



## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 1 of 121

# TEST REPORT

**Application No.:** KSCR2405000923AT  
**FCC ID:** 2AXNA-RCL36  
**Applicant:** AGM Global Vision LLC  
**Address of Applicant:** 173 West Main Street, #962, Springerville, AZ 85938, USA  
**Manufacturer:** AGM Global Vision LLC  
**Address of Manufacturer:** 173 West Main Street, #962, Springerville, AZ 85938, USA  
**Equipment Under Test (EUT):**  
**EUT Name:** Thermal Imaging Monocular  
**Model No.:** AGM ReachIR LRF 35-640,  
AGM ReachIR LRF 50-640, AGM ReachIR LRF 25-384  
  
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.  
**Trade Mark:** AGM  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.247  
**Date of Receipt:** 2024-05-22  
**Date of Test:** 2024-05-30 to 2024-06-12  
**Date of Issue:** 2024-06-13

<b>Test Result:</b>	<b>Pass*</b>
---------------------	--------------

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

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.





# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 2 of 121

<i>Revision Record</i>			
<i>Version</i>	<i>Description</i>	<i>Date</i>	<i>Remark</i>
00	Original	2024-06-13	/

<b>Authorized for issue by:</b>			
<b>Tested By</b>			
	Eric Liu /Project Engineer		
<b>Approved By</b>			
	Terry Hou /Reviewer		



## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 3 of 121

## 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)	

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Emissions which fall in the restricted bands		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

Note: Only the model AGM ReachIR LRF 35-640 was tested.

There are series models mentioned in this report, and they are the identical in electrical and electronic characters. Only the model AGM ReachIR LRF 35-640 was tested. Main differences: Inconsistent detector boards and differences in lens focal length. There are two suppliers for the laser ranging module, but the manufacturer is different, which does not affect RF performance.

### 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 Conducted Emissions at AC Power Line (150kHz-30MHz).....	10
7.2 Radiated Emissions which fall in the restricted bands.....	14
7.3 Radiated Spurious Emissions Below 1GHz .....	36
7.4 Radiated Spurious Emissions Above 1GHz.....	40
7.5 Conducted Peak Output Power.....	60
7.6 Minimum 6dB Bandwidth .....	62
7.7 Power Spectrum Density .....	63
7.8 Conducted Band Edges Measurement.....	64
7.9 Conducted Spurious Emissions .....	66
<b>8 Test Setup Photo .....</b>	<b>68</b>
<b>9 EUT Constructional Details (EUT Photos) .....</b>	<b>68</b>
<b>10 Appendix .....</b>	<b>69</b>

## 4 General Information

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

Power supply:	DC 5V by adapter Model: ADS-12EA-05 05010E Input: 100-240V~ 50/60Hz Output: DC 5.0V 2.0A
Test Voltage:	AC 120V/60Hz
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
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;802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	FPC Antenna
Antenna Gain:	1.62dBi (Provided by the manufacturer)

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	LENOVO	K27	EB24537645

### 4.3 Power level setting using in test

Channel	802.11b	802.11g	802.11n(HT20)
	Ant 1	Ant 1	Ant 1
1	17	18	18
6	16	17	17
11	16	17	16
Channel	802.11n(HT40)		
	Ant 1		
3	17		
6	17		
9	17		

**4.4 Measurement Uncertainty**

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 <sup>-8</sup>
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.

#### **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.: KSCR240500092301

Page: 8 of 121

### 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	Faratronc	EZ_EMC-v 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 FPC antenna and no consideration of replacement. The best case gain of the antenna is 1.62dBi.

Antenna location: Refer to internal photo.

## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

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

Operating Environment:

Temperature: 24.8 °C

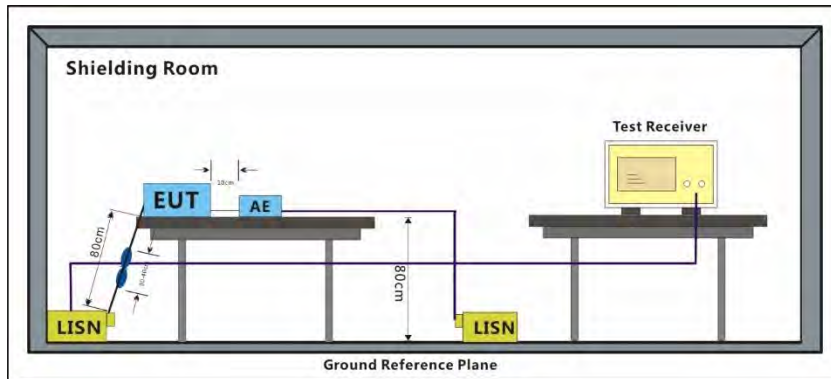
Humidity: 40.0 % RH

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**

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor

# Compliance Certification Services (Kunshan) Inc.

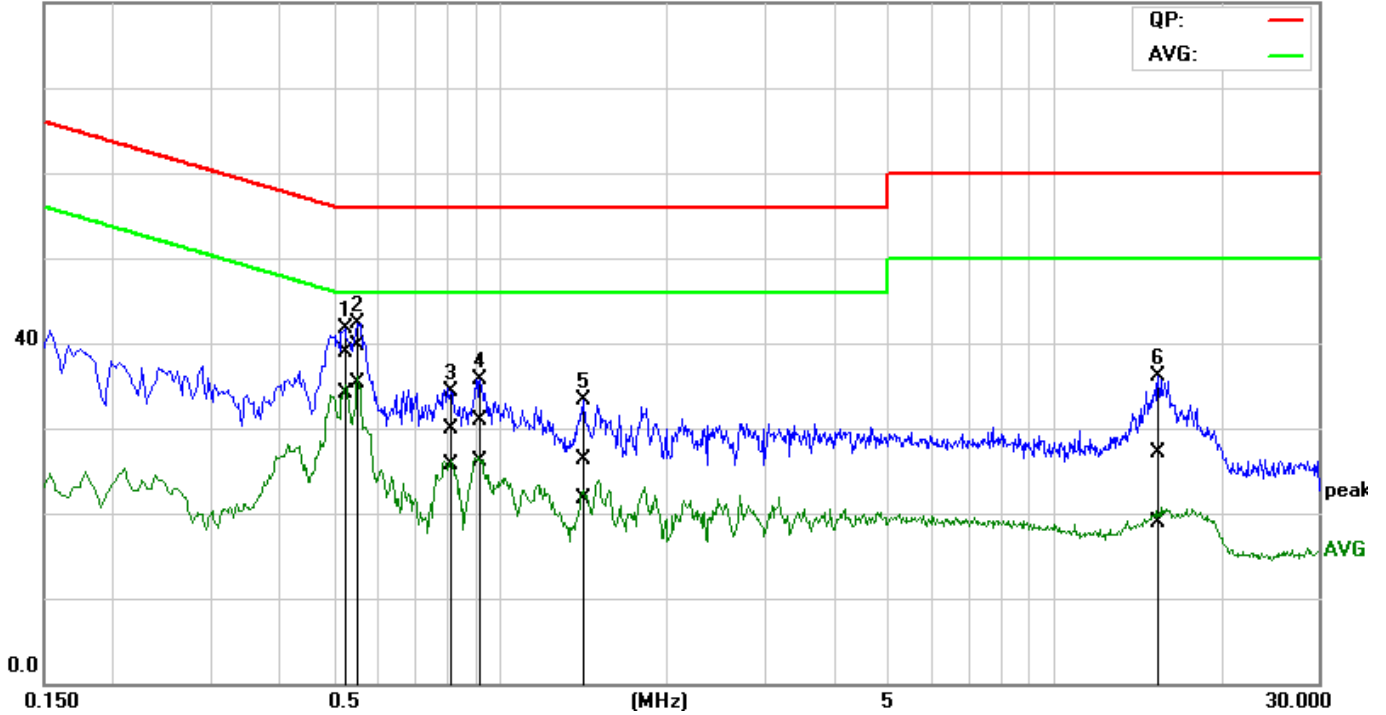
CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240500092301

Page: 12 of 121

Test Mode: 00; Line: Live line

80.0 dBuV



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.5207	18.95	14.12	20.00	38.95	34.12	56.00	46.00	-17.05	-11.88	Pass
2*	0.5564	19.81	15.33	19.96	39.77	35.29	56.00	46.00	-16.23	-10.71	Pass
3	0.8149	10.05	5.82	19.79	29.84	25.61	56.00	46.00	-26.16	-20.39	Pass
4	0.9112	11.18	6.36	19.82	31.00	26.18	56.00	46.00	-25.00	-19.82	Pass
5	1.4246	6.31	1.77	19.93	26.24	21.70	56.00	46.00	-29.76	-24.30	Pass
6	15.4411	7.45	-0.92	19.73	27.18	18.81	60.00	50.00	-32.82	-31.19	Pass

## Compliance Certification Services (Kunshan) Inc.

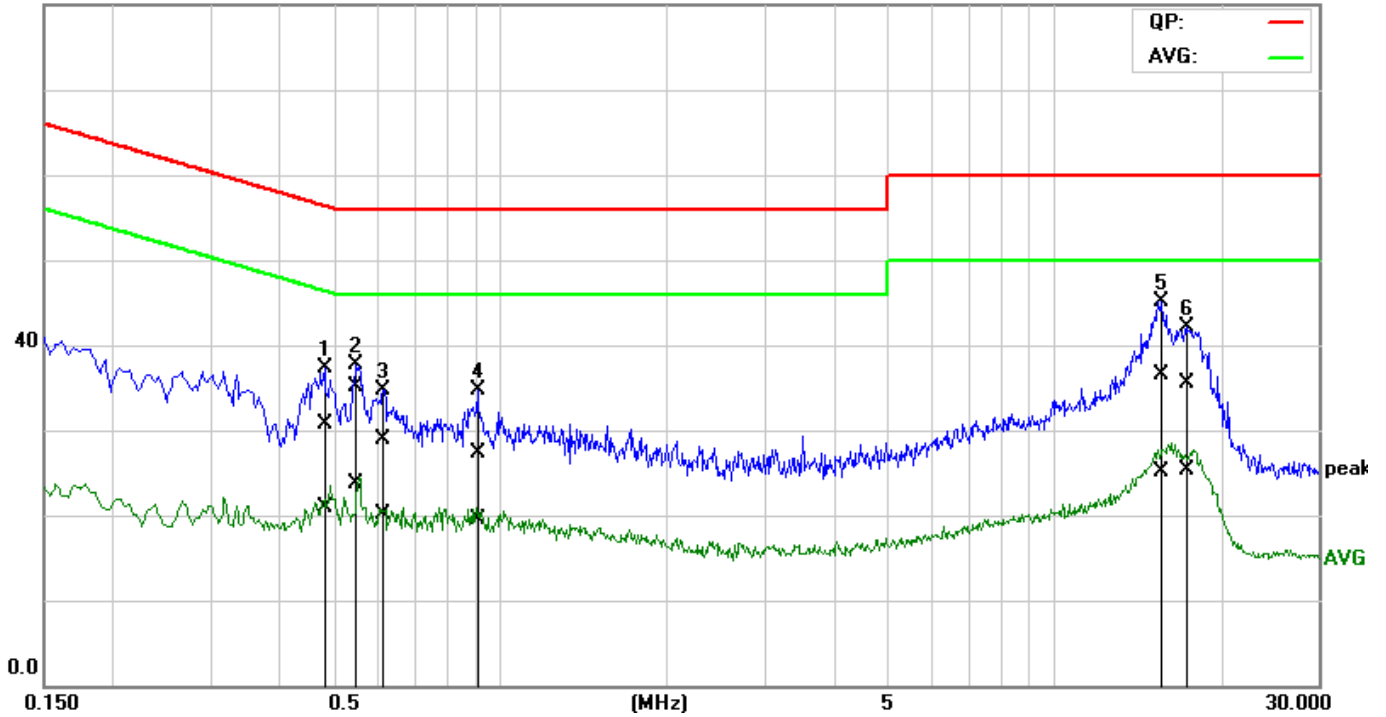
CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240500092301

Page: 13 of 121

Test Mode: 00; Line: Neutral Line

80.0 dBuV



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.4843	10.67	0.91	19.96	30.63	20.87	56.26	46.26	-25.63	-25.39	Pass
2*	0.5527	15.18	3.72	19.91	35.09	23.63	56.00	46.00	-20.91	-22.37	Pass
3	0.6082	9.12	0.28	19.88	29.00	20.16	56.00	46.00	-27.00	-25.84	Pass
4	0.9108	7.51	-0.30	19.89	27.40	19.59	56.00	46.00	-28.60	-26.41	Pass
5	15.6128	16.73	5.34	19.84	36.57	25.18	60.00	50.00	-23.43	-24.82	Pass
6	17.4320	15.59	5.49	19.83	35.42	25.32	60.00	50.00	-24.58	-24.68	Pass

## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 14 of 121

### 7.2 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.

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

Operating Environment:

Temperature: 20.5 °C

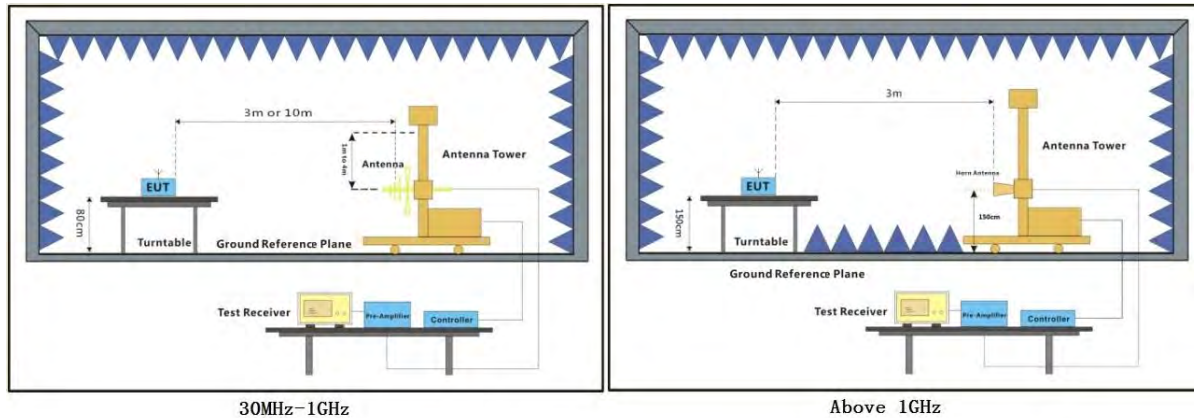
Humidity: 50.5 % RH

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. 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.
- c. 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.
- d. 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.
- e. 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.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. 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.
- j. 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.

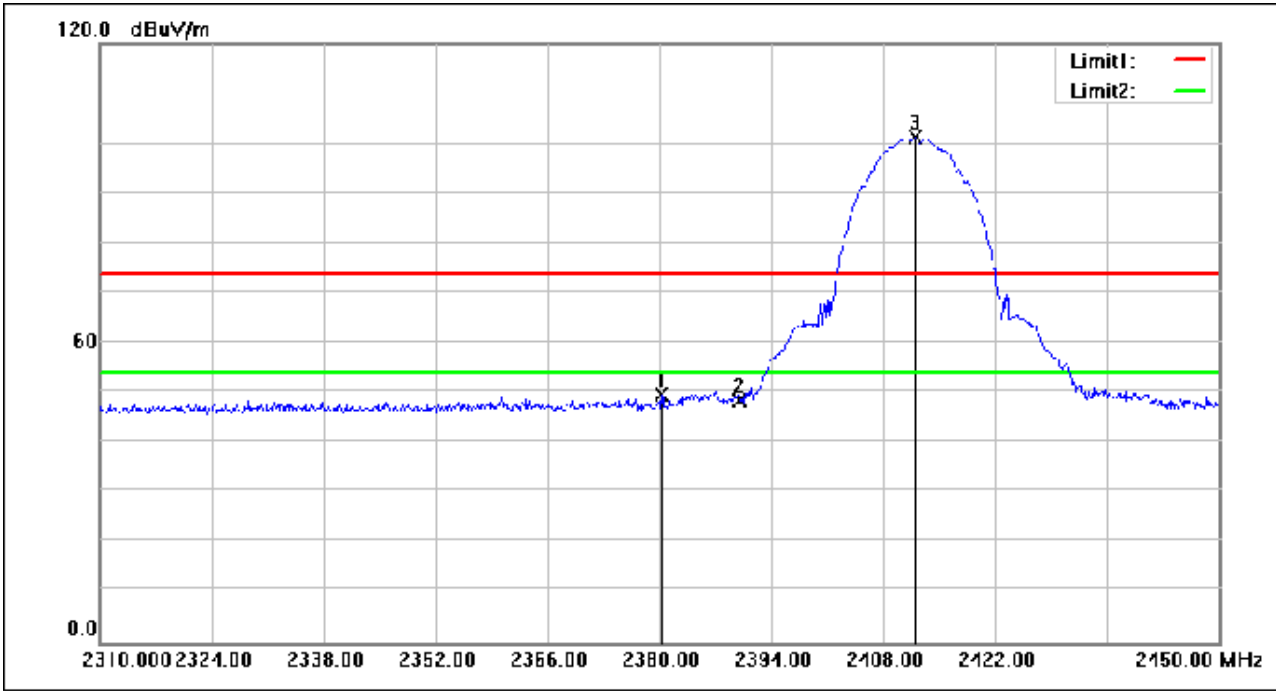
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 16 of 121

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	2380.350	73.10	-23.40	49.70	74.00	-24.30	peak
2	2390.000	71.71	-23.39	48.32	74.00	-25.68	peak
3	2411.990	124.48	-23.37	101.11	74.00	27.11	peak



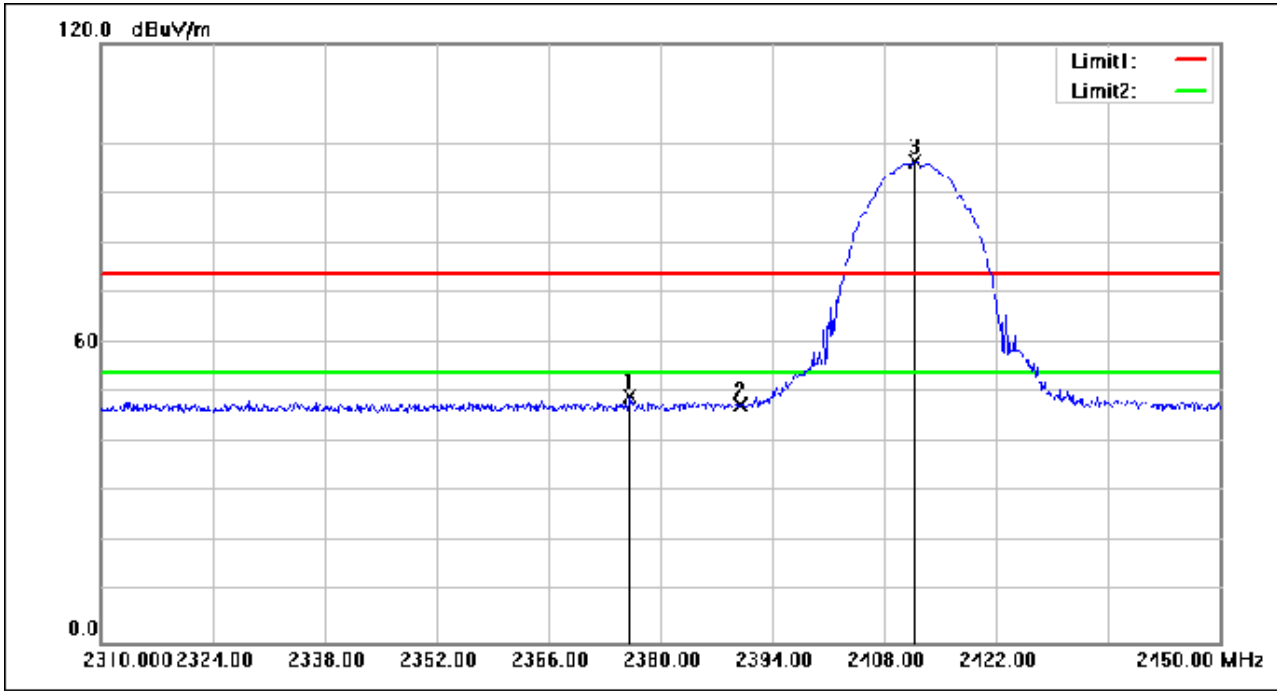
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 17 of 121

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	2376.290	72.67	-23.42	49.25	74.00	-24.75	peak
2	2390.000	70.96	-23.39	47.57	74.00	-26.43	peak
3	2411.850	119.79	-23.37	96.42	74.00	22.42	peak

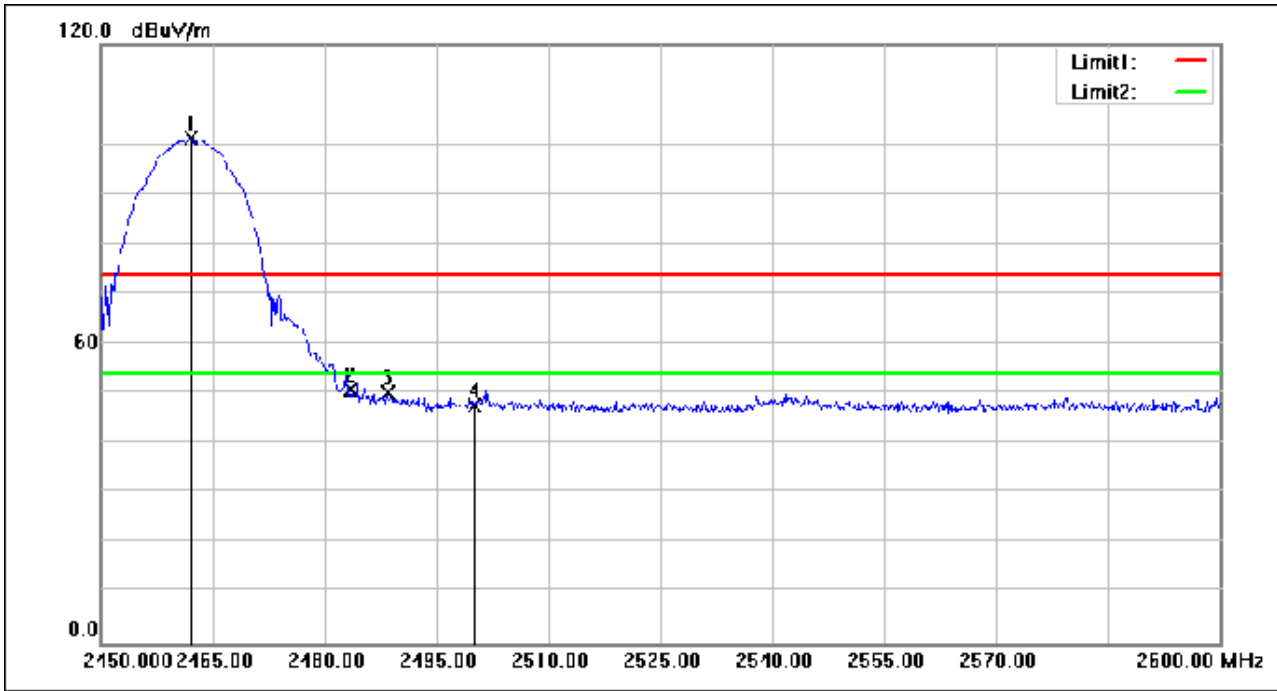
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 18 of 121

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	2462.000	124.53	-23.33	101.20	74.00	27.20	peak
2	2483.500	74.27	-23.36	50.91	74.00	-23.09	peak
3	2488.475	73.67	-23.36	50.31	74.00	-23.69	peak
4	2500.000	70.78	-23.37	47.41	74.00	-26.59	peak

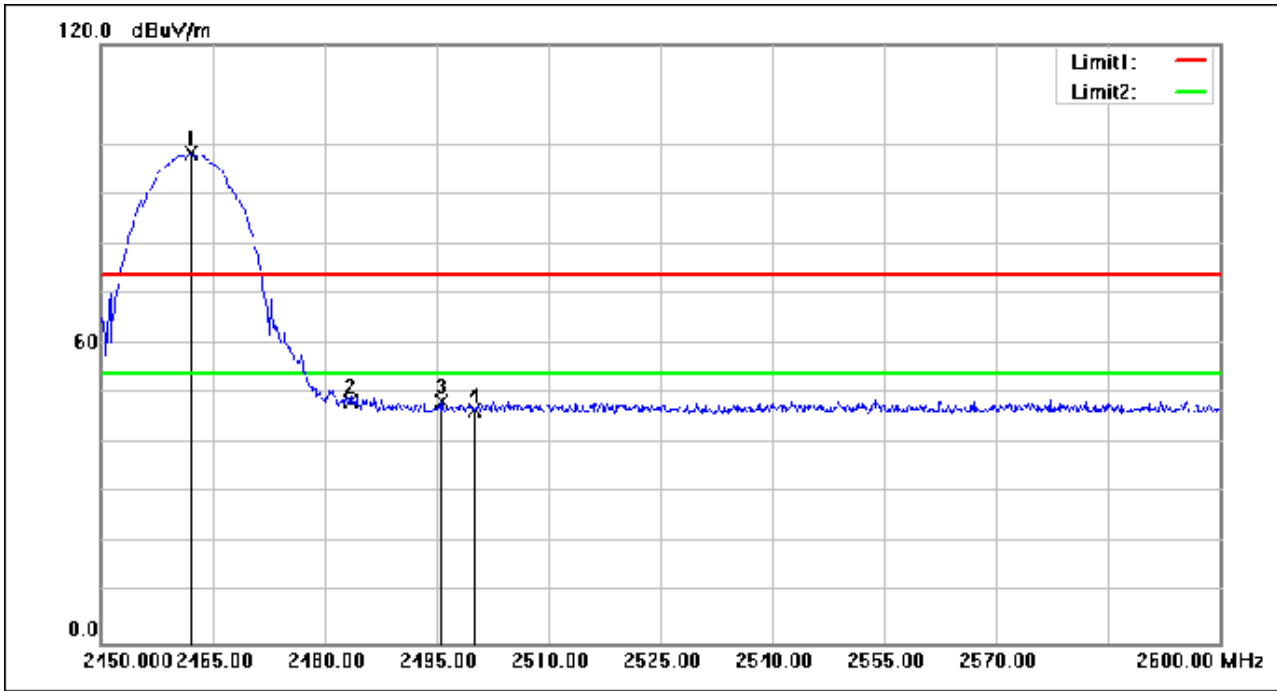
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 19 of 121

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	2462.150	121.64	-23.33	98.31	74.00	24.31	peak
2	2483.500	71.80	-23.36	48.44	74.00	-25.56	peak
3	2495.750	71.96	-23.36	48.60	74.00	-25.40	peak
4	2500.000	70.15	-23.37	46.78	74.00	-27.22	peak

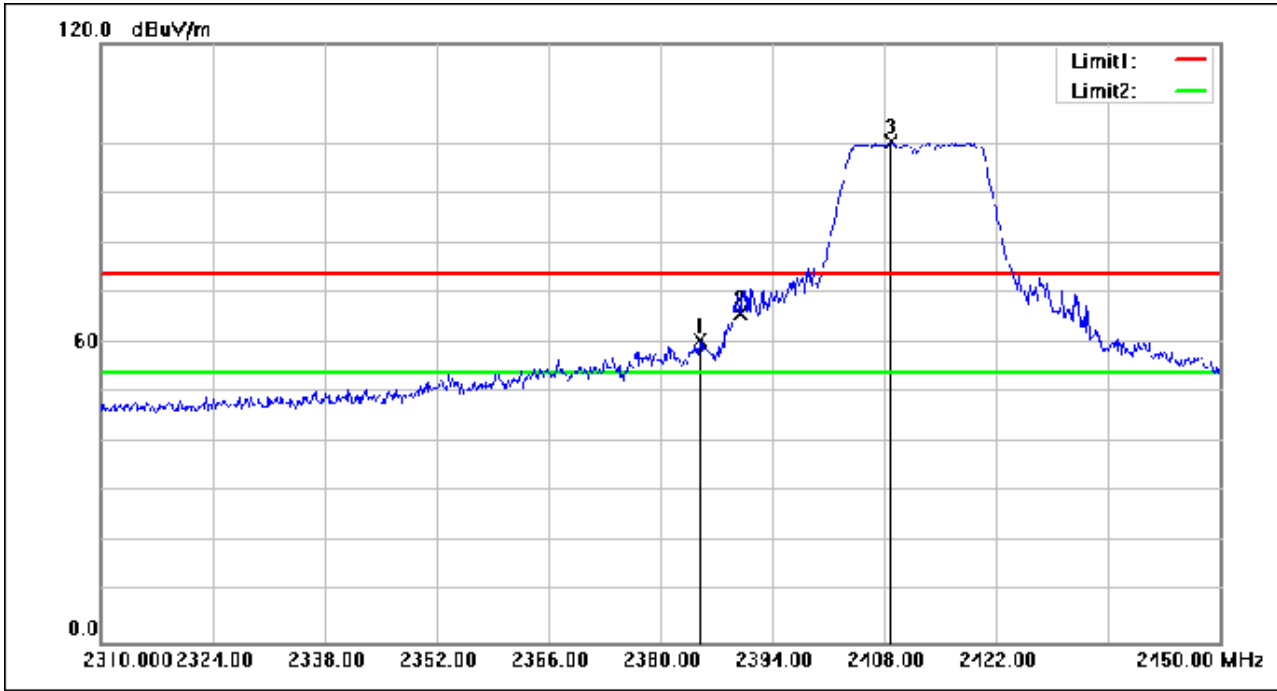
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 20 of 121

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	2384.900	83.78	-23.40	60.38	74.00	-13.62	peak
2	2390.000	89.30	-23.39	65.91	74.00	-8.09	peak
3	2408.840	123.73	-23.37	100.36	74.00	26.36	peak

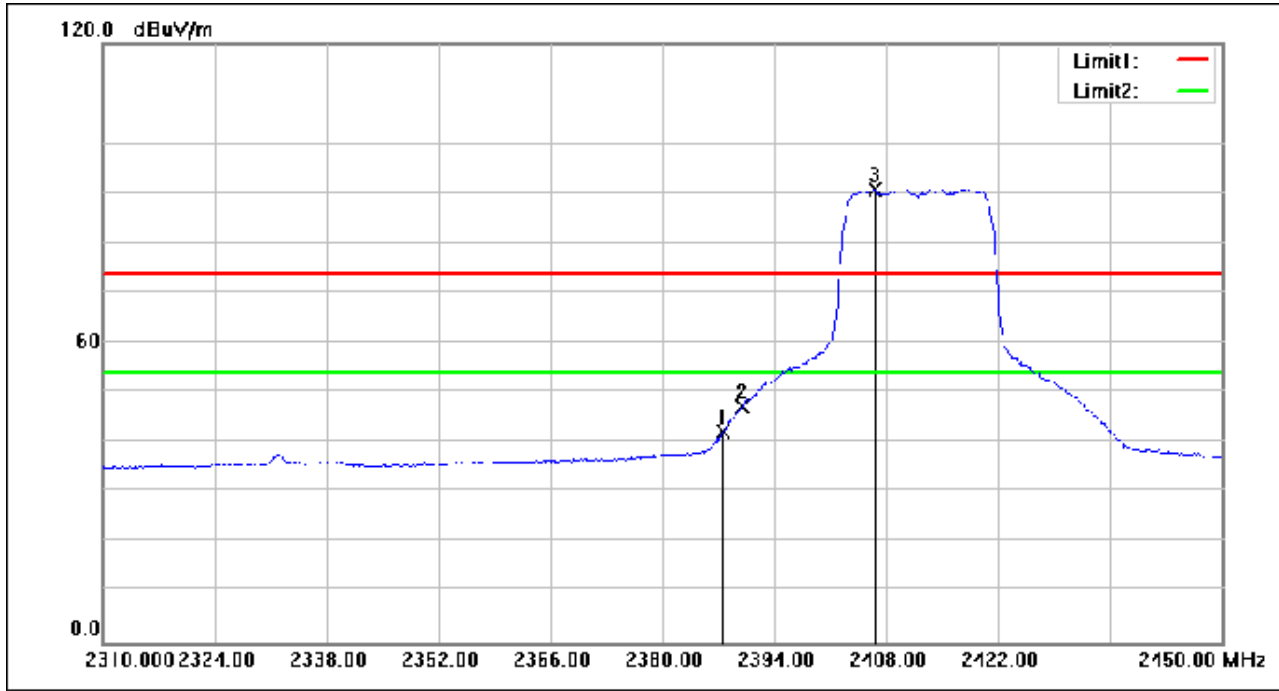
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 21 of 121

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	2387.630	65.49	-23.39	42.10	54.00	-11.90	AVG
2	2390.000	70.62	-23.39	47.23	54.00	-6.77	AVG
3	2406.600	114.06	-23.37	90.69	54.00	36.69	AVG

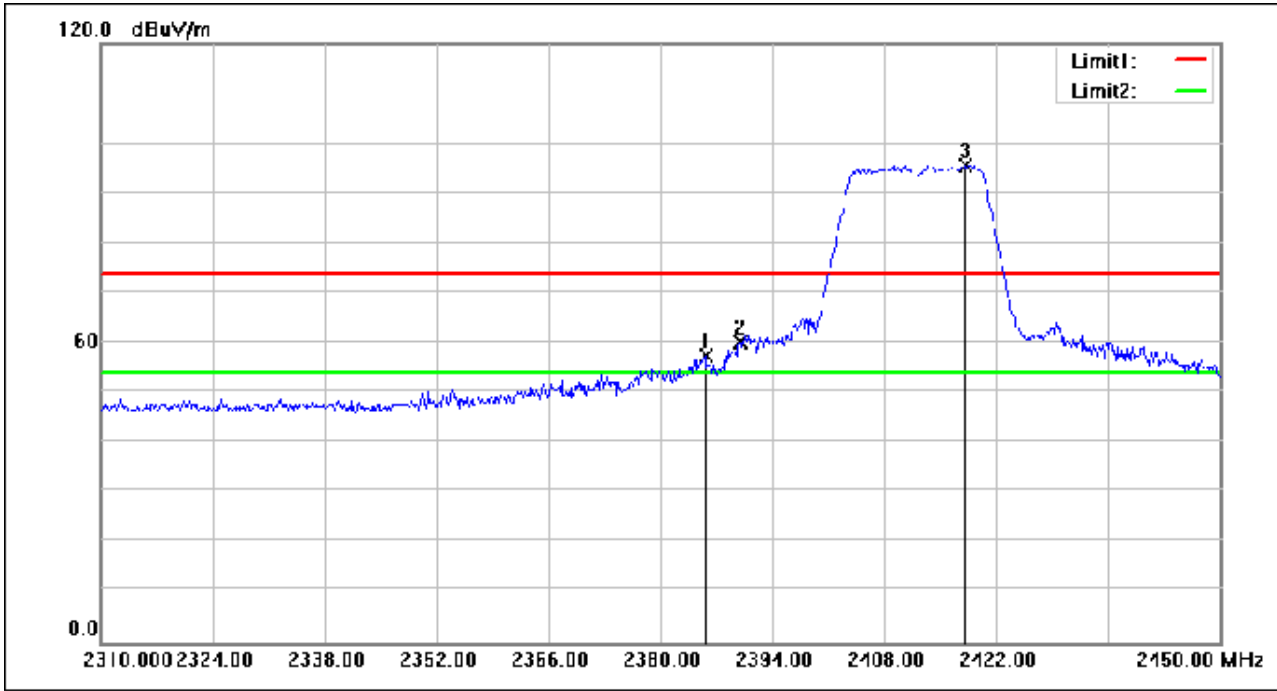
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 22 of 121

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	2385.600	80.94	-23.40	57.54	74.00	-16.46	peak
2	2390.000	83.66	-23.39	60.27	74.00	-13.73	peak
3	2418.220	118.91	-23.36	95.55	74.00	21.55	peak

