

TEST REPORT

Application No.:	SUCR2504000355MO
Applicant:	METICOMM PTE. LTD.
Address of Applicant:	15 UPPER CIRCULAR ROAD, #06-01, SINGAPORE 058413
Manufacturer:	METICOMM PTE. LTD.
Address of Manufacturer:	15 UPPER CIRCULAR ROAD, #06-01, SINGAPORE 058413
EUT Description:	IoT Module
Model No.:	MQM744-0-50-0B, MQM744-0-50-0U, MQM744-0-50-0P, MQM748-0-50-0B, MQM748-0-50-0U, MQM748-0-50-0P ♣
♣	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:	Meticomm
FCC ID:	2BQY7-M7400
Standards:	FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C
Date of Receipt:	June 7, 2025
Date of Test:	June 8, 2025 to June 16, 2025
Date of Issue:	July 3, 2025
Test Result :	PASS *

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

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Version

<i>Revision Record</i>			
<i>Version</i>	<i>Description</i>	<i>Date</i>	<i>Remark</i>
01	Original	July 3, 2025	/

Authorized for issue by:			
Tested By		 _____ Hayley Zhang/Project Manager	
Approved By		 _____ Cloud Peng/Technical Manager	

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1 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result
Antenna Requirement	15.203/15.247(b)	--	Clause 3.1	PASS
AC Power Line Conducted Emission	15.207	ANSI C63.10 2020 Section 6.2	Clause 3.2	PASS
Duty Cycle	--	ANSI C63.10 2020 Section 11.6	Clause 3.3 For Report Purpose	
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2020 Section11.9	Clause 3.4	PASS
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2020 Section 11.8 / 6.9	Clause 3.5	PASS
Power Spectral Density	15.247 (e)	ANSI C63.10 2020 Section 11.10	Clause 3.6	PASS
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2020 Section 11.11	Clause 3.7	PASS
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2020 Section 11.11	Clause 3.8	PASS
Radiated Spurious Emissions	15.247(d);15.205/15.209	ANSI C63.10 2020 Section 11.12	Clause 3.9	PASS
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d);15.205/15.209	ANSI C63.10 2020 Section 11.12	Clause 3.10	PASS

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2 General Information

2.1 Details of Client

Applicant:	METICOMM PTE. LTD.
Address of Applicant:	15 UPPER CIRCULAR ROAD, #06-01, SINGAPORE 058413
Manufacturer:	METICOMM PTE. LTD.
Address of Manufacturer:	15 UPPER CIRCULAR ROAD, #06-01, SINGAPORE 058413

2.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Tizzy Song

2.3 Test Facility

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

- **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

- **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

2.4 General Description of EUT

Hardware Version:	N/A			
Software Version:	N/A			
Power Supply:	3.3V			
Operation Frequency:	802.11b/g/n(HT20)/ax(HEW20)	2412MHz to 2462MHz		
	802.11n(HT40)/ax(HEW40)	2422MHz to 2452MHz		
Modulation Type:	802.11b:	DSSS (DBPSK, DQPSK, CCK)		
	802.11g/n:	OFDM (BPSK, QPSK, 16QAM, 64QAM)		
	802.11ax:	OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)		
Number of Channels:	802.11b/g/n(HT20)/ax(HEW20): 11 02.11n(HT40)/ax(HEW40): 7			
Channel Spacing:	5MHz			
Smart System:	<input checked="" type="checkbox"/> SISO	802.11b/g/n/ax		
Antenna Type:	MQM744-0-50-0B, MQM748-0-50-0B: PCB Antenna MQM744-0-50-0U, MQM744-0-50-0P, MQM748-0-50-0U, MQM748-0-50-0P: Dipole Antenna			
Antenna Gain:	MQM744-0-50-0B, MQM748-0-50-0B: 2.52dBi MQM744-0-50-0U, MQM744-0-50-0P, MQM748-0-50-0U, MQM748-0-50-0P: 3.37dBi			
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.			
RF Cable:	1dB			
The differences between models are listed below, while the other parts are completely identical. Based on the differences, complete testing was conducted for MQM744-0-50-0U, and RSE was tested for MQM744-0-50-0B. 11g is same modulation and bandwidth as 11n, 11g power level will be equal to 11n, thus 11g is covered by 11n.				
Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.				

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Model	MQM744-0-50-0U	MQM744-0-50-0B	MQM744-0-50-0P
Antenna	1 types: Dipole	1 type: PCB	1 types: Dipole
Impedance	C21=1.2pF C20=1.5pF	C21=1.2pF C20=1.5pF	C21=1.8pF C20=2pF
Inductor	L2=2.7nH	L2=3nH	L2=2.2nH
Support platform system and feature	Support external antenna with antenna connect on module	Support integrated PCB antenna	Support external antenna with antenna connect on host platform. Module support RF output pins in the module package.

Model	MQM748-0-50-0U	MQM748-0-50-0B	MQM748-0-50-0P
Antenna	1 types: Dipole	1 type: PCB	1 types: Dipole
Impedance	C21=1.2pF C20=1.5pF	C21=1.2pF C20=1.5pF	C21=1.8pF C20=2pF
Inductor	L2=2.7nH	L2=3nH	L2=2.2nH
Support platform system and feature	Support external antenna with antenna connect on module	Support integrated PCB antenna	Support external antenna with antenna connect on host platform. Module support RF output pins in the module package.

Antenna Type	Antenna Part No.	Freq.	Peak Antenna Gain (dBi)
PCB Antenna	RFIQM0744010NB001	2.4G Hz	2.52
Dipole Antenna	RFPCA521010EMABY01		3.37

Remark:

1. Pre-scan was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
2. Antenna information is provided by the applicant.

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Operation Frequency of each channel (802.11b/n HT20 /ax HE20)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Operation Frequency of each channel (802.11n HT40 / ax HE40)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
3	2422MHz	6	2437MHz	9	2452MHz		
4	2427MHz	7	2442MHz				
5	2432MHz	8	2447MHz				

Remark:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency for 802.11 b/g/n (HT20) ax (HE20)	Frequency for 802.11n (HT40) ax(HE40)
The Lowest channel	2412MHz	2422MHz
The Middle channel	2437MHz	2437MHz
The Highest channel	2462MHz	2452MHz

2.5 Test Environment

Environment Parameter	101 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~23	3.3
Remark: NV: Normal Voltage NT: Normal Temperature		

2.6 Description of Support Units

The EUT has been tested as an independent unit.

2.7 Worst-case configuration and mode

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. Following are the worst-case data rates set for test:

Modulation Type	SISO - Data Rate	MIMO - Data Rate
802.11b	1 Mbps	/
802.11n (HT 20)	MCS0 (6.5 Mbps)	/
802.11n (HT 40)	MCS0 (13.5 Mbps)	/
802.11ax (HE 20)	MCS0 (8 Mbps)	/
802.11ax (HE 40)	MCS0 (16 Mbps)	/

The output power and PSD for the 802.11 ax mode were investigated between all different tones, and we found that SU mode had the highest output power and the lowest tone had the highest PSD readings. And after investigation, conducted tests were performed on both SU and lowest tones.

3 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals						
1	EMI Test Receive	R&S	ESR7	SUWI-01-10-01	1/15/2025	1/14/2026
2	LISN	R&S	ENV216	SUWI-01-19-03	2025/5/8	2026/5/7
3	LISN	Schwarzbeck	ENV216	SUWI-01-19-04	2025/5/8	2026/5/7
6	Test Software	Tonscend	JS32-CE_4.0.0.2	SUWI-02-09-05	N.C.R	N.C.R
RF Conducted Test						
1	Shielding Room	Brilliant-emc	N/A	SUWI-04-08-01	11/9/2022	11/8/2025
2	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2025/5/8	2026/5/7
9	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-15	11/21/2024	11/20/2025
7	MXG Vector signal genitor	KEYSIGHT	N5182B	SUWI-01-38-01	1/15/2025	1/14/2026
8	Signal Generator	ROHDE&SCHWARZ	SMW200A	SUWI-01-07-08	3/27/2025	3/26/2026
10	MXG Vector Signal Generator	ROHDE&SCHWARZ	SMR20	SUWI-01-33-01	3/17/2025	3/16/2026
3	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-13	2025/5/8	2026/5/7
11	Wideband Radio Communication Test Ststion	Anritsu	MT8000A	SUWI-01-34-02	11/19/2024	11/18/2025
12	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	11/19/2024	11/18/2025
5	Power meter	Anritsu	ML2495A	SUWI-01-31-01	11/19/2024	11/18/2025
6	Pulse power sensor	Anritsu	MA2411B	SUWI-01-32-01	11/19/2024	11/18/2025
4	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	1/15/2025	1/14/2026
13	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2/13/2025	2/12/2026
14	Temperature Chamber	GIANT FORCE	ICT-017-40-SP-SD	SUWI-01-13-02	2025/5/8	2026/5/7
15	Measurement Software	TST	TST 272 V2.0	SUWI-03-55-03	NCR	NCR
RF Radiated Test						
1	Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	6/3/2023	6/2/2026
4	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	1/20/2025	1/19/2026
5	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-09	11/21/2024	11/20/2025
6	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	1/15/2025	1/14/2026
8	Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	VULB 9168	SUWI-01-11-04	8/22/2024	8/21/2026
9	Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	5/7/2025	5/6/2027
10	Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9170	SUWI-01-11-03	5/7/2025	5/6/2027
11	Active Loop Antenna	SCHWRZBECK MESS-ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	5/7/2025	5/6/2027
12	Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	1/16/2025	1/15/2026
13	Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	1/16/2025	1/15/2026
14	Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	1/20/2025	1/19/2026
15	Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-26-01	2025/5/8	2026/5/7
16	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	11/19/2024	11/18/2025
17	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-09	2025/5/8	2026/5/7



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18	Radio Communication Analyzer	StarPoint	SP9500E	SUWI-01-28-02	11/19/2024	11/18/2025
3	Signal Generator	ROHDE&SCHWARZ	SMB100A	SUWI-01-08-01	2025/5/8	2026/5/7
7	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	1/15/2025	1/14/2026
2	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2/13/2025	2/12/2026
19	Measurement Software	Tonscend	JS32-RSE 4.0.0.1	SUWI-02-09-06	NCR	NCR

Remark: NCR=No Calibration Requirement.

4 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.54dB
2	RF power density, conducted	±1.03dB
3	Spurious emissions, conducted	±0.54dB
4	Radio Frequency	±1.0 %
5	Duty Cycle	±0.37%
6	Occupied Bandwidth	±1.0 %
7	Conduction Emission	± 2.90dB (150kHz to 30MHz)
8	Radiated Emission	± 3.13dB (9k -30MHz)
		± 4.80dB (30M -1GHz)
		± 4.80dB (1GHz to 18GHz)
		± 4.80dB (Above 18GHz)

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{cispri/ETSI}$ (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

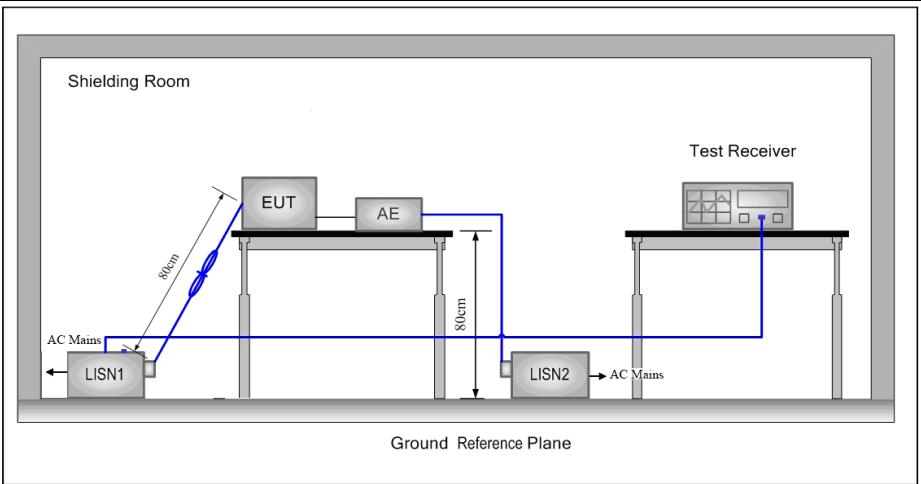
5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(b)
15.203 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.
Note:	The antenna is PCB Antenna and dipole Antenna and no consideration of replacement. The best case gain of the antenna is 2.52dBi for PCB Antenna, 3.37dBi for Dipole Antenna
Remark:	<i>The antenna gain are derived from the gain information report provided by the manufacturer.</i>
<i>As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.</i>	

5.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2020 Section 6.2		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range (MHz)		Limit (dBuV)
			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.			
Test Procedure:	<ol style="list-style-type: none">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 $50\Omega/50\mu\text{H} + 5\Omega$ 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. 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: 2013 on conducted measurement.		

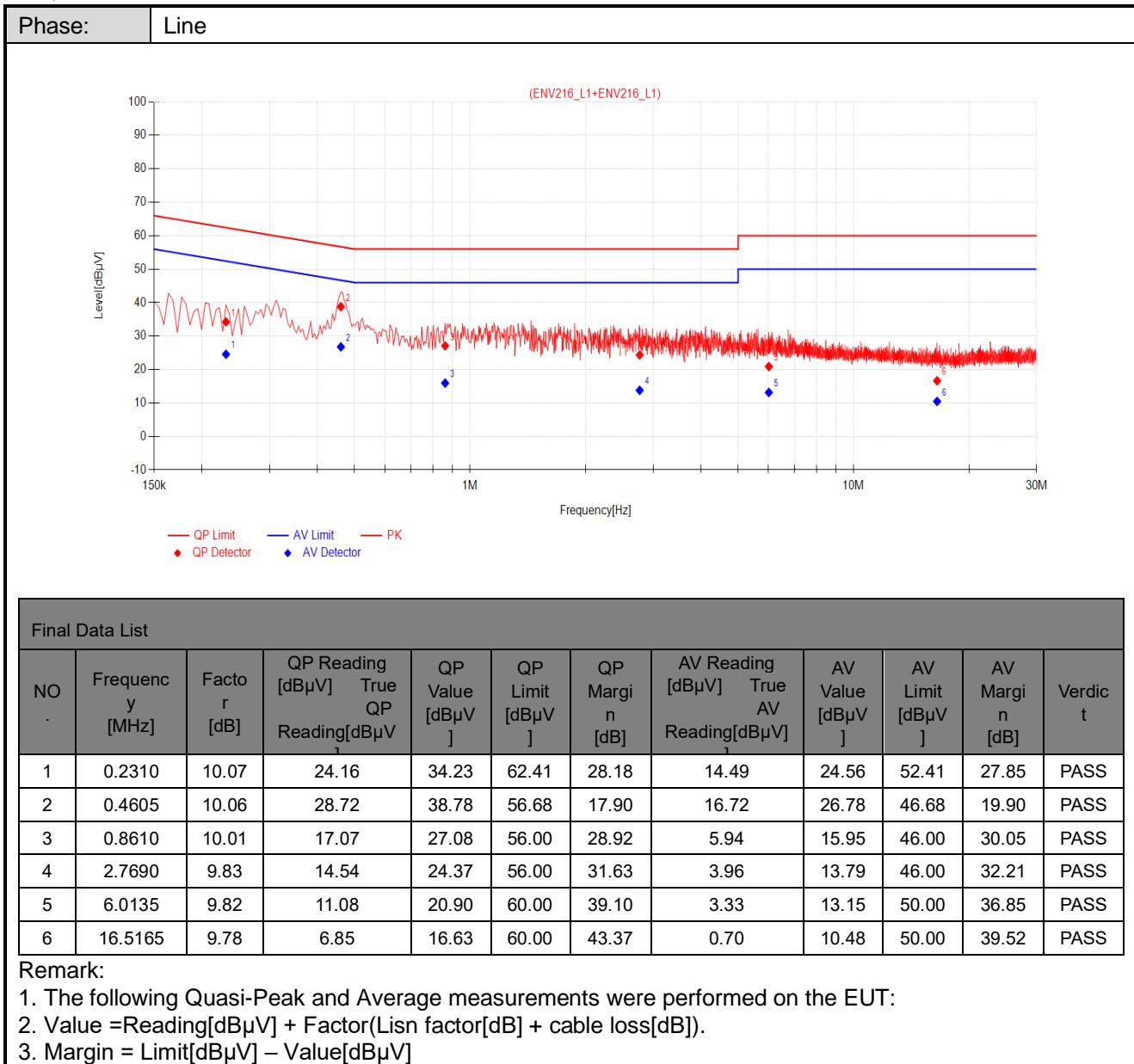
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Adapter + Transmitting mode.
Final Test Mode:	Refer to section 2.7 for details. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 3 for details.
Test Results:	Pass

