FCC REPORT
(UNII)

Applicant:	8Devices
Address of Applicant:	Gedimino 47, Kaunas, LT-44242, Lithuania
Equipment Under Test (EUT)	
Product Name:	Komikan
Model No.:	Komikan
FCC ID:	Z9W-KOM
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of sample receipt:	24 Mar., 2020
Date of Test:	24 Mar., to 06 May, 2020
Date of report issued:	06 May, 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	*06 May, 2020*	*Original*

Tested by: Mike.ou ***Date:*** *06 May, 2020*

Test Engineer

Reviewed by: Winner zhang ***Date:*** *06 May, 2020*

Project Engineer

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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) (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) (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 1.0dB (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:	8Devices
Address:	Gedimino 47, Kaunas, LT-44242, Lithuania
Manufacturer/ Factory:	8Devices
Address:	Gedimino 47, Kaunas, LT-44242, Lithuania

5.2 General Description of E.U.T.

Product Name:	Komikan
Model No.:	Komikan
Operation Frequency:	Band 1: 5150MHz-5250MHz, Band 4: 5725MHz-5825MHz
Channel numbers:	Band 1: 802.11a/802.11n/ac20: 4, 802.11n/ac40/: 2, 802.11ac80: 1 Band 4: 802.11a/802.11n/ac20: 5, 802.11n/ac40: 2, 802.11ac80: 1
Channel separation:	802.11a/802.11n/ac20: 20MHz, 802.11n/ac40: 40MHz, 802.11ac80: 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:	Ceramic Antenna, Whip Antenna, Flex Antenna
Antenna gain:	Ceramic Antenna: Band 1 and Band 4: 4.32dBi Flex Antenna: Band 1 and Band 4: 4.75dBi Whip Antenna: Band 1: 4.5dBi, Band 4: 5dBi
Power supply:	DC 3.3V
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 test mode

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.

Remark:

1. *Conducted Emission and Radiated Emission below 1GHz pre-scan Ceramic Antenna and Flex Antenna and Whip Antenna, found Whip Antenna was worse case mode, the report only reflects the worst mode*
2. *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

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
DELL	PC	OPTIPLEX7070	2J8XSZ2	DoC
DELL	MONITOR	SE2018HR	3M7QPY2	DoC
DELL	KEYBOARD	KB216d	N/A	DoC
DELL	MOUSE	MS116t1	N/A	DoC

Test Software	Power Setting	Power setting command	Test Software	Power Setting

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)	±5.38 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.36 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.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **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
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-07-2020	03-06-2021
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-07-2020	03-06-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
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	MWRFTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTEST	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

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
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 Part 15 C Section 15.203 /247(b)

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.
15.247(b) (4) requirement:
(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

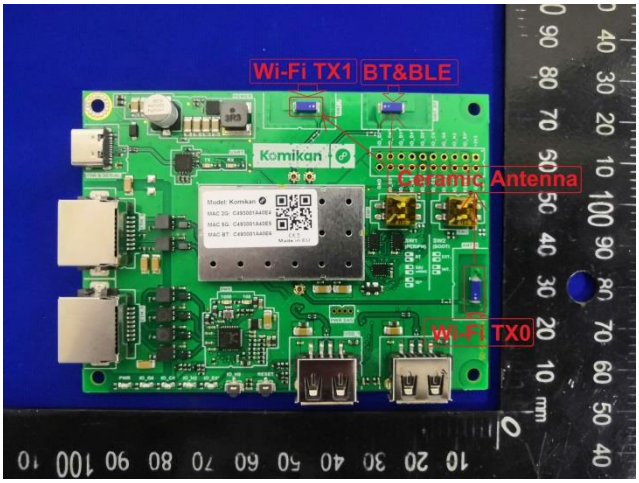
E.U.T Antenna:	

The product is a professionally installed device which has two types of antennas for the application. The antennas information as below table:

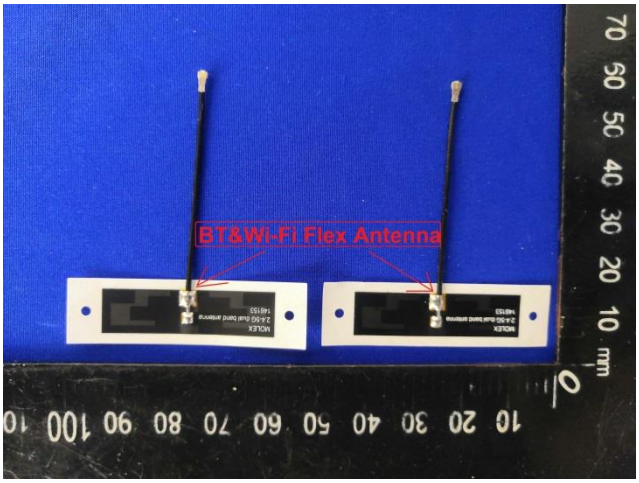
Antenna Type	Antenna Gain(dBi)	
	Band 1	Band 4
Ceramic Antenna	4.32	4.32
Flex Antenna	4.75	4.75
Whip Antenna	4.50	5.00

According to above information, the antennas meet the requirements of this section

Ceramic Antenna

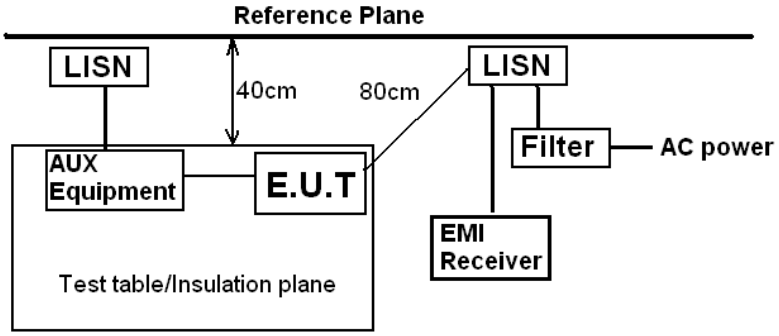


Flex Antenna



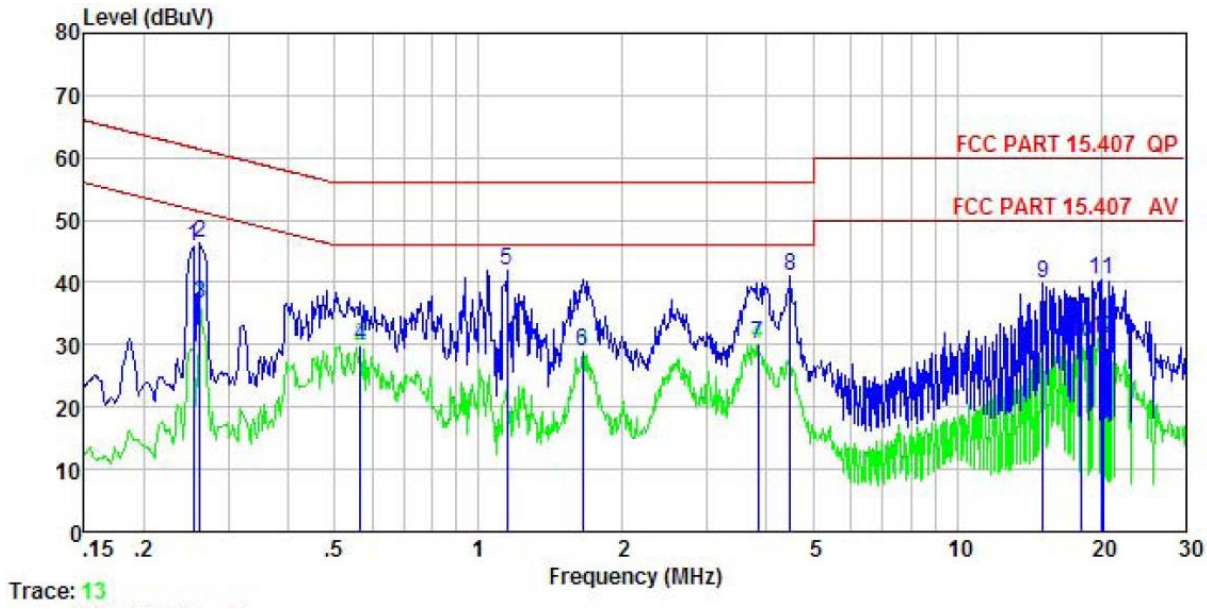
Whip Antenna

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:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence 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:	Komikan	**Product model:**	Komikan
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℃ Huni: 55%

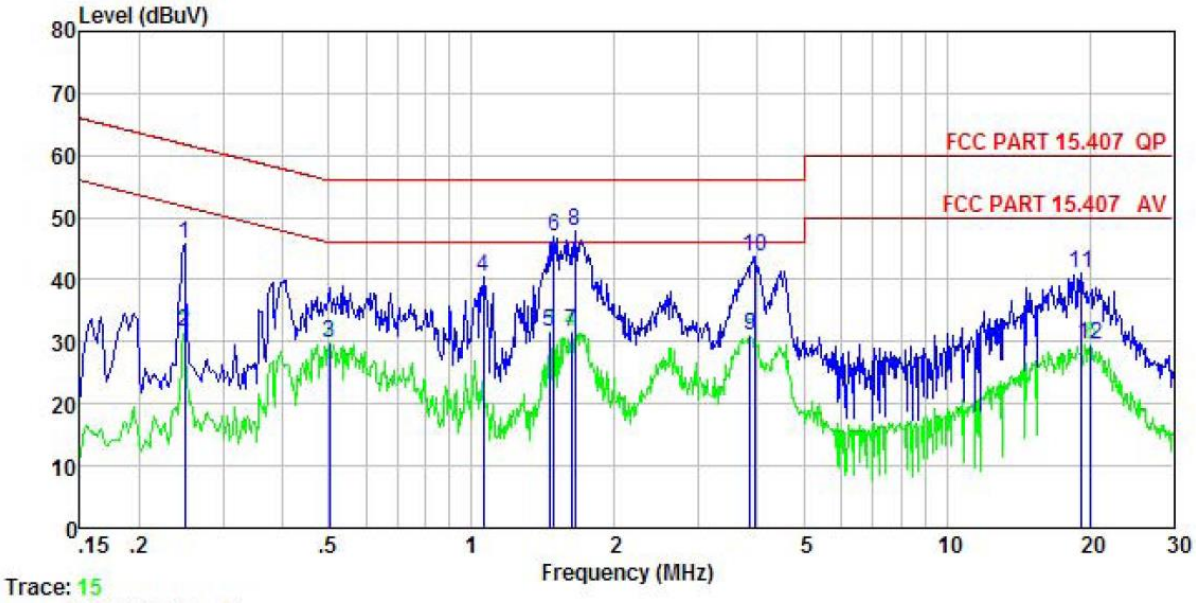


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.253	35.62	-0.40	-0.22	10.75	45.75	61.64	-15.89	QP
2	0.262	36.13	-0.39	-0.23	10.75	46.26	61.38	-15.12	QP
3	0.262	26.37	-0.39	-0.23	10.75	36.50	51.38	-14.88	Average
4	0.567	19.76	-0.39	-0.37	10.76	29.76	46.00	-16.24	Average
5	1.147	31.21	-0.39	0.30	10.89	42.01	56.00	-13.99	QP
6	1.654	18.43	-0.40	-0.11	10.94	28.86	46.00	-17.14	Average
7	3.840	19.76	-0.46	-0.07	10.89	30.12	46.00	-15.88	Average
8	4.478	30.48	-0.47	0.02	10.87	40.90	56.00	-15.10	QP
9	15.146	26.08	-0.69	3.53	10.90	39.82	60.00	-20.18	QP
10	18.232	18.48	-0.88	1.74	10.92	30.26	50.00	-19.74	Average
11	20.056	29.52	-0.97	0.89	10.93	40.37	60.00	-19.63	QP
12	20.270	20.11	-0.97	0.90	10.93	30.97	50.00	-19.03	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:	Komikan	**Product model:**	Komikan
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℃ Huni: 55%

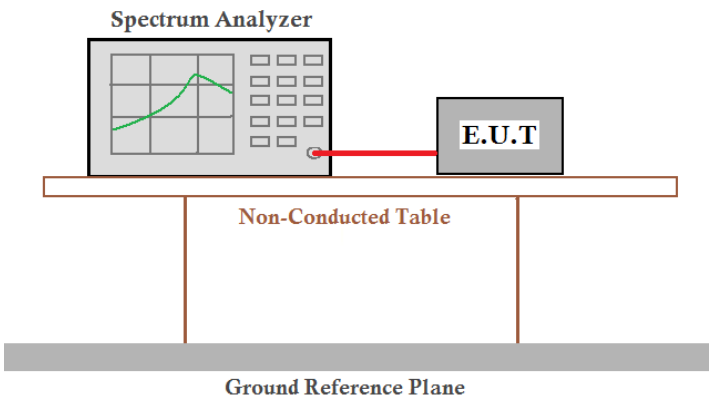


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.249	35.77	-0.66	0.01	10.75	45.87	61.78	-15.91	QP
2	0.249	21.59	-0.66	0.01	10.75	31.69	51.78	-20.09	Average
3	0.502	19.80	-0.65	0.03	10.76	29.94	46.00	-16.06	Average
4	1.060	30.20	-0.63	0.09	10.88	40.54	56.00	-15.46	QP
5	1.456	21.12	-0.65	0.13	10.92	31.52	46.00	-14.48	Average
6	1.487	36.66	-0.65	0.13	10.92	47.06	56.00	-8.94	QP
7	1.619	21.09	-0.66	0.14	10.93	31.50	46.00	-14.50	Average
8	1.654	37.43	-0.66	0.15	10.94	47.86	56.00	-8.14	QP
9	3.860	20.26	-0.69	0.49	10.89	30.95	46.00	-15.05	Average
10	3.964	33.10	-0.70	0.50	10.89	43.79	56.00	-12.21	QP
11	19.224	30.79	-1.33	0.64	10.93	41.03	60.00	-18.97	QP
12	20.056	19.79	-1.41	0.23	10.93	29.54	50.00	-20.46	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.*

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:	
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Band 1						
Mode	Test CH	Ant. Port	Conducted Output power(dBm)	Total power (dBm)	Limit (dBm)	Result
802.11a	Lowest	TX0	18.11	/	24.00	Pass
		TX1	18.11			
	Middle	TX0	18.00			
		TX1	18.28			
	Highest	TX0	17.86			
		TX1	18.19			
802.11n20	Lowest	TX0	14.92	18.16	*Ceramic Antenna:22.68* *Flex Antenna:22.25* *Whip Antenna:22.50*	Pass
		TX1	15.37			
	Middle	TX0	15.45	18.47		
		TX1	15.46			
	Highest	TX0	15.32	18.34		
		TX1	15.34			
802.11n40	Lowest	TX0	15.00	18.07	*Ceramic Antenna:24* *Flex Antenna:23.8* *Whip Antenna:23.0*	Pass
		TX1	15.11			
	Highest	TX0	15.23	18.28		
		TX1	15.30			
802.11ac20	Lowest	TX0	15.56	18.35	*Ceramic Antenna:22.68* *Flex Antenna:22.25* *Whip Antenna:22.50*	Pass
		TX1	15.11			
	Middle	TX0	15.34	18.26		
		TX1	15.16			
	Highest	TX0	15.30	18.31		
		TX1	15.30			
802.11ac40	Lowest	TX0	15.17	18.19	*Ceramic Antenna:22.68* *Flex Antenna:22.25* *Whip Antenna:22.50*	Pass
		TX1	15.18			
	Highest	TX0	15.18	18.25		
		TX1	15.30			
802.11ac80	Lowest	TX0	15.03	18.12	*Ceramic Antenna:22.68* *Flex Antenna:22.25* *Whip Antenna:22.500*	Pass
		TX1	15.19			

1. *Because transmit signals are correlated,* Directional gain = $G_{ANT} + 10\log(N_{ANT})$ dBi.
2. *So Ceramic Antenna: The Directional gain=4.32 + 10* $\log(2)$*=7.32dBi, The directional Gain of antenna is greater than 6 dBi, so the limit of power is 22.68 dBm (for 802.11n/ac).*

   Flex Antenna: The Directional gain=4.75 + 10 $\log(2)$*=7.75dBi, The directional Gain of antenna is* greater *than 6 dBi, so the limit of power is 22.25 dBm (for 802.11n/ac).*

   Whip Antenna: The Directional gain=4.5 + 10 $\log(2)$*=7.5dBi, The directional Gain of antenna is* greater *than 6dBi, so the limit of power is 22.5 dBm (for 802.11n/ac).*

Band 4						
Mode	Test CH	Ant. Port	Conducted Output power(dBm)	Total power (dBm)	Limit (dBm)	Result
802.11a	Lowest	TX0	17.80	/	30.00	Pass
		TX1	18.34			
	Middle	TX0	17.60			
		TX1	18.28			
	Highest	TX0	17.46			
		TX1	18.10			
802.11n20	Lowest	TX0	15.53	18.43	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.0*	Pass
		TX1	15.30			
	Middle	TX0	15.44	18.31		
		TX1	15.15			
	Highest	TX0	15.39	18.40		
		TX1	15.38			
802.11n40	Lowest	TX0	15.15	18.26	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.0*	Pass
		TX1	15.34			
	Highest	TX0	15.12	18.20		
		TX1	15.26			
802.11ac20	Lowest	TX0	15.21	18.21	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.0*	Pass
		TX1	15.18			
	Middle	TX0	15.26	18.29		
		TX1	15.30			
	Highest	TX0	15.38	18.21		
		TX1	15.02			
802.11ac40	Lowest	TX0	15.03	18.09	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.0*	Pass
		TX1	15.13			
	Highest	TX0	15.05	18.09		
		TX1	15.11			
802.11ac80	Lowest	TX0	15.15	18.17	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.0*	Pass
		TX1	15.17			

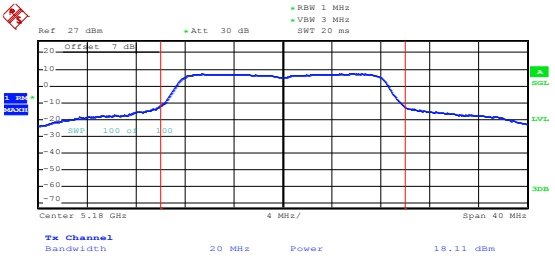
1. *Because transmit signals are correlated,* Directional gain = $G_{ANT} + 10\log(N_{ANT})$ dBi.
2. *So Ceramic Antenna: The Directional gain=4.32 + 10* $\log(2)$*=7.32dBi, The directional Gain of antenna is greater than 6 dBi, so the limit of power is 28.68 dBm (for 802.11n/ac).*

   Flex Antenna: The Directional gain=4.75 + 10 $\log(2)$*=7.75dBi, The directional Gain of antenna is* greater *than 6 dBi, so the limit of power is 28.25 dBm (for 802.11n/ac).*

   Whip Antenna: The Directional gain=5 + 10 $\log(2)$*=8.0dBi, The directional Gain of antenna is* greater *than 6dBi, so the limit of power is 28.0 dBm (for 802.11n/ac).*

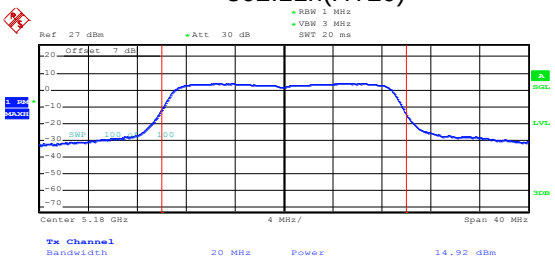
Test plot as follows: TX0:
Band 1:

802.11a



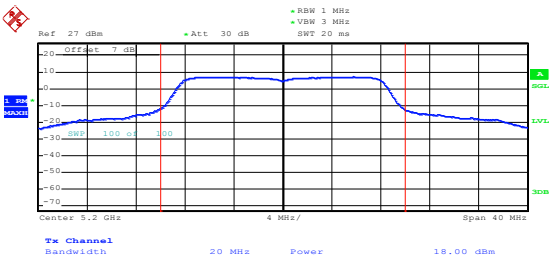
Date: 13.APR.2020 11:19:27

802.11n(HT20)



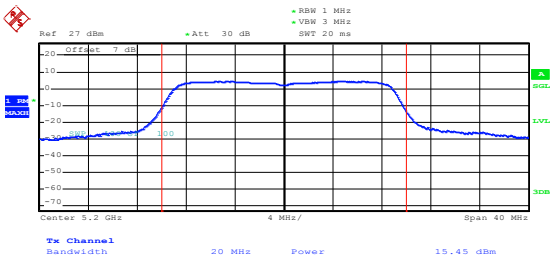
Date: 13.APR.2020 11:23:36

Lowest channel



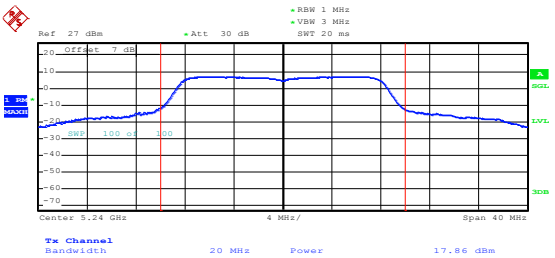
Date: 13.APR.2020 11:19:58

Lowest channel



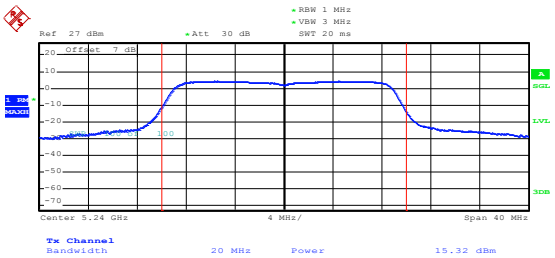
Date: 13.APR.2020 11:24:21

Middle channel



Date: 13.APR.2020 11:21:07

Middle channel

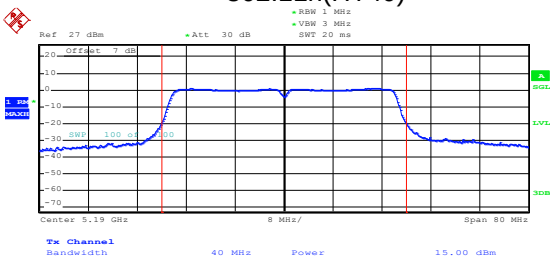


Date: 13.APR.2020 11:25:03

Highest channel

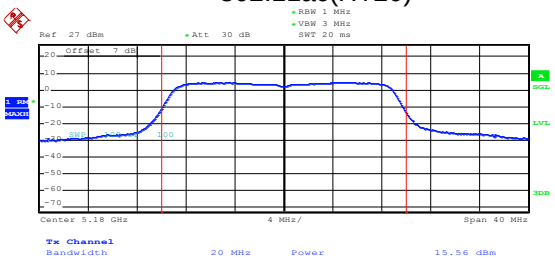
Highest channel

802.11n(HT40)



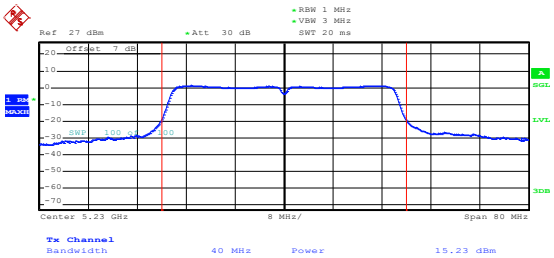
Date: 13.APR.2020 18:10:02

802.11ac(HT20)



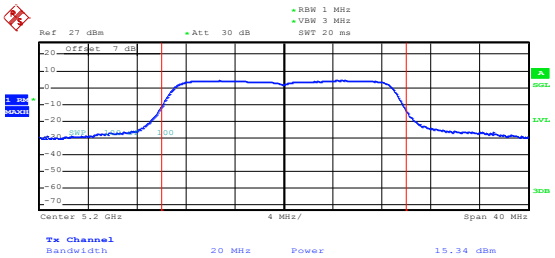
Date: 13.APR.2020 12:00:57

Lowest channel



Date: 13.APR.2020 18:15:13

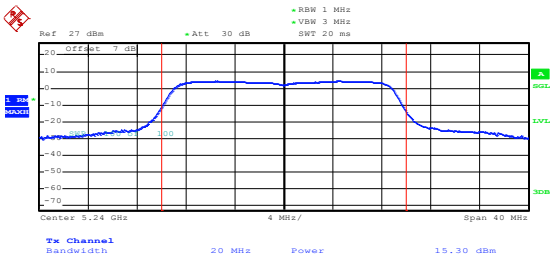
Lowest channel



Date: 13.APR.2020 11:26:02

Highest channel

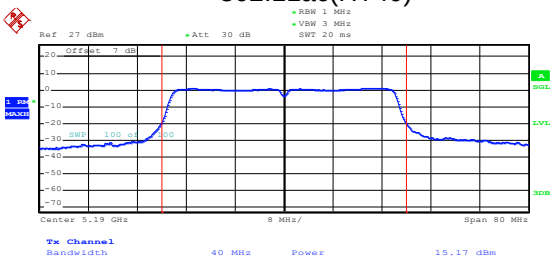
Middle channel



Date: 13.APR.2020 11:25:35

Highest channel

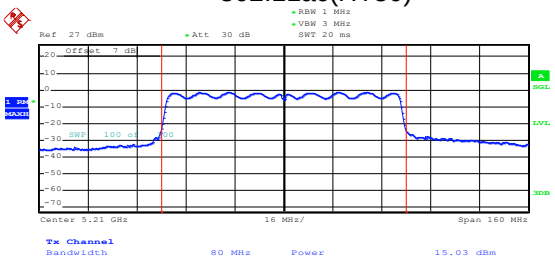
802.11ac(HT40)



Date: 13.APR.2020 18:16:14

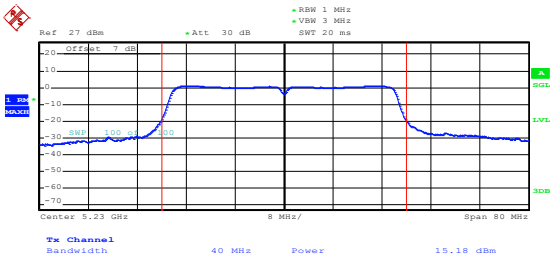
Lowest channel

802.11ac(HT80)



Date: 13.APR.2020 18:20:15

Middle channel

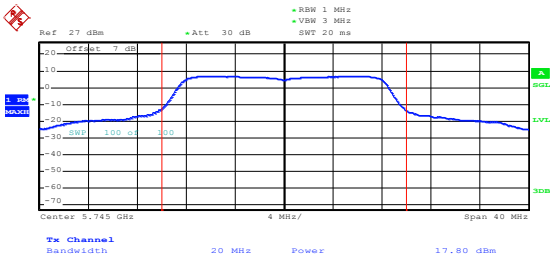


Date: 13.APR.2020 18:15:38

Highest channel

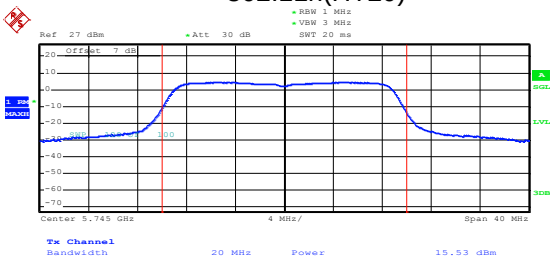
Band 4:

802.11a



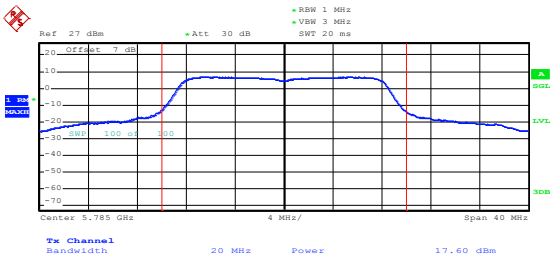
Date: 13.APR.2020 18:00:55

802.11n(HT20)



