


TEST REPORT

Reference No. : WTS18S07117020-4W V1
FCC ID..... : XUJMAX3
Applicant..... : Launch Tech Co., Ltd.
Address : Launch Industrial Park, North of Wuhe Rd. Banxuegang, Longgang,
Shenzhen, China
Manufacturer : The same as above
Address : The same as above
Product..... : Automotive intelligent diagnostic tools
Model(s)..... : MAXIMUS 3.0
Brand Name : 
Standards..... : FCC CFR47 Part 15 C Section 15.407: 2017
Date of Receipt sample..... : 2018-07-03
Date of Test..... : 2018-07-04 to 2018-08-02
Date of Issue : 2018-08-14
Test Result : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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2 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation) of USA, Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CEC(California energy efficiency), IC(Industry Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek(ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.



Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. Electro Magnetic Compatibility (EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

Test Facility:**A. Accreditations for Conformity Assessment (International)**

Country/Region	Accreditation Body	Scope	Note
USA	A2LA (Certificate No.: 4243.01)	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India	International Services	WPC	-
Thailand		NTC	-
Singapore		IDA	-
Note:			
1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.			
2. IC Canada Registration No.: 7760A			

B. TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of ...	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

3 Contents

	Page
1 COVER PAGE	1
2 LABORATORIES INTRODUCTION	2
3 CONTENTS	4
4 REVISION HISTORY	5
5 GENERAL INFORMATION	6
5.1 GENERAL DESCRIPTION OF E.U.T.	6
5.2 DETAILS OF E.U.T.	6
5.3 CHANNEL LIST	8
6 TEST SUMMARY	11
7 EQUIPMENT USED DURING TEST	12
7.1 EQUIPMENTS LIST	12
7.2 DESCRIPTION OF SUPPORT UNITS	13
7.3 MEASUREMENT UNCERTAINTY	13
7.4 TEST EQUIPMENT CALIBRATION	13
8 CONDUCTED EMISSION	14
8.1 E.U.T. OPERATION	14
8.2 EUT SETUP.....	14
8.3 MEASUREMENT DESCRIPTION	14
8.4 CONDUCTED EMISSION TEST RESULT	15
9 RADIATED EMISSIONS	17
9.1 EUT OPERATION.....	17
9.2 TEST SETUP	18
9.3 SPECTRUM ANALYZER SETUP	19
9.4 TEST PROCEDURE	20
9.5 SUMMARY OF TEST RESULTS	21
10 DUTY CYCLE	29
10.1 SUMMARY OF TEST RESULTS	29
11 BAND EDGE	43
11.1 TEST PRODUCE	43
11.2 TEST RESULT	44
12 26 DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH	68
12.1 TEST PROCEDURE:.....	68
12.2 TEST RESULT:	68
13 CONDUCTED OUTPUT POWER	98
13.1 TEST PROCEDURE:.....	98
13.2 TEST RESULT:	98
14 POWER SPECTRAL DENSITY	127
14.1 TEST PROCEDURE:.....	127
14.2 TEST RESULT:	127
15 ANTENNA REQUIREMENT	157
16 RF EXPOSURE	158
17 PHOTOGRAPHS OF TEST SETUP AND EUT	159

4 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS18S07117 020-4W	2018-07-03	2018-07-04 to 2018-08-02	2018-08-03	original	-	Replaced
WTS18S07117 020-4W V1	2018-07-03	2018-07-04 to 2018-08-02	2018-08-14	Version 1	Updated	Valid

5 General Information

5.1 General Description of E.U.T.

Product:	Automotive intelligent diagnostic tools
Model(s):	MAXIMUS 3.0
Model Description:	N/A
Wi-Fi Specification:	2.4G-802.11b/g/n HT20/n HT40 5G-802.11a/n/ac HT20/n HT40 HT80
Bluetooth Version:	Bluetooth v4.0 with BLE
GPS:	Support
NFC:	N/A
Hardware Version:	V1
Software Version:	V2
Highest frequency (Exclude Radio):	1.25GHz
Storage Location:	Internal Storage

5.2 Details of E.U.T.

Operation Frequency:	2.4G WiFi: 802.11b/g/n HT20: 2412~2462MHz 802.11n HT40: 2422~2452MHz 5G WiFi: 802.11a/n/ac (HT20): U-NII-1: 5180-5240MHz, U-NII-2A: 5260-5320MHz(DFS), U-NII-2C: 5550-5700MHz(DFS), U-NII-3:5745-5825MHz 802.11n/ac (HT40): U-NII-1: 5190-5230MHz, U-NII-2A: 5270-5310MHz(DFS), U-NII-2C: 5510-5670MHz(DFS), U-NII-3: 5755-5795MHz 802.11ac (HT80): U-NII-1: 5210MHz, U-NII-2A: 5290MHz(DFS), U-NII-2C: 5530MHz(DFS), U-NII-3: 5775MHz Bluetooth: 2402~2480MHz
Max. RF output power:	WiFi (2.4G): 13.26dBm WiFi (5G): 11.82dBm Bluetooth: 6.47dBm
Type of Modulation:	WiFi: CCK, OFDM Bluetooth: GFSK, Pi/4 DQPSK, 8DPSK
Antenna installation:	WiFi/Bluetooth: internal permanent antenna
Antenna Gain:	WiFi (2.4G): 5.56dBi WiFi (5G): 6.4dBi Bluetooth: 5.56dBi

Ratings: Battery DC 3.8V, 9360mAh
DC 5V, 3.0A/9V, 2.7A/12V, 2.0A charging from adapter
(Adapter Input: AC100-240V, 50/60Hz 0.7A)

Adapter: Manufacturer: Dongguan Guangshu Electrical Technology Co., Ltd
Model No.: GS-QC24W

5.3 Channel List

U-NII-1 (5.15-5.25GHz)			
channel	Frequency(MHz)	channel	Frequency(MHz)
36	5180	38	5190
40	5200	42	5210
44	5220	46	5230
48	5240		

U-NII-2A (5.25-5.35GHz)			
channel	Frequency(MHz)	channel	Frequency(MHz)
52	5260	54	5270
56	5280	58	5290
60	5300	62	5310
64	5320		

U-NII-2C (5.47-5.725GHz)			
channel	Frequency(MHz)	channel	Frequency(MHz)
100	5500	102	5510
104	5520	106	5530
108	5540	110	5550
112	5560	116	5580
118	5590	120	5600
124	5620	126	5630
128	5640	132	5660
134	5670	136	5680
140	5700		

U-NII-3 (5.725-5.85GHz)			
channel	Frequency(MHz)	channel	Frequency(MHz)
149	5745	151	5755
153	5765	155	5775
157	5785	159	5795
161	5805	165	5825

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

For 802.11a/n/ac(HT20):

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<http://www.waltek.com.cn>

channel	Frequency(MHz)	channel	Frequency(MHz)
36	5180	40	5200
48	5240		

channel	Frequency(MHz)	channel	Frequency(MHz)
52	5260	56	5280
64	5320		

channel	Frequency(MHz)	channel	Frequency(MHz)
100	5500	120	5600
140	5700		

channel	Frequency(MHz)	channel	Frequency(MHz)
149	5745	157	5785
165	5825		

For 802.11n/ac(HT40):

channel	Frequency(MHz)	channel	Frequency(MHz)
38	5190	46	5230

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

channel	Frequency(MHz)	channel	Frequency(MHz)
102	5510	110	5550
134	5670		

channel	Frequency(MHz)	channel	Frequency(MHz)
151	5755	159	5795

For 802.11ac(HT80):

channel	Frequency(MHz)	channel	Frequency(MHz)
42	5210		

channel	Frequency(MHz)	channel	Frequency(MHz)
58	5290		

channel	Frequency(MHz)	channel	Frequency(MHz)
106	5530		

channel	Frequency(MHz)	channel	Frequency(MHz)
155	5775		

6 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emissions	15.407 15.205(a) 15.209(a)	PASS
Duty Cycle	KDB 789033	PASS
6dB Bandwidth	15.407	PASS
26 dB Emission Bandwidth & 99% Occupied Bandwidth	15.407	PASS
Maximum Conducted Output Power	15.407	PASS
Power Spectral Density	15.407	PASS
Restricted bands around fundamental frequency	15.407	PASS
Antenna Requirement	15.203	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

7 Equipment Used during Test

7.1 Equipments List

Conducted Emissions Test Site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	2017-09-12	2018-09-11
2.	LISN	R&S	ENV216	101215	2017-09-12	2018-09-11
3.	Cable	Top	TYPE16(3.5M)	-	2017-09-12	2018-09-11
Conducted Emissions Test Site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	2017-09-12	2018-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2017-09-12	2018-09-11
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2017-09-12	2018-09-11
4.	Cable	LARGE	RF300	-	2017-09-12	2018-09-11
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP	100091	2018-04-29	2019-04-28
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	2018-04-09	2019-04-08
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2018-04-09	2019-04-08
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2017-09-12	2018-09-11
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2018-04-09	2019-04-08
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2018-04-09	2019-04-08
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2018-04-13	2019-04-12
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	2017-04-13	2018-04-12
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2017-04-13	2018-04-12
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2018-04-09	2019-04-08
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	2017-04-13	2018-04-12
4	Cable	HUBER+SUHNER	CBL2	525178	2017-04-13	2018-04-12

RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	2017-09-12	2018-09-11
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	2017-09-12	2018-09-11
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	2017-09-12	2018-09-11

7.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
/	/	/	/

7.3 Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	± 3.64 dB(AC mains 150KHz~30MHz)
Radiated Spurious Emissions	± 5.08 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Radio Frequency	± 1 x 10 ⁻⁷ Hz
RF Power	± 0.42 dB
RF Power Density	± 0.7dB
Conducted Spurious Emissions	± 2.76 dB (9kHz~26500MHz)
Confidence interval : 95%. Confidence factor:k=2	

7.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

8 Conducted Emission

Test Requirement: FCC CFR 47 Part 15 Section 15.207

Test Method: ANSI C63.10:2013

Test Result: PASS

Frequency Range: 150kHz to 30MHz

Class/Severity: Class B

Limit:

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

8.1 E.U.T. Operation

Operating Environment :

Temperature: 21.5 °C

Humidity: 51.9 % RH

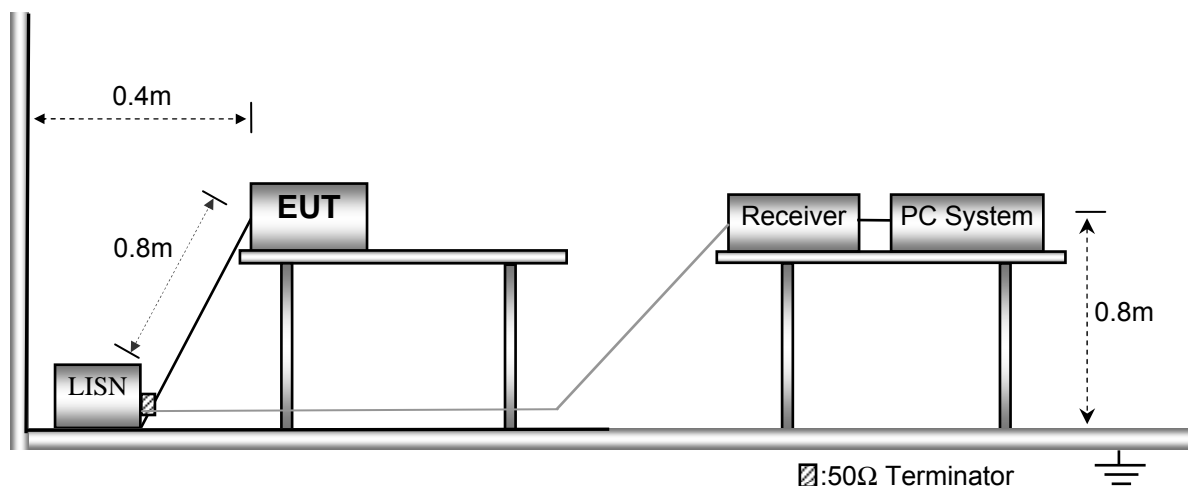
Atmospheric Pressure: 101.2kPa

EUT Operation :

The test was performed in TX transmitting mode, the test data were shown in the report.

8.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4.



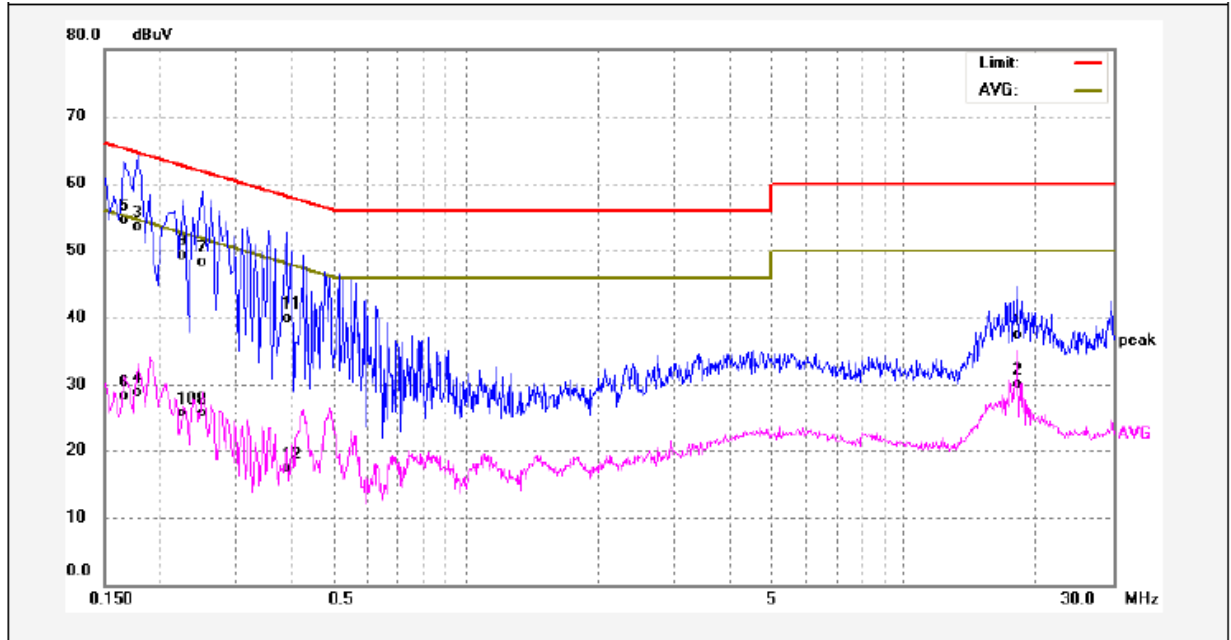
8.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

8.4 Conducted Emission Test Result

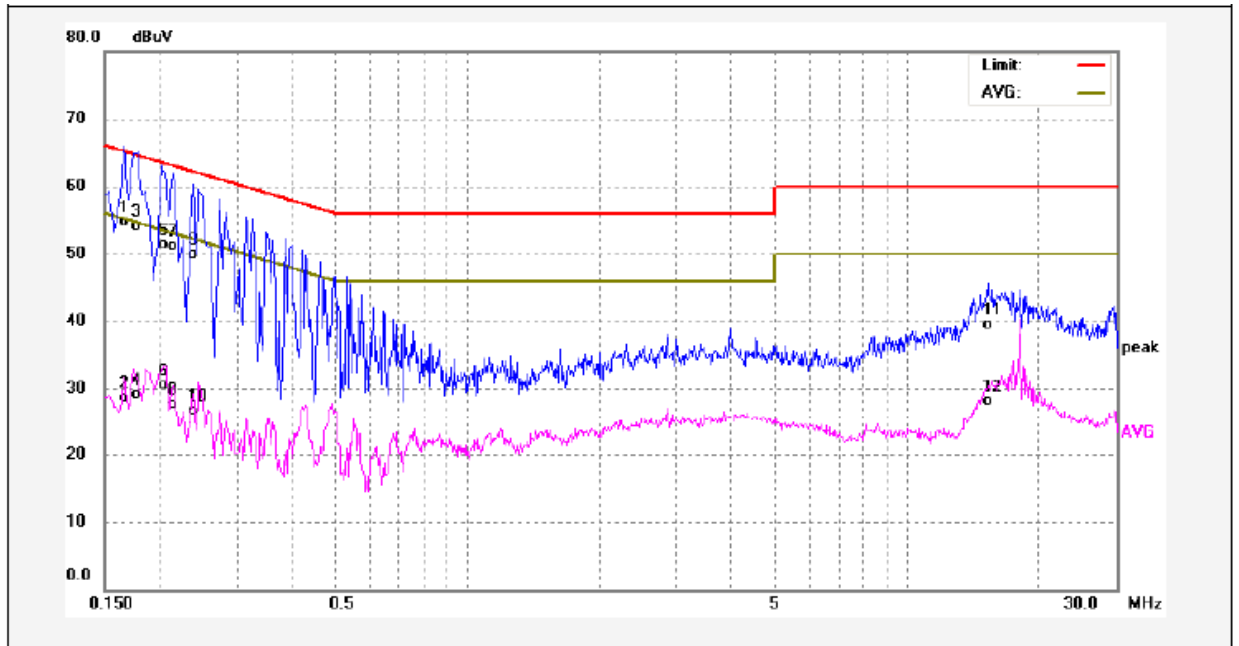
An initial pre-scan was performed on the live and neutral lines. only the worst data (802.11n20 mode low channel) were reported.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	18.1259	26.78	10.80	37.58	60.00	-22.42	QP	
2	18.1259	19.26	10.80	30.06	50.00	-19.94	AVG	
3	0.1780	43.22	10.30	53.52	64.57	-11.05	QP	
4	0.1780	18.55	10.30	28.85	54.57	-25.72	AVG	
5	0.1660	44.25	10.28	54.53	65.15	-10.62	QP	
6	0.1660	18.06	10.28	28.34	55.15	-26.81	AVG	
7	0.2500	37.95	10.39	48.34	61.75	-13.41	QP	
8	0.2500	15.34	10.39	25.73	51.75	-26.02	AVG	
9	0.2260	38.86	10.36	49.22	62.59	-13.37	QP	
10	0.2260	15.37	10.36	25.73	52.59	-26.86	AVG	
11	0.3899	29.46	10.42	39.88	58.06	-18.18	QP	
12	0.3899	6.87	10.42	17.29	48.06	-30.77	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1660	44.39	10.28	54.67	65.15	-10.48	QP	
2	0.1660	18.45	10.28	28.73	55.15	-26.42	AVG	
3	0.1780	43.72	10.30	54.02	64.57	-10.55	QP	
4	0.1780	18.90	10.30	29.20	54.57	-25.37	AVG	
5	0.2020	41.04	10.33	51.37	63.52	-12.15	QP	
6	0.2020	20.12	10.33	30.45	53.52	-23.07	AVG	
7	0.2140	40.74	10.34	51.08	63.04	-11.96	QP	
8	0.2140	17.42	10.34	27.76	53.04	-25.28	AVG	
9	0.2380	39.47	10.37	49.84	62.16	-12.32	QP	
10	0.2380	16.29	10.37	26.66	52.16	-25.50	AVG	
11	15.2700	28.65	10.87	39.52	60.00	-20.48	QP	
12	15.2700	17.28	10.87	28.15	50.00	-21.85	AVG	

9 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.407

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

9.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

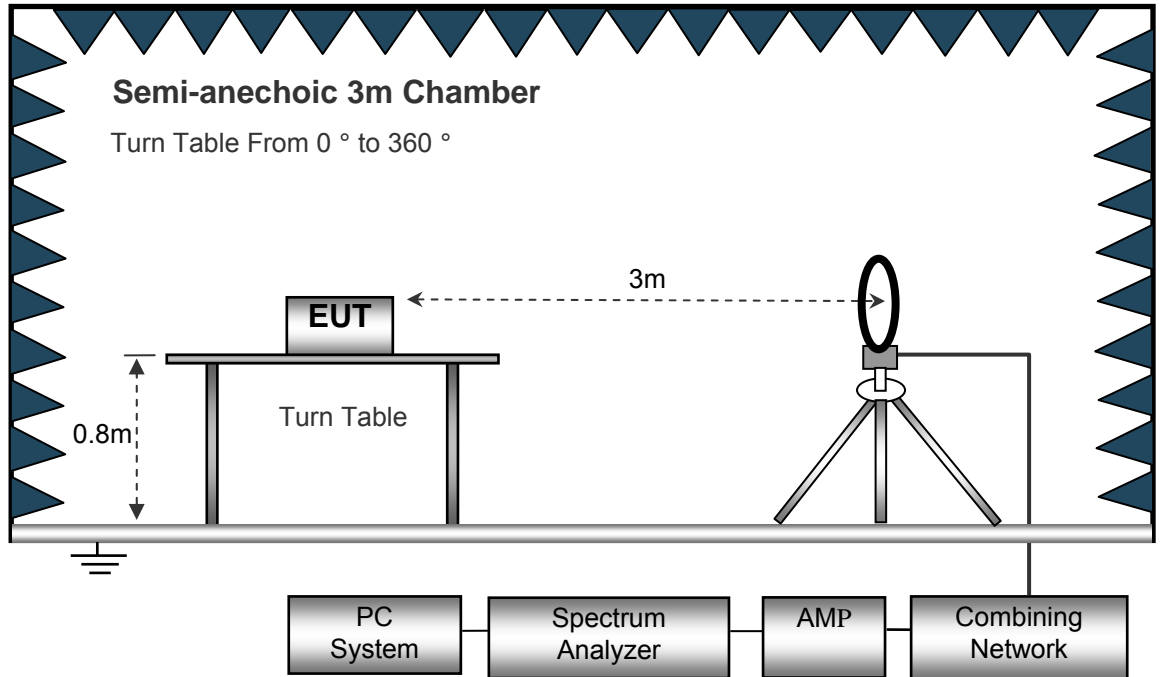
EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

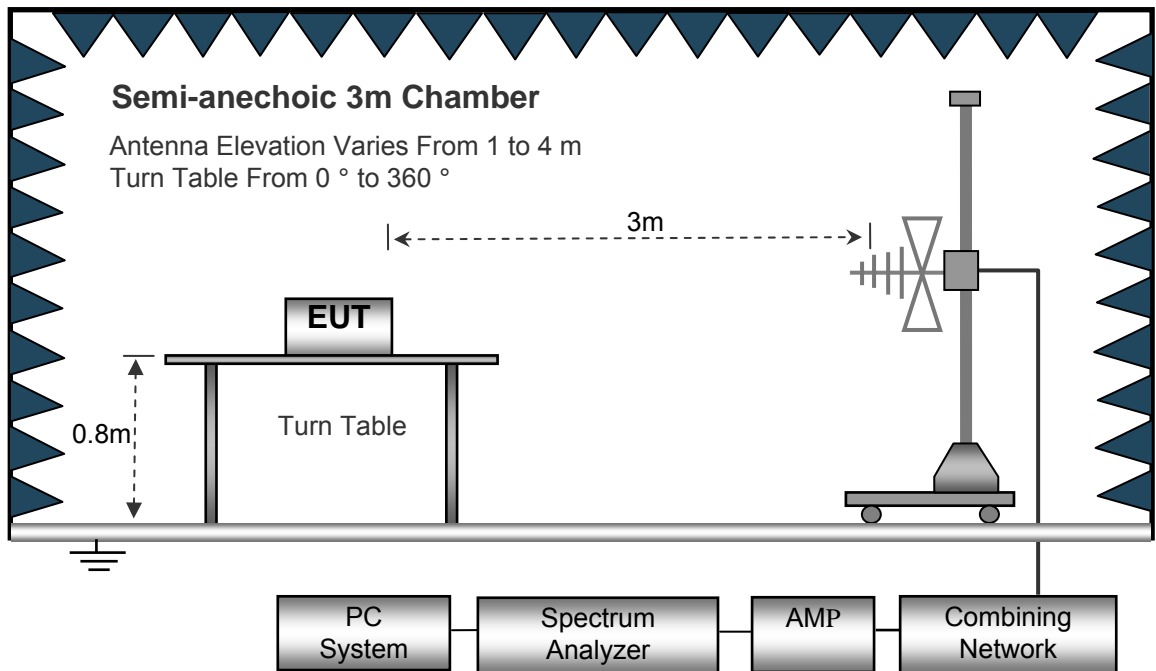
9.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4.

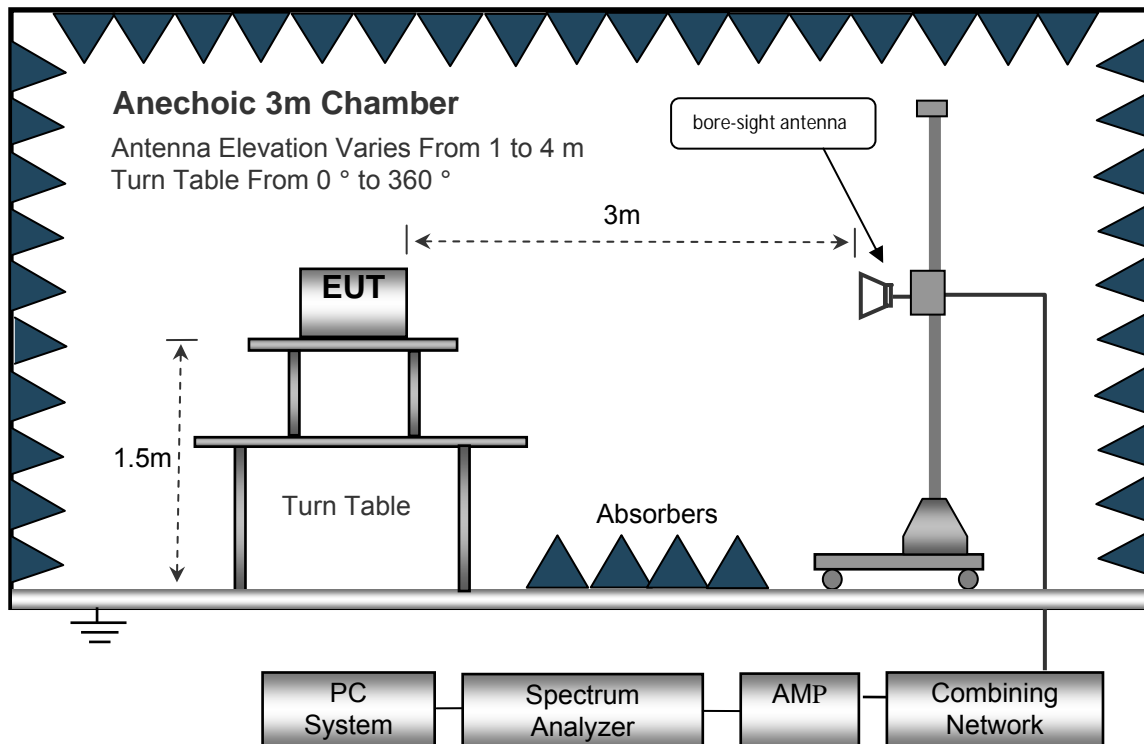
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



9.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed Auto
 IF Bandwidth..... 10kHz
 Video Bandwidth..... 10kHz
 Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed Auto
 Detector PK
 Resolution Bandwidth..... 100kHz
 Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed Auto
 Detector PK
 Resolution Bandwidth..... 1MHz
 Video Bandwidth..... 3MHz
 Detector Ave.
 Resolution Bandwidth..... 1MHz
 Video Bandwidth..... 10Hz

9.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in Z axis,so the worst data were shown as follow.
8. A 2.4GHz high -pass filter is used during radiated emissions above 1GHz measurement.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

9.5 Summary of Test Results

Test Frequency: 9KHz~30MHz

Remark :All band measurement for low/middle/high/channel, only the worst case (low channel for each band) were shown follow:

Frequency	Measurement results dB μ V @3m	Detector PK/QP	Correct factor dB/m	Extrapolation factor dB	Measurement results (calculated) dB μ V/m @30m	Limits dB μ V/m @30m	Margin dB
(MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
U-NII-1:802.11a 5180MHz							
6.022	25.11	QP	21.84	40.00	6.95	29.54	-22.59
15.730	24.70	QP	21.35	40.00	6.05	29.54	-23.49
25.680	24.09	QP	20.67	40.00	4.76	29.54	-24.78
U-NII-1:802.11n20 5180MHz							
6.022	25.13	QP	21.84	40.00	6.97	29.54	-22.57
15.730	24.57	QP	21.35	40.00	5.92	29.54	-23.62
25.680	25.16	QP	20.67	40.00	5.83	29.54	-23.71
U-NII-1:802.11ac 5180MHz							
6.022	25.33	QP	21.84	40.00	7.17	29.54	-22.37
15.730	24.40	QP	21.35	40.00	5.75	29.54	-23.79
25.680	25.38	QP	20.67	40.00	6.05	29.54	-23.49
U-NII-1:802.11n40 5190MHz							
6.022	25.31	QP	21.84	40.00	7.15	29.54	-22.39
15.730	25.67	QP	21.35	40.00	7.02	29.54	-22.52
25.680	25.49	QP	20.67	40.00	6.16	29.54	-23.38
U-NII-1:802.11ac40 5190MHz							
6.022	25.82	QP	21.84	40.00	7.66	29.54	-21.88
15.730	24.88	QP	21.35	40.00	6.23	29.54	-23.31
25.680	25.64	QP	20.67	40.00	6.31	29.54	-23.23

Frequency	Measurement results dB μ V @3m	Detector PK/QP	Correct factor dB/m	Extrapolation factor dB	Measurement results (calculated) dB μ V/m @30m	Limits dB μ V/m @30m	Margin dB
(MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
U-NII-2A:802.11a 5260MHz							
6.022	25.48	QP	21.84	40.00	7.32	29.54	-22.22
15.730	24.17	QP	21.35	40.00	5.52	29.54	-24.02
25.680	25.79	QP	20.67	40.00	6.46	29.54	-23.08
U-NII-2A:802.11n20 5260MHz							
6.022	25.71	QP	21.84	40.00	7.55	29.54	-21.99
15.730	24.22	QP	21.35	40.00	5.57	29.54	-23.97
25.680	25.73	QP	20.67	40.00	6.40	29.54	-23.14
U-NII-2A:802.11ac 5260MHz							
6.022	25.89	QP	21.84	40.00	7.73	29.54	-21.81
15.730	24.32	QP	21.35	40.00	5.67	29.54	-23.87
25.680	25.41	QP	20.67	40.00	6.08	29.54	-23.46
U-NII-2A:802.11n40 5270MHz							
6.022	25.50	QP	21.84	40.00	7.34	29.54	-22.20
15.730	24.61	QP	21.35	40.00	5.96	29.54	-23.58
25.680	24.77	QP	20.67	40.00	5.44	29.54	-24.10
U-NII-2A:802.11ac40 5270MHz							
6.022	25.48	QP	21.84	40.00	7.32	29.54	-22.22
15.730	24.60	QP	21.35	40.00	5.95	29.54	-23.59
25.680	25.98	QP	20.67	40.00	6.65	29.54	-22.89

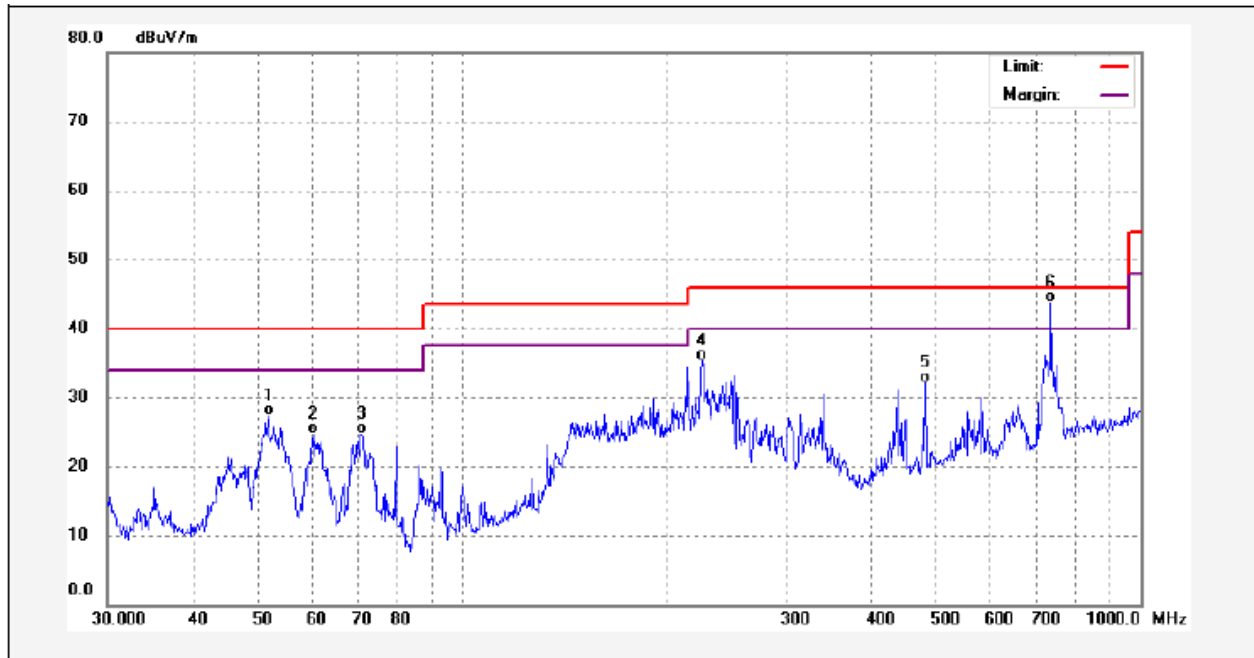
Frequency	Measurement results dB μ V @3m	Detector PK/QP	Correct factor dB/m	Extrapolation factor dB	Measurement results (calculated) dB μ V/m @30m	Limits dB μ V/m @30m	Margin dB
(MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
U-NII-2C:802.11a 5500MHz							
6.022	24.82	QP	21.84	40.00	6.66	29.54	-22.88
15.730	25.49	QP	21.35	40.00	6.84	29.54	-22.70
25.680	25.67	QP	20.67	40.00	6.34	29.54	-23.20
U-NII-2C:802.11n20 5500MHz							
6.022	24.84	QP	21.84	40.00	6.68	29.54	-22.86
15.730	25.68	QP	21.35	40.00	7.03	29.54	-22.51
25.680	25.35	QP	20.67	40.00	6.02	29.54	-23.52
U-NII-2C:802.11ac20 5500MHz							
6.022	25.30	QP	21.84	40.00	7.14	29.54	-22.40
15.730	25.41	QP	21.35	40.00	6.76	29.54	-22.78
25.680	24.54	QP	20.67	40.00	5.21	29.54	-24.33
U-NII-2C:802.11n40 5510MHz							
6.022	25.67	QP	21.84	40.00	7.51	29.54	-22.03
15.730	24.82	QP	21.35	40.00	6.17	29.54	-23.37
25.680	26.57	QP	20.67	40.00	7.24	29.54	-22.30
U-NII-2C:802.11ac40 5510MHz							
6.022	25.15	QP	21.84	40.00	6.99	29.54	-22.55
15.730	26.67	QP	21.35	40.00	8.02	29.54	-21.52
25.680	24.17	QP	20.67	40.00	4.84	29.54	-24.70

Frequency	Measurement results dB μ V @3m	Detector PK/QP	Correct factor dB/m	Extrapolation factor dB	Measurement results (calculated) dB μ V/m @30m	Limits dB μ V/m @30m	Margin dB
(MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
U-NII-3 802.11a 5745MHz							
6.022	25.55	QP	21.84	40.00	7.39	29.54	-22.15
15.730	24.07	QP	21.35	40.00	5.42	29.54	-24.12
25.680	26.02	QP	20.67	40.00	6.69	29.54	-22.85
U-NII-3 802.11n20 5745MHz							
6.022	25.52	QP	21.84	40.00	7.36	29.54	-22.18
15.730	24.25	QP	21.35	40.00	5.60	29.54	-23.94
25.680	25.03	QP	20.67	40.00	5.70	29.54	-23.84
U-NII-3 802.11ac 5745MHz							
6.022	25.45	QP	21.84	40.00	7.29	29.54	-22.25
15.730	24.57	QP	21.35	40.00	5.92	29.54	-23.62
25.680	26.50	QP	20.67	40.00	7.17	29.54	-22.37
U-NII-3 802.11n40 5755MHz							
6.022	25.33	QP	21.84	40.00	7.17	29.54	-22.37
15.730	24.79	QP	21.35	40.00	6.14	29.54	-23.40
25.680	25.05	QP	20.67	40.00	5.72	29.54	-23.82
U-NII-3 802.11ac40 5755MHz							
6.022	25.39	QP	21.84	40.00	7.23	29.54	-22.31
15.730	25.63	QP	21.35	40.00	6.98	29.54	-22.56
25.680	26.12	QP	20.67	40.00	6.79	29.54	-22.75

Test Frequency: 30MHz ~ 1GHz

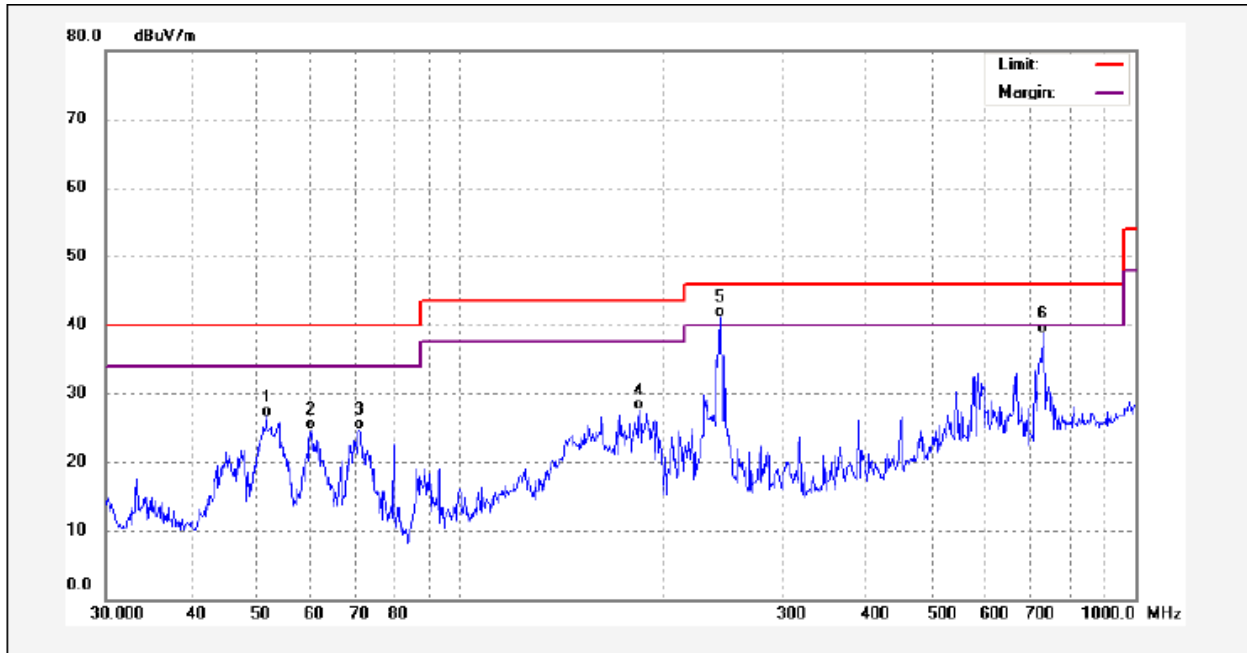
Remark: only the worst data (802.11a HT20 Low Channel mode) were reported.

Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	51.8430	43.57	-16.34	27.23	40.00	-12.77	QP	
2	60.2801	41.39	-16.66	24.73	40.00	-15.27	QP	
3	71.0803	42.92	-18.31	24.61	40.00	-15.39	QP	
4	225.3080	52.93	-17.56	35.37	46.00	-10.63	QP	
5	480.5276	42.26	-10.17	32.09	46.00	-13.91	QP	
6	737.0714	49.11	-5.48	43.63	46.00	-2.37	QP	

Vertical

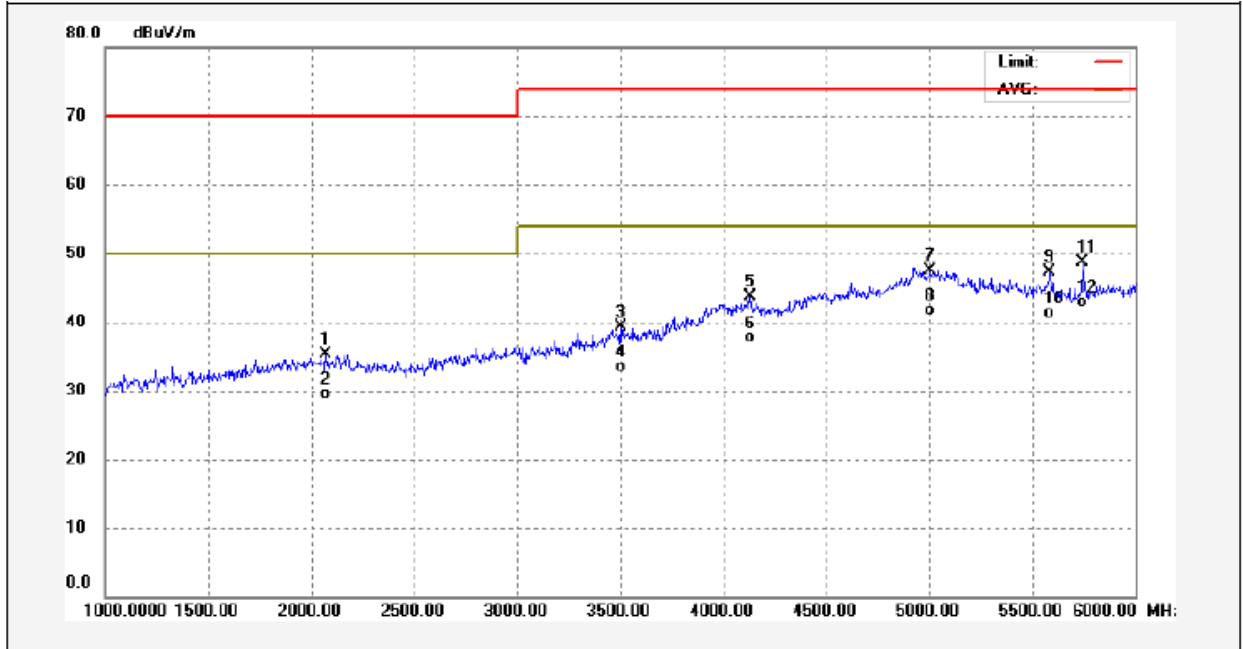


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	51.8430	42.94	-16.34	26.60	40.00	-13.40	QP	
2	60.2801	41.31	-16.66	24.65	40.00	-15.35	QP	
3	71.0803	43.04	-18.31	24.73	40.00	-15.27	QP	
4	184.4898	44.50	-16.98	27.52	43.50	-15.98	QP	
5	242.5253	57.60	-16.44	41.16	46.00	-4.84	QP	
6	729.3583	44.38	-5.66	38.72	46.00	-7.28	QP	

Test Frequency: Above 1GHz

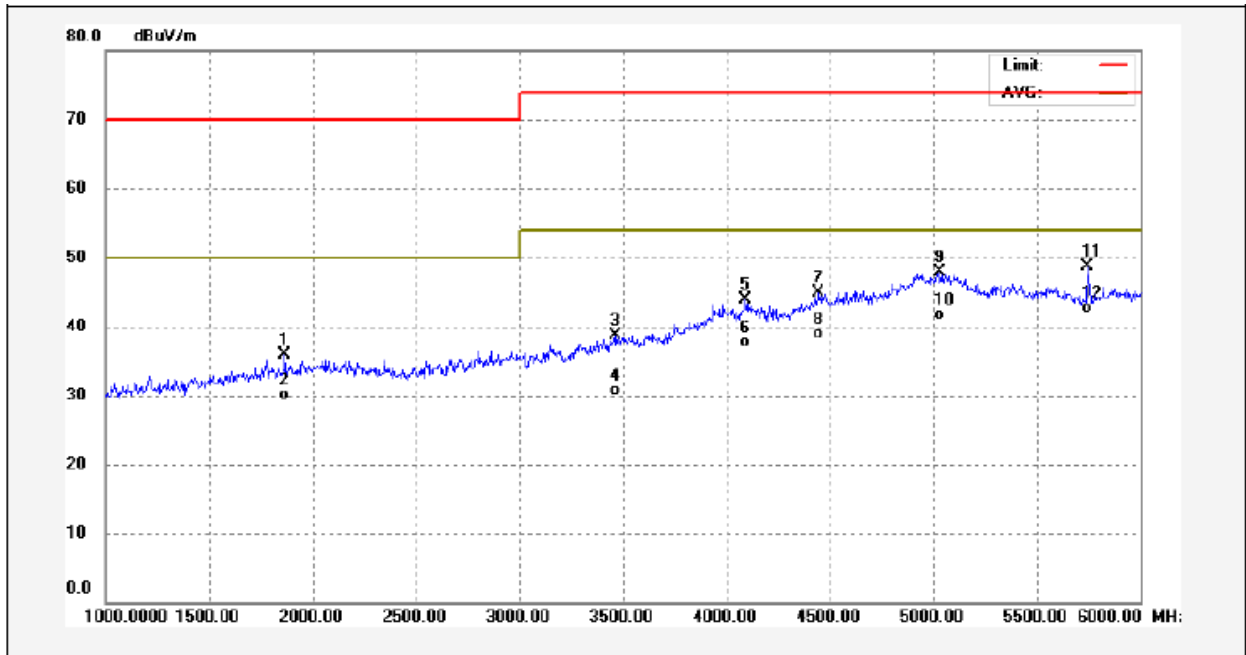
Remark: only the worst data (802.11a HT20 Low Channel mode) were reported

Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2070.000	50.04	-14.64	35.40	70.00	-34.60	peak	
2	2070.000	44.20	-14.64	29.56	50.00	-20.44	AVG	
3	3500.000	50.02	-10.62	39.40	74.00	-34.60	peak	
4	3500.000	44.17	-10.62	33.55	54.00	-20.45	AVG	
5	4130.000	49.85	-6.23	43.62	74.00	-30.38	peak	
6	4130.000	44.01	-6.23	37.78	54.00	-16.22	AVG	
7	5005.000	48.43	-0.86	47.57	74.00	-26.43	peak	
8	5005.000	42.52	-0.86	41.66	54.00	-12.34	AVG	
9	5585.000	49.78	-2.51	47.27	74.00	-26.73	peak	
10	5585.000	43.89	-2.51	41.38	54.00	-12.62	AVG	
11	5745.000	51.00	-2.26	48.74	74.00	-25.26	peak	
12	5745.000	45.14	-2.26	42.88	54.00	-11.12	AVG	

Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1865.000	51.00	-15.08	35.92	70.00	-34.08	peak	
2	1865.000	45.15	-15.08	30.07	50.00	-19.93	AVG	
3	3460.000	49.43	-10.80	38.63	74.00	-35.37	peak	
4	3460.000	41.57	-10.80	30.77	54.00	-23.23	AVG	
5	4090.000	50.24	-6.38	43.86	74.00	-30.14	peak	
6	4090.000	44.07	-6.38	37.69	54.00	-16.31	AVG	
7	4445.000	49.85	-5.03	44.82	74.00	-29.18	peak	
8	4445.000	43.97	-5.03	38.94	54.00	-15.06	AVG	
9	5030.000	48.78	-0.95	47.83	74.00	-26.17	peak	
10	5030.000	42.63	-0.95	41.68	54.00	-12.32	AVG	
11	5745.000	50.89	-2.26	48.63	74.00	-25.37	peak	
12	5745.000	45.03	-2.26	42.77	54.00	-11.23	AVG	

Test Frequency: 18GHz~40GHz

The measurements were more than 20 dB below the limit and not reported.

10 Duty cycle

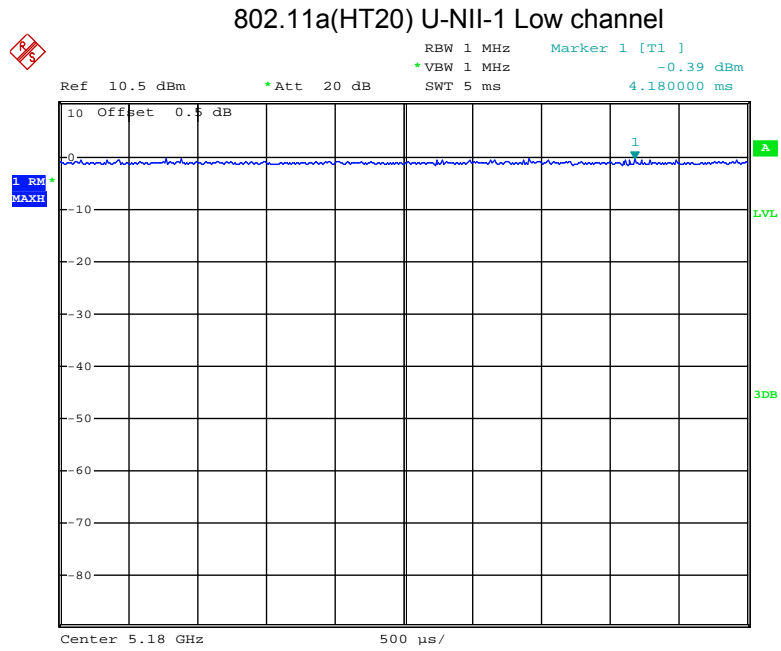
Test Requirement:	47 CFR Part 15C 15.407
Test Method:	ANSI C63.10: 2013
Test Limit:	N/A
Test Result:	PASS
Remark:	N/A

10.1 Summary of Test Results

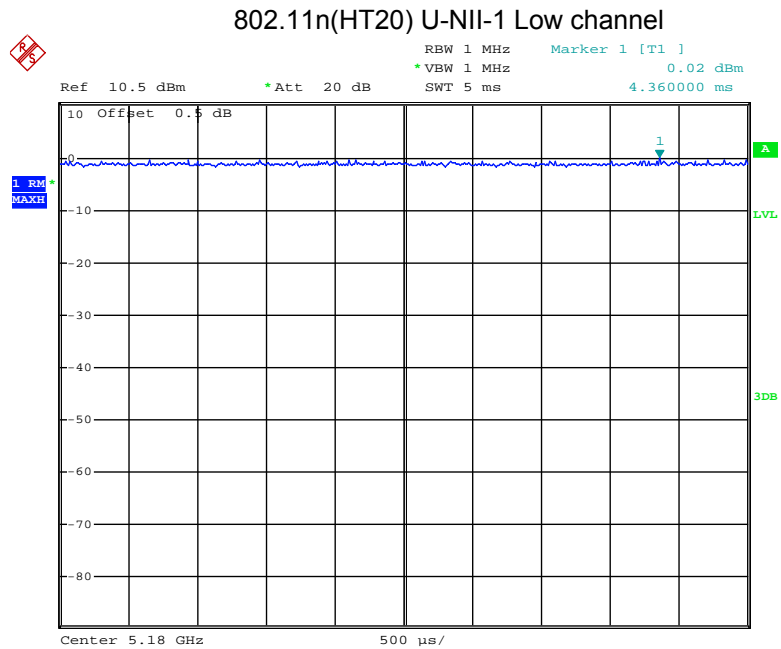
802.11a(HT20) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
52	100	100	100
100	100	100	100
149	100	100	100
802.11n(HT20) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
52	100	100	100
100	100	100	100
149	100	100	100
802.11ac(HT20) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
52	100	100	100
100	100	100	100
149	100	100	100
802.11n(HT40) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
38	100	100	100
54	100	100	100
102	100	100	100
151	100	100	100

802.11ac(HT40) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
38	100	100	100
54	100	100	100
102	100	100	100
151	100	100	100
802.11ac(HT80) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
42	100	100	100
58	100	100	100
106	100	100	100
155	100	100	100

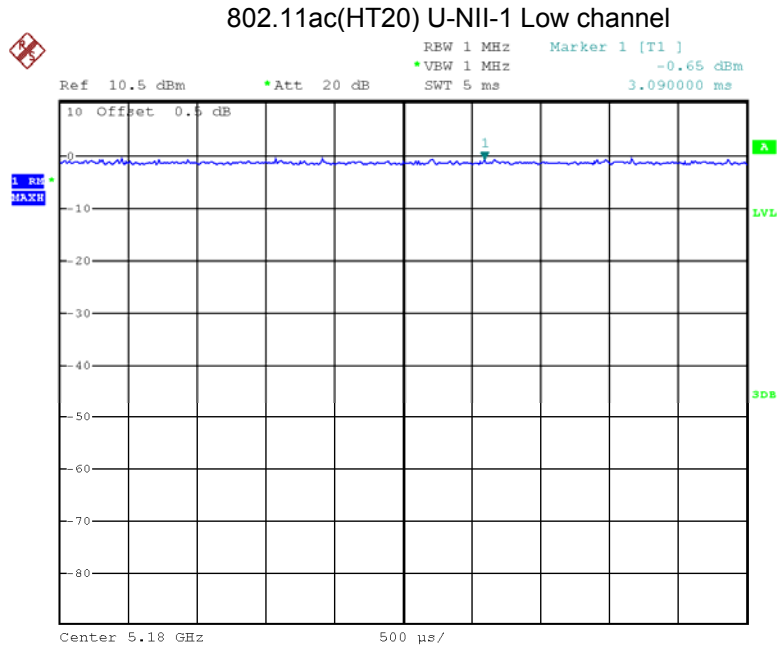
Test result plots shown as follows:



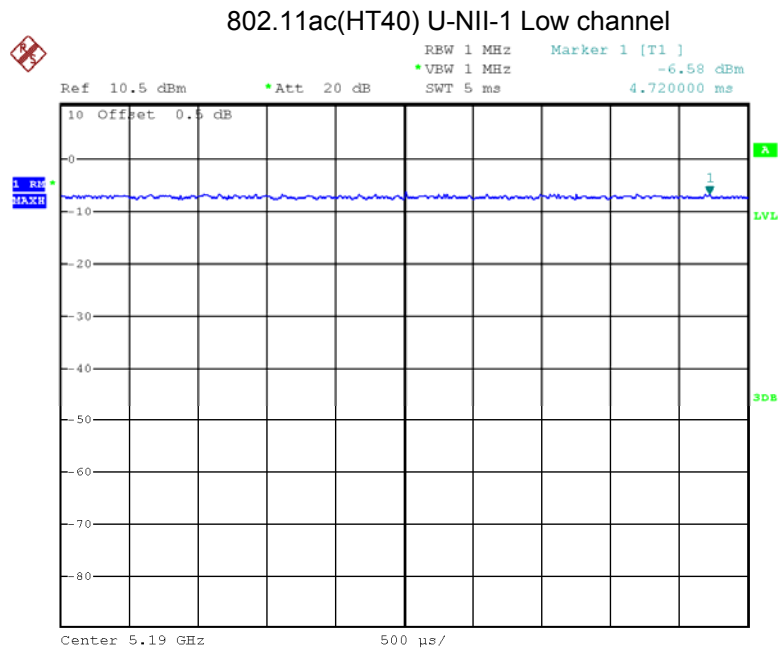
Date: 24.JUL.2018 21:28:06



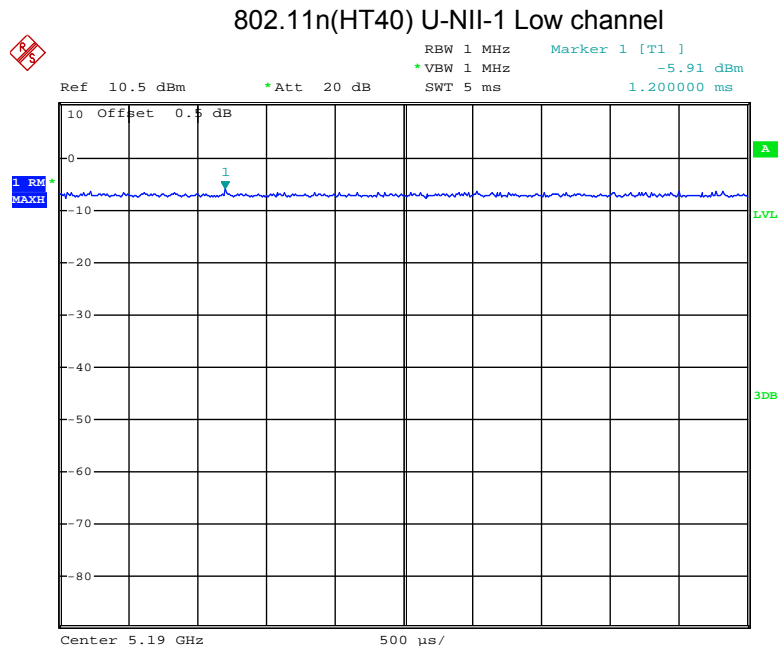
Date: 24.JUL.2018 21:28:26



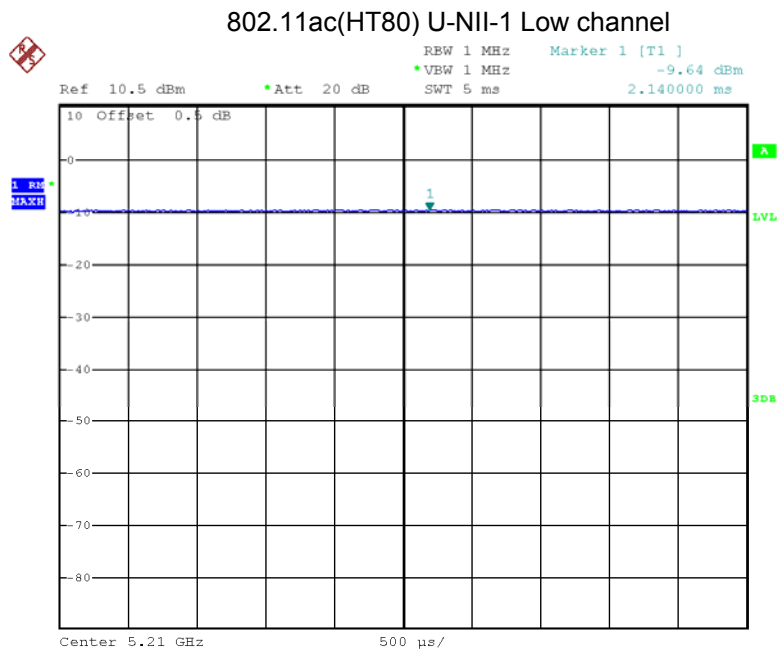
Date: 26.JUL.2018 21:34:19



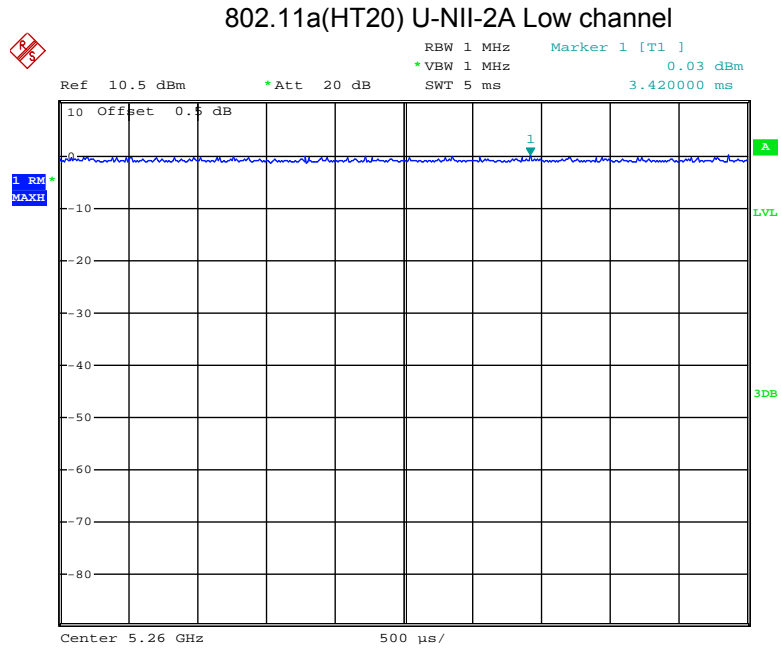
Date: 26.JUL.2018 21:43:34



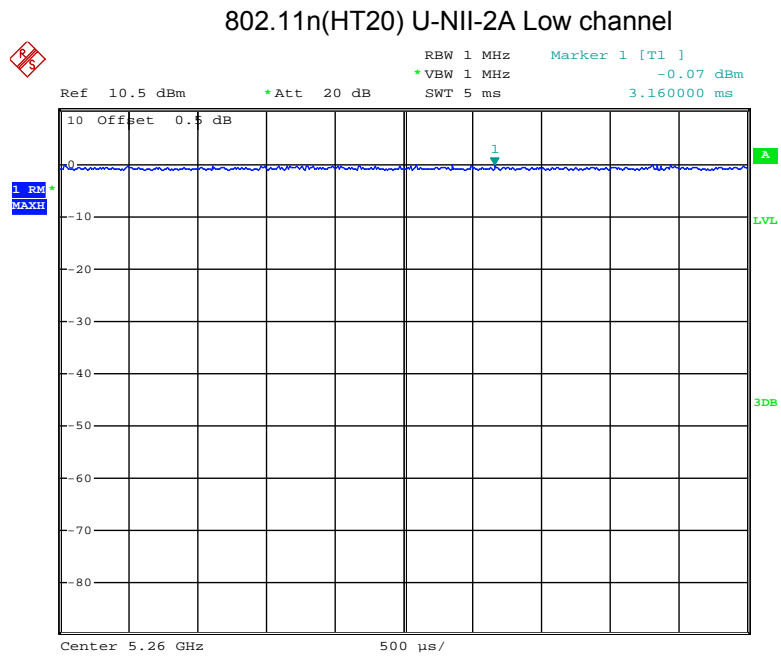
Date: 24.JUL.2018 21:46:01



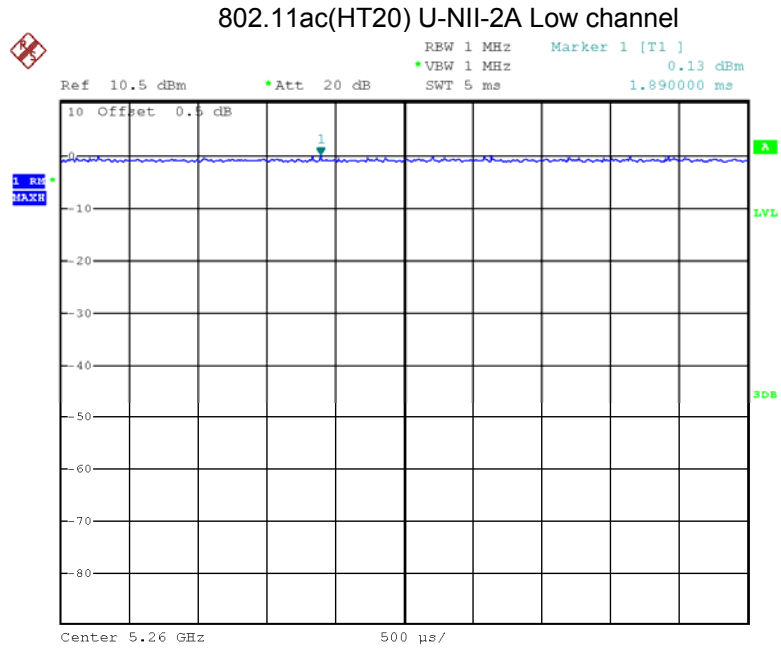
Date: 29.JUL.2018 21:46:00



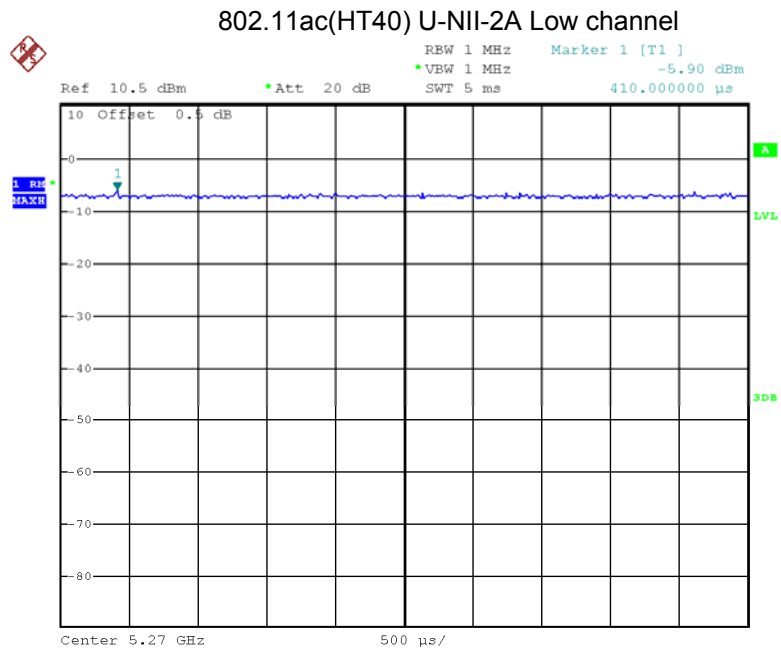
Date: 24.JUL.2018 22:57:28



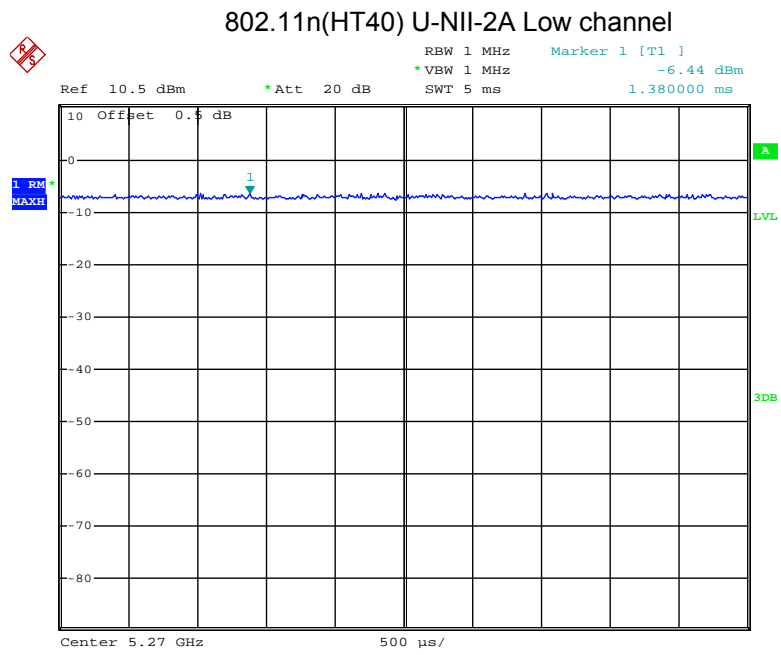
Date: 24.JUL.2018 22:57:54



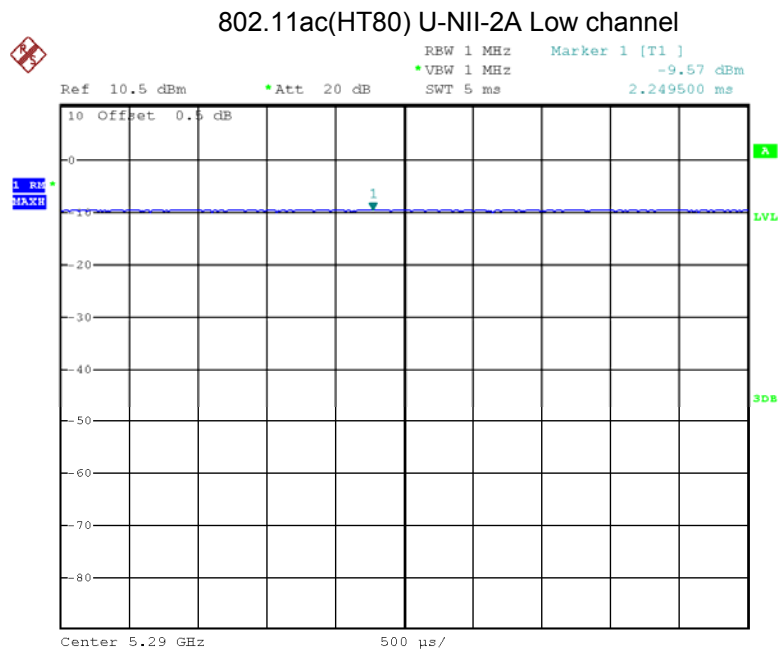
Date: 26.JUL.2018 21:57:01



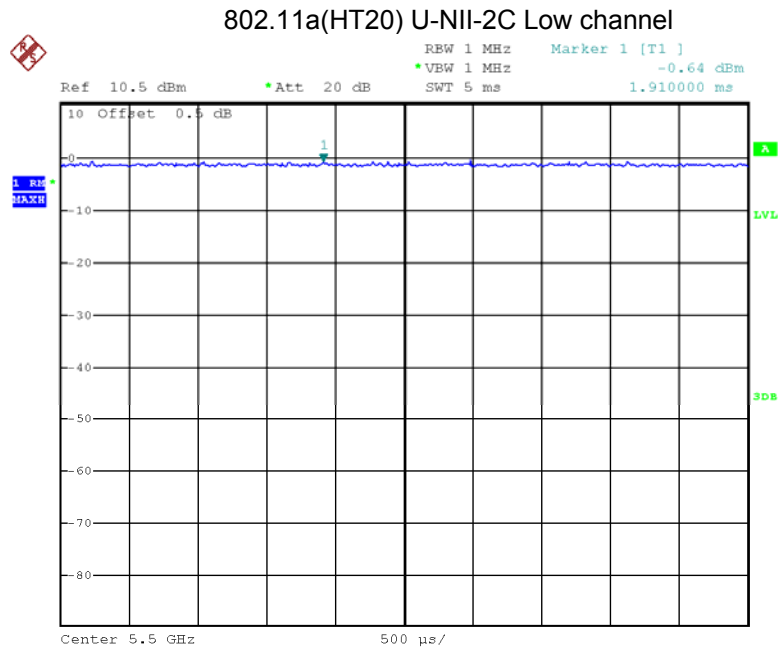
Date: 26.JUL.2018 22:11:14



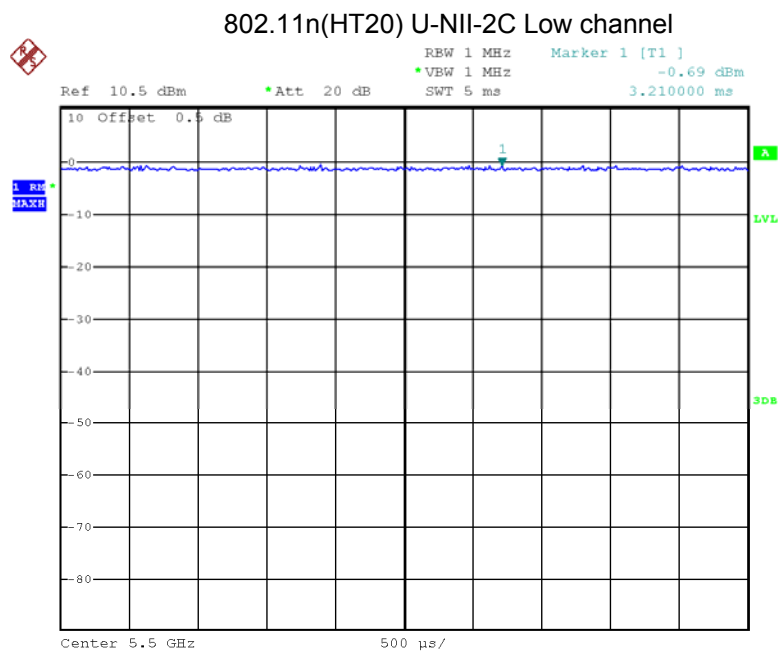
Date: 24.JUL.2018 23:11:11



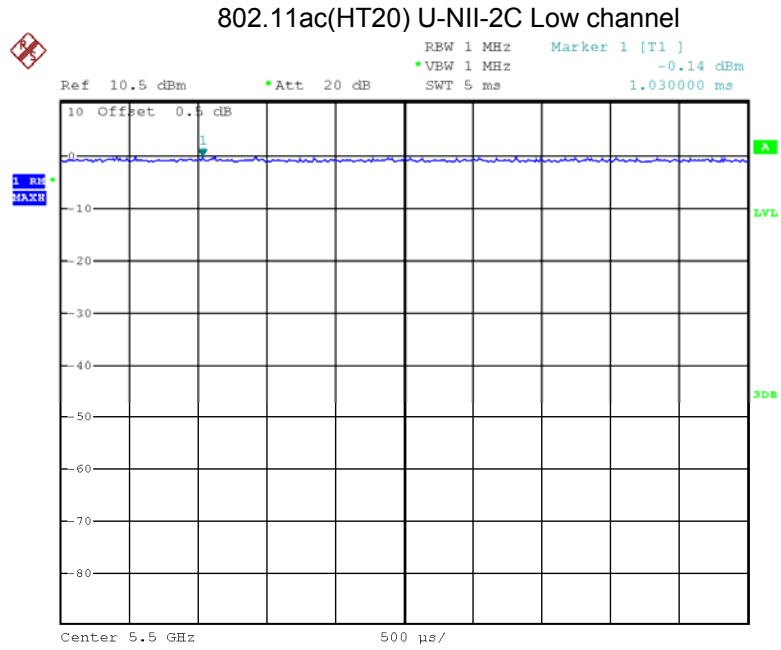
Date: 29.JUL.2018 21:56:01



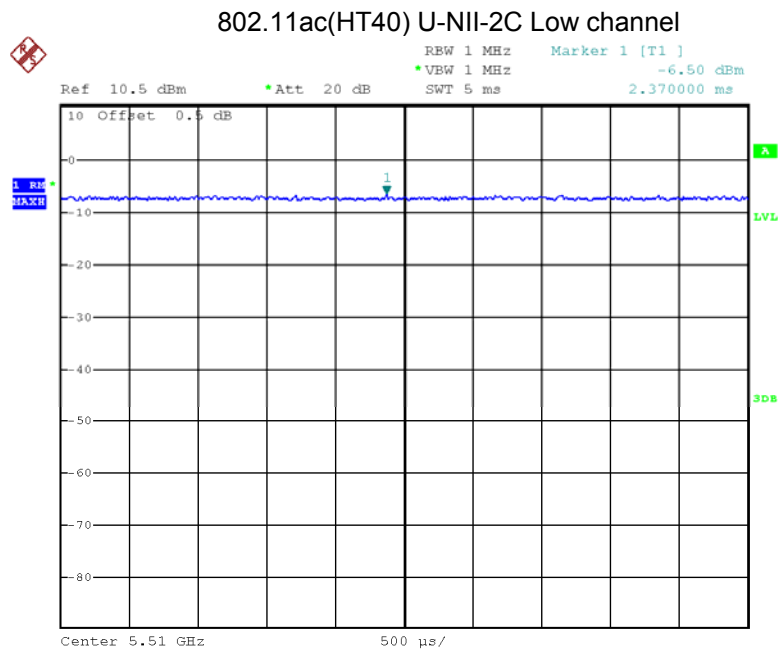
Date: 26.JUL.2018 06:55:58



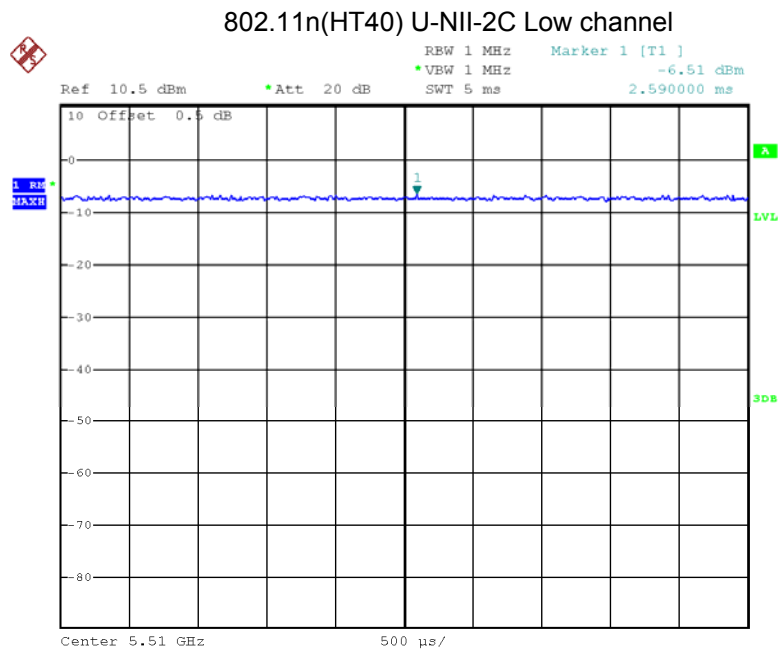
Date: 26.JUL.2018 06:55:32



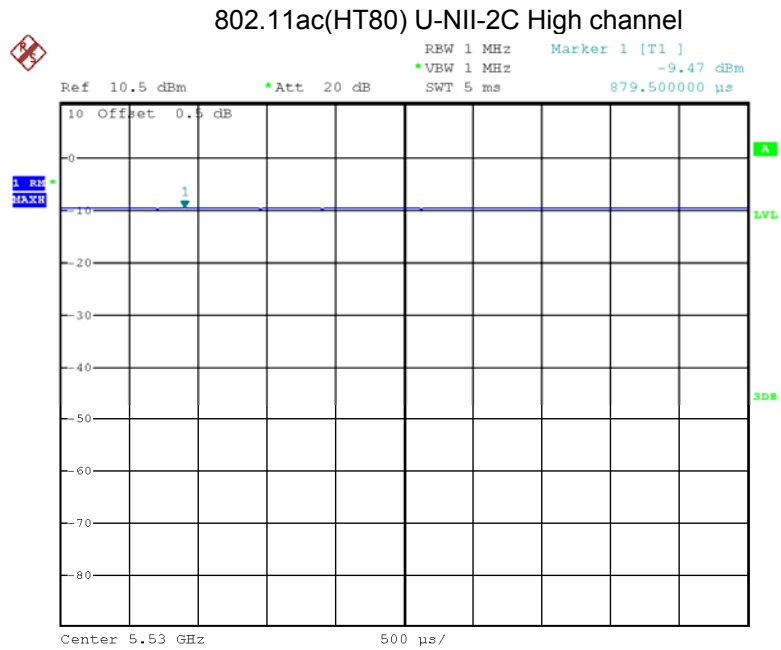
Date: 26.JUL.2018 22:22:29



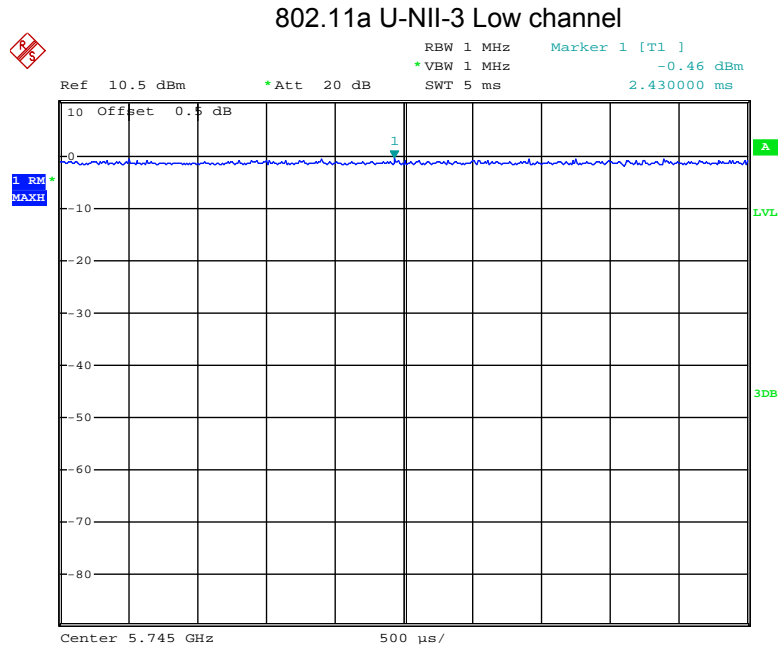
Date: 26.JUL.2018 22:31:19



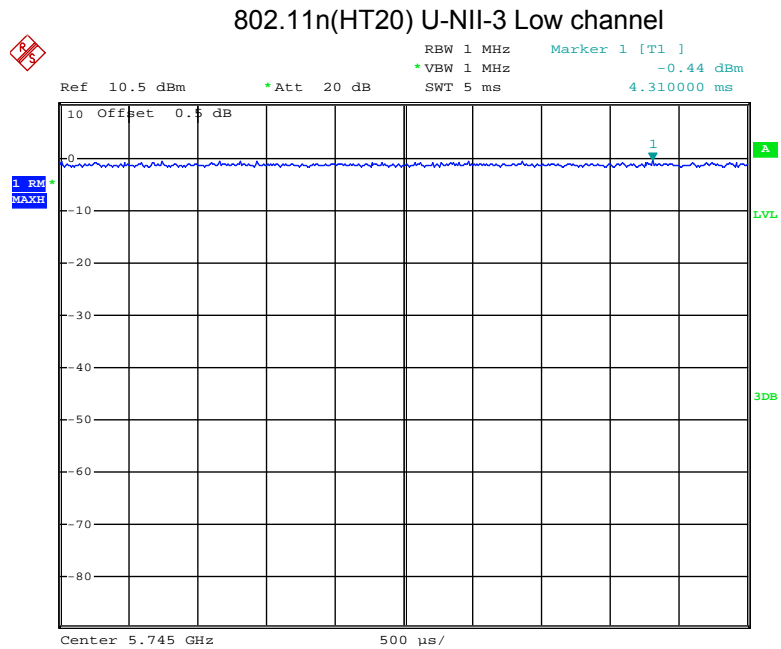
Date: 26.JUL.2018 07:08:38



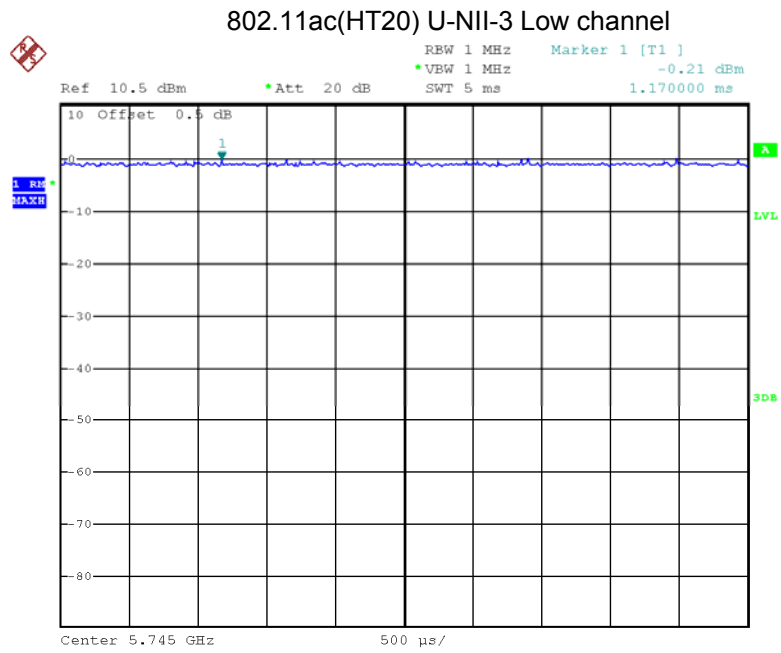
Date: 29.JUL.2018 22:00:44



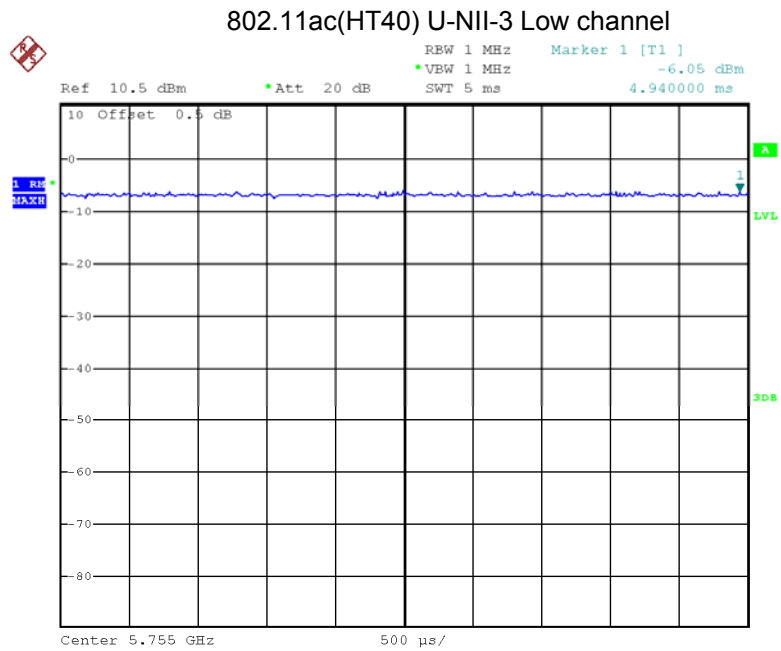
Date: 24.JUL.2018 22:13:17



Date: 24.JUL.2018 22:13:46

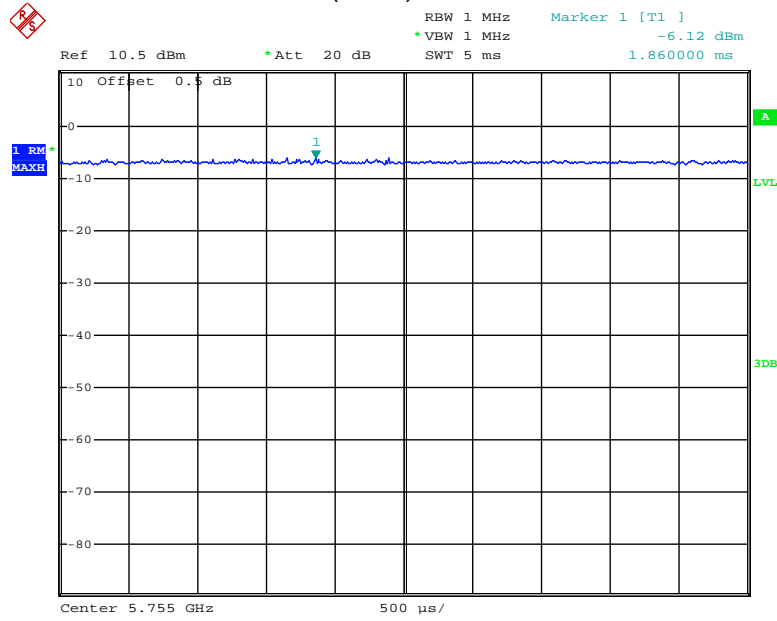


Date: 26.JUL.2018 22:48:16



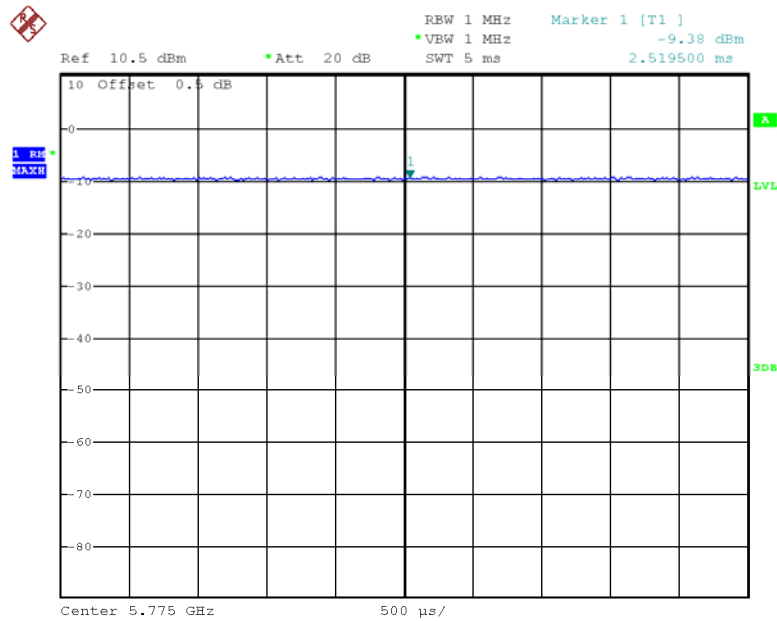
Date: 26.JUL.2018 22:56:53

802.11n(HT40) U-NII-3 Low channel



Date: 24.JUL.2018 22:33:11

802.11ac(HT80) U-NII-3 Low channel



Date: 29.JUL.2018 22:09:10

11 Band Edge

Test Requirement:	FCC CFR47 Part 15 Section 15.407
Test Method:	ANSI C63.10 2013
Test Limit:	<p>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 -27dBm/MHz.</p> <p>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.</p> <p>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.</p> <p>For transmitters operating in the 5.725-5.85 GHz band:</p> <p>(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.</p> <p>(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.</p>
Test Result:	PASS

