ETSI EN 301 893 V2.1.1 (2017-05)

TEST REPORT

For

Tomorrow systems s.r.o

Karlstejnska 323,Orech

Tested Model: 524WiFi 900VX
Series Model: 524WiFi 600VX,524WiFi 900VX-MX, 524WiFi 600VX-MX,WDS-WLE600VX-7A,WDS-WLE900VX-7A

Report Type:	**Product Type:**
Amended Report	Dual Band 11AC wireless Module

Report Number:	RKSA210121001-01B
Report Date:	2021-01-27
Reviewed By:	Oscar Ye EMC Manager
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

TABLE OF CONTENTS

FINAL

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Issue
1	RKSA191022001-01B	Original Report	2019-11-30
2	RKSA210121001-01B	Amended Report	2021-01-27

Note:

This is an amended report application based on RKSA191022001-01B, the details as below:

1. Change the manufacturer from “Wallys Communications（SuZhou）Co.,LTD” to “Tomorrow systems s.r.o”.

2. Change the address from “Room 2723,Le Jia building,Jia Rui Xiang No.8, Suzhou Industrial Park, Suzhou, P.R Suzhou, 215000 China” to “Karlstejnska 323,Orech”.

3. Change the tested model from “DR900VX” to “524WiFi 900VX”.

4. Change the series model from “DR900VX-4.9,DR600VX,DR600VX-4.9,DR900VX-MX,DR600VX-MX” to “524WiFi 600VX,524WiFi 900VX-MX,524WiFi 600VX-MX,WDS-WLE600VX-7A,WDS-WLE900VX-7A”.

5. Update the Product Similarity Declaration Letter.

The above changes will affect nothing, all test data and photos were referred to the original report RKSA191022001-01B that issued on 2019-11-30 by BACL (Kunshan).

FINAL

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Tomorrow systems s.r.o
Tested Model	524WiFi 900VX
Series Model	524WiFi 600VX,524WiFi 900VX-MX,524WiFi 600VX-MX, WDS-WLE600VX-7A,WDS-WLE900VX-7A
Model Difference	See Product Similarity Declaration Letter
Product Type	Dual Band 11AC wireless Module
Power Supply	DC 3.3V
RF Function	2.4G Wi-Fi, 5G Wi-Fi, DFS
Operating Band/Frequency	2.4G Wi-Fi: 2412-2472 MHz 5G Wi-Fi Band1: 5150-5250MHz,5G Wi-Fi Band2: 5250-5350MHz 5G Wi-Fi Band3: 5470-5725MHz
Channel Number	2.4G Wi-Fi: 13; 5G Wi-Fi B1:7, B2:7, B3:18
Channel Separation	2.4G Wi-Fi: 5MHz; 5G Wi-Fi B1,B2,B3:10MHz
Antenna Type	Omni antenna
Antenna Gain	2.0dBi

*****_All measurement and test data in this report was gathered from production sample serial number: 20191022001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-10-22)_

FINAL

Declarations

1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

3: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

4: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

5: This report cannot be reproduced except in full, without prior written approval of the Company.

6: This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

FINAL

PRODUCT SIMILARITY DECLARATION LETTER

Tomorrow systems s.r.o
Add: Karlstejnska 323,Orech
Tel: +420775262900
Fax: +420608262004
Mail: info@524wifi.com
Date: 2021-1-21

DECLARATION OF SIMILARITY

Dear Sir or Madam:

We, Tomorrow systems s.r.o , hereby declare that product:Dual Band 11AC wireless Module, as following models: 524WiFi 900VX ,524WiFi 600VX,524WiFi 900VX-MX ,524WiFi 600VX-MX ,WDS-WLE600VX-7A,WDS-WLE900VX-7A. And only 524WiFi 900VX was tested by BACL with the same electromagnetic emissions and electromagnetic compatibility characteristics.

The detail differences description as below:

All the products are the different model name, with the same appearance, structure, power and size, and schematic and PCB design.

Please contact me if there is need for any additional clarification or information.

Best Regards,

Signature:

Contact Person: Karel Horky
Title: CEO, founder

Tomorrow systems s.r.o.
Wodasign - Wodaplug - 524wifi
Radlická 33, Praha 5, 155 00
ičo 26705257 dič cz26705257
524wifi.com

BELOW IS THE ORIGINAL REPORT

FINAL

ETSI EN 301 893 V2.1.1 (2017-05)

TEST REPORT

For

Wallys Communications（SuZhou）Co.,LTD

Room 2723,Le Jia building,Jia Rui Xiang No.8, Suzhou Industrial Park, Suzhou, P.R Suzhou, 215000 China

Tested Model: DR900VX
Series Model: DR900VX-4.9,DR600VX,DR600VX-4.9,DR900VX-MX,DR600VX-MX

Report Type:	**Product Type:**
Original Report	Dual Band 11AC wireless Module

Test Engineer:	Carry Cai
Report Number:	RKSA191022001-01B
Report Date:	2019-11-30
Reviewed By:	Oscar Ye EMC Manager
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

FINAL

Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp**.** This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

FINAL

FINAL

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Wallys Communications（SuZhou）Co.,LTD
Tested Model:	DR900VX
Series Model:	DR900VX-4.9,DR600VX,DR600VX-4.9,DR900VX-MX,DR600VX-MX
Model Difference:	Model names
Product Type:	Dual Band 11AC wireless Module
Power Supply:	DC 3.3V
RF Function:	2.4G Wi-Fi, 5G Wi-Fi, DFS
Operating Band/Frequency:	2.4G Wi-Fi: 2412-2472 MHz 5G Wi-Fi Band1: 5150-5250MHz,5G Wi-Fi Band2: 5250-5350MHz 5G Wi-Fi Band3: 5470-5725MHz
Channel Number:	2.4G Wi-Fi: 13; 5G Wi-Fi B1:7, B2:7, B3:18
Channel Separation:	2.4G Wi-Fi: 5MHz; 5G Wi-Fi: B1,B2,B3:10MHz
Antenna Type:	Omni antenna
Antenna Gain:	2.0dBi

**All measurement and test data in this report was gathered from production sample serial number: 20191022001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-10-22)*

Objective

This report is prepared on behalf of *Wallys Communications（SuZhou）Co.,LTD*. in accordance with ETSI EN 301 893 V2.1.1 (2017-05), 5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

The objective is to determine the compliance of EUT with ETSI EN 301 893 V2.1.1 (2017-05).

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 893 V2.1.1 (2017-05).

FINAL

Measurement Uncertainty

Item		Uncertainty
RF Output Power with Power meter		0.5dB
Power Spectral Density, conducted		0.5dB
Unwanted Emissions, conducted		2.34 dB
Radiated emission	30MHz~1GHz	5.91dB
	1GHz~6GHz	4.68dB
	6 GHz ~18 GHz	4.92dB
	18 GHz~40 GHz	4.88dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%
Time		5 %
Supply voltages		0.04%

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01), the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

FINAL

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For **5150~5250 MHz** band, test channel list is as below:

For 802.11a/ac20/n-HT20 bandwidth system, channel 36 was tested.
For 802.11 ac40/n-HT40 bandwidth system, channel 38 was tested.
For 802.11ac80 bandwidth system, channel 42 was tested.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240
42	5210	/	/

For **5250~5350 MHz** band, test channel list is as below:

For 802.11a/ac20/n-HT20 bandwidth system, channel 64 was tested.
For 802.11 ac40/n-HT40 bandwidth system, channel 62 was tested.
For 802.11ac80 bandwidth system, channel 58 was tested.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
54	5270	62	5310
56	5280	64	5320
58	5290	/	/

FINAL

For **5470~5725 MHz** band, test channel list is as below:

For 802.11a/ac20/n-HT20 bandwidth system, channel 100, 140 was tested.
For 802.11 ac40/n-HT40 bandwidth system, channel 102, 134 was tested.
For 802.11ac80 bandwidth system, channel 106, 122 was tested.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	124	5620
102	5510	126	5630
104	5520	128	5640
106	5530	132	5660
108	5540	134	5670
110	5550	136	5680
112	5560	140	5700
116	5580	/	/
118	5590		
120	5600		
122	5610		

The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the average power and PSD across all date rates ,bandwidths and modulations.

Equipment Modifications

No modifications were made to the EUT.

EUT Exercise Software

RF test tool: Cart.exe

FINAL

The worst condition was performed under:

For **5150~5250 MHz** band:

Mode	Data rate	Channel	Power level
802.11a	6 Mbps	5180	15
802.11ac20	MCS0	5180	11
802.11n-HT20	MCS0	5180	11
802.11n-ac40	MCS0	5190	11
802.11n-HT40	MCS0	5190	11
802.11ac80	MCS0	5210	11

For **5250~5350 MHz** band:

Mode	Data rate	Channel	Power level
802.11a	6 Mbps	5320	15
802.11ac20	MCS0	5320	11
802.11n-HT20	MCS0	5320	11
802.11n-ac40	MCS0	5310	11
802.11n-HT40	MCS0	5310	11
802.11ac80	MCS0	5290	11

For **5470~5725 MHz** band:

Mode	Data rate	Channel	Power level
802.11a	6 Mbps	5500	15
		5700	15
802.11ac20	6 Mbps	5500	11
		5700	11
802.11n-HT20	MCS0	5500	11
		5700	11
802.11n-ac40	MCS0	5510	11
		5670	11
802.11n-HT40	MCS0	5510	11
		5670	11
802.11ac80	MCS0	5530	11
		5610	11

FINAL

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

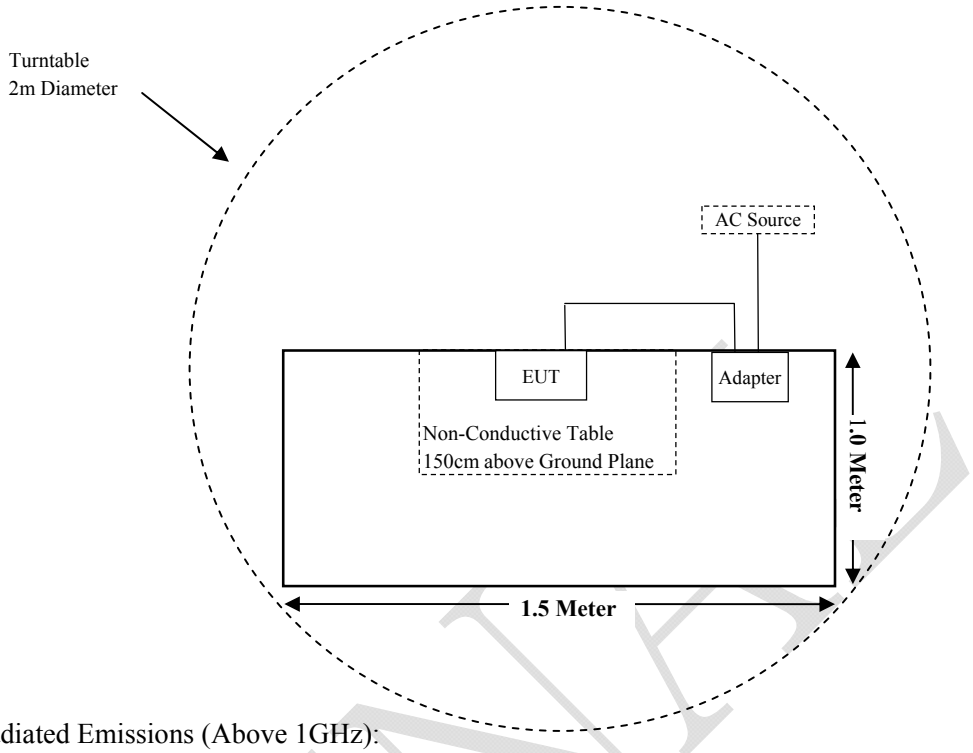
External I/O Cable

Cable Description	Length (m)	From Port	To
Power Cable	1.0	EUT	Adapter
Power Cable	1.0	Adapter	AC Source

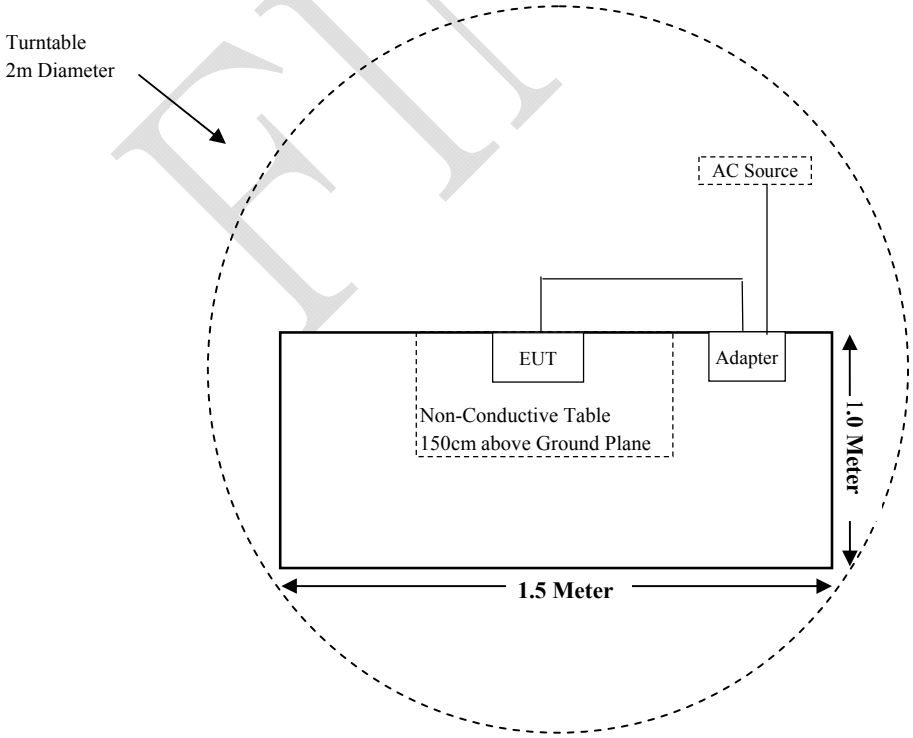
FINAL

Block Diagram of Test Setup

For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

ETSI EN 301 893 V2.1.1 (2017-05)	Description of Test	Test Result
Clause 4.2.1	Nominal Centre frequencies	Compliant
Clause 4.2.2	Nominal Channel Bandwidth and Occupied Channel Bandwidth	Compliant
Clause 4.2.3	RF output power	Compliant
Clause 4.2.3	Transmit Power Control (TPC)	Not Applicable (See Note1)
Clause 4.2.3	Power Density	Compliant
Clause 4.2.4.1	Transm itter unwanted emissions outside the 5 GHz RLAN bands	Compliant
Clause 4.2.4.2	Transmitter unwanted emissions within the 5 GHz RLAN bands	Compliant
Clause 4.2.5	Receiver spurious emissions	Compliant
Clause 4.2.7	Adaptivity (Channel Access Mechanism)	Compliant
Clause 4.2.8	Receiver Blocking	Compliant
Clause 4.2.9	User Access Restrictions	Compliant (See Note2)
Clause 4.2.10	Geo-location capability	Not Applicable (See Note 3)

Note1: The EUT doesn't support the TPC function.
Note2: Please refer to the user manual.
Note3: The supplier declared that the equipment is unable to perform this function.

FINAL

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test(Chamber 1#)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2018-11-30	2019-11-29
HP	Signal Generator	HP 8341B	2624A00116	2018-11-30	2019-11-29
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sunol Sciences	Bilog antenna	JB3	A060217	2017-08-04	2020-08-03
Sonoma Instrunent	Pre-amplifier	310N	171205	2019-08-14	2020-08-13
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-7	007	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
Radiated Emission Test(Chamber 2#)					
HP	Signal Generator	HP 8341B	2624A00116	2018-11-30	2019-11-29
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2019-05-30	2020-05-29
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2019-07-15	2020-07-14
ETS-LINDGREN	Horn Antenna	3115	6229	2016-12-12	2019-12-11
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-12-12	2019-12-11
ETS-LINDGREN	Horn Antenna	3116	2516	2016-12-12	2019-12-11
A.H.Systems, inc	Amplifier	2641-1	466	2019-09-11	2020-09-10
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2019-08-15	2020-08-14
RF Conducted Test					
Tonscend Corporation	RF Control Unit	JS0806-2	/	2019-08-01	2020-07-31
Tonscend Corporation	RF Test System	JS1120-3	/	N/A	N/A
Rohde & Schwarz	SMBV100A Vector Signal Generator	SMBV100A	261558	2019-07-21	2020-07-20
Rohde & Schwarz	SMB 100A Signal Generator	SMB100A	110390	2019-07-21	2020-07-20
HP	Attenuator/11dB	8494B	011	2019-01-10	2020-01-09
Agilent	Attenuator/110dB	8496B	110	2019-01-10	2020-01-09
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-11-30	2019-11-29
BACL	Temperature & Humidity Chamber	BTH-150	30023	2018-12-20	2019-12-19
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	104478	2019-07-21	2020-07-20
Wallys	RF Cable	Wallys C01	C01	Each Time	/

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

FINAL

ETSI EN 301 893 V2.1.1 (2017-05) Clause 4.2.1 - NOMINAL CENTRE FREQUENCIES

Definition

The *Nominal Centre Frequency* is the centre of the *Operating Channel*.

Limits

The *Nominal Centre Frequencies* (fc) for a *Nominal Channel Bandwidth* of 20 MHz are defined by equation (1). See also figure 3.

fc = 5 160 + (g × 20) MHz, where $0 \leq g \leq 9$ or $16 \leq g \leq 27$ and where g shall be an integer. (1)

A maximum offset of the *Nominal Centre Frequency* of ± 200 kHz is permitted. Where the manufacturer decides to make use of this frequency offset, the manufacturer shall declare the actual centre frequencies used by the equipment. See clause 5.4.1, item a).

The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range f_c ± 20 ppm.

Equipment may have simultaneous transmissions on more than one *Operating Channel* with a *Nominal Channel Bandwidth* of 20 MHz.

Test Procedure

Test conditions

These measurements shall be performed under both normal and extreme test conditions (see clause 5.1.3).

The channels on which the conformance requirements in clause 4.2.1 shall be verified are defined in clause 5.3.2.

The UUT shall be configured to operate at a normal RF Output Power level. In addition, the UUT shall be configured to operate on a single channel.

For a UUT with antenna connector(s) and using dedicated external antenna(s), or for a UUT with integral antenna(s) but with a temporary antenna connector(s) provided, conducted measurements shall be used.

In case of conducted measurements on smart antenna systems (devices with multiple transmit chains) the measurements shall be performed on only one of the active transmit chains.

For a UUT with integral antenna(s) and without a temporary antenna connector(s), radiated measurements shall be used.

FINAL

Test method

Conducted measurement

1. Equipment operating without modulation

This test method requires that the UUT can be operated in an unmodulated test mode.

The UUT shall be connected to a suitable frequency measuring device (e.g. a frequency counter or a spectrum analyser) and operated in an unmodulated mode. The result shall be recorded.

2. Equipment operating with modulation

This method is an alternative to the above method in case the UUT cannot be operated in an un-modulated mode.

The UUT shall be connected to spectrum analyser.

Max Hold shall be selected and the centre frequency adjusted to that of the UUT.

The peak value of the power envelope shall be measured and noted. The span shall be reduced and the marker moved in a positive frequency increment until the upper, (relative to the centre frequency), -10 dBc point is reached. This value shall be noted as f1.

The marker shall then be moved in a negative frequency increment until the lower, (relative to the centre frequency), -10 dBc point is reached. This value shall be noted as f2.

The centre frequency is calculated as (f1 + f2) / 2.

Radiated measurement

The test set up as described in annex B shall be used with a spectrum analyser of sufficient accuracy attached to the test antenna.

The test procedure is as described under clause 5.4.2.2.1.

Test Data

Environmental Conditions

Temperature:	24.3 ℃
Relative Humidity:	56 %
ATM Pressure:	101.3kPa

The testing was performed by Carry Cai on 2019-10-28.

Test Result: Compliant.

Test Mode: Transmitting

Band 1:

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain0	802.11a	5180	-40	3.3	5179.929699	-13.57	±20
			25		5179.941994	-11.20	±20
			70		5179.932248	-13.08	±20
	802.11ac20	5180	-40	3.3	5179.931051	-13.31	±20
			25		5179.932610	-13.01	±20
			70		5179.934240	-12.69	±20
	802.11n20	5180	-40	3.3	5179.941855	-11.22	±20
			25		5179.938458	-11.88	±20
			70		5179.935174	-12.51	±20
	802.11ac40	5190	-40	3.3	5189.936346	-12.26	±20
			25		5189.930931	-13.31	±20
			70		5189.930812	-13.33	±20
	802.11n40	5190	-40	3.3	5189.928621	-13.75	±20
			25		5189.934285	-12.66	±20
			70		5189.938975	-11.76	±20
	802.11ac80	5210	-40	3.3	5209.932507	-12.95	±20
			25		5209.936148	-12.26	±20
			70		5209.935988	-12.29	±20

FINAL

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain1	802.11a	5180	-40	3.3	5179.930101	-13.49	±20
			25		5179.932645	-13.00	±20
			70		5179.939040	-11.77	±20
	802.11ac20	5180	-40	3.3	5179.940377	-11.51	±20
			25		5179.932025	-13.12	±20
			70		5179.935407	-12.47	±20
	802.11n20	5180	-40	3.3	5179.930055	-13.50	±20
			25		5179.928982	-13.71	±20
			70		5179.937865	-12.00	±20
	802.11ac40	5190	-40	3.3	5189.940818	-11.40	±20
			25		5189.930124	-13.46	±20
			70		5189.938658	-11.82	±20
	802.11n40	5190	-40	3.3	5189.935813	-12.37	±20
			25		5189.928278	-13.82	±20
			70		5189.930122	-13.46	±20
	802.11ac80	5210	-40	3.3	5209.929253	-13.58	±20
			25		5209.940092	-11.50	±20
			70		5209.936958	-12.10	±20

FINAL

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain2	802.11a	5180	-40	3.3	5179.929002	-13.71	±20
			25		5179.941508	-11.29	±20
			70		5179.933629	-12.81	±20
	802.11ac20	5180	-40	3.3	5179.937126	-12.14	±20
			25		5179.932799	-12.97	±20
			70		5179.934706	-12.60	±20
	802.11n20	5180	-40	3.3	5179.940479	-11.49	±20
			25		5179.940116	-11.56	±20
			70		5179.940043	-11.57	±20
	802.11ac40	5190	-40	3.3	5189.936603	-12.22	±20
			25		5189.929530	-13.58	±20
			70		5189.933812	-12.75	±20
	802.11n40	5190	-40	3.3	5189.934150	-12.69	±20
			25		5189.935998	-12.33	±20
			70		5189.932597	-12.99	±20
	802.11ac80	5210	-40	3.3	5209.940605	-11.40	±20
			25		5209.934882	-12.50	±20
			70		5209.932276	-13.00	±20

FINAL

Band 2:

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain0	802.11a	5320	-40	3.3	5319.929182	-13.31	±20
			25		5319.936873	-11.87	±20
			70		5319.931342	-12.91	±20
	802.11ac20	5320	-40	3.3	5319.935442	-12.13	±20
			25		5319.931661	-12.85	±20
			70		5319.933869	-12.43	±20
	802.11n20	5320	-40	3.3	5319.930803	-13.01	±20
			25		5319.927761	-13.58	±20
			70		5319.935748	-12.08	±20
	802.11ac40	5310	-40	3.3	5309.927552	-13.64	±20
			25		5309.939827	-11.33	±20
			70		5309.926683	-13.81	±20
	802.11n40	5310	-40	3.3	5309.934003	-12.43	±20
			25		5309.938881	-11.51	±20
			70		5309.933958	-12.44	±20
	802.11ac80	5290	-40	3.3	5289.935580	-12.18	±20
			25		5289.938110	-11.70	±20
			70		5289.936963	-11.92	±20

FINAL

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain1	802.11a	5320	-40	3.3	5319.932060	-12.77	±20
			25		5319.927239	-13.68	±20
			70		5319.937849	-11.68	±20
	802.11ac20	5320	-40	3.3	5319.930786	-13.01	±20
			25		5319.934699	-12.27	±20
			70		5319.937332	-11.78	±20
	802.11n20	5320	-40	3.3	5319.928026	-13.53	±20
			25		5319.933026	-12.59	±20
			70		5319.928753	-13.39	±20
	802.11ac40	5310	-40	3.3	5309.929919	-13.20	±20
			25		5309.935594	-12.13	±20
			70		5309.936846	-11.89	±20
	802.11n40	5310	-40	3.3	5309.936018	-12.05	±20
			25		5309.931665	-12.87	±20
			70		5309.936320	-11.99	±20
	802.11ac80	5290	-40	3.3	5289.928055	-13.60	±20
			25		5289.931960	-12.86	±20
			70		5289.931947	-12.86	±20

FINAL

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain2	802.11a	5320	-40	3.3	5319.926970	-13.73	±20
			25		5319.938931	-11.48	±20
			70		5319.935612	-12.10	±20
	802.11ac20	5320	-40	3.3	5319.929789	-13.20	±20
			25		5319.939662	-11.34	±20
			70		5319.926787	-13.76	±20
	802.11n20	5320	-40	3.3	5319.939005	-11.47	±20
			25		5319.938987	-11.47	±20
			70		5319.927163	-13.69	±20
	802.11ac40	5310	-40	3.3	5309.928599	-13.45	±20
			25		5309.933050	-12.61	±20
			70		5309.929180	-13.34	±20
	802.11n40	5310	-40	3.3	5309.929573	-13.26	±20
			25		5309.928005	-13.56	±20
			70		5309.940144	-11.27	±20
	802.11ac80	5290	-40	3.3	5289.937780	-11.76	±20
			25		5289.936132	-12.07	±20
			70		5289.934280	-12.42	±20

FINAL

Band3:

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain0	802.11a	5500	-40	3.3	5499.930592	-12.62	±20
			25		5499.938411	-11.20	±20
			70		5499.924663	-13.70	±20
	802.11ac20	5500	-40	3.3	5499.924726	-13.69	±20
			25		5499.924369	-13.75	±20
			70		5499.932359	-12.30	±20
	802.11n20	5500	-40	3.3	5499.932927	-12.20	±20
			25		5499.932292	-12.31	±20
			70		5499.924793	-13.67	±20
	802.11ac40	5510	-40	3.3	5509.930640	-12.59	±20
			25		5509.928929	-12.90	±20
			70		5509.926073	-13.42	±20
	802.11n40	5510	-40	3.3	5509.936033	-11.61	±20
			25		5509.924366	-13.73	±20
			70		5509.932106	-12.32	±20
	802.11ac80	5530	-40	3.3	5529.933158	-12.09	±20
			25		5529.924053	-13.73	±20
			70		5529.924540	-13.65	±20

FINAL

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain1	802.11a	5500	-40	3.3	5499.932576	-12.26	±20
			25		5499.934791	-11.86	±20
			70		5499.931337	-12.48	±20
	802.11ac20	5500	-40	3.3	5499.931810	-12.40	±20
			25		5499.929462	-12.83	±20
			70		5499.938341	-11.21	±20
	802.11n20	5500	-40	3.3	5499.929951	-12.74	±20
			25		5499.931579	-12.44	±20
			70		5499.938202	-11.24	±20
	802.11ac40	5510	-40	3.3	5509.924640	-13.68	±20
			25		5509.933357	-12.09	±20
			70		5509.923948	-13.80	±20
	802.11n40	5510	-40	3.3	5509.936502	-11.52	±20
			25		5509.924721	-13.66	±20
			70		5509.934716	-11.85	±20
	802.11ac80	5530	-40	3.3	5529.930442	-12.58	±20
			25		5529.931112	-12.46	±20
			70		5529.934833	-11.78	±20

FINAL

Chain	Mode	f_c	Temperature	Voltage	f	Frequency Error	Limit
		MHz	℃	V_{DC}	MHz	ppm	ppm
Chain2	802.11a	5500	-40	3.3	5499.937402	-11.38	±20
			25		5499.937920	-11.29	±20
			70		5499.930690	-12.60	±20
	802.11ac20	5500	-40	3.3	5499.932815	-12.22	±20
			25		5499.936902	-11.47	±20
			70		5499.932703	-12.24	±20
	802.11n20	5500	-40	3.3	5499.932031	-12.36	±20
			25		5499.931387	-12.48	±20
			70		5499.929817	-12.76	±20
	802.11ac40	5510	-40	3.3	5509.927853	-13.09	±20
			25		5509.933333	-12.10	±20
			70		5509.926263	-13.38	±20
	802.11n40	5510	-40	3.3	5509.930689	-12.58	±20
			25		5509.931415	-12.45	±20
			70		5509.933274	-12.11	±20
	802.11ac80	5530	-40	3.3	5529.933330	-12.06	±20
			25		5529.926218	-13.34	±20
			70		5529.935043	-11.75	±20

FINAL

ETSI EN 301 893 V2.1.1 (2017-05) Clause 4.2.2 - NOMINAL CHANNEL BANDWIDTH AND OCCUPIED CHANNEL BANDWIDTH

Definition

The *Nominal Channel Bandwidth* is the widest band of frequencies, inclusive of guard bands, assigned to a single channel.

The *Occupied Channel Bandwidth* is the bandwidth containing 99 % of the power of the signal.

When equipment has simultaneous transmissions in adjacent channels, these transmissions may be considered as one signal with an actual *Nominal Channel Bandwidth* of 'n' times the individual *Nominal Channel Bandwidth* where 'n' is the number of adjacent channels. When equipment has simultaneous transmissions in non-adjacent channels, each power envelope shall be considered separately.

Limits

The *Nominal Channel Bandwidth* for a single *Operating Channel* shall be 20 MHz.

Alternatively, equipment may implement a lower *Nominal Channel Bandwidth* with a minimum of 5 MHz, providing they still comply with the *Nominal Centre Frequencies* defined in clause 4.2.1 (20 MHz raster).

The *Occupied Channel Bandwidth* shall be between 80 % and 100 % of the declared *Nominal Channel Bandwidth*. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement. The *Occupied Channel Bandwidth* might change with time/payload.

During a *Channel Occupancy Time (COT)*, equipment may operate temporarily with an *Occupied Channel Bandwidth* of less than 80 % of its *Nominal Channel Bandwidth* with a minimum of 2 MHz.

Test Procedure

Test conditions

The conformance requirements in clause 4.2.2 shall be verified only under normal operating conditions, and on those channels and channel bandwidths defined in clause 5.3.2.

The measurements shall be performed using normal operation of the equipment with the test signal applied (see clause 5.3.1.1).

The UUT shall be configured to operate at a typical RF power output level used for normal operation.

When equipment has simultaneous transmissions in adjacent channels, these transmissions may be considered as one signal with an actual *Nominal Channel Bandwidth* of 'n' times the individual *Nominal Channel Bandwidth* where 'n' is the number of adjacent channels. When equipment has simultaneous transmissions in non-adjacent channels, each power envelope shall be considered separately.

For a UUT with antenna connector(s) and using dedicated external antenna(s), or for a UUT with integral antenna(s) but with a temporary antenna connector(s) provided, conducted measurements shall be used.

FINAL

In case of conducted measurements on smart antenna systems (devices with multiple transmit chains) measurements need only to be performed on one of the active transmit chains (antenna outputs).

For a UUT with integral antenna(s) and without a temporary antenna connector(s), radiated measurements shall be used.

Test method

Conducted measurement

The measurement procedure shall be as follows:

Step 1:

- Connect the UUT to the spectrum analyser and use the following settings:

  - Centre Frequency: The centre frequency of the channel under test
  - Resolution BW: 100 kHz
  - Video BW: 300 kHz
  - Frequency Span: 2 x Nominal Bandwidth (e.g. 40 MHz for a 20 MHz channel)
  - Sweep time: > 1 s; for larger Nominal Bandwidths, the sweep time may be increased until a value where the sweep time has no impact on the RMS value of the signal
  - Detector Mode: RMS
  - Trace Mode: Max Hold

Step 2:

Wait for the trace to stabilize.

Step 3:

- Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.

- Use the 99 % bandwidth function of the spectrum analyser to measure the *Occupied Channel Bandwidth* of the UUT. This value shall be recorded.

The measurement described in steps 1 to 3 above shall be repeated in case of simultaneous transmissions in non-adjacent channels.

Radiated measurement

The test set up as described in annex B and the applicable measurement procedures described in annex C shall be used. The test procedure is as described under clause 5.4.3.2.1.

FINAL

Test Data

Environmental Conditions

Temperature:	24.3 ℃~25.0 ℃
Relative Humidity:	50 %~56 %
ATM Pressure:	101.2kPa ~101.3kPa

The testing was performed by Carry Cai from 2019-11-18 to 2019-11-30.

Test Mode: Transmitting

Test Result: Compliant.

Band 1:

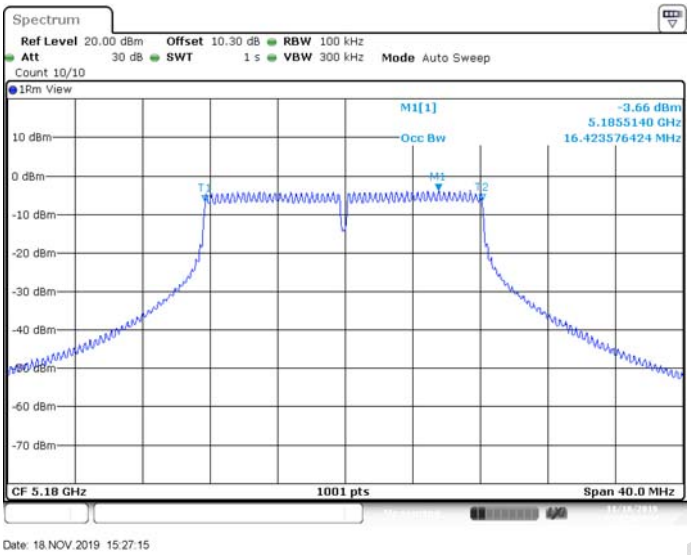
Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain0	802.11a	5180	20	16.424	16~20
	802.11ac20	5180	20	17.622	16~20
	802.11n-HT20	5180	20	17.622	16~20
	802.11ac40	5190	40	36.204	32~40
	802.11n-HT40	5190	40	36.204	32~40
	802.11ac80	5210	80	75.604	64~80

Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain1	802.11a	5180	20	16.424	16~20
	802.11ac20	5180	20	17.622	16~20
	802.11n-HT20	5180	20	17.622	16~20
	802.11ac40	5190	40	36.204	32~40
	802.11n-HT40	5190	40	36.204	32~40
	802.11ac80	5210	80	75.604	64~80

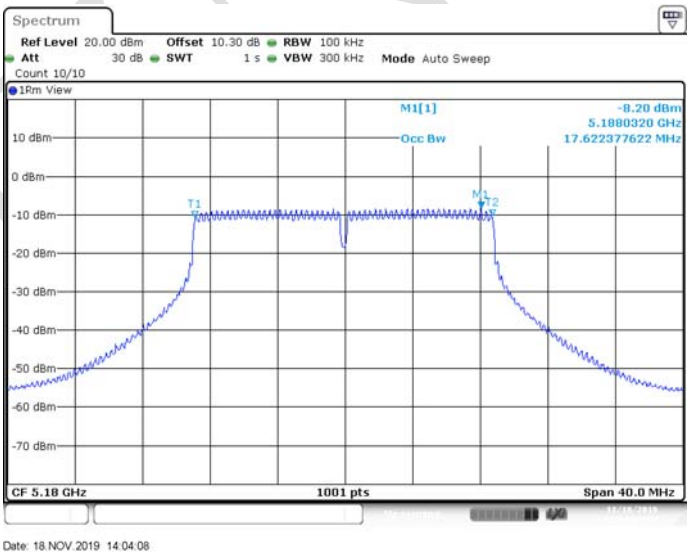
Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain2	802.11a	5180	20	16.424	16~20
	802.11ac20	5180	20	17.622	16~20
	802.11n-HT20	5180	20	17.622	16~20
	802.11ac40	5190	40	36.204	32~40
	802.11n-HT40	5190	40	36.204	32~40
	802.11ac80	5210	80	75.604	64~80

FINAL

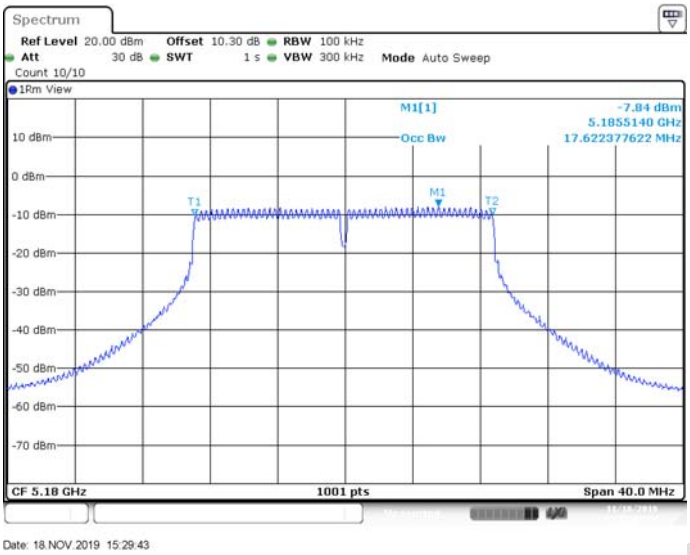
Chain0:802.11a 5180MHz, 99% Occupied Channel Bandwidth



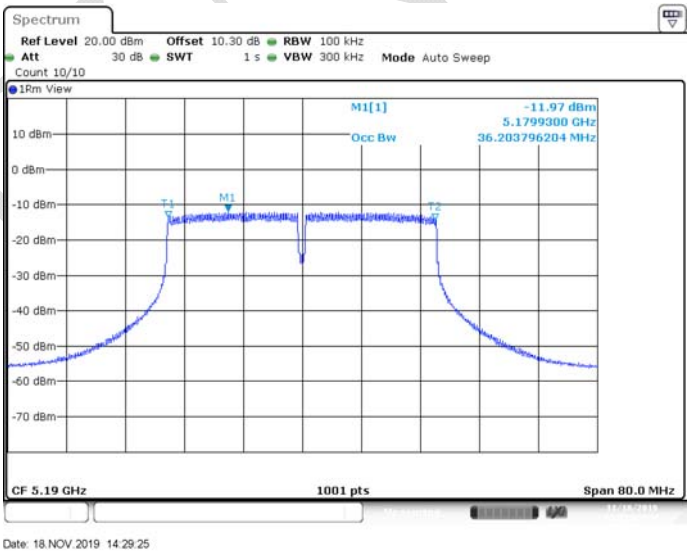
Chain0:802.11ac20 5180MHz, 99% Occupied Channel Bandwidth



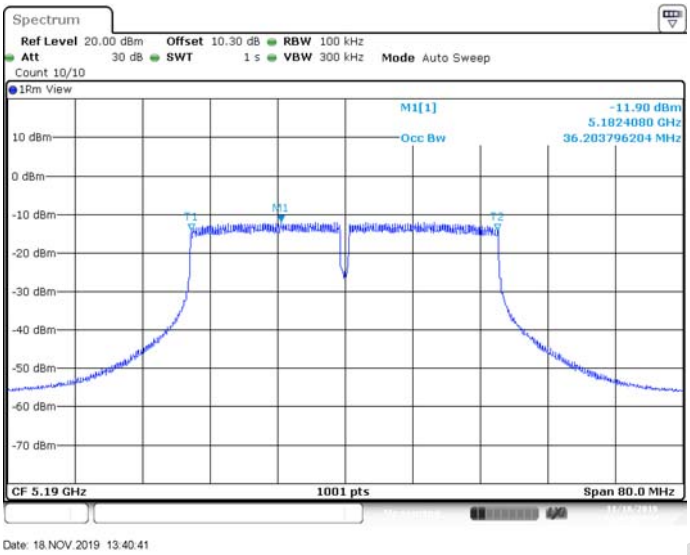
Chain0:802.11n-HT20 5180MHz, 99% Occupied Channel Bandwidth



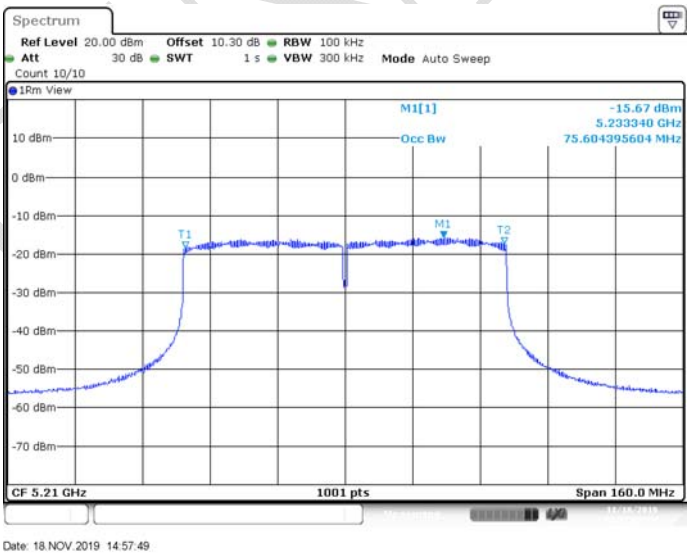
Chain0:802.11ac40 5190MHz, 99% Occupied Channel Bandwidth



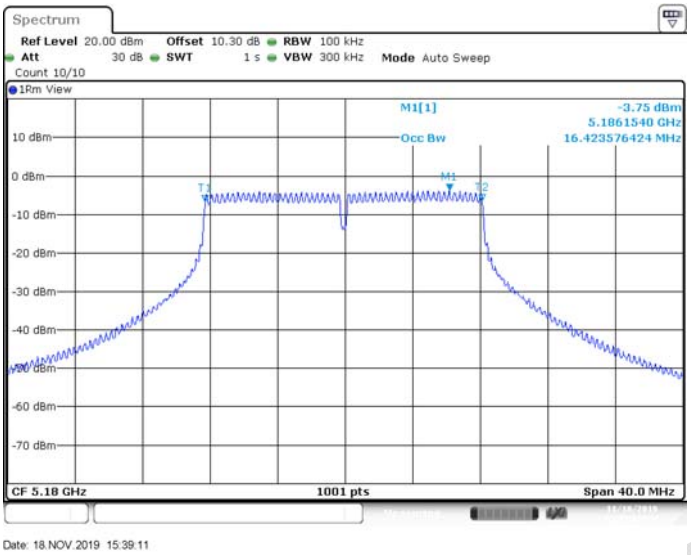
Chain0:802.11n40 5190MHz, 99% Occupied Channel Bandwidth



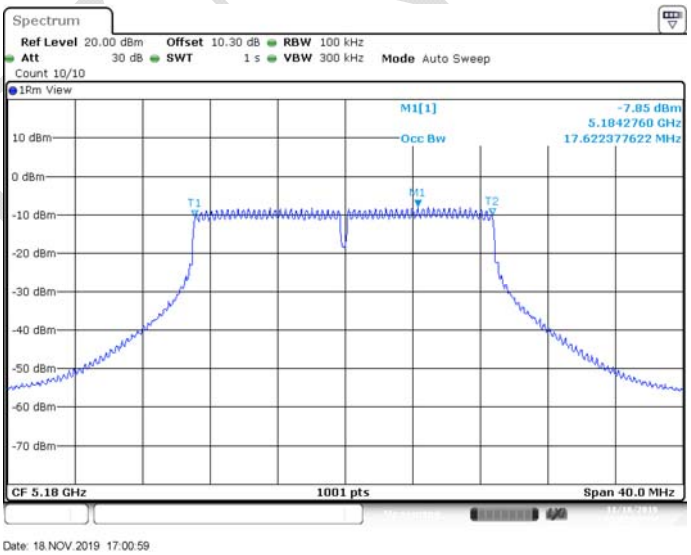
Chain0:802.11ac80 5210MHz, 99% Occupied Channel Bandwidth



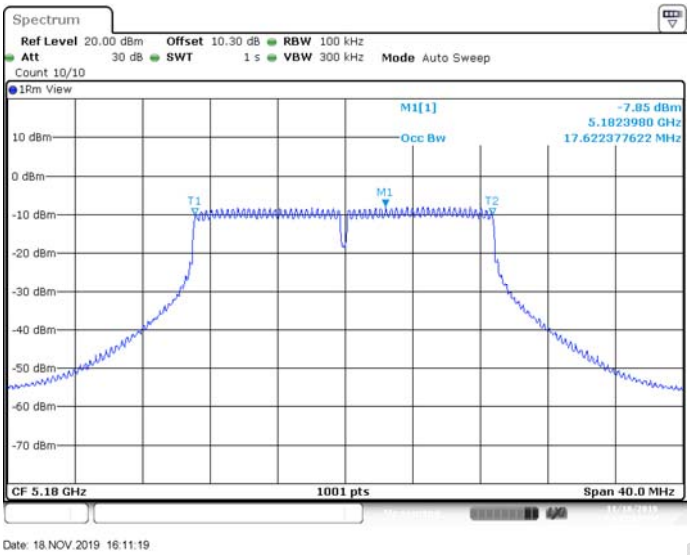
Chain1:802.11a 5180MHz, 99% Occupied Channel Bandwidth



