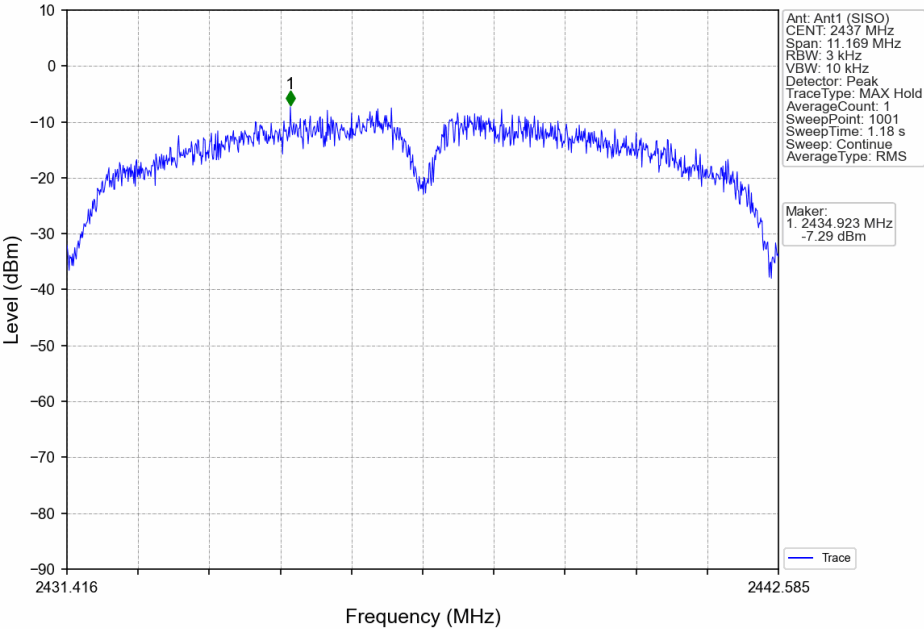
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

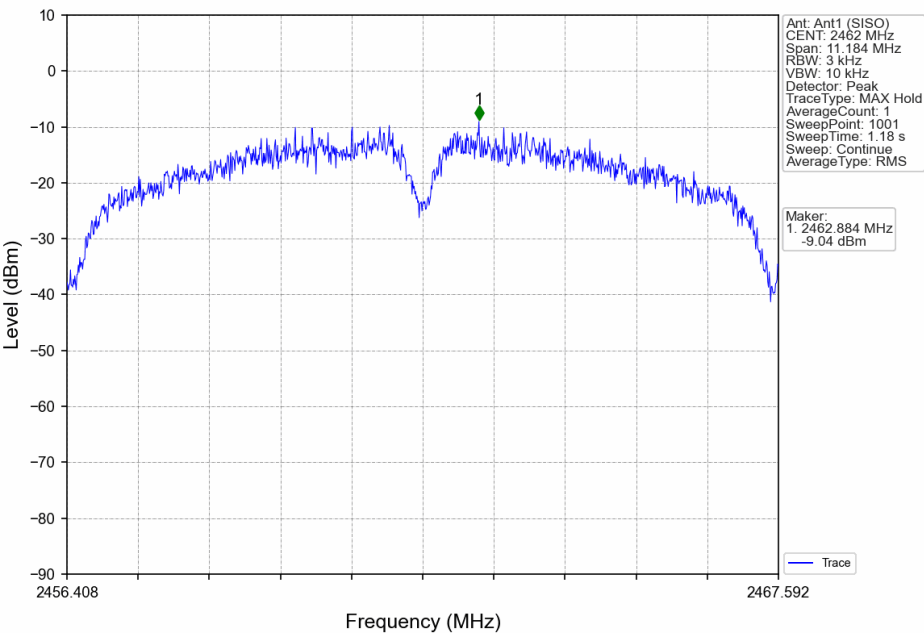
Report No.: KSCR240400073803

Page: 75 of 92

802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



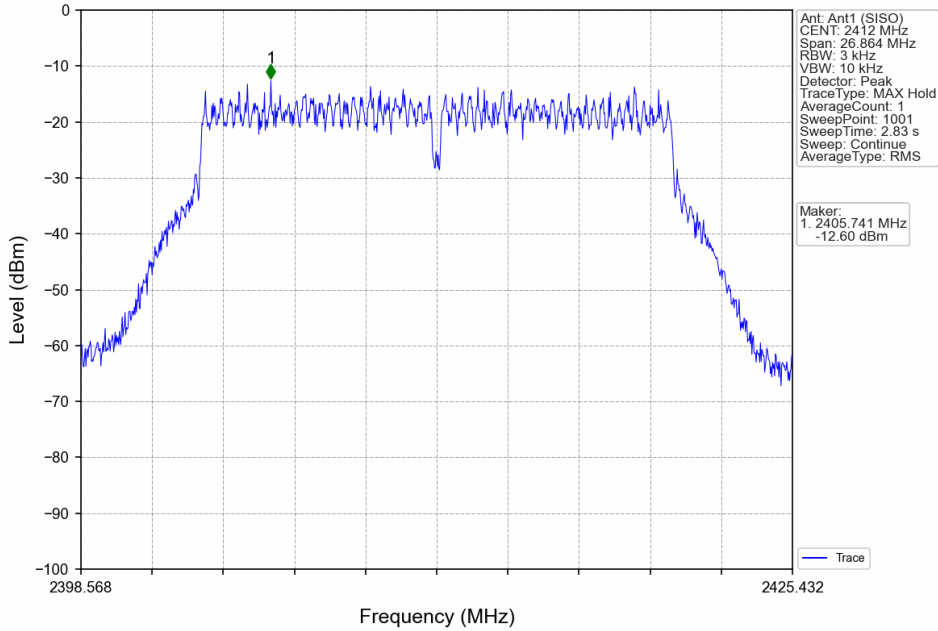
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

