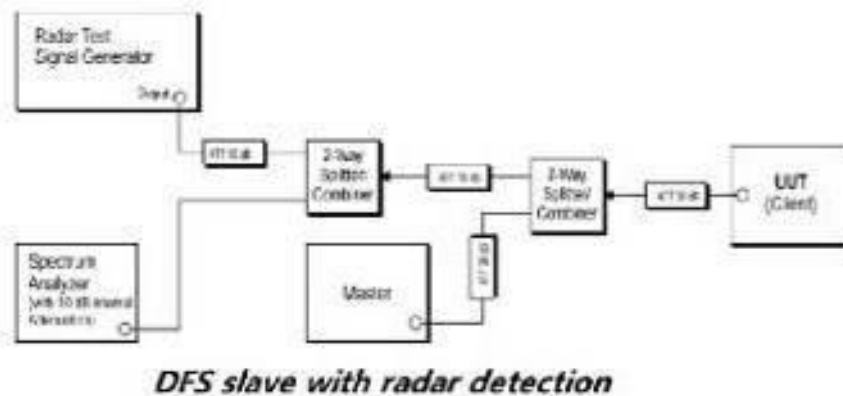
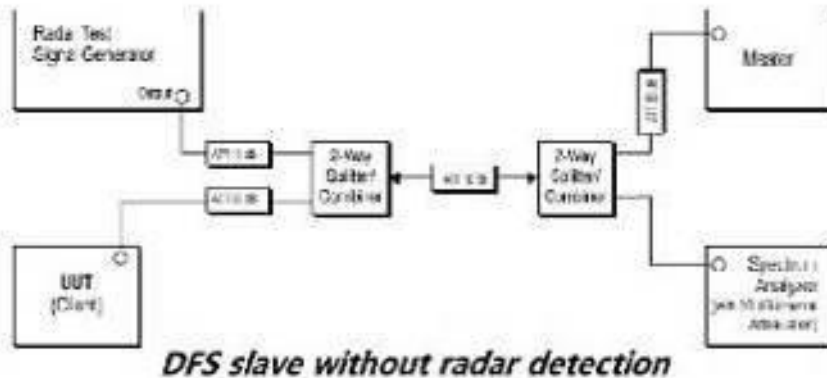
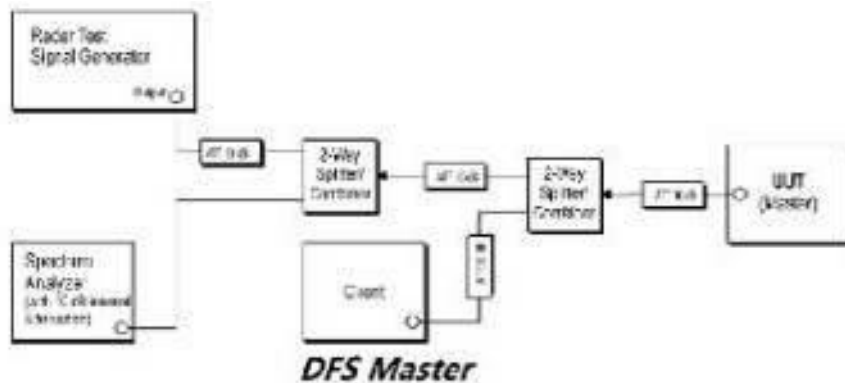


### 7.14.2 Test Mode Description

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



## 7.15 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.

## 7.15.1 E.U.T. Operation

Operating Environment:

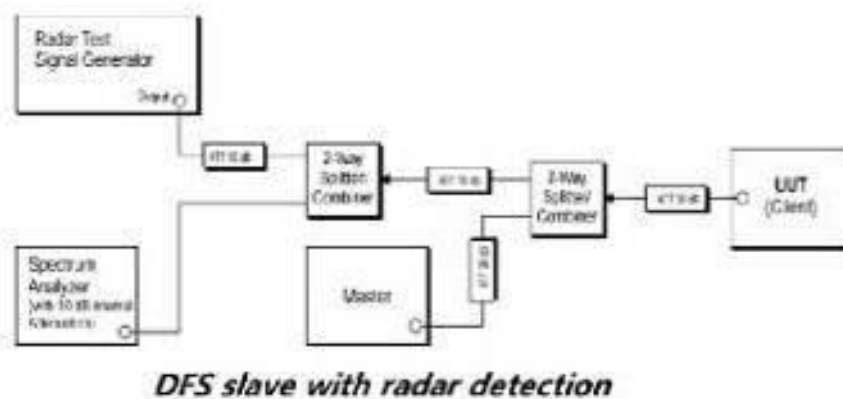
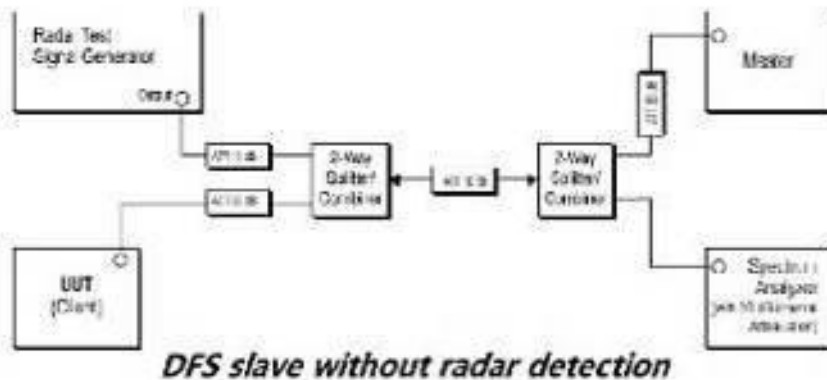
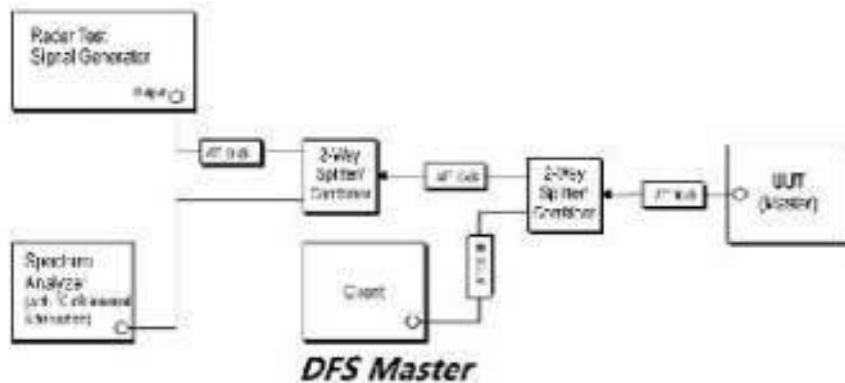
Temperature: 22.1 °C Humidity: 44.5 % RH Atmospheric Pressure: 1020 mbar



### 7.15.2 Test Mode Description

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

### 7.15.3 Test Setup Diagram





## 7.15.4 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



### 7.16 Contention Based Protocol

Test Requirement 47 CFR Part 15, Subpart E 15.407 (d)  
 Test Method: KDB 987594 D02 v02r01  
 Limit: Detect co-channel energy with 90% or greater certainty.

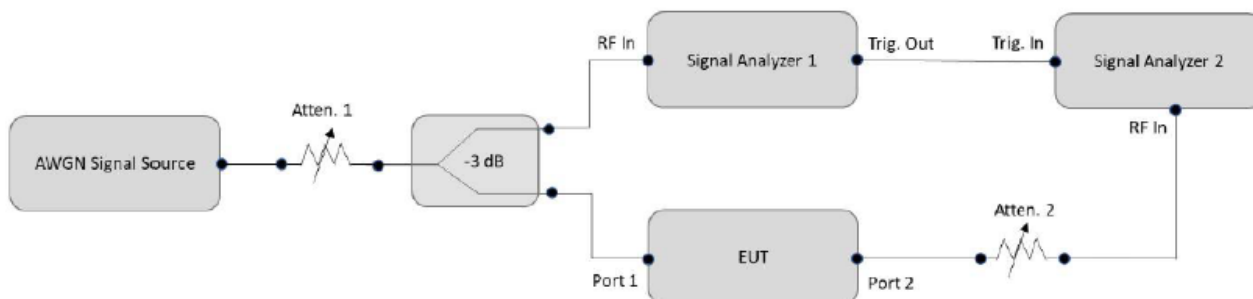
#### 7.16.1 E.U.T. Operation

Operating Environment:  
 Temperature: 21.9 °C Humidity: 55.5 % RH Atmospheric Pressure: 1020 mbar

#### 7.16.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	10	TX mode Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

#### 7.16.3 Test Setup Diagram



## 7.16.4 Measurement Procedure and Data

1. Configure the EUT to transmit with a constant duty cycle.
2. Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth.
3. Set the signal analyzer center frequency to the nominal EEUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2, as shown in Figure 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
4. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.
5. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
6. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1.
7. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.
8. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
9. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
10. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.

Detection Level=Injected AWGN Power(dBm)-Antenna Gain(dBi)+Path Loss(dB)

## 7.16.5 Measurement Procedure and Data

Please Refer to Appendix for Details



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## 8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SZCR2412004705AT

## 9 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for SZCR2412004705AT



## 10 Appendix – WiFi 5G

### 1. Duty Cycle

#### 1.1 Test Result

##### 1.1.1 Ant1

Ant1									
Mode	TX Type	Frequency (MHz)	RU	RU Pos	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11a	SISO	5180	/	/	1.393	2.022	68.89	1.62	0.32
		5200	/	/	1.392	2.021	68.88	1.62	0.34
		5240	/	/	1.392	2.022	68.84	1.62	0.34
		5260	/	/	1.392	2.021	68.88	1.62	0.32
		5300	/	/	1.301	1.344	96.80	0.14	0.75
		5320	/	/	1.392	2.039	68.27	1.66	0.95
		5500	/	/	1.392	2.048	67.97	1.68	1.25
		5580	/	/	1.394	2.021	68.98	1.61	0.34
		5700	/	/	1.393	2.021	68.93	1.62	0.35
		5745	/	/	1.394	2.057	67.77	1.69	1.52
		5785	/	/	1.393	1.446	96.33	0.16	1.26
		5825	/	/	1.393	1.436	97.01	0.13	0.64
802.11n (HT20)	MIMO	5180	/	/	1.302	1.948	66.84	1.75	0.99
		5200	/	/	1.301	1.930	67.41	1.71	0.36
		5240	/	/	1.301	1.930	67.41	1.71	0.34
		5260	/	/	1.300	1.929	67.39	1.71	2.26
		5300	/	/	1.300	1.929	67.39	1.71	0.33
		5320	/	/	1.301	1.947	66.82	1.75	0.93
		5500	/	/	1.301	1.947	66.82	1.75	0.96
		5580	/	/	1.301	1.938	67.13	1.73	0.66
		5700	/	/	1.302	1.930	67.46	1.71	0.36
		5745	/	/	1.302	1.929	67.50	1.71	4.69
		5785	/	/	1.302	1.947	66.87	1.75	0.96
		5825	/	/	1.302	1.984	65.63	1.83	2.20
802.11n (HT40)	MIMO	5190	/	/	0.648	1.285	50.43	2.97	0.38
		5230	/	/	0.648	1.286	50.39	2.98	0.39
		5270	/	/	0.649	1.286	50.47	2.97	0.36



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		5310	/	/	0.648	1.286	50.39	2.98	0.36
		5510	/	/	0.648	1.286	50.39	2.98	0.39
		5550	/	/	0.650	1.286	50.54	2.96	0.38
		5670	/	/	0.649	1.286	50.47	2.97	0.36
		5755	/	/	0.648	1.286	50.39	2.98	0.39
		5795	/	/	0.648	1.304	49.69	3.04	1.03
802.11ac (VHT20)	MIMO	5180	/	/	1.312	1.958	67.01	1.74	1.26
		5200	/	/	1.312	1.959	66.97	1.74	14.21
		5240	/	/	1.312	1.960	66.94	1.74	1.26
		5260	/	/	1.313	1.960	66.99	1.74	1.28
		5300	/	/	1.312	1.950	67.28	1.72	0.99
		5320	/	/	1.313	1.960	66.99	1.74	1.25
		5500	/	/	1.312	1.959	66.97	1.74	1.28
		5580	/	/	1.313	1.968	66.72	1.76	1.57
		5700	/	/	1.313	1.977	66.41	1.78	0.98
		5745	/	/	1.313	1.960	66.99	1.74	11.11
		5785	/	/	1.313	1.959	67.02	1.74	10.74
		5825	/	/	1.321	1.959	67.43	1.71	21.18
802.11ac (VHT40)	MIMO	5190	/	/	0.653	1.290	50.62	2.96	0.36
		5230	/	/	1.312	1.958	67.01	1.74	1.27
		5270	/	/	0.654	1.290	50.70	2.95	0.36
		5310	/	/	0.655	1.309	50.04	3.01	1.05
		5510	/	/	0.655	1.299	50.42	2.97	0.70
		5550	/	/	0.654	1.308	50.00	3.01	1.07
		5670	/	/	0.655	1.299	50.42	2.97	0.72
		5755	/	/	0.653	1.290	50.62	2.96	0.39
		5795	/	/	0.653	1.308	49.92	3.02	1.06
802.11ac (VHT80)	MIMO	5210	/	/	0.325	0.971	33.47	4.75	0.99
		5290	/	/	0.325	0.962	33.78	4.71	0.66
		5530	/	/	0.325	0.953	34.10	4.67	0.71
		5610	/	/	0.325	0.989	32.86	4.83	1.59
		5775	/	/	0.325	0.962	33.78	4.71	0.66
802.11ax (HEW20)	MIMO	5180	SU	/	1.014	1.652	61.38	2.12	0.34
		5200	SU	/	1.014	1.661	61.05	2.14	1.00
		5240	SU	/	1.015	1.653	61.40	2.12	0.34
		5260	SU	/	1.014	1.671	60.68	2.17	1.34
		5300	SU	/	1.014	1.661	61.05	2.14	1.00
		5320	SU	/	1.014	1.652	61.38	2.12	0.36
		5500	SU	/	1.014	1.652	61.38	2.12	8.81
		5580	SU	/	1.014	1.059	95.75	0.19	0.84



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		5700	SU	/	1.301	1.947	66.82	1.75	0.95
		5745	SU	/	1.014	1.652	61.38	2.12	7.49
		5785	SU	/	1.014	1.652	61.38	2.12	0.34
		5825	SU	/	1.014	1.652	61.38	2.12	0.36
802.11ax (HEW40)	MIMO	5190	SU	/	0.067	0.103	65.05	1.87	13.24
		5230	SU	/	0.067	0.104	64.42	1.91	13.59
		5270	SU	/	0.067	0.103	65.05	1.87	13.56
		5310	SU	/	0.067	0.104	64.42	1.91	13.72
		5510	SU	/	0.067	0.103	65.05	1.87	13.34
		5550	SU	/	0.067	0.086	77.91	1.08	0.16
		5670	SU	/	0.067	0.104	64.42	1.91	13.43
		5755	SU	/	0.066	0.085	77.65	1.10	0.19
802.11ax (HEW80)	MIMO	5795	SU	/	0.067	0.104	64.42	1.91	13.62
		5210	SU	/	0.040	0.059	67.80	1.69	0.13
		5290	SU	/	0.039	0.059	66.10	1.80	0.13
		5530	SU	/	0.040	0.077	51.95	2.84	15.80
		5610	SU	/	0.041	0.077	53.25	2.74	15.78
		5775	SU	/	0.002	0.039	5.13	12.90	64.04



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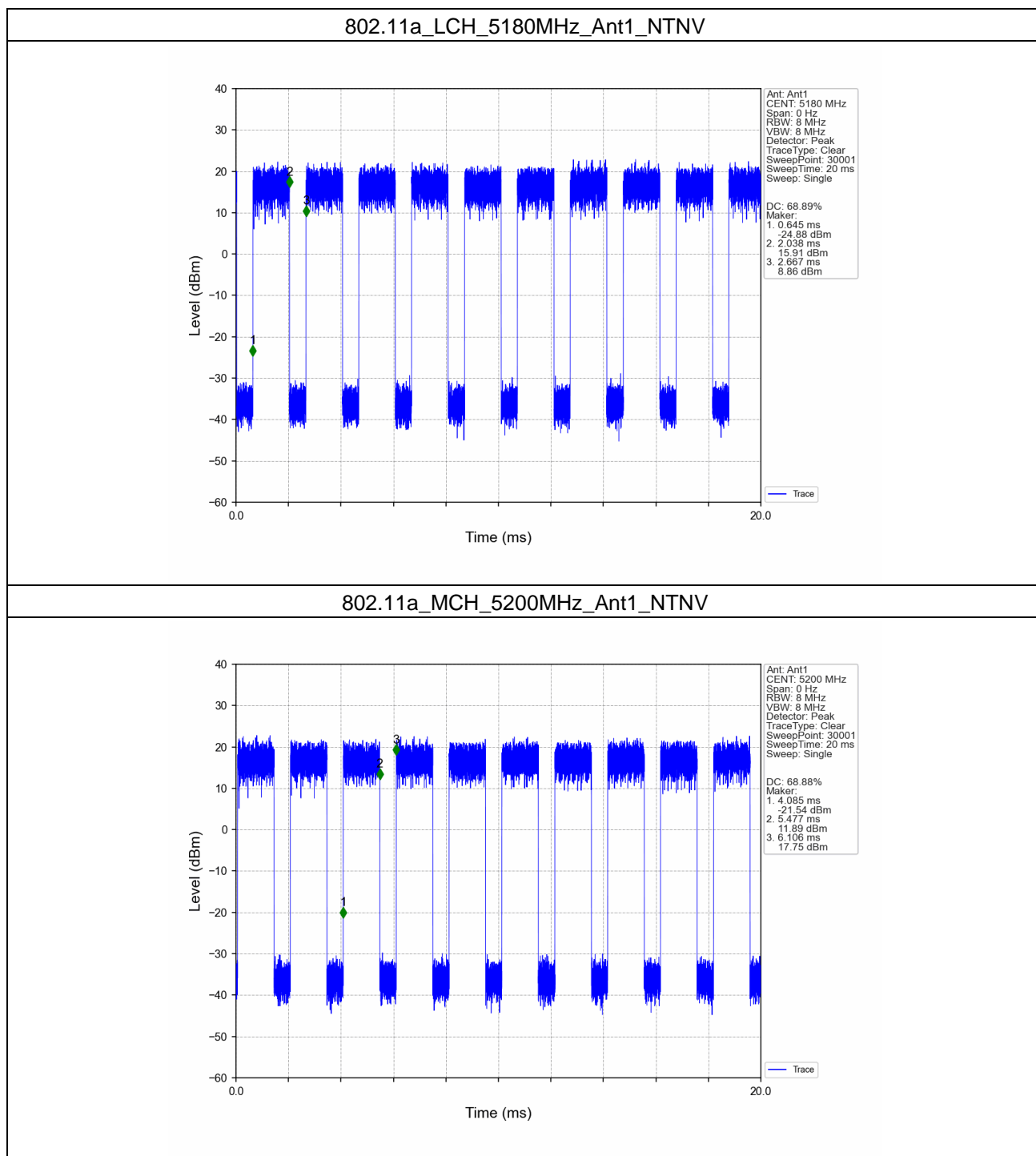
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### 1.2 Test Graph

