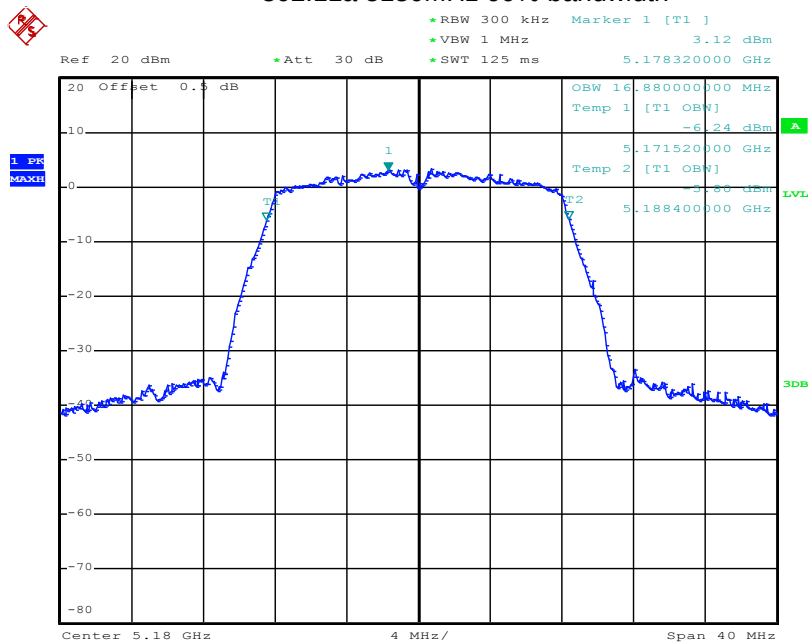


Mode	Channel	Frequency (MHz)	99% bandwidth(M Hz)	26dB bandwidth (MHz)	Limit MHz	Result
			ANT C	ANT C		
802.11a	CH36	5180	16.80	20.40	N/A	Pass
	CH40	5200	16.80	20.40	N/A	Pass
	CH48	5240	16.80	20.40	N/A	Pass
802.11 n20	CH36	5180	17.76	20.56	N/A	Pass
	CH40	5200	17.76	20.56	N/A	Pass
	CH48	5240	17.76	20.64	N/A	Pass
802.11 n40	CH 38	5190	36.36	42.12	N/A	Pass
	CH 46	5230	36.36	41.76	N/A	Pass
802.11 ac20	CH36	5180	17.76	20.64	N/A	Pass
	CH40	5200	17.76	20.56	N/A	Pass
	CH48	5240	17.76	20.48	N/A	Pass
802.11 ac40	CH 38	5190	36.24	41.64	N/A	Pass
	CH 46	5230	36.36	41.52	N/A	Pass
802.11 ac80	CH 42	5210	75.60	81.12	N/A	Pass

Mode	Channel	Frequency (MHz)	99% bandwidth(M Hz)	26dB bandwidth (MHz)	Limit MHz	Result
			ANT D	ANT D		
802.11a	CH36	5180	16.64	20.08	N/A	Pass
	CH40	5200	16.64	20.08	N/A	Pass
	CH48	5240	16.64	20.16	N/A	Pass
802.11 n20	CH36	5180	17.76	20.64	N/A	Pass
	CH40	5200	17.76	20.64	N/A	Pass
	CH48	5240	17.76	20.56	N/A	Pass
802.11 n40	CH 38	5190	36.36	41.64	N/A	Pass
	CH 46	5230	36.36	41.76	N/A	Pass
802.11 ac20	CH36	5180	17.76	20.56	N/A	Pass
	CH40	5200	17.76	20.64	N/A	Pass
	CH48	5240	17.76	20.56	N/A	Pass
802.11 ac40	CH 38	5190	36.36	41.28	N/A	Pass
	CH 46	5230	36.36	41.04	N/A	Pass
802.11 ac80	CH 42	5210	75.60	81.36	N/A	Pass