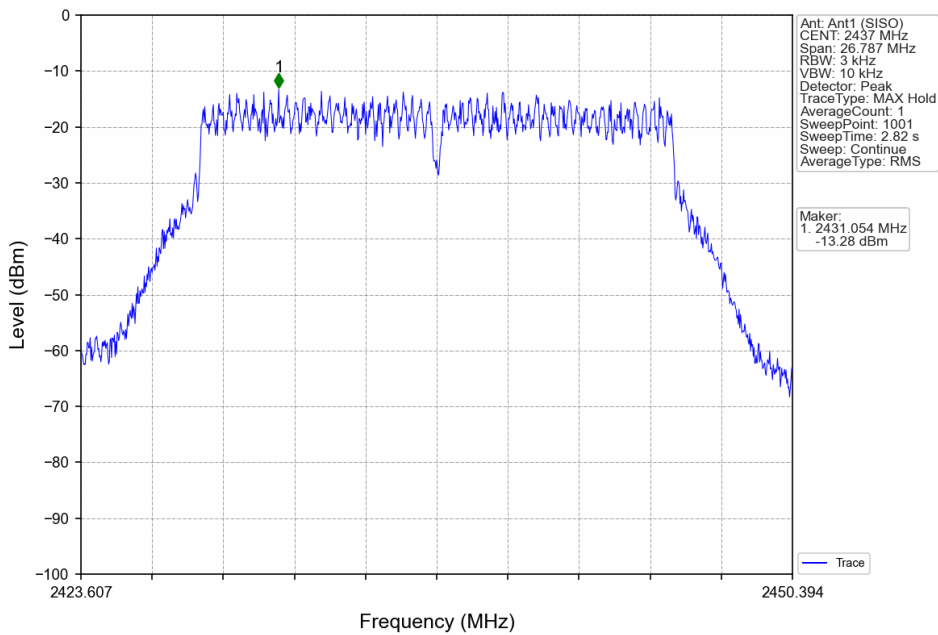
Report No.: KSCR240400073803

Page: 76 of 92

802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV

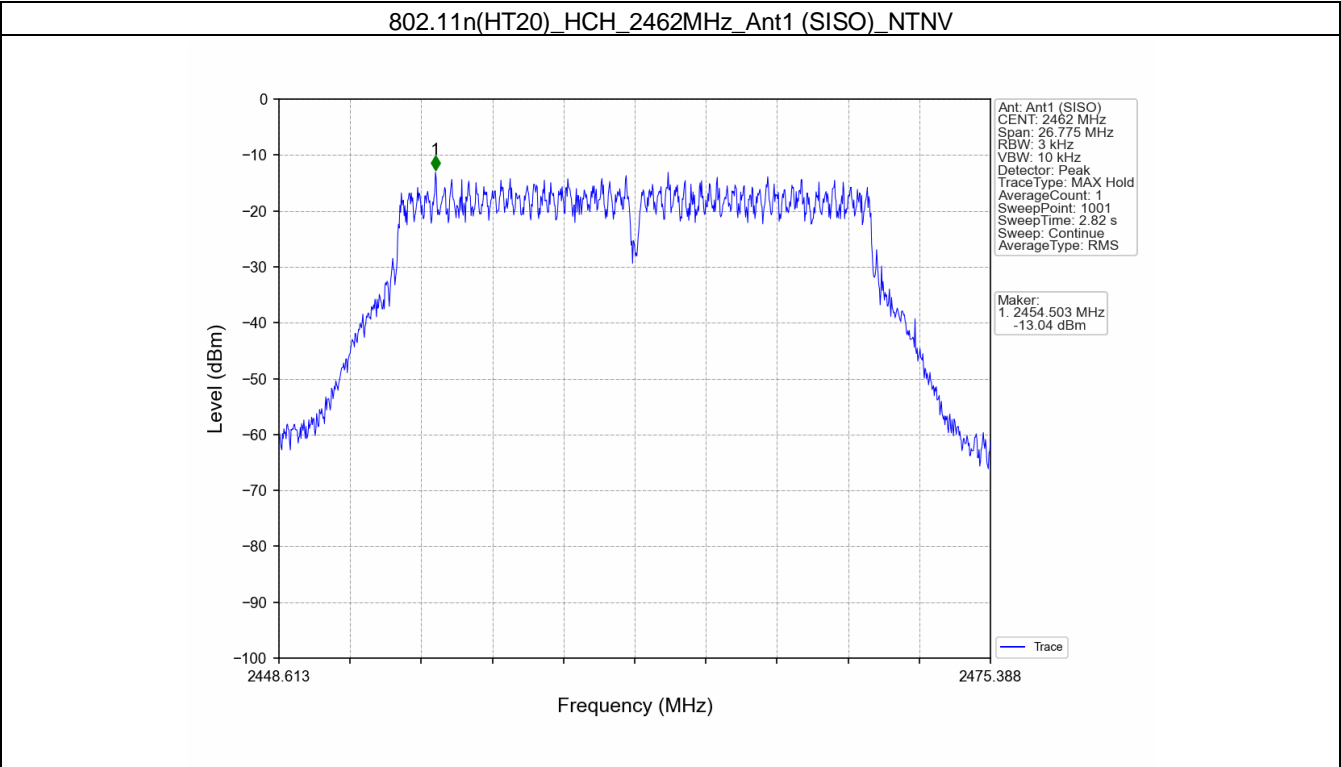


## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 77 of 92



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 78 of 92

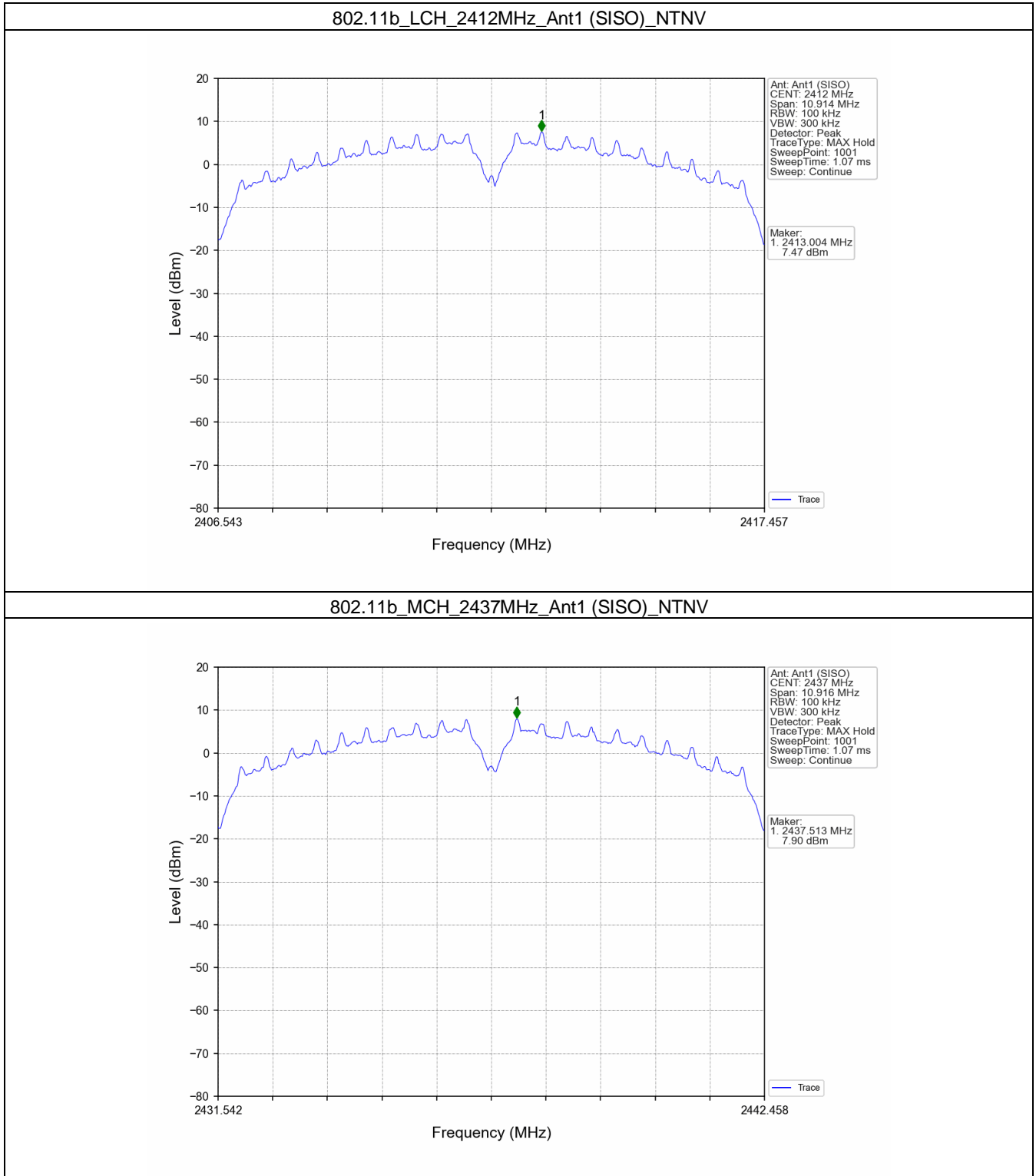
### 5. Unwanted Emissions In Non-restricted Frequency Bands