#### 1.2.1 Ant1



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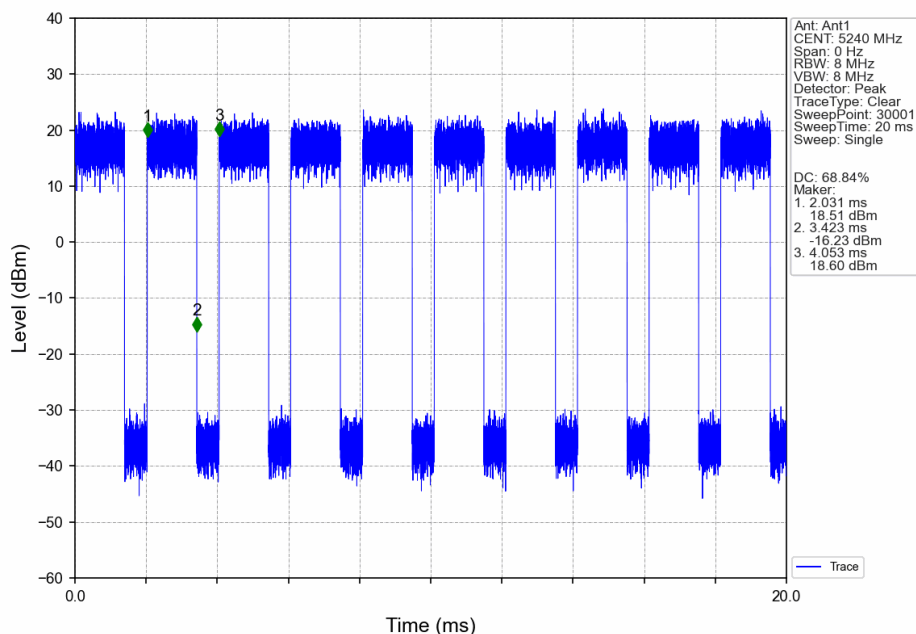
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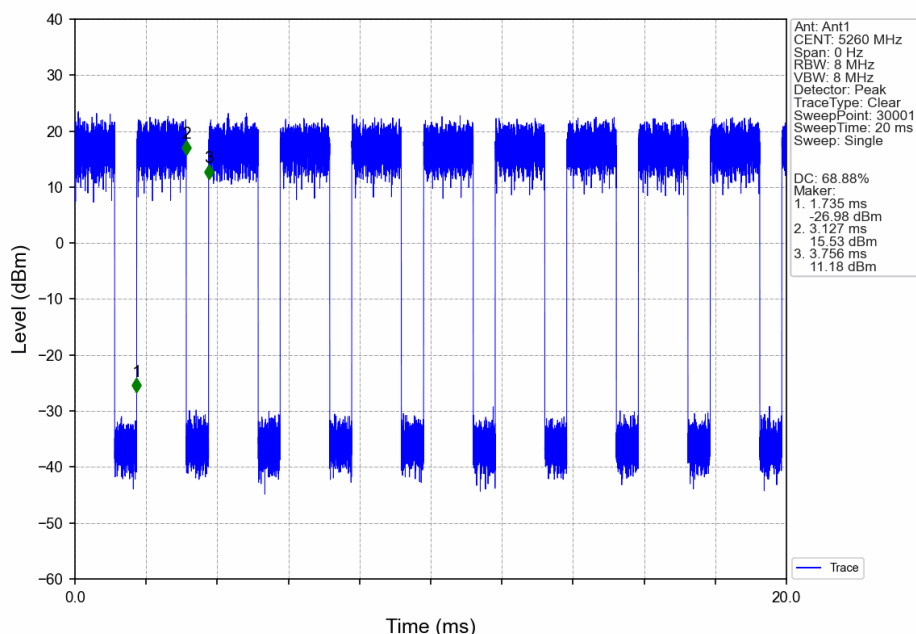
No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn  
中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com



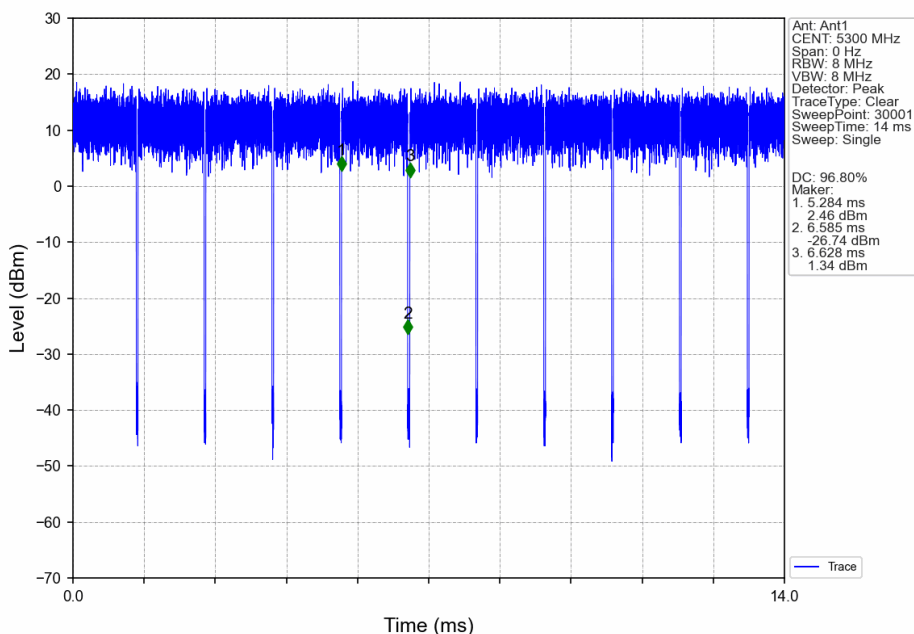
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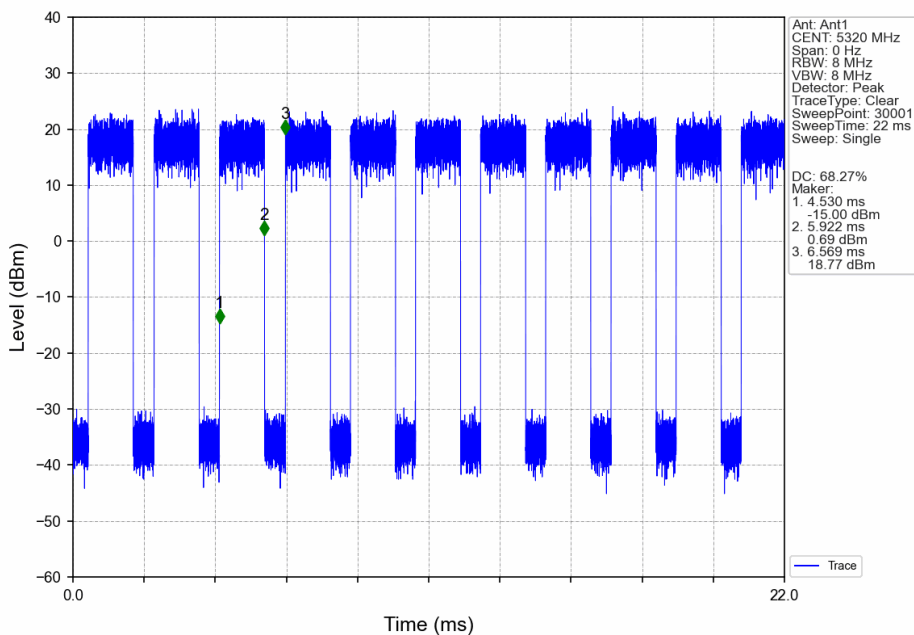
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802.11a\_MCH\_5300MHz\_Ant1\_NTNV



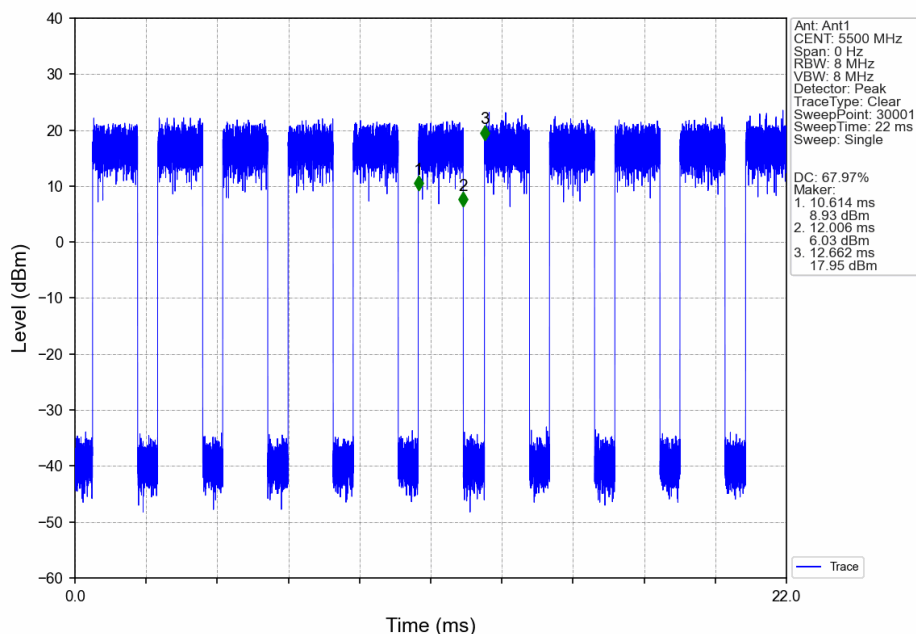
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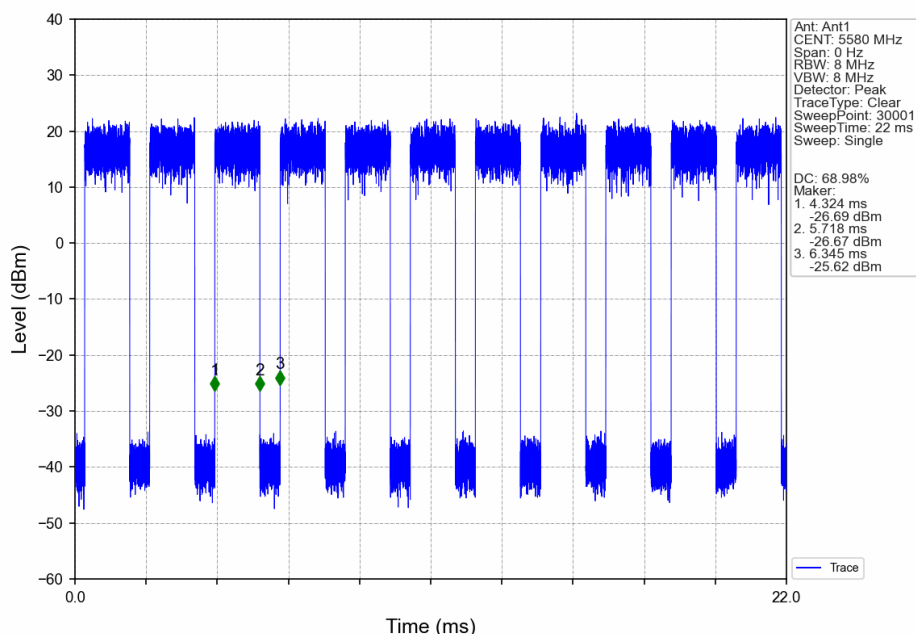
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802.11a\_LCH\_5500MHz\_Ant1\_NTNV



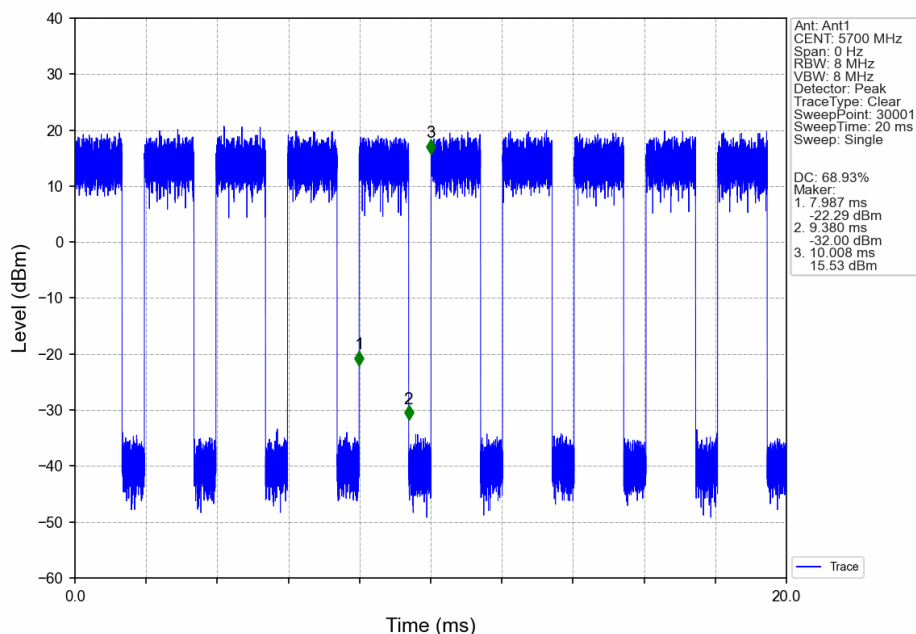
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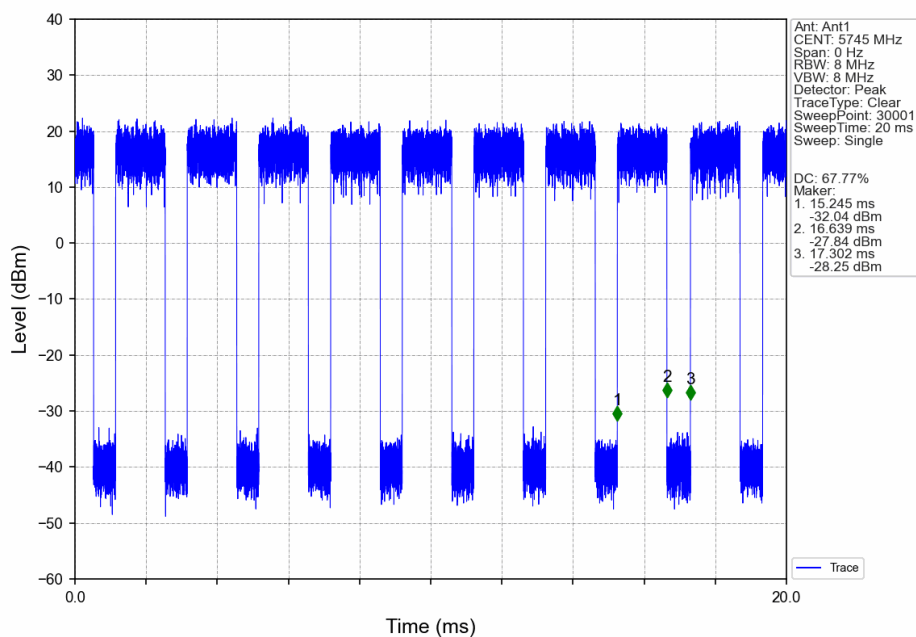
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802.11a\_HCH\_5700MHz\_Ant1\_NTNV

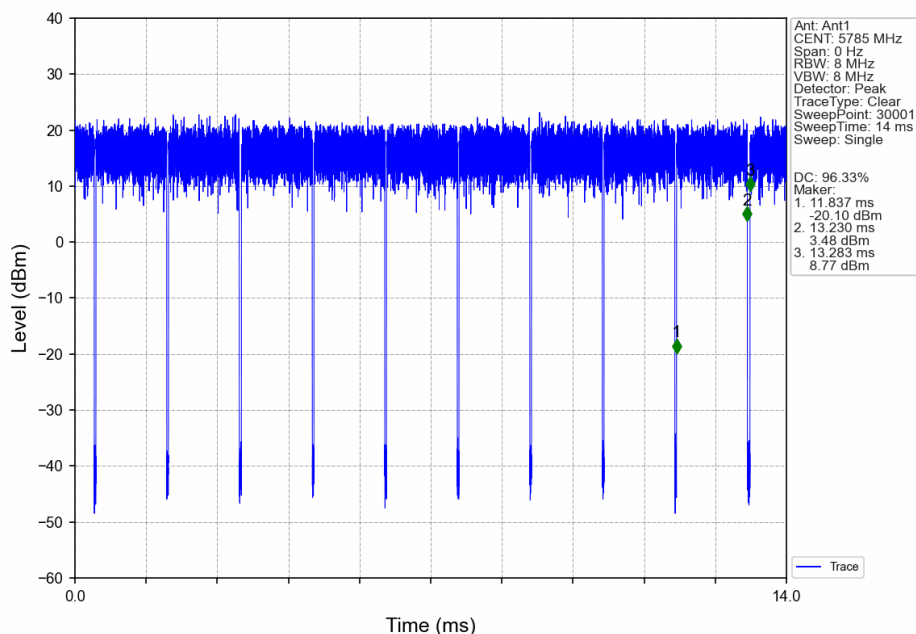


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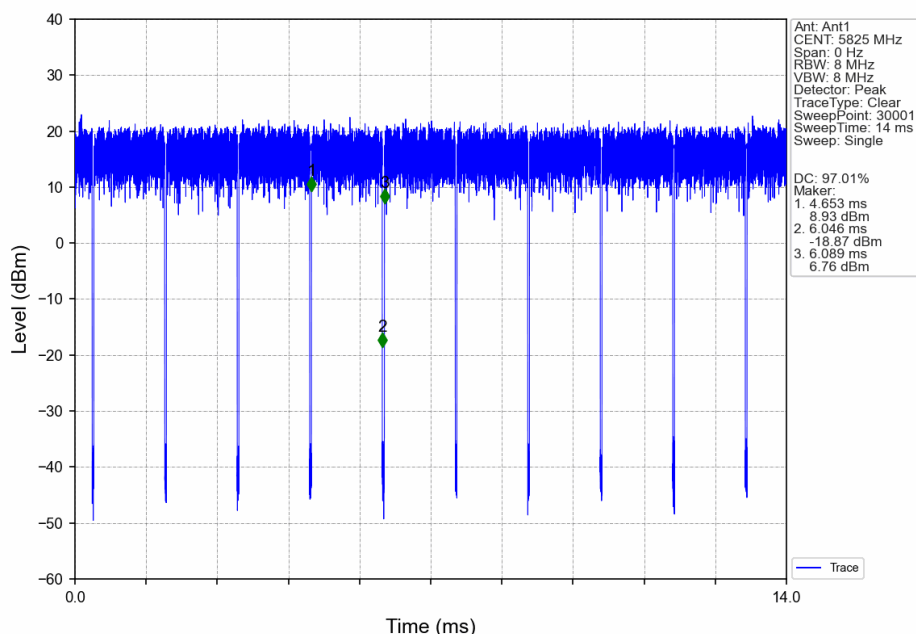




