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TEST REPORT

FCC PART 15 SUBPART E 15.407

Report Reference No.: CTL2001034051-WF04

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Product Name.....: MaaxBoard Mini

Model/Type reference: MaaXBoard Mini

List Model(s).....: N/A

Trade Mark: N/A

FCC ID: 2AFLY-MAAX-MINI

Applicant's name: Embest Technology Co., Ltd

Address of applicant: TowerB 4/F, Shanshui Building, Nanshan Yungu Innovation
Industry Park, Liuxian Ave.No.1183, Nanshan District, ShenZhen,
China.

Test Firm: Shenzhen CTL Testing Technology Co., Ltd.

Address of Test Firm: Floor 1-A, Baisha Technology Park, No.3011, ShaheXi Road,
Nanshan District, Shenzhen, China 518055

Test specification.....:

Standard.....: 47 CFR FCC Part 15 Subpart E 15.407

TRF Originator: Shenzhen CTL Testing Technology Co., Ltd.

Master TRF: Dated 2011-01

Date of receipt of test item.....: Jan. 16, 2020

Date of sampling: Jan. 16, 2020

Date of Test Date.....: Jan. 16, 2020-Mar. 16, 2020

Data of Issue.....: Mar. 25, 2020

Result.....: Pass

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TEST REPORT

Test Report No. : CTL2001034051-WF04	Mar. 25, 2020 Date of issue
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Equipment under Test : MaaxBoard Mini

Model /Type : MaaXBoard Mini

Listed Models : N/A

Applicant : **Embest Technology Co., Ltd**

Address : TowerB 4/F, Shanshui Building, Nanshan Yungu
Innovation Industry Park, Liuxian Ave.No.1183,
Nanshan District, ShenZhen, China.

Manufacturer : **Embest Technology Co., Ltd**

Address : TowerB 4/F, Shanshui Building, Nanshan Yungu
Innovation Industry Park, Liuxian Ave.No.1183,
Nanshan District, ShenZhen, China.

Test result	Pass *
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* In the configuration tested, the EUT complied with the standards specified page 5.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

**** Modified History ****

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1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15 Subpart E](#)—Unlicensed National Information Infrastructure Devices

[ANSI C63.10:2013](#) : American National Standard for Testing Unlicensed Wireless Devices

[KDB789033 D02](#): General UNII Test Procedures New Rules v02r01

1.2. Test Description

FCC Requirement		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.407(a)	Emission Bandwidth(26dBm Bandwidth)	PASS _{Note1}
FCC Part 15.407(e)	Minimum Emission Bandwidth(6dBm Bandwidth)	PASS _{Note2}
FCC Part 15.407(a)	Maximum Conducted Output Power	PASS
FCC Part 15.407(a)	Peak Power Spectral Density	PASS
FCC Part 15.407(g)	Frequency Stability	PASS
FCC Part 15.407(b)	Undesirable emission	PASS
FCC Part 15.407(b)/15.205/15.209	Radiated Emissions	PASS
FCC Part 15.407(h)	Dynamic Frequency Selection	PASS _{Note 3}
FCC Part 15.203/15.247(b)	Antenna Requirement	PASS

Note 1: Apply to U-NII 1, U-NII 2A, and U-NII 2C band.

Note 2: Apply to U-NII 3 band only.

Note 3: Test result see DFS report.

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.3.2 Laboratory accreditation

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

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9618B

CAB identifier: CN0041

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B on Jan. 22, 2019.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power conducted	± 0.57 dB	(1)
Transmitter power Radiated	± 2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	± 2.20 dB	(1)
Occupied Bandwidth	± 0.01 ppm	(1)
Radiated Emission 30~1000MHz	± 4.10 dB	(1)
Radiated Emission Above 1GHz	± 4.32 dB	(1)

Conducted Disturbance0.15~30MHz	$\pm 3.20\text{dB}$	(1)
---------------------------------	---------------------	-----

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

2. GENERAL INFORMATION

2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2. General Description of EUT

Product Name:	MaaxBoard Mini			
Model/Type reference:	MaaXBoard Mini			
Power supply:	DC 5.0V			
WIFI				
Supported type:	20MHz system	40MHz system	80MHz system	160MHz system
	802.11a 802.11n 802.11ac	802.11n 802.11ac	802.11ac	N/A
Operation frequency:	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755MHz,5795MHz	5210MHz; 5290MHz; 5530MHz; 5610MHz; 5775MHz	N/A
Modulation:	OFDM	OFDM	OFDM	N/A
Channel number:	24	11	5	N/A
Channel separation:	20MHz	40MHz	80MHz	N/A
Antenna type:	Ceramics Antenna			
Antenna gain:	1dBi			

Note: For more details, please refer to the user's manual of the EUT.

2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

All test performed at the low, middle and high of operational frequency range of each mode.

Operation Frequency List WIFI on 5G Band:

Operating band	20MHz		40MHz		80MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII 1 (5150MHz-5250MHz)	36	5180	38	5190	42	5210
	40	5200				
	44	5220	46	5230		
	48	5240				
U-NII 2A (5120MHz-5350MHz)	52	5260	54	5270	58	5290
	56	5280				
	60	5300	62	5310		
	64	5320				
U-NII 2C (5470MHz-5725MHz)	100	5500	102	5510	106	5530
	104	5520				
	108	5540	110	5550		
	112	5560				
	116	5580	118	5590	122	5610
	120	5600				
	124	5620	126	5630		
	128	5640				
	132	5660	134	5670	--	--
	136	5680			--	--
	140	5700	--	--	--	--
	U-NII 3 (5725MHz-5850MHz)	149	5745	151	5755	155
153		5765				
157		5785	159	5795		
161		5805				
165		5825	--	--	--	--

Note:

1. "--Means no channel(s) available any more.
2. The line display in grey is those Channels/Frequencies select to test in this report for each operation mode.

Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate
Maximum Conducted Output Power Power Spectral Density Emission Bandwidth(26dBm Bandwidth) Minimum Emission Bandwidth(6dBm Bandwidth) Undesirable emission Frequency Stability	11a/OFDM	6 Mbps
	11n(20MHz),11ac(20MHz)/OFDM	7.2 Mbps
	11n(40MHz),11ac(40MHz)/OFDM	15.0Mbps
	11ac(80MHz)/OFDM	65.0Mbps

2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ESH2-Z5	860014/010	2019/05/21	2020/05/20
Double cone logarithmic antenna	Schwarzbeck	VULB 9168	824	2019/05/23	2020/05/22
Horn Antenna	Ocean Microwave	OBH100400	26999002	2019/11/28	2020/11/27
EMI Test Receiver	R&S	ESCI	1166.5950.03	2019/05/21	2020/05/20
Spectrum Analyzer	Agilent	E4407B	MY41440676	2019/05/20	2020/05/19
Spectrum Analyzer	Agilent	N9020A	US46220290	2019/05/20	2020/05/19
Spectrum Analyzer	Keysight	N9020A	MY53420874	2019/05/20	2020/05/19
Controller	EM Electronics	EM 1000	060859	2019/05/21	2020/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2019/05/23	2020/05/22
Active Loop Antenna	Da Ze	ZN30900A	/	2019/05/23	2020/05/22
Amplifier	Agilent	8449B	3008A02306	2019/05/21	2020/05/20
Amplifier	Agilent	8447D	2944A10176	2019/05/21	2020/05/20
Amplifier	Brief&Smart	LNA-4018	2104197	2019/05/20	2020/05/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2019/05/22	2020/05/21
Power Sensor	Agilent	U2021XA	MY55130004	2019/05/20	2020/05/19
Power Sensor	Agilent	U2021XA	MY55130006	2019/05/20	2020/05/19
Power Sensor	Agilent	U2021XA	MY54510008	2019/05/20	2020/05/19
Power Sensor	Agilent	U2021XA	MY55060003	2019/05/20	2020/05/19
Spectrum Analyzer	RS	FSP	1164.4391.38	2019/05/20	2020/05/19

Test Software

Name of Software	Version
TST-PASS:	1.0.2
ES-K1(Below 1GHz):	V1.71
e3(Above 1GHz):	6.111221a

The calibration interval was one year

2.5. Special Accessories

Manufacturer	Description	Model	Serial Number	Certificate
ASUS	Notebook PC	FL5900U	9014	FCC ID:PPD-QCNFA335
Delta	AC Adapter	ADP-65DW A	00A99	SDOC

2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emissions Test

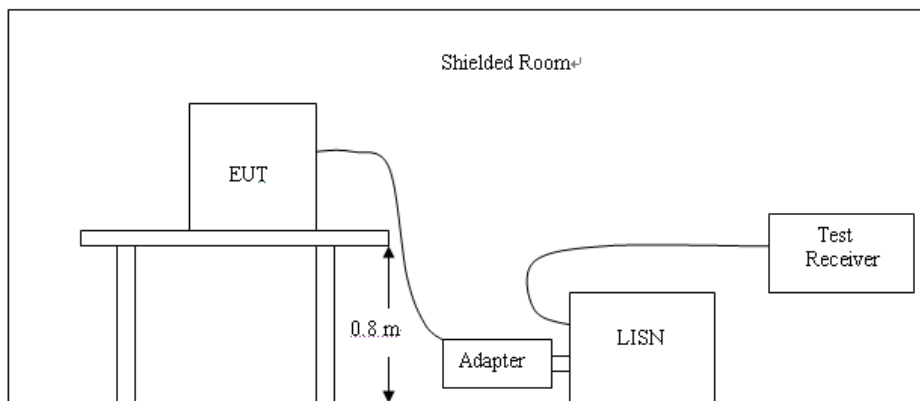
LIMIT

According to FCC CFR Title 47 Part 15 Subpart C Section 15.207, AC Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus as below:

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 CONFIGURATION



TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

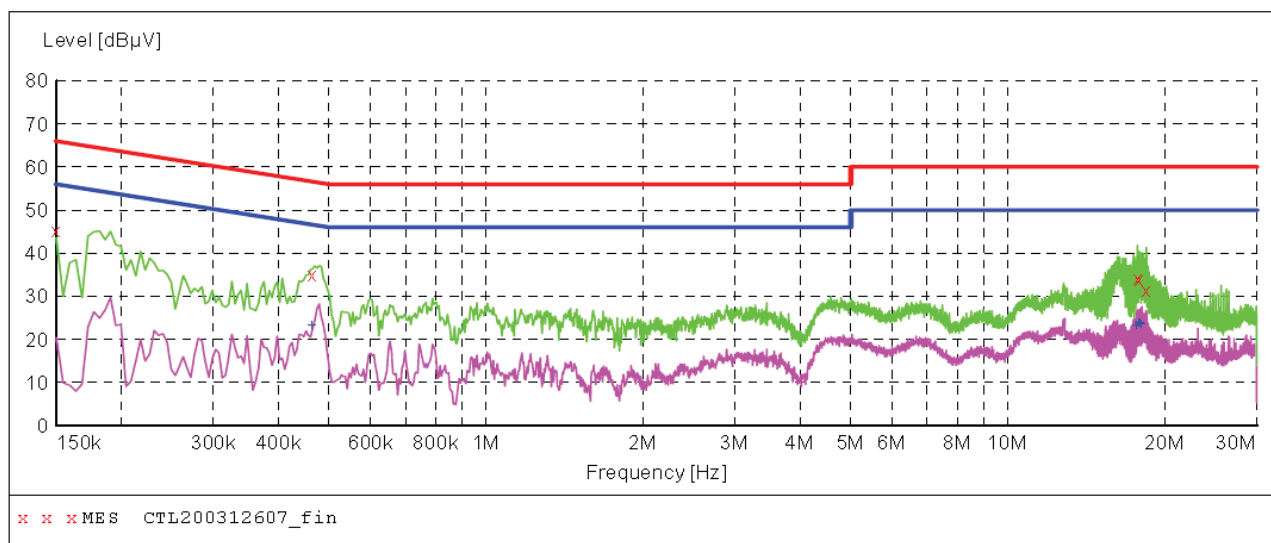
TEST RESULTS

Remark:

1. All modes of 802.11a/ n/ac were tested at Low, Middle, and High channel; only the worst result of 802.11a CH36 was reported as below:
2. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:
3. Pre-test AC conducted emission at power from AC mains mode and at charge from PC mode, recorded worst case.

Test Mode**WIFI****Line:****L****SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL200312607_fin"**

2020-3-12 16:35

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	45.20	11.2	66	20.8	QP	L1	GND
0.465000	35.20	11.2	57	21.4	QP	L1	GND
17.763000	34.30	11.1	60	25.7	QP	L1	GND
17.785500	34.20	11.1	60	25.8	QP	L1	GND
17.898000	34.00	11.1	60	26.0	QP	L1	GND
18.420000	31.50	11.2	60	28.5	QP	L1	GND

MEASUREMENT RESULT: "CTL200312607_fin2"

2020-3-12 16:35

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.465000	23.30	11.2	47	23.3	AV	L1	GND
17.704500	23.30	11.1	50	26.7	AV	L1	GND
17.848500	23.80	11.1	50	26.2	AV	L1	GND
17.983500	23.70	11.1	50	26.3	AV	L1	GND
18.069000	23.40	11.1	50	26.6	AV	L1	GND
18.096000	23.40	11.1	50	26.6	AV	L1	GND

Test Mode

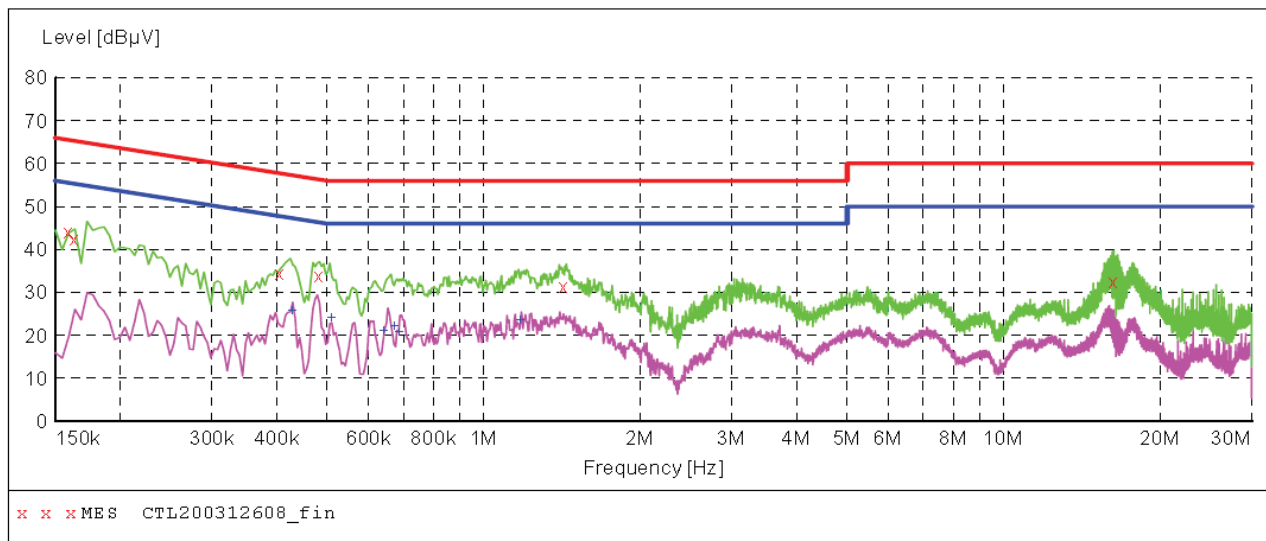
WIFI

Line:

N

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL200312608_fin"**

2020-3-12 16:38

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.159000	44.30	11.2	66	21.2	QP	N	GND
0.163500	42.40	11.2	65	22.9	QP	N	GND
0.406500	34.60	11.2	58	23.1	QP	N	GND
0.483000	33.90	11.2	56	22.4	QP	N	GND
1.423500	31.40	11.2	56	24.6	QP	N	GND
16.260000	32.60	11.0	60	27.4	QP	N	GND

MEASUREMENT RESULT: "CTL200312608_fin2"

2020-3-12 16:38

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.429000	25.70	11.2	47	21.6	AV	N	GND
0.510000	24.10	11.2	46	21.9	AV	N	GND
0.645000	20.90	11.2	46	25.1	AV	N	GND
0.676500	22.20	11.2	46	23.8	AV	N	GND
0.690000	20.60	11.2	46	25.4	AV	N	GND
1.180500	23.60	11.2	46	22.4	AV	N	GND

3.2. Radiated Emissions

Limit

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Undesirable emission limits

Requirement	Limit(EIRP)	Limit (Field strength at 3m) ^{Note1}
15.407(b)(1)	PK:-27(dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)		

Note1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$

(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209

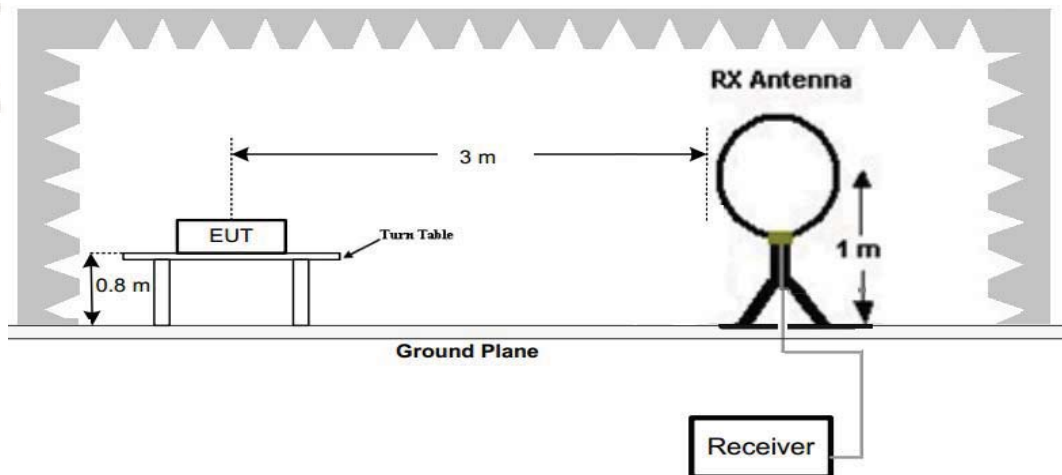
(6) In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

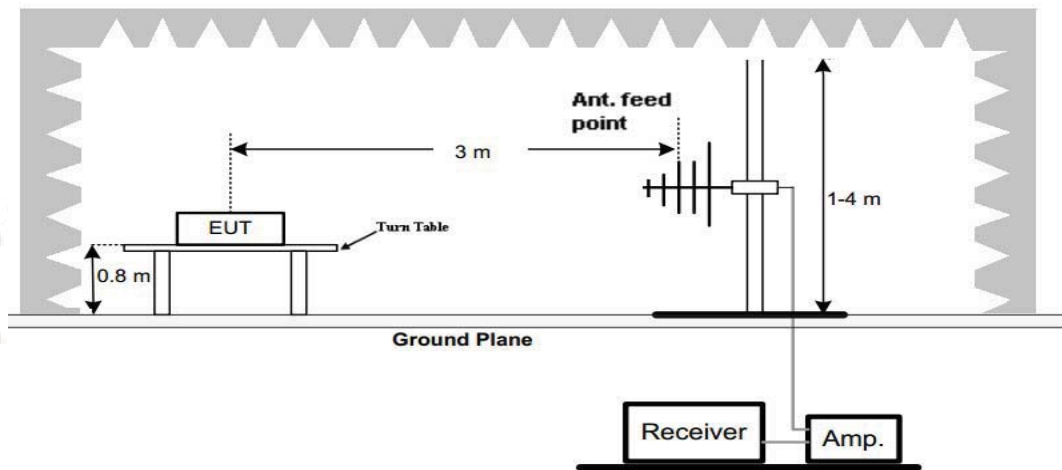
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

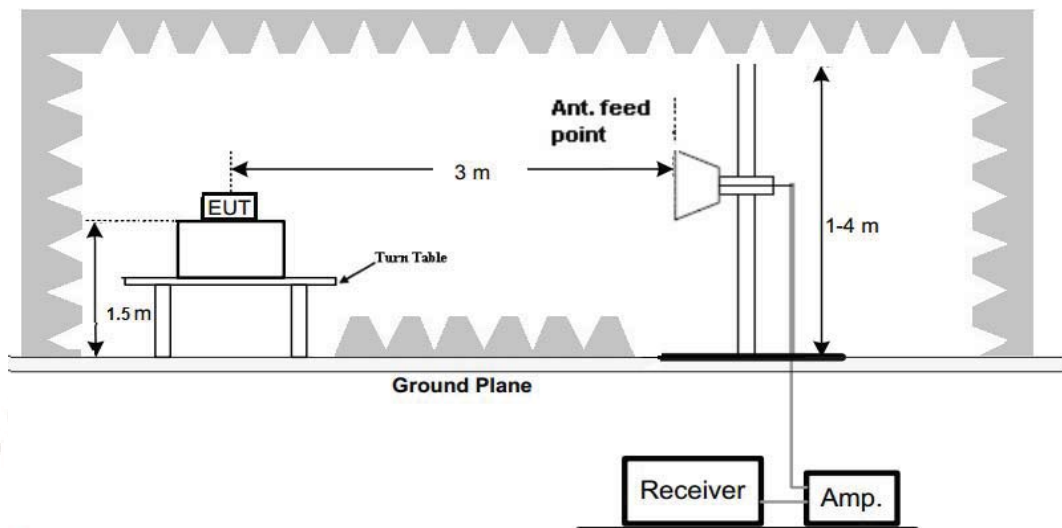
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 40GHz.
- The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3
1GHz-18GHz	Horn Antenna	3
18GHz-25GHz	Horn Antennna	1

- Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz, Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz, Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz, Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

TEST RESULTS

Remark:

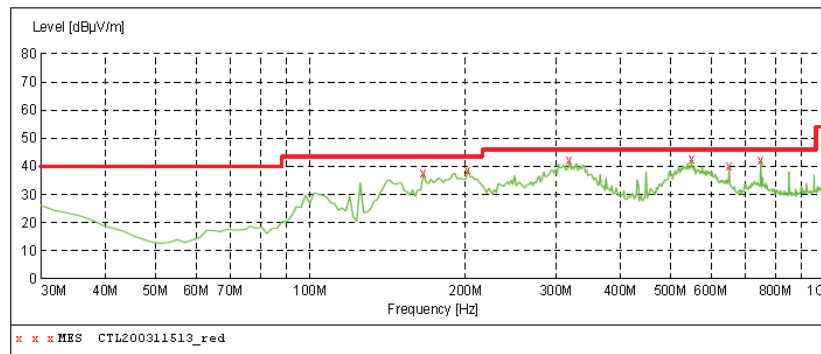
- This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
- All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80) modes have been tested for below 1GHz test, only the worst case 802.11ac (HT20) low channel of U-NII 1 band was recorded.
- All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80) modes have been tested for above 1GHz test, only the worst case 802.11ac (HT20) was recorded.
- Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Horizontal

SWEEP TABLE: "test (30M-1G)"

Short Description: Field Strength
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
30.0 MHz 1.0 GHz MaxPeak 300.0 ms 100 kHz JB1

**MEASUREMENT RESULT: "CTL200311513_red"**

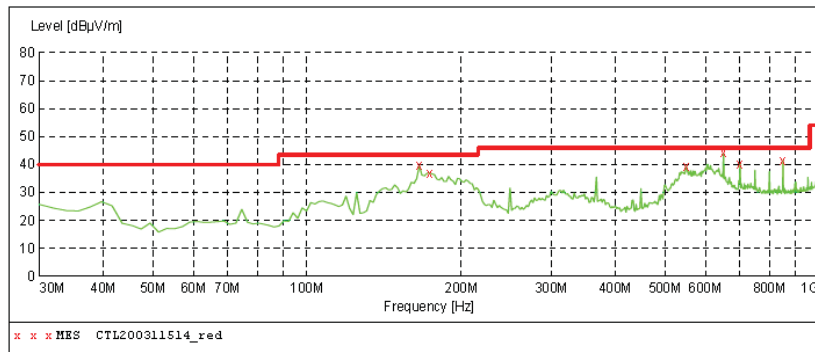
2020-3-11 16:51

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
165.800000	37.60	14.5	43.5	5.9	---	0.0	0.00	HORIZONTAL
202.660000	38.70	14.6	43.5	4.8	---	0.0	0.00	HORIZONTAL
319.060000	42.10	16.6	46.0	3.9	---	0.0	0.00	HORIZONTAL
549.920000	42.50	21.9	46.0	3.5	---	0.0	0.00	HORIZONTAL
650.800000	40.00	23.7	46.0	6.0	---	0.0	0.00	HORIZONTAL
749.740000	42.30	24.9	46.0	3.7	---	0.0	0.00	HORIZONTAL

Vertical

SWEEP TABLE: "test (30M-1G)"

Short Description: Field Strength
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
30.0 MHz 1.0 GHz MaxPeak 300.0 ms 100 kHz JB1

**MEASUREMENT RESULT: "CTL200311514_red"**

2020-3-11 16:53

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
165.800000	39.60	14.5	43.5	3.9	---	0.0	0.00	VERTICAL
173.560000	37.00	14.5	43.5	6.5	---	0.0	0.00	VERTICAL
549.920000	39.40	21.9	46.0	6.6	---	0.0	0.00	VERTICAL
650.800000	43.20	23.7	46.0	2.8	QP	0.0	0.00	VERTICAL
701.240000	40.20	24.3	46.0	5.8	---	0.0	0.00	VERTICAL
850.620000	41.60	25.9	46.0	4.4	---	0.0	0.00	VERTICAL

For 1GHz to 25GHz

Note: All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80) modes have been tested for above 1GHz test, only the worst case 802.11ac (HT20) was recorded.

U-NII 1 & 802.11ac (HT20) Mode (above 1GHz)

[illegible][illegible]

U-NII 2A & 802.11ac (HT20) Mode (above 1GHz)

[illegible]

U-NII 3 & 802.11ac (HT20) Mode (above 1GHz)

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
149 (5745MHz)	5720.00	50.23	PK	H	68.20	17.97	38.85	37.64	9.28	35.41	11.51
	11490.00	52.45	PK	H	68.20	15.75	34.19	39.69	12.90	34.33	18.26
	--	--	--	--	--	--	--	--	--	--	--
157 (5785MHz)	11570.00	51.86	PK	H	68.20	16.34	33.53	39.71	13.05	34.31	18.45
	--	--	--	--	--	--	--	--	--	--	--
165 (5825MHz)	5855.00	49.43	PK	H	68.20	18.77	38.00	37.64	9.28	35.38	11.54
	11650.00	52.16	PK	H	68.20	16.04	33.59	39.73	13.19	34.30	18.62
	--	--	--	--	--	--	--	--	--	--	--

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
149 (5745MHz)	5720.00	49.16	PK	V	68.20	19.04	37.69	37.64	9.28	35.41	11.51
	11490.00	52.17	PK	V	68.20	16.03	33.96	39.69	12.90	34.33	18.26
	--	--	--	--	--	--	--	--	--	--	--
157 (5785MHz)	11570.00	51.76	PK	V	68.20	16.44	33.53	39.71	13.05	34.31	18.45
	--	--	--	--	--	--	--	--	--	--	--
165 (5825MHz)	5855.00	49.13	PK	V	68.20	19.07	37.67	37.64	9.28	35.38	11.54
	11650.00	52.05	PK	V	68.20	16.15	33.51	39.73	13.19	34.30	18.62
	--	--	--	--	--	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the other emission levels were very low against the limit.
5. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
6. Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac VHT20 ,IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;

3.3. Maximum Conducted Average Output Power

Limit

FCC requirement:

For the band 5.15-5.25 GHz.

- (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.
- (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.
- (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.
- (iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

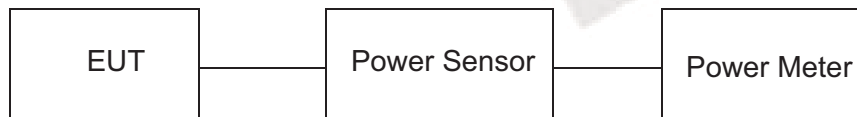
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results

See Appendix 2

3.4. Power Spectral Density

Limit

FCC requirement:

For the band 5.15-5.25 GHz.

- (i) For an outdoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.^{note1}
- (ii) For an indoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.^{note1}
- (iii) For fixed point-to-point access points operating in the band 5.15 - 5.25 GHz, transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
- (iv) For mobile and portable client devices in the 5.15 - 5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band.^{note1}

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725 - 5.85 GHz

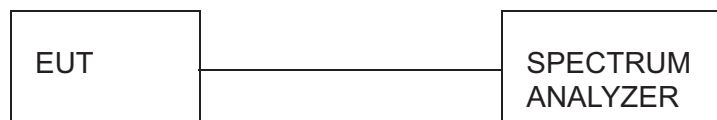
The maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.^{note1, note2}

Note1: If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note2: Fixed point - to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 1MHz for U-NII 1, U-NII 2A, U-NII C band and 510KHz for U-NII 3 band.
3. Set the VBW $\geq 3 \times$ RBW.
4. Set the span to encompass the entire EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.

Test Configuration**Test Results**

See Appendix 3

3.5. Emission Bandwidth (26dBm Bandwidth)

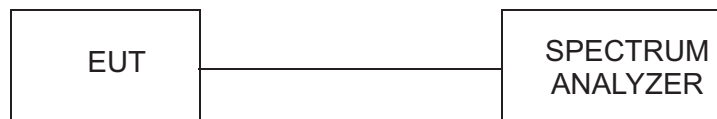
Limit

N/A

Test Procedure

1. Set resolution bandwidth (RBW) = approximately 1 % of the EBW.
2. Set the video bandwidth (VBW) > RBW.
3. Detector = Peak.
4. Trace mode = Max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW / EBW ratio is approximately 1 %.