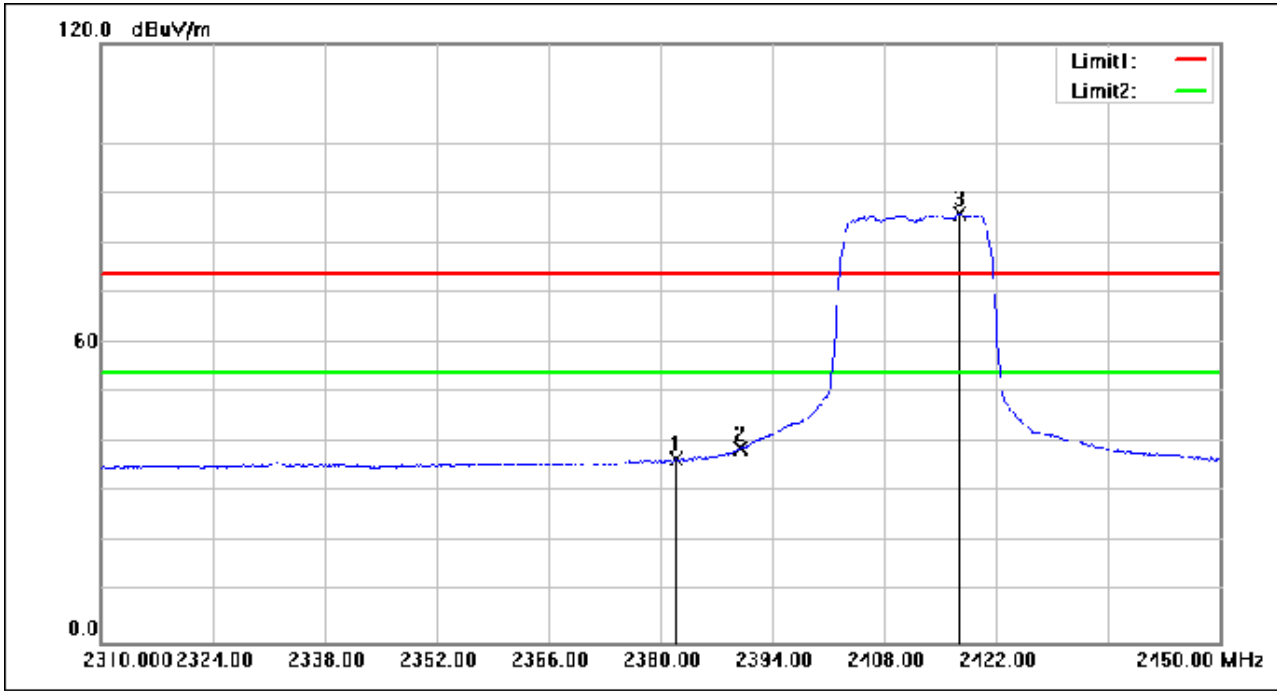
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 23 of 121

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	2382.030	60.12	-23.40	36.72	54.00	-17.28	AVG
2	2390.000	62.35	-23.39	38.96	54.00	-15.04	AVG
3	2417.380	109.28	-23.36	85.92	54.00	31.92	AVG

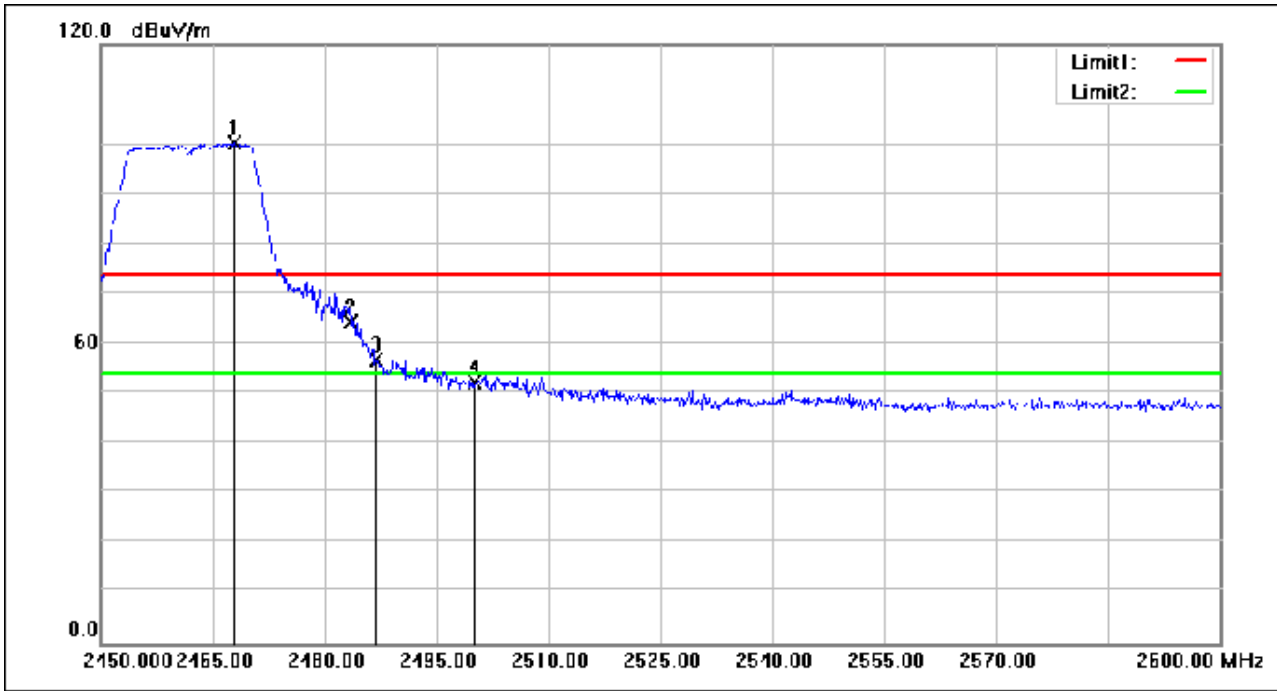
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 24 of 121

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	2467.850	123.67	-23.34	100.33	74.00	26.33	peak
2	2483.500	87.62	-23.36	64.26	74.00	-9.74	peak
3	2486.975	80.22	-23.35	56.87	74.00	-17.13	peak
4	2500.000	75.73	-23.37	52.36	74.00	-21.64	peak



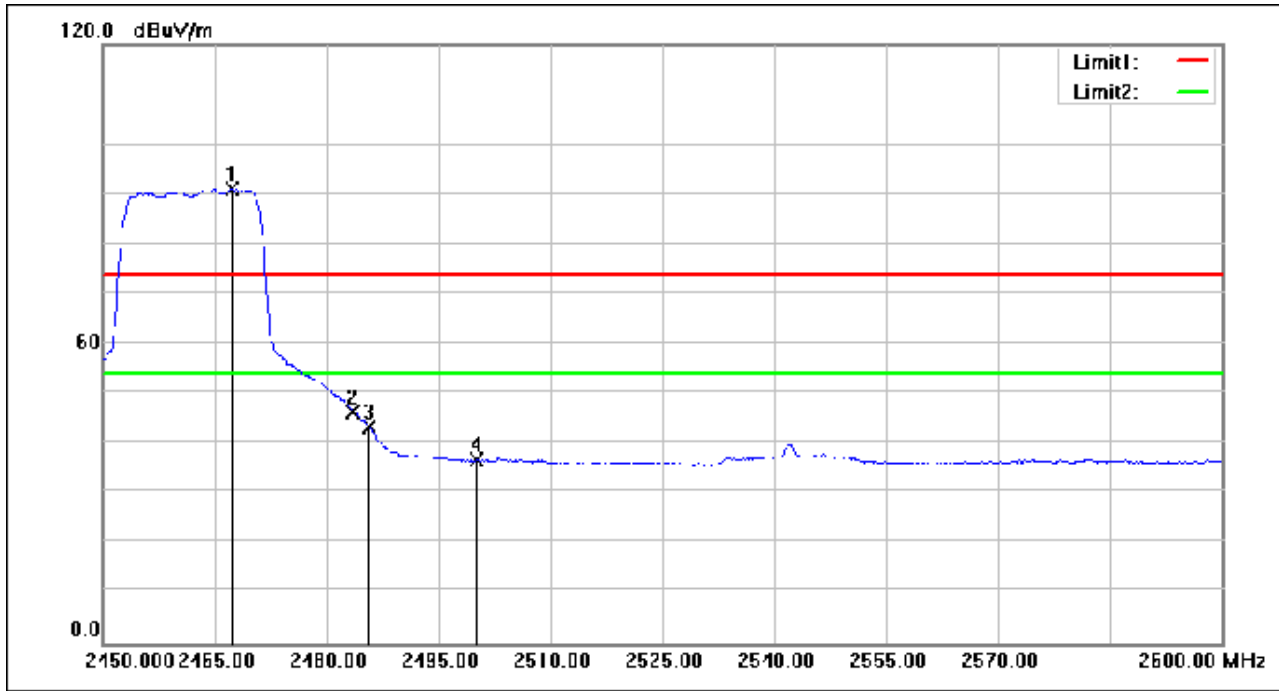
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 25 of 121

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	2467.250	114.39	-23.33	91.06	54.00	37.06	AVG
2	2483.500	69.86	-23.36	46.50	54.00	-7.50	AVG
3	2485.775	66.67	-23.35	43.32	54.00	-10.68	AVG
4	2500.000	60.23	-23.37	36.86	54.00	-17.14	AVG

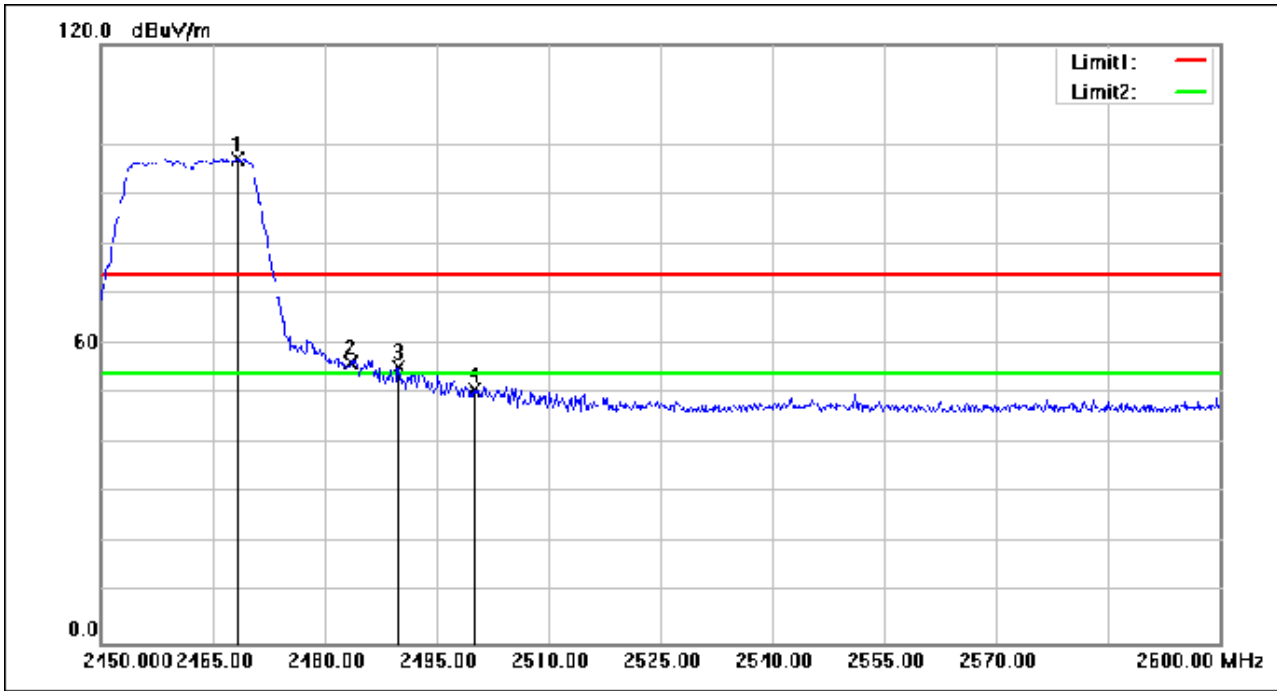
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 26 of 121

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	2468.300	120.50	-23.34	97.16	74.00	23.16	peak
2	2483.500	79.49	-23.36	56.13	74.00	-17.87	peak
3	2489.975	78.64	-23.36	55.28	74.00	-18.72	peak
4	2500.000	74.22	-23.37	50.85	74.00	-23.15	peak

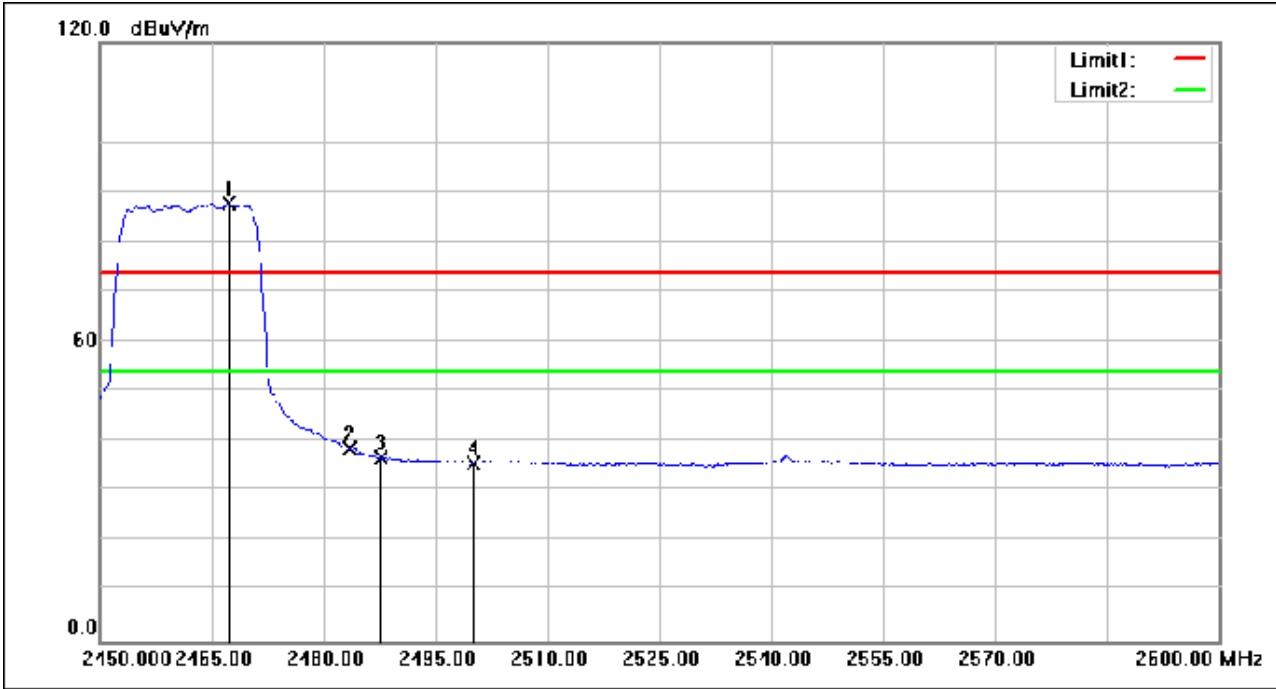
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 27 of 121

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	2467.250	111.12	-23.33	87.79	54.00	33.79	AVG
2	2483.500	62.01	-23.36	38.65	54.00	-15.35	AVG
3	2487.650	60.17	-23.36	36.81	54.00	-17.19	AVG
4	2500.000	59.05	-23.37	35.68	54.00	-18.32	AVG

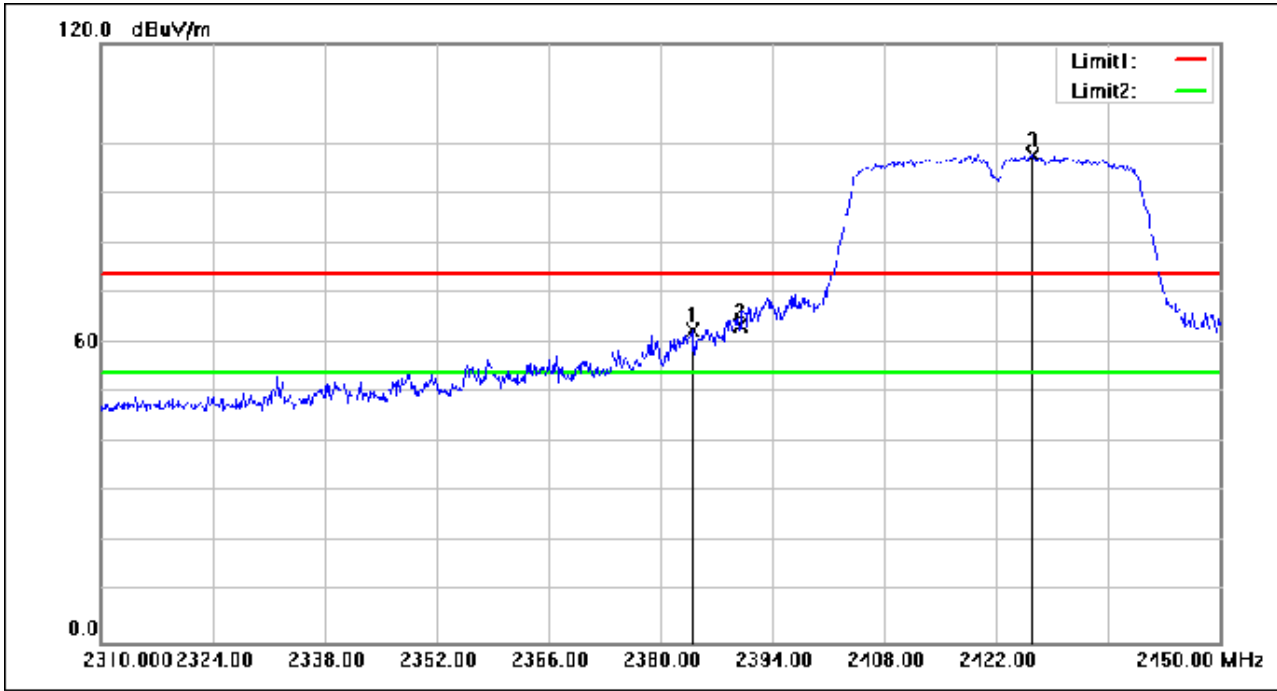
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 28 of 121

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2383.990	85.97	-23.40	62.57	74.00	-11.43	peak
2	2390.000	86.97	-23.39	63.58	74.00	-10.42	peak
3	2426.480	121.01	-23.35	97.66	74.00	23.66	peak

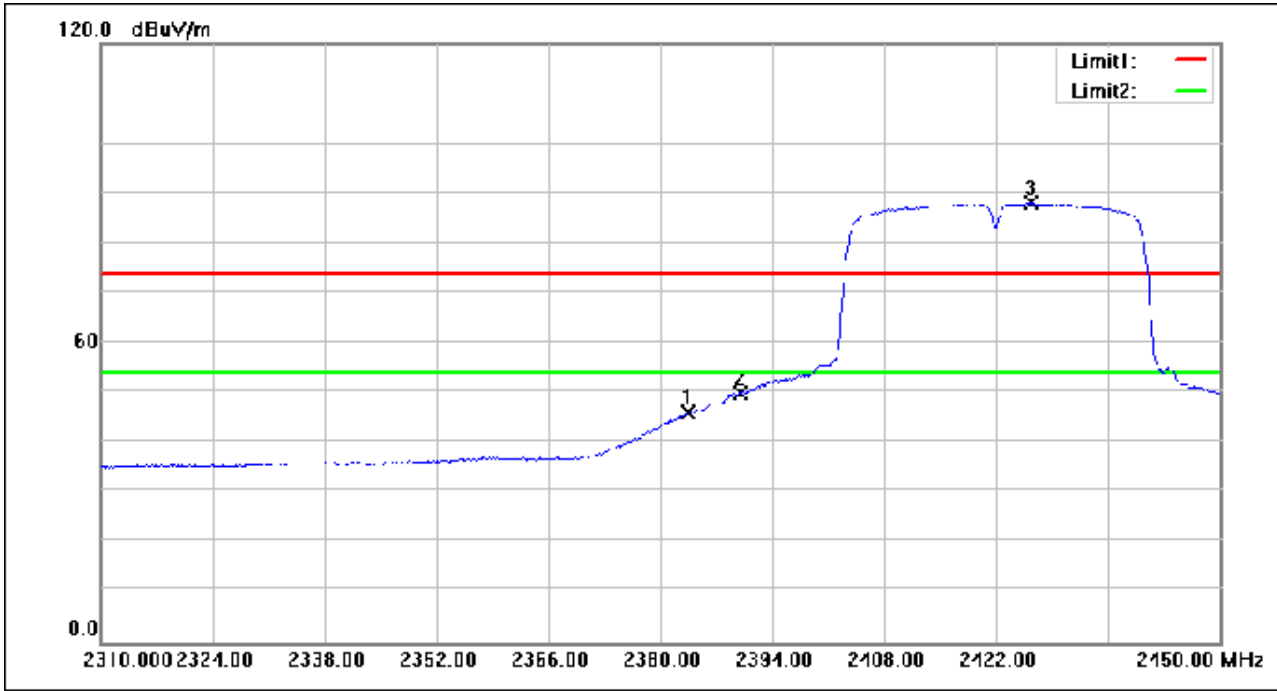
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 29 of 121

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2383.570	69.41	-23.40	46.01	54.00	-7.99	AVG
2	2390.000	73.23	-23.39	49.84	54.00	-4.16	AVG
3	2426.410	111.37	-23.35	88.02	54.00	34.02	AVG

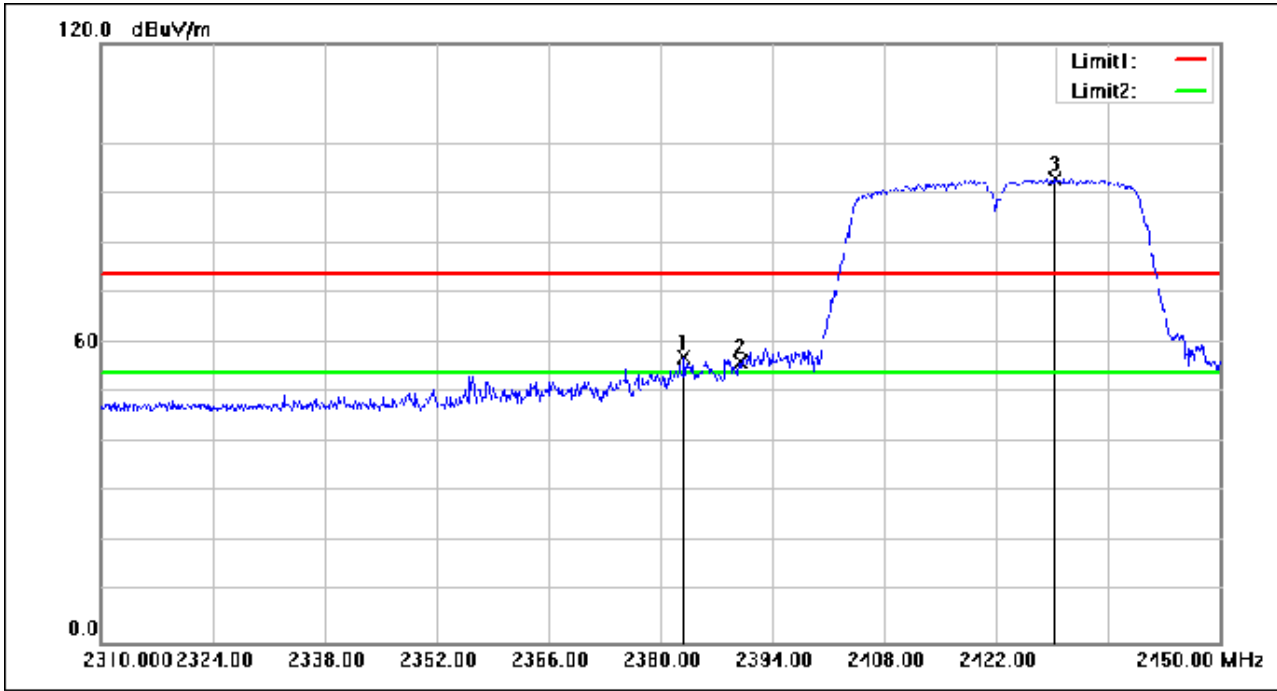
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 30 of 121

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2383.010	80.49	-23.40	57.09	74.00	-16.91	peak
2	2390.000	79.79	-23.39	56.40	74.00	-17.60	peak
3	2429.420	116.31	-23.35	92.96	74.00	18.96	peak

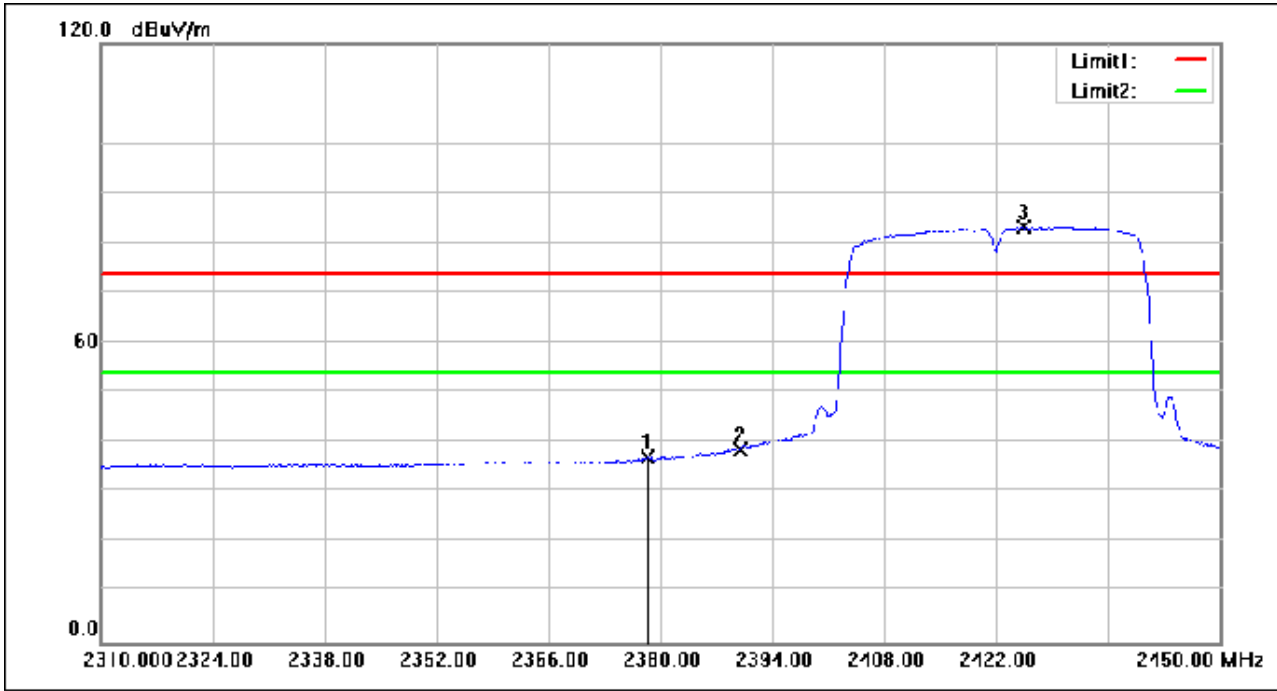
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 31 of 121

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2378.390	60.56	-23.42	37.14	54.00	-16.86	AVG
2	2390.000	62.08	-23.39	38.69	54.00	-15.31	AVG
3	2425.430	106.65	-23.35	83.30	54.00	29.30	AVG

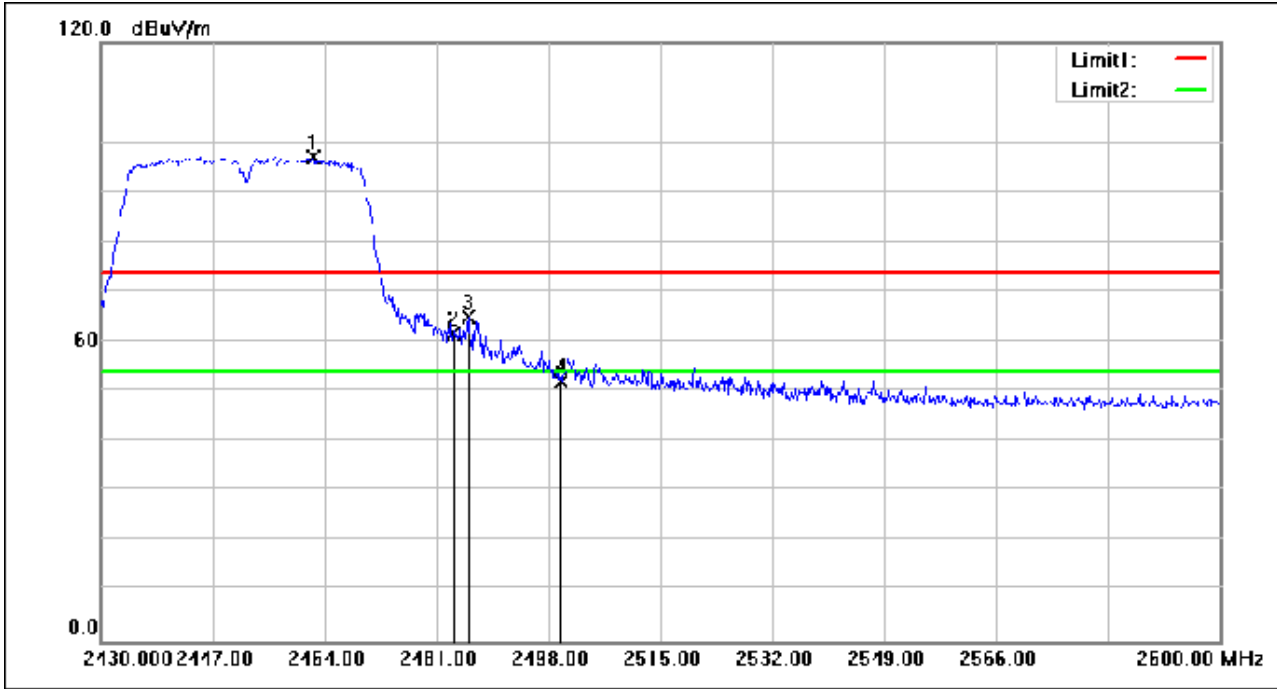
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 32 of 121

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.300	120.29	-23.33	96.96	74.00	22.96	peak
2	2483.500	85.00	-23.36	61.64	74.00	-12.36	peak
3	2485.845	88.33	-23.35	64.98	74.00	-9.02	peak
4	2500.000	75.42	-23.37	52.05	74.00	-21.95	peak



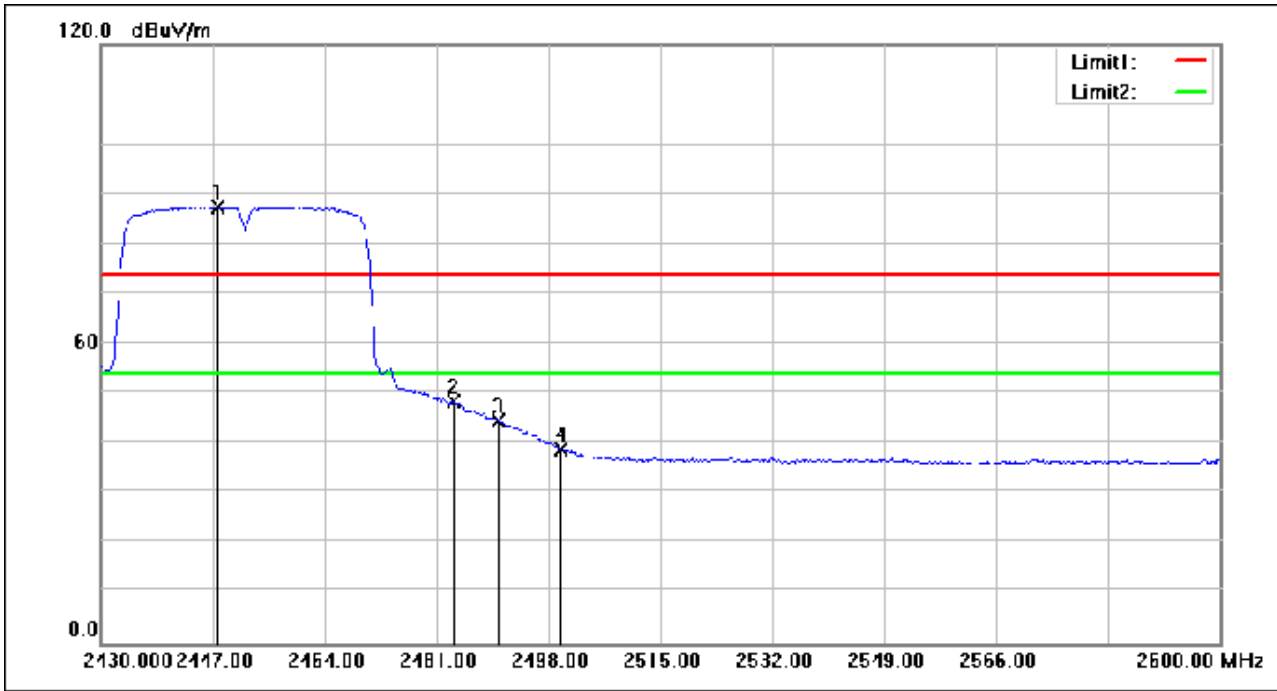
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 33 of 121

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2447.850	110.81	-23.33	87.48	54.00	33.48	AVG
2	2483.500	71.67	-23.36	48.31	54.00	-5.69	AVG
3	2490.350	67.97	-23.36	44.61	54.00	-9.39	AVG
4	2500.000	62.17	-23.37	38.80	54.00	-15.20	AVG

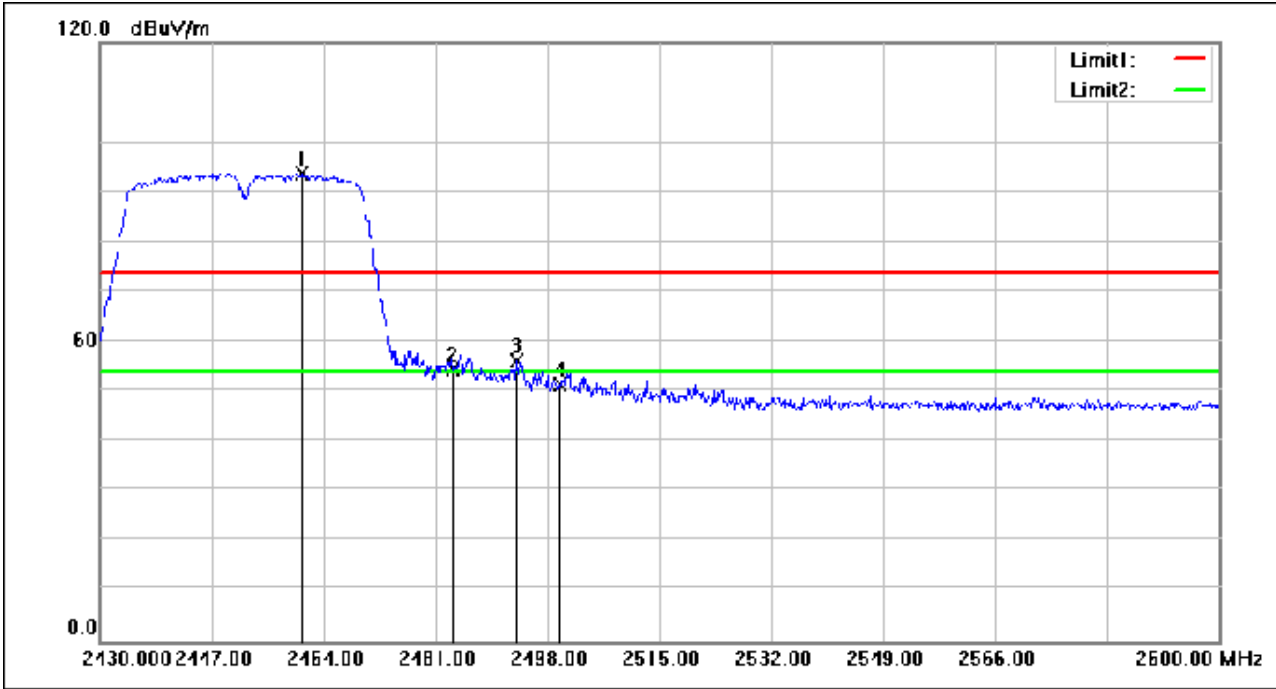
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 34 of 121

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.770	117.11	-23.33	93.78	74.00	19.78	peak
2	2483.500	77.88	-23.36	54.52	74.00	-19.48	peak
3	2493.240	79.72	-23.36	56.36	74.00	-17.64	peak
4	2500.000	74.70	-23.37	51.33	74.00	-22.67	peak

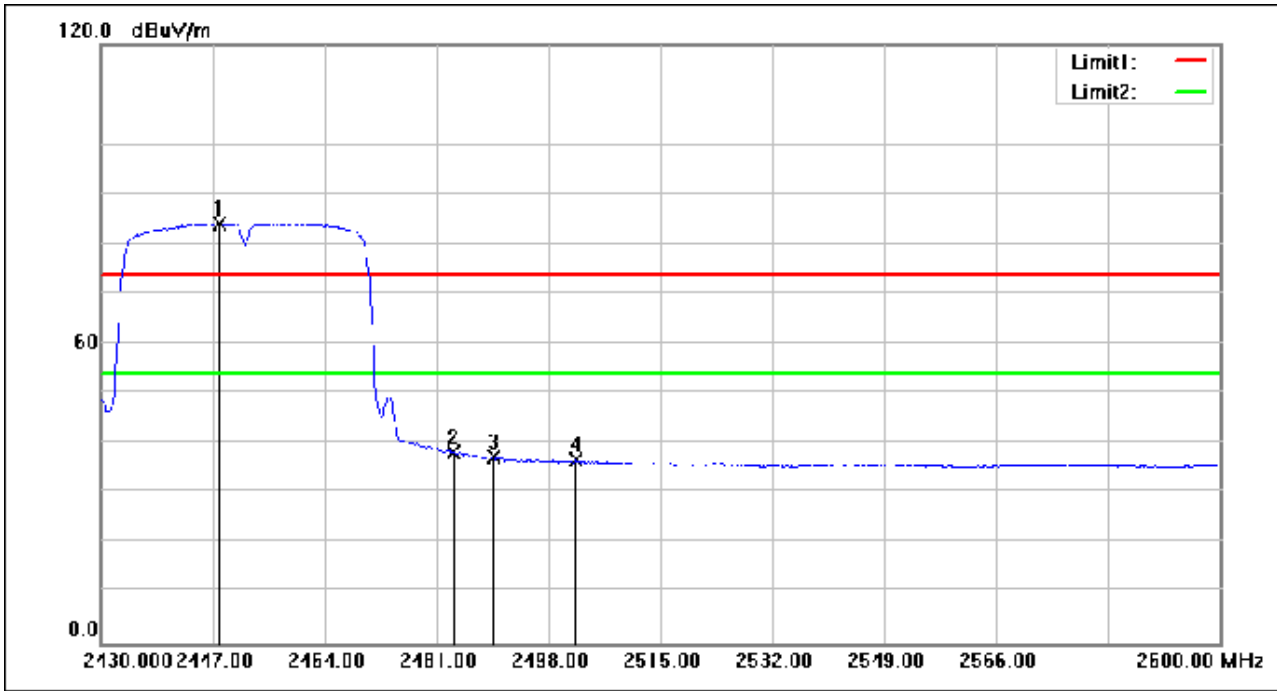
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 35 of 121

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2448.105	107.61	-23.33	84.28	54.00	30.28	AVG
2	2483.500	61.58	-23.36	38.22	54.00	-15.78	AVG
3	2489.755	60.73	-23.36	37.37	54.00	-16.63	AVG
4	2502.335	59.96	-23.36	36.60	54.00	-17.40	AVG

**7.3 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

**7.3.1 E.U.T. Operation**

Operating Environment:

Temperature: 20.5 °C

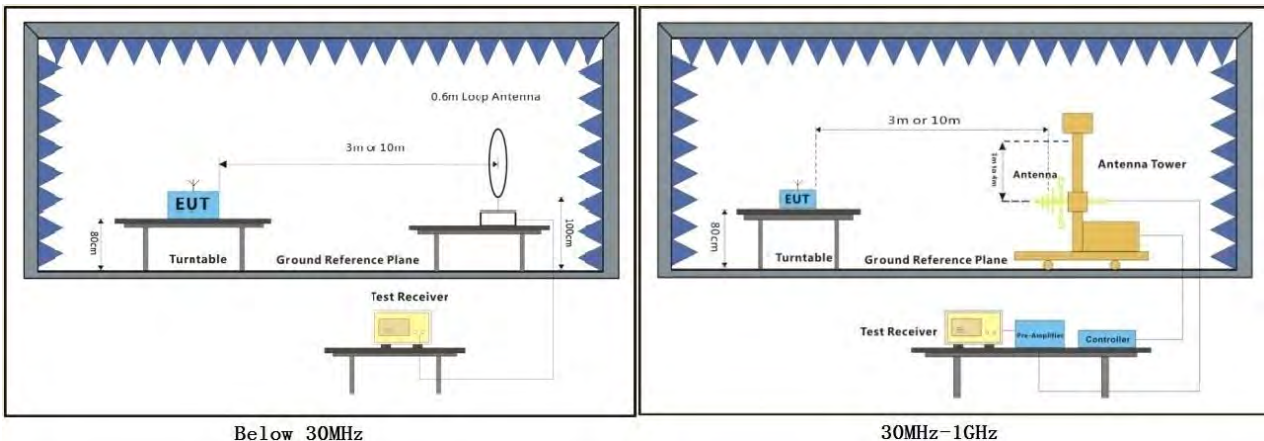
Humidity: 50.5 % RH

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 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.  $Level = Read\ Level + Cable\ Loss + Antenna\ Factor - Preamplifier\ Factor$
- 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.

