



SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd

Report No.: SUCR241200051806
Rev.: 01
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TEST REPORT

Application No.: SUCR2412000518IT
Applicant: Wacom Co., Ltd
Address of Applicant: 2-510-1 Toyonodai, Kazo-shi, Saitama 349-1148, Japan
Manufacturer: Wacom Co., Ltd
Address of Manufacturer: 2-510-1 Toyonodai, Kazo-shi, Saitama 349-1148, Japan
EUT Description: Portable Pad
Model No.: DTHA116, DTHA116*****("*" maybe alphanumeric/symbol or blank)
Trade Mark: Wacom
FCC ID: HV4DTHA116
Standards: FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart E
Date of Receipt: December 4, 2024
Date of Test: December 14, 2024 to January 13, 2025
Date of Issue: January 23, 2025

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

Nature Shen

Cloud Peng

Prepared by: Nature Shen/ Project Manager

**Approved by: Cloud Peng/
Technical Manager**

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Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		January 23, 2025		Original

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1 Test Summary

Test Item	Band ^[1]	FCC rules No.	Test Requirements	Test Result	Result	Lab ^[2]
Antenna Requirement	--	15.203/15.407(a)	--	Clause 3.1	PASS	--
26dB Emission Bandwidth	Band I	15.407(a)(1)	No limit.	Clause 3.5	For Report Purpose	A
	Band II-A	15.407(a)(2)				
	Band II-C	15.407(a)(2)				
6dB Emission Bandwidth	Band III	15.407(e)	≥ 500 kHz.	Clause 3.6	PASS	A
99% Occupied Bandwidth	Band I	KDB 789033 D02§ D	No limit.	Clause 3.7	For Report Purpose	A
	Band II-A					
	Band II-C					
	Band III					
Duty Cycle	Band I Band II-A Band II-C Band III	--	No limit.	Clause 3.3	For Report Purpose	A
Maximum Conducted Output Power	Band I	15.407(a)(iv)	< 250mW	Clause 3.4	PASS	A
	Band II-A	15.407(a)(2)	<MIN{250mW,11dBm+10*lg(EBW)}			
	Band II-C					
	Band III	15.407(a)(3)	< 1W			
Maximum Power Spectral Density	Band I	15.407(a)(iv)	<11dBm/MHz	Clause 3.8	PASS	A
	Band II-A	15.407(a)(2)	<11dBm/MHz			
	Band II-C					
	Band III	15.407(a)(3)	<30dBm/500KHz			
Radiated Spurious Emissions	Band I	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.15-5.35 GHz). F≥1GHz & in-restricted: §15.209 limit (AV&PK).	Clause 3.9	PASS	C
	Band II-A	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.25-5.35 GHz). F≥1GHz & in-restricted: §15.209 limit (AV&PK).		PASS	
	Band II-C	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.47-5.725 GHz).		PASS	

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Test Item	Band ^[1]	FCC rules No.	Test Requirements	Test Result	Result	Lab ^[2]
			F≥1GHz & in-restricted: §15.209 limit (AV&PK).			
	Band III	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP) F≥1GHz & out-restricted:(PK) 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. F≥1GHz & in-restricted: §15.209 limit (AV&PK).		PASS	
Restricted bands around fundamental frequency	Band I Band II-A Band II-C Band III	15.407(b) 15.205/15.209	---	Clause 3.10	PASS	C
AC Power Line Conducted Emissions	Band I Band II-A Band II-C Band III	15.207	---	Clause 3.2	PASS	C
Dynamic Frequency Selection	Band II-A Band II-C	15.407	Channel Move Time:10 Seconds	Clause 3.11	PASS	A
Frequency Stability	Band I Band II-A Band II-C Band III	15.407(g)	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	N/A	N/A	N/A

Note 1:

Band I: 5150-5250MHz

Band II-A: 5250-5350MHz

Band II-C: 5470-5725MHz

Band III: 5725-5850MHz

Note 2:

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Test Item	Band ^[1]	FCC rules No.	Test Requirements	Test Result	Result	Lab ^[2]
Lab A SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. Lab B SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Lab C SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.						

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2 General Information

2.1 Details of Client

Applicant:	Wacom Co., Ltd
Address of Applicant:	2-510-1 Toyonodai, Kazo-shi, Saitama 349-1148, Japan
Manufacturer:	Wacom Co., Ltd
Address of Manufacturer:	2-510-1 Toyonodai, Kazo-shi, Saitama 349-1148, Japan

2.2 Test Location

Lab A:	
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:	Weller Liu, King-p Li, Nature Shen, Tizzy Song
Lab C:	
Company:	SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.
Address:	1/F, Unit D, Building 1, Kanghong Orange Science Park, No.137, Keyuan 3rd Road, Fengdong New Town, Xi' an, Shaanxi China
Post code:	710086
Test engineer:	Leah Chen, Ken Liu, Andy Yao

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2.3 Test Facility

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

Lab A:

- **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

Lab C:

- **A2LA (Certificate No. 4854.01)**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

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

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0095.

IC#: 25613.

- **FCC –Designation Number: CN1337**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN1337.

Test Firm Registration Number: 917410

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2.4 General Description of EUT

EUT Description:	Portable Pad	
Model No.:	DTHA116, DTHA116*****("*" maybe alphanumeric/symbol or blank)	
Trade Mark:	Wacom	
Hardware Version:	V3	
Software Version:	1V01SU.03.00.00	
Power Supply:	3.45~4.33V, typ3.86V	
WLAN Mode Supported:	802.11a:	20 MHz channel bandwidth
	802.11n:	20 MHz / 40 MHz channel bandwidth
	802.11ac:	20 MHz / 40 MHz / 80 MHz channel bandwidth
Operation Frequency:	5150MHz to 5250MHz 5250MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz	
Modulation Type:	802.11a:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
	802.11n:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
	802.11ac:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing:	20MHz:	802.11a/n(HT20)/ac(VHT20)
	40MHz:	802.11n(HT40)/ac(VHT40)
	80MHz:	802.11ac(VHT80)
Antenna Type:	Cavity Antenna	
Antenna Gain:	5150MHz to 5250MHz: 1.56dBi; 5250MHz to 5350MHz: 0.4dBi; 5470MHz to 5725MHz: 2.6dBi; 5725MHz to 5850MHz: 2.47dBi;	
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.	
Smart System:	☒ SISO	802.11a/n/ac
	☐ MIMO	CDD: 802.11a/n/ac: Tx & Rx
		STBC: 802.11n/ac: Tx & Rx
		TXBF: 802.11n/ac: Tx & Rx
	☐ Diversity	802.11a: Tx & Rx

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TPC Function:	☒ Support, ☐ Not Support	
Use Conditions:	Client devices	
DFS Function:	☐ Master	
	☐ Slave with radar detection	☒ Slave without radar detection
RF Cable*:	1dB	
Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion. 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.		

Remark: In FCC 15.31, for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table, and the selected channel to perform the test as below:		
Frequency range over which device operates	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre

For UNII Band I:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5180
	The Middle channel	5200
	The Highest channel	5240
IEEE 802.11n/ac 40MHz	The Lowest channel	5190
	The Highest channel	5230
IEEE 802.11ac 80MHz	The Middle channel	5210

For UNII Band II-A:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ 20MHz	The Lowest channel	5260

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	The Middle channel	5280
	The Highest channel	5320
IEEE 802.11n/ac 40MHz	The Lowest channel	5270
	The Highest channel	5310
IEEE 802.11ac 80MHz	The Middle channel	5290

For UNII Band II-C:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5500
	The Middle channel	5580
	The Highest channel	5700
IEEE 802.11n/ac 40MHz	The Lowest channel	5510
	The Middle channel	5550
	The Highest channel	5670
IEEE 802.11ac 80MHz	The Middle channel	5530

For UNII Band III:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5745
	The Middle channel	5785
	The Highest channel	5825
IEEE 802.11n/ac 40MHz	The Lowest channel	5755
	The Highest channel	5795
IEEE 802.11ac 80MHz	The Middle channel	5775

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SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd

Report No.: SUCR241200051806

Rev.: 01

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2.5 Test Environment and Mode

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~23	3.86
Remark: NV: Normal Voltage NT: Normal Temperature		

2.6 Description of Support Units

Description	Manufacturer	Model No.
USB cable	HUIZHOU WASHIN ELECTRONICS CO.,LTD	HX-HQ-28
Remark: all above the information of table are provided by client.		

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
802.11a	6 Mbps	/
802.11n (HT 20)	MCS0 (6.5 Mbps)	/
802.11n (HT 40)	MCS0 (13.5 Mbps)	/
802.11ac (VHT 20)	MCS0 (6.5 Mbps)	/
802.11ac (VHT 40)	MCS0 (13.5 Mbps)	/
802.11ac (VHT 80)	MCS0 (29.3 Mbps)	/

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Wireless Laboratory

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3 Test results and Measurement Data

3.1 Antenna Requirement

Standard requirement:	47 CFR Part 15 Section 15.203
The antenna is Cavity Antenna and no consideration of replacement. The best case gain of the antenna is 5150MHz to 5250MHz: 1.56dBi; 5250MHz to 5350MHz: 0.4dBi; 5470MHz to 5725MHz: 2.6dBi; 5725MHz to 5850MHz: 2.47dBi; <i>Note:</i> <i>The antenna gain are derived from the gain information report provided by the manufacturer.</i> <i>Remark:</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>	

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3.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15 Section 15.207		
Test Method:	ANSI C63.10: 2013 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:	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 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		

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Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Refer to section 3.7 for details. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass

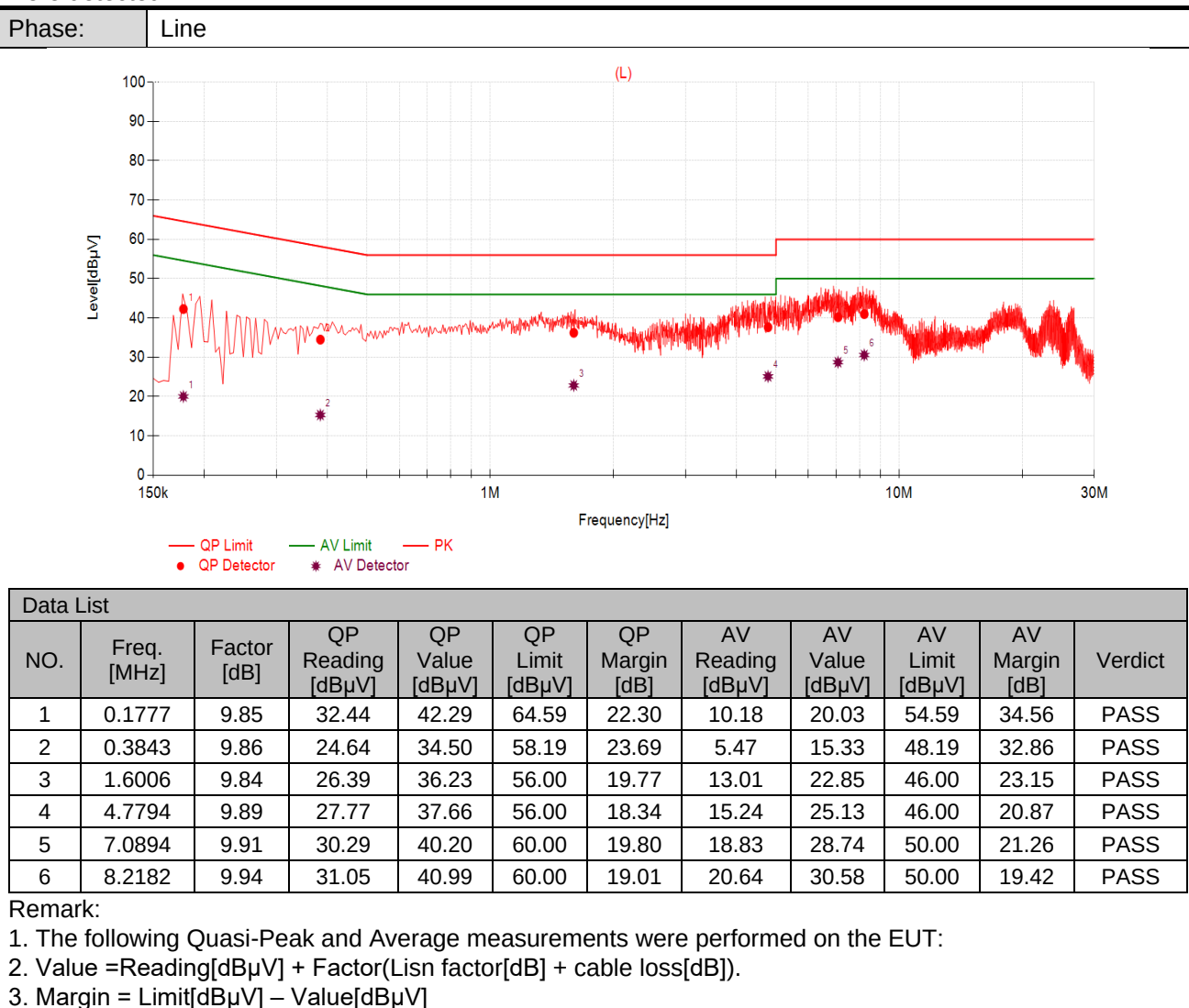
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Measurement Data

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.

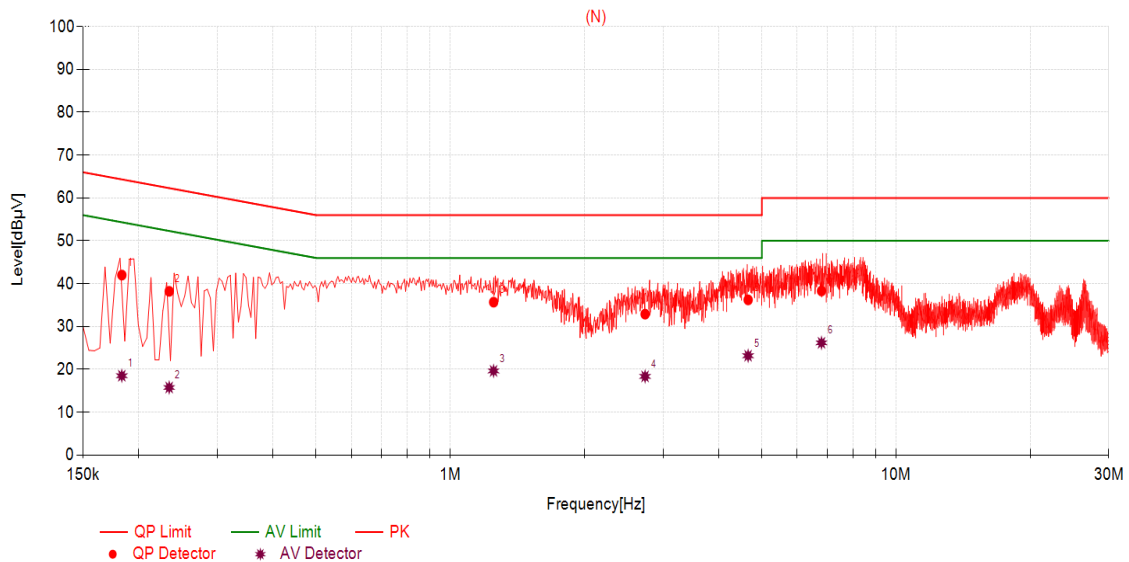


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Phase: Neutral



Data List											
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1832	9.82	32.20	42.02	64.34	22.32	8.70	18.52	54.34	35.82	PASS
2	0.2340	9.83	28.40	38.23	62.31	24.08	5.95	15.78	52.31	36.53	PASS
3	1.2503	9.81	25.89	35.70	56.00	20.30	9.84	19.65	46.00	26.35	PASS
4	2.7347	9.95	22.95	32.90	56.00	23.10	8.42	18.37	46.00	27.63	PASS
5	4.6568	9.98	26.25	36.23	56.00	19.77	13.21	23.19	46.00	22.81	PASS
6	6.8042	10.06	28.26	38.32	60.00	21.68	16.15	26.21	50.00	23.79	PASS

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Value = Reading[dBμV] + Factor(Lin factor[dB] + cable loss[dB]).

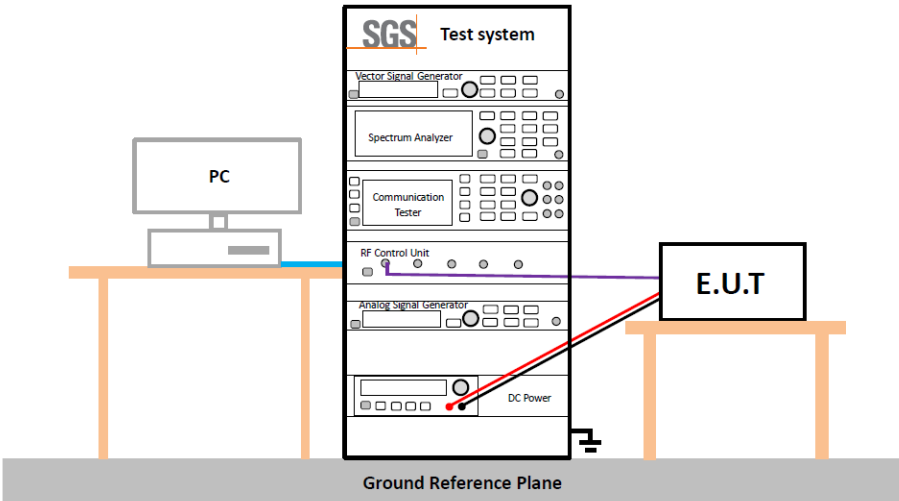
3. Margin = Limit[dBμV] – Value[dBμV]

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3.3 Duty Cycle

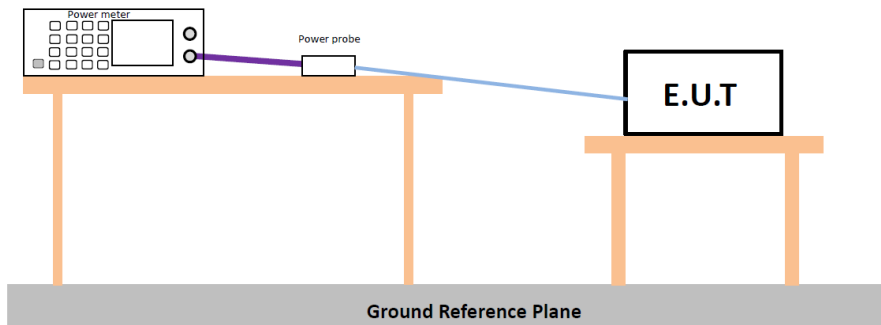
Test Requirement:	ANSI C63.10 :2013 Section 12.2
Test Method:	ANSI C63.10 :2013 Section 12.2
Test Setup:	
Instruments Used:	Refer to section 6 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	No restriction limits
Test Results:	For report purpose
The detailed test data see: Appendix	

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3.4 Conducted Output Power

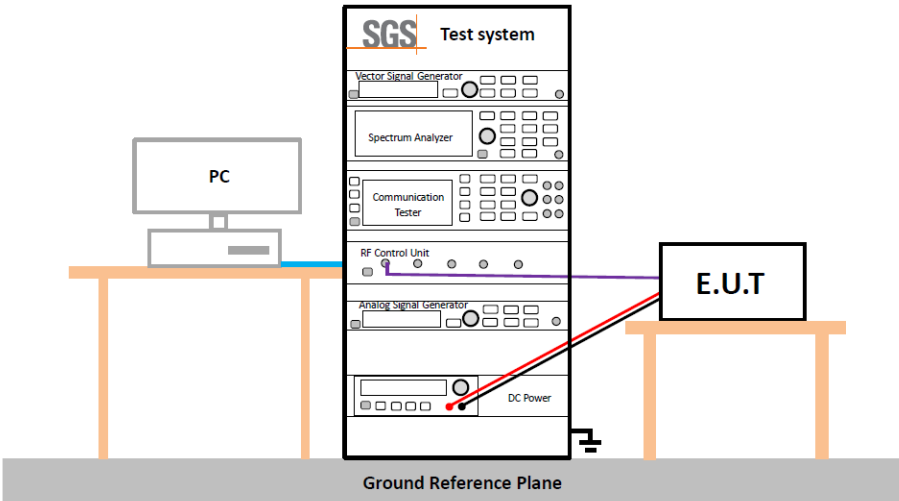
Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10 :2013 Section 12.3.3.2	
Test Setup:	 * Test with power meter (Detector function: Average) Method PM-G is measurement using a gated RF average power meter. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.	
Test Instruments:	Refer to section 6 for details.	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Refer to section 3.7 for details.	
Limit:	Frequency Band	Limit
	5150-5250MHz	Not exceed 250mW(23.98dBm)
	5250-5350MHz	The lesser of 250mW(23.98dBm) or 11+ 10logB
	5470-5725MHz	The lesser of 250mW(23.98dBm) or 11+ 10logB
	5725-5850MHz	Not exceed 1W(30dBm)
	*Where B is the 26dB emission bandwidth in MHz	
Test Results:	Pass	
The detailed test data see: Appendix		

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3.5 26dB Emission Bandwidth

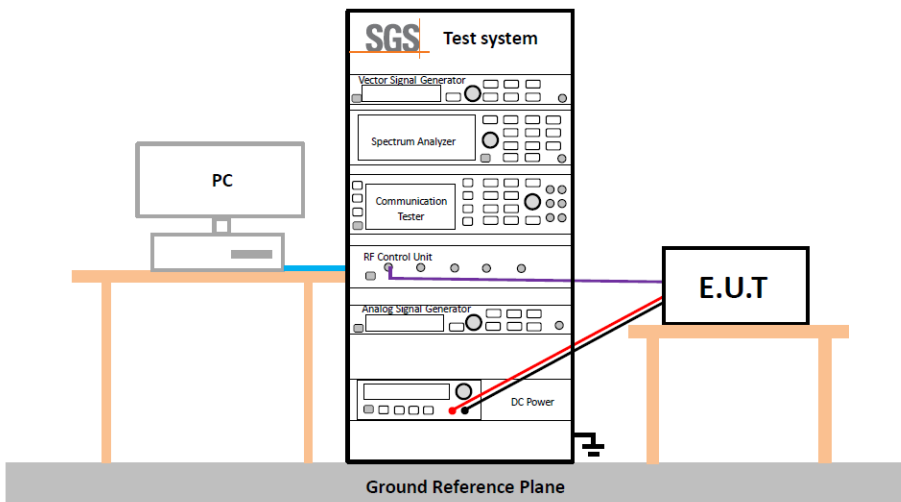
Test Requirement:	47 CFR Part 15 Section 15.407(a), KDB 789033 D02& C
Test Method:	ANSI C63.10: 2013 Section 12.4.1
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	No restriction limits
Test Results:	For Report Purpose
The detailed test data see: Appendix	

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3.6 6dB Emission Bandwidth

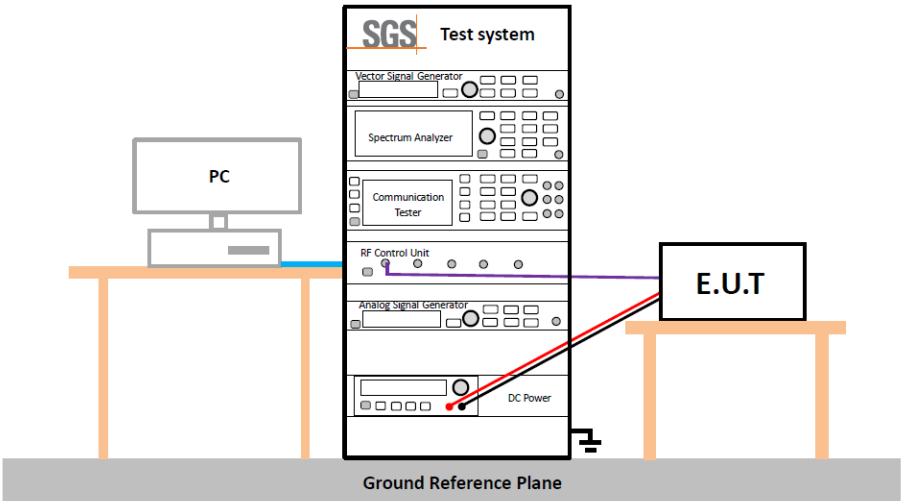
Test Requirement:	47 CFR Part 15 Section 15.407(e)		
Test Method:	ANSI C63.10: 2013 Section 12.4.1		
Test Setup:			
Test Instruments:	Refer to section 6 for details.		
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates		
Final Test Mode:	Refer to section 3.7 for details.		
Limit:	Frequency Band	Limit	
	5725-5850MHz	At least 500kHz	
Test Results:	Pass		
The detailed test data see: Appendix			

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3.7 99% Occupied Bandwidth

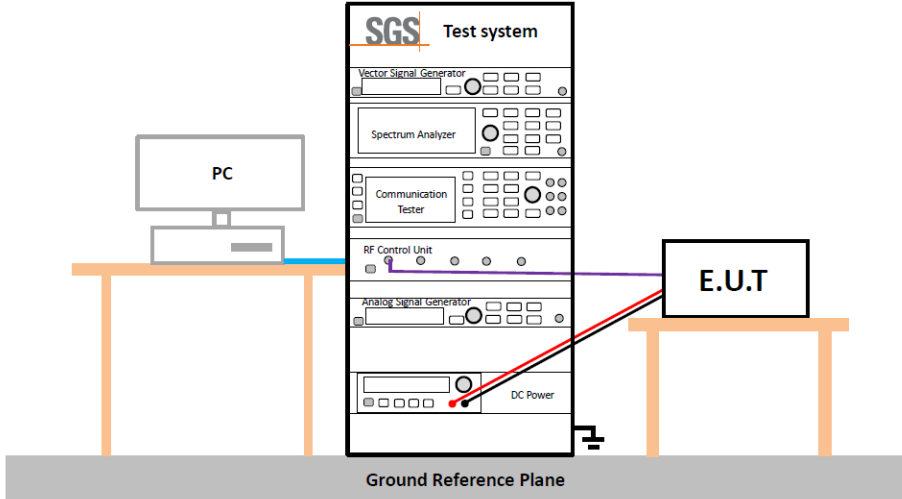
Test Requirement:	KDB 789033 D02§ D
Test Method:	ANSI C63.10: 2013 Section 12.4.2
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	No restriction limits
Test Results:	For Report Purpose
The detailed test data see: Appendix	

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3.8 Power Spectral Density

Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10: 2013 Section 12.5 KDB 789033 D02 v02r01, Section F.	
Test Setup:		
Instruments Used:	Refer to section 6 for details.	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Refer to section 3.7 for details.	
Limit:	Frequency Band	Limit
	5150-5250MHz	The power spectral density less than 11dBm/1MHz
	5250-5350MHz	The power spectral density less than 11dBm/1MHz
	5470-5725MHz	The power spectral density less than 11dBm/1MHz
	5725-5850MHz	The power spectral density less than <30dBm/500KHz
Test Results:	Pass	
The detailed test data see: Appendix		

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3.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15 Section 15.205 and 15.209
Test Method:	ANSI C63.10: 2013 Section 6.4 / 6.5 / 6.6
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)
Test frequency:	9kHz ~ 40GHz(or 10 Harmonic)

Test Setup:

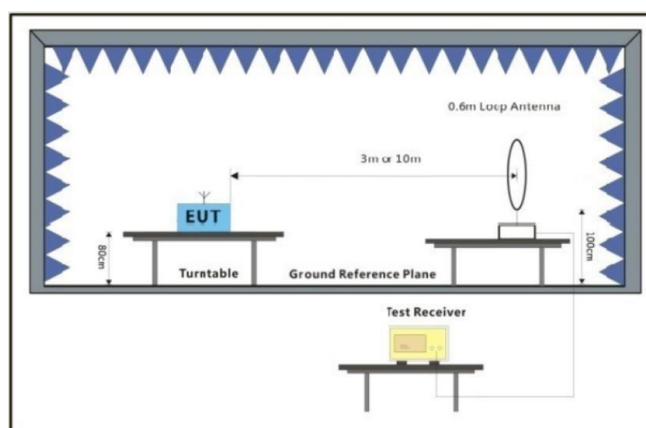


Figure 1. 9kHz to 30MHz

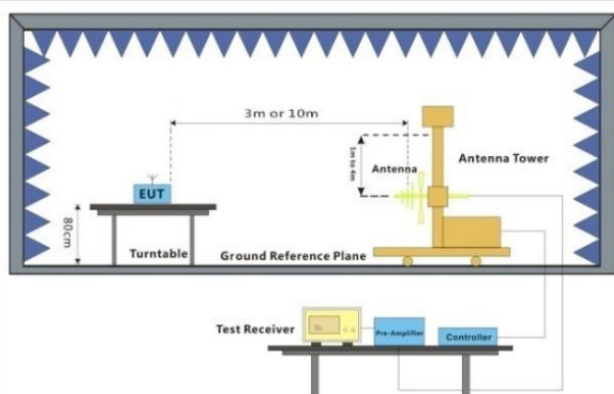


Figure 1. 30MHz to 1GHz

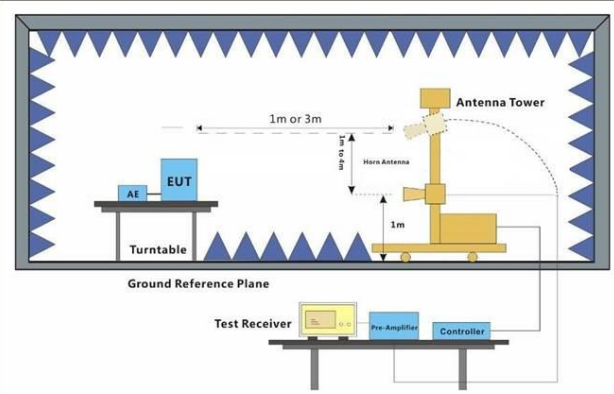


Figure 2. Above 1 GHz

Test Procedure:	a. For below 1GHz test, 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 test, 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.
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	(Distance from antenna to EUT is 1m for measurements >18GHz). 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. Test the EUT in the outermost channels. 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. i. Repeat above procedures until all frequencies measured was complete. 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 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. l. At a measurement distance of 1 meter the limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54 \text{ dB}$.
Test Configuration:	Measurements below 30MHz • RBW = 10 kHz • VBW = 30 kHz • Detector = Peak & Average & Quasi-peak • Trace mode = max hold Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW $\geq$ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz

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	• RBW = 1 MHz • VBW = 10Hz, 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.
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 6 for details.
Test Results:	Pass
The detailed test data see: Appendix	

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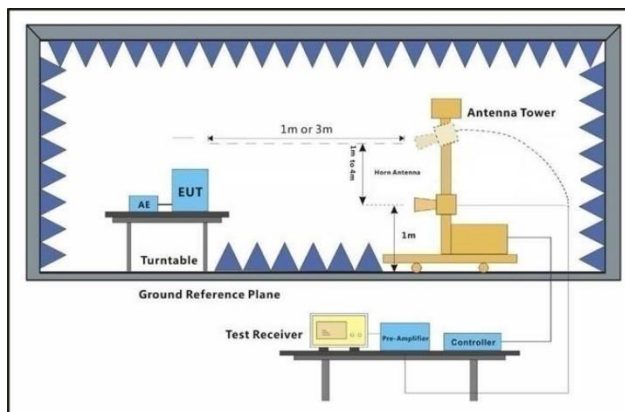
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3.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15 Section 15.407(b)		
Test Method:	ANSI C63.10: 2013 Section 12.7		
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:



Test Procedure:

- 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.
- The EUT was set 3 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 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.