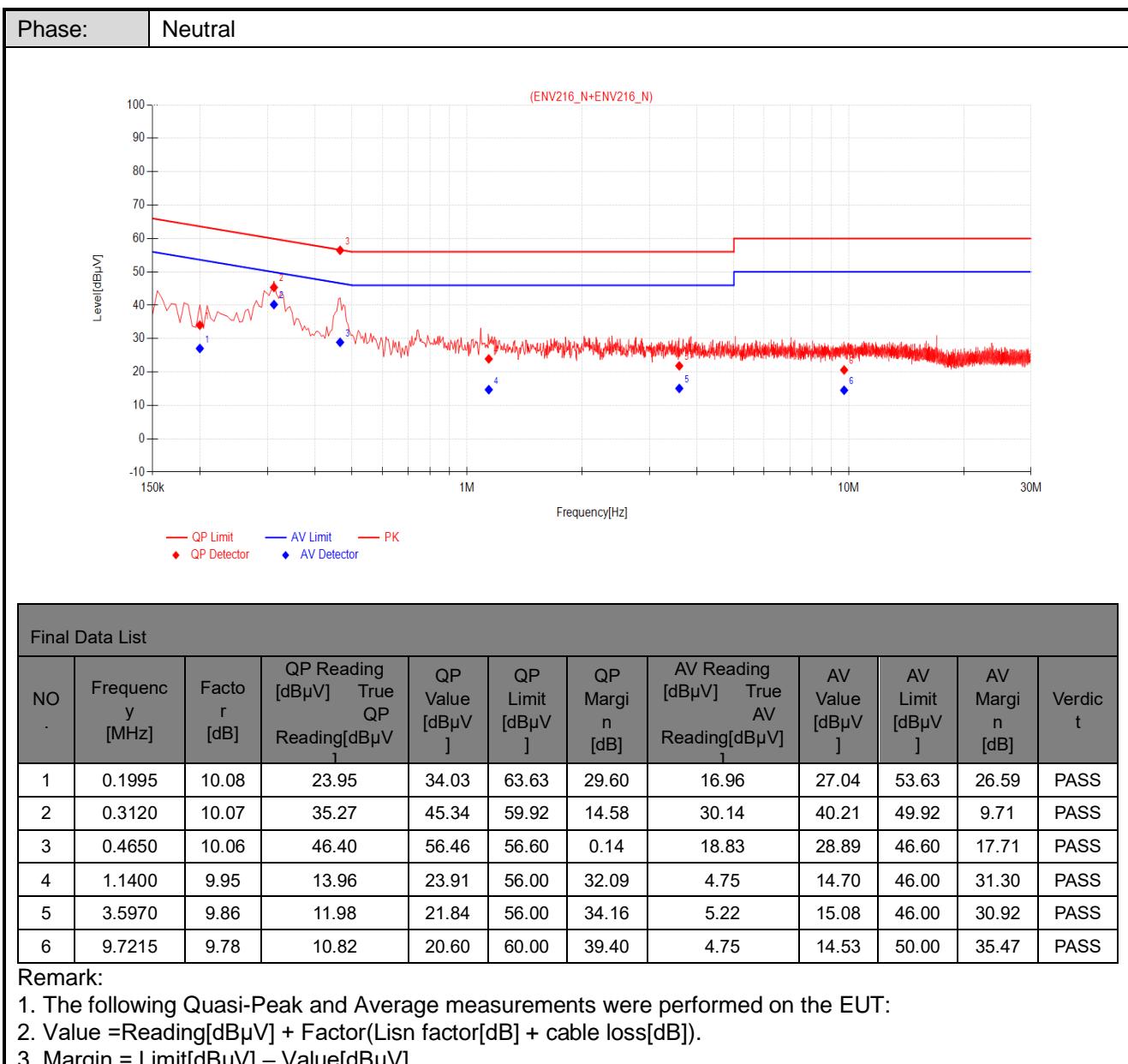
Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

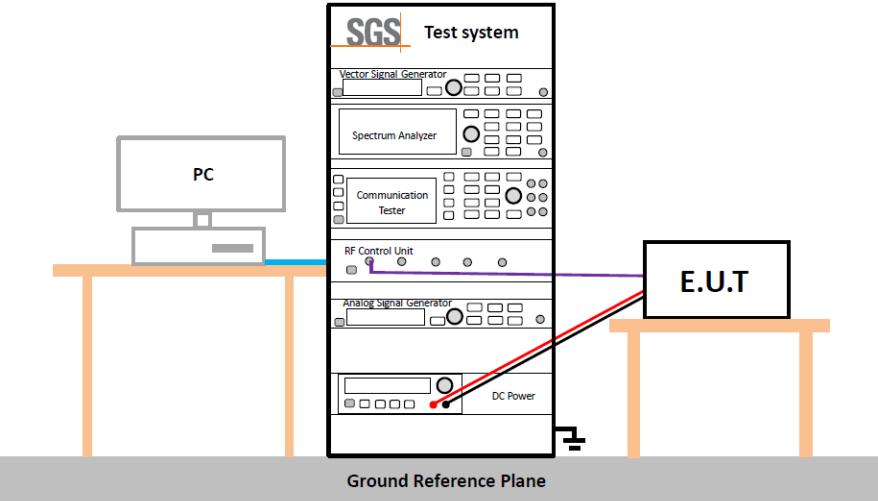
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

MQM744-0-50-0U

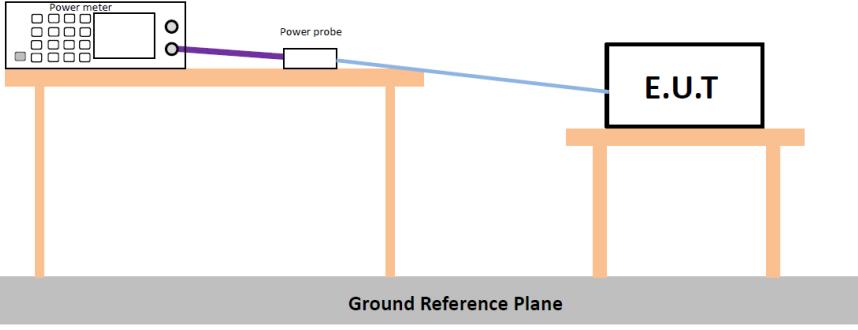




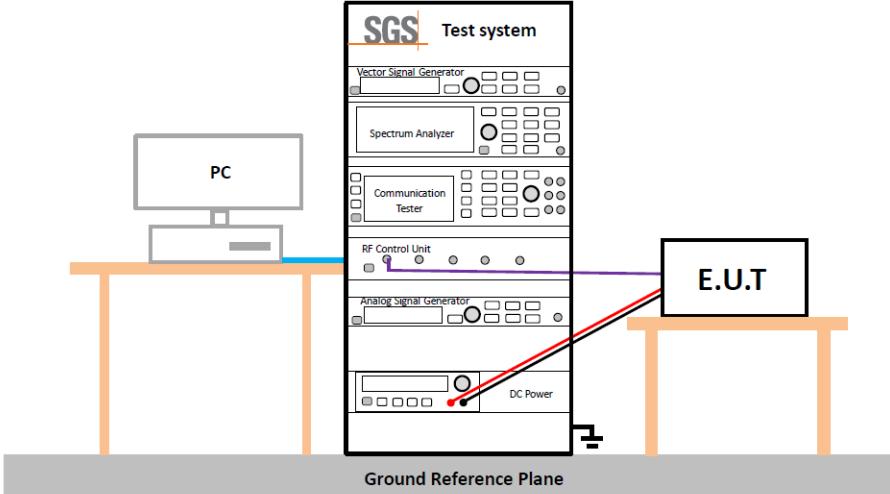
5.3 Duty Cycle

Test Requirement:	ANSI C63.10 :2020 Section 11.6
Test Method:	ANSI C63.10 :2020 Section 11.6
Test Setup:	
Instruments Used:	Refer to section 3 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	No restriction limits
Test Results:	For Report Purpose
The detailed test data see: Appendix	

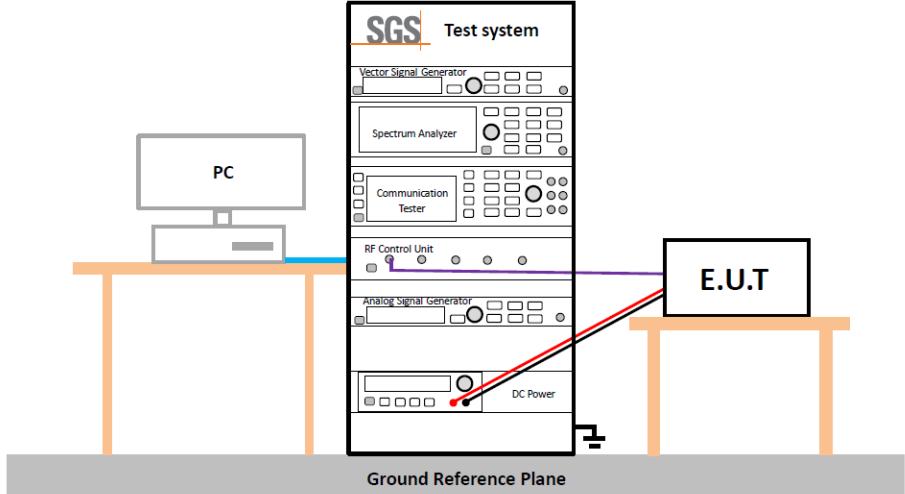
5.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 :2020 Section11.9
Test Setup:	 <p>* Test with power meter (Detector function: Peak)</p>
Test Instruments:	Refer to section 3 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	30dBm
Test Results:	Pass
The detailed test data see: Appendix	

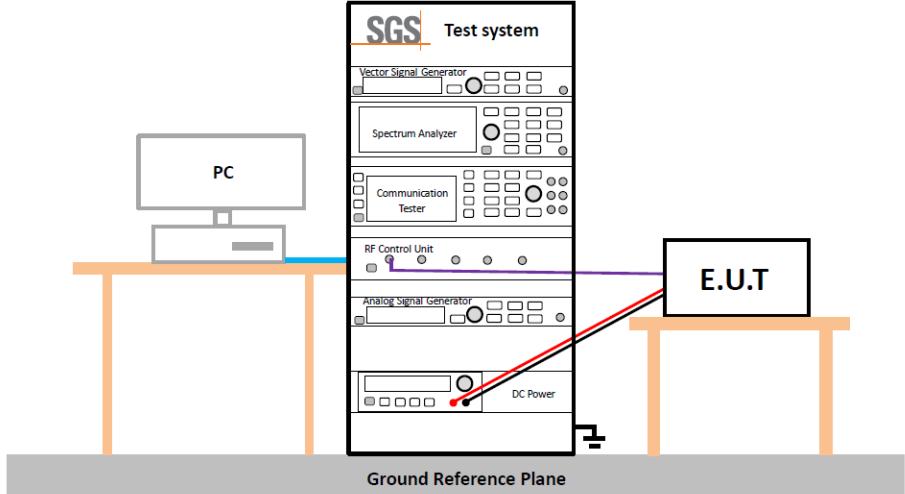
5.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2020 Section 11.8 / 6.9
Test Setup:	
Instruments Used:	Refer to section 3 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	≥ 500 kHz for DTS Bandwidth
Test Results:	Pass
The detailed test data see: Appendix	

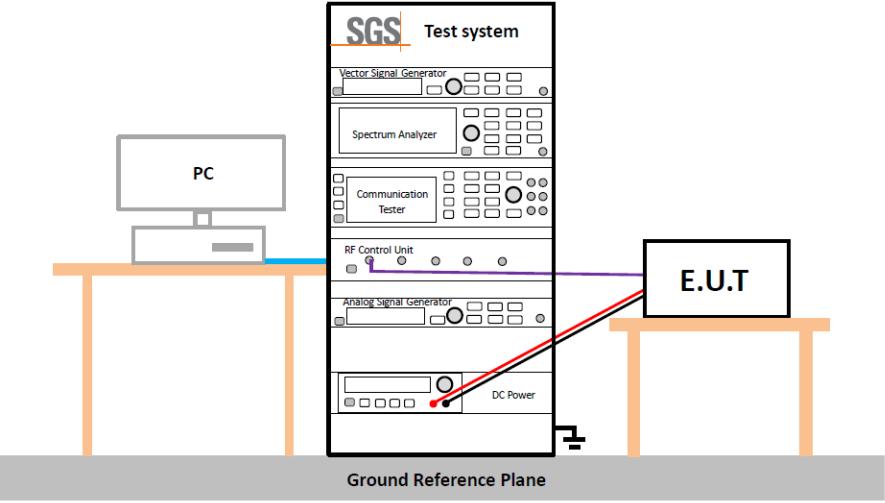
5.6 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2020 Section 11.10
Test Setup:	
Test Instruments:	Refer to section 3 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	$\leq 8.00\text{dBm}/3\text{kHz}$
Test Results:	Pass
The detailed test data see: Appendix	

5.7 Band-edge for RF Conducted Emissions

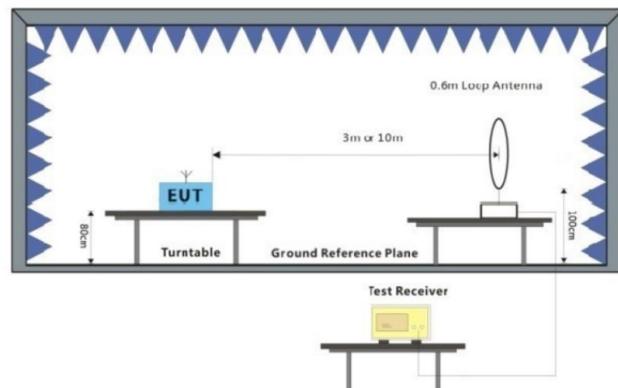
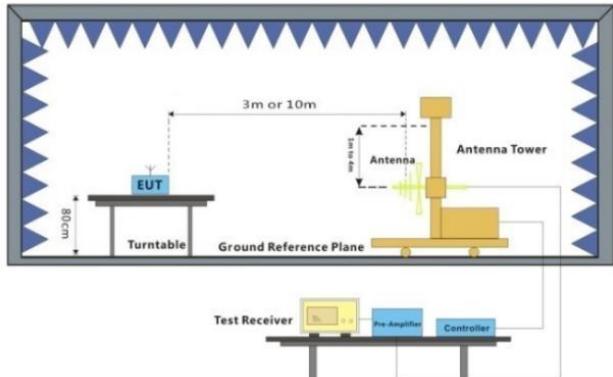
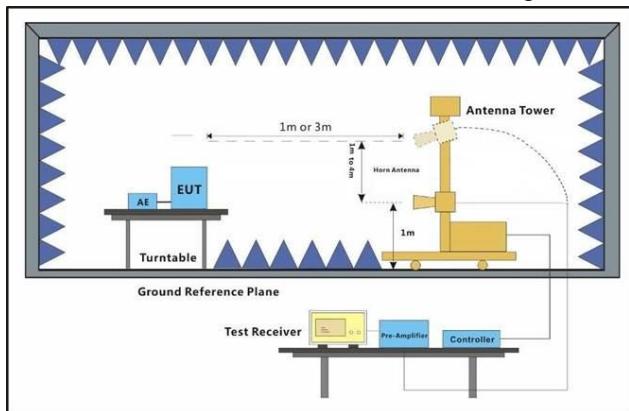
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2020 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 3 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass
The detailed test data see: Appendix	

5.8 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2020 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 3 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass
The detailed test data see: Appendix	

5.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2020 Section 11.12				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Test Frequency:	9kHz ~ 25GHz				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	3MHz	Peak
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

Test Setup:

Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

Figure 3. Above 1 GHz
Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Distance from antenna to EUT is 1m for measurements >18GHz).
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- Test the EUT in the lowest channel, the middle channel ,the Highest

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	<p>channel.</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported</p> <p>k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.</p> <p>l. At a measurement distance of 1 meter the limit line was increased by $20 \times \log(3/1) = 9.54$ dB.</p>
Test Configuration:	<p>Measurements below 30MHz</p> <ul style="list-style-type: none">• RBW = 10 kHz• VBW = 30 kHz• Detector = Peak & Average & Quasi-peak• Trace mode = max hold <p>Measurements Below 1000MHz</p> <ul style="list-style-type: none">• RBW = 120 kHz• VBW = 300 kHz• Detector = Quasi-peak• Trace mode = max hold <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none">• RBW = 1 MHz• VBW \geq 3 MHz• Detector = Peak• Sweep time = auto• Trace mode = max hold <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none">• RBW = 1 MHz• VBW = 10 Hz, when duty cycle is no less than 98 percent.• VBW \geq 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Adapter + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details. For below 1GHz part, through pre-scan all channels, but only the worst case is recorded in the report.
Instruments Used:	Refer to section 3 for details.
Test Results:	Pass
The detailed test data see: Appendix	

5.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2020 Section 11.12		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

Test Setup:

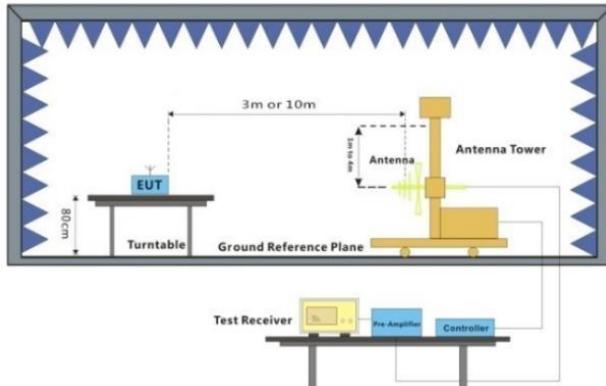


Figure 1. 30MHz to 1GHz

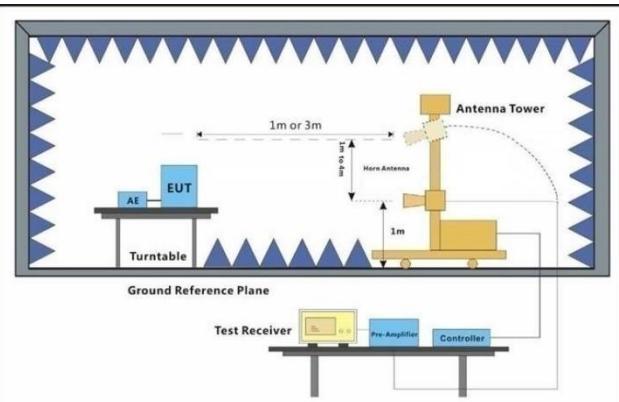


Figure 2. Above 1 GHz

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Test Procedure:	<ol style="list-style-type: none">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 semi-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 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. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channelh. Test the EUT in the lowest channel , the Highest channeli. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.j. Repeat above procedures until all frequencies measured was complete.
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none">• RBW = 120 kHz• VBW = 300 kHz• Detector = Quasi-peak• Trace mode = max hold <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none">• RBW = 1 MHz• VBW \geq 3 MHz• Detector = Peak• Sweep time = auto• Trace mode = max hold <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none">• RBW = 1 MHz• VBW = 10 Hz, when duty cycle is no less than 98 percent.• VBW \geq 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Adapter + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 3 for details.
Test Results:	Pass
The detailed test data see: Appendix	

6 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.