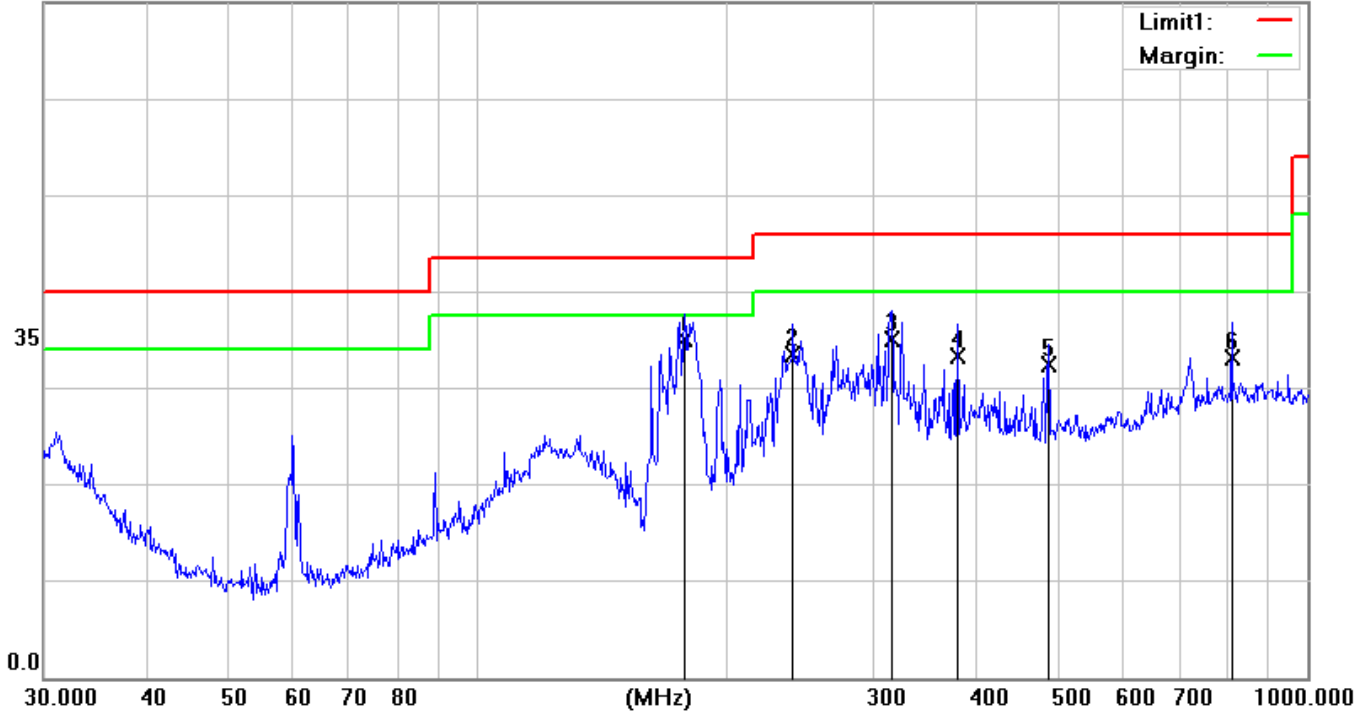
CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240500092301

Page: 38 of 121

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	177.5092	22.77	12.25	35.02	43.50	-8.48	200	359	QP
2	239.9873	19.80	13.72	33.52	46.00	-12.48	100	205	QP
3	315.4808	19.29	15.86	35.15	46.00	-10.85	300	344	QP
4	378.5843	16.38	17.04	33.42	46.00	-12.58	100	76	QP
5	487.3151	12.15	20.26	32.41	46.00	-13.59	100	135	QP
6	810.2654	8.77	24.48	33.25	46.00	-12.75	100	41	QP

# Compliance Certification Services (Kunshan) Inc.

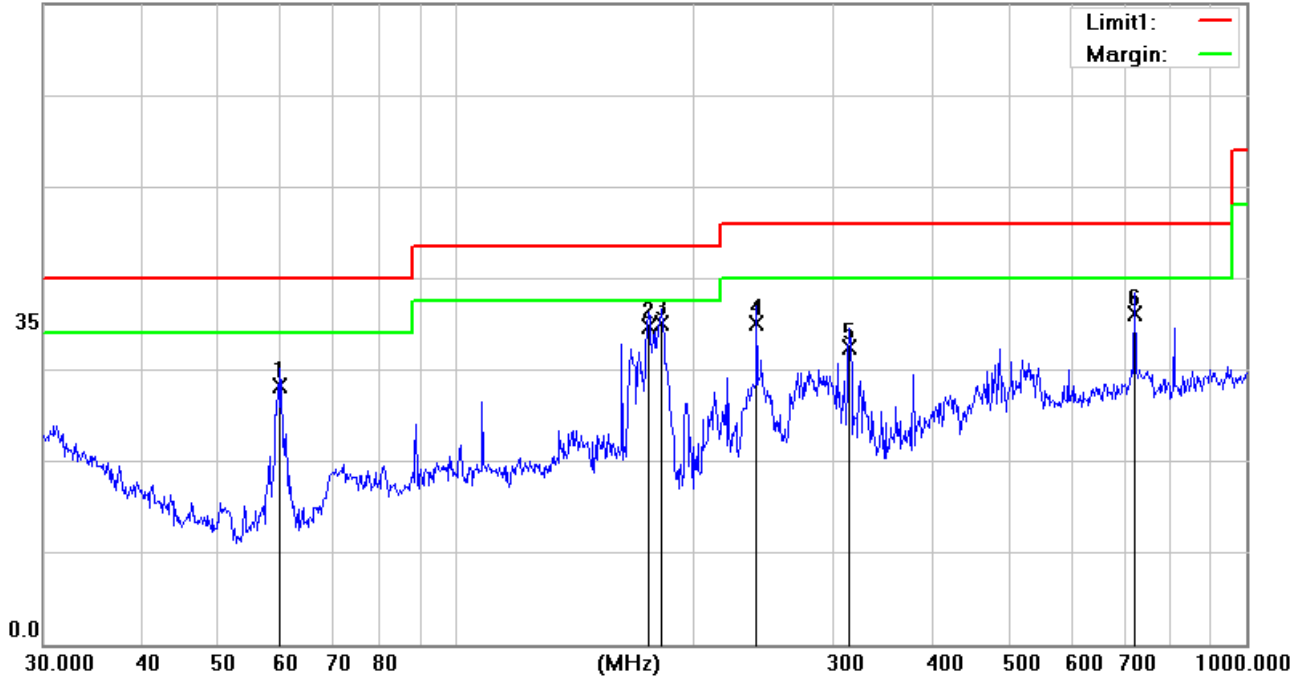
CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240500092301

Page: 39 of 121

Test Mode: 00; Polarity: Vertical

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	59.8588	22.20	6.12	28.32	40.00	-11.68	100	298	QP
2	175.0368	22.99	11.67	34.66	43.50	-8.84	200	336	QP
3	181.9202	22.89	12.13	35.02	43.50	-8.48	100	309	QP
4	239.9873	21.43	13.72	35.15	46.00	-10.85	100	253	QP
5	314.3765	16.44	15.97	32.41	46.00	-13.59	100	305	QP
6	721.7259	12.06	24.16	36.22	46.00	-9.78	100	117	QP

# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 40 of 121

## 7.4 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

### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 20.5 °C

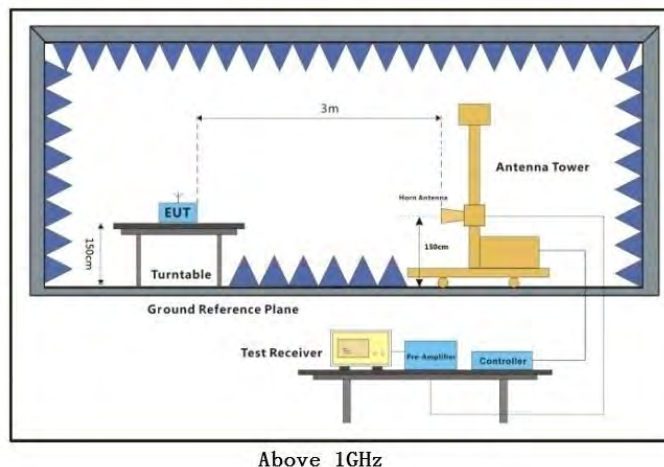
Humidity: 50.5 % RH

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





**7.4.4 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.  $Level = Read\ Level + Cable\ Loss + Antenna\ Factor - Preamp\ Factor$
- 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.



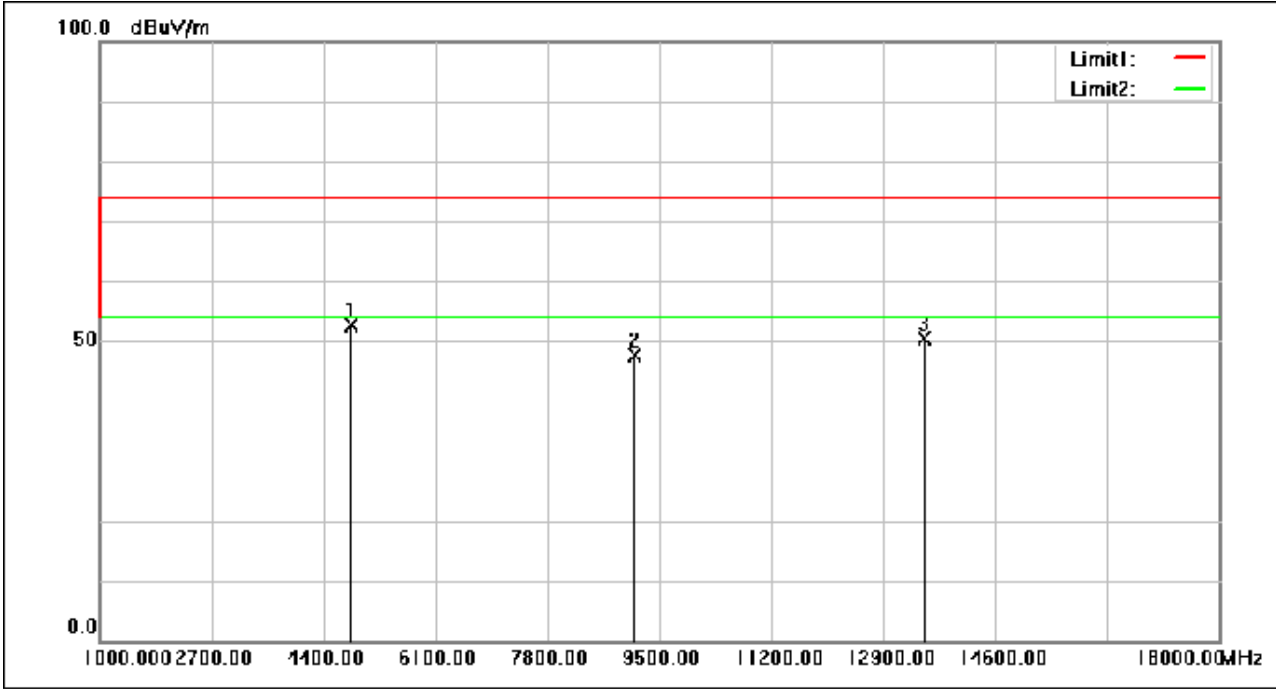
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 42 of 121

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	4823.640	70.69	-18.09	52.60	74.00	-21.40	peak
2	9137.560	57.41	-9.86	47.55	74.00	-26.45	peak
3	13522.200	58.08	-7.66	50.42	74.00	-23.58	peak



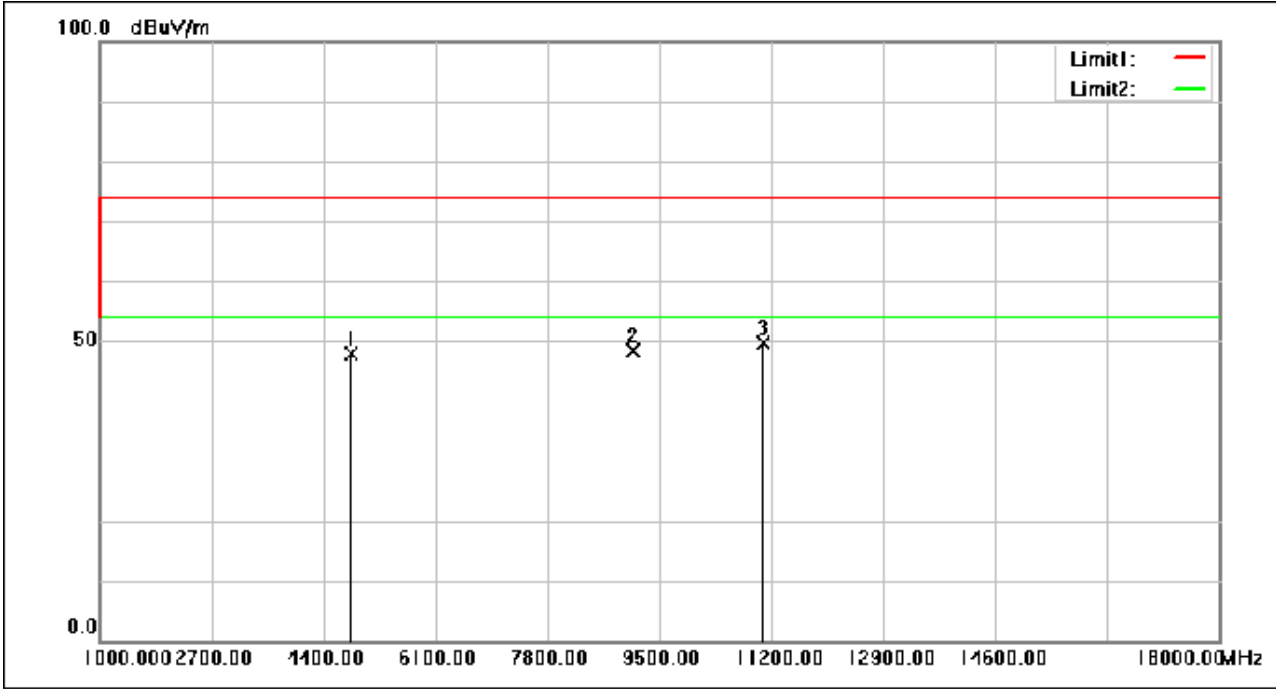
**Compliance Certification Services (Kunshan) Inc.**

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

Report No.: KSCR240500092301

Page: 43 of 121

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	4823.640	65.90	-18.09	47.81	74.00	-26.19	peak
2	9115.120	58.25	-9.87	48.38	74.00	-25.62	peak
3	11072.160	57.10	-7.44	49.66	74.00	-24.34	peak



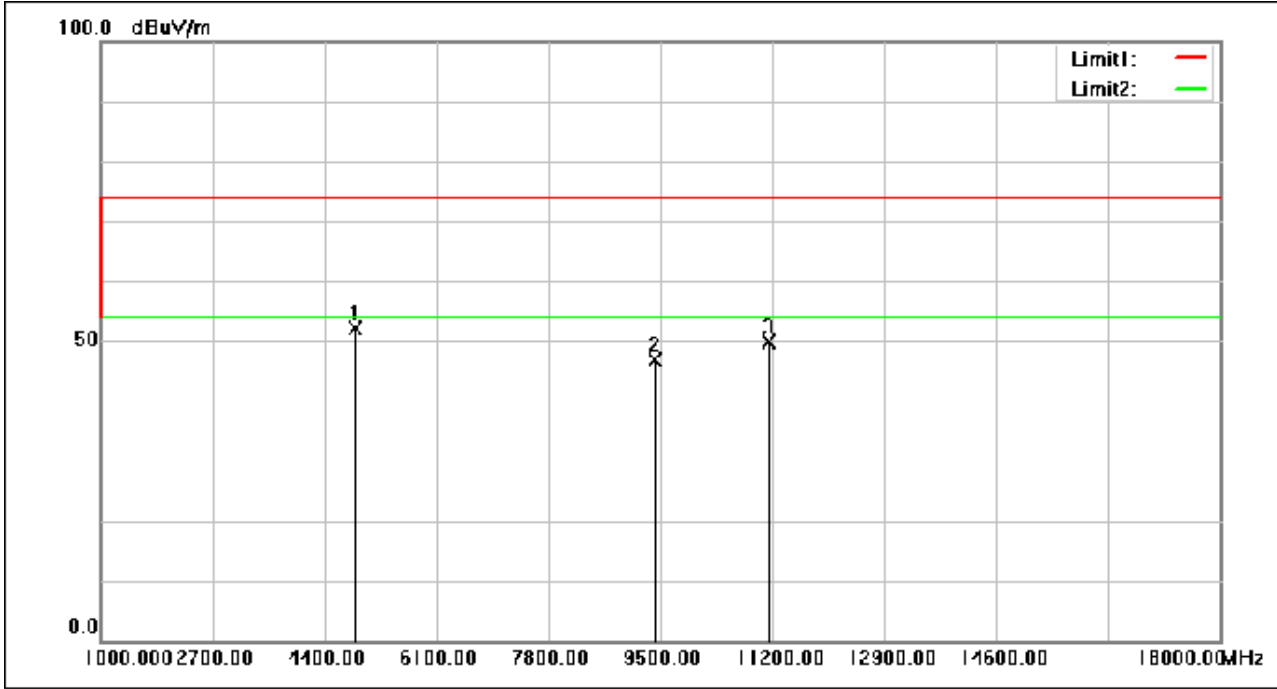
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 44 of 121

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	4873.960	70.10	-17.92	52.18	74.00	-21.82	peak
2	9415.000	56.60	-9.61	46.99	74.00	-27.01	peak
3	11159.880	57.26	-7.39	49.87	74.00	-24.13	peak



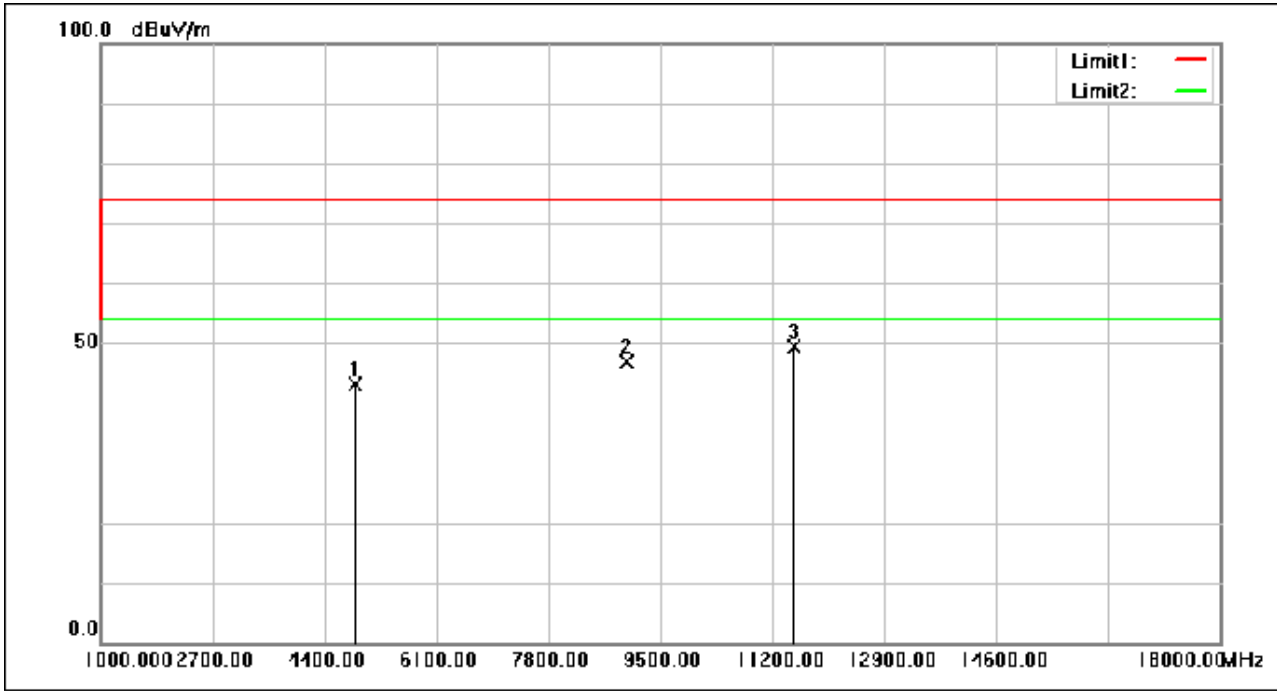
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 45 of 121

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	4873.960	61.15	-17.92	43.23	74.00	-30.77	peak
2	8996.800	56.92	-9.98	46.94	74.00	-27.06	peak
3	11537.960	56.70	-7.24	49.46	74.00	-24.54	peak

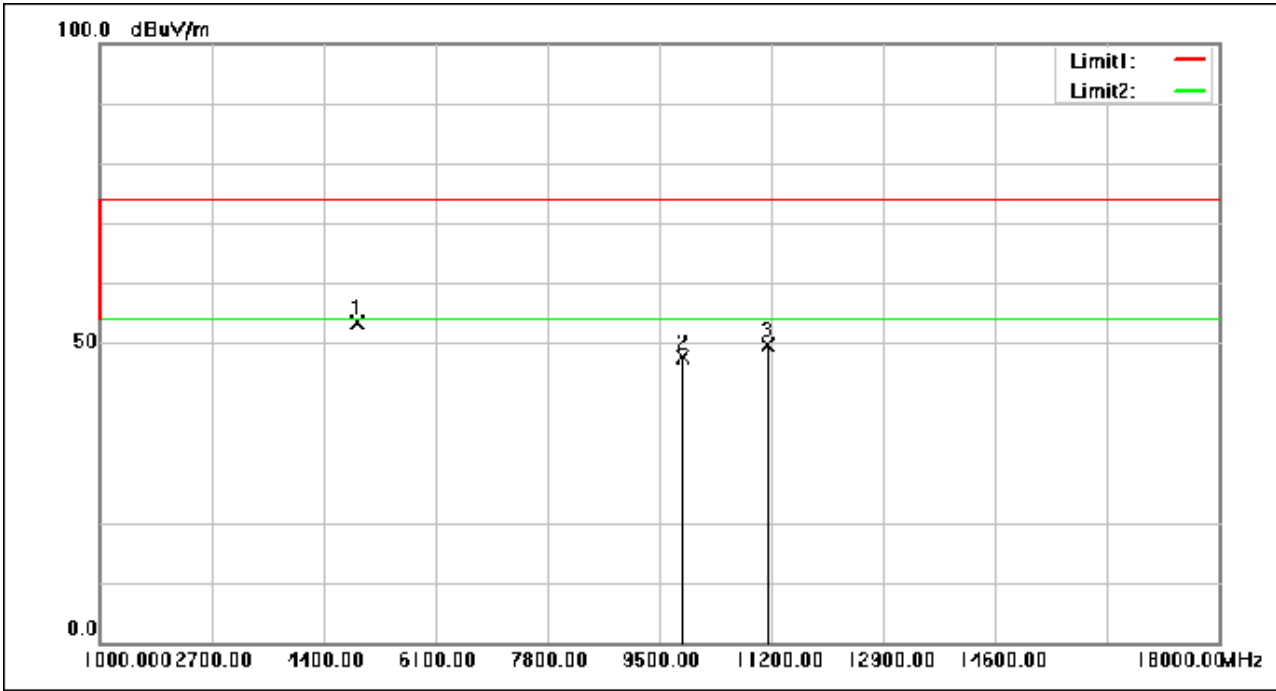
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 46 of 121

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	4923.600	71.02	-17.76	53.26	74.00	-20.74	peak
2	9850.200	56.84	-9.16	47.68	74.00	-26.32	peak
3	11157.840	57.06	-7.39	49.67	74.00	-24.33	peak

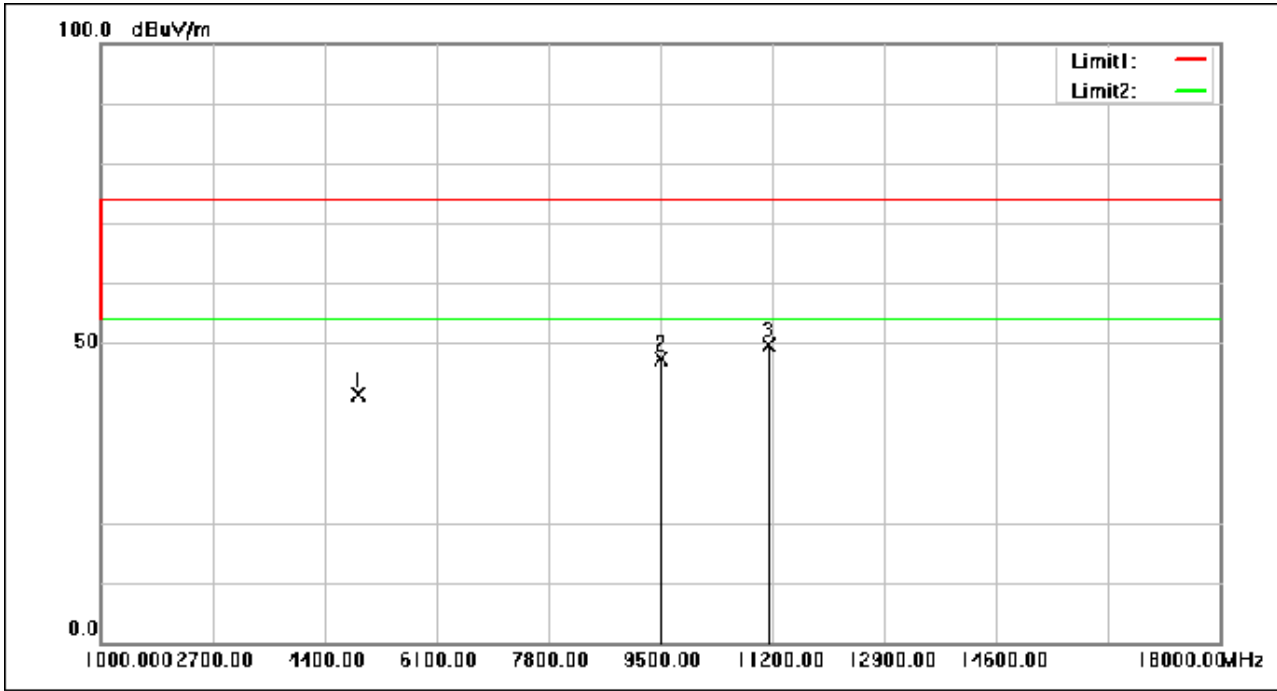
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 47 of 121

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	4924.280	59.19	-17.76	41.43	74.00	-32.57	peak
2	9510.200	56.90	-9.52	47.38	74.00	-26.62	peak
3	11153.080	57.05	-7.40	49.65	74.00	-24.35	peak



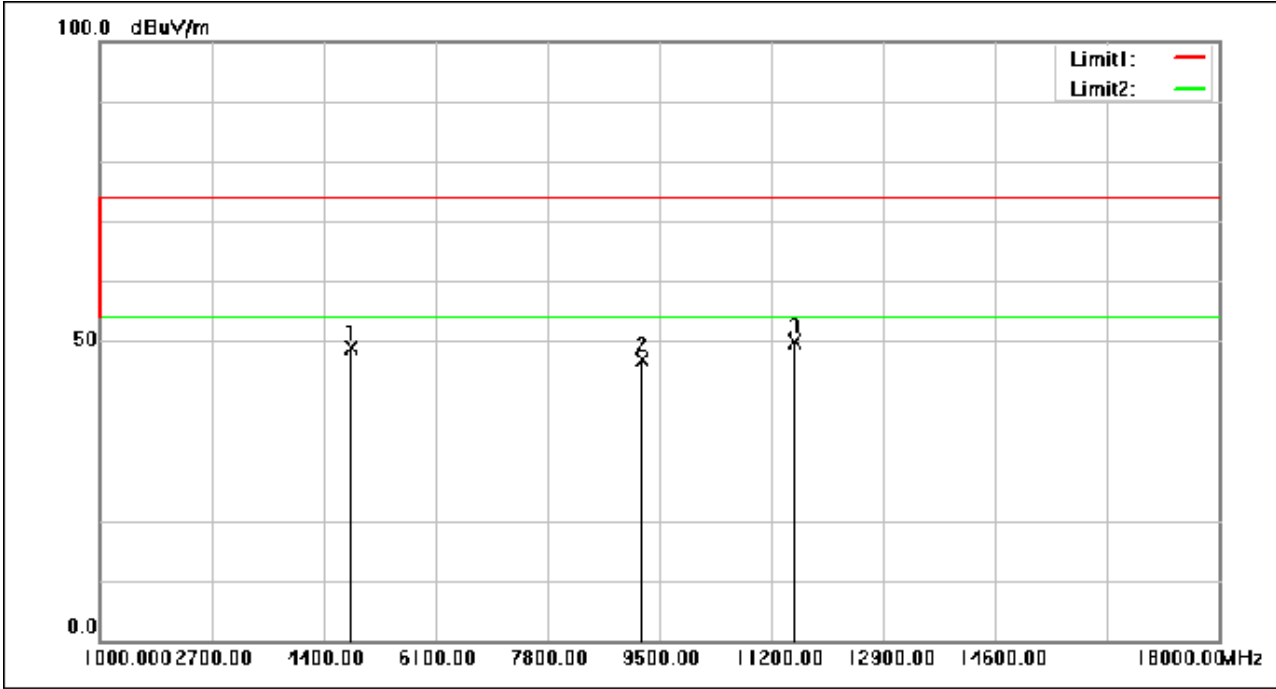
**Compliance Certification Services (Kunshan) Inc.**

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

Report No.: KSCR240500092301

Page: 48 of 121

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	4824.320	67.03	-18.09	48.94	74.00	-25.06	peak
2	9229.360	56.75	-9.77	46.98	74.00	-27.02	peak
3	11554.960	57.07	-7.26	49.81	74.00	-24.19	peak





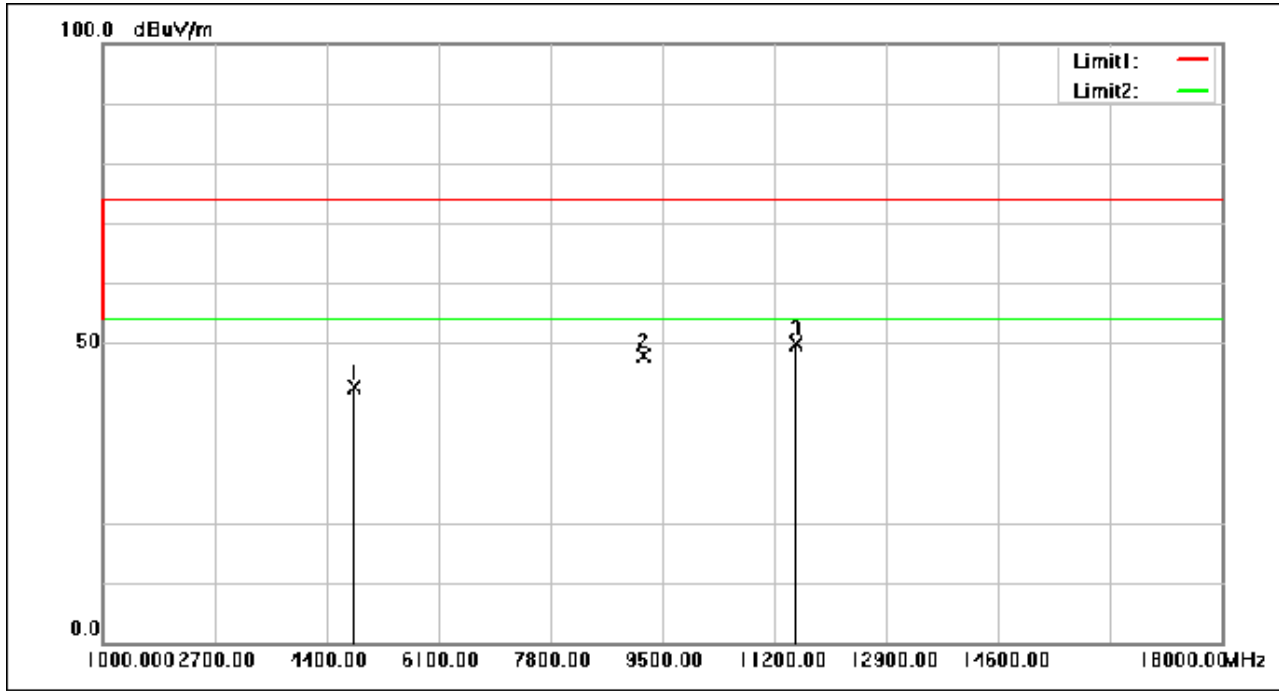
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 49 of 121