#### 5.1 Ref

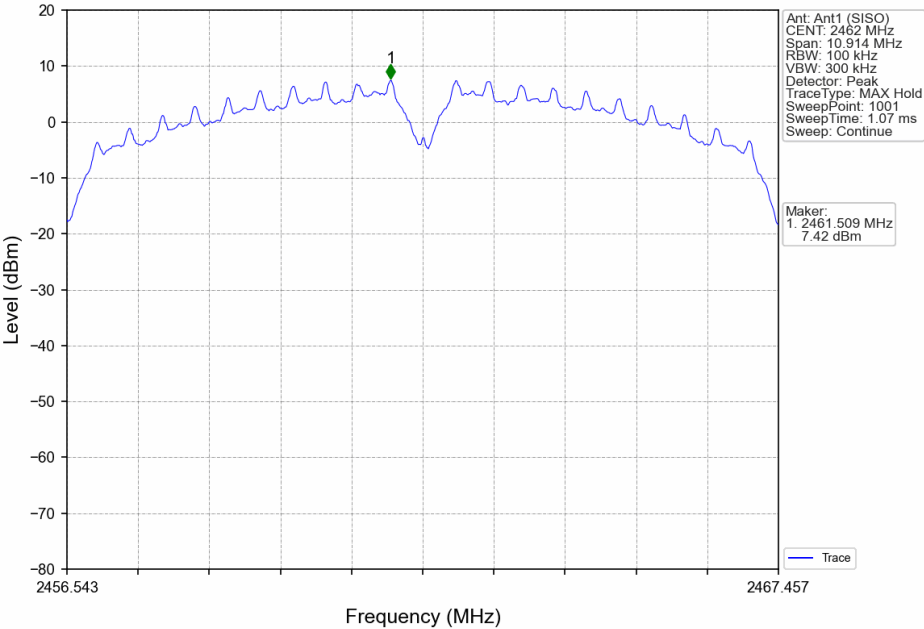
##### 5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	1	7.47
		2437	1	7.90
		2462	1	7.42
802.11g	SISO	2412	1	4.17
		2437	1	7.66
		2462	1	4.74
802.11n (HT20)	SISO	2412	1	1.36
		2437	1	1.36
		2462	1	1.48
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.				