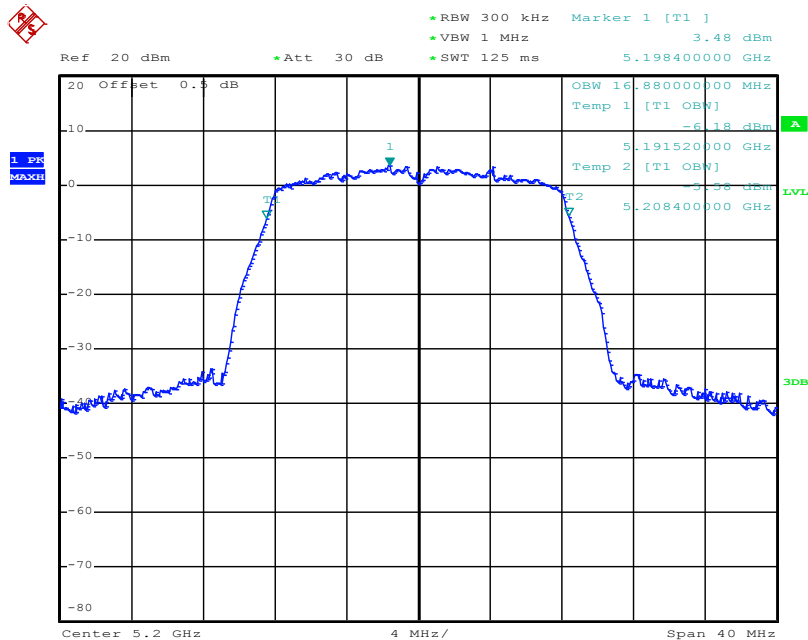
Test plot

802.11a 5180MHz 99% bandwidth



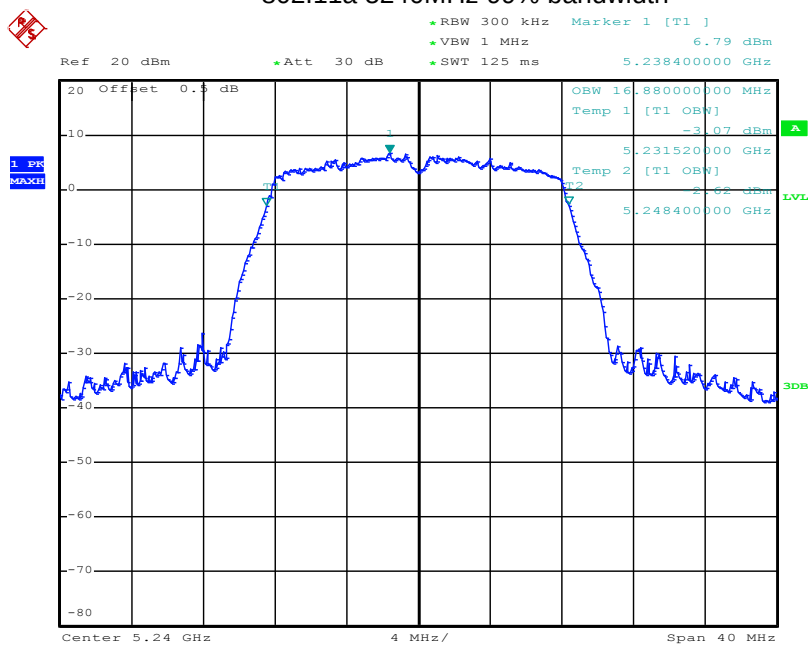
Date: 20.OCT.2021 11:31:35

802.11a 5200MHz 99% bandwidth



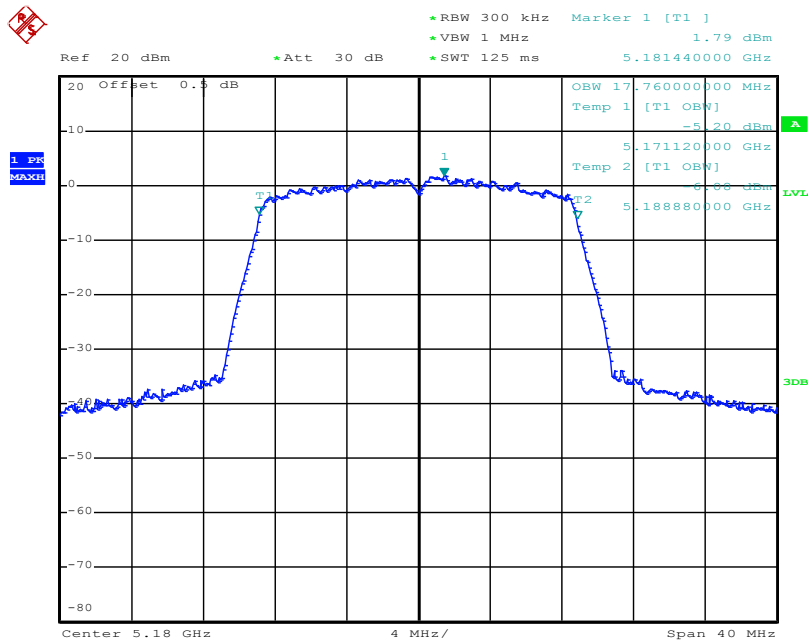
Date: 20.OCT.2021 11:33:54

802.11a 5240MHz 99% bandwidth



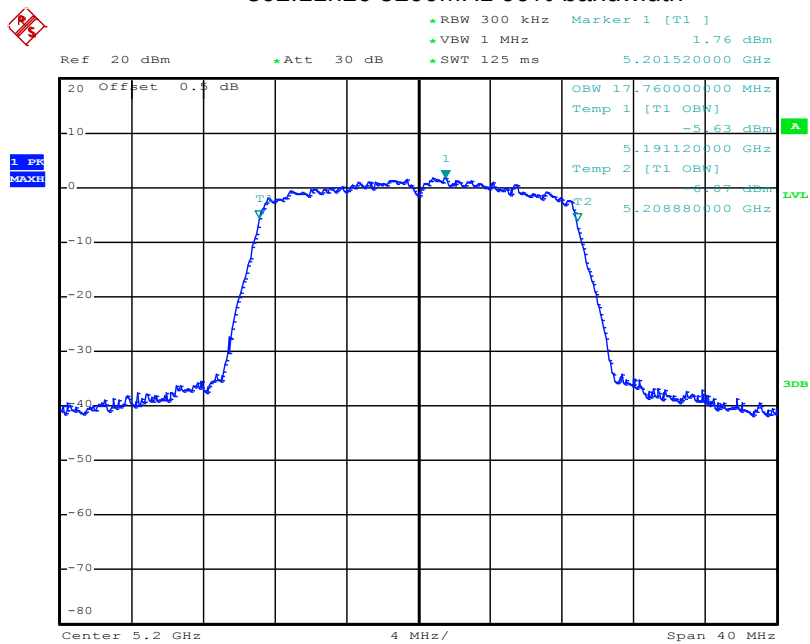
Date: 20.OCT.2021 11:34:32

802.11n20 5180MHz 99% bandwidth



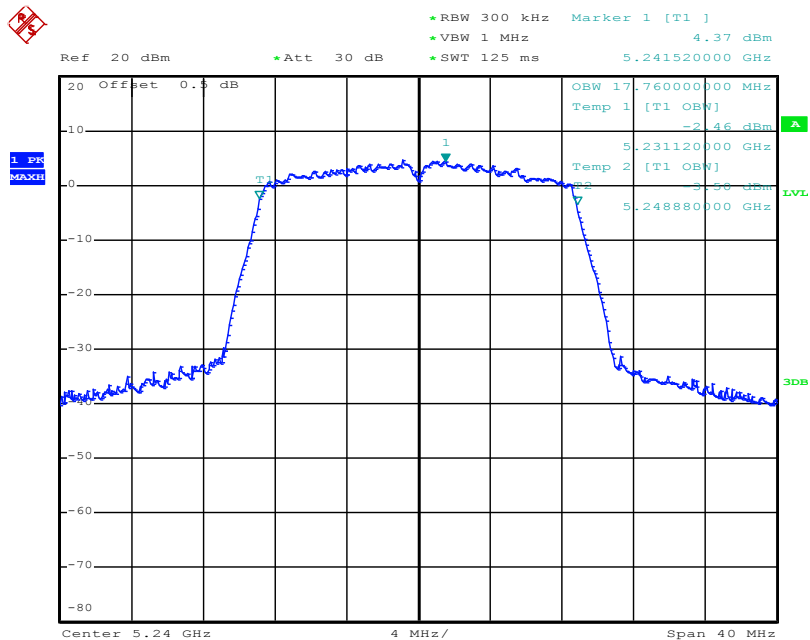
Date: 20.OCT.2021 11:32:02

802.11n20 5200MHz 99% bandwidth



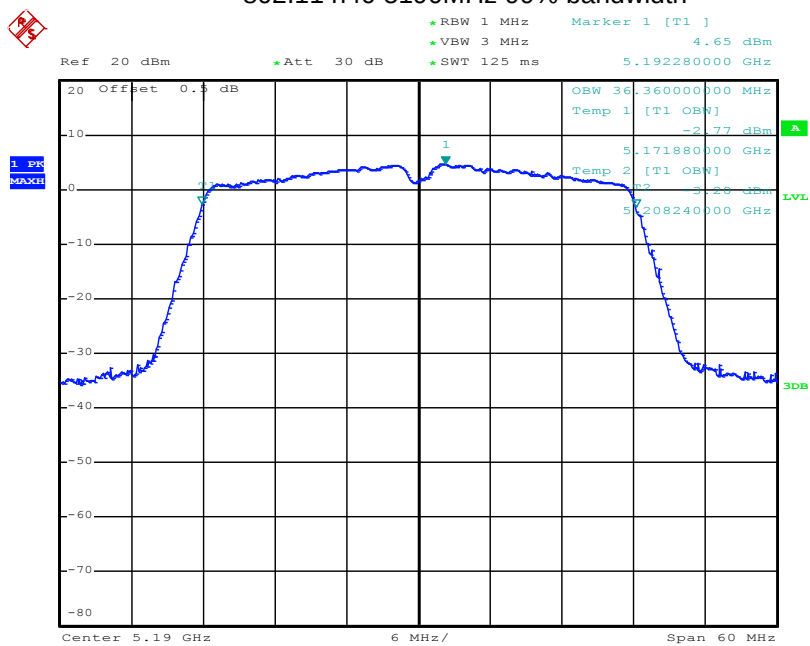
Date: 20.OCT.2021 11:33:13

802.11n20 5240MHz 99% bandwidth



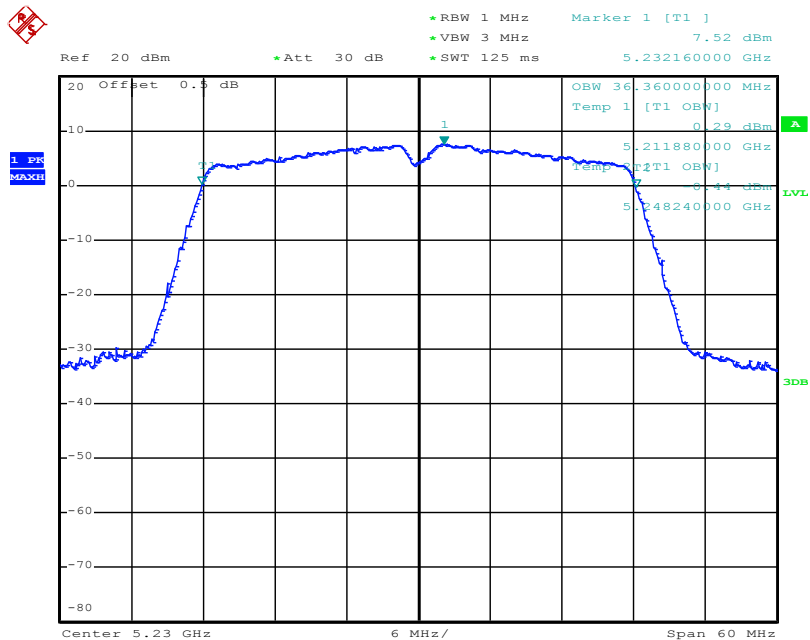
Date: 20.OCT.2021 11:35:50

802.11 n40 5190MHz 99% bandwidth



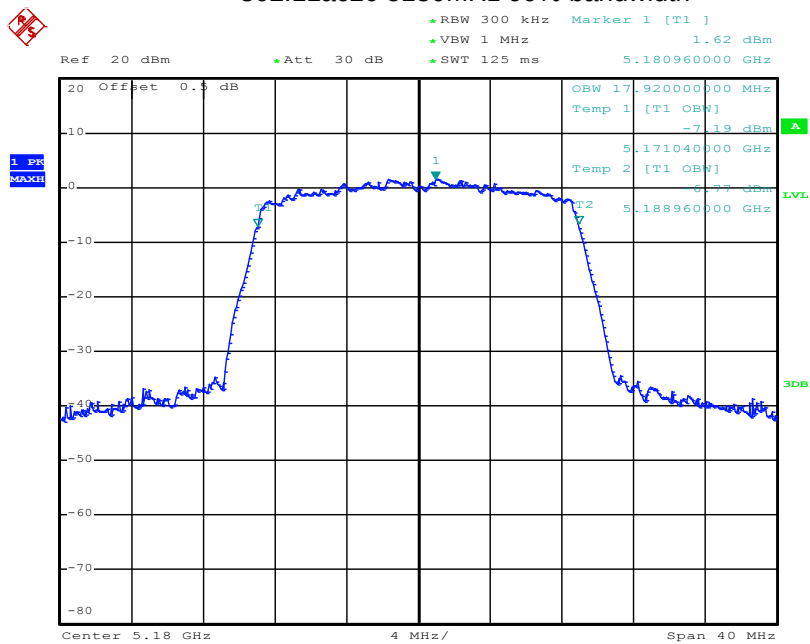
Date: 20.OCT.2021 11:38:34

802.11 n40 5230MHz 99% bandwidth



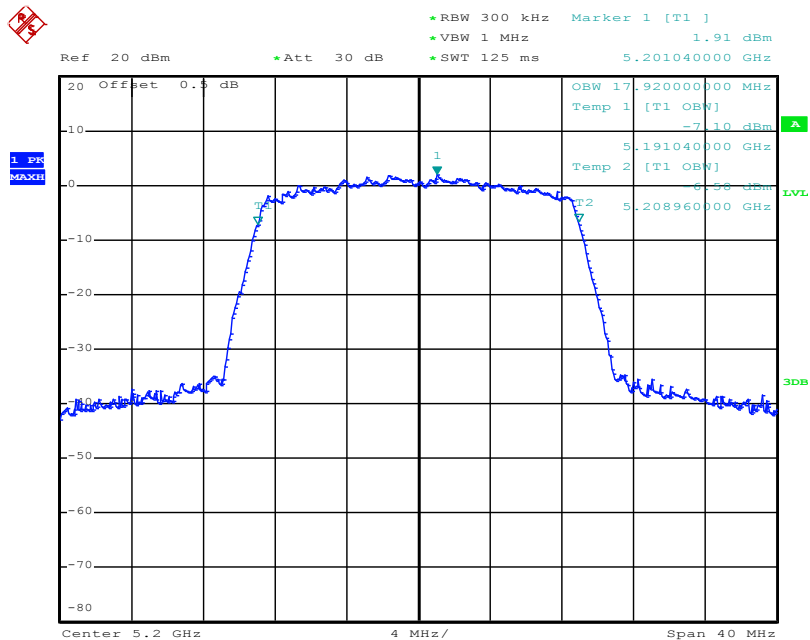
Date: 20.OCT.2021 11:39:12

802.11ac20 5180MHz 99% bandwidth



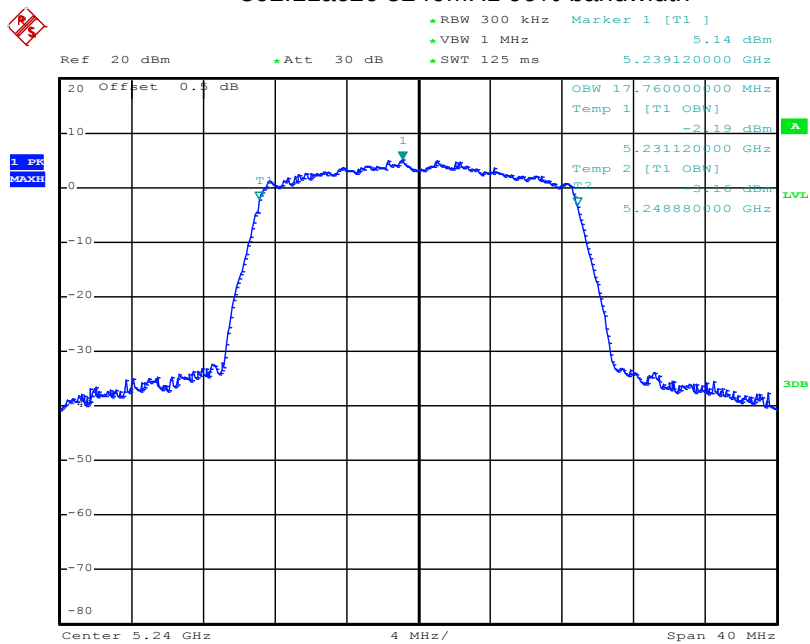
Date: 20.OCT.2021 11:32:28

802.11ac20 5200MHz 99% bandwidth



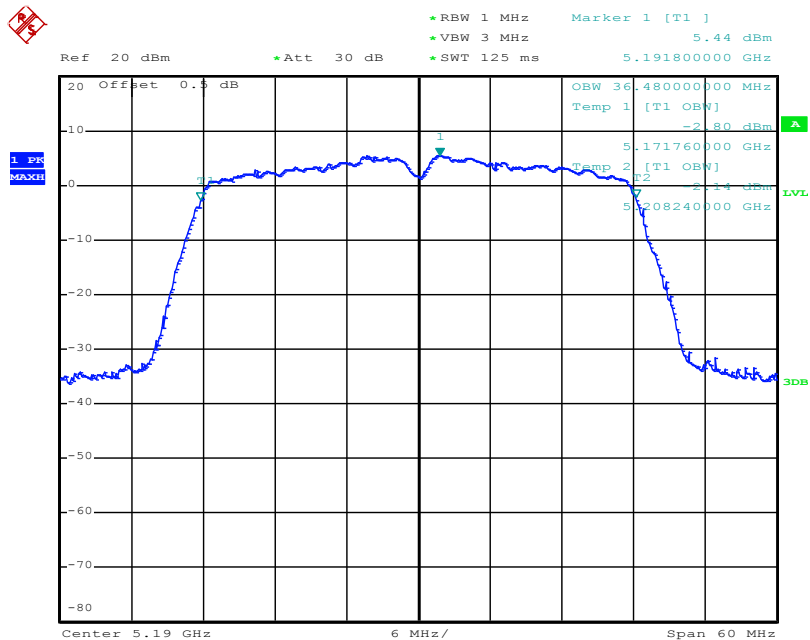
Date: 20.OCT.2021 11:32:52

802.11ac20 5240MHz 99% bandwidth



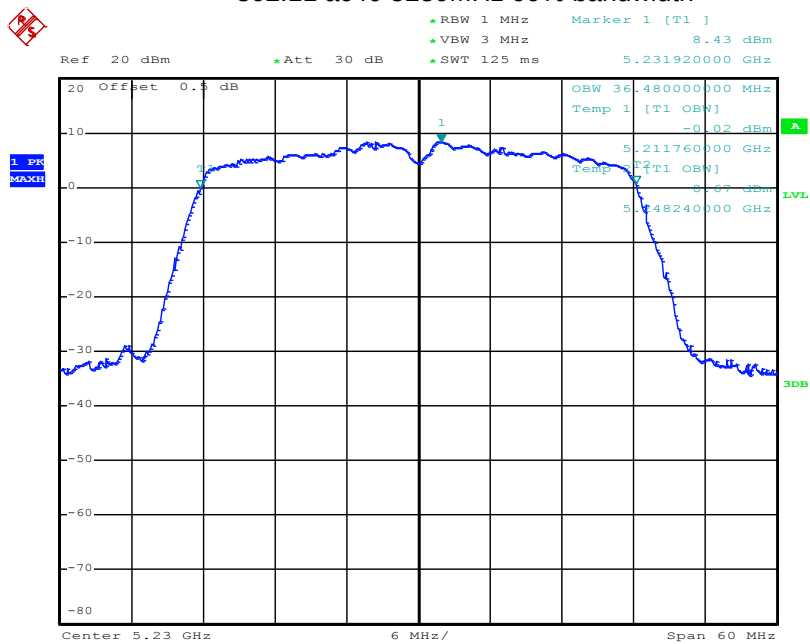
Date: 20.OCT.2021 11:35:27

802.11 ac40 5190MHz 99% bandwidth



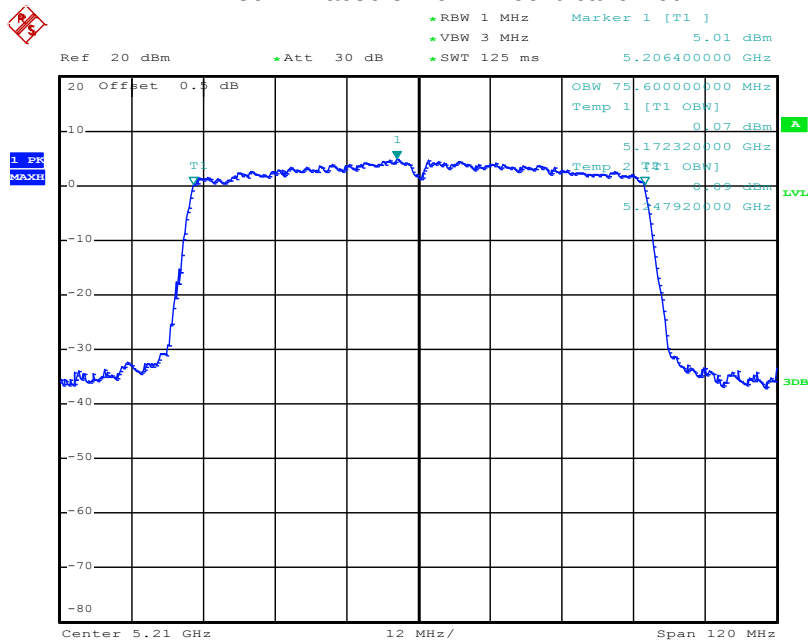
Date: 20.OCT.2021 11:37:57

802.11 ac40 5230MHz 99% bandwidth



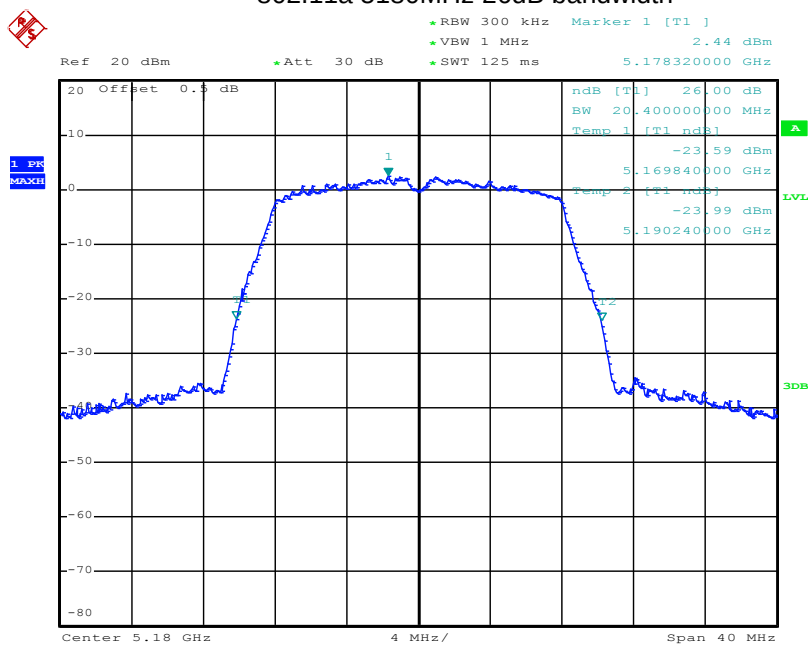
Date: 20.OCT.2021 11:39:40

802.11 ac80 5210MHz 99% bandwidth



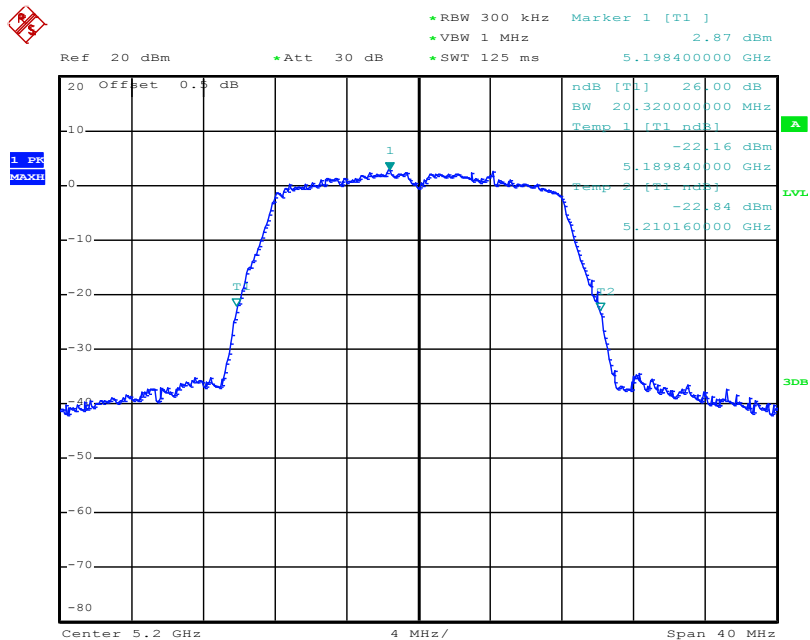
Date: 20.OCT.2021 11:40:21

802.11a 5180MHz 26dB bandwidth



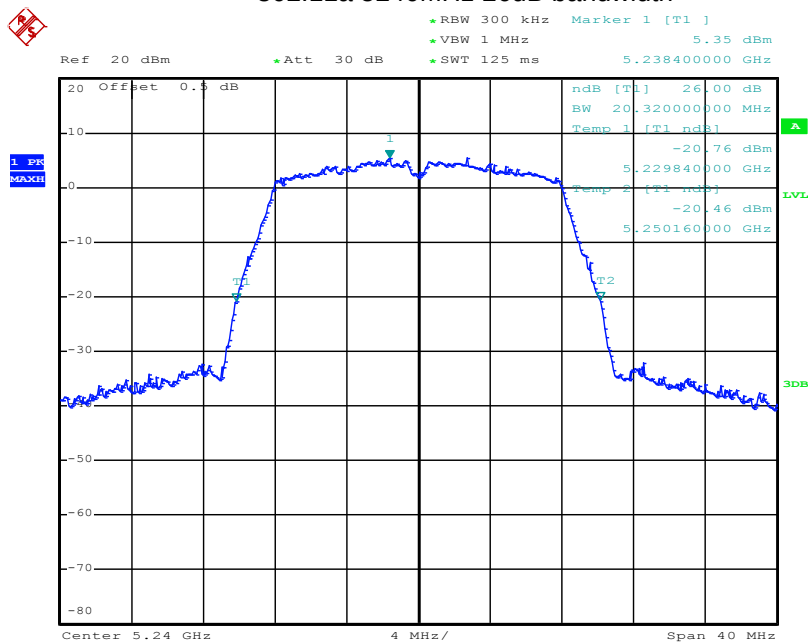
Date: 20.OCT.2021 11:23:57

802.11a 5200MHz 26dB bandwidth



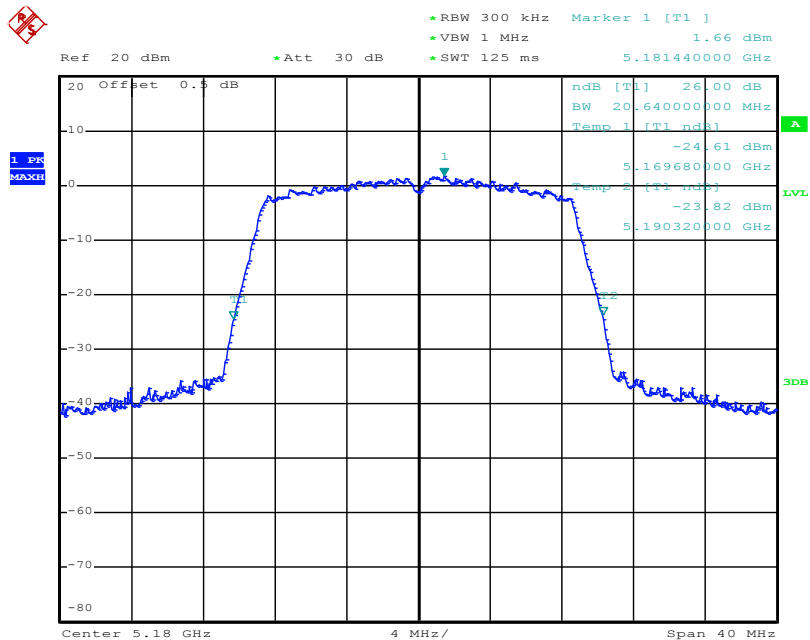
Date: 20.OCT.2021 11:24:25

802.11a 5240MHz 26dB bandwidth



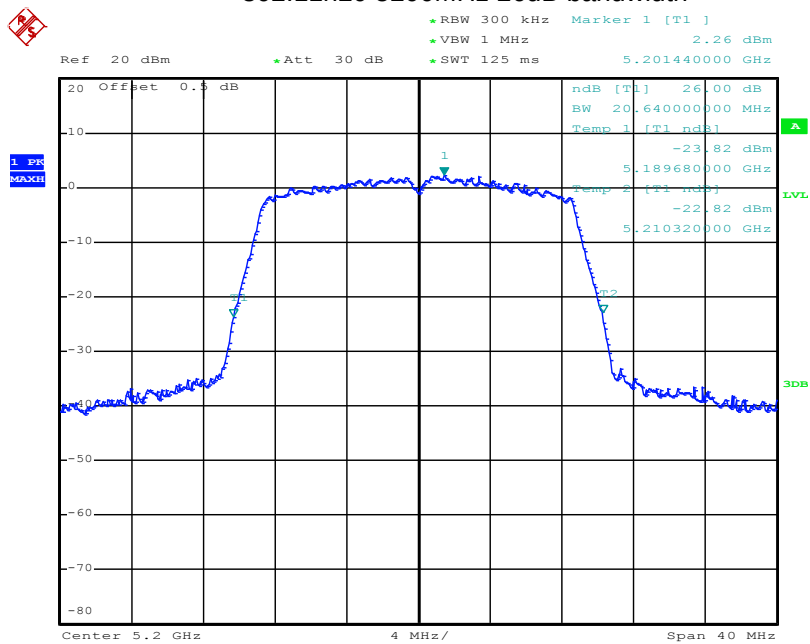
Date: 20.OCT.2021 11:26:43

802.11n20 5180MHz 26dB bandwidth



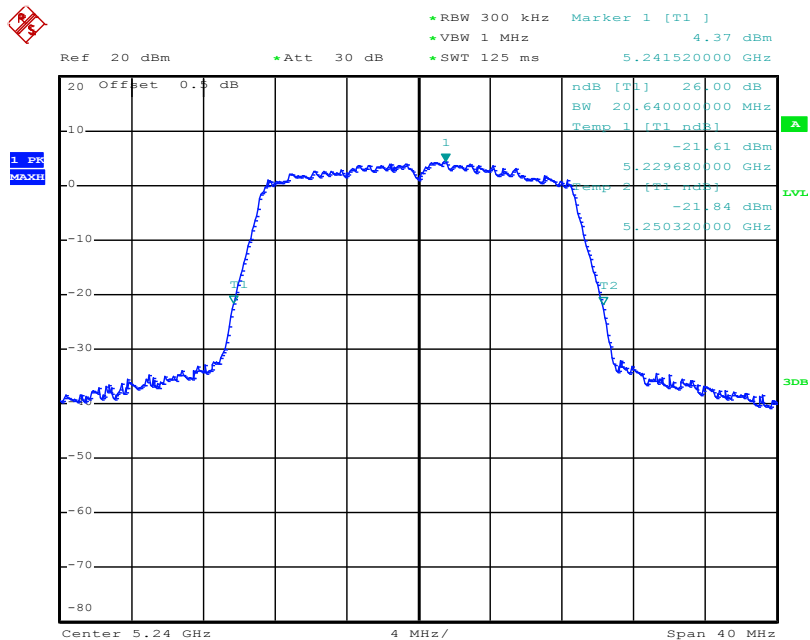
Date: 20.OCT.2021 11:23:22

802.11n20 5200MHz 26dB bandwidth



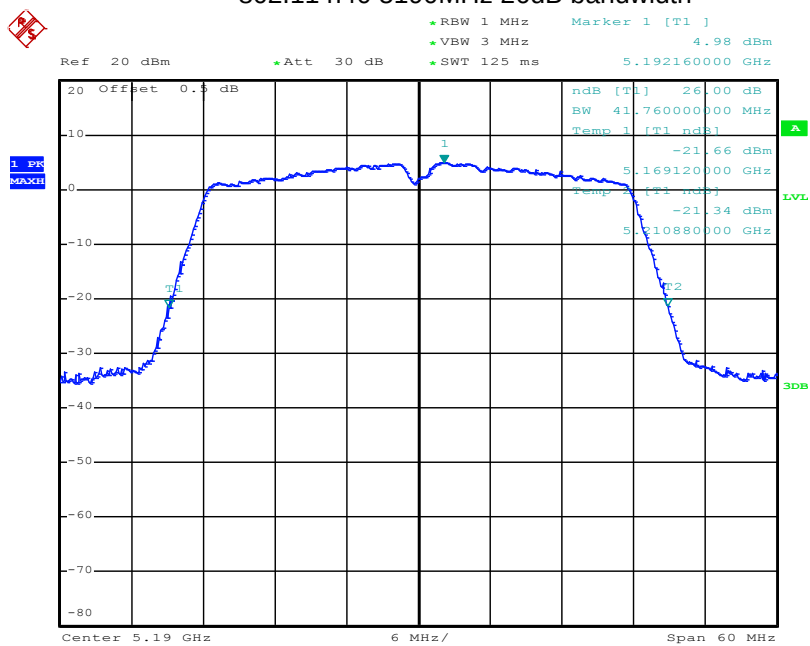
Date: 20.OCT.2021 11:24:48

802.11n20 5240MHz 26dB bandwidth



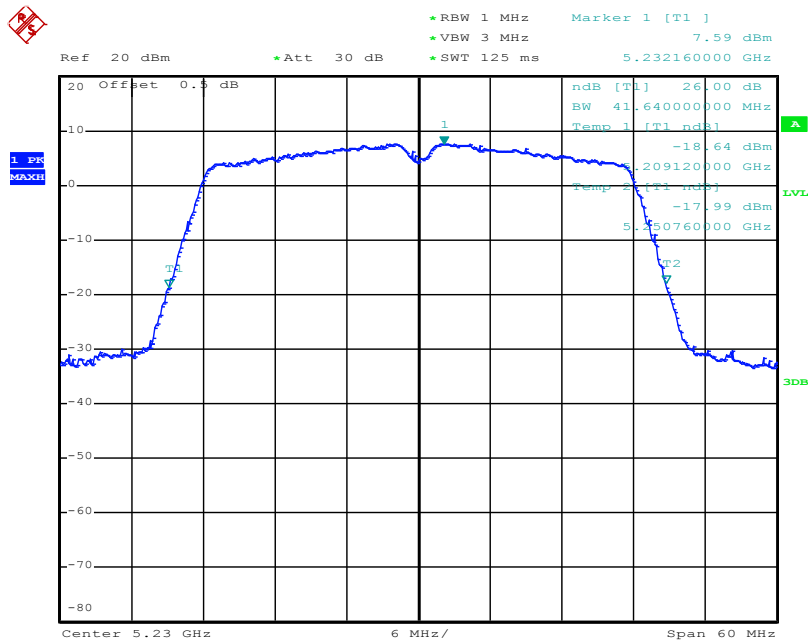
Date: 20.OCT.2021 11:26:16

802.11 n40 5190MHz 26dB bandwidth



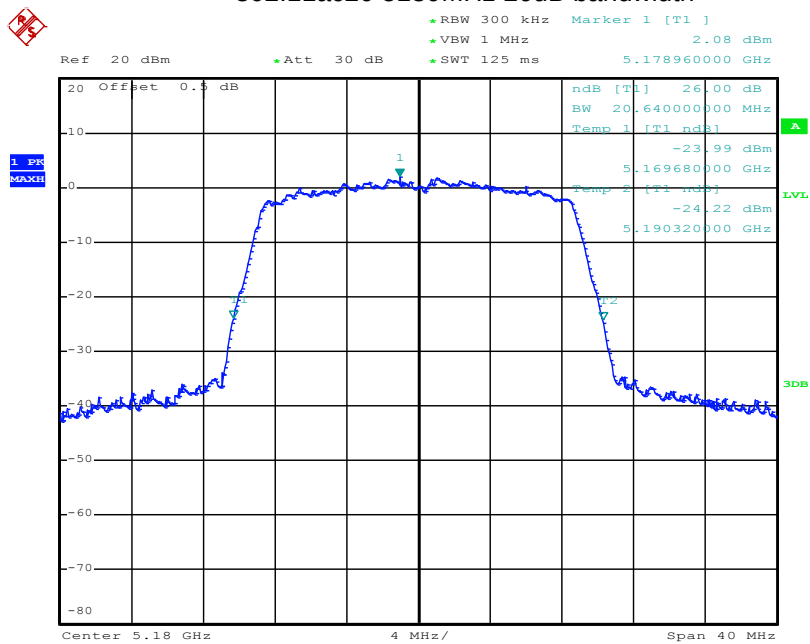
Date: 20.OCT.2021 11:21:35

802.11 n40 5230MHz 26dB bandwidth



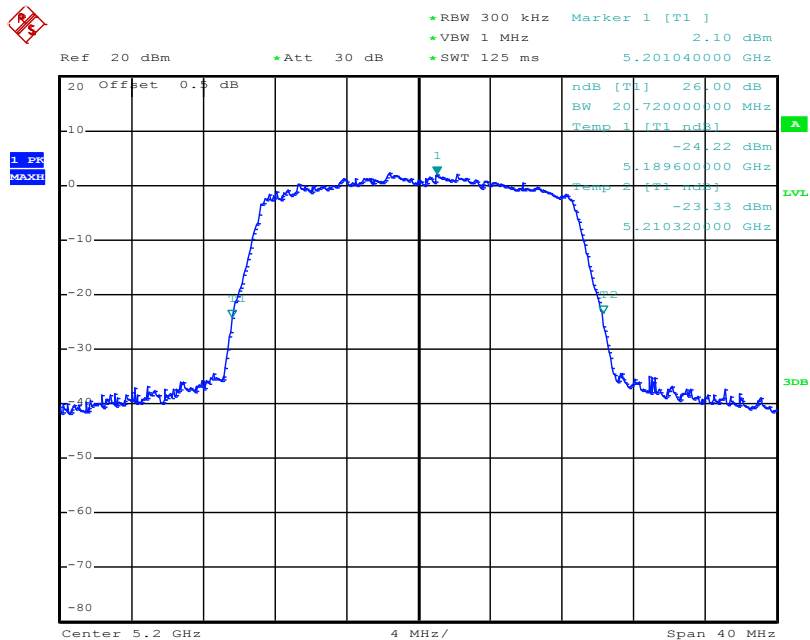
Date: 20.OCT.2021 11:21:02

802.11ac20 5180MHz 26dB bandwidth



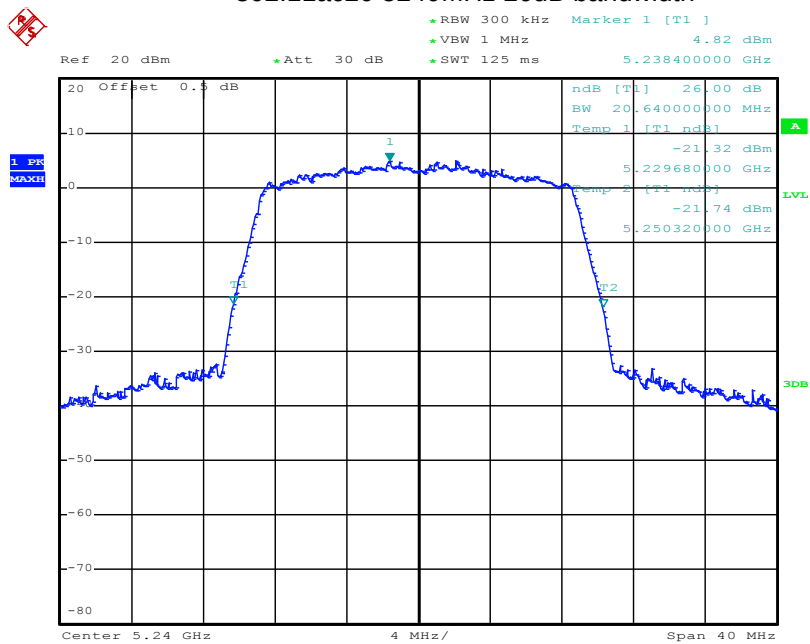
Date: 20.OCT.2021 11:22:51

802.11ac20 5200MHz 26dB bandwidth



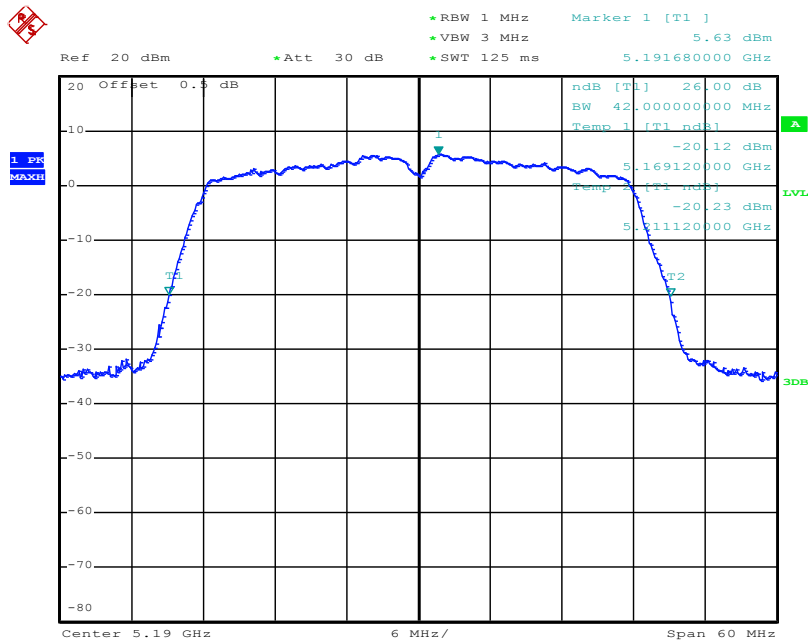
Date: 20.OCT.2021 11:27:19

802.11ac20 5240MHz 26dB bandwidth



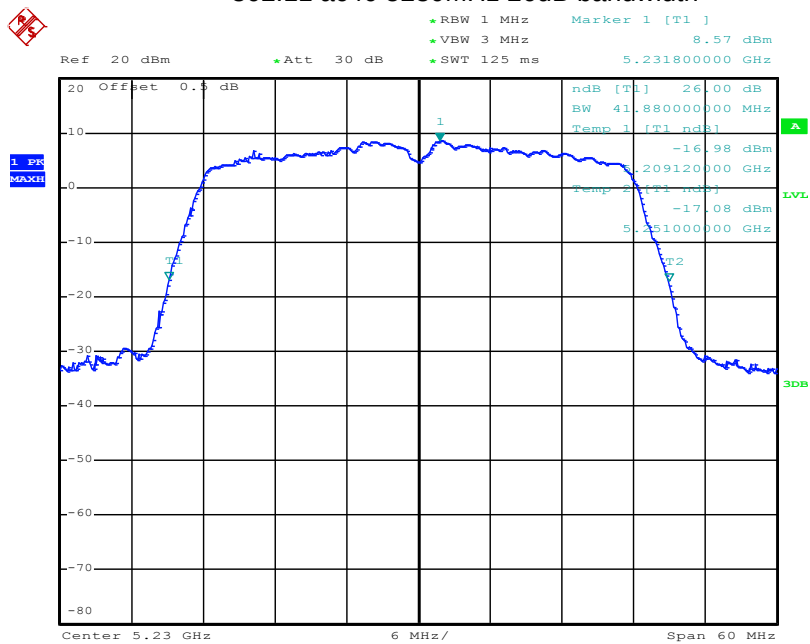
Date: 20.OCT.2021 11:25:54

802.11 ac40 5190MHz 26dB bandwidth



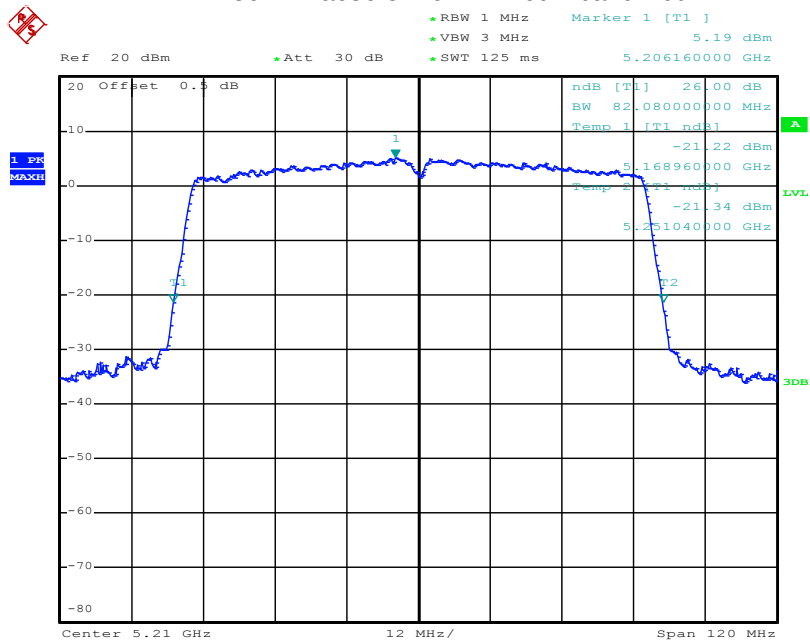
Date: 20.OCT.2021 11:22:01

802.11 ac40 5230MHz 26dB bandwidth



Date: 20.OCT.2021 11:20:31

802.11 ac80 5210MHz 26dB bandwidth



Date: 20.OCT.2021 11:19:29

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	AC120V/60Hz
Test Mode:	TX Frequency U-NII-3(5745-5825MHz)		

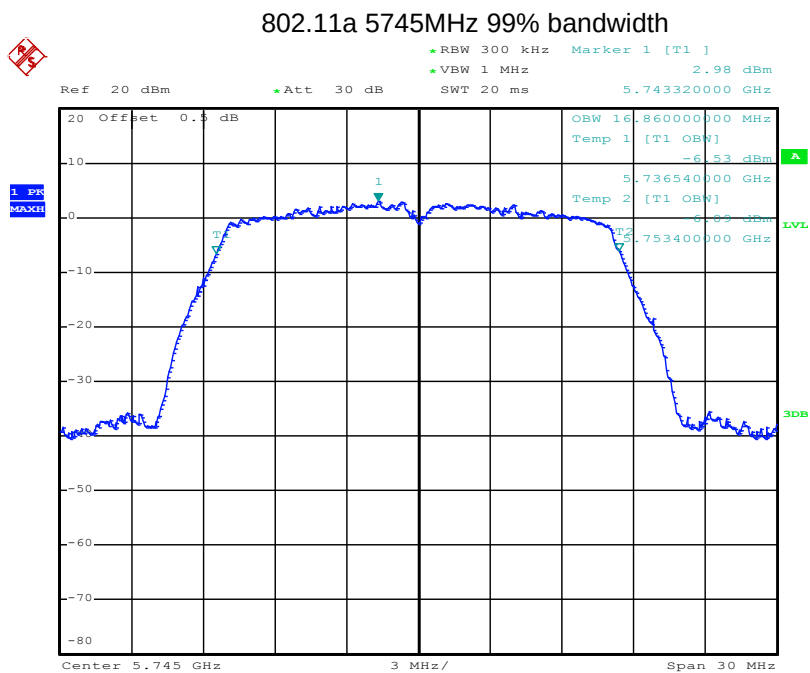
Note: A\B\C\D Represent the value of antenna A\B\C\D, The worst data is Antenna A, only shown Antenna A Plot.

Mode	Channel	Frequency (MHz)	99% bandwidth(M Hz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT A	ANT A		
802.11a	CH149	5745	16.86	15.36	≥500	Pass
	CH157	5785	16.86	15.18	≥500	Pass
	CH165	5825	16.86	15.18	≥500	Pass
802.11 n20	CH149	5745	17.76	15.36	≥500	Pass
	CH157	5785	17.70	15.18	≥500	Pass
	CH165	5825	17.70	15.18	≥500	Pass
802.11 n40	CH151	5755	36.24	35.32	≥500	Pass
	CH159	5795	36.24	35.24	≥500	Pass
802.11 ac20	CH149	5745	17.76	15.24	≥500	Pass
	CH157	5785	17.76	15.24	≥500	Pass
	CH165	5825	17.82	15.24	≥500	Pass
802.11 ac40	CH151	5755	36.48	35.32	≥500	Pass
	CH159	5795	36.60	35.28	≥500	Pass
802.11 ac80	CH155	5775	75.60	75.84	≥500	Pass

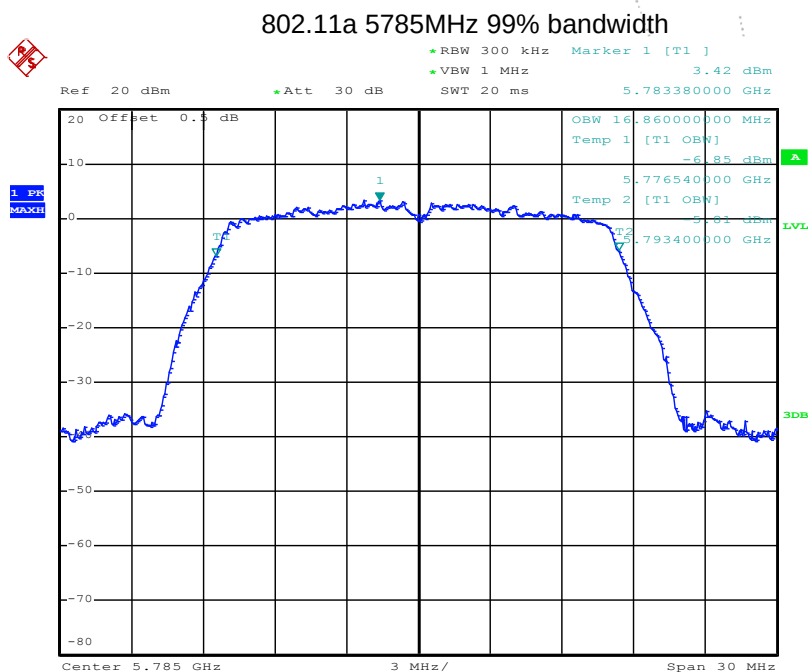
Mode	Channel	Frequency (MHz)	99% bandwidth(M Hz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT B	ANT B		
802.11a	CH149	5745	16.64	15.28	≥500	Pass
	CH157	5785	16.72	15.36	≥500	Pass
	CH165	5825	16.72	15.20	≥500	Pass
802.11 n20	CH149	5745	17.76	15.20	≥500	Pass
	CH157	5785	17.68	15.44	≥500	Pass
	CH165	5825	17.68	15.20	≥500	Pass
802.11 n40	CH151	5755	36.24	35.24	≥500	Pass
	CH159	5795	36.24	35.32	≥500	Pass
802.11 ac20	CH149	5745	17.68	15.76	≥500	Pass
	CH157	5785	17.76	15.76	≥500	Pass
	CH165	5825	17.76	15.76	≥500	Pass
802.11 ac40	CH151	5755	36.60	35.12	≥500	Pass
	CH159	5795	36.60	35.32	≥500	Pass
802.11 ac80	CH155	5775	75.60	75.60	≥500	Pass

Mode	Channel	Frequency (MHz)	99% bandwidth(M Hz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT C	ANT C		
802.11a	CH149	5745	16.80	15.20	≥500	Pass
	CH157	5785	16.80	15.20	≥500	Pass
	CH165	5825	16.80	15.36	≥500	Pass
802.11 n20	CH149	5745	17.76	15.20	≥500	Pass
	CH157	5785	17.76	15.20	≥500	Pass
	CH165	5825	17.68	15.32	≥500	Pass
802.11 n40	CH151	5755	36.24	35.32	≥500	Pass
	CH159	5795	36.36	35.28	≥500	Pass
802.11 ac20	CH149	5745	17.76	16.00	≥500	Pass
	CH157	5785	17.76	16.32	≥500	Pass
	CH165	5825	17.76	16.40	≥500	Pass
802.11 ac40	CH151	5755	36.24	35.32	≥500	Pass
	CH159	5795	36.24	33.92	≥500	Pass
802.11 ac80	CH155	5775	75.36	75.36	≥500	Pass

Mode	Channel	Frequency (MHz)	99% bandwidth(M Hz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT D	ANT D		
802.11a	CH149	5745	16.56	15.20	≥500	Pass
	CH157	5785	16.64	15.20	≥500	Pass
	CH165	5825	16.64	15.20	≥500	Pass
802.11 n20	CH149	5745	17.76	15.20	≥500	Pass
	CH157	5785	17.76	15.20	≥500	Pass
	CH165	5825	17.76	15.28	≥500	Pass
802.11 n40	CH151	5755	36.36	35.24	≥500	Pass
	CH159	5795	36.48	35.24	≥500	Pass
802.11 ac20	CH149	5745	17.76	15.20	≥500	Pass
	CH157	5785	17.76	15.20	≥500	Pass
	CH165	5825	17.76	15.36	≥500	Pass
802.11 ac40	CH151	5755	36.36	35.12	≥500	Pass
	CH159	5795	36.36	35.28	≥500	Pass
802.11 ac80	CH155	5775	75.36	75.64	≥500	Pass

