

FCC REPORT

(UNII)

Applicant: SUZHOU INDUSTRIAL PARK DUBU ELECTRONIC CO. Ltd

Address of Applicant: Room10-04, Building 3, Suzhou Haobainian International Commercial Plaza, Gusu District, Suzhou City

Equipment Under Test (EUT)

Product Name: JUNCO NBOOK

Model No.: NB-YWS-I501

FCC ID: 2AXC9N253

Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407

Date of sample receipt: 03 Jul., 2020

Date of Test: 04 Jul., to 28 Jul., 2020

Date of report issued: 25 Aug., 2020

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	31 Jul., 2020	Original
01	25 Aug., 2020	Update FCC ID.

Tested by: Mike.ou
Test Engineer

Date: 25 Aug., 2020

Reviewed by: Winner Zhang
Project Engineer

Date: 25 Aug., 2020

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4 Test Summary

Test Item	Section in CFR 47	Test Result
Antenna requirement	15.203 & 15.407 (a)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.407 (a) (1) (iv) & (a) (2) & (a) (3)	Pass
26dB Occupied Bandwidth	15.407 (a) (5)	Pass
6dB Emission Bandwidth	15.407(e)	Pass
Power Spectral Density	15.407 (a) (1) (iv) & (a) (2) & (a) (3)	Pass
Band Edge	15.407(b)	Pass
Spurious Emission	15.407 (b) & 15.205 & 15.209	Pass
Frequency Stability	15.407(g)	Pass
Remark: 1. Pass: The EUT complies with the essential requirements in the standard. 2. N/A: Not Applicable. 3. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).		
Test Method:	ANSI C63.4-2014 ANSI C63.10-2013 KDB 789033 D02 General UNII Test Procedures New Rules v02r01	

5 General Information

5.1 Client Information

Applicant:	SUZHOU INDUSTRIAL PARK DUBU ELECTRONIC CO. Ltd
Address:	Room10-04, Building 3, Suzhou Haobainian International Commercial Plaza, Gusu District, Suzhou City

5.2 General Description of E.U.T.

Product Name:	JUNCO NBOOK
Model No.:	NB-YWS-I501
Operation Frequency:	Band 1: 5150MHz-5250MHz, Band 4: 5725MHz-5825MHz
Channel numbers:	Band 1: 802.11a/802.11n/ac-n20: 4, 802.11n40/802.11ac-n40: 2, 802.11ac-n80: 1 Band 4: 802.11a/802.11n/ac-n20: 4, 802.11n40/802.11ac-n40: 2, 802.11ac-n80: 1
Channel separation:	802.11a/802.11n20: 20MHz, 802.11n40: 40MHz, 802.11ac: 80MHz
Modulation technology (IEEE 802.11a):	BPSK, QPSK, 16-QAM, 64-QAM
Modulation technology (IEEE 802.11n):	BPSK, QPSK, 16-QAM, 64-QAM
Modulation technology (IEEE 802.11ac):	BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
Data speed (IEEE 802.11a):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
Data speed (IEEE 802.11n20):	MCS0: 6.5Mbps, MCS1:13Mbps, MCS2:19.5Mbps, MCS3:26Mbps, MCS4:39Mbps, MCS5:52Mbps, MCS6:58.5Mbps, MCS7:65Mbps
Data speed (IEEE 802.11n40):	MCS0:15Mbps, MCS1:30Mbps, MCS2:45Mbps, MCS3:60Mbps, MCS4:90Mbps, MCS5:120Mbps, MCS6:135Mbps, MCS7:150Mbps
Data speed (IEEE 802.11ac):	Up to 433.3Mbps
Antenna Type:	Internal Antenna
Antenna gain:	Main Antenna : Band 1: 3 dBi, Band 4: 3 dBi Aux Antenna : Band 1: 3 dBi, Band 4: 3 dBi
Power supply:	Rechargeable Li-ion Battery DC11.55V-4800mAh
AC adapter:	Model: ADS-65HI-19A-3 19065E Input: AC100-240V, 50/60Hz, 1.5A Output: DC 19.0V, 3.42A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Operation Frequency each of channel					
Band 1					
802.11a/802.11n/ac-HT20		802.11n/ac-HT40		802.11ac-HT80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190MHz	42	5210MHz
40	5200MHz	46	5230MHz		
44	5220MHz				
48	5240MHz				
Band 4					
802.11a/802.11n/ac-HT20		802.11n/ac-HT40		802.11ac-HT80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	151	5755MHz	155	5775MHz
153	5765MHz	159	5795MHz		
157	5785MHz				
161	5805MHz				
165	5825MHz				

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Band 1					
802.11a/802.11n/ac-HT20		802.11n/ac-HT40		802.11ac-HT80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
Lowest	5180MHz	Lowest	5190MHz	Middle	5210MHz
Middle	5200MHz	Highest	5230MHz		
Highest	5240MHz				
Band 4					
802.11a/802.11n/ac-HT20		802.11n/ac-HT40		802.11ac-HT80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
Lowest	5745MHz	Lowest	5755MHz	Middle	5775MHz
Middle	5785MHz	Highest	5795MHz		
Highest	5825MHz				

5.3 Test environment and mode, and test samples plans

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Continuously transmitting mode	Keep the EUT in 100% duty cycle transmitting with modulation.
We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:	
Per-scan all kind of data rate, and found the follow list were the worst case.	
Mode	Data rate
802.11a	6 Mbps
802.11n/ac20	6.5 Mbps
802.11n/ac40	13.5 Mbps
802.11ac80	29.3 Mbps

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.20 dB (k=2)

5.6 Additions to, deviations, or exclusions from the method

No

5.7 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.8 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.9 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No.110~116, Building B, Jinyuan Business Building, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

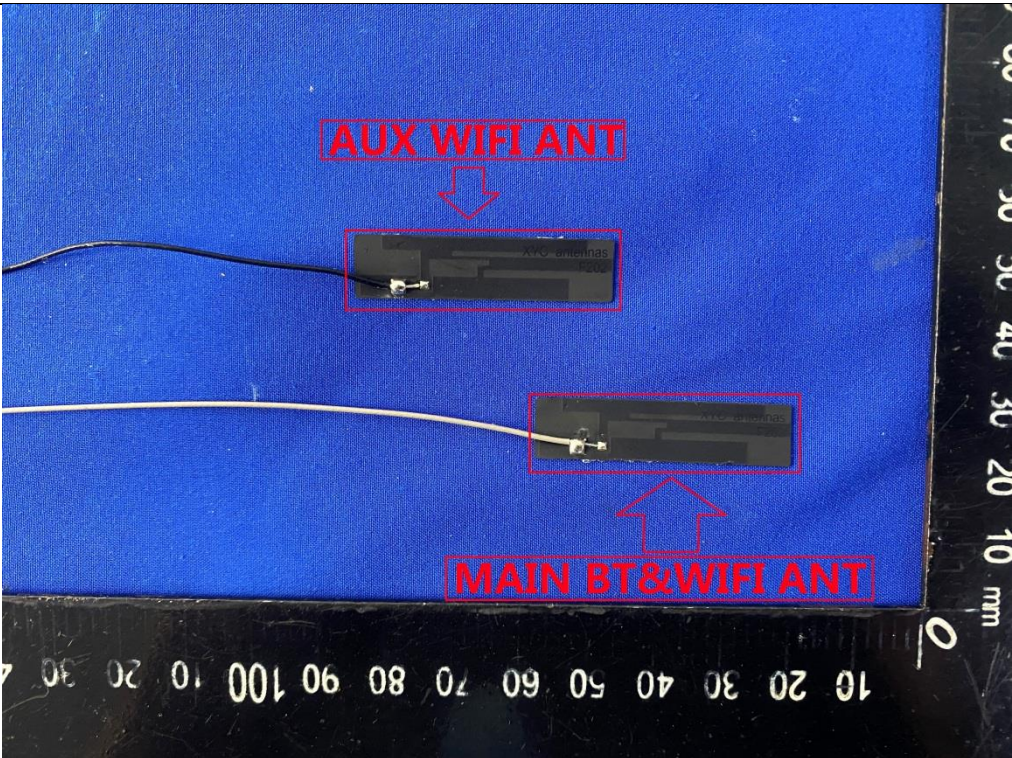
5.10 Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
				07-22-2020	07-21-2021
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-07-2020	03-06-2021
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
				06-22-2020	06-21-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-07-2020	03-06-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
				06-22-2020	06-21-2021
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-18-2019	11-17-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-07-2020	03-06-2021
Pre-amplifier	CD	PAP-1G18	11804	03-07-2020	03-06-2021
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-05-2020	03-04-2021
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-18-2019	11-17-2020
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-05-2020	03-04-2021
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-18-2019	11-17-2020
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-05-2020	03-04-2021
Signal Generator	R&S	SMR20	1008100050	03-05-2020	03-04-2021
RF Switch Unit	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS8200	Version: 2.0.0.0		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2020	03-06-2021
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2020	03-06-2021
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2020	03-06-2021
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	09-25-2019	09-24-2020
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	11-01-2019	10-31-2020
Simulated Station	Rohde & Schwarz	CMW500	140493	07-22-2019	07-21-2020
				07-22-2020	07-21-2021

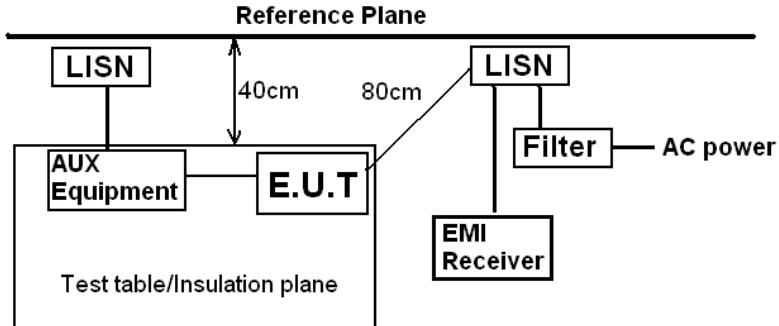
Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-05-2020	03-04-2021
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-05-2020	03-04-2021
LISN	CHASE	MN2050D	1447	03-05-2020	03-04-2021
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2017	07-20-2020
				07-21-2020	07-20-2021
Cable	HP	10503A	N/A	03-05-2020	03-04-2021
EMI Test Software	AUDIX	E3	Version: 6.110919b		

6 Test results and Measurement Data

6.1 Antenna requirement

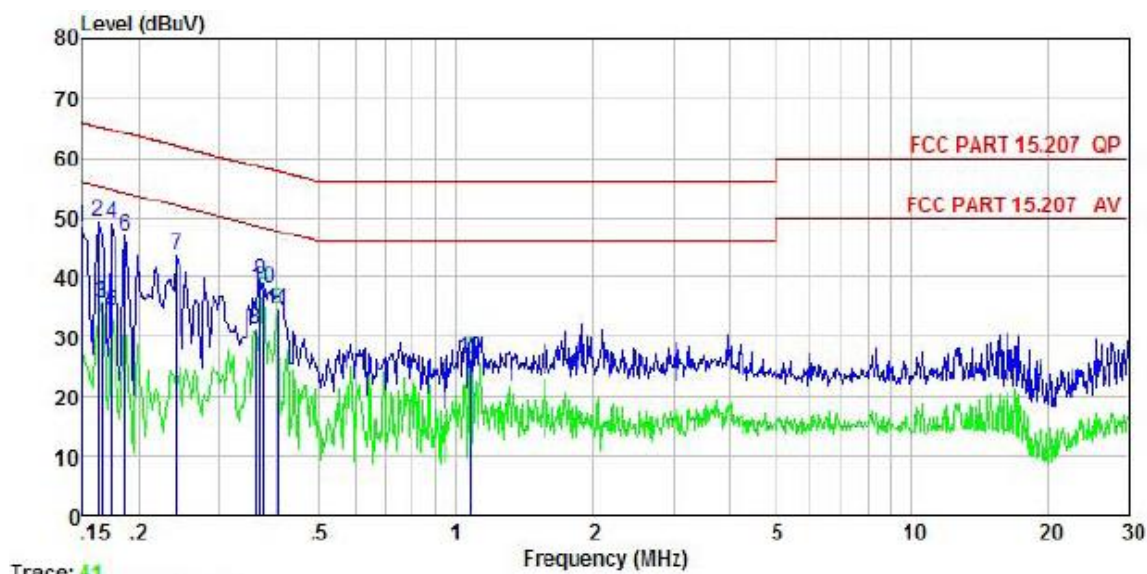
Standard requirement:	FCC Part15 E Section 15.203 /407(a)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	
E.U.T Antenna:	
The Wi-Fi antenna is an Internal antenna which cannot replace by end-user, the best case gain of the antenna is 3.0 dBi.	
	

6.2 Conducted Emission

Test Requirement:	FCC Part15 C Section 15.207		
Test Frequency Range:	150kHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	
	0.15-0.5	66 to 56*	0.15-0.5
	0.5-5	56	0.5-5
	5-30	60	5-30
* Decreases with the logarithm of the frequency.			
Test procedure	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). It provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10(latest version) on conducted measurement.		
Test setup:	 <i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.10 for details		
Test mode:	Refer to section 5.3 for details.		
Test results:	Passed		

Measurement Data:

Product name:	JUNCO NBOOK	Product model:	NB-YWS-I501
Test by:	Mike	Test mode:	5G Wi-Fi Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Humi: 55%

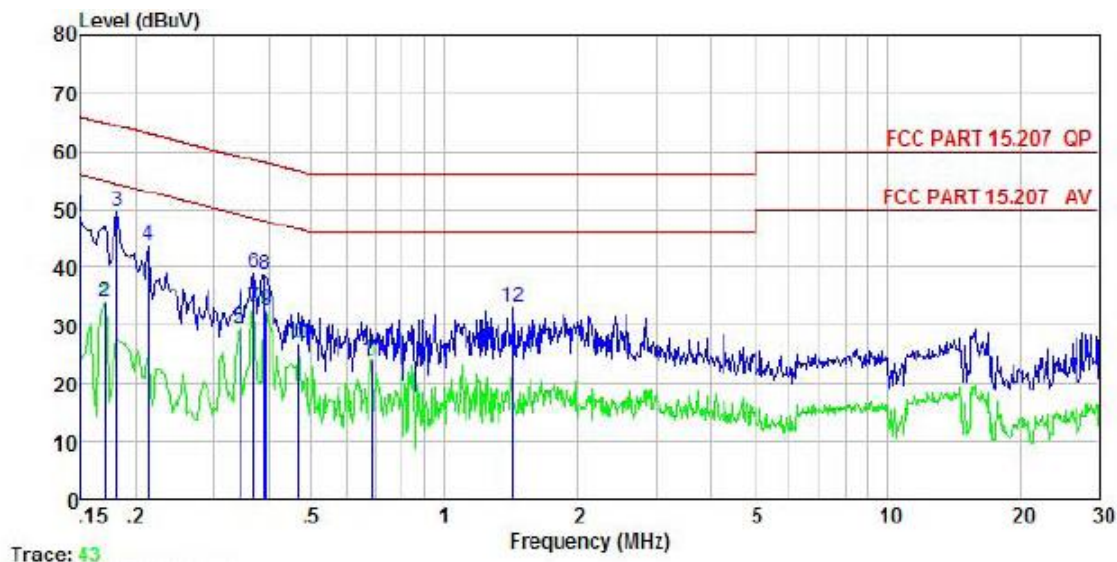


	Freq	Read	LISN	Cable	Aux	Level	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.150	38.11	-0.57	10.78	-0.05	48.27	66.00	-17.73	QP
2	0.162	39.24	-0.58	10.77	-0.08	49.35	65.34	-15.99	QP
3	0.166	25.58	-0.58	10.77	-0.09	35.68	55.16	-19.48	Average
4	0.174	38.87	-0.58	10.77	-0.11	48.95	64.77	-15.82	QP
5	0.174	24.19	-0.58	10.77	-0.11	34.27	54.77	-20.50	Average
6	0.186	36.98	-0.59	10.76	-0.13	47.02	64.20	-17.18	QP
7	0.242	33.67	-0.57	10.75	-0.21	43.64	62.04	-18.40	QP
8	0.361	20.85	-0.51	10.73	0.17	31.24	48.69	-17.45	Average
9	0.369	28.97	-0.50	10.73	0.23	39.43	58.52	-19.09	QP
10	0.377	27.68	-0.50	10.72	0.27	38.17	48.34	-10.17	Average
11	0.402	23.88	-0.48	10.72	0.42	34.54	47.81	-13.27	Average
12	1.071	15.57	-0.61	10.88	0.39	26.23	46.00	-19.77	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Aux Factor + Cable Loss.

Product name:	JUNCO NBOOK	Product model:	NB-YWS-I501
Test by:	Mike	Test mode:	5G Wi-Fi Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Humi: 55%

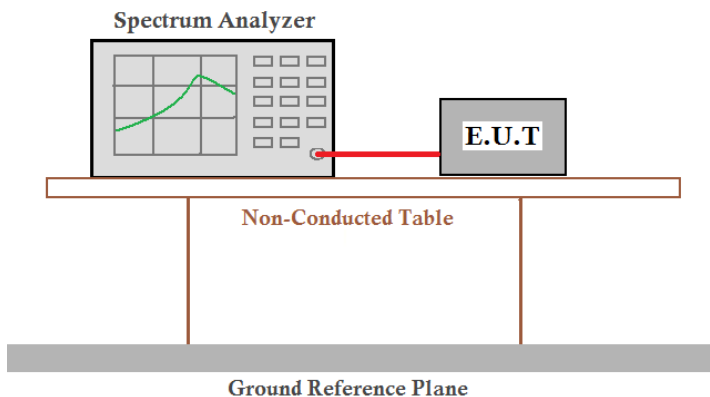


	Freq	Read Level	LISN Factor	Cable Loss	Aux Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.150	38.51	-0.69	10.78	0.01	48.61	66.00	-17.39	QP
2	0.170	23.72	-0.68	10.77	0.01	33.82	54.94	-21.12	Average
3	0.182	39.39	-0.68	10.77	0.00	49.48	64.42	-14.94	QP
4	0.214	33.61	-0.67	10.76	0.00	43.70	63.05	-19.35	QP
5	0.343	19.57	-0.65	10.73	-0.02	29.63	49.13	-19.50	Average
6	0.369	28.80	-0.64	10.73	-0.04	38.85	58.52	-19.67	QP
7	0.369	23.10	-0.64	10.73	-0.04	33.15	48.52	-15.37	Average
8	0.389	28.58	-0.63	10.72	-0.05	38.62	58.08	-19.46	QP
9	0.393	22.46	-0.63	10.72	-0.06	32.49	47.99	-15.50	Average
10	0.466	16.72	-0.64	10.75	0.00	26.83	46.58	-19.75	Average
11	0.686	13.79	-0.64	10.77	0.04	23.96	46.00	-22.04	Average
12	1.426	22.68	-0.70	10.92	0.13	33.03	56.00	-22.97	QP

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Aux Factor + Cable Loss.