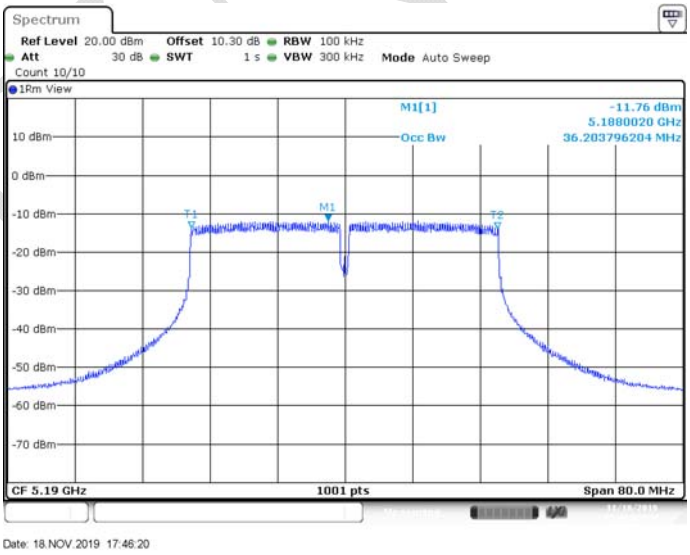
Chain1:802.11ac20 5180MHz, 99% Occupied Channel Bandwidth



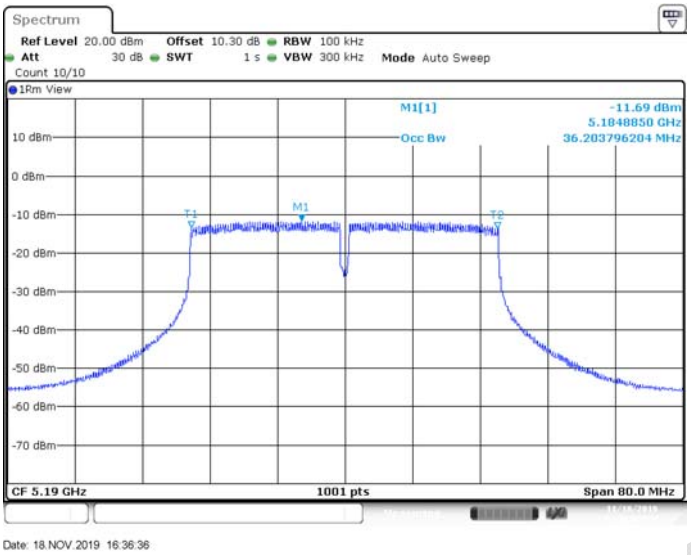
Chain1:802.11n-HT20 5180MHz, 99% Occupied Channel Bandwidth



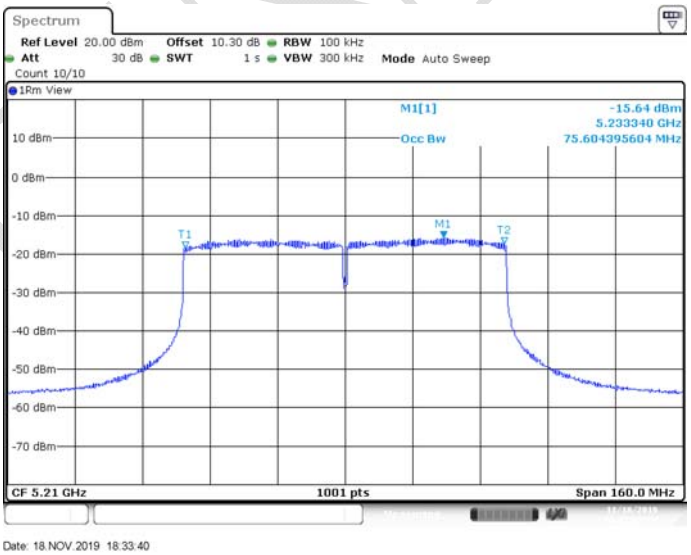
Chain1:802.11ac40 5190MHz, 99% Occupied Channel Bandwidth



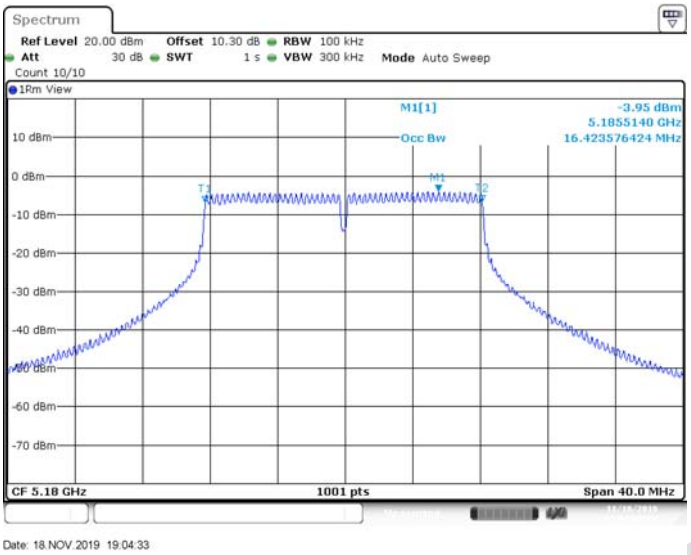
Chain1:802.11n40 5190MHz, 99% Occupied Channel Bandwidth



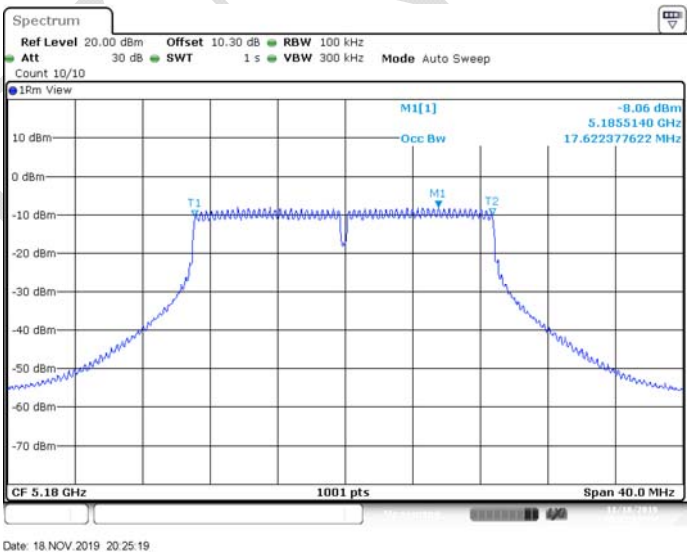
Chain1:802.11ac80 5210MHz, 99% Occupied Channel Bandwidth



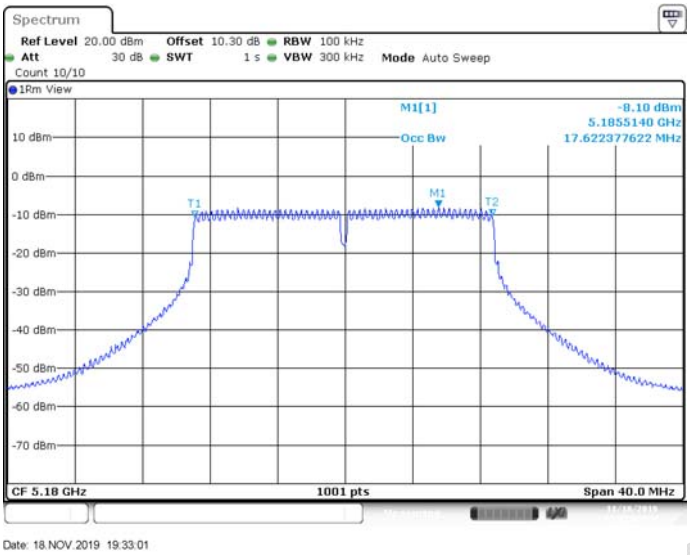
Chain2:802.11a 5180MHz, 99% Occupied Channel Bandwidth



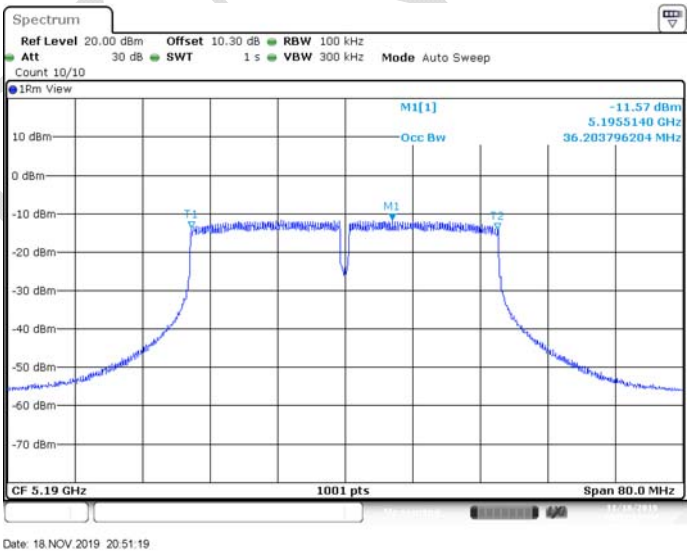
Chain2:802.11ac20 5180MHz, 99% Occupied Channel Bandwidth



Chain2:802.11n-HT20 5180MHz, 99% Occupied Channel Bandwidth

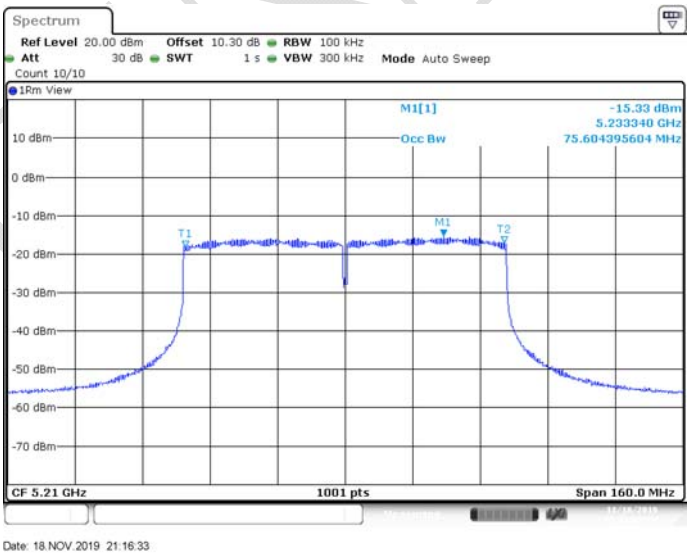


Chain2:802.11ac40 5190MHz, 99% Occupied Channel Bandwidth



Chain2:802.11n40 5190MHz, 99% Occupied Channel Bandwidth

Chain2:802.11ac80 5210MHz, 99% Occupied Channel Bandwidth



Band 2:

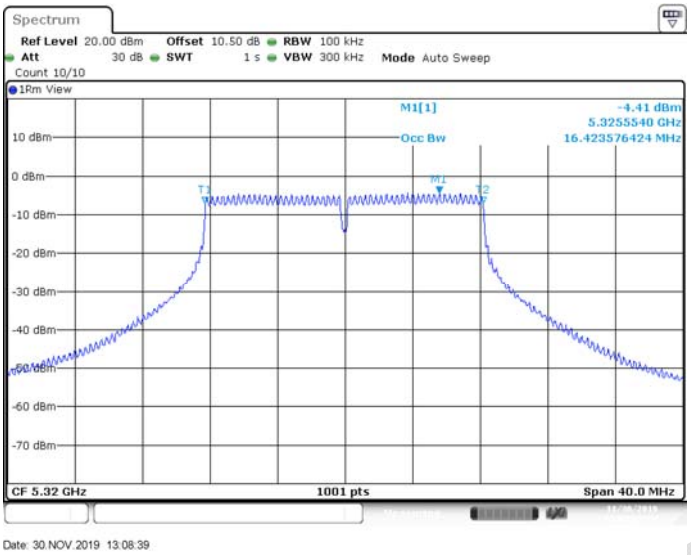
Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain0	802.11a	5320	20	16.424	16~20
	802.11ac20	5320	20	17.662	16~20
	802.11n-HT20	5320	20	17.622	16~20
	802.11ac40	5310	40	36.204	32~40
	802.11n-HT40	5310	40	36.284	32~40
	802.11ac80	5290	80	75.604	64~80

Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain1	802.11a	5320	20	16.424	16~20
	802.11ac20	5320	20	17.662	16~20
	802.11n-HT20	5320	20	17.662	16~20
	802.11ac40	5310	40	36.284	32~40
	802.11n-HT40	5310	40	36.284	32~40
	802.11ac80	5290	80	75.604	64~80

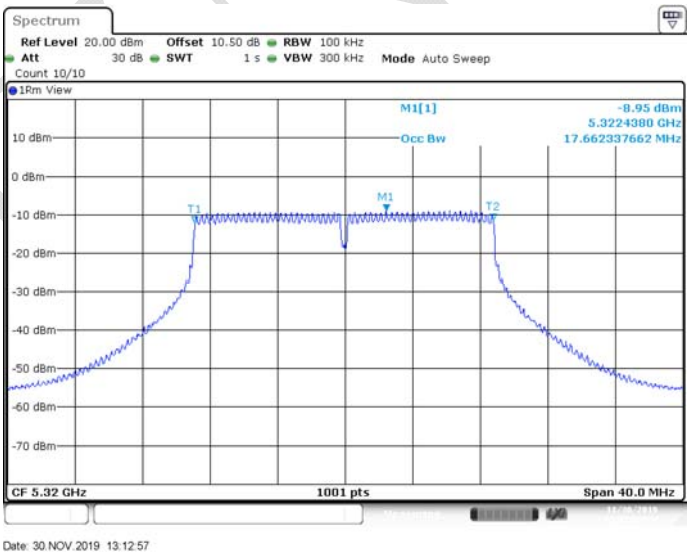
Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain2	802.11a	5320	20	16.424	16~20
	802.11ac20	5320	20	17.662	16~20
	802.11n-HT20	5320	20	17.662	16~20
	802.11ac40	5310	40	36.284	32~40
	802.11n-HT40	5310	40	36.284	32~40
	802.11ac80	5290	80	75.604	64~80

FINAL

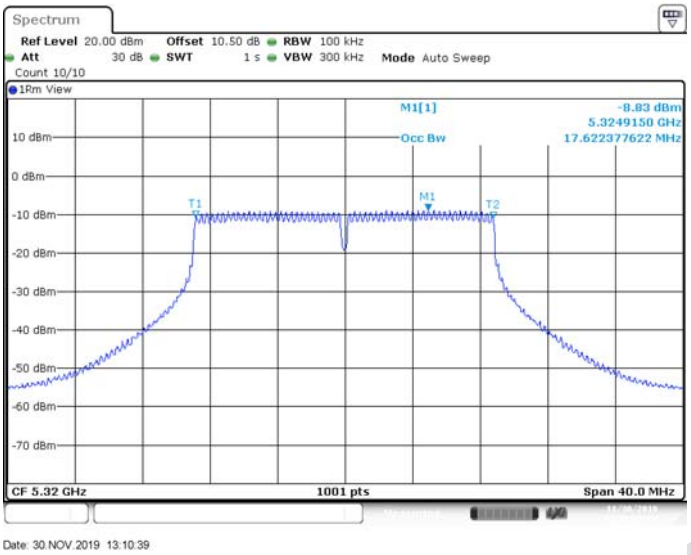
Chain0:802.11a 5320MHz, 99% Occupied Channel Bandwidth



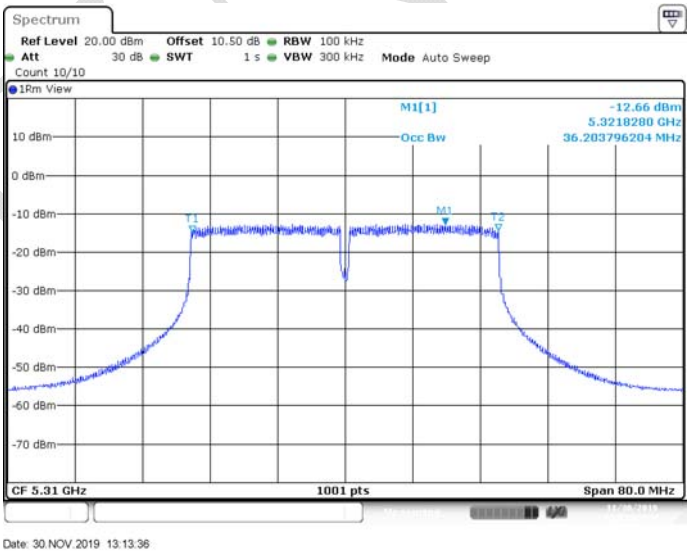
Chain0:802.11ac20 5320MHz, 99% Occupied Channel Bandwidth



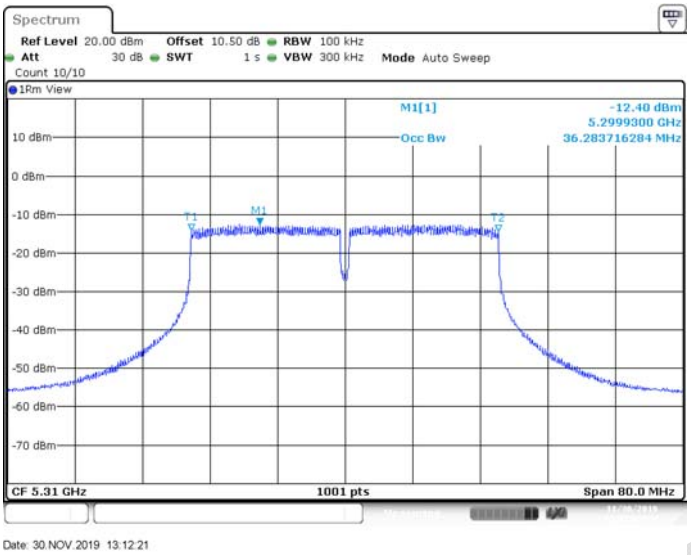
Chain0:802.11n-HT20 5320MHz, 99% Occupied Channel Bandwidth



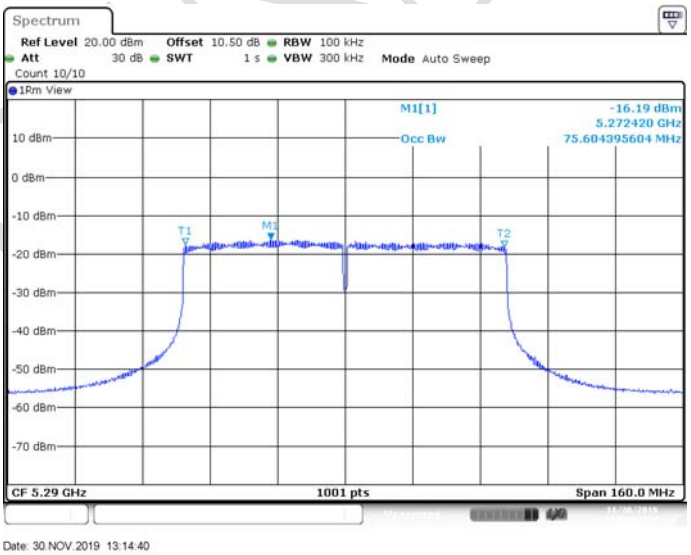
Chain0:802.11ac40 5310MHz, 99% Occupied Channel Bandwidth



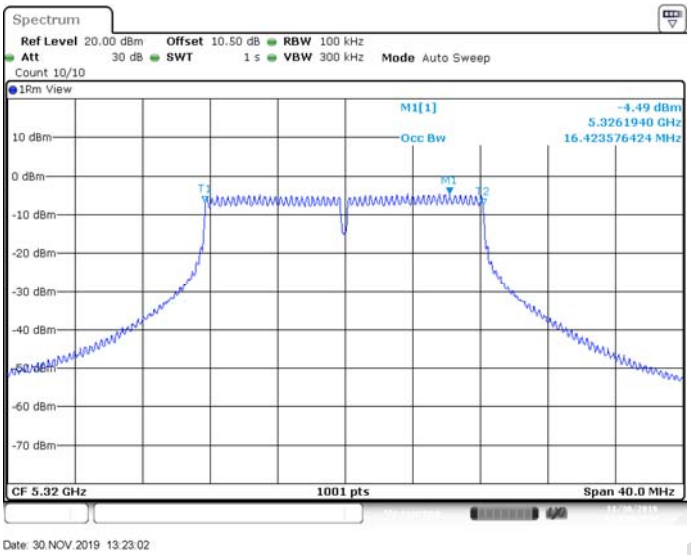
Chain0:802.11n40 5310MHz, 99% Occupied Channel Bandwidth



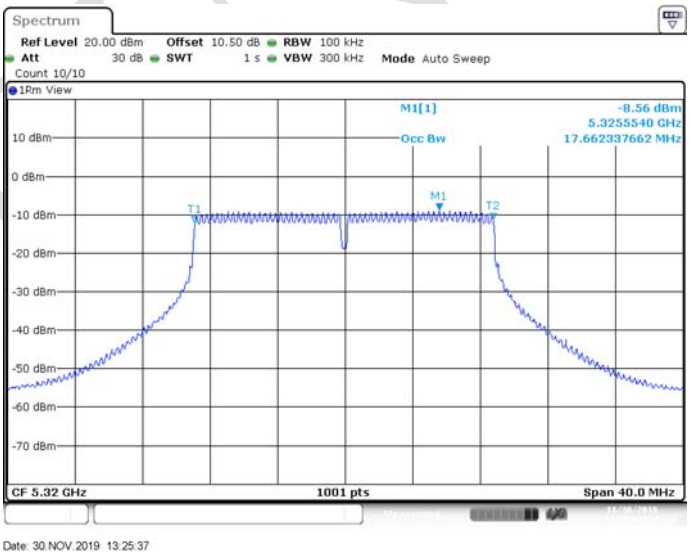
Chain0:802.11ac80 5290MHz, 99% Occupied Channel Bandwidth



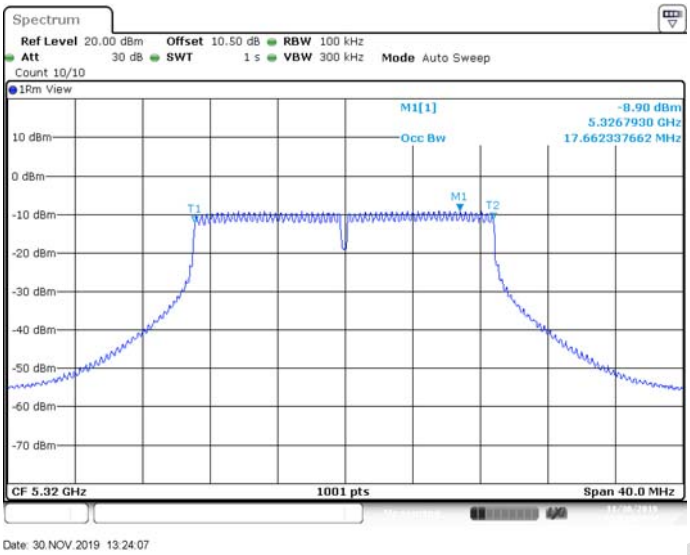
Chain1:802.11a 5320MHz, 99% Occupied Channel Bandwidth



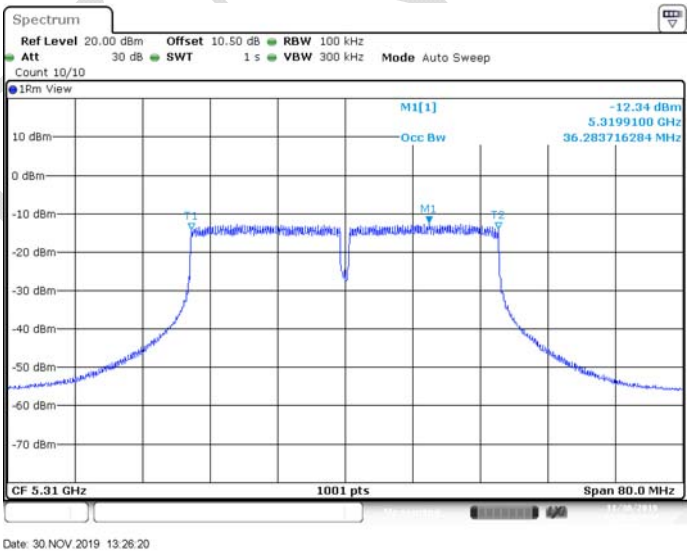
Chain1:802.11ac20 5320MHz, 99% Occupied Channel Bandwidth



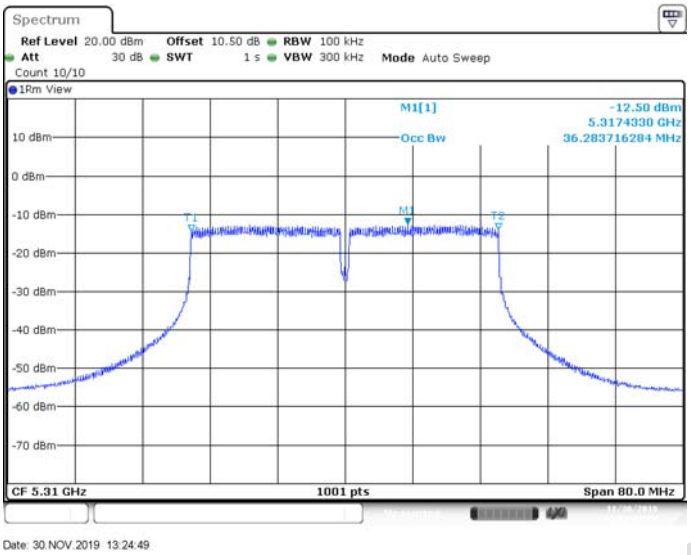
Chain1:802.11n-HT20 5320MHz, 99% Occupied Channel Bandwidth



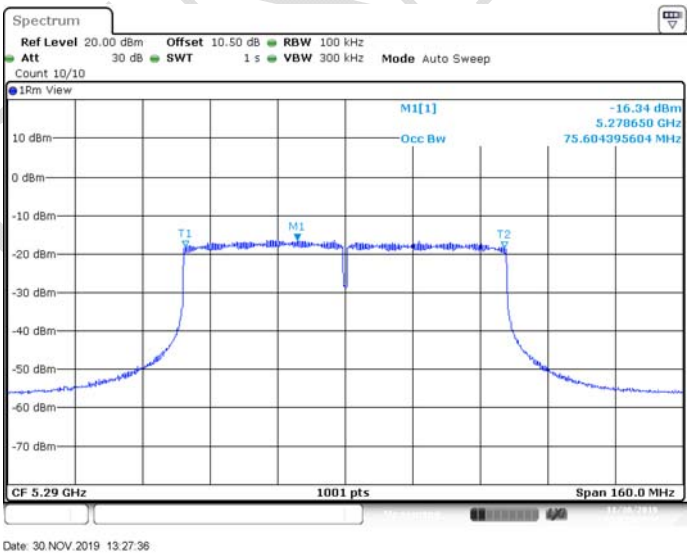
Chain1:802.11ac40 5310MHz, 99% Occupied Channel Bandwidth



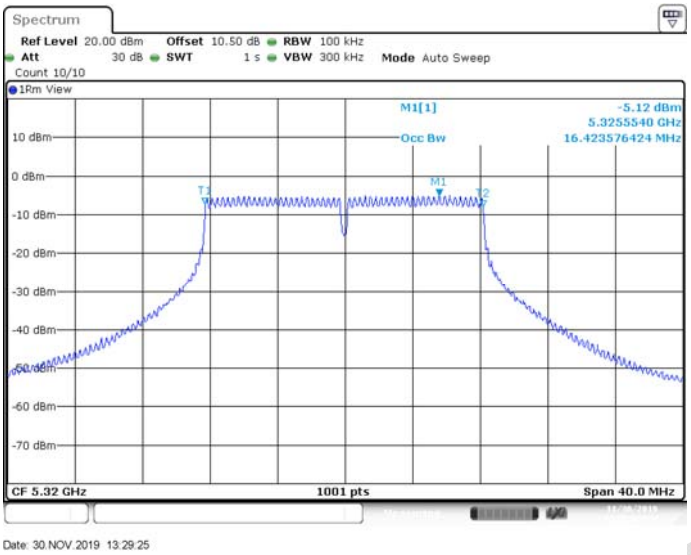
Chain1:802.11n40 5310MHz, 99% Occupied Channel Bandwidth



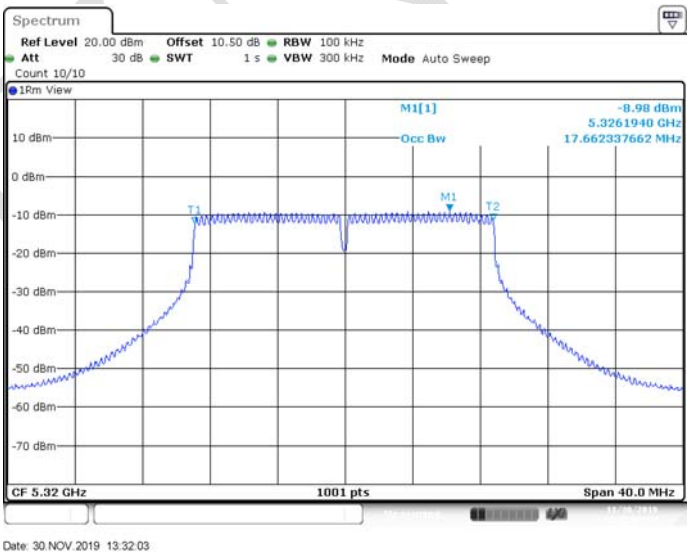
Chain1:802.11ac80 5290MHz, 99% Occupied Channel Bandwidth



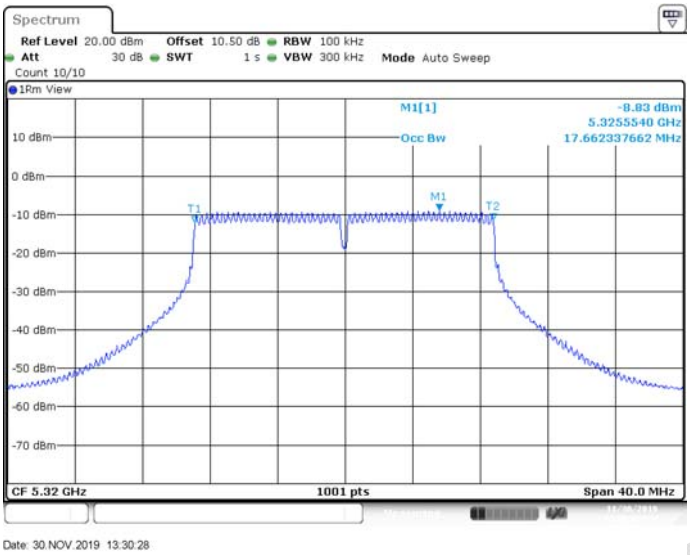
Chain2:802.11a 5320MHz, 99% Occupied Channel Bandwidth



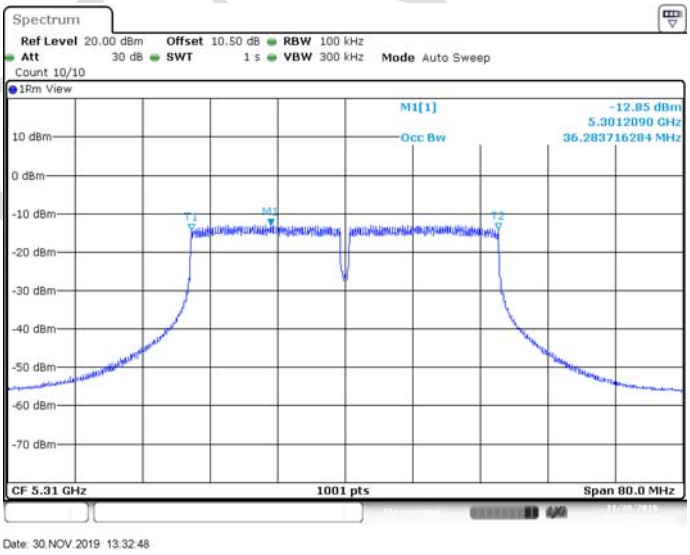
Chain2:802.11ac20 5320MHz, 99% Occupied Channel Bandwidth



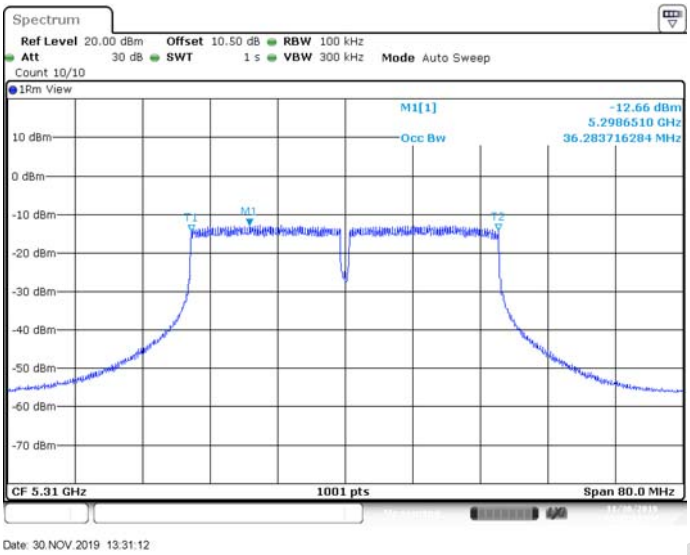
Chain2:802.11n-HT20 5320MHz, 99% Occupied Channel Bandwidth



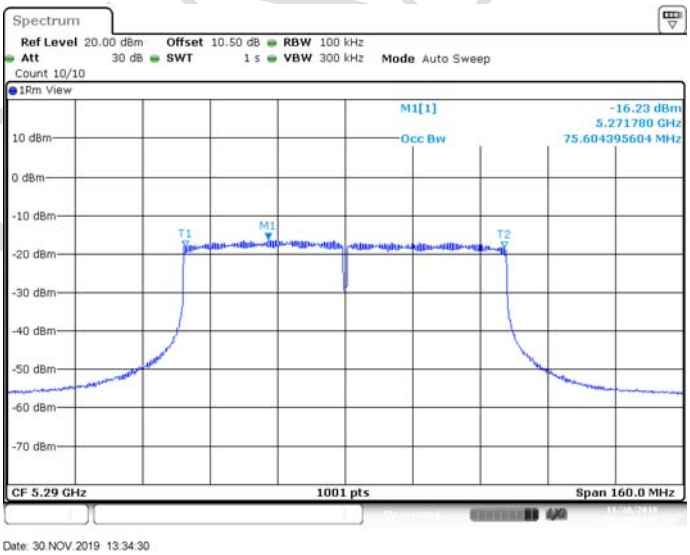
Chain2:802.11ac40 5310MHz, 99% Occupied Channel Bandwidth



Chain2:802.11n40 5310MHz, 99% Occupied Channel Bandwidth



Chain2:802.11ac80 5290MHz, 99% Occupied Channel Bandwidth



Band 3:

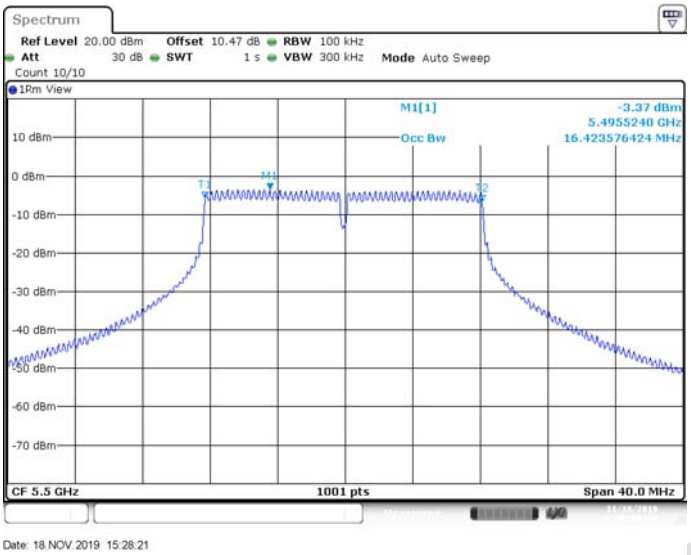
Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain0	802.11a	5500	20	16.424	16~20
	802.11ac20	5500	20	17.662	16~20
	802.11n-HT20	5500	20	17.662	16~20
	802.11ac40	5510	40	36.204	32~40
	802.11n-HT40	5510	40	36.204	32~40
	802.11ac80	5530	80	75.764	64~80

Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain1	802.11a	5500	20	16.424	16~20
	802.11ac20	5500	20	17.662	16~20
	802.11n-HT20	5500	20	17.662	16~20
	802.11ac40	5510	40	36.204	32~40
	802.11n-HT40	5510	40	36.204	32~40
	802.11ac80	5530	80	75.764	64~80

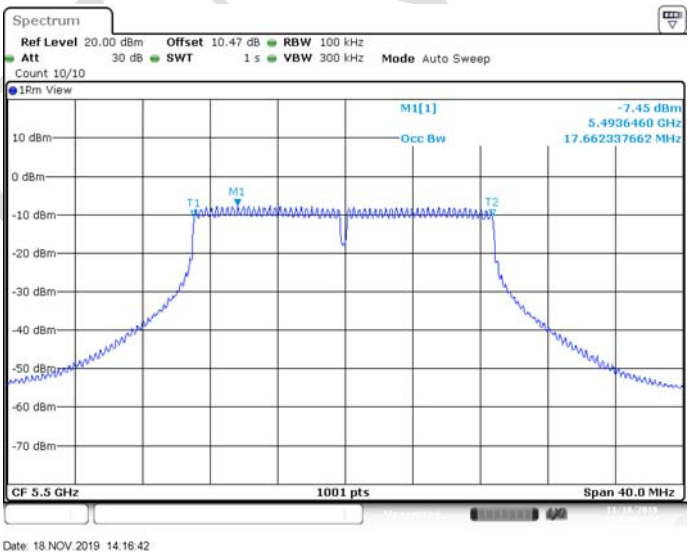
Chain	Mode	f_c	Nominal Channel Bandwidth	99% Occupied Channel Bandwidth	Limit
		MHz	MHz	MHz	MHz
Chain2	802.11a	5500	20	16.424	16~20
	802.11ac20	5500	20	17.662	16~20
	802.11n-HT20	5500	20	17.662	16~20
	802.11ac40	5510	40	36.204	32~40
	802.11n-HT40	5510	40	36.204	32~40
	802.11ac80	5530	80	75.764	64~80

FINAL

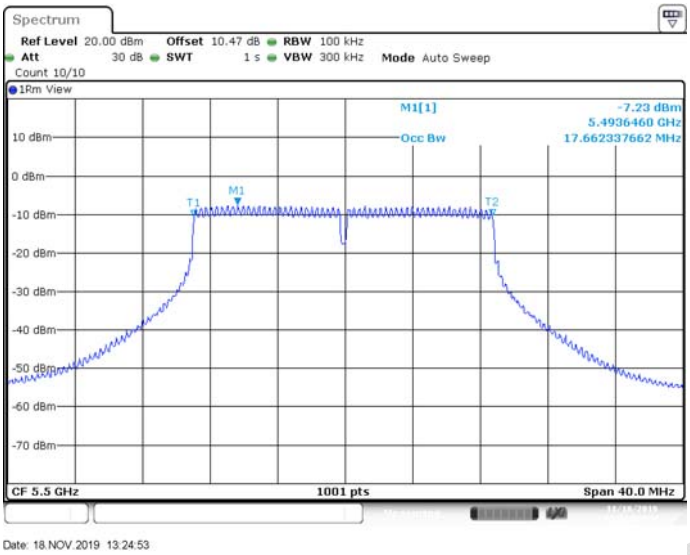
Chain0:802.11a 5500MHz, 99% Occupied Channel Bandwidth



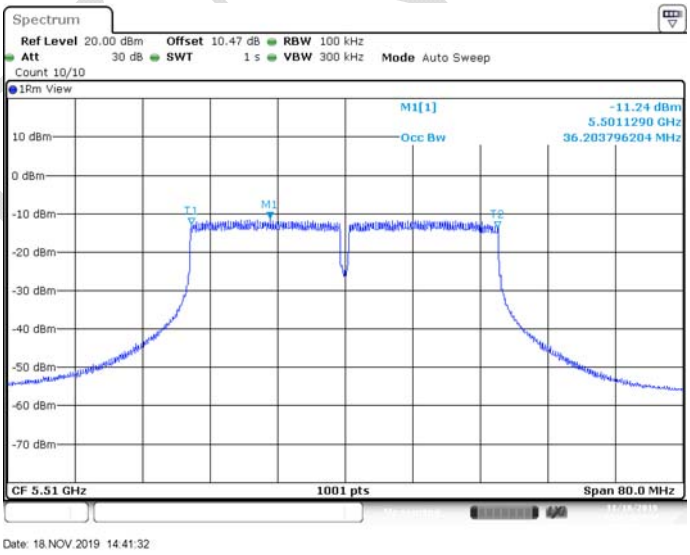
Chain0:802.11ac20 5500MHz, 99% Occupied Channel Bandwidth



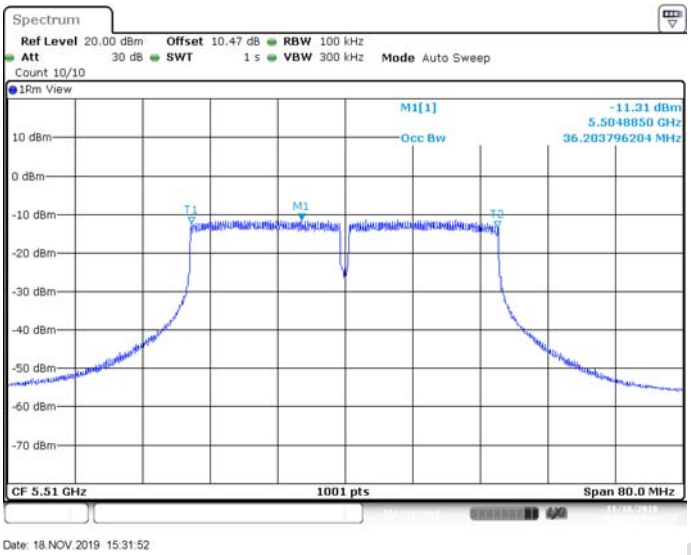
Chain0:802.11n-HT20 5500MHz, 99% Occupied Channel Bandwidth



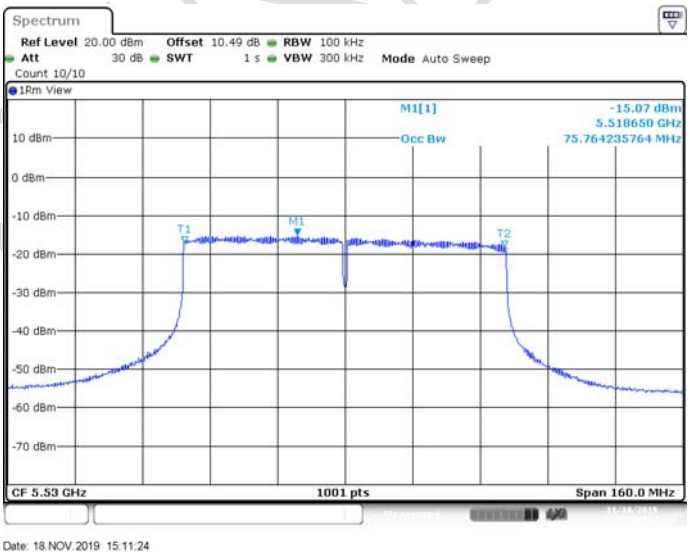
Chain0:802.11ac40 5510MHz, 99% Occupied Channel Bandwidth