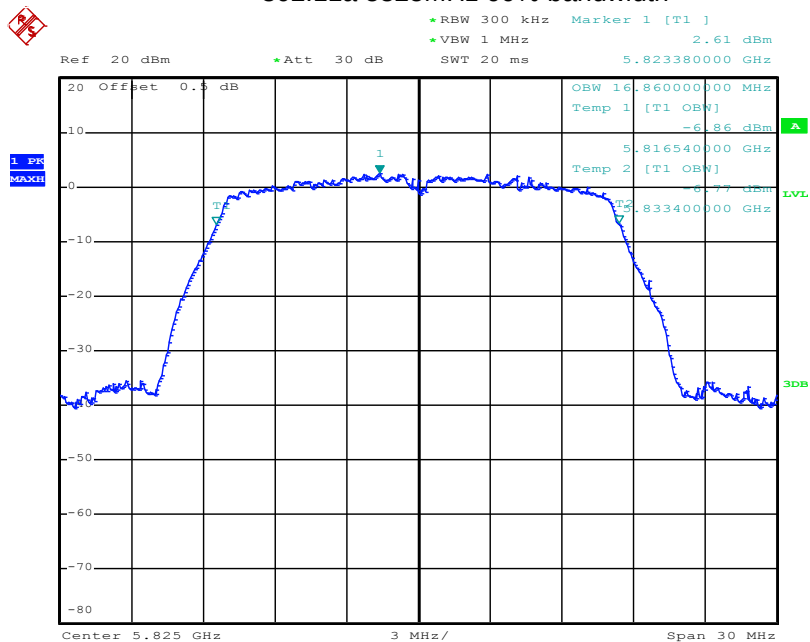


Date: 20.OCT.2021 21:46:13



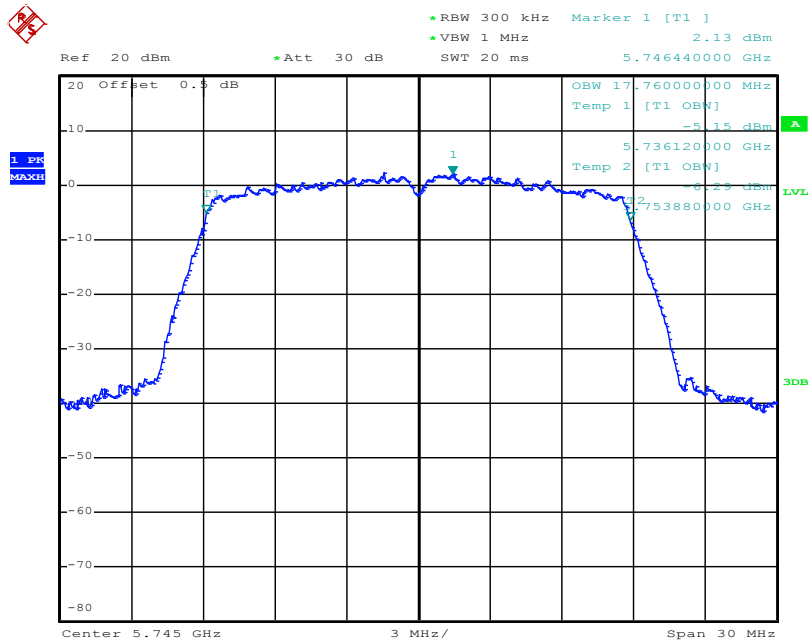
Date: 20.OCT.2021 21:45:02

802.11a 5825MHz 99% bandwidth



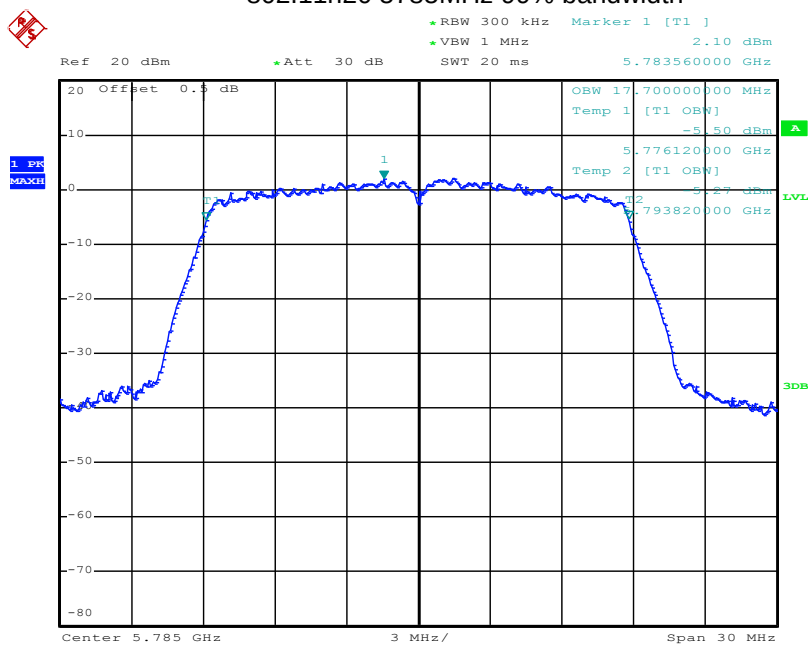
Date: 20.OCT.2021 21:43:09

802.11n20 5745MHz 99% bandwidth



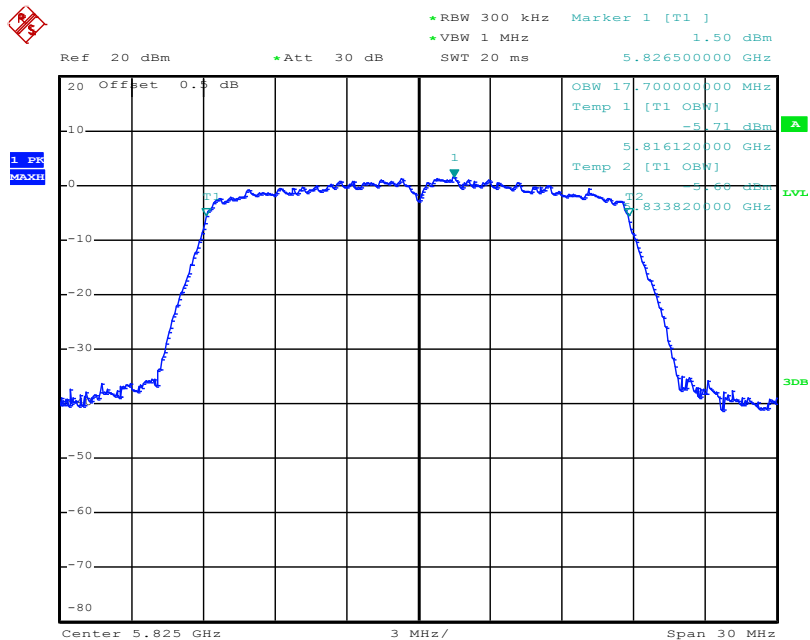
Date: 20.OCT.2021 21:46:35

802.11n20 5785MHz 99% bandwidth



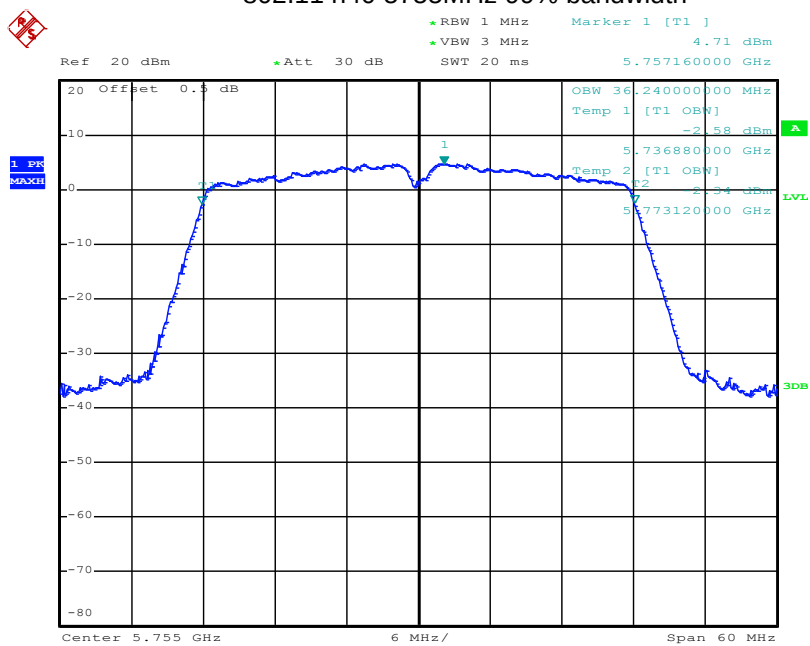
Date: 20.OCT.2021 21:44:37

802.11n20 5825MHz 99% bandwidth



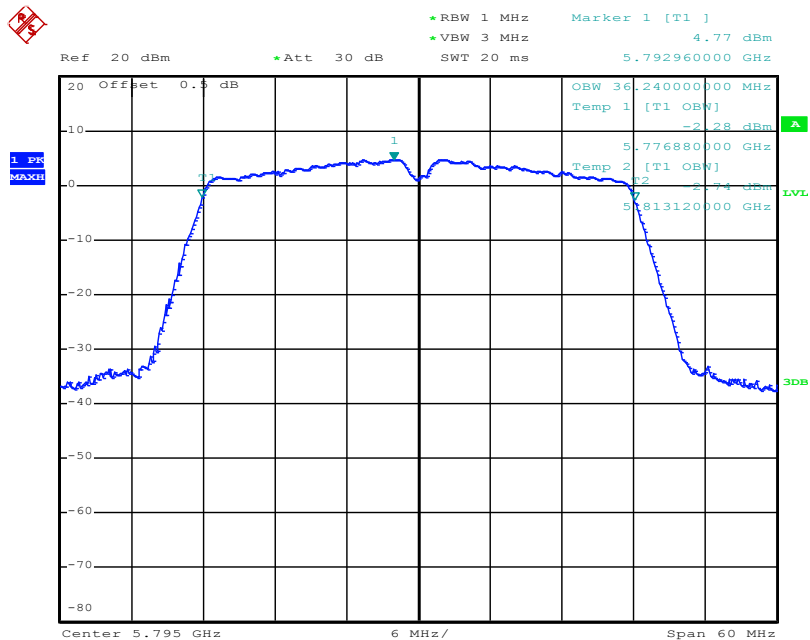
Date: 20.OCT.2021 21:43:30

802.11 n40 5755MHz 99% bandwidth



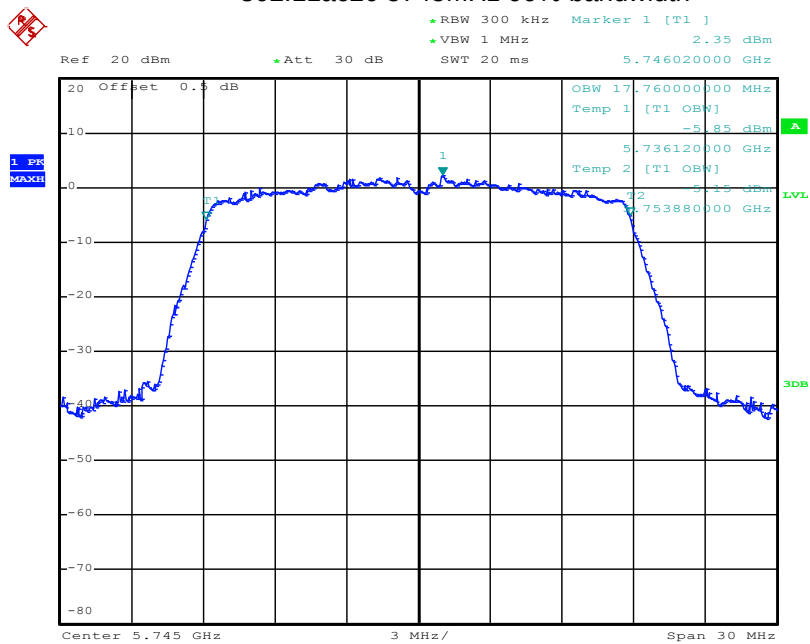
Date: 20.OCT.2021 21:50:24

802.11 n40 5795MHz 99% bandwidth



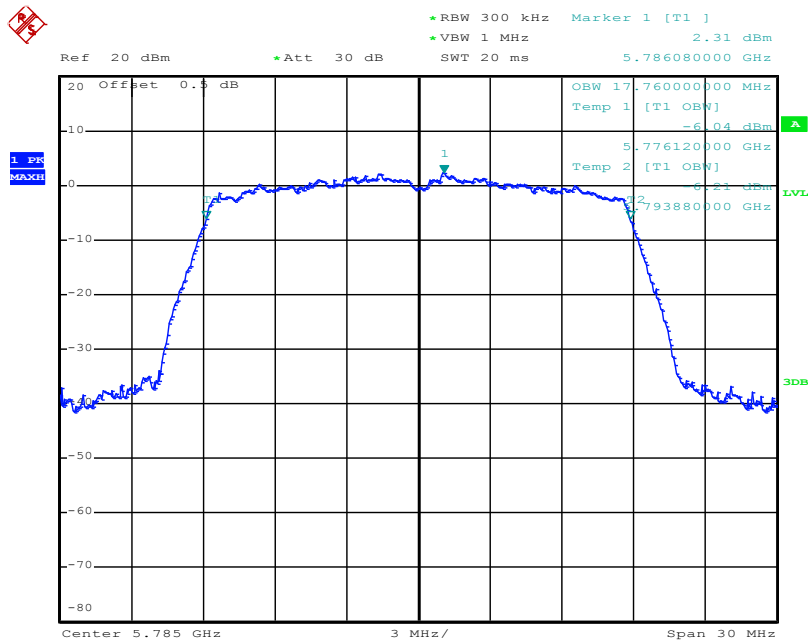
Date: 20.OCT.2021 21:49:59

802.11ac20 5745MHz 99% bandwidth



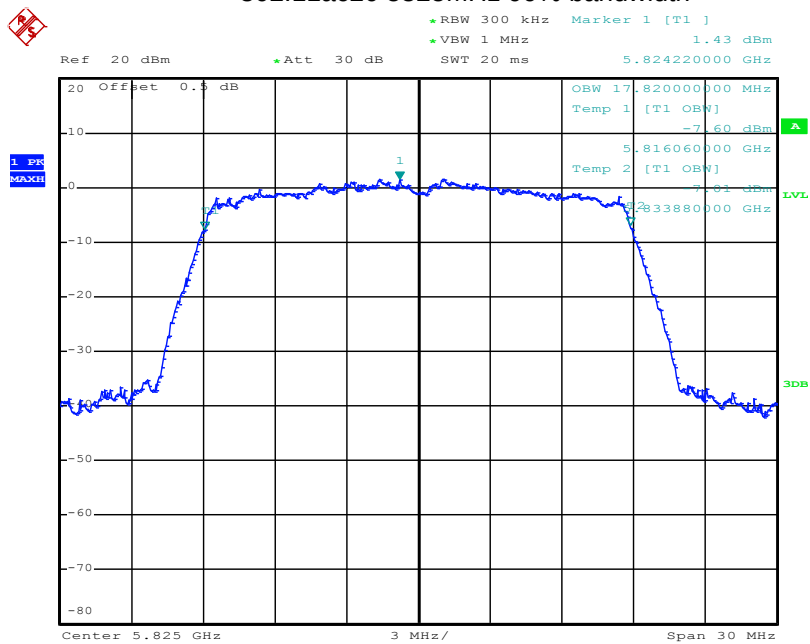
Date: 20.OCT.2021 21:47:04

802.11ac20 5785MHz 99% bandwidth



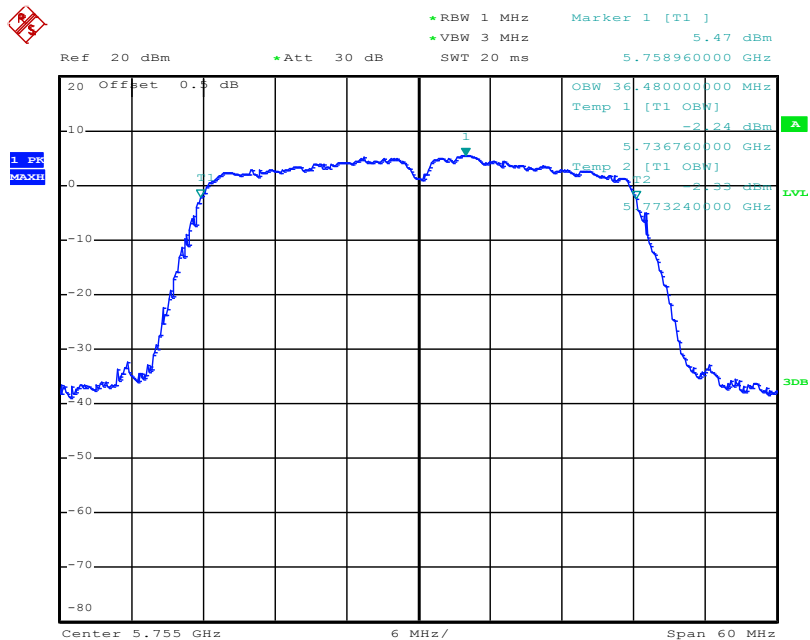
Date: 20.OCT.2021 21:44:13

802.11ac20 5825MHz 99% bandwidth



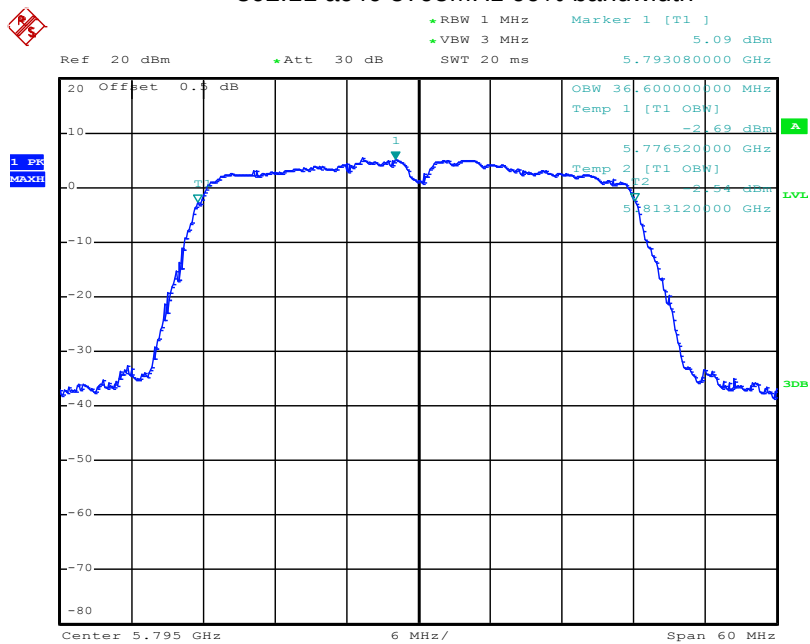
Date: 20.OCT.2021 21:43:48

802.11 ac40 5755MHz 99% bandwidth



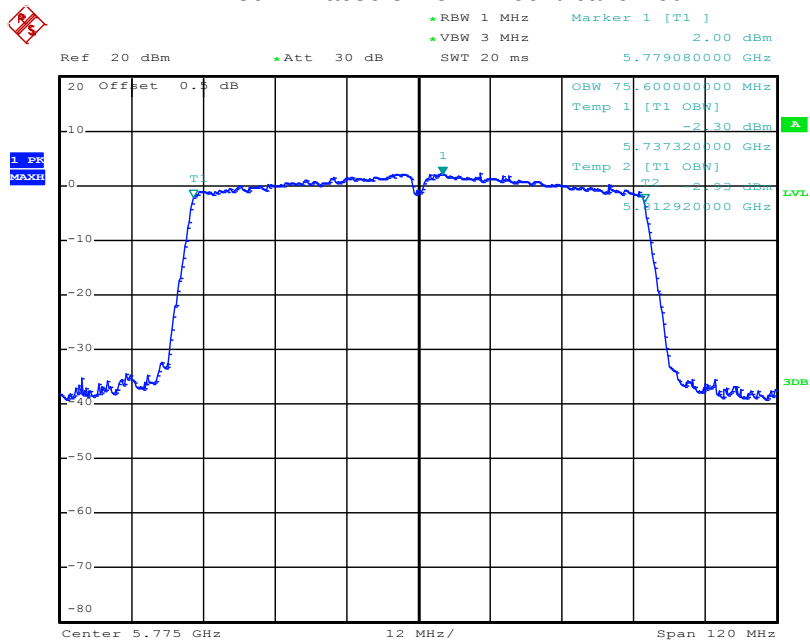
Date: 20.OCT.2021 21:50:50

802.11 ac40 5795MHz 99% bandwidth



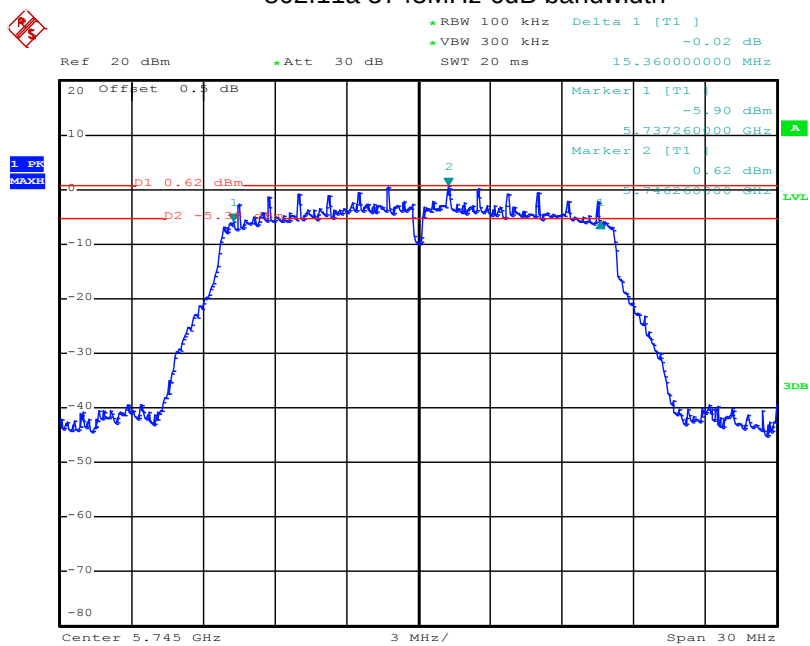
Date: 20.OCT.2021 21:49:37

802.11 ac80 5775MHz 99% bandwidth



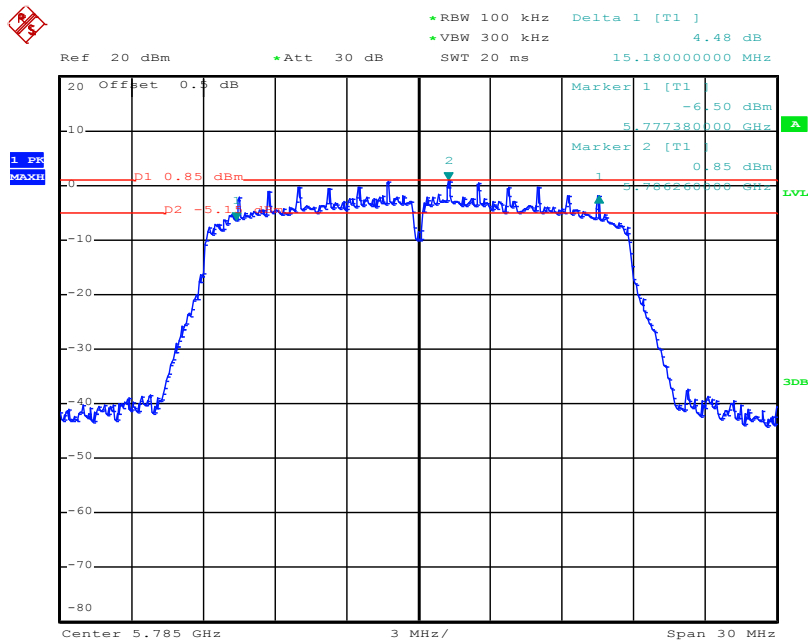
Date: 20.OCT.2021 21:51:44

802.11a 5745MHz 6dB bandwidth



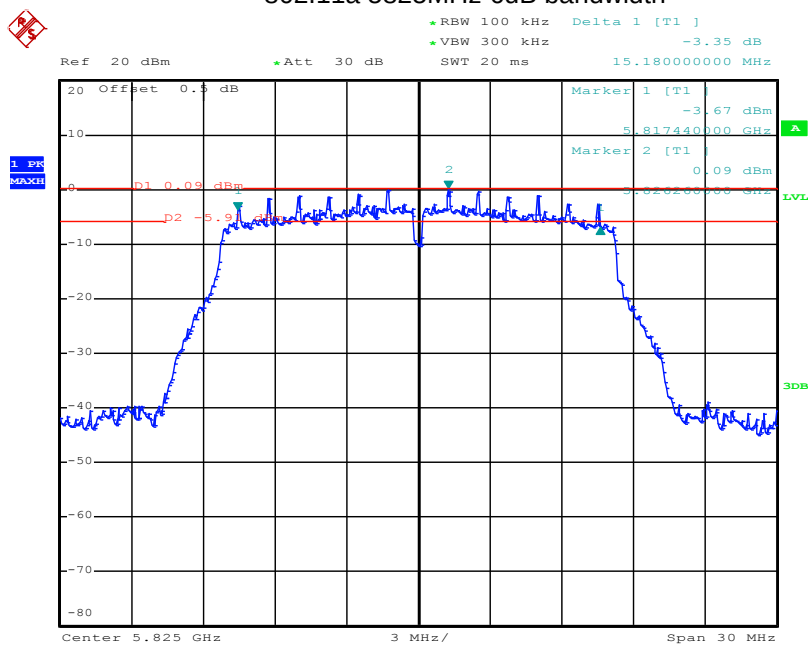
Date: 20.OCT.2021 21:32:40

802.11a 5785MHz 6dB bandwidth



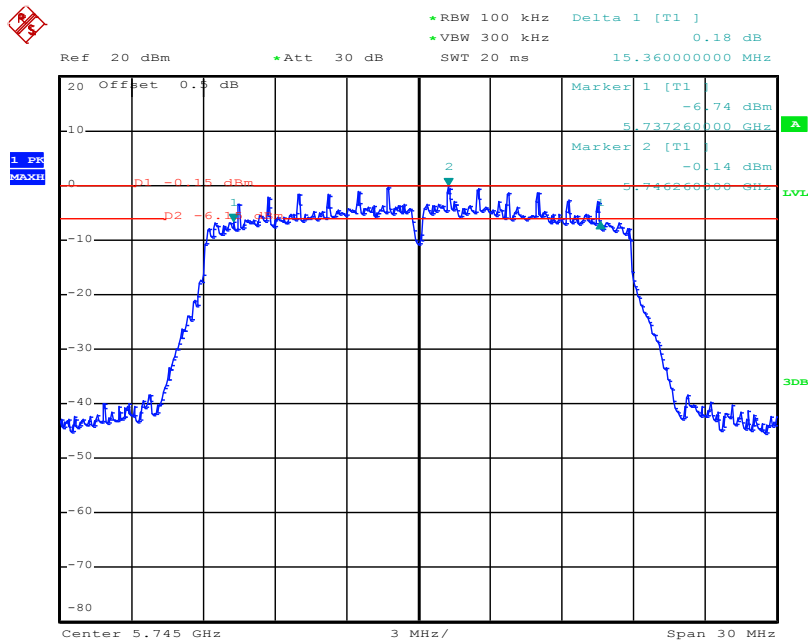
Date: 20.OCT.2021 21:35:17

802.11a 5825MHz 6dB bandwidth



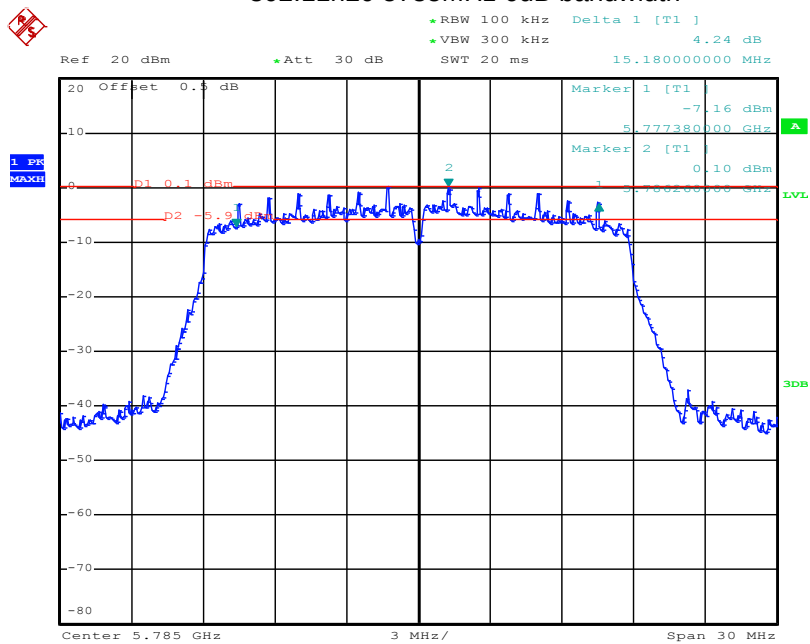
Date: 20.OCT.2021 21:42:06

802.11n20 5745MHz 6dB bandwidth



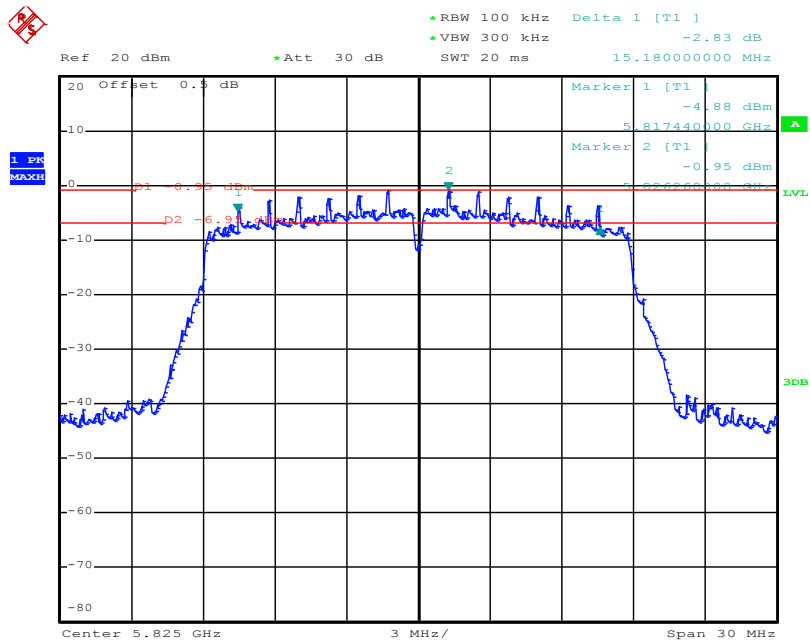
Date: 20.OCT.2021 21:29:45

802.11n20 5785MHz 6dB bandwidth



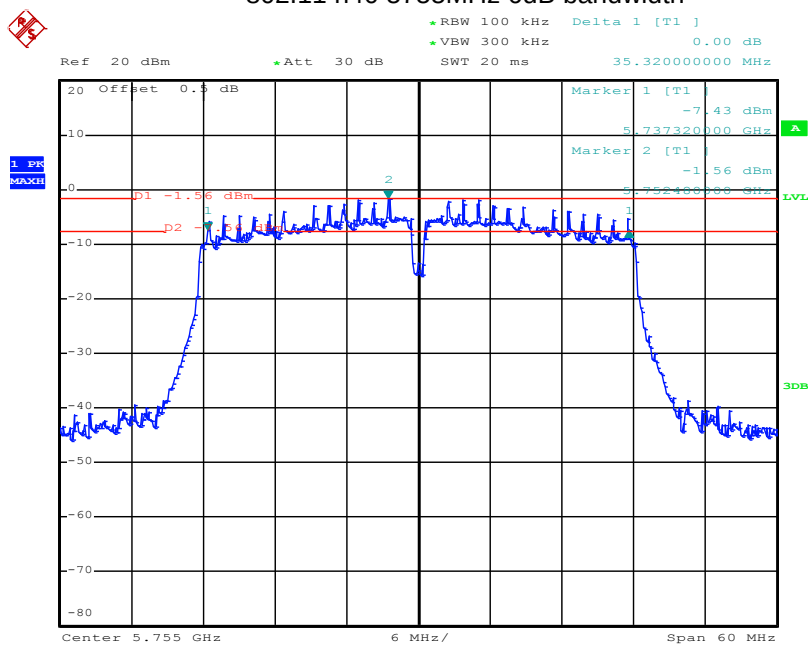
Date: 20.OCT.2021 21:36:59

802.11n20 5825MHz 6dB bandwidth



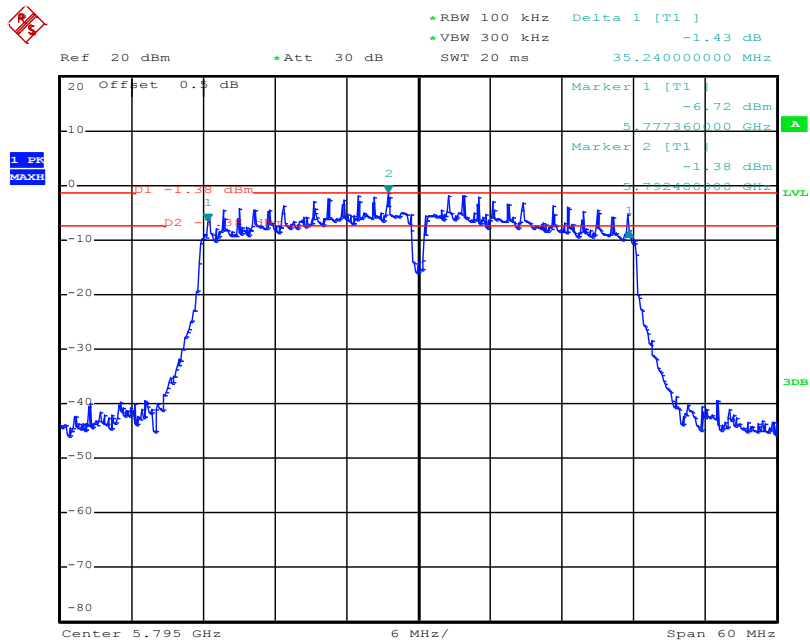
Date: 20.OCT.2021 21:40:57

802.11 n40 5755MHz 6dB bandwidth



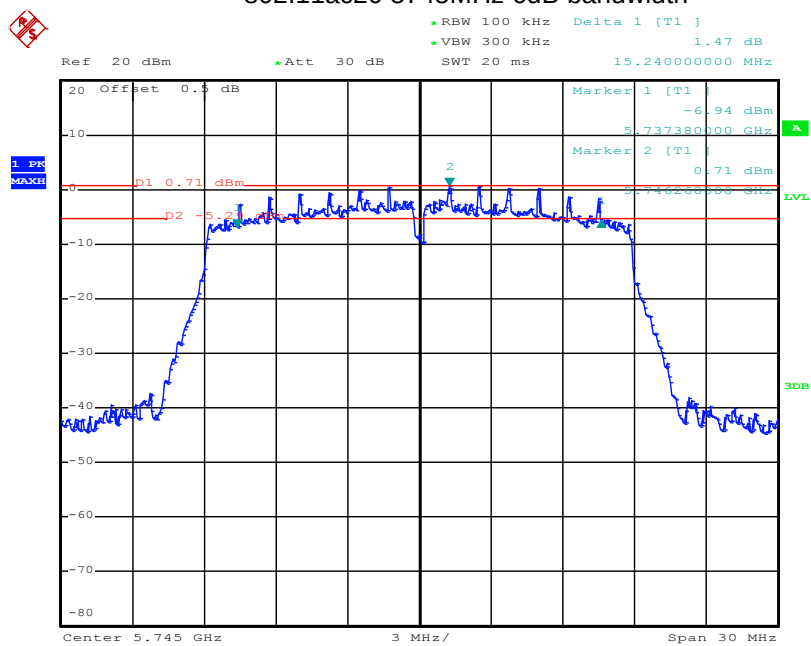
Date: 20.OCT.2021 21:23:59

802.11 n40 5795MHz 6dB bandwidth



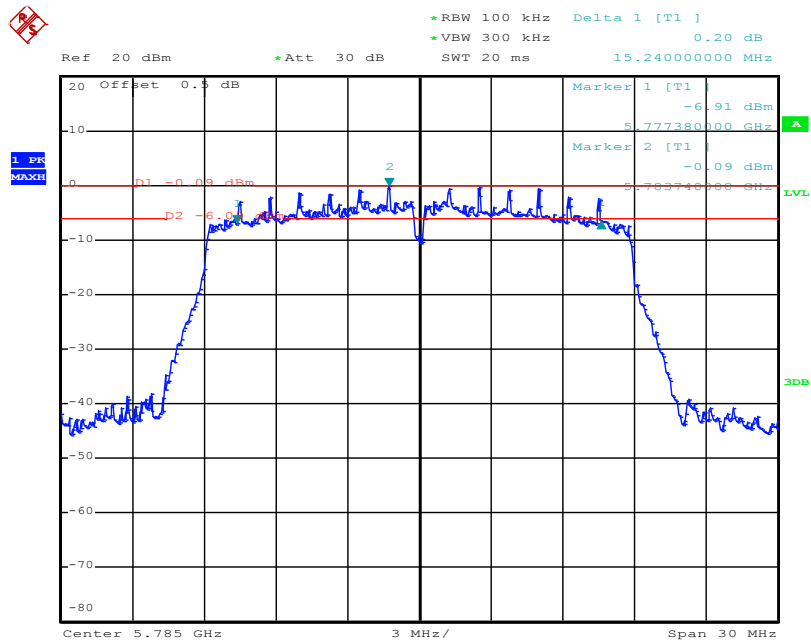
Date: 20.OCT.2021 21:25:38

802.11ac20 5745MHz 6dB bandwidth



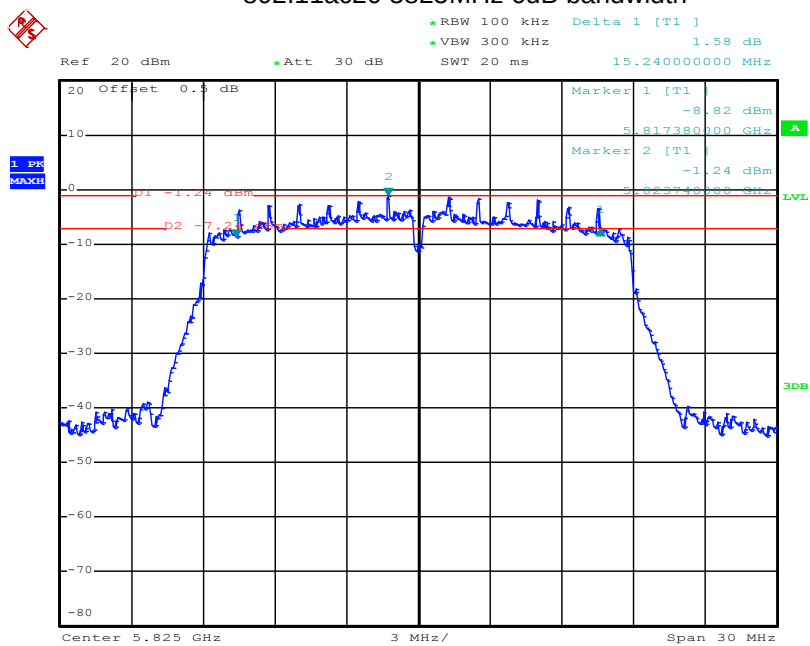
Date: 20.OCT.2021 21:28:30

802.11ac20 5785MHz 6dB bandwidth



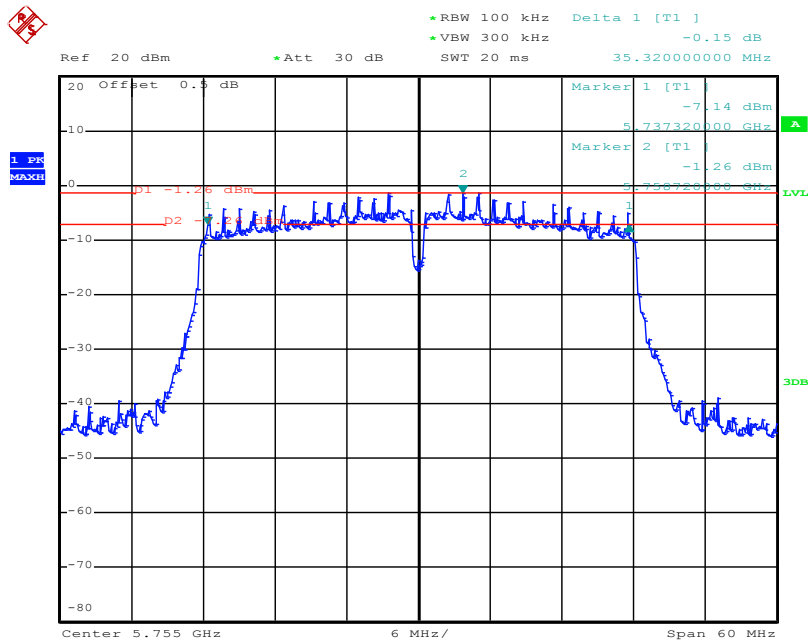
Date: 20.OCT.2021 21:37:53

802.11ac20 5825MHz 6dB bandwidth



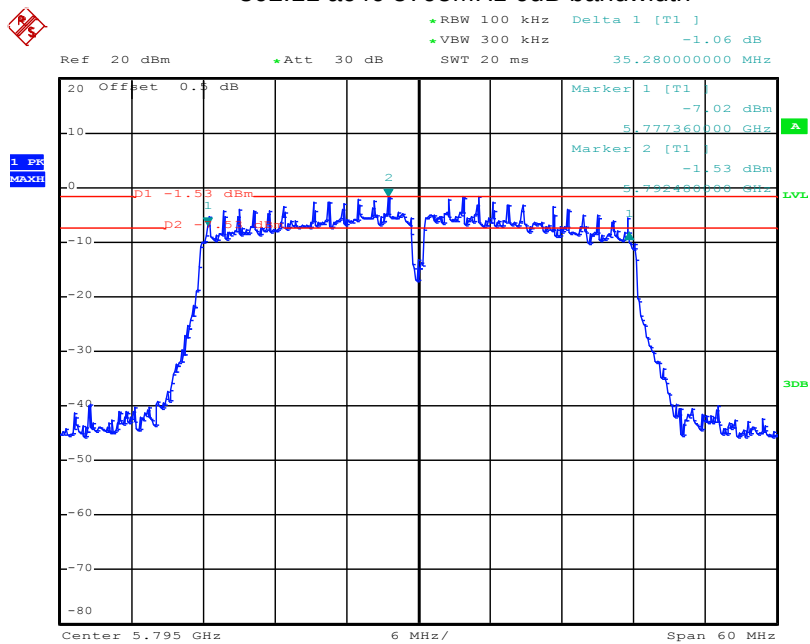
Date: 20.OCT.2021 21:39:29

802.11 ac40 5755MHz 6dB bandwidth



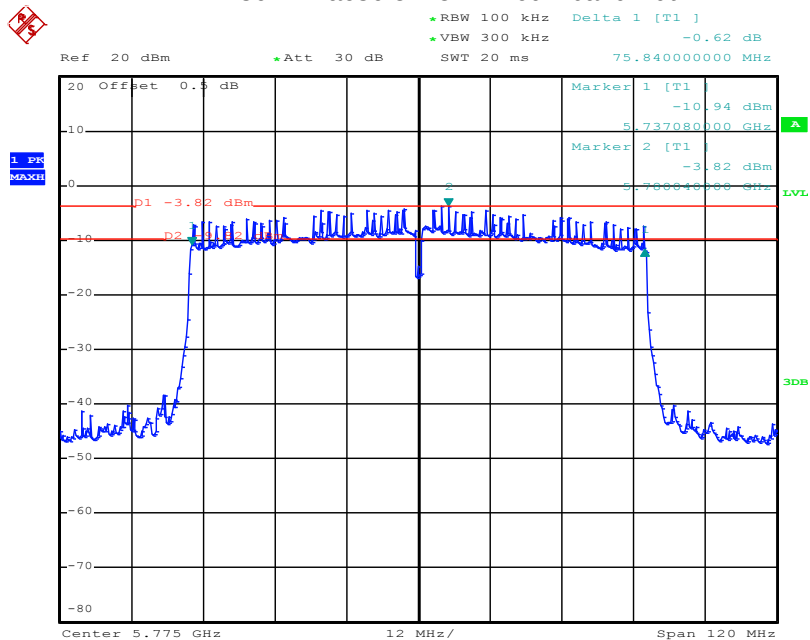
Date: 20.OCT.2021 21:22:53

802.11 ac40 5795MHz 6dB bandwidth



Date: 20.OCT.2021 21:26:44

802.11 ac80 5775MHz 6dB bandwidth



Date: 20.OCT.2021 21:21:20

10. Maximum Conducted Output Power

10.1 Block Diagram Of Test Setup



10.2 Limit

According to FCC §15.407

The maximum conducted output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	1W
5725~5850	1W

10.3 Test procedure

Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.¹ However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

- The EUT transmits continuously (or with a duty cycle ≥ 98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the

transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

10.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

10.5 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	AC120V/60Hz
Test Mode:	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

Mode	Test Channel	Frequency (MHz)	Maximum output power. Antenna port (AV) (dBm)					Limit (dBm/MHz)	Result
			ANT A	ANT B	ANT C	ANT D	Total		
802.11 a	CH36	5180	14.83	14.34	13.82	14.99	20.54	30	PASS
	CH40	5200	15.23	13.91	14.00	14.62	20.49	30	PASS
	CH48	5240	15.21	15.35	14.46	14.35	20.89	30	PASS
802.11 n20	CH36	5180	13.10	12.43	11.77	11.59	18.28	30	PASS
	CH40	5200	14.20	12.29	11.81	12.17	18.74	30	PASS
	CH48	5240	15.04	15.15	14.42	14.52	20.81	30	PASS
802.11 n40	CH38	5190	11.33	9.44	8.70	10.06	16.01	30	PASS
	CH46	5230	13.98	13.25	14.68	15.14	20.34	30	PASS
802.11 ac20	CH36	5180	13.42	12.81	11.82	11.84	18.55	30	PASS
	CH40	5200	14.52	12.66	17.07	12.31	20.60	30	PASS
	CH48	5240	17.02	16.23	9.26	18.54	22.36	30	PASS
802.11 ac40	CH38	5190	10.91	8.93	14.21	9.96	17.51	30	PASS
	CH46	5230	13.94	12.53	10.45	15.30	19.43	30	PASS
802.11 ac80	CH42	5210	10.54	9.50	11.89	12.39	17.24	30	PASS

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	AC120V/60Hz
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Mode	Test Channel	Frequency (MHz)	Maximum output power. Antenna port (AV)					Limit (dBm/MHz)	Result
			ANT A	ANT B	ANT C	ANT D	Total		
802.11 a	CH 149	5745	16.45	14.69	13.63	13.64	20.78	30	PASS
	CH 157	5785	16.29	12.95	13.74	12.34	20.13	30	PASS
	CH 165	5825	16.35	15.24	16.57	13.16	21.54	30	PASS
802.11 n20	CH 149	5745	15.28	13.25	11.96	12.26	19.41	30	PASS
	CH 157	5785	15.00	11.88	12.04	12.44	19.06	30	PASS
	CH 165	5825	14.46	14.13	15.19	11.26	20.01	30	PASS
802.11 n40	CH 151	5755	12.24	11.30	10.20	9.95	17.04	30	PASS
	CH 159	5795	11.87	9.35	8.60	8.80	15.89	30	PASS
802.11 ac20	CH 149	5745	15.18	13.25	11.74	12.02	19.29	30	PASS
	CH 157	5785	15.00	11.87	11.93	13.11	19.19	30	PASS
	CH 165	5825	14.37	14.21	15.95	11.26	20.27	30	PASS
802.11 ac40	CH 151	5755	12.17	10.01	9.82	10.08	16.65	30	PASS
	CH 159	5795	11.68	8.57	9.12	10.04	16.04	30	PASS
802.11 ac80	CH 155	5775	8.65	7.35	6.33	6.43	13.31	30	PASS

11. Out Of Band Emissions

11.1 Block Diagram Of Test Setup



11.2 Limit

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

11.3 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

11.4 EUT operating Conditions

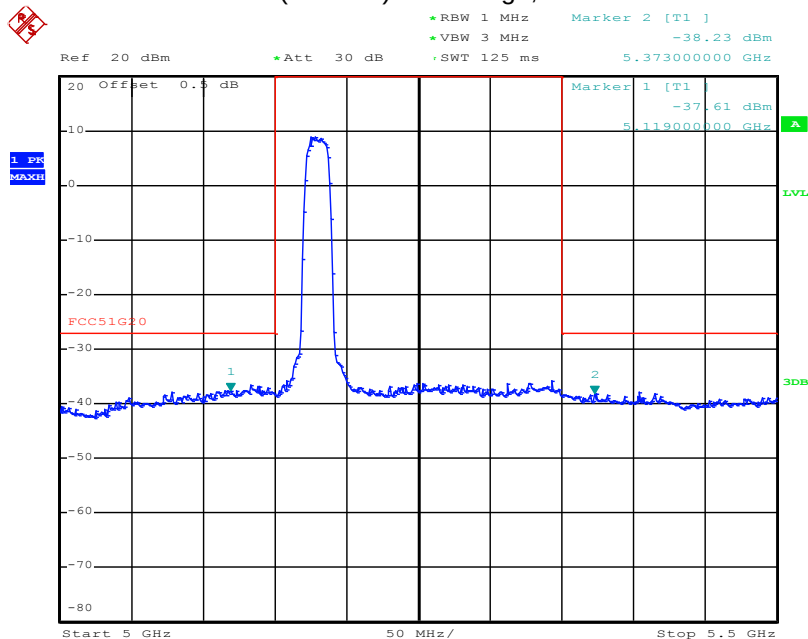
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

11.5 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	AC120V/60Hz

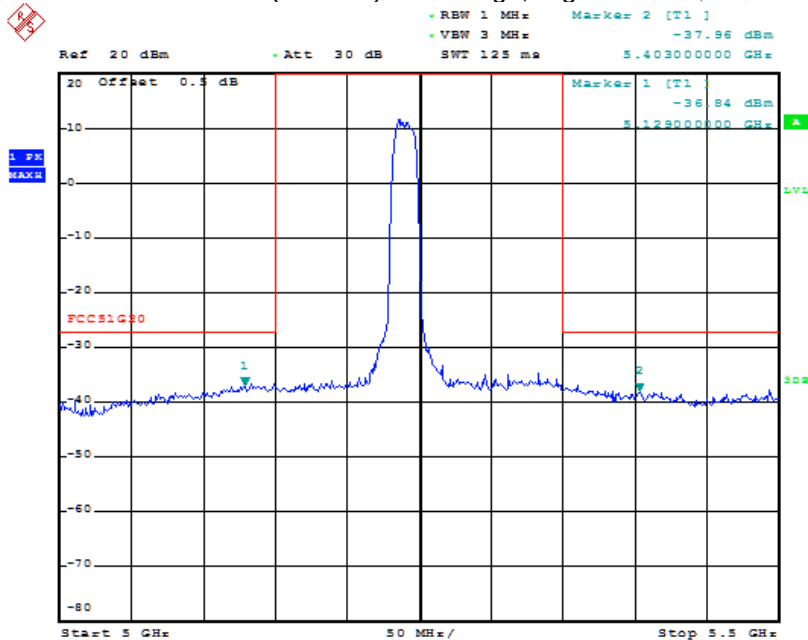
Note: A\B\C\D Represent the value of antenna A\B\C\D, The worst data is Antenna A, only shown Antenna A Plot.

5.180~5.240 GHz (802.11a) Band Edge, Left Side



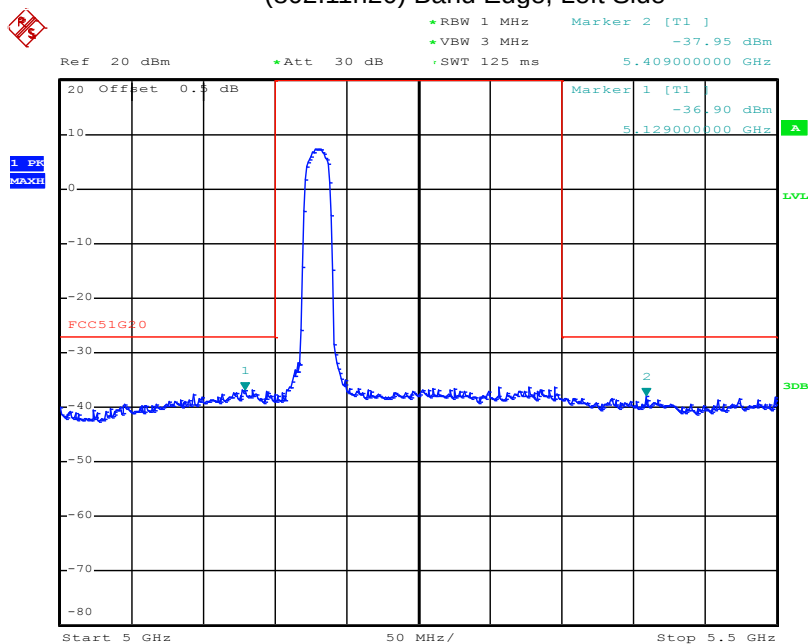
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(802.11a) Band Edge, Right Side



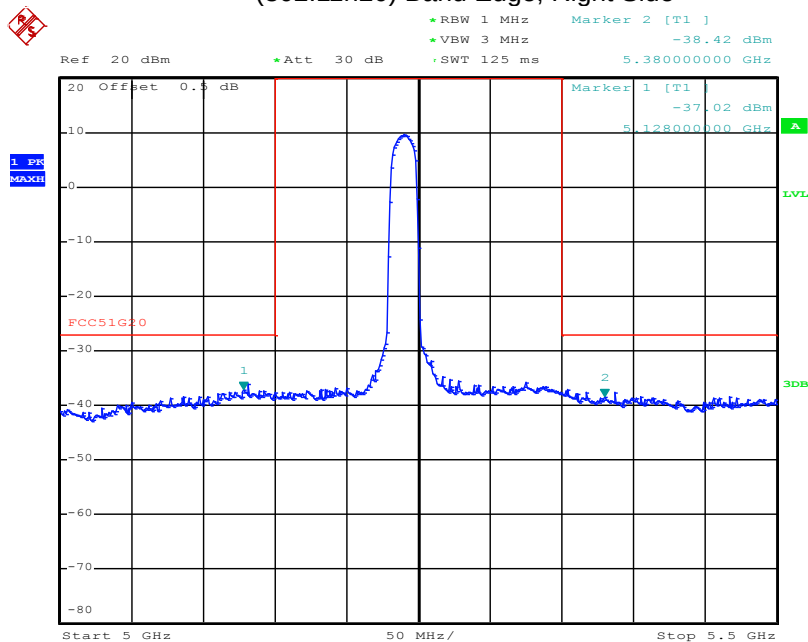
Date: 20.OCT.2021 12:06:35

5.180~5.240 GHz (802.11n20) Band Edge, Left Side



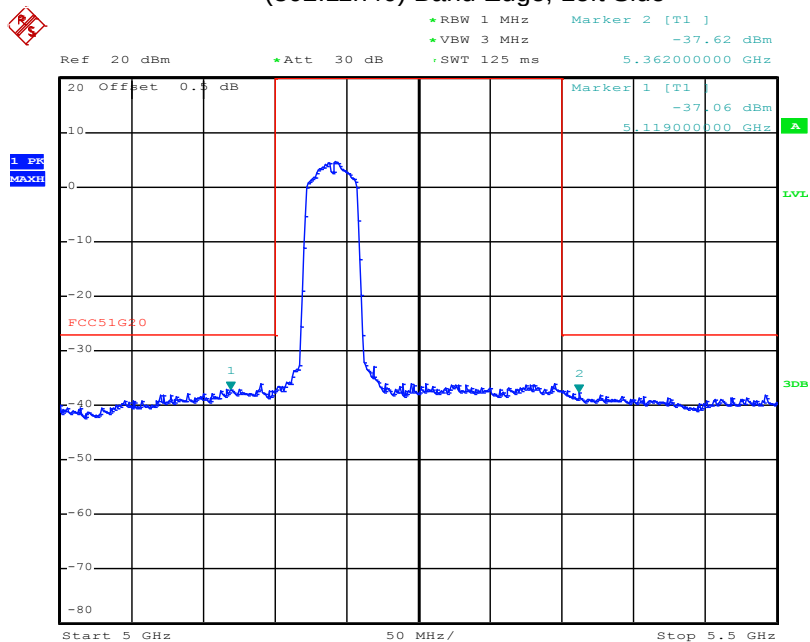
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(802.11n20) Band Edge, Right Side



