



7.14 Channel Closing Transmission Time

Test Requirement KDB 905462 D02 Section 5.1

Test Method: KDB 905462 D02 Section 7.8.3

Limit:

Test item	Limit	Applicability	
		Master Device or client with Radar Detection	Client without Radar Detection
Non-occupancy period	Minimum 30 minutes	Yes	Not required
Channel Availability Check Time	60 seconds	Yes	Not required
Channel Move Time	10 seconds See Note 1.	Yes	Yes
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.	Yes	Yes
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.	Yes	Not required

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel 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 U-NII Detection Bandwidth 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.

7.14.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

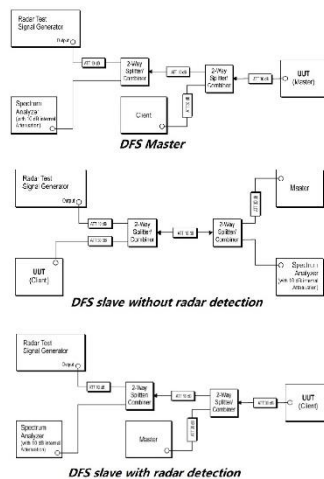
Humidity: 56 % RH

Atmospheric Pressure: 1024 mbar

7.14.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	09	Normal operating_Keep the EUT communication with the companion device.

7.14.3 Test Setup Diagram



7.14.4 Measurement Procedure and Data

- 1) The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
- 2) The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device.
- 3) A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
- 4) EUT will associate with the master at channel. The file "iperf.exe" specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Media Player Classic Ver. 6.4.8.6 in order to properly load the network for the entire period of the test.
- 5) When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.
- 6) Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type.
- 7) Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: $Dwell (0.3ms) = S (12000ms) / B (4000)$; where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: $C (ms) = N \times Dwell (0.3ms)$; where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.
- 8) Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

Please Refer to Appendix for Details



Report No.: SUCR250900091507

Page: 189 of 321

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SUCR2509000915WM

9 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photographs of EUT Constructional Details for SUCR2509000915WM

10 Appendix

1. Duty Cycle

1.1 Test Result

1.1.1 Ant7

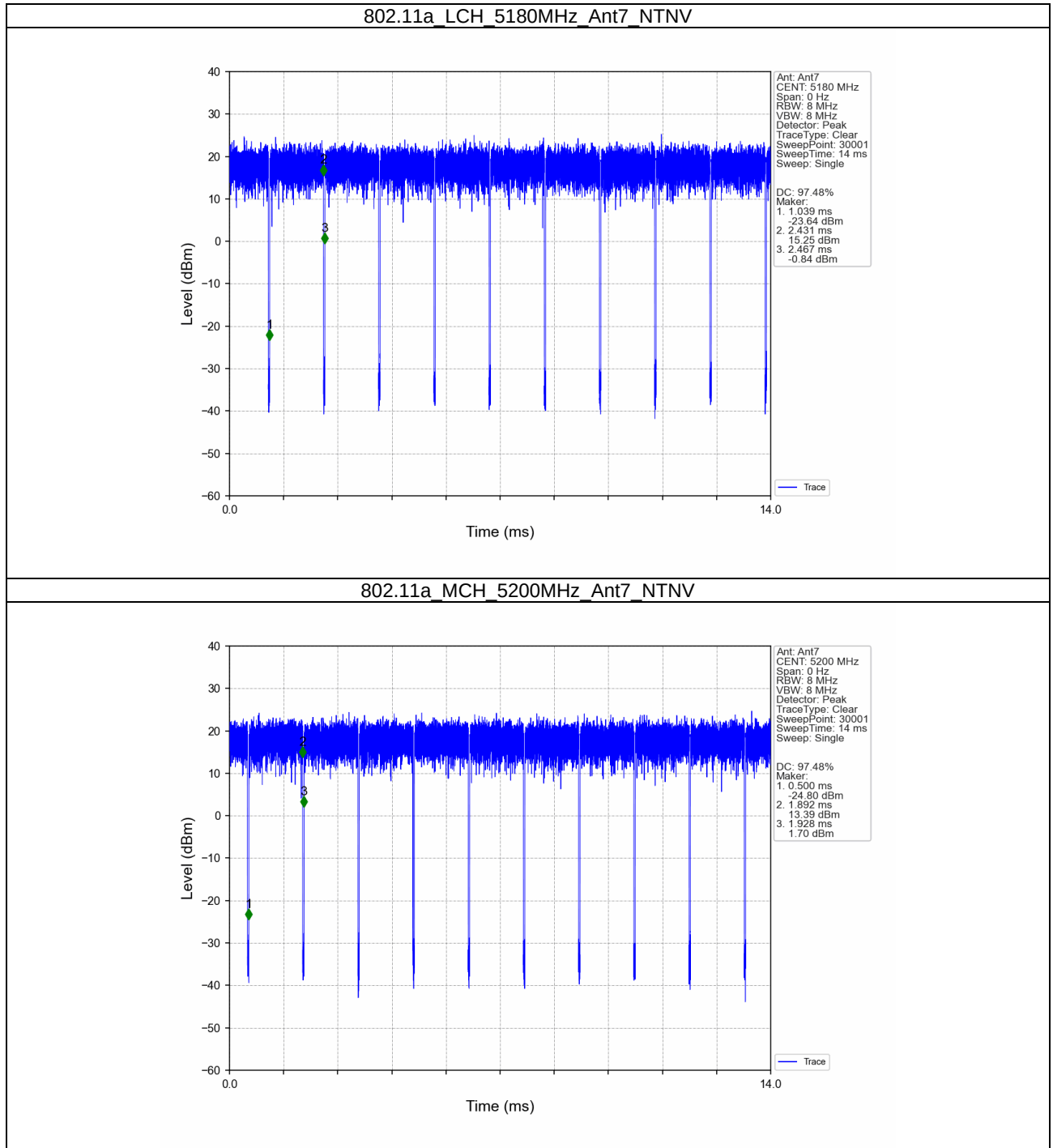
Ant7							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11a	SISO	5180	1.392	1.428	97.48	0.11	0.03
		5200	1.392	1.428	97.48	0.11	0.06
		5240	1.392	1.427	97.55	0.11	0.03
		5260	1.392	1.428	97.48	0.11	0.03
		5300	1.392	1.427	97.55	0.11	0.03
		5320	1.392	1.428	97.48	0.11	0.03
		5500	1.392	1.428	97.48	0.11	0.00
		5580	1.392	1.427	97.55	0.11	0.03
		5700	1.392	1.428	97.48	0.11	0.06
		5745	1.392	1.427	97.55	0.11	0.00
		5785	1.392	1.427	97.55	0.11	0.00
802.11n (HT20)	SISO	5825	1.392	1.428	97.48	0.11	0.03
		5180	1.301	1.336	97.38	0.12	0.11
		5200	1.300	1.336	97.31	0.12	0.07
		5240	1.301	1.336	97.38	0.12	0.07
		5260	1.300	1.336	97.31	0.12	0.10
		5300	1.301	1.336	97.38	0.12	0.00
		5320	1.300	1.335	97.38	0.12	0.03
		5500	1.300	1.335	97.38	0.12	0.07
		5580	1.300	1.335	97.38	0.12	0.00
		5700	1.301	1.336	97.38	0.12	0.00
		5745	1.300	1.335	97.38	0.12	0.03
802.11n (HT40)	SISO	5785	1.300	1.336	97.31	0.12	0.03
		5825	1.301	1.336	97.38	0.12	0.07
		5190	0.648	0.683	94.88	0.23	0.07
		5230	0.648	0.683	94.88	0.23	0.03
		5270	0.649	0.683	95.02	0.22	0.04
		5310	0.649	0.683	95.02	0.22	0.03
		5510	0.648	0.683	94.88	0.23	0.03
		5550	0.648	0.683	94.88	0.23	0.03
		5670	0.648	0.683	94.88	0.23	0.03
802.11ac (VHT20)	SISO	5755	0.648	0.683	94.88	0.23	0.03
		5795	0.648	0.683	94.88	0.23	0.07
		5180	1.313	1.348	97.40	0.11	0.10
		5200	1.314	1.348	97.48	0.11	0.07
		5240	1.312	1.348	97.33	0.12	0.03
		5260	1.312	1.348	97.33	0.12	0.03
		5300	1.312	1.348	97.33	0.12	0.03
		5320	1.313	1.348	97.40	0.11	0.00
	SISO	5500	1.312	1.348	97.33	0.12	0.07
		5580	1.312	1.348	97.33	0.12	0.03



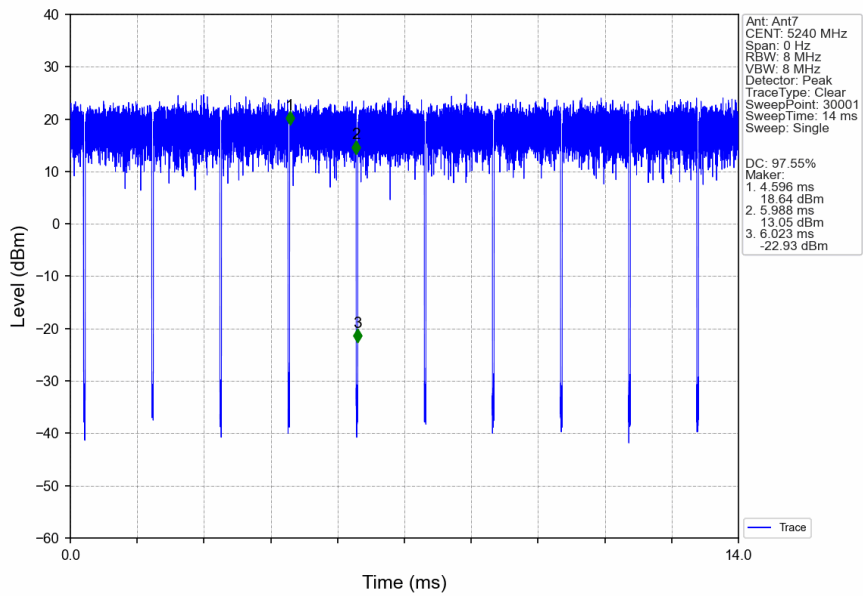
		5700	1.312	1.348	97.33	0.12	0.00
		5745	1.312	1.347	97.40	0.11	0.03
		5785	1.312	1.348	97.33	0.12	0.03
		5825	1.313	1.348	97.40	0.11	0.03
802.11ac (VHT40)	SISO	5190	0.653	0.687	95.05	0.22	0.07
		5230	0.652	0.687	94.91	0.23	0.03
		5270	0.652	0.687	94.91	0.23	0.04
		5310	0.653	0.687	95.05	0.22	0.03
		5510	0.653	0.687	95.05	0.22	0.03
		5550	0.652	0.687	94.91	0.23	0.03
		5670	0.652	0.687	94.91	0.23	0.03
		5755	0.652	0.687	94.91	0.23	0.07
		5795	0.652	0.687	94.91	0.23	0.03
802.11ac (VHT80)	SISO	5210	0.324	0.358	90.50	0.43	0.04
		5290	0.324	0.358	90.50	0.43	0.11
		5530	0.325	0.359	90.53	0.43	0.04
		5610	0.325	0.359	90.53	0.43	0.11
		5775	0.324	0.358	90.50	0.43	0.07