6.3 Conducted Output Power

Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv) & (a) (3)
Limit:	Band 1: 24dBm Band 4: 30dBm
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer, shown with a green trace on its screen, is connected to an E.U.T. (Equipment Under Test) box by a red cable. Both the Spectrum Analyzer and the E.U.T. are positioned on a table labeled 'Non-Conducted Table'. This table is supported by two vertical legs and sits on a thick grey horizontal bar labeled 'Ground Reference Plane'.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

ANT1:

Band 1				
Mode	Test CH	Conducted Output power (dBm)	Limit (dBm)	Result
802.11a	Lowest	10.13	24.00	Pass
	Middle	9.93		
	Highest	9.91		
802.11n20	Lowest	10.01	24.00	Pass
	Middle	9.98		
	Highest	9.62		
802.11n40	Lowest	10.13	24.00	Pass
	Highest	9.63		
802.11ac20	Lowest	9.77	24.00	Pass
	Middle	9.85		
	Highest	9.64		
802.11ac40	Lowest	10.09	24.00	Pass
	Highest	9.70		
802.11ac80	Lowest	9.42	24.00	Pass

Band 4				
Mode	Test CH	Conducted Output power (dBm)	Limit (dBm)	Result
802.11a	Lowest	7.95	30.00	Pass
	Middle	8.39		
	Highest	8.68		
802.11n20	Lowest	8.19	30.00	Pass
	Middle	8.22		
	Highest	8.55		
802.11n40	Lowest	8.06	30.00	Pass
	Highest	8.21		
802.11ac20	Lowest	8.30	30.00	Pass
	Middle	8.22		
	Highest	8.50		
802.11ac40	Lowest	8.09	30.00	Pass
	Highest	8.11		
802.11ac80	Lowest	8.58	30.00	Pass

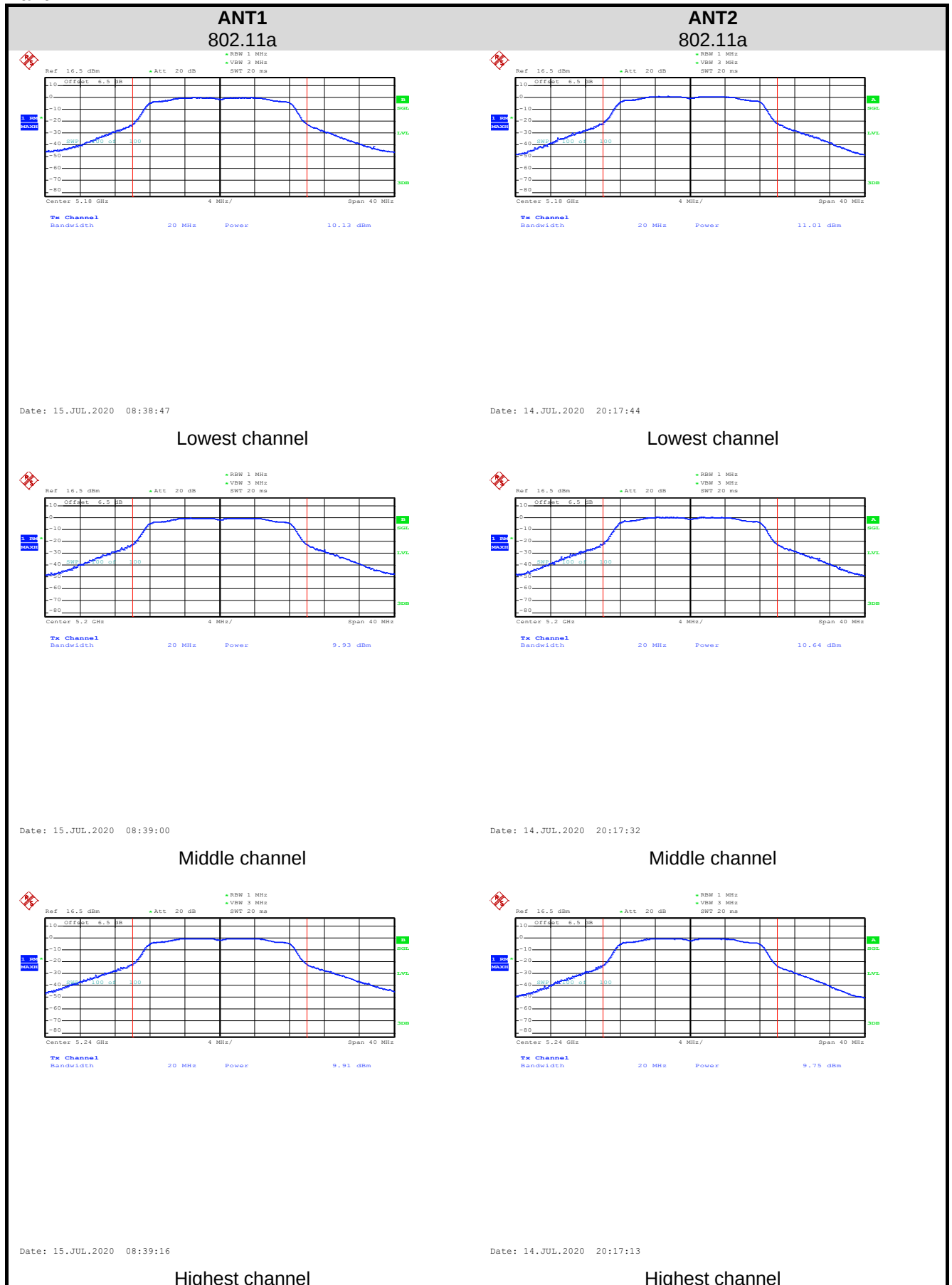
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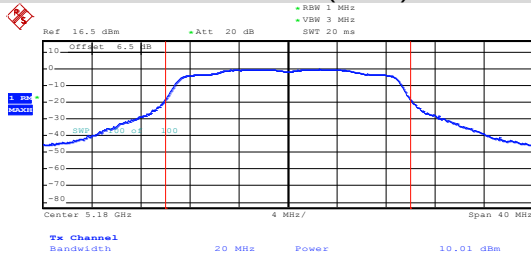
Band 1				
Mode	Test CH	Conducted Output power (dBm)	Limit (dBm)	Result
802.11a	Lowest	11.01	24.00	Pass
	Middle	10.64		
	Highest	9.75		
802.11n20	Lowest	10.79	24.00	Pass
	Middle	10.33		
	Highest	8.95		
802.11n40	Lowest	10.44	24.00	Pass
	Highest	9.06		
802.11ac20	Lowest	10.65	24.00	Pass
	Middle	10.27		
	Highest	8.93		
802.11ac40	Lowest	10.37	24.00	Pass
	Highest	9.08		
802.11ac80	Lowest	9.75	24.00	Pass

Band 4				
Mode	Test CH	Conducted Output power (dBm)	Limit (dBm)	Result
802.11a	Lowest	9.11	30.00	Pass
	Middle	9.52		
	Highest	9.36		
802.11n20	Lowest	8.99	30.00	Pass
	Middle	9.40		
	Highest	9.35		
802.11n40	Lowest	8.91	30.00	Pass
	Highest	9.24		
802.11ac20	Lowest	8.99	30.00	Pass
	Middle	9.42		
	Highest	9.34		
802.11ac40	Lowest	9.00	30.00	Pass
	Highest	9.30		
802.11ac80	Lowest	9.65	30.00	Pass

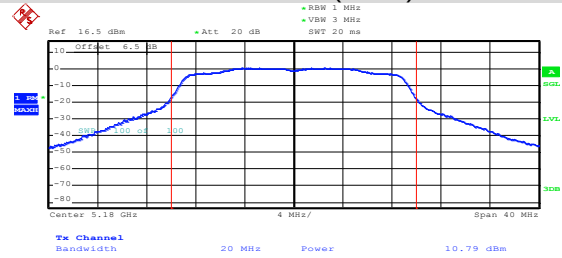
Test plot as follows:

Band 1:



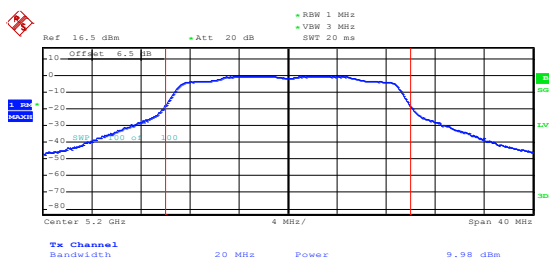
ANT1
802.11n(HT20)

Date: 15.JUL.2020 08:38:32

ANT2
802.11n(HT20)

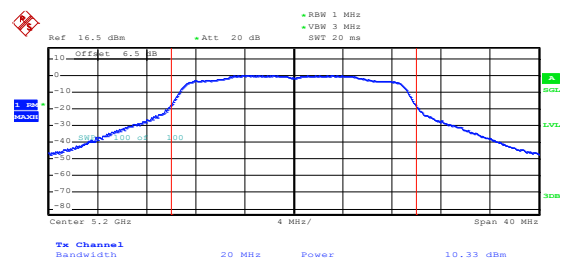
Date: 14.JUL.2020 20:18:16

Lowest channel



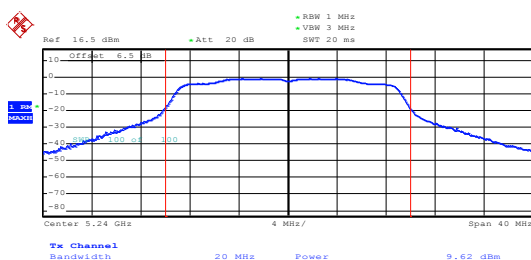
Date: 15.JUL.2020 08:38:17

Lowest channel



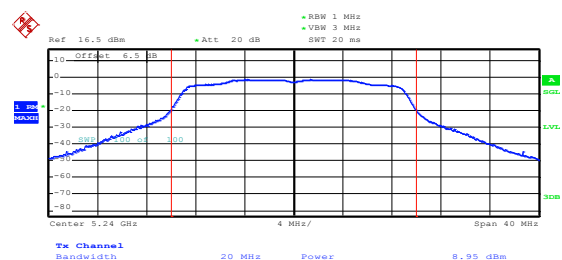
Date: 14.JUL.2020 20:18:27

Middle channel



Date: 15.JUL.2020 08:38:02

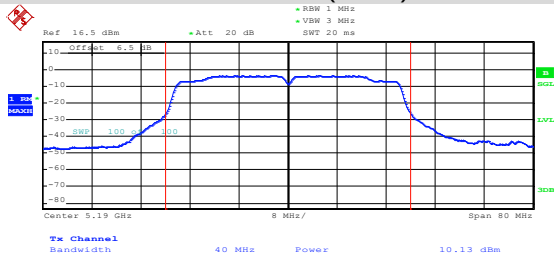
Middle channel



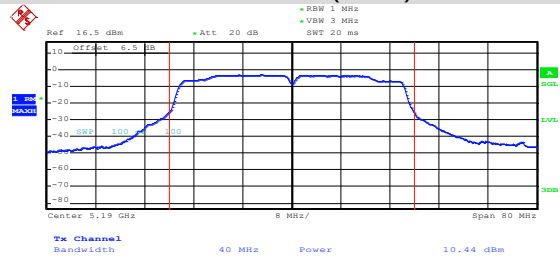
Date: 14.JUL.2020 20:18:42

Highest channel

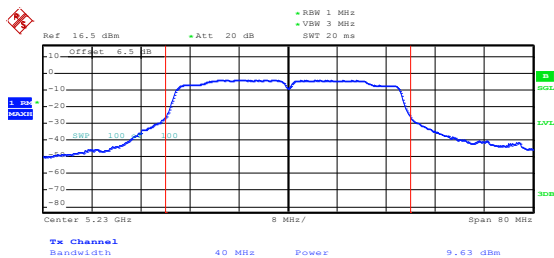
Highest channel

ANT1
802.11n(HT40)

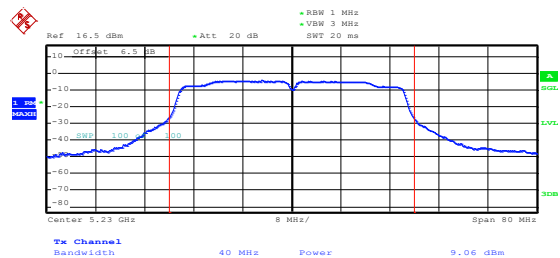
Date: 15.JUL.2020 08:42:44

ANT2
802.11n(HT40)

Date: 14.JUL.2020 20:22:01

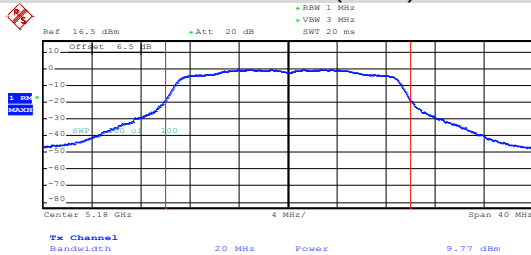
Lowest channel

Date: 15.JUL.2020 08:42:57

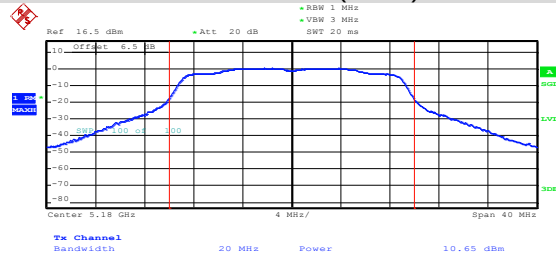
Lowest channel

Date: 14.JUL.2020 20:22:17

Highest channel**Highest channel**

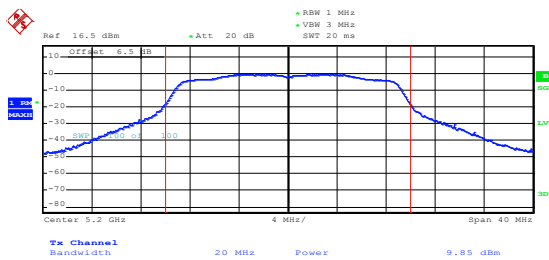
ANT1
802.11ac(HT20)

Date: 15.JUL.2020 08:37:18

ANT2
802.11ac(HT20)

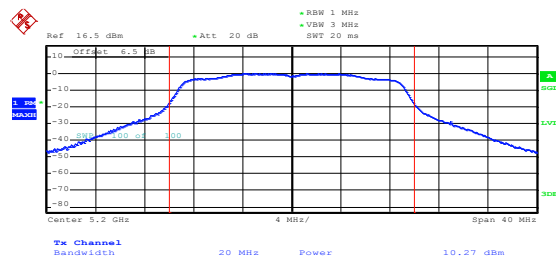
Date: 14.JUL.2020 20:19:21

Lowest channel



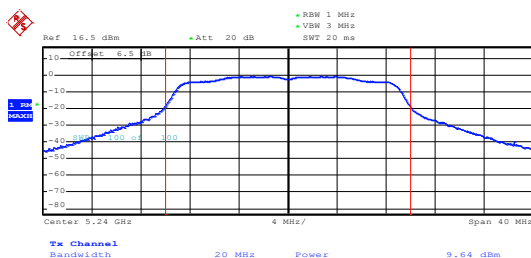
Date: 15.JUL.2020 08:37:33

Lowest channel



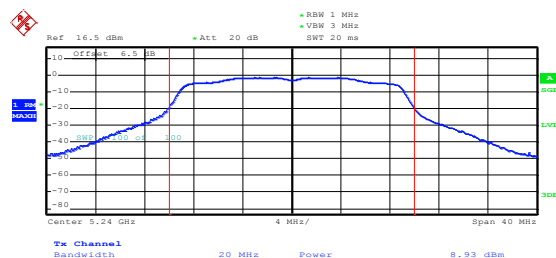
Date: 14.JUL.2020 20:19:08

Middle channel



Date: 15.JUL.2020 08:37:46

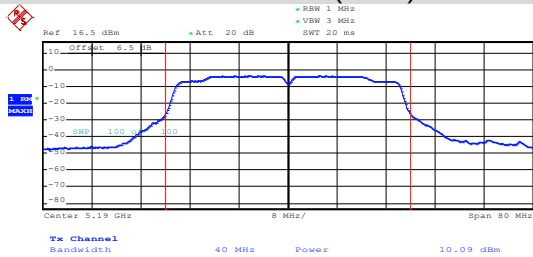
Middle channel



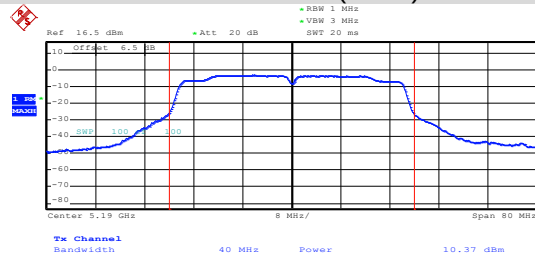
Date: 14.JUL.2020 20:18:58

Highest channel

Highest channel

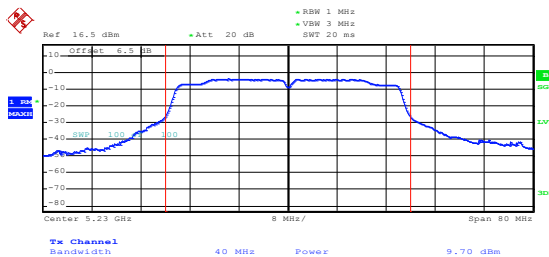
ANT1
802.11ac(HT40)

Date: 15.JUL.2020 08:43:24

ANT2
802.11ac(HT40)

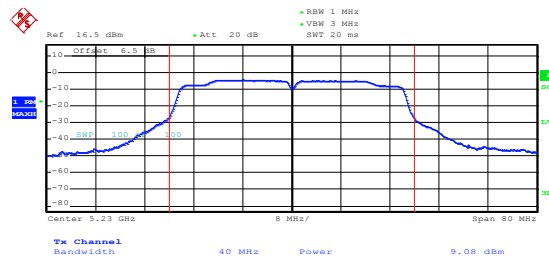
Date: 14.JUL.2020 20:22:45

Lowest channel



Date: 15.JUL.2020 08:43:10

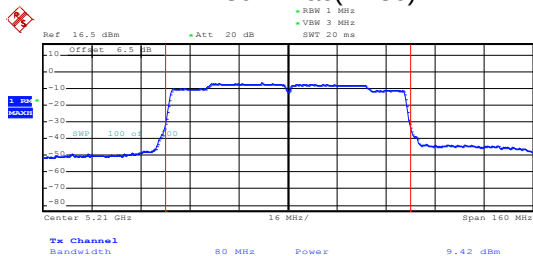
Lowest channel



Date: 14.JUL.2020 20:22:32

Highest channel

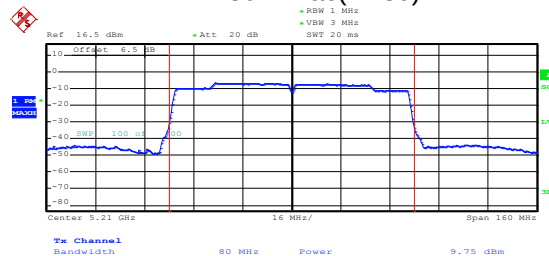
802.11ac(HT80)



Date: 15.JUL.2020 08:43:47

Highest channel

802.11ac(HT80)