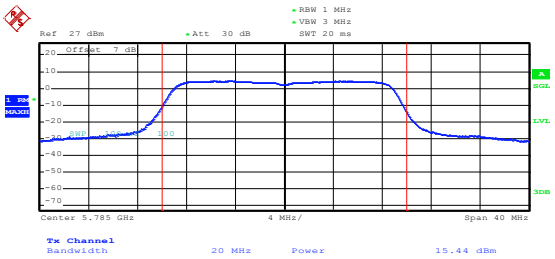
Date: 13.APR.2020 18:04:18

Lowest channel



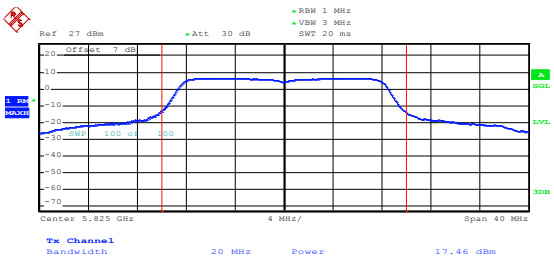
Date: 13.APR.2020 18:01:26

Lowest channel



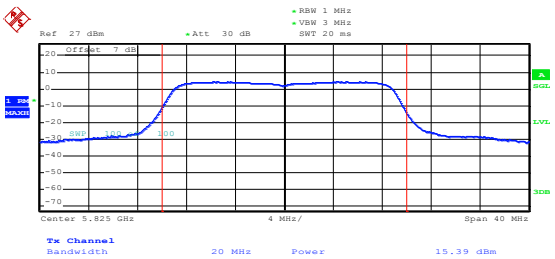
Date: 13.APR.2020 18:03:41

Middle channel



Date: 13.APR.2020 18:01:55

Middle channel

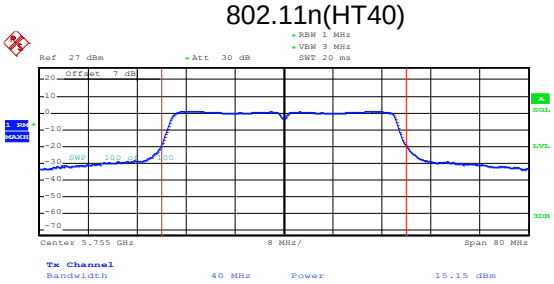


Date: 13.APR.2020 18:03:11

Highest channel

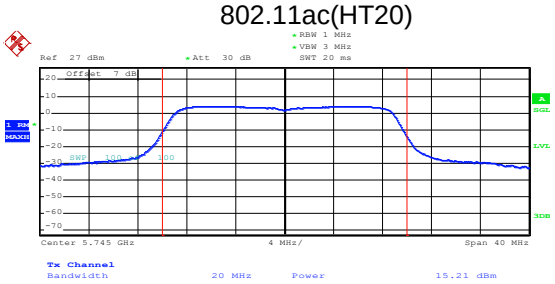
Highest channel

802.11n(HT40)



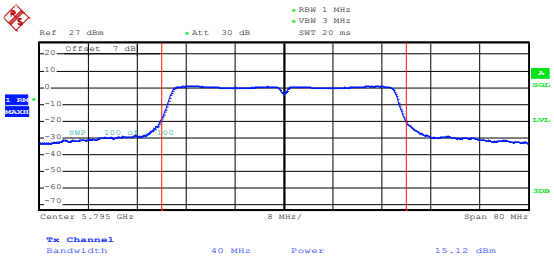
Date: 13.APR.2020 18:08:14

802.11ac(HT20)



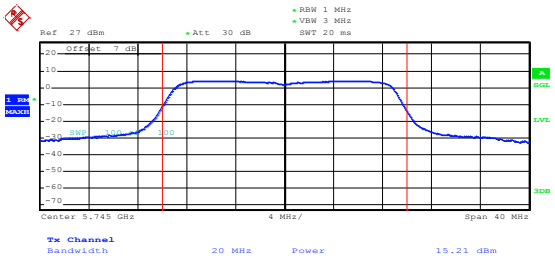
Date: 13.APR.2020 18:04:53

Lowest channel



Date: 13.APR.2020 18:08:59

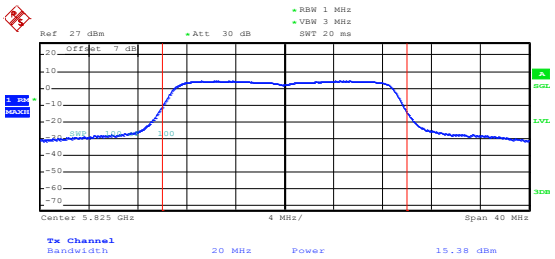
Lowest channel



Date: 13.APR.2020 18:05:21

Highest channel

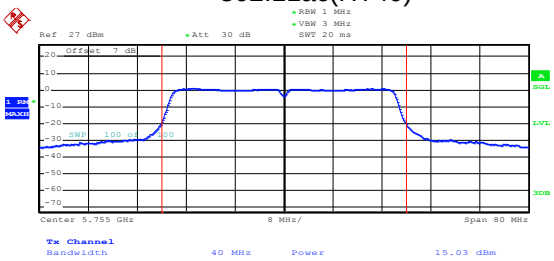
Middle channel



Date: 13.APR.2020 18:06:41

Highest channel

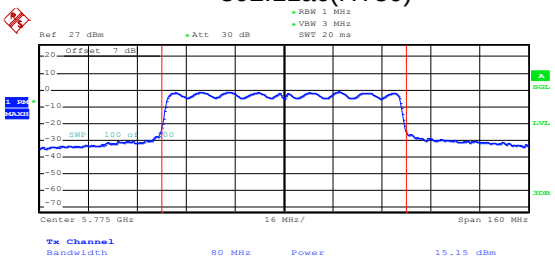
802.11ac(HT40)



Date: 13.APR.2020 18:17:19

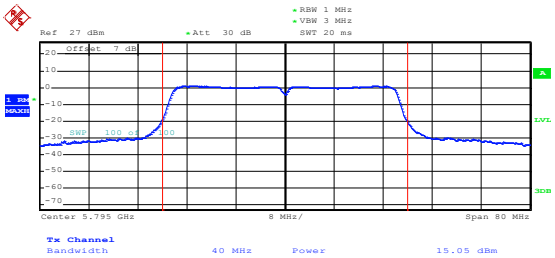
Lowest channel

802.11ac(HT80)



Date: 13.APR.2020 18:21:00

Middle channel

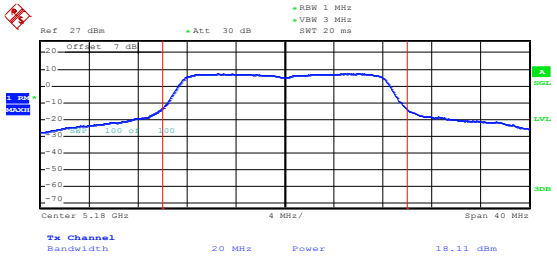


Date: 13.APR.2020 17:24:30

Highest channel

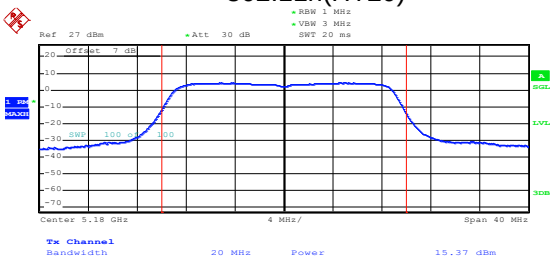
TX1:
Band 1:

802.11a



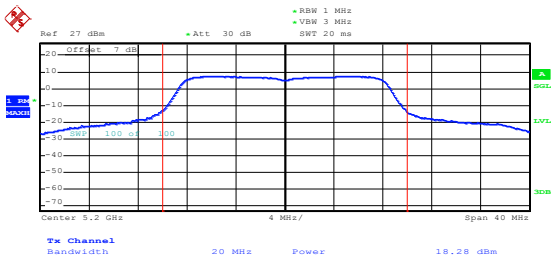
Date: 13.APR.2020 18:32:41

802.11n(HT20)



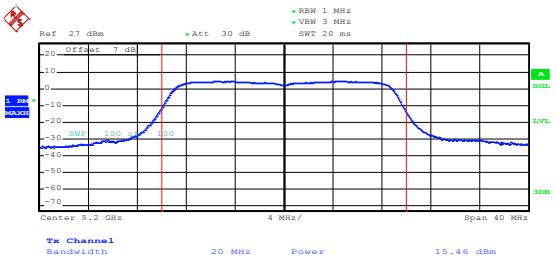
Date: 13.APR.2020 18:36:02

Lowest channel



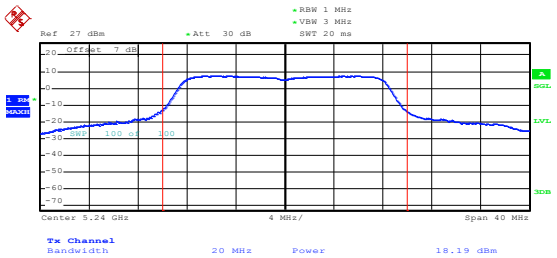
Date: 13.APR.2020 18:32:22

Lowest channel



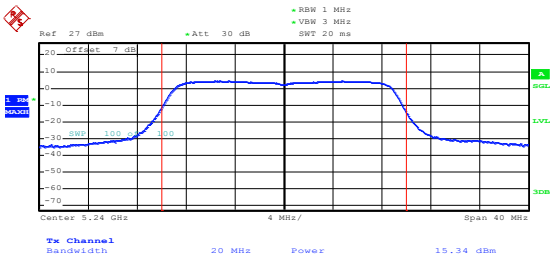
Date: 13.APR.2020 18:35:40

Middle channel



Date: 13.APR.2020 18:31:58

Middle channel

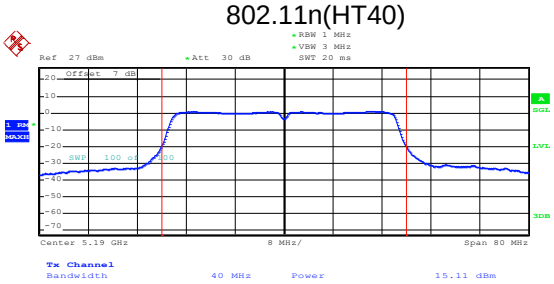


Date: 13.APR.2020 18:35:15

Highest channel

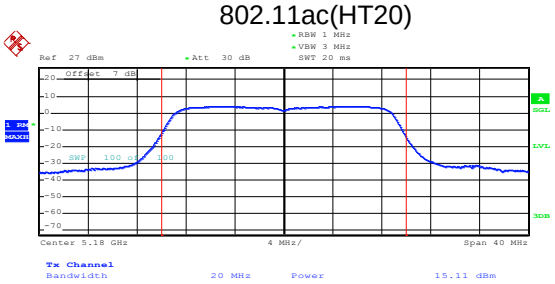
Highest channel

802.11n(HT40)



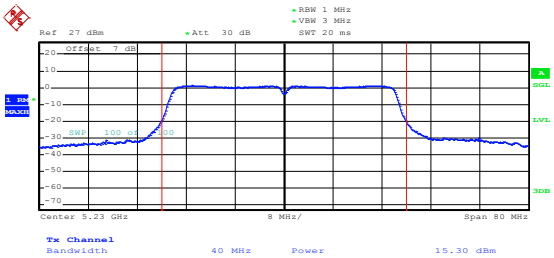
Date: 18.APR.2020 18:02:47

802.11ac(HT20)



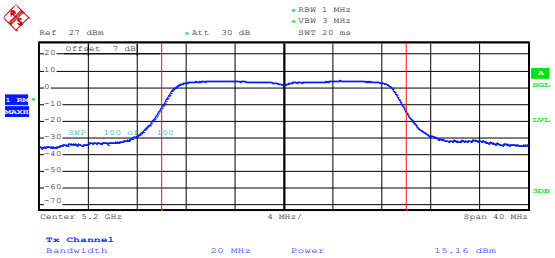
Date: 13.APR.2020 18:33:45

Lowest channel



Date: 18.APR.2020 18:03:24

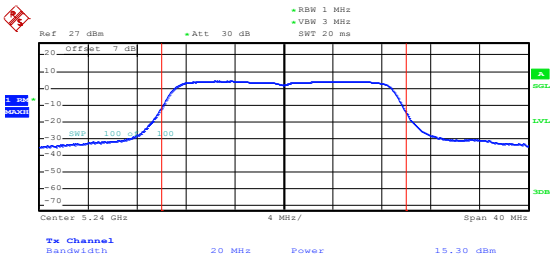
Lowest channel



Date: 13.APR.2020 18:34:08

Highest channel

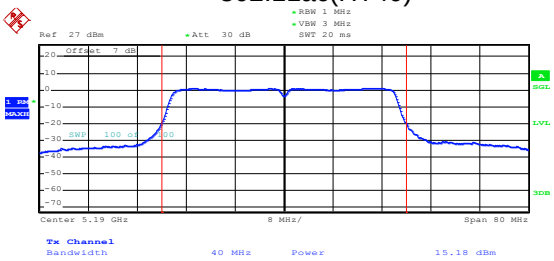
Middle channel



Date: 13.APR.2020 18:34:44

Highest channel

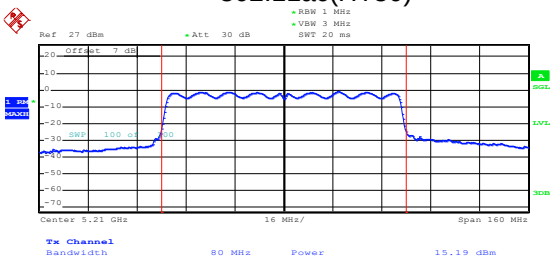
802.11ac(HT40)



Date: 13.APR.2020 18:45:29

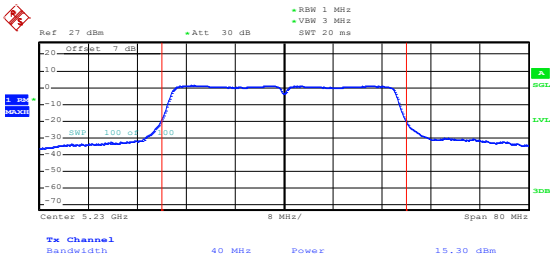
Lowest channel

802.11ac(HT80)



Date: 13.APR.2020 18:24:24

Middle channel

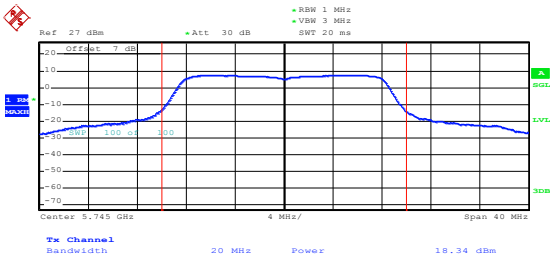


Date: 13.APR.2020 18:46:21

Highest channel

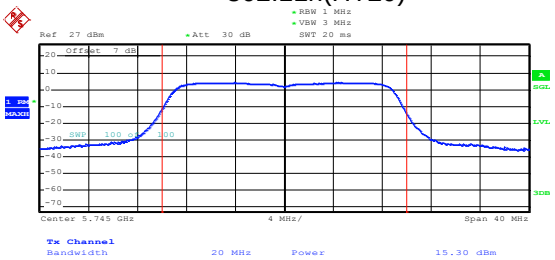
Band 4:

802.11a



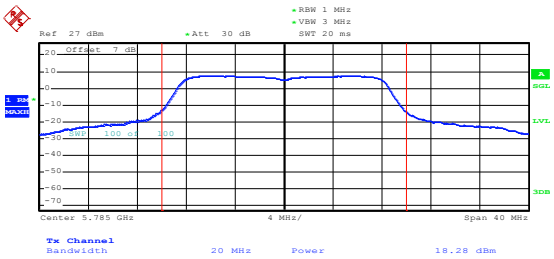
Date: 13.APR.2020 18:37:10

802.11n(HT20)



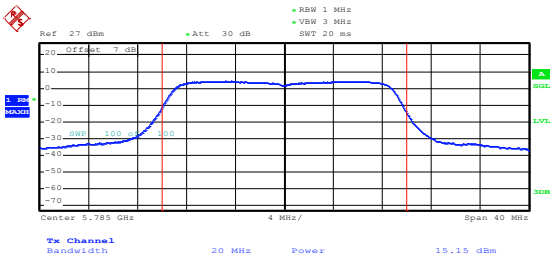
Date: 13.APR.2020 18:40:21

Lowest channel



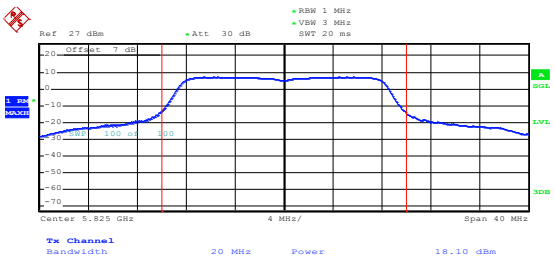
Date: 13.APR.2020 18:37:45

Lowest channel



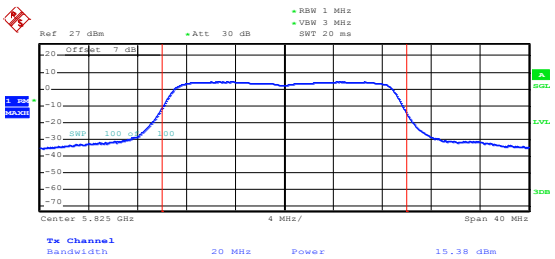
Date: 13.APR.2020 18:39:34

Middle channel



Date: 13.APR.2020 18:38:10

Middle channel

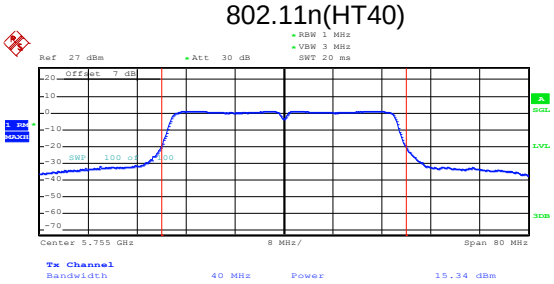


Date: 13.APR.2020 18:39:03

Highest channel

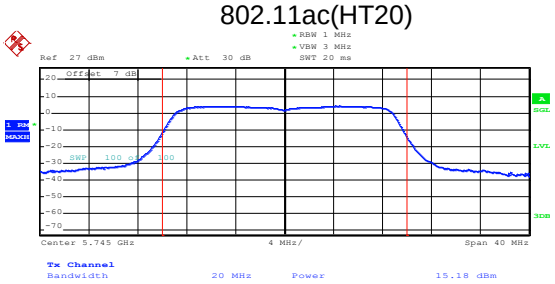
Highest channel

802.11n(HT40)



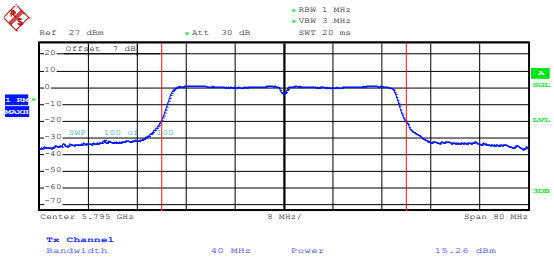
Date: 18.APR.2020 18:04:15

802.11ac(HT20)



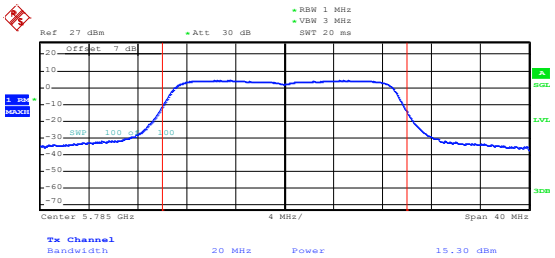
Date: 13.APR.2020 18:41:04

Lowest channel



Date: 18.APR.2020 18:04:57

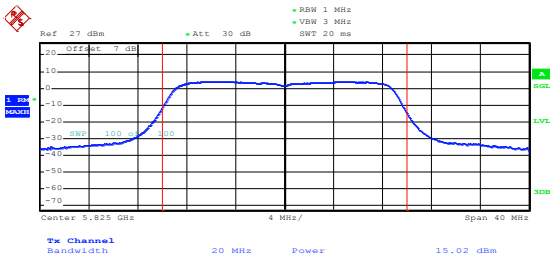
Lowest channel



Date: 13.APR.2020 18:41:38

Highest channel

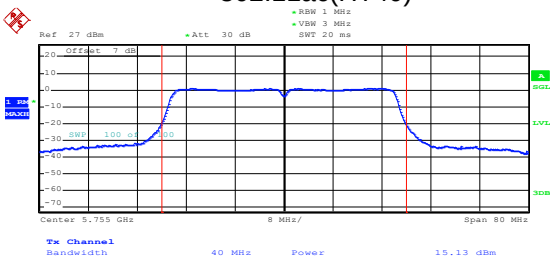
Middle channel



Date: 13.APR.2020 18:42:02

Highest channel

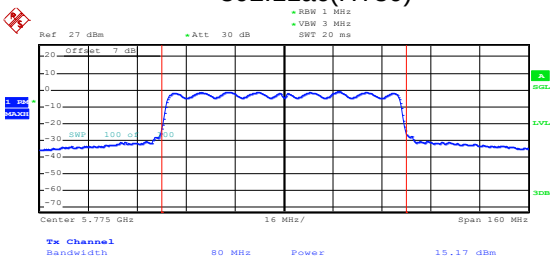
802.11ac(HT40)



Date: 13.APR.2020 18:44:10

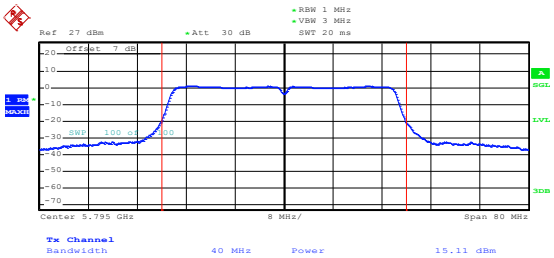
Lowest channel

802.11ac(HT80)



Date: 13.APR.2020 18:23:36

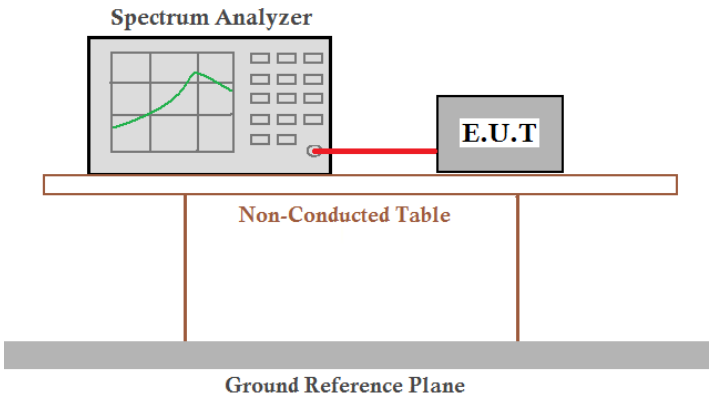
Middle channel



Date: 13.APR.2020 18:44:53

Highest channel

6.4 Occupy 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% Occupy 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:

TX0:

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	22.06	21.41	43.28	21.21	43.46	---	N/A	PASS
Middle	21.43	21.32	---	20.15	---	80.36		
Highest	20.09	20.27	40.26	20.11	39.92	---		
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	17.60	17.88	37.48	17.84	37.54	---	N/A	PASS
Middle	17.52	17.85	---	17.85	---	76.02		
Highest	17.58	17.88	37.44	17.86	37.48	---		

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	21.51	21.46	44.48	21.45	44.30	---	N/A	PASS
Middle	21.78	21.57	---	21.58	---	83.28		
Highest	22.31	21.62	44.34	21.17	44.30	---		
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	17.39	17.99	37.60	18.02	37.58	---	N/A	PASS
Middle	17.41	17.96	---	17.98	---	76.52		
Highest	17.37	17.96	37.56	17.97	37.58	---		
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	16.56	17.68	36.64	17.68	36.64	---	>500kHz	PASS
Middle	16.64	17.68	---	17.68	---	76.48		
Highest	16.64	17.76	36.64	17.68	36.64	---		

TX1:

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	21.12	21.31	44.10	21.41	44.16	---	N/A	PASS
Middle	22.40	20.95	---	21.31	---	79.56		
Highest	20.15	20.09	39.78	19.57	39.86	---		
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	17.19	17.80	37.32	17.82	37.44	---	N/A	PASS
Middle	17.18	17.78	---	17.82	---	75.88		
Highest	17.09	17.81	37.46	17.83	37.28	---		

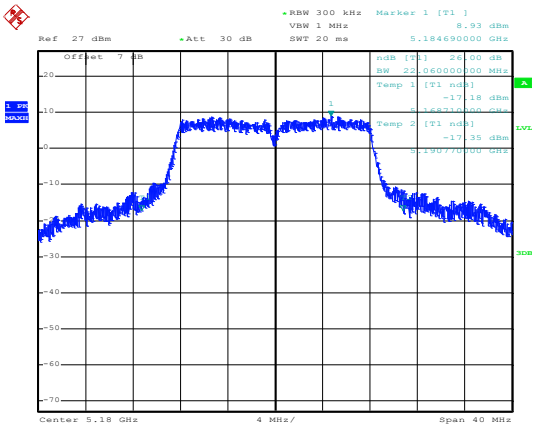
Band 4:

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	21.99	21.38	44.04	21.09	44.06	---	N/A	PASS
Middle	21.70	21.29	---	21.20	---	83.56		
Highest	21.48	21.08	43.48	21.04	43.78	---		
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	17.11	17.80	37.38	17.81	37.28	---	N/A	PASS
Middle	17.07	17.81	---	17.81	---	75.96		
Highest	17.09	17.80	37.32	17.83	37.38	---		
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	16.48	17.68	36.64	17.52	36.64	---	>500kHz	PASS
Middle	16.48	17.68	---	17.68	---	76.16		
Highest	16.48	17.68	36.64	17.68	36.64	---		

Test plot as follows: TX0:
Band 1:

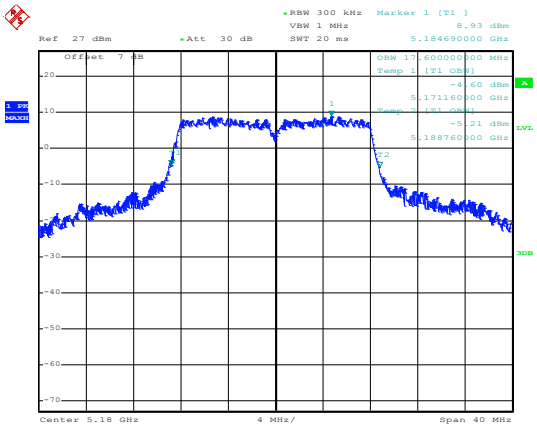
802.11a

26 dB EBW



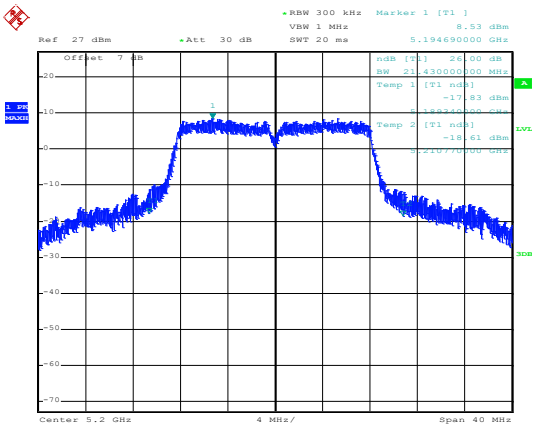
Date: 18.APR.2020 14:01:42

99% OBW

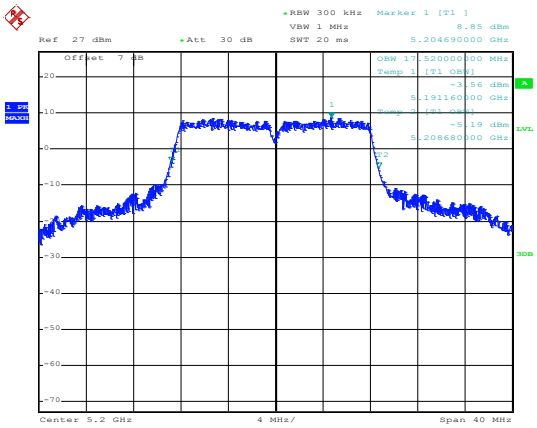


Date: 18.APR.2020 14:01:54

Lowest channel

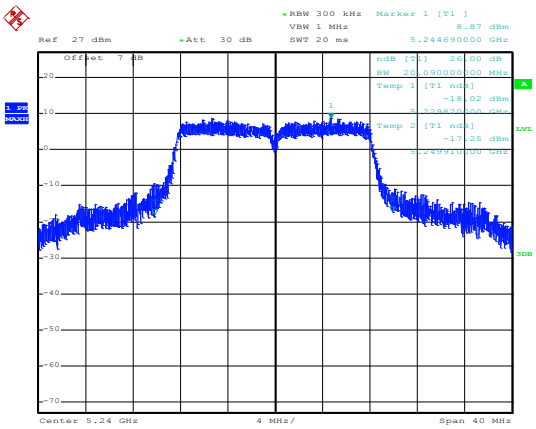


Date: 18.APR.2020 14:01:14

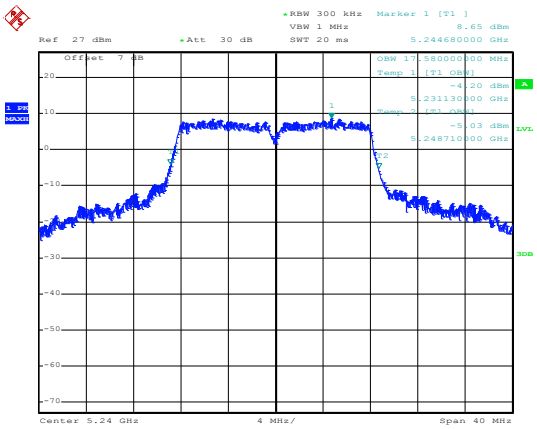


Date: 18.APR.2020 14:00:27

Middle channel



Date: 18.APR.2020 13:58:33

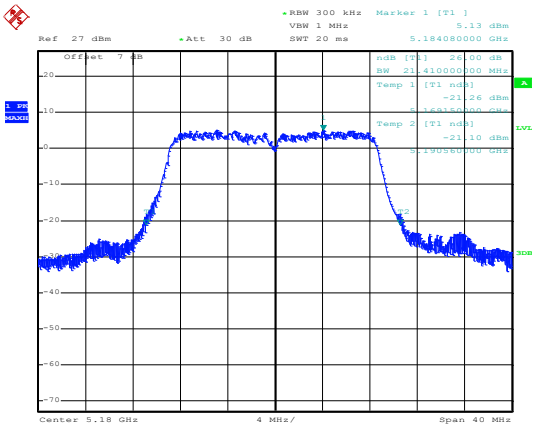


Date: 18.APR.2020 13:59:09

Highest channel

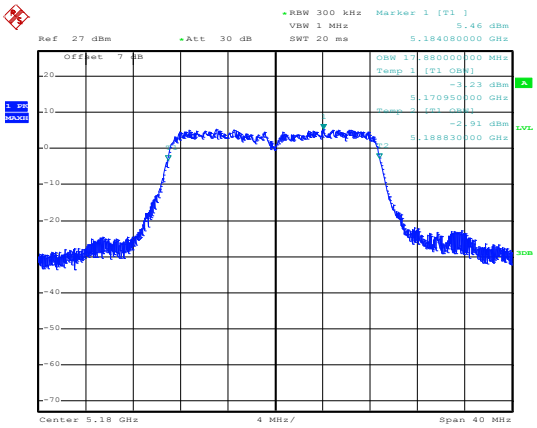
802.11n(HT20)