7 Appendix

1. Duty Cycle

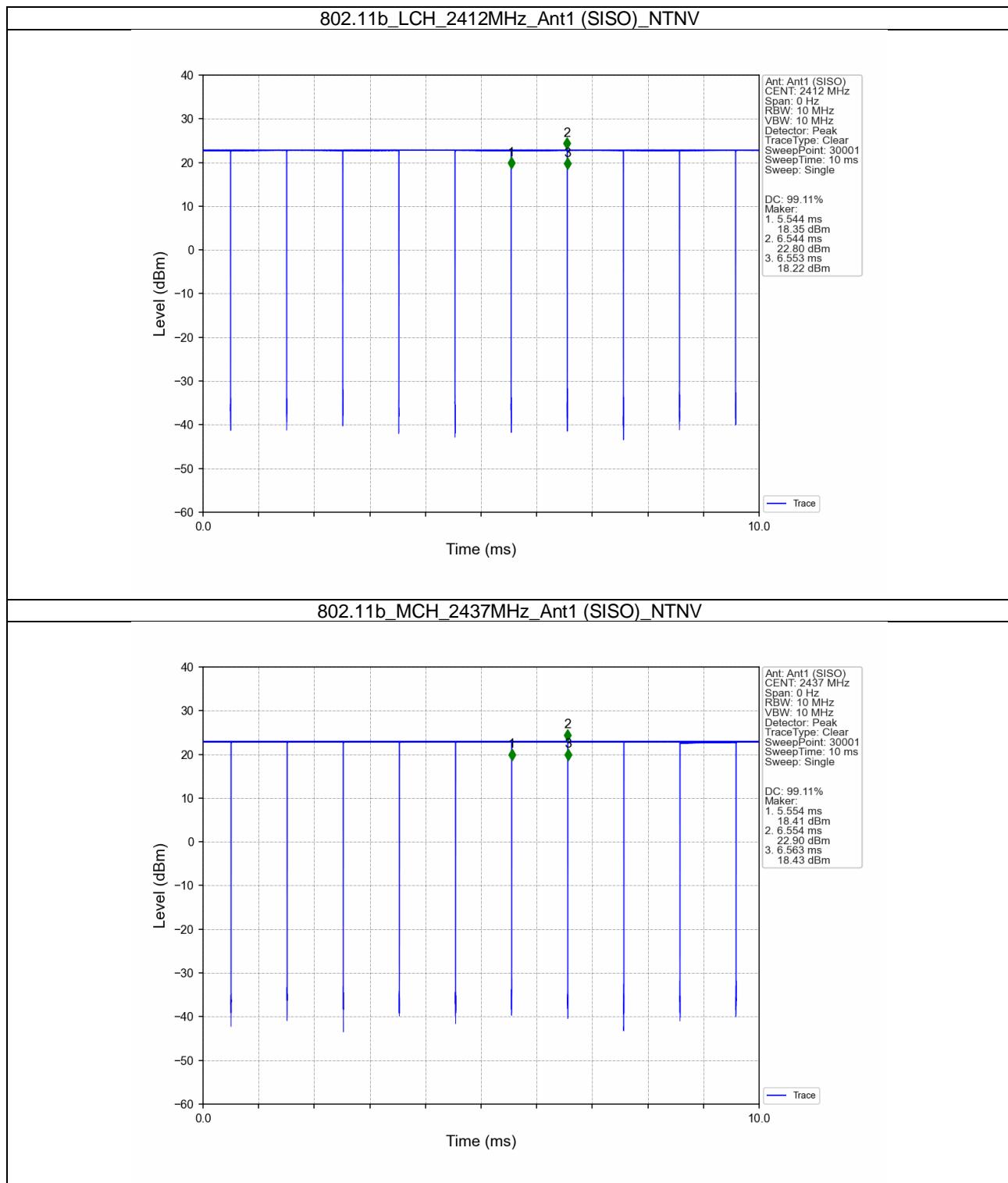
1.1 Test Result

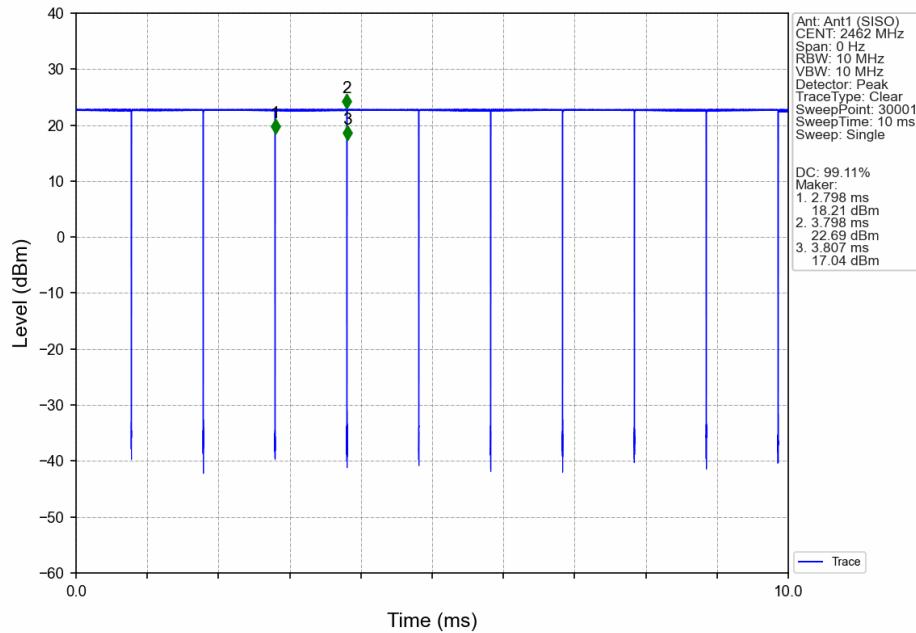
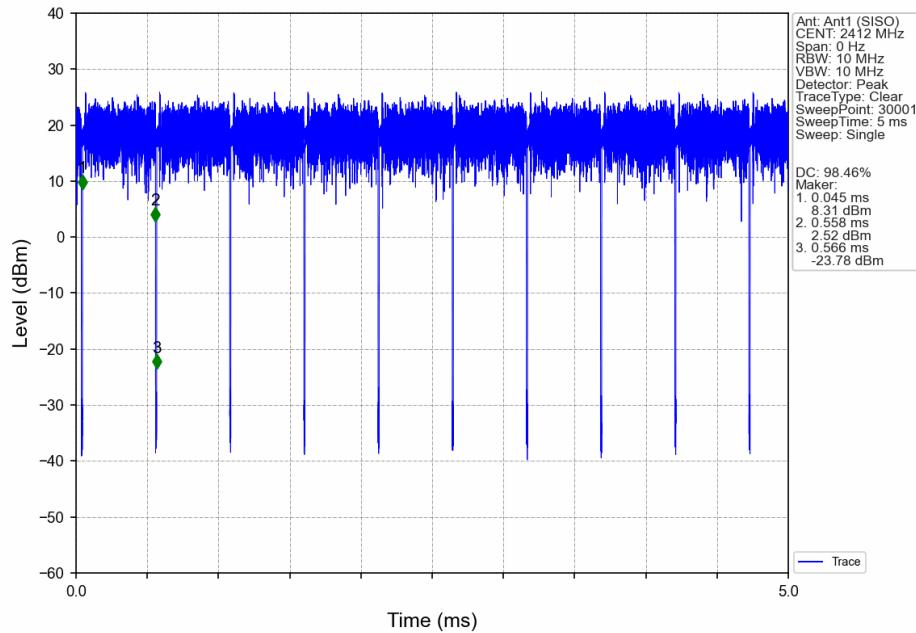
1.1.1 Ant1

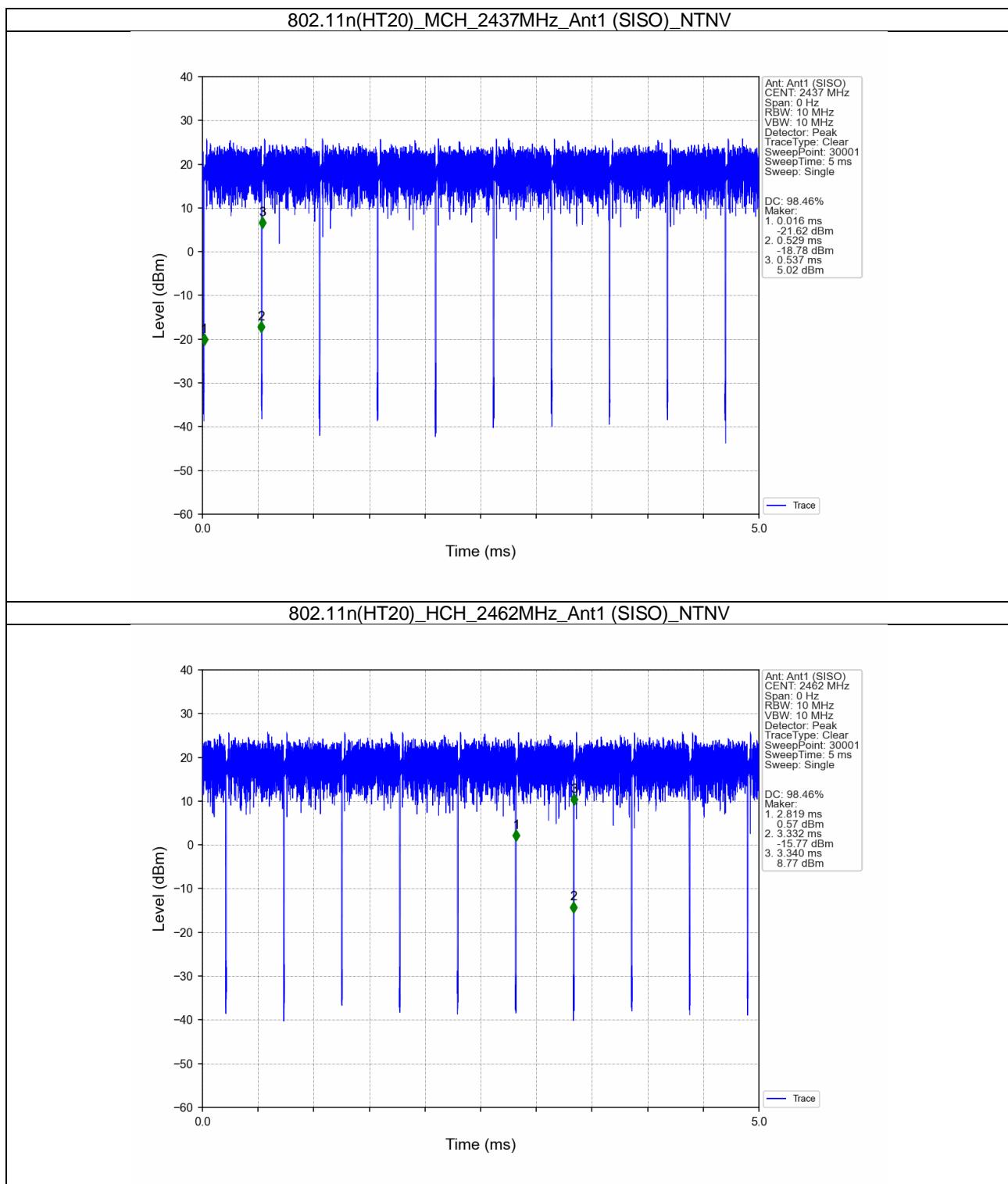
Ant1									
Mode	TX Type	Frequency (MHz)	RU	RU Pos	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	/	/	1.000	1.009	99.11	0.04	0.03
		2437	/	/	1.000	1.009	99.11	0.04	0.03
		2462	/	/	1.000	1.009	99.11	0.04	0.03
802.11n (HT20)	SISO	2412	/	/	0.513	0.521	98.46	0.07	0.06
		2437	/	/	0.513	0.521	98.46	0.07	0.06
		2462	/	/	0.513	0.521	98.46	0.07	0.06
802.11n (HT40)	SISO	2422	/	/	0.268	0.276	97.10	0.13	0.04
		2437	/	/	0.268	0.276	97.10	0.13	0.07
		2452	/	/	0.268	0.276	97.10	0.13	0.11
802.11ax (HEW20)	SISO	2412	SU	/	3.864	3.872	99.79	0.01	0.03
		2437	SU	/	3.864	3.872	99.79	0.01	0.03
		2462	SU	/	3.866	3.874	99.79	0.01	0.04
802.11ax (HEW40)	SISO	2422	SU	/	1.963	1.971	99.59	0.02	0.03
		2437	SU	/	1.963	1.971	99.59	0.02	0.03
		2452	SU	/	1.963	1.971	99.59	0.02	0.03