Test Configuration



Test Results

See Appendix 1.2

3.6. Minimum Emission Bandwidth (6dBm Bandwidth)

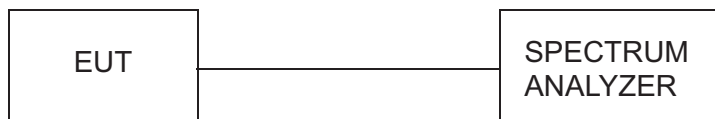
Limit

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth 3 x RBW.
3. Detector = Peak.
4. Trace mode = Max hold.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Configuration



Test Results

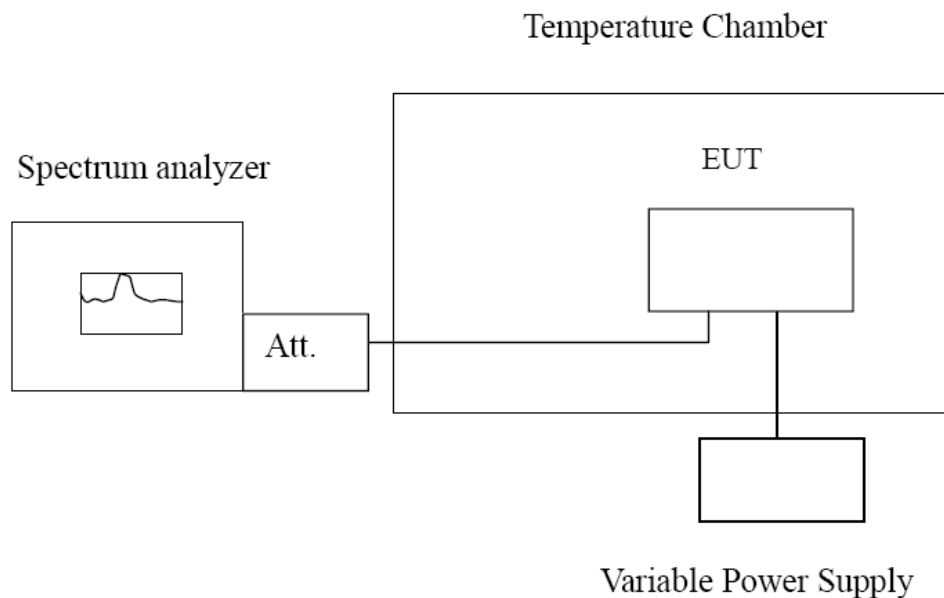
See Appendix 1.2

3.7. Frequency Stability

LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

TEST CONFIGURATION



TEST PROCEDURE

Frequency Stability under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Frequency Stability under Voltage Variations:

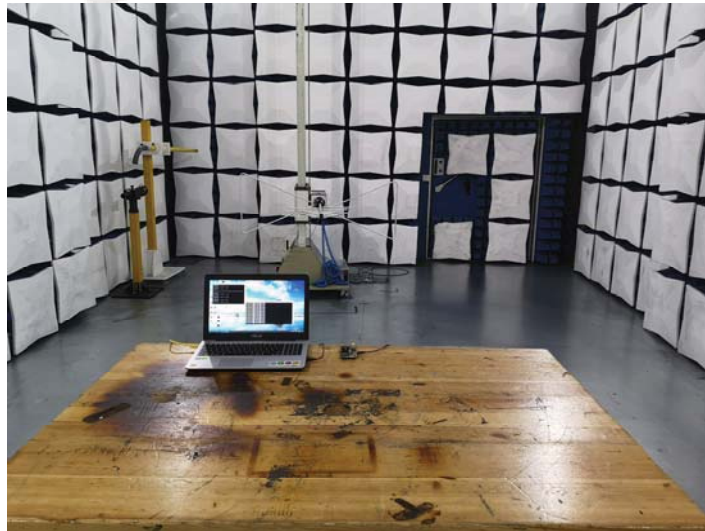
Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

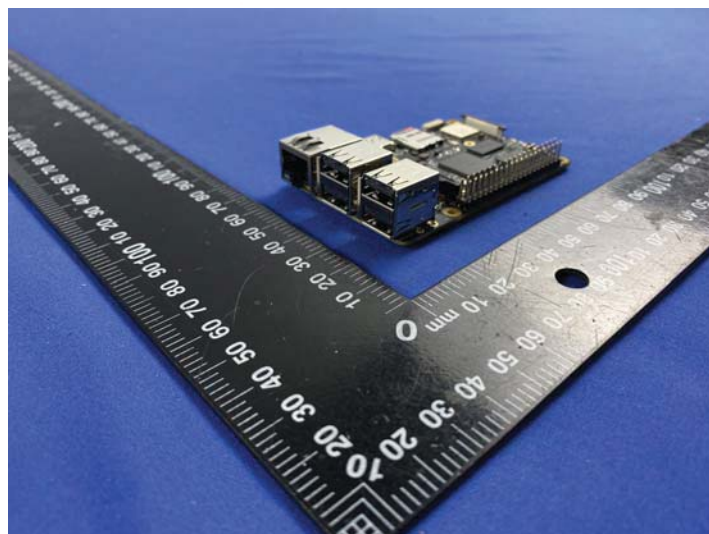
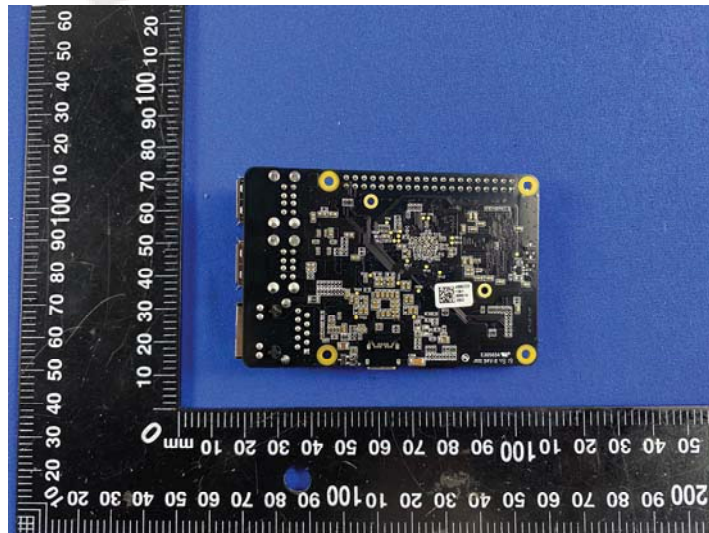
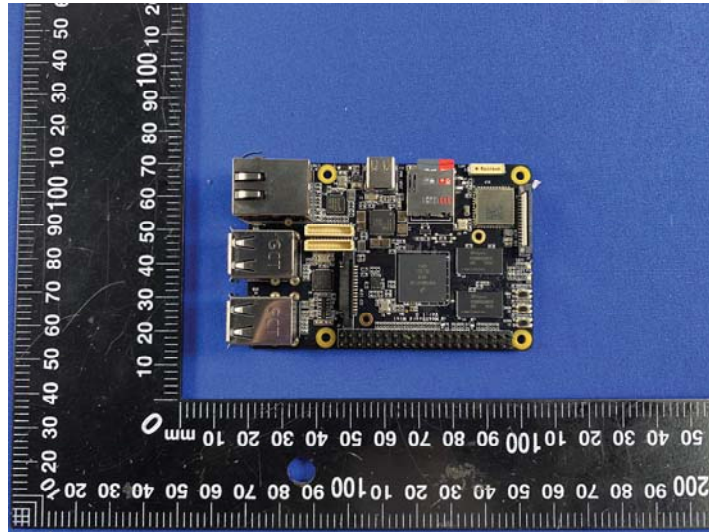
TEST RESULTS

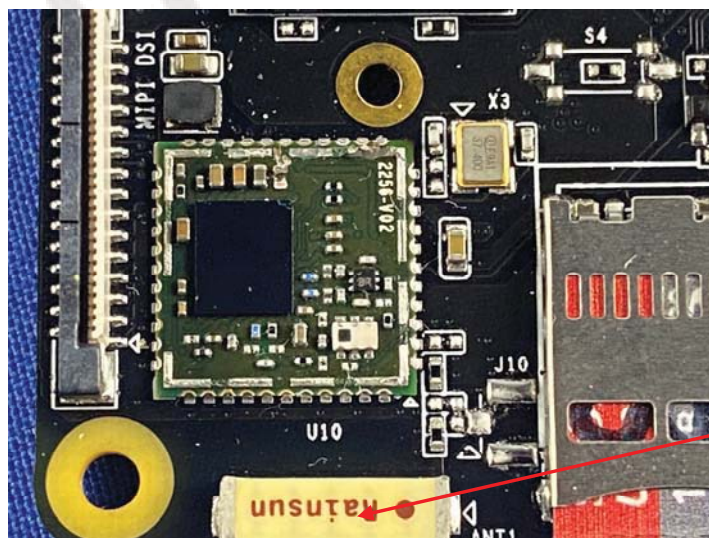
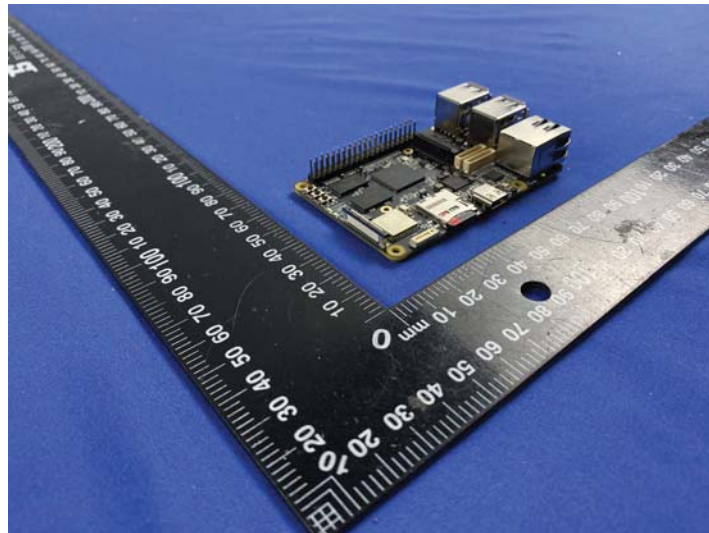
See Appendix 4

4. Test Setup Photos of the EUT

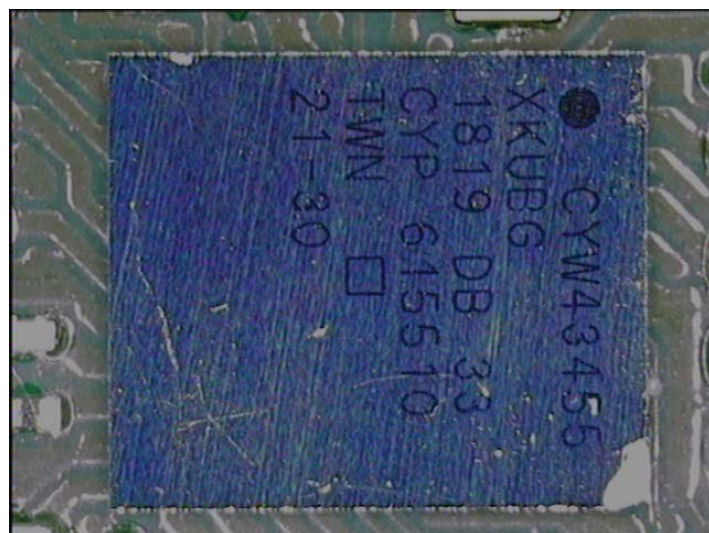


5. Photos of the EUT





antenna



***** End of Report *****

Appendix for 15.407

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1. Bandwidth

1.1 Test Result

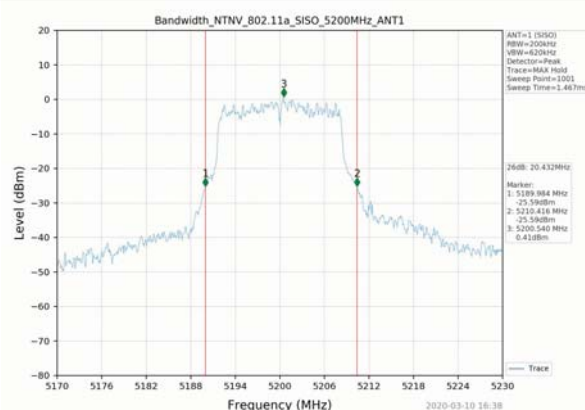
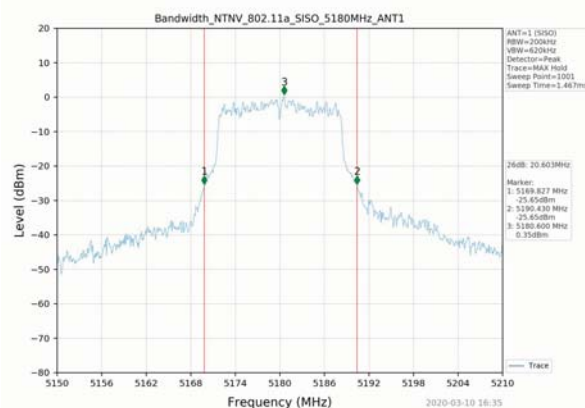
Test Mode	Frequency (MHz)	TX Type	ANT No.	Emission Bandwidth		Verdict
				Test Result (MHz)	Limits (MHz)	
802.11a	5180	SISO	1	20.603	/	PASS
	5200	SISO	1	20.432	/	PASS
	5240	SISO	1	20.449	/	PASS
	5260	SISO	1	20.344	/	PASS
	5300	SISO	1	20.122	/	PASS
	5320	SISO	1	20.326	/	PASS
	5500	SISO	1	20.770	/	PASS
	5580	SISO	1	20.860	/	PASS
	5600	SISO	1	20.552	/	PASS
	5700	SISO	1	20.573	/	PASS
	5745	SISO	1	16.398	≥0.5	PASS
	5785	SISO	1	16.199	≥0.5	PASS
	5825	SISO	1	16.164	≥0.5	PASS
802.11n(HT20)	5180	SISO	1	21.061	/	PASS
	5200	SISO	1	21.167	/	PASS
	5240	SISO	1	21.133	/	PASS
	5260	SISO	1	21.077	/	PASS
	5300	SISO	1	20.949	/	PASS
	5320	SISO	1	20.979	/	PASS
	5500	SISO	1	21.377	/	PASS
	5580	SISO	1	21.050	/	PASS
	5600	SISO	1	21.060	/	PASS
	5700	SISO	1	20.854	/	PASS
	5745	SISO	1	17.296	≥0.5	PASS
	5785	SISO	1	17.584	≥0.5	PASS
	5825	SISO	1	17.671	≥0.5	PASS
802.11n(HT40)	5190	SISO	1	39.385	/	PASS
	5230	SISO	1	39.111	/	PASS
	5270	SISO	1	39.515	/	PASS
	5310	SISO	1	39.376	/	PASS
	5510	SISO	1	39.282	/	PASS
	5550	SISO	1	39.543	/	PASS
	5590	SISO	1	39.430	/	PASS
	5755	SISO	1	36.474	≥0.5	PASS
	5795	SISO	1	36.100	≥0.5	PASS
802.11ac(VHT20)	5180	SISO	1	21.109	/	PASS
	5200	SISO	1	21.123	/	PASS
	5240	SISO	1	21.006	/	PASS
	5260	SISO	1	20.766	/	PASS
	5300	SISO	1	20.249	/	PASS
	5320	SISO	1	21.259	/	PASS
	5500	SISO	1	21.024	/	PASS
	5580	SISO	1	21.234	/	PASS
	5600	SISO	1	21.053	/	PASS
	5700	SISO	1	21.212	/	PASS
	5745	SISO	1	17.650	≥0.5	PASS
	5785	SISO	1	17.699	≥0.5	PASS
	5825	SISO	1	17.564	≥0.5	PASS
802.11ac(VHT40)	5190	SISO	1	63.699	/	PASS
	5230	SISO	1	42.472	/	PASS
	5270	SISO	1	39.821	/	PASS
	5310	SISO	1	39.887	/	PASS

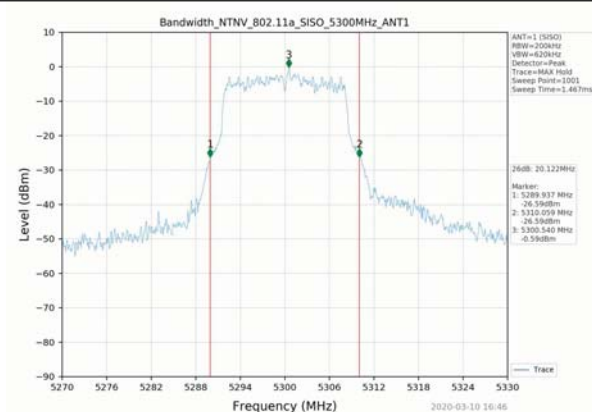
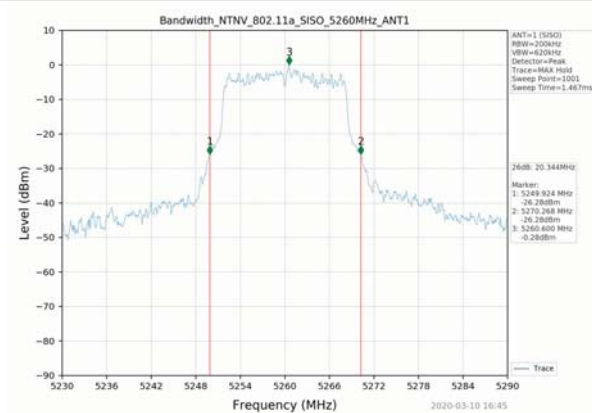
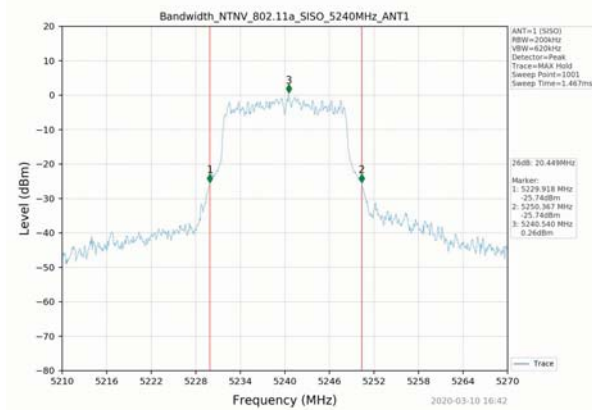
	5510	SISO	1	39.817	/	PASS
	5550	SISO	1	39.913	/	PASS
	5590	SISO	1	40.139	/	PASS
	5755	SISO	1	36.131	≥0.5	PASS
	5795	SISO	1	35.535	≥0.5	PASS
802.11ac(VHT80)	5210	SISO	1	80.530	/	PASS
	5290	SISO	1	80.847	/	PASS
	5530	SISO	1	80.663	/	PASS
	5610	SISO	1	80.573	/	PASS
	5775	SISO	1	75.607	≥0.5	PASS

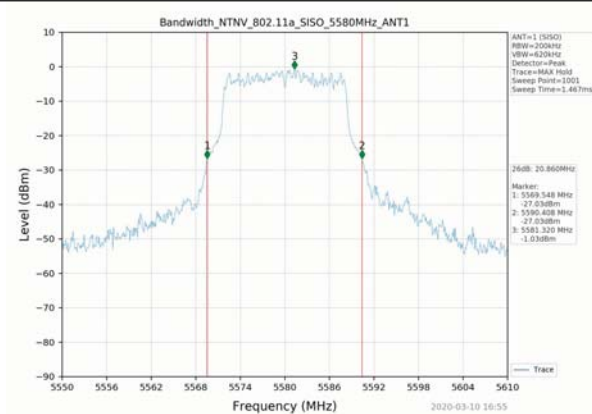
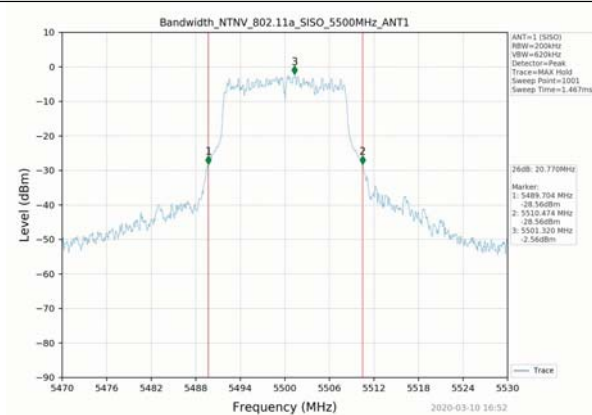
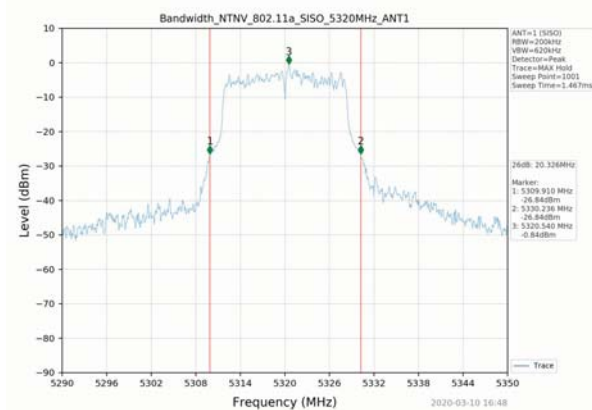
Test Mode	Frequency (MHz)	TX Type	ANT No.	99% Occupied Bandwidth	
				Test Result (MHz)	
802.11a	5180	SISO	1	16.656	Only for Report Use
	5200	SISO	1	16.631	Only for Report Use
	5240	SISO	1	16.629	Only for Report Use
	5260	SISO	1	16.598	Only for Report Use
	5300	SISO	1	16.574	Only for Report Use
	5320	SISO	1	16.590	Only for Report Use
	5500	SISO	1	16.634	Only for Report Use
	5580	SISO	1	16.581	Only for Report Use
	5600	SISO	1	16.596	Only for Report Use
	5700	SISO	1	16.592	Only for Report Use
	5745	SISO	1	16.603	Only for Report Use
	5785	SISO	1	16.606	Only for Report Use
	5825	SISO	1	16.618	Only for Report Use
802.11n(HT20)	5180	SISO	1	17.962	Only for Report Use
	5200	SISO	1	17.845	Only for Report Use
	5240	SISO	1	17.937	Only for Report Use
	5260	SISO	1	17.872	Only for Report Use
	5300	SISO	1	17.893	Only for Report Use
	5320	SISO	1	17.873	Only for Report Use
	5500	SISO	1	17.871	Only for Report Use
	5580	SISO	1	17.856	Only for Report Use
	5600	SISO	1	17.905	Only for Report Use
	5700	SISO	1	17.885	Only for Report Use
	5745	SISO	1	17.869	Only for Report Use
	5785	SISO	1	17.846	Only for Report Use
	5825	SISO	1	17.855	Only for Report Use
802.11n(HT40)	5190	SISO	1	36.581	Only for Report Use
	5230	SISO	1	36.677	Only for Report Use
	5270	SISO	1	36.720	Only for Report Use
	5310	SISO	1	36.608	Only for Report Use
	5510	SISO	1	36.527	Only for Report Use
	5550	SISO	1	36.580	Only for Report Use
	5590	SISO	1	36.546	Only for Report Use
	5755	SISO	1	36.537	Only for Report Use
	5795	SISO	1	36.597	Only for Report Use
802.11ac(VHT20)	5180	SISO	1	17.899	Only for Report Use
	5200	SISO	1	17.861	Only for Report Use
	5240	SISO	1	17.903	Only for Report Use
	5260	SISO	1	17.825	Only for Report Use
	5300	SISO	1	17.867	Only for Report Use
	5320	SISO	1	17.840	Only for Report Use
	5500	SISO	1	17.867	Only for Report Use
	5580	SISO	1	17.901	Only for Report Use
	5600	SISO	1	17.827	Only for Report Use
	5700	SISO	1	17.857	Only for Report Use

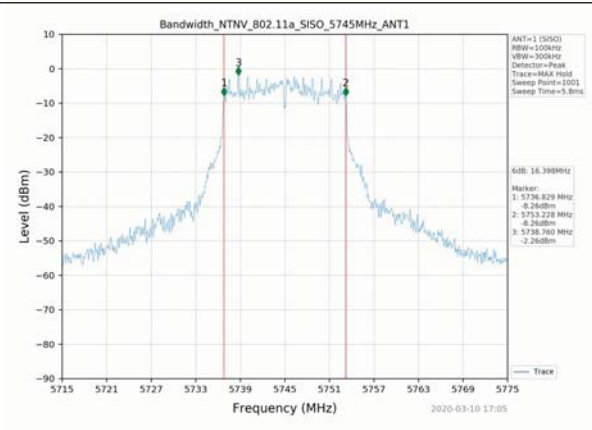
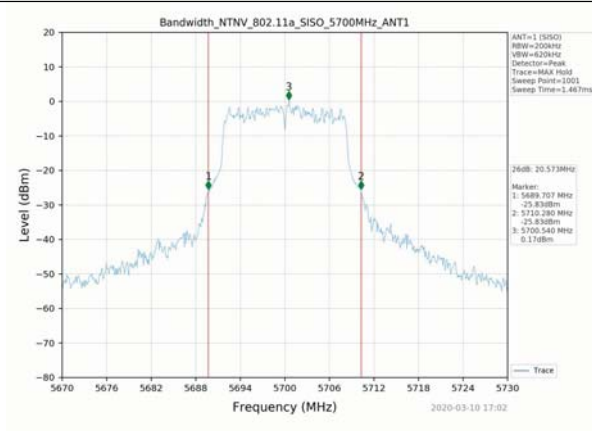
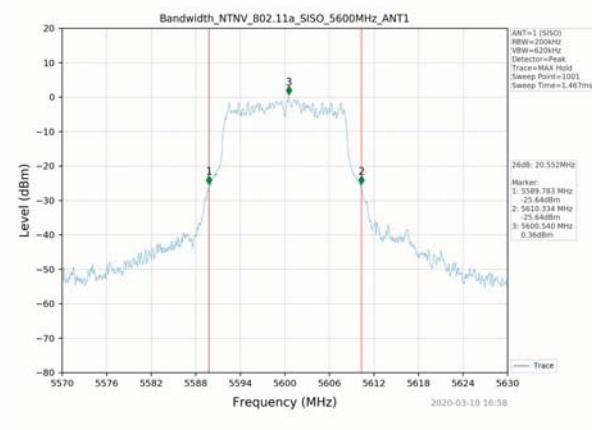
	5745	SISO	1	17.874	Only for Report Use
	5785	SISO	1	17.884	Only for Report Use
	5825	SISO	1	17.879	Only for Report Use
802.11ac(VHT40)	5190	SISO	1	37.229	Only for Report Use
	5230	SISO	1	37.157	Only for Report Use
	5270	SISO	1	36.998	Only for Report Use
	5310	SISO	1	37.018	Only for Report Use
	5510	SISO	1	36.992	Only for Report Use
	5550	SISO	1	36.929	Only for Report Use
	5590	SISO	1	36.875	Only for Report Use
	5755	SISO	1	36.752	Only for Report Use
	5795	SISO	1	37.064	Only for Report Use
802.11ac(VHT80)	5210	SISO	1	75.592	Only for Report Use
	5290	SISO	1	75.689	Only for Report Use
	5530	SISO	1	75.711	Only for Report Use
	5610	SISO	1	75.667	Only for Report Use
	5775	SISO	1	75.655	Only for Report Use

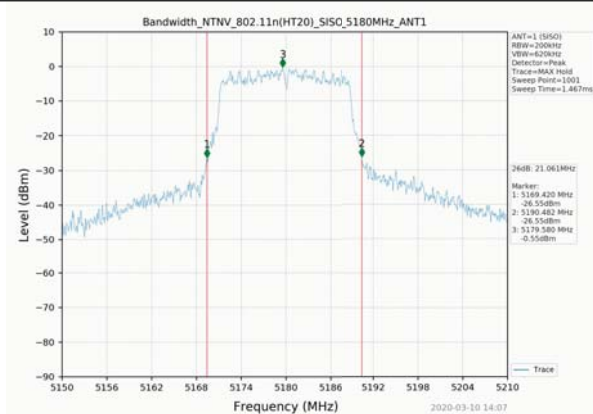
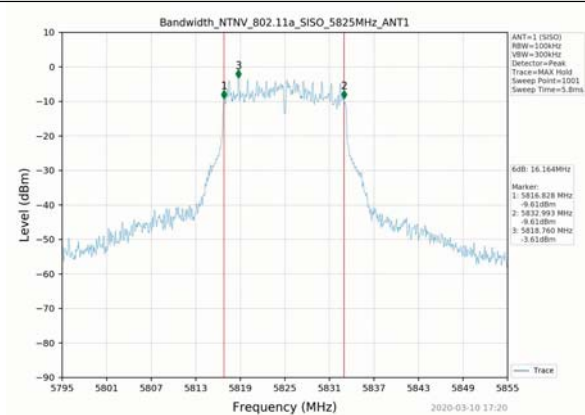
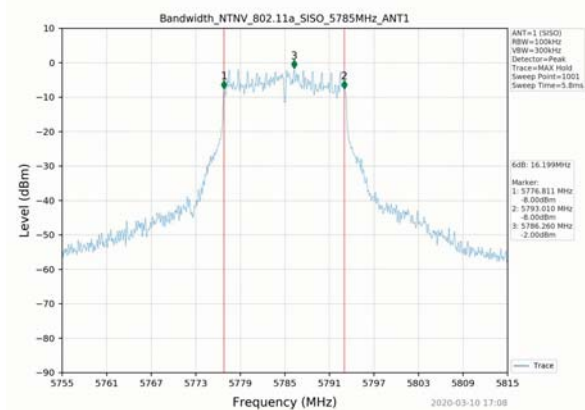
1.2 Test Graph - Emission Bandwidth

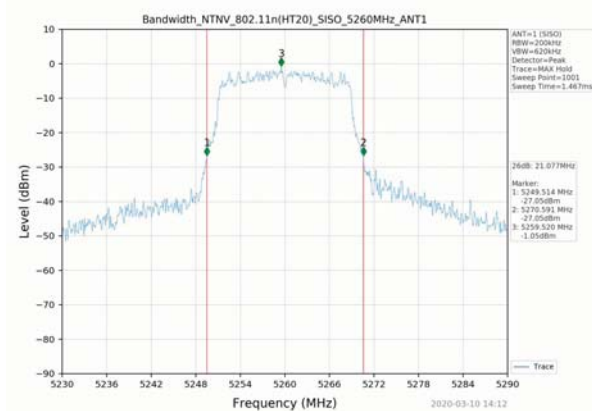
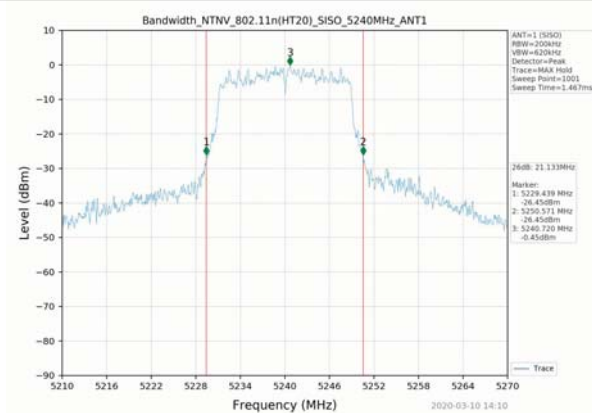
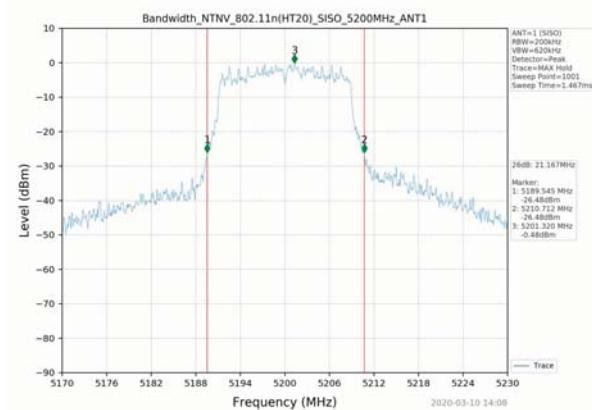