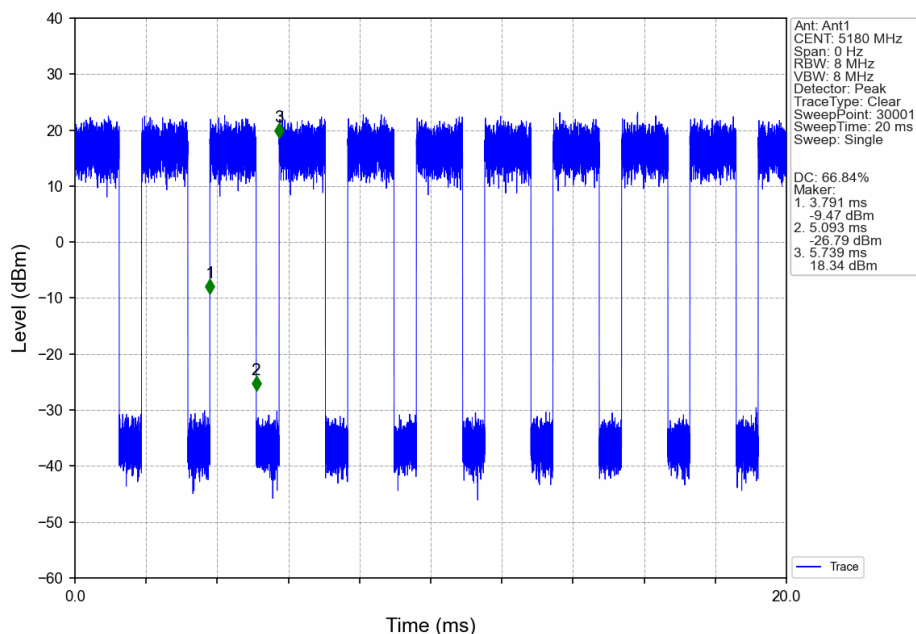
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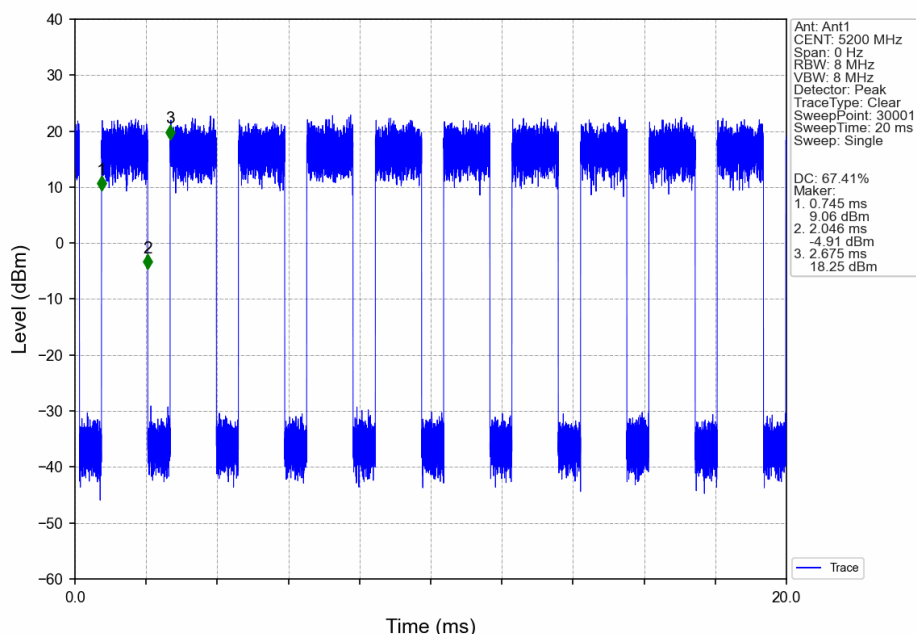
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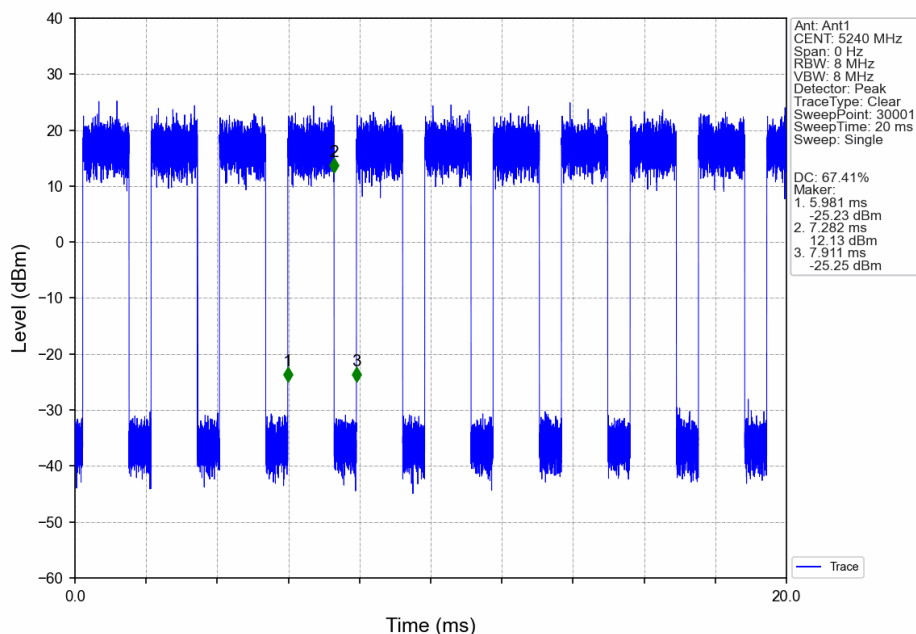
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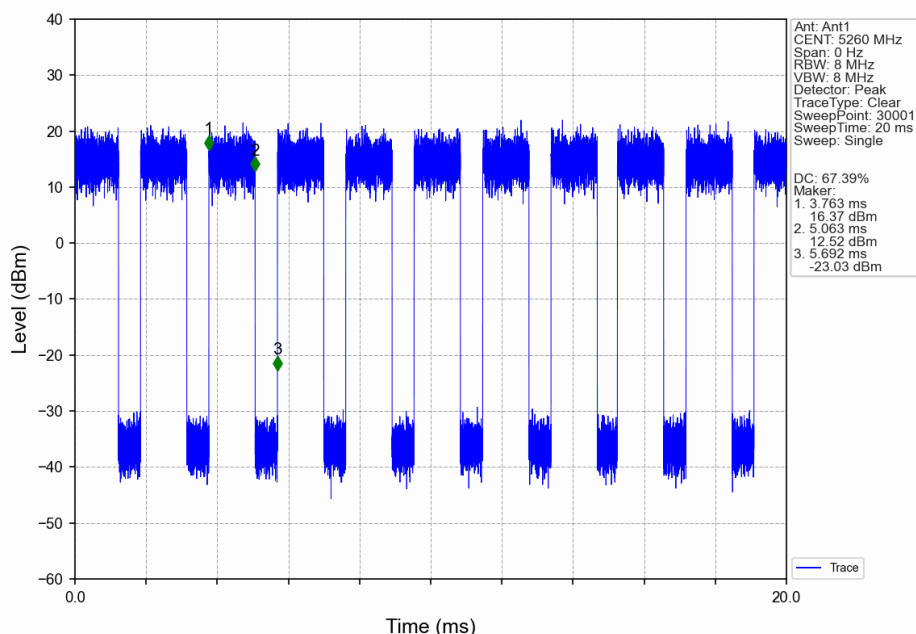
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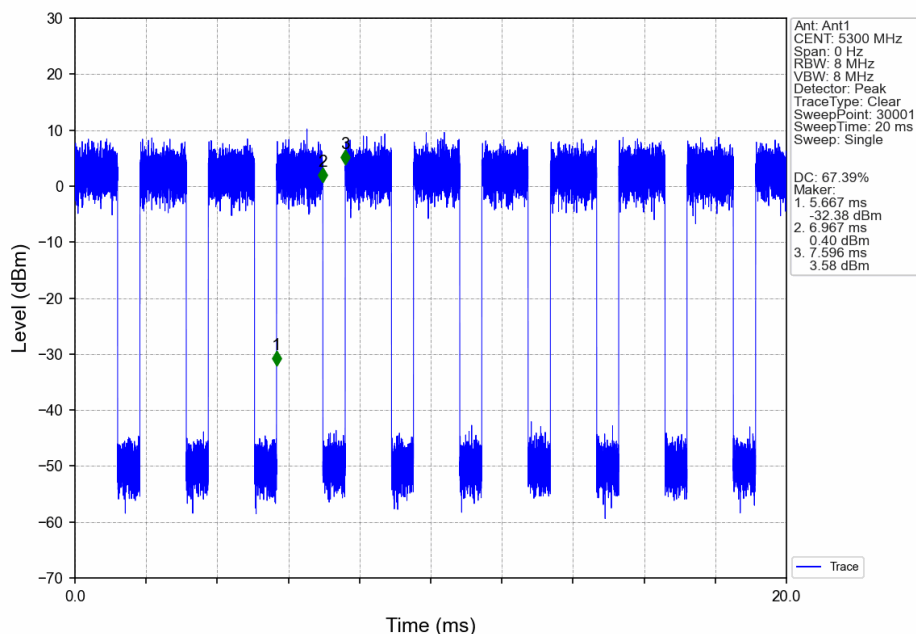
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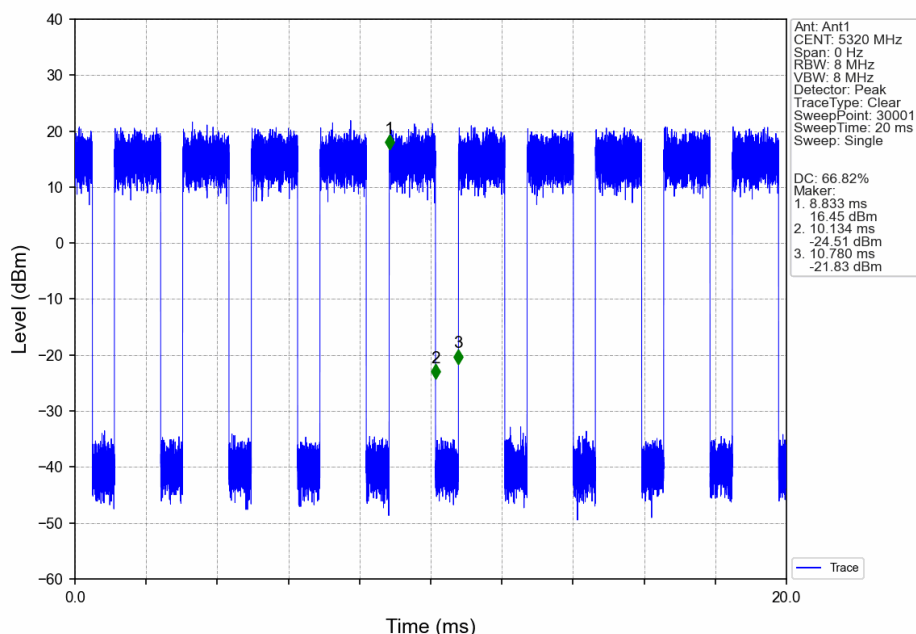
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802.11n(HT20)\_MCH\_5300MHz\_Ant1\_NTNV

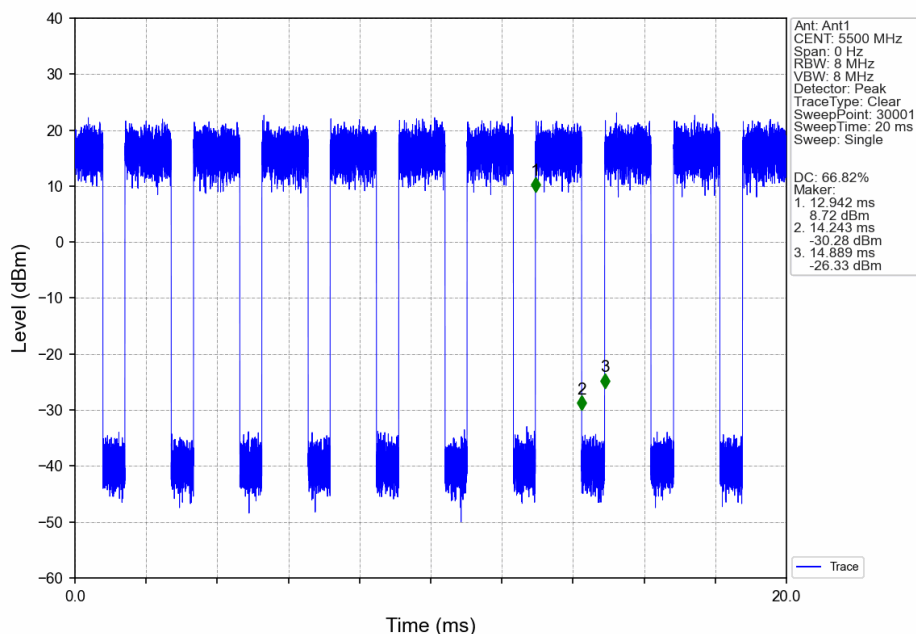


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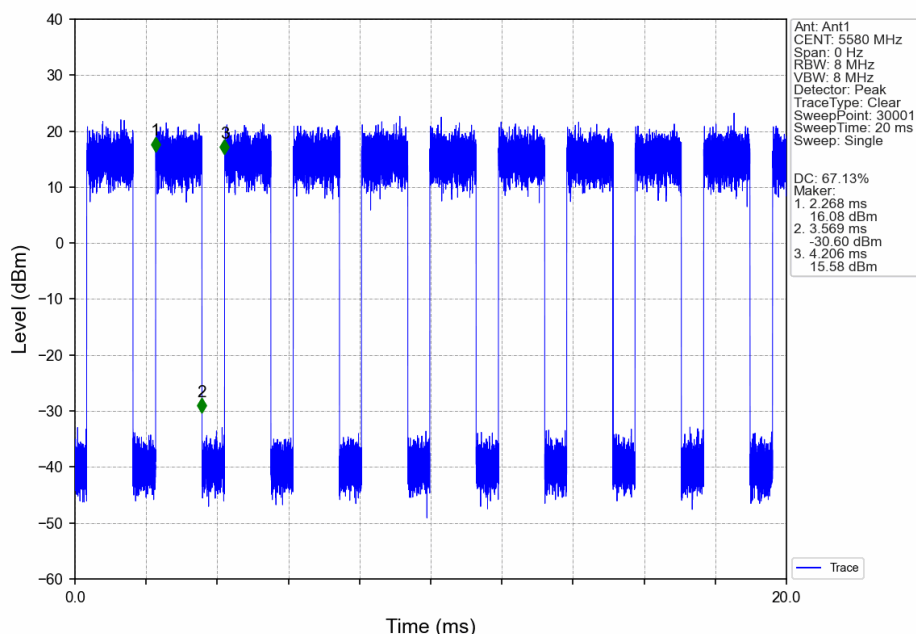




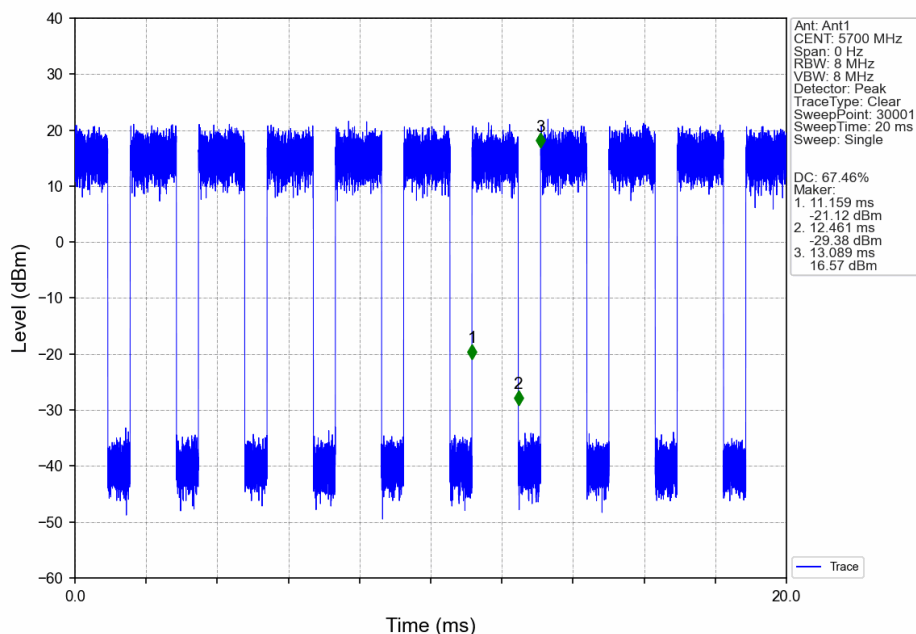
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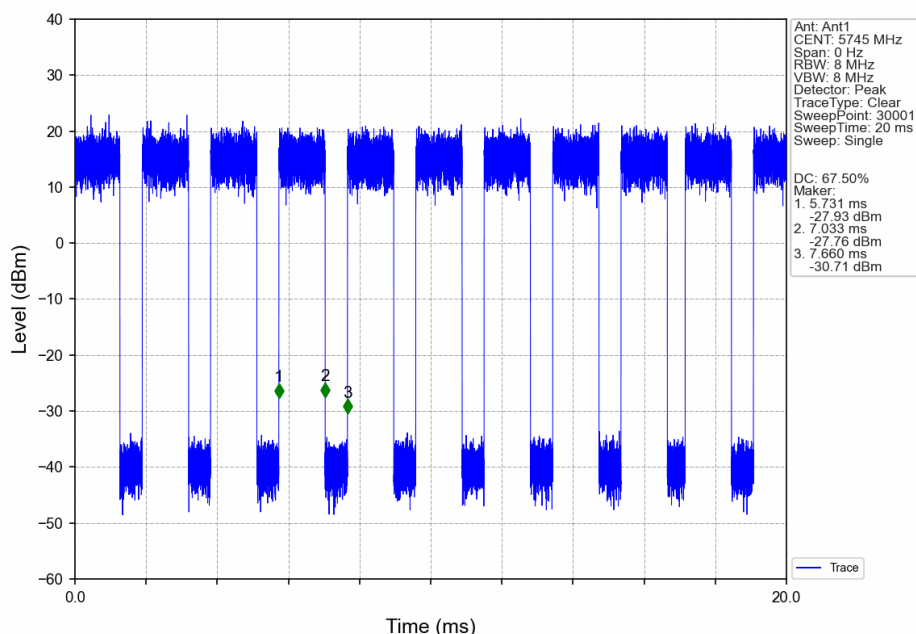
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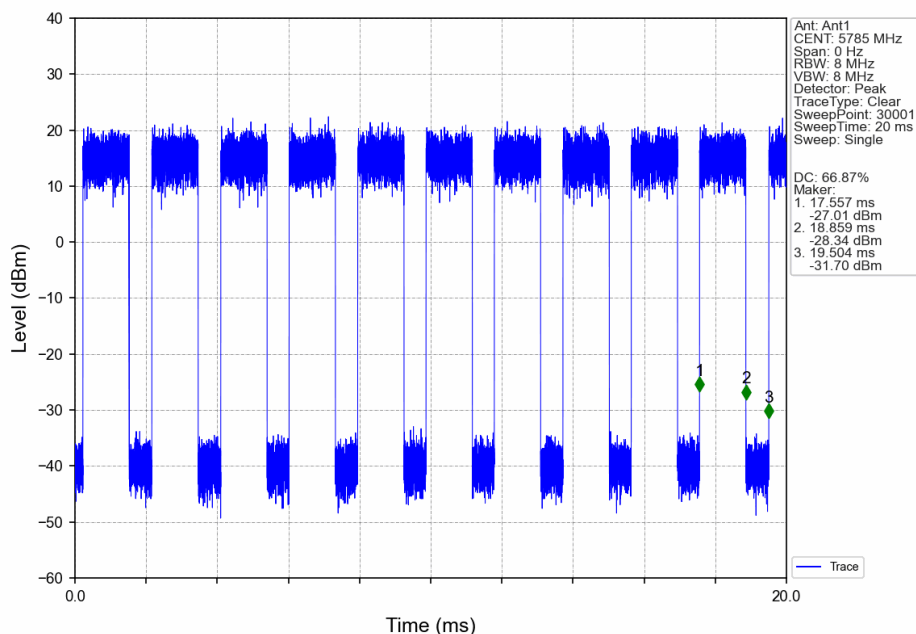
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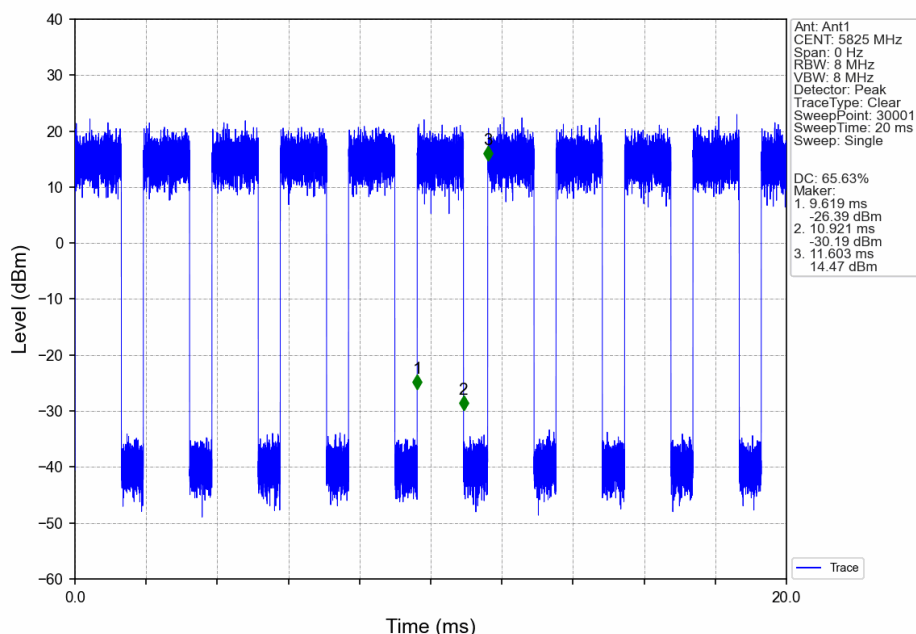
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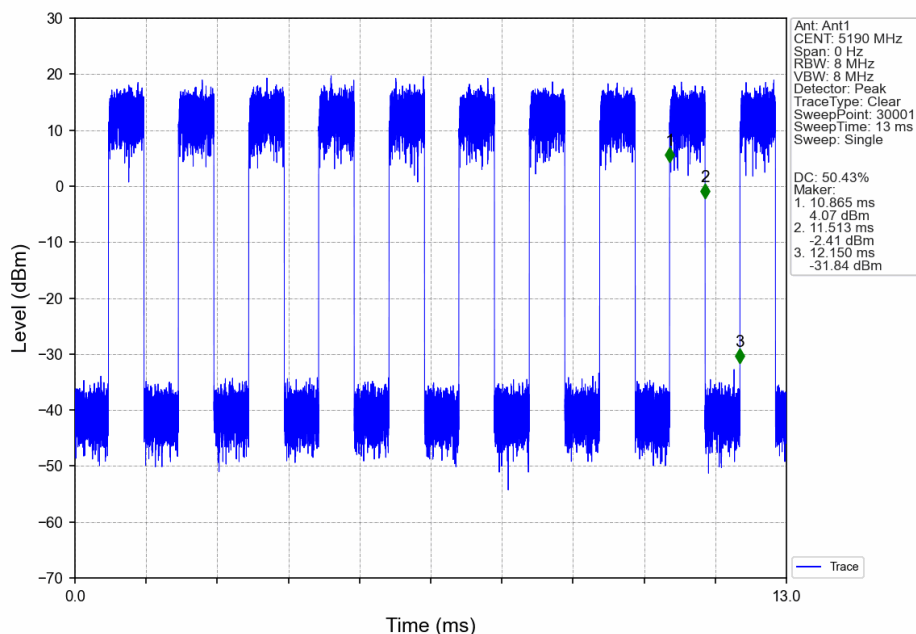
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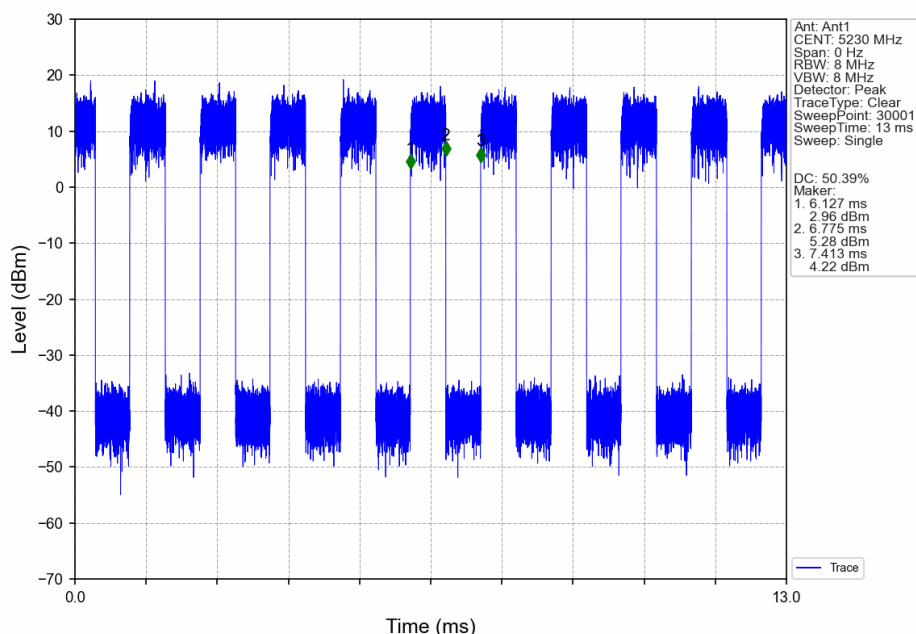
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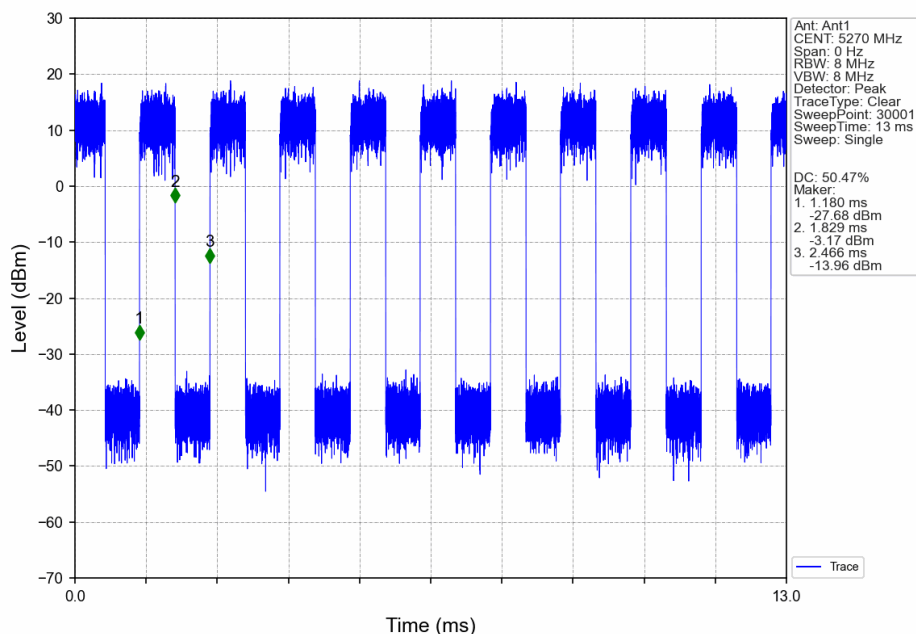