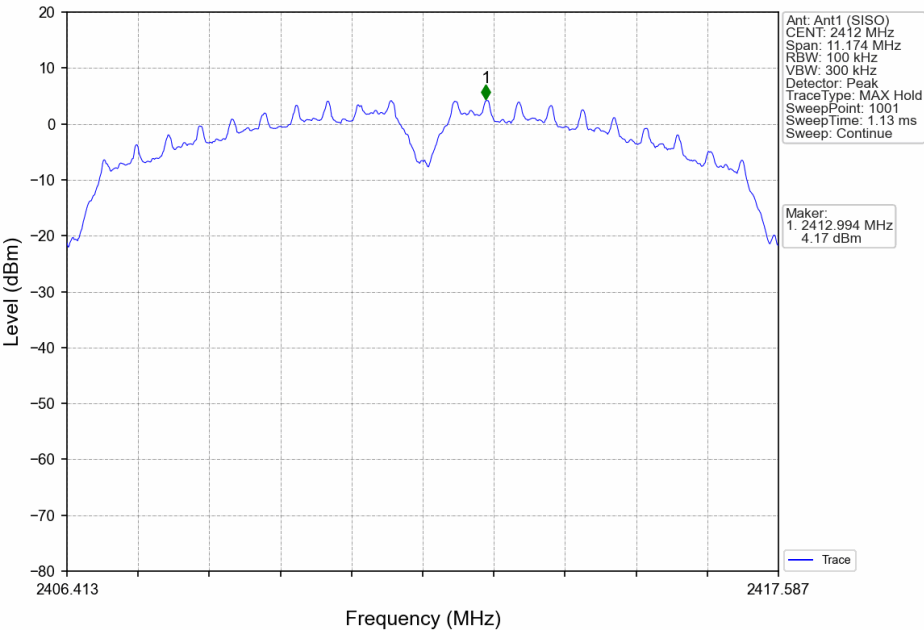
### 5.1.2 Test Graph



802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV

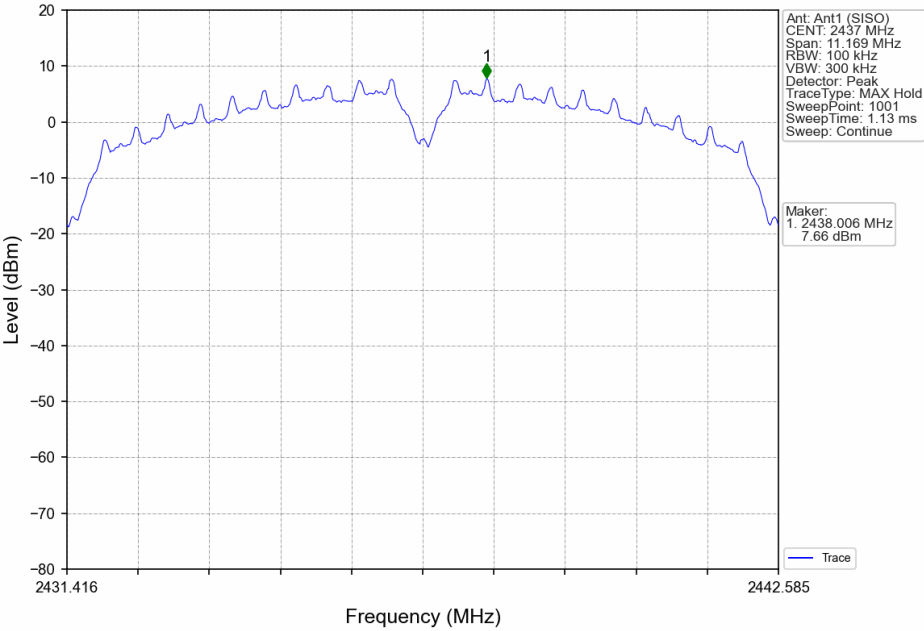


802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

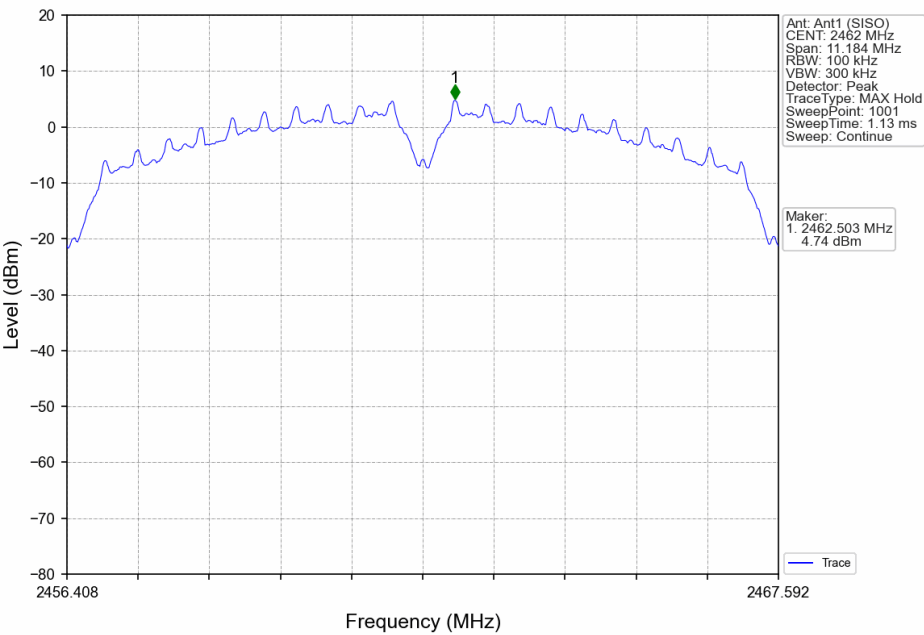




802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



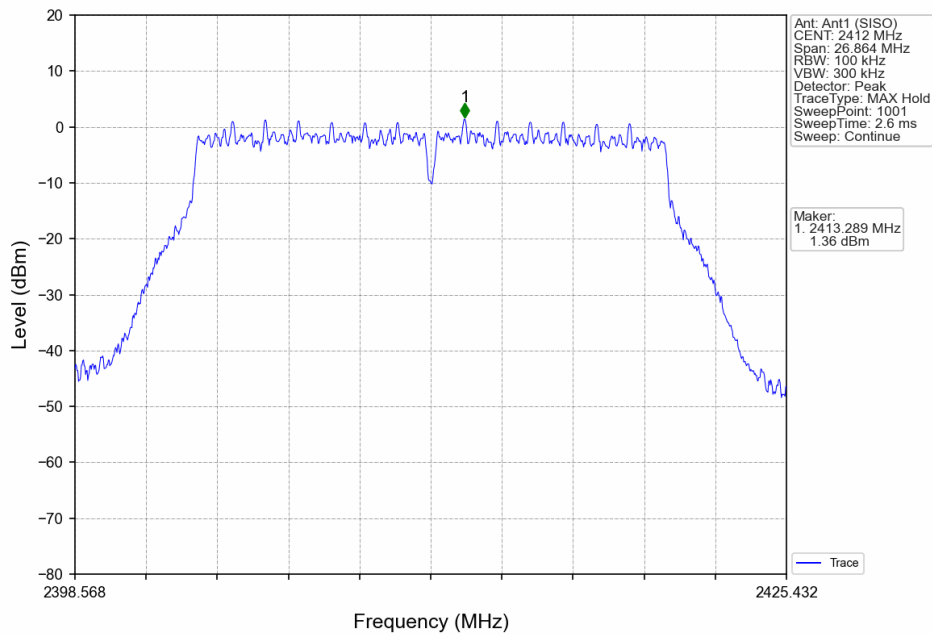
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CCSEM-TRF-001 Rev. 02 Sep 01, 2023