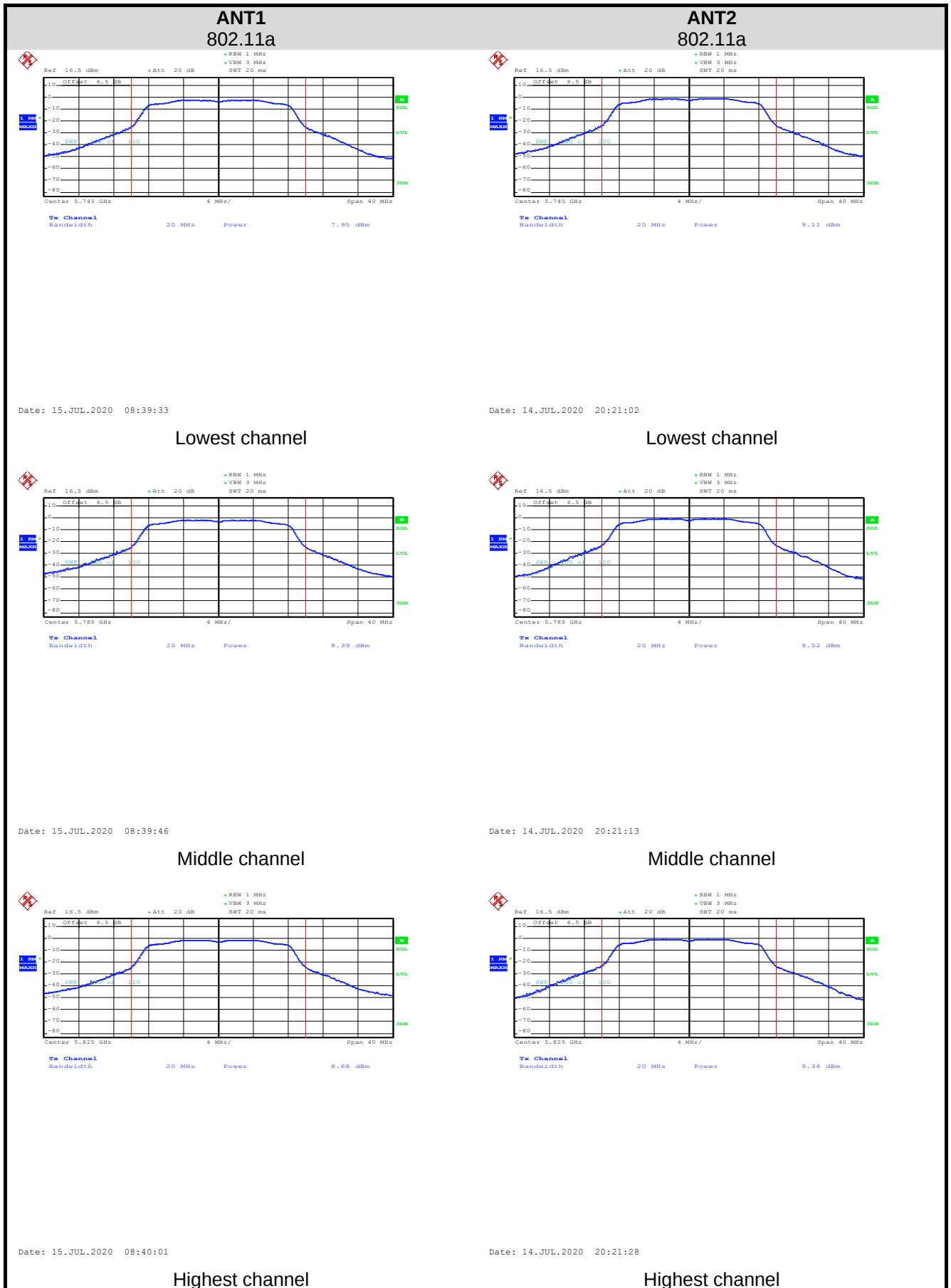


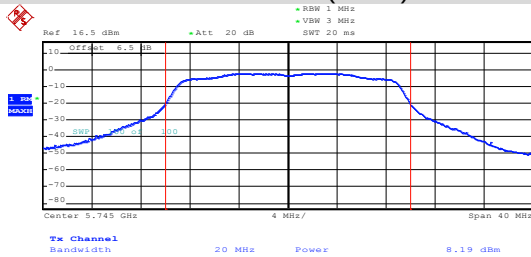
Date: 14.JUL.2020 20:24:12

Middle channel

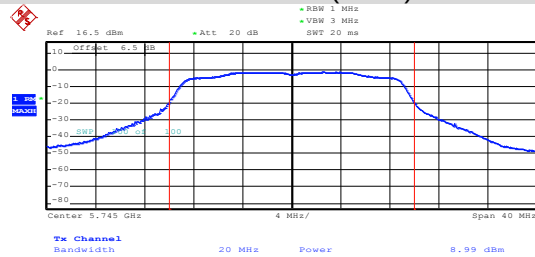
Middle channel

Band 4:



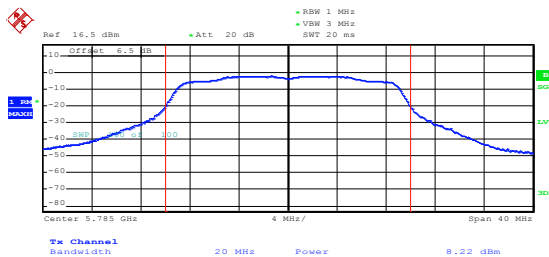
ANT1
802.11n(HT20)

Date: 15.JUL.2020 08:40:40

ANT2
802.11n(HT20)

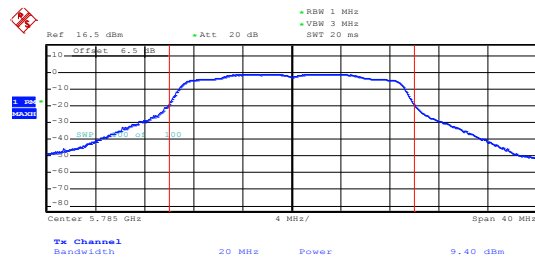
Date: 14.JUL.2020 20:20:47

Lowest channel



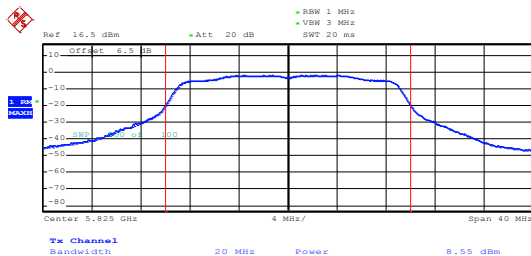
Date: 15.JUL.2020 08:40:26

Lowest channel



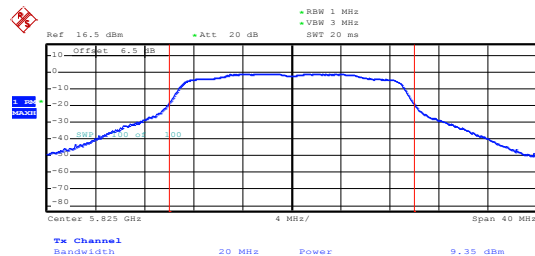
Date: 14.JUL.2020 20:20:35

Middle channel



Date: 15.JUL.2020 08:40:14

Middle channel

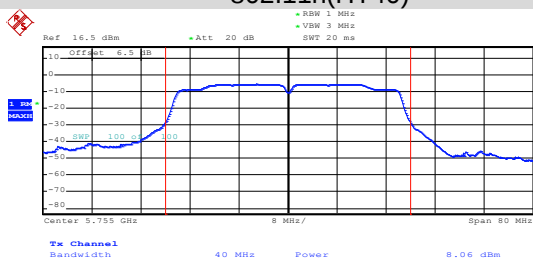


Date: 14.JUL.2020 20:20:19

Highest channel

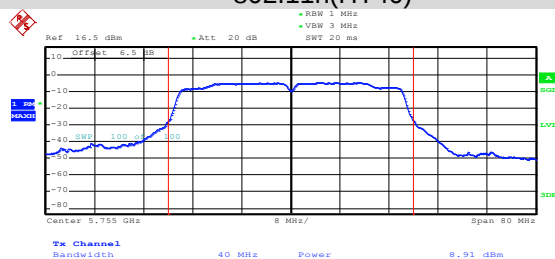
Highest channel

ANT1 802.11n(HT40)



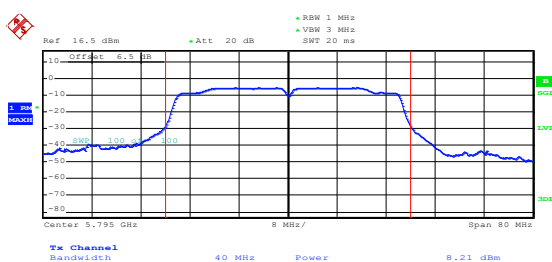
Date: 15.JUL.2020 08:42:29

ANT2 802.11n(HT40)



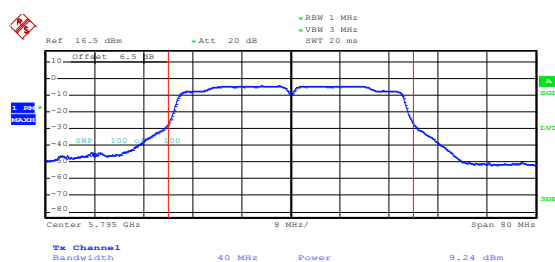
Date: 14.JUL.2020 20:23:49

Lowest channel



Date: 15.JUL.2020 08:42:17

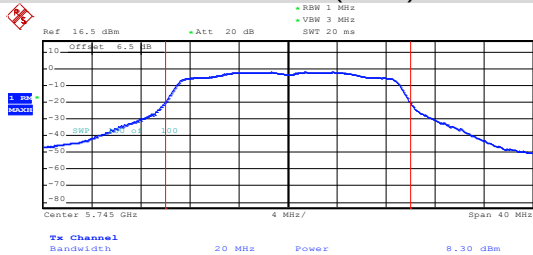
Lowest channel



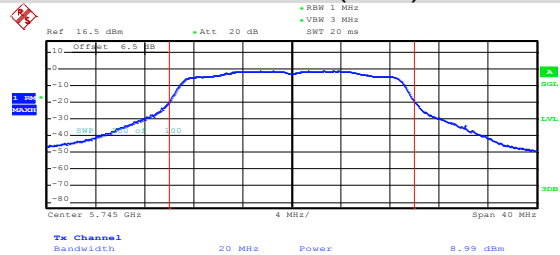
Date: 14.JUL.2020 20:23:34

Highest channel

Highest channel

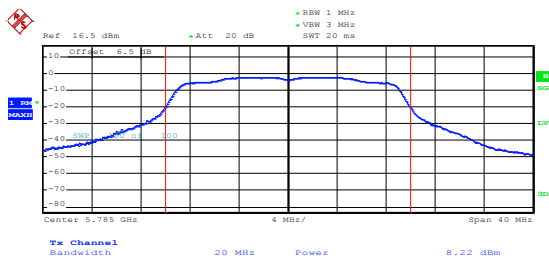
ANT1
802.11ac(HT20)

Date: 15.JUL.2020 08:40:56

ANT2
802.11ac(HT20)

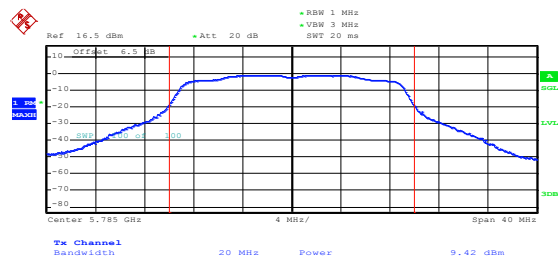
Date: 14.JUL.2020 20:19:37

Lowest channel



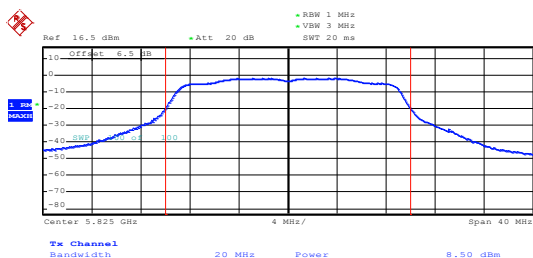
Date: 15.JUL.2020 08:41:10

Lowest channel



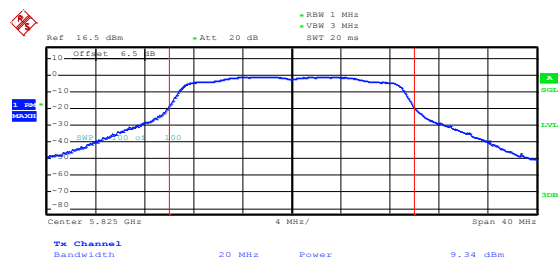
Date: 14.JUL.2020 20:19:49

Middle channel



Date: 15.JUL.2020 08:41:24

Middle channel

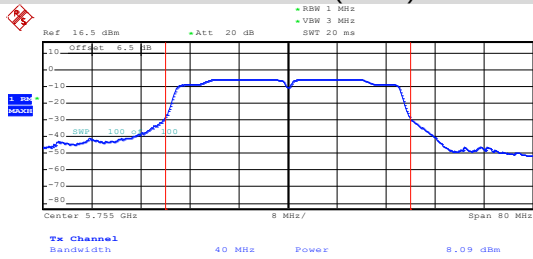


Date: 14.JUL.2020 20:20:04

Highest channel

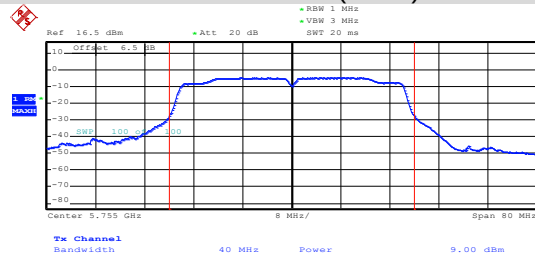
Highest channel

ANT1 802.11ac(HT40)



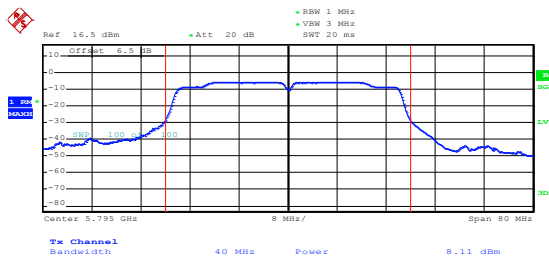
Date: 15.JUL.2020 08:41:44

ANT2 802.11ac(HT40)



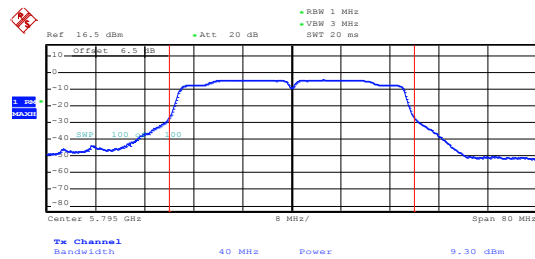
Date: 14.JUL.2020 20:23:01

Lowest channel



Date: 15.JUL.2020 08:42:01

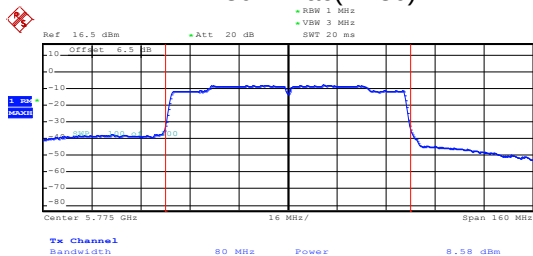
Lowest channel



Date: 14.JUL.2020 20:23:15

Highest channel

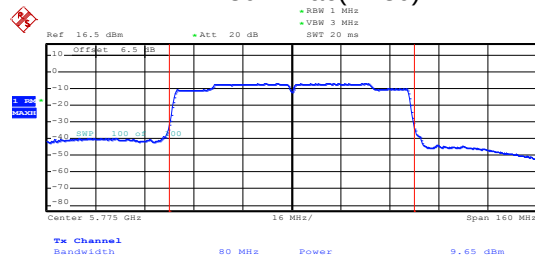
802.11ac(HT80)



Date: 15.JUL.2020 08:44:11

Highest channel

802.11ac(HT80)

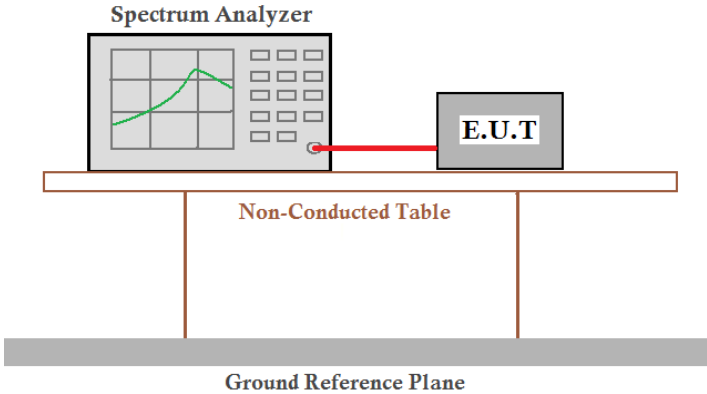


Date: 14.JUL.2020 20:24:32

Middle channel

Middle channel

6.4 Occupancy Bandwidth

Test Requirement:	FCC Part15 E Section 15.407 (a) (5) and Section 15.407 (e)
Limit:	Band 1/4: N/A (26dB Emission Bandwidth and 99% Occupancy Bandwidth) Band 4: >500kHz (6dB Bandwidth)
Test setup:	
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

ANT1

Band 1:

Test Channel	26dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	21.28	21.10	41.66	21.36	42.22	---	N/A	PASS
Middle	20.48	21.40	---	21.25	---	80.24		
Highest	18.59	19.80	40.04	19.97	40.32	---		
Test Channel	99% Occupancy Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.68	17.79	36.26	17.82	36.28	---	N/A	PASS
Middle	16.69	17.80	---	17.85	---	75.28		
Highest	16.75	17.85	36.32	17.87	36.34	---		

Band 4:

Test Channel	26dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	19.76	20.94	41.80	21.56	41.06	---	N/A	PASS
Middle	19.88	21.16	---	22.30	---	81.08		
Highest	20.43	21.80	41.62	21.31	41.70	---		
Test Channel	99% Occupy Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.65	17.78	36.28	17.79	36.34	---	N/A	PASS
Middle	16.61	17.77	---	17.81	---	75.40		
Highest	16.65	17.78	36.32	17.81	36.30	---		
Test Channel	6dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	15.36	16.16	35.52	15.36	35.52	---	>500kHz	PASS
Middle	15.28	16.16	---	15.44	---	76.16		
Highest	15.52	16.16	35.52	15.44	35.52	---		