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	f. 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 channel. g. Test the EUT in the outermost channels. 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. i. Repeat above procedures until all frequencies measured was complete.
Test Configuration:	Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW $\geq$ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • RBW = 1 MHz • VBW = 10Hz, 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.
Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass
The detailed test data see: Appendix	

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3.11 Dynamic Frequency Selection

3.11.1 DFS Overview

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
<i>Non-Occupancy Period</i>	Yes	Not required	Yes
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Availability Check Time</i>	Yes	Not required	Not required
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>DFS Detection Threshold</i>	Yes	Not required
<i>Channel Closing Transmission Time</i>	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not required

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Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>U-NII Detection Bandwidth and Statistical Performance Check</i>	All BW modes must be tested	Not required
<i>Channel Move Time and Channel Closing Transmission Time</i>	Test using widest BW mode available	Test using the widest BW mode available for the link
<i>All other tests</i>	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

3.11.2 DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP $\geq$ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

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3.11.3 RADAR TEST WAVEFORMS

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

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Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4. For example, the following table indicates how to compute the aggregate of percentage of successful detections.

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detection
1	35	29	82.9%
2	30	18	60%
3	30	27	90%
4	50	44	88%
Aggregate $(82.9\% + 60\% + 90\% + 88\%) / 4 = 80.2\%$			

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Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per <i>Burst</i>	Number of <i>Bursts</i>	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

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3.11.4 Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

The detailed test data see: **Appendix**

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

Lab A:		
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%
5	Duty Cycle	±0.37%
6	Occupied Bandwidth	1%
Lab C:		
No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
2	Radiated Emission	± 4.6dB (9KHz~30MHz)
		± 4.9dB (30MHz~1GHz)
		± 4.9dB (1GHz to 6GHz)
		± 4.7dB (6GHz to 18GHz)
		± 5.26dB (Above 18GHz)
Remark: The U _{lab} (lab Uncertainty) is less than U _{cispr/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.		

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5 Equipment List

Lab A:					
RF Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	SUWI-04-08-01	2022/11/9	2025/11/8
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2024/2/18	2025/2/17
Signal Analyzer	ROHDE&SCHWARZ	FSV3030	SUWI-01-02-02	2024/5/8	2025/5/7
Measurement Software	Tonscend	TST272 V2.0	SUWI-03-55-03	NCR	NCR
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2024/5/8	2025/5/7
Temperature Chamber	ESPEC	SU-242	SUWI-01-13-02	2024/5/9	2025/5/8
Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-05	2024/2/4	2025/2/3
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2024/2/4	2025/2/3
Power meter	Anritsu	ML2495A	SUWI-01-31-01	2024/11/19	2025/11/18
Pulse power sensor	Anritsu	MA2411B	SUWI-01-32-01	2024/11/19	2025/11/18
MXG Vector signal genitor	KEYSIGHT	N5182B	SUWI-01-38-01	2024/2/4	2025/2/3
Router	ASUS	GT-AXE11000(FCC ID MSQ-RTAXJF00)	SUWI-03-14-02	NCR	NCR
Router	TP-LINK	Archer BE800 (FCC ID 2AXJ4BE800)	SUWI-03-14-03	NCR	NCR
RF Control Unit	Tonscend	JS0806-1	SUWI-02-20-01	NCR	NCR
RF Control Unit	TST	TSCB3023R2	SUWI-02-21-01	NCR	NCR
Signal Generator	ROHDE&SCHWARZ	SMM100A	SUWI-01-07-04	20242/16	2025/2/15
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-07	2024/11/19	2025/11/18

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Lab C:					
CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW04-03-01	N/A	N/A
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2024/8/29	2025/8/28
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2024/7/3	2025/7/2
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2024/9/3	2025/9/2
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-07-01	NCR	NCR
Wireless Test platform	StarPoint	SP9500E	XAW01-45-02	2024/5/14	2025/5/13
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-07	2024/8/16	2025/8/15
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-02	2024/7/3	2025/7/2

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Wireless Laboratory

South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone 215000 t (86-512) 62992980 www.sgsgroup.com.cn

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Lab C:					
RSE Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2024/6/4	2027/6/3
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2024/2/2	2025/2/1
Spectrum Analyzer	ROHDE&SCHWARZ	FSV3044	XAW01-13-05	2024/5/8	2025/5/7
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2024/8/29	2025/8/28
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2022/7/28	2025/7/27
Receiving antenna(1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2022/7/28	2025/7/27
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2022/7/23	2025/7/22
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP9K3G32	XAW01-41-01	2024/5/14	2025/5/13
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2024/8/29	2025/8/28
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2024/8/16	2025/8/15
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2024/8/29	2025/8/28
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2024/9/3	2025/9/2
Wireless Test platform	StarPoint	SP9500E	XAW01-45-02	2024/5/14	2025/5/13
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-07	2024/8/16	2025/8/15
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-05-01	NCR	NCR
Radio Communication Analyzer	ANRITSU	MT8821	XAW01-03-24	2024/8/16	2025/8/15
Loop Antenna	Schwarzbeck	FMZB 1519B	XAW01-48-02	2024/5/23	2026/5/22

Remark: NCR=No Calibration Requirement.

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6 Photographs - Setup Photos

Refer to Appendix A.2 BT&WLAN&EMR Setup Photos.

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7 Appendix

1. Duty Cycle

1.1 Test Result

1.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11a	SISO	5180	1.392	1.428	97.48	0.11	0.03
802.11n (HT20)	SISO	5180	1.300	1.336	97.31	0.12	0.04
802.11n (HT40)	SISO	5190	0.649	0.684	94.88	0.23	0.03
802.11ac (VHT20)	SISO	5180	1.312	1.348	97.33	0.12	0.03
802.11ac (VHT40)	SISO	5190	0.652	0.687	94.91	0.23	0.03
802.11ac (VHT80)	SISO	5210	0.324	0.359	90.25	0.45	0.04

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2. Bandwidth

2.1 Test Result

2.1.1 OBW

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5180	1	17.743	/	Pass
		5200	1	17.750	/	Pass
		5240	1	17.720	/	Pass
		5260	1	17.679	/	Pass
		5300	1	17.741	/	Pass
		5320	1	17.336	/	Pass
		5500	1	17.722	/	Pass
		5580	1	17.857	/	Pass
		5700	1	17.824	/	Pass
		5745	1	17.805	/	Pass
		5785	1	17.937	/	Pass
802.11n (HT20)	SISO	5825	1	18.032	/	Pass
		5180	1	18.345	/	Pass
		5200	1	18.324	/	Pass
		5240	1	18.342	/	Pass
		5260	1	18.307	/	Pass
		5300	1	18.333	/	Pass
		5320	1	18.277	/	Pass
		5500	1	18.339	/	Pass
		5580	1	18.381	/	Pass
		5700	1	18.392	/	Pass
		5745	1	18.407	/	Pass
802.11n (HT40)	SISO	5785	1	18.377	/	Pass
		5825	1	18.394	/	Pass
		5190	1	37.014	/	Pass
		5230	1	36.979	/	Pass
		5270	1	37.067	/	Pass
		5310	1	37.109	/	Pass
		5510	1	36.985	/	Pass
		5550	1	36.822	/	Pass
		5670	1	37.013	/	Pass
802.11ac (VHT20)	SISO	5755	1	37.038	/	Pass
		5795	1	36.999	/	Pass
		5180	1	18.154	/	Pass
		5200	1	18.189	/	Pass
		5240	1	18.184	/	Pass
		5260	1	18.162	/	Pass
		5300	1	18.133	/	Pass
		5320	1	18.136	/	Pass
		5500	1	18.179	/	Pass

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		5580	1	18.196	/	Pass
		5700	1	18.193	/	Pass
		5745	1	18.220	/	Pass
		5785	1	18.159	/	Pass
		5825	1	18.173	/	Pass
802.11ac (VHT40)	SISO	5190	1	36.702	/	Pass
		5230	1	36.619	/	Pass
		5270	1	36.636	/	Pass
		5310	1	36.669	/	Pass
		5510	1	36.699	/	Pass
		5550	1	36.709	/	Pass
		5670	1	36.732	/	Pass
		5755	1	36.780	/	Pass
802.11ac (VHT80)	SISO	5795	1	36.667	/	Pass
		5210	1	75.348	/	Pass
		5290	1	75.346	/	Pass
		5530	1	75.296	/	Pass
		5775	1	75.459	/	Pass

2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5745	1	15.180	>=0.5	Pass
		5785	1	15.184	>=0.5	Pass
		5825	1	15.375	>=0.5	Pass
802.11n (HT20)	SISO	5745	1	15.183	>=0.5	Pass
		5785	1	15.191	>=0.5	Pass
		5825	1	15.189	>=0.5	Pass
802.11n (HT40)	SISO	5755	1	35.168	>=0.5	Pass
		5795	1	35.172	>=0.5	Pass
802.11ac (VHT20)	SISO	5745	1	15.184	>=0.5	Pass
		5785	1	15.189	>=0.5	Pass
		5825	1	15.188	>=0.5	Pass
802.11ac (VHT40)	SISO	5755	1	35.174	>=0.5	Pass
		5795	1	35.175	>=0.5	Pass
802.11ac (VHT80)	SISO	5775	1	75.184	>=0.5	Pass

2.1.3 26dB BW

Mode	TX Type	Frequency (MHz)	ANT	26dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5180	1	22.165	/	Pass
		5200	1	23.221	/	Pass
		5240	1	23.077	/	Pass
		5260	1	24.874	/	Pass

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		5300	1	23.339	/	Pass
		5320	1	20.044	/	Pass
		5500	1	23.348	/	Pass
		5580	1	23.803	/	Pass
		5700	1	25.548	/	Pass
802.11n (HT20)	SISO	5180	1	20.383	/	Pass
		5200	1	20.447	/	Pass
		5240	1	20.330	/	Pass
		5260	1	20.391	/	Pass
		5300	1	20.385	/	Pass
		5320	1	20.372	/	Pass
		5500	1	20.343	/	Pass
		5580	1	20.286	/	Pass
802.11n (HT40)	SISO	5700	1	20.334	/	Pass
		5190	1	41.842	/	Pass
		5230	1	40.935	/	Pass
		5270	1	41.101	/	Pass
		5310	1	41.187	/	Pass
		5510	1	40.666	/	Pass
802.11ac (VHT20)	SISO	5550	1	40.964	/	Pass
		5670	1	40.929	/	Pass
		5180	1	20.430	/	Pass
		5200	1	20.466	/	Pass
		5240	1	20.372	/	Pass
		5260	1	20.449	/	Pass
		5300	1	20.361	/	Pass
		5320	1	20.378	/	Pass
802.11ac (VHT40)	SISO	5500	1	20.356	/	Pass
		5580	1	20.401	/	Pass
		5700	1	20.539	/	Pass
		5190	1	41.175	/	Pass
		5230	1	41.055	/	Pass
		5270	1	41.211	/	Pass
		5310	1	41.031	/	Pass
802.11ac (VHT80)	SISO	5510	1	40.866	/	Pass
		5550	1	41.007	/	Pass
		5670	1	41.130	/	Pass
		5210	1	81.539	/	Pass
		5290	1	81.681	/	Pass
		5530	1	81.485	/	Pass

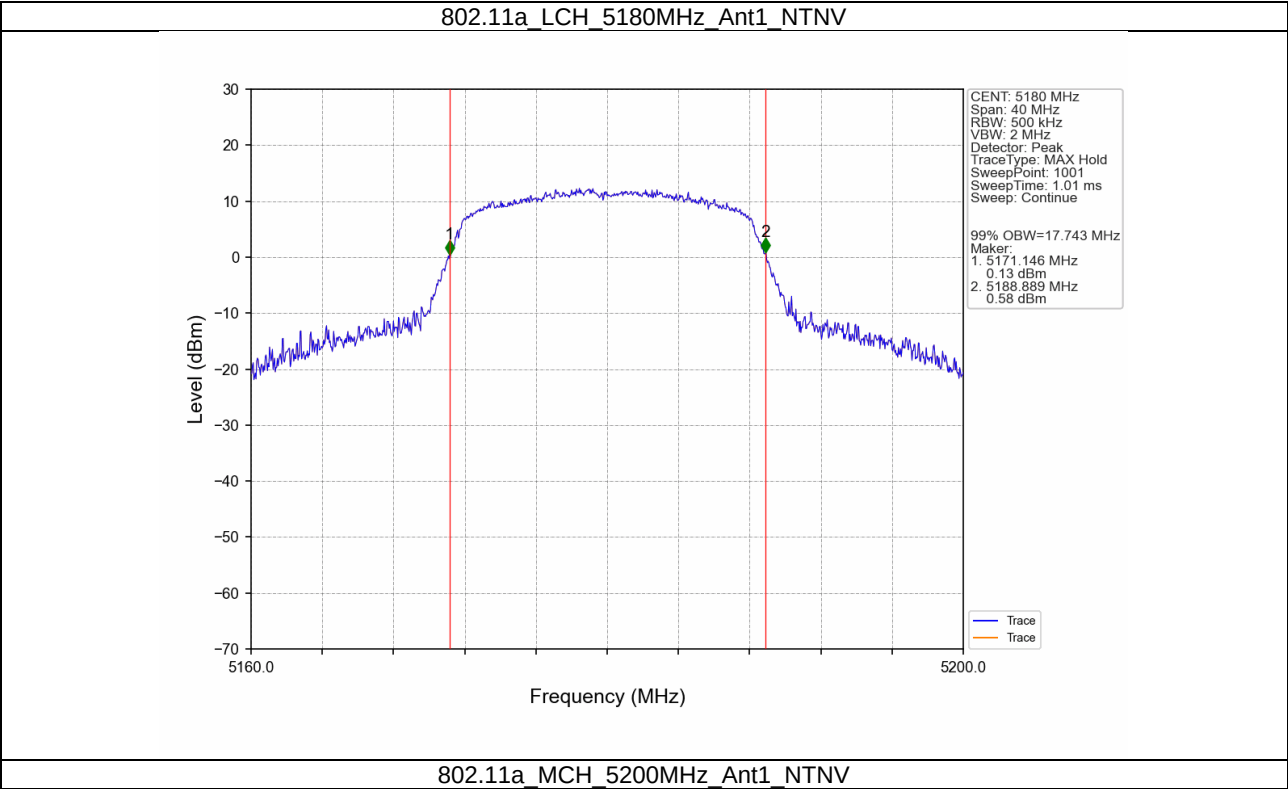
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2.2 Test Graph

