FCC Part 15.407

TEST REPORT

For

SmartRG, Inc.

501 SE Columbia Shores Blvd., Suite 500, Vancouver, WA 98661 USA

Model: SR400ac
FCC ID: VW7SR400AC

Report Type:	**Product Type:**
Class II Permissive Change	802.11ac Gigabit Router

Report Producer: Kaylee Chiang

Report Number: RSZ160104012-00CA1

Report Date: 2017-04-06

Reviewed By: Jerry Chang

Bay Area Compliance Laboratories Corp.(Taiwan)
70, Lane 169, Sec. 2, Datong Road,
Xizhi Dist.,New Taipei City 22183, Taiwan, R.O.C.
Tel: +886 (2) 2647 6898
Fax: +886 (2) 2647 6895
www.bacl.com.tw

REVISION HISTORY

Revision	Issue Date	Description
1.0	2015-09-16	Original
2.0	2017-02-24	Class II Permissive Change

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1 General Information

1.1 Product Description for Equipment Under Test (EUT)

Applicant	:	SmartRG, Inc. 501 SE Columbia Shores Blvd., Suite 500, Vancouver, WA 98661 USA
Manufacturer	:	Taicang T&W Electronics Co.,Ltd Jiangnan Road 89, Ludu Town, Taicang, Suzhou, Jiangsu, 215412, China PRC
Product	:	802.11ac Gigabit Router
Model	:	SR400ac
Trade Name	:	N/A
Frequency Range	:	5260 MHz ~5320 MHz, 5500 MHz ~ 5720 MHz
Transmit Power	:	IEEE 802.11a Mode: 13.02dBm IEEE802.11n HT20: 17.51dBm IEEE 802.11n HT40 Mode: 17.52dBm IEEE 802.11ac VHT80 Mode:17.54dBm
Modulation Technique	:	IEEE 802.11a: OFDM IEEE 802.11n HT20Mode: OFDM IEEE 802.11n HT40Mode: OFDM IEEE 802.11ac VHT80Mode: OFDM
Transmit Data Rate	:	IEEE 802.11a Mode :up to 54Mbps IEEE 802.11n Mode: up to 300Mbps IEEE 802.11ac Mode:up to 866.7Mbps
Number of Channels	:	IEEE 802.11a / IEEE802.11n HT20 Mode: 16 Channels IEEE 802.11n HT40 Mode: 8 Channels IEEE 802.11ac VHT80 Mode: 4 Channels
Antenna Specification	:	PCB Antenna Gain: 5250~5350MHz: 3.0 dBi 5470~5725MHz: 3.0 dBi
Voltage Range	:	I/P: 100-240Vac, 1.0A O/P: 12Vdc, 3 A
Date of Test	:	Feb 15, 2017~ Feb 25, 2017

**All measurement and test data in this report was gathered from production sample serial number: 1601016 (Assigned by BACL, Taiwan) The EUT supplied by the applicant was received on 2016-01-04.*

1.2 Objective

This report is prepared on behalf of *SmartRG, Inc.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B, C and E of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, and section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

This is a CIIPC application of the device; the differences between the original device and the current one are as follows:

1. Adding DFS Bands (Band 2: 5250-5350 MHz, Band 3: 5470-5725 MHz) to existing certificate through a software operation.

For the change made to the device, the required test items were performed.

1.3 Related Submittal(s)/Grant(s)

Part 15.407 submissions with FCC ID: VW7SR400AC.

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Taiwan)

1.5 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Taiwan) to collect test data is located on the 70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.
Test site at Bay Area Compliance Laboratories Corp. (Taiwan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10-2013.
The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 431084. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

2 System Test Configuration

2.1 Description of Test Configuration

The system was configured for testing in an engineering mode, which is provided by manufacture.
The system support 802.11a/n ht20/n ht40/ac vht20/ac vht40/ac vht80, the vht20/vht40 were reduced since the identical parameters with 802.11n ht20 and ht40, except the 802.11ac channel cross the band UNII 2C to U-NII 3.

FOR 5250 ~ 5350MHz
4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
56	5280	64	5320

2 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	62	5310

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
58	5290

For 802.11a, 802.11n ht20, Channel 52, 60 and 64 were tested, for 802.11n ht40, Channel 54, 62 were tested,
For 802.11ac 80, channel 58 was tested.

FOR 5470 ~ 5725MHz
12 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	124	5620
104	5520	128	5640
108	5540	132	5660
112	5560	136	5680
116	5580	140	5700
120	5600	144	5720

6 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	126	5630
110	5550	134	5670
118	5590	142	5710

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	138	5690
122	5610	/	/

For 802.11a, 802.11n ht20, Channel 100, 120 and 140 were tested, for 802.11n ht40, Channel 102, 118and 134 were tested, for 802.11ac 80, channel 106, 122 were tested. For crossband , channel 144 for n20, 142 for n40, 138 for ac80 were chosed to test for compliance requirement.

2.2 Equipment Modifications

No modification was made to the EUT

2.3 EUT Exercise Software

The software was used "MTool_2.0.1.1".

UNII Band	Mode	Channel	Frequency (MHz)	Power setting					
				SISO			MIMO		
				Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2
5250-5350MHz	802.11 a	Low	5260	55	55	55			
		Middle	5300	55	55	55			
		High	5320	55	55	55			
	5G 802.11 n20	Low	5260	55	55	55	55	55	55
		Middle	5300	55	55	55	55	55	55
		High	5320	55	55	55	55	55	55
	5G 802.11 n40	Low	5270	55	55	55	55	55	55
		High	5310	55	55	55	55	55	55
	802.11 ac80	Middle	5290	53	53	53	53	53	53
5470-5725MHz	802.11 a	Low	5500	55	55	55			
		Middle	5600	55	55	55			
		High	5700	55	55	55			
	5G 802.11 n20	Low	5500	55	55	55	55	55	55
		Middle	5600	55	55	55	55	55	55
		High	5700	55	55	55	55	55	55
	5G 802.11 n40	Low	5510	55	55	55	55	55	55
		Middle	5590	55	55	55	55	55	55
		High	5670	55	55	55	55	55	55
	802.11 ac80	Low	5530	53	53	53	53	53	53
		High	5610	53	53	53	53	53	53
5470-5725MHz Cross Band	802.11n20	High	5720	55	55	55	55	55	55
	802.11n40	High	5710	55	55	55	55	55	55
	802.11ac80	High	5690	53	53	53	53	53	53

The EUT was configured for testing in an engineering mode which was provided by the manufacturer. The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

802.11a:6Mbps
802.11n ht20:MCS0
802.11n ht40: MCS0
802.11ac 80:MCS0 Nss =1

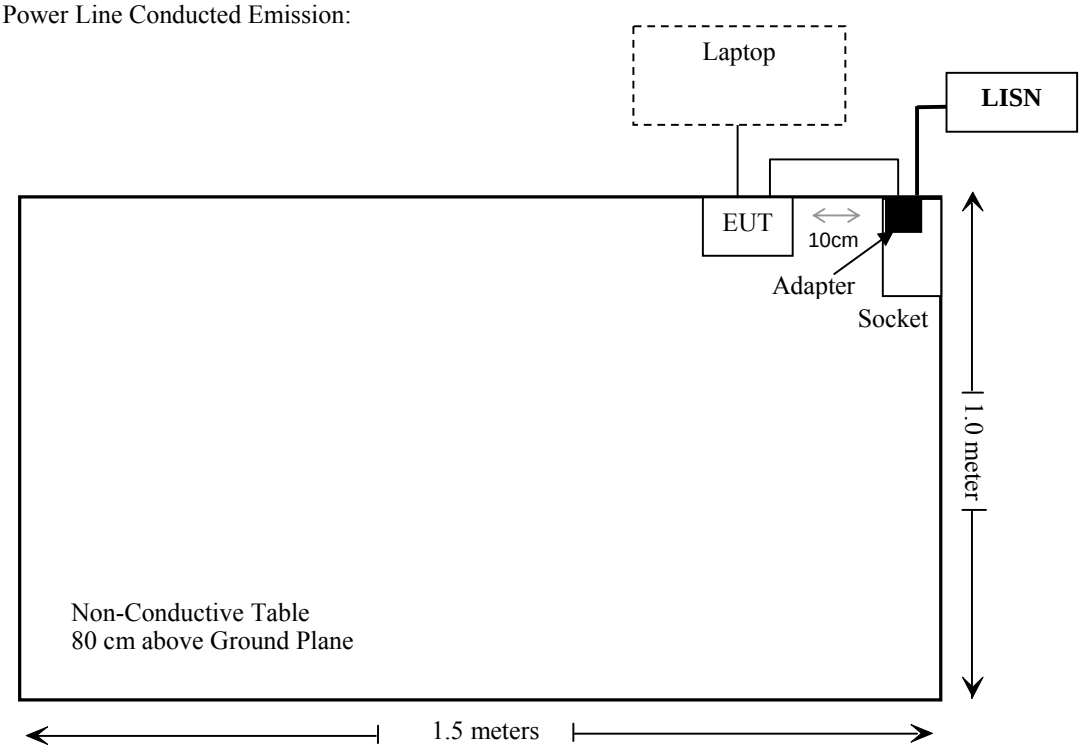
2.4 Support Equipment List and Details

Description	Manufacturer	Model Number	BSMI	FCC ID	S/N
Laptop	DELL	E6422	N/A	N/A	GYXJ3A00 JAG9

2.5 Block Diagram of Test Setup

See test photographs attached in Exhibit A for the actual connections between EUT and support equipment.

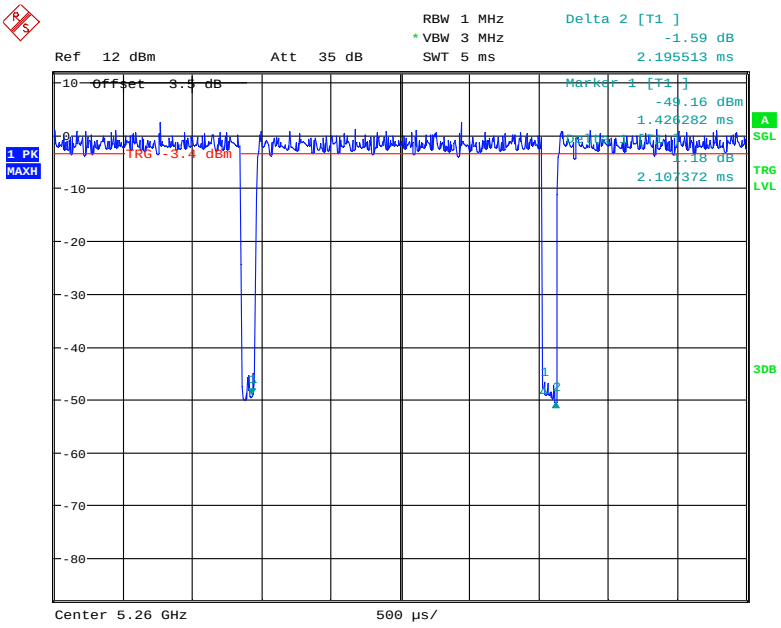
AC Power Line Conducted Emission:



2.6 Duty Cycle

Duty cycle of test signal is < 98%, duty factor shall be considered.
A Mode: Duty cycle = 0.96, Duty factor = 10 * log(1/x) = 0.18 dB,SA VBW setting1kHz
n20 Mode: Duty cycle = 0.99
n40 Mode: Duty cycle = 0.99
AC80 Mode: Duty cycle = 0.95, Duty factor = 10 * log(1/X) = 0.22 dB, SA VBW setting5kHz

A Mode



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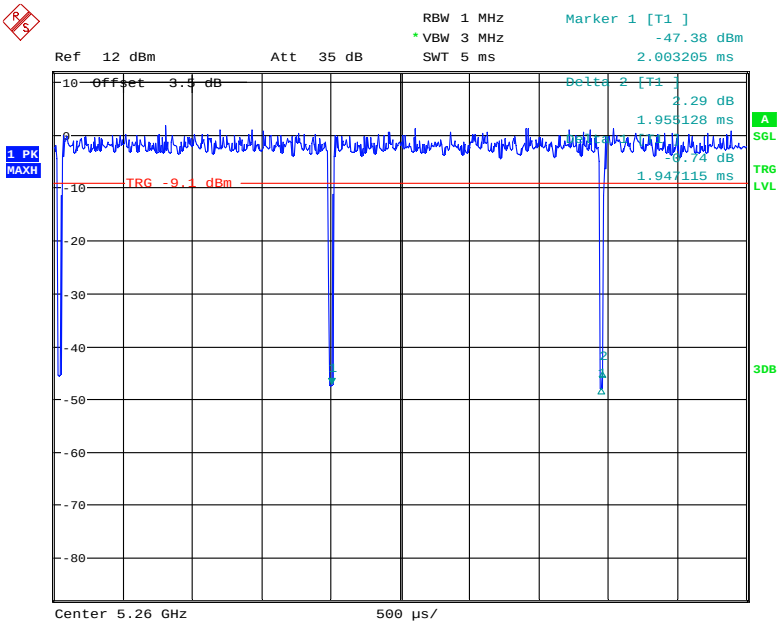
N20 Mode



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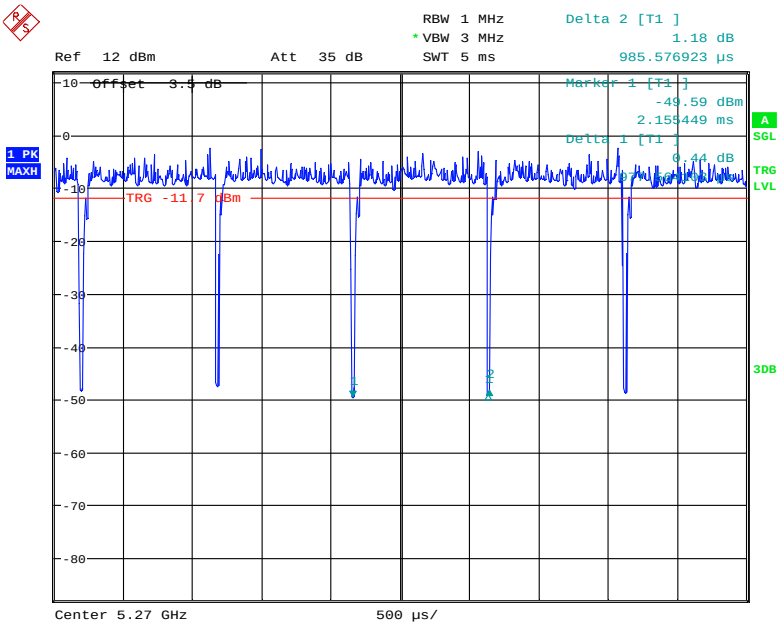
N40 Mode



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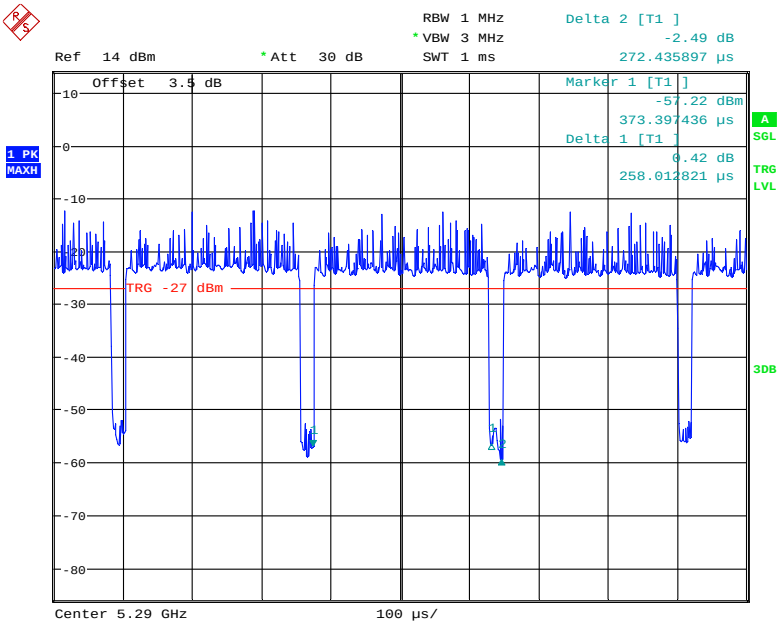
AC80 Mode



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3 Summary of Test Results

FCC Rules	Description of Test	Result
FCC §15.407 (f) & §2.1091	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	AC Line Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliance
§15.407(b) (2,(3	Out Of Band Emission	Compliance
§15.407(a) (1)	Emission Bandwidth	Compliance
§15.407(g)	Frequency Stability	Compliance
§15.407(a) (1)	Conducted Transmitter Output Power	Compliance
§15.407 (a) (1)(5)	Power Spectral Density	Compliance
§15.407(H)	Dynamic Frequency Selection	Compliance*

Compliance*: Please refer to the DFS report RSZ150819007-00 that issued on 2017-03-31.

4 FCC §15.407 (f) & §2.1091 –Maximum Permissible exposure (MPE)

4.1 Applicable Standard

According to FCC §2.1091 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Frequency Band (MHz)	**Antenna Gain**		**Max tune –up Conducted Power**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
	(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
5250-5350	3.0	2.0	18.00	63.1	20	0.025	1.0
5470-5725	3.0	2.0	18.50	70.8	20	0.028	1.0
2422-2452	3.0	2.0	22.50	177.8	20	0.071	1.0

Note: 2.4GHz band and 5GHz band can transmit simultaneounsly
The ratio=MPE_{DTS}/limit+MPE_{UNII}/limit=0.071+0.028=0.099＜1.0.

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance

5 FCC §15.203 – Antenna Requirements

5.1 Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. 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.
And according to FCC 47 CFR section 15.407 (a)(3),If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2 Antenna List and Details

Manufacturer	Model	Type	Antenna Gain	Result
N/A	N/A	PCB Antenna	5250~5350MHz: 3.0 dBi 5470~5725MHz: 3.0 dBi	Compliance

6 FCC §15.407 (b) (6)§15.207 - AC Line Conducted Emissions

6.1 Applicable Standard

FCC §15.207, §15.407(b) (6)

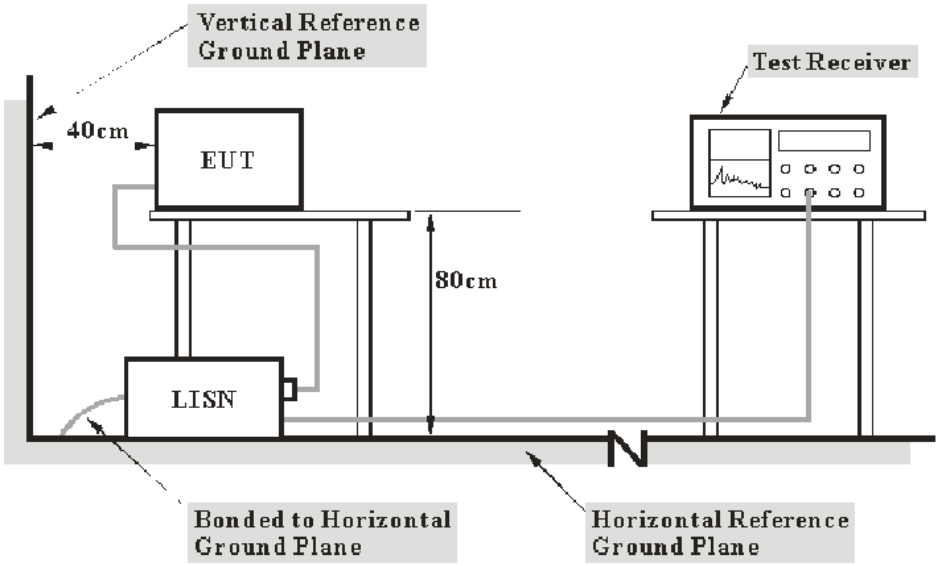
6.2 Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN/ISN and receiver, LISN/ISN voltage division factor, LISN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Taiwan) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Expanded Measurement uncertainty
AC Mains	2.71 dB (k=2, 95% level of confidence)

6.3 EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.
The spacing between the peripherals was 10 cm.

6.4 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz. During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	IF B/W
150 kHz - 30 MHz	9 kHz

6.5 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN. Maximizing procedure was performed on the six (6) highest emissions of the EUT. All data was recorded in the Quasi-peak and average detection mode.

6.6 Corrected Factor & Margin Calculation

The factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:
Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation
The "Over Limit" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of -7 dB means the emission is 7 dB below the limit. The equation for Over Limit calculation is as follows:
Over Limit = Level – Limit Line

6.7 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Date	Calibration Due Date
LISN	Rohde & Schwarz	ENV216	101248	2016/7/27	2017/7/26
LISN	EMCO	3816/2	75848	2016/8/4	2017/8/3
EMI Test Receiver	Rohde & Schwarz	ESCI	100540	2016/7/22	2017/7/21
Pulse Limiter	Rohde & Schwarz	ESH3Z2	TXZEM025	2016/8/19	2017/8/18
RF Cable	EMEC	EM-CB5D	001	2016/7/27	2017/7/26
Software	AUDIX	E3	V9.150826k	N.C.R	N.C.R

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

6.8 Test Environmental Conditions

Temperature:	25℃
Relative Humidity:	58 %
ATM Pressure:	1020 hPa

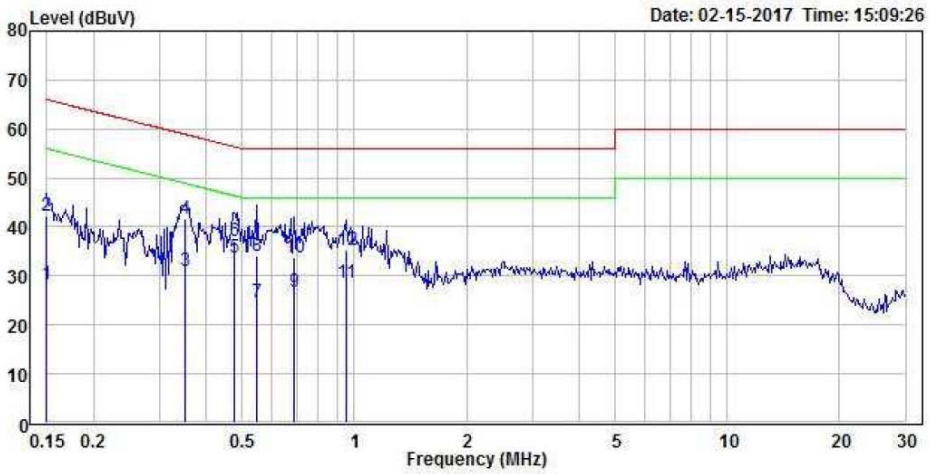
The testing was performed by David Hsu on 2017-02-15.

6.9 Test Results

Please refer to the following plots and tables.

Test Mode: Transmitting

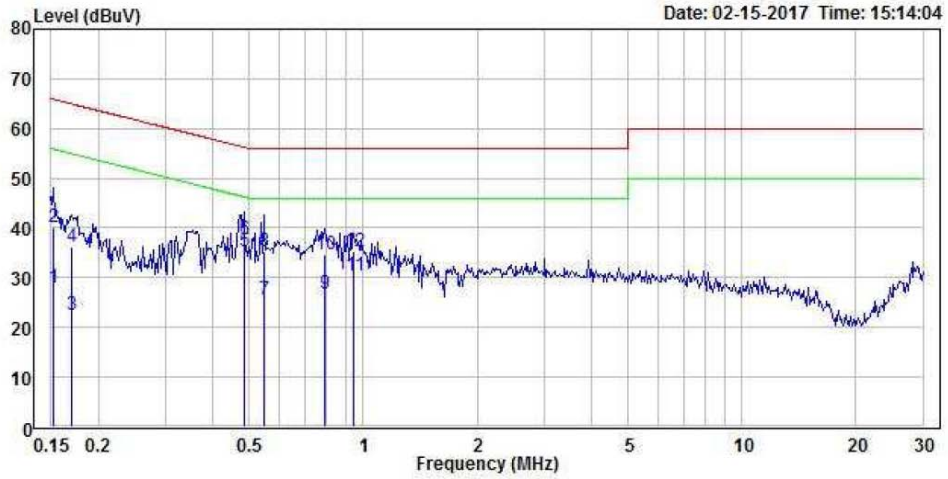
Main: AC 120V/60 Hz, Line



Condition: Line
EUT :
Mode :
Note : 120V/60Hz

	Freq	Level	Limit Line	Over Limit	Factor	Read Level	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB	dB	dBuV		
1	0.150	28.29	56.00	-27.71	19.56	8.73	Average	Line
2	0.150	42.35	66.00	-23.65	19.56	22.79	QP	Line
3	0.352	31.02	48.92	-17.90	19.55	11.47	Average	Line
4	0.352	41.68	58.92	-17.24	19.55	22.13	QP	Line
5	0.476	33.62	46.40	-12.78	19.55	14.07	Average	Line
6	0.476	36.97	56.40	-19.43	19.55	17.42	QP	Line
7	0.550	24.50	46.00	-21.50	19.55	4.95	Average	Line
8	0.550	34.05	56.00	-21.95	19.55	14.50	QP	Line
9	0.687	26.72	46.00	-19.28	19.56	7.16	Average	Line
10	0.687	33.62	56.00	-22.38	19.56	14.06	QP	Line
11	0.952	28.66	46.00	-17.34	19.59	9.07	Average	Line
12	0.952	35.14	56.00	-20.86	19.59	15.55	QP	Line

Main: AC 120V/60 Hz, Neutral



Condition: Neutral
EUT :
Mode :
Note : 120V/60Hz

	Freq	Level	Limit Line	Over Limit	Factor	Read Level	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB	dB	dBuV		
1	0.152	27.94	55.87	-27.93	19.56	8.38	Average	Neutral
2	0.152	40.08	65.87	-25.79	19.56	20.52	QP	Neutral
3	0.170	22.59	54.94	-32.35	19.54	3.05	Average	Neutral
4	0.170	36.26	64.94	-28.68	19.54	16.72	QP	Neutral
5	0.484	35.16	46.27	-11.11	19.55	15.61	Average	Neutral
6	0.484	37.72	56.27	-18.55	19.55	18.17	QP	Neutral
7	0.545	25.43	46.00	-20.57	19.55	5.88	Average	Neutral
8	0.545	35.17	56.00	-20.83	19.55	15.62	QP	Neutral
9	0.793	26.83	46.00	-19.17	19.57	7.26	Average	Neutral
10	0.793	34.57	56.00	-21.43	19.57	15.00	QP	Neutral
11	0.945	30.48	46.00	-15.52	19.58	10.90	Average	Neutral
12	0.945	35.15	56.00	-20.85	19.58	15.57	QP	Neutral

7 FCC §15.209, §15.205 && §15.407(b) –UNWANTED EMISSION

7.1 Applicable Standard

FCC§15.407 (b); §15.209; §15.205

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

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

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

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

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

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits

7.2 Measurement Uncertainty

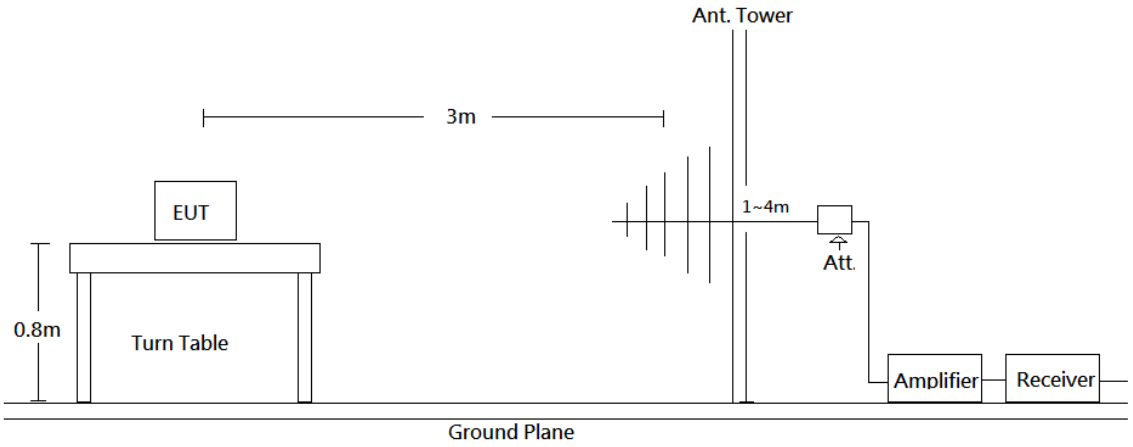
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Taiwan) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

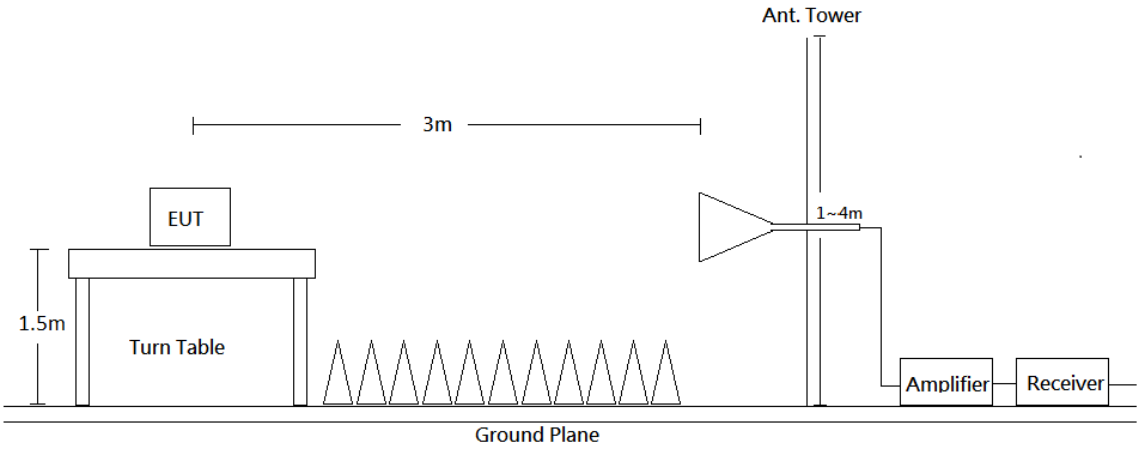
Frequency	Measurement uncertainty
30 MHz~200 MHz	4.21 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	4.41 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	4.51 dB (k=2, 95% level of confidence)
6 GHz~18 GHz	4.88 dB (k=2, 95% level of confidence)
18 GHz~26 GHz	4.30 dB (k=2, 95% level of confidence)
26 GHz~40 GHz	4.30 dB (k=2, 95% level of confidence)

7.3 EUT Setup

Blow 1 GHz:



Above 1 GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 and FCC 15.407 Limits.

7.4 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Frequency Range	RBW	VBW	IF BW	Detector	Duty cycle
30-1000 MHz	100 kHz	300 kHz	120 kHz	QP	
Above 1 GHz	1 MHz	3 MHz	/	PK	
	1 MHz	10 Hz	/	Ave	>98%
	1 MHz	1/T	/	Ave	<98%

7.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.
All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

According to C63.10-2013, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3meters.
Frequency Band 5150~5250 MHz,5250~5350 MHz and 5470~5725MHz EIRP Limit -27(dBm/MHz)
Equivalent Field Strength at 3m is 68.23dBμV/m
Frequency Band 5725~5850 MHz,EIRP is all emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Equivalent Field Strength at 3m isall emissions shall be limited to a level of 68.2 dBμV/m at 75 MHz or more above or below the band edge increasing linearly to 105.2 dBμV/m 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 110.8 dBμV/m 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 122.2dBμV/m at the band edge

7.6 Corrected Factor & Margin Calculation

The Correct Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Result –Limit

7.7 Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.209 Limit and FCC 15.407 Limits. Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$Lm + U(Lm) \leq Llim + Ucispr$

In BACL, U(Lm) is less than Ucispr, if Lm is less than Llim, it implies that the EUT complies with the limit.

7.8 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Date	Calibration Due Date
Broadband Antenna	Sunol Sciences	JB6	A050115	2016/11/16	2017/11/15
Amplifier	Sonoma	310N	130602	2016/7/15	2017/7/14
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2016/11/3	2017/11/2
Mircoflex Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2016/11/2	2017/11/1
Mircoflex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2016/7/15	2017/7/14
Mircoflex Cable	UTIFLEX	UFA210A-1-3149-300300	MFR64639 226389-001	2016/12/1	2017/11/30
Turn Table	Champro	TT-2000	060772-T	N.C.R	N.C.R
Antenna Tower	Champro	AM-BS-4500-B	060772-A	N.C.R	N.C.R
Controller	Champro	EM1000	060772	N.C.R	N.C.R
Software	Farad	EZ_EMC	BACL-03A1	N.C.R	N.C.R
Horn Antenna	EMCO	3115	9311-4158	2016/5/10	2017/5/9
Horn Antenna	ETS-Lindgren	3116	00062638	2016/9/5	2017/9/4
Preamplifier	EMEC	EM01G18G	060657	2016/12/13	2017/12/12
Preamplifier	EMEC	EM18G40G	060656	2016/12/13	2017/12/12
Spectrum Analyzer	Rohde & Schwarz	FSEK30	825084/006	2016/7/14	2017/7/13
Mircoflex Cable	ROSNAL	K1K50-UP0264-K1K50-80CM	160309-2	2016/3/24	2017/3/23
Mircoflex Cable	ROSNAL	K1K50-UP0264-K1K50-450CM	160309-1	2016/3/24	2017/3/23

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

7.9 Test Environmental Conditions

Temperature:	25℃
Relative Humidity:	58 %
ATM Pressure:	1020 hPa

The testing was performed by David Hsu on 2017-02-15.

7.10 Test Results

Mode: *Transmitting Mode*

Below 1 GHz (the worst case is 802.11n HT20)

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	31.95	32.17	-3.57	28.6	40.00	-11.4	114.0	26.0	QP
2	36.25	34.36	-7.03	27.33	40.00	-12.67	102.0	0.0	QP
3	44.75	35.67	-10.66	25.01	40.00	-14.99	102.0	289.0	QP
4	144.00	40.07	-10.96	29.11	43.50	-14.39	199.0	304.0	QP
5	375.00	43.97	-8.77	35.2	46.00	-10.8	102.0	348.0	QP
6	500.01	48.79	-5.72	43.07	46.00	-2.93	108.0	18.0	QP

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	263.35	44.01	-11.33	32.68	46.00	-13.32	124.0	323.0	QP
2	387.45	39.23	-8.77	30.46	46.00	-15.54	166.0	327.0	QP
3	434.03	47.30	-7.73	39.57	46.00	-6.43	100.0	37.0	QP
4	469.11	49.40	-6.52	42.88	46.00	-3.12	104.0	26.0	QP
5	532.86	34.75	-5.72	29.03	46.00	-16.97	100.0	159.0	QP
6	800.03	38.55	-0.57	37.98	46.00	-8.02	104.0	176.0	QP

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Above 1 GHz

For 802.11 a mode, the three antennas can transmit separately. And we pre-tested the spurious with the three antennas; the worst case is from the Chain 0.

For 802.11n&ac mode, the three antennas can transmit simultaneously. And we pre-tested separately and simultaneously the spurious with the three antennas. The worst case is the three antennas transmit simultaneously.

Mode: 802.11a / 5260MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5260.000	104.66	2.13	106.79	NA	NA	130	325	peak
2	5260.000	89.63	2.13	91.76	NA	NA	130	325	AVG
3	5149.000	49.17	1.82	50.99	74.00	-23.01	170	298	peak
4	5149.000	36.02	1.82	37.84	54.00	-16.16	170	298	AVG
5	10520.000	41.58	12.51	54.09	74.00	-19.91	140	276	peak
6	10520.000	26.84	12.51	39.35	54.00	-14.65	140	276	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5260.000	102.47	2.13	104.6	NA	NA	140	290	peak
2	5260.000	88.77	2.13	90.9	NA	NA	140	290	AVG
3	5149.000	49.78	1.82	51.6	74.00	-22.4	190	88	peak
4	5149.000	34.61	1.82	36.43	54.00	-17.57	190	88	AVG
5	10520.000	42.27	12.51	54.78	74.00	-19.22	230	256	peak
6	10520.000	28.35	12.51	40.86	54.00	-13.14	230	256	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode: 802.11a / 5300MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5300.000	104.3	2.13	106.43	NA	NA	150	177	peak
2	5300.000	90.11	2.13	92.24	NA	NA	150	177	AVG
3	10600.000	40.89	12.61	53.5	74.00	-20.50	210	99	peak
4	10600.000	25.82	12.61	38.43	54.00	-15.57	210	99	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5300.000	102.36	2.13	104.49	NA	NA	200	199	peak
2	5300.000	87.68	2.13	89.81	NA	NA	200	199	AVG
3	10600.000	42.06	12.61	54.67	74.00	-19.33	200	51	peak
4	10600.000	27.82	12.61	40.43	54.00	-13.57	200	51	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode: 802.11a / 5320MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5320.000	102.36	2.13	104.49	NA	NA	140	121	peak
2	5320.000	88.89	2.13	91.02	NA	NA	140	121	AVG
3	5350.000	50.81	2.28	53.09	74.00	-20.91	130	101	peak
4	5350.000	35.78	2.28	38.06	54.00	-15.94	130	101	AVG
5	10640.000	41.14	12.61	53.75	74.00	-20.25	140	258	peak
6	10640.000	25.48	12.61	38.09	54.00	-15.91	140	258	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5320.000	100.46	2.13	102.59	NA	NA	200	241	peak
2	5320.000	86.19	2.13	88.32	NA	NA	200	241	AVG
3	5350.000	48.45	2.28	50.73	74.00	-23.27	140	158	peak
4	5350.000	35.14	2.28	37.42	54.00	-16.58	140	158	AVG
5	10640.000	42.04	12.61	54.65	74.00	-19.35	160	219	peak
6	10640.000	26.59	12.61	39.2	54.00	-14.8	160	219	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode: 802.11a / 5500MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5500.000	113.17	2.44	115.61	NA	NA	240	292	peak
2	5500.000	99.67	2.44	102.11	NA	NA	240	292	AVG
3	5469.000	50.98	2.44	53.42	74.00	-20.58	200	146	peak
4	5469.000	36.9	2.44	39.34	54.00	-14.66	200	146	AVG
5	11000.000	45.15	13	58.15	74.00	-15.85	190	175	peak
6	11000.000	26.04	13	39.04	54.00	-14.96	190	175	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5500.000	110.2	2.44	112.64	NA	NA	110	53	peak
2	5500.000	95.57	2.44	98.01	NA	NA	110	53	AVG
3	5469.000	48.4	2.44	50.84	74.00	-23.16	180	320	peak
4	5469.000	35.53	2.44	37.97	54.00	-16.03	180	320	AVG
5	11000.000	38.67	13	51.67	74.00	-22.33	250	93	peak
6	11000.000	23.36	13	36.36	54.00	-17.64	250	93	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other spurious emission which is 20dB to the limit was not recorded.

Mode: 802.11a / 5600MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5600.000	112.48	2.7	115.18	NA	NA	230	325	peak
2	5600.000	97.25	2.7	99.95	NA	NA	230	325	AVG
3	11200.000	43.04	13.07	56.11	74.00	-17.89	180	64	peak
4	11200.000	26.95	13.07	40.02	54.00	-13.98	180	64	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5600.000	109.43	2.7	112.13	NA	NA	230	169	peak
2	5600.000	95.29	2.7	97.99	NA	NA	230	169	AVG
3	11200.000	38.68	13.07	51.75	74.00	-22.25	110	153	peak
4	11200.000	24.44	13.07	37.51	54.00	-16.49	110	153	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode: 802.11a / 5700MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5700.000	111.24	2.95	114.19	NA	NA	160	33	peak
2	5700.000	95.84	2.95	98.79	NA	NA	160	33	AVG
3	5725.000	53.37	2.95	56.32	74.00	-17.68	120	148	peak
4	5725.000	39.22	2.95	42.17	54.00	-11.83	120	148	AVG
5	11400.000	42.44	13.14	55.58	74.00	-18.42	180	275	peak
6	11400.000	27.36	13.14	40.5	54.00	-13.5	180	275	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5700.000	105.73	2.95	108.68	NA	NA	170	210	peak
2	5700.000	91.15	2.95	94.10	NA	NA	170	210	AVG
3	5725.000	48.04	2.95	50.99	74.00	-23.01	190	326	peak
4	5725.000	34.86	2.95	37.81	54.00	-16.19	190	326	AVG
5	11400.000	39.15	13.14	52.29	74.00	-21.71	210	260	peak
6	11400.000	23.67	13.14	36.81	54.00	-17.19	210	260	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT20 / 5260MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5260.000	110.55	2.13	112.68	NA	NA	110	37	peak
2	5260.000	97.03	2.13	99.16	NA	NA	110	37	AVG
3	5150.000	51.49	1.97	53.46	74.00	-20.54	230	48	peak
4	5150.000	37.17	1.97	39.14	54.00	-14.86	230	48	AVG
5	10520.000	45.35	12.51	57.86	74.00	-16.14	180	214	peak
6	10520.000	26.18	12.51	38.69	54.00	-15.31	180	214	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5260.000	107.64	2.13	109.77	NA	NA	110	330	peak
2	5260.000	92.98	2.13	95.11	NA	NA	110	330	AVG
3	5150.000	48.68	1.97	50.65	74.00	-23.35	160	352	peak
4	5150.000	36.04	1.97	38.01	54.00	-15.99	160	352	AVG
5	10520.000	41.07	12.51	53.58	74.00	-20.42	190	209	peak
6	10520.000	25.69	12.51	38.20	54.00	-15.80	190	209	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT20 / 5300MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5300.000	110.22	2.13	112.35	NA	NA	240	338	peak
2	5300.000	94.79	2.13	96.92	NA	NA	240	338	AVG
3	10600.000	41.23	12.61	53.84	74.00	-20.16	120	253	peak
4	10600.000	26.3	12.61	38.91	54.00	-15.09	120	253	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5300.000	107.37	2.13	109.50	NA	NA	170	347	peak
2	5300.000	93.09	2.13	95.22	NA	NA	170	347	AVG
3	10600.000	39.06	12.61	51.67	74.00	-22.33	120	329	peak
4	10600.000	24.81	12.61	37.42	54.00	-16.58	120	329	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT20 / 5320MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5320.000	110.89	2.13	113.02	NA	NA	240	184	peak
2	5320.000	95.9	2.13	98.03	NA	NA	240	184	AVG
3	5350.000	53.64	2.28	55.92	74.00	-18.08	200	360	peak
4	5350.000	39.53	2.28	41.81	54.00	-12.19	200	360	AVG
5	10640.000	41.82	12.61	54.43	74.00	-19.57	160	266	peak
6	10640.000	26.56	12.61	39.17	54.00	-14.83	160	266	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5320.000	105.75	2.13	107.88	NA	NA	240	310	peak
2	5320.000	91.03	2.13	93.16	NA	NA	240	310	AVG
3	5350.000	48.53	2.28	50.81	74.00	-23.19	180	348	peak
4	5350.000	35.17	2.28	37.45	54.00	-16.55	180	348	AVG
5	10640.000	38.76	12.61	51.37	74.00	-22.63	230	44	peak
6	10640.000	23.25	12.61	35.86	54.00	-18.14	230	44	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT20 / 5500MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5500.000	108.45	2.44	110.89	NA	NA	150	333	peak
2	5500.000	94.21	2.44	96.65	NA	NA	150	333	AVG
3	5470.000	54.67	2.44	57.11	74.00	-16.89	130	268	peak
4	5470.000	35.6	2.44	38.04	54.00	-15.96	130	268	AVG
5	11000.000	46.16	13	59.16	74.00	-14.84	240	68	peak
6	11000.000	27.97	13	40.97	54.00	-13.03	240	68	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5500.000	107.41	2.44	109.85	NA	NA	130	295	peak
2	5500.000	91.88	2.44	94.32	NA	NA	130	295	AVG
3	5470.000	50.86	2.44	53.30	74.00	-20.70	170	259	peak
4	5470.000	27.99	2.44	30.43	54.00	-23.57	170	259	AVG
5	11000.000	38.77	13	51.77	74.00	-22.23	120	217	peak
6	11000.000	20.71	13	33.71	54.00	-20.29	120	217	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT20 / 5600MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5600.000	107.17	2.7	109.87	NA	NA	140	33	peak
2	5600.000	92.67	2.7	95.37	NA	NA	140	33	AVG
3	11200.000	40.96	13.07	54.03	74.00	-19.97	250	188	peak
4	11200.000	26.49	13.07	39.56	54.00	-14.44	250	188	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5600.000	105.46	2.7	108.16	NA	NA	120	24	peak
2	5600.000	90.33	2.7	93.03	NA	NA	120	24	AVG
3	11200.000	37.14	13.07	50.21	74.00	-23.79	210	358	peak
4	11200.000	18.39	13.07	31.46	54.00	-22.54	210	358	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT20 / 5700MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5700.000	103.82	2.95	106.77	NA	NA	210	254	peak
2	5700.000	88.84	2.95	91.79	NA	NA	210	254	AVG
3	5725.000	55.03	2.95	57.98	74.00	-16.02	160	43	peak
4	5725.000	37.21	2.95	40.16	54.00	-13.84	160	43	AVG
5	11400.000	42.32	13.14	55.46	74.00	-18.54	120	320	peak
6	11400.000	26.81	13.14	39.95	54.00	-14.05	120	320	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5700.000	102.22	2.95	105.17	NA	NA	190	141	peak
2	5700.000	88.07	2.95	91.02	NA	NA	190	141	AVG
3	5725.000	47.3	2.95	50.25	74.00	-23.75	210	265	peak
4	5725.000	29.49	2.95	32.44	54.00	-21.56	210	265	AVG
5	11400.000	38.28	13.14	51.42	74.00	-22.58	160	321	peak
6	11400.000	19.42	13.14	32.56	54.00	-21.44	160	321	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT40 / 5270MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5270.000	103.78	2.13	105.91	NA	NA	100	281	peak
2	5270.000	88.85	2.13	90.98	NA	NA	100	281	AVG
3	5150.000	51.07	1.97	53.04	74	-20.96	160	325	peak
4	5150.000	35.88	1.97	37.85	54	-16.15	160	325	AVG
5	10540.000	44.08	12.51	56.59	74	-17.41	190	40	peak
6	10540.000	28.29	12.51	40.8	54	-13.2	190	40	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5270.000	99.34	2.13	101.47	NA	NA	190	3	peak
2	5270.000	85.39	2.13	87.52	NA	NA	190	3	AVG
3	5150.000	54.1	1.97	56.07	74	-17.93	110	216	peak
4	5150.000	33.12	1.97	35.09	54	-18.91	110	216	AVG
5	10540.000	43.31	12.51	55.82	74	-18.18	200	294	peak
6	10540.000	23.96	12.51	36.47	54	-17.53	200	294	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT40 / 5310MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5310.000	105.19	2.13	107.32	NA	NA	140	192	peak
2	5310.000	86.91	2.13	89.04	NA	NA	140	192	AVG
3	5350.000	55.9	2.28	58.18	74	-15.82	220	291	peak
4	5350.000	42.15	2.28	44.43	54	-9.57	220	291	AVG
5	10620.000	43.39	12.61	56	74	-18	120	279	peak
6	10620.000	27.99	12.61	40.6	54	-13.4	120	279	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5310.000	100.57	2.13	102.7	NA	NA	150	141	peak
2	5310.000	84.43	2.13	86.56	NA	NA	150	141	AVG
3	5350.000	50.3	2.28	52.58	74	-21.42	170	8	peak
4	5350.000	37.01	2.28	39.29	54	-14.71	170	8	AVG
5	10620.000	43.02	12.61	55.63	74	-18.37	240	220	peak
6	10620.000	27.34	12.61	39.95	54	-14.05	240	220	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT40 / 5510MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5510.000	107.35	2.44	109.79	NA	NA	170	18	peak
2	5510.000	92.96	2.44	95.4	NA	NA	170	18	AVG
3	5470.000	55.47	2.44	57.91	74	-16.09	230	336	peak
4	5470.000	41.42	2.44	43.86	54	-10.14	230	336	AVG
5	11020.000	44.1	13	57.1	74	-16.9	230	109	peak
6	11020.000	28.47	13	41.47	54	-12.53	230	109	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5510.000	104.12	2.44	106.56	NA	NA	160	140	peak
2	5510.000	89.59	2.44	92.03	NA	NA	160	140	AVG
3	5470.000	50.34	2.44	52.78	74	-21.22	210	155	peak
4	5470.000	37.18	2.44	39.62	54	-14.38	210	155	AVG
5	11020.000	40.36	13	53.36	74	-20.64	240	138	peak
6	11020.000	25.18	13	38.18	54	-15.82	240	138	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT40 / 5590MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5590.000	105.2	2.7	107.9	NA	NA	100	235	peak
2	5590.000	90.26	2.7	92.96	NA	NA	100	235	AVG
3	11180.000	42.48	13.07	55.55	74.00	-18.45	100	27	peak
4	11180.000	27.33	13.07	40.4	54.00	-13.6	100	27	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5590.000	103.05	2.7	105.75	NA	NA	140	99	peak
2	5590.000	89.27	2.7	91.97	NA	NA	140	99	AVG
3	11180.000	38.06	13.07	51.13	74.00	-22.87	170	343	peak
4	11180.000	20.42	13.07	33.49	54.00	-20.51	170	343	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT40 / 5670MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5670.000	107.24	2.95	110.19	NA	NA	150	169	peak
2	5670.000	91.95	2.95	94.9	NA	NA	150	169	AVG
3	5725.000	55.81	2.95	58.76	74.00	-15.24	180	75	peak
4	5725.000	38.3	2.95	41.25	54.00	-12.75	180	75	AVG
5	11340.000	42.58	13.1	55.68	74.00	-18.32	190	320	peak
6	11340.000	27.43	13.1	40.53	54.00	-13.47	190	320	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5670.000	103.85	2.95	106.8	NA	NA	130	160	peak
2	5670.000	89.61	2.95	92.56	NA	NA	130	160	AVG
3	5725.000	48.67	2.95	51.62	74.00	-22.38	210	245	peak
4	5725.000	31.03	2.95	33.98	54.00	-20.02	210	245	AVG
5	11340.000	39.83	13.1	52.93	74.00	-21.07	190	36	peak
6	11340.000	20.52	13.1	33.62	54.00	-20.38	190	36	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11ac VHT80 / 5290MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5290.000	102.43	2.13	104.56	NA	NA	130	317	peak
2	5290.000	88.43	2.13	90.56	NA	NA	130	317	AVG
3	5150.000	52.09	1.97	54.06	74.00	-19.94	170	37	peak
4	5150.000	36.17	1.97	38.14	54.00	-15.86	170	37	AVG
5	5350.000	53.41	2.28	55.69	74.00	-18.31	100	241	peak
6	5350.000	40.09	2.28	42.37	54.00	-11.63	100	241	AVG
7	10580.000	41.35	12.61	53.96	74.00	-20.04	250	351	peak
8	10580.000	26.51	12.61	39.12	54.00	-14.88	250	351	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5290.000	97.25	2.13	99.38	NA	NA	210	288	peak
2	5290.000	82.6	2.13	84.73	NA	NA	210	288	AVG
3	5150.000	48.65	1.97	50.62	74	-23.38	120	356	peak
4	5150.000	35.97	1.97	37.94	54	-16.06	120	356	AVG
5	5350.000	49.35	2.28	51.63	74	-22.37	170	305	peak
6	5350.000	33.81	2.28	36.09	54	-17.91	170	305	AVG
7	10580.000	40.66	12.61	53.27	74	-20.73	150	184	peak
8	10580.000	28.24	12.61	40.85	54	-13.15	150	184	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11ac VHT80 / 5530MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5530.000	102.11	2.44	104.55	NA	NA	250	163	peak
2	5530.000	88.01	2.44	90.45	NA	NA	250	163	AVG
3	5470.000	53.69	2.44	56.13	74.00	-17.87	190	173	peak
4	5470.000	39.58	2.44	42.02	54.00	-11.98	190	173	AVG
5	11060.000	41.15	13.03	54.18	74.00	-19.82	100	121	peak
6	11060.000	26.51	13.03	39.54	54.00	-14.46	100	121	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5530.000	97.12	2.44	99.56	NA	NA	110	263	peak
2	5530.000	83.67	2.44	86.11	NA	NA	110	263	AVG
3	5470.000	48.5	2.44	50.94	74.00	-23.06	170	214	peak
4	5470.000	34.98	2.44	37.42	54.00	-16.58	170	214	AVG
5	11060.000	38.22	13.03	51.25	74.00	-22.75	160	357	peak
6	11060.000	23.22	13.03	36.25	54.00	-17.75	160	357	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11ac VHT80 / 5610MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5610.000	100.69	2.7	103.39	NA	NA	250	163	peak
2	5610.000	86.59	2.7	89.29	NA	NA	250	163	AVG
3	5725.000	53.18	2.95	56.13	74.00	-17.87	190	173	peak
4	5725.000	39.07	2.95	42.02	54.00	-11.98	190	173	AVG
5	11220.000	40.83	13.07	53.9	74.00	-20.1	160	272	peak
6	11220.000	26.19	13.07	39.26	54.00	-14.74	160	272	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5610.000	95.7	2.7	98.4	NA	NA	180	140	peak
2	5610.000	82.25	2.7	84.95	NA	NA	180	140	AVG
3	5725.000	47.99	2.95	50.94	74.00	-23.06	160	219	peak
4	5725.000	34.47	2.95	37.42	54.00	-16.58	160	219	AVG
5	11220.000	38.18	13.07	51.25	74.00	-22.75	110	357	peak
6	11220.000	23.18	13.07	36.25	54.00	-17.75	110	357	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT20 / 5720MHz / Cross Band

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5720.000	103.07	2.95	106.02	NA	NA	190	41	peak
2	5720.000	88.51	2.95	91.46	NA	NA	190	41	AVG
3	11440.000	41.43	13.14	54.57	74.00	-19.43	170	322	peak
4	11440.000	25.7	13.14	38.84	54.00	-15.16	170	322	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5720.000	101.21	2.95	104.16	NA	NA	240	265	peak
2	5720.000	87.11	2.95	90.06	NA	NA	240	265	AVG
3	11440.000	35.9	13.14	49.04	74.00	-24.96	210	274	peak
4	11440.000	18.19	13.14	31.33	54.00	-22.67	210	274	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11n HT40 / 5710MHz / Cross Band

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5710.000	104.99	2.95	107.94	NA	NA	240	100	peak
2	5710.000	90.34	2.95	93.29	NA	NA	240	100	AVG
3	11420.000	42.98	13.14	56.12	74.00	-17.88	110	148	peak
4	11420.000	27.86	13.14	41	54.00	-13	110	148	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5710.000	101.46	2.95	104.41	NA	NA	190	168	peak
2	5710.000	86.94	2.95	89.89	NA	NA	190	168	AVG
3	11420.000	39.46	13.14	52.6	74.00	-21.4	160	142	peak
4	11420.000	26.76	13.14	39.9	54.00	-14.1	160	142	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Mode:802.11ac VHT80 / 5690MHz / Cross Band

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5690.000	100.44	2.95	103.39	NA	NA	190	173	peak
2	5690.000	86.34	2.95	89.29	NA	NA	190	173	AVG
3	11380.000	40.76	13.14	53.9	74.00	-20.1	160	272	peak
4	11380.000	26.12	13.14	39.26	54.00	-14.74	160	272	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5690.000	95.45	2.95	98.40	NA	NA	180	219	peak
2	5690.000	82.00	2.95	84.95	NA	NA	180	219	AVG
3	11380.000	37.80	13.14	50.94	74.00	-23.06	160	357	peak
4	11380.000	24.28	13.14	37.42	54.00	-16.58	160	357	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The other spurious emission which is 20dB to the limit was not recorded.

8 FCC §15.407(B) (2),(3) –OUT OF BAND EMISSION

8.1 Applicable Standard

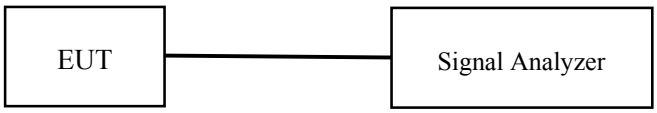
FCC §15.407 (b) (2), (3);

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

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

8.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The Resolution bandwidth is set to 1MHz, The Video bandwidth is set to ≥ 1MHz, report the peak value out of the oprating band.
3. Repeat above procedures until all frequencies measured were complete.



8.3 Test Equipment List and Details

Description	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

8.4 Test Environmental Conditions

Temperature:	22 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

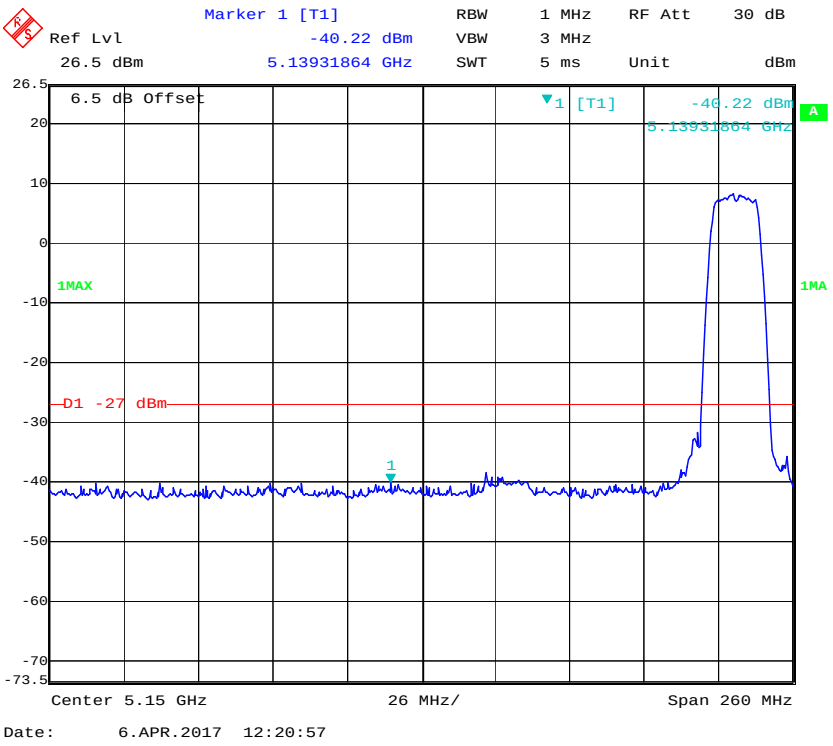
The testing was performed by David Hsu on 2017-04-06.

EUT operation mode: Transmitting

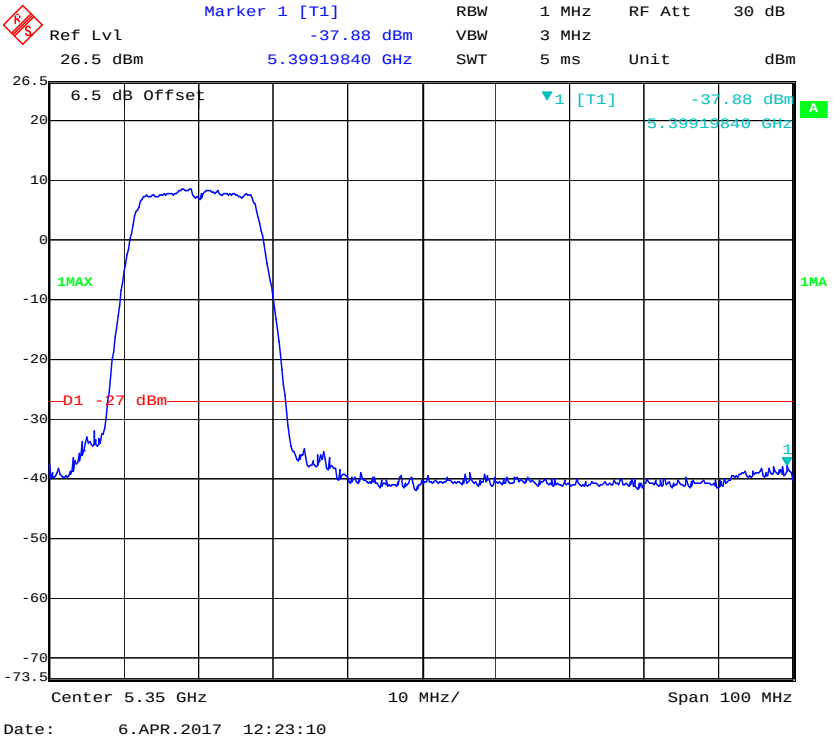
Note: The antenna gain had been offset in the plot, the limit is EIRP, 3 antenna can transmitting together.

5250 – 5350 MHz, Chain 0:

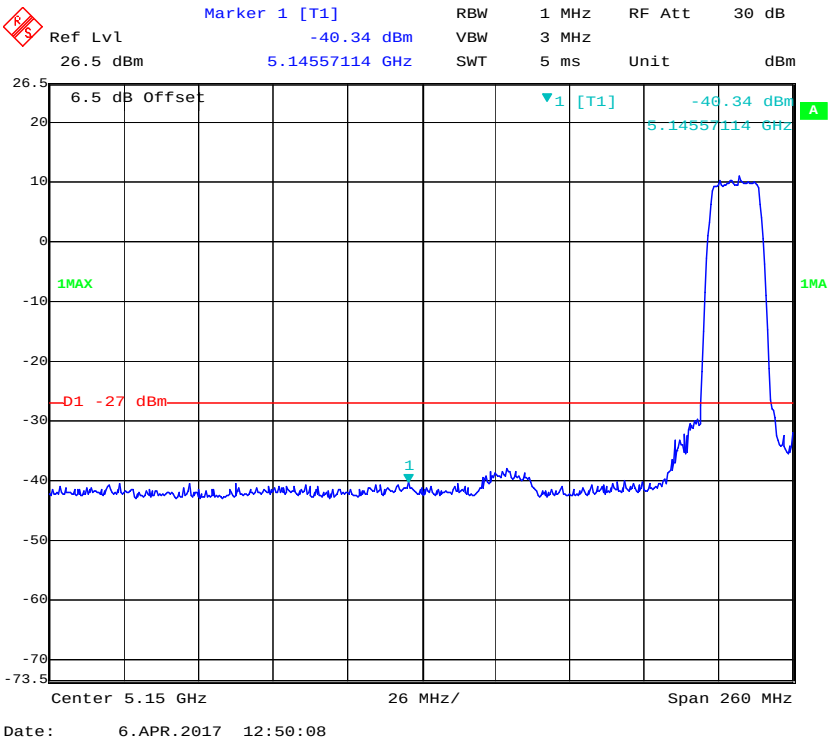
802.11a mode, Band Edge, Left Side



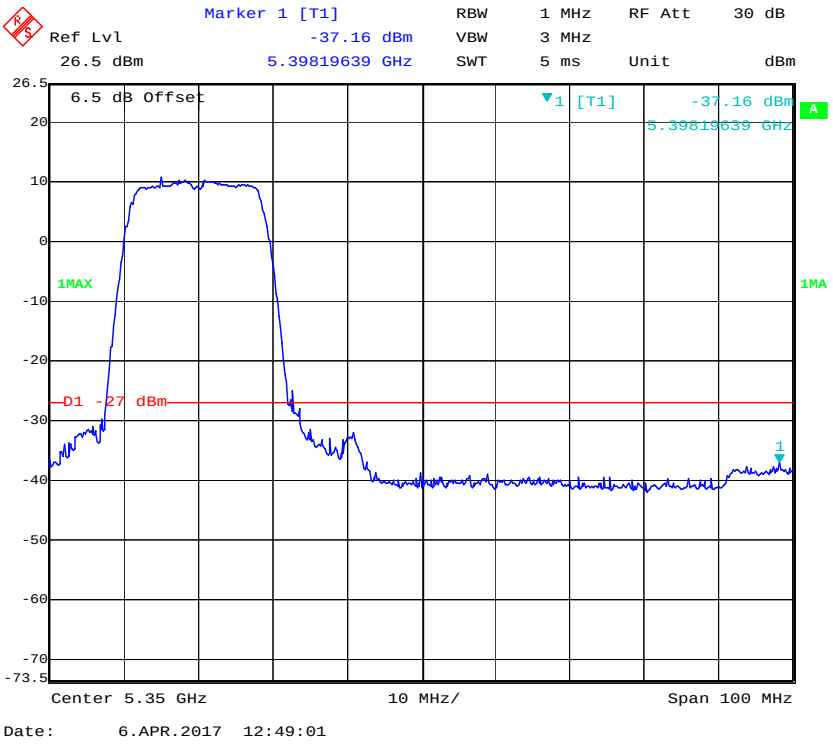
802.11a mode, Band Edge, Right Side



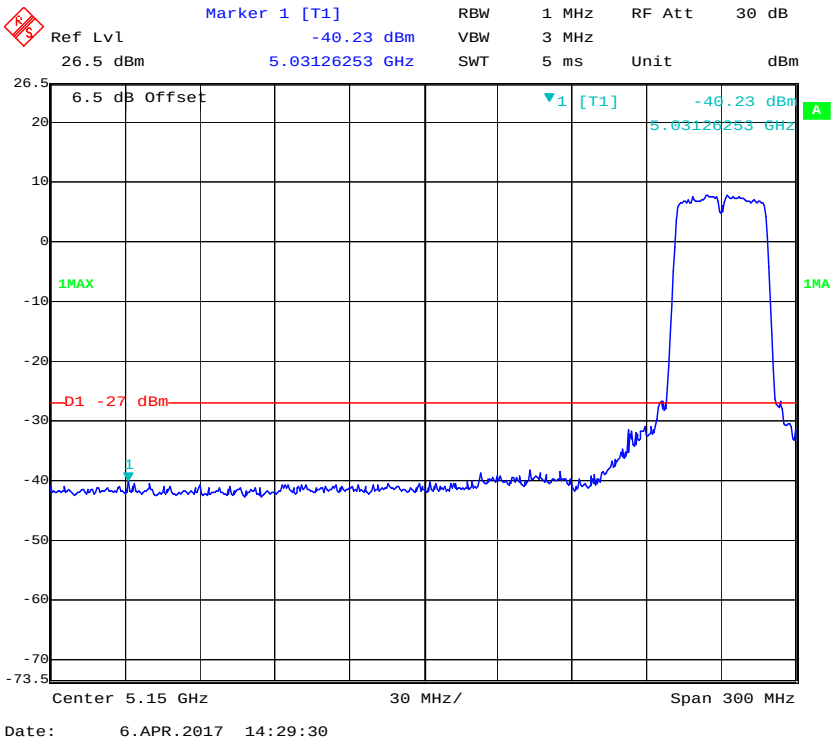
802.11n20 mode, Band Edge, Left Side



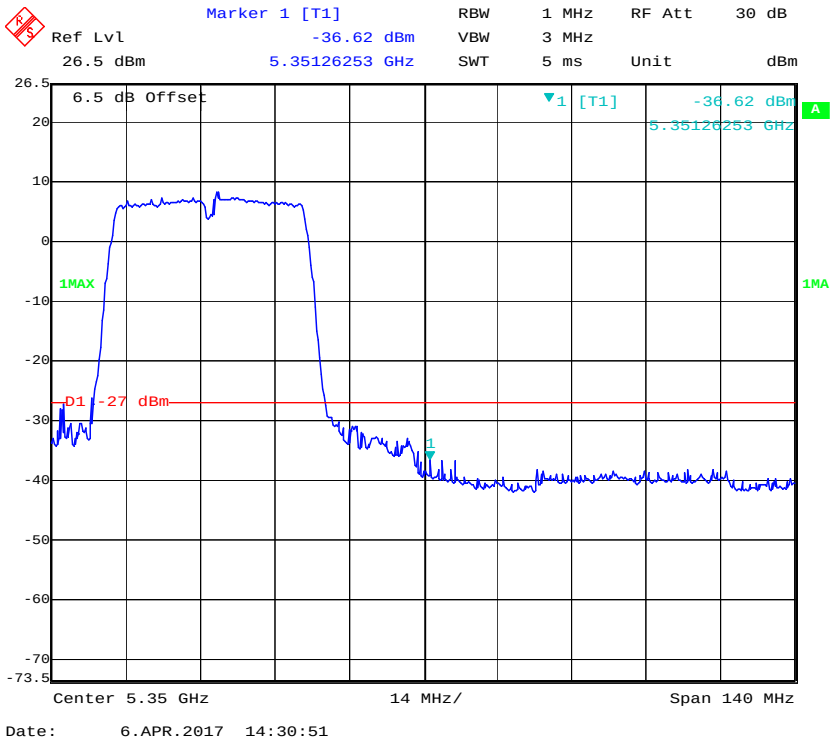
802.11n20 mode, Band Edge, Right Side



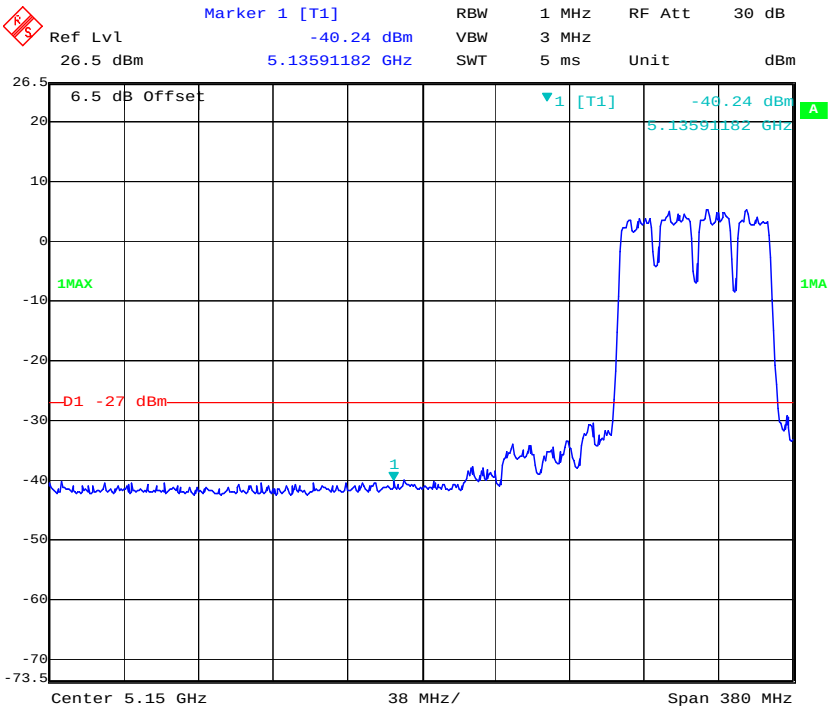
802.11n40 mode, Band Edge, Left Side



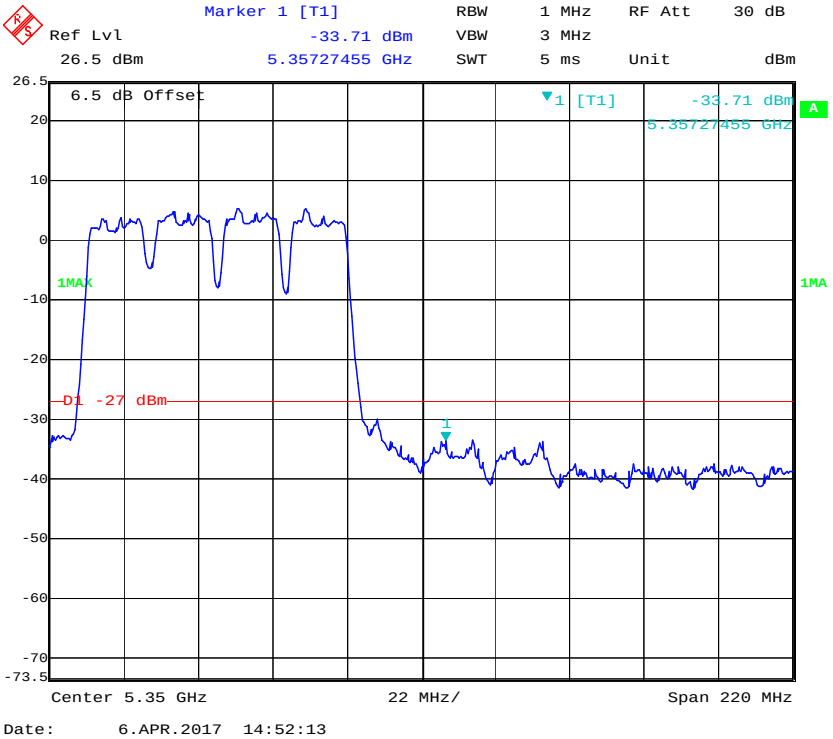
802.11n40 mode, Band Edge, Right Side



802.11ac80 mode, Band Edge, Left Side

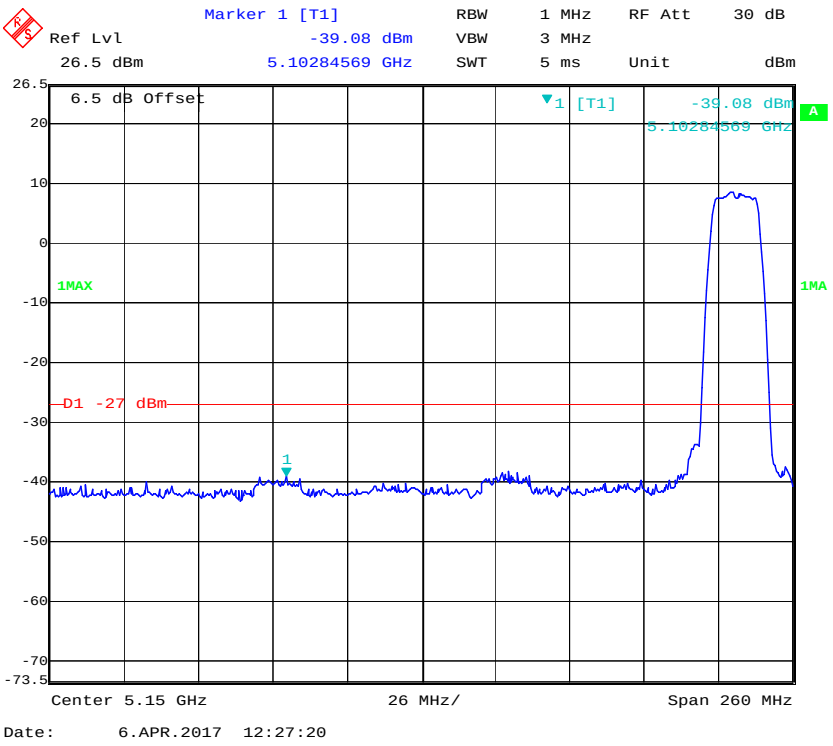


802.11ac80 mode, Band Edge, Right Side

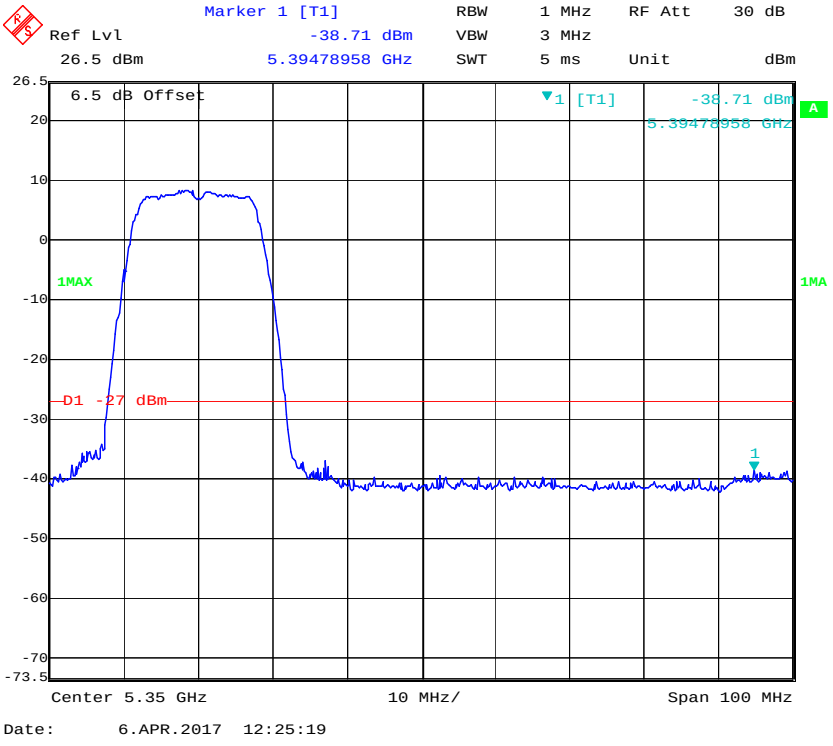


5250 – 5350 MHz, Chain 1:

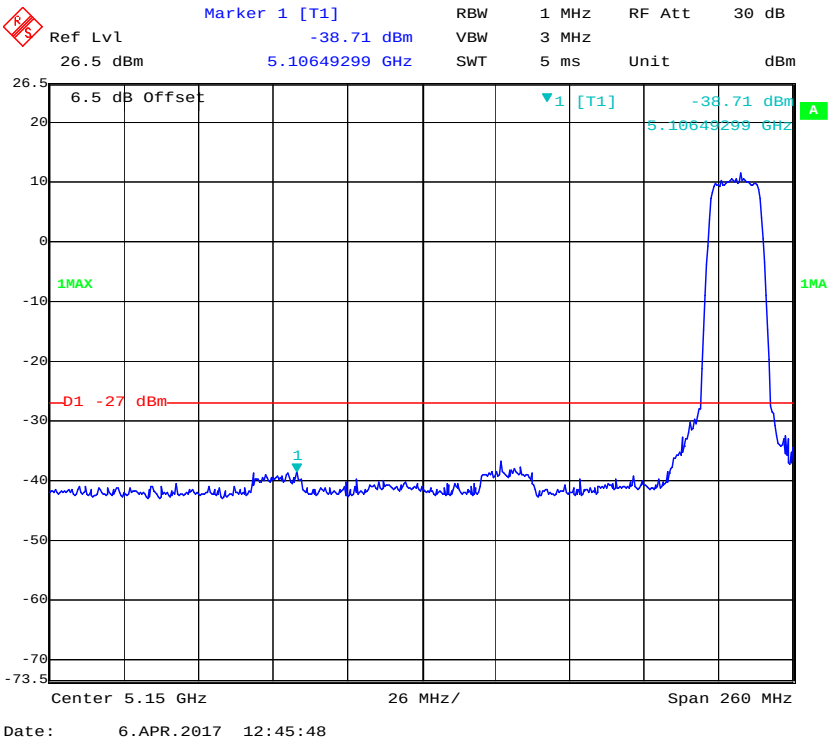
802.11a mode, Band Edge, Left Side



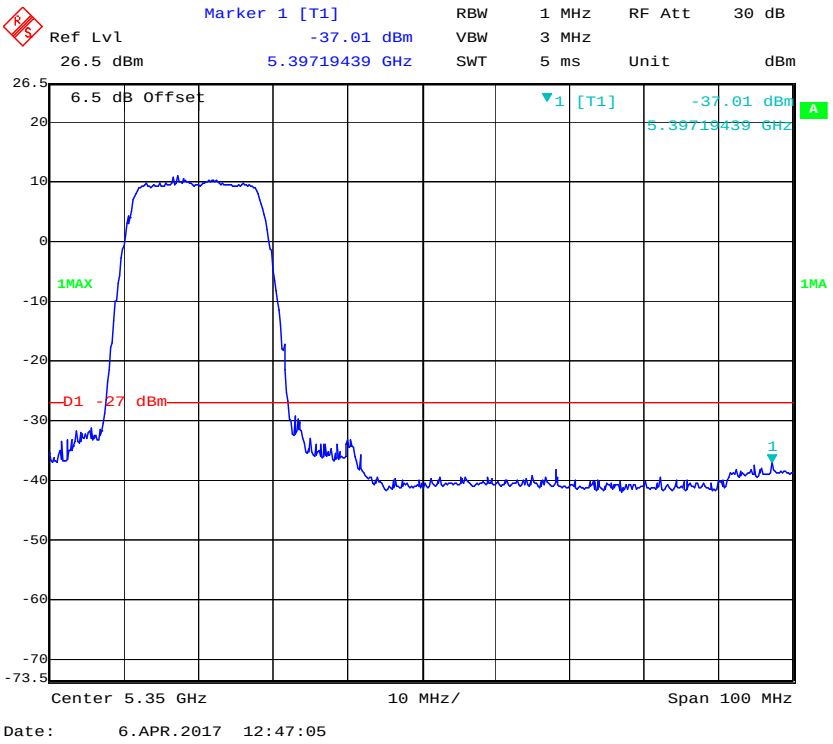
802.11a mode, Band Edge, Right Side



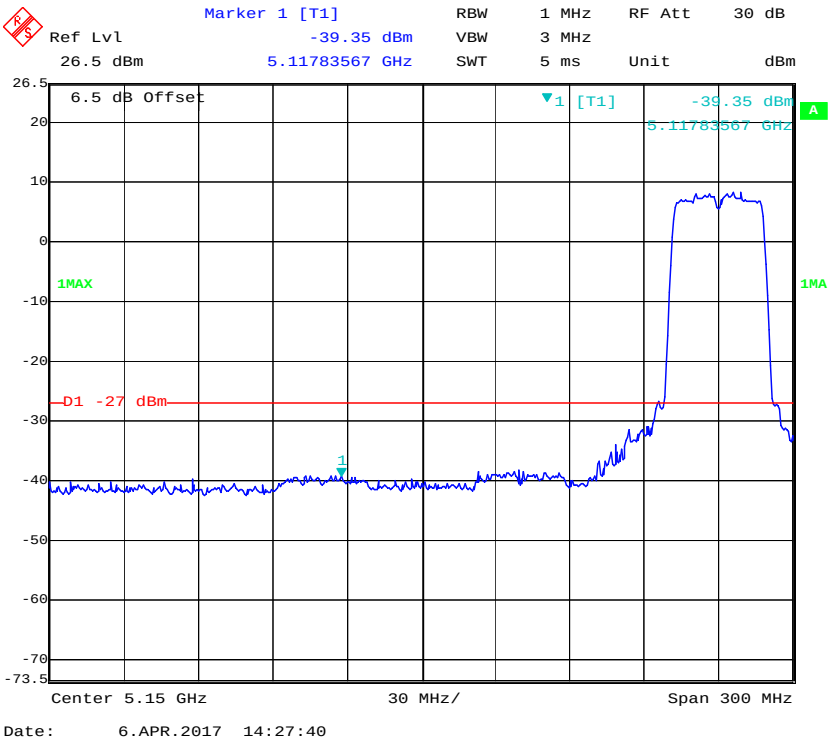
802.11n20 mode, Band Edge, Left Side



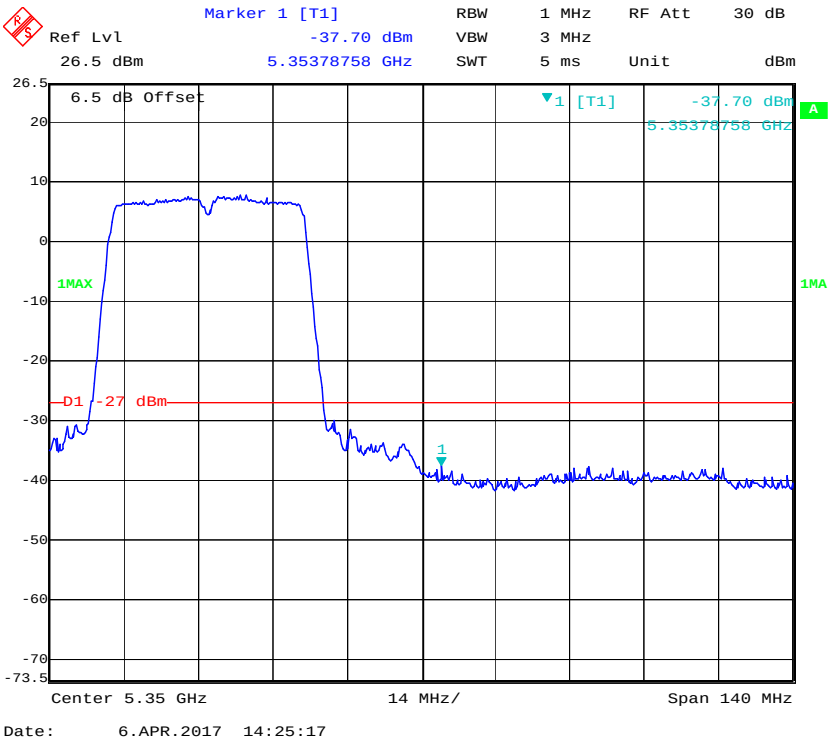
802.11n20 mode, Band Edge, Right Side



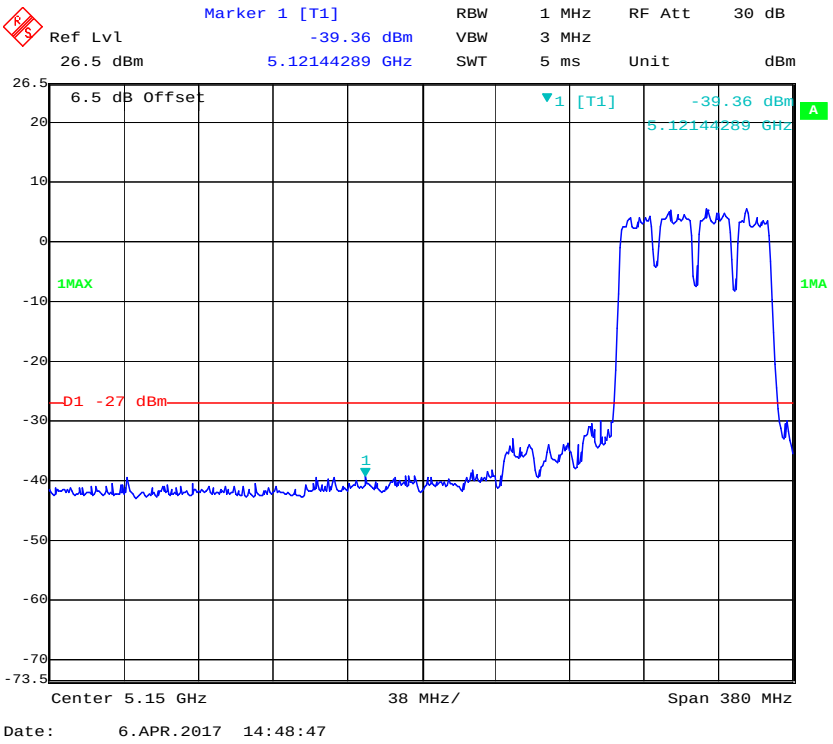
802.11n40 mode, Band Edge, Left Side



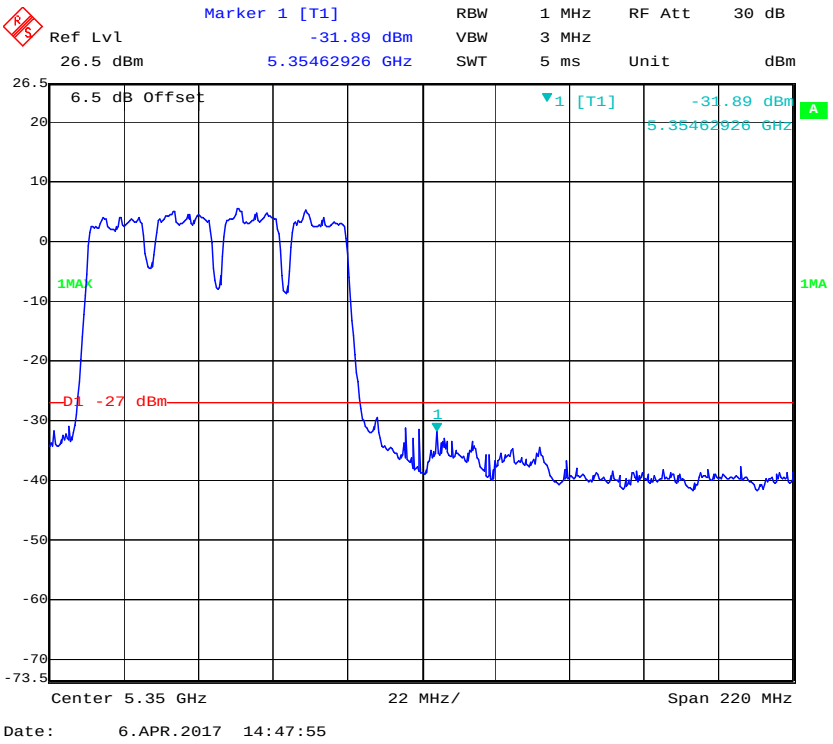
802.11n40 mode, Band Edge, Right Side



802.11ac80 mode, Band Edge, Left Side

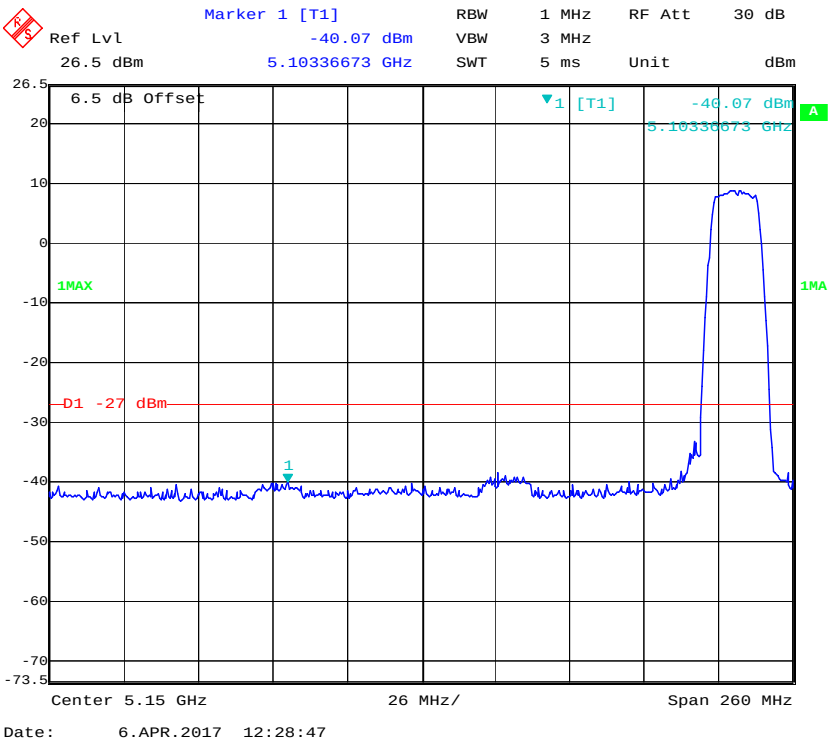


802.11ac80 mode, Band Edge, Right Side

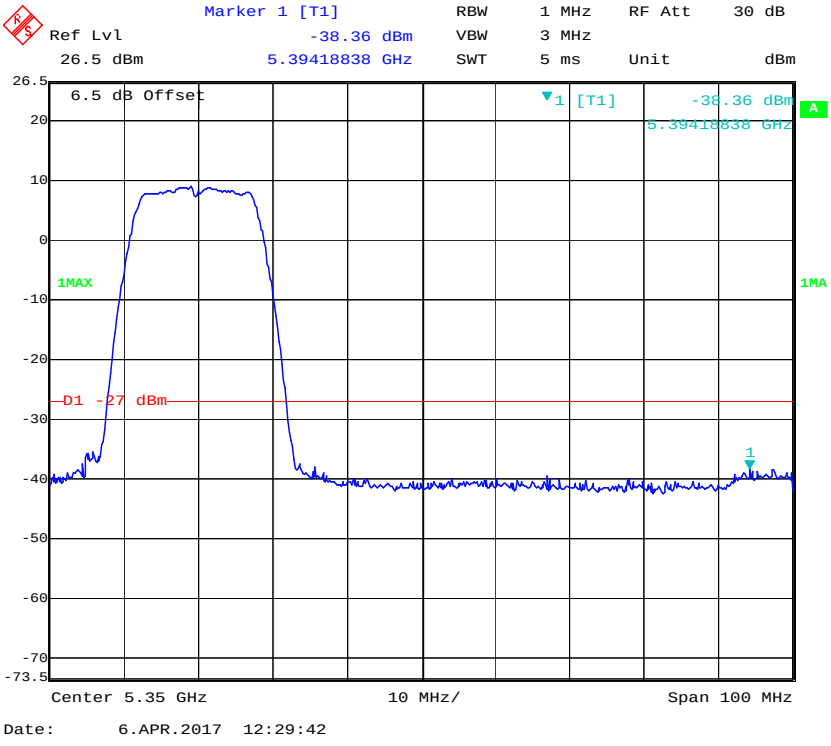


5250 – 5350 MHz, Chain 2:

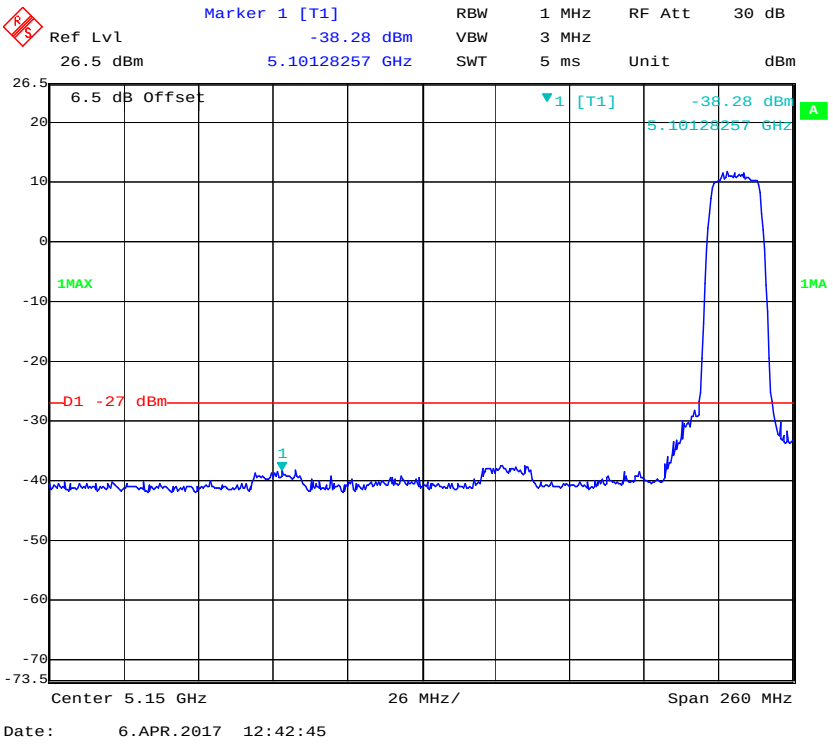
802.11a mode, Band Edge, Left Side



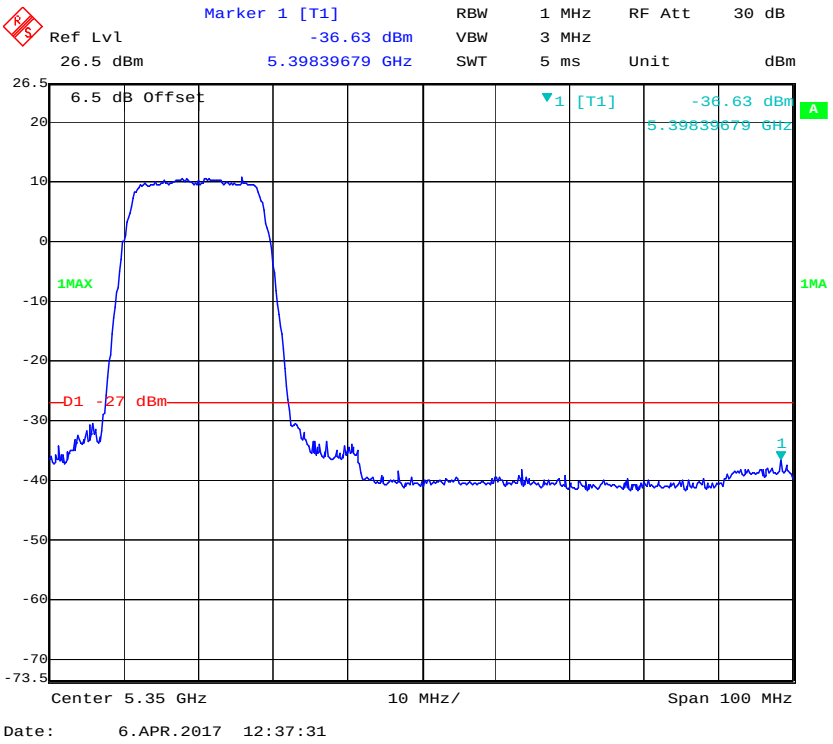
802.11a mode, Band Edge, Right Side



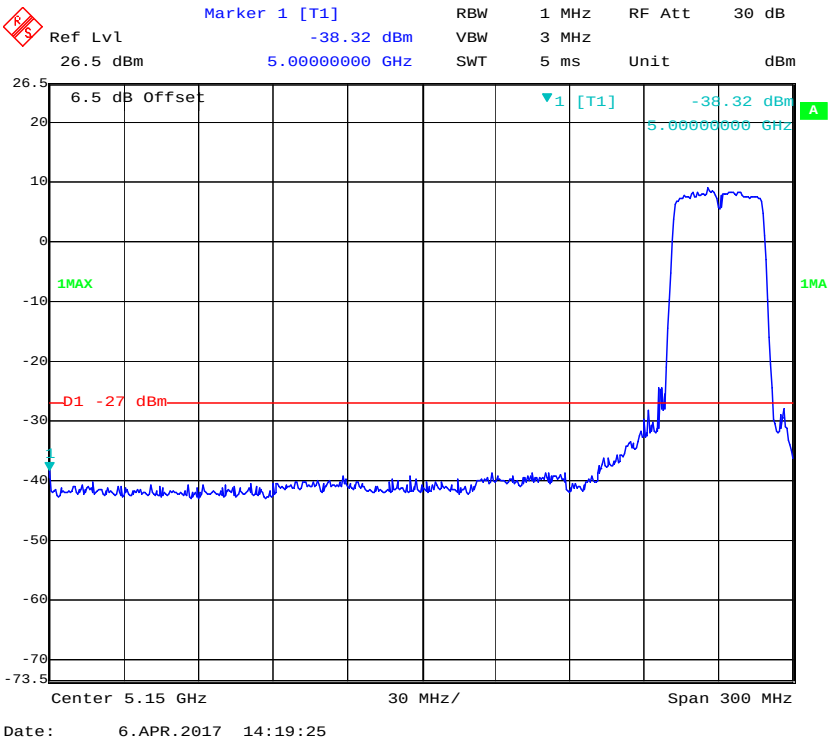
802.11n20 mode, Band Edge, Left Side



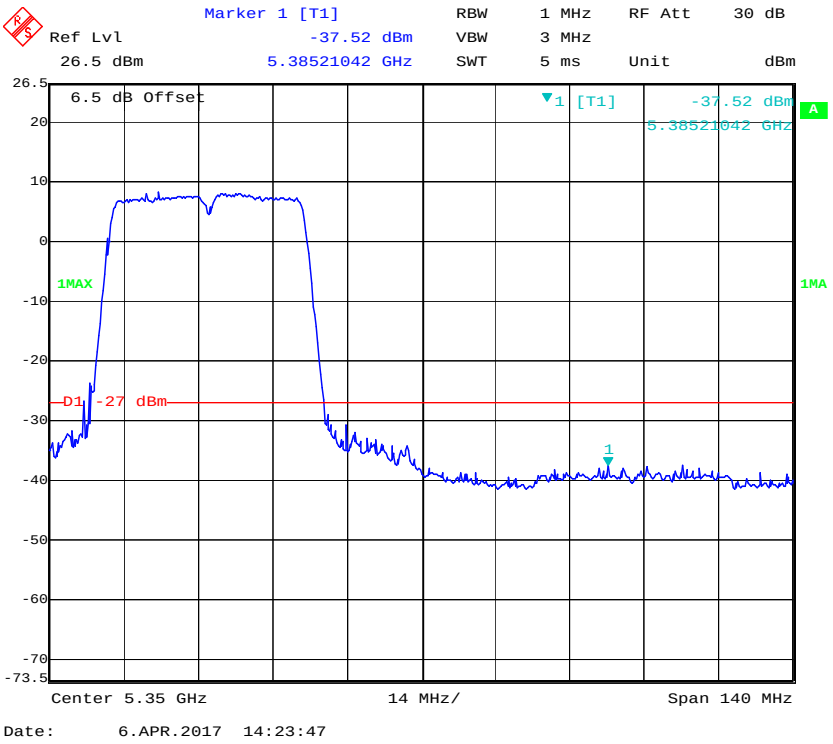
802.11n20 mode, Band Edge, Right Side



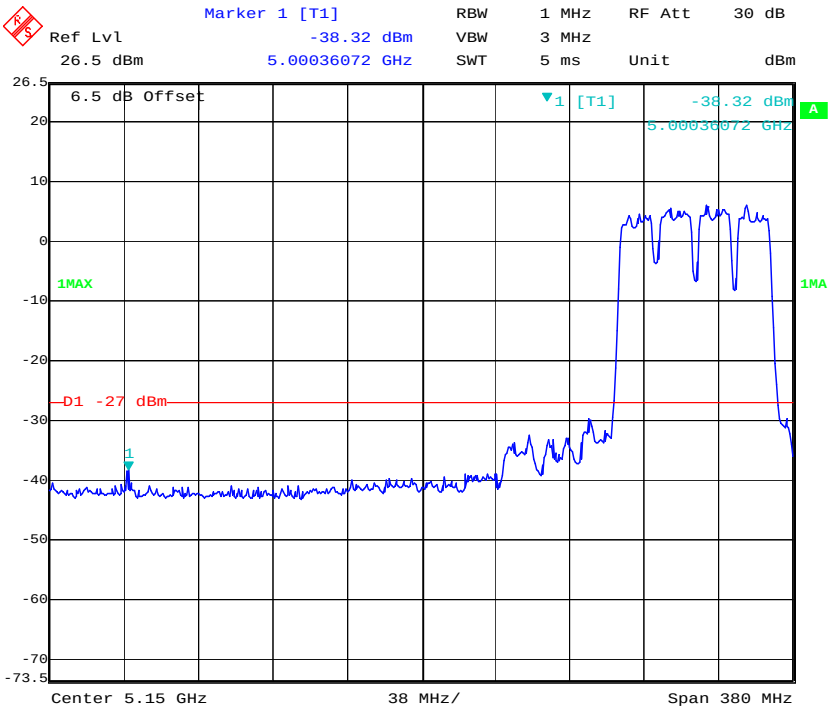
802.11n40 mode, Band Edge, Left Side



802.11n40 mode, Band Edge, Right Side

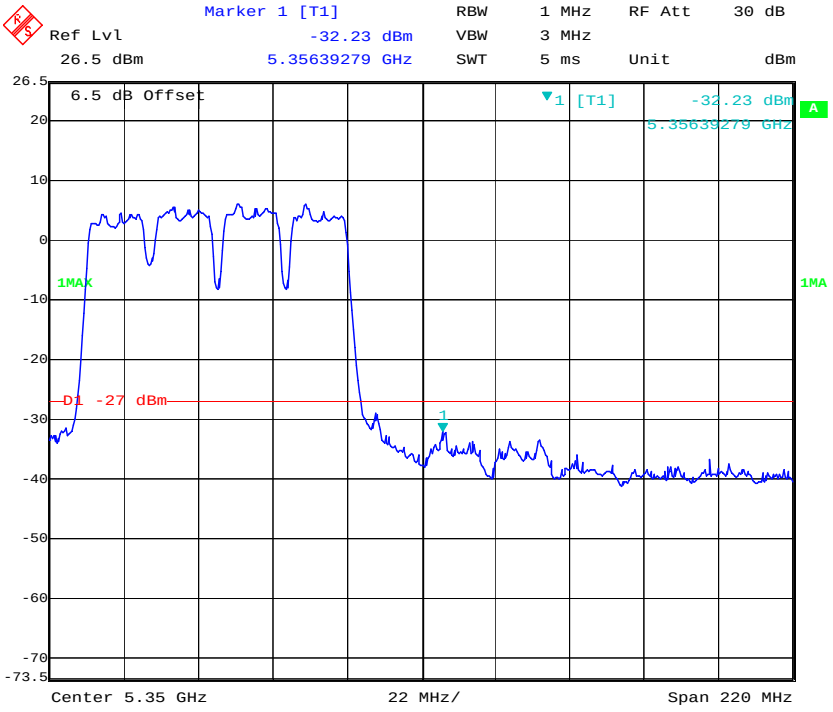


802.11ac80 mode, Band Edge, Left Side



Date: 6.APR.2017 14:45:17

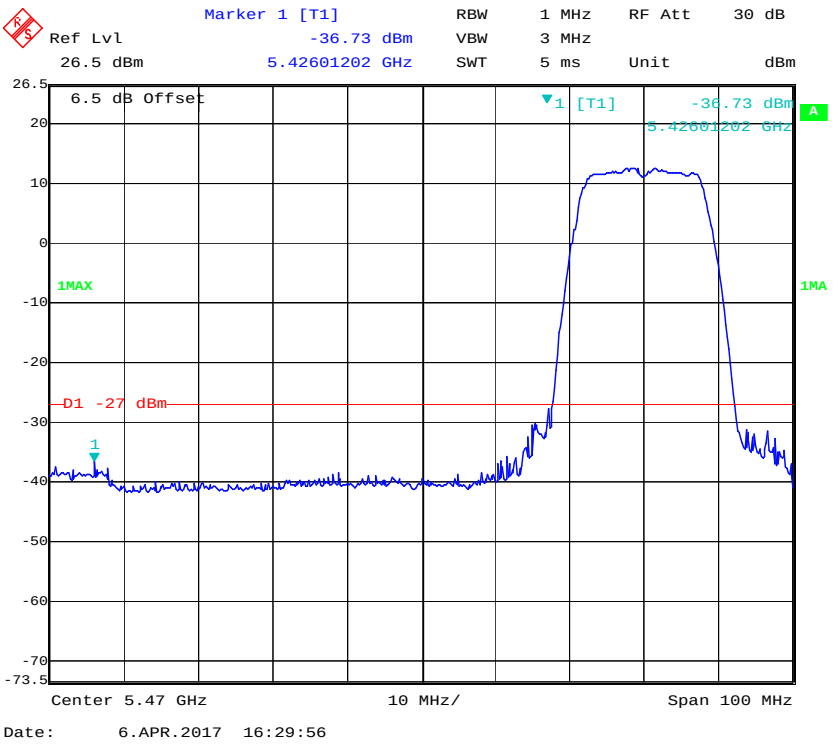
802.11ac80 mode, Band Edge, Right Side



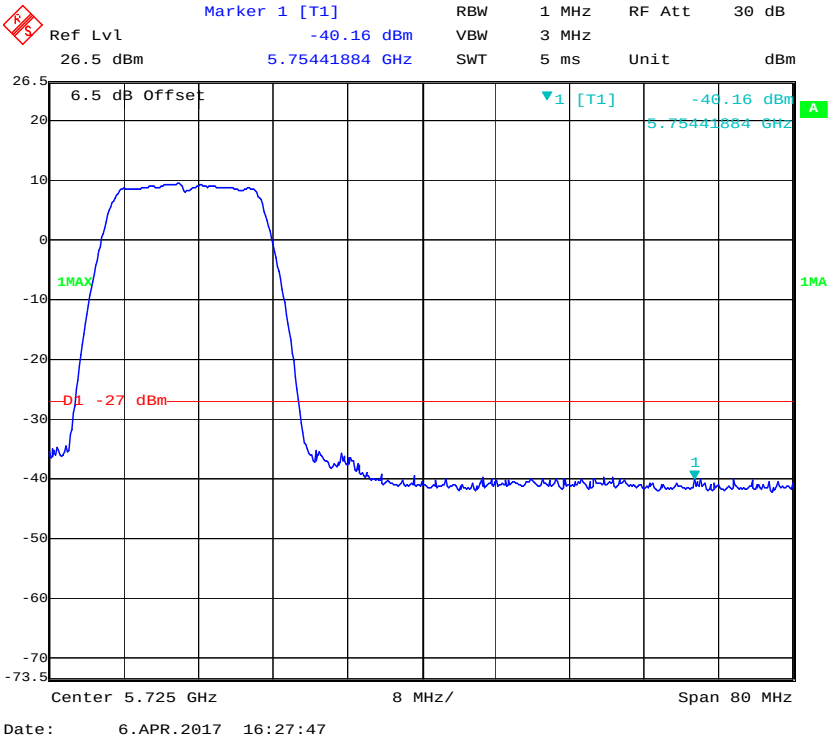
Date: 6.APR.2017 14:46:49

5470 – 5725 MHz, Chain 0:

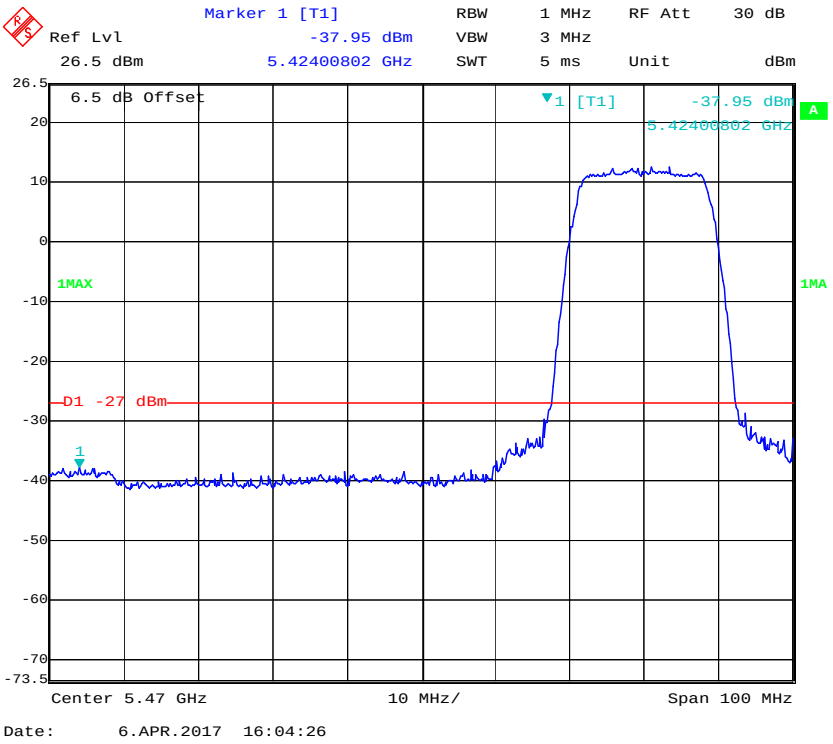
802.11a mode, Band Edge, Left Side



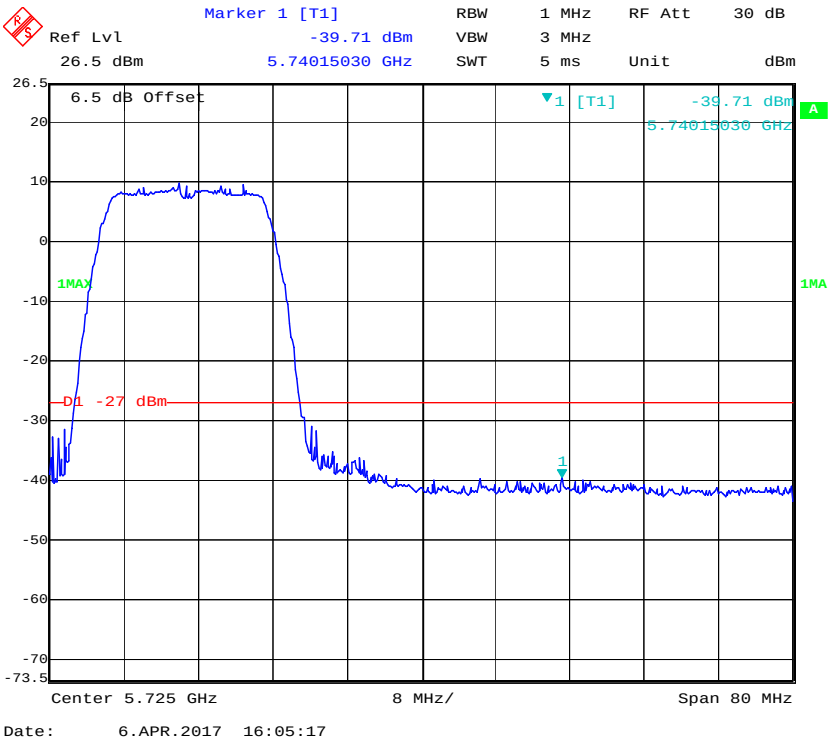
802.11a mode, Band Edge, Right Side



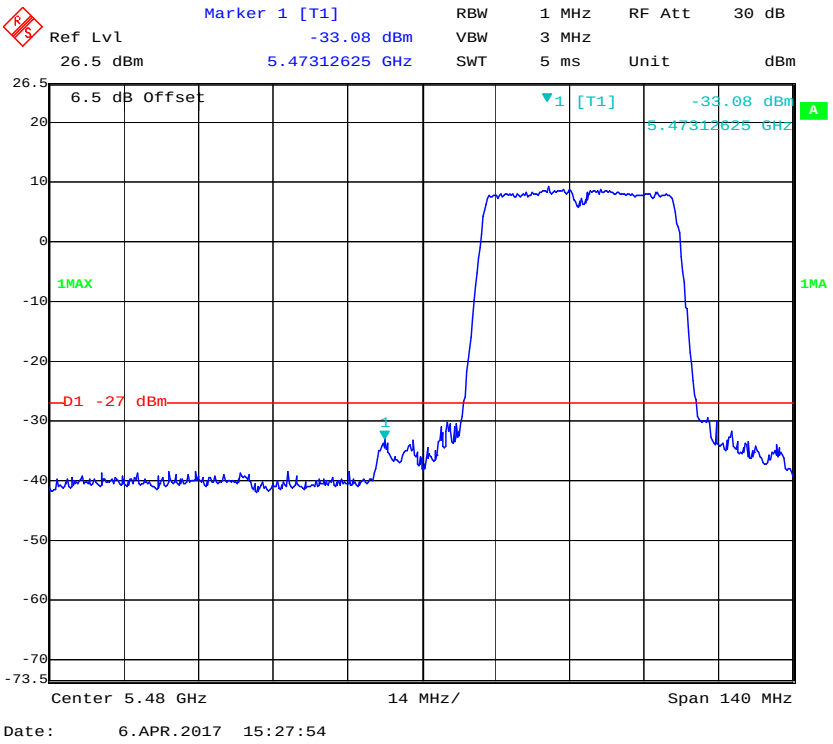
802.11n20 mode, Band Edge, Left Side



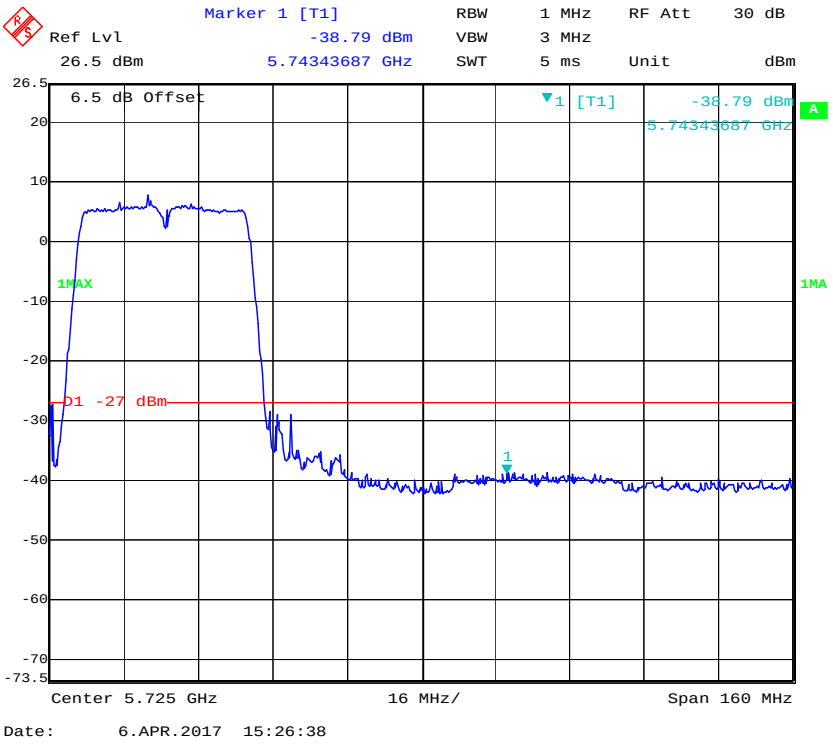
802.11n20 mode, Band Edge, Right Side



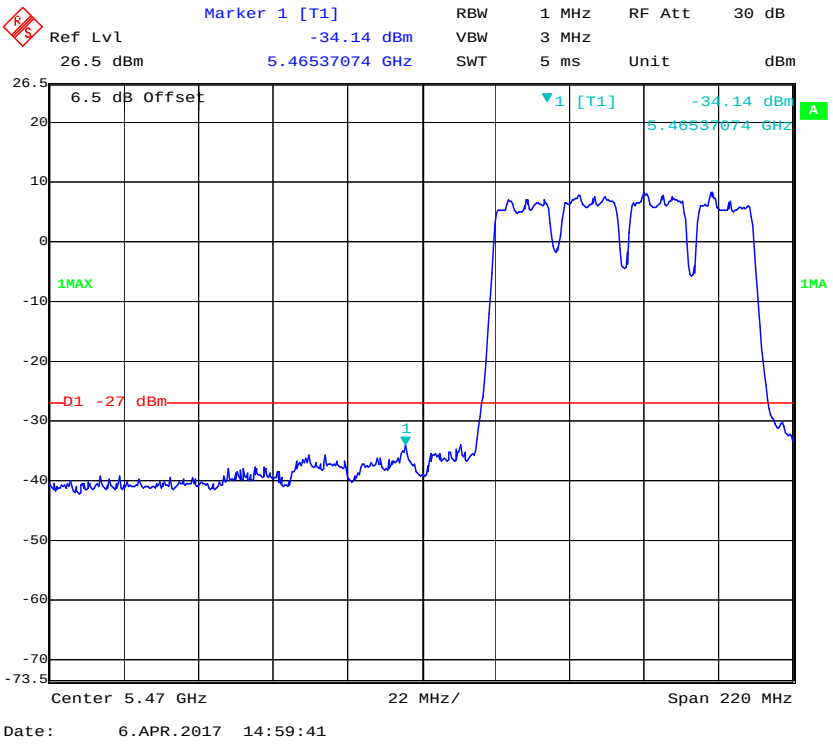
802.11n40 mode, Band Edge, Left Side



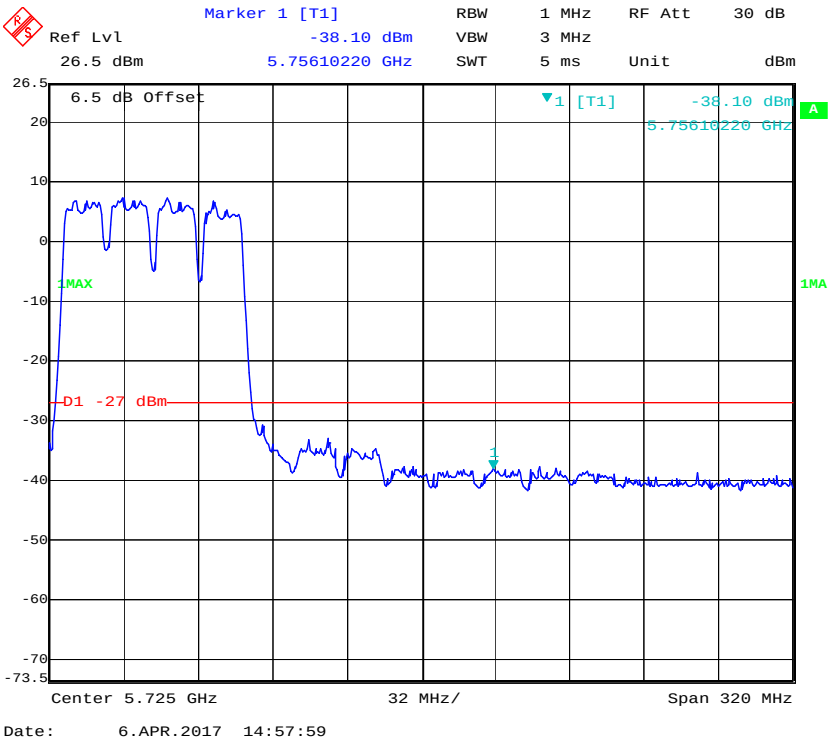
802.11n40 mode, Band Edge, Right Side



802.11ac80 mode, Band Edge, Left Side

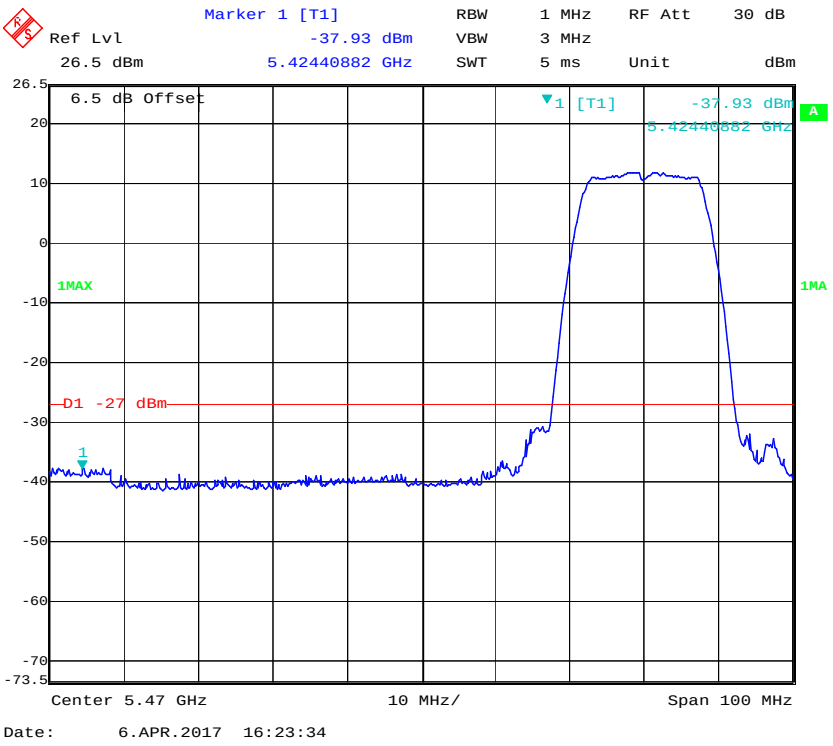


802.11ac80 mode, Band Edge, Right Side

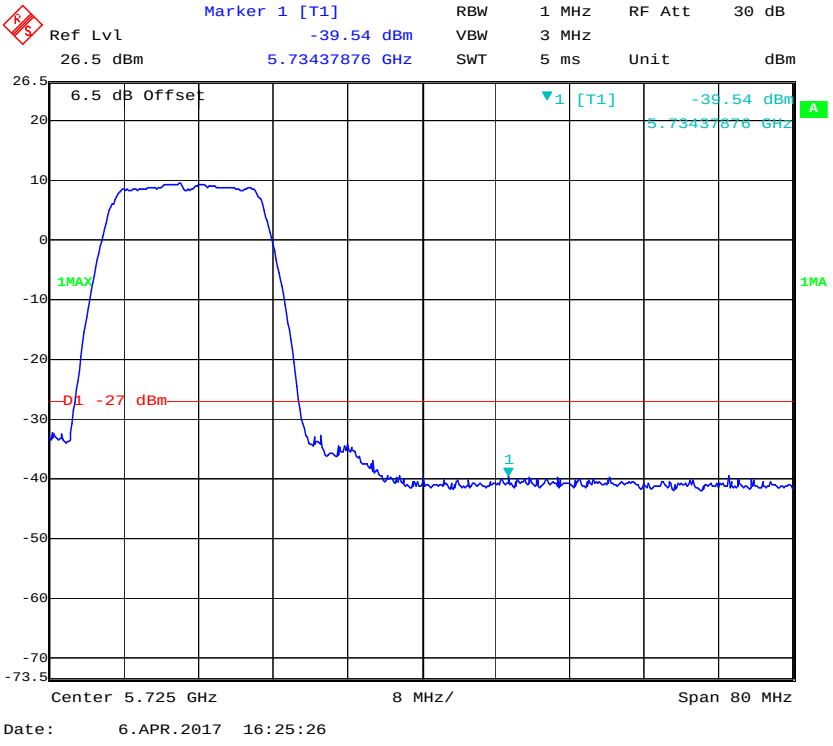


5470 – 5725 MHz, Chain 1

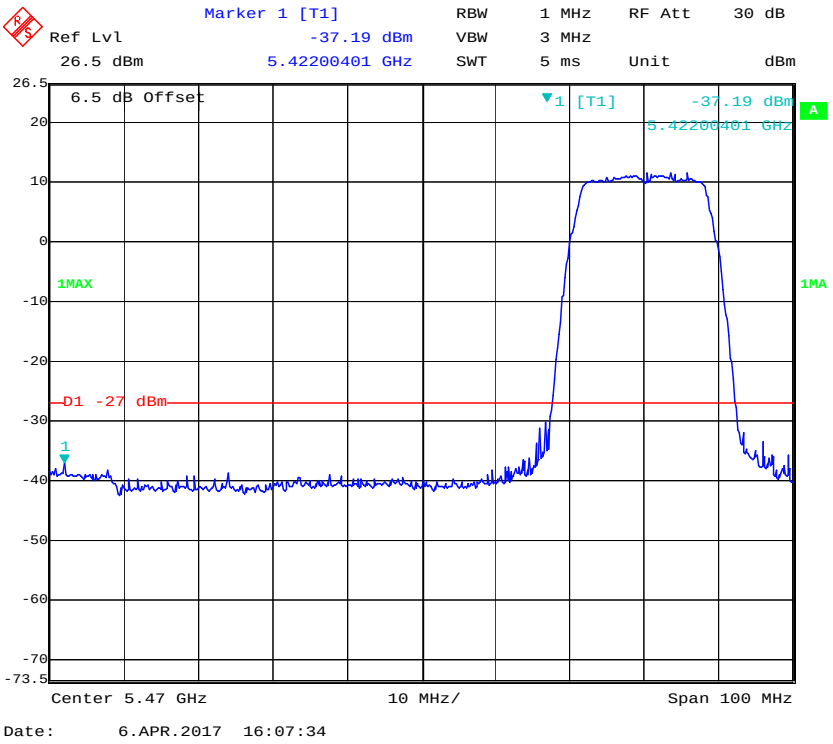
802.11a mode, Band Edge, Left Side



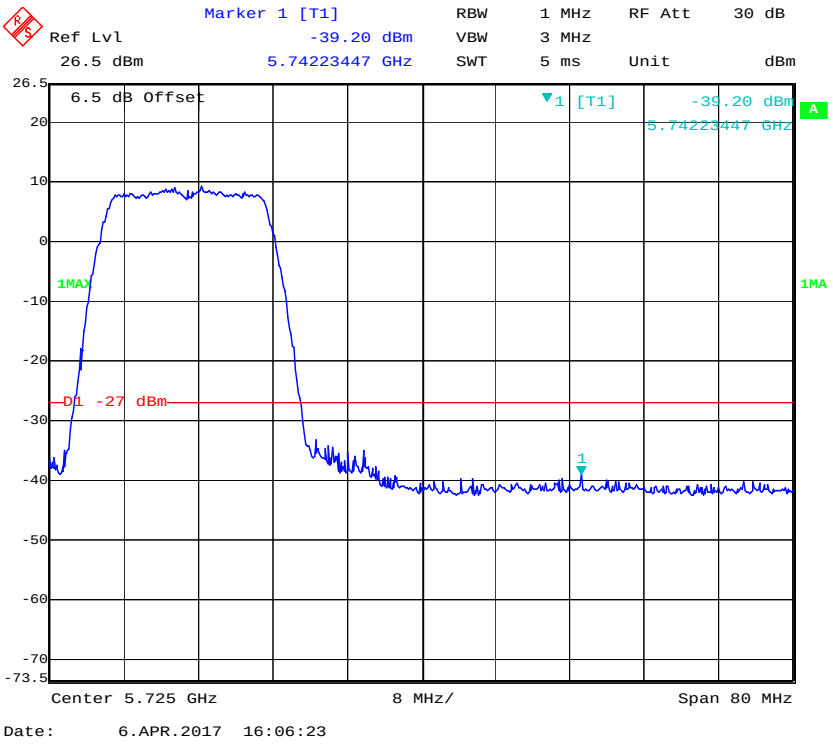
802.11a mode, Band Edge, Right Side



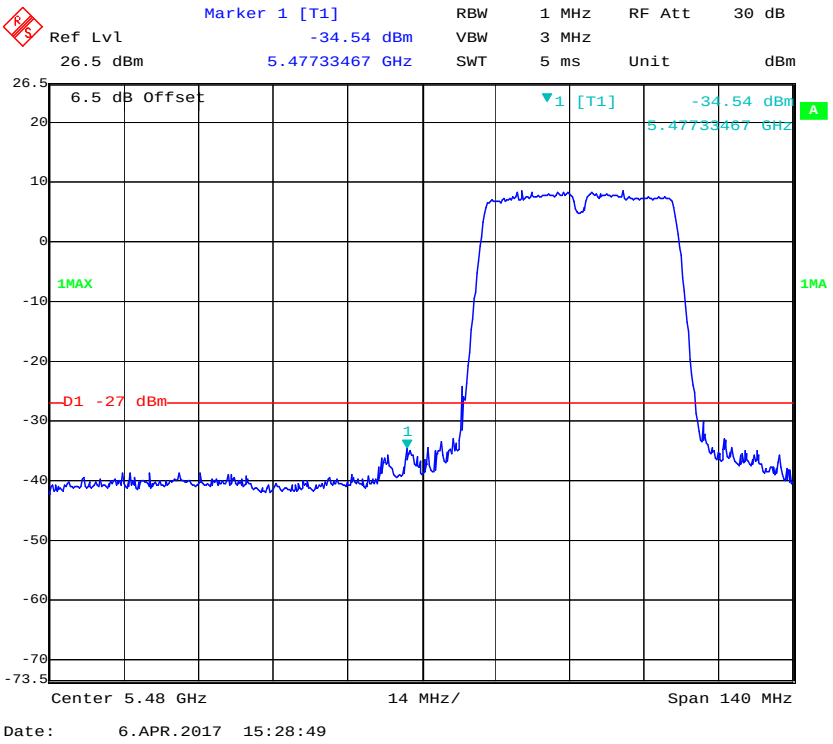
802.11n20 mode, Band Edge, Left Side



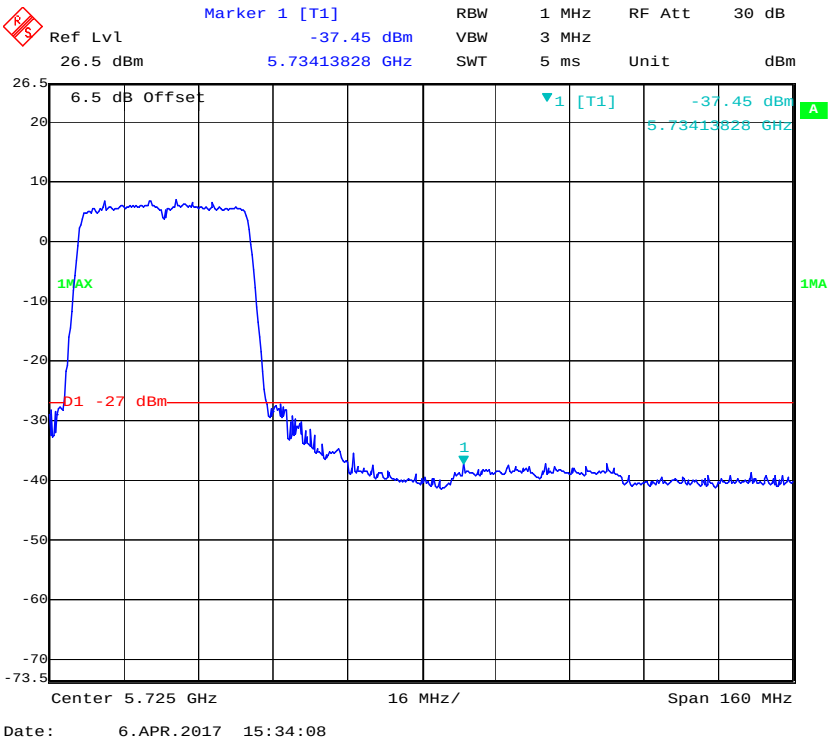
802.11n20 mode, Band Edge, Right Side



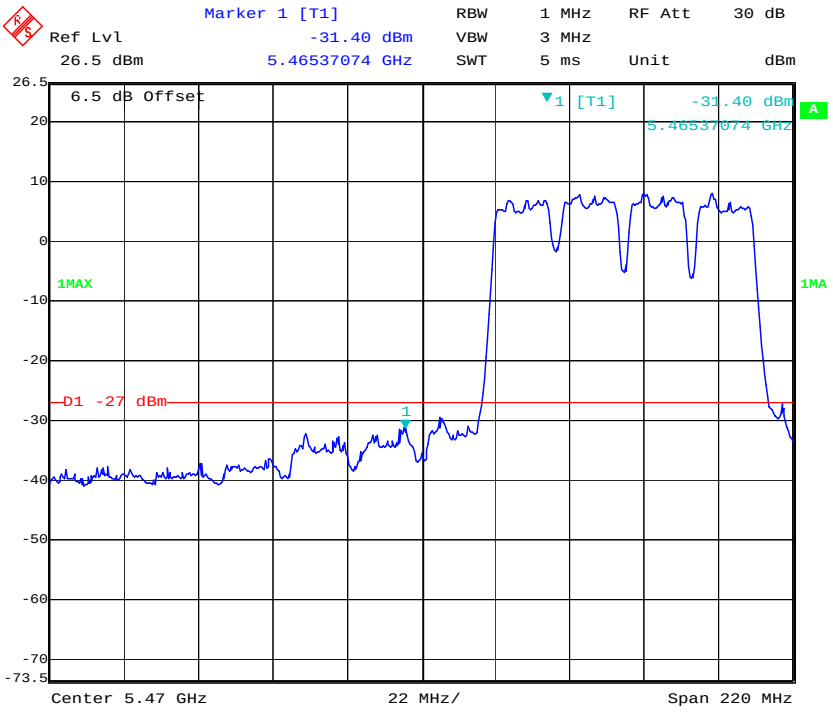
802.11n40 mode, Band Edge, Left Side



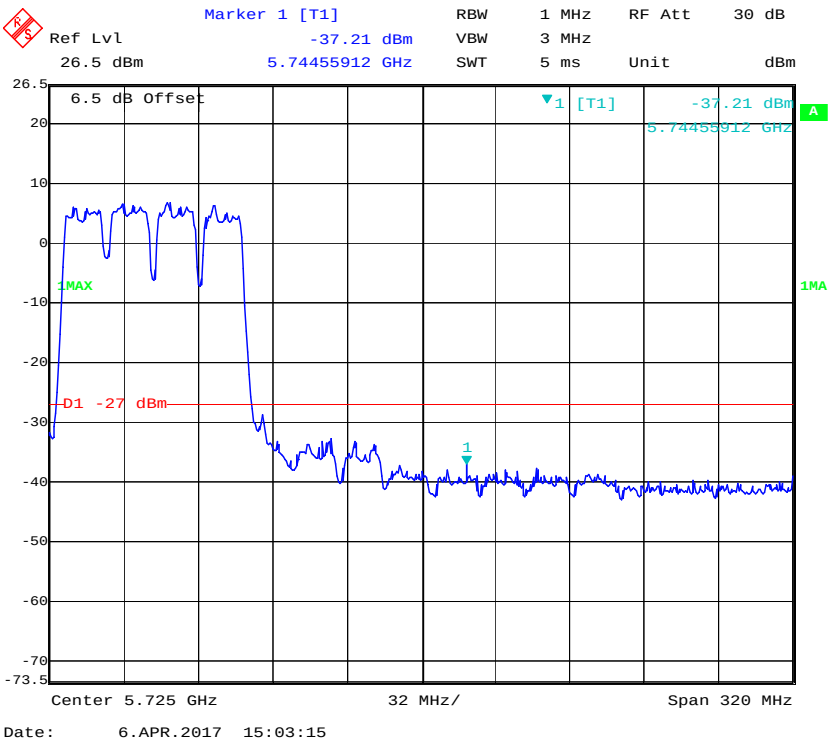
802.11n40 mode, Band Edge, Right Side



802.11ac80 mode, Band Edge, Left Side

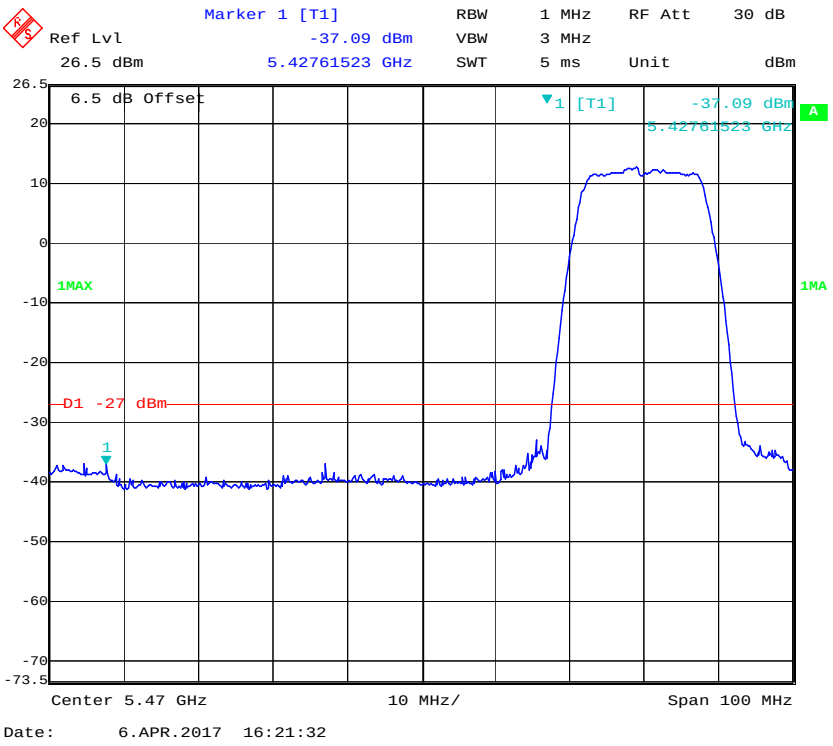


802.11ac80 mode, Band Edge, Right Side

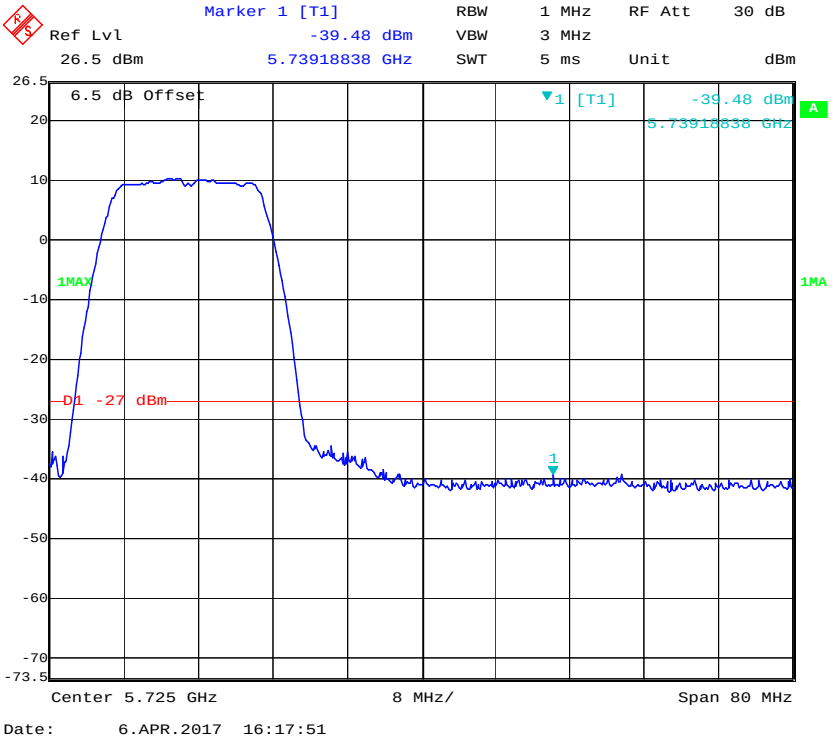


5470 – 5725 MHz, Chain 2

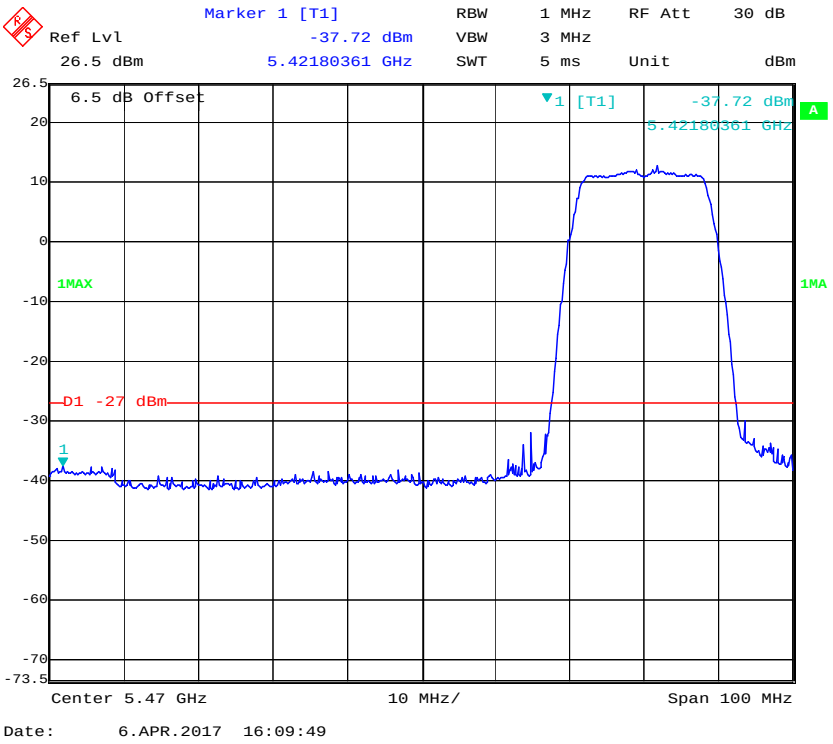
802.11a mode, Band Edge, Left Side



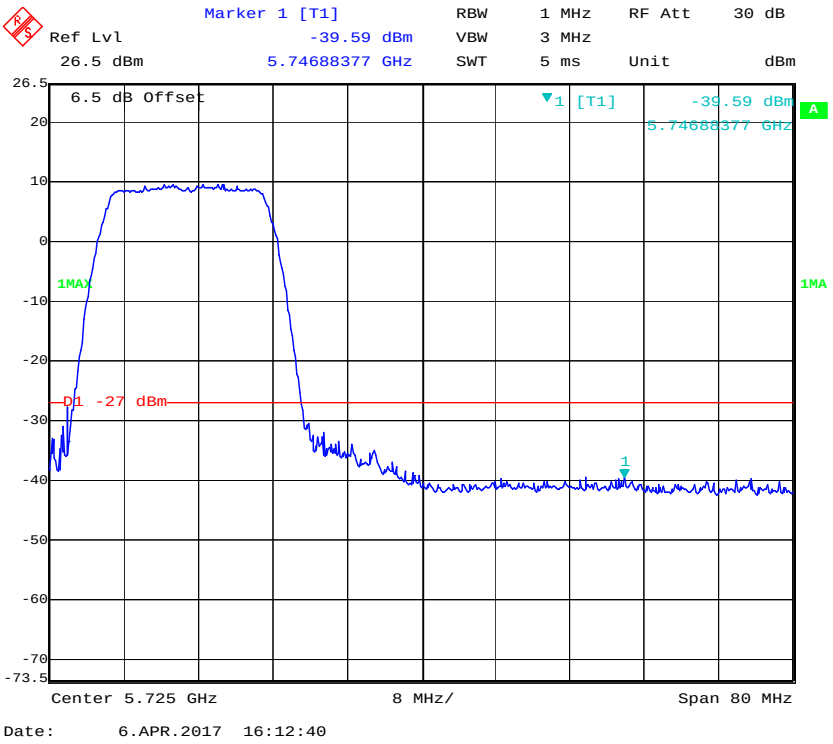
802.11a mode, Band Edge, Right Side



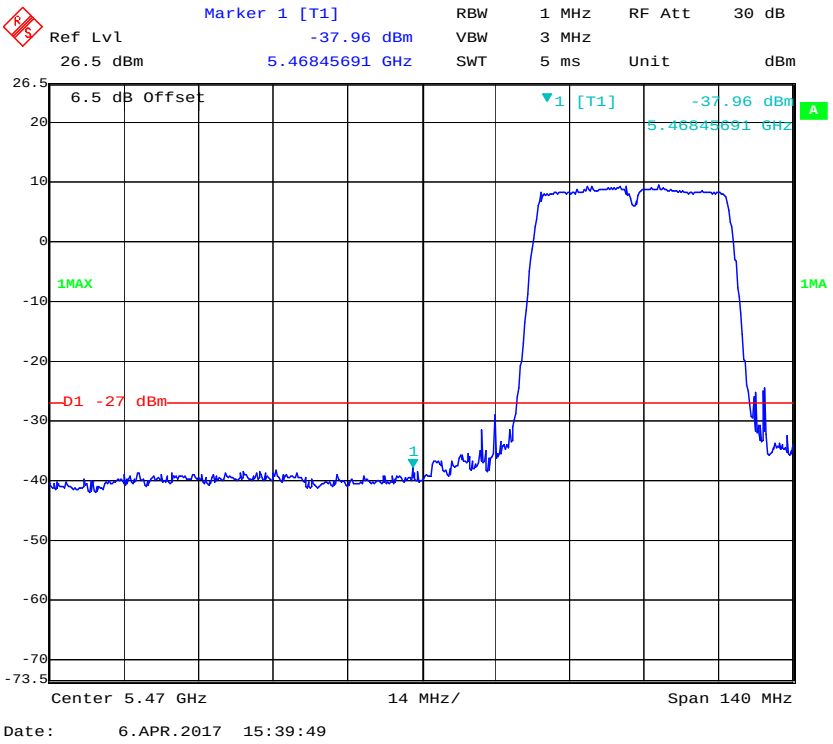
802.11n20 mode, Band Edge, Left Side



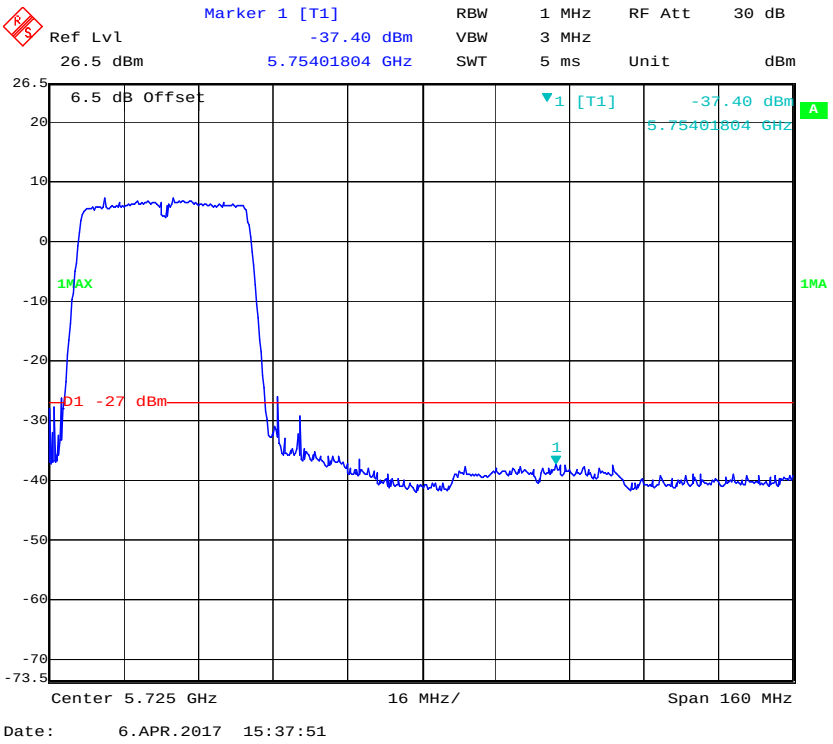
802.11n20 mode, Band Edge, Right Side



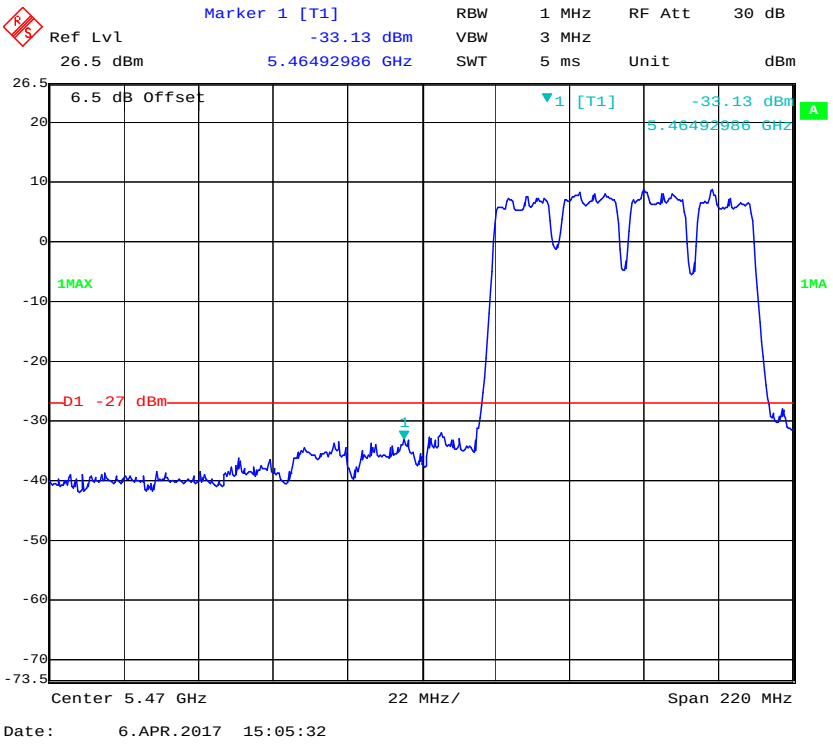
802.11n40 mode, Band Edge, Left Side



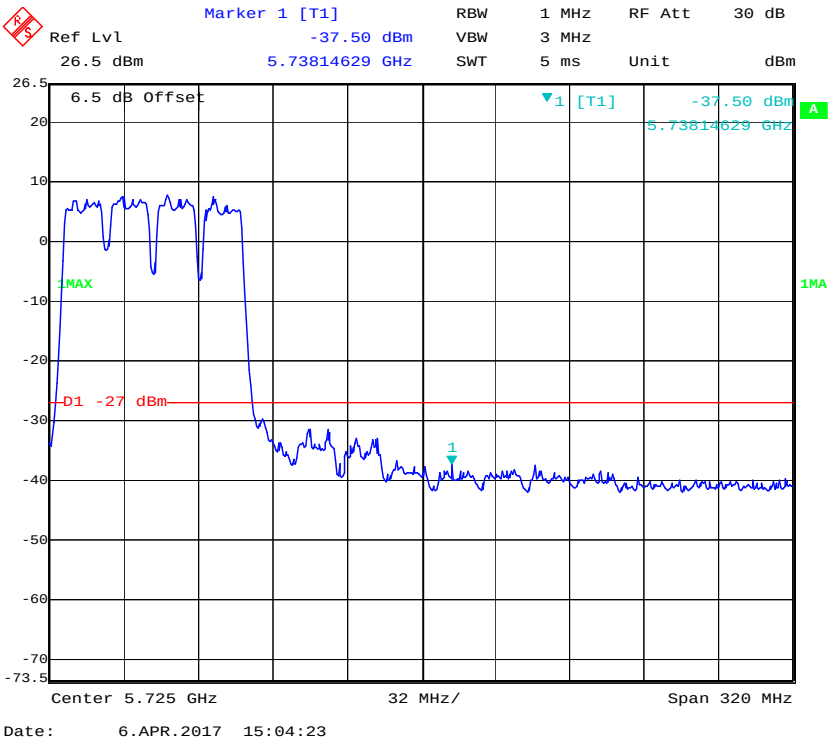
802.11n40 mode, Band Edge, Right Side



802.11ac80 mode, Band Edge, Left Side



802.11ac80 mode, Band Edge, Right Side



9 FCC §15.407(a) –EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH

9.1 Applicable Standard

15.407(a),(e)

9.2 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r03

9.3 Test Equipment List and Details

Description	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

9.4 Test Environmental Conditions

Temperature:	22~24℃
Relative Humidity:	50~57 %
ATM Pressure:	1015~1020 hPa

The testing was performed by David Hsu on 2017-02-18~2017-02-25.