26 dB EBW



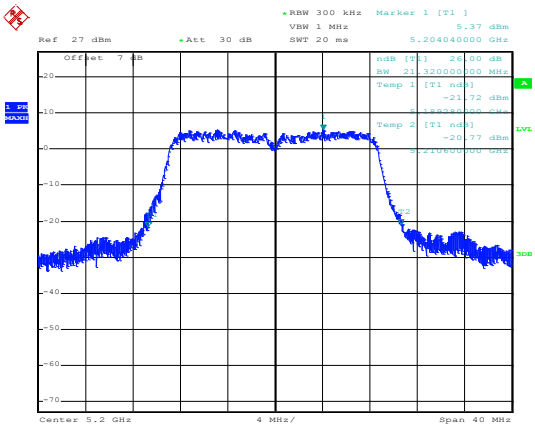
Date: 18.APR.2020 14:02:53

99% OBW

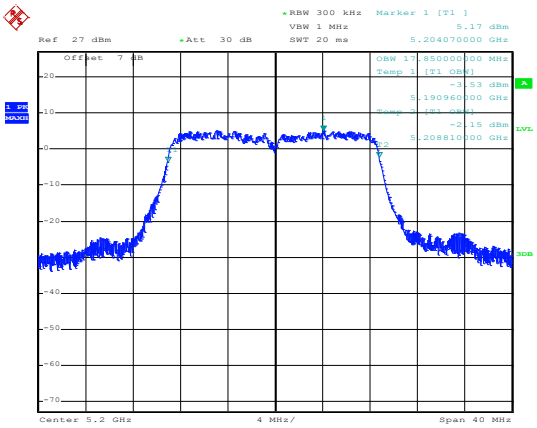


Date: 18.APR.2020 14:02:39

Lowest channel

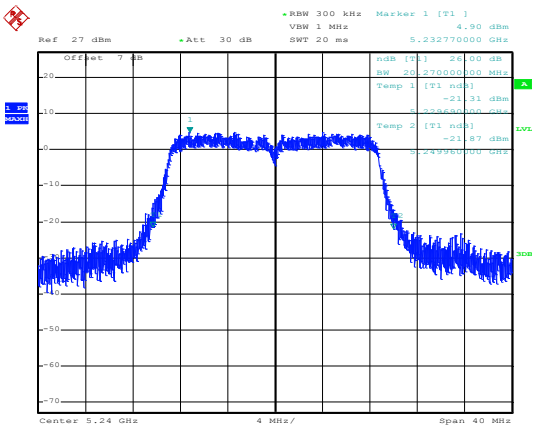


Date: 18.APR.2020 14:03:12

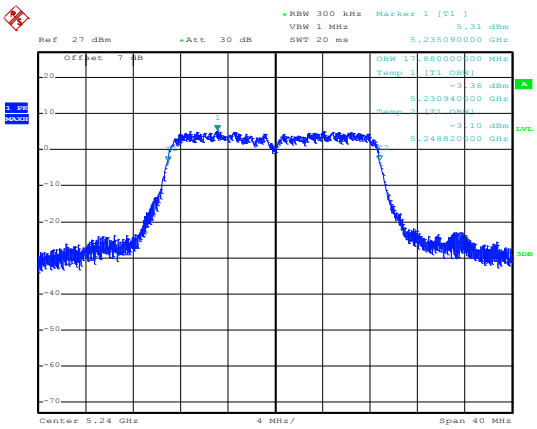


Date: 18.APR.2020 14:03:26

Middle channel



Date: 18.APR.2020 14:04:17

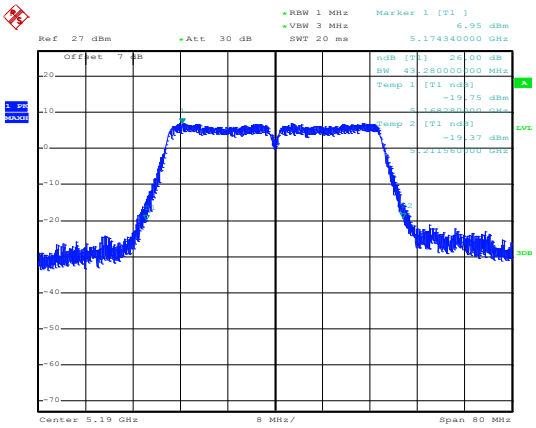


Date: 18.APR.2020 14:03:53

Highest channel

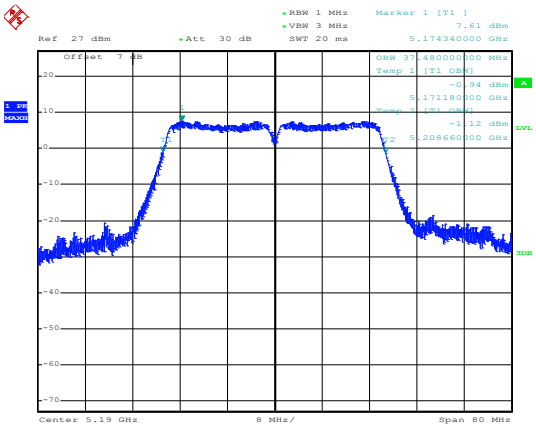
802.11n(HT40)

26 dB EBW



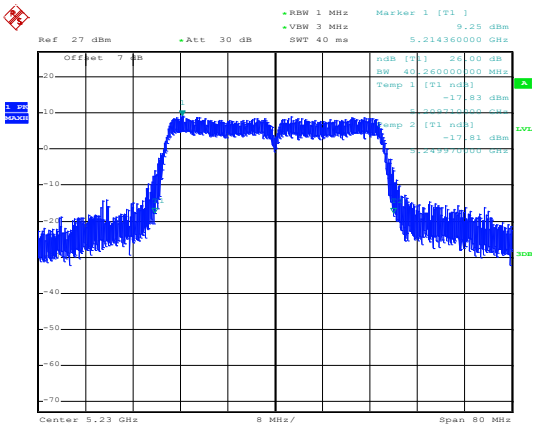
Date: 18.APR.2020 14:19:30

99% OBW

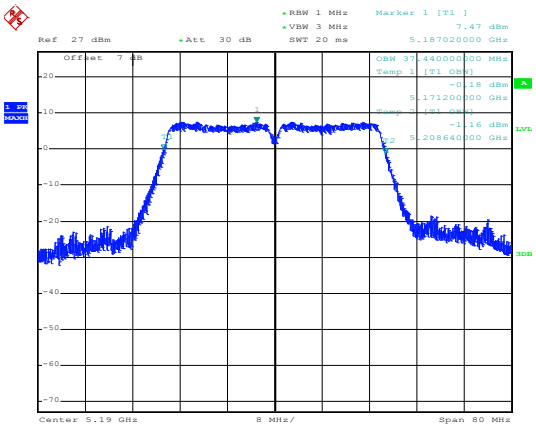


Date: 18.APR.2020 14:19:46

Lowest channel



Date: 18.APR.2020 17:44:40

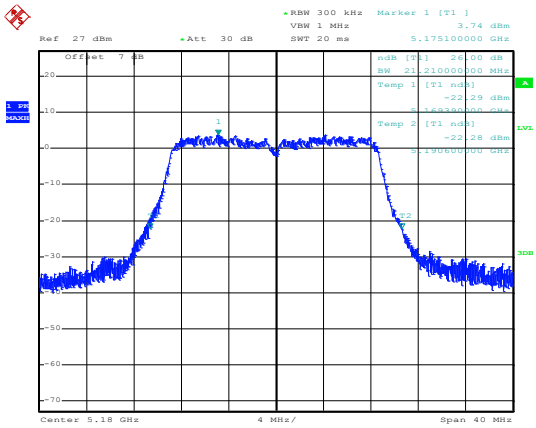


Date: 18.APR.2020 14:20:10

Highest channel

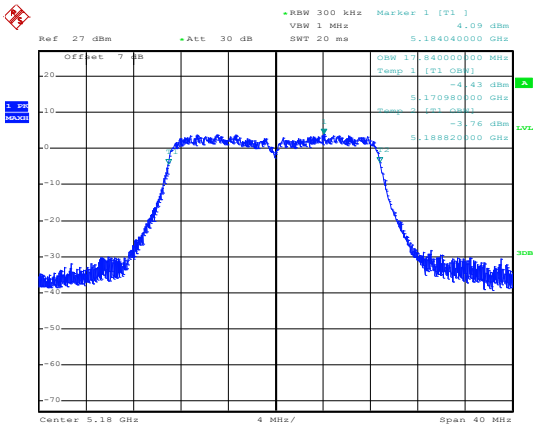
802.11ac(HT20)

26 dB EBW



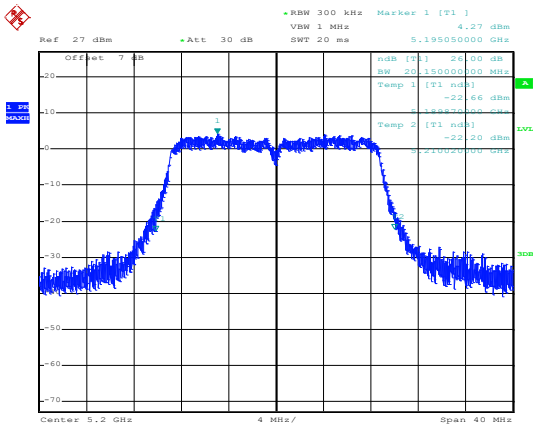
Date: 18.APR.2020 14:07:24

99% OBW

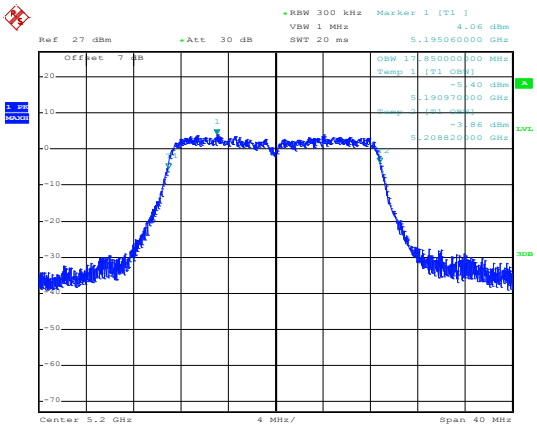


Date: 18.APR.2020 14:07:40

Lowest channel

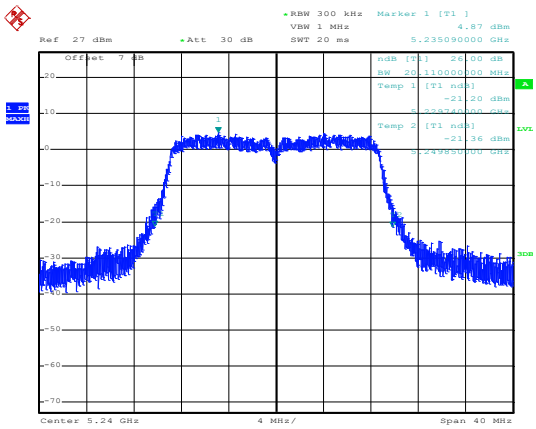


Date: 18.APR.2020 14:07:00

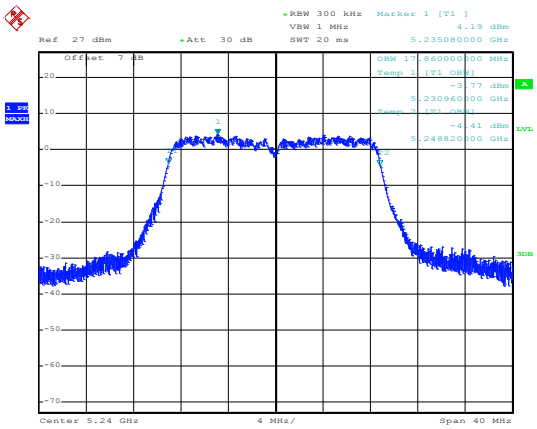


Date: 18.APR.2020 14:06:36

Middle channel



Date: 18.APR.2020 14:05:50

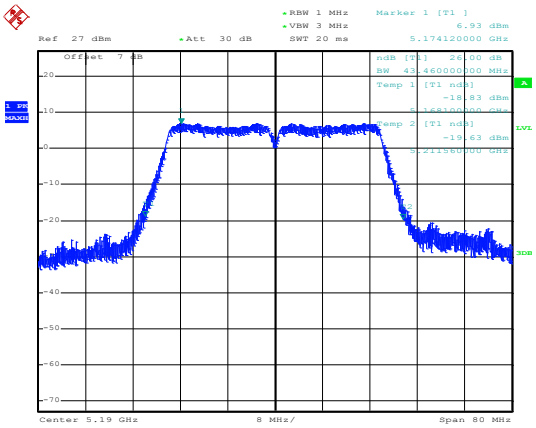


Date: 18.APR.2020 14:06:11

Highest channel

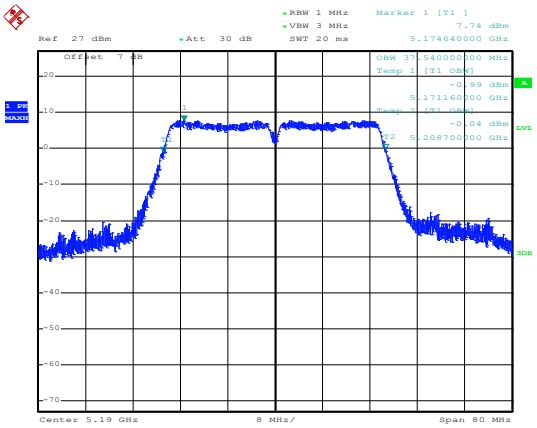
802.11ac(HT40)

26 dB EBW



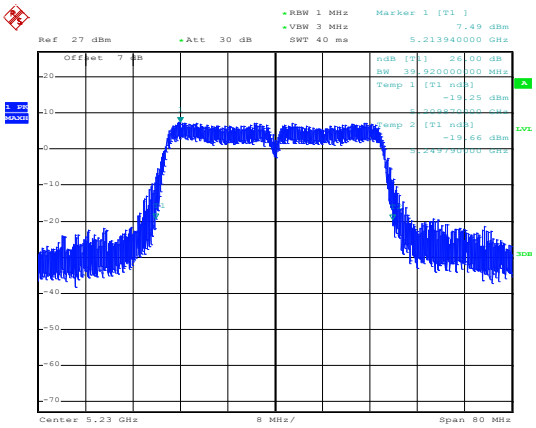
Date: 18.APR.2020 14:20:53

99% OBW

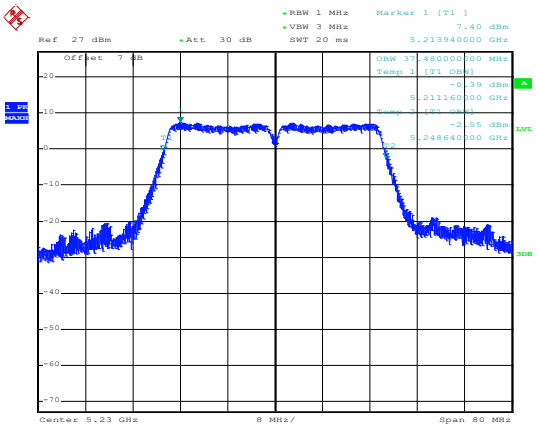


Date: 18.APR.2020 14:21:07

Lowest channel



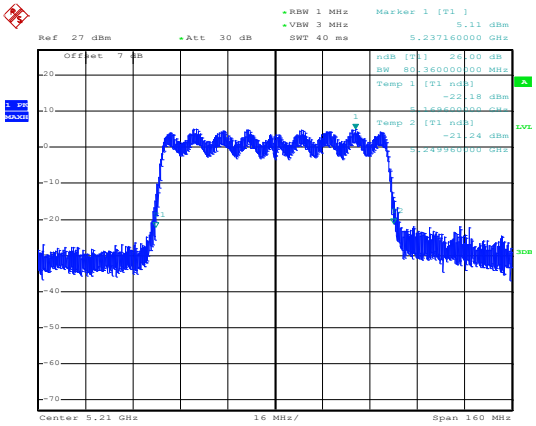
Date: 18.APR.2020 14:23:11



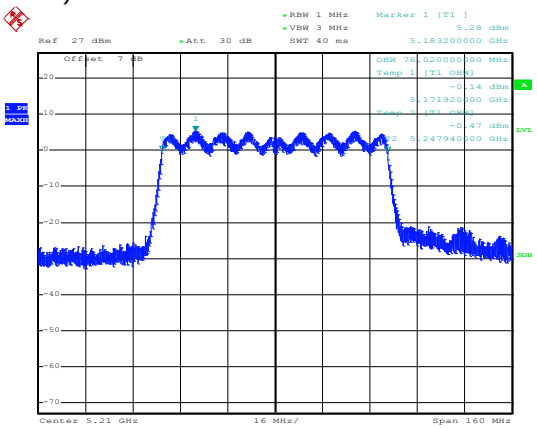
Date: 18.APR.2020 14:21:43

Highest channel

802.11ac(HT80)



Date: 18.APR.2020 14:51:02



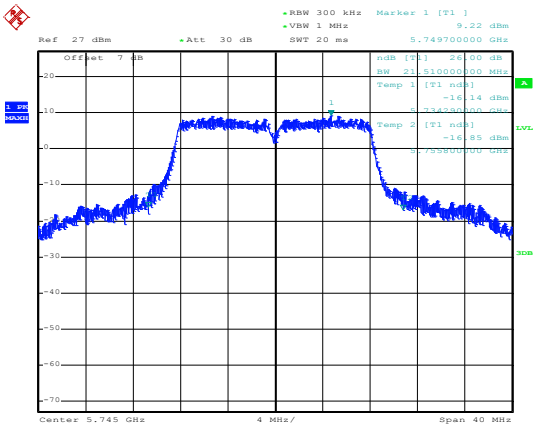
Date: 18.APR.2020 14:50:40

Middle channel

Band 4:

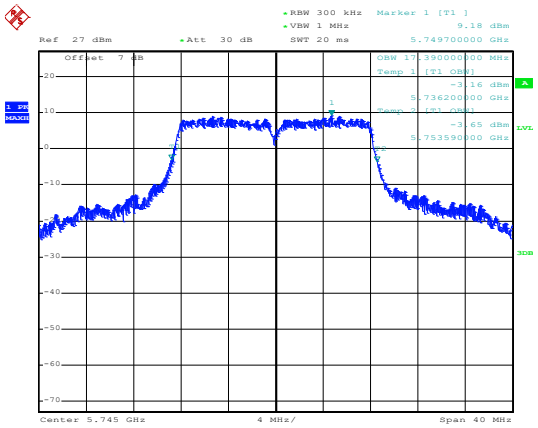
802.11a

26 dB EBW



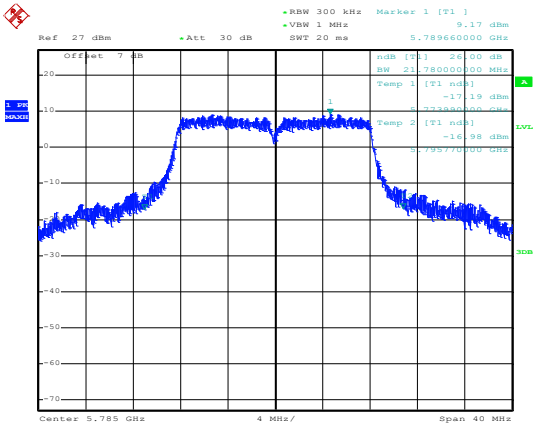
Date: 18.APR.2020 19:42:59

99% OBW

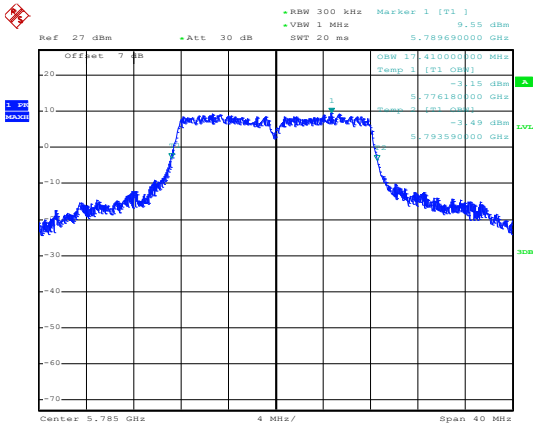


Date: 18.APR.2020 19:42:47

Lowest channel

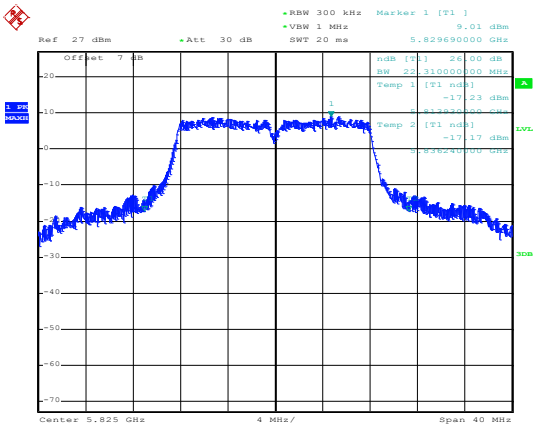


Date: 18.APR.2020 19:43:24

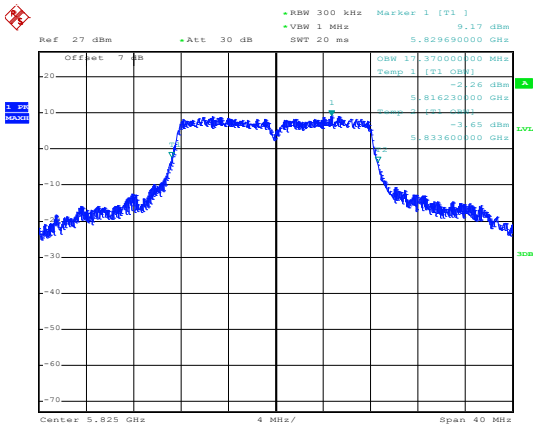


Date: 18.APR.2020 19:43:36

Middle channel



Date: 18.APR.2020 19:44:10

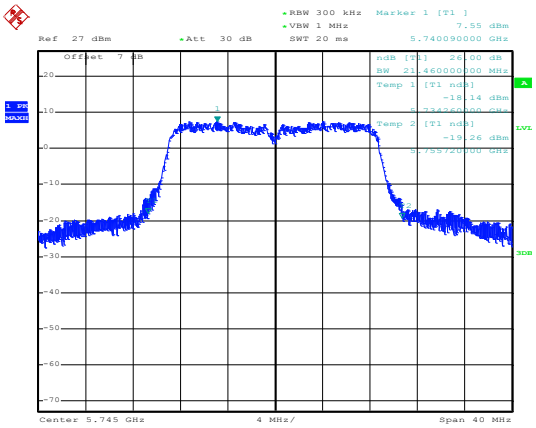


Date: 18.APR.2020 19:43:54

Highest channel

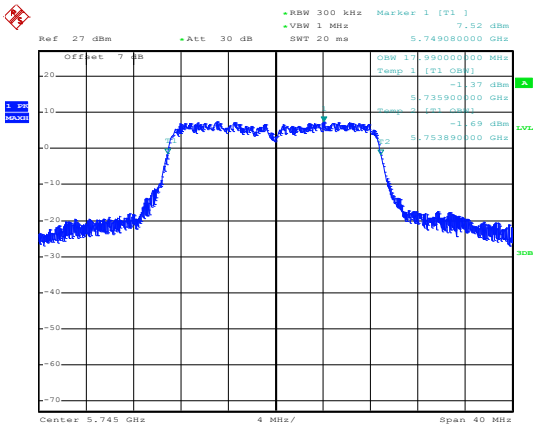
802.11n(HT20)

26 dB EBW



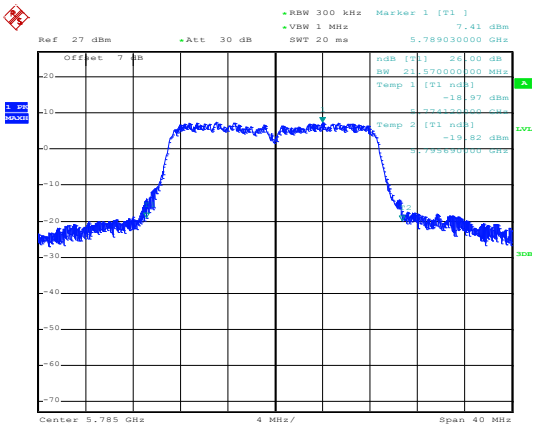
Date: 18.APR.2020 19:45:36

99% OBW



Date: 18.APR.2020 19:45:46

Lowest channel



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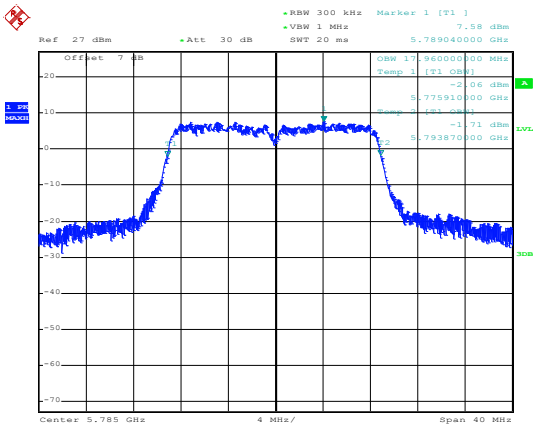
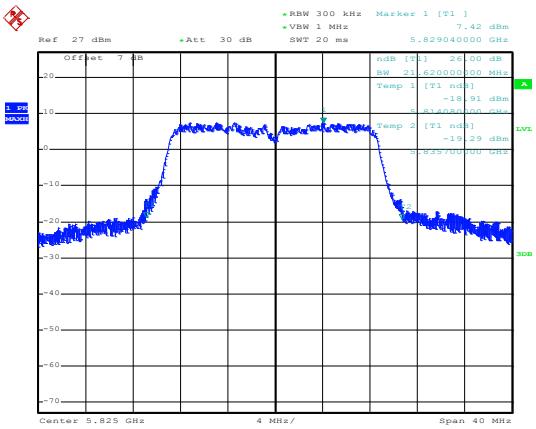
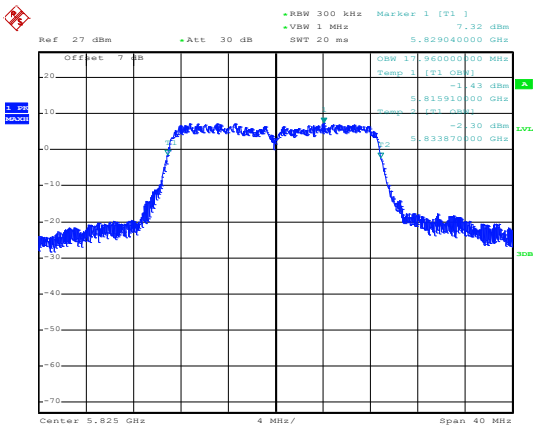


Date: 18.APR.2020 19:45:04

Middle channel



Date: 18.APR.2020 19:44:36

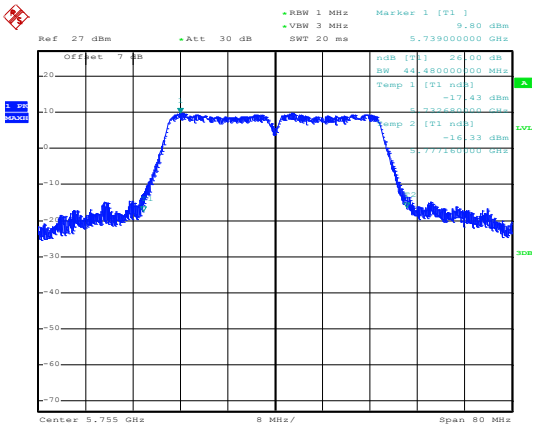


Date: 18.APR.2020 19:44:45

Highest channel

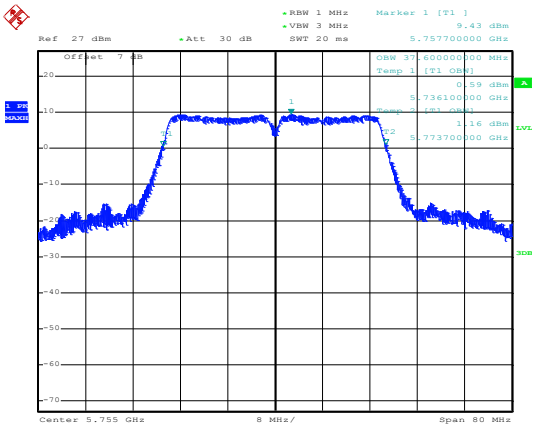
802.11n(HT40)