2.2.1 OBW



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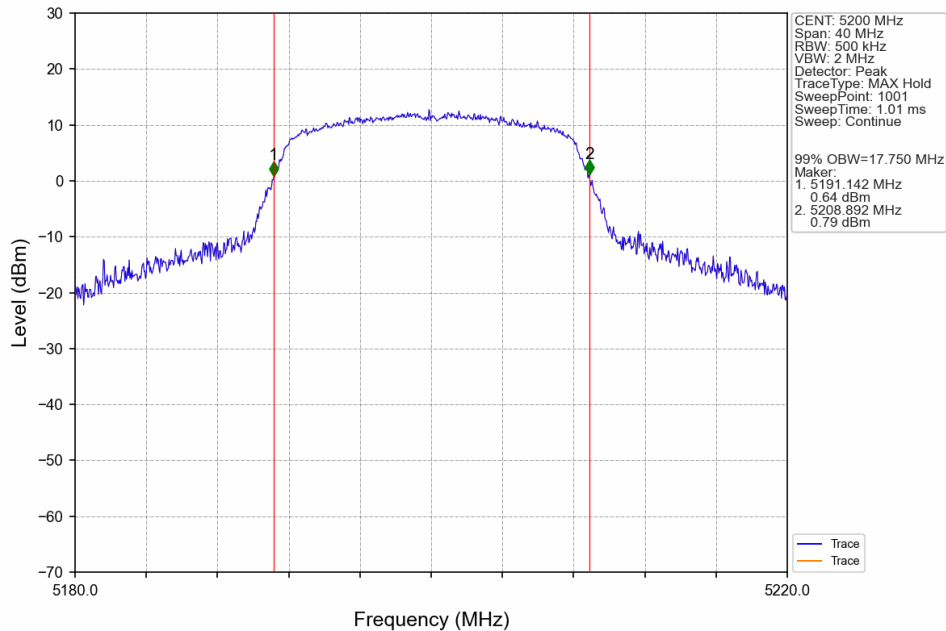
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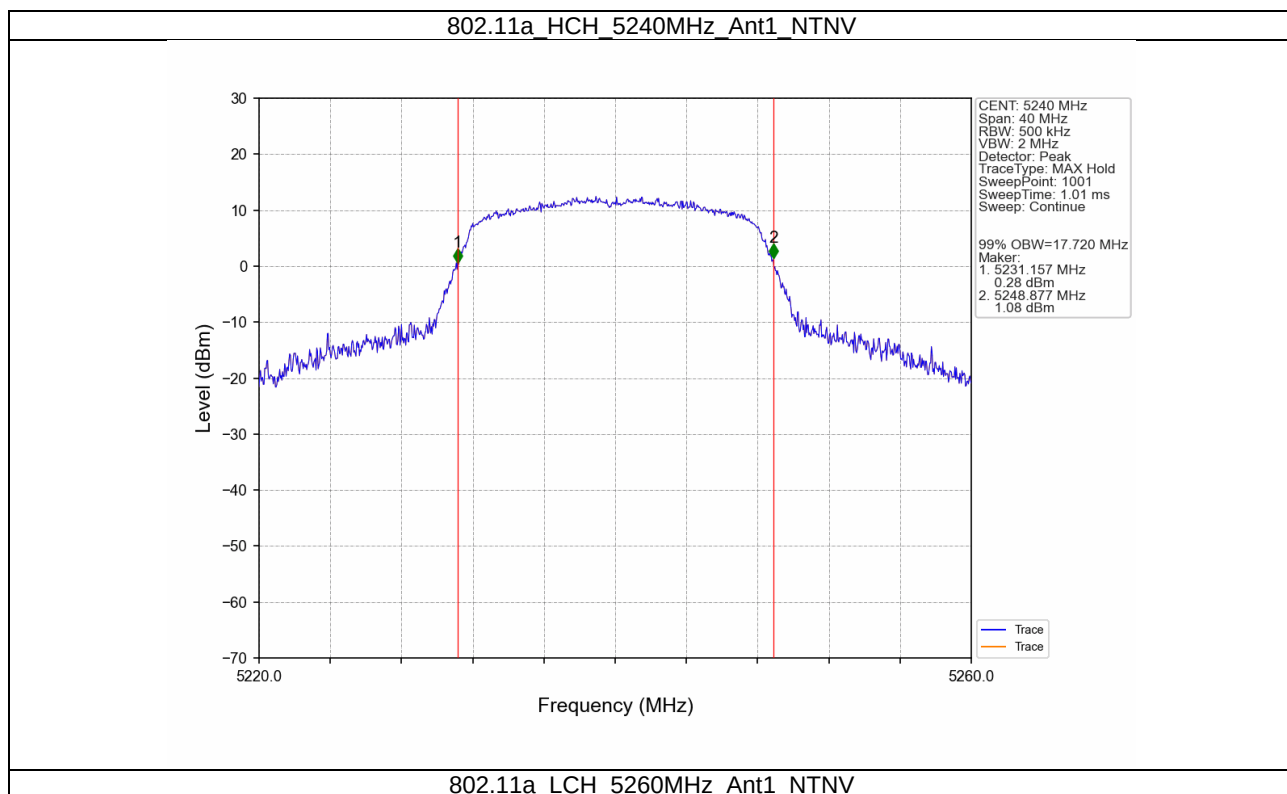
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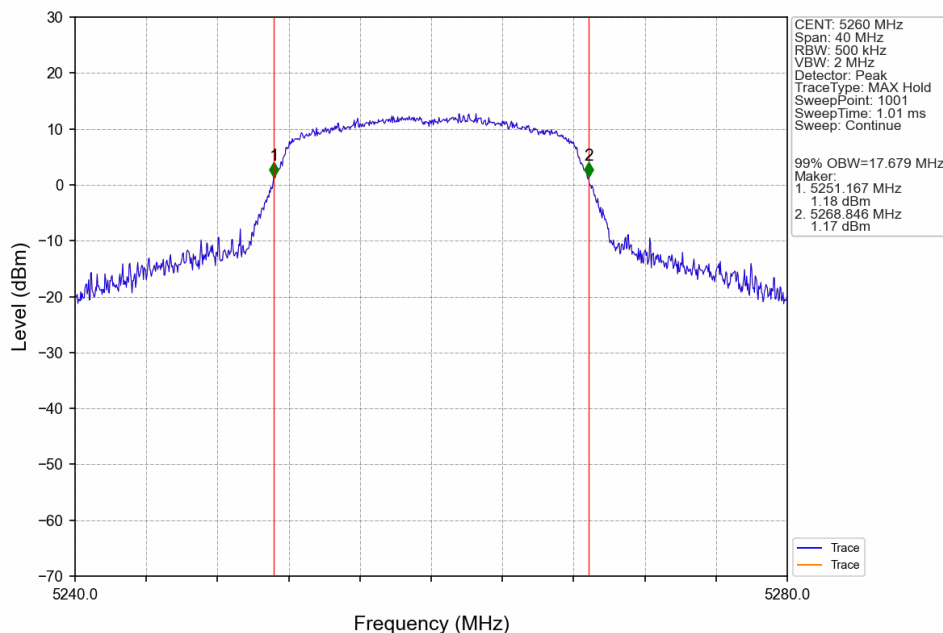
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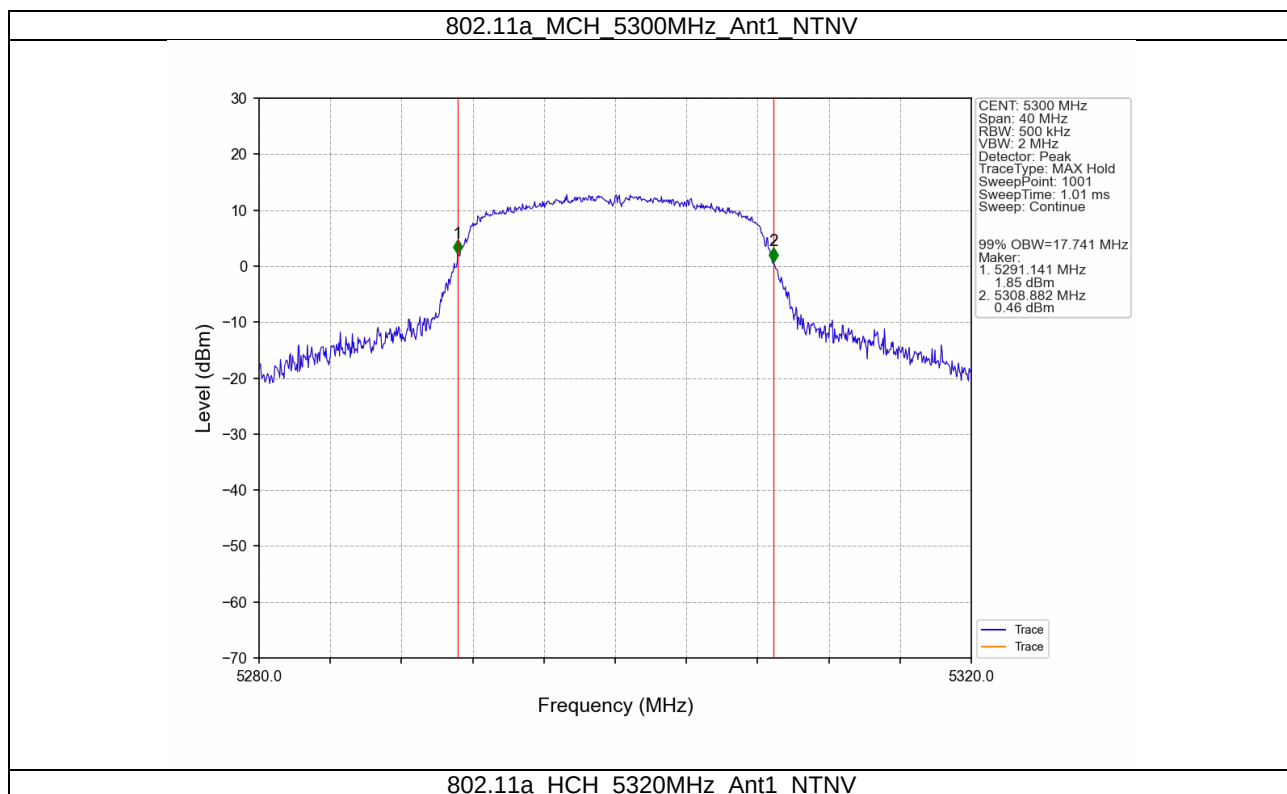
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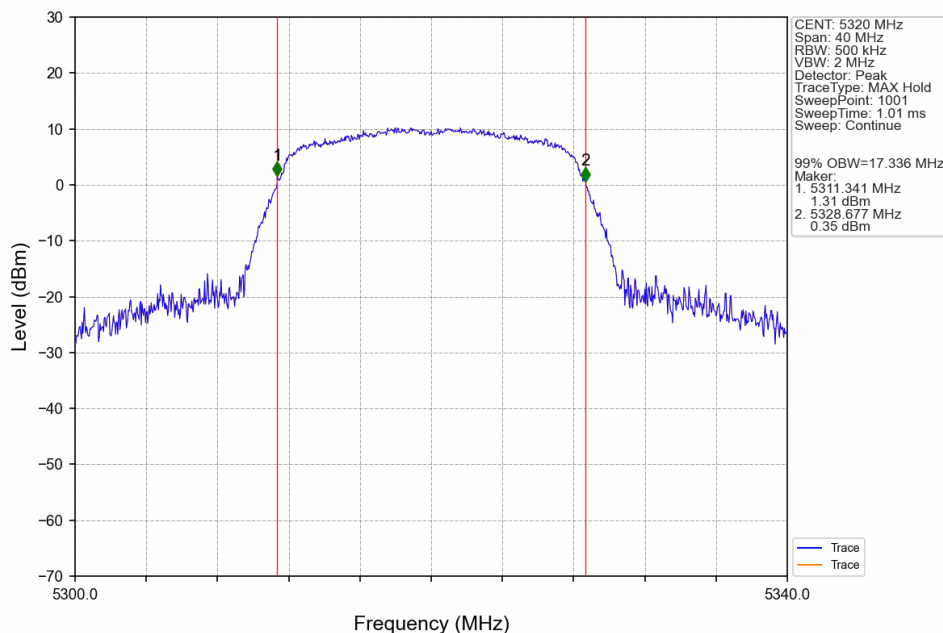
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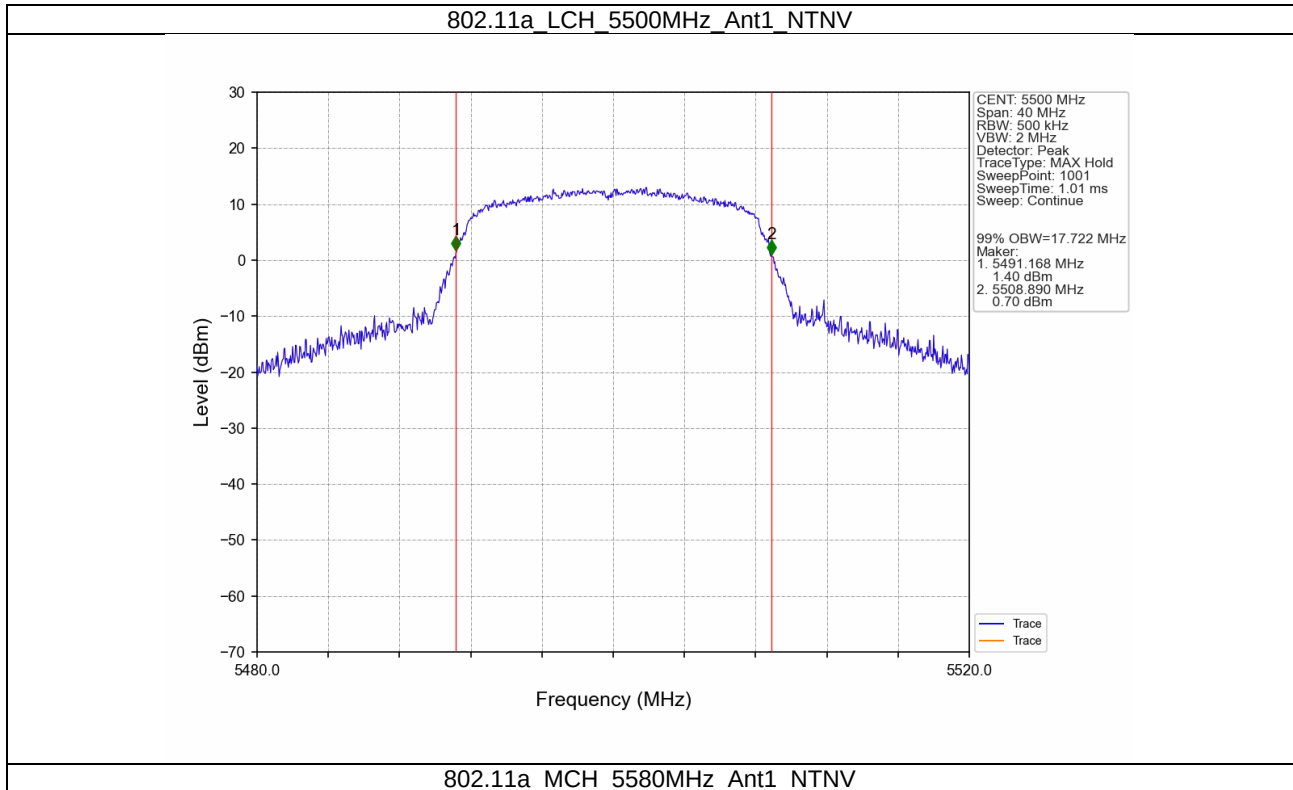
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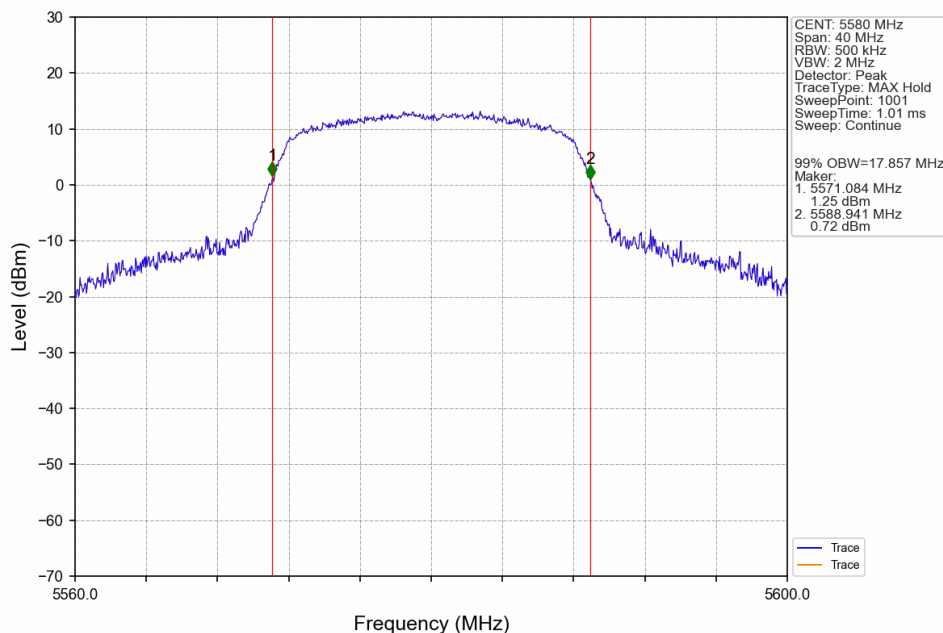
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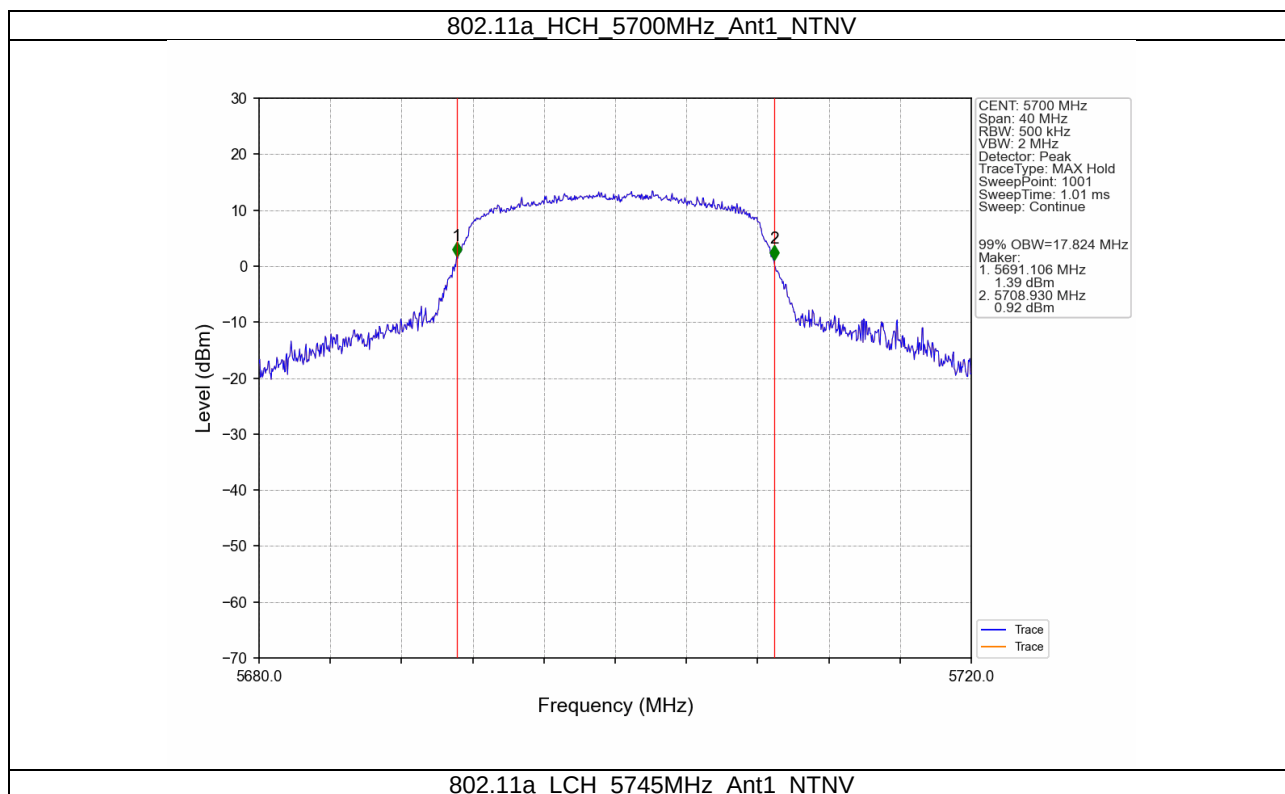
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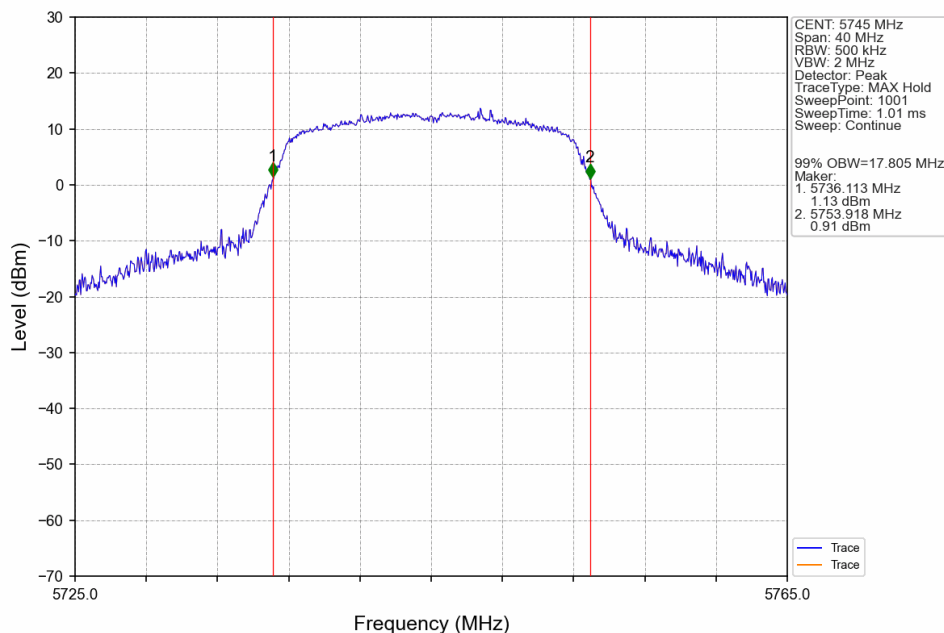
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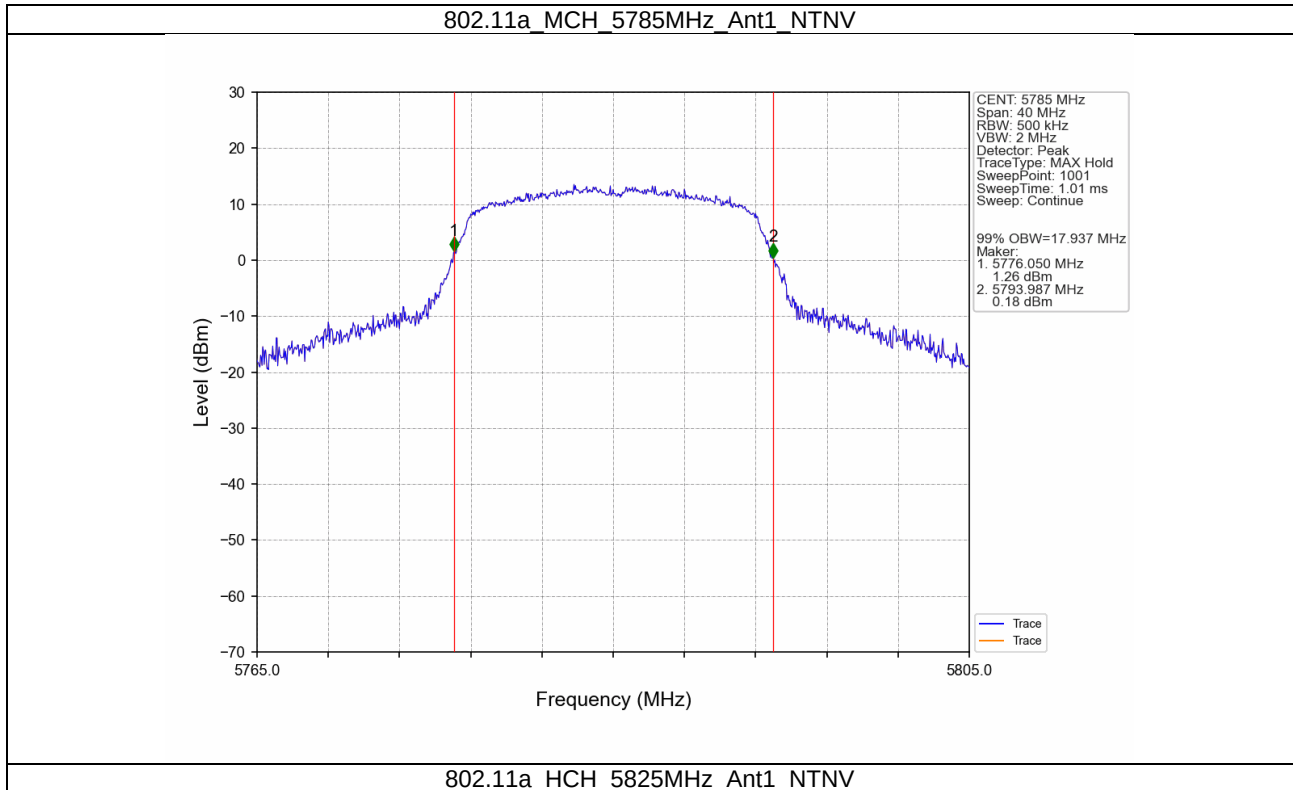
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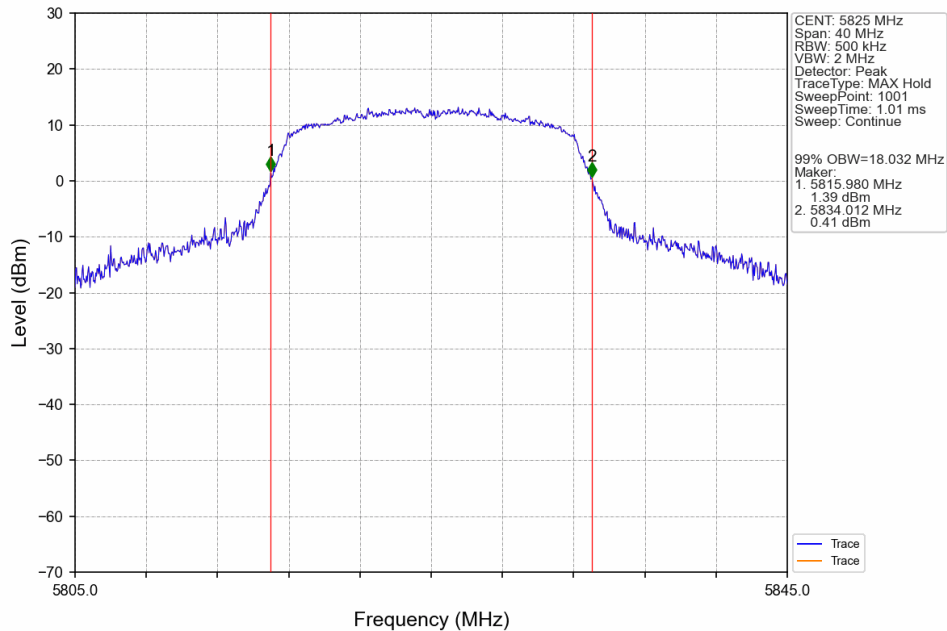
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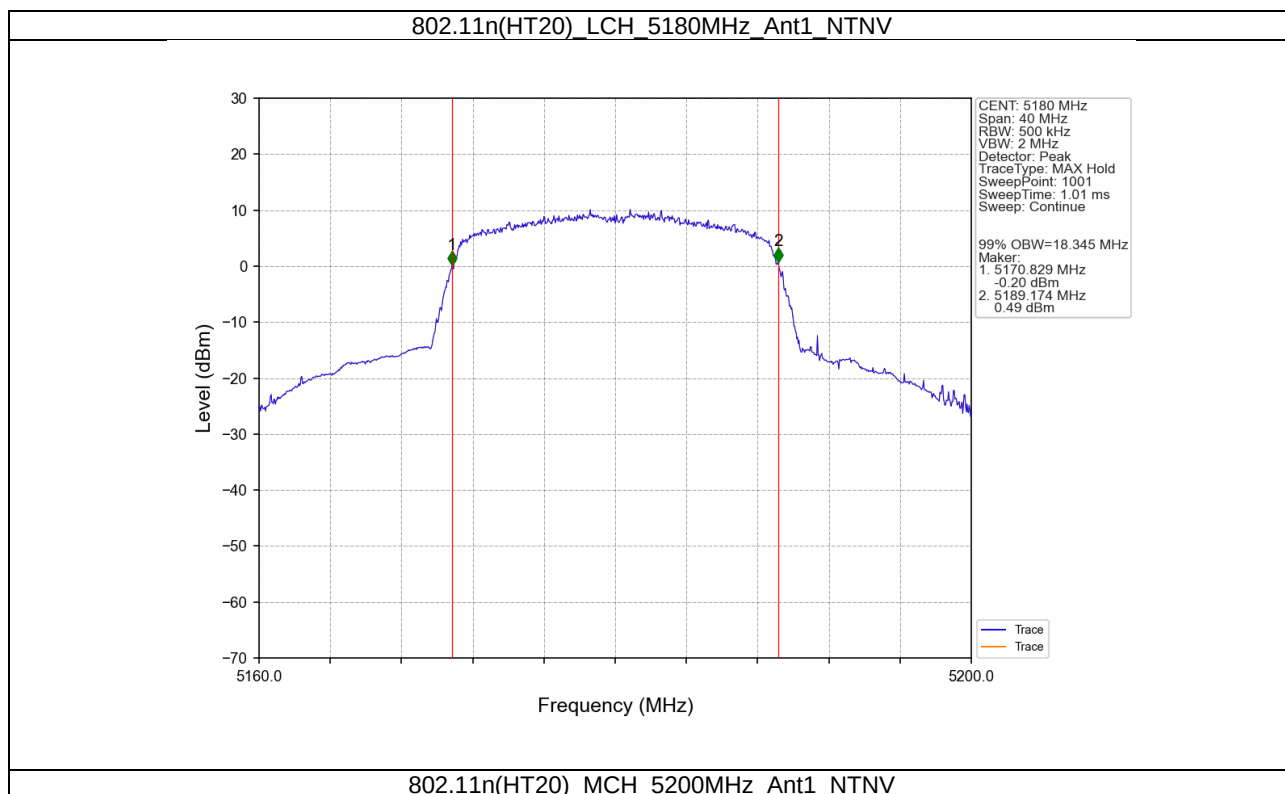
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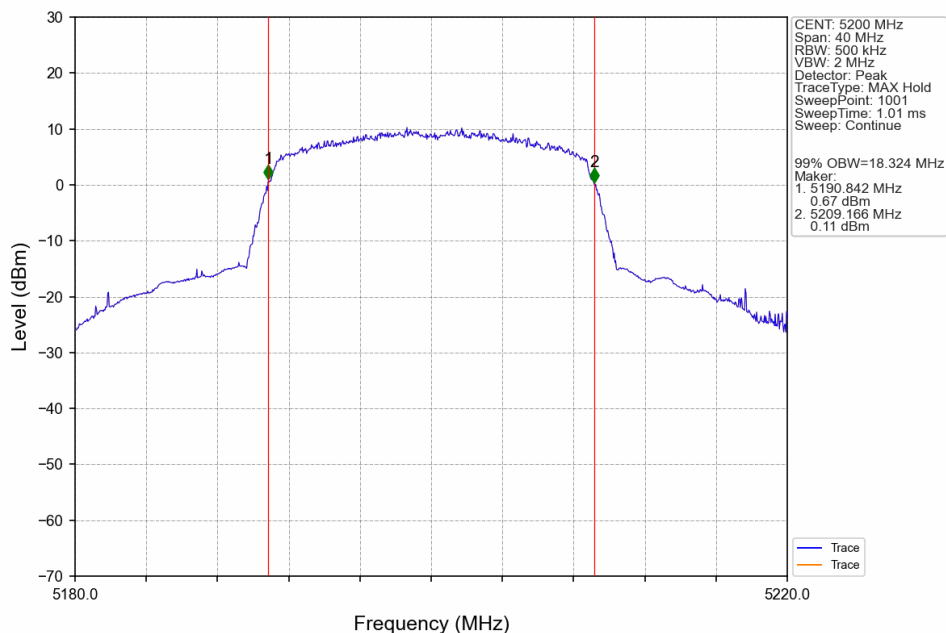
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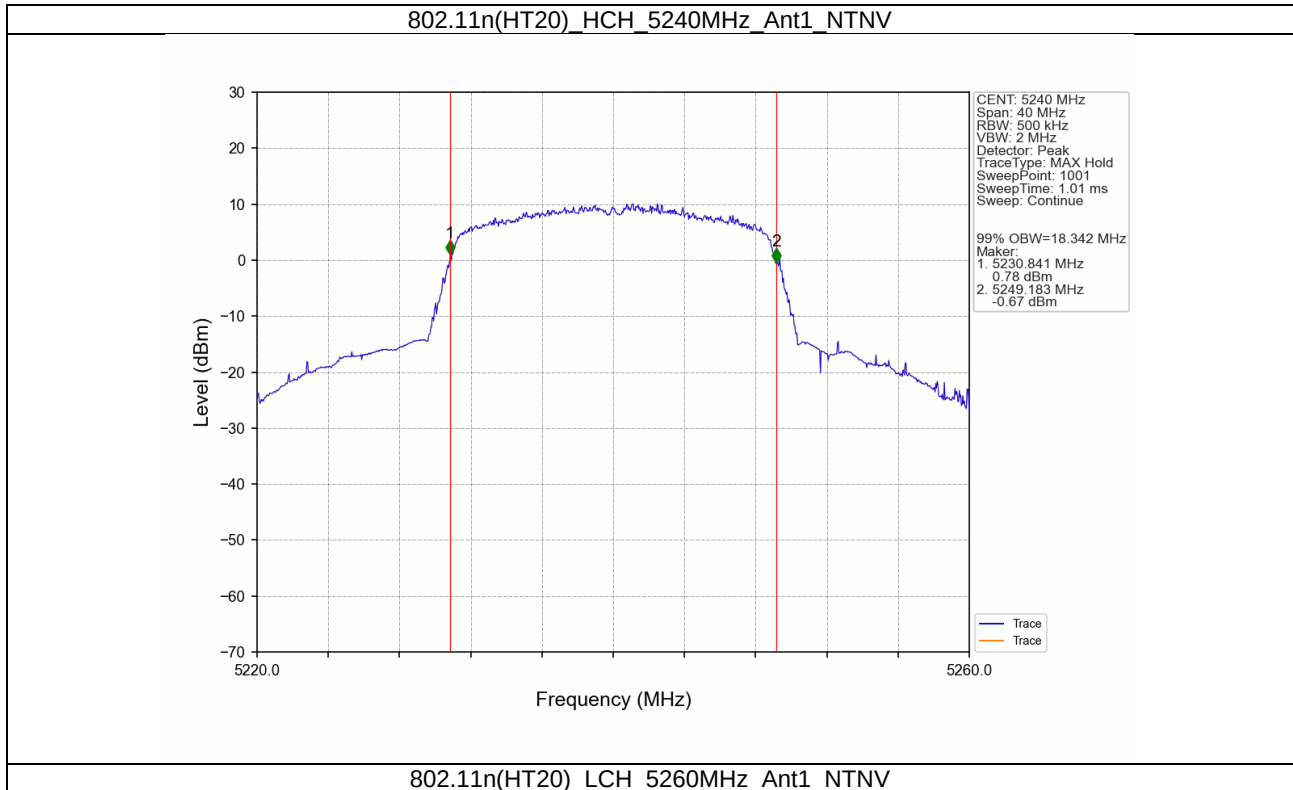