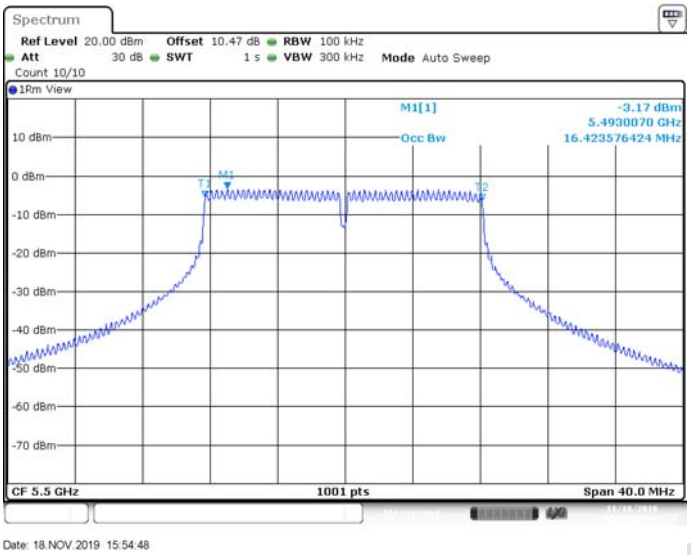
Chain0:802.11n40 5510MHz, 99% Occupied Channel Bandwidth



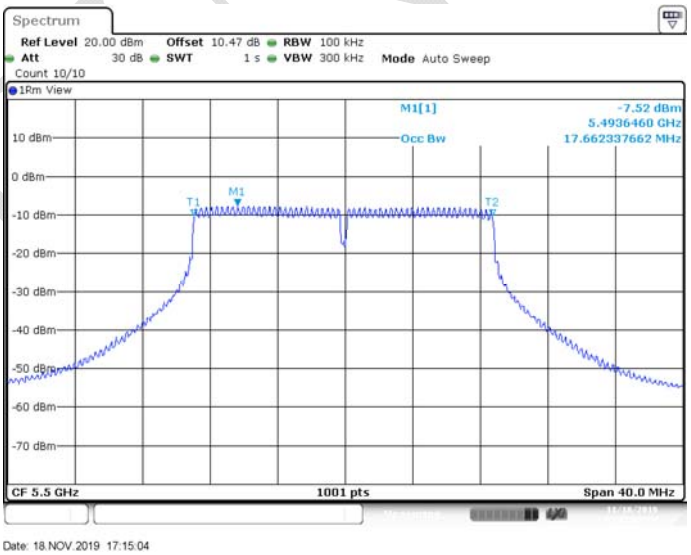
Chain0:802.11ac80 5530MHz, 99% Occupied Channel Bandwidth



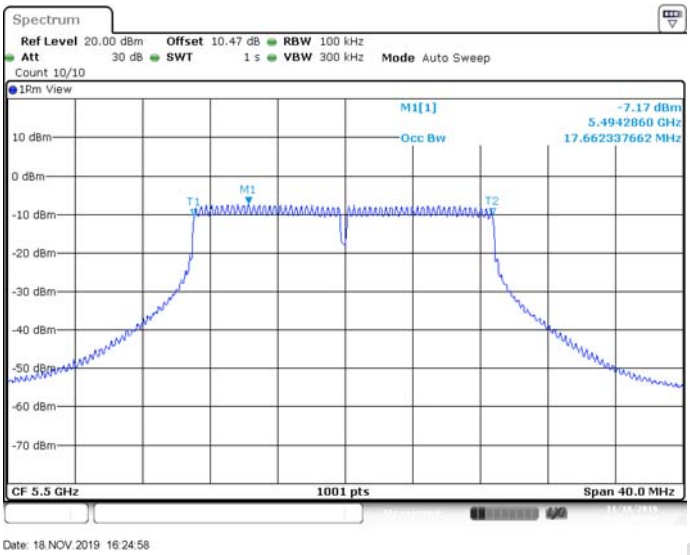
Chain1:802.11a 5500MHz, 99% Occupied Channel Bandwidth



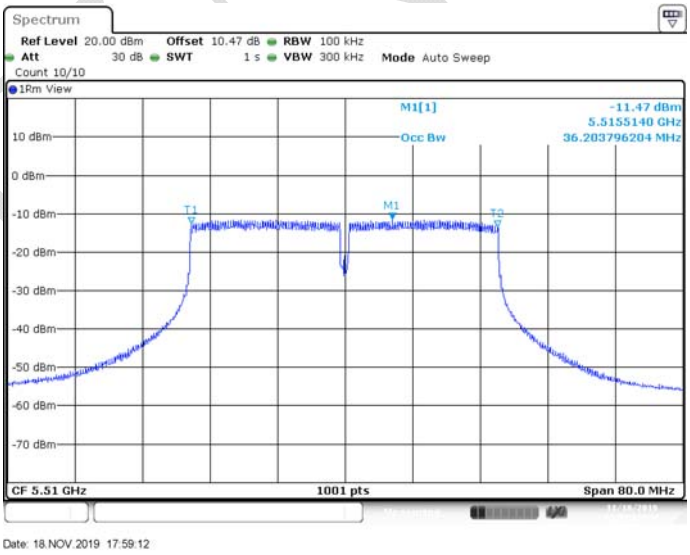
Chain1:802.11ac20 5500MHz, 99% Occupied Channel Bandwidth



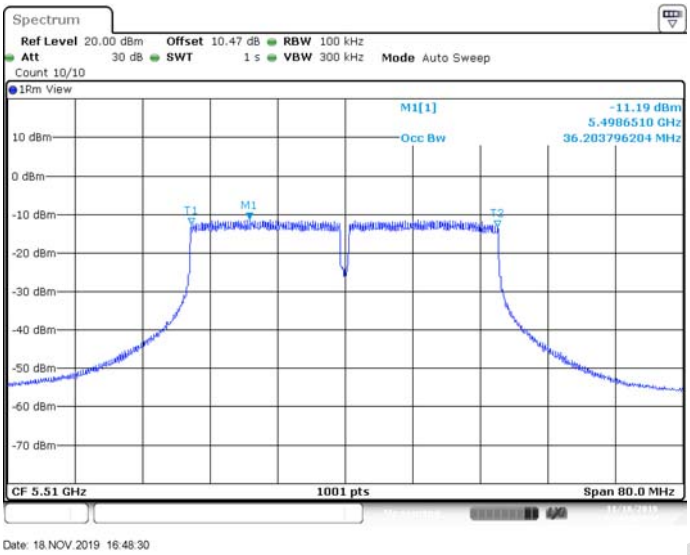
Chain1:802.11n-HT20 5500MHz, 99% Occupied Channel Bandwidth



Chain1:802.11ac40 5510MHz, 99% Occupied Channel Bandwidth

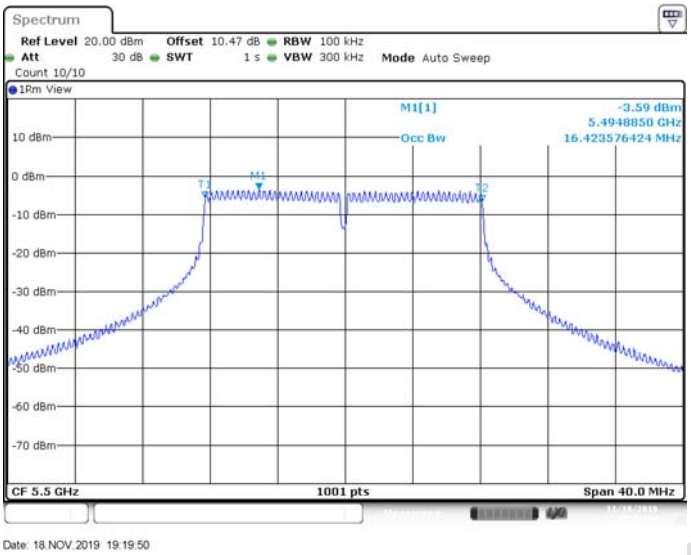


Chain1:802.11n40 5510MHz, 99% Occupied Channel Bandwidth

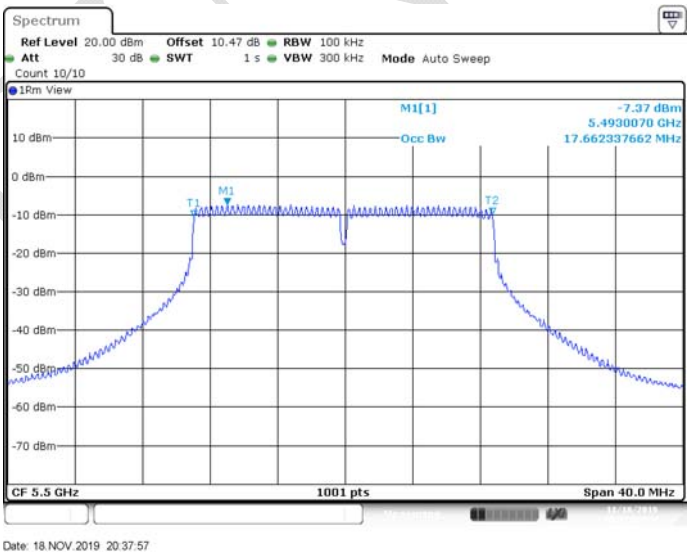


Chain1:802.11ac80 5530MHz, 99% Occupied Channel Bandwidth

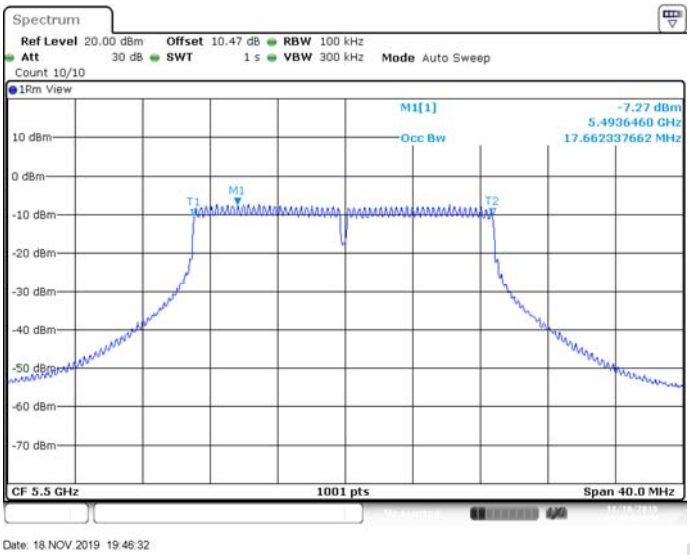
Chain2:802.11a 5500MHz, 99% Occupied Channel Bandwidth



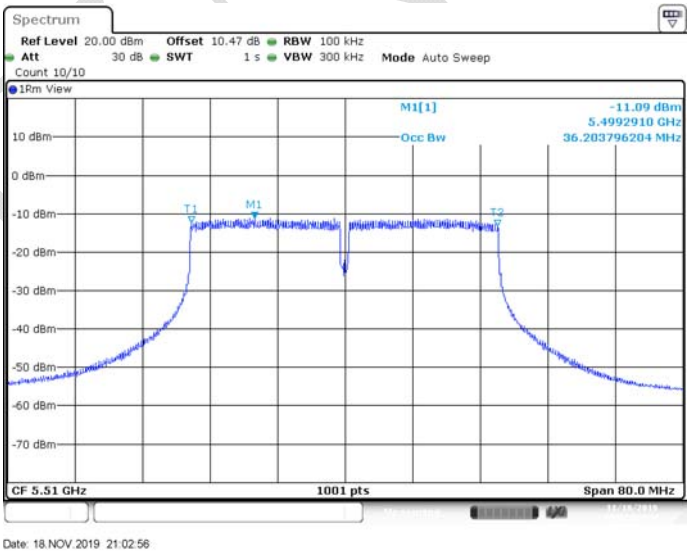
Chain2:802.11ac20 5500MHz, 99% Occupied Channel Bandwidth



Chain2:802.11n-HT20 5500MHz, 99% Occupied Channel Bandwidth

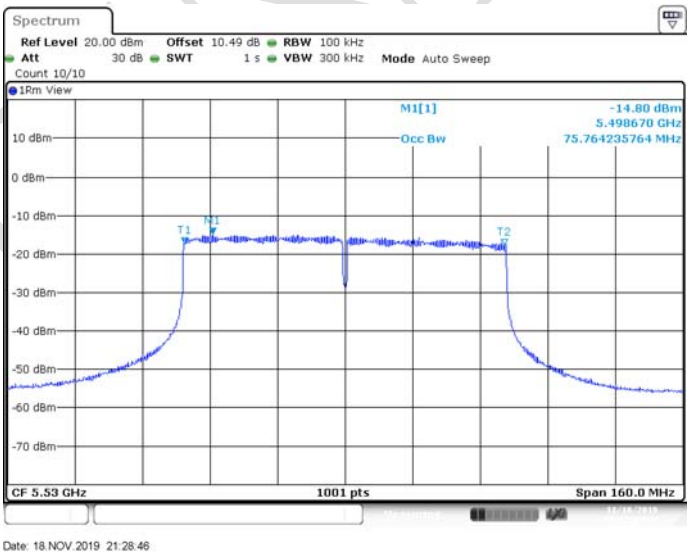


Chain2:802.11ac40 5510MHz, 99% Occupied Channel Bandwidth



Chain2:802.11n40 5510MHz, 99% Occupied Channel Bandwidth

Chain2:802.11ac80 5530MHz, 99% Occupied Channel Bandwidth



ETSI EN 301 893 V2.1.1 (2017-05) Clause 4.2.3 - RF OUTPUT POWER, TRANSMIT POWER CONTROL (TPC) AND POWER DENSITY

Definition

RF Output Power:

The *RF Output Power* is the mean equivalent isotropically radiated power (e.i.r.p.) during a transmission burst.

Transmit Power Control (TPC):

Transmit Power Control (TPC) is a mechanism to be used by the RLAN device to ensure a mitigation factor of at least 3 dB on the aggregate power from a large number of devices. This requires the RLAN device to have a TPC range from which the lowest value is at least 6 dB below the values for mean e.i.r.p. given in table 2 for devices with TPC.

Power Density:

The *Power Density* is the mean Equivalent Isotropically Radiated Power (e.i.r.p.) density during a transmission burst.

Limits

TPC is not required for channels whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz.

For devices with TPC, the RF output power and the power density when configured to operate at the highest stated power level of the TPC range shall not exceed the levels given in table 2.

Devices are allowed to operate without TPC. See table 2 for the applicable limits in this case.

Table 2: Mean e.i.r.p. limits for RF output power and power density at the highest power level (P_H)

Frequency range	Mean e.i.r.p. limit for P_H		Mean e.i.r.p. density limit	
	dBm		dBm/MHz	
MHz	with TPC	without TPC	with TPC	without TPC
5150 to 5350	23	20 / 23 (see note 1)	10	7 / 10 (see note 2)
5470 to 5725	30 (see note 3)	27 (see note 3)	17 (see note 3)	14 (see note 3)

NOTE 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.
NOTE 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.
NOTE 3: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.

For devices using TPC, the *RF output power* during a transmission burst when configured to operate at the lowest stated power level of the TPC range shall not exceed the levels given in table 3. For devices without TPC, the limits in table 3 do not apply.

Table 3: Mean e.i.r.p. limits for RF output power at the lowest power level of the TPC range

Frequency range	Mean e.i.r.p. (dBm)
5250 MHz to 5350 MHz	17
5470 MHz to 5725 MHz	24 (see note)
NOTE:Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.	

Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) Clause5.4.4

Test Data

Environmental Conditions

Temperature:	24.3~25.0 ℃
Relative Humidity:	48~50 %
ATM Pressure:	101.1~101.3kPa

The testing was performed by Carry Cai from 2019-11-04 to 2019-11-08.

Test Result: Compliant.

RF output power:

Test Mode: Transmitting

FINAL

Band1:

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain0	802.11a	5180	-40	3.3	16.09	2	18.09	23
			25		15.10	2	17.1	23
			70		15.51	2	17.51	23
	802.11ac20	5180	-40	3.3	12.69	2	14.69	23
			25		11.77	2	13.77	23
			70		12.21	2	14.21	23
	802.1n-HT20	5180	-40	3.3	12.68	2	14.68	23
			25		11.74	2	13.74	23
			70		12.21	2	14.21	23
	802.11ac40	5190	-40	3.3	12.3	2	14.3	23
			25		11.31	2	13.31	23
			70		11.81	2	13.81	23
	802.1n-HT40	5190	-40	3.3	12.46	2	14.46	23
			25		11.48	2	13.48	23
			70		11.95	2	13.95	23
	802.11ac80	5210	-40	3.3	12.13	2	14.13	23
			25		11.12	2	13.12	23
			70		11.65	2	13.65	23

FINAL

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain1	802.11a	5180	-40	3.3	16.18	2	18.18	23
			25		15.22	2	17.22	23
			70		15.72	2	17.72	23
	802.11ac20	5180	-40	3.3	12.88	2	14.88	23
			25		11.91	2	13.91	23
			70		12.32	2	14.32	23
	802.1n-HT20	5180	-40	3.3	12.79	2	14.79	23
			25		11.87	2	13.87	23
			70		12.33	2	14.33	23
	802.11ac40	5190	-40	3.3	12.52	2	14.52	23
			25		11.53	2	13.53	23
			70		12.01	2	14.01	23
	802.1n-HT40	5190	-40	3.3	11.47	2	13.47	23
			25		12.45	2	14.45	23
			70		11.96	2	13.96	23
	802.11ac80	5210	-40	3.3	12.12	2	14.12	23
			25		11.13	2	13.13	23
			70		11.63	2	13.63	23

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain2	802.11a	5180	-40	3.3	16.27	2	18.27	23
			25		15.35	2	17.35	23
			70		15.81	2	17.81	23
	802.11ac20	5180	-40	3.3	12.82	2	14.82	23
			25		11.97	2	13.97	23
			70		12.51	2	14.51	23
	802.1n-HT20	5180	-40	3.3	12.72	2	14.72	23
			25		11.7	2	13.7	23
			70		12.26	2	14.26	23
	802.11ac40	5190	-40	3.3	12.49	2	14.49	23
			25		11.53	2	13.53	23
			70		12.02	2	14.02	23
	802.1n-HT40	5190	-40	3.3	12.42	2	14.42	23
			25		11.43	2	13.43	23
			70		12.93	2	14.93	23
	802.11ac80	5210	-40	3.3	12.08	2	14.08	23
			25		11.09	2	13.09	23
			70		11.45	2	13.45	23

Note : the extreme temperature was declared by manufacturer.

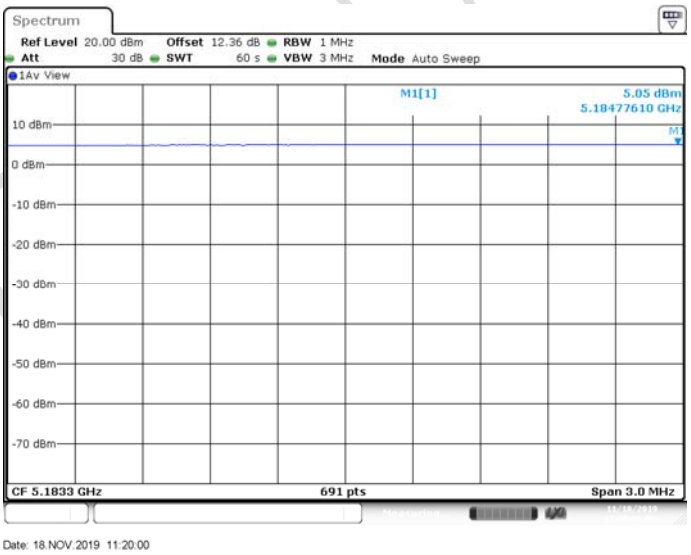
Power density:

Test Mode: Transmitting

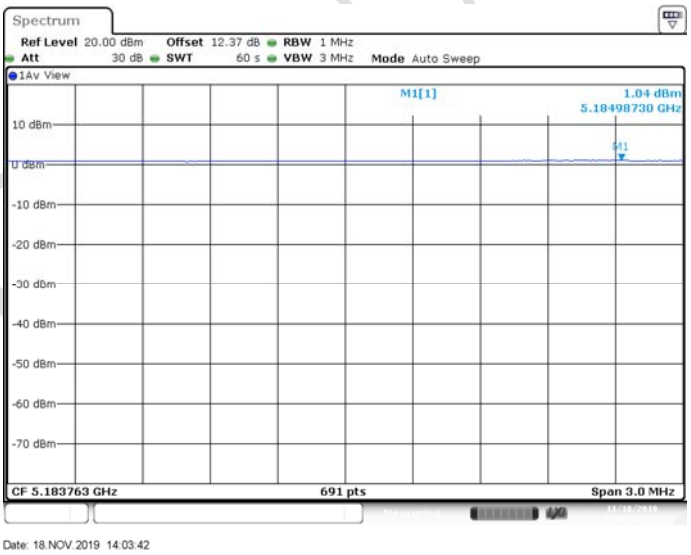
Mode	fc (MHz)	Power Density EIRP (dBm/MHz)				Limit (dBm/MHz)	Result
		Chain0	Chain1	Chain2	Total		
802.11a	5180	5.05	5.2	5.01	/	<= 10.0	PASS
802.11ac20	5180	1.04	1.15	1.06	5.85	<= 10.0	PASS
802.11n-HT20	5180	0.97	1.06	1.08	5.81	<= 10.0	PASS
802.11ac40	5190	-2.83	-2.85	-2.36	2.10	<= 10.0	PASS
802.11n-HT40	5190	-2.79	-2.57	-2.65	2.10	<= 10.0	PASS
802.11ac80	5210	-6.15	-6.25	-5.98	-1.35	<= 10.0	PASS

FINAL

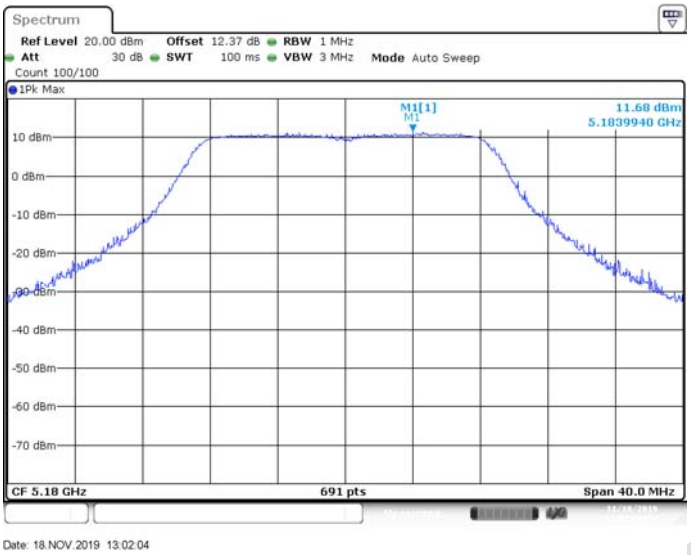
Chain0: 802.11a 5180MHz–Power density

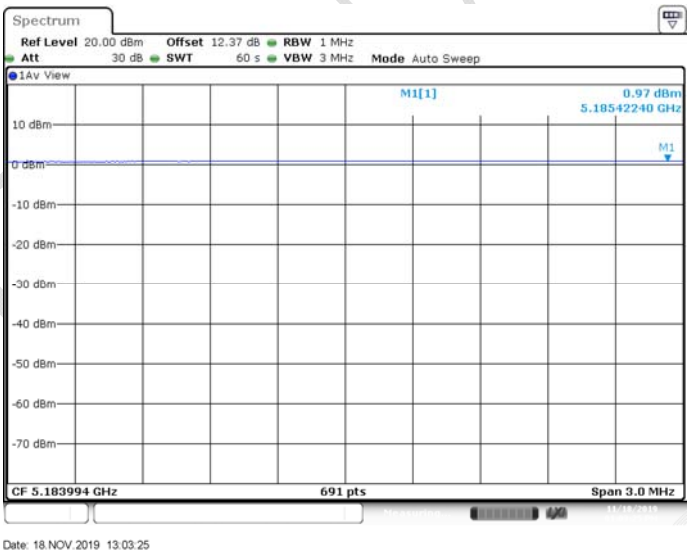


Chain0:802.11ac20 5180MHz–Power density

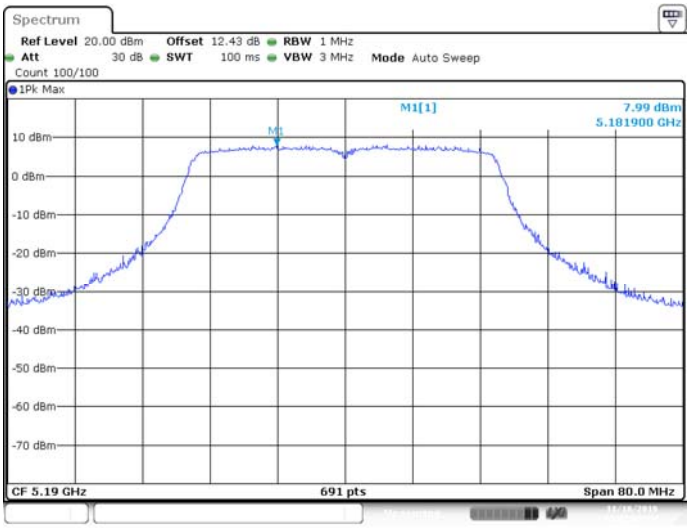


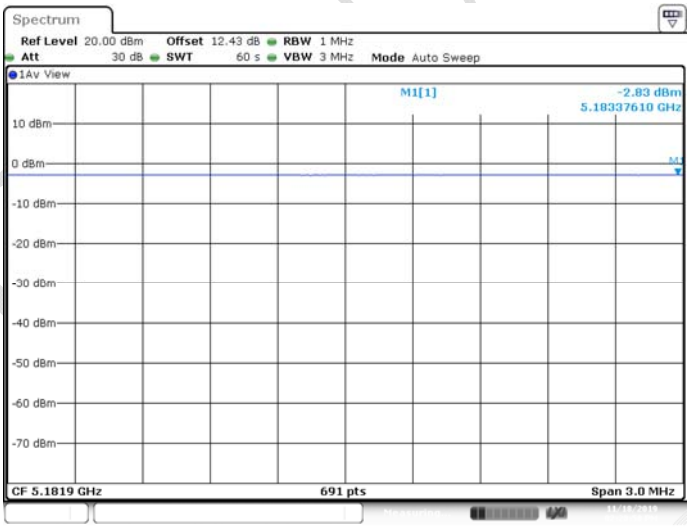
Chain0:802.11n-HT20 5180MHz–Power density



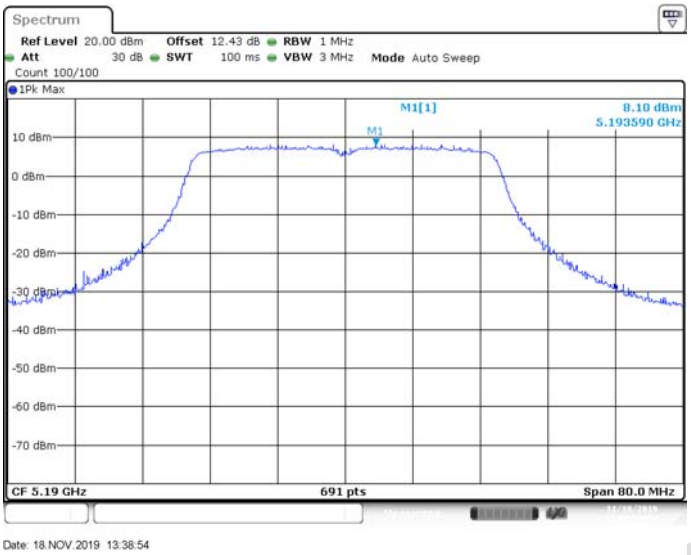


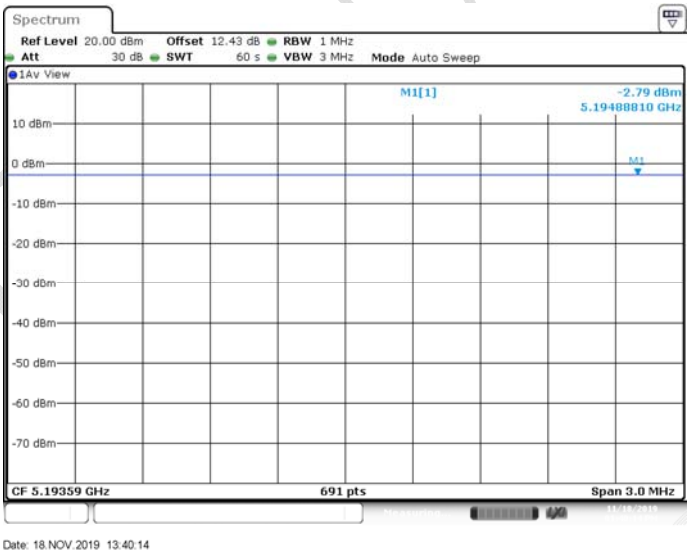
Chain0:802.11ac40 5190MHz–Power density



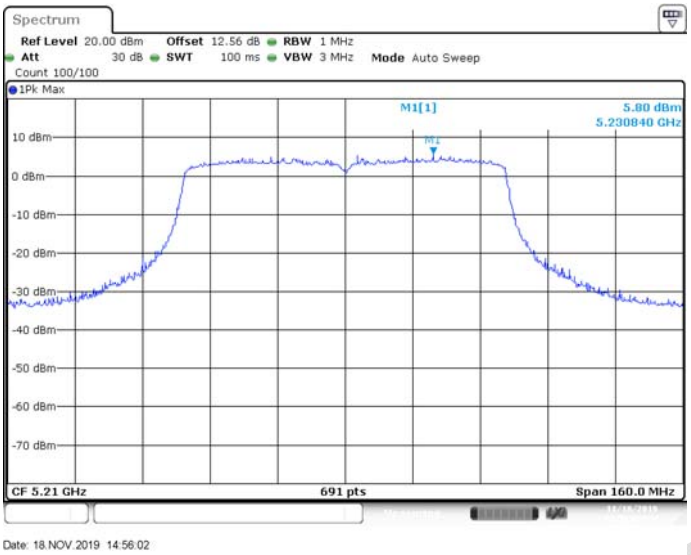


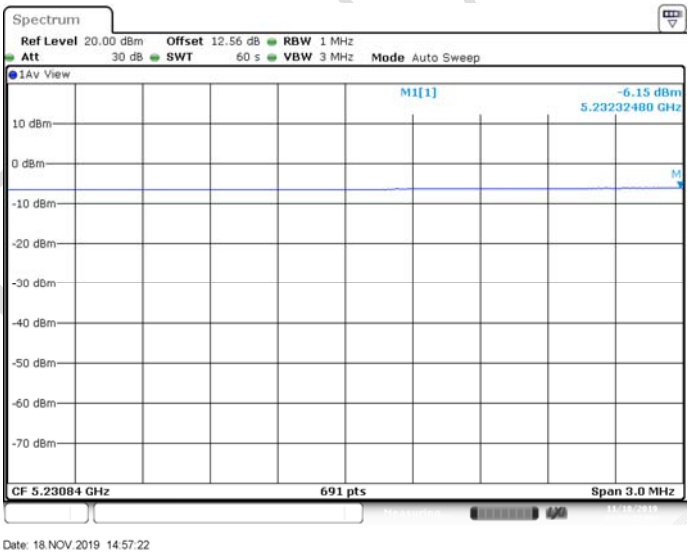
Chain0:802.11n-HT40 5190MHz–Power density



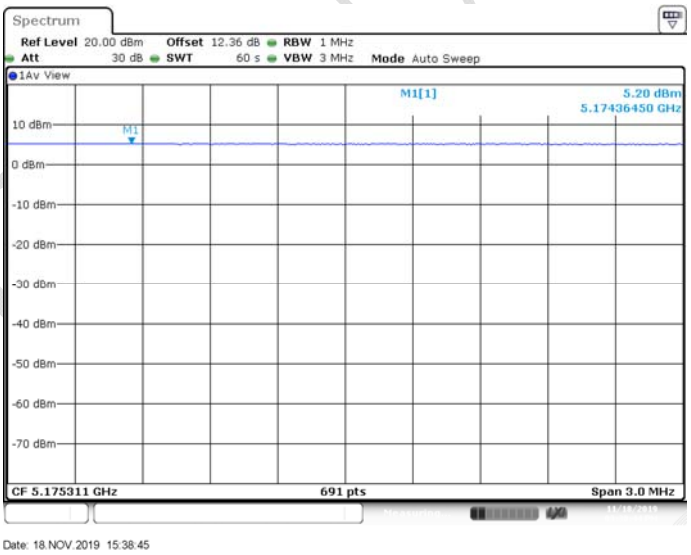


Chain0:802.11ac80 5210MHz–Power density

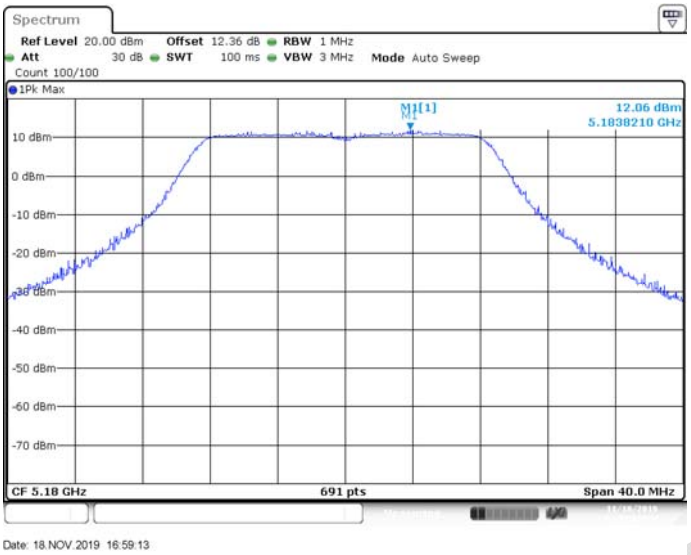


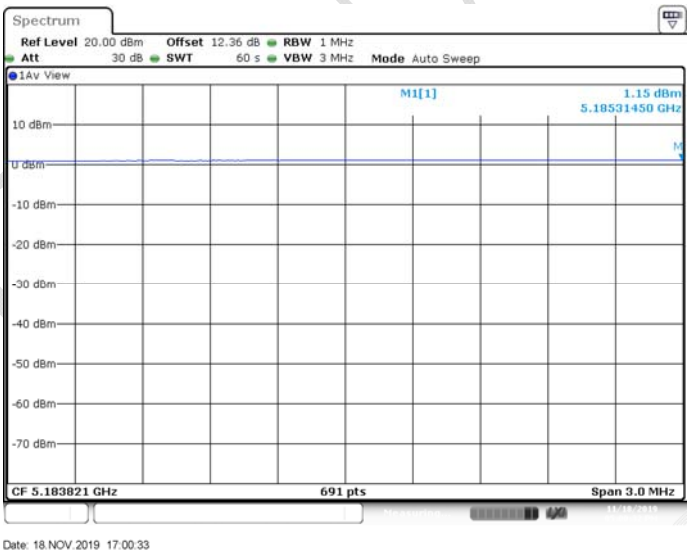


Chain1: 802.11a 5180MHz–Power density

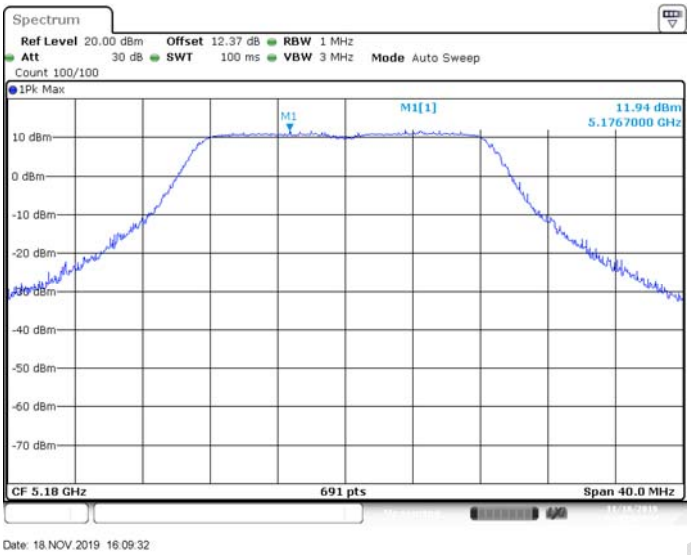


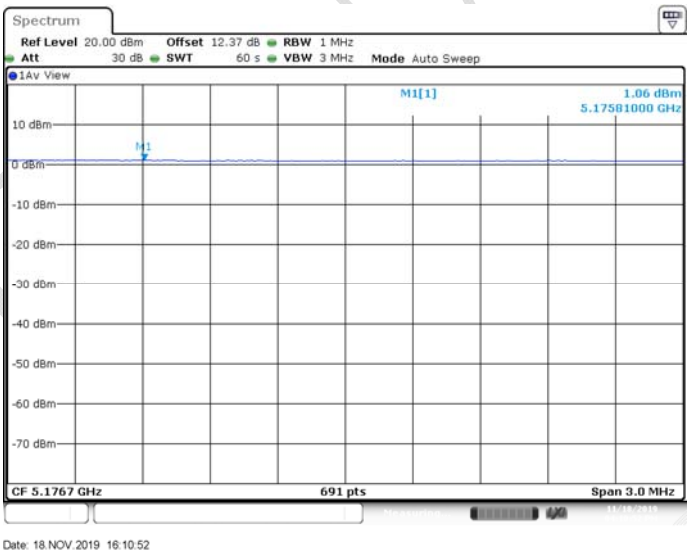
Chain1:802.11ac20 5180MHz–Power density



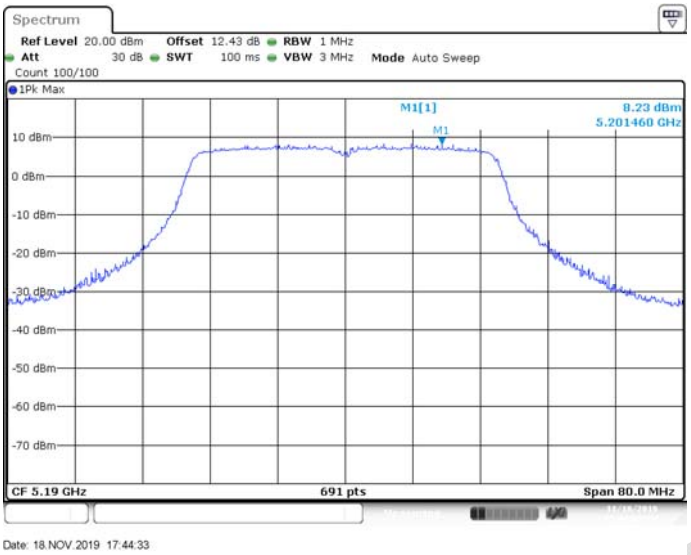


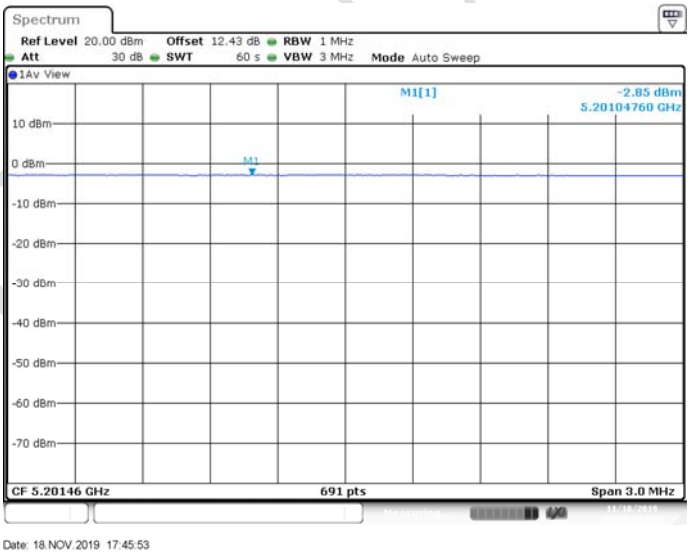
Chain1:802.11n-HT20 5180MHz–Power density



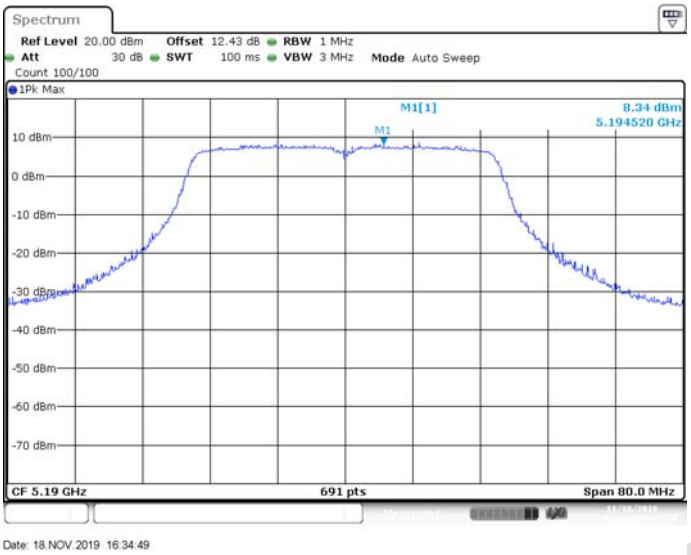


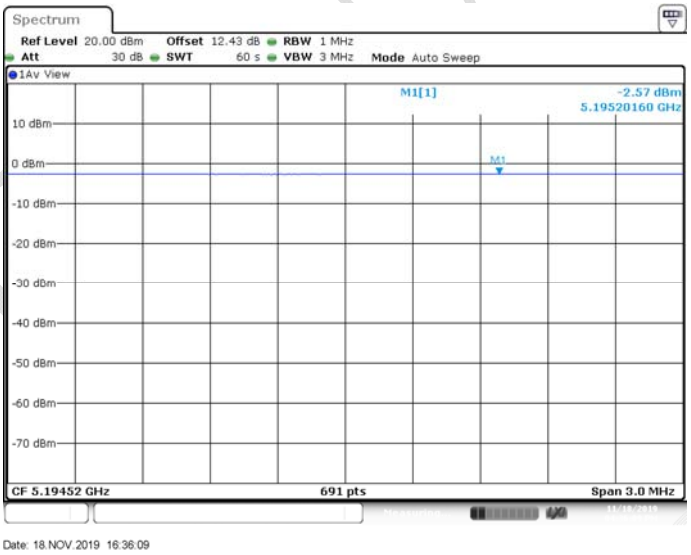
Chain1:802.11ac40 5190MHz–Power density



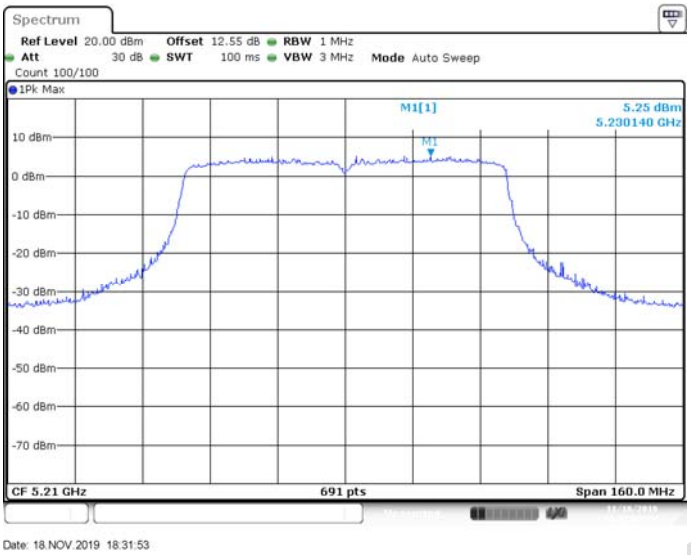


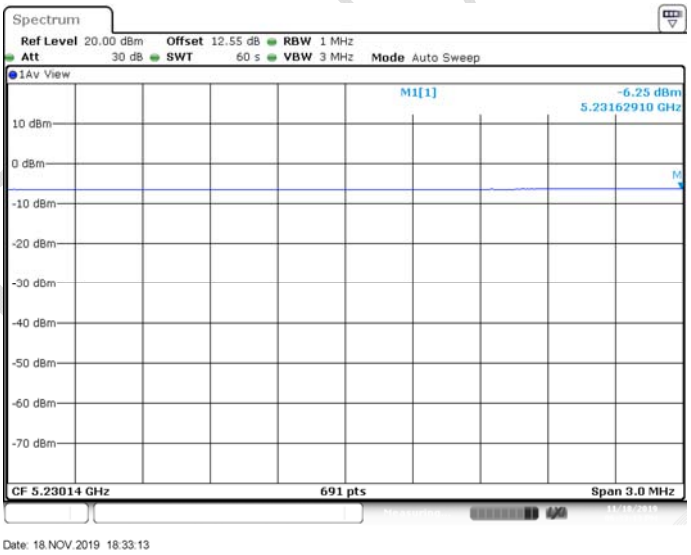
Chain1:802.11n-HT40 5190MHz–Power density