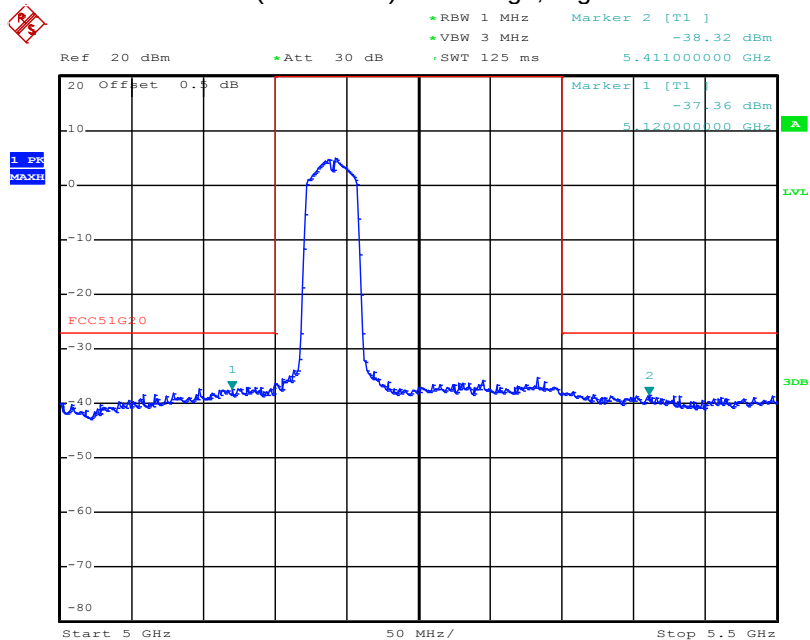
Date: 20.OCT.2021 12:09:21

5.180~5.240 GHz (802.11n40) Band Edge, Left Side



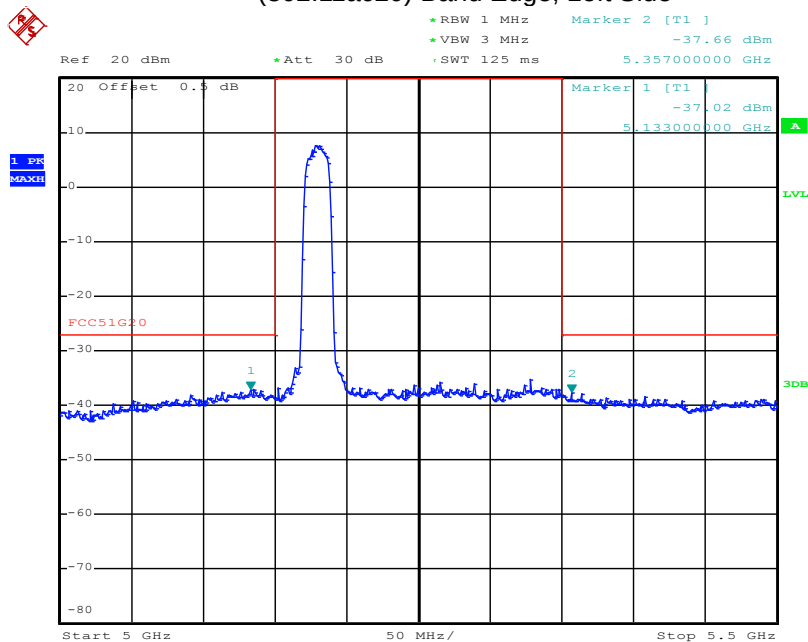
Date: 20.OCT.2021 12:10:10

(802.11n40) Band Edge, Right Side



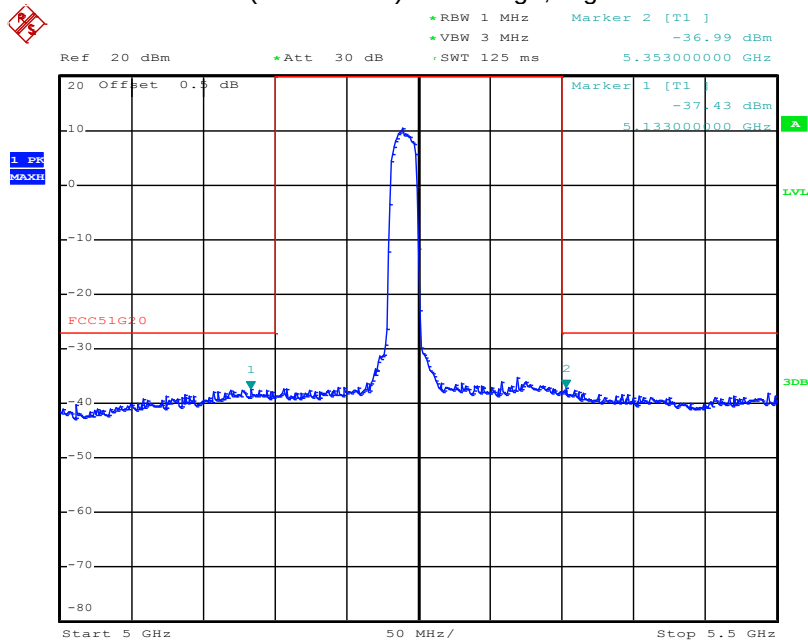
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5.180~5.240 GHz (802.11ac20) Band Edge, Left Side



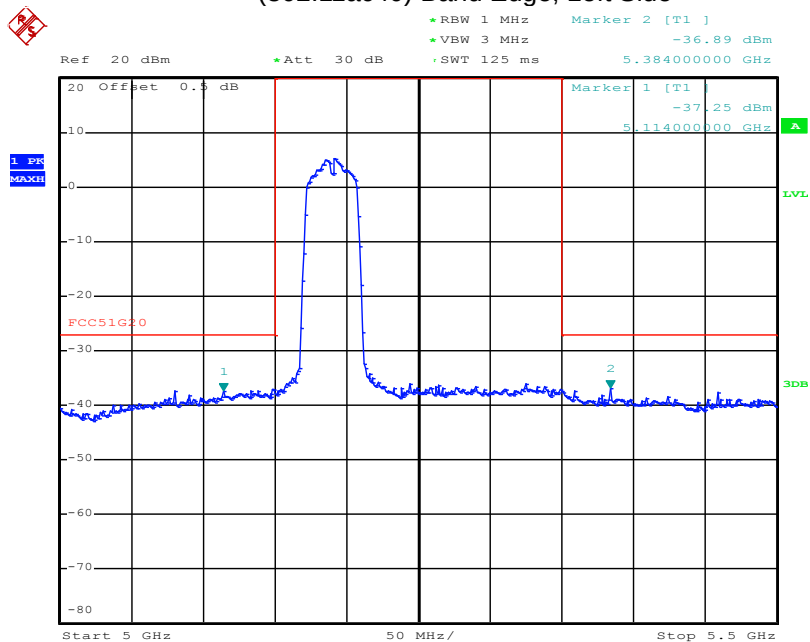
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(802.11ac20) Band Edge, Right Side



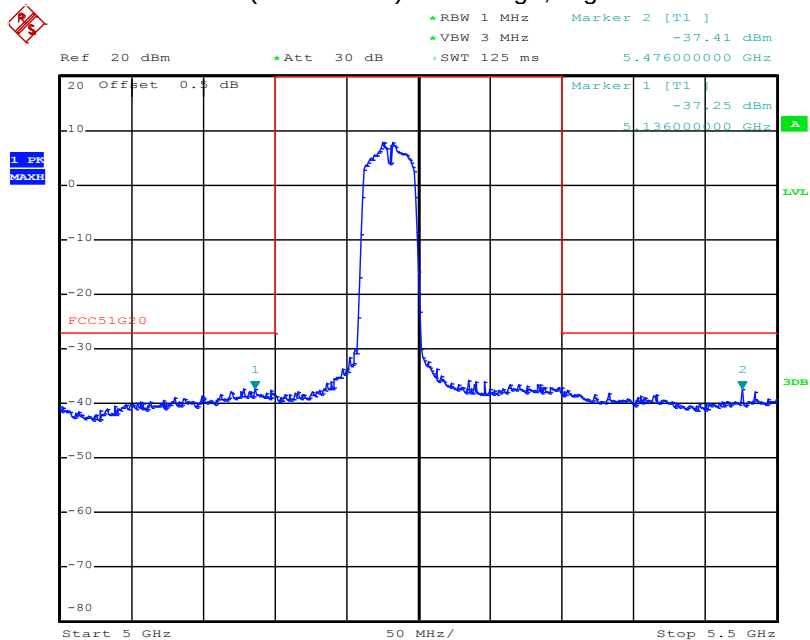
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5.180~5.240 GHz (802.11ac40) Band Edge, Left Side



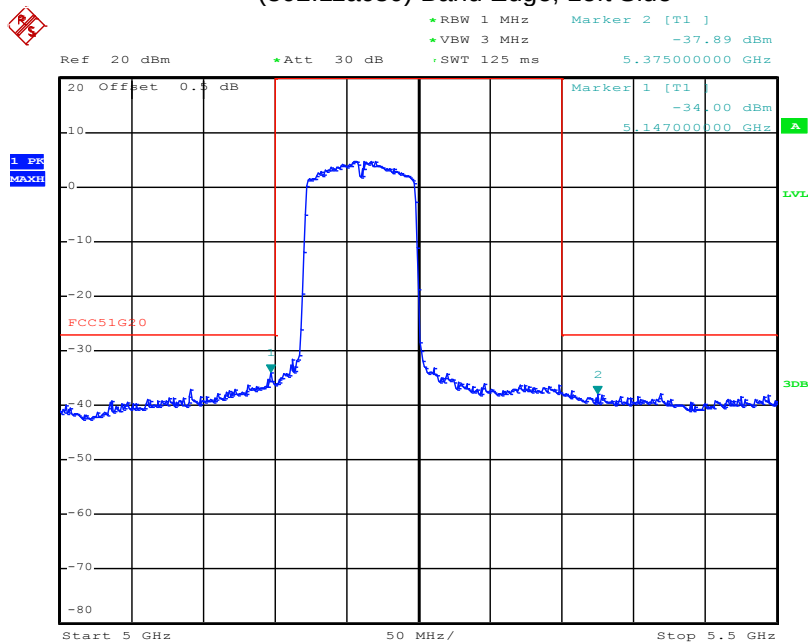
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(802.11ac40) Band Edge, Right Side



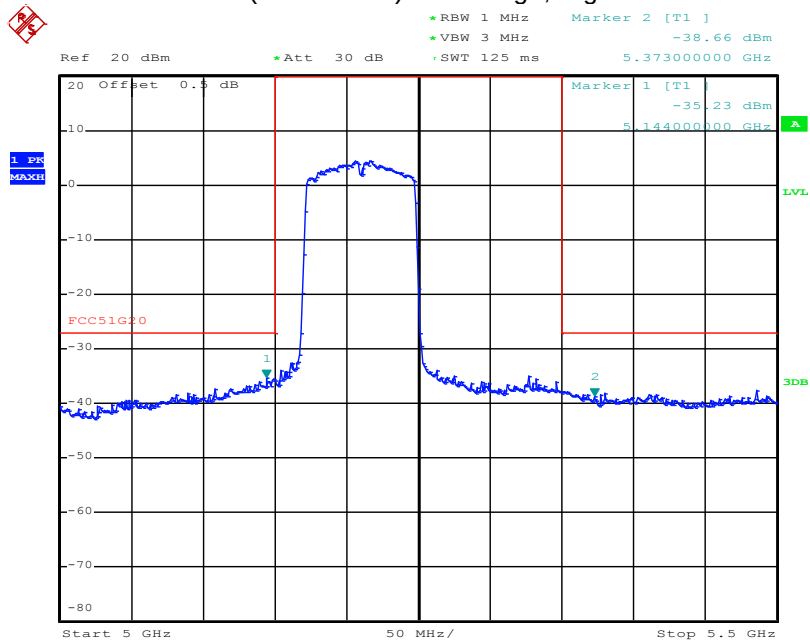
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5.180~5.240 GHz (802.11ac80) Band Edge, Left Side



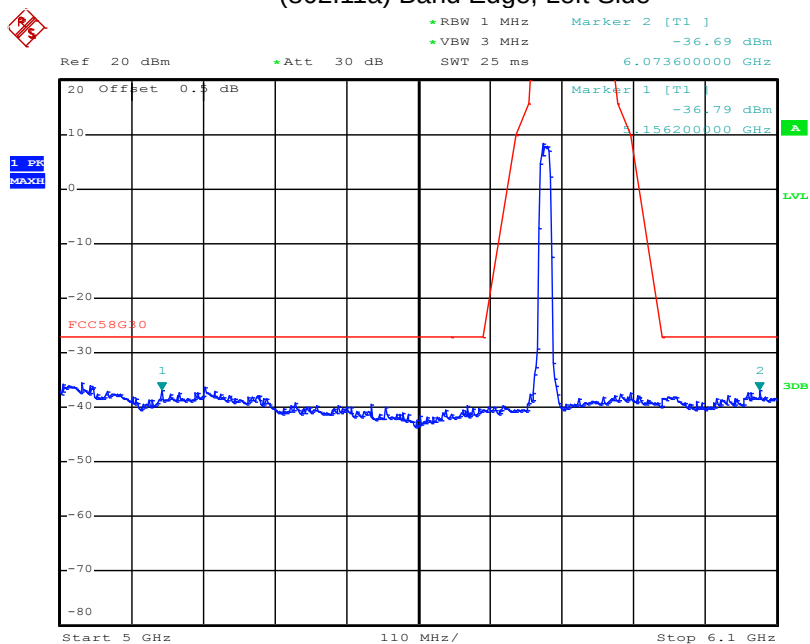
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(802.11ac80) Band Edge, Right Side



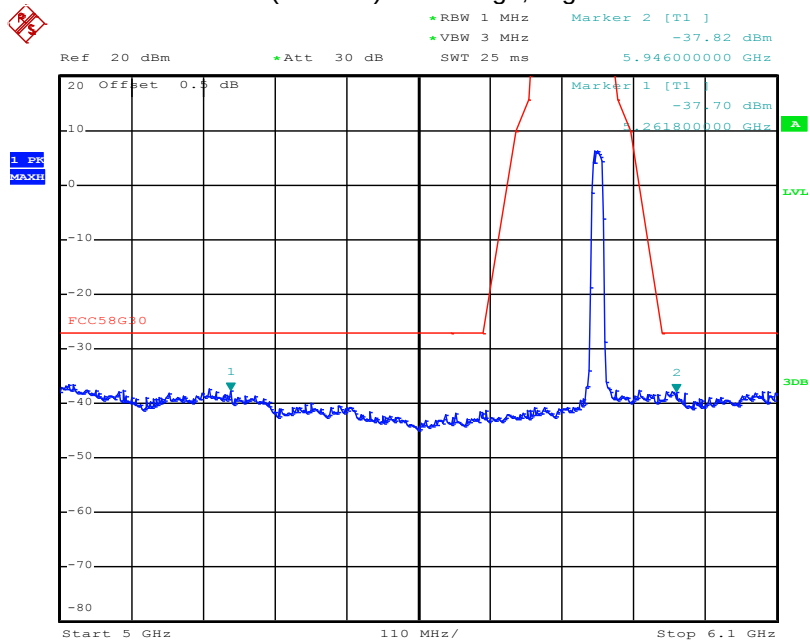
Date: 20.OCT.2021 12:15:20

5.745~5.825 GHz
(802.11a) Band Edge, Left Side



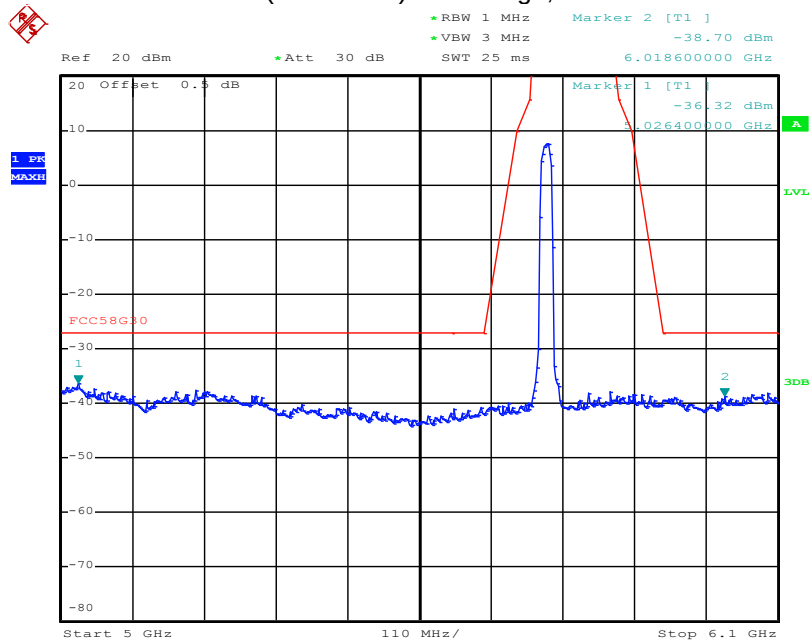
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(802.11a) Band Edge, Right Side



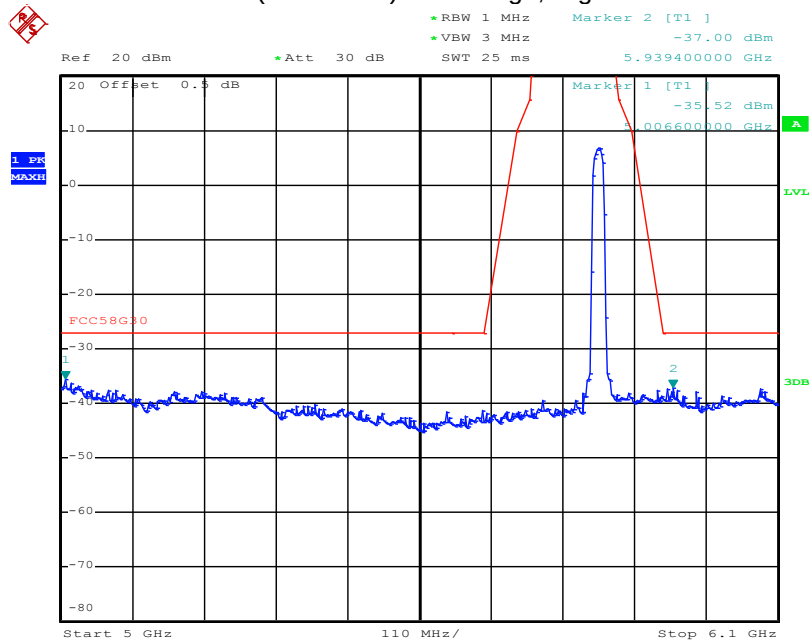
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5.745~5.825 GHz (802.11n20) Band Edge, Left Side



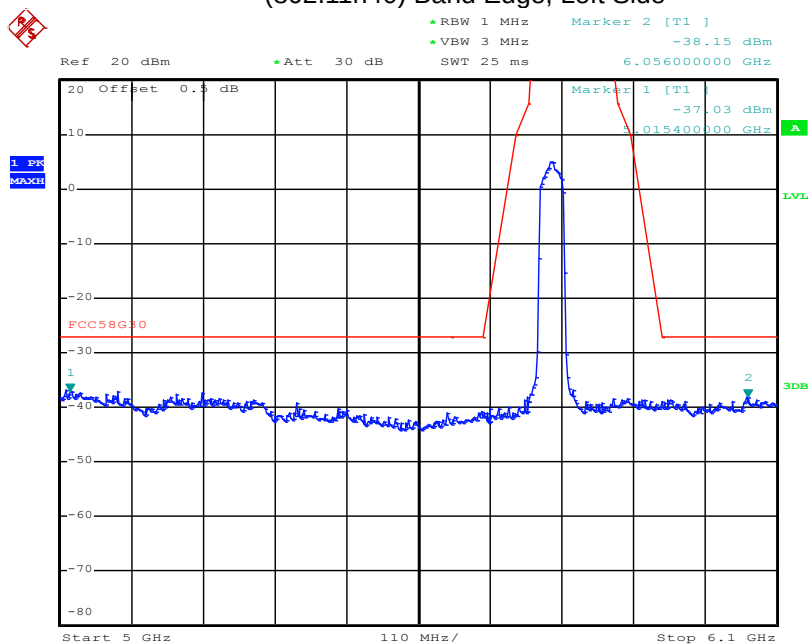
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(802.11n20) Band Edge, Right Side



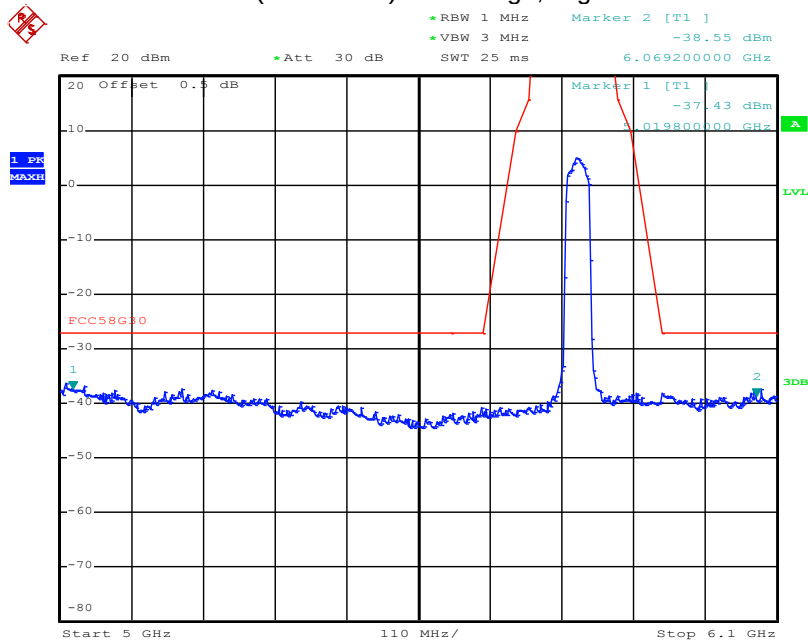
Date: 21.OCT.2021 12:02:19

5.745~5.825 GHz
(802.11n40) Band Edge, Left Side



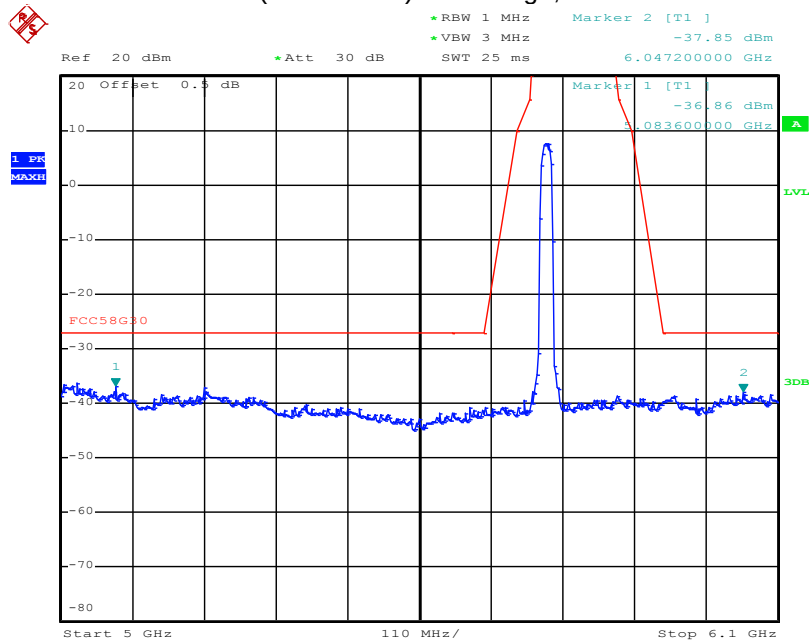
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(802.11n40) Band Edge, Right Side



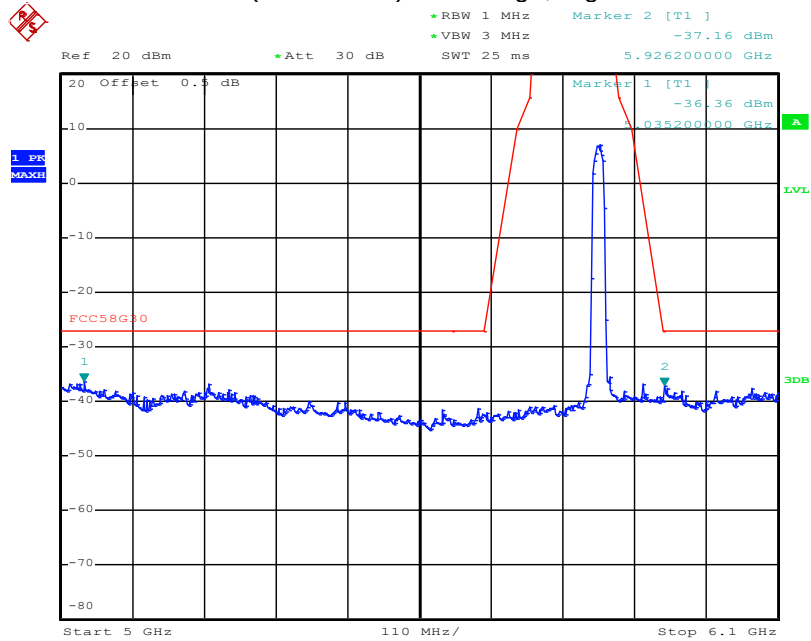
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5.745~5.825 GHz (802.11ac20) Band Edge, Left Side



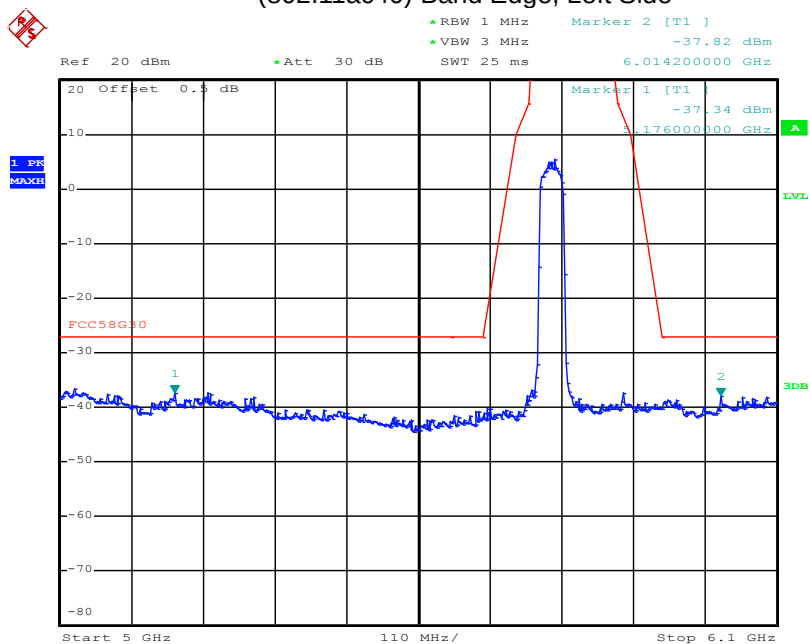
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(802.11ac20) Band Edge, Right Side



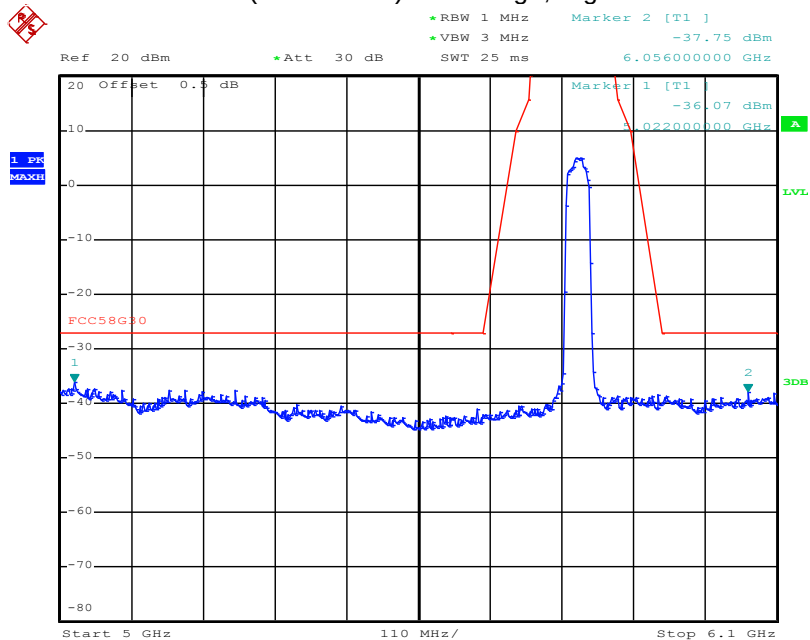
Date: 21.OCT.2021 12:03:47

5.745~5.825 GHz (802.11ac40) Band Edge, Left Side



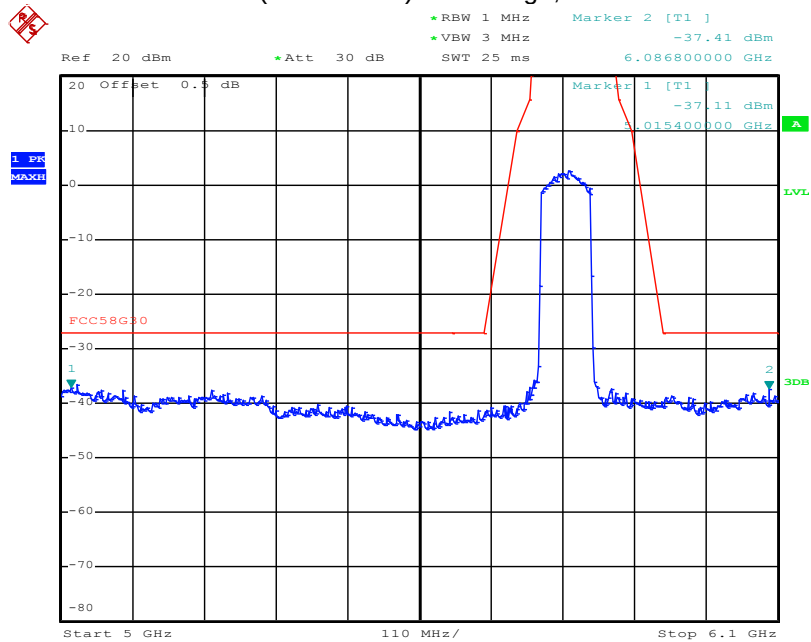
Date: 21.OCT.2021 12:04:30

(802.11ac40) Band Edge, Right Side



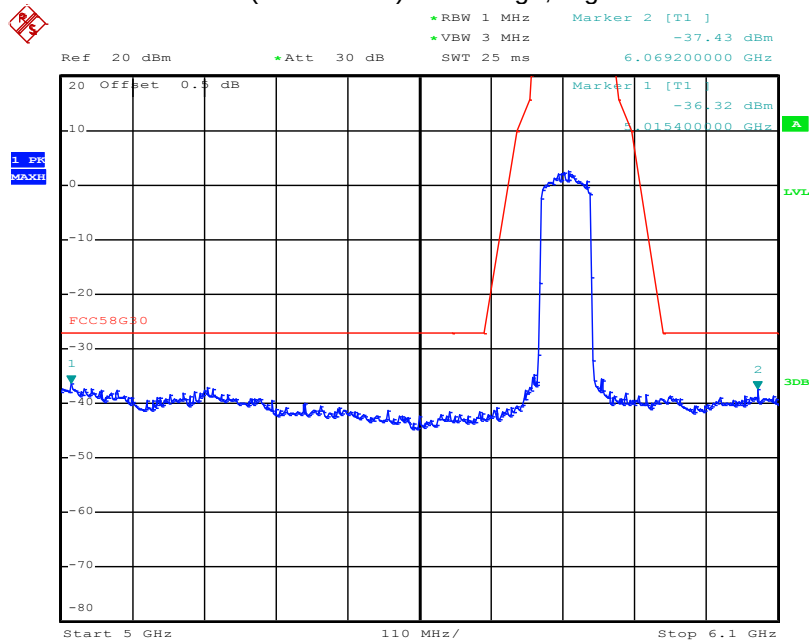
Date: 21.OCT.2021 12:06:43

5.745~5.825 GHz (802.11ac80) Band Edge, Left Side



Date: 21.OCT.2021 12:07:22

(802.11ac80) Band Edge, Right Side



Date: 21.OCT.2021 12:07:48

12. Spurious RF Conducted Emissions

12.1 Block Diagram Of Test Setup



12.2 Limit

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge..