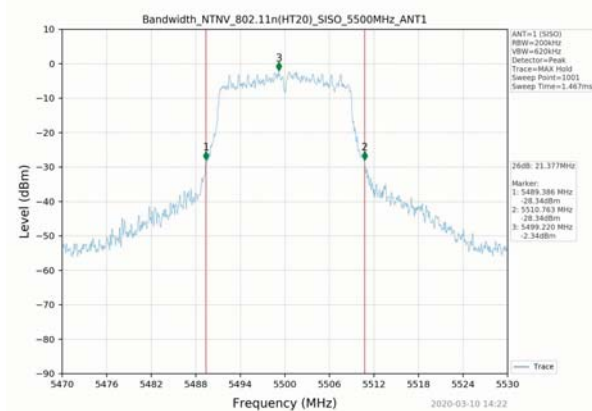
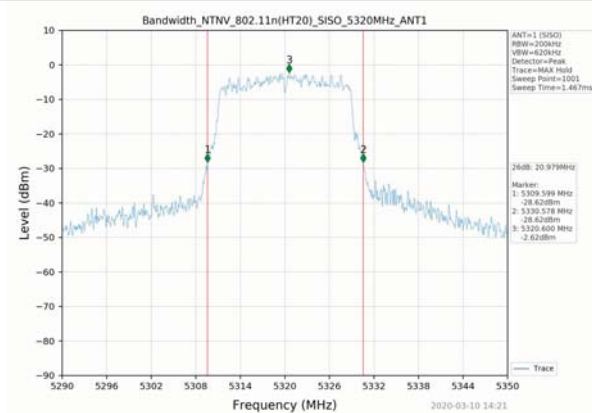
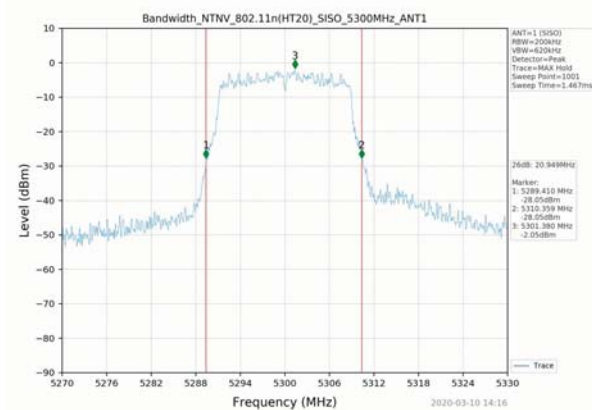


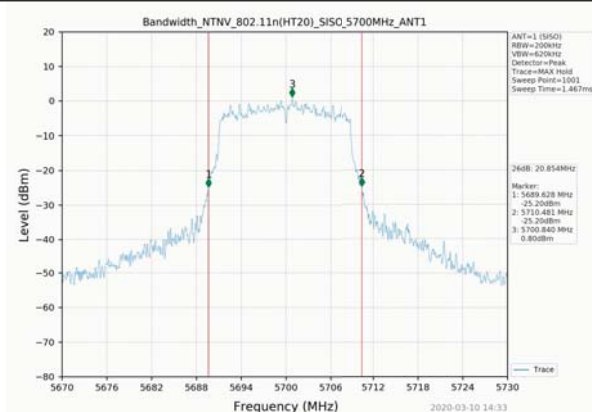
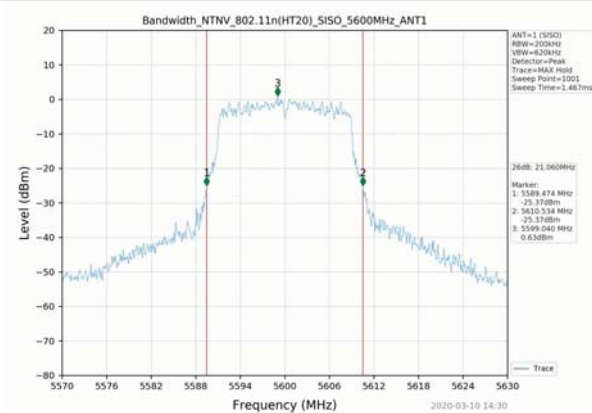
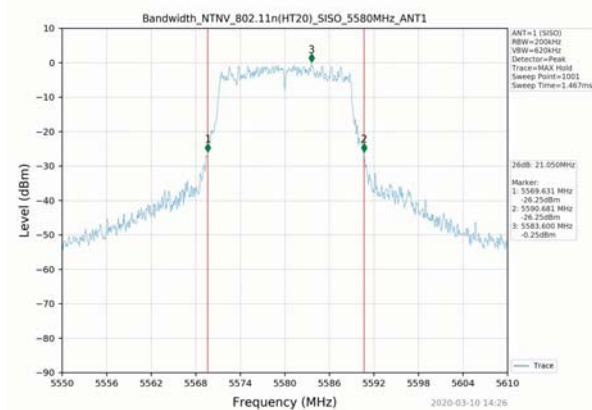


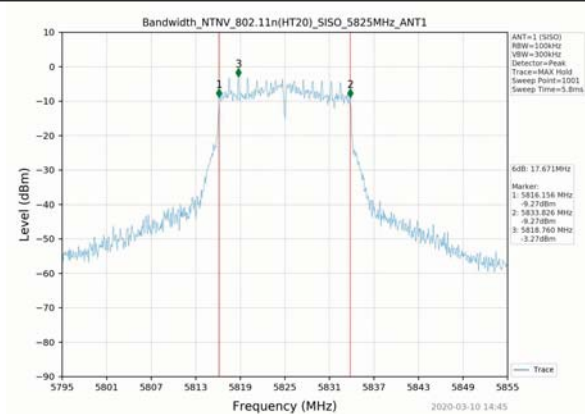
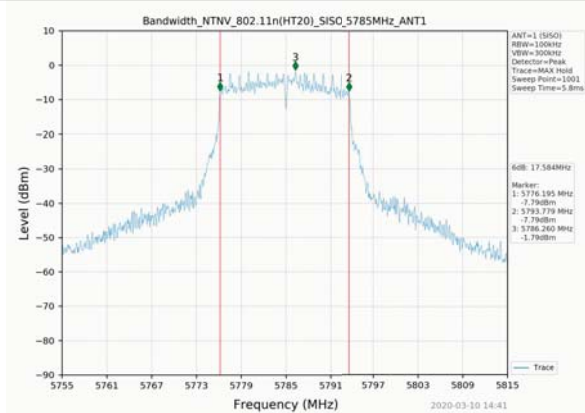
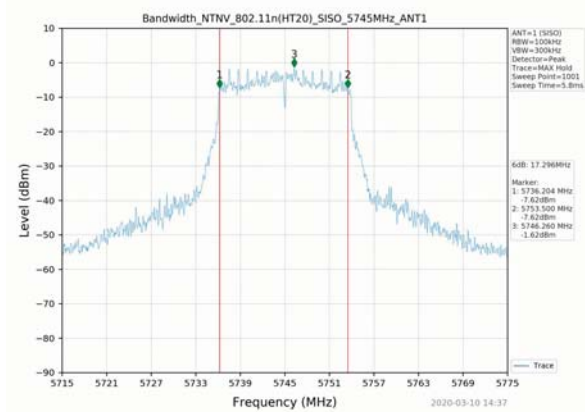


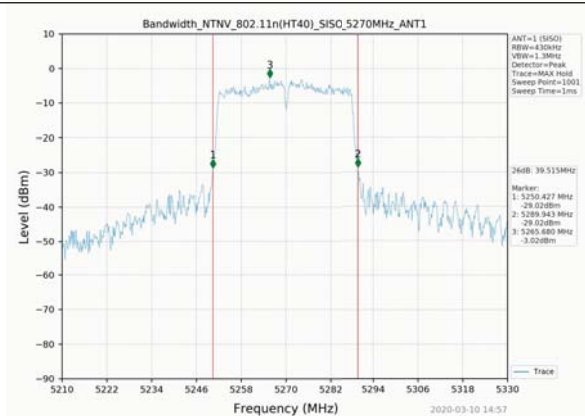
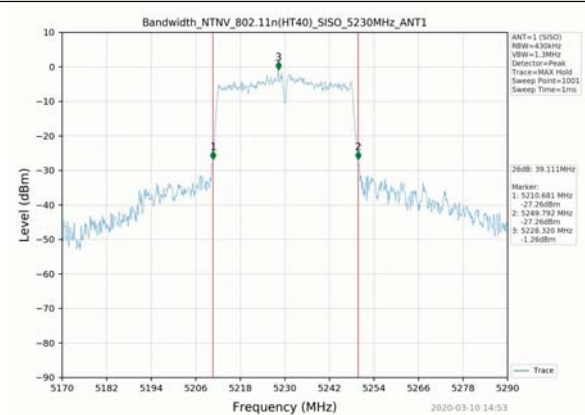
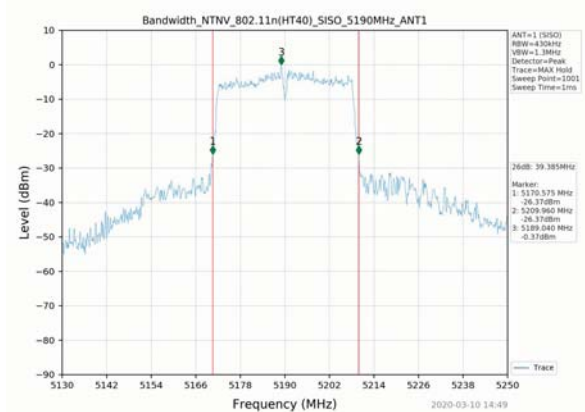


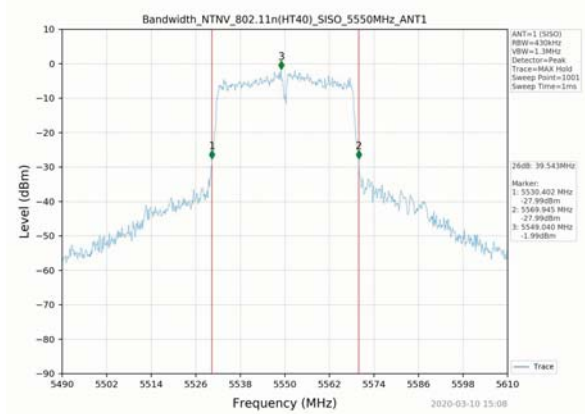
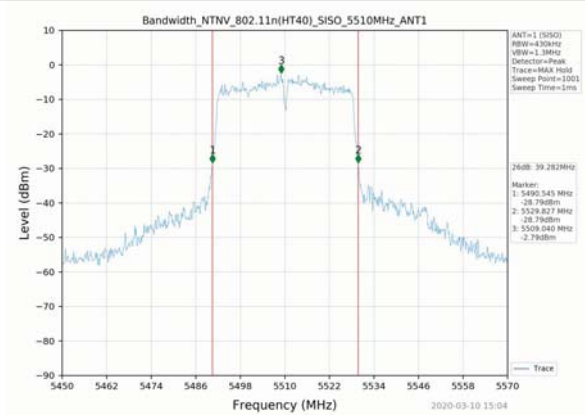
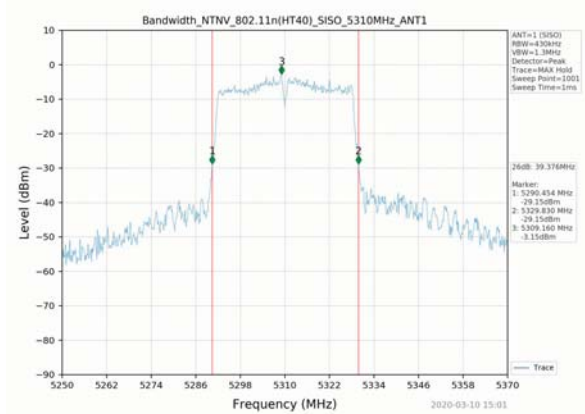


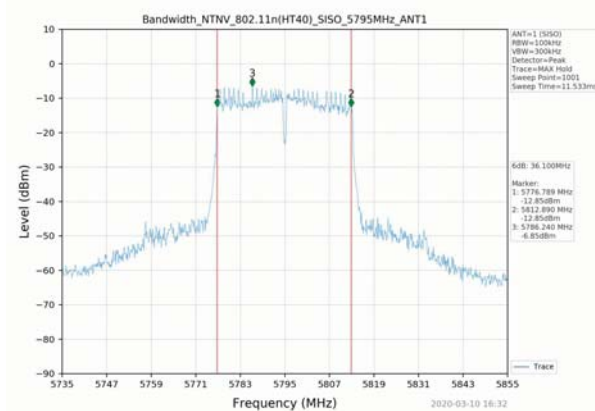
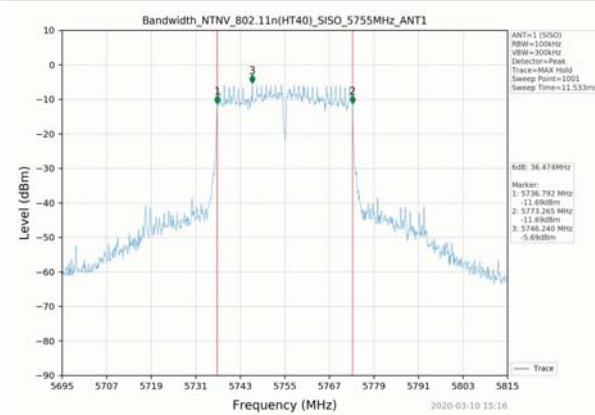
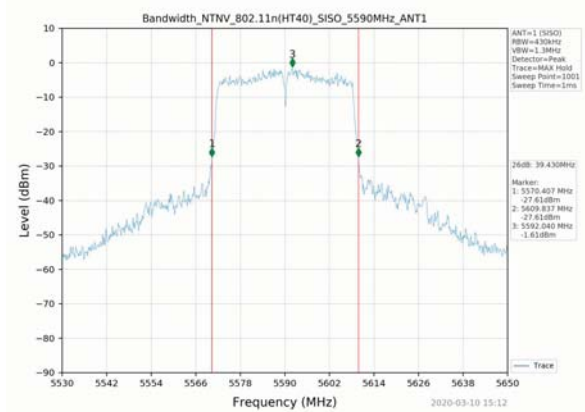


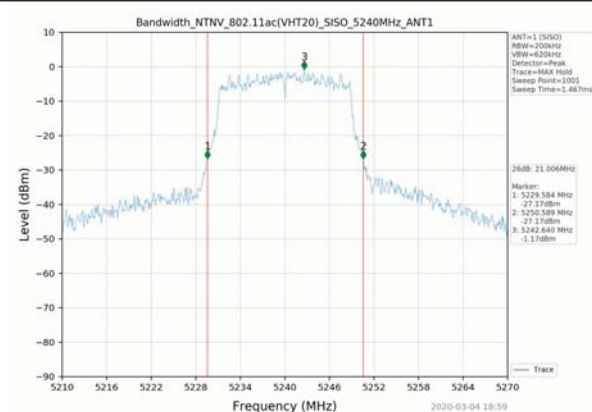
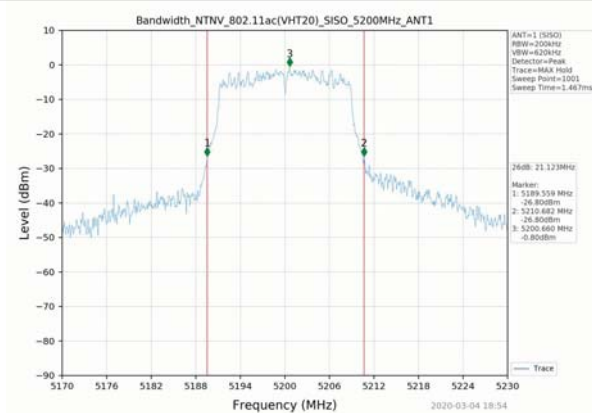
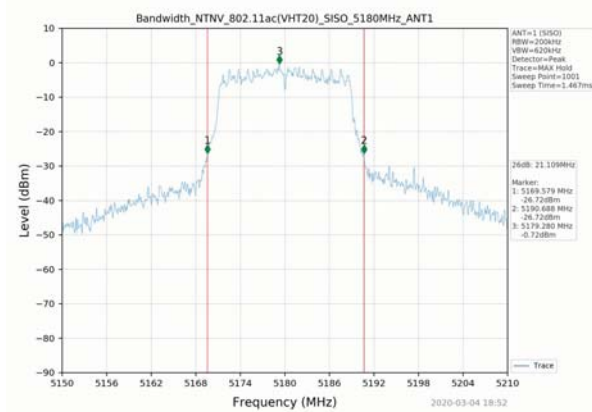


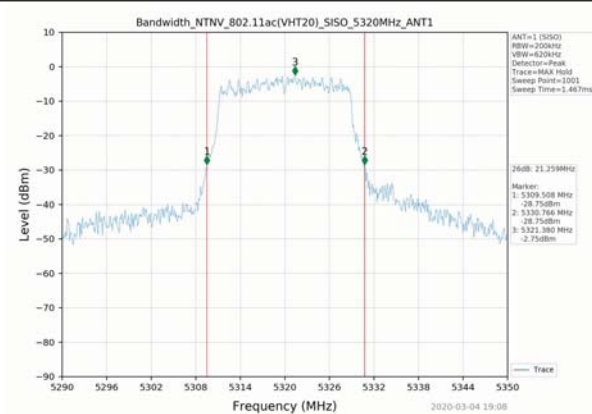
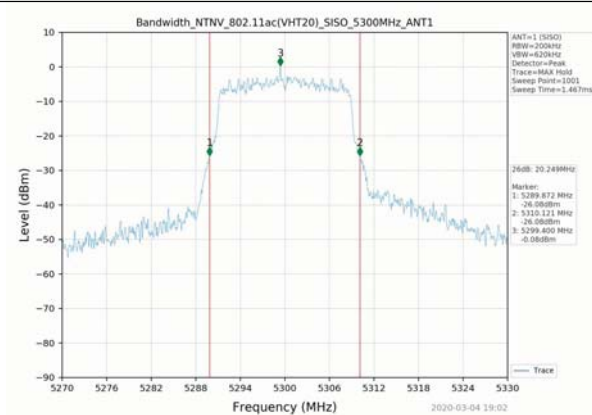
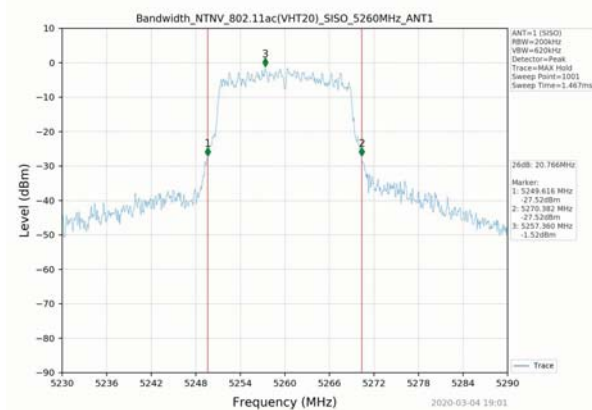


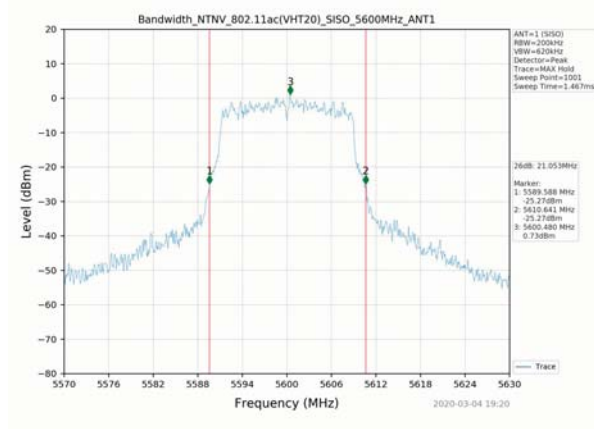
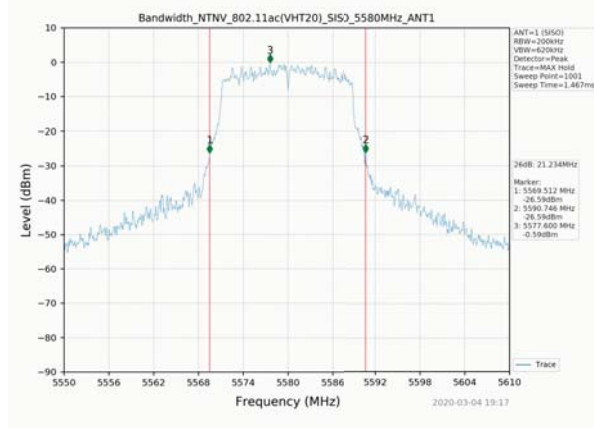
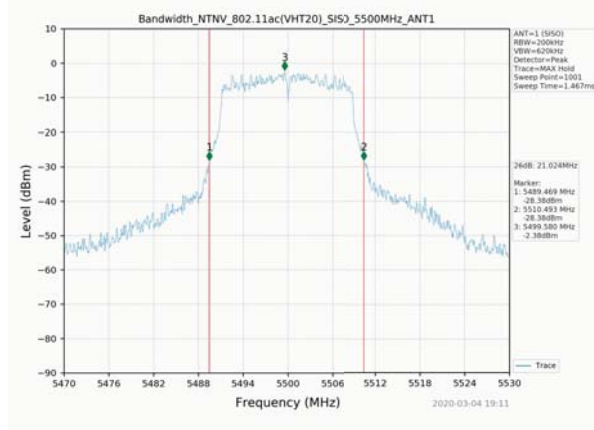


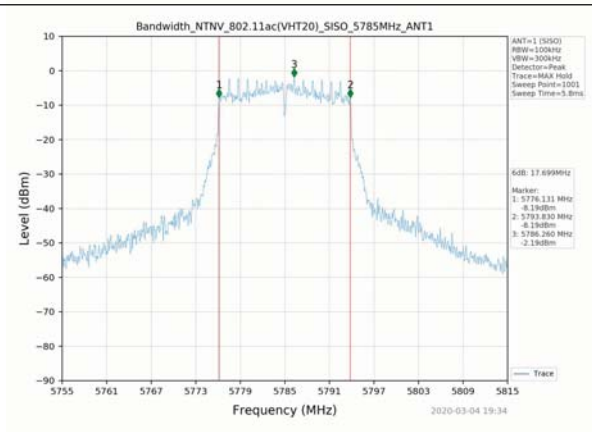
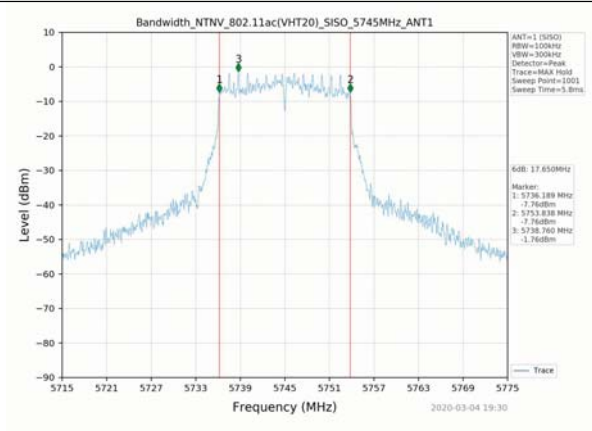
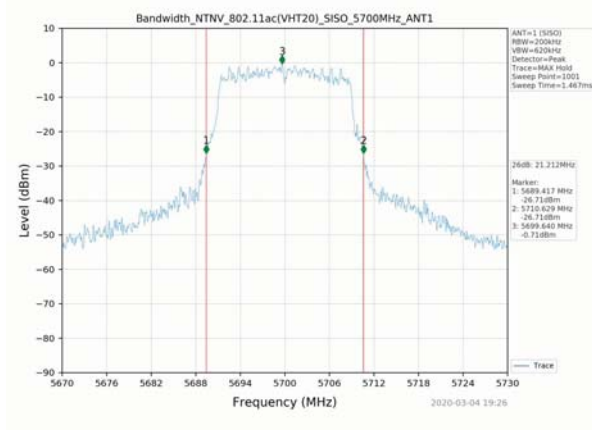


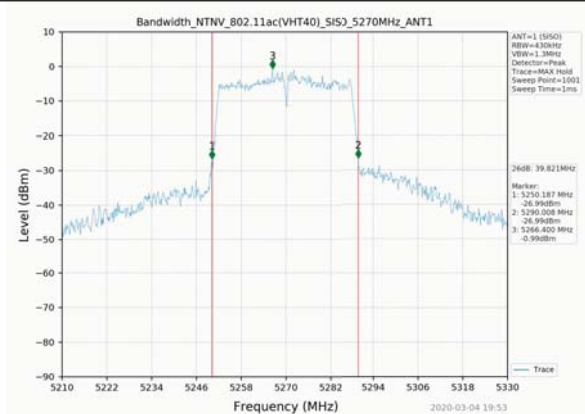
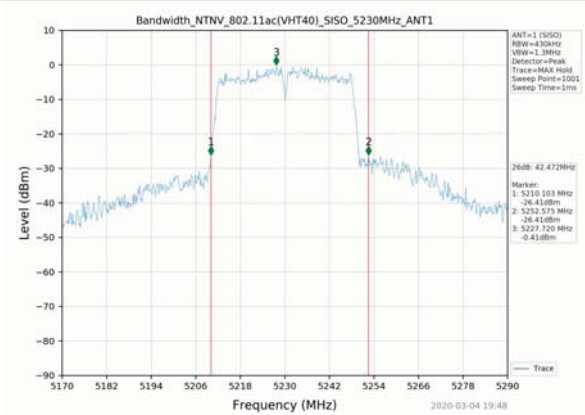
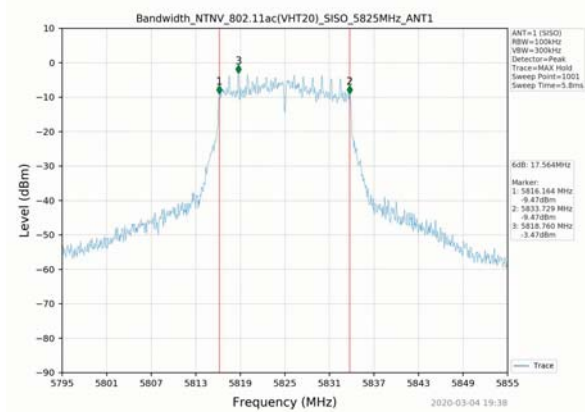


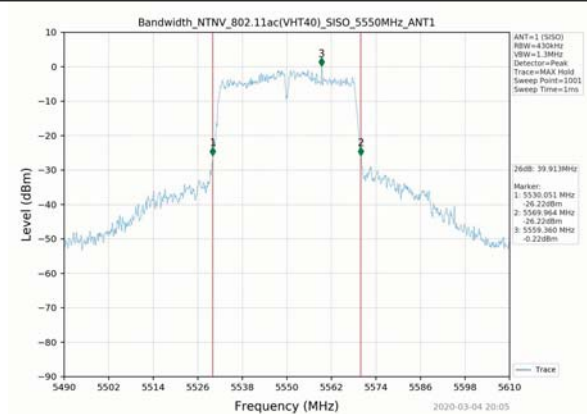
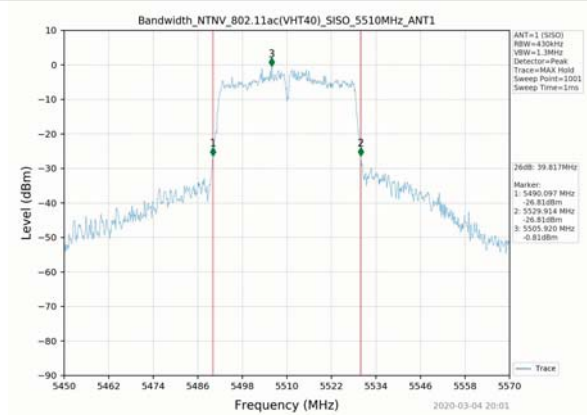
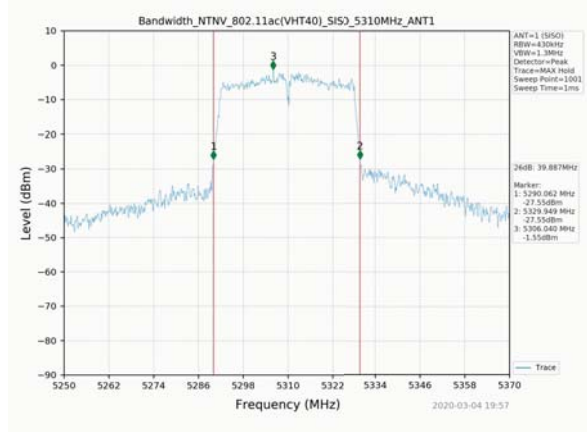


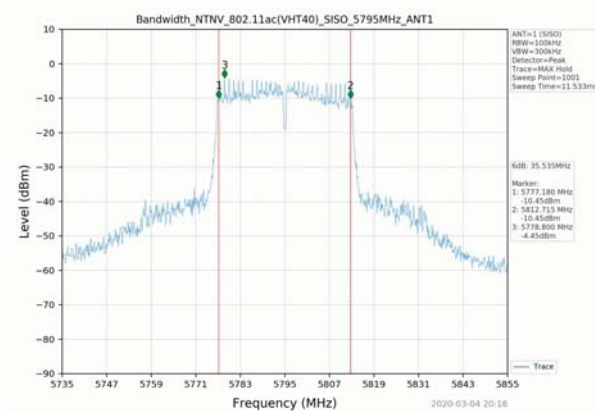
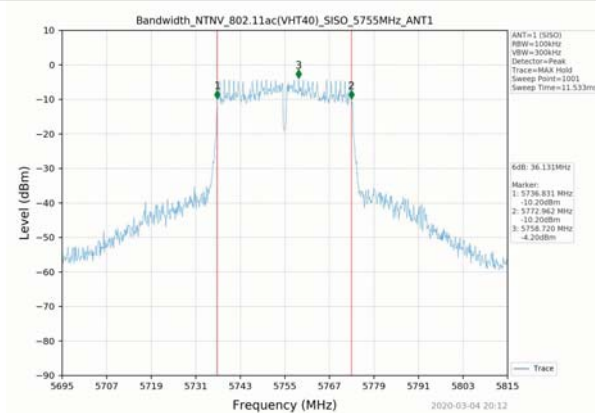
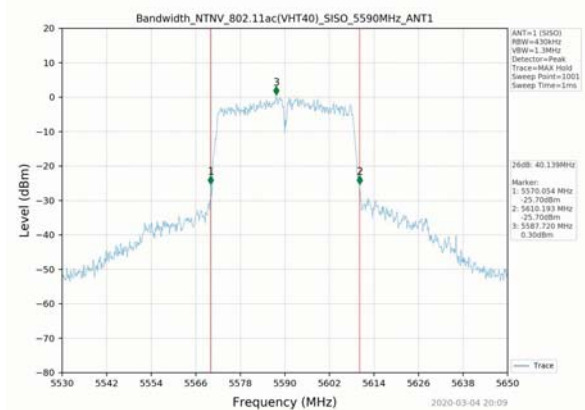