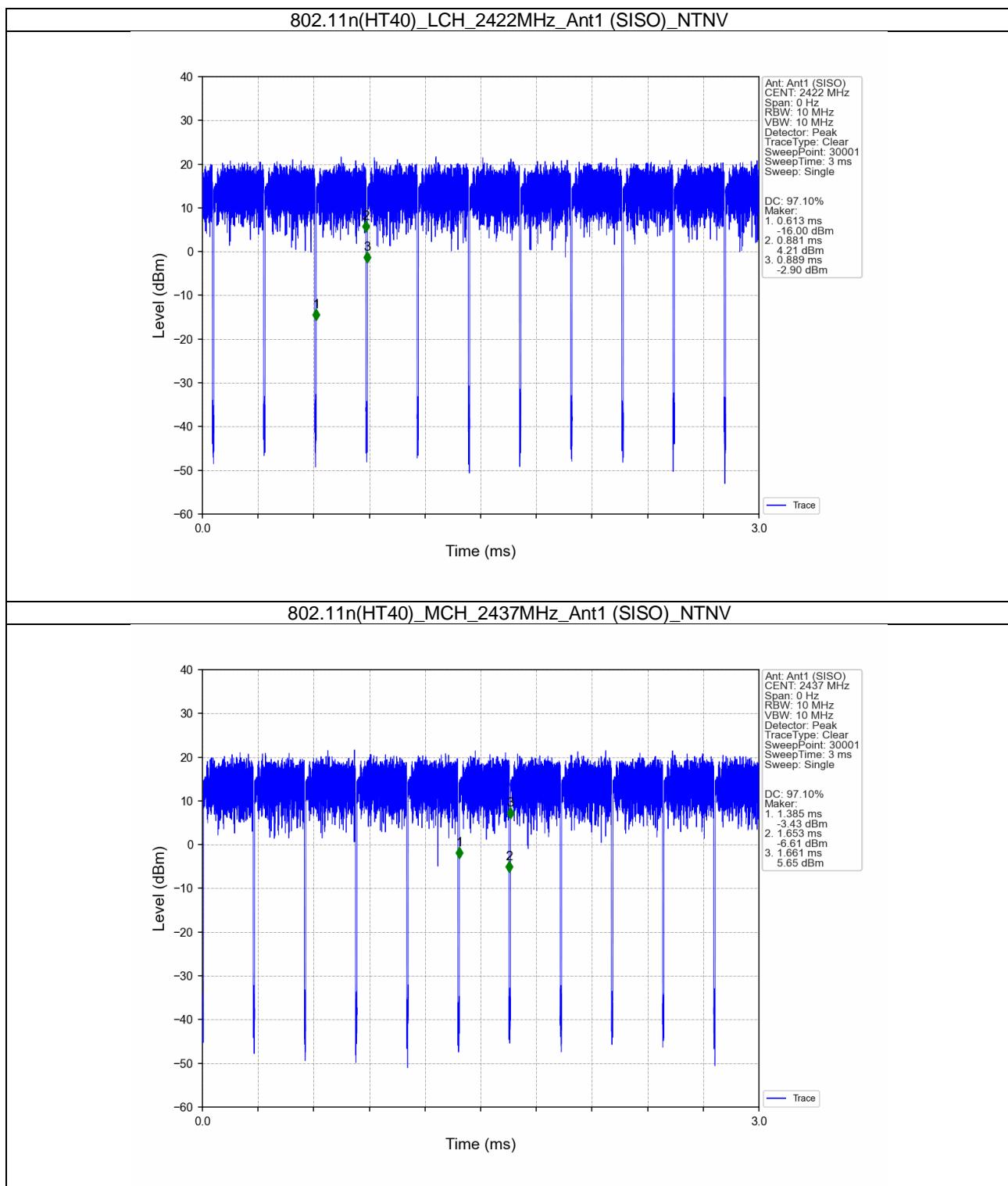
1.2 Test Graph

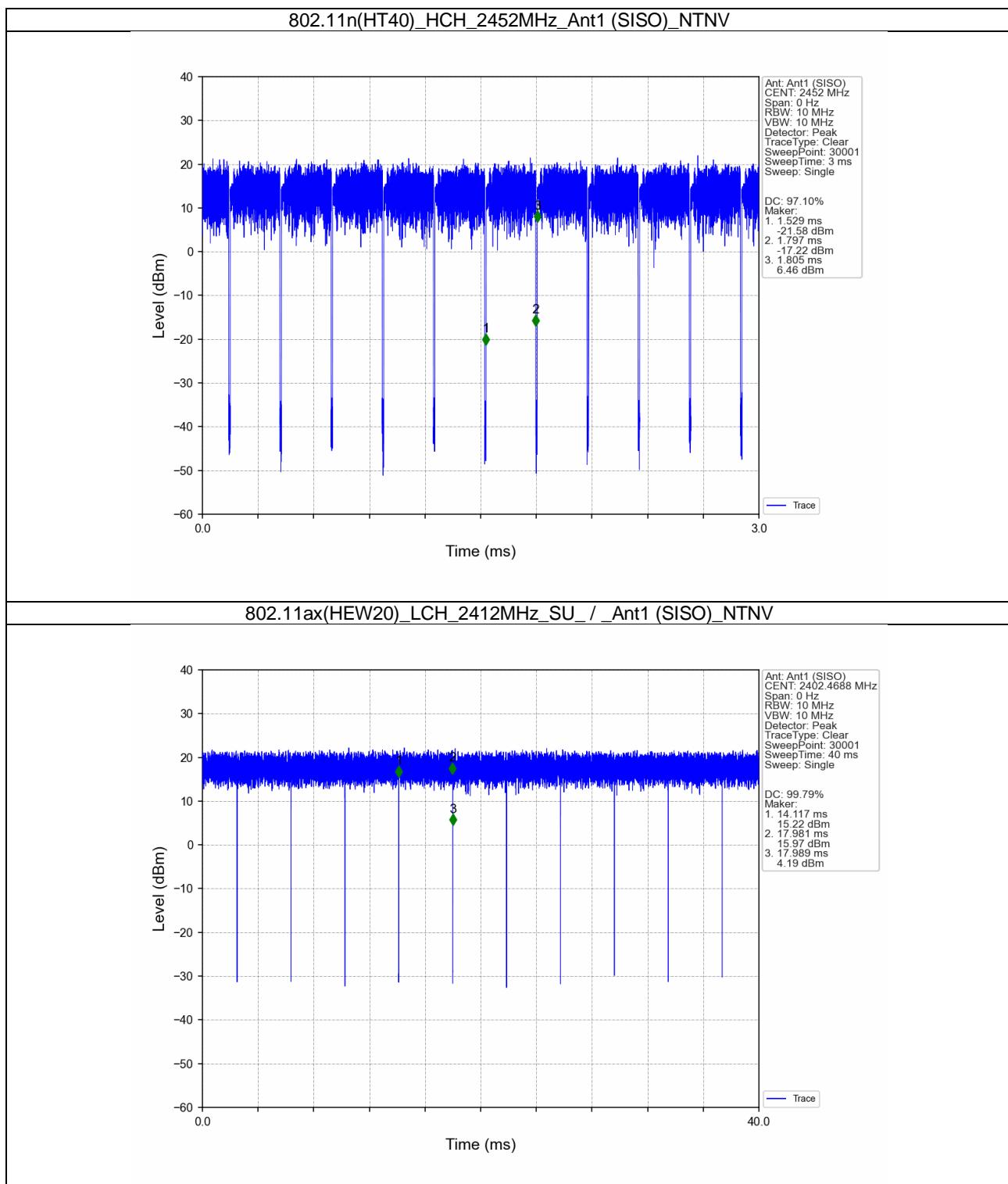
1.2.1 Ant1

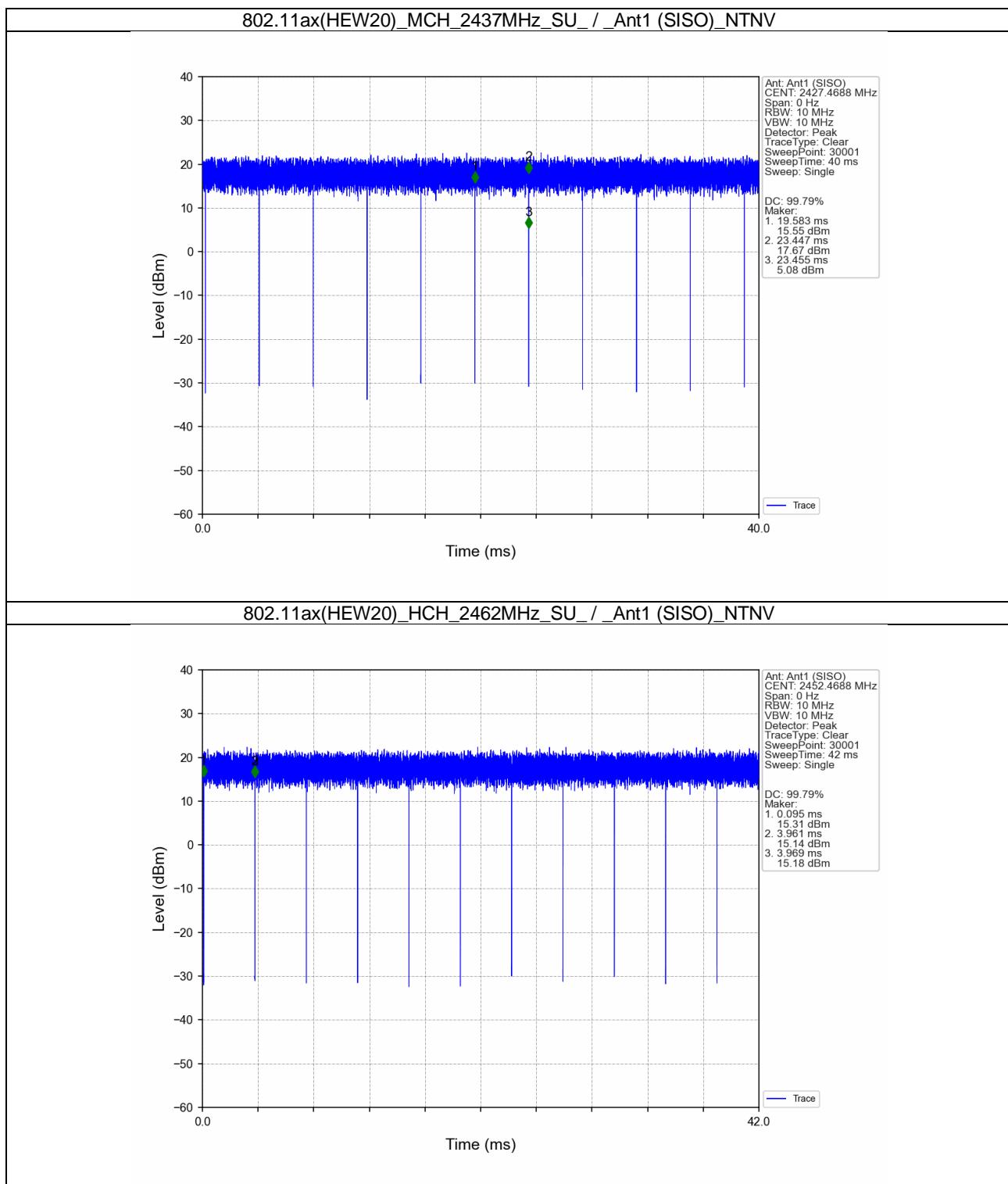


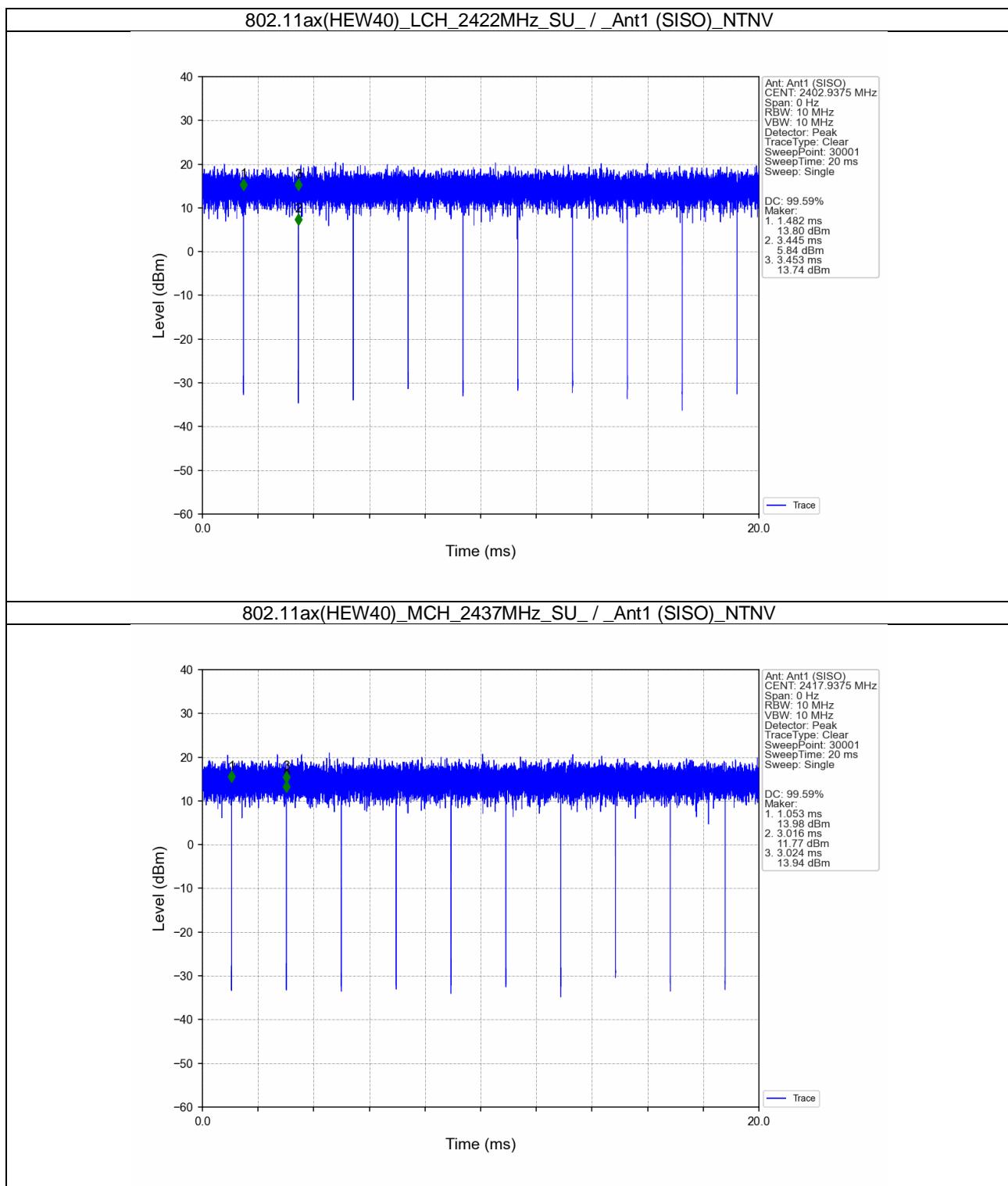
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV**802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV**