26 dB EBW



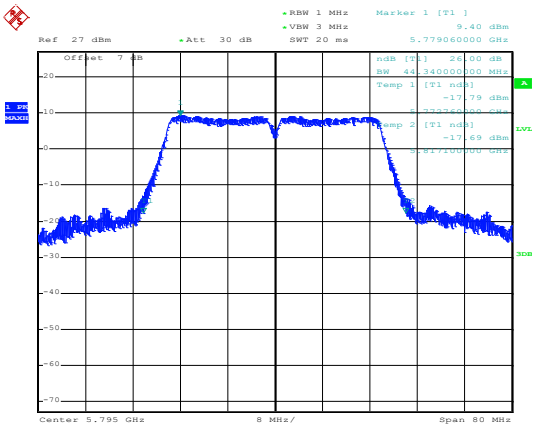
Date: 18.APR.2020 19:55:06

99% OBW

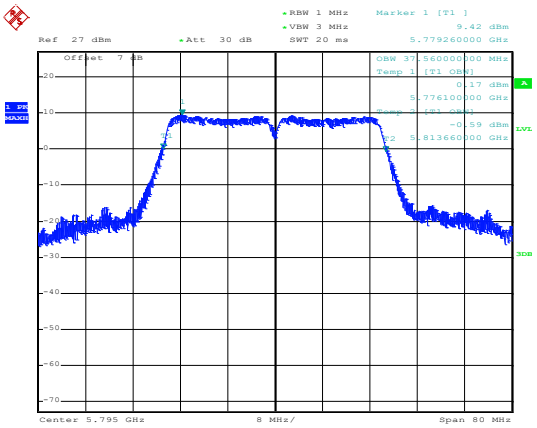


Date: 18.APR.2020 19:55:17

Lowest channel



Date: 18.APR.2020 19:55:48

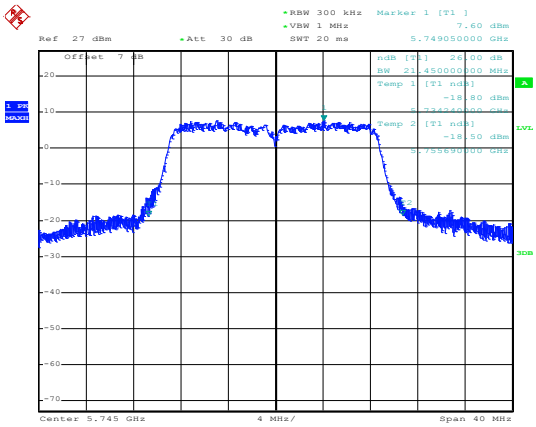


Date: 18.APR.2020 19:55:40

Highest channel

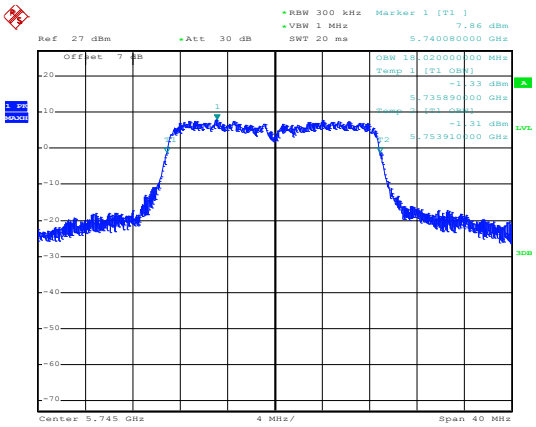
802.11ac(HT20)

26 dB EBW



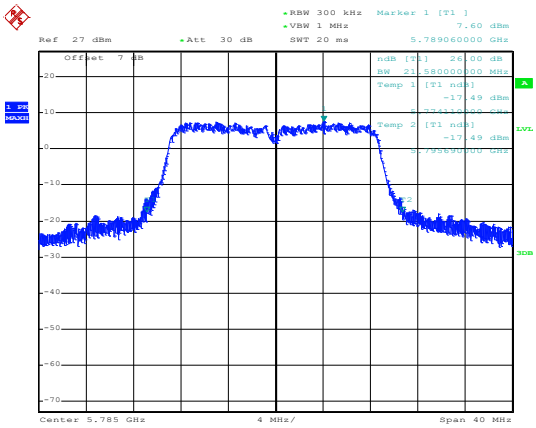
Date: 18.APR.2020 19:46:20

99% OBW

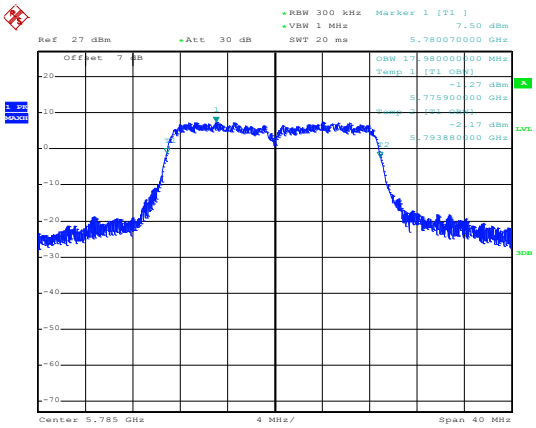


Date: 18.APR.2020 19:46:09

Lowest channel

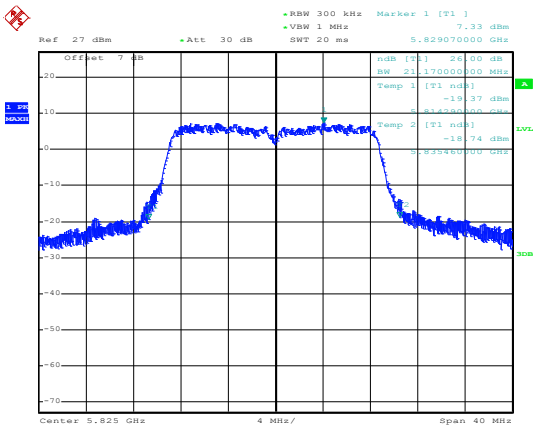


Date: 18.APR.2020 19:46:37

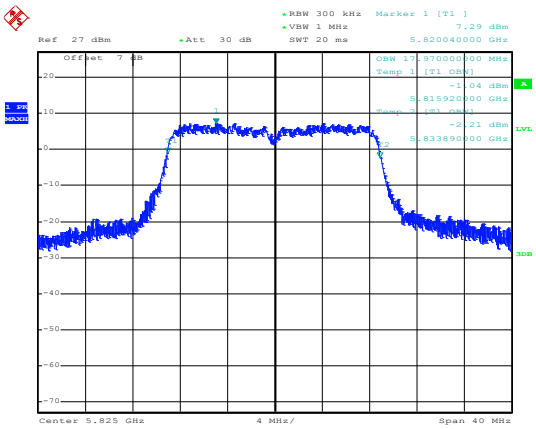


Date: 18.APR.2020 19:46:47

Middle channel



Date: 18.APR.2020 19:47:13

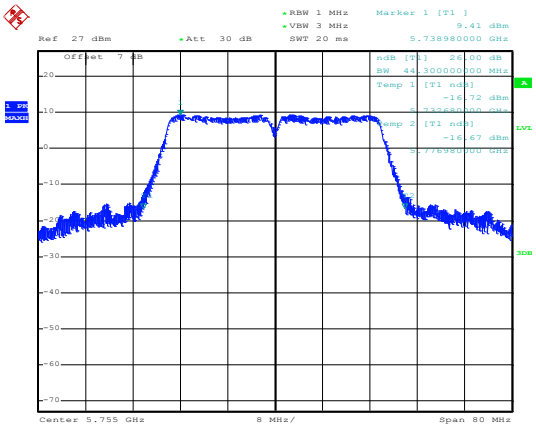


Date: 18.APR.2020 19:47:03

Highest channel

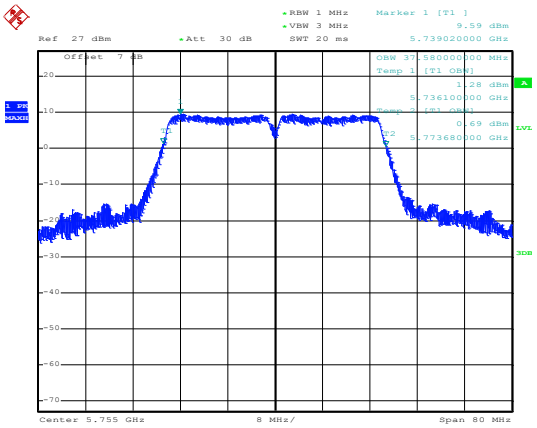
802.11ac(HT40)

26 dB EBW



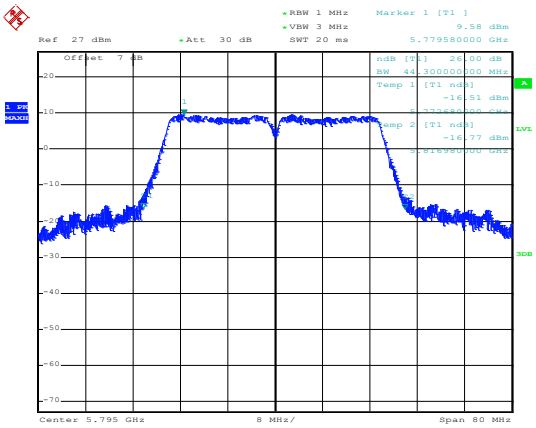
Date: 18.APR.2020 19:56:53

99% OBW

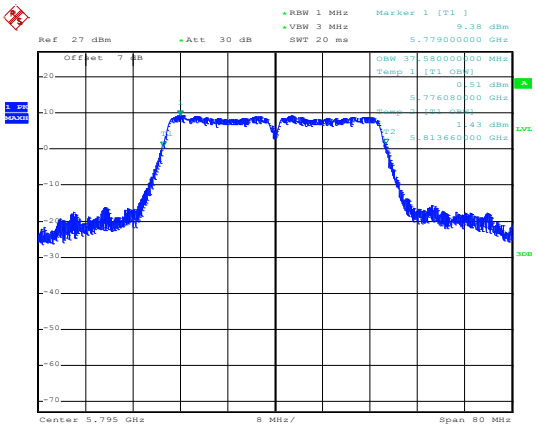


Date: 18.APR.2020 19:56:41

Lowest channel



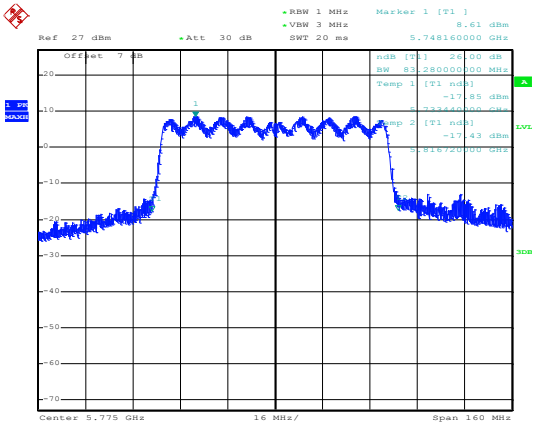
Date: 18.APR.2020 19:56:12



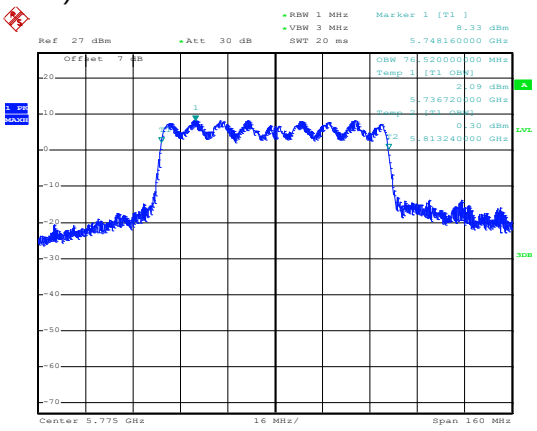
Date: 18.APR.2020 19:56:23

Highest channel

802.11ac(HT80)



Date: 18.APR.2020 19:53:40

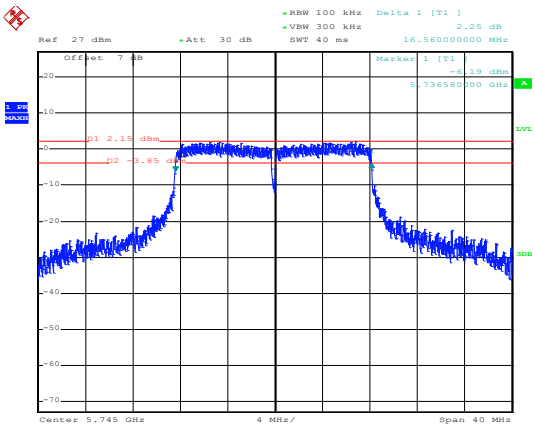


Date: 18.APR.2020 19:53:54

Middle channel

6dB BW

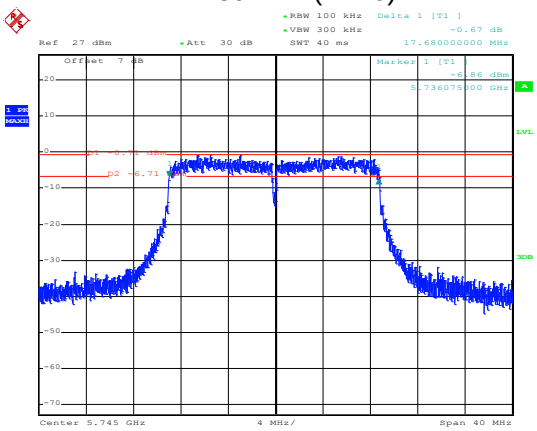
802.11a



Date: 18.APR.2020 14:55:25

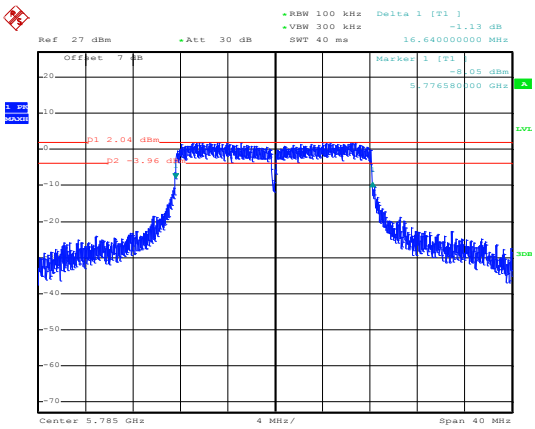
Lowest channel

802.11n(HT20)



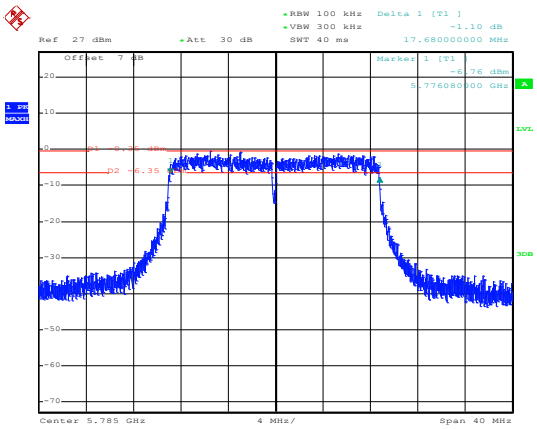
Date: 18.APR.2020 15:00:33

Lowest channel



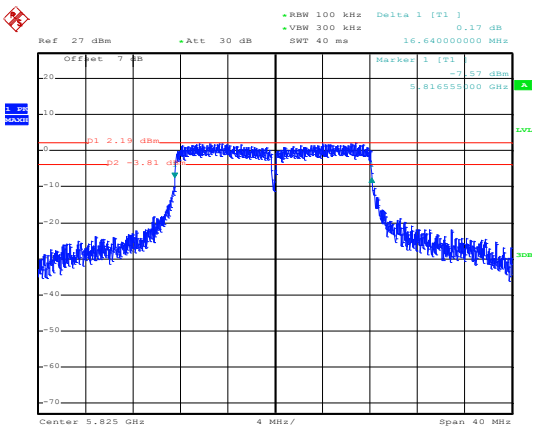
Date: 18.APR.2020 14:56:29

Middle channel



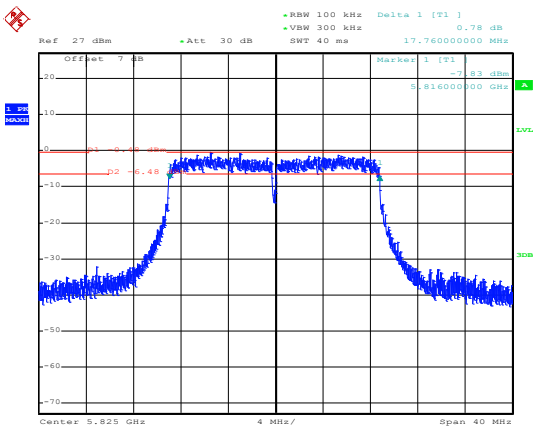
Date: 18.APR.2020 14:59:37

Middle channel



Date: 18.APR.2020 14:57:40

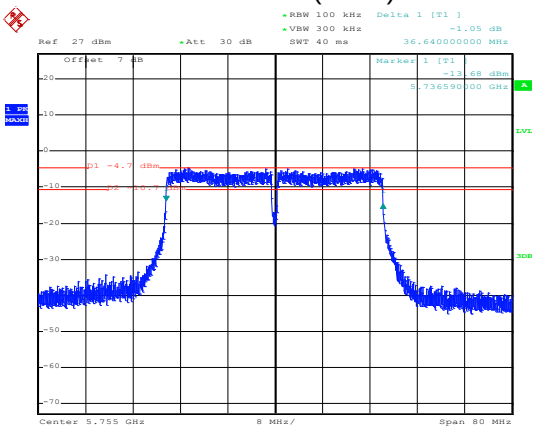
Highest channel



Date: 18.APR.2020 14:58:53

Highest channel

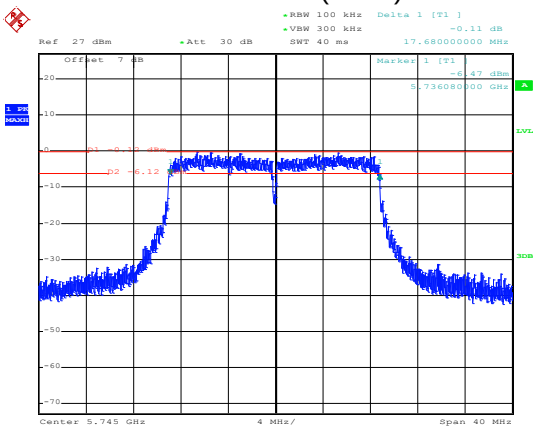
802.11n(HT40)



Date: 18.APR.2020 15:04:48

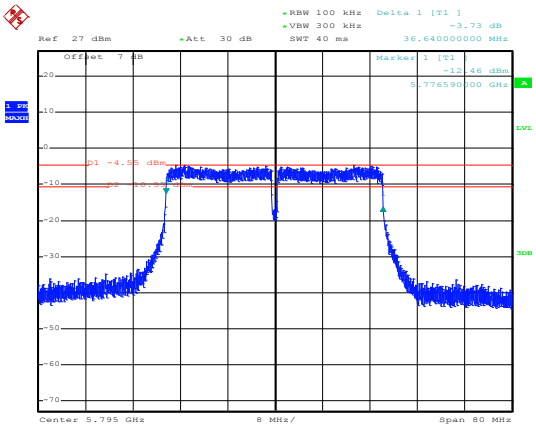
Lowest channel

802.11ac(HT20)



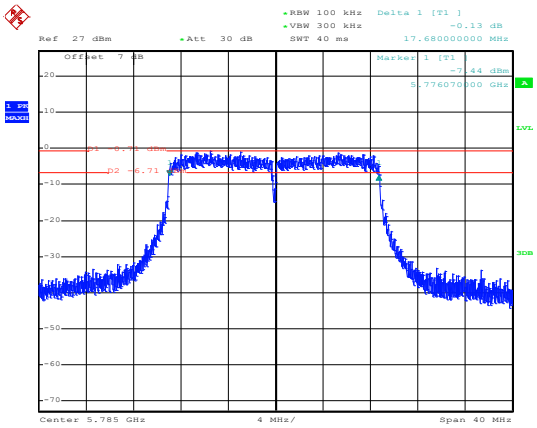
Date: 18.APR.2020 15:01:41

Lowest channel



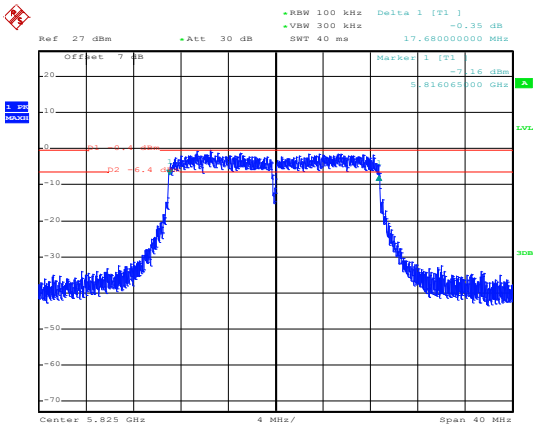
Date: 18.APR.2020 15:06:15

Highest channel



Date: 18.APR.2020 15:02:26

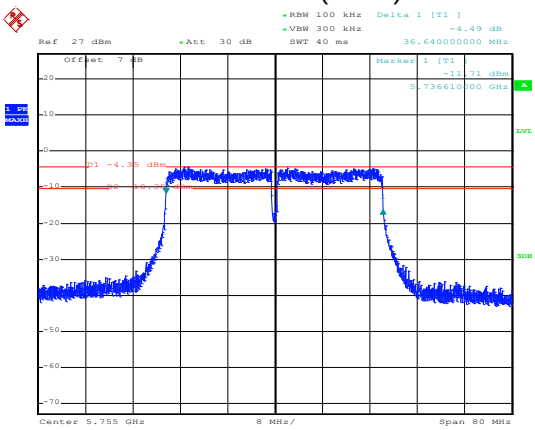
Middle channel



Date: 18.APR.2020 15:03:22

Highest channel

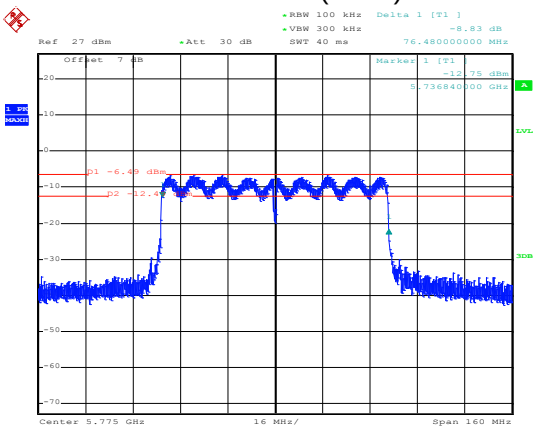
802.11ac(HT40)



Date: 18.APR.2020 15:08:50

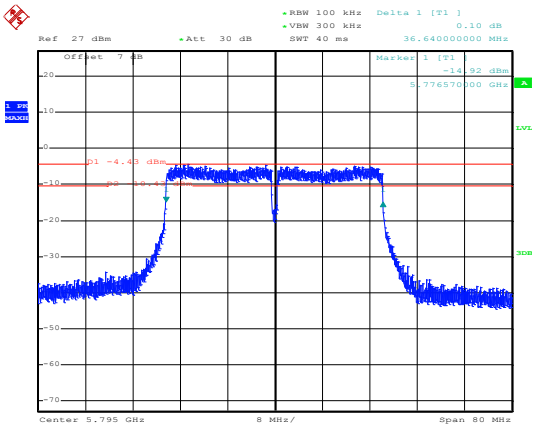
Lowest channel

802.11ac(HT80)



Date: 18.APR.2020 14:53:57

Middle channel



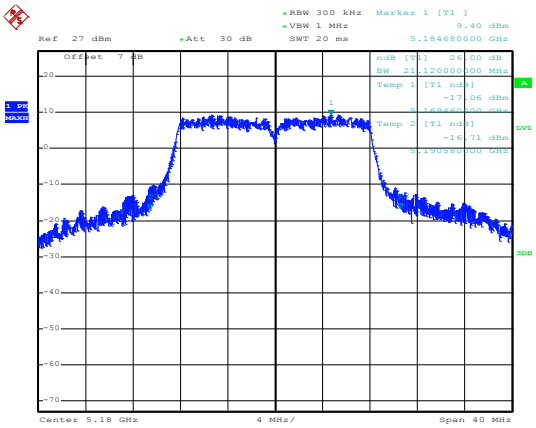
Date: 18.APR.2020 15:07:21

Highest channel

TX1:
Band 1:

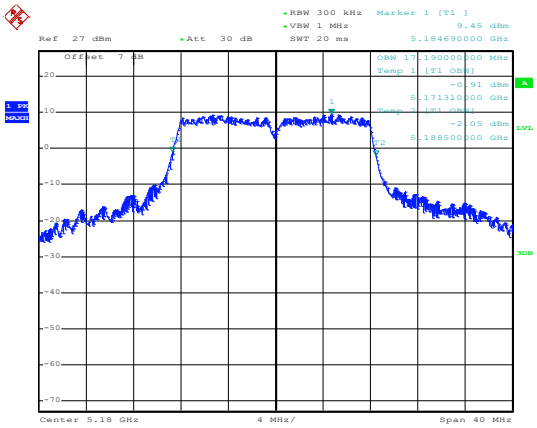
802.11a

26 dB EBW



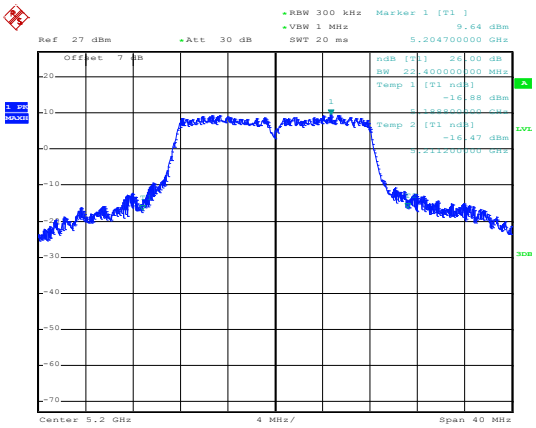
Date: 18.APR.2020 18:42:04

99% OBW

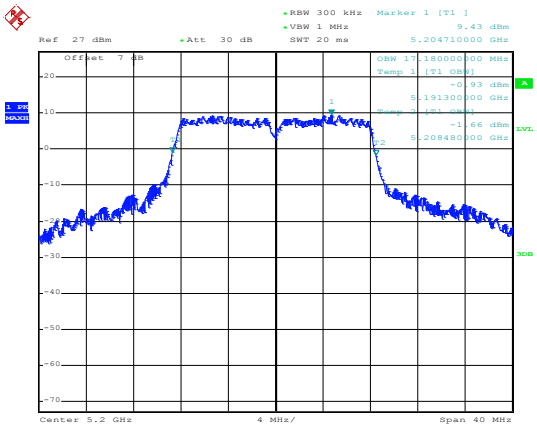


Date: 18.APR.2020 18:41:34

Lowest channel

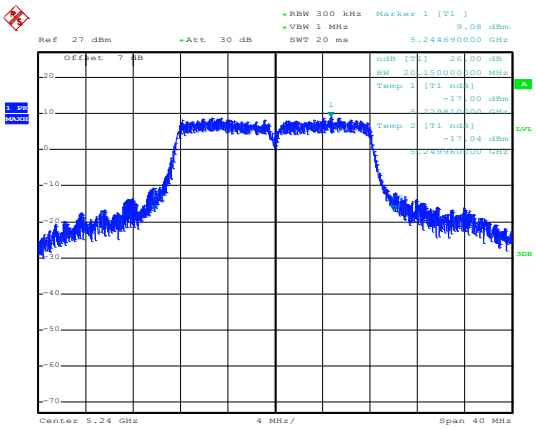


Date: 18.APR.2020 18:42:23

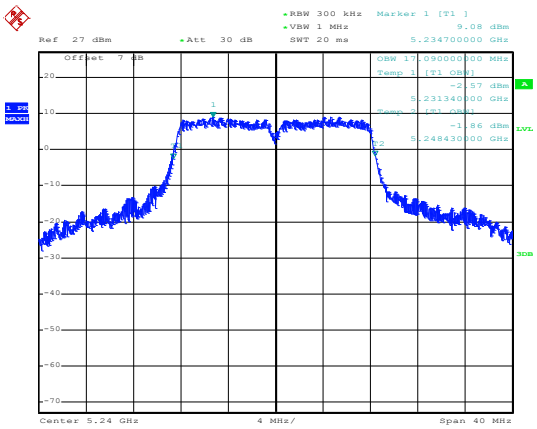


Date: 18.APR.2020 18:42:34

Middle channel



Date: 18.APR.2020 18:43:18

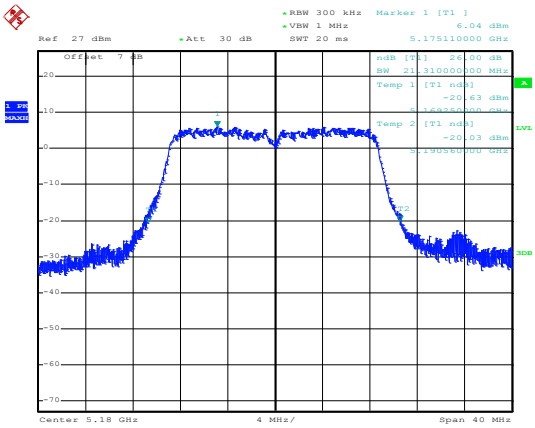


Date: 18.APR.2020 18:42:58

Highest channel

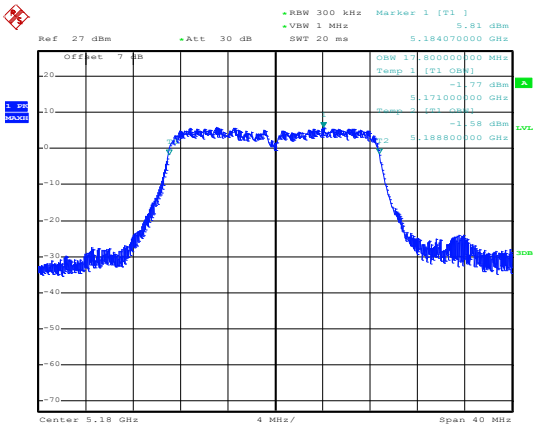
802.11n(HT20)