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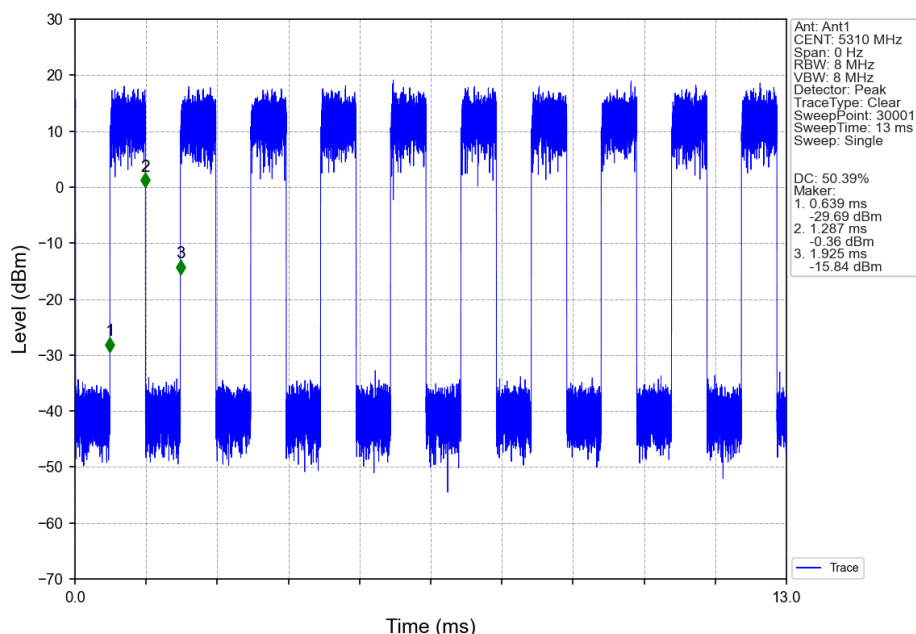




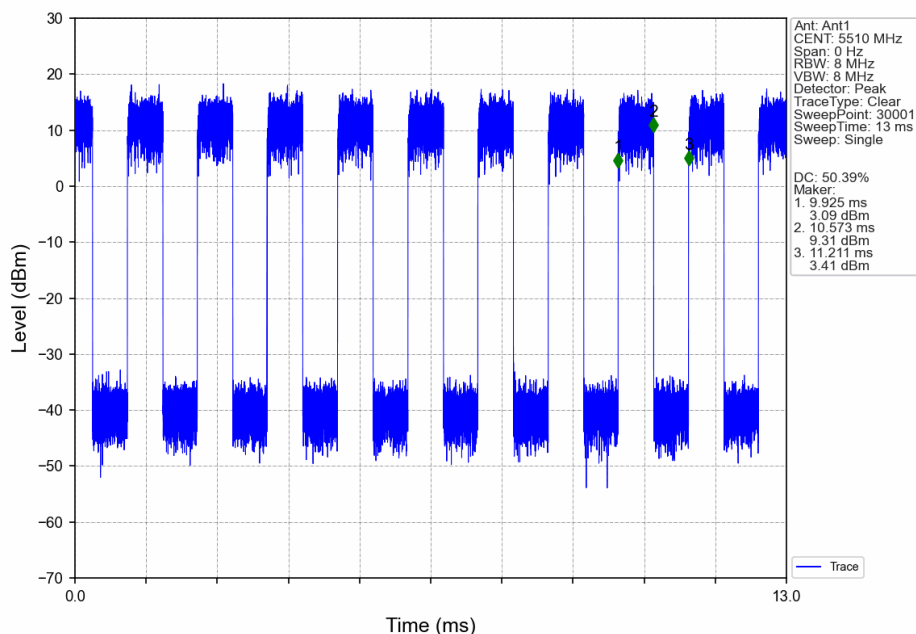
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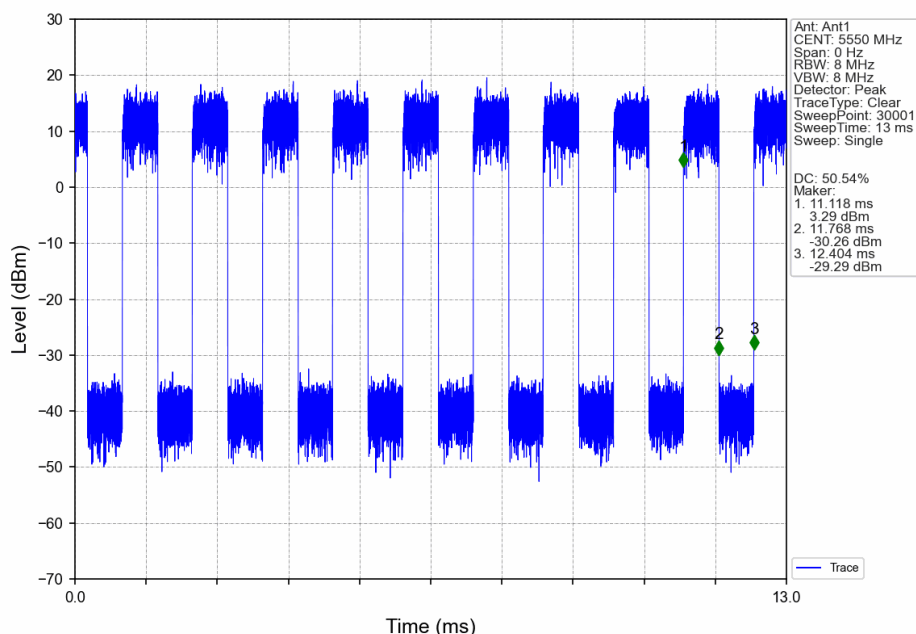
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802.11n(HT40)\_LCH\_5510MHz\_Ant1\_NTNV



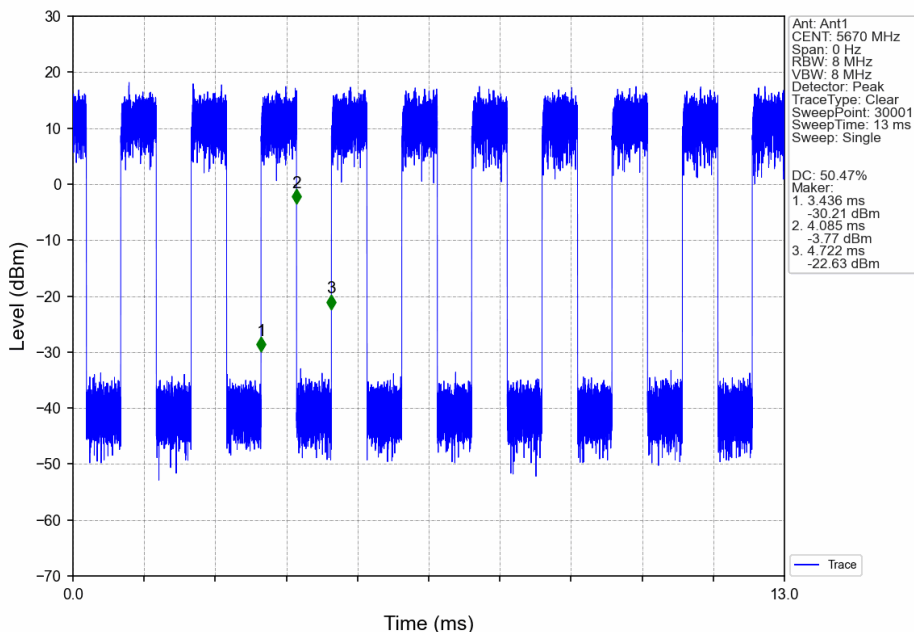
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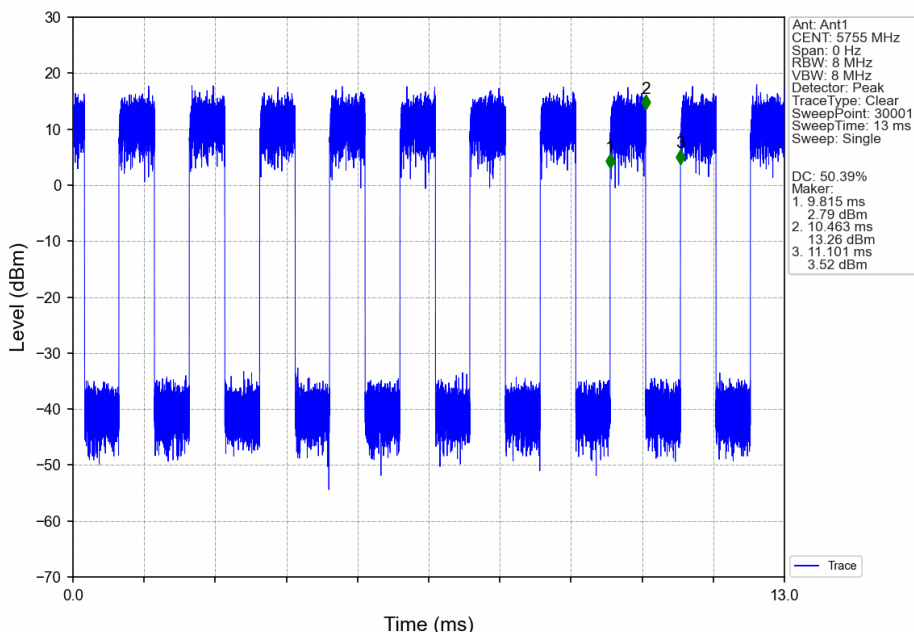
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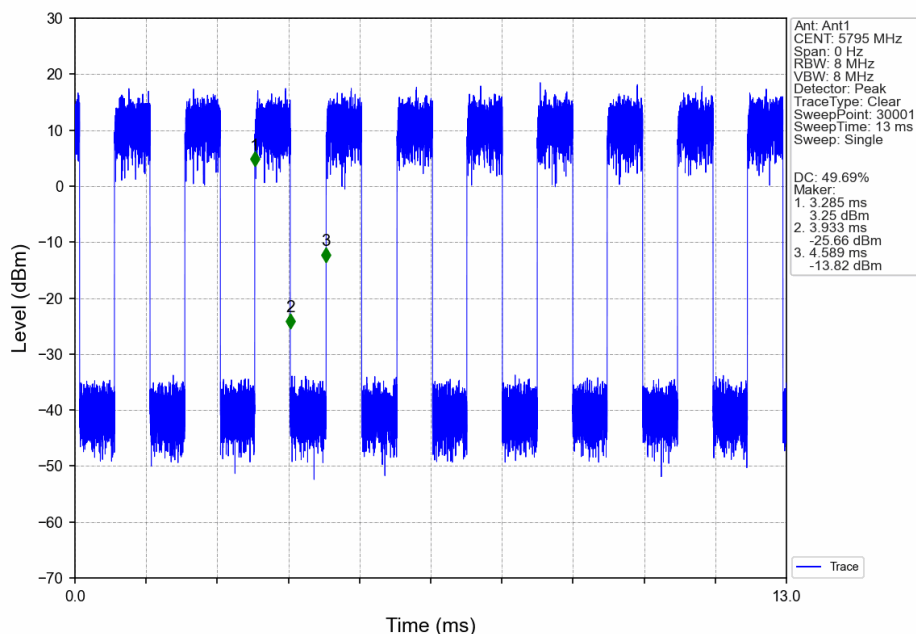
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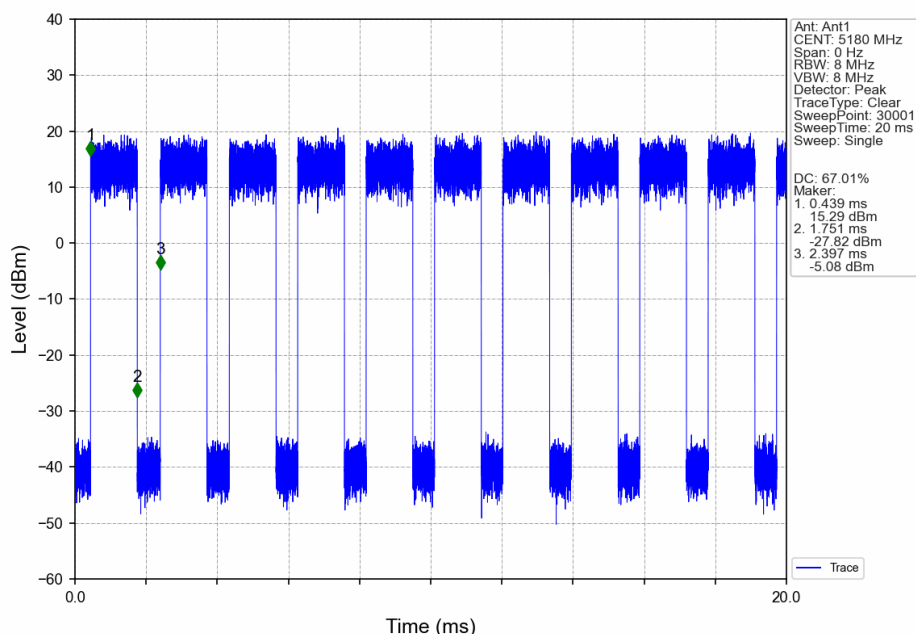
802.11n(HT40)\_LCH\_5755MHz\_Ant1\_NTNV