11.1 Test Produce

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

11.2 Test Result

Test result plots shown as follows:

802.11a U-NII-1 Band edge-left side



802.11a U-NII-1 Band edge-right side



802.11n(HT20) U-NII-1 Band edge-left side



802.11n(HT20) U-NII-1 Band edge-right side



802.11ac(HT20) U-NII-1 Band edge-left side



802.11ac(HT20) U-NII-1 Band edge-right side



802.11n(HT40) U-NII-1 Band edge-left side



802.11n(HT40) U-NII-1 Band edge-right side



802.11ac(HT40) U-NII-1 Band edge-left side



802.11ac(HT40) U-NII-1 Band edge-right side



802.11ac(HT80) U-NII-1 Band edge



802.11a U-NII-2A Band edge-left side



802.11a U-NII-2A Band edge-right side



802.11n(HT20) U-NII-2A Band edge-left side



802.11n(HT20) U-NII-2A Band edge-right side



802.11ac(HT20) U-NII-2A Band edge-left side



802.11ac(HT20) U-NII-2A Band edge-right side



802.11n(HT40) U-NII-2A Band edge-left side



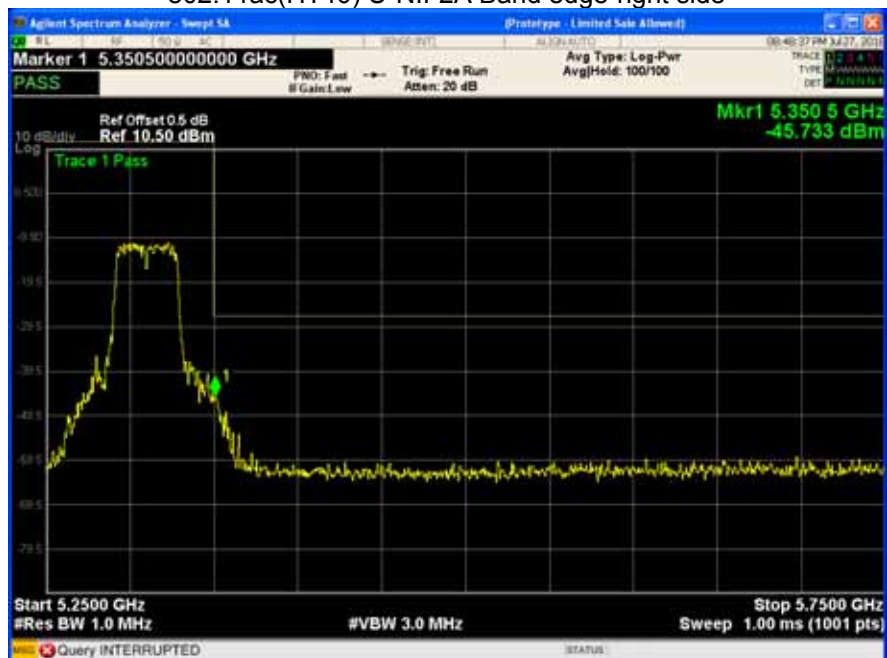
802.11n(HT40) U-NII-2A Band edge-right side



802.11ac(HT40) U-NII-2A Band edge-left side



802.11ac(HT40) U-NII-2A Band edge-right side



802.11ac(HT80) U-NII-2A Band edge



802.11a U-NII-2C Band edge-left side



802.11a U-NII-2C Band edge-right side



802.11n(HT20) U-NII-2C Band edge-left side



802.11n(HT20) U-NII-2C Band edge-right side



802.11ac(HT20) U-NII-2C Band edge-left side



802.11ac(HT20) U-NII-2C Band edge-right side



802.11n(HT40) U-NII-2C Band edge-left side



802.11n(HT40) U-NII-2C Band edge-right side



802.11ac(HT40) U-NII-2C Band edge-left side



802.11ac(HT40) U-NII-2C Band edge-right side



802.11ac(HT80) U-NII-2C Band edge-left side



802.11a U-NII-3 Band edge-left side



802.11a U-NII-3 Band edge-right side



802.11n(HT20) U-NII-3 Band edge-left side



802.11n(HT20) U-NII-3 Band edge-right side



802.11ac(HT20) U-NII-3 Band edge-left side



802.11ac(HT20) U-NII-3 Band edge-right side



802.11n(HT40) U-NII-3 Band edge-left side



802.11n(HT40) U-NII-3 Band edge-right side



802.11ac(HT40) U-NII-3 Band edge-left side



802.11ac(HT40) U-NII-3 Band edge-left side



802.11ac(HT80) U-NII-3 Band edge



12 26 dB Bandwidth and 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Test Limit:	No restriction limits for U-NII-1/II/III. Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Test Result:	PASS

12.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

12.2 Test Result:

Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
U-NII-1	802.11a	17.820	17.820	17.820	17.766	17.766	17.766
	802.11n(HT20)	17.820	17.820	17.820	17.766	17.766	17.766
	802.11ac(HT20)	17.766	17.766	17.766	17.766	17.766	17.766
	802.11n(HT40)	36.520	/	36.520	36.190	/	36.190
	802.11ac(HT40)	36.520	/	36.520	36.190	/	36.190
	802.11ac(HT80)	/	75.312	/	/	75.012	/

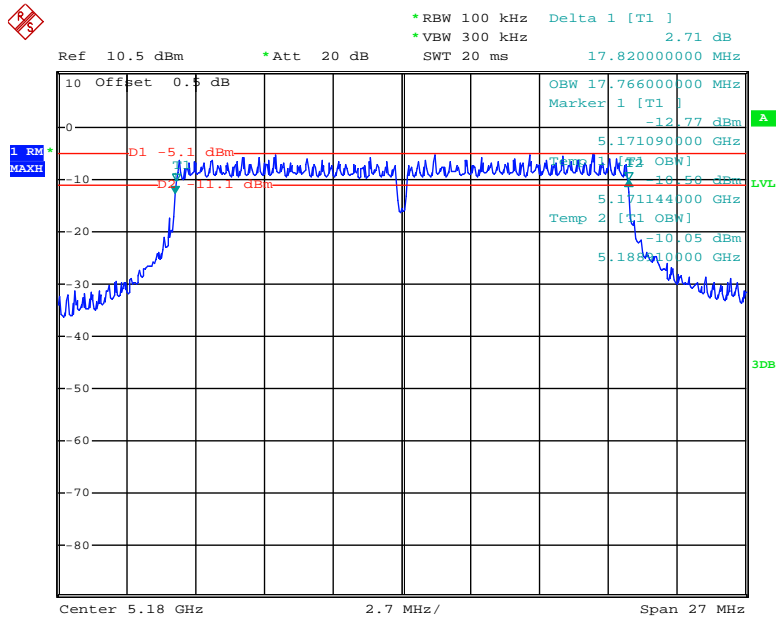
Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
U-NII-2A	802.11a	17.820	17.820	17.820	17.776	17.766	17.766
	802.11n(HT20)	17.820	17.820	17.820	17.766	17.766	17.766
	802.11ac(HT20)	17.766	17.766	17.766	17.766	17.766	17.766
	802.11n(HT40)	36.520	/	36.520	36.190	/	36.190
	802.11ac(HT40)	36.520	/	36.520	36.190	/	36.190
	802.11ac(HT80)	/	75.468	/	/	75.012	/

Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
U-NII-2C	802.11a	17.766	17.820	17.820	17.776	17.766	18.954
	802.11n(HT20)	17.766	17.766	17.820	17.766	17.766	17.792
	802.11ac(HT20)	17.766	17.766	17.766	17.766	17.766	18.846
	802.11n(HT40)	36.520	/	36.520	36.300	/	36.410
	802.11ac(HT40)	36.520	/	36.520	36.190	/	36.190
	802.11ac(HT80)	/	75.468	/	/	75.240	/

Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
U-NII-3	802.11a	17.820	17.820	17.820	19.602	20.034	19.278
	802.11n(HT20)	17.820	17.820	17.820	19.602	20.034	19.548
	802.11ac(HT20)	17.766	17.766	17.766	20.466	20.088	19.332
	802.11n(HT40)	36.520	/	35.520	38.830	/	39.710
	802.11ac(HT40)	36.520	/	36.520	40.150	/	39.270
	802.11ac(HT80)	/	75.468	/	/	77.064	/

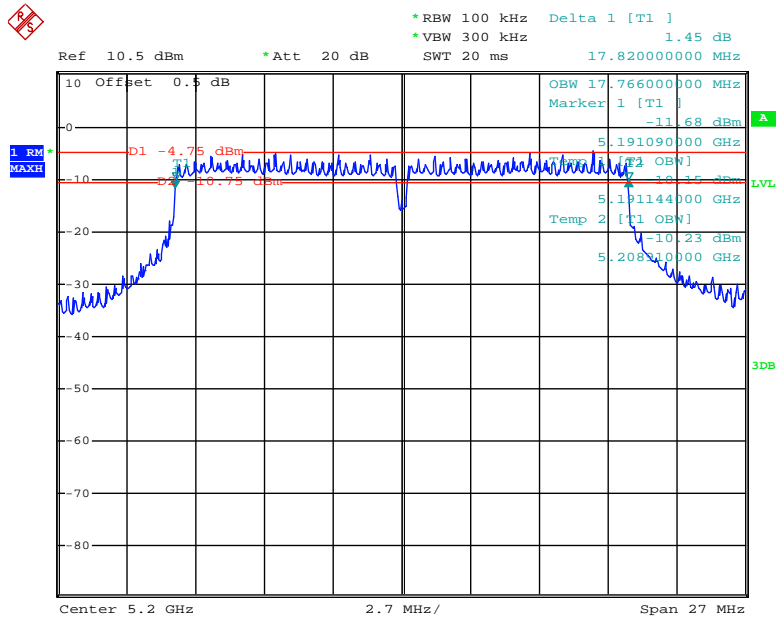
Test result plots shown as follows:

802.11a U-NII-1 Low channel



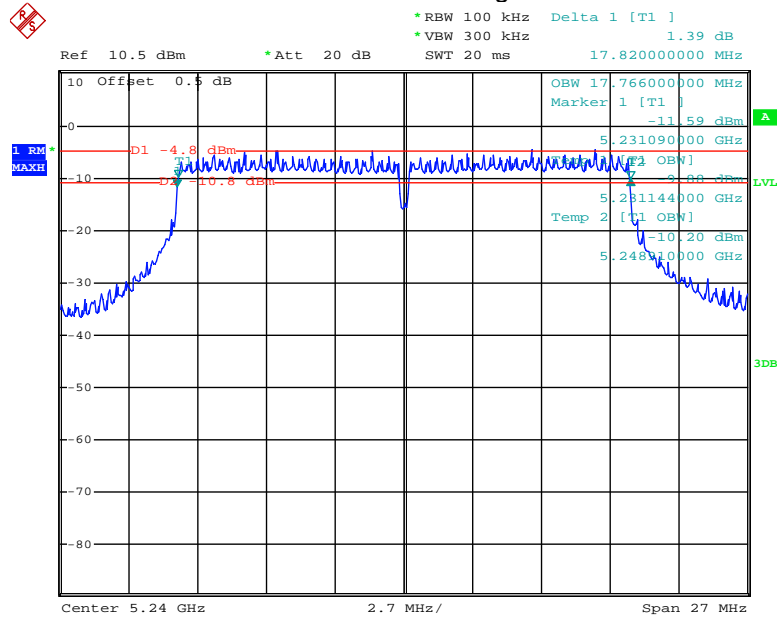
Date: 24.JUL.2018 21:22:58

802.11a U-NII-1 Middle channel



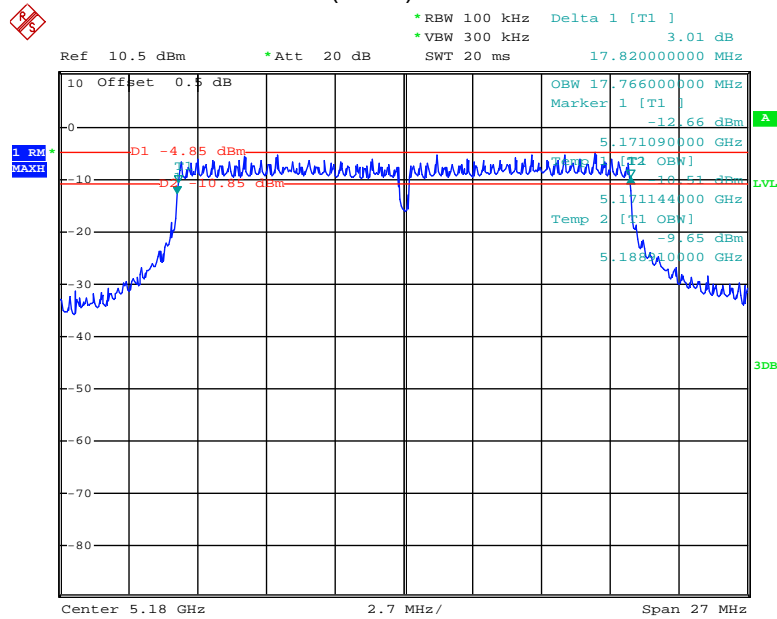
Date: 24.JUL.2018 21:31:32

802.11a U-NII-1 High channel



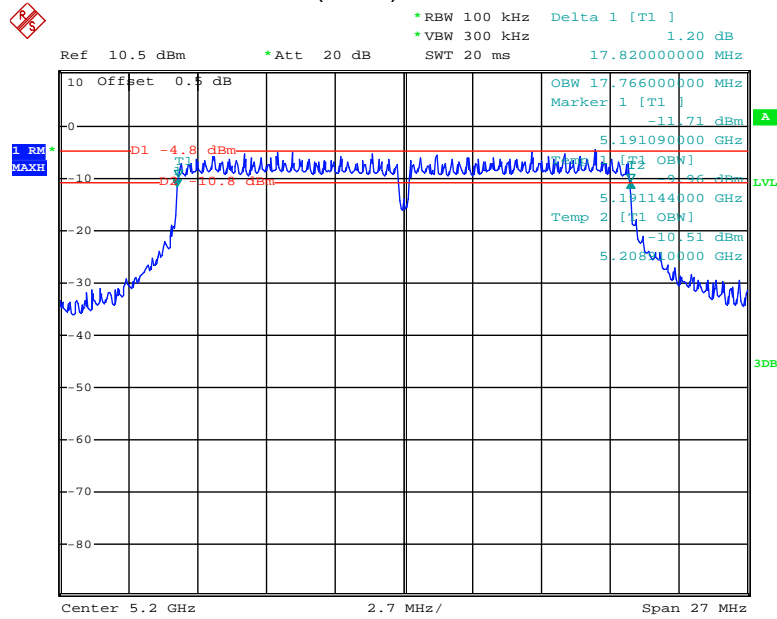
Date: 24.JUL.2018 21:37:22

802.11n(HT20) U-NII-1 Low channel



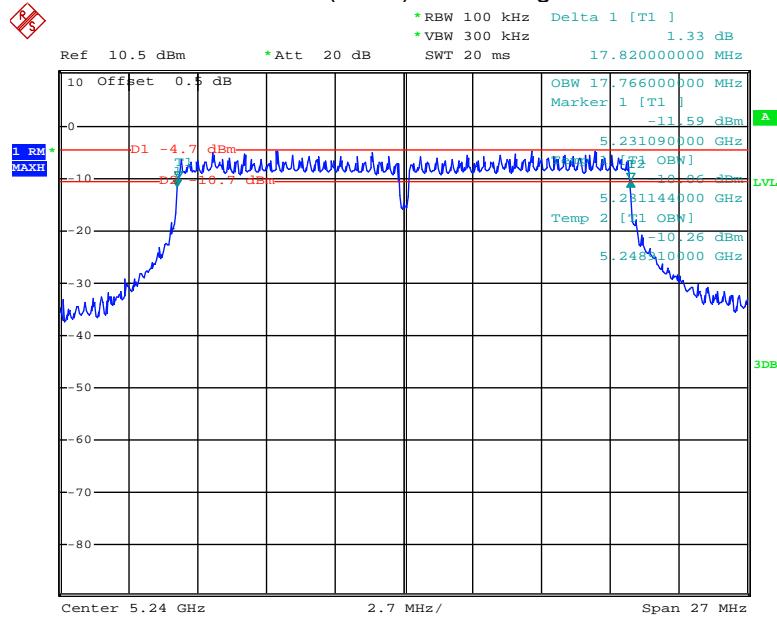
Date: 24.JUL.2018 21:24:18

802.11n(HT20) U-NII-1 Middle channel

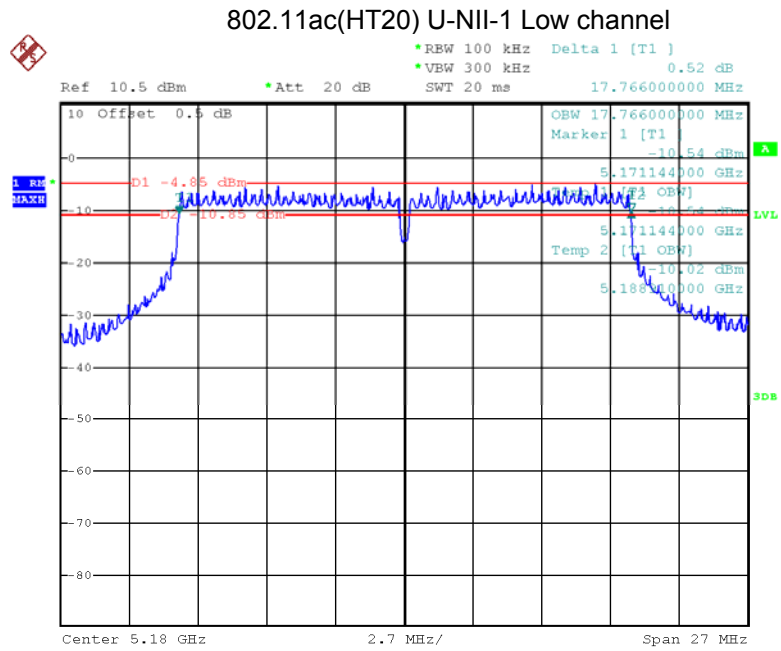


Date: 24.JUL.2018 21:32:27

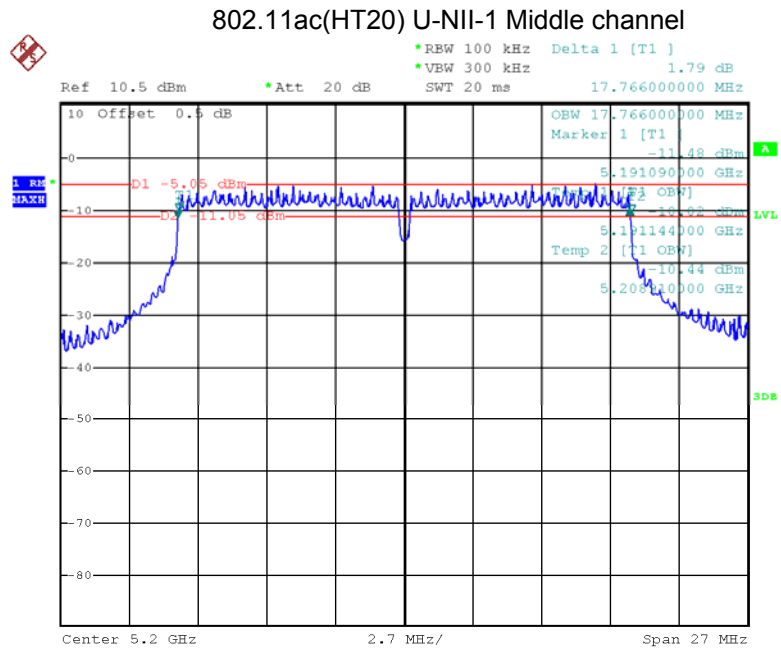
802.11n(HT20) U-NII-1 High channel



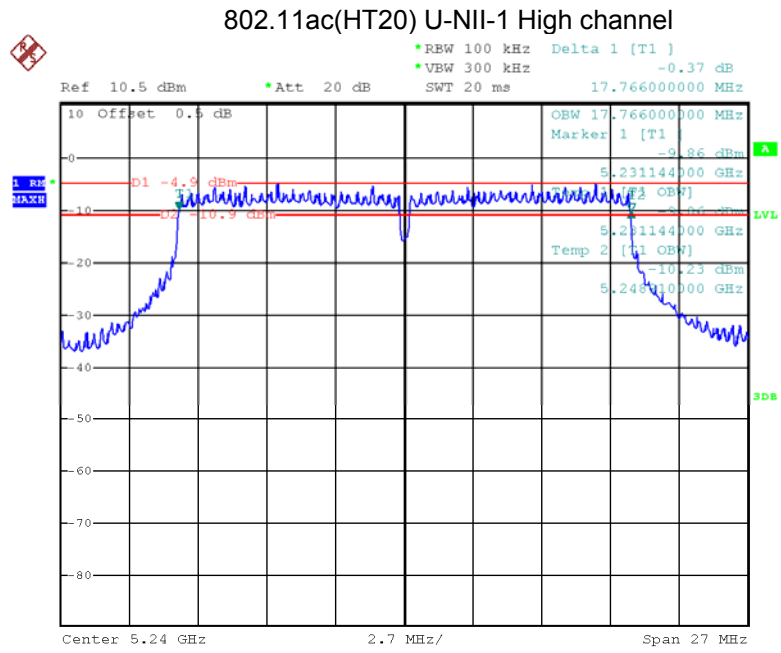
Date: 24.JUL.2018 21:38:23



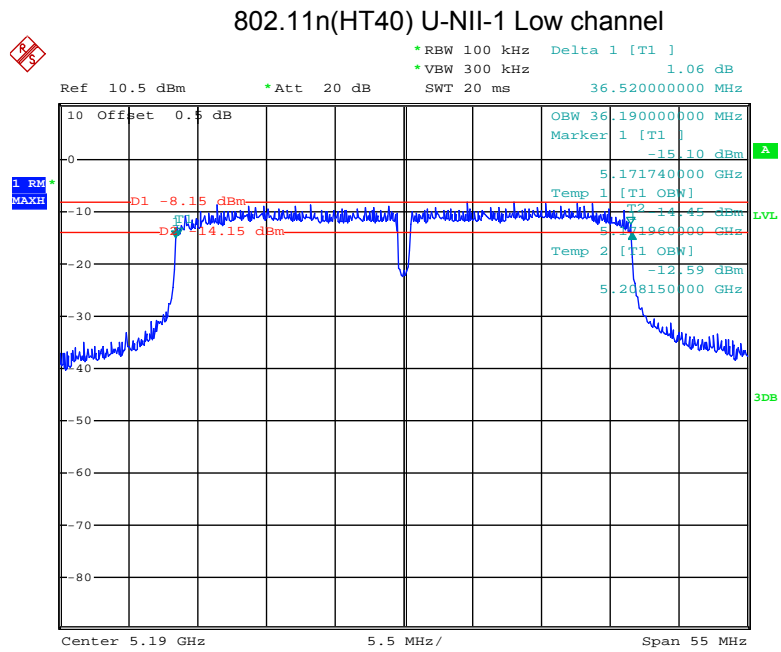
Date: 26.JUL.2018 21:32:57



Date: 26.JUL.2018 21:36:38

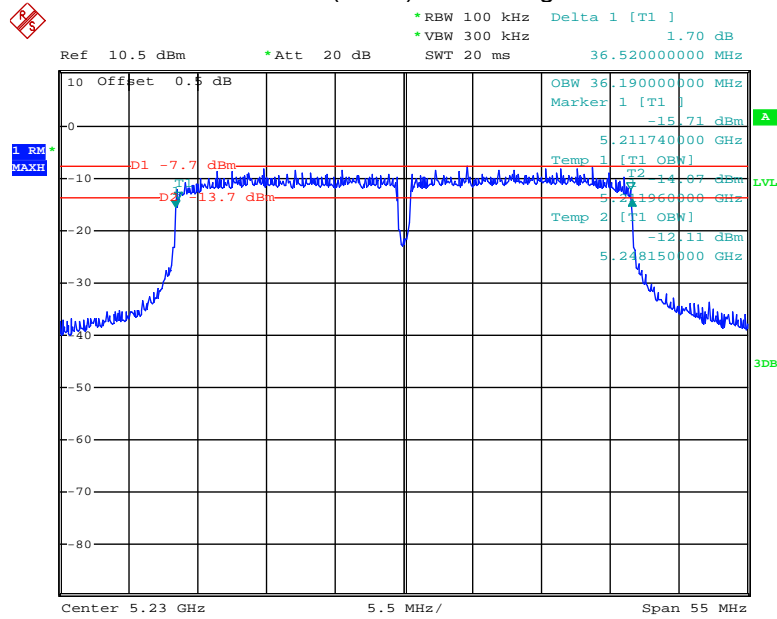


Date: 26.JUL.2018 21:39:18



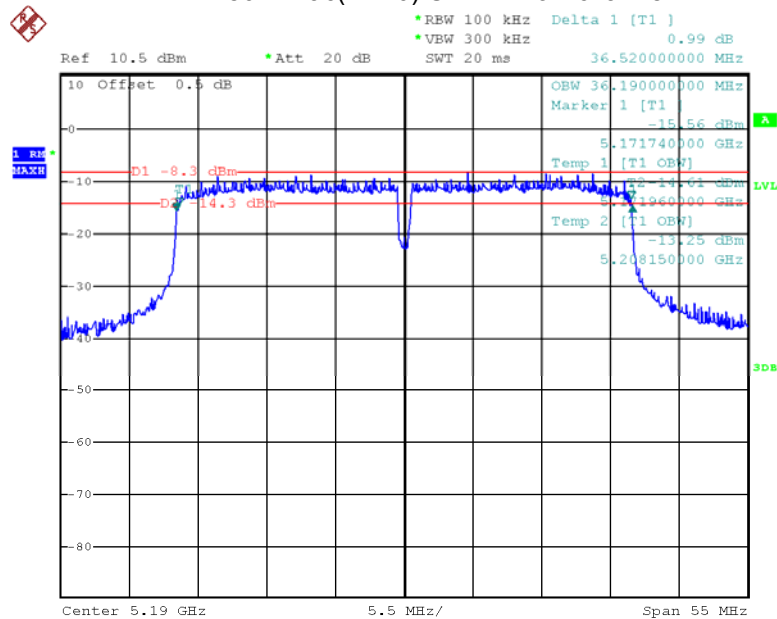
Date: 24.JUL.2018 21:43:10

802.11n(HT40) U-NII-1 Highchannel

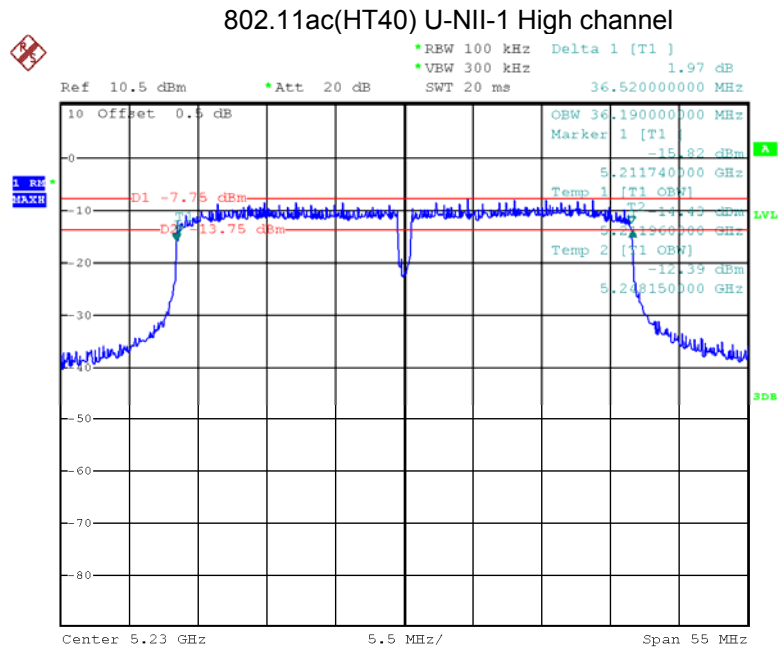


Date: 24.JUL.2018 21:48:46

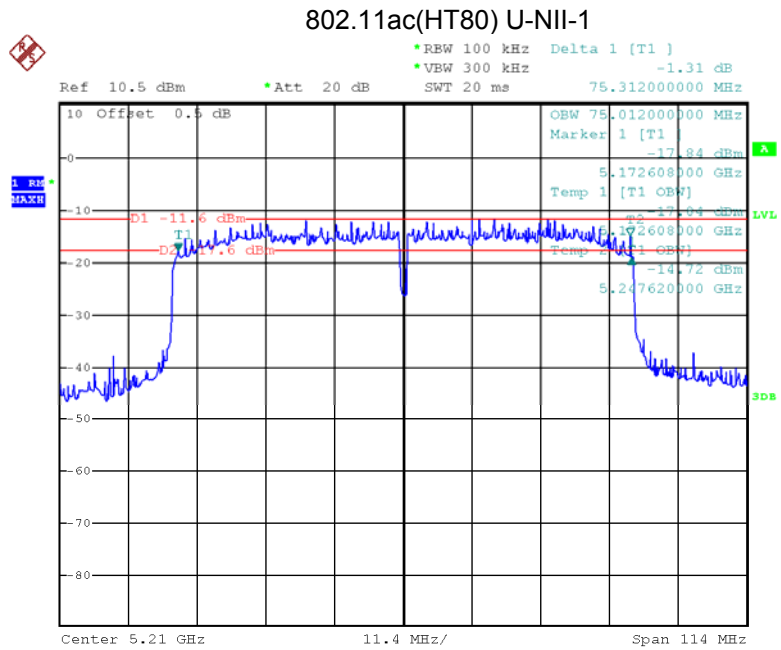
802.11ac(HT40) U-NII-1 Low channel



Date: 26.JUL.2018 21:42:32

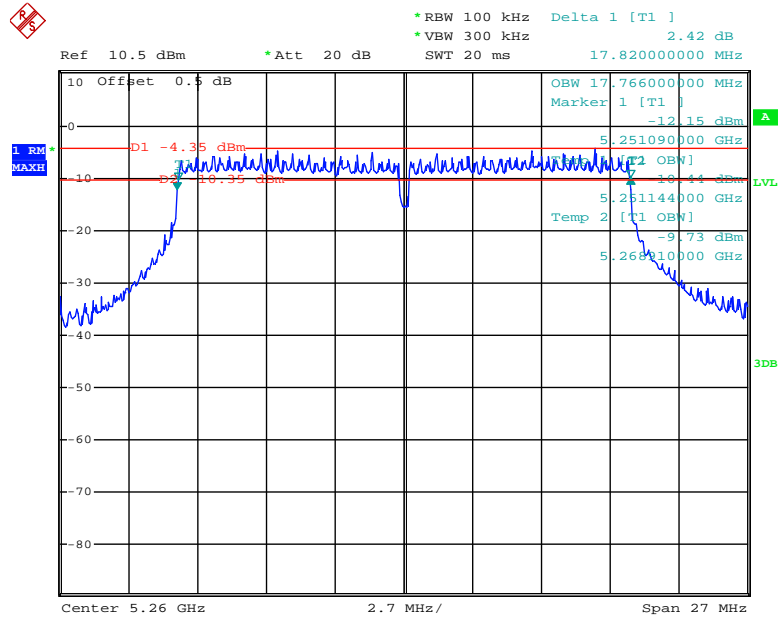


Date: 26.JUL.2018 21:46:43



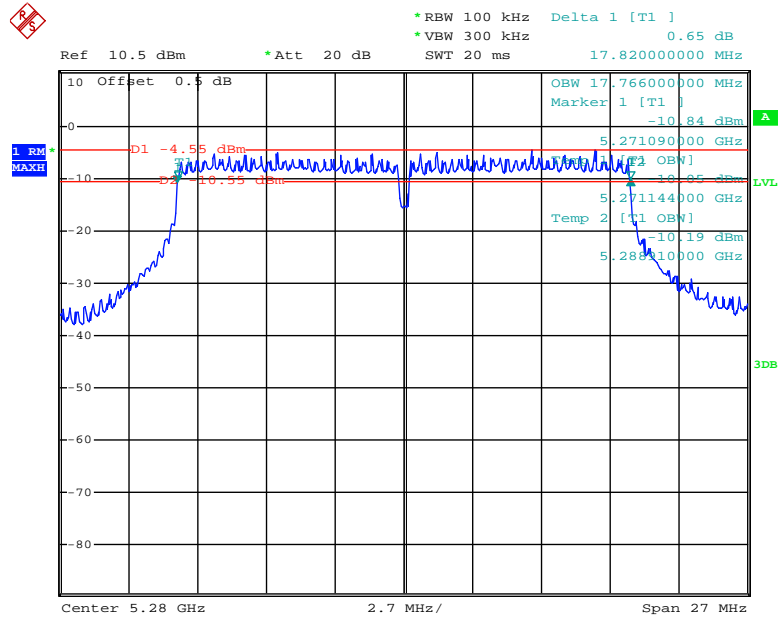
Date: 29.JUL.2018 21:42:31

802.11a U-NII-2A Low channel



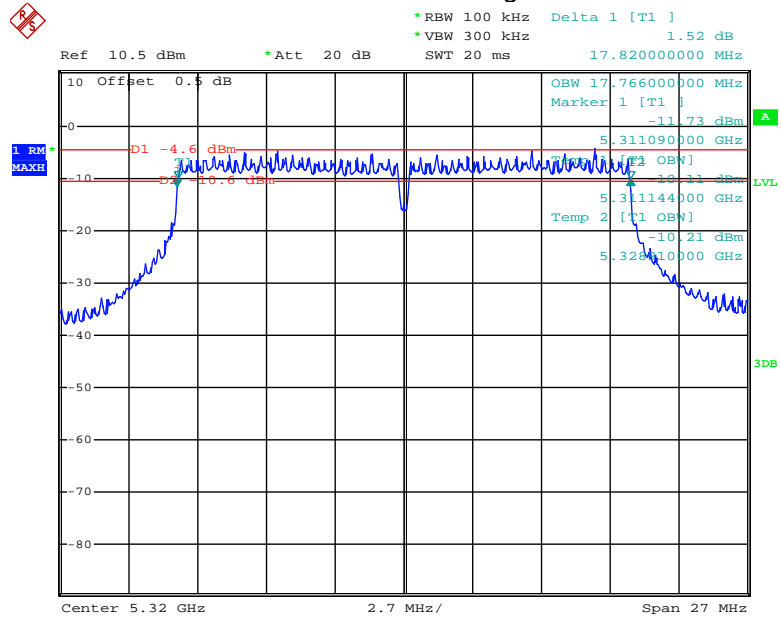
Date: 24.JUL.2018 22:54:45

802.11a U-NII-2A Middle channel



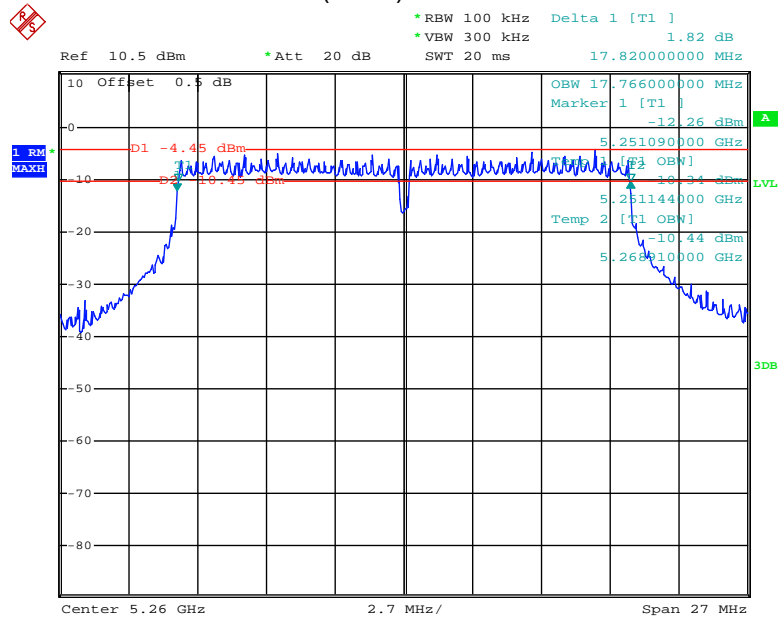
Date: 24.JUL.2018 23:00:43

802.11a U-NII-2A High channel

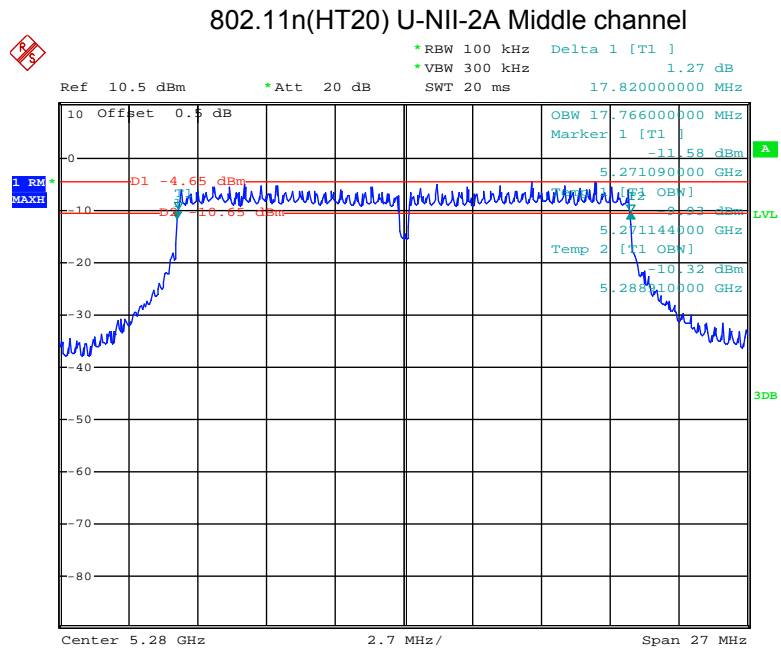


Date: 24.JUL.2018 23:05:08

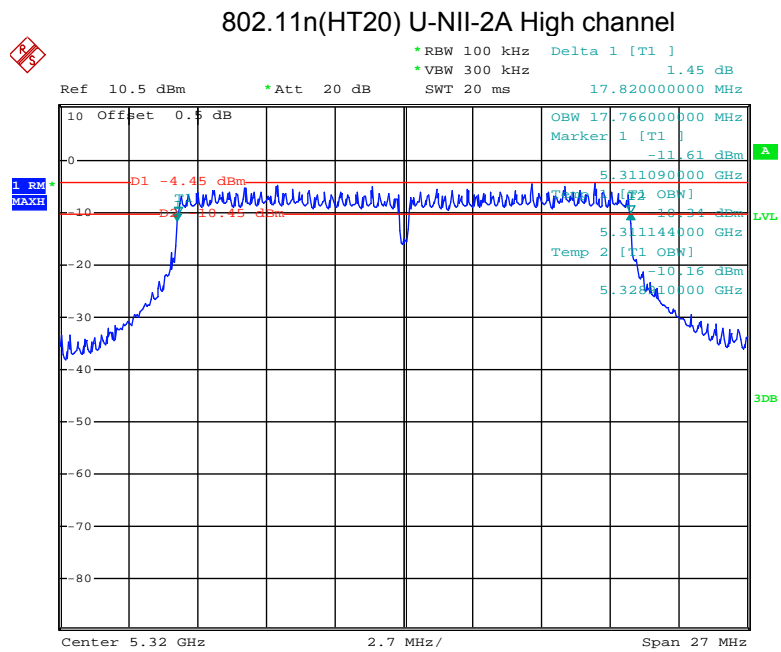
802.11n(HT20) U-NII-2A Low channel



Date: 24.JUL.2018 22:55:38

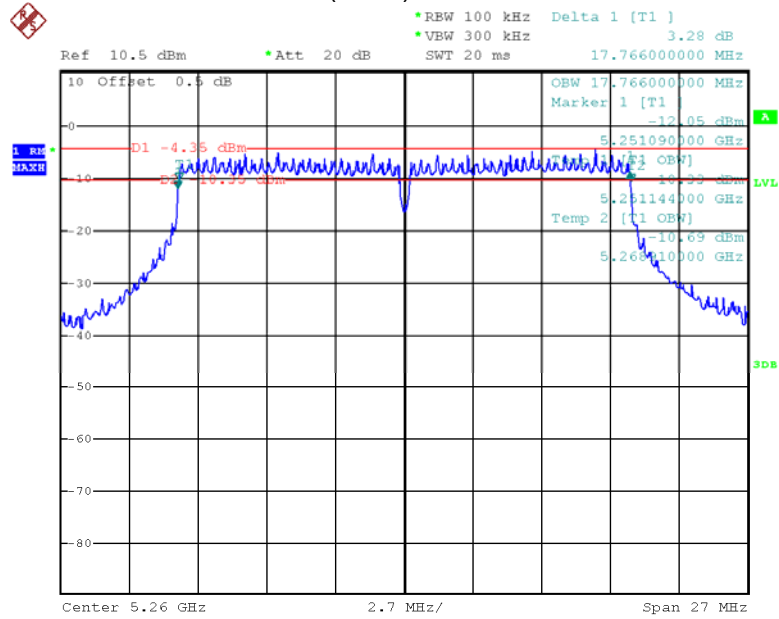


Date: 24.JUL.2018 23:01:51



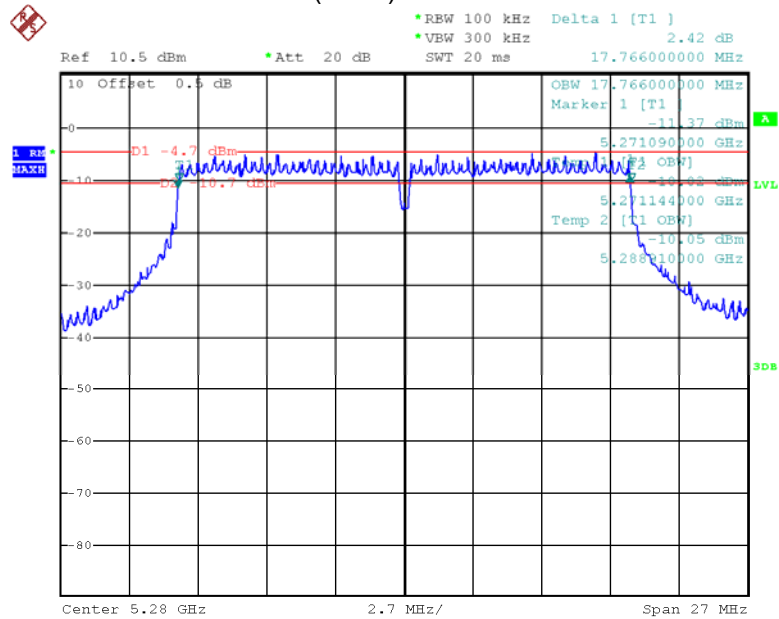
Date: 24.JUL.2018 23:06:17

802.11ac(HT20) U-NII-2A Low channel

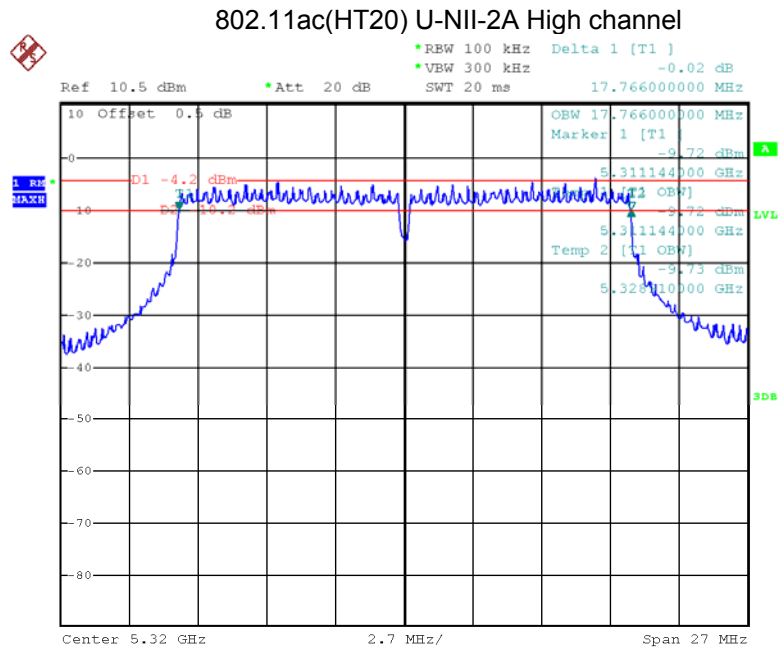


Date: 26.JUL.2018 21:55:29

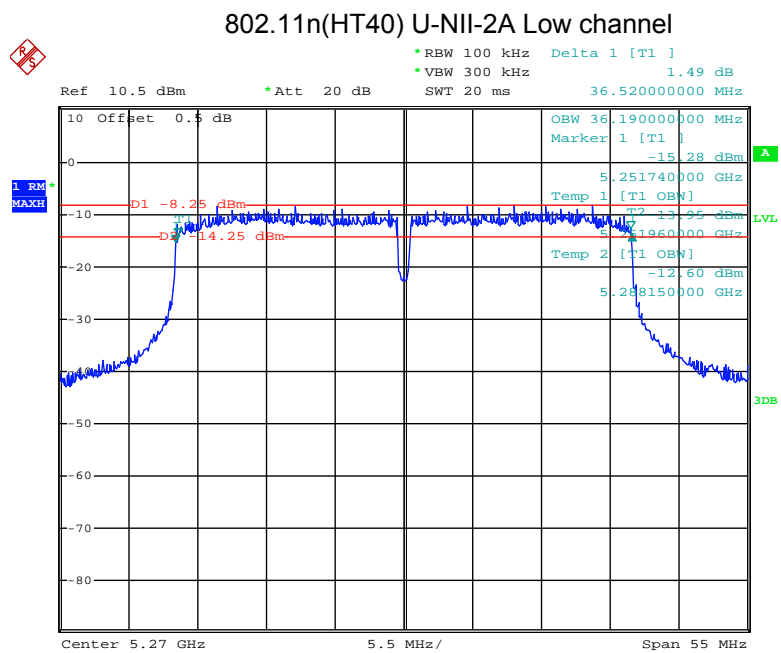
802.11ac(HT20) U-NII-2A Middle channel



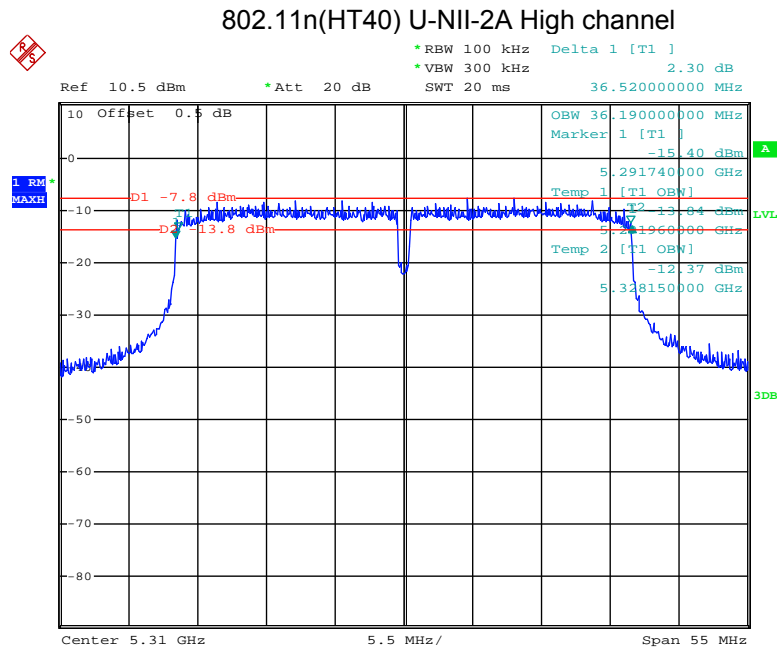
Date: 26.JUL.2018 22:00:26



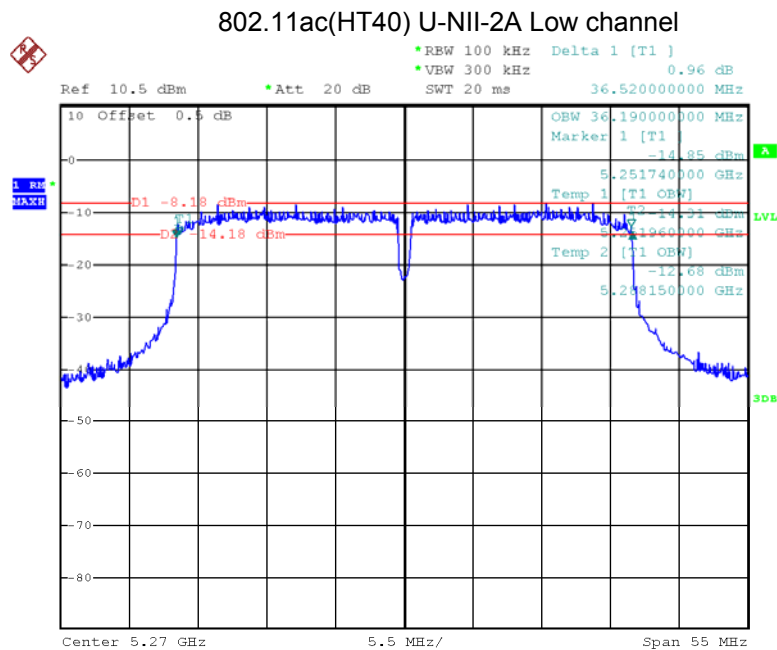
Date: 26.JUL.2018 22:02:56



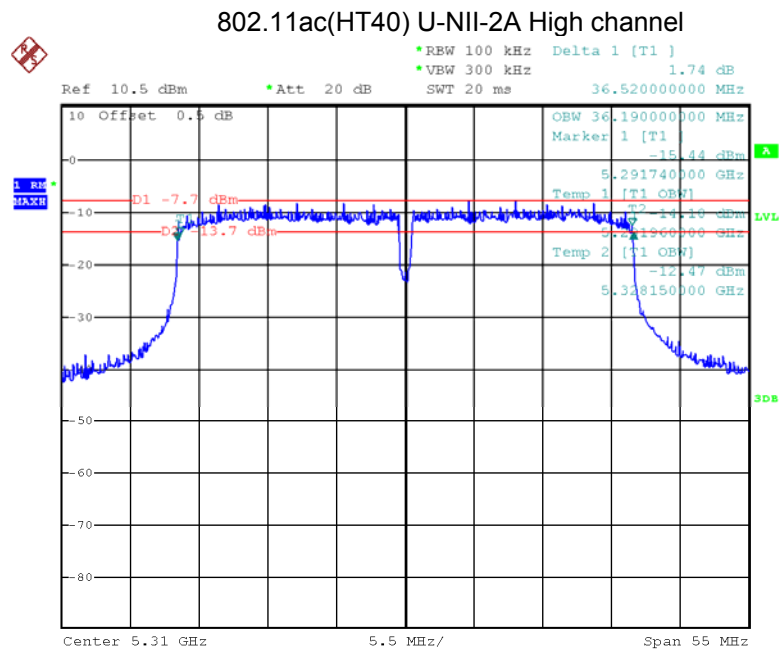
Date: 24.JUL.2018 23:09:54



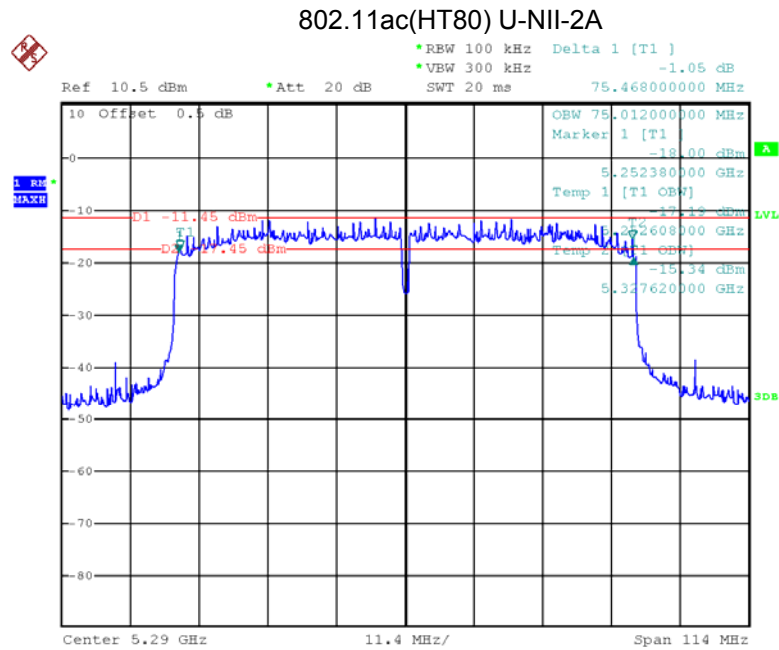
Date: 25.JUL.2018 00:53:55



Date: 26.JUL.2018 22:09:58

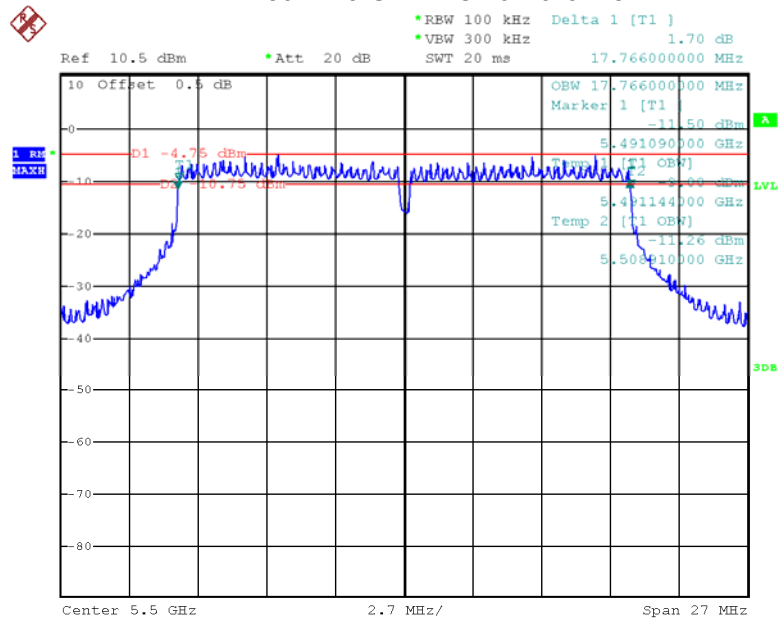


Date: 26.JUL.2018 22:13:15



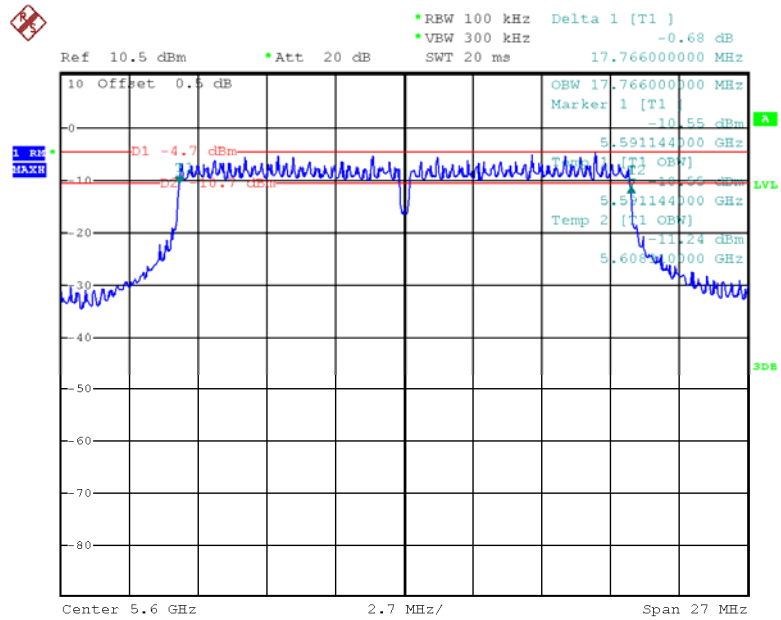
Date: 29.JUL.2018 21:53:02

802.11a U-NII-2C Low channel



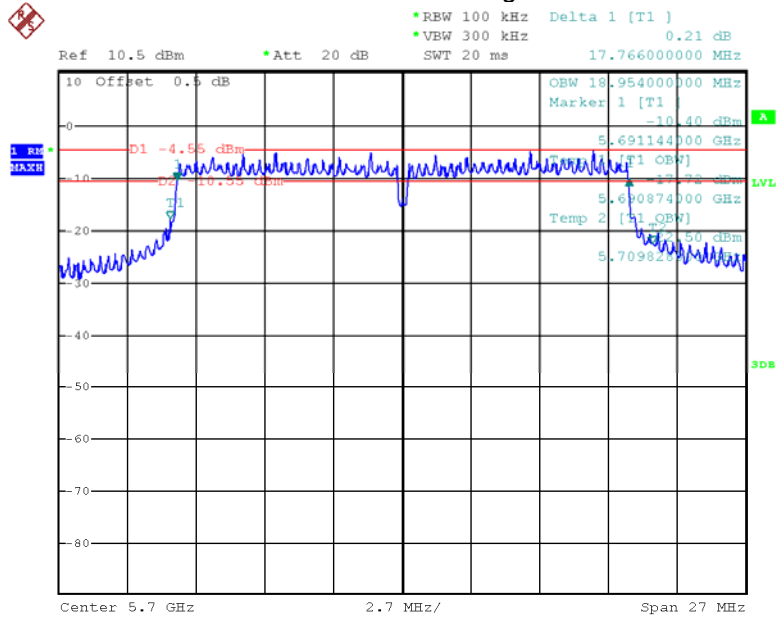
Date: 26.JUL.2018 06:51:24

802.11a U-NII-2C Middle channel



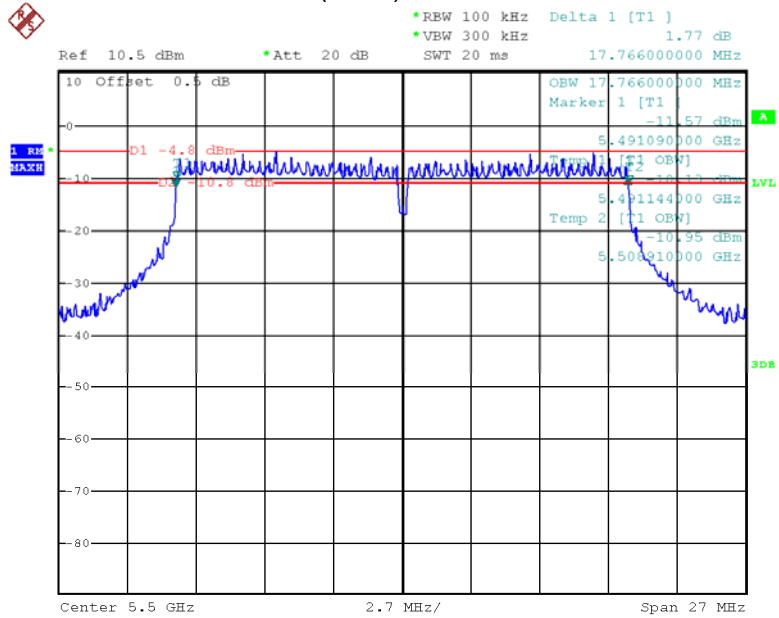
Date: 26.JUL.2018 06:59:35

802.11a U-NII-2C High channel

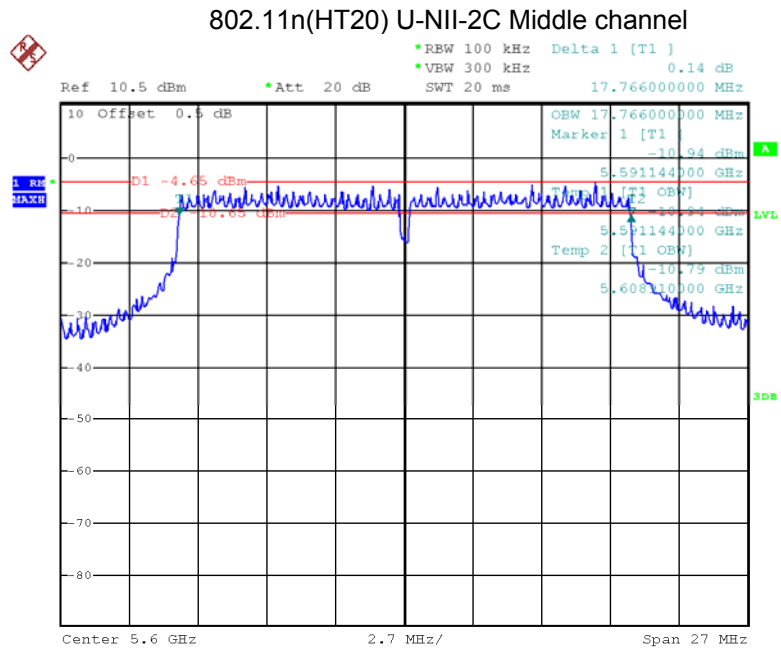


Date: 26.JUL.2018 07:03:32

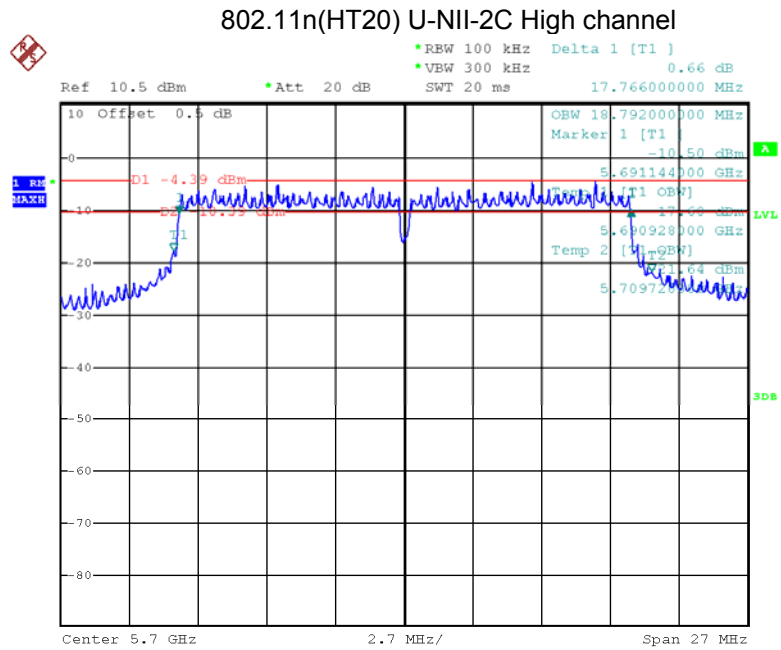
802.11n(HT20) U-NII-2C Low channel



Date: 26.JUL.2018 06:52:31

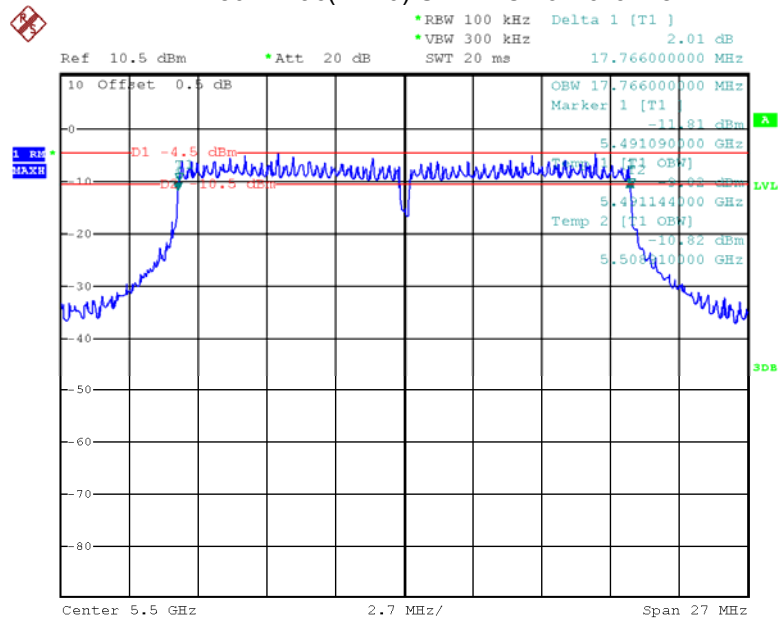


Date: 26.JUL.2018 06:58:39



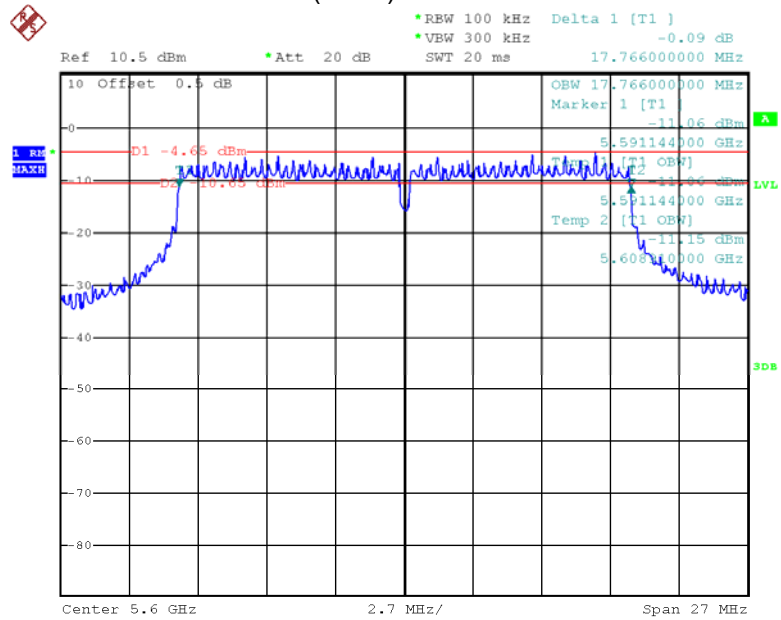
Date: 26.JUL.2018 07:04:37

802.11ac(HT20) U-NII-2C Low channel



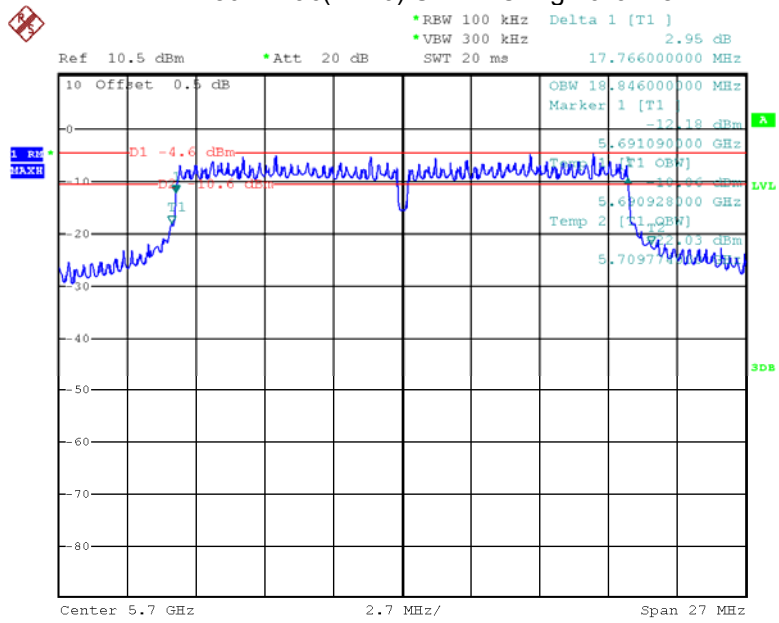
Date: 26.JUL.2018 22:20:47

802.11ac(HT20) U-NII-2C Middle channel



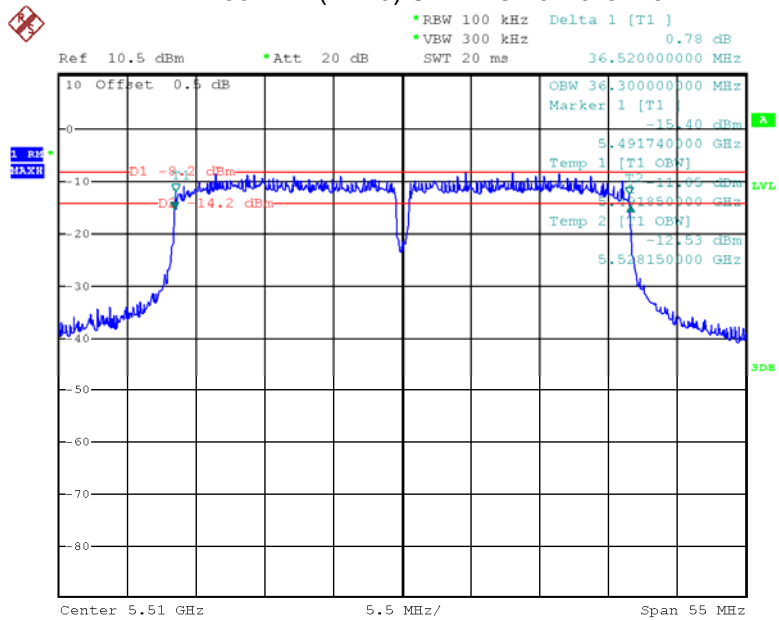
Date: 26.JUL.2018 22:24:51

802.11ac(HT20) U-NII-2C High channel



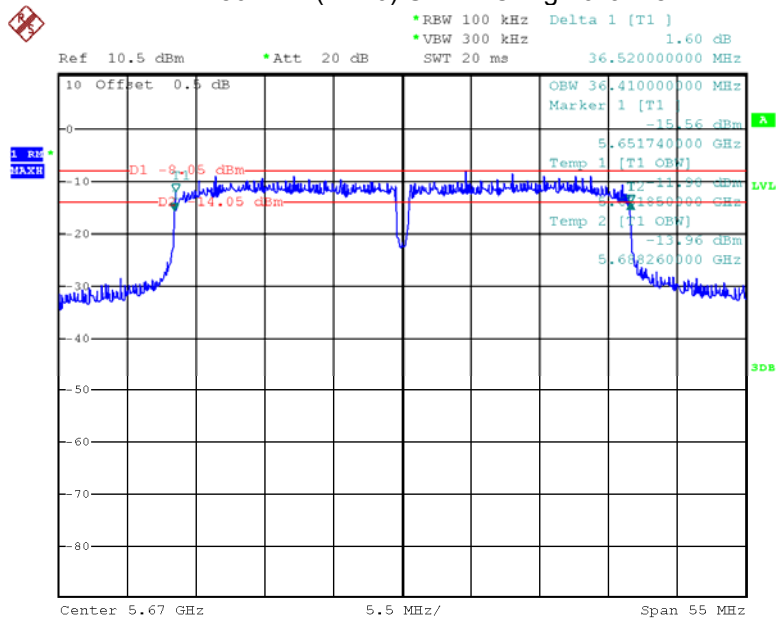
Date: 26.JUL.2018 22:27:31

802.11n(HT40) U-NII-2C Low channel



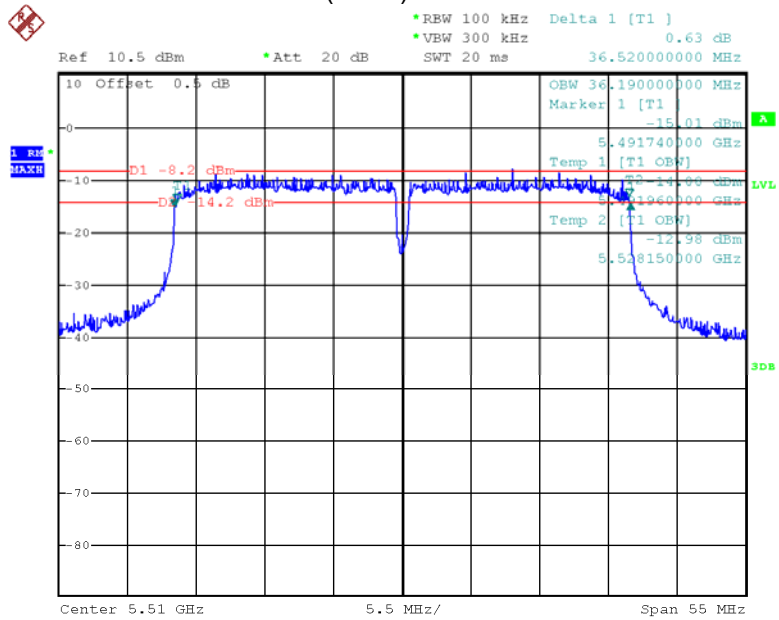
Date: 26.JUL.2018 07:07:43

802.11n(HT40) U-NII-2C High channel



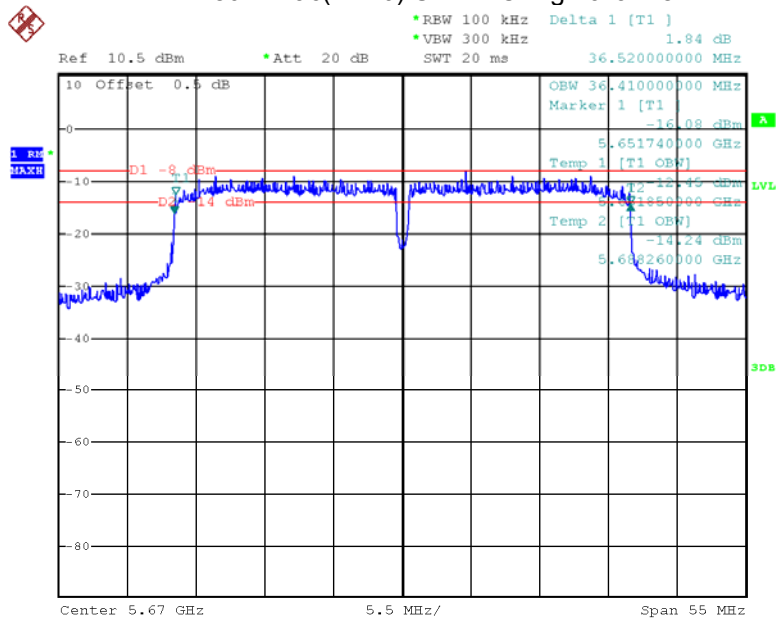