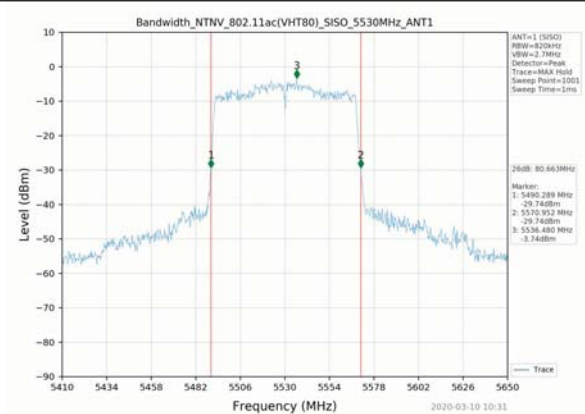
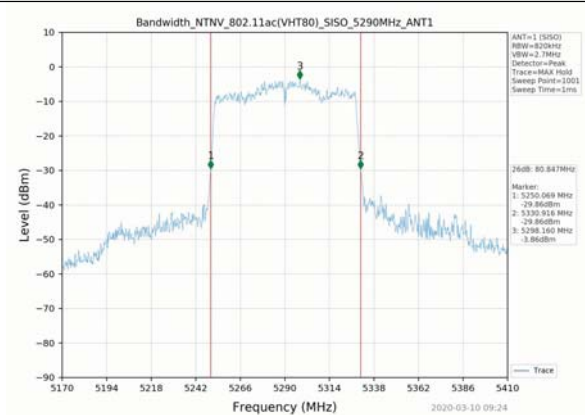
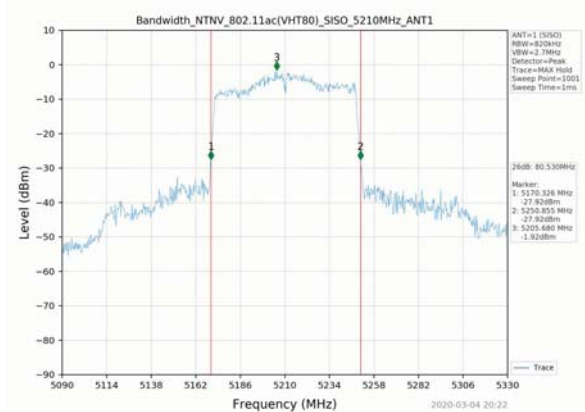


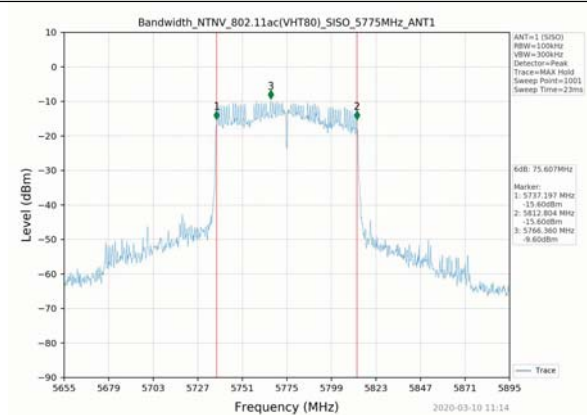
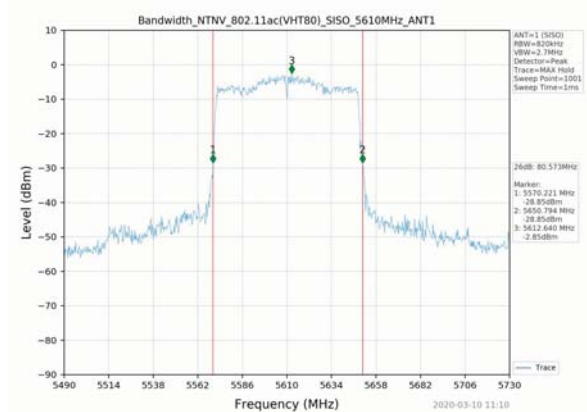




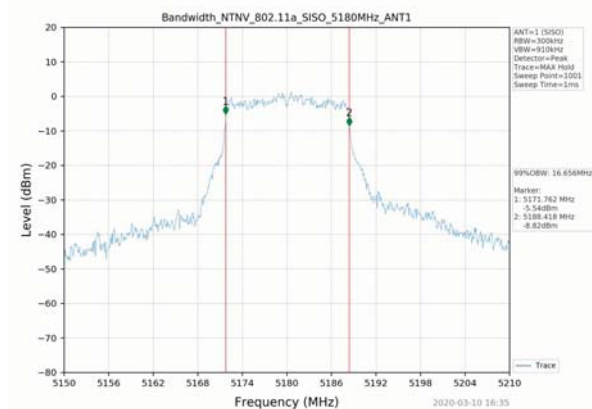


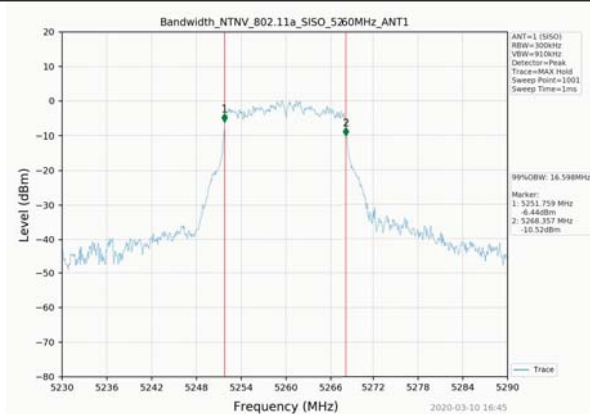
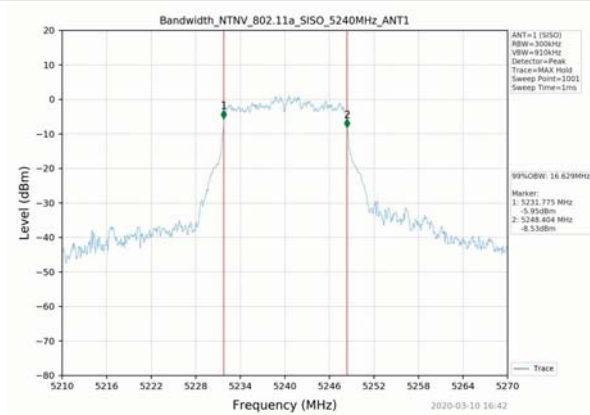
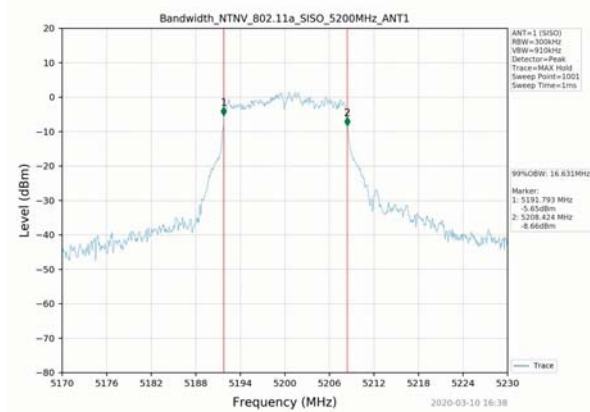


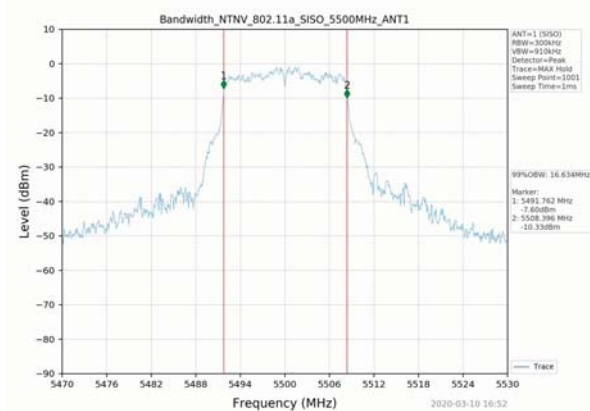
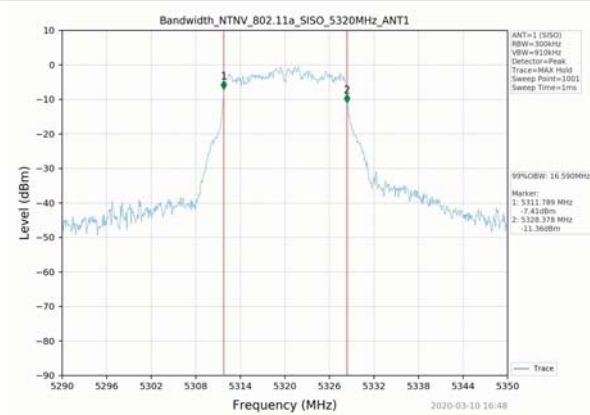
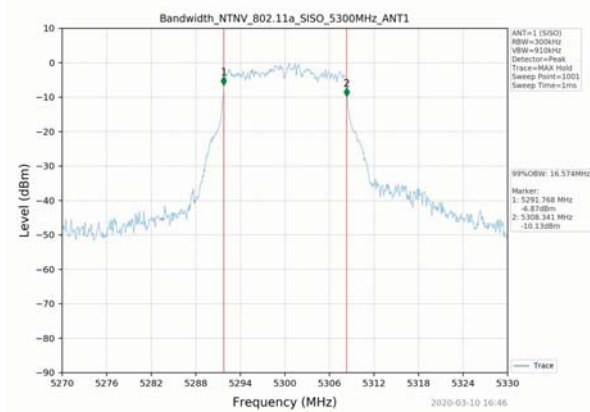


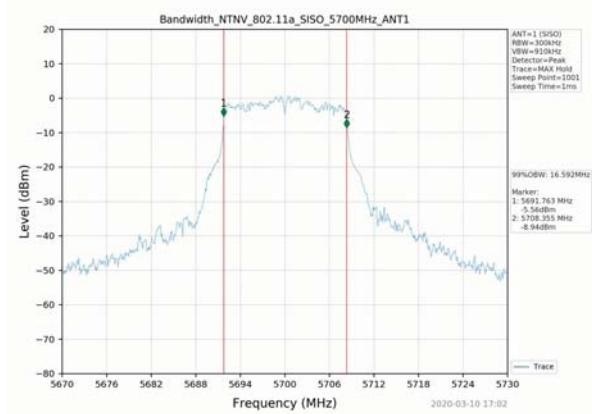
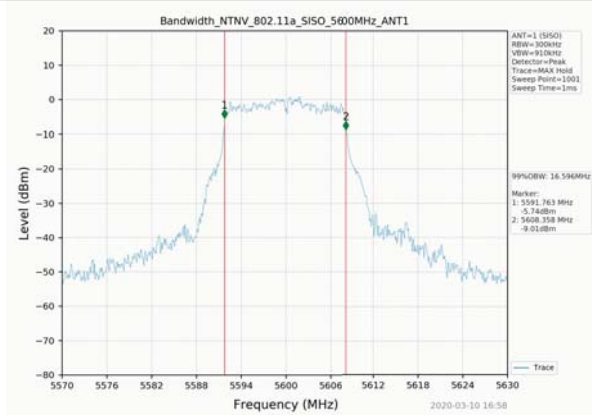
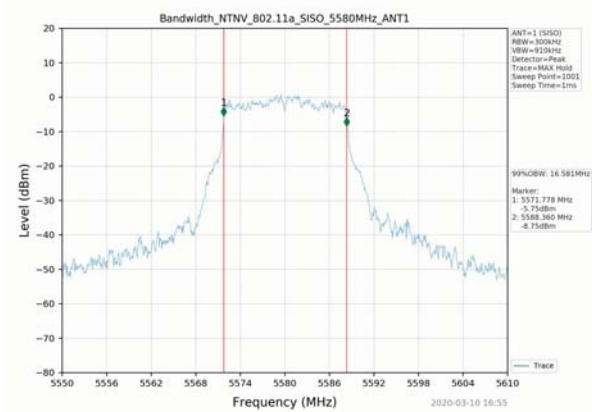


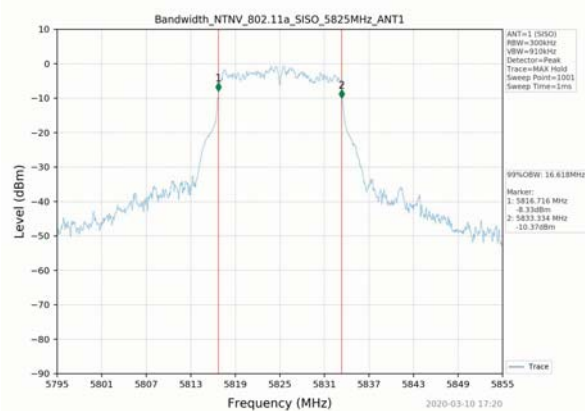
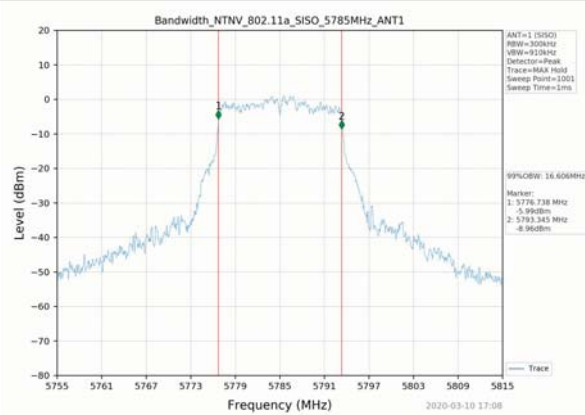
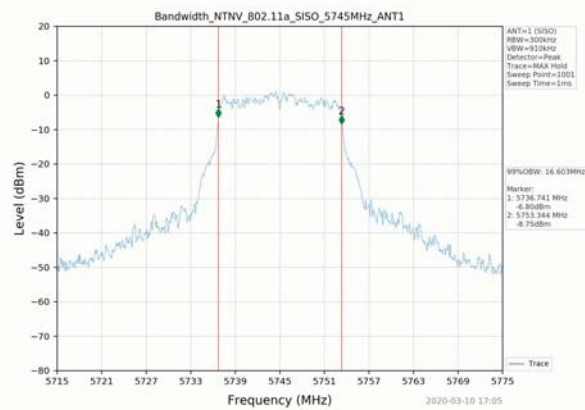
1.3 Test Graph - 99% Occupied Bandwidth

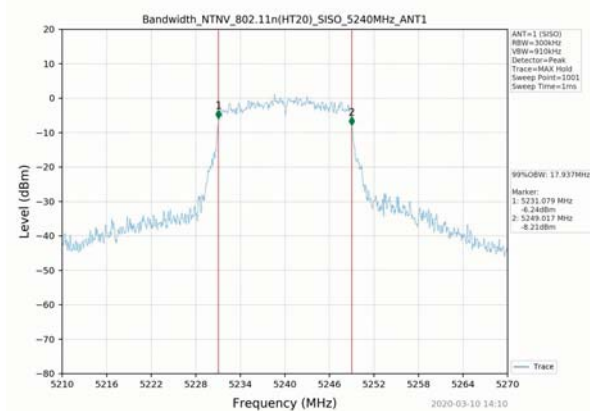
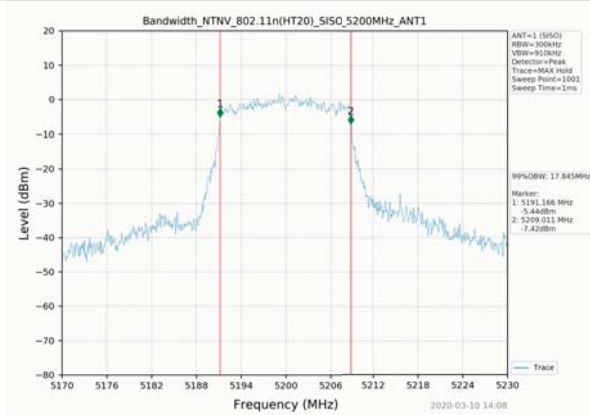
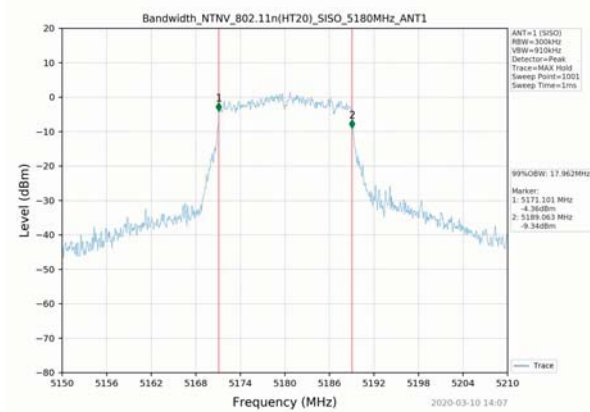


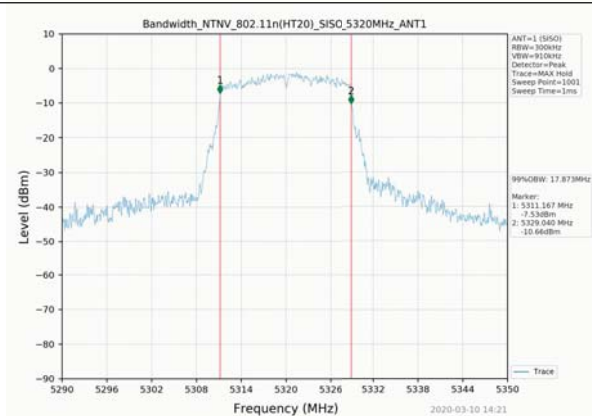
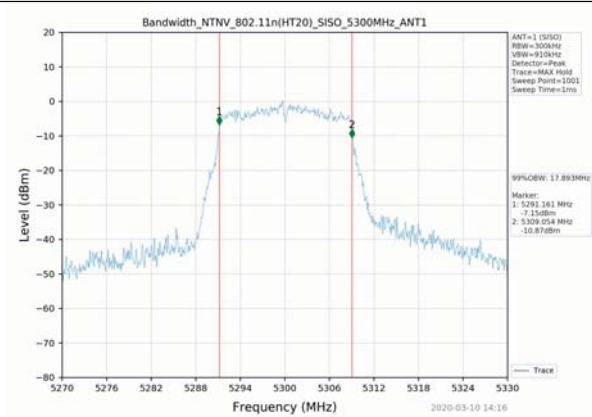
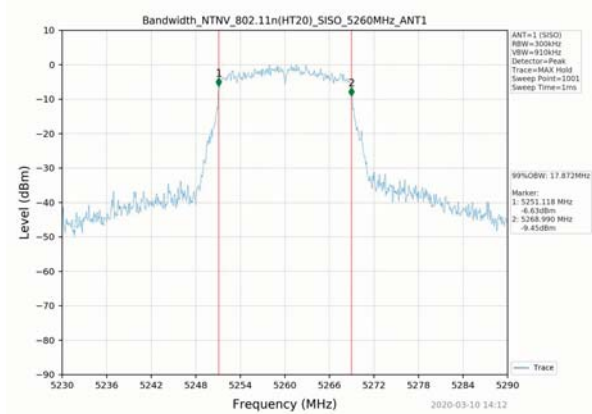


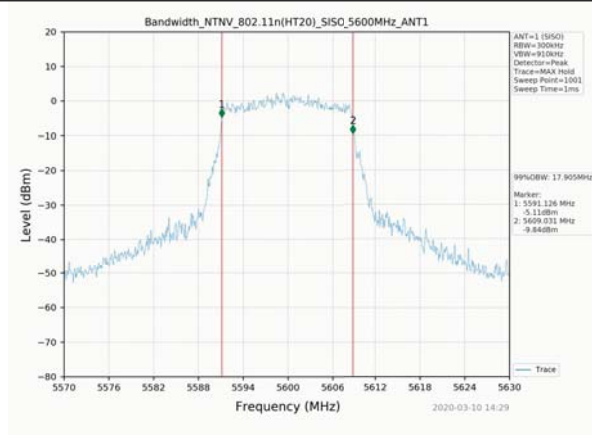
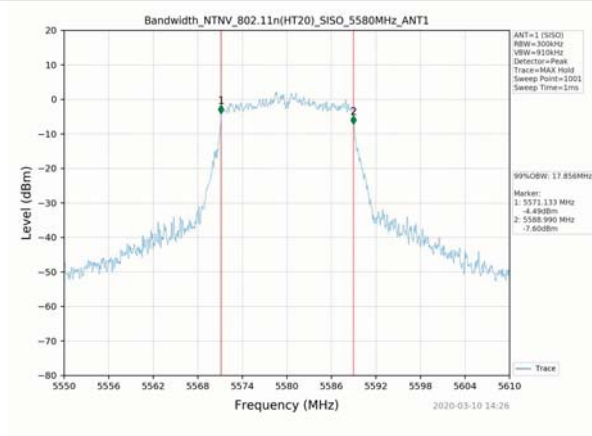
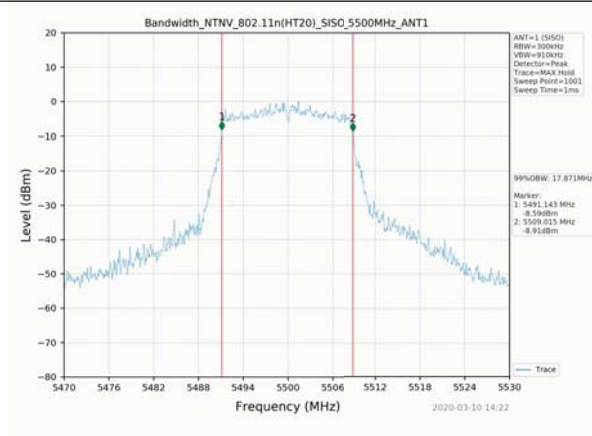


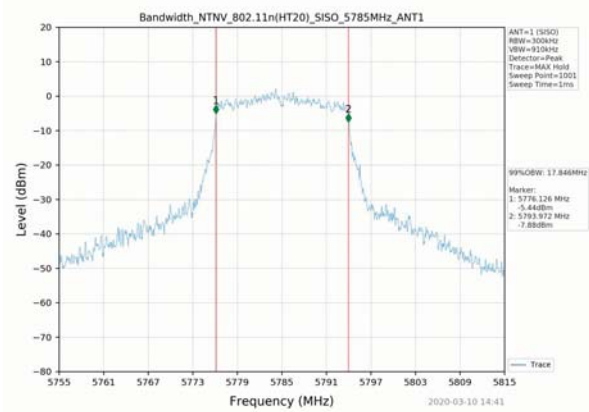
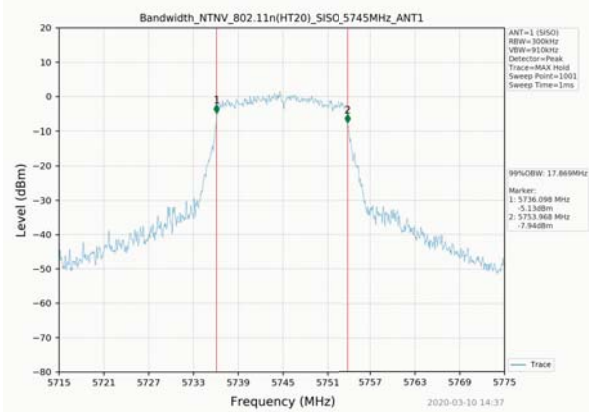
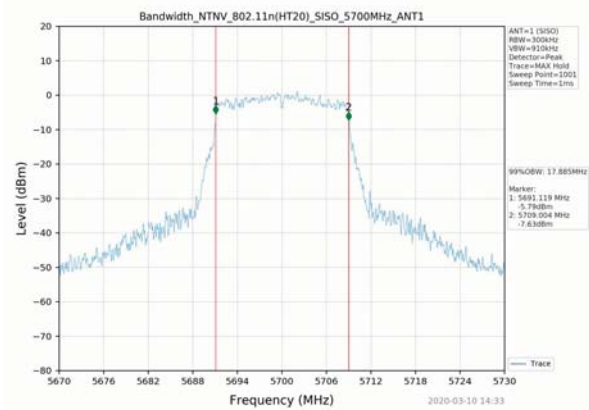


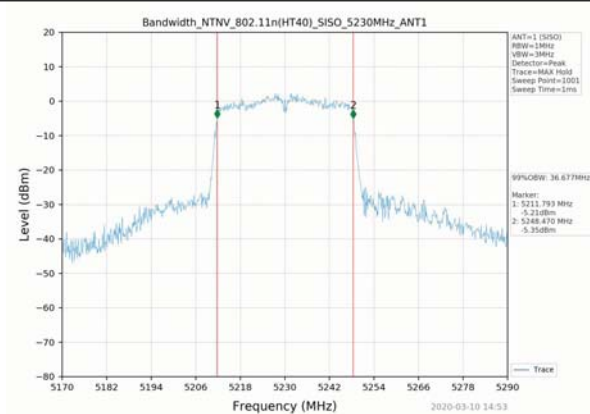
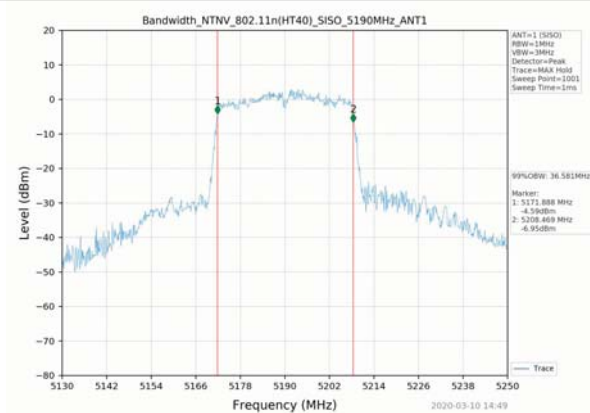
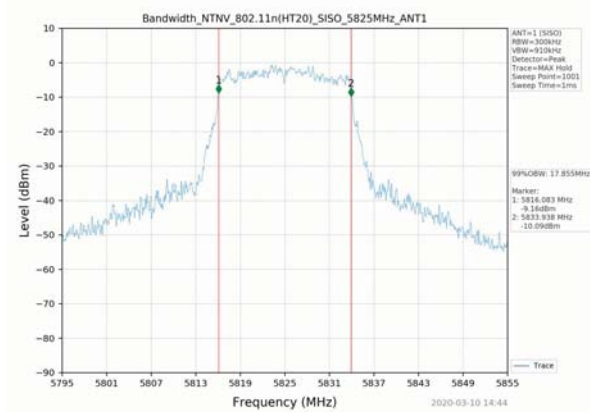


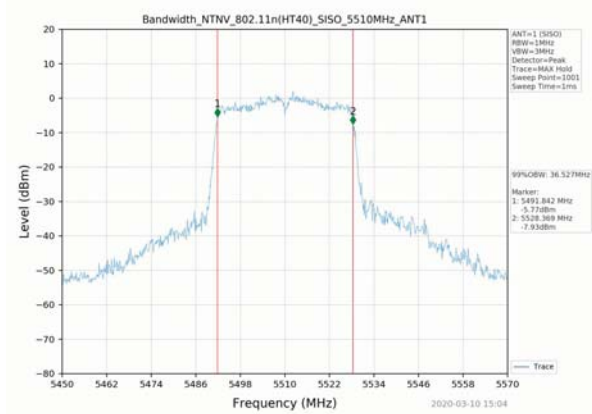
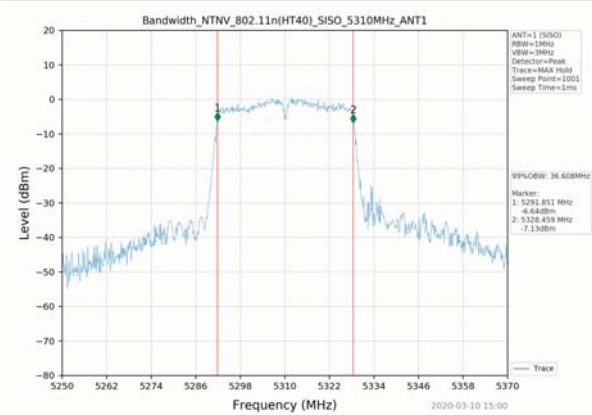
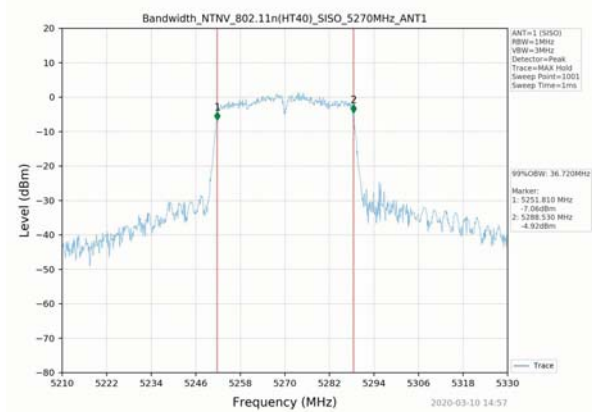