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	4822.960	60.69	-18.09	42.60	74.00	-31.40	peak
2	9211.000	57.73	-9.78	47.95	74.00	-26.05	peak
3	11535.920	57.02	-7.24	49.78	74.00	-24.22	peak



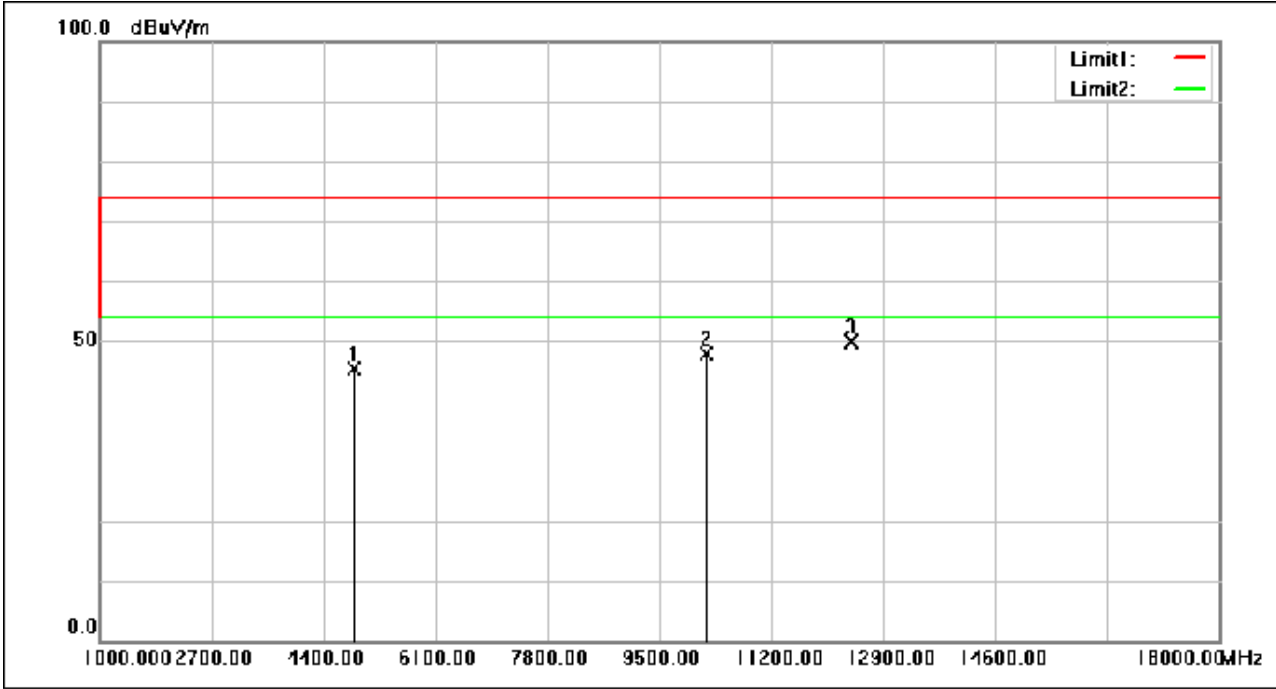
**Compliance Certification Services (Kunshan) Inc.**

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

Report No.: KSCR240500092301

Page: 50 of 121

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	4873.960	63.34	-17.92	45.42	74.00	-28.58	peak
2	10228.960	56.48	-8.55	47.93	74.00	-26.07	peak
3	12415.160	57.52	-7.56	49.96	74.00	-24.04	peak

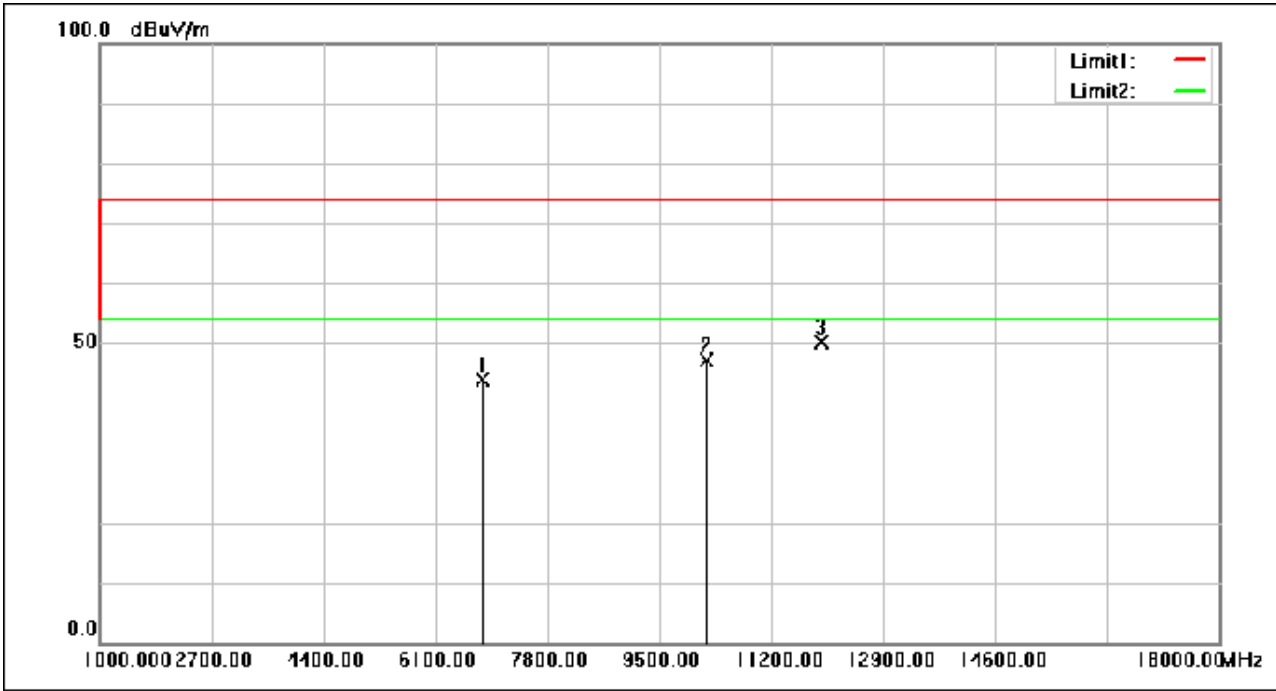
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 51 of 121

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	6824.200	57.04	-13.20	43.84	74.00	-30.16	peak
2	10227.600	55.78	-8.56	47.22	74.00	-26.78	peak
3	11963.640	57.68	-7.60	50.08	74.00	-23.92	peak

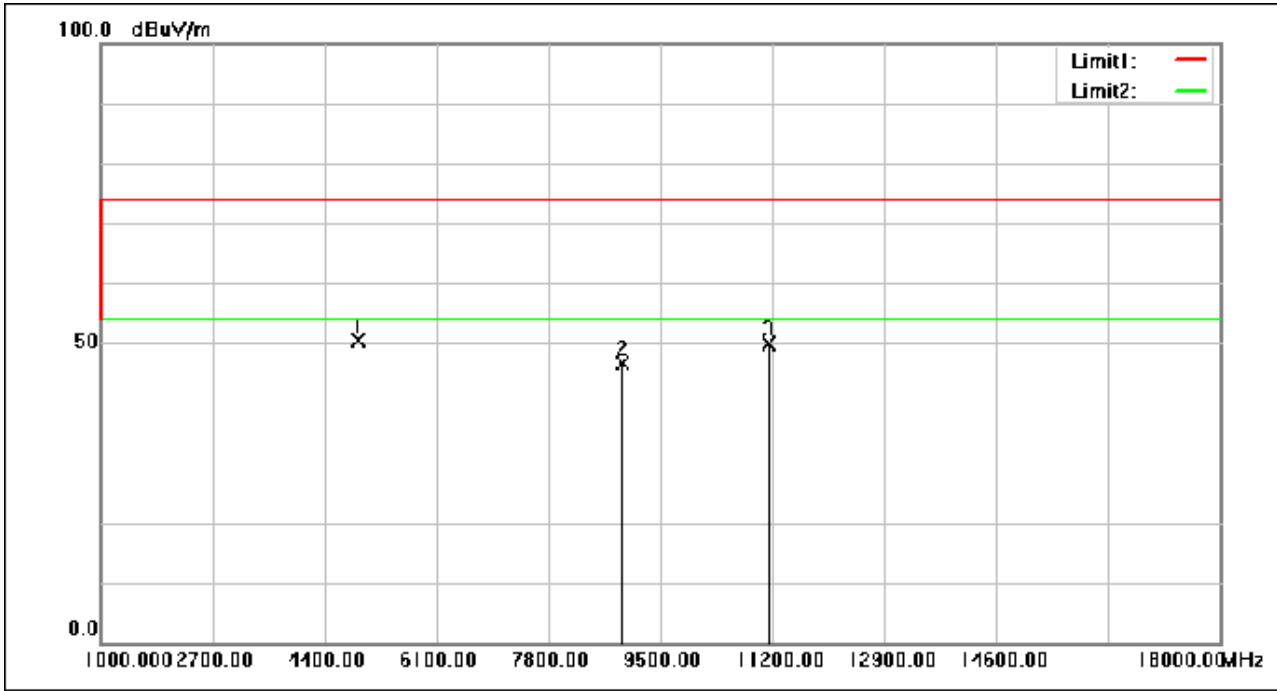
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 52 of 121

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	4924.280	68.02	-17.76	50.26	74.00	-23.74	peak
2	8934.240	56.66	-10.10	46.56	74.00	-27.44	peak
3	11155.800	57.31	-7.40	49.91	74.00	-24.09	peak

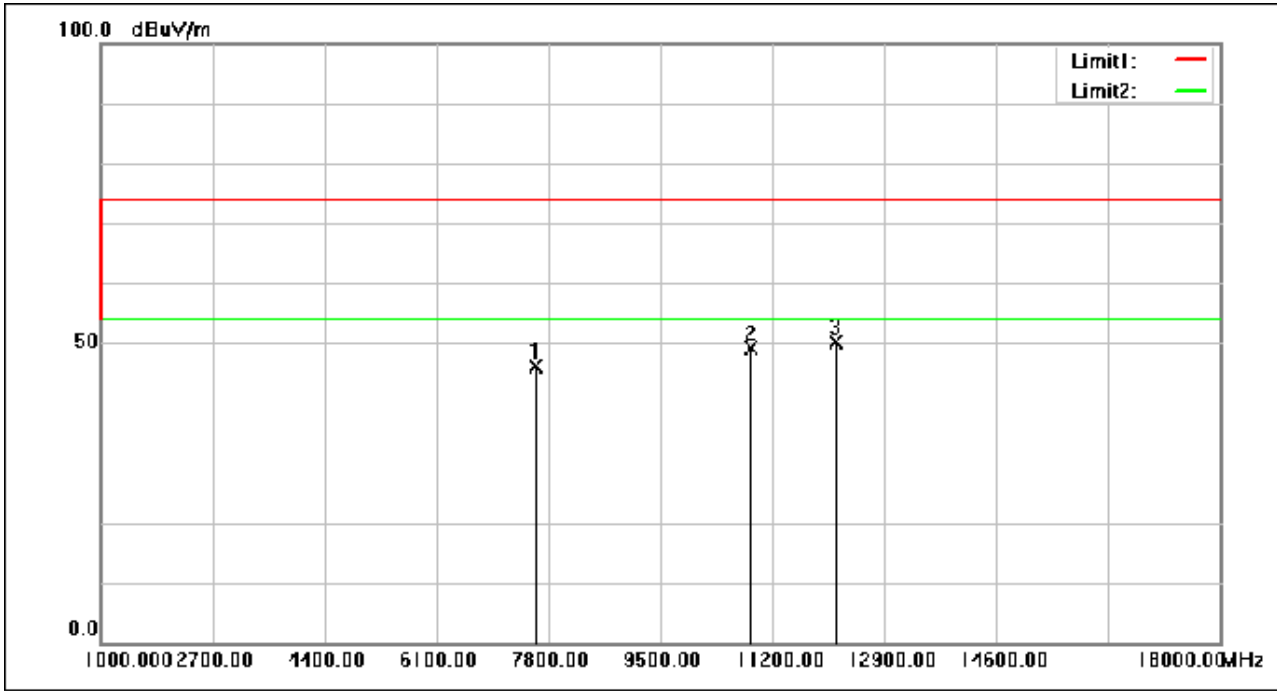
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 53 of 121

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	7615.720	57.23	-10.99	46.24	74.00	-27.76	peak
2	10870.200	56.62	-7.48	49.14	74.00	-24.86	peak
3	12184.640	57.78	-7.59	50.19	74.00	-23.81	peak

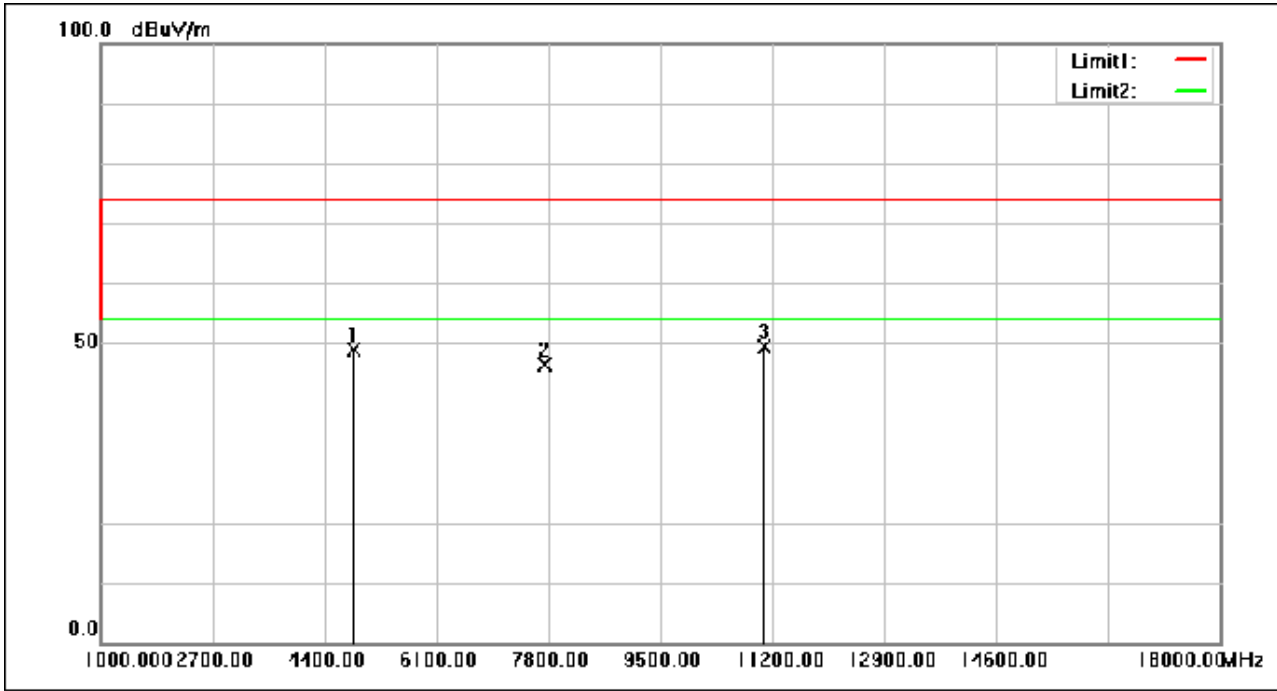
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 54 of 121

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4843.360	66.79	-18.03	48.76	74.00	-25.24	peak
2	7748.320	57.57	-11.16	46.41	74.00	-27.59	peak
3	11070.120	56.78	-7.44	49.34	74.00	-24.66	peak

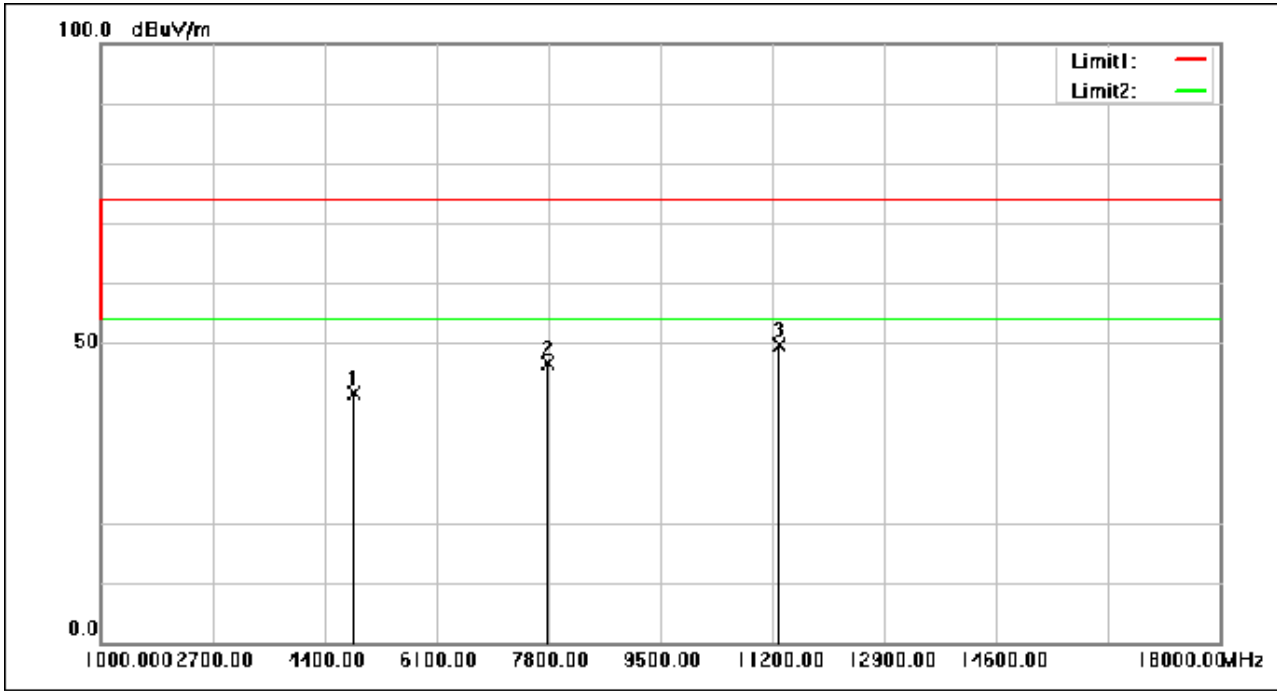
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 55 of 121

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4844.040	59.70	-18.02	41.68	74.00	-32.32	peak
2	7793.200	57.75	-11.21	46.54	74.00	-27.46	peak
3	11316.960	56.99	-7.31	49.68	74.00	-24.32	peak



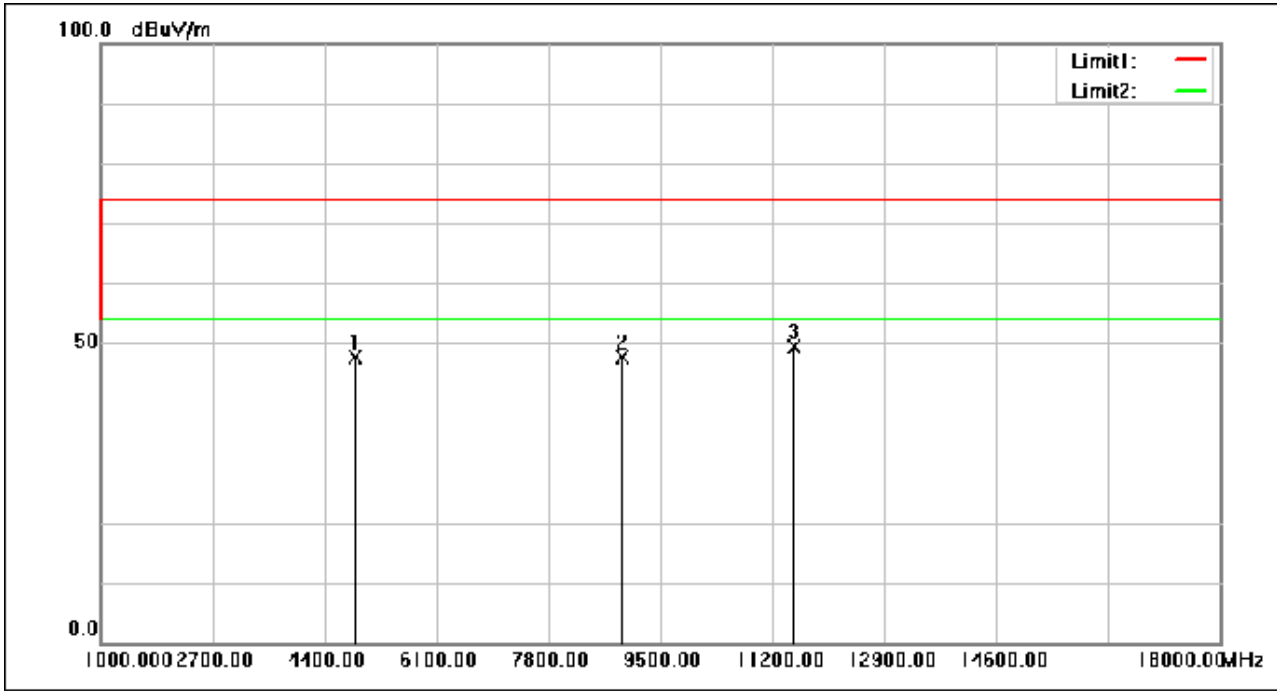
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 56 of 121

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4873.960	65.64	-17.92	47.72	74.00	-26.28	peak
2	8936.280	57.77	-10.10	47.67	74.00	-26.33	peak
3	11538.640	56.73	-7.24	49.49	74.00	-24.51	peak



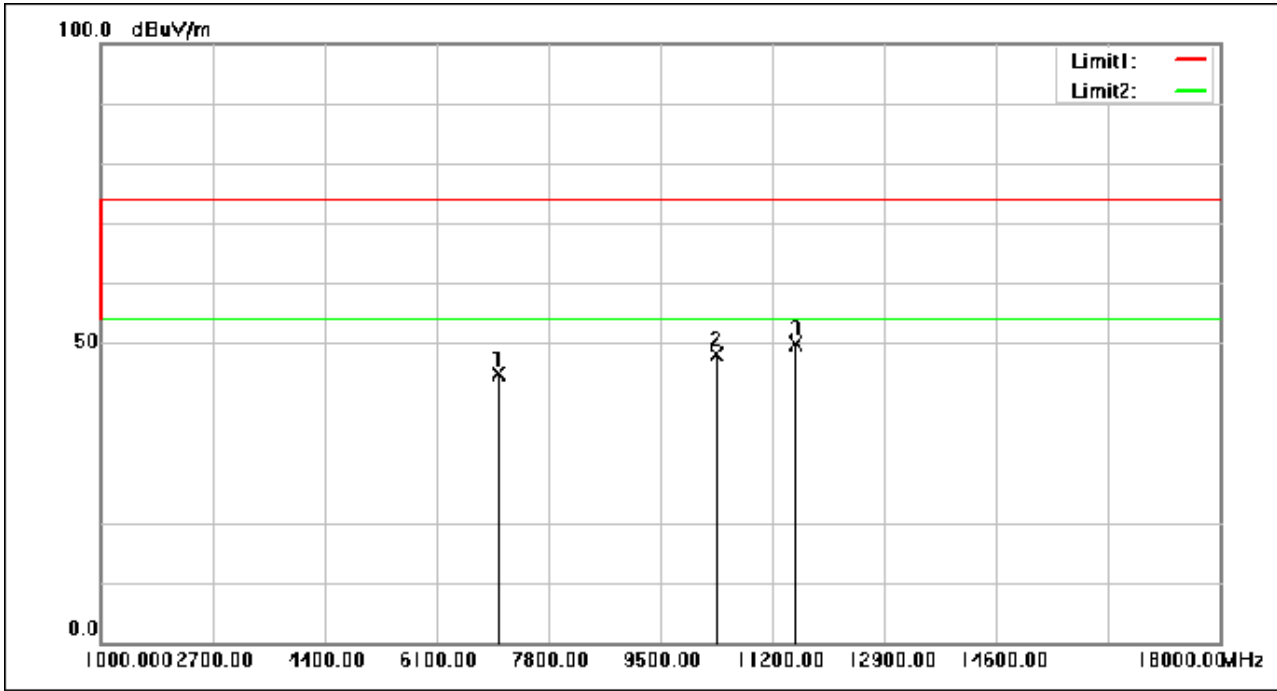
## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 57 of 121

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7050.640	57.14	-12.32	44.82	74.00	-29.18	peak
2	10365.640	56.56	-8.33	48.23	74.00	-25.77	peak
3	11546.120	57.08	-7.25	49.83	74.00	-24.17	peak

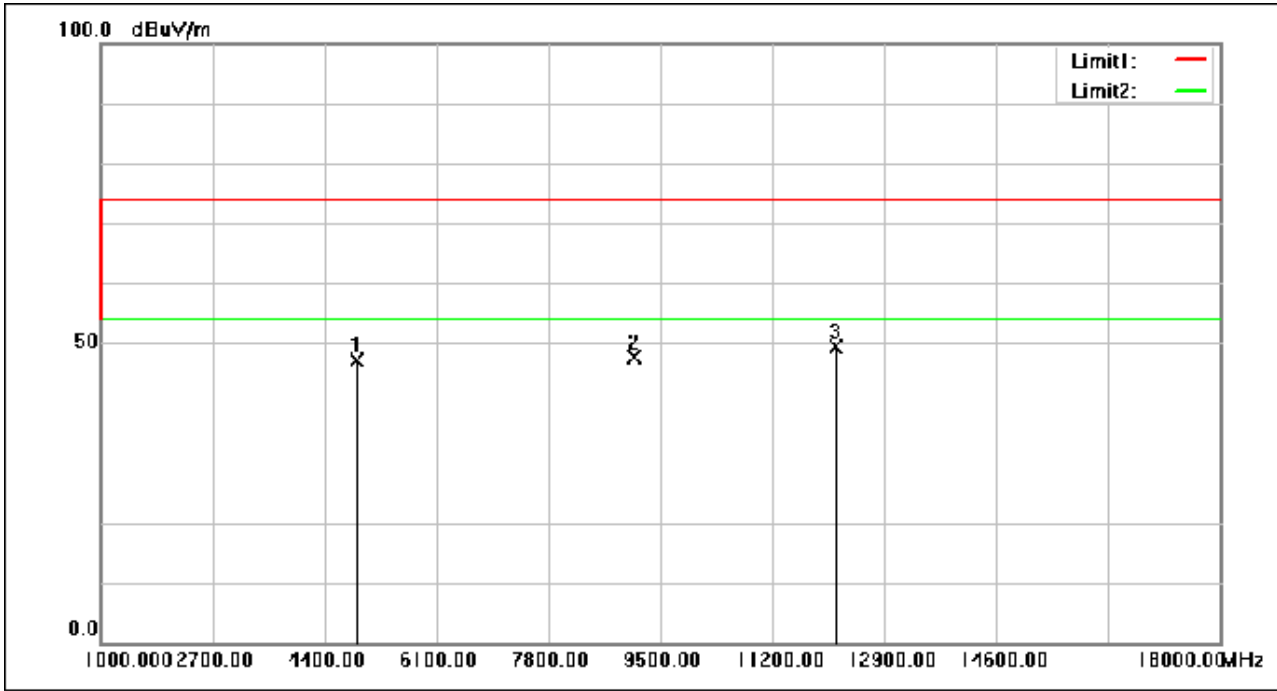
# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 58 of 121

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4903.880	65.07	-17.83	47.24	74.00	-26.76	peak
2	9112.400	57.53	-9.87	47.66	74.00	-26.34	peak
3	12181.920	57.06	-7.59	49.47	74.00	-24.53	peak



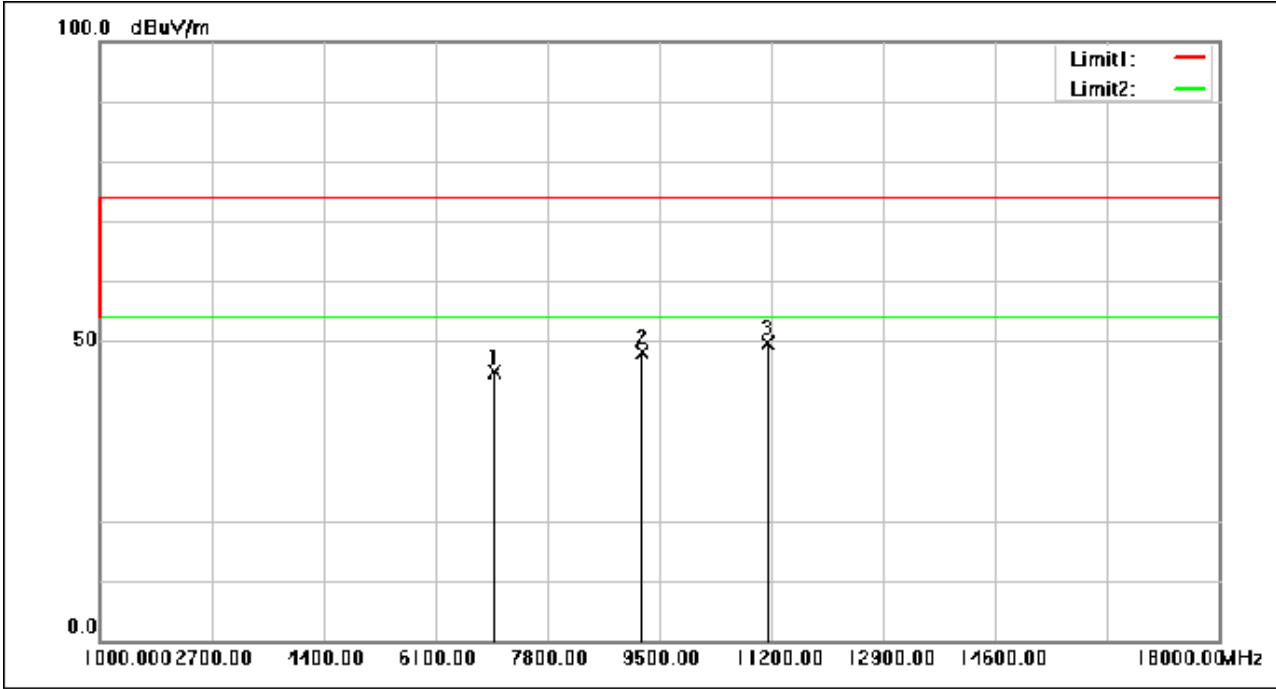
**Compliance Certification Services (Kunshan) Inc.**

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

Report No.: KSCR240500092301

Page: 59 of 121

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7008.480	57.43	-12.49	44.94	74.00	-29.06	peak
2	9228.680	57.78	-9.77	48.01	74.00	-25.99	peak
3	11139.480	56.95	-7.41	49.54	74.00	-24.46	peak

**7.5 Conducted Peak Output Power**

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

Test Method: ANSI C63.10 (2013) Section 11.9.1

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥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

**7.5.1 E.U.T. Operation**

Operating Environment:

Temperature: 24.8 °C

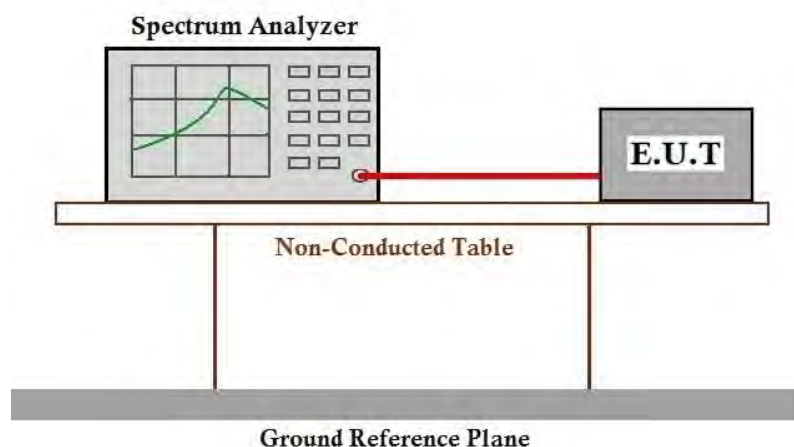
Humidity: 40.0 % RH

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**





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

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

Report No.: KSCR240500092301

Page: 61 of 121

### **7.5.4 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

# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 62 of 121

## 7.6 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

### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C

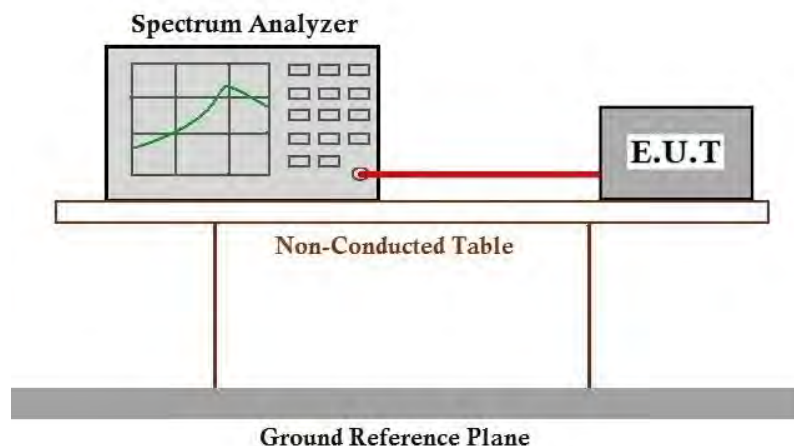
Humidity: 40.0 % RH

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.: KSCR240500092301

Page: 63 of 121

## 7.7 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

### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C

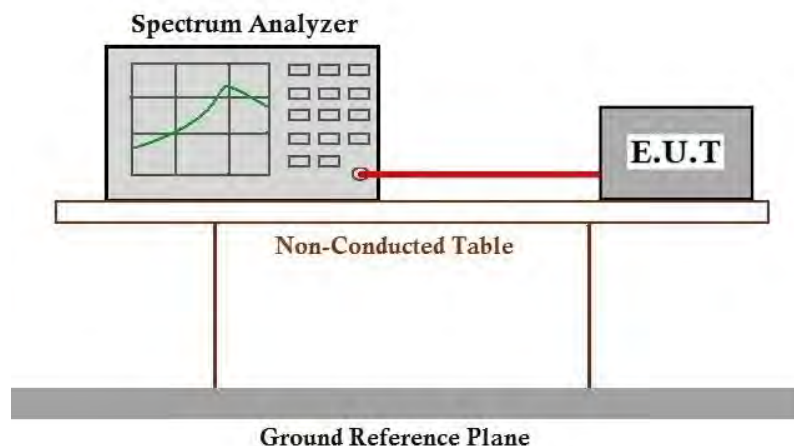
Humidity: 40.0 % RH

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

# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 64 of 121

## 7.8 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)).

### 7.8.1 E.U.T. Operation

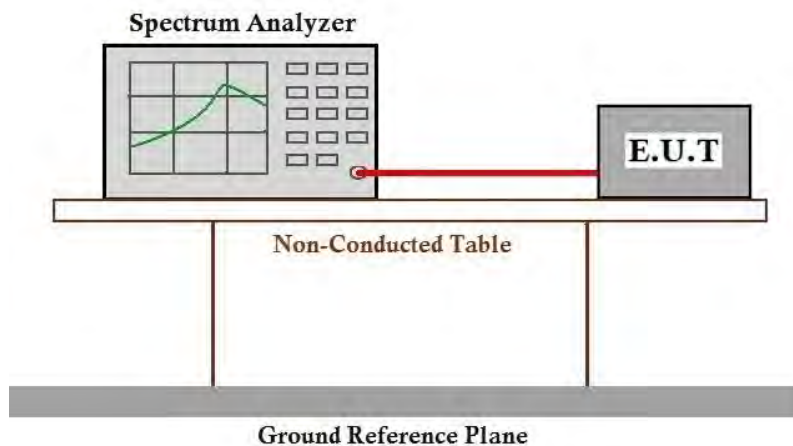
Operating Environment:

Temperature: 24.8 °C Humidity: 40.0 % 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