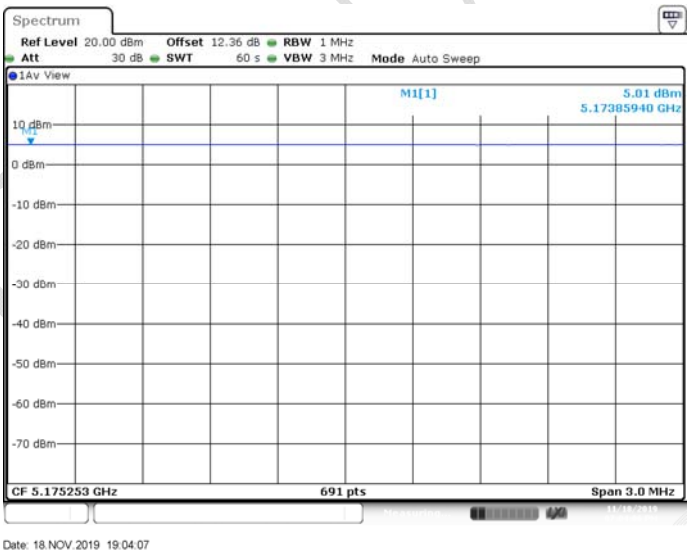


Chain1:802.11ac80 5210MHz–Power density

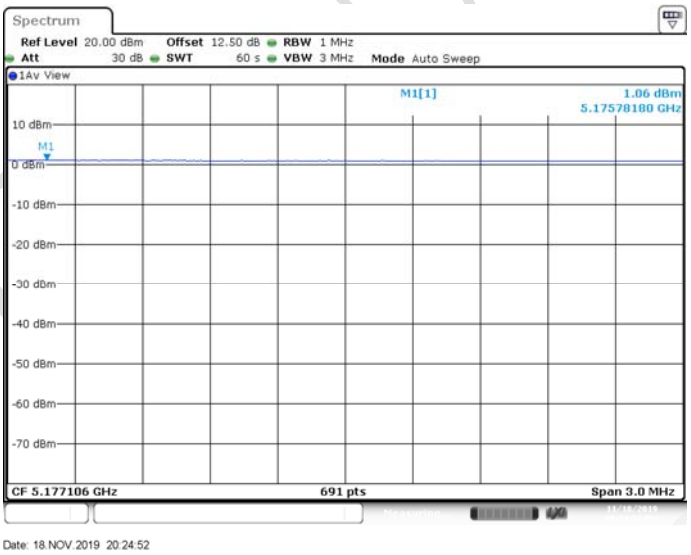




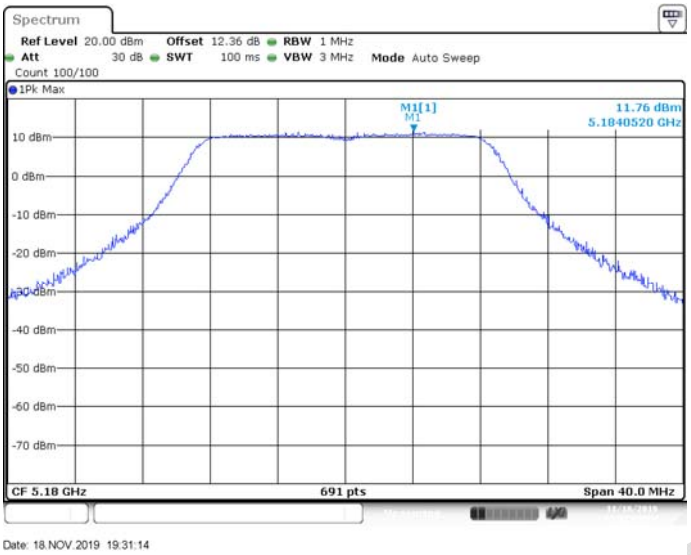
Chain2: 802.11a 5180MHz–Power density

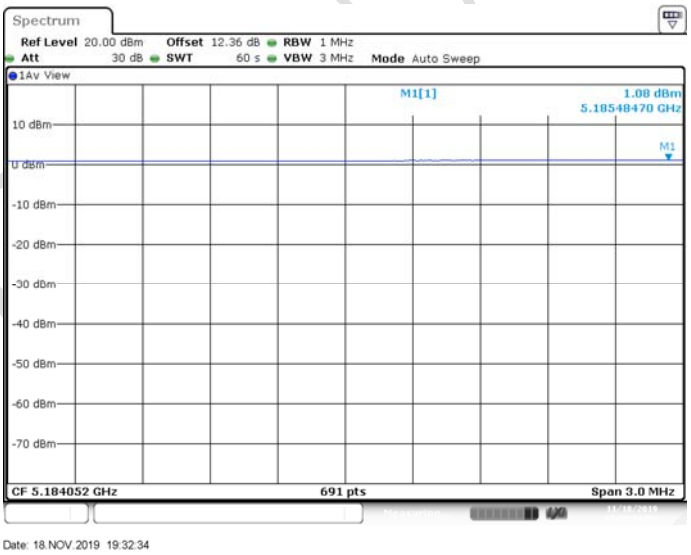


Chain2:802.11ac20 5180MHz–Power density

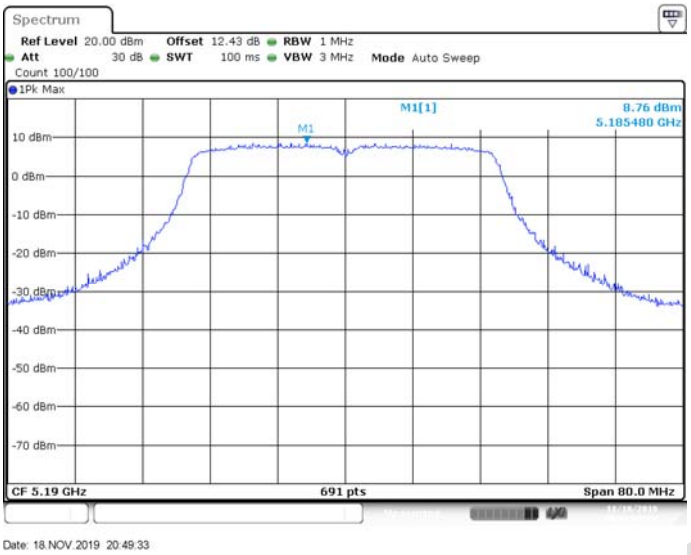


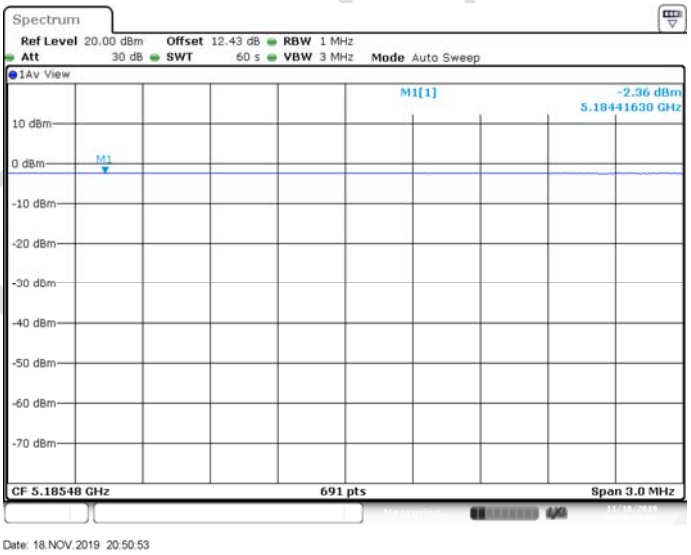
Chain2:802.11n-HT20 5180MHz–Power density



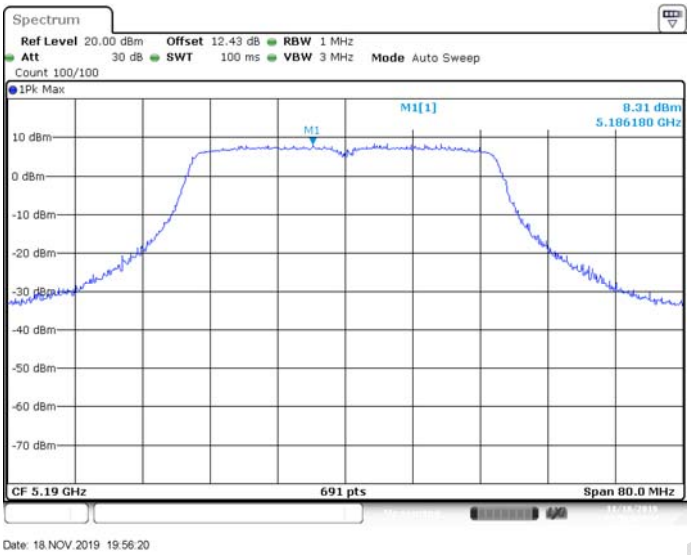


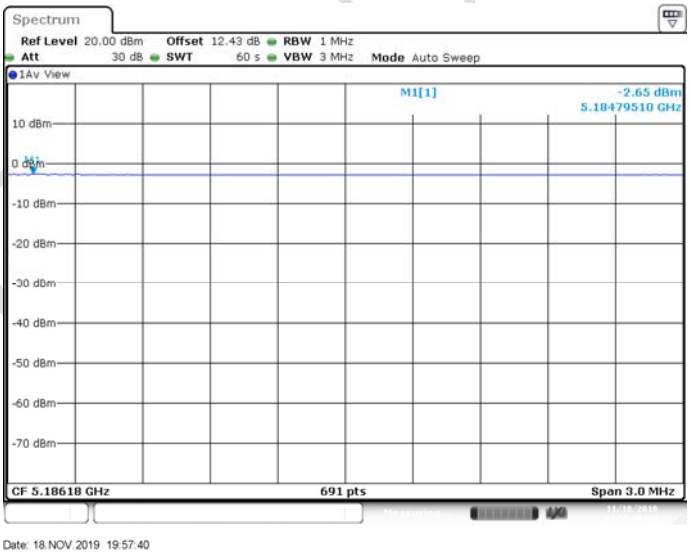
Chain2:802.11ac40 5190MHz–Power density



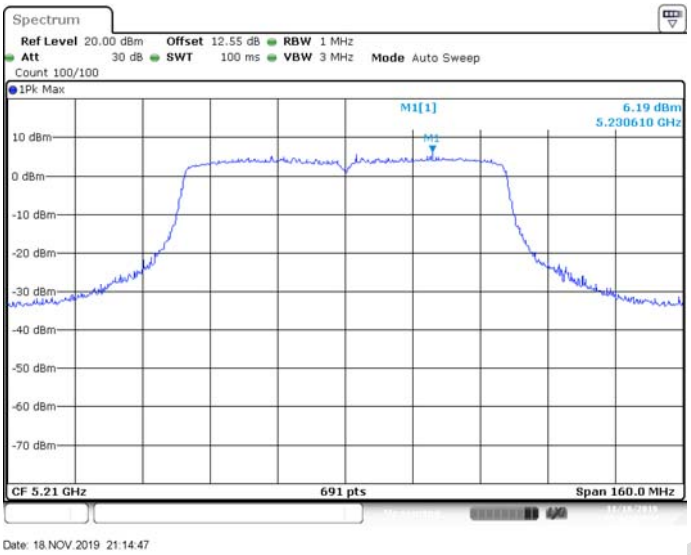


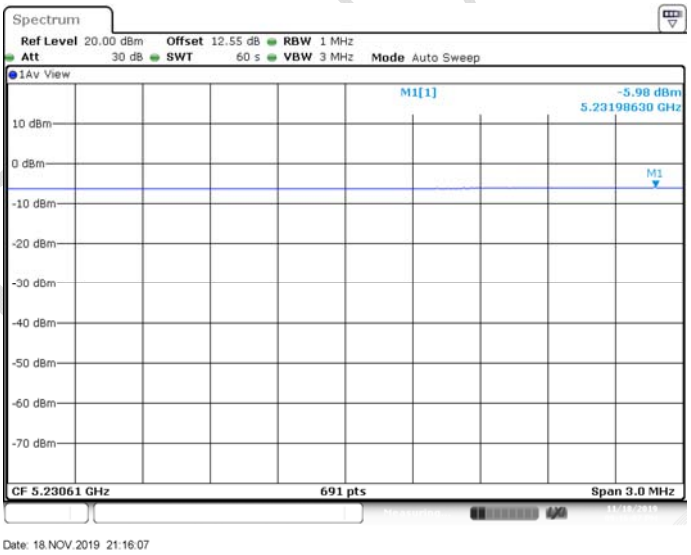
Chain2:802.11n-HT40 5190MHz–Power density





Chain2:802.11ac80 5210MHz–Power density





Band2:

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain0	802.11a	5320	-40	3.3	15.95	2	17.95	20
			25		15.01	2	17.01	20
			70		15.52	2	17.52	20
	802.11ac20	5320	-40	3.3	12.41	2	14.41	20
			25		11.43	2	13.43	20
			70		11.89	2	13.89	20
	802.1n-HT20	5320	-40	3.3	12.48	2	14.48	20
			25		11.5	2	13.5	20
			70		12.02	2	14.02	20
	802.11ac40	5310	-40	3.3	12.29	2	14.29	20
			25		11.32	2	13.32	20
			70		11.83	2	13.83	20
	802.1n-HT40	5310	-40	3.3	12.38	2	14.38	20
			25		11.42	2	13.42	20
			70		11.92	2	13.92	20
	802.11ac80	5290	-40	3.3	12.08	2	14.08	20
			25		11.15	2	13.15	20
			70		11.65	2	13.65	20

FINAL

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain1	802.11a	5320	-40	3.3	15.92	2	17.92	20
			25		14.93	2	16.93	20
			70		15.51	2	17.51	20
	802.11ac20	5320	-40	3.3	12.52	2	14.52	20
			25		11.55	2	13.55	20
			70		12.03	2	14.03	20
	802.1n-HT20	5320	-40	3.3	12.53	2	14.53	20
			25		11.56	2	13.56	20
			70		12.08	2	14.08	20
	802.11ac40	5310	-40	3.3	12.31	2	14.31	20
			25		11.37	2	13.37	20
			70		11.86	2	13.86	20
	802.1n-HT40	5310	-40	3.3	12.57	2	14.57	20
			25		11.58	2	13.58	20
			70		12.12	2	14.12	20
	802.11ac80	5290	-40	3.3	12.22	2	14.22	20
			25		11.19	2	13.19	20
			70		11.59	2	13.59	20

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain2	802.11a	5320	-40	3.3	15.95	2	17.95	20
			25		15.01	2	17.01	20
			70		15.52	2	17.52	20
	802.11ac20	5320	-40	3.3	12.52	2	14.52	20
			25		11.54	2	13.54	20
			70		11.97	2	13.97	20
	802.1n-HT20	5320	-40	3.3	12.47	2	14.47	20
			25		11.53	2	13.53	20
			70		12.01	2	14.01	20
	802.11ac40	5310	-40	3.3	12.19	2	14.19	20
			25		11.24	2	13.24	20
			70		11.73	2	13.73	20
	802.1n-HT40	5310	-40	3.3	12.28	2	14.28	20
			25		11.31	2	13.31	20
			70		11.77	2	13.77	20
	802.11ac80	5290	-40	3.3	12.12	2	14.12	20
			25		11.19	2	13.19	20
			70		11.62	2	13.62	20

Note : the extreme temperature was declared by manufacturer.

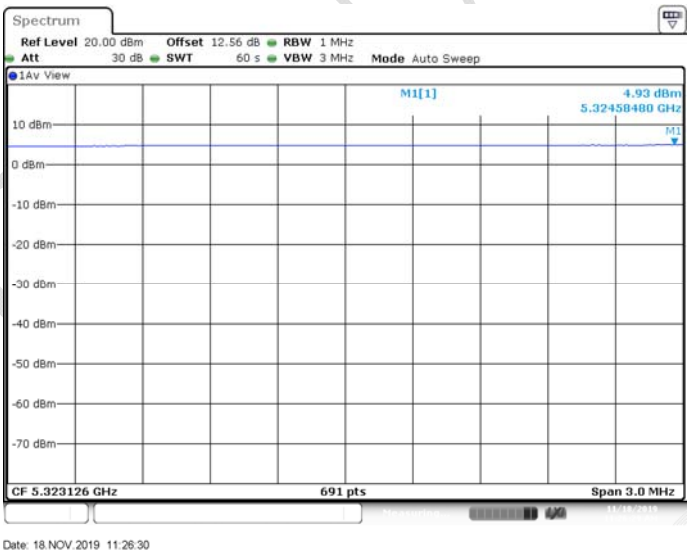
Power density:

Test Mode: Transmitting

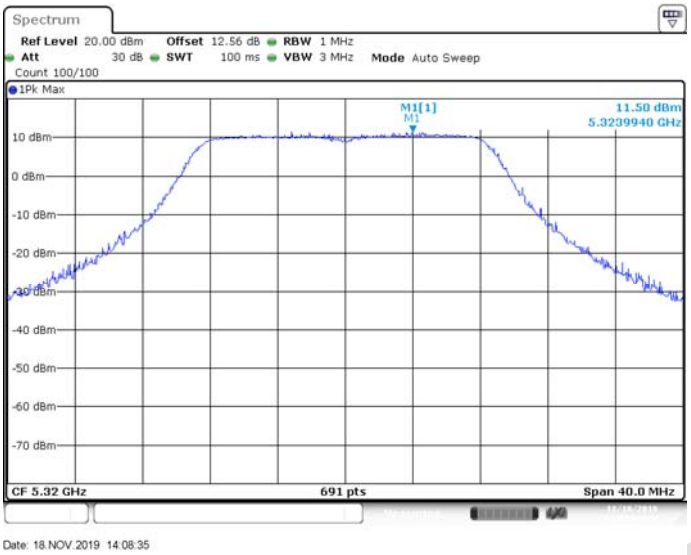
Mode	fc (MHz)	Power Density EIRP (dBm/MHz)				Limit (dBm/MHz)	Result
		Chain0	Chain1	Chain2	Total		
802.11a	5320	4.93	5.28	4.66	/	<= 7.0	PASS
802.11ac20	5320	0.8	0.97	1.06	5.72	<= 7.0	PASS
802.11n-HT20	5320	0.86	1.2	0.99	5.79	<= 7.0	PASS
802.11ac40	5310	-3.16	-2.63	-2.48	2.02	<= 7.0	PASS
802.11n-HT40	5310	-2.67	-2.21	-2.55	2.30	<= 7.0	PASS
802.11ac80	5290	-6.39	-6.39	-6.05	-1.50	<= 7.0	PASS

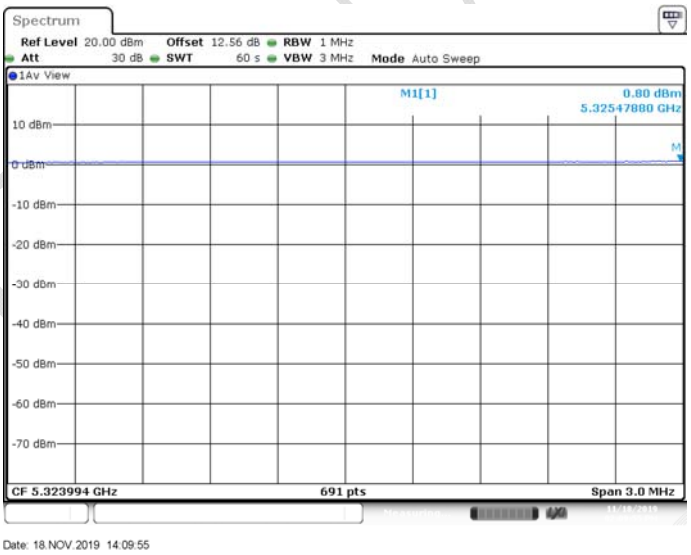
FINAL

Chain0: 802.11a 5320MHz–Power density

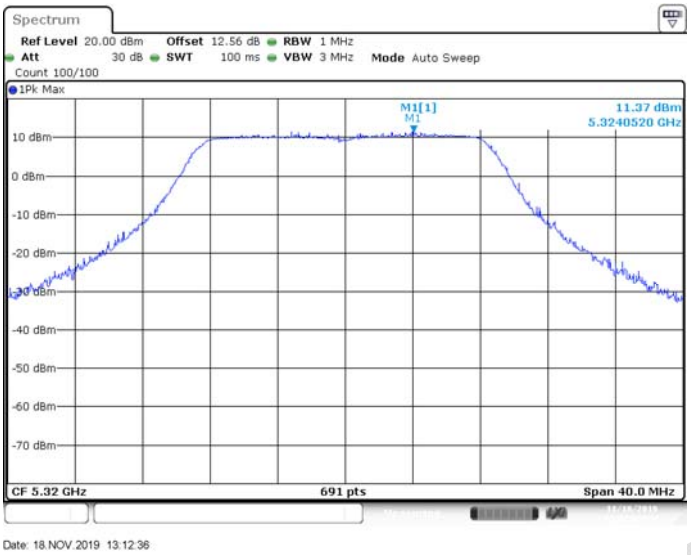


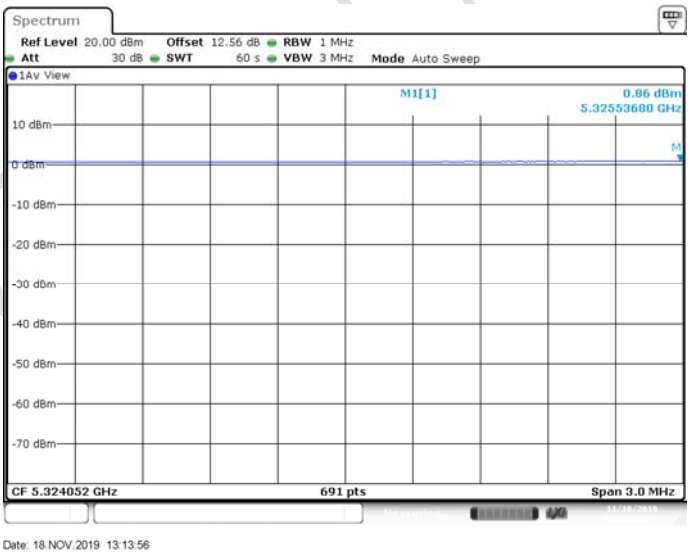
Chain0:802.11ac20 5320MHz–Power density



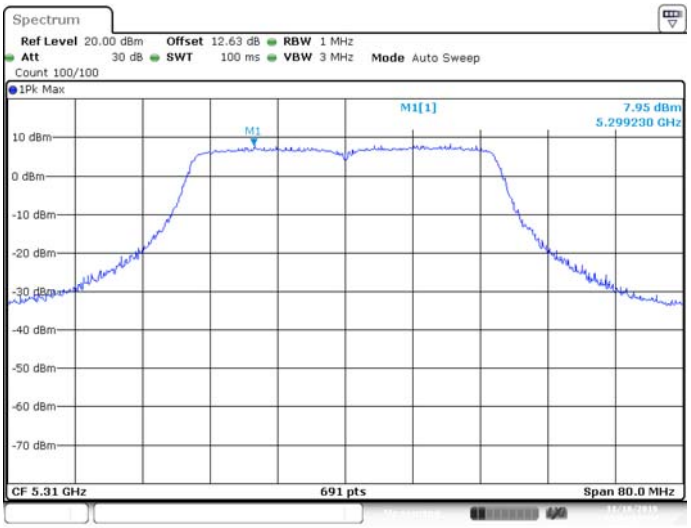


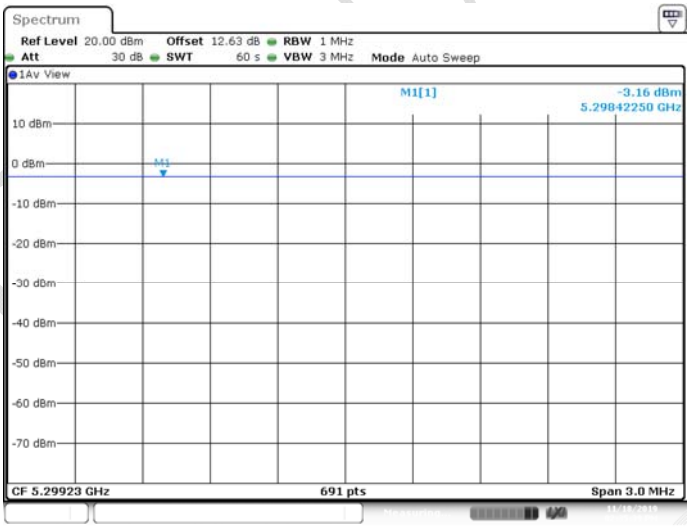
Chain0:802.11n-HT20 5320MHz–Power density



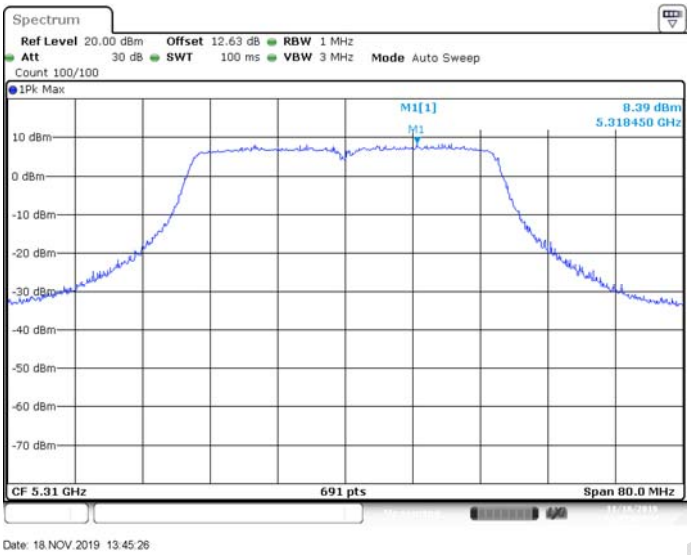


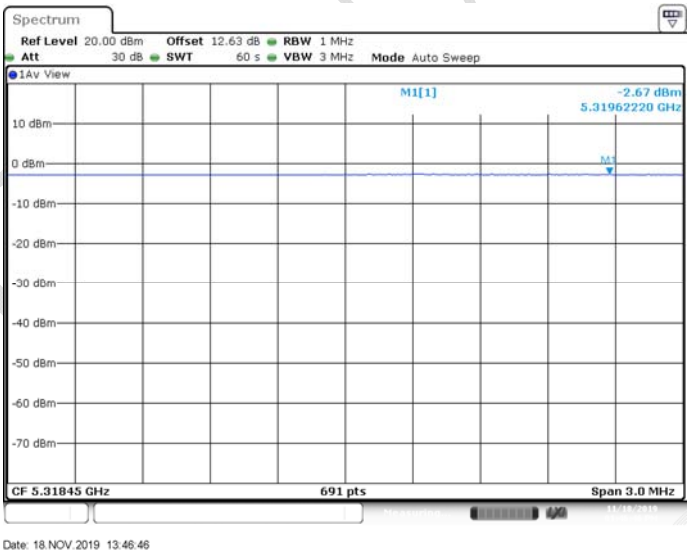
Chain0:802.11ac40 5310MHz–Power density



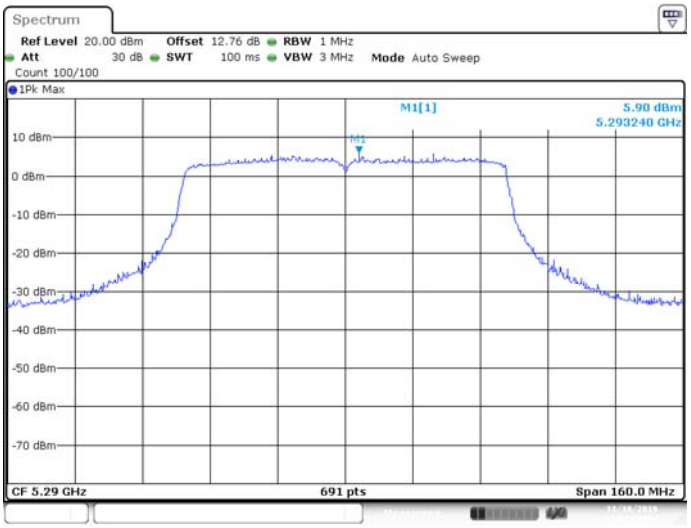


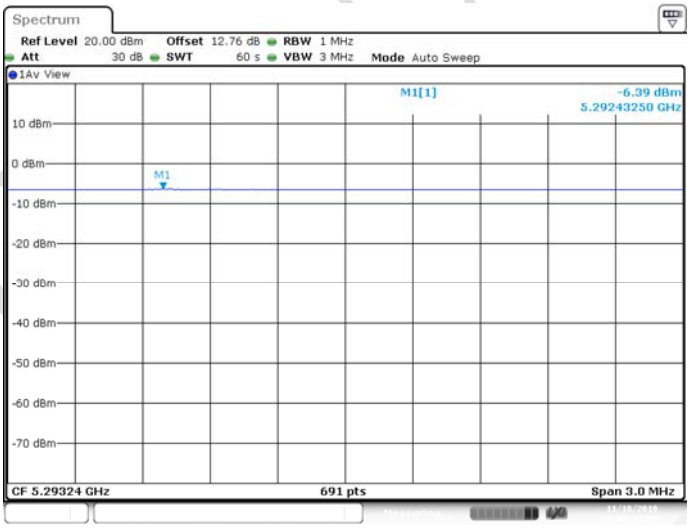
Chain0:802.11n-HT40 5310MHz–Power density



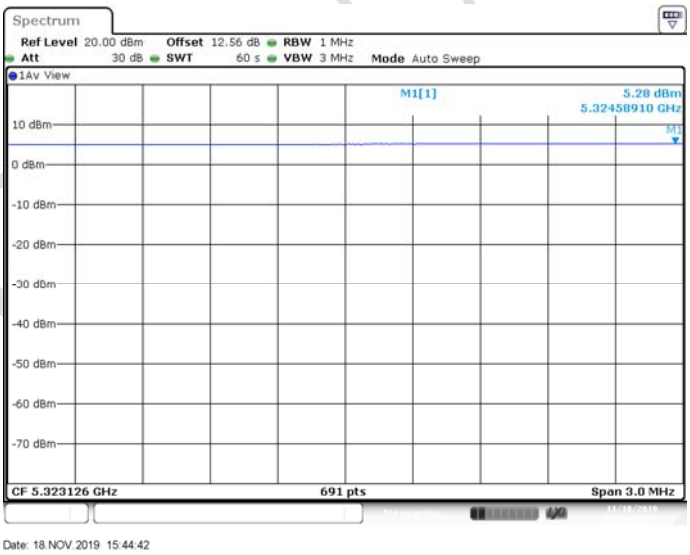


Chain0:802.11ac80 5290MHz–Power density

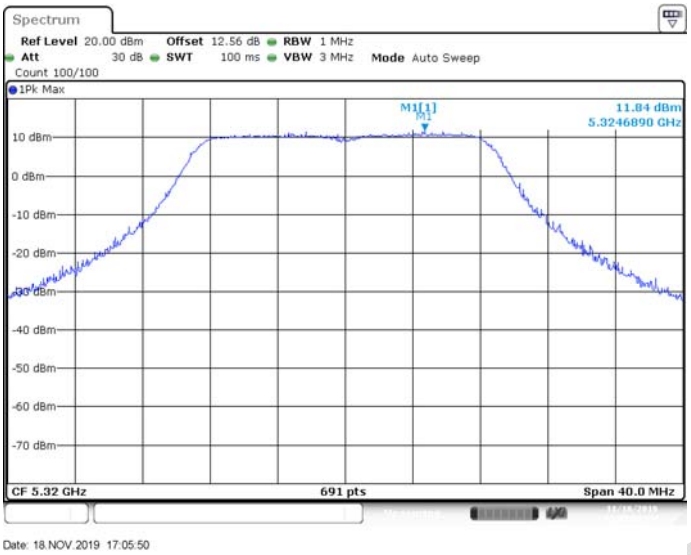


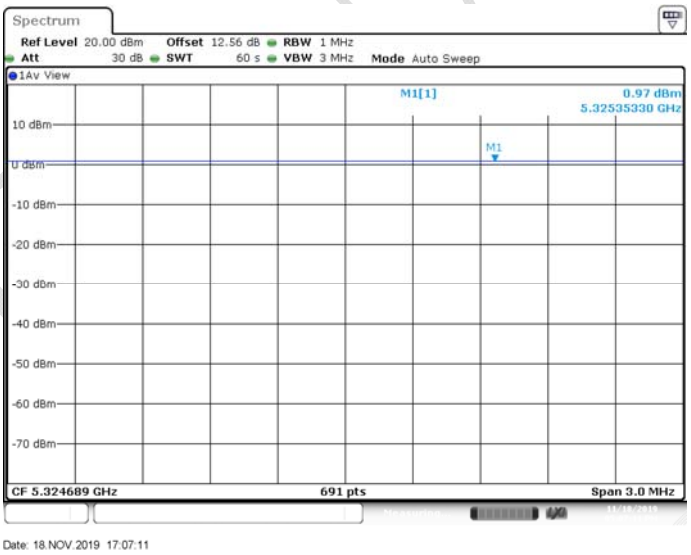


Chain1: 802.11a 5320MHz–Power density

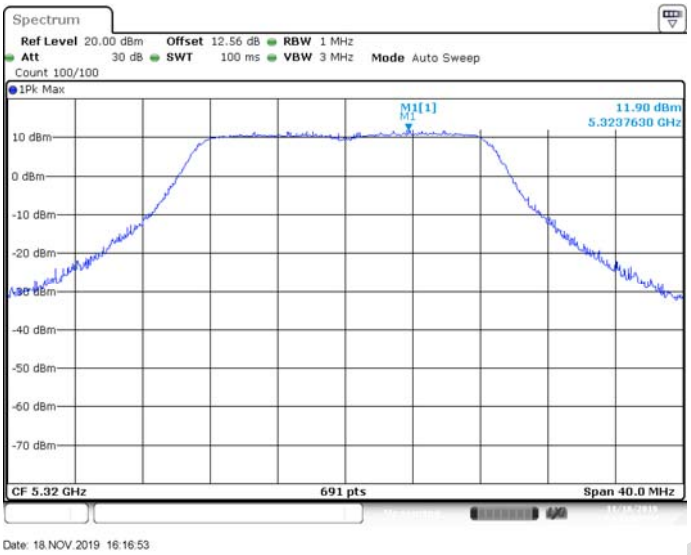


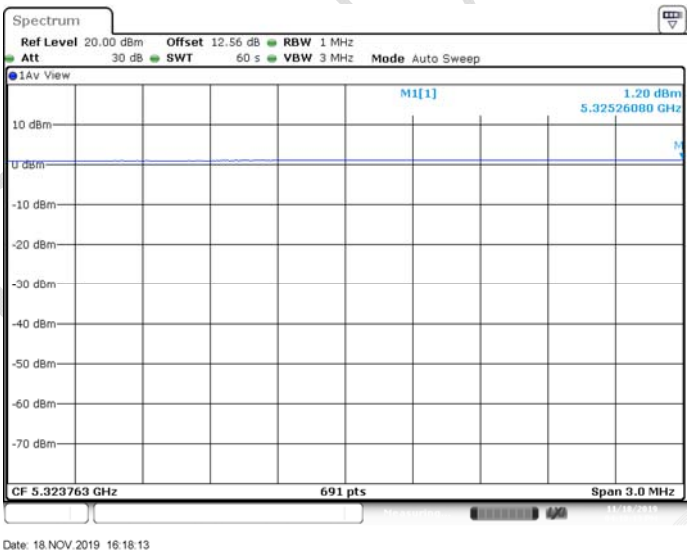
Chain1:802.11ac20 5320MHz–Power density



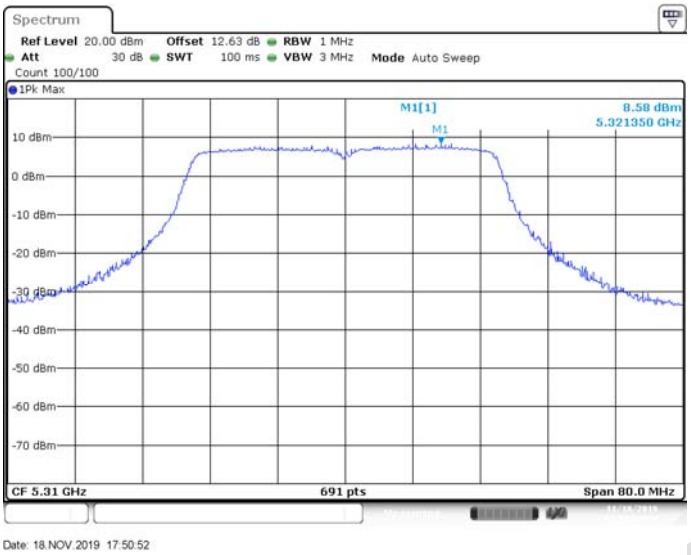


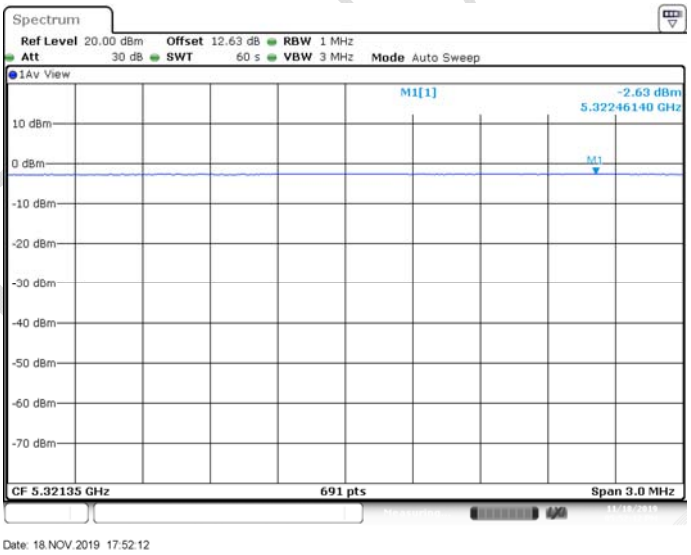
Chain1:802.11n-HT20 5320MHz–Power density



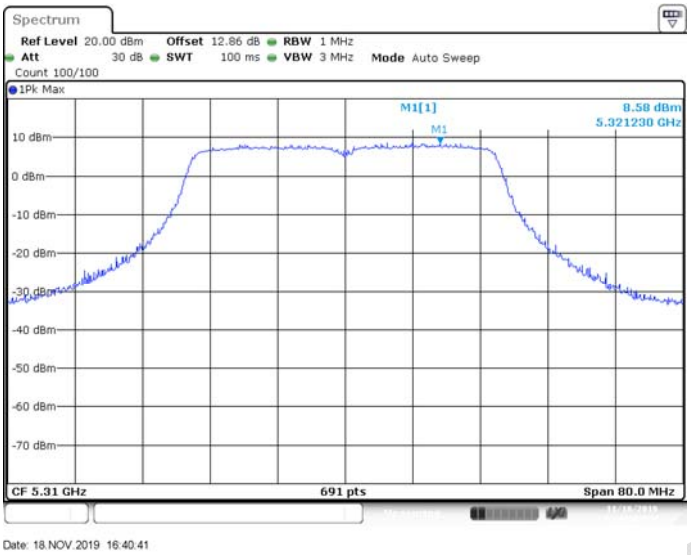


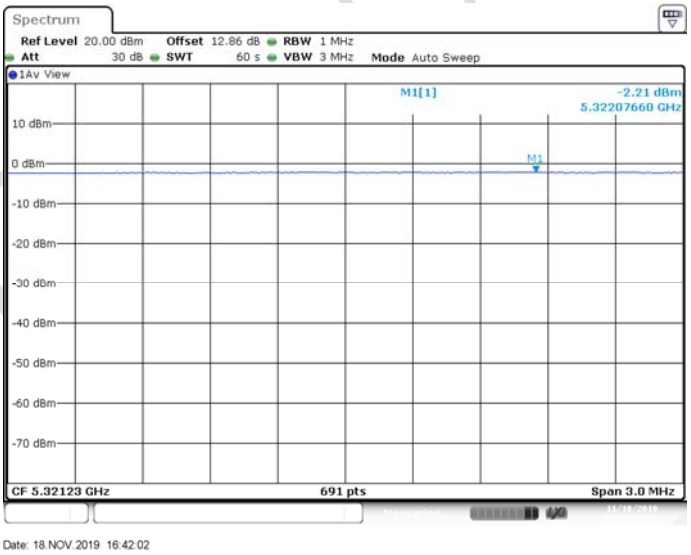
Chain1:802.11ac40 5310MHz–Power density



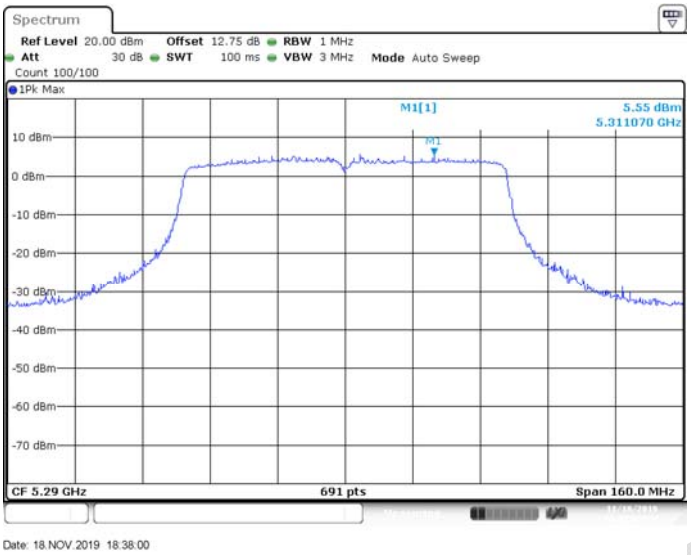


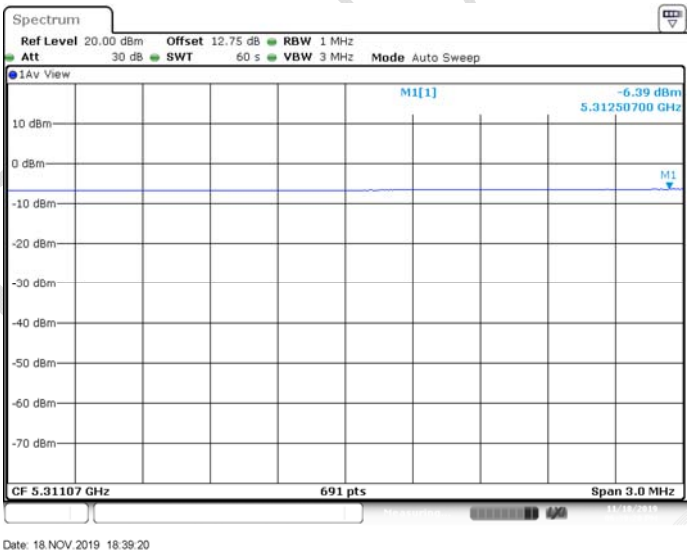
Chain1:802.11n-HT40 5310MHz–Power density