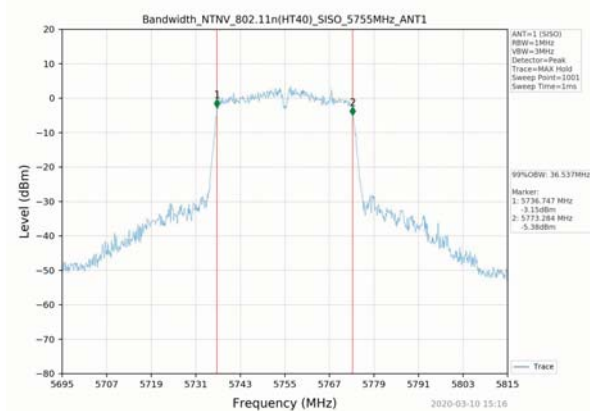
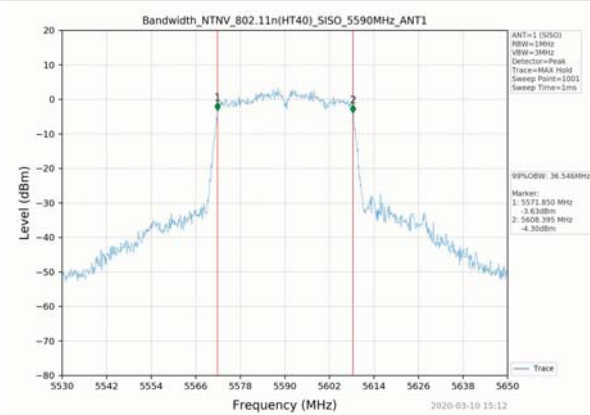
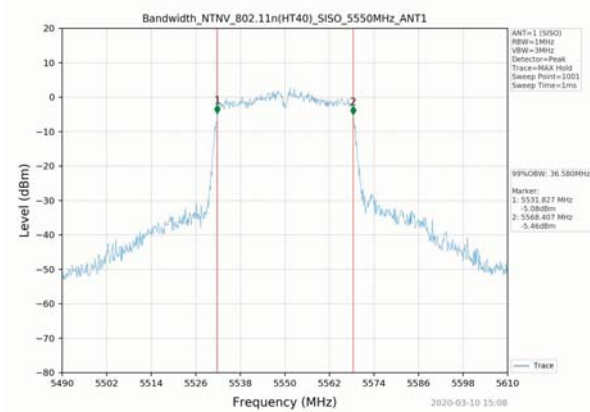


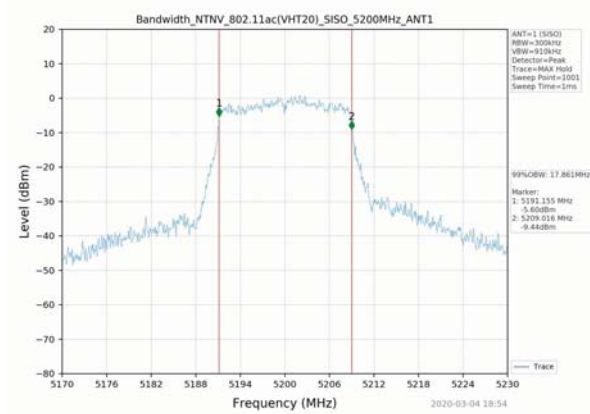
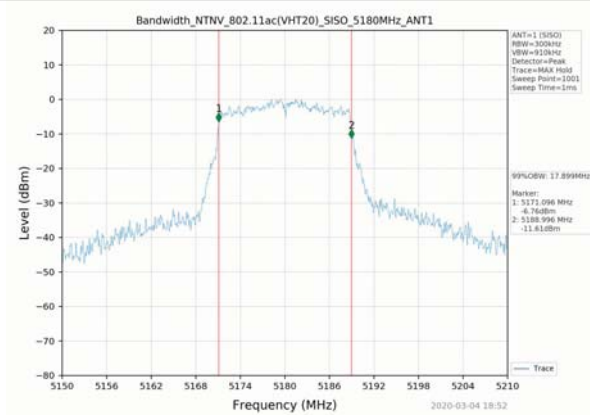
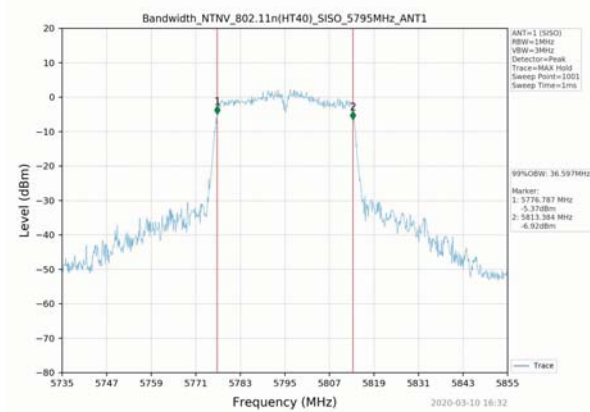


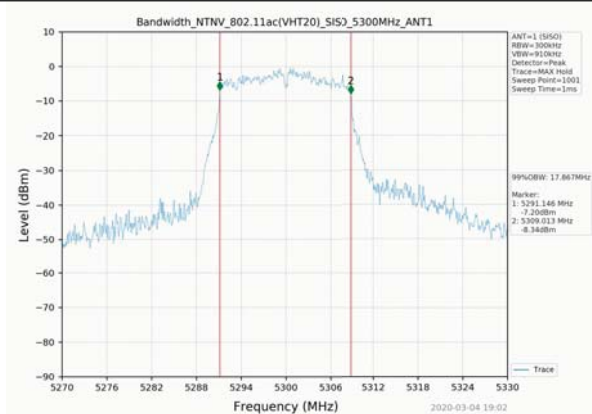
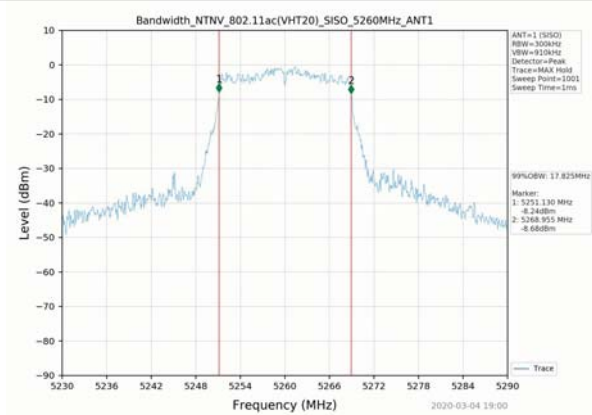
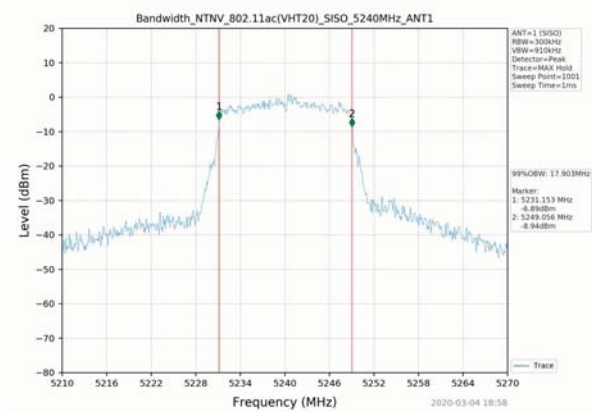


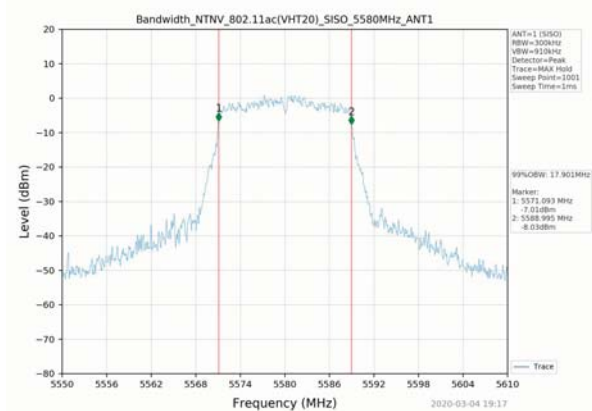
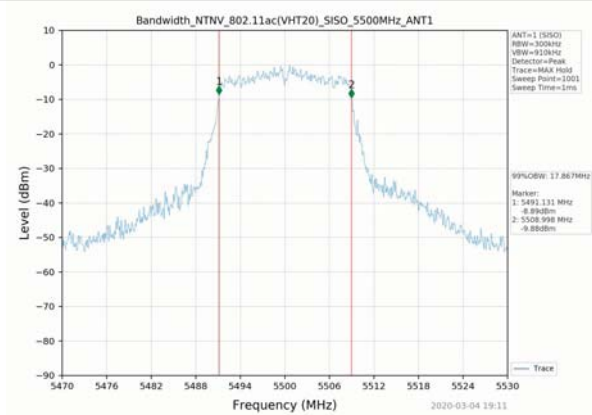
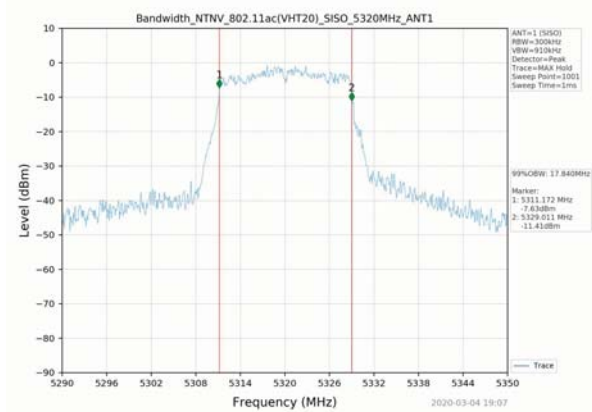


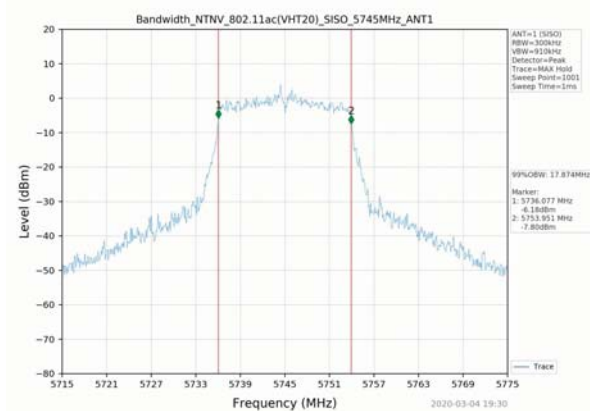
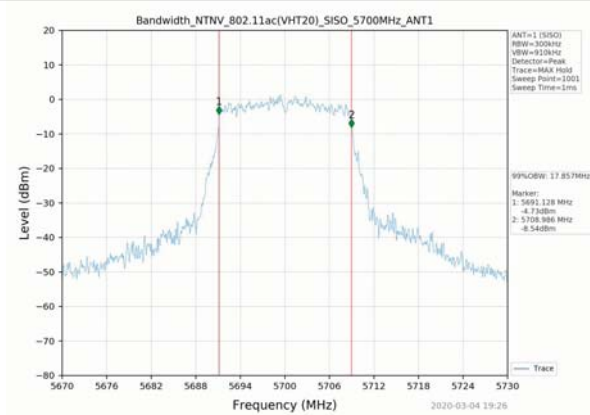
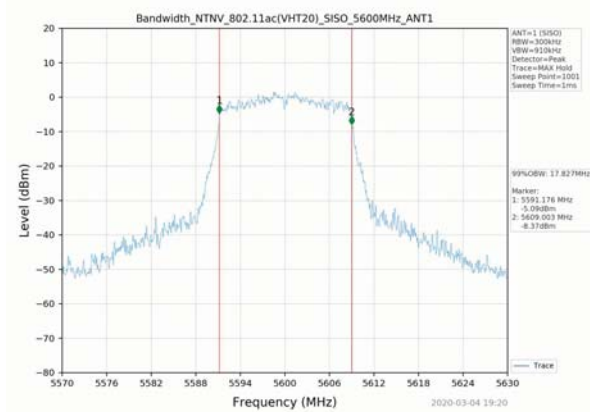


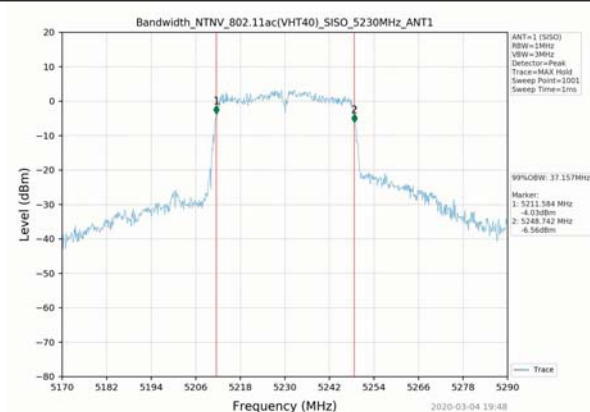
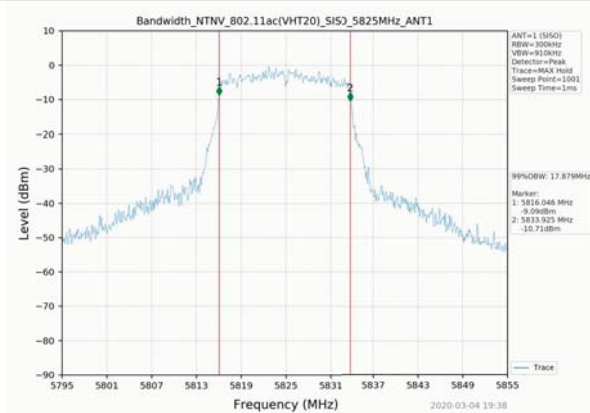
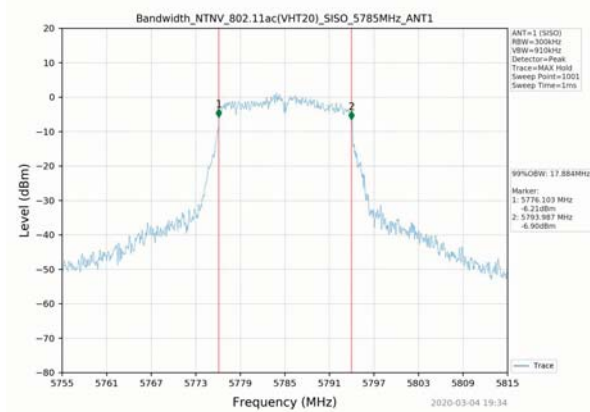


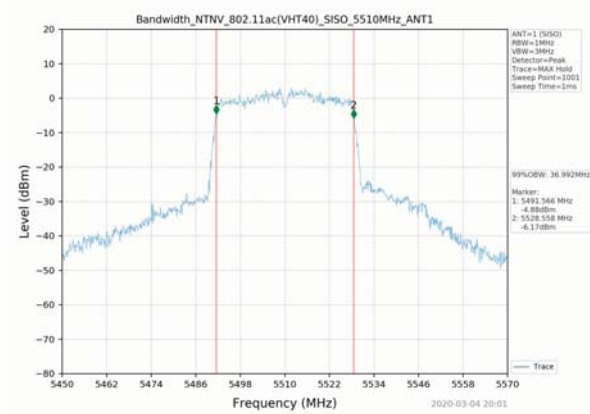
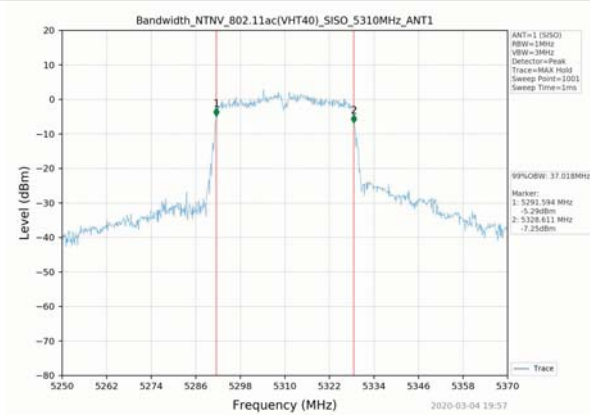
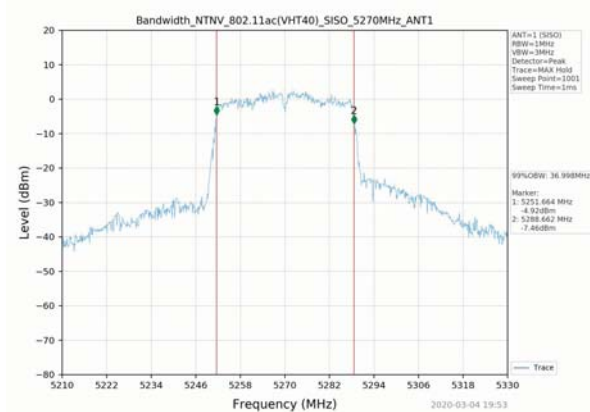


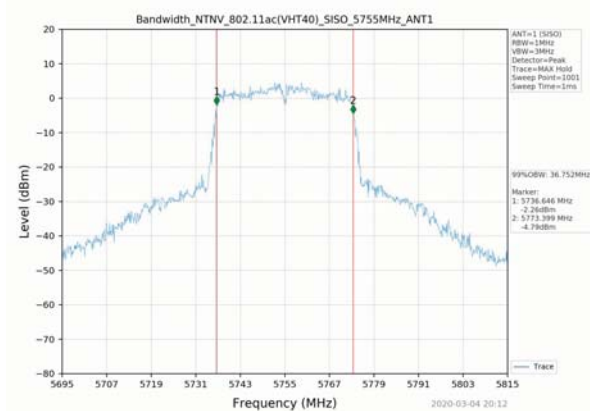
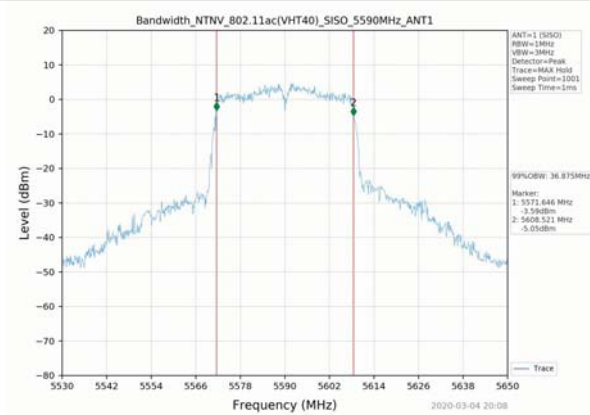
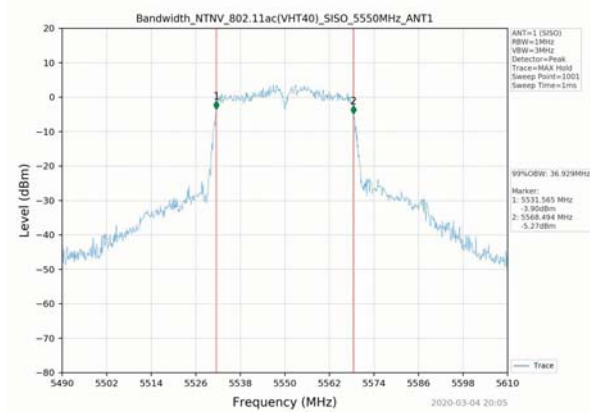


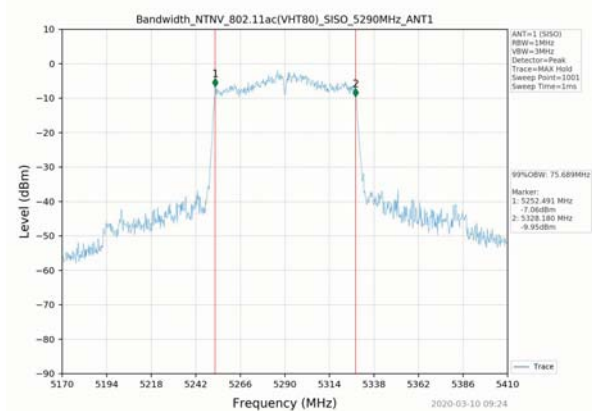
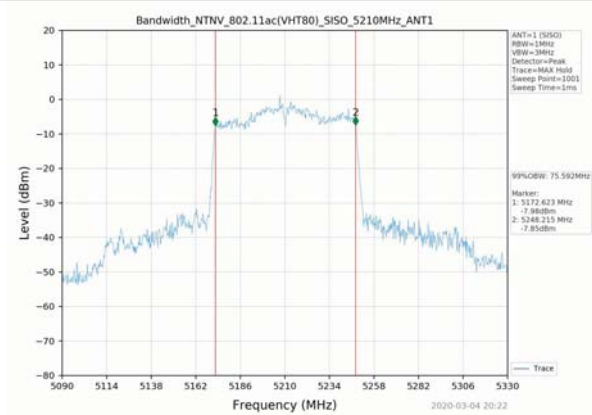
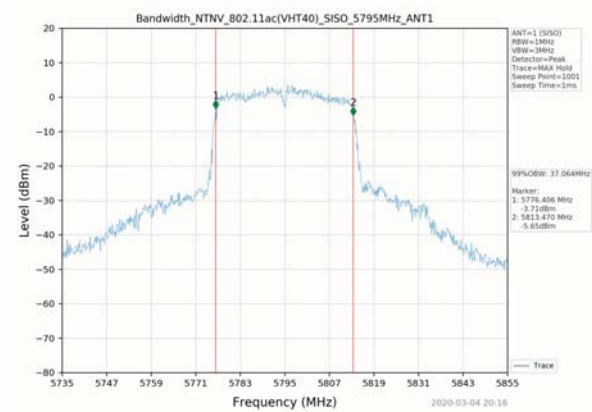


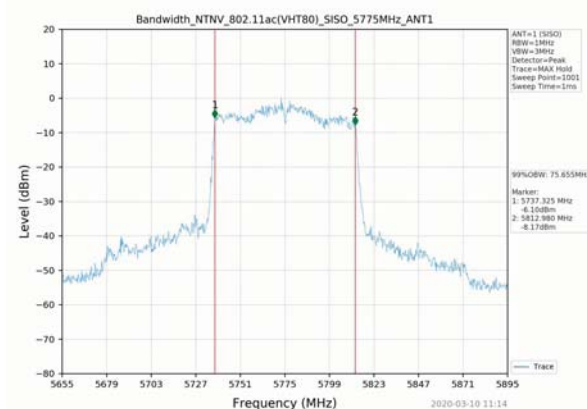
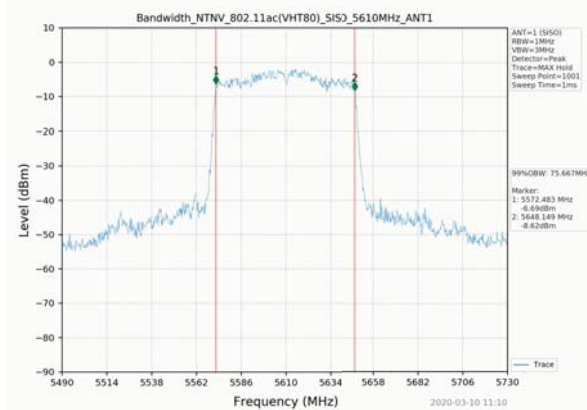
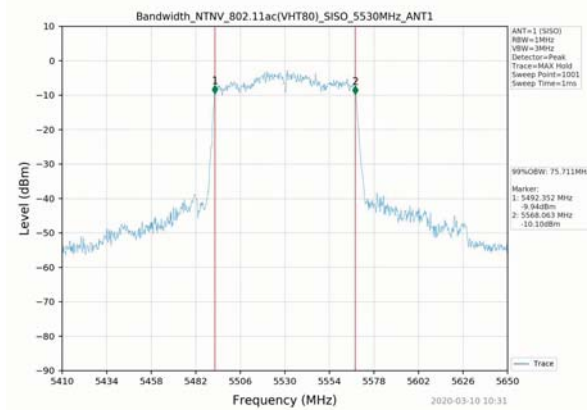












2. Maximum Conducted Output Power

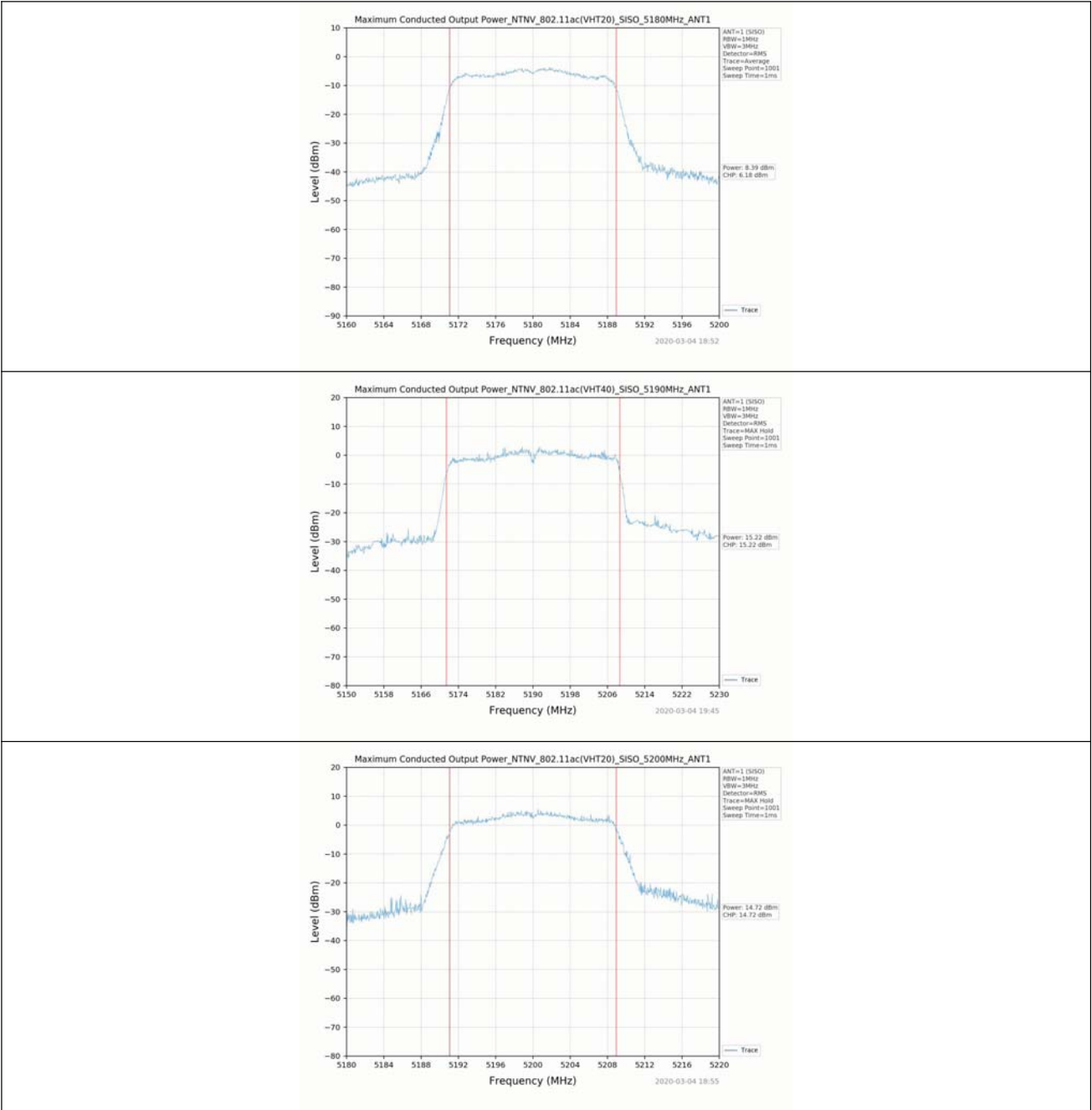
2.1 Test Result

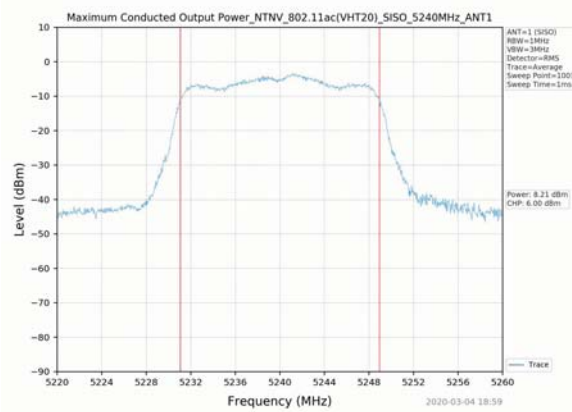
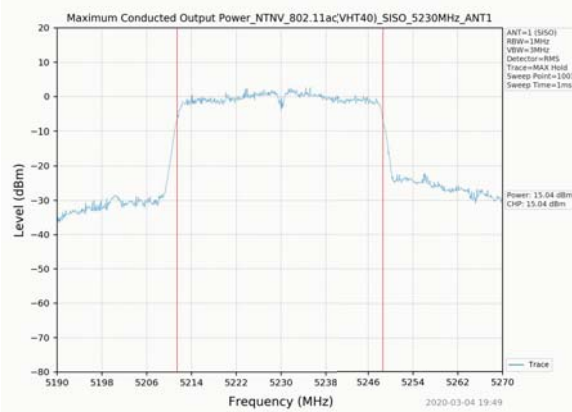
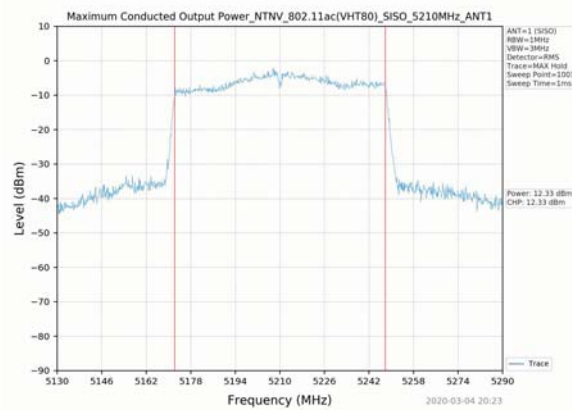
Test Mode	Frequency (MHz)	Tx Type	Measured Output Power (dBm)	Limits (dBm)	Verdict
			Ant 1		
802.11ac	5180	SISO	8.39	≤24	PASS
	5190	SISO	15.22	≤24	PASS