802.11n(HT40)\_HCH\_5795MHz\_Ant1\_NTNV



802.11ac(VHT20)\_LCH\_5180MHz\_Ant1\_NTNV

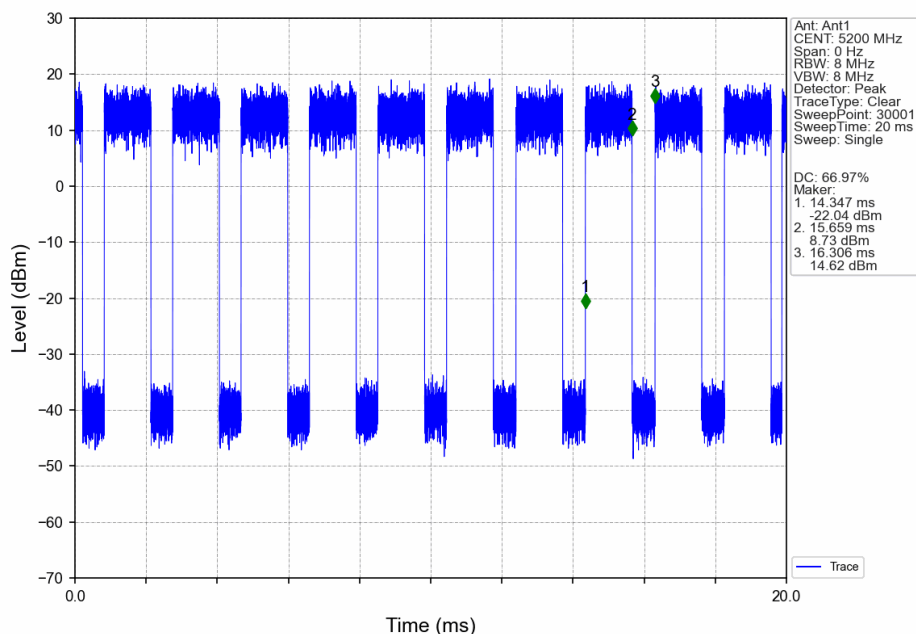


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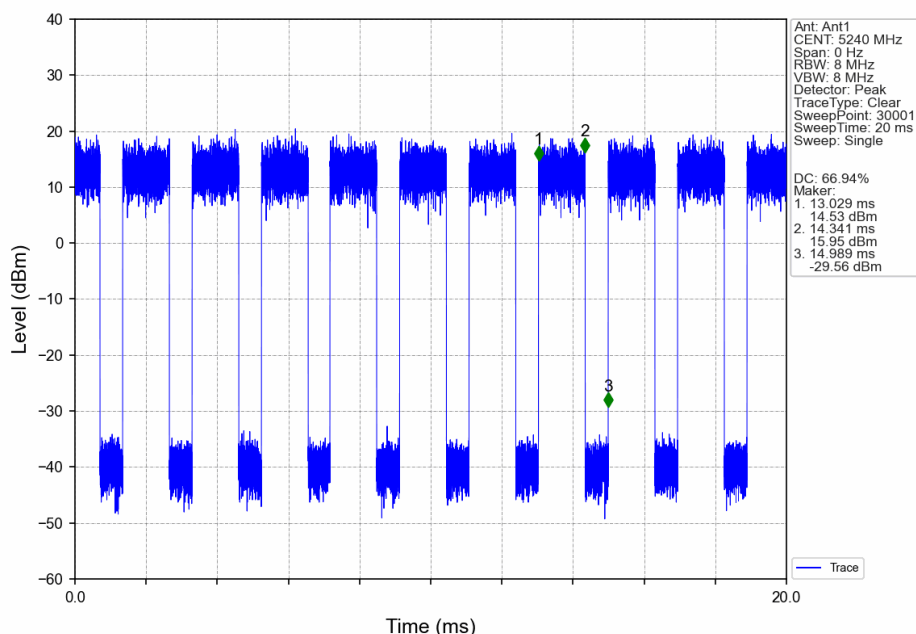
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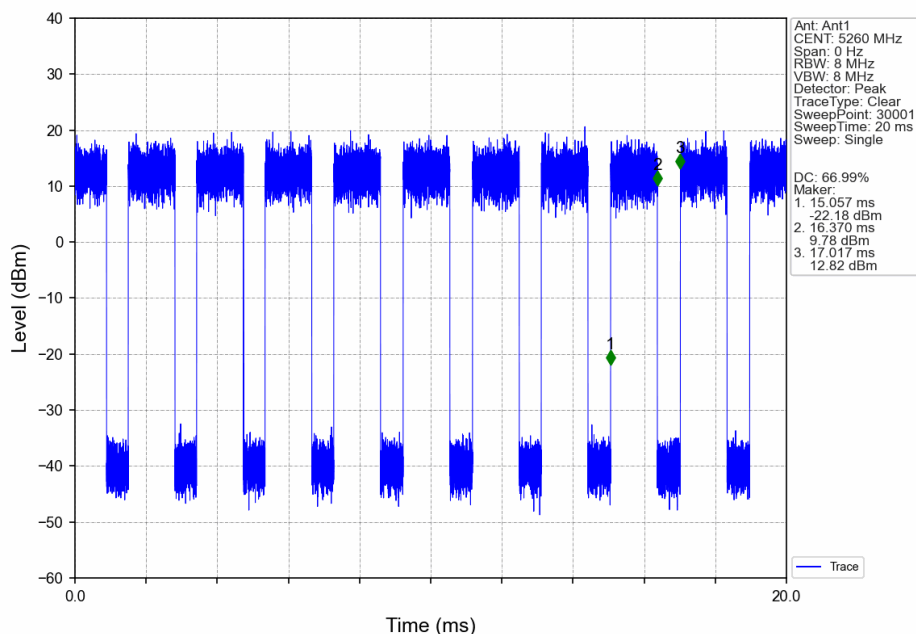
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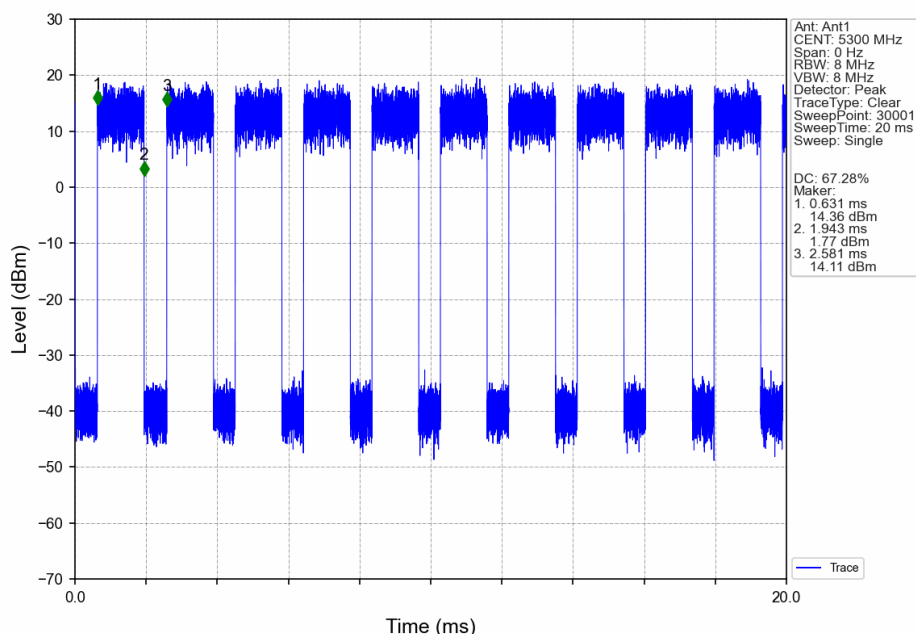
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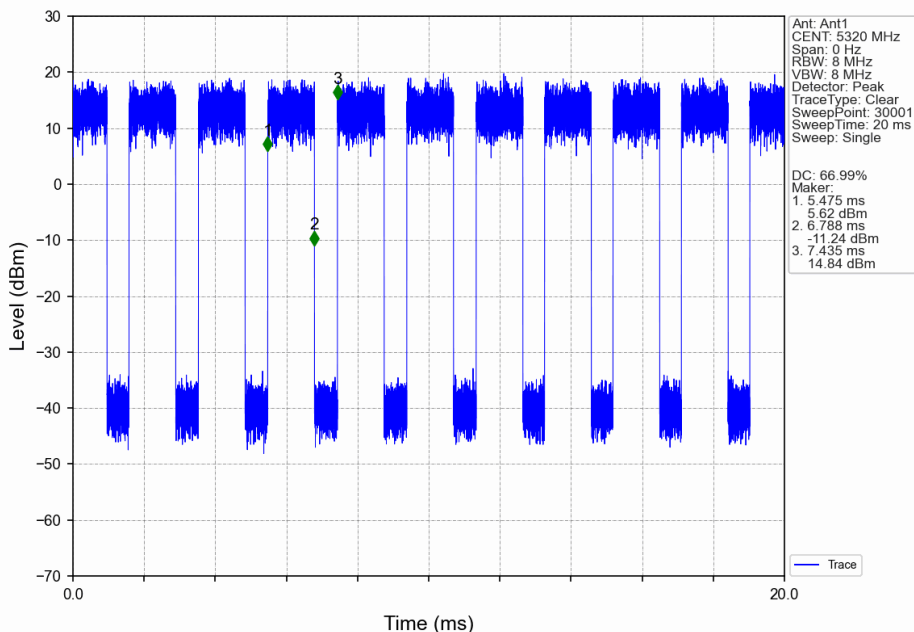
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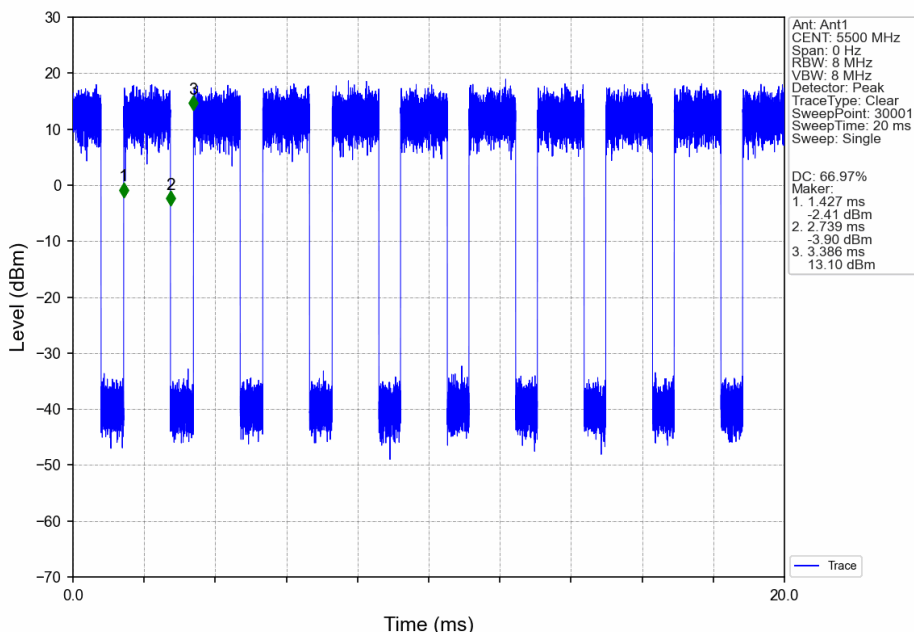
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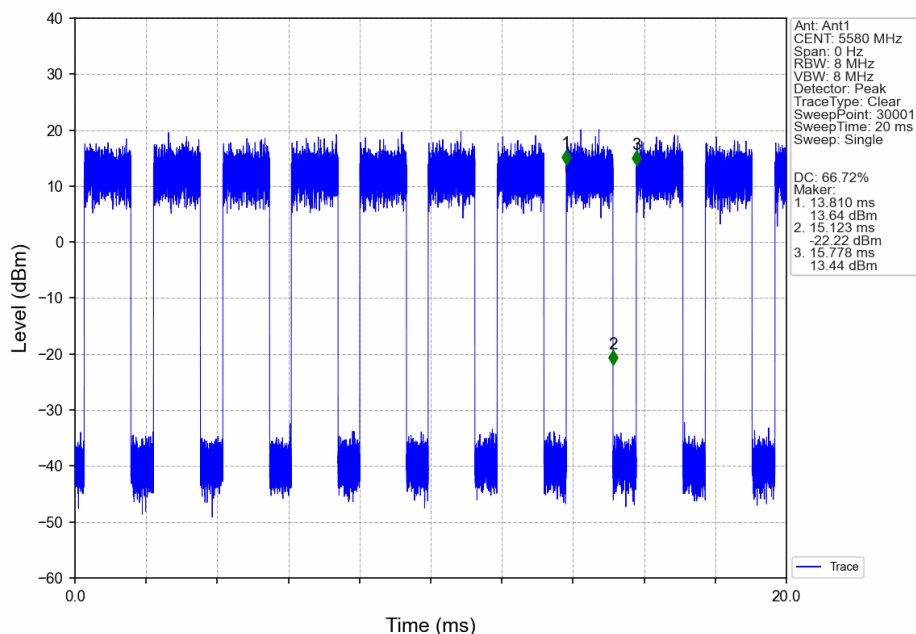
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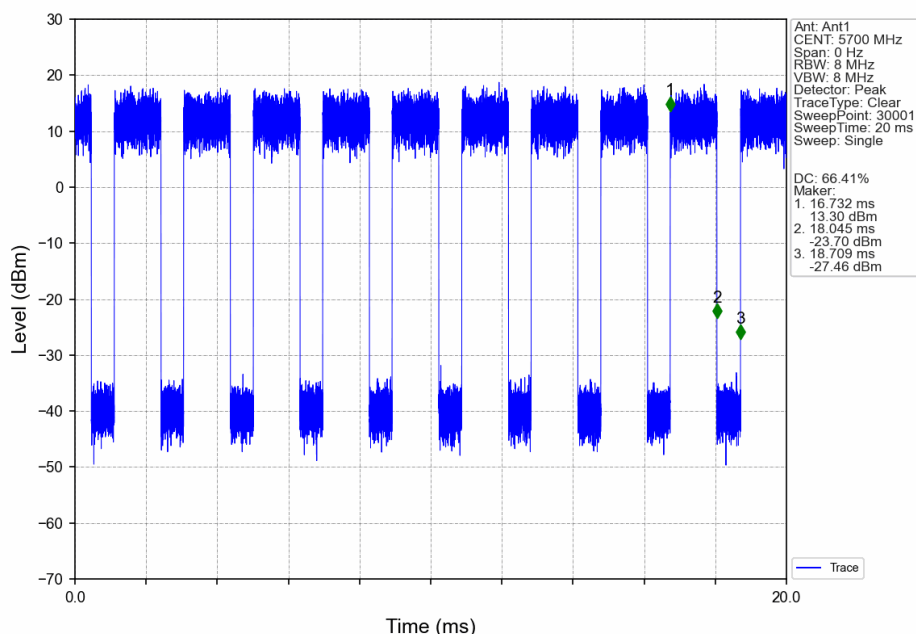
802.11ac(VHT20)\_LCH\_5500MHz\_Ant1\_NTNV



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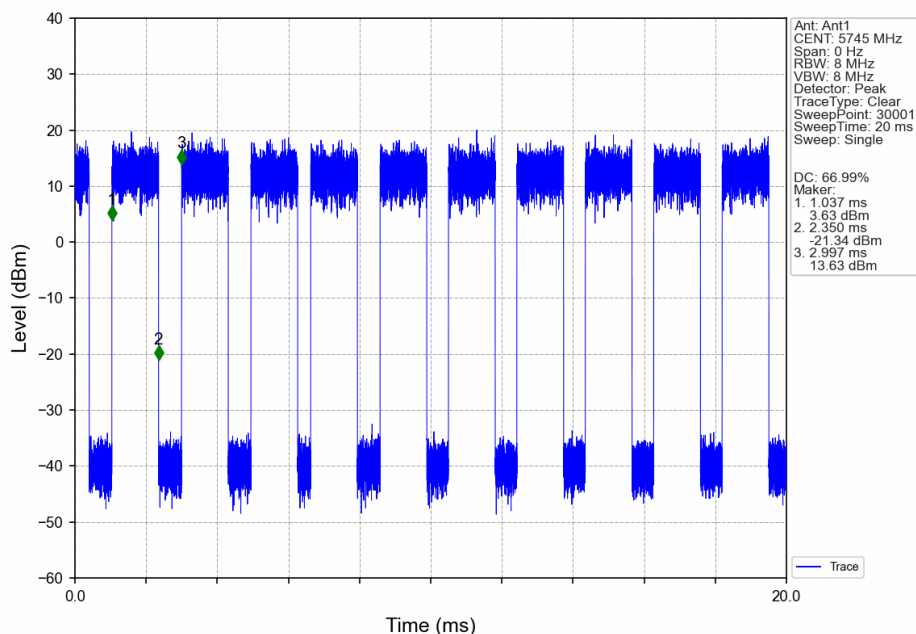