ANT2**Band 1:**

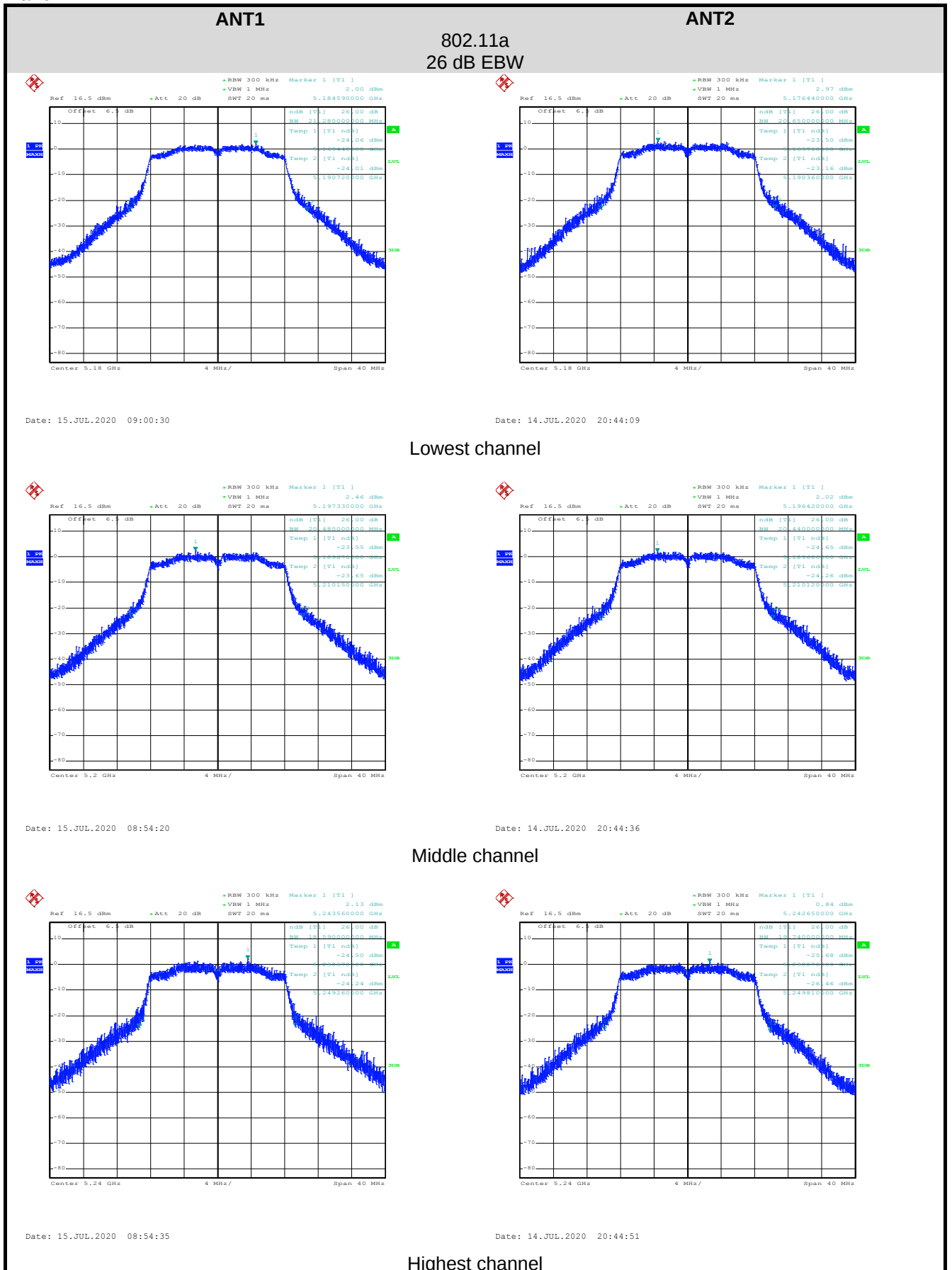
Test Channel	26dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	20.65	20.85	41.86	21.47	41.96	---	N/A	PASS
Middle	20.44	21.54	---	21.10	---	80.28		
Highest	19.74	19.70	40.14	20.03	40.18	---		
Test Channel	99% Occupy Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.69	17.82	36.30	17.82	36.26	---	N/A	PASS
Middle	16.67	17.81	---	17.83	---	75.24		
Highest	16.69	17.81	36.30	17.85	36.36	---		

Band 4:

Test Channel	26dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	20.31	20.93	41.48	20.99	41.66	---	N/A	PASS
Middle	20.01	22.07	---	21.01	---	80.92		
Highest	20.37	21.82	41.22	21.58	41.70	---		
Test Channel	99% Occupy Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.63	17.77	36.26	17.79	36.28	---	N/A	PASS
Middle	16.63	17.79	---	17.78	---	75.24		
Highest	16.64	17.81	36.28	17.79	36.28	---		
Test Channel	6dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	15.28	15.36	35.52	15.36	35.52	---	>500kHz	PASS
Middle	15.20	15.44	---	15.36	---	76.16		
Highest	15.36	15.28	35.52	15.36	35.52	---		

Test plot as follows:

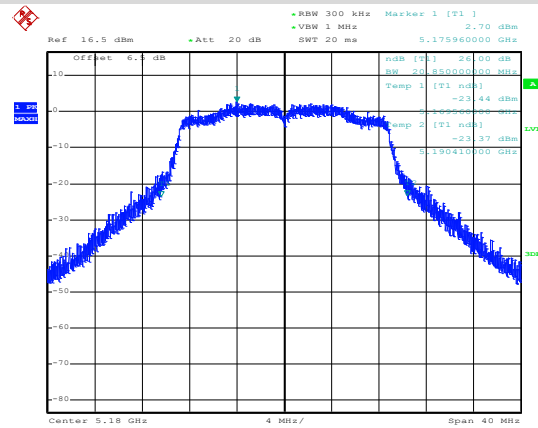
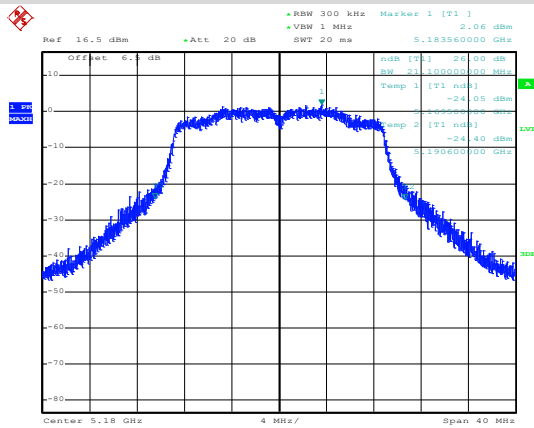
Band 1:



ANT1

ANT2

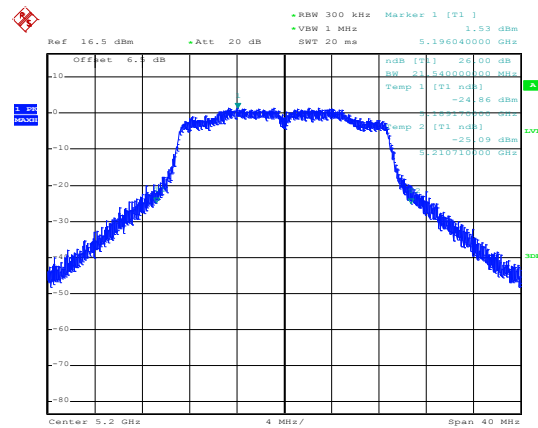
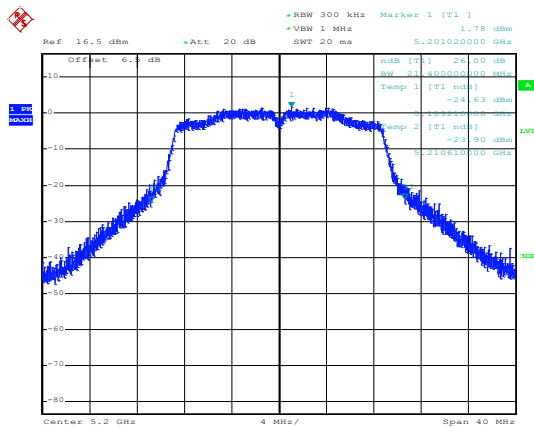
802.11n(HT20)
26 dB EBW



Date: 15.JUL.2020 08:59:59

Date: 14.JUL.2020 20:41:45

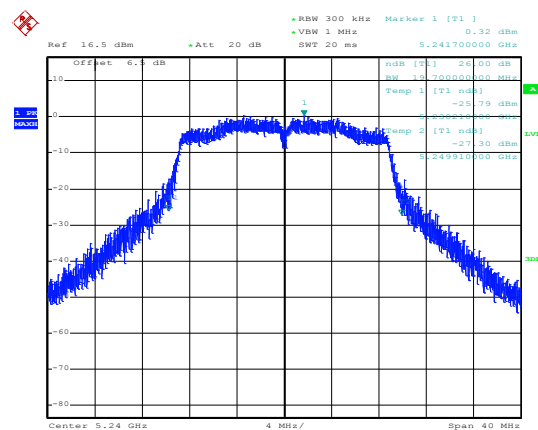
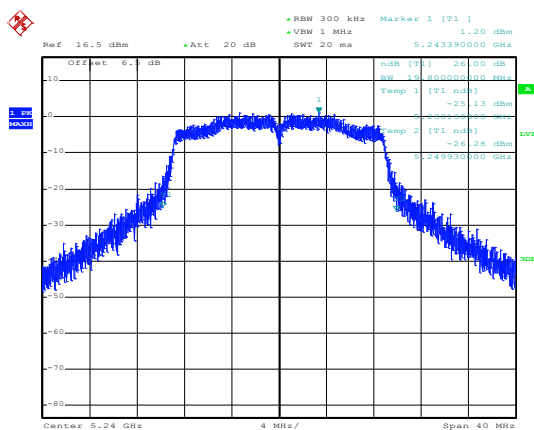
Lowest channel



Date: 15.JUL.2020 08:59:49

Date: 14.JUL.2020 20:42:06

Middle channel



Date: 15.JUL.2020 08:55:18

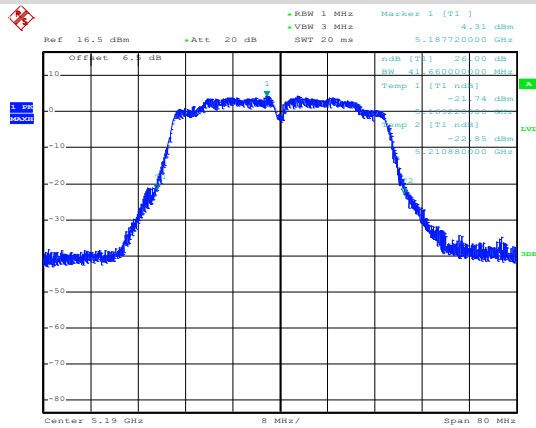
Date: 14.JUL.2020 20:42:25

Highest channel

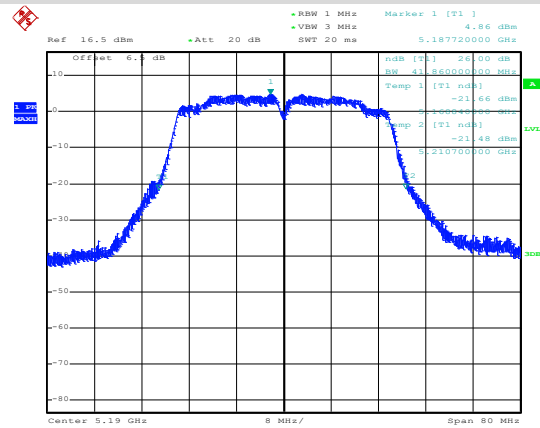
ANT1

802.11n(HT40)
26 dB EBW

ANT2

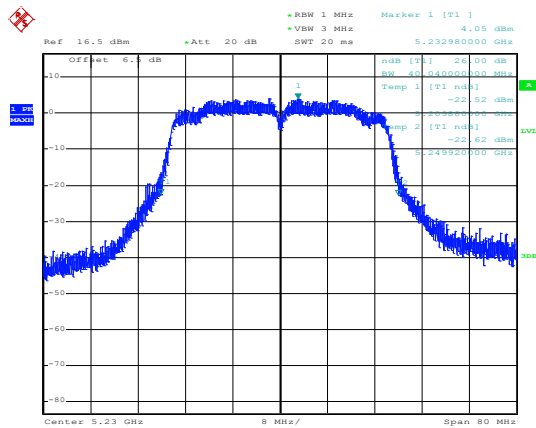


Date: 15.JUL.2020 08:46:58

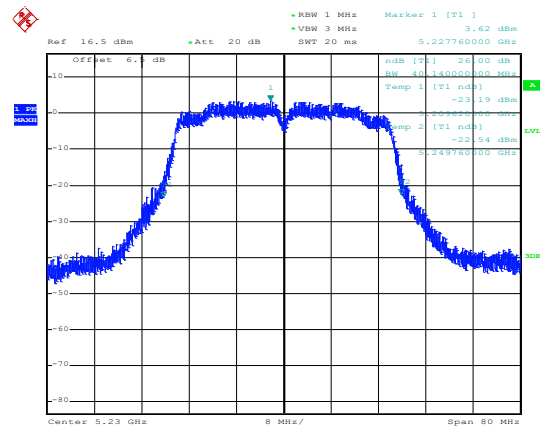


Date: 14.JUL.2020 20:41:14

Lowest channel



Date: 15.JUL.2020 08:46:49



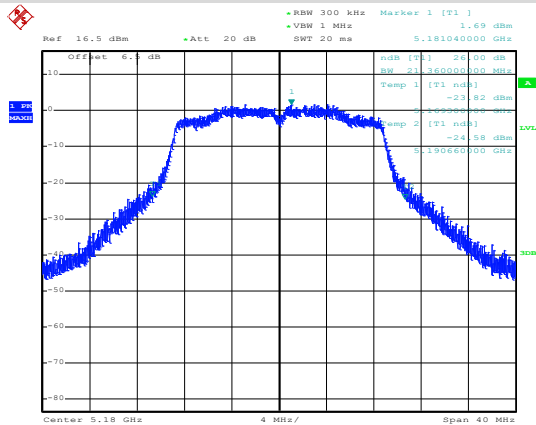
Date: 14.JUL.2020 20:40:47

Highest channel

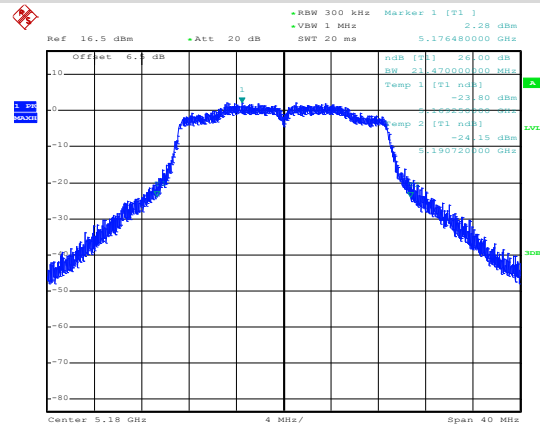
ANT1

ANT2

802.11ac(HT20)
26 dB EBW

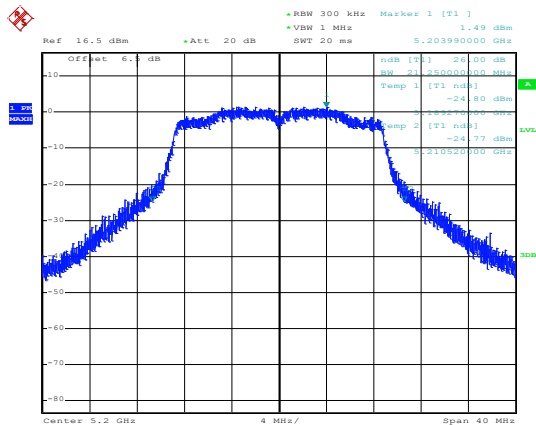


Date: 15.JUL.2020 09:01:43

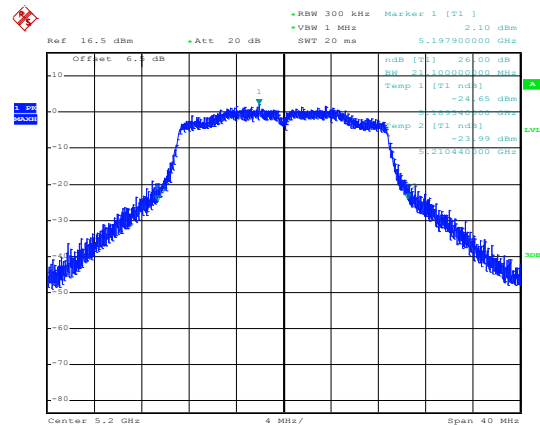


Date: 14.JUL.2020 20:43:58

Lowest channel

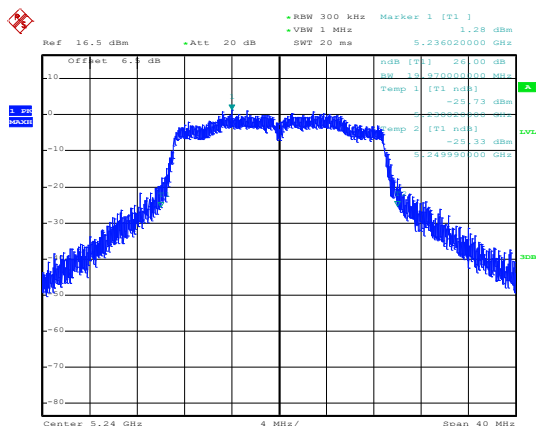


Date: 15.JUL.2020 09:01:53

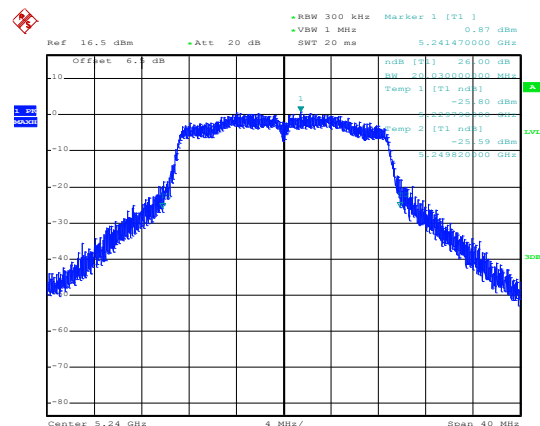


Date: 14.JUL.2020 20:43:34

Middle channel



Date: 15.JUL.2020 09:02:34



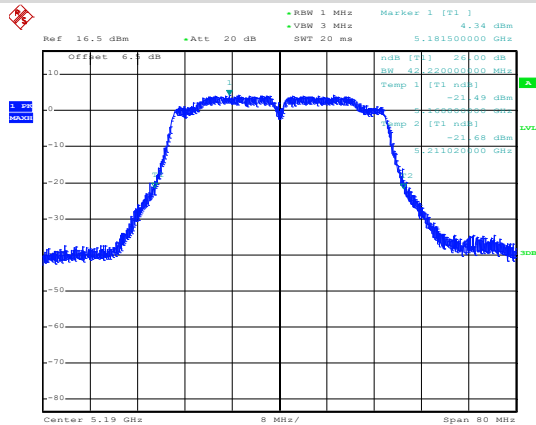
Date: 14.JUL.2020 20:43:25

Highest channel

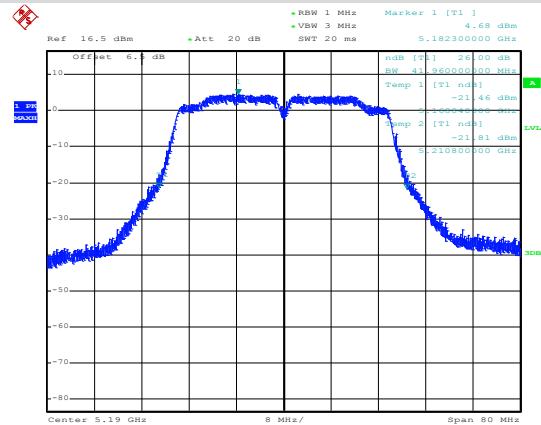
ANT1

802.11ac(HT40)
26 dB EBW

ANT2

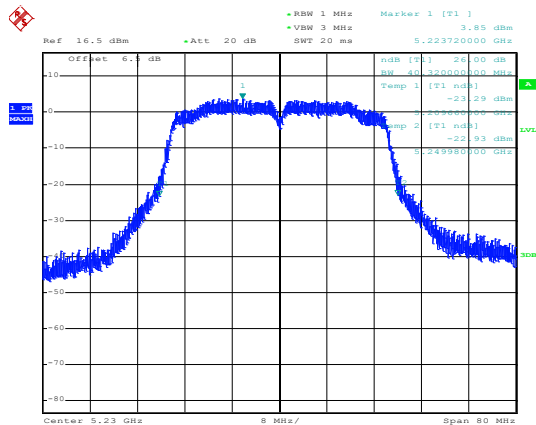


Date: 15.JUL.2020 08:45:27

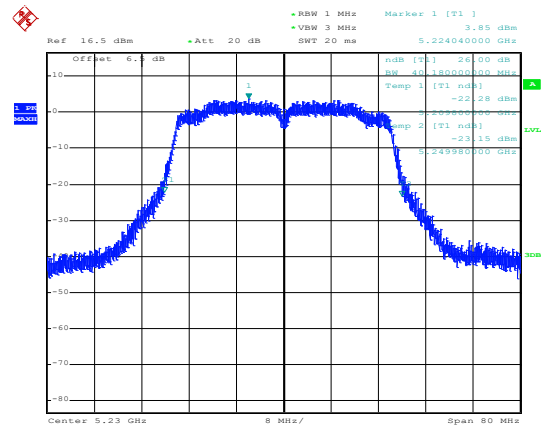


Date: 14.JUL.2020 20:39:40

Lowest channel



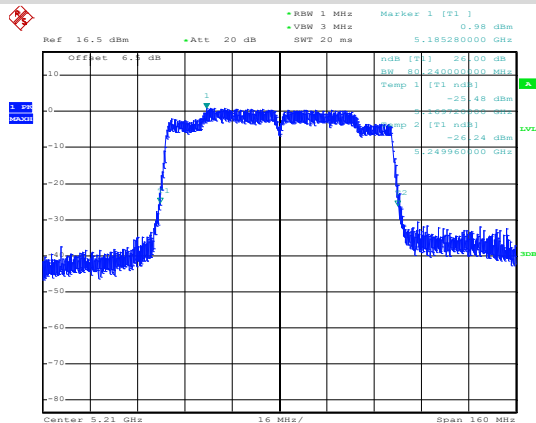
Date: 15.JUL.2020 08:46:07



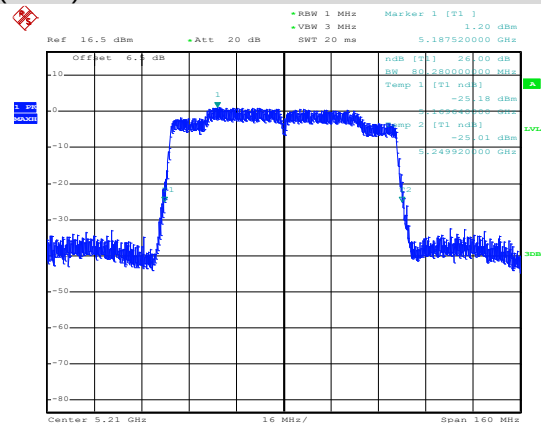
Date: 14.JUL.2020 20:40:16

Highest channel

802.11ac(HT80)