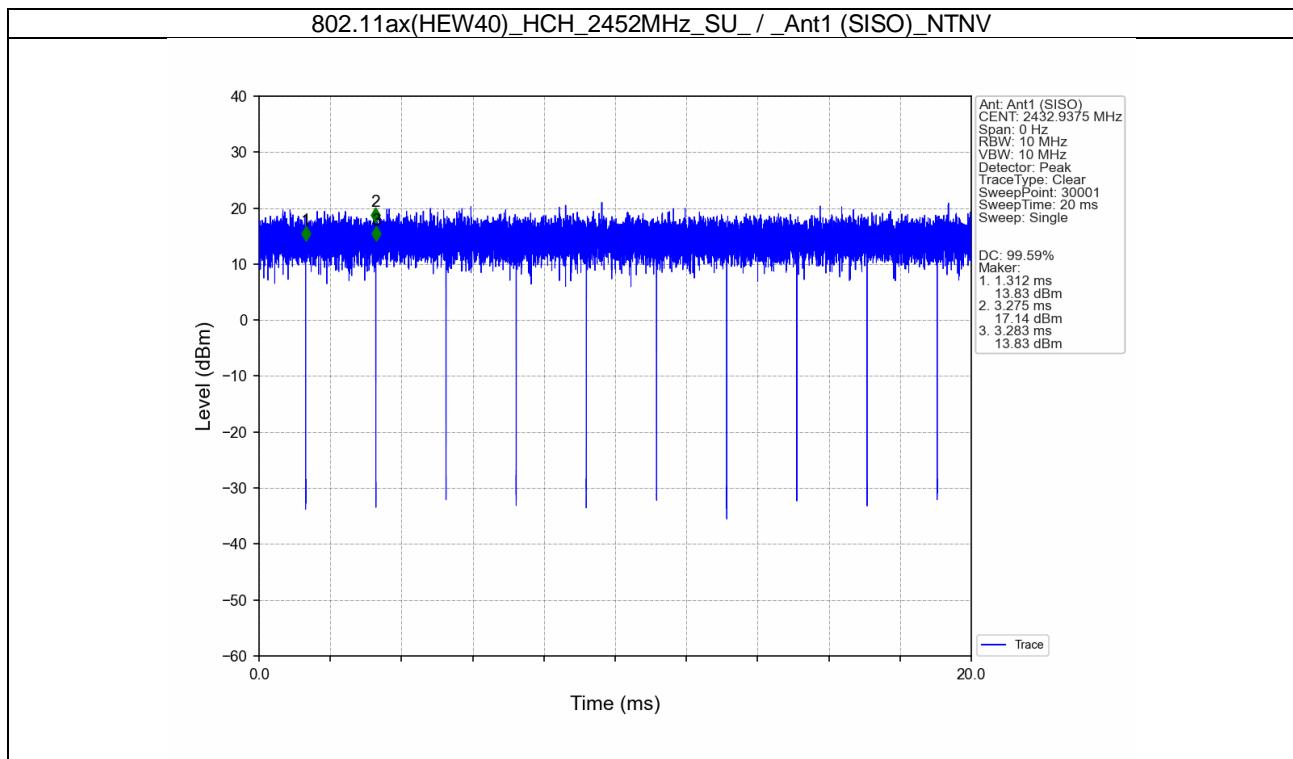












2. Bandwidth

2.1 Test Result

2.1.1 OBW

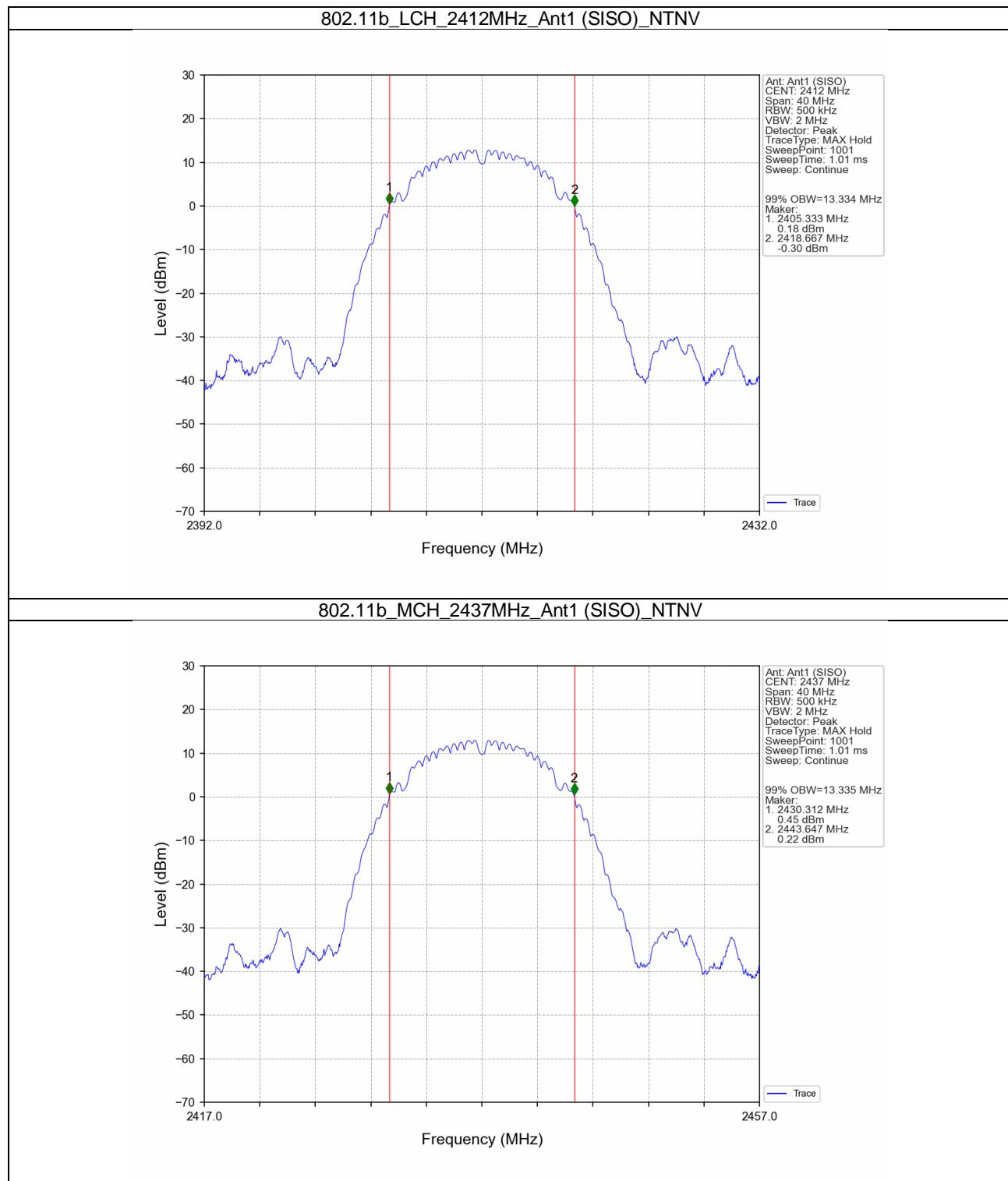
Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	99% Occupied Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	1	13.334	/	Pass
		2437	/	/	1	13.335	/	Pass
		2462	/	/	1	13.309	/	Pass
802.11n (HT20)	SISO	2412	/	/	1	17.866	/	Pass
		2437	/	/	1	17.873	/	Pass
		2462	/	/	1	17.837	/	Pass
802.11n (HT40)	SISO	2422	/	/	1	35.917	/	Pass
		2437	/	/	1	35.935	/	Pass
		2452	/	/	1	35.935	/	Pass
802.11ax (HEW20)	SISO	2412	SU	/	1	19.004	/	Pass
		2437	SU	/	1	19.015	/	Pass
		2462	SU	/	1	18.978	/	Pass
802.11ax (HEW40)	SISO	2422	SU	/	1	38.154	/	Pass
		2437	SU	/	1	38.304	/	Pass
		2452	SU	/	1	38.166	/	Pass

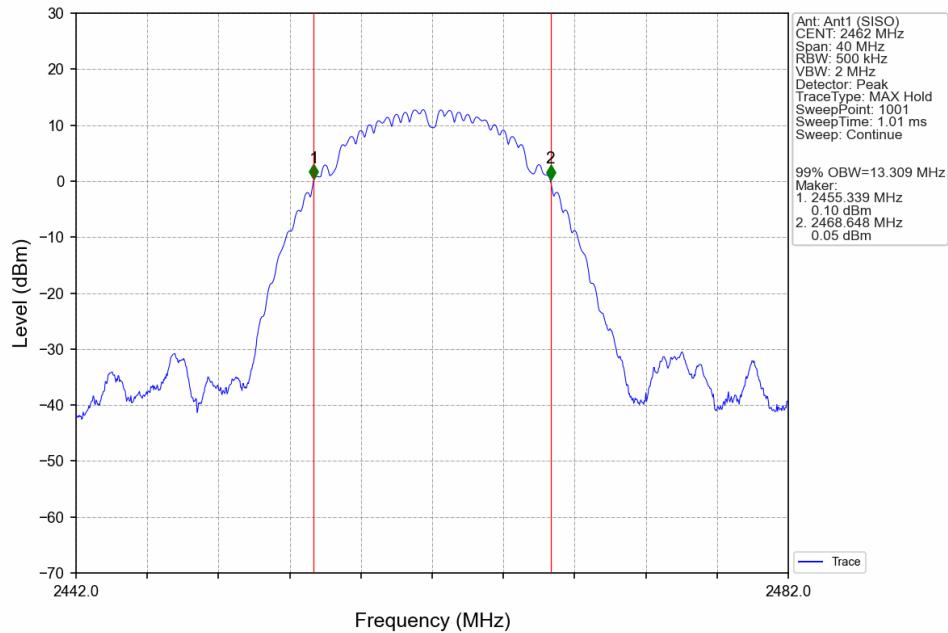
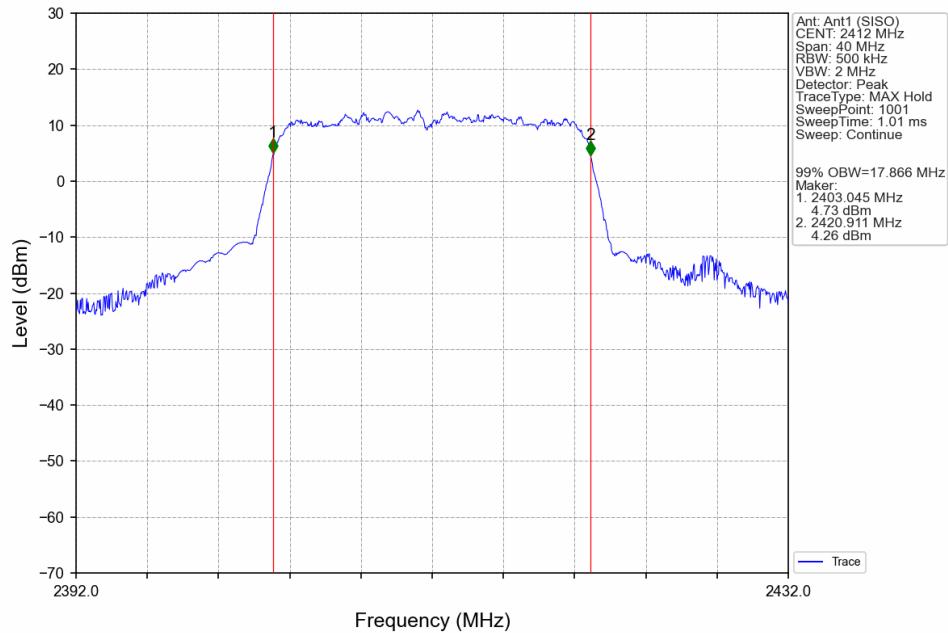
2.1.2 6dB BW

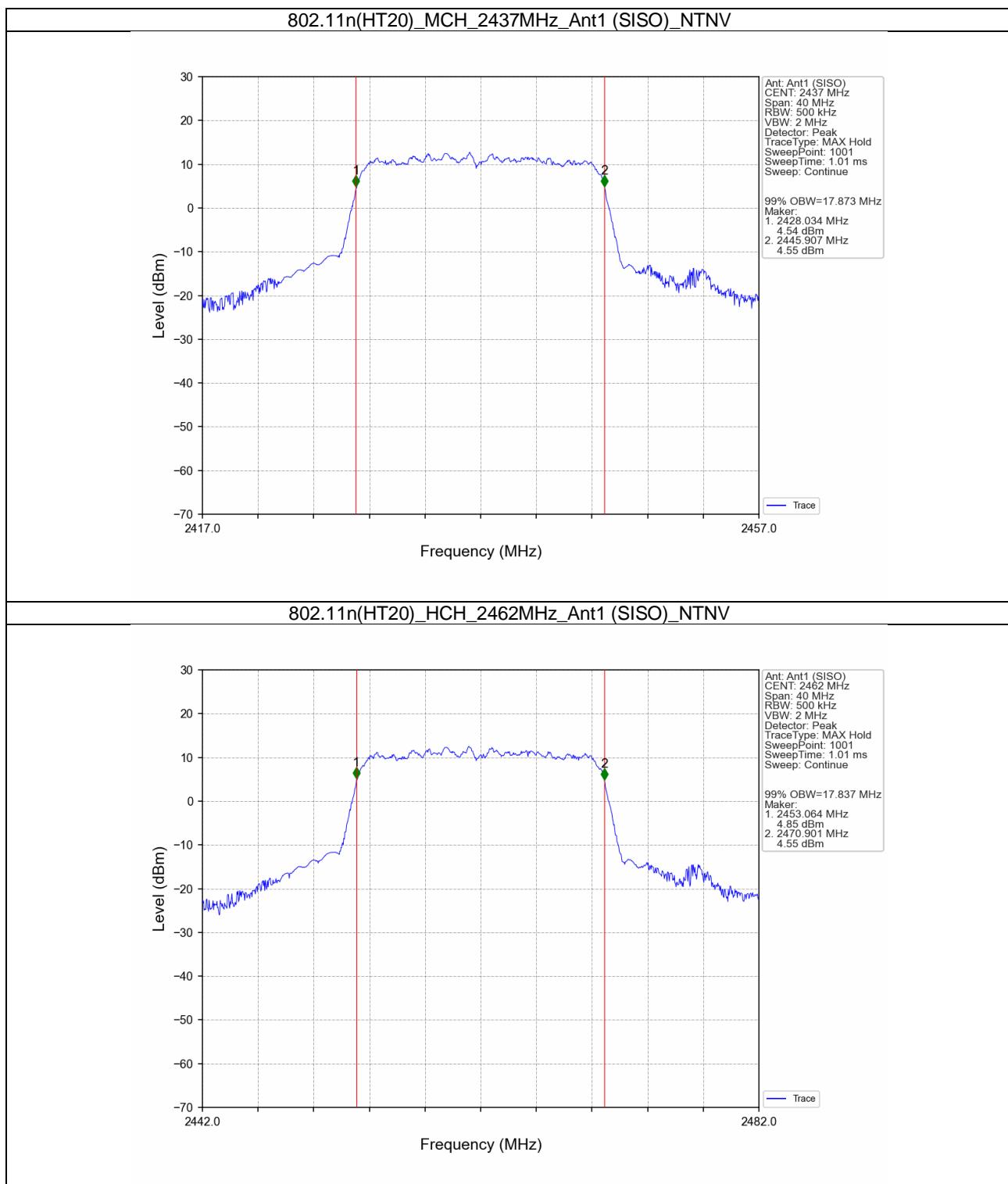
Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	6dB Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	1	9.334	>=0.5	Pass
		2437	/	/	1	9.340	>=0.5	Pass
		2462	/	/	1	9.154	>=0.5	Pass
802.11n (HT20)	SISO	2412	/	/	1	17.545	>=0.5	Pass
		2437	/	/	1	17.521	>=0.5	Pass
		2462	/	/	1	17.448	>=0.5	Pass
802.11n (HT40)	SISO	2422	/	/	1	35.749	>=0.5	Pass
		2437	/	/	1	35.818	>=0.5	Pass
		2452	/	/	1	35.778	>=0.5	Pass
802.11ax (HEW20)	SISO	2412	SU	/	1	19.029	>=0.5	Pass
		2437	SU	/	1	19.038	>=0.5	Pass
		2462	SU	/	1	19.001	>=0.5	Pass
802.11ax (HEW40)	SISO	2422	SU	/	1	37.521	>=0.5	Pass
		2437	SU	/	1	37.827	>=0.5	Pass
		2452	SU	/	1	37.723	>=0.5	Pass