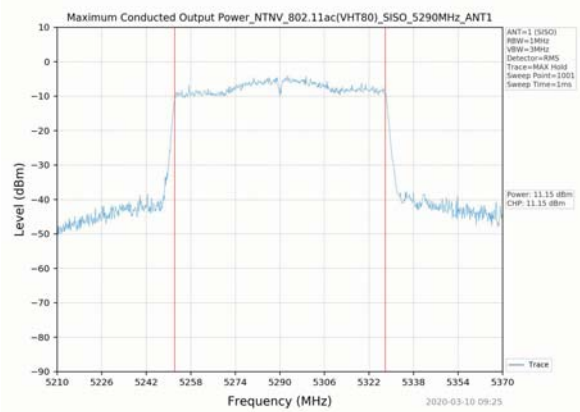
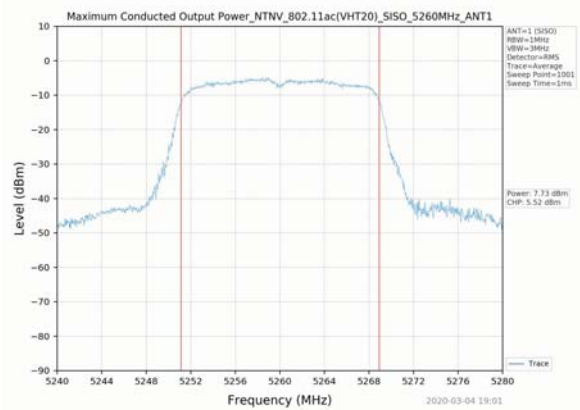
	5200	SISO	14.72	≤24	PASS
	5210	SISO	12.33	≤24	PASS
	5230	SISO	15.04	≤24	PASS
	5240	SISO	8.21	≤24	PASS
	5260	SISO	7.73	≤30	PASS
	5270	SISO	13.85	≤30	PASS
	5290	SISO	11.15	≤30	PASS
	5300	SISO	13.21	≤30	PASS
	5310	SISO	13.59	≤30	PASS
	5320	SISO	6.86	≤30	PASS
	5500	SISO	7.00	≤24	PASS
	5510	SISO	13.99	≤24	PASS
	5530	SISO	11.32	≤24	PASS
	5550	SISO	14.83	≤24	PASS
	5580	SISO	14.90	≤24	PASS
	5590	SISO	15.71	≤24	PASS
	5600	SISO	15.50	≤24	PASS
	5610	SISO	12.98	≤24	PASS
	5700	SISO	15.13	≤24	PASS
	5745	SISO	15.44	≤30	PASS
	5755	SISO	15.88	≤30	PASS
	5775	SISO	12.02	≤30	PASS
	5785	SISO	14.91	≤30	PASS
	5795	SISO	15.02	≤30	PASS
802.11a	5825	SISO	13.59	≤30	PASS
	5180	SISO	14.99	≤24	PASS
	5200	SISO	15.21	≤24	PASS
	5240	SISO	14.78	≤24	PASS
	5260	SISO	8.23	≤30	PASS
	5300	SISO	7.79	≤30	PASS
	5320	SISO	13.38	≤30	PASS
	5500	SISO	13.03	≤24	PASS
	5580	SISO	14.61	≤24	PASS
	5600	SISO	15.00	≤24	PASS
	5700	SISO	14.53	≤24	PASS
802.11n	5745	SISO	15.05	≤30	PASS
	5785	SISO	15.02	≤30	PASS
	5825	SISO	13.52	≤30	PASS
	5180	SISO	9.06	≤24	PASS
	5190	SISO	13.74	≤24	PASS
	5200	SISO	8.98	≤24	PASS
	5230	SISO	13.54	≤24	PASS
	5240	SISO	8.79	≤24	PASS
	5260	SISO	14.12	≤30	PASS
	5270	SISO	12.43	≤30	PASS
	5300	SISO	13.50	≤30	PASS
	5310	SISO	11.95	≤30	PASS
	5320	SISO	7.10	≤30	PASS
	5500	SISO	13.27	≤24	PASS
	5510	SISO	12.30	≤24	PASS
	5550	SISO	13.37	≤24	PASS
	5580	SISO	15.30	≤24	PASS
	5590	SISO	14.14	≤24	PASS
	5600	SISO	15.71	≤24	PASS
	5700	SISO	15.30	≤24	PASS
	5745	SISO	15.50	≤30	PASS
	5755	SISO	14.39	≤30	PASS
	5785	SISO	15.26	≤30	PASS
	5795	SISO	12.77	≤30	PASS

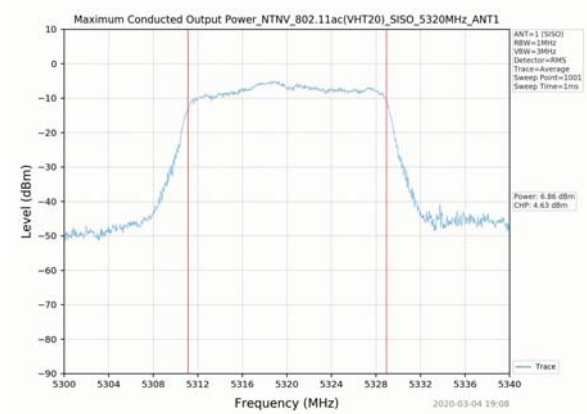
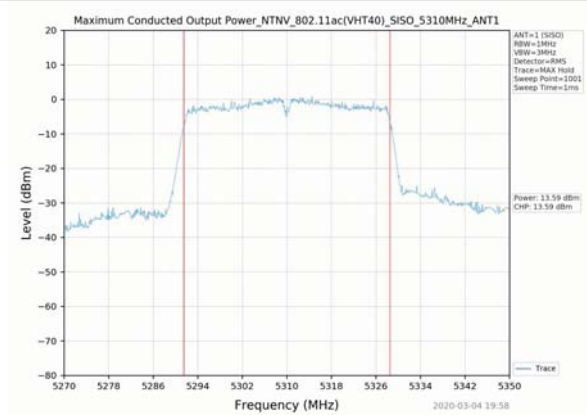
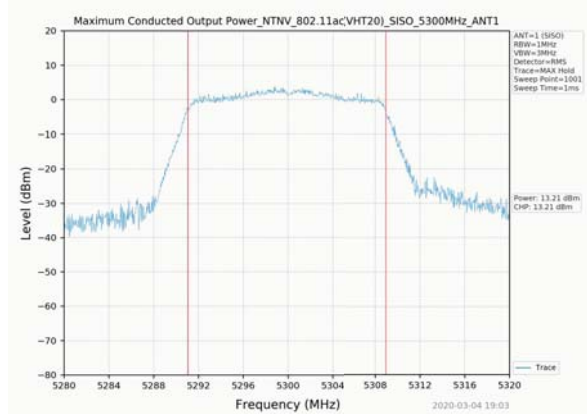
	5825	SISO	13.66	≤30	PASS
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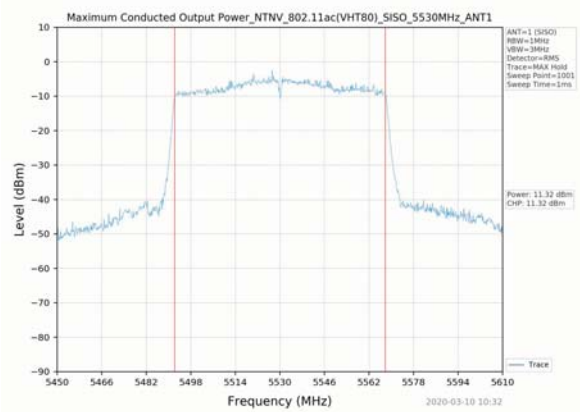
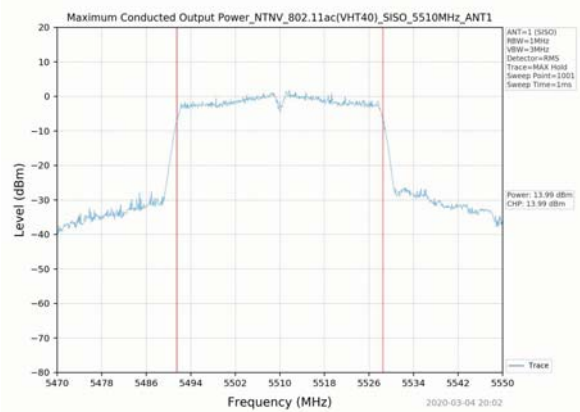
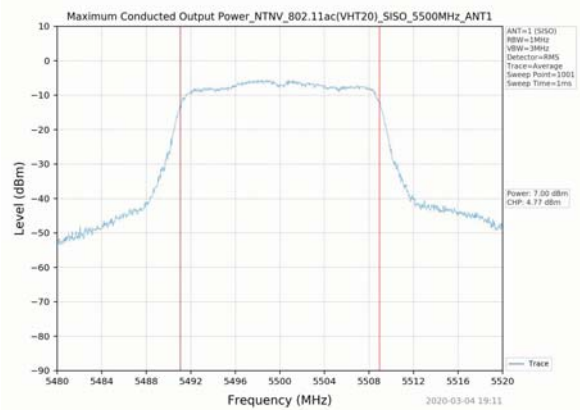
2.2 Test Graph

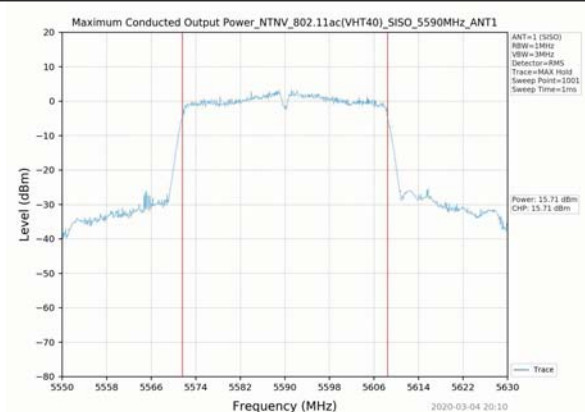
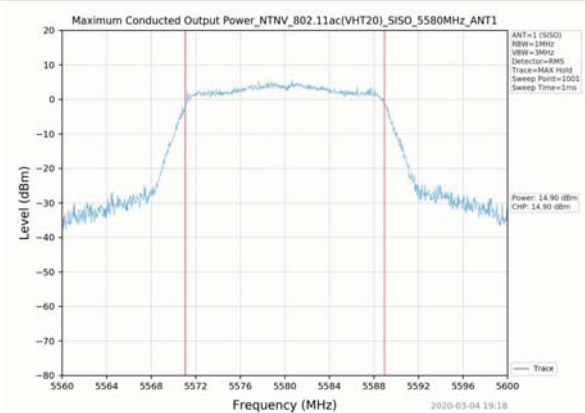
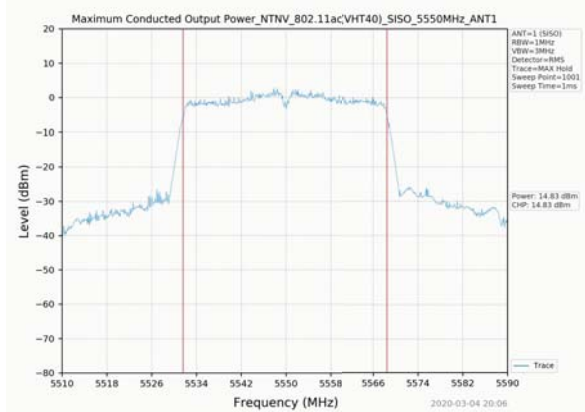


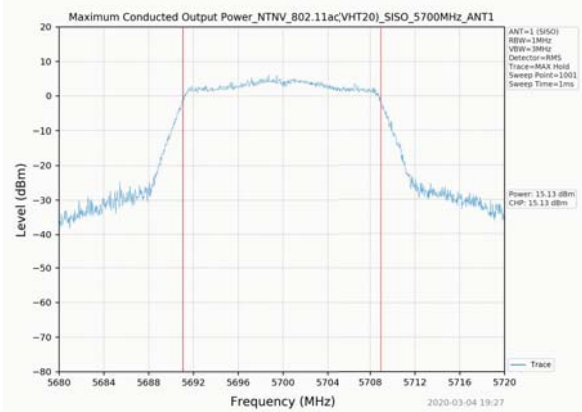
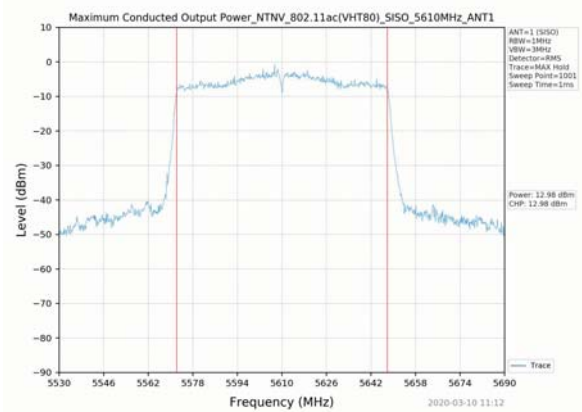
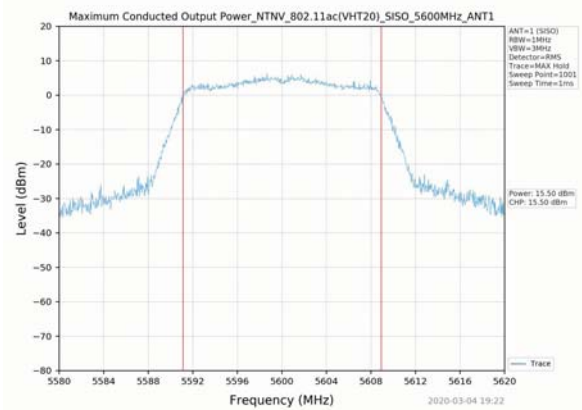


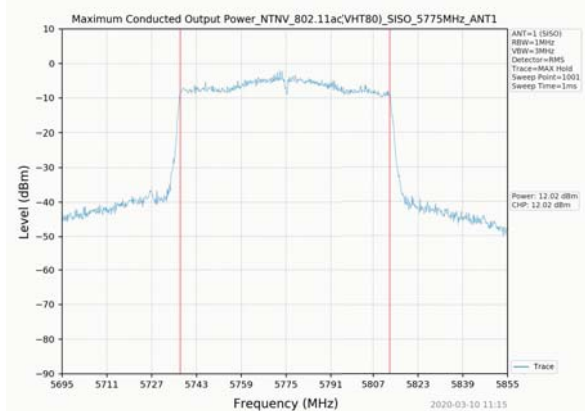
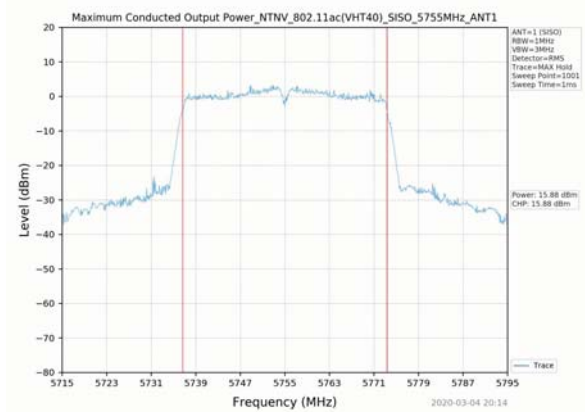
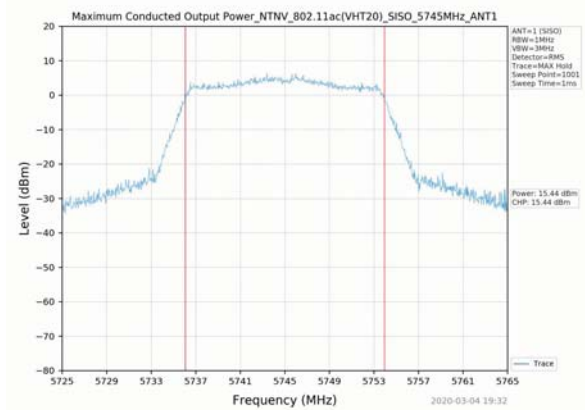


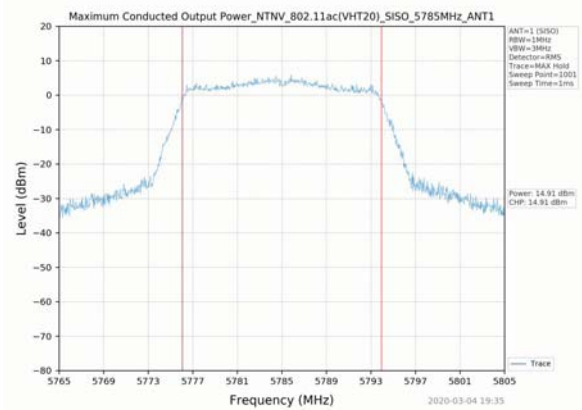


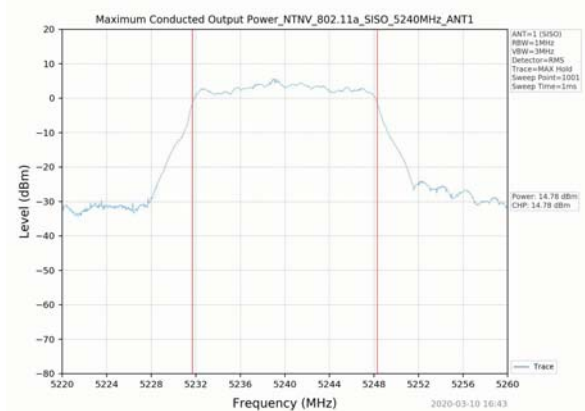
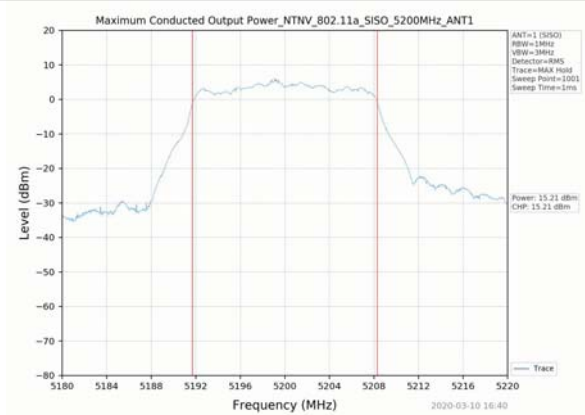
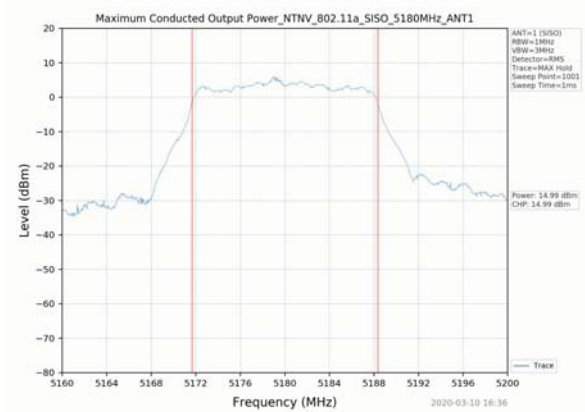


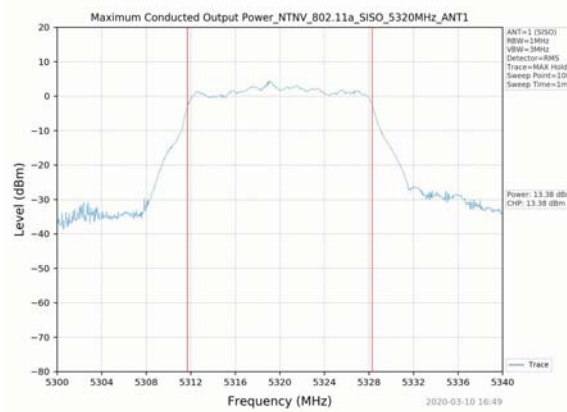
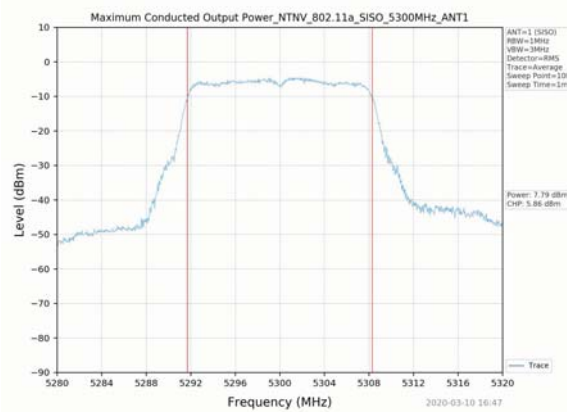
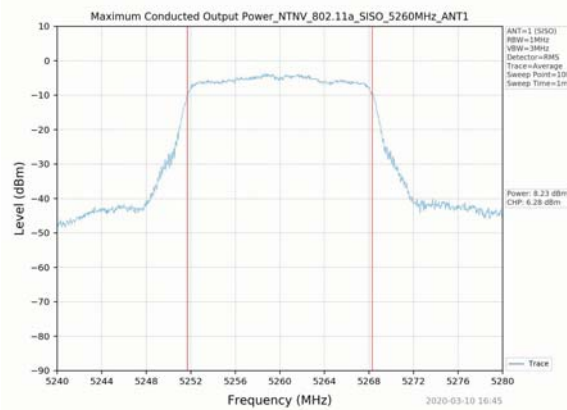


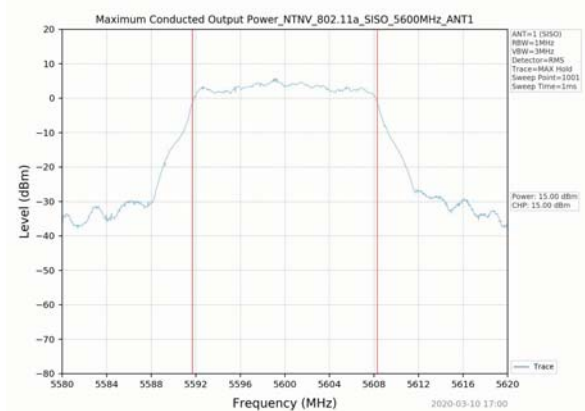
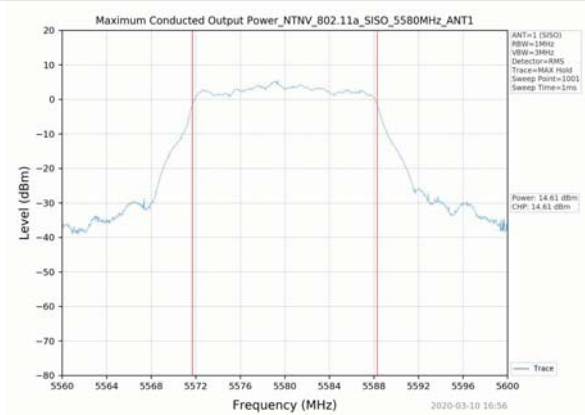
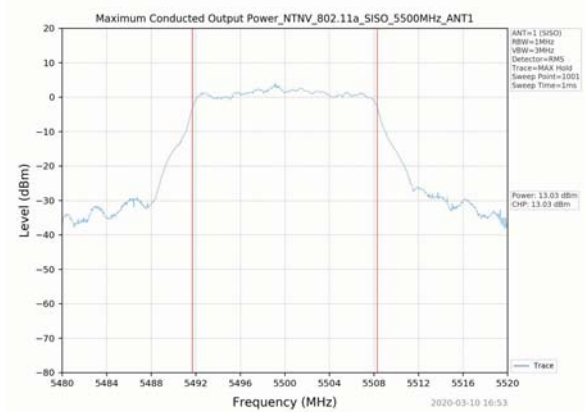


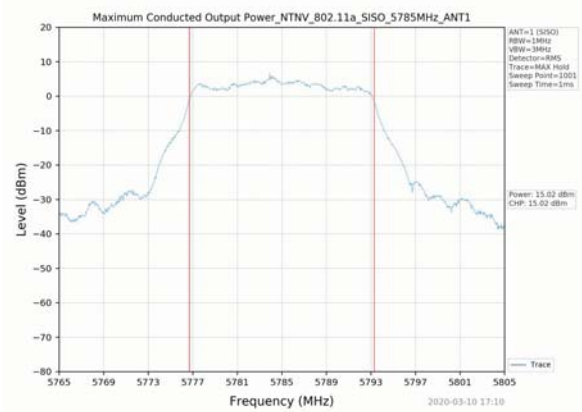
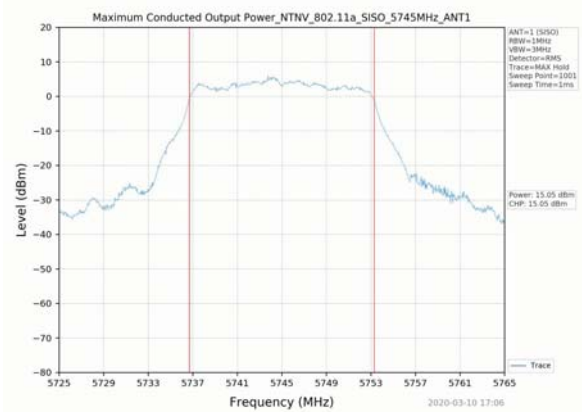
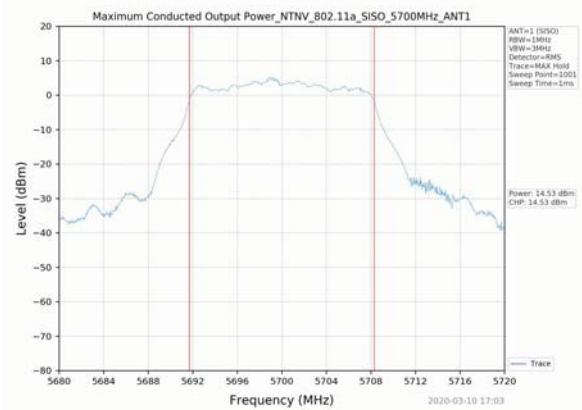


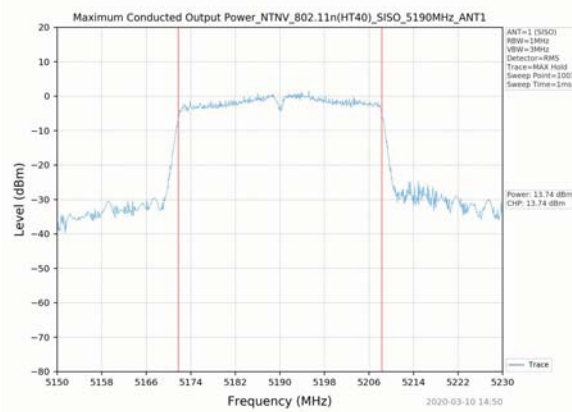
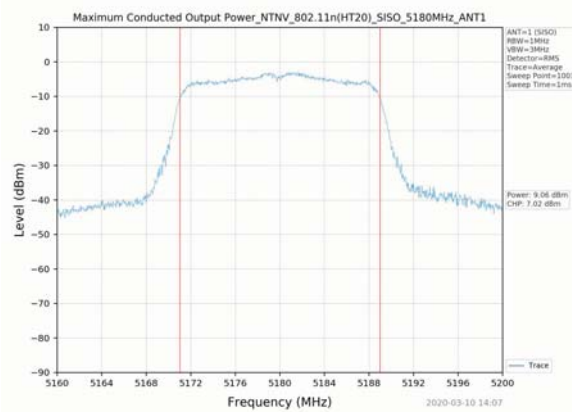
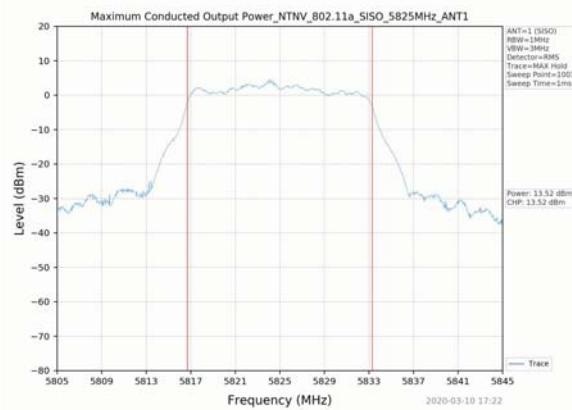


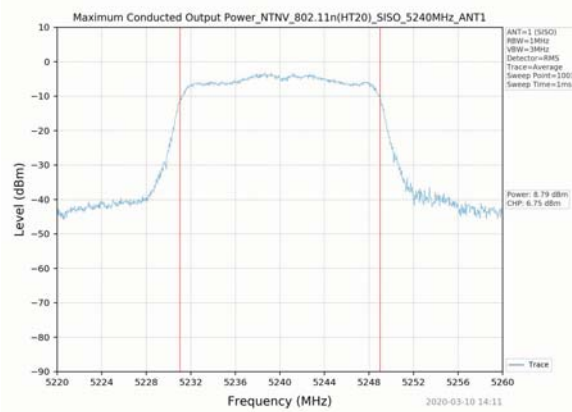
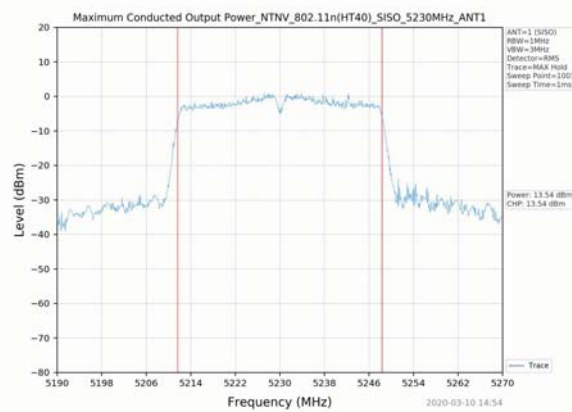
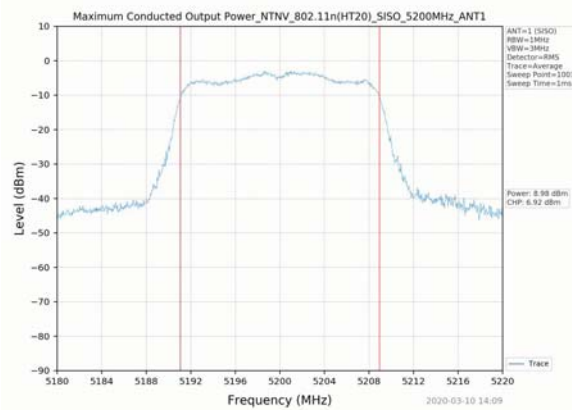


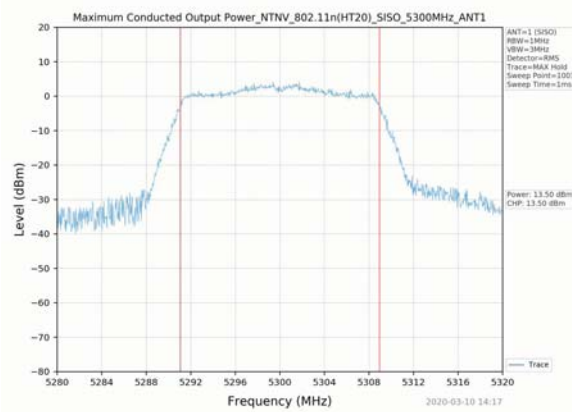
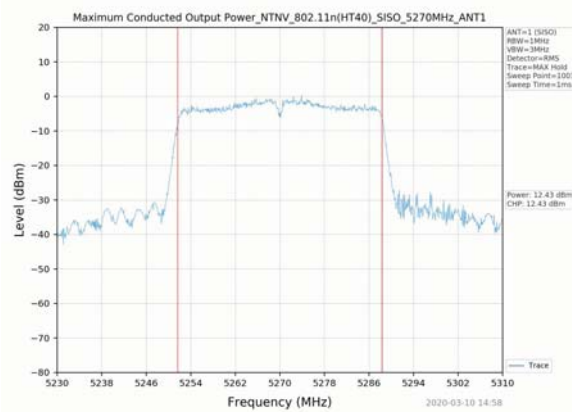
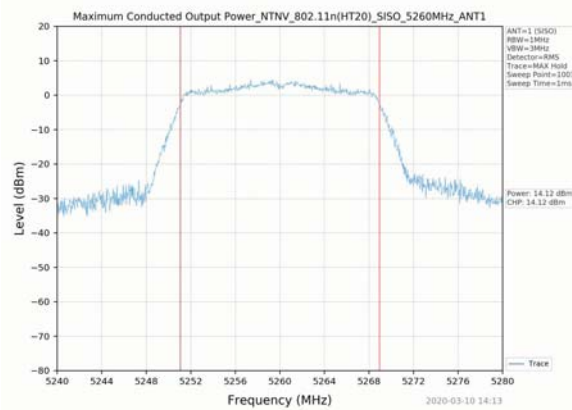