Date: 15.JUL.2020 08:44:56



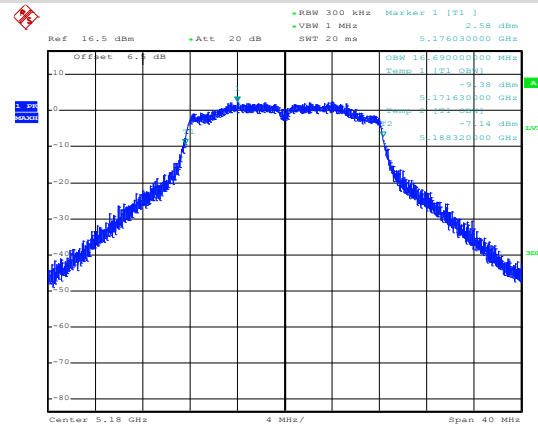
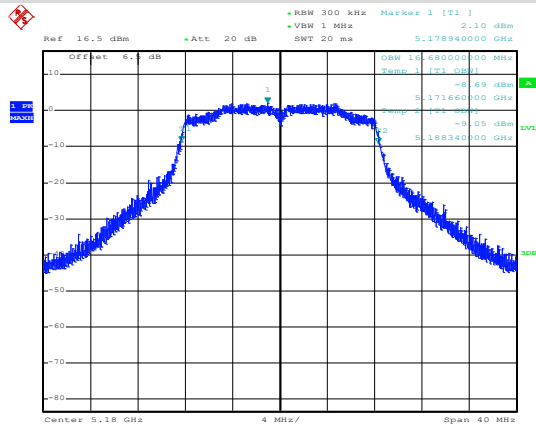
Date: 14.JUL.2020 20:39:24

Middle channel

ANT1

ANT2

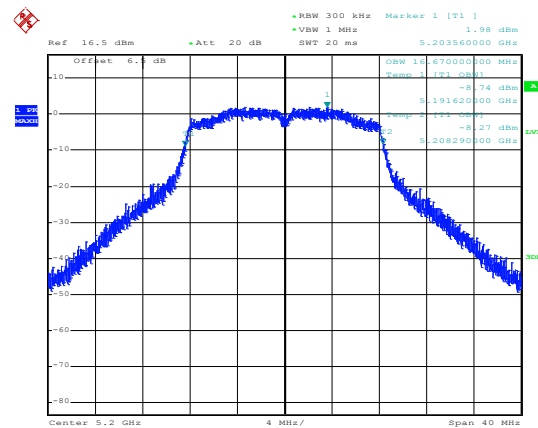
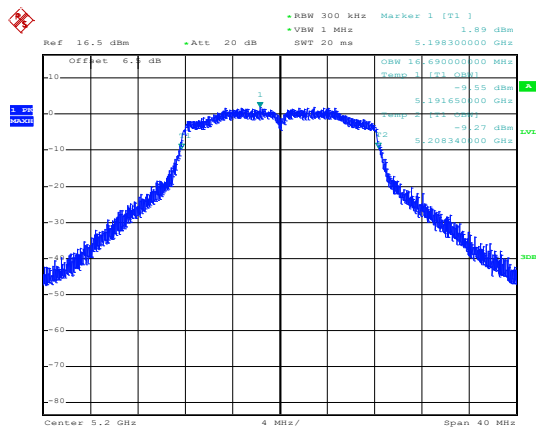
802.11a
99% OBW



Date: 15.JUL.2020 09:00:38

Date: 14.JUL.2020 20:44:18

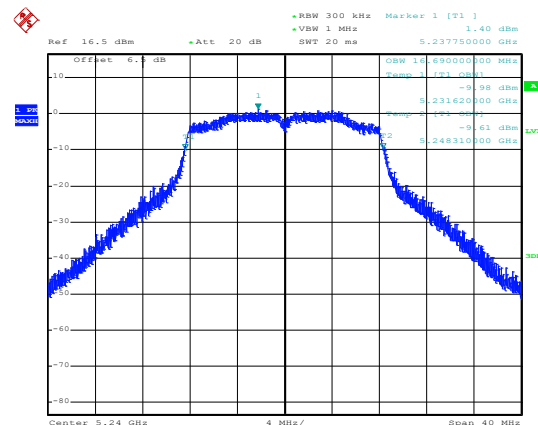
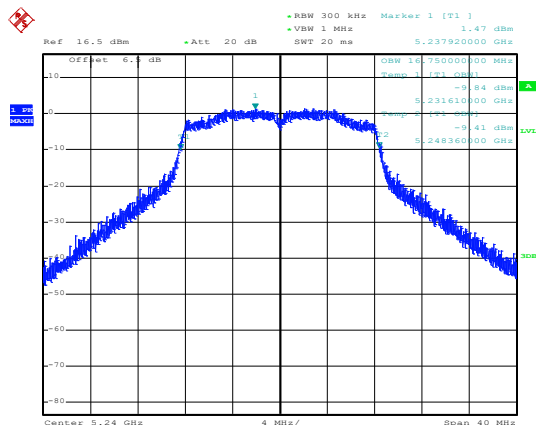
Lowest channel



Date: 15.JUL.2020 08:54:14

Date: 14.JUL.2020 20:44:29

Middle channel



Date: 15.JUL.2020 08:54:43

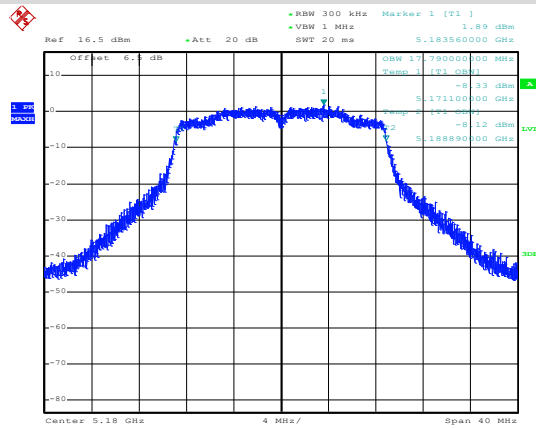
Date: 14.JUL.2020 20:44:59

Highest channel

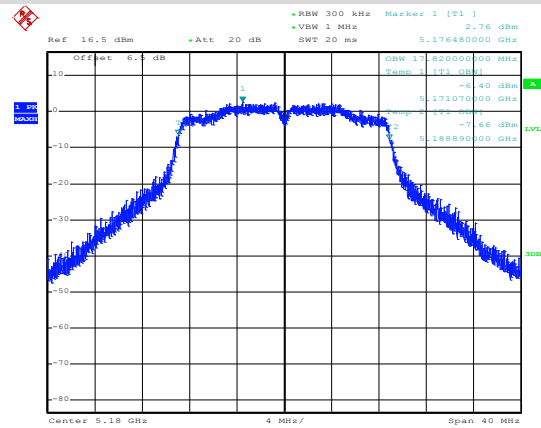
ANT1

802.11n(HT20)
99% OBW

ANT2

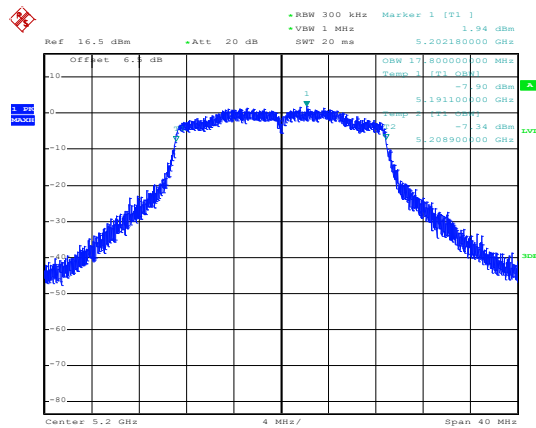


Date: 15.JUL.2020 09:00:05

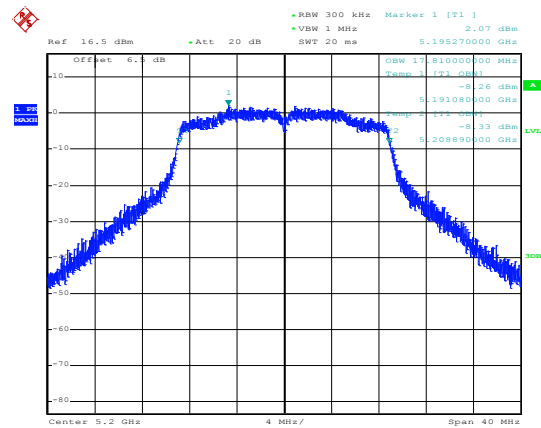


Date: 14.JUL.2020 20:41:51

Lowest channel

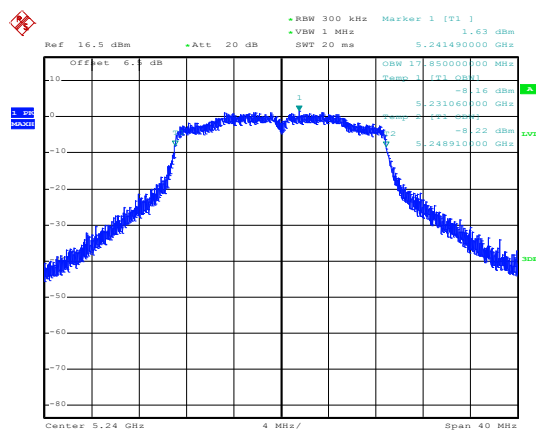


Date: 15.JUL.2020 08:59:43

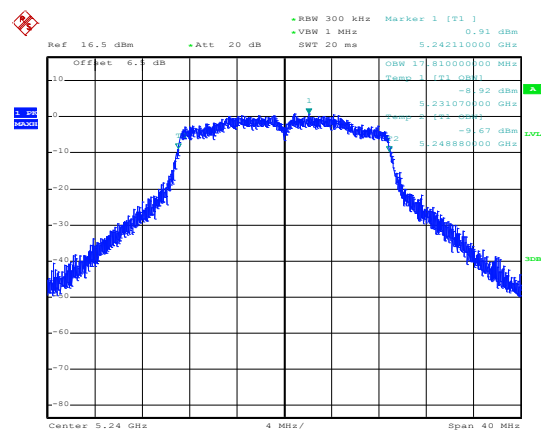


Date: 14.JUL.2020 20:42:00

Middle channel



Date: 15.JUL.2020 08:59:33



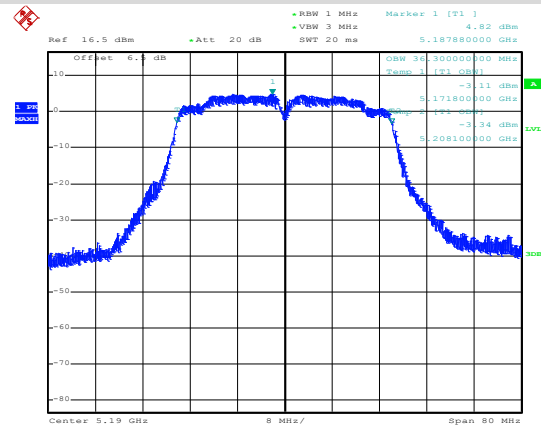
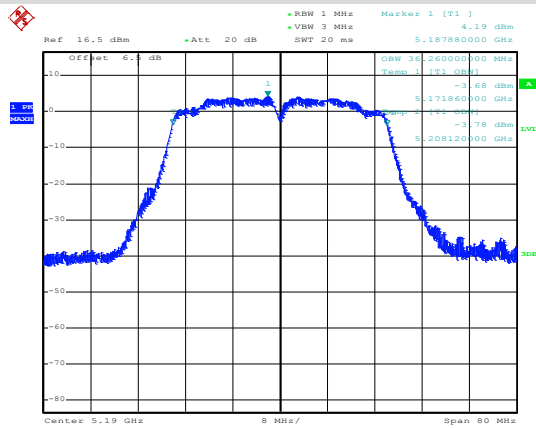
Date: 14.JUL.2020 20:42:32

Highest channel

ANT1

ANT2

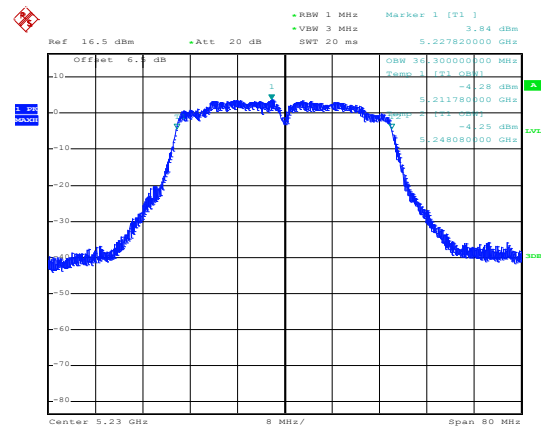
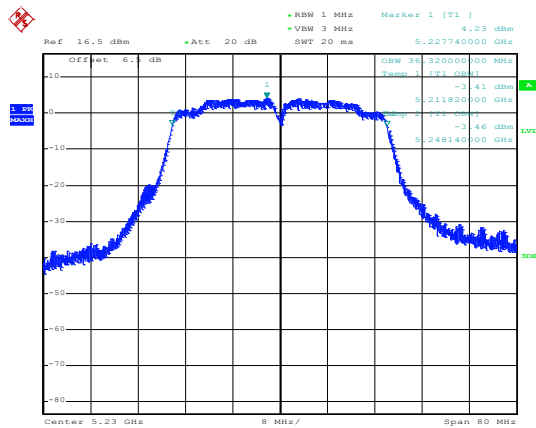
802.11n(HT40)
99% OBW



Date: 15.JUL.2020 08:47:06

Date: 14.JUL.2020 20:41:08

Lowest channel



Date: 15.JUL.2020 08:46:30

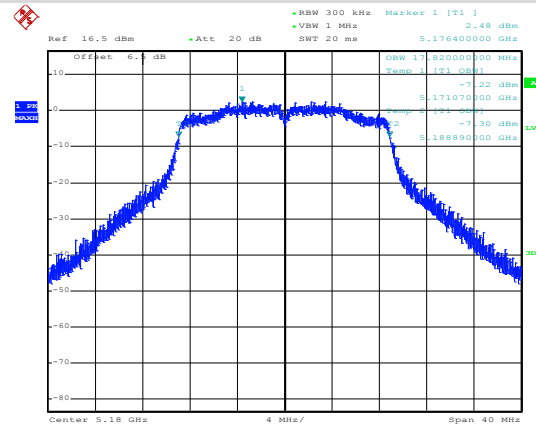
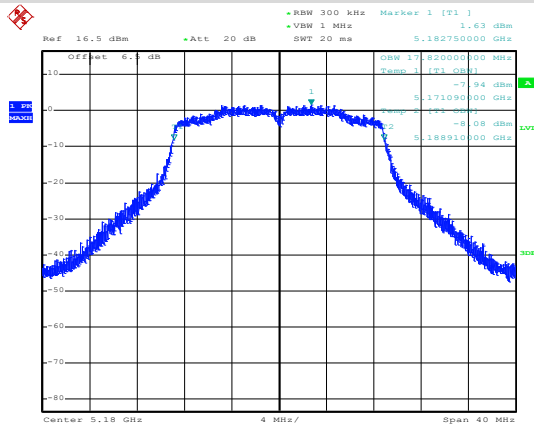
Date: 14.JUL.2020 20:40:54

Highest channel

ANT1

ANT2

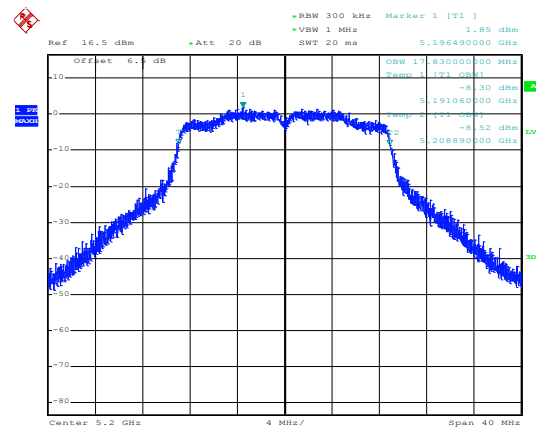
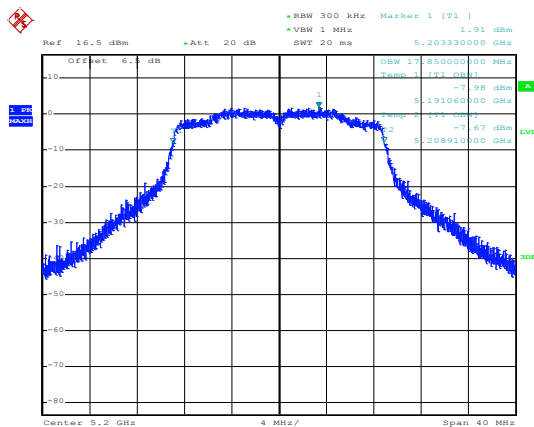
802.11ac(HT20)
99% OBW