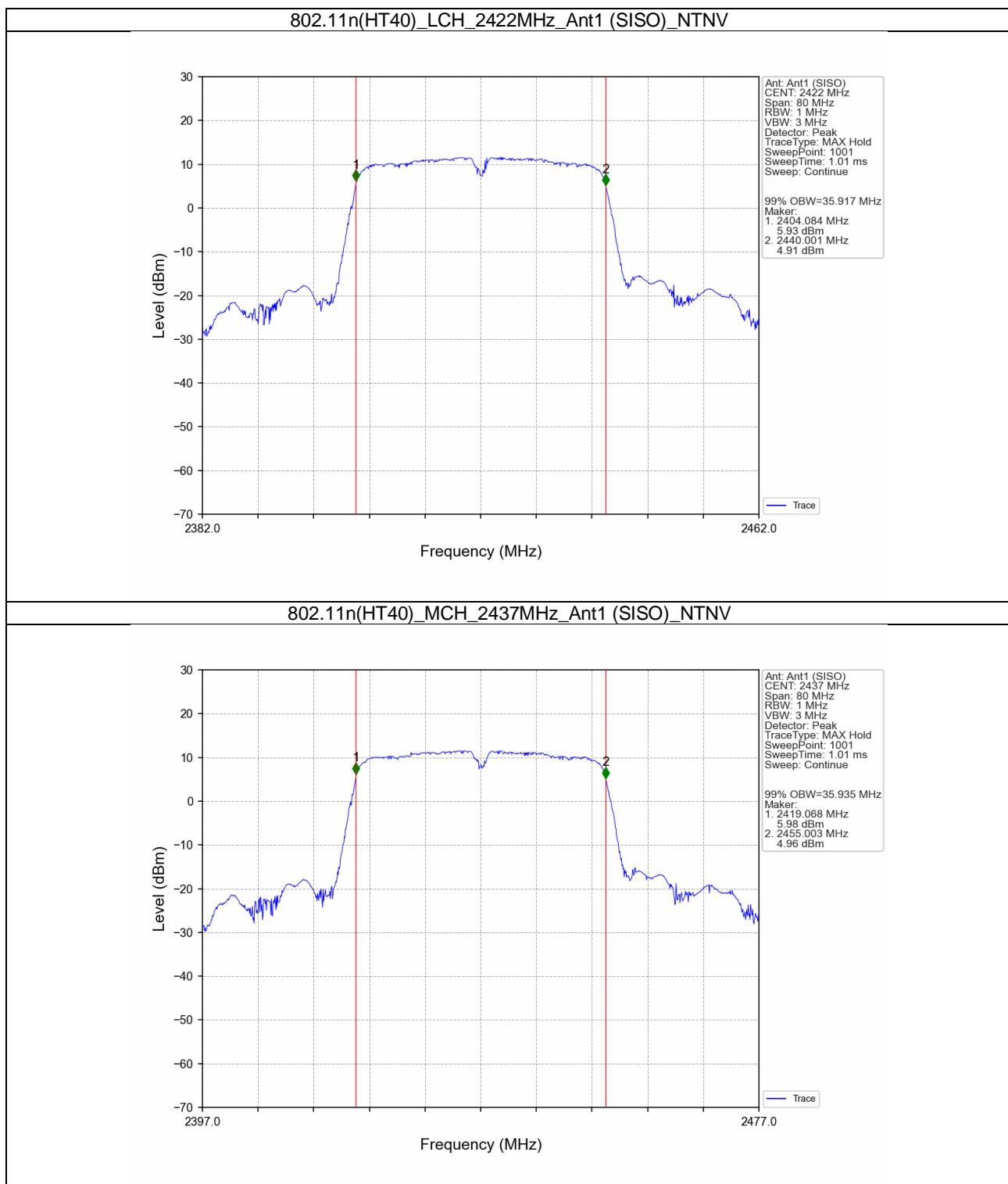
2.2 Test Graph

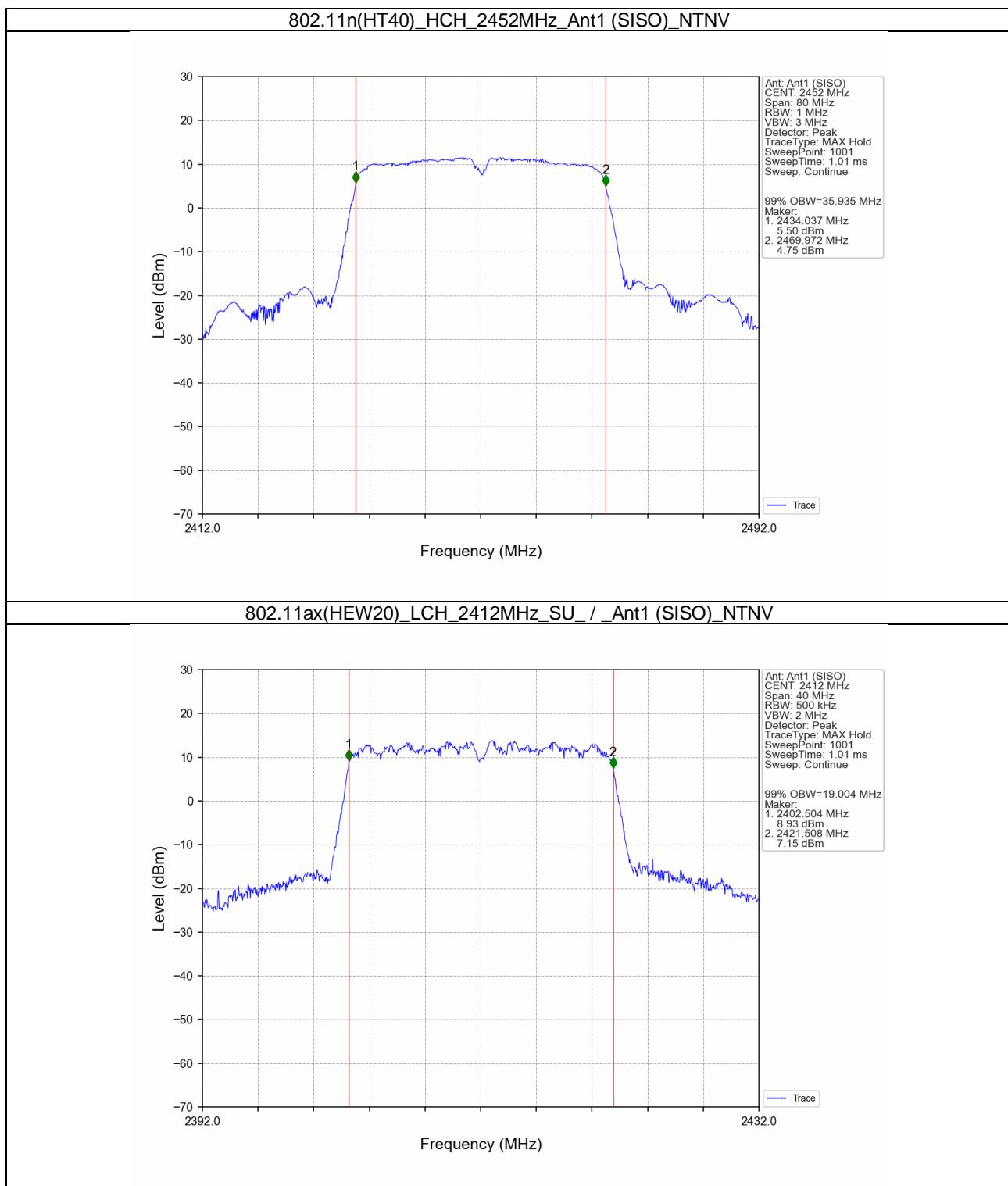
2.2.1 OBW

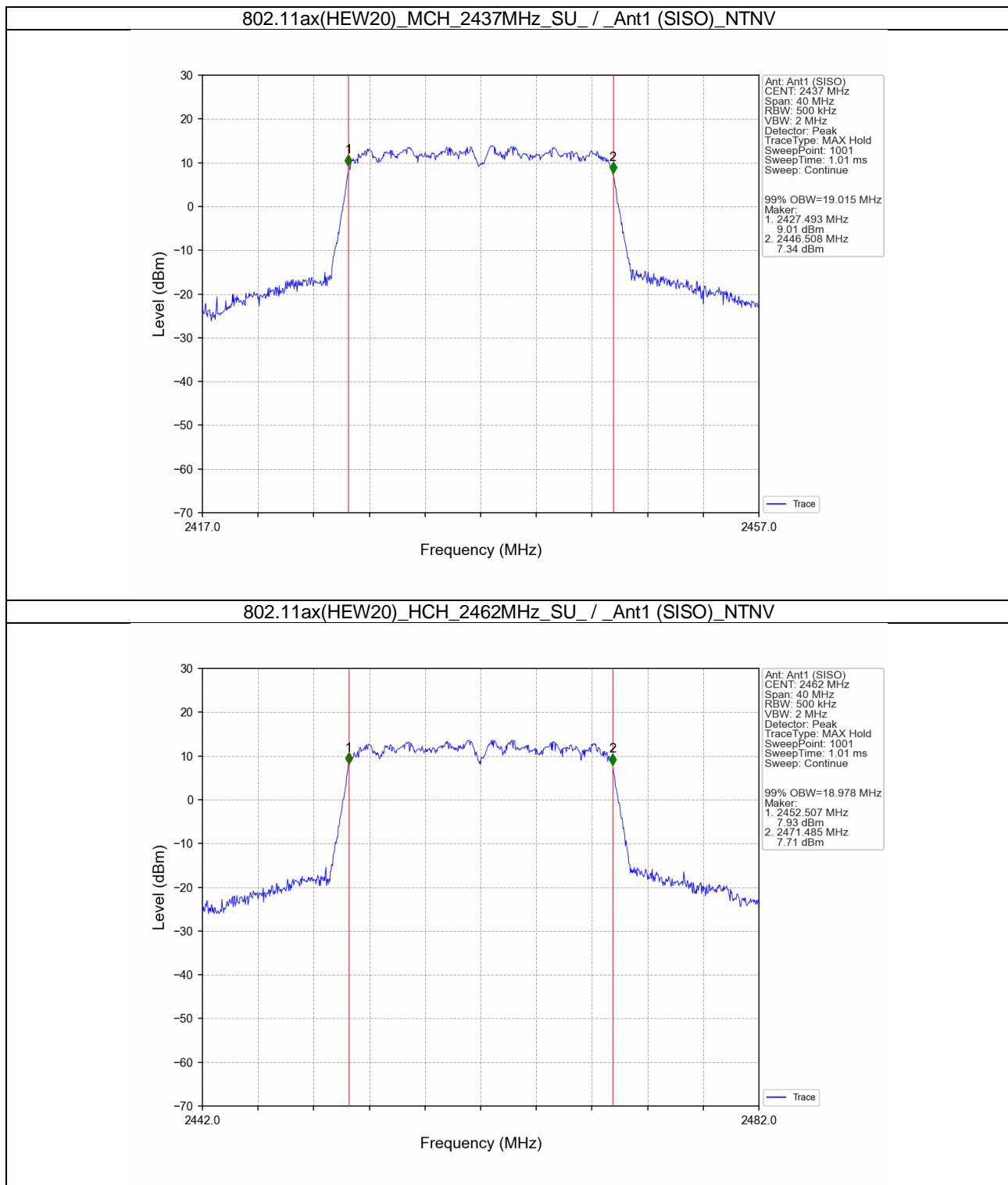


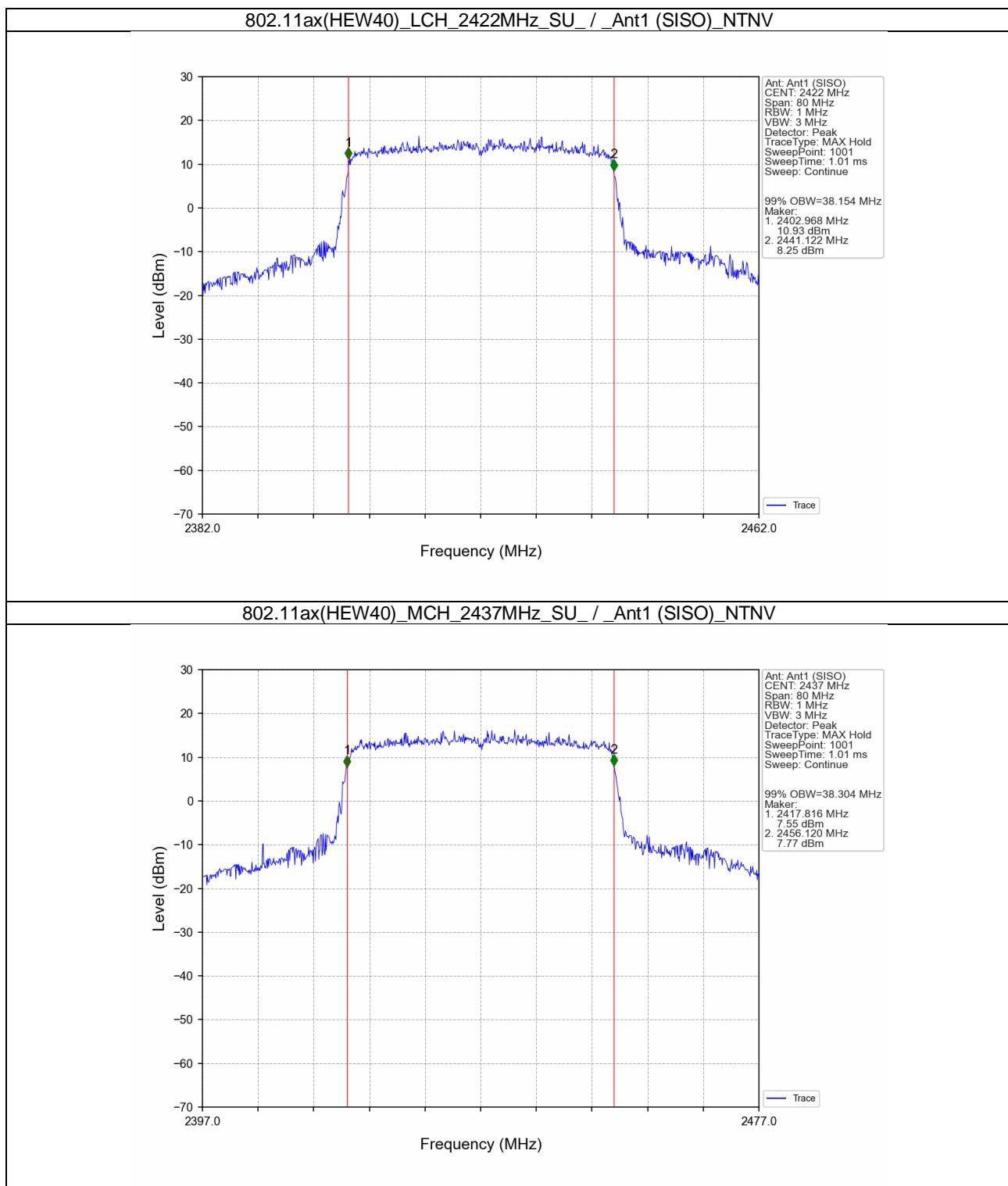
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV**802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV**