12.3 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

12.4 Test Result

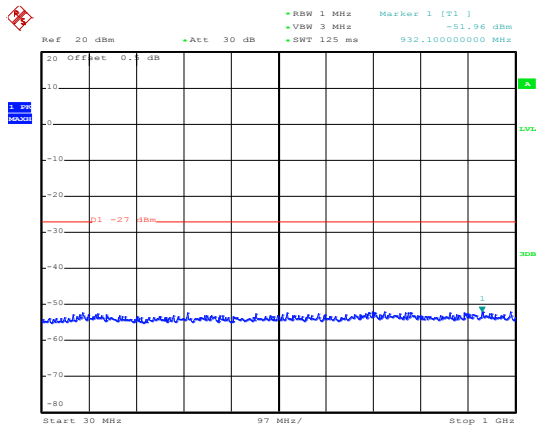
Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.

About: 26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Note: A\B\C\D Represent the value of antenna A\B\C\D, The worst data is Antenna A, only shown Antenna A Plot.

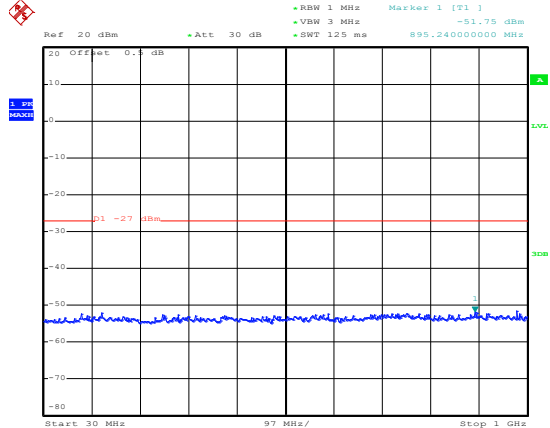
5.1G Test Plot

802.11a on channel 36



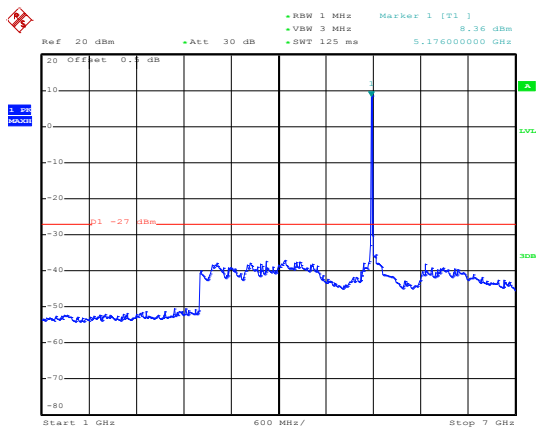
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802.11a on channel 40



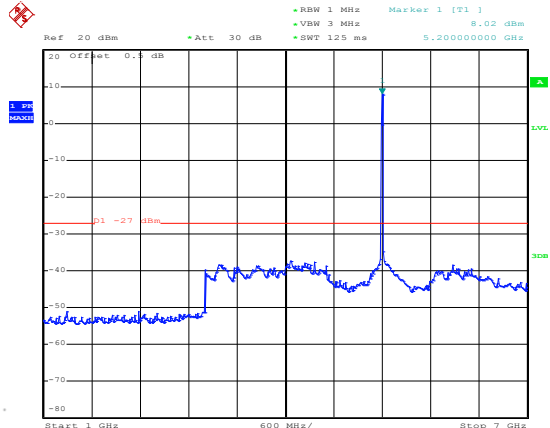
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802.11a on channel 36



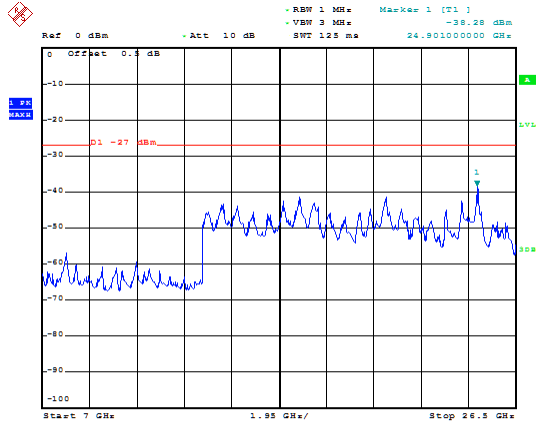
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802.11a on channel 40



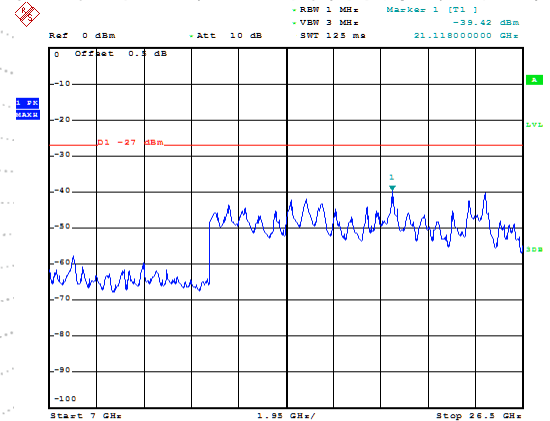
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802.11a on channel 36



Date: 20.OCT.2021 12:00:18

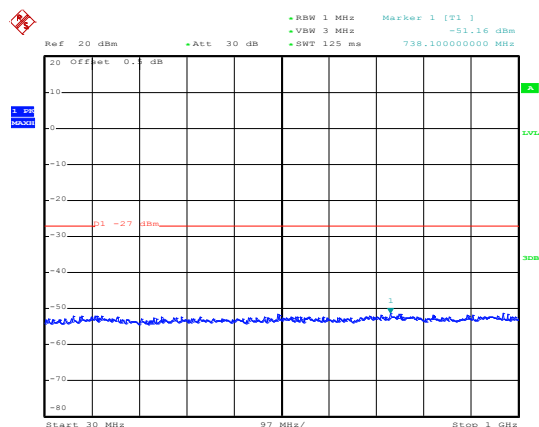
802.11a on channel 40



Date: 20.OCT.2021 12:00:00

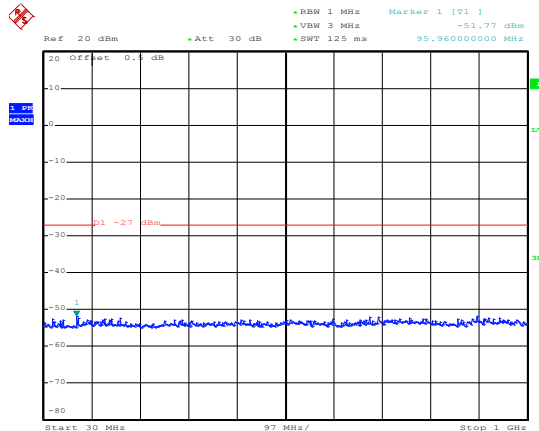
Test Plot

802.11a on channel 48



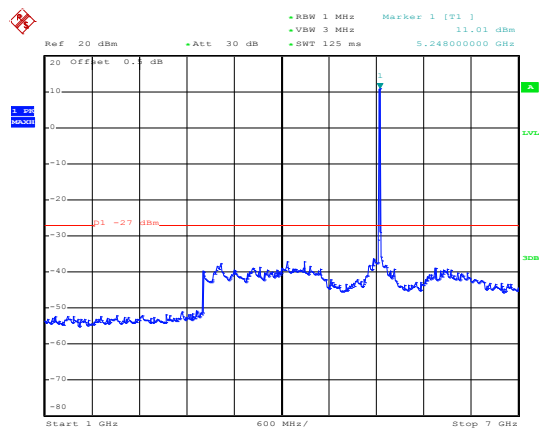
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802.11n20 on channel 36



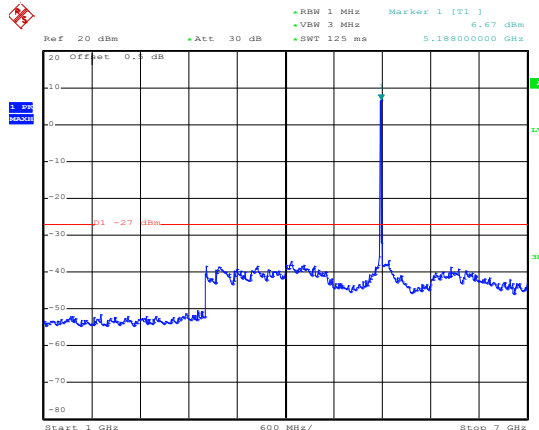
Date: 20.OCT.2021 11:47:53

802.11a on channel 48



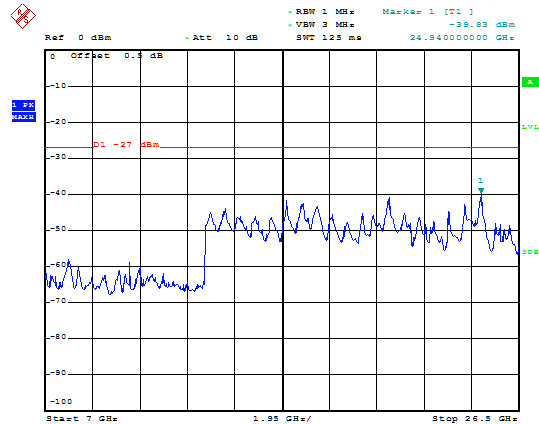
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802.11n20 on channel 36