Date: 26.JUL.2018 07:10:58

802.11ac(HT40) U-NII-2C Low channel



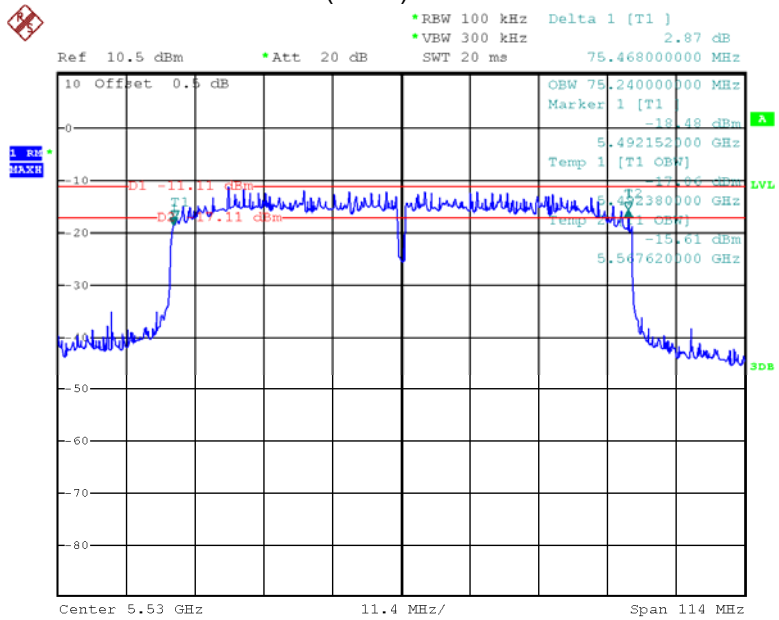
Date: 26.JUL.2018 22:30:21

802.11ac(HT40) U-NII-2C High channel



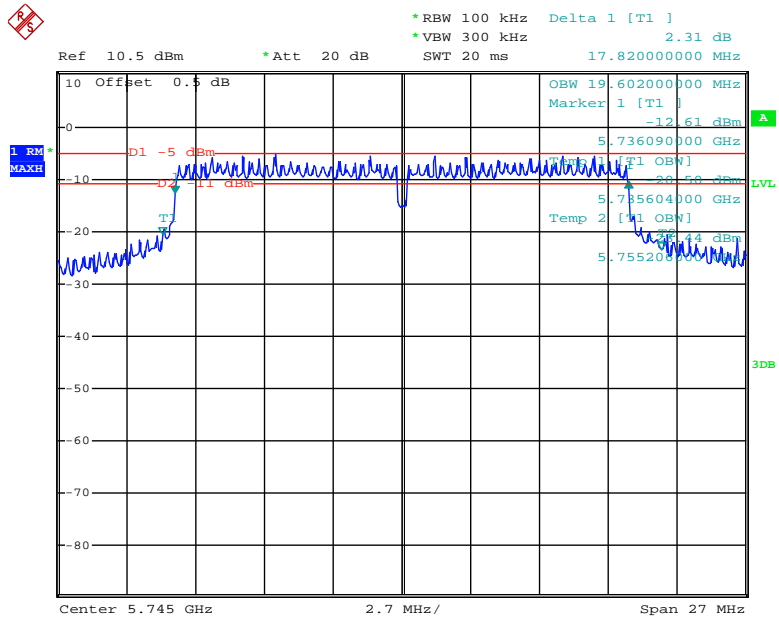
Date: 26.JUL.2018 22:33:13

802.11ac(HT80) U-NII-2C Low channel



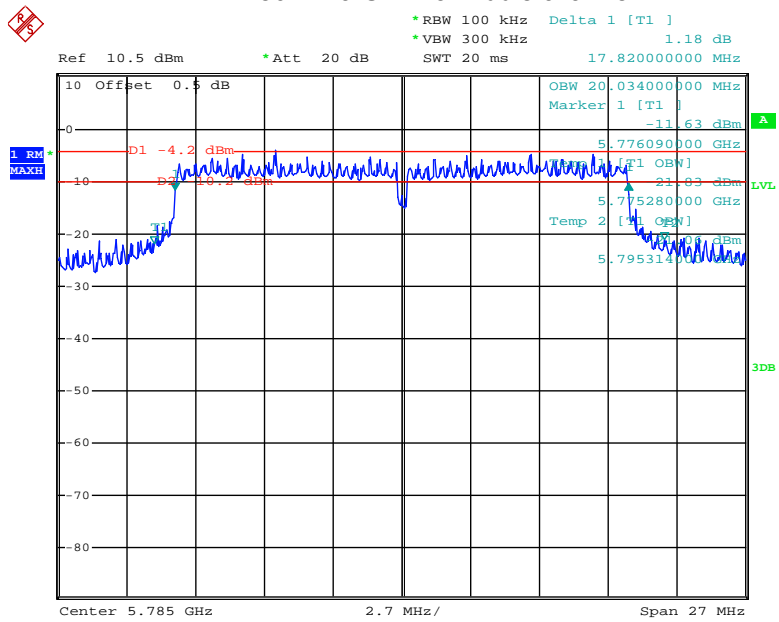
Date: 29.JUL.2018 21:59:00

802.11a U-NII-3 Low channel



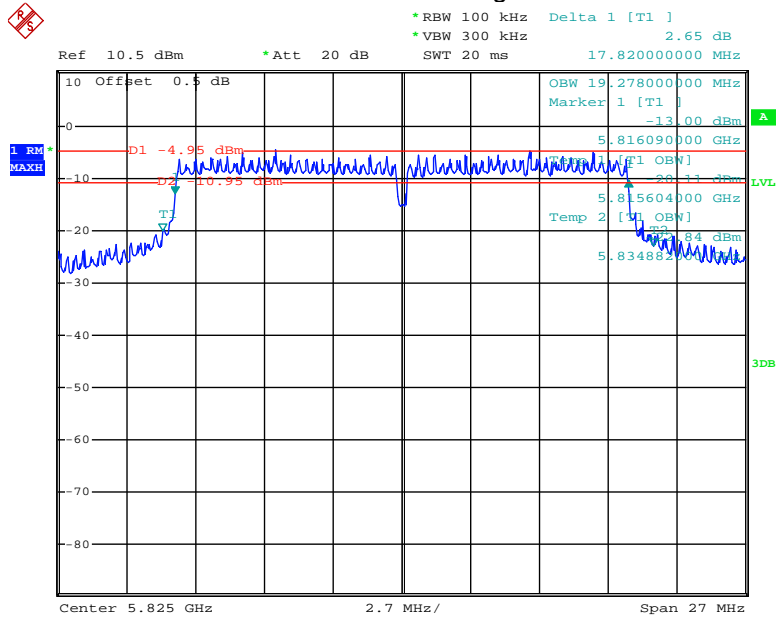
Date: 24.JUL.2018 21:58:02

802.11a U-NII-3 Middle channel



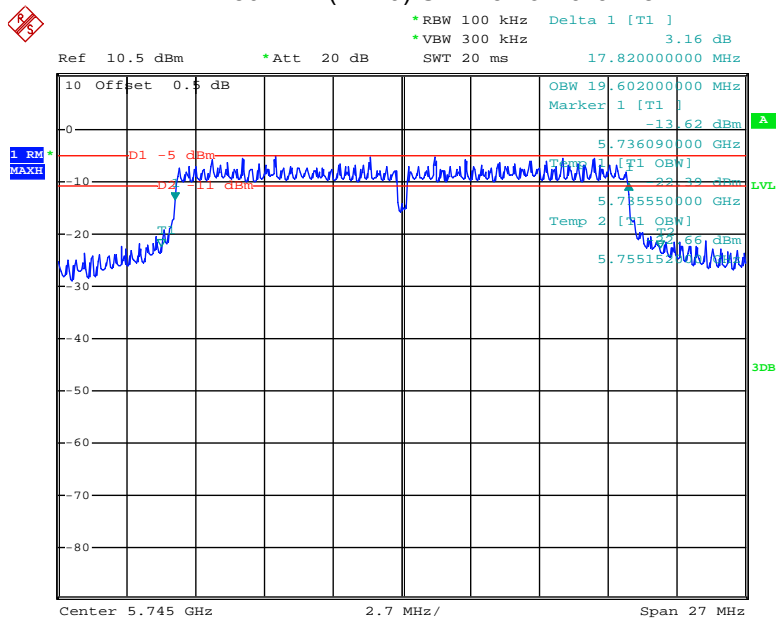
Date: 24.JUL.2018 22:15:55

802.11a U-NII-3 High channel



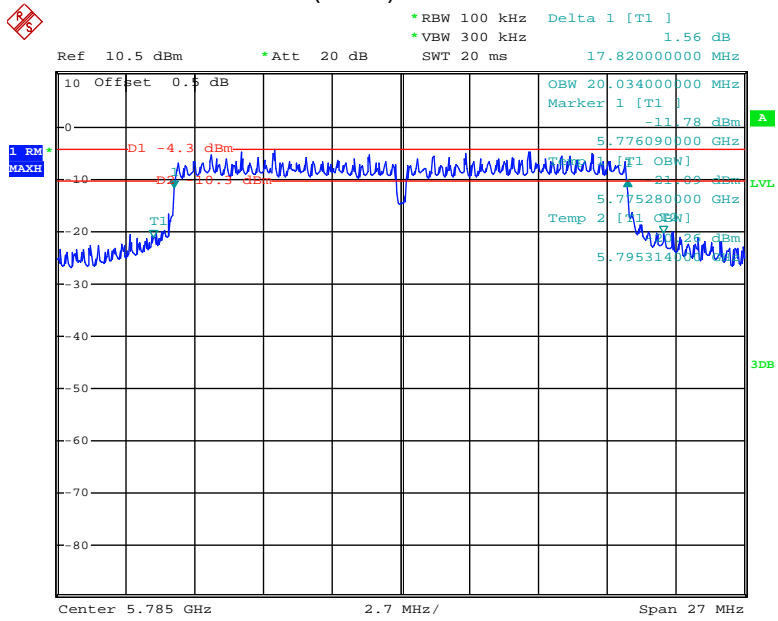
Date: 24.JUL.2018 22:21:43

802.11n(HT20) U-NII-3 Low channel



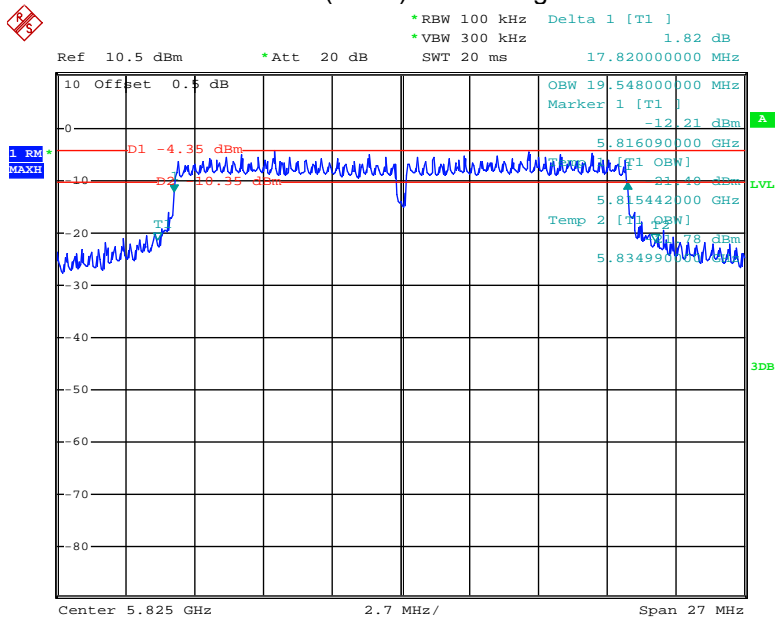
Date: 24.JUL.2018 21:59:05

802.11n(HT20) U-NII-3 Middle channel



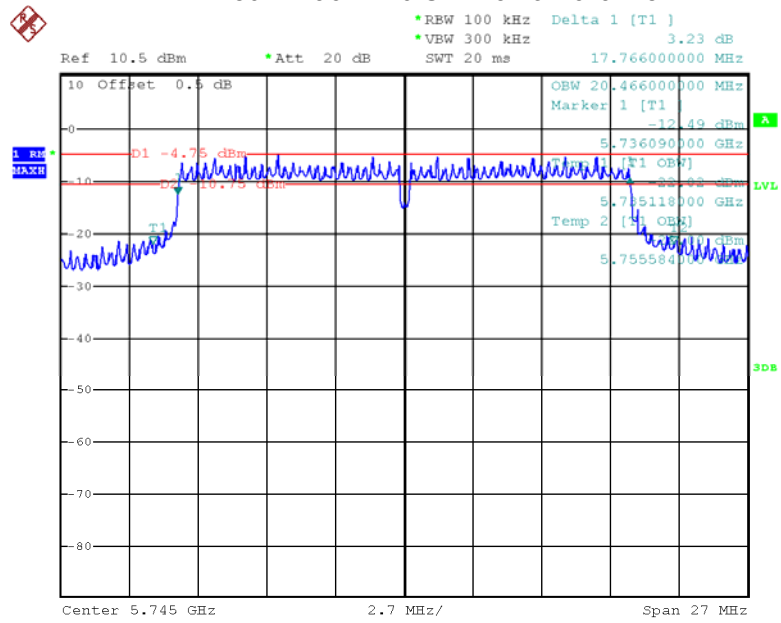
Date: 24.JUL.2018 22:16:54

802.11n(HT20) U-NII-3 High channel



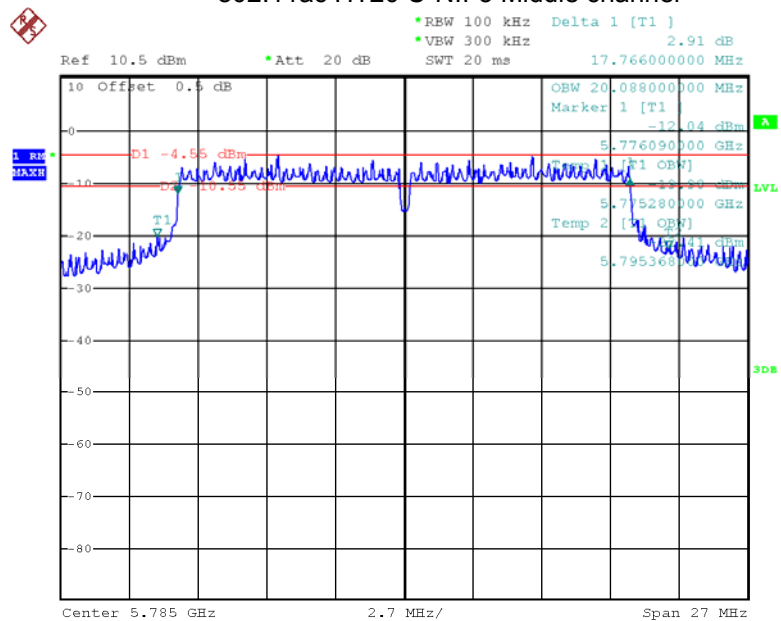
Date: 24.JUL.2018 22:25:58

802.11ac HT20 U-NII-3 Low channel



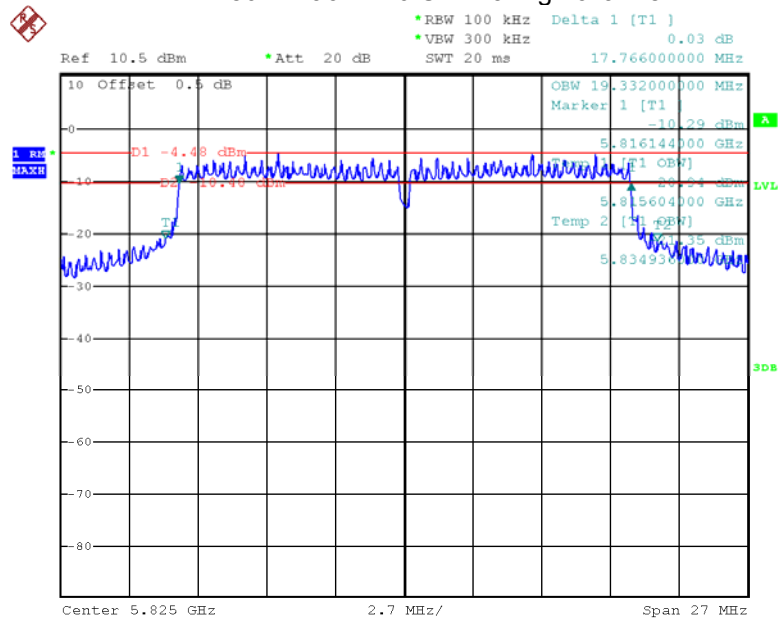
Date: 26.JUL.2018 22:46:57

802.11ac HT20 U-NII-3 Middle channel



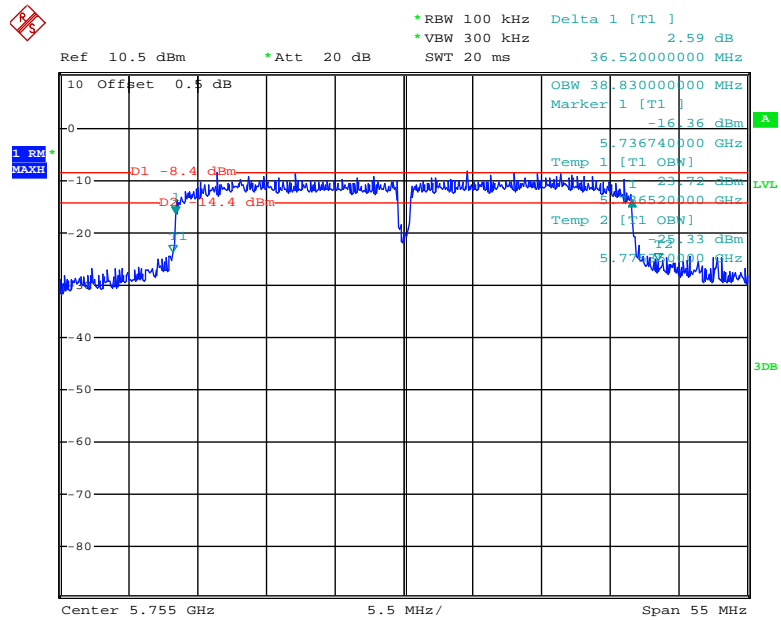
Date: 26.JUL.2018 22:50:22

802.11ac HT20 U-NII-3 High channel



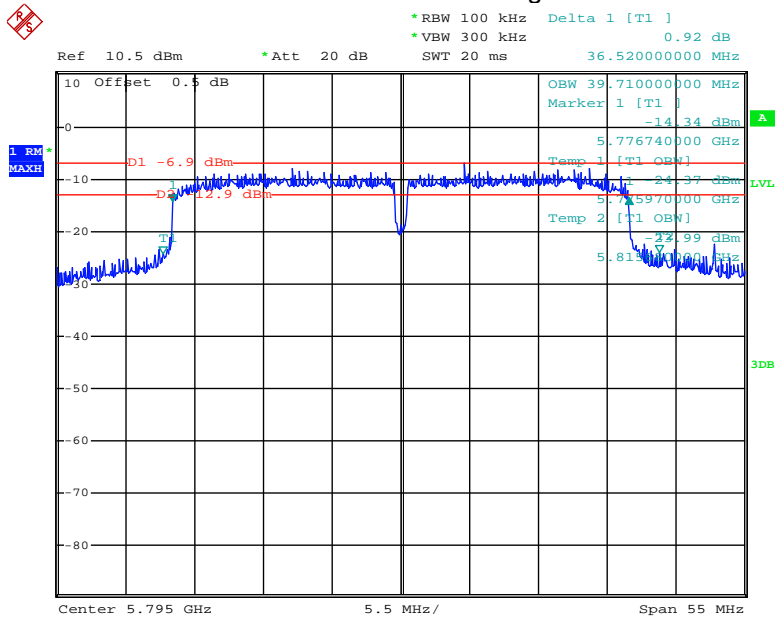
Date: 26.JUL.2018 22:52:37

802.11n HT40 U-NII-3 Low channel



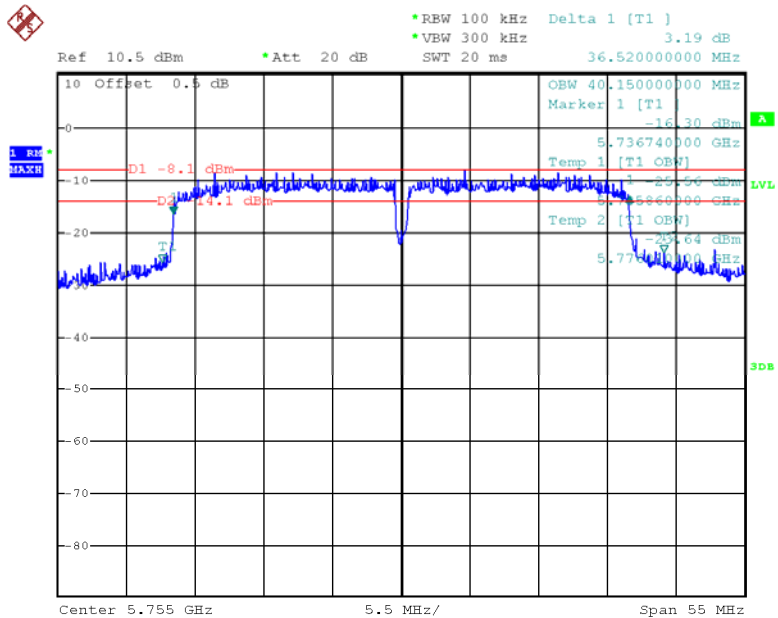
Date: 24.JUL.2018 22:30:44

802.11n HT40 U-NII-3 High channel



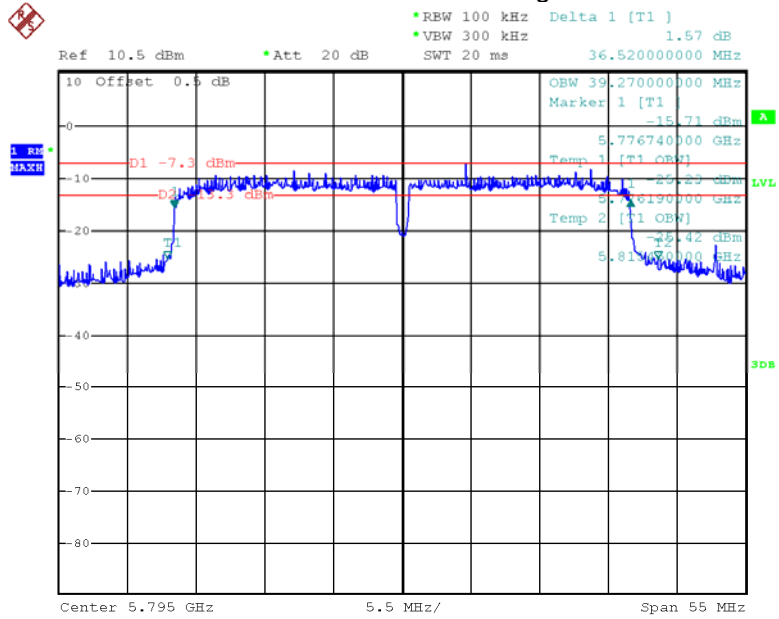
Date: 24.JUL.2018 22:42:01

802.11ac HT40 U-NII-3 Low channel



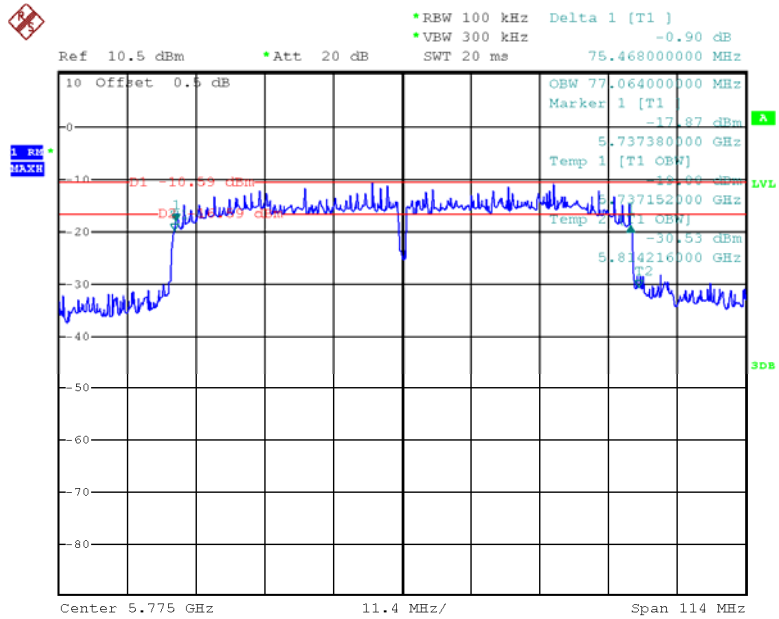
Date: 26.JUL.2018 22:55:58

802.11ac HT40 U-NII-3 High channel



Date: 26.JUL.2018 22:59:07

802.11ac HT80 U-NII-3



Date: 29.JUL.2018 22:07:13

13 Conducted Output Power

Test Requirement:	FCC CFR47 Part 15 Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Test Limit:	24dBm for 5150-5250MHz,5250-5350MHz and 5470-5725MHz; 30 dBm for 5725-5850MHz
Test Result:	PASS Conducted output power= measurement power+10log(1/x)
Remark:	X is duty cycle=1, so 10log(1/1)=0 Conducted output power= measurement power

13.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak, Set the span to fully encompass the DTS bandwidth.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

13.2 Test Result:

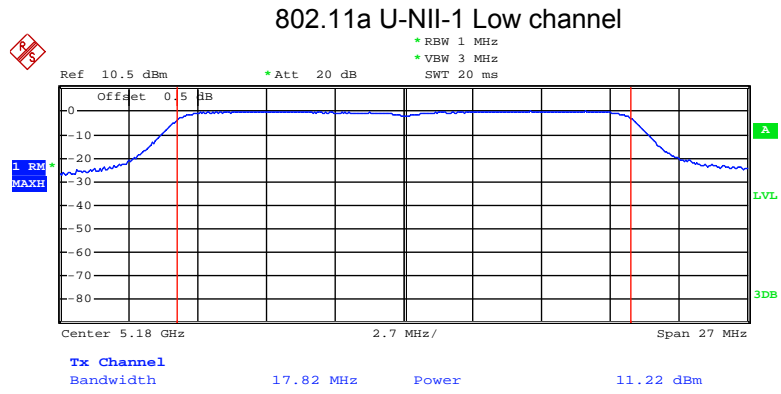
Band	Operation mode	Conducted Output Power (dBm)		
		Low channel	Middle channel	High channel
U-NII-1	802.11a	11.22	11.45	11.72
	802.11n(HT20)	11.19	11.44	11.45
	802.11ac(HT20)	11.17	11.40	11.71
	802.11ac(HT40)	11.30	/	11.81
	802.11n(HT40)	11.33	/	11.82
	802.11ac(HT80)	/	11.27	/

Band	Operation mode	Conducted Output Power (dBm)		
		Low channel	Middle channel	High channel
U-NII-2A	802.11a	11.50	11.65	11.70
	802.11n(HT20)	11.47	11.62	11.63
	802.11ac(HT20)	11.60	11.72	11.67
	802.11ac(HT40)	11.37	/	11.70
	802.11n(HT40)	11.29	/	11.73
	802.11ac(HT80)	/	11.31	/

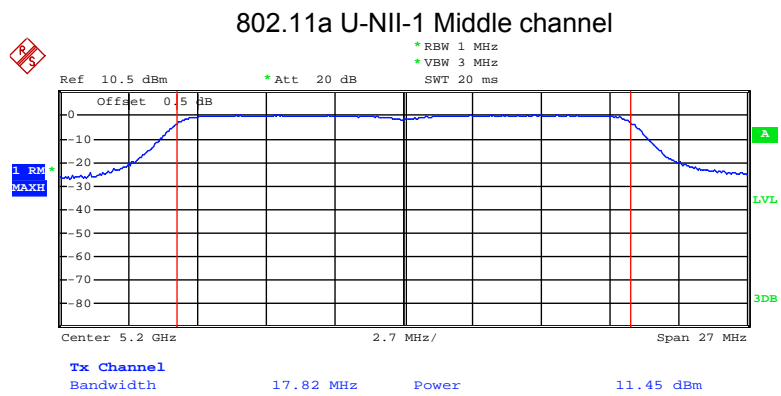
Band	Operation mode	Conducted Output Power (dBm)		
		Low channel	Middle channel	High channel
U- NII- 2C	802.11a	11.05	11.21	11.26
	802.11n(HT20)	11.12	11.14	11.29
	802.11ac(HT20)	11.38	11.18	11.25
	802.11ac(HT40)	11.37	/	11.03
	802.11n(HT40)	11.47	/	11.09
	802.11ac(HT80)	/	11.33	/

Band	Operation mode	Conducted Output Power (dBm)		
		Low channel	Middle channel	High channel
U- NII-3	802.11a	11.02	11.53	11.76
	802.11n(HT20)	10.92	11.45	11.73
	802.11ac(HT20)	11.32	11.26	11.46
	802.11ac(HT40)	11.43	/	11.34
	802.11n(HT40)	11.13	/	11.67
	802.11ac(HT80)	/	11.13	/

Test result plots shown as follows:

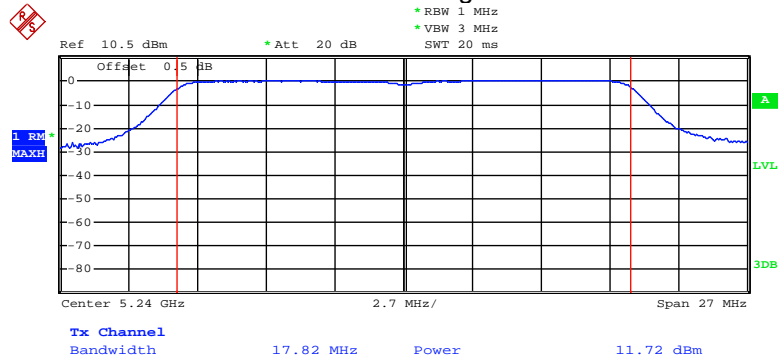


Date: 24.JUL.2018 21:26:14



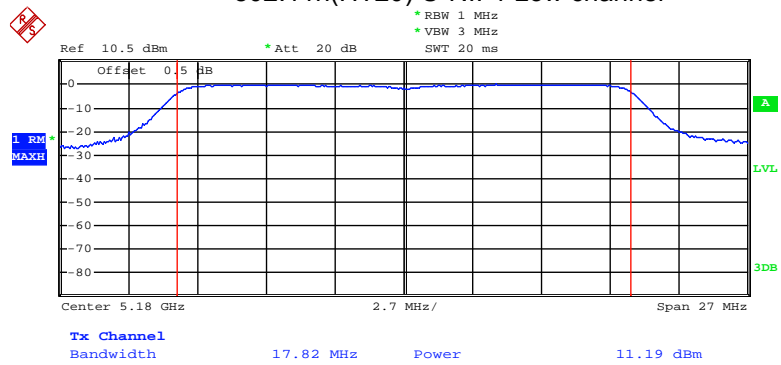
Date: 24.JUL.2018 21:29:24

802.11a U-NII-1 High channel



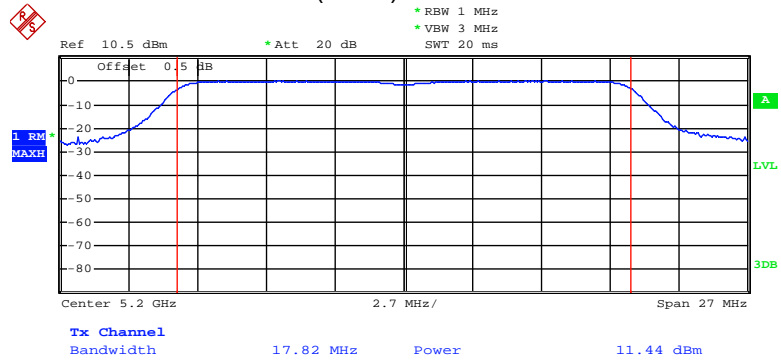
Date: 24.JUL.2018 21:35:07

802.11n(HT20) U-NII-1 Low channel



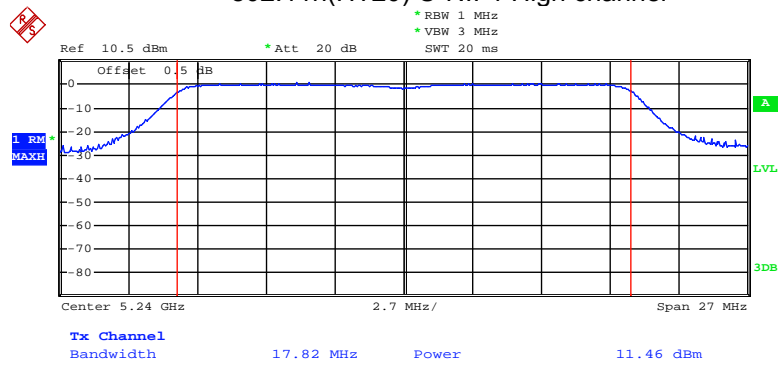
Date: 24.JUL.2018 21:26:31

802.11n(HT20) U-NII-1 Middle channel

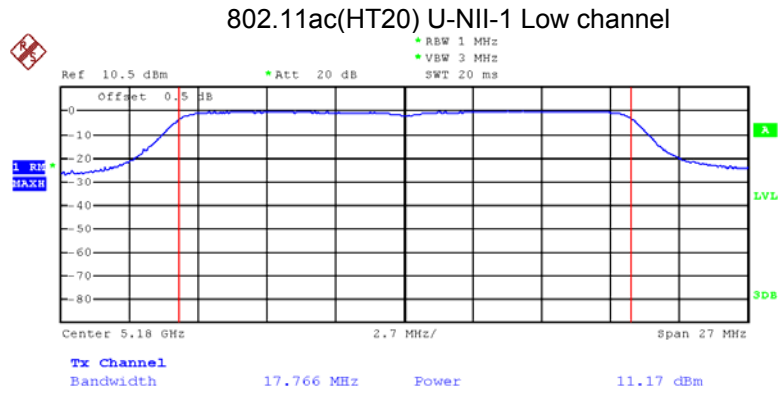


Date: 24.JUL.2018 21:29:52

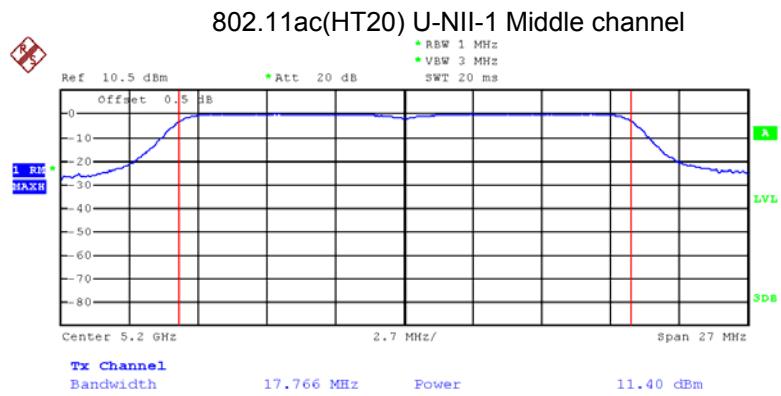
802.11n(HT20) U-NII-1 High channel



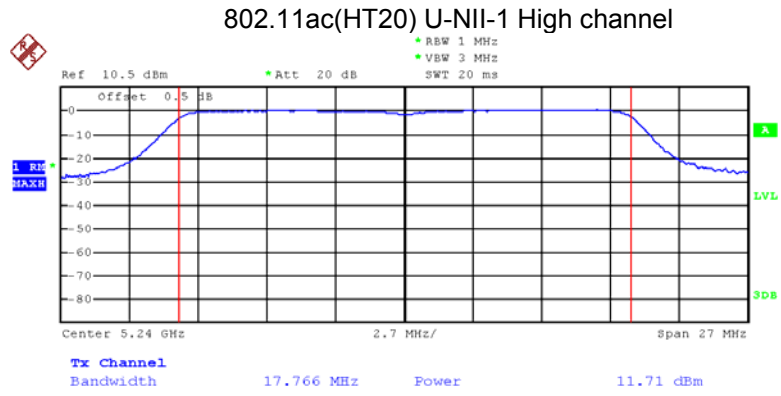
Date: 24.JUL.2018 21:53:17



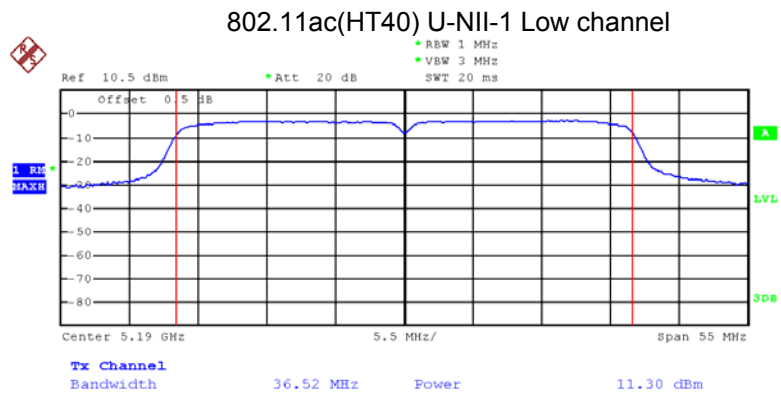
Date: 26.JUL.2018 21:28:51



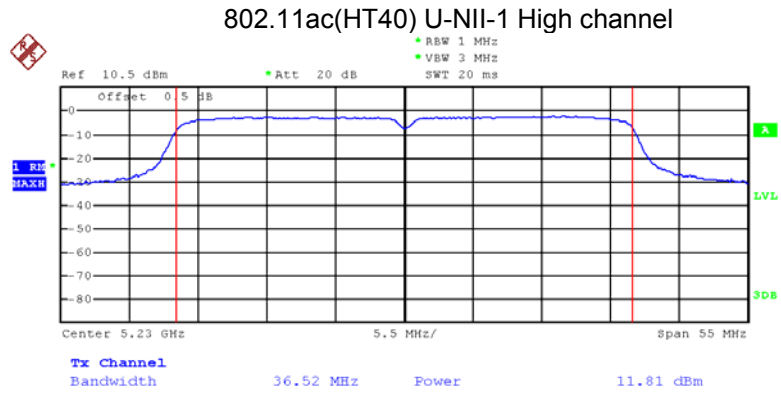
Date: 26.JUL.2018 21:35:35



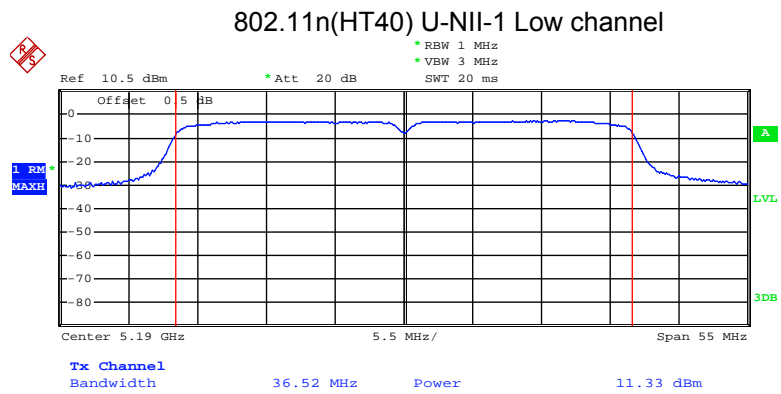
Date: 26.JUL.2018 21:39:46



Date: 26.JUL.2018 21:41:40

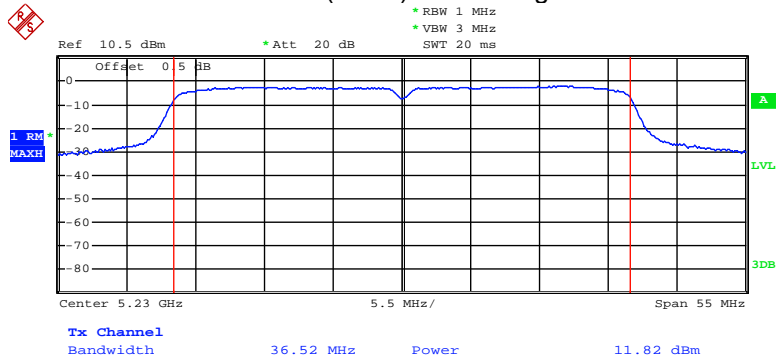


Date: 26.JUL.2018 21:44:28



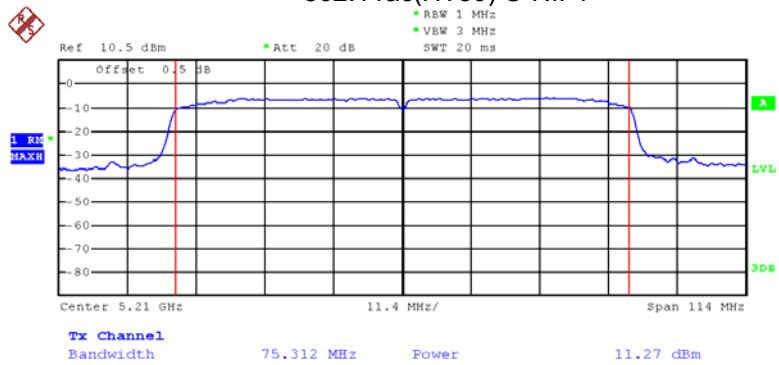
Date: 24.JUL.2018 21:43:52

802.11n(HT40) U-NII-1 High channel



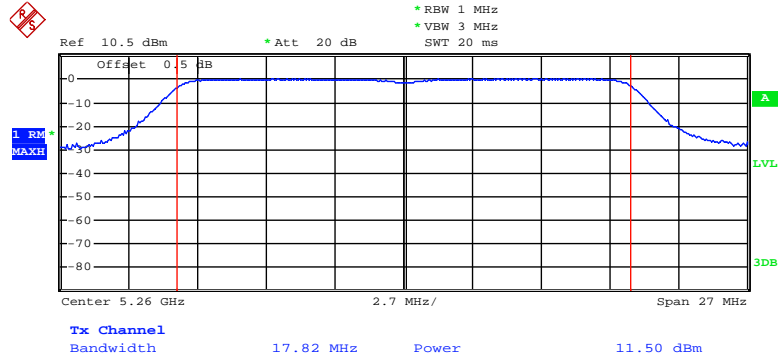
Date: 24.JUL.2018 21:47:38

802.11ac(HT80) U-NII-1



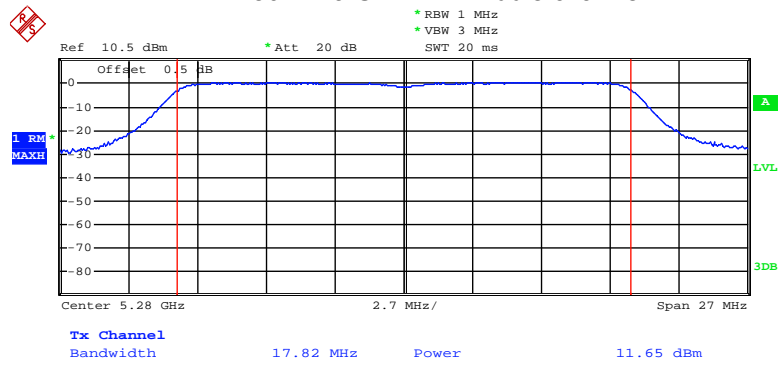
Date: 29.JUL.2018 21:43:37

802.11a U-NII-2A Low channel



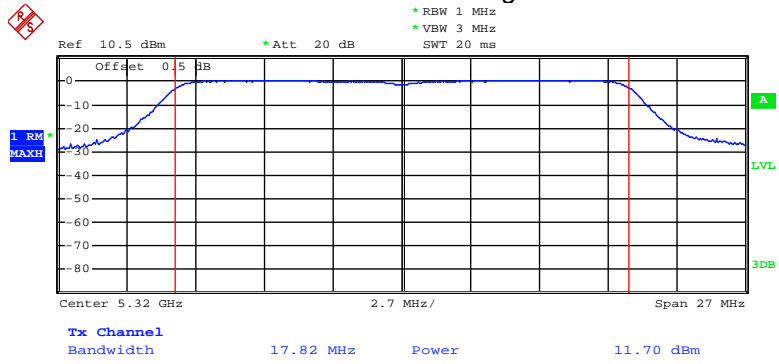
Date: 24.JUL.2018 22:56:00

802.11a U-NII-2A Middle channel



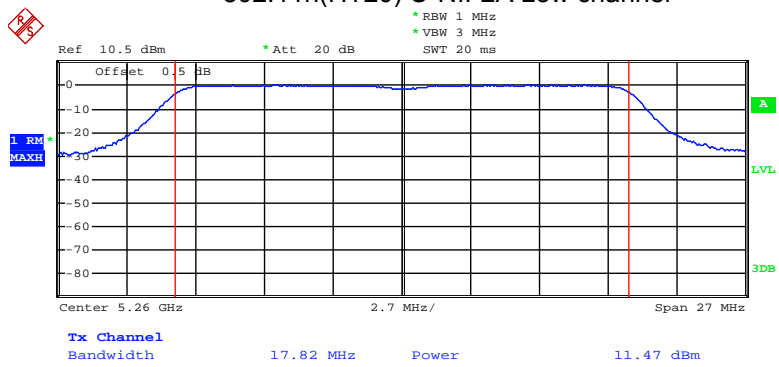
Date: 24.JUL.2018 22:58:48

802.11a U-NII-2A High channel



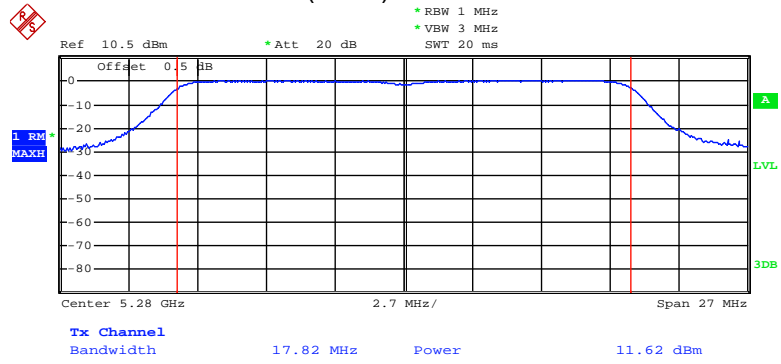
Date: 24.JUL.2018 23:04:08

802.11n(HT20) U-NII-2A Low channel



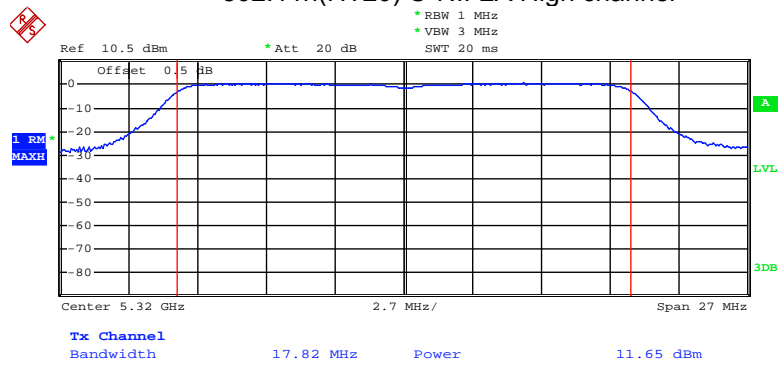
Date: 24.JUL.2018 22:56:14

802.11n(HT20) U-NII-2A Middle channel



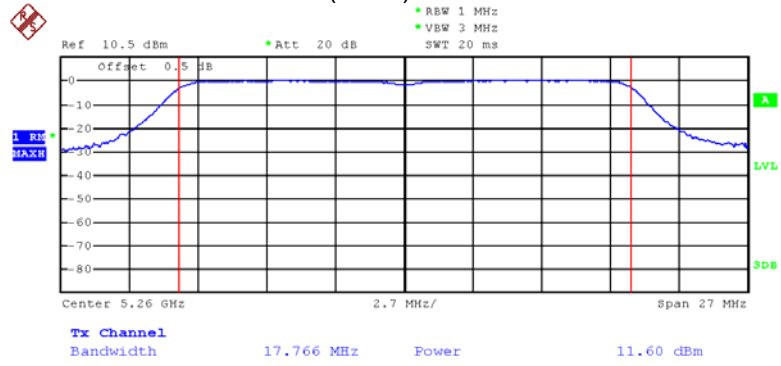
Date: 24.JUL.2018 22:59:01

802.11n(HT20) U-NII-2A High channel



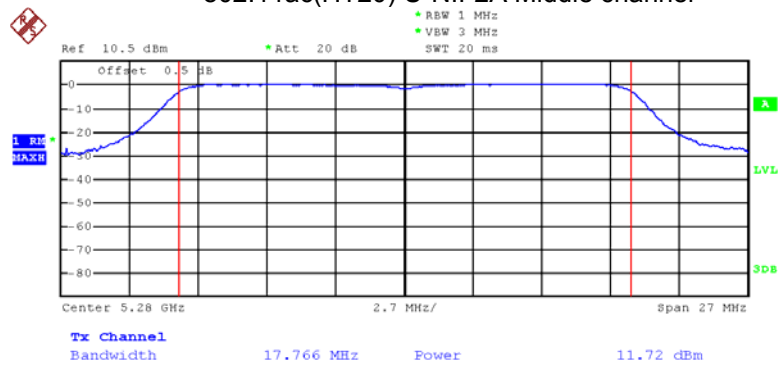
Date: 24.JUL.2018 23:04:20

802.11ac(HT20) U-NII-2A Low channel

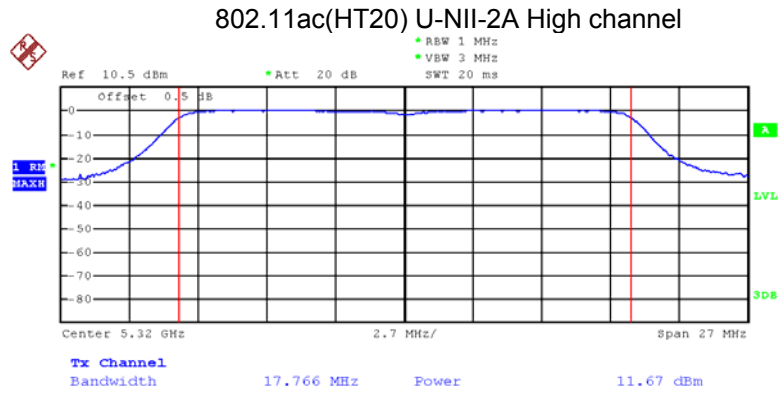


Date: 26.JUL.2018 21:54:14

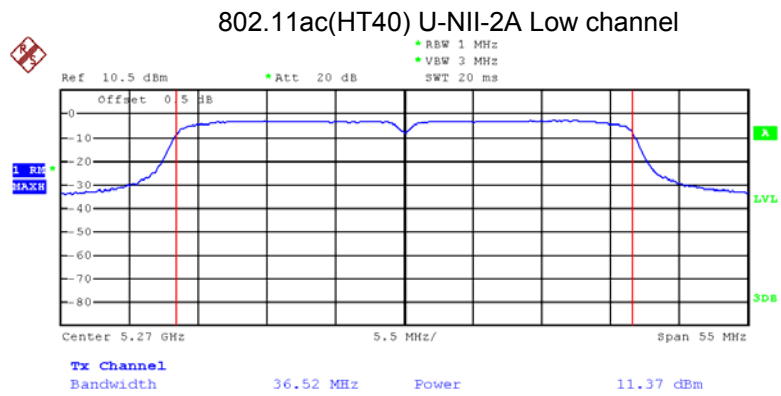
802.11ac(HT20) U-NII-2A Middle channel



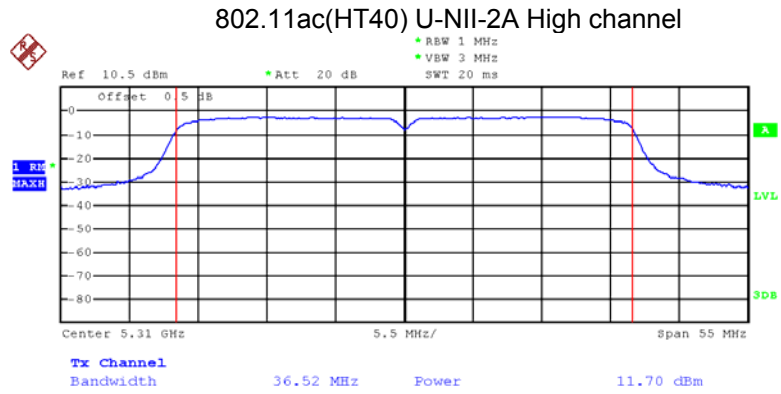
Date: 26.JUL.2018 21:58:54



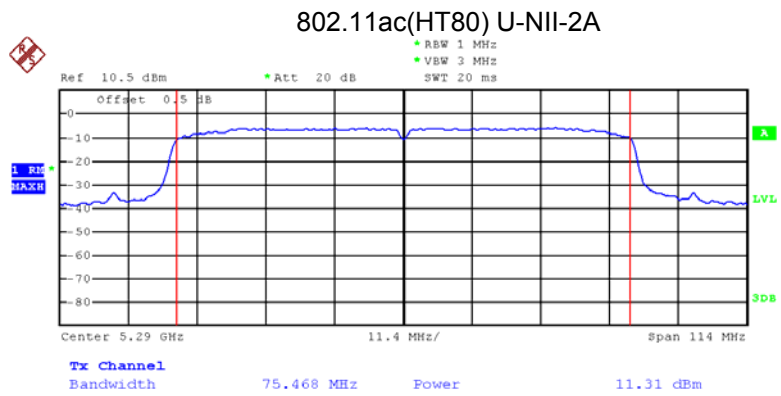
Date: 26.JUL.2018 22:03:33



Date: 26.JUL.2018 22:08:46

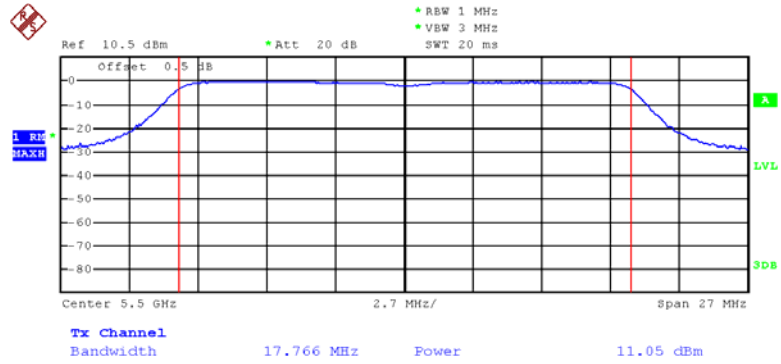


Date: 26.JUL.2018 22:12:14



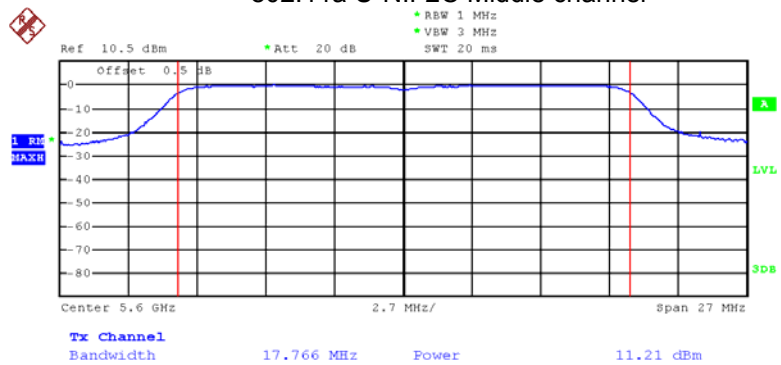
Date: 29.JUL.2018 21:53:59

802.11a U-NII-2C Low channel

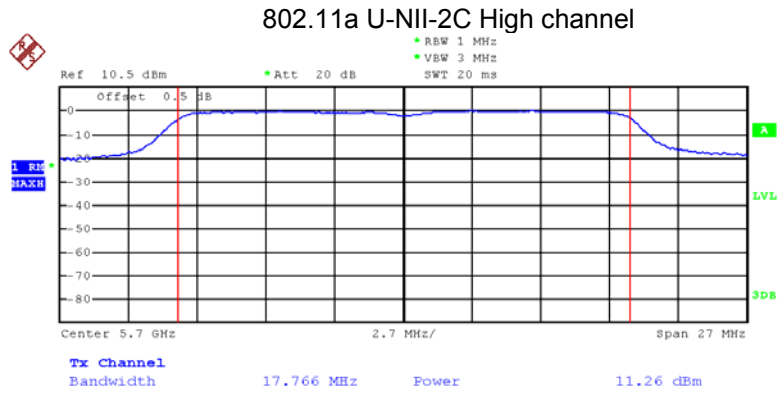


Date: 26.JUL.2018 06:54:08

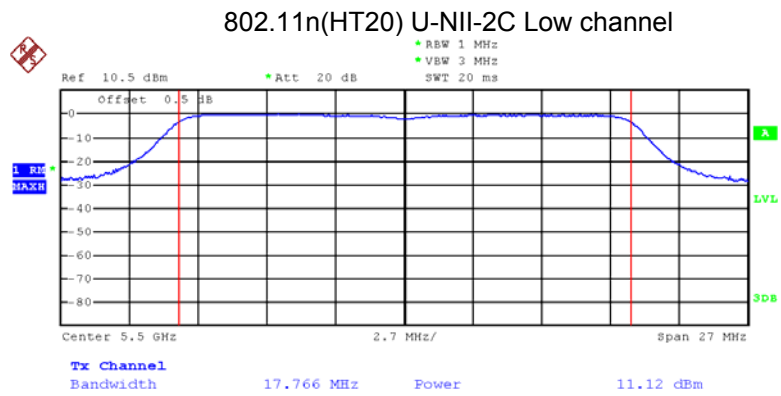
802.11a U-NII-2C Middle channel



Date: 26.JUL.2018 06:57:21

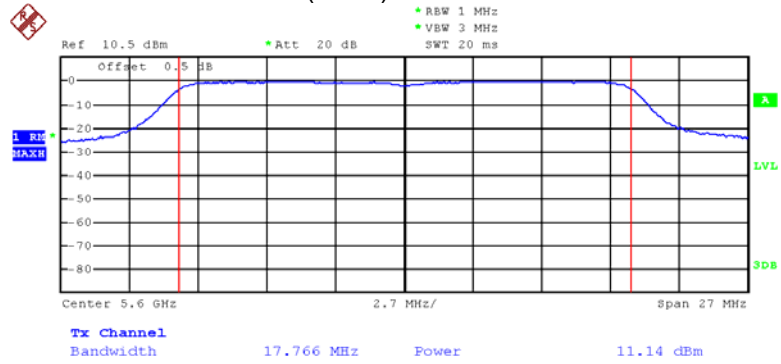


Date: 26.JUL.2018 07:01:58



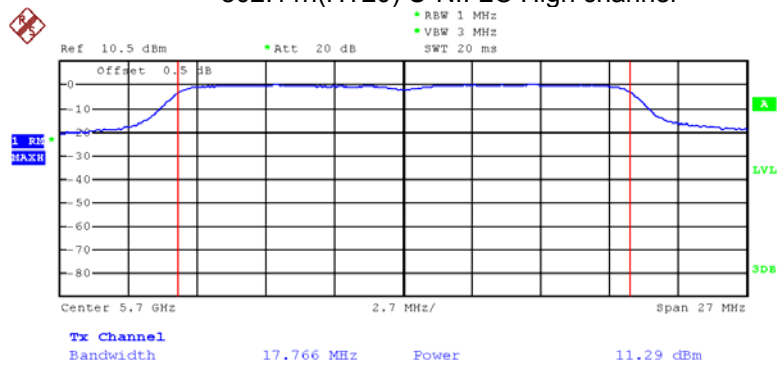
Date: 26.JUL.2018 06:53:53

802.11n(HT20) U-NII-2C Middle channel



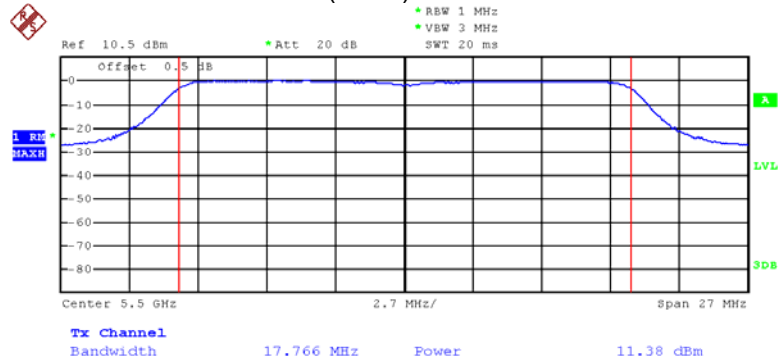
Date: 26.JUL.2018 06:57:34

802.11n(HT20) U-NII-2C High channel



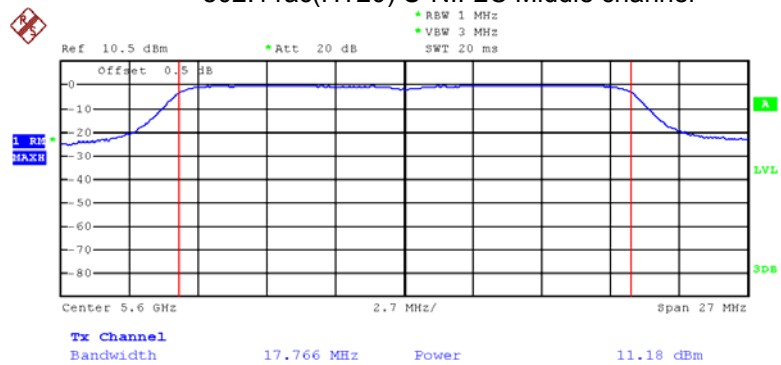
Date: 26.JUL.2018 07:01:38

802.11ac(HT20) U-NII-2C Low channel



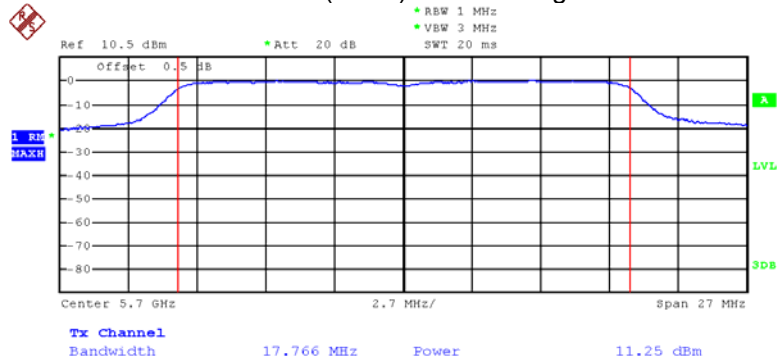
Date: 26.JUL.2018 22:19:51

802.11ac(HT20) U-NII-2C Middle channel



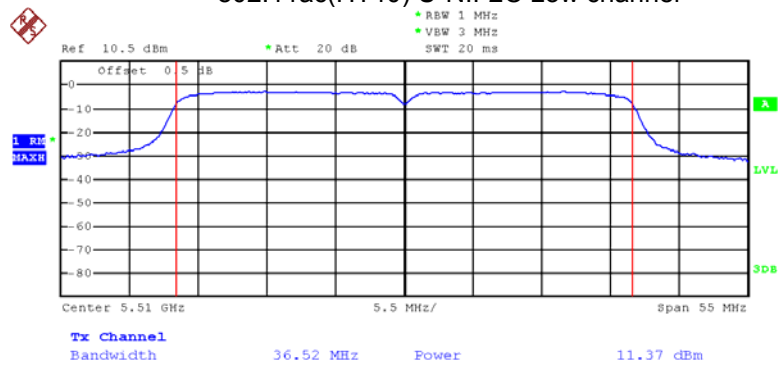
Date: 26.JUL.2018 22:23:48

802.11ac(HT20) U-NII-2C High channel

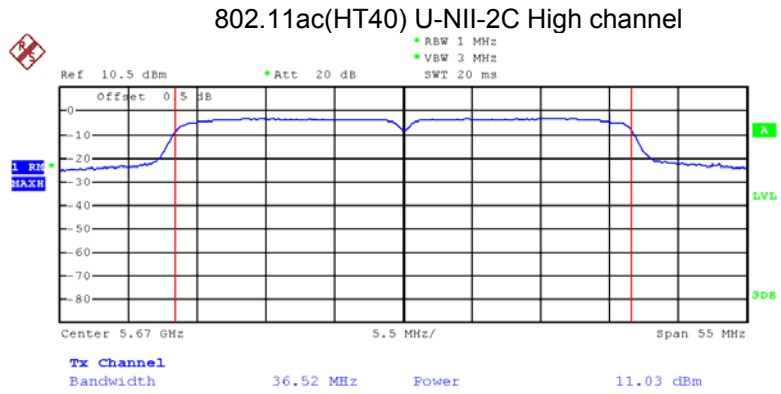


Date: 26.JUL.2018 22:28:01

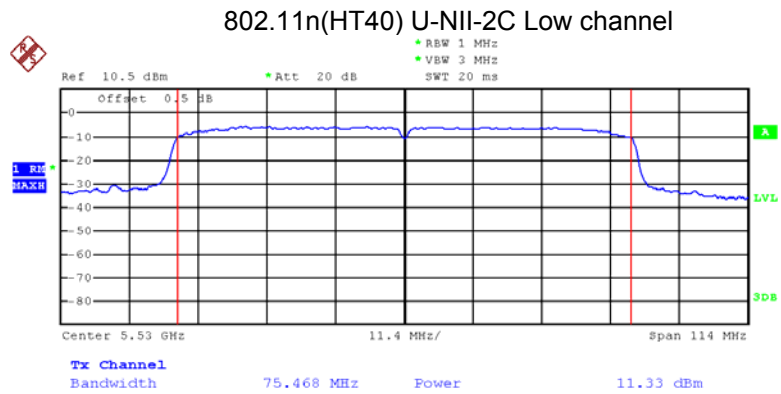
802.11ac(HT40) U-NII-2C Low channel



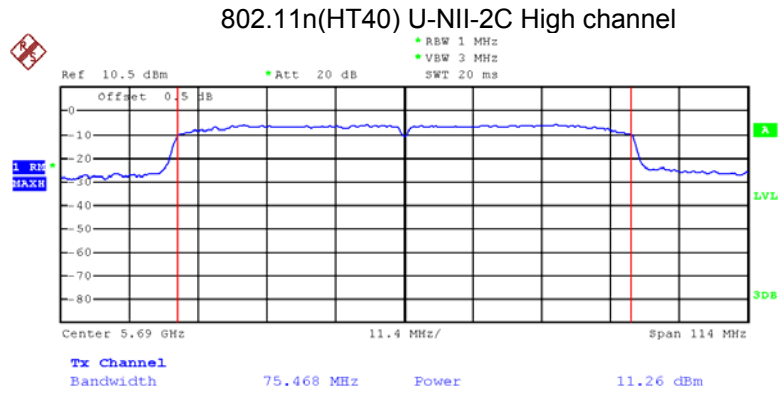
Date: 26.JUL.2018 22:29:33



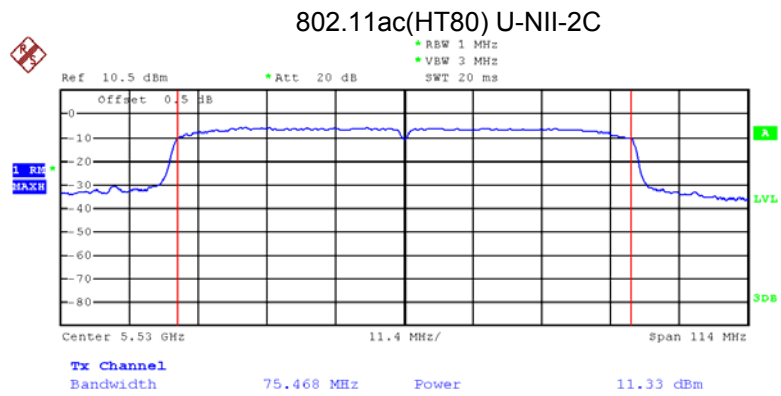
Date: 26.JUL.2018 22:32:12



Date: 29.JUL.2018 21:59:36

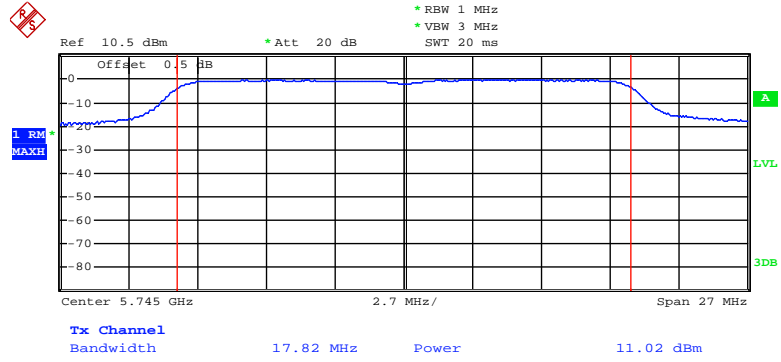


Date: 29.JUL.2018 22:02:05



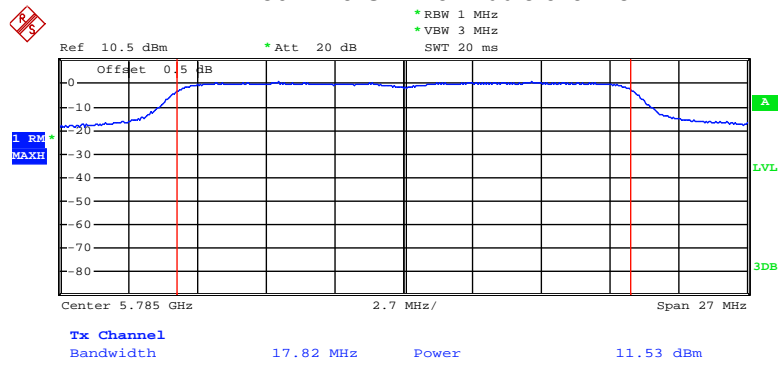
Date: 29.JUL.2018 21:59:36

802.11a U-NII-3 Low channel



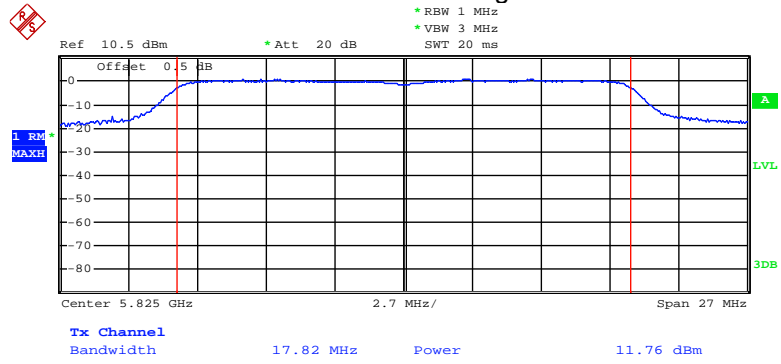
Date: 24.JUL.2018 22:10:42

802.11a U-NII-3 Middle channel



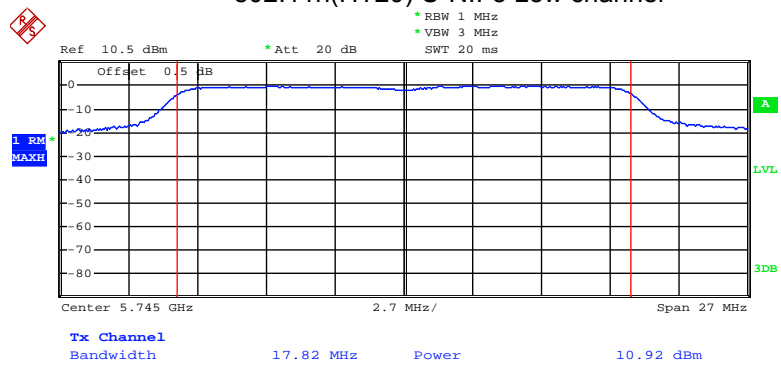
Date: 24.JUL.2018 22:14:37

802.11a U-NII-3 High channel



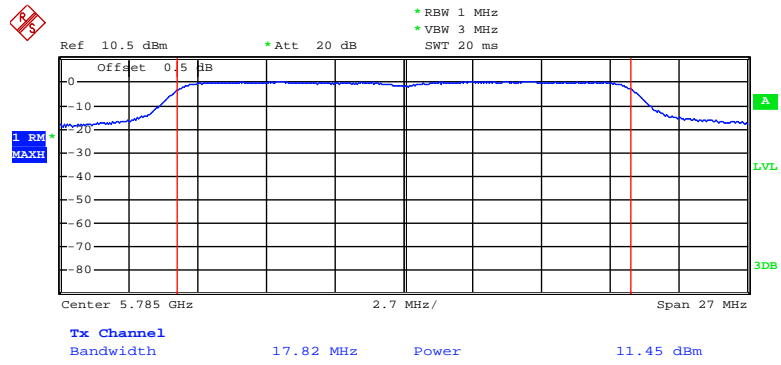
Date: 24.JUL.2018 22:20:13

802.11n(HT20) U-NII-3 Low channel



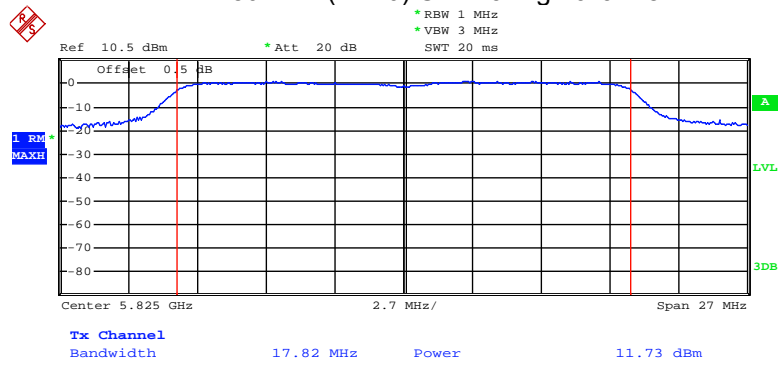
Date: 24.JUL.2018 22:10:57

802.11n(HT20) U-NII-3 Middle channel



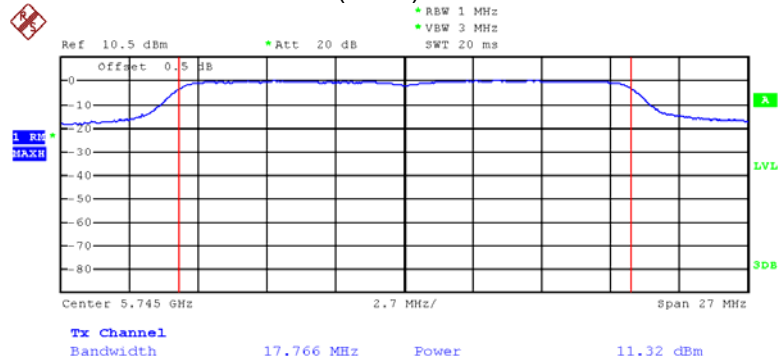
Date: 24.JUL.2018 22:14:48

802.11n(HT20) U-NII-3 High channel



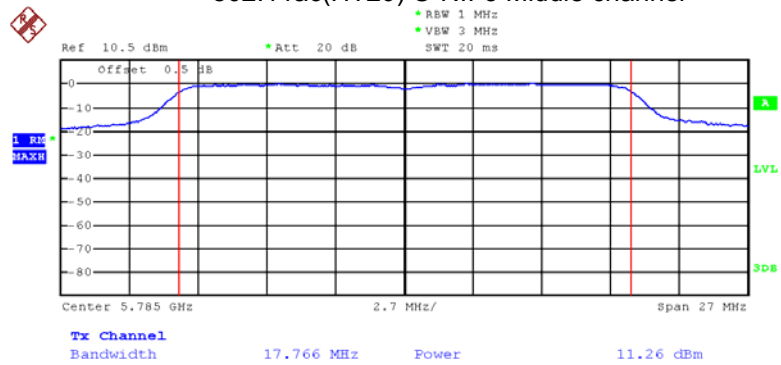
Date: 24.JUL.2018 22:20:30

802.11ac(HT20) U-NII-3 Low channel

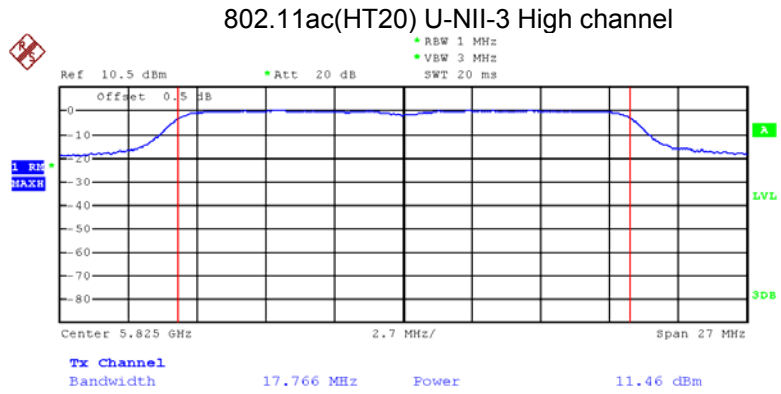


Date: 26.JUL.2018 22:47:21

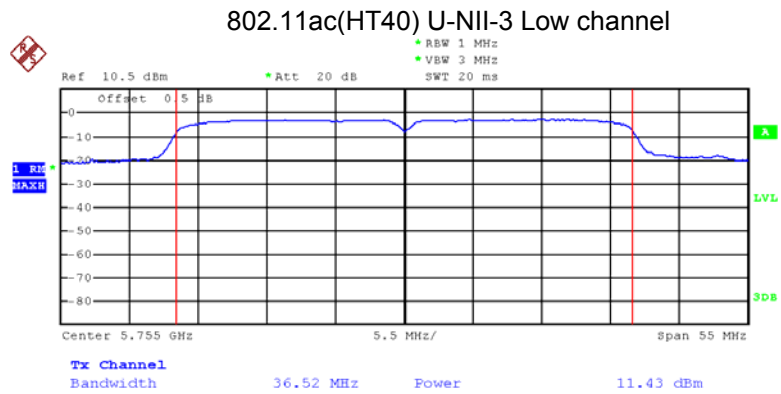
802.11ac(HT20) U-NII-3 Middle channel



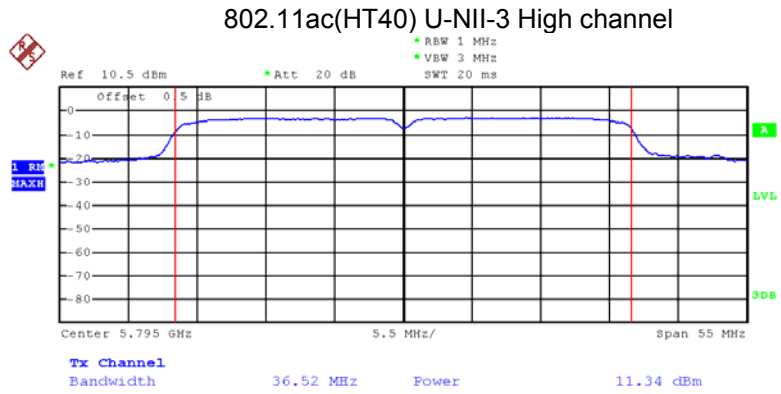
Date: 26.JUL.2018 22:49:20



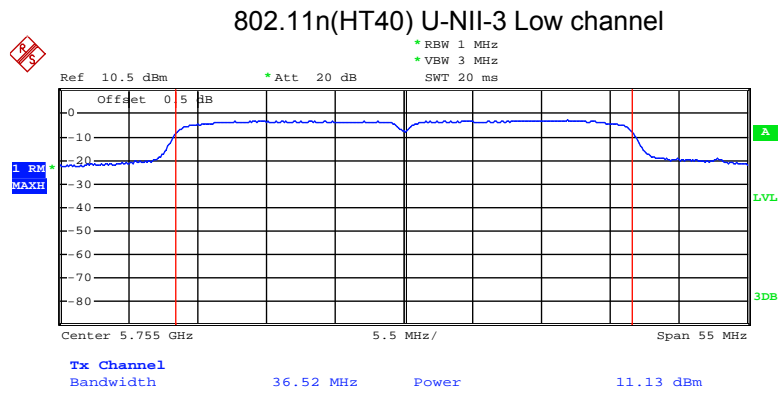
Date: 26.JUL.2018 22:53:36



Date: 26.JUL.2018 22:55:12

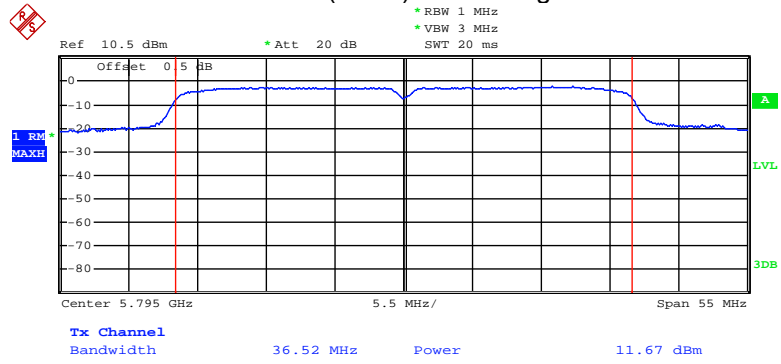


Date: 26.JUL.2018 22:58:08



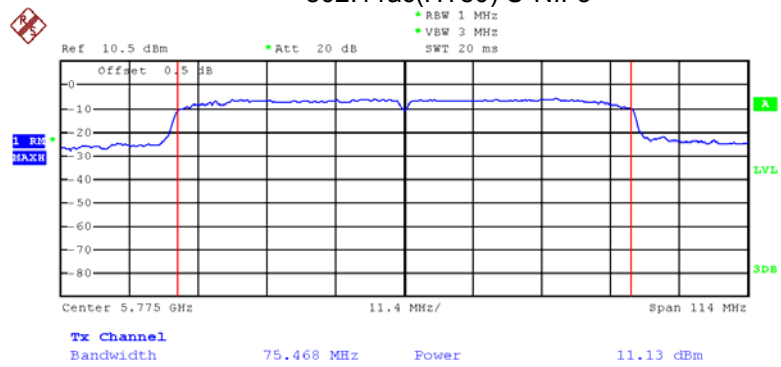
Date: 24.JUL.2018 22:31:31

802.11n(HT40) U-NII-3 High channel



Date: 24.JUL.2018 22:39:35

802.11ac(HT80) U-NII-3



Date: 29.JUL.2018 22:07:45

14 Power Spectral density

Test Requirement:	FCC CFR47 Part 15 Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Test Limit:	≤11dBm/MHz for Operation in the U-NII-1(5150MHz-5250MHz,5250-5350MHz and 5470-5725MHz)of device; ≤30dBm/500kHz for Operation in the U-NII-1(5725MHz-5850MHz)of device
Test Result:	PASS

14.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 510kHz/1MHz. VBW = 3 RBW Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

14.2 Test Result:

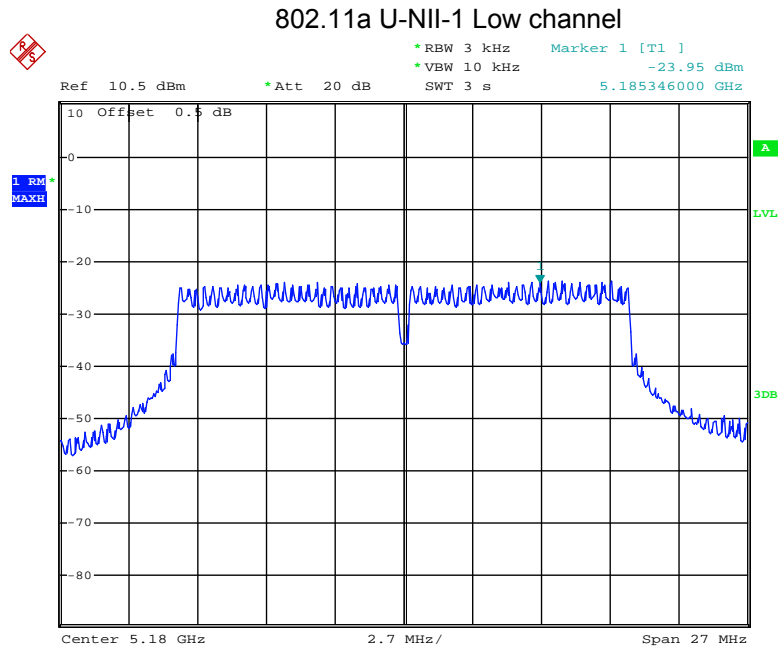
Band	Operation mode	Power Spectral Density (dBm/MHz)		
		Low channel	Middle	High
U-NII-1	802.11a	-23.95	-22.36	-22.45
	802.11n(HT20)	-23.79	-23.23	-23.07
	802.11ac(HT20)	-23.28	-22.60	-23.06
	802.11ac(HT40)	-27.79	/	-27.20
	802.11n(HT40)	-27.67	/	-27.52
	802.11ac(HT80)	/	-32.66	/
	Limit	≤11dBm/MHz		

Band	Operation mode	Power Spectral Density (dBm/MHz)		
		Low channel	Middle	High
U- NII- 2A	802.11a	-23.54	-22.39	-22.90
	802.11n(HT20)	-23.42	-22.58	-23.02
	802.11ac(HT20)	-23.09	-22.57	-22.81
	802.11ac(HT40)	-26.91	/	-27.40
	802.11n(HT40)	-27.05	/	-27.55
	802.11ac(HT80)	/	32.71	/
	Limit	≤11dBm/MHz		

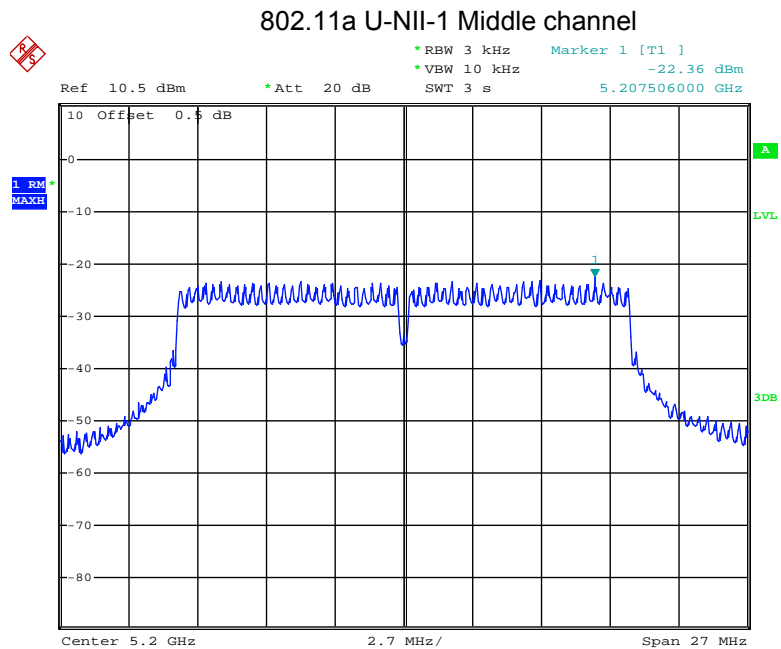
Band	Operation mode	Power Spectral Density (dBm/MHz)		
		Low channel	Middle	High
U- NII- 2C	802.11a	-23.70	-23.40	-23.31
	802.11n(HT20)	-23.59	-23.45	-22.39
	802.11ac(HT20)	-22.75	-23.47	-22.83
	802.11ac(HT40)	-27.22	/	-27.98
	802.11n(HT40)	-27.75	/	-28.13
	802.11ac(HT80)	/	-32.87	/
	Limit	≤11dBm/MHz		

Band	Operation mode	Power Spectral Density (dBm/MHz)		
		Low channel	Middle	High
U- NII-3	802.11a	-23.82	-22.79	-23.27
	802.11n(HT20)	-23.65	-22.53	-23.25
	802.11ac(HT20)	-23.83	-23.28	-23.21
	802.11ac(HT40)	-27.74	/	-28.02
	802.11n(HT40)	-27.42	/	-27.26
	802.11ac(HT80)	/	-32.43	/
	Limit	≤30dBm/500kHz		

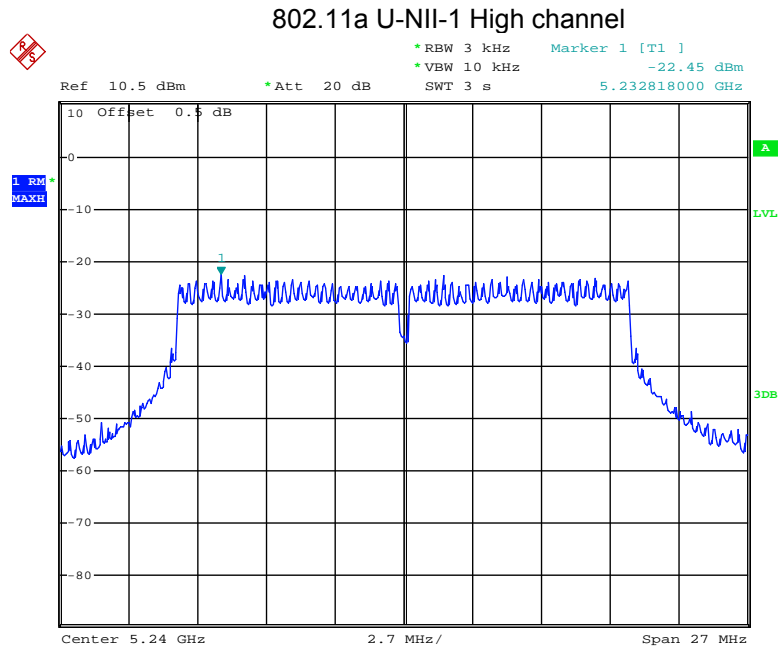
Test result plots shown as follows:



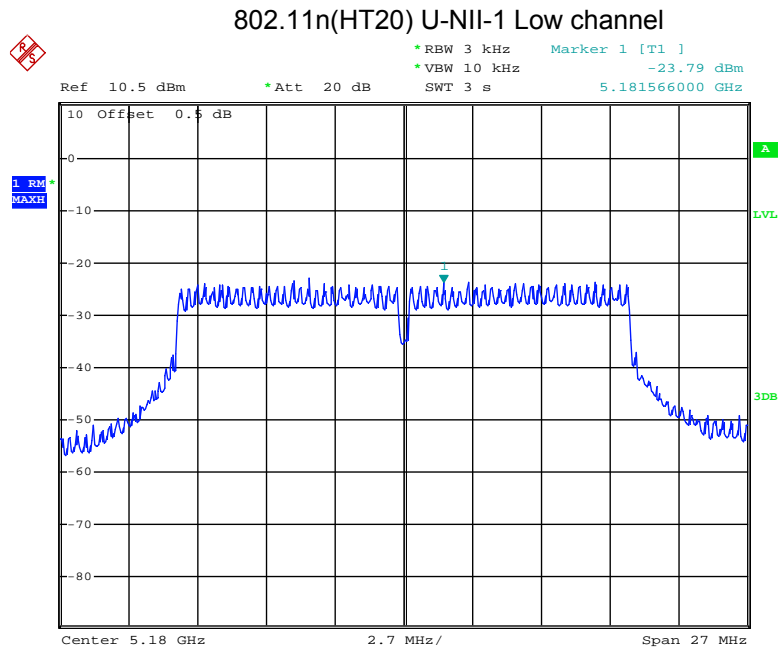
Date: 24.JUL.2018 21:27:05



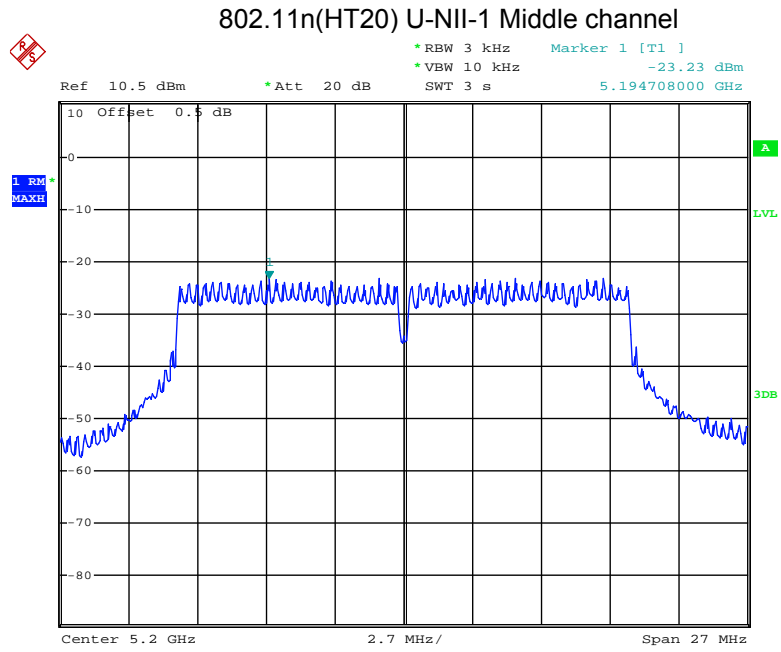
Date: 24.JUL.2018 21:33:26



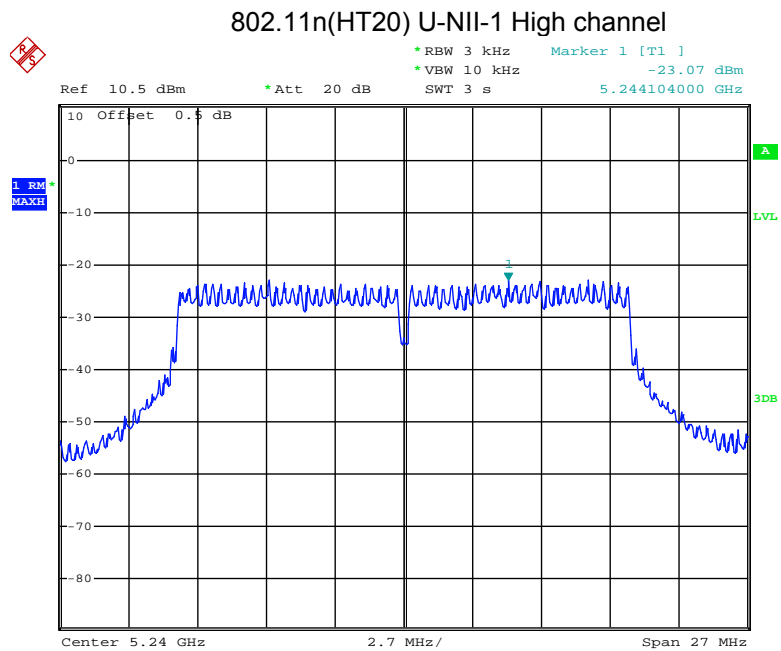
Date: 24.JUL.2018 21:38:57



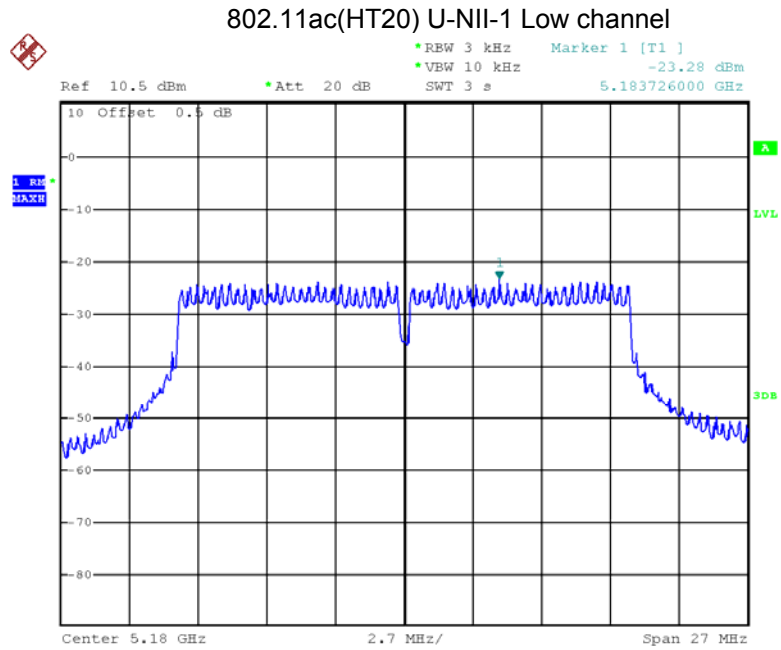
Date: 24.JUL.2018 21:27:34



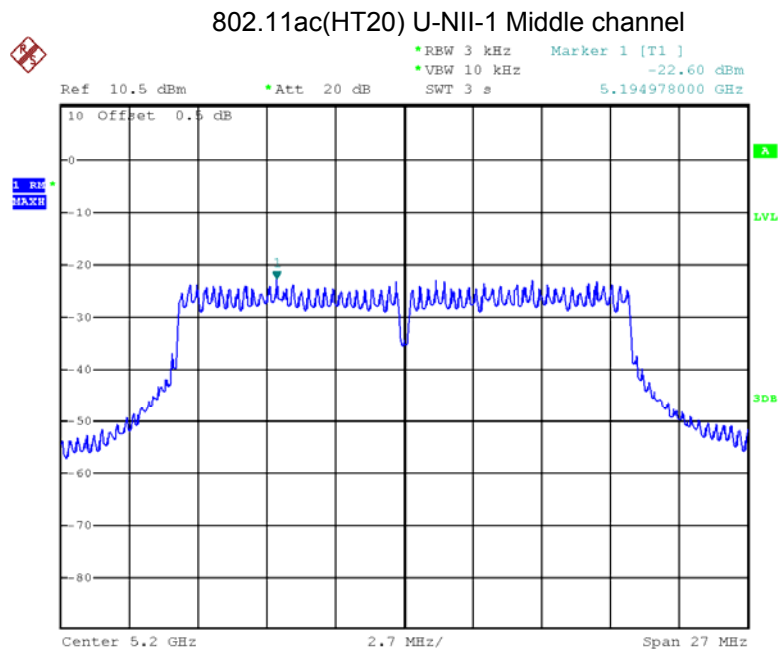
Date: 24.JUL.2018 21:34:13



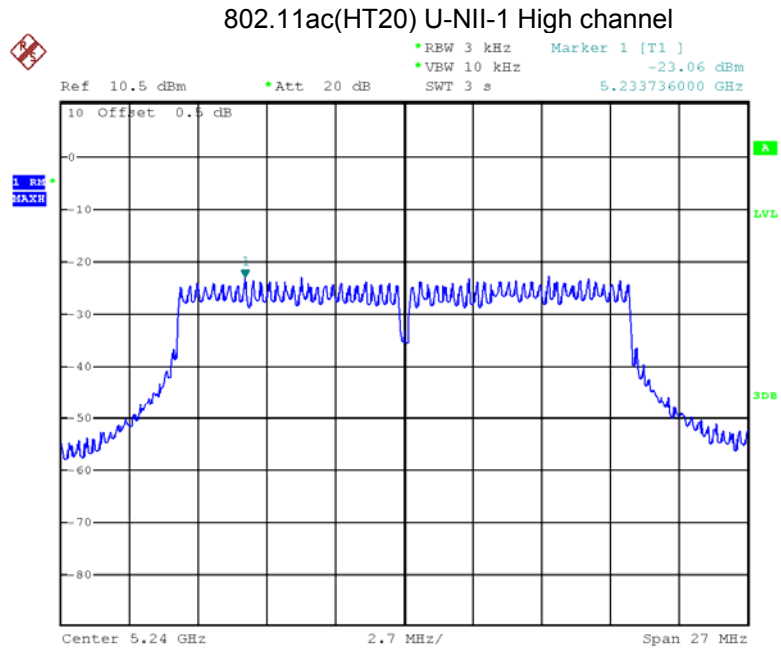
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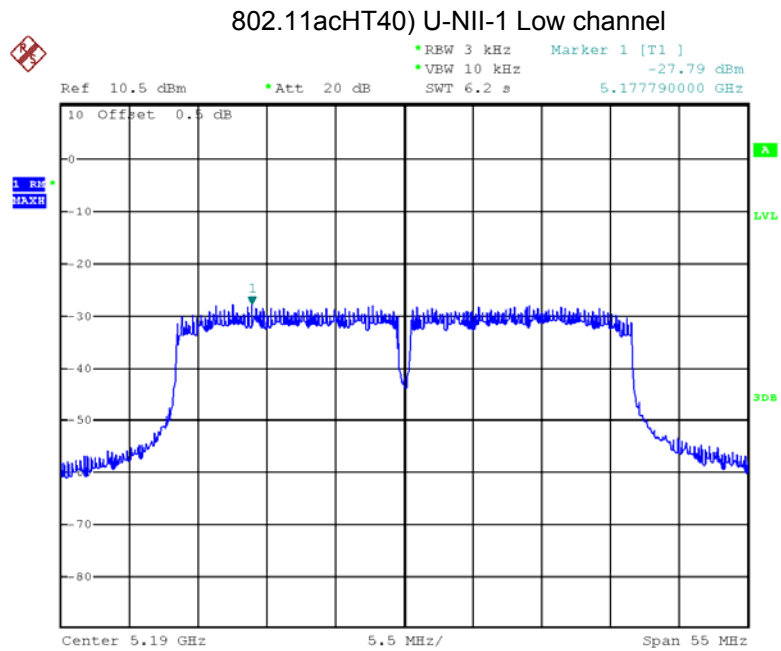
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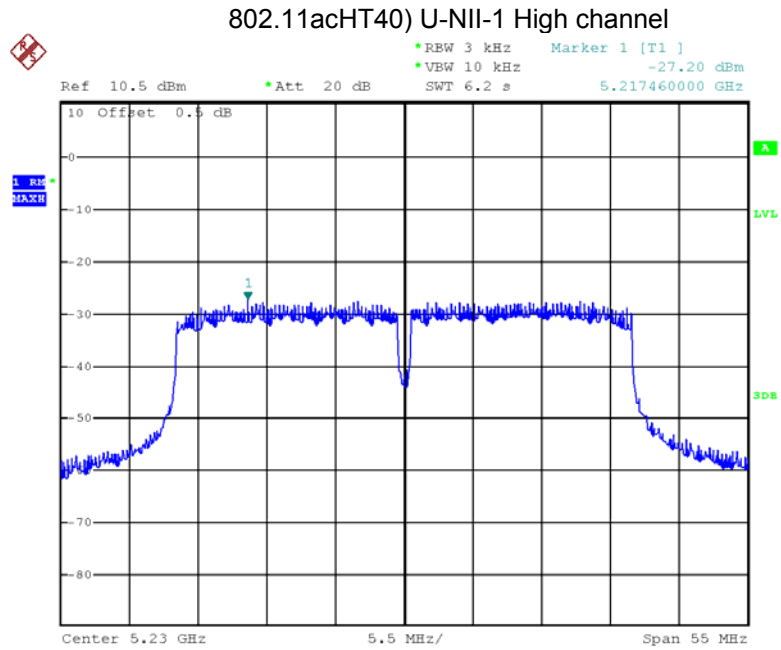
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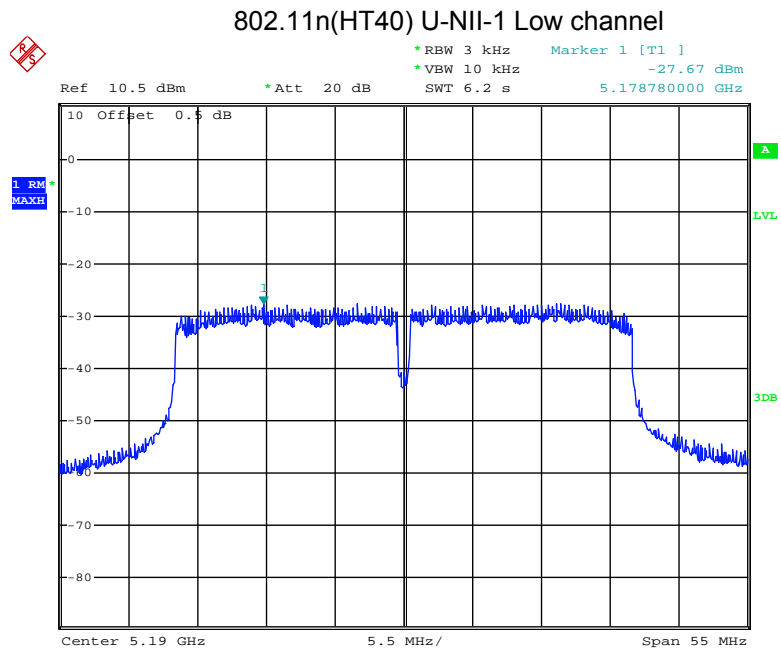
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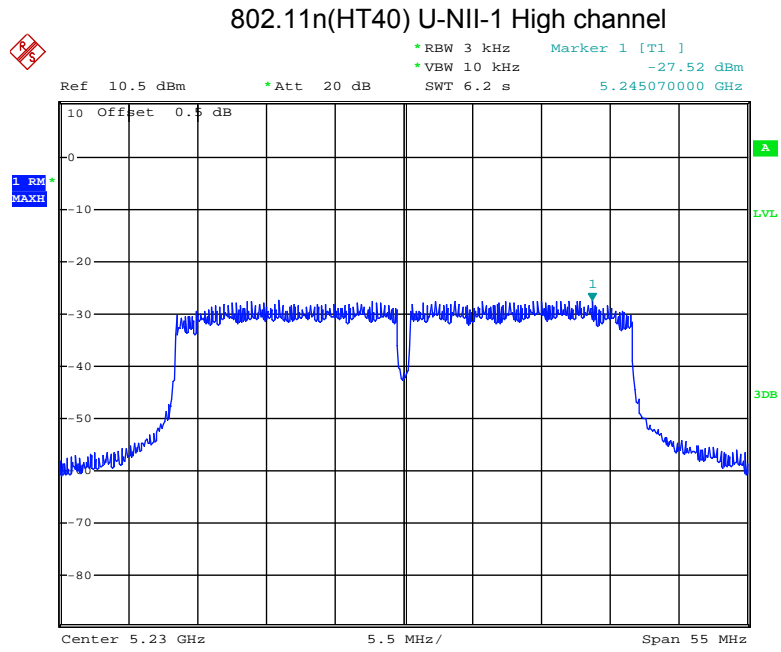
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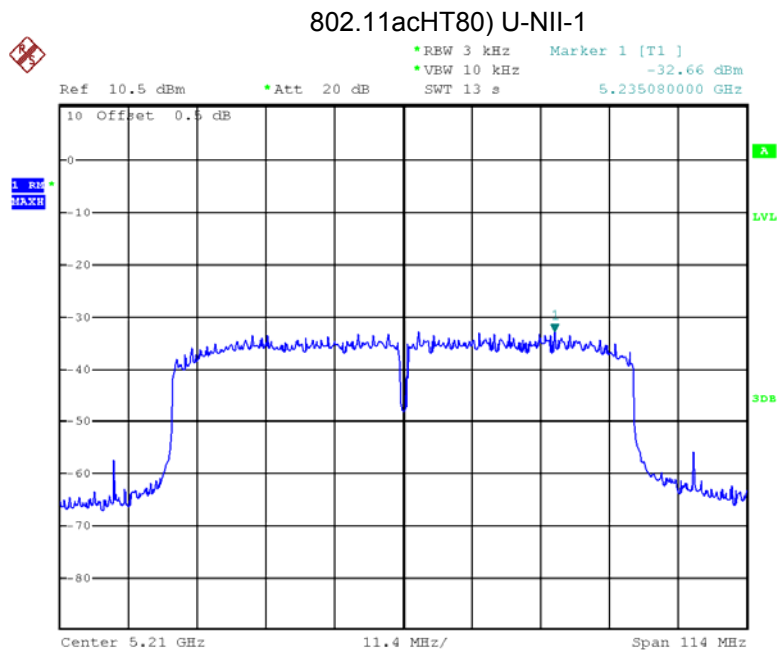
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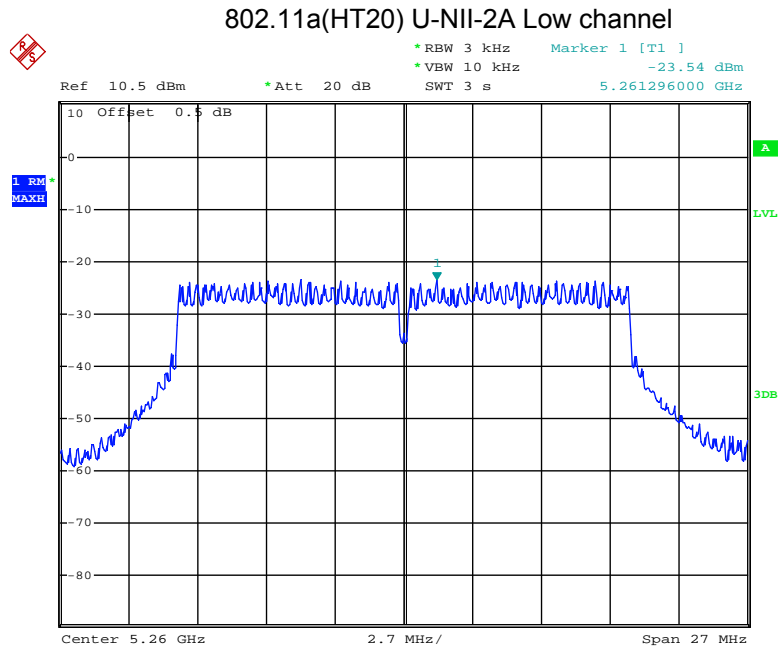
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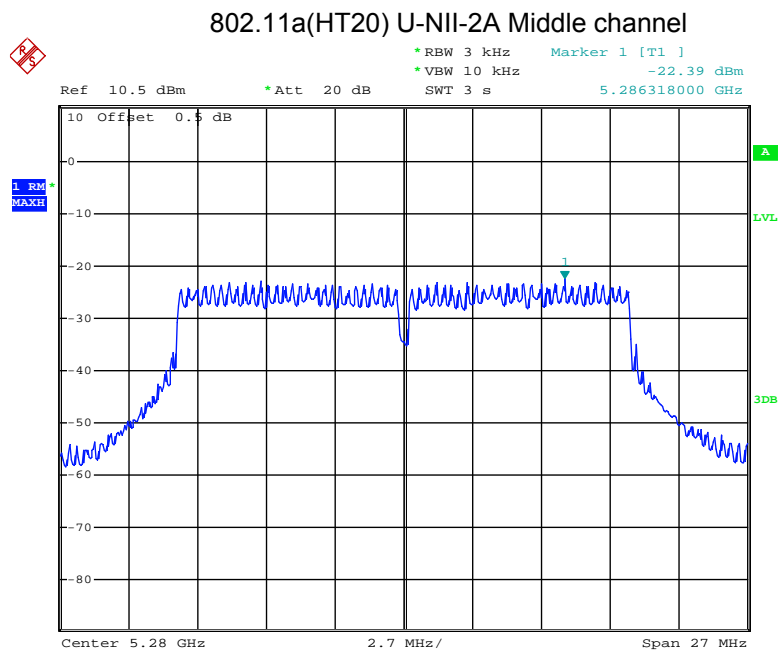
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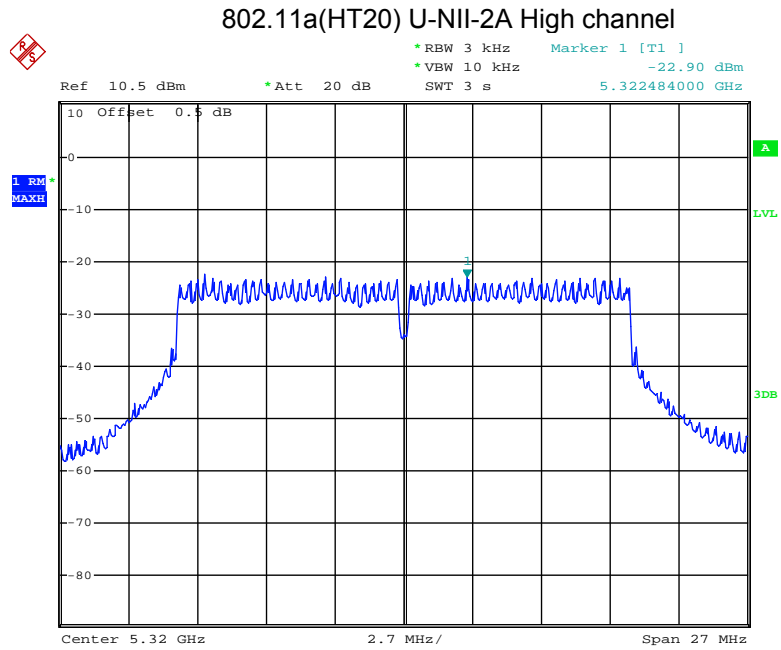
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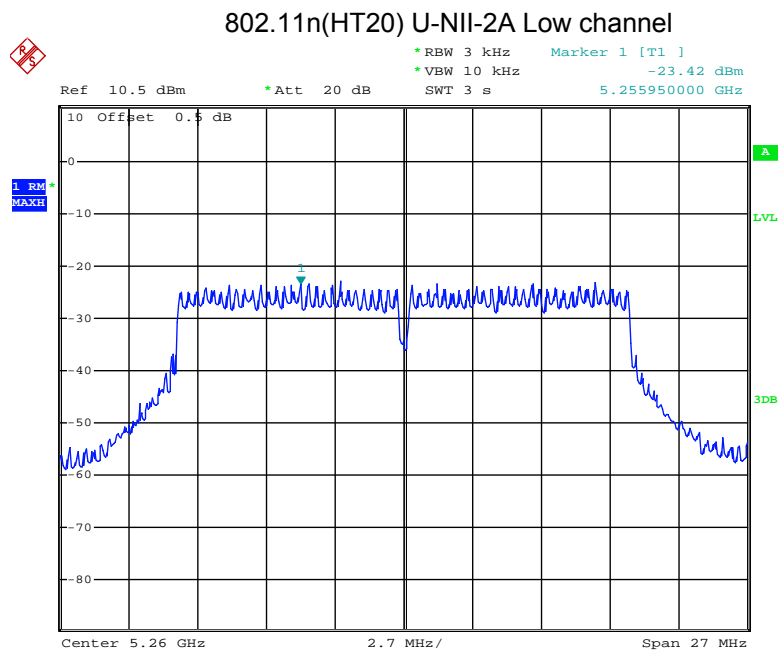
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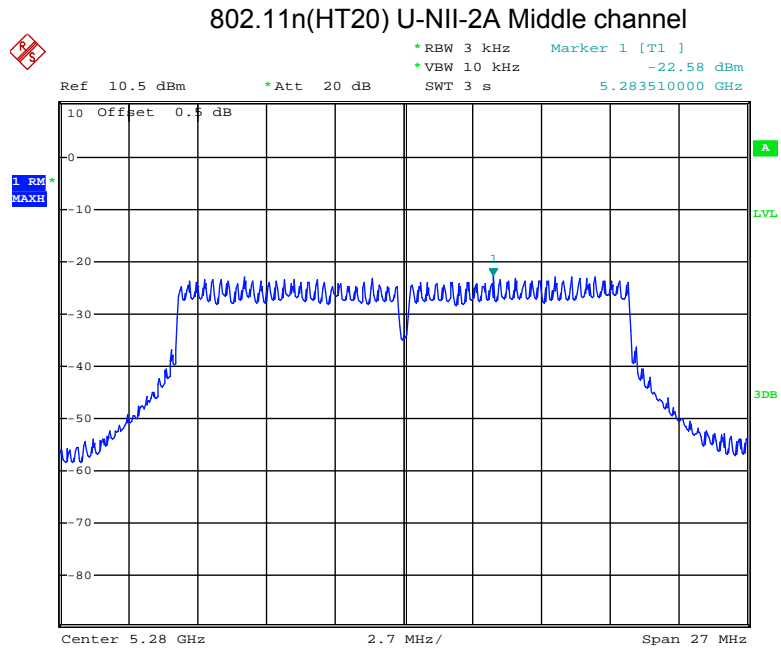
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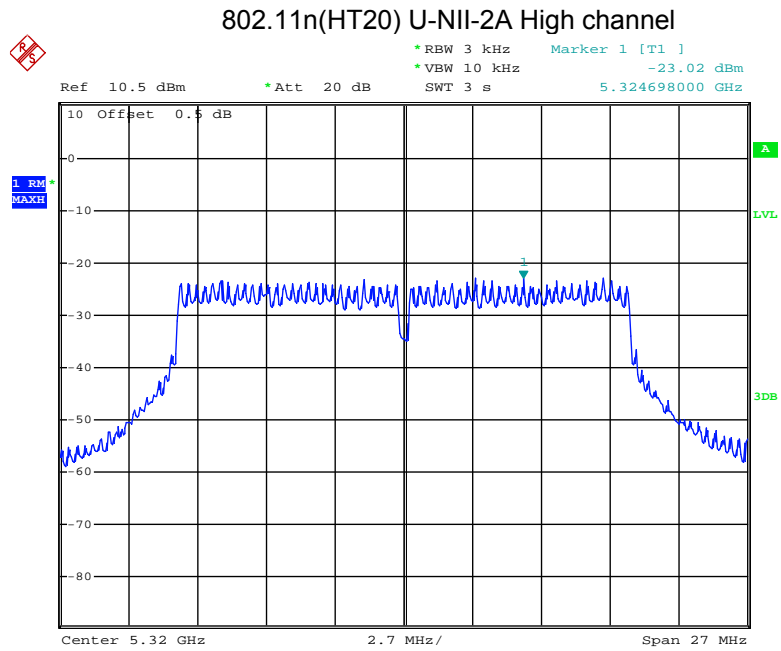
Date: 24.JUL.2018 23:06:59



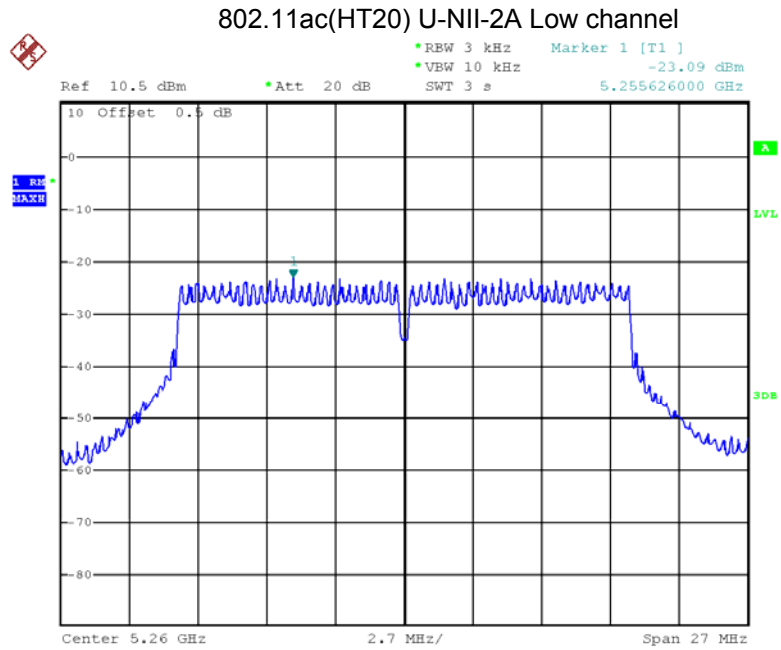
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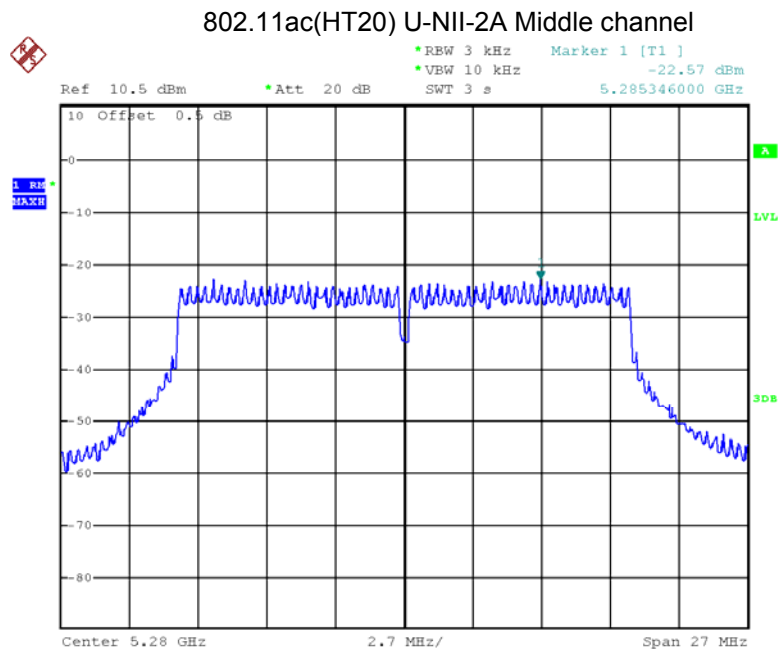
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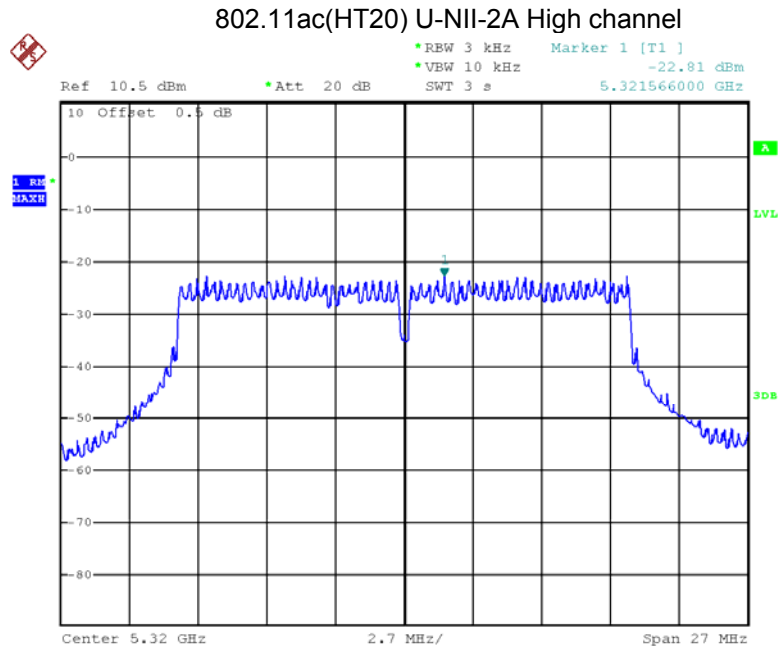
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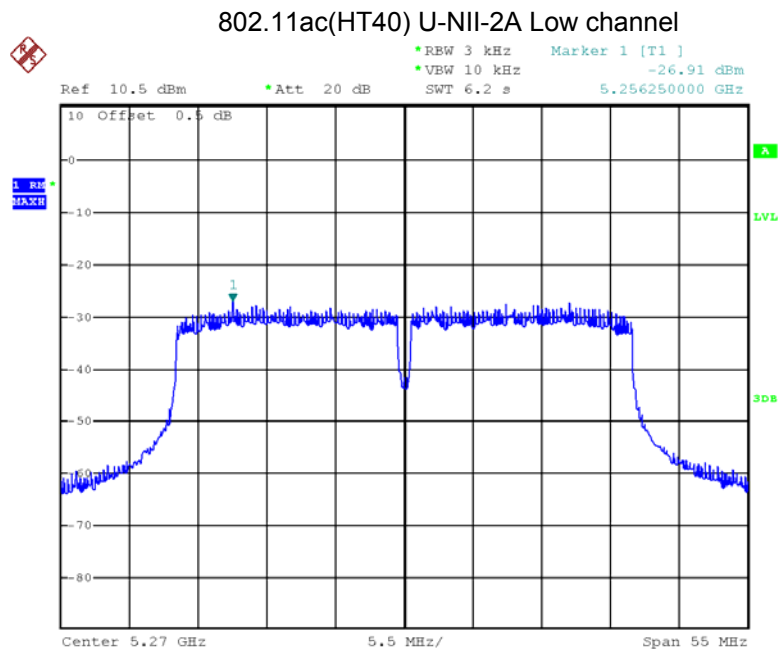
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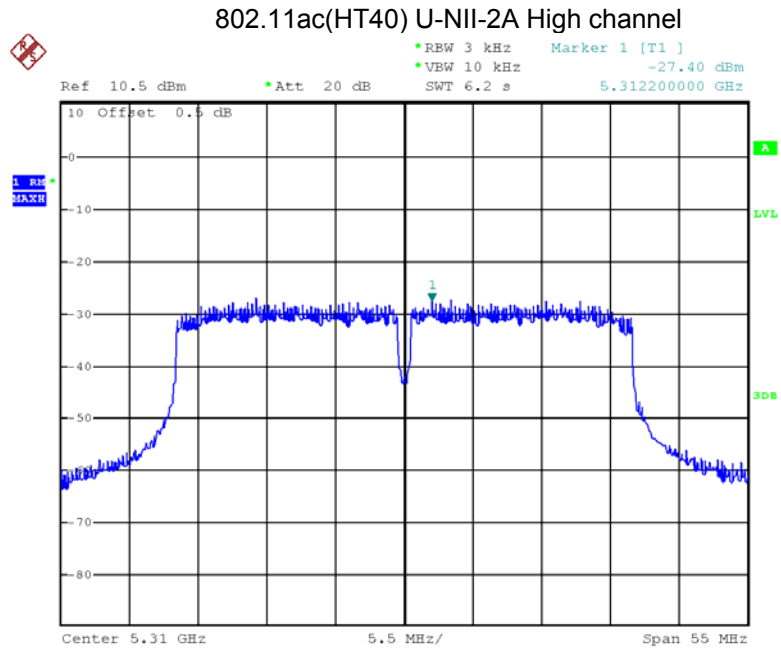
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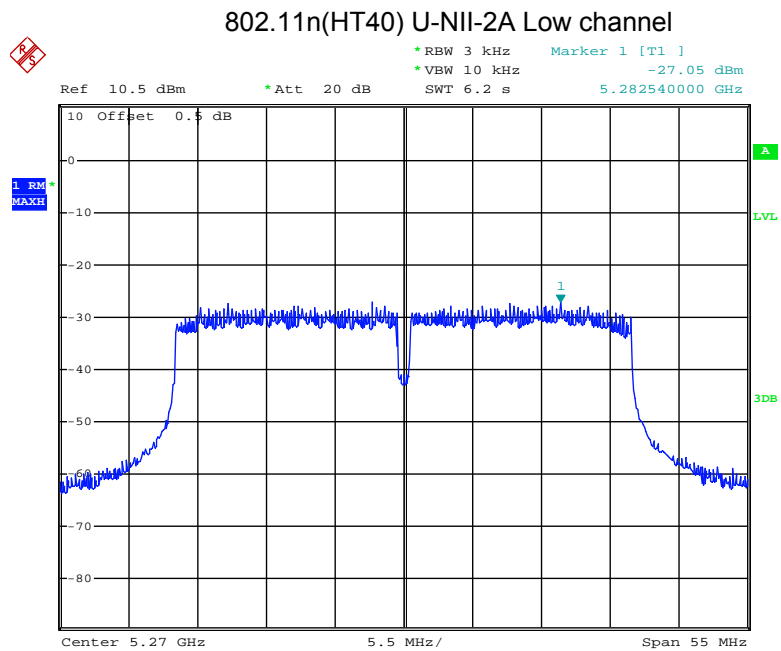
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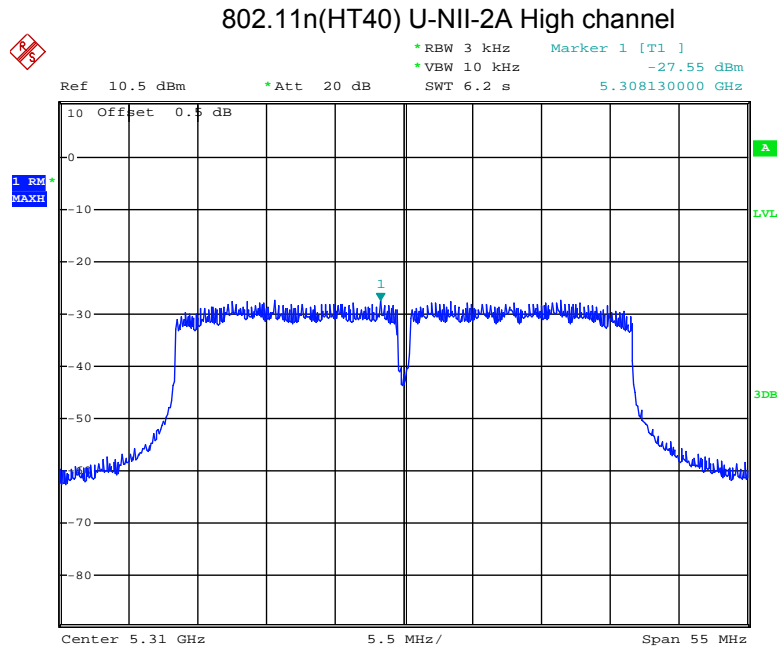
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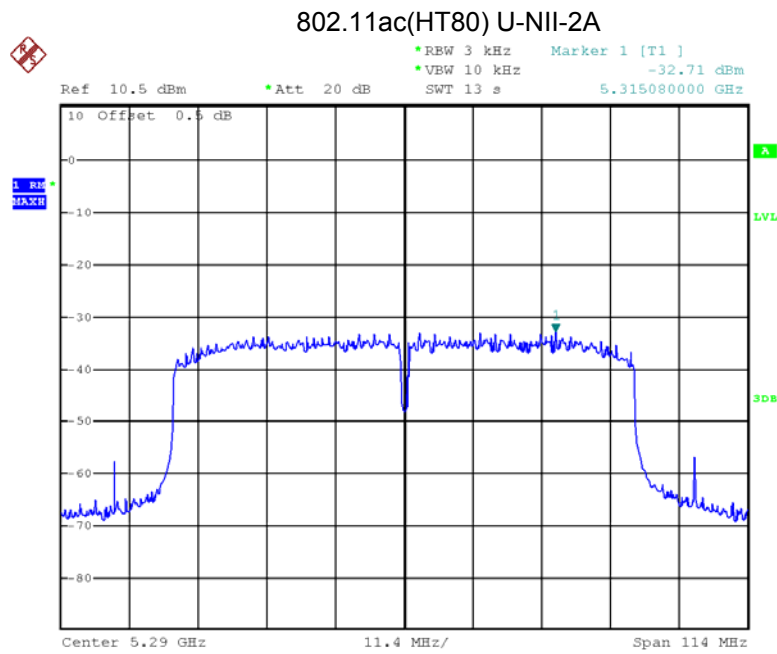
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Date: 24.JUL.2018 23:10:29