1.2 Test Graph

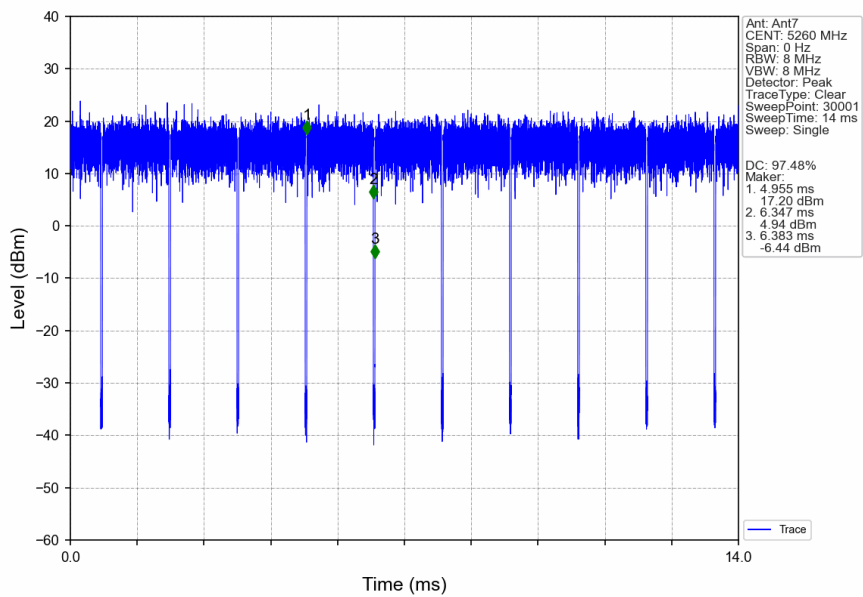
1.2.1 Ant7



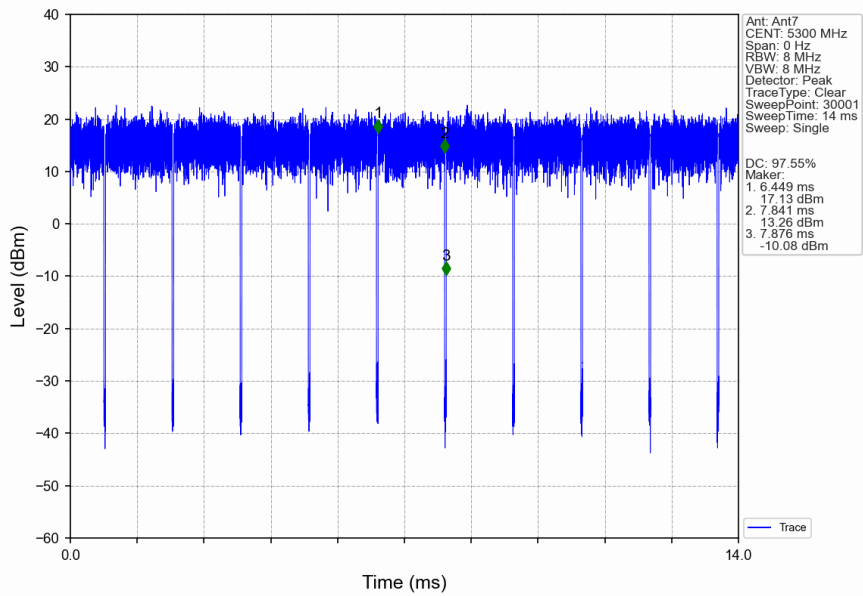
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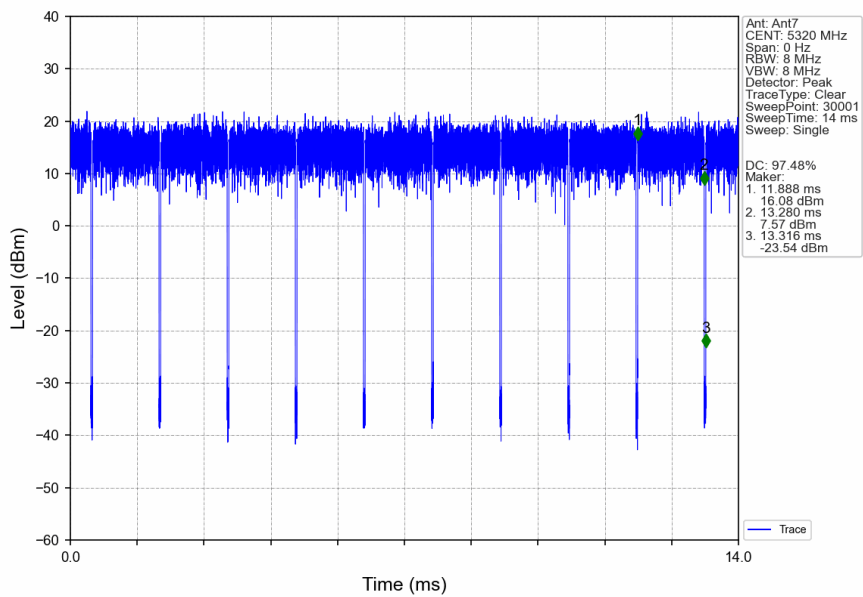
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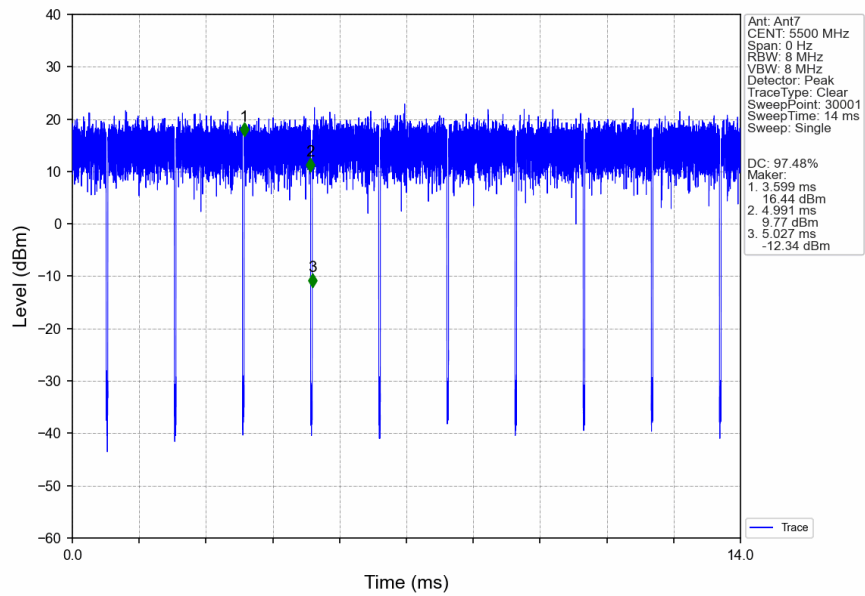
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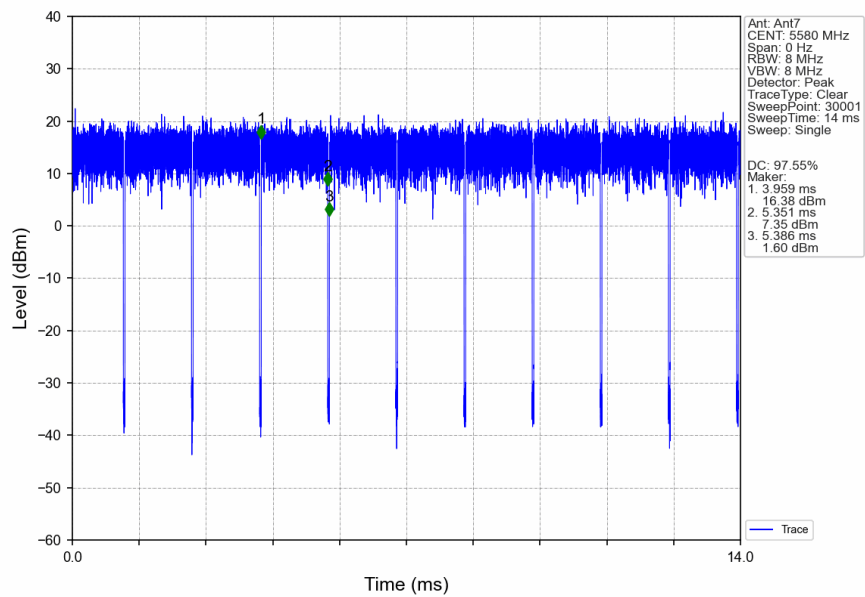
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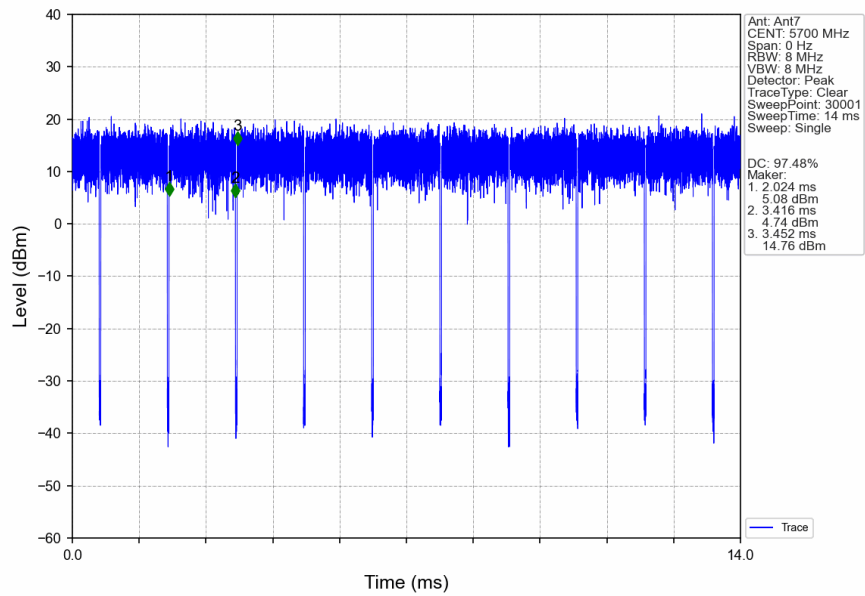
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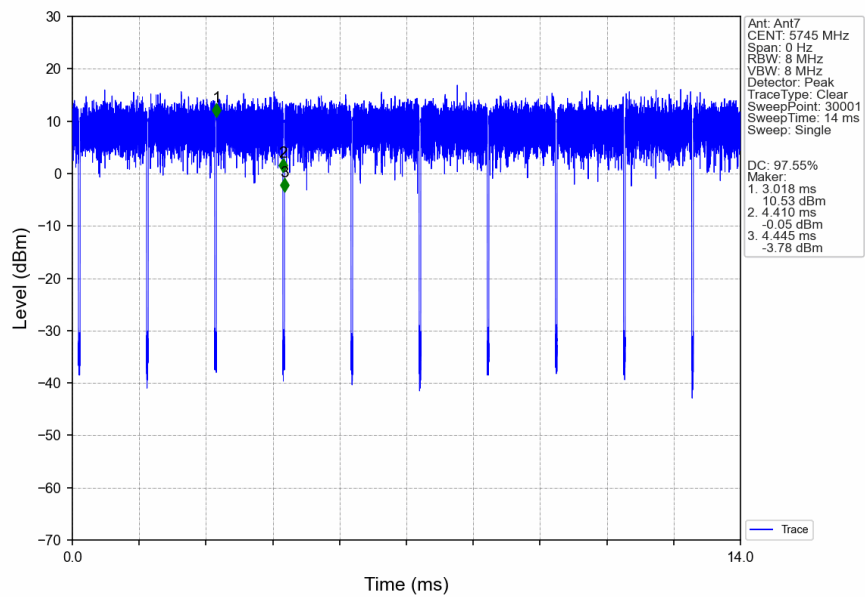
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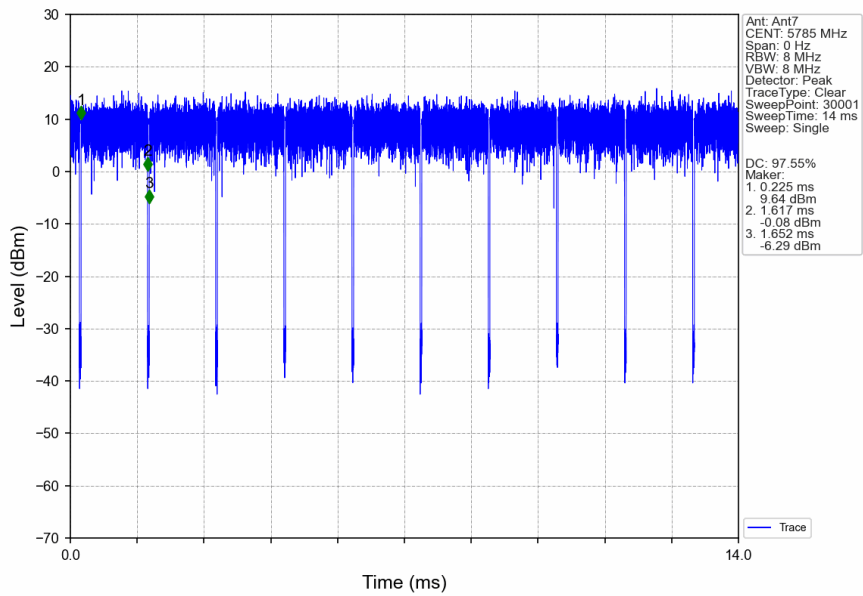
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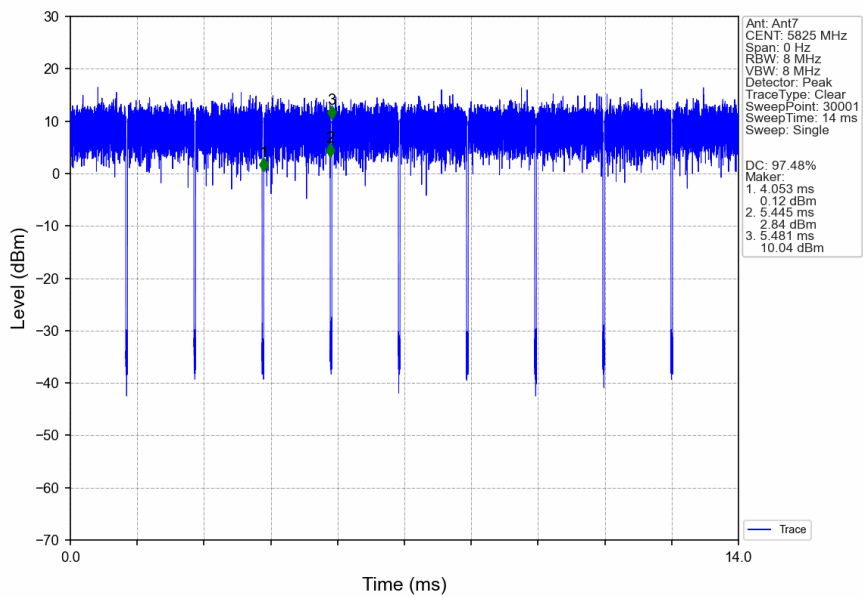
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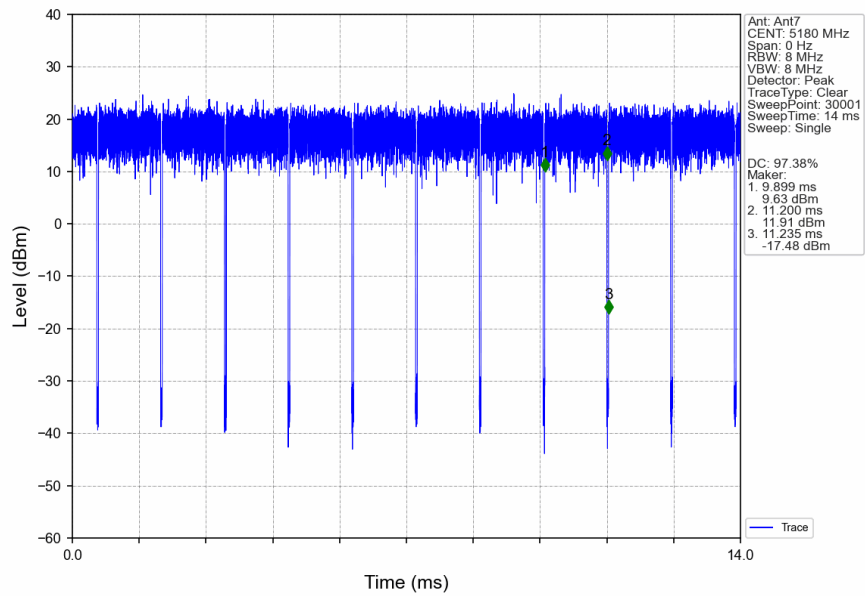
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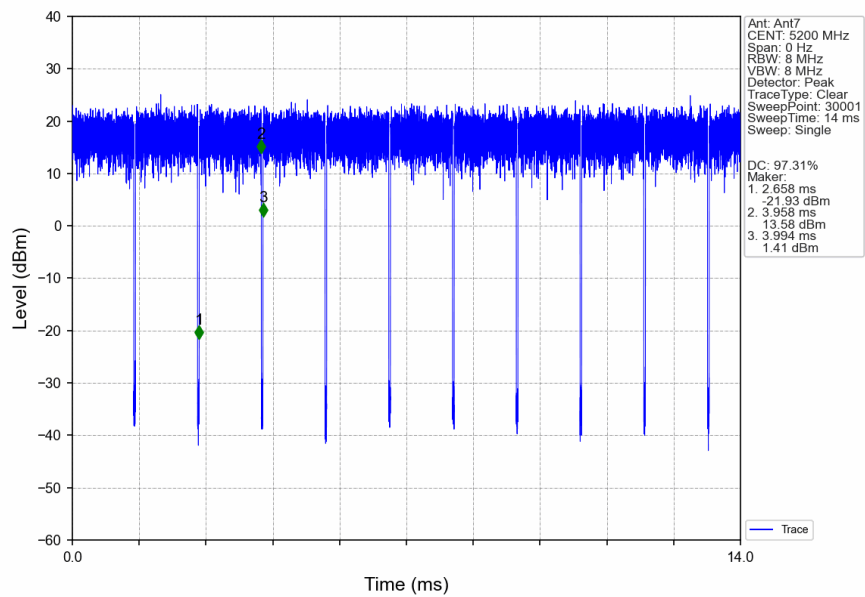
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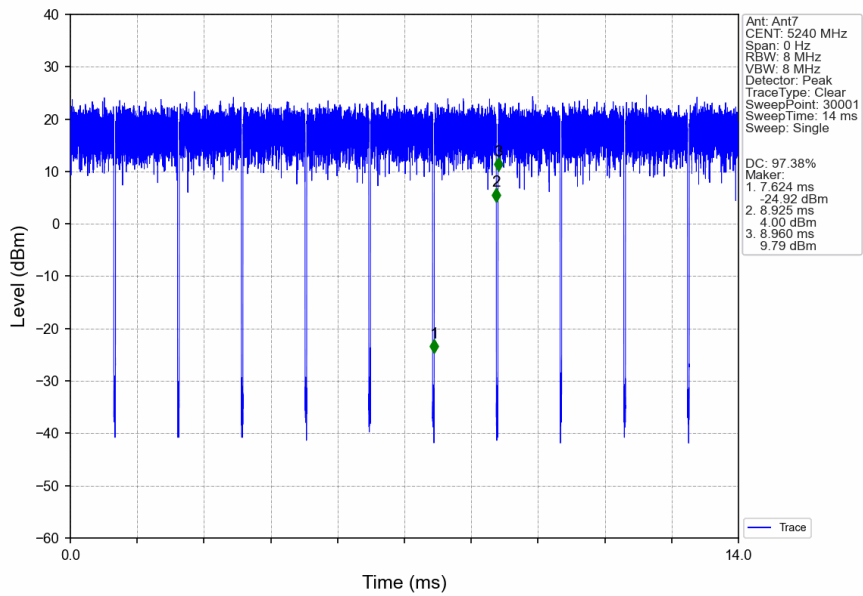
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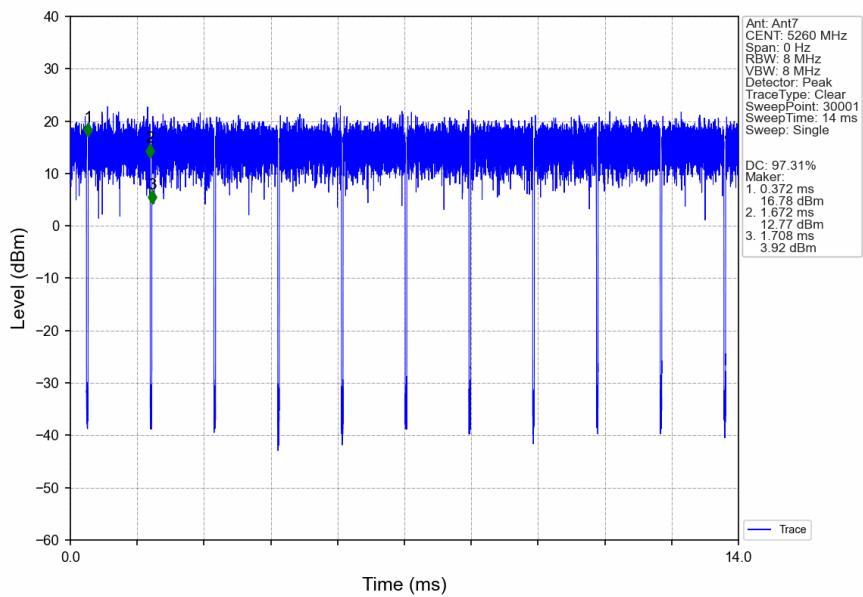
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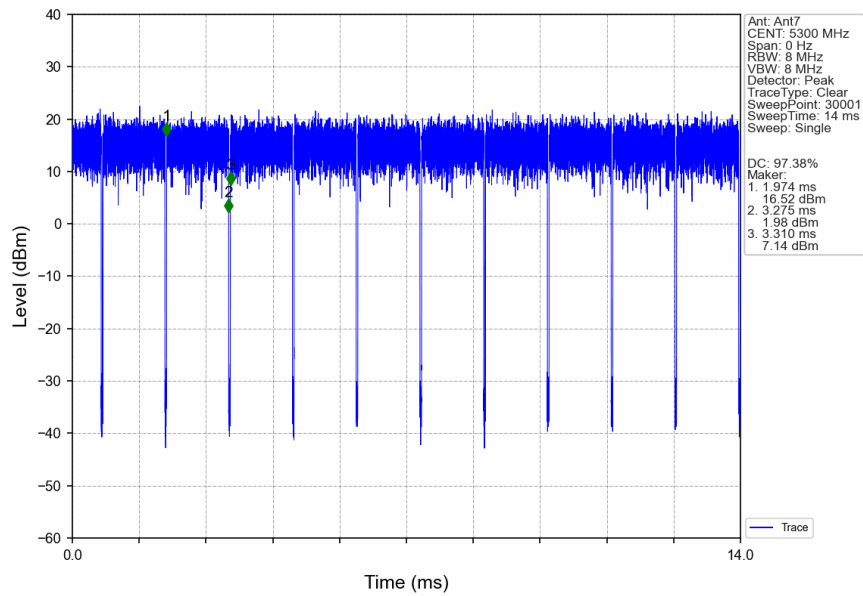
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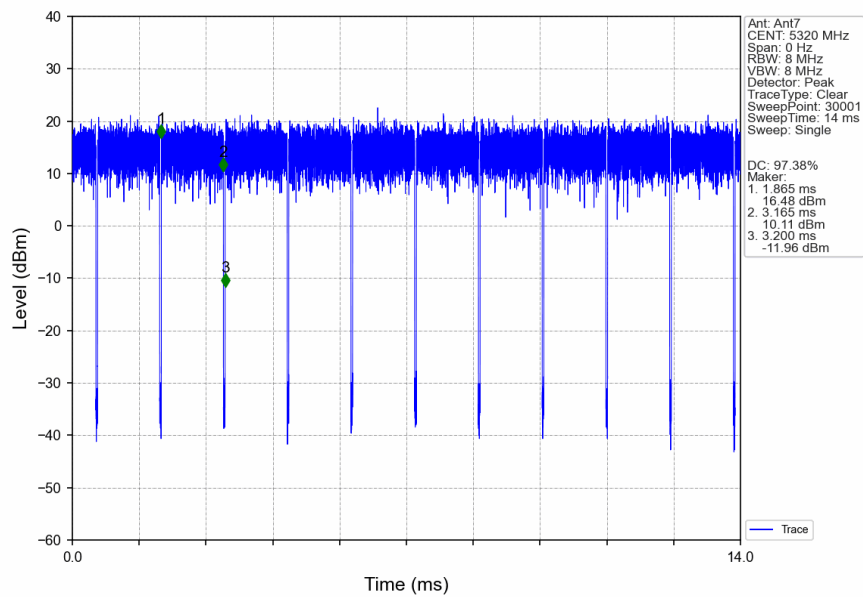
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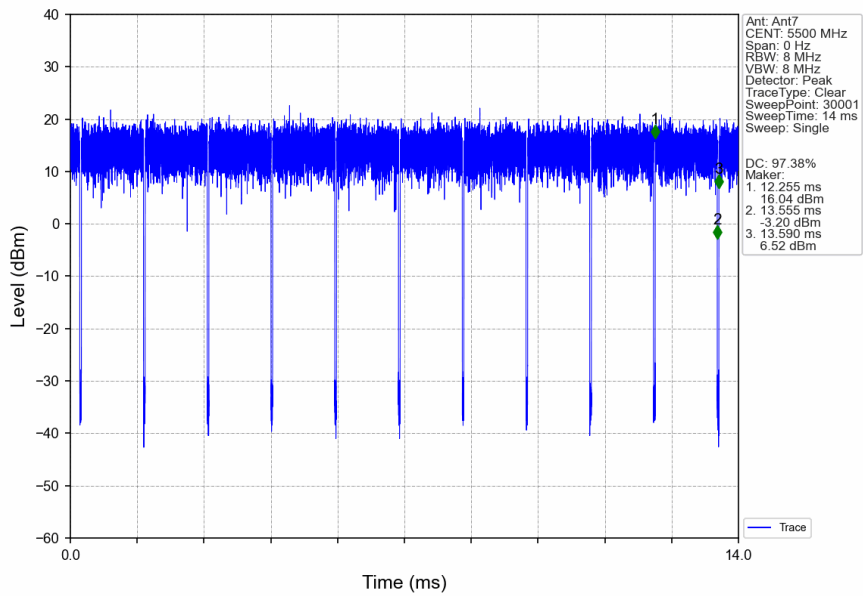
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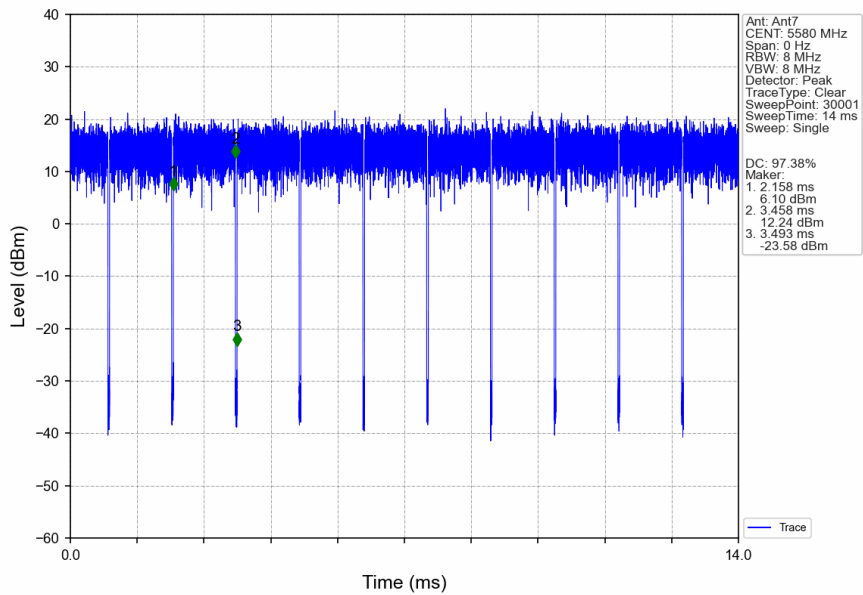
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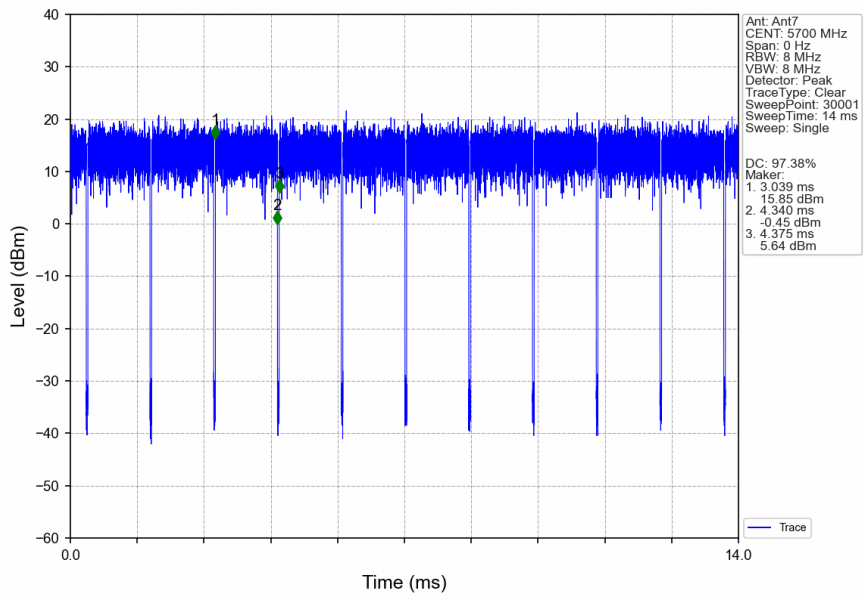
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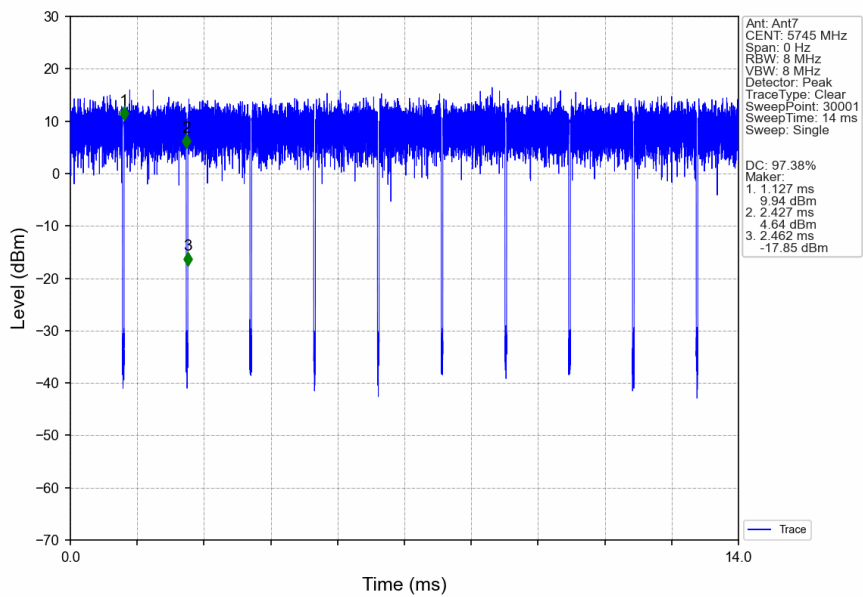
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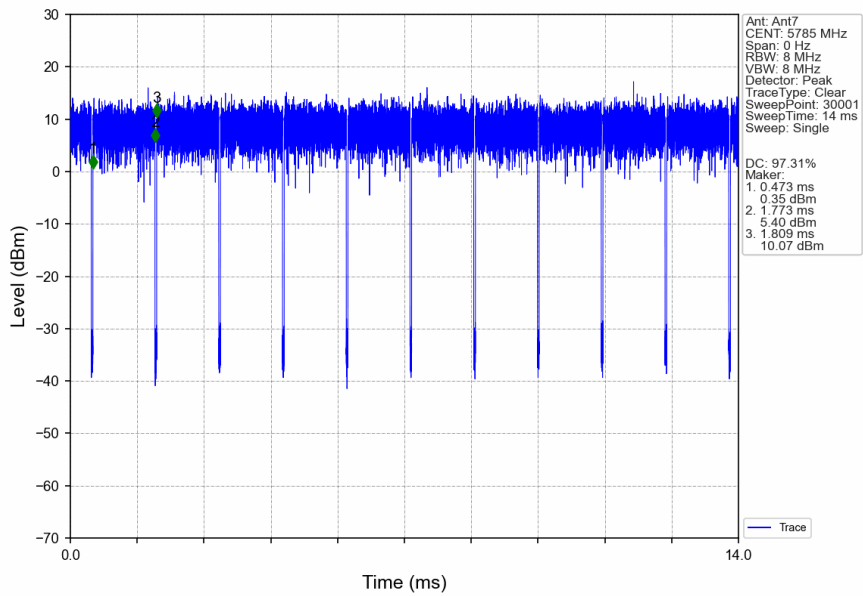
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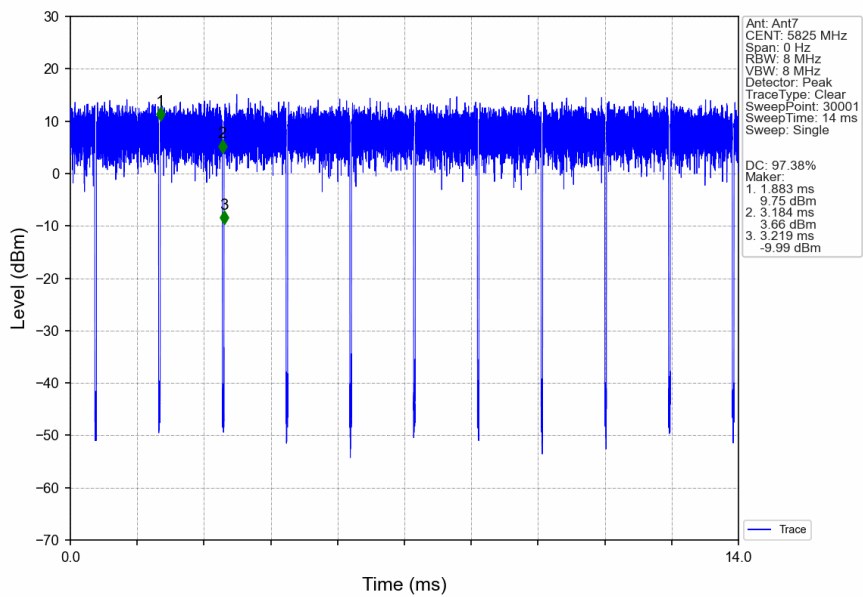
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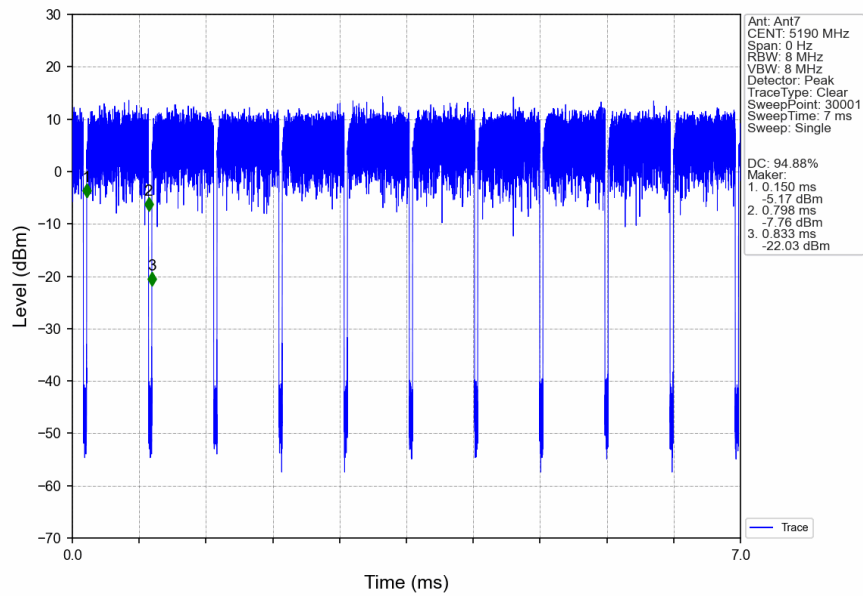
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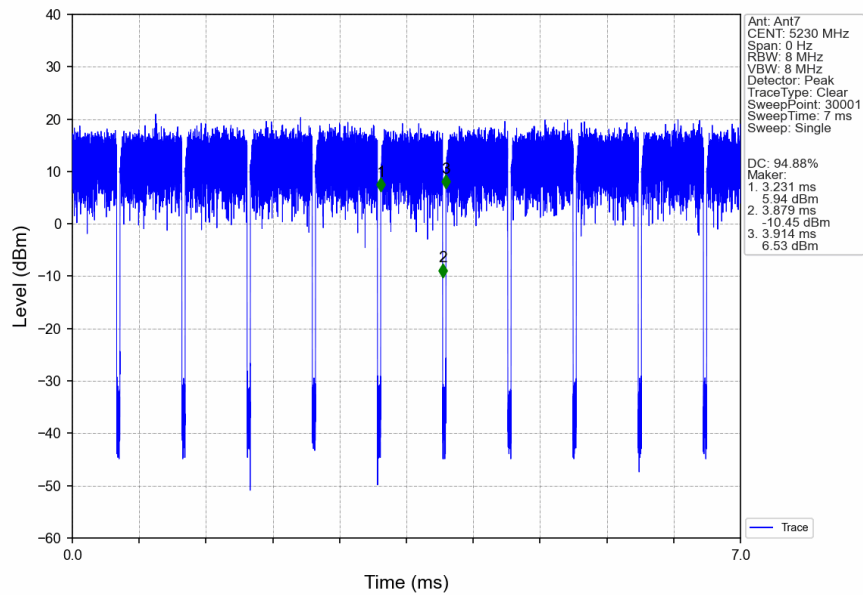
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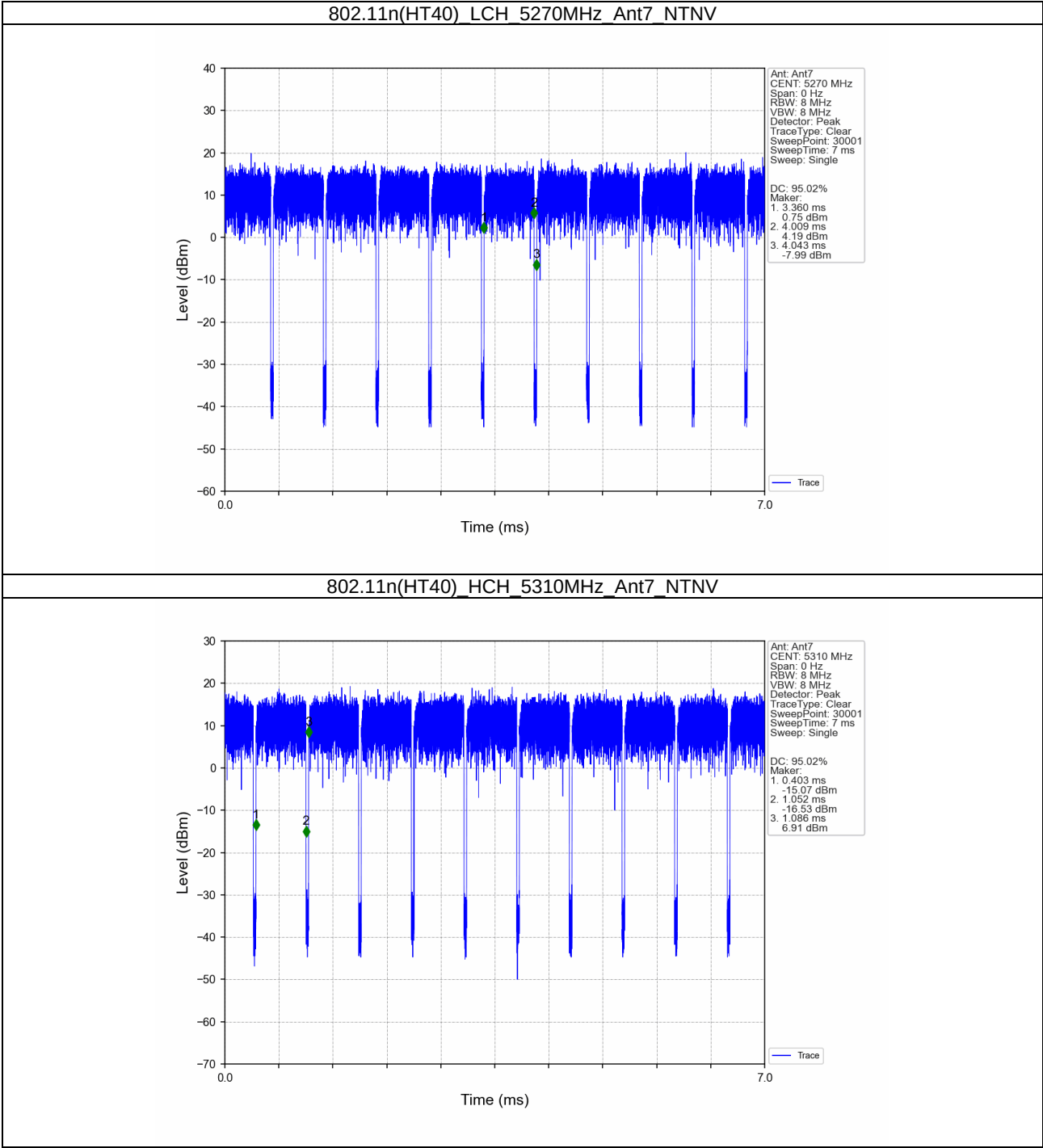