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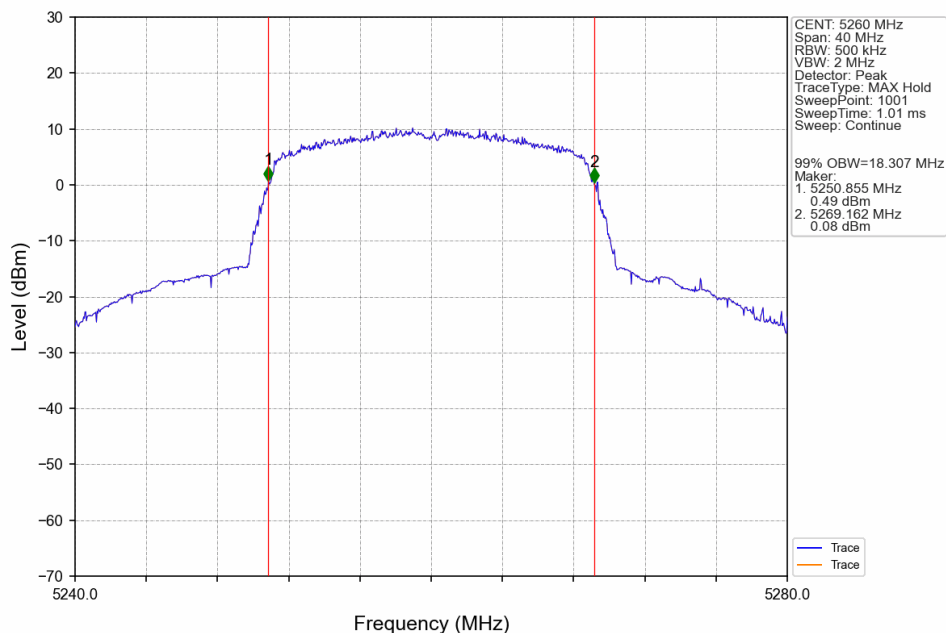
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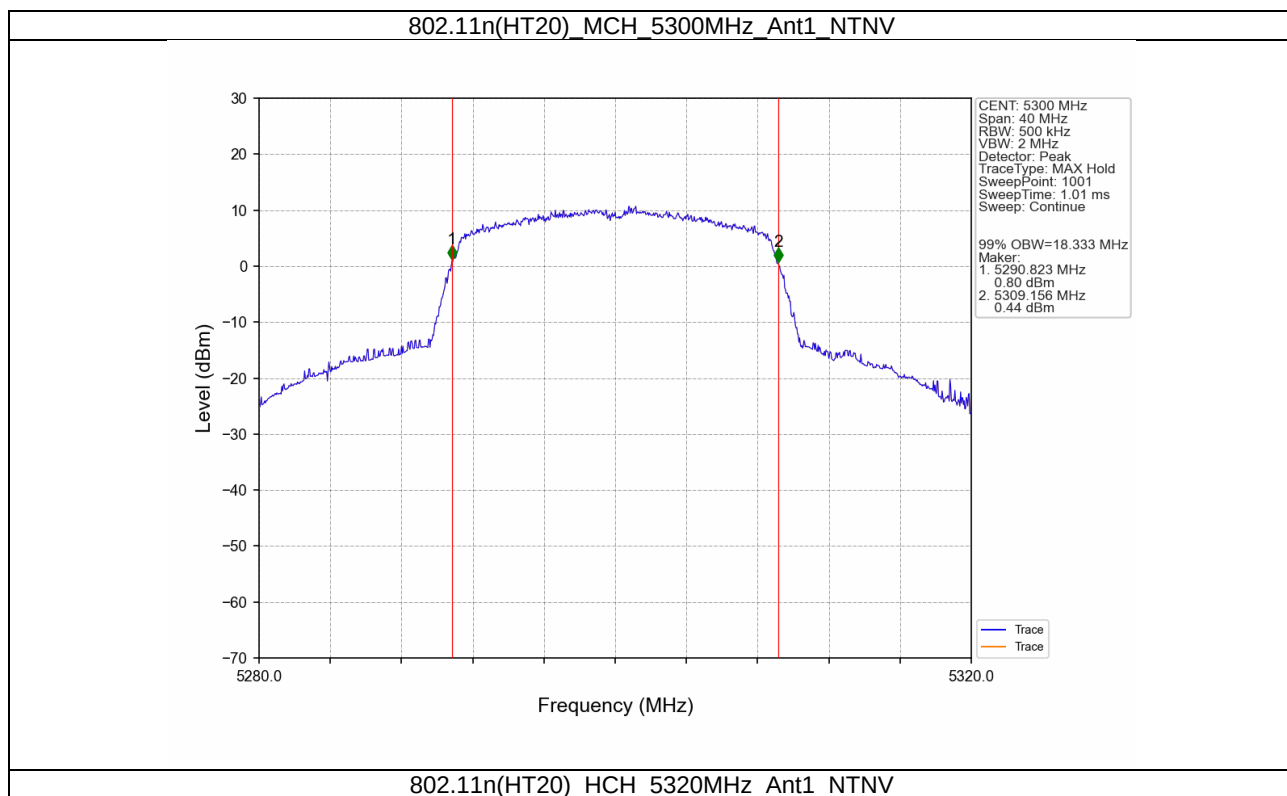
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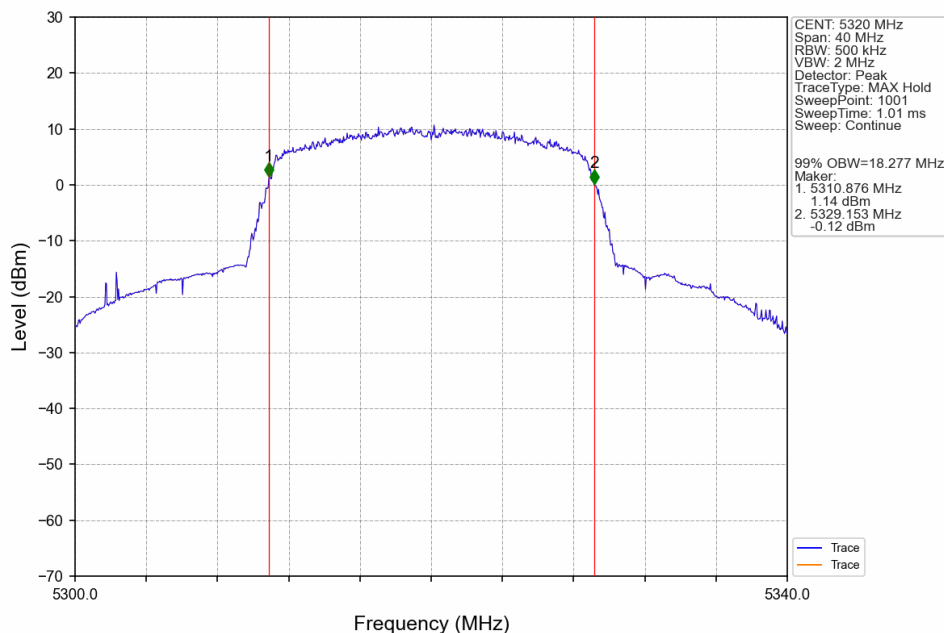
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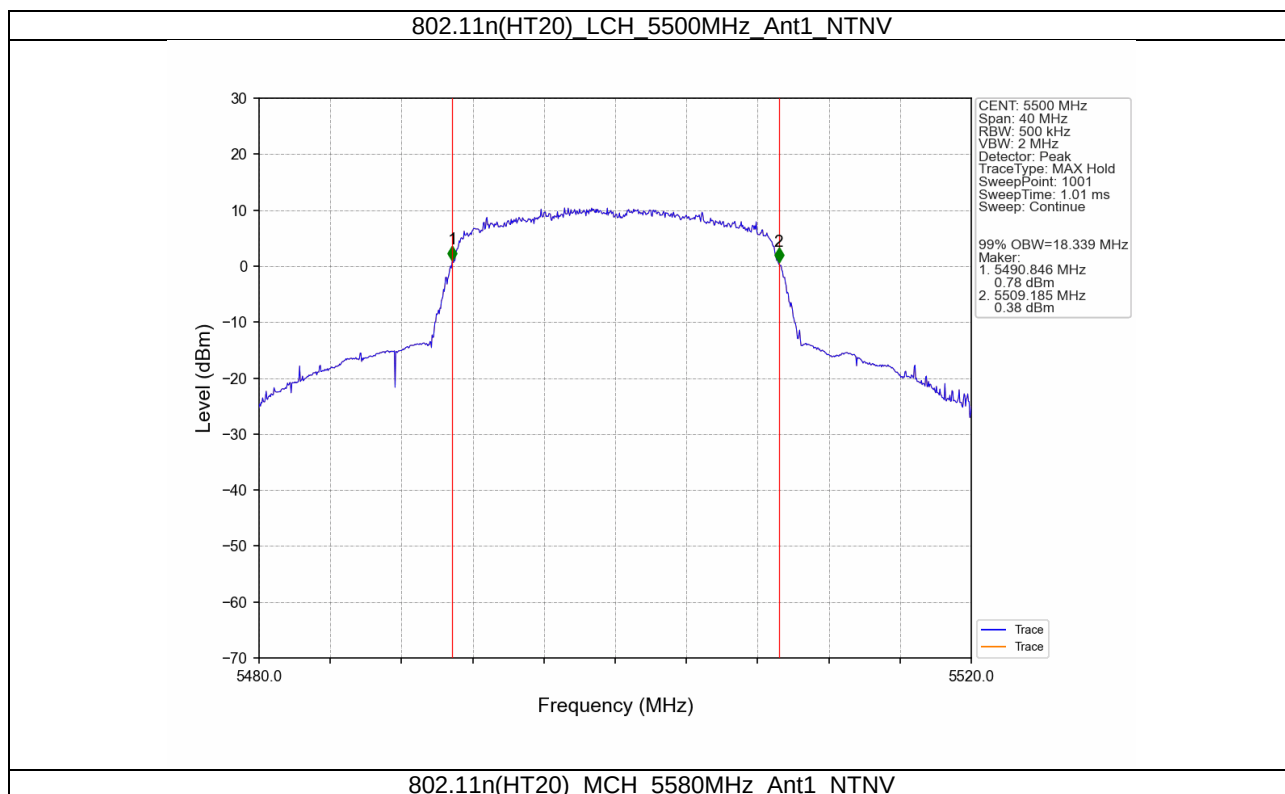
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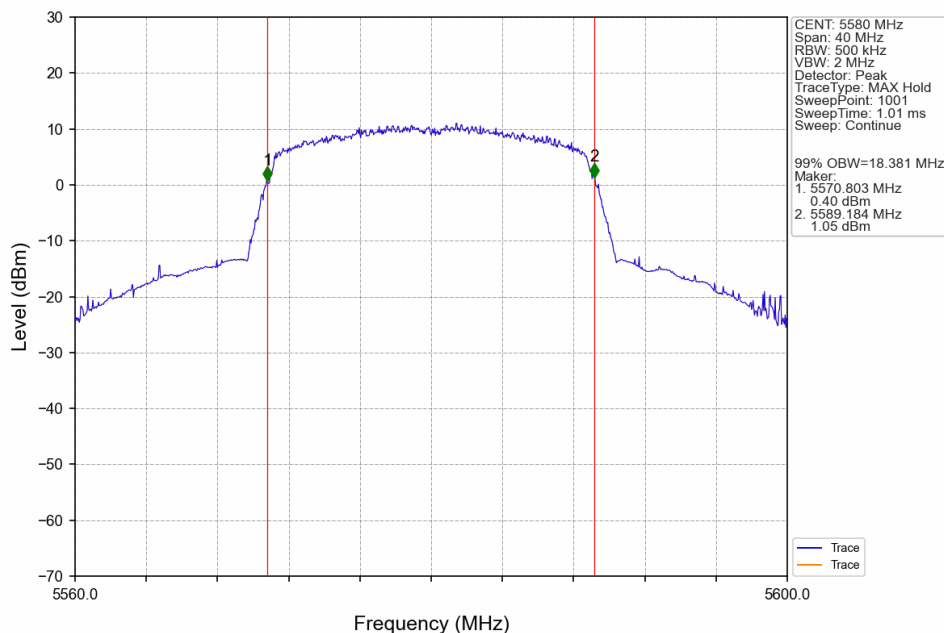
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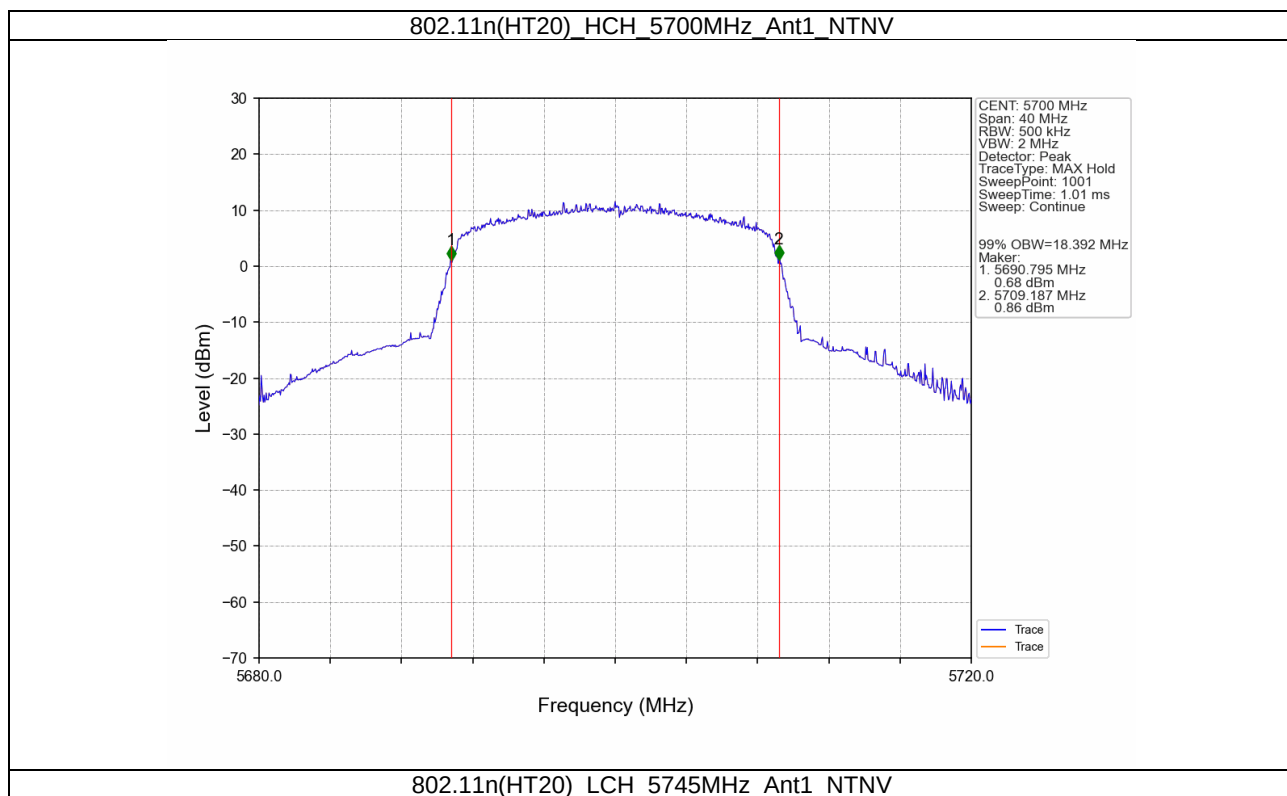
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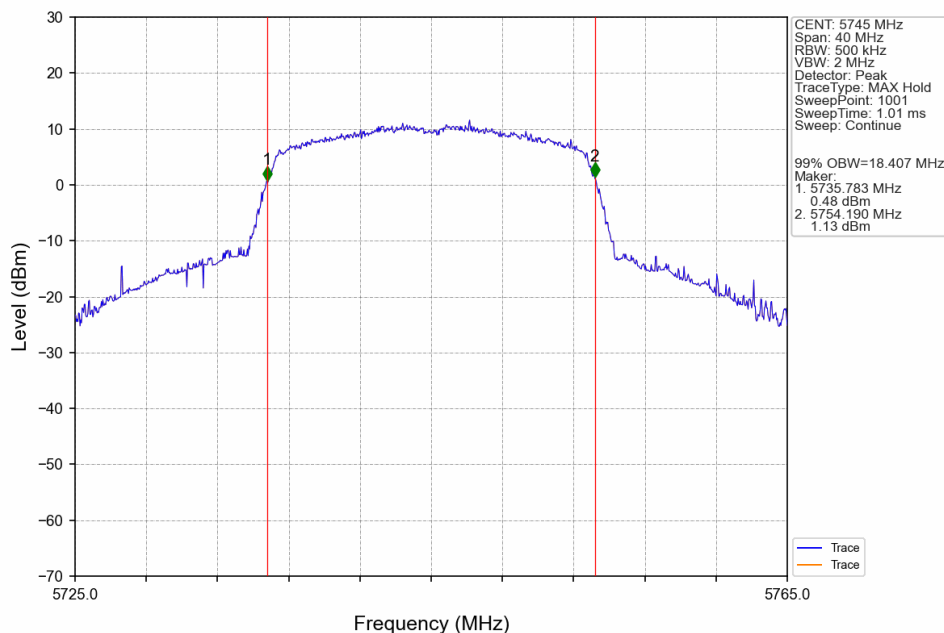
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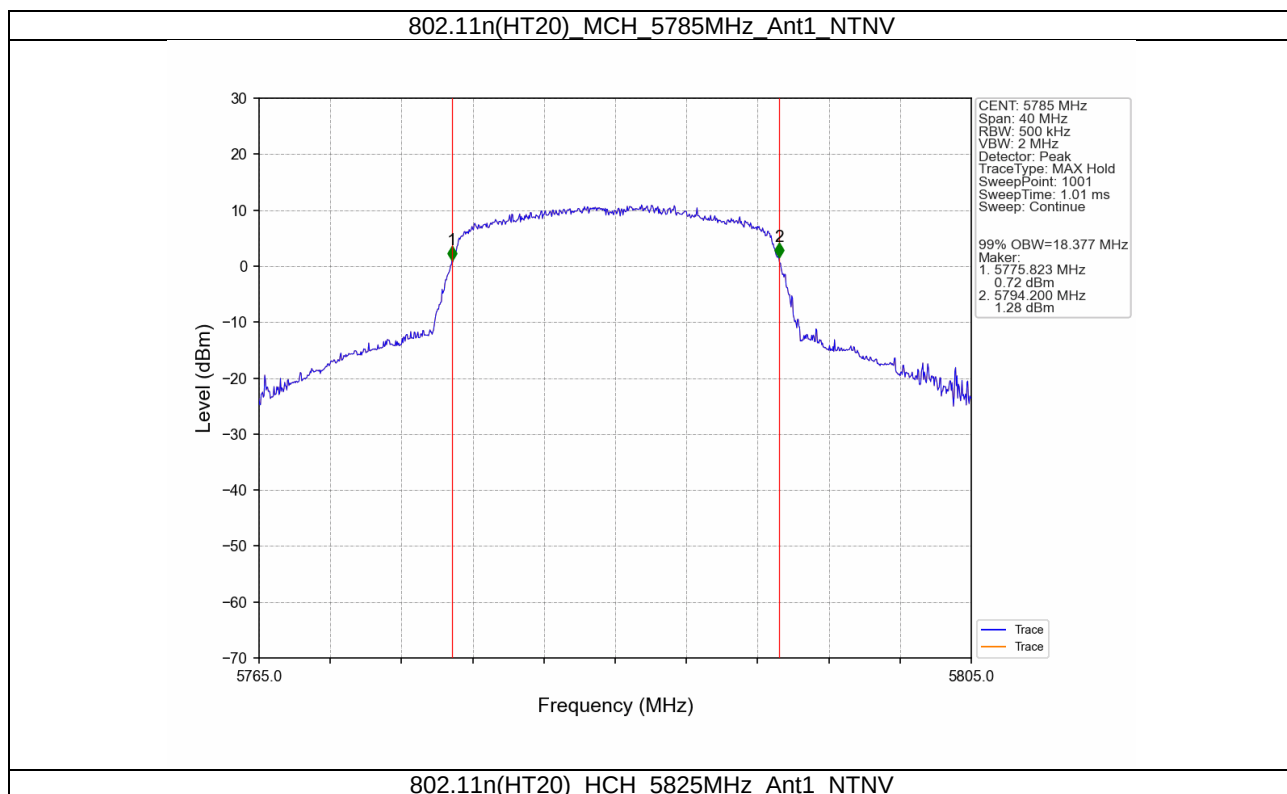
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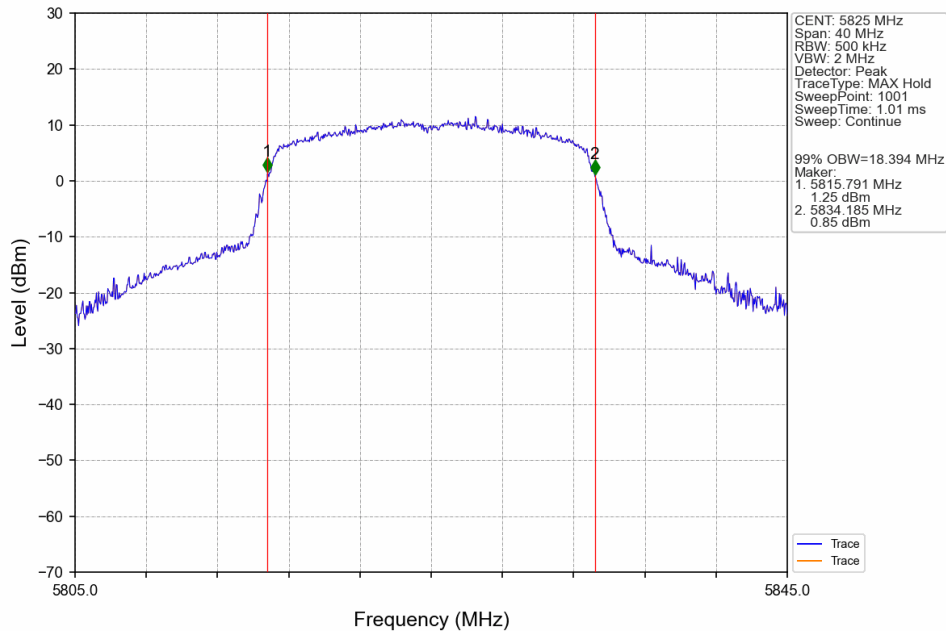
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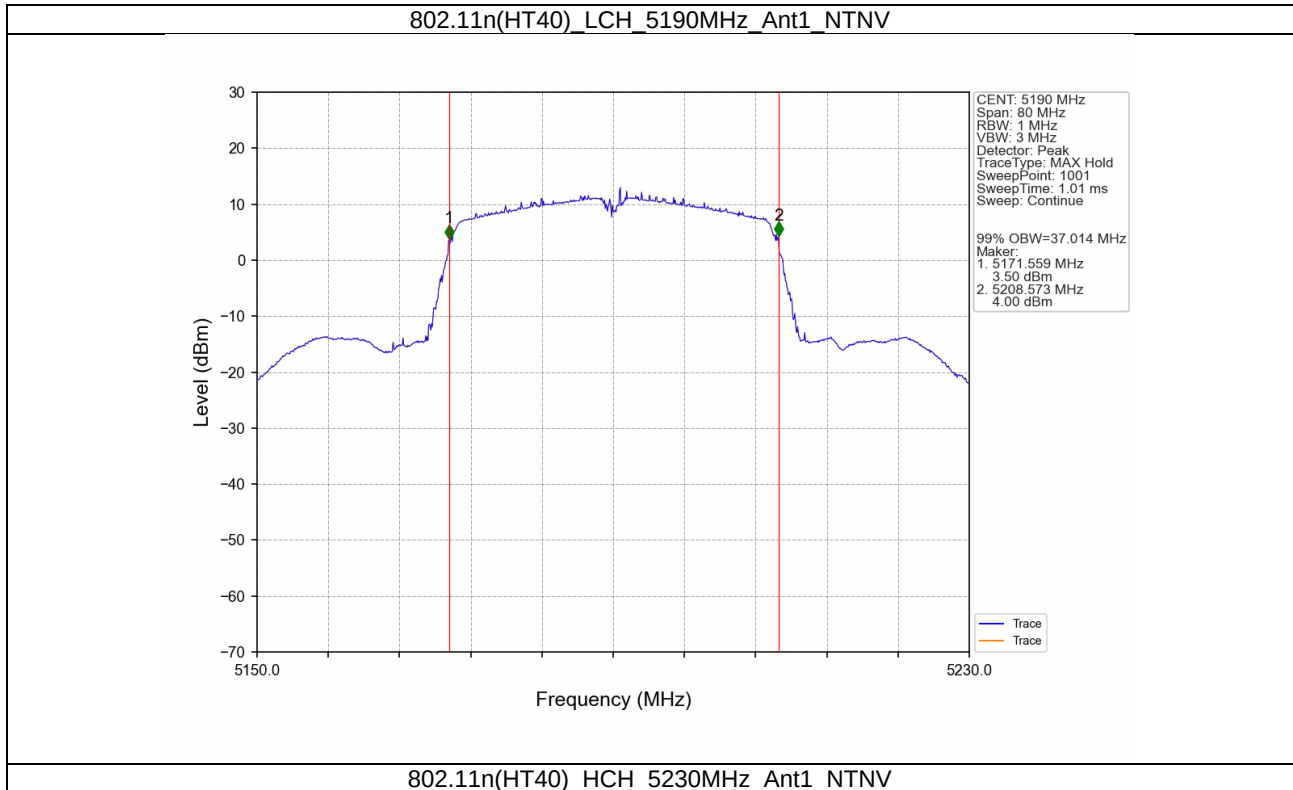
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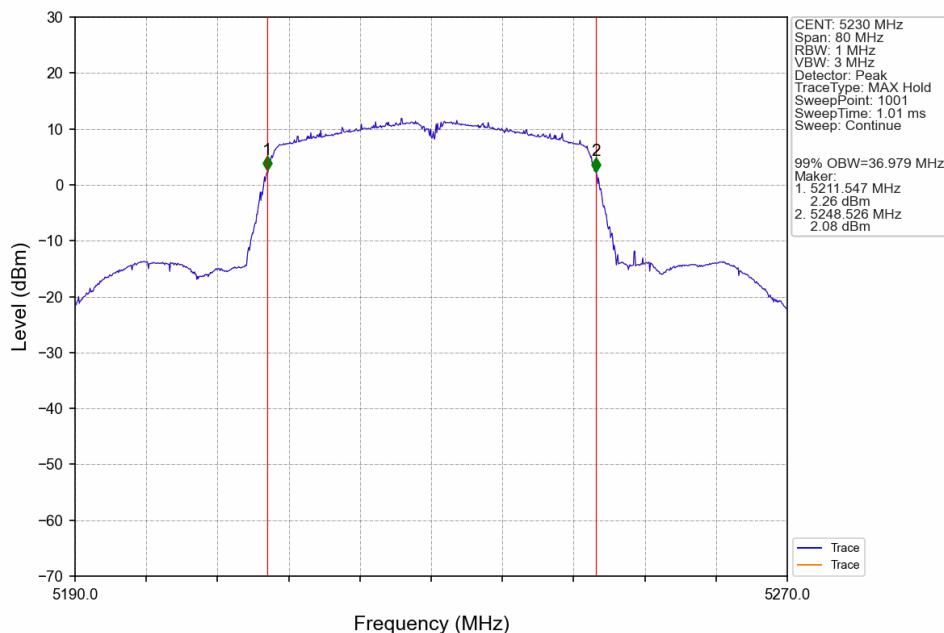
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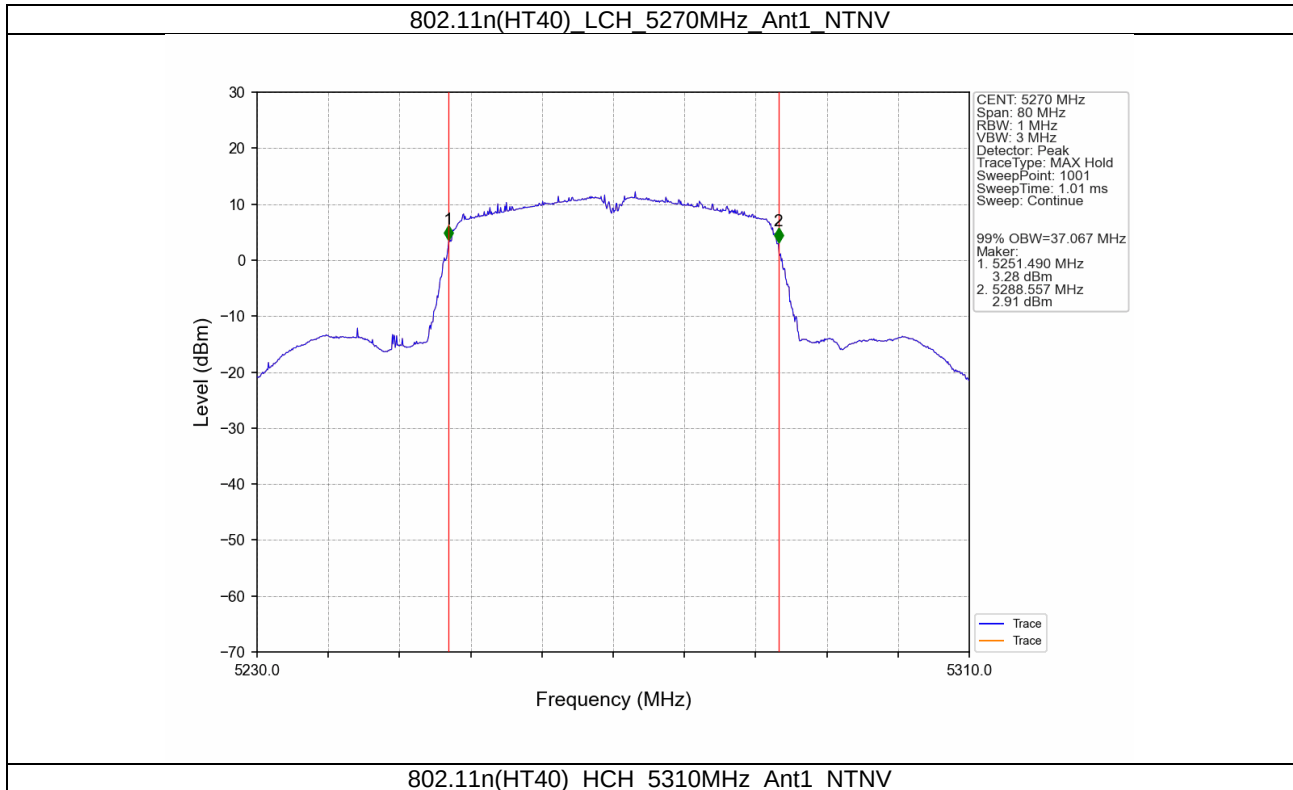
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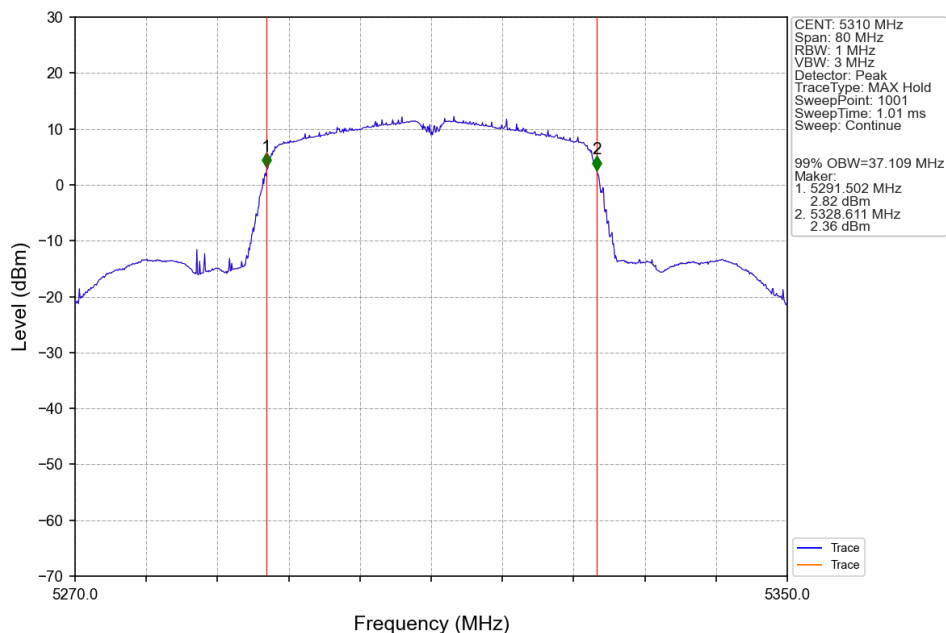
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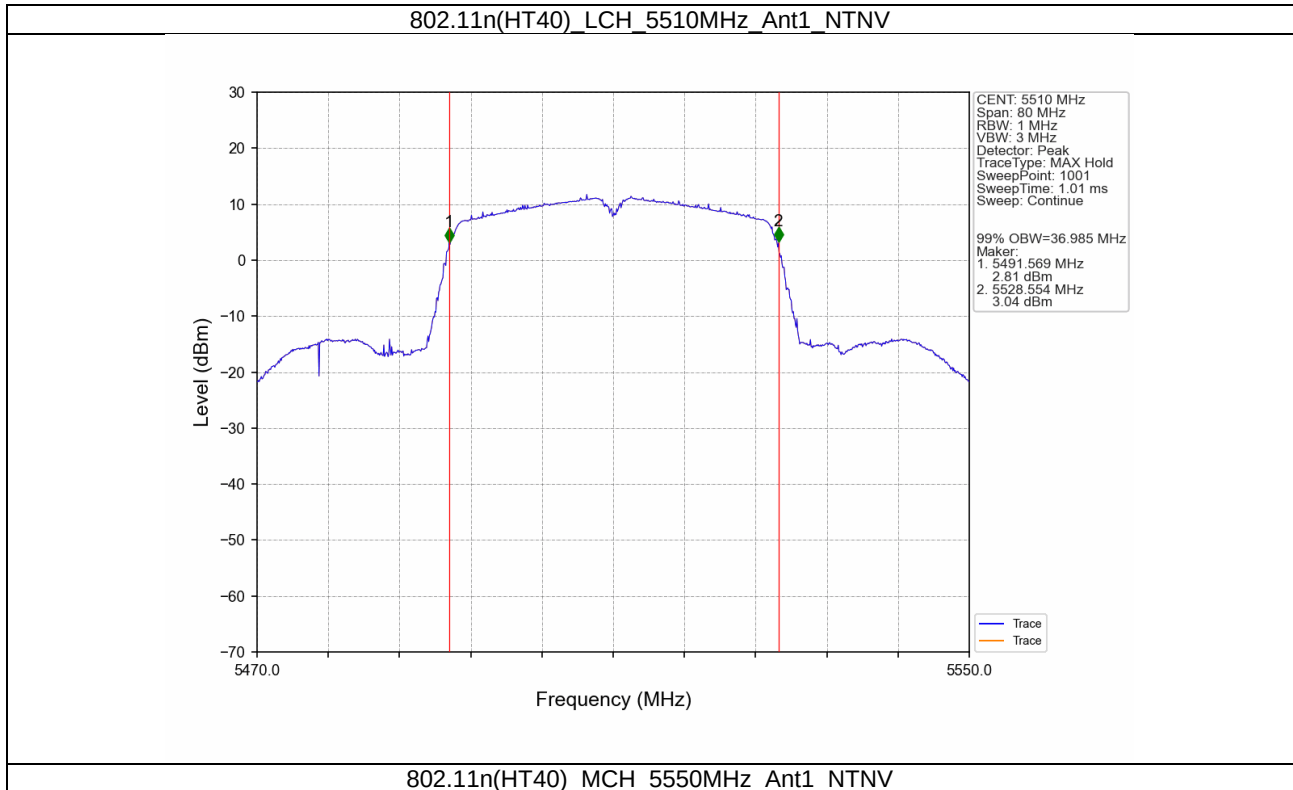
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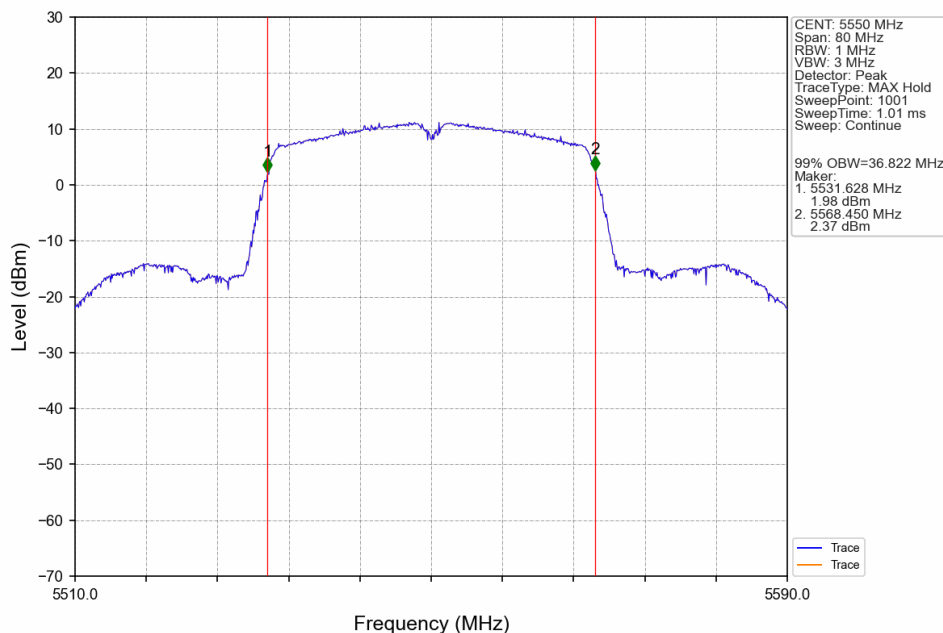