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

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

Report No.: KSCR240500092301

Page: 65 of 121

### **7.8.4 Measurement Procedure and Data**

Please Refer to Appendix for Details

# Compliance Certification Services (Kunshan) Inc.

## 7.9 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)).

### 7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C

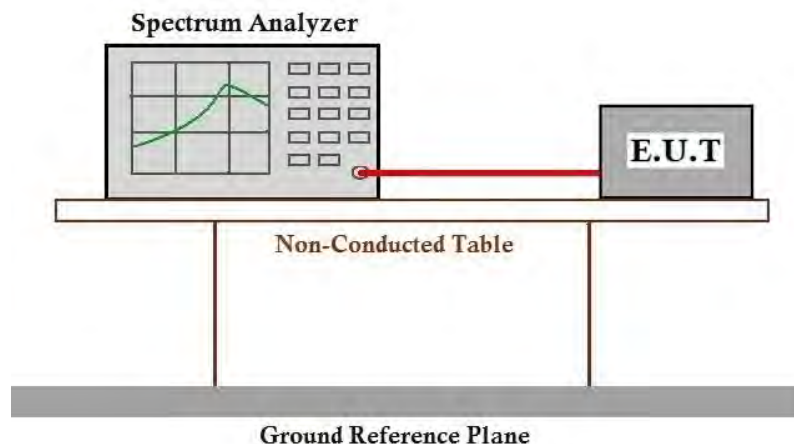
Humidity: 40.0 % RH

Atmospheric Pressure: 1010 mbar

### 7.9.2 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.

### 7.9.3 Test Setup Diagram





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

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

Report No.: KSCR240500092301

Page: 67 of 121

### **7.9.4 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.: KSCR240500092301

Page: 68 of 121

### **8 Test Setup Photo**

Refer to Appendix - Test Setup Photo for KSCR2405000923AT

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

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2405000923AT



# Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 69 of 121

## 10 Appendix

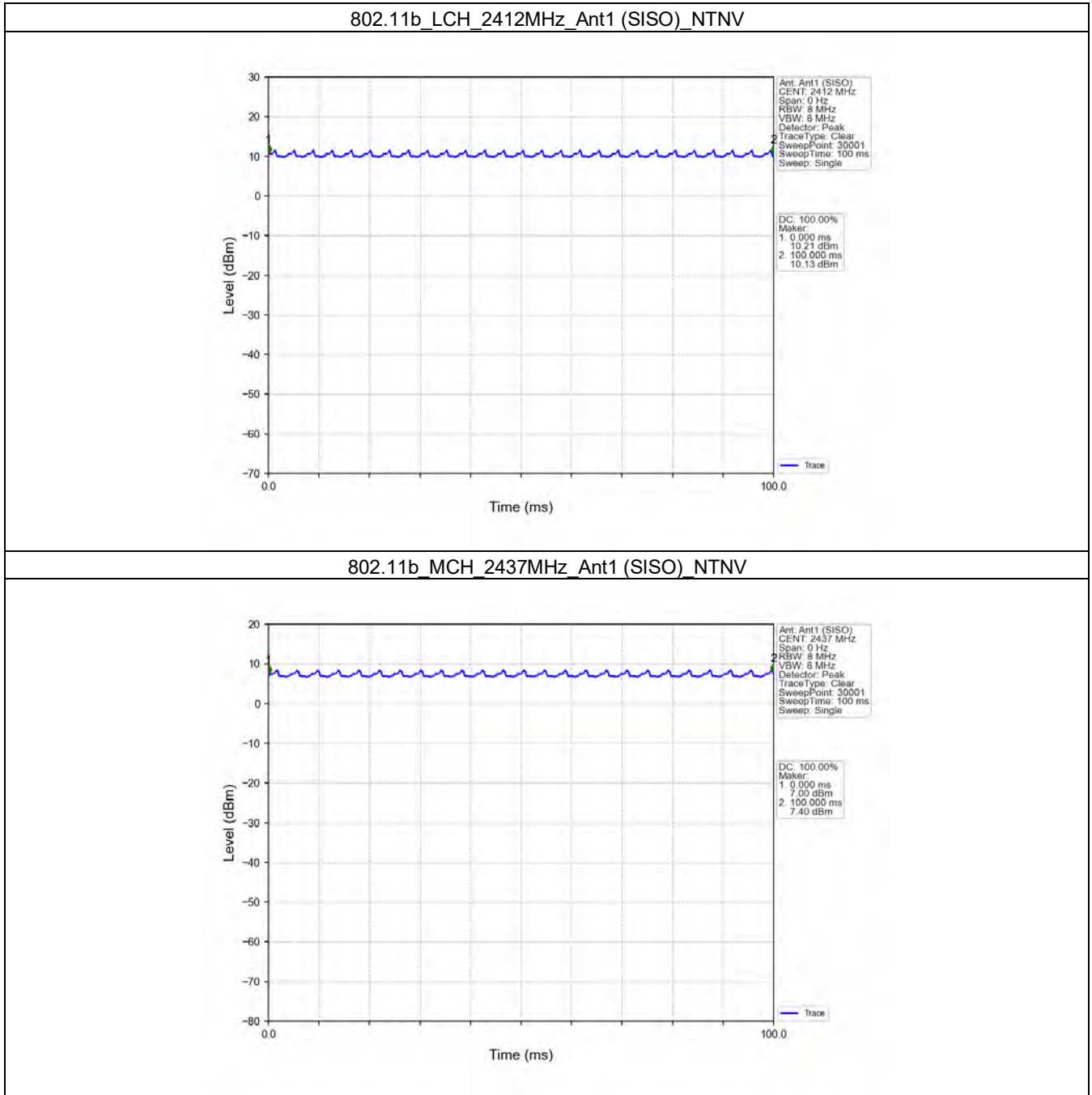
### 1. Duty Cycle

#### 1.1 Ant1

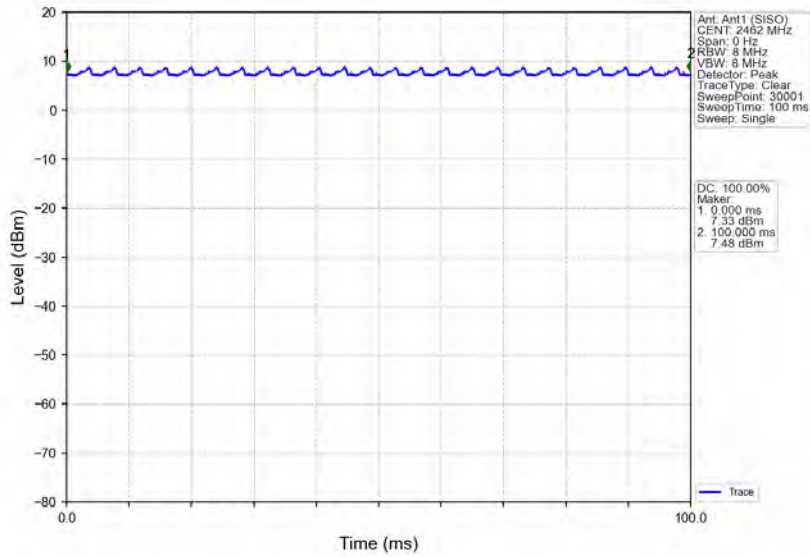
##### 1.1.1 Test Result

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	100.000	100.000	100.00	0.00	0.00
		2437	100.000	100.000	100.00	0.00	0.00
		2462	100.000	100.000	100.00	0.00	0.00
802.11g	SISO	2412	100.000	100.000	100.00	0.00	0.00
		2437	100.000	100.000	100.00	0.00	0.00
		2462	100.000	100.000	100.00	0.00	0.00
802.11n (HT20)	SISO	2412	100.000	100.000	100.00	0.00	0.00
		2437	100.000	100.000	100.00	0.00	0.00
		2462	100.000	100.000	100.00	0.00	0.00
802.11n (HT40)	SISO	2422	100.000	100.000	100.00	0.00	0.00
		2437	100.000	100.000	100.00	0.00	0.00
		2452	100.000	100.000	100.00	0.00	0.00

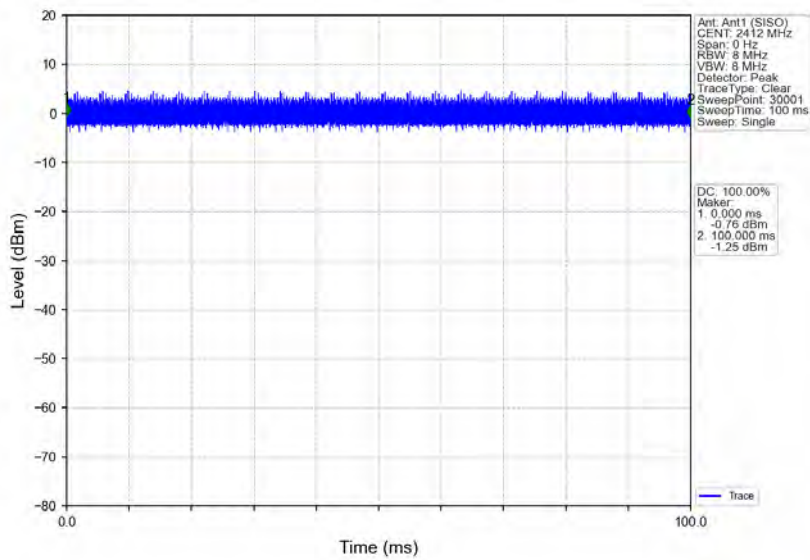
### 1.1.2 Test Graph



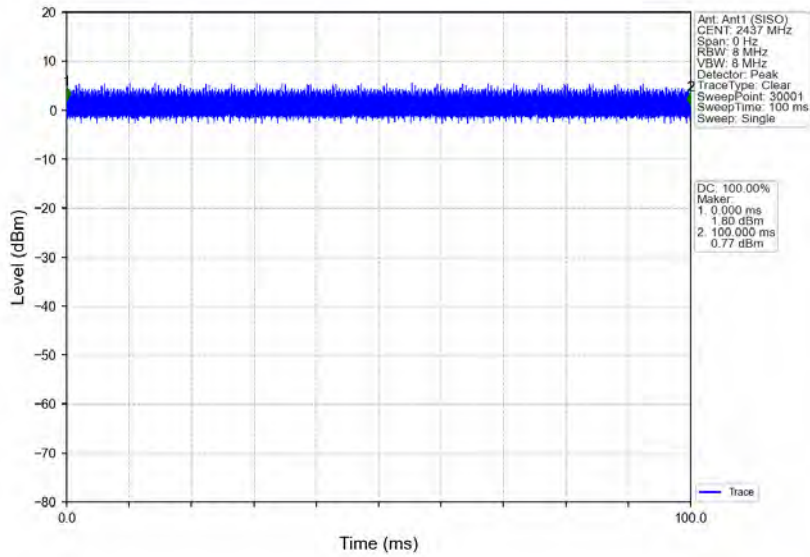
802.11b HCH 2462MHz Ant1 (SISO) NTN



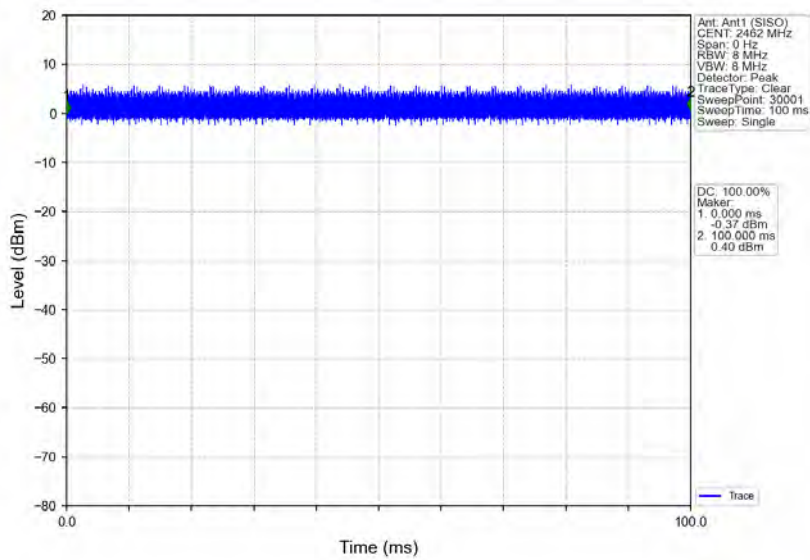
802.11g\_LCH\_2412MHz\_Ant1 (SISO) NTN



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

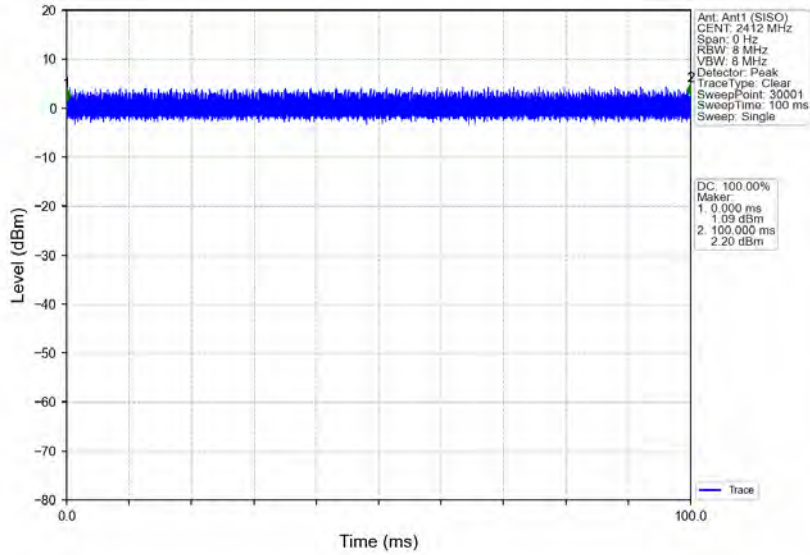


802.11g\_HCH\_2462MHz\_Ant1 (SISO) NTN

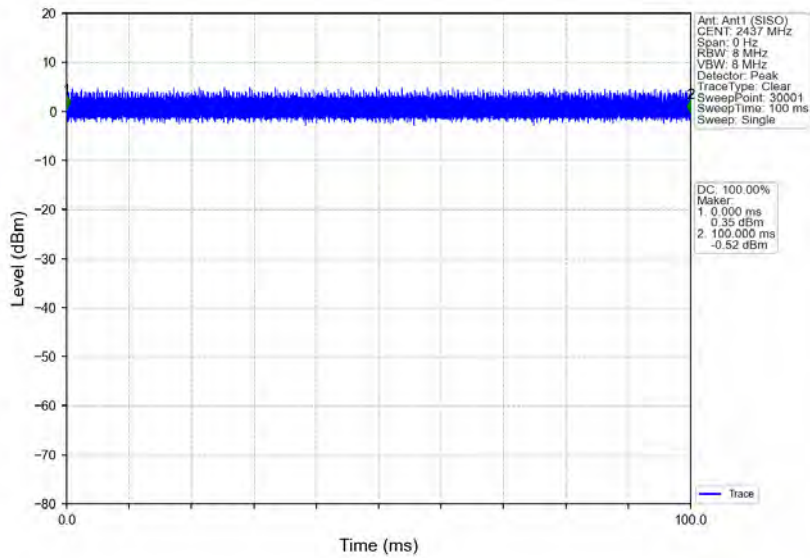




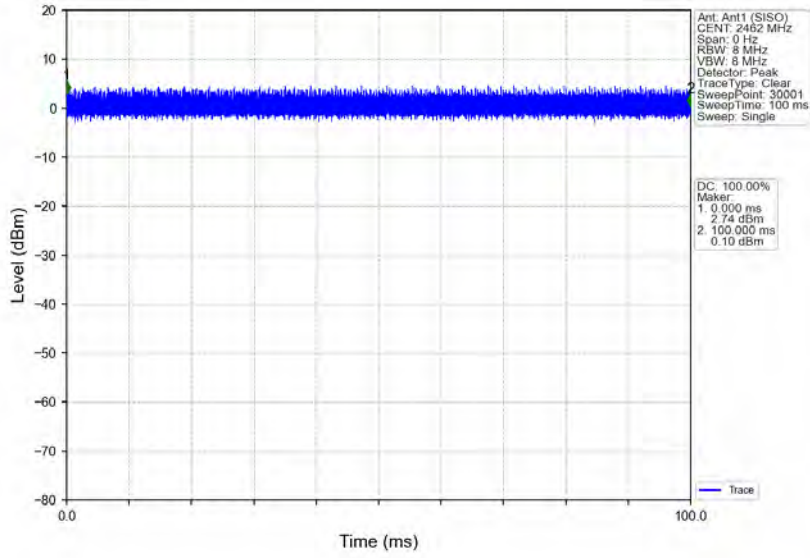
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTN



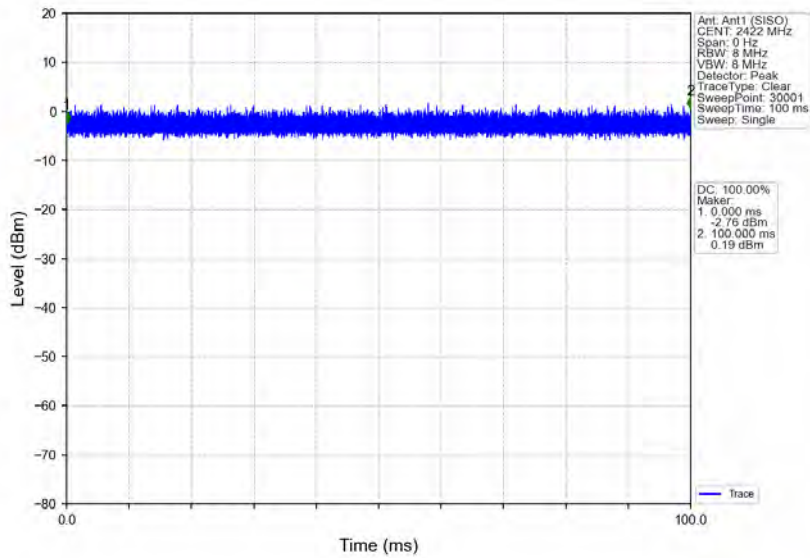
802.11n(HT20)\_MCH\_2437MHz\_Ant1 (SISO)\_NTN



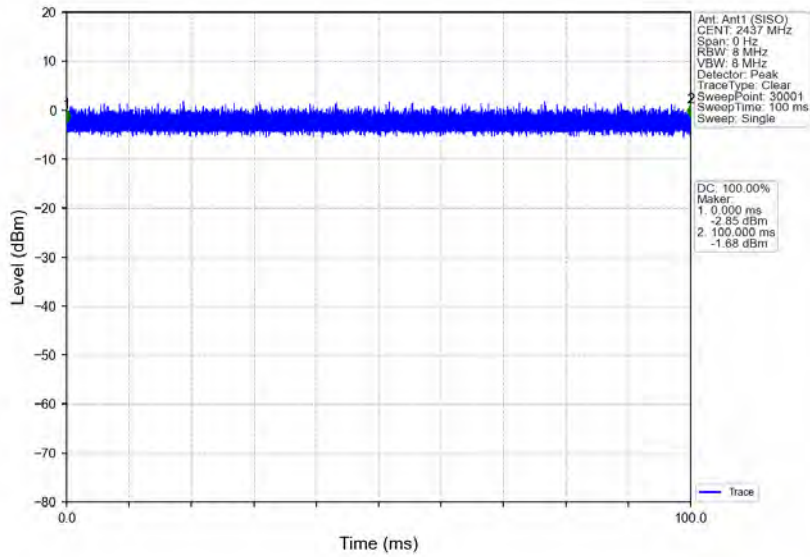
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN



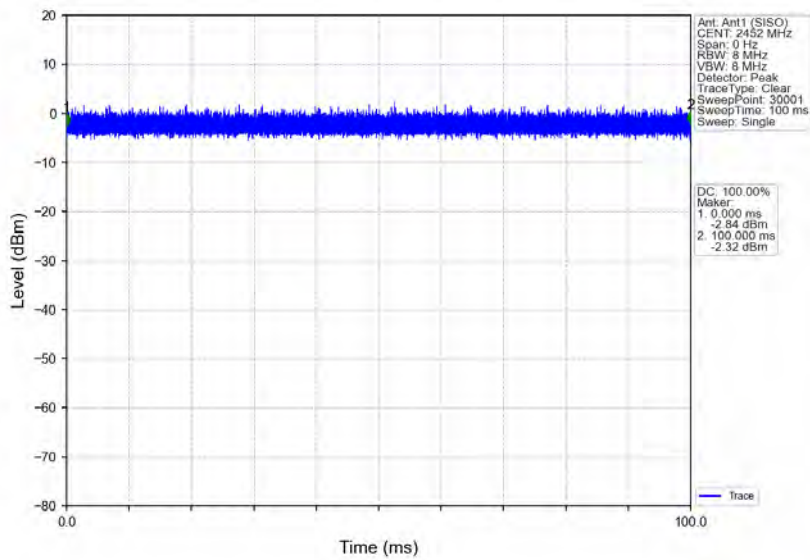
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTN



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTN



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTN





## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 76 of 121

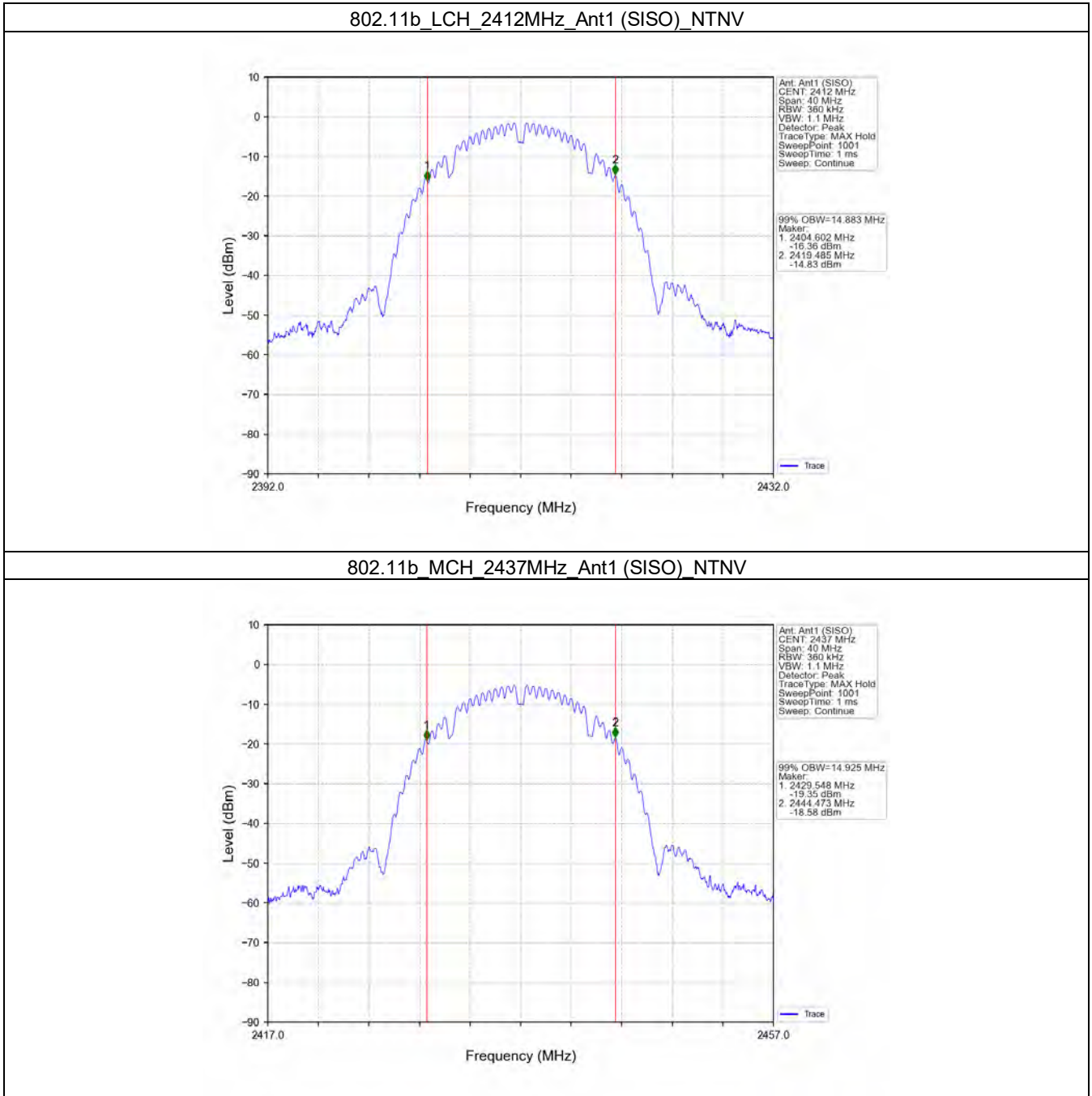
### 2. Bandwidth

#### 2.1 OBW

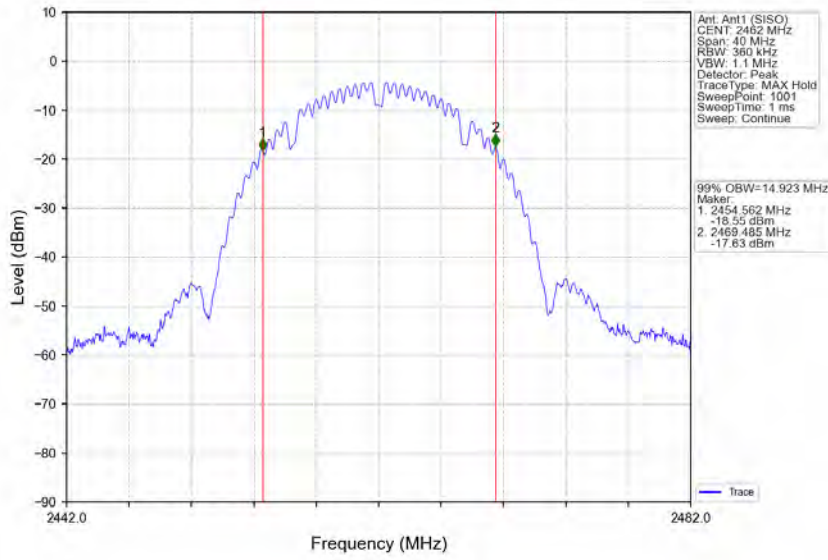
##### 2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	14.883	/	Pass
		2437	1	14.925	/	Pass
		2462	1	14.923	/	Pass
802.11g	SISO	2412	1	17.523	/	Pass
		2437	1	17.530	/	Pass
		2462	1	17.556	/	Pass
802.11n (HT20)	SISO	2412	1	18.356	/	Pass
		2437	1	18.355	/	Pass
		2462	1	18.372	/	Pass
802.11n (HT40)	SISO	2422	1	36.123	/	Pass
		2437	1	36.127	/	Pass
		2452	1	36.175	/	Pass

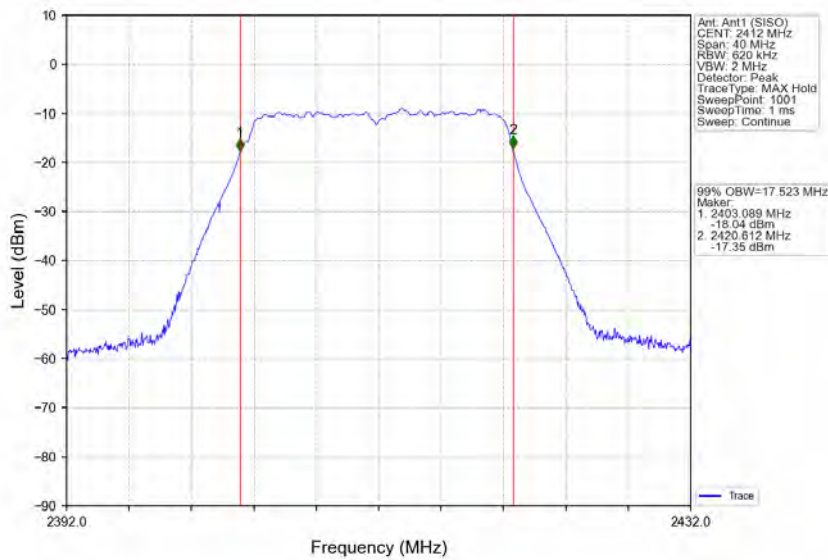
### 2.1.2 Test Graph



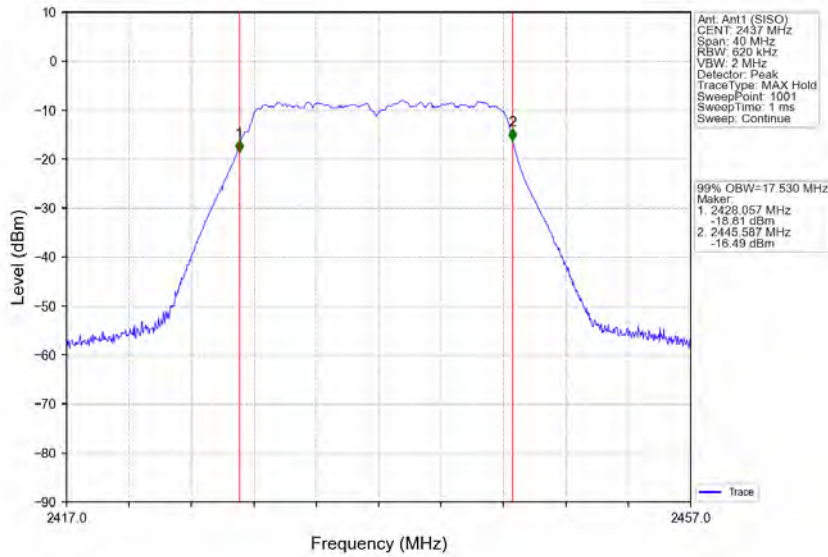
802.11b HCH 2462MHz Ant1 (SISO) NTN



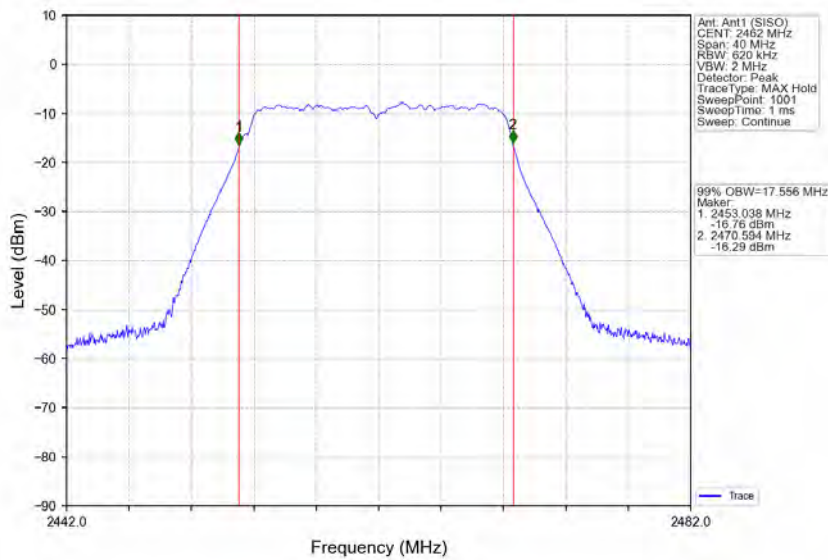
802.11g\_LCH\_2412MHz\_Ant1 (SISO) NTN



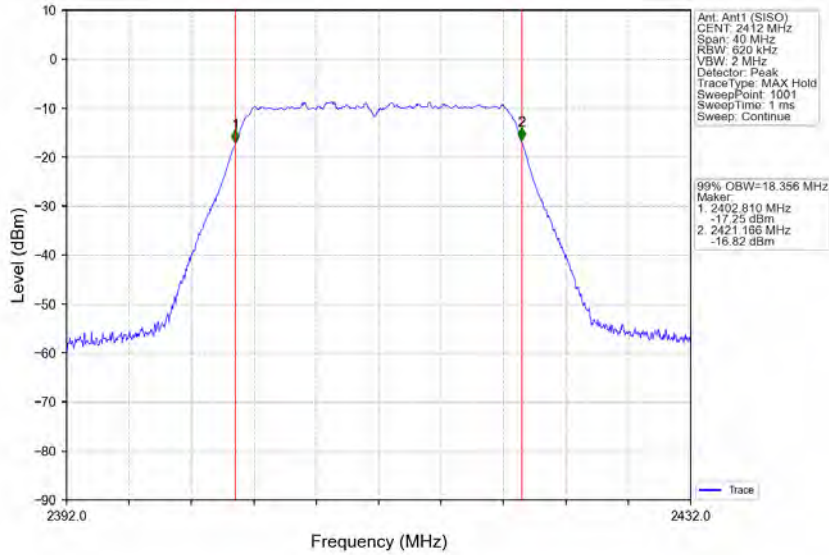
802.11g MCH 2437MHz Ant1 (SISO) NTVN



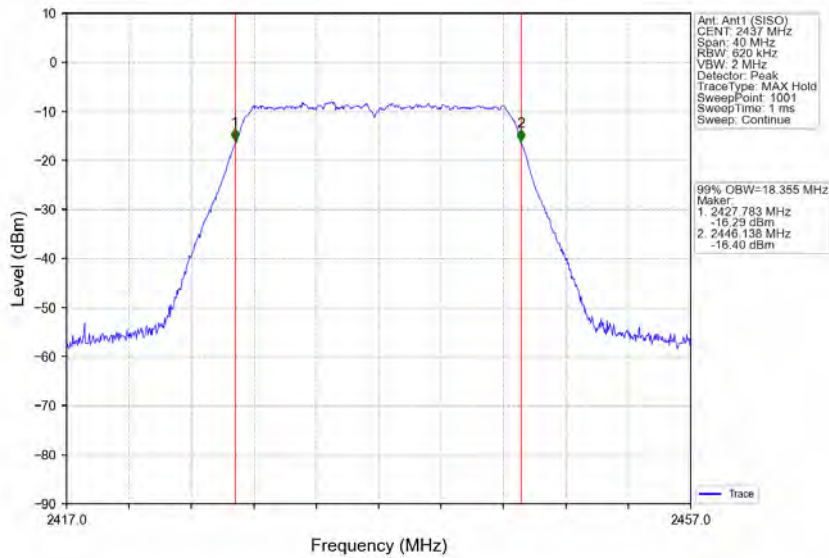
802.11g\_HCH 2462MHz Ant1 (SISO) NTVN



802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTN

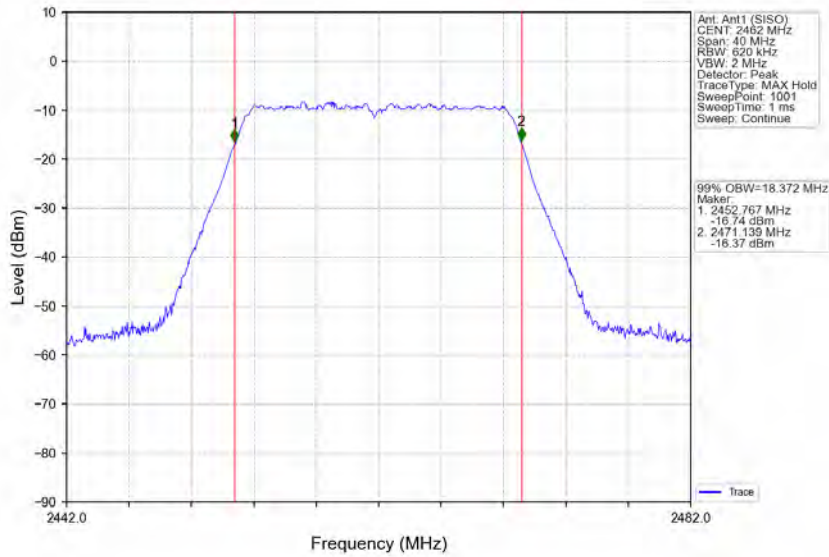


802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTN

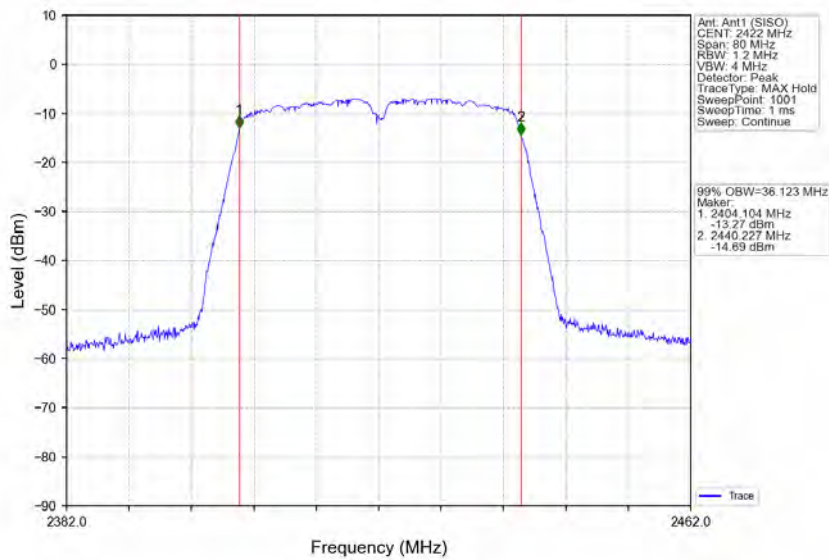




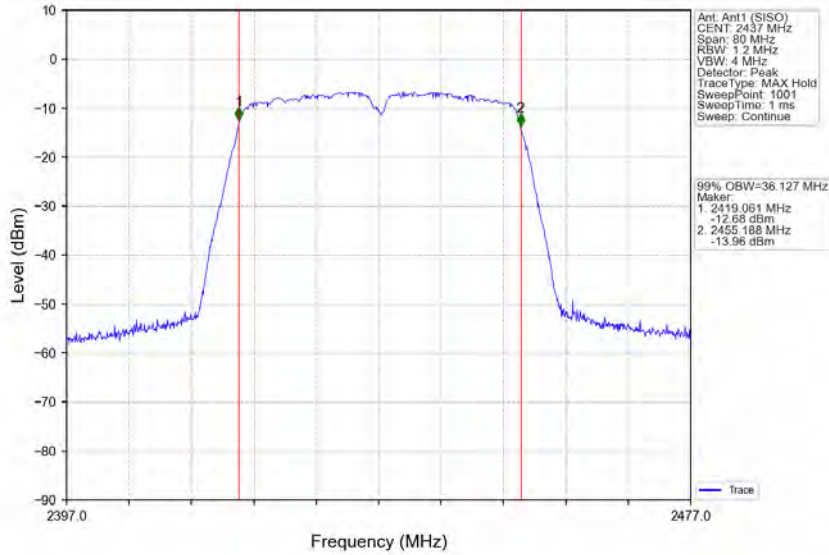
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTV



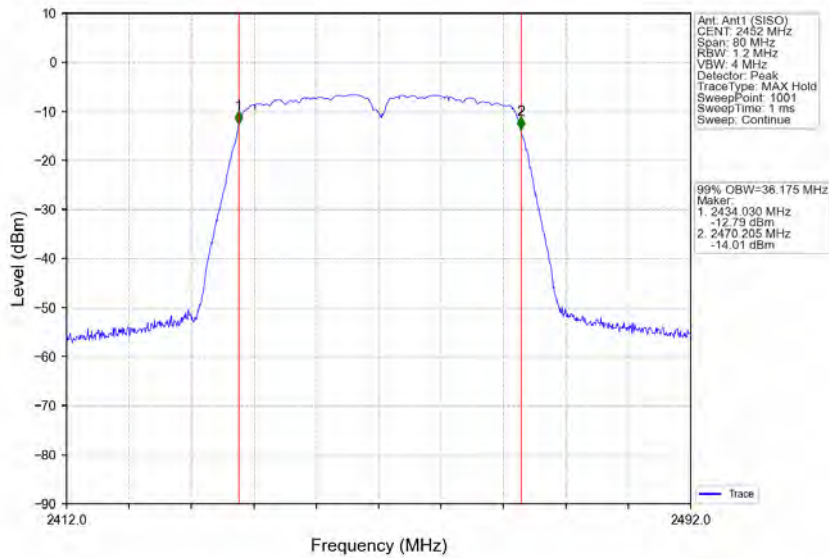
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTV



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTN



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTN





## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

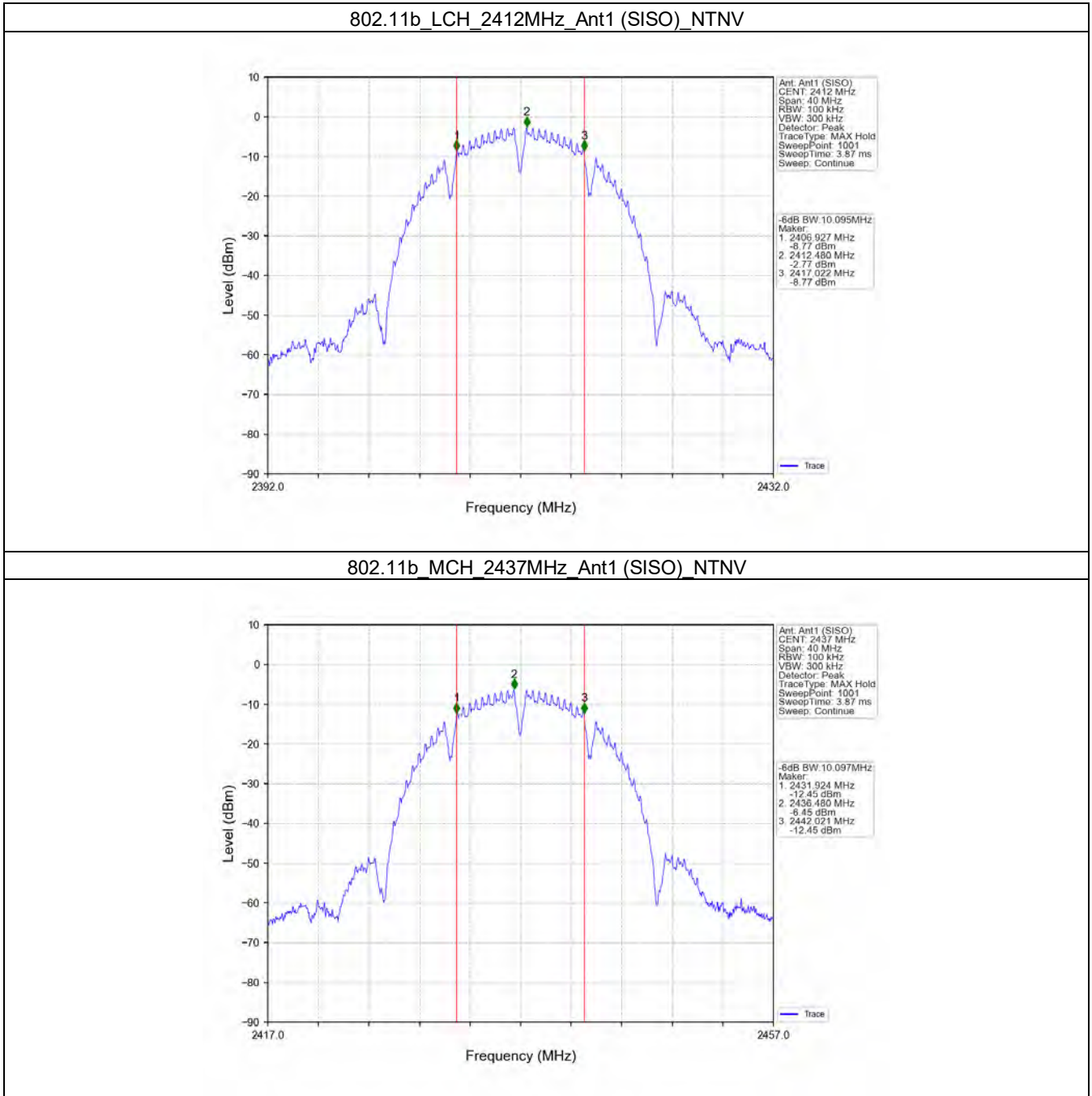
Page: 83 of 121

### 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	10.095	$\geq 0.5$	Pass
		2437	1	10.097	$\geq 0.5$	Pass
		2462	1	10.090	$\geq 0.5$	Pass
802.11g	SISO	2412	1	16.602	$\geq 0.5$	Pass
		2437	1	16.599	$\geq 0.5$	Pass
		2462	1	16.600	$\geq 0.5$	Pass
802.11n (HT20)	SISO	2412	1	17.790	$\geq 0.5$	Pass
		2437	1	17.796	$\geq 0.5$	Pass
		2462	1	17.806	$\geq 0.5$	Pass
802.11n (HT40)	SISO	2422	1	36.342	$\geq 0.5$	Pass
		2437	1	36.357	$\geq 0.5$	Pass
		2452	1	36.366	$\geq 0.5$	Pass

### 2.2.2 Test Graph



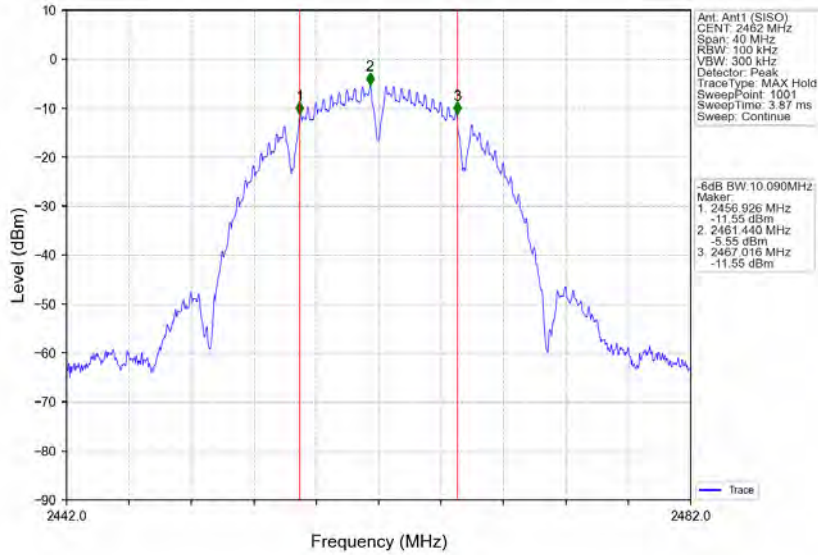
## Compliance Certification Services (Kunshan) Inc.

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

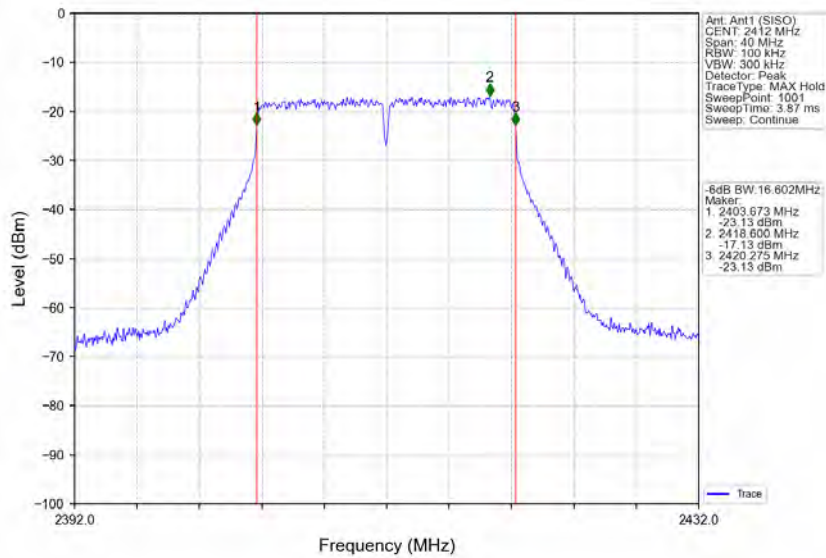
Report No.: KSCR240500092301

Page: 85 of 121

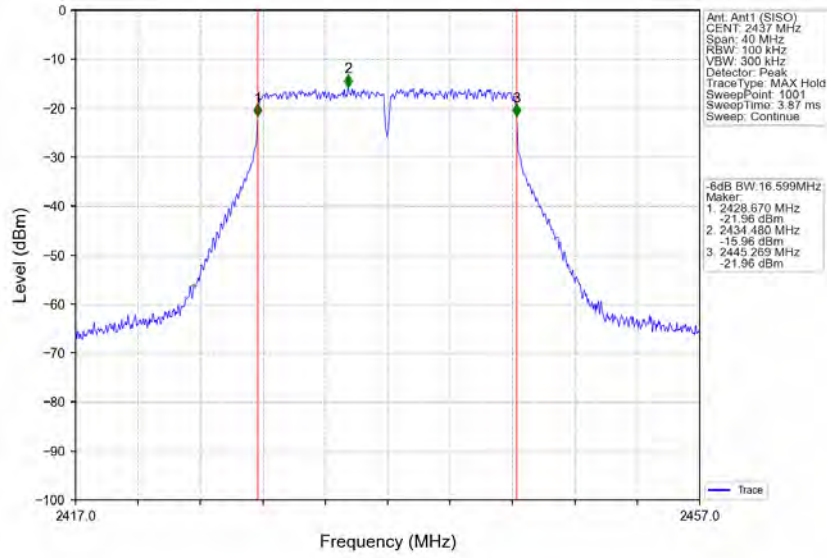
802.11b HCH 2462MHz Ant1 (SISO) NTN



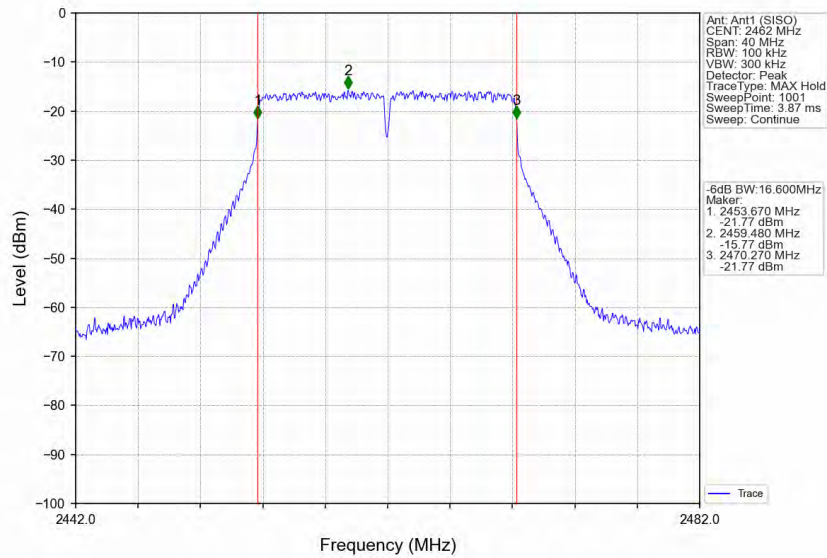
802.11g\_LCH\_2412MHz\_Ant1 (SISO) NTN



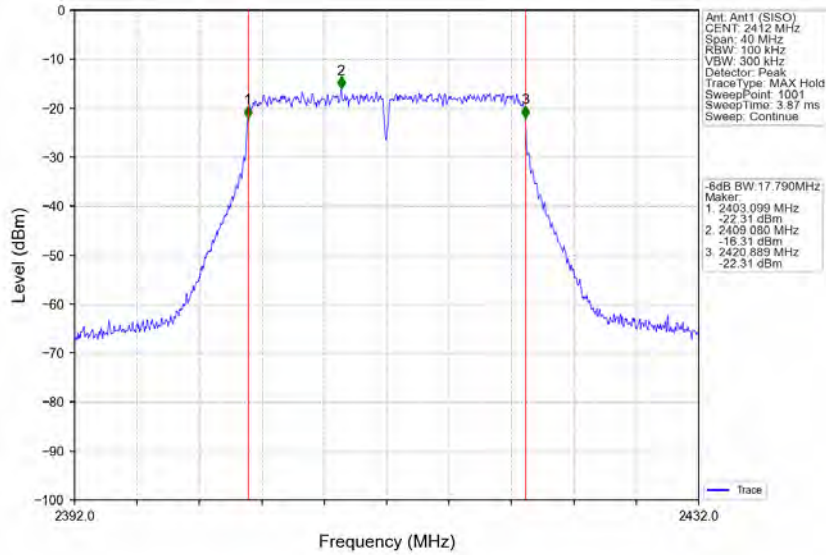
802.11g MCH 2437MHz Ant1 (SISO) NTVV



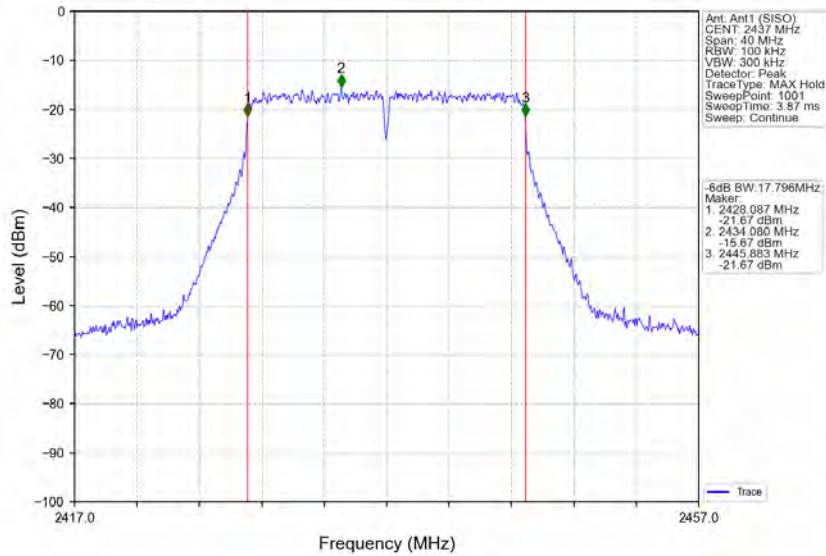
802.11g\_HCH 2462MHz Ant1 (SISO) NTVV



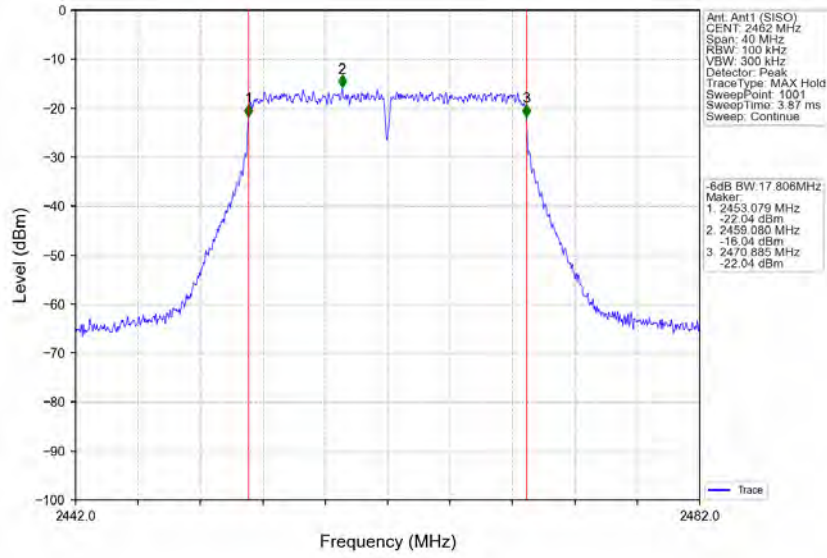
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTN



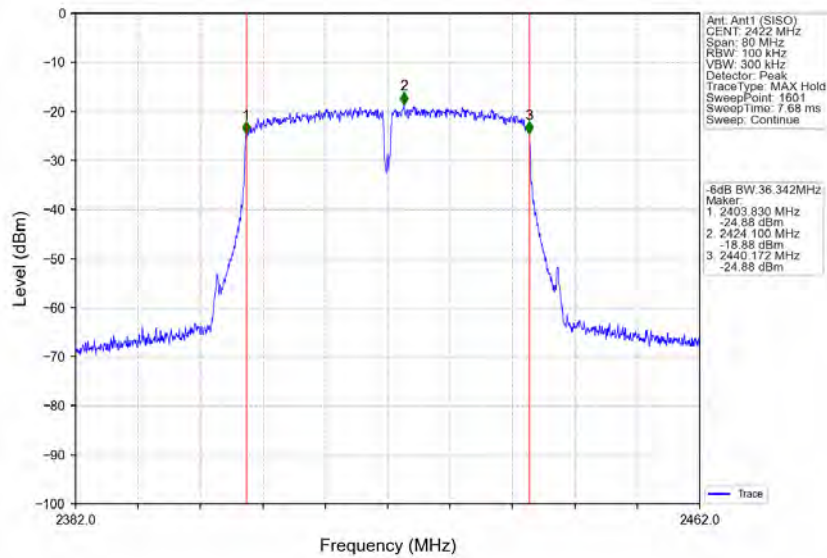
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTN



802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTVN

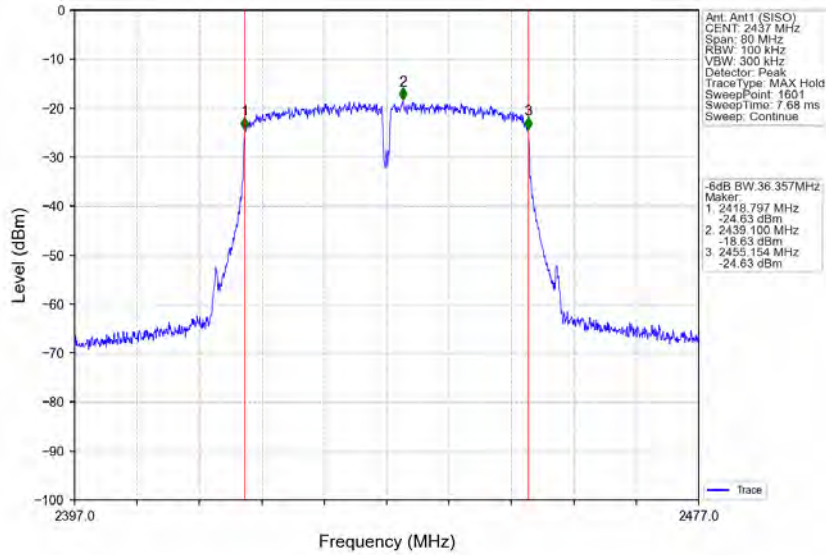


802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTVN

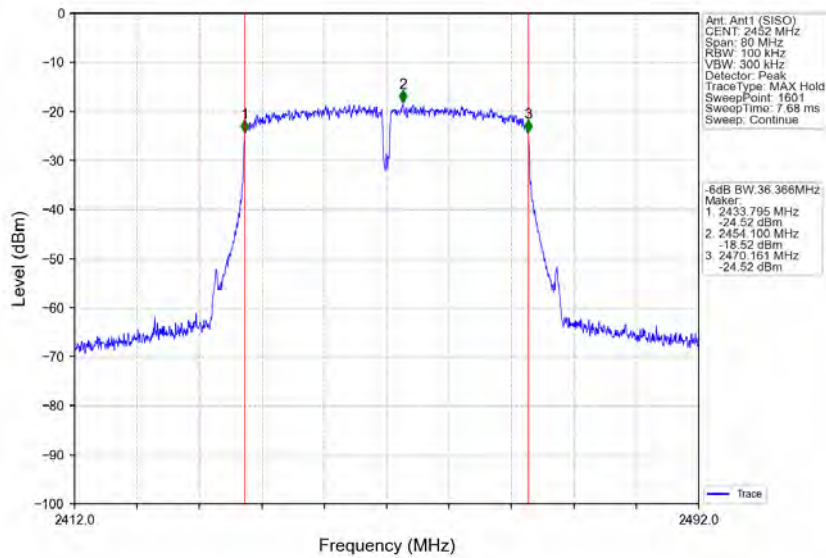




802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTN



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTN





## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 90 of 121

### 3. Maximum Conducted Output Power

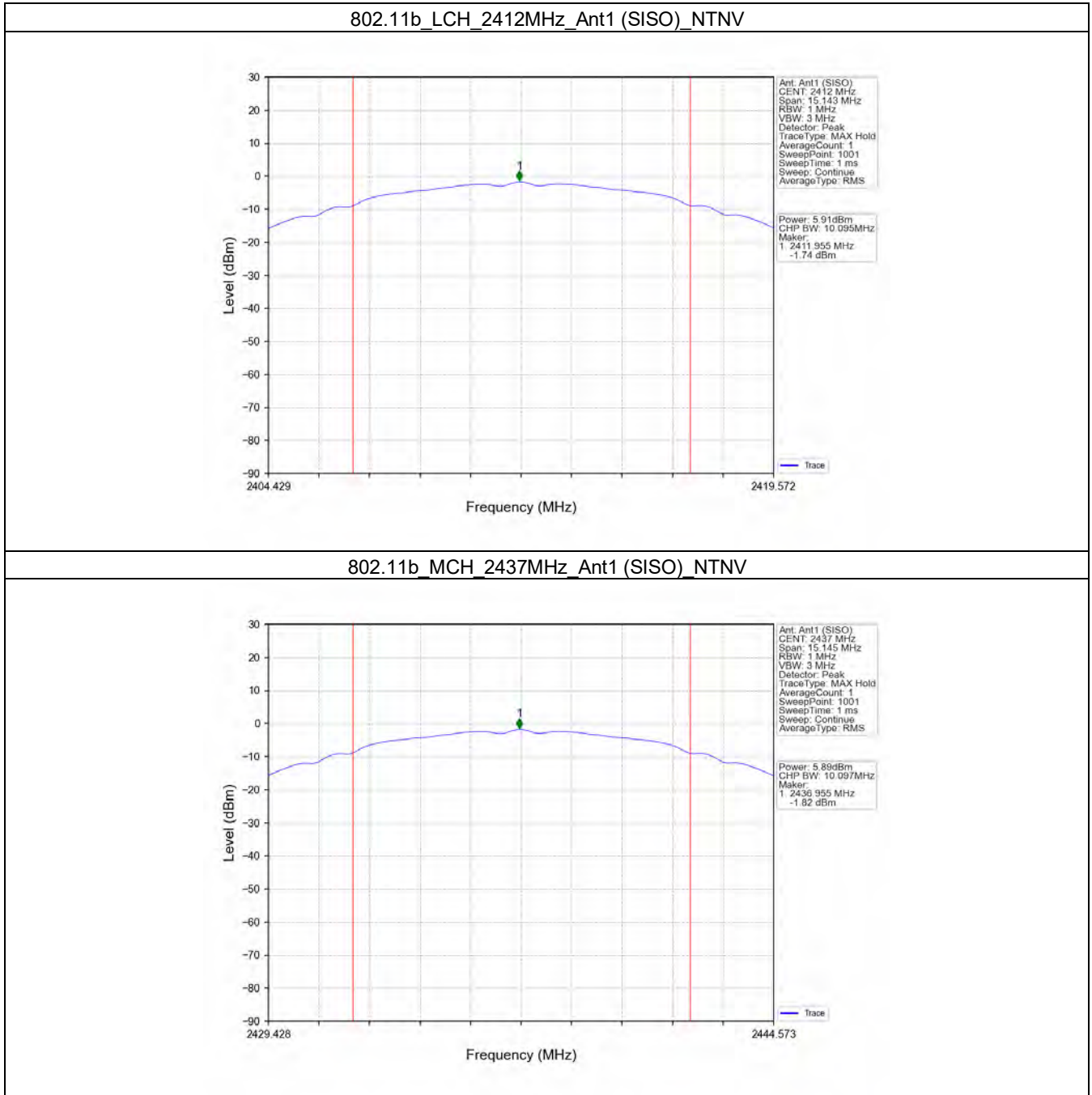
#### 3.1 Power

##### 3.1.1 Test Result

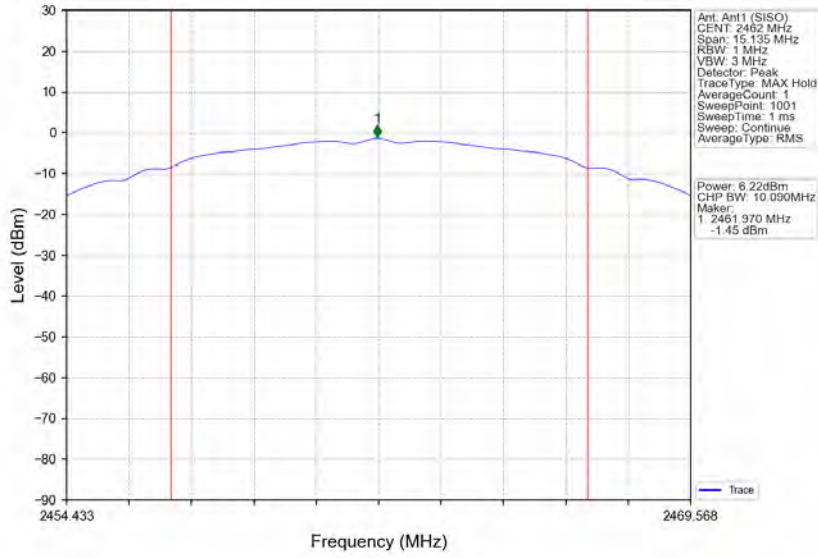
Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	5.91	<=30	Pass
		2437	5.89	<=30	Pass
		2462	6.22	<=30	Pass
802.11g	SISO	2412	5.90	<=30	Pass
		2437	5.96	<=30	Pass
		2462	6.14	<=30	Pass
802.11n (HT20)	SISO	2412	6.03	<=30	Pass
		2437	6.09	<=30	Pass
		2462	5.79	<=30	Pass
802.11n (HT40)	SISO	2422	5.63	<=30	Pass
		2437	5.95	<=30	Pass
		2452	6.09	<=30	Pass

Note1: Antenna Gain: Ant1: 1.62dBi;

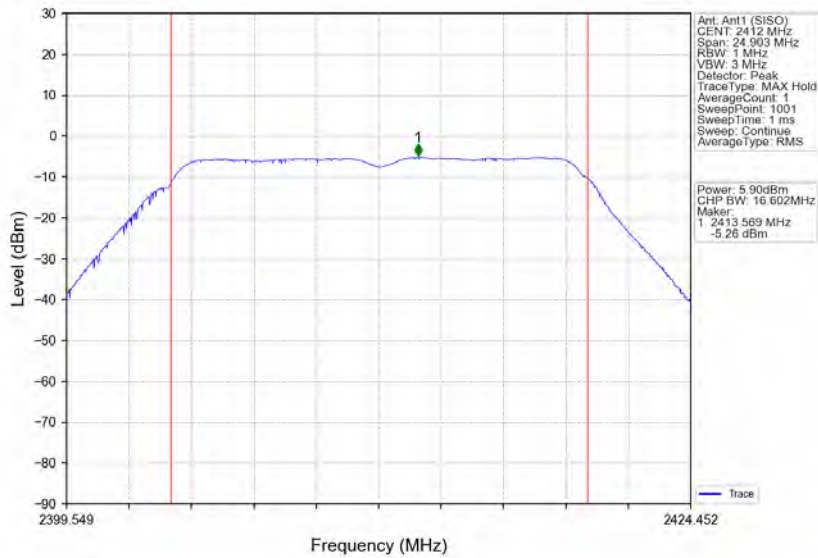
### 3.1.2 Test Graph



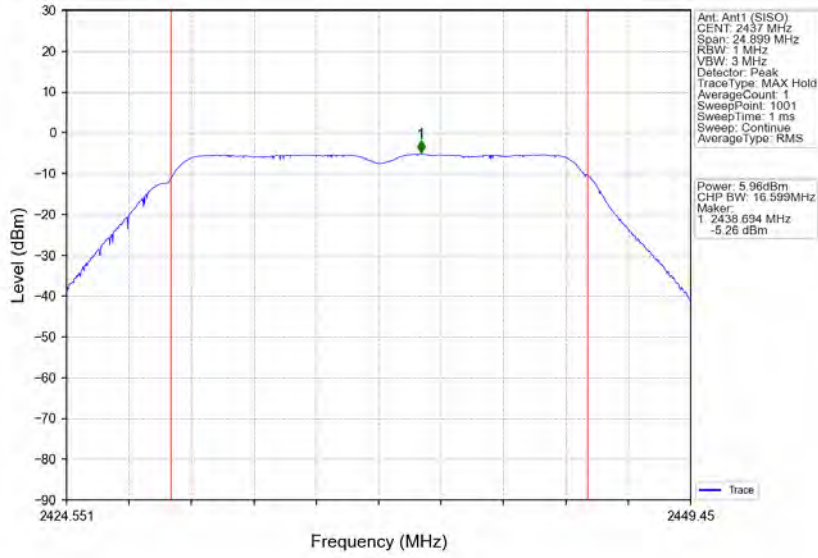
802.11b HCH 2462MHz Ant1 (SISO) NTN



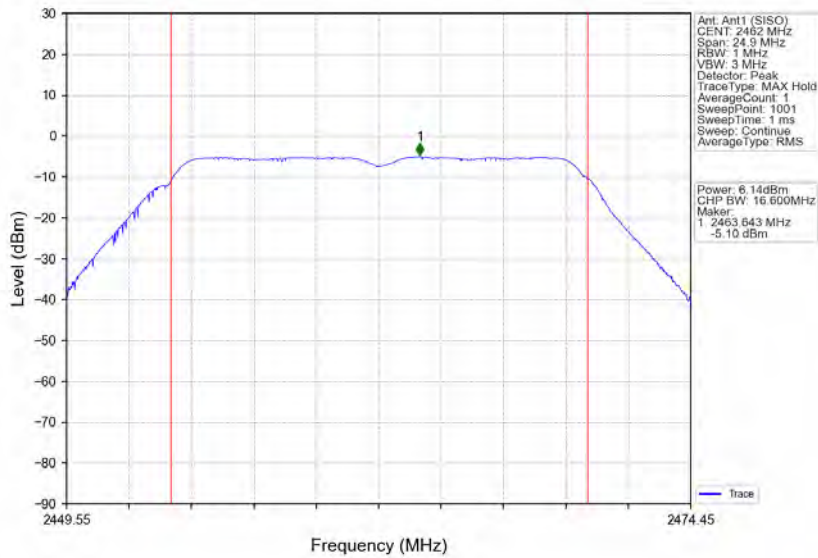
802.11g LCH 2412MHz Ant1 (SISO) NTN



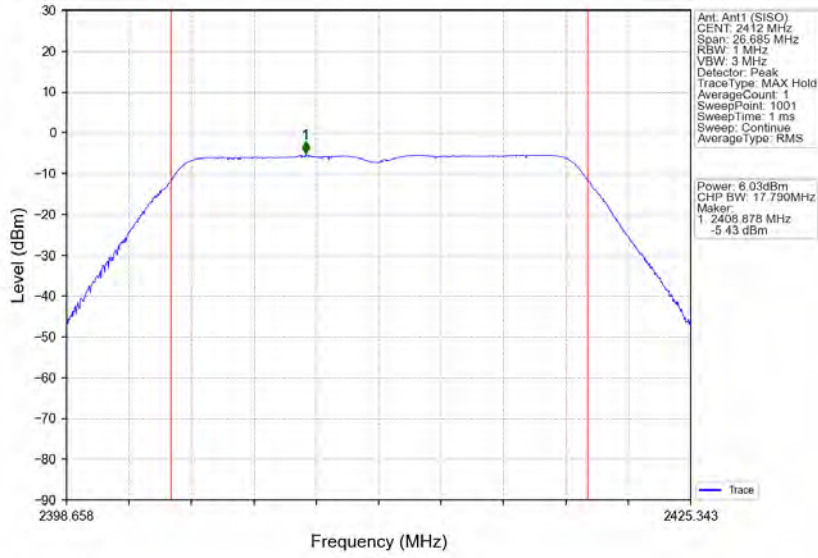
802.11g\_MCH\_2437MHz\_Ant1 (SISO) NTV



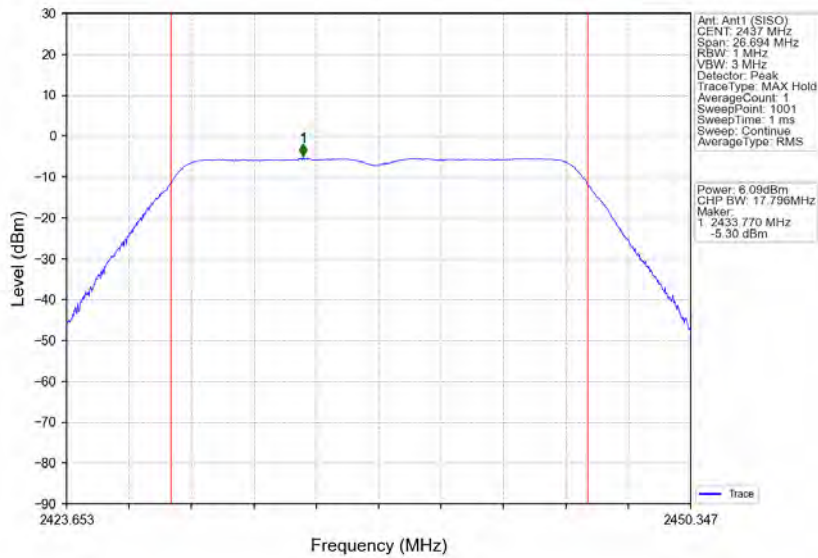
802.11g\_HCH\_2462MHz\_Ant1 (SISO) NTV



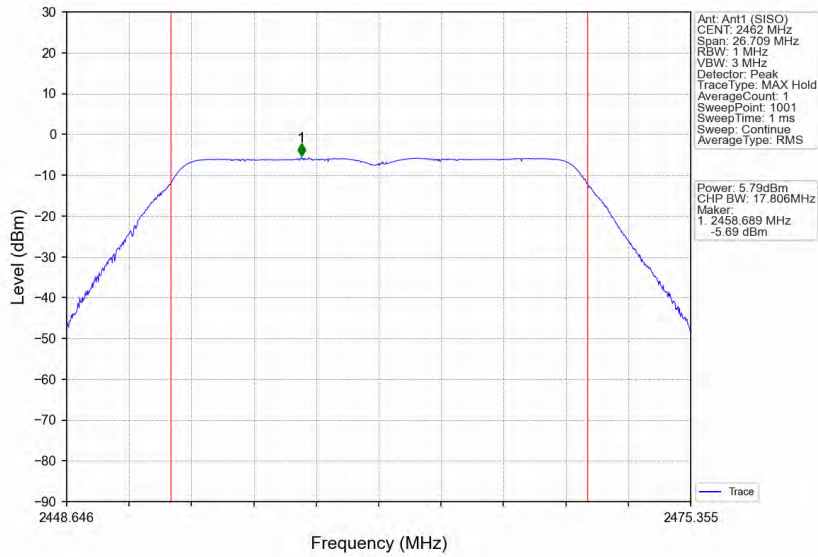
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTN