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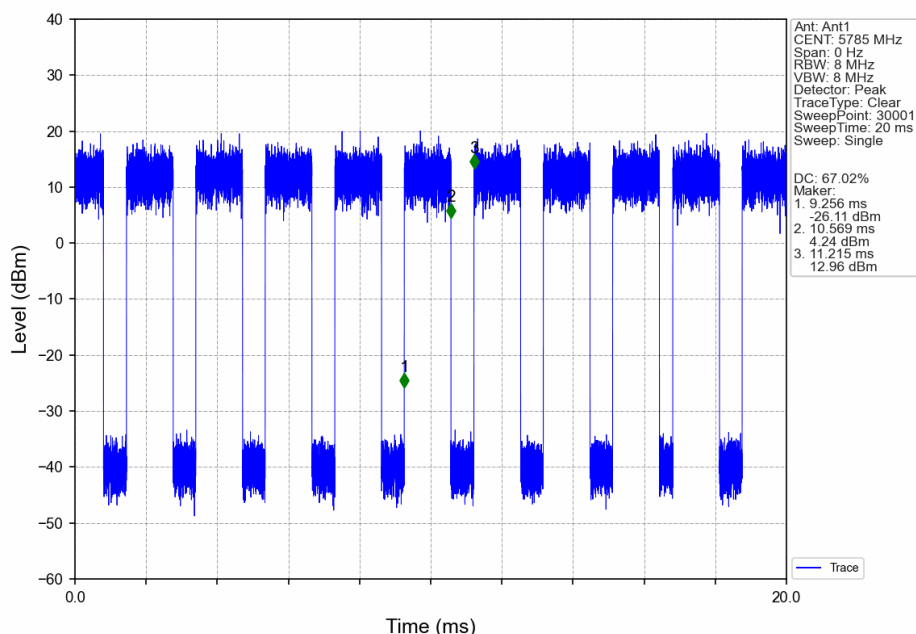
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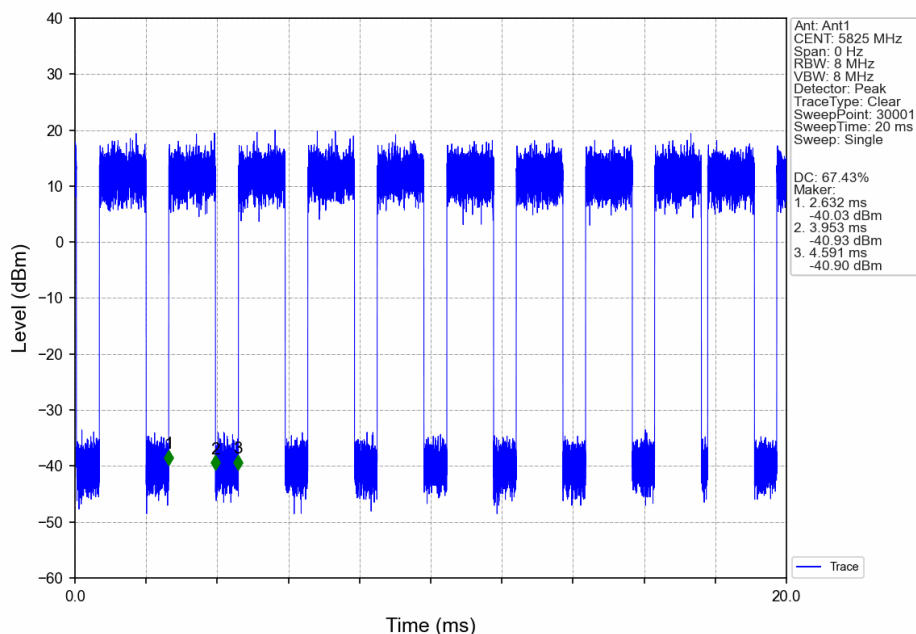
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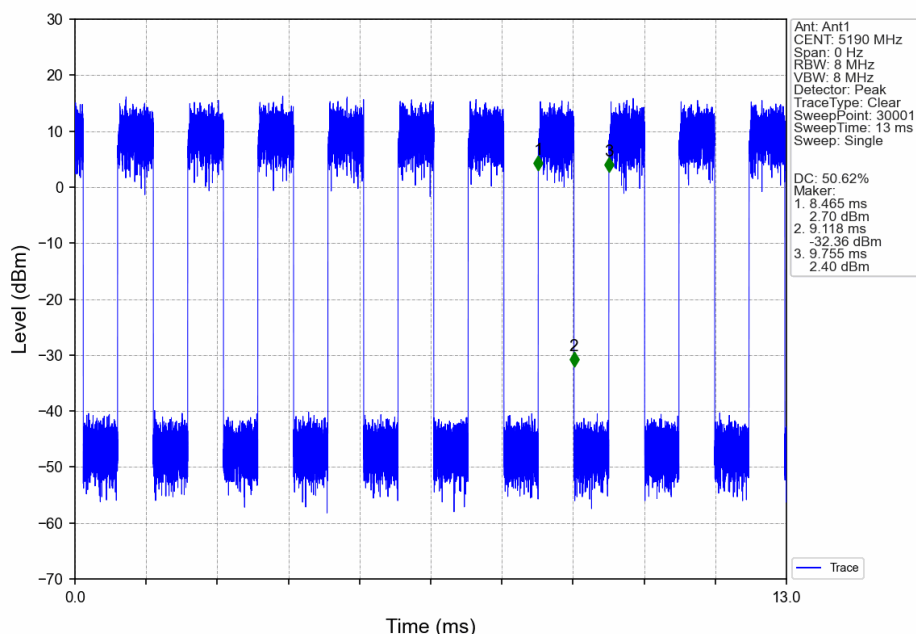
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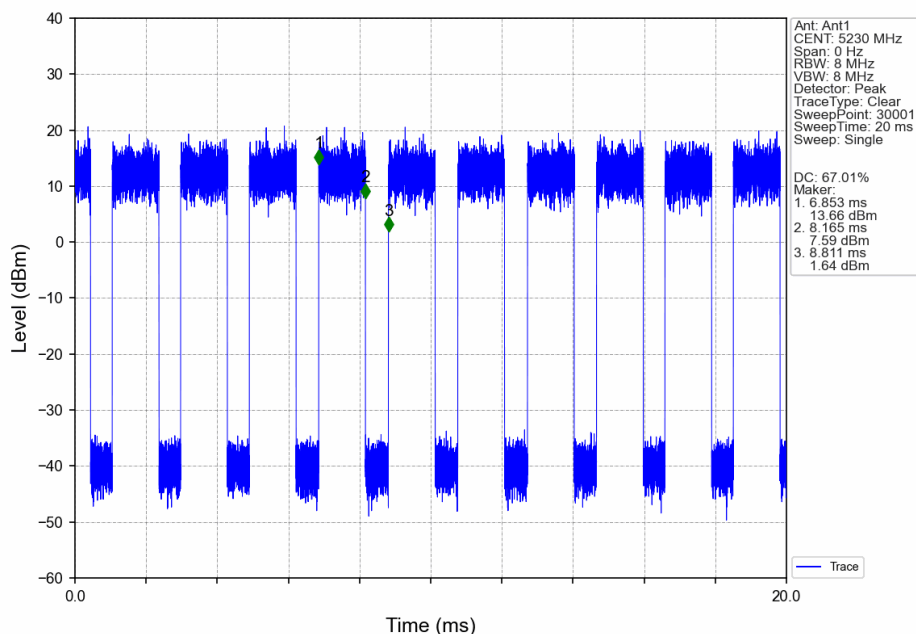
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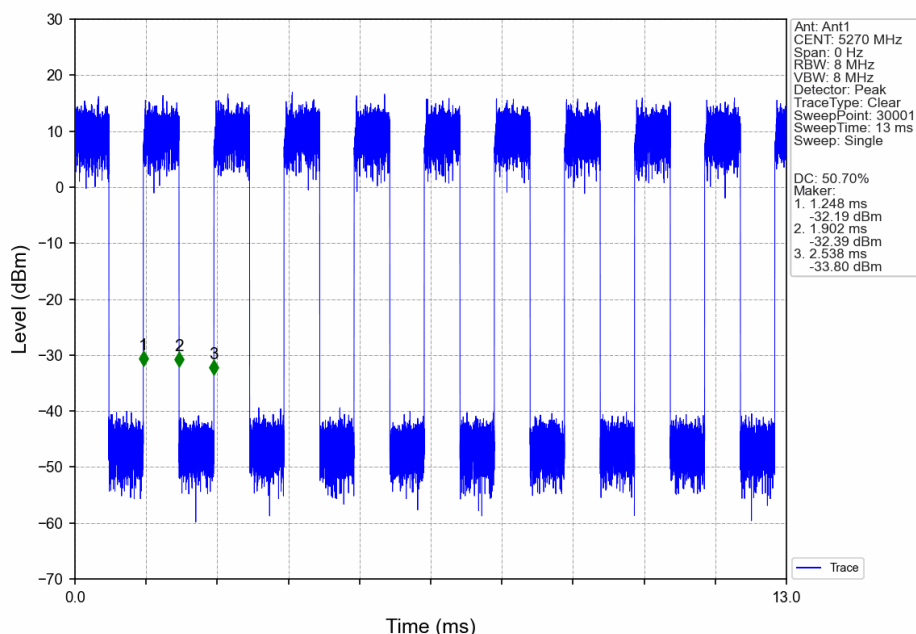
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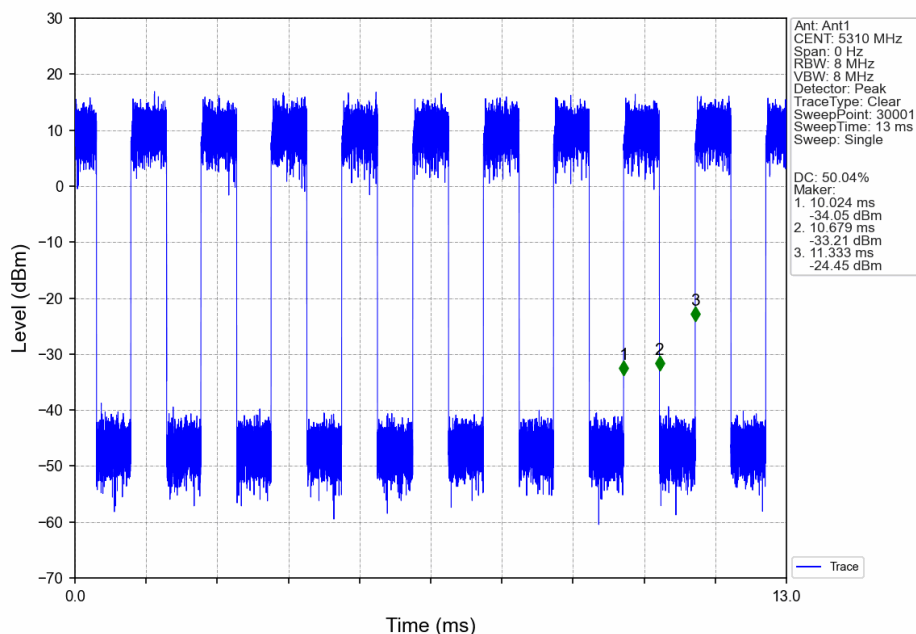
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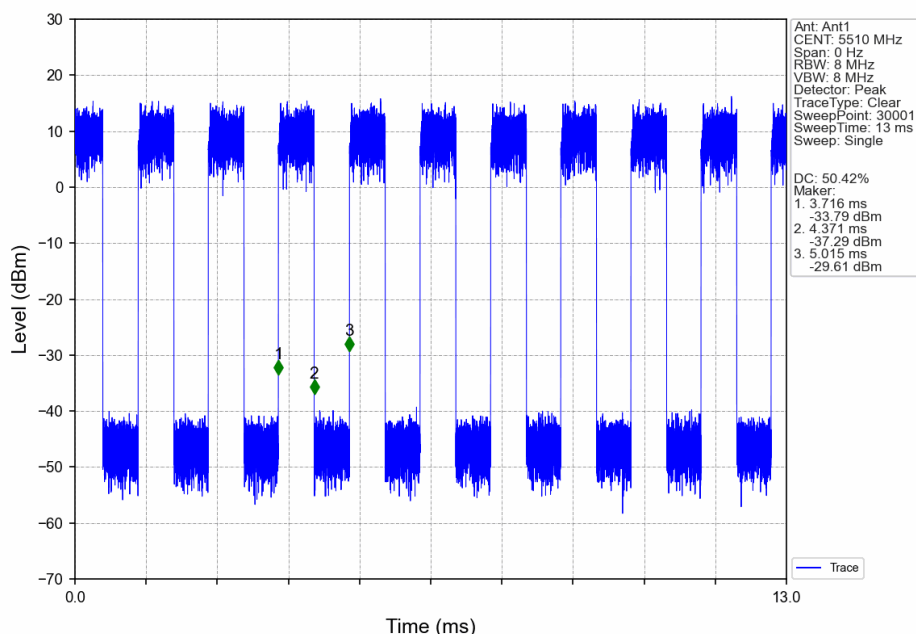
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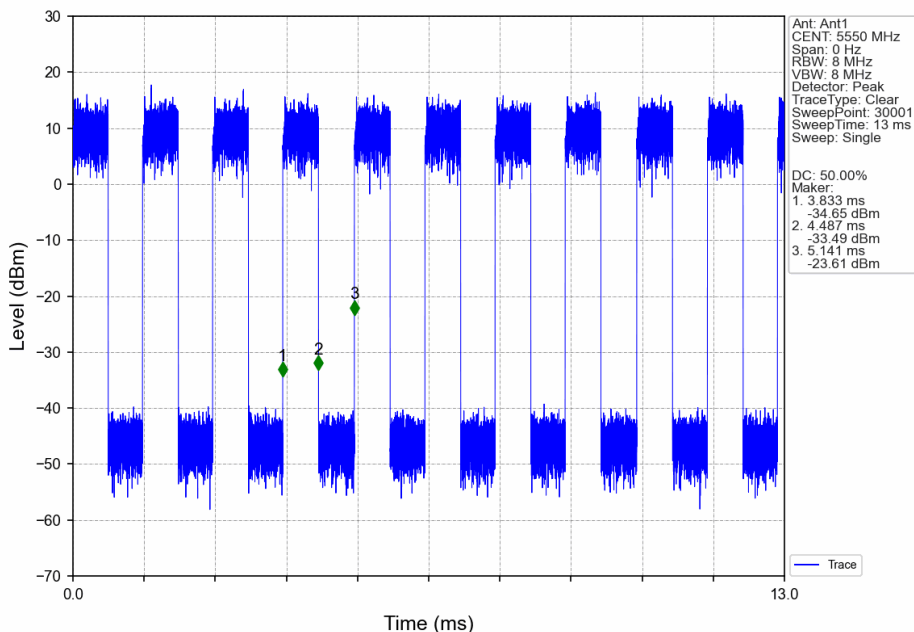


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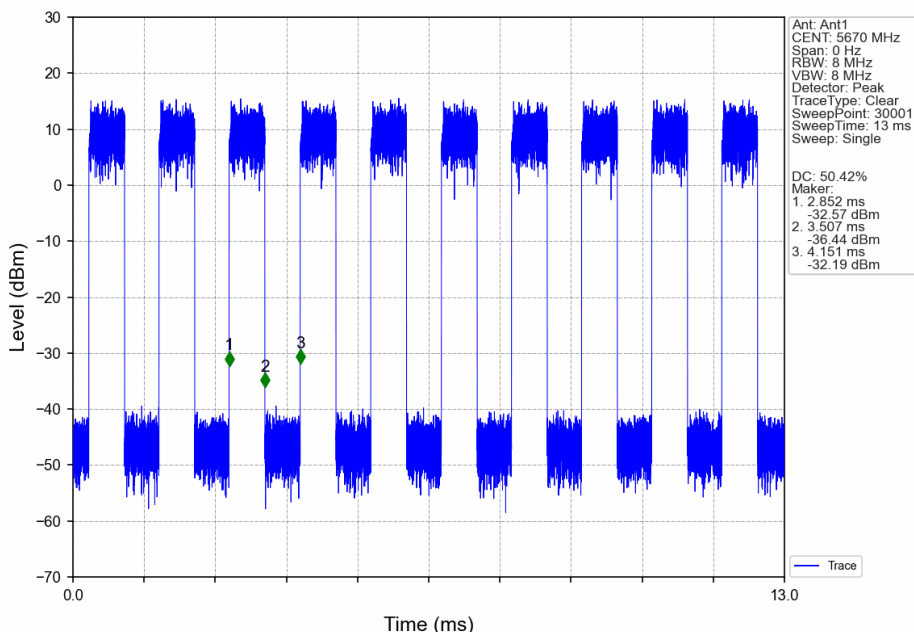




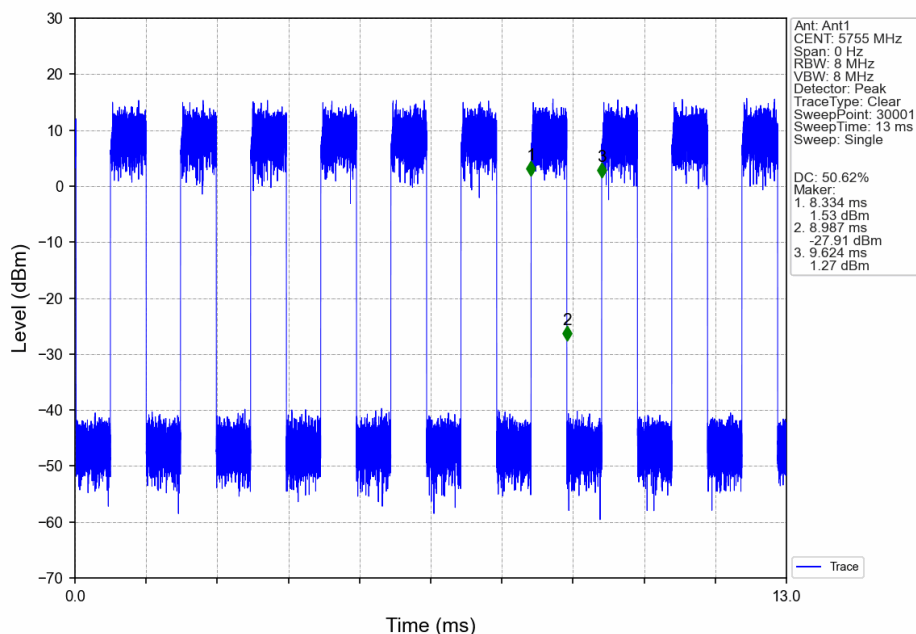
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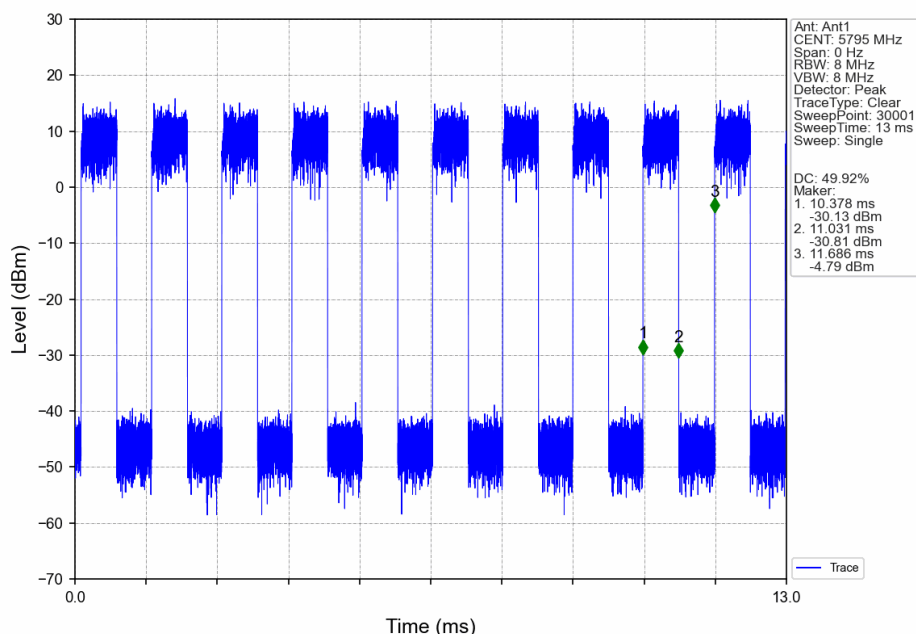
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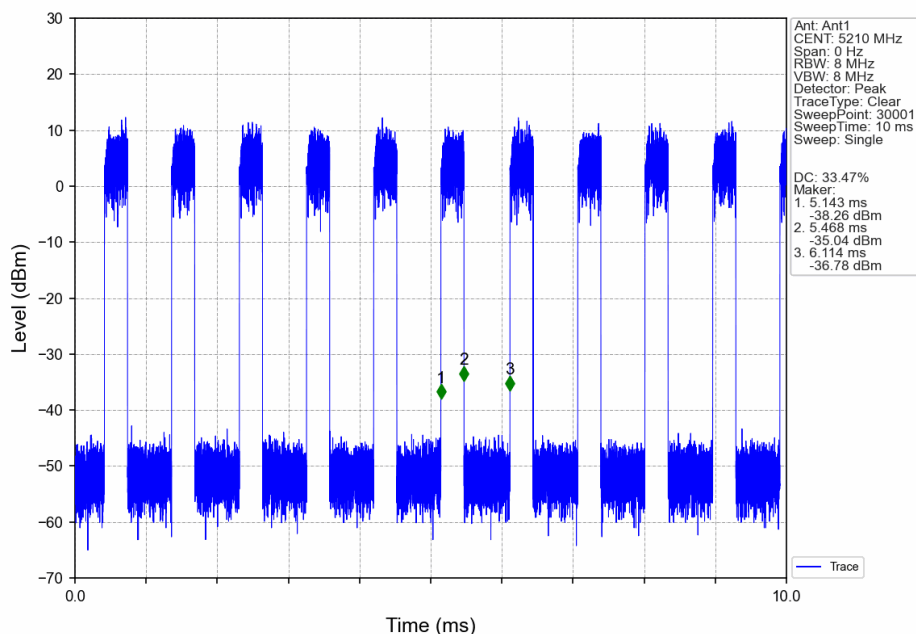
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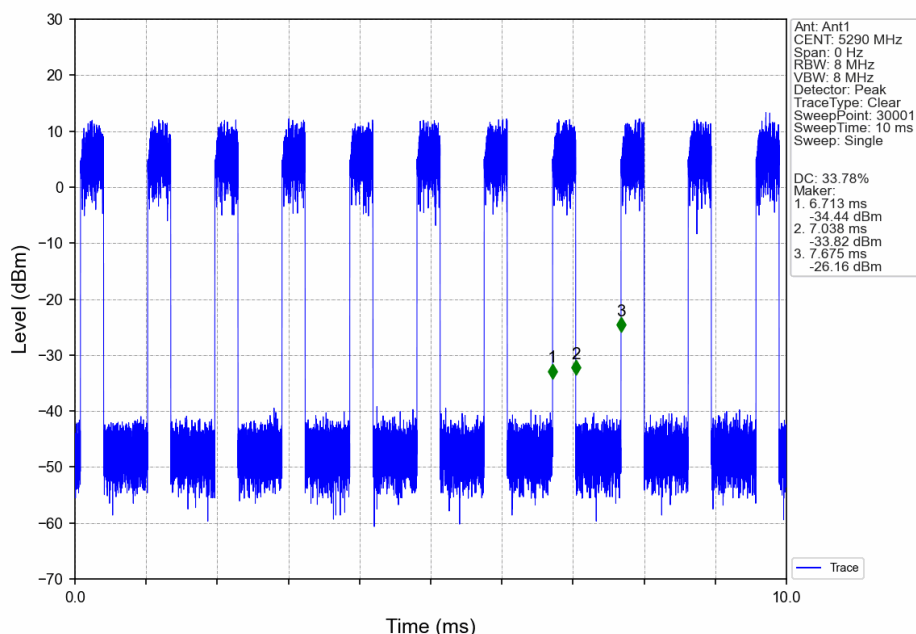
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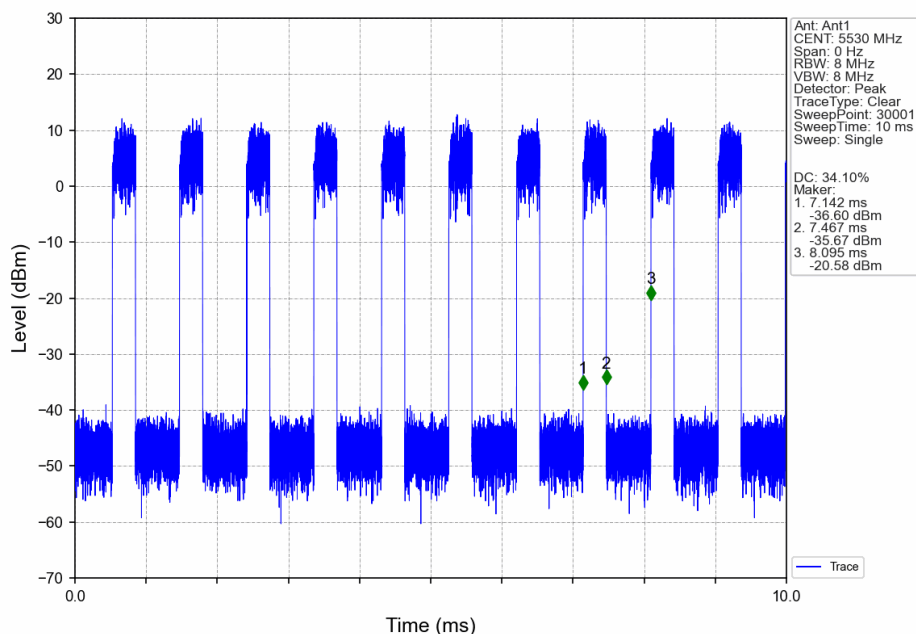
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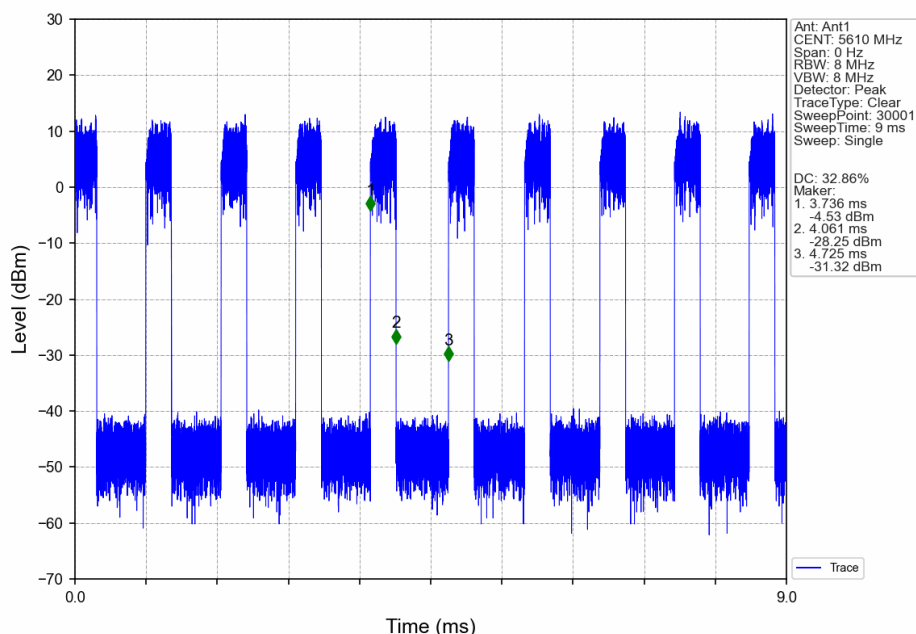
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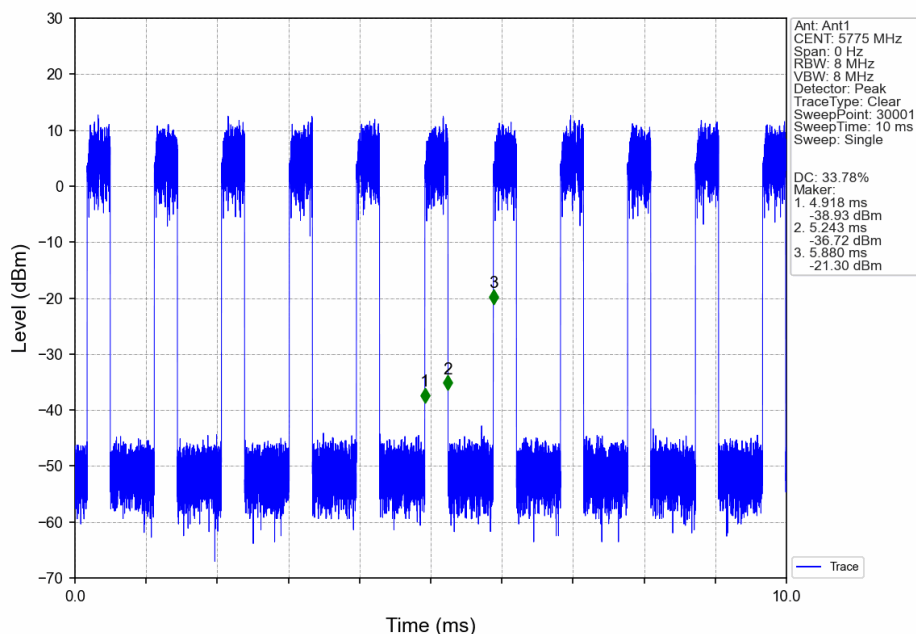