26 dB EBW



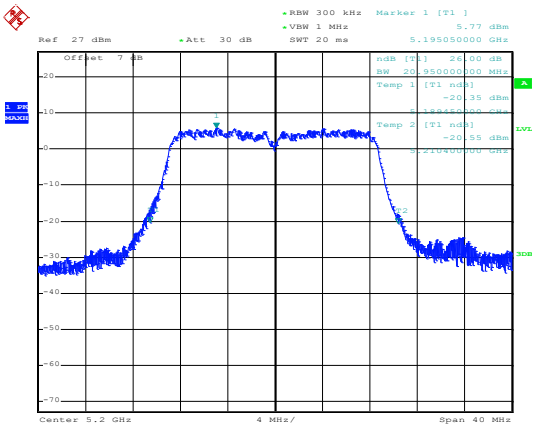
Date: 18.APR.2020 18:46:29

99% OBW

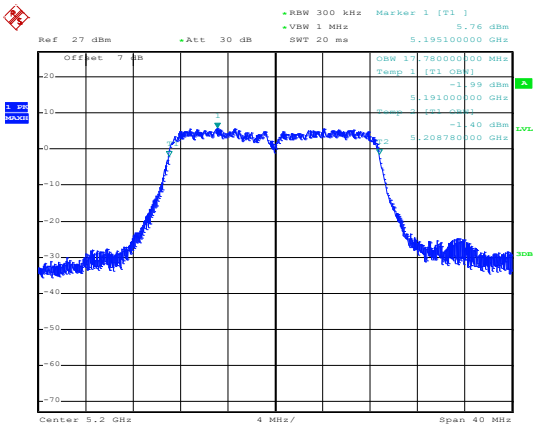


Date: 18.APR.2020 18:46:39

Lowest channel

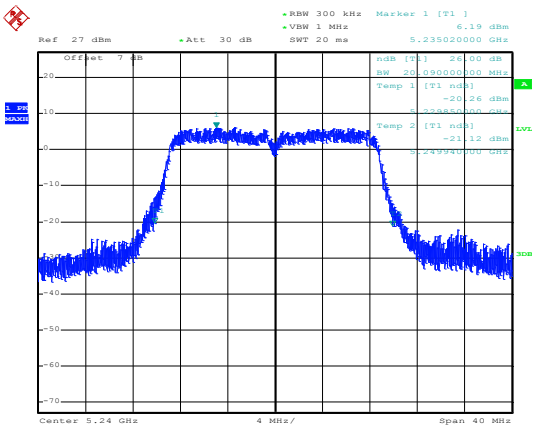


Date: 18.APR.2020 18:47:21

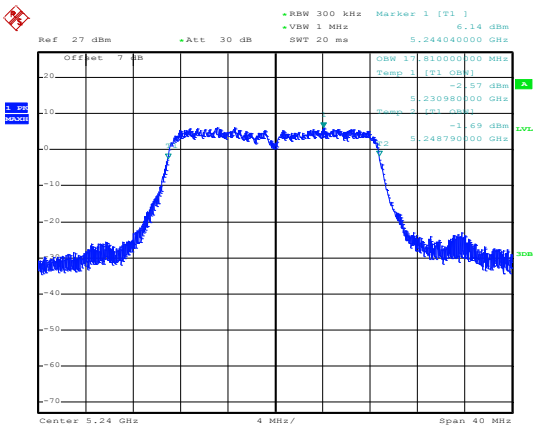


Date: 18.APR.2020 18:47:35

Middle channel



Date: 18.APR.2020 18:48:25

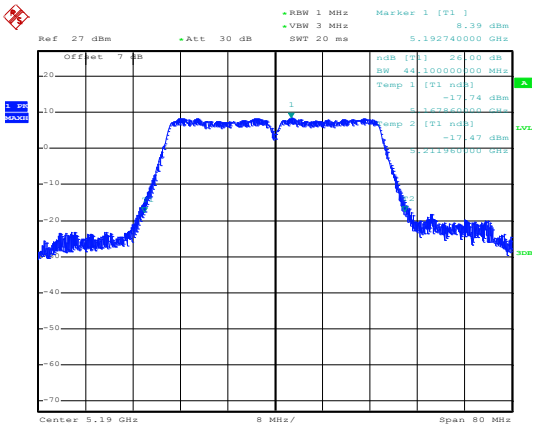


Date: 18.APR.2020 18:47:57

Highest channel

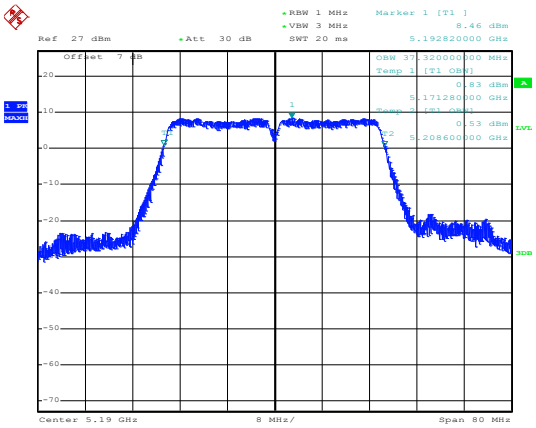
802.11n(HT40)

26 dB EBW



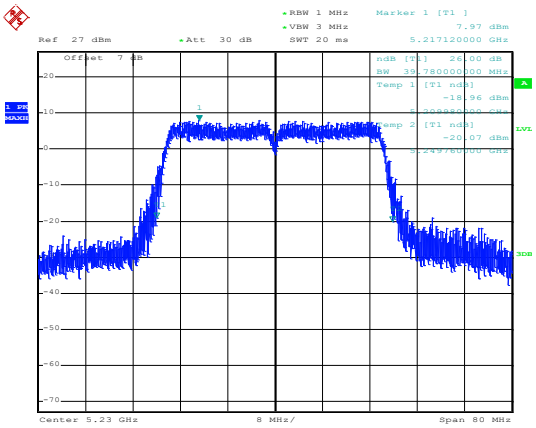
Date: 18.APR.2020 18:55:29

99% OBW

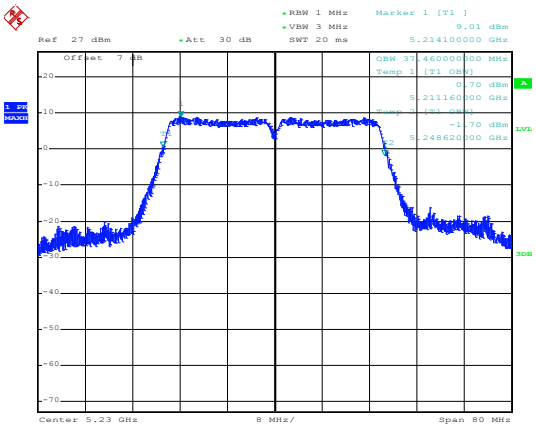


Date: 18.APR.2020 18:55:19

Lowest channel



Date: 18.APR.2020 18:55:54

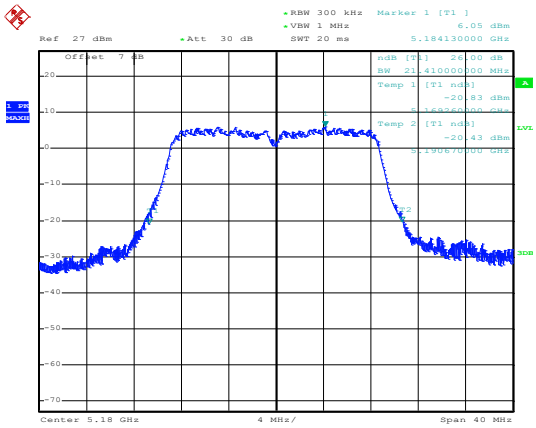


Date: 18.APR.2020 18:56:09

Highest channel

802.11ac(HT20)

26 dB EBW



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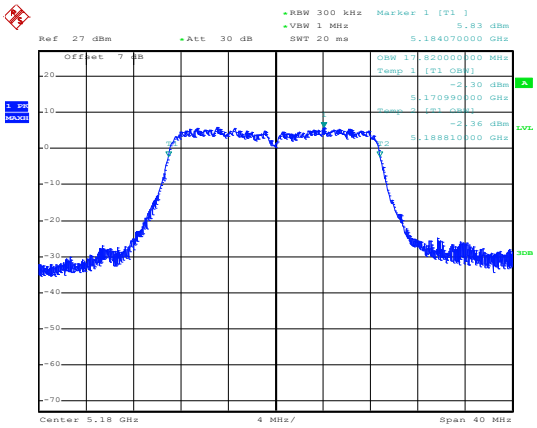
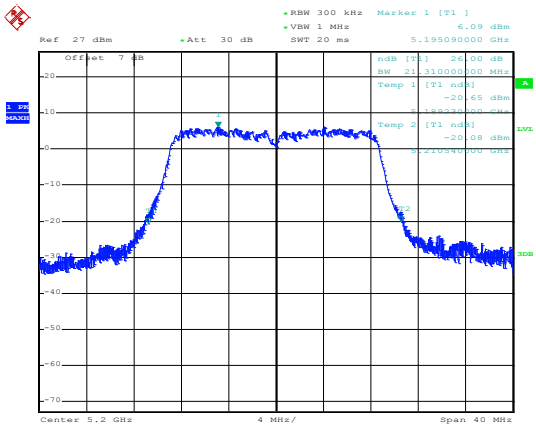
99% OBW

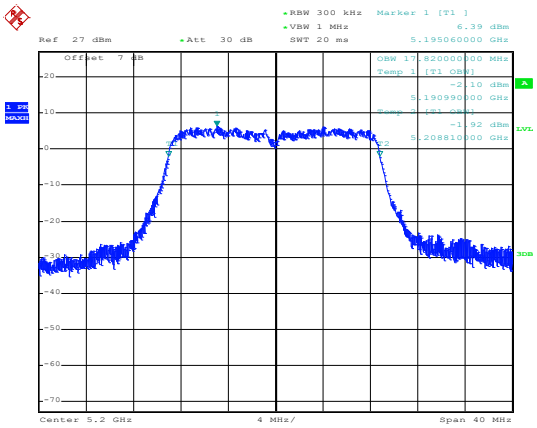


Date: 18.APR.2020 18:52:55

Lowest channel

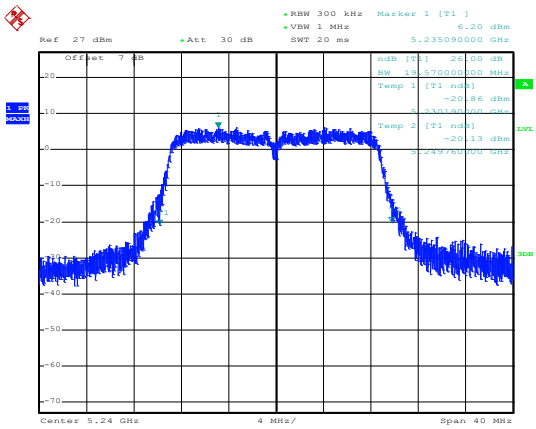


Date: 18.APR.2020 18:53:21

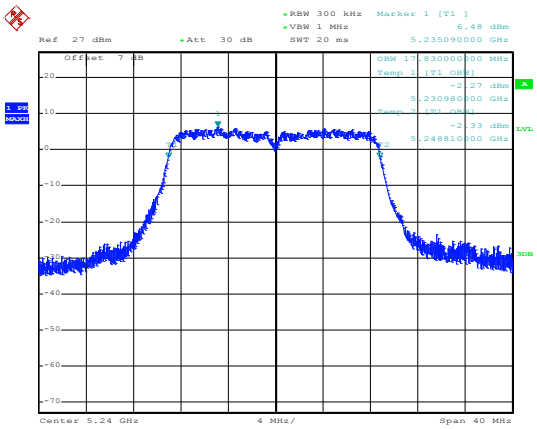


Date: 18.APR.2020 18:53:08

Middle channel



Date: 18.APR.2020 18:54:09

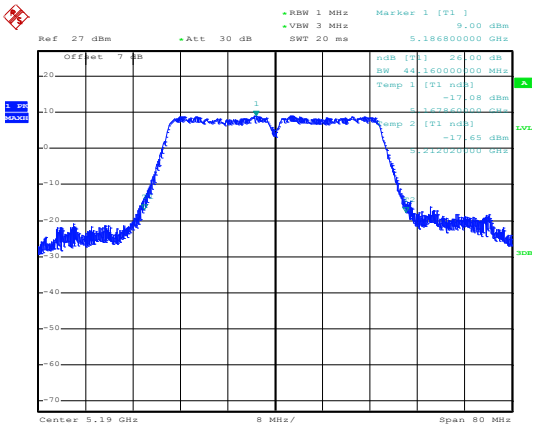


Date: 18.APR.2020 18:54:23

Highest channel

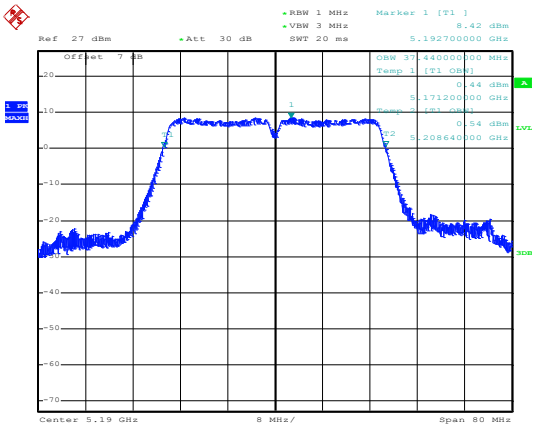
802.11ac(HT40)

26 dB EBW



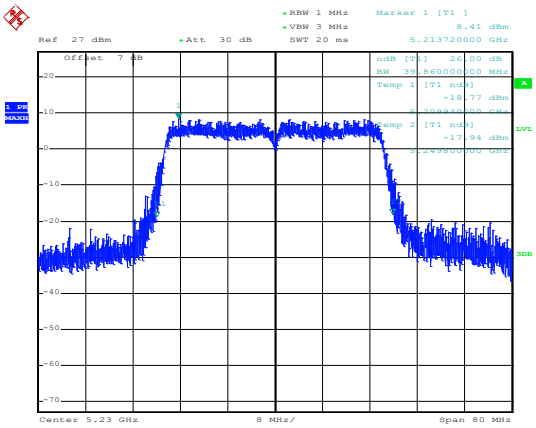
Date: 18.APR.2020 19:10:57

99% OBW

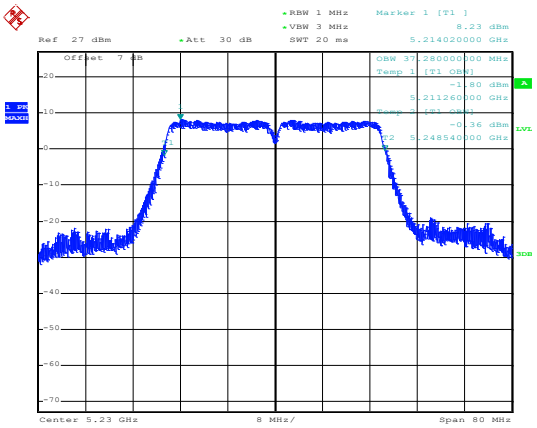


Date: 18.APR.2020 18:59:35

Lowest channel



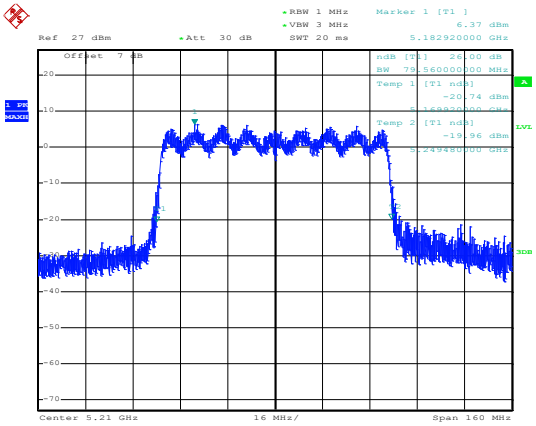
Date: 18.APR.2020 19:01:31



Date: 18.APR.2020 19:00:56

Highest channel

802.11ac(HT80)



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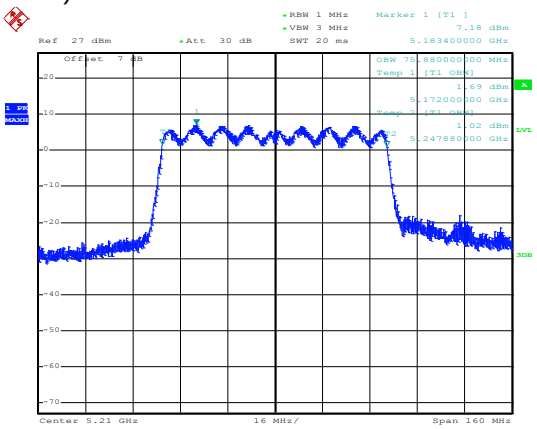


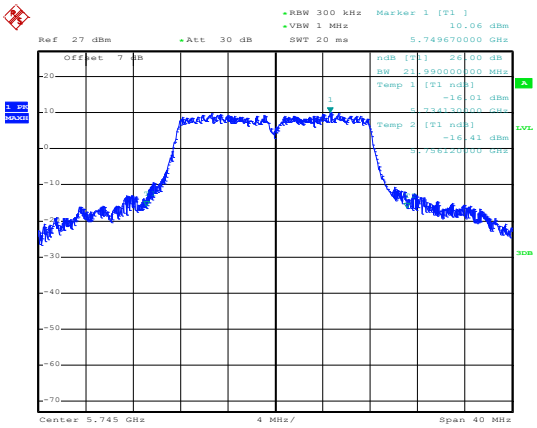
Date: 18.APR.2020 19:02:35

Middle channel

Band 4:

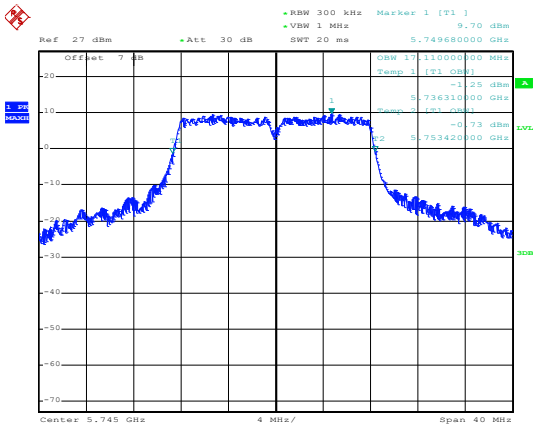
802.11a

26 dB EBW



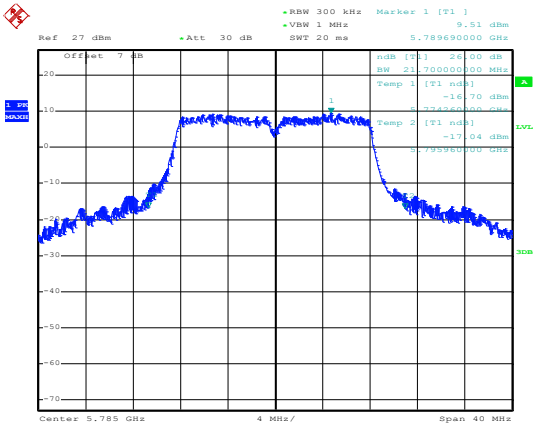
Date: 18.APR.2020 18:43:50

99% OBW



Date: 18.APR.2020 18:44:01

Lowest channel



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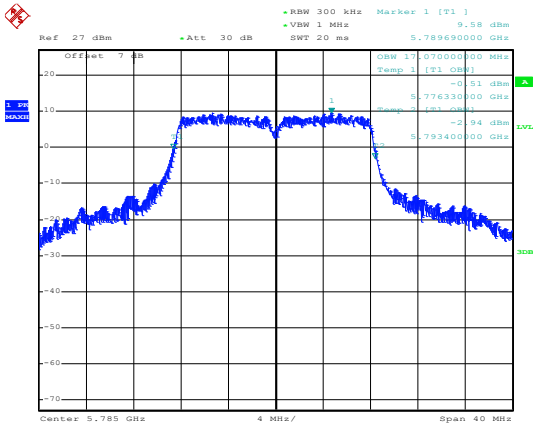
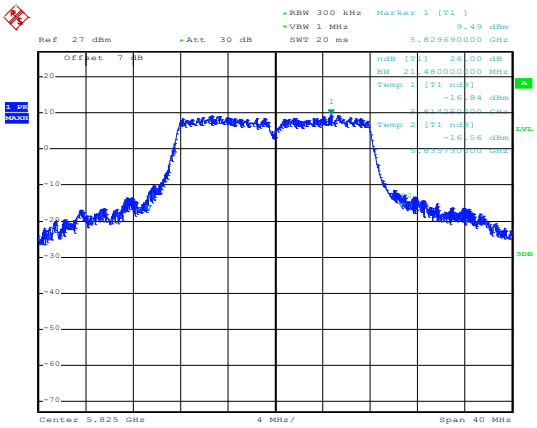
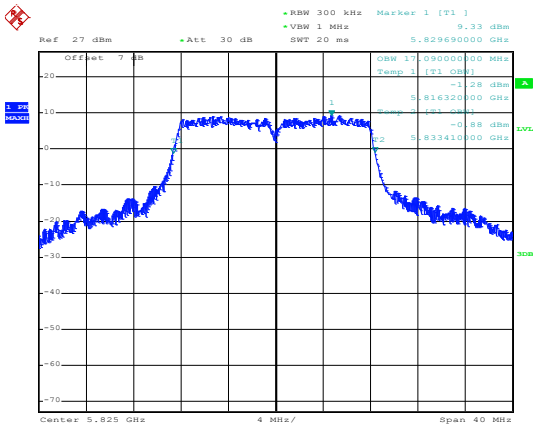


Date: 18.APR.2020 18:44:20

Middle channel



Date: 18.APR.2020 18:44:45

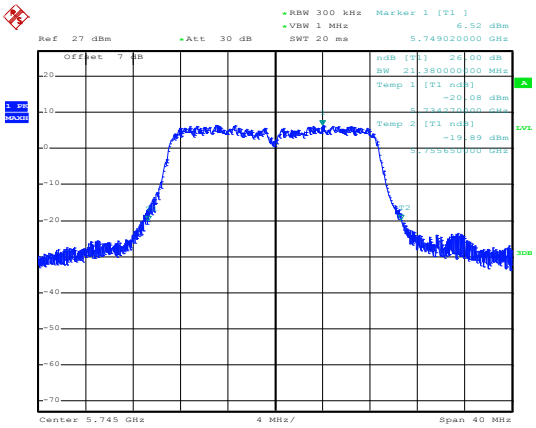


Date: 18.APR.2020 18:44:57

Highest channel

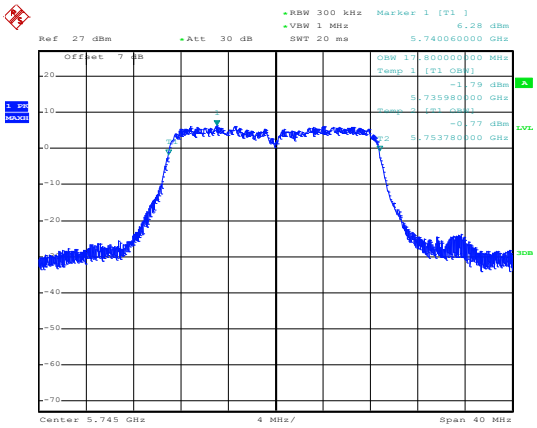
802.11n(HT20)

26 dB EBW



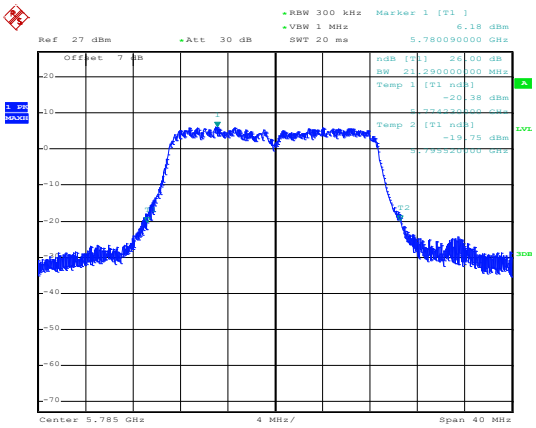
Date: 18.APR.2020 18:48:59

99% OBW

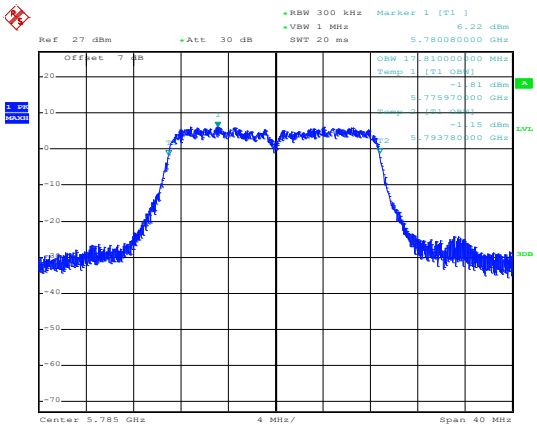


Date: 18.APR.2020 18:49:11

Lowest channel

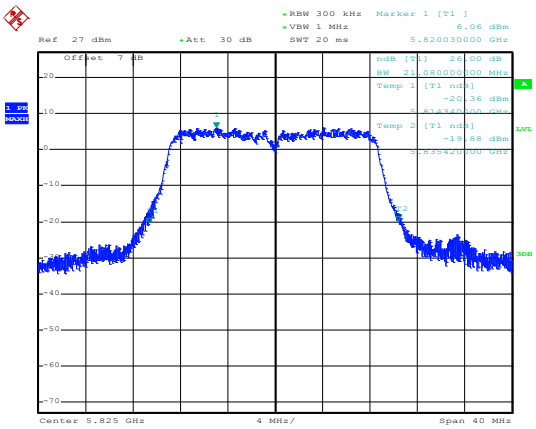


Date: 18.APR.2020 18:49:47

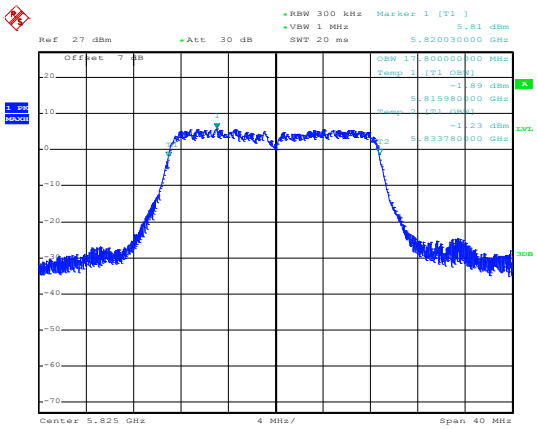


Date: 18.APR.2020 18:49:35

Middle channel



Date: 18.APR.2020 18:50:03

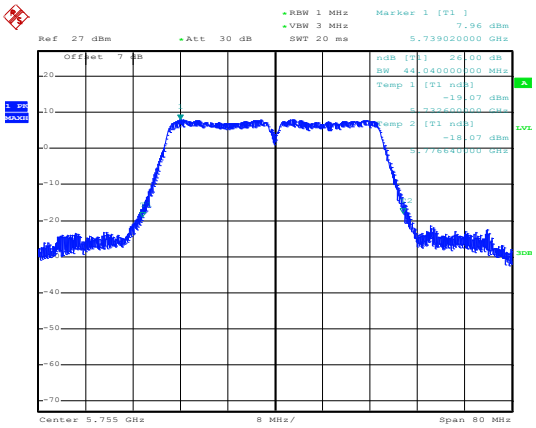


Date: 18.APR.2020 18:50:15

Highest channel

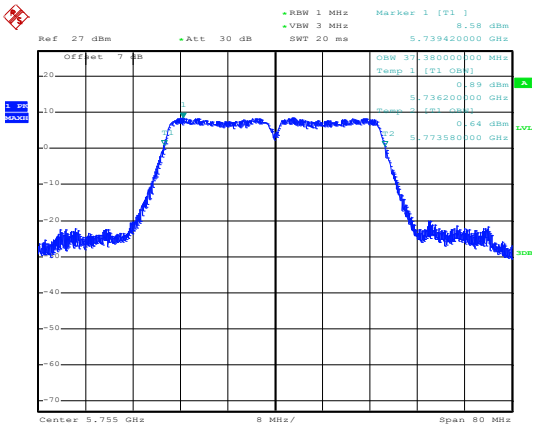
802.11n(HT40)