Date: 15.JUL.2020 09:01:36

Date: 14.JUL.2020 20:43:51

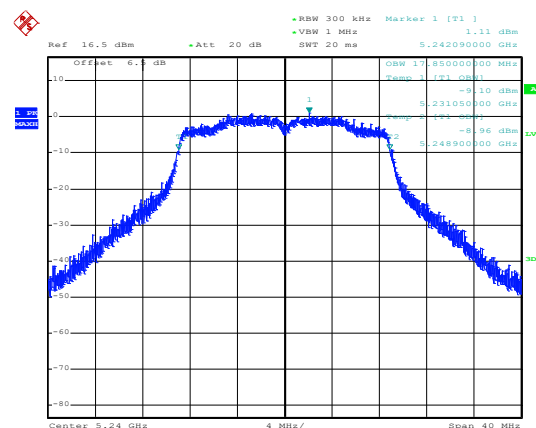
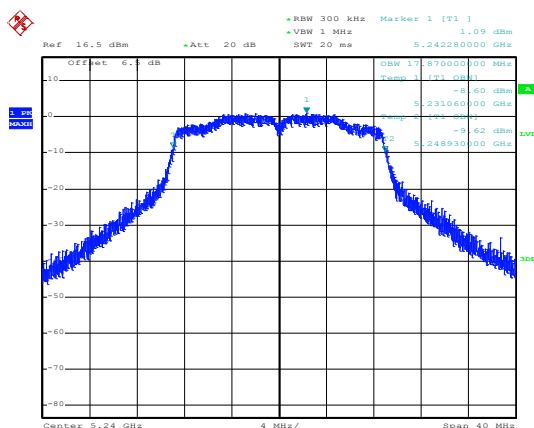
Lowest channel



Date: 15.JUL.2020 09:02:03

Date: 14.JUL.2020 20:43:41

Middle channel



Date: 15.JUL.2020 09:02:17

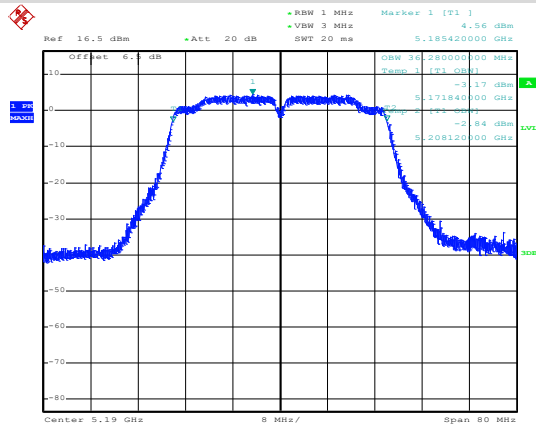
Date: 14.JUL.2020 20:42:56

Highest channel

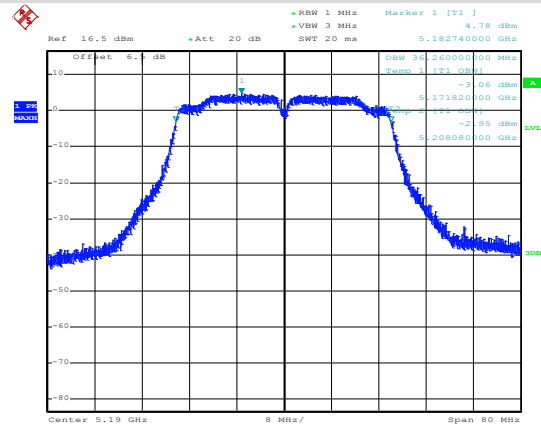
ANT1

802.11ac(HT40)
99% OBW

ANT2

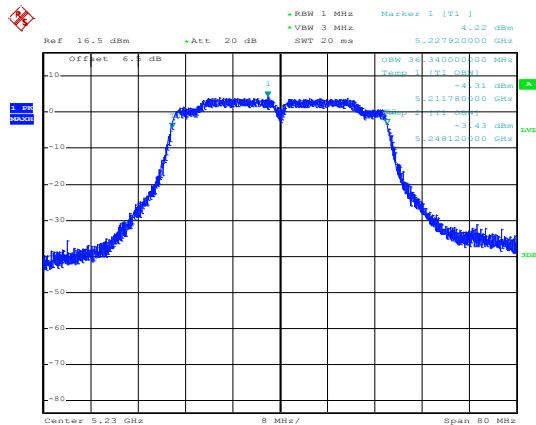


Date: 15.JUL.2020 08:45:20

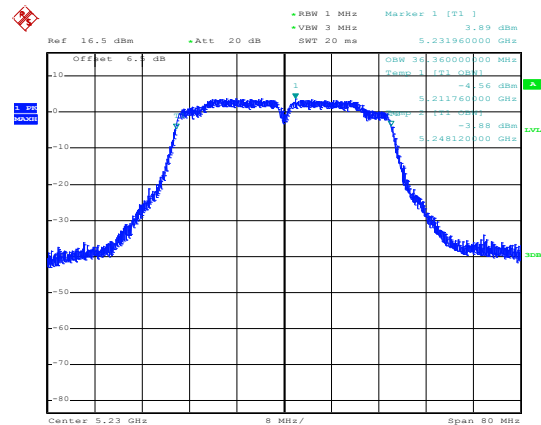


Date: 14.JUL.2020 20:39:47

Lowest channel



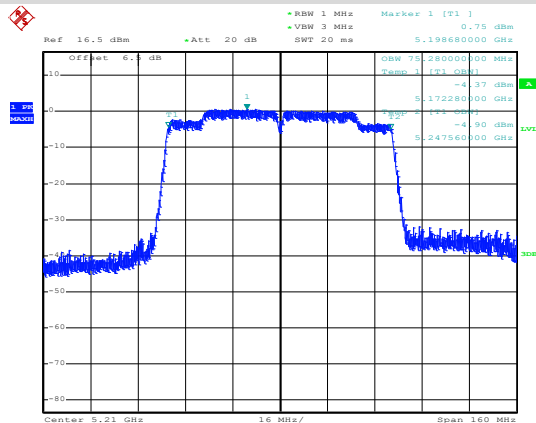
Date: 15.JUL.2020 08:46:17



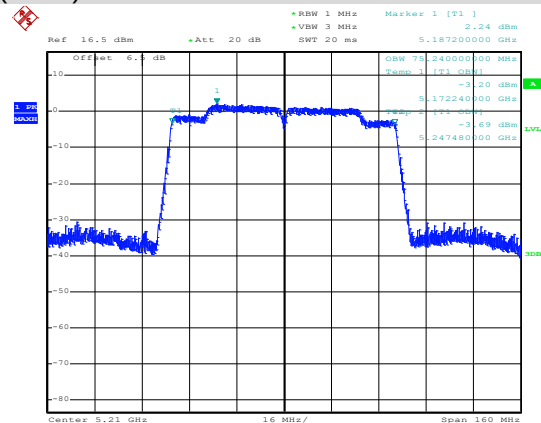
Date: 14.JUL.2020 20:40:01

Highest channel

802.11ac(HT80)



Date: 15.JUL.2020 08:45:03



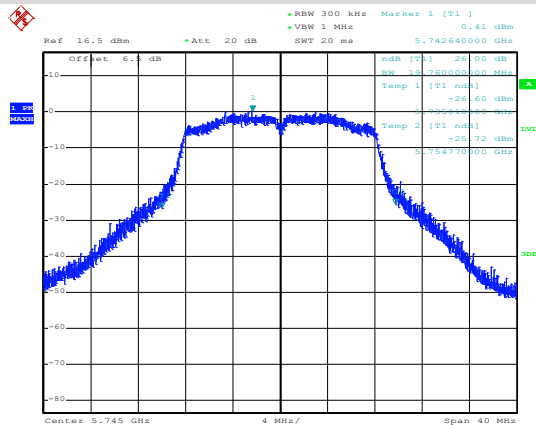
Date: 14.JUL.2020 20:39:04

Middle channel

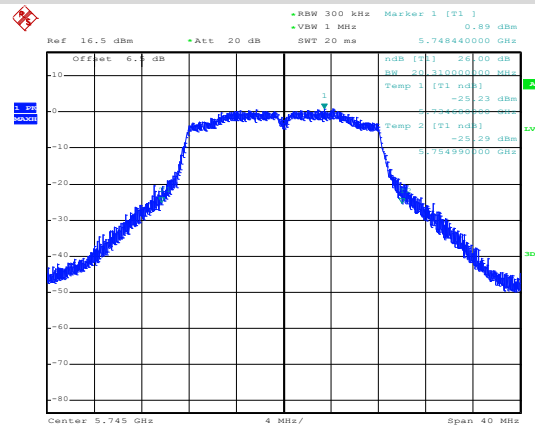
Band 4:

ANT1

ANT2

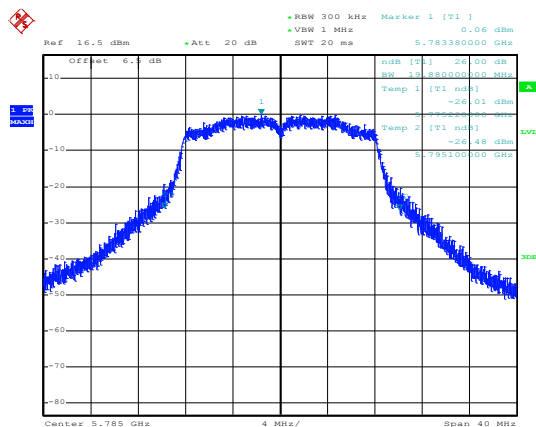
802.11a
26 dB EBW

Date: 15.JUL.2020 08:52:34

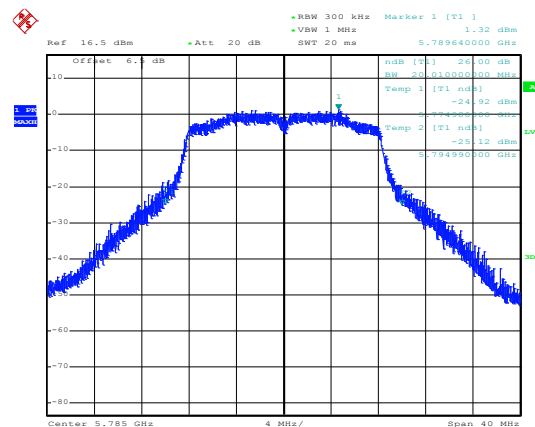


Date: 14.JUL.2020 20:45:24

Lowest channel

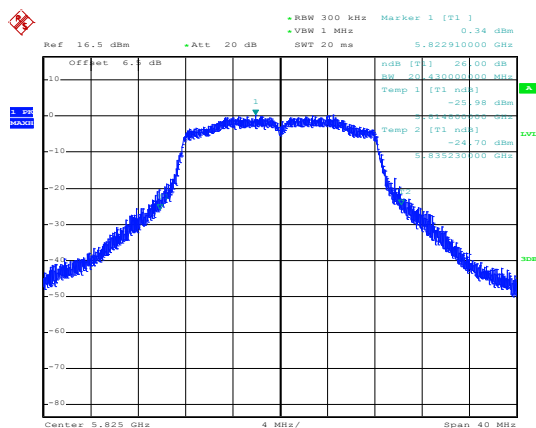


Date: 15.JUL.2020 08:52:43

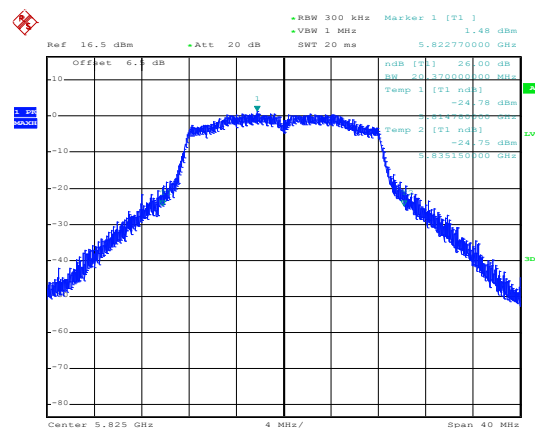


Date: 14.JUL.2020 20:45:34

Middle channel



Date: 15.JUL.2020 08:53:05



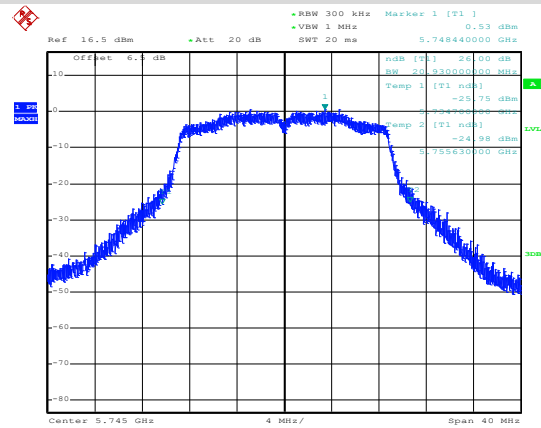
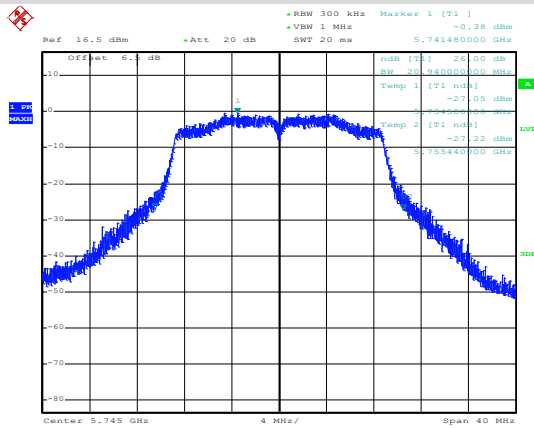
Date: 14.JUL.2020 20:45:57

Highest channel

ANT1

ANT2

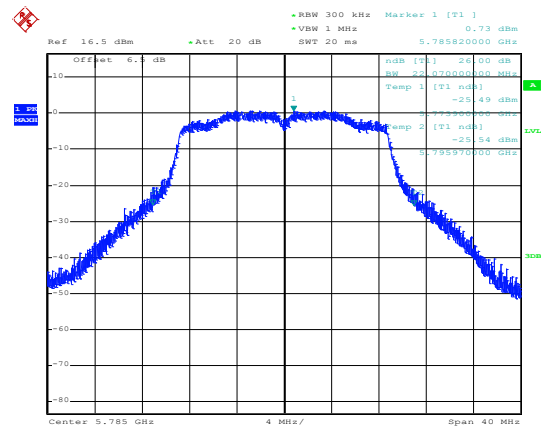
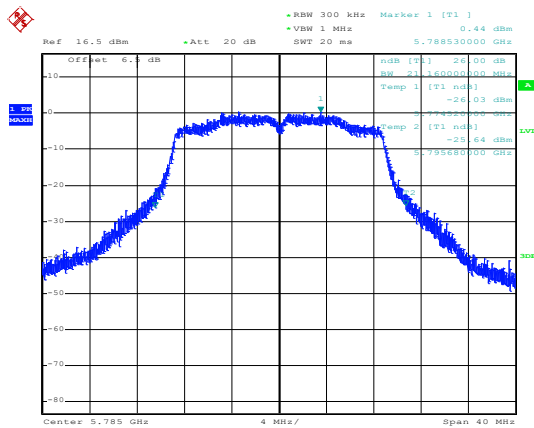
802.11n(HT20)
26 dB EBW



Date: 15.JUL.2020 08:52:08

Date: 14.JUL.2020 20:46:57

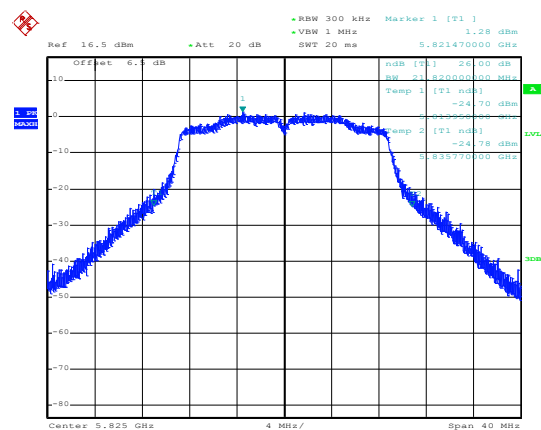
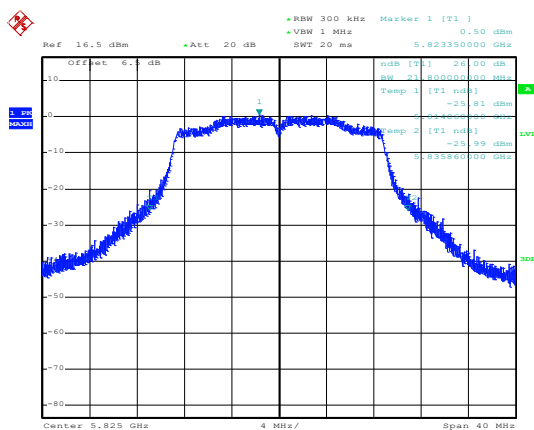
Lowest channel



Date: 15.JUL.2020 08:51:58

Date: 14.JUL.2020 20:46:45

Middle channel



Date: 15.JUL.2020 08:51:36

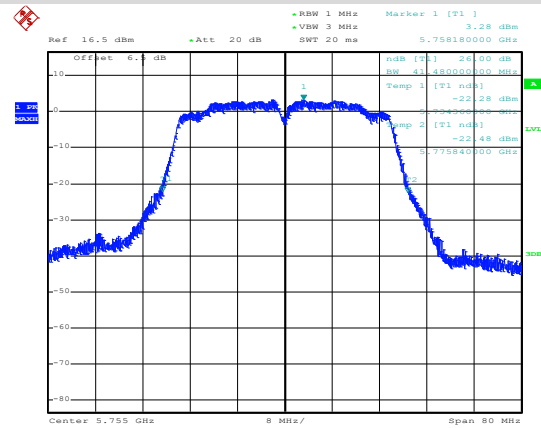
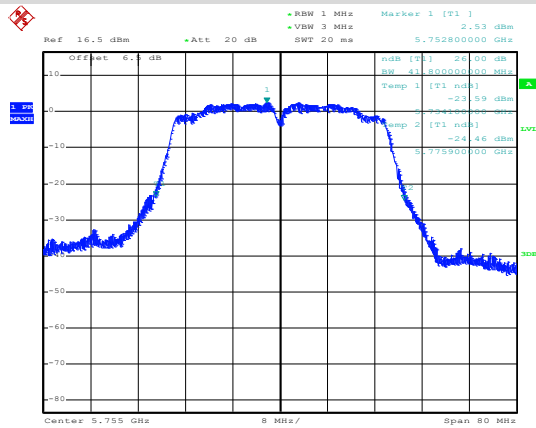
Date: 14.JUL.2020 20:46:13

Highest channel

ANT1

ANT2

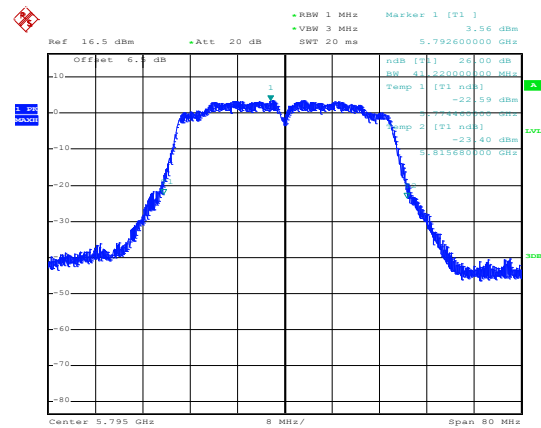
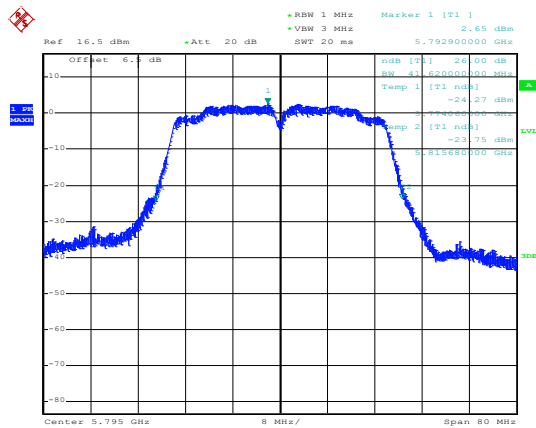
802.11n(HT40)
26 dB EBW