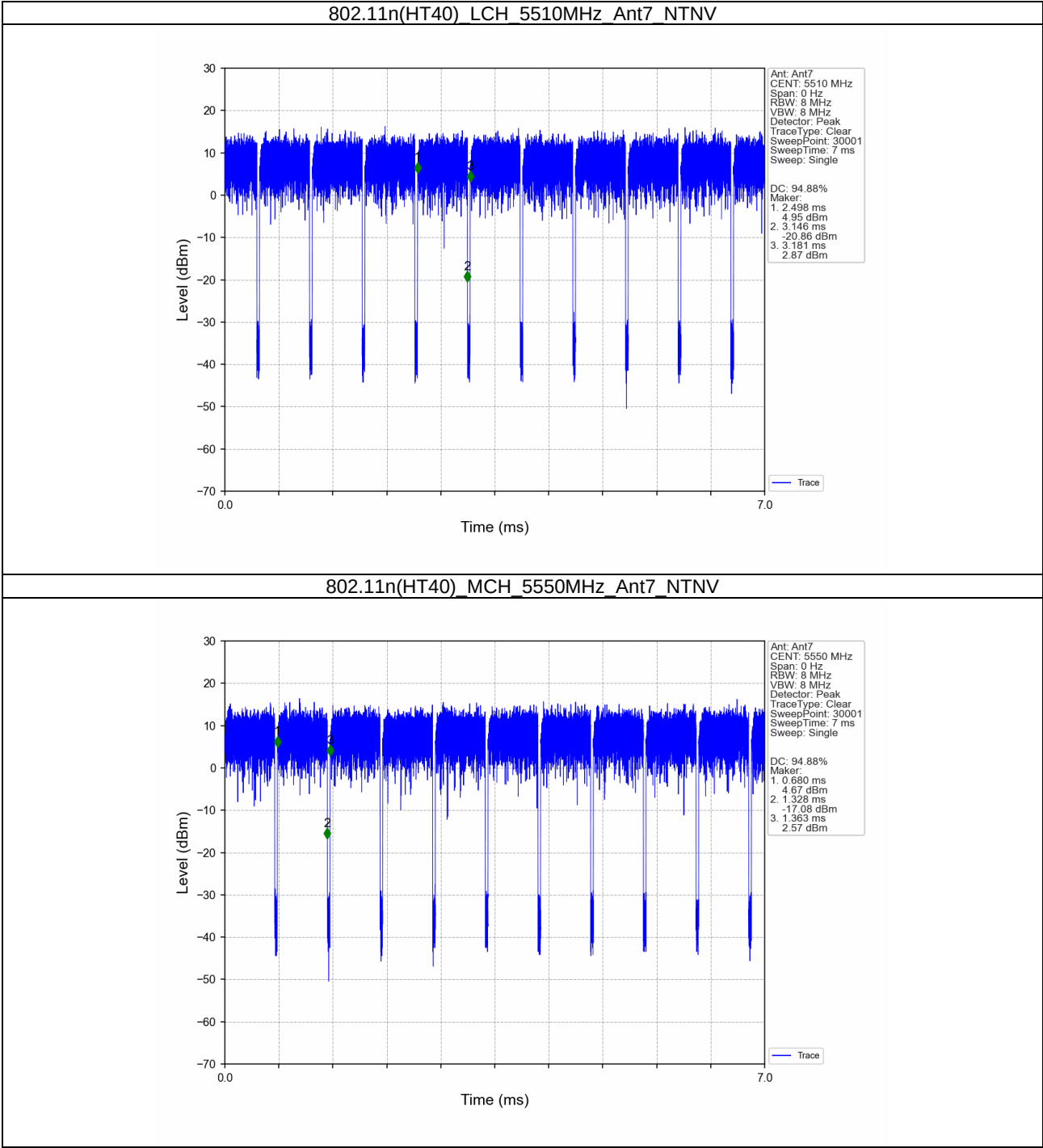
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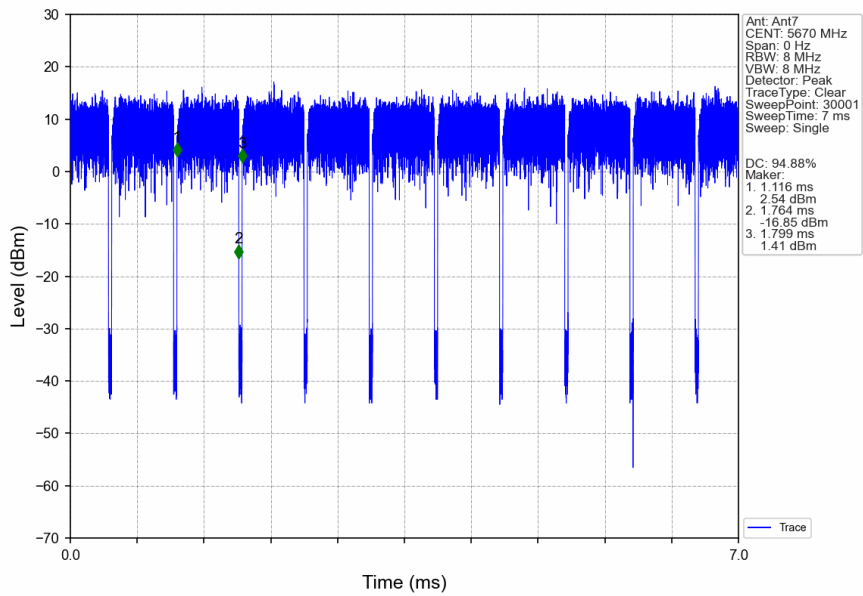
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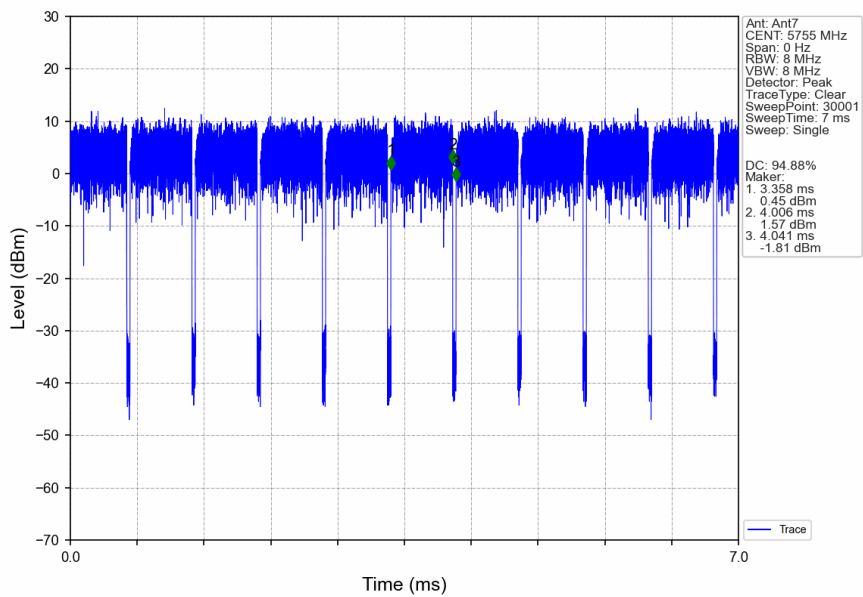