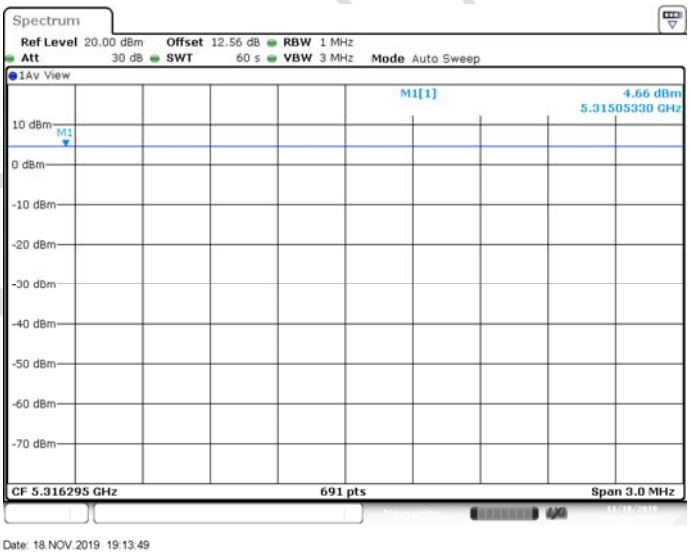


Chain1:802.11ac80 5290MHz–Power density

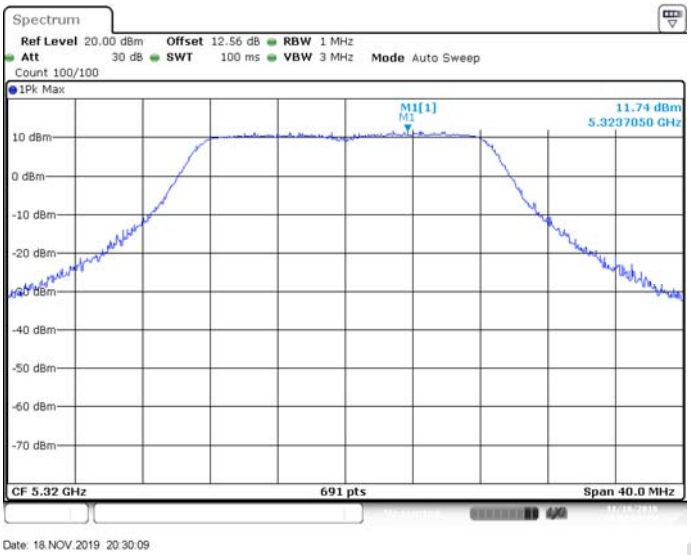


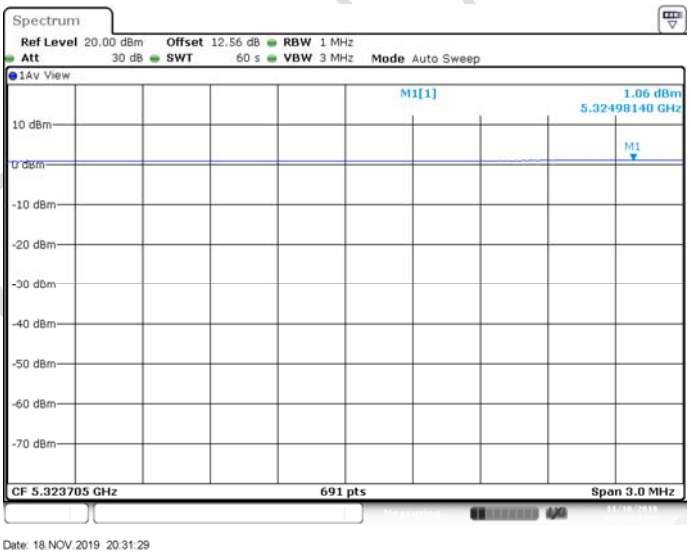


Chain2: 802.11a 5320MHz–Power density

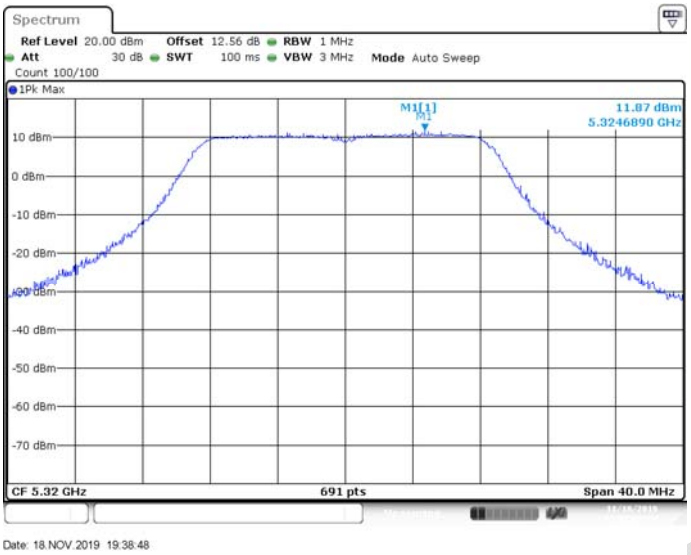


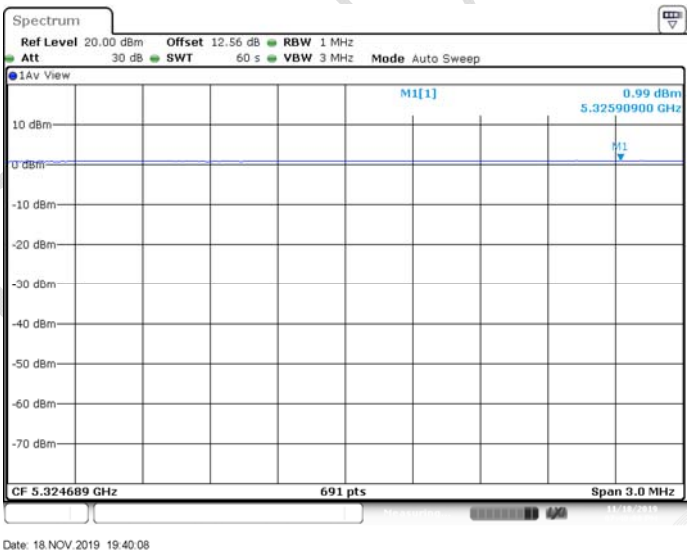
Chain2:802.11ac20 5320MHz–Power density



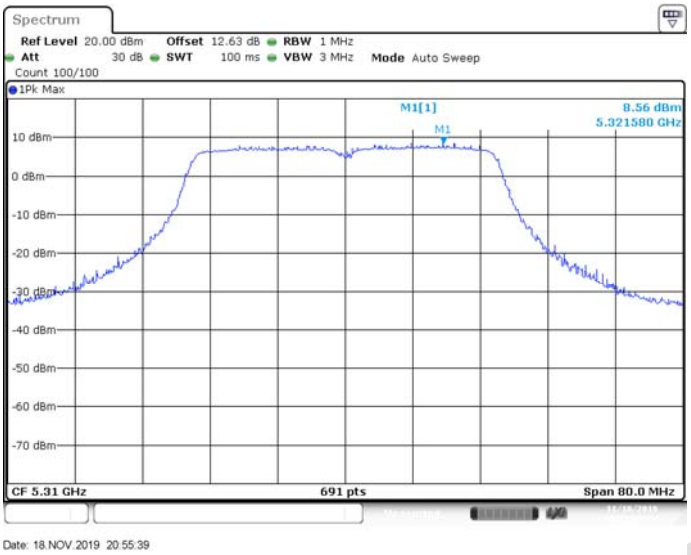


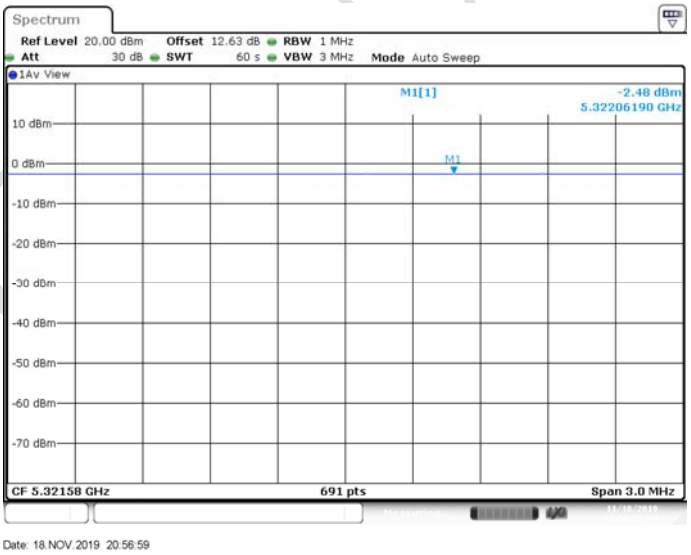
Chain2:802.11n-HT20 5320MHz–Power density



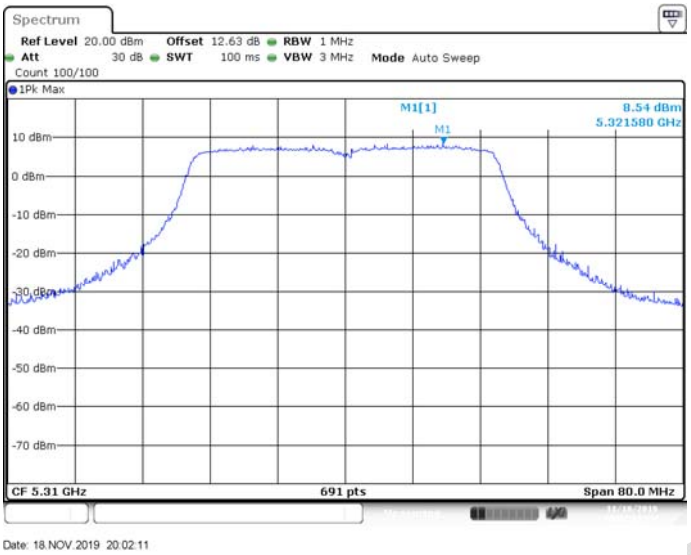


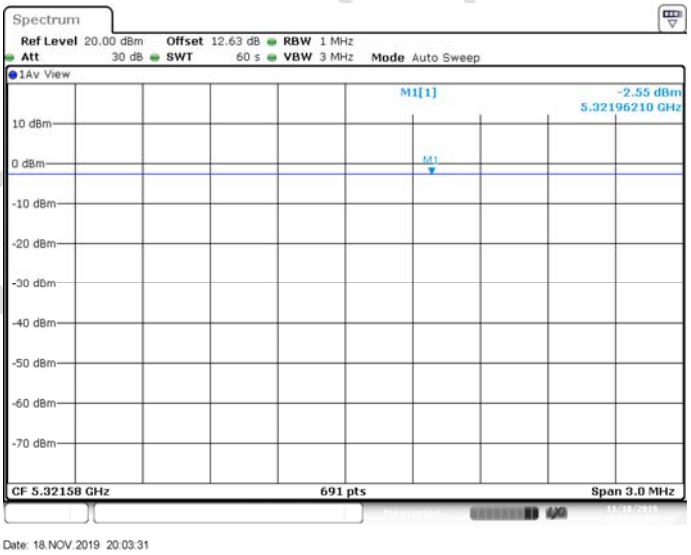
Chain2:802.11ac40 5310MHz–Power density



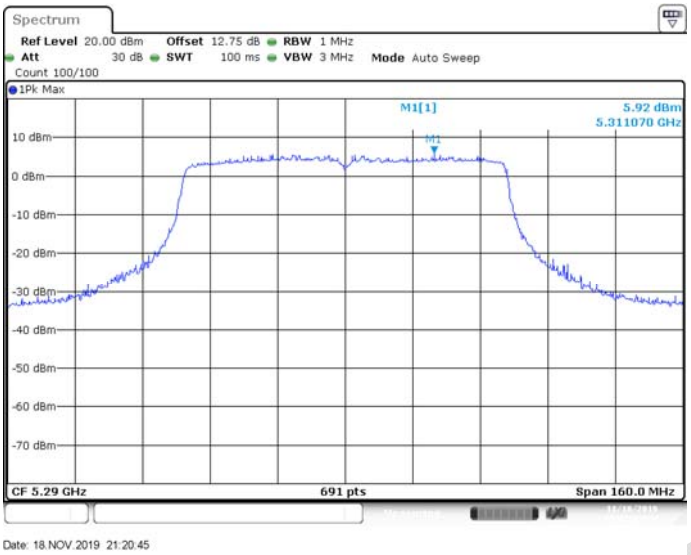


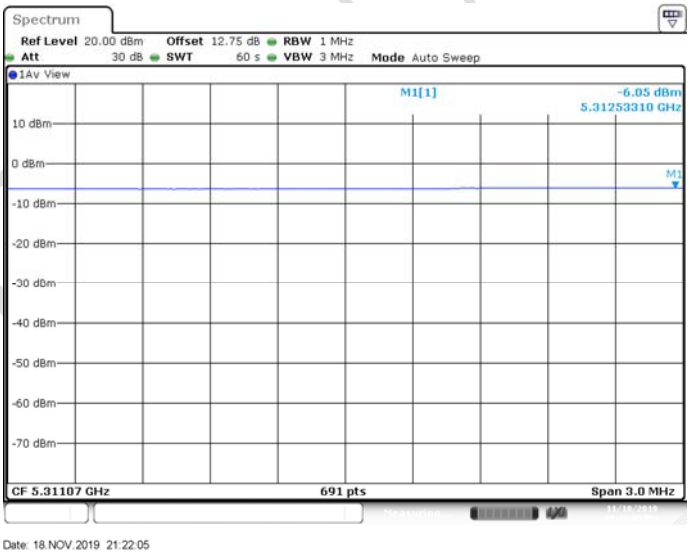
Chain2:802.11n-HT40 5310MHz–Power density





Chain2:802.11ac80 5290MHz–Power density





Band3:

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain0	802.11a	5500	-40	3.3	16.69	2	18.69	20
			25		15.7	2	17.7	20
			70		16.21	2	18.21	20
		5700	-40		15.68	2	17.68	20
			25	3.3	14.75	2	16.75	20
			70		15.24	2	17.24	20
	802.11ac20	5500	-40		13.39	2	15.39	20
			25	3.3	12.42	2	14.42	20
			70		12.92	2	14.92	20
		5700	-40		12.34	2	14.34	20
			25	3.3	11.36	2	13.36	20
			70		11.84	2	13.84	20
	802.1n-HT20	5500	-40		13.38	2	15.38	20
			25	3.3	12.4	2	14.4	20
			70		12.85	2	14.85	20
		5700	-40		12.49	2	14.49	20
			25	3.3	11.51	2	13.51	20
			70		12.02	2	14.02	20
	802.11ac40	5510	-40		12.75	2	14.75	20
			25	3.3	11.76	2	13.76	20
			70		12.28	2	14.28	20
		5670	-40		11.01	2	13.01	20
			25	3.3	12.11	2	14.11	20
			70		11.01	2	13.01	20
	802.1n-HT40	5510	-40		11.54	2	13.54	20
			25	3.3	12.72	2	14.72	20
			70		11.75	2	13.75	20
		5670	-40		12.26	2	14.26	20
			25	3.3	11.91	2	13.91	20
			70		10.94	2	12.94	20
	802.11ac80	5530	-40		11.51	2	13.51	20
			25	3.3	12.39	2	14.39	20
			70		11.42	2	13.42	20
		5610	-40		11.91	2	13.91	20
			25	3.3	12.08	2	14.08	20
			70		11.1	2	13.1	20

FINAL

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain1	802.11a	5500	-40	3.3	16.81	2	18.81	20
			25		15.83	2	17.83	20
			70		16.29	2	18.29	20
		5700	-40	3.3	15.88	2	17.88	20
			25		14.93	2	16.93	20
			70		15.46	2	17.46	20
	802.11ac20	5500	-40	3.3	13.61	2	15.61	20
			25		12.61	2	14.61	20
			70		13.12	2	15.12	20
		5700	-40	3.3	12.41	2	14.41	20
			25		11.45	2	13.45	20
			70		11.93	2	13.93	20
	802.1n-HT20	5500	-40	3.3	13.52	2	15.52	20
			25		12.53	2	14.53	20
			70		12.99	2	14.99	20
		5700	-40	3.3	12.42	2	14.42	20
			25		11.47	2	13.47	20
			70		11.87	2	13.87	20
	802.11ac40	5510	-40	3.3	12.75	2	14.75	20
			25		11.79	2	13.79	20
			70		12.31	2	14.31	20
		5670	-40	3.3	12.09	2	14.09	20
			25		11.11	2	13.11	20
			70		11.62	2	13.62	20
	802.1n-HT40	5510	-40	3.3	12.79	2	14.79	20
			25		11.83	2	13.83	20
			70		12.32	2	14.32	20
		5670	-40	3.3	12.08	2	14.08	20
			25		11.07	2	13.07	20
			70		11.51	2	13.51	20
	802.11ac80	5530	-40	3.3	12.61	2	14.61	20
			25		11.63	2	13.63	20
			70		12.09	2	14.09	20
		5610	-40	3.3	12.58	2	14.58	20
			25		11.57	2	13.57	20
			70		12.05	2	14.05	20

FINAL

Chain	Mode	f_c	Temperature	Voltage	Reading	Antenna gain	e.i.r.p	Limit
		MHz	℃	V_{DC}	dBm	dBi	dBm	dBm
Chain2	802.11a	5500	-40	3.3	16.69	2	18.69	20
			25		15.76	2	17.76	20
			70		16.25	2	18.25	20
		5700	-40	3.3	15.79	2	17.79	20
			25		14.82	2	16.82	20
			70		15.32	2	17.32	20
	802.11ac20	5500	-40	3.3	13.52	2	15.52	20
			25		12.53	2	14.53	20
			70		13.02	2	15.02	20
		5700	-40	3.3	12.18	2	14.18	20
			25		11.24	2	13.24	20
			70		11.72	2	13.72	20
	802.1n-HT20	5500	-40	3.3	13.41	2	15.41	20
			25		12.43	2	14.43	20
			70		12.88	2	14.88	20
		5700	-40	3.3	12.45	2	14.45	20
			25		11.5	2	13.5	20
			70		11.97	2	13.97	20
	802.11ac40	5510	-40	3.3	12.69	2	14.69	20
			25		11.72	2	13.72	20
			70		12.25	2	14.25	20
		5670	-40	3.3	12.06	2	14.06	20
			25		11.06	2	13.06	20
			70		11.54	2	13.54	20
	802.1n-HT40	5510	-40	3.3	12.72	2	14.72	20
			25		11.76	2	13.76	20
			70		12.28	2	14.28	20
		5670	-40	3.3	12.01	2	14.01	20
			25		11.04	2	13.04	20
			70		11.54	2	13.54	20
	802.11ac80	5530	-40	3.3	12.45	2	14.45	20
			25		11.47	2	13.47	20
			70		11.89	2	13.89	20
		5610	-40	3.3	12.19	2	14.19	20
			25		11.27	2	13.27	20
			70		11.72	2	13.72	20

Note : the extreme temperature was declared by manufacturer.

FINAL

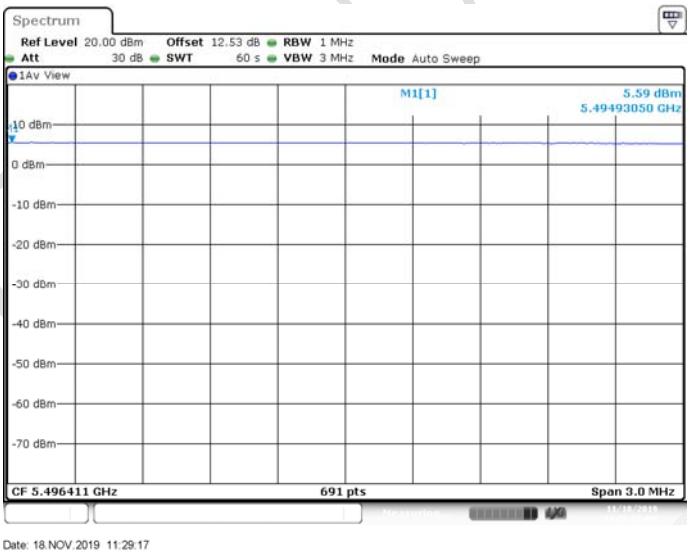
Power density:

Test Mode: Transmitting

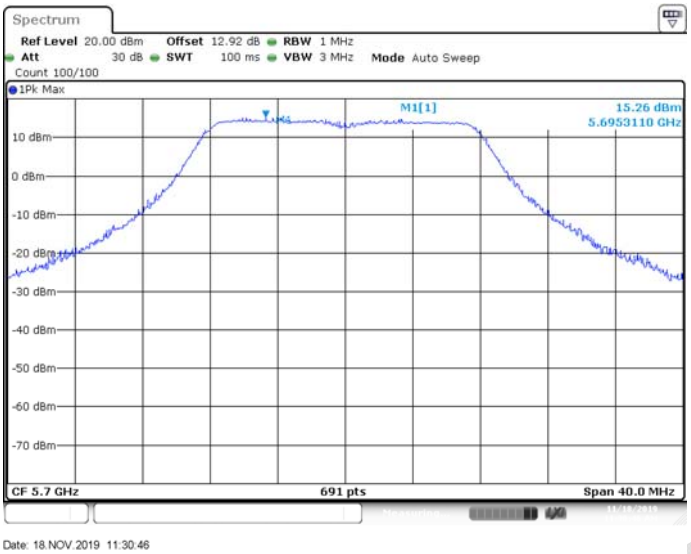
Mode	fc (MHz)	Power Density EIRP (dBm/MHz)				Limit (dBm/MHz)	Result
		Chain0	Chain1	Chain2	Total		
802.11a	5500	5.59	5.96	5.78	/	<= 7.0	PASS
	5700	4.76	5.09	4.84	/	<= 7.0	PASS
802.11ac20	5500	1.55	1.77	1.82	6.49	<= 7.0	PASS
	5700	0.4	0.41	0.72	5.28	<= 7.0	PASS
802.11n-HT20	5500	1.57	2.04	1.71	6.55	<= 7.0	PASS
	5700	0.44	0.81	0.55	5.37	<= 7.0	PASS
802.11ac40	5510	-2.38	-2.19	-2.07	2.56	<= 7.0	PASS
	5670	-2.71	-2.71	-2.4	2.17	<= 7.0	PASS
802.11n-HT40	5510	-2.51	-2.06	-8.27	1.25	<= 7.0	PASS
	5670	-2.79	-2.52	-2.55	2.15	<= 7.0	PASS
802.11ac80	5530	-5.78	-6.08	-5.6	-1.04	<= 7.0	PASS
	5610	-5.68	-5.34	-5.56	-0.75	<= 7.0	PASS

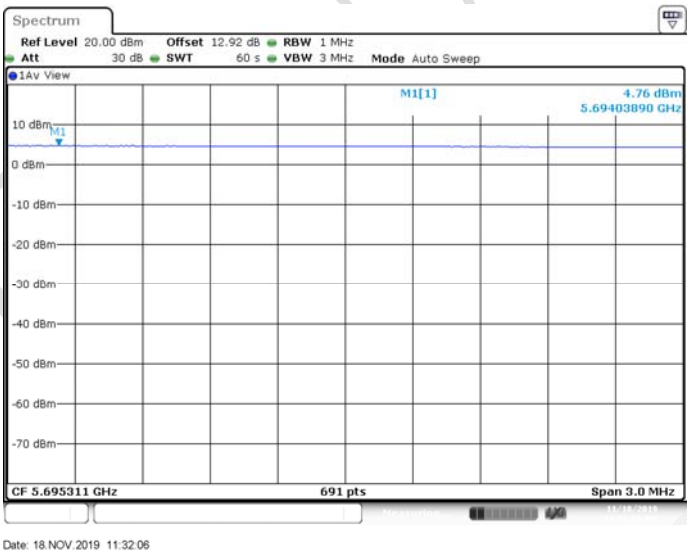
FINAL

Chain0: 802.11a 5500MHz–Power density

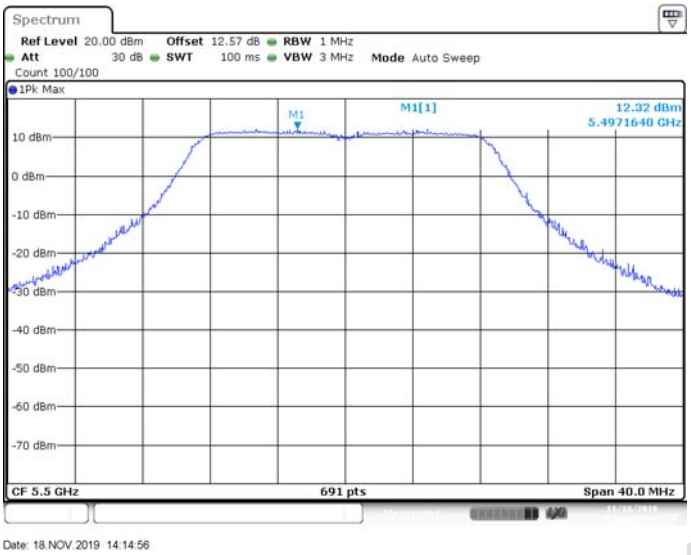


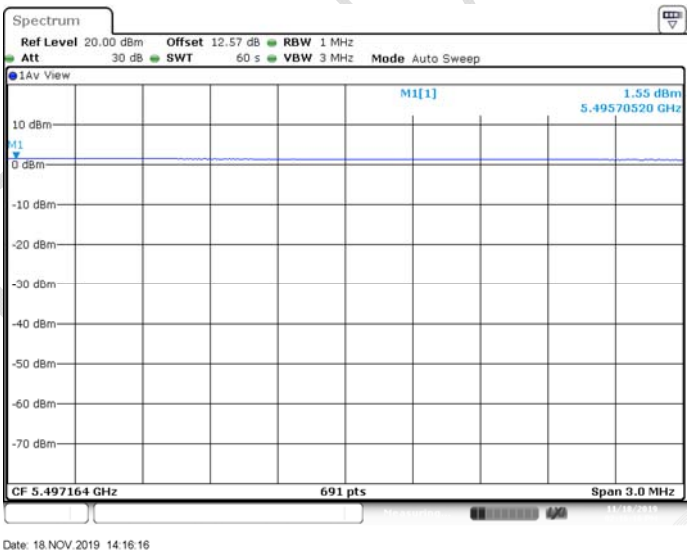
Chain0: 802.11a 5700MHz–Power density



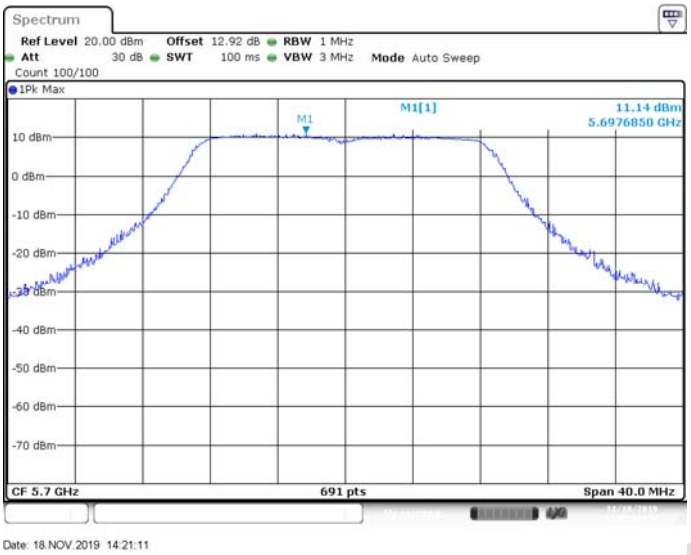


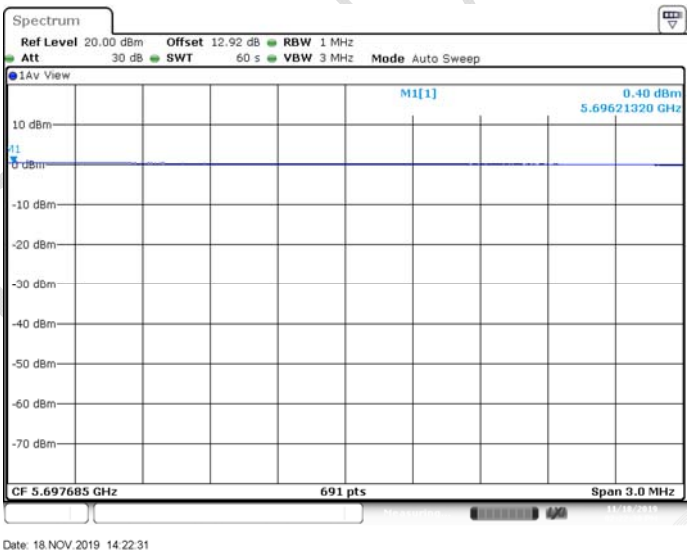
Chain0:802.11ac20 5500MHz–Power density



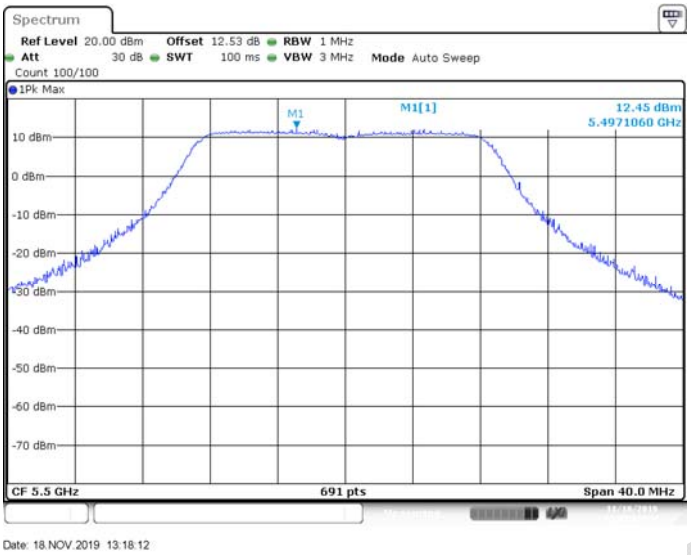


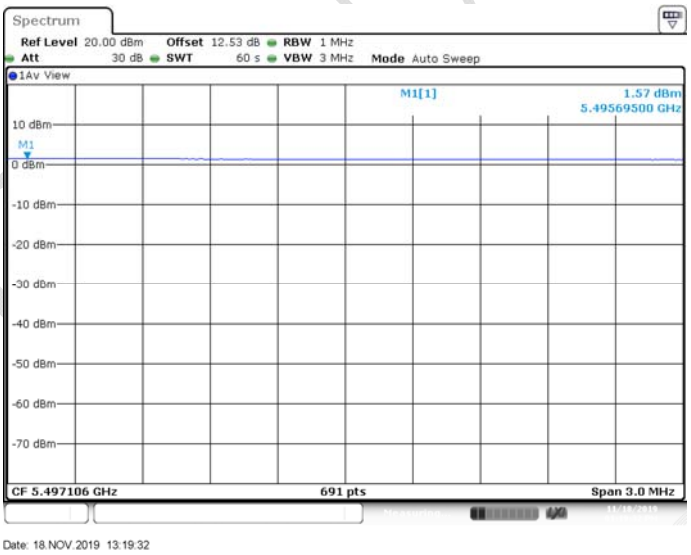
Chain0:802.11ac20 5700MHz–Power density



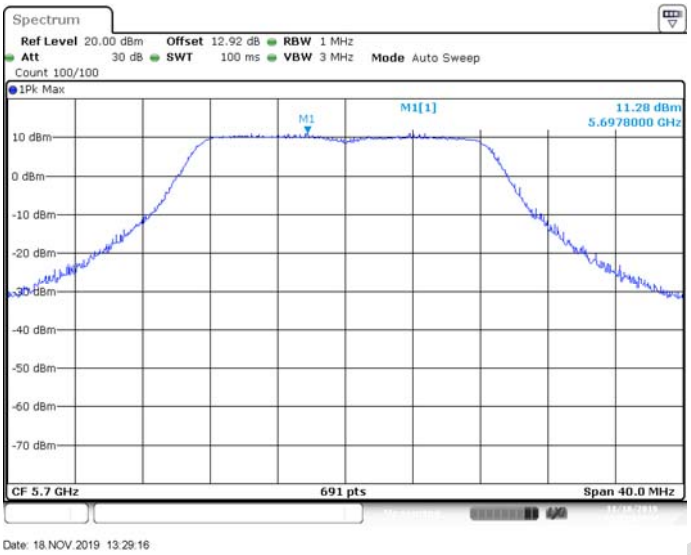


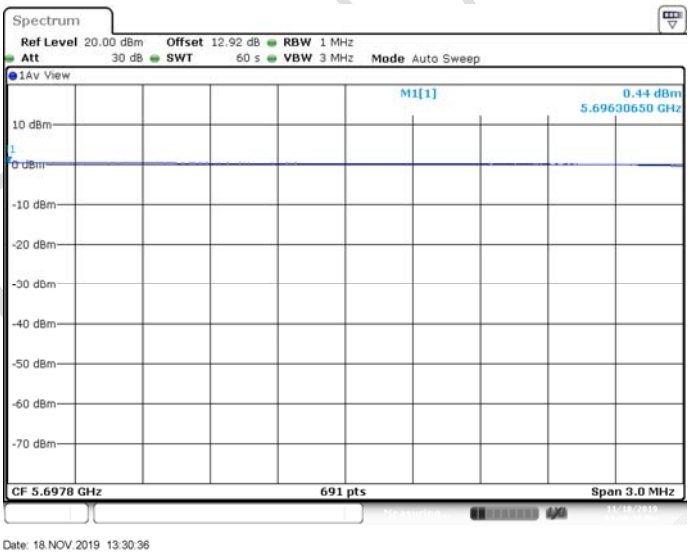
Chain0:802.11n-HT20 5500MHz–Power density



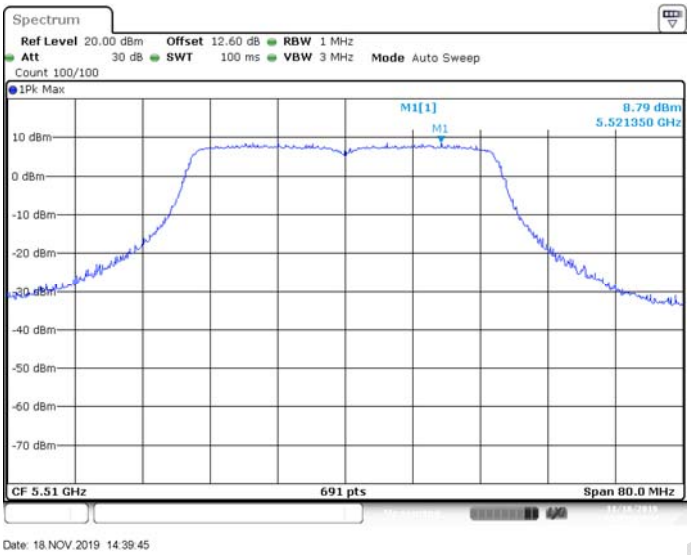


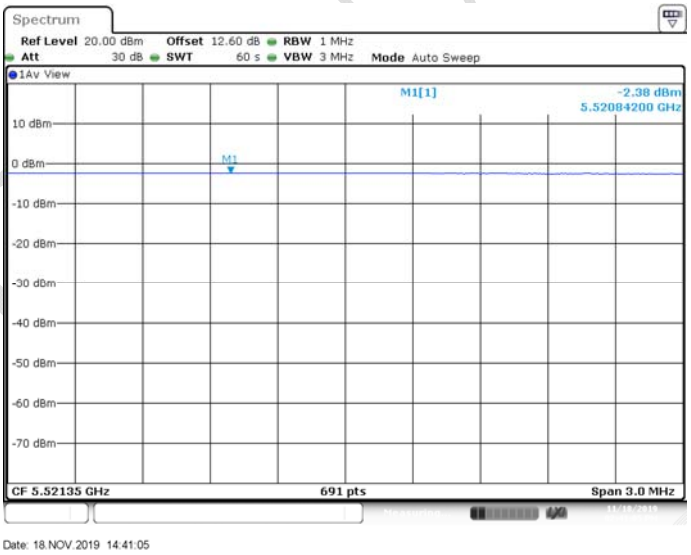
Chain0:802.11n-HT20 5700MHz–Power density



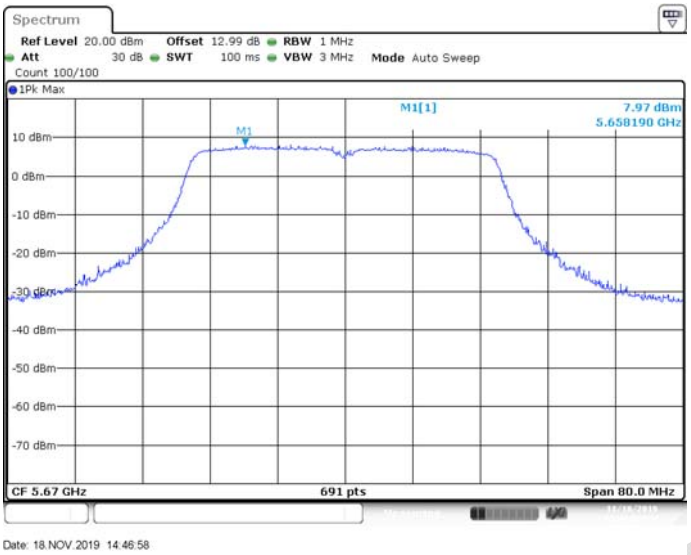


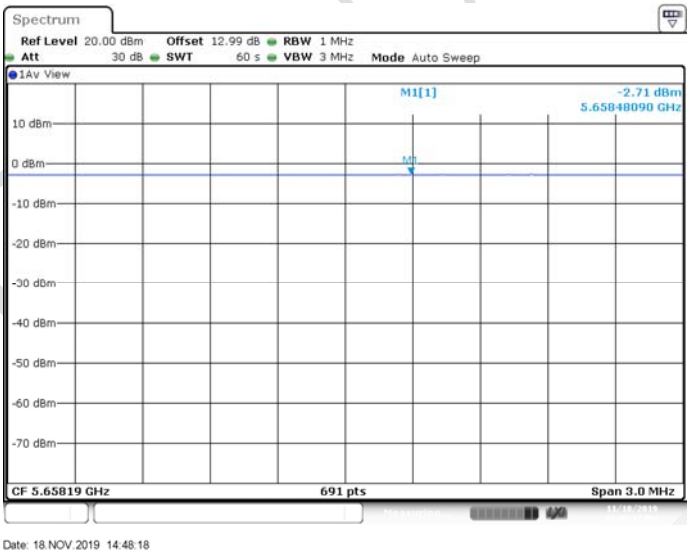
Chain0:802.11ac40 5510MHz–Power density



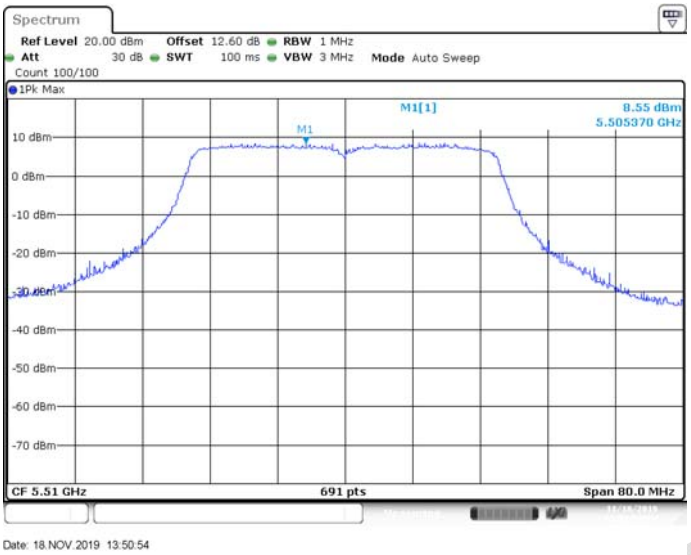


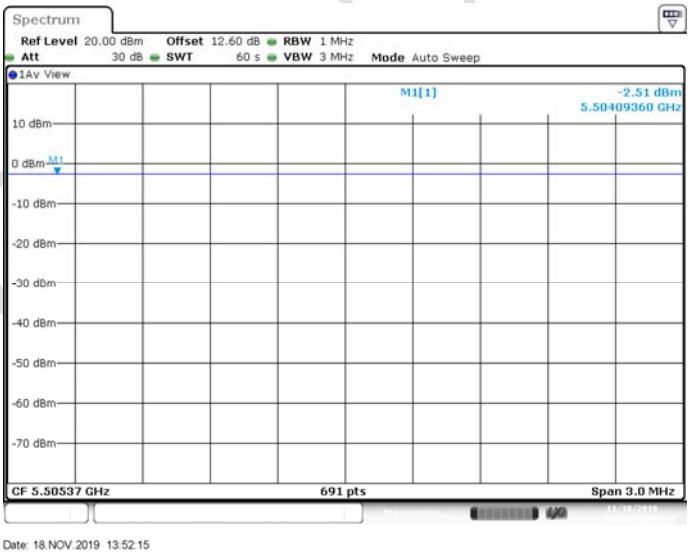
Chain0:802.11ac40 5670MHz–Power density



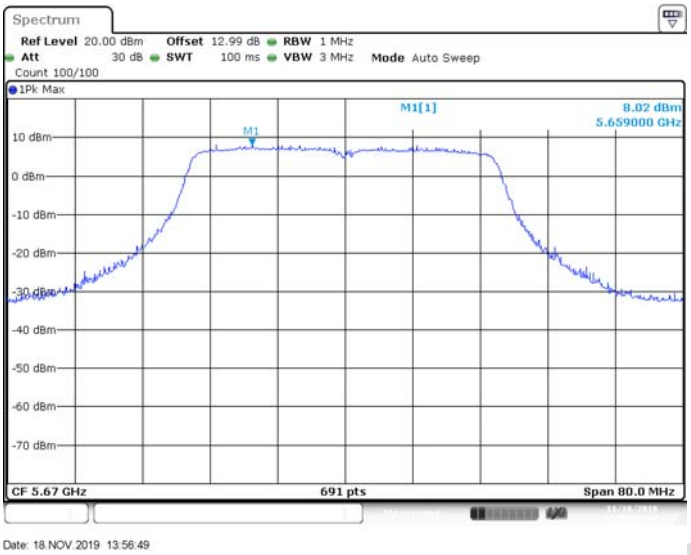


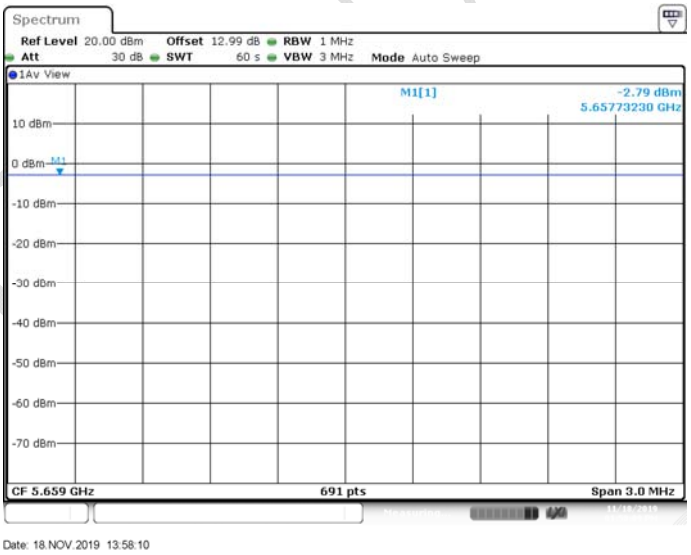
Chain0:802.11n-HT40 5510MHz–Power density



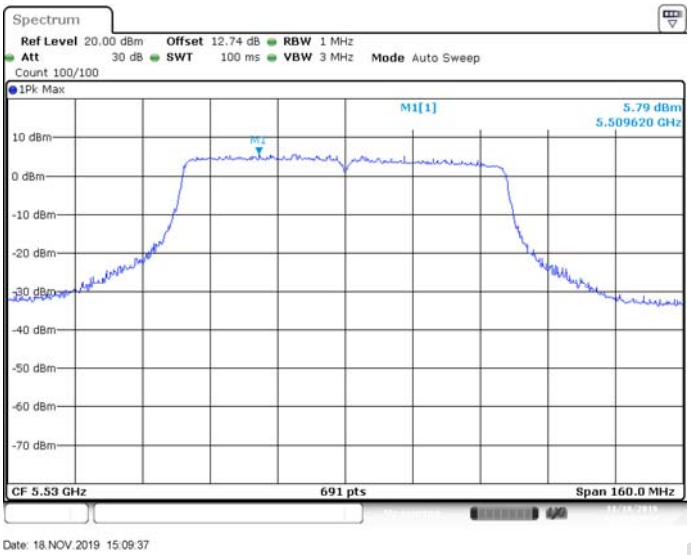


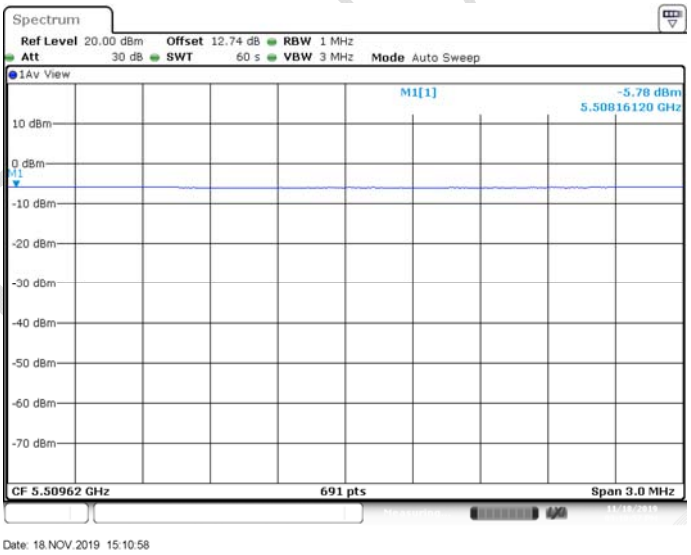
Chain0:802.11n-HT40 5670MHz–Power density