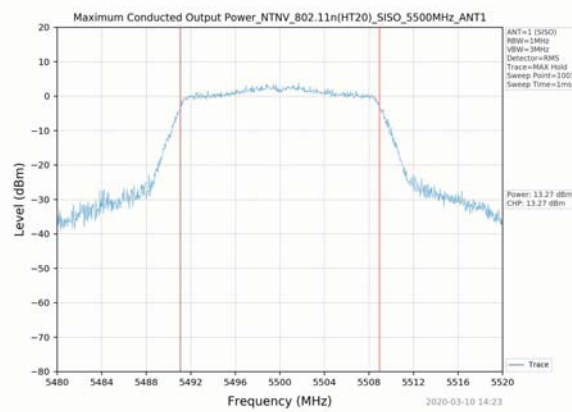
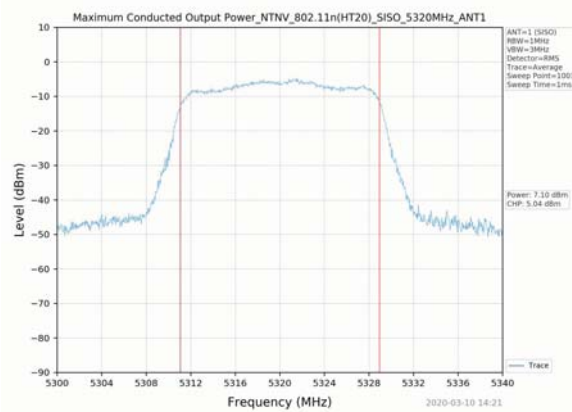
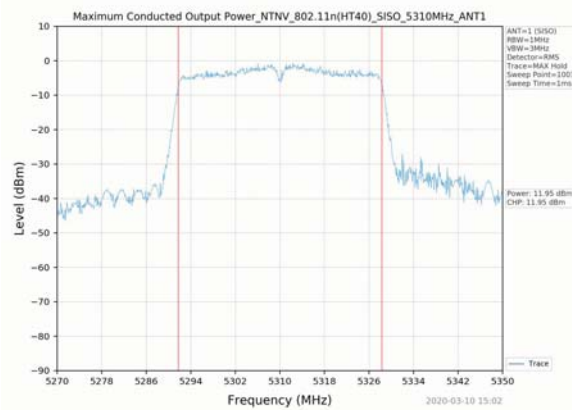


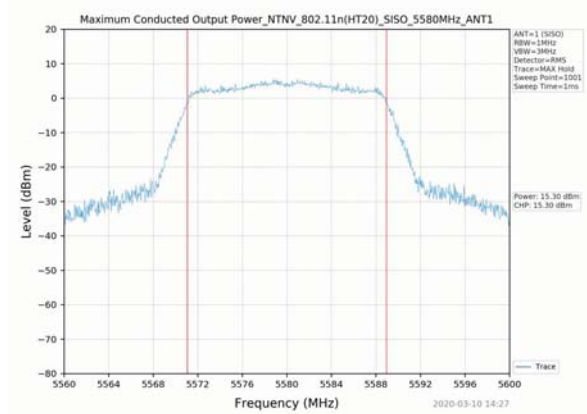
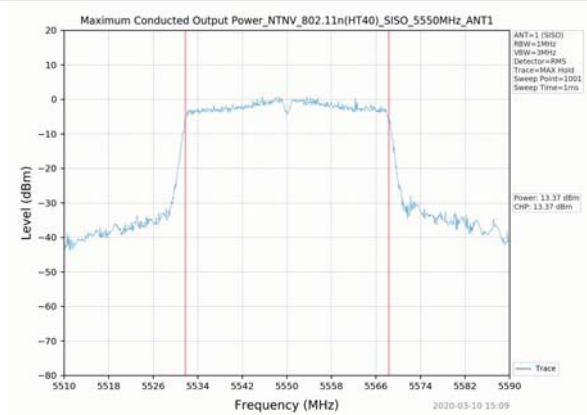


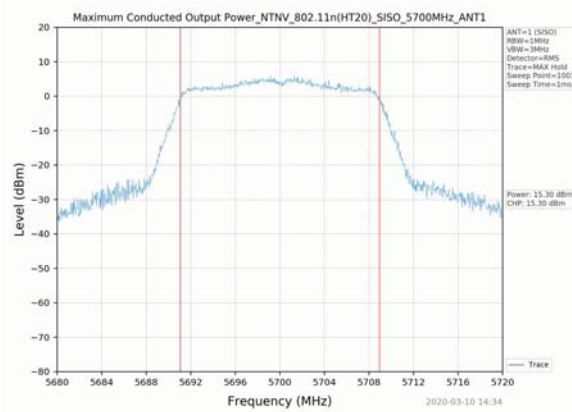
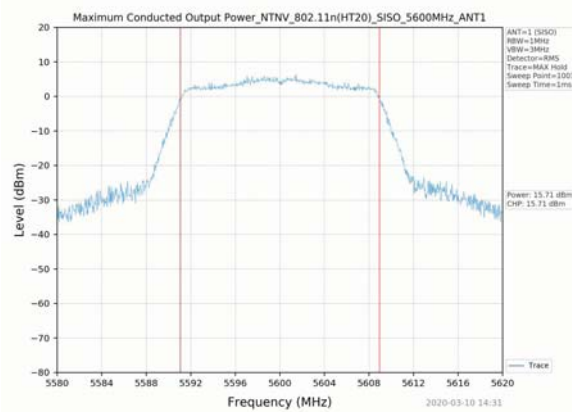
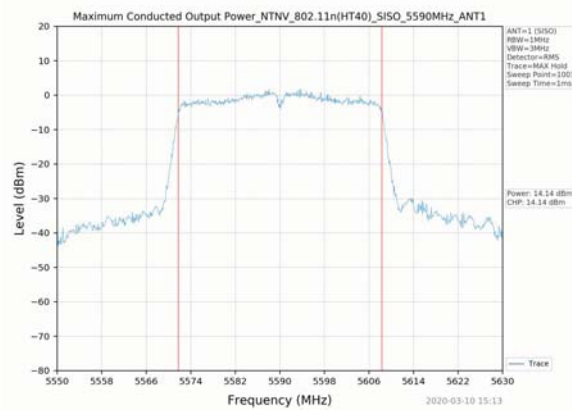


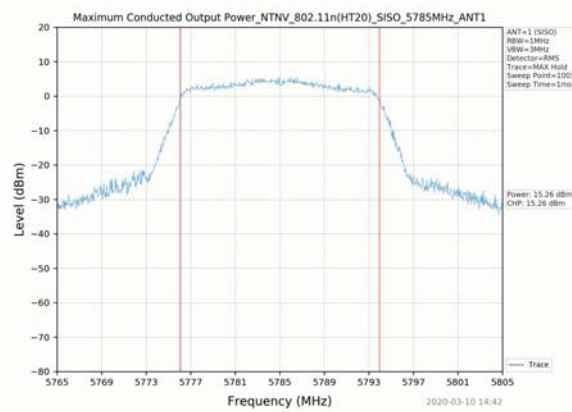
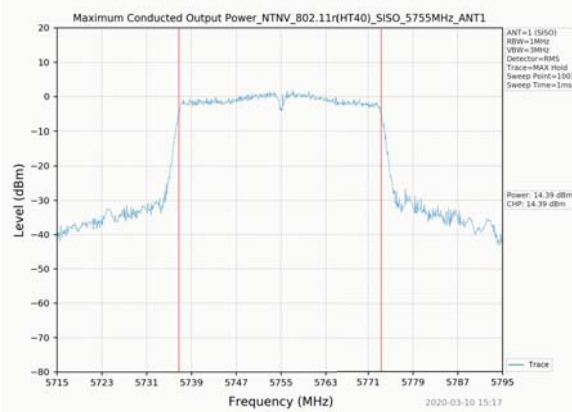
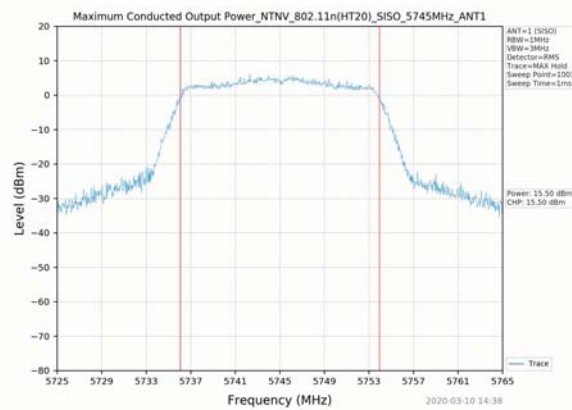


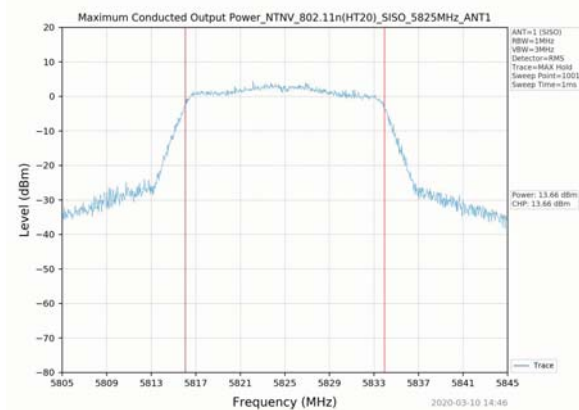
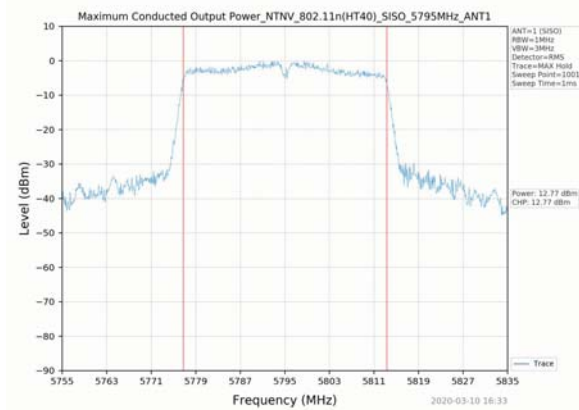












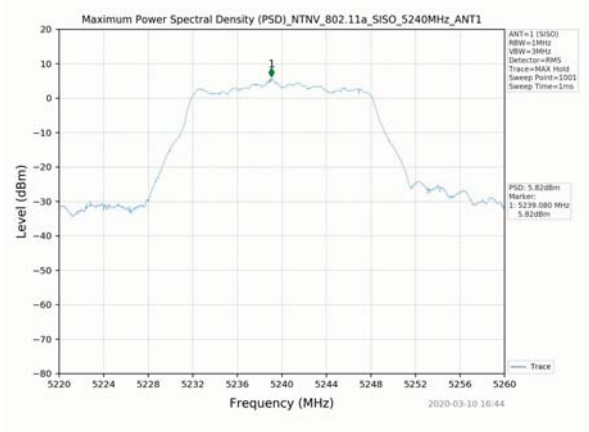
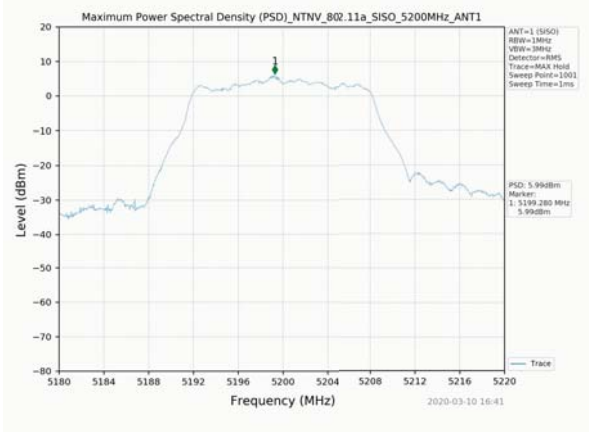
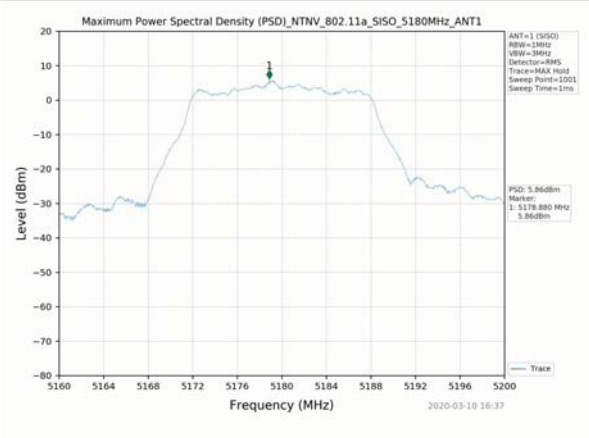
3. Maximum Power Spectral Density (PSD)

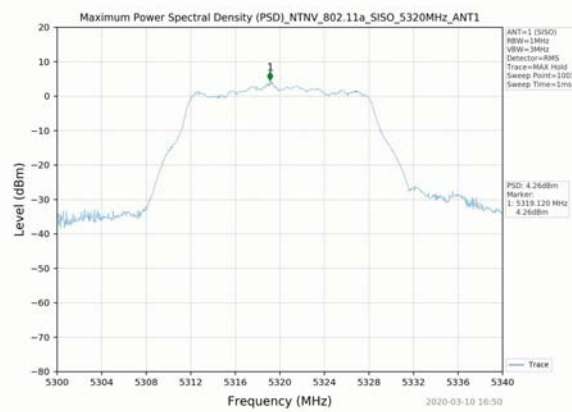
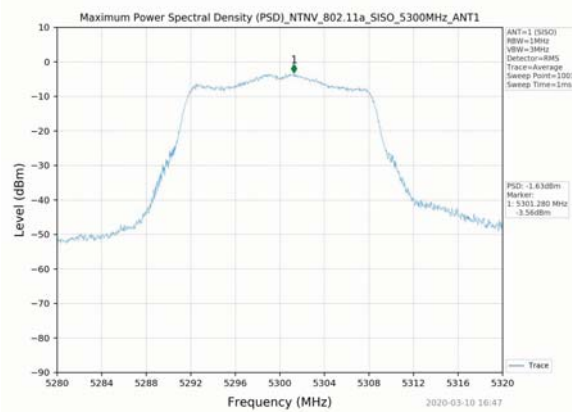
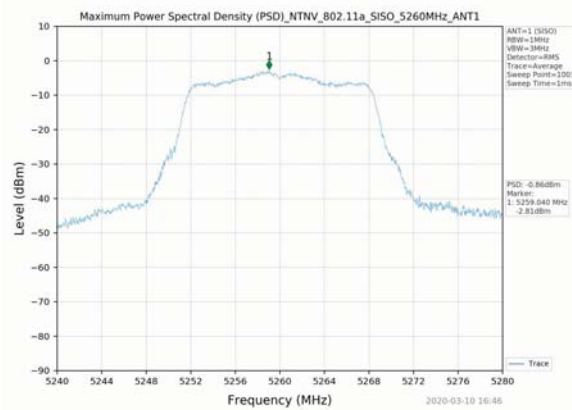
3.1 Test Result

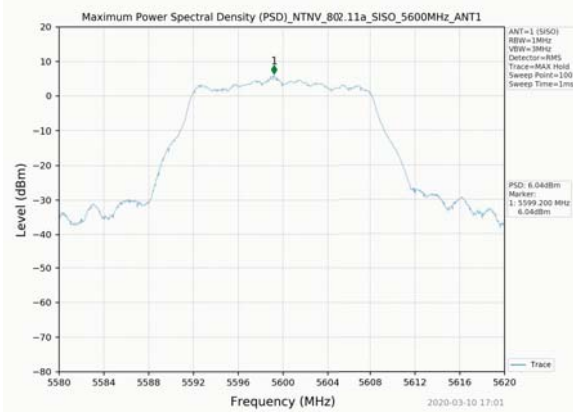
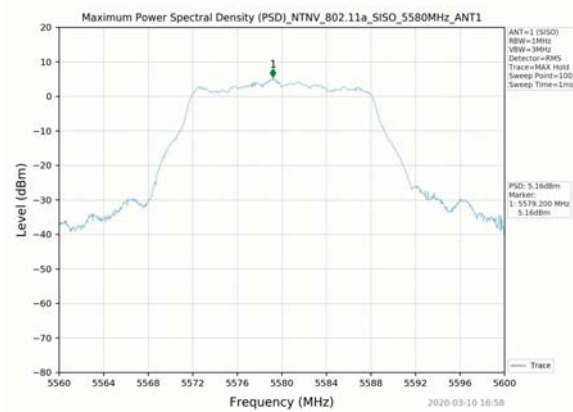
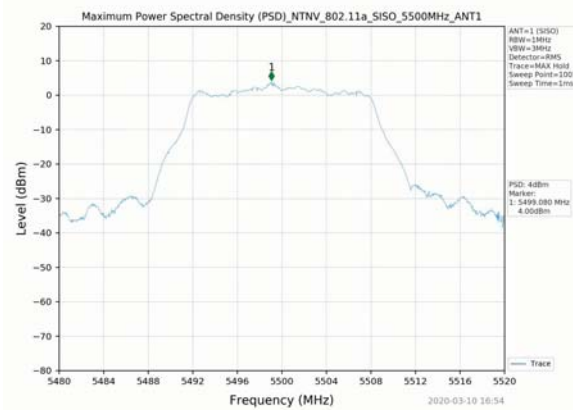
Test Mode	Frequency (MHz)	Tx Type	Maximum Power Spectral Density (dBm/MHz)	Limits	Verdict
			Ant 1		
802.11a	5180	SISO	5.86	11dBm/MHz	PASS
	5200	SISO	5.99	11dBm/MHz	PASS
	5240	SISO	5.82	11dBm/MHz	PASS
	5260	SISO	-0.86	11dBm/MHz	PASS
	5300	SISO	-1.63	11dBm/MHz	PASS
	5320	SISO	4.26	11dBm/MHz	PASS
	5500	SISO	4.00	11dBm/MHz	PASS
	5580	SISO	5.16	11dBm/MHz	PASS
	5600	SISO	6.04	11dBm/MHz	PASS
	5700	SISO	5.12	11dBm/MHz	PASS
	5745	SISO	-1.632	30dBm/500KHz	PASS
802.11n(HT20)	5785	SISO	-1.131	30dBm/500KHz	PASS
	5825	SISO	-2.257	30dBm/500KHz	PASS
	5180	SISO	-0.67	11dBm/MHz	PASS
	5200	SISO	-1.24	11dBm/MHz	PASS
	5240	SISO	-0.78	11dBm/MHz	PASS
	5260	SISO	4.25	11dBm/MHz	PASS

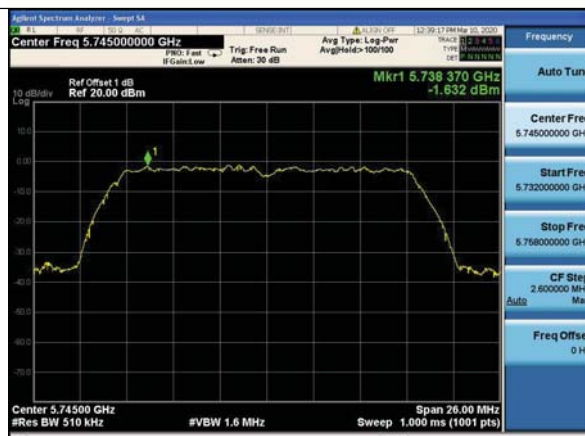
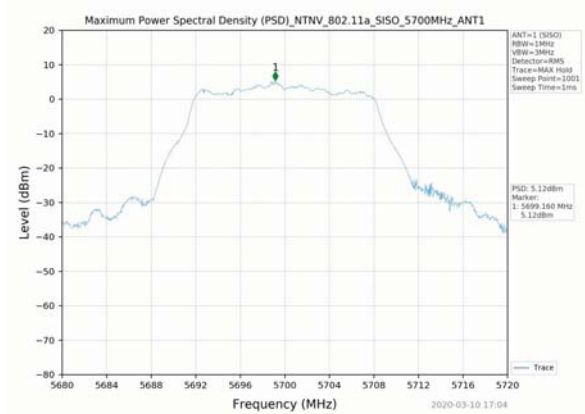
	5300	SISO	4.08	11dBm/MHz	PASS
	5320	SISO	-2.73	11dBm/MHz	PASS
	5500	SISO	3.85	11dBm/MHz	PASS
	5580	SISO	5.73	11dBm/MHz	PASS
	5600	SISO	5.75	11dBm/MHz	PASS
	5700	SISO	5.41	11dBm/MHz	PASS
	5745	SISO	-2.318	30dBm/500KHz	PASS
	5785	SISO	-2.522	30dBm/500KHz	PASS
802.11n(HT40)	5825	SISO	-1.973	30dBm/500KHz	PASS
	5190	SISO	1.80	11dBm/MHz	PASS
	5230	SISO	0.71	11dBm/MHz	PASS
	5270	SISO	-0.31	11dBm/MHz	PASS
	5310	SISO	-0.37	11dBm/MHz	PASS
	5510	SISO	-0.02	11dBm/MHz	PASS
	5550	SISO	1.37	11dBm/MHz	PASS
	5590	SISO	1.80	11dBm/MHz	PASS
802.11ac(VHT20)	5755	SISO	-4.500	30dBm/500KHz	PASS
	5795	SISO	-4.566	30dBm/500KHz	PASS
	5180	SISO	-1.45	11dBm/MHz	PASS
	5200	SISO	5.25	11dBm/MHz	PASS
	5240	SISO	-1.99	11dBm/MHz	PASS
	5260	SISO	-2.19	11dBm/MHz	PASS
	5300	SISO	3.18	11dBm/MHz	PASS
	5320	SISO	-3.34	11dBm/MHz	PASS
	5500	SISO	-3.04	11dBm/MHz	PASS
	5580	SISO	5.56	11dBm/MHz	PASS
	5600	SISO	5.98	11dBm/MHz	PASS
	5700	SISO	5.98	11dBm/MHz	PASS
802.11ac(VHT40)	5745	SISO	-1.310	30dBm/500KHz	PASS
	5785	SISO	-0.968	30dBm/500KHz	PASS
	5825	SISO	-1.710	30dBm/500KHz	PASS
	5190	SISO	2.92	11dBm/MHz	PASS
	5230	SISO	3.72	11dBm/MHz	PASS
	5270	SISO	1.40	11dBm/MHz	PASS
	5310	SISO	1.05	11dBm/MHz	PASS
	5510	SISO	1.83	11dBm/MHz	PASS
802.11ac(VHT80)	5550	SISO	2.48	11dBm/MHz	PASS
	5590	SISO	3.36	11dBm/MHz	PASS
	5755	SISO	-4.164	30dBm/500KHz	PASS
	5795	SISO	-4.366	30dBm/500KHz	PASS
	5210	SISO	-1.13	11dBm/MHz	PASS
	5290	SISO	-3.67	11dBm/MHz	PASS
	5530	SISO	-4.55	11dBm/MHz	PASS
	5610	SISO	-1.89	11dBm/MHz	PASS
	5775	SISO	-3.526	30dBm/500KHz	PASS

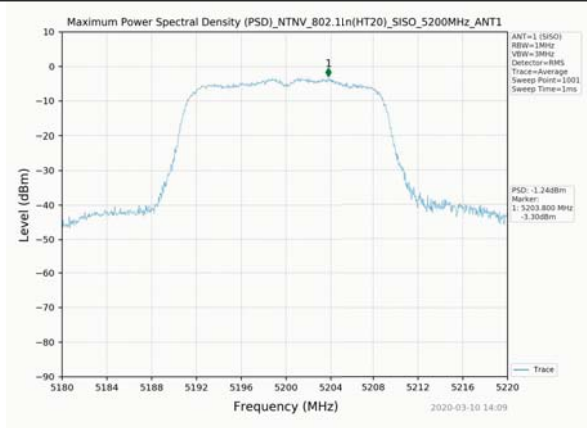
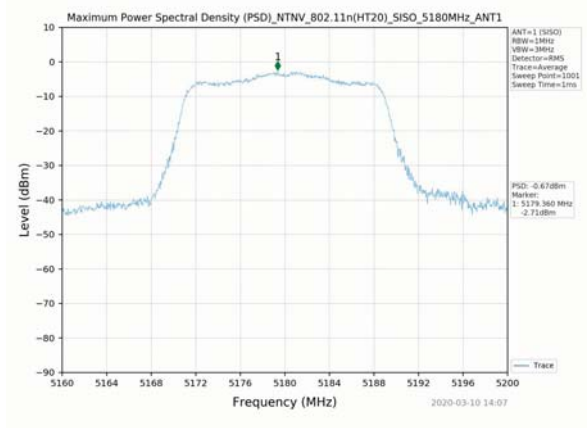
3.2 Test Graph

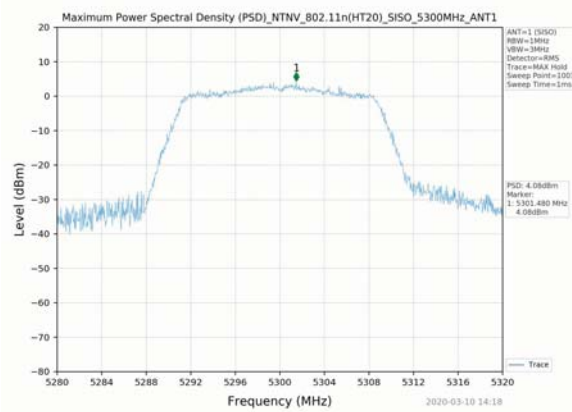
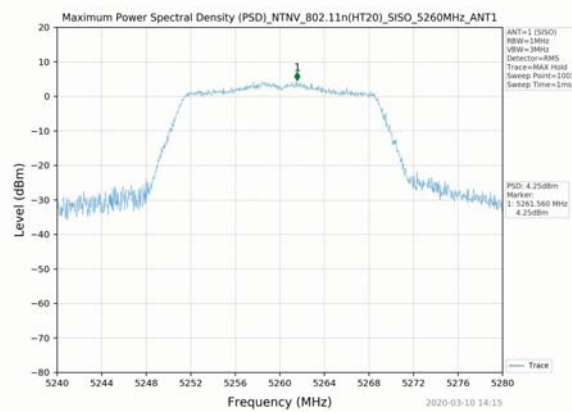
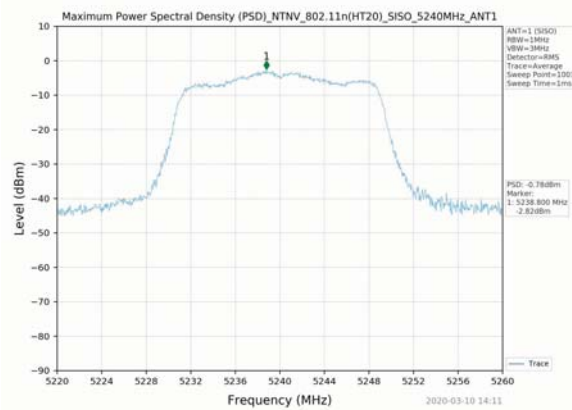


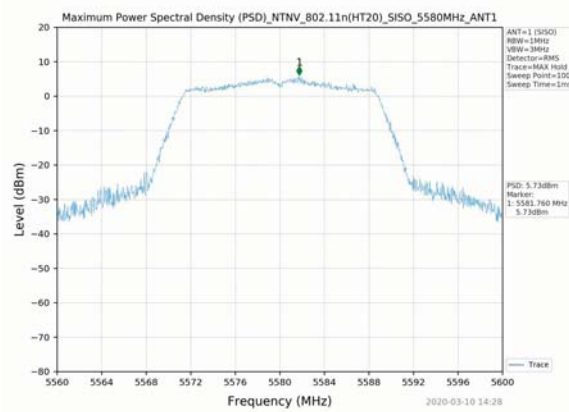
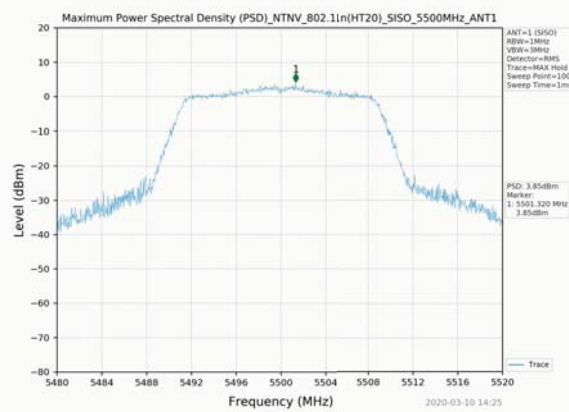
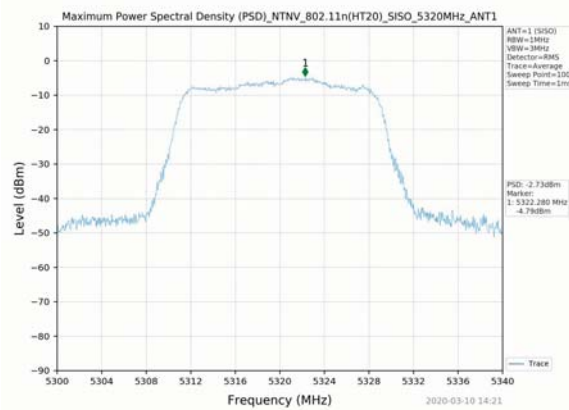