Test mode: Transmitting (test performed at SISO mode)

9.5 Test Results

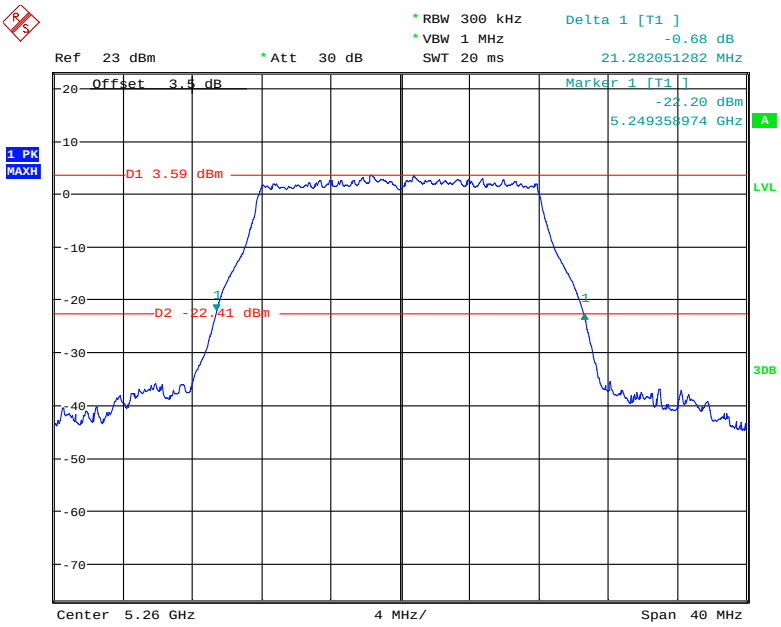
Frequency (MHz)	Antenna	26dB bandwidth (MHz)	99% occupied bandwidth (MHz)
802.11 a			
5260	0	21.28	17.05
	1	21.28	17.05
	2	21.28	17.05
5300	0	21.28	17.05
	1	21.28	17.05
	2	21.28	17.12
5320	0	21.28	17.05
	1	21.28	17.05
	2	21.28	17.05
802.11 n20			
5260	0	21.60	18.14
	1	21.79	18.14
	2	21.79	18.14
5300	0	21.60	18.14
	1	21.79	18.14
	2	21.79	18.21
5320	0	21.60	18.14
	1	21.79	18.14
	2	21.67	18.27
802.11 n40			
5270	0	40.64	36.67
	1	40.77	36.67
	2	40.77	36.67
5310	0	40.64	36.67
	1	40.77	36.67
	2	40.77	36.67
802.11 ac80			
5290	0	81.79	76.15
	1	81.79	76.15
	2	81.79	76.15

Please refer to the following plots

BW26dBc

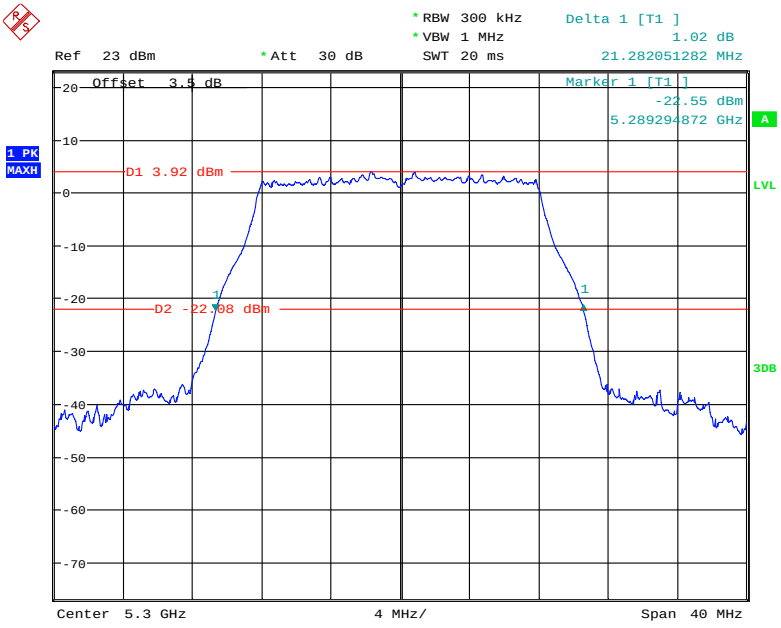
IEEE 802.11a mode / 5250 ~ 5350MHz(chain0)

5260MHz



Date: 18.FEB.2017 16:30:00

5300MHz



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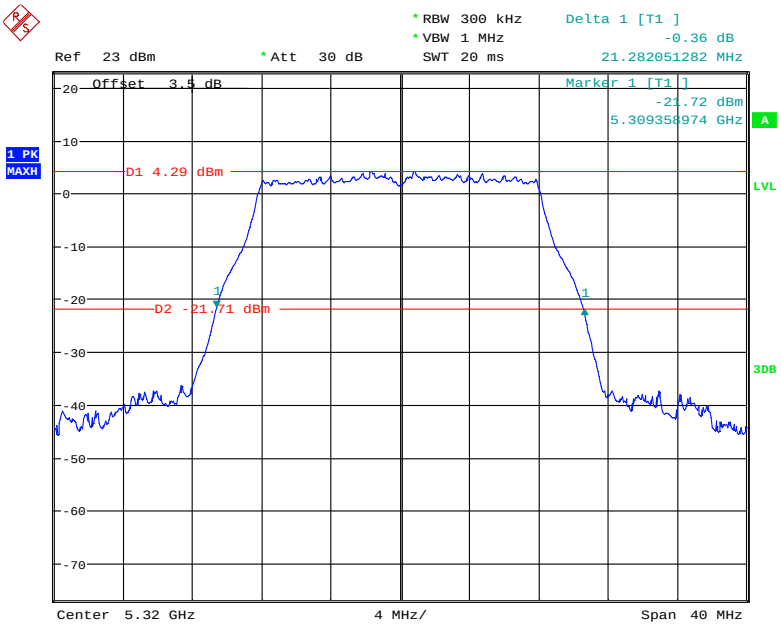
5320MHz



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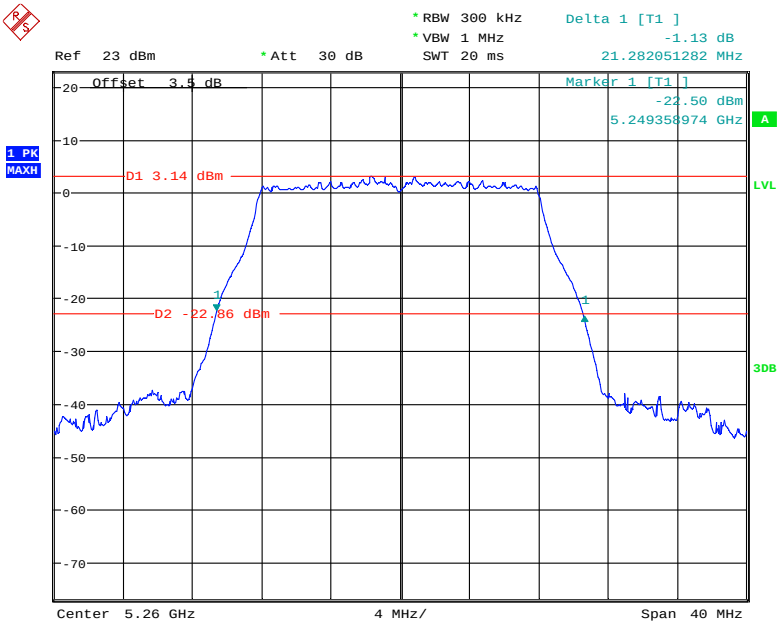
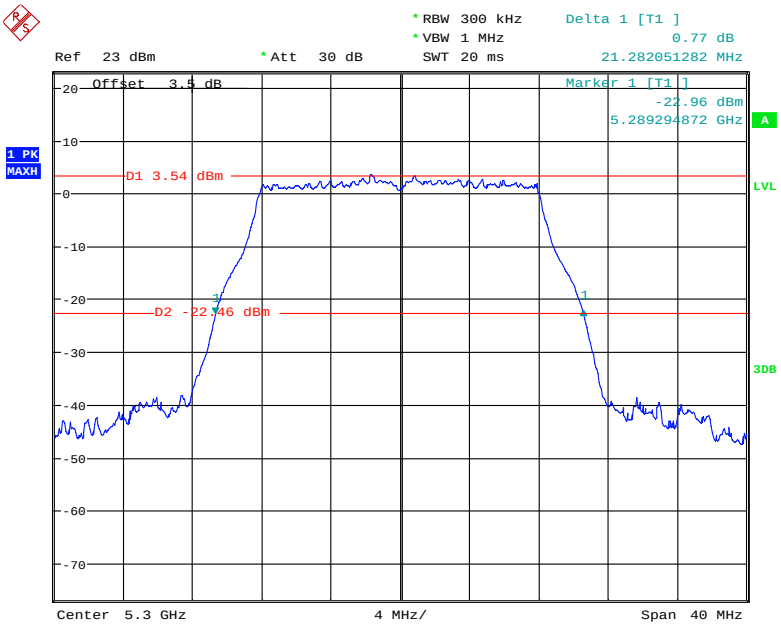
IEEE 802.11a mode / 5250 ~ 5350MHz(chain 1)
5260MHz



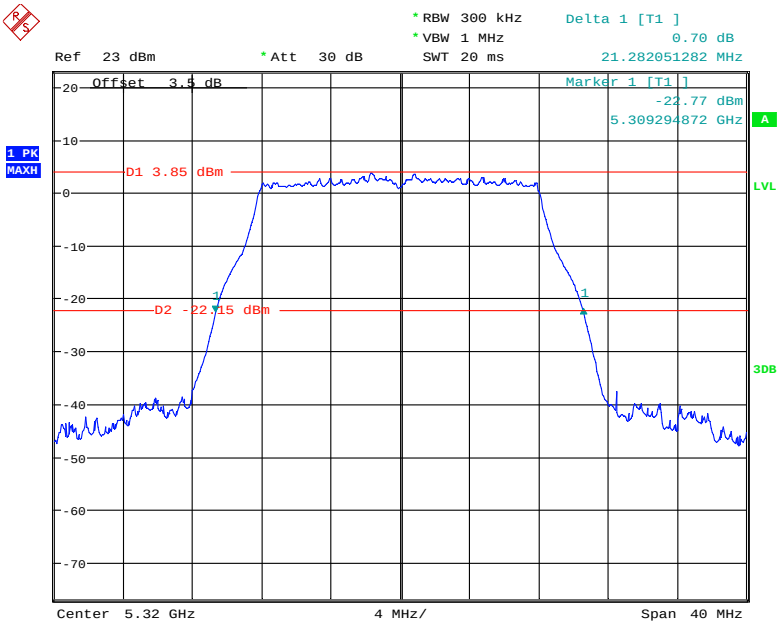
Date: 18.FEB.2017 16:48:49

5300MHz



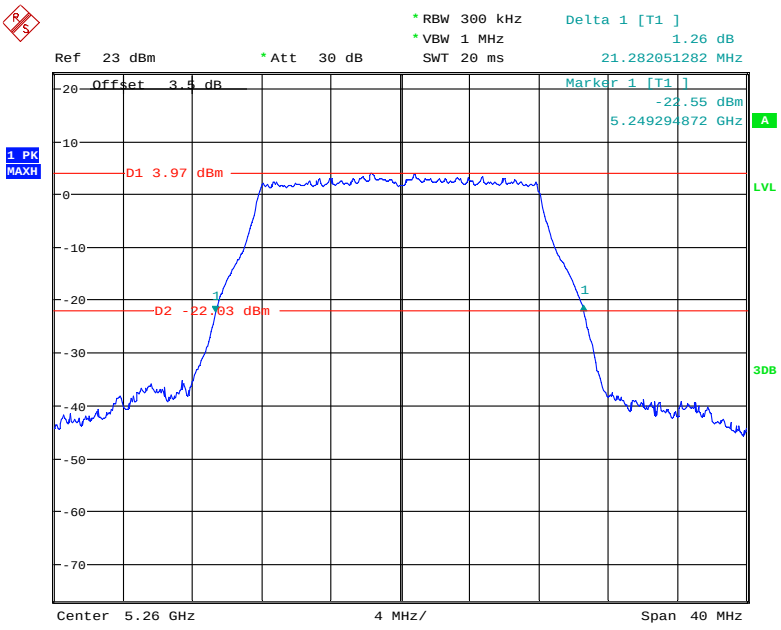
Date: 18.FEB.2017 16:47:05

5320MHz



Date: 18.FEB.2017 16:45:25

IEEE 802.11a mode / 5250 ~ 5350MHz(chain2)
5260MHz



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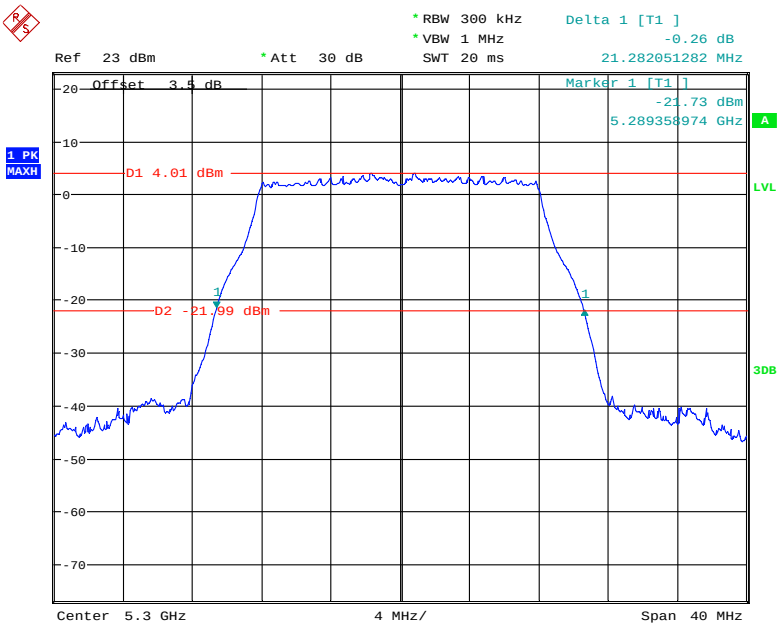
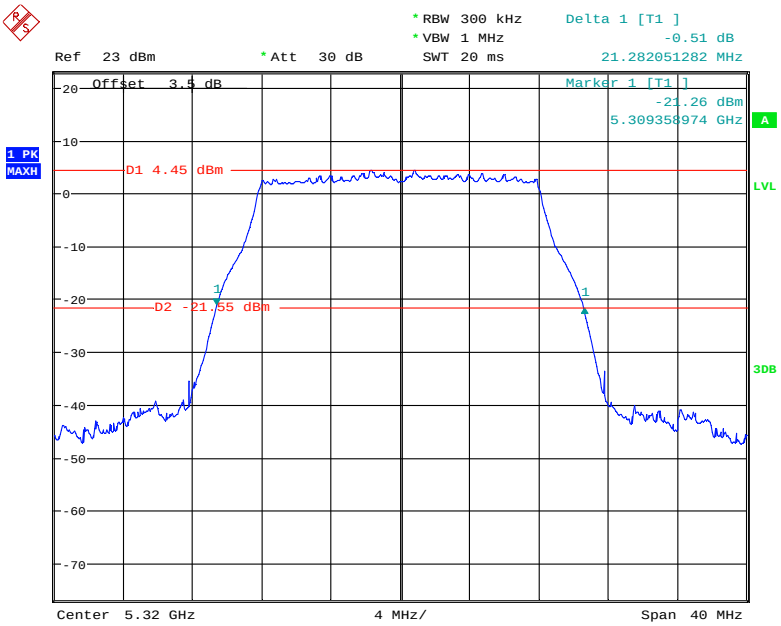
5300MHz



Date: 18.FEB.2017 17:05:58

5320MHz



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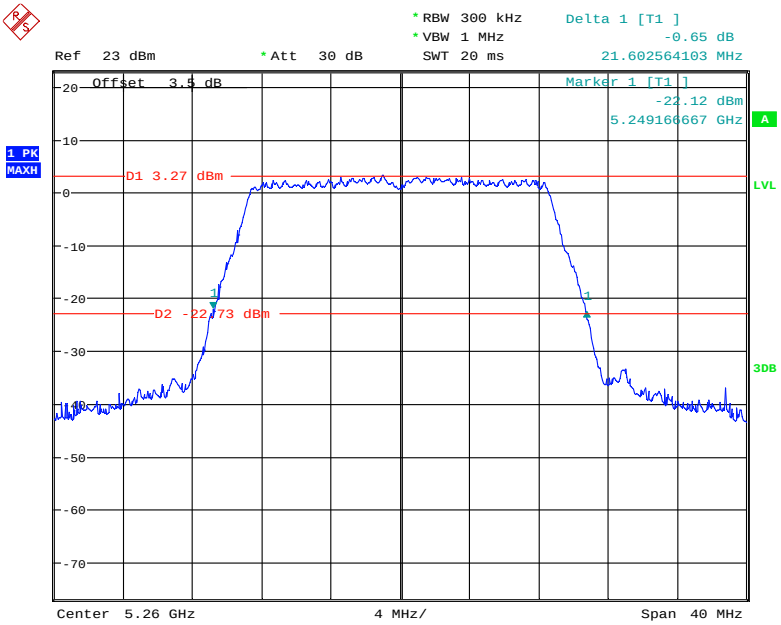
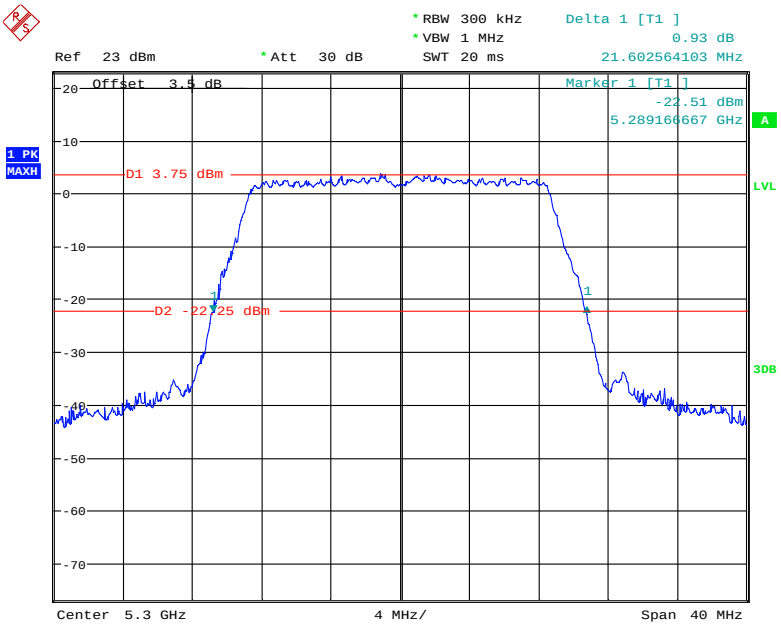
IEEE 802.11n HT20 Mode / 5250 ~ 5350MHz(chain0)
5260MHz



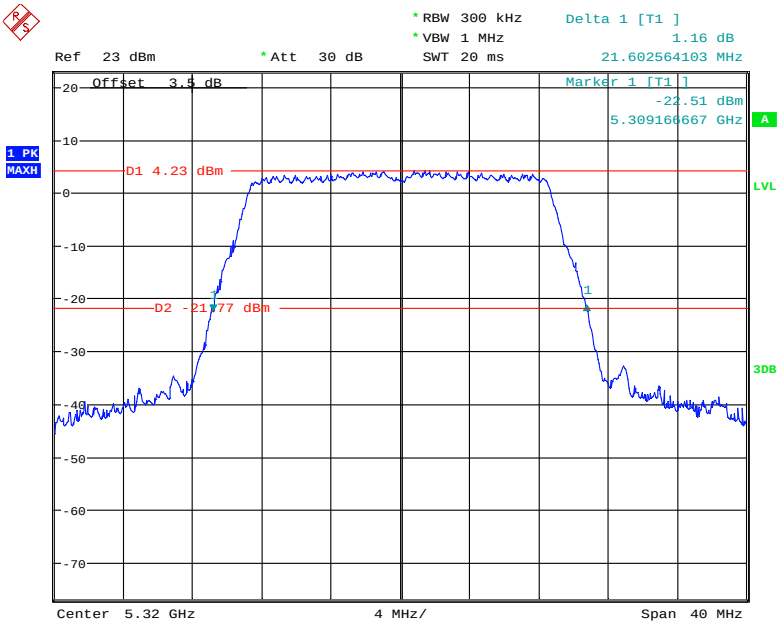
Date: 18.FEB.2017 17:57:50

5300MHz



Date: 18.FEB.2017 17:56:05

5320MHz



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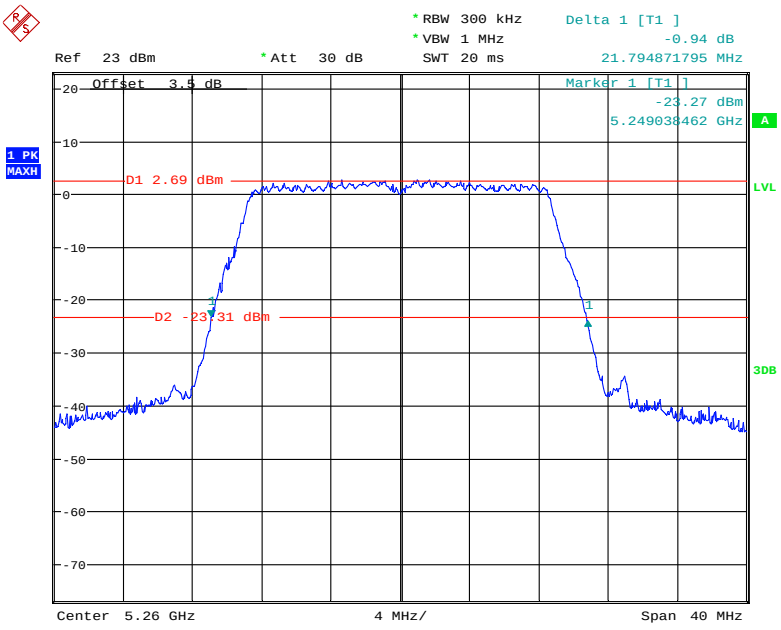
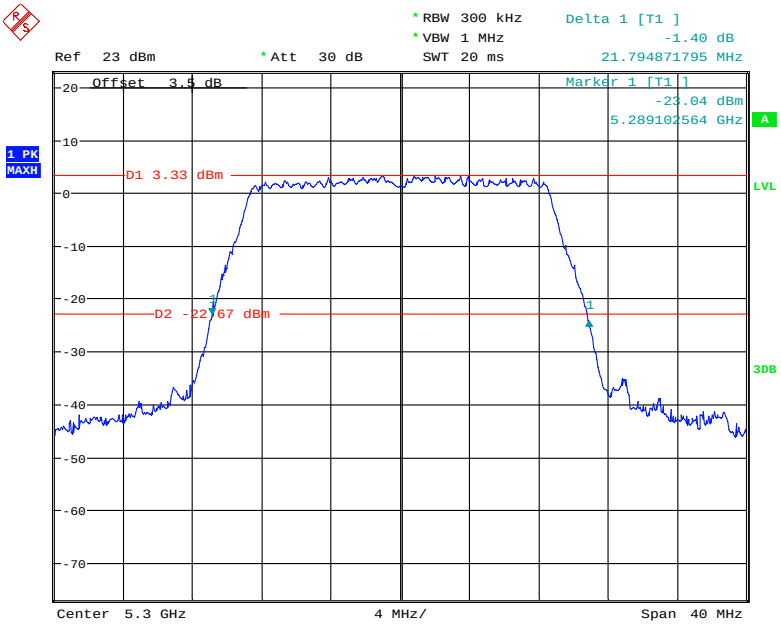
IEEE 802.11n HT20 Mode / 5250 ~ 5350MHz(chain 1)
5260MHz



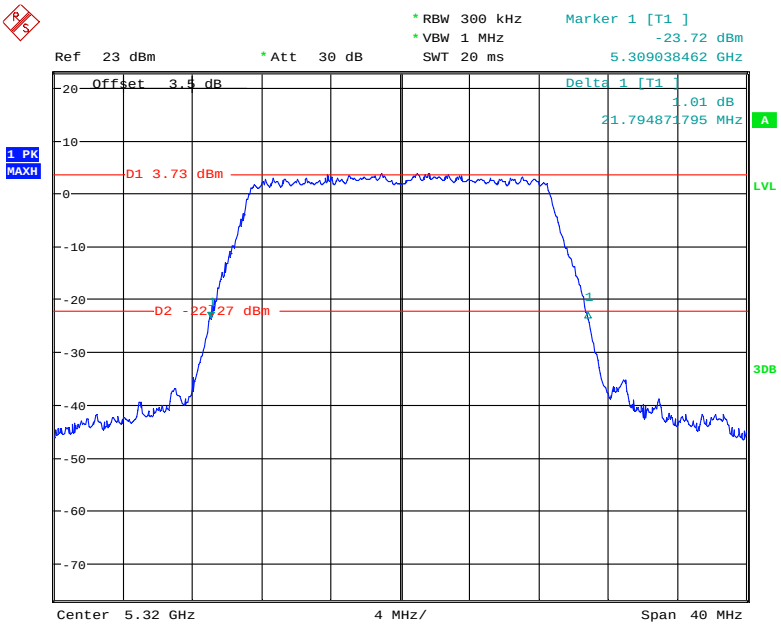
Date: 18.FEB.2017 17:37:57

5300MHz



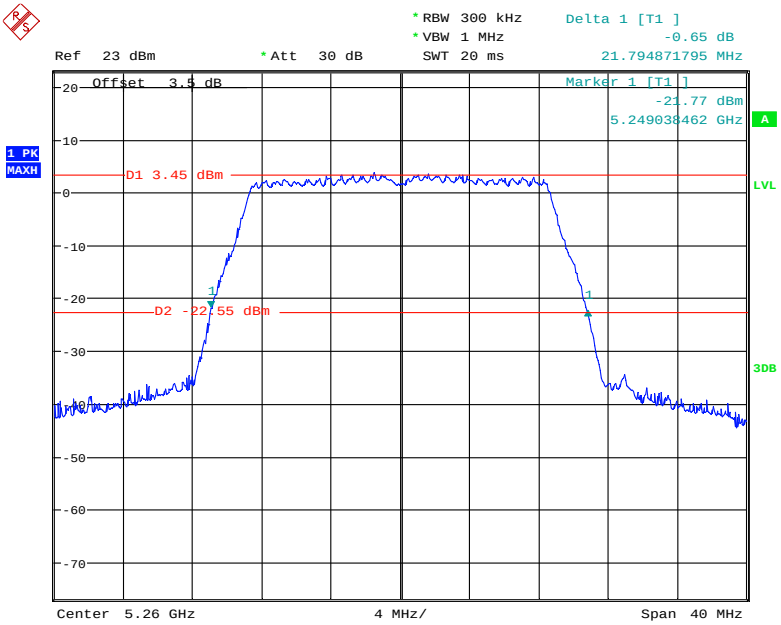
Date: 18.FEB.2017 17:39:40

5320MHz



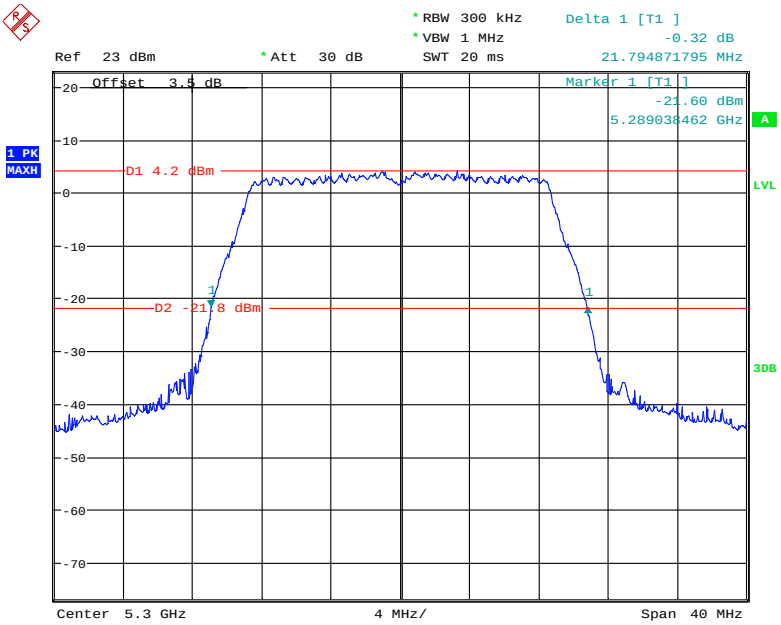
Date: 18.FEB.2017 17:44:12

IEEE 802.11n HT20 Mode / 5250 ~ 5350MHz(chain 2)
5260MHz



Date: 18.FEB.2017 17:25:28

5300MHz



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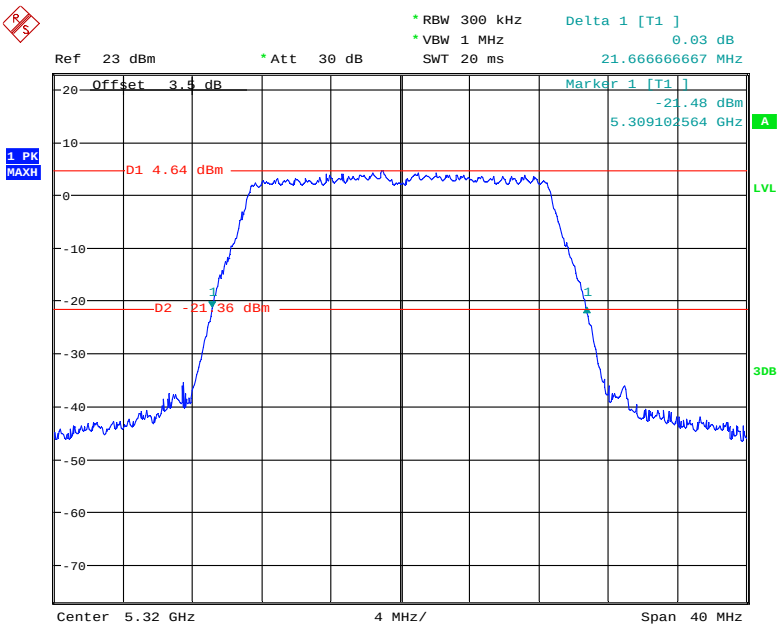
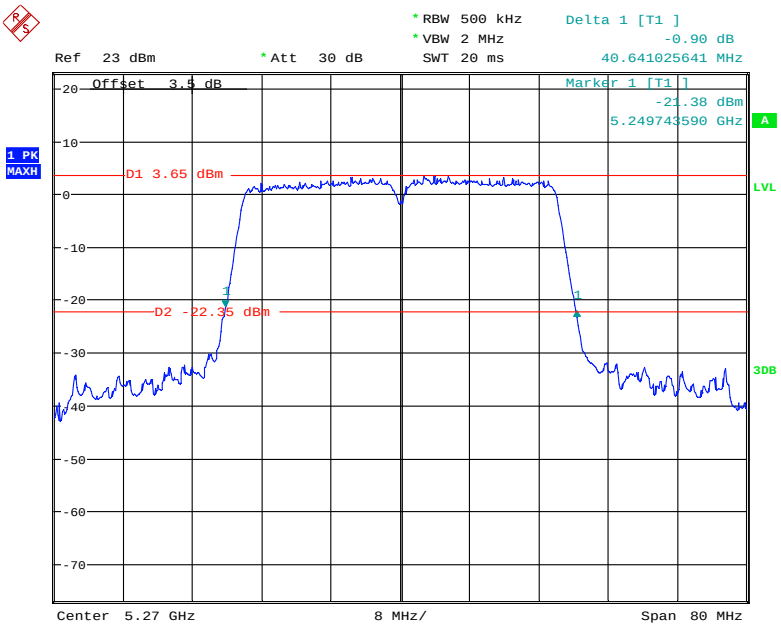
5320MHz



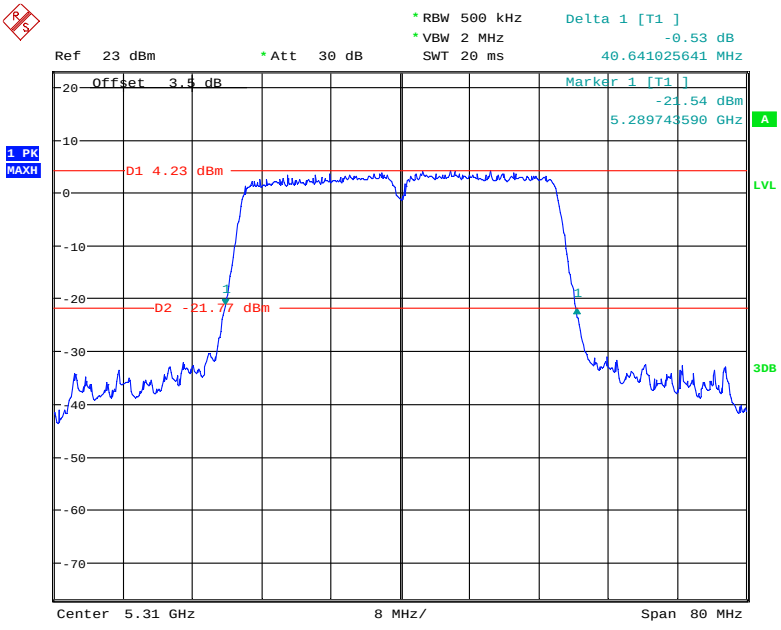
Date: 18.FEB.2017 17:17:02

IEEE 802.11n HT40 Mode / 5250 ~ 5350MHz (chain0)
5270MHz



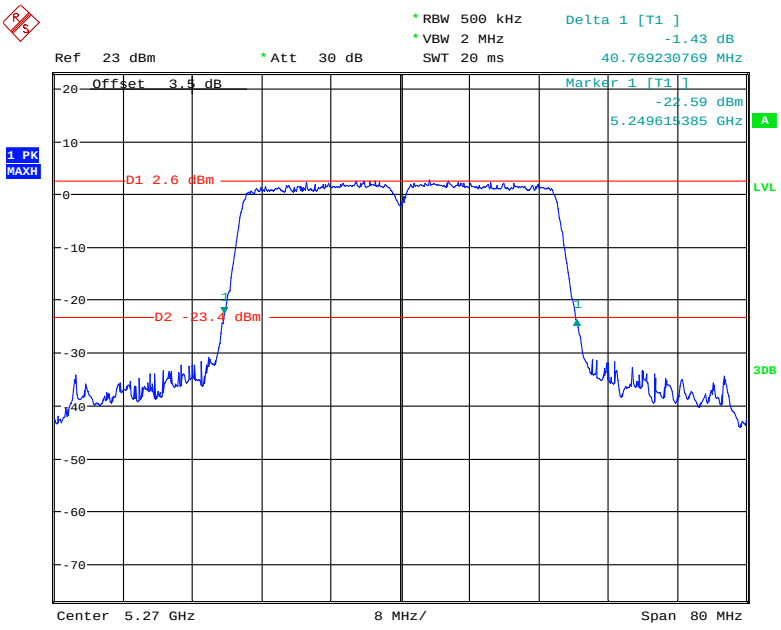
Date: 18.FEB.2017 16:10:58

5310MHz



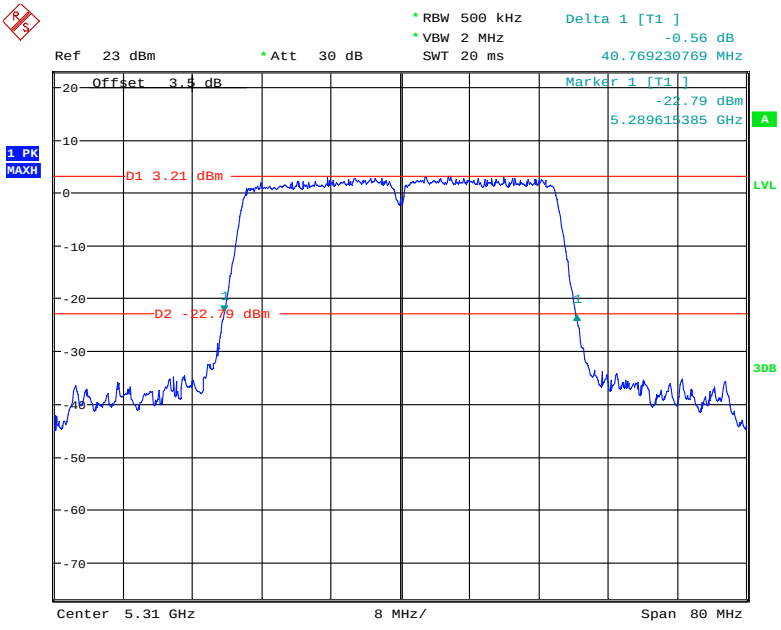
Date: 18.FEB.2017 16:08:56

IEEE 802.11n HT40 Mode / 5250 ~ 5350MHz (chain1)
5270MHz



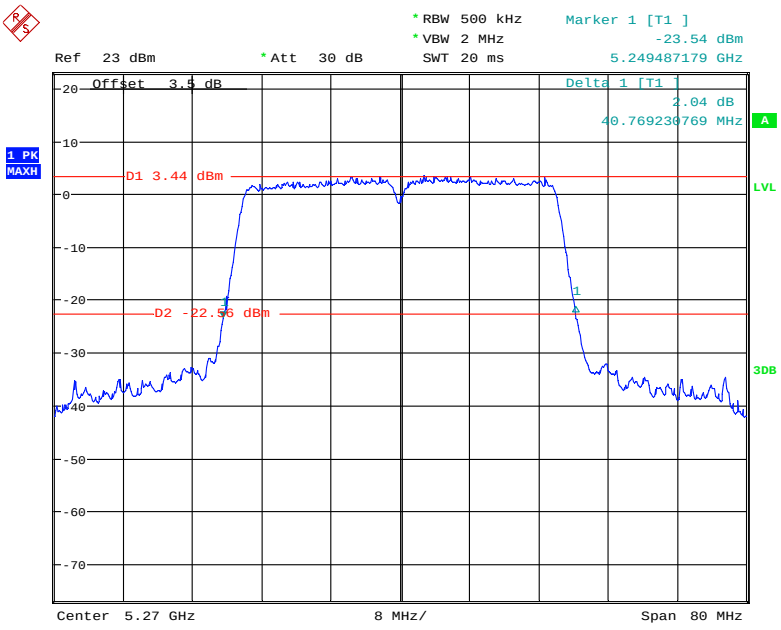
Date: 18.FEB.2017 15:56:29

5310MHz



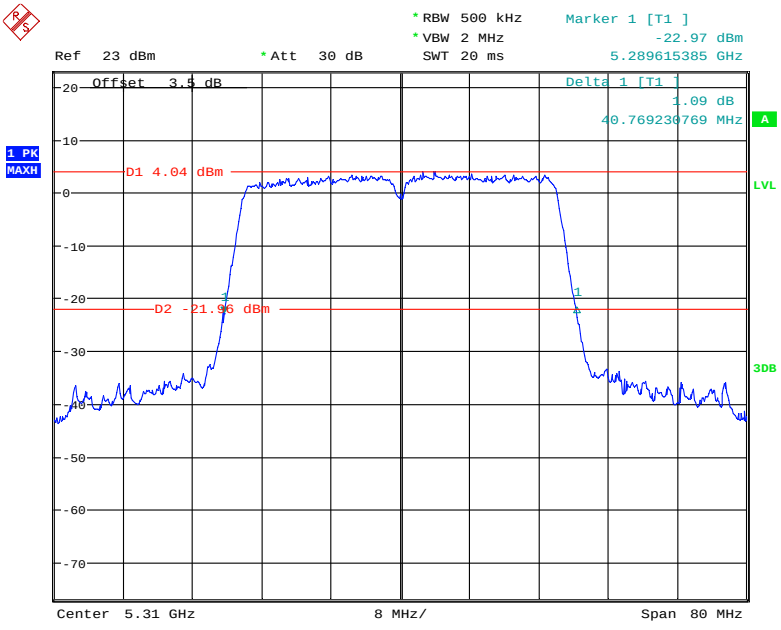
Date: 18.FEB.2017 15:59:03

IEEE 802.11n HT40 Mode / 5250 ~ 5350MHz (chain2)
5270MHz



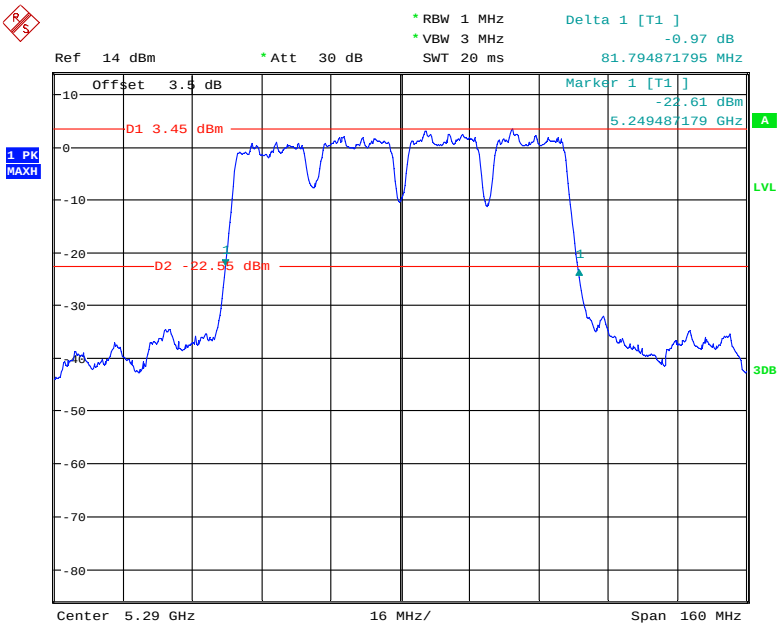
Date: 18.FEB.2017 15:36:02

5310MHz



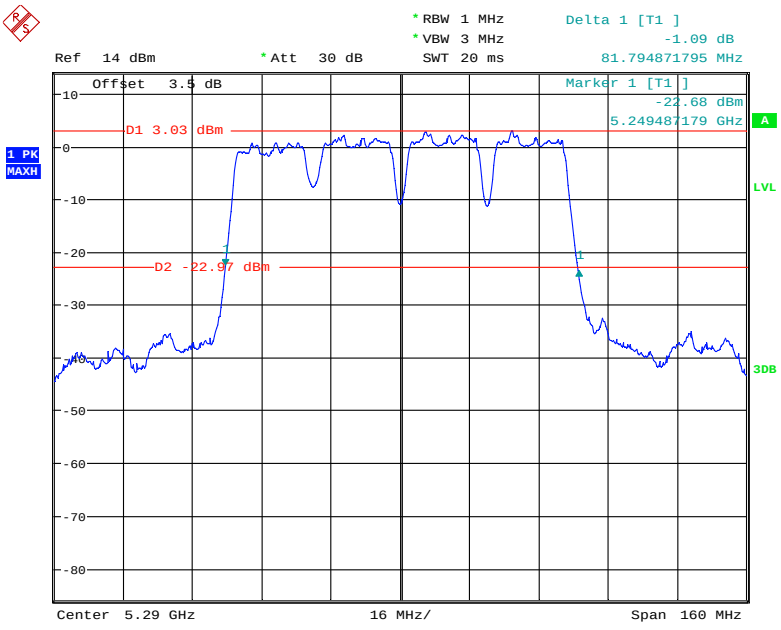
Date: 18.FEB.2017 15:40:15

IEEE 802.11ac VHT80 Mode / 5250~5350MHz (chain 0)
5290MHz



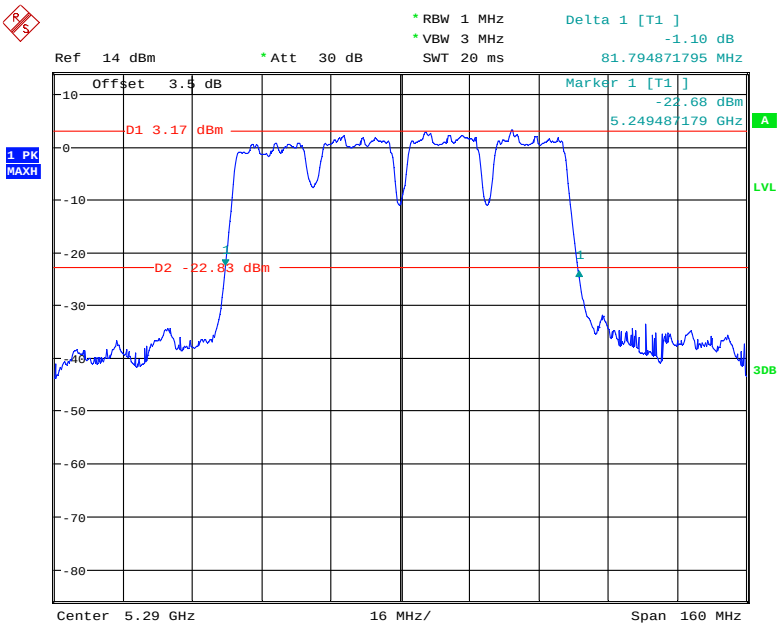
Date: 18.FEB.2017 14:19:01

IEEE 802.11ac VHT80 Mode / 5250~5350MHz (chain 1)
5290MHz



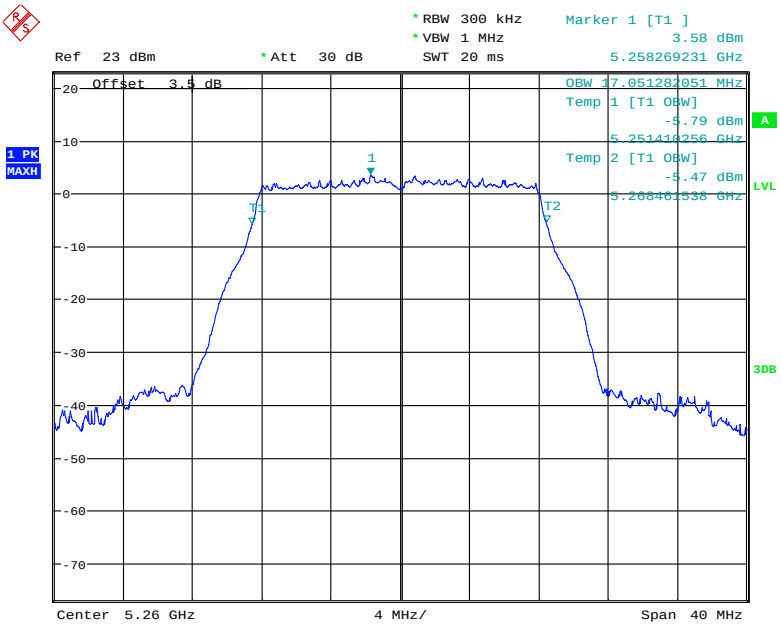
Date: 18.FEB.2017 14:11:40

IEEE 802.11ac VHT80 Mode / 5250~5350MHz (chain 2)
5290MHz



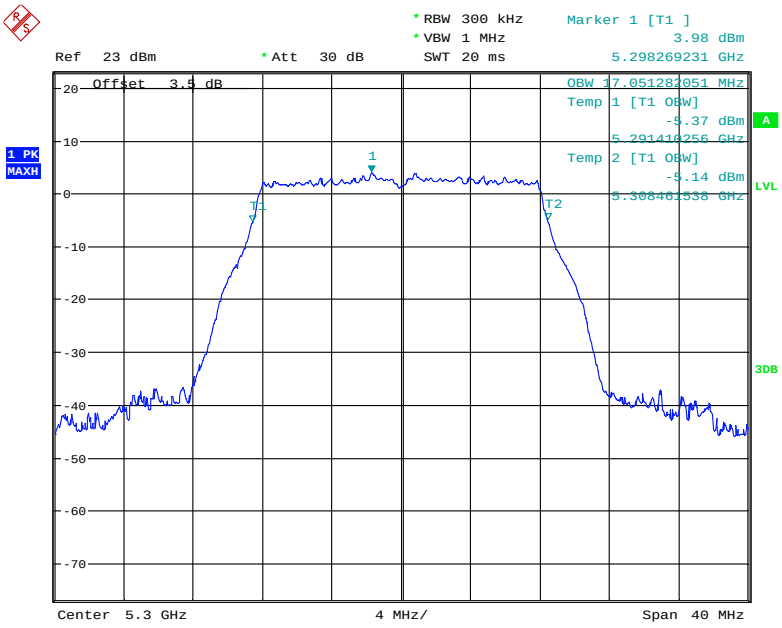
Date: 18.FEB.2017 14:00:45

OBW99%
IEEE 802.11a mode / 5250 ~ 5350MHz(chain0)
5260MHz



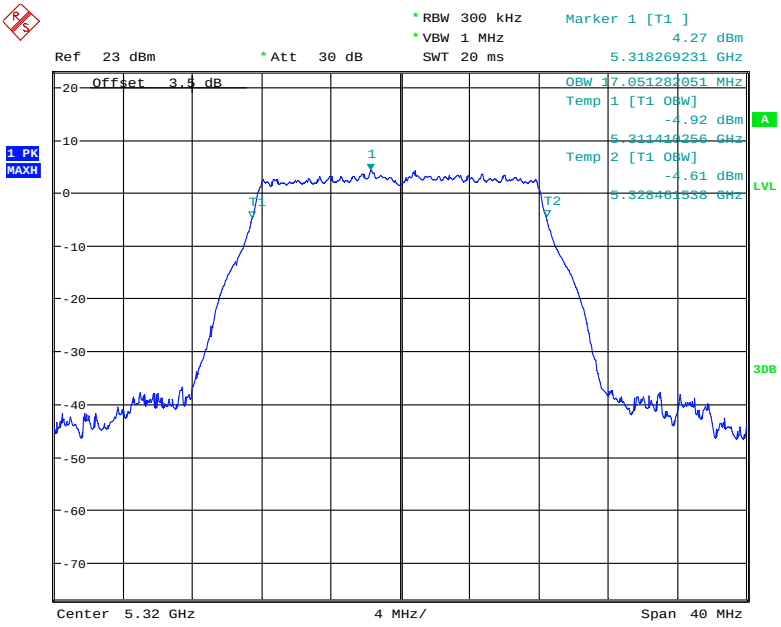
Date: 18.FEB.2017 16:27:43

5300MHz



Date: 18.FEB.2017 16:34:35

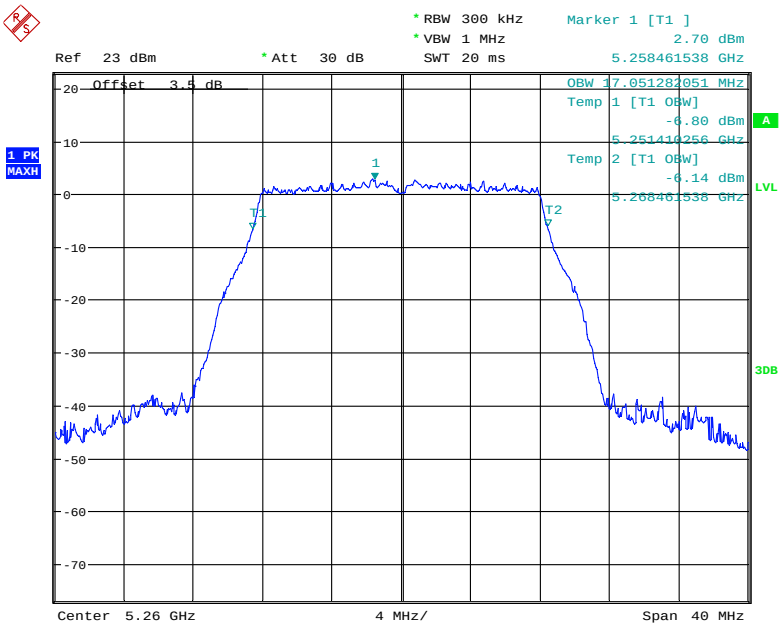
5320MHz



Date: 18.FEB.2017 16:33:56

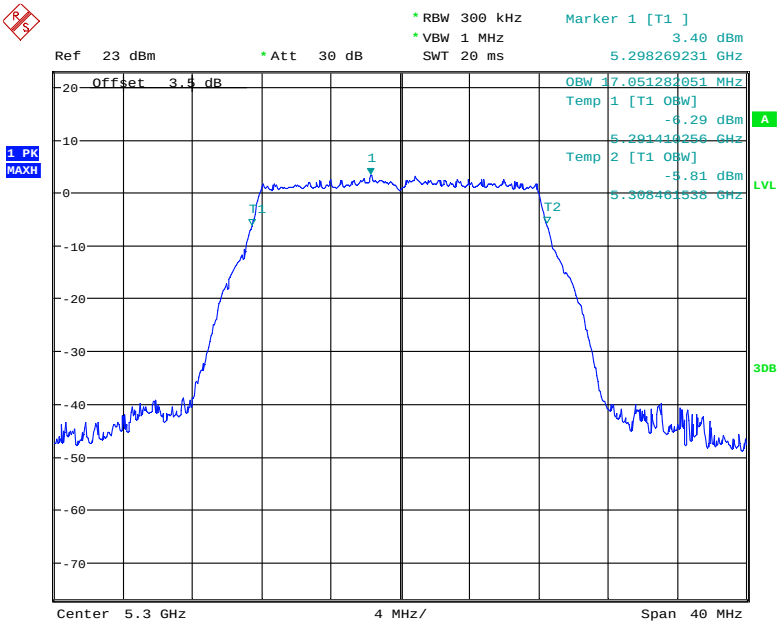
IEEE 802.11a mode / 5250 ~ 5350MHz(chain 1)

5260MHz



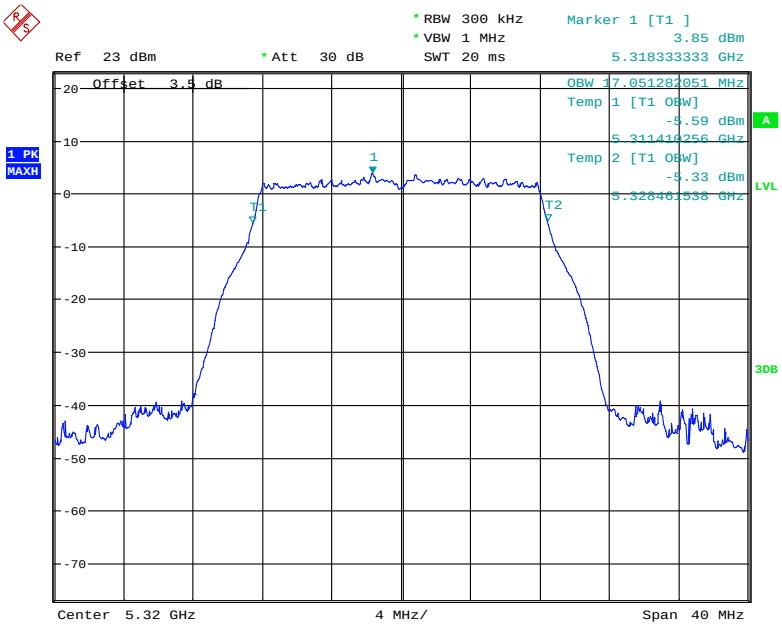
Date: 18.FEB.2017 16:43:22

5300MHz



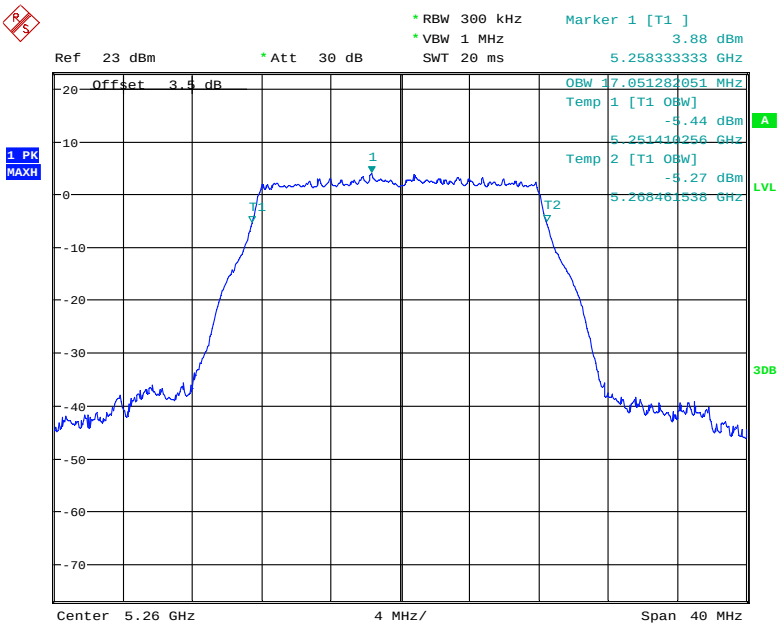
Date: 18.FEB.2017 16:43:48

5320MHz



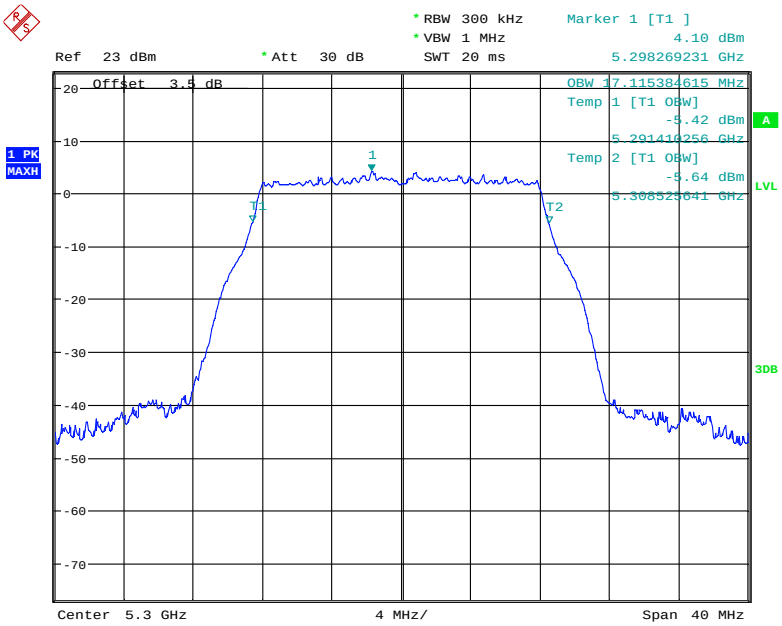
Date: 18.FEB.2017 16:44:30

IEEE 802.11a mode / 5250 ~ 5350MHz(chain2)
5260MHz



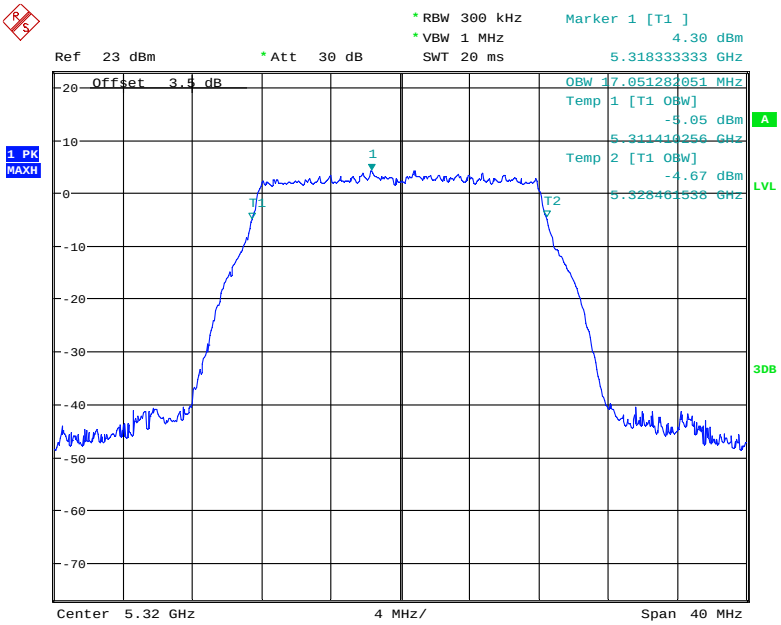
Date: 18.FEB.2017 17:08:35

5300MHz



Date: 18.FEB.2017 17:04:57

5320MHz



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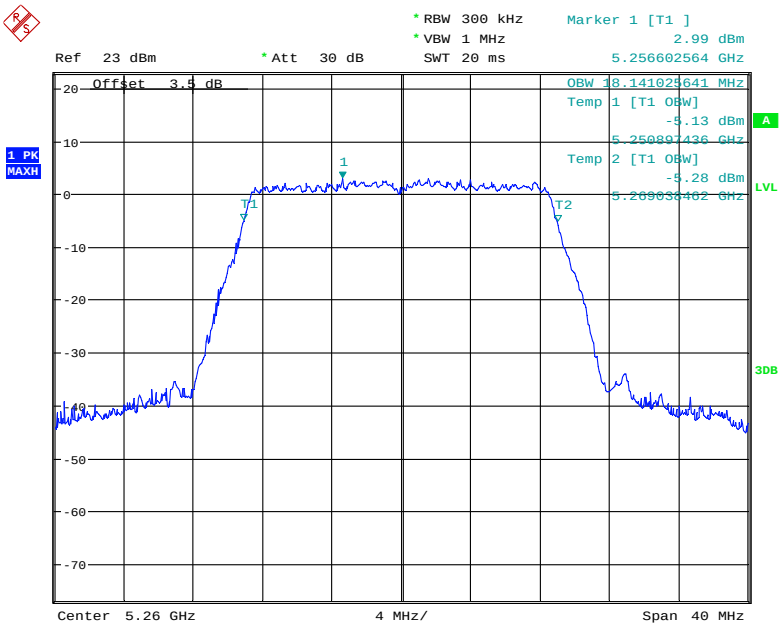
IEEE 802.11n HT20 Mode / 5250 ~ 5350MHz(chain0)
5260MHz



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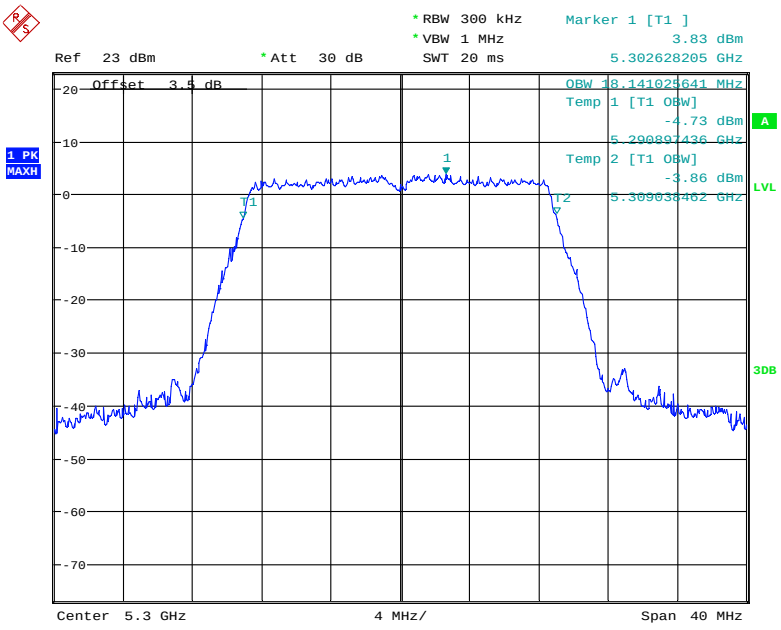
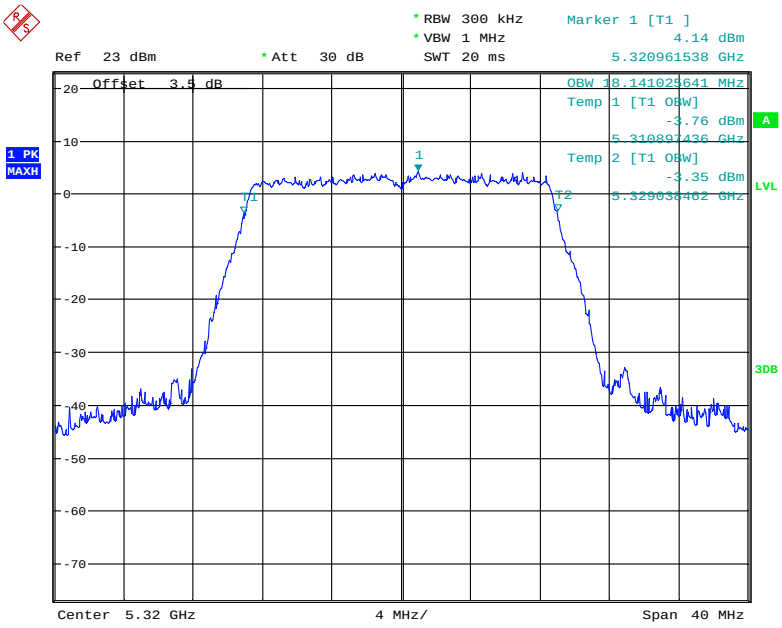
5300MHz