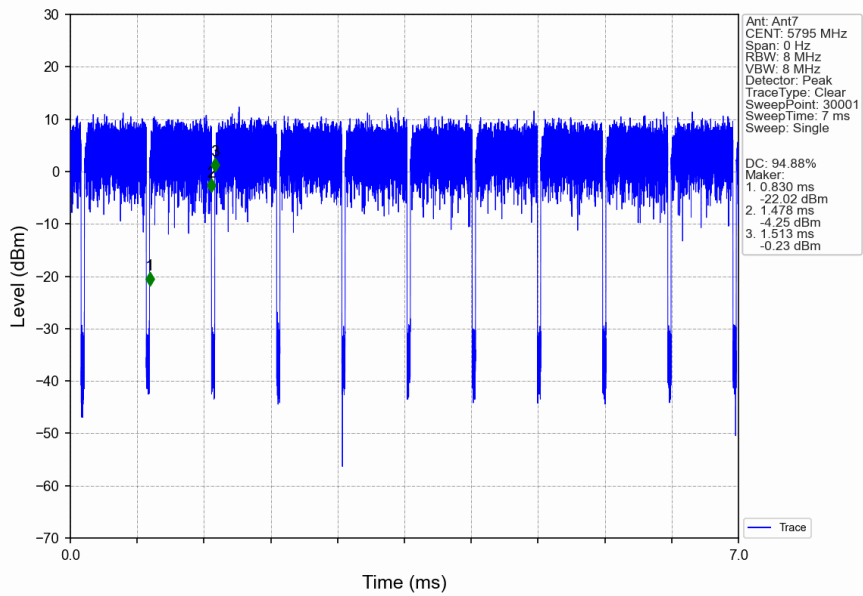
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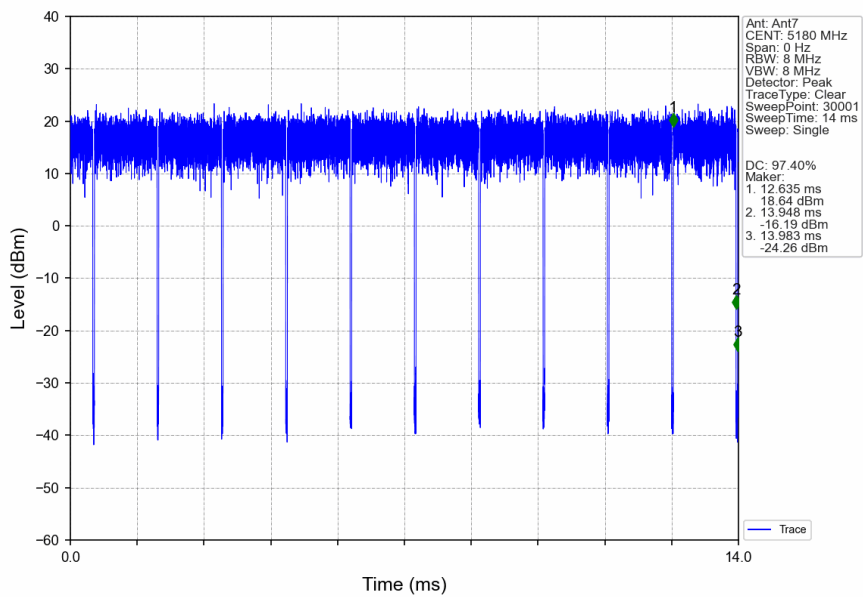
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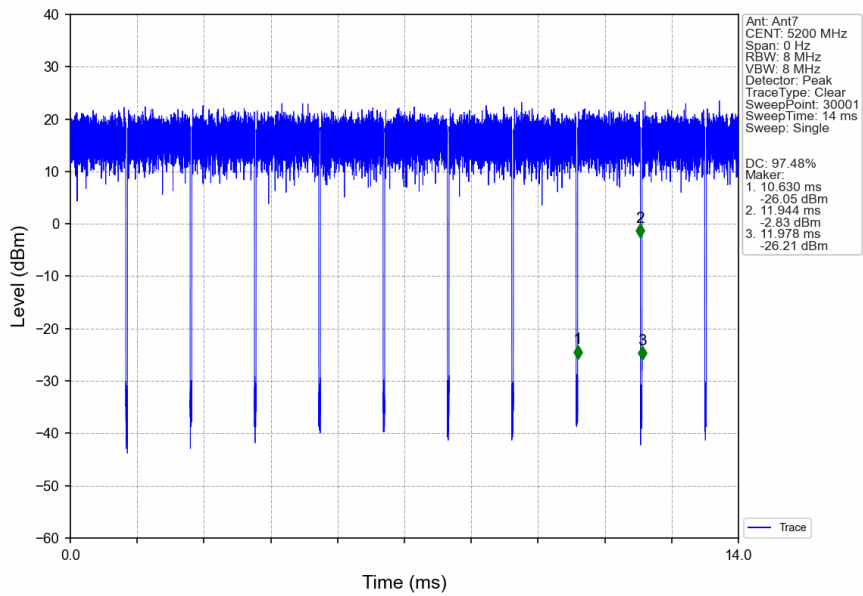
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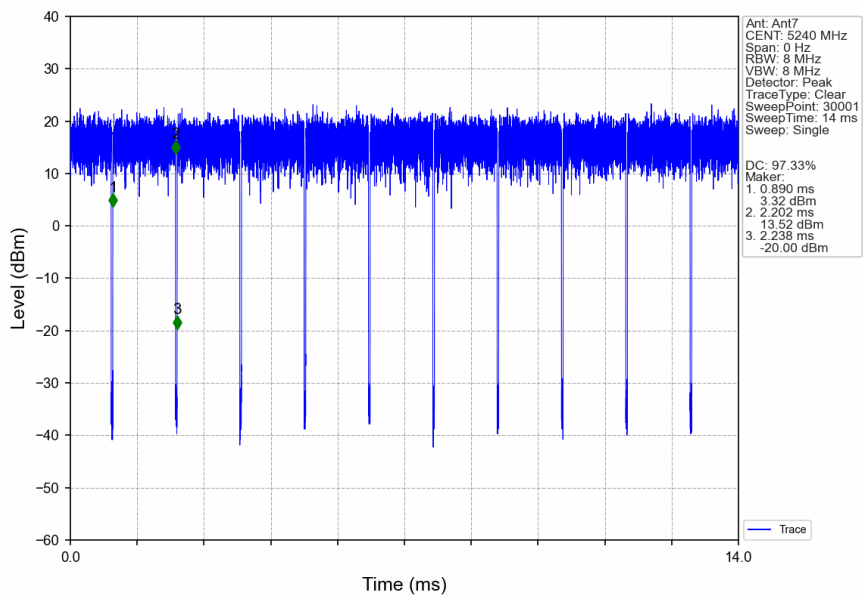
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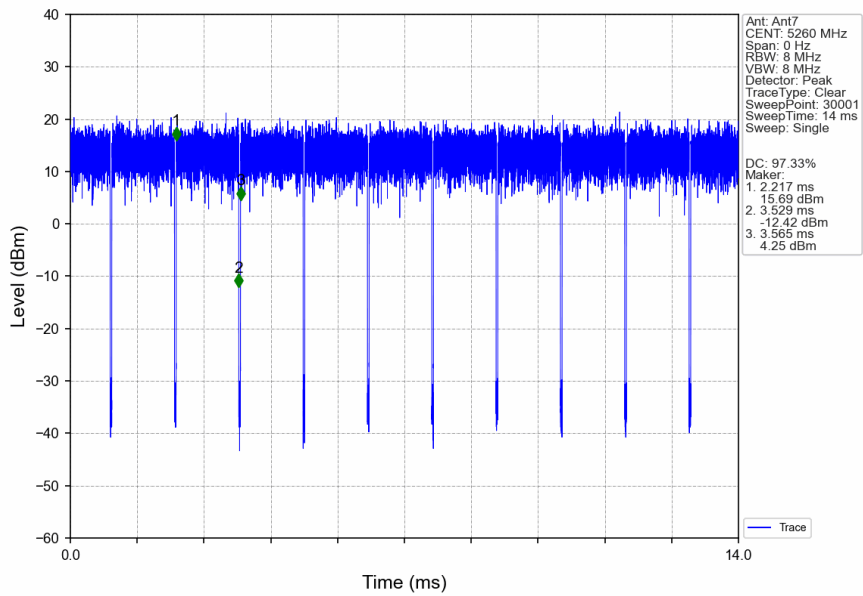
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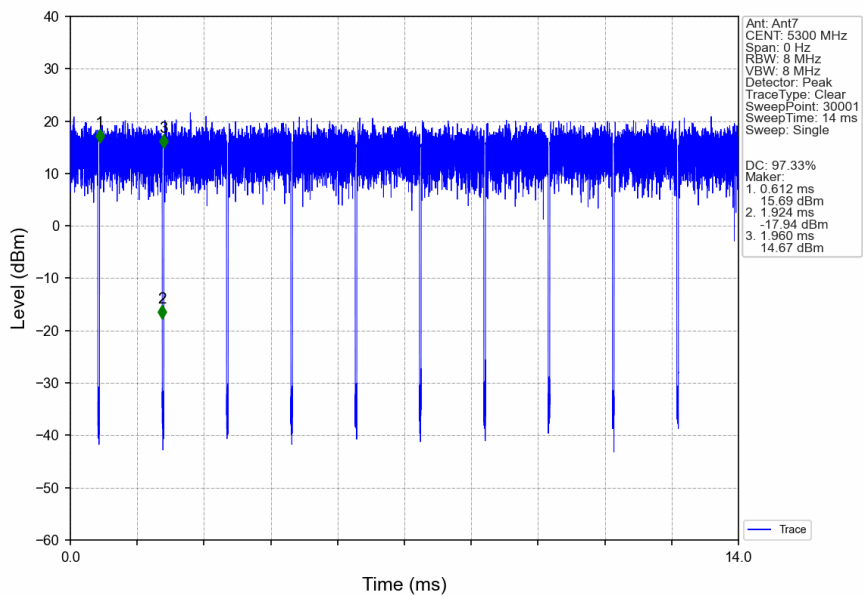
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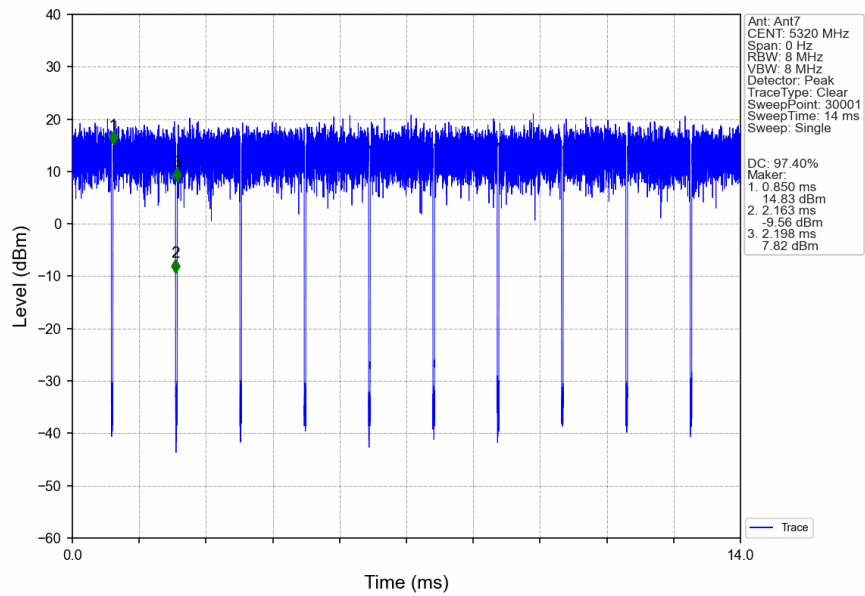
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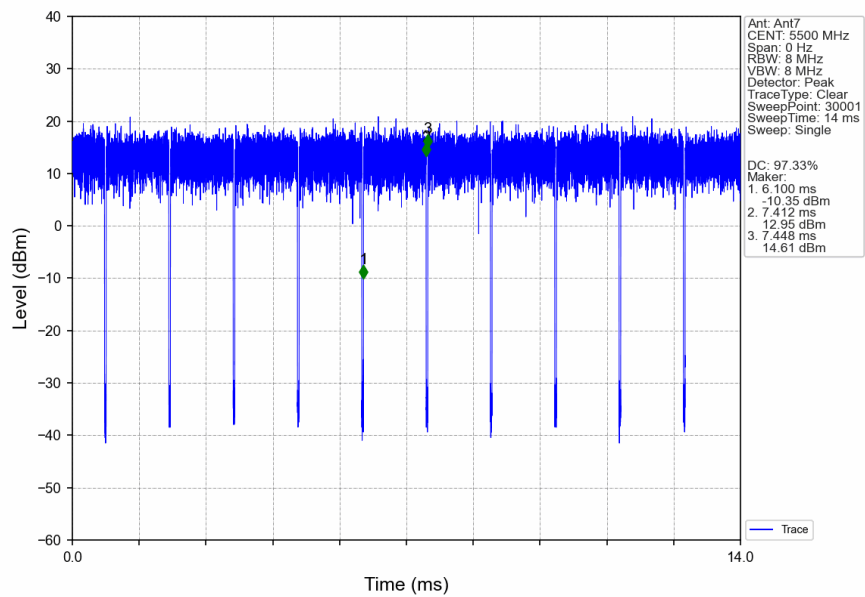
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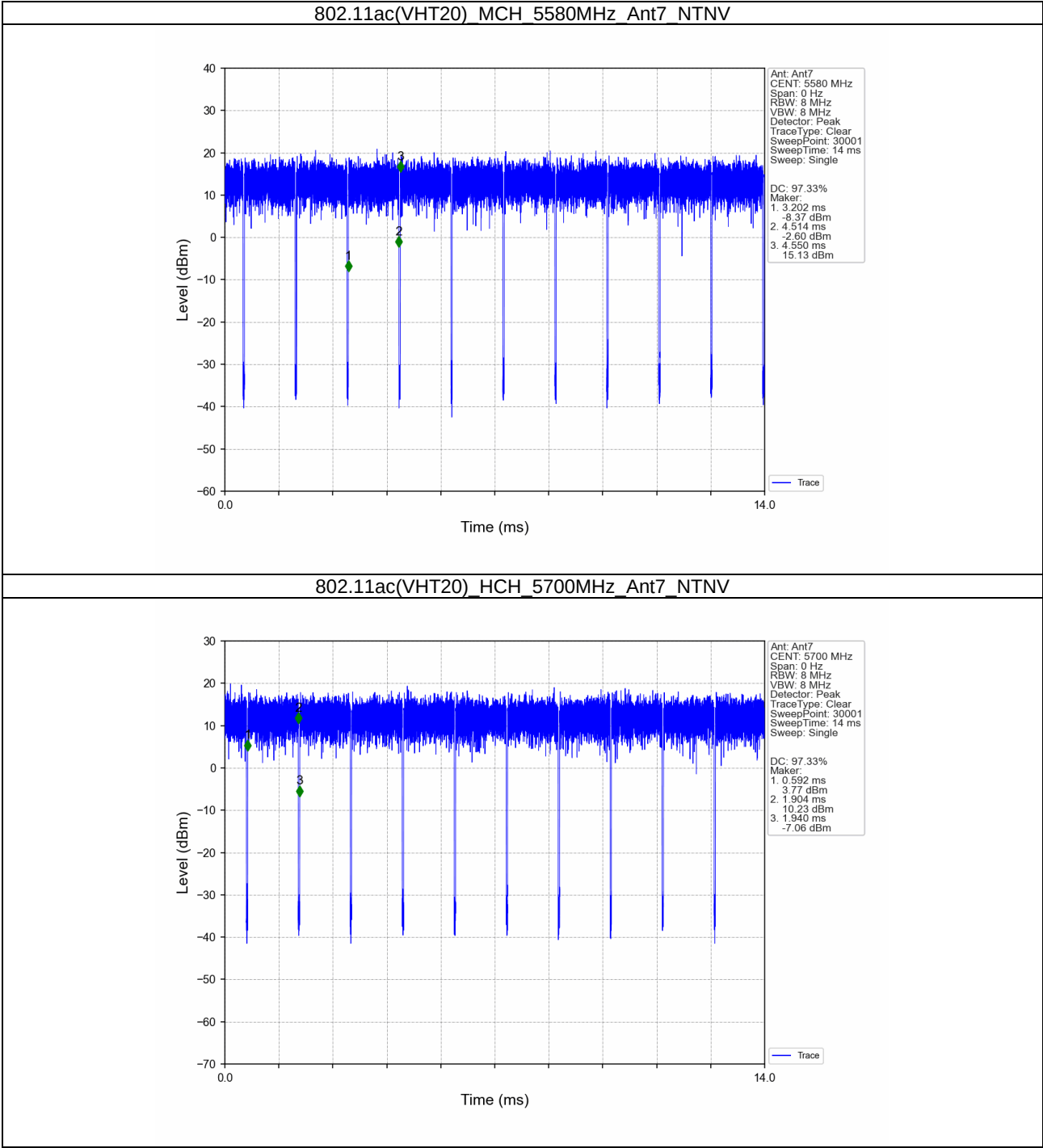