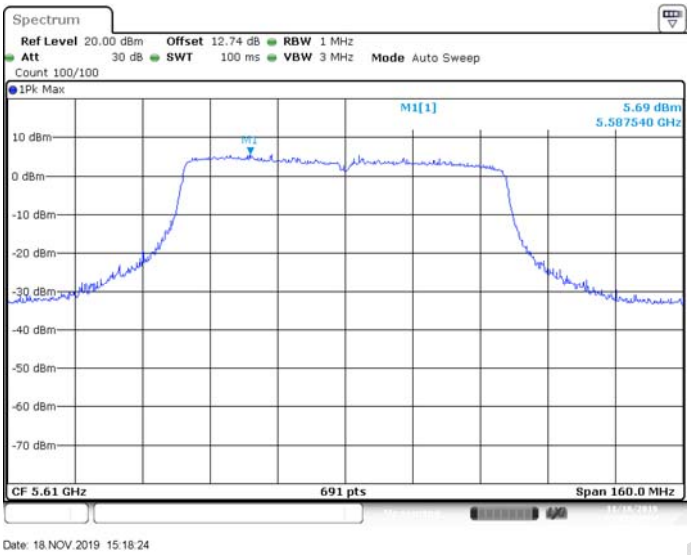


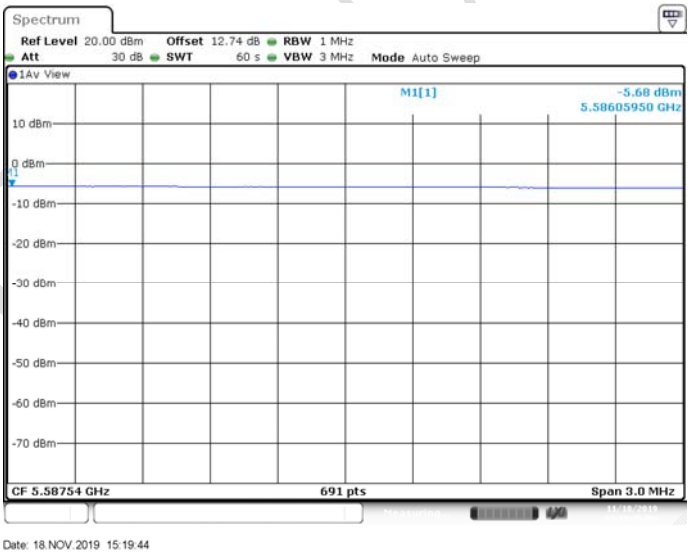
Chain0:802.11ac80 5530MHz–Power density



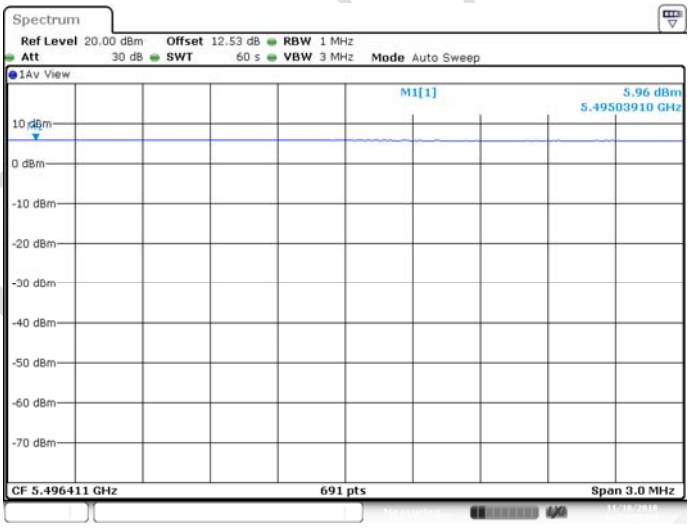


Chain0:802.11ac80 5610MHz–Power density

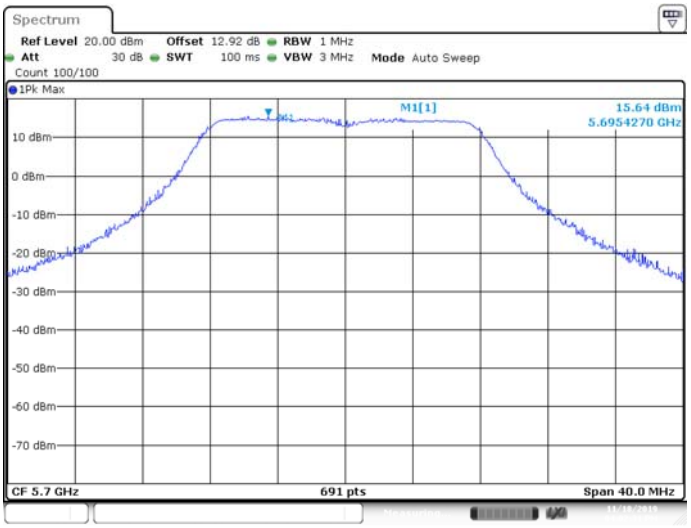


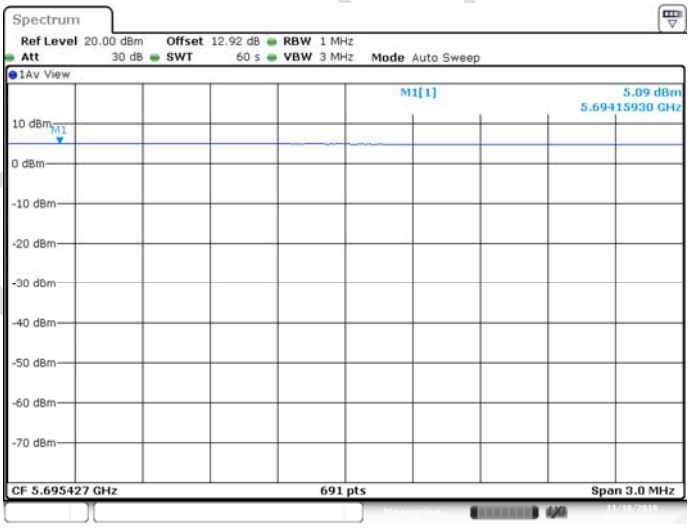


Chain1:802.11a 5500MHz–Power density

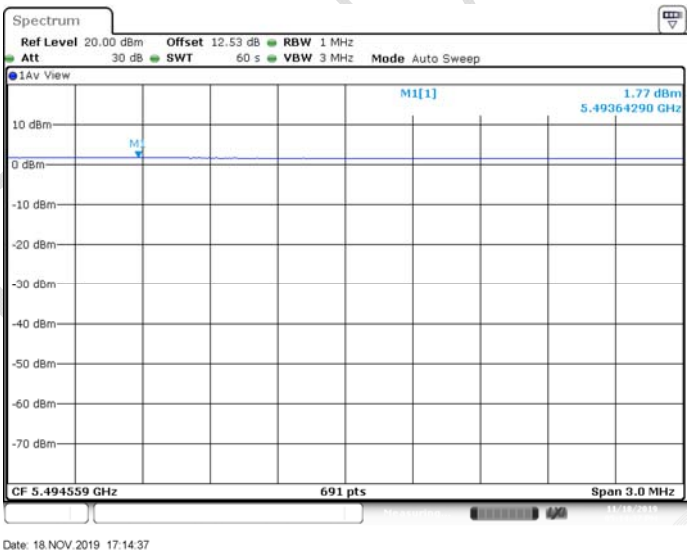


Chain1:802.11a 5700MHz–Power density

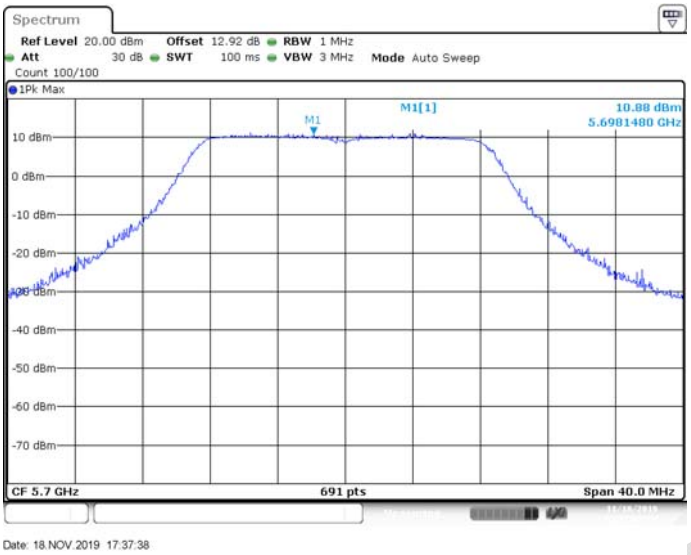


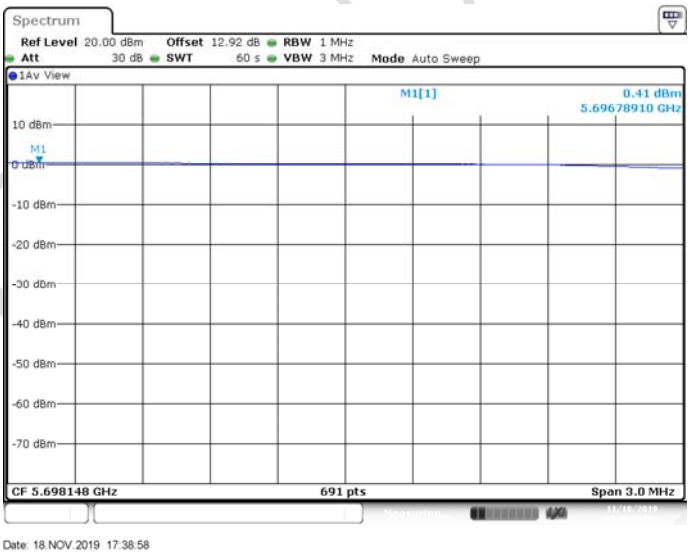


Chain1:802.11ac20 5500MHz–Power density

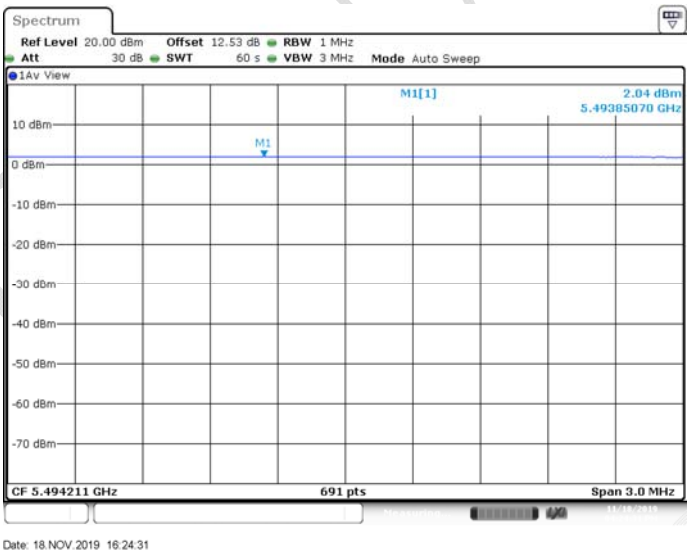


Chain1:802.11ac20 5700MHz–Power density

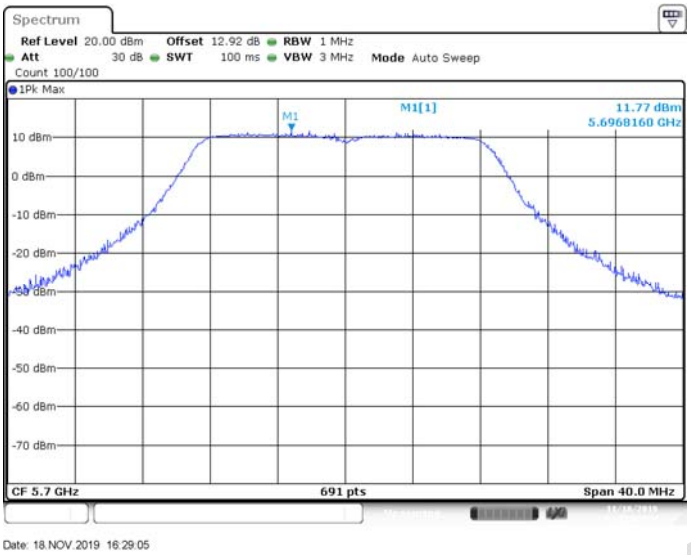


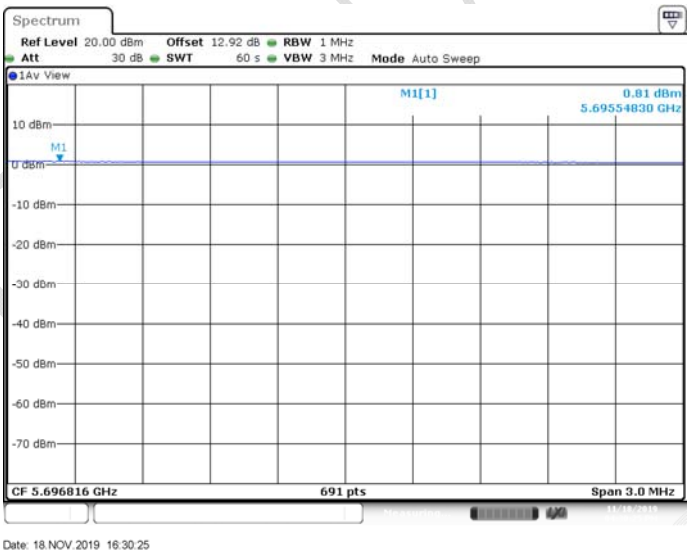


Chain1:802.11n-HT20 5500MHz–Power density

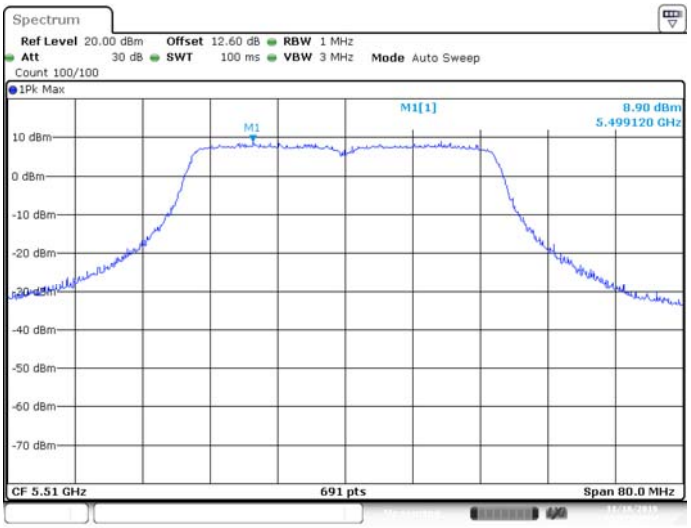


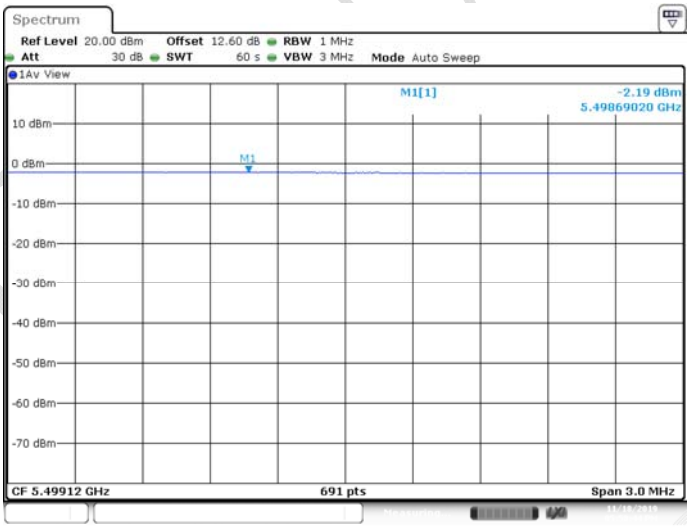
Chain1:802.11n-HT20 5700MHz–Power density



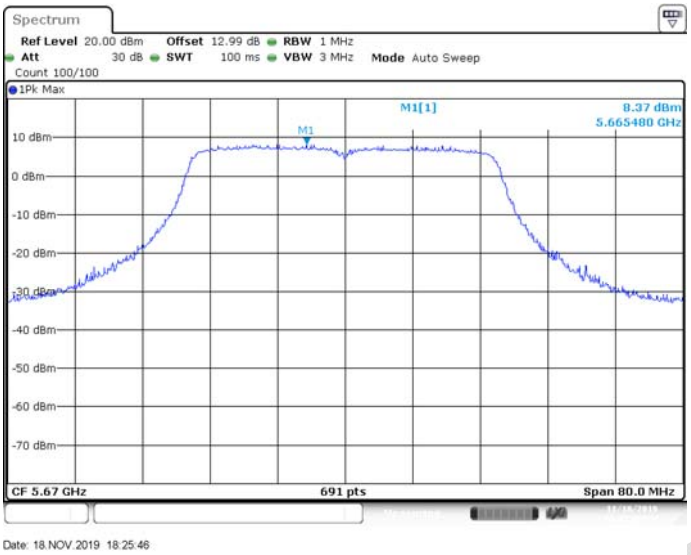


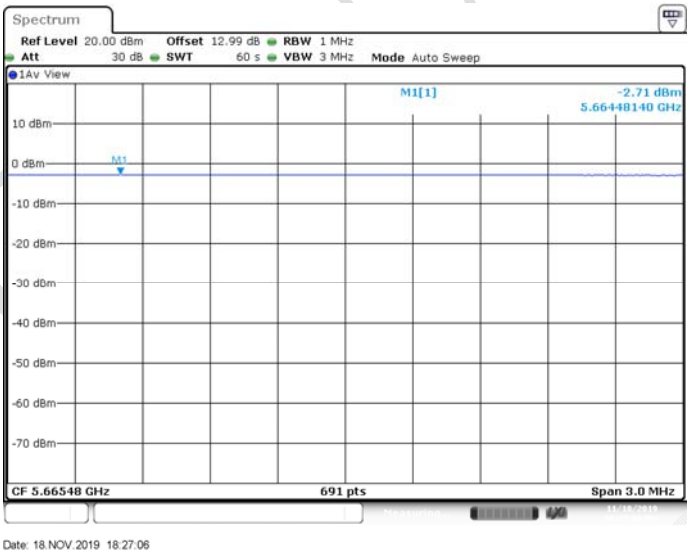
Chain1:802.11ac40 5510MHz–Power density



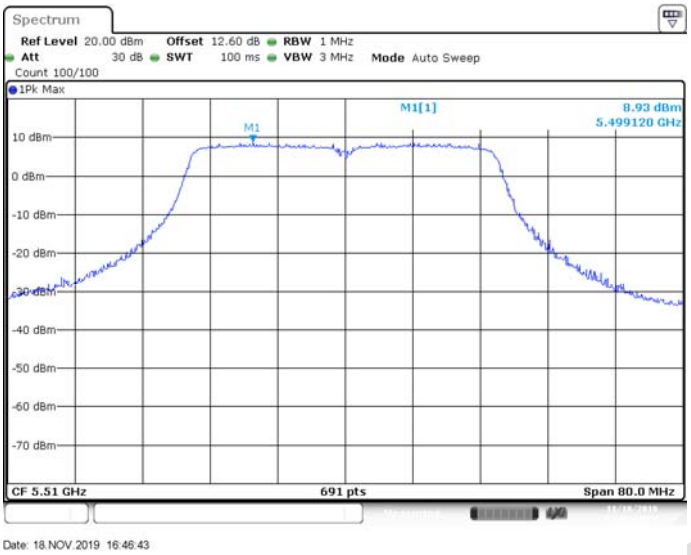


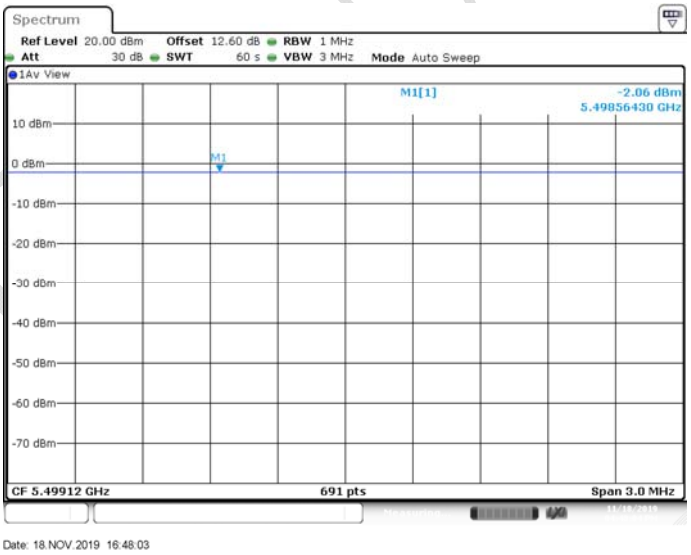
Chain1:802.11ac40 5670MHz–Power density



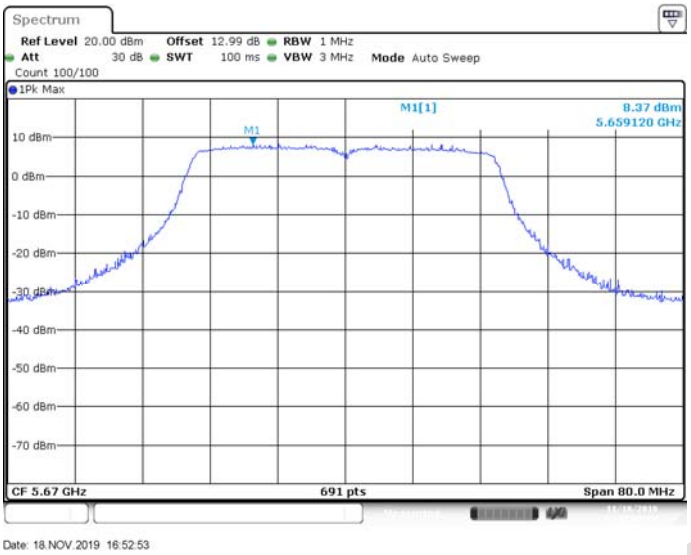


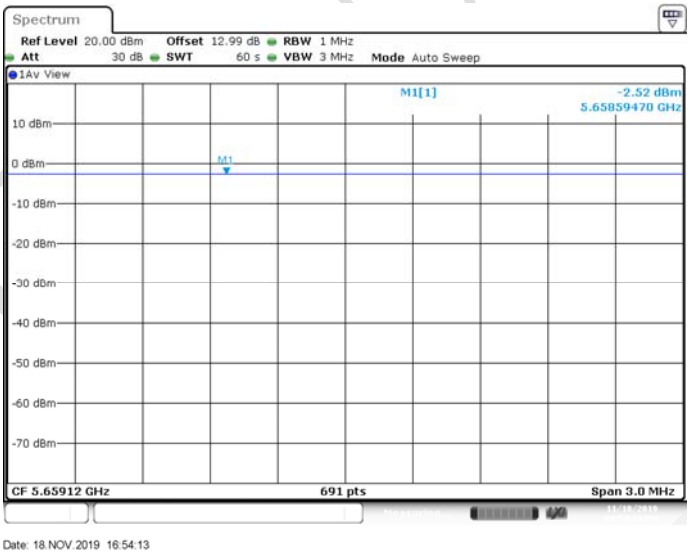
Chain1802.11n-HT40 5510MHz–Power density



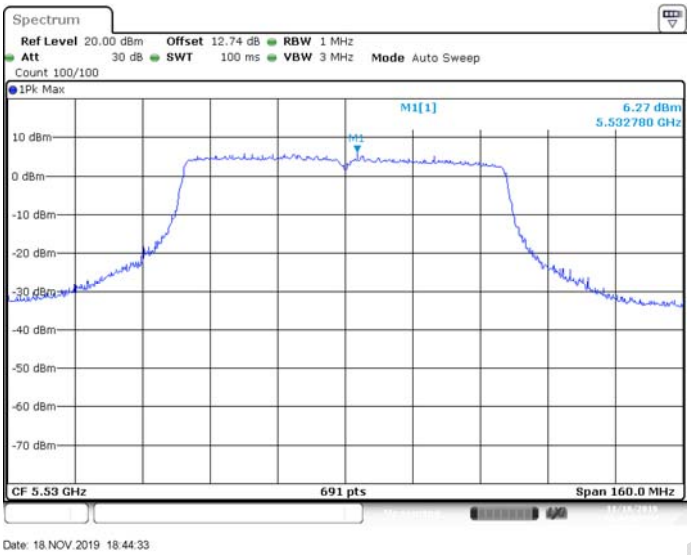


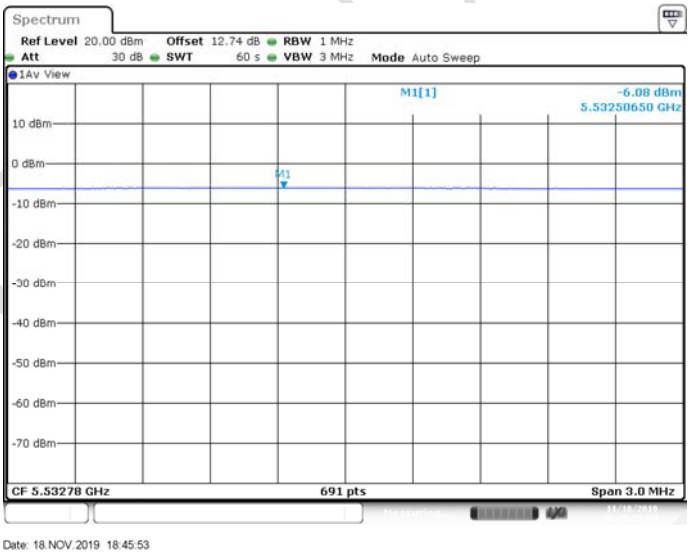
Chain1:802.11n-HT40 5670MHz–Power density



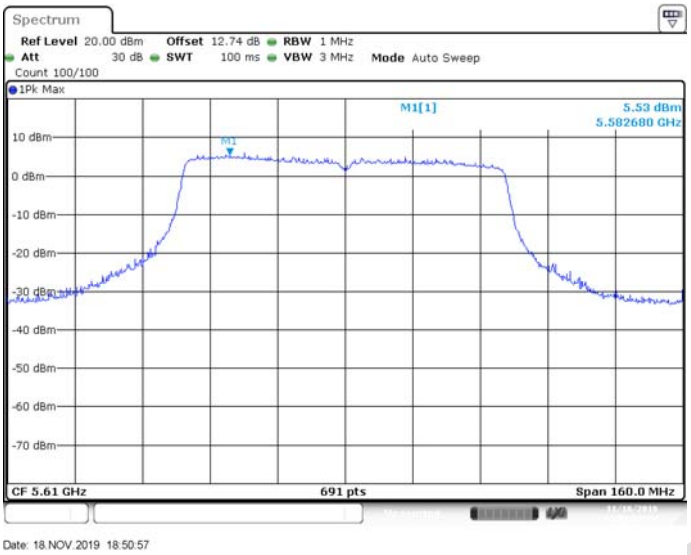


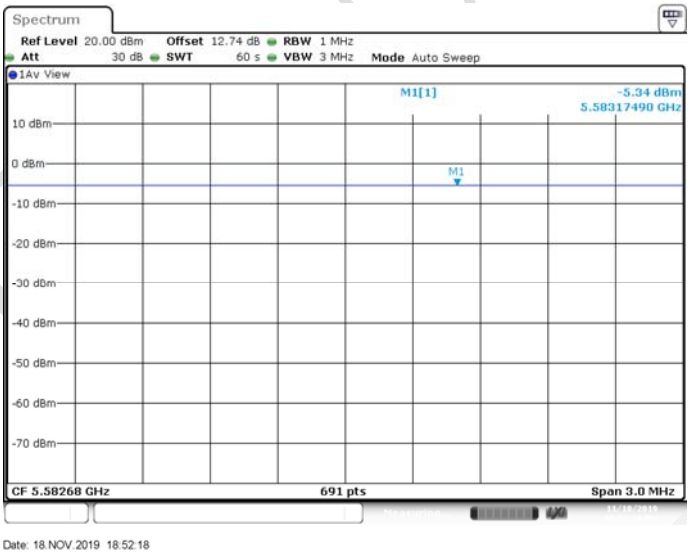
Chain1:802.11ac80 5530MHz–Power density



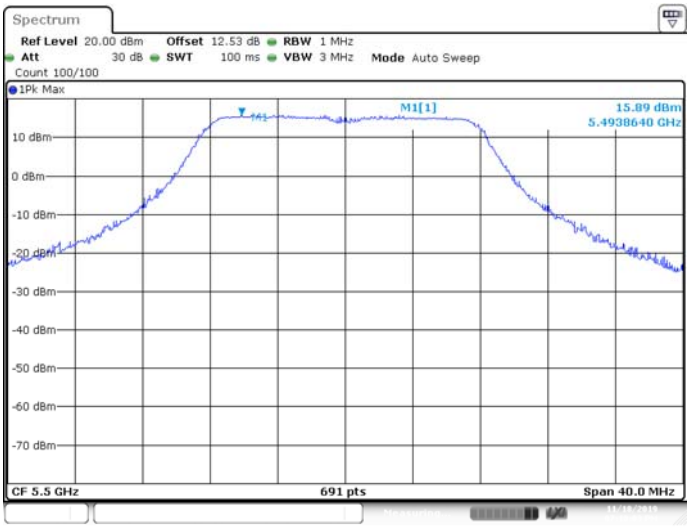


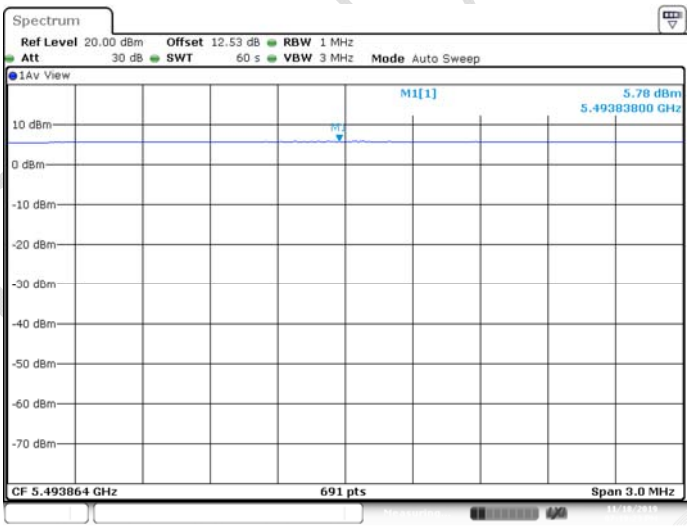
Chain1:802.11ac80 5610MHz–Power density



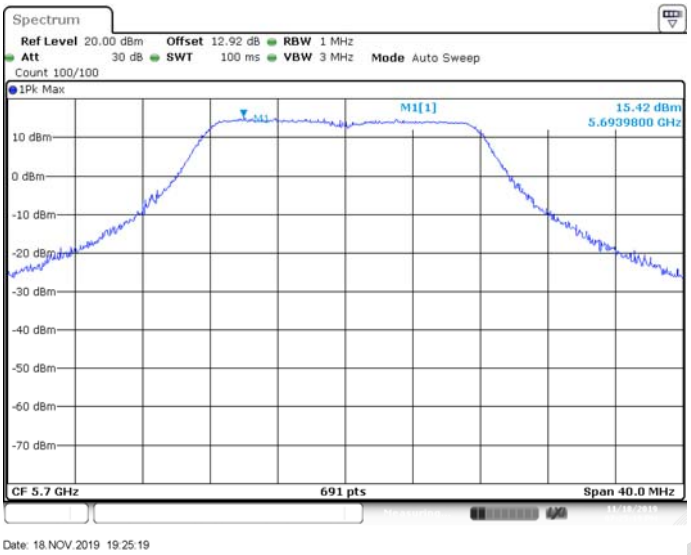


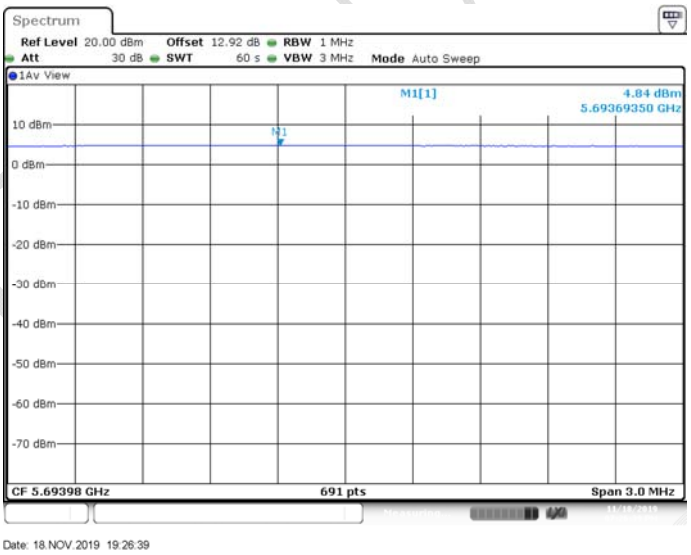
Chain2:802.11a 5500MHz–Power density



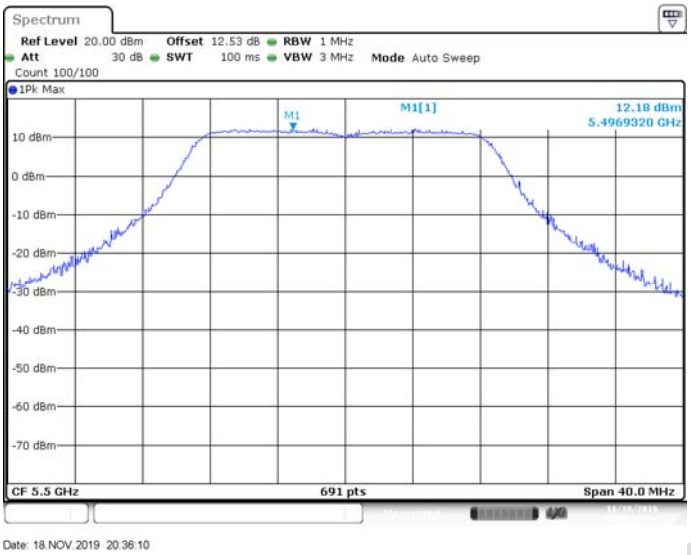


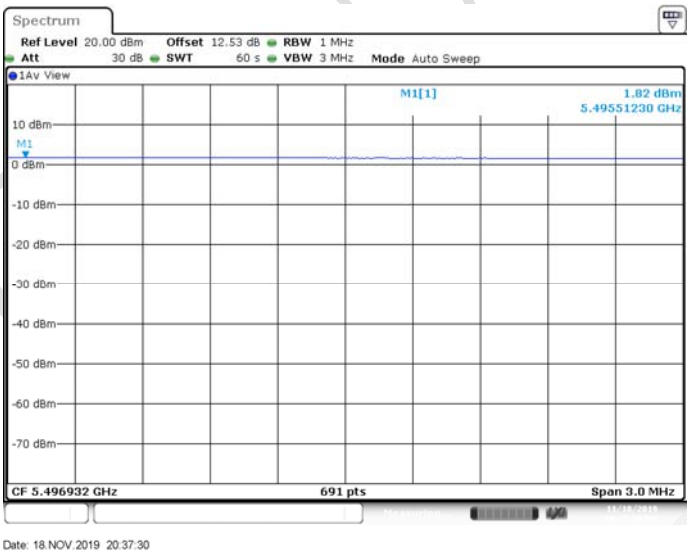
Chain2:802.11a 5700MHz–Power density



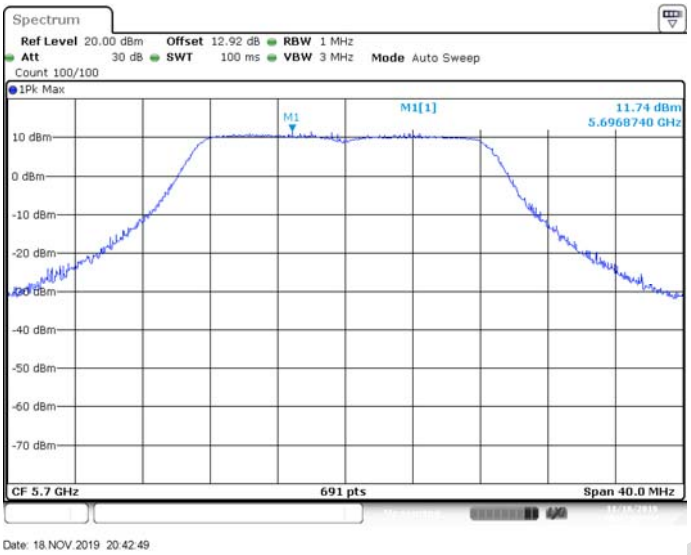


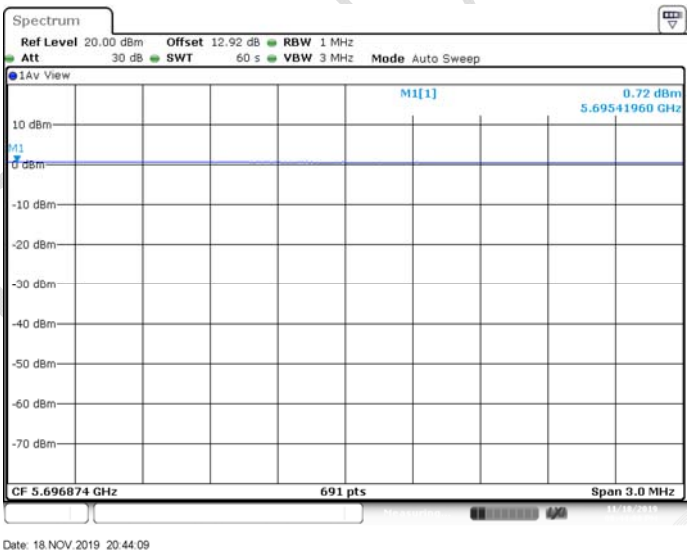
Chain2:802.11ac20 5500MHz–Power density



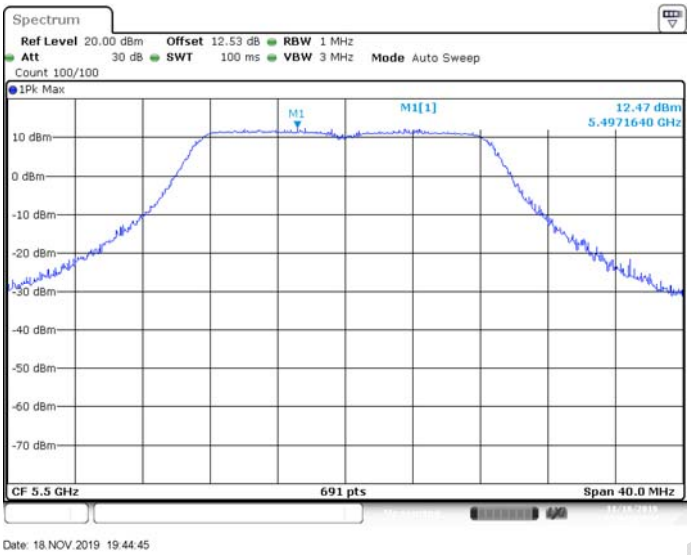


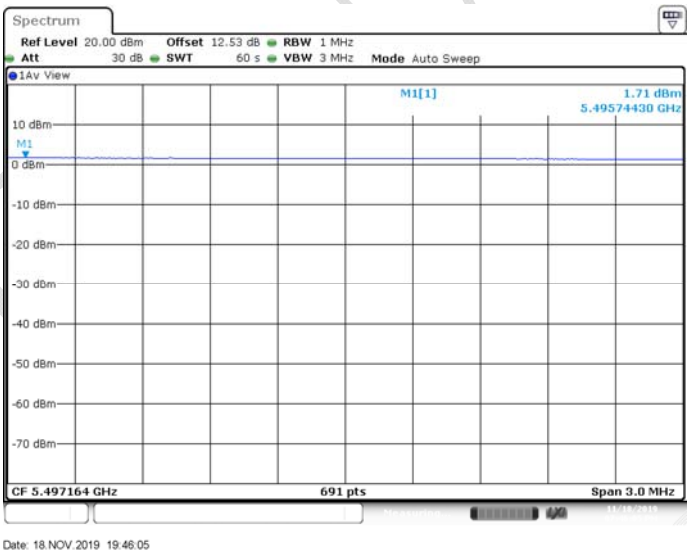
Chain2:802.11ac20 5700MHz–Power density



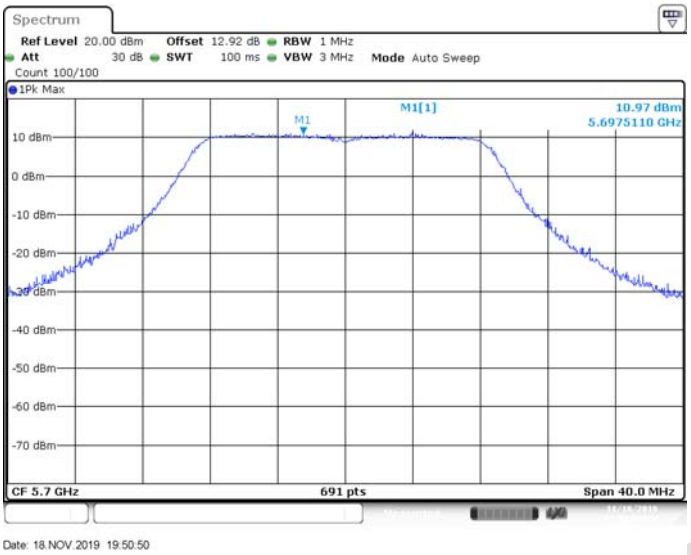


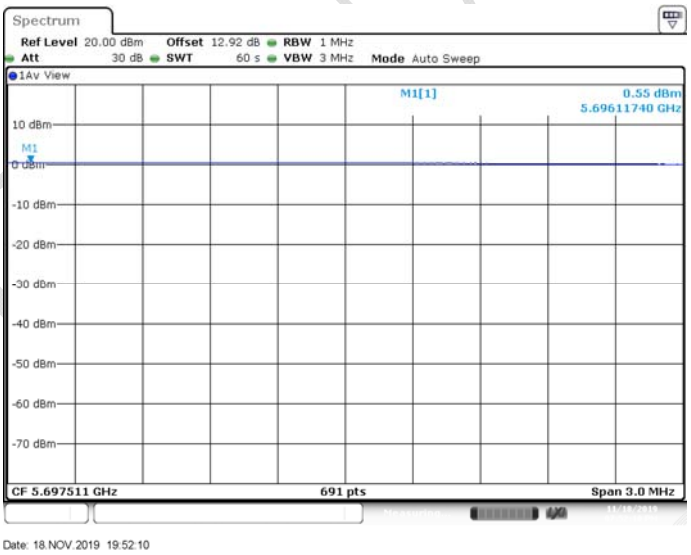
Chain2:802.11n-HT20 5500MHz–Power density



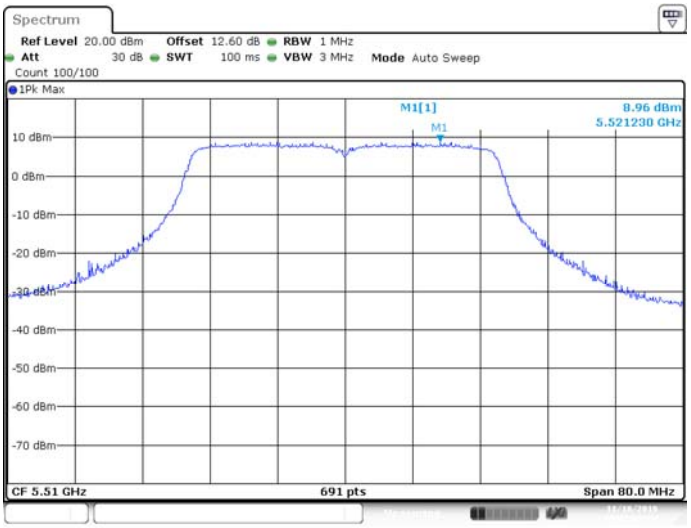


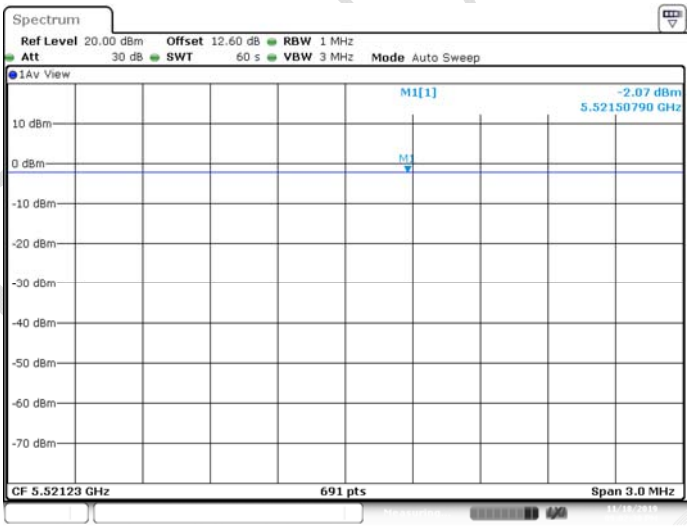
Chain2:802.11n-HT20 5700MHz–Power density