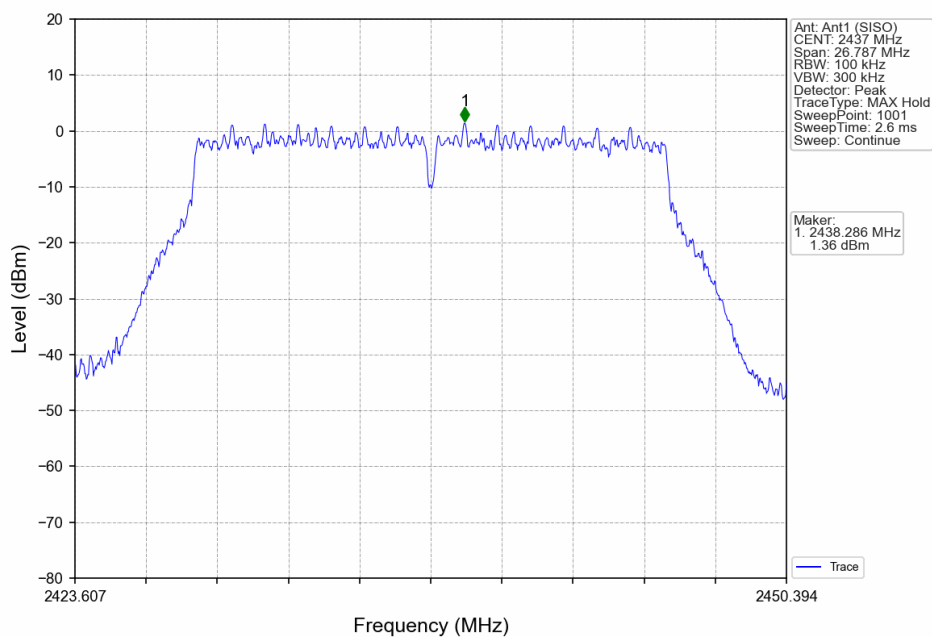
Report No.: KSCR240400073803

Page: 82 of 92

802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV

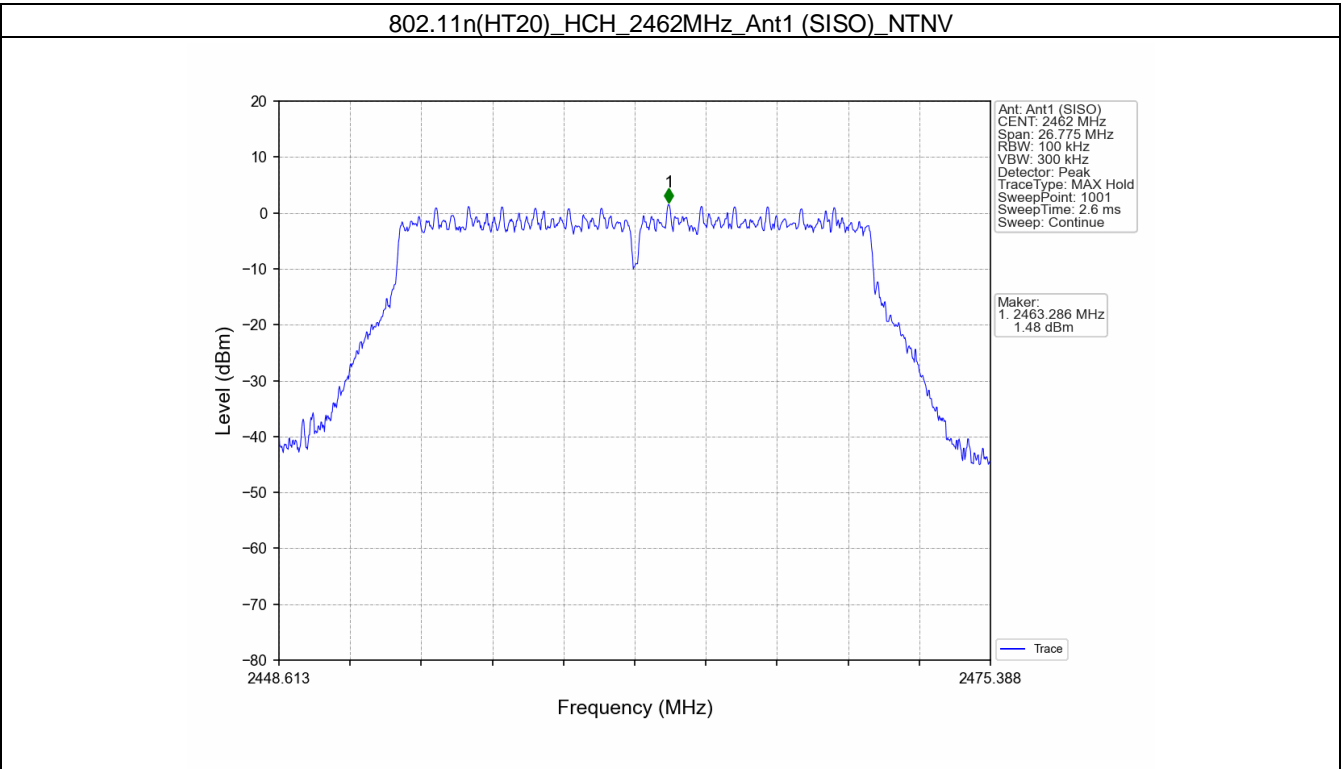


## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 83 of 92



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400073803

Page: 84 of 92

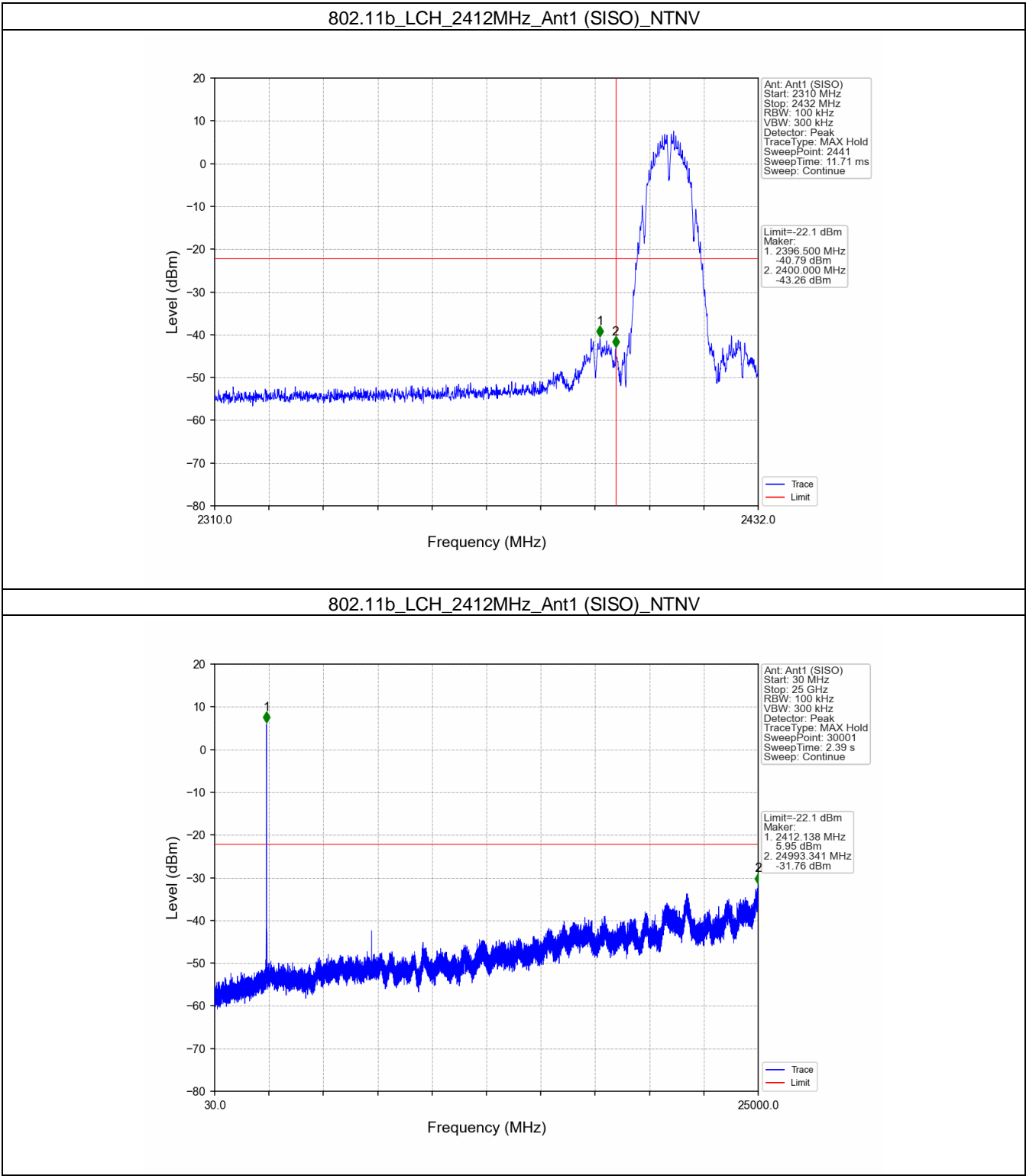
### 5.2 CSE

#### 5.2.1 Test Result

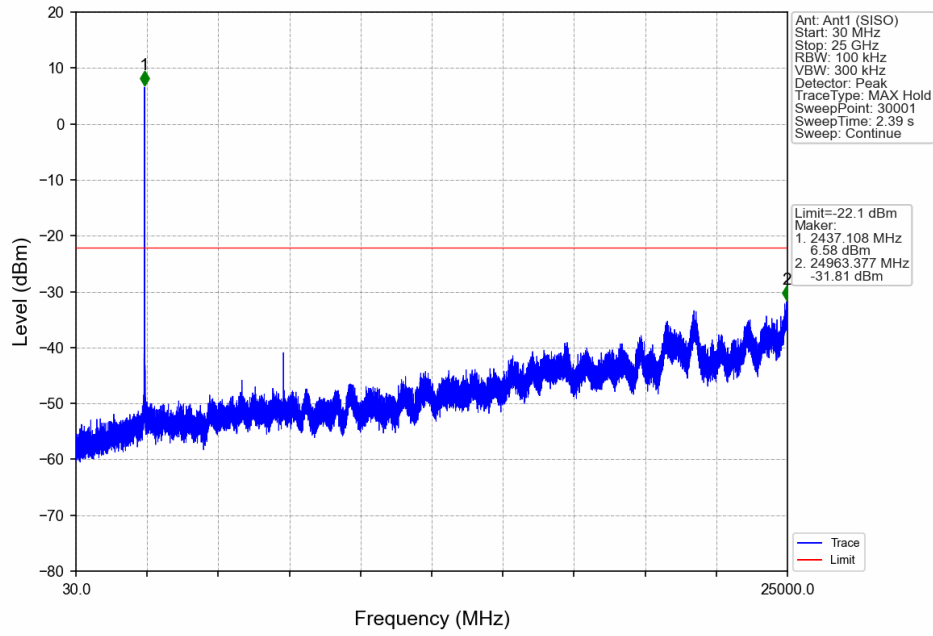
Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	7.90	-22.10	Pass
		2437	1	7.90	-22.10	Pass
		2462	1	7.90	-22.10	Pass
802.11g	SISO	2412	1	7.66	-22.34	Pass
		2437	1	7.66	-22.34	Pass
		2462	1	7.66	-22.34	Pass
802.11n (HT20)	SISO	2412	1	1.48	-28.52	Pass
		2437	1	1.48	-28.52	Pass
		2462	1	1.48	-28.52	Pass