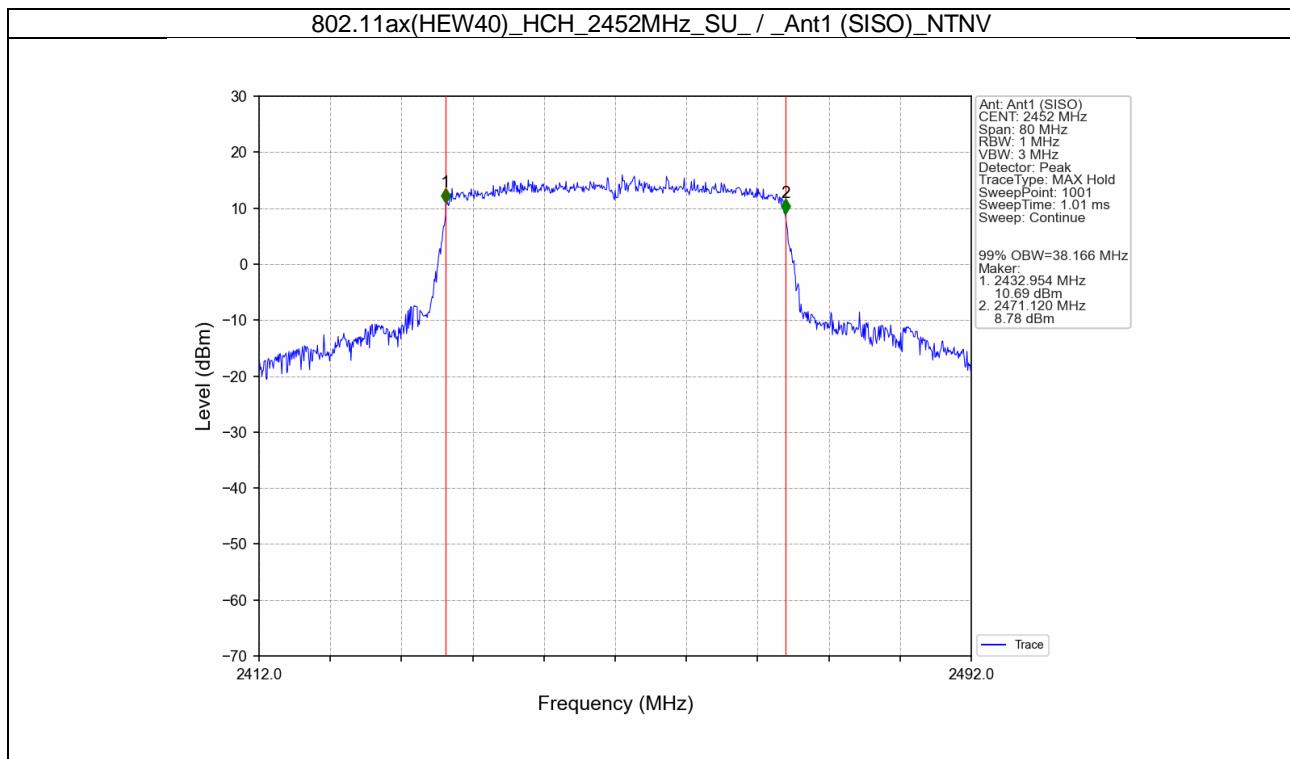




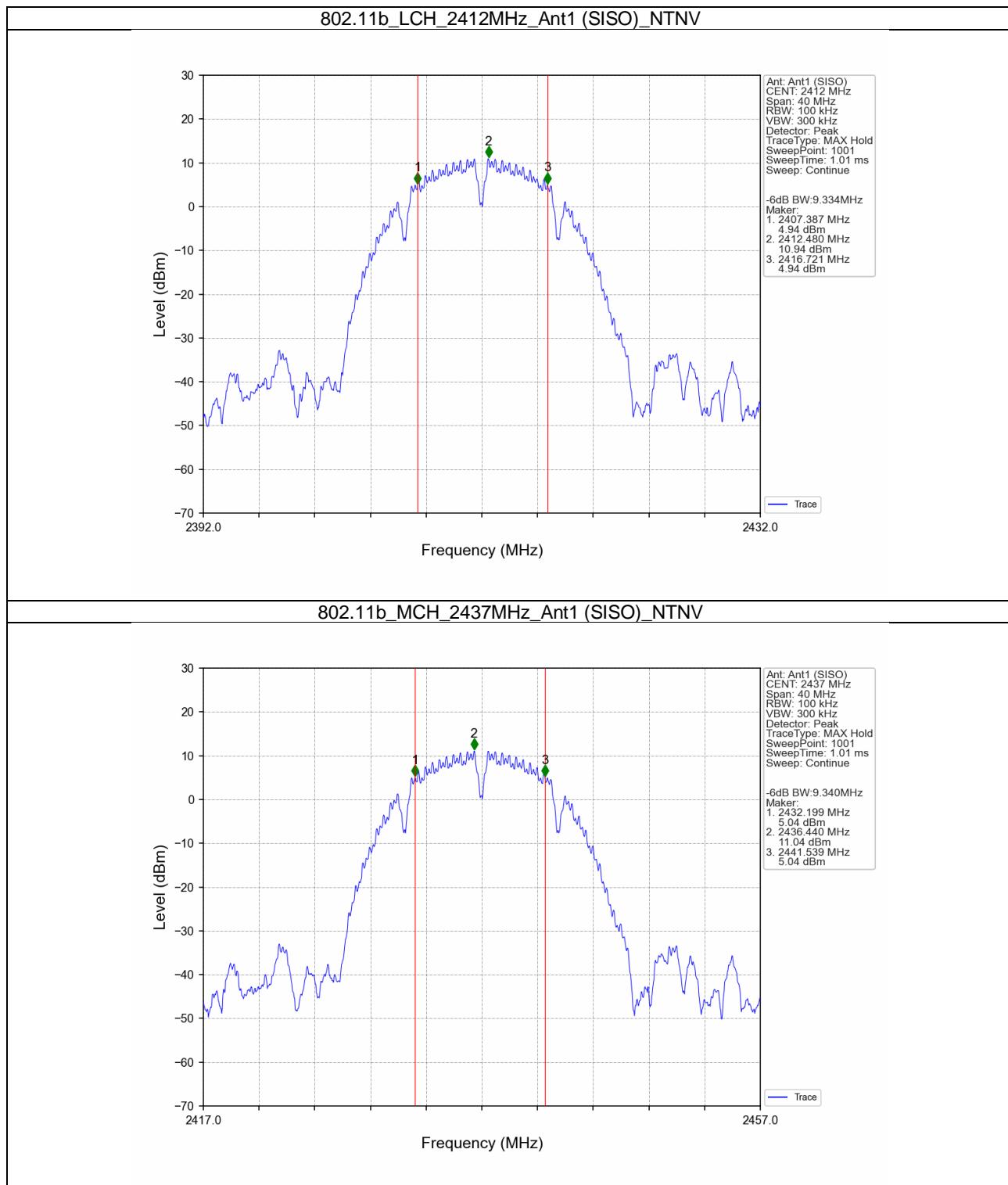


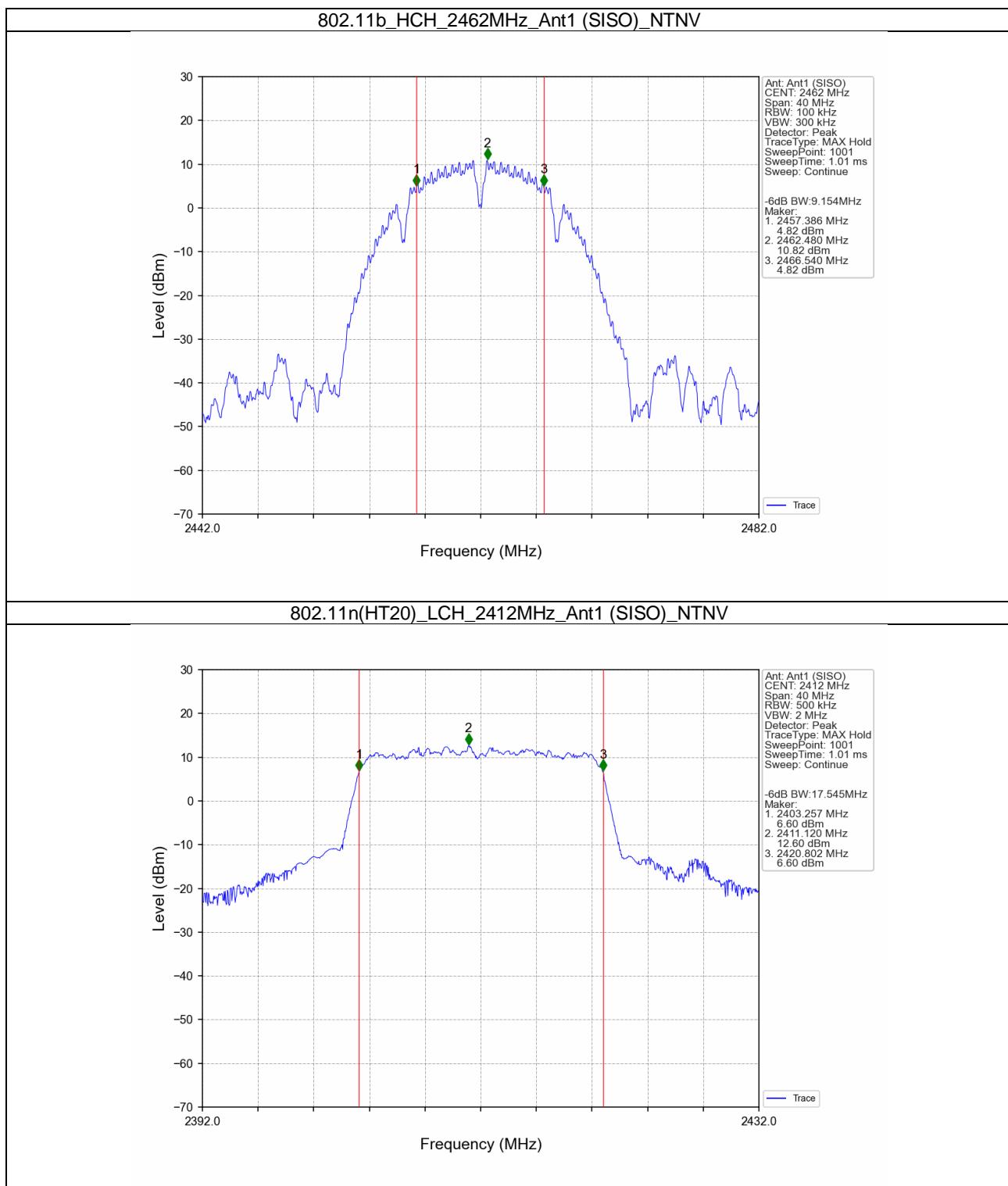


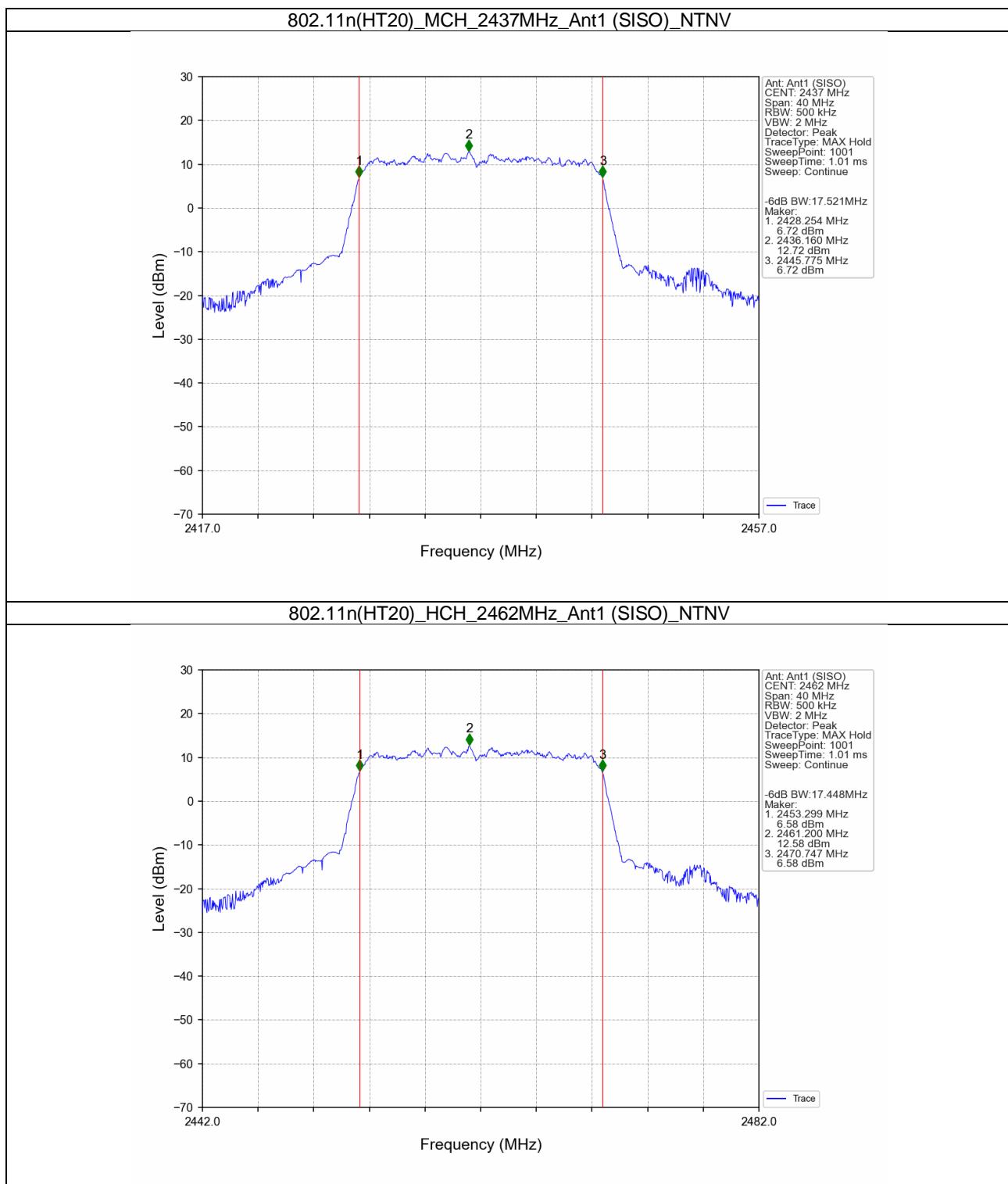


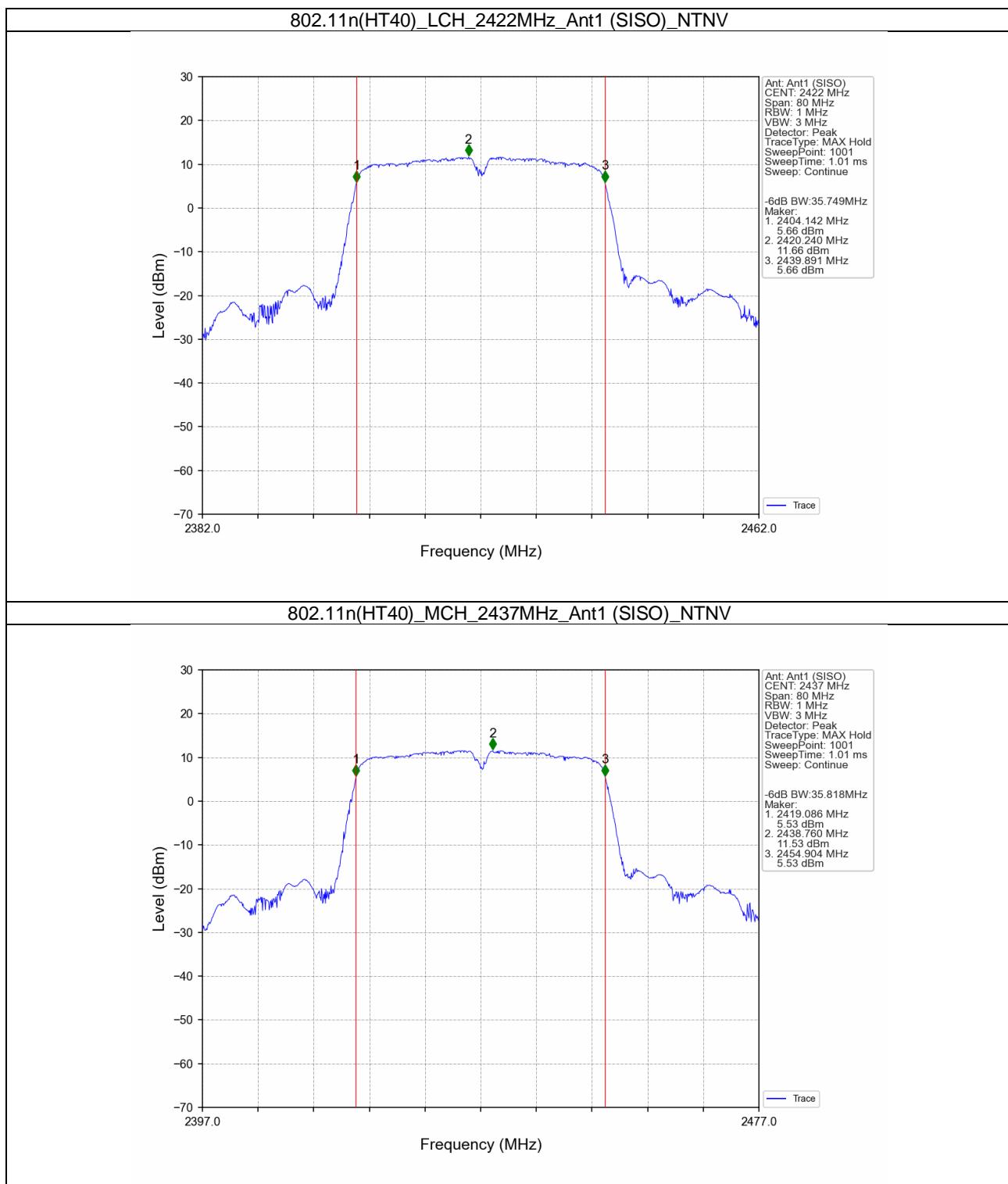


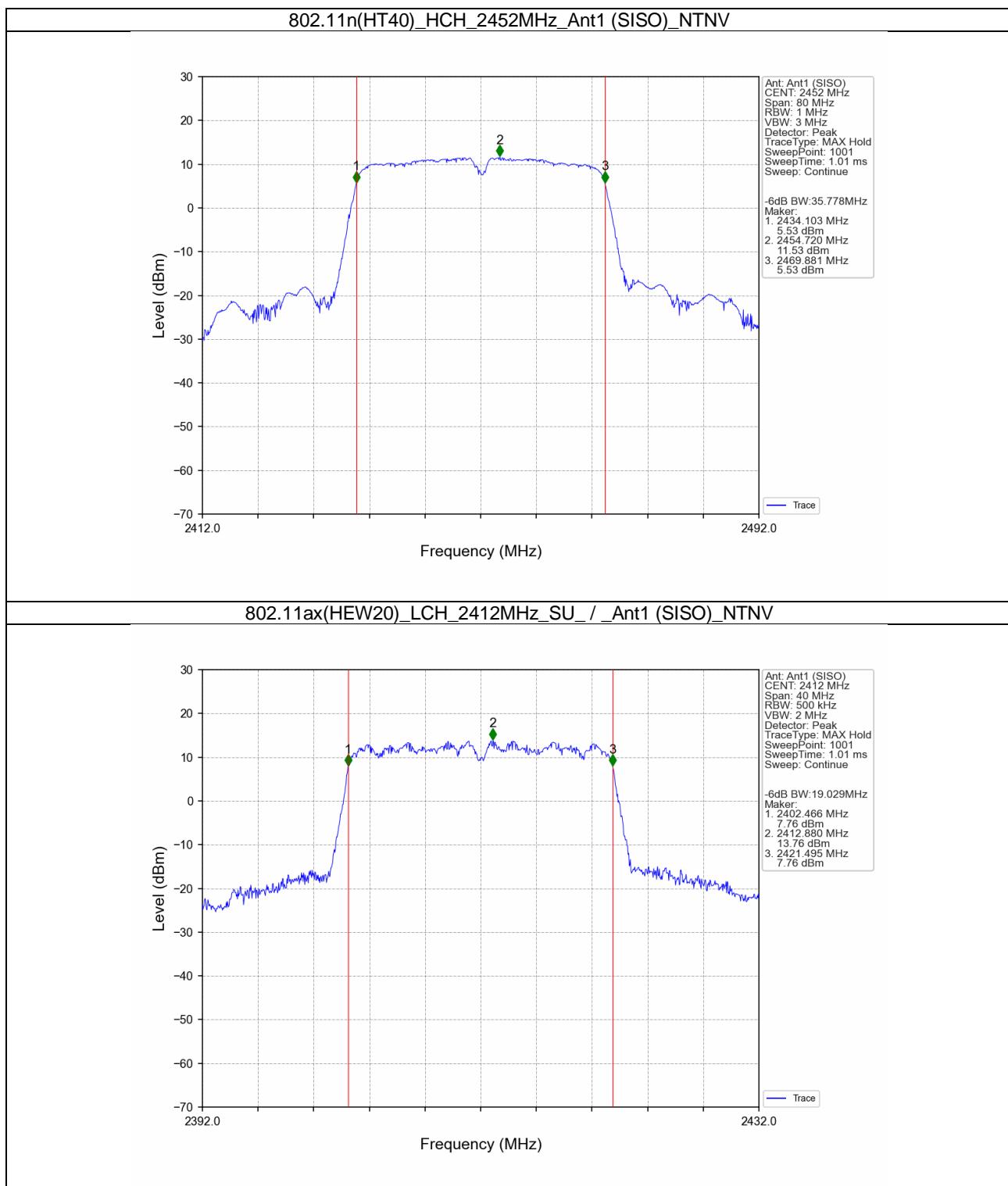
2.2.2 6dB BW

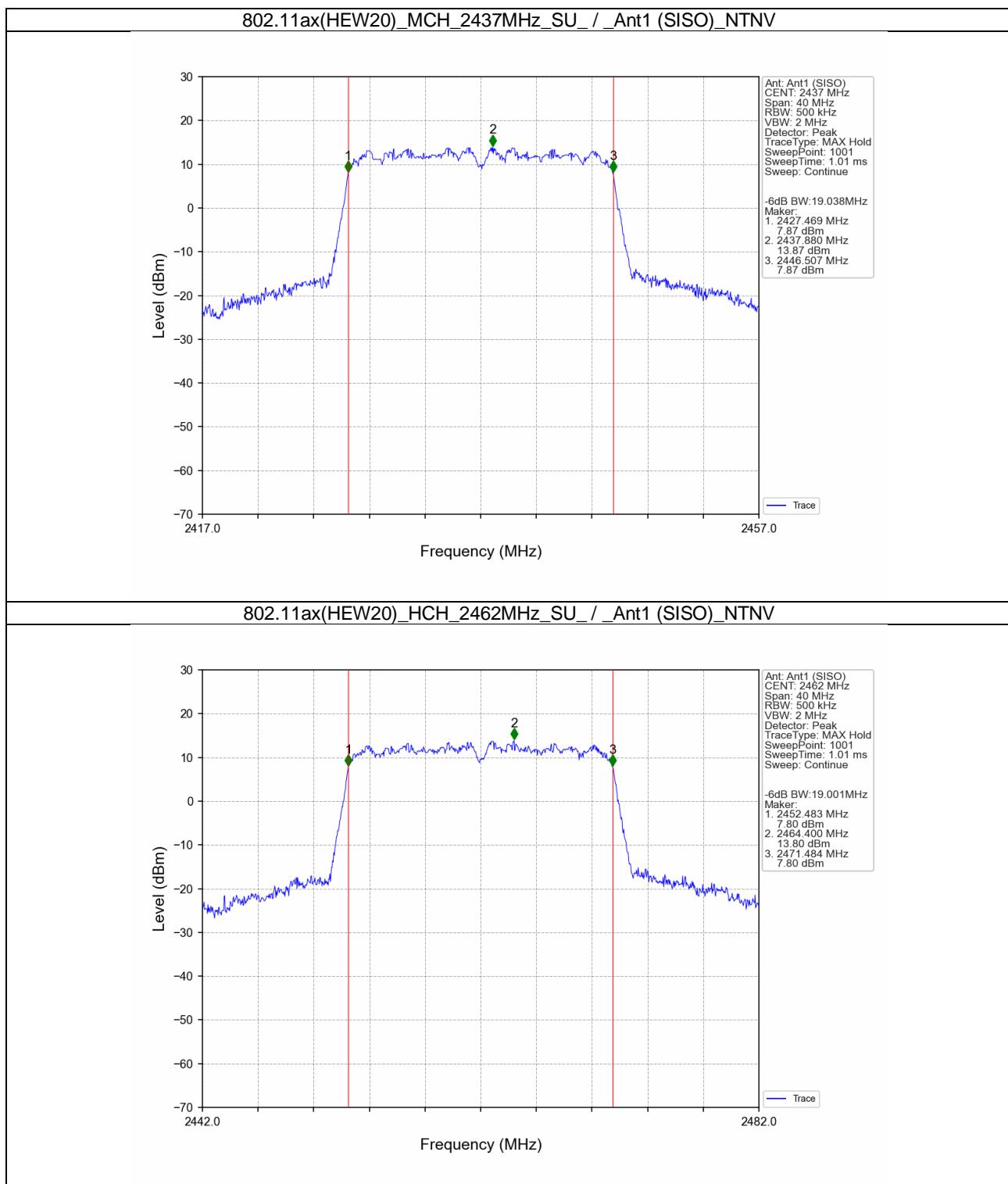


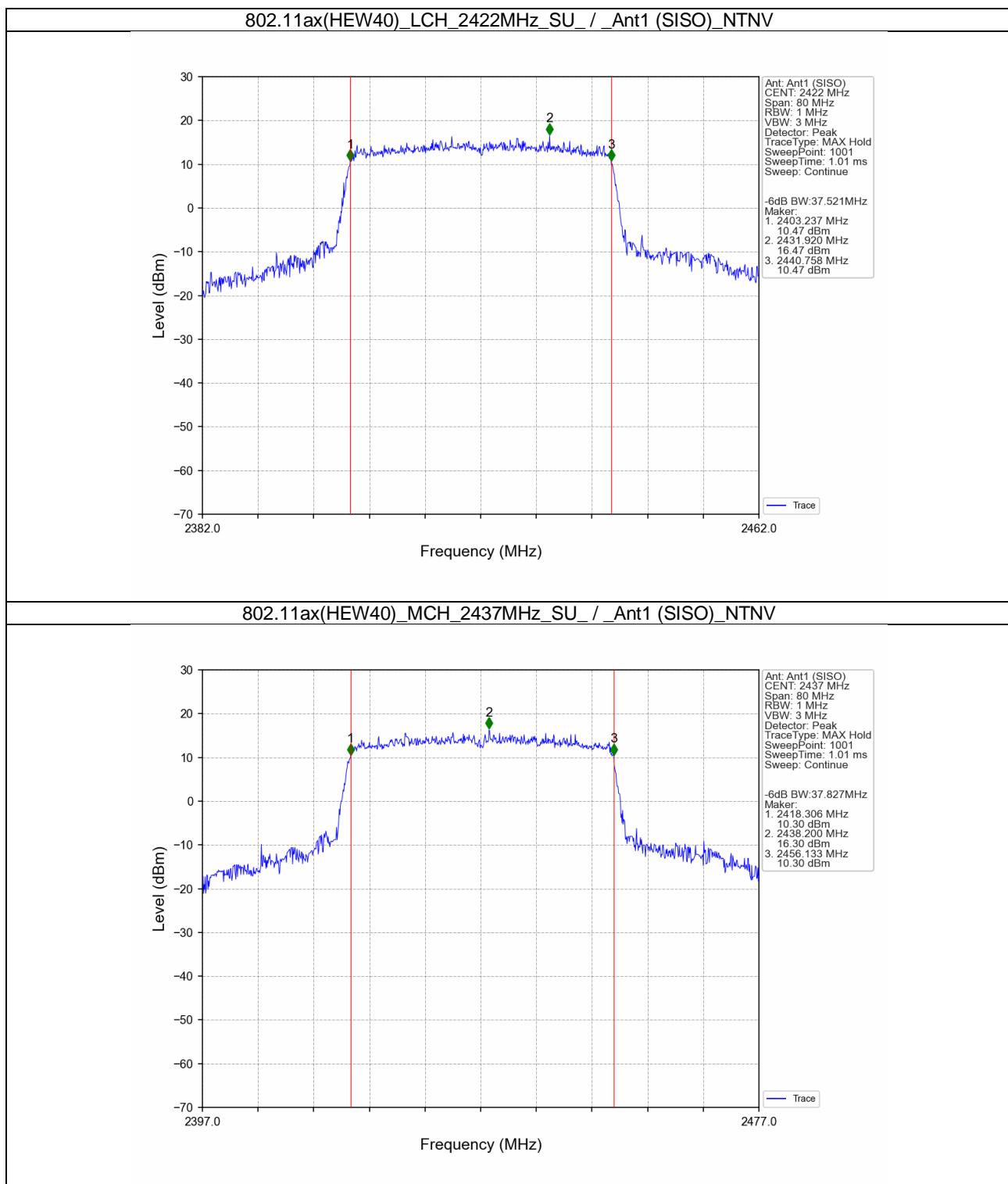


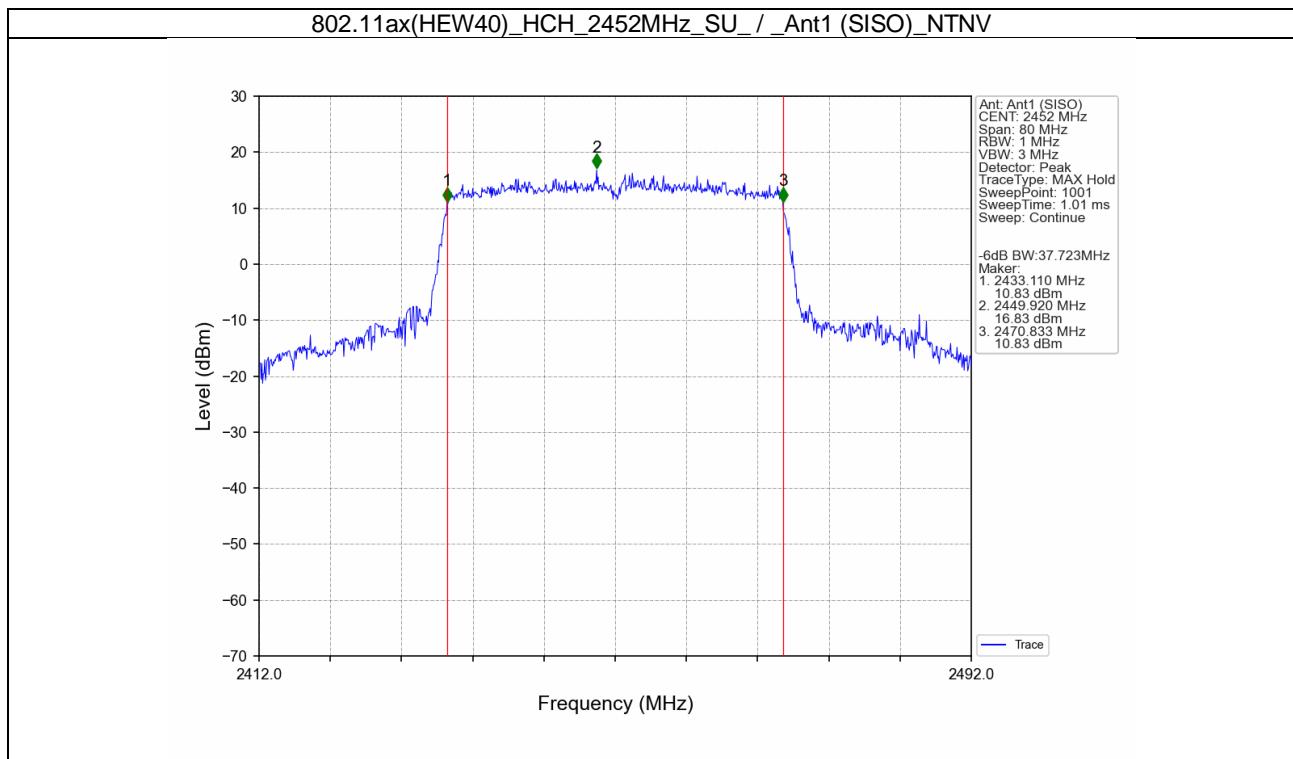












3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum Peak Conducted Output Power (dBm)		Verdict
					ANT1	Limit	
802.11b	SISO	2412	/	/	23.23	<=30	Pass
		2437	/	/	23.29	<=30	Pass
		2462	/	/	22.96	<=30	Pass
802.11n (HT20)	SISO	2412	/	/	24.65	<=30	Pass
		2437	/	/	26.02	<=30	Pass
		2462	/	/	24.54	<=30	Pass
802.11n (HT40)	SISO	2422	/	/	21.61	<=30	Pass
		2437	/	/	24.08	<=30	Pass
		2452	/	/	22.77	<=30	Pass
802.11ax (HEW20)	SISO	2412	RU26	/	23.18	<=30	Pass
			RU52	/	23.29	<=30	Pass
			RU106	/	23.47	<=30	Pass
			SU	/	24.52	<=30	Pass
		2437	RU26	/	25.94	<=30	Pass
			RU52	/	25.08	<=30	Pass
			RU106	/	25.88	<=30	Pass
			SU	/	26.83	<=30	Pass
		2462	RU26	/	23.34	<=30	Pass
			RU52	/	23.49	<=30	Pass
			RU106	/	23.19	<=30	Pass
			SU	/	24.54	<=30	Pass
802.11ax (HEW40)	SISO	2422	SU	/	24.00	<=30	Pass