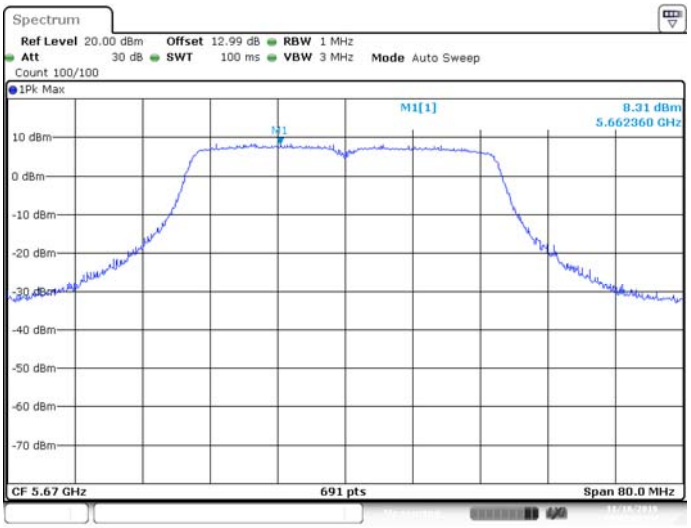


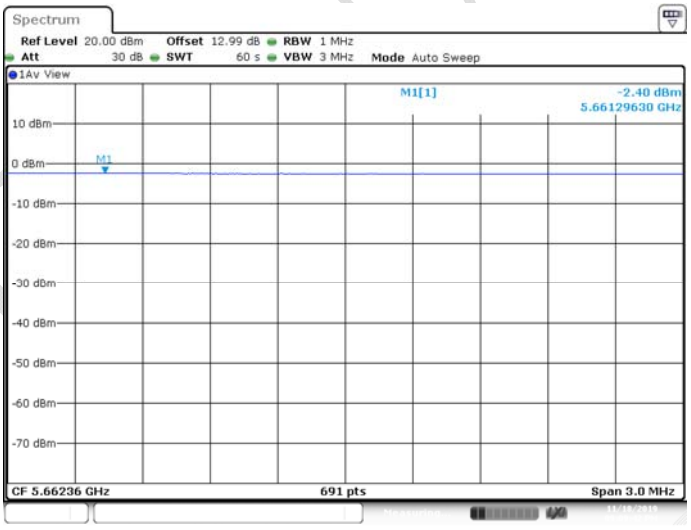
Chain2:802.11ac40 5510MHz–Power density



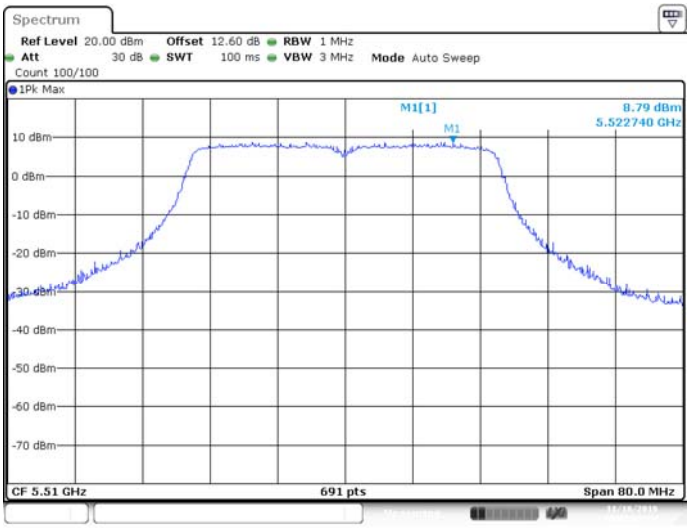


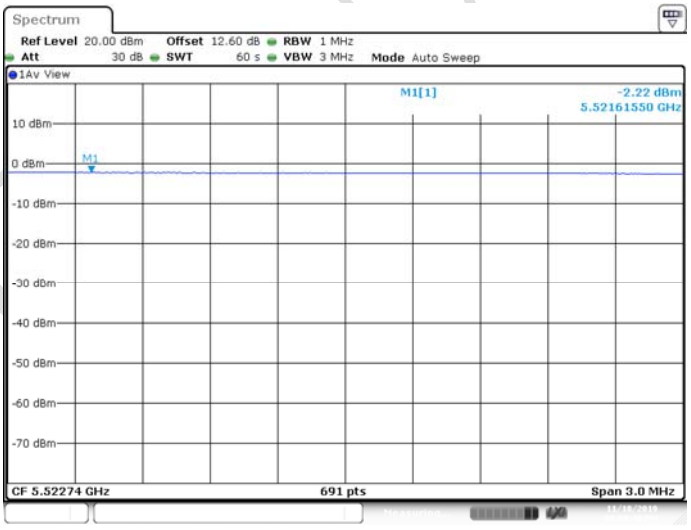
Chain2:802.11ac40 5670MHz–Power density



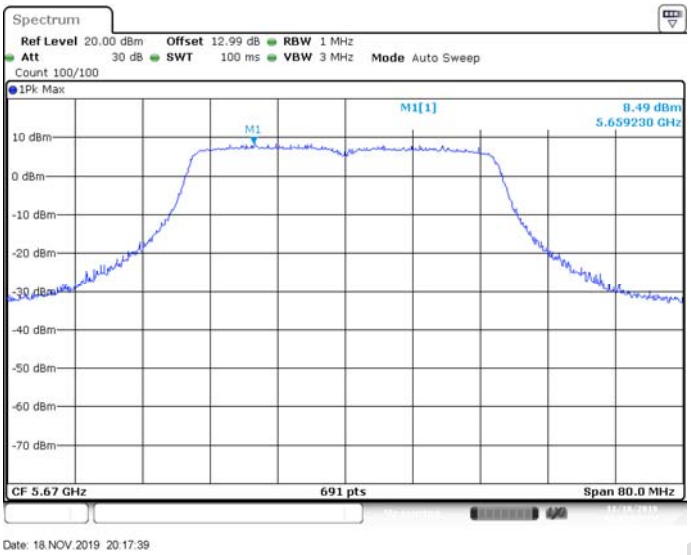


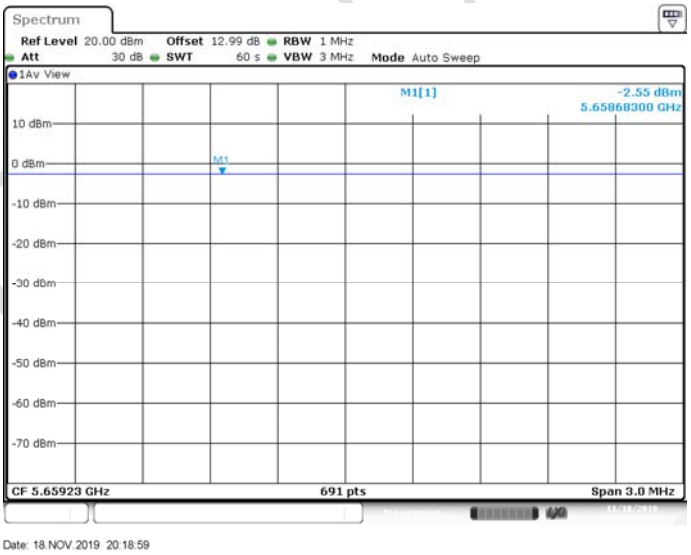
Chain2:802.11n-HT40 5510MHz–Power density



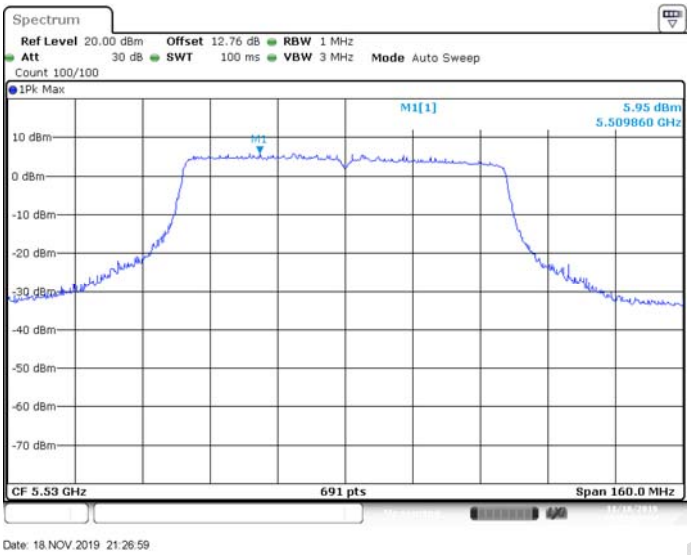


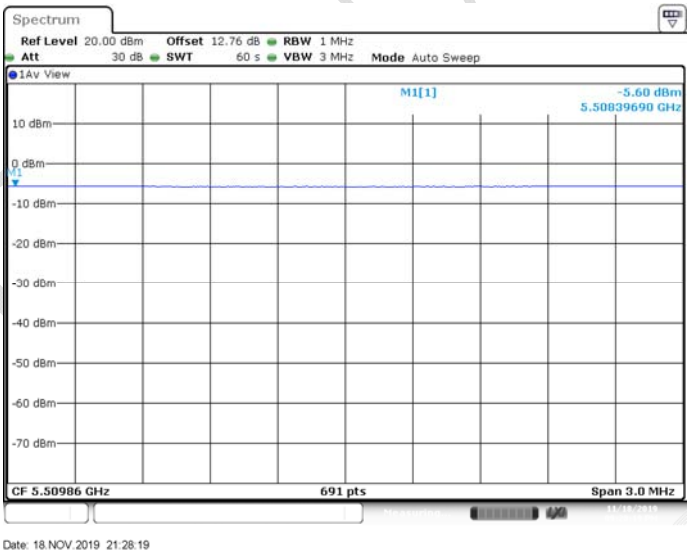
Chain2:802.11n-HT40 5670MHz–Power density



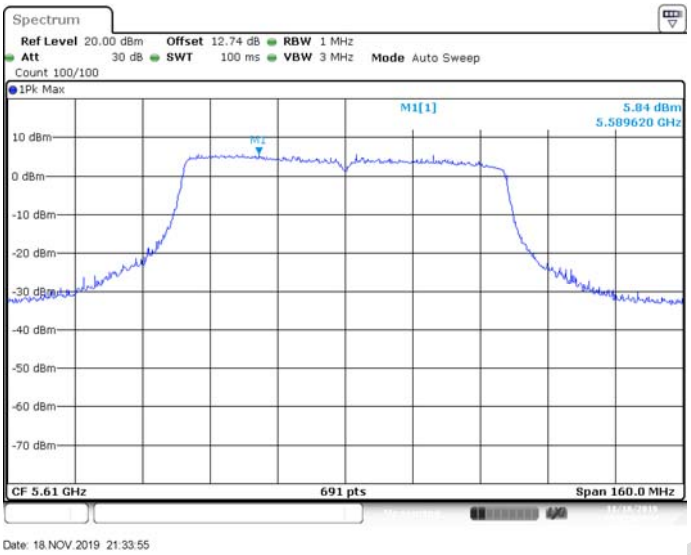


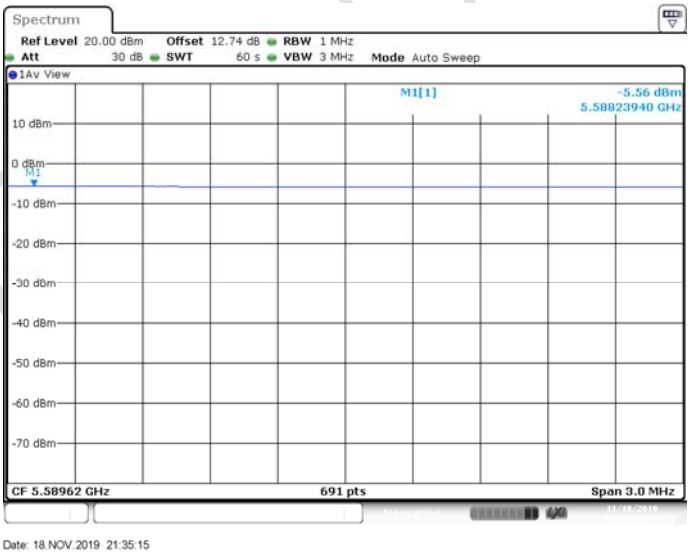
Chain2:802.11ac80 5530MHz–Power density





Chain2:802.11ac80 5610MHz–Power density





ETSI EN 301 893 V2.1.1 (2017-05) Clause 4.2.4.1 - TRANSMITTER UNWANTED EMISSIONS OUTSIDE THE 5 GHZ RLAN BANDS

Definition

Transmitter unwanted emissions outside the 5 GHz RLAN bands are radio frequency emissions outside the 5 GHz RLAN bands defined in clause 3.1.

Limits

The level of transmitter unwanted emissions outside the 5 GHz RLAN bands shall not exceed the limits given in table 4.
In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Table 4: Transmitter unwanted emission limits outside the 5 GHz RLAN bands

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 5,15 GHz	-30 dBm	1 MHz
5,35 GHz to 5,47 GHz	-30 dBm	1 MHz
5,725 GHz to 26 GHz	-30 dBm	1 MHz

Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) Clause5.4.5

Test Data

Environmental Conditions

Temperature:	24.3 ℃
Relative Humidity:	56 %
ATM Pressure:	101.3kPa

The testing was performed by Carry Cai on 2019-11-09.

Test Mode: Transmitting in 802.11n-HT20 mode (worst case).

Test Result: Compliant.

Radiated Spurious Emission

band1 n20

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	EN 301893	
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
Low Channel										
58.82	54.84	352	100	H	-46.66	0.27	-10.98	-57.91	-54	3.91
58.82	56.43	352	100	V	-48.62	0.27	-10.98	-59.87	-54	5.87
6900.00	51.36	76	150	H	-46.8	1.63	10.27	-38.16	-30	8.16
6900.00	49.55	76	150	V	-48.89	1.63	10.27	-40.25	-30	10.25
10360.00	35.79	59	200	H	-55.48	1.98	11.93	-45.53	-30	15.53
10360.00	33.93	59	200	V	-57.59	1.98	11.93	-47.64	-30	17.64
High Channel										
58.82	54.6	128	100	H	-46.9	0.27	-10.98	-58.15	-54	4.15
58.82	56.22	128	100	V	-48.83	0.27	-10.98	-60.08	-54	6.08
6985.70	51.9	156	150	H	-46.11	1.67	10.21	-37.57	-30	7.57
6985.70	50.27	156	150	V	-48.02	1.67	10.21	-39.48	-30	9.48
10480.00	35.48	200	150	H	-55.57	1.99	12.01	-45.55	-30	15.55
10480.00	33.62	200	150	V	-57.71	1.99	12.01	-47.69	-30	17.69

Note:
Absolute Level = Submitted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FINAL

Band2 n20

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	EN 301893	
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
Low Channel										
199.99	52.56	225	150	H	-53.07	0.42	-3.95	-57.44	-54	3.44
199.99	50.09	225	150	V	-54.99	0.42	-3.95	-59.36	-54	5.36
10520.00	35.69	266	150	H	-55.29	2.00	12.04	-45.25	-30	15.25
10520.00	33.95	266	150	V	-57.32	2.00	12.04	-47.28	-30	17.28
15780.00	34.87	211	200	H	-53.43	2.66	14.56	-41.53	-30	11.53
15780.00	32.24	211	200	V	-55.38	2.66	14.56	-43.48	-30	13.48
High Channel										
199.99	47.5	147	150	H	-54	0.42	-3.95	-58.37	-54	4.37
199.99	49.11	147	150	V	-55.94	0.42	-3.95	-60.31	-54	6.31
10640.00	35.54	188	200	H	-55.22	2.07	12.12	-45.17	-30	15.17
10640.00	33.63	188	200	V	-57.13	2.07	12.12	-47.08	-30	17.08
15960.00	34.71	154	150	H	-54.3	2.66	14.84	-42.12	-30	12.12
15960.00	32.59	154	150	V	-56.42	2.66	14.84	-44.24	-30	14.24

Note:
Absolute Level = Submitted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FINAL

Band3 n20

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	EN 301893	
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
Low Channel										
199.99	51.74	51	100	H	-53.89	0.42	-3.95	-58.26	-54	4.26
199.99	49.26	51	100	V	-55.82	0.42	-3.95	-60.19	-54	6.19
11000.00	35.73	180	100	H	-55.17	2.04	12.35	-44.86	-30	14.86
11000.00	33.74	180	100	V	-57.16	2.04	12.35	-46.85	-30	16.85
16500.00	33.66	84	200	H	-52.78	2.67	14.4	-41.05	-30	11.05
16500.00	31.57	84	200	V	-54.87	2.67	14.4	-43.14	-30	13.14
High Channel										
199.99	46.69	37	100	H	-54.81	0.42	-3.95	-59.18	-54	5.18
199.99	48.17	37	100	V	-56.88	0.42	-3.95	-61.25	-54	7.25
11400.00	34.29	237	200	H	-55.06	2.08	12.61	-44.53	-30	14.53
11400.00	32.33	237	200	V	-57.02	2.08	12.61	-46.49	-30	16.49
17100.00	30.66	248	100	H	-51.68	2.68	13.8	-40.56	-30	10.56
17100.00	28.71	248	100	V	-53.63	2.68	13.8	-42.51	-30	12.51

Note:
Absolute Level = Submitted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FINAL

ETSI EN 301 893 V2.1.1 (2017-05) Clause 4.2.4.2 – TRANSMITTER UNWANTED EMISSIONS WITHIN THE 5 GHZ RLAN BANDS

Definition

Transmitter unwanted emissions within the 5 GHz RLAN bands are radio frequency emissions within the 5 GHz RLAN bands defined in clause 3.1.

Limits

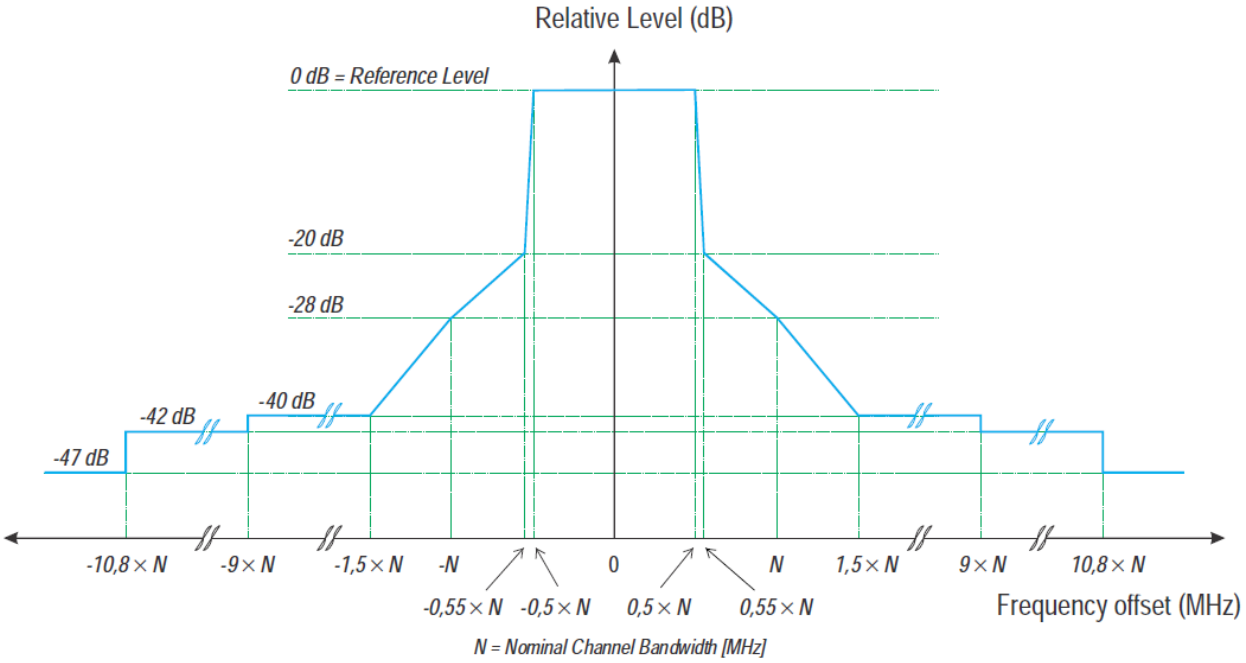


Figure 1: Transmit spectral power mask

The mean Power Density (measured with a 1 MHz measurement bandwidth) of the transmitter unwanted emissions within the 5 GHz RLAN bands shall not exceed the limits of the mask provided in figure 1 or an absolute level of -30 dBm/MHz, whichever is greater. The limits in figure 1 are relative to the maximum Power Density of the RLAN device when measured with a reference bandwidth of 1 MHz.

The mask is only applicable within the band of operation. Beyond the band edges the requirements of clause 4.2.4.1 apply.

In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet the limits provided in figure 1.

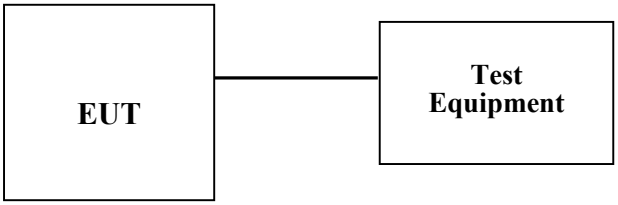
For transmitter unwanted emissions within the 5 GHz RLAN bands, simultaneous transmissions in adjacent channels may be considered as one signal with an actual *Nominal Channel Bandwidth* of "n" times the individual *Nominal Channel Bandwidth* where "n" is the number of adjacent channels used simultaneously.

For simultaneous transmissions in multiple non-adjacent channels, the overall transmit spectral power mask is constructed in the following manner. First, a mask as provided in figure 1 is applied to each of the channels. Then, for each frequency point, the greatest value from the spectral masks of all the channels assessed shall be taken as the overall spectral mask requirement at that frequency.

Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) Clause5.4.6

Test Set up Block diagram



Test Data

Environmental Conditions

Temperature:	24.3 ℃
Relative Humidity:	56 %
ATM Pressure:	101.3kPa

The testing was performed by Carry Cai on 2019-11-10.

Test mode: Transmitting of chain 1 worst case

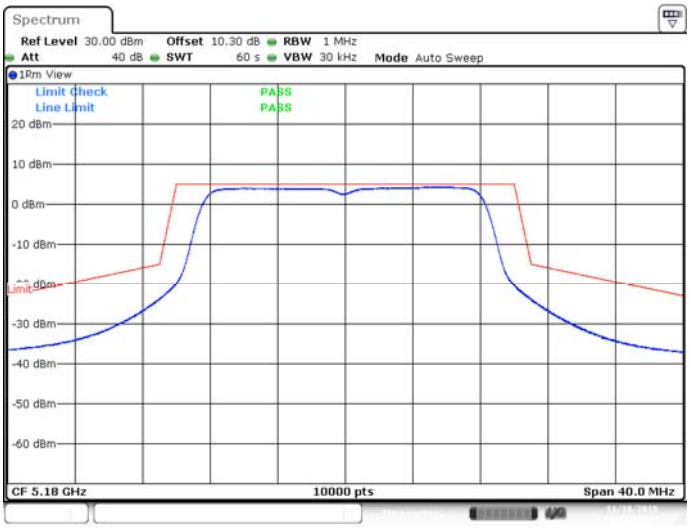
Test Result: Compliant.

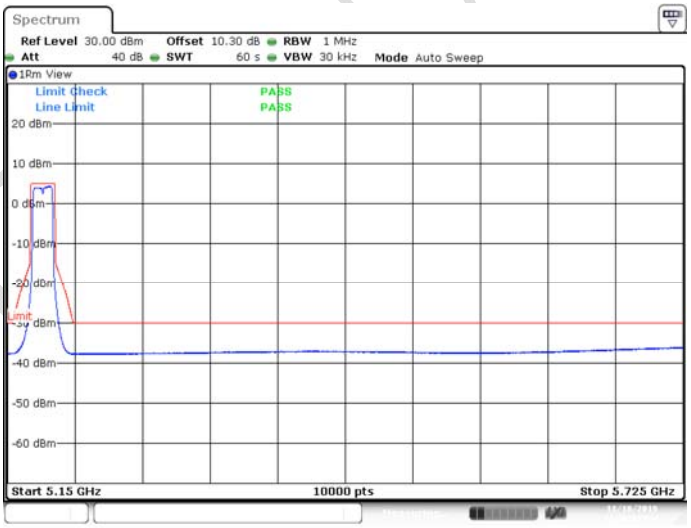
FINAL

TestMode	Antenna	Channel	Result [dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	See test graph	See test graph	PASS
11A	Ant1	5320	See test graph	See test graph	PASS
11A	Ant1	5500	See test graph	See test graph	PASS
11A	Ant1	5700	See test graph	See test graph	PASS
11N20SISO	Ant1	5180	See test graph	See test graph	PASS
11N20SISO	Ant1	5320	See test graph	See test graph	PASS
11N20SISO	Ant1	5500	See test graph	See test graph	PASS
11N20SISO	Ant1	5700	See test graph	See test graph	PASS
11N40SISO	Ant1	5190	See test graph	See test graph	PASS
11N40SISO	Ant1	5310	See test graph	See test graph	PASS
11N40SISO	Ant1	5510	See test graph	See test graph	PASS
11N40SISO	Ant1	5670	See test graph	See test graph	PASS
11AC20SISO	Ant1	5180	See test graph	See test graph	PASS
11AC20SISO	Ant1	5320	See test graph	See test graph	PASS
11AC20SISO	Ant1	5500	See test graph	See test graph	PASS
11AC20SISO	Ant1	5700	See test graph	See test graph	PASS
11AC40SISO	Ant1	5190	See test graph	See test graph	PASS
11AC40SISO	Ant1	5310	See test graph	See test graph	PASS
11AC40SISO	Ant1	5510	See test graph	See test graph	PASS
11AC40SISO	Ant1	5670	See test graph	See test graph	PASS
11AC80SISO	Ant1	5210	See test graph	See test graph	PASS
11AC80SISO	Ant1	5290	See test graph	See test graph	PASS
11AC80SISO	Ant1	5530	See test graph	See test graph	PASS
11AC80SISO	Ant1	5610	See test graph	See test graph	PASS