26 dB EBW



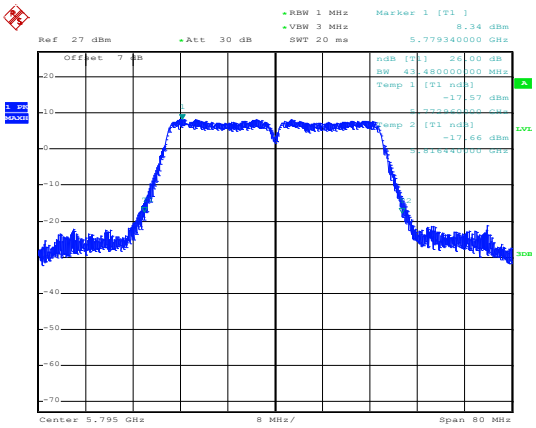
Date: 18.APR.2020 18:56:50

99% OBW

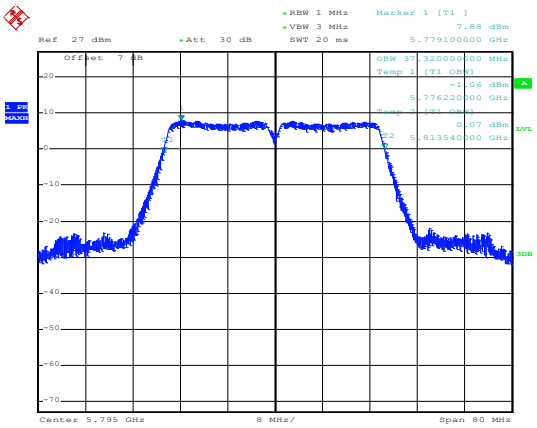


Date: 18.APR.2020 18:56:40

Lowest channel



Date: 18.APR.2020 18:57:19

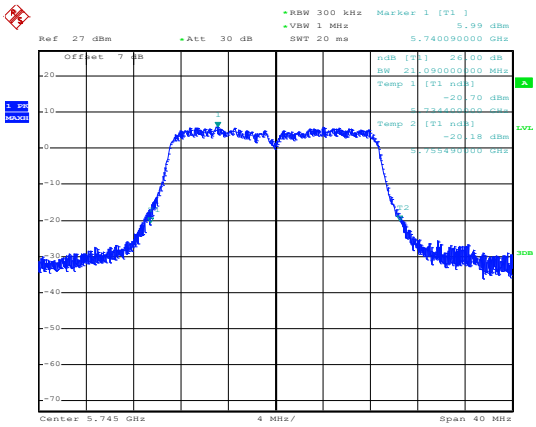


Date: 18.APR.2020 18:57:31

Highest channel

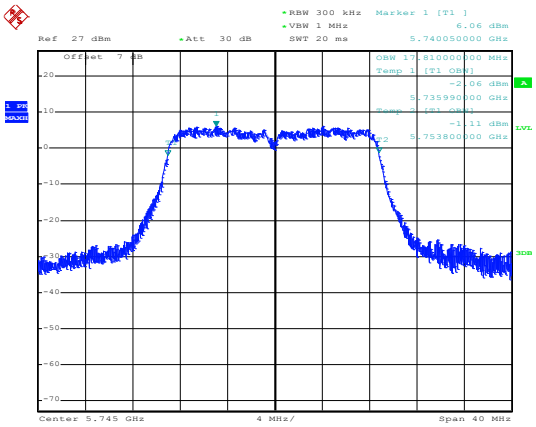
802.11ac(HT20)

26 dB EBW



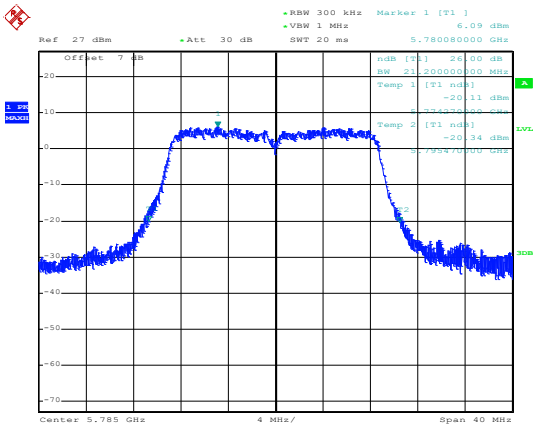
Date: 18.APR.2020 18:52:05

99% OBW

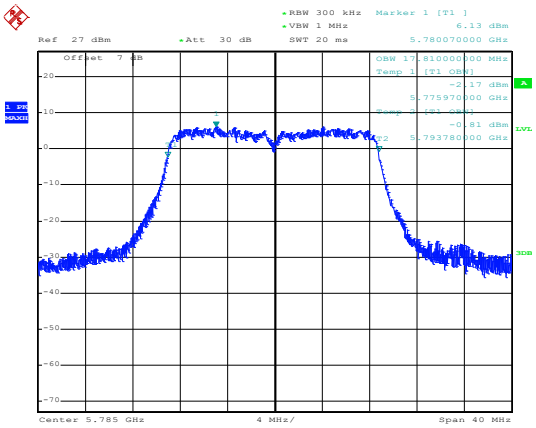


Date: 18.APR.2020 18:51:54

Lowest channel

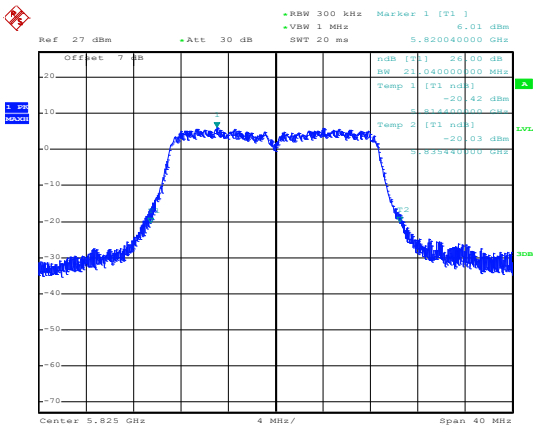


Date: 18.APR.2020 18:51:26

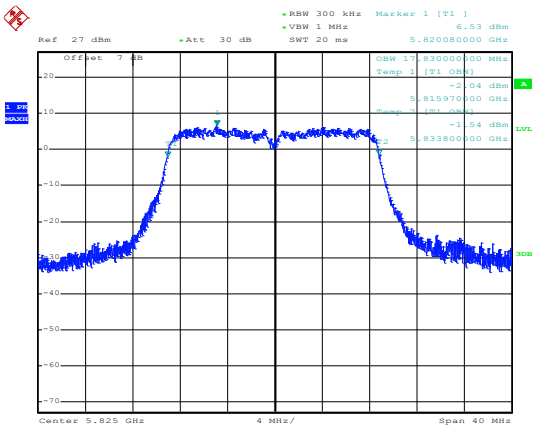


Date: 18.APR.2020 18:51:36

Middle channel



Date: 18.APR.2020 18:50:53

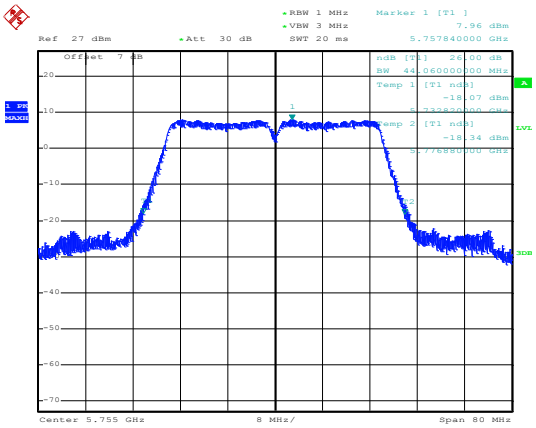


Date: 18.APR.2020 18:50:44

Highest channel

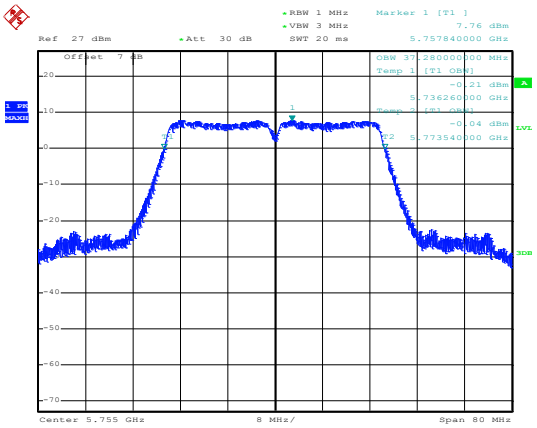
802.11ac(HT40)

26 dB EBW



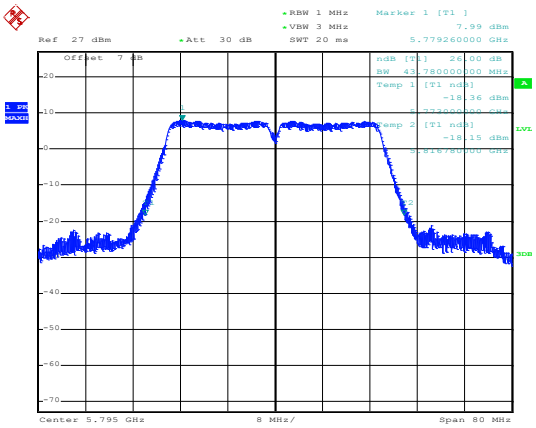
Date: 18.APR.2020 18:58:55

99% OBW

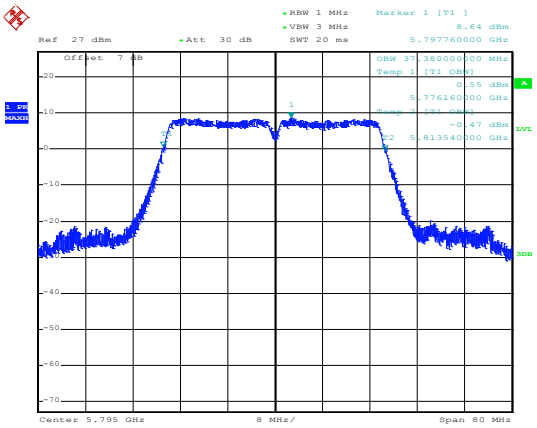


Date: 18.APR.2020 18:59:05

Lowest channel



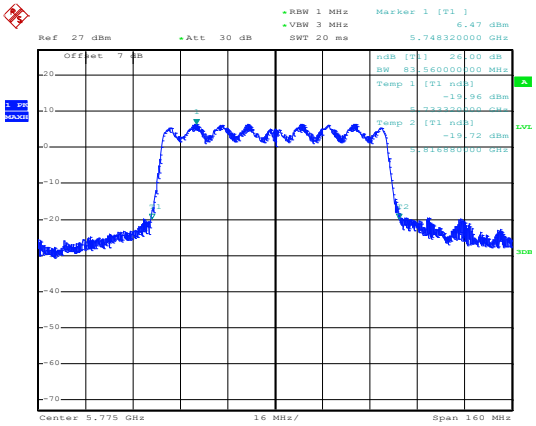
Date: 18.APR.2020 18:58:32



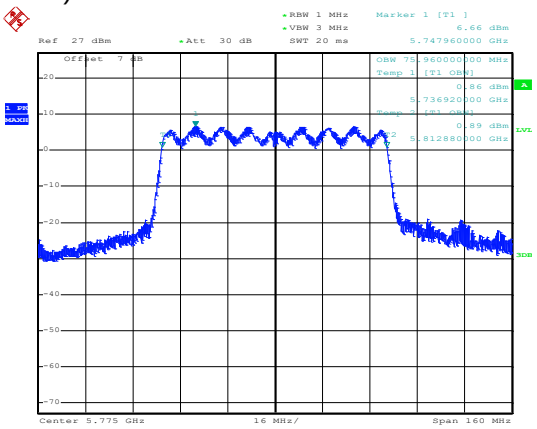
Date: 18.APR.2020 18:58:22

Highest channel

802.11ac(HT80)



Date: 18.APR.2020 19:09:34

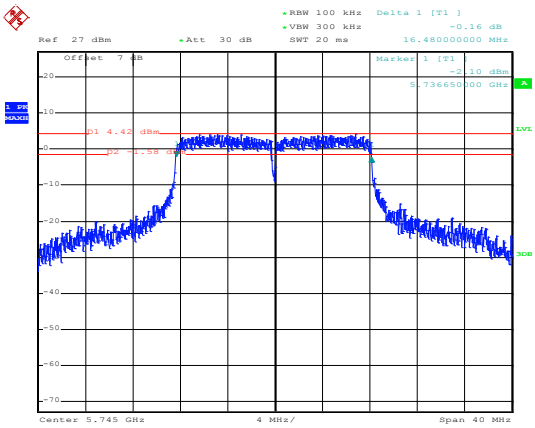


Date: 18.APR.2020 19:03:08

Middle channel

6dB BW

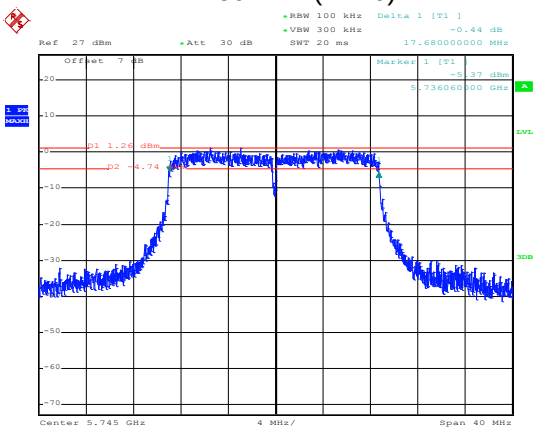
802.11a



Date: 18.APR.2020 19:13:04

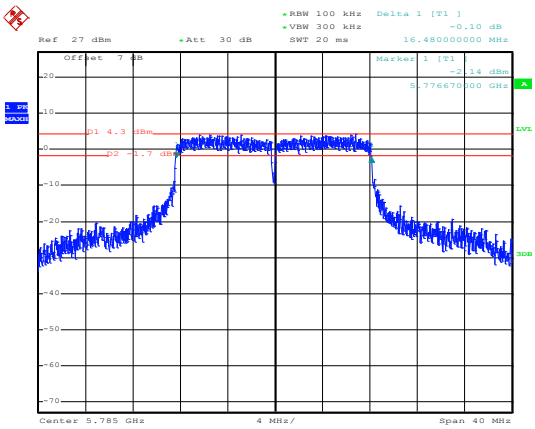
Lowest channel

802.11n(HT20)



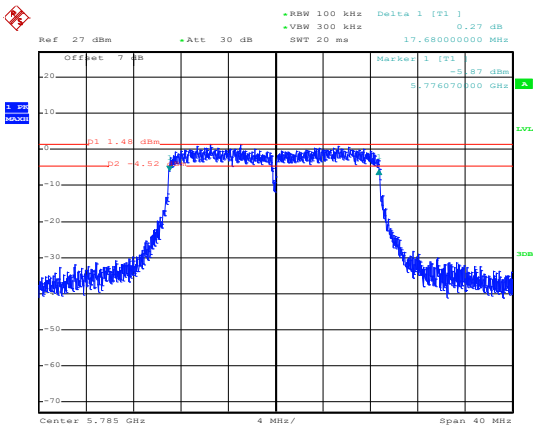
Date: 18.APR.2020 19:17:02

Lowest channel



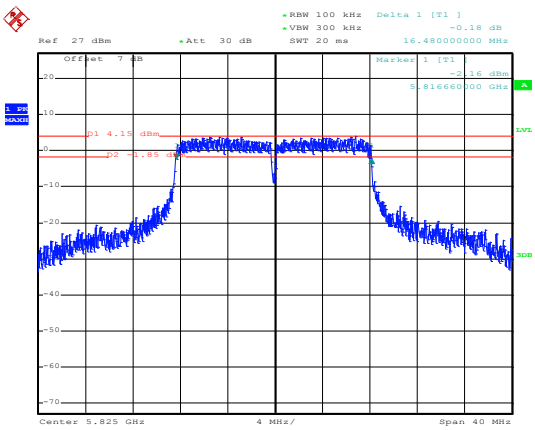
Date: 18.APR.2020 19:13:54

Middle channel



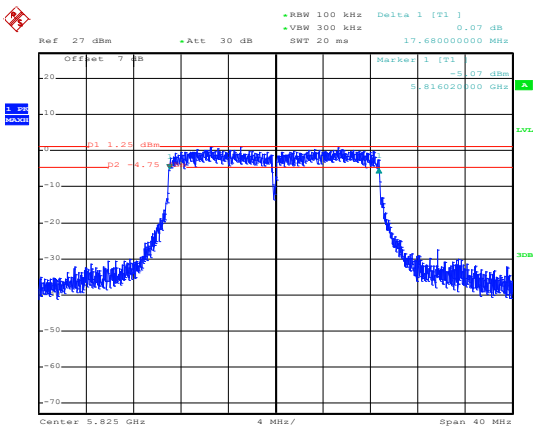
Date: 18.APR.2020 19:16:06

Middle channel



Date: 18.APR.2020 19:14:31

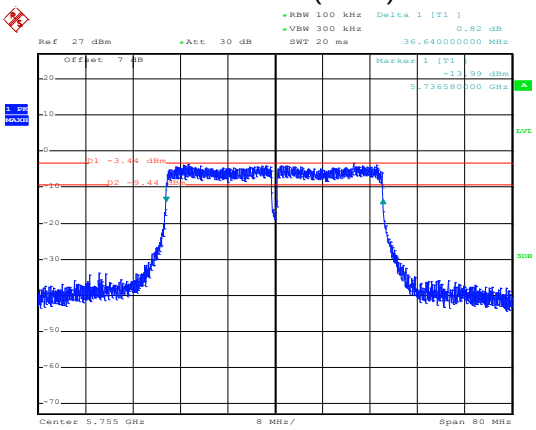
Highest channel



Date: 18.APR.2020 19:15:25

Highest channel

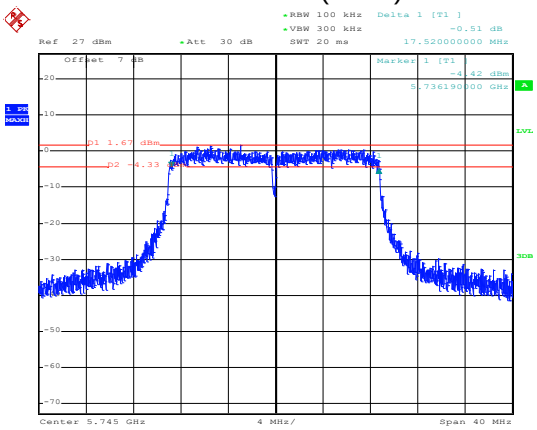
802.11n(HT40)



Date: 18.APR.2020 19:20:23

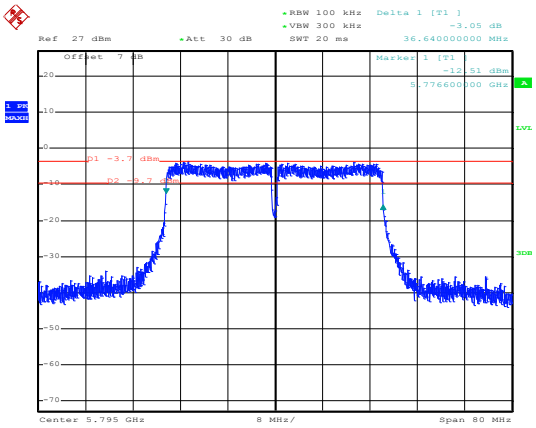
Lowest channel

802.11ac(HT20)



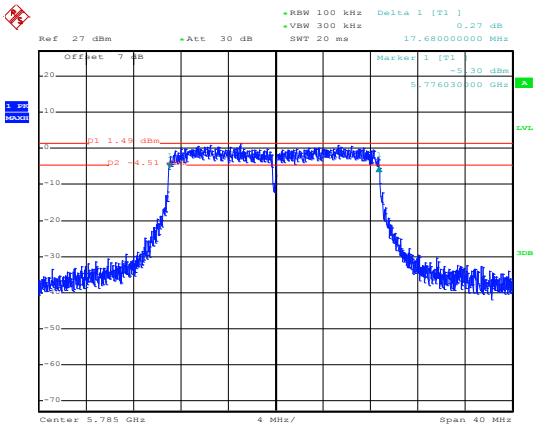
Date: 18.APR.2020 19:17:53

Lowest channel



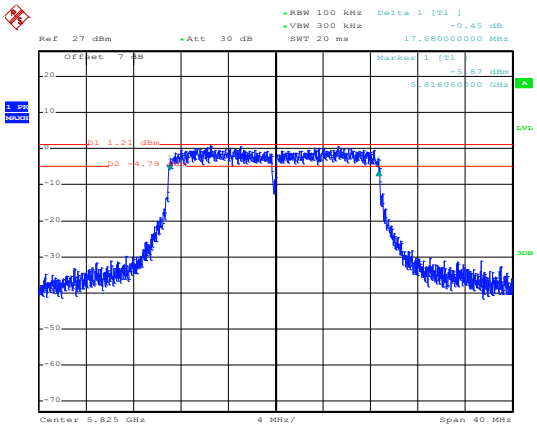
Date: 18.APR.2020 19:21:40

Highest channel



Date: 18.APR.2020 19:18:38

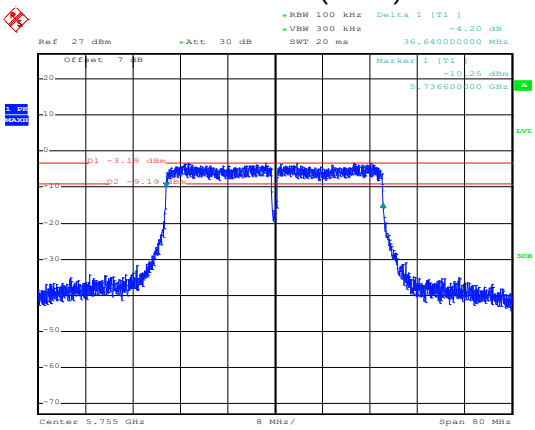
Middle channel



Date: 18.APR.2020 19:19:15

Highest channel

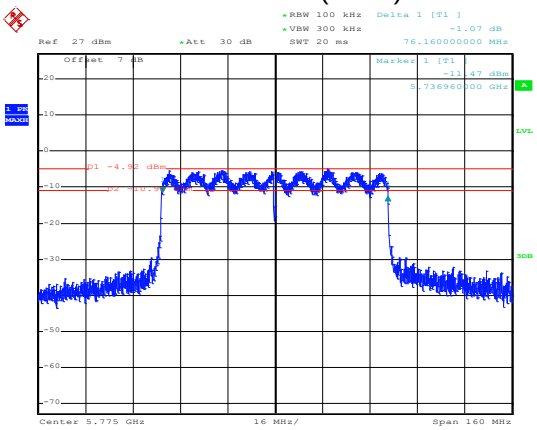
802.11ac(HT40)



Date: 18.APR.2020 19:23:23

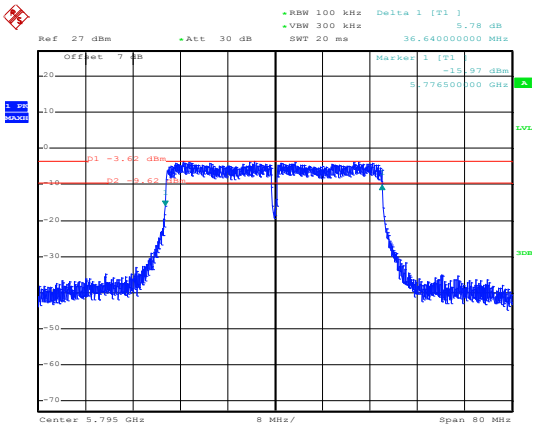
Lowest channel

802.11ac(HT80)



Date: 18.APR.2020 19:24:38

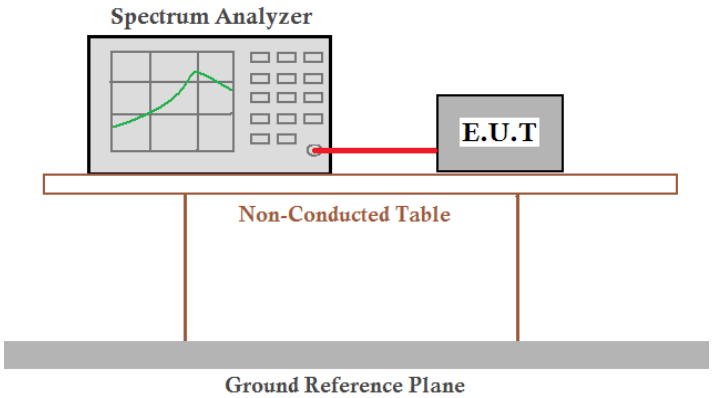
Middle channel



Date: 18.APR.2020 19:22:37

Highest channel

6.5 Power Spectral Density

Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv) & (a)(3)
Limit:	Band 1: 11 dBm/MHz Band 4: 30 dBm/500kHz
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:

Band 1						
Mode	Test CH	Ant. Port	Conducted P.S.D (dBm)	Total P.S.D (dBm)	Limit (dBm)	Result
802.11a	Lowest	TX0	7.53	/	11.00	Pass
		TX1	7.66			
	Middle	TX0	7.37			
		TX1	7.81			
	Highest	TX0	7.17			
		TX1	7.37			
802.11n20	Lowest	TX0	3.99	7.05	*Ceramic Antenna:9.68* *Flex Antenna:9.25* *Whip Antenna:9.50*	Pass
		TX1	4.09			
	Middle	TX0	4.26	7.42		
		TX1	4.56			
	Highest	TX0	4.08	7.14		
		TX1	4.17			
802.11n40	Lowest	TX0	0.71	3.58	*Ceramic Antenna:9.68* *Flex Antenna:9.25* *Whip Antenna:9.50*	Pass
		TX1	0.43			
	Highest	TX0	1.10	3.79		
		TX1	0.43			
802.11ac20	Lowest	TX0	3.81	7.14	*Ceramic Antenna:9.68* *Flex Antenna:9.25* *Whip Antenna:9.50*	Pass
		TX1	4.43			
	Middle	TX0	3.76	6.81		
		TX1	3.83			
	Highest	TX0	3.55	6.85		
		TX1	4.12			
802.11ac40	Lowest	TX0	0.73	3.54	*Ceramic Antenna:9.68* *Flex Antenna:9.25* *Whip Antenna:9.50*	Pass
		TX1	0.31			
	Highest	TX0	1.22	3.93		
		TX1	0.60			
802.11ac80	Lowest	TX0	-1.13	1.74	*Ceramic Antenna:9.68* *Flex Antenna:9.25* *Whip Antenna:9.50*	Pass
		TX1	-1.41			

1. *Because transmit signals are correlated,* Directional gain = $G_{ANT} + 10\log(N_{ANT})$ dBi.
2. *So Ceramic Antenna: The Directional gain=4.32 + 10* $\log(2)$*=7.32dBi, The directional Gain of antenna is greater than 6 dBi, so the limit of P.S.D is 9.68 dBm (for 802.11n/ac).*

   Flex Antenna: The Directional gain=4.75 + 10 $\log(2)$*=7.75dBi, The directional Gain of antenna is* greater *than 6 dBi, so the limit of P.S.D is 9.25 dBm (for 802.11n/ac).*

   Whip Antenna: The Directional gain=4.5 + 10 $\log(2)$*=7.5dBi, The directional Gain of antenna is* greater *than 6dBi, so the limit of power is 9.50 dBm (for 802.11n/ac).*