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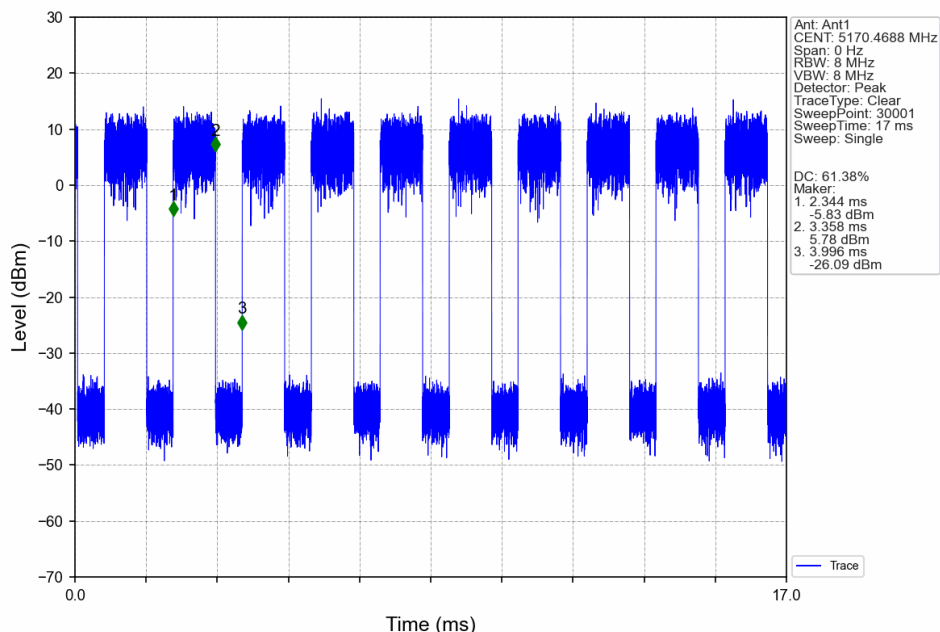
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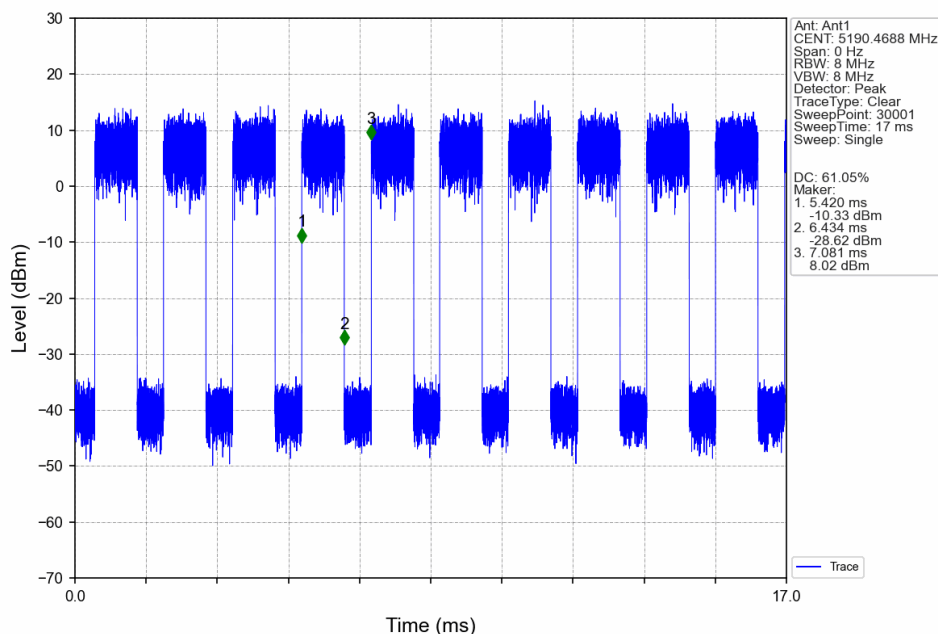
802.11ac(VHT80)\_MCH\_5775MHz\_Ant1\_NTNV



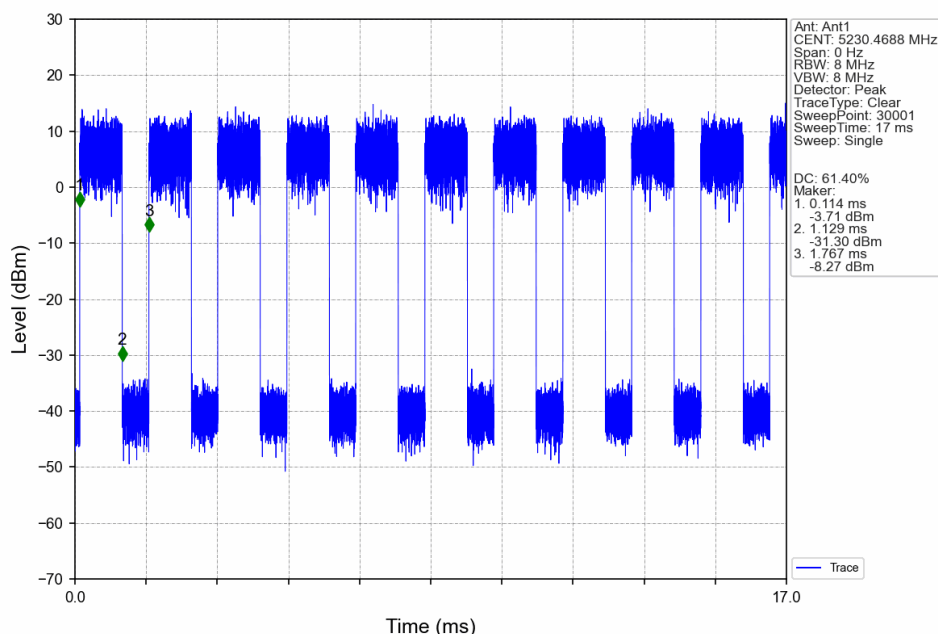
802.11ax(HEW20)\_LCH\_5180MHz\_SU\_ / \_Ant1\_NTNV



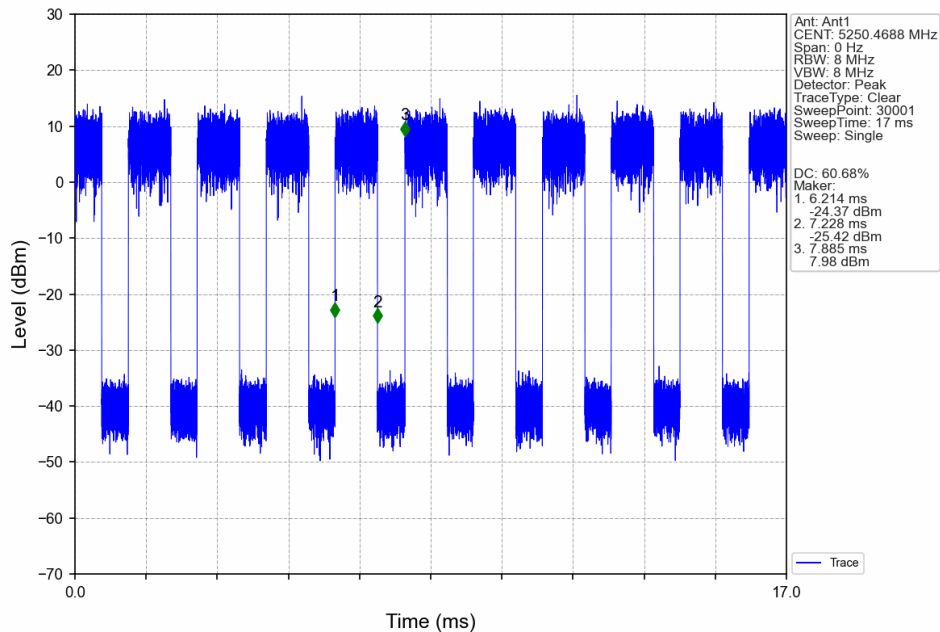
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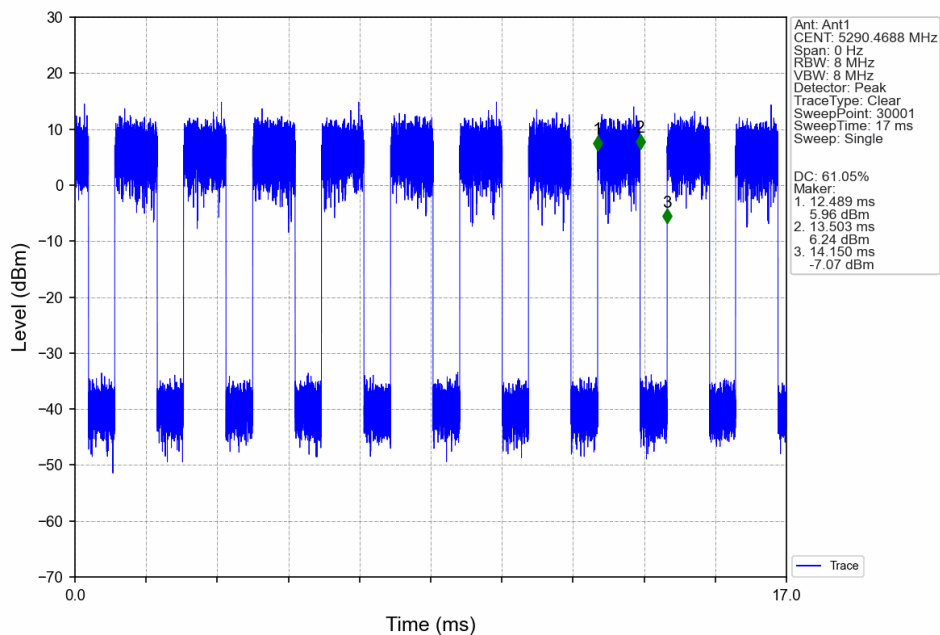
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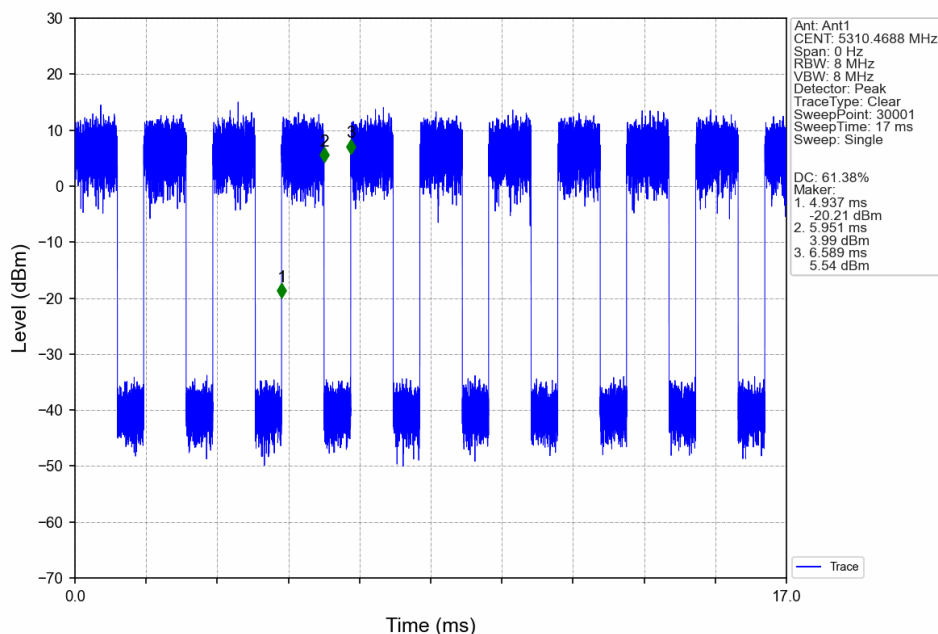
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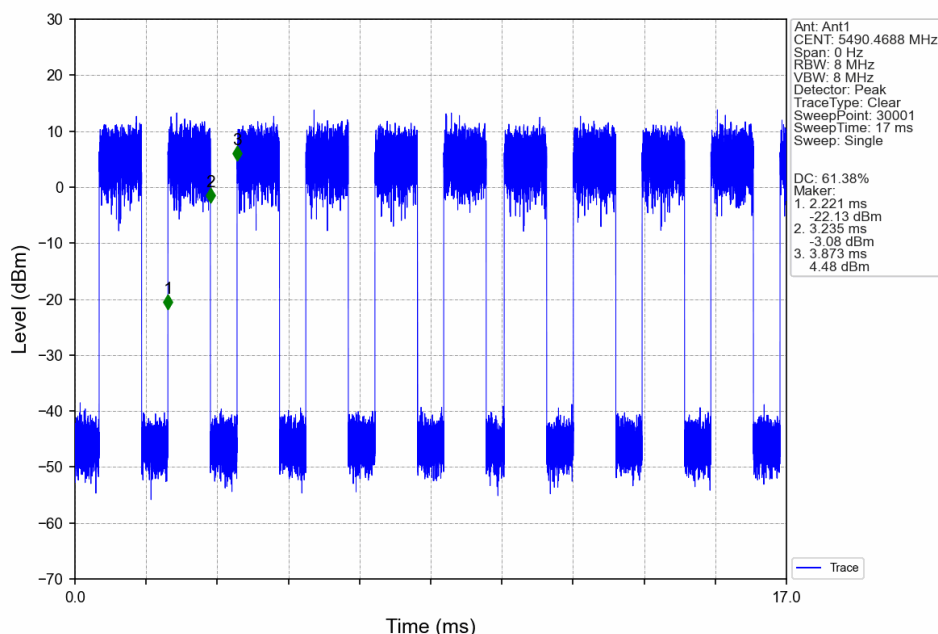
### 802.11ax(HEW20)\_MCH\_5300MHz\_SU\_ / \_Ant1\_NTNV