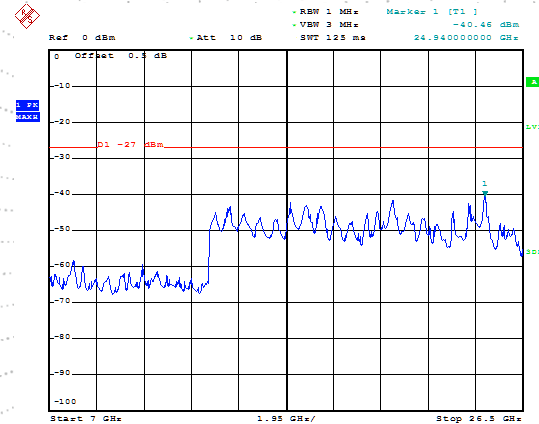
Date: 20.OCT.2021 11:53:08

802.11a on channel 48



Date: 20.OCT.2021 11:59:33

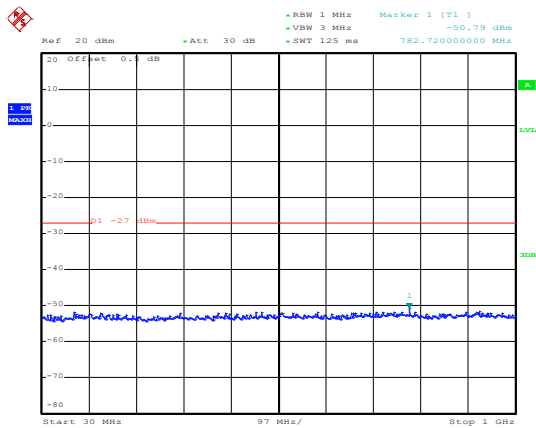
802.11n20 on channel 36



Date: 20.OCT.2021 12:00:33

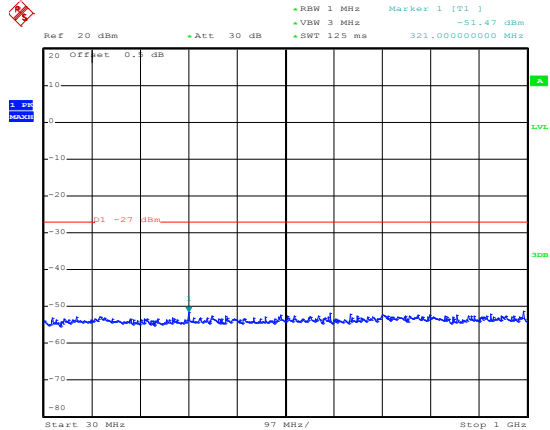
Test Plot

802.11n20 on channel 40



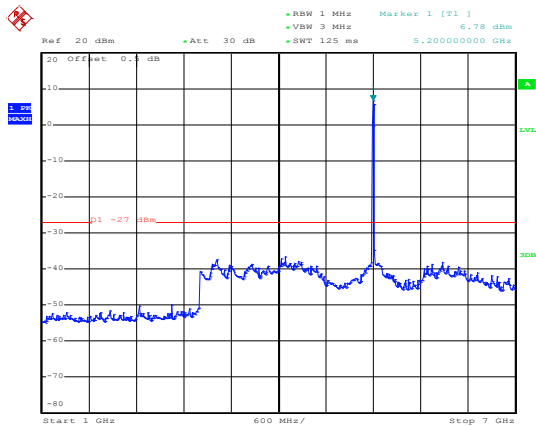
Date: 20.OCT.2021 11:48:21

802.11n20 on channel 48



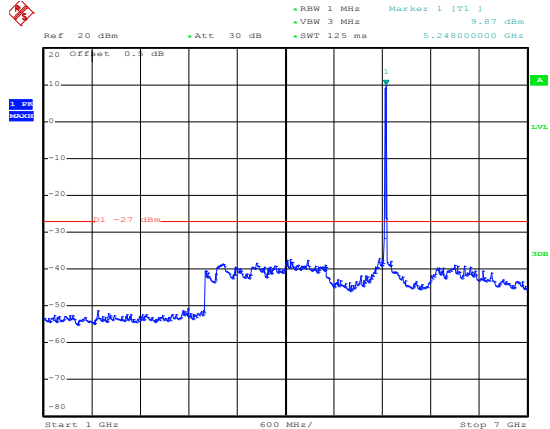
Date: 20.OCT.2021 11:48:36

802.11n20 on channel 40



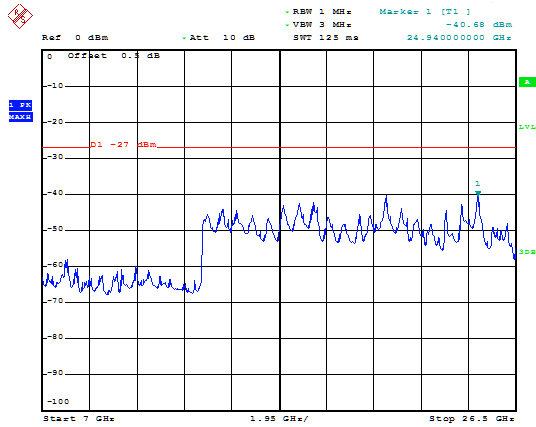
Date: 20.OCT.2021 11:53:39

802.11n20 on channel 48



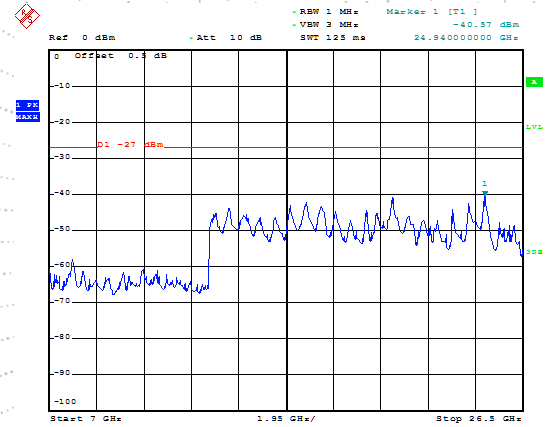
Date: 20.OCT.2021 11:53:57

802.11n20 on channel 40



Date: 20.OCT.2021 12:00:49

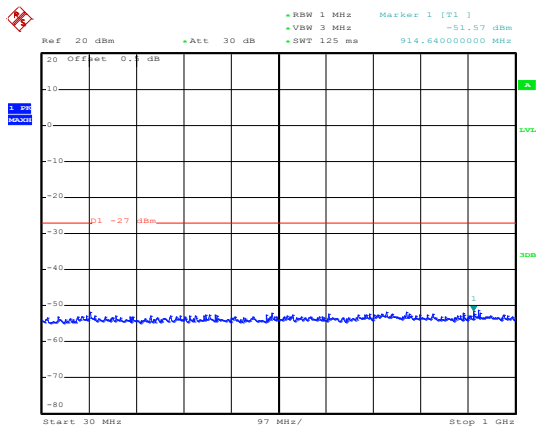
802.11n20 on channel 48



Date: 20.OCT.2021 12:01:03

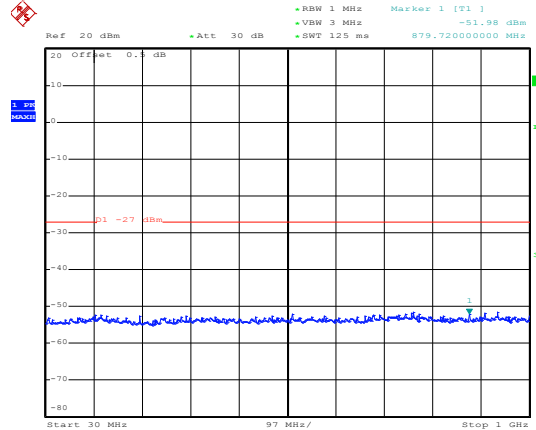
Test Plot

802.11n40 on channel 38



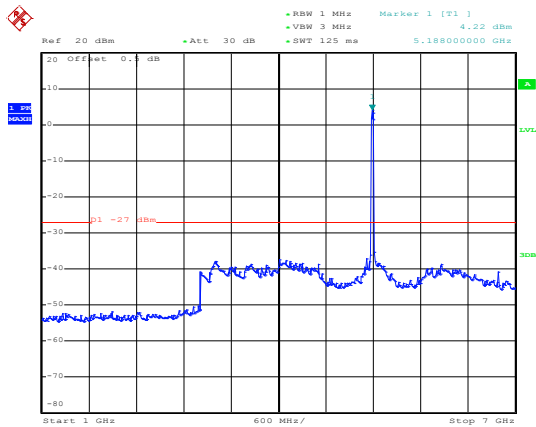
Date: 20.OCT.2021 11:48:55

802.11n40 on channel 46



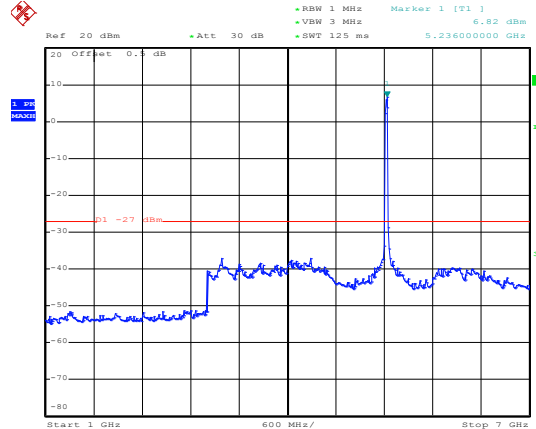
Date: 20.OCT.2021 11:49:11

802.11n40 on channel 38



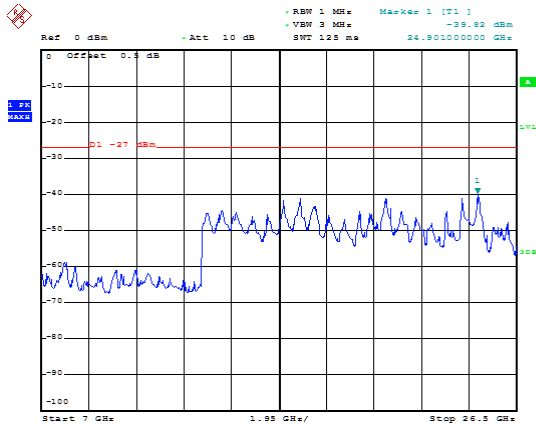
Date: 20.OCT.2021 11:54:33

802.11n40 on channel 46



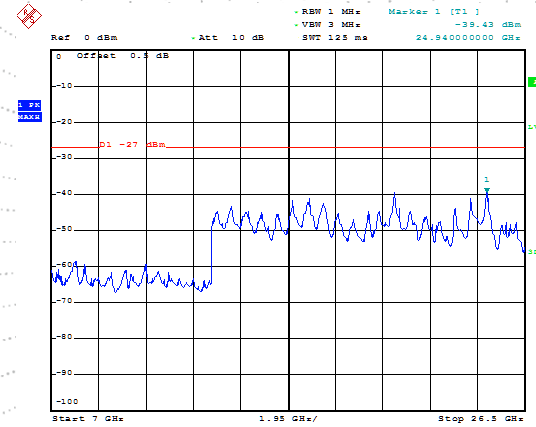
Date: 20.OCT.2021 11:55:03

802.11n40 on channel 38



Date: 20.OCT.2021 12:03:12

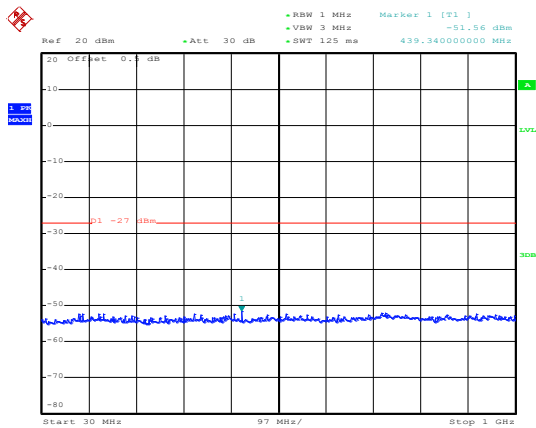
802.11n40 on channel 46



Date: 20.OCT.2021 12:03:27

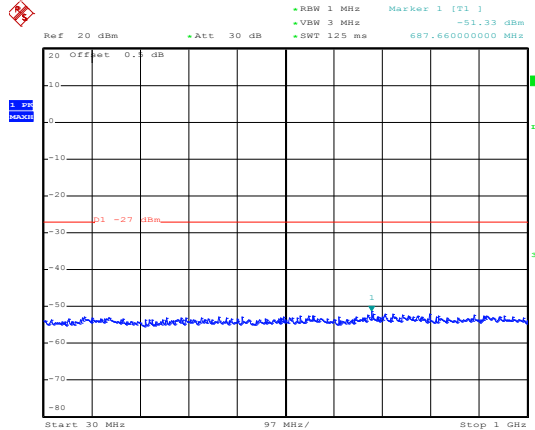
Test Plot

802.11ac20 on channel 36



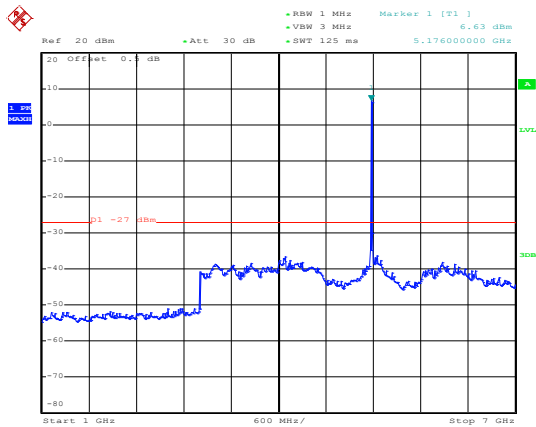
Date: 20.OCT.2021 11:46:12

802.11ac20 on channel 40



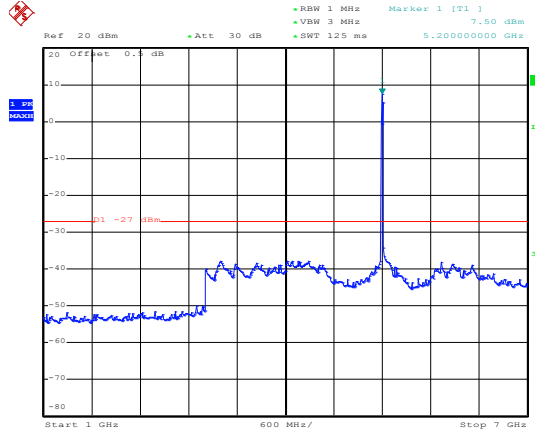
Date: 20.OCT.2021 11:46:29

802.11ac20 on channel 36



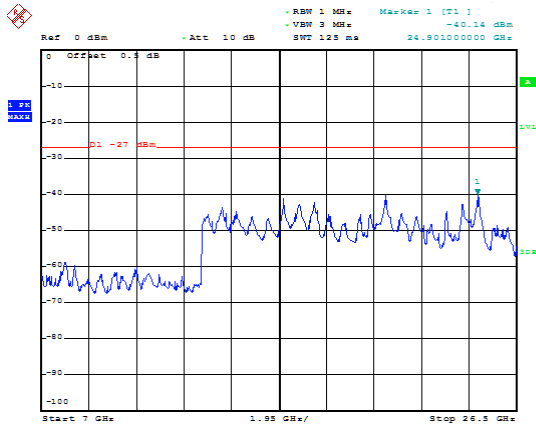
Date: 20.OCT.2021 11:52:42

802.11ac20 on channel 40



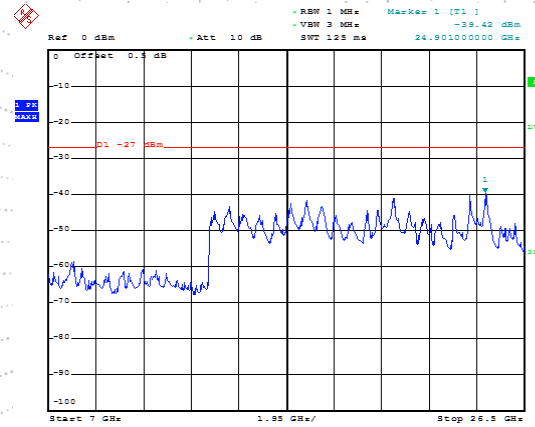
Date: 20.OCT.2021 11:52:02

802.11ac20 on channel 36



Date: 20.OCT.2021 12:02:10

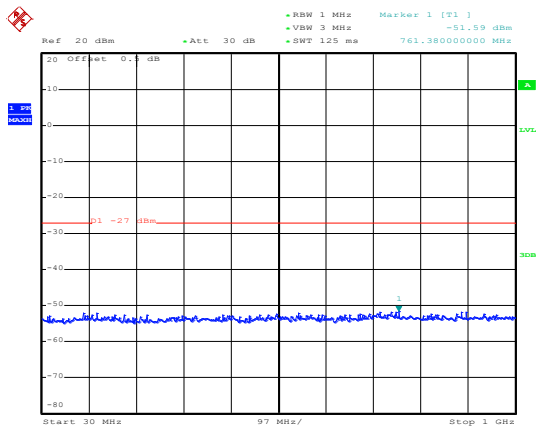
802.11ac20 on channel 40



Date: 20.OCT.2021 12:02:40

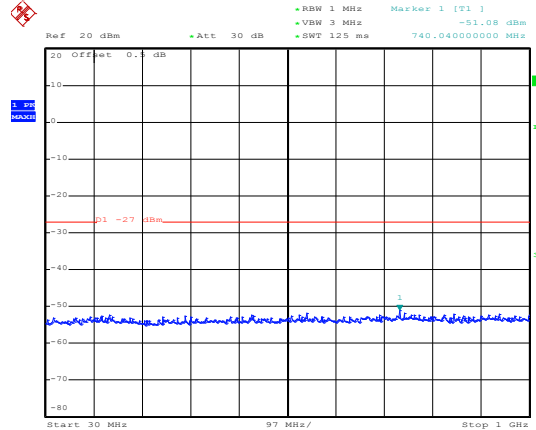
Test Plot

802.11ac20 on channel 48



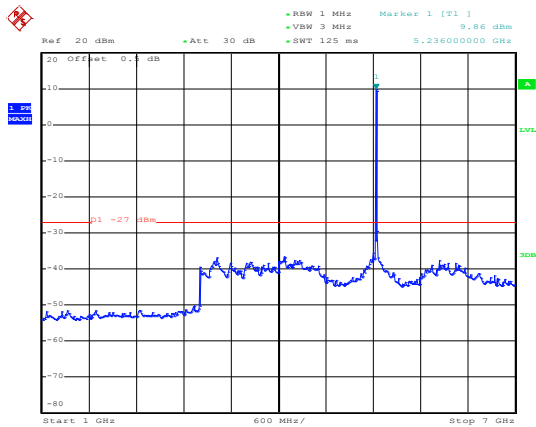
Date: 20.OCT.2021 11:46:48

802.11ac40 on channel 38



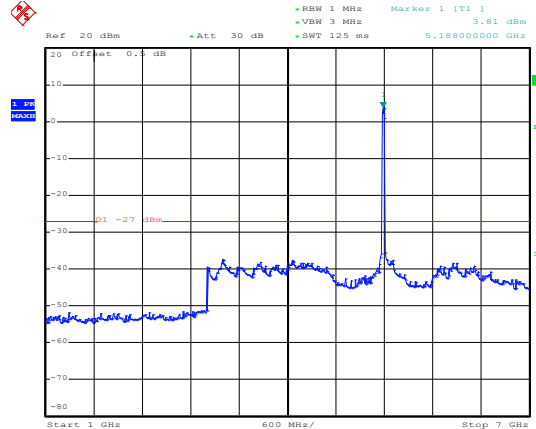
Date: 20.OCT.2021 11:47:21

802.11ac20 on channel 48



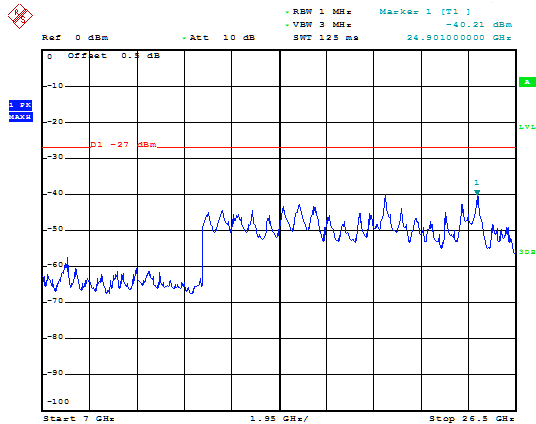
Date: 20.OCT.2021 11:51:33

802.11ac40 on channel 38



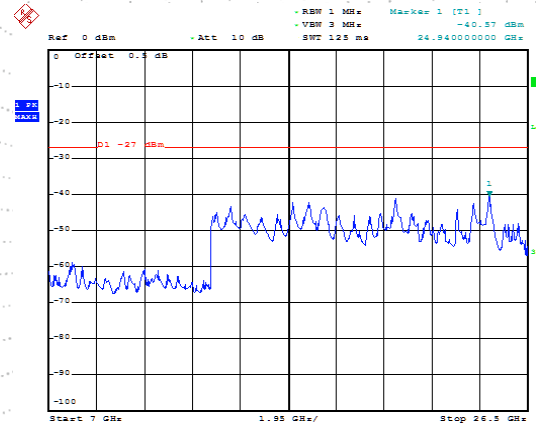
Date: 20.OCT.2021 11:56:07

802.11ac20 on channel 48



Date: 20.OCT.2021 12:02:57

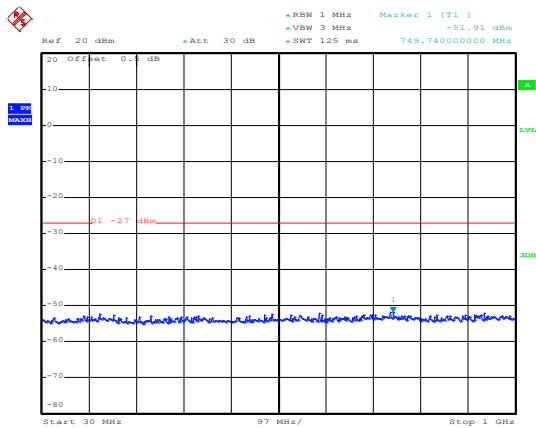
802.11ac40 on channel 38



Date: 20.OCT.2021 12:01:32

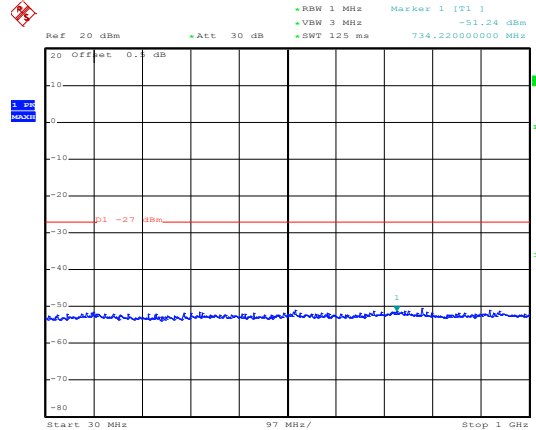
Test Plot

802.11ac40 on channel 46



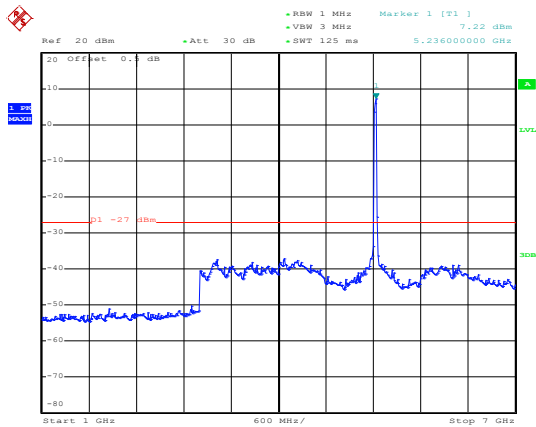
Date: 20.OCT.2021 11:47:38

802.11ac80 on channel 42



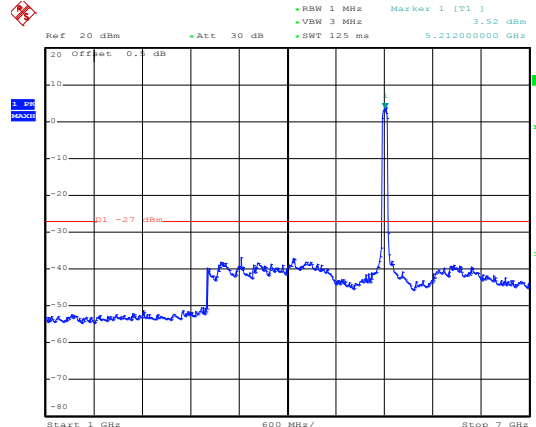
Date: 20.OCT.2021 11:43:11

802.11 ac40 on channel 46



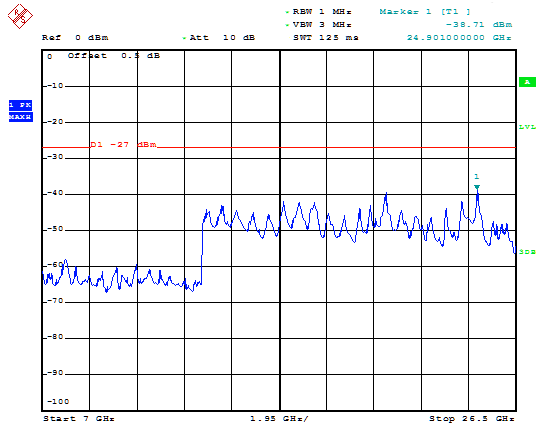
Date: 20.OCT.2021 11:55:33

802.11ac80 on channel 42



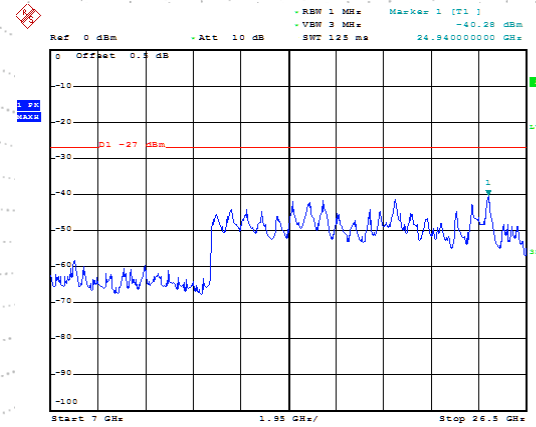
Date: 20.OCT.2021 11:56:59

802.11 ac40 on channel 46



Date: 20.OCT.2021 12:01:53

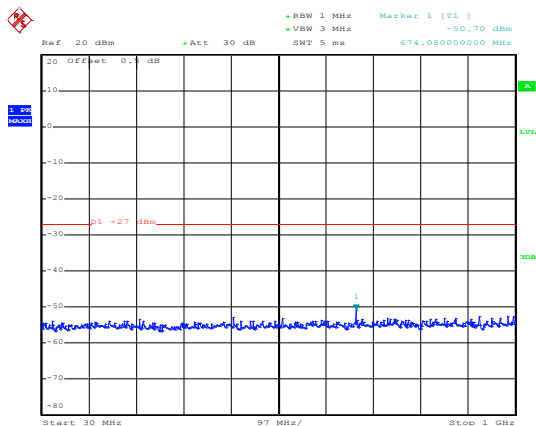
802.11ac80 on channel 42



Date: 20.OCT.2021 11:58:47

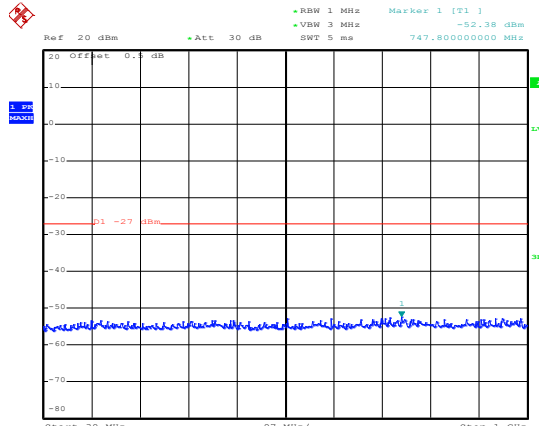
5.8G Test Plot

802.11a on channel 149



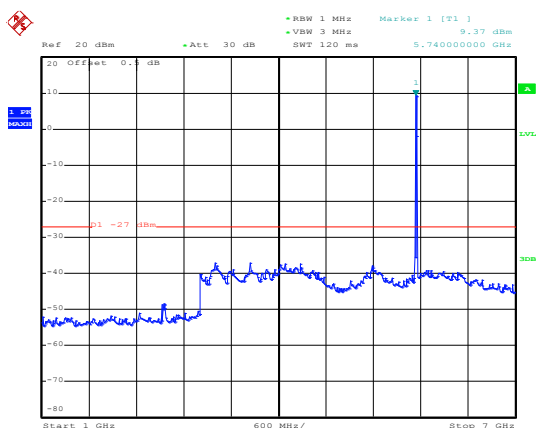
Date: 21.OCT.2021 12:09:03

802.11a on channel 157



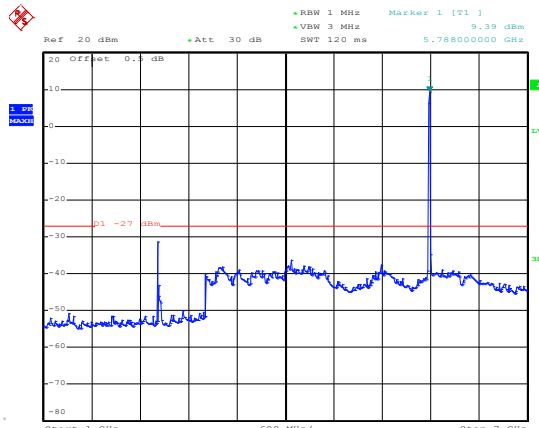
Date: 21.OCT.2021 12:09:51

802.11a on channel 149



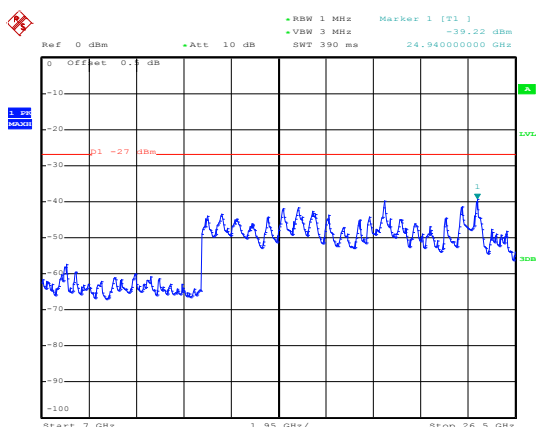
Date: 21.OCT.2021 12:14:58

802.11a on channel 157



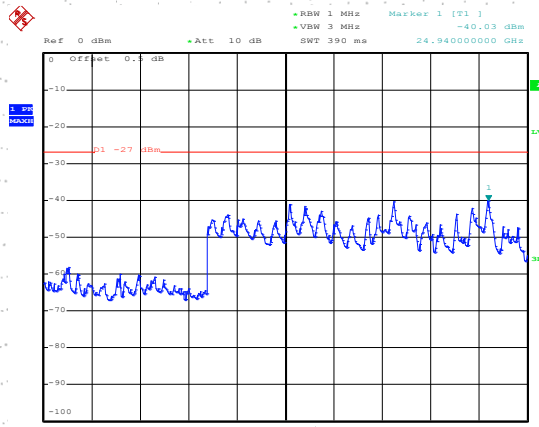
Date: 21.OCT.2021 12:15:57

802.11a on channel 149



Date: 21.OCT.2021 12:32:08

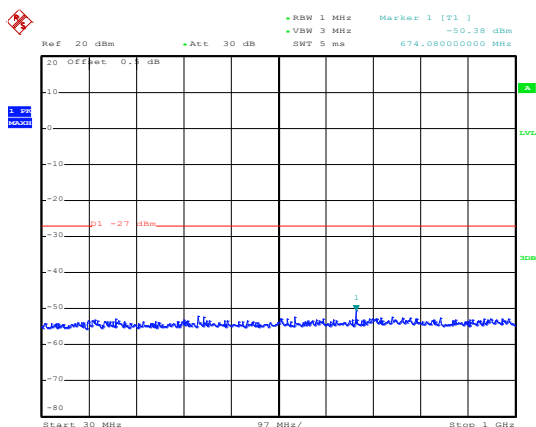
802.11a on channel 157



Date: 21.OCT.2021 12:32:25

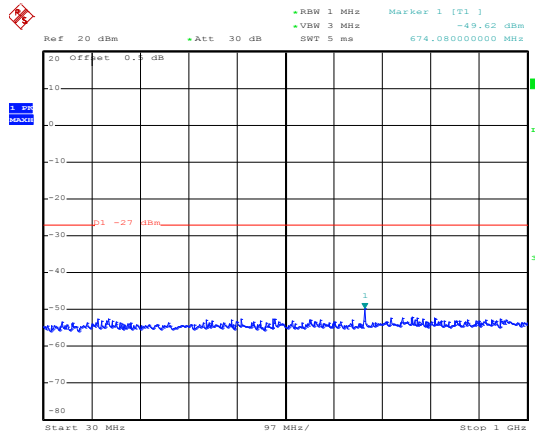
Test Plot

802.11a on channel 165



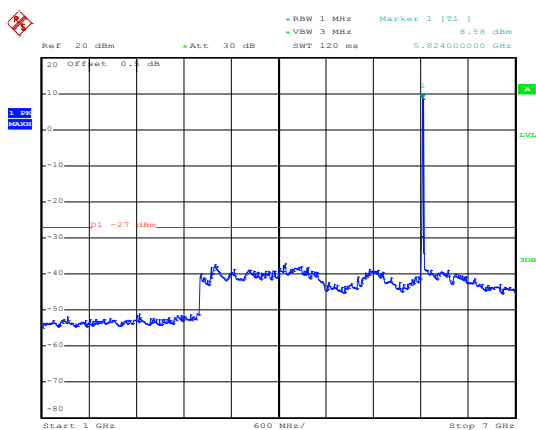
Date: 21.OCT.2021 12:10:04

802.11n20 on channel 149



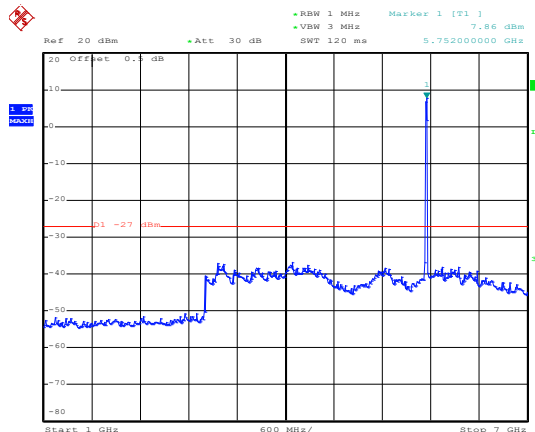
Date: 21.OCT.2021 12:12:44

802.11a on channel 165



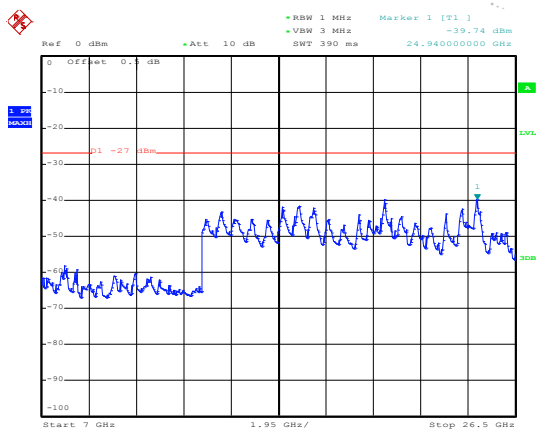
Date: 21.OCT.2021 12:19:05

802.11n20 on channel 149



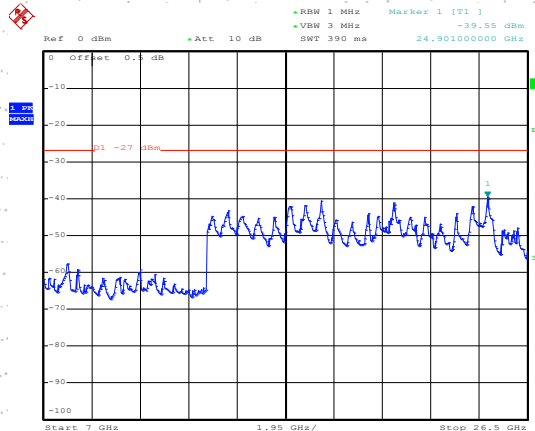
Date: 21.OCT.2021 12:23:26

802.11a on channel 165



Date: 21.OCT.2021 12:32:37

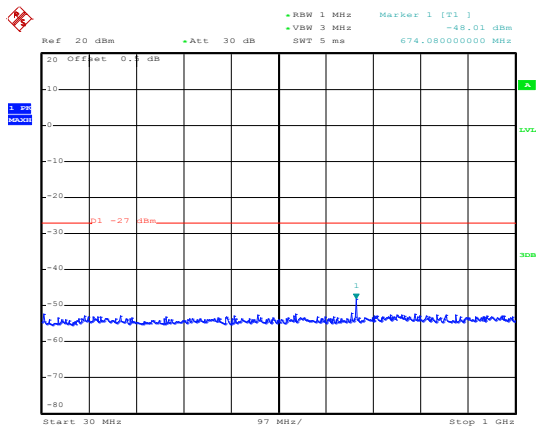
802.11n20 on channel 149



Date: 21.OCT.2021 12:34:08

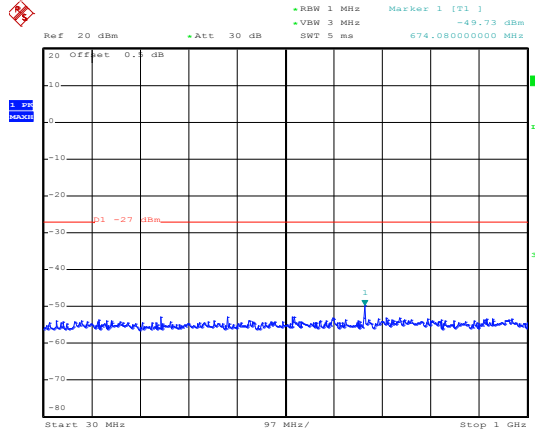
Test Plot

802.11n20 on channel 157



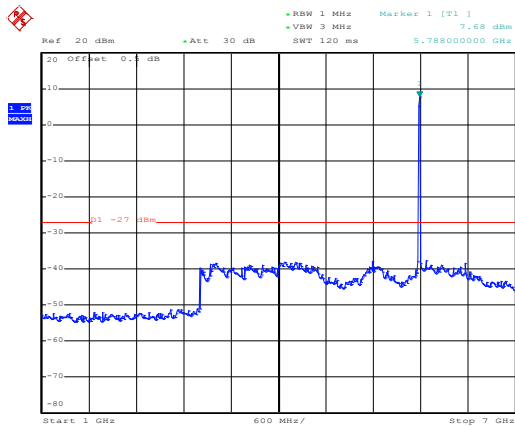
Date: 21.OCT.2021 12:13:29

802.11n20 on channel 165



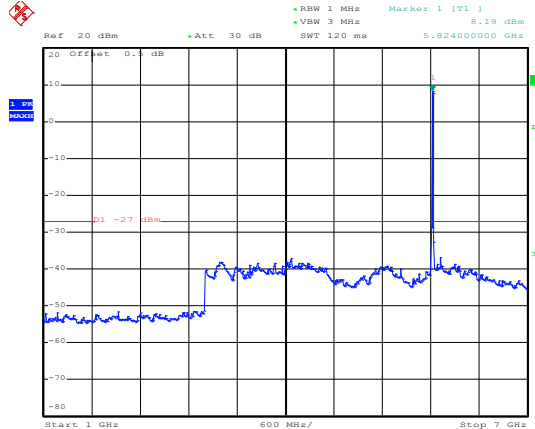
Date: 21.OCT.2021 12:13:44

802.11n20 on channel 157



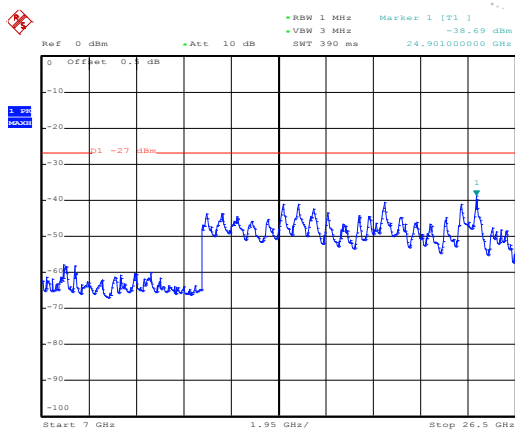
Date: 21.OCT.2021 12:24:31

802.11n20 on channel 165



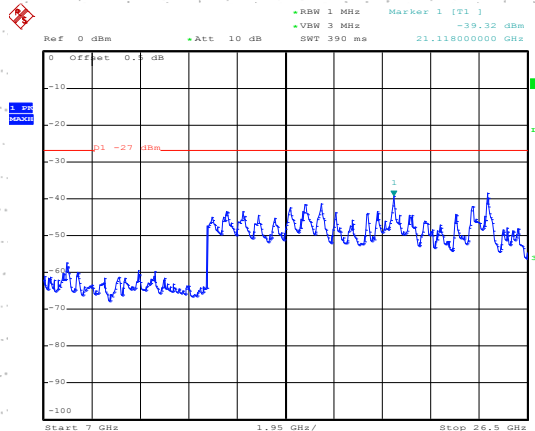
Date: 21.OCT.2021 12:25:03

802.11n20 on channel 157



Date: 21.OCT.2021 12:34:25

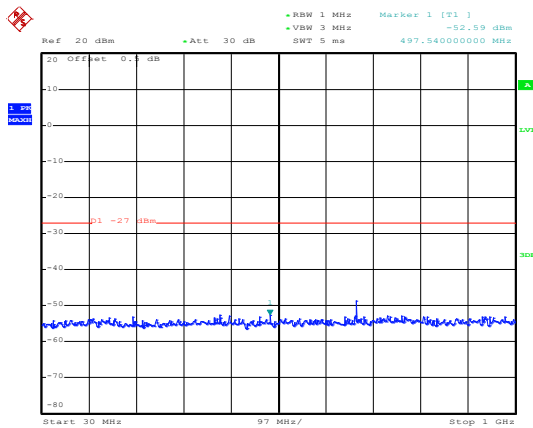
802.11n20 on channel 165



Date: 21.OCT.2021 12:34:42

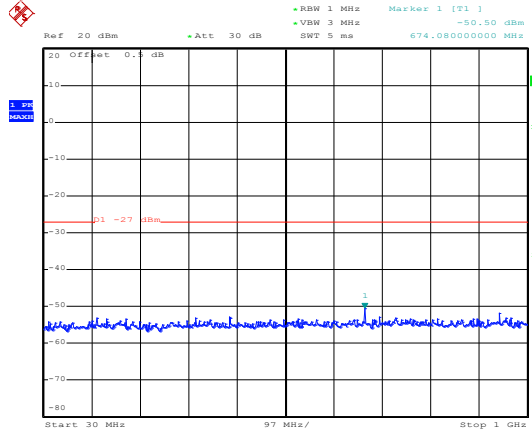
Test Plot

802.11n40 on channel 151



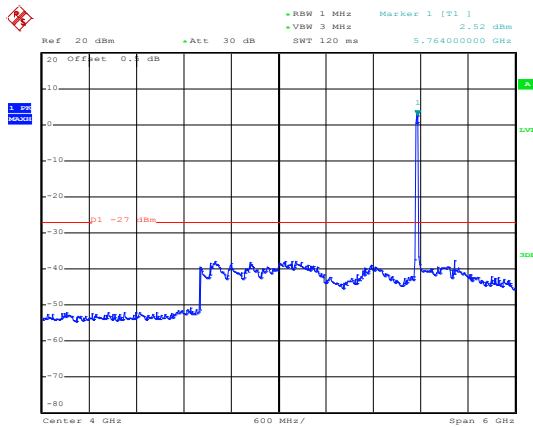
Date: 21.OCT.2021 12:14:10

802.11n40 on channel 159



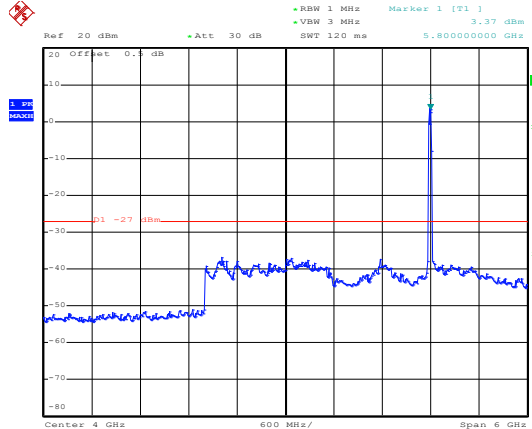
Date: 21.OCT.2021 12:14:26

802.11n40 on channel 151



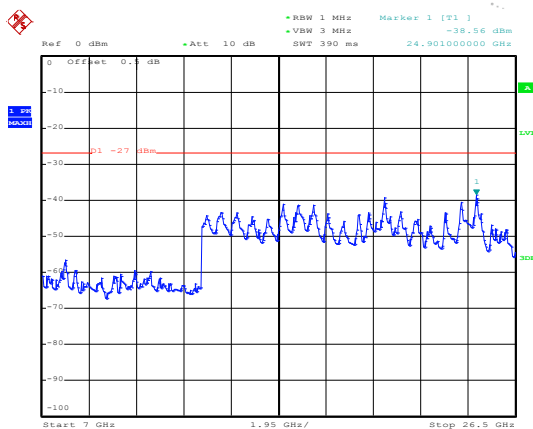
Date: 21.OCT.2021 12:27:45

802.11n40 on channel 159



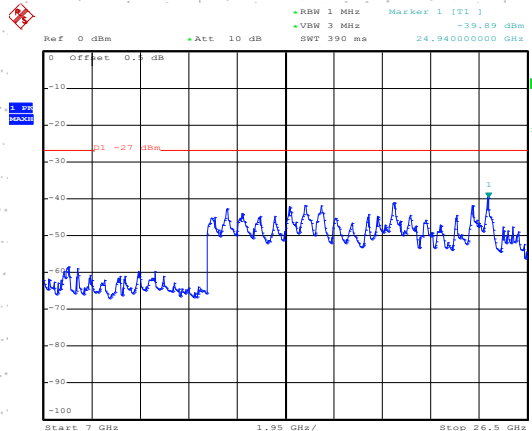
Date: 21.OCT.2021 12:28:21

802.11n40 on channel 151



Date: 21.OCT.2021 12:34:55

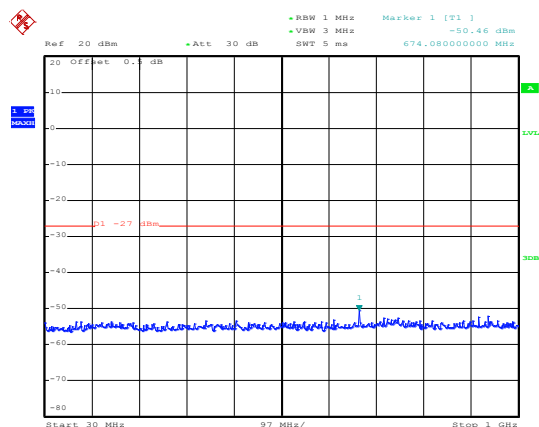
802.11n40 on channel 159



Date: 21.OCT.2021 12:35:15

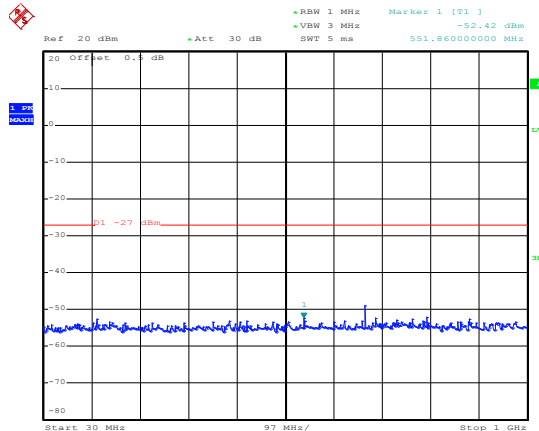
Test Plot

802.11ac20 on channel 149



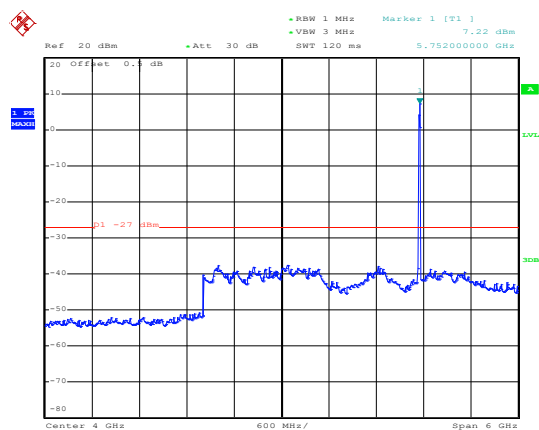
Date: 21.OCT.2021 12:10:19

802.11ac20 on channel 157



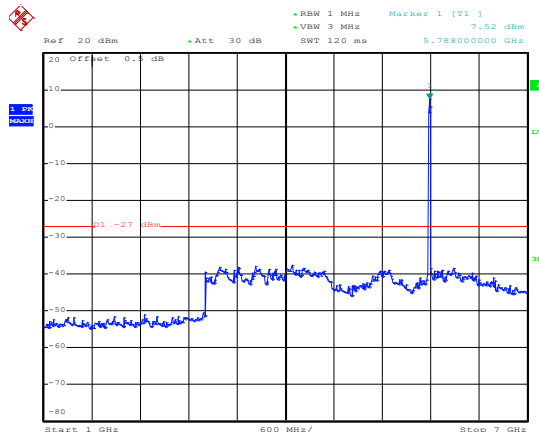
Date: 21.OCT.2021 12:10:33

802.11ac20 on channel 149



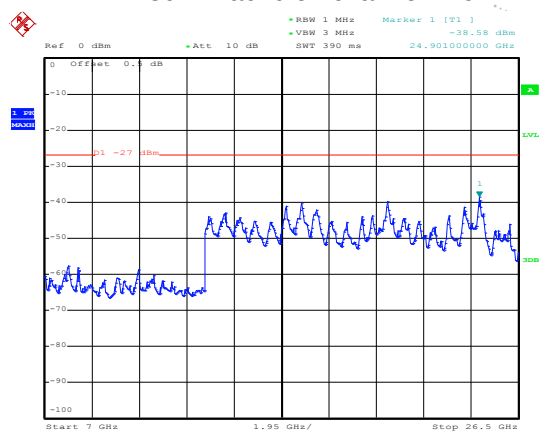
Date: 21.OCT.2021 12:26:40

802.11ac20 on channel 157



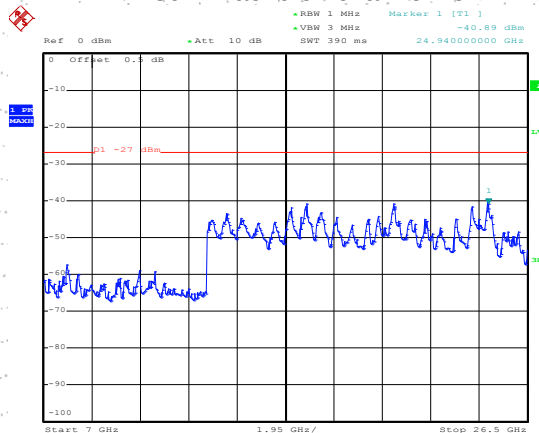
Date: 21.OCT.2021 12:26:07

802.11ac20 on channel 149



Date: 21.OCT.2021 12:32:53

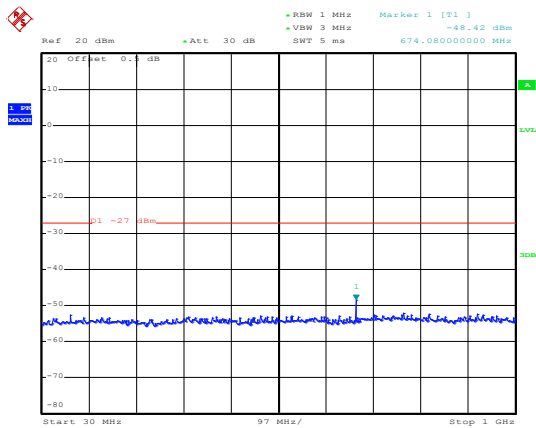
802.11ac20 on channel 157



Date: 21.OCT.2021 12:33:07

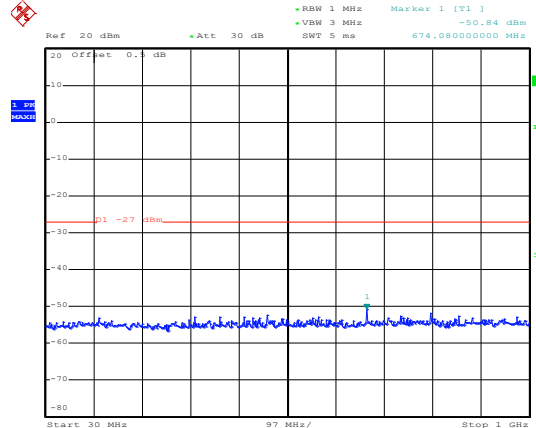
Test Plot

802.11ac20 on channel 165



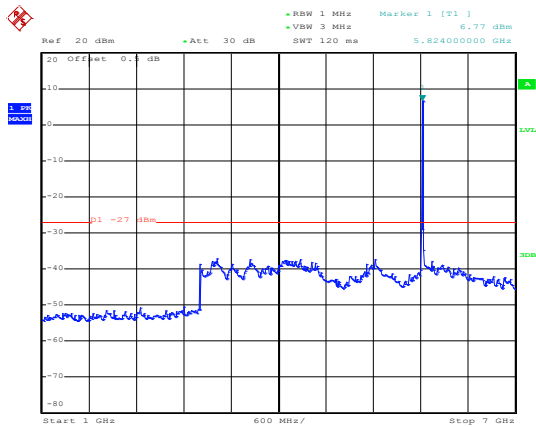
Date: 21.OCT.2021 12:11:15

802.11ac40 on channel 151



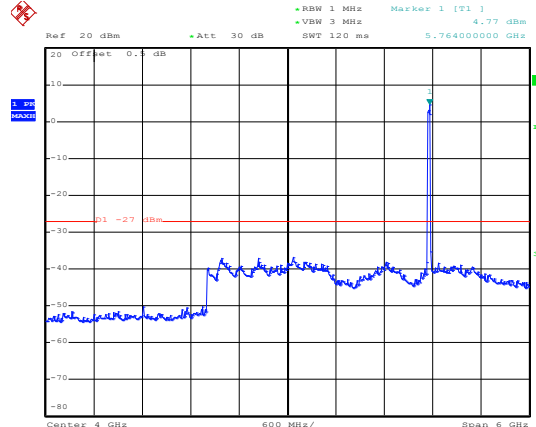
Date: 21.OCT.2021 12:11:46

802.11ac20 on channel 165



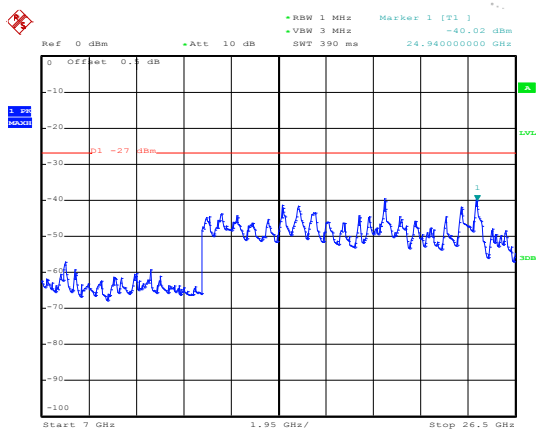
Date: 21.OCT.2021 12:25:36

802.11ac40 on channel 151



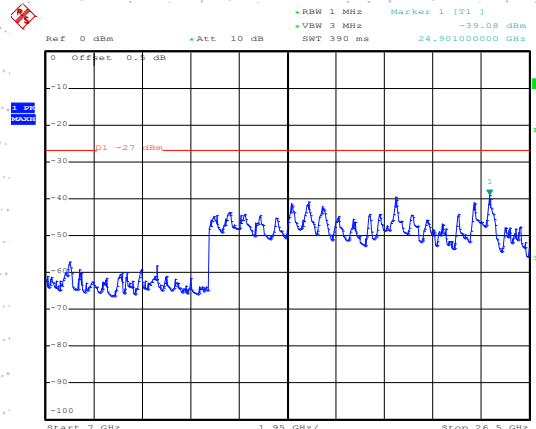
Date: 21.OCT.2021 12:27:13

802.11ac20 on channel 165



Date: 21.OCT.2021 12:33:22

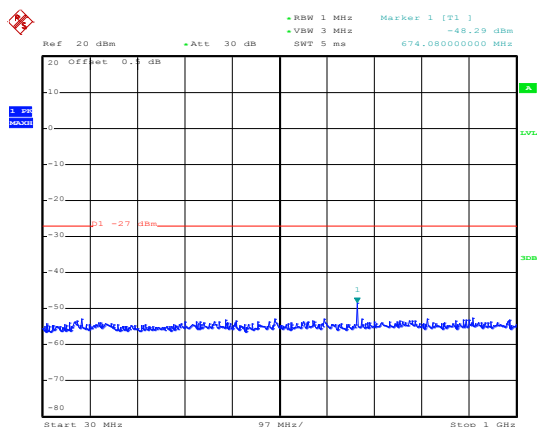
802.11ac40 on channel 151



Date: 21.OCT.2021 12:33:37

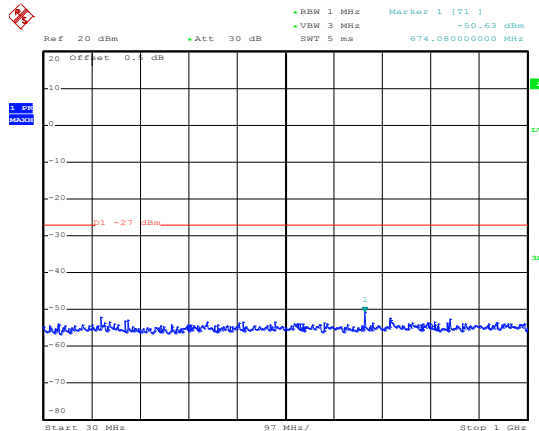
Test Plot

802.11ac40 on channel 159



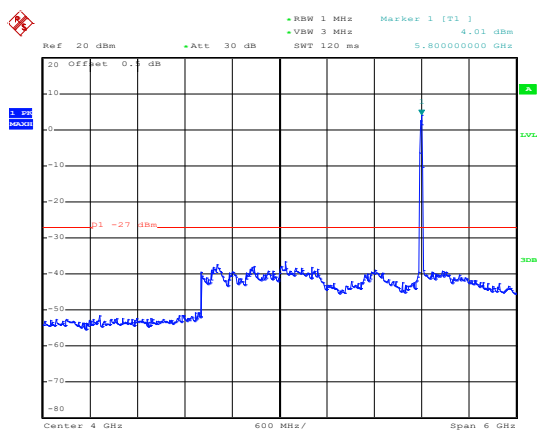
Date: 21.OCT.2021 12:12:00

802.11ac80 on channel 155



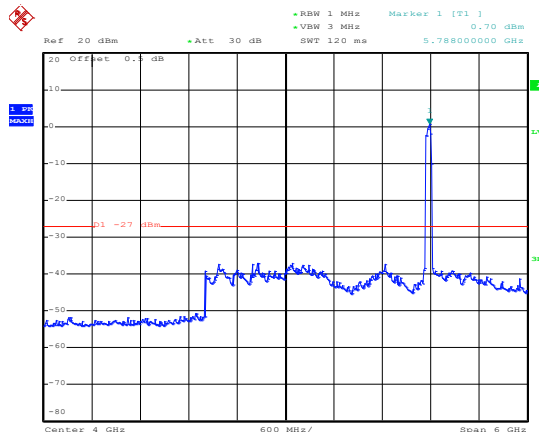
Date: 21.OCT.2021 12:12:15

802.11 ac40 on channel 159



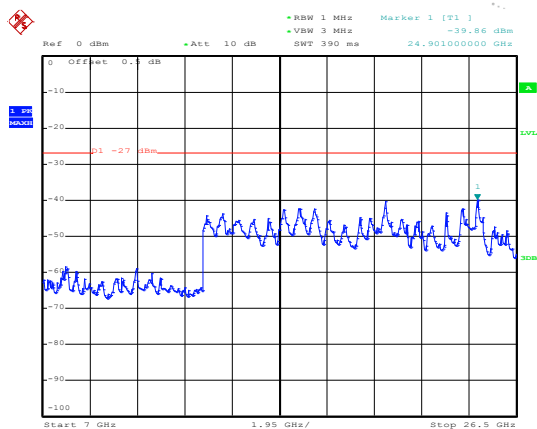
Date: 21.OCT.2021 12:28:51

802.11ac80 on channel 155



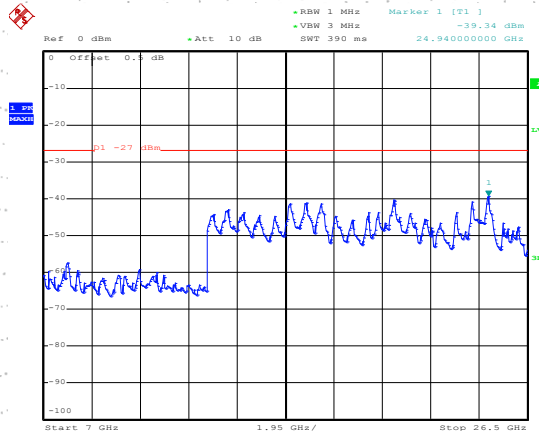
* Date: 21.OCT.2021 12:29:47

802.11 ac40 on channel 159



Date: 21.OCT.2021 12:33:51

802.11ac80 on channel 155



Date: 21.OCT.2021 12:31:16

13. Frequency Stability Measurement

13.1 Block Diagram Of Test Setup



13.2 Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)..

13.3 Test procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm and he limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-20^\circ\text{C} \sim 70^\circ\text{C}$.

13.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	AC120V/60Hz
Test Mode:	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency : 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5180.0209	5180	0.0209	4.0275
		V max (V)	138.00	5180.0082	5180	0.0082	1.5776
		V min (V)	102.00	5180.0093	5180	0.0093	1.7857
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

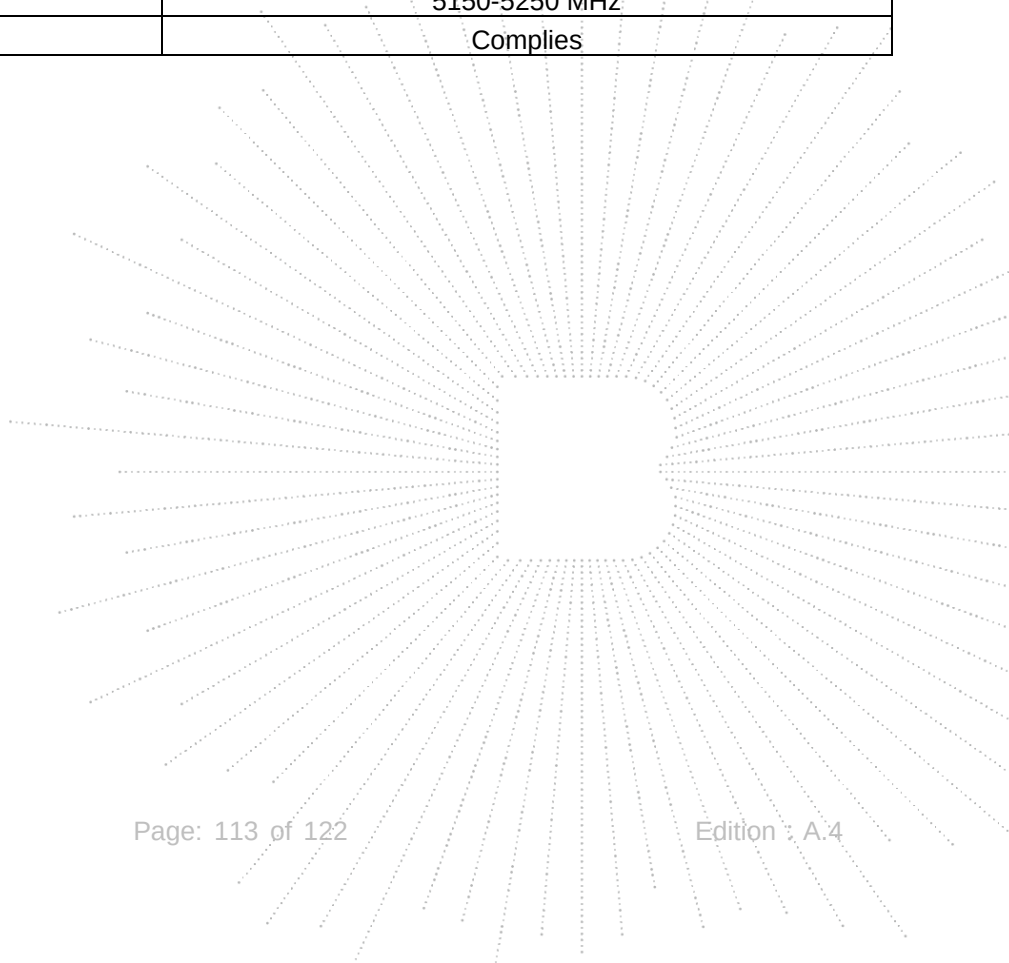
TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5180.0022	5180	0.0022	0.4276
		T (°C)	-10	5180.0010	5180	0.0010	0.1945
		T (°C)	0	5180.0052	5180	0.0052	1.0051
		T (°C)	10	5180.0010	5180	0.0010	0.1851
		T (°C)	20	5180.0127	5180	0.0127	2.4483
		T (°C)	30	5180.0002	5180	0.0002	0.0419
		T (°C)	40	5180.0017	5180	0.0017	0.3298
		T (°C)	50	5180.0071	5180	0.0071	1.3770
		T (°C)	60	5180.0037	5180	0.0037	0.7150
		T (°C)	70	5180.0077	5180	0.0077	1.4877
Limits				5150-5250 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5200.0126	5200	0.0126	2.4310
		V max (V)	138.00	5200.0053	5200	0.0053	1.0278
		V min (V)	102.00	5200.0120	5200	0.0120	2.3011
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5200.00820	5200	0.00820	1.5763
		T (°C)	-10	5200.00781	5200	0.00781	1.5027
		T (°C)	0	5200.00485	5200	0.00485	0.9323
		T (°C)	10	5200.00478	5200	0.00478	0.9185
		T (°C)	20	5200.00332	5200	0.00332	0.6384
		T (°C)	30	5200.00825	5200	0.00825	1.5869
		T (°C)	40	5200.01005	5200	0.01005	1.9333
		T (°C)	50	5200.00076	5200	0.00076	0.1469
		T (°C)	60	5200.00709	5200	0.00709	1.3640
		T (°C)	70	5200.00393	5200	0.00393	0.7549
Limits				5150-5250 MHz			
Result				Complies			

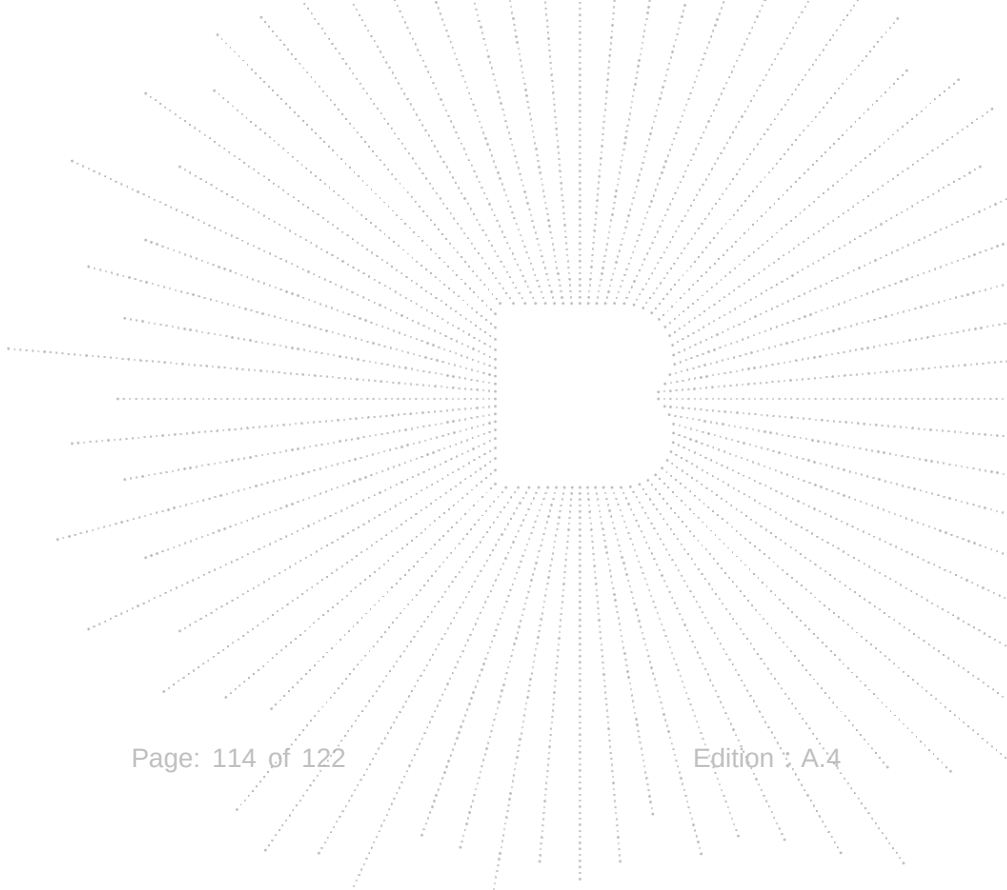


Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5240.0055	5240	0.0055	1.0459
		V max (V)	138.00	5240.0001	5240	0.0001	0.0190
		V min (V)	102.00	5240.0050	5240	0.0050	0.9561
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5240.0021	5240	0.0021	0.4010
		T (°C)	-10	5240.0118	5240	0.0118	2.2580
		T (°C)	0	5240.0082	5240	0.0082	1.5708
		T (°C)	10	5240.0014	5240	0.0014	0.2596
		T (°C)	20	5240.0078	5240	0.0078	1.4837
		T (°C)	30	5240.0084	5240	0.0084	1.6094
		T (°C)	40	5240.0122	5240	0.0122	2.3268
		T (°C)	50	5240.0127	5240	0.0127	2.4149
		T (°C)	60	5240.0043	5240	0.0043	0.8126
		T (°C)	70	5240.0052	5240	0.0052	0.9974
Limits				5150-5250 MHz			
Result				Complies			



Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	AC120V/60Hz
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Voltage vs. Frequency Stabilit

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5745.00511	5745	0.00511	0.8895
		V max (V)	138.00	5745.00226	5745	0.00226	0.3942
		V min (V)	102.00	5745.00725	5745	0.00725	1.2615
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

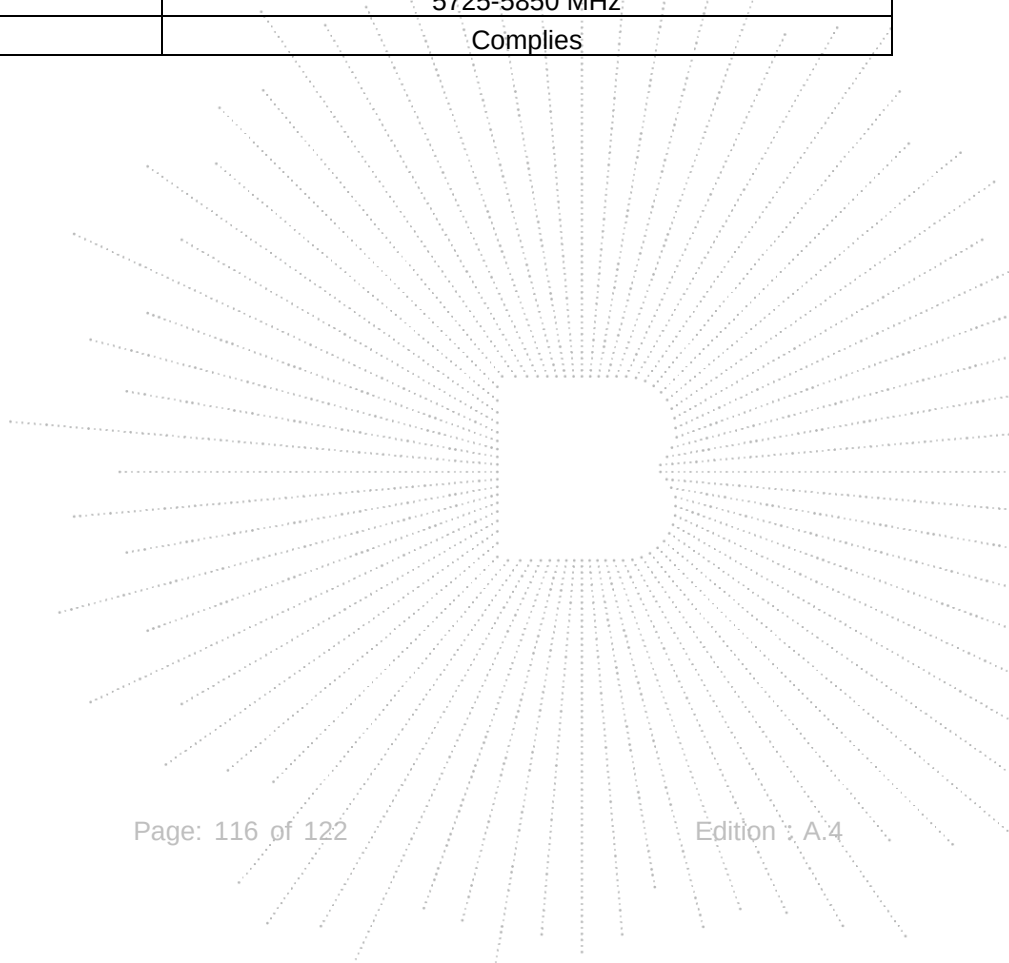
TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5745.00222	5745	0.00222	0.3862
		T (°C)	-10	5745.00453	5745	0.00453	0.7893
		T (°C)	0	5745.00310	5745	0.00310	0.5392
		T (°C)	10	5745.00603	5745	0.00603	1.0500
		T (°C)	20	5745.00334	5745	0.00334	0.5807
		T (°C)	30	5745.01260	5745	0.01260	2.1924
		T (°C)	40	5745.00956	5745	0.00956	1.6634
		T (°C)	50	5745.01335	5745	0.01335	2.3236
		T (°C)	60	5745.00131	5745	0.00131	0.2288
		T (°C)	70	5745.00643	5745	0.00643	1.1186
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5785.01102	5785	0.01102	1.9046
		V max (V)	138.00	5785.01061	5785	0.01061	1.8336
		V min (V)	102.00	5785.00368	5785	0.00368	0.6369
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5785.01325	5785	0.01325	2.2908
		T (°C)	-10	5785.00011	5785	0.00011	0.0196
		T (°C)	0	5785.00716	5785	0.00716	1.2372
		T (°C)	10	5785.00018	5785	0.00018	0.0306
		T (°C)	20	5785.00952	5785	0.00952	1.6462
		T (°C)	30	5785.00467	5785	0.00467	0.8079
		T (°C)	40	5785.01023	5785	0.01023	1.7678
		T (°C)	50	5785.00214	5785	0.00214	0.3699
		T (°C)	60	5785.00904	5785	0.00904	1.5626
		T (°C)	70	5785.00010	5785	0.00010	0.0173
Limits				5725-5850 MHz			
Result				Complies			



Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5825.01216	5825	0.01216	2.0867
		V max (V)	138.00	5825.01190	5825	0.01190	2.0432
		V min (V)	102.00	5825.00304	5825	0.00304	0.5225
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5825.00164	5825	0.00164	0.2817
		T (°C)	-10	5825.00521	5825	0.00521	0.8940
		T (°C)	0	5825.00349	5825	0.00349	0.5997
		T (°C)	10	5825.01352	5825	0.01352	2.3216
		T (°C)	20	5825.00045	5825	0.00045	0.0771
		T (°C)	30	5825.00465	5825	0.00465	0.7977
		T (°C)	40	5825.00732	5825	0.00732	1.2571
		T (°C)	50	5825.00828	5825	0.00828	1.4209
		T (°C)	60	5825.00075	5825	0.00075	0.1293
		T (°C)	70	5825.00421	5825	0.00421	0.7229
Limits				5725-5850 MHz			
Result				Complies			

14. Antenna Requirement

14.1 Limit

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

14.2 Test Result

The EUT antenna is External antenna (antenna gain: 2dBi), fulfill the requirement of this section.

15. EUT Photographs

EUT Photo 1



EUT Photo 2



16. EUT Test Setup Photographs

Conducted Measurement Photos





STATEMENT

- 1.The equipment lists are traceable to the national reference standards.
- 2.The test report can not be partially copied unless prior written approval is issued from our lab.
- 3.The test report is invalid without stamp of laboratory.
- 4.The test report is invalid without signature of person(s) testing and authorizing.
- 5.The test process and test result is only related to the Unit Under Test.
- 6.The quality system of our laboratory is in accordance with ISO/IEC17025.
- 7.If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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******* END *******