Date: 18.FEB.2017 17:50:46

5320MHz



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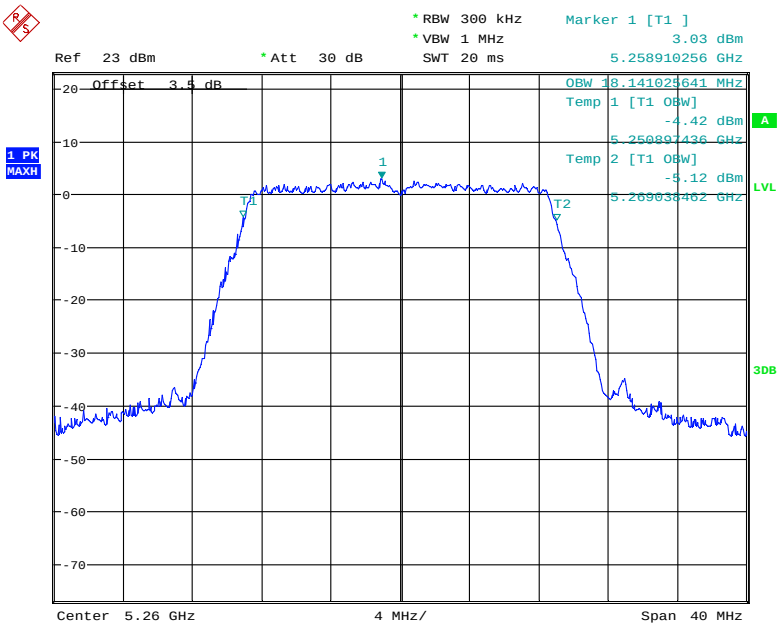
IEEE 802.11n HT20 Mode / 5250 ~ 5350MHz(chain 1)
5260MHz



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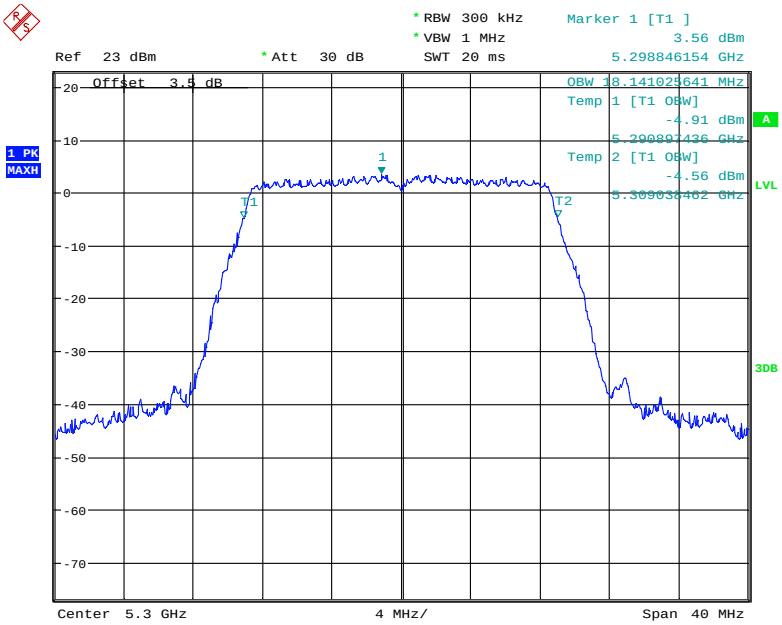
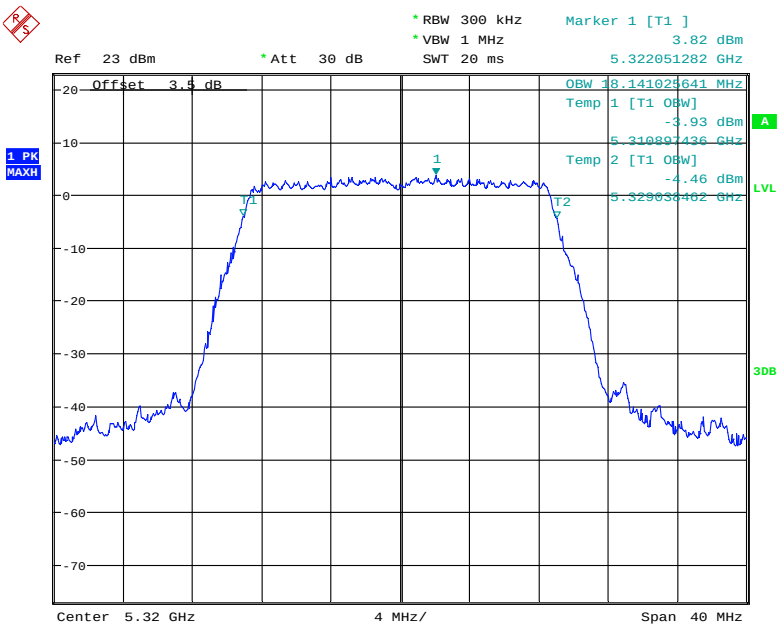
5300MHz



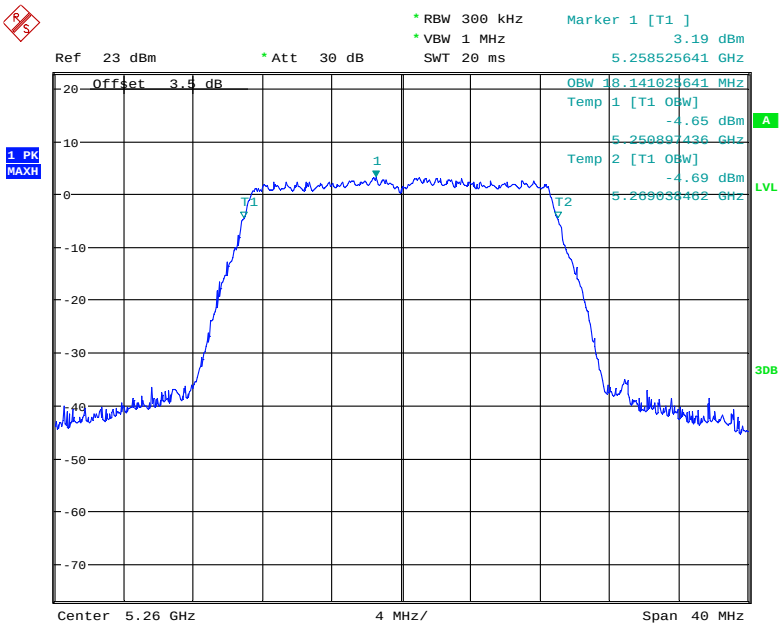
Date: 18.FEB.2017 17:41:27

5320MHz



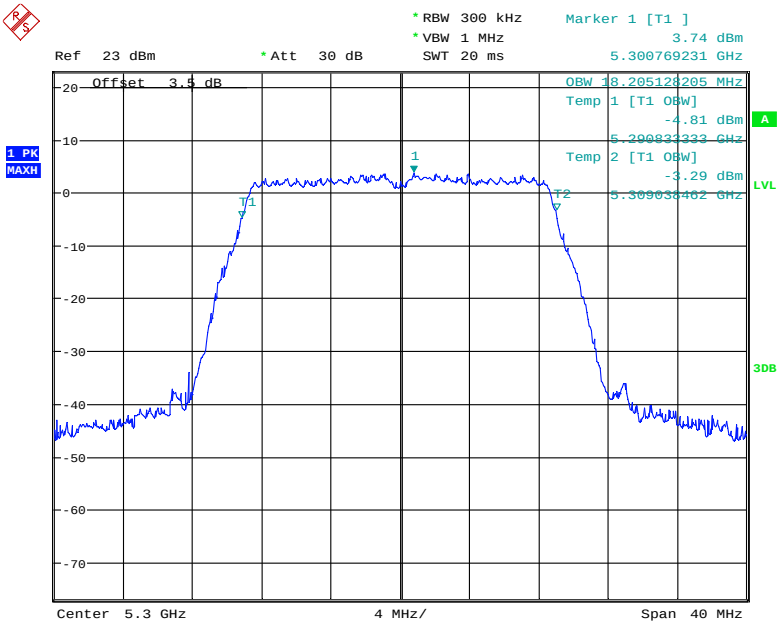
Date: 18.FEB.2017 17:42:21

IEEE 802.11n HT20 Mode / 5250 ~ 5350MHz(chain 2)
5260MHz



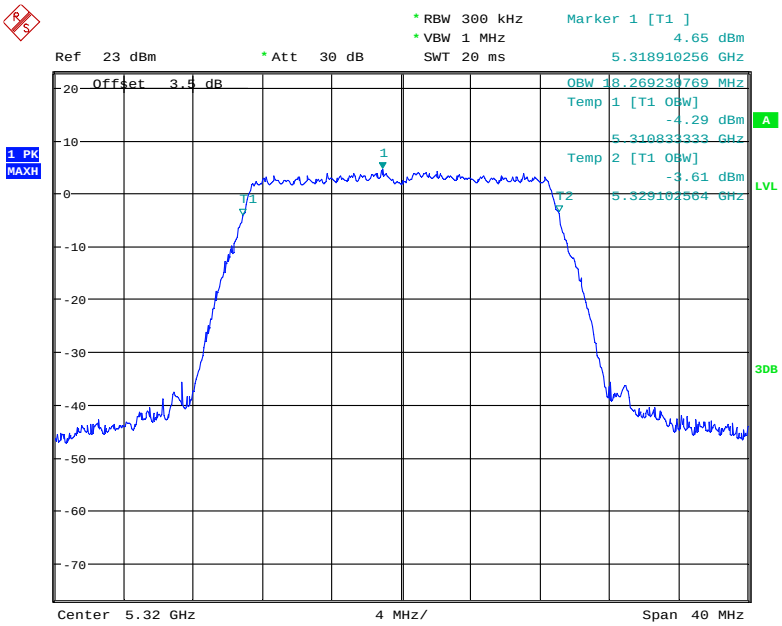
Date: 18.FEB.2017 17:22:55

5300MHz



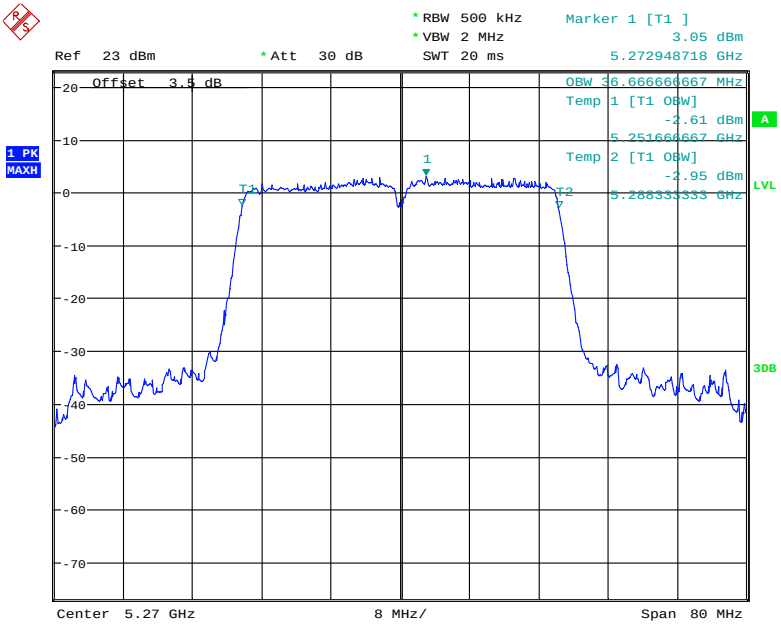
Date: 18.FEB.2017 17:21:52

5320MHz



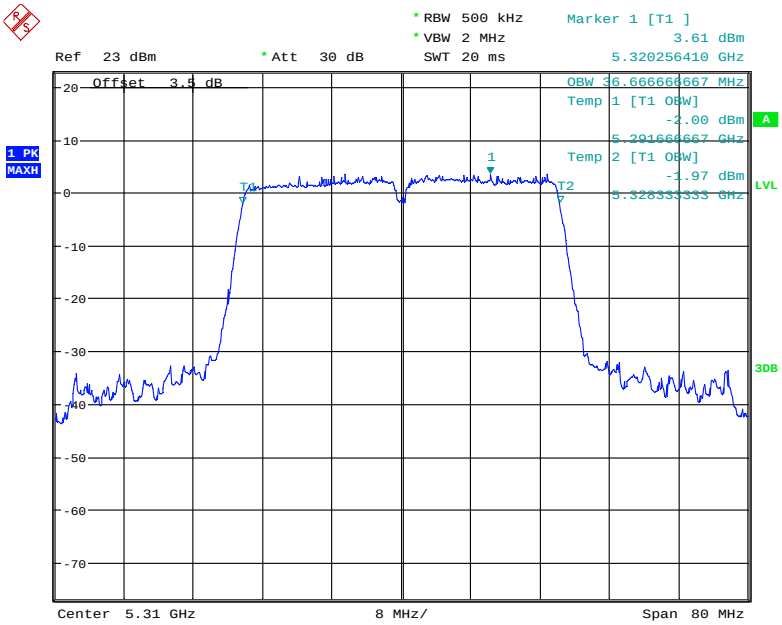
Date: 18.FEB.2017 17:15:06

IEEE 802.11n HT40 Mode / 5250 ~ 5350MHz (chain0)
5270MHz

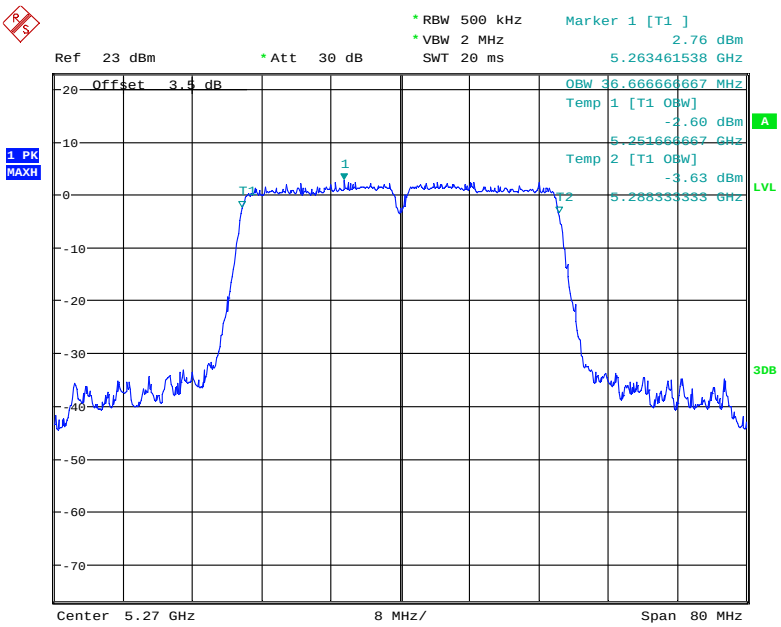


Date: 18.FEB.2017 16:12:07

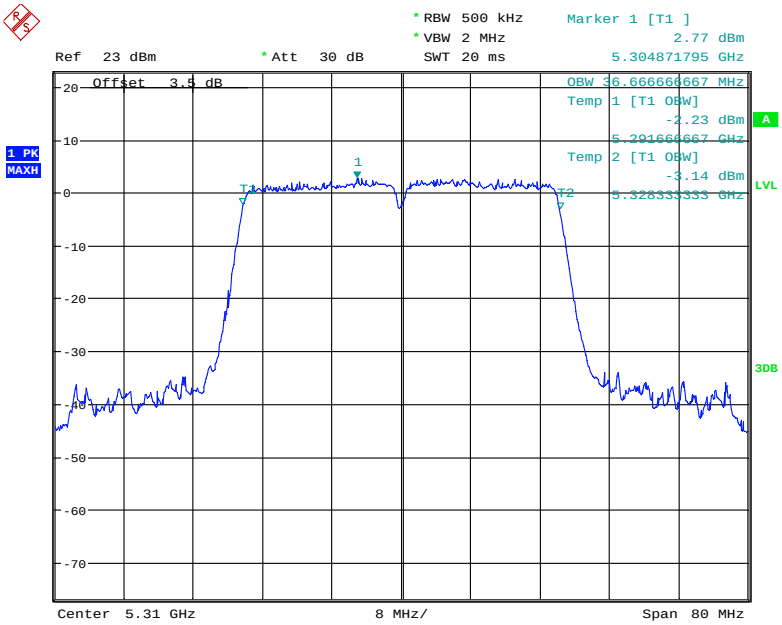
5310MHz



IEEE 802.11n HT40 Mode / 5250 ~ 5350MHz (chain1)
5270MHz

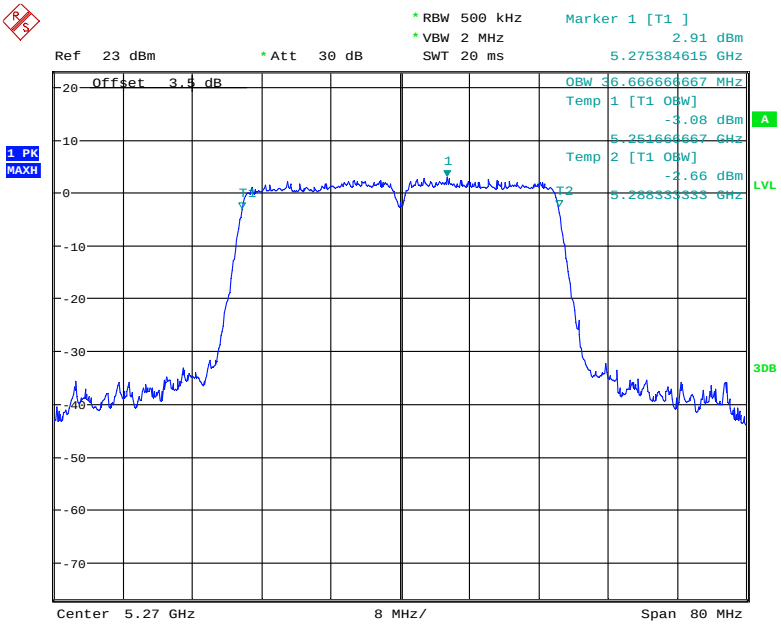


5310MHz



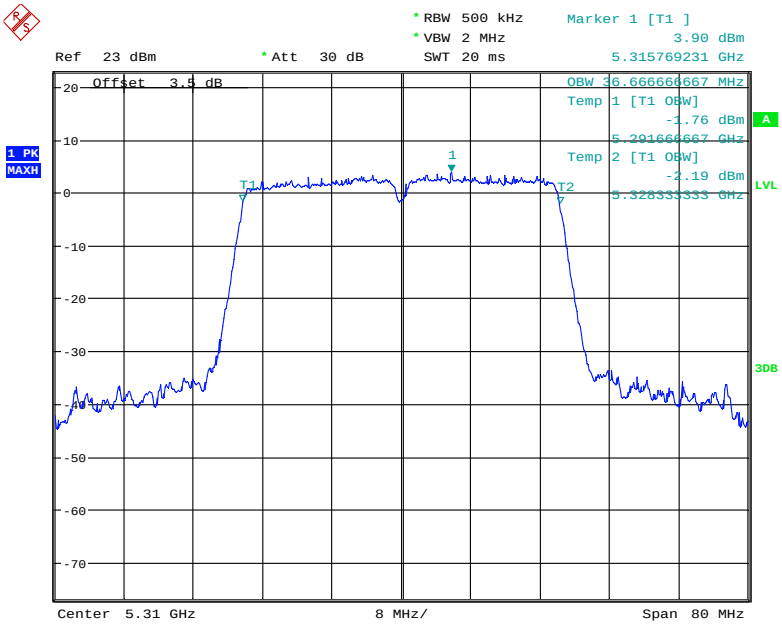
Date: 18.FEB.2017 15:57:46

IEEE 802.11n HT40 Mode / 5250 ~ 5350MHz (chain2)
5270MHz



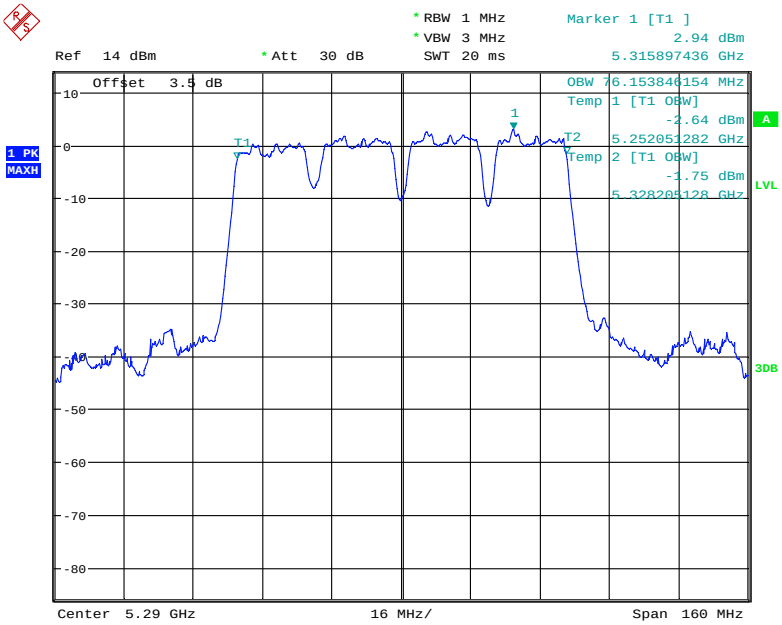
Date: 18.FEB.2017 15:32:22

5310MHz



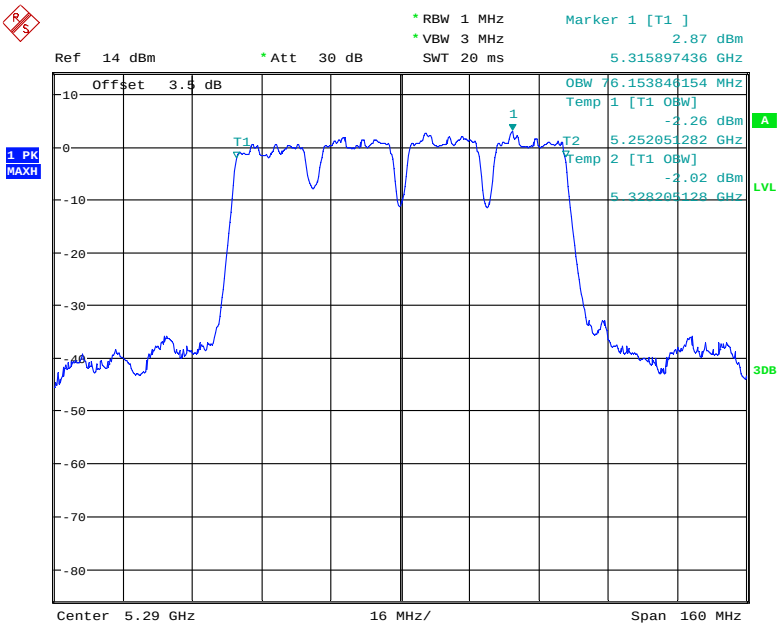
Date: 18.FEB.2017 15:42:05

IEEE 802.11ac VHT80 Mode / 5250~5350MHz (chain 0)
5290MHz



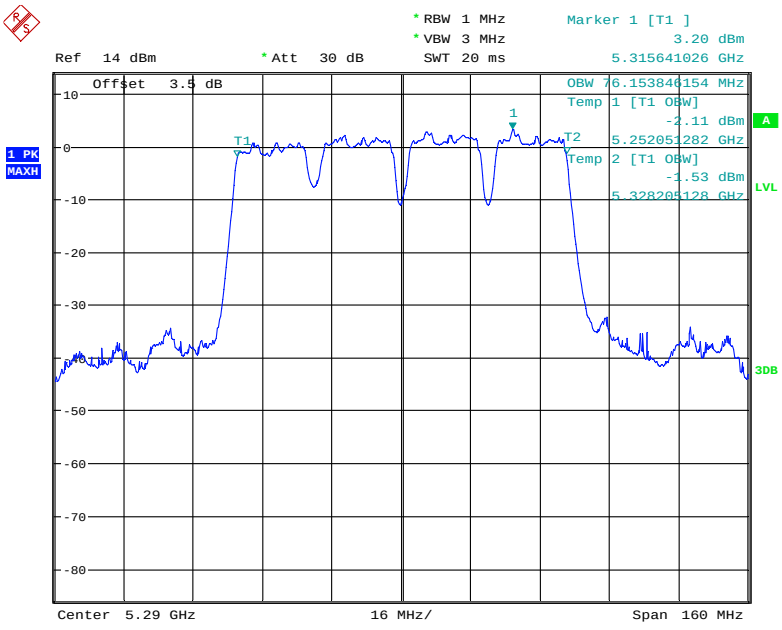
Date: 18.FEB.2017 14:19:57

IEEE 802.11ac VHT80 Mode / 5250~5350MHz (chain 1)
5290MHz



Date: 18.FEB.2017 14:12:47

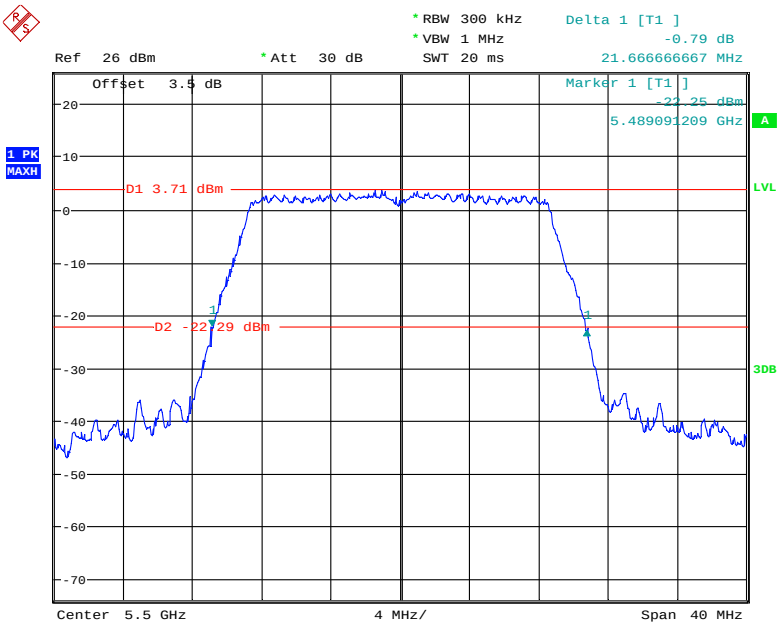
IEEE 802.11ac VHT80 Mode / 5250~5350MHz (chain 2)
5290MHz



Date: 18.FEB.2017 13:58:51

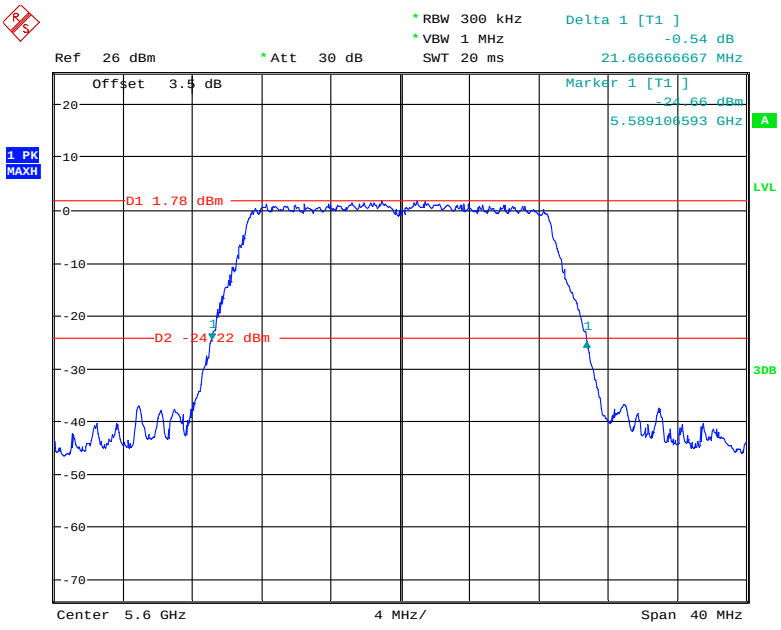
Frequency (MHz)	Antenna	26dB bandwidth (MHz)	99% occupied bandwidth (MHz)
802.11 a			
5500	0	21.67	18.06
	1	21.15	17.09
	2	21.28	17.12
5600	0	21.67	18.11
	1	21.15	17.05
	2	21.28	17.05
5700	0	21.67	18.17
	1	21.15	17.05
	2	21.28	17.05
802.11 n20			
5500	0	21.73	18.21
	1	21.67	18.21
	2	21.86	18.14
5600	0	21.67	18.08
	1	21.67	18.14
	2	21.67	18.21
5700	0	21.67	18.21
	1	21.67	18.14
	2	21.67	18.14
802.11 n40			
5510	0	40.77	36.67
	1	40.77	36.54
	2	40.77	36.54
5590	0	40.77	36.67
	1	40.77	36.67
	2	40.77	36.67
5670	0	40.64	36.67
	1	40.77	36.67
	2	40.77	36.67
802.11 ac80			
5530	0	81.79	76.41
	1	81.79	75.90
	2	81.79	76.15
5610	0	81.79	76.15
	1	81.79	76.15
	2	81.79	76.15