802.11ax(HEW20)\_HCH\_5320MHz\_SU\_ / \_Ant1\_NTNV

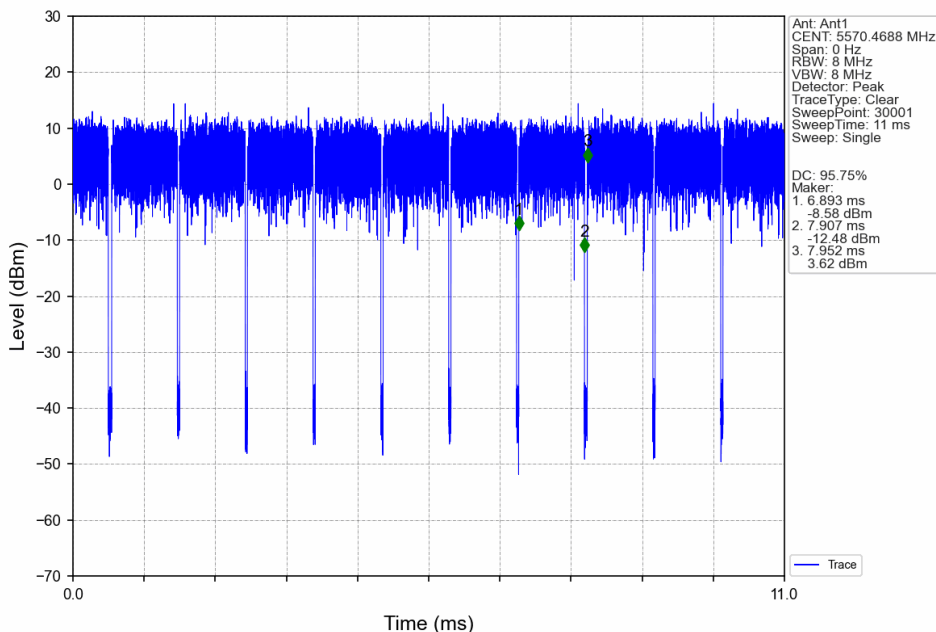


802.11ax(HEW20)\_LCH\_5500MHz\_SU\_ / \_Ant1\_NTNV

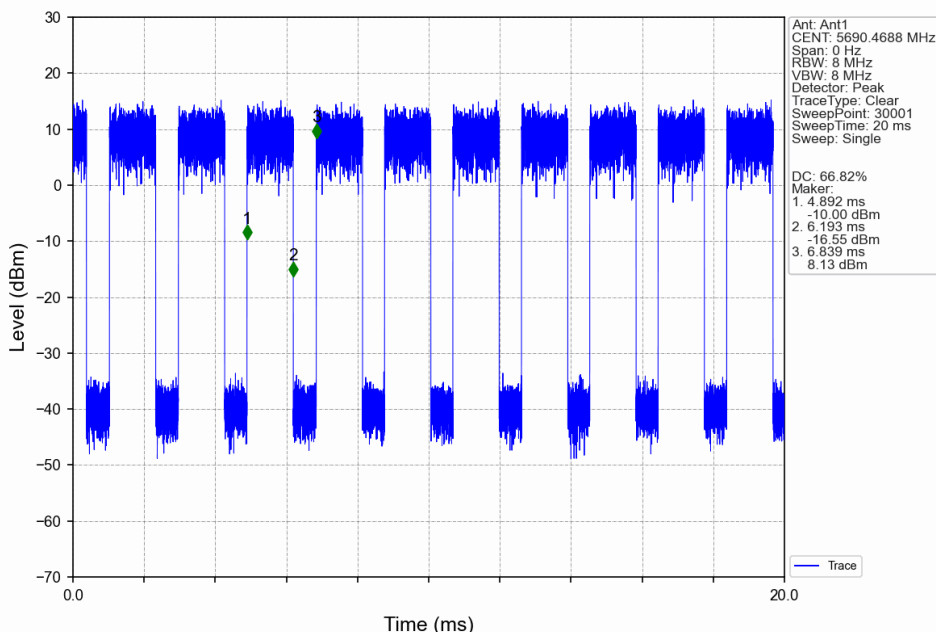




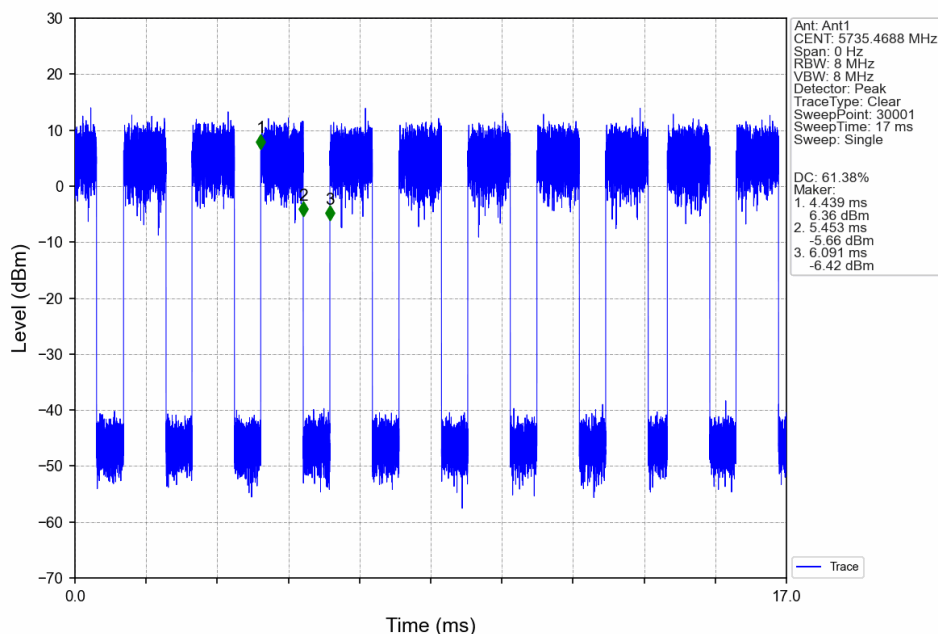
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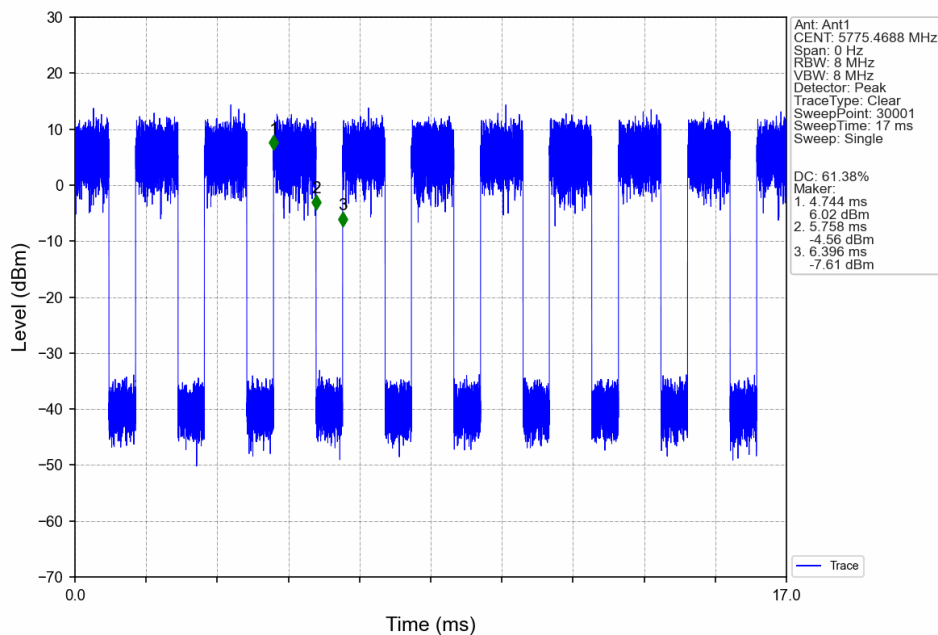
### 802.11ax(HEW20)\_HCH\_5700MHz\_SU\_/\_Ant1\_NTNV



### 802.11ax(HEW20)\_LCH\_5745MHz\_SU\_ / \_Ant1\_NTNV



### 802.11ax(HEW20)\_MCH\_5785MHz\_SU\_ / \_Ant1\_NTNV



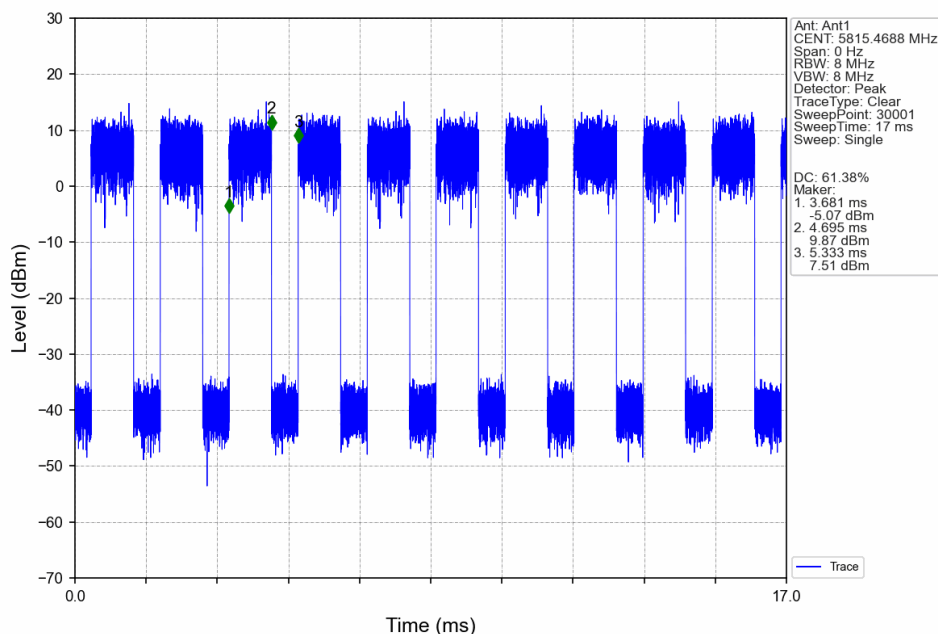
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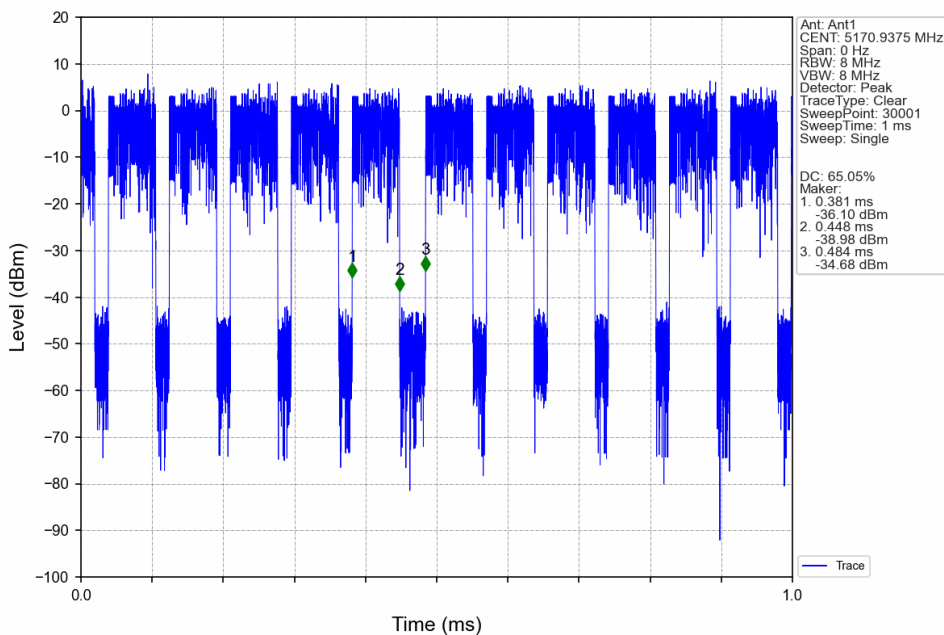
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### 802.11ax(HEW20)\_HCH\_5825MHz\_SU\_ / \_Ant1\_NTNV



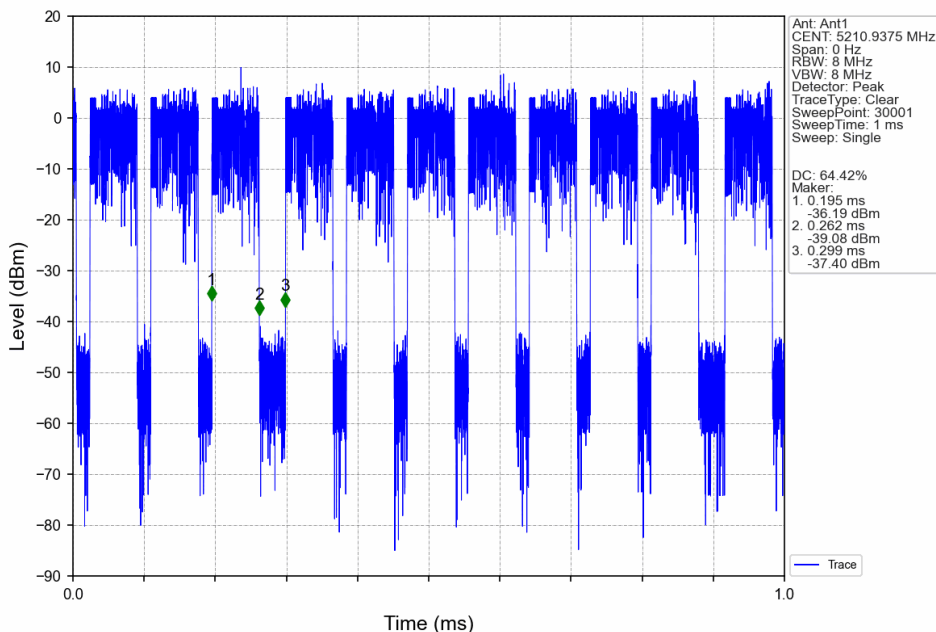
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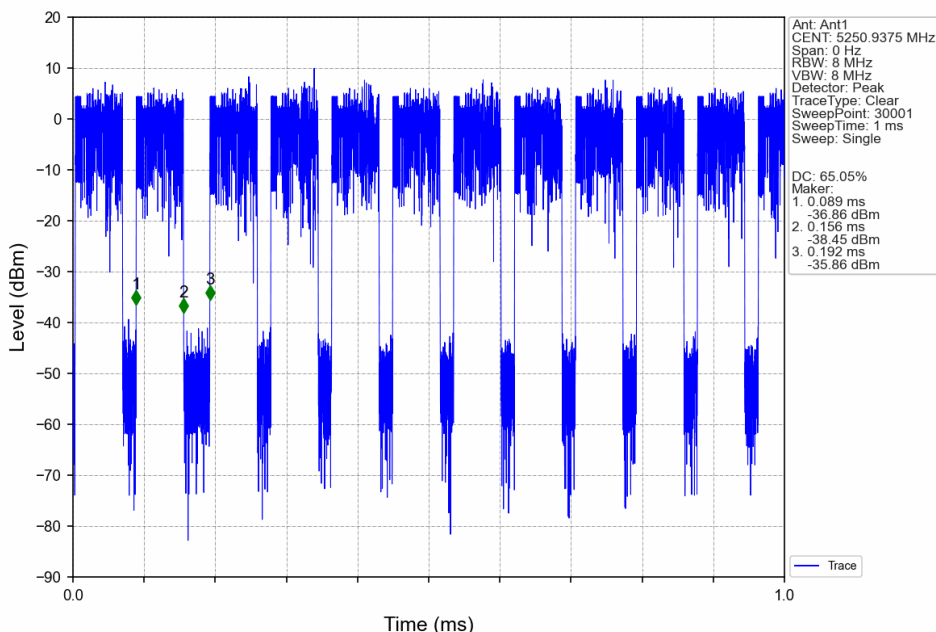
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### 802.11ax(HEW40)\_HCH\_5230MHz\_SU\_ / \_Ant1\_NTNV



### 802.11ax(HEW40)\_LCH\_5270MHz\_SU\_ / \_Ant1\_NTNV

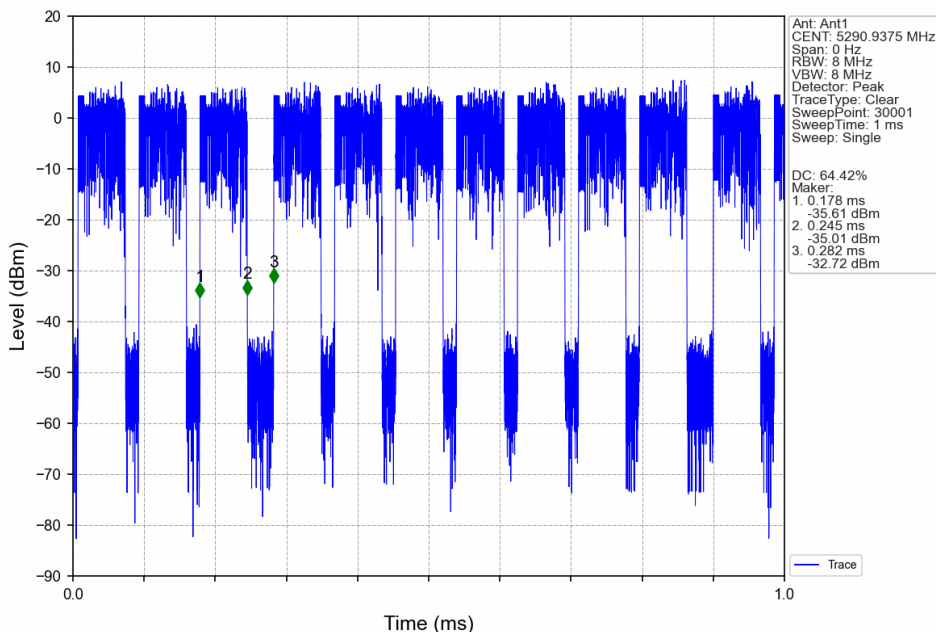


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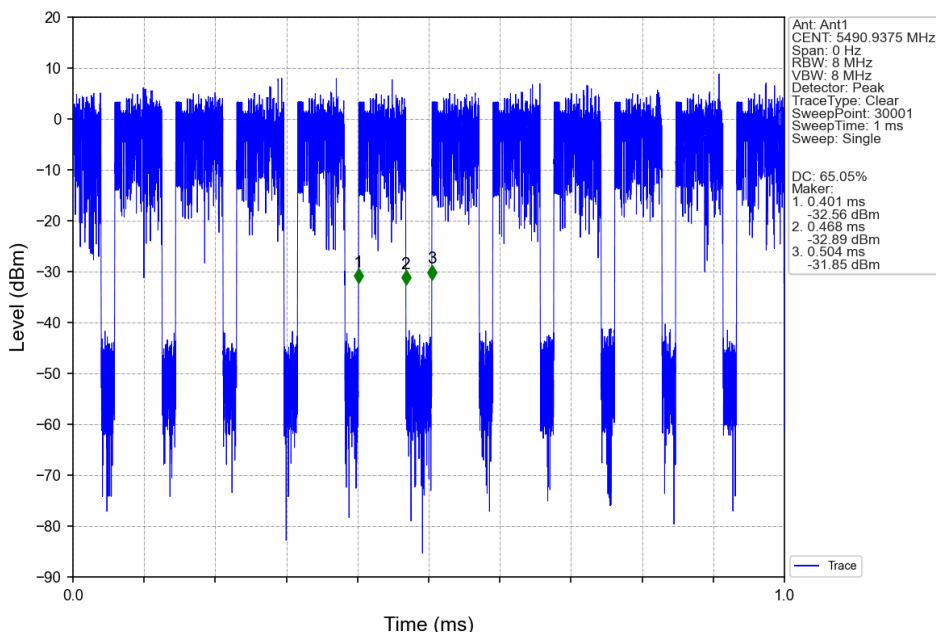
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### 802.11ax(HEW40)\_HCH\_5310MHz\_SU\_ / \_Ant1\_NTNV



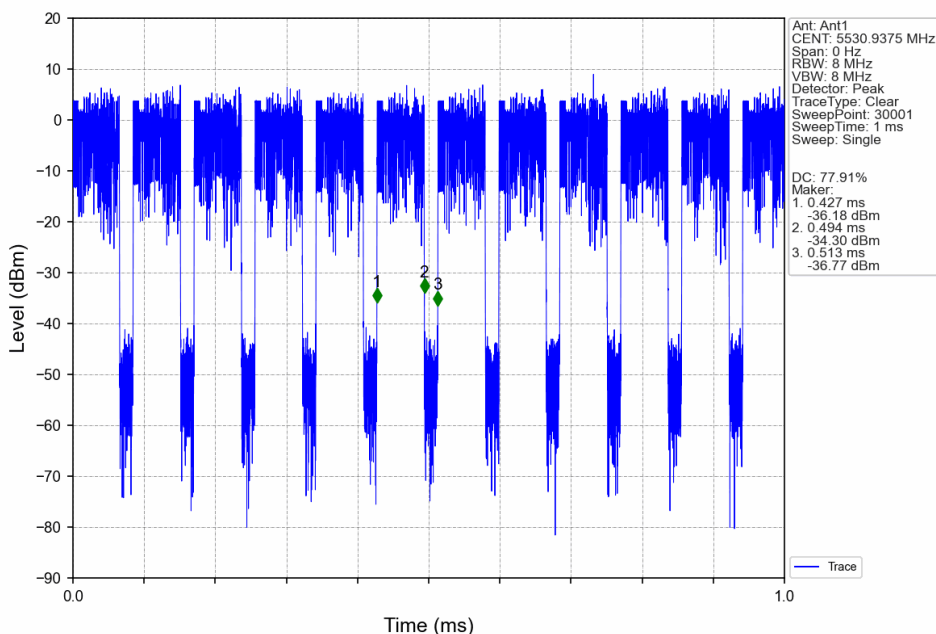
### 802.11ax(HEW40)\_LCH\_5510MHz\_SU\_ / \_Ant1\_NTNV



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### 802.11ax(HEW40)\_MCH\_5550MHz\_SU\_/\_Ant1\_NTNV



### 802.11ax(HEW40)\_HCH\_5670MHz\_SU\_/\_Ant1\_NTNV