		2437	SU	/	24.80	<=30	Pass
		2452	SU	/	23.94	<=30	Pass

4. Maximum Power Spectral Density

4.1 Test Result

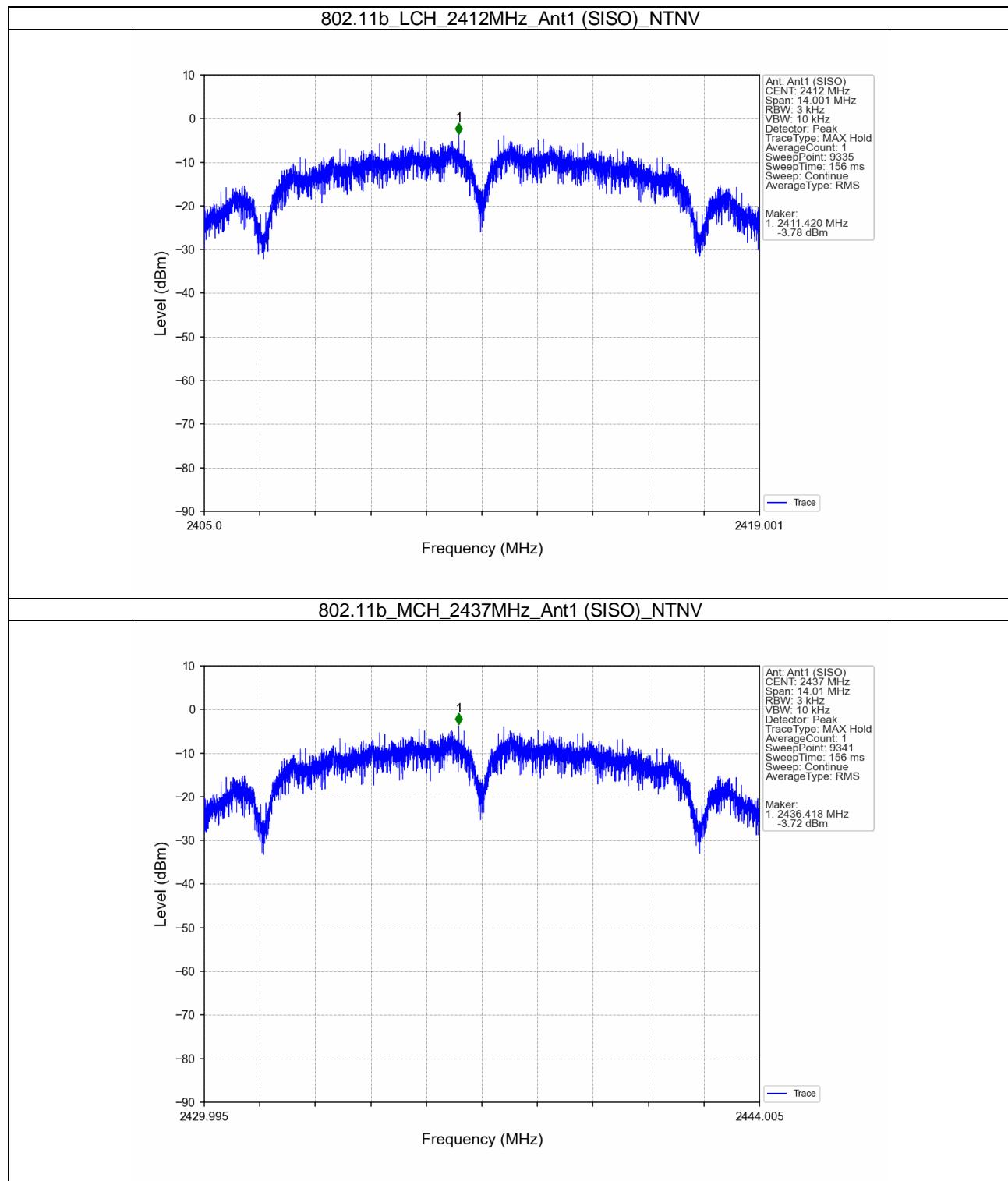
4.1.1 PSD

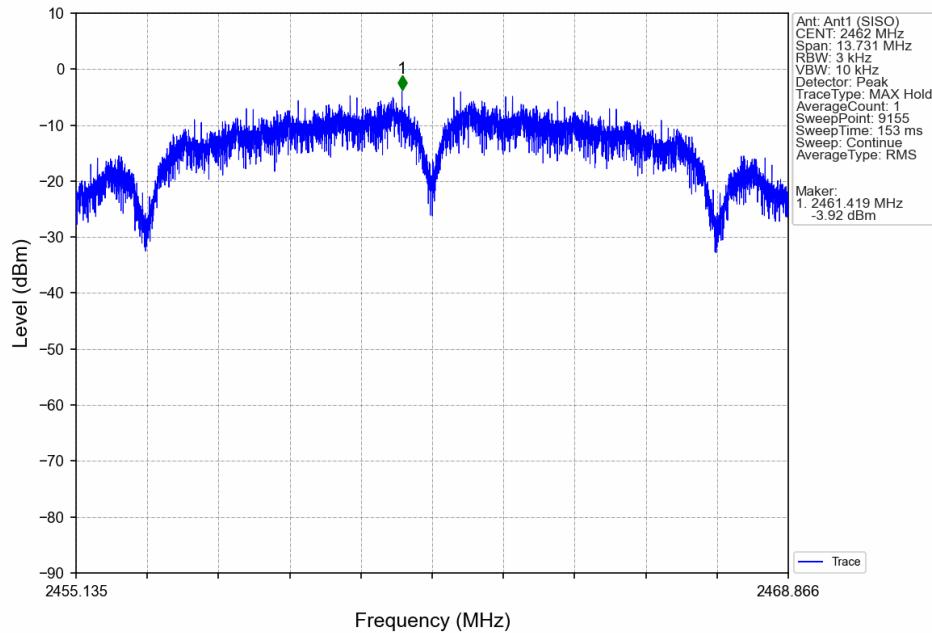
Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum PSD (dBm)		Verdict
					ANT1	Limit	
802.11b	SISO	2412	/	/	-3.78	<=8	Pass
		2437	/	/	-3.72	<=8	Pass
		2462	/	/	-3.92	<=8	Pass
802.11n (HT20)	SISO	2412	/	/	-7.19	<=8	Pass
		2437	/	/	-7.17	<=8	Pass
		2462	/	/	-7.37	<=8	Pass
802.11n (HT40)	SISO	2422	/	/	-9.99	<=8	Pass
		2437	/	/	-10.79	<=8	Pass
		2452	/	/	-10.79	<=8	Pass
802.11ax (HEW20)	SISO	2412	RU26	/	-11.13	<=8	Pass
			RU52	/	-11.31	<=8	Pass
			RU106	/	-11.75	<=8	Pass
			SU	/	-9.94	<=8	Pass
		2437	RU26	/	-11.28	<=8	Pass
			RU52	/	-10.38	<=8	Pass
			RU106	/	-12.04	<=8	Pass
			SU	/	-9.31	<=8	Pass
		2462	RU26	/	-11.92	<=8	Pass
			RU52	/	-10.69	<=8	Pass
			RU106	/	-13.28	<=8	Pass
			SU	/	-9.63	<=8	Pass
802.11ax (HEW40)	SISO	2422	SU	/	-9.99	<=8	Pass
		2437	SU	/	-9.46	<=8	Pass
		2452	SU	/	-9.76	<=8	Pass

Note1: Antenna Gain: Ant1: 3.37dBi;

4.2 Test Graph

4.2.1 PSD



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV**802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV**