3.3 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

3.3.1 LIMITS OF MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

| Operation Band		EUT Category	LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	B	Indoor Access Point	1 Watt (30 dBm)
	√	Client devices	250mW (24 dBm)
U-NII-2A		√	250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C		√	250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3		√	1 Watt (30 dBm)

NOTE: Where B is the 26dB emission bandwidth in MHz.

3.3.2 TEST SETUP

FOR POWER OUTPUT MEASUREMENT

```
┌──────────┐        ┌──────────────┐        ┌──────────────┐
│          │        │              │        │              │
│   EUT    │────┤├──│ Power Sensor │────────│ Power Meter  │
│          │        │              │        │              │
└──────────┘        └──────────────┘        └──────────────┘
      10dB ATTENUATION
      PAD
```

FOR 26dB BANDWIDTH

```
┌──────────┐                    ┌──────────────┐
│          │                    │   SPECTRUM   │
│   EUT    │────────────────┤├──│              │
│          │                    │   ANALYZER   │
└──────────┘                    └──────────────┘
           10dB ATTENUATION
           PAD
```
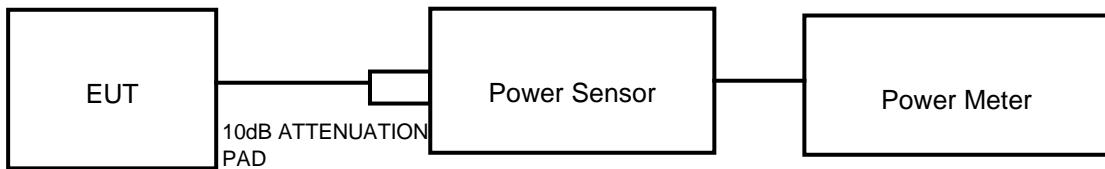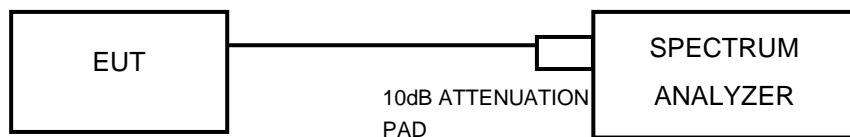
3.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	R&S	ESW 44	101973	Feb.24,24	Feb.23,26
Open Switch and Control Unit	R&S	OSP-B157W8	100836	N/A	N/A
Vector Signal Generator	R&S	SMBV100B	102176	Feb.15,24	Feb.14,26
Signal Generator	R&S	SMB100A03	182185	Feb.15,24	Feb.14,26
Wideband Radio Communication	R&S	CMW500	169399	Jun.25,24	Jun.24,26
Hygrothermograph	DELI	20210528	SZ015	Sep.05,24	Sep.04,26
PC	LENOVO	E14	HRSW0024	N/A	N/A
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,24	Apr.26,26
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,24	Apr.26,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26
Power Meter	R&S	NRX	102380	Feb.15,24	Feb.14,26
Power Meter probe	R&S	NRP6A	102942	Feb.15,24	Feb.14,26

NOTE:

1. The calibration interval of the above test instruments is 12 /24months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

3.3.4 TEST PROCEDURE

FOR POWER MEASUREMENT

For 802.11a, 802.11n/ac/ax (20MHz), 802.11 n/ac/ax (40MHz) ,802.11 ac/ax (160MHz)

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

FOR 99 PERCENT OCCUPIED BANDWIDTH

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

FOR 26dB BANDWIDTH

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

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FOR 6dB BANDWIDTH

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.3.5 DEVIATION FROM TEST STANDARD

No deviation.

3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

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3.3.7 TEST RESULTS

Please Refer to Appendix of this test report.

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3.4 MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

3.4.1 LIMITS OF MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

Operation Band	EUT Category			LIMIT
U-NII-1			Outdoor Access Point	17dBm/ MHz
			Fixed point-to-point Access Point	
			Indoor Access Point	
	√		Client devices	11dBm/ MHz
U-NII-2A		√		11dBm/ MHz
U-NII-2C		√		11dBm/ MHz
U-NII-3		√		30dBm/ 500kHz

3.4.2 TEST SETUP
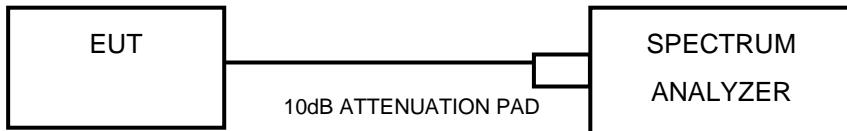
3.4.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

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3.4.4 TEST PROCEDURES

Using method SA-2(Band1/2/3)

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.

2) Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS

3) Set Channel power measure = 1MHz

4) Sweep time = auto, trigger set to "free run".

5) Trace average at least 100 traces in power averaging mode.

6) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).

7) Record the max value

Using method SA-2 (Band4)

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.

2) Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS

3) Set Channel power measure = 1MHz

4) Sweep time = auto, trigger set to "free run".

5) Trace average at least 100 traces in power averaging mode.

6) Add 10 log(500kHz/RBW) to the test result. 10 log(500kHz/300KHZ) = 2.22dBm

7) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).

8) Record the max value

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

Same as 3.1.7.

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3.4.7 TEST RESULTS

Please Refer to Appendix of this test report.

3.5 AUTOMATICALLY DISCONTINUE TRANSMISSION

3.5.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information, or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

3.5.2 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.5.3 TEST RESULT

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving。 The EUT can detect the controlling of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

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3.6 ANTENNA REQUIREMENTS

3.6.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmits power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.6.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

3.6.3 ANTENNA GAIN

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit and PSD limit.

4. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

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5. MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

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6. Appendix
EMISSION BANDWIDTH

TEST RESULT

TestMode	Antenna	Frequency [MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	ANT6	5180	22.556	5168.822	5191.378	---	---
	ANT6	5200	23.158	5188.221	5211.379	---	---
	ANT6	5240	23.058	5228.321	5251.379	---	---
	ANT6	5260	23.158	5248.221	5271.379	---	---
	ANT6	5300	23.258	5288.221	5311.479	---	---
	ANT6	5320	23.358	5308.221	5331.579	---	---
	ANT6	5500	23.158	5488.221	5511.379	---	---
	ANT6	5580	22.857	5568.622	5591.479	---	---
	ANT6	5700	22.657	5688.722	5711.379	---	---
	ANT6	5720	23.158	5708.221	5731.379	---	---
11N20	ANT6	5180	23.358	5168.120	5191.478	---	---
	ANT6	5200	24.461	5187.318	5211.779	---	---
	ANT6	5240	23.860	5228.020	5251.880	---	---
	ANT6	5260	24.060	5247.619	5271.679	---	---
	ANT6	5300	23.860	5288.020	5311.880	---	---

	ANT6	5320	23.759	5308.020	5331.779	---	---
	ANT6	5500	23.559	5488.120	5511.679	---	---
	ANT6	5580	23.559	5568.120	5591.679	---	---
	ANT6	5700	23.459	5688.221	5711.680	---	---
	ANT6	5720	23.960	5707.619	5731.579	---	---
11N40	ANT6	5190	42.105	5169.098	5211.203	---	---
	ANT6	5230	42.105	5209.248	5251.353	---	---
	ANT6	5270	41.955	5248.947	5290.902	---	---
	ANT6	5310	42.105	5289.098	5331.203	---	---
	ANT6	5510	41.955	5489.098	5531.053	---	---
	ANT6	5550	41.955	5528.947	5570.902	---	---
	ANT6	5670	41.955	5649.098	5691.053	---	---
	ANT6	5710	42.105	5689.098	5731.203	---	---
11AC80	ANT6	5210	86.771	5167.618	5254.389	---	---
	ANT6	5290	86.771	5247.618	5334.389	---	---
	ANT6	5530	86.270	5487.618	5573.888	---	---
	ANT6	5610	85.266	5567.618	5652.884	---	---
	ANT6	5690	86.771	5647.618	5734.389	---	---

TEST GRAPHS

11A_ANT6_5180

26 dB Bandwidth

22.556 MHz

11A _ANT6_5200

26 dB Bandwidth

23.158 MHz
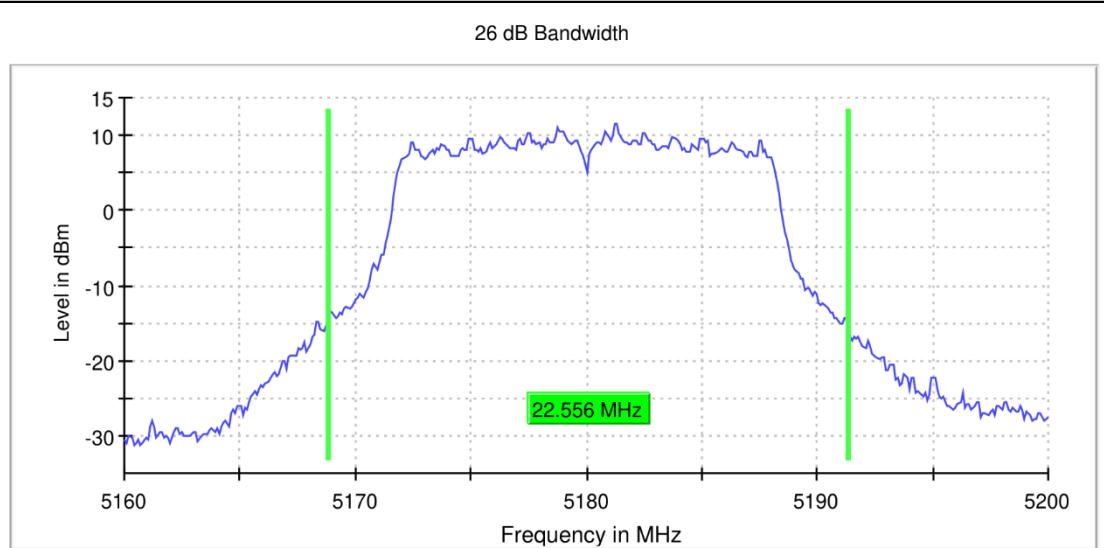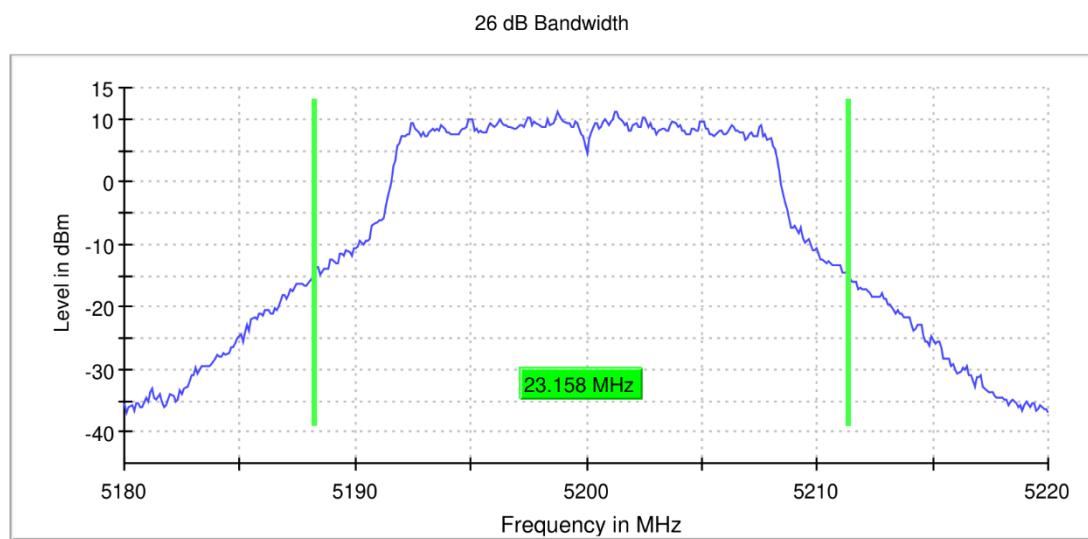
11A _ANT6_5240

26 dB Bandwidth

23.058 MHz
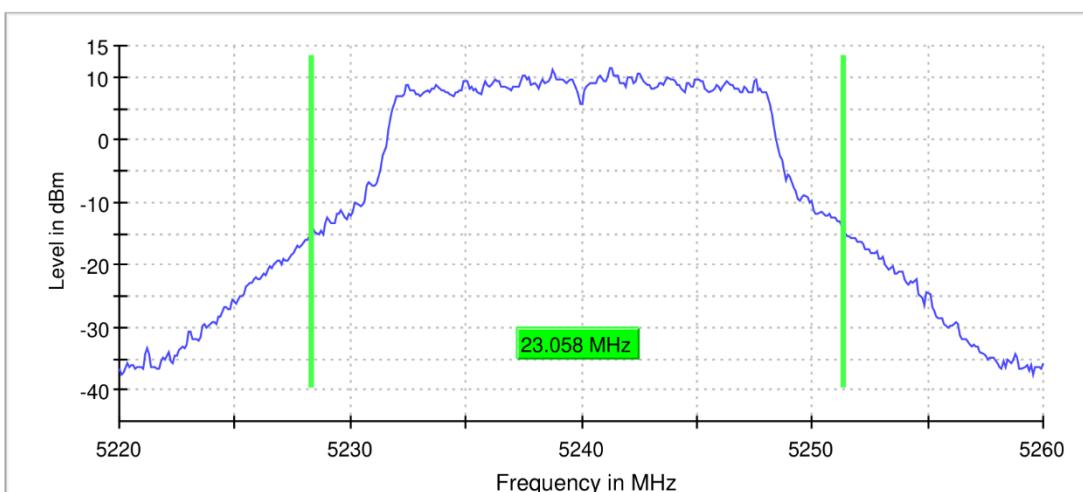
11A _ANT6_5260

26 dB Bandwidth

23.158 MHz
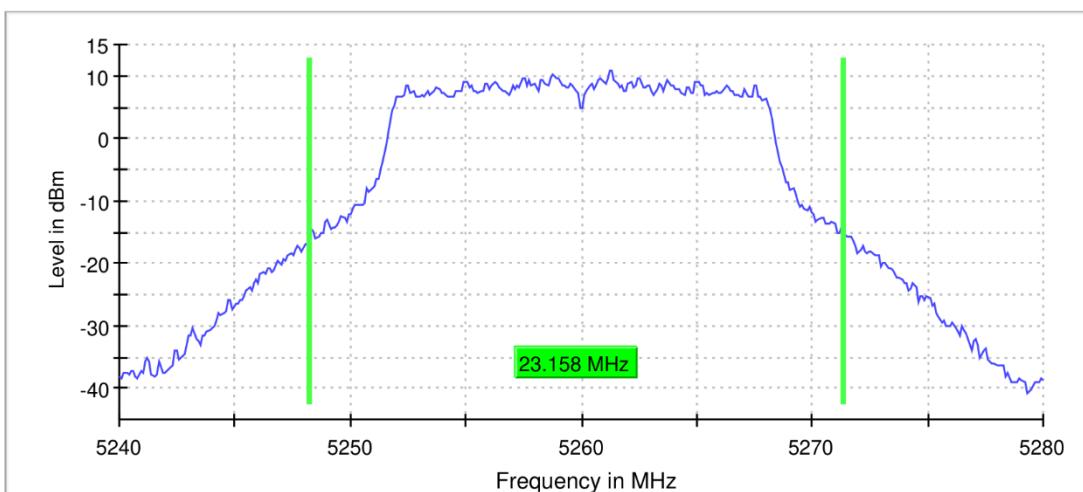
11A _ANT6_5300

26 dB Bandwidth
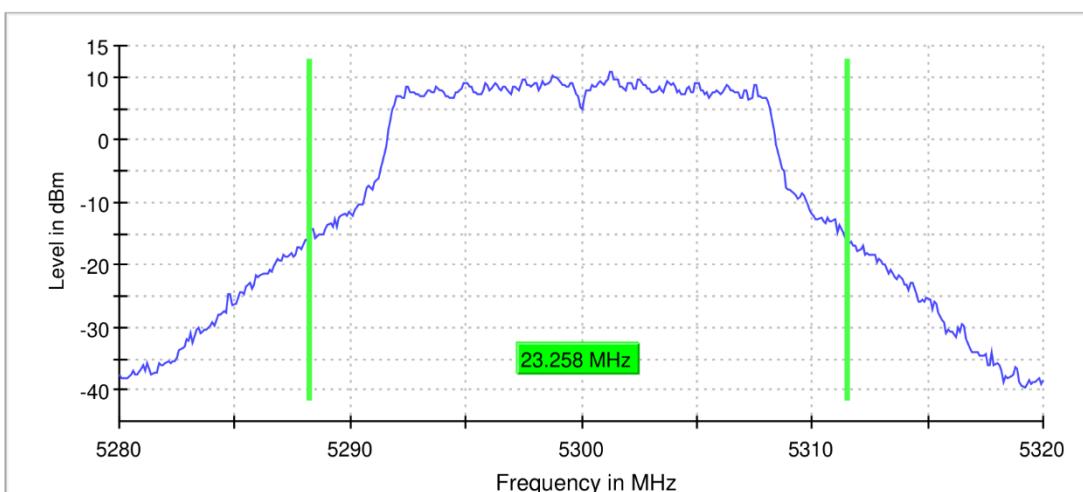
11A _ANT6_5320

26 dB Bandwidth
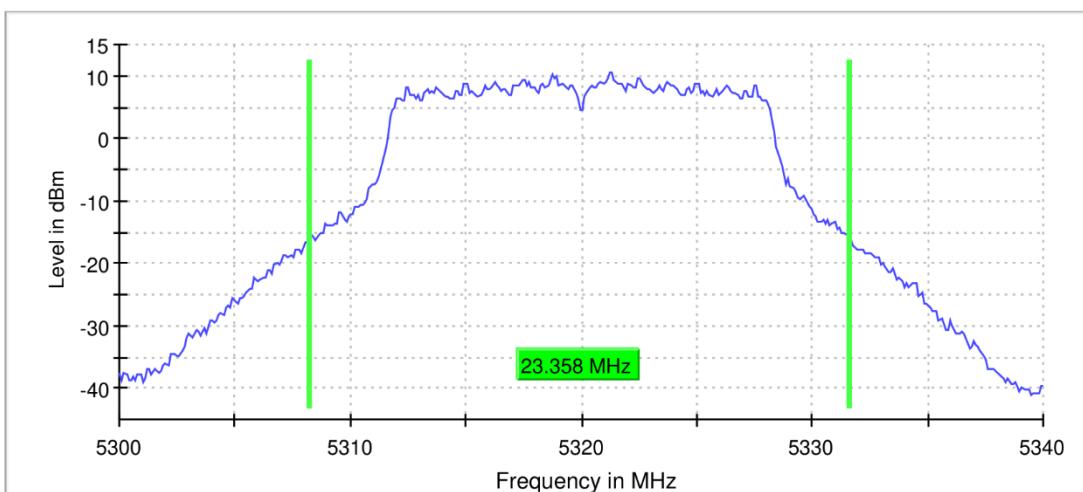
11A _ANT6_5500

26 dB Bandwidth


11A _ANT6_5580

26 dB Bandwidth

11A _ANT6_5700

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26 dB Bandwidth

22.657 MHz

11A _ANT6_5720

26 dB Bandwidth

23.158 MHz

11N20_ANT6_5180

26 dB Bandwidth
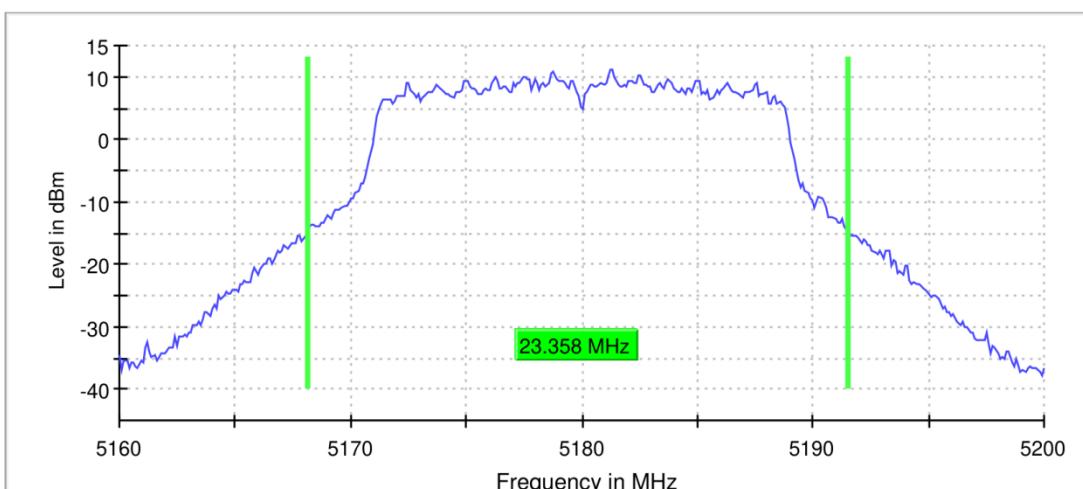
11N20 _ANT6_5200

26 dB Bandwidth
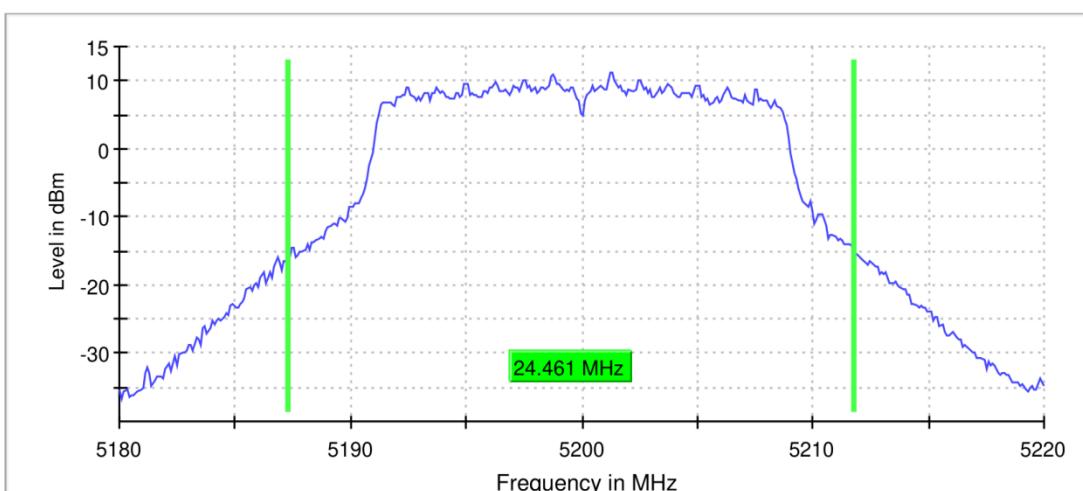
11N20 _ANT6_5240

26 dB Bandwidth

23.860 MHz
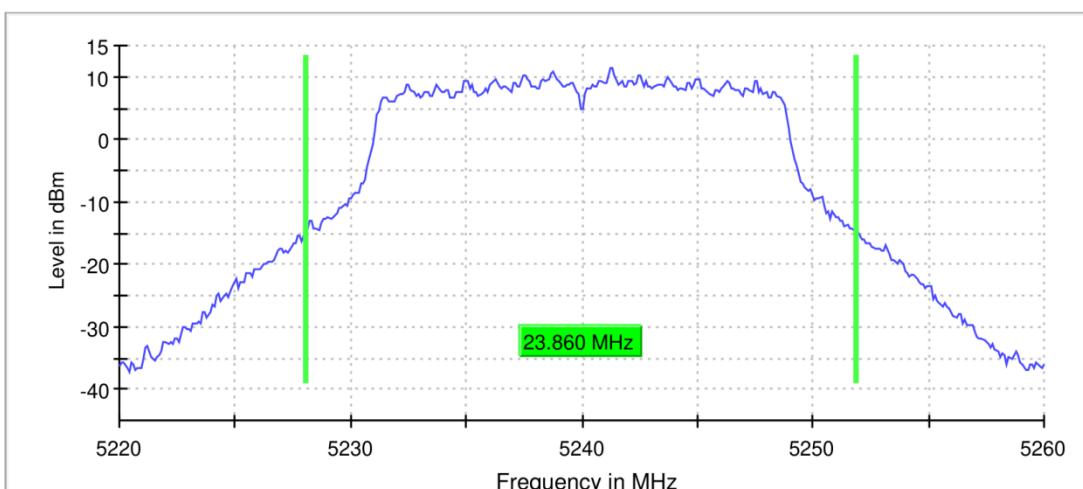
11N20 _ANT6_5260

26 dB Bandwidth

24.060 MHz
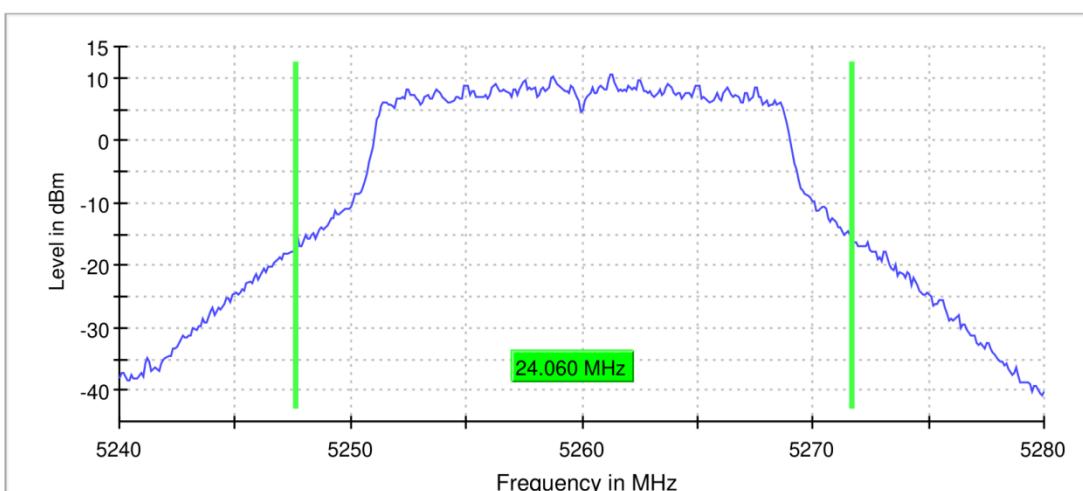
11N20_ANT6_5300

26 dB Bandwidth

23.860 MHz
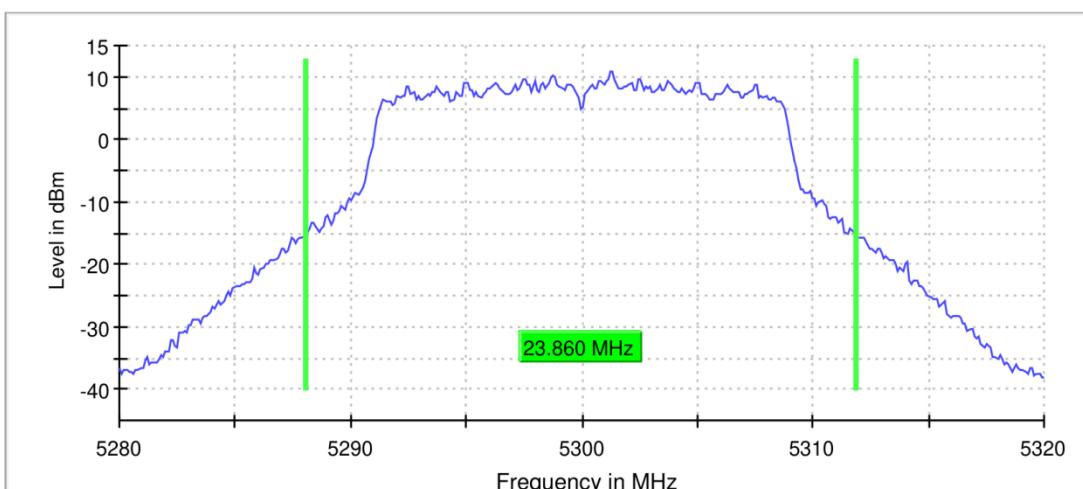
11N20 _ANT6_5320

26 dB Bandwidth

23.759 MHz
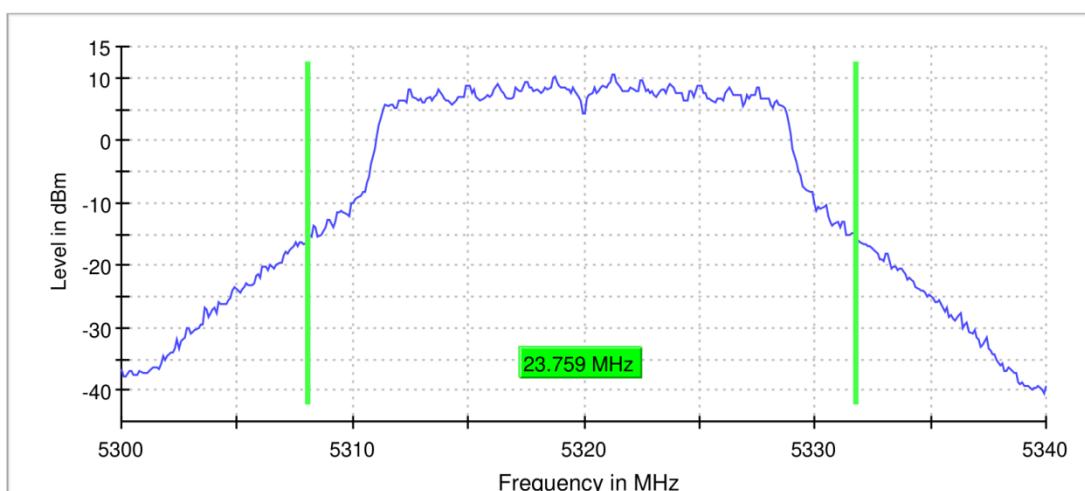
11N20 _ANT6_5500

26 dB Bandwidth
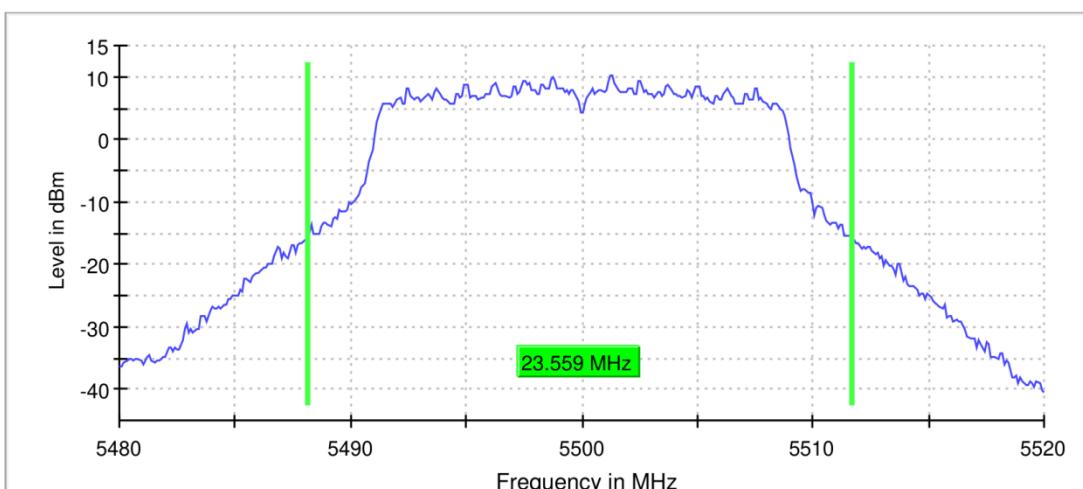
11N20_ANT6_5580

26 dB Bandwidth
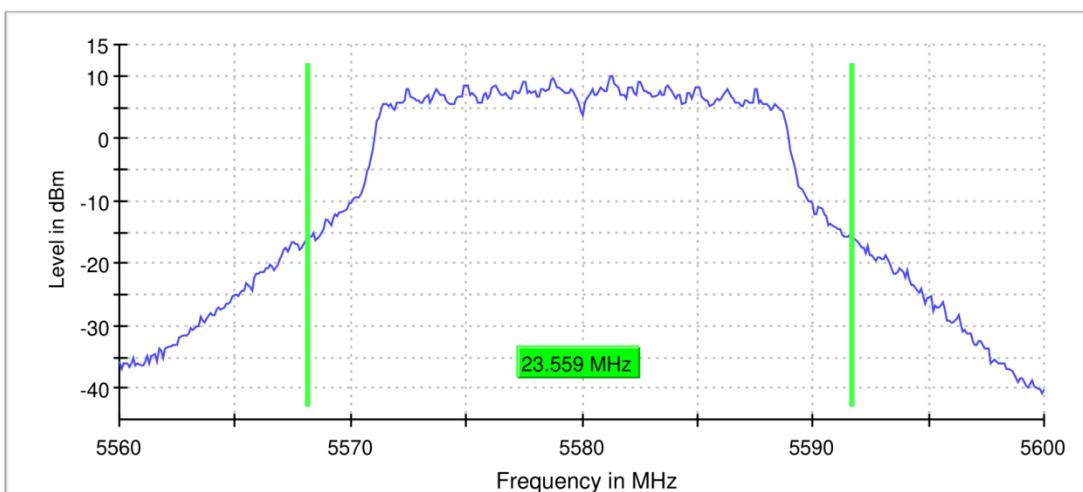
11N20_ANT6_5700

26 dB Bandwidth
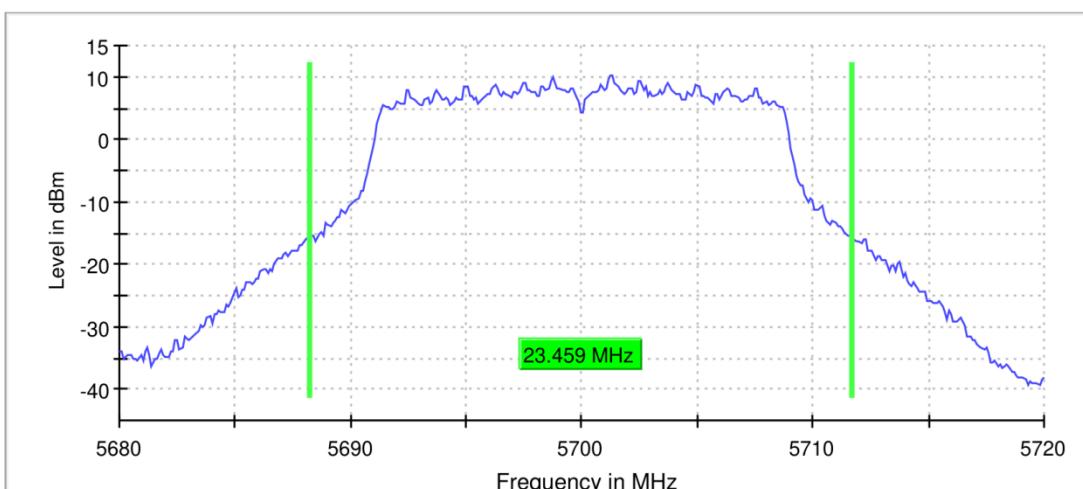
11N20_ANT6_5720

26 dB Bandwidth
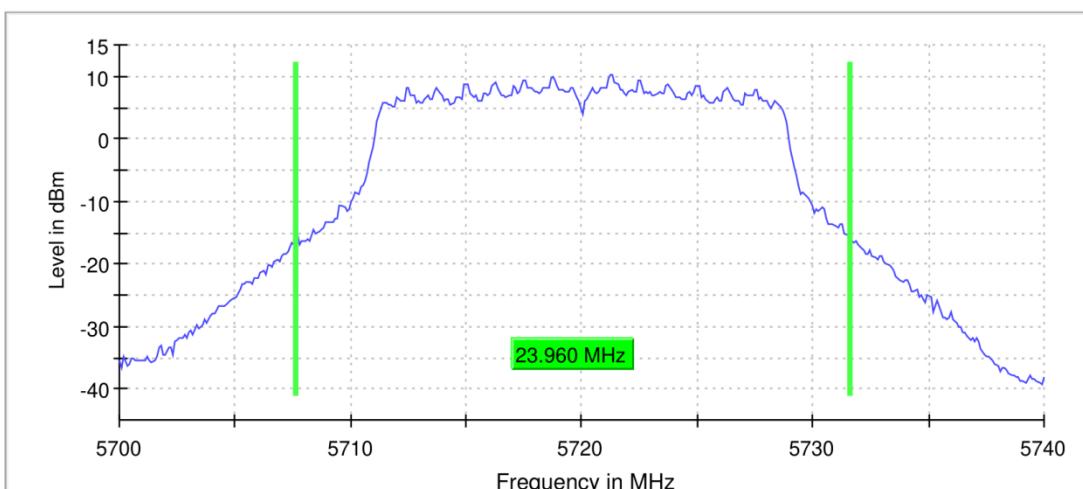
11N40 _ANT6_5190

26 dB Bandwidth
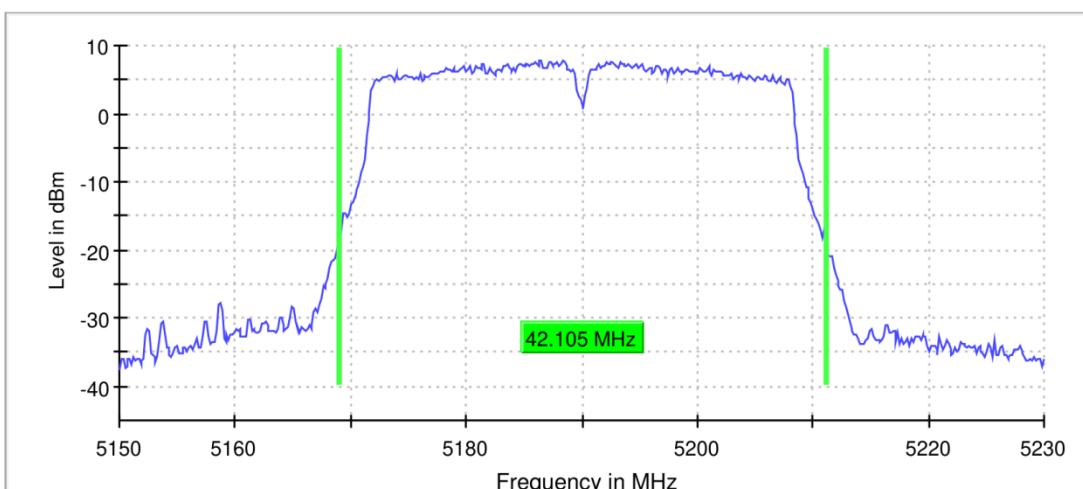
11N40 _ANT6_5230

26 dB Bandwidth
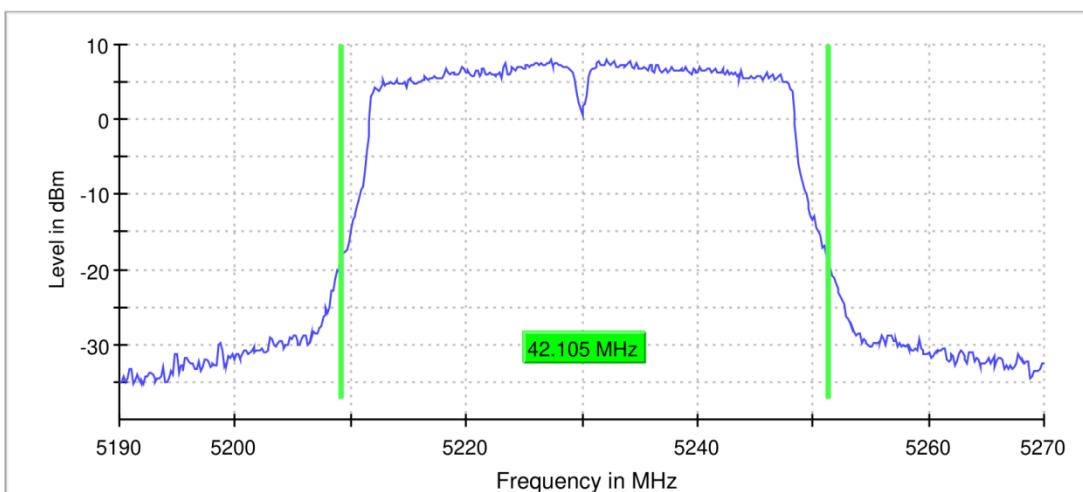
11N40 _ANT6_5270

26 dB Bandwidth

41.955 MHz
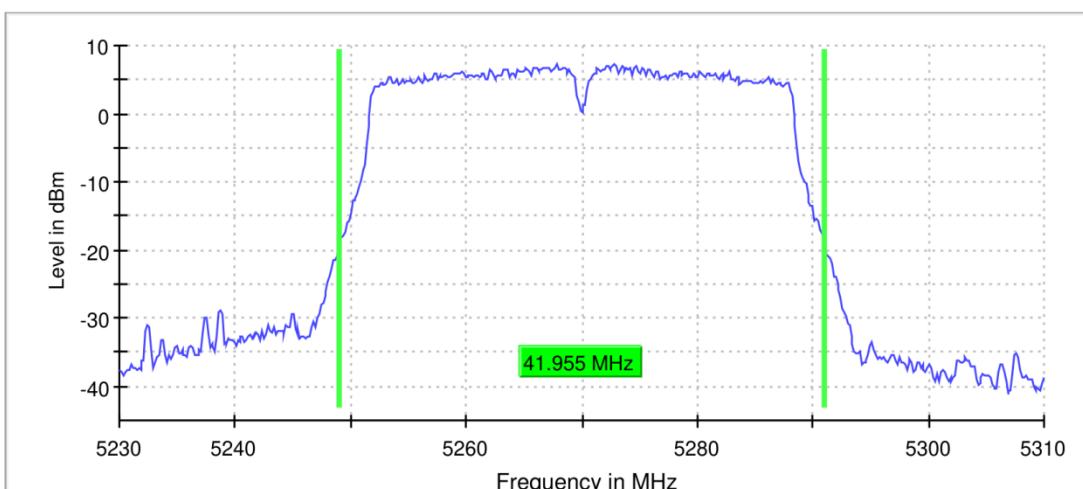
11N40 _ANT6_5310

26 dB Bandwidth
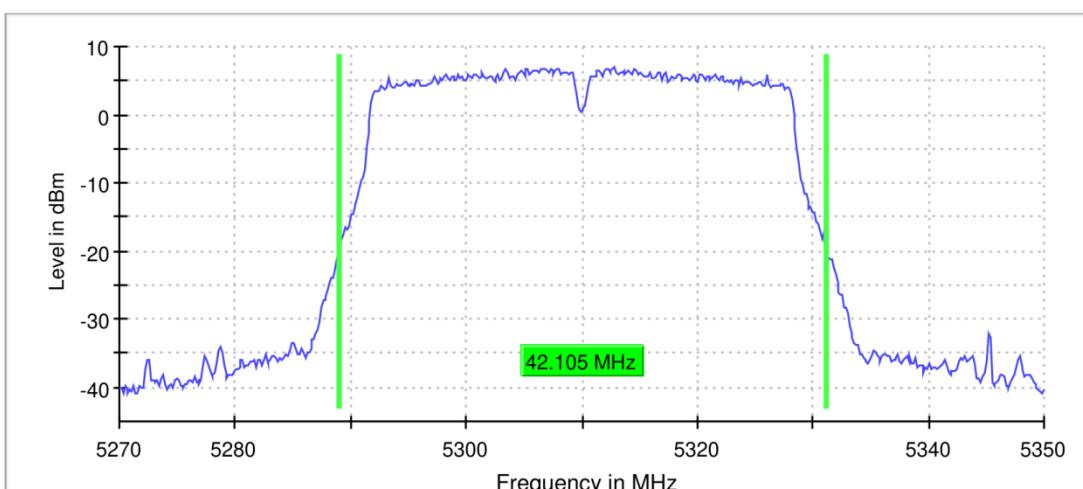
42.105 MHz

11N40 _ANT6_5510

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26 dB Bandwidth

41.955 MHz
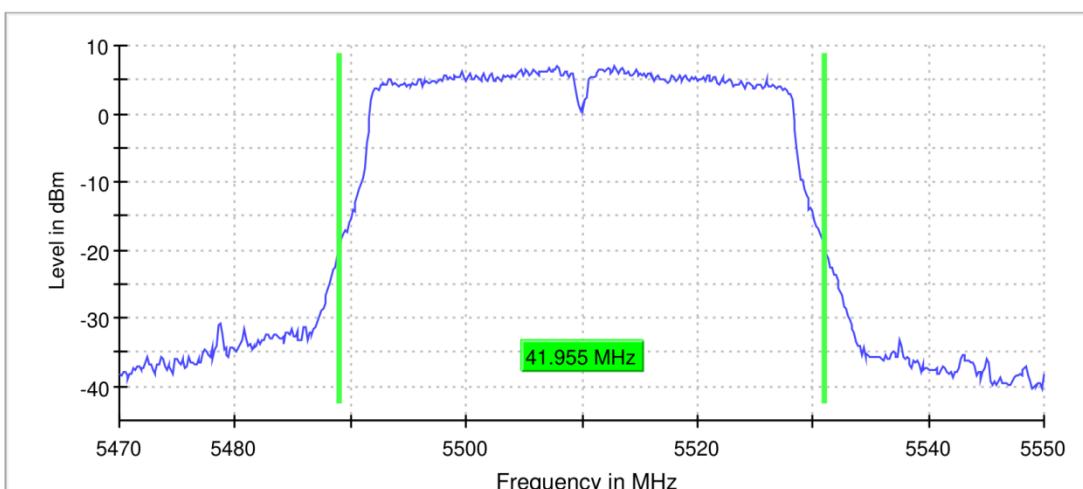
11N40 _ANT6_5550

26 dB Bandwidth
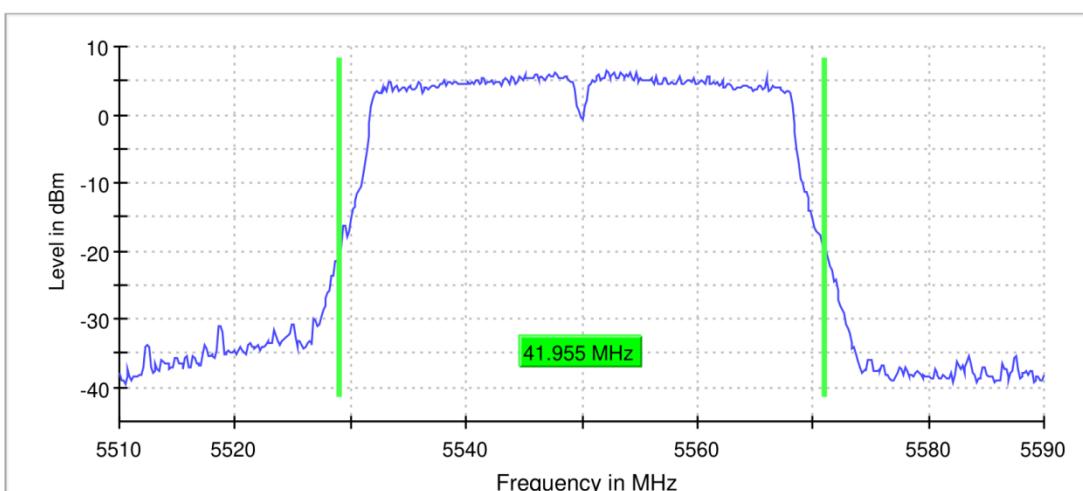
41.955 MHz

11N40 _ANT6_5670

26 dB Bandwidth

41.955 MHz
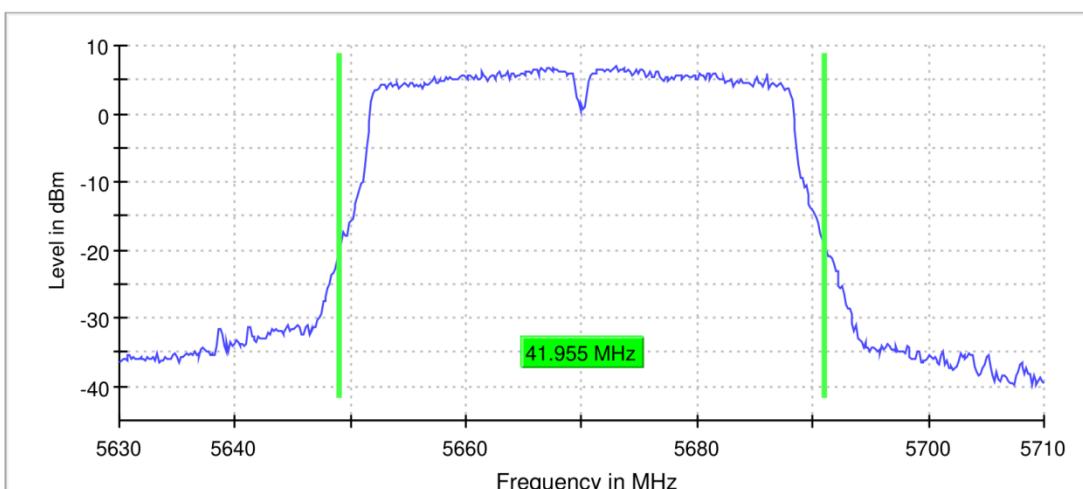
11N40 _ANT6_5710

26 dB Bandwidth
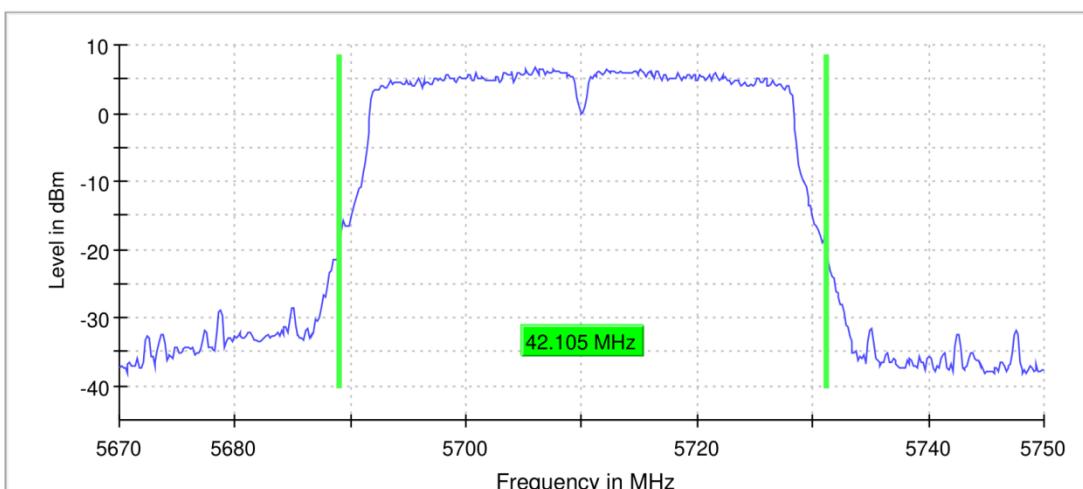
42.105 MHz

11AC80 _ANT6_5210

26 dB Bandwidth
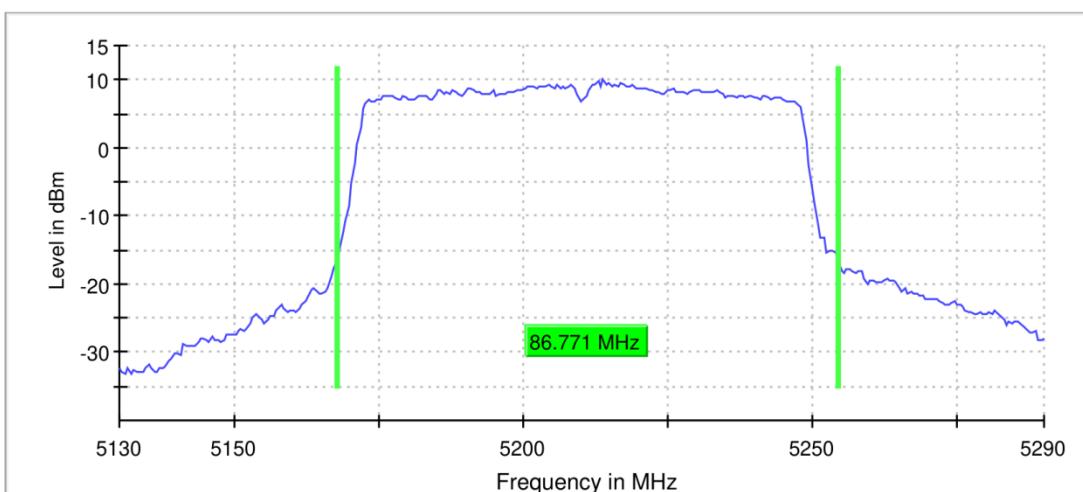
11AC80 _ANT6_5290

26 dB Bandwidth
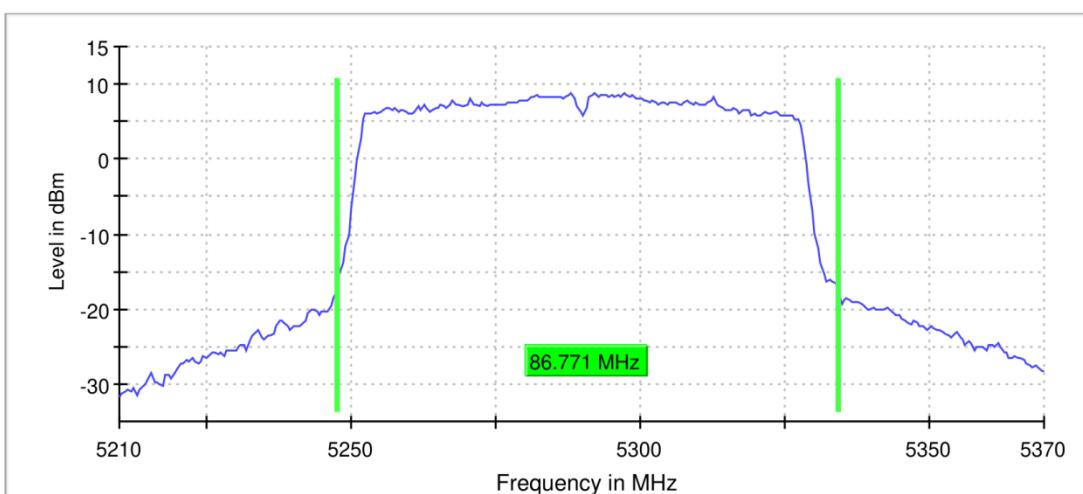
11AC80 _ANT6_5530

26 dB Bandwidth
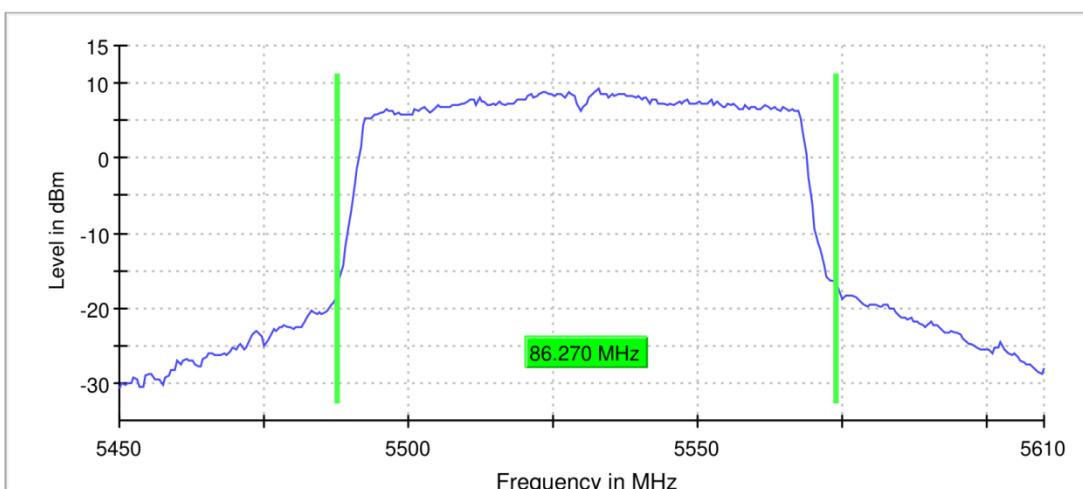
11AC80 _ANT6_5610

26 dB Bandwidth

11AC80 _ANT6_5690

26 dB Bandwidth

20M

RBW300 KHz

VBW 1 MHz

40M

RBW500 KHz

VBW 2 MHz

80M

RBW 1.000 MHz

VBW 3.000 MHz
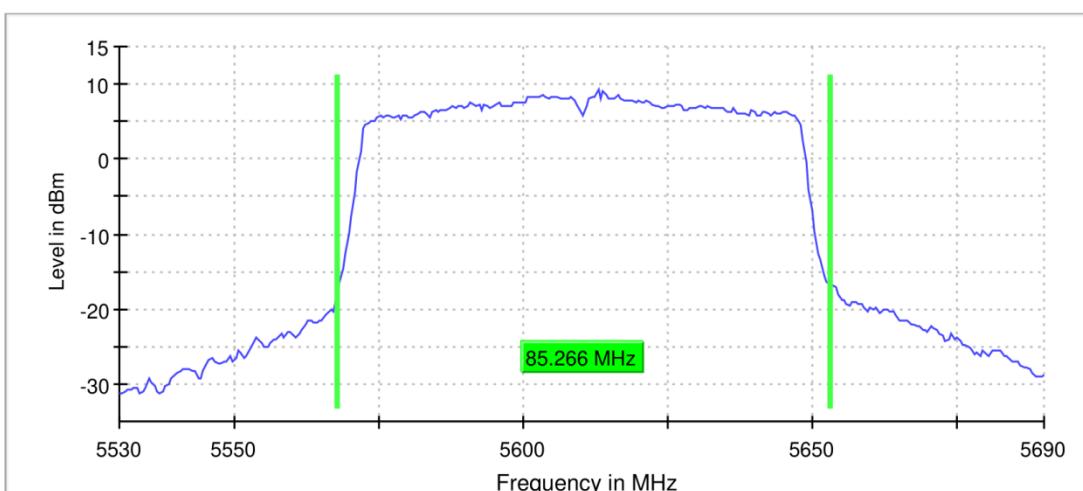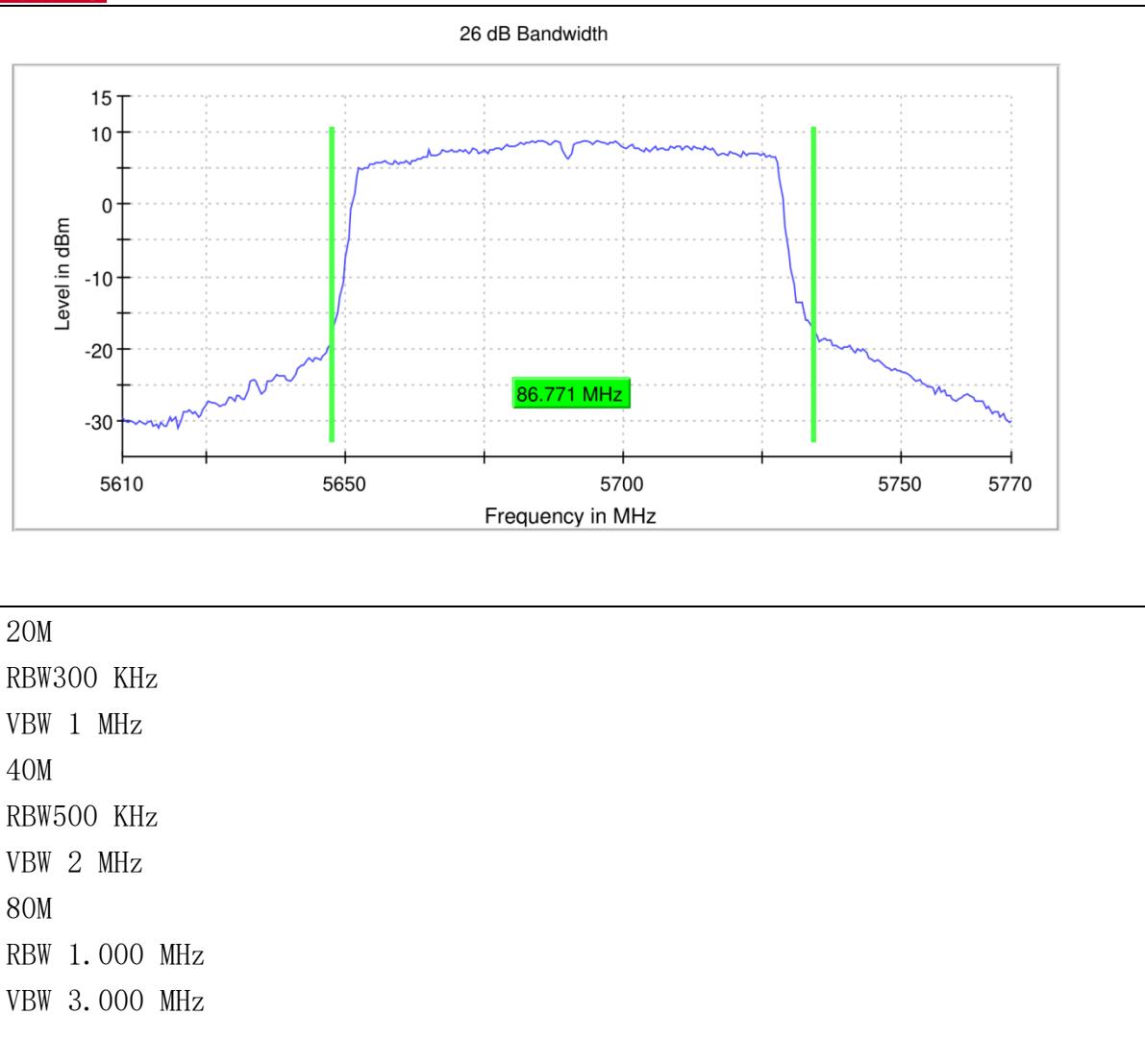
OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

TestMode	Antenna	Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	ANT6	5180	16.642	5171.729	5188.371	———	———
	ANT6	5200	16.742	5191.629	5208.371	———	———

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	ANT6	5240	16.642	5231.729	5248.371	---	----
	ANT6	5260	16.742	5251.629	5268.371	---	----
	ANT6	5300	16.742	5291.629	5308.371	---	----
	ANT6	5320	16.742	5311.629	5328.371	---	----
	ANT6	5500	16.742	5491.629	5508.371	---	----
	ANT6	5580	16.742	5571.629	5588.371	---	----
	ANT6	5700	16.742	5691.629	5708.371	---	----
	ANT6	5720	16.742	5711.629	5728.371	---	----
	ANT6	5745	16.742	5736.629	5753.371	---	----
	ANT6	5785	16.742	5776.629	5793.371	---	----
	ANT6	5825	16.742	5816.629	5833.371	---	----
11N20	ANT6	5180	17.845	5171.028	5188.873	---	----
	ANT6	5200	17.845	5191.028	5208.873	---	----
	ANT6	5240	17.845	5231.128	5248.973	---	----
	ANT6	5260	17.845	5251.128	5268.973	---	----
	ANT6	5300	17.845	5291.128	5308.973	---	----
	ANT6	5320	17.845	5311.128	5328.973	---	----
	ANT6	5500	17.845	5491.028	5508.873	---	----

	ANT6	5580	17.845	5571.028	5588.873	---- ----
	ANT6	5700	17.845	5691.128	5708.973	---- ----
	ANT6	5720	17.845	5711.028	5728.873	---- ----
	ANT6	5745	17.945	5736.028	5753.973	---- ----
	ANT6	5785	17.744	5776.128	5793.872	---- ----
	ANT6	5825	17.845	5816.028	5833.873	---- ----
11N40	ANT6	5190	36.614	5171.567	5208.181	---- ----
	ANT6	5230	36.614	5211.818	5248.432	---- ----
	ANT6	5270	36.614	5251.818	5288.432	---- ----
	ANT6	5310	36.364	5291.818	5328.182	---- ----
	ANT6	5510	36.364	5491.818	5528.182	---- ----
	ANT6	5550	36.614	5531.818	5568.432	---- ----
	ANT6	5670	36.364	5651.818	5688.182	---- ----
	ANT6	5710	36.865	5691.567	5728.432	---- ----
	ANT6	5755	36.614	5736.567	5773.181	---- ----
	ANT6	5795	36.614	5776.818	5813.432	---- ----
11AC80	ANT6	5210	76.238	5172.132	5248.370	---- ----
	ANT6	5290	75.737	5252.132	5327.869	---- ----

ANT6	5530	76.238	5492.132	5568.370	———	———
ANT6	5610	76.238	5572.132	5648.370	———	———
ANT6	5690	76.238	5652.132	5728.370	———	———
ANT6	5775	76.238	5737.132	5813.370	———	———

TEST GRAPHS

11A_ANT6_5180

99 % Bandwidth

16.642 MHz

11A _ANT6_5200

99 % Bandwidth

16.742 MHz
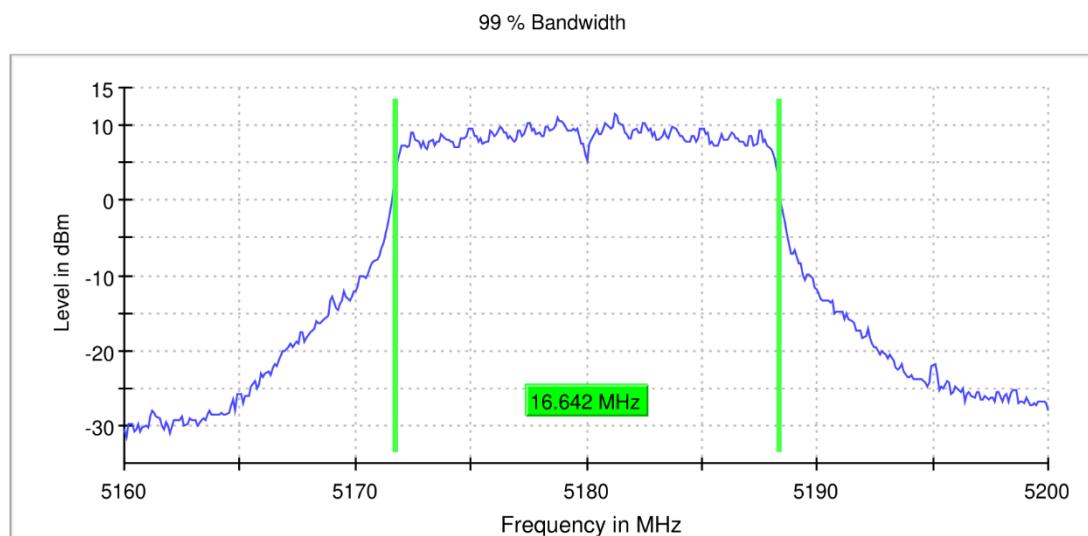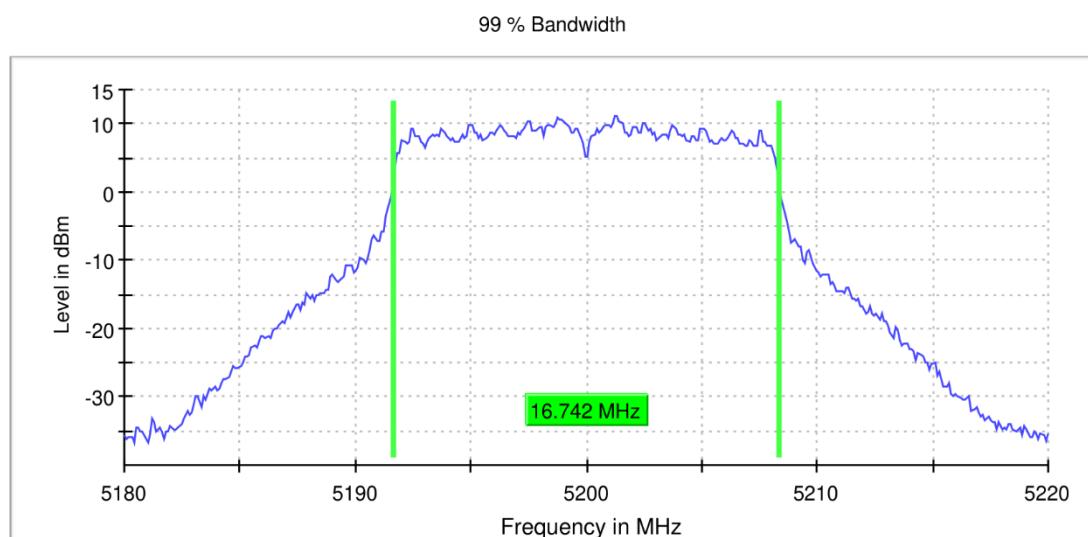
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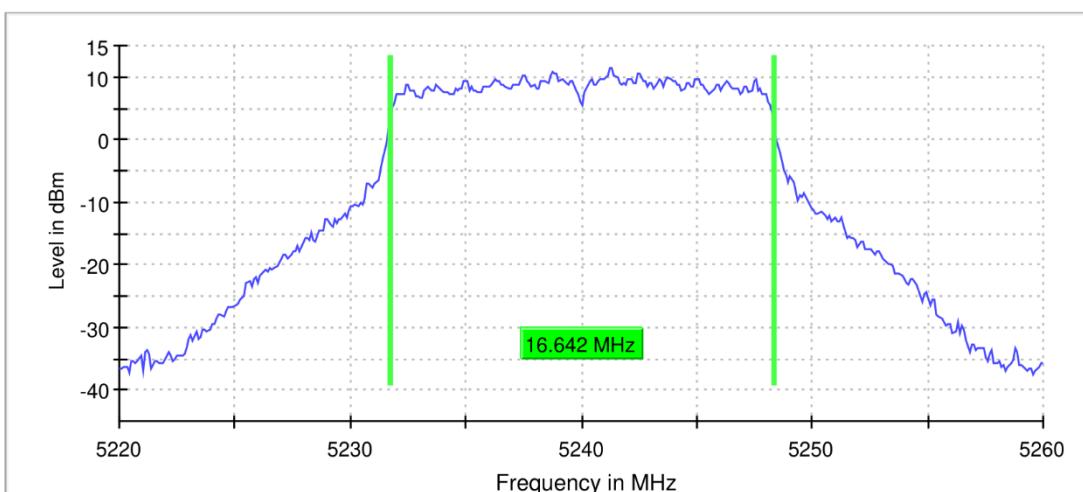
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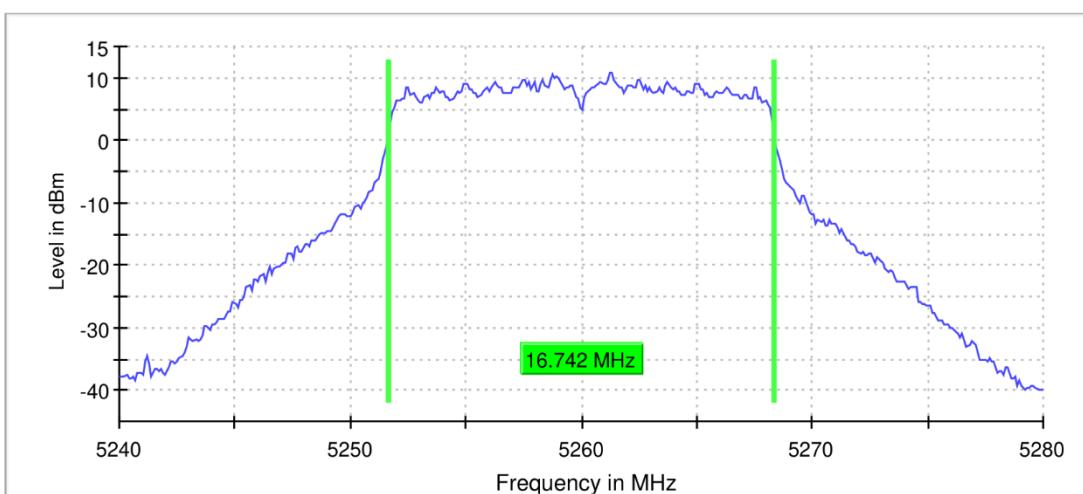
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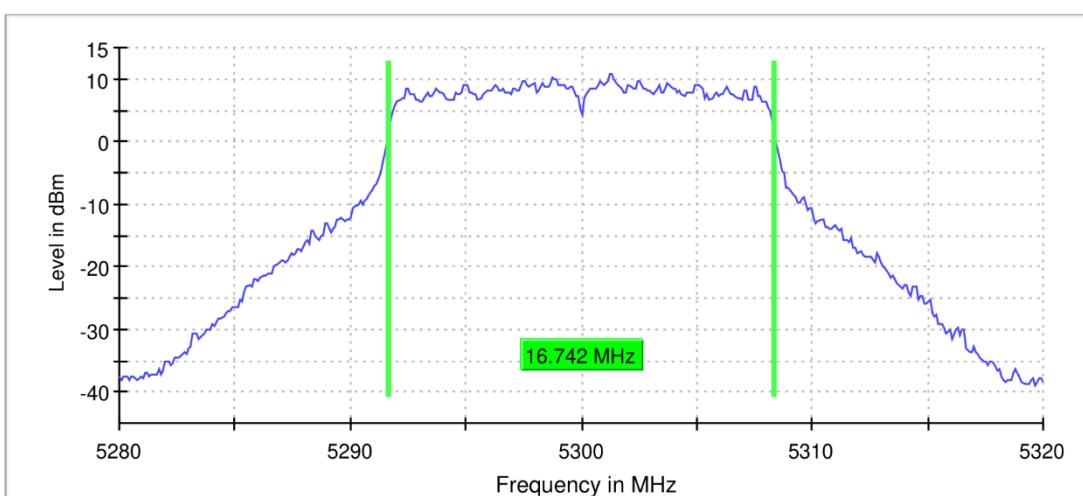
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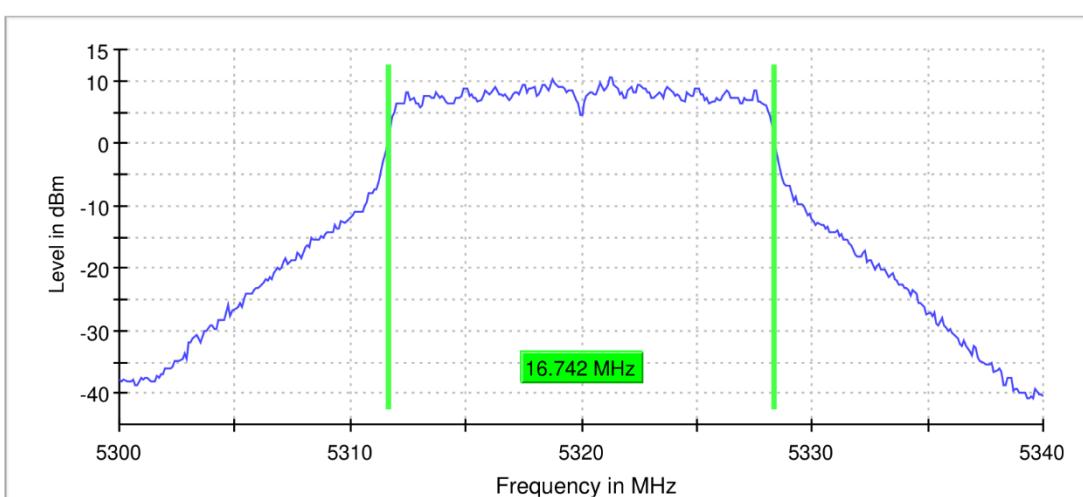
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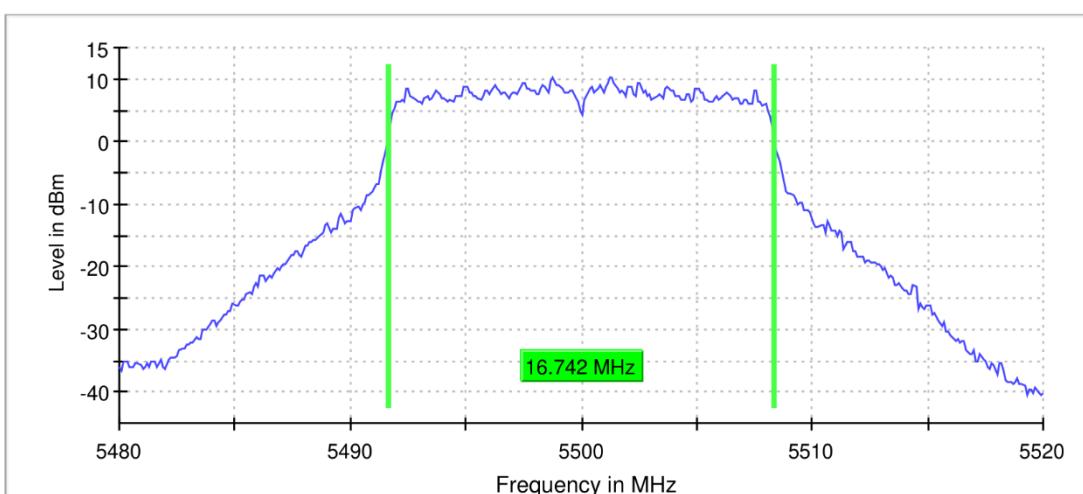
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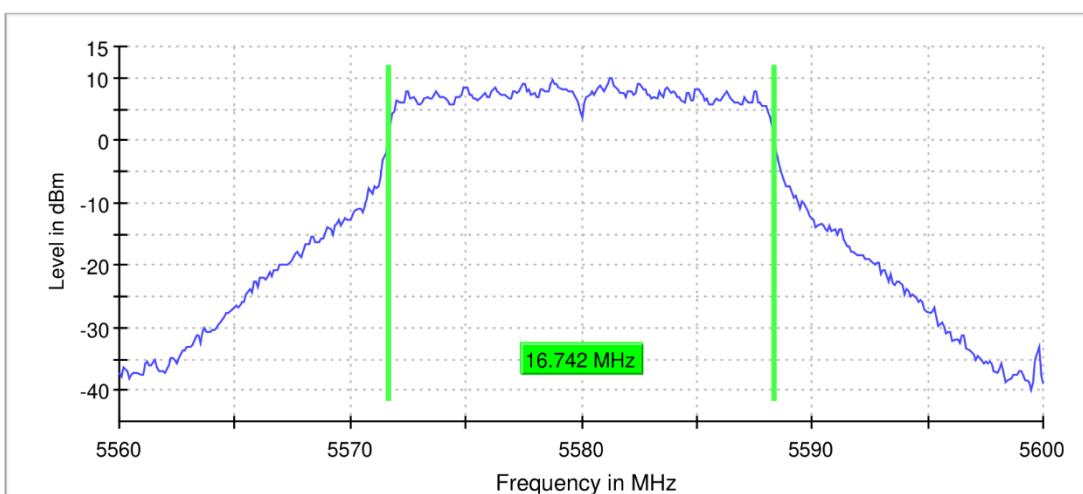
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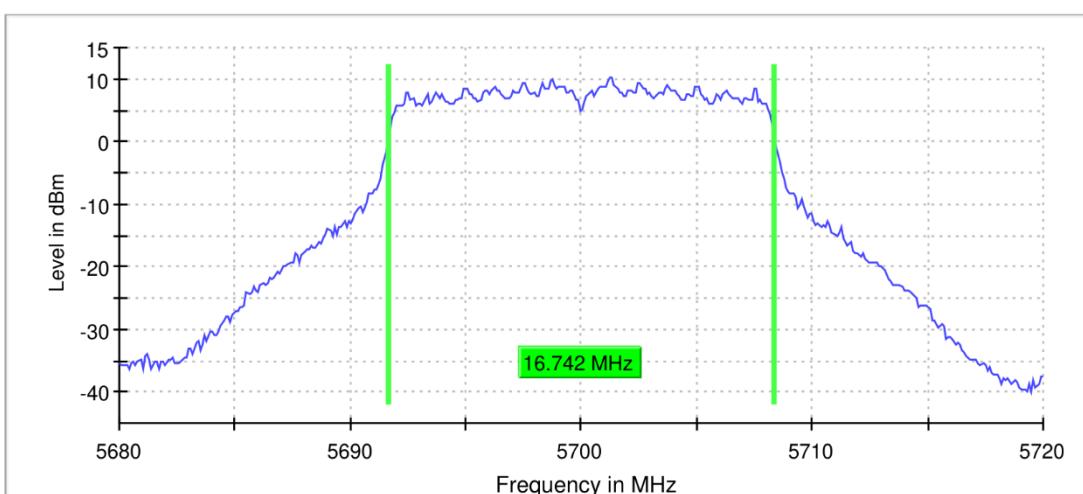
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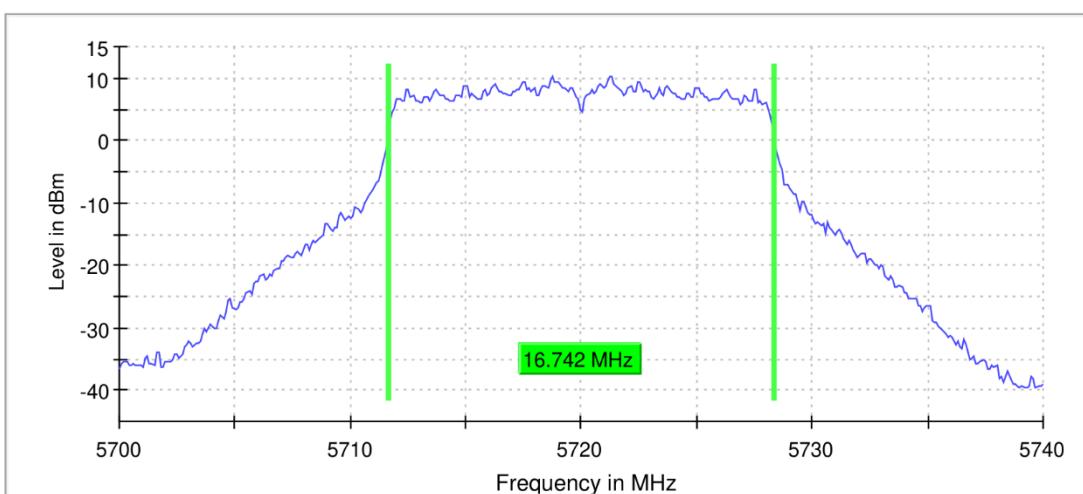
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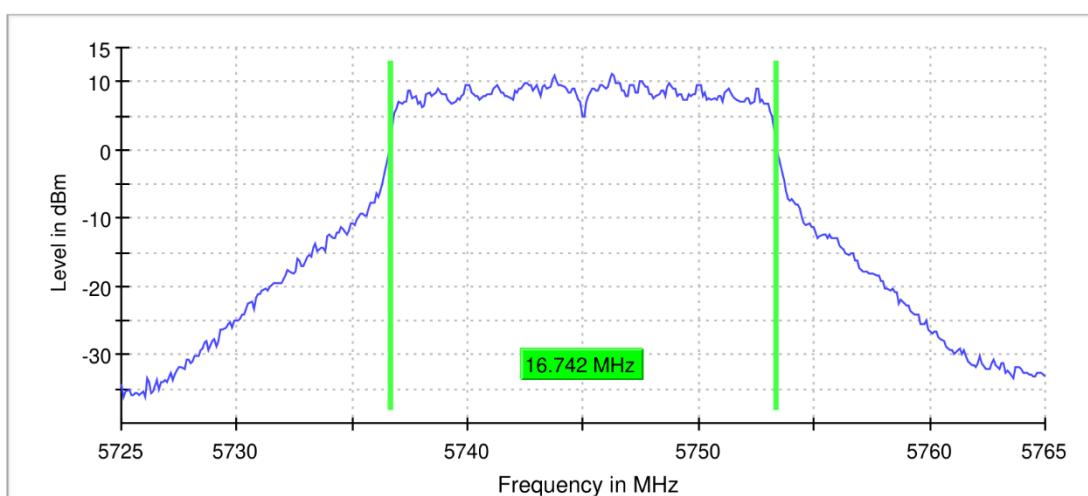
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11A_ANT6_5825

11N20_ANT6_5180

11N20 _ANT6_5200

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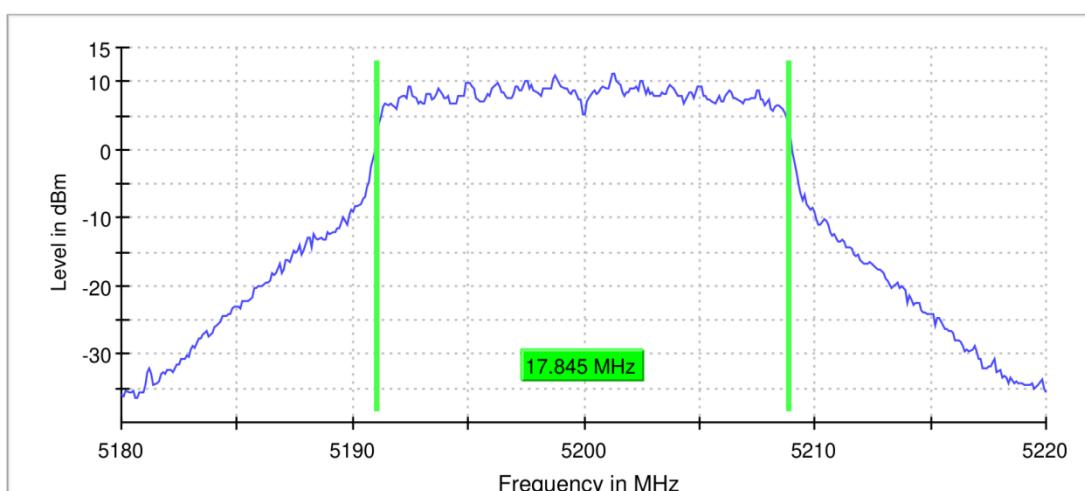
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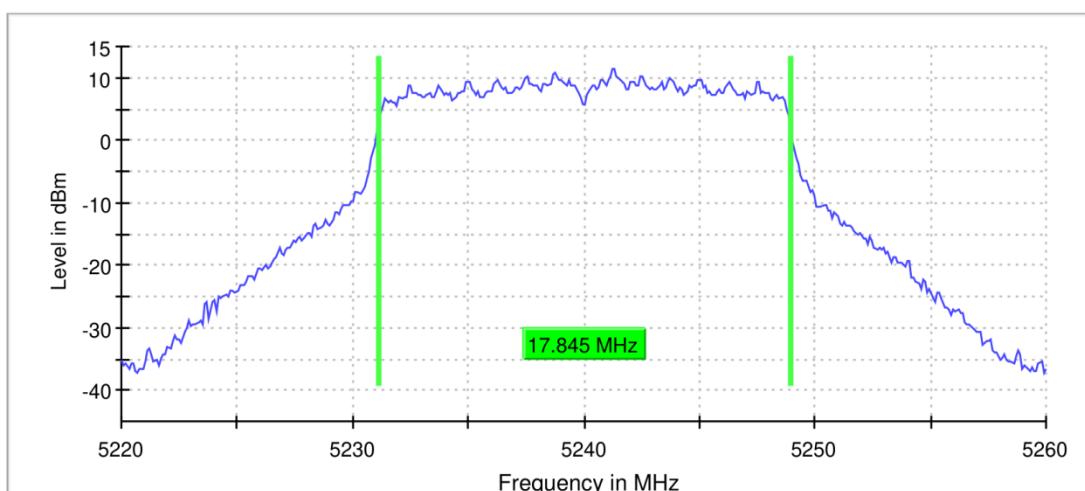
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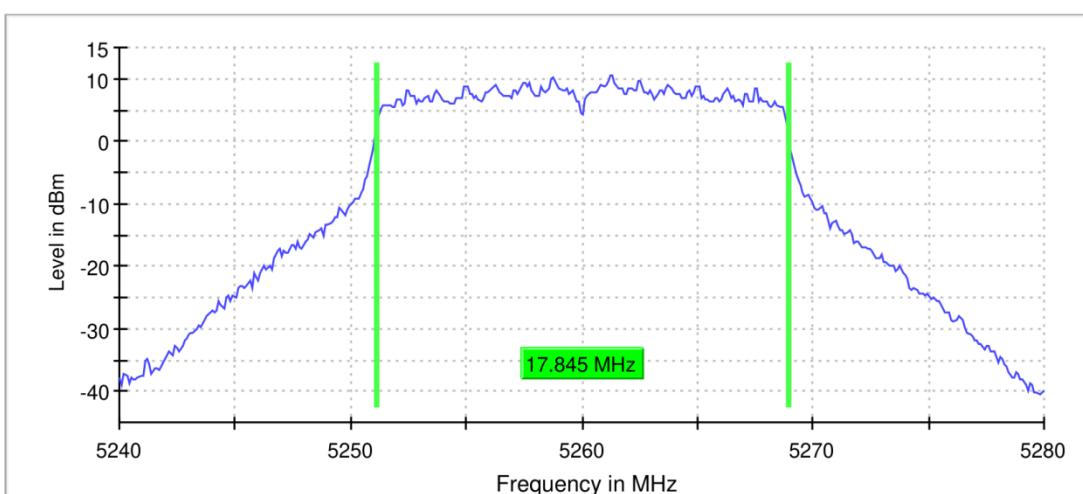
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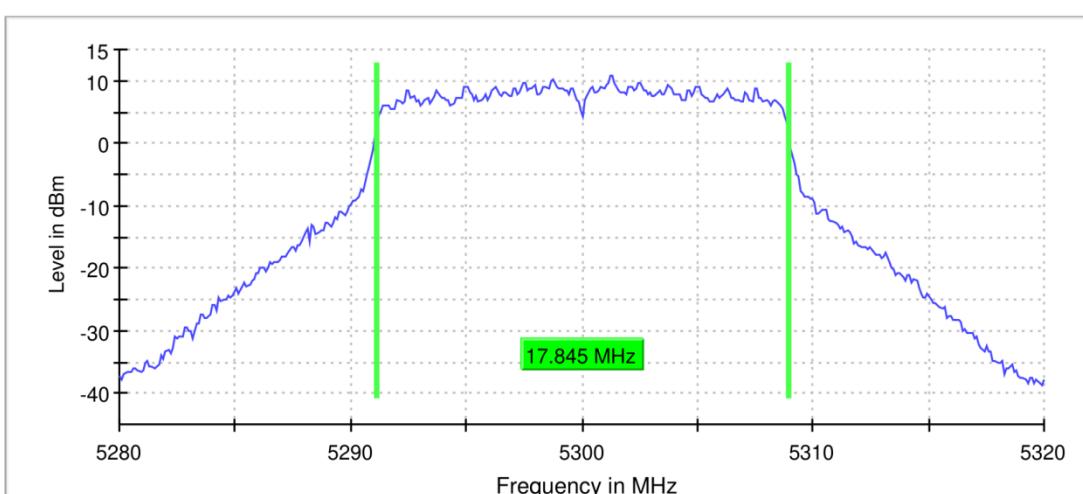
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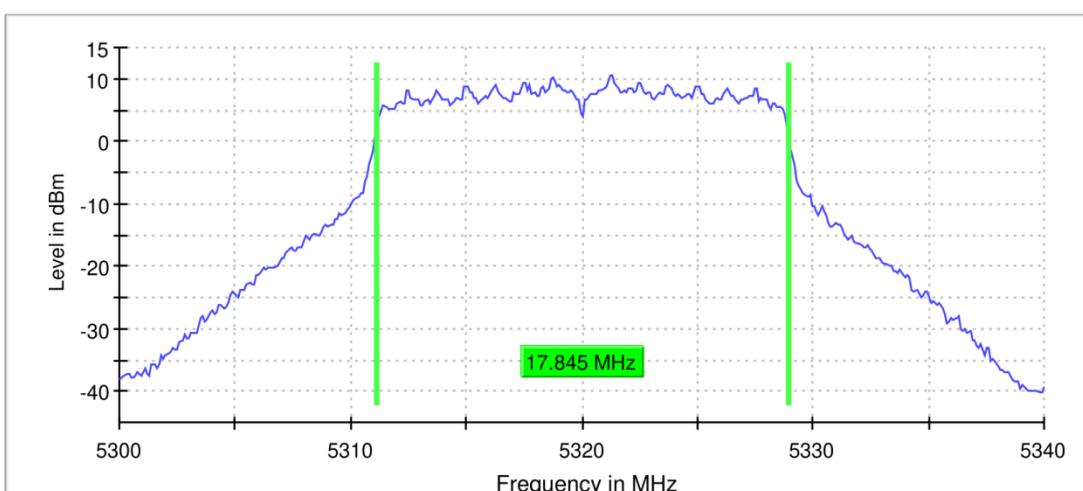
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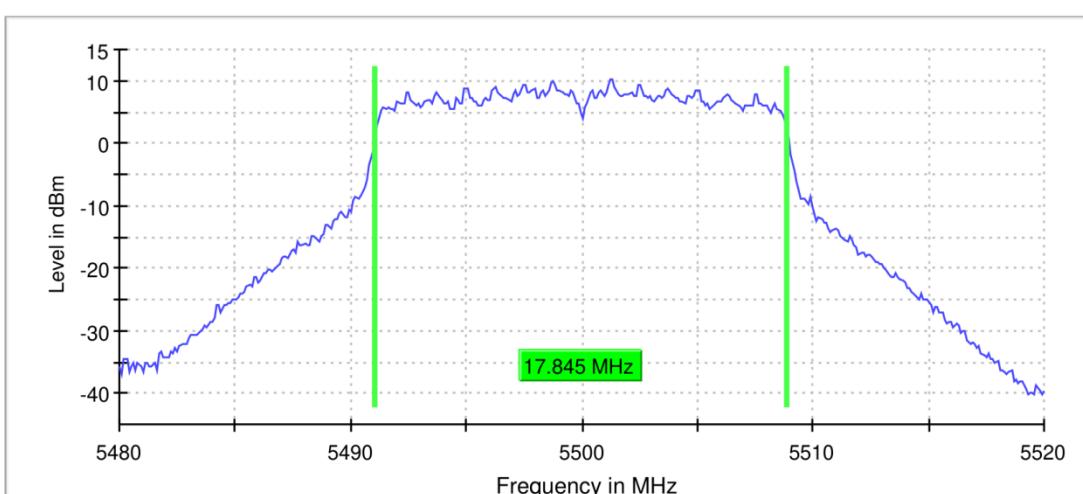

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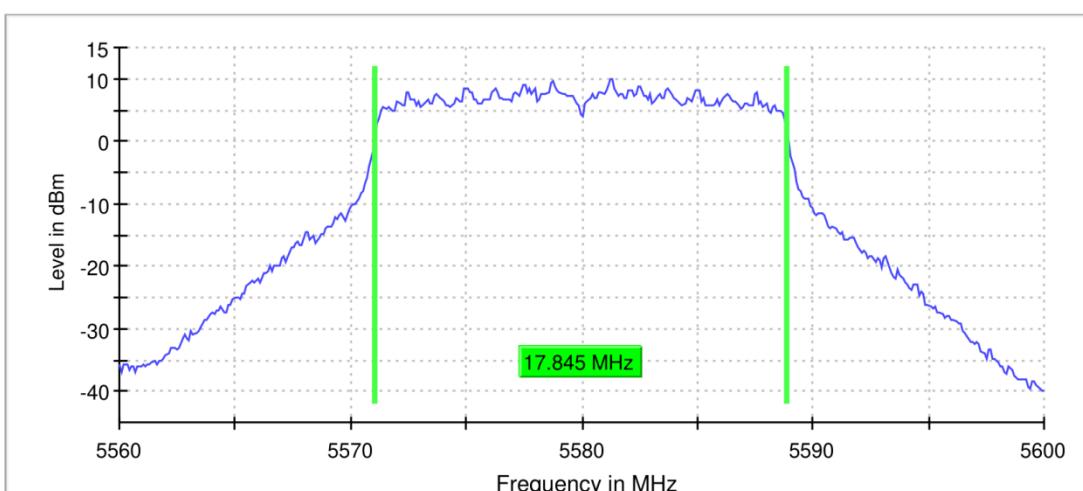
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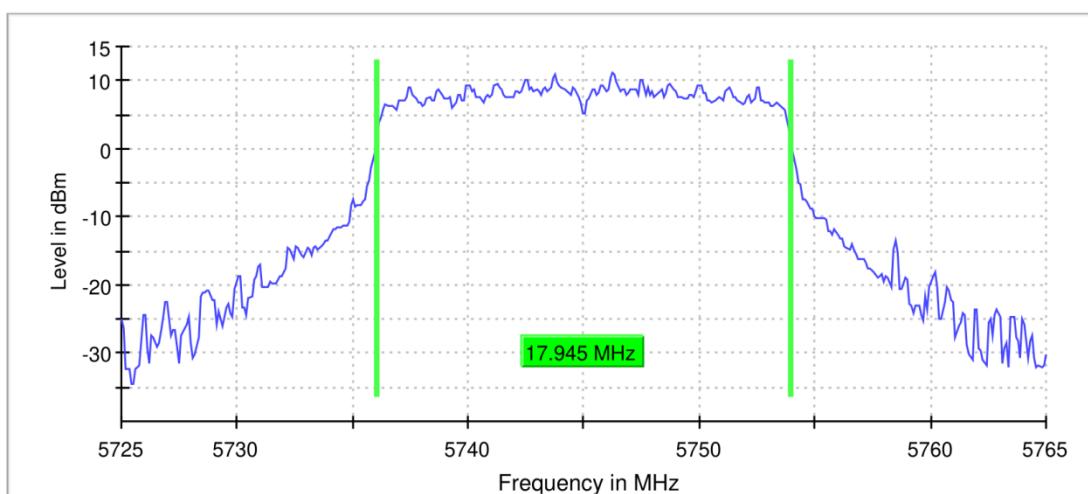
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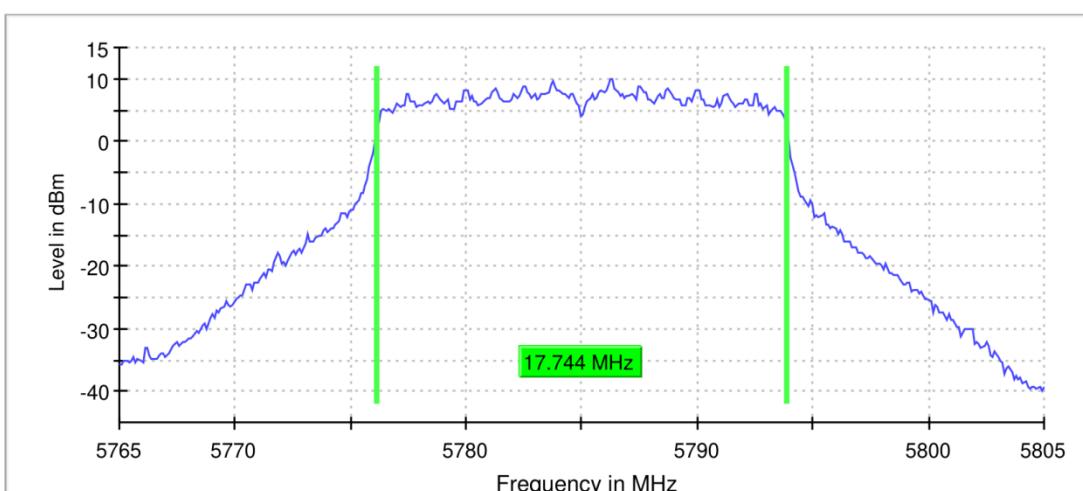
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