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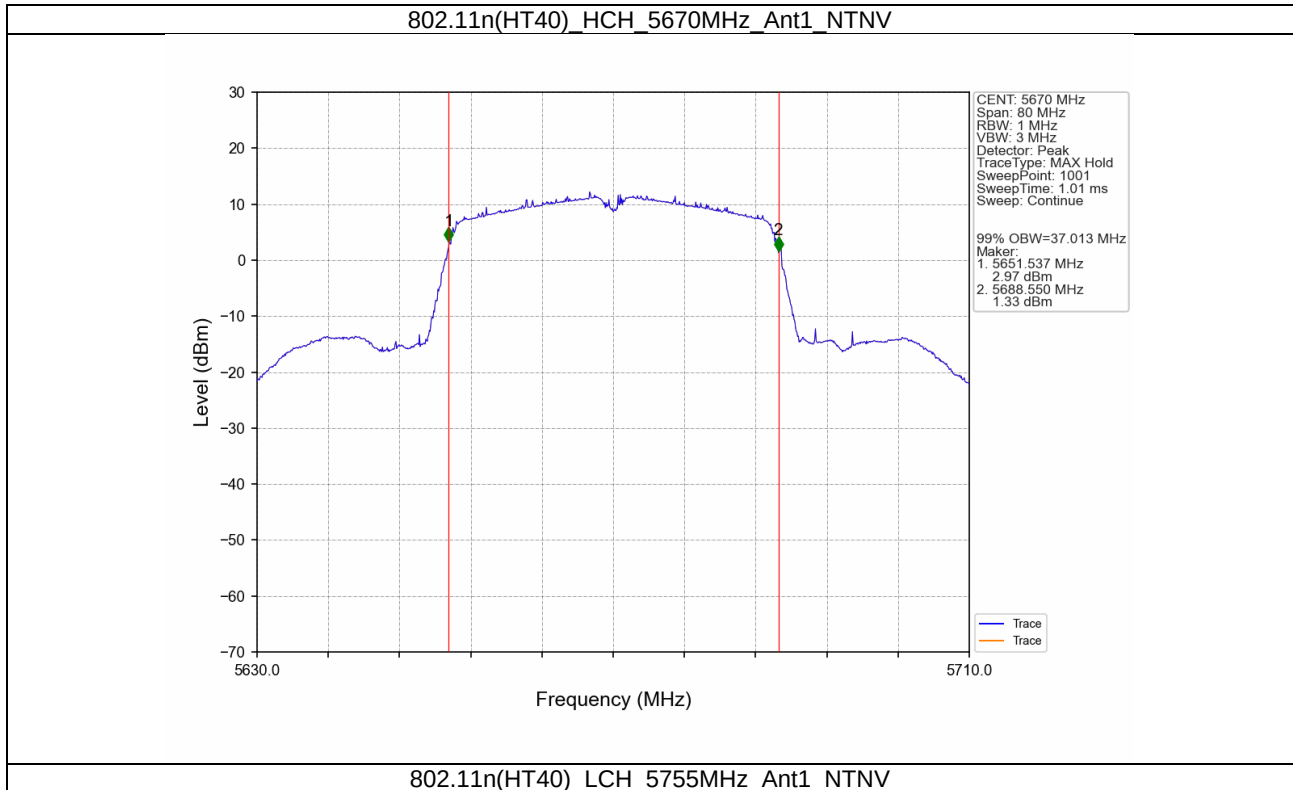
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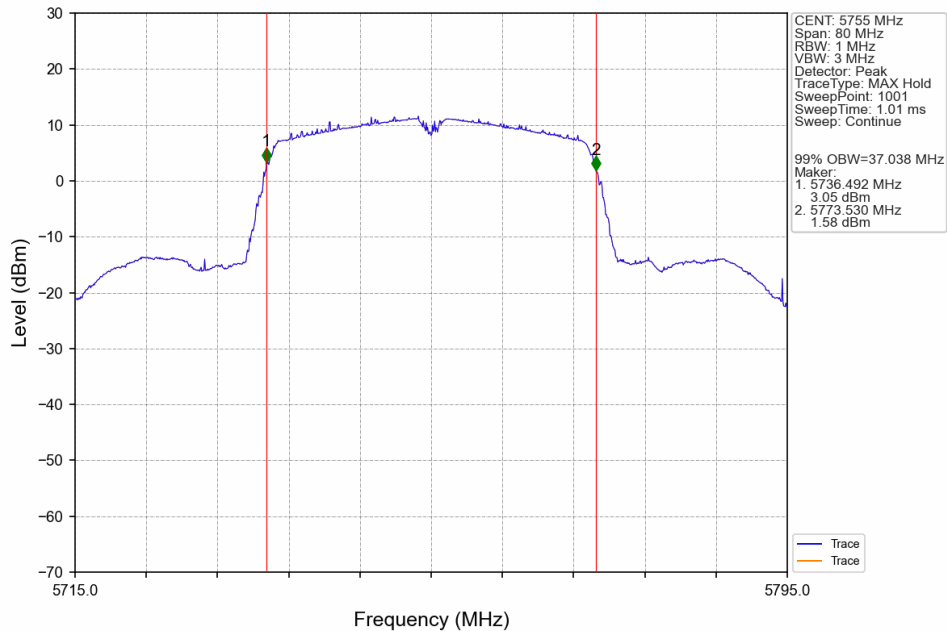
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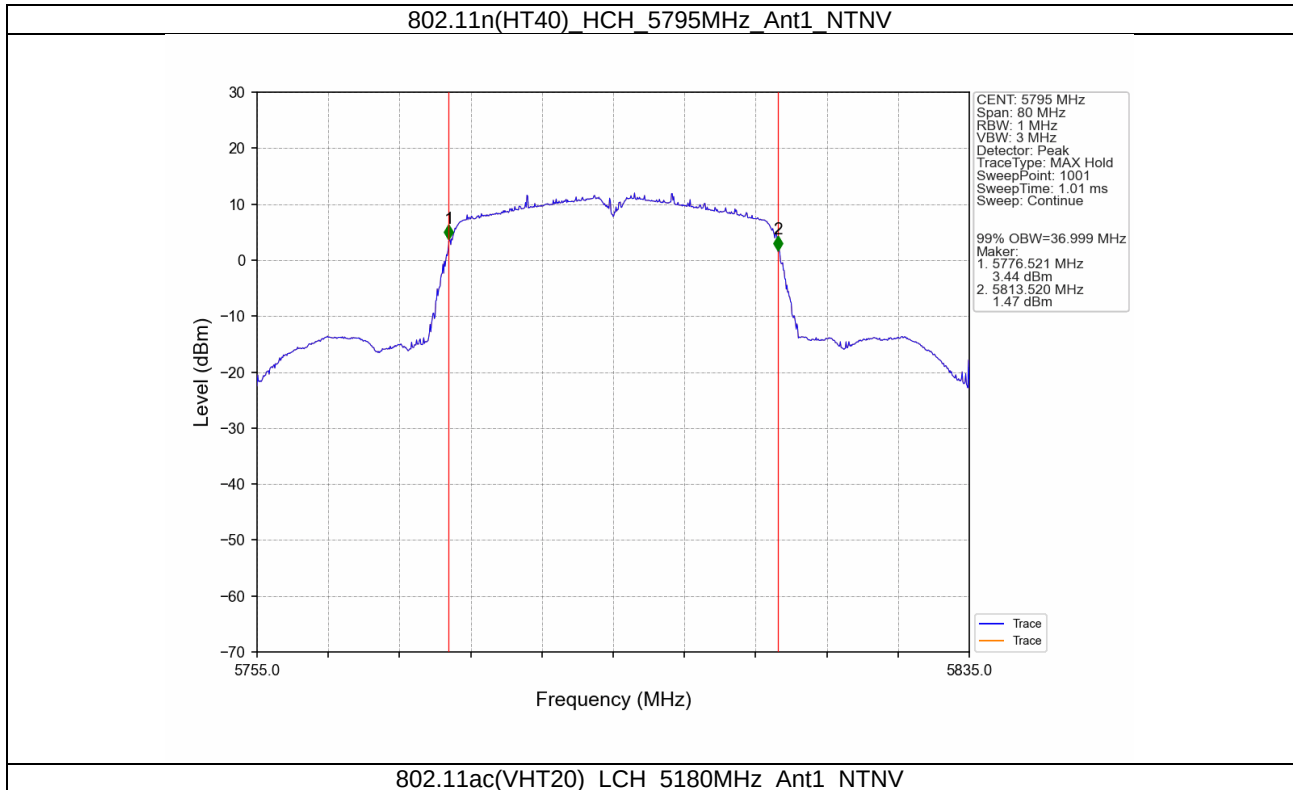
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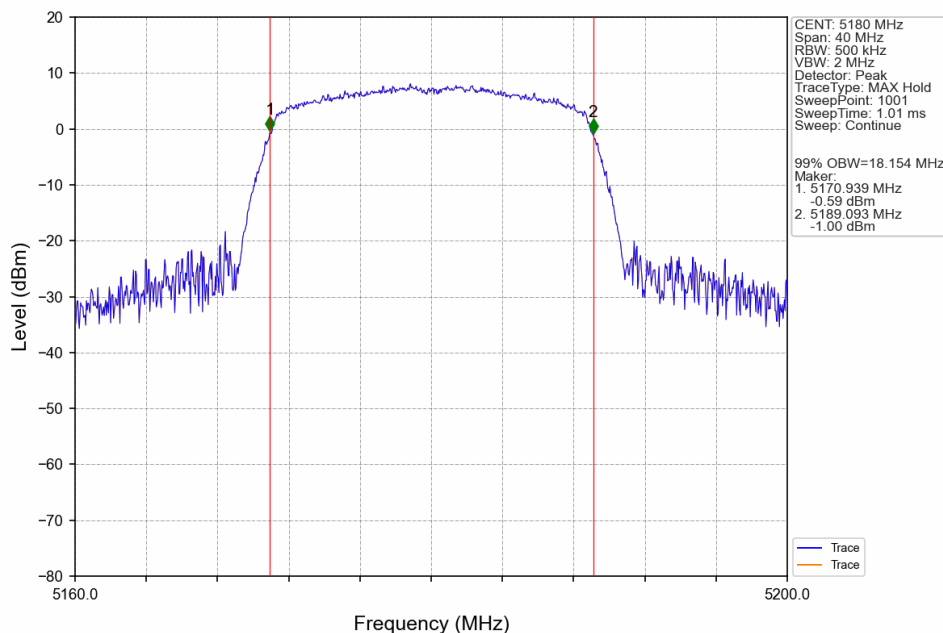
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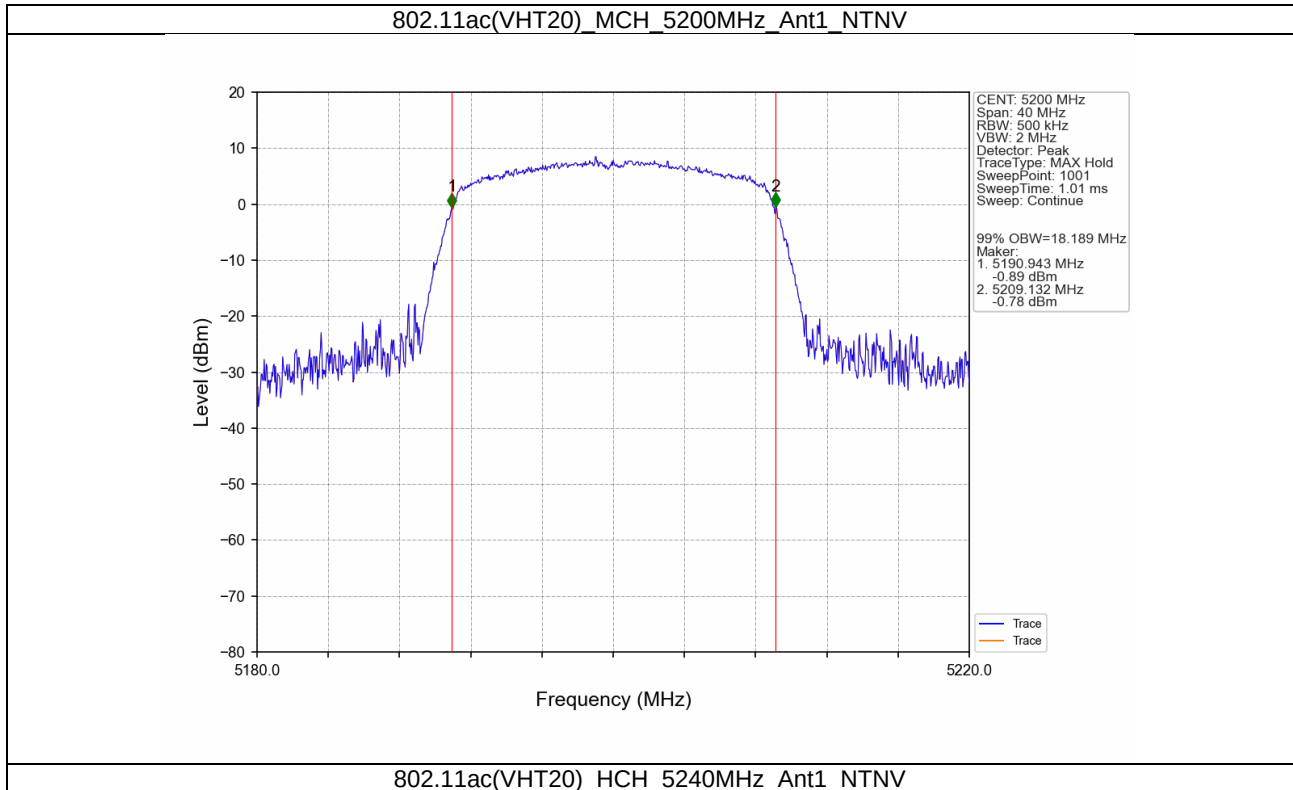
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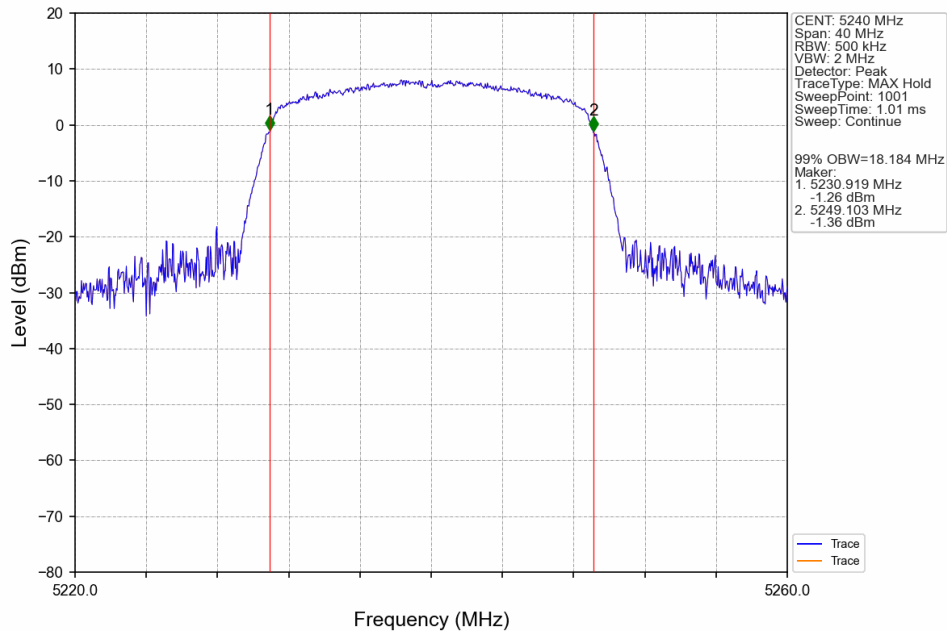
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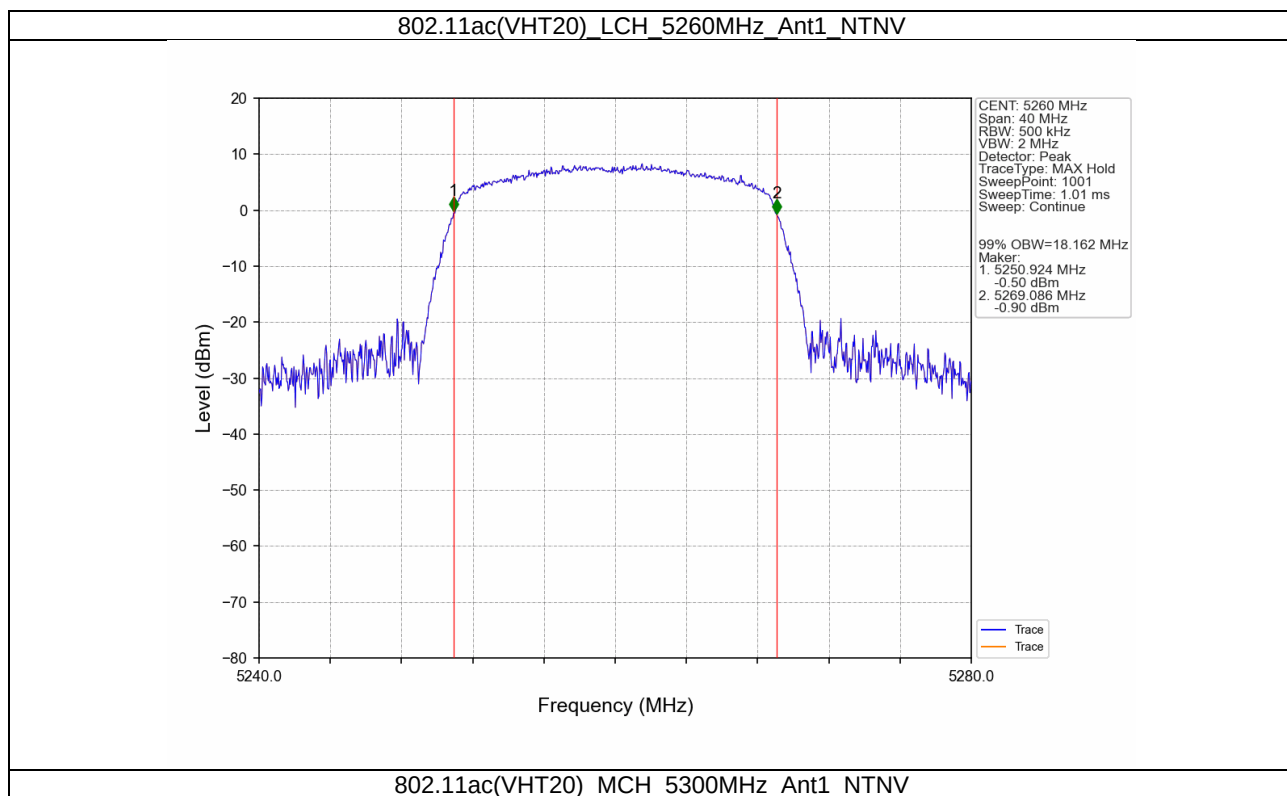
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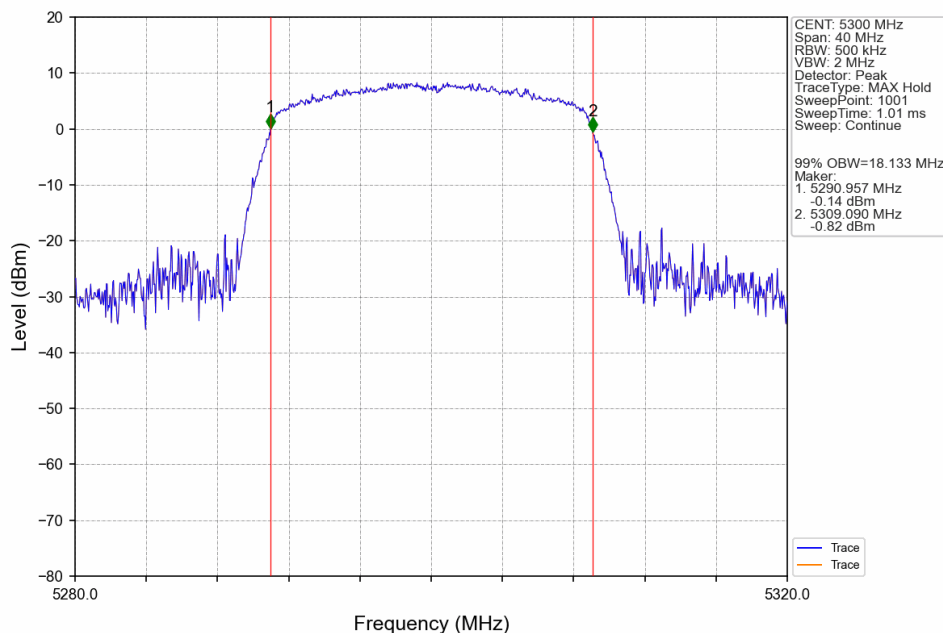
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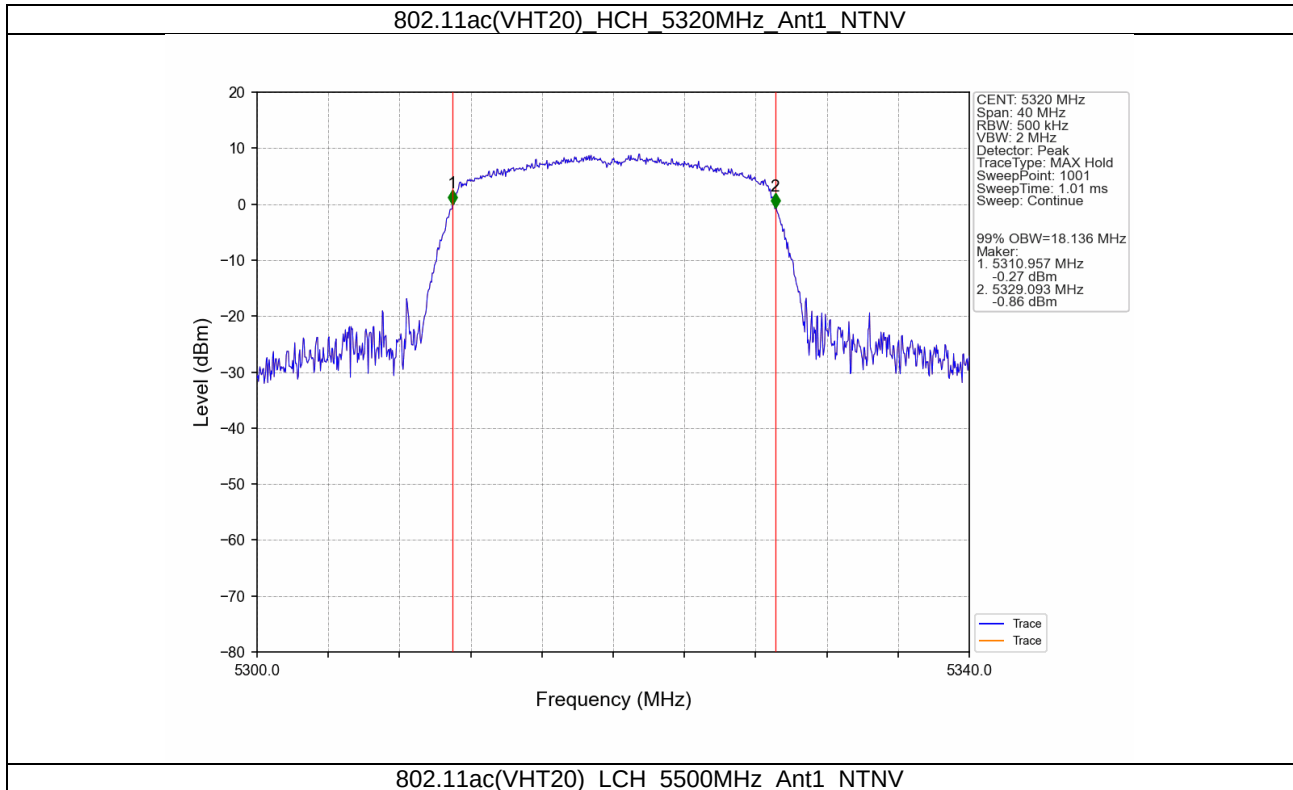
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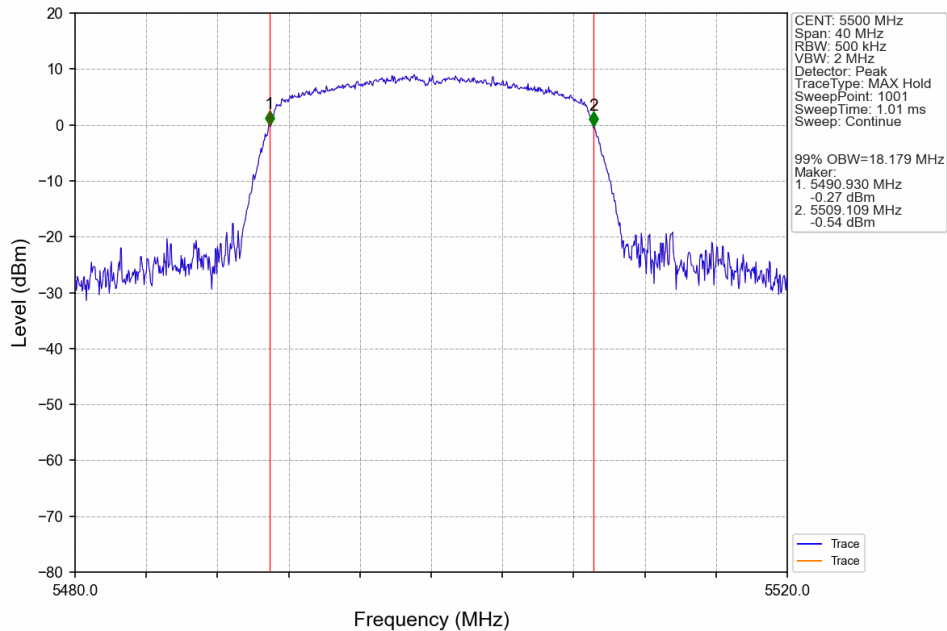
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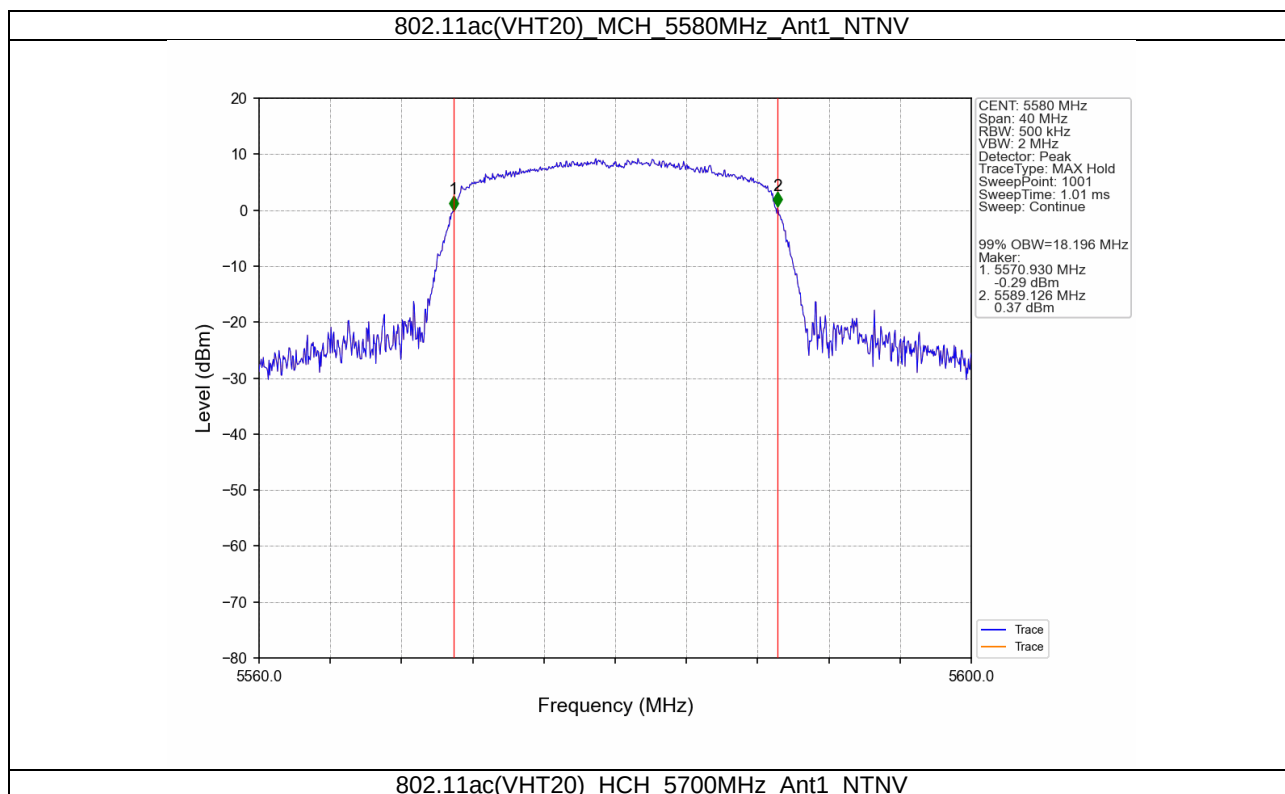
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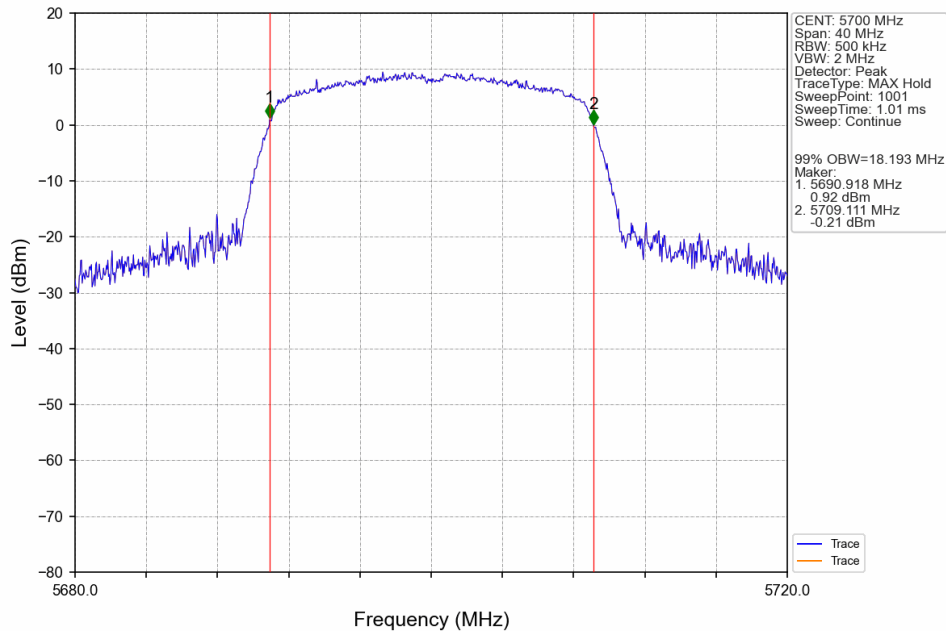
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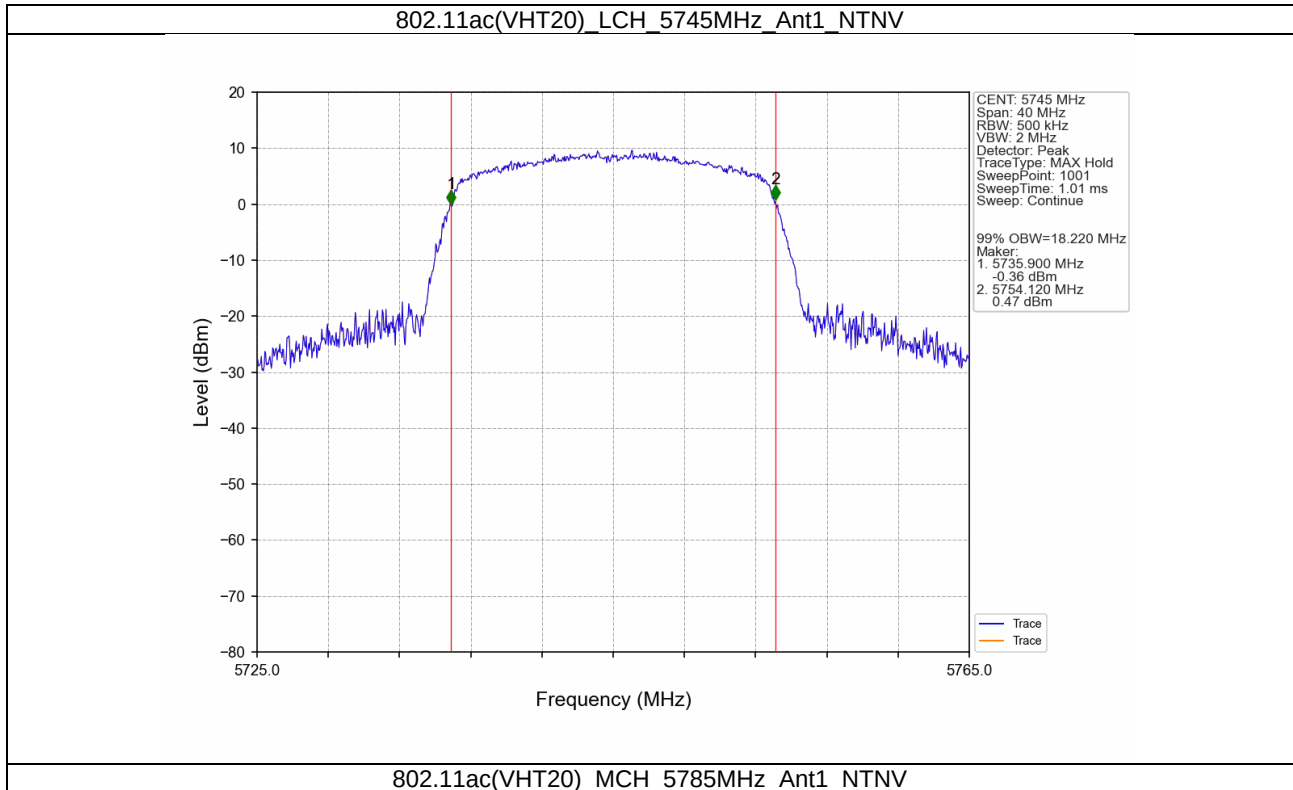
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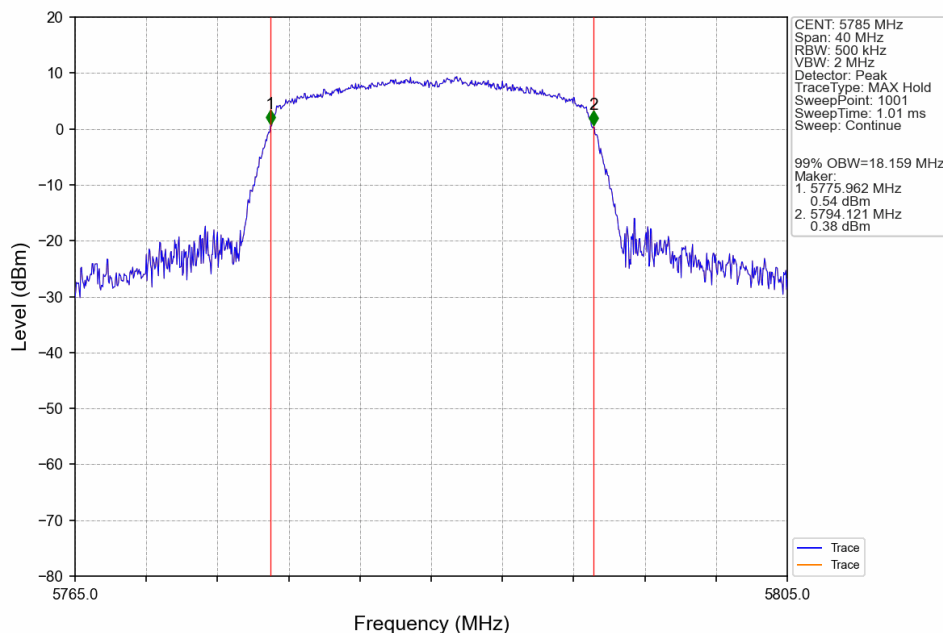