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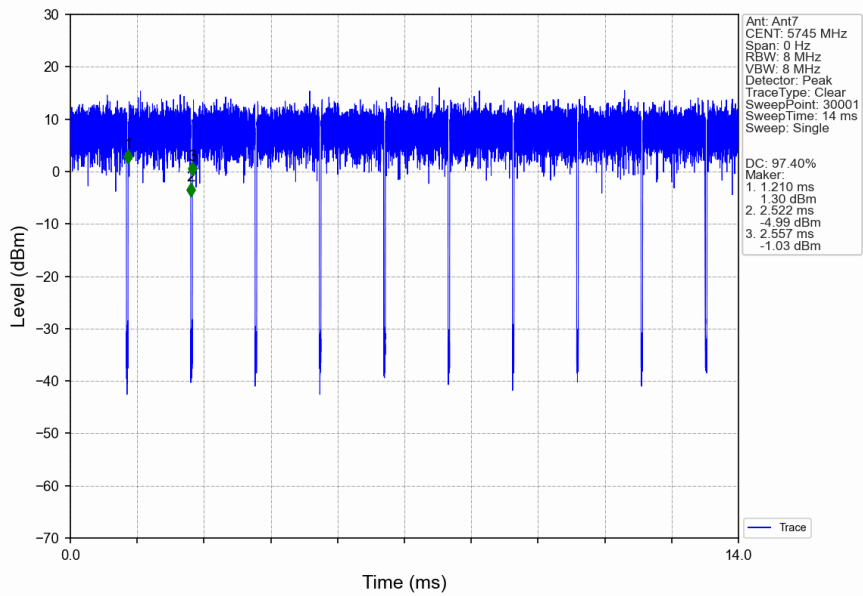


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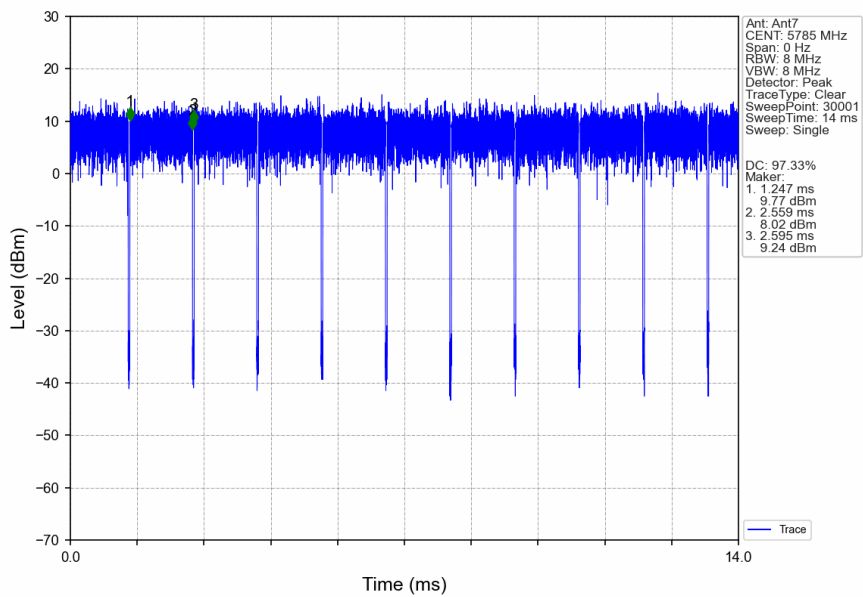


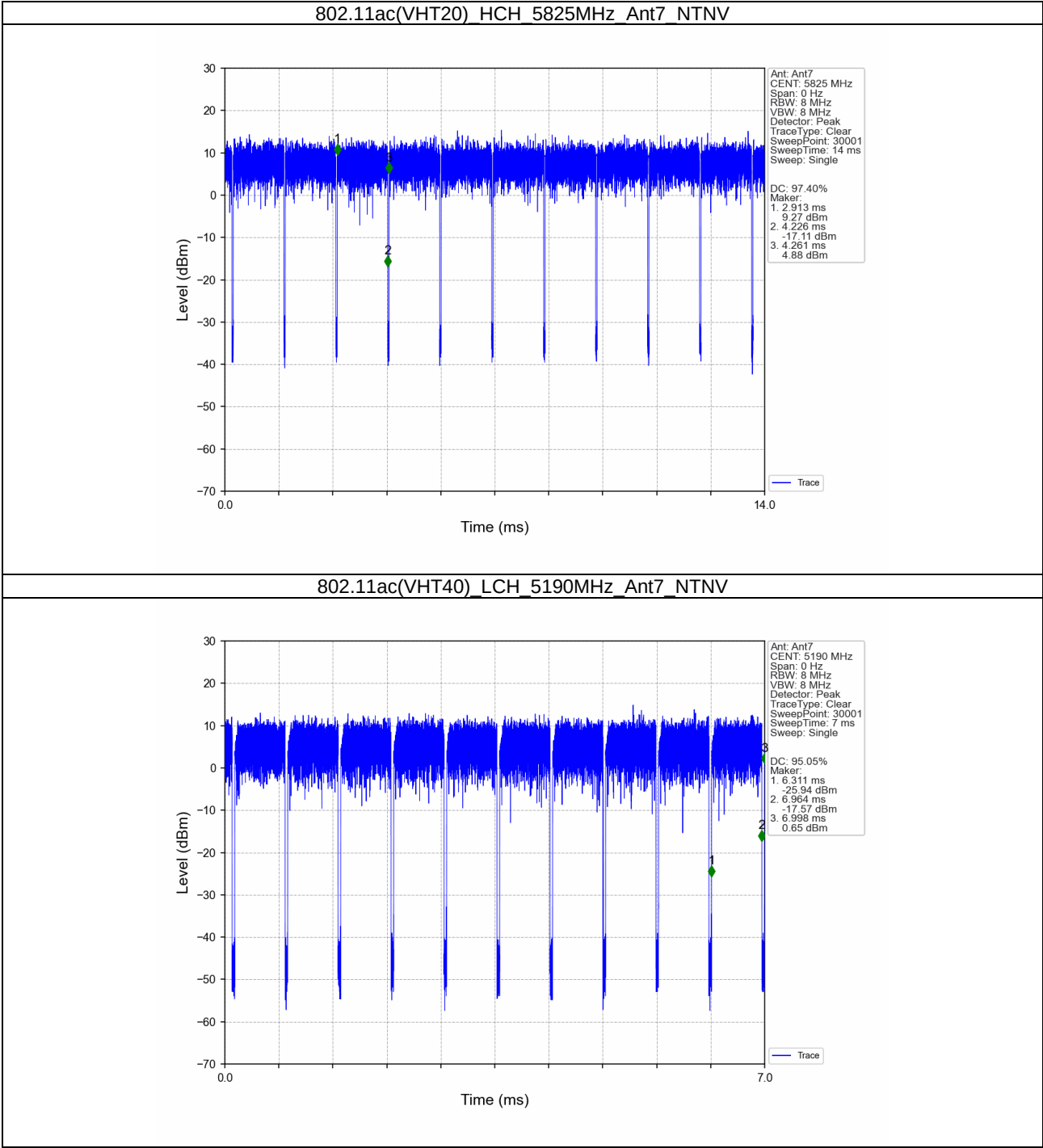


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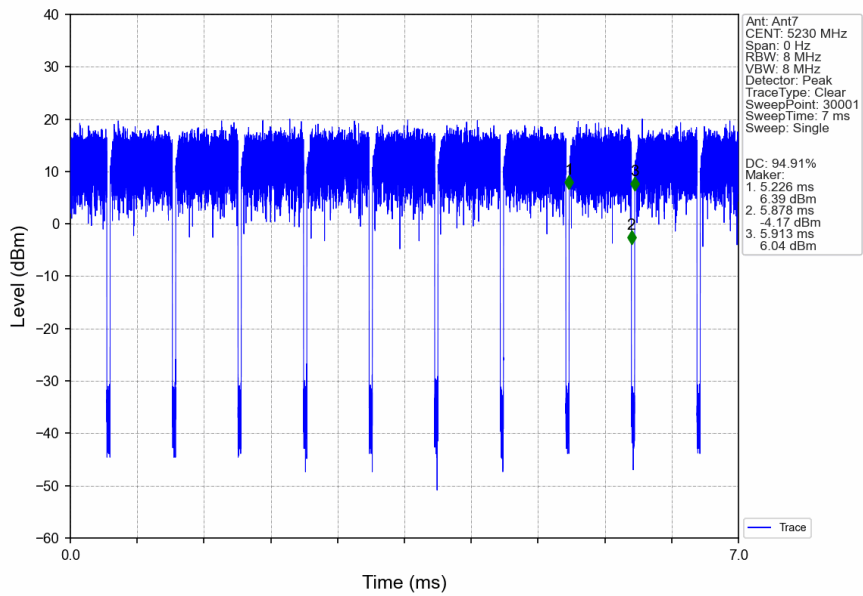


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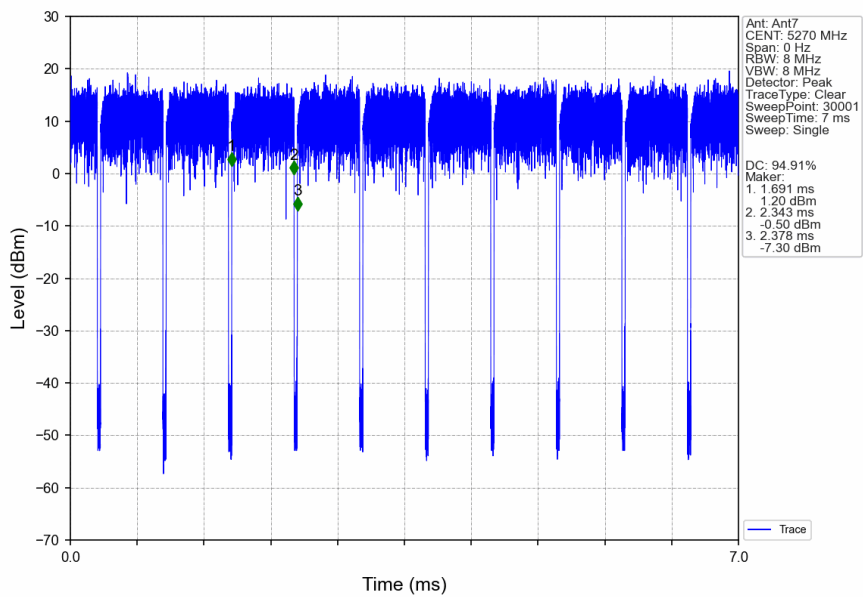