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

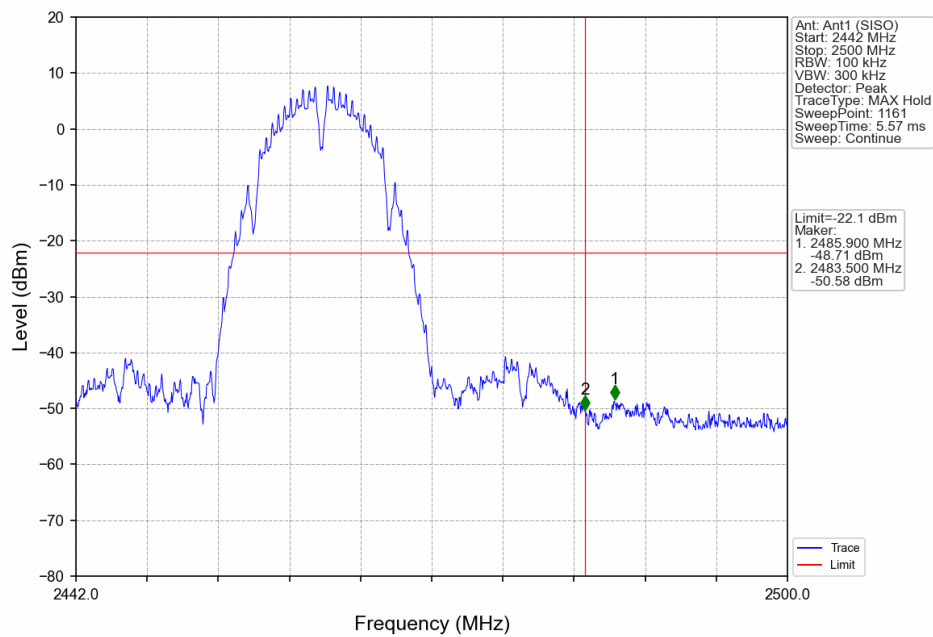
### 5.2.2 Test Graph



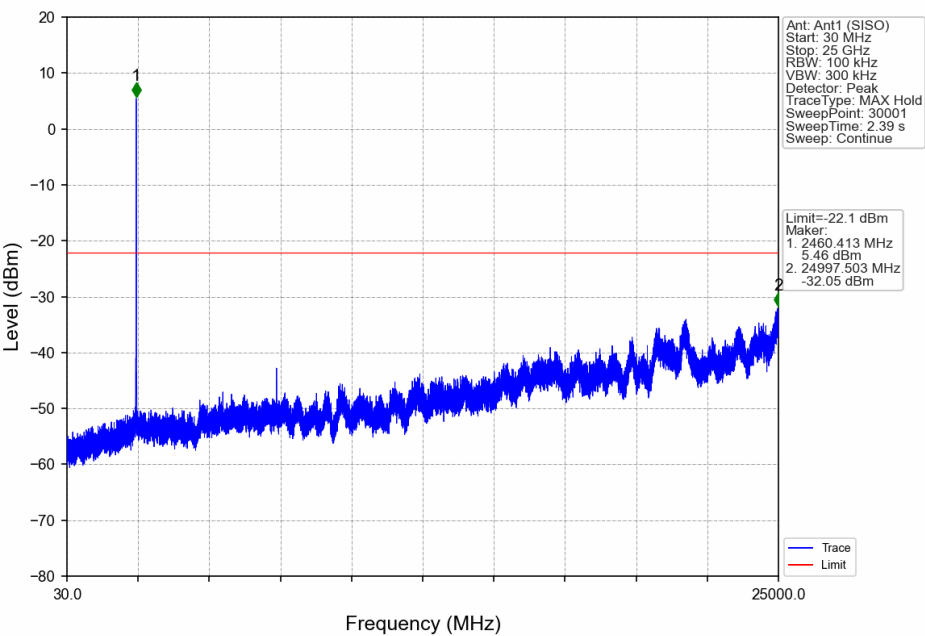
802.11b\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



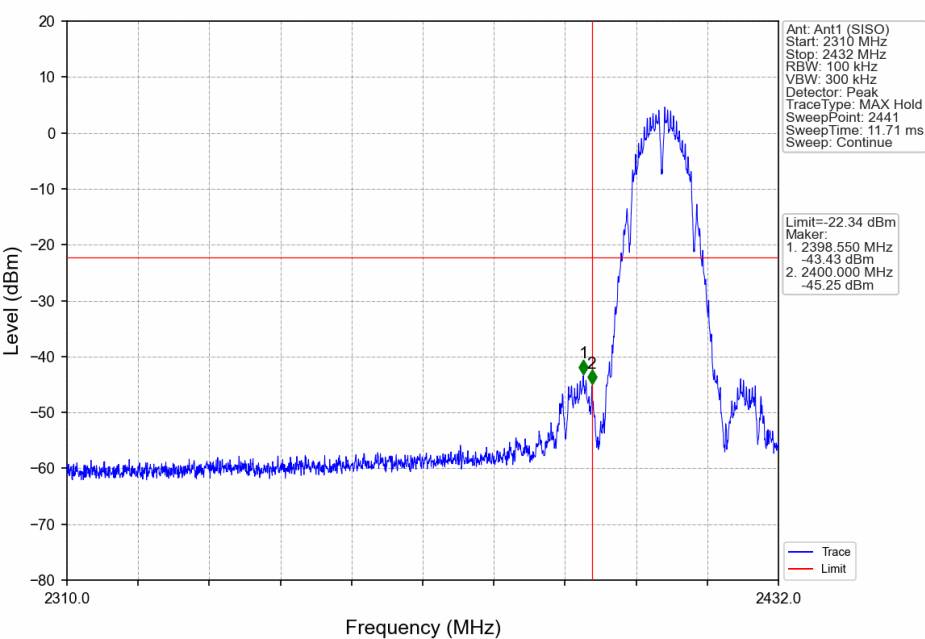
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



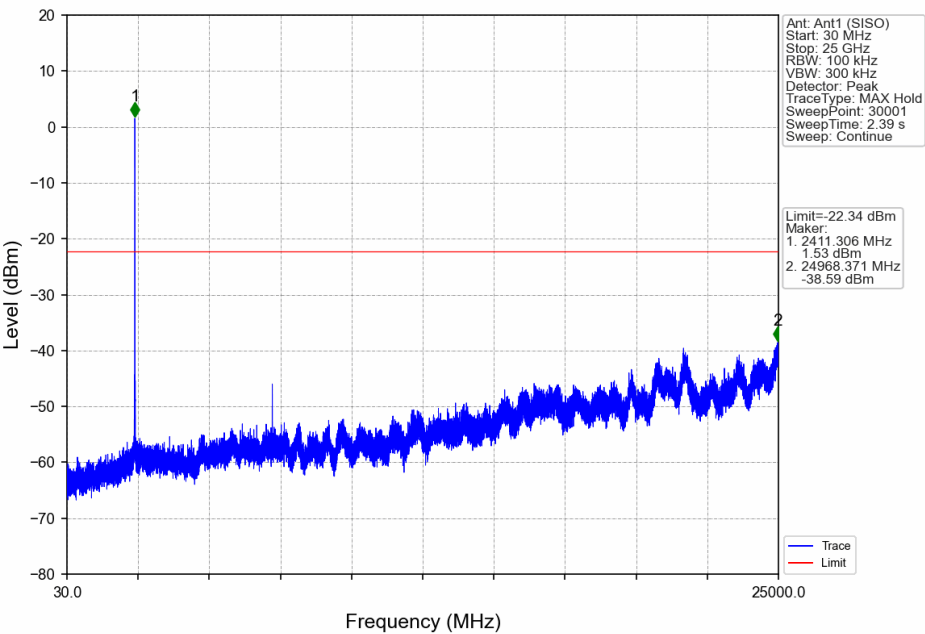
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



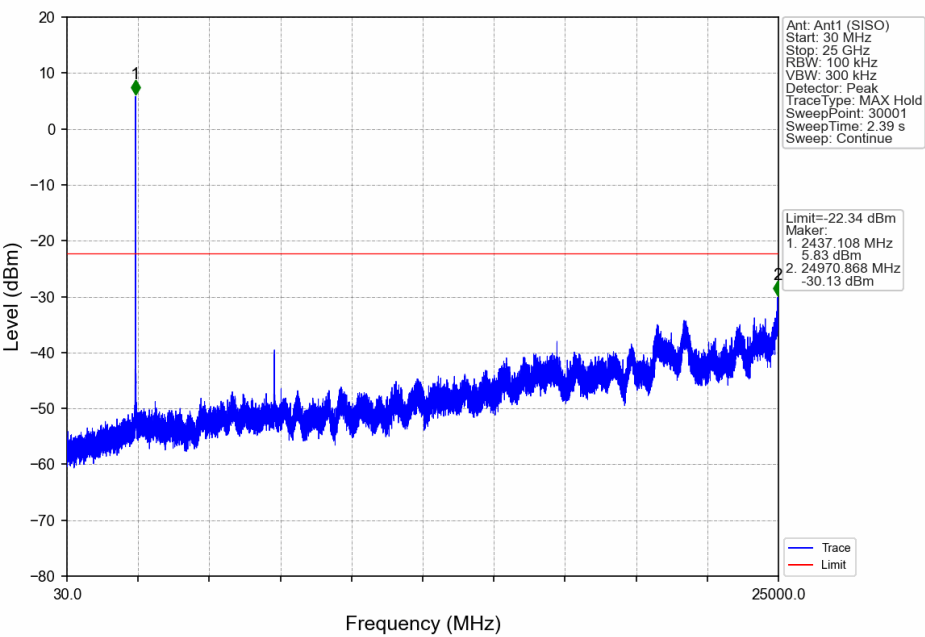
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