DTS BW 26dBc
IEEE 802.11a mode / 5470 ~ 5725MHz(chain0)
5500MHz



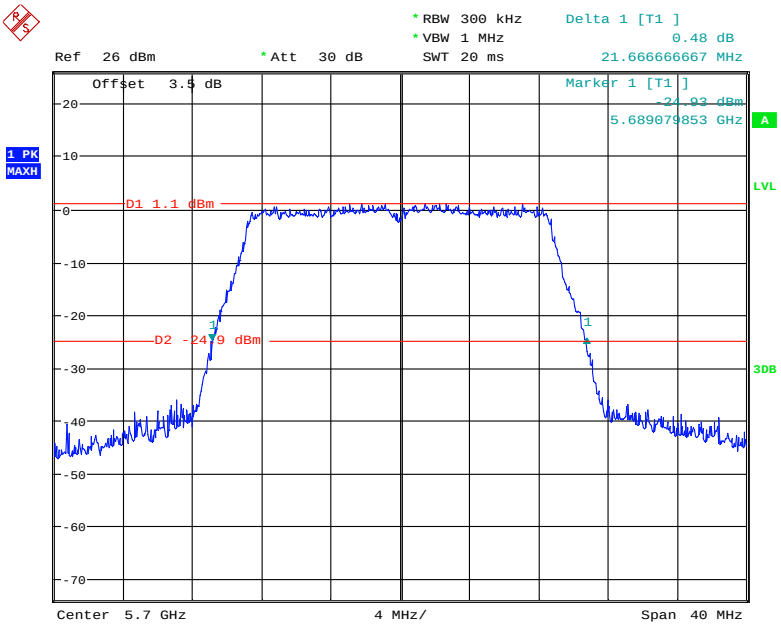
Date: 22.FEB.2017 09:29:51

5600MHz



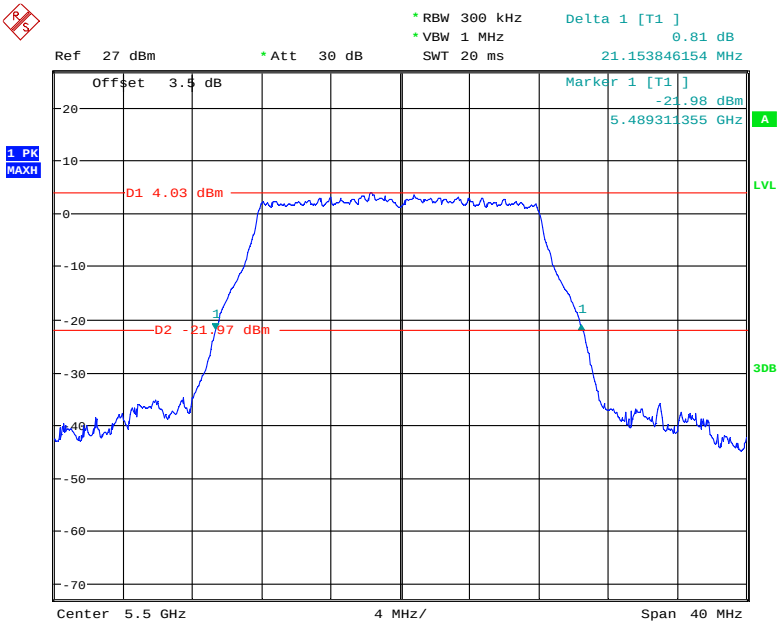
Date: 22.FEB.2017 09:34:48

5700MHz



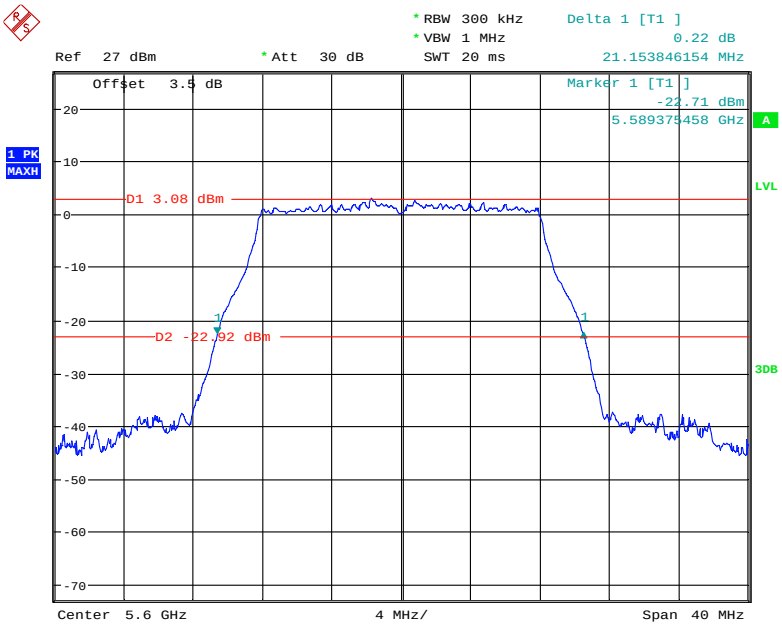
Date: 22.FEB.2017 09:45:04

IEEE 802.11a mode / 5470 ~ 5725MHz(chain 1)
5500MHz



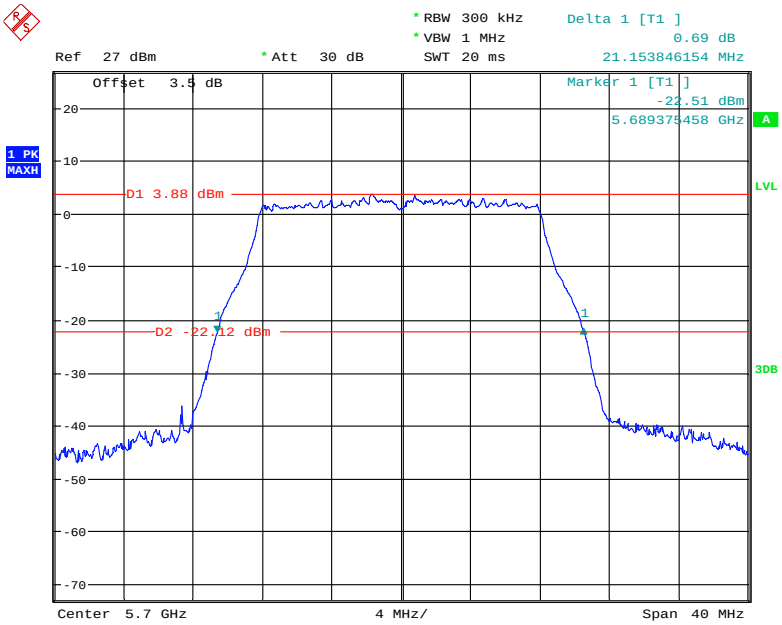
Date: 22.FEB.2017 14:09:06

5600MHz



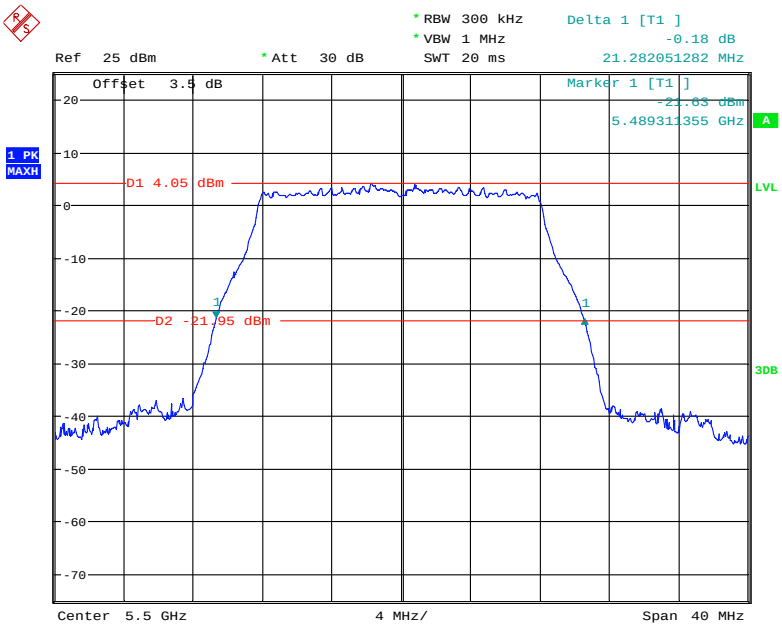
Date: 22.FEB.2017 14:06:09

5700MHz



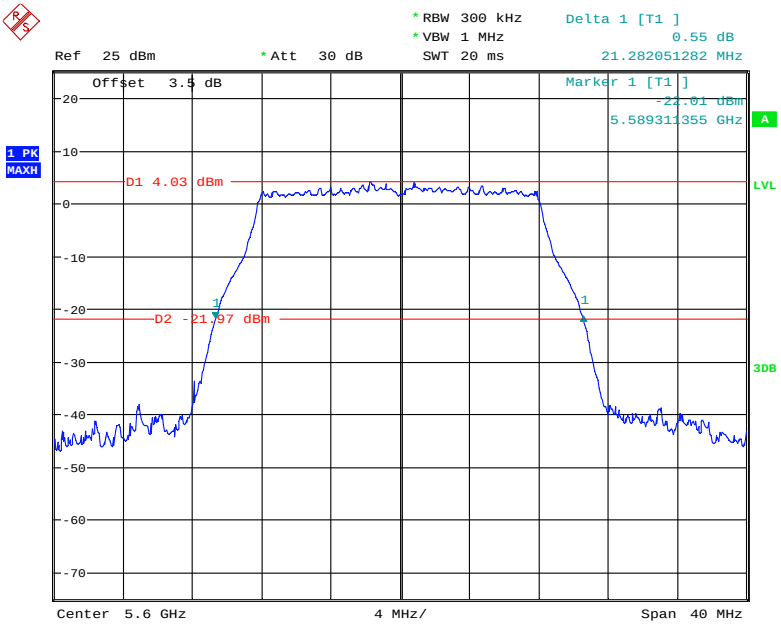
Date: 22.FEB.2017 14:04:09

IEEE 802.11a mode / 5470 ~ 5725MHz(chain 2)
5500MHz



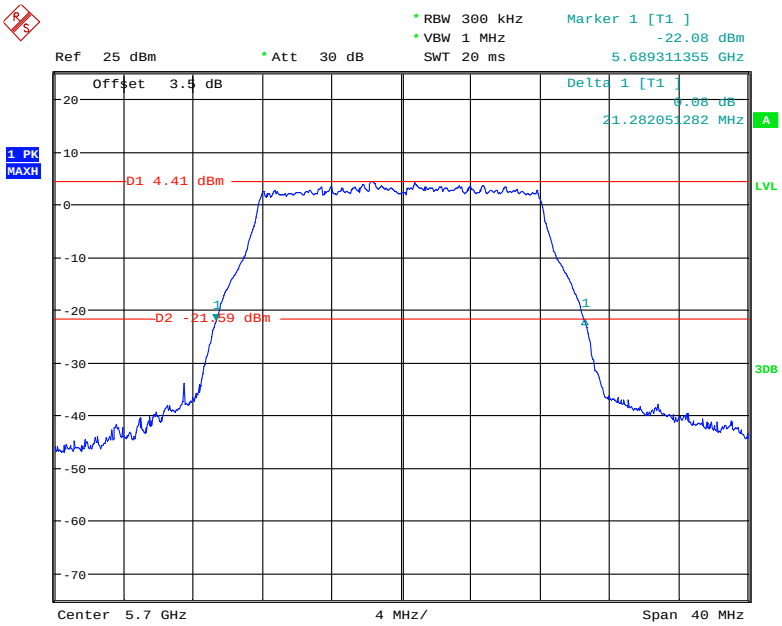
Date: 22.FEB.2017 13:42:07

5600MHz



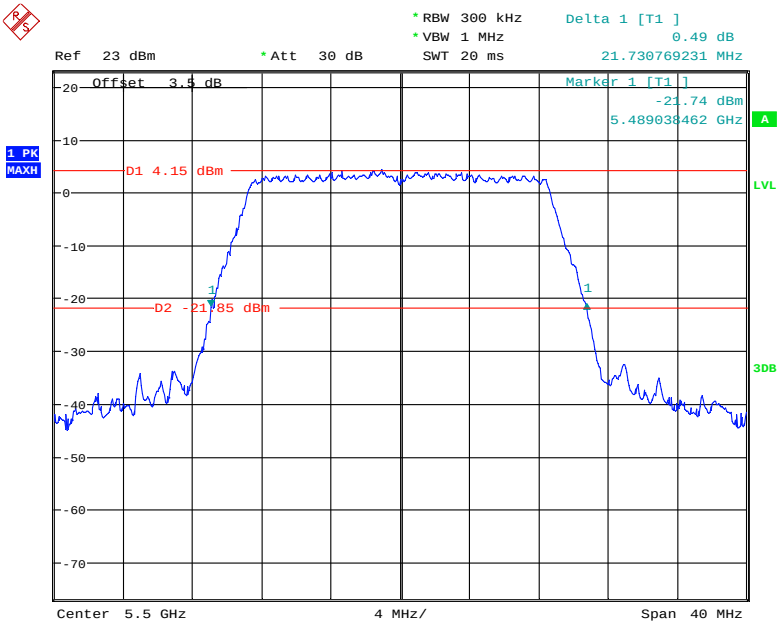
Date: 22.FEB.2017 13:46:09

5700MHz



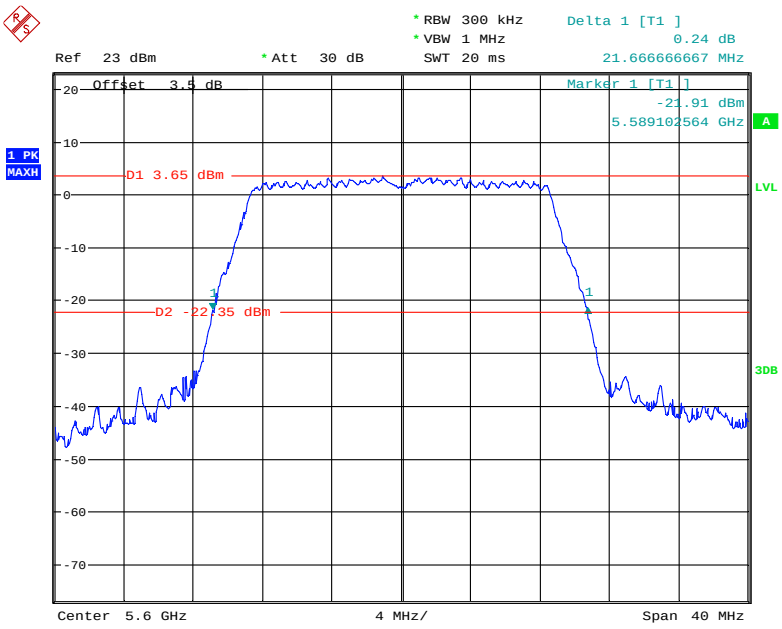
Date: 22.FEB.2017 13:49:58

IEEE 802.11n HT20 Mode / 5470 ~ 5725MHz (chain0)
5500MHz



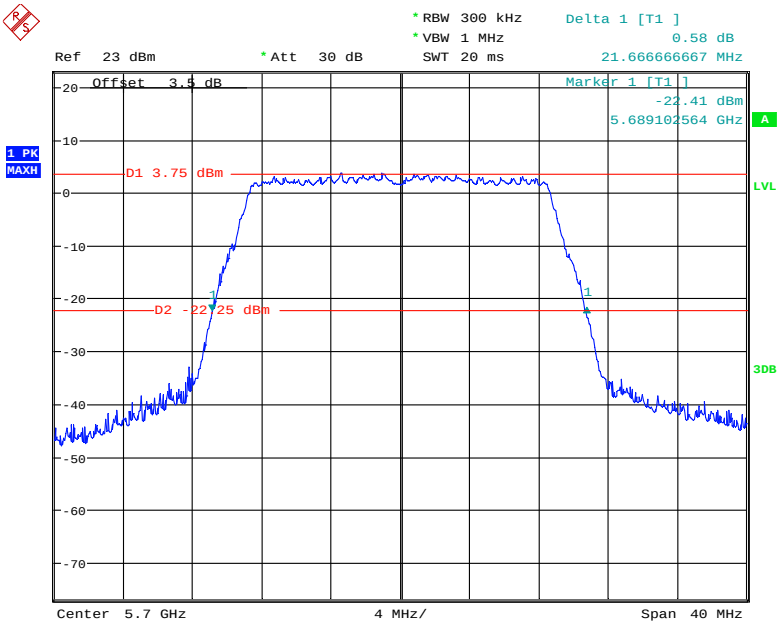
Date: 21.FEB.2017 17:12:20

5600MHz



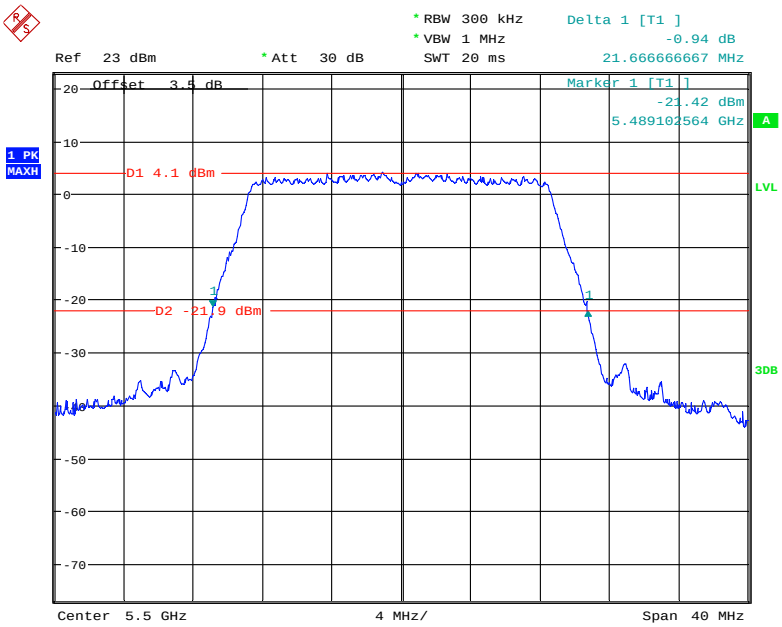
Date: 21.FEB.2017 17:10:06

5700MHz



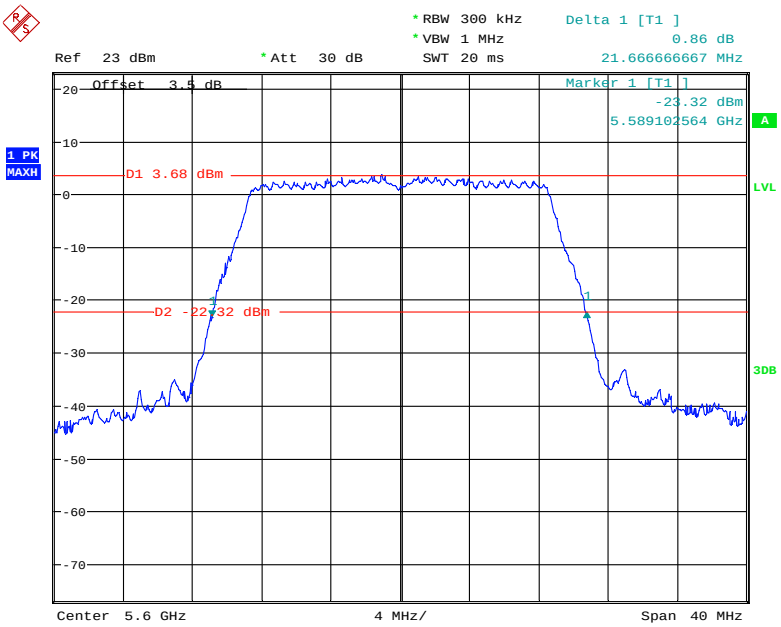
Date: 21.FEB.2017 17:14:20

IEEE 802.11n HT20 Mode / 5470 ~ 5725MHz (chain 1)
5500MHz



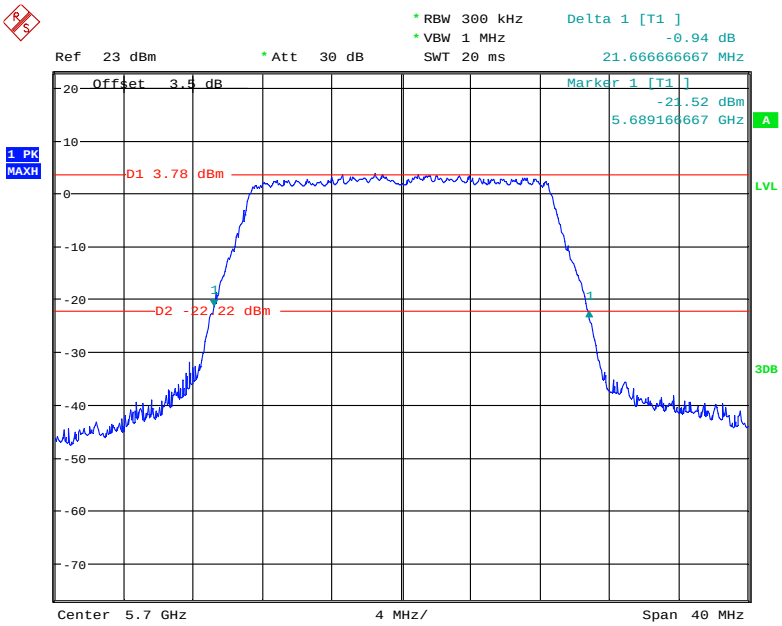
Date: 21.FEB.2017 17:50:55

5600MHz



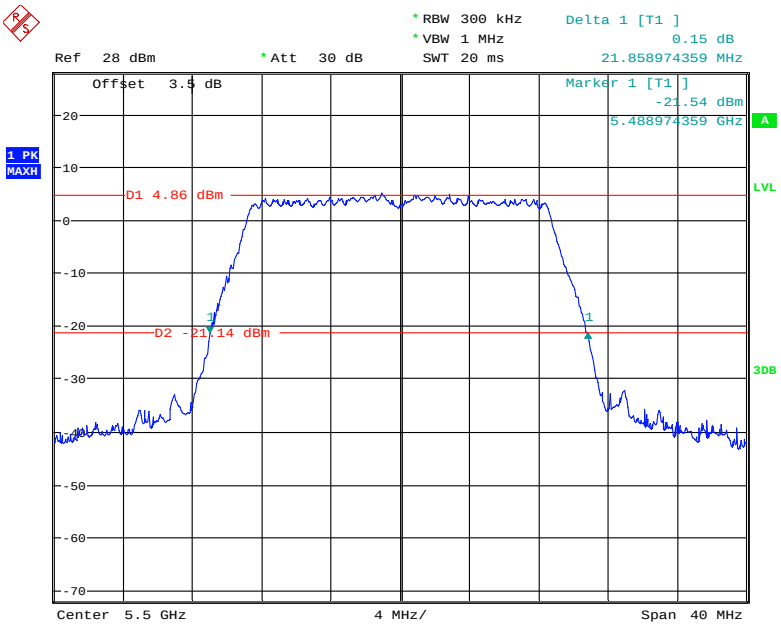
Date: 21.FEB.2017 17:47:02

5700MHz



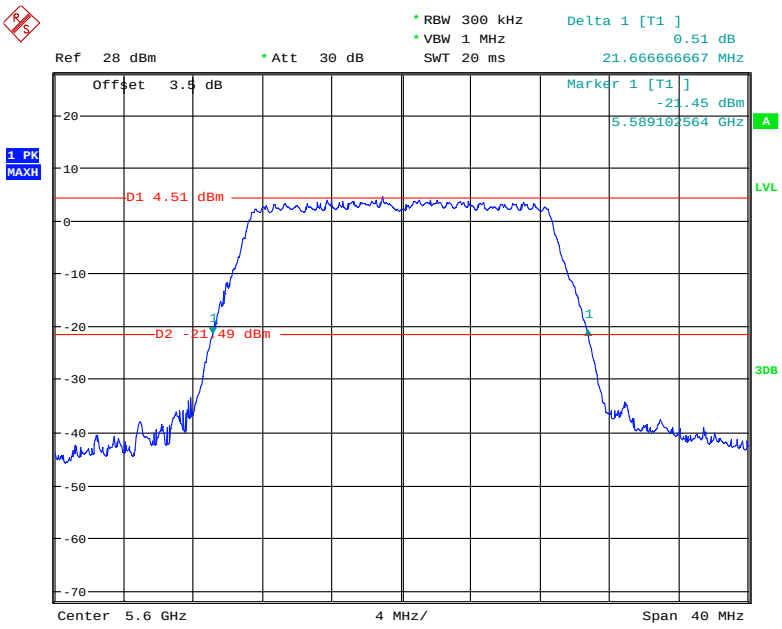
Date: 21.FEB.2017 17:44:31

IEEE 802.11n HT20 Mode / 5470 ~ 5725MHz (chain 2)
5500MHz



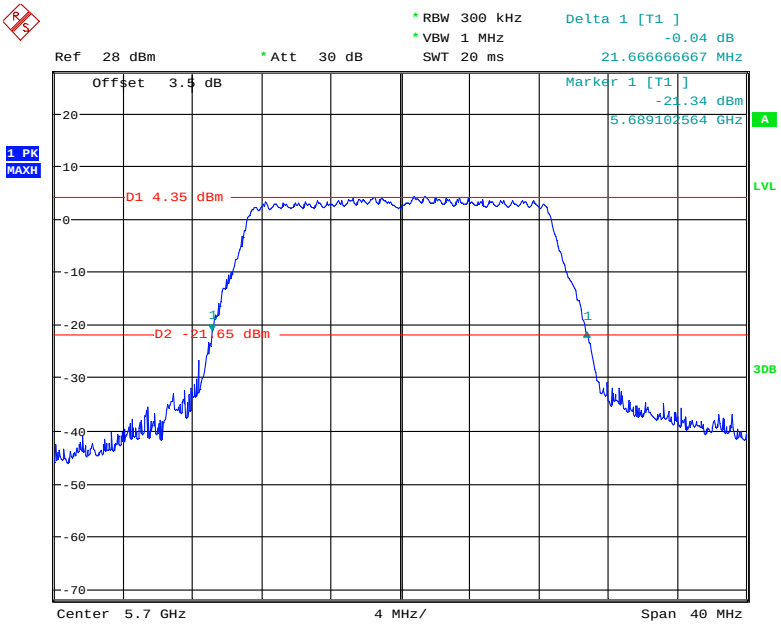
Date: 21.FEB.2017 18:09:34

5600MHz



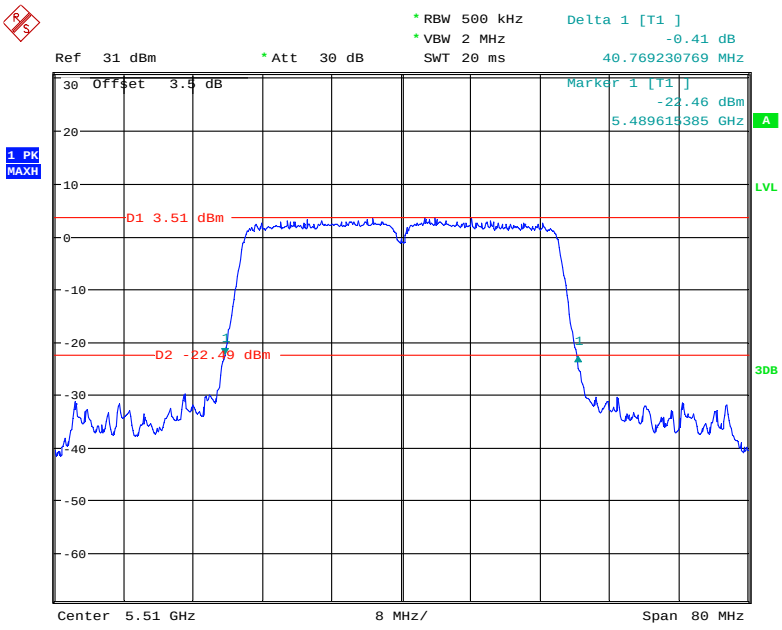
Date: 21.FEB.2017 18:14:18

5700MHz



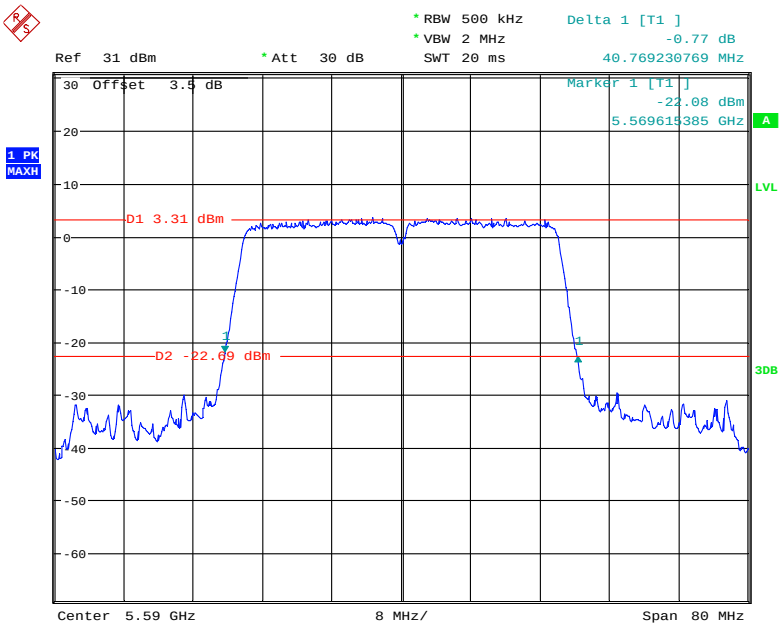
Date: 21.FEB.2017 18:17:42

IEEE 802.11n HT40 Mode / 5470 ~ 5725MHz (chain0)
5510MHz



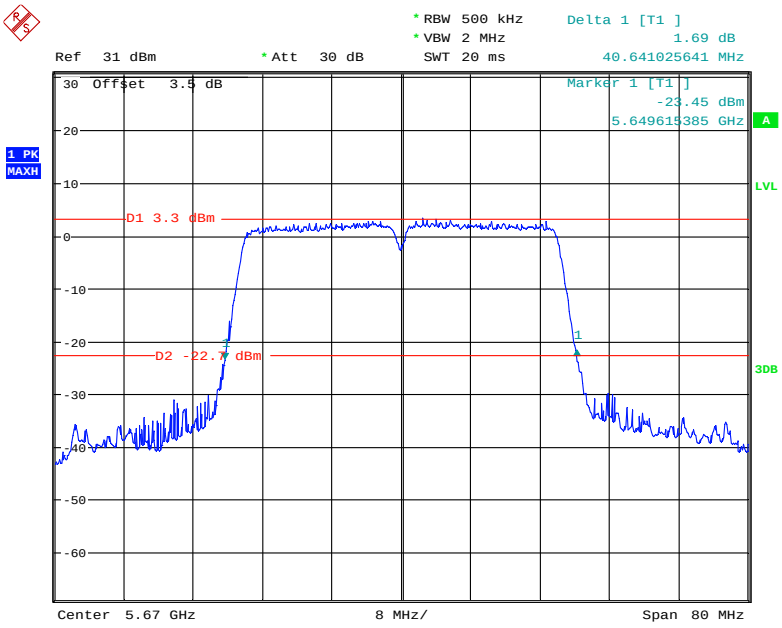
Date: 23.FEB.2017 11:24:10

5590MHz



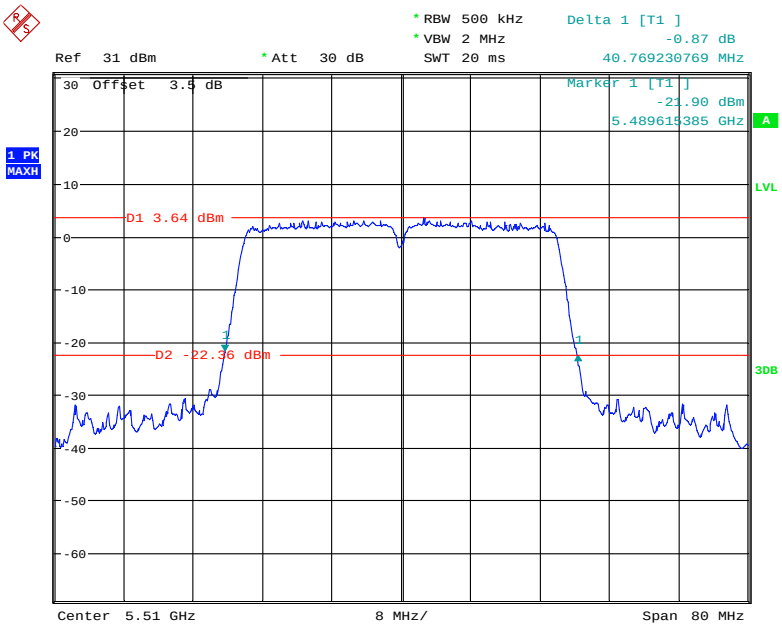
Date: 23.FEB.2017 11:22:28

5670MHz



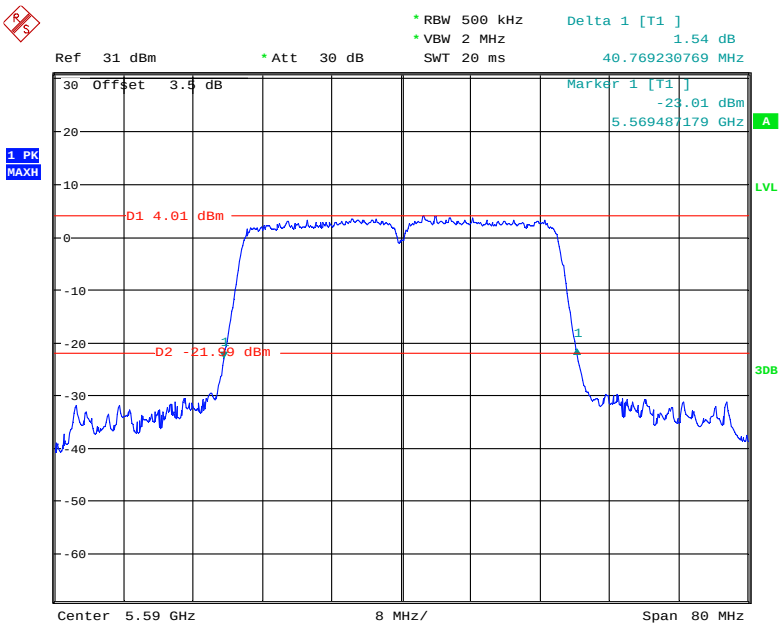
Date: 23.FEB.2017 11:20:15

IEEE 802.11n HT40 Mode / 5470 ~ 5725MHz (chain1)
5510MHz



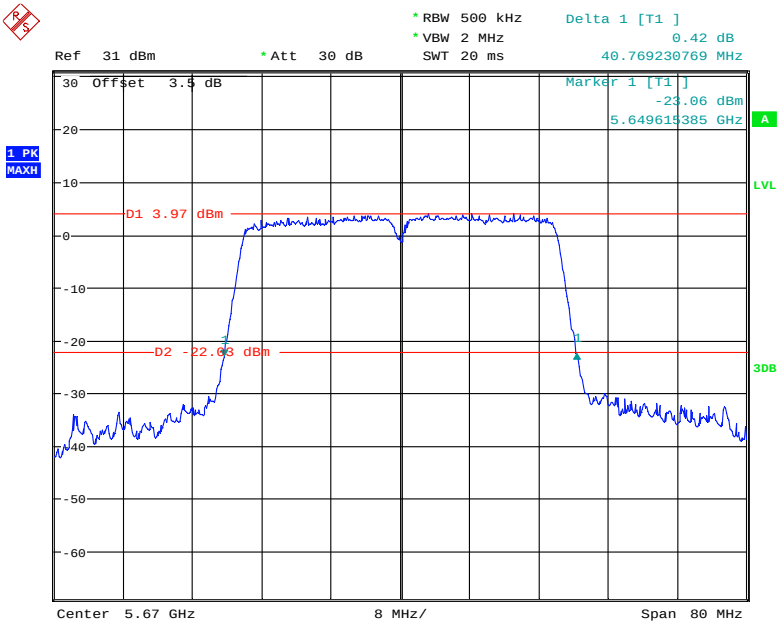
Date: 23.FEB.2017 11:01:54

5590MHz



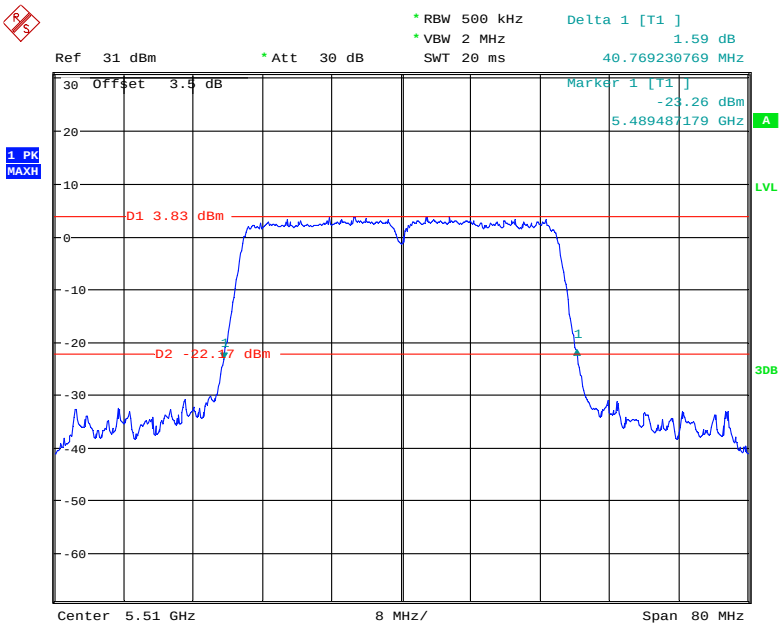
Date: 23.FEB.2017 11:07:45

5670MHz



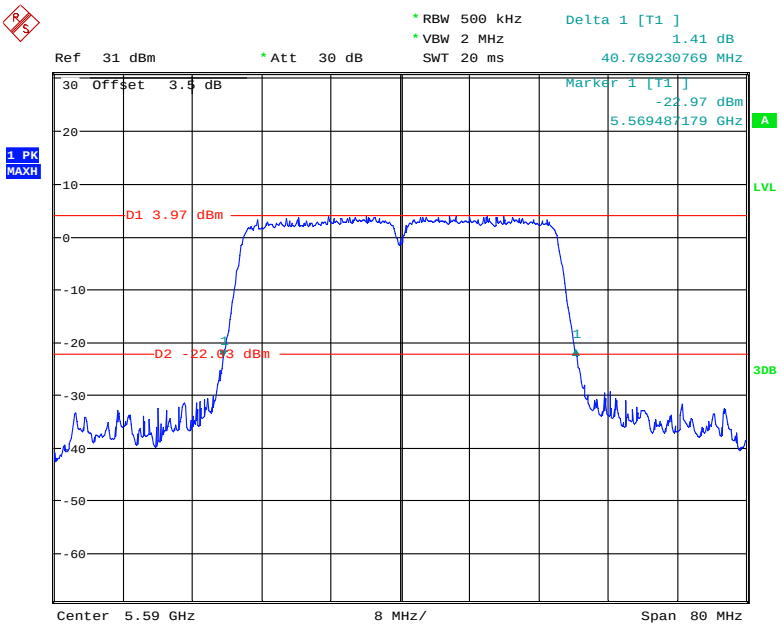
Date: 23.FEB.2017 11:09:47

IEEE 802.11n HT40 Mode / 5470 ~ 5725MHz (chain2)
5510MHz



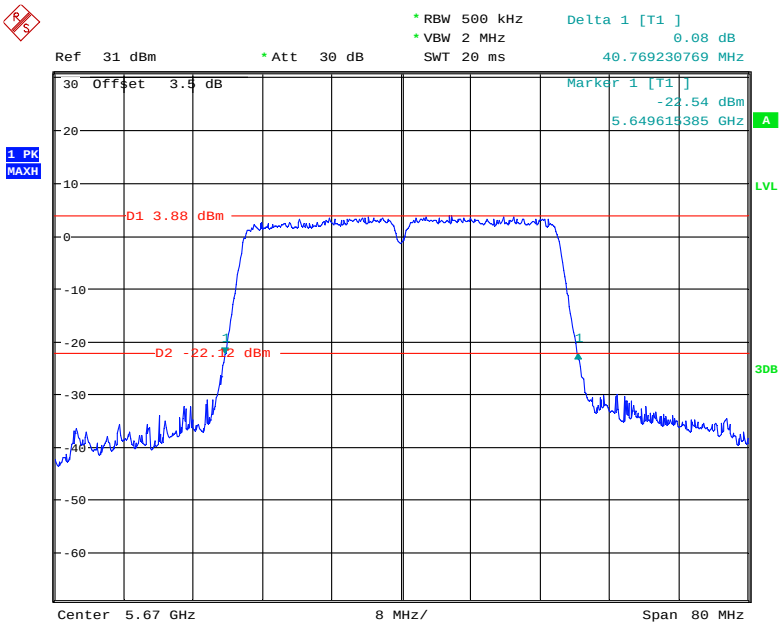
Date: 23.FEB.2017 11:36:35

5590MHz



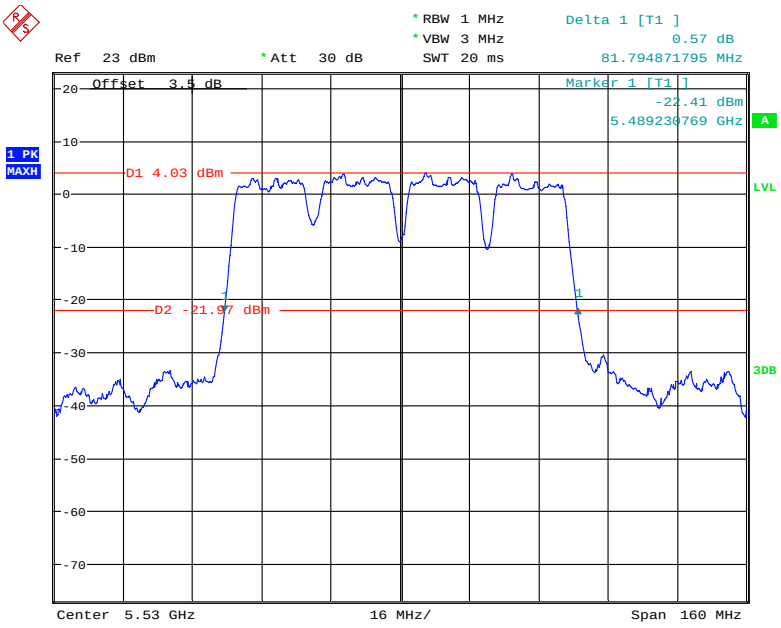
Date: 23.FEB.2017 11:42:57

5670MHz



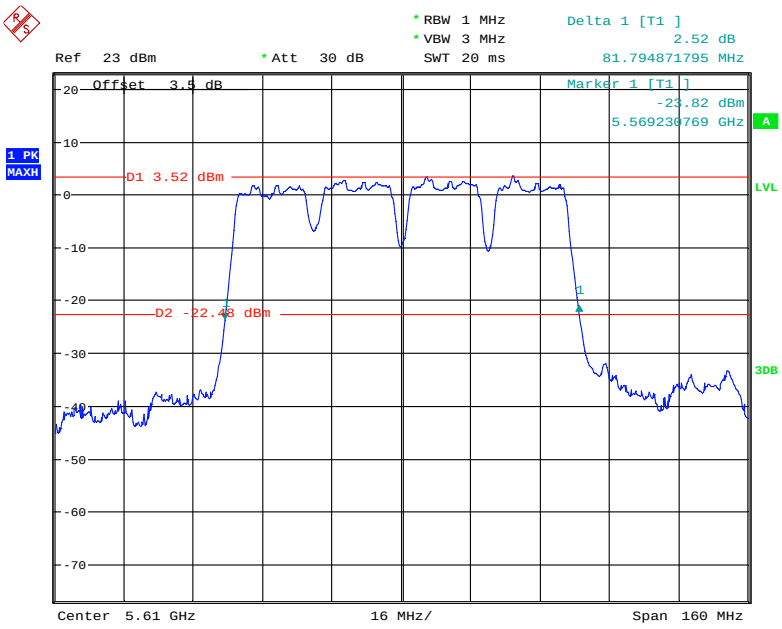
Date: 23.FEB.2017 11:40:57

IEEE 802.11ac VHT80 Mode /5470 ~ 5725MHz (chain 0)
5530MHz



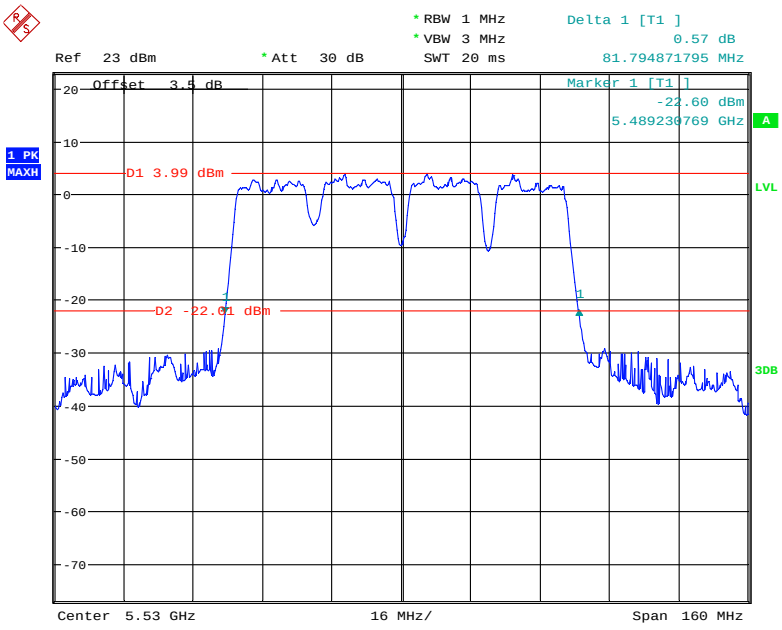
Date: 23.FEB.2017 13:47:36

5610MHz



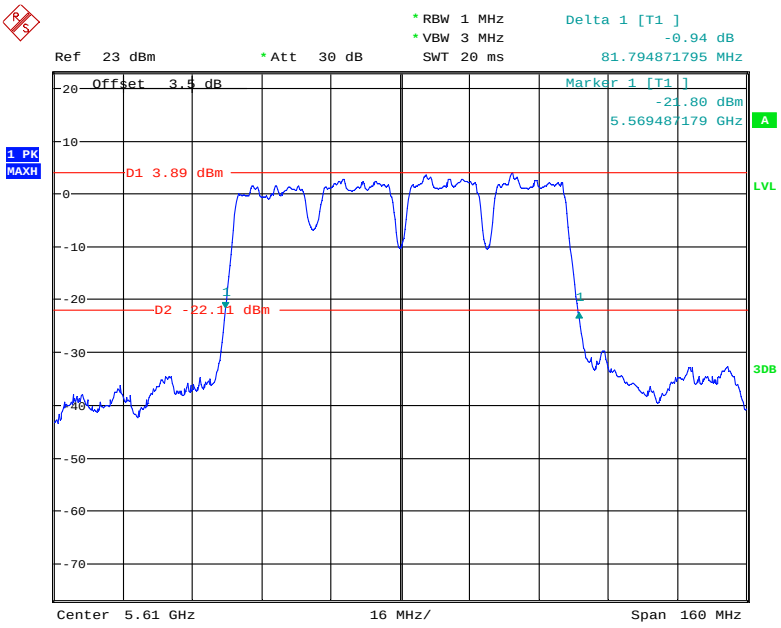
Date: 23.FEB.2017 13:50:45

IEEE 802.11ac VHT80 Mode / 5775MHz (chain 1)
5530MHz



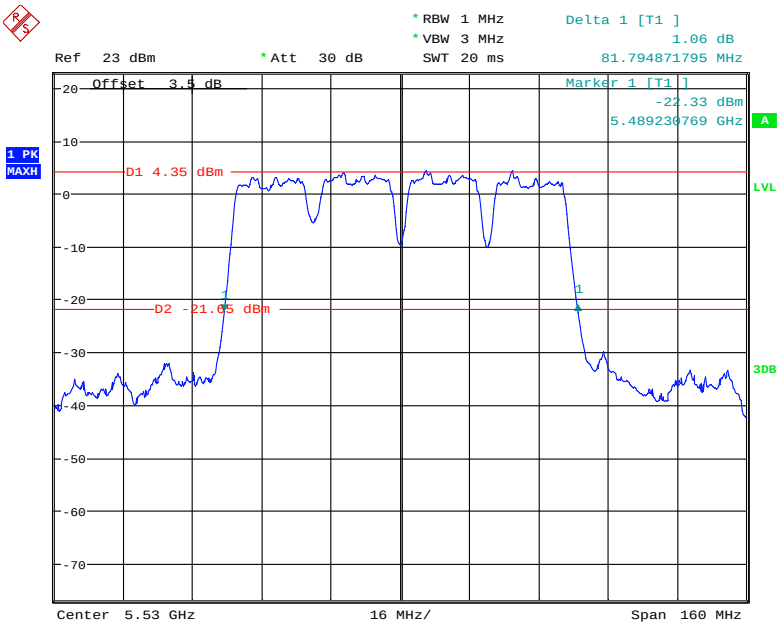
Date: 23.FEB.2017 14:15:48

5610MHz



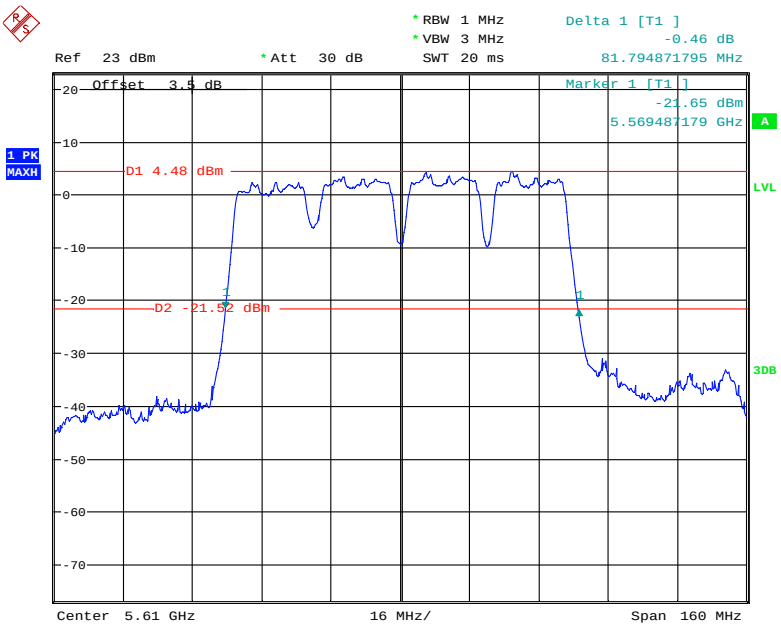
Date: 23.FEB.2017 14:18:36

IEEE 802.11ac VHT80 Mode / 5775MHz (chain 2)
5530MHz



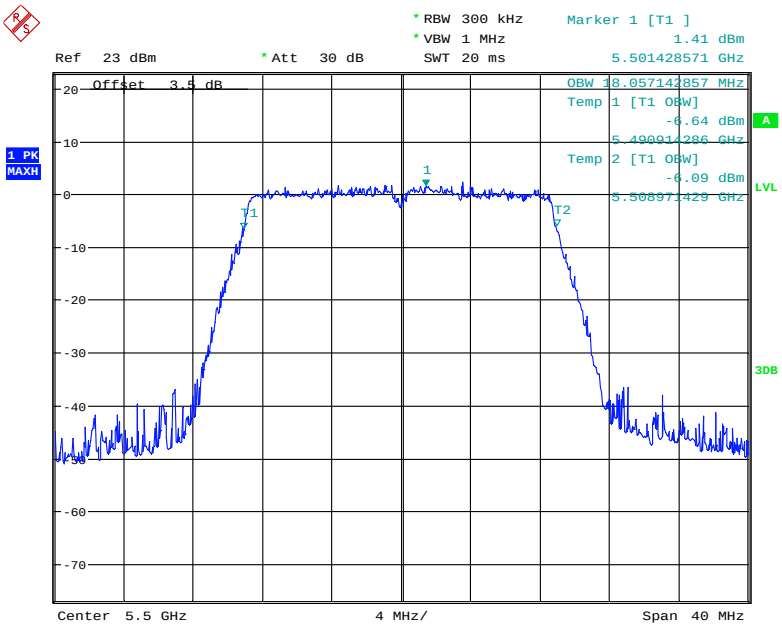
Date: 23.FEB.2017 14:25:18

5610MHz



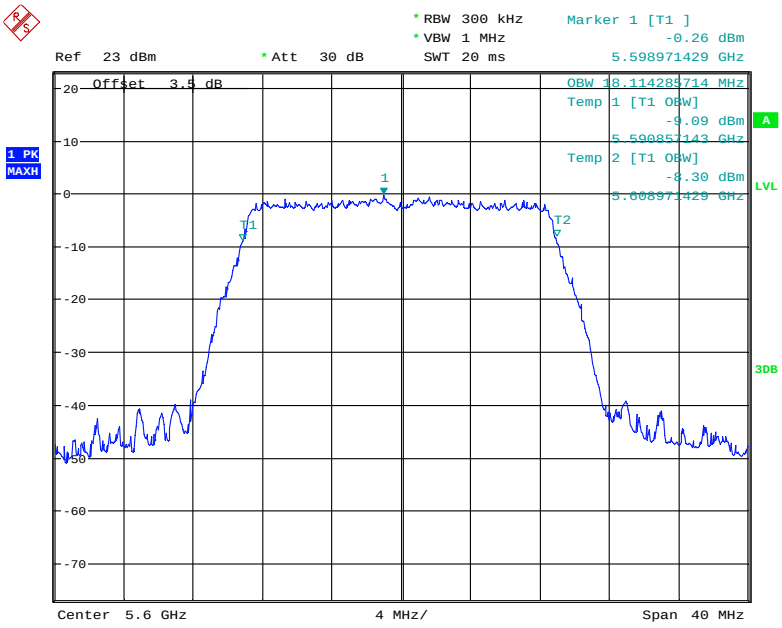
Date: 23.FEB.2017 14:27:28

OBW99%
IEEE 802.11a mode / 5470 ~ 5725MHz(chain0)
5500MHz



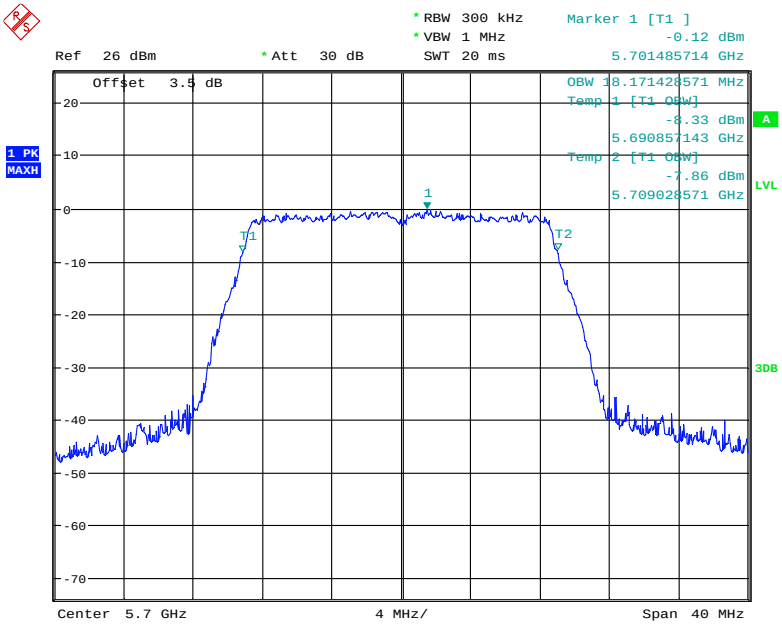
Date: 22.FEB.2017 09:48:38

5600MHz



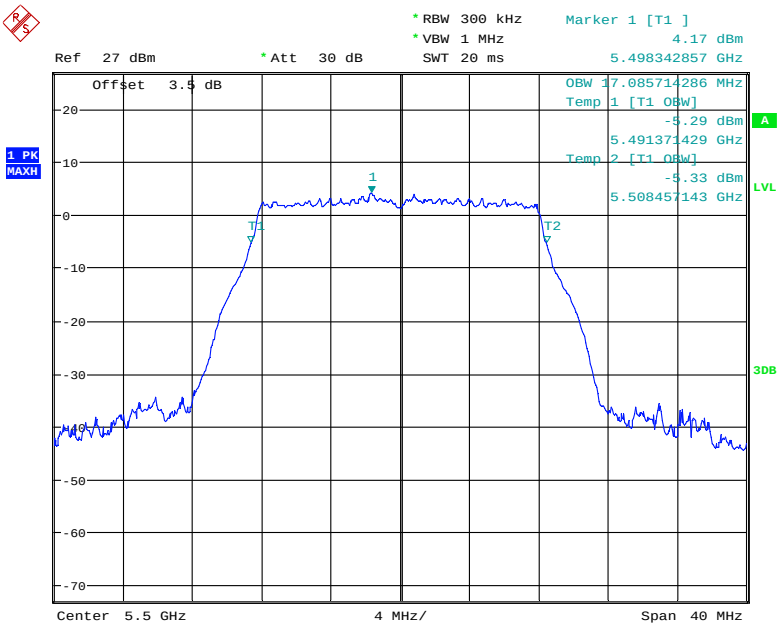
Date: 22.FEB.2017 09:47:18

5700MHz



Date: 22.FEB.2017 09:46:10

IEEE 802.11a mode / 5470 ~ 5725MHz(chain 1)
5500MHz



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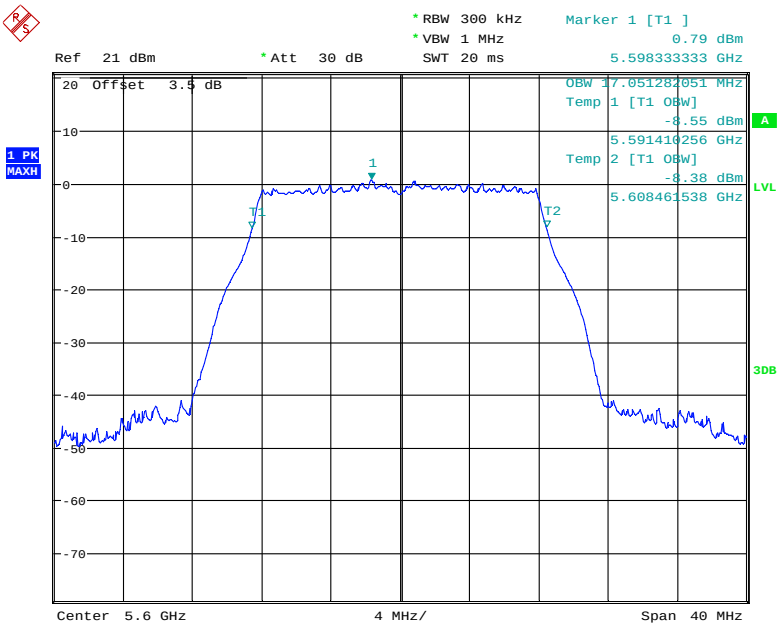
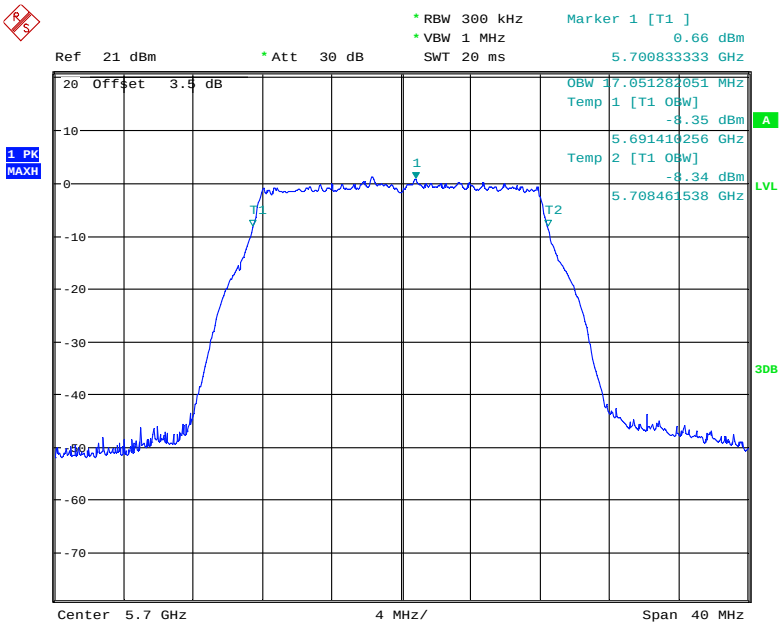
5600MHz



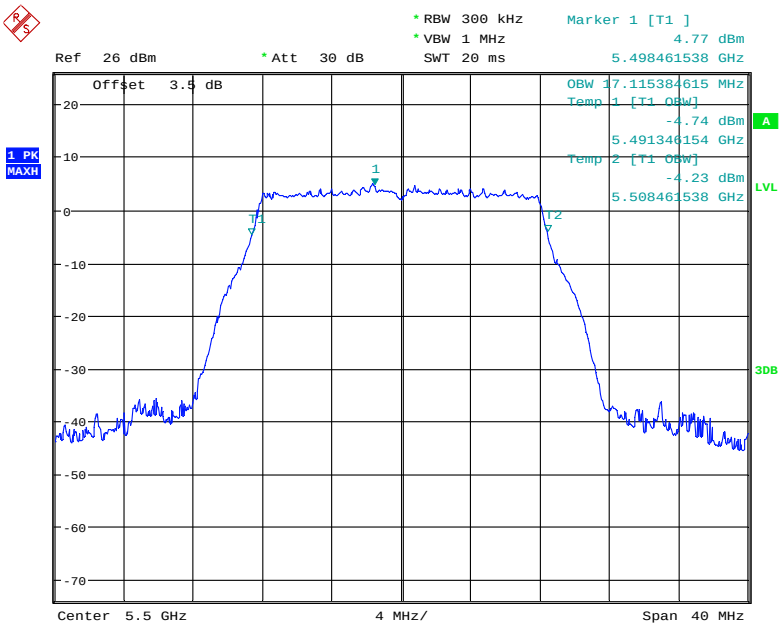
Date: 23.FEB.2017 10:41:16

5700MHz



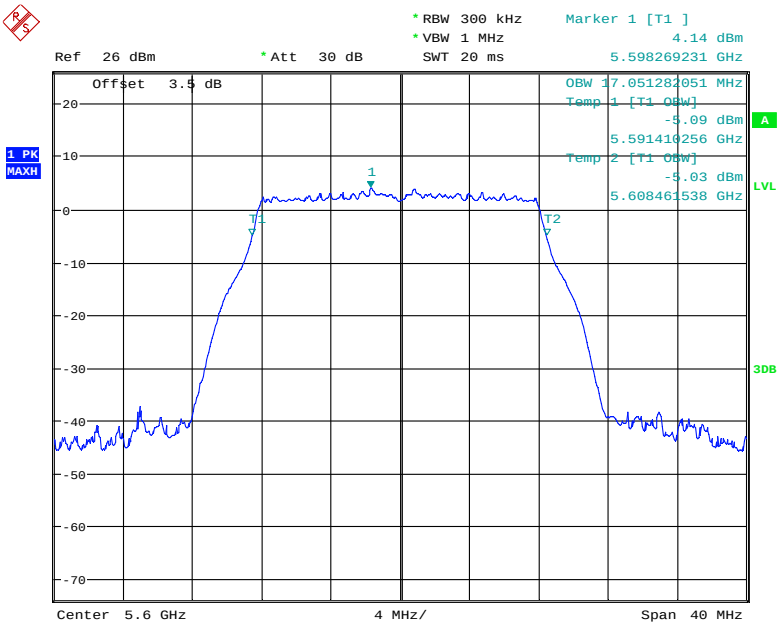
Date: 23.FEB.2017 10:44:41

IEEE 802.11a mode / 5470 ~ 5725MHz(chain 2)
5500MHz



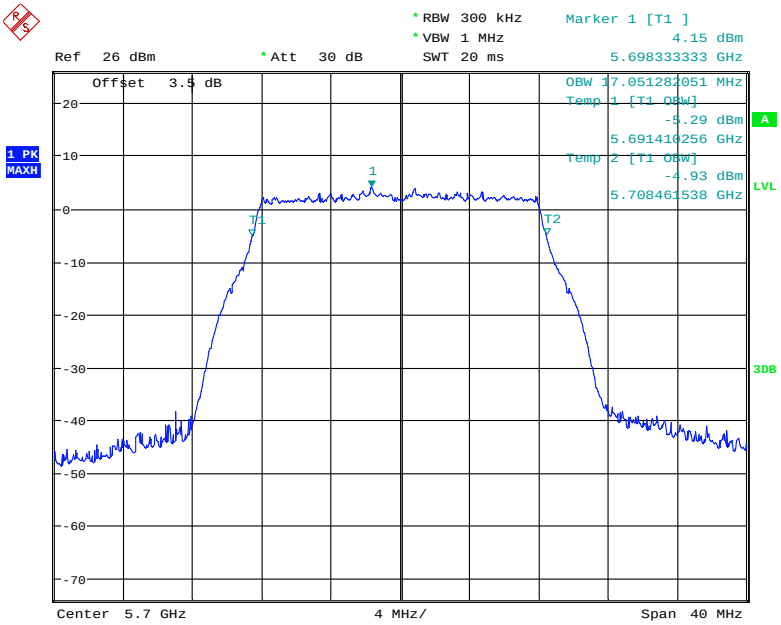
Date: 21.FEB.2017 18:37:54

5600MHz



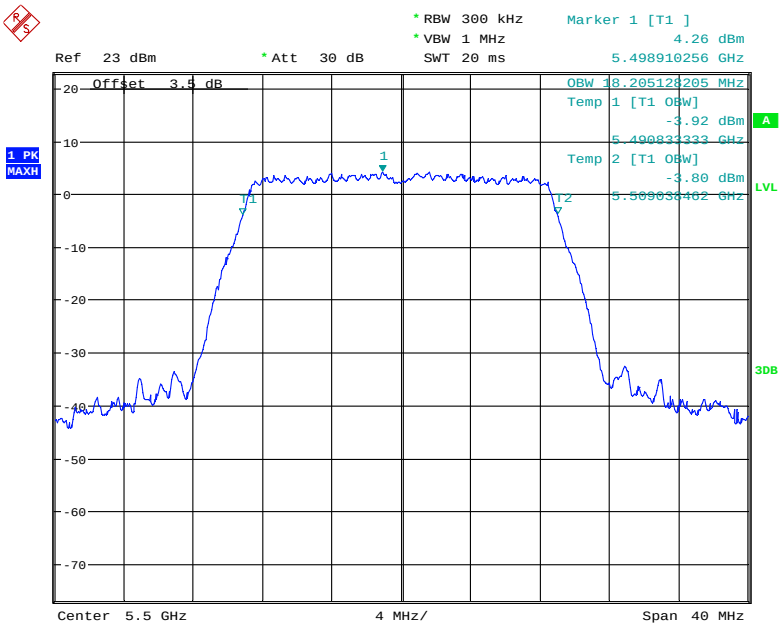
Date: 21.FEB.2017 18:37:07

5700MHz



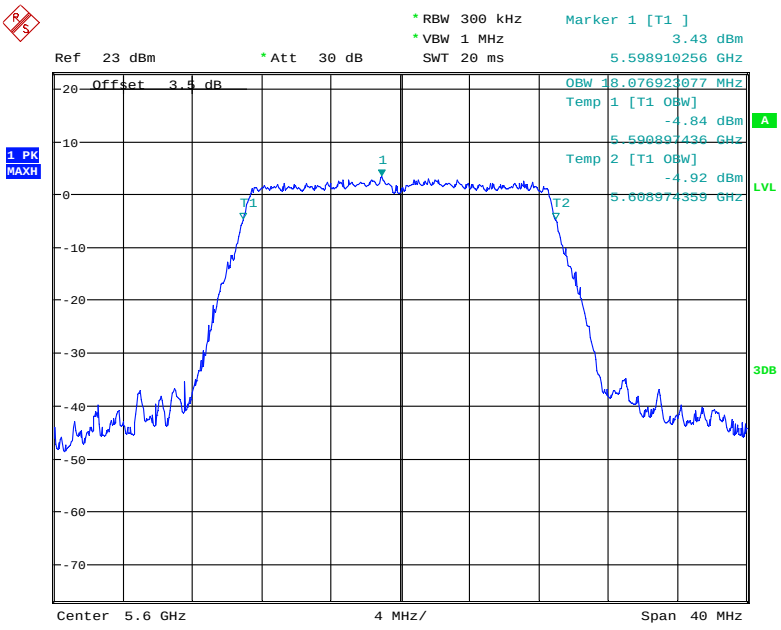
Date: 21.FEB.2017 18:35:04

IEEE 802.11n HT20 Mode / 5470 ~ 5725MHz (chain0)
5500MHz



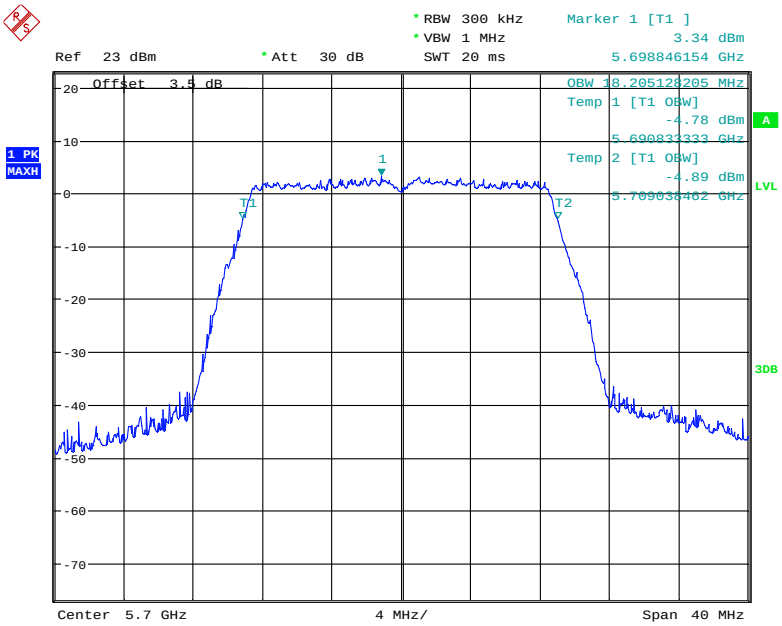
Date: 21.FEB.2017 17:02:54

5600MHz



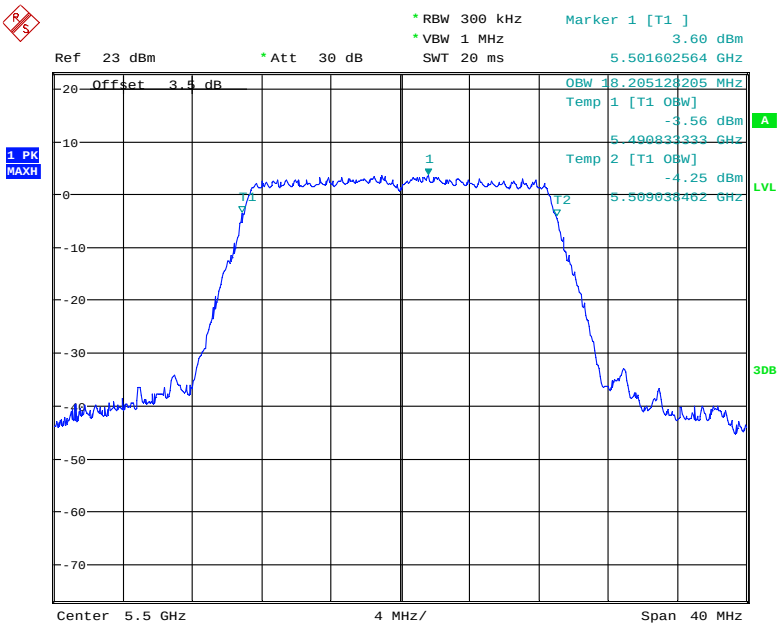
Date: 21.FEB.2017 17:07:12

5700MHz



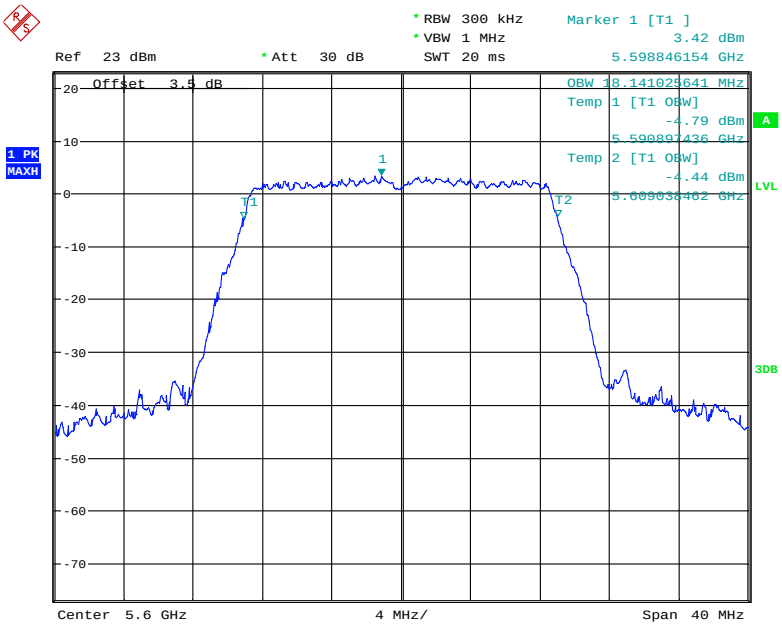
Date: 21.FEB.2017 17:06:01

IEEE 802.11n HT20 Mode / 5470 ~ 5725MHz (chain 1)
5500MHz



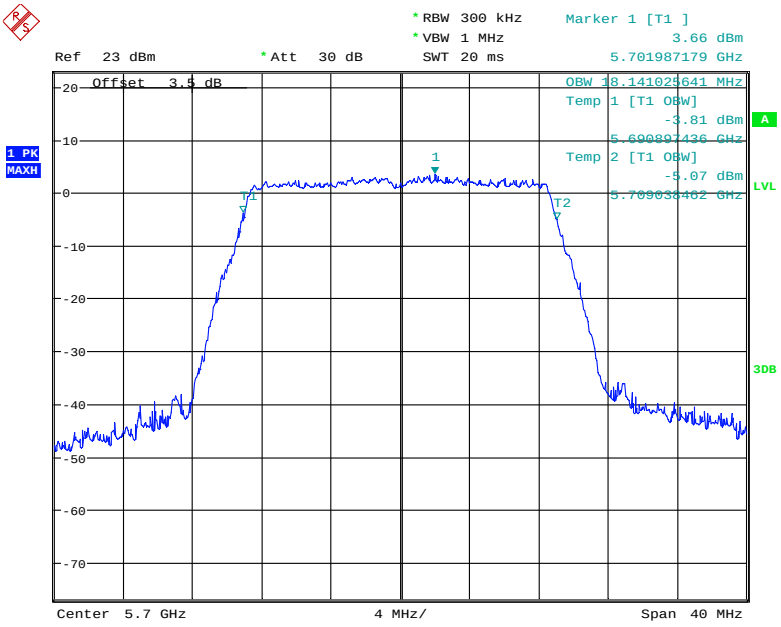
Date: 21.FEB.2017 17:37:20

5600MHz



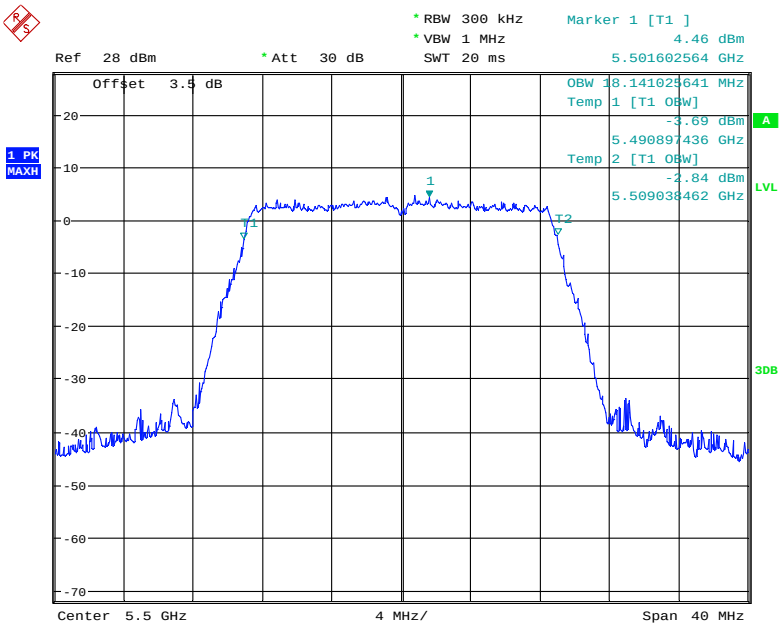
Date: 21.FEB.2017 17:39:34

5700MHz



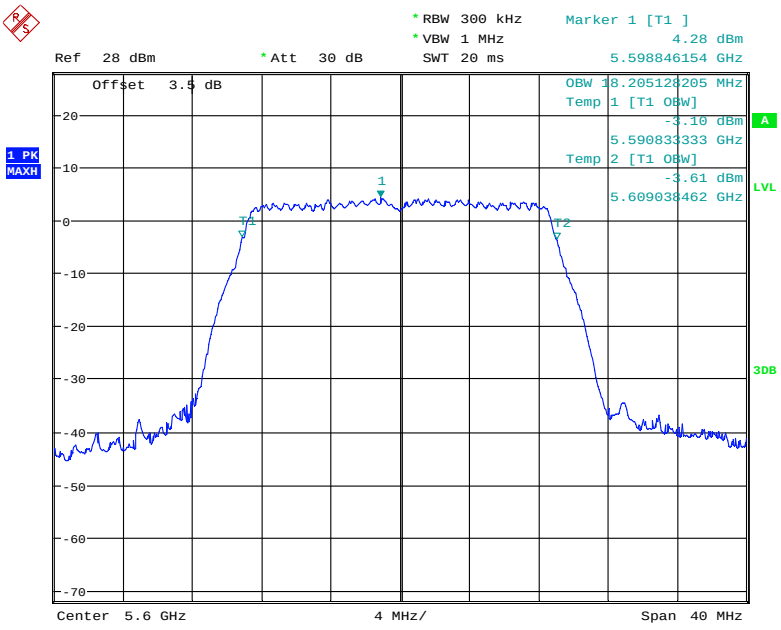
Date: 21.FEB.2017 17:41:00

IEEE 802.11n HT20 Mode / 5470 ~ 5725MHz (chain 2)
5500MHz



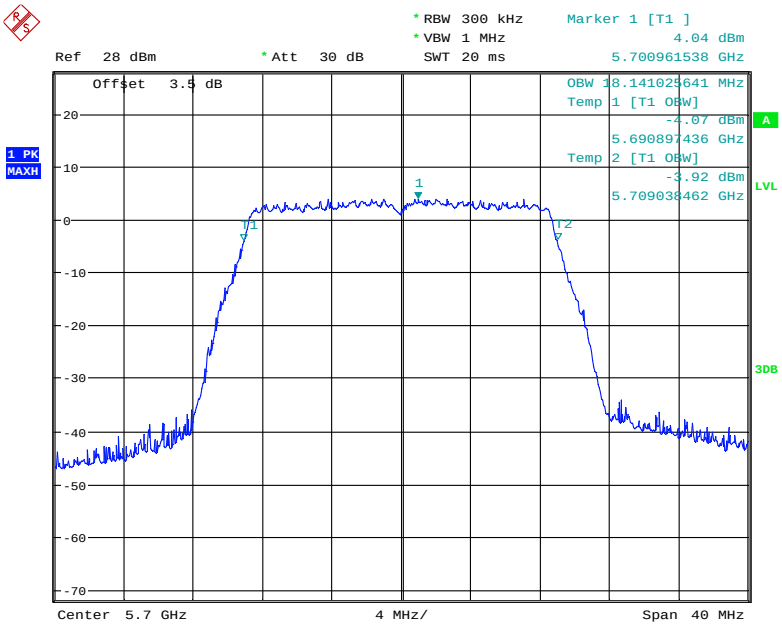
Date: 21.FEB.2017 18:25:54

5600MHz



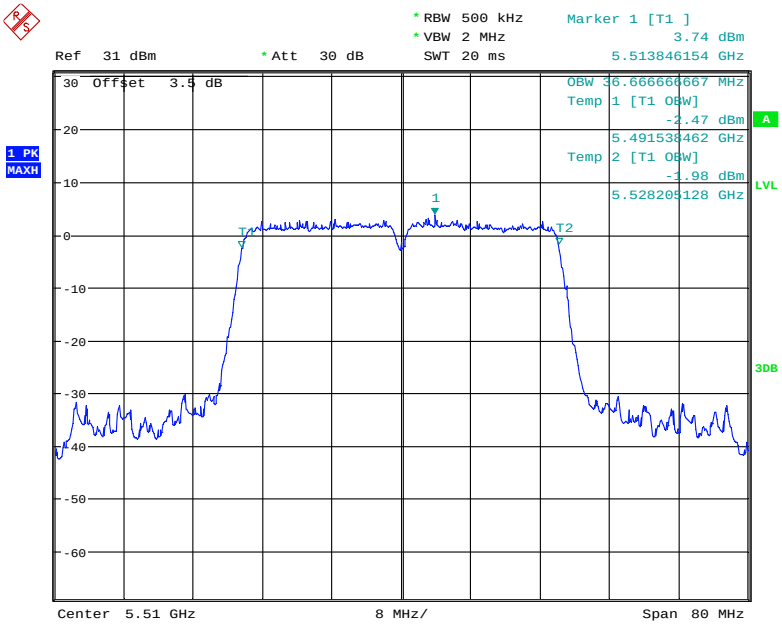
Date: 21.FEB.2017 18:25:10

5700MHz



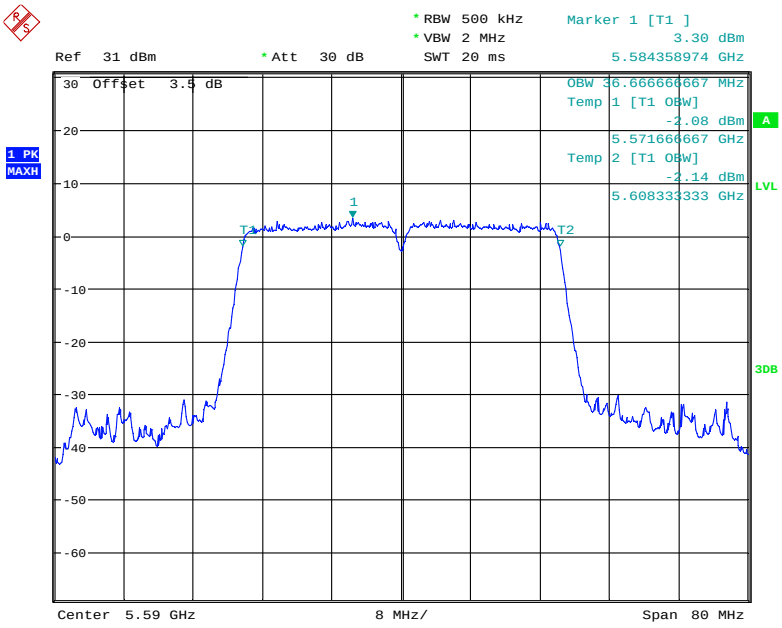
Date: 21.FEB.2017 18:18:49

IEEE 802.11n HT40 Mode / 5470 ~ 5725MHz (chain0)
5510MHz



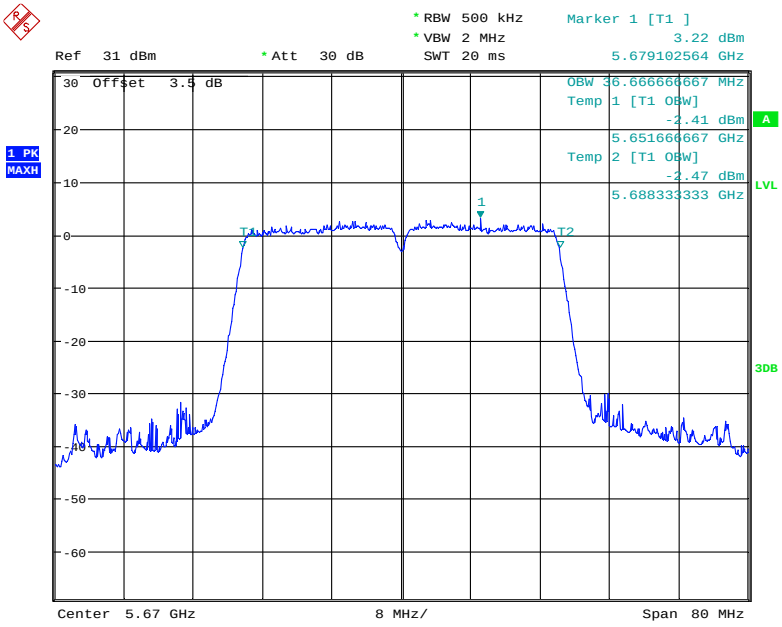
Date: 23.FEB.2017 11:24:42

5590MHz



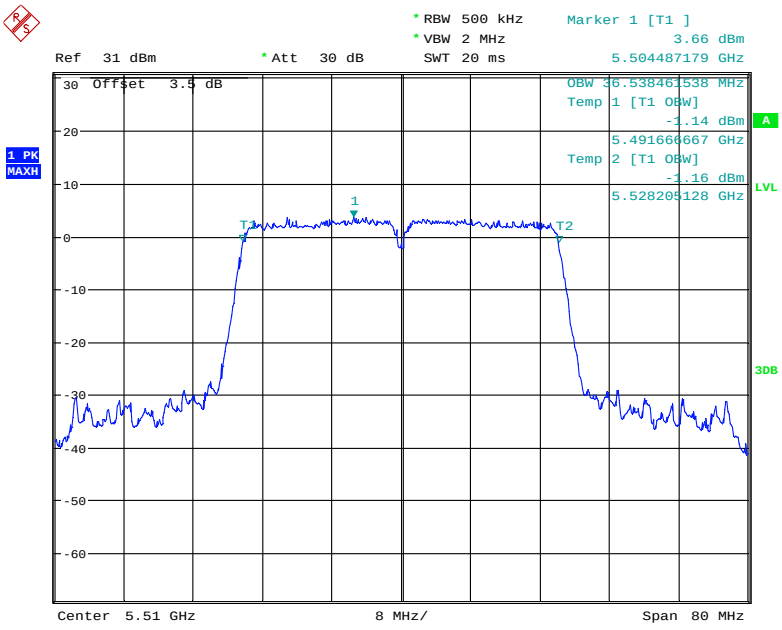
Date: 23.FEB.2017 11:25:32

5670MHz



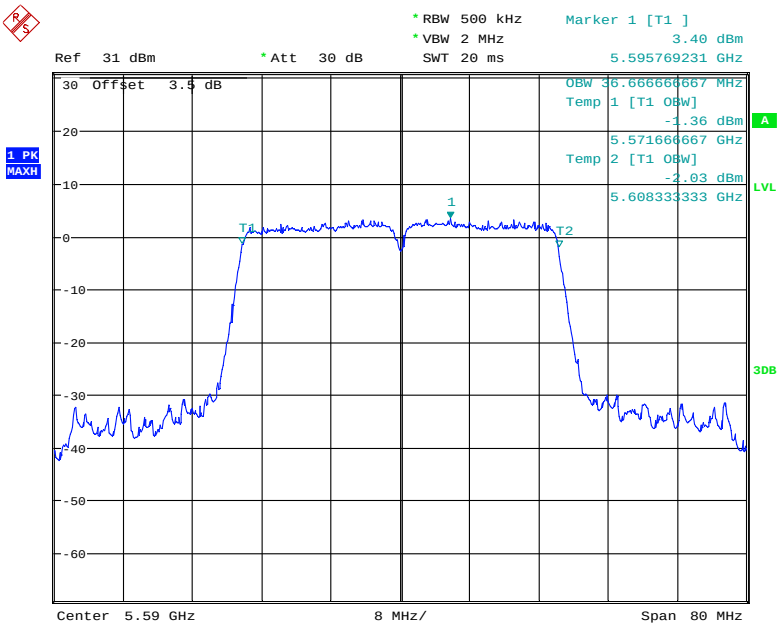
Date: 23.FEB.2017 11:27:00

IEEE 802.11n HT40 Mode / 5470 ~ 5725MHz (chain1)
5510MHz



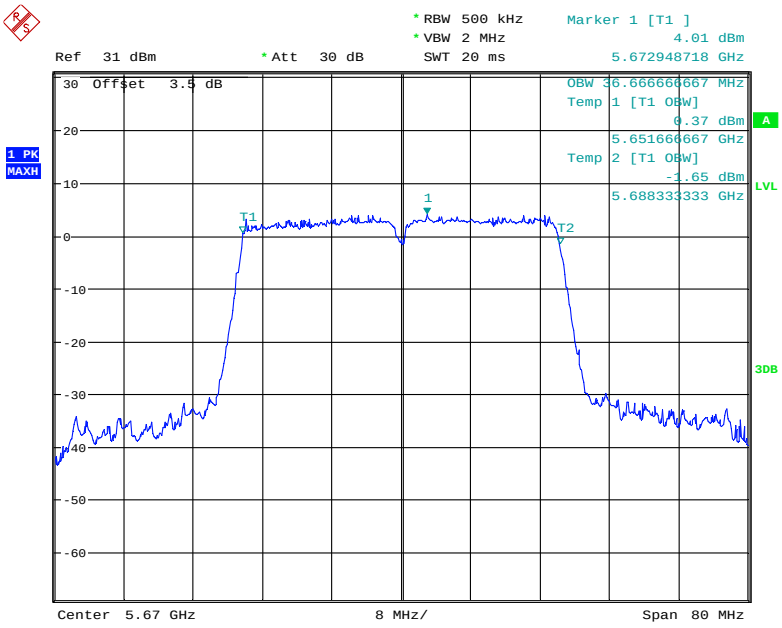
Date: 23.FEB.2017 11:13:01

5590MHz



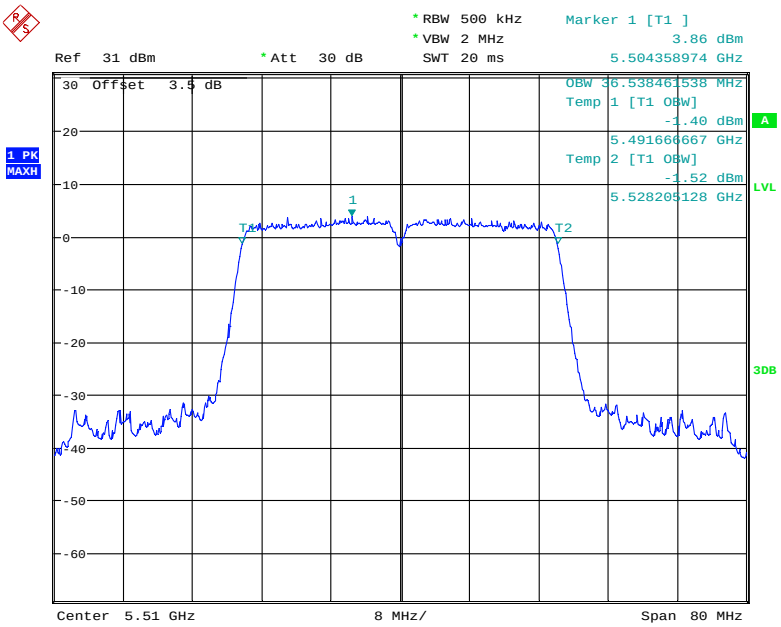
Date: 23.FEB.2017 11:12:13

5670MHz



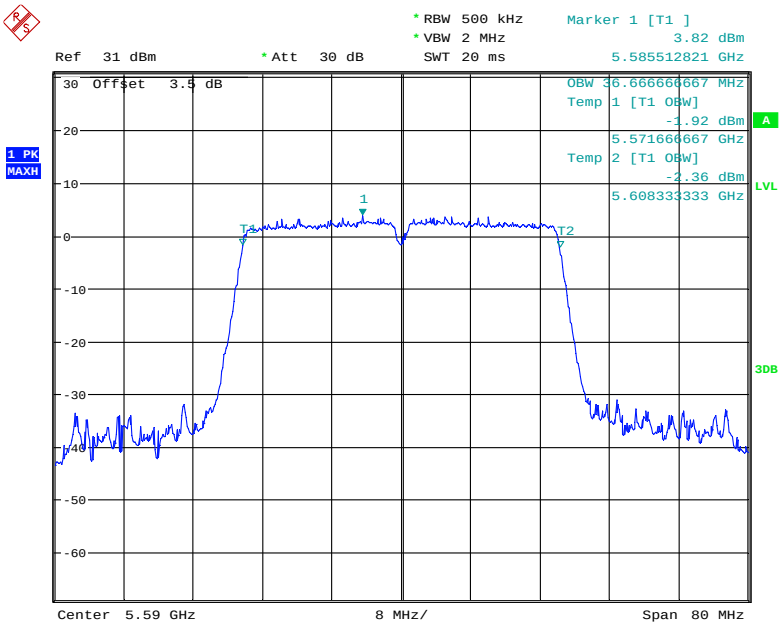
Date: 23.FEB.2017 11:10:58

IEEE 802.11n HT40 Mode / 5470 ~ 5725MHz (chain2)
5510MHz



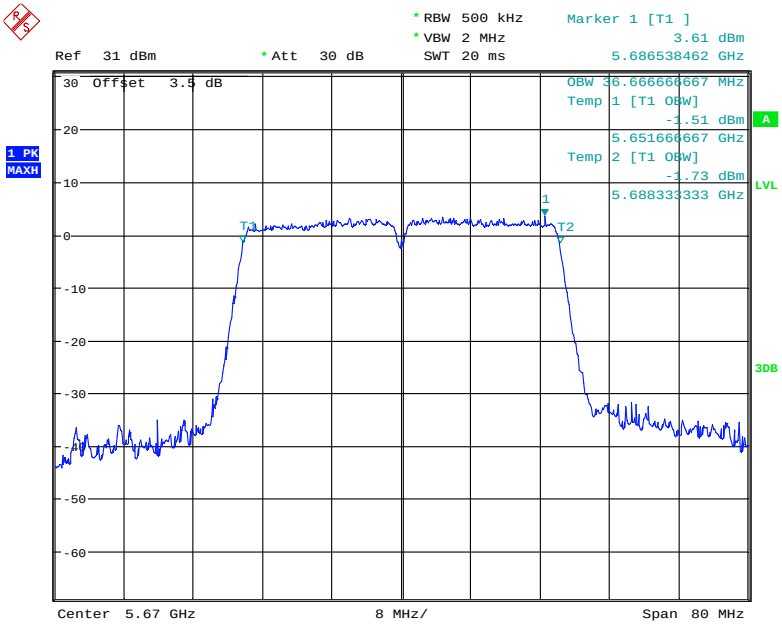
Date: 23.FEB.2017 11:37:30

5590MHz



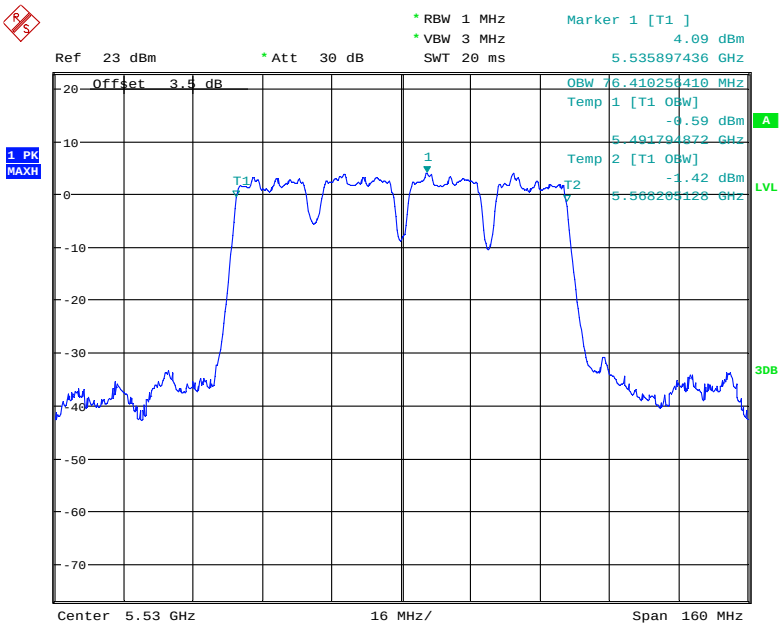
Date: 23.FEB.2017 11:38:05

5670MHz



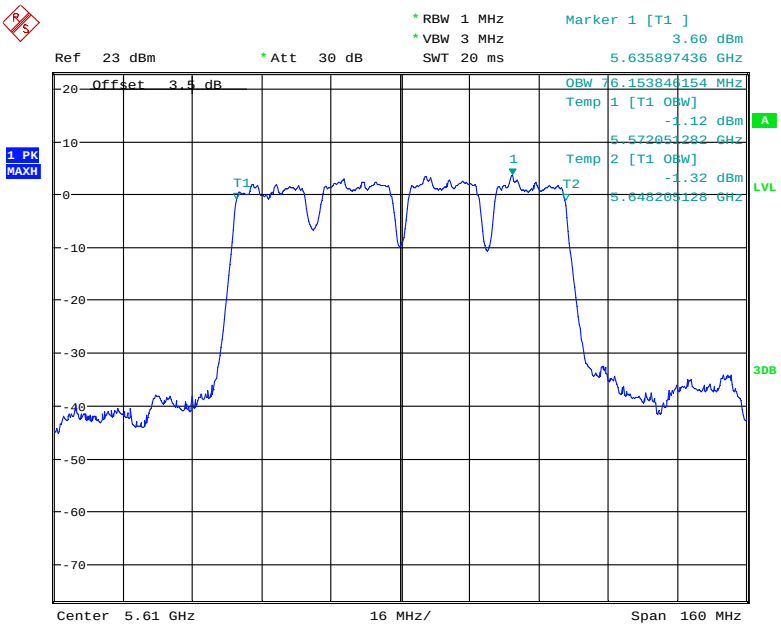
Date: 23.FEB.2017 11:39:40

IEEE 802.11ac VHT80 Mode /5470 ~ 5725MHz (chain 0)
5530MHz



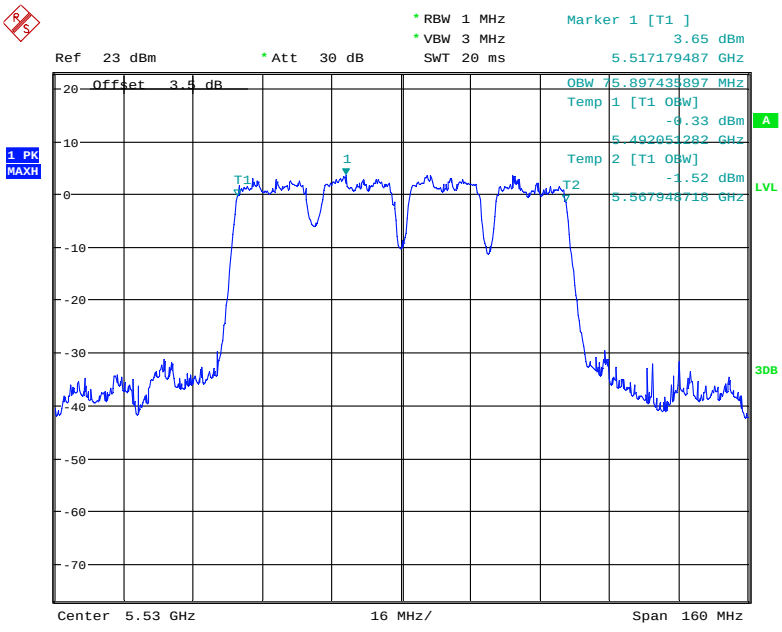
Date: 23.FEB.2017 13:48:17

5610MHz



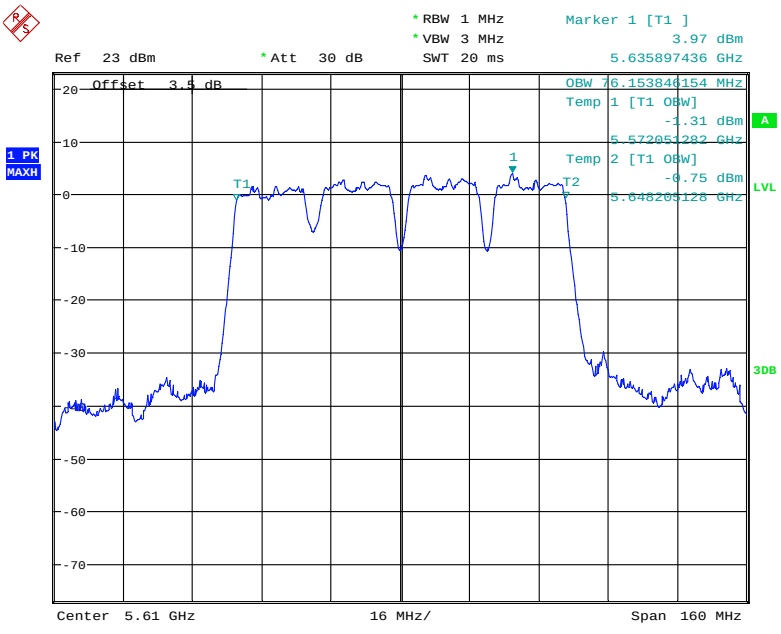
Date: 23.FEB.2017 13:49:26

IEEE 802.11ac VHT80 Mode / 5775MHz (chain 1)
5530MHz



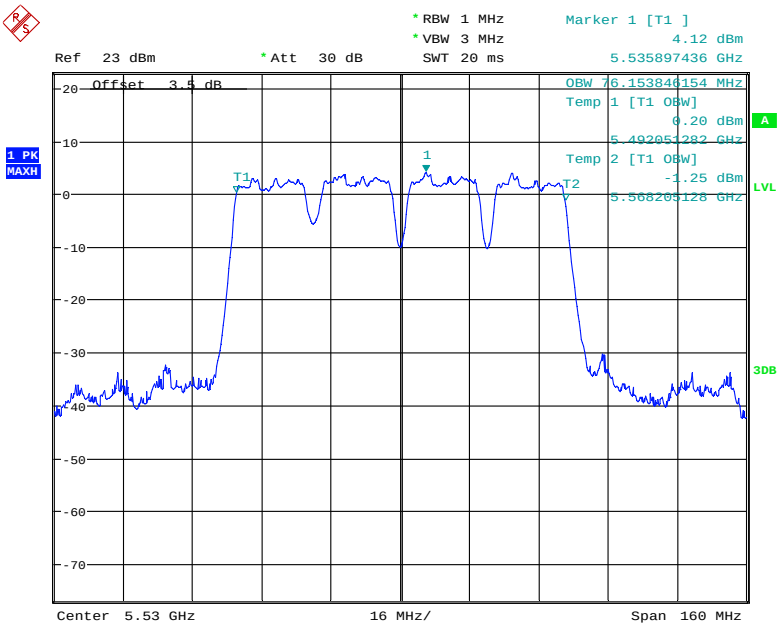
Date: 23.FEB.2017 14:16:35

5610MHz



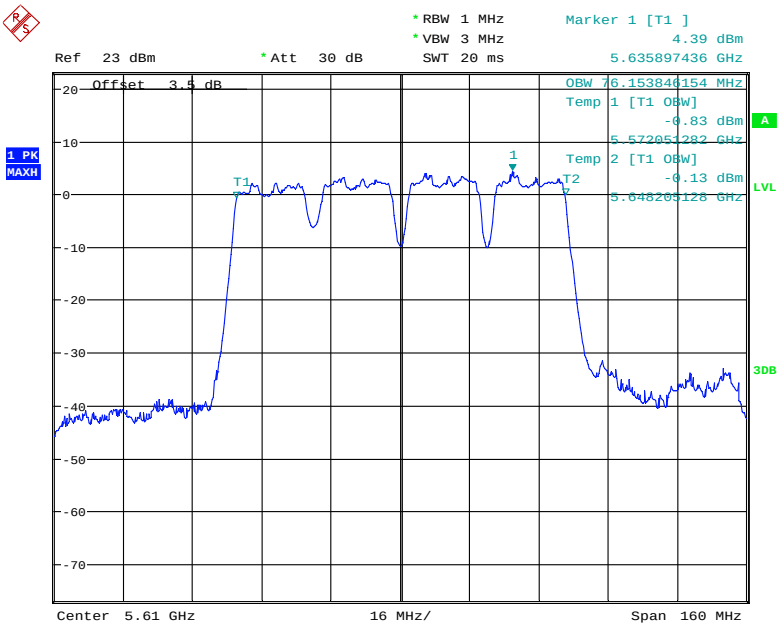
Date: 23.FEB.2017 14:17:23

IEEE 802.11ac VHT80 Mode / 5775MHz (chain 2)
5530MHz



Date: 23.FEB.2017 14:25:49

5610MHz

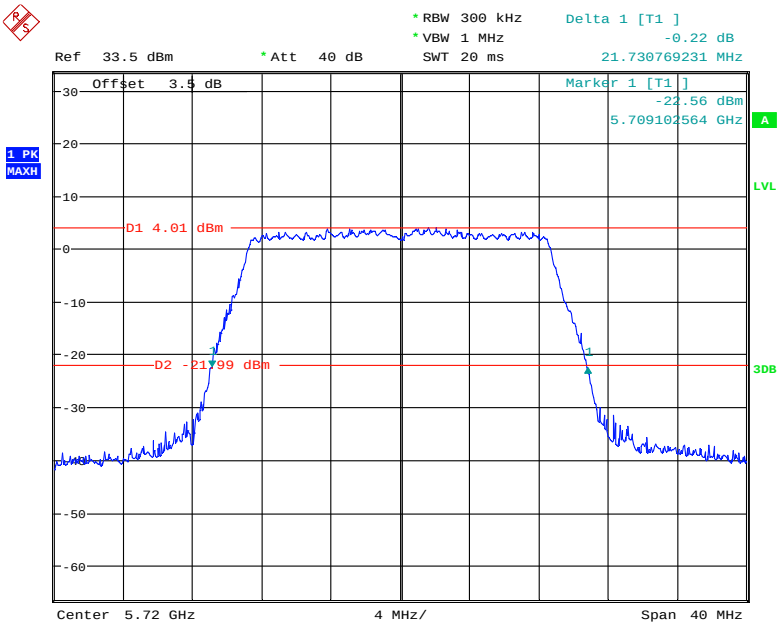


Date: 23.FEB.2017 14:26:25

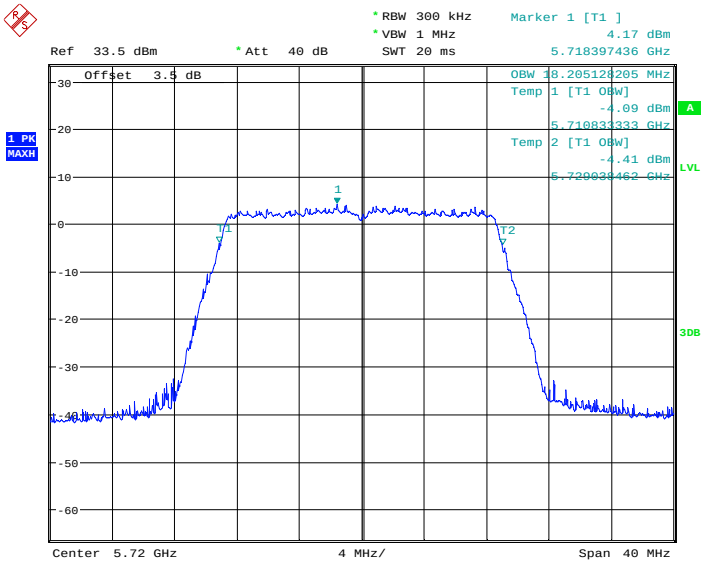
	Mode	Frequency (MHz)	Antenna Port	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Cross Band	802.11N20	5720	Chain 0	21.73	18.21
			Chain 1	21.73	18.21
			Chain 2	21.73	18.21
	802.11N40	5710	Chain 0	40.77	36.63
			Chain 1	40.77	36.54
			Chain 2	40.77	36.54
	802.11AC80	5690	Chain 0	81.92	75.96
			Chain 1	81.92	75.15
			Chain 2	81.92	75.15

IEEE 802.11n HT20 Mode / 5720MHz (chain 0)-Cross Band

26 dB Bandwidth



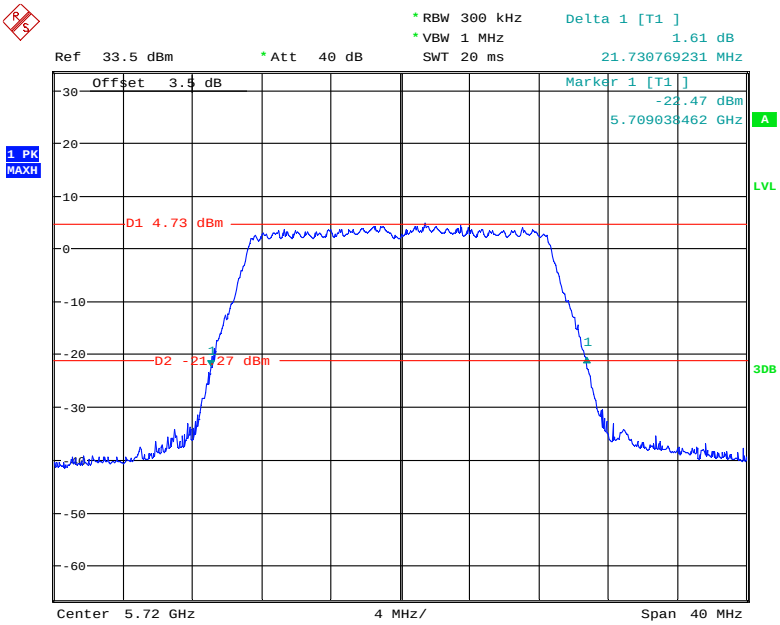
99% Bandwidth



Date: 25.FEB.2017 18:08:27

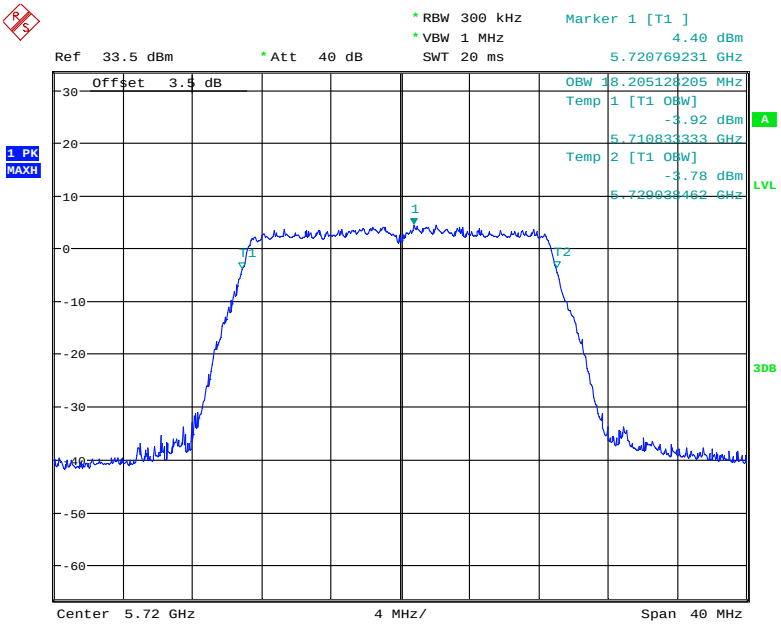
IEEE 802.11n HT20 Mode / 5720MHz (chain 1) -Cross Band

26 dB Bandwidth



Date: 25.FEB.2017 18:15:01

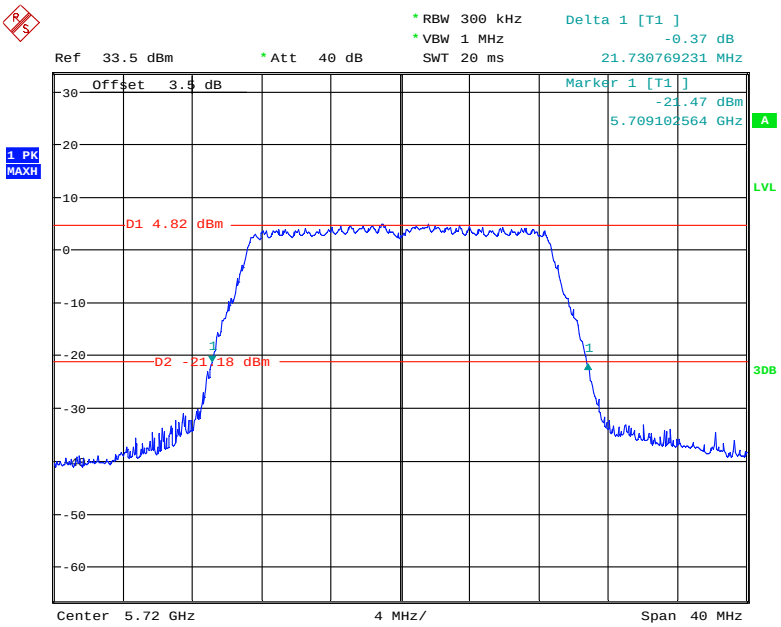
99% Bandwidth



Date: 25.FEB.2017 18:16:33

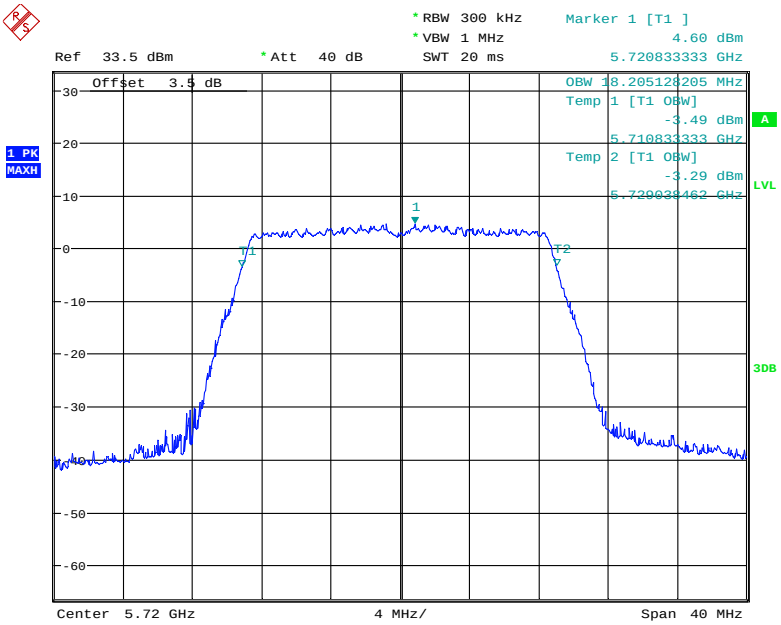
IEEE 802.11n HT20 Mode / 5720MHz (chain 2) -Cross Band

26 dB Bandwidth



Date: 25.FEB.2017 18:19:46

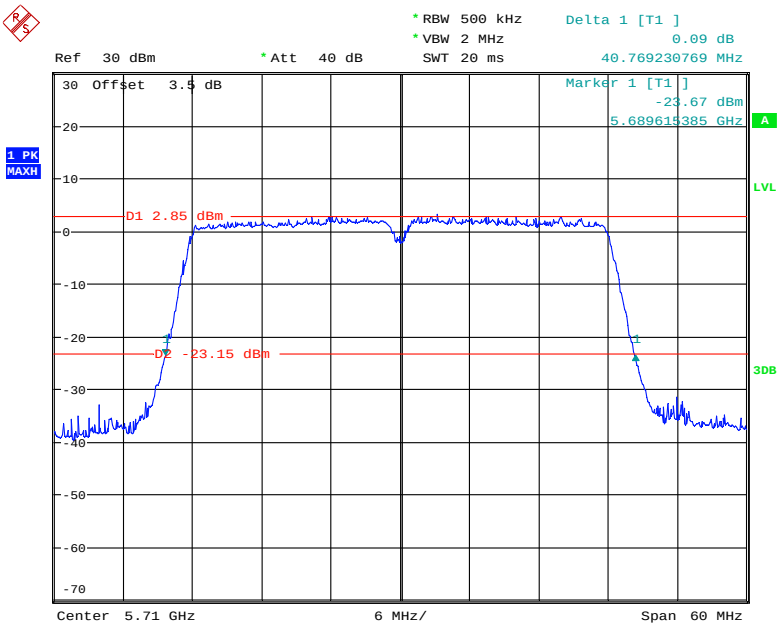
99% Bandwidth



Date: 25.FEB.2017 18:17:55

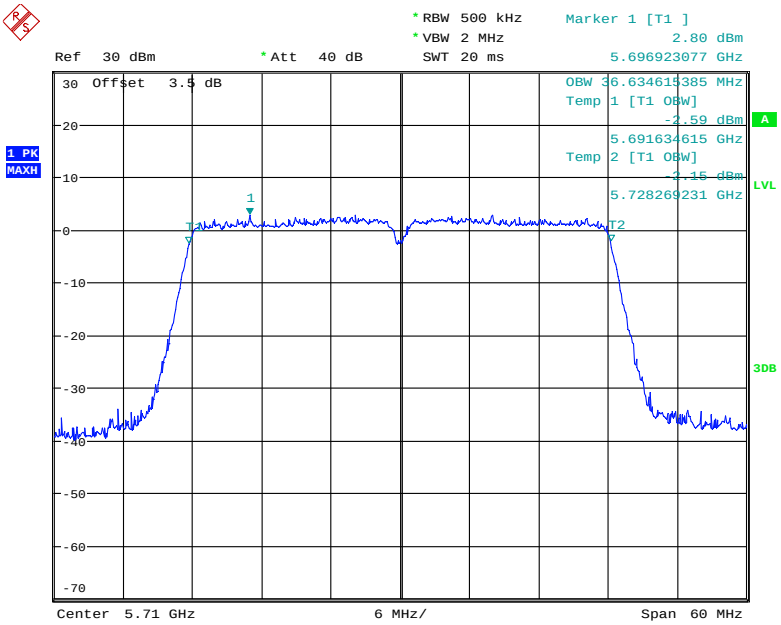
IEEE 802.11n HT40 Mode / 5710MHz (chain 0) -Cross Band

26 dB Bandwidth



Date: 25.FEB.2017 19:07:46

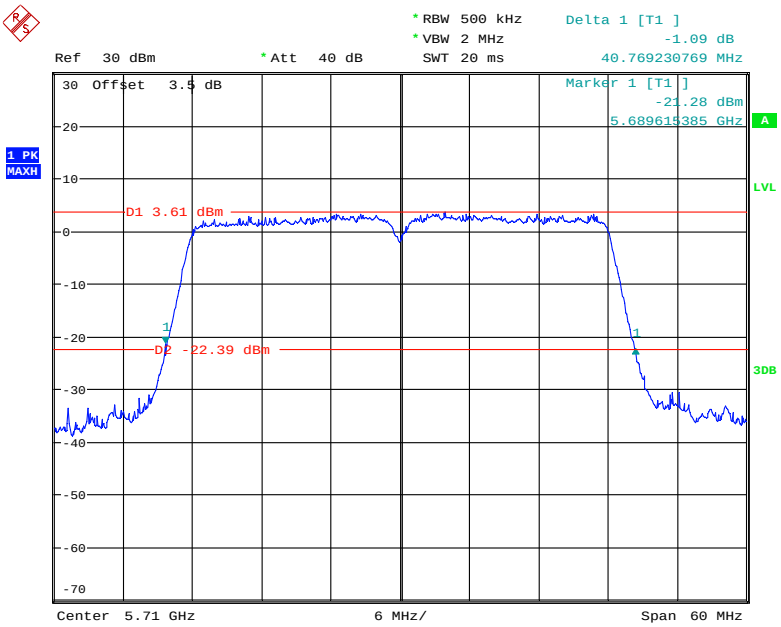
99% Bandwidth



Date: 25.FEB.2017 19:06:36

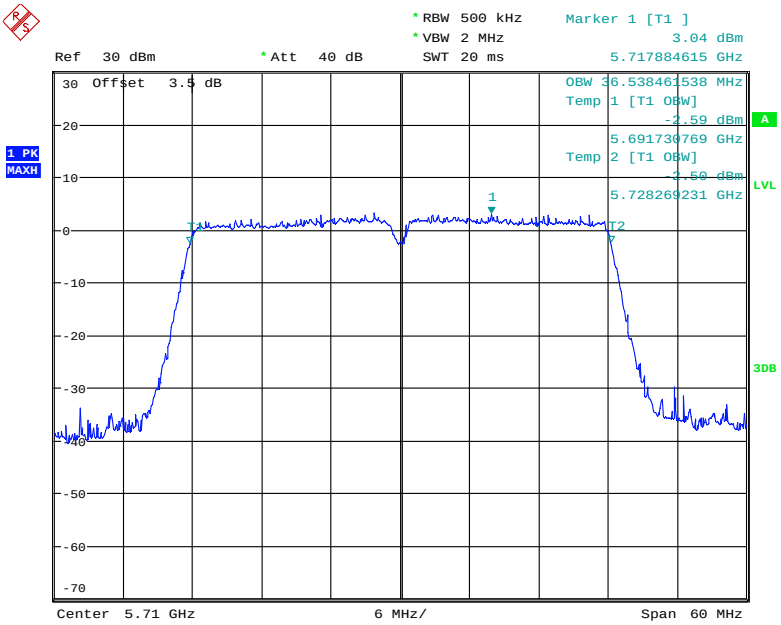
IEEE 802.11n HT40 Mode / 5710MHz (chain 1) -Cross Band

26 dB Bandwidth



Date: 25.FEB.2017 19:10:58

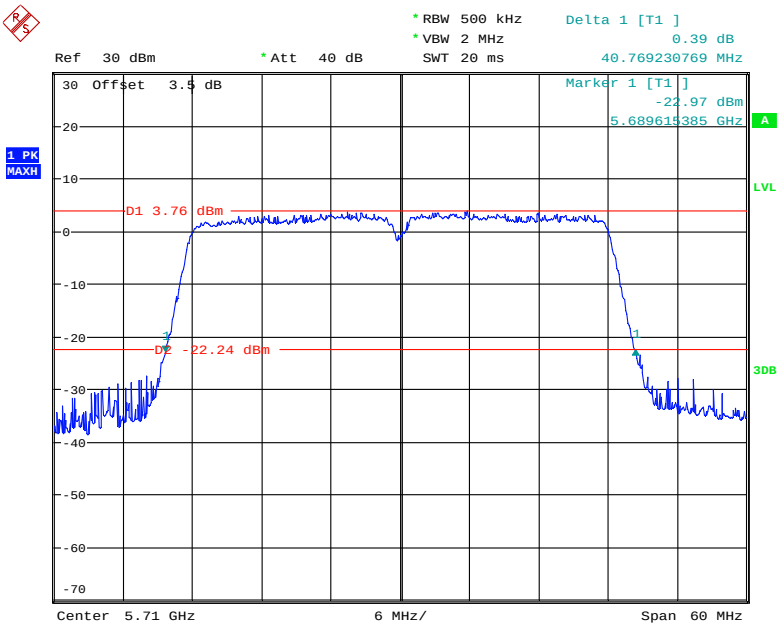
99% Bandwidth



Date: 25.FEB.2017 19:09:49

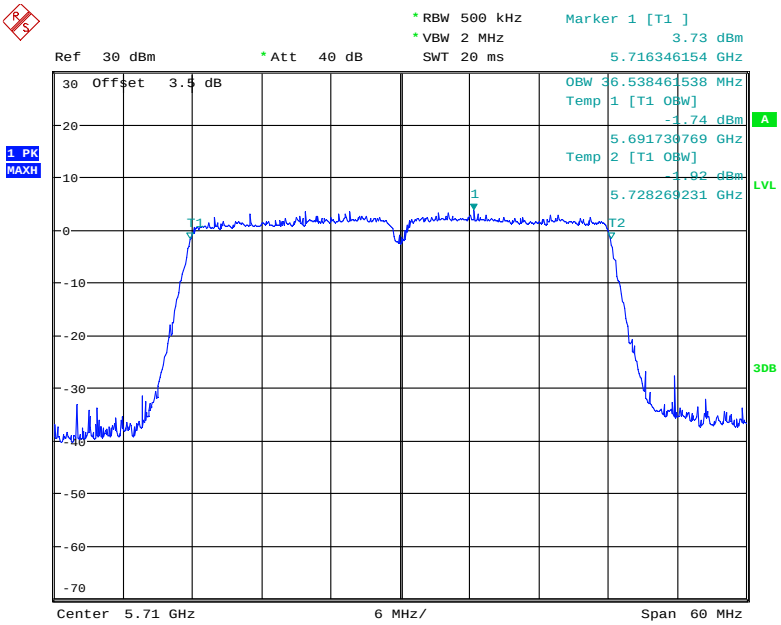
IEEE 802.11n HT40 Mode / 5710MHz (chain 2) -Cross Band

26 dB Bandwidth



Date: 25.FEB.2017 19:12:20

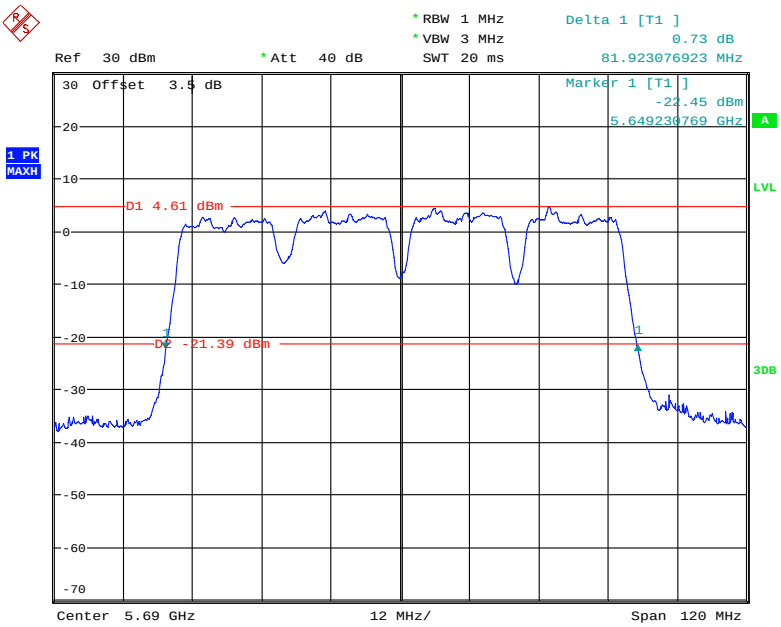
99% Bandwidth



Date: 25.FEB.2017 19:12:45

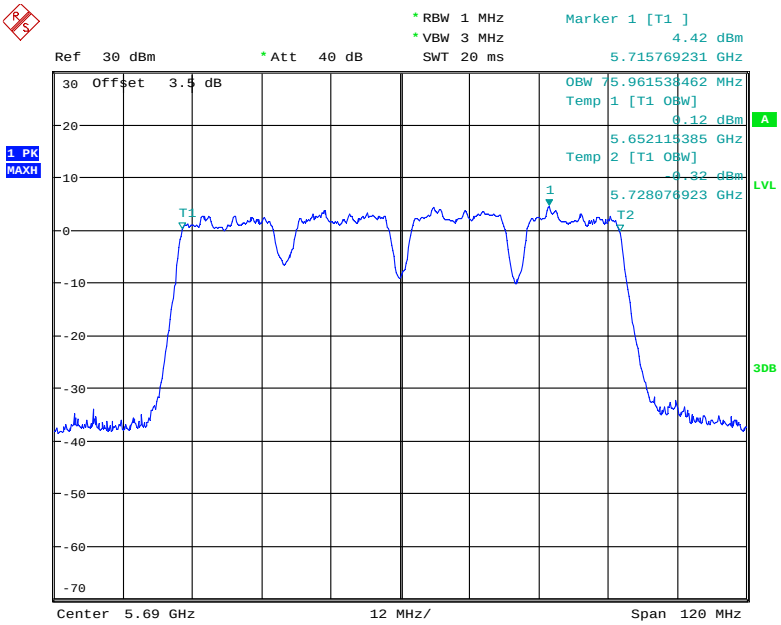
IEEE 802.11ac VHT80 Mode / 5690MHz (chain 0) -Cross Band

26 dB Bandwidth



Date: 25.FEB.2017 19:04:04

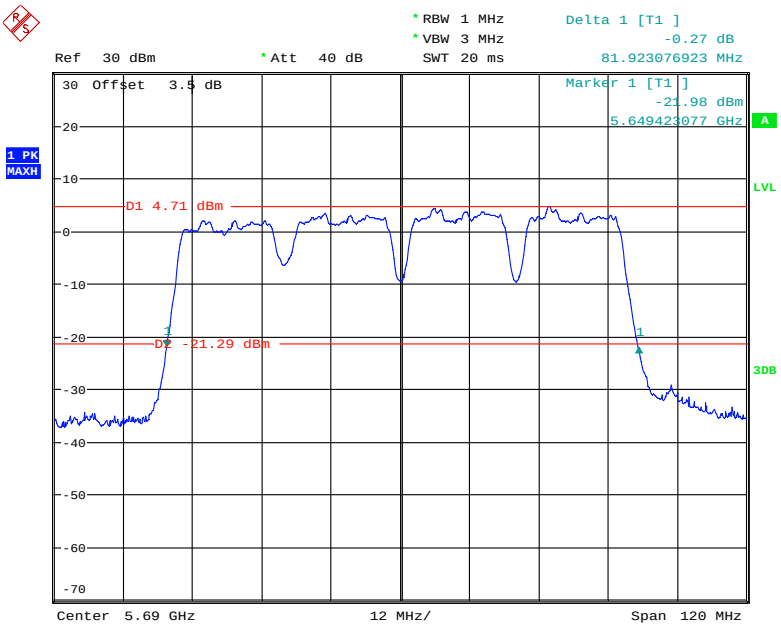
99% Bandwidth



Date: 25.FEB.2017 19:03:07

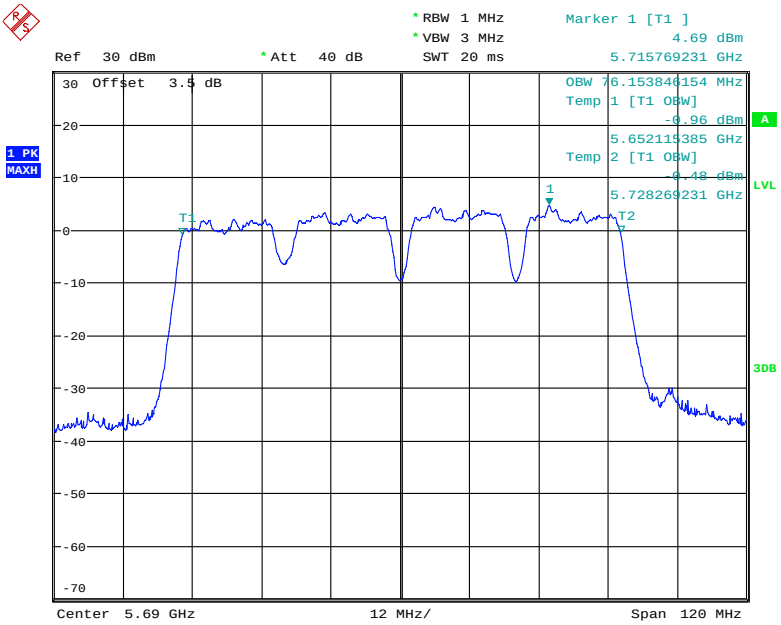
IEEE 802.11ac VHT80 Mode / 5690MHz (chain 1) -Cross Band

26 dB Bandwidth



Date: 25.FEB.2017 19:02:19

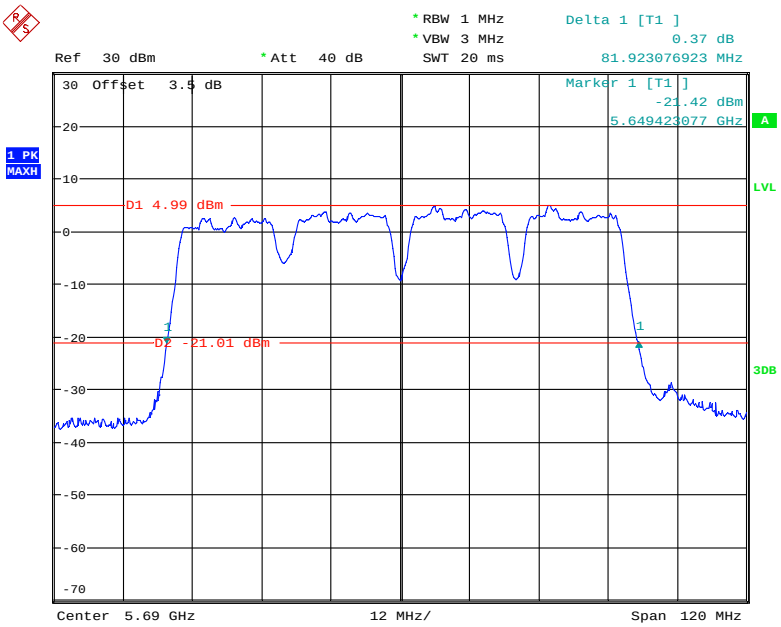
99% Bandwidth



Date: 25.FEB.2017 19:01:16

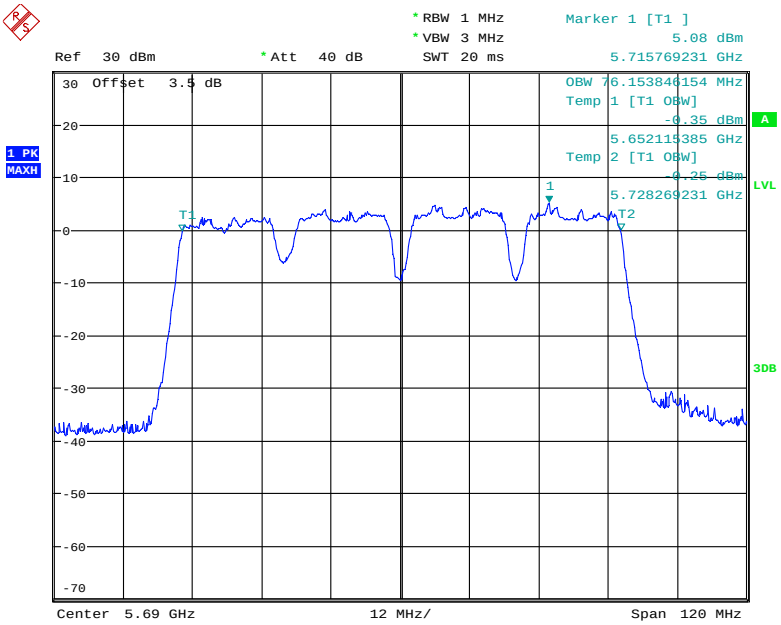
IEEE 802.11ac VHT80 Mode / 5690MHz (chain 2) -Cross Band

26 dB Bandwidth



Date: 25.FEB.2017 18:56:25

99% Bandwidth



Date: 25.FEB.2017 18:59:02

10 FCC §15.247(g) – FREQUENCY STABILITY

10.1 Applicable Standard

FCC §15.407(G)

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

10.2 Test Procedure

According to ANSI C63.10-2013 §6.8

Some unlicensed wireless device requirements specify frequency stability tests with variation of supply voltage and temperature; the requirements can be found in the regulatory specifications for each type of unlicensed wireless device. The procedures listed in 6.8.1 and 6.8.2 shall be used for frequency stability tests.

10.3 Test Equipment List and Details

Descriptions	Manufacturer	Models	Serial Numbers	Calibration Date	Calibration Due Date
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

10.4Test Environmental Conditions

Temperature:	22 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by David Hsu on 2017-04-06.

EUT operation mode: Transmitting

Test Result: Pass

20M

Low channel, f_o =5260MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5260.024	Pass
-20		5260.031	
-10		5260.027	
0		5260.016	
10		5260.012	
20		5260.044	
30		5260.036	
40		5260.020	
50		5260.018	
25	102	5260.029	
25	138	5260.038	

Middle channel, f_o =5300MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5300.020	Pass
-20		5300.017	
-10		5300.035	
0		5300.035	
10		5300.017	
20		5300.022	
30		5300.019	
40		5300.040	
50		5300.032	
25	102	5300.034	
25	138	5300.016	

High channel, f_o =5320MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5320.018	Pass
-20		5320.034	
-10		5320.027	
0		5320.025	
10		5320.016	
20		5320.023	
30		5320.030	
40		5320.028	
50		5320.013	
25	102	5320.020	
25	138	5320.031	

Low channel, f_o =5500MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5500.011	Pass
-20		5500.023	
-10		5500.034	
0		5500.060	
10		5500.045	
20		5500.039	
30		5500.042	
40		5500.017	
50		5500.045	
25	102	5500.032	
25	138	5500.040	

Middle channel, f_o =5600MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5600.043	Pass
-20		5600.029	
-10		5600.035	
0		5600.027	
10		5600.039	
20		5600.042	
30		5600.043	
40		5600.046	
50		5600.049	
25	102	5600.051	
25	138	5600.048	

High channel, f_o =5700MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5700.044	Pass
-20		5700.045	
-10		5700.031	
0		5700.052	
10		5700.026	
20		5700.032	
30		5700.049	
40		5700.043	
50		5700.050	
25	102	5700.029	
25	138	5700.047	

Note: the frequency stability range plus the operation bandwidth edge within the operation band.

40M

Low channel, f_o =5270MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5270.056	Pass
-20		5270.012	
-10		5270.009	
0		5270.030	
10		5270.024	
20		5270.050	
30		5270.036	
40		5270.021	
50		5270.057	
25	102	5270.025	
25	138	5270.034	

Middle channel, f_o =5310MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5310.013	Pass
-20		5310.022	
-10		5310.037	
0		5310.029	
10		5310.040	
20		5310.032	
30		5310.017	
40		5310.026	
50		5310.016	
25	102	5310.021	
25	138	5310.018	

Low channel, f_o =5510MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5510.011	Pass
-20		5510.024	
-10		5510.037	
0		5510.046	
10		5510.013	
20		5510.041	
30		5510.038	
40		5510.012	
50		5510.019	
25	102	5510.053	
25	138	5510.059	

Middle channel, f_o =5590MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5610.008	Pass
-20		5610.014	
-10		5610.055	
0		5610.068	
10		5610.032	
20		5610.044	
30		5610.057	
40		5610.015	
50		5610.024	
25	102	5610.029	
25	138	5610.035	

High channel, f_o =5670MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5670.025	Pass
-20		5670.036	
-10		5670.028	
0		5670.049	
10		5670.029	
20		5670.035	
30		5670.065	
40		5670.014	
50		5670.059	
25	102	5670.013	
25	138	5670.060	

80M

Low channel, f_o =5290MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5290.047	Pass
-20		5290.034	
-10		5290.072	
0		5290.017	
10		5290.038	
20		5290.042	
30		5290.040	
40		5290.031	
50		5290.045	
25	102	5290.024	
25	138	5290.026	

Low channel, f_o =5530MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5530.033	Pass
-20		5530.032	
-10		5530.019	
0		5530.031	
10		5530.045	
20		5530.026	
30		5530.054	
40		5530.020	
50		5530.043	
25	102	5530.040	
25	138	5530.039	

Middle channel, f_o =5610MHz			
Temperature (℃)	**Power Supplied (V_{AC})**	**Test Frequency (MHz)**	**Result**
-30	120	5610.012	Pass
-20		5610.023	
-10		5610.055	
0		5610.048	
10		5610.086	
20		5610.013	
30		5610.063	
40		5610.070	
50		5610.017	
25	102	5610.058	
25	138	5610.034	

11 FCC §15.247(b)(3) – Maximum Output Power

11.1 Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

11.2 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r03

Set span to encompass the entire EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

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

(v) Manually set sweep time ≥ 10 * (number of points in sweep) * (symbol period of the transmitted signal), but not less than the automatic default sweep time.

(vi) Set detector = RMS.

(vii) The EUT shall be operated at 100 percent duty cycle.

(viii) Perform a single sweep.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

11.3 Test Equipment List and Details

Descriptions	Manufacturer	Models	Serial Numbers	Calibration Date	Calibration Due Date
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

11.4Test Environmental Conditions

Temperature:	22~24℃
Relative Humidity:	50~57 %
ATM Pressure:	1015~1020 hPa

The testing was performed by David Hsu on 2017-02-18~2017-02-23.

11.5Test Results

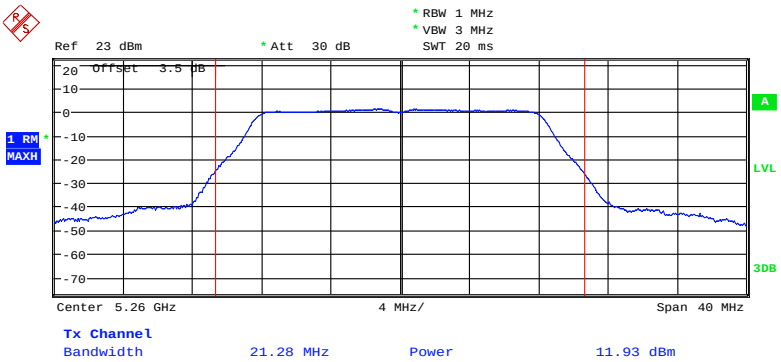
Frequency (MHz)	Antenna	Maximum Conducted Output Power (dBm)	Correct Factor (dB)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
802.11a					
5260	0	11.93	0.18	12.11	24
	1	11.48	0.18	11.66	
	2	12.15	0.18	12.33	
5300	0	12.30	0.18	12.48	
	1	11.74	0.18	11.92	
	2	12.31	0.18	12.49	
5320	0	12.84	0.18	13.02	
	1	12.01	0.18	12.19	
	2	12.57	0.18	12.75	
802.11n20					
5260	0	11.68	0	16.37	24
	1	11.10	0		
	2	11.98	0		
5300	0	11.77	0	16.61	
	1	11.54	0		
	2	12.18	0		
5320	0	12.42	0	17.15	
	1	11.96	0		
	2	12.71	0		
802.11n40					
5270	0	12.34	0	17.09	24
	1	12.17	0		
	2	12.44	0		
5310	0	12.97	0	17.37	
	1	12.32	0		
	2	12.49	0		
802.11ac80					
5290	0	10.87	0.22	15.94	24
	1	10.84	0.22		
	2	11.13	0.22		

Frequency (MHz)	Antenna	Maximum Conducted Output Power (dBm)	Correct Factor (dB)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
802.11a					
5500	0	12.10	0.18	12.28	24
	1	12.04	0.18	12.22	
	2	12.55	0.18	12.73	
5600	0	12.08	0.18	12.26	
	1	12.14	0.18	12.32	
	2	12.02	0.18	12.20	
5700	0	11.01	0.18	11.19	
	1	12.11	0.18	12.29	
	2	12.36	0.18	12.54	
802.11n20					
5500	0	12.46	0	17.32	24
	1	12.28	0		
	2	12.89	0		
5600	0	11.85	0	16.90	
	1	12.05	0		
	2	12.46	0		
5700	0	12.18	0	17.25	
	1	12.95	0		
	2	12.28	0		
802.11n40					
5510	0	12.60	0	17.40	24
	1	12.29	0		
	2	12.97	0		
5590	0	12.42	0	17.52	
	1	12.65	0		
	2	13.15	0		
5670	0	12.24	0	17.22	
	1	12.51	0		
	2	12.60	0		
802.11ac80					
5530	0	12.43	0.22	17.54	24
	1	12.11	0.22		
	2	13.04	0.22		
5610	0	11.76	0.22	17.00	
	1	11.81	0.22		
	2	12.43	0.22		

Frequency (MHz)	Antenna	Maximum Conducted Output Power (dBm)	Correct Factor (dB)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Cross Band					
802.11n20 5720	0	12.27	0	17.38	24
	1	12.57	0		
	2	12.97	0		
802.11n40 5710	0	12.22	0	17.23	
	1	12.43	0		
	2	12.71	0		
802.11ac80 5690	0	12.28	0.22	17.46	
	1	12.29	0.22		
	2	12.81	0.22		

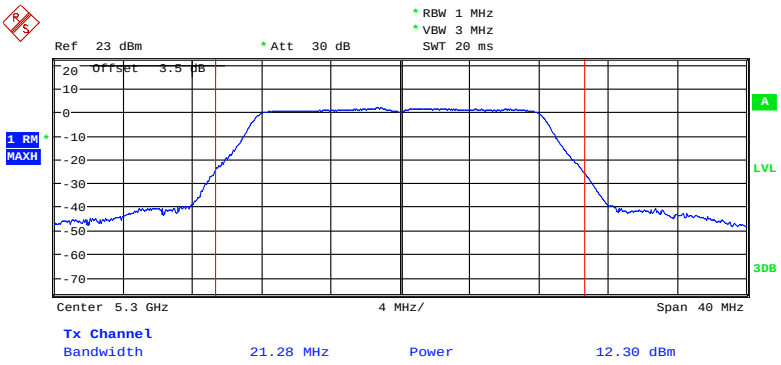
Note:
Correct Factor=10 * log(1/X)
The 5250-5350MHz and 5470-5725MHz power limit 11dBm+10*log(min BW) over 24dBm,
So Limit is 24dBm.
Please refer to the following plots

IEEE 802.11a mode / 5250 ~ 5350MHz(chain0)
5260MHz



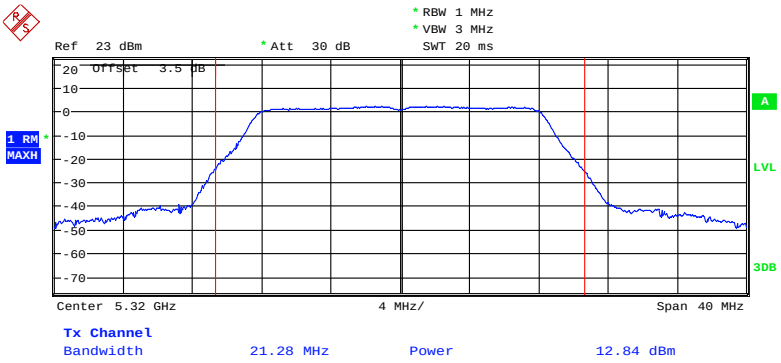
Date: 18.FEB.2017 16:37:09

5300MHz



Date: 18.FEB.2017 16:35:35

5320MHz



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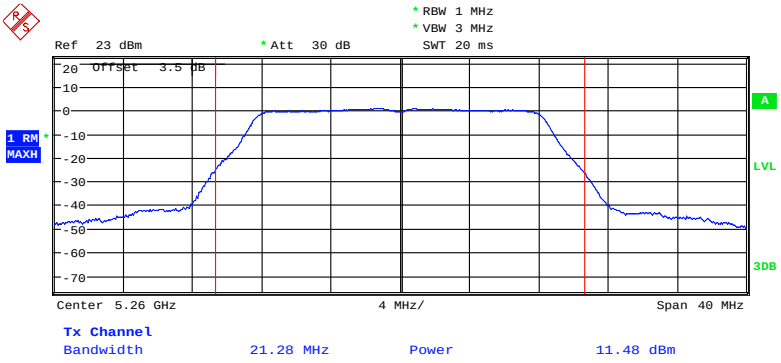
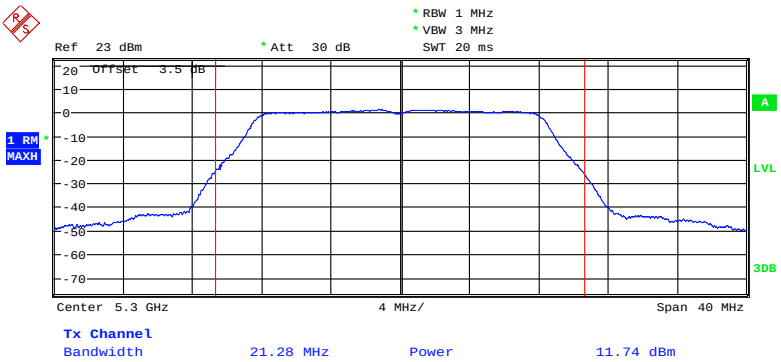
IEEE 802.11a mode / 5250 ~ 5350MHz(chain1)
5260MHz



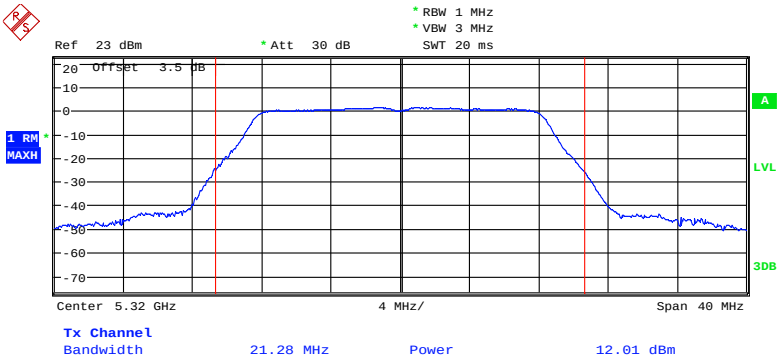
Date: 18.FEB.2017 16:58:19

5300MHz



Date: 18.FEB.2017 16:59:29

5320MHz



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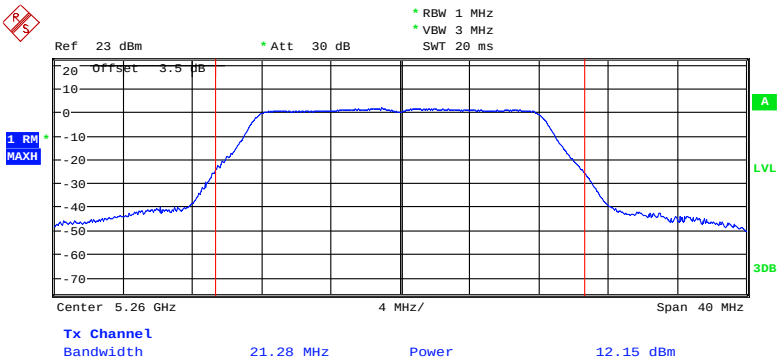
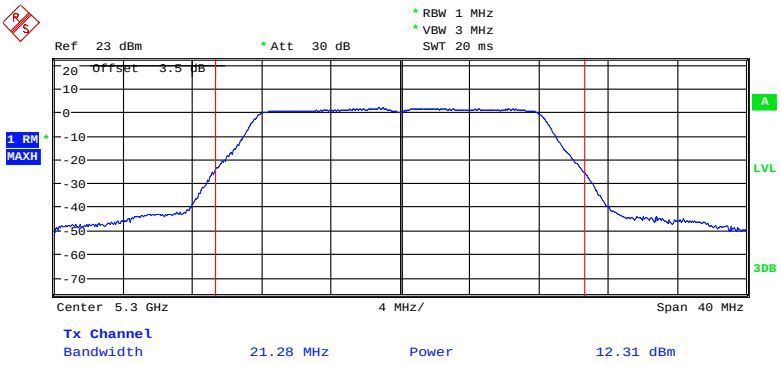
IEEE 802.11a mode / 5250 ~ 5350MHz(chain2)
5260MHz



Date: 18.FEB.2017 17:09:46

5300MHz



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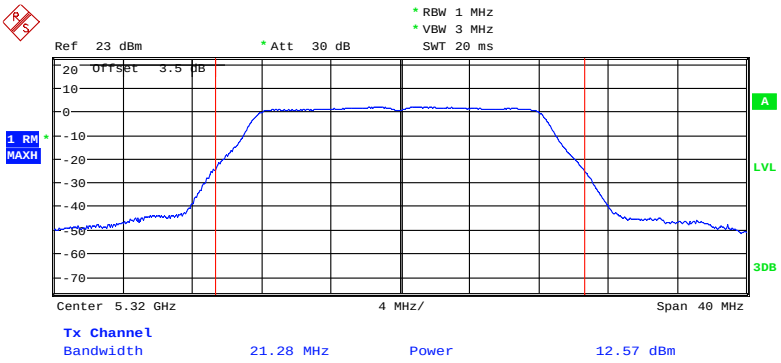
5320MHz



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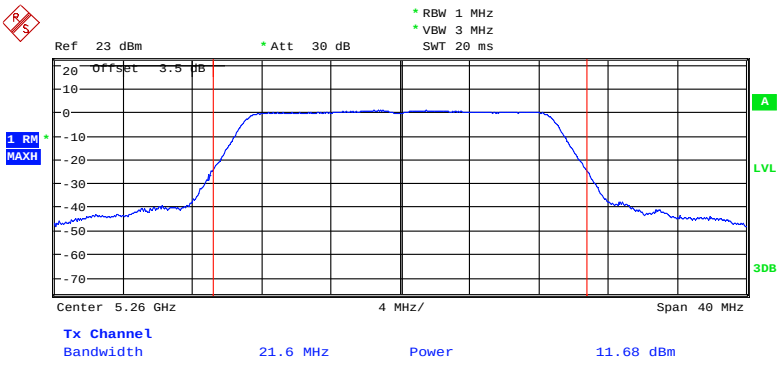
IEEE 802.11n HT20 mode / 5250 ~ 5350MHz(chain0)
5260MHz



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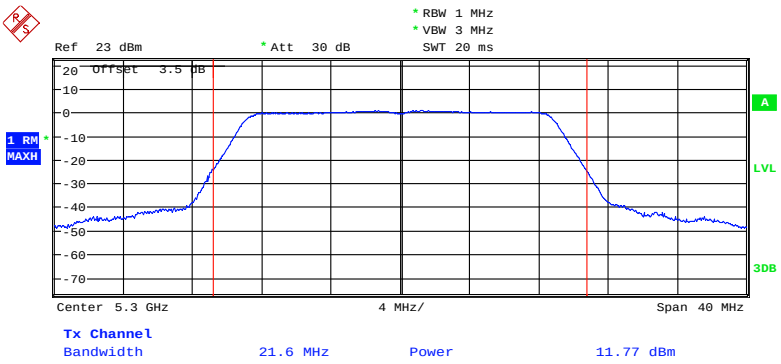
5300MHz



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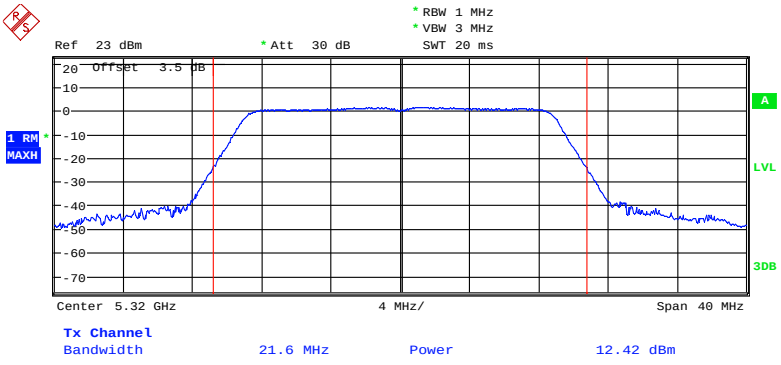
5320MHz



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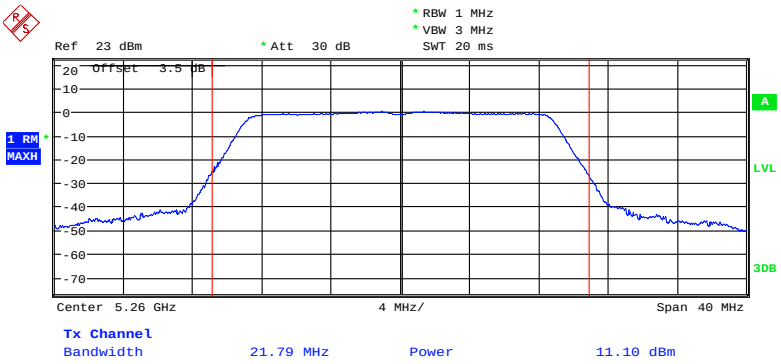
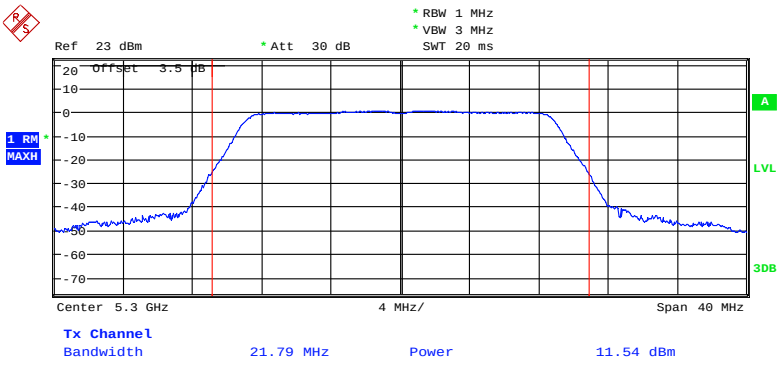
IEEE 802.11n HT20 mode / 5250 ~ 5350MHz(chain1)
5260MHz



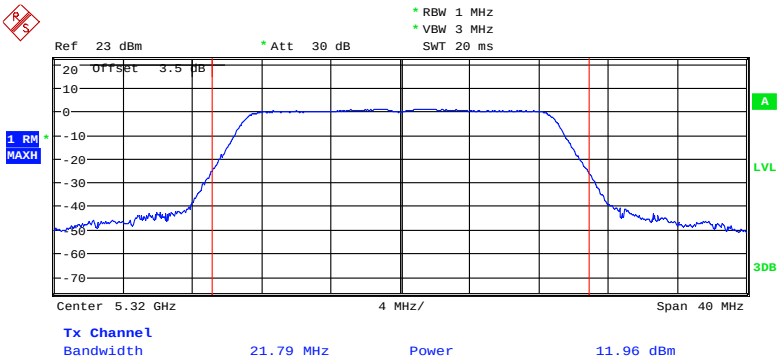
Date: 18.FEB.2017 17:48:11

5300MHz



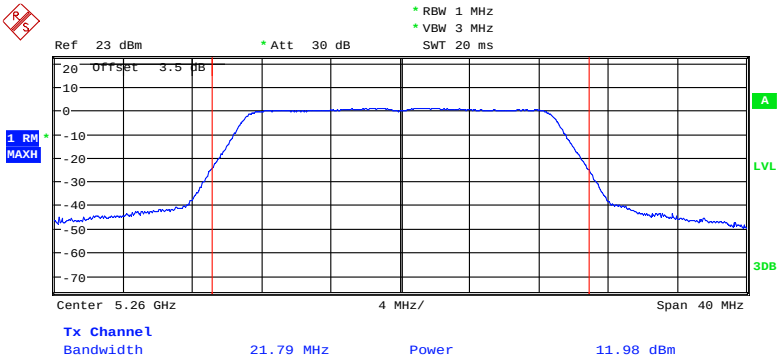
Date: 18.FEB.2017 17:47:00

5320MHz



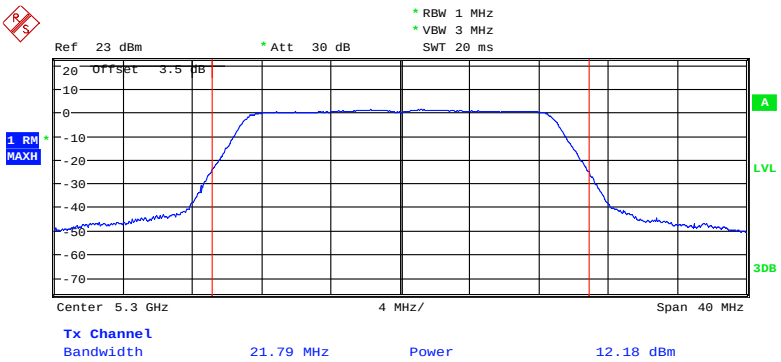
Date: 18.FEB.2017 17:47:28

IEEE 802.11n HT20 mode / 5250 ~ 5350MHz(chain2)
5260MHz



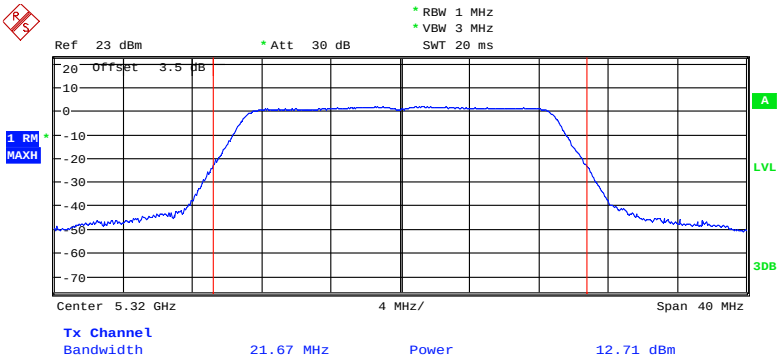
Date: 18.FEB.2017 17:27:10

5300MHz



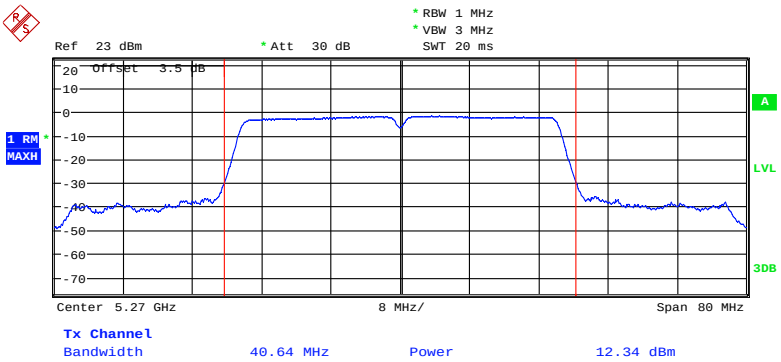
Date: 18.FEB.2017 17:29:00

5320MHz



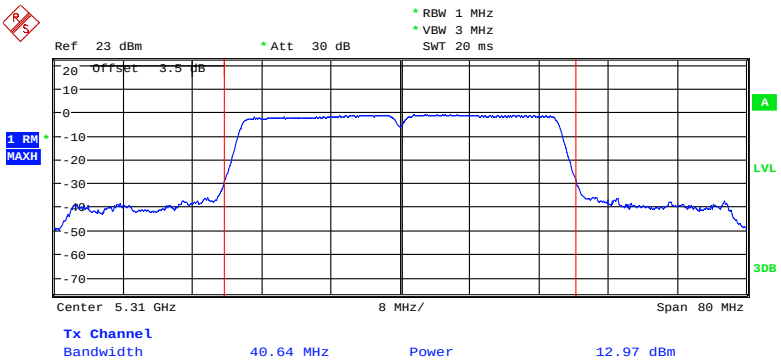
Date: 18.FEB.2017 17:29:50

IEEE 802.11n HT40 mode / 5250 ~ 5350MHz(chain0)
5270MHz



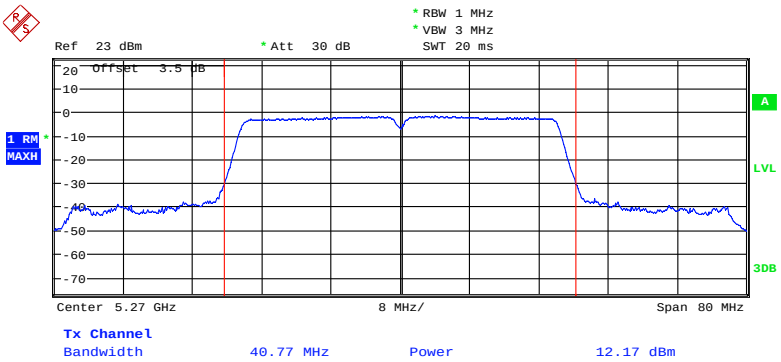
Date: 18.FEB.2017 16:16:02

5310MHz



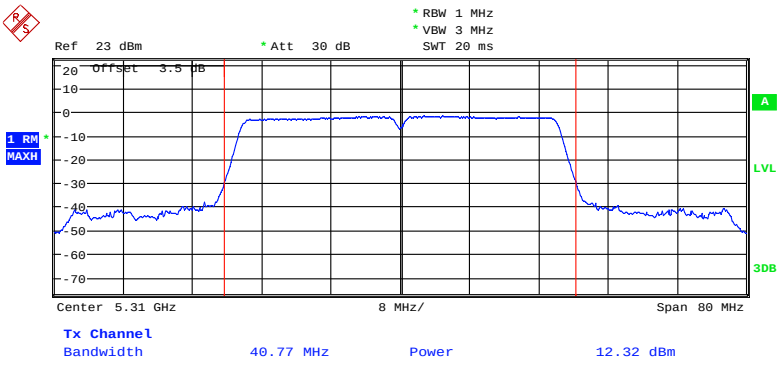
Date: 18.FEB.2017 16:14:03

IEEE 802.11n HT40 mode / 5250 ~ 5350MHz(chain1)
5270MHz



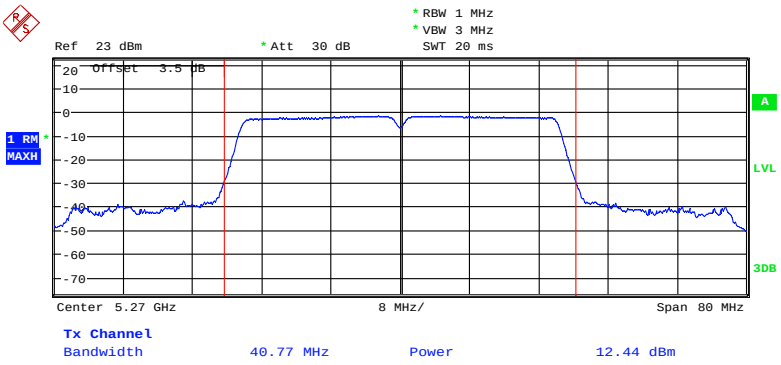
Date: 18.FEB.2017 16:02:09

5310MHz



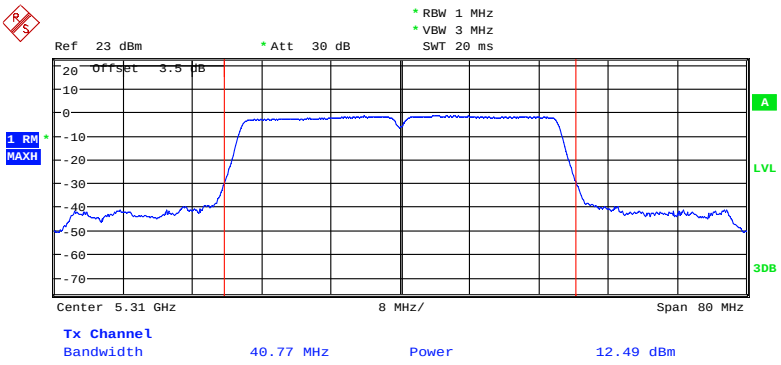
Date: 18.FEB.2017 16:00:12

IEEE 802.11n HT40 mode / 5250 ~ 5350MHz(chain2)
5270MHz



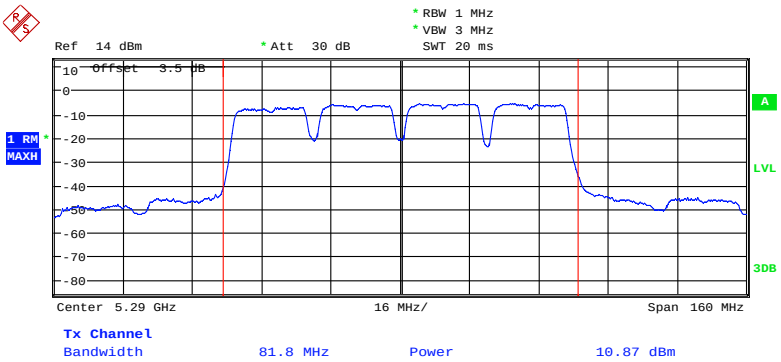
Date: 18.FEB.2017 16:04:41

5310MHz



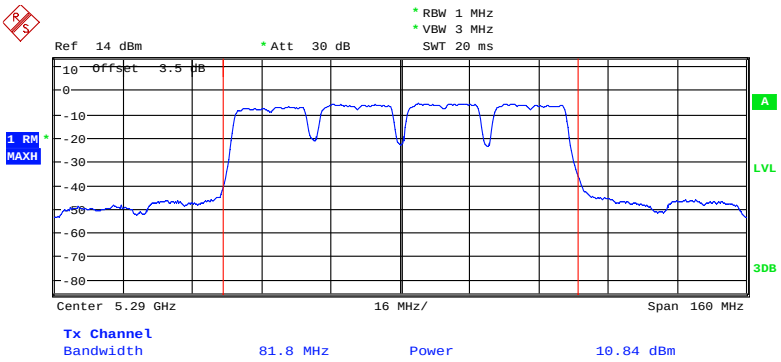
Date: 18.FEB.2017 16:05:45

IEEE 802.11ac VHT80 mode / 5250 ~ 5350MHz(chain0)
5290MHz



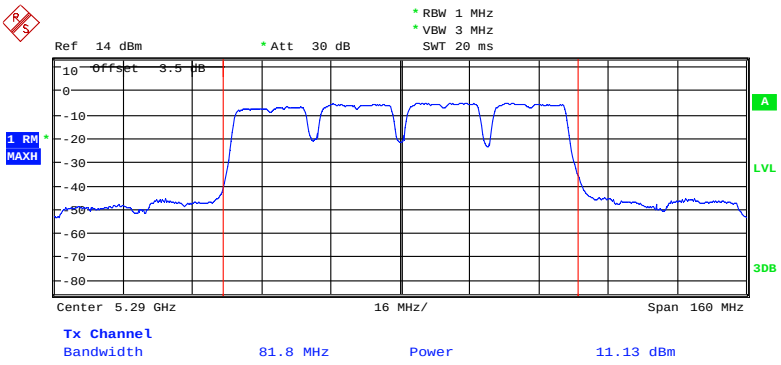
Date: 18.FEB.2017 14:21:22

IEEE 802.11ac VHT80 mode / 5250 ~ 5350MHz(chain 1)
5290MHz



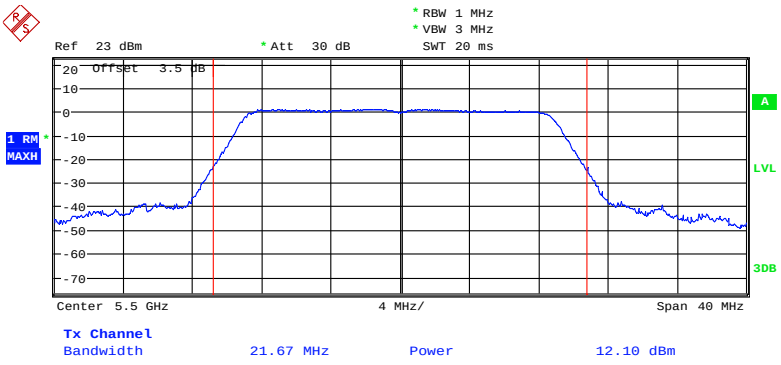
Date: 18.FEB.2017 14:14:08

IEEE 802.11ac VHT80 mode / 5250 ~ 5350MHz(chain 2)
5290MHz



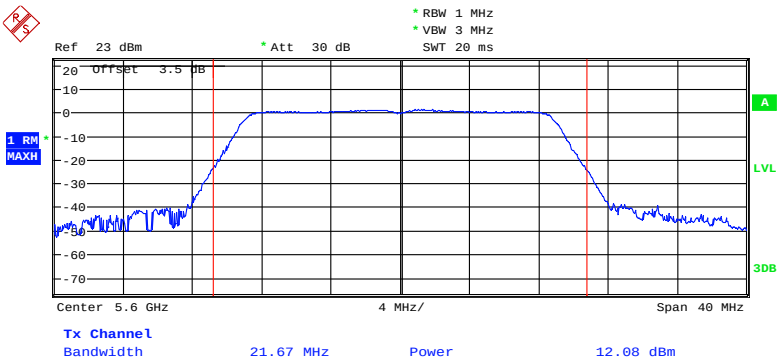
Date: 18.FEB.2017 14:02:28

IEEE 802.11a mode / 5470 ~ 5725MHz(chain0)
5500MHz



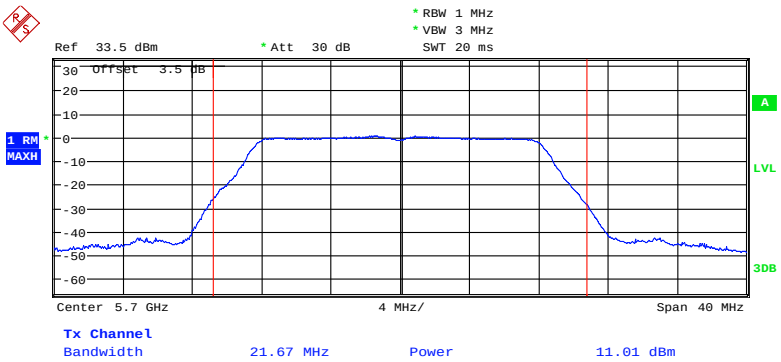
Date: 22.FEB.2017 09:51:58

5600MHz



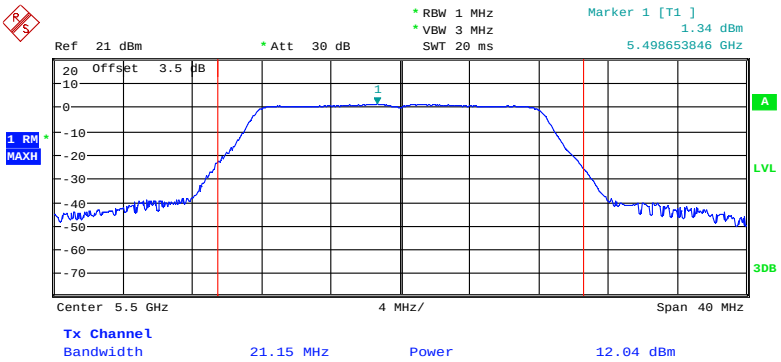
Date: 22.FEB.2017 09:54:57

5700MHz



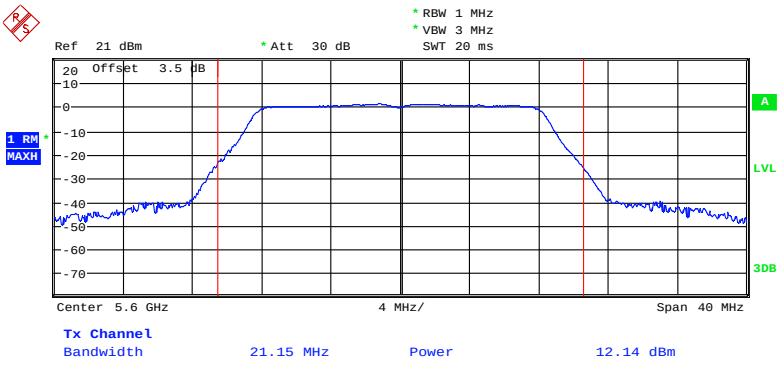
Date: 22.FEB.2017 13:31:54

IEEE 802.11a mode / 5470 ~ 5725MHz(chain1)
5500MHz



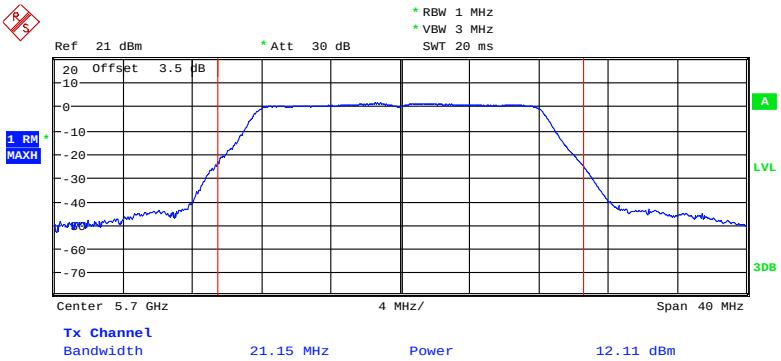
Date: 23.FEB.2017 10:50:32

5600MHz



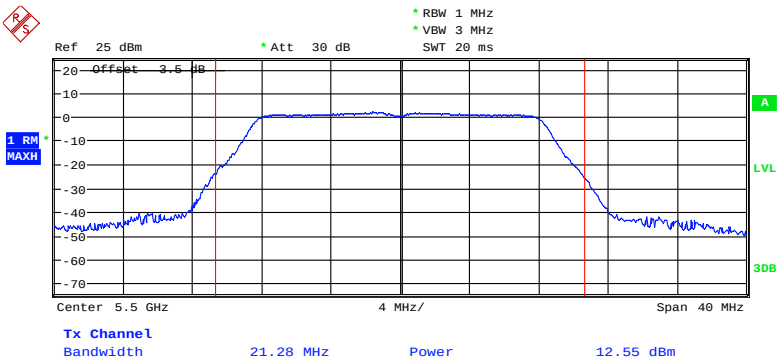
Date: 23.FEB.2017 10:49:34

5700MHz



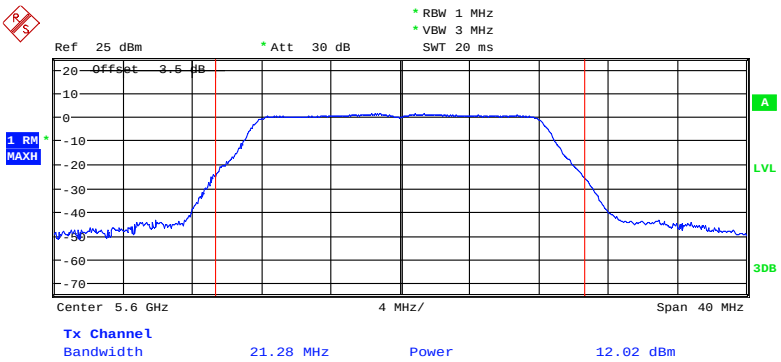
Date: 23.FEB.2017 10:46:31

IEEE 802.11a mode / 5470 ~ 5725MHz(chain2)
5500MHz



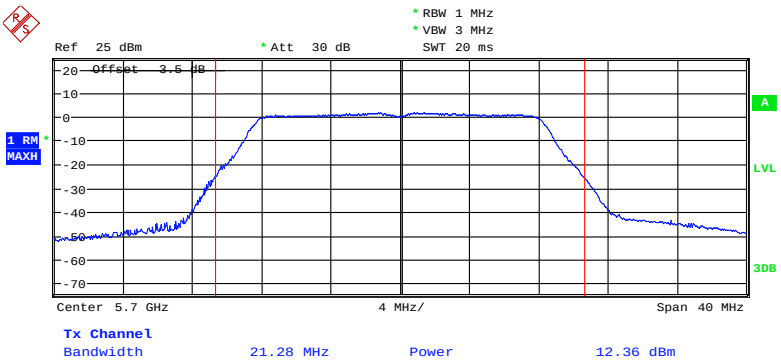
Date: 22.FEB.2017 13:56:27

5600MHz



Date: 22.FEB.2017 13:55:11

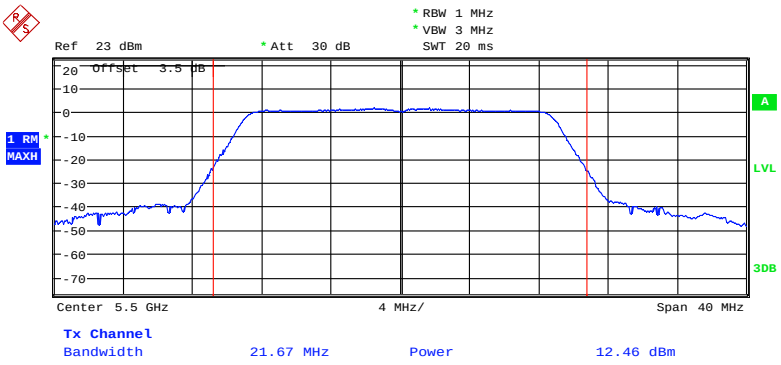
5700MHz



Date: 22.FEB.2017 13:52:10

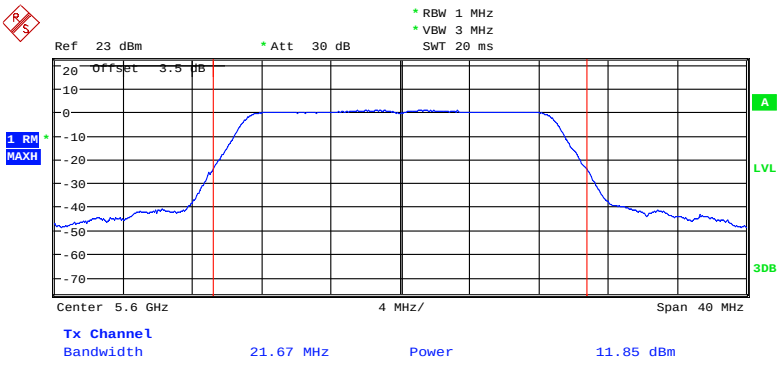
IEEE 802.11n HT20 mode / 5470 ~ 5725MHz(chain0)

5500MHz



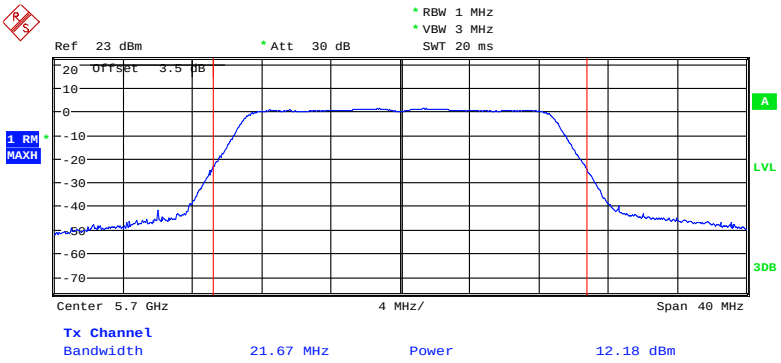
Date: 21.FEB.2017 17:28:01

5600MHz



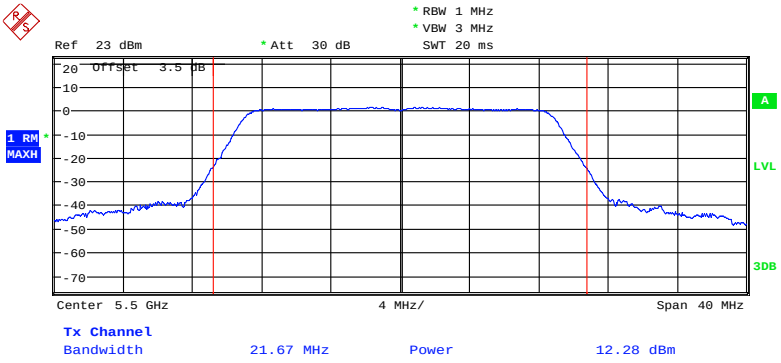
Date: 21.FEB.2017 17:24:32

5700MHz



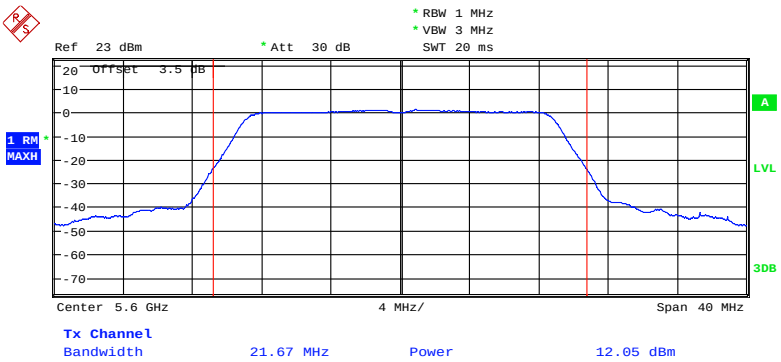
Date: 21.FEB.2017 17:21:07

IEEE 802.11n HT20 mode / 5470 ~ 5725MHz(chain1)
5500MHz



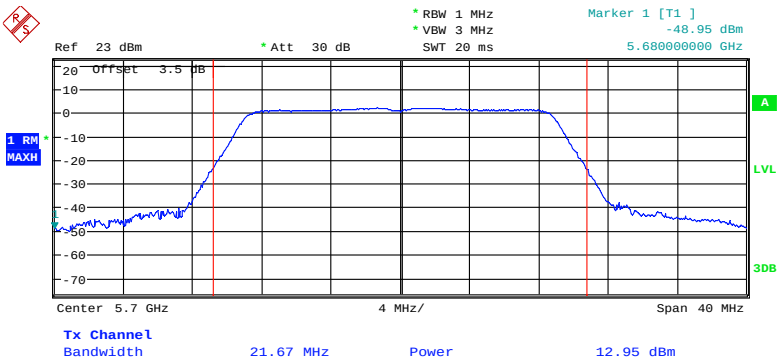
Date: 21.FEB.2017 17:51:56

5600MHz



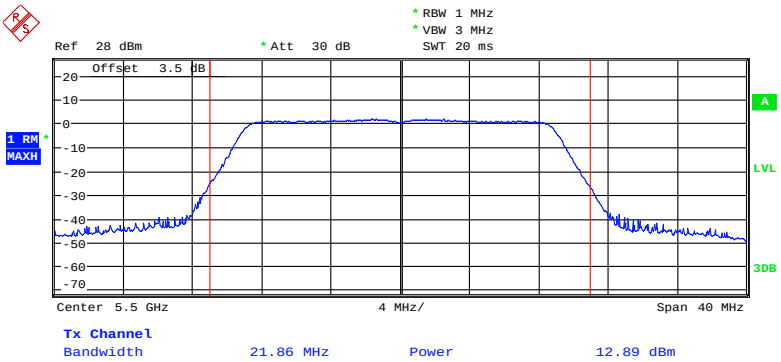
Date: 21.FEB.2017 17:54:50

5700MHz



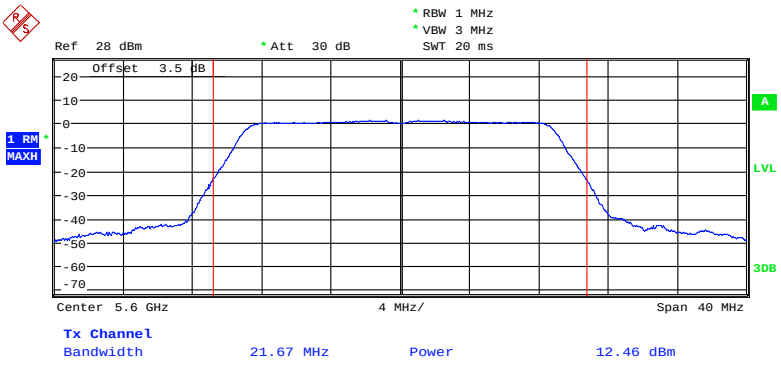
Date: 21.FEB.2017 17:56:21

IEEE 802.11n HT20 mode / 5470 ~ 5725MHz(chain2)
5500MHz



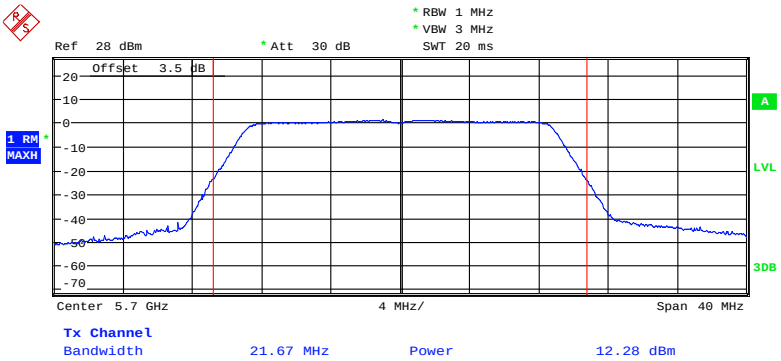
Date: 21.FEB.2017 18:27:14

5600MHz



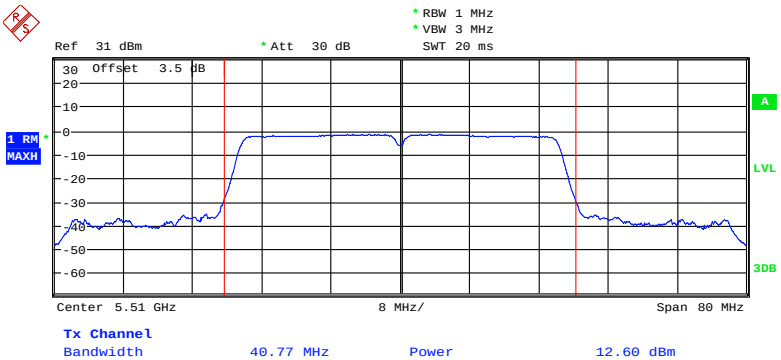
Date: 21.FEB.2017 18:28:48

5700MHz



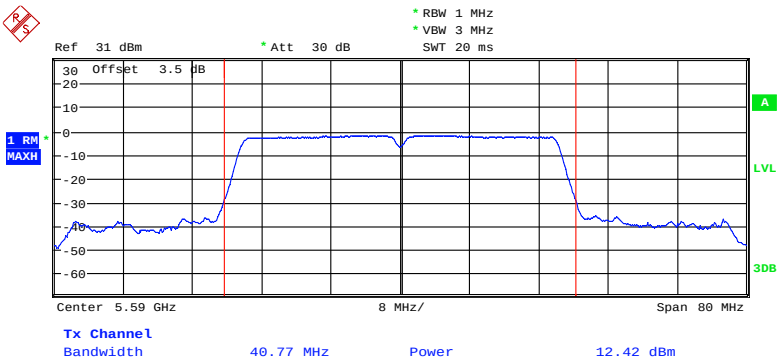
Date: 21.FEB.2017 18:29:50

IEEE 802.11n HT40 mode / 5470 ~ 5725MHz(chain0)
5510MHz



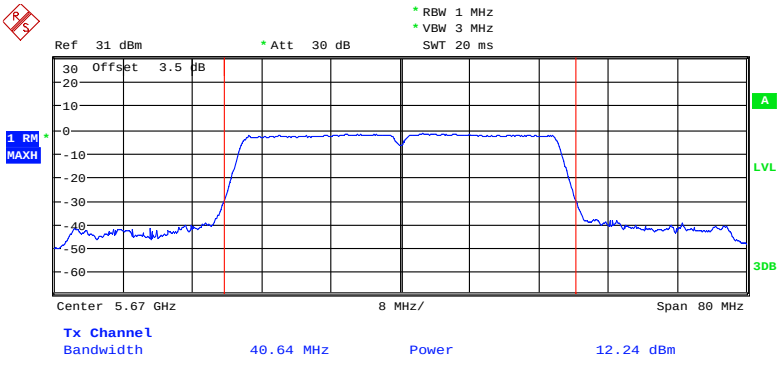
Date: 23.FEB.2017 11:32:11

5590MHz



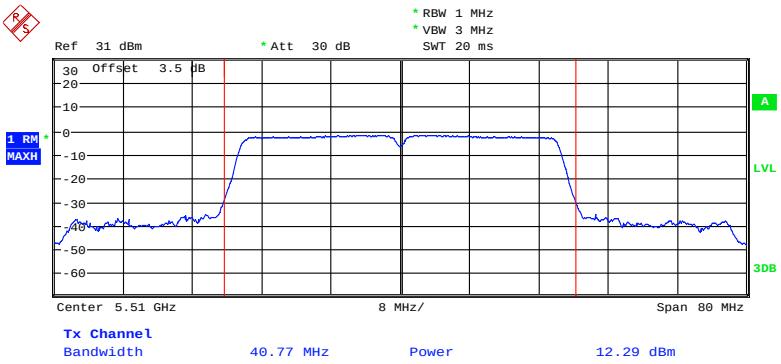
Date: 23.FEB.2017 11:31:10

5670MHz



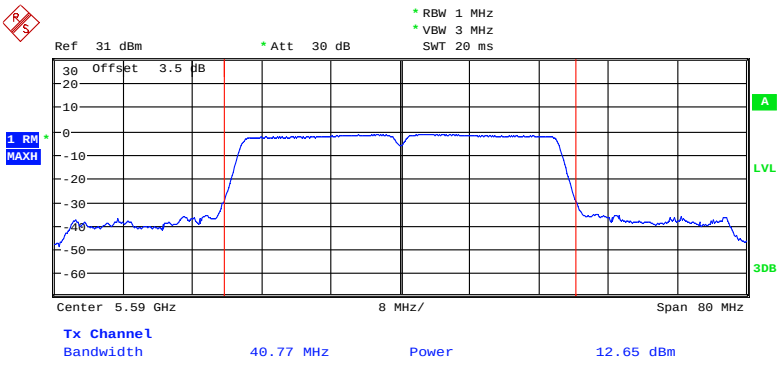
Date: 23.FEB.2017 11:28:46

IEEE 802.11n HT40 mode / 5470 ~ 5725MHz(chain1)
5510MHz



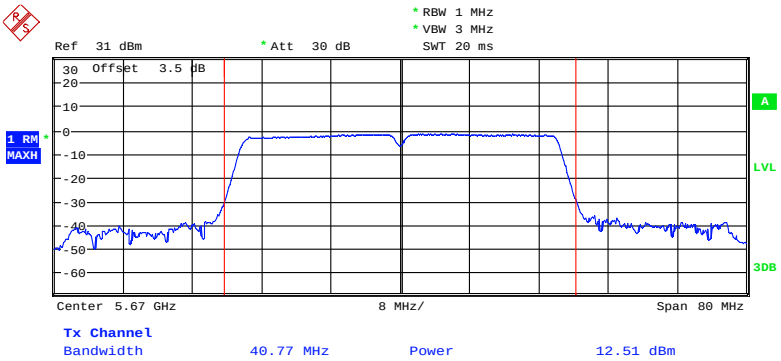
Date: 23.FEB.2017 11:14:37

5590MHz



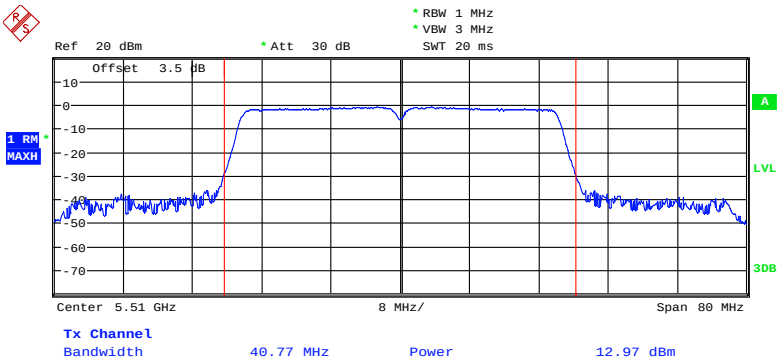
Date: 23.FEB.2017 11:16:07

5670MHz



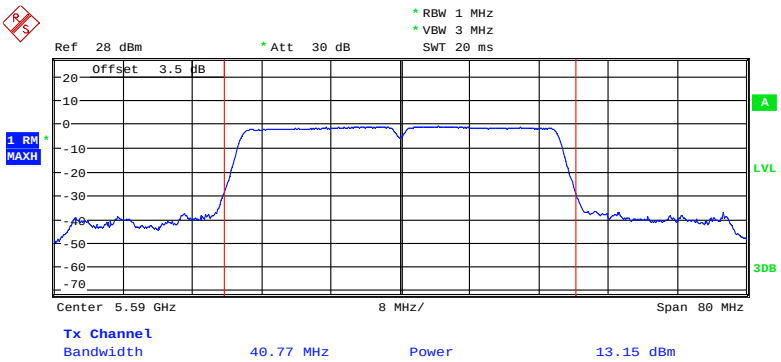
Date: 23.FEB.2017 11:17:21

IEEE 802.11n HT40 mode / 5470 ~ 5725MHz(chain2)
5510MHz



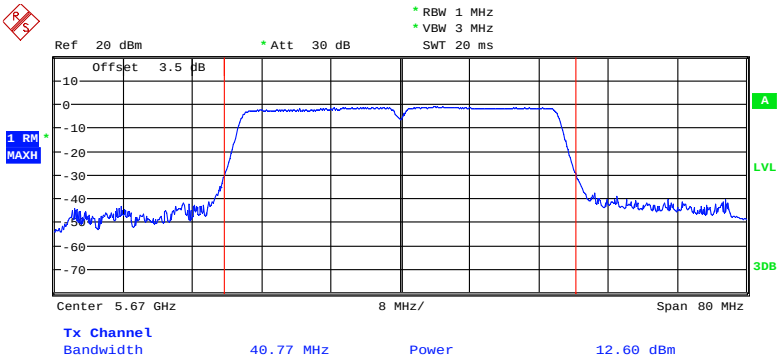
Date: 23.FEB.2017 11:47:48

5590MHz



Date: 23.FEB.2017 11:44:02

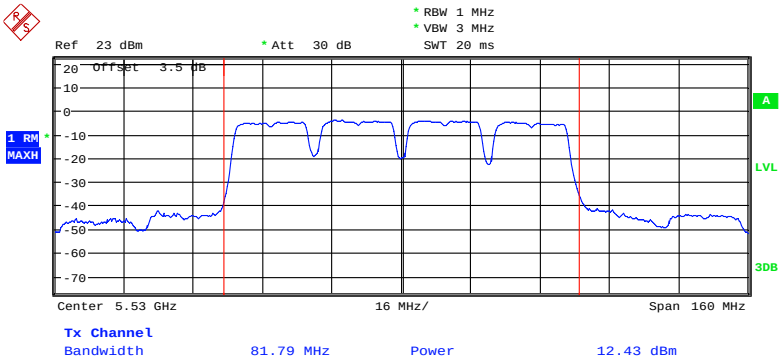
5670MHz



Date: 23.FEB.2017 11:47:17

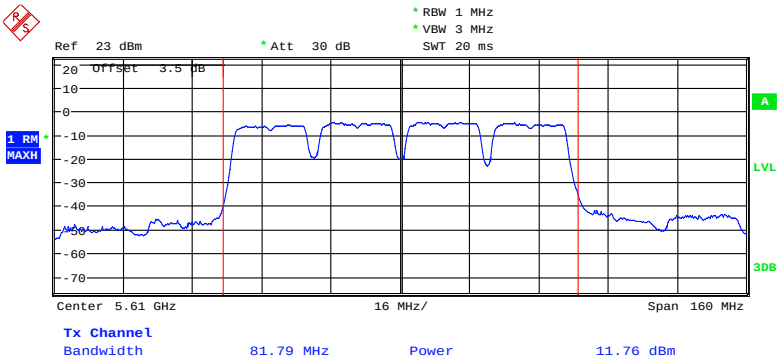
IEEE 802.11ac VHT80 mode / 5470 ~ 5725MHz(chain0)

5530MHz



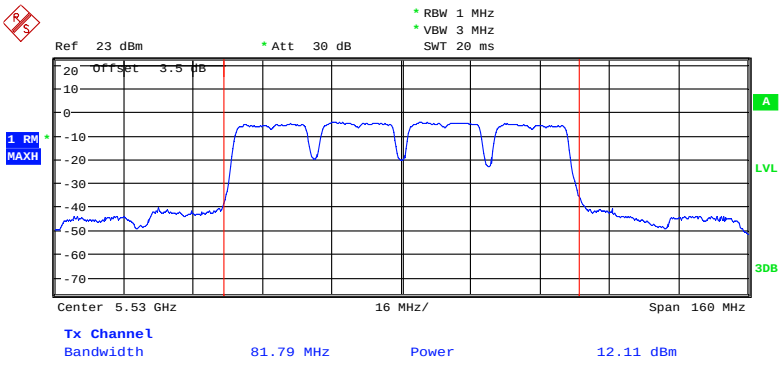
Date: 23.FEB.2017 13:55:07

5610MHz



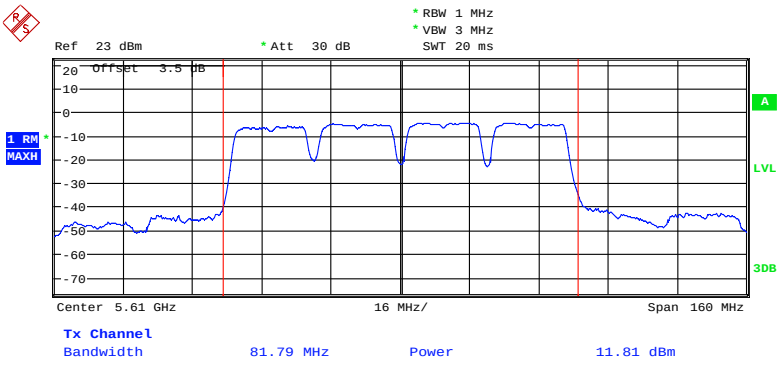
Date: 23.FEB.2017 13:51:55

IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz(chain 1)
5530MHz



Date: 23.FEB.2017 14:21:51

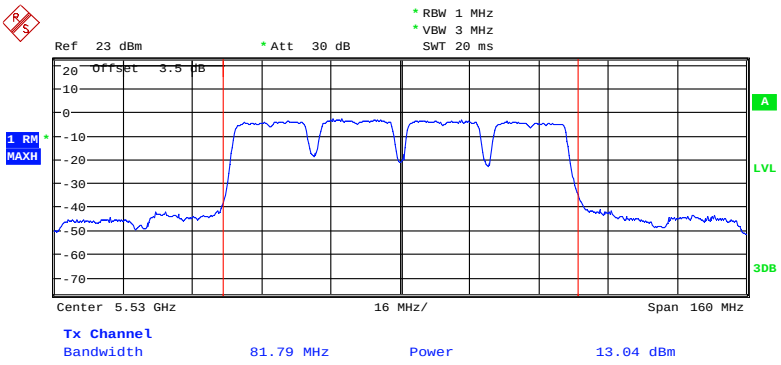
5610MHz



Date: 23.FEB.2017 14:19:57

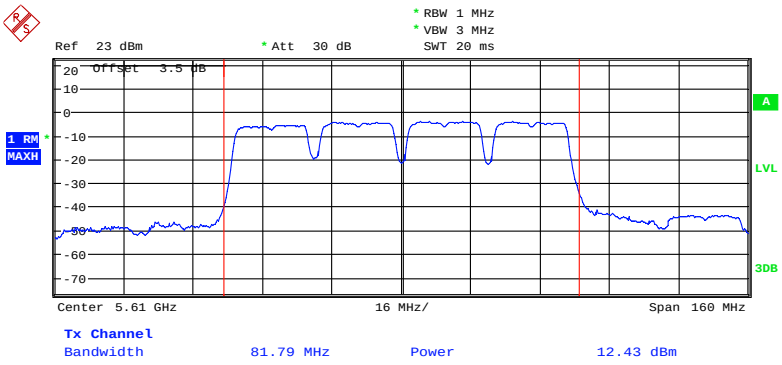
IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz(chain 2)

5530MHz



Date: 23.FEB.2017 14:30:36

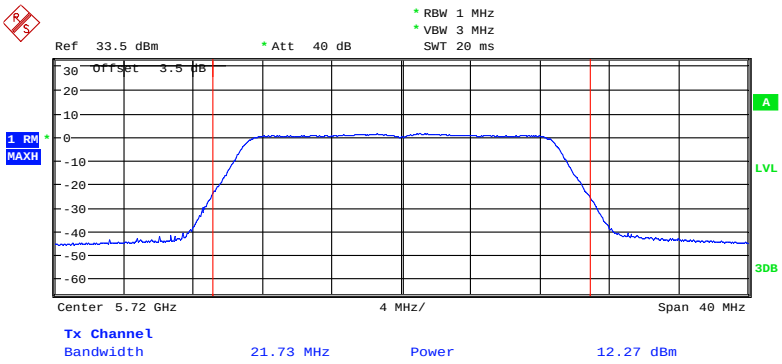
5610MHz



Date: 23.FEB.2017 14:28:31

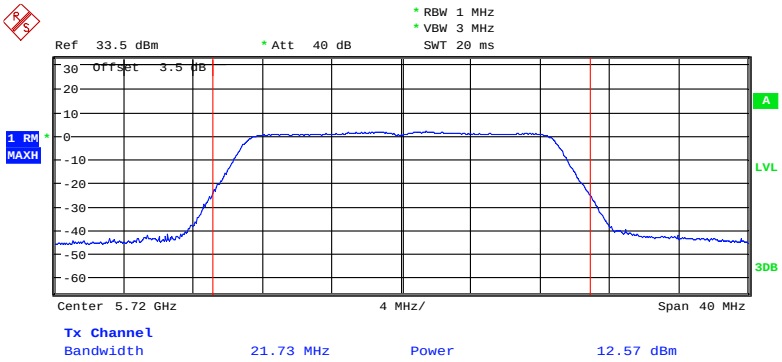
Cross Band:

IEEE 802.11n HT20 mode / 5720MHz(chain 0)



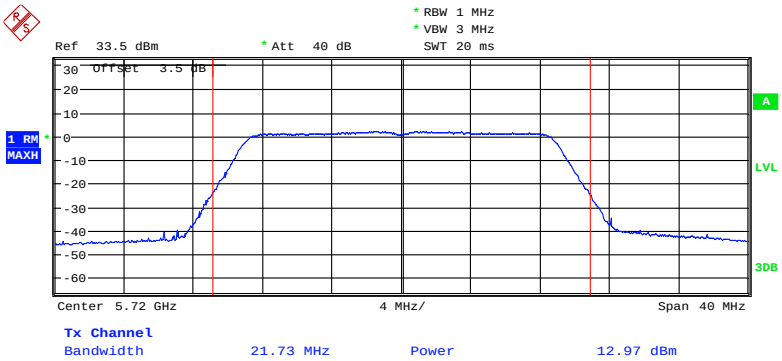
Date: 25.FEB.2017 18:11:00

IEEE 802.11n HT20 mode / 5720MHz(chain 1)



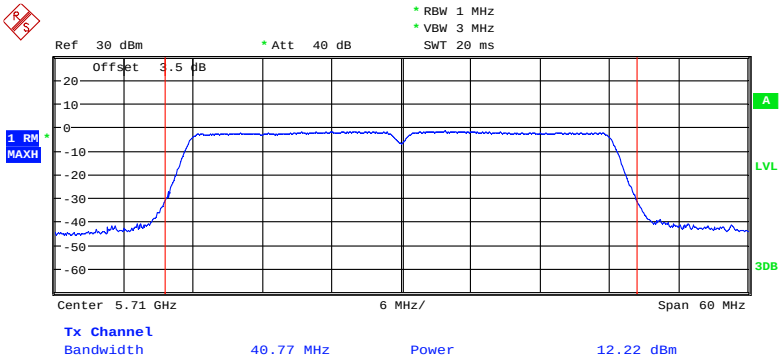
Date: 25.FEB.2017 18:12:41

IEEE 802.11n HT20 mode / 5720MHz(chain 2)



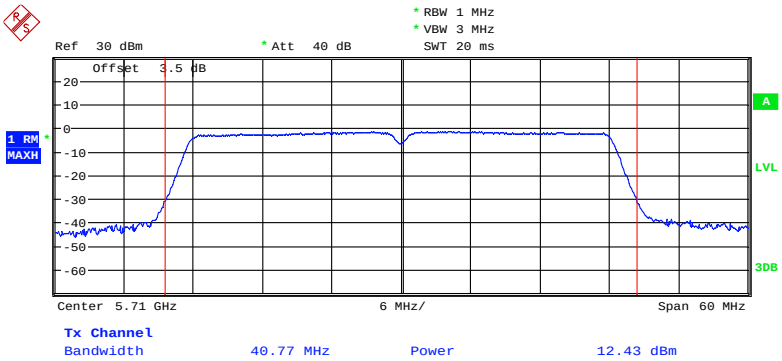
Date: 25.FEB.2017 18:20:07

IEEE 802.11n HT40 mode / 5710MHz(chain 0)



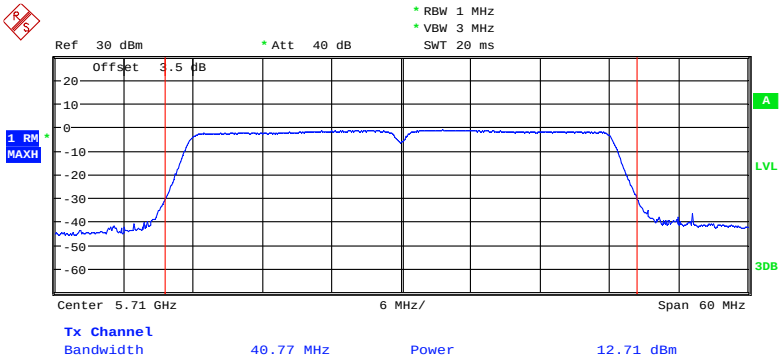
Date: 25.FEB.2017 19:08:21

IEEE 802.11n HT40 mode / 5710MHz(chain 1)



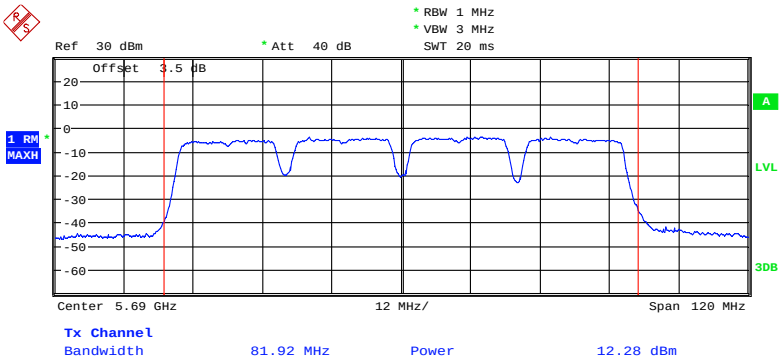
Date: 25.FEB.2017 19:09:21

IEEE 802.11n HT40 mode / 5710MHz(chain 2)



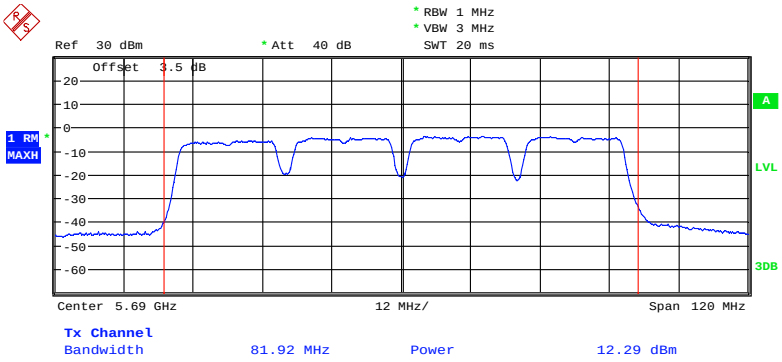
Date: 25.FEB.2017 19:13:06

IEEE 802.11ac VHT80 mode / 5690MHz(chain 0)



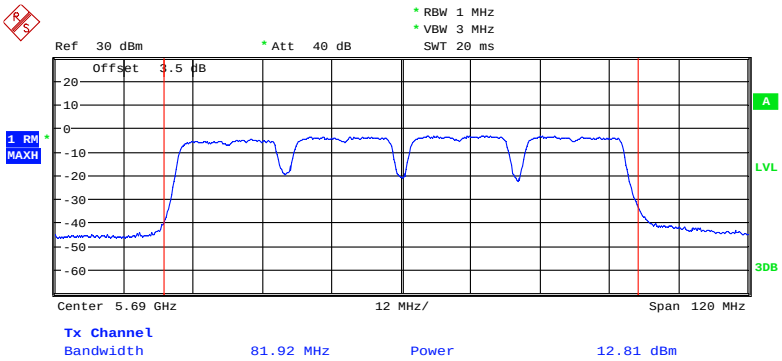
Date: 25.FEB.2017 19:04:30

IEEE 802.11ac VHT80 mode / 5690MHz(chain 1)



Date: 25.FEB.2017 19:00:51

IEEE 802.11ac VHT80 mode / 5690MHz(chain 2)



Date: 25.FEB.2017 18:59:36

12 FCC §15.247(e) – Power Spectral Density

12.1 Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

12.2 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r03

12.3 Test Equipment List and Details

Descriptions	Manufacturer	Models	Serial Numbers	Calibration Date	Calibration Due Date
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

12.4Test Environmental Conditions

Temperature:	22~24℃
Relative Humidity:	50~57 %
ATM Pressure:	1015~1020 hPa

The testing was performed by David Hsu on 2017-02-18~2017-02-23.

Note:
the 3 antenna maximum atenna gain are 3.0dBi,

Directional gain = GANT + Array Gain = 3+10*log(3) =7.77 dBi
The Power density Limits was reduce 1.77dB

12.5Test Results

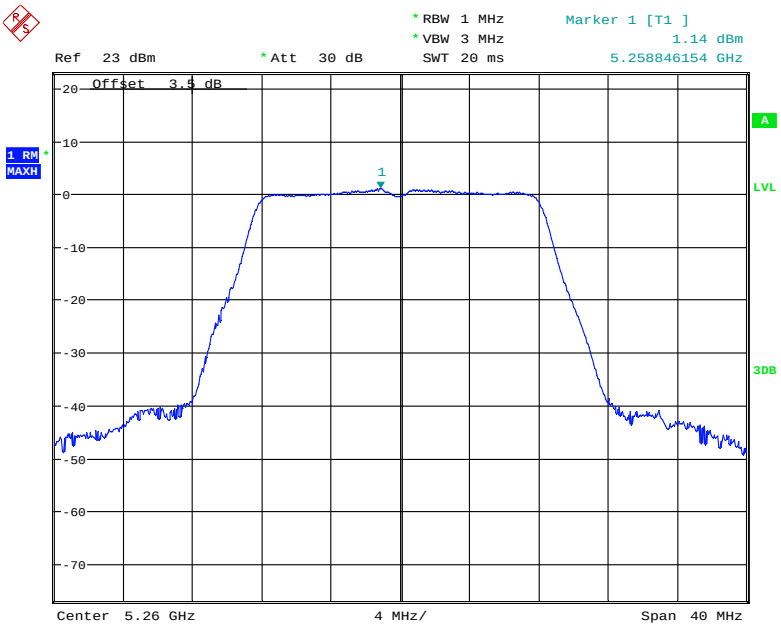
Test Mode: Transmitting

Note: per output power test, the SISO mode was the worst, so only SISO mode was test for this item, and used to evaluate

Frequency (MHz)	Antenna	Power Spectral Density (dBm/MHz)	Correct Factor (dB)	Total Power spectral Density(dBm/MHz)	Limit (dBm/MHz)
802.11a					
5260	0	1.14	0.18	1.32	11
	1	0.72	0.18	0.9	
	2	1.39	0.18	1.57	
5300	0	1.73	0.18	1.91	
	1	1.01	0.18	1.19	
	2	1.44	0.18	1.62	
5320	0	1.55	0.18	1.73	
	1	1.25	0.18	1.43	
	2	1.74	0.18	1.92	
802.11n20					
5260	0	0.24	0	5.18	9.23
	1	-0.11	0		
	2	1.03	0		
5300	0	0.56	0	5.49	
	1	0.64	0		
	2	0.94	0		
5320	0	1.63	0	6.21	
	1	0.99	0		
	2	1.66	0		
802.11n40					
5270	0	-1.69	0	2.93	9.23
	1	-2.16	0		
	2	-1.68	0		
5310	0	-1.17	0	3.33	
	1	-1.74	0		
	2	-1.42	0		
802.11ac80					
5290	0	-5.59	0.22	-0.52	9.23
	1	-5.71	0.22		
	2	-5.26	0.22		

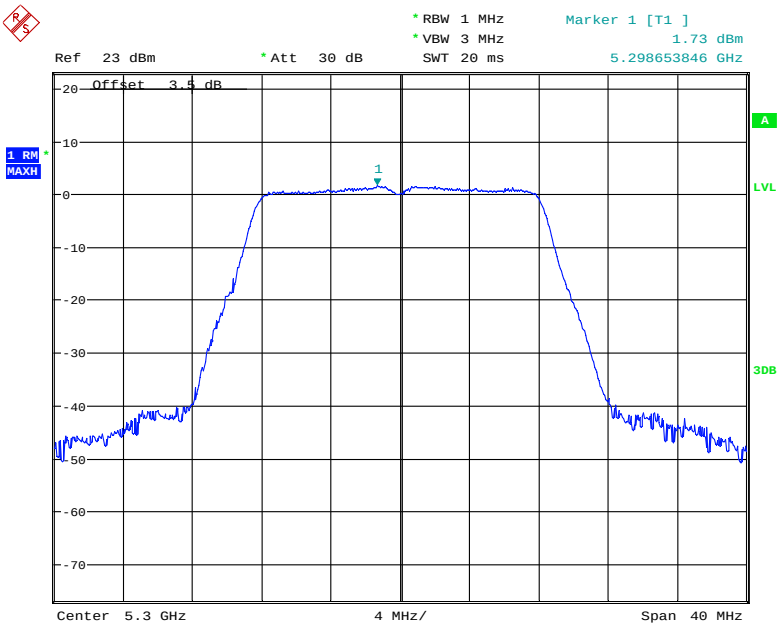
Please refer to the following plots

IEEE 802.11a mode / 5250 ~ 5350MHz(chain0)
5260MHz



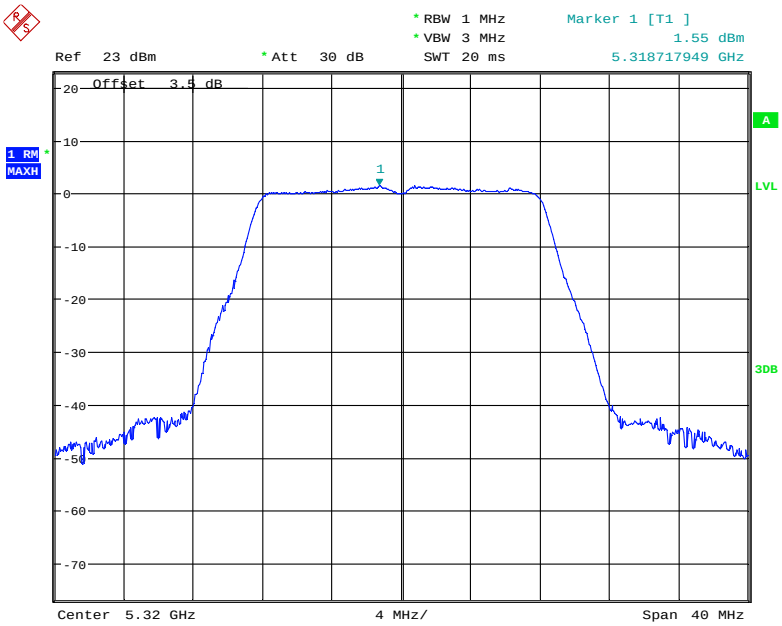
Date: 18.FEB.2017 16:37:39

5300MHz



Date: 18.FEB.2017 16:38:07

5320MHz



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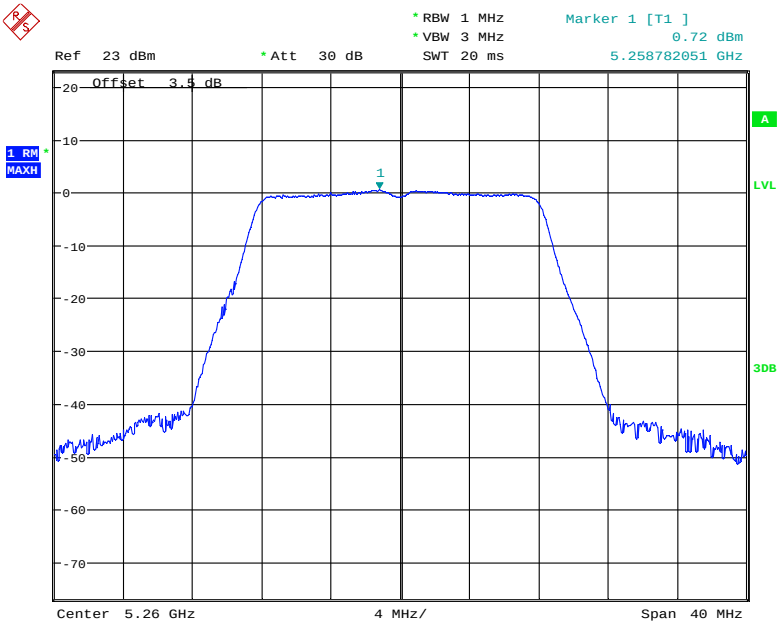
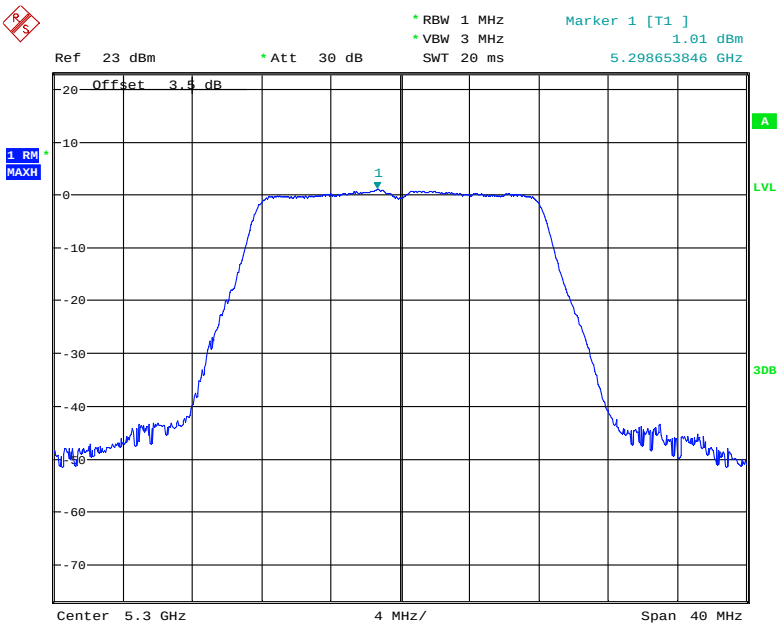
IEEE 802.11a mode / 5250 ~ 5350MHz(chain1)
5260MHz



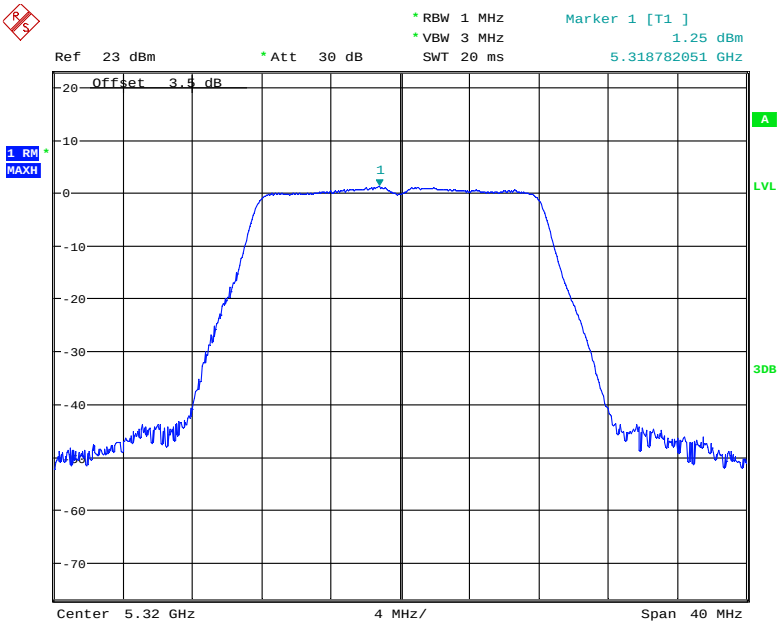
Date: 18.FEB.2017 16:42:50

5300MHz



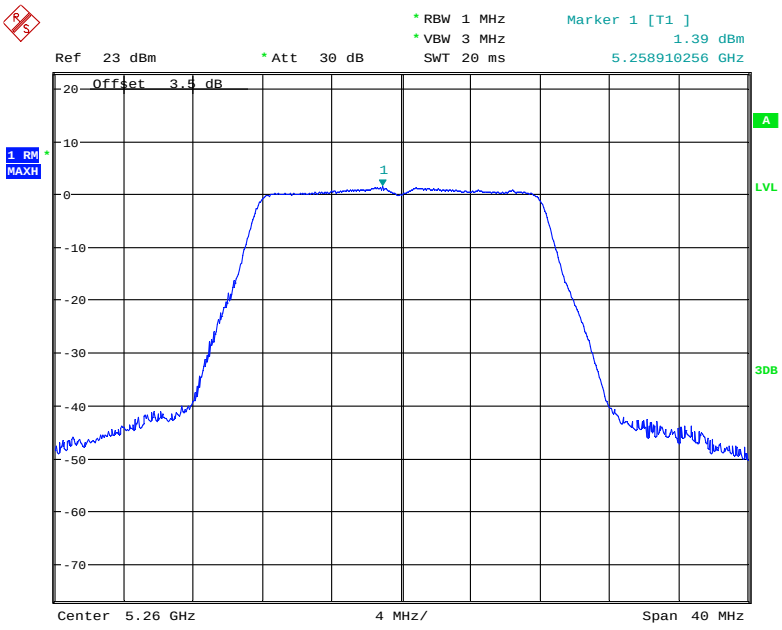
Date: 18.FEB.2017 16:42:09

5320MHz



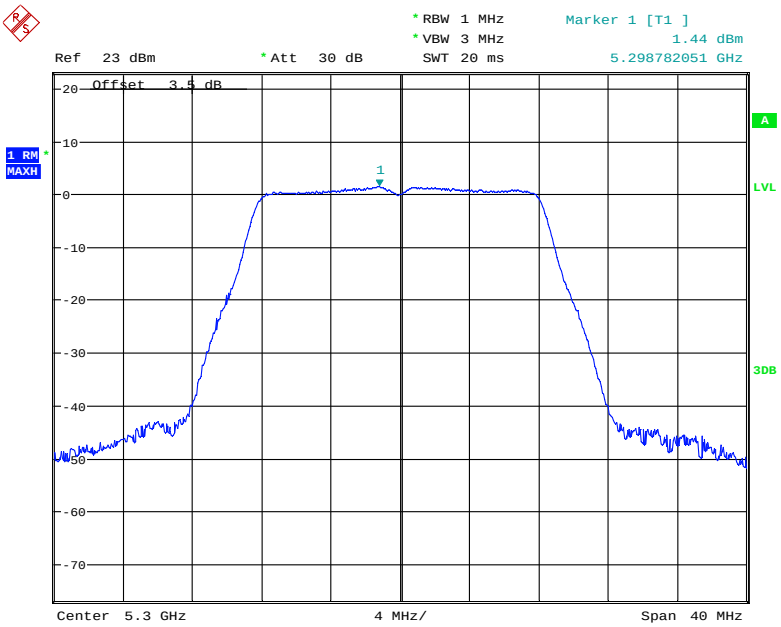
Date: 18.FEB.2017 16:41:35

IEEE 802.11a mode / 5250 ~ 5350MHz(chain2)
5260MHz



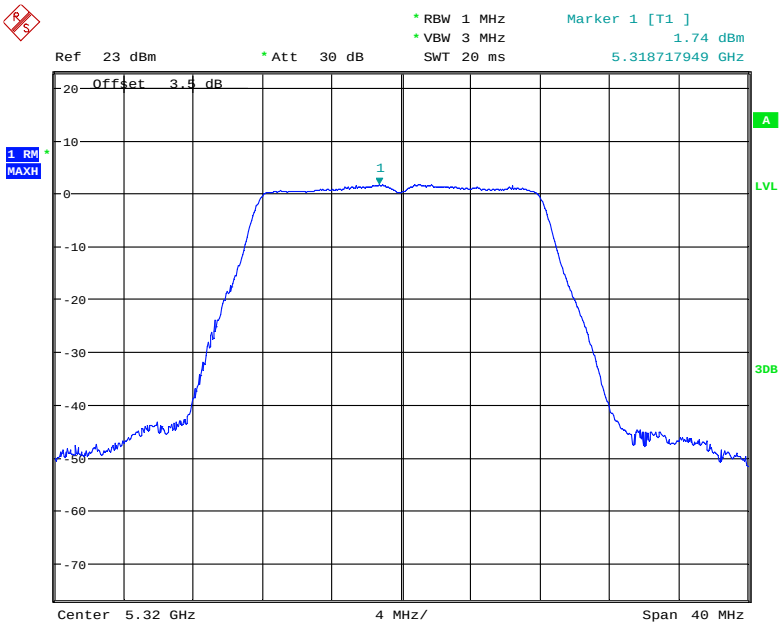
Date: 18.FEB.2017 17:10:09

5300MHz



Date: 18.FEB.2017 17:10:31

5320MHz



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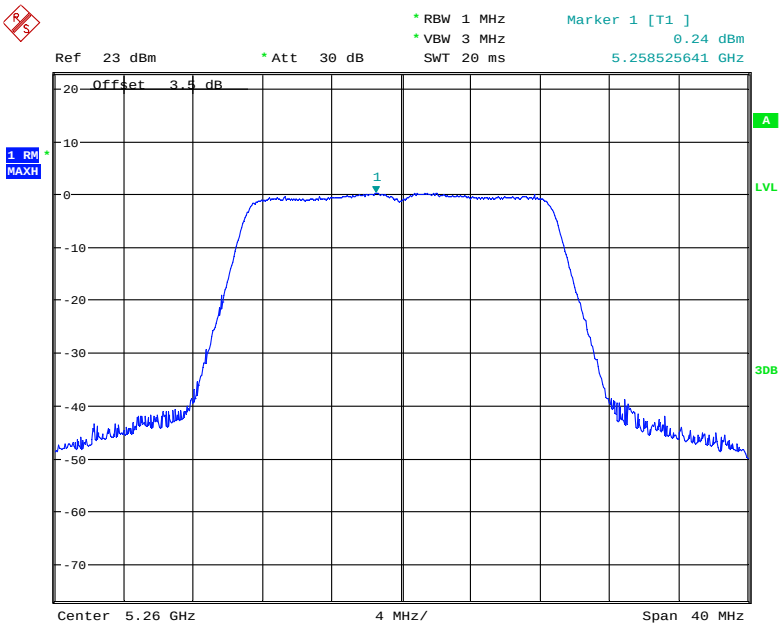
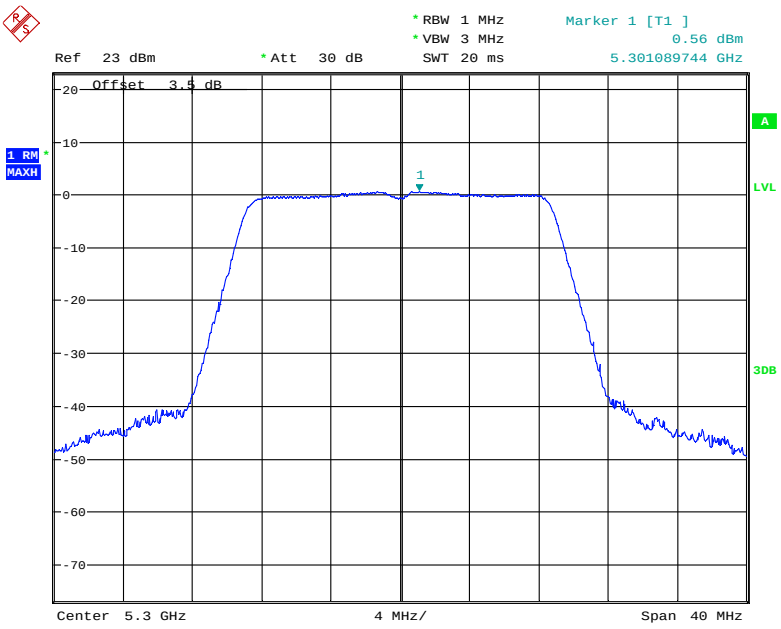
IEEE 802.11n HT20 mode / 5250 ~ 5350MHz(chain0)
5260MHz



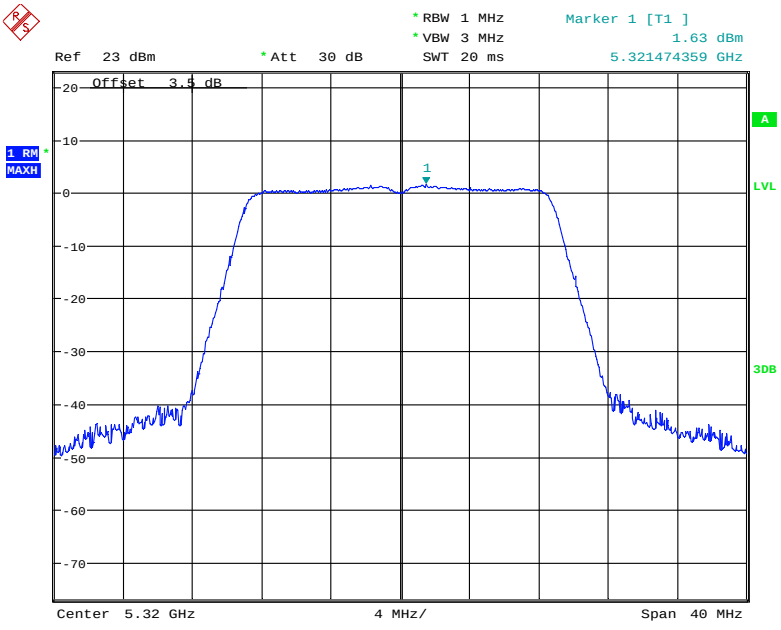
Date: 18.FEB.2017 17:59:43

5300MHz



Date: 18.FEB.2017 18:00:22

5320MHz



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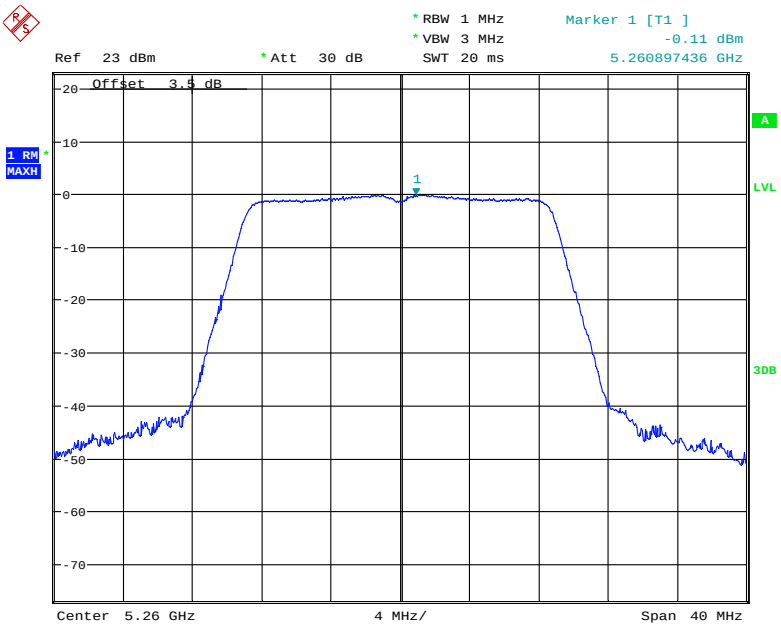
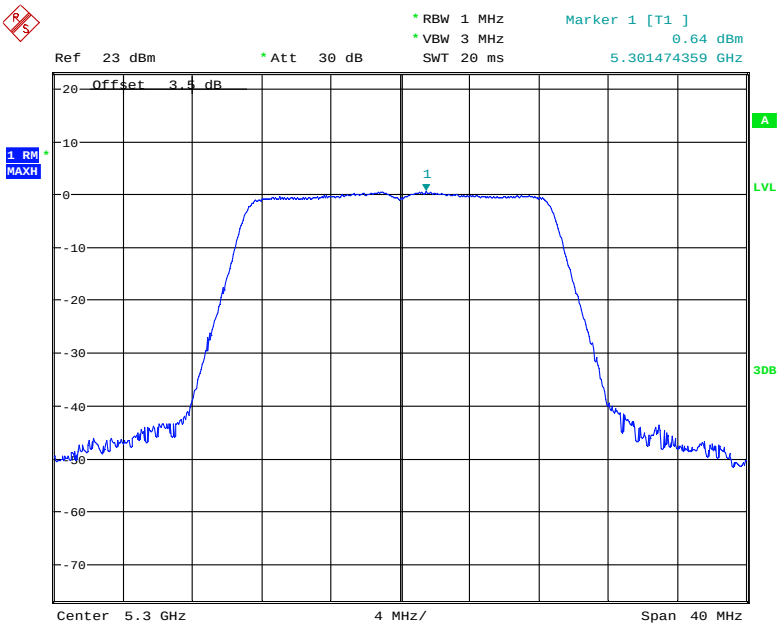
IEEE 802.11n HT20 mode / 5250 ~ 5350MHz(chain1)
5260MHz



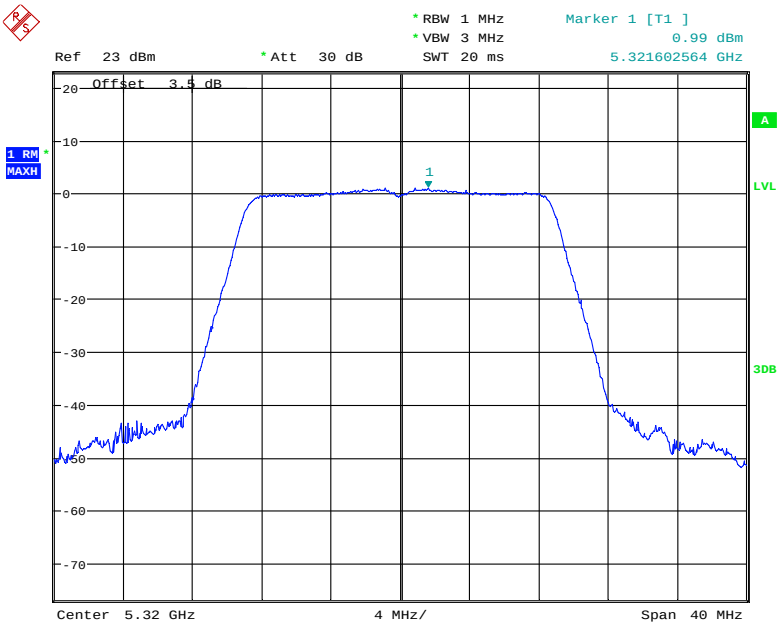
Date: 18.FEB.2017 17:33:55

5300MHz



Date: 18.FEB.2017 17:32:51

5320MHz



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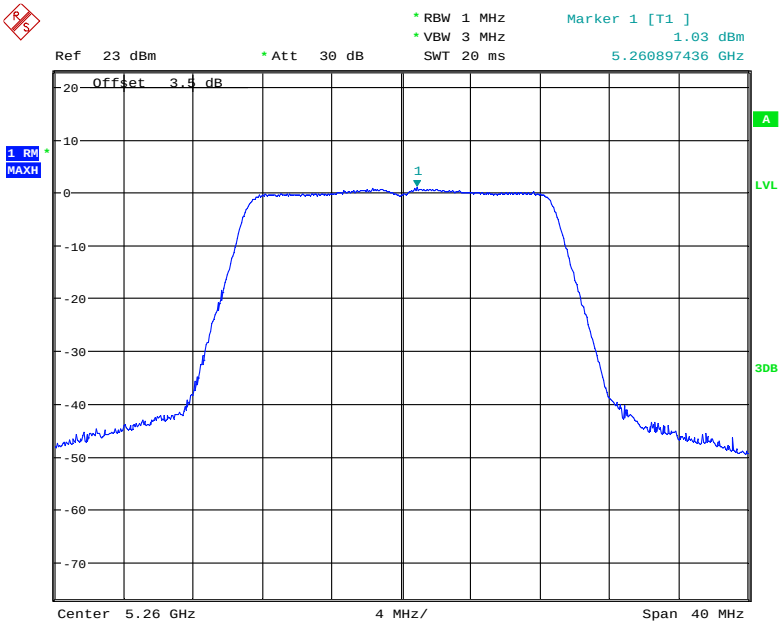
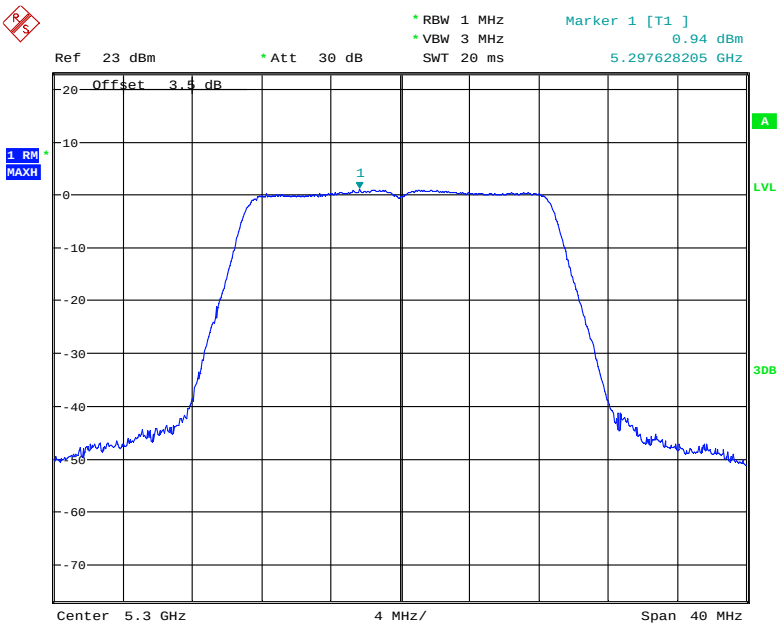
IEEE 802.11n HT20 mode / 5250 ~ 5350MHz(chain2)
5260MHz



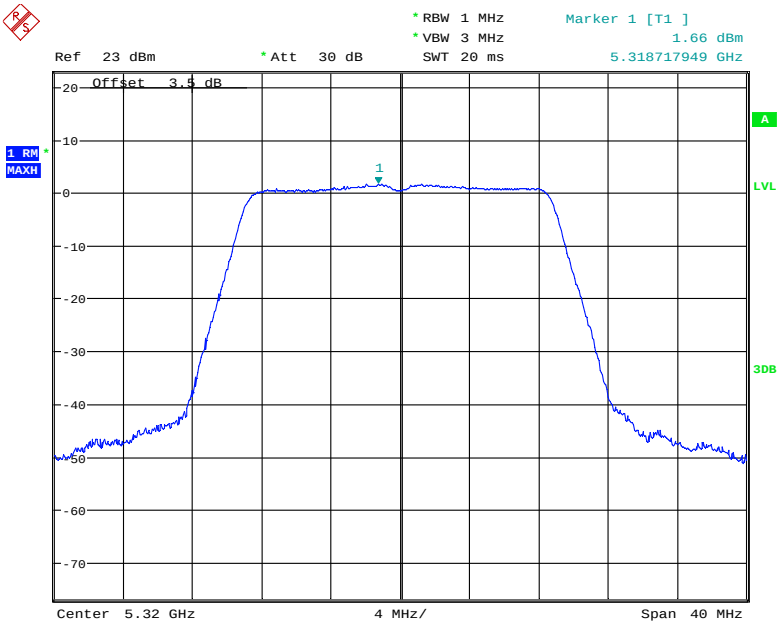
Date: 18.FEB.2017 17:27:44

5300MHz



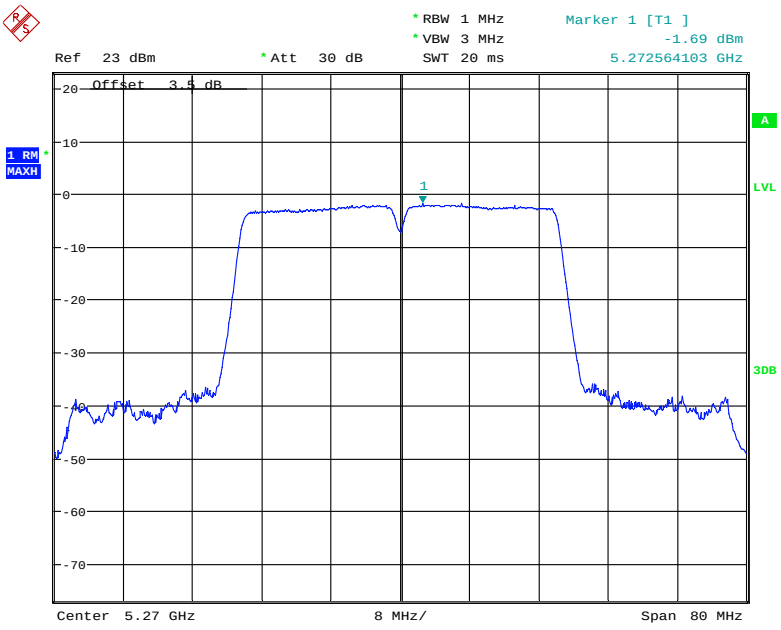
Date: 18.FEB.2017 17:28:18

5320MHz



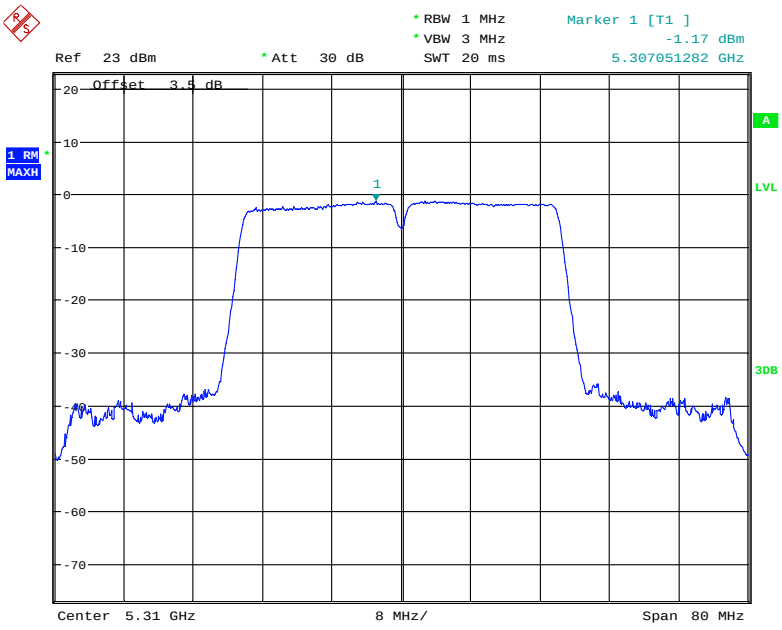
Date: 18.FEB.2017 17:30:45

IEEE 802.11n HT40 mode / 5250 ~ 5350MHz(chain0)
5270MHz



Date: 18.FEB.2017 16:15:06

5310MHz



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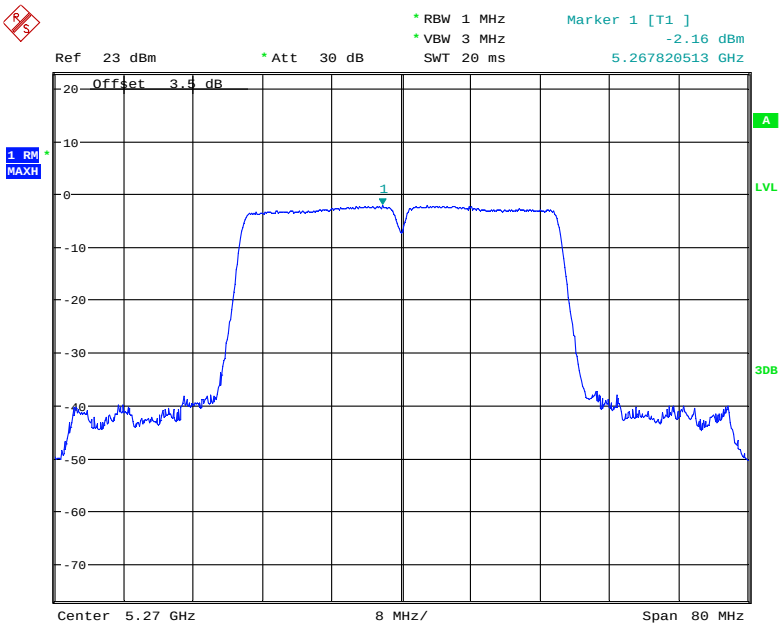
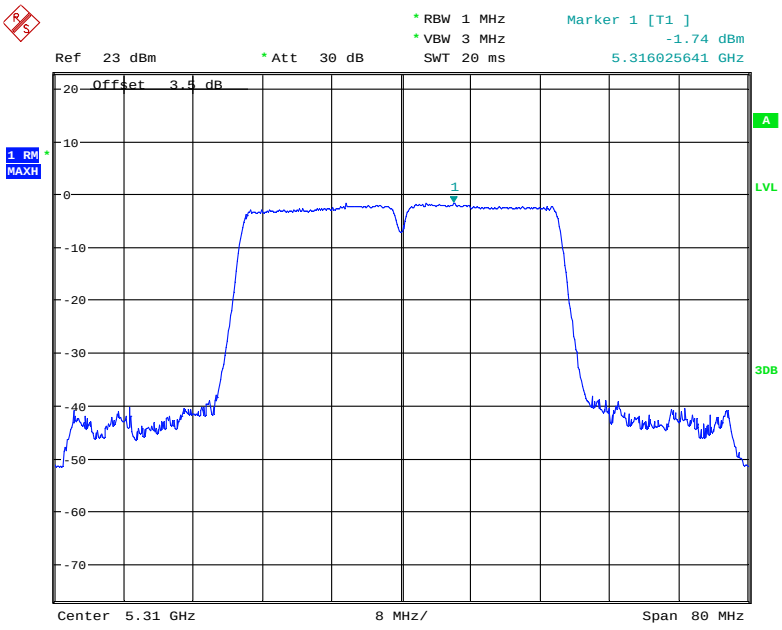
IEEE 802.11n HT40 mode / 5250 ~ 5350MHz(chain1)
5270MHz



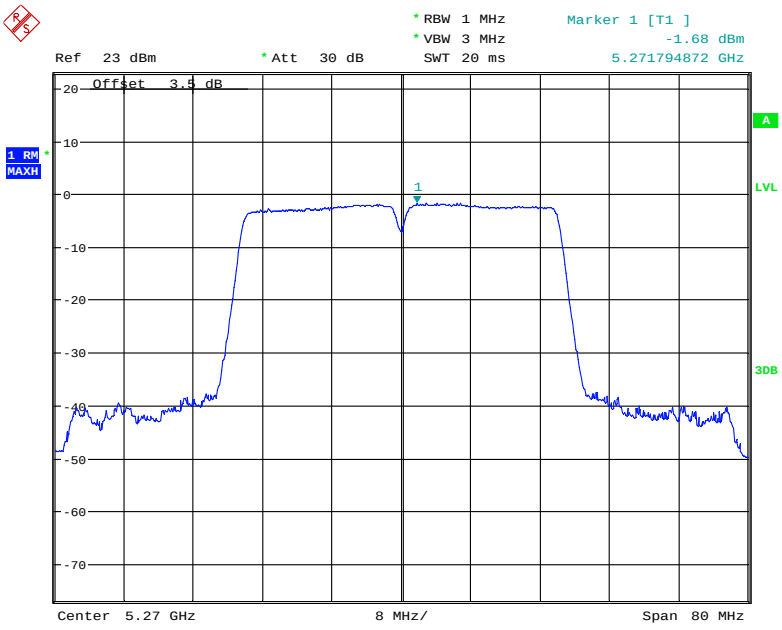
Date: 18.FEB.2017 16:01:19

5310MHz



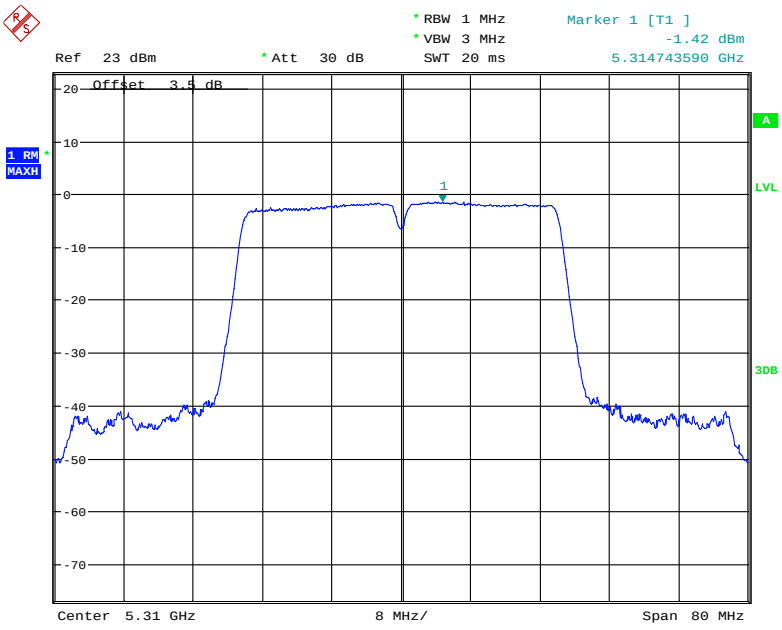
Date: 18.FEB.2017 16:00:37

IEEE 802.11n HT40 mode / 5250 ~ 5350MHz(chain2)
5270MHz



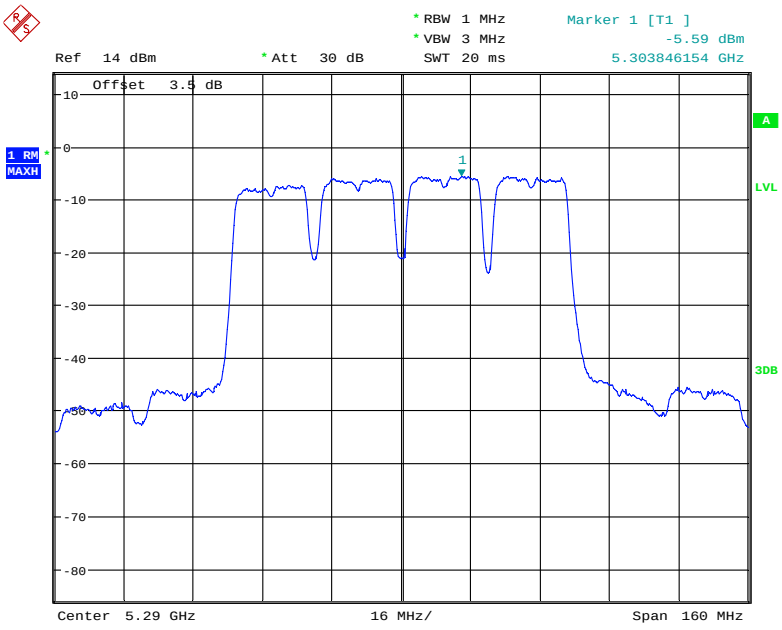
Date: 18.FEB.2017 15:46:16

5310MHz



Date: 18.FEB.2017 15:45:02

IEEE 802.11ac VHT80 mode / 5250 ~ 5350MHz(chain0)
5290MHz



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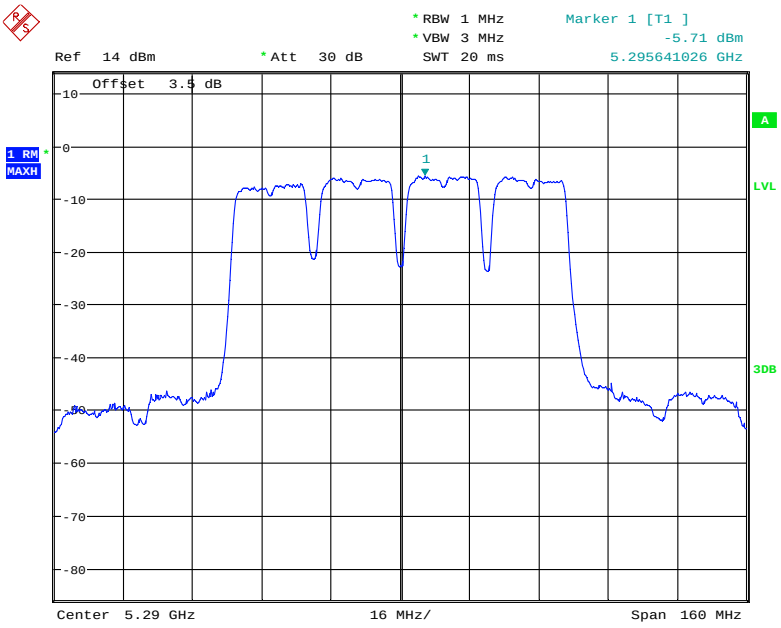
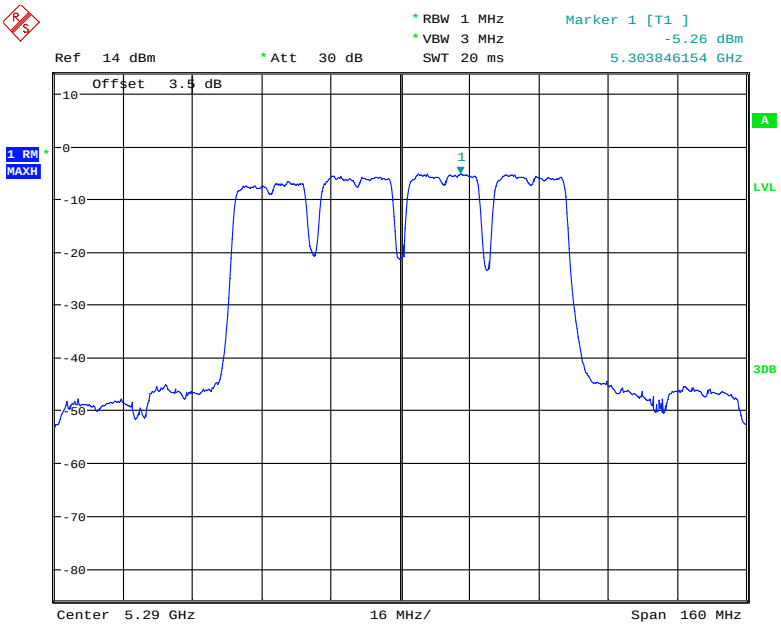
IEEE 802.11ac VHT80 mode / 5250 ~ 5350MHz(chain 1)
5290MHz



Date: 18.FEB.2017 14:14:40

IEEE 802.11ac VHT80 mode / 5250 ~ 5350MHz(chain 2)
5290MHz



Frequency (MHz)	Antenna	Power Spectral Density (dBm/MHz)	Correct Factor (dB)	Total Power spectral Density(dBm/MHz)	Limit (dBm/MHz)
802.11a					
5500	0	1.09	0.18	1.27	11
	1	1.37	0.18	1.55	
	2	1.78	0.18	1.96	
5600	0	0.37	0.18	0.55	
	1	1.45	0.18	1.63	
	2	1.62	0.18	1.80	
5700	0	0.29	0.18	0.47	
	1	1.51	0.18	1.69	
	2	1.61	0.18	1.79	
802.11n20					
5500	0	1.27	0	6.19	9.23
	1	1.23	0		
	2	1.74	0		
5600	0	0.78	0	5.69	
	1	0.80	0		
	2	1.17	0		
5700	0	1.32	0	6.46	
	1	1.82	0		
	2	1.89	0		
802.11n40					
5510	0	-1.61	0	3.11	9.23
	1	-1.97	0		
	2	-1.41	0		
5590	0	-1.52	0	3.41	
	1	-1.58	0		
	2	-1.00	0		
5670	0	-1.89	0	3.11	
	1	-1.74	0		
	2	-1.38	0		
802.11ac80					
5530	0	-4.14	0.22	1.12	9.23
	1	-4.21	0.22		
	2	-3.33	0.22		
5610	0	-4.77	0.22	0.48	
	1	-4.62	0.22		
	2	-4.18	0.22		

Frequency (MHz)	Antenna	Power Spectral Density (dBm/MHz)	Correct Factor (dB)	Total Power spectral Density(dBm/MHz)	Limit (dBm/MHz)
Cross Band					
802.11n20 5720	0	1.61	0	6.48	9.23
	1	1.56	0		
	2	1.95	0		
802.11n40 5710	0	-1.94	0	3.13	
	1	-1.70	0		
	2	-1.31	0		
802.11ac80 5690	0	-4.15	0.22	1.11	
	1	-4.06	0.22		
	2	-3.47	0.22		

Note:
the 3 antenna maximum atenna gain are 3dBi

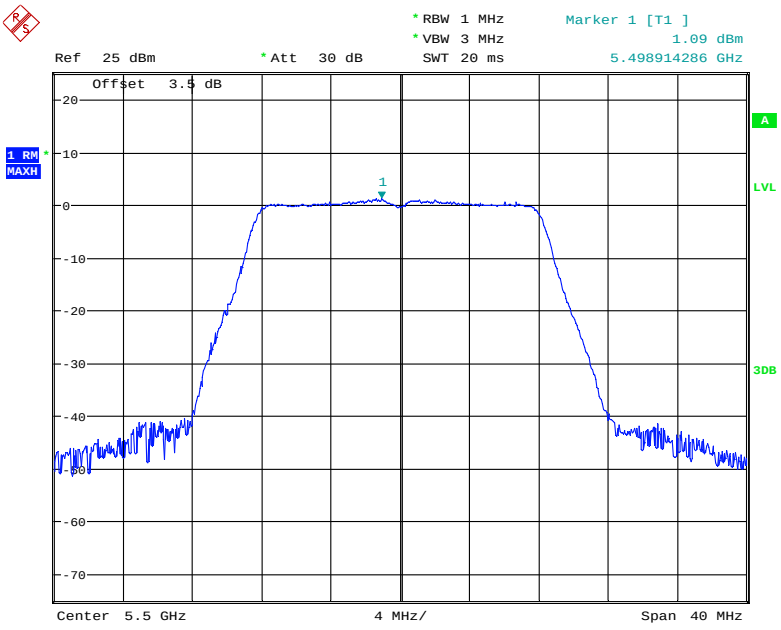
Directional gain = GANT + Array Gain = 3+10*log(3) =7.77 dBi

The Power density Limits was reduce 1.77dB

Correct Factor=10 * log(1/X)

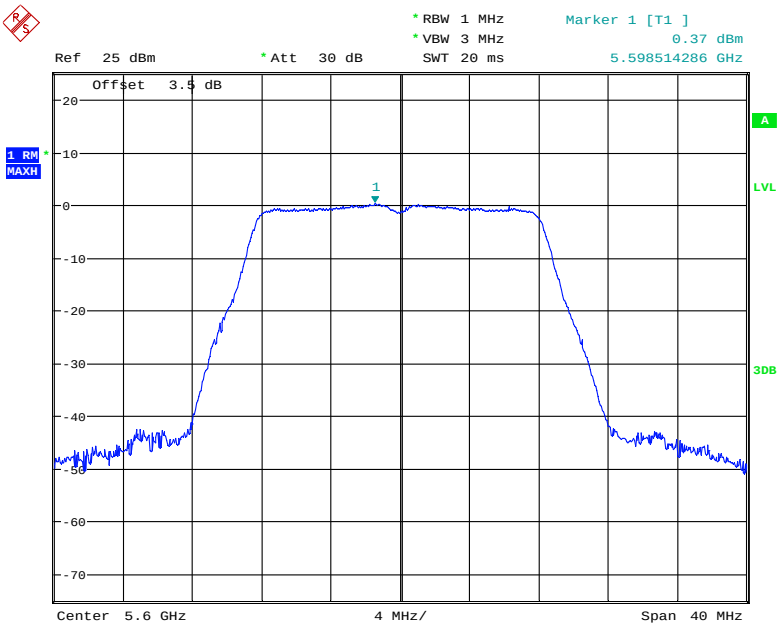
Please refer to the following plots

IEEE 802.11a mode / 5470 ~ 5725MHz(chain0)
5500MHz



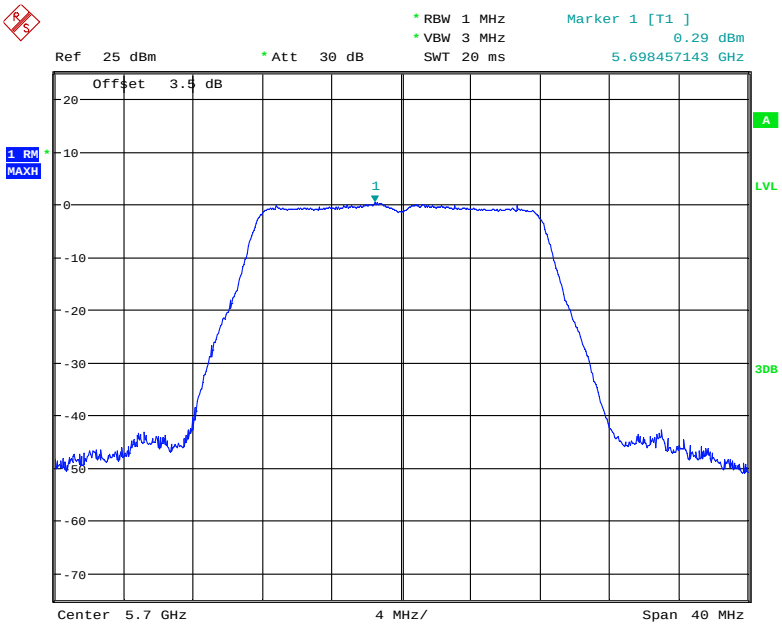
Date: 22.FEB.2017 13:34:51

5600MHz



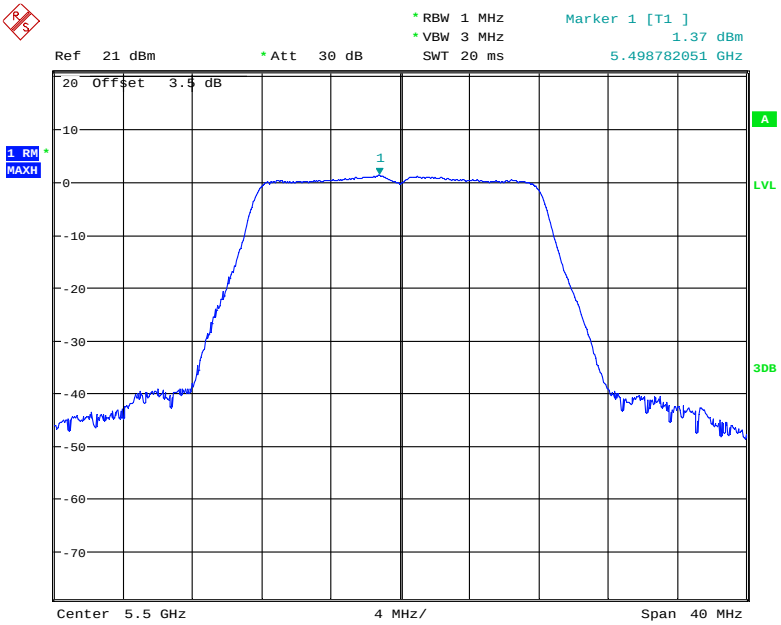
Date: 22.FEB.2017 13:33:50

5700MHz



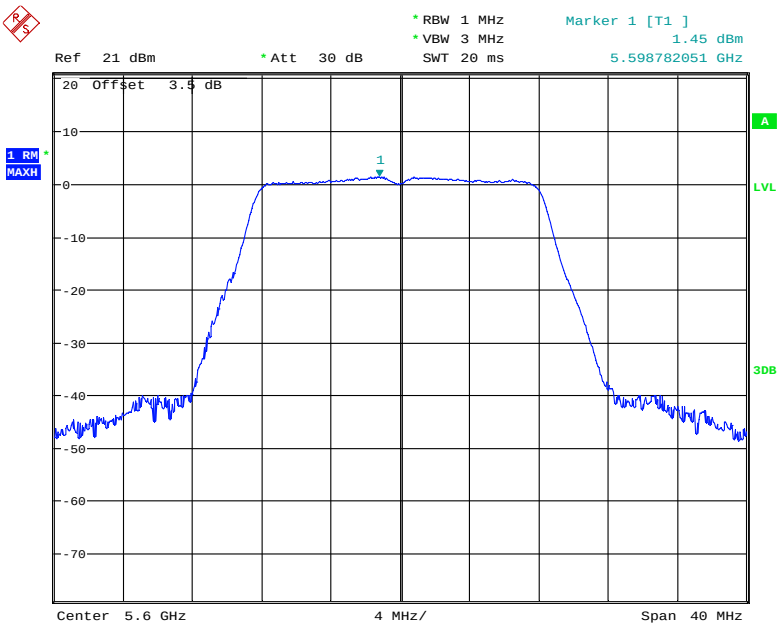
Date: 22.FEB.2017 13:32:45

IEEE 802.11a mode / 5470 ~ 5725MHz(chain1)
5500MHz



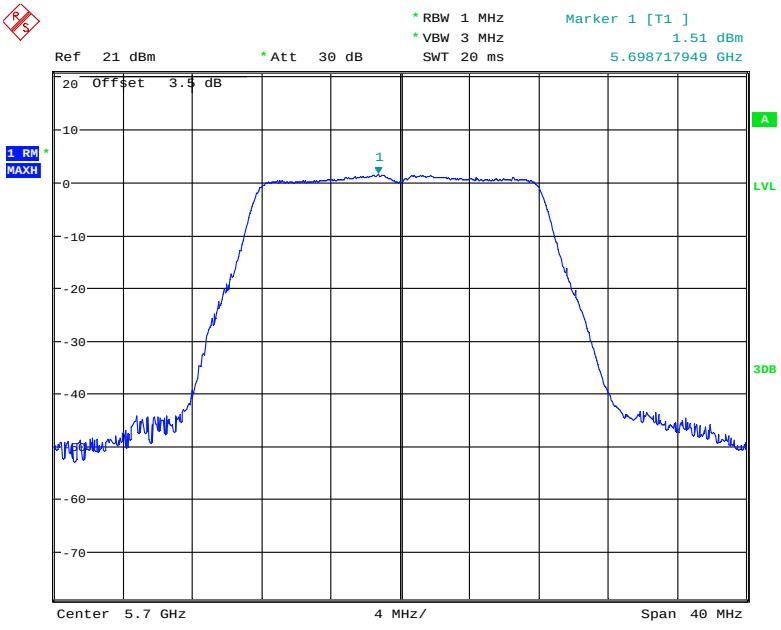
Date: 23.FEB.2017 10:50:57

5600MHz



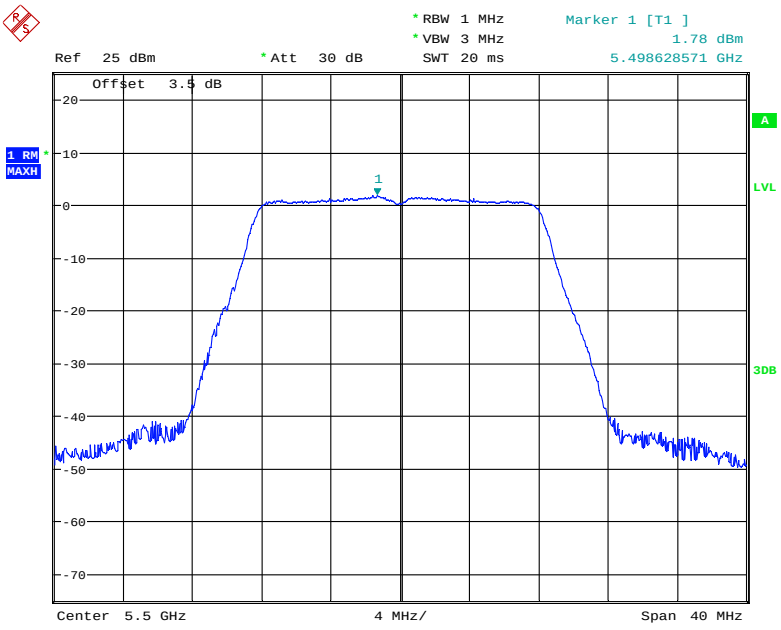
Date: 23.FEB.2017 10:49:10

5700MHz



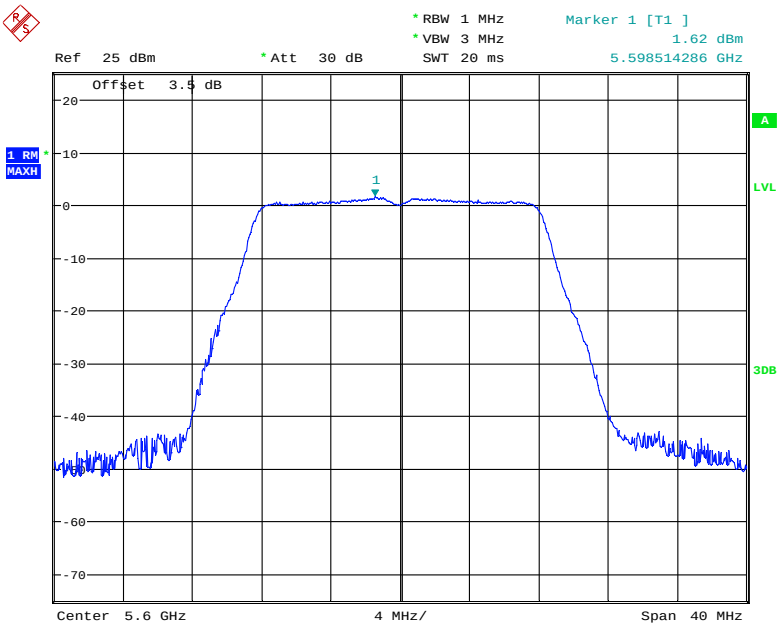
Date: 23.FEB.2017 10:47:20

IEEE 802.11a mode / 5470 ~ 5725MHz(chain2)
5500MHz



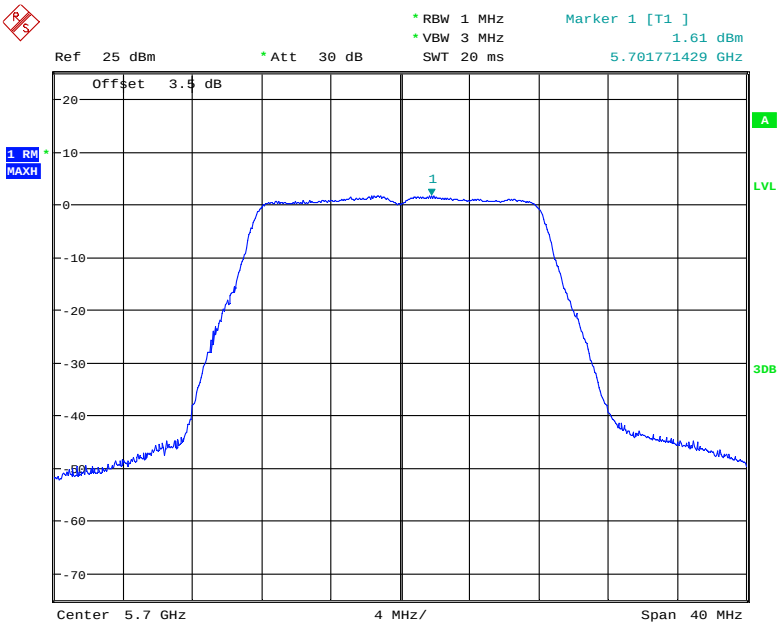
Date: 22.FEB.2017 13:57:51

5600MHz



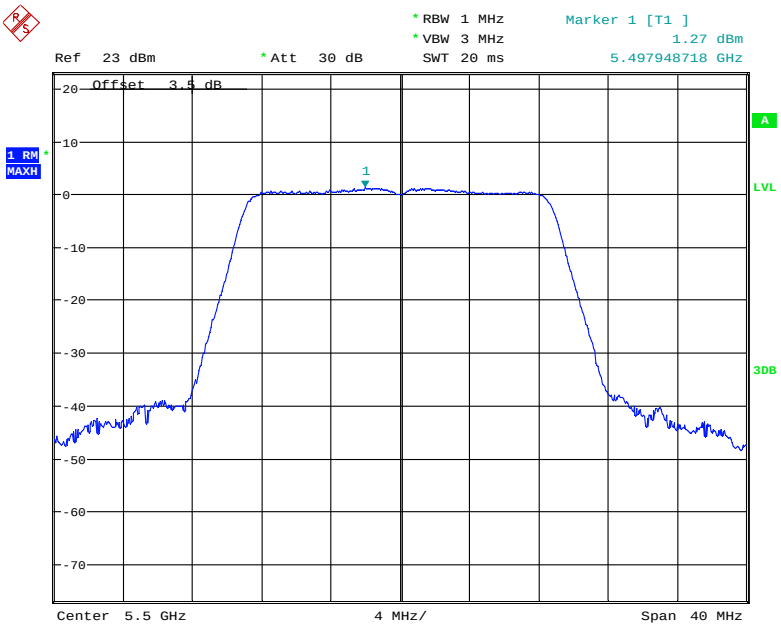
Date: 22.FEB.2017 13:58:32

5700MHz



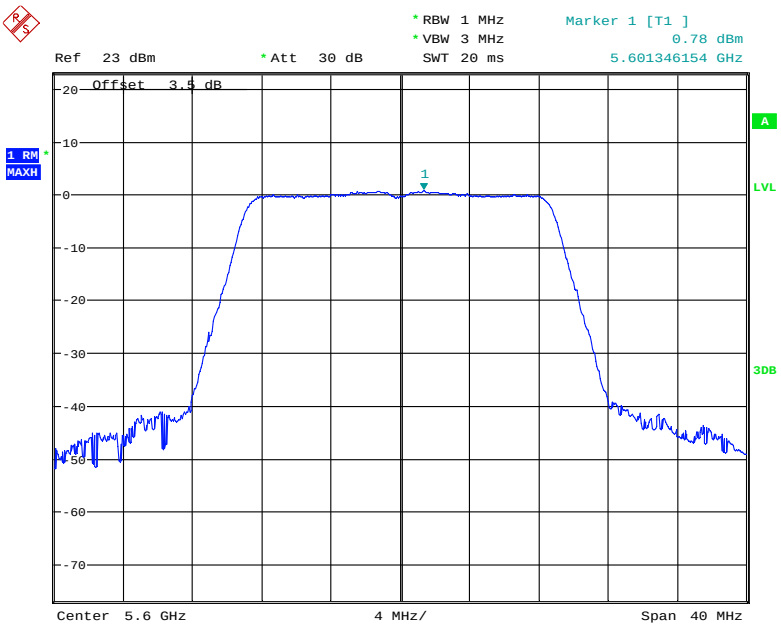
Date: 22.FEB.2017 14:00:38

IEEE 802.11n HT20 mode / 5470 ~ 5725MHz(chain0)
5500MHz



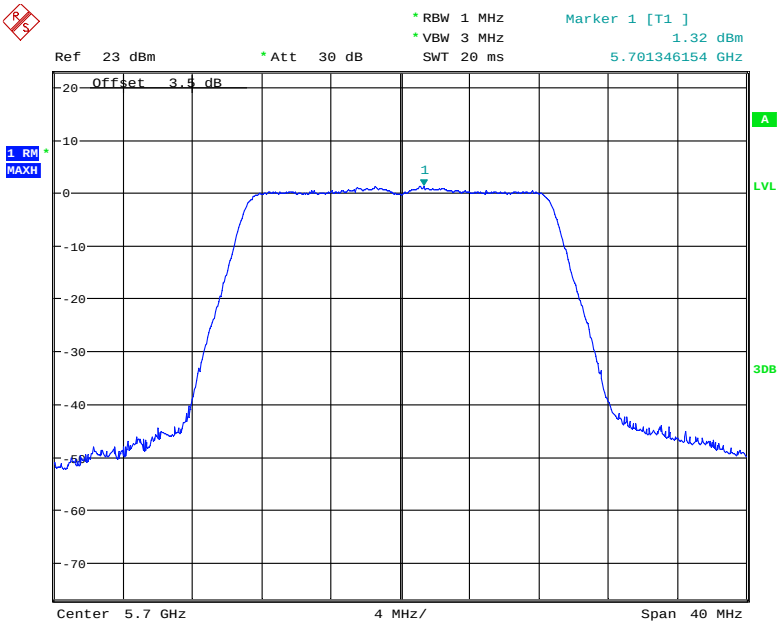
Date: 21.FEB.2017 17:29:27

5600MHz



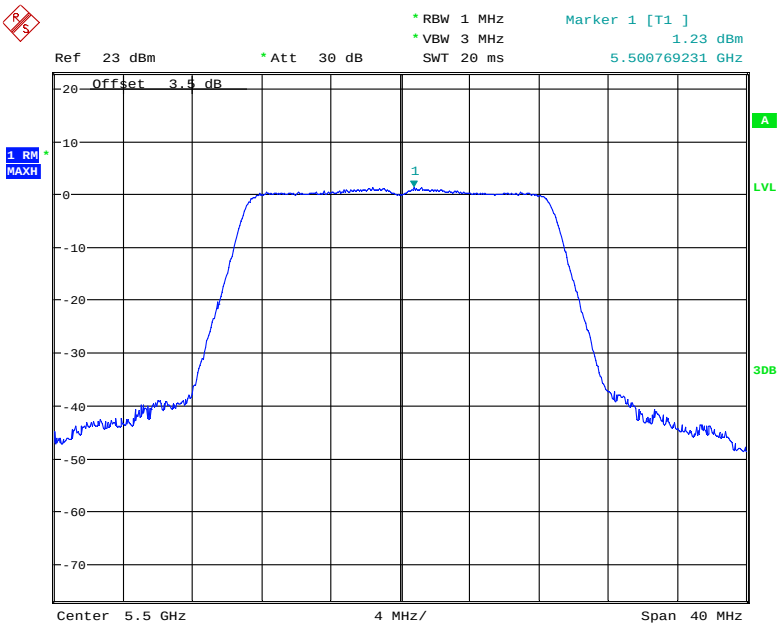
Date: 21.FEB.2017 17:23:33

5700MHz



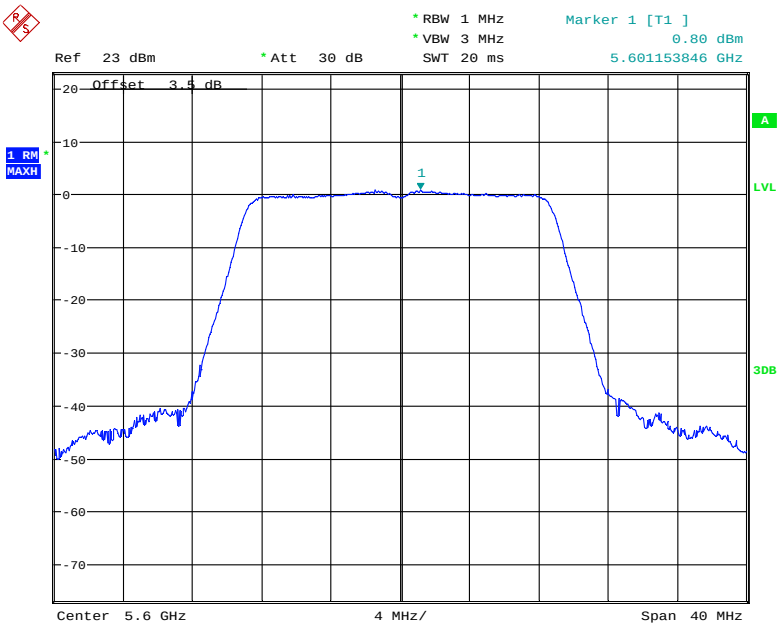
Date: 21.FEB.2017 17:21:37

IEEE 802.11n HT20 mode / 5470 ~ 5725MHz(chain1)
5500MHz



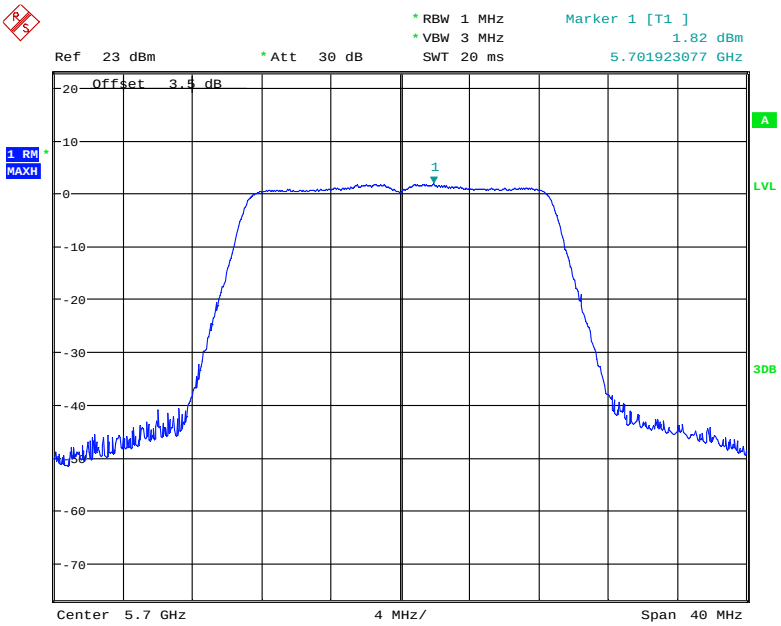
Date: 21.FEB.2017 17:52:30

5600MHz



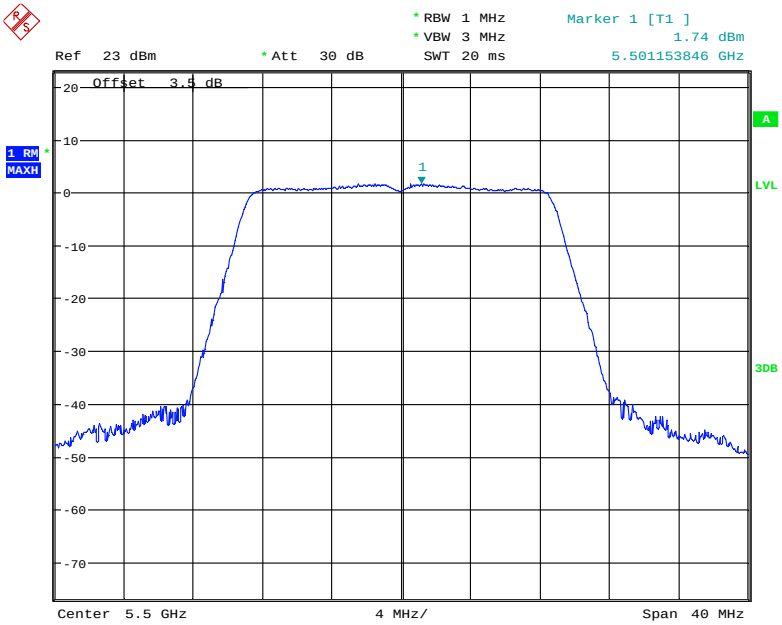
Date: 21.FEB.2017 17:55:13

5700MHz



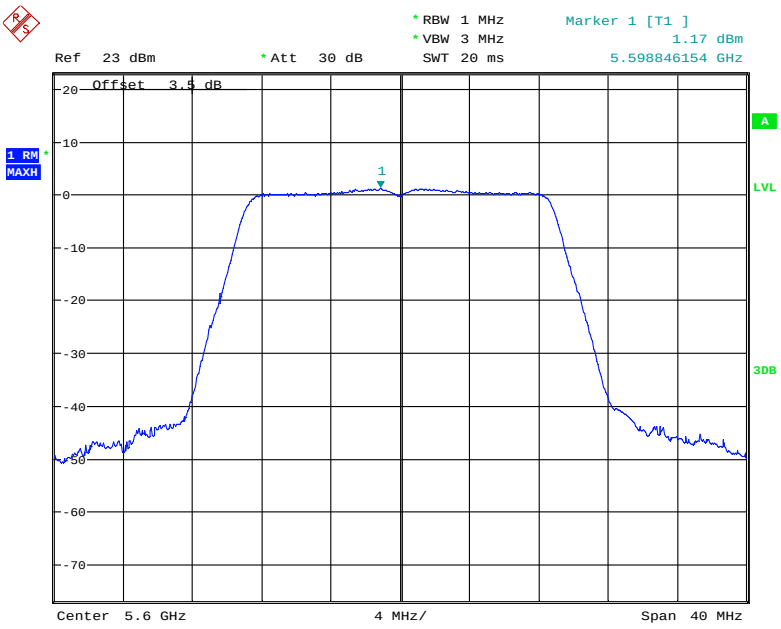
Date: 21.FEB.2017 17:57:22

IEEE 802.11n HT20 mode / 5470 ~ 5725MHz(chain2)
5500MHz



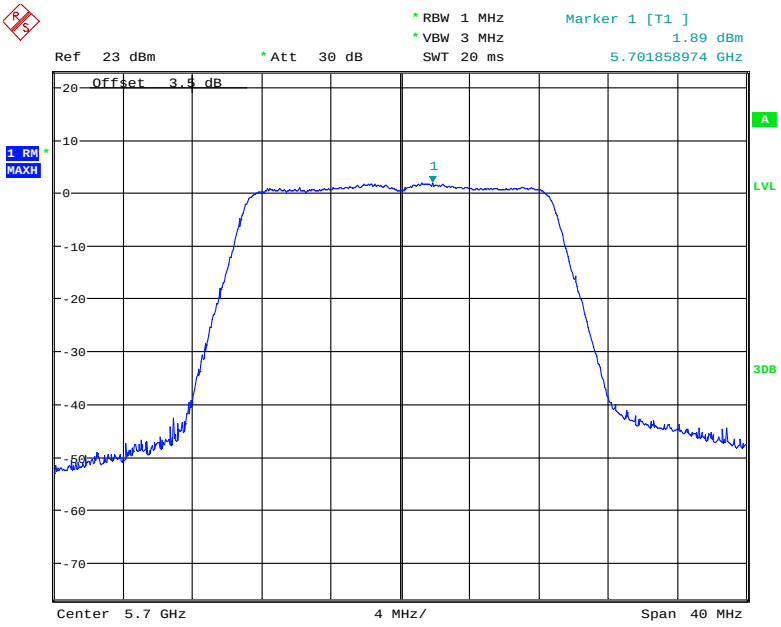
Date: 21.FEB.2017 18:06:20

5600MHz



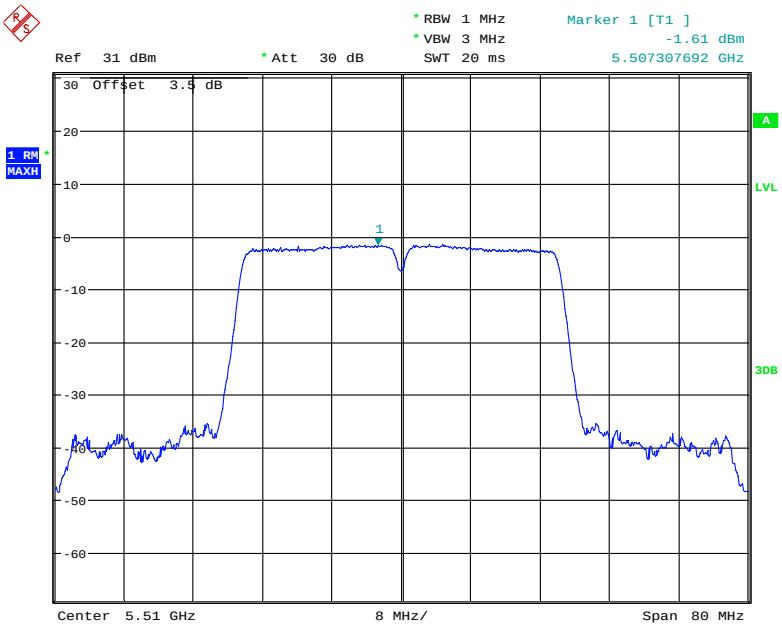
Date: 21.FEB.2017 18:05:11

5700MHz



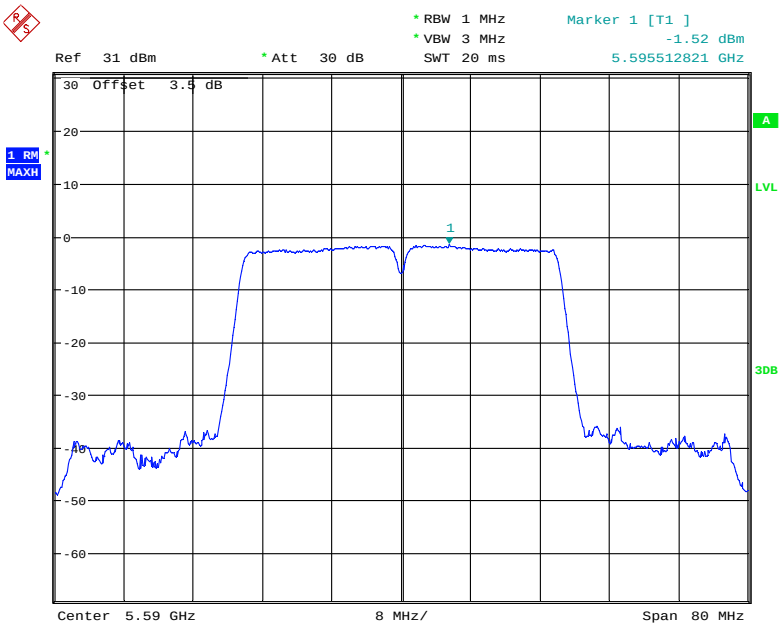
Date: 21.FEB.2017 18:03:37

IEEE 802.11n HT40 mode / 5470 ~ 5725MHz(chain0)
5510MHz



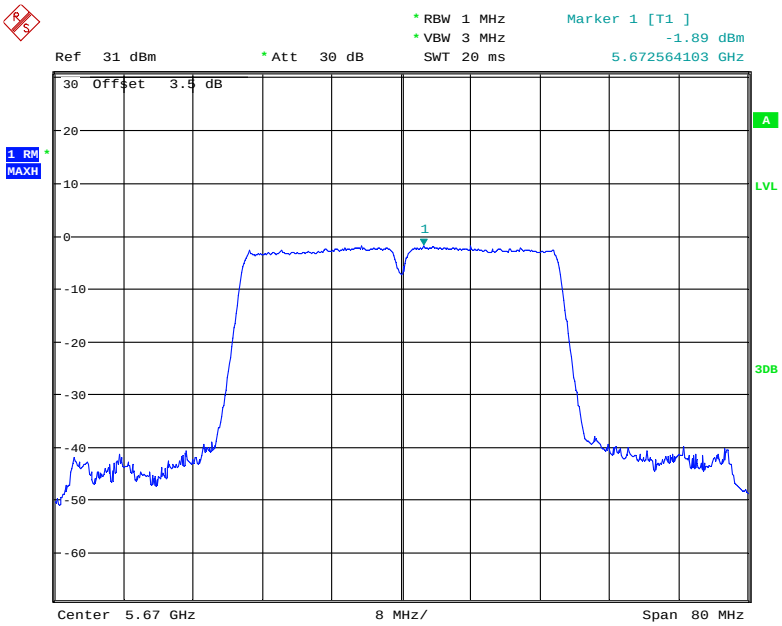
Date: 23.FEB.2017 11:32:36

5590MHz



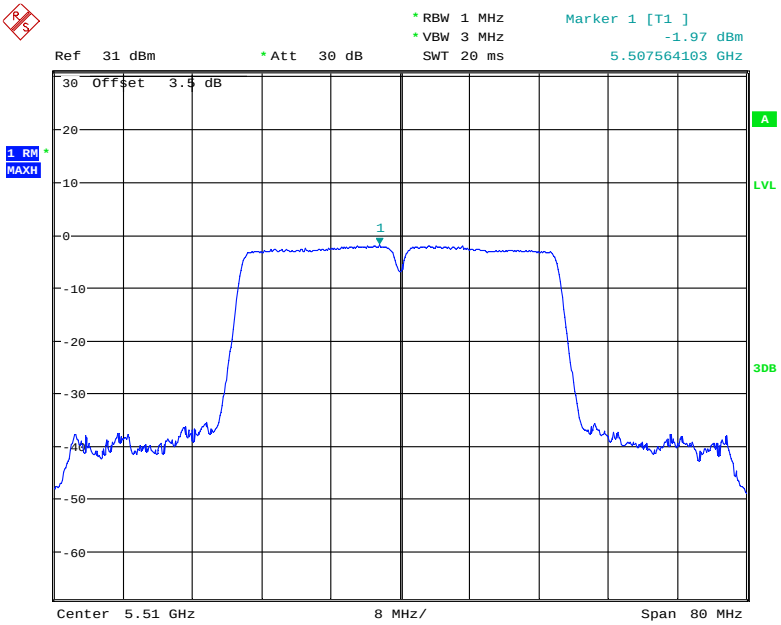
Date: 23.FEB.2017 11:30:20

5670MHz



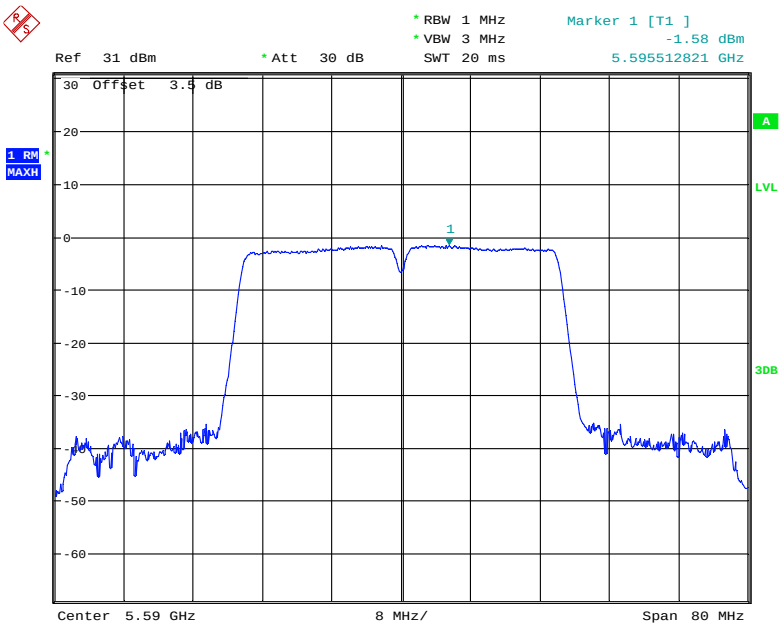
Date: 23.FEB.2017 11:29:35

IEEE 802.11n HT40 mode / 5470 ~ 5725MHz(chain1)
5510MHz



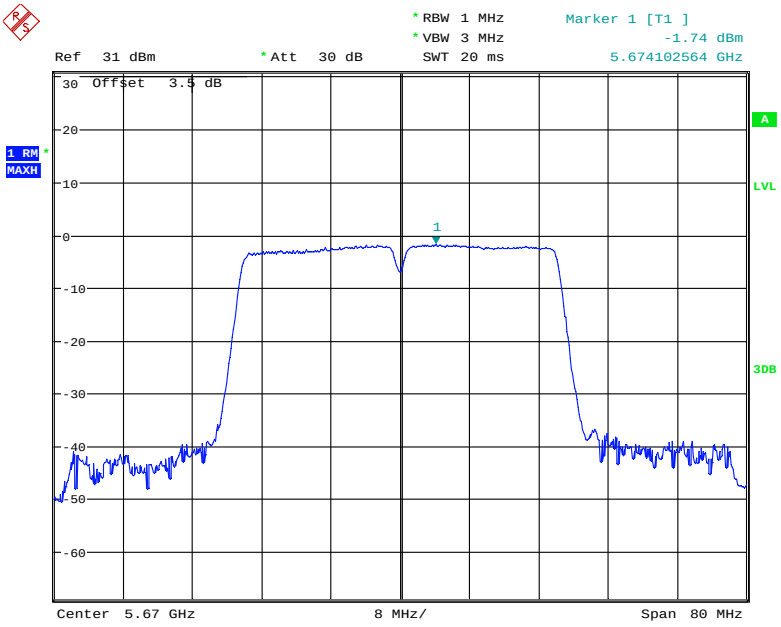
Date: 23.FEB.2017 11:14:59

5590MHz



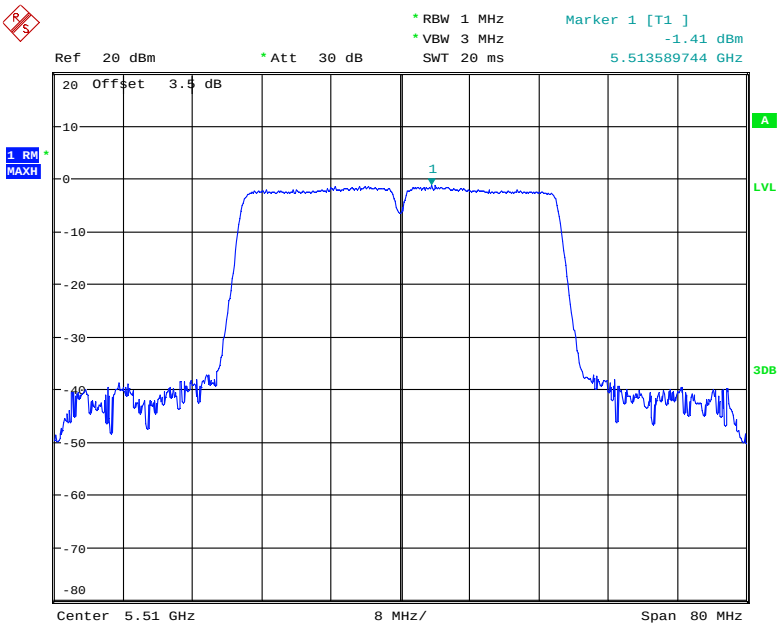
Date: 23.FEB.2017 11:15:44

5670MHz



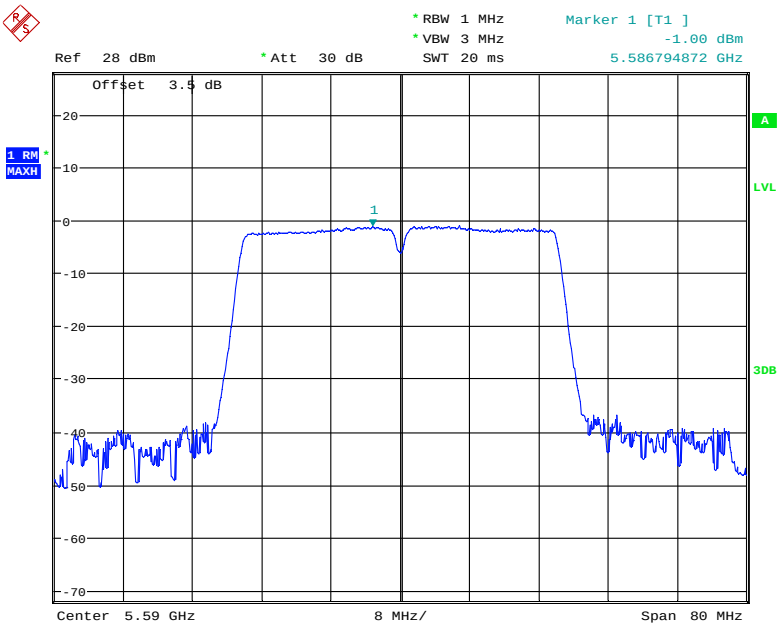
Date: 23.FEB.2017 11:17:47

IEEE 802.11n HT40 mode / 5470 ~ 5725MHz(chain2)
5510MHz



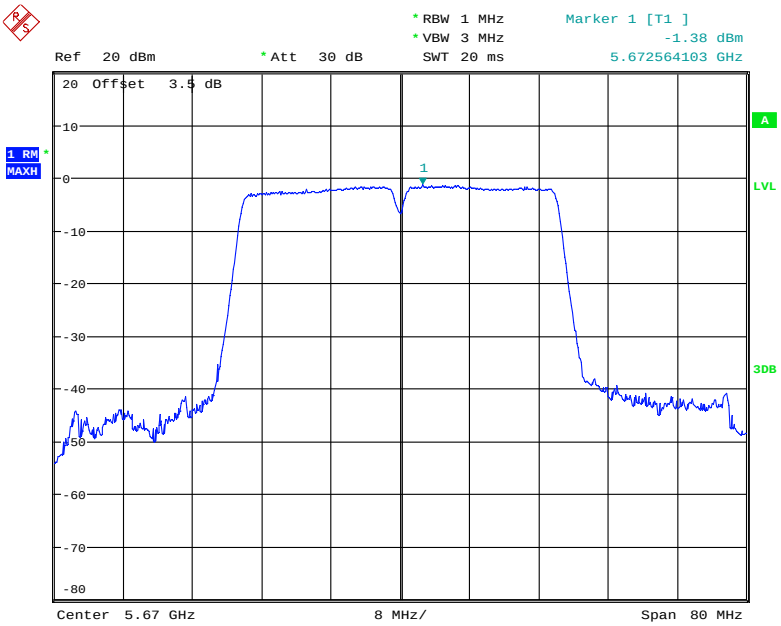
Date: 23.FEB.2017 11:45:59

5590MHz



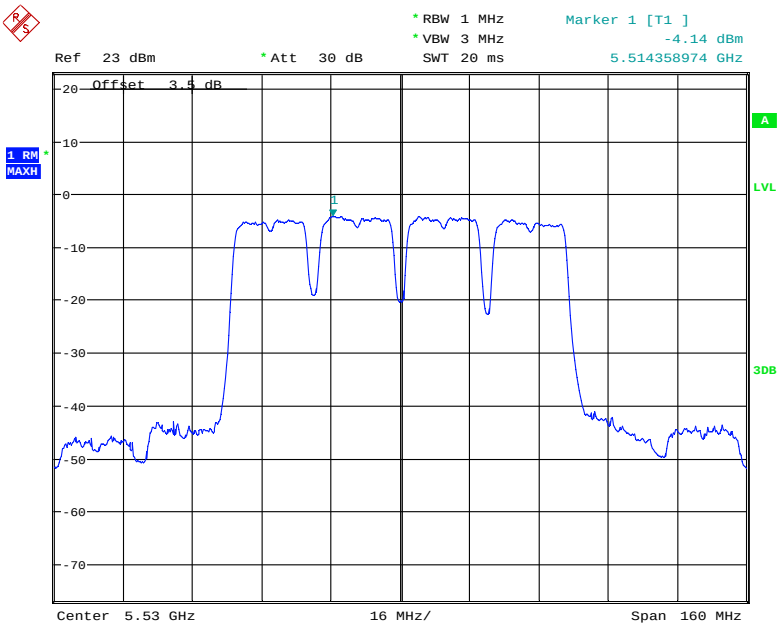
Date: 23.FEB.2017 11:44:33

5670MHz



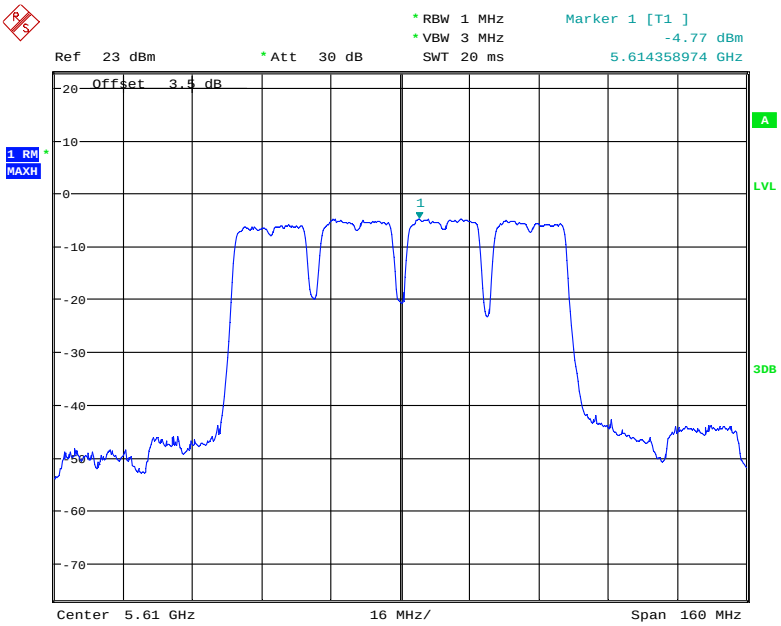
Date: 23.FEB.2017 11:46:44

IEEE 802.11ac VHT80 mode / 5470 ~ 5725MHz(chain0)
5530MHz



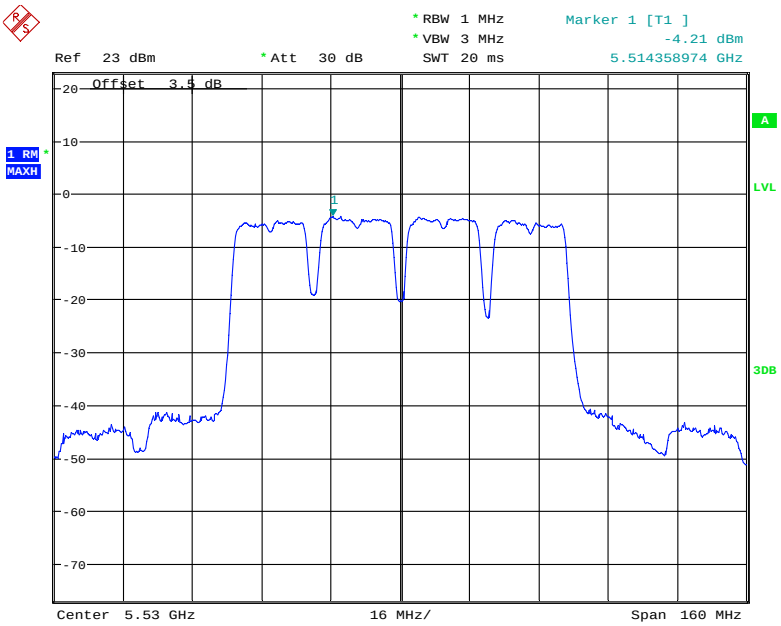
Date: 23.FEB.2017 13:54:27

5610MHz



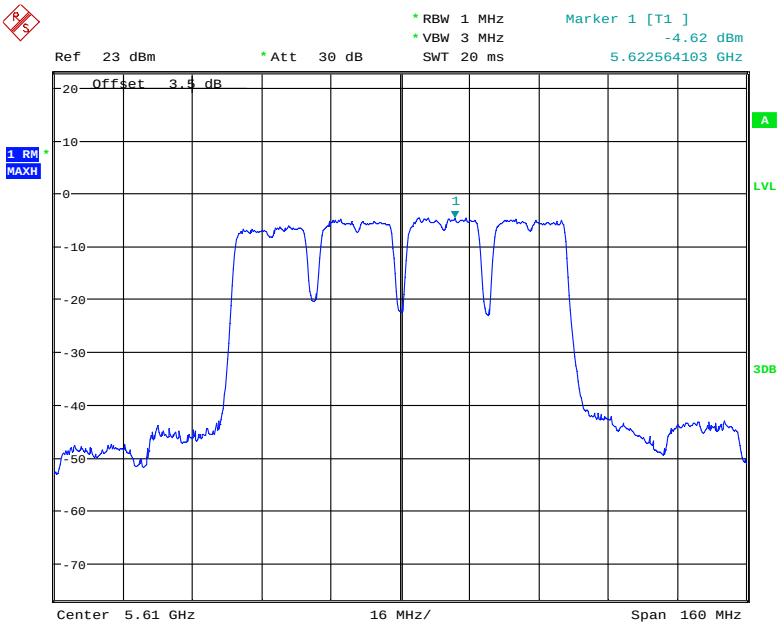
Date: 23.FEB.2017 13:53:27

IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz(chain 1)
5530MHz



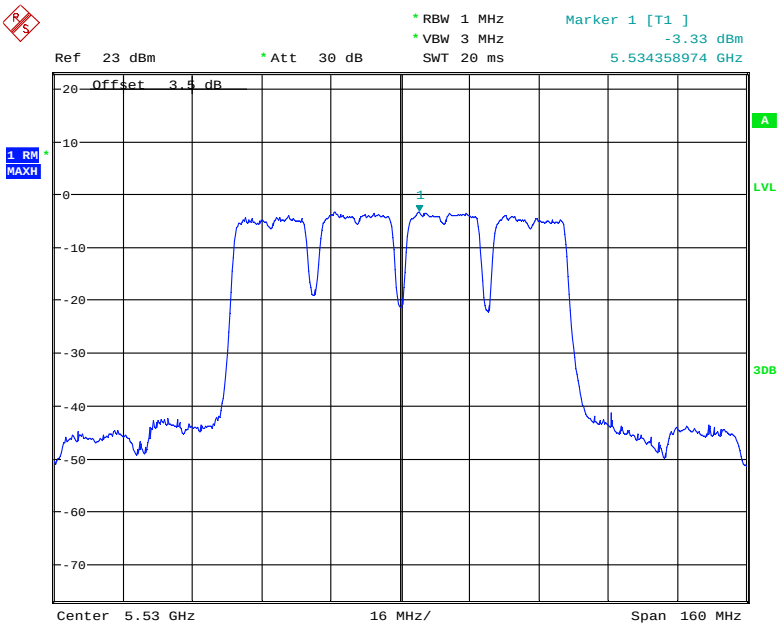
Date: 23.FEB.2017 14:21:28

5610MHz



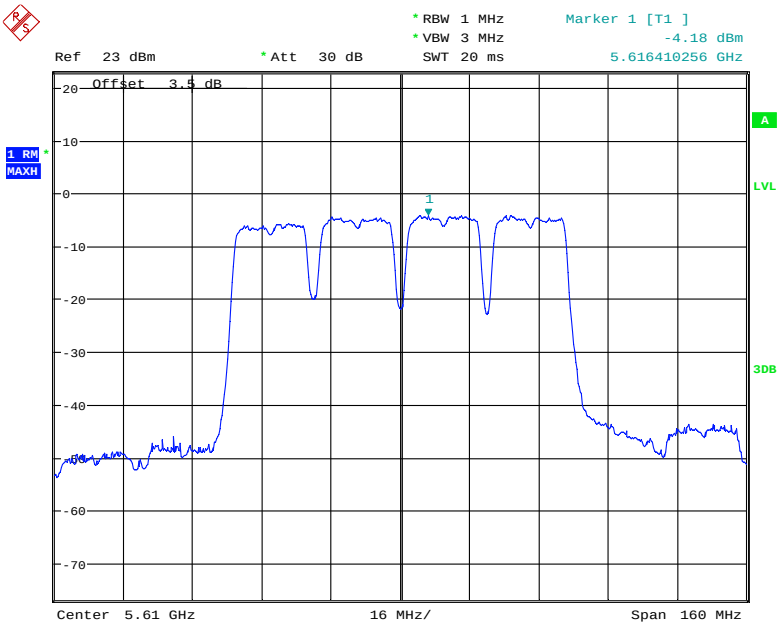
Date: 23.FEB.2017 14:20:17

IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz(chain 2)
5530MHz



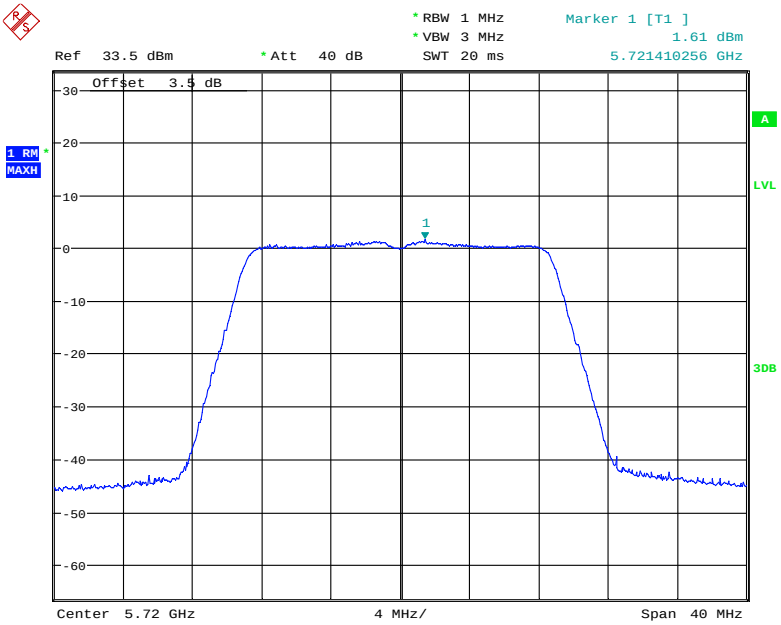
Date: 23.FEB.2017 14:30:00

5610MHz



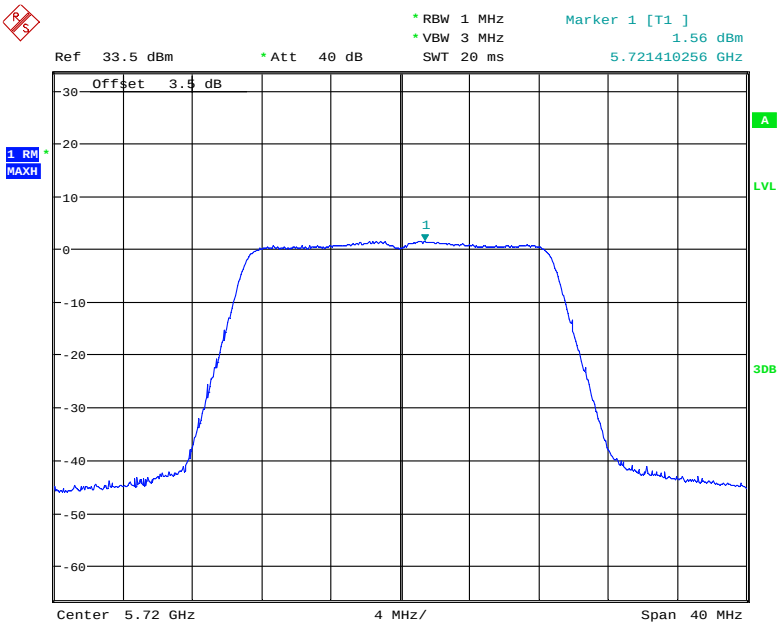
Date: 23.FEB.2017 14:29:03

Cross Band :
IEEE 802.11n HT20 mode 5720MHz(chain 0)



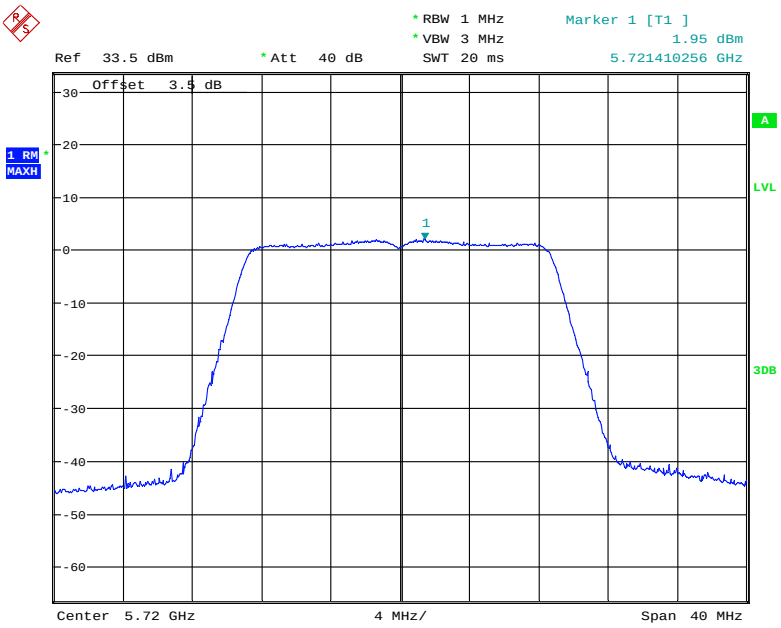
Date: 25.FEB.2017 18:11:32

IEEE 802.11n HT20 mode 5720MHz(chain 1)



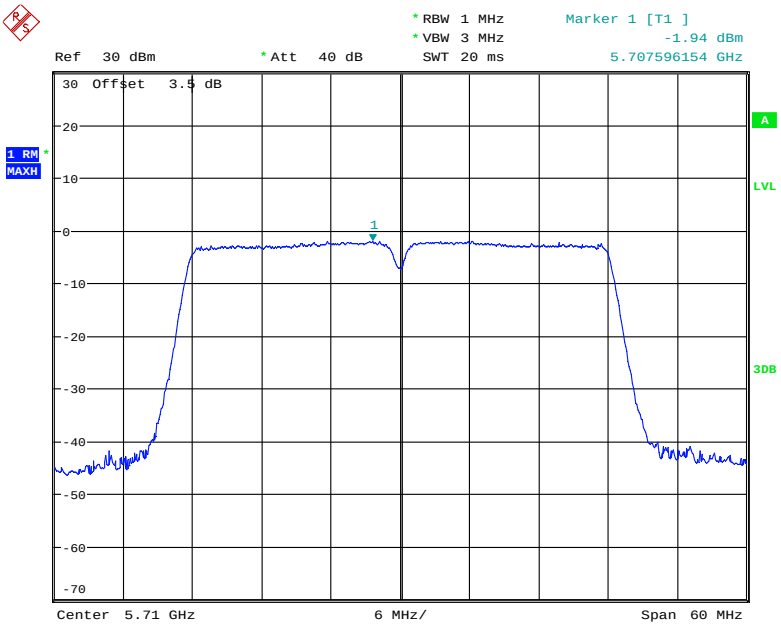
Date: 25.FEB.2017 18:12:21

IEEE 802.11n HT20 mode 5720MHz(chain 2)



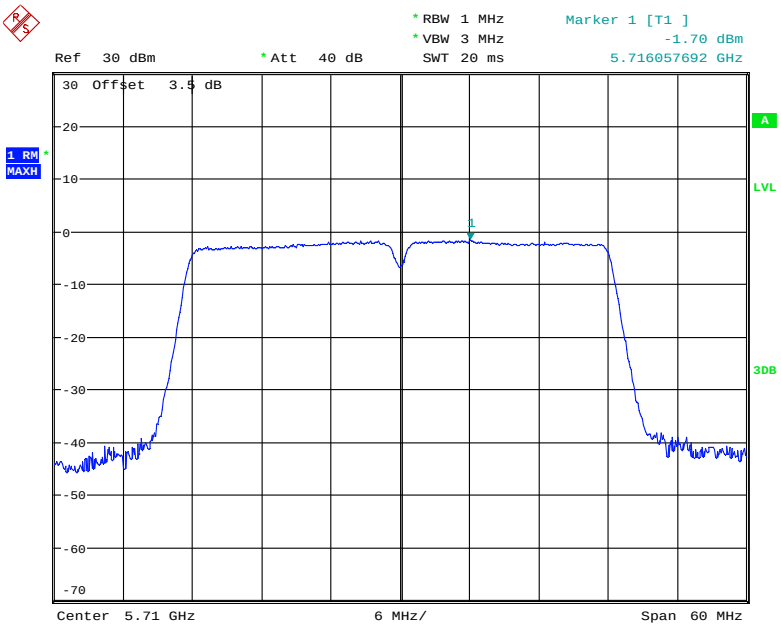
Date: 25.FEB.2017 18:20:29

IEEE 802.11n HT40 mode 5710MHz(chain 0)



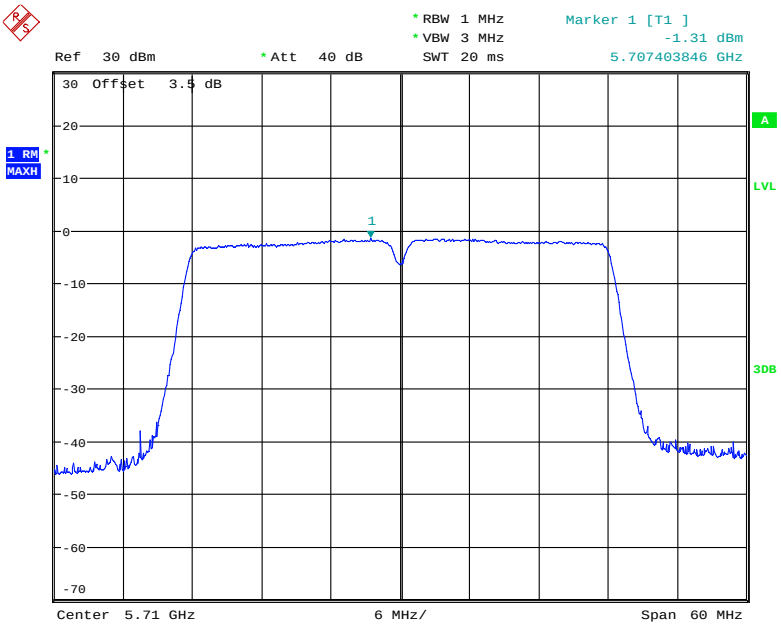
Date: 25.FEB.2017 19:08:34

IEEE 802.11n HT40 mode 5710MHz(chain 1)



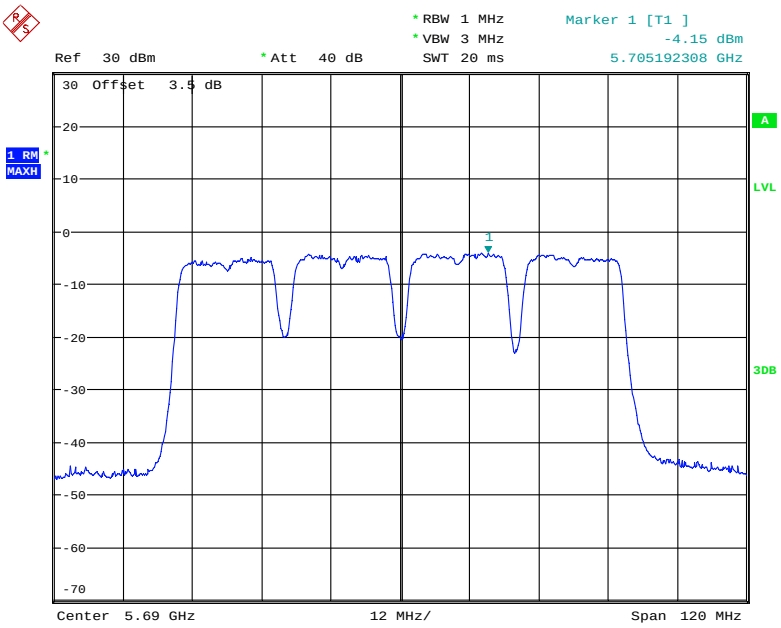
Date: 25.FEB.2017 19:09:07

IEEE 802.11n HT40 mode 5710MHz(chain 2)



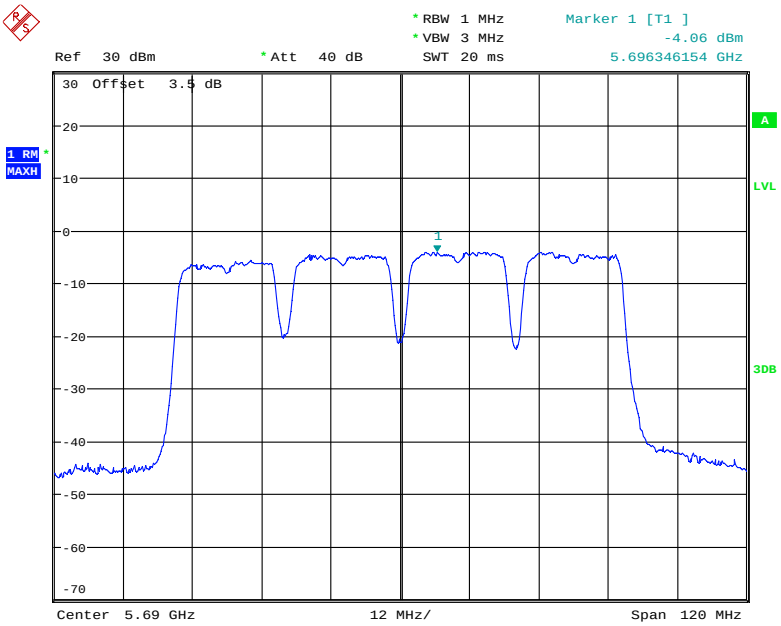
Date: 25.FEB.2017 19:13:24

IEEE 802.11ac VHT80 mode 5690MHz(chain 0)



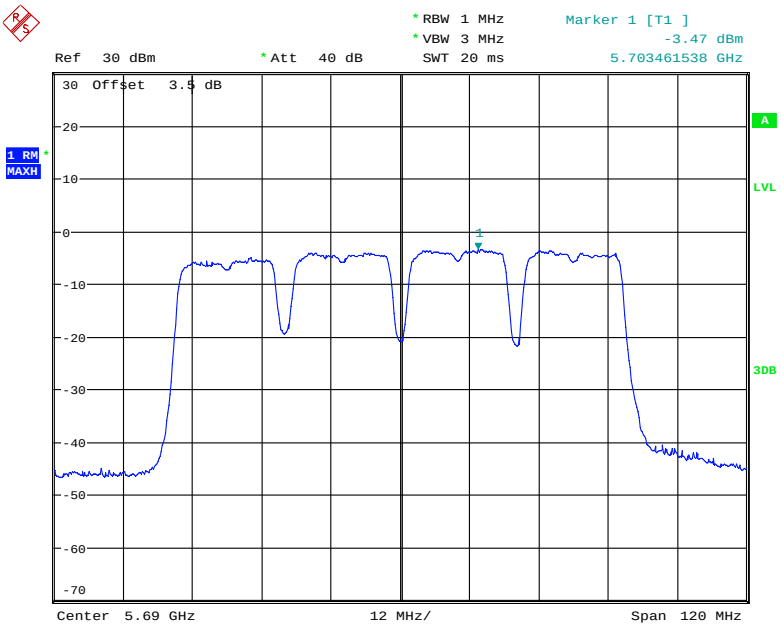
Date: 25.FEB.2017 19:04:44

IEEE 802.11ac VHT80 mode 5690MHz(chain 1)



Date: 25.FEB.2017 19:00:36

IEEE 802.11ac VHT80 mode 5690MHz(chain 2)



Date: 25.FEB.2017 18:59:57

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