Date: 15.JUL.2020 08:47:45

Date: 14.JUL.2020 20:49:17

Lowest channel



Date: 15.JUL.2020 08:47:57

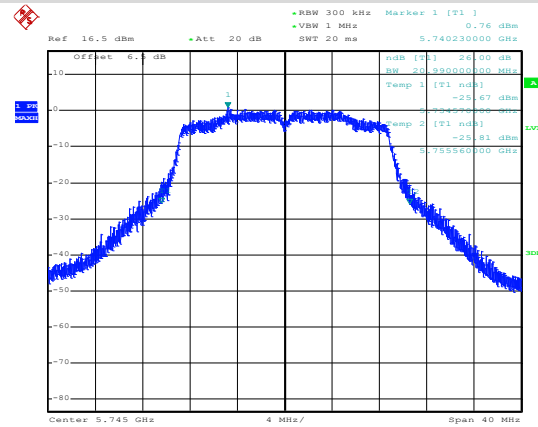
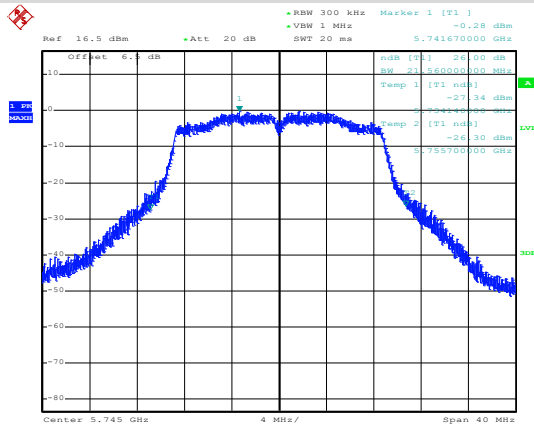
Date: 14.JUL.2020 20:48:54

Highest channel

ANT1

ANT2

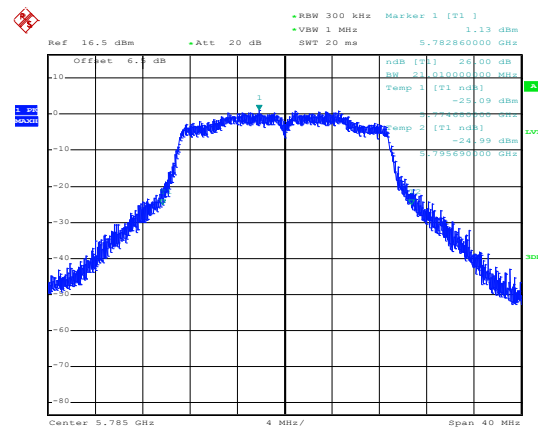
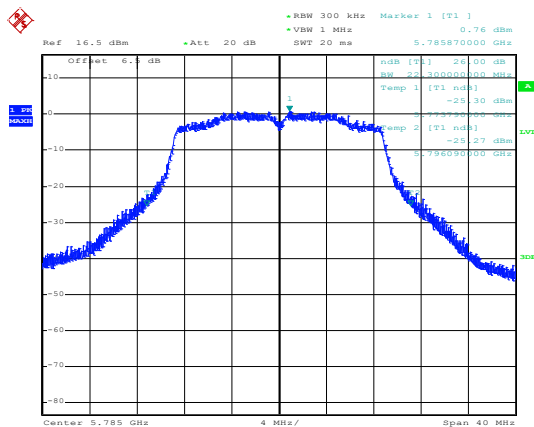
802.11ac(HT20)
26 dB EBW



Date: 15.JUL.2020 08:49:10

Date: 14.JUL.2020 20:47:22

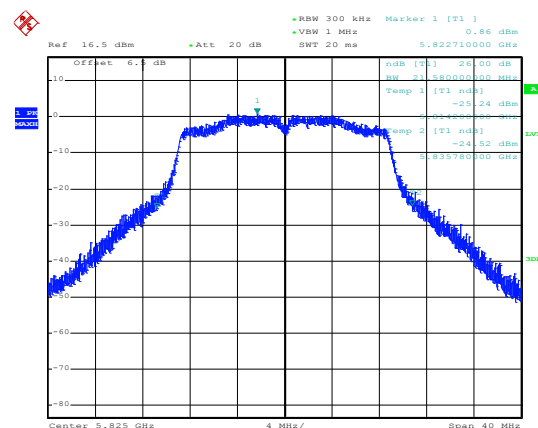
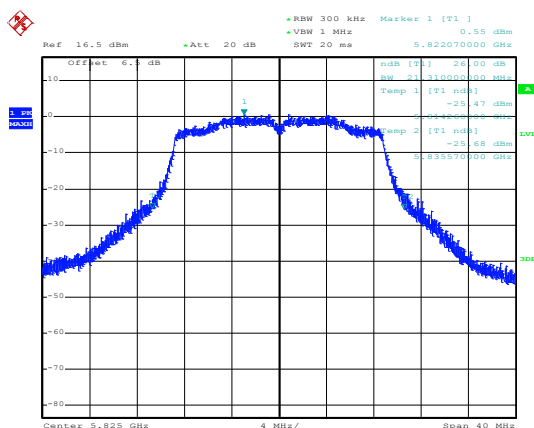
Lowest channel



Date: 15.JUL.2020 08:50:32

Date: 14.JUL.2020 20:47:33

Middle channel



Date: 15.JUL.2020 08:51:21

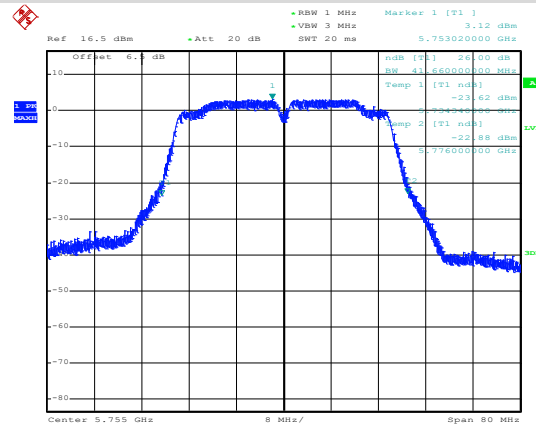
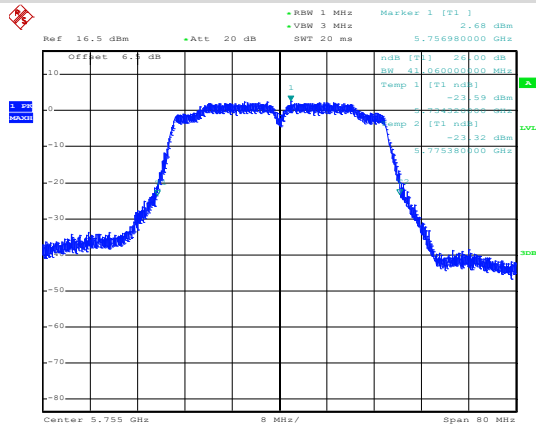
Date: 14.JUL.2020 20:47:56

Highest channel

ANT1

ANT2

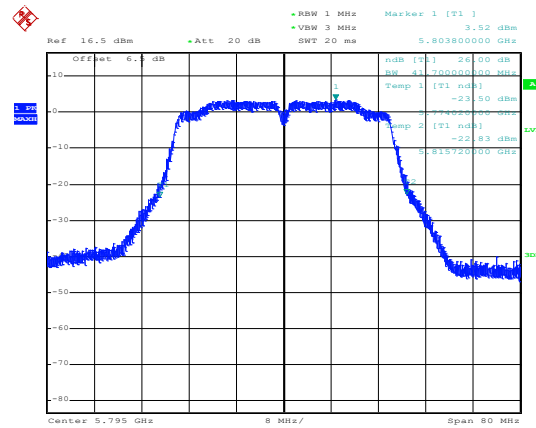
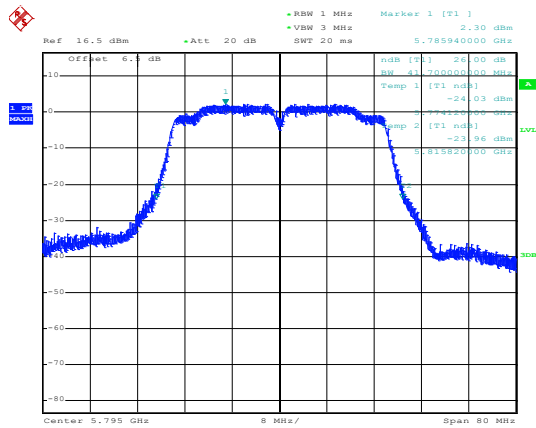
802.11ac(HT40)
26 dB EBW



Date: 15.JUL.2020 08:48:34

Date: 14.JUL.2020 20:48:16

Lowest channel

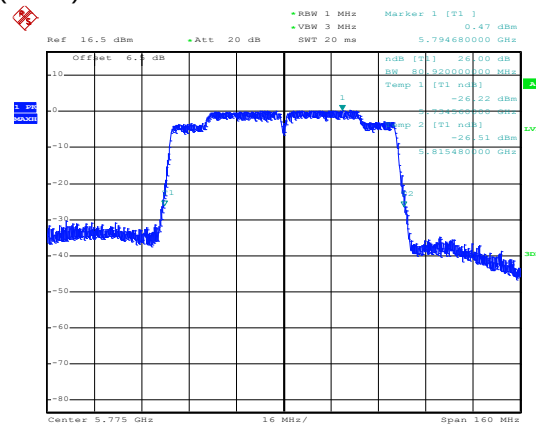
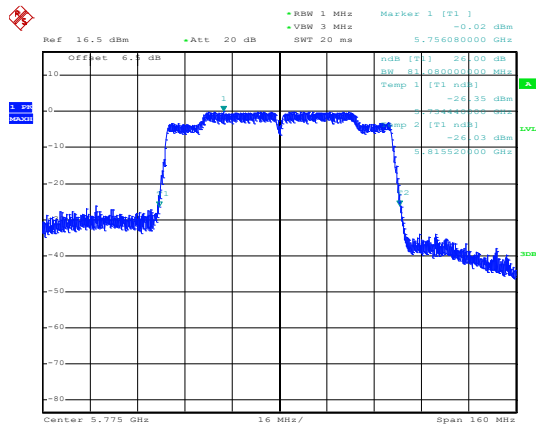


Date: 15.JUL.2020 08:48:23

Date: 14.JUL.2020 20:48:42

Highest channel

802.11ac(HT80)



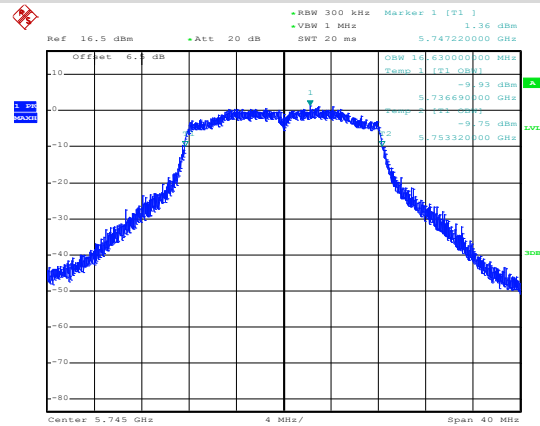
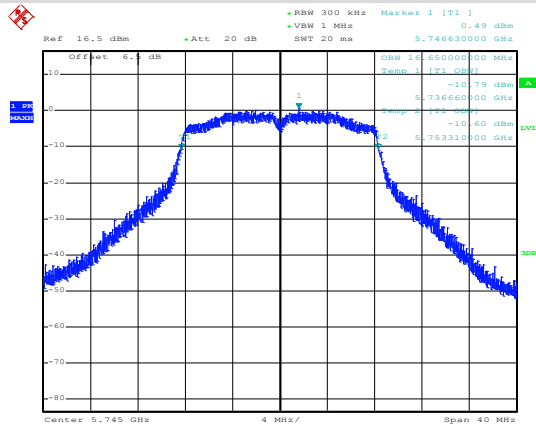
Date: 15.JUL.2020 08:44:32

Date: 14.JUL.2020 20:49:37

Middle channel

ANT1

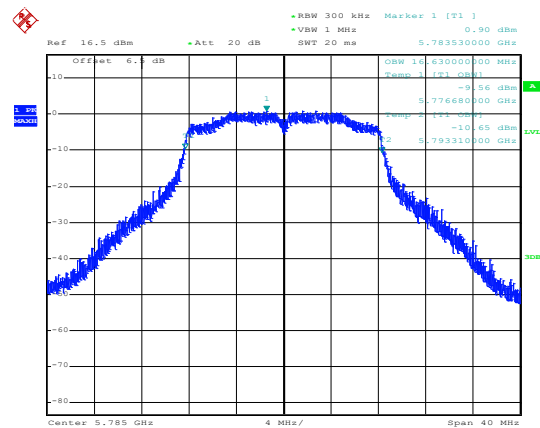
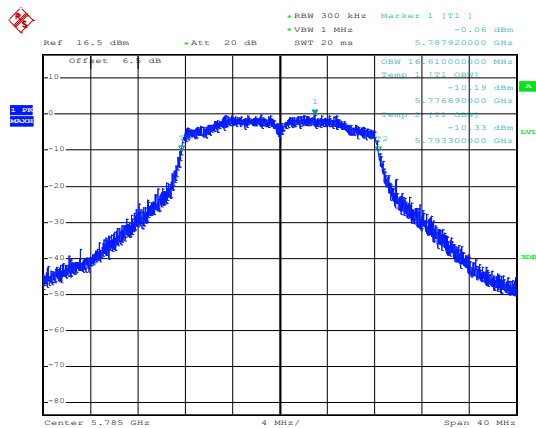
ANT2

802.11a
99% OBW

Date: 15.JUL.2020 08:52:27

Date: 14.JUL.2020 20:45:14

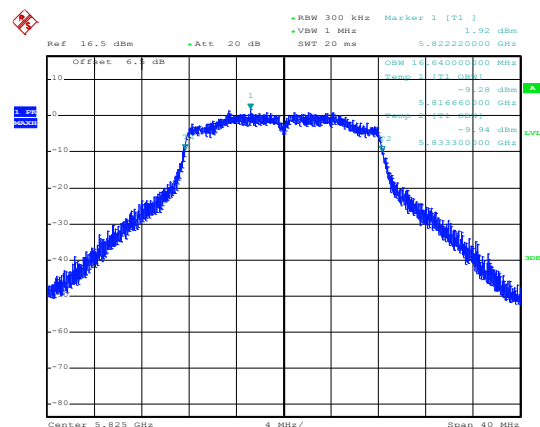
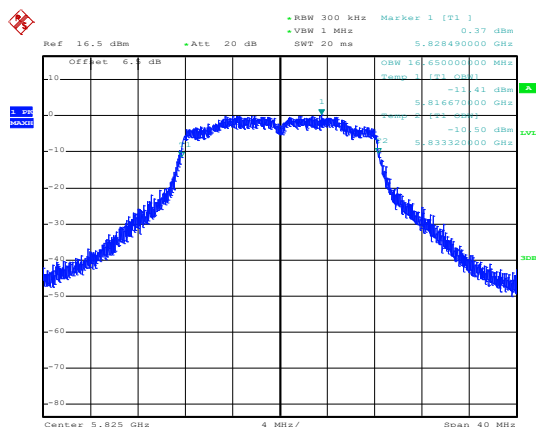
Lowest channel



Date: 15.JUL.2020 08:52:49

Date: 14.JUL.2020 20:45:40

Middle channel



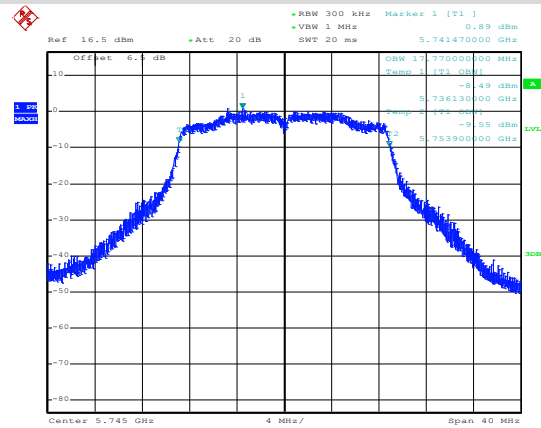
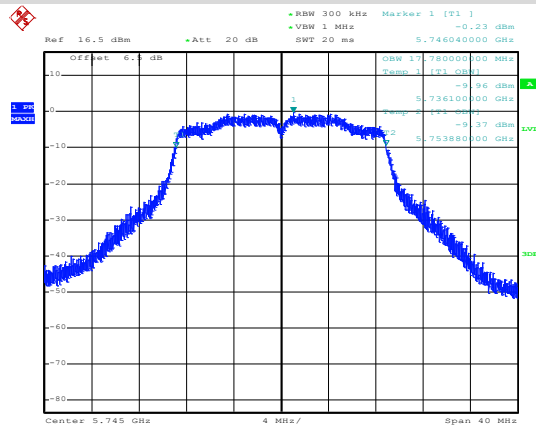
Date: 15.JUL.2020 08:52:59

Date: 14.JUL.2020 20:45:51

Highest channel

ANT1

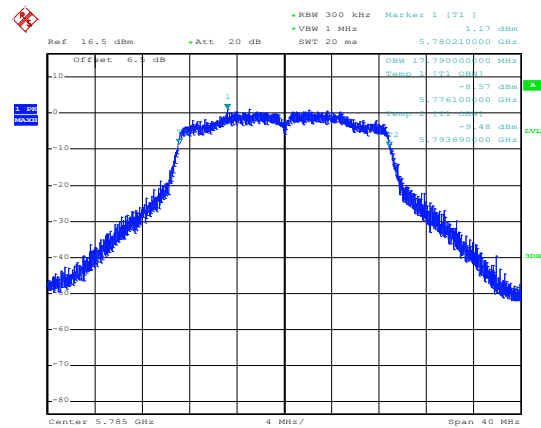
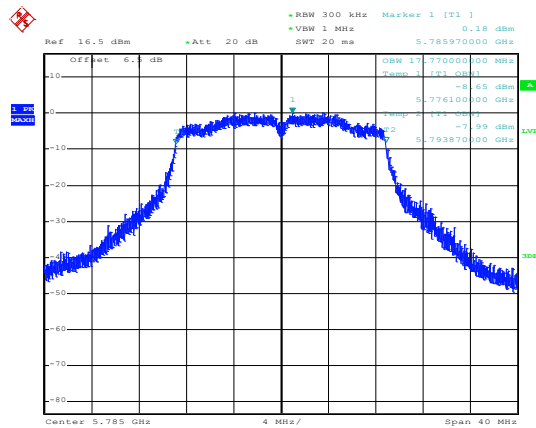
ANT2