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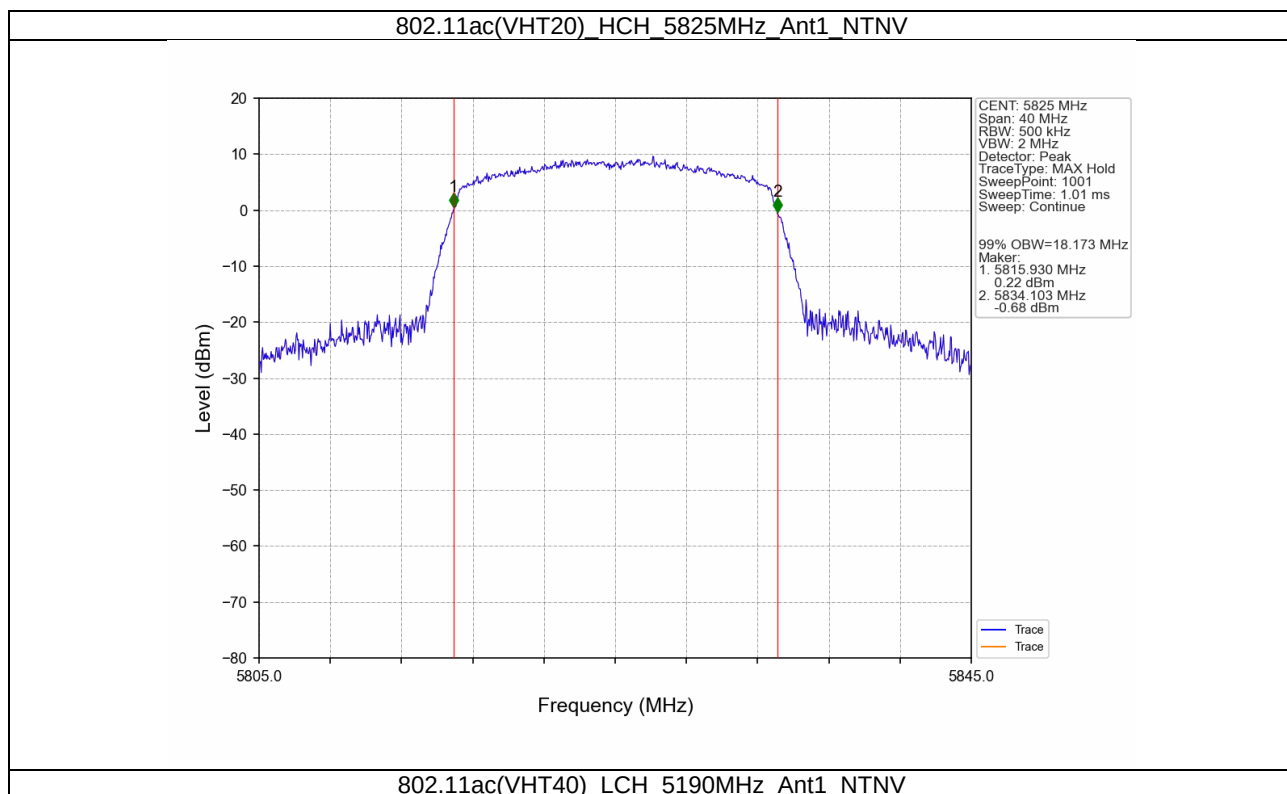
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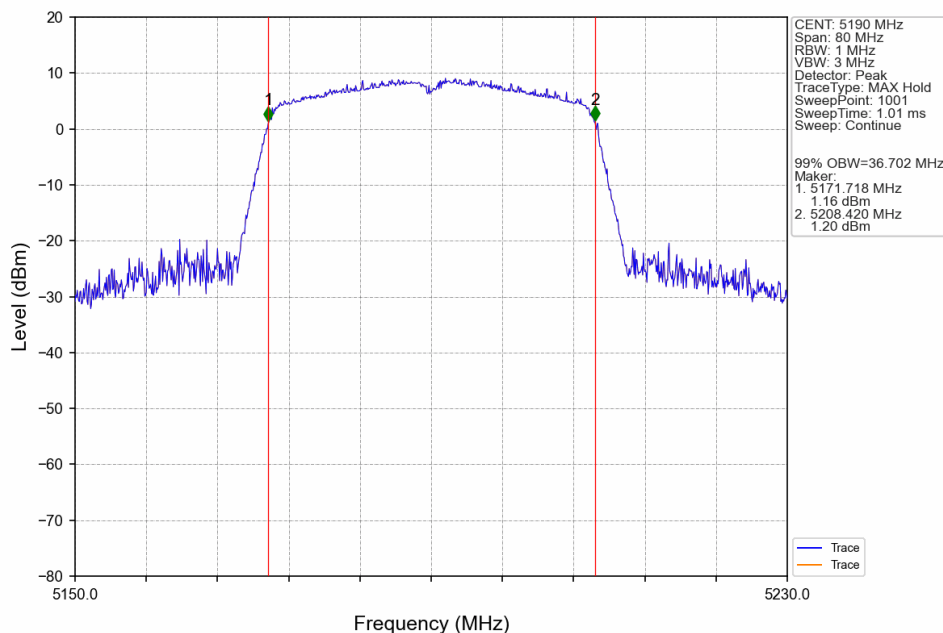
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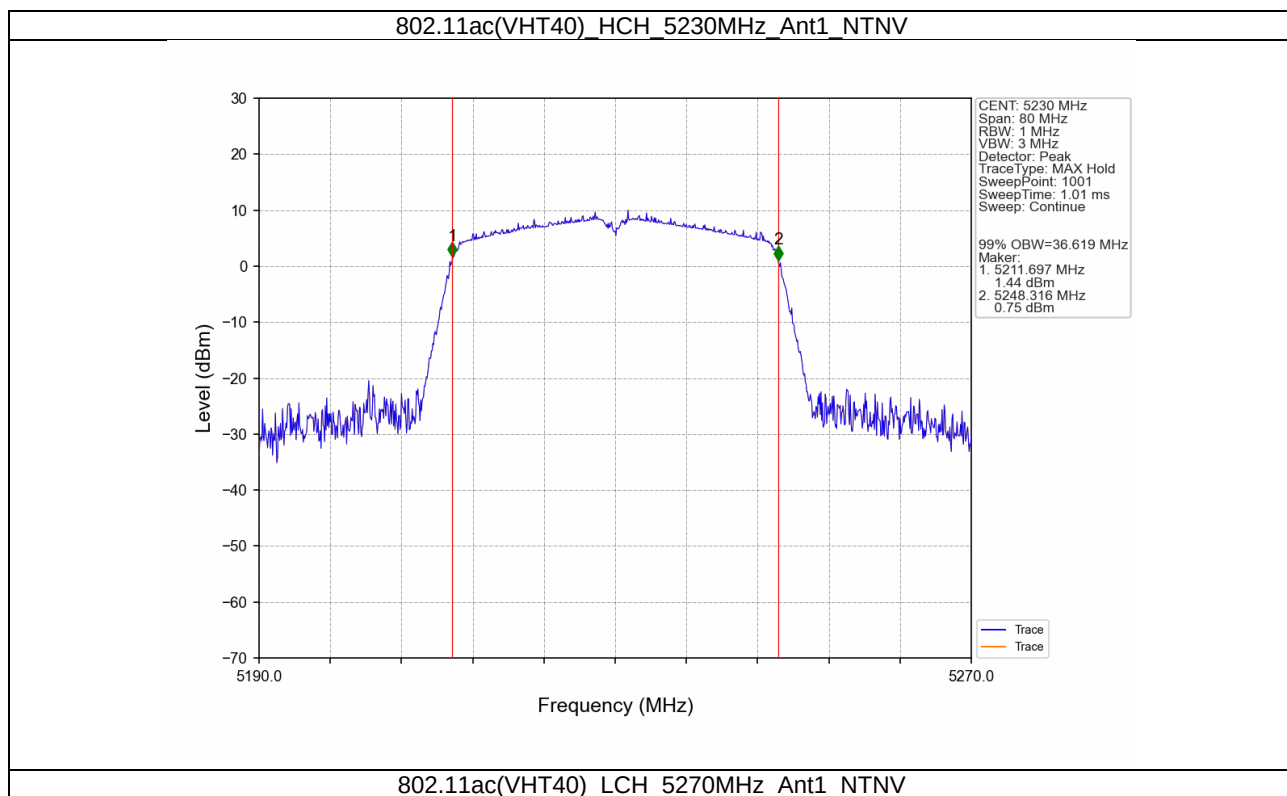
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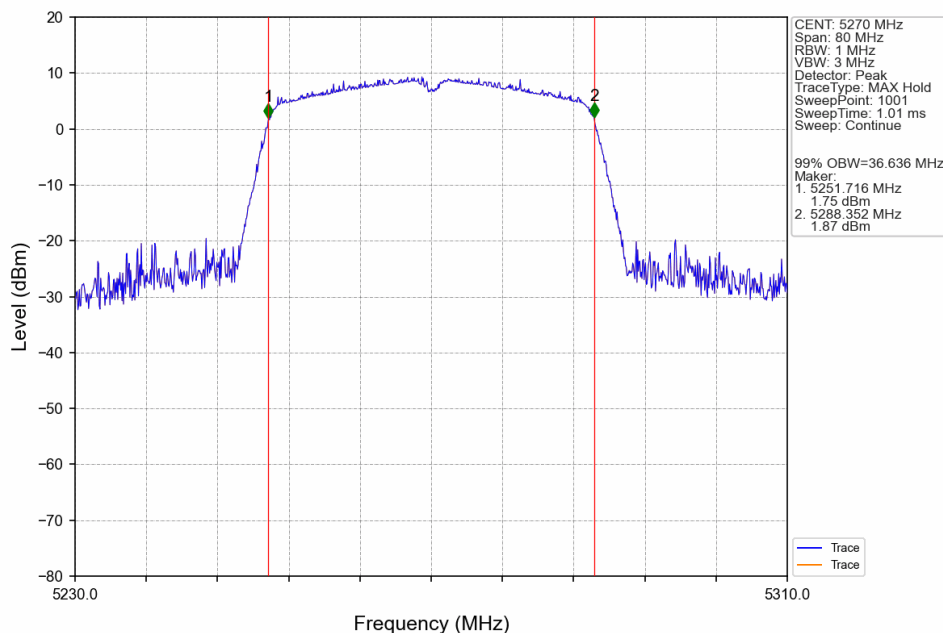
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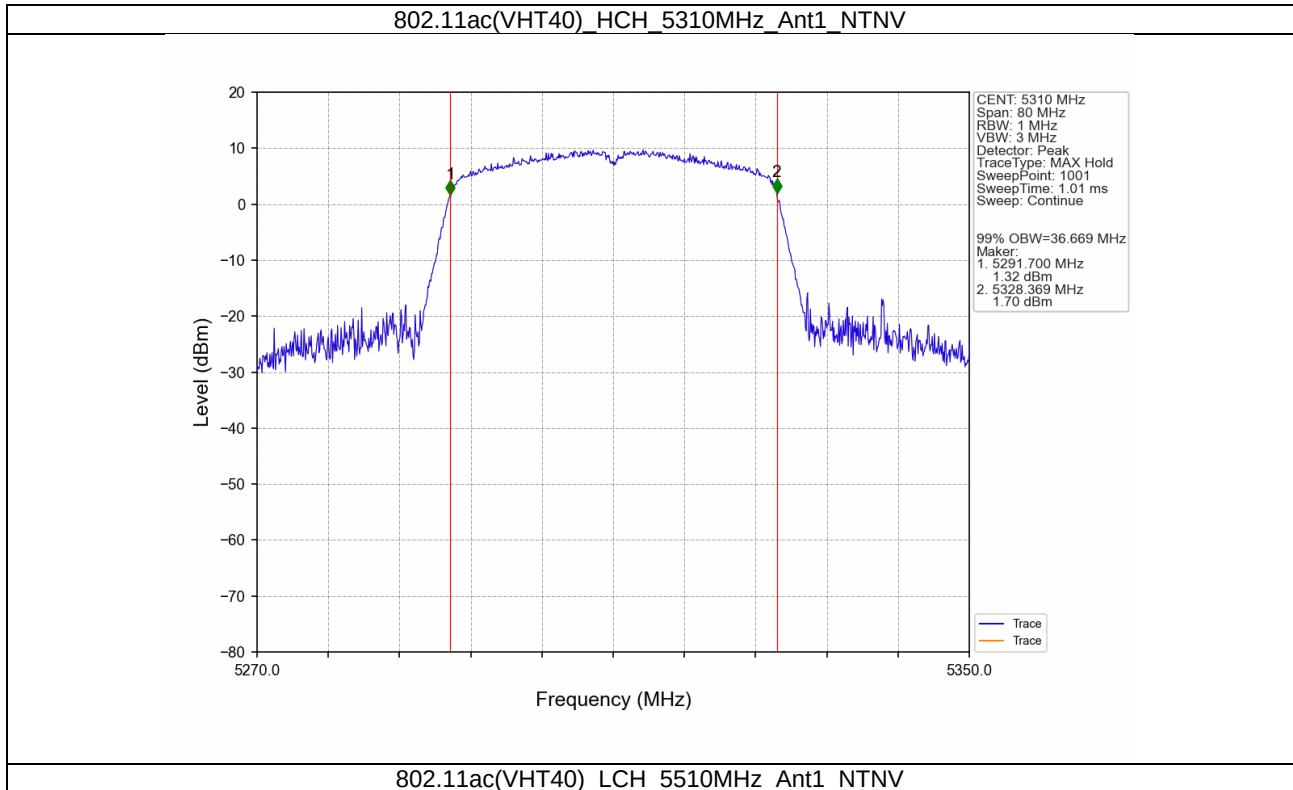
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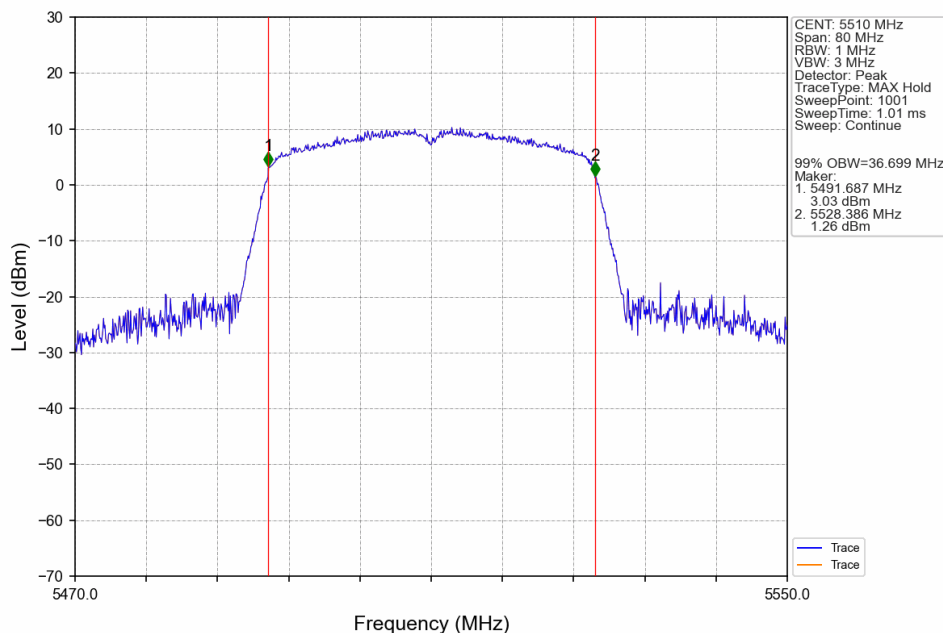
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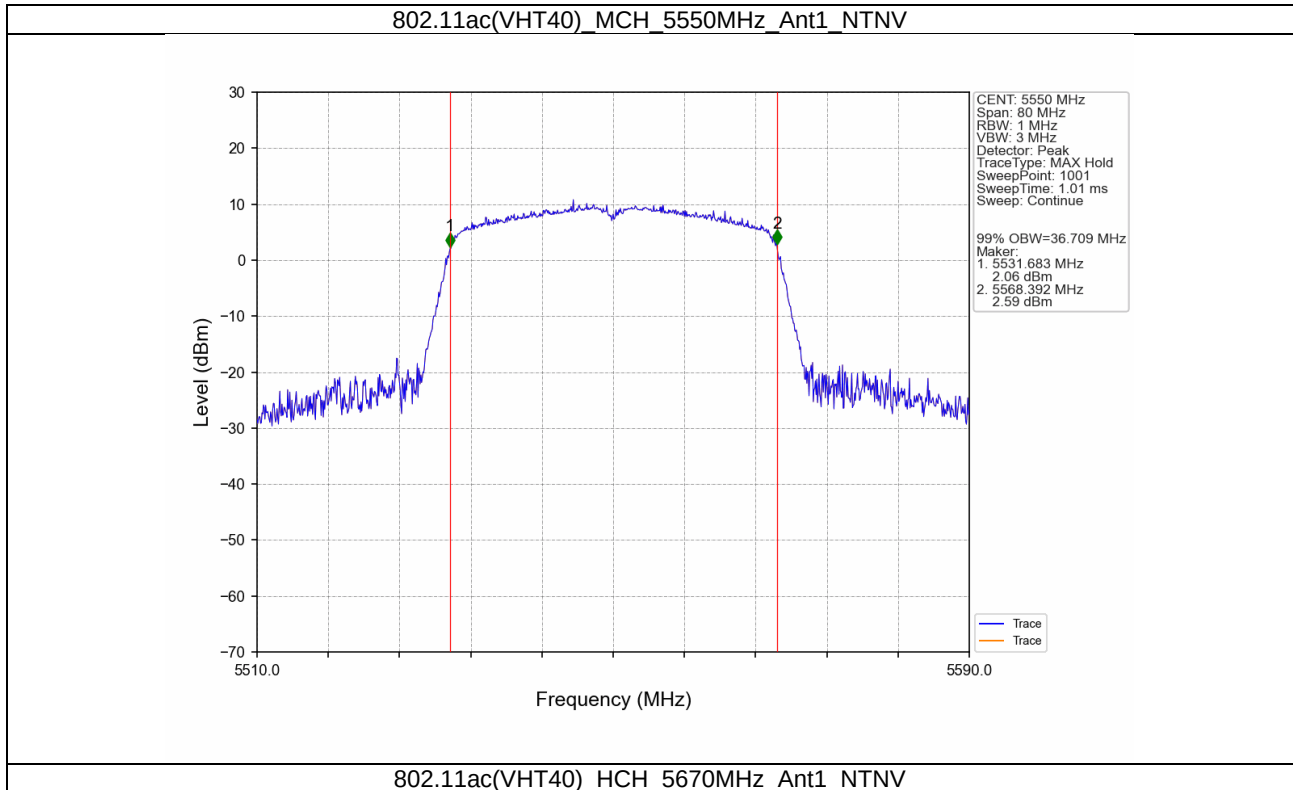
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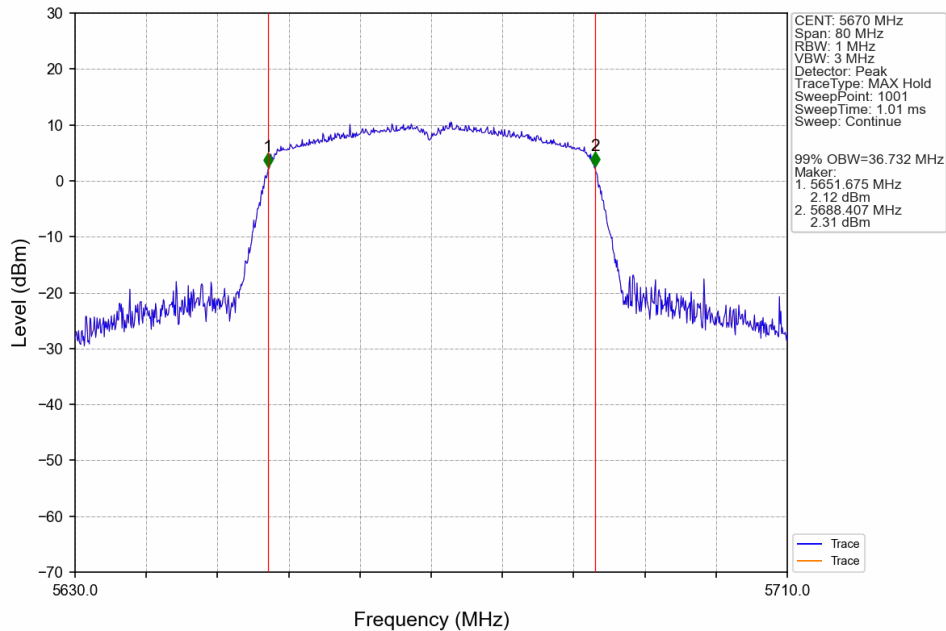
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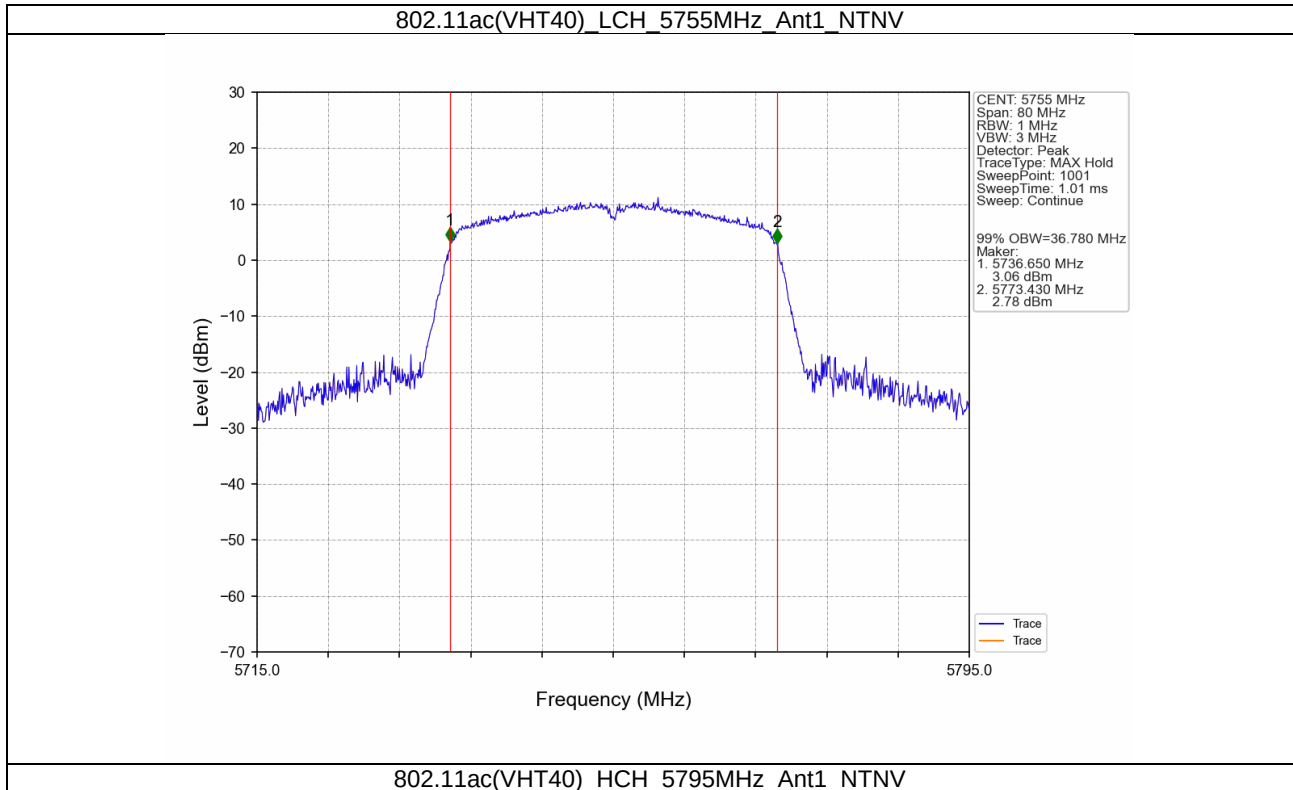
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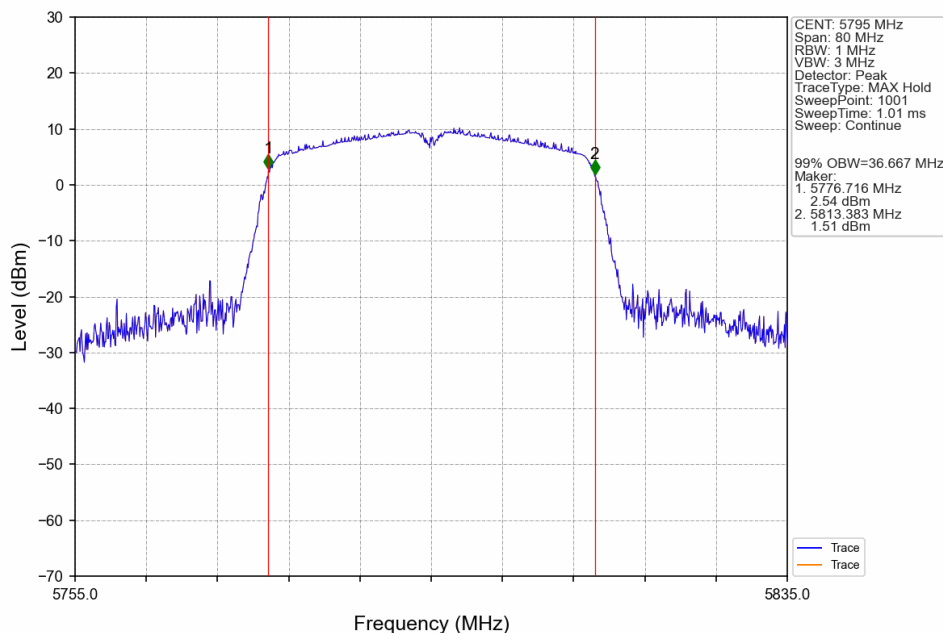
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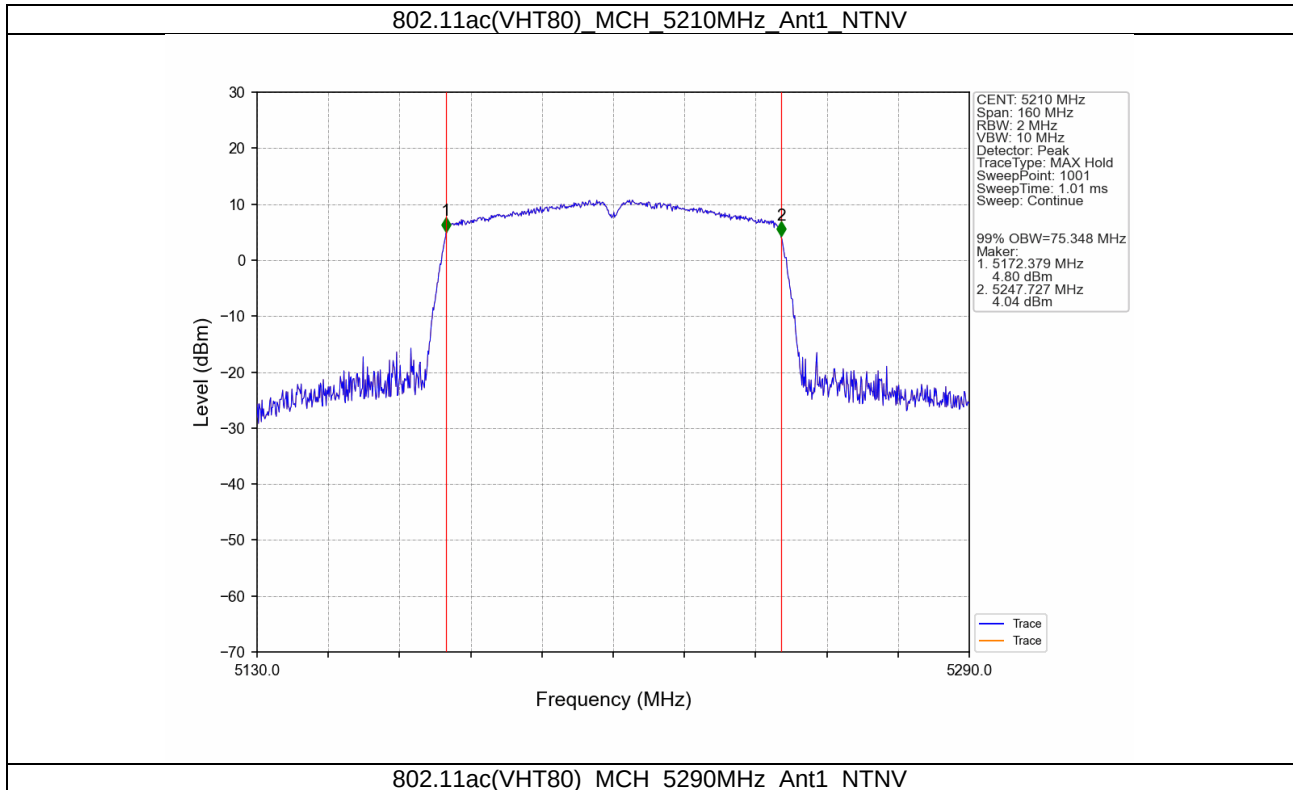
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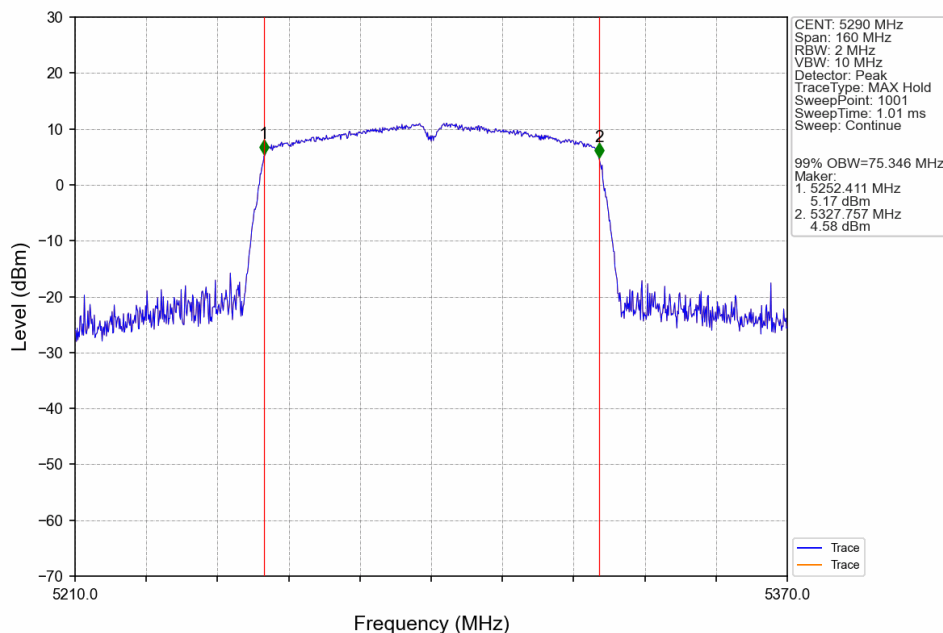
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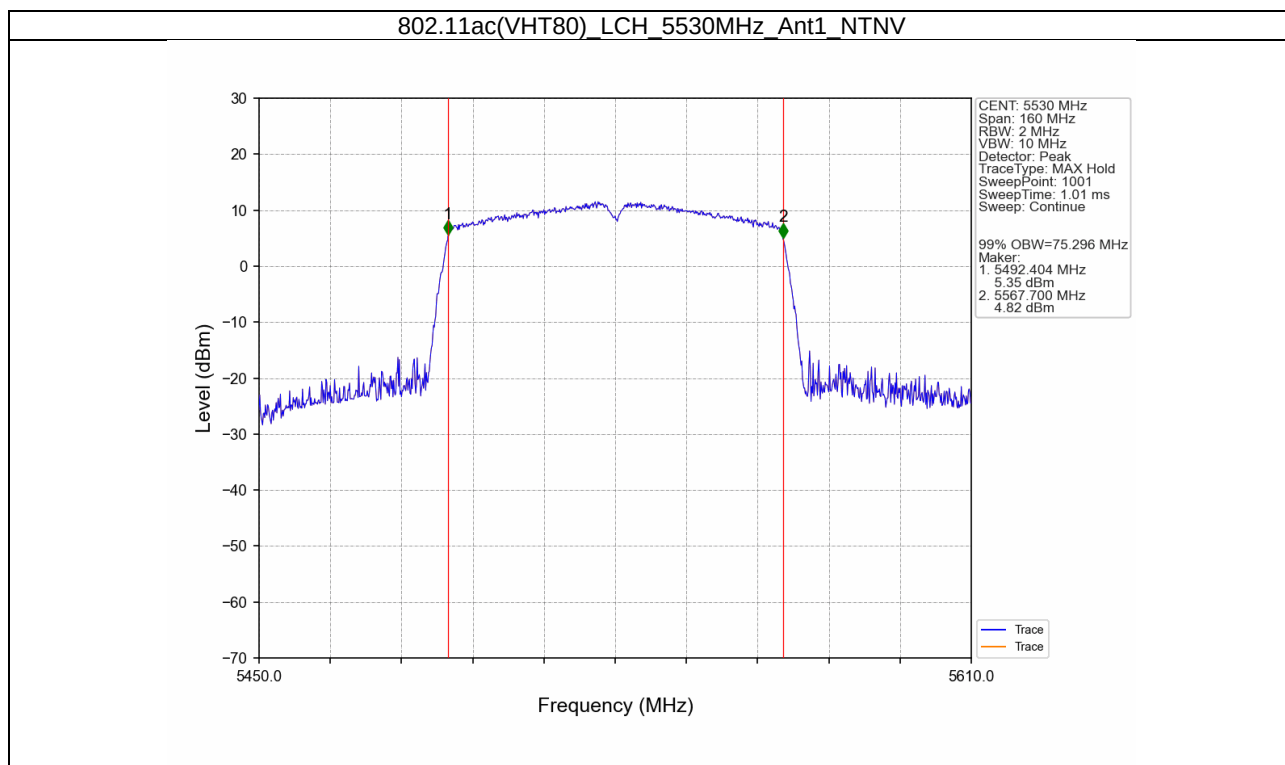
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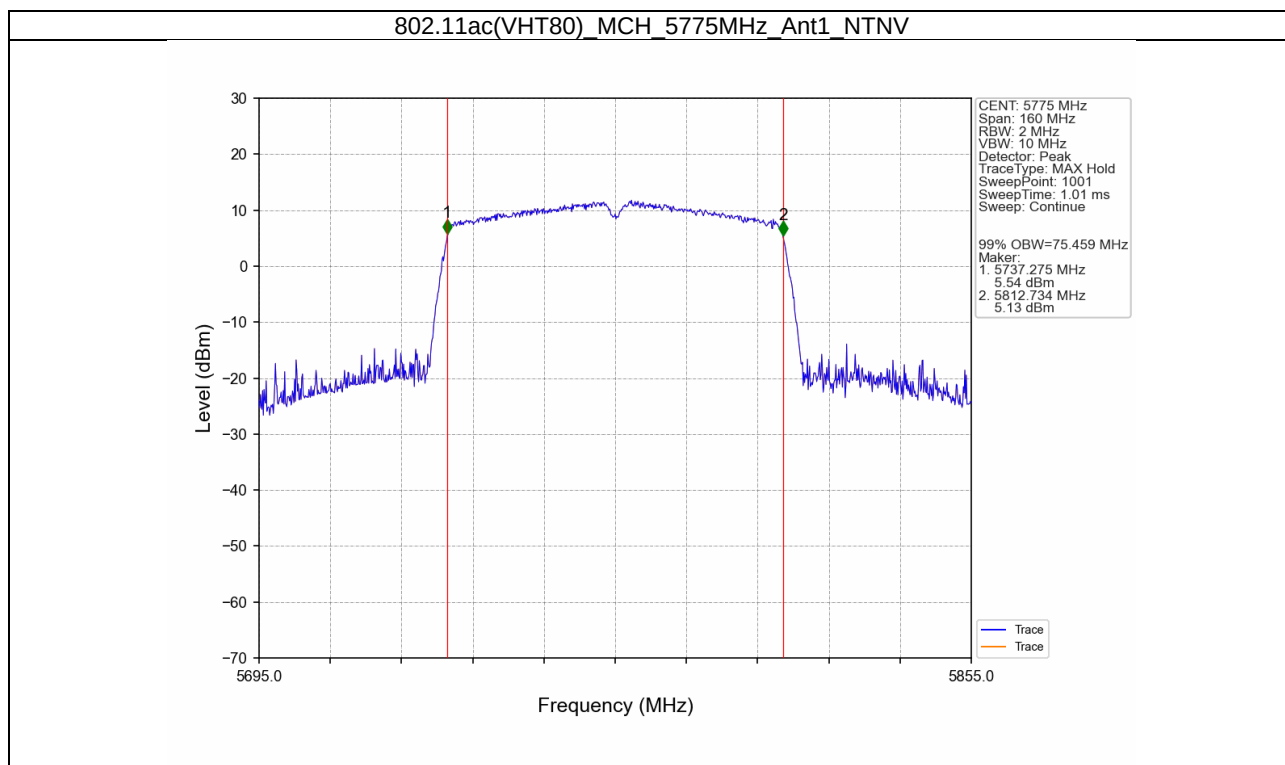
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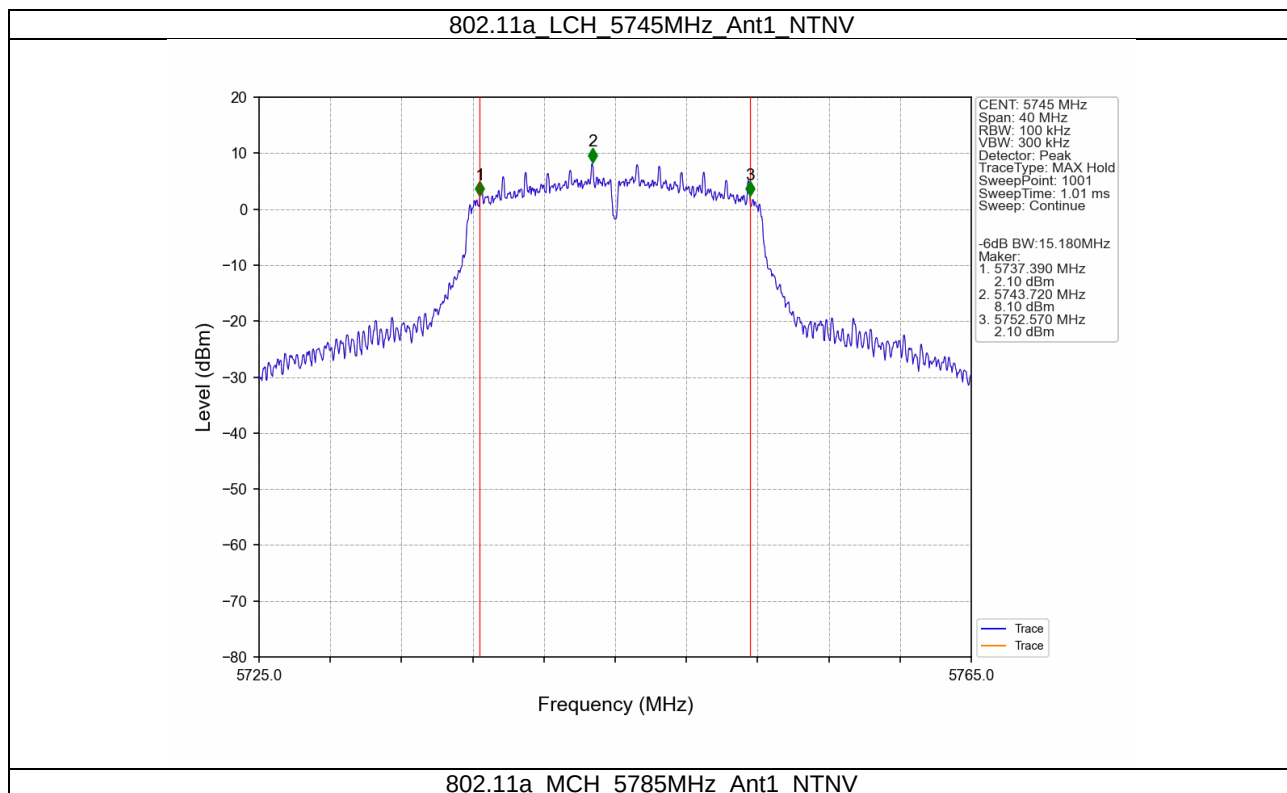