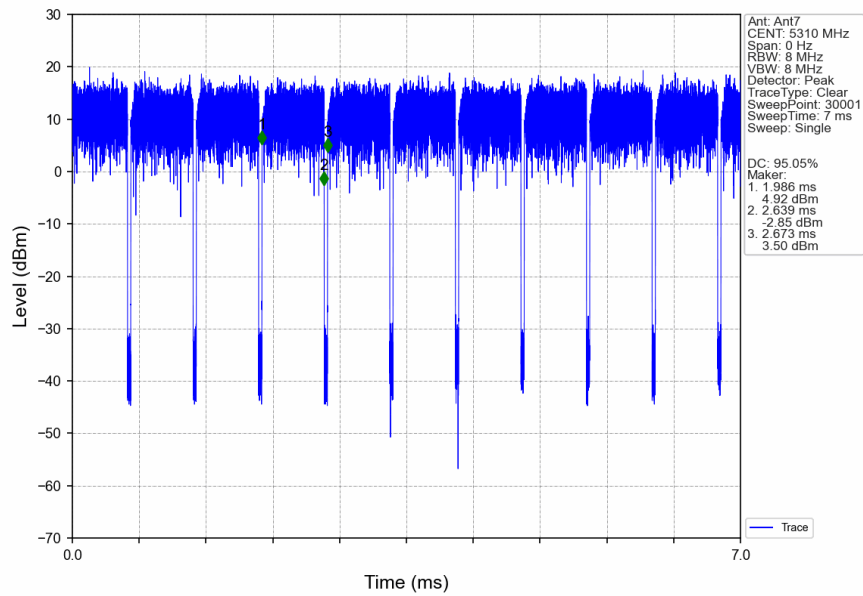
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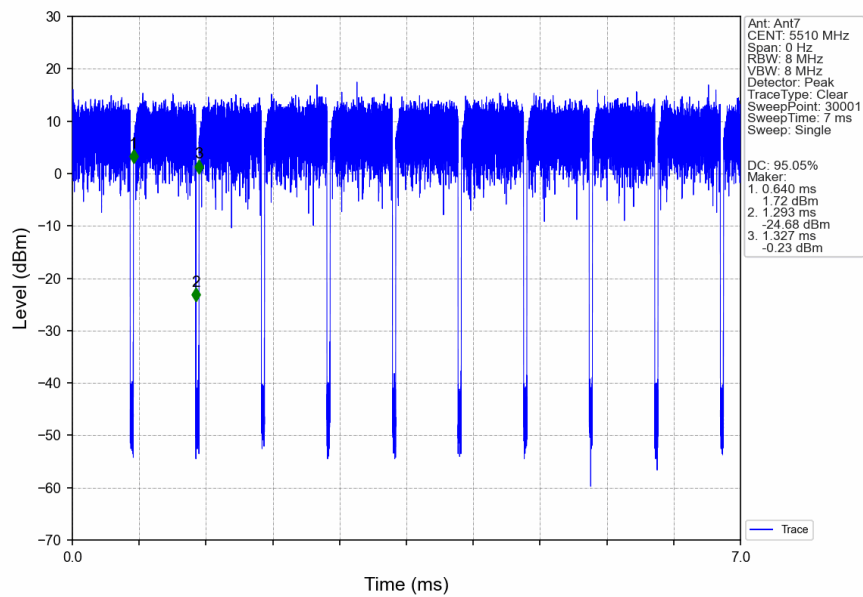
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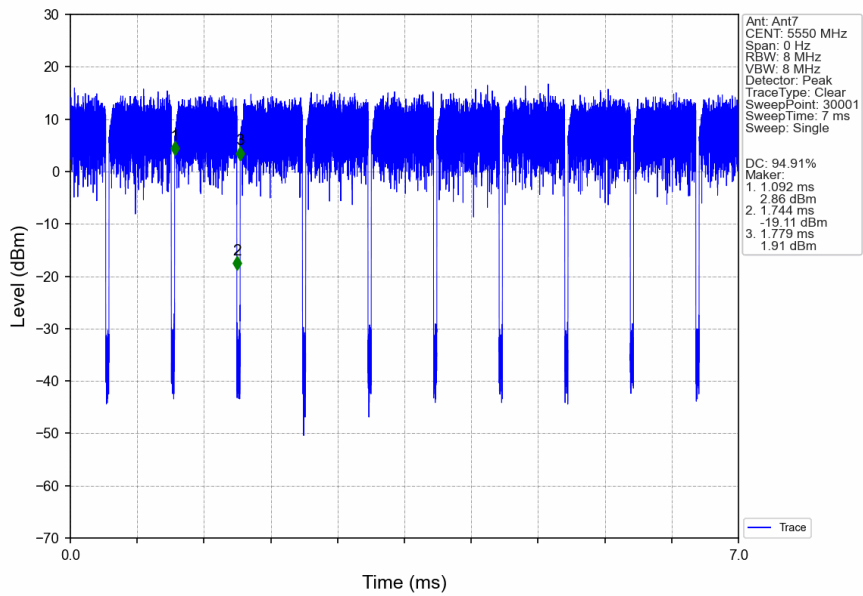
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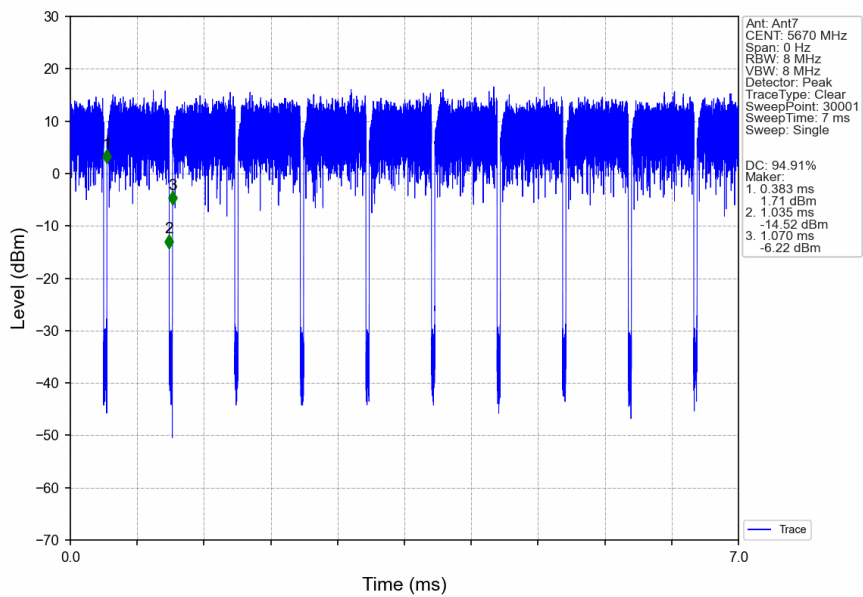
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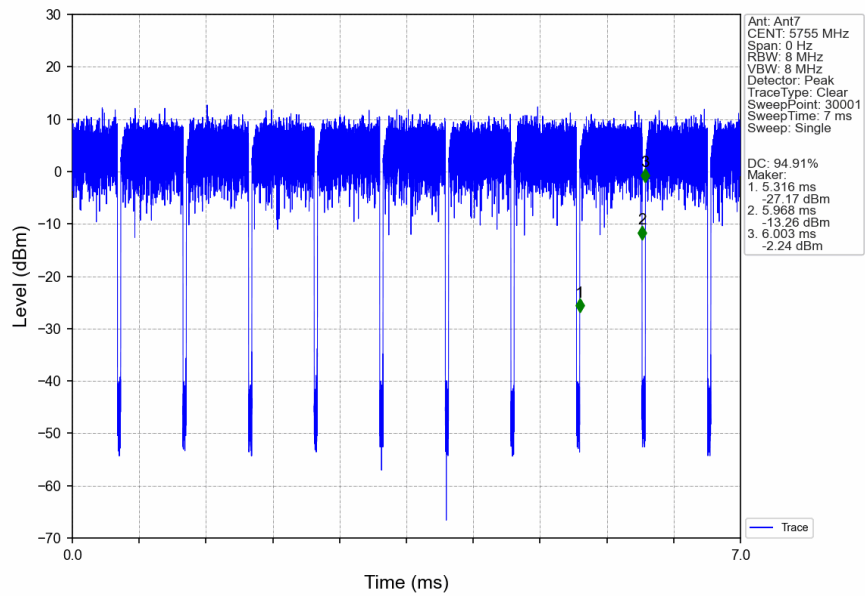
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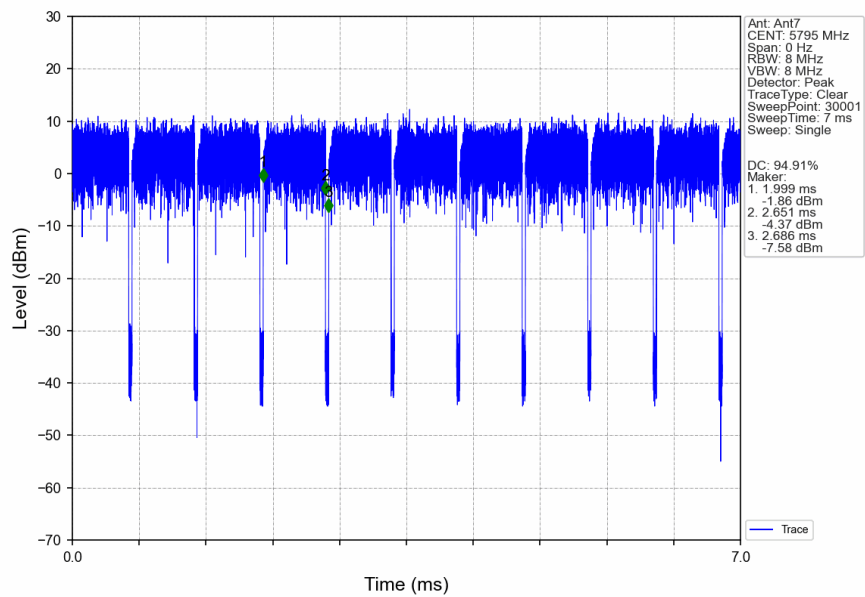
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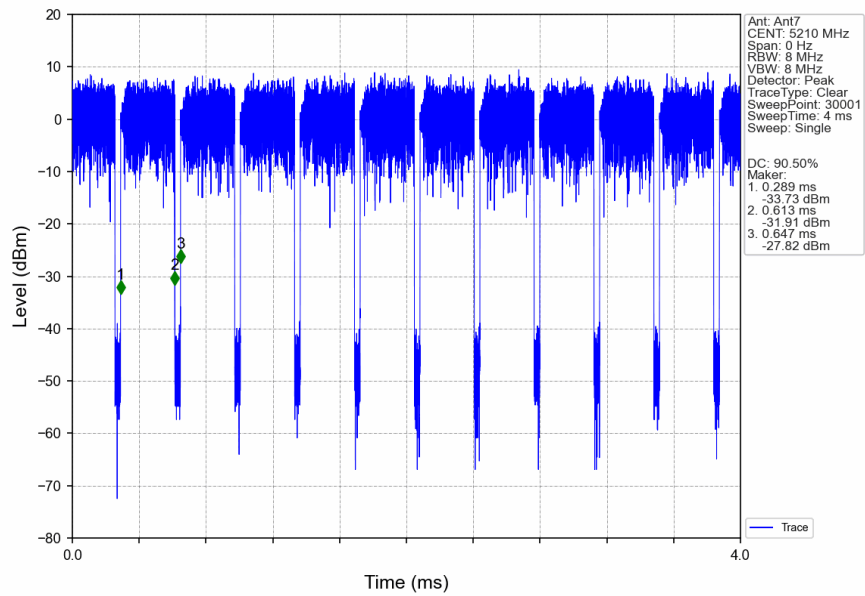
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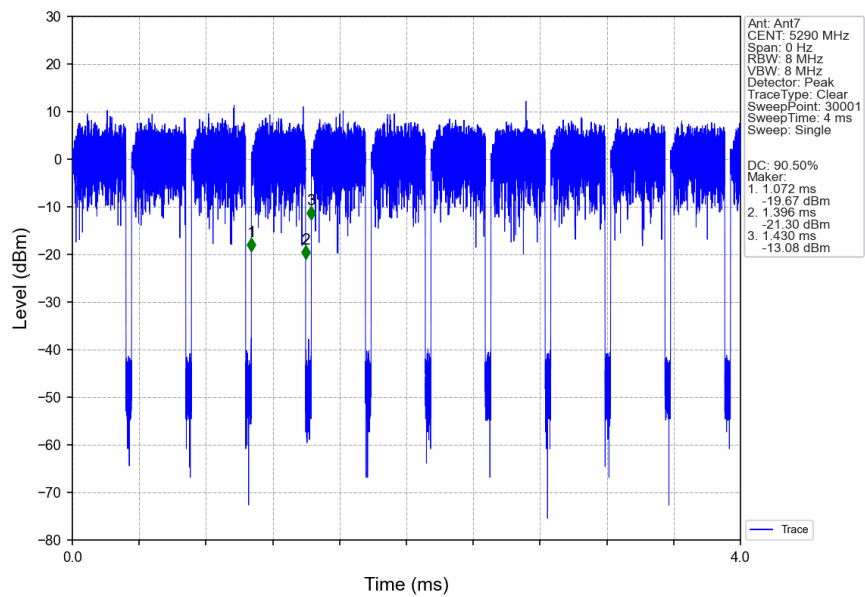
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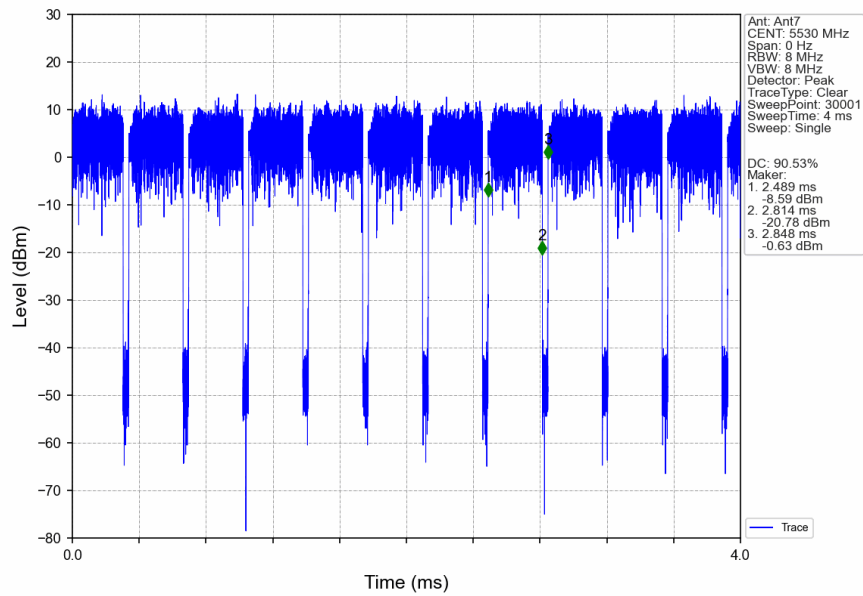
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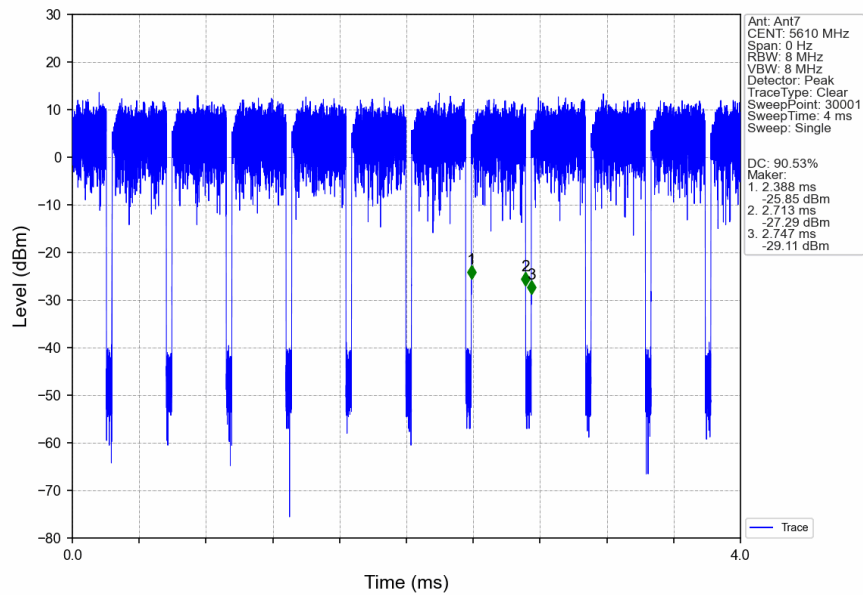
802.11ac(VHT80) MCH 5290MHz Ant7 NTN