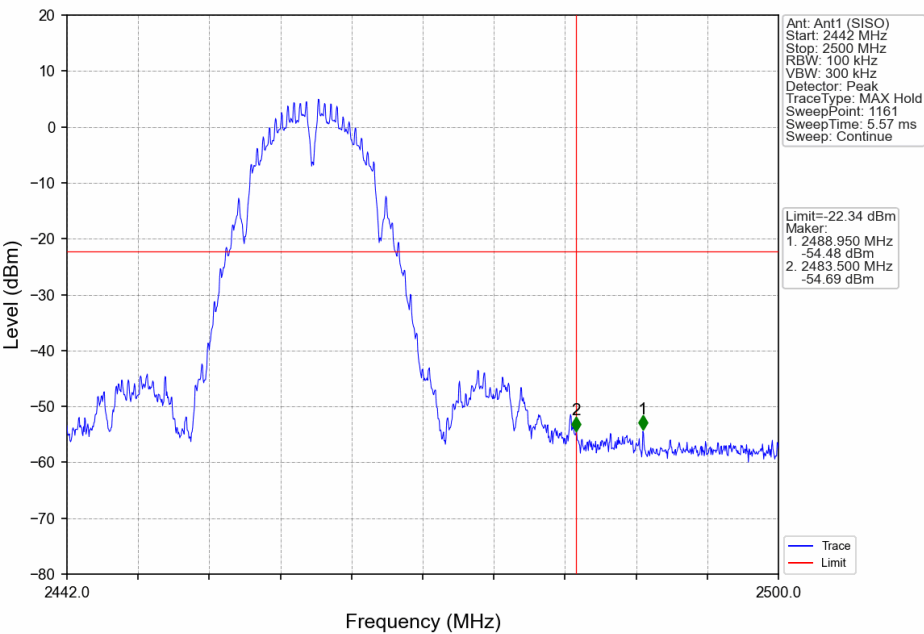


802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV

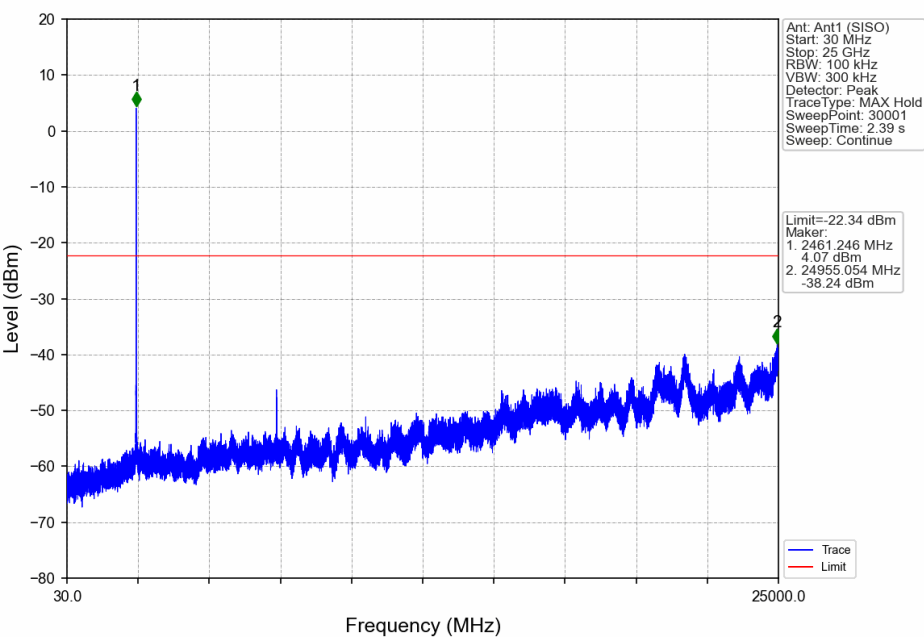




802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



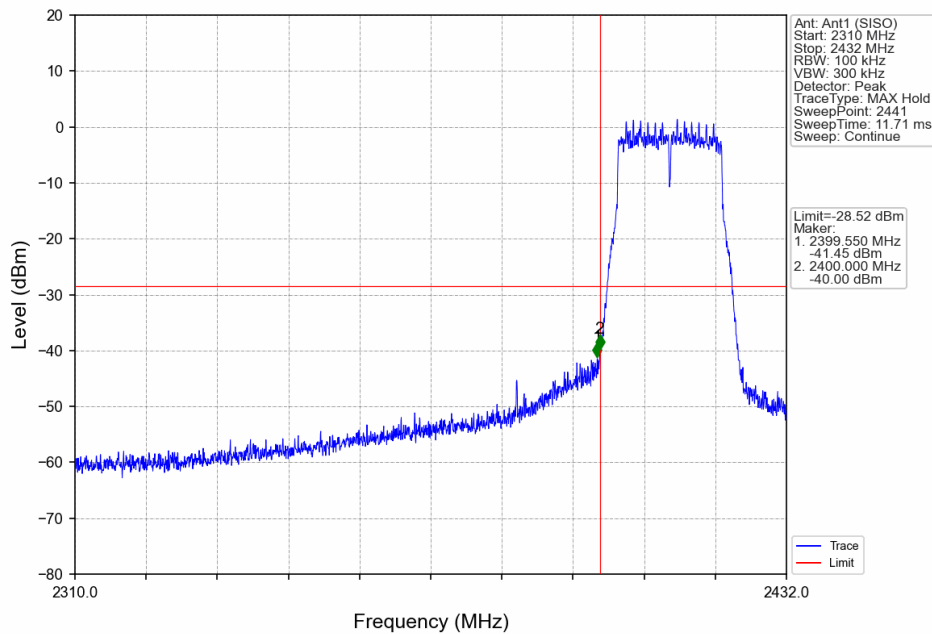
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CCSEM-TRF-001 Rev. 02 Sep 01, 2023