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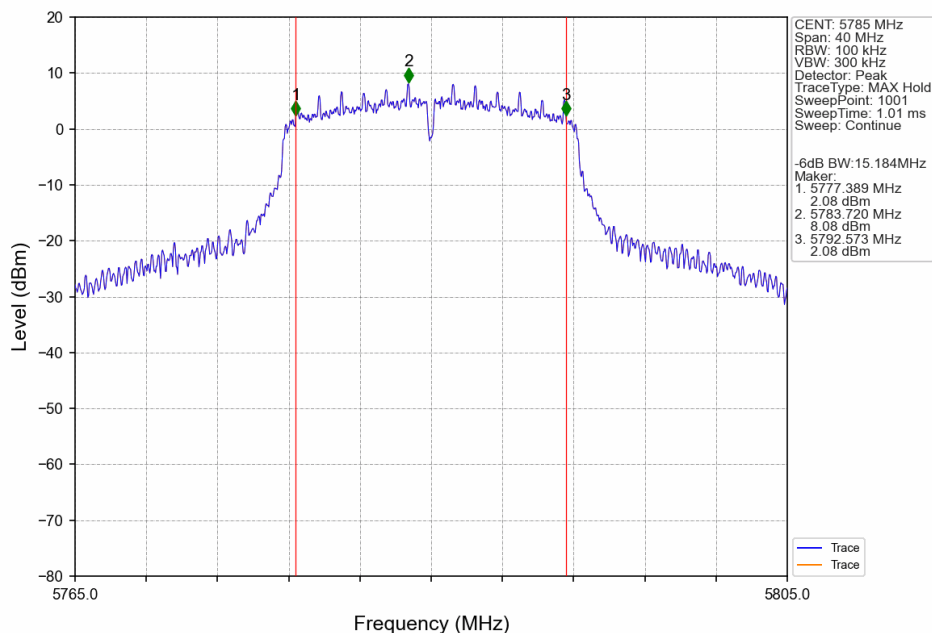
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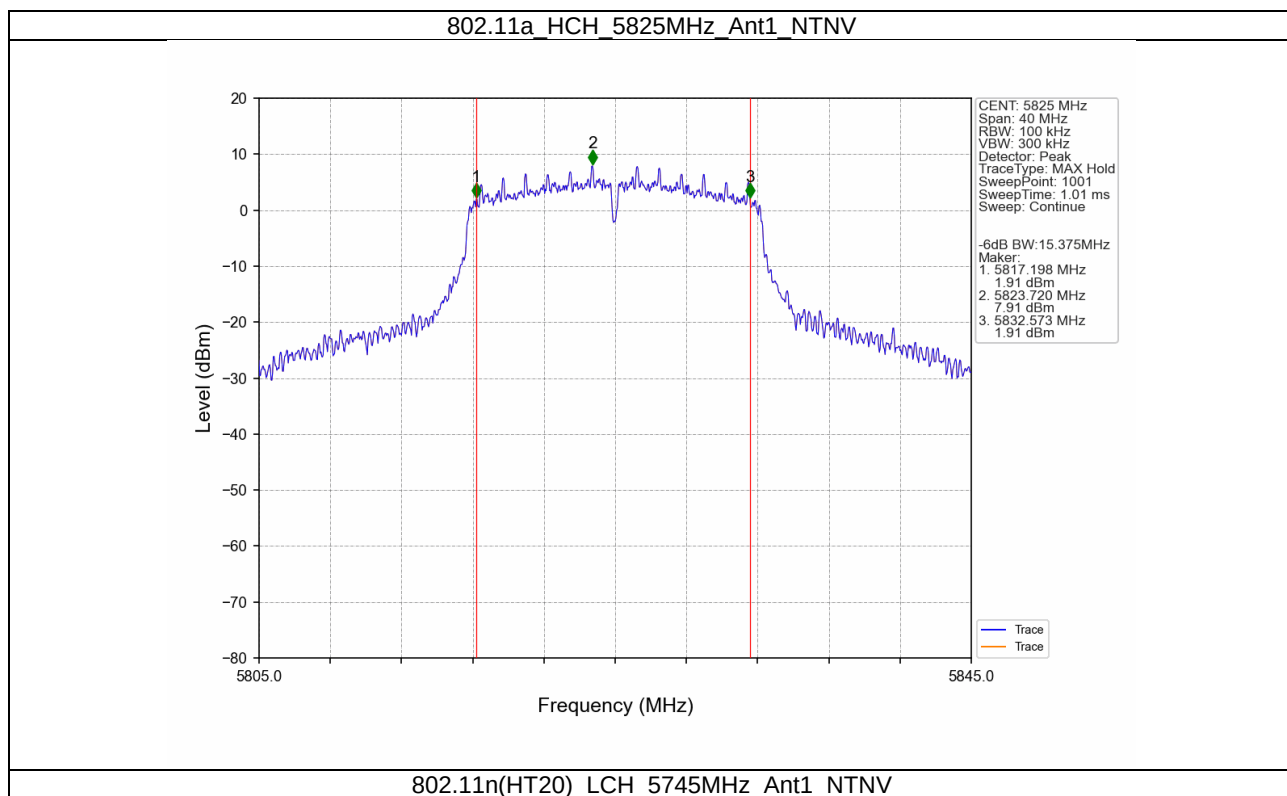
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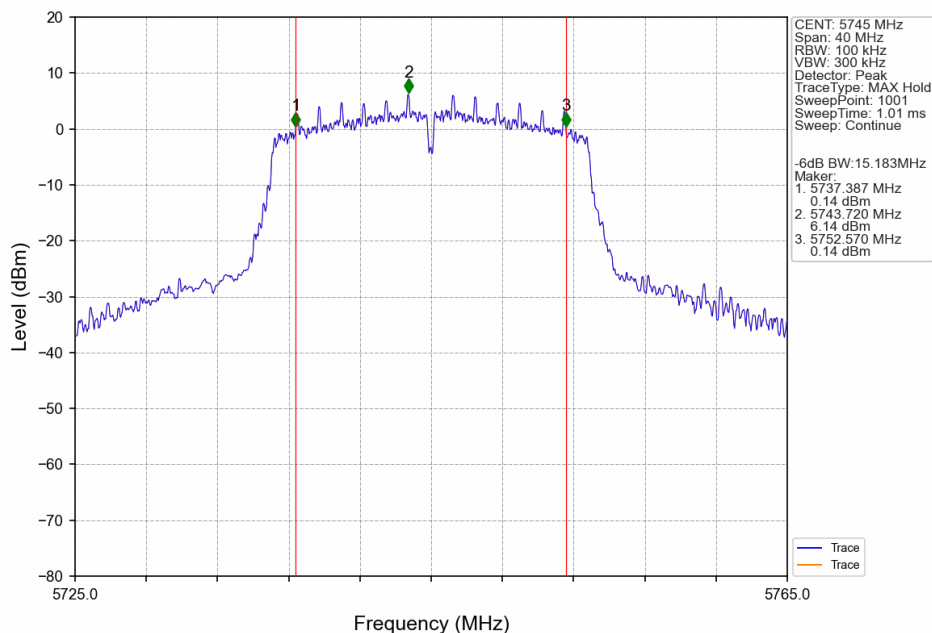
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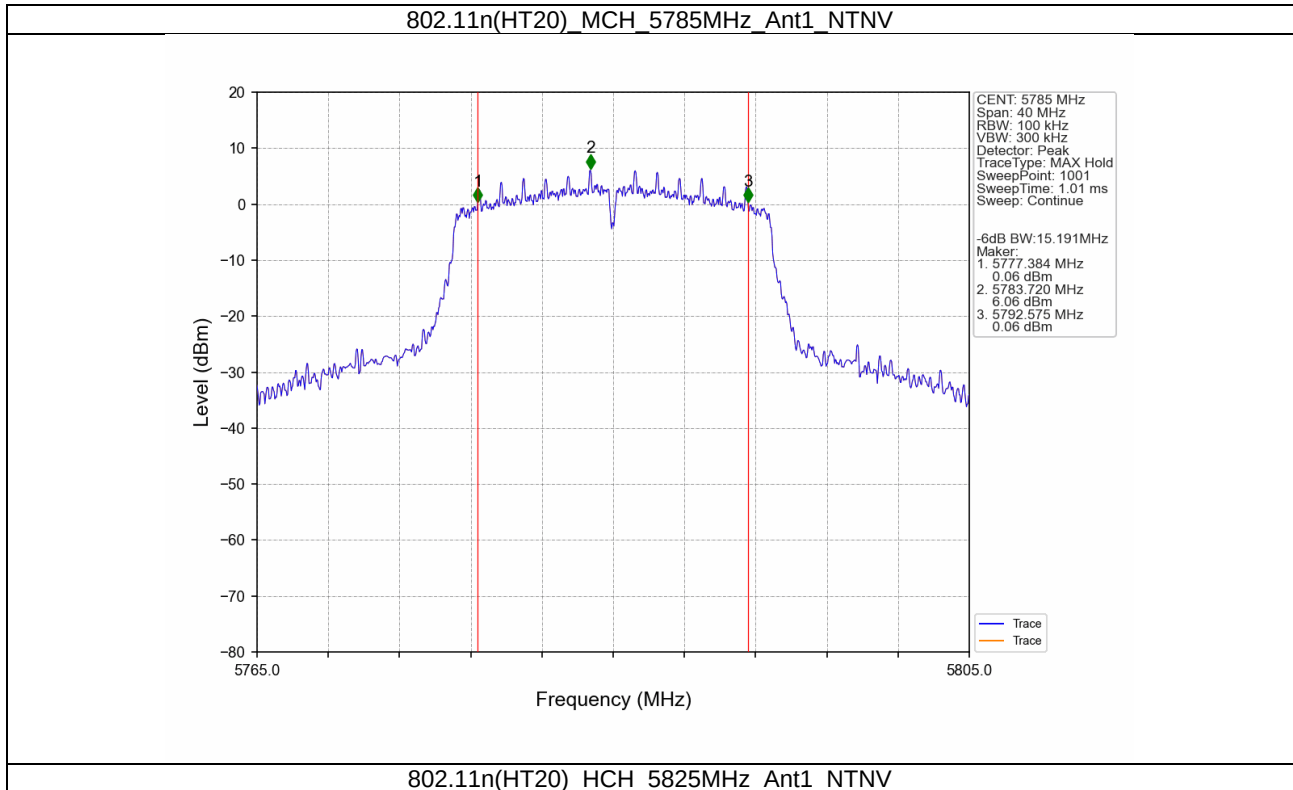
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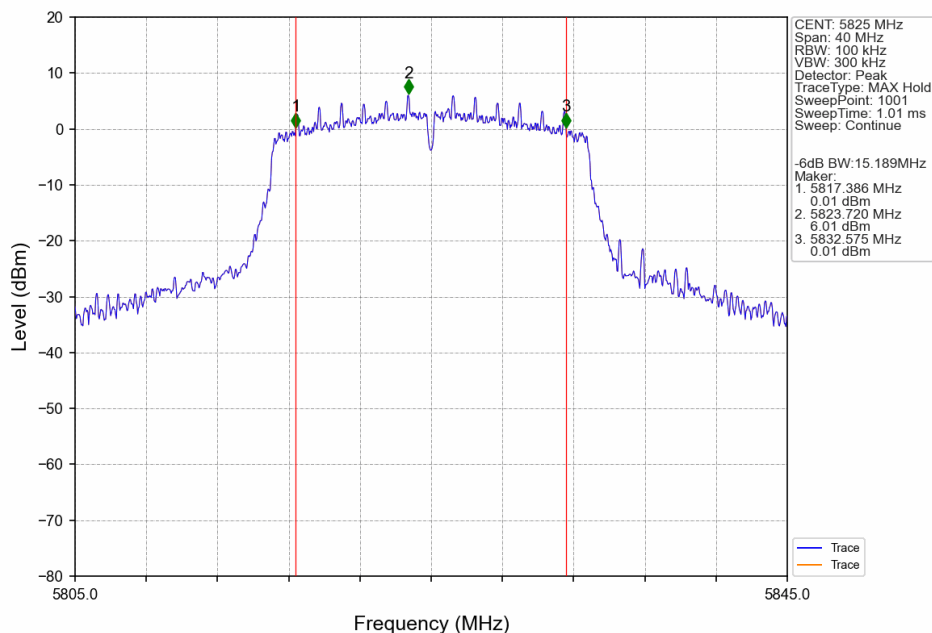
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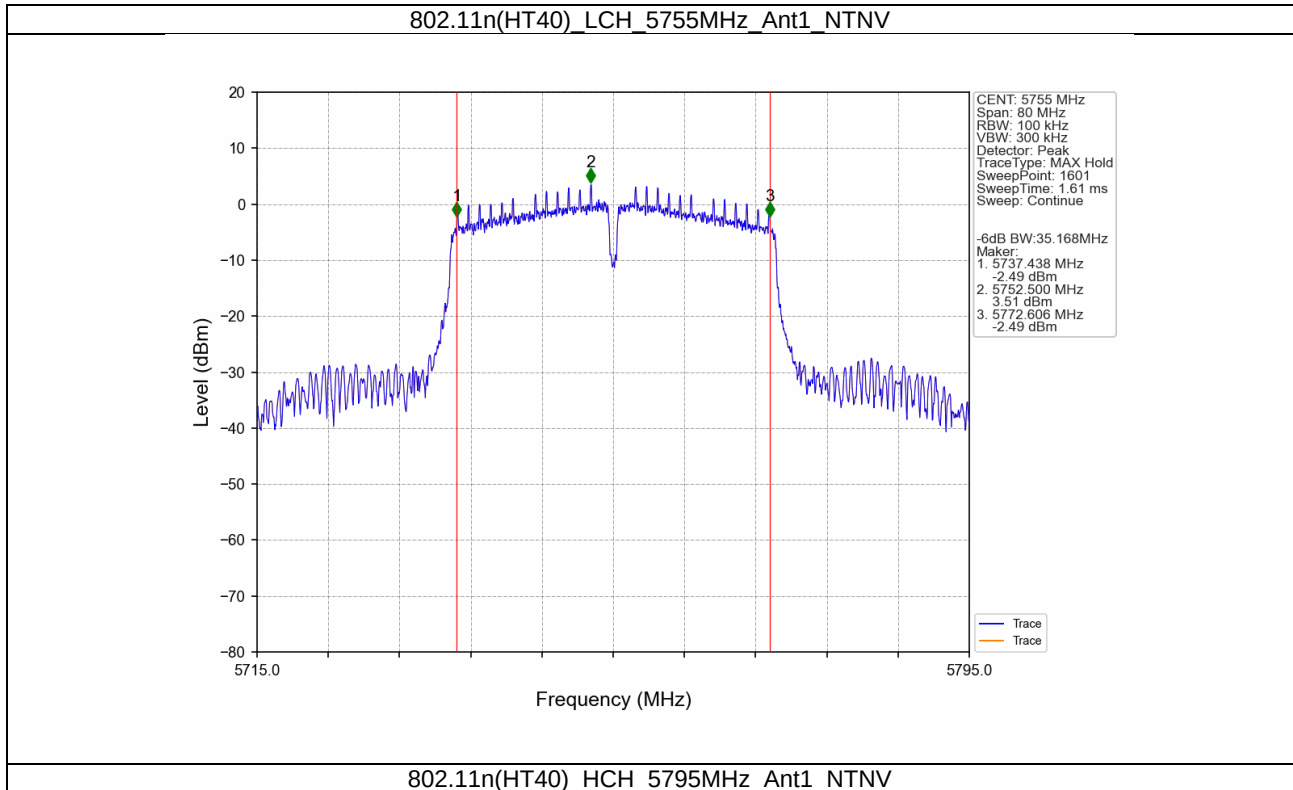
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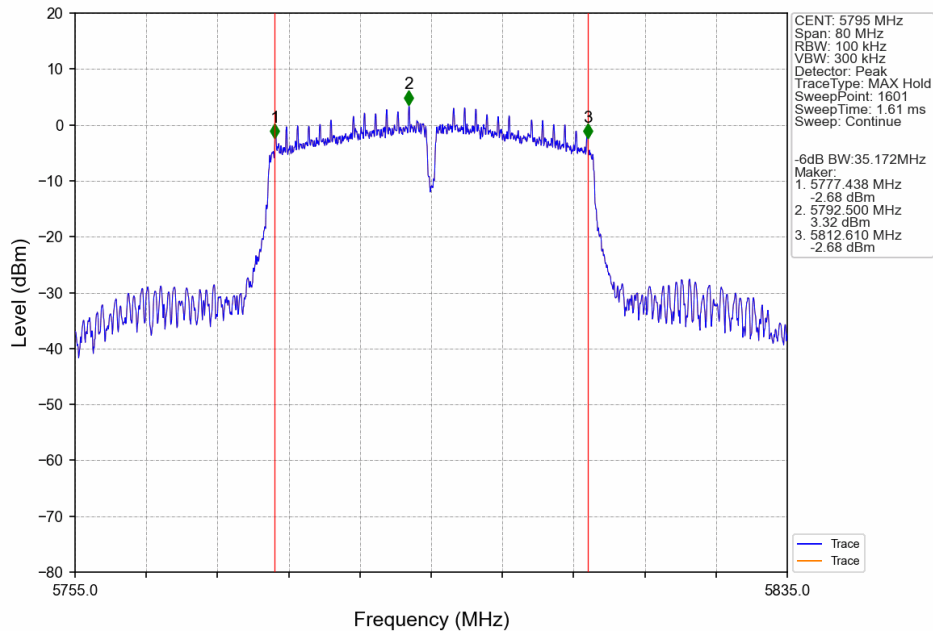
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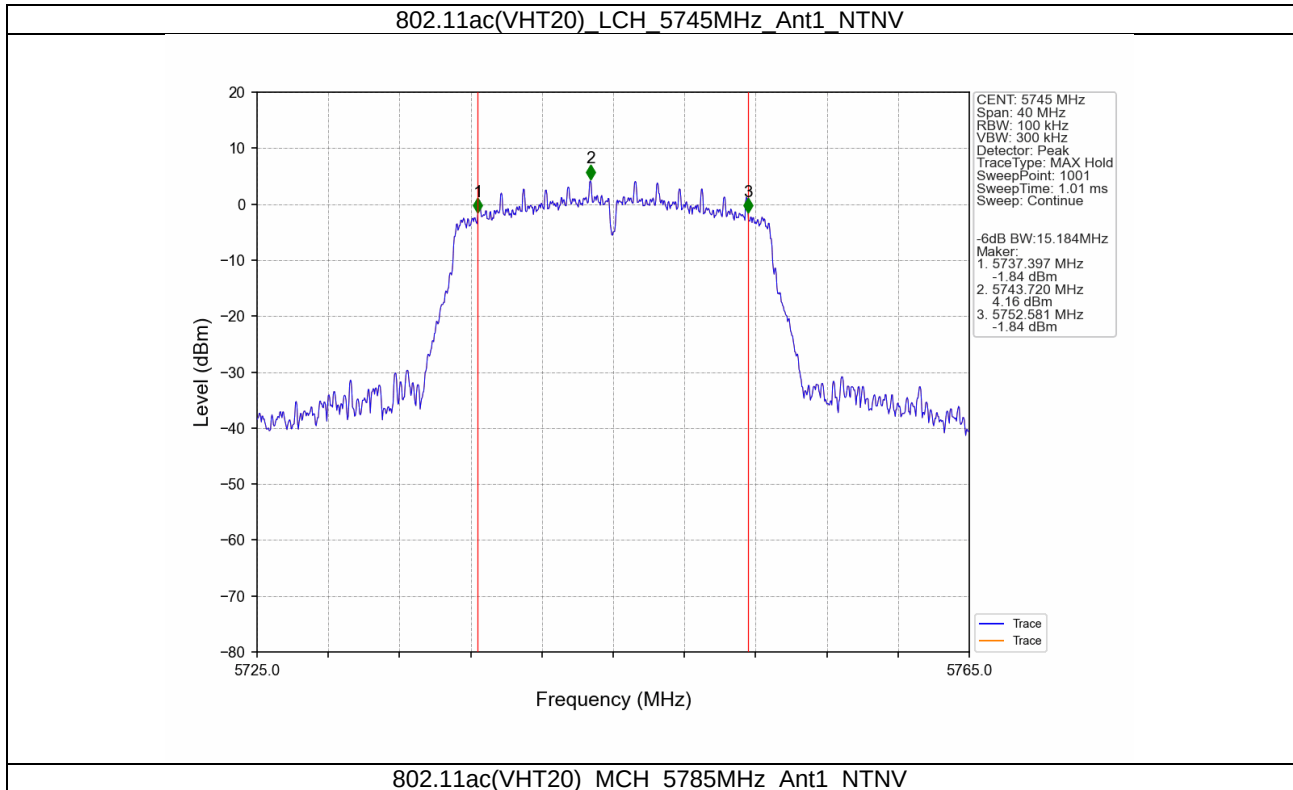
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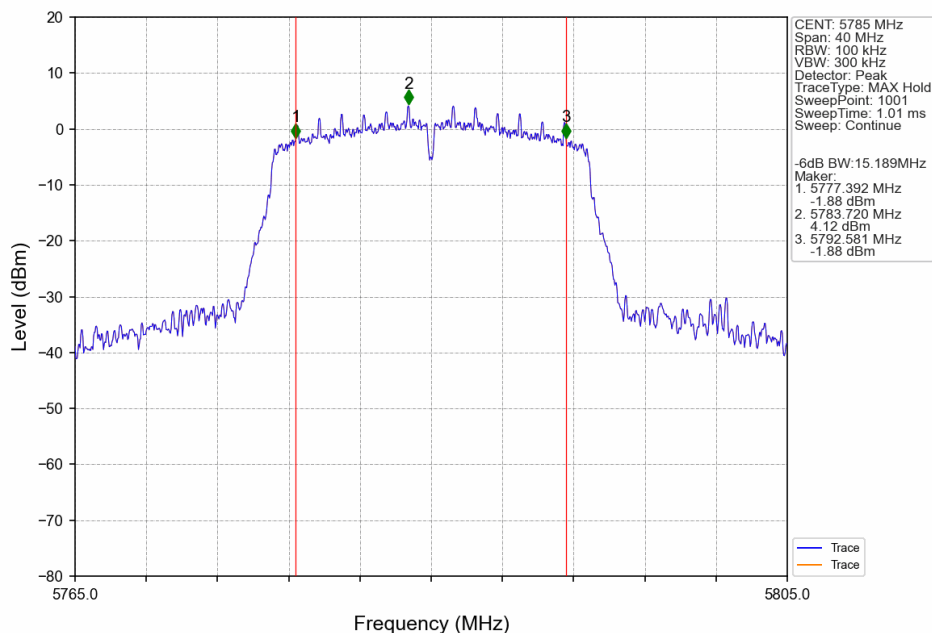
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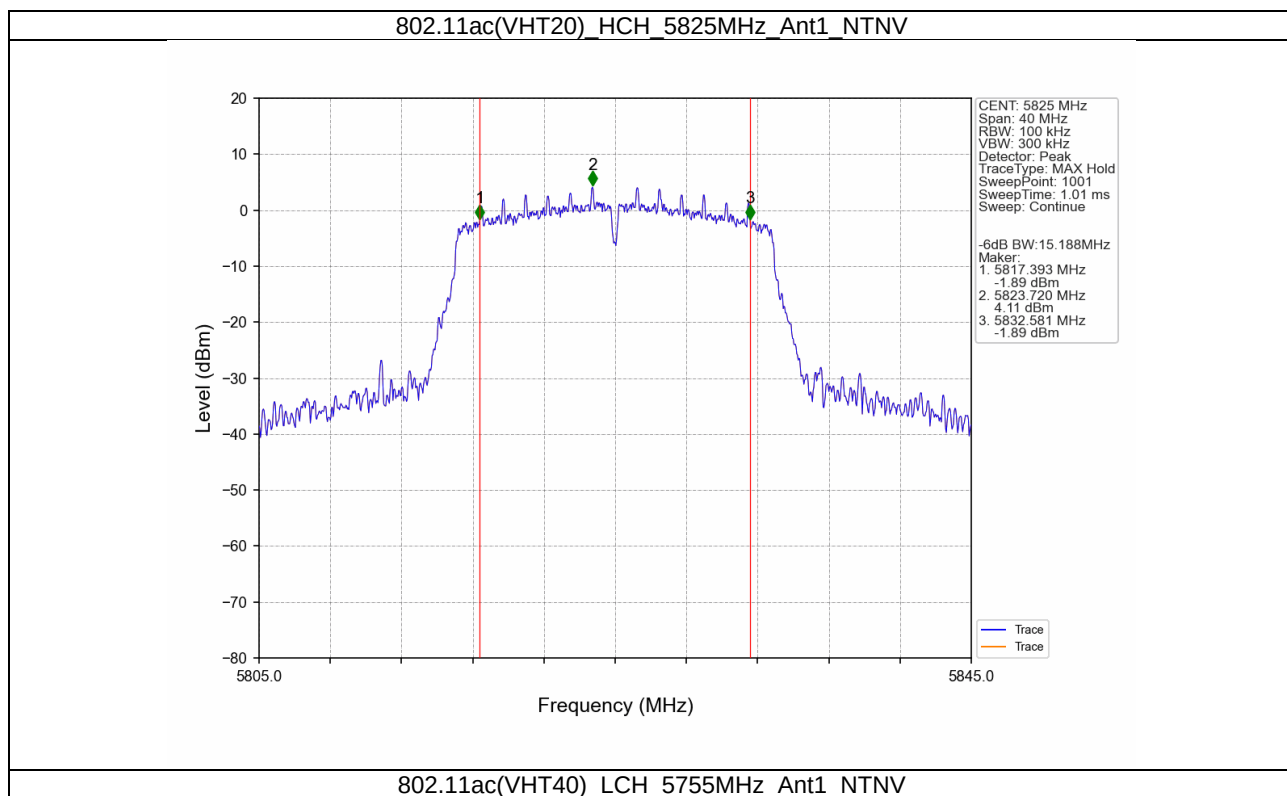
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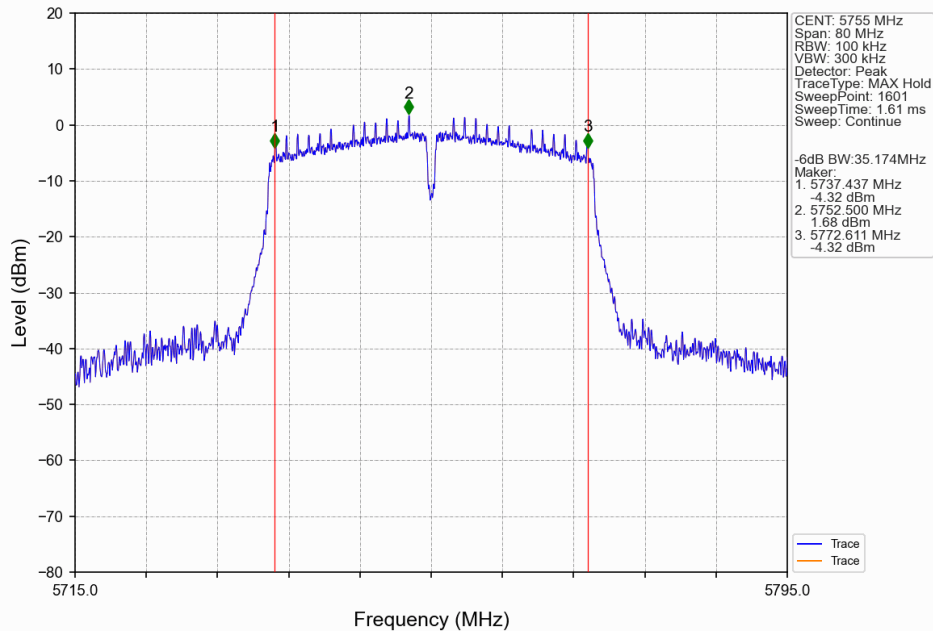
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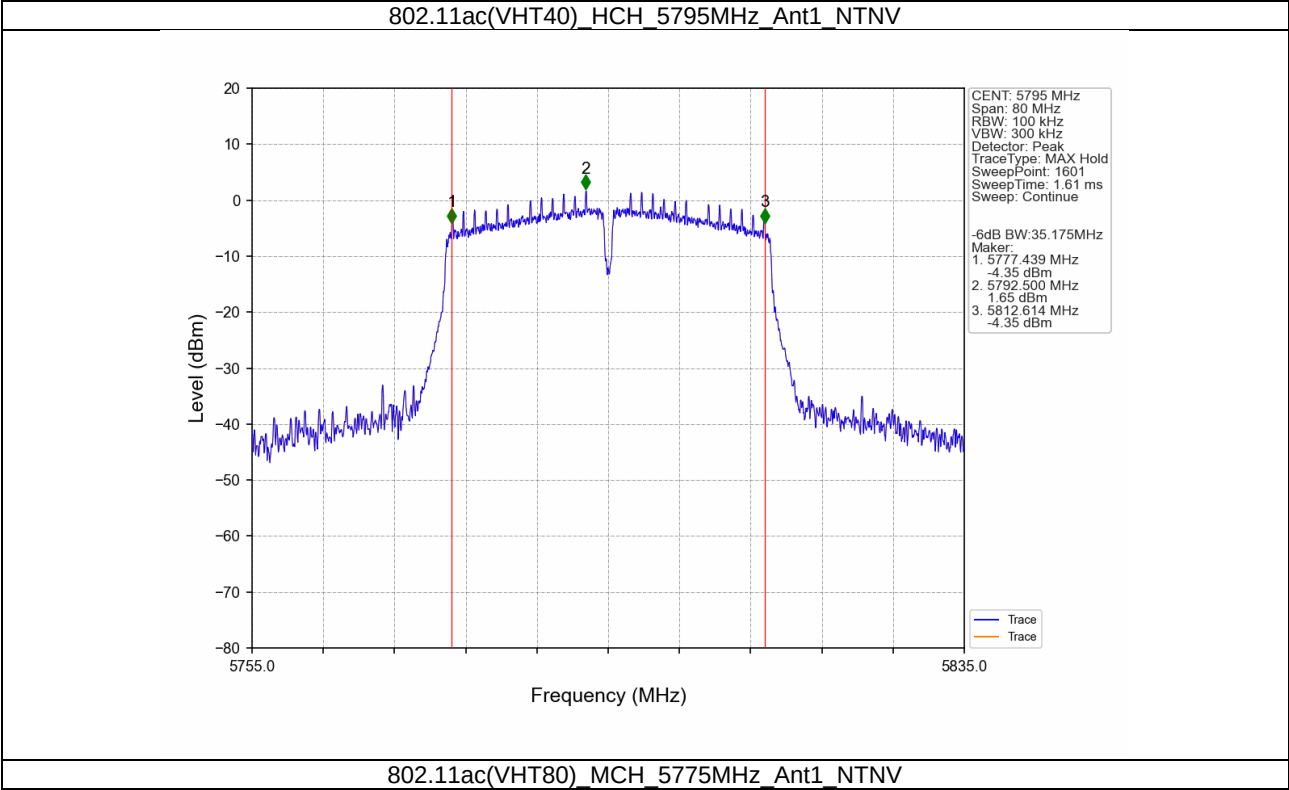
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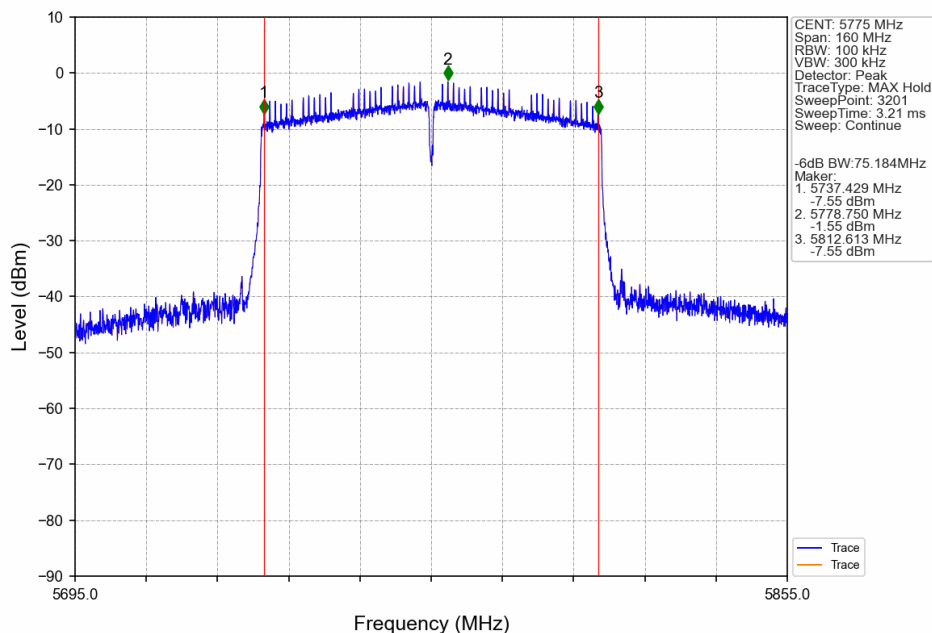
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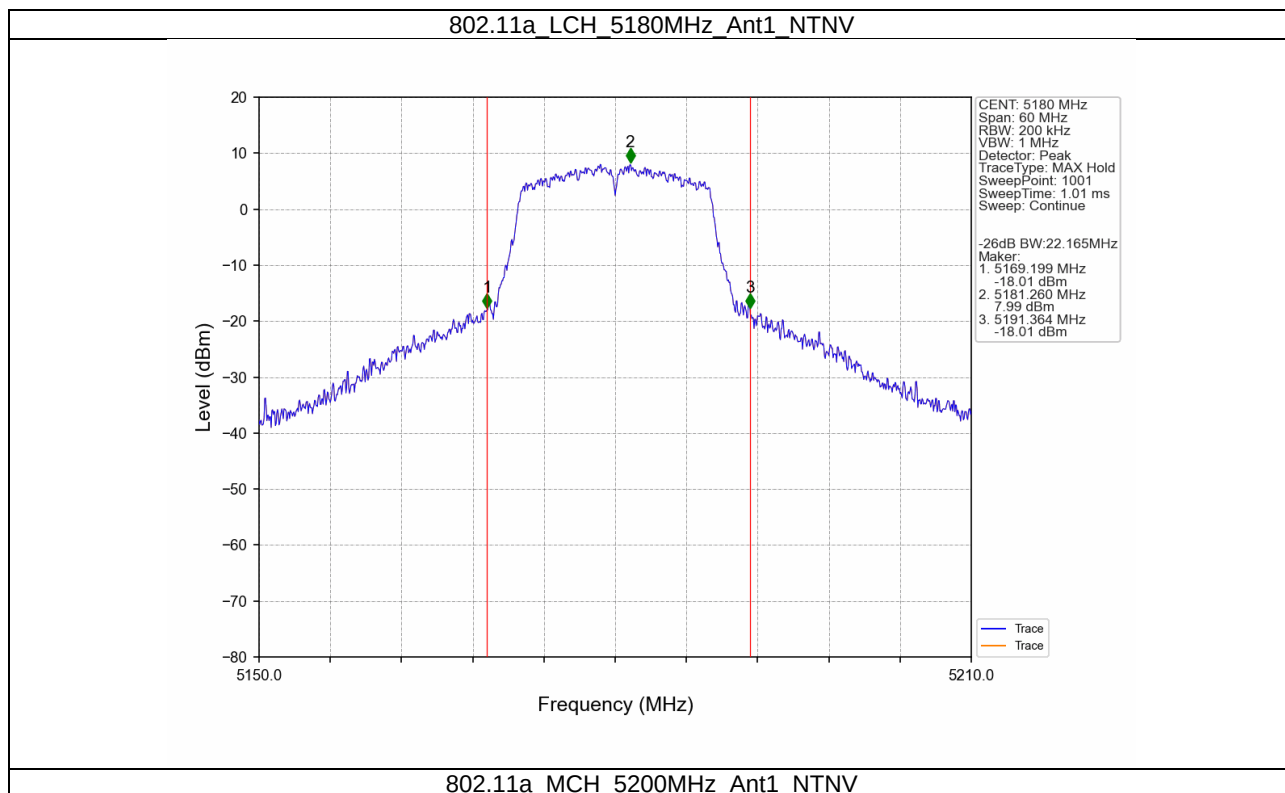