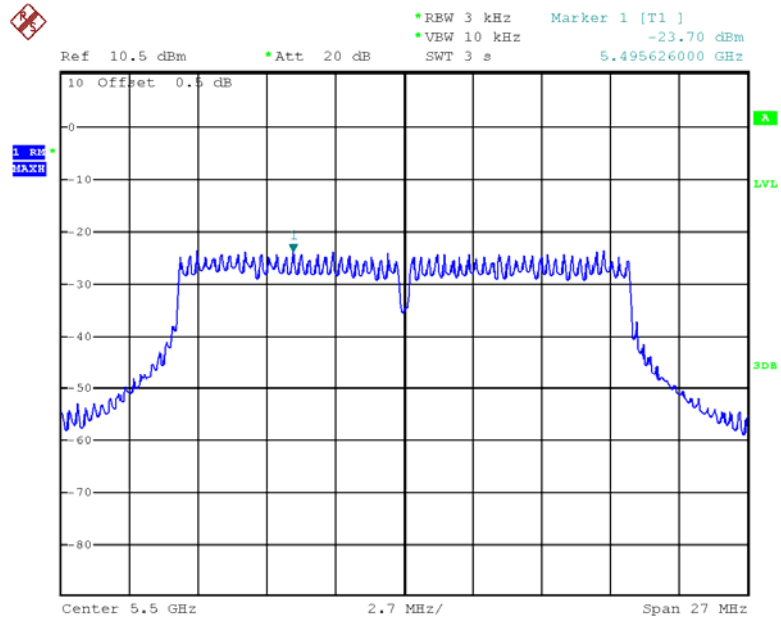


Date: 25.JUL.2018 00:54:32



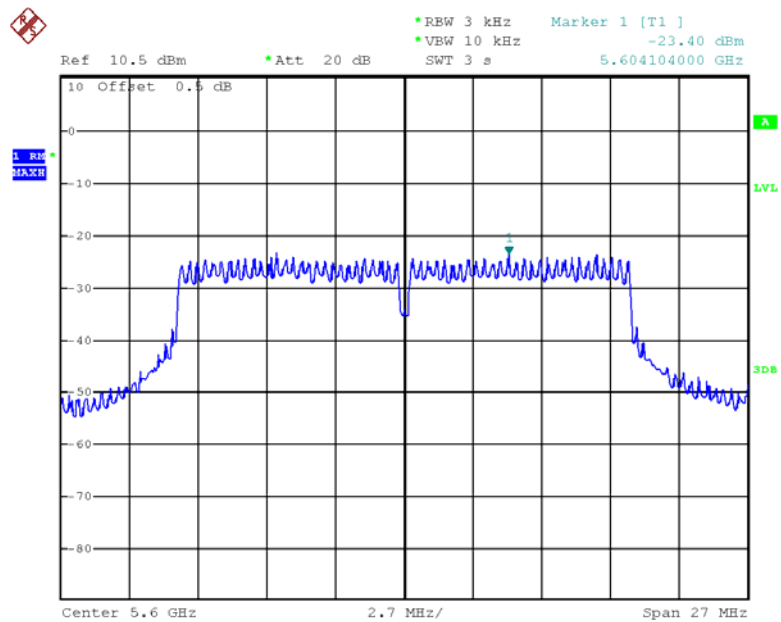
Date: 29.JUL.2018 21:54:44

802.11a U-NII-2C Low channel

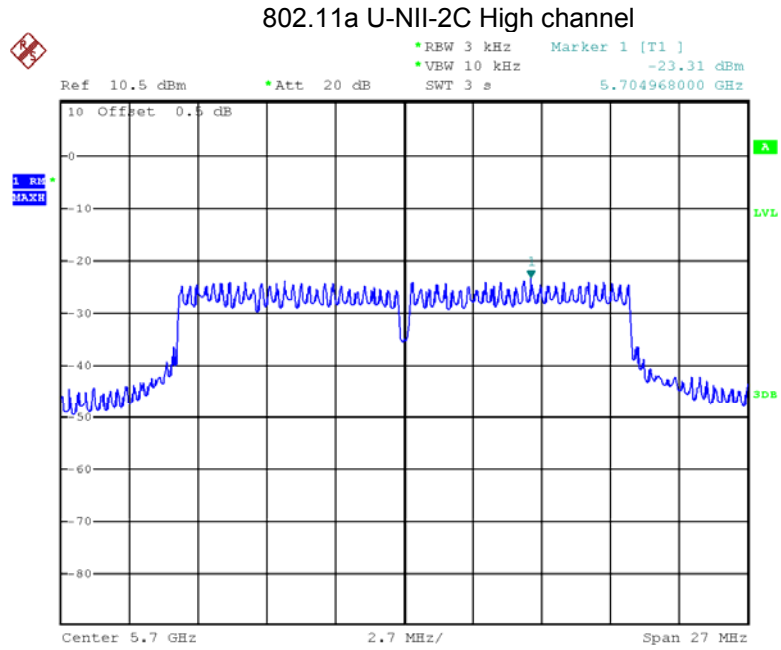


Date: 26.JUL.2018 06:54:40

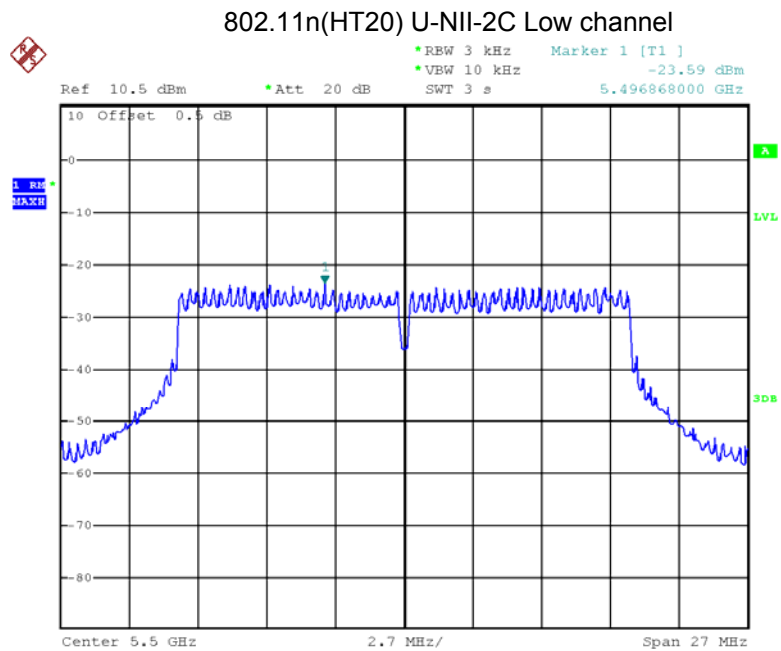
802.11a U-NII-2C Middle channel



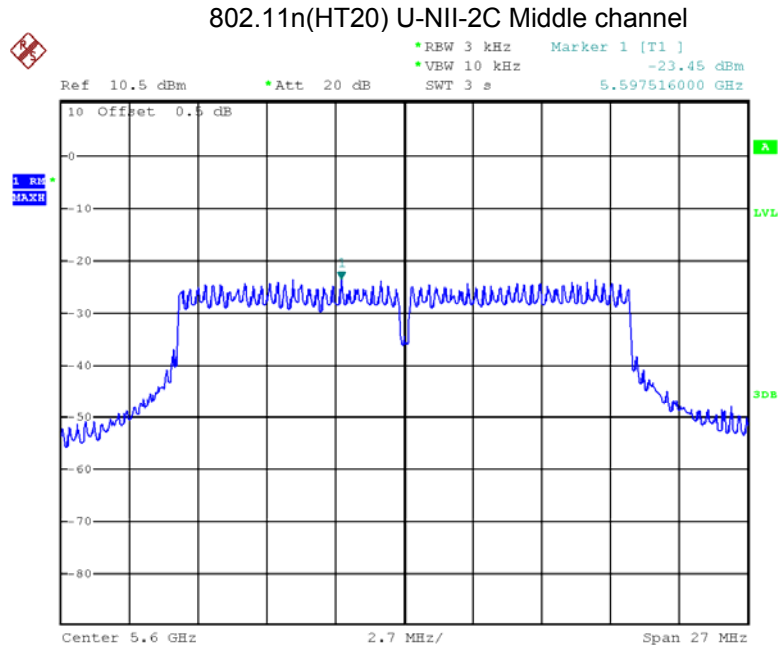
Date: 26.JUL.2018 07:00:06



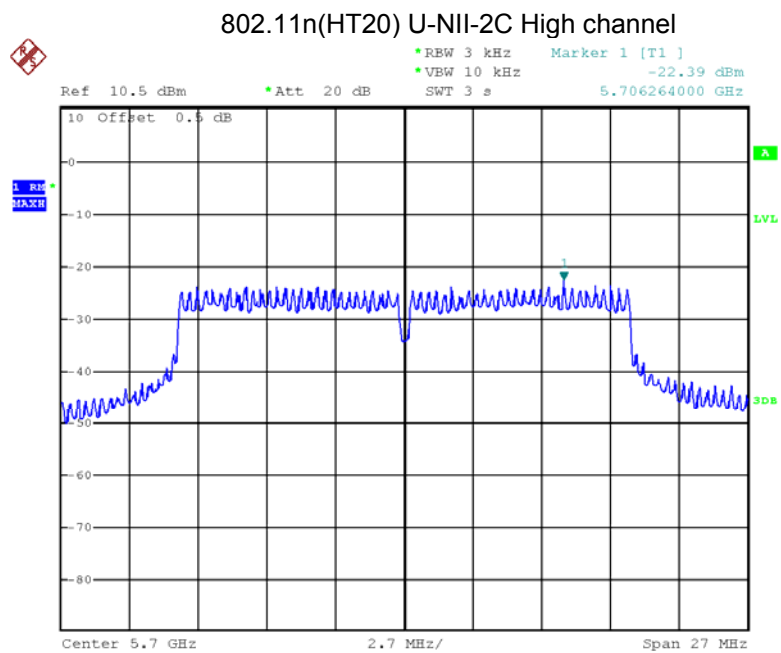
Date: 26.JUL.2018 07:15:05



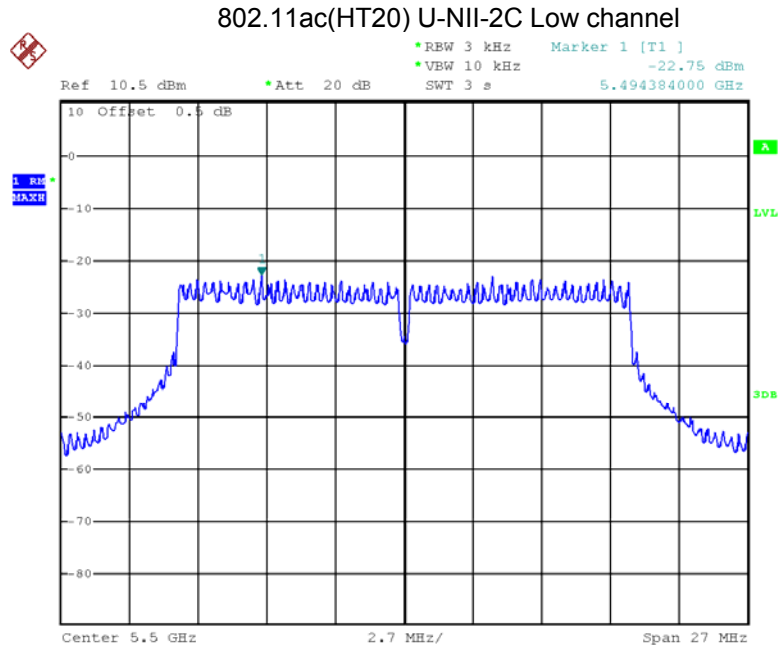
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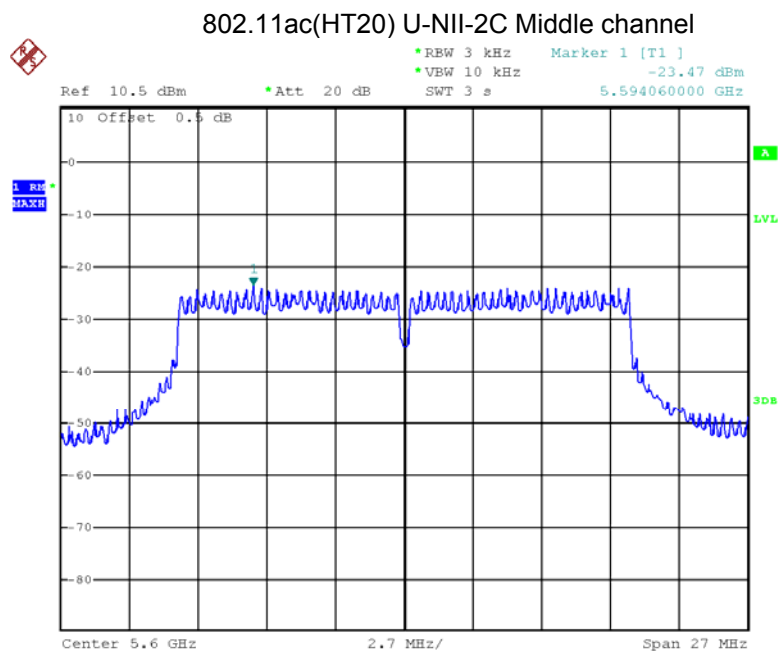
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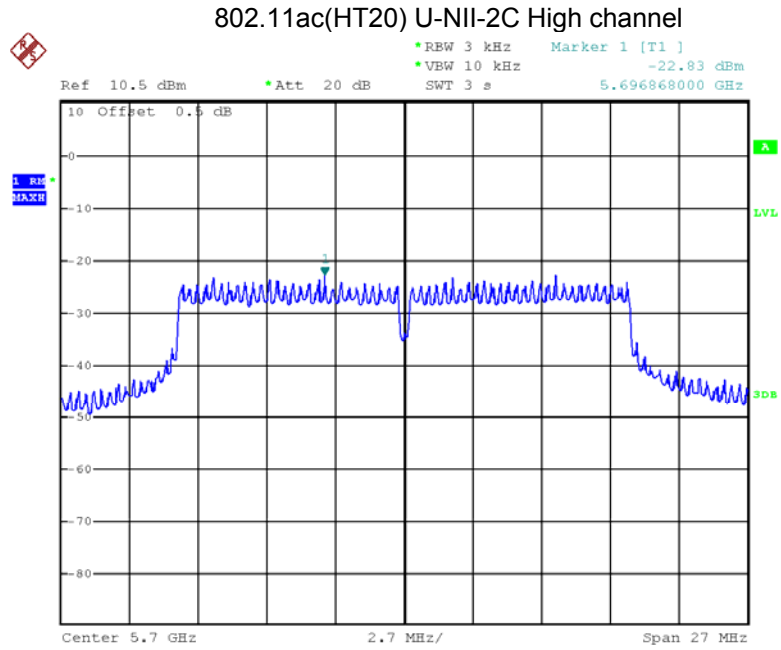
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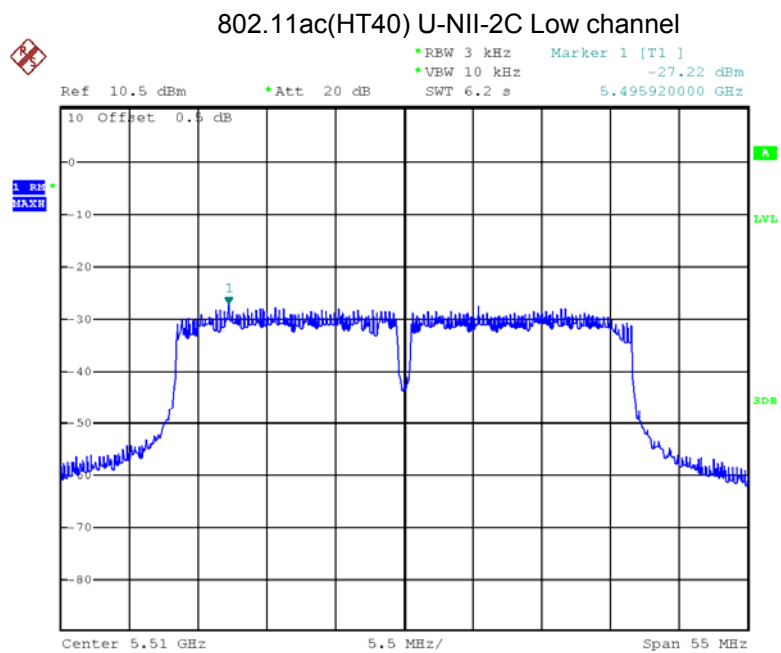
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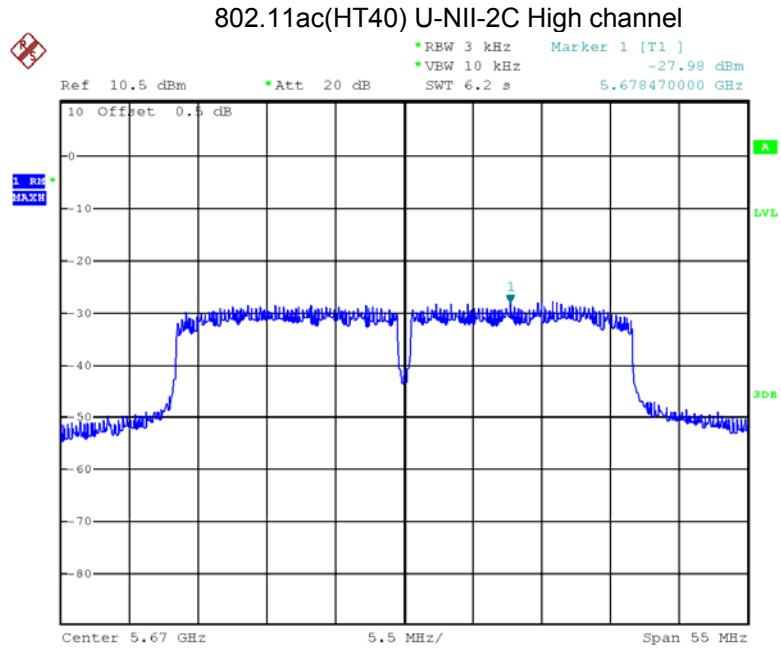
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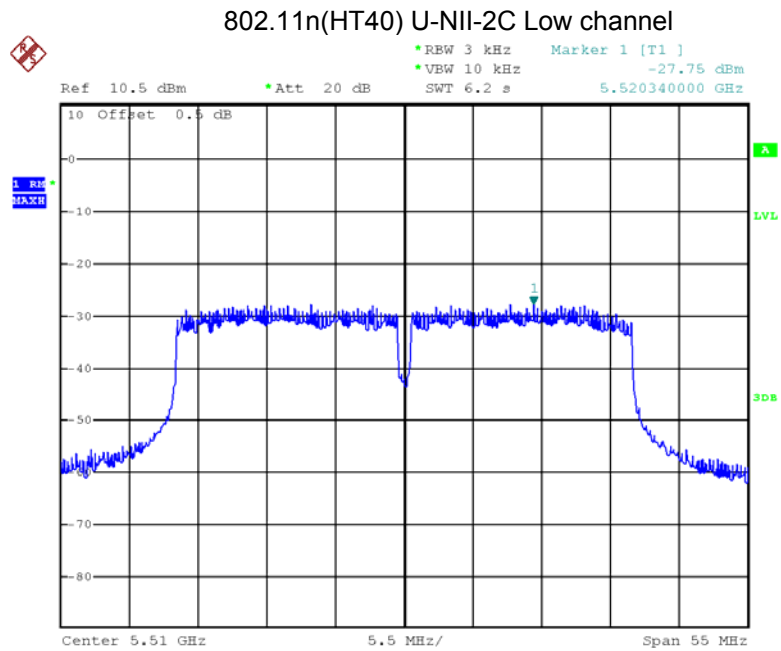
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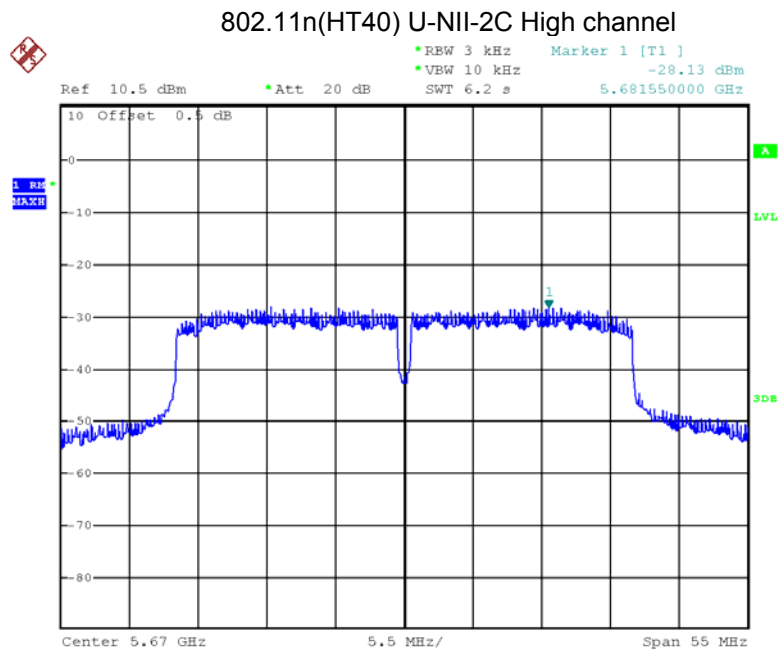
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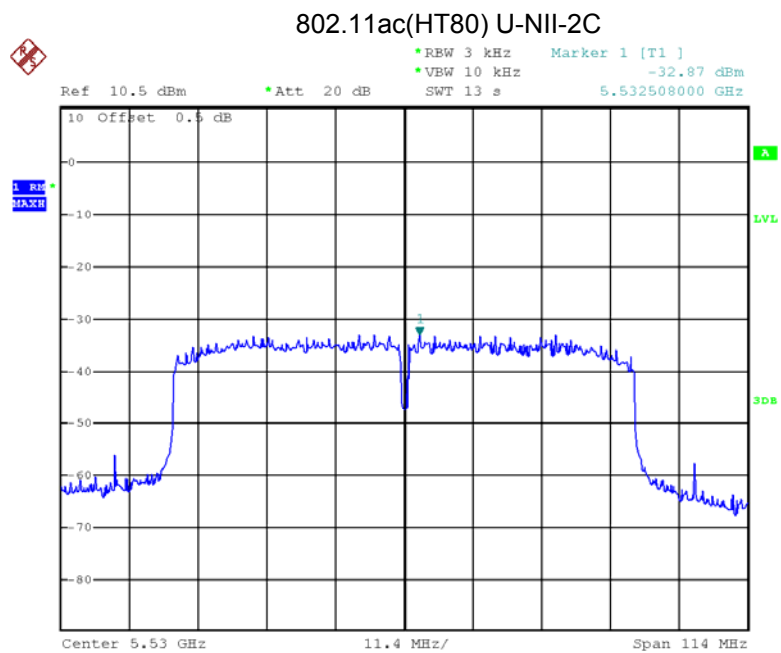
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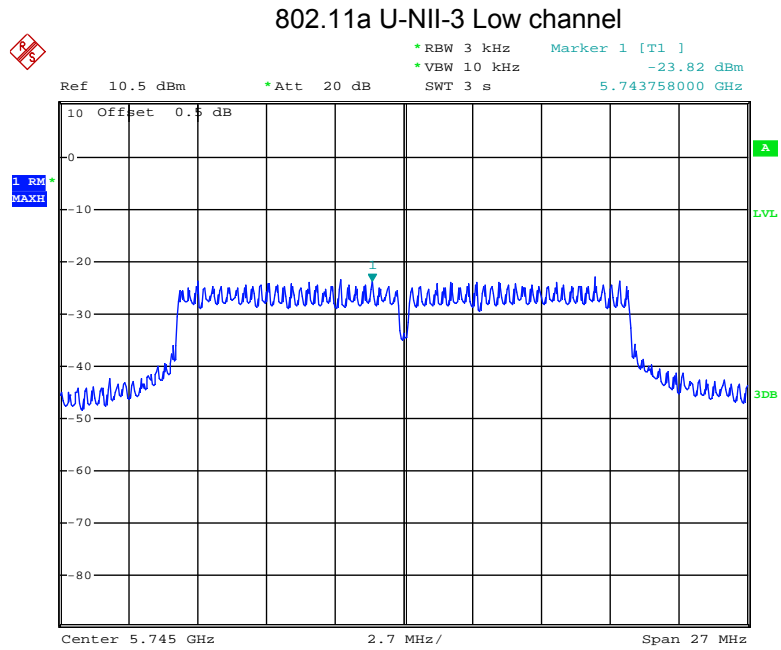
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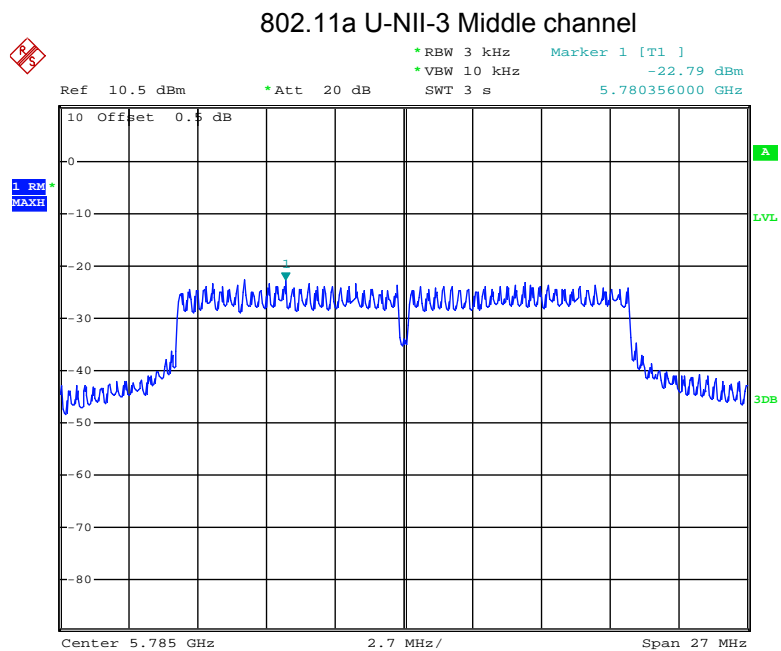
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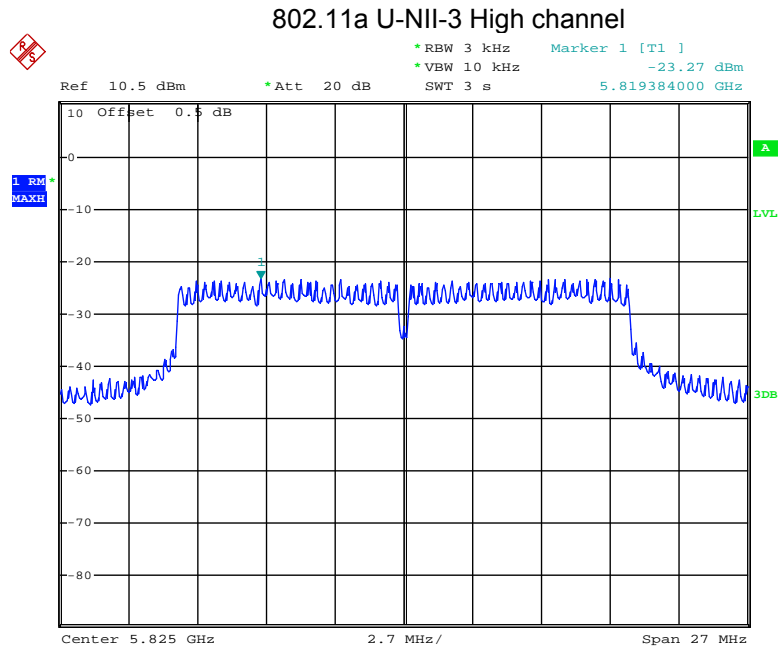
Date: 29.JUL.2018 22:00:16



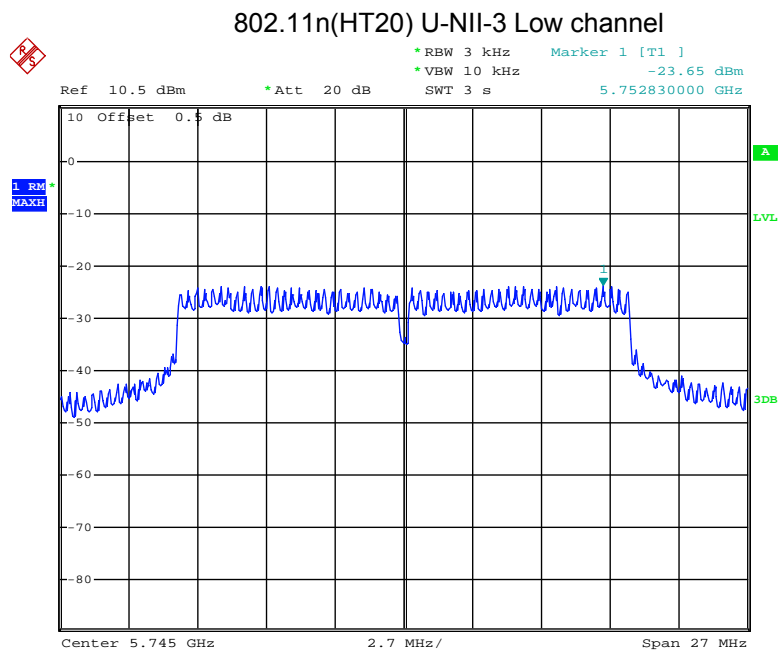
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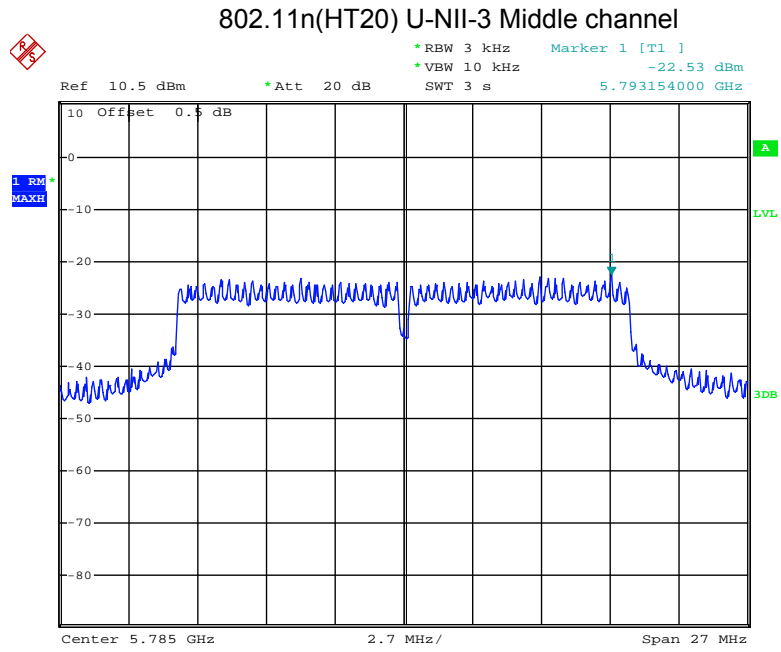
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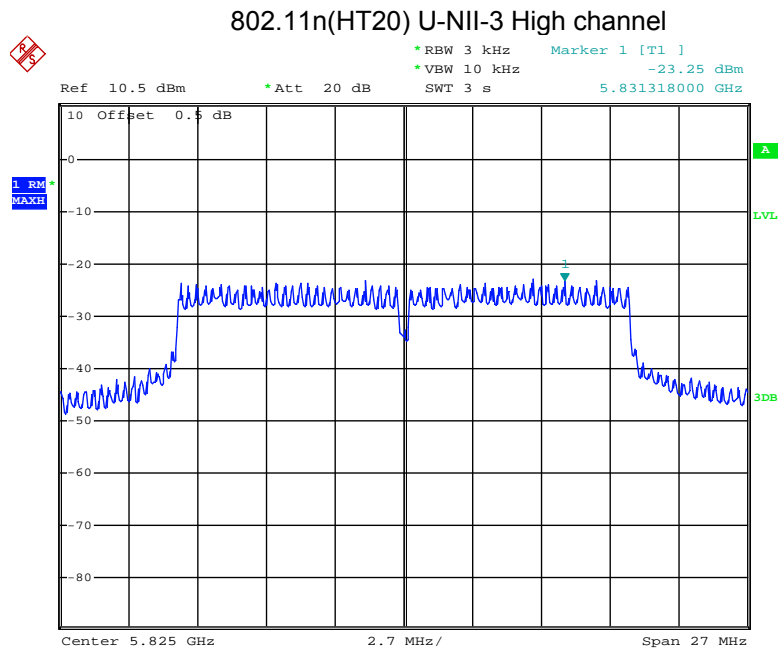
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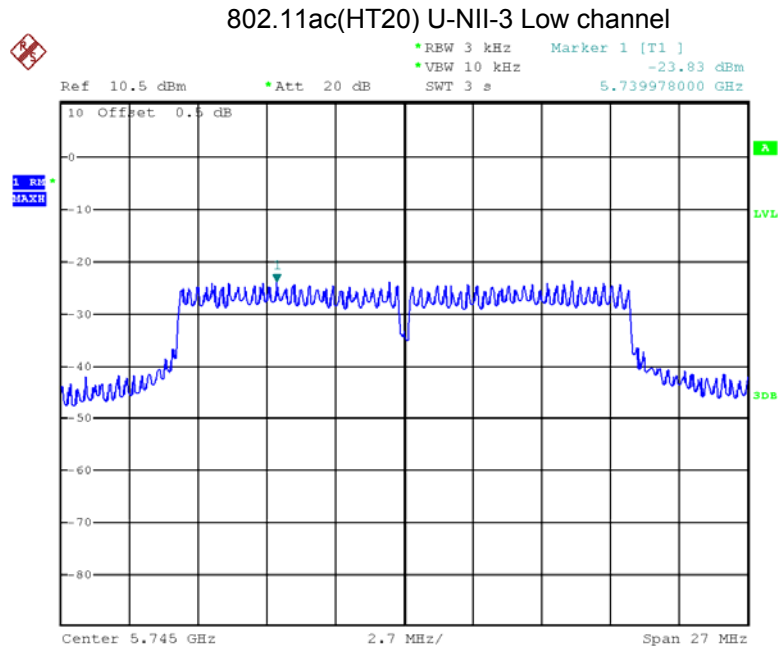
Date: 24.JUL.2018 22:12:38



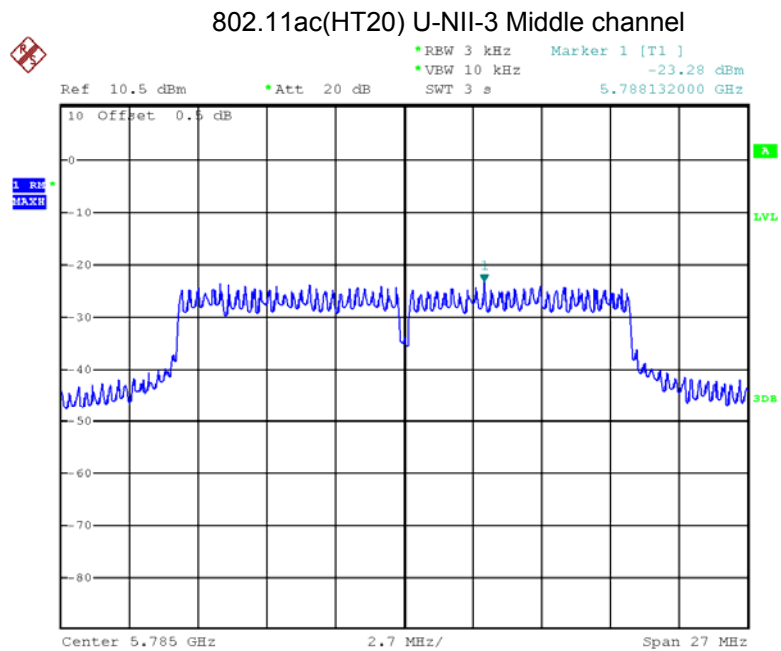
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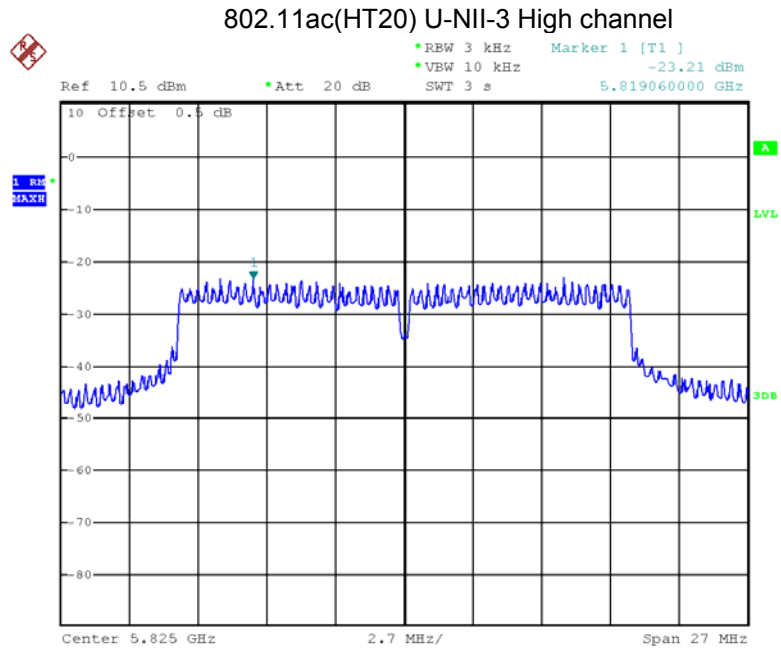
Date: 24.JUL.2018 22:27:25



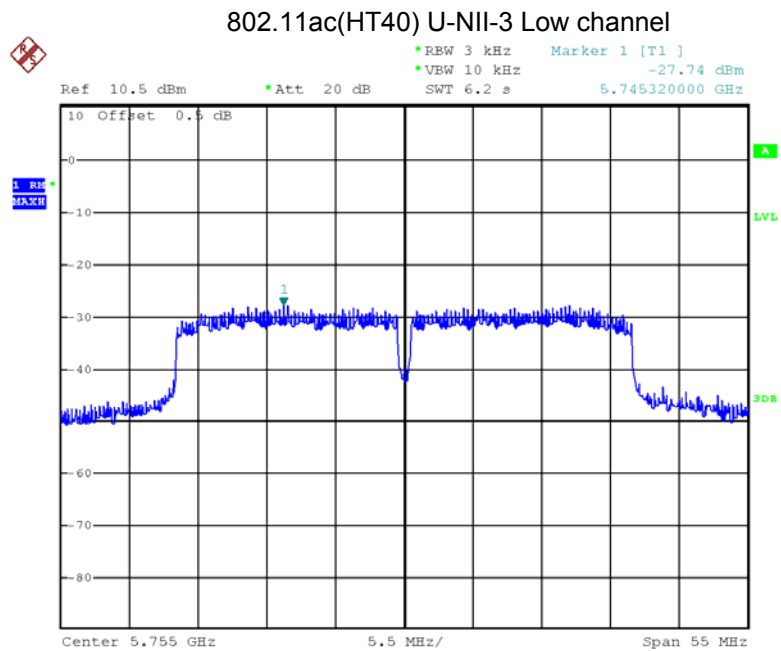
Date: 26.JUL.2018 22:47:48



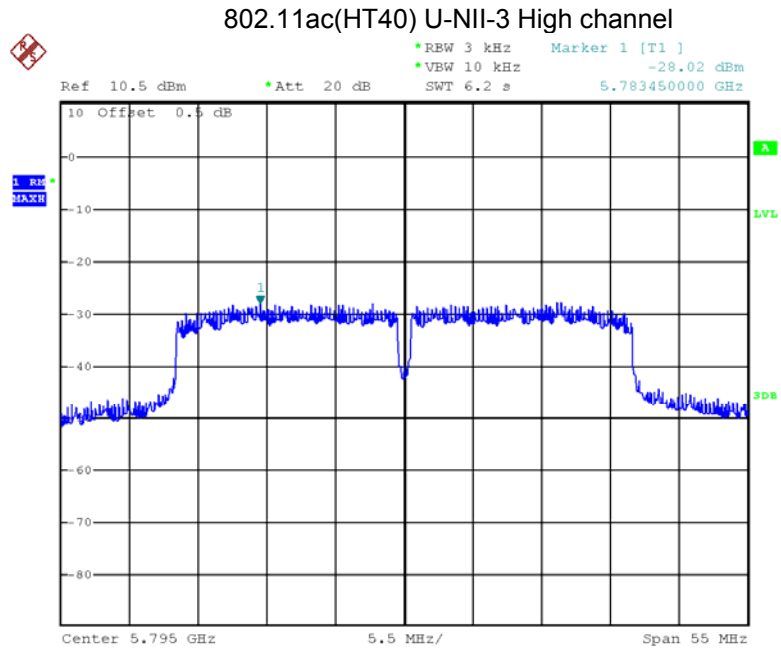
Date: 26.JUL.2018 22:50:50



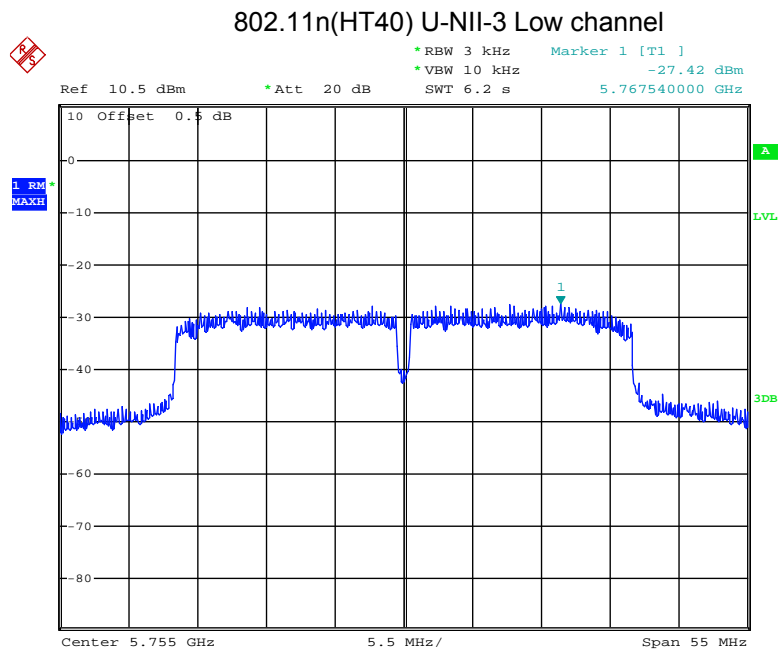
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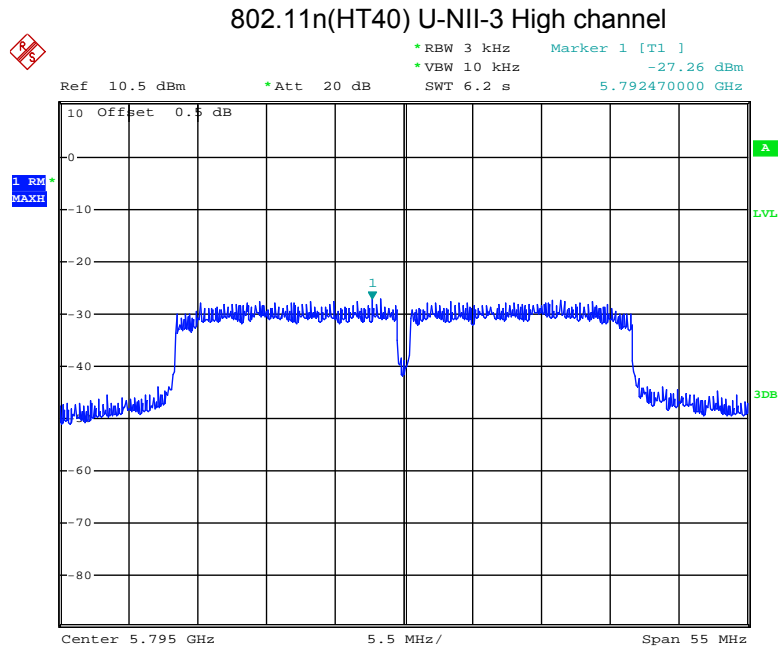
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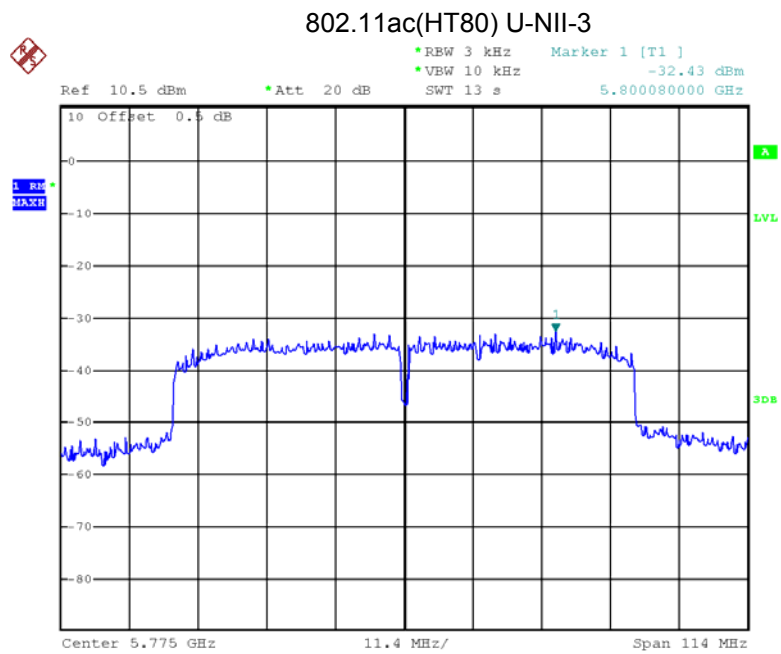
Date: 26.JUL.2018 22:59:47



Date: 24.JUL.2018 22:32:16



Date: 24.JUL.2018 22:43:20



Date: 29.JUL.2018 22:08:48

15 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has an internal integrated antenna fulfill the requirement of this section.

16 RF Exposure

Remark: refer to SAR test report: WTS18S07117020-1W.

17 Photographs of test setup and EUT.

Note: Please refer to appendix: WTS18S07117020W_Photo.

=====**End of Report**=====