802.11n(HT20)
99% OBW

Date: 15.JUL.2020 08:52:14

Date: 14.JUL.2020 20:47:04

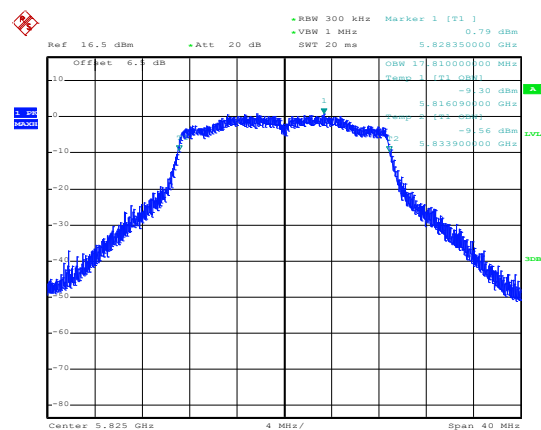
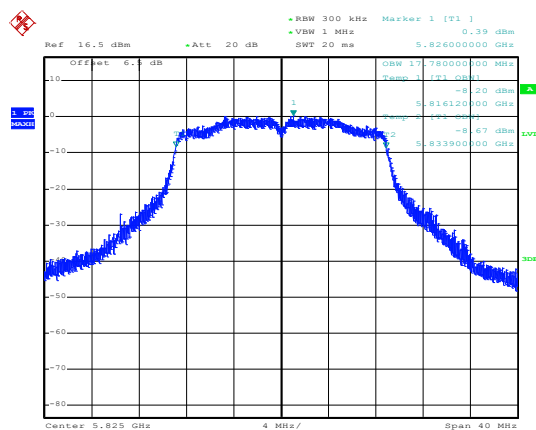
Lowest channel



Date: 15.JUL.2020 08:51:51

Date: 14.JUL.2020 20:46:35

Middle channel



Date: 15.JUL.2020 08:51:42

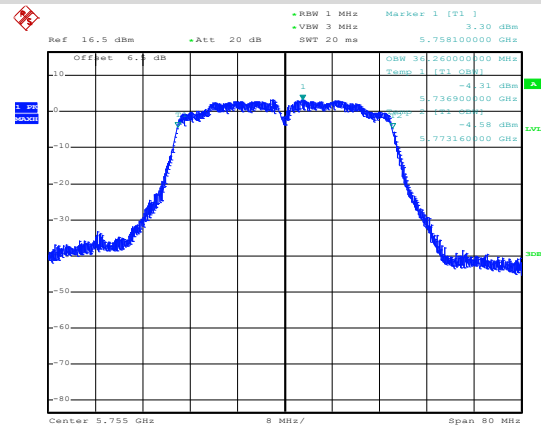
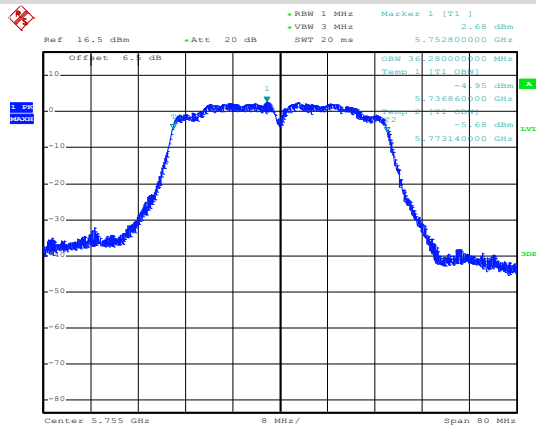
Date: 14.JUL.2020 20:46:21

Highest channel

ANT1

ANT2

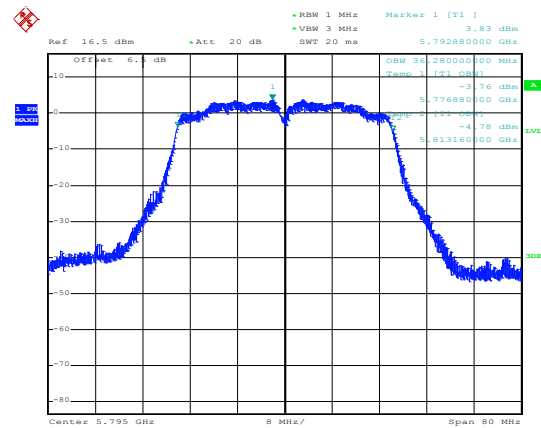
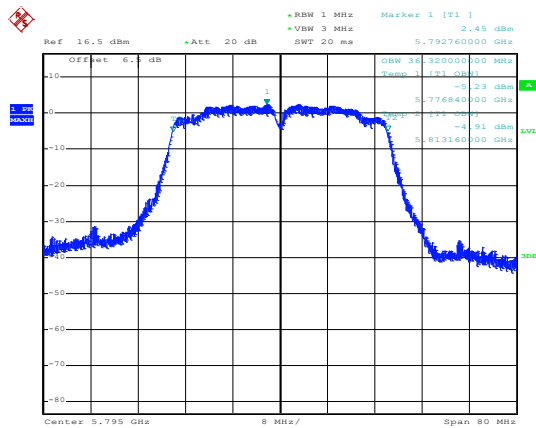
802.11n(HT40)
99% OBW



Date: 15.JUL.2020 08:47:37

Date: 14.JUL.2020 20:49:11

Lowest channel



Date: 15.JUL.2020 08:48:04

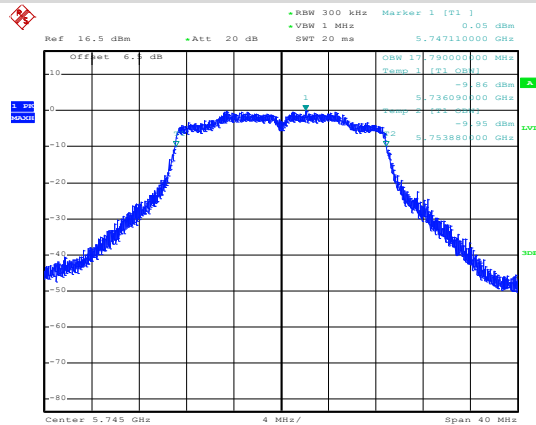
Date: 14.JUL.2020 20:49:00

Highest channel

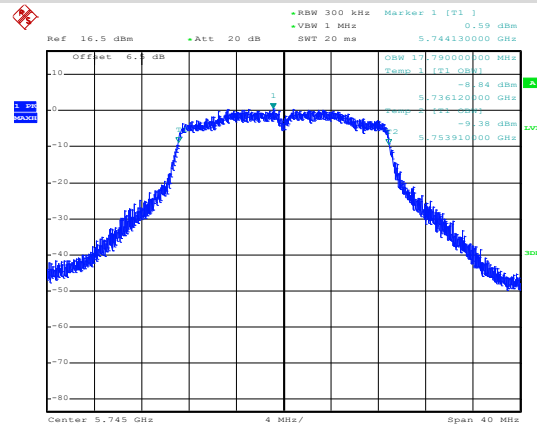
ANT1

802.11ac(HT20)
99% OBW

ANT2

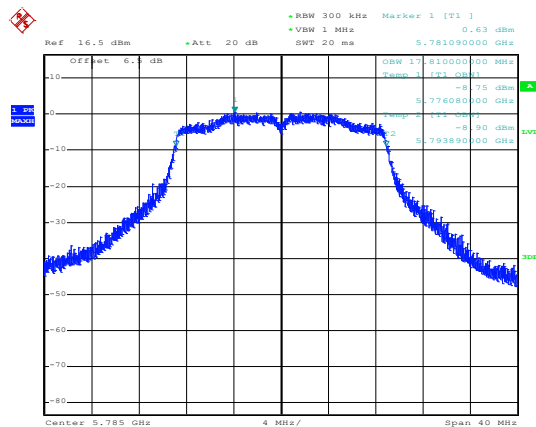


Date: 15.JUL.2020 08:49:03

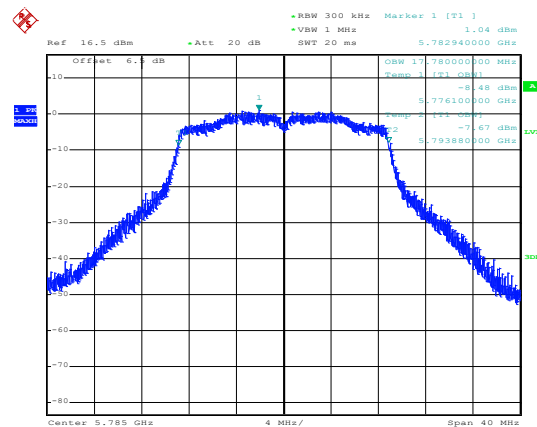


Date: 14.JUL.2020 20:47:16

Lowest channel

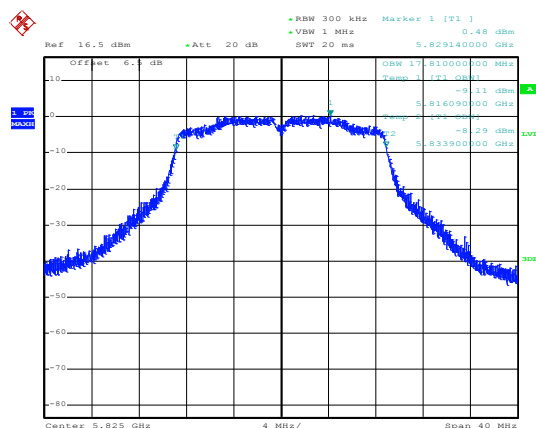


Date: 15.JUL.2020 08:50:40

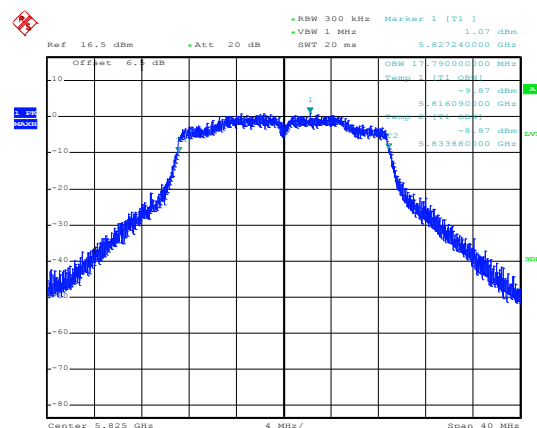


Date: 14.JUL.2020 20:47:40

Middle channel



Date: 15.JUL.2020 08:51:13



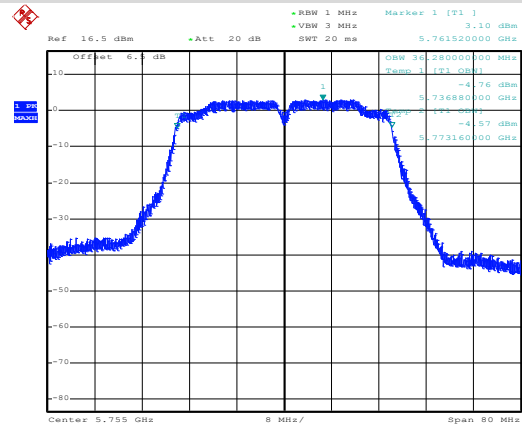
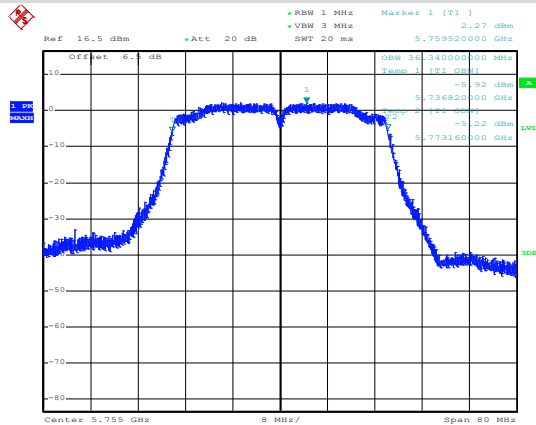
Date: 14.JUL.2020 20:47:49

Highest channel

ANT1

802.11ac(HT40)
99% OBW

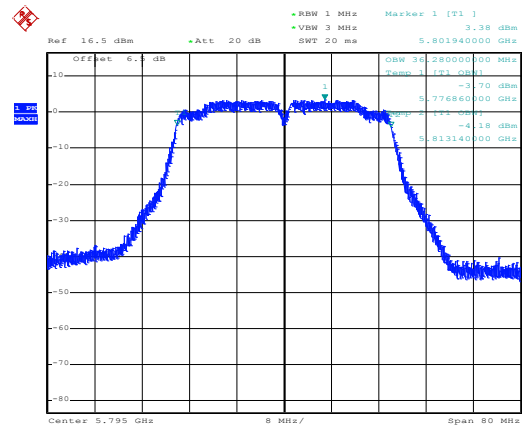
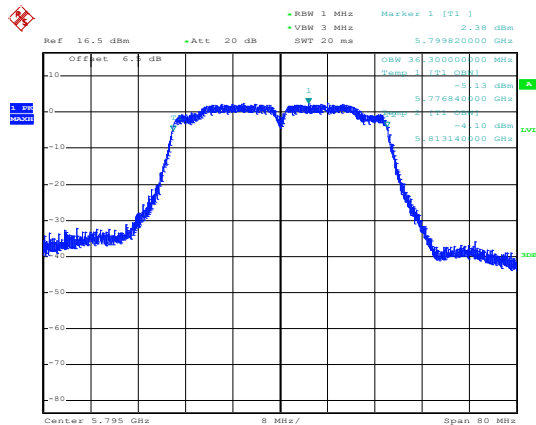
ANT2



Date: 15.JUL.2020 08:48:40

Date: 14.JUL.2020 20:48:23

Lowest channel

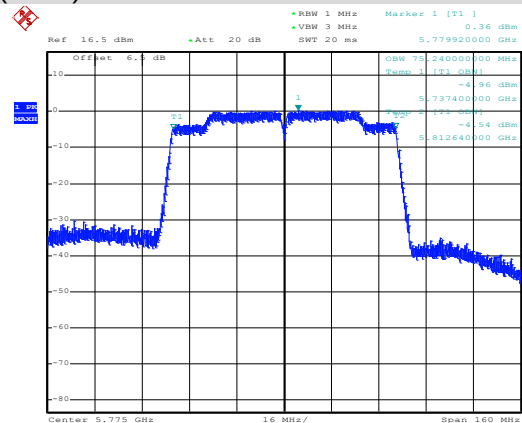
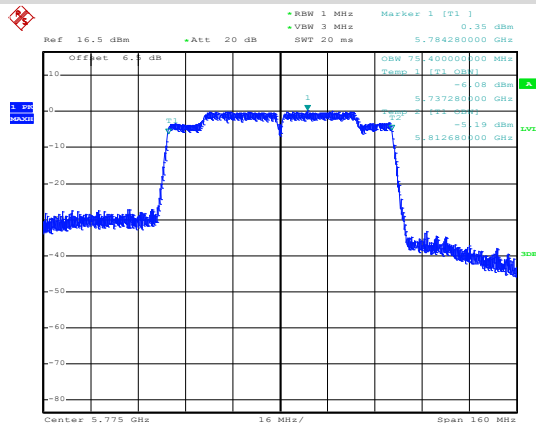


Date: 15.JUL.2020 08:48:17

Date: 14.JUL.2020 20:48:36

Highest channel

802.11ac(HT80)



Date: 15.JUL.2020 08:44:25

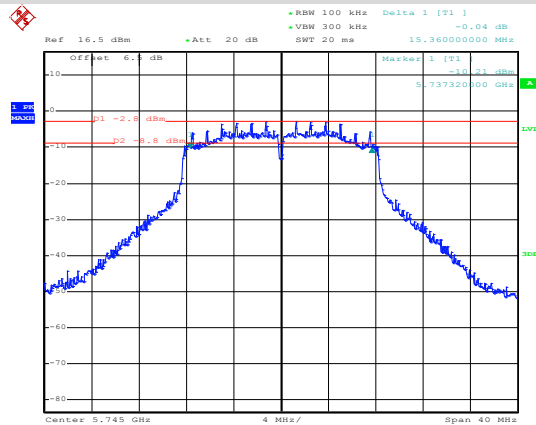
Date: 14.JUL.2020 20:49:43

Middle channel

ANT1

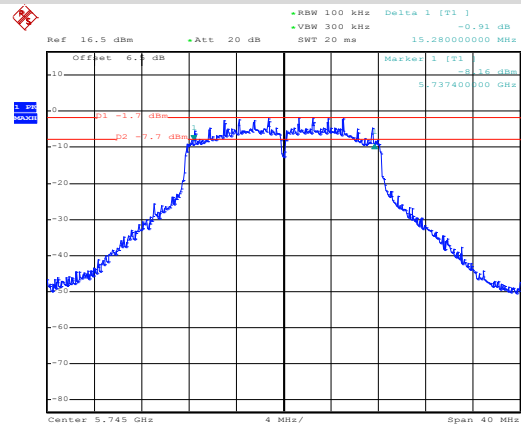
6dB BW
802.11a

ANT2



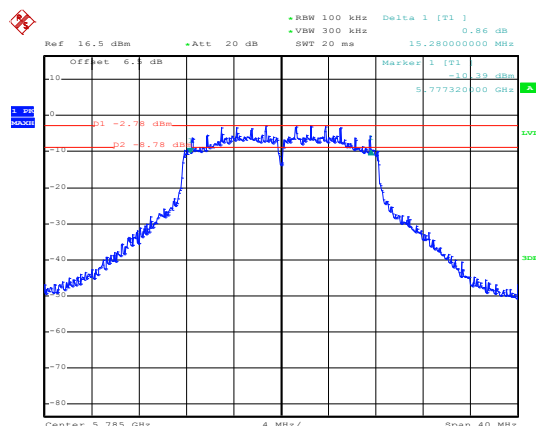
Date: 15.JUL.2020 09:15:01

Lowest channel



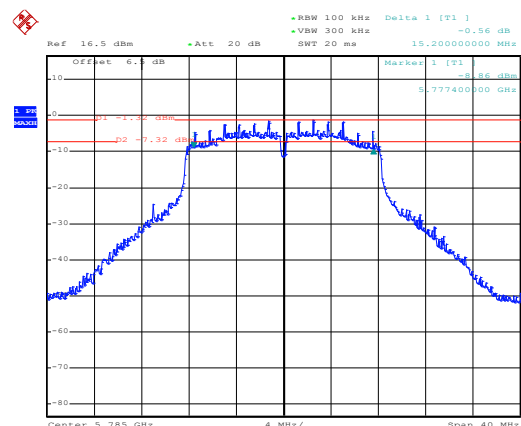
Date: 14.JUL.2020 20:33:52

Lowest channel



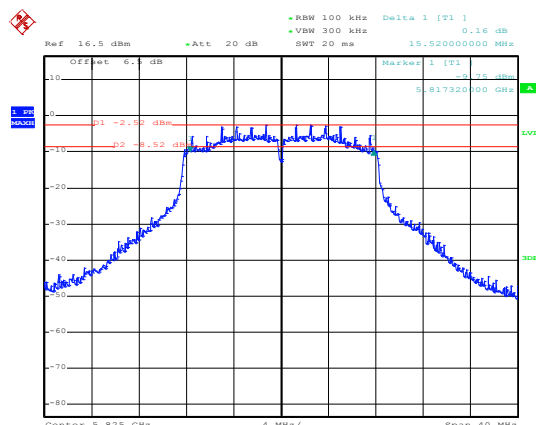
Date: 15.JUL.2020 09:15:39

Middle channel



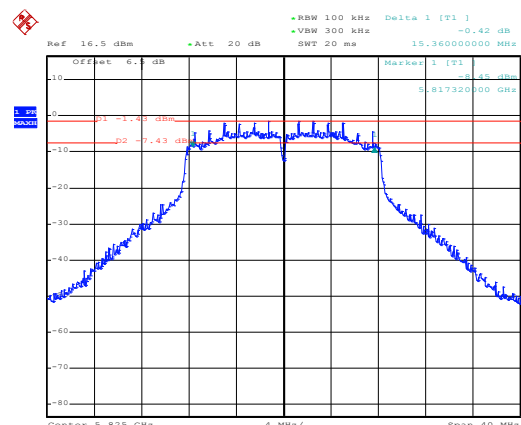
Date: 14.JUL.2020 20:34:22

Middle channel



Date: 15.JUL.2020 09:16:10

Highest channel



Date: 14.JUL.2020 20:34:56

Highest channel