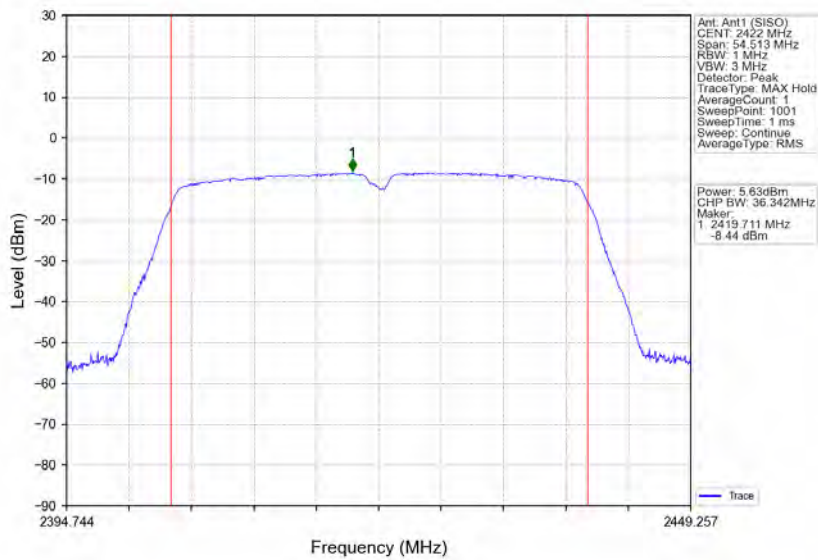
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTN



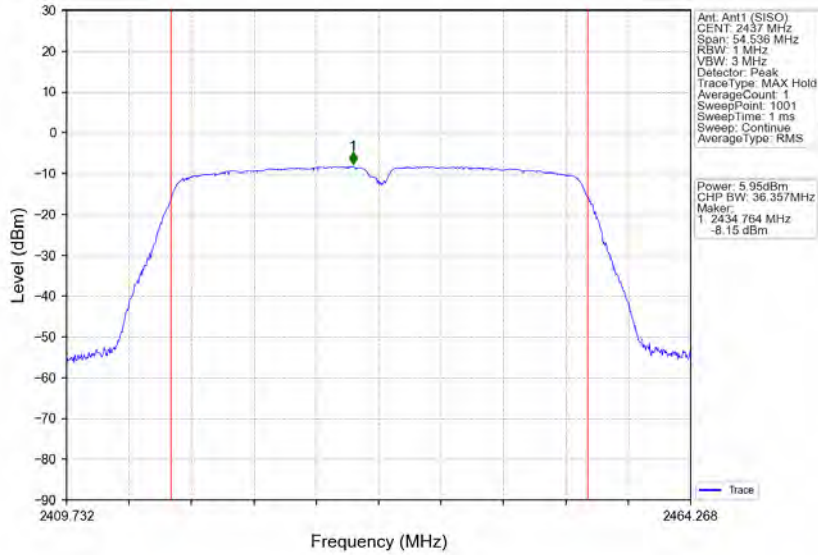
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTVN



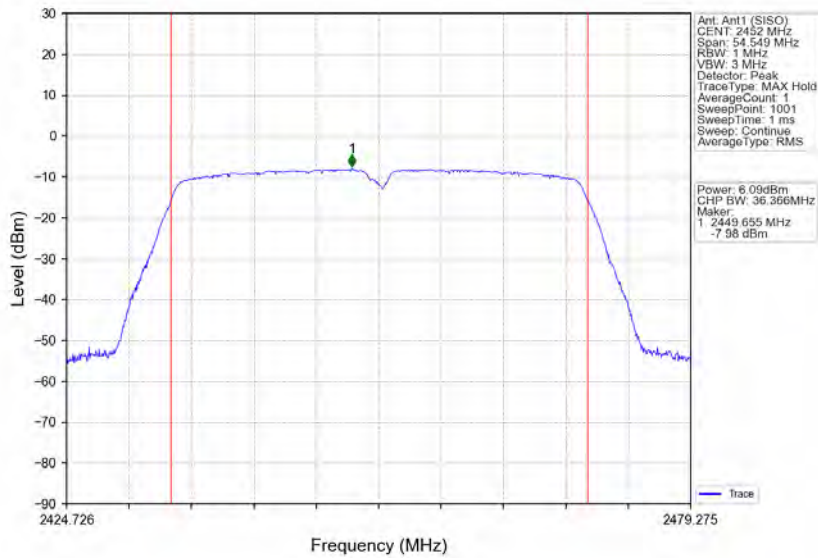
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTVN



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTV



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTV







## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 97 of 121

### 4. Maximum Power Spectral Density

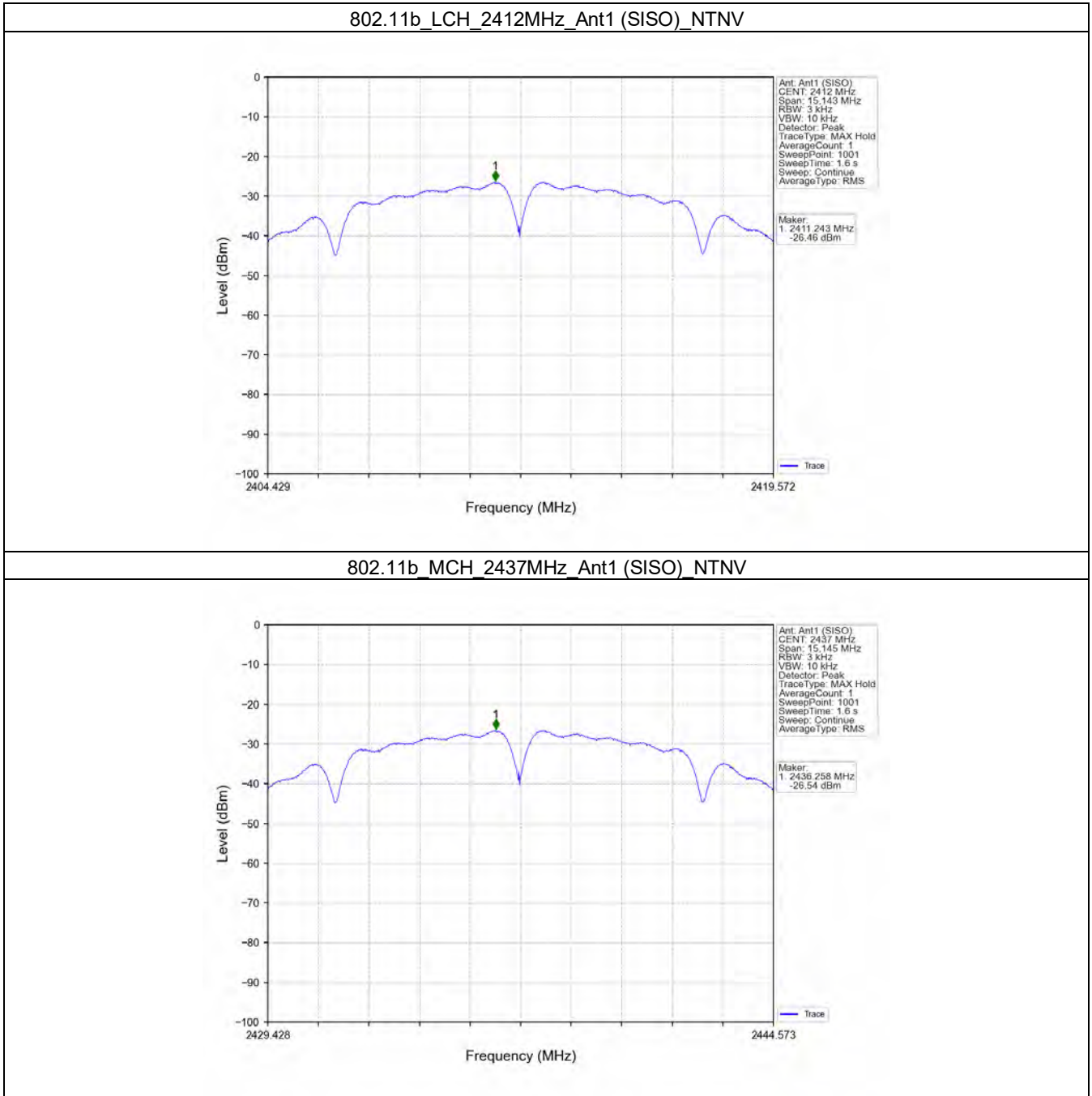
#### 4.1 PSD

##### 4.1.1 Test Result

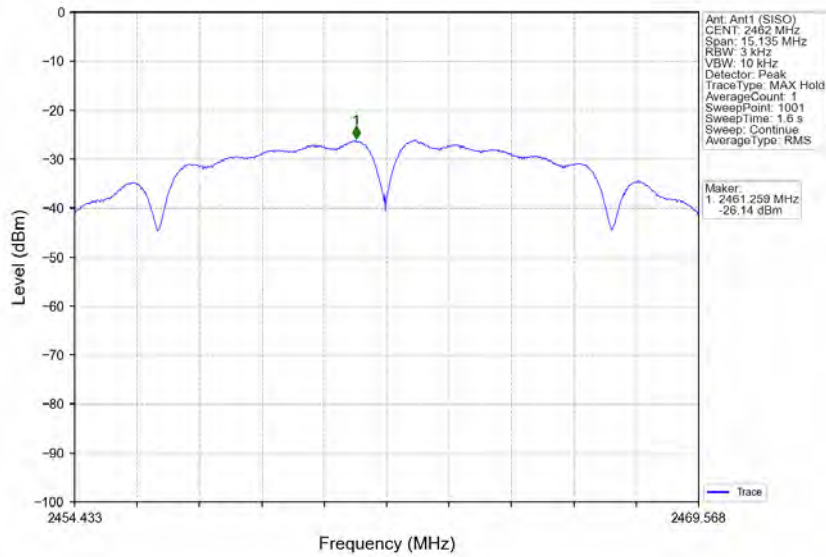
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-26.46	<=8	Pass
		2437	-26.54	<=8	Pass
		2462	-26.14	<=8	Pass
802.11g	SISO	2412	-30.25	<=8	Pass
		2437	-30.11	<=8	Pass
		2462	-29.96	<=8	Pass
802.11n (HT20)	SISO	2412	-29.77	<=8	Pass
		2437	-29.83	<=8	Pass
		2462	-30.32	<=8	Pass
802.11n (HT40)	SISO	2422	-31.53	<=8	Pass
		2437	-29.97	<=8	Pass
		2452	-30.27	<=8	Pass

Note1: Antenna Gain: Ant1: 1.62dBi;

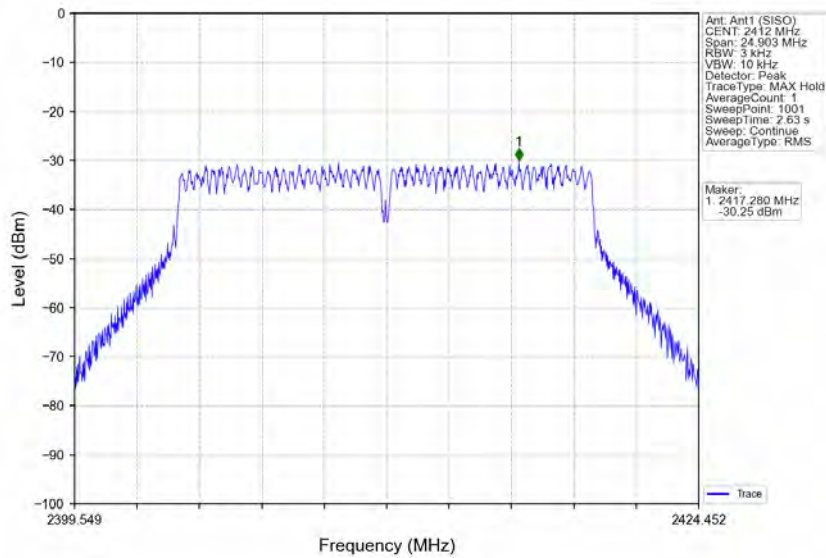
### 4.1.2 Test Graph



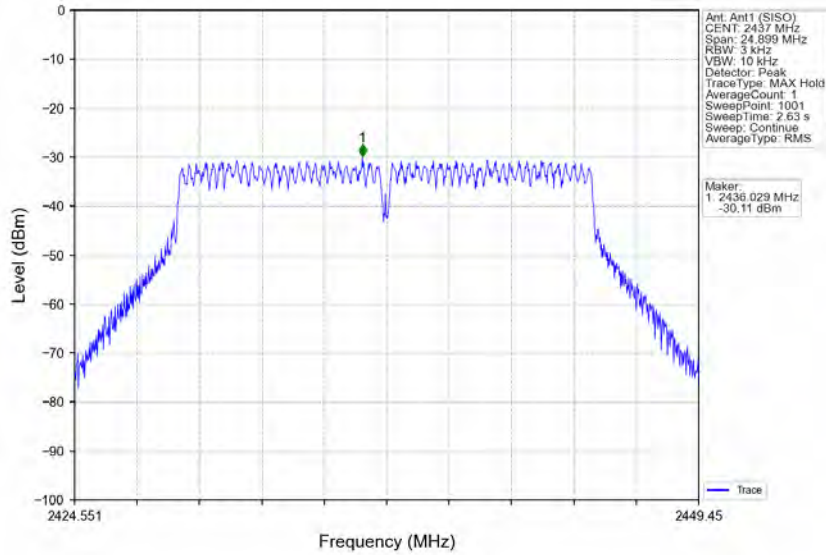
802.11b HCH 2462MHz Ant1 (SISO) NTN



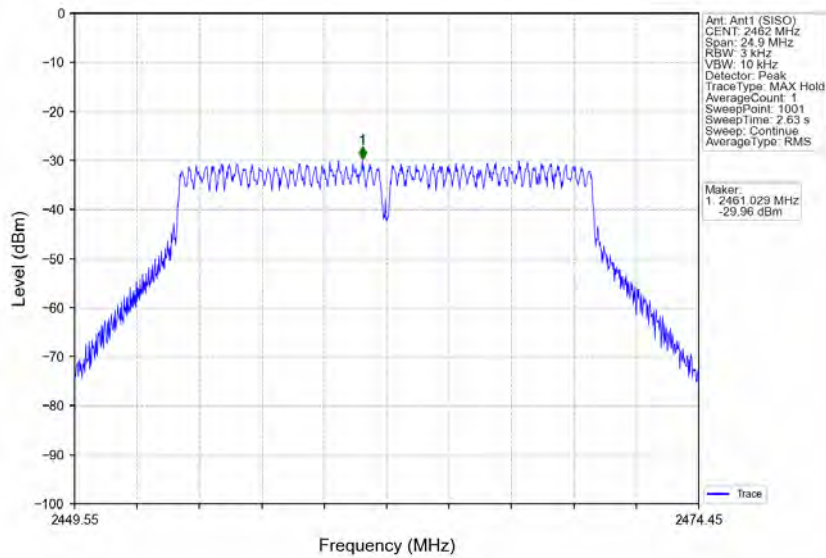
802.11g\_LCH\_2412MHz\_Ant1 (SISO) NTN



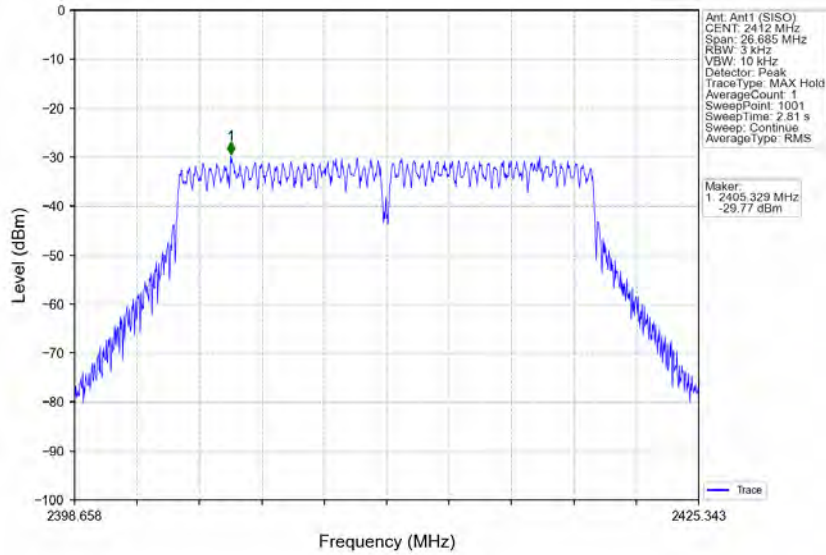
802.11g\_MCH\_2437MHz\_Ant1 (SISO) NTN



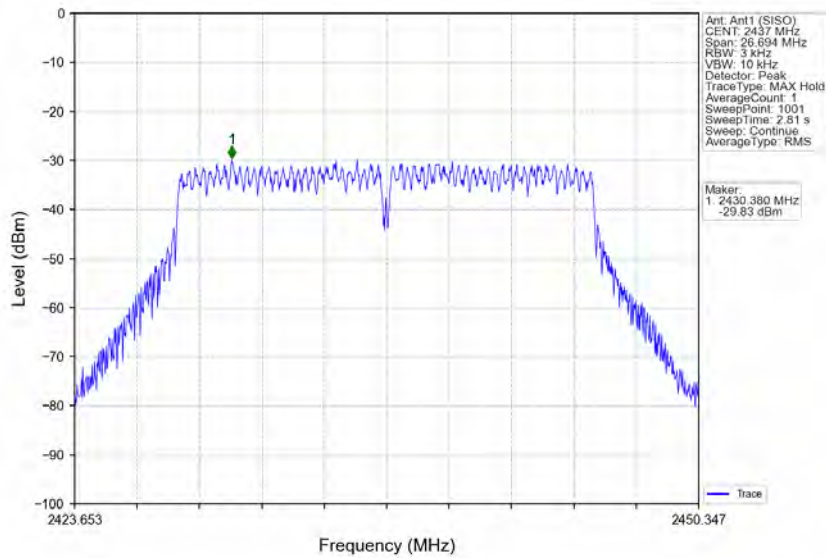
802.11g\_HCH\_2462MHz\_Ant1 (SISO) NTN



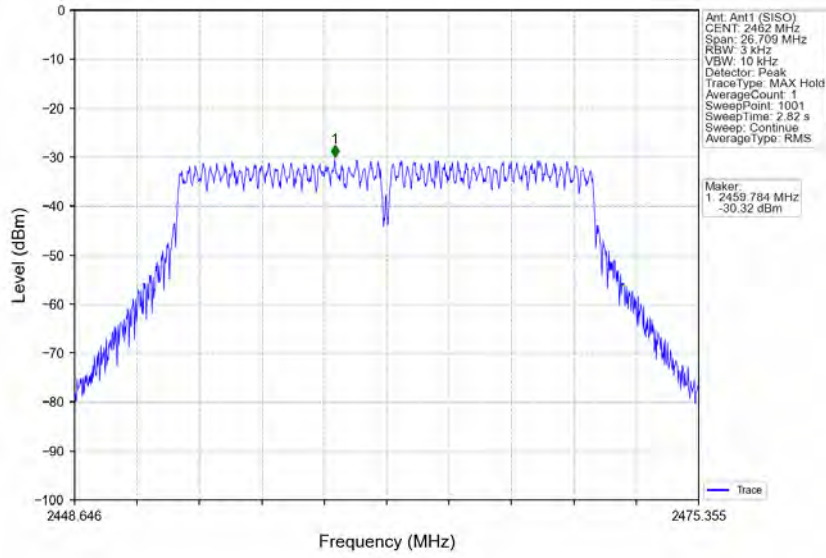
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTN



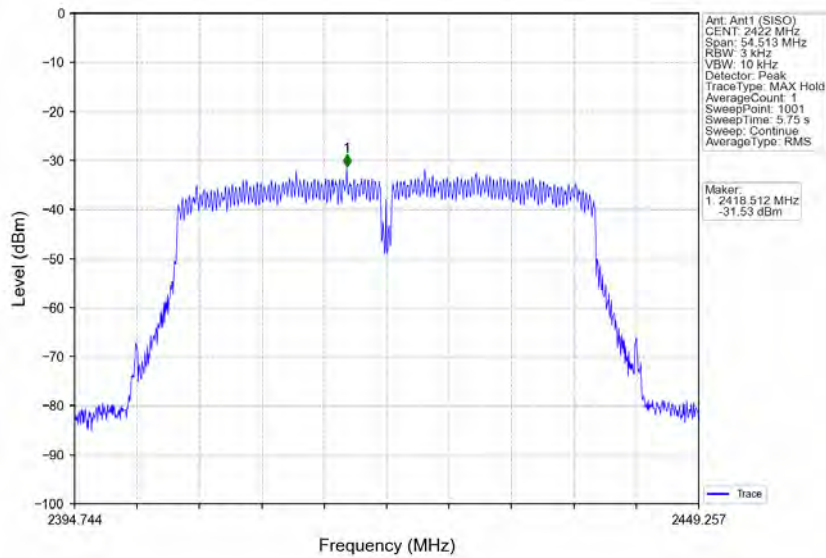
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTN



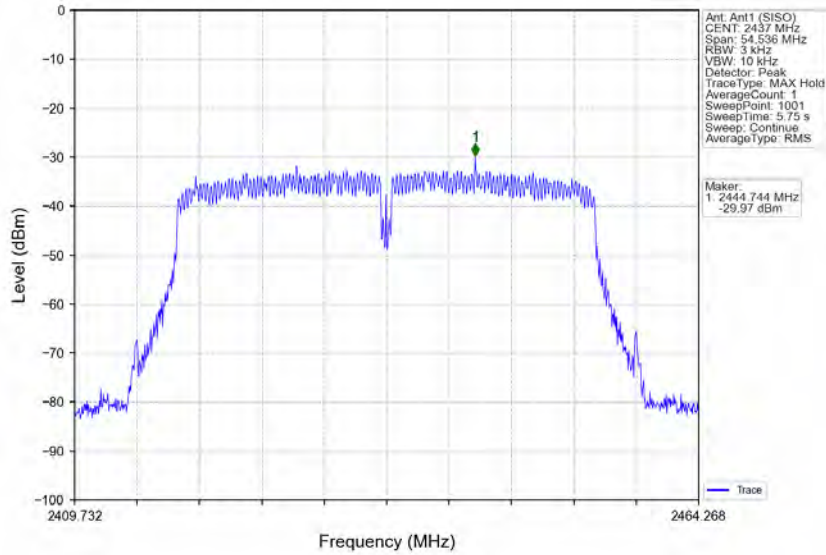
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTVN



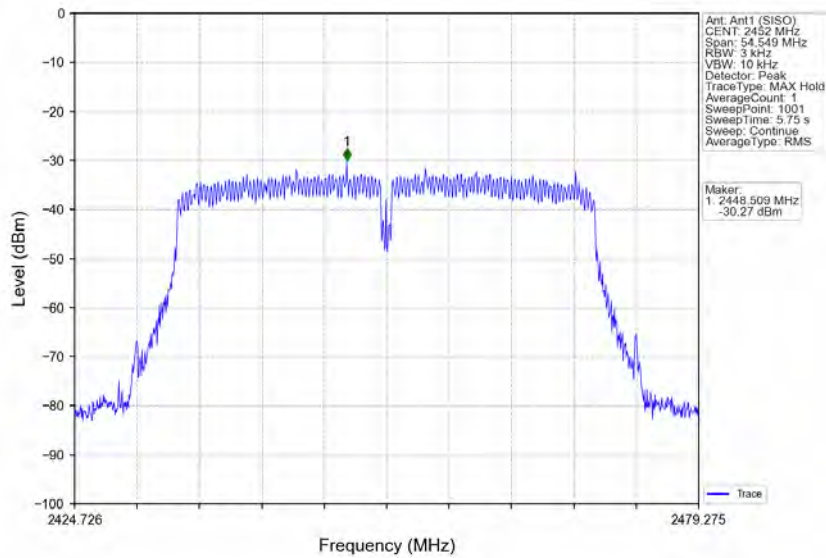
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTVN



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTV



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTV





## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 104 of 121

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

#### 5.1 Ref

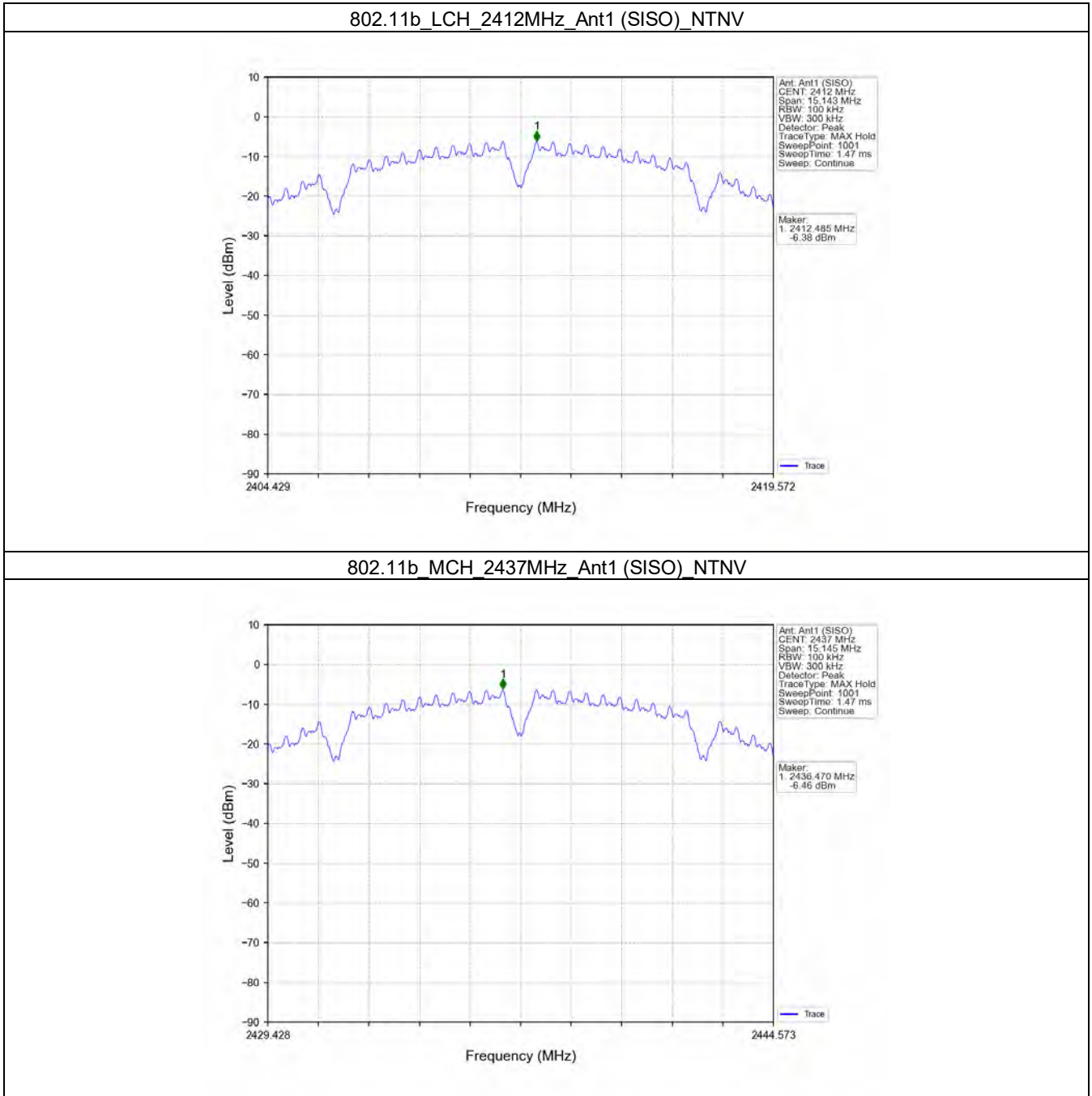
##### 5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	1	-6.38
		2437	1	-6.46
		2462	1	-6.09
802.11g	SISO	2412	1	-16.05
		2437	1	-15.92
		2462	1	-15.75
802.11n (HT20)	SISO	2412	1	-15.81
		2437	1	-15.64
		2462	1	-15.95
802.11n (HT40)	SISO	2422	1	-18.99
		2437	1	-18.78
		2452	1	-18.62

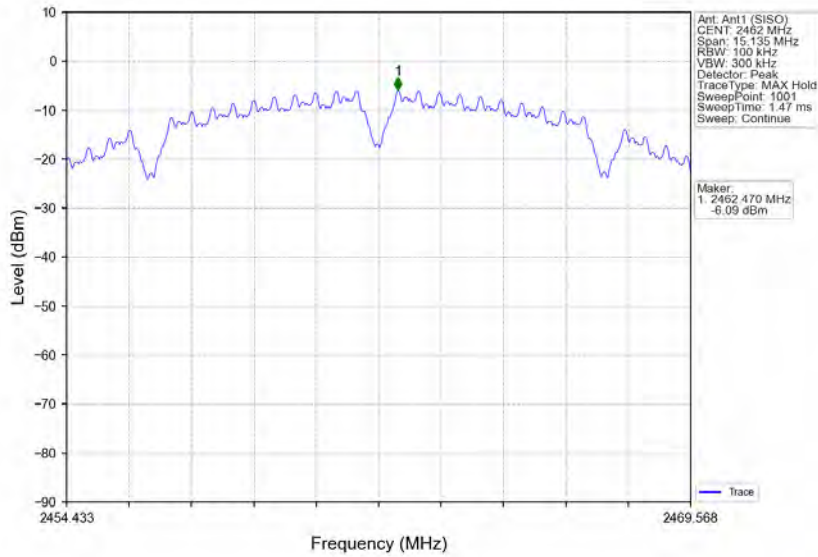
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.



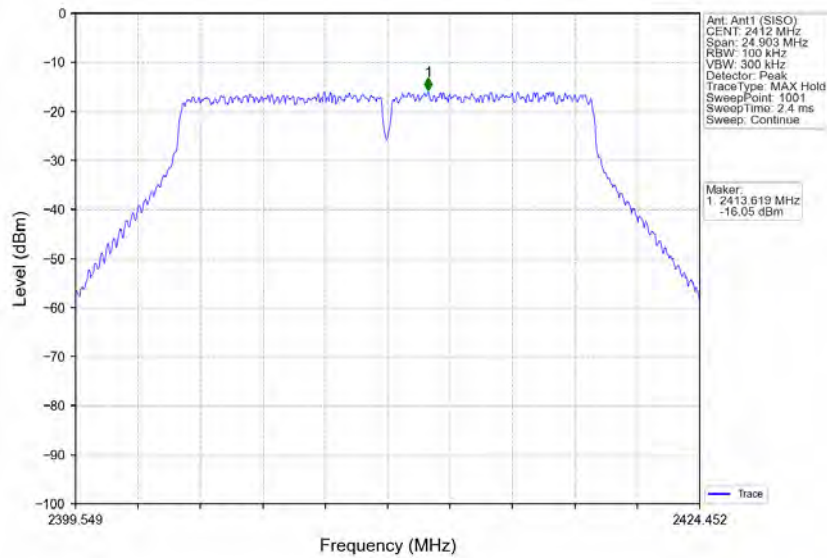
### 5.1.2 Test Graph



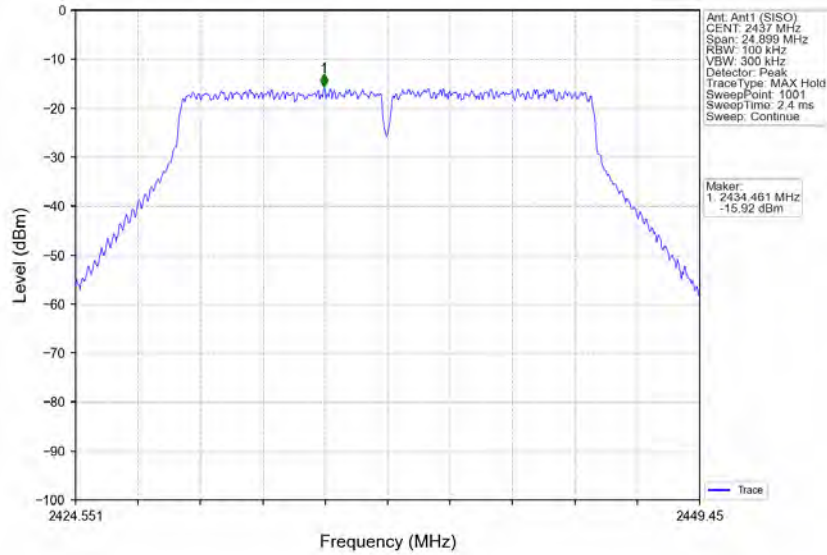
802.11b HCH 2462MHz Ant1 (SISO) NTN



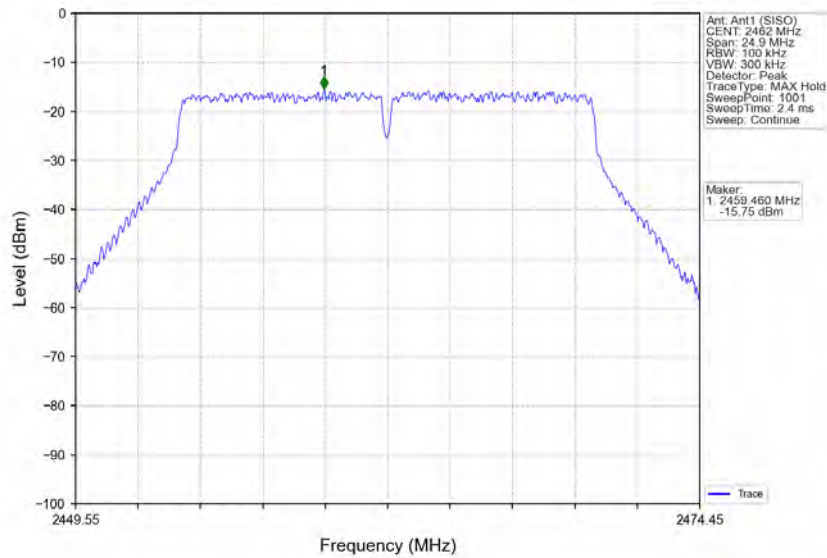
802.11g\_LCH\_2412MHz\_Ant1 (SISO) NTN



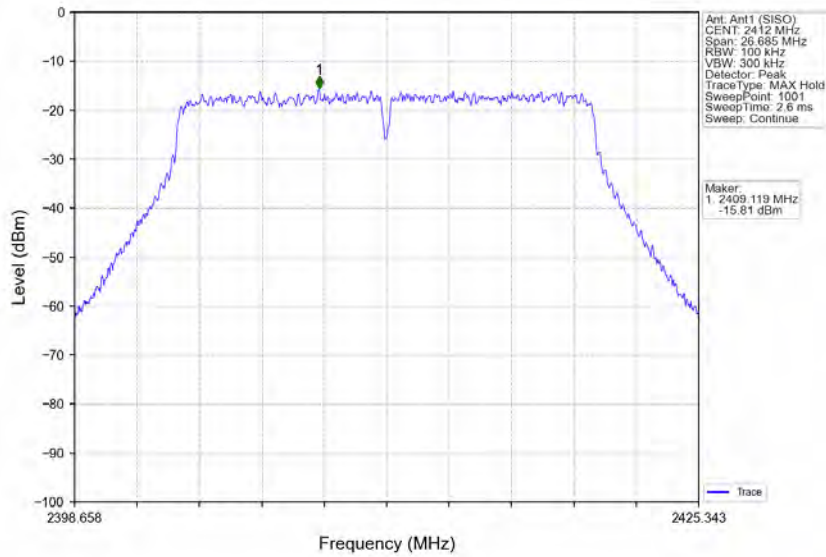
802.11g\_MCH\_2437MHz\_Ant1 (SISO) NTN



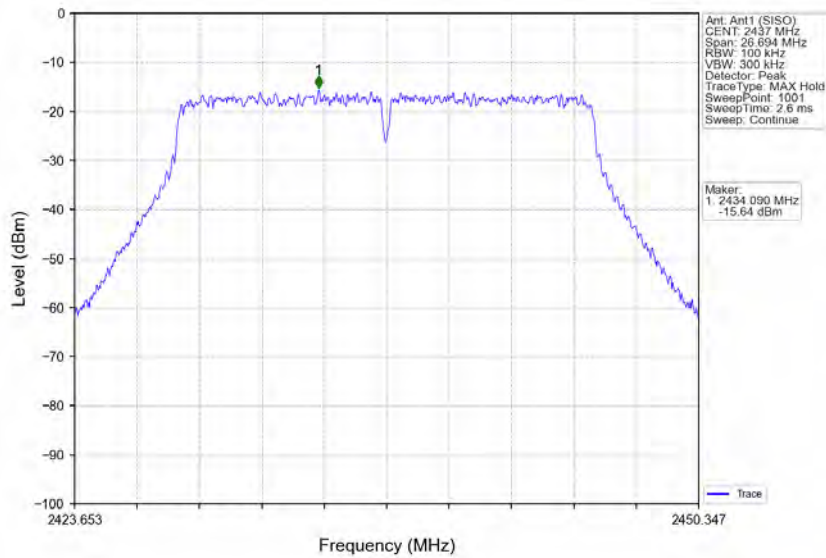
802.11g\_HCH\_2462MHz\_Ant1 (SISO) NTN



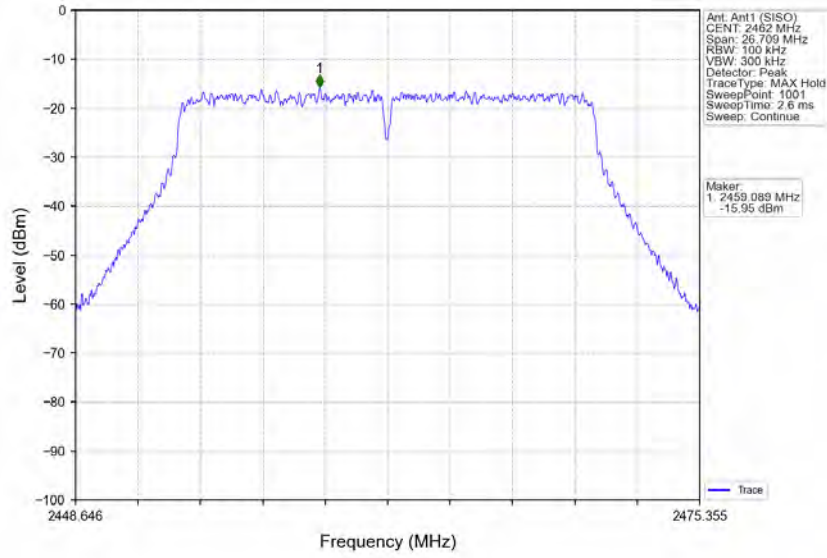
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTN



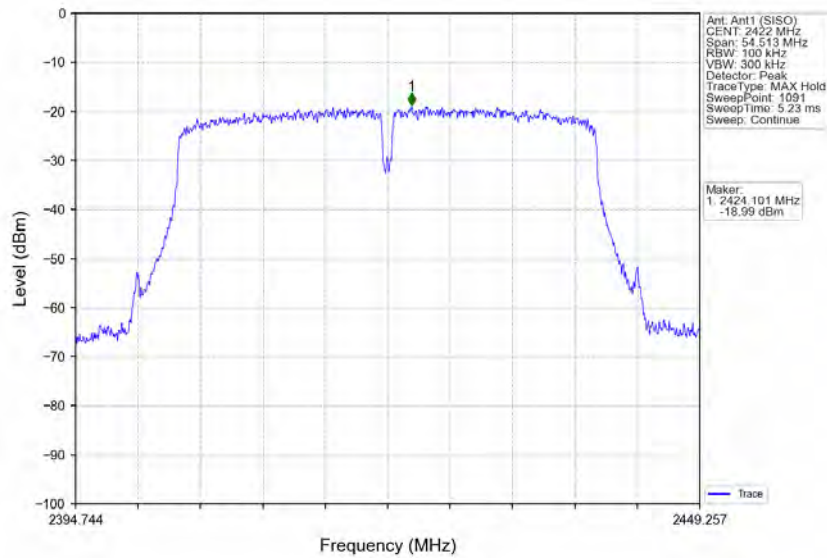
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTN



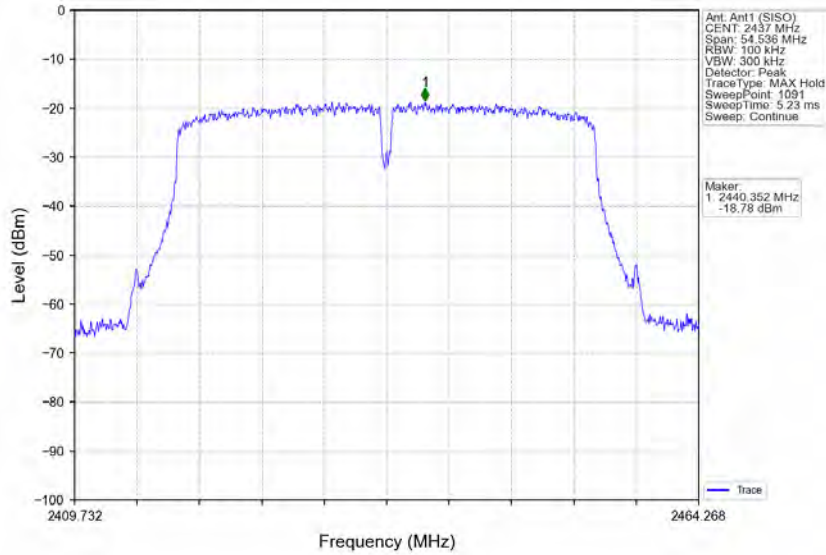
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN



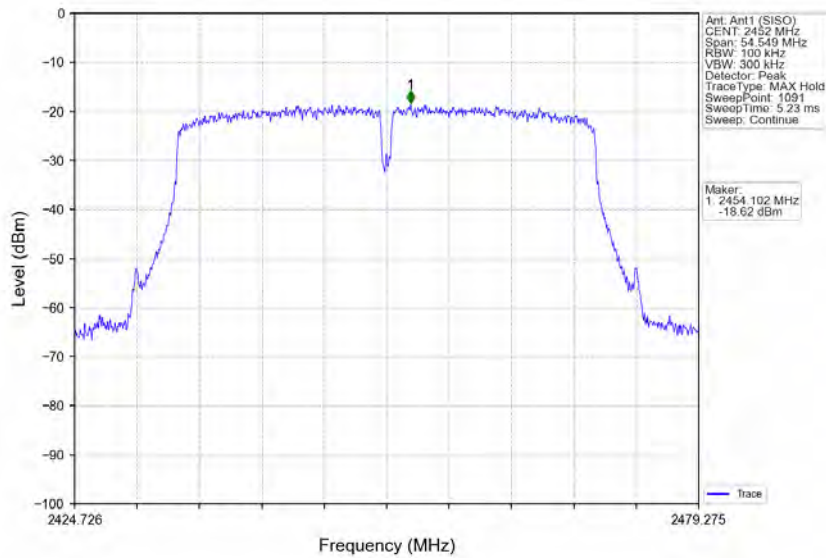
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTN



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTN



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTN





## Compliance Certification Services (Kunshan) Inc.

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

Report No.: KSCR240500092301

Page: 111 of 121

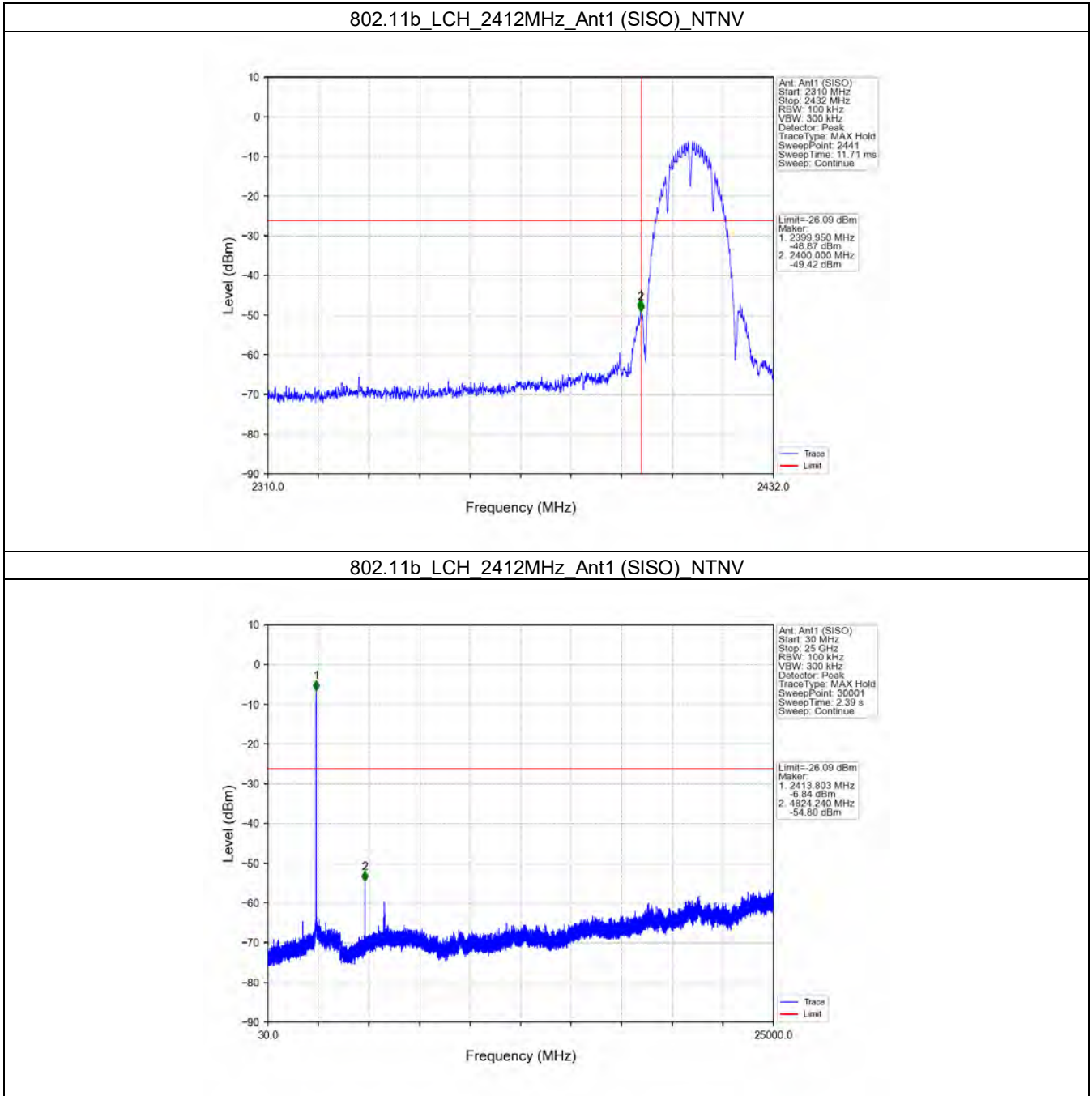
### 5.2 CSE

#### 5.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	-6.09	-26.09	Pass
		2437	1	-6.09	-26.09	Pass
		2462	1	-6.09	-26.09	Pass
802.11g	SISO	2412	1	-15.75	-35.75	Pass
		2437	1	-15.75	-35.75	Pass
		2462	1	-15.75	-35.75	Pass
802.11n (HT20)	SISO	2412	1	-15.64	-35.64	Pass
		2437	1	-15.64	-35.64	Pass
		2462	1	-15.64	-35.64	Pass
802.11n (HT40)	SISO	2422	1	-18.62	-38.62	Pass
		2437	1	-18.62	-38.62	Pass
		2452	1	-18.62	-38.62	Pass

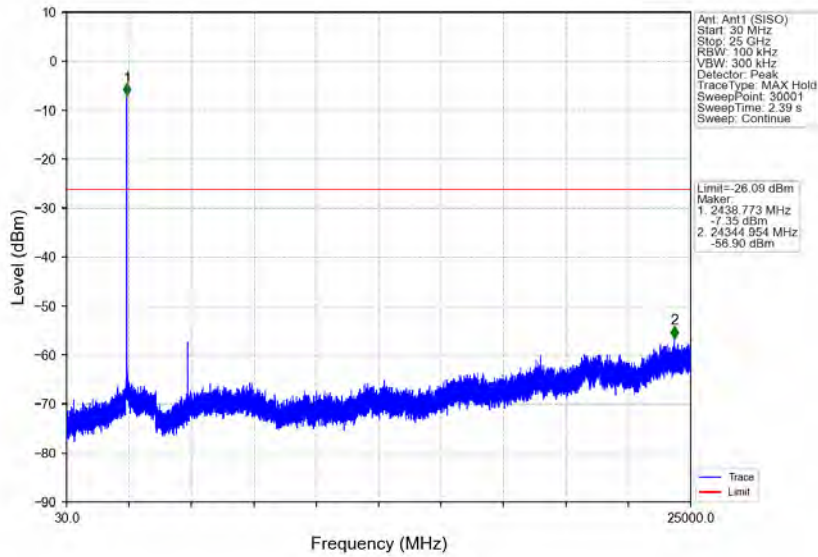
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

### 5.2.2 Test Graph

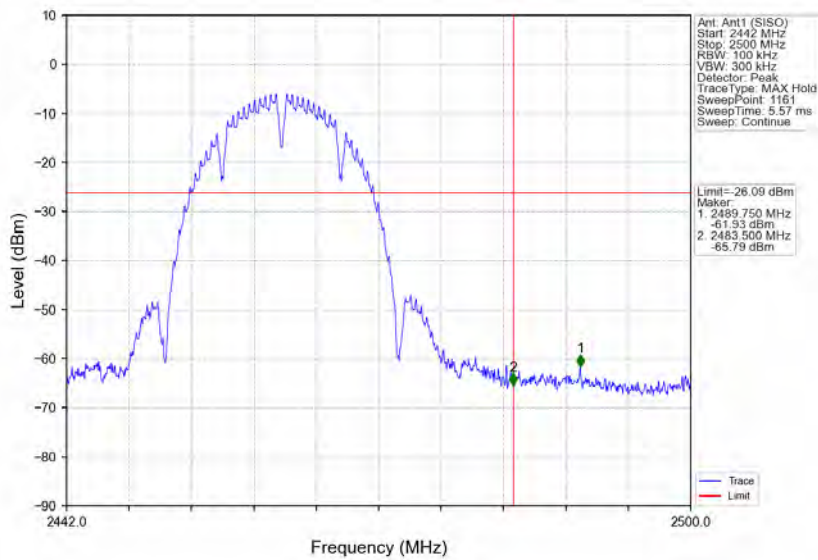




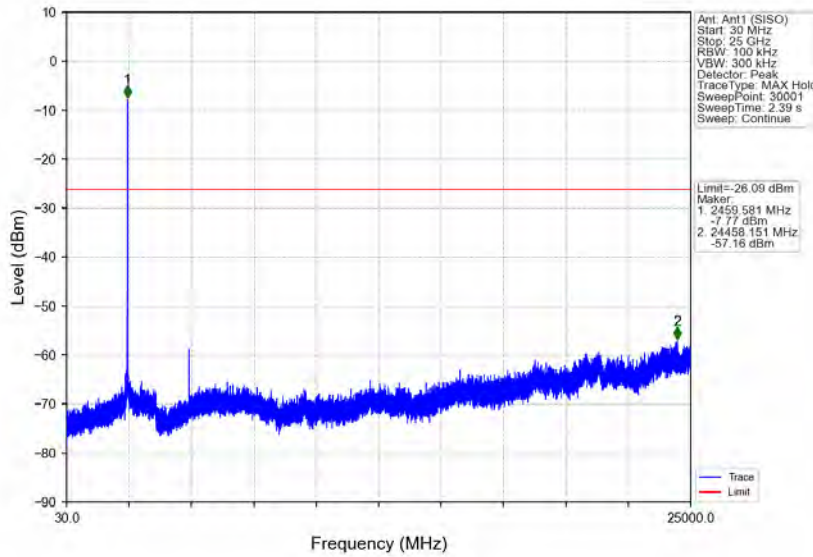
### 802.11b MCH 2437MHz Ant1 (SISO) NTV



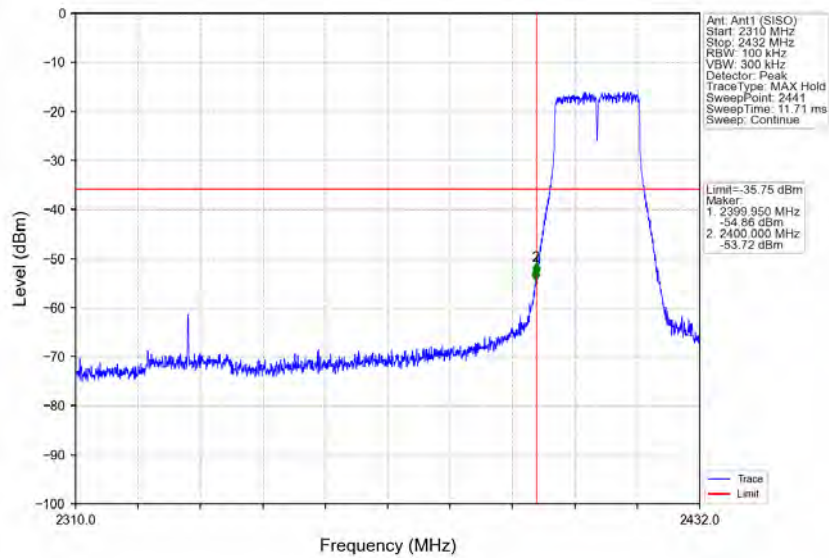
### 802.11b\_HCH\_2462MHz\_Ant1 (SISO) NTV



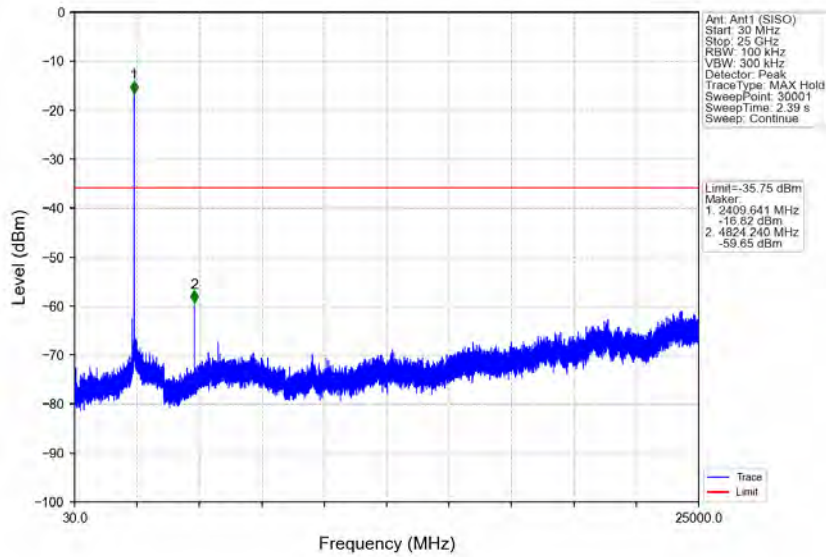
802.11b HCH 2462MHz Ant1 (SISO) NTN



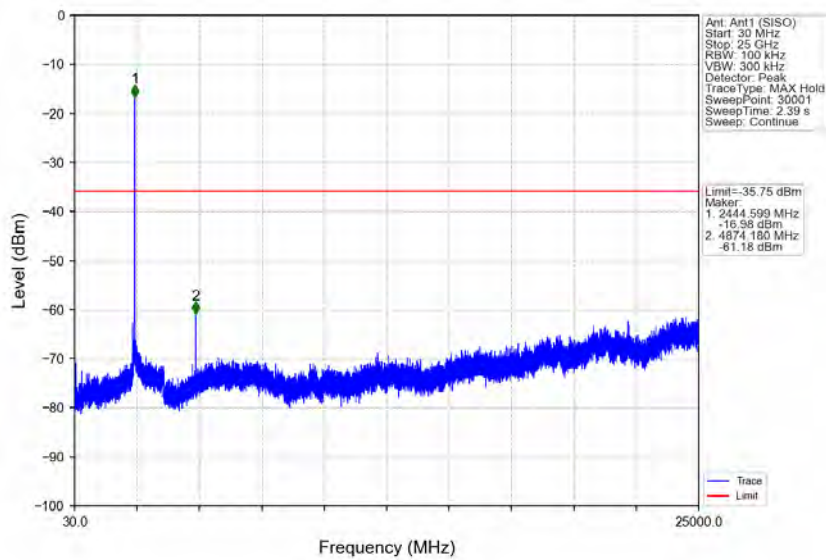
802.11g\_LCH\_2412MHz\_Ant1 (SISO) NTN



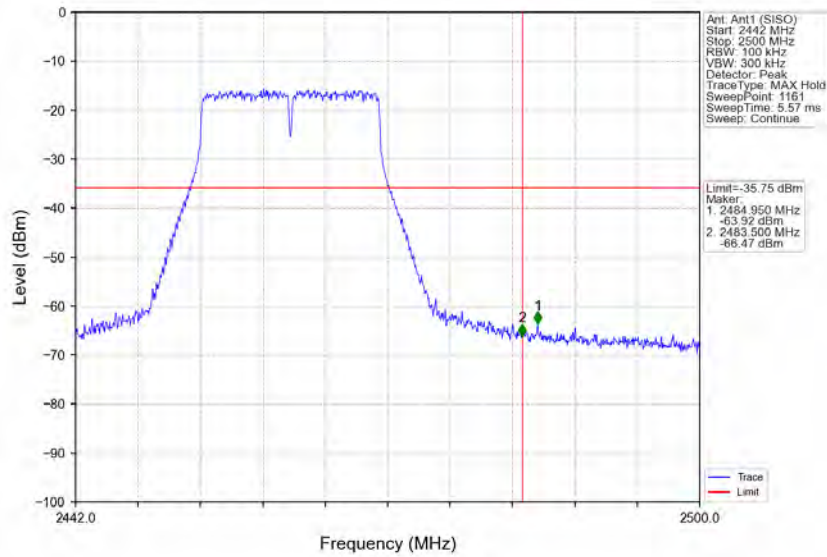
802.11g LCH 2412MHz Ant1 (SISO) NTN



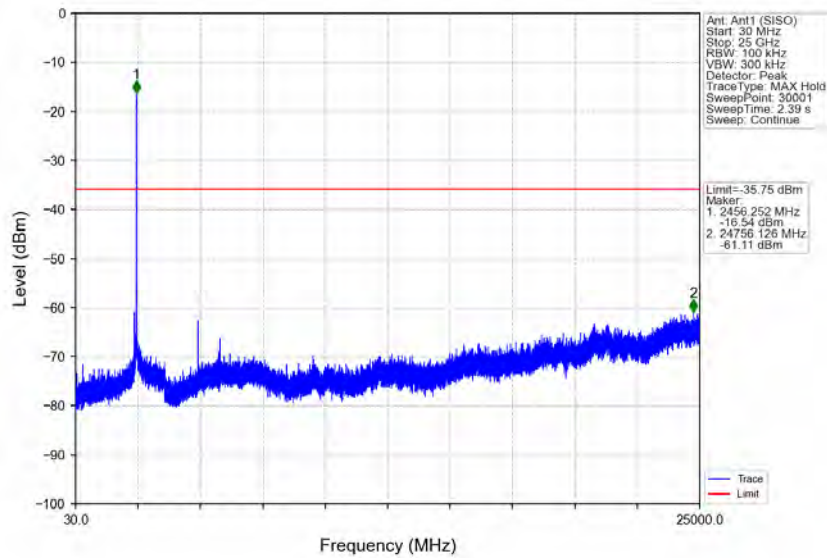
802.11g MCH 2437MHz Ant1 (SISO) NTN



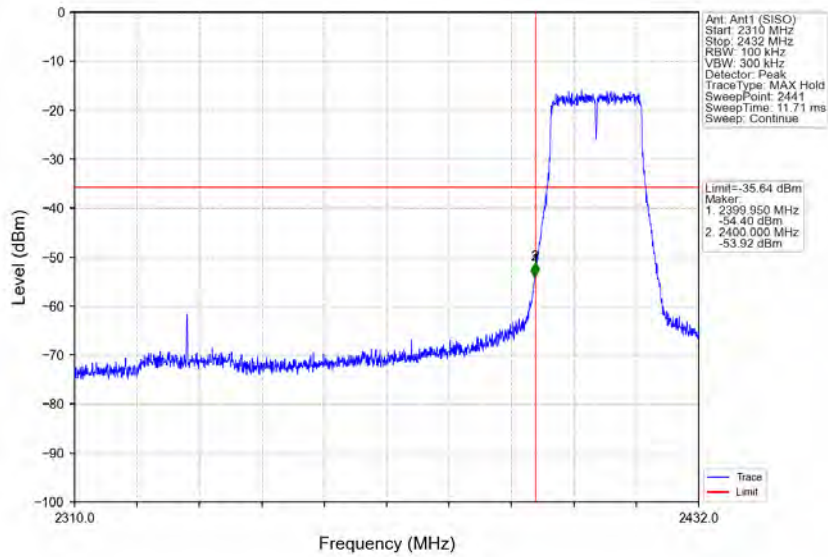
802.11g HCH 2462MHz Ant1 (SISO) NTN



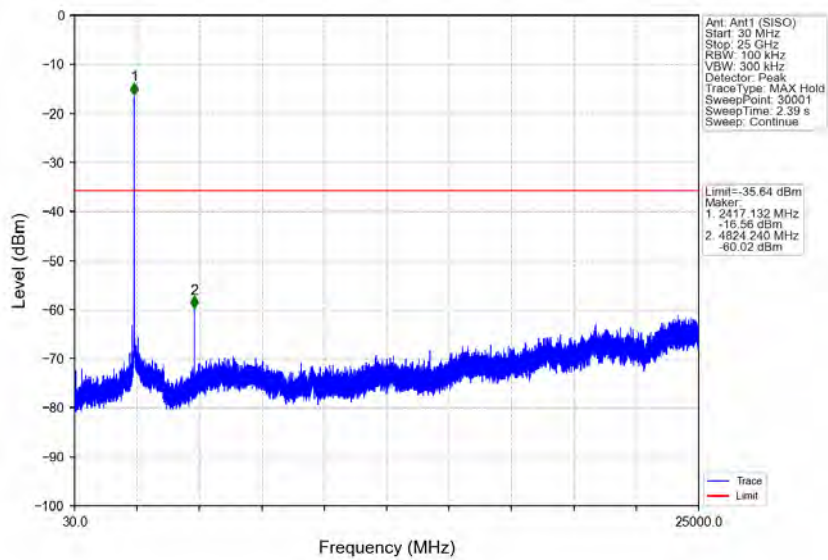
802.11g\_HCH\_2462MHz\_Ant1 (SISO) NTN



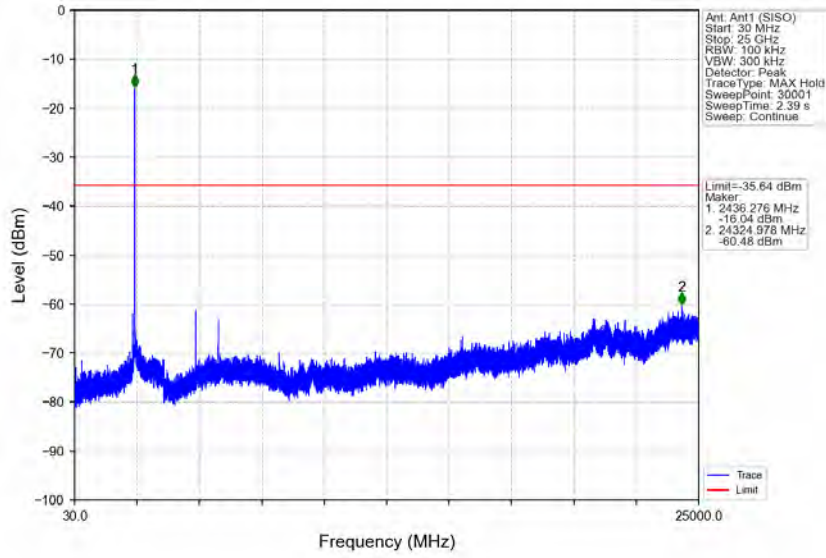
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTNv



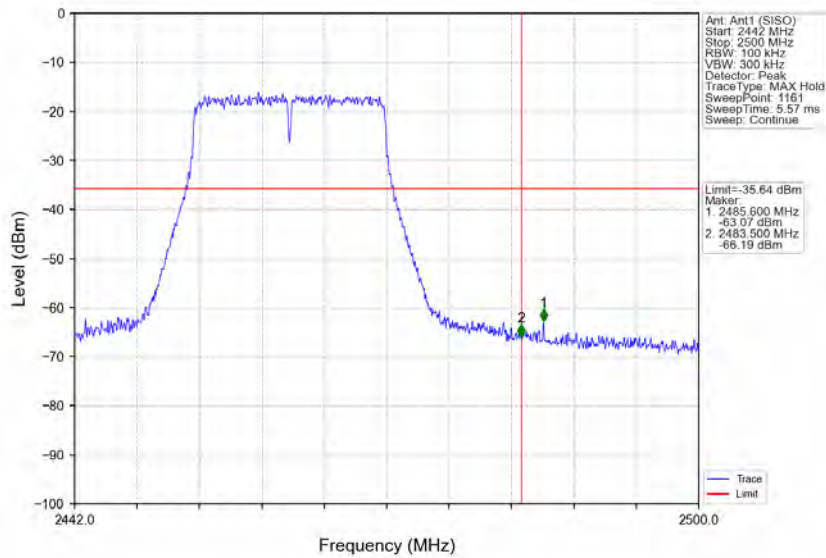
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTNv



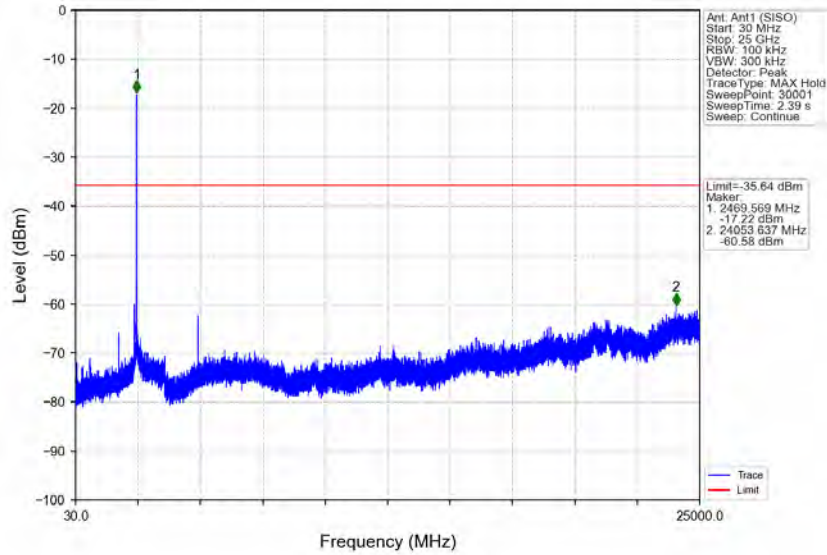
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTN



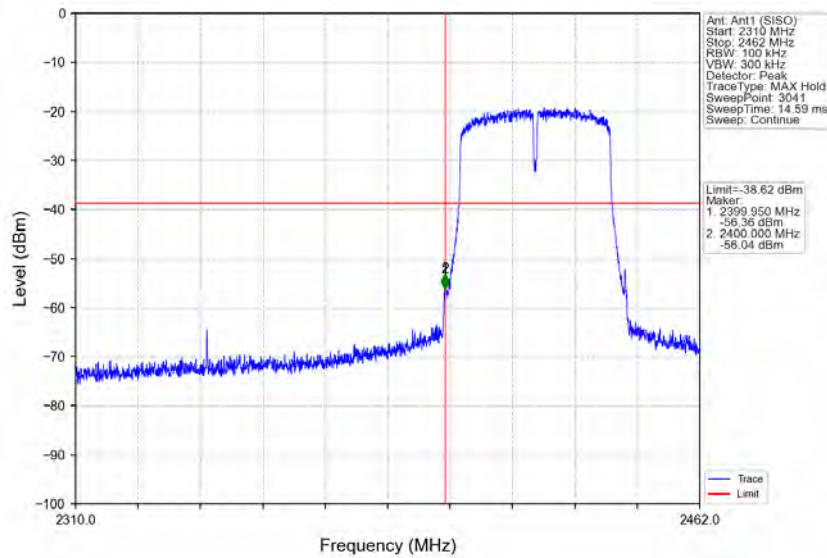
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN



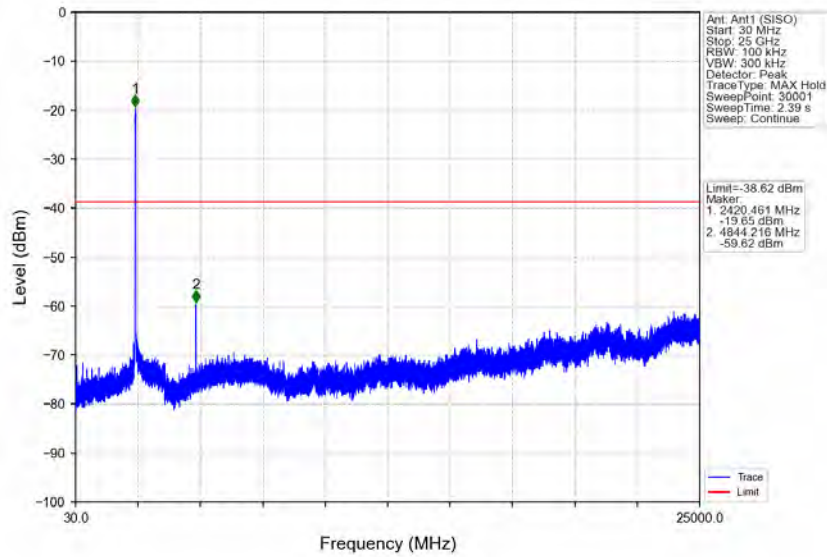
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN



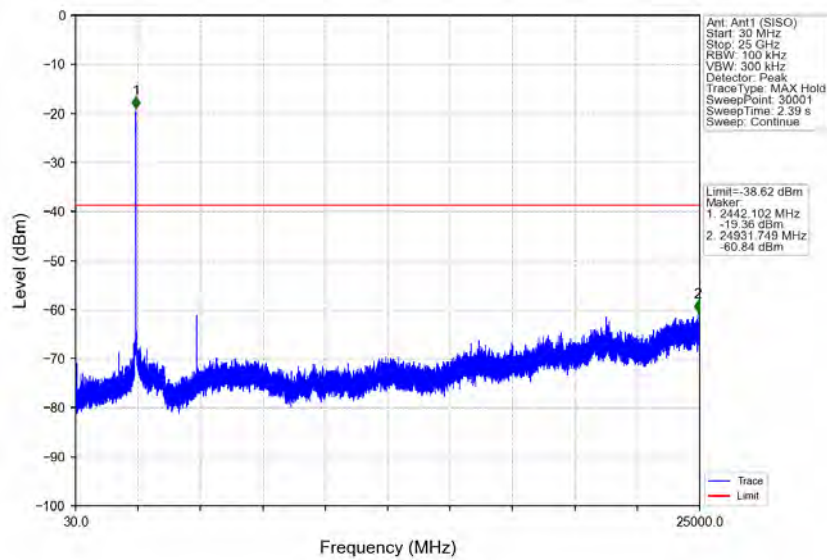
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTN



802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTN

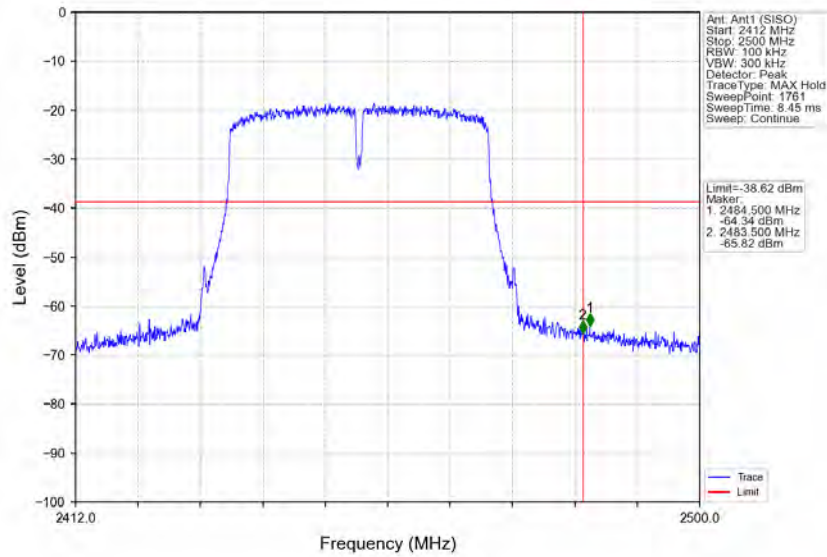


802.11n(HT40)\_MCH\_2437MHz\_Ant1 (SISO)\_NTN





802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTN



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTN