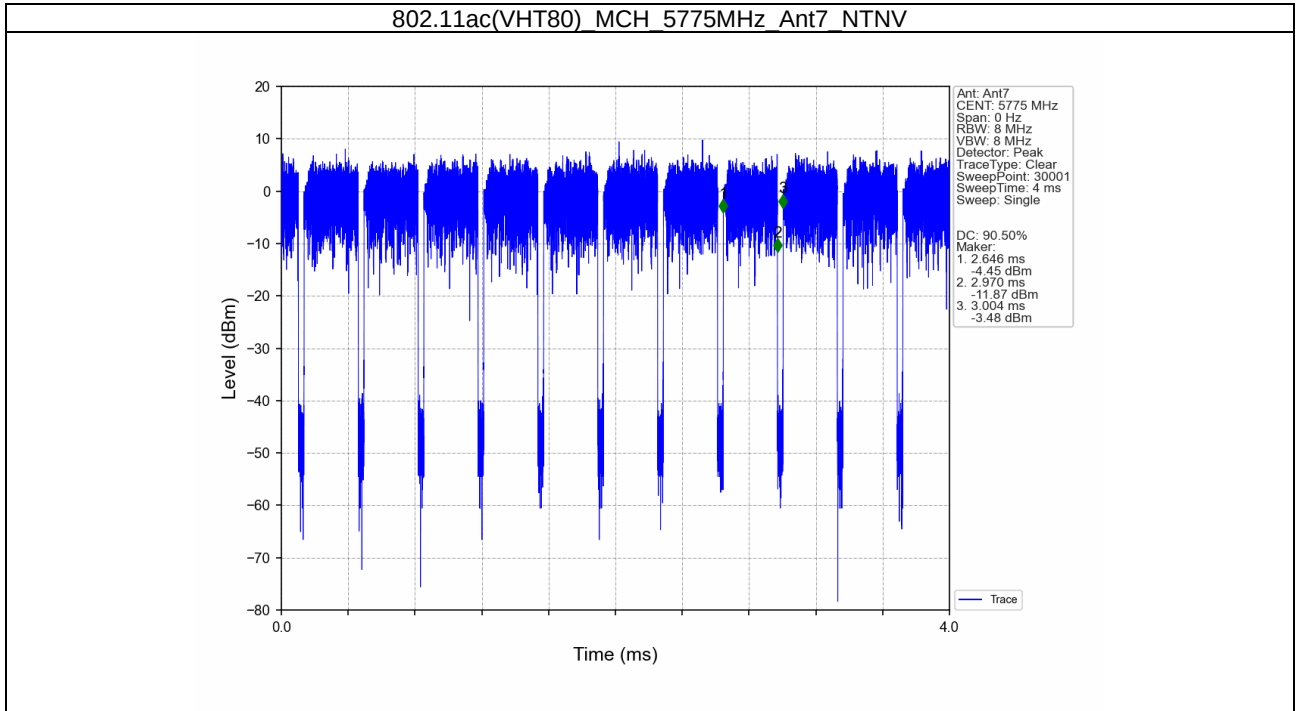


802.11ac(VHT80) LCH 5530MHz Ant7 NTN



802.11ac(VHT80) HCH 5610MHz Ant7 NTN





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	7	17.178	/	Pass
		5200	7	17.149	/	Pass
		5240	7	17.230	/	Pass
		5260	7	17.047	/	Pass
		5300	7	17.064	/	Pass
		5320	7	17.128	/	Pass
		5500	7	17.104	/	Pass
		5580	7	17.072	/	Pass
		5700	7	17.133	/	Pass
		5745	7	17.135	/	Pass
		5785	7	17.190	/	Pass
		5825	7	17.125	/	Pass
802.11n (HT20)	SISO	5180	7	18.129	/	Pass
		5200	7	18.134	/	Pass
		5240	7	18.170	/	Pass
		5260	7	17.935	/	Pass
		5300	7	18.132	/	Pass
		5320	7	18.038	/	Pass
		5500	7	18.021	/	Pass
		5580	7	18.031	/	Pass
		5700	7	17.965	/	Pass
		5745	7	17.961	/	Pass
		5785	7	18.025	/	Pass
		5825	7	17.998	/	Pass
802.11n (HT40)	SISO	5190	7	36.222	/	Pass
		5230	7	36.564	/	Pass
		5270	7	36.469	/	Pass
		5310	7	36.330	/	Pass
		5510	7	36.171	/	Pass
		5550	7	36.191	/	Pass
		5670	7	36.271	/	Pass
		5755	7	36.145	/	Pass
		5795	7	36.258	/	Pass
802.11ac (VHT20)	SISO	5180	7	18.020	/	Pass
		5200	7	18.052	/	Pass
		5240	7	18.063	/	Pass
		5260	7	17.958	/	Pass
		5300	7	17.941	/	Pass
		5320	7	17.899	/	Pass
		5500	7	17.927	/	Pass
		5580	7	17.959	/	Pass
		5700	7	17.948	/	Pass
		5745	7	17.994	/	Pass



Report No.: SUCR250900091507

Page: 223 of 321

		5785	7	18.001	/	Pass
		5825	7	17.968	/	Pass
802.11ac (VHT40)	SISO	5190	7	36.164	/	Pass
		5230	7	36.354	/	Pass
		5270	7	36.212	/	Pass
		5310	7	36.156	/	Pass
		5510	7	36.201	/	Pass
		5550	7	36.110	/	Pass
		5670	7	36.274	/	Pass
		5755	7	36.124	/	Pass
		5795	7	36.170	/	Pass
		5210	7	75.516	/	Pass
802.11ac (VHT80)	SISO	5290	7	75.331	/	Pass
		5530	7	75.419	/	Pass
		5610	7	75.528	/	Pass
		5775	7	75.501	/	Pass

2.1.2 26dB BW

Mode	TX Type	Frequency (MHz)	ANT	26dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5180	7	22.860	/	Pass
		5200	7	20.207	/	Pass
		5240	7	23.681	/	Pass
		5260	7	20.169	/	Pass
		5300	7	20.191	/	Pass
		5320	7	20.175	/	Pass
		5500	7	20.099	/	Pass
		5580	7	20.017	/	Pass
		5700	7	19.869	/	Pass
802.11n (HT20)	SISO	5180	7	25.964	/	Pass
		5200	7	27.589	/	Pass
		5240	7	27.420	/	Pass
		5260	7	20.633	/	Pass
		5300	7	20.502	/	Pass
		5320	7	20.650	/	Pass
		5500	7	20.310	/	Pass
		5580	7	20.579	/	Pass
		5700	7	20.480	/	Pass
802.11n (HT40)	SISO	5190	7	41.245	/	Pass
		5230	7	66.692	/	Pass
		5270	7	53.700	/	Pass
		5310	7	53.809	/	Pass
		5510	7	40.939	/	Pass
		5550	7	41.090	/	Pass
		5670	7	40.511	/	Pass
802.11ac (VHT20)	SISO	5180	7	20.513	/	Pass
		5200	7	24.099	/	Pass
		5240	7	21.687	/	Pass
		5260	7	20.611	/	Pass
		5300	7	20.378	/	Pass
		5320	7	20.795	/	Pass
		5500	7	20.445	/	Pass
		5580	7	20.555	/	Pass
802.11ac	SISO	5700	7	20.569	/	Pass
		5190	7	40.590	/	Pass



Report No.: SUCR250900091507

Page: 224 of 321

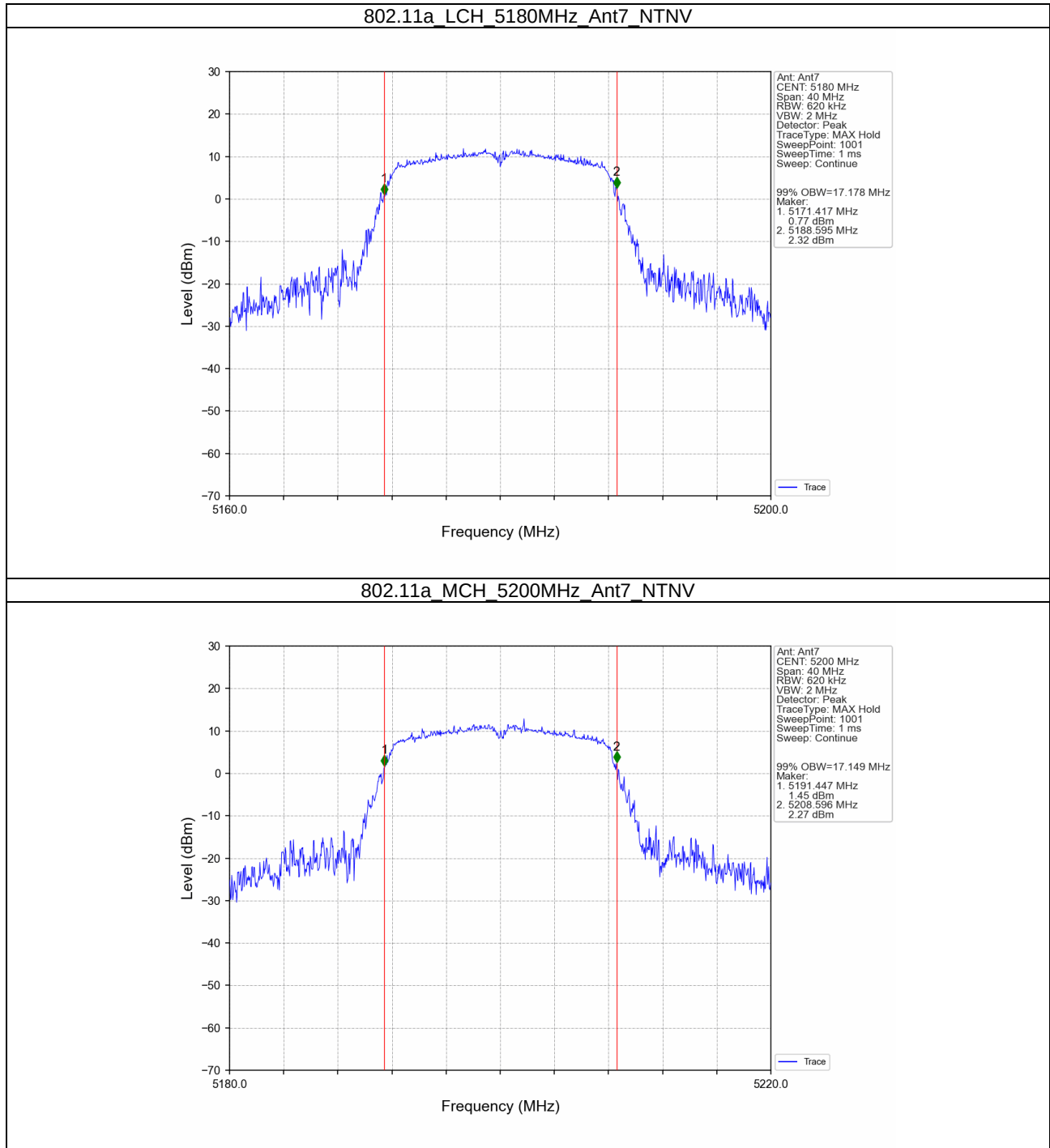
(VHT40)		5230	7	42.992	/	Pass
		5270	7	41.357	/	Pass
		5310	7	40.926	/	Pass
		5510	7	40.908	/	Pass
		5550	7	40.879	/	Pass
		5670	7	40.699	/	Pass
802.11ac (VHT80)	SISO	5210	7	81.034	/	Pass
		5290	7	81.565	/	Pass
		5530	7	81.598	/	Pass
		5610	7	81.528	/	Pass

2.1.3 6dB BW

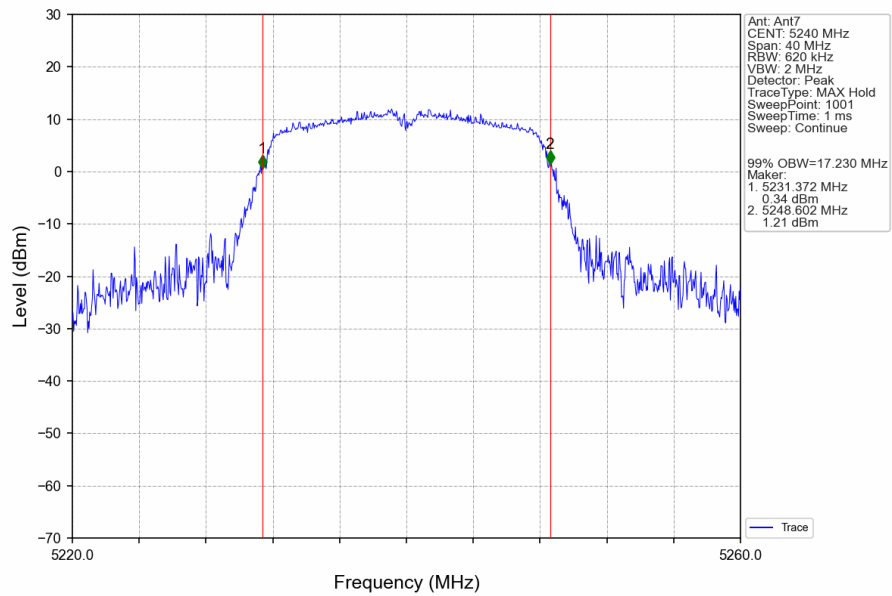
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5745	7	15.126	≥ 0.5	Pass
		5785	7	14.669	≥ 0.5	Pass
		5825	7	15.108	≥ 0.5	Pass
802.11n (HT20)	SISO	5745	7	15.036	≥ 0.5	Pass
		5785	7	13.922	≥ 0.5	Pass
		5825	7	15.758	≥ 0.5	Pass
802.11n (HT40)	SISO	5755	7	35.113	≥ 0.5	Pass
		5795	7	35.056	≥ 0.5	Pass
802.11ac (VHT20)	SISO	5745	7	15.143	≥ 0.5	Pass
		5785	7	15.095	≥ 0.5	Pass
		5825	7	15.368	≥ 0.5	Pass
802.11ac (VHT40)	SISO	5755	7	32.582	≥ 0.5	Pass
		5795	7	35.144	≥ 0.5	Pass
802.11ac (VHT80)	SISO	5775	7	75.098	≥ 0.5	Pass

2.2 Test Graph

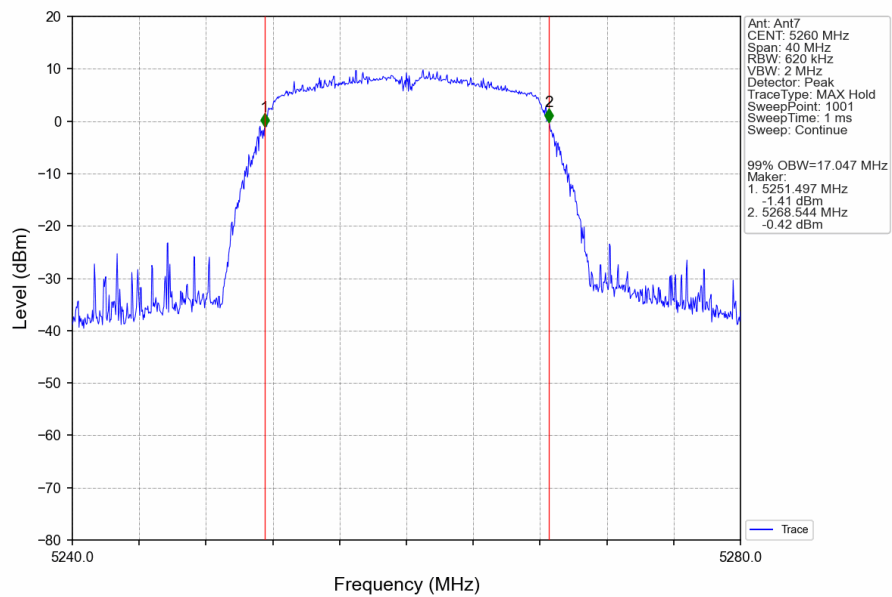
2.2.1 OBW

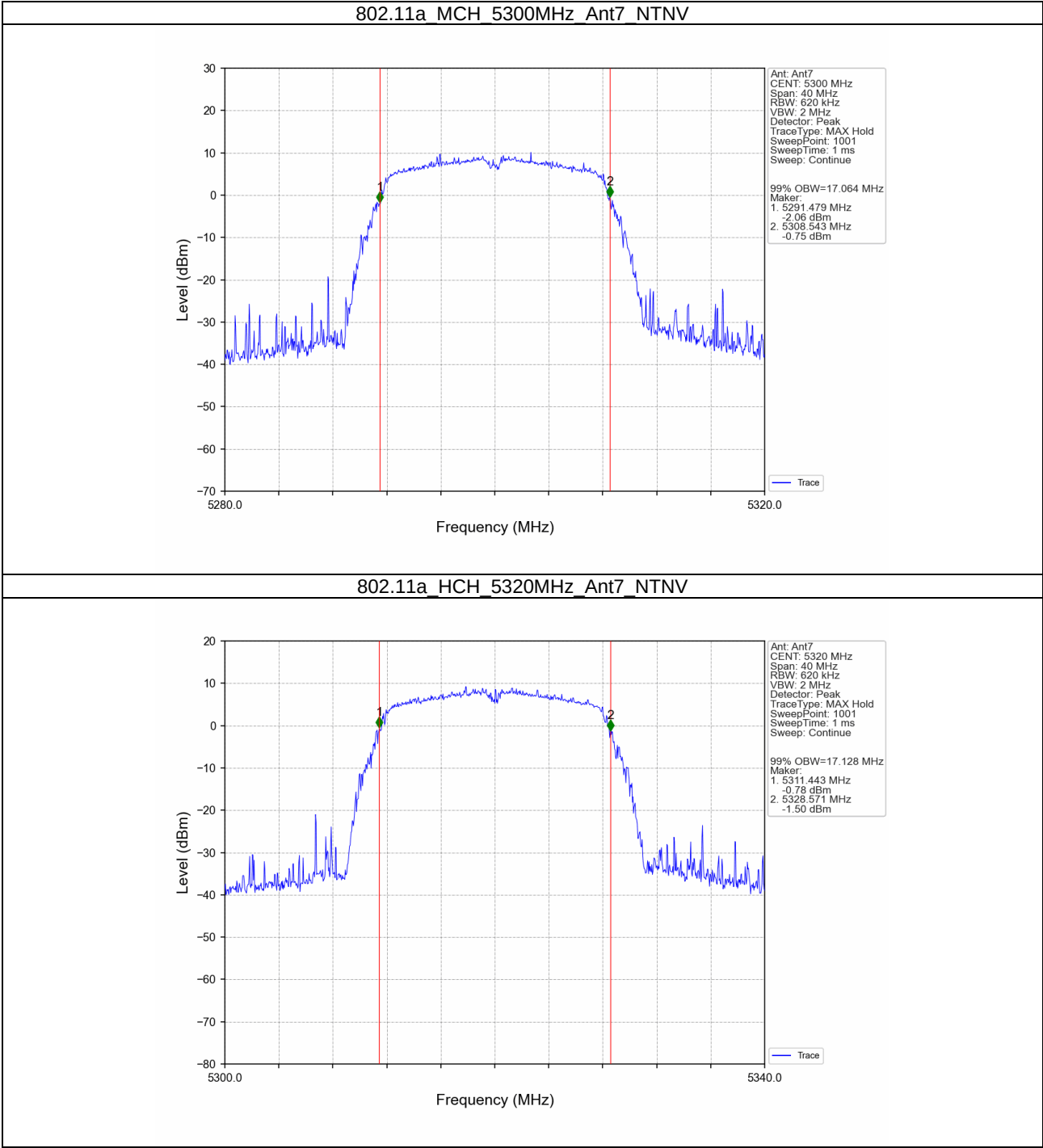


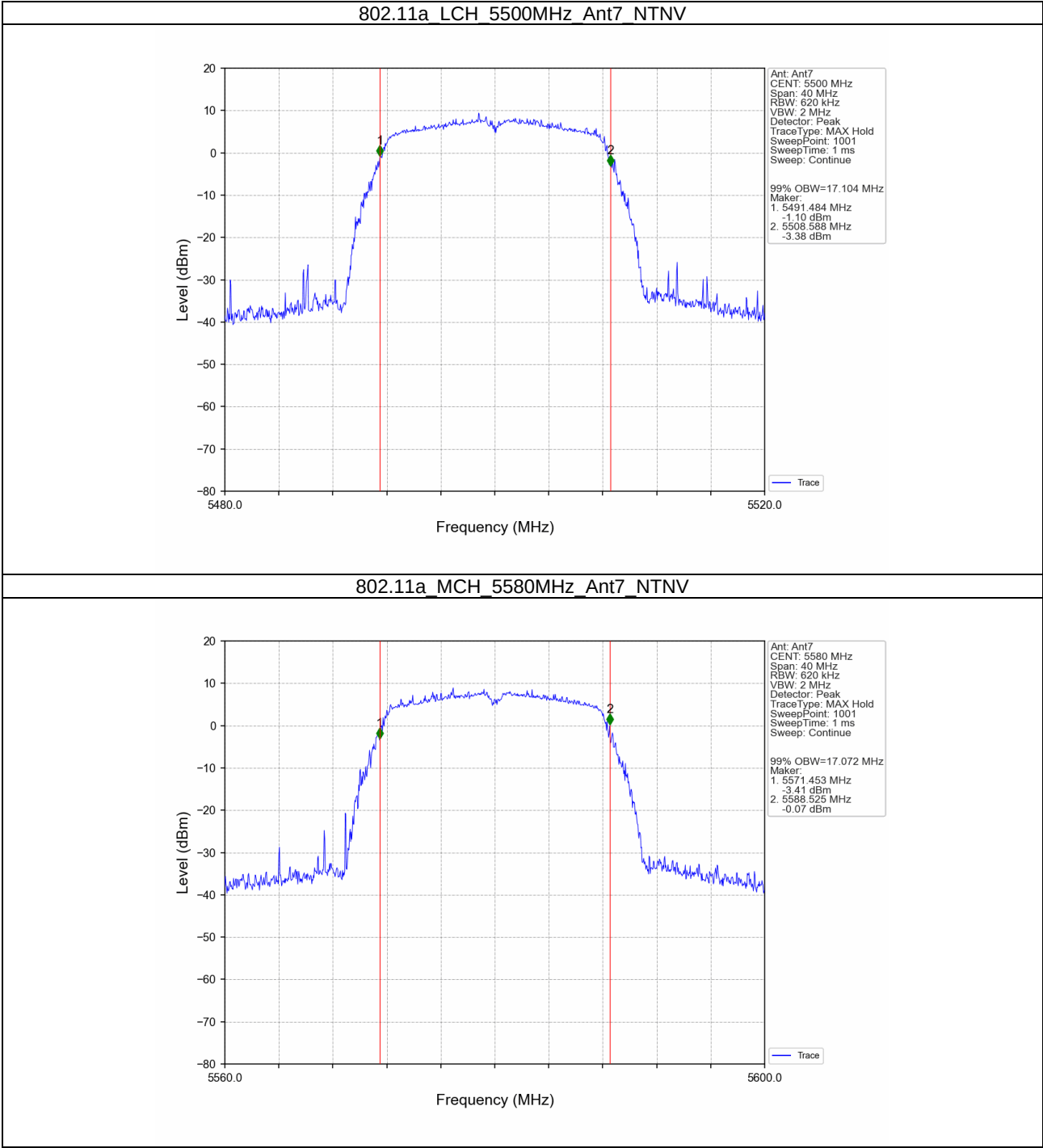
802.11a HCH 5240MHz Ant7 NTN



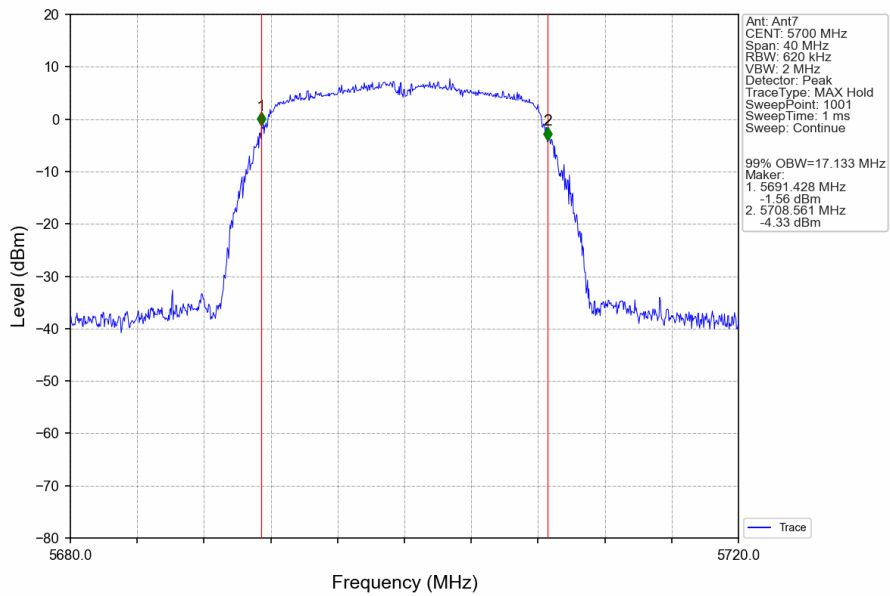
802.11a LCH 5260MHz Ant7 NTN



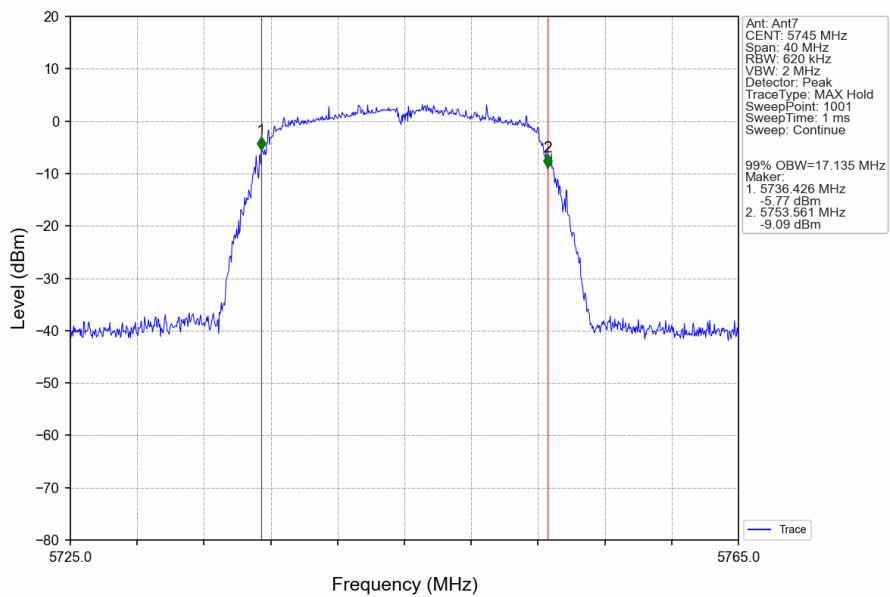


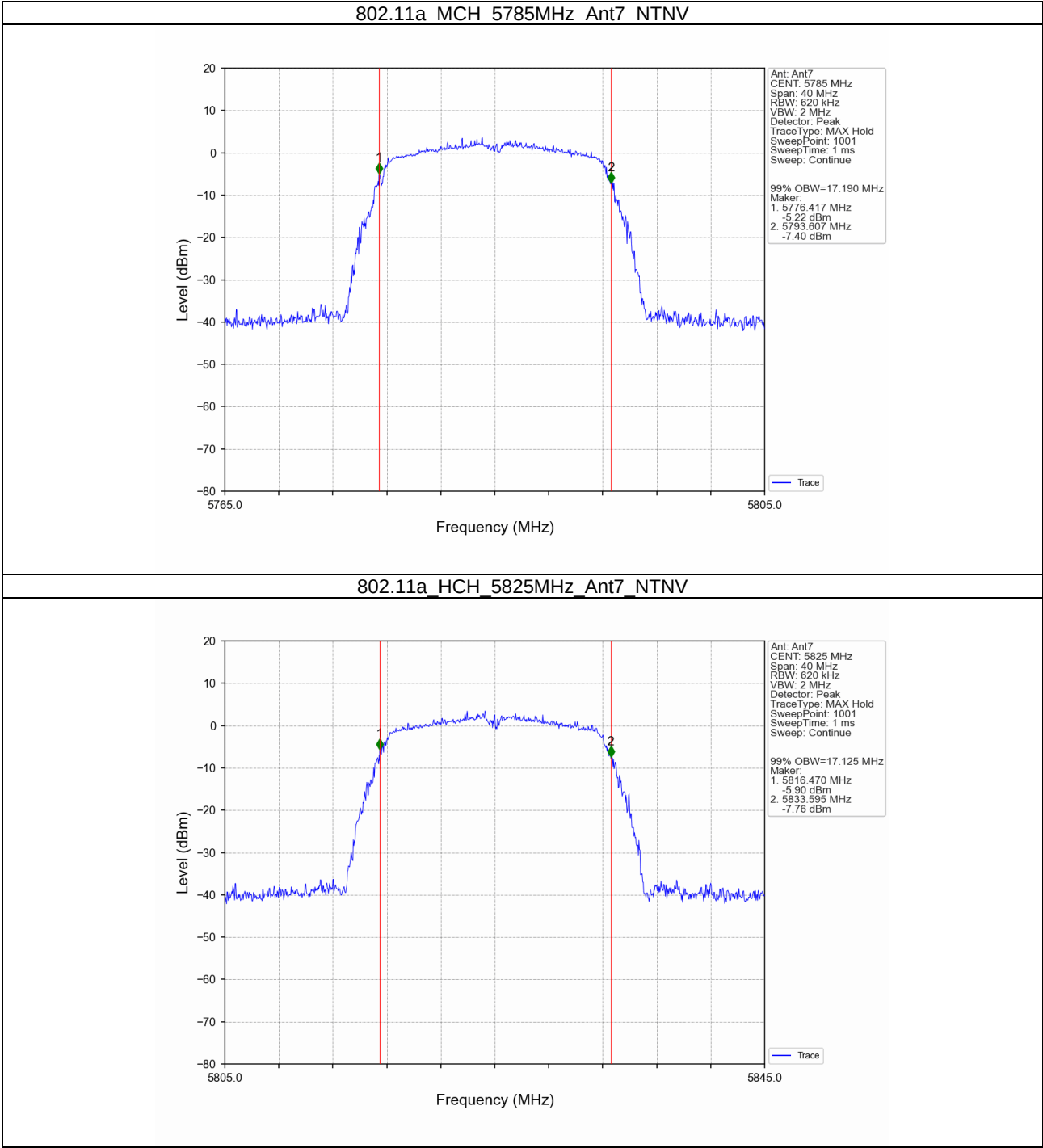


802.11a HCH 5700MHz Ant7 NTN

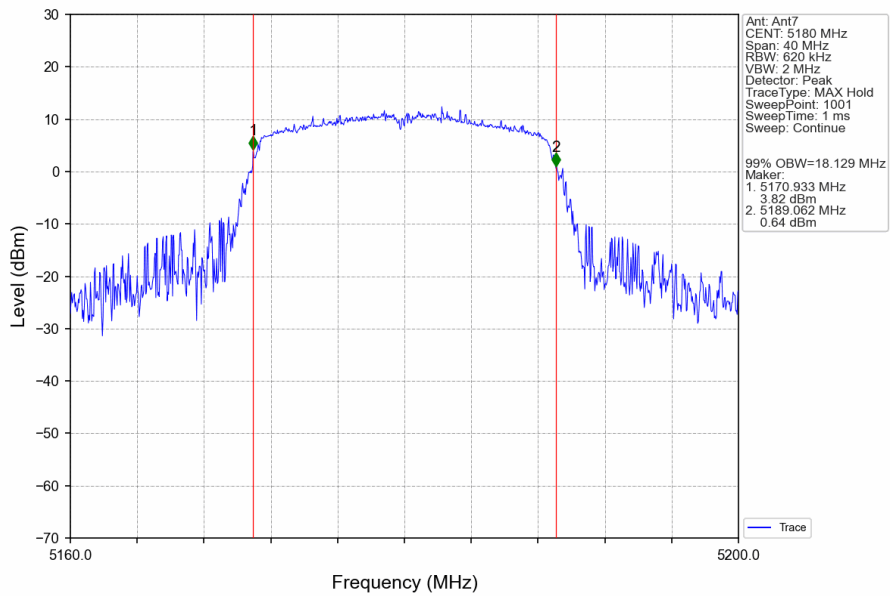


802.11a LCH 5745MHz Ant7 NTN

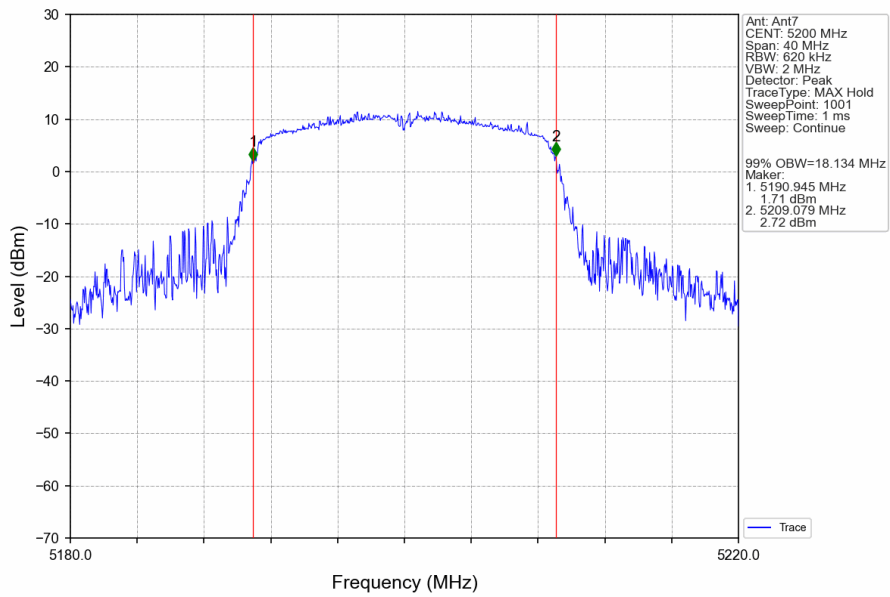




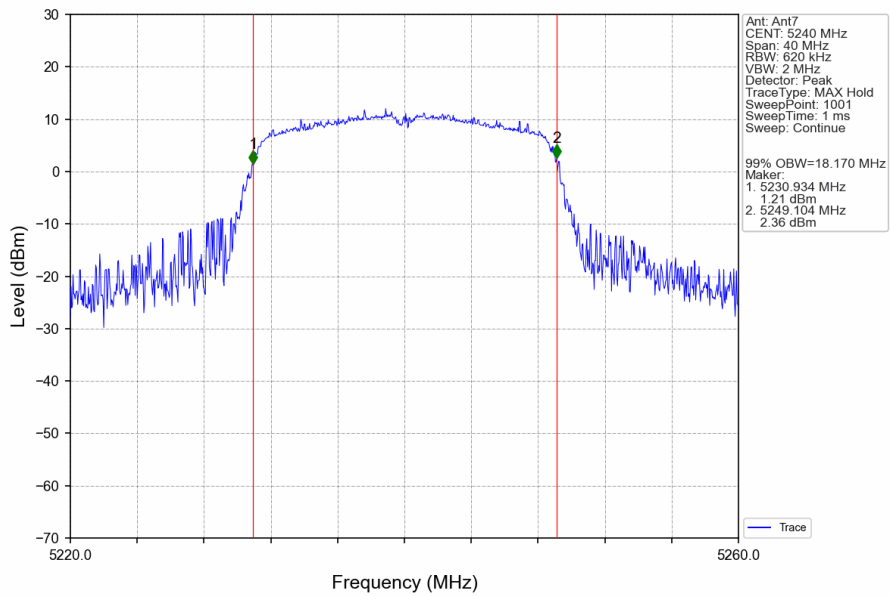
802.11n(HT20) LCH 5180MHz Ant7 NTN



802.11n(HT20) MCH 5200MHz Ant7 NTN



802.11n(HT20) HCH 5240MHz Ant7 NTN



802.11n(HT20) LCH 5260MHz Ant7 NTN