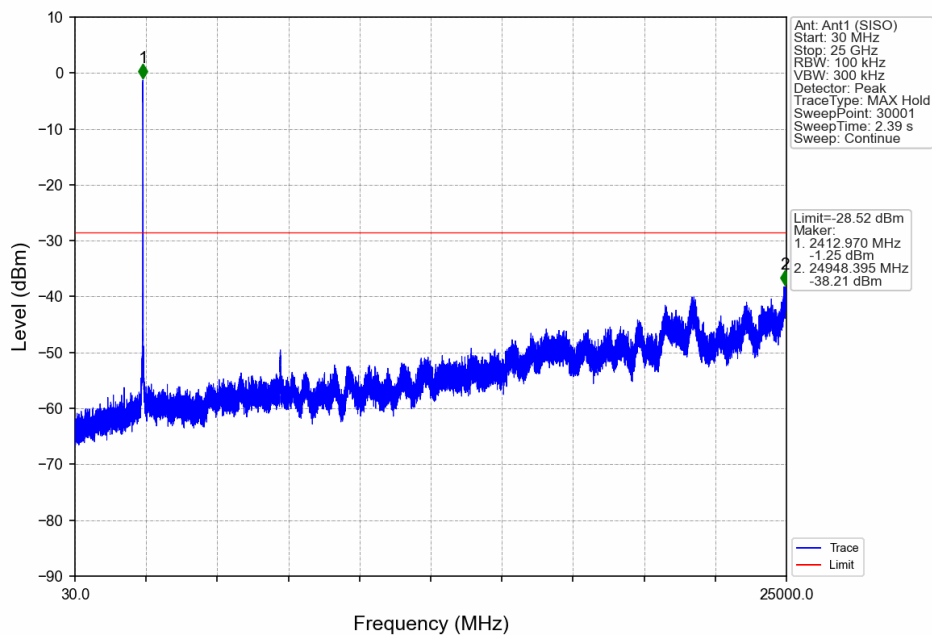
Report No.: KSCR240400073803

Page: 90 of 92

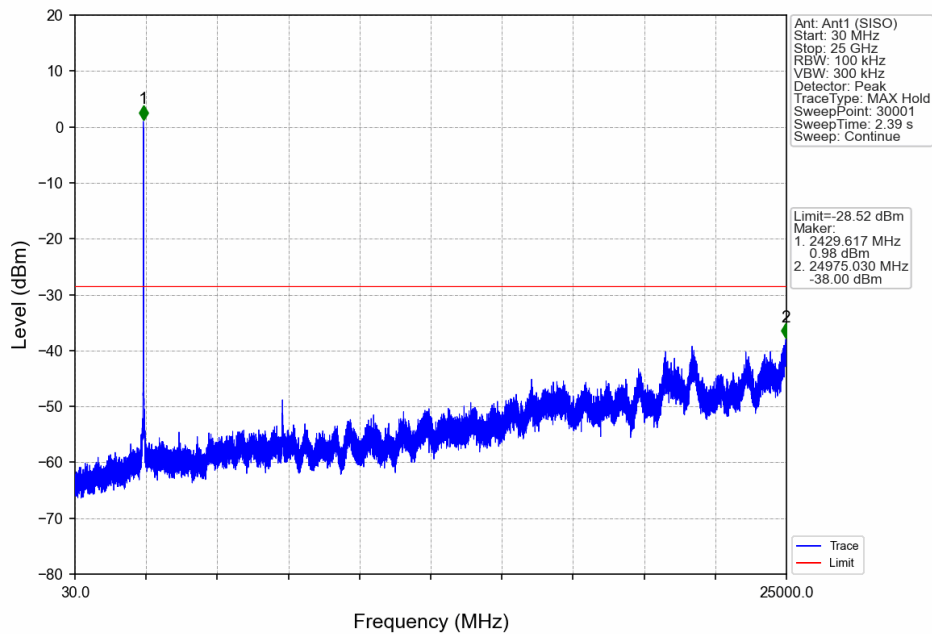
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



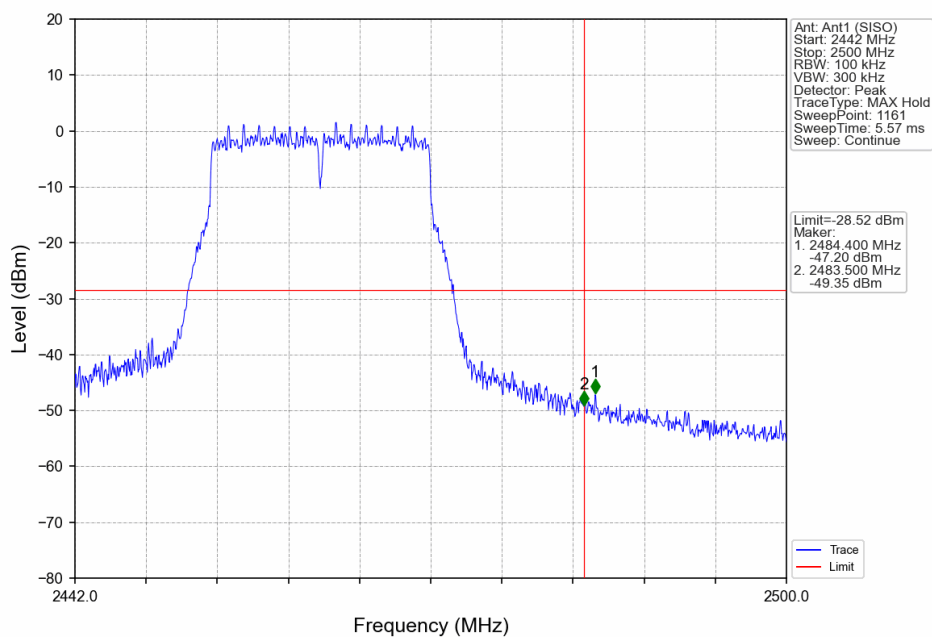
802.11n(HT20)\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

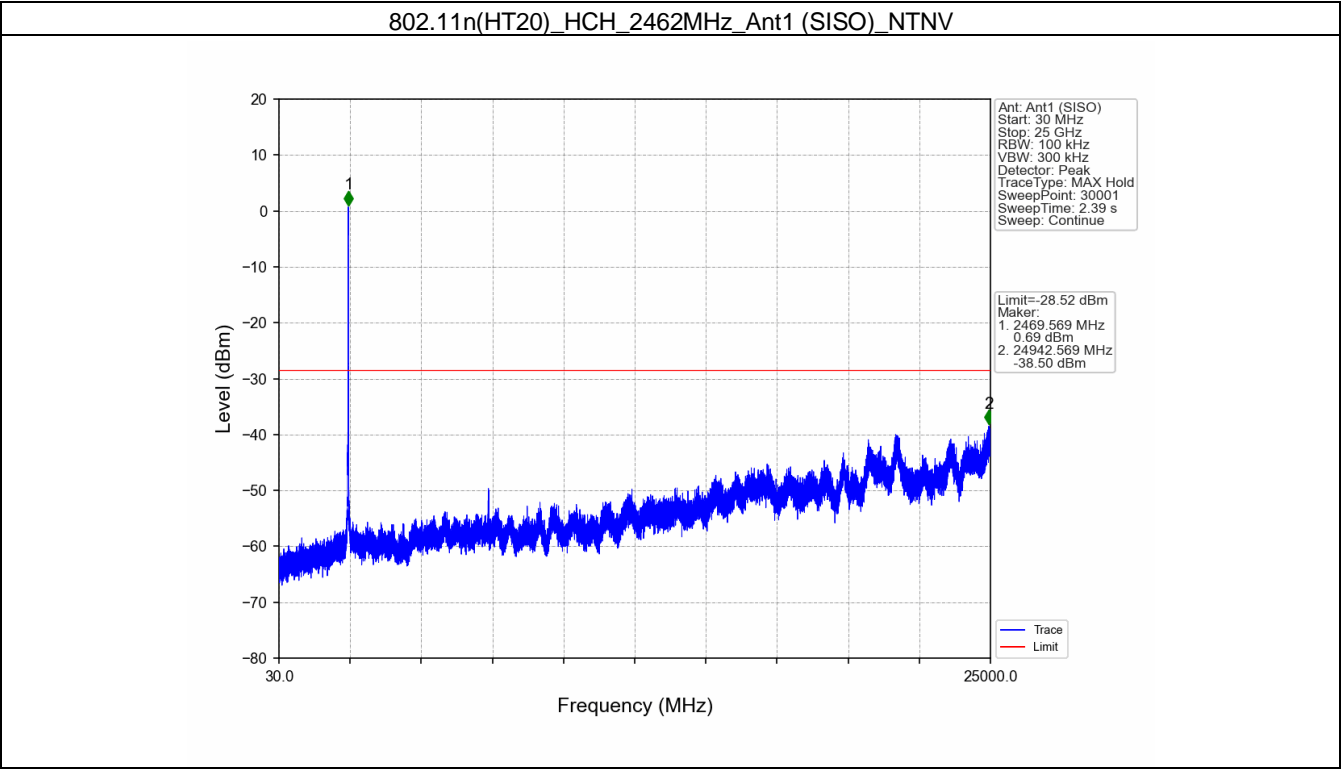


802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV



802.11n(HT20)\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV





- End of the Report -