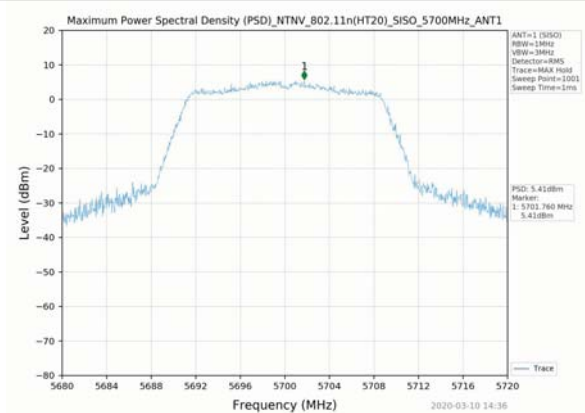
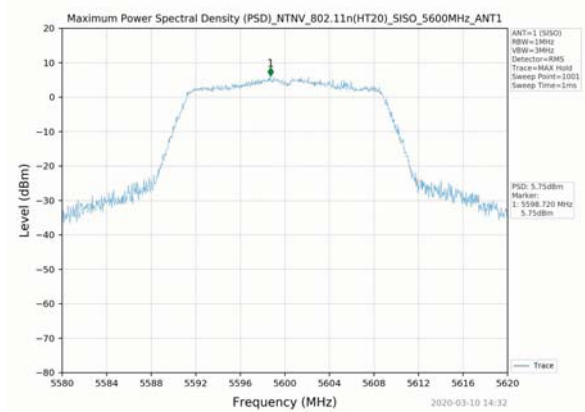


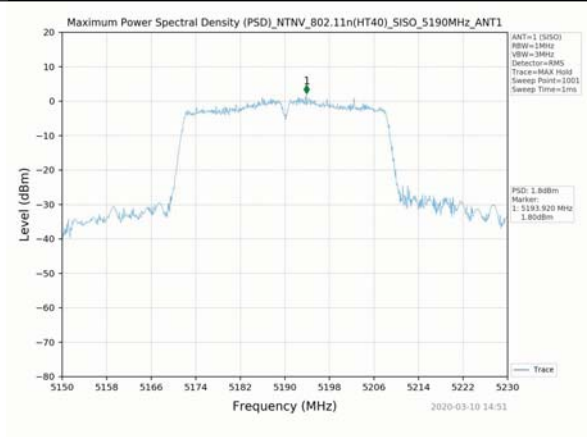


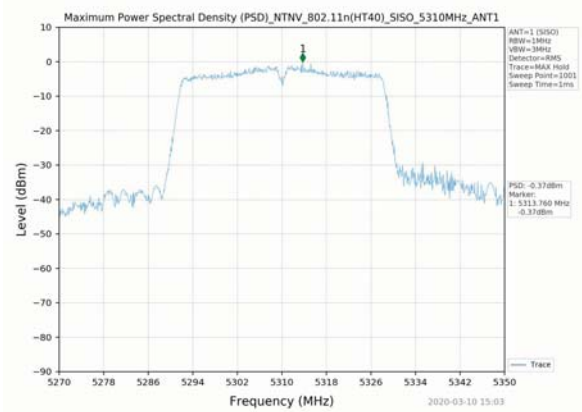
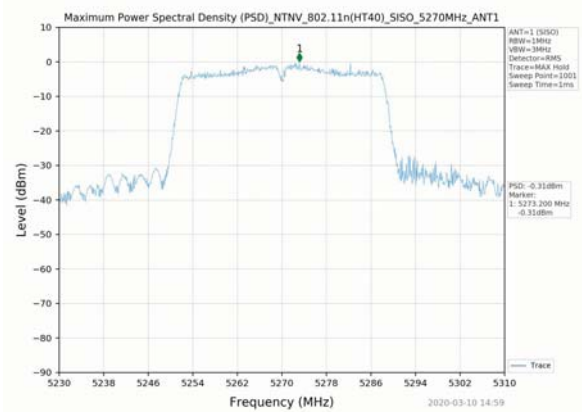
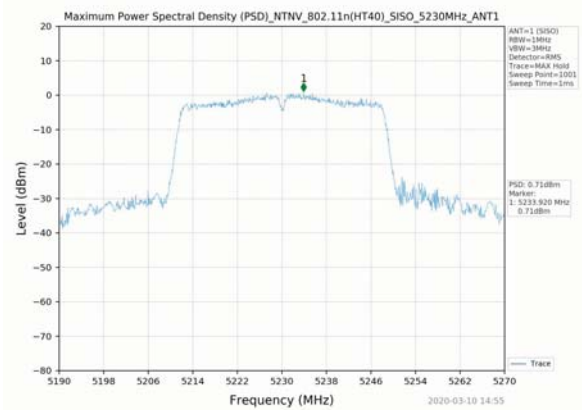


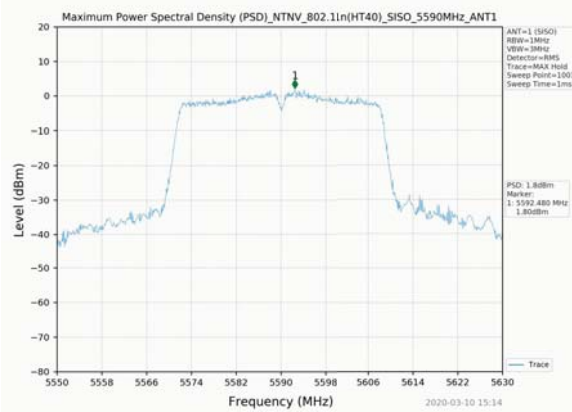
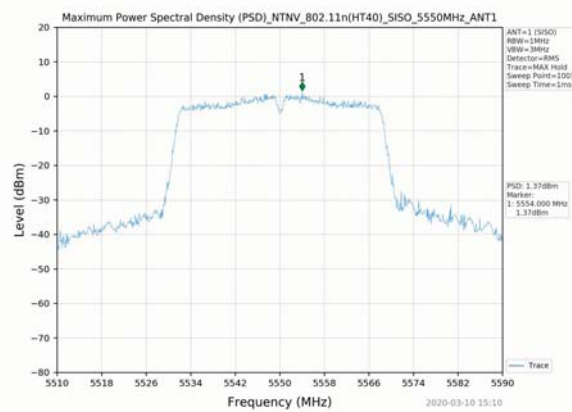
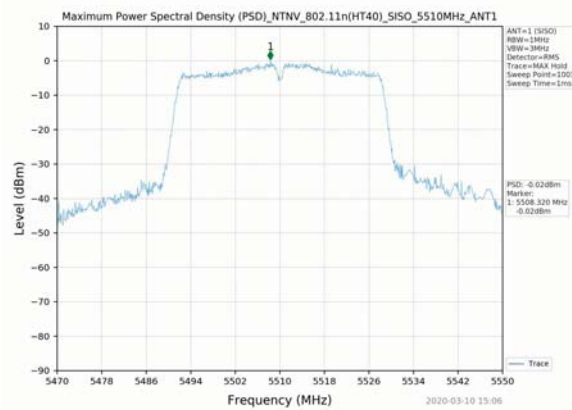


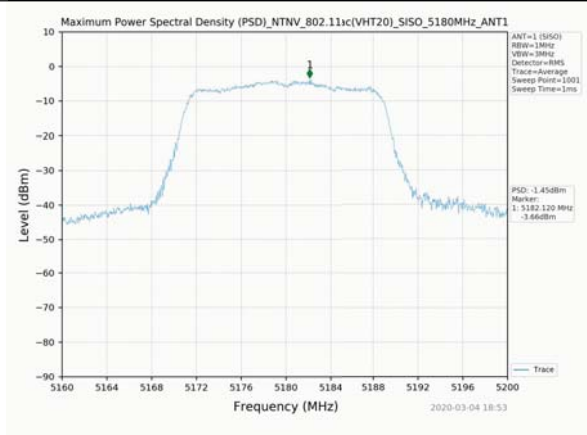
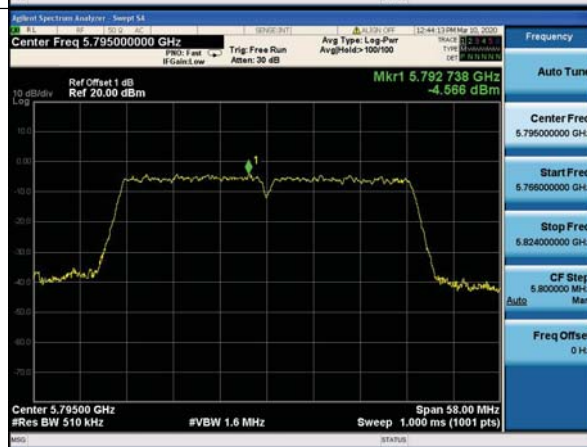
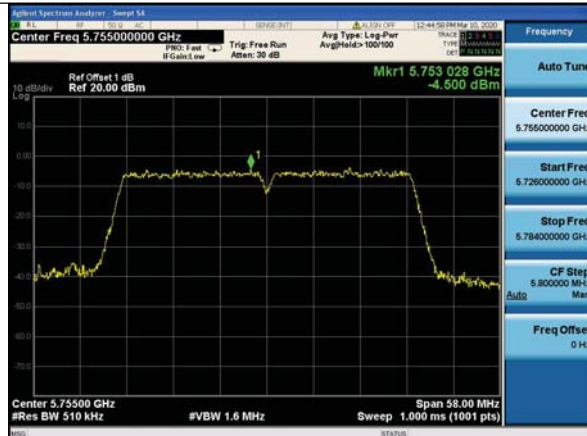


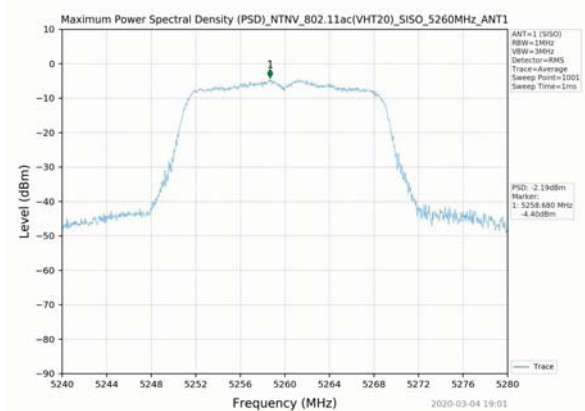
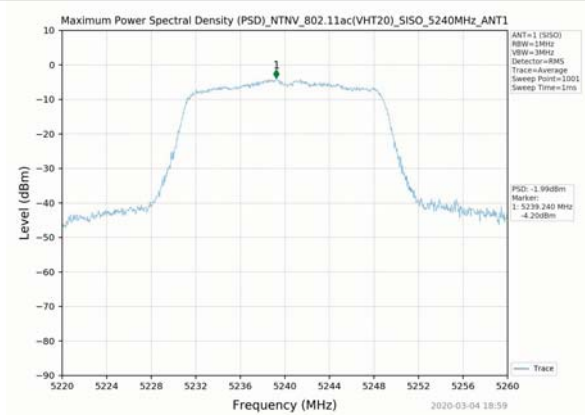
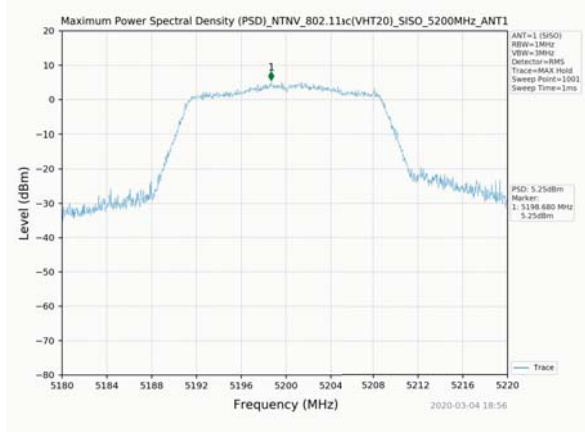


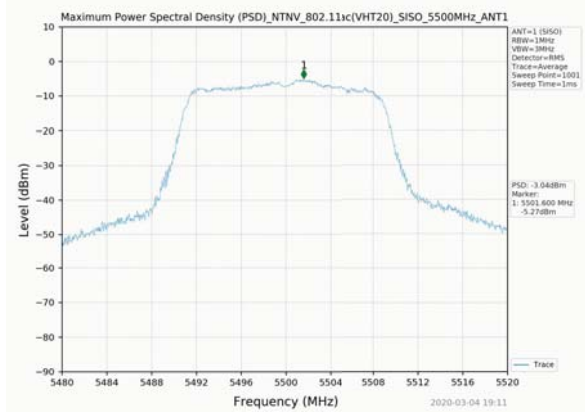
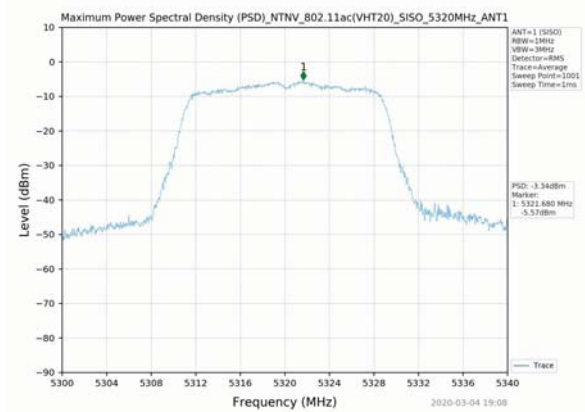
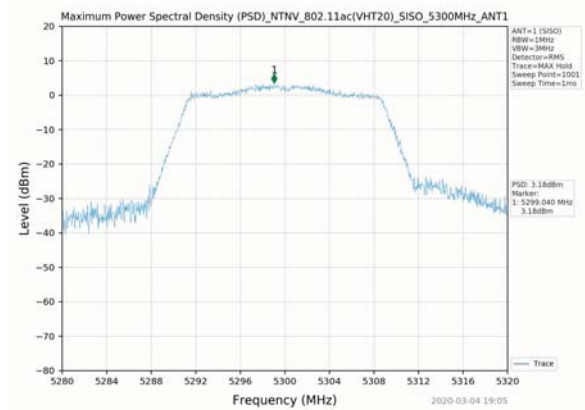


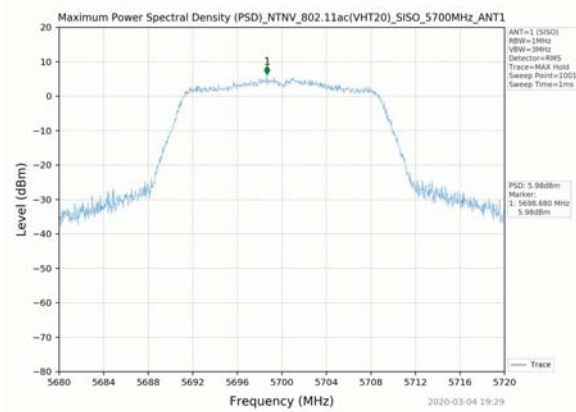
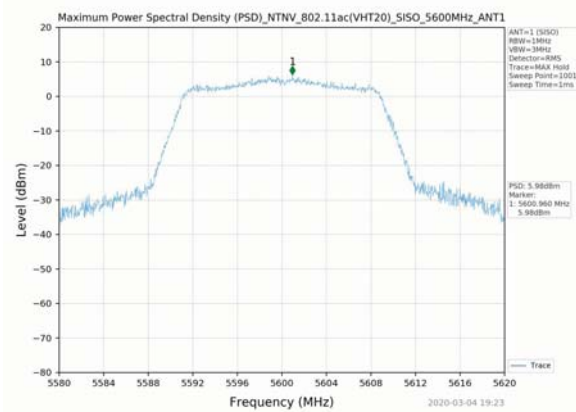
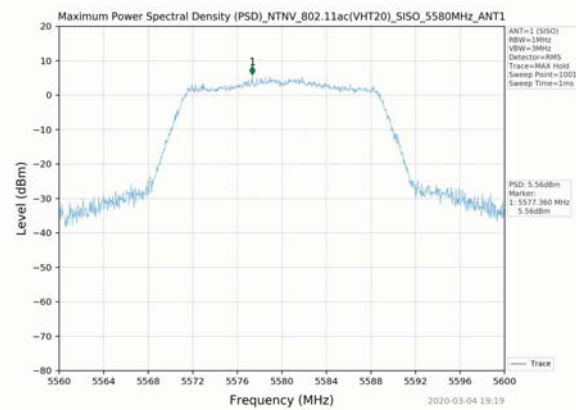


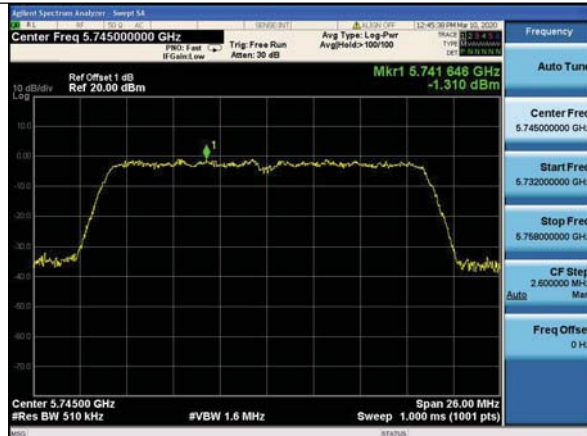


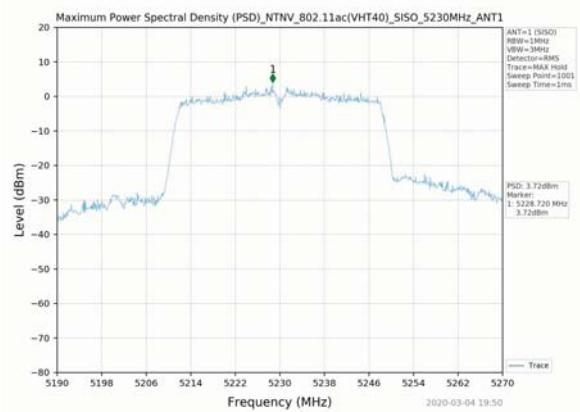
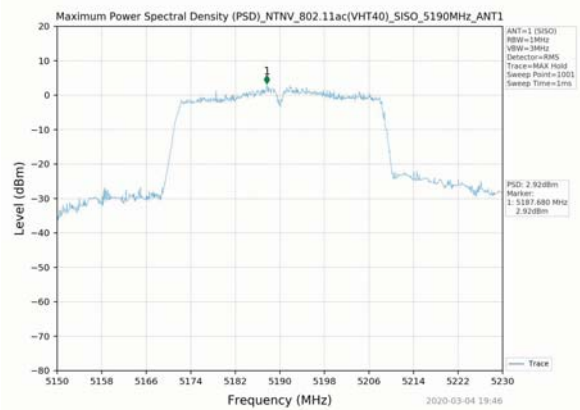


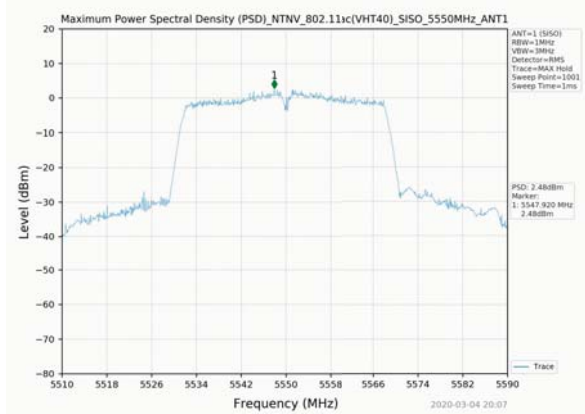
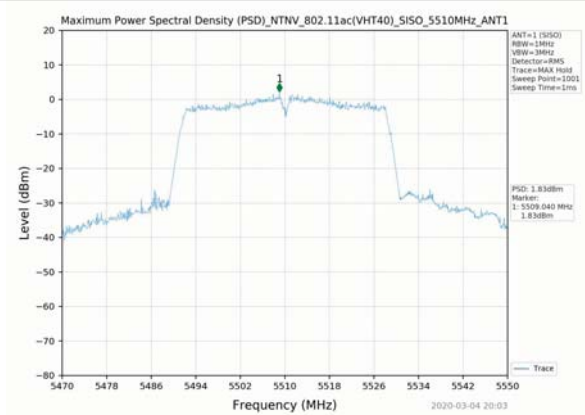
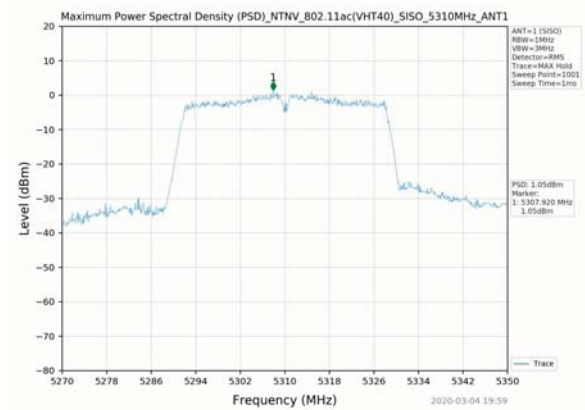


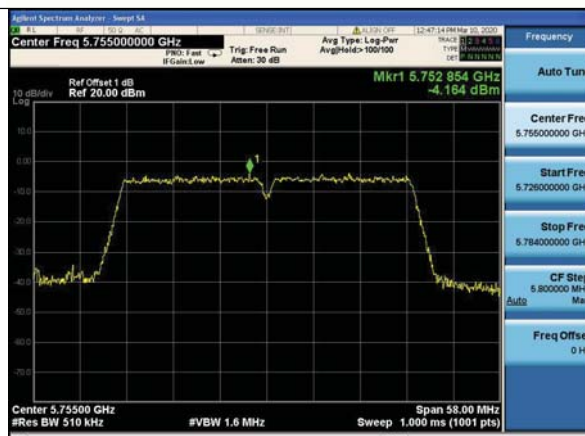
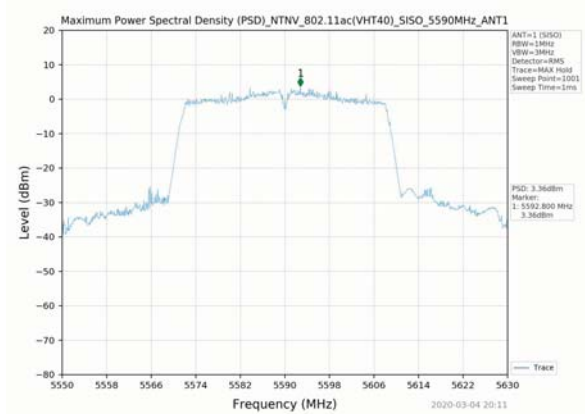


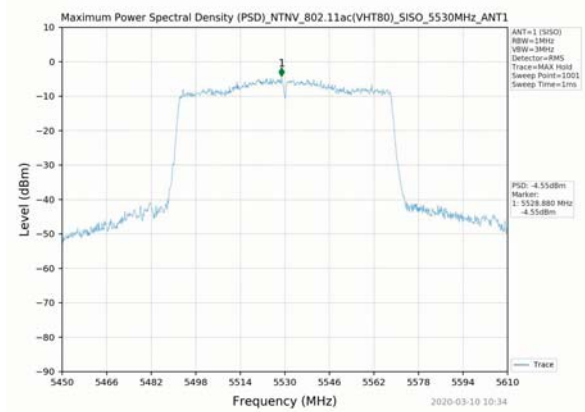
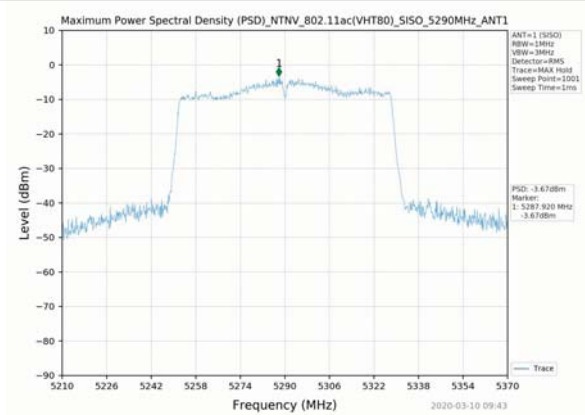
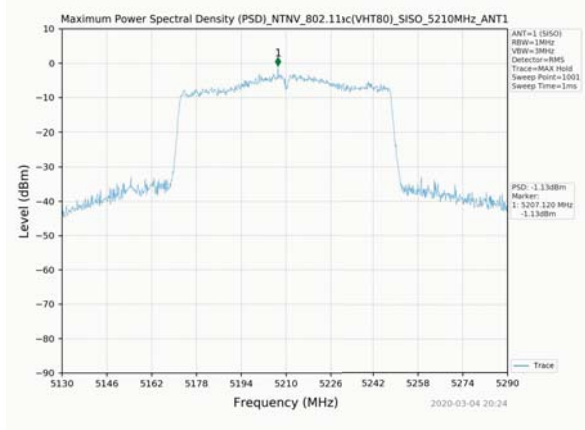














4. Frequency Stability

4.1 Test Result

Test Condition	Test Mode	Test Frequency [MHz]	Ant	Result [ppm]	Limit [ppm]	Verdict
NTNV	Carrier	5180	1	-1.16	<=20	PASS
		5190	1	-0.96	<=20	PASS
		5200	1	-1.15	<=20	PASS
		5210	1	-1.27	<=20	PASS
		5230	1	-1.15	<=20	PASS
		5240	1	-1.15	<=20	PASS
		5260	1	-1.14	<=20	PASS
		5270	1	-1.14	<=20	PASS
		5290	1	-0.38	<=20	PASS
		5300	1	-1.13	<=20	PASS
		5310	1	-1.13	<=20	PASS
		5320	1	-1.13	<=20	PASS
		5500	1	-1.27	<=20	PASS
		5510	1	-1.09	<=20	PASS
		5530	1	-0.72	<=20	PASS
		5550	1	-1.08	<=20	PASS
		5580	1	-1.25	<=20	PASS
		5590	1	-1.07	<=20	PASS
		5600	1	-1.25	<=20	PASS
		5610	1	-0.89	<=20	PASS
		5700	1	-1.23	<=20	PASS
		5745	1	-1.22	<=20	PASS
		5755	1	-1.22	<=20	PASS
		5775	1	-1.04	<=20	PASS
		5785	1	-1.21	<=20	PASS
		5795	1	-1.21	<=20	PASS
		5825	1	-1.20	<=20	PASS
HTHV	Carrier	5180	1	-2.13	<=20	PASS
		5190	1	-2.05	<=20	PASS
		5200	1	-1.96	<=20	PASS
		5210	1	-1.86	<=20	PASS
		5230	1	-2.23	<=20	PASS
		5240	1	-1.93	<=20	PASS
		5260	1	-2.11	<=20	PASS
		5270	1	-2.04	<=20	PASS
		5290	1	-2.03	<=20	PASS
		5300	1	-2.13	<=20	PASS
		5310	1	-2.16	<=20	PASS
		5320	1	-1.83	<=20	PASS
		5500	1	-1.92	<=20	PASS
		5510	1	-2.24	<=20	PASS
		5530	1	-1.97	<=20	PASS
		5550	1	-1.53	<=20	PASS
		5580	1	-2.24	<=20	PASS
		5590	1	-1.96	<=20	PASS
		5600	1	-1.96	<=20	PASS
		5610	1	-2.10	<=20	PASS
		5700	1	-2.21	<=20	PASS
		5745	1	-2.31	<=20	PASS
		5755	1	-2.11	<=20	PASS
		5775	1	-2.17	<=20	PASS
		5785	1	-2.19	<=20	PASS

		5795	1	-1.93	<=20	PASS
		5825	1	-1.87	<=20	PASS
HTLV	Carrier	5180	1	-1.86	<=20	PASS
		5190	1	-1.52	<=20	PASS
		5200	1	-1.63	<=20	PASS
		5210	1	-2.14	<=20	PASS
		5230	1	-2.53	<=20	PASS
		5240	1	-2.46	<=20	PASS
		5260	1	-2.51	<=20	PASS
		5270	1	-2.47	<=20	PASS
		5290	1	-2.38	<=20	PASS
		5300	1	-2.15	<=20	PASS
		5310	1	-2.26	<=20	PASS
		5320	1	-2.30	<=20	PASS
		5500	1	-2.28	<=20	PASS
		5510	1	-2.15	<=20	PASS
		5530	1	-2.28	<=20	PASS
		5550	1	-2.31	<=20	PASS
		5580	1	-2.48	<=20	PASS
		5590	1	-2.36	<=20	PASS
		5600	1	-2.47	<=20	PASS
		5610	1	-2.58	<=20	PASS
		5700	1	-2.33	<=20	PASS
		5745	1	-2.17	<=20	PASS
		5755	1	-2.09	<=20	PASS
		5775	1	-2.12	<=20	PASS
		5785	1	-2.19	<=20	PASS
		5795	1	-2.31	<=20	PASS
		5825	1	-1.93	<=20	PASS
LTHV	Carrier	5180	1	-1.86	<=20	PASS
		5190	1	-1.29	<=20	PASS
		5200	1	-2.38	<=20	PASS
		5210	1	-2.16	<=20	PASS
		5230	1	-2.15	<=20	PASS
		5240	1	-2.17	<=20	PASS
		5260	1	-2.24	<=20	PASS
		5270	1	-2.36	<=20	PASS
		5290	1	-2.41	<=20	PASS
		5300	1	-2.18	<=20	PASS
		5310	1	-2.34	<=20	PASS
		5320	1	-2.25	<=20	PASS
		5500	1	-2.27	<=20	PASS
		5510	1	-2.14	<=20	PASS
		5530	1	-1.86	<=20	PASS
		5550	1	-1.73	<=20	PASS
		5580	1	-1.76	<=20	PASS
		5590	1	-1.73	<=20	PASS
		5600	1	-1.69	<=20	PASS
		5610	1	-2.15	<=20	PASS
		5700	1	-2.34	<=20	PASS
		5745	1	-2.41	<=20	PASS
		5755	1	-2.37	<=20	PASS
		5775	1	-2.45	<=20	PASS
		5785	1	-2.52	<=20	PASS
		5795	1	-1.36	<=20	PASS
		5825	1	-2.04	<=20	PASS
LTLV	Carrier	5180	1	-1.58	<=20	PASS
		5190	1	-1.37	<=20	PASS
		5200	1	-1.29	<=20	PASS

		5210	1	-1.54	<=20	PASS
		5230	1	-1.63	<=20	PASS
		5240	1	-1.72	<=20	PASS
		5260	1	-1.48	<=20	PASS
		5270	1	-2.01	<=20	PASS
		5290	1	-2.08	<=20	PASS
		5300	1	-1.93	<=20	PASS
		5310	1	-1.56	<=20	PASS
		5320	1	-1.48	<=20	PASS
		5500	1	-1.69	<=20	PASS
		5510	1	-1.47	<=20	PASS
		5530	1	-1.25	<=20	PASS
		5550	1	-1.63	<=20	PASS
		5580	1	-1.79	<=20	PASS
		5590	1	-1.96	<=20	PASS
		5600	1	-2.11	<=20	PASS
		5610	1	-2.54	<=20	PASS
		5700	1	-2.48	<=20	PASS
		5745	1	-2.57	<=20	PASS
		5755	1	-2.41	<=20	PASS
		5775	1	-2.36	<=20	PASS
		5785	1	-2.25	<=20	PASS
		5795	1	-2.21	<=20	PASS
		5825	1	-2.18	<=20	PASS