Band 4						
Mode	Test CH	Ant. Port	Conducted P.S.D (dBm)	Total P.S.D (dBm)	Limit (dBm)	Result
802.11a	Lowest	TX0	8.03	/	30.00	Pass
		TX1	7.94			
	Middle	TX0	7.61			
		TX1	7.86			
	Highest	TX0	7.58			
		TX1	7.83			
802.11n20	Lowest	TX0	4.83	7.90	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.00*	Pass
		TX1	4.94			
	Middle	TX0	4.97	7.85		
		TX1	4.70			
	Highest	TX0	4.66	8.11		
		TX1	5.50			
802.11n40	Lowest	TX0	0.35	3.42	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.0*	Pass
		TX1	0.46			
	Highest	TX0	0.60	3.54		
		TX1	0.45			
802.11ac20	Lowest	TX0	4.94	8.39	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.0*	Pass
		TX1	5.78			
	Middle	TX0	5.00	7.76		
		TX1	4.49			
	Highest	TX0	4.79	8.07		
		TX1	5.32			
802.11ac40	Lowest	TX0	1.19	3.92	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.00*	Pass
		TX1	0.62			
	Highest	TX0	0.96	3.86		
		TX1	0.73			
802.11ac80	Lowest	TX0	-0.73	2.14	*Ceramic Antenna:28.68* *Flex Antenna:28.25* *Whip Antenna:28.0*	Pass
		TX1	-1.01			

1. *Because transmit signals are correlated,* Directional gain = $G_{ANT} + 10\log(N_{ANT})$ dBi.
2. *So Ceramic Antenna: The Directional gain=4.32 + 10* $\log(2)$*=7.32dBi, The directional Gain of antenna is greater than 6 dBi, so the limit of P.S.D is 28.68 dBm (for 802.11n/ac).*

   Flex Antenna: The Directional gain=4.75 + 10 $\log(2)$*=7.75dBi, The directional Gain of antenna is* greater *than 6 dBi, so the limit of P.S.D is 28.25 dBm (for 802.11n/ac).*

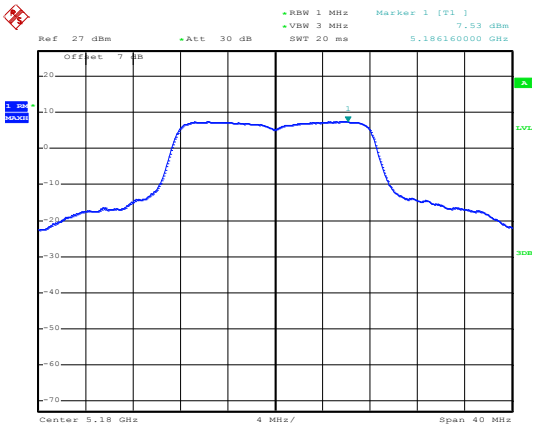
   Whip Antenna: The Directional gain=5 + 10 $\log(2)$*=8.0dBi, The directional Gain of antenna is* greater *than 6dBi, so the limit of P.S.D is 28.00 dBm (for 802.11n/ac).*

Test plot as follows:

TX0:

Band 1

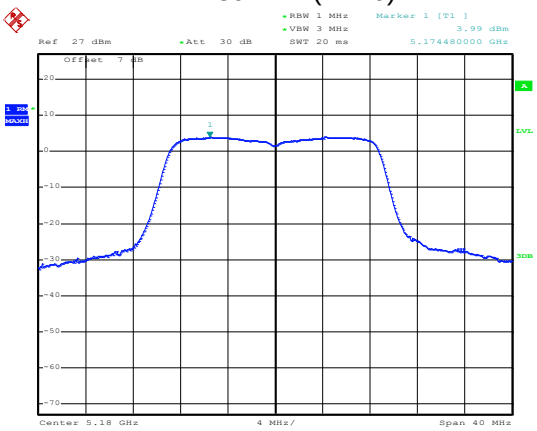
802.11a



Date: 18.APR.2020 16:23:55

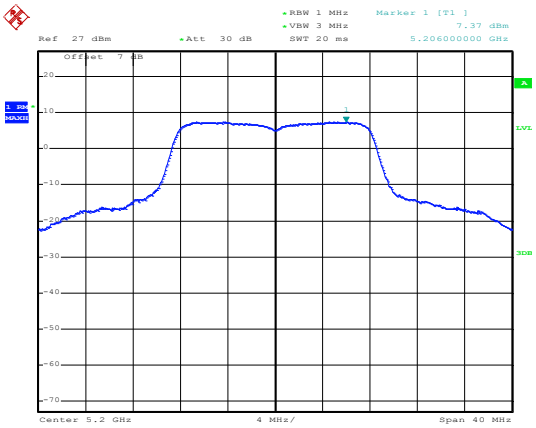
Lowest channel

802.11n(HT20)



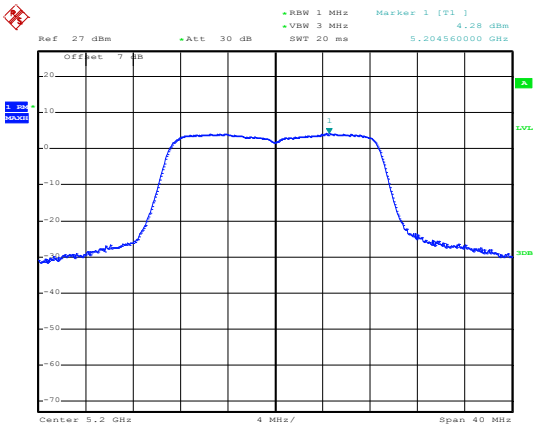
Date: 18.APR.2020 16:26:27

Middle channel



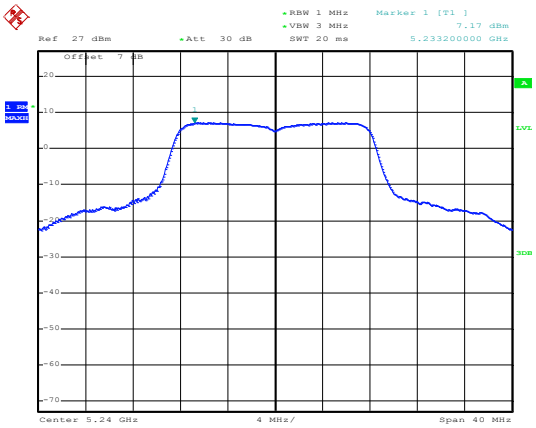
Date: 18.APR.2020 16:24:26

Middle channel



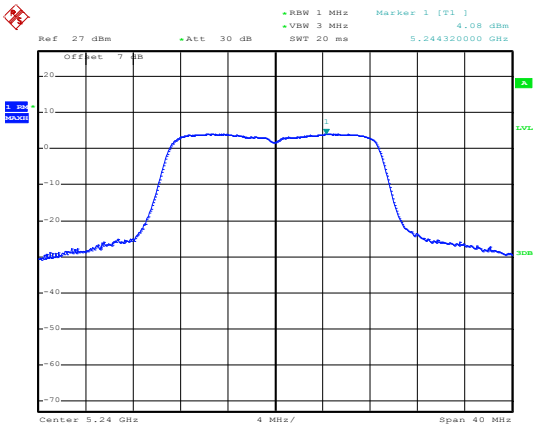
Date: 18.APR.2020 16:26:08

Middle channel



Date: 18.APR.2020 16:24:51

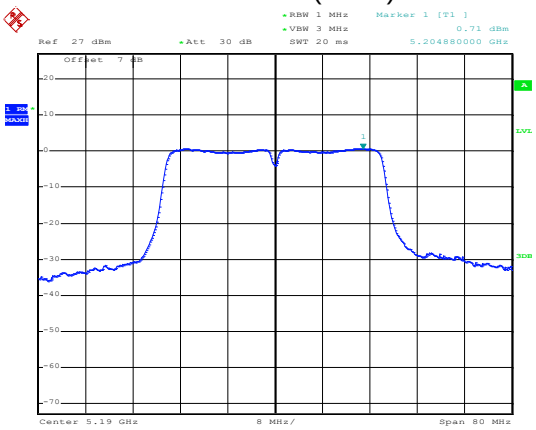
Highest channel



Date: 18.APR.2020 16:25:43

Highest channel

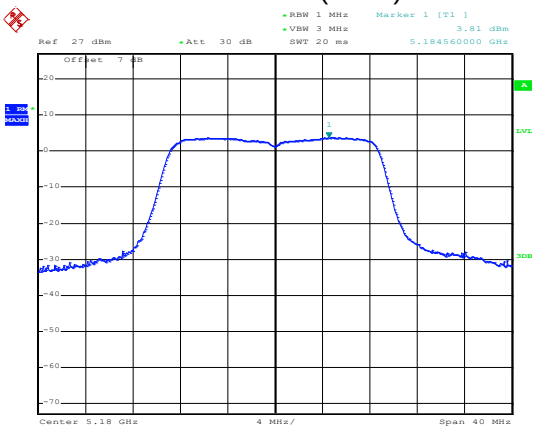
802.11n(HT40)



Date: 18.APR.2020 16:28:28

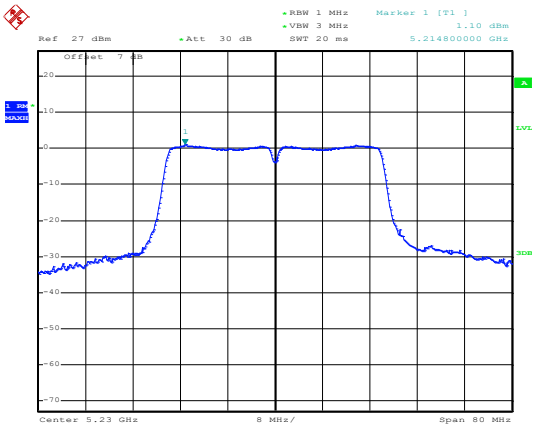
Lowest channel

802.11ac(HT20)



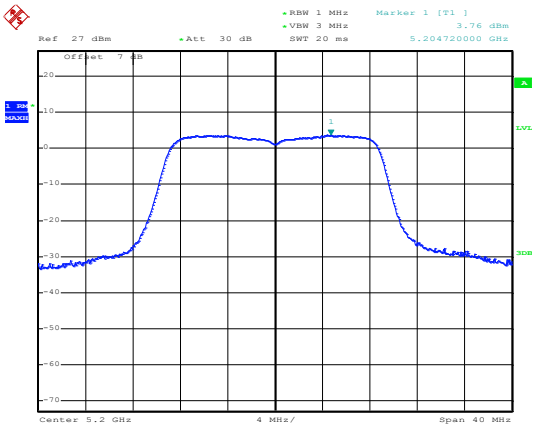
Date: 18.APR.2020 16:27:08

Middle channel



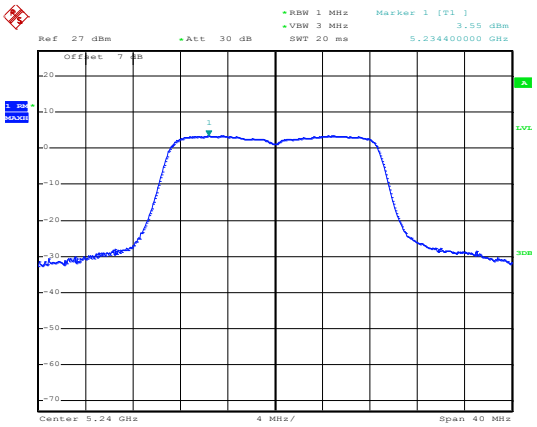
Date: 18.APR.2020 16:28:49

Highest channel



Date: 18.APR.2020 16:27:21

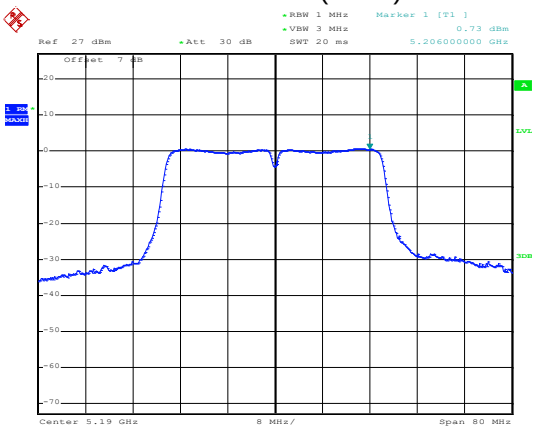
Middle channel



Date: 18.APR.2020 16:27:37

Highest channel

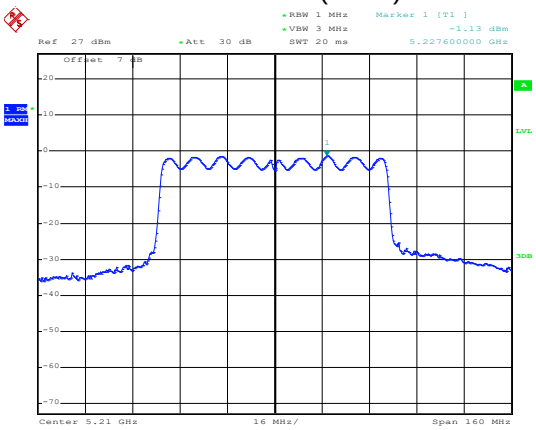
802.11ac(HT40)



Date: 18.APR.2020 16:29:21

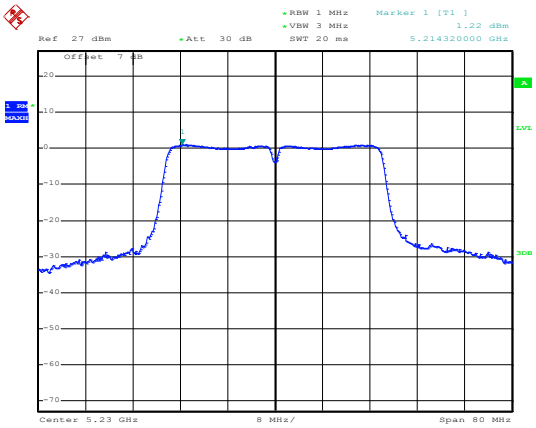
Lowest channel

802.11ac(HT80)



Date: 18.APR.2020 16:29:55

Middle channel

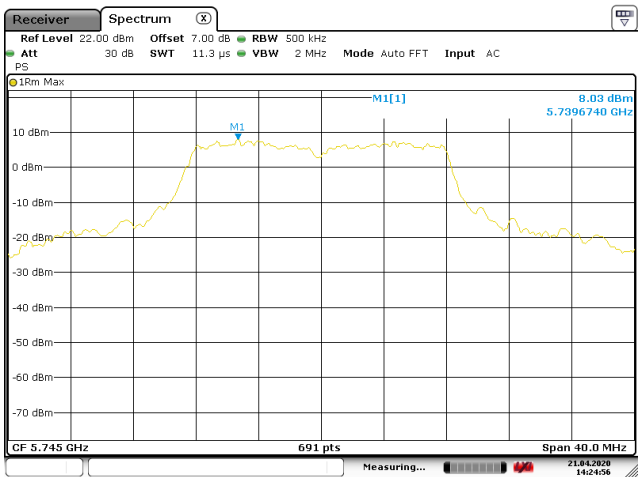


Date: 18.APR.2020 16:29:05

Highest channel

Band 4

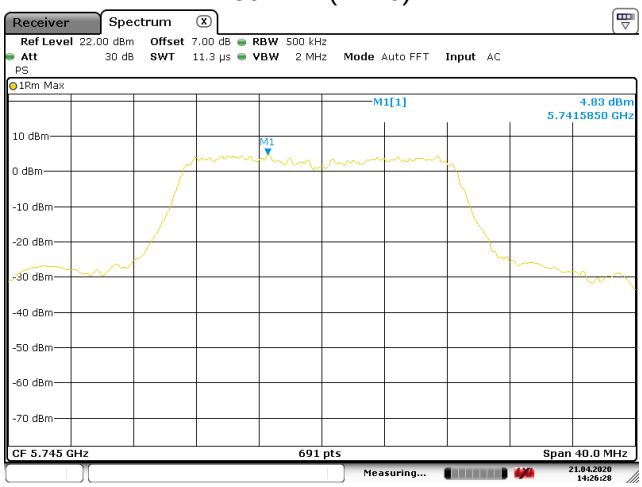
802.11a



Date: 21.APR.2020 14:24:56

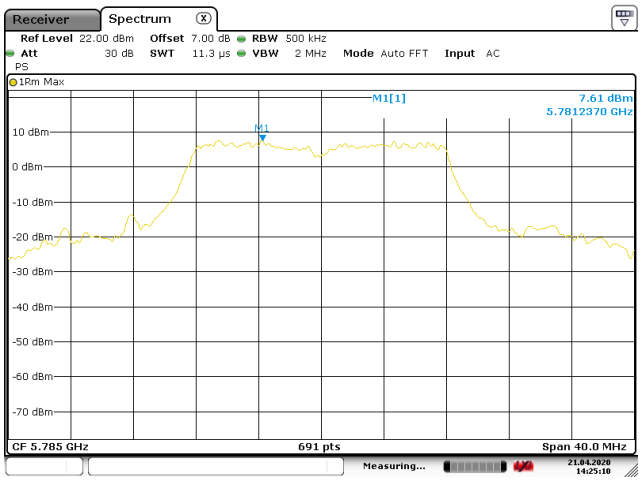
Lowest channel

802.11n(HT20)



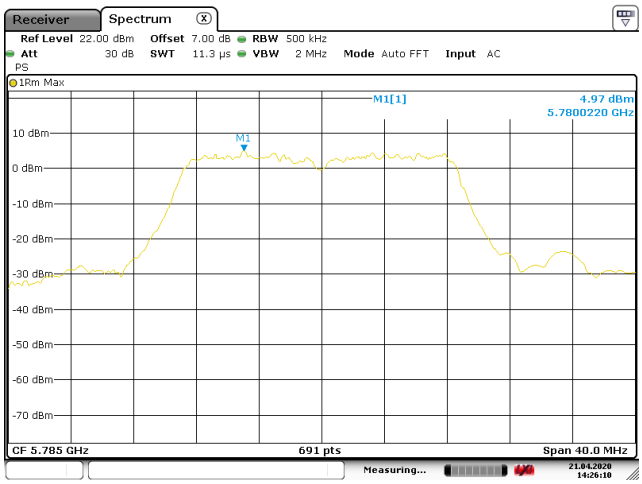
Date: 21.APR.2020 14:26:28

Lowest channel



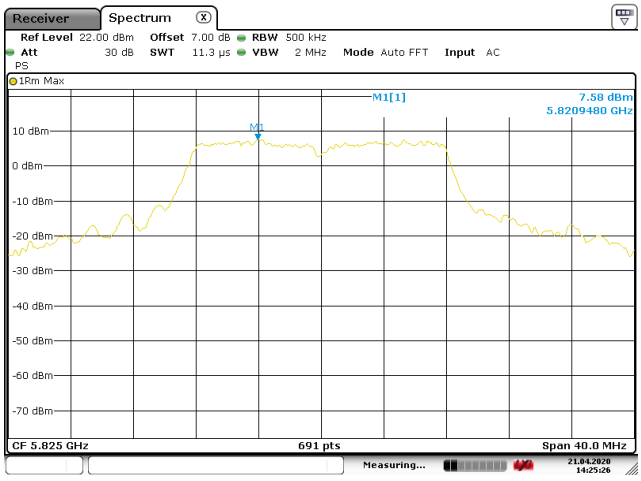
Date: 21.APR.2020 14:25:10

Middle channel



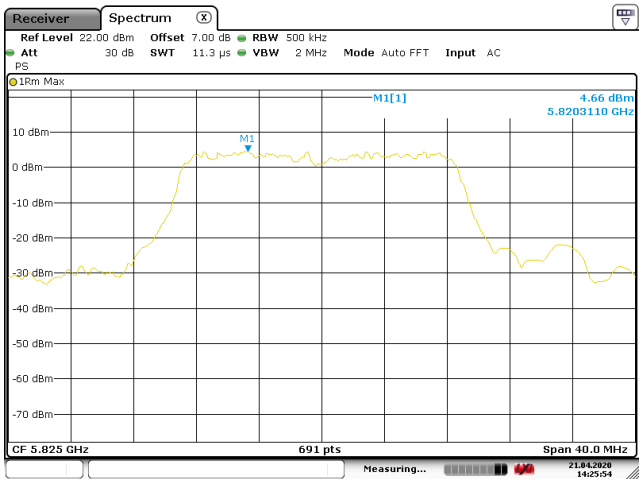
Date: 21.APR.2020 14:26:11

Middle channel



Date: 21.APR.2020 14:25:26

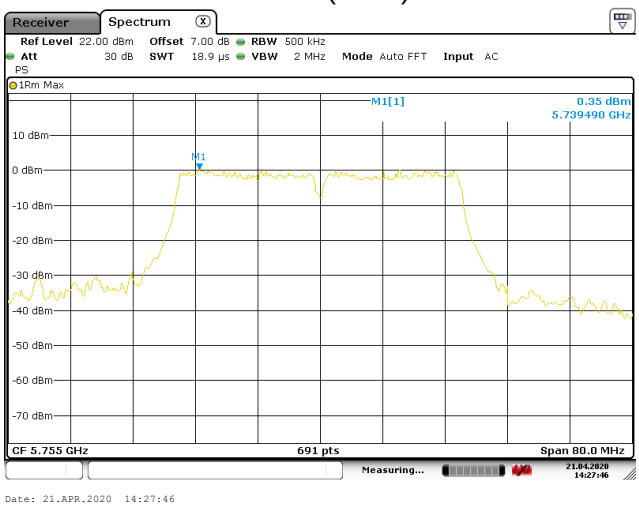
Highest channel



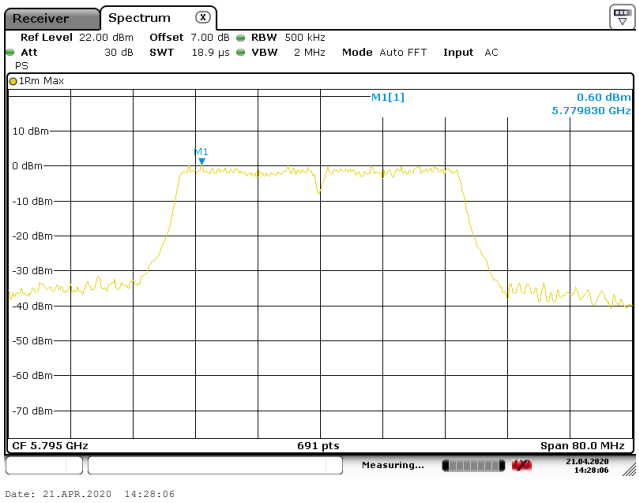
Date: 21.APR.2020 14:25:54

Highest channel

802.11n(HT40)

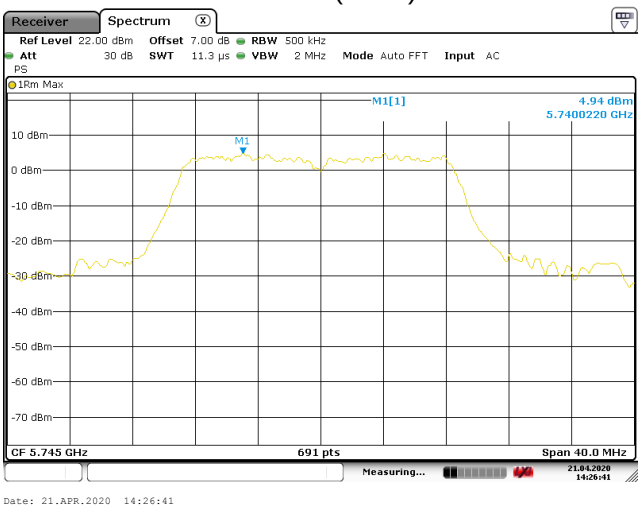


Lowest channel

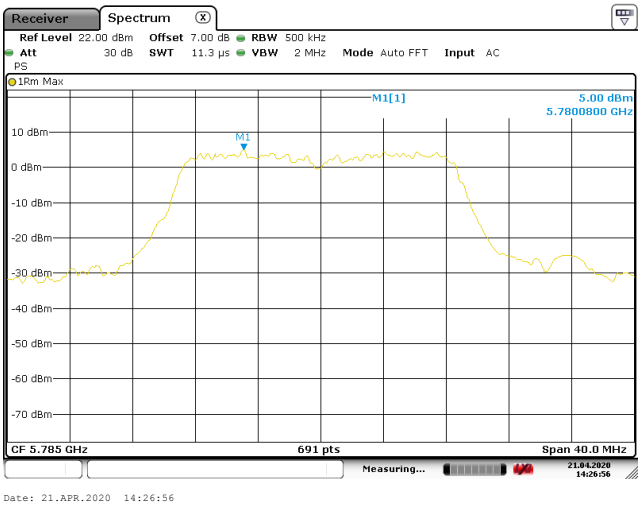


Highest channel

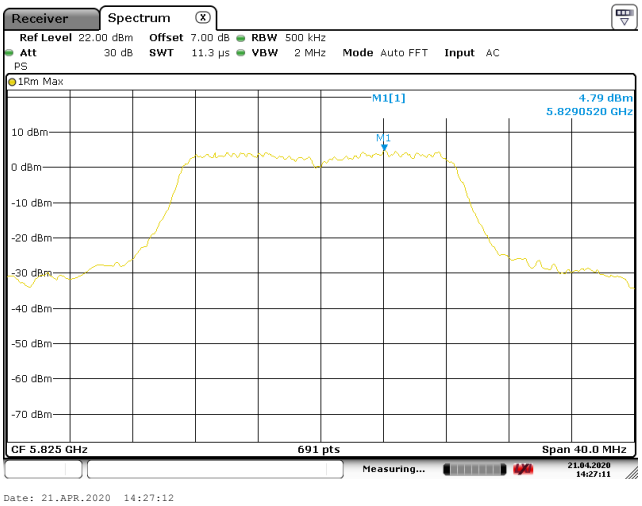
802.11ac(HT20)



Middle channel

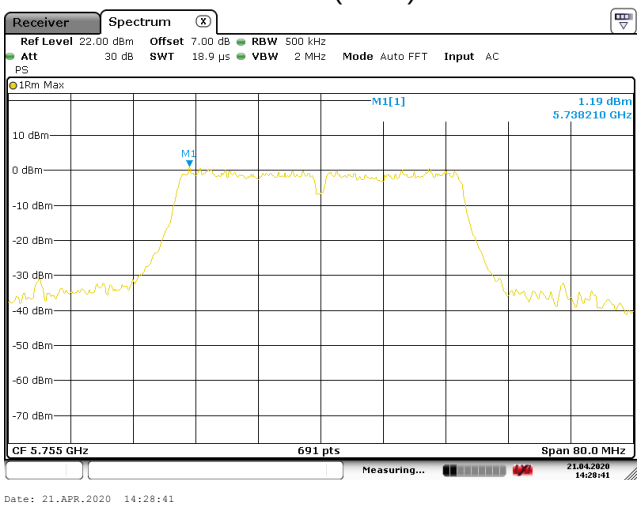


Middle channel



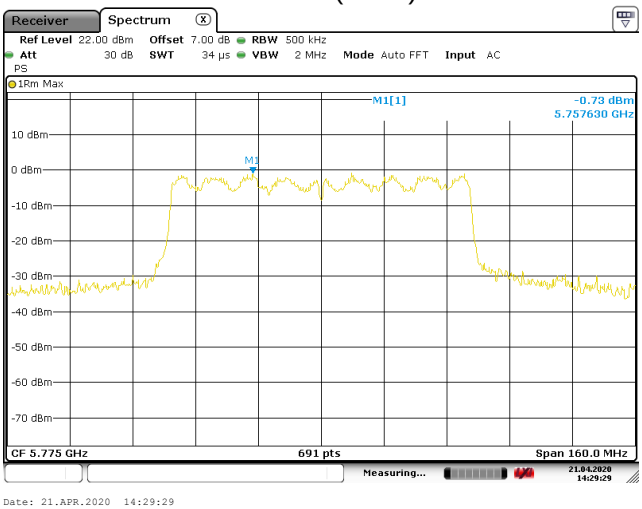
Highest channel

802.11ac(HT40)

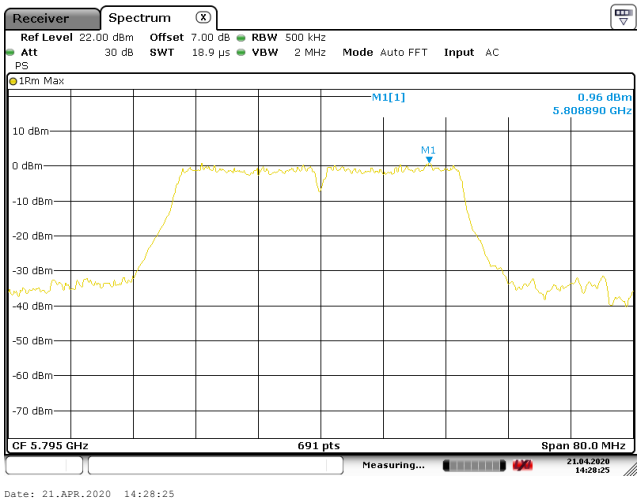


Lowest channel

802.11ac(HT80)



Middle channel

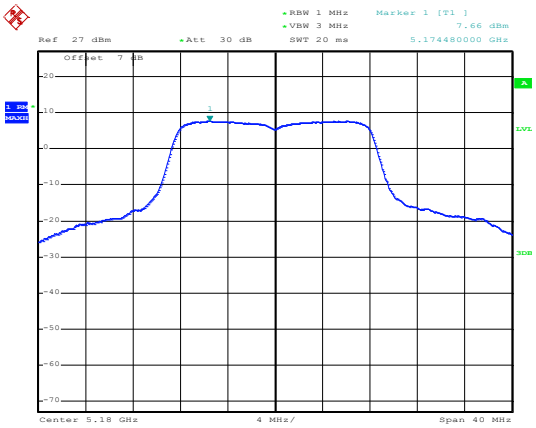


Highest channel

TX1:

Band 1

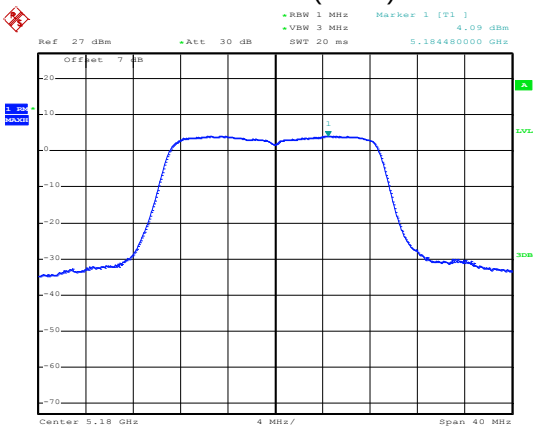
802.11a



Date: 18.APR.2020 19:27:02

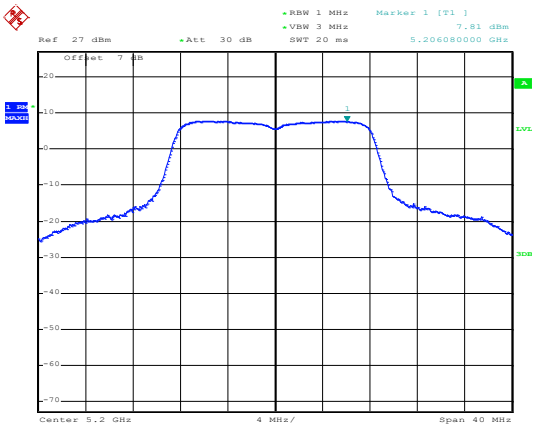
Lowest channel

802.11n(HT20)



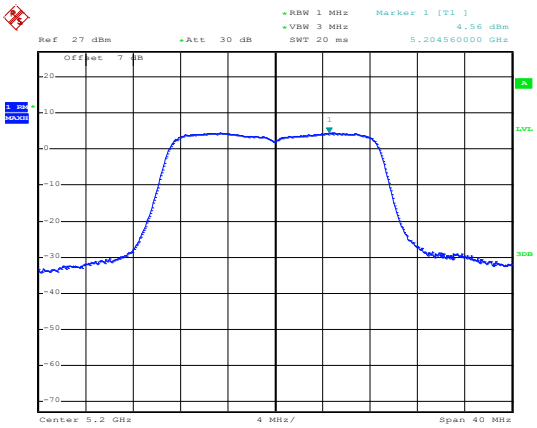
Date: 18.APR.2020 19:28:56

Middle channel



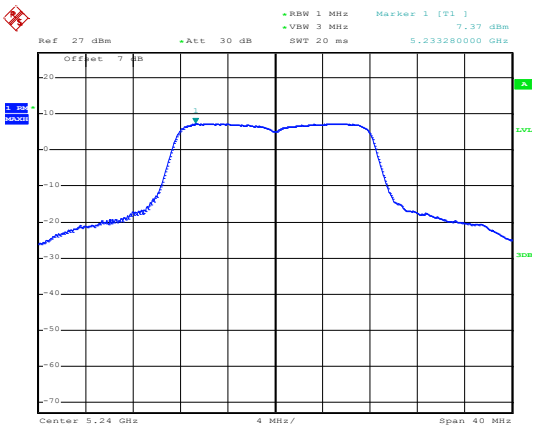
Date: 18.APR.2020 19:27:18

Middle channel



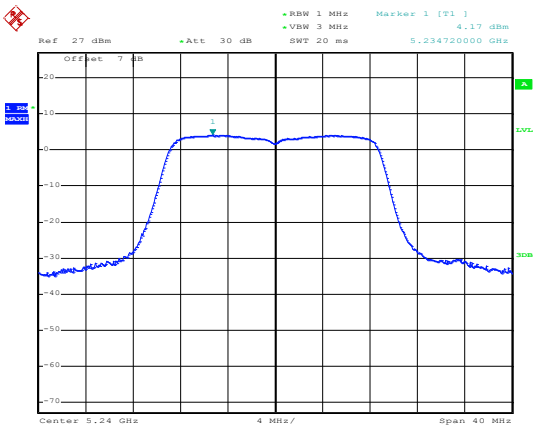
Date: 18.APR.2020 19:28:35

Middle channel



Date: 18.APR.2020 19:27:33

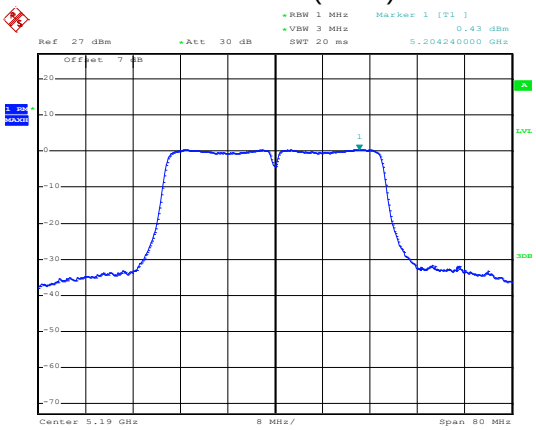
Highest channel



Date: 18.APR.2020 19:28:12

Highest channel

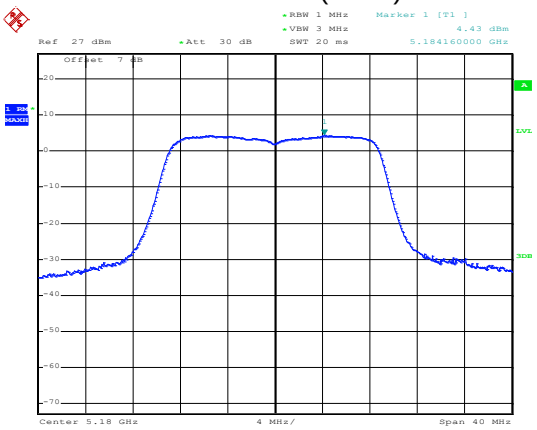
802.11n(HT40)



Date: 18.APR.2020 19:30:59

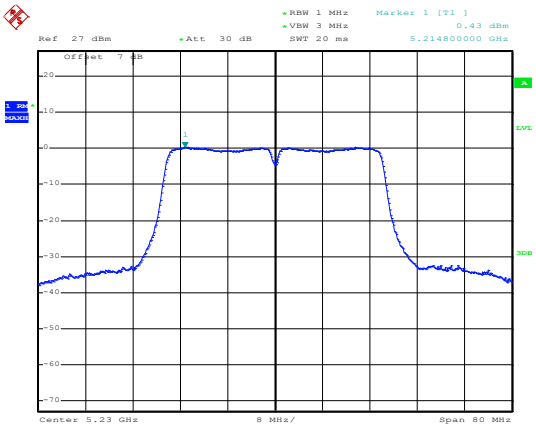
Lowest channel

802.11ac(HT20)



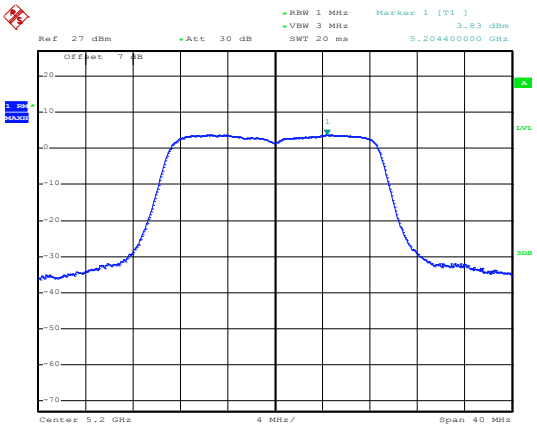
Date: 18.APR.2020 19:29:19

Middle channel



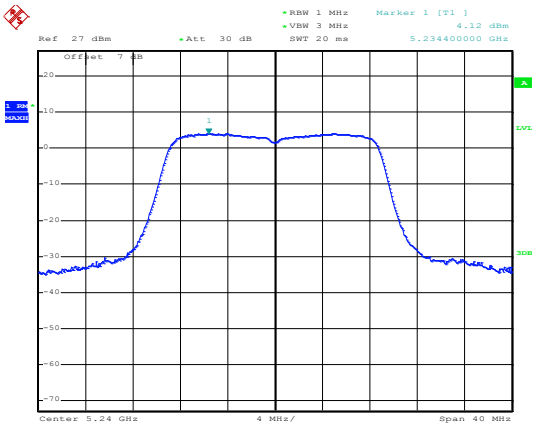
Date: 18.APR.2020 19:31:14

Highest channel



Date: 18.APR.2020 19:29:43

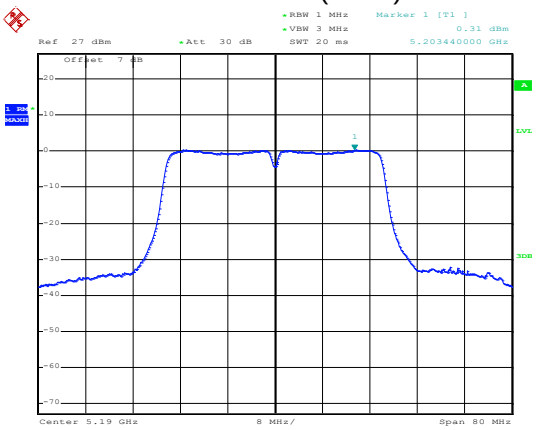
Middle channel



Date: 18.APR.2020 19:30:13

Highest channel

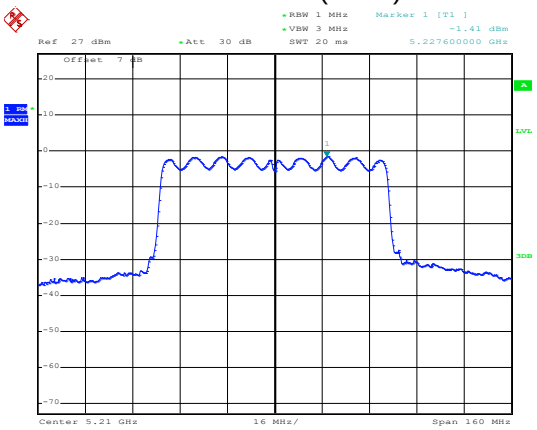
802.11ac(HT40)



Date: 18.APR.2020 19:31:58

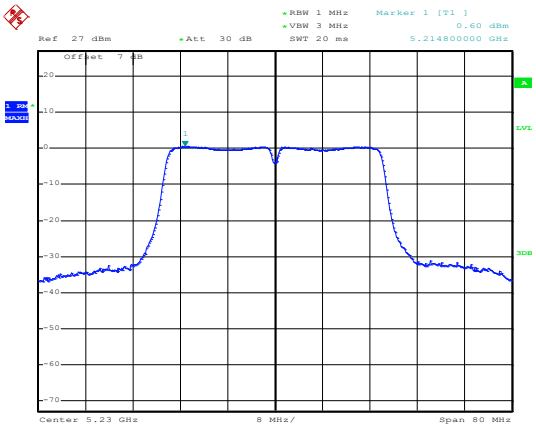
Lowest channel

802.11ac(HT80)



Date: 18.APR.2020 19:32:29

Middle channel

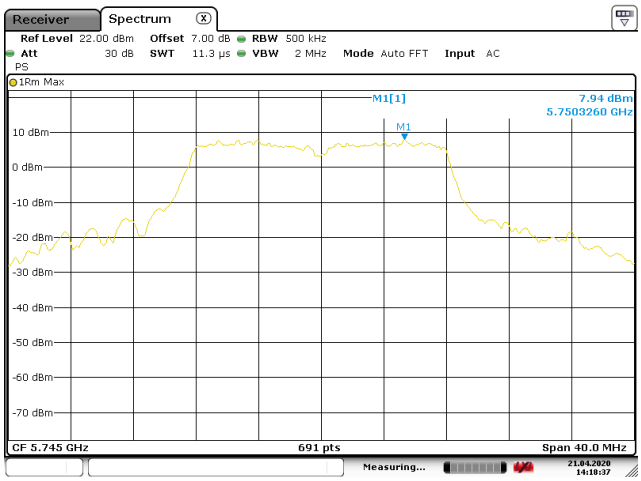


Date: 18.APR.2020 19:31:35

Highest channel

Band 4

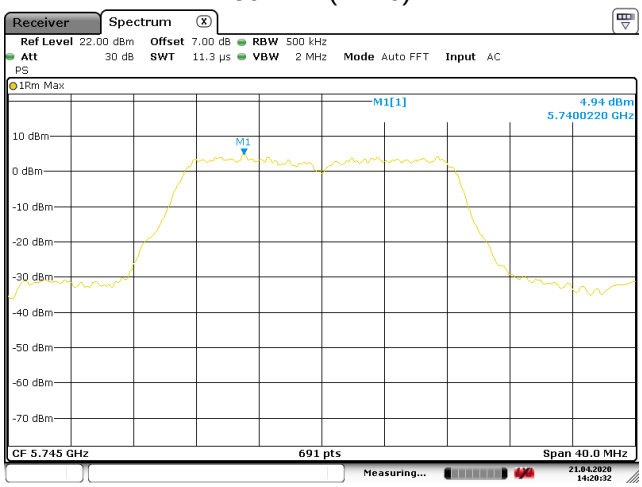
802.11a



Date: 21.APR.2020 14:18:37

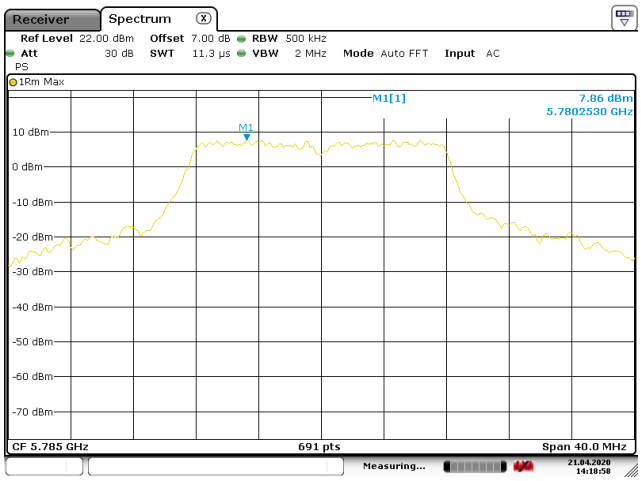
Lowest channel

802.11n(HT20)



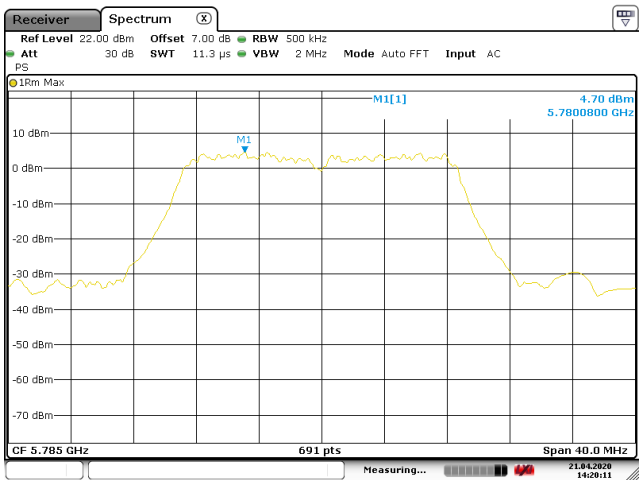
Date: 21.APR.2020 14:20:32

Middle channel



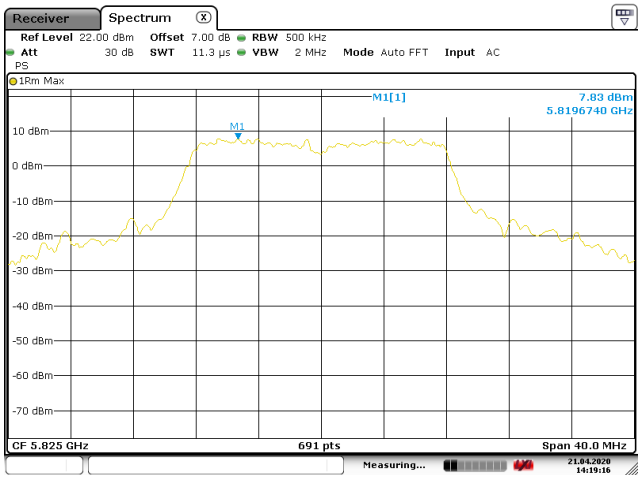
Date: 21.APR.2020 14:18:58

Middle channel



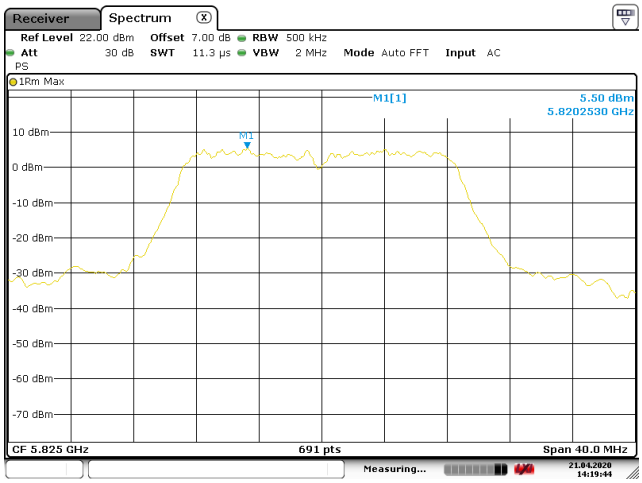
Date: 21.APR.2020 14:20:11

Middle channel



Date: 21.APR.2020 14:19:16

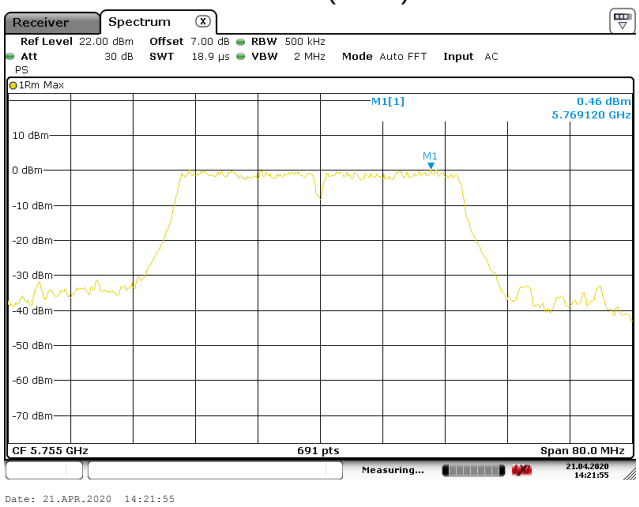
Highest channel



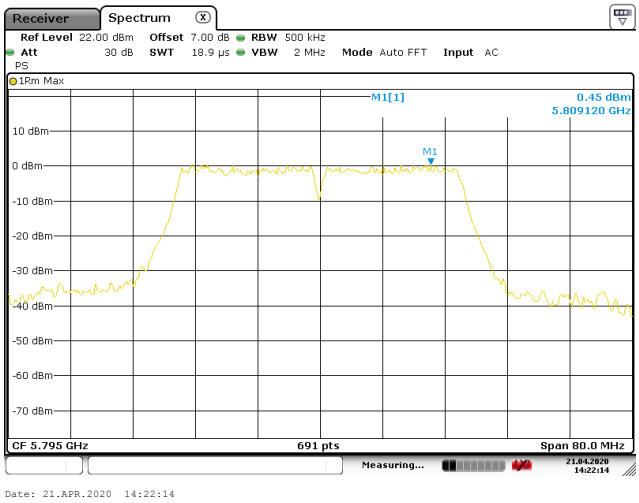
Date: 21.APR.2020 14:19:44

Highest channel

802.11n(HT40)

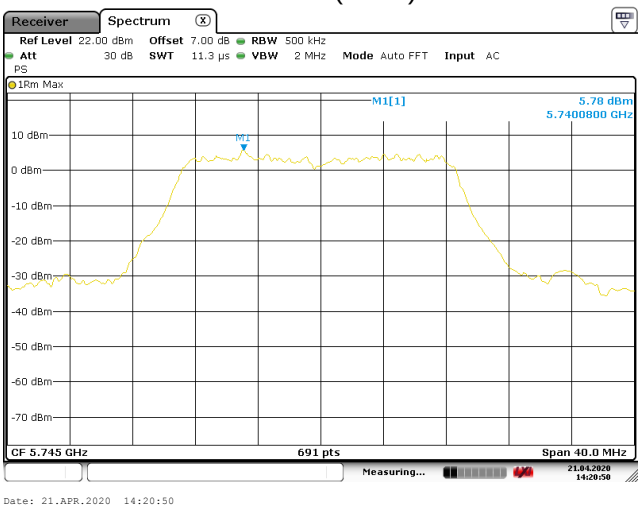


Lowest channel

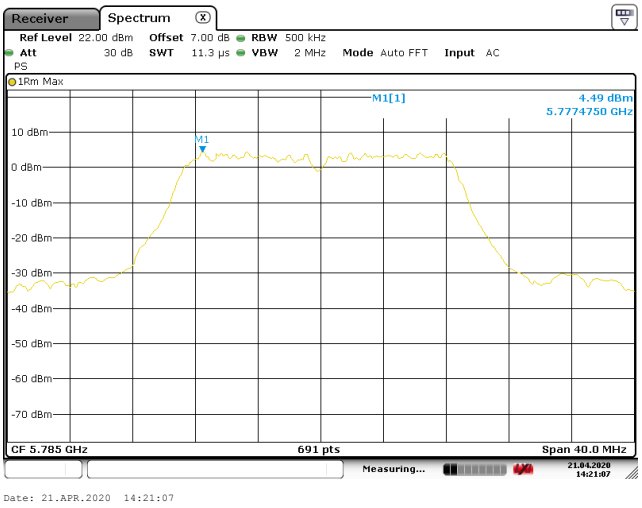


Highest channel

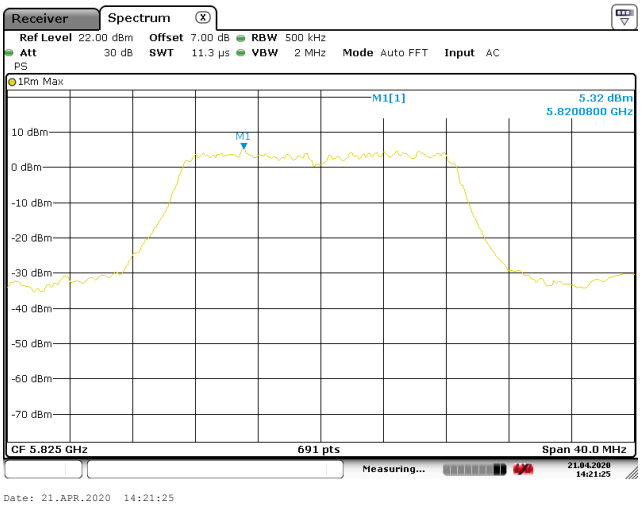
802.11ac(HT20)



Middle channel

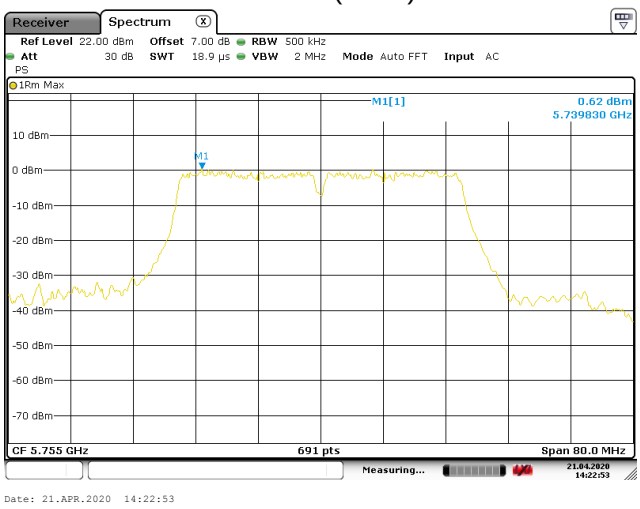


Middle channel



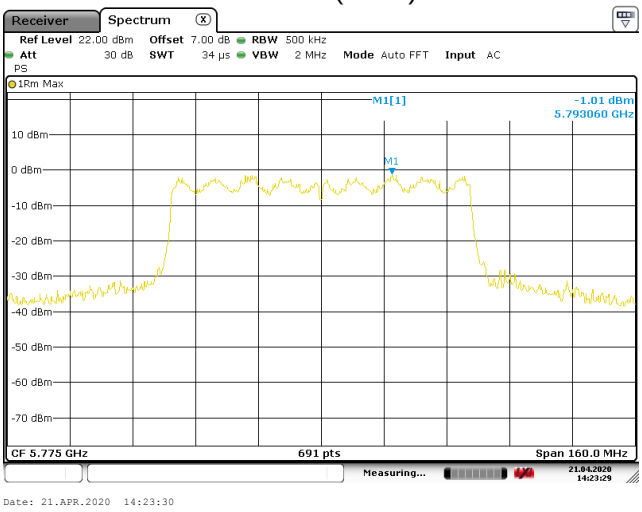
Highest channel

802.11ac(HT40)

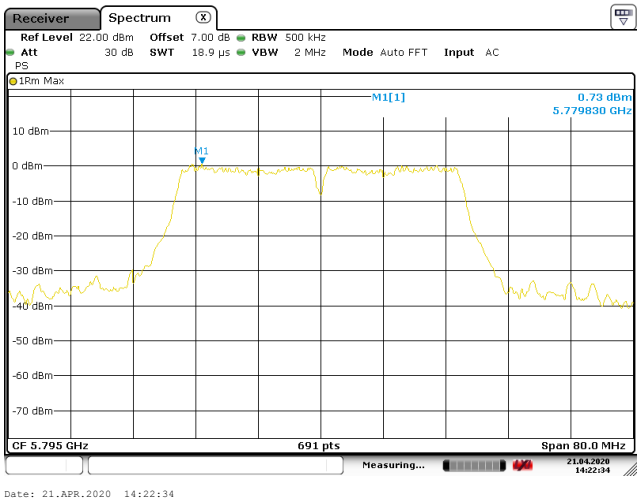


Lowest channel

802.11ac(HT80)

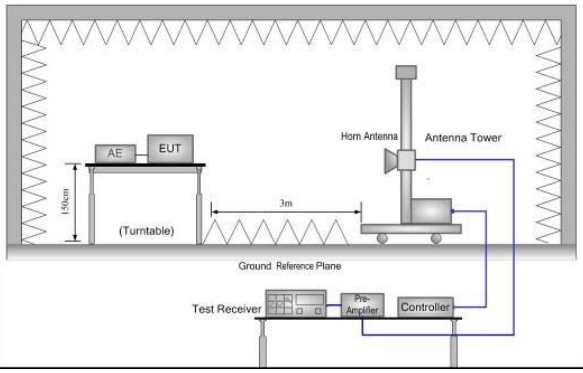


Middle channel



Highest channel

6.6 Band Edge

Test Requirement:	FCC Part 15 E Section 15.407 (b)			
Receiver setup:	Detector	RBW	VBW	Remark
	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	RMS	1MHz	3MHz	Average Value
Limit:	Band	Limit (dBuV/m @3m)		Remark
	Band 1	68.20		Peak Value
		54.00		Average Value
	Band 4 limit: For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasinglinearly 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. Remark: 1. Band 1 limit: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBuV/m, for EIPR[dBm]=-27dBm. 2. Band 4 limit: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBuV/m, for EIPR[dBm]=-27dBm. E[dBμV/m] = EIRP[dBm] + 95.2=105.2 dBuV/m, for EIPR[dBm]=10dBm. E[dBμV/m] = EIRP[dBm] + 95.2=110.8 dBuV/m, for EIPR[dBm]=15.6dBm. E[dBμV/m] = EIRP[dBm] + 95.2=122.2 dBuV/m, for EIPR[dBm]=27dBm.			
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.			
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 (worst case):

Ceramic Antenna:

Band 1:

Band 1 – 802.11a –TX0									
Test channel: Lowest channel									
Detector: Peak Value									
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	49.92	31.77	7.05	2.54	41.93	49.35	68.20	-18.85	Horizontal
5150.00	45.35	31.77	7.05	2.54	41.93	44.78	68.20	-23.42	Vertical
Detector: Average Value									
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	42.21	31.77	7.05	2.54	41.93	41.64	54.00	-12.36	Horizontal
5150.00	39.68	31.77	7.05	2.54	41.93	39.11	54.00	-14.89	Vertical
Test channel: Highest channel									
Detector: Peak Value									
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	50.15	32.24	7.11	2.61	41.89	50.22	68.20	-17.98	Horizontal
5350.00	50.00	32.24	7.11	2.61	41.89	50.07	68.20	-18.13	Vertical
Detector: Average Value									
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	40.01	32.24	7.11	2.61	41.89	40.08	54.00	-13.92	Horizontal
5350.00	41.87	32.24	7.11	2.61	41.89	41.94	54.00	-12.06	Vertical

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*