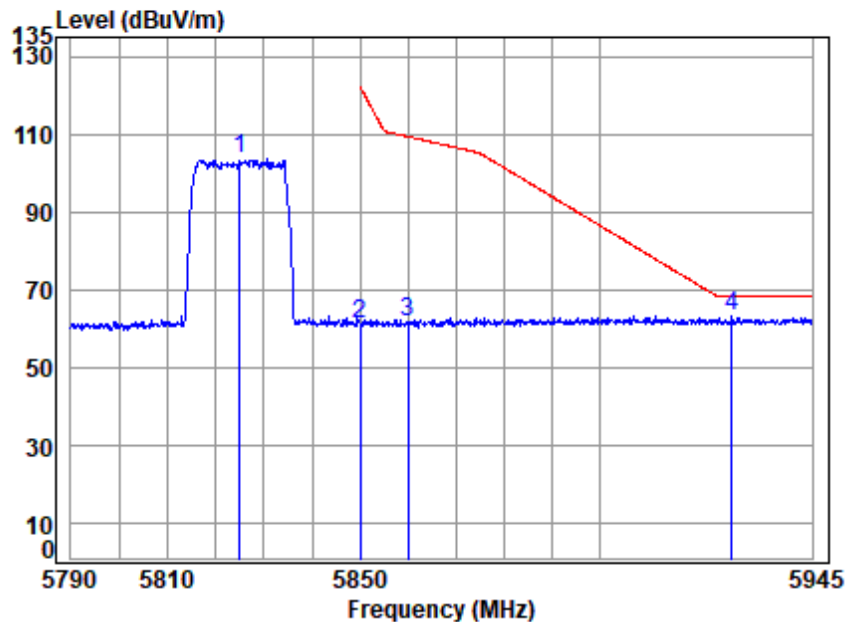


Test Mode: 04; Polarity: Horizontal; Modulation:802.11be(Full RU0); Bandwidth:20MHz; Channel:High

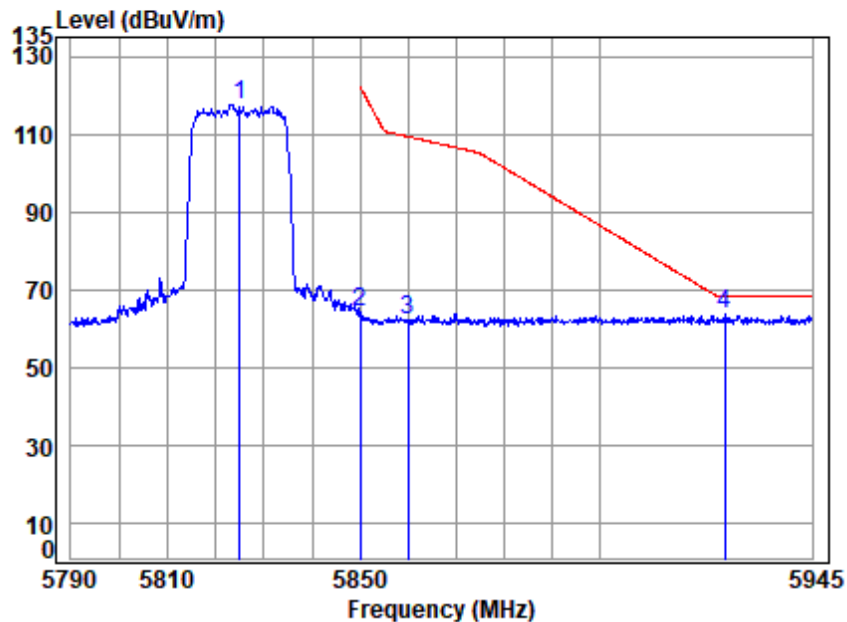


Site : chamber
Condition: 3m HORIZONTAL
Job No : 04877AT\00791AT
Mode : 5825 Band edge
: 5G WIFI 11BE20

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	5825.000	19.52	34.35	31.62	81.42	103.67	-----	----- peak
2	5850.000	19.54	34.40	31.63	38.77	61.08	122.20	-61.12 peak
3	5860.000	19.54	34.44	31.64	39.43	61.77	109.40	-47.63 peak
4 p	5928.062	19.59	34.66	31.67	40.77	63.35	68.20	-4.85 peak



Test Mode: 04; Polarity: Vertical; Modulation:802.11be(Full RU0); Bandwidth:20MHz; Channel:High

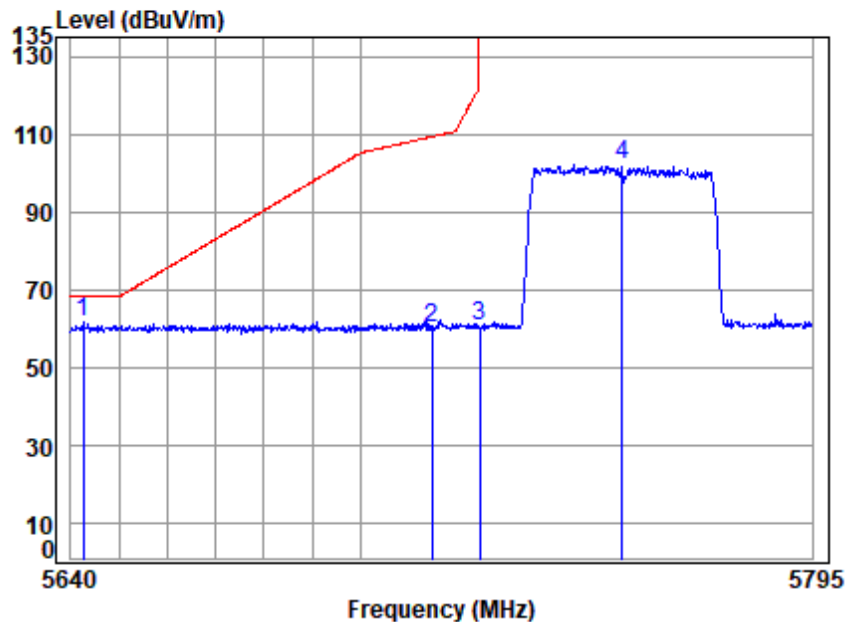


Site : chamber
Condition: 3m VERTICAL
Job No : 04877AT\00791AT
Mode : 5825 Band edge
: 5G WIFI 11BE20

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 5825.000	19.52	34.35	31.62	95.46	117.71	-----	-----	peak
2 5850.000	19.54	34.40	31.63	41.86	64.17	122.20	-58.03	peak
3 5860.000	19.54	34.44	31.64	39.93	62.27	109.40	-47.13	peak
4 p 5926.496	19.58	34.65	31.67	40.94	63.50	68.20	-4.70	peak



Test Mode: 04; Polarity: Horizontal; Modulation:802.11be(Full RU0); Bandwidth:40MHz; Channel:Low

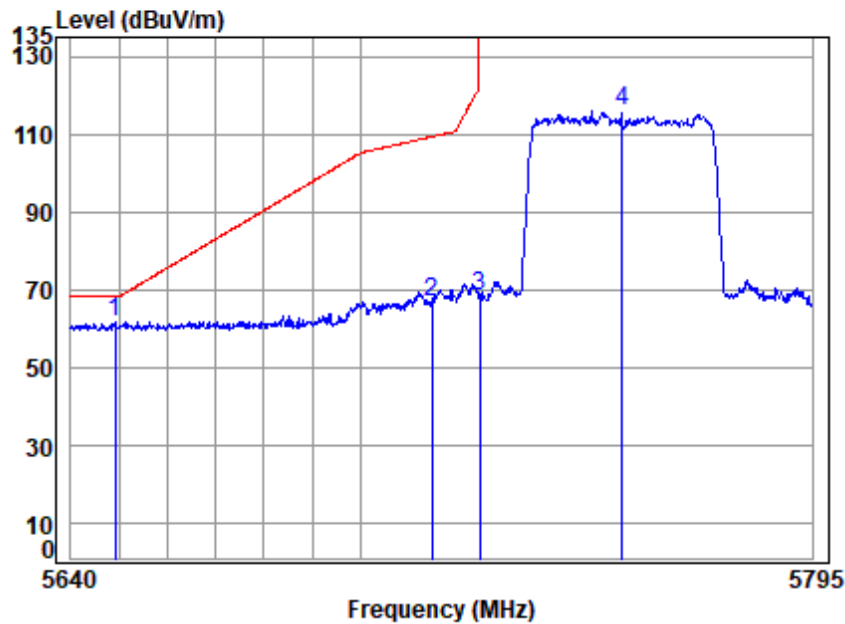


Site : chamber
Condition: 3m HORIZONTAL
Job No : 04877AT\00791AT
Mode : 5755 Band edge
: 5G WIFI 11BE40

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 p 5642.600	19.40	34.44	31.53	39.10	61.41	68.20	-6.79	peak
2 5715.000	19.45	34.27	31.57	37.79	59.94	109.40	-49.46	peak
3 5725.000	19.46	34.25	31.57	38.59	60.73	122.20	-61.47	peak
4 5755.000	19.48	34.21	31.59	80.10	102.20	-----	-----	peak



Test Mode: 04; Polarity: Vertical; Modulation:802.11be(Full RU0); Bandwidth:40MHz; Channel:Low

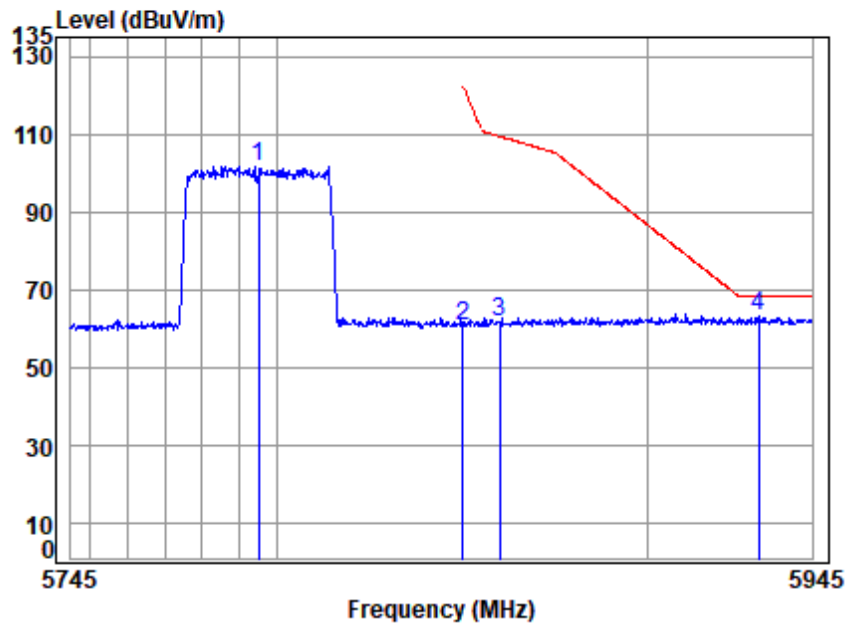


Site : chamber
Condition: 3m VERTICAL
Job No : 04877AT\00791AT
Mode : 5755 Band edge
: 5G WIFI 11BE40

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 p 5649.182	19.41	34.40	31.53	39.12	61.40	68.20	-6.80	peak
2 5715.000	19.45	34.27	31.57	44.41	66.56	109.40	-42.84	peak
3 5725.000	19.46	34.25	31.57	46.00	68.14	122.20	-54.06	peak
4 5755.000	19.48	34.21	31.59	93.75	115.85	-----	-----	peak



Test Mode: 04; Polarity: Horizontal; Modulation:802.11be(Full RU0); Bandwidth:40MHz; Channel:High

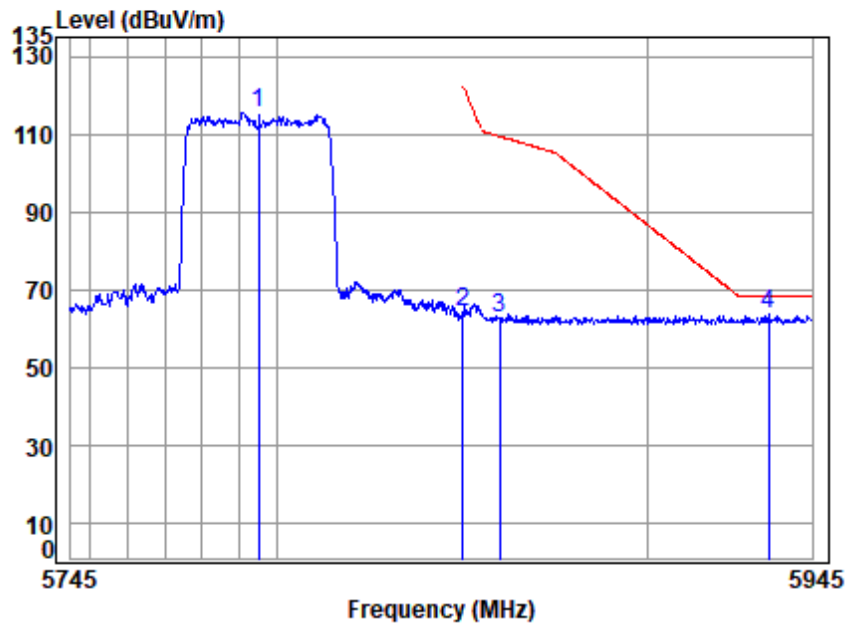


Site : chamber
Condition: 3m HORIZONTAL
Job No : 04877AT\00791AT
Mode : 5795 Band edge
: 5G WIFI 11BE40

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5795.000	19.50	34.29	31.60	79.42	101.61	-----	peak
2	5850.000	19.54	34.40	31.63	38.41	60.72	122.20	-61.48 peak
3	5860.000	19.54	34.44	31.64	39.48	61.82	109.40	-47.58 peak
4 p	5930.370	19.59	34.66	31.67	40.58	63.16	68.20	-5.04 peak



Test Mode: 04; Polarity: Vertical; Modulation:802.11be(Full RU0); Bandwidth:40MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 04877AT\00791AT
Mode : 5795 Band edge
: 5G WIFI 11BE40

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5795.000	19.50	34.29	31.60	93.38	115.57	-----	peak
2	5850.000	19.54	34.40	31.63	41.89	64.20	122.20	-58.00 peak
3	5860.000	19.54	34.44	31.64	40.38	62.72	109.40	-46.68 peak
4 p	5933.009	19.59	34.67	31.67	41.08	63.67	68.20	-4.53 peak



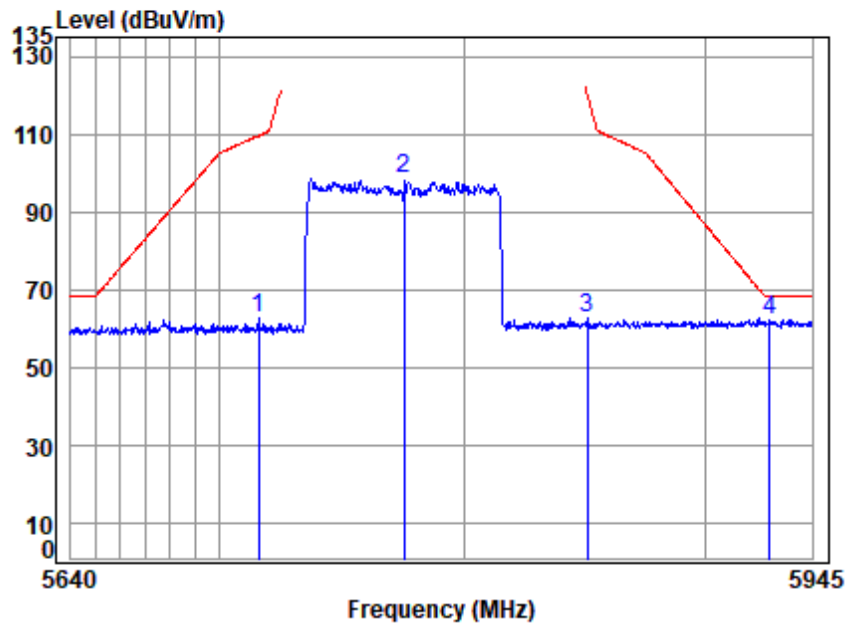
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Test Mode: 04; Polarity: Horizontal; Modulation: 802.11be(Full RU0); Bandwidth: 80MHz; Channel: middle



Site : chamber
Condition: 3m HORIZONTAL
Job No : 04877AT\00791AT
Mode : 5775 Band edge
: 5G WIFI 11BE80

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5715.654	19.45	34.27	31.57	40.27	62.42	109.58	-47.16 peak
2	5775.000	19.49	34.25	31.60	76.50	98.64	-----	----- peak
3	5850.883	19.54	34.40	31.63	40.41	62.72	120.19	-57.47 peak
4 p	5927.180	19.59	34.65	31.67	39.64	62.21	68.20	-5.99 peak



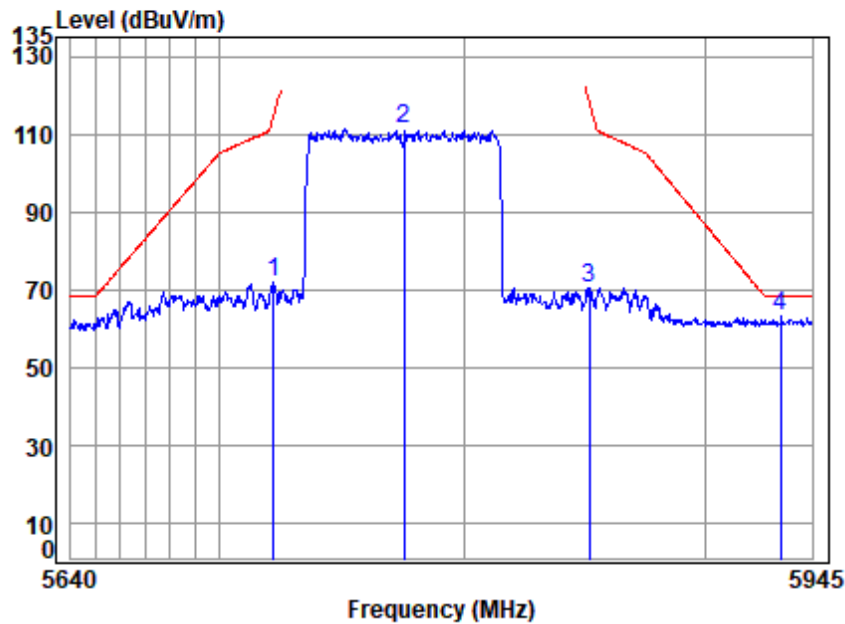
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Test Mode: 04; Polarity: Vertical; Modulation:802.11be(Full RU0); Bandwidth:80MHz; Channel:middle



Site : chamber
Condition: 3m VERTICAL
Job No : 04877AT\00791AT
Mode : 5775 Band edge
: 5G WIFI 11BE80

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5721.979	19.46	34.26	31.57	49.67	71.82	115.31	-43.49 peak
2	5775.000	19.49	34.25	31.60	89.22	111.36	-----	----- peak
3	5851.808	19.54	34.41	31.63	48.21	70.53	118.08	-47.55 peak
4 p	5931.864	19.59	34.66	31.67	40.49	63.07	68.20	-5.13 peak



7.6 Channel Move 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.

7.6.1 E.U.T. Operation

Operating Environment:

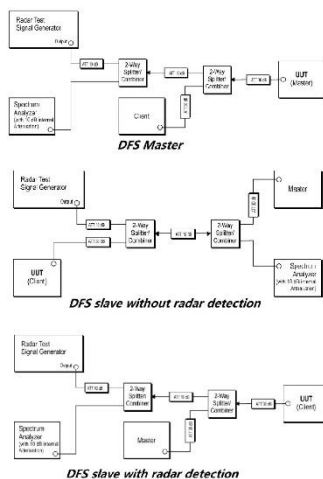
Temperature: 23.1 °C Humidity: 37.9 % RH Atmospheric Pressure: 1020 mbar



7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	Normal operating_Keep the EUT communication with the companion device.

7.6.3 Test Setup Diagram



7.6.4 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.

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7.7 Duty Cycle

Test Requirement ANSI C63.10 (2013) Section 12.2

Test Method: ANSI C63.10 (2013) Section 12.2

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 21.9 °C Humidity: 30.2 % RH Atmospheric Pressure: 1020 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2A) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.



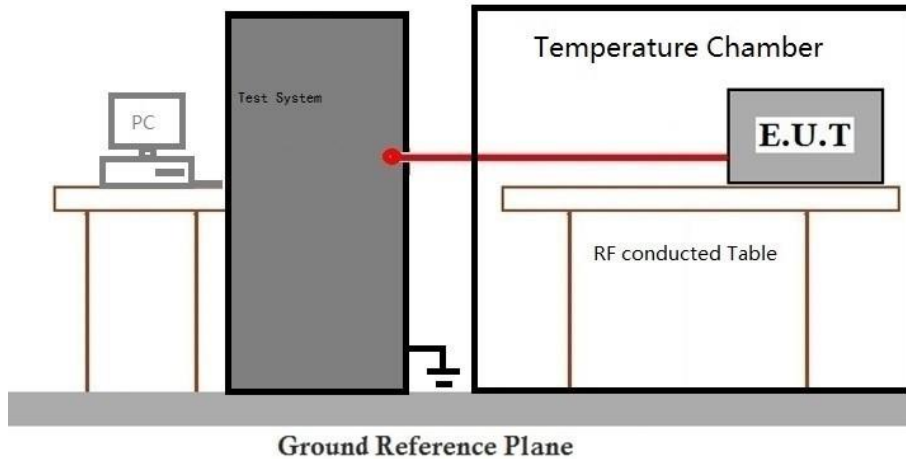
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7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.8 99% Bandwidth

Test Requirement ANSI C63.10 (2013) Section 12.4.2

Test Method: ANSI C63.10 (2013) Section 12.4.2

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 21.9 °C Humidity: 30.2 % RH Atmospheric Pressure: 1020 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2A) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.



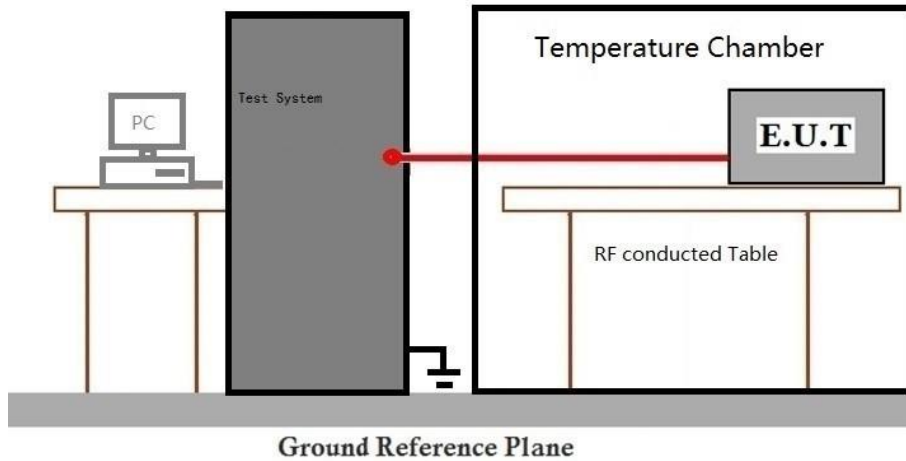
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7.8.3 Test Setup Diagram



7.8.4 Measurement Procedure and Data

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7.9 26dB Emission bandwidth

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)

Test Method: ANSI C63.10 (2013) Section 12.4.1

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 21.9 °C Humidity: 30.2 % RH Atmospheric Pressure: 1020 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2A) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.



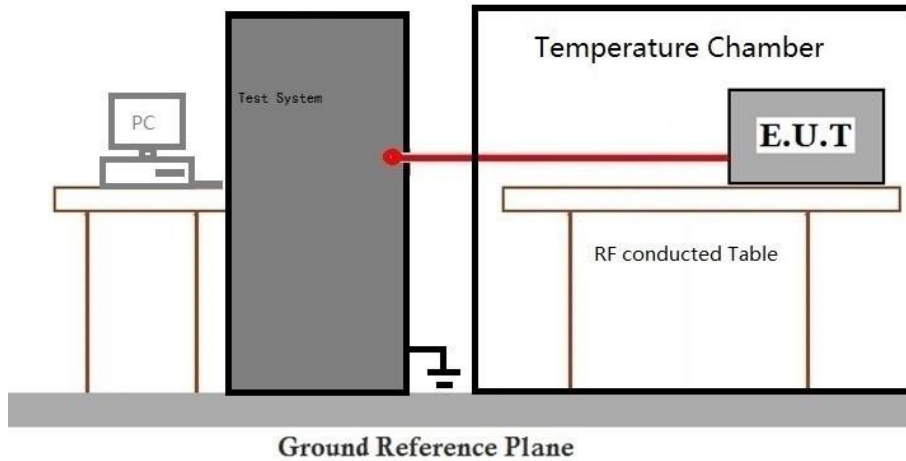
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7.9.3 Test Setup Diagram



7.9.4 Measurement Procedure and Data

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7.10 Minimum 6 dB bandwidth (5.725-5.85 GHz band)

Test Requirement 47 CFR Part 15, Subpart E 15.407 (e)

Test Method: ANSI C63.10 (2013) Section 6.9.2

Limit:

Frequency band(MHz)	Limit
5725-5850	≥500 kHz

7.10.1 E.U.T. Operation

Operating Environment:

Temperature: 21.9 °C

Humidity: 30.2 % RH

Atmospheric Pressure: 1020 mbar

7.10.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode (U-NII-3) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.



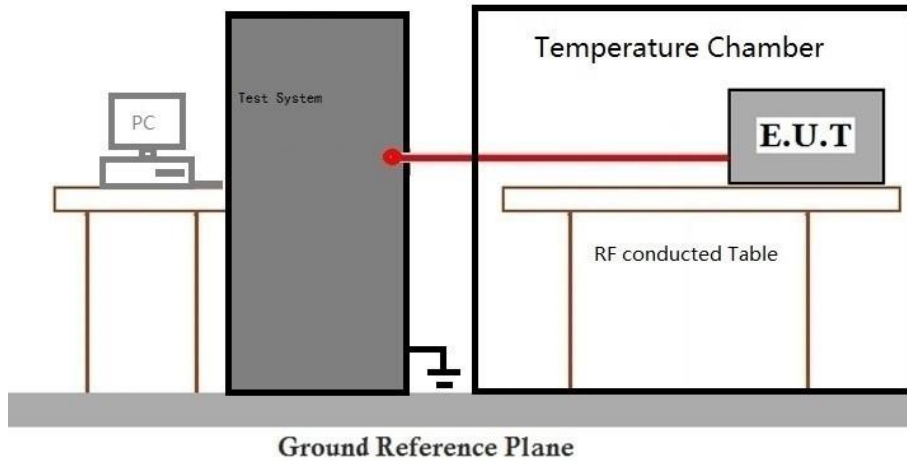
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Shenzhen Branch Inspection & Testing Laboratory

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7.10.3 Test Setup Diagram



7.10.4 Measurement Procedure and Data

Please Refer to Appendix for Details



7.11 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)

Test Method: ANSI C63.10 (2013) Section 12.5

Limit:

Frequency band(MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

7.11.1 E.U.T. Operation

Operating Environment:

Temperature: 21.9 °C

Humidity: 30.2 % RH

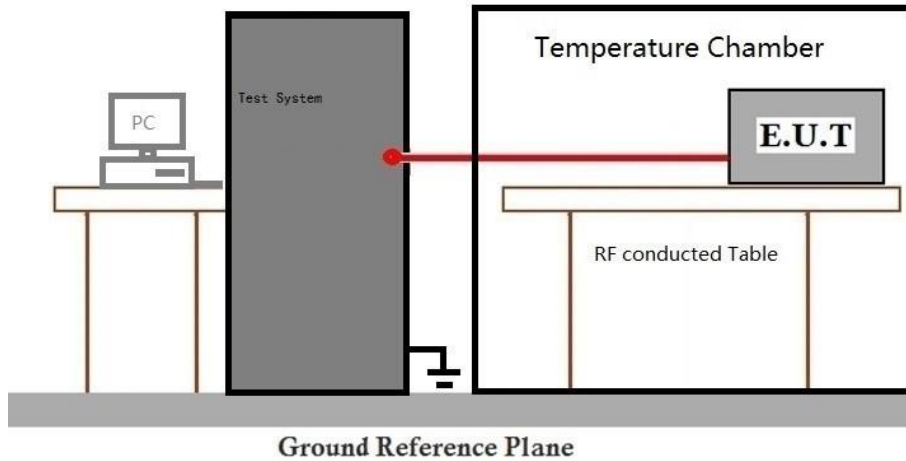
Atmospheric Pressure: 1020 mbar

7.11.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2A) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.



7.11.3 Test Setup Diagram



7.11.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.12 Frequency Stability

Test Requirement 47 CFR Part 15, Subpart E 15.407 (g)

Test Method: ANSI C63.10 (2013) Section 6.8

7.12.1 E.U.T. Operation

Operating Environment:

Temperature: 21.9 °C Humidity: 30.2 % RH Atmospheric Pressure: 1020 mbar

7.12.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2A) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.



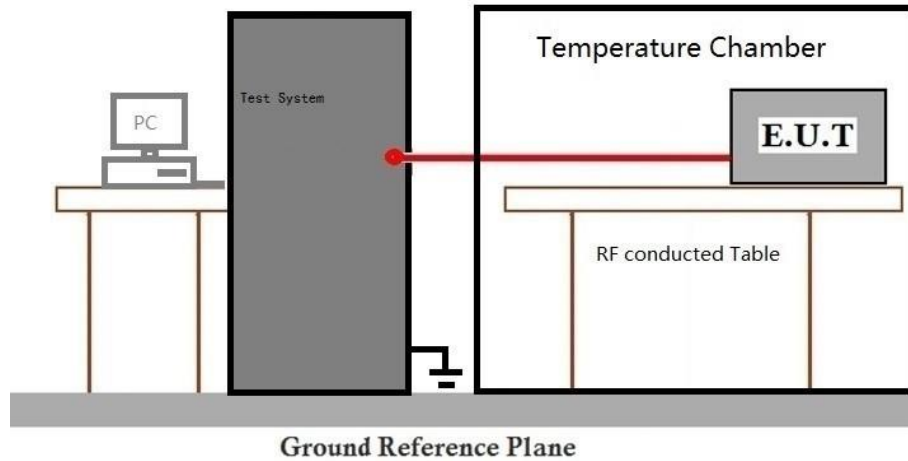
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7.12.3 Test Setup Diagram



7.12.4 Measurement Procedure and Data

Please Refer to Appendix for Details



7.13 Non-occupancy period

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.

7.13.1 E.U.T. Operation

Operating Environment:

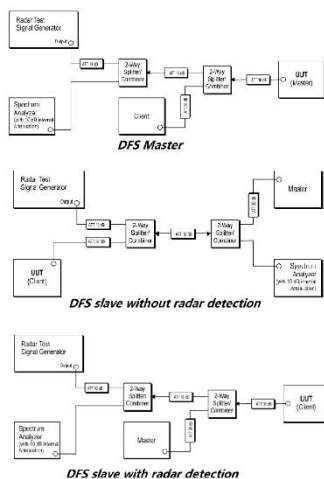
Temperature: 23.1 °C Humidity: 37.9 % RH Atmospheric Pressure: 1020 mbar



7.13.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	Normal operating_Keep the EUT communication with the companion device.

7.13.3 Test Setup Diagram



7.13.4 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

7.14 Channel Availability Check Time

Test Requirement KDB 905462 D02 Section 5.1
Test Method: KDB 905462 D02 Section 7.8.2

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:

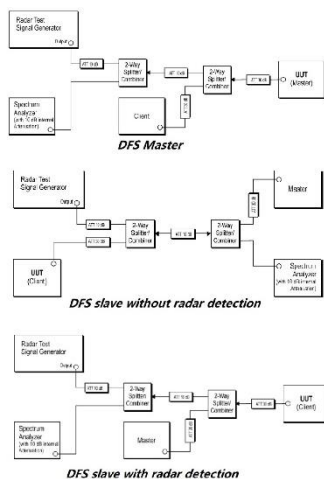
Temperature: 23.1 °C Humidity: 37.9 % RH Atmospheric Pressure: 1020 mbar



7.14.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	Normal operating_Keep the EUT communication with the companion device.

7.14.3 Test Setup Diagram



7.14.4 Measurement Procedure and Data

1) Initial Channel Availability Check Time

The Initial Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms and only needs to be performed one time.

- a) The U-NII devices will be powered on and be instructed to operate on the appropriate U-NII Channel that must incorporate DFS functions. At the same time the UUT is powered on, the spectrum analyzer will be set to zero span mode with a 3 MHz RBW and 3 MHz VBW on the Channel occupied by the radar (Chr) with a 2.5 minute sweep time. The spectrum analyzer's sweep will be started at the same time power is applied to the U-NII device.
- b) The UUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle.
- c) Confirm that the UUT initiates transmission on the channel

This measurement can be used to determine the length of the power-on cycle if it is not supplied by the manufacturer. If the spectrum analyzer sweep is started at the same time the UUT is powered on and the UUT does not begin transmissions until it has completed the cycle, the power-on time can be determined by comparing the two times.

2) Radar Burst at the Beginning of the Channel Availability Check Time

The steps below define the procedure to verify successful radar detection on the test Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time.

- a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections on configuration for Conducted Tests or Radiated Tests and the power of the UUT is switched off.
- b) The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence (T_{power-up}). The Channel Availability Check Time commences on Chr at instant T1 and will end no sooner than T1 + T_{ch_avail_check}.
- c) A single Burst of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at T1. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
- d) Visual indication or measured results on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of Chr for UUT emissions will continue for 2.5 minutes after the radar Burst has been generated.
- e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Chr. The Channel Availability Check results will be recorded.

e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Chr. The Channel Availability Check results will be recorded.



3) Radar Burst at the End of the Channel Availability Check Time

The steps below define the procedure to verify successful radar detection on the test Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1dB occurs at the end of the Channel Availability Check Time.

- a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.
- b) The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence (T_{power_up}). The Channel Availability Check Time commences on Chr at instant T1 and will end no sooner than T1 + Tch_{avail_check}.
- c) A single Burst of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at T1 + 54 seconds. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
- d) Visual indication or measured results on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of Chr for UUT emissions will continue for 2.5 minutes after the radar Burst has been generated.

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:

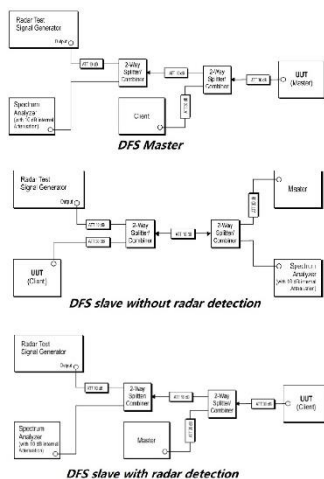
Temperature: 23.1 °C Humidity: 37.9 % RH Atmospheric Pressure: 1020 mbar



7.15.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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 U-NII Detection Bandwidth

Test Requirement KDB 905462 D02 Section 5.1
Test Method: KDB 905462 D02 Section 7.8.1

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.

7.16.1 E.U.T. Operation

Operating Environment:

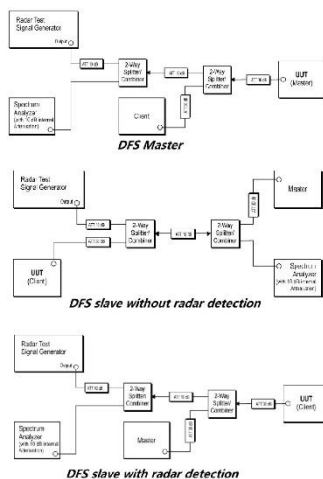
Temperature: 23.1 °C Humidity: 37.9 % RH Atmospheric Pressure: 1020 mbar



7.16.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	Normal operating_Keep the EUT communication with the companion device.

7.16.3 Test Setup Diagram



7.16.4 Measurement Procedure and Data

1. Set up the DFS timing monitoring equipment and Set up the overall system for either radiated or conducted coupling to the UUT.

Adjust the equipment to produce a single Burst of any one of the Short Pulse Radar Types 0 - 4 at the center frequency of the UUT Operating Channel at the specified DFS Detection Threshold level.

Set the UUT up as a standalone device (no associated Client or Master, as appropriate) and no traffic. Frame based systems will be set to a talk/listen ratio reflecting the worst case (maximum) that is user configurable during this test.

2. Generate a single radar Burst, and note the response of the UUT. Repeat for a minimum of 10 trials. The UUT must detect the Radar Waveform within the DFS band using the specified U-NII Detection Bandwidth criterion.

3. Starting at the center frequency of the UUT operating Channel, increase the radar frequency in 5 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion. Repeat this measurement in 1MHz steps at frequencies 5 MHz below where the detection rate begins to fall. Record the highest frequency (denote as FH) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies above FH is not required to demonstrate compliance.

4. Starting at the center frequency of the UUT operating Channel, decrease the radar frequency in 5 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion. Repeat this measurement in 1MHz steps at frequencies 5 MHz above where the detection rate begins to fall. Record the lowest frequency (denote as FL) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies below FL is not required to demonstrate compliance.

5. The U-NII Detection Bandwidth is calculated as follows:

$$\text{U-NII Detection Bandwidth} = \text{FH} - \text{FL}$$

The U-NII Detection Bandwidth must meet the U-NII Detection Bandwidth criterion. Otherwise, the UUT does not comply with DFS requirements. This is essential to ensure that the UUT is capable of detecting Radar Waveforms across the same frequency spectrum that contains the significant energy from the system. In the case that the U-NII Detection Bandwidth is greater than or equal to the 99 percent power bandwidth for the measured FH and FL, the test can be truncated and the U-NII Detection Bandwidth can be reported as the measured FH and FL.

Please Refer to Appendix for Details

7.17 Transmitter Power Control

Test Requirement 47 CFR Part 15, Subpart E 15.407 (h)(1)

Test Method: ANSI C63.10 (2013) Section 12.3

Limit:

Able to lower EIRP below 24dBm when Max_EIRP $\geq$ 500 mW (27 dBm).

7.17.1 E.U.T. Operation

Operating Environment:

Temperature: 21.9 °C

Humidity: 30.2 % RH

Atmospheric Pressure: 1020 mbar

7.17.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode (U-NII-2A) _Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n/ac/ax/be 20/40/80, Only the data of worst case is recorded in the report.

7.17.3 Test Setup Diagram

7.17.4 Measurement Procedure and Data

Please Refer to Appendix for Details



8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SZCR2412004877AT

9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2412004877AT



10 Appendix

ANT1_ANT2

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	/	/	1.392	1.454	95.74	0.19	0.63
		5200	/	/	1.392	1.453	95.80	0.19	0.63
		5240	/	/	1.392	1.454	95.74	0.19	0.63
		5260	/	/	1.393	1.455	95.74	0.19	0.63
		5300	/	/	1.392	1.453	95.80	0.19	0.63
		5320	/	/	1.393	1.454	95.80	0.19	0.62
		5745	/	/	1.392	1.453	95.80	0.19	0.60
		5785	/	/	1.392	1.453	95.80	0.19	0.63
		5825	/	/	1.392	1.453	95.80	0.19	0.60
802.11n (HT20)	MIMO	5180	/	/	1.308	1.369	95.54	0.20	0.66
		5200	/	/	1.308	1.370	95.47	0.20	0.69
		5240	/	/	1.309	1.370	95.55	0.20	0.66
		5260	/	/	1.309	1.370	95.55	0.20	0.66
		5300	/	/	1.308	1.369	95.54	0.20	0.66
		5320	/	/	1.309	1.370	95.55	0.20	0.69
		5745	/	/	1.308	1.369	95.54	0.20	0.66
		5785	/	/	1.309	1.370	95.55	0.20	0.66
		5825	/	/	1.309	1.370	95.55	0.20	0.66
802.11n (HT40)	MIMO	5190	/	/	0.637	0.698	91.26	0.40	1.24
		5230	/	/	0.637	0.698	91.26	0.40	1.21
		5270	/	/	0.636	0.697	91.25	0.40	1.20
		5310	/	/	0.636	0.697	91.25	0.40	1.24
		5755	/	/	0.636	0.697	91.25	0.40	1.21
		5795	/	/	0.636	0.698	91.12	0.40	1.21



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802.11ac (VHT20)	MIMO	5180	/	/	0.476	0.538	88.48	0.53	1.54
		5200	/	/	0.477	0.538	88.66	0.52	1.54
		5240	/	/	0.477	0.538	88.66	0.52	1.54
		5260	/	/	0.479	0.538	89.03	0.50	1.54
		5300	/	/	0.476	0.537	88.64	0.52	1.48
		5320	/	/	0.476	0.537	88.64	0.52	1.51
		5745	/	/	0.477	0.538	88.66	0.52	1.54
		5785	/	/	0.476	0.537	88.64	0.52	1.54
		5825	/	/	0.477	0.538	88.66	0.52	1.57
802.11ac (VHT40)	MIMO	5190	/	/	0.256	0.317	80.76	0.93	2.42
		5230	/	/	0.257	0.317	81.07	0.91	2.39
		5270	/	/	0.256	0.317	80.76	0.93	2.39
		5310	/	/	0.257	0.318	80.82	0.92	2.39
		5755	/	/	0.257	0.318	80.82	0.92	2.39
		5795	/	/	0.256	0.317	80.76	0.93	2.45
802.11ac (VHT80)	MIMO	5210	/	/	0.151	0.210	71.90	1.43	3.35
		5290	/	/	0.149	0.210	70.95	1.49	3.30
		5775	/	/	0.151	0.210	71.90	1.43	3.29
802.11ac (VHT160)	MIMO	5250	/	/	0.102	0.161	63.35	1.98	3.95
802.11ax (HEW20)	MIMO	5180	SU	/	0.428	0.487	87.89	0.56	1.69
		5200	SU	/	0.426	0.487	87.47	0.58	1.72
		5240	SU	/	0.425	0.477	89.10	0.50	0.03
		5260	SU	/	0.428	0.478	89.54	0.48	0.07
		5300	SU	/	0.425	0.477	89.10	0.50	0.10
		5320	SU	/	0.426	0.487	87.47	0.58	1.75
		5745	SU	/	0.425	0.487	87.27	0.59	1.69
		5785	SU	/	0.425	0.486	87.45	0.58	1.68
		5825	SU	/	0.427	0.487	87.68	0.57	1.73
802.11ax (HEW40)	MIMO	5190	SU	/	0.434	0.494	87.85	0.56	1.73
		5230	SU	/	0.436	0.495	88.08	0.55	1.70
		5270	SU	/	0.436	0.495	88.08	0.55	1.70
		5310	SU	/	0.434	0.495	87.68	0.57	1.69
		5755	SU	/	0.433	0.494	87.65	0.57	1.63
		5795	SU	/	0.433	0.494	87.65	0.57	1.66
802.11ax (HEW80)	MIMO	5210	SU	/	0.418	0.477	87.63	0.57	1.79
		5290	SU	/	0.418	0.468	89.32	0.49	0.10
		5775	SU	/	0.418	0.477	87.63	0.57	1.75
802.11ax (HEW160)	MIMO	5250	SU	/	0.418	0.477	87.63	0.57	1.69
802.11be	MIMO	5180	SU	/	0.436	0.486	89.71	0.47	0.10



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(EHT20)		5200	SU	/	0.435	0.485	89.69	0.47	0.07
		5240	SU	/	0.433	0.494	87.65	0.57	1.69
		5260	SU	/	0.435	0.494	88.06	0.55	1.67
		5300	SU	/	0.436	0.495	88.08	0.55	1.71
		5320	SU	/	0.433	0.485	89.28	0.49	0.07
		5745	SU	/	0.434	0.486	89.30	0.49	0.13
		5785	SU	/	0.436	0.495	88.08	0.55	1.72
		5825	SU	/	0.436	0.494	88.26	0.54	1.67
802.11be (EHT40)	MIMO	5190	SU	/	0.179	0.231	77.49	1.11	0.06
		5230	SU	/	0.179	0.232	77.16	1.13	0.08
		5270	SU	/	0.442	0.502	88.05	0.55	1.64
		5310	SU	/	0.444	0.503	88.27	0.54	1.70
		5755	SU	/	0.441	0.502	87.85	0.56	1.67
		5795	SU	/	0.441	0.502	87.85	0.56	1.60
802.11be (EHT80)	MIMO	5210	SU	/	0.424	0.485	87.42	0.58	1.68
		5290	SU	/	0.426	0.485	87.84	0.56	1.73
		5775	SU	/	0.424	0.476	89.08	0.50	0.10
802.11be (EHT160)	MIMO	5250	SU	/	0.426	0.485	87.84	0.56	1.76



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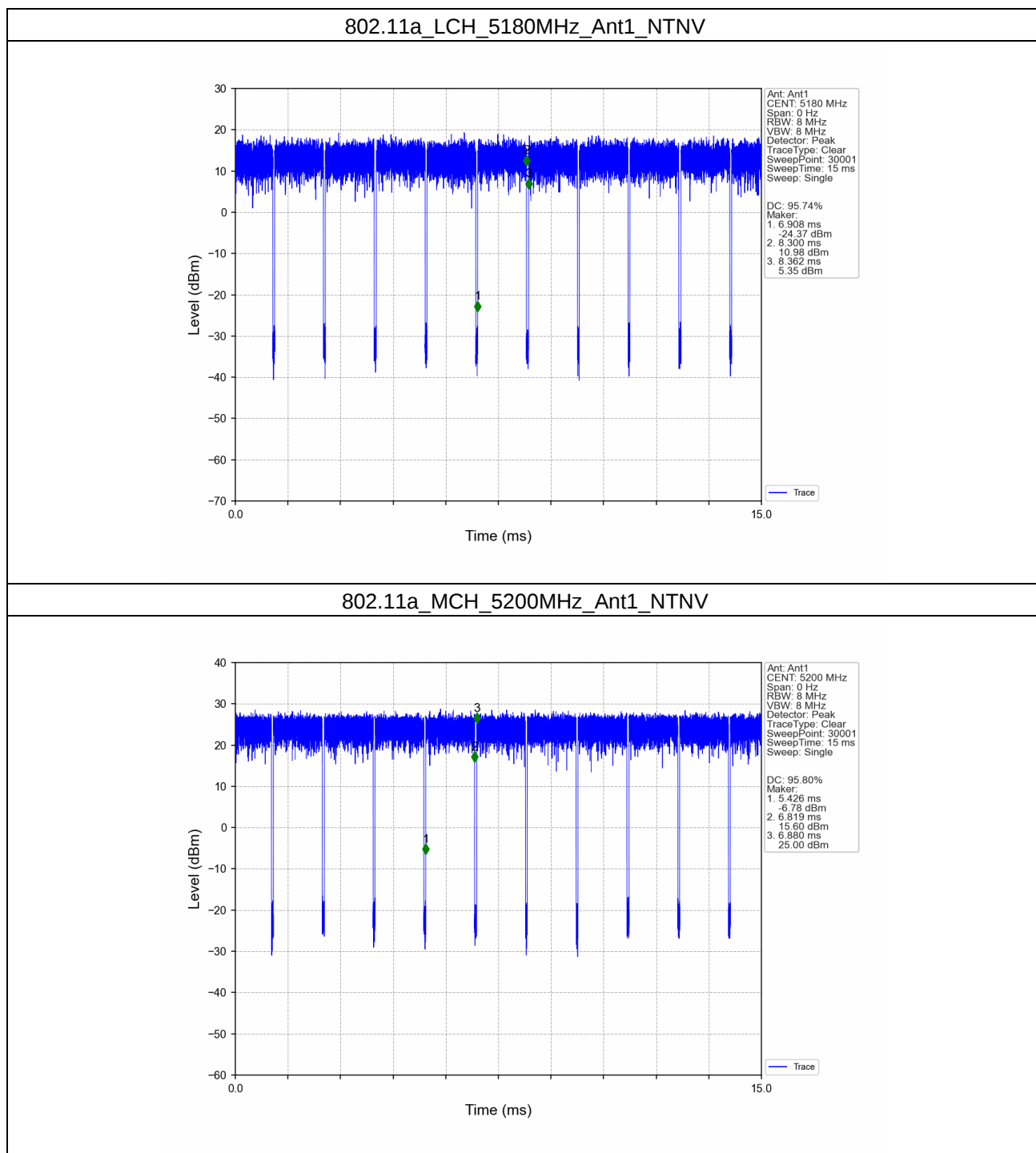
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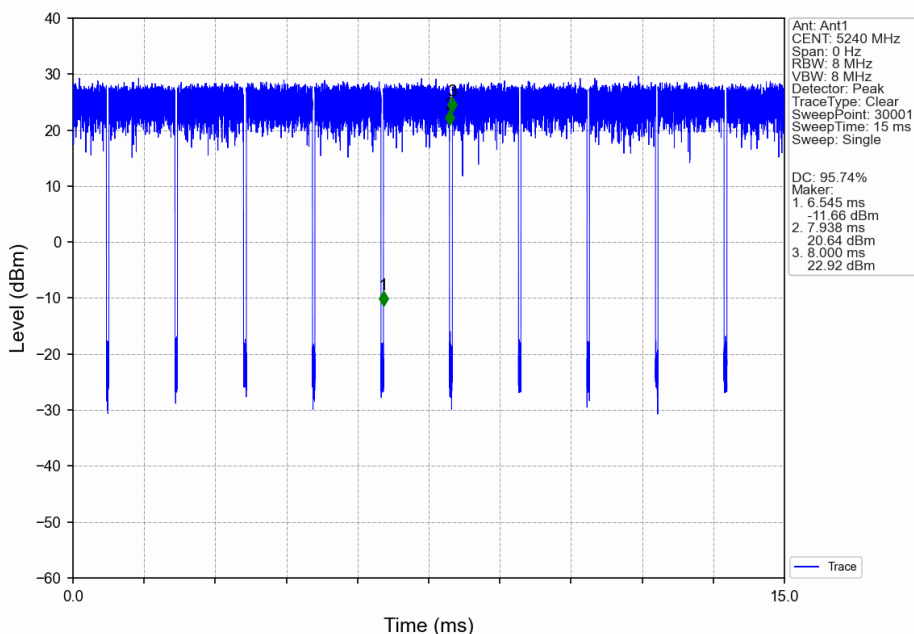
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1.2 Test Graph

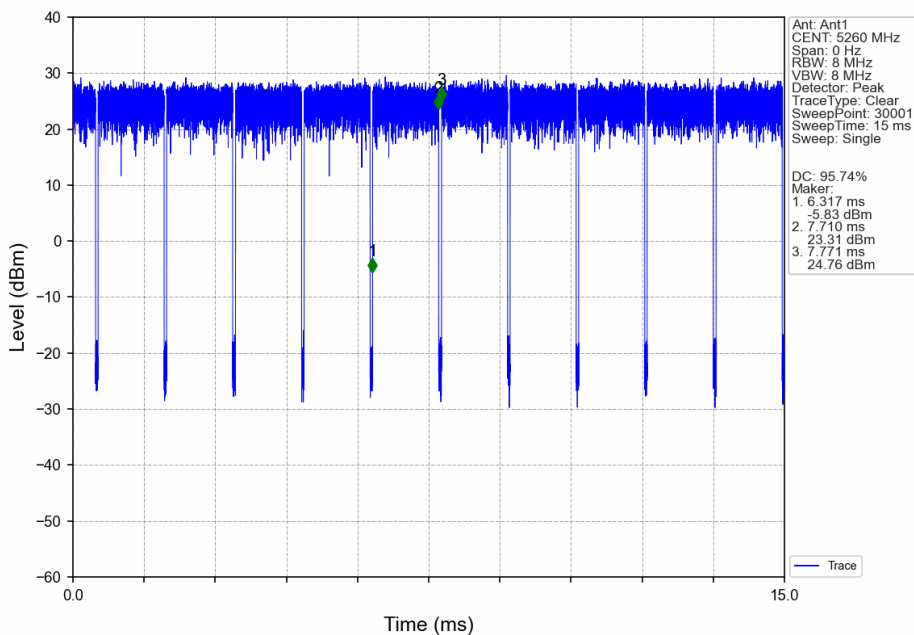
1.2.1 Ant1



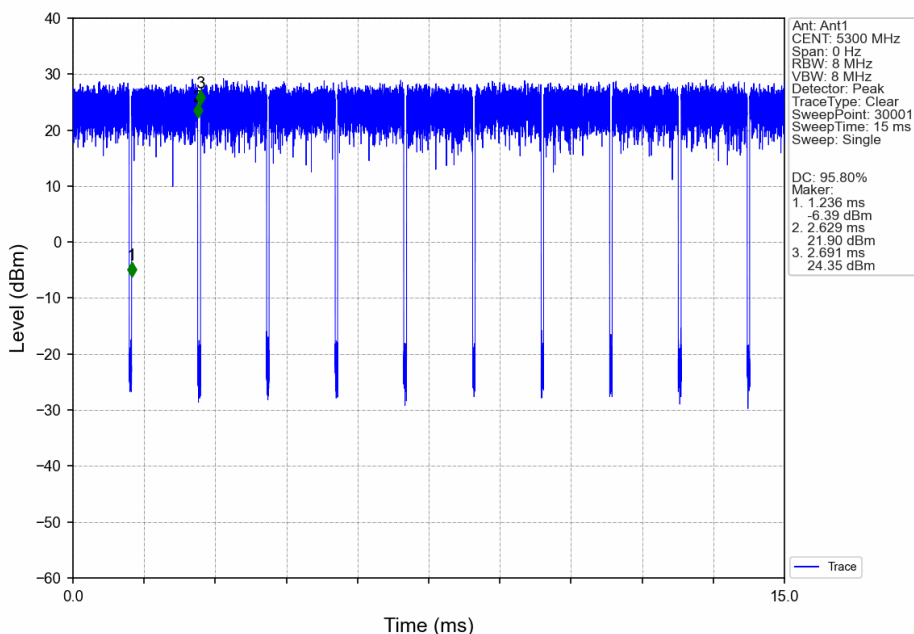
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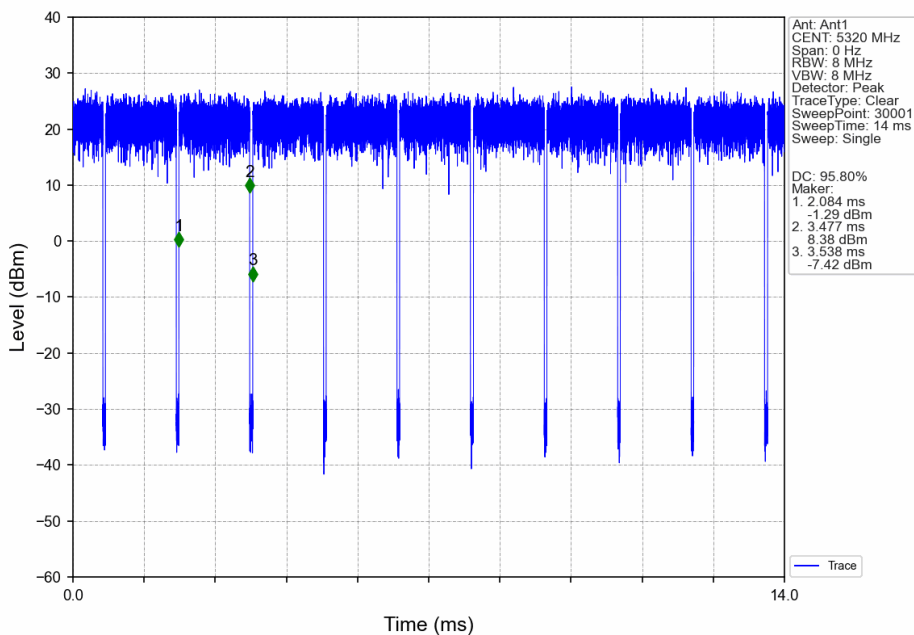
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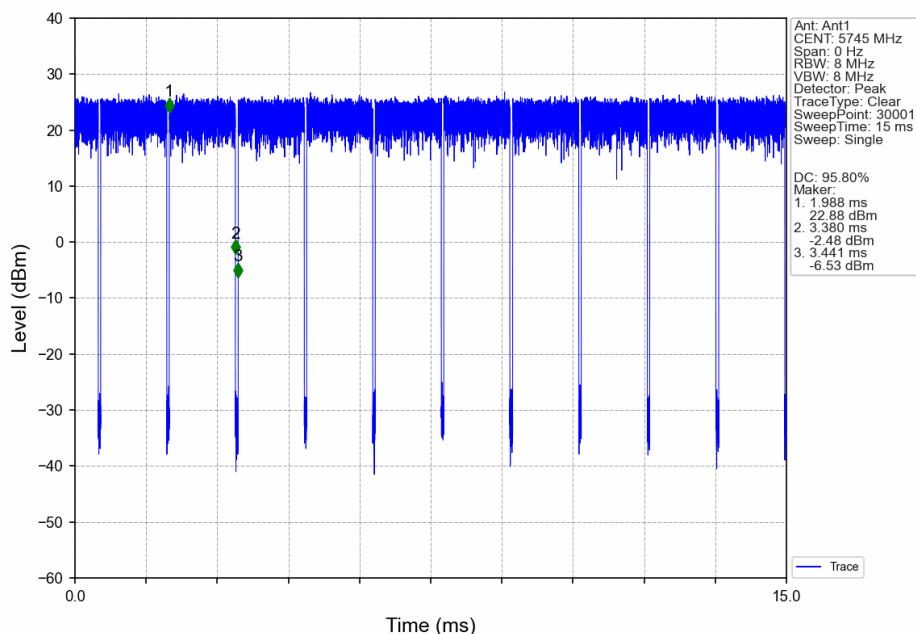
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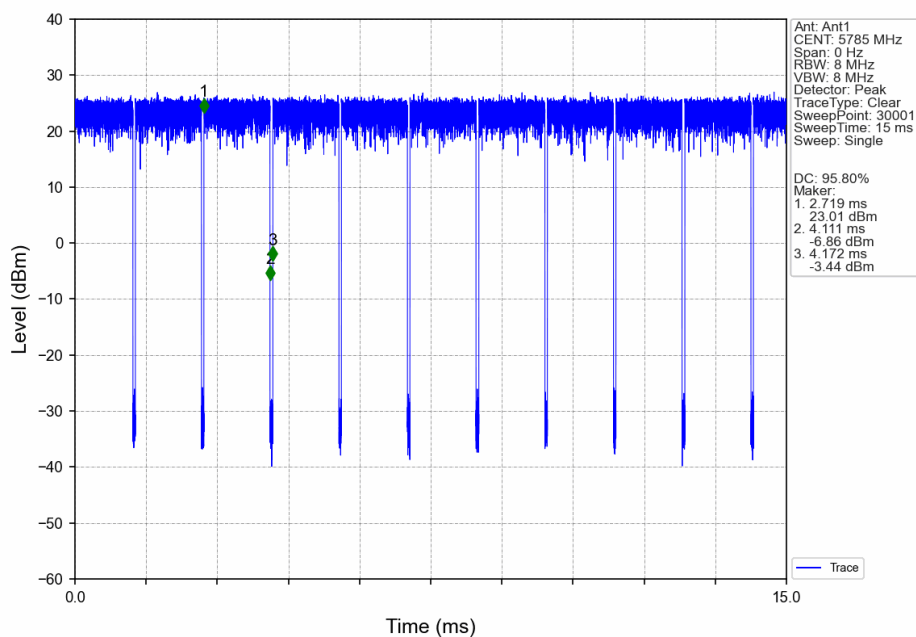
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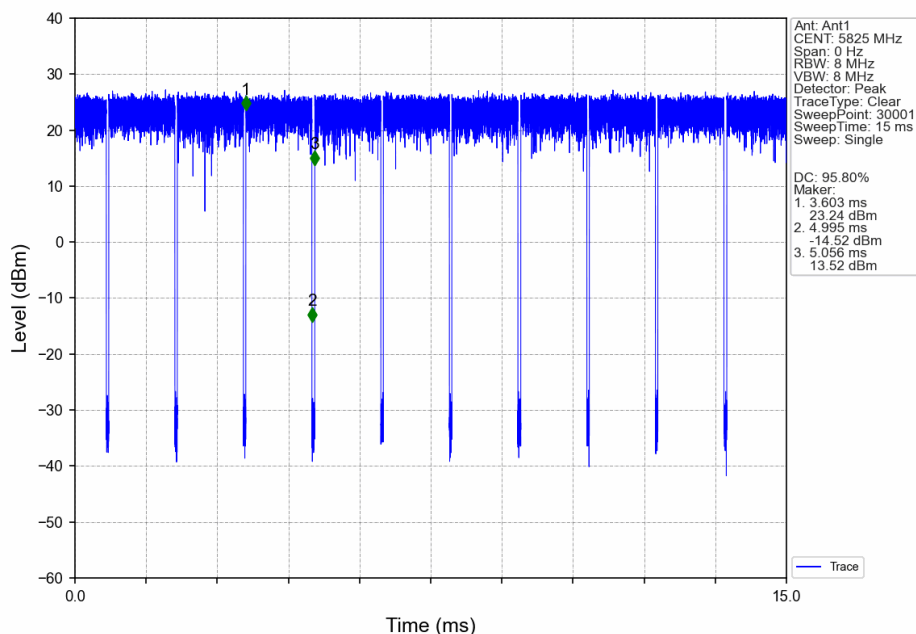
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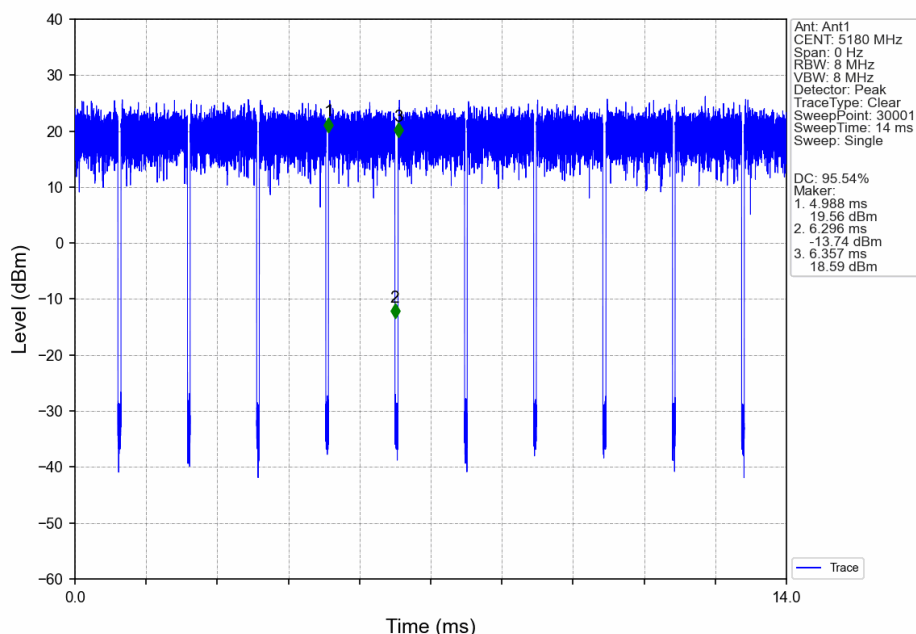
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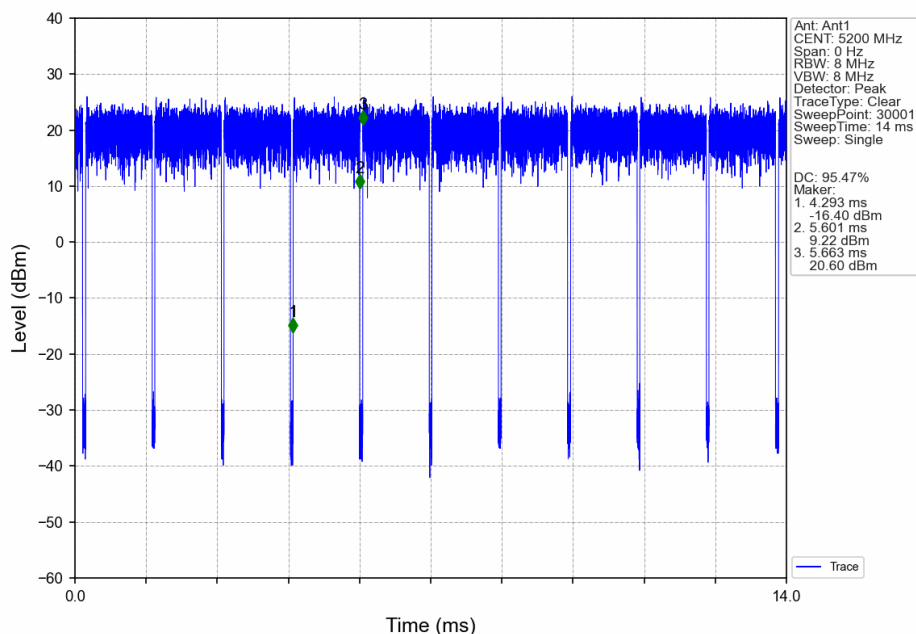
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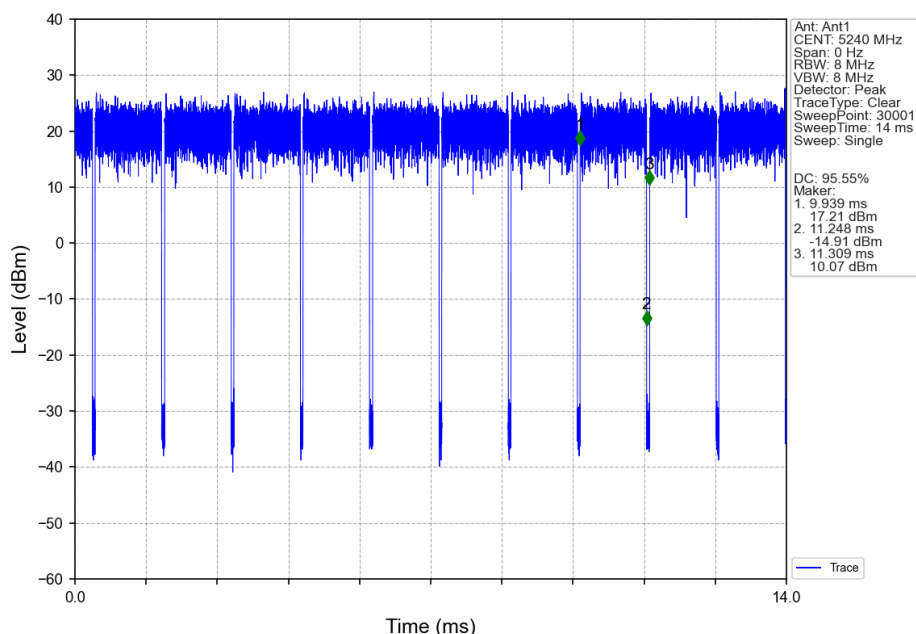
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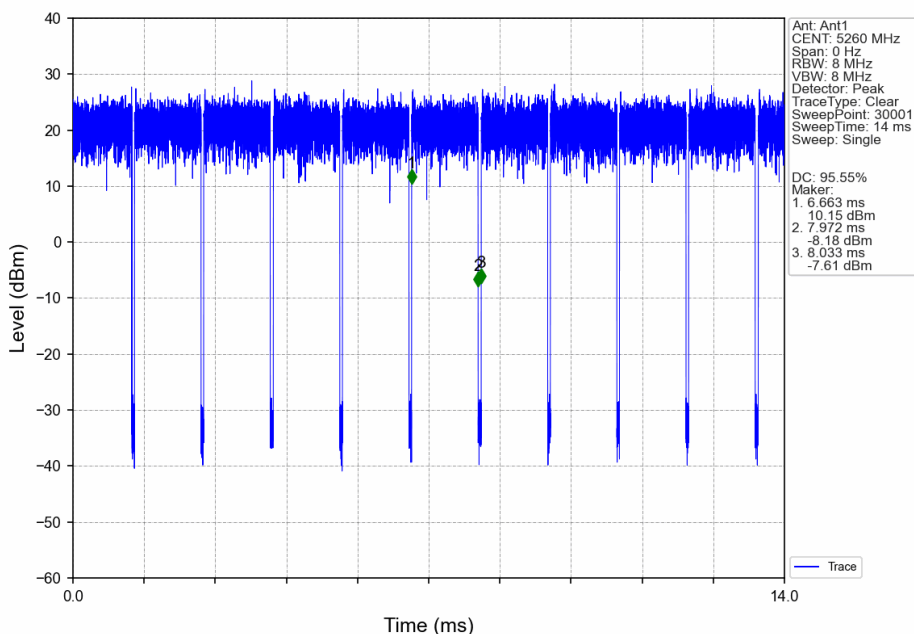
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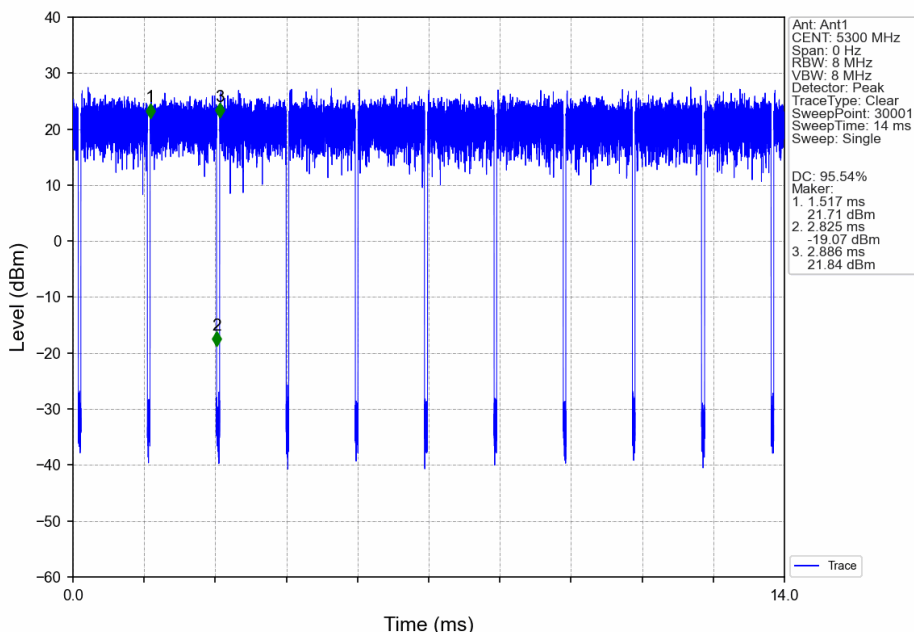
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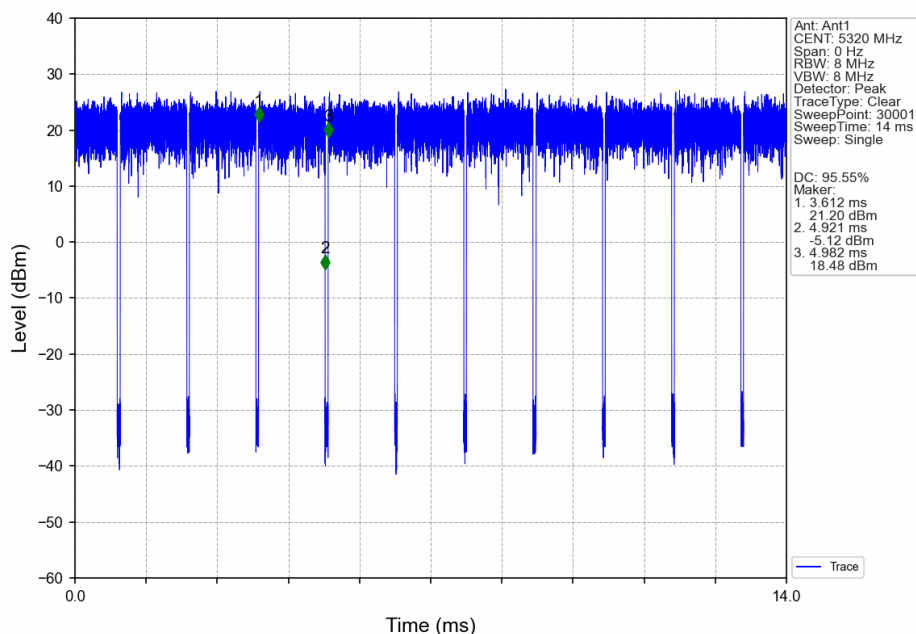
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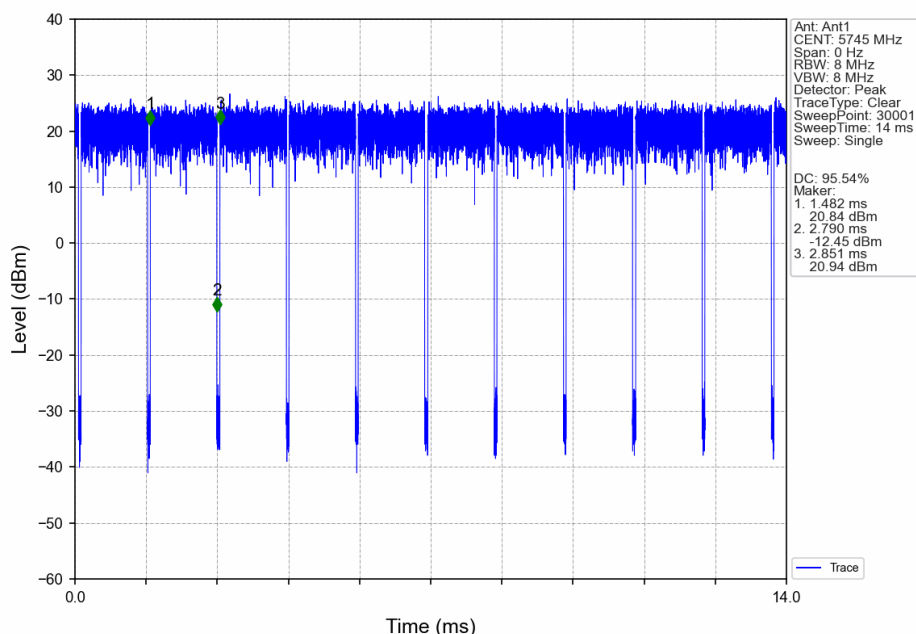
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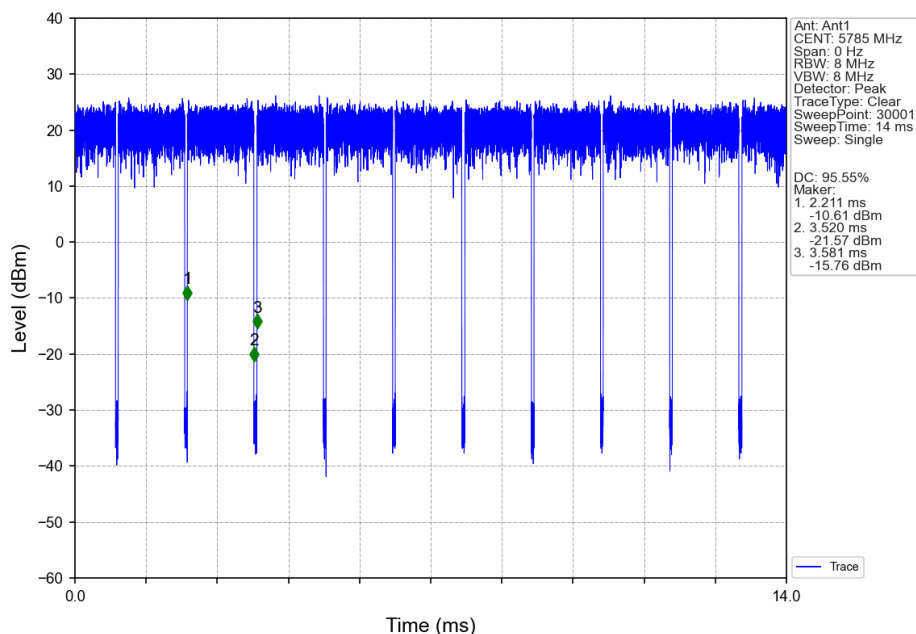
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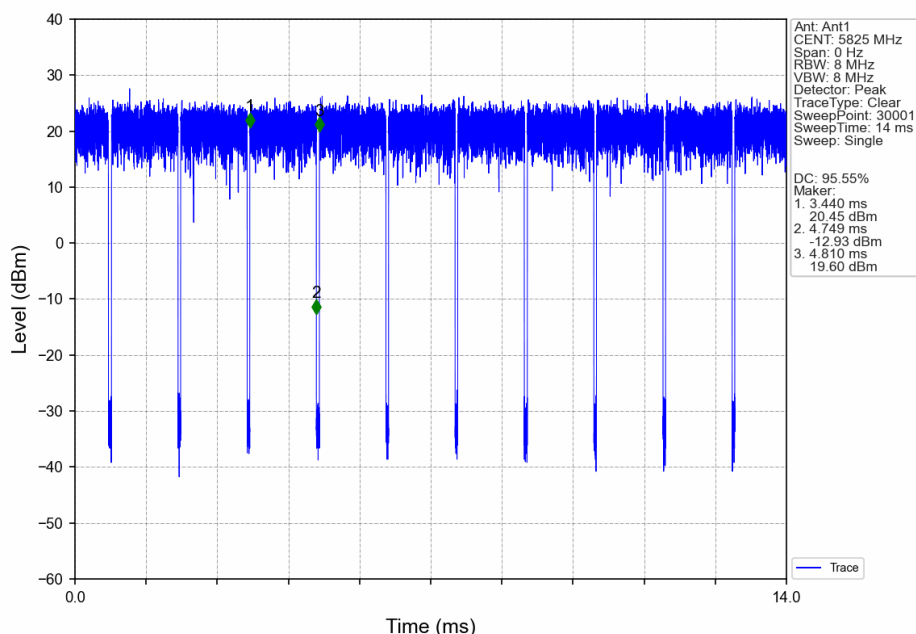
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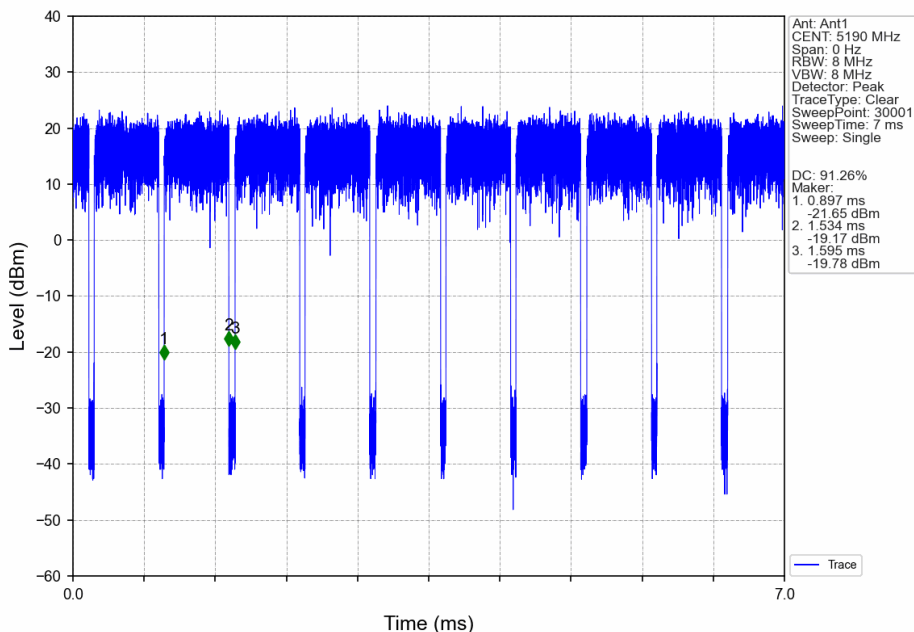
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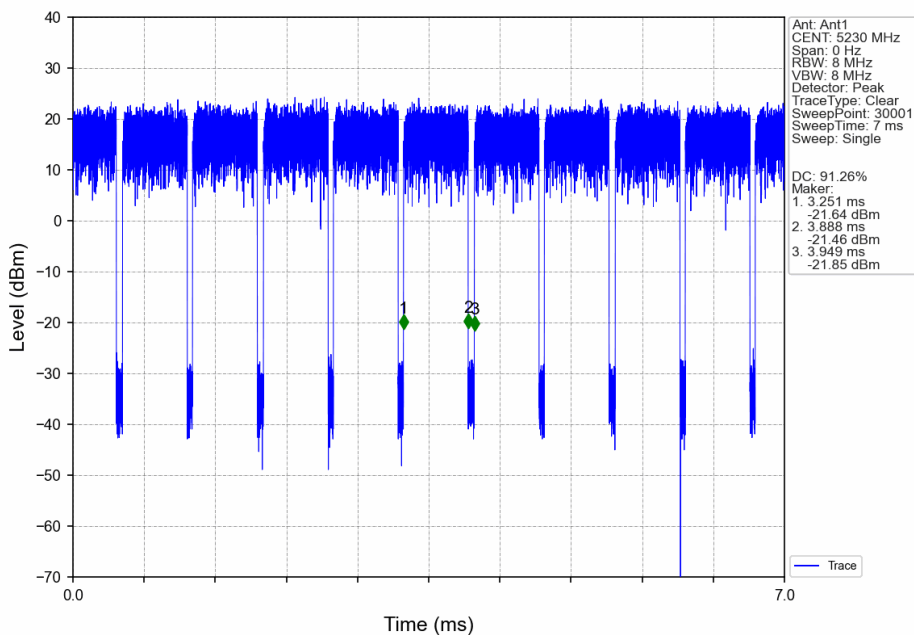
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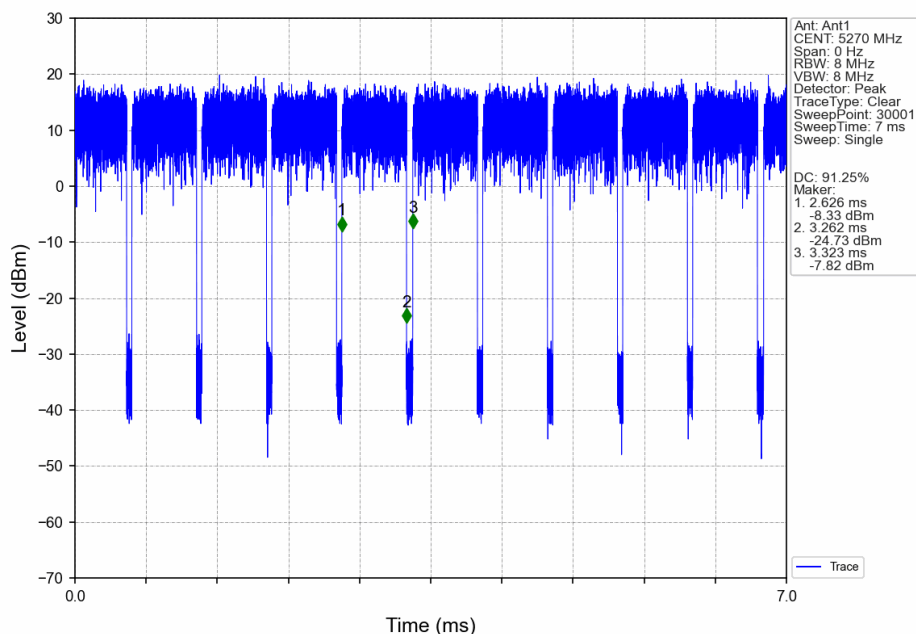
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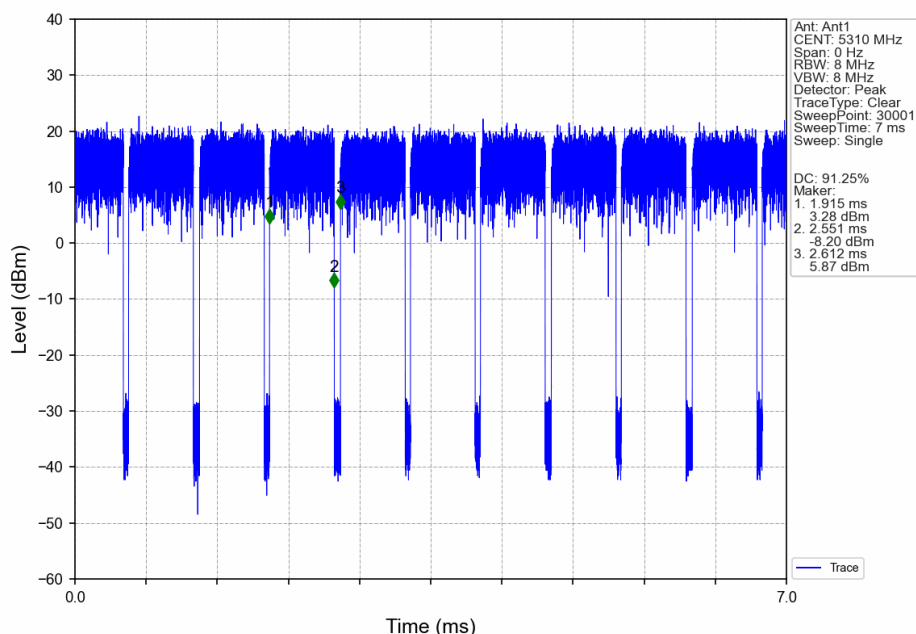
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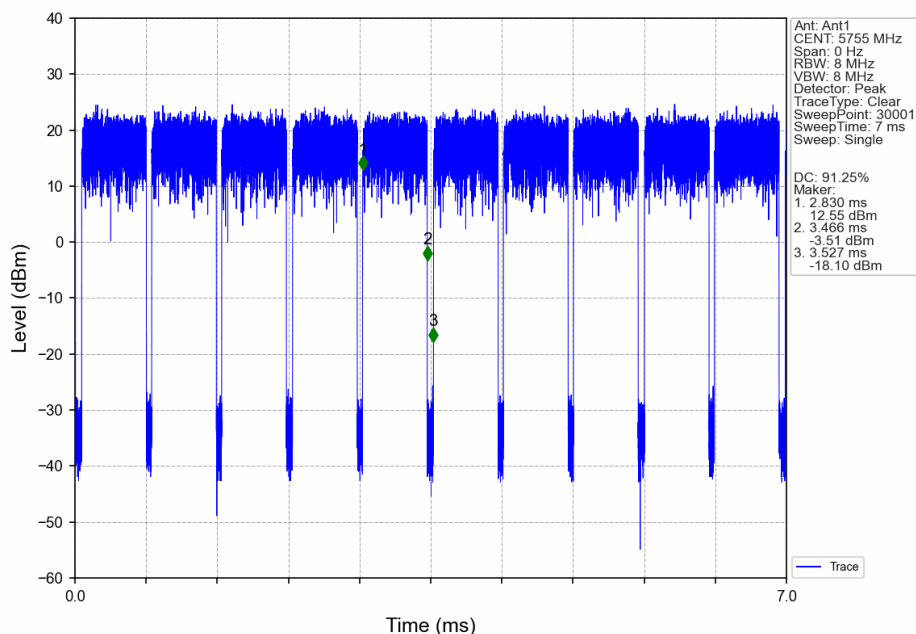
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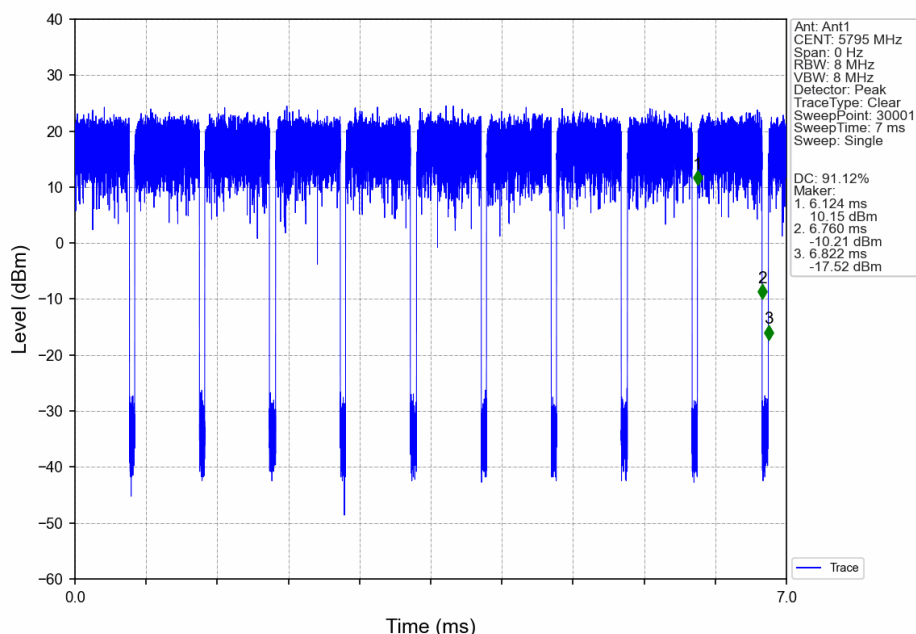
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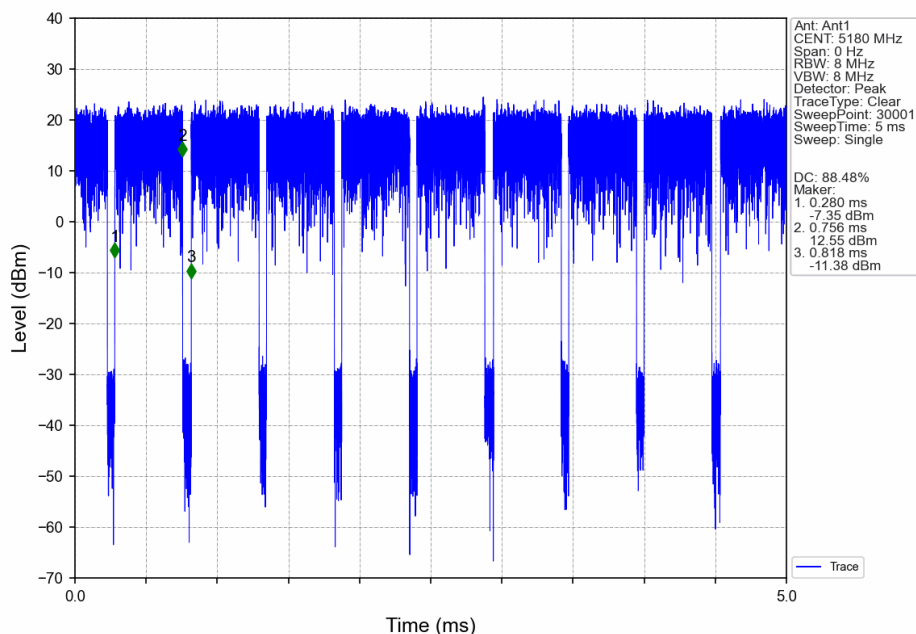
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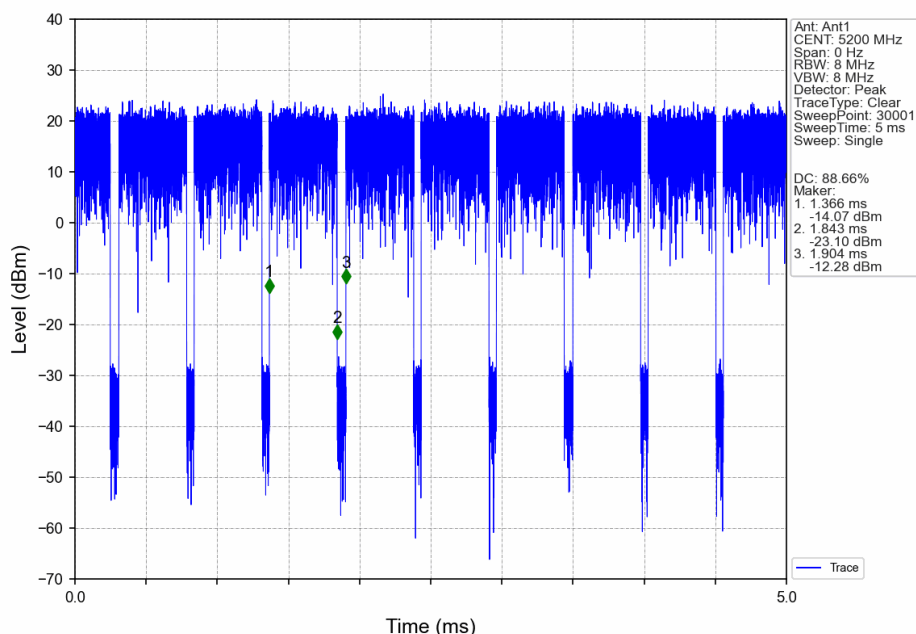
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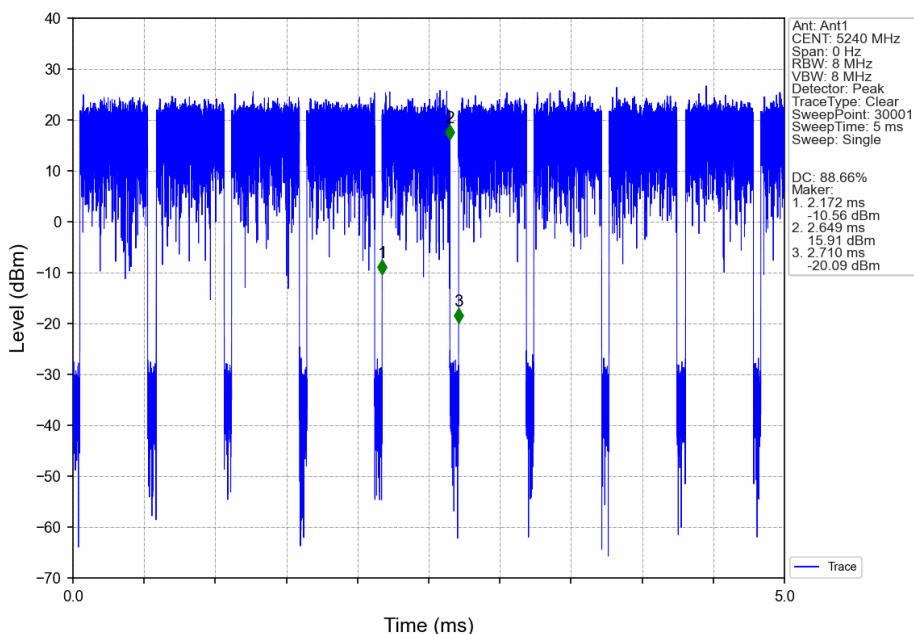
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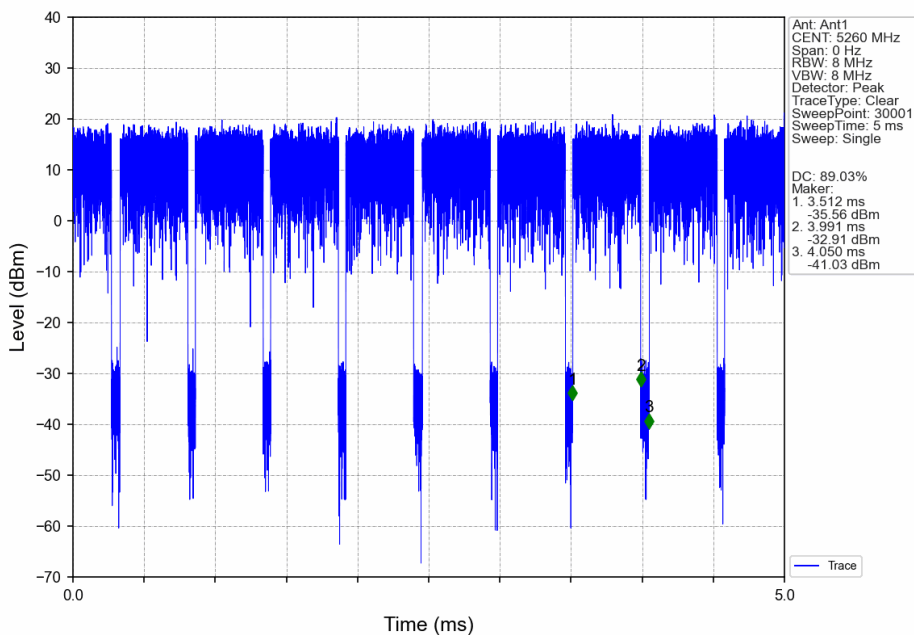
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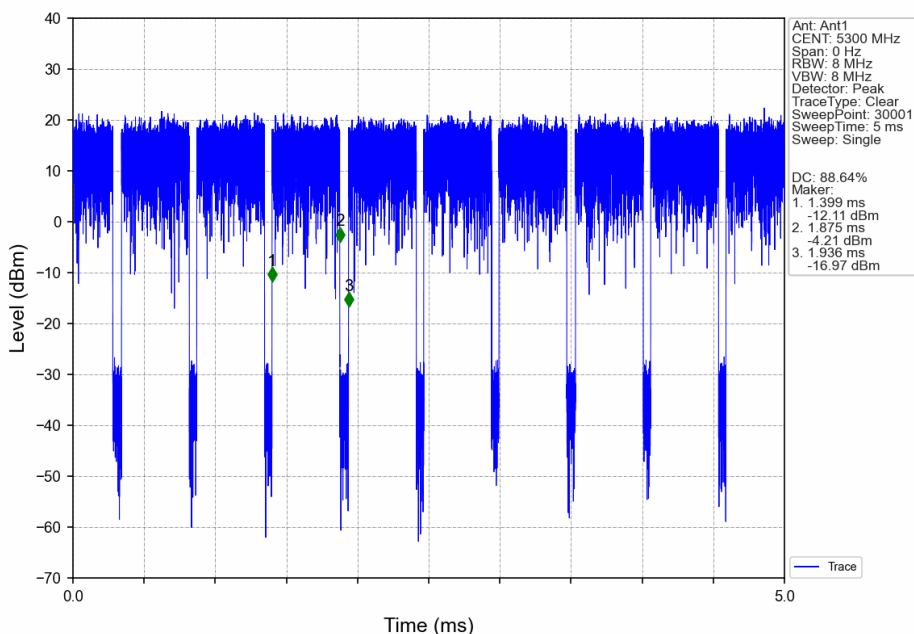
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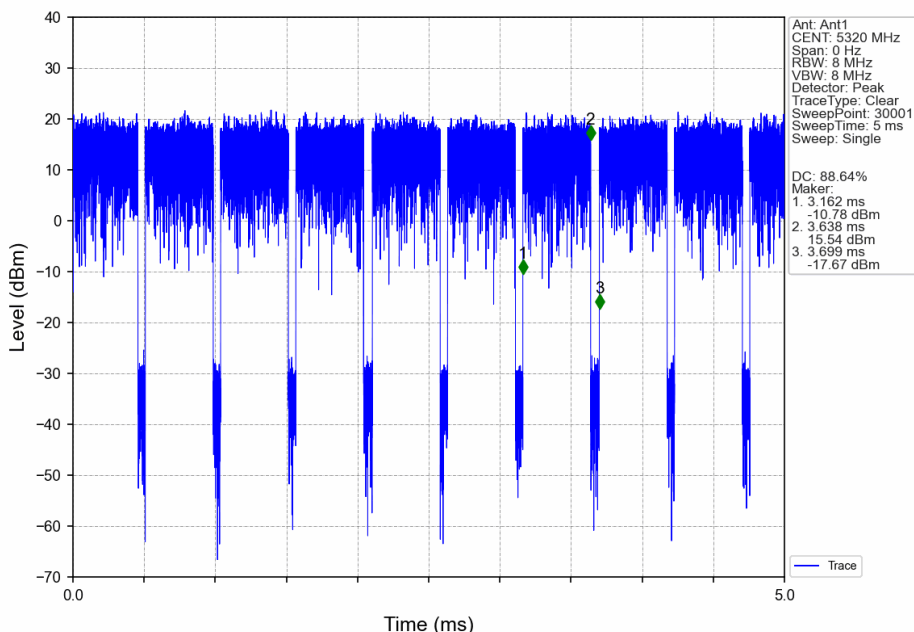
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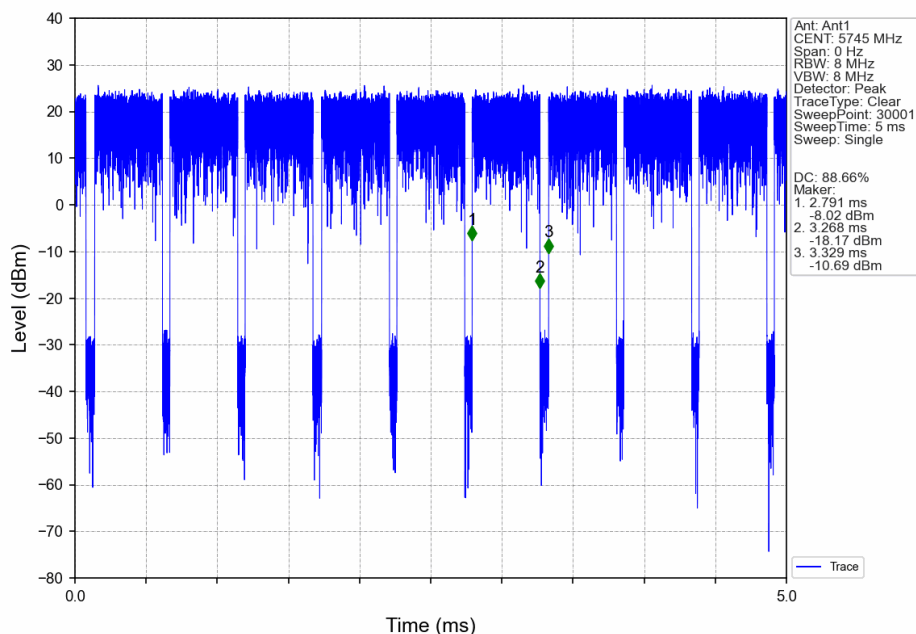
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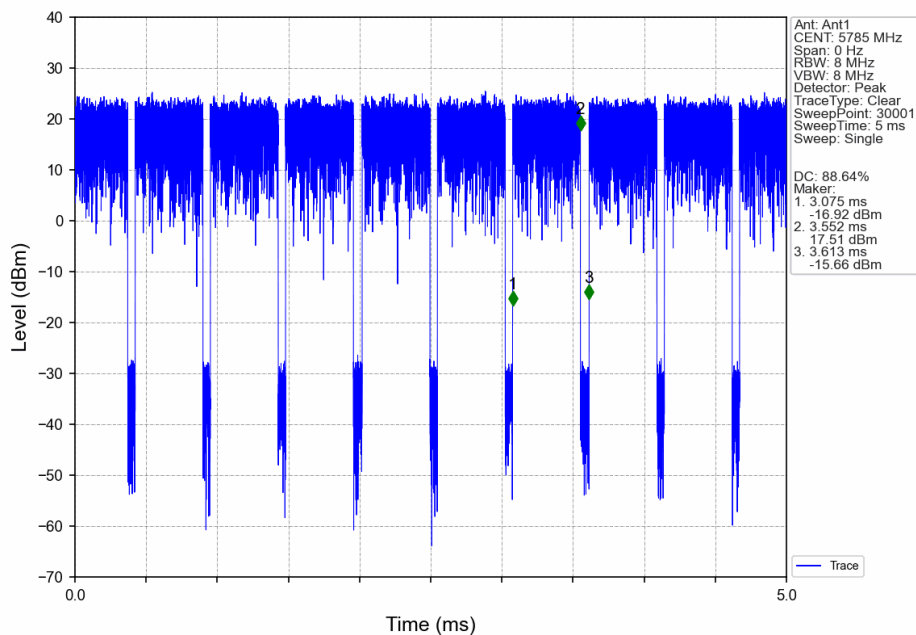
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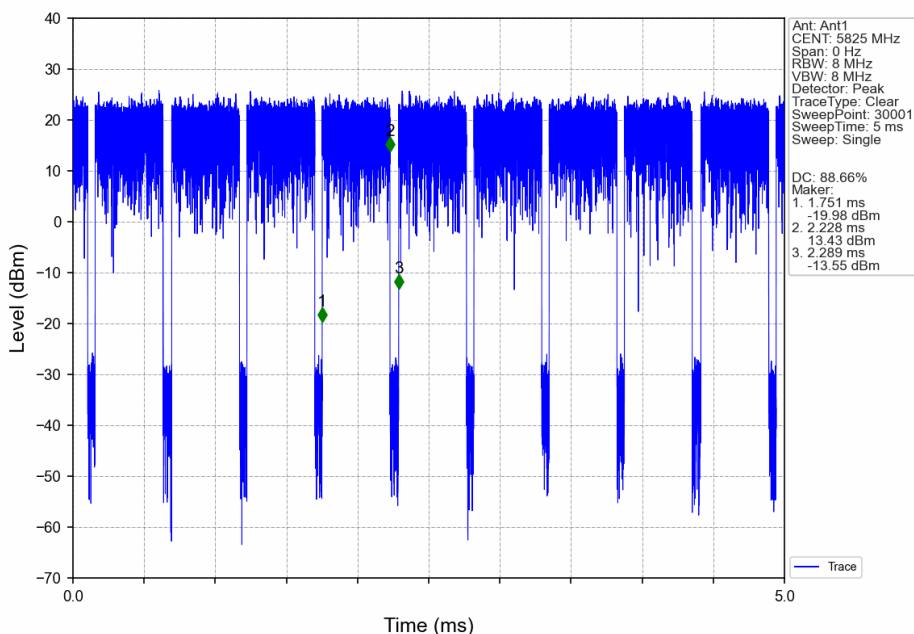
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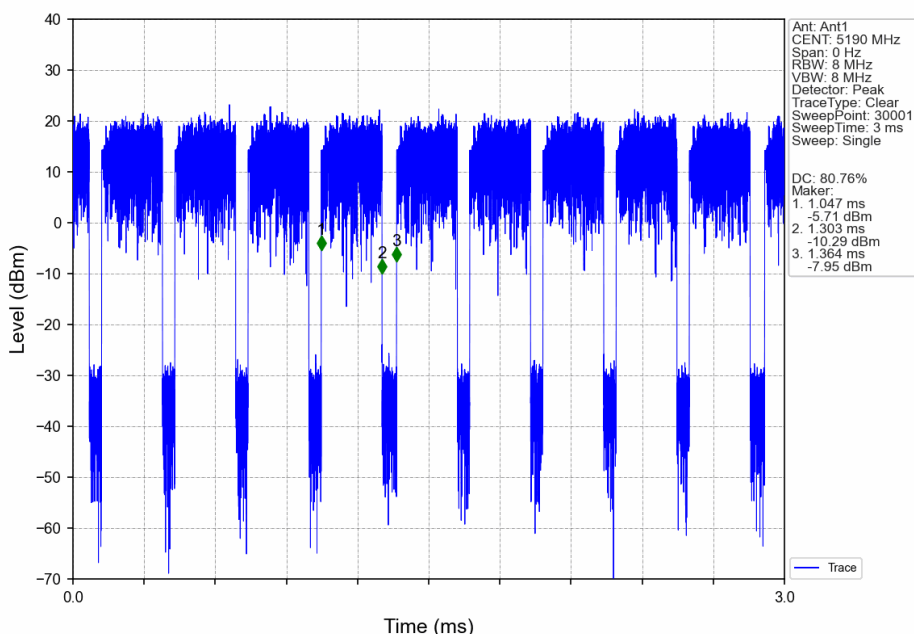
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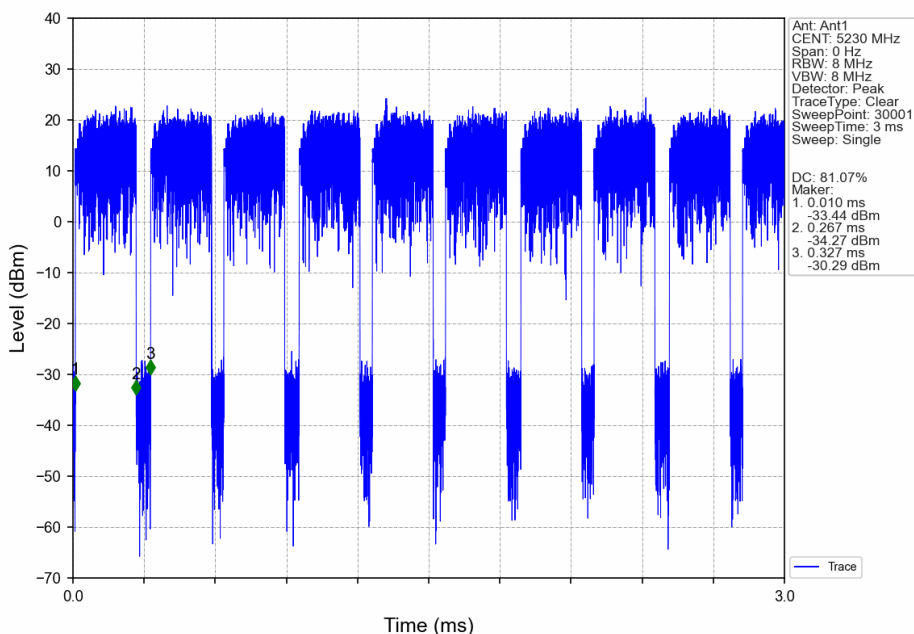
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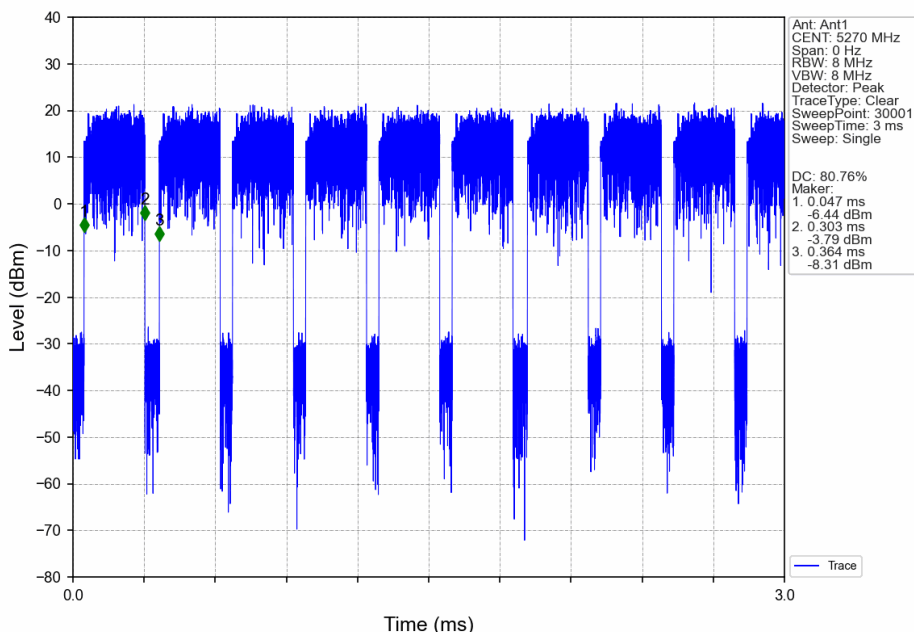
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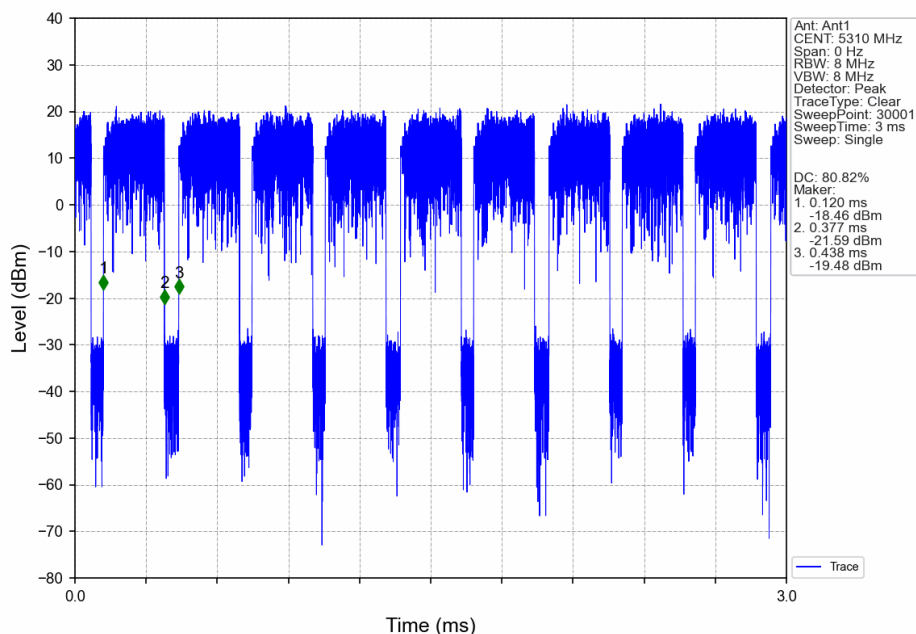
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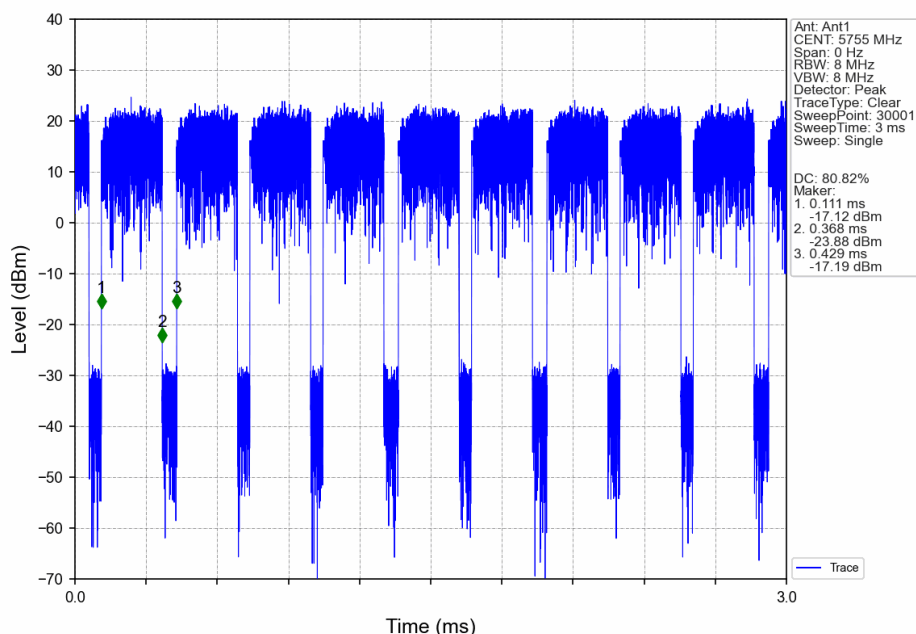
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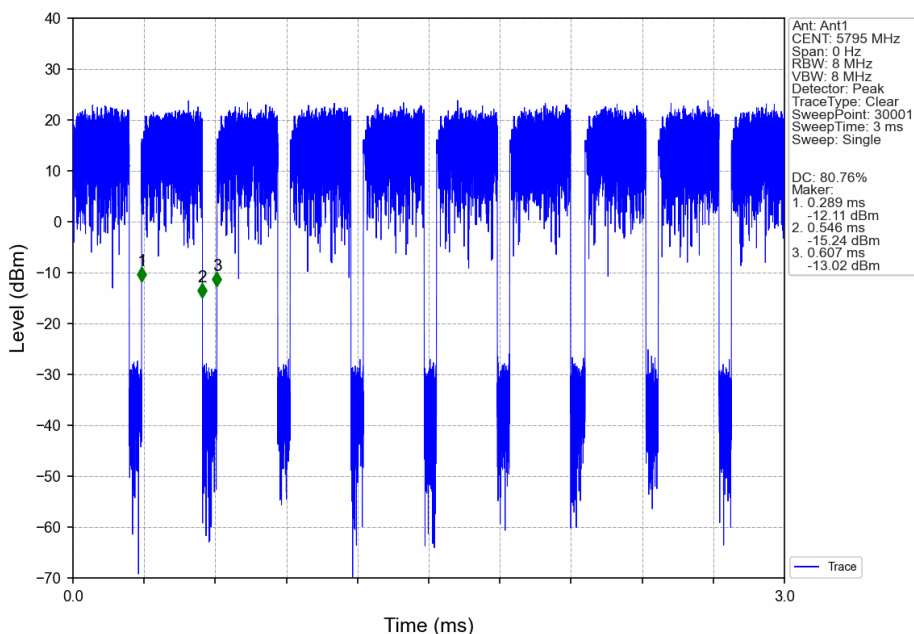
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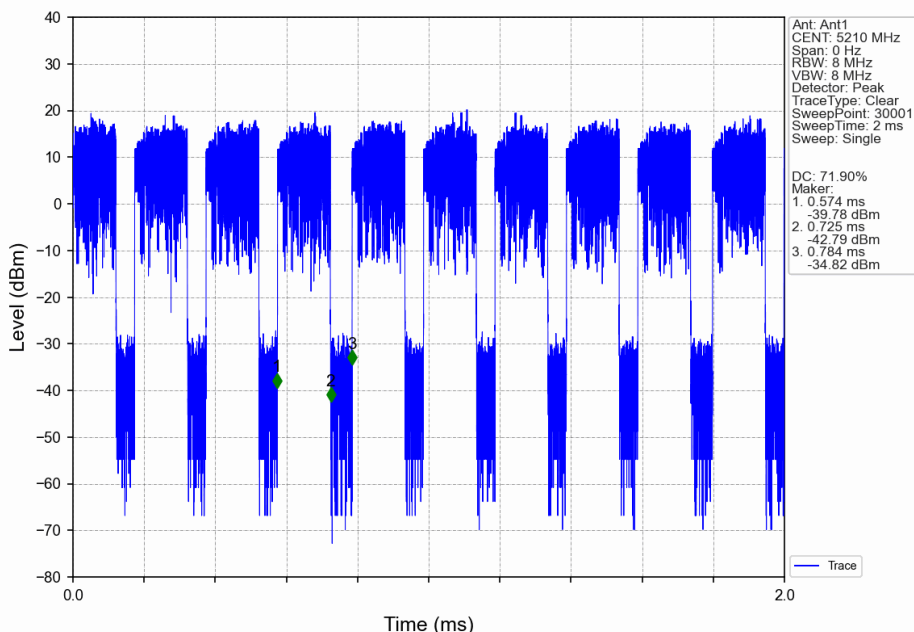
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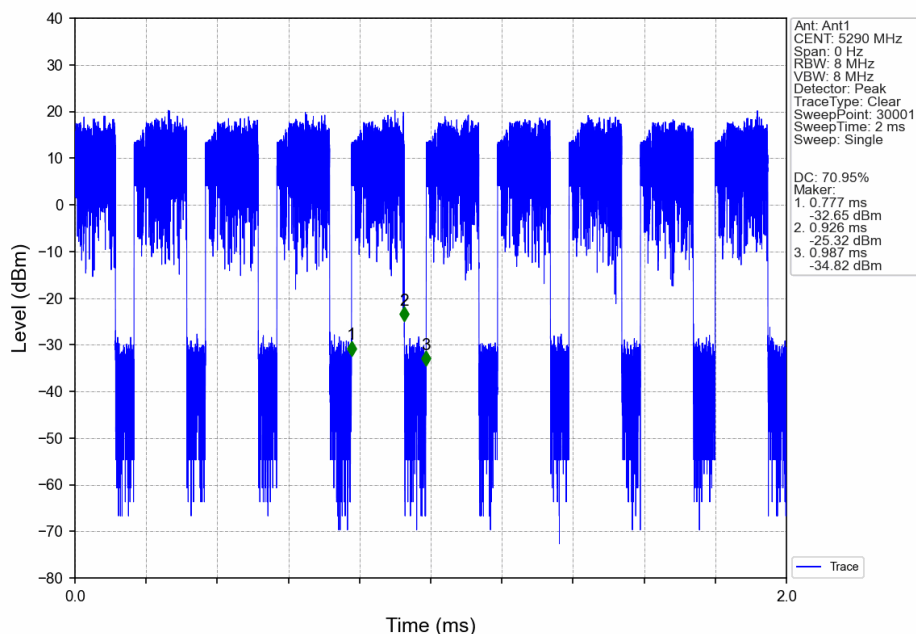
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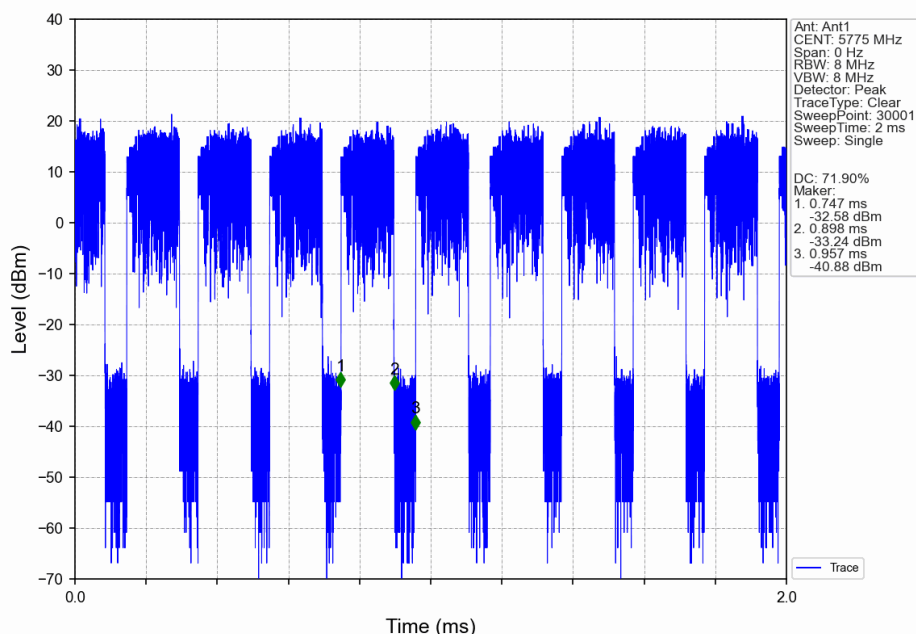
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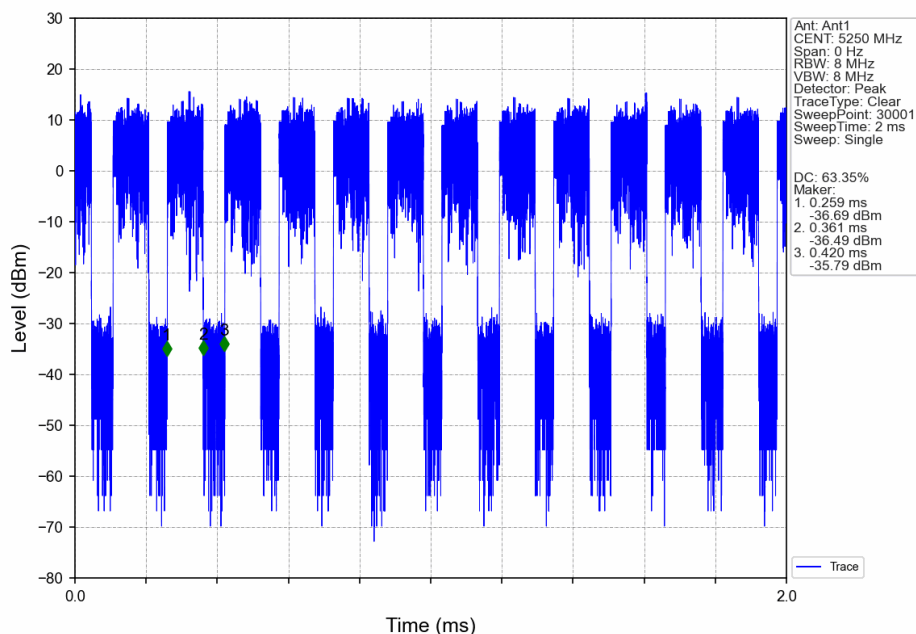
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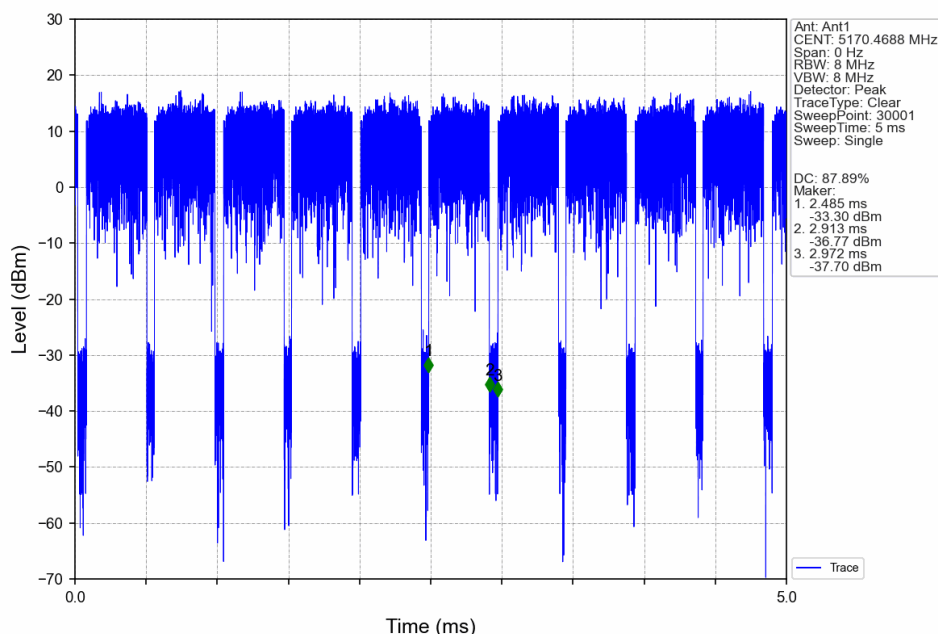
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802.11ac(VHT160)_MCH_5250MHz_Ant1_NTNV



802.11ax(HEW20)_LCH_5180MHz_SU_ / _Ant1_NTNV



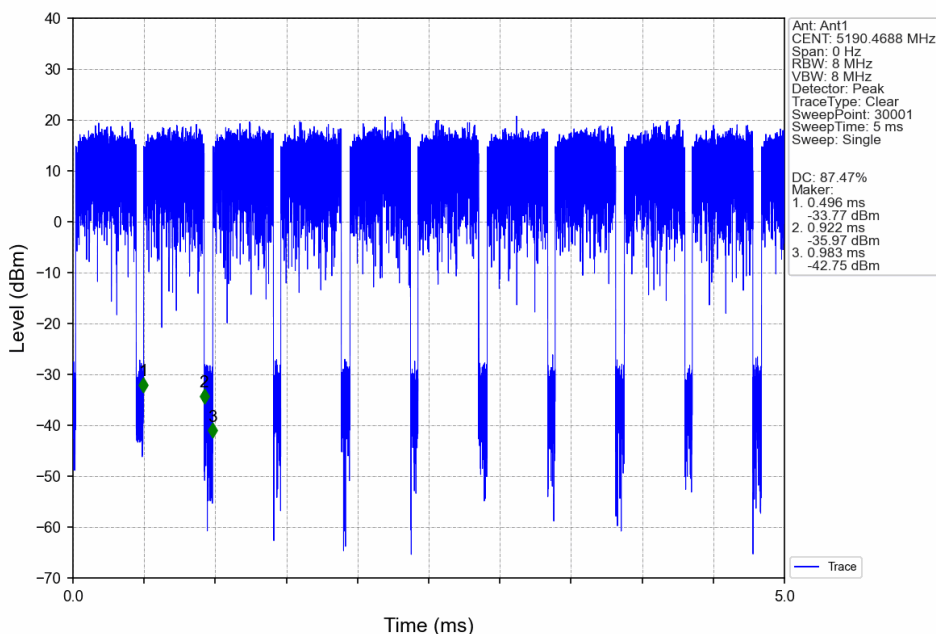
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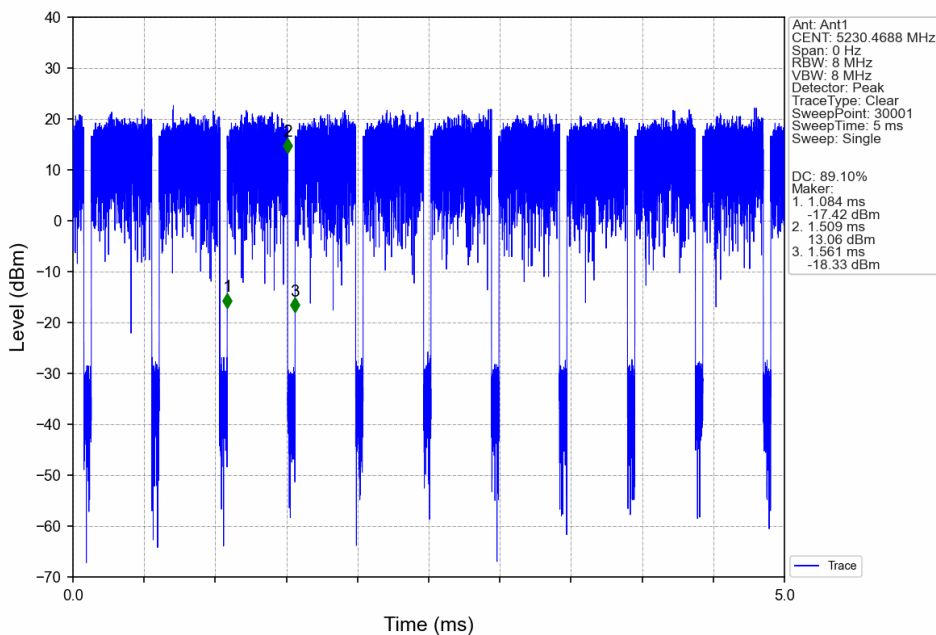
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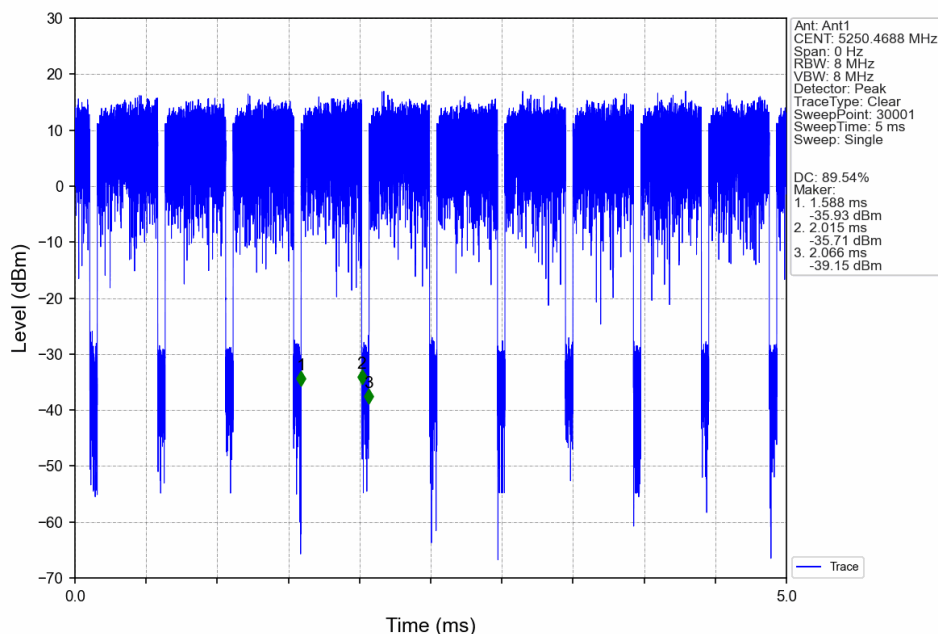
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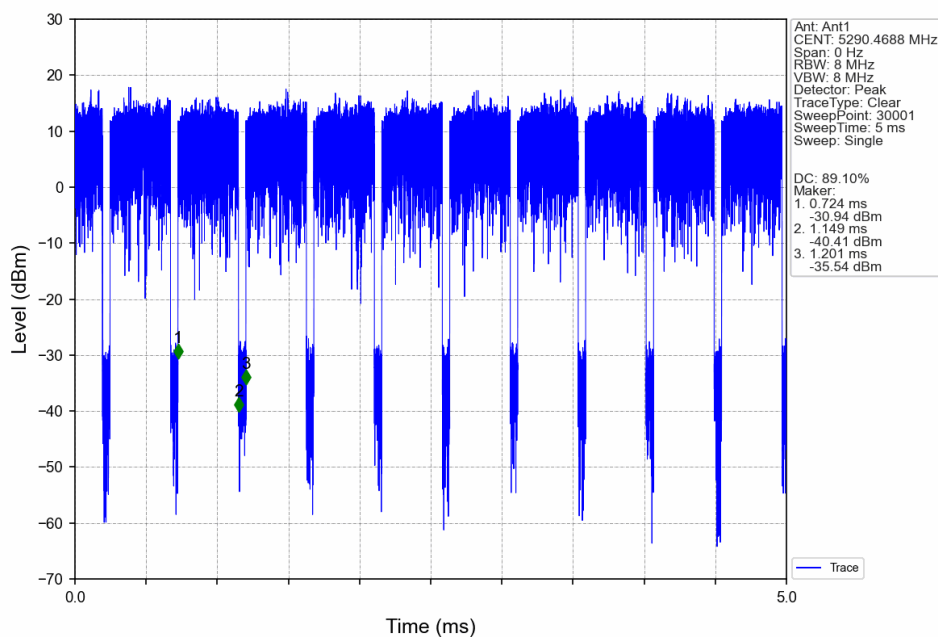
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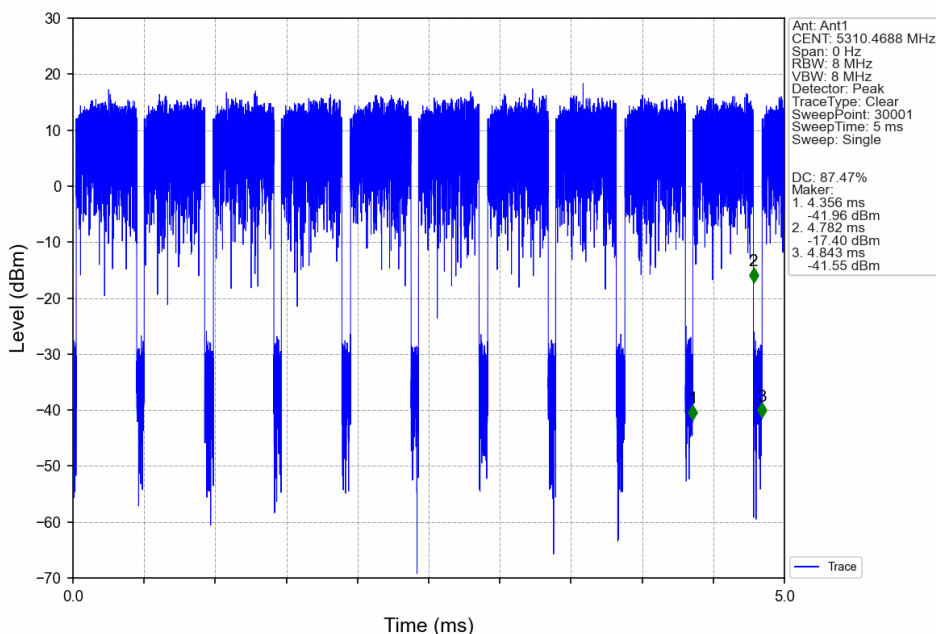
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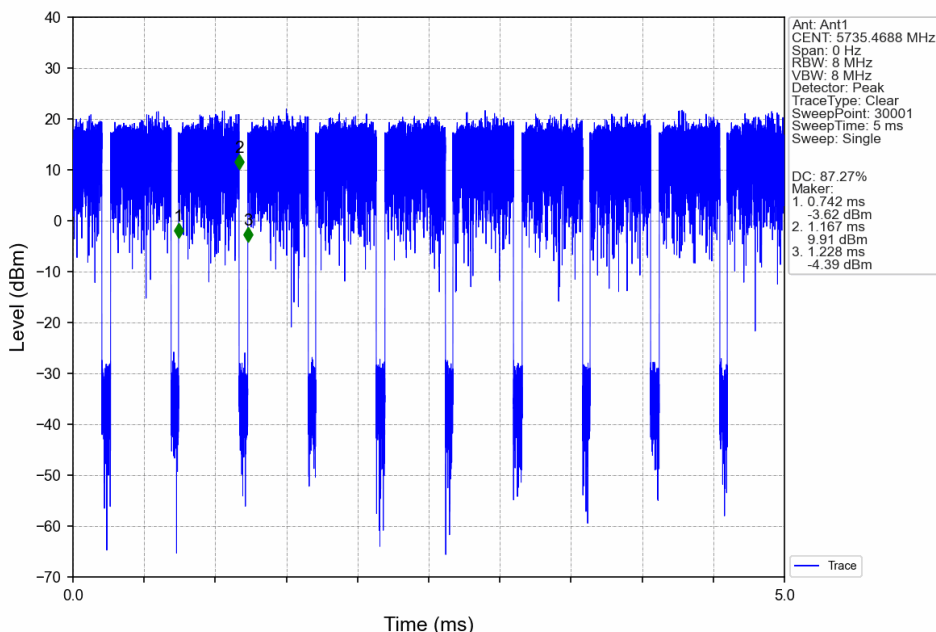
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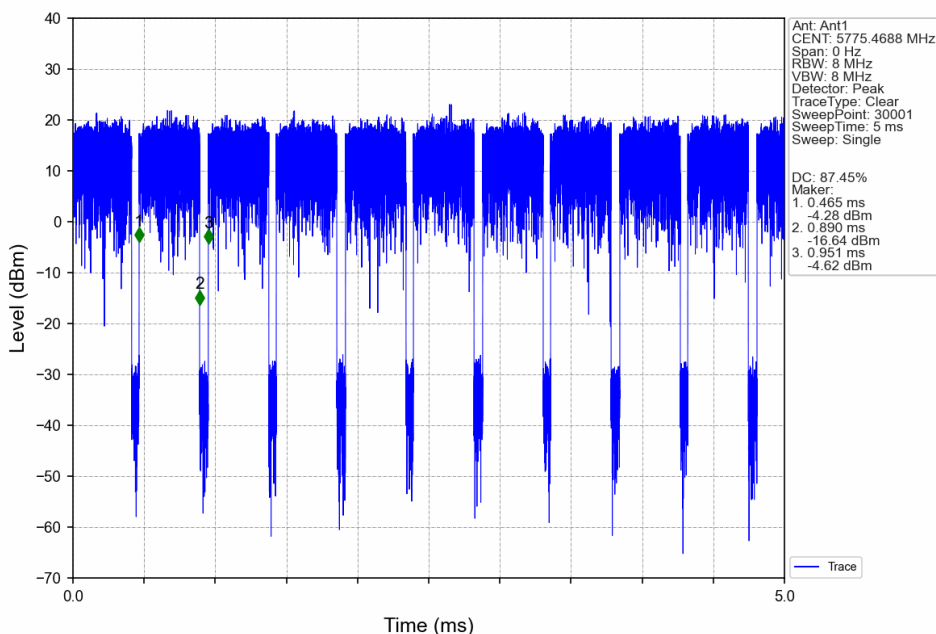
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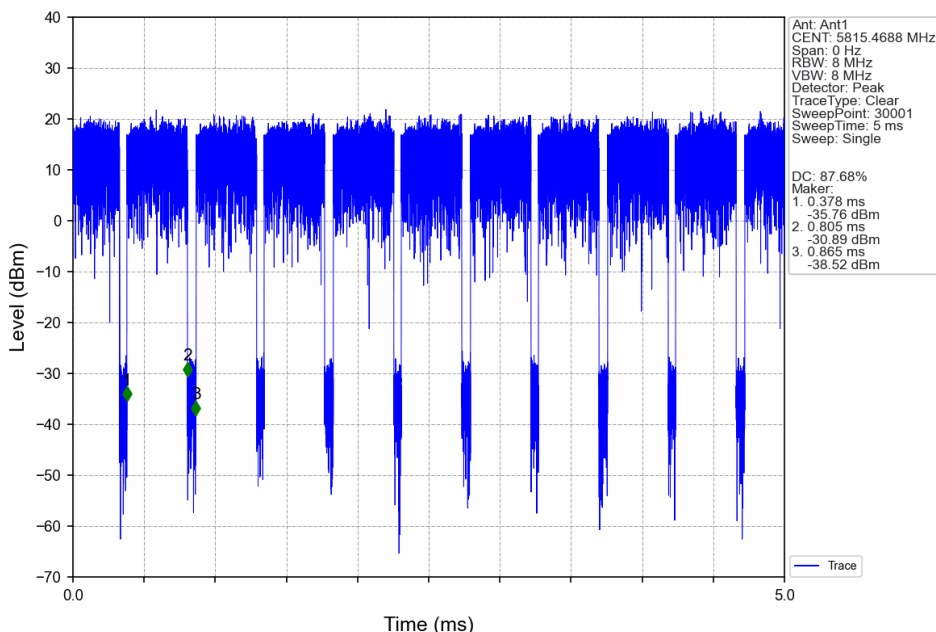
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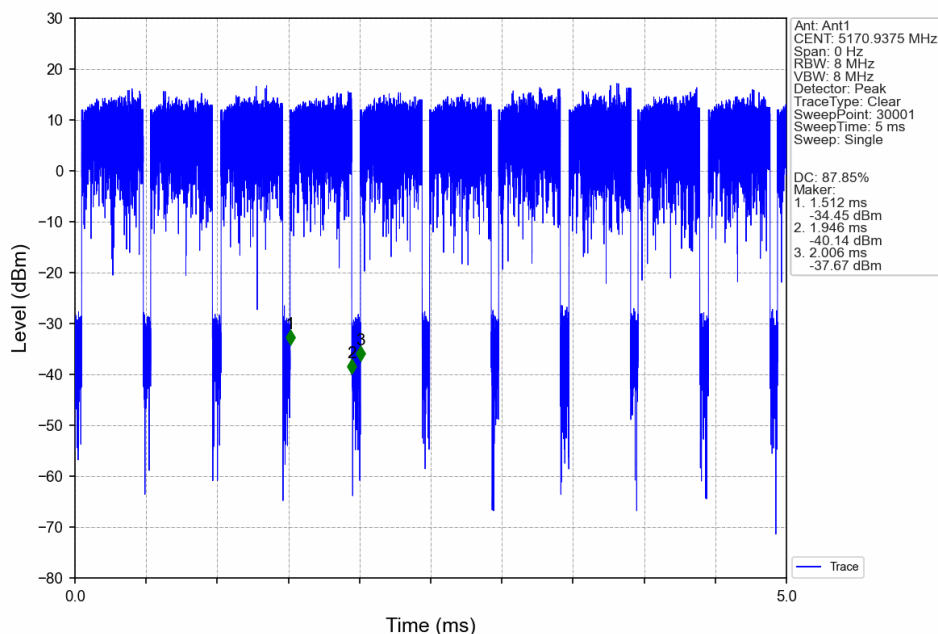
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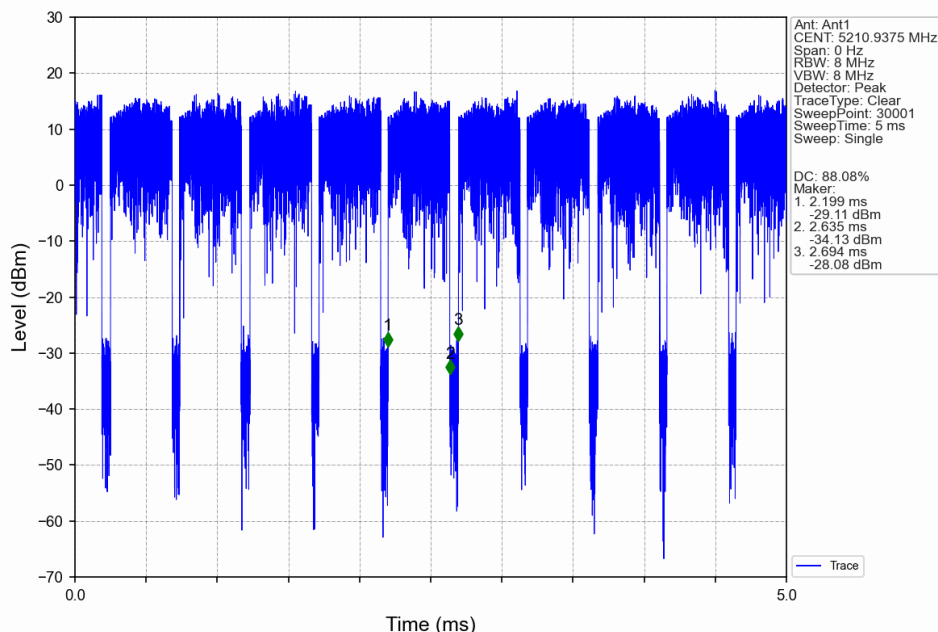
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802.11ax(HEW40)_LCH_5190MHz_SU_/_Ant1_NTNV



802.11ax(HEW40)_HCH_5230MHz_SU_/_Ant1_NTNV



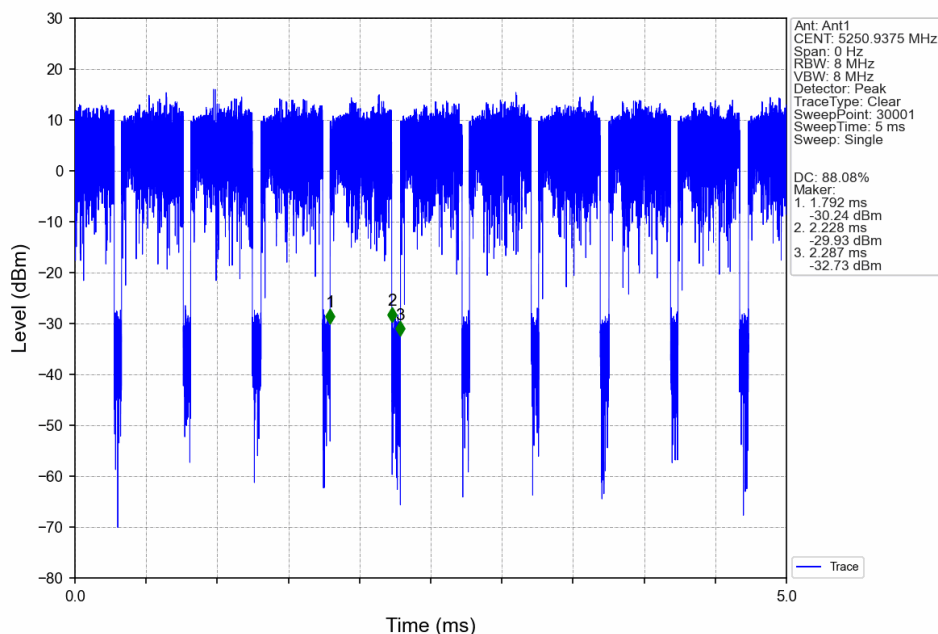
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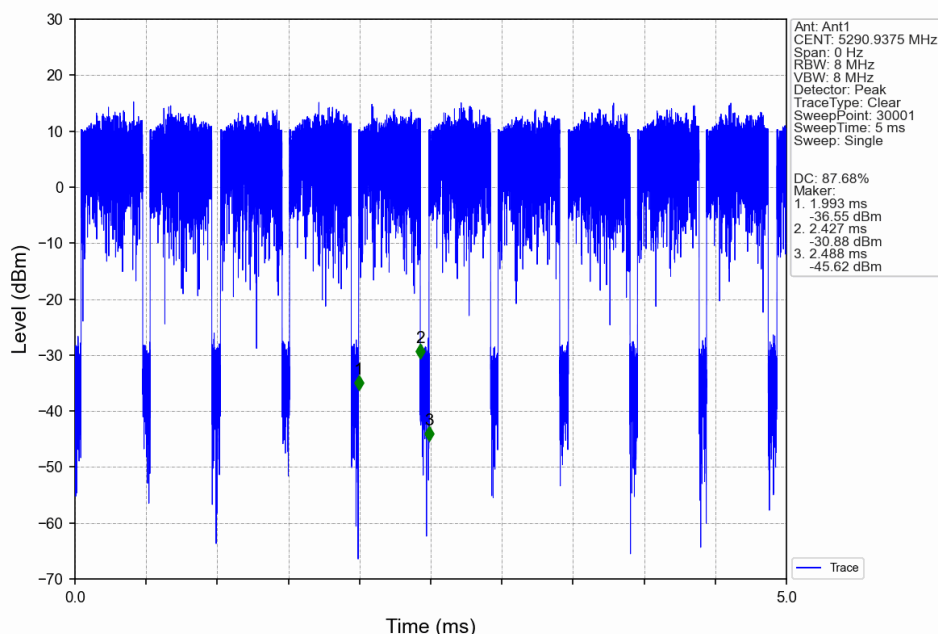
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802.11ax(HEW40)_LCH_5270MHz_SU_/_Ant1_NTNV



802.11ax(HEW40)_HCH_5310MHz_SU_/_Ant1_NTNV



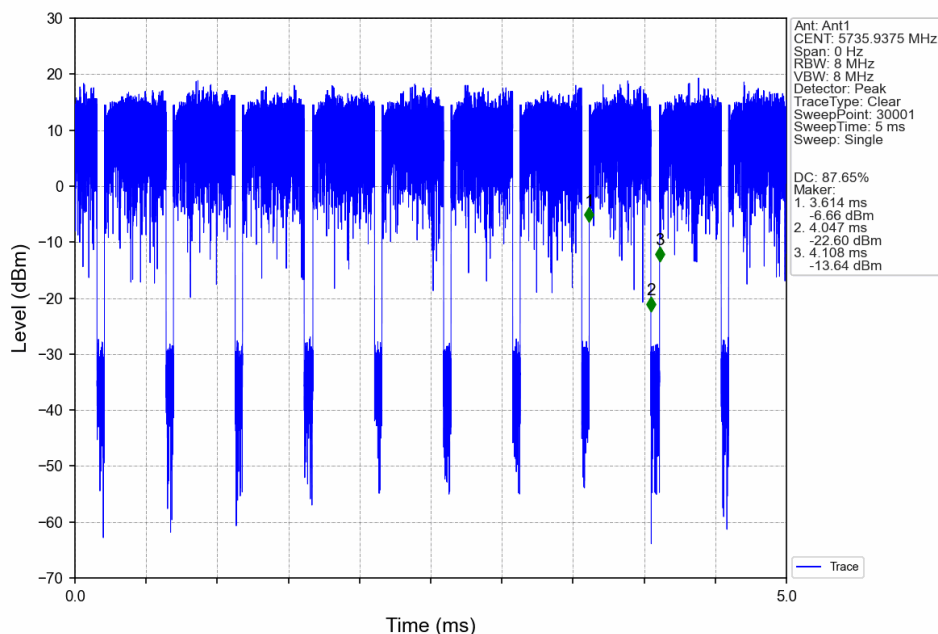
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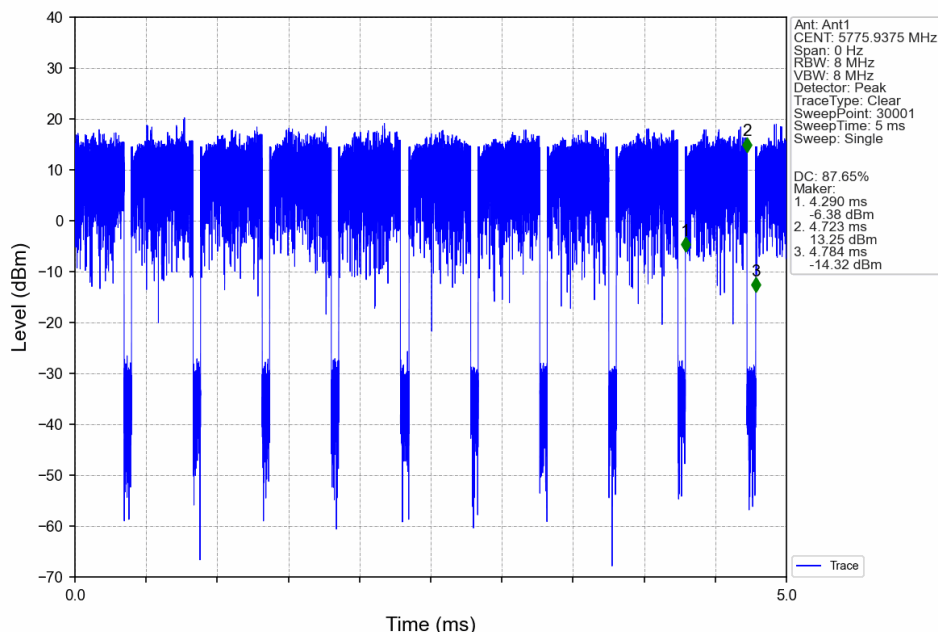
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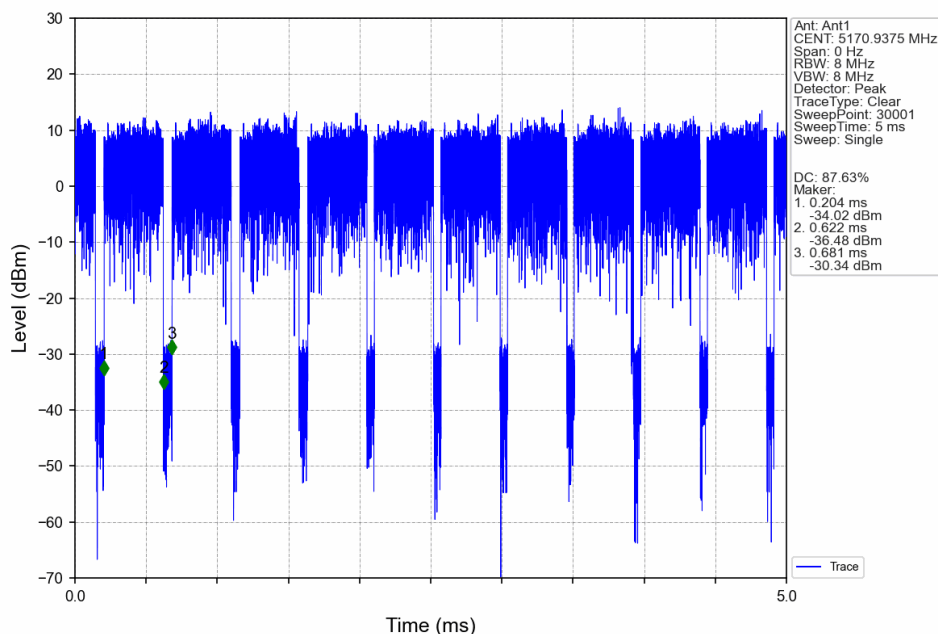
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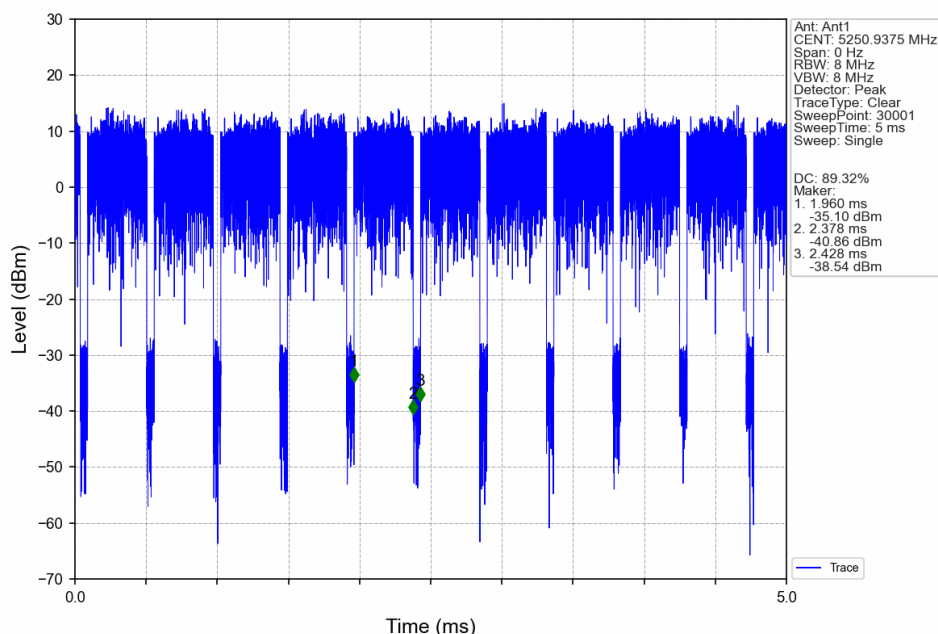
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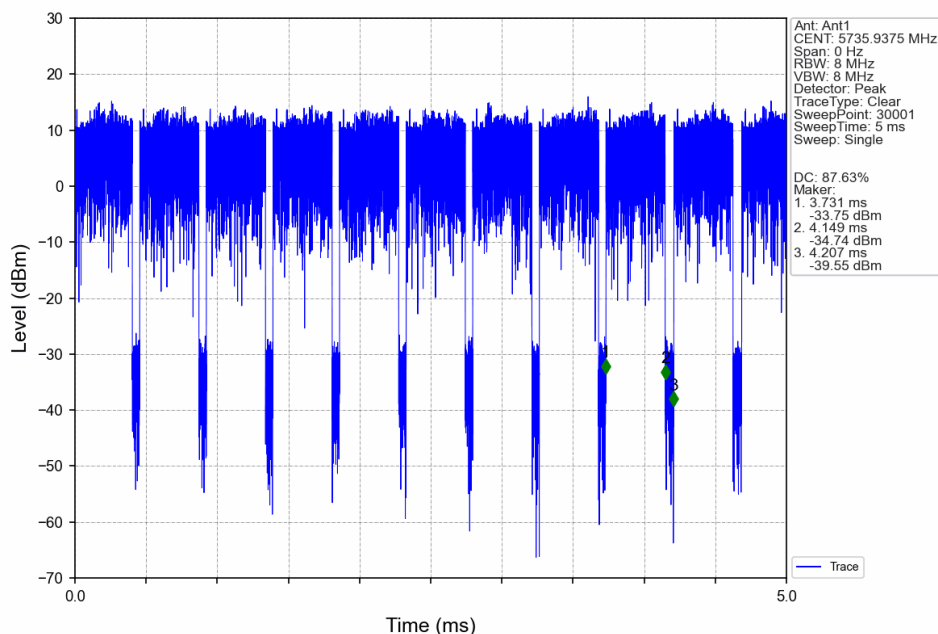
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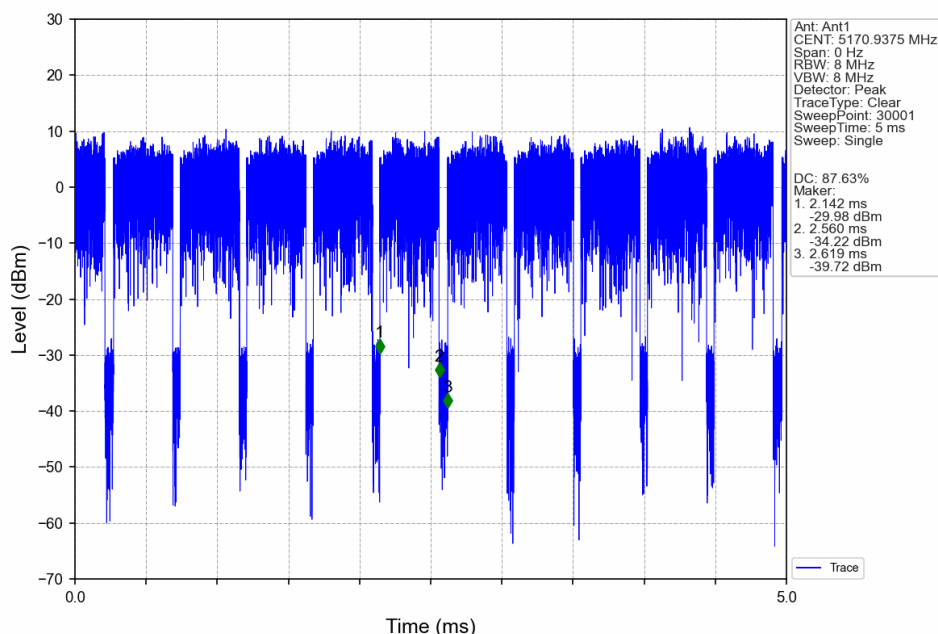
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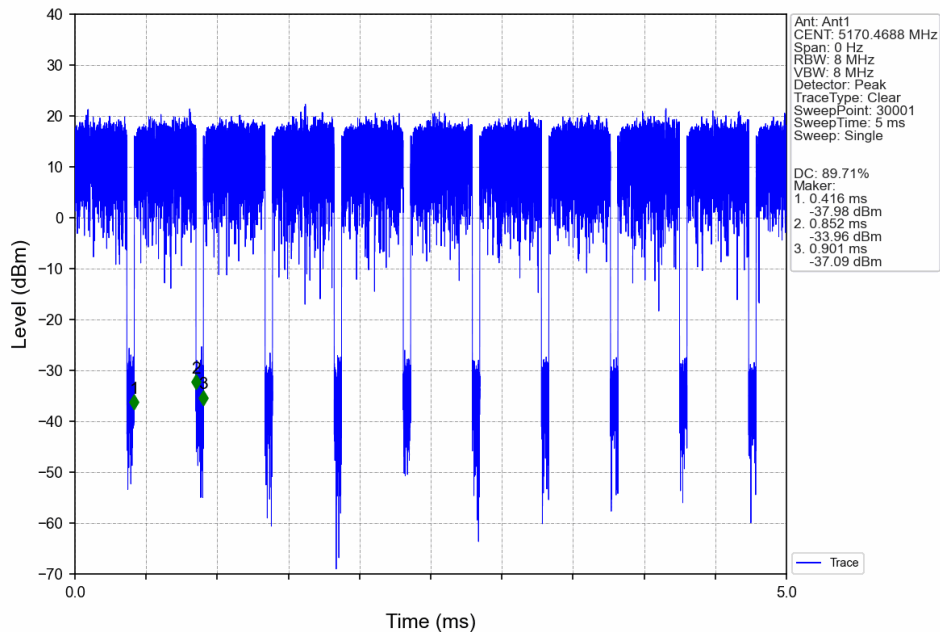
802.11ax(HEW160)_MCH_5250MHz_SU_/_Ant1_NTNV



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802.11be(EHT20)_LCH_5180MHz_SU_/_Ant1_NTNV



802.11be(EHT20)_MCH_5200MHz_SU_/_Ant1_NTNV