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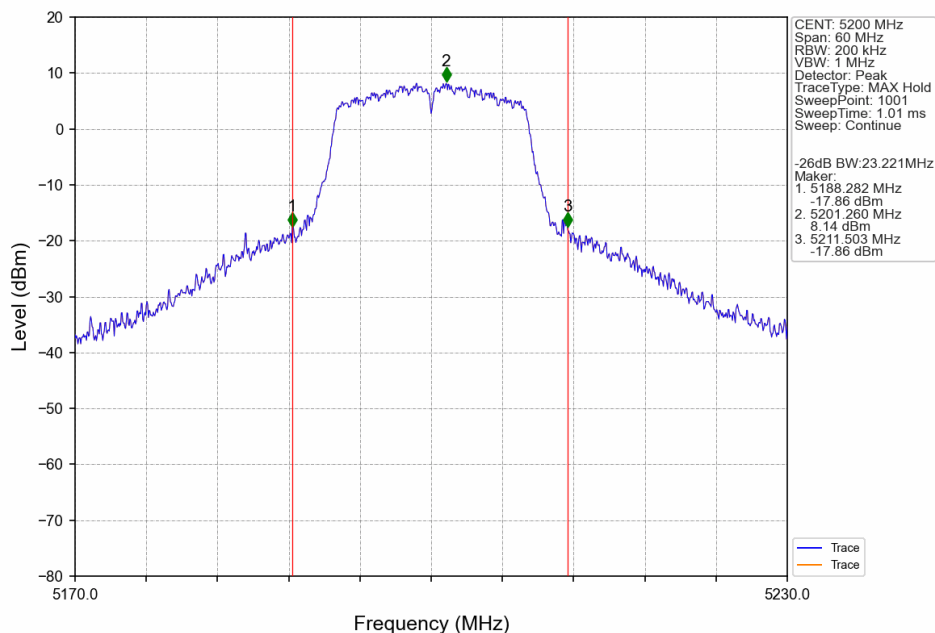
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