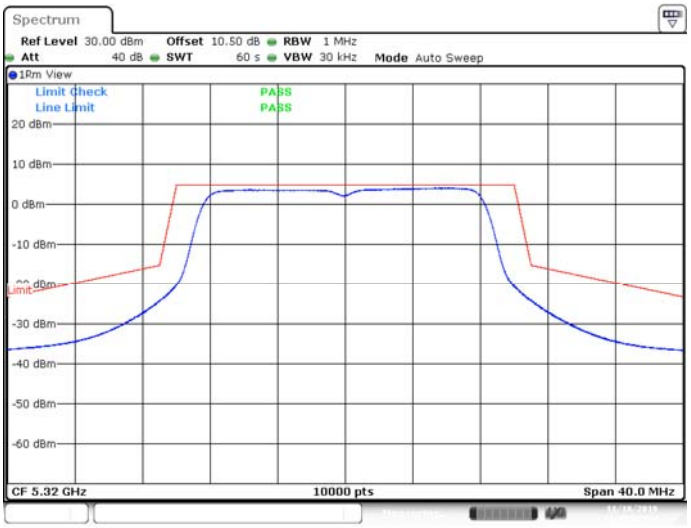
FINAL

802.11a 5180MHz

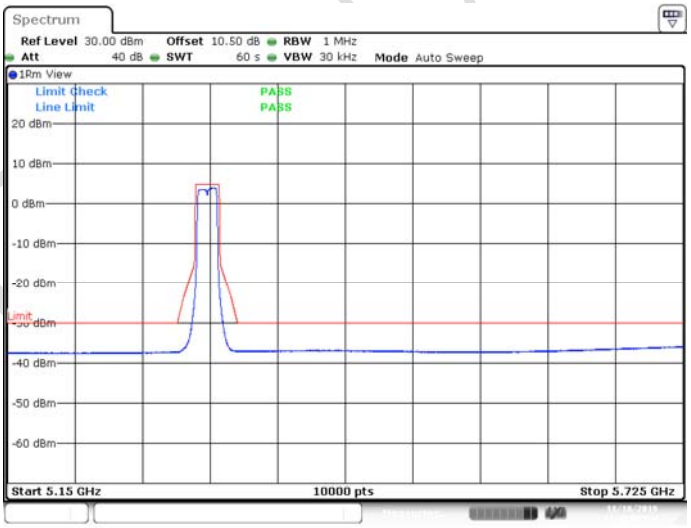




802.11a 5320MHz

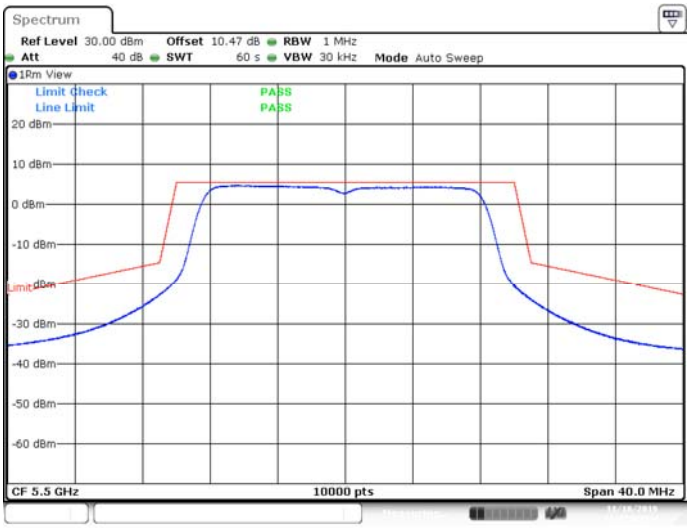


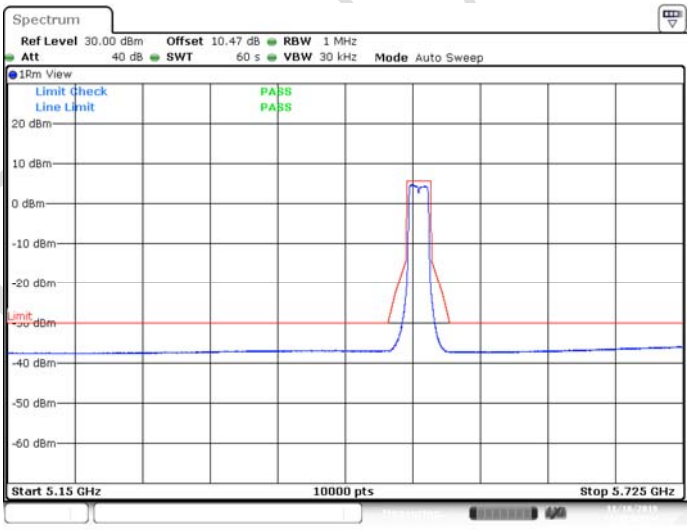
Date: 18.NOV.2019 11:39:31



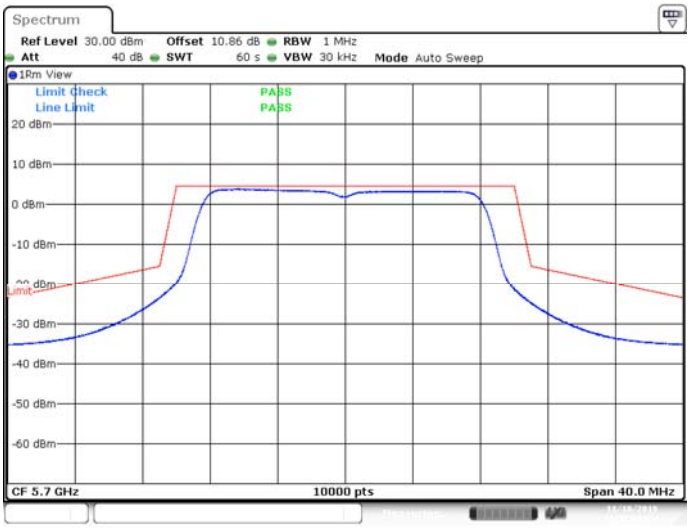
Date: 18.NOV.2019 11:40:51

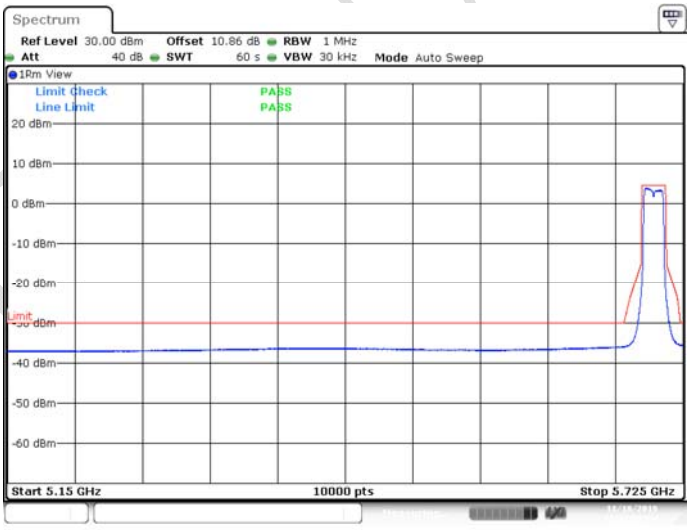
802.11a 5500MHz



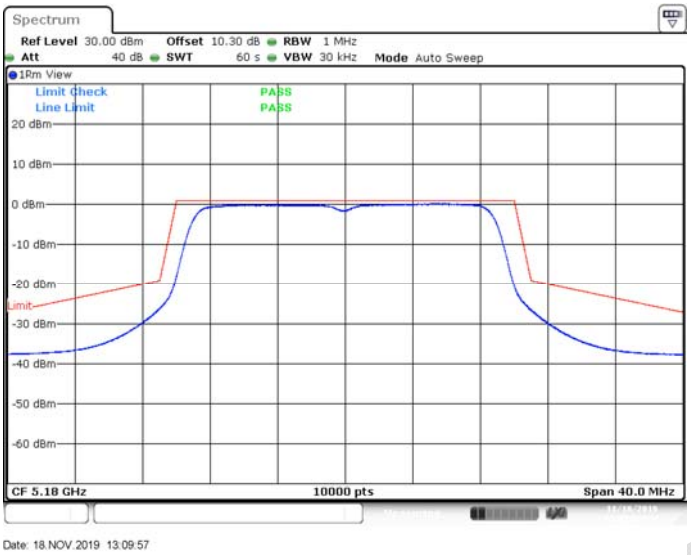


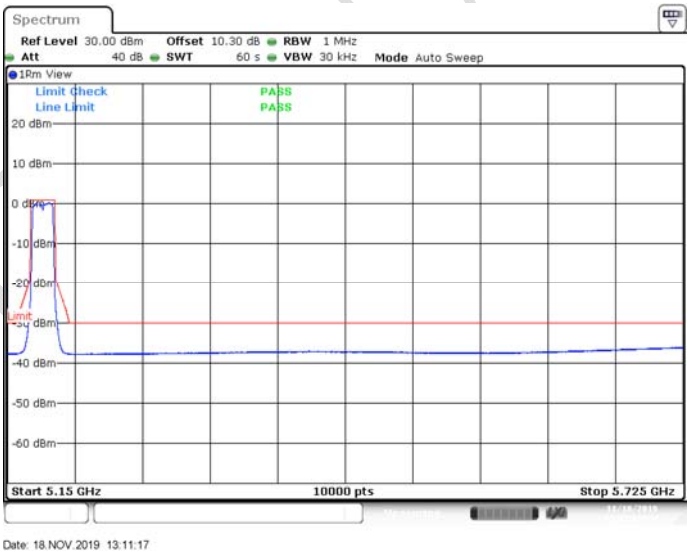
802.11a 5700MHz



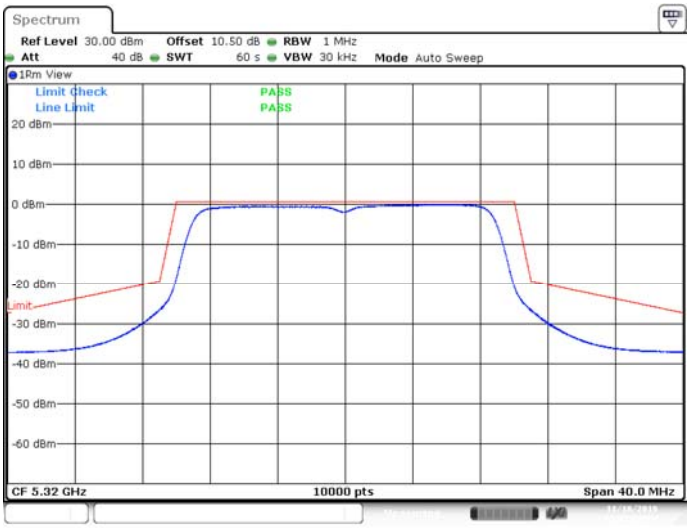


802.11n-HT20 5180MHz

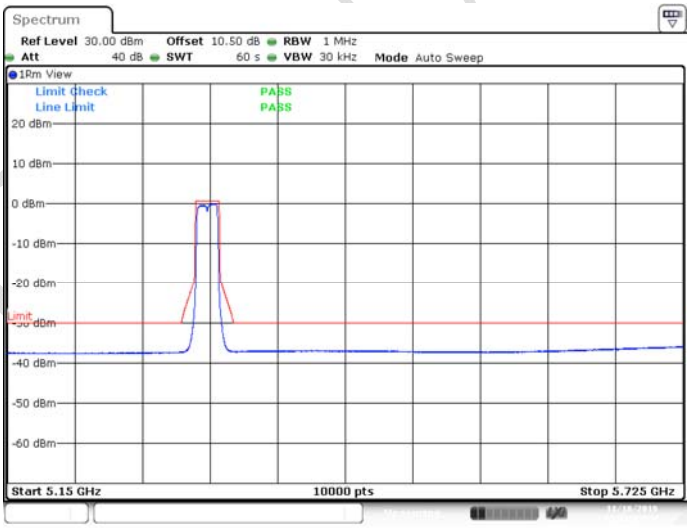




802.11n-HT20 5320MHz

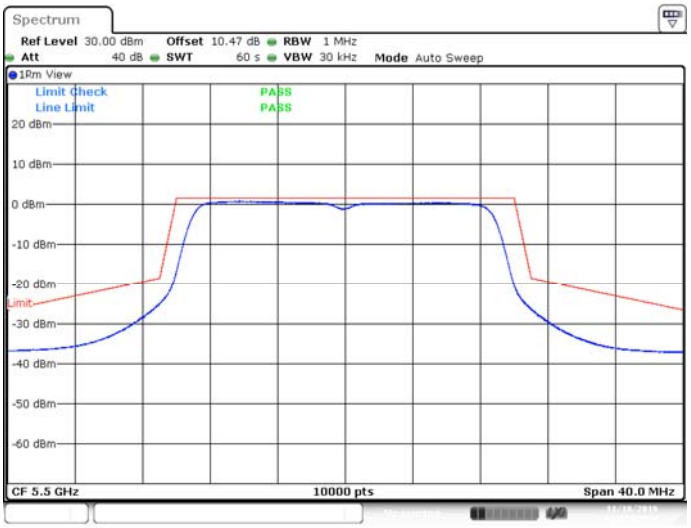


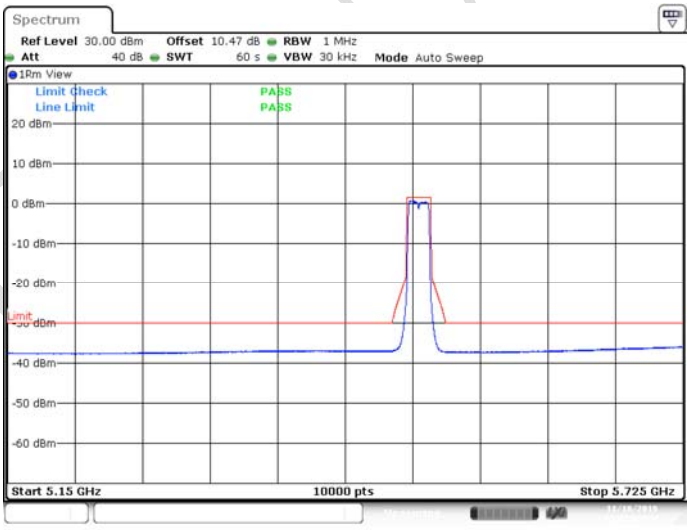
Date: 18.NOV.2019 13:15:25



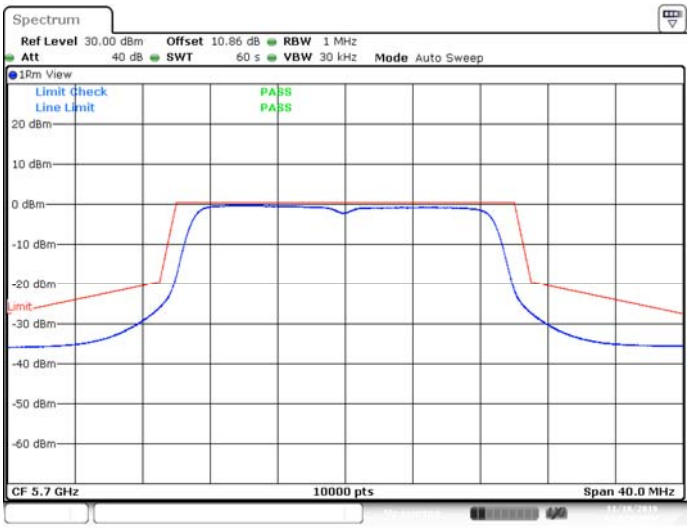
Date: 18.NOV.2019 13:16:44

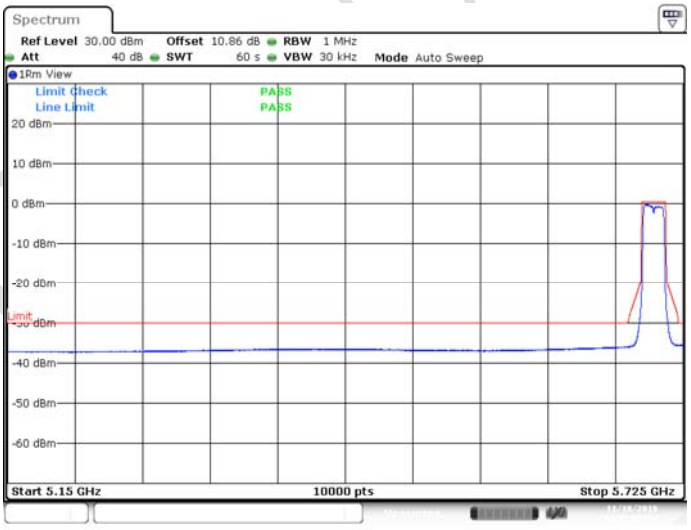
802.11n-HT20 5500MHz



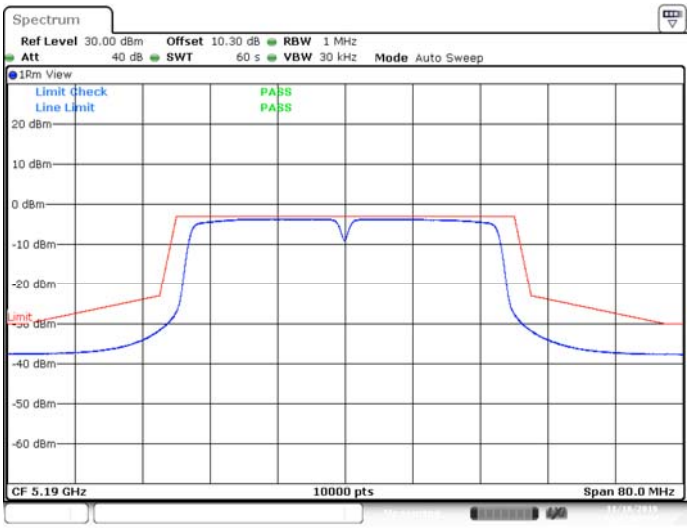


802.11n-HT20 5700MHz

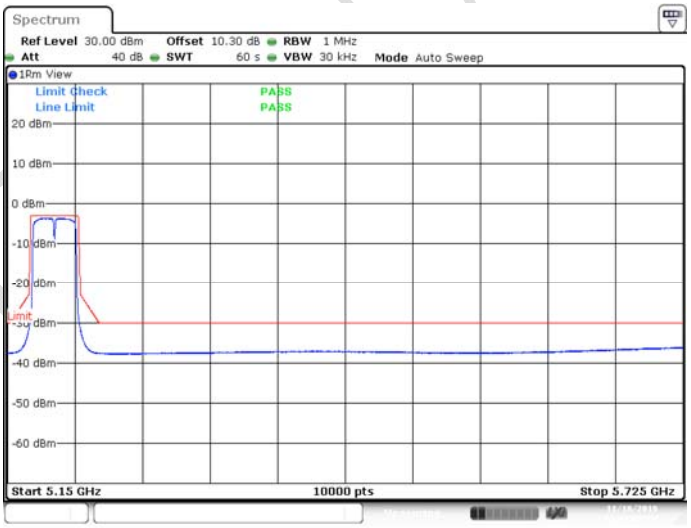




802.11n-HT40 5190MHz

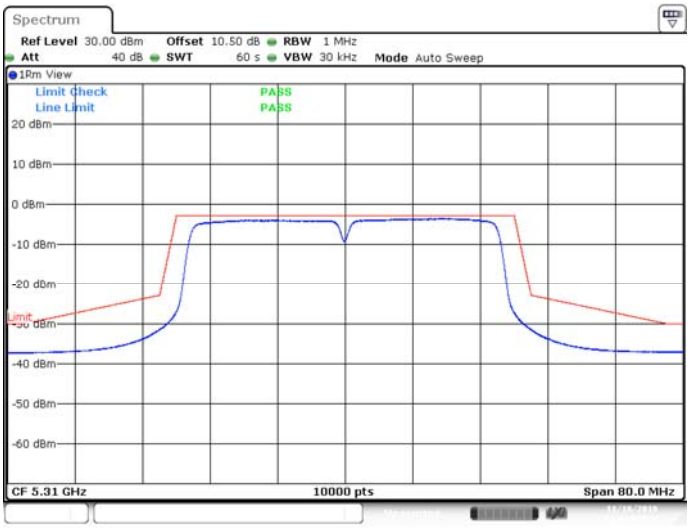


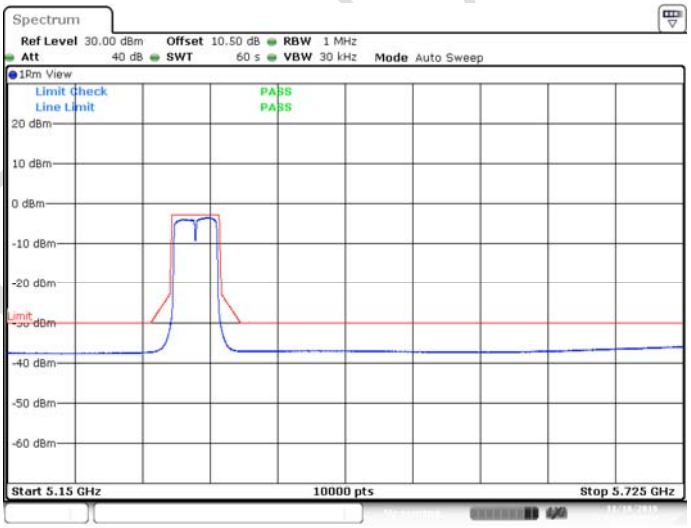
Date: 18.NOV.2019 13:42:09



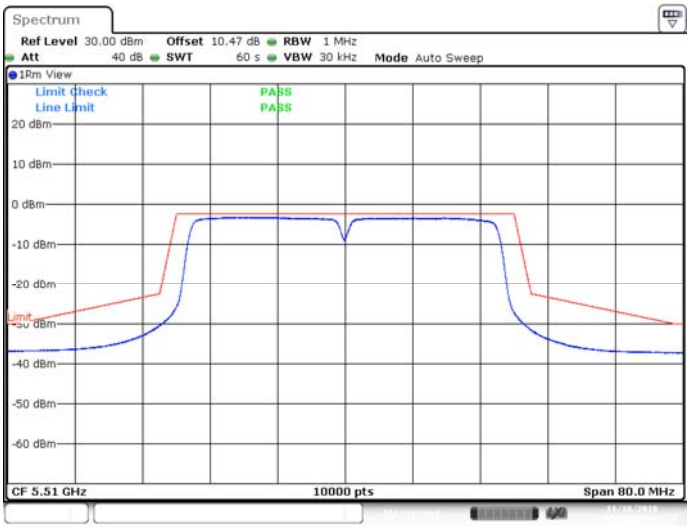
Date: 18.NOV.2019 13:43:29

802.11n-HT40 5310MHz

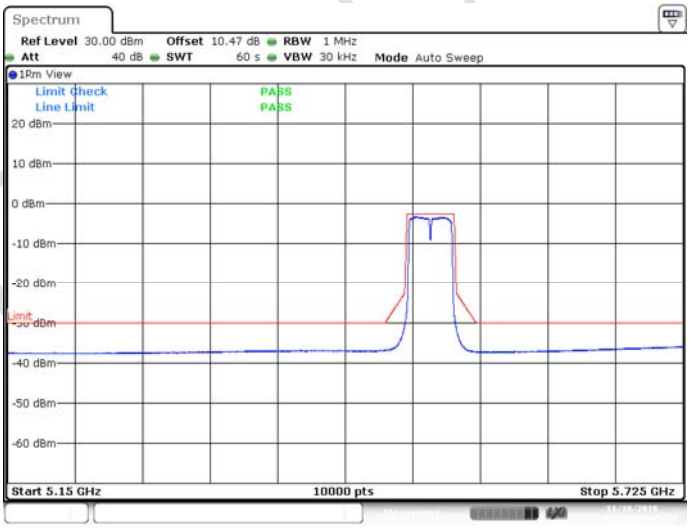




802.11n-HT40 5510MHz

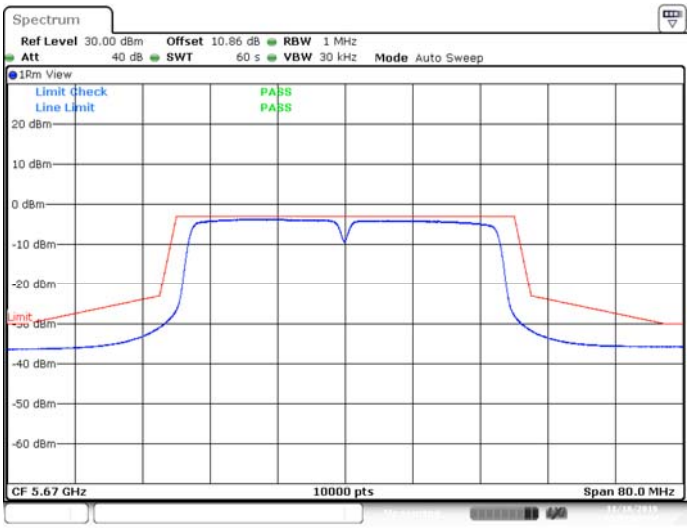


Date: 18.NOV.2019 13:53:43

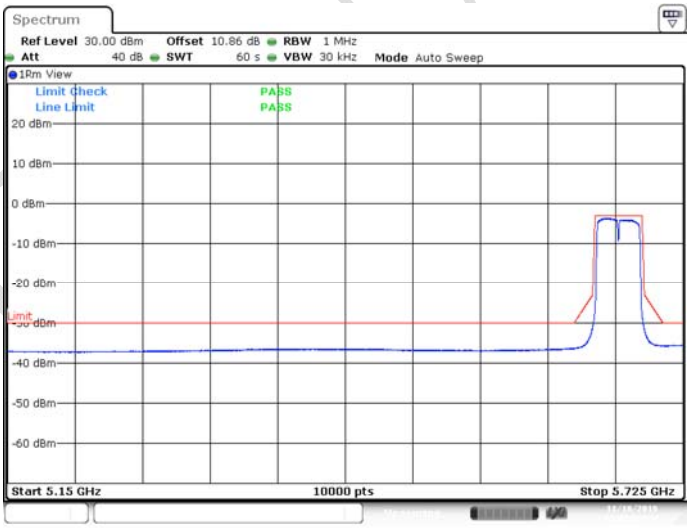


Date: 18.NOV.2019 13:55:03

802.11n-HT40 5670MHz

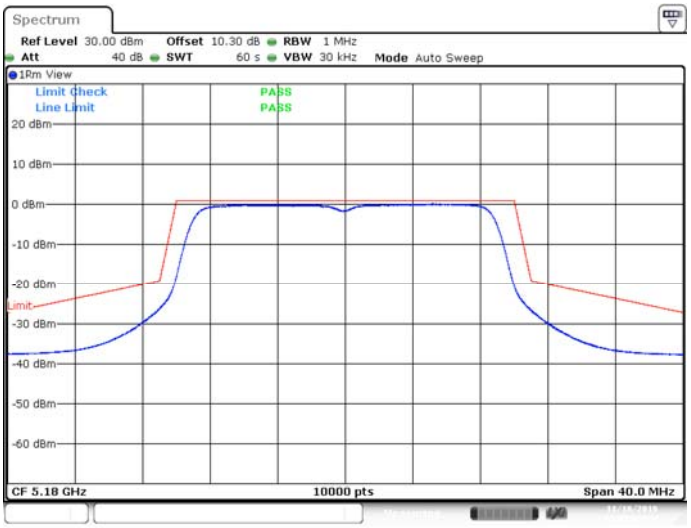


Date: 18.NOV.2019 13:59:38

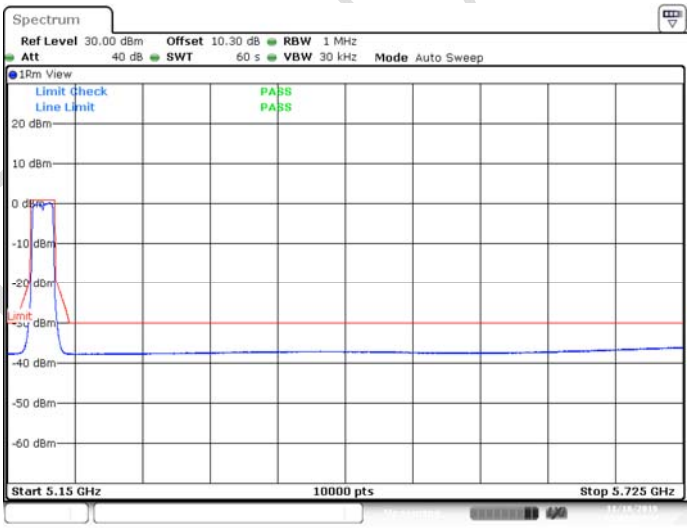


Date: 18.NOV.2019 14:00:58

802.11ac20 5180MHz

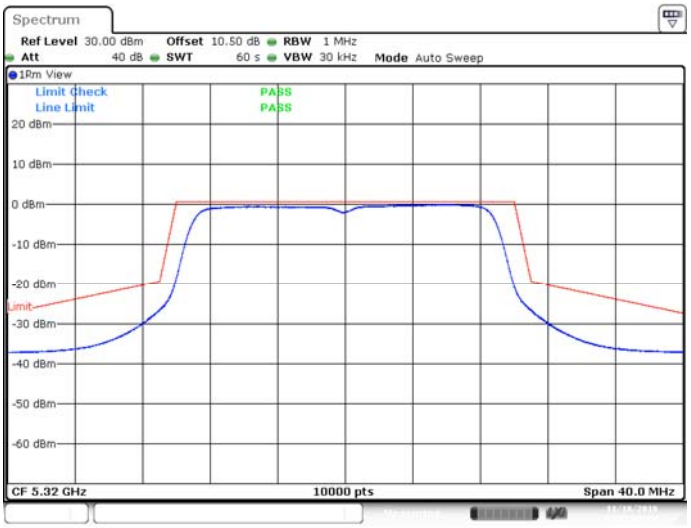


Date: 18.NOV.2019 14:05:37

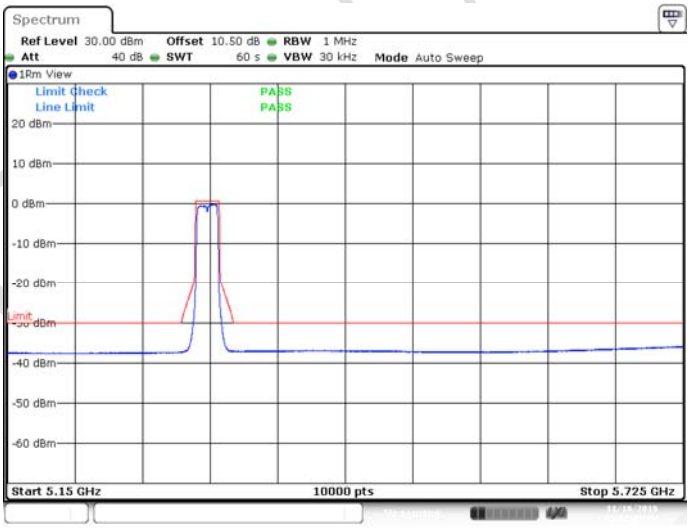


Date: 18.NOV.2019 14:06:57

802.11ac20 5320MHz

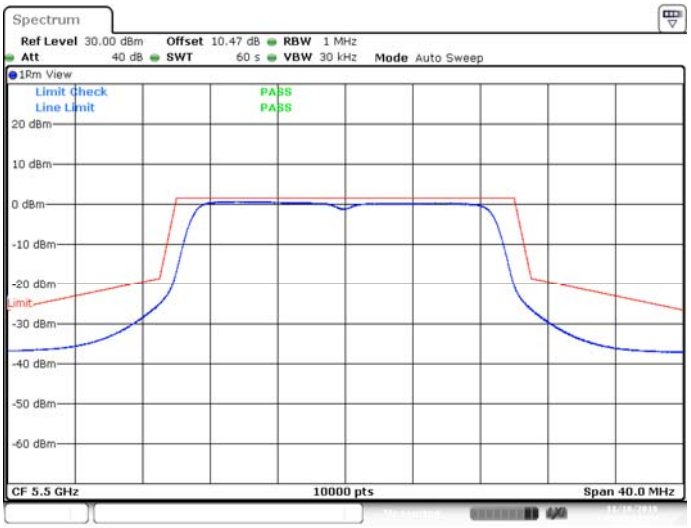


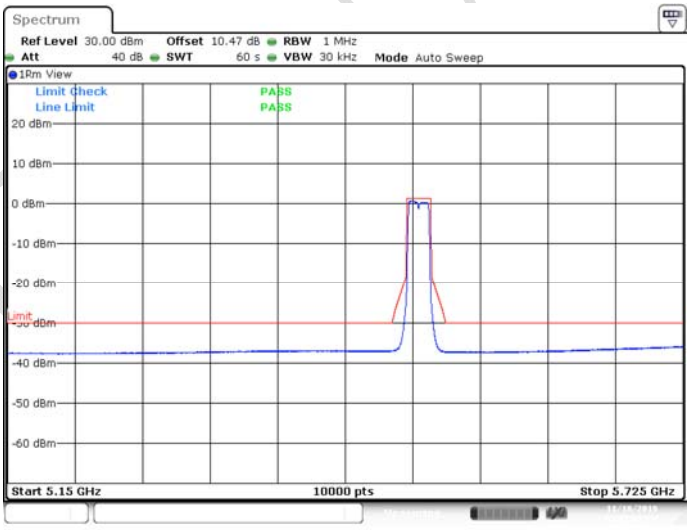
Date: 18.NOV.2019 14:11:23



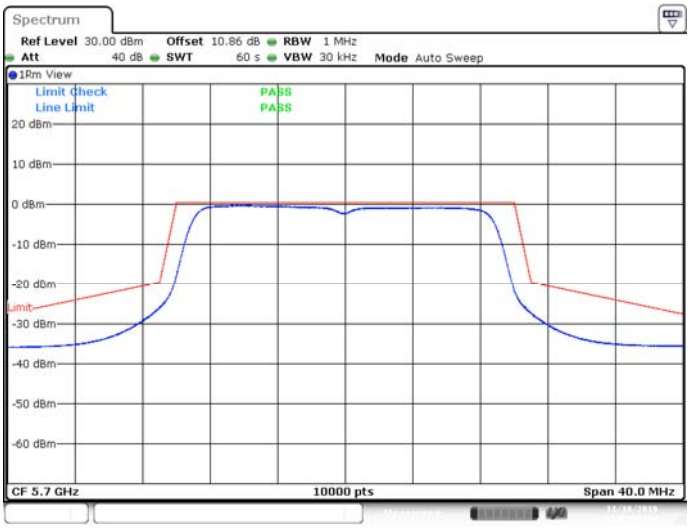
Date: 18.NOV.2019 14:12:43

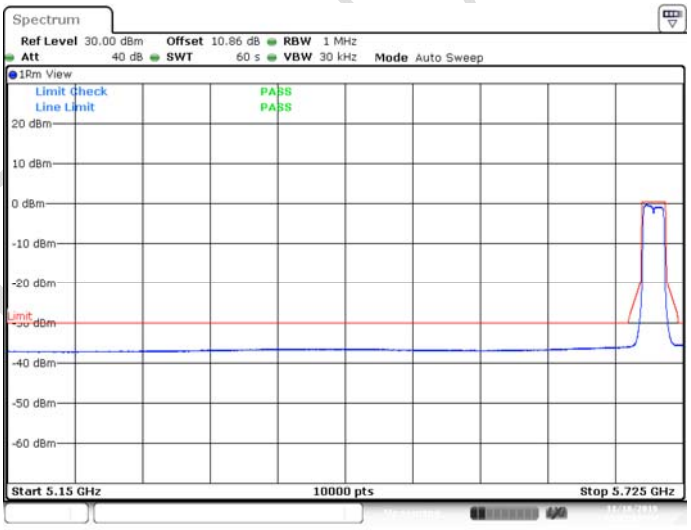
802.11ac20 5500MHz



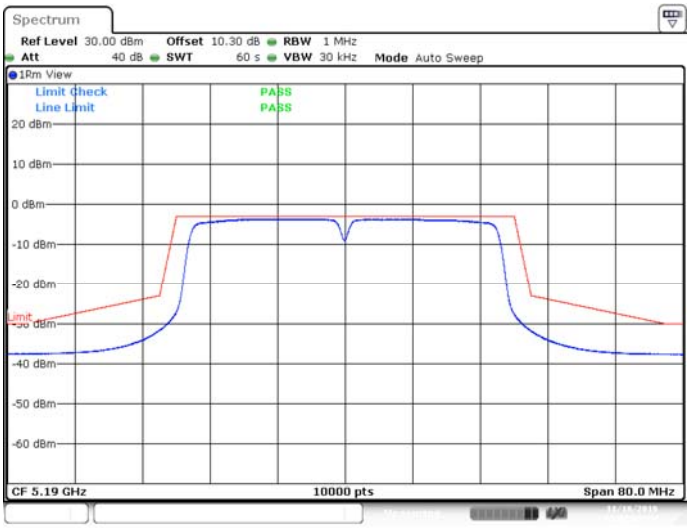


802.11ac20 5700MHz

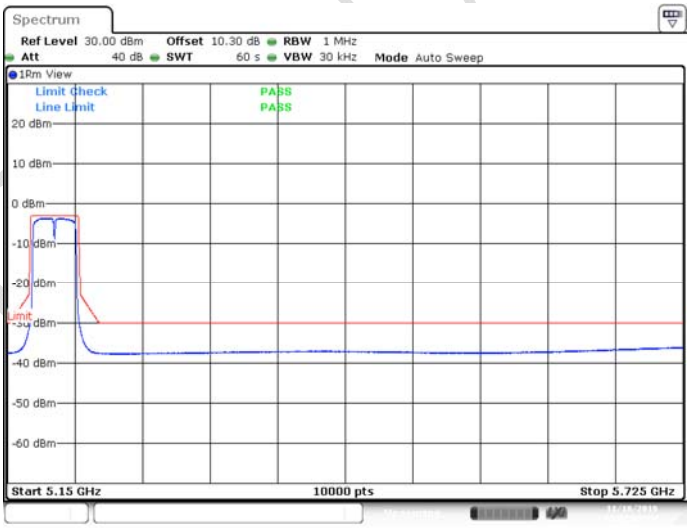




802.11ac40 5190MHz

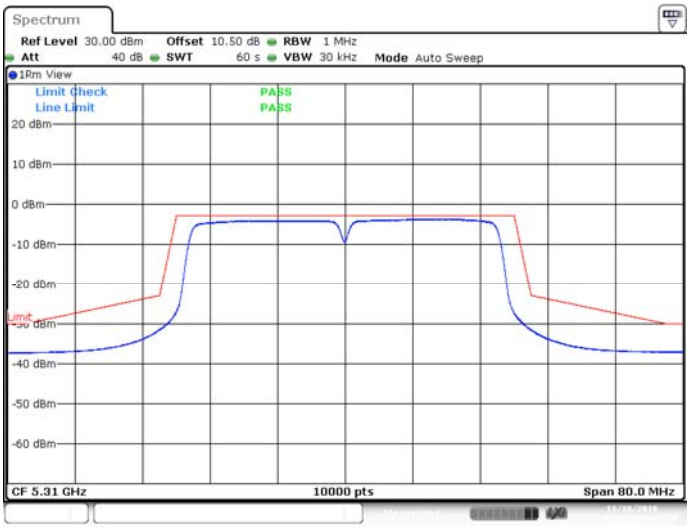


Date: 18.NOV.2019 14:30:53

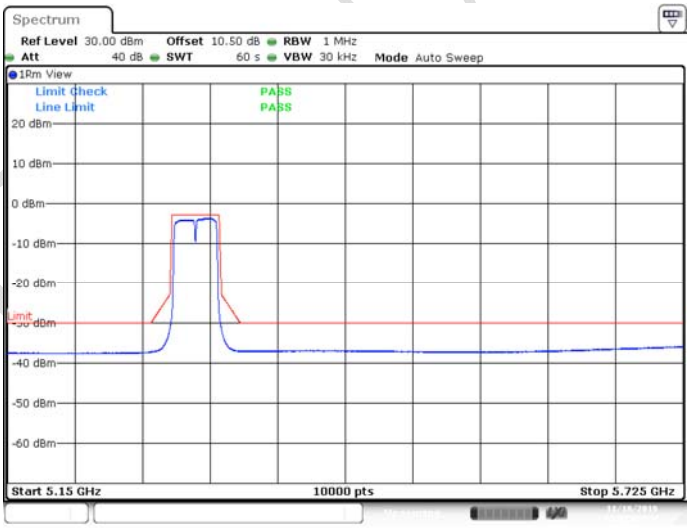


Date: 18.NOV.2019 14:32:13

802.11ac40 5310MHz

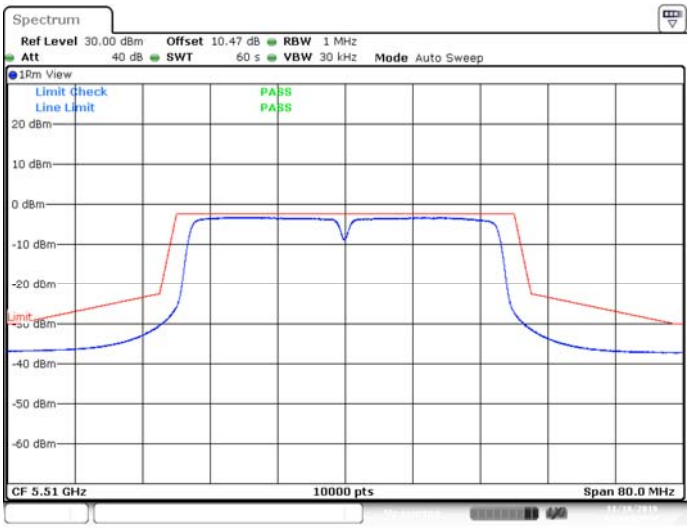


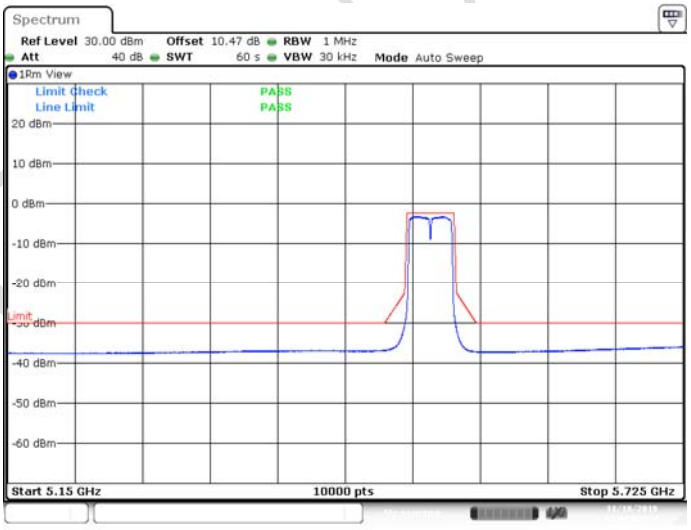
Date: 18.NOV.2019 14:37:07



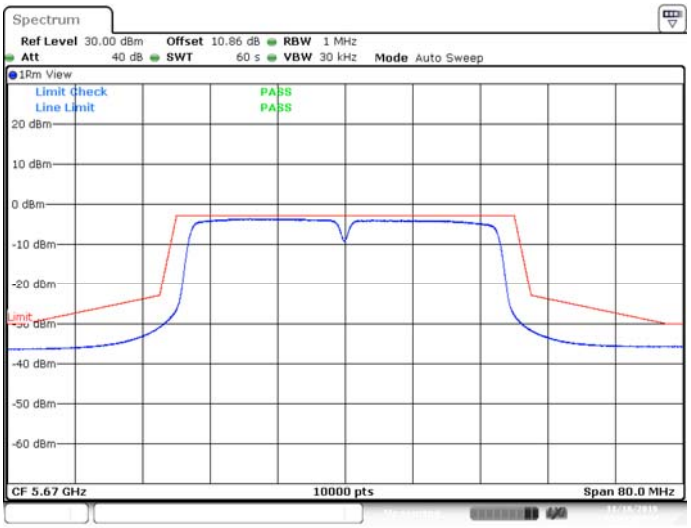
Date: 18.NOV.2019 14:38:27

802.11ac40 5510MHz

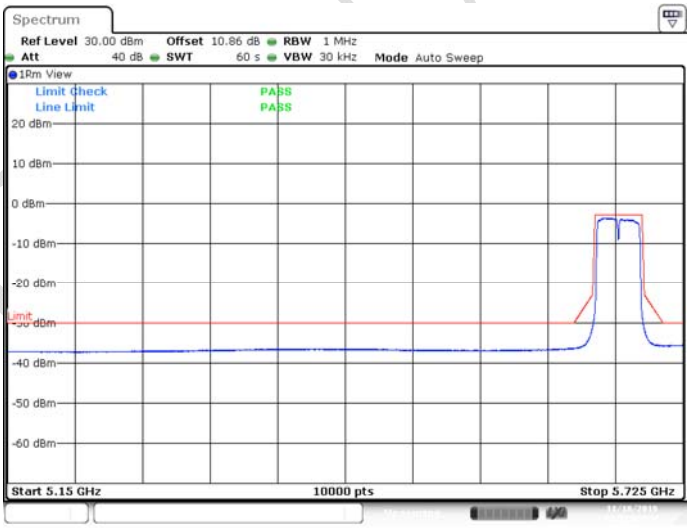




802.11ac40 5670MHz

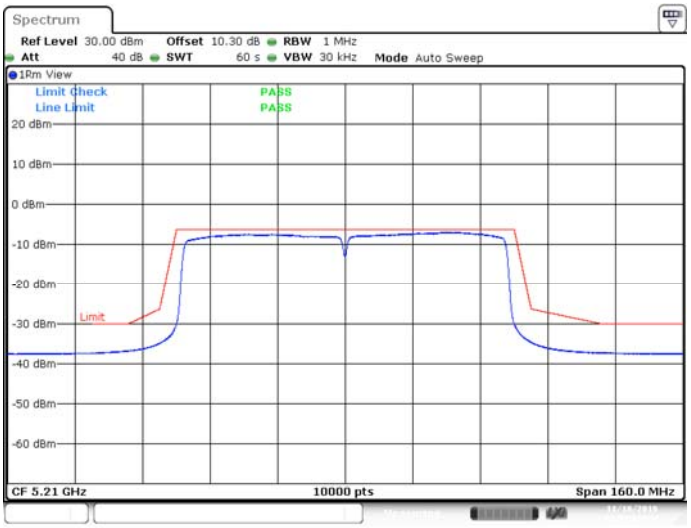


Date: 18.NOV.2019 14:49:46

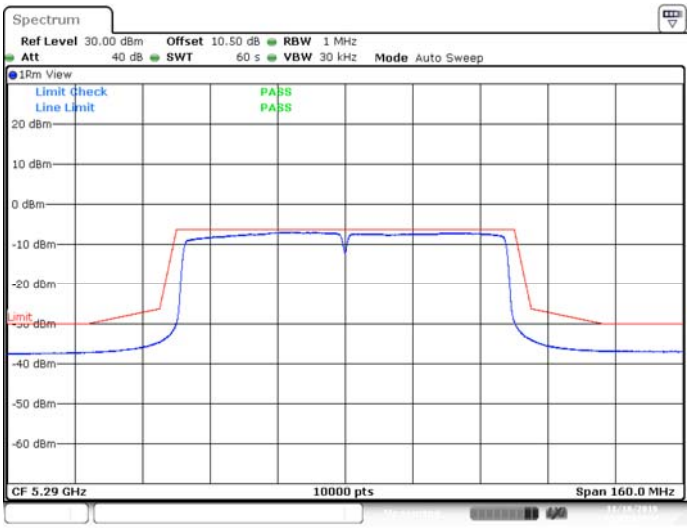


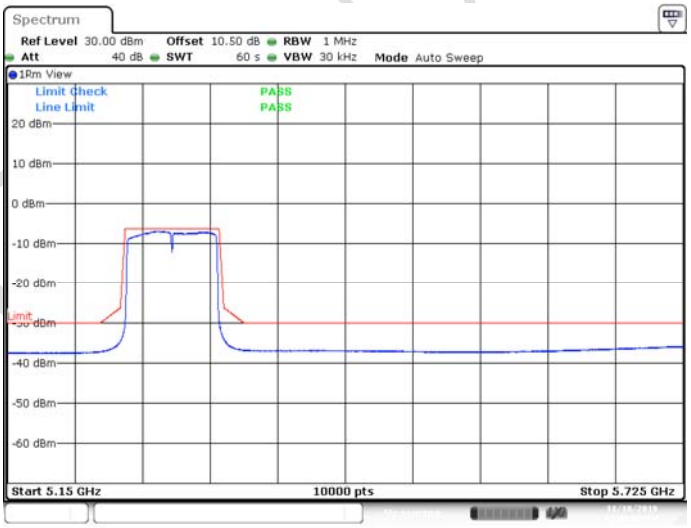
Date: 18.NOV.2019 14:51:06

802.11ac80 5210MHz

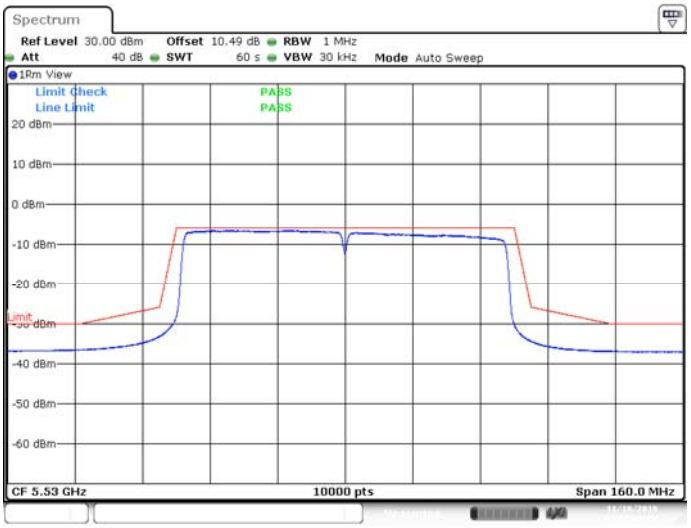


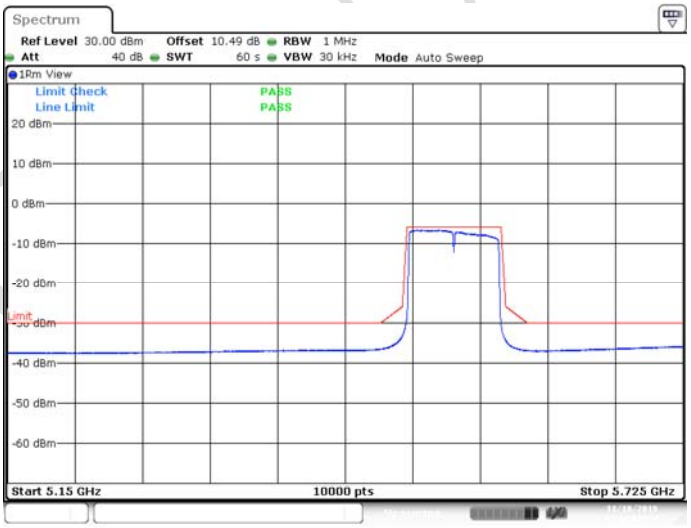
802.11ac80 5290MHz



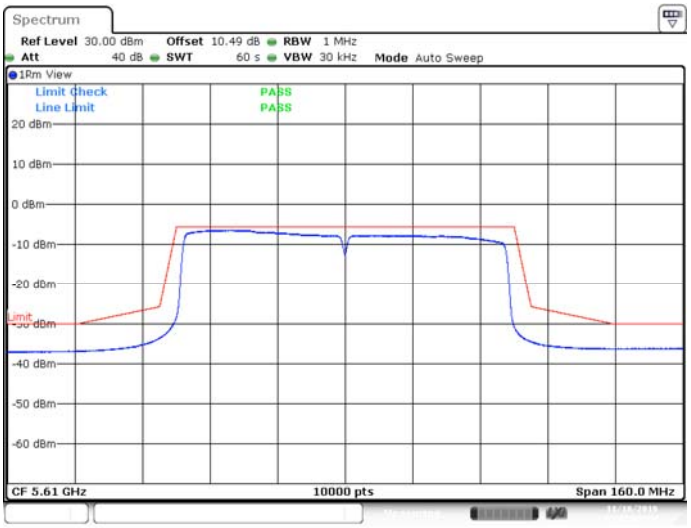


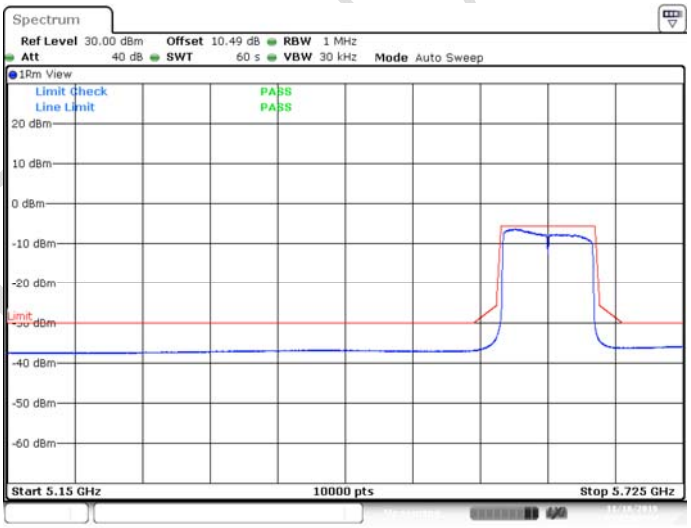
802.11ac80 5530MHz





802.11ac80 5610MHz





ETSI EN 301 893 V2.1.1 (2017-05) Clause 4.2.5 – RECEIVER SPURIOUS EMISSIONS

Definition

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

Limits

The spurious emissions of the receiver shall not exceed the limits given in table 5.
In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Table 5: Spurious radiated emission limits

Frequency range	Maximum power	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 26 GHz	-47 dBm	1 MHz

Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) Clause5.4.7

Test Data

Environmental Conditions

Temperature:	24.3 ℃
Relative Humidity:	56 %
ATM Pressure:	101.3kPa

The testing was performed by Carry Cai on 2019-11-07.

Test Mode: Transmitting

Test Result: Compliant.

Band1:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	EN 301893	
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
Low Channel										
101.42	51.27	43	100	H	-56.24	0.33	-6.05	-62.62	-57	5.62
101.42	40.27	43	100	V	-58.16	0.33	-6.05	-64.54	-57	7.54
1800.00	53.56	47	200	H	-56.49	0.84	8.68	-48.65	-47	1.65
1800.00	45.05	47	200	V	-58.42	0.84	8.68	-50.58	-47	3.58
High Channel										
101.42	51.38	233	150	H	-56.13	0.33	-6.05	-62.51	-57	5.51
101.42	40.34	233	200	V	-58.09	0.33	-6.05	-64.47	-57	7.47
1800.00	52.87	285	100	H	-57.18	0.84	8.68	-49.34	-47	2.34
1800.00	44.59	285	100	V	-58.88	0.84	8.68	-51.04	-47	4.04

Note:
Absolute Level = Submitted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FINAL

Band2:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	EN 301893	
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
Low Channel										
10142	51.34	147	100	H	-56.17	0.33	-6.05	-62.55	-57	5.55
101.42	40.23	147	100	V	-58.2	0.33	-6.05	-64.58	-57	7.58
1800.00	53.67	55	200	H	-56.38	0.84	8.68	-48.54	-47	1.54
1800.00	45.14	55	200	V	-58.33	0.84	8.68	-50.49	-47	3.49
High Channel										
101.42	51.42	29	150	H	-56.09	0.33	-6.05	-62.47	-57	5.47
101.42	40.4	29	200	V	-58.03	0.33	-6.05	-64.41	-57	7.41
1800.00	52.9	201	100	H	-57.15	0.84	8.68	-49.31	-47	2.31
1800.00	44.58	201	100	V	-58.89	0.84	8.68	-51.05	-47	4.05

Note:
Absolute Level = Submitted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FINAL

Band3:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	EN 301893	
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
Low Channel										
101.42	51.22	146	100	H	-56.29	0.33	-6.05	-62.67	-57	5.67
101.42	40.22	146	100	V	-58.21	0.33	-6.05	-64.59	-57	7.59
1800.00	53.50	310	200	H	-56.55	0.84	8.68	-48.71	-47	1.71
1800.00	45.11	310	200	V	-58.36	0.84	8.68	-50.52	-47	3.52
High Channel										
101.42	51.3	248	150	H	-56.21	0.33	-6.05	-62.59	-57	5.59
101.42	40.29	248	200	V	-58.14	0.33	-6.05	-64.52	-57	7.52
1800.00	52.79	284	100	H	-57.26	0.84	8.68	-49.42	-47	2.42
1800.00	44.45	284	100	V	-59.02	0.84	8.68	-51.18	-47	4.18

Note:
Absolute Level = Submitted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

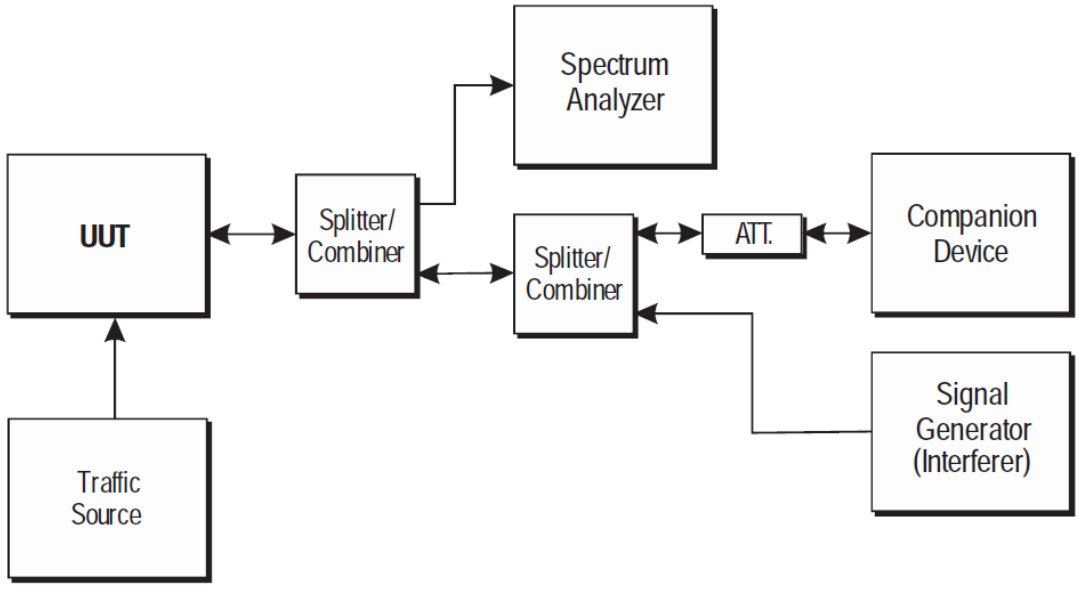
FINAL

ETSI EN 301 893 V2.1.1 (2017-05) Clause 4.2.7 – ADAPTIVITY (CHANNEL ACCESS MECHANISM)

Applicable Standard

Load base Equipment shall implement a Listen Before Talk (LBT) based Channel Access Mechanism to detect the presence of the RLAN transmissions on an Operating Channel.

Measurement Procedure



Step 1:

•The UUT shall connect to a companion device during the test. The signal generator, spectrum analyser, the UUT, the traffic source and the companion device are connected using a Set-up equivalent to the example given by figure above although the interference source is switched off at this point in time. The spectrum analyser is used to monitor the transmissions of the UUT in response to the interference signal.

•The received signal level (wanted signal from the companion device) at the UUT shall be sufficient to maintain a reliable link for the duration of the test. A typical value for the received signal level which can be used in most case is -50 dBm/MHz.

•The analyser shall be set as follows:

- RBW: ≥ Occupied Channel Bandwidth (if the analyser does not support this setting, the highest available setting shall be used)

- VBW: 3 × RBW (if the analyser does not support this setting, the highest available setting shall be used)

- Detector Mode: RMS

- Centre Frequency: Equal to the centre frequency of the operating channel

- Span: 0 Hz

- Sweep time: > 2 × Channel Occupancy Time

- Trace Mode: Clear/Write

- Trigger Mode: Video or RF/IF power

Step 2:

•Configure the traffic source so that it exceeds the UUT's theoretical radio performance. The traffic source shall fill the UUT's buffers causing the UUT to always have transmissions queued (full buffer condition) towards the companion device.

5.4.9.3.2.2 Procedure to verify the capability to detect other RLAN transmissions on the Operating Channel when operating on a single channel.

Step 1: Setting up the communications link

•The UUT shall be configured to operate on a single Operating Channel.

Step 2: Adding the interference signal.

•One of the three interference signals as defined in clause B.7 is injected on the current Operating Channel of the UUT. The level (at the input of the UUT) of this interference signal shall be equal to the applicable CCA threshold level defined in clause 4.2.7.3.2.5.

Step 3: Verification of reaction to the interference signal.

•The spectrum analyser shall be used to monitor the transmissions of the UUT on the selected Operating Channel after the interference signal was injected. This may require the spectrum analyser sweep to be triggered by the start of the interfering signal.

•Using the procedure defined in clause 5.4.9.3.3, it shall be verified that:

i) The UUT stops transmissions on the current Operating Channel.

The UUT is assumed to stop transmissions within a period equal to the maximum Channel Occupancy Time that corresponds to the Priority Class being tested (see table 7 and table 8). The UUT is allowed to have Short Control Signalling Transmissions on the current operating channel, see ii) and iii).

ii) Apar ft rom Short Control Signalling Transmissions there shall be no subsequent transmissions while the interfering signal is present.

iii) The Short Control Signalling Transmissions shall comply with the limits defined in clause 4.2.7.3.3. The verification of the Short Control Signalling Transmissions may require the analyser settings to be changed (e.g. sweep time).

FINAL

•To verify that the UUT is not resuming normal transmissions as long as the interference signal is present, the monitoring time may need to be 60 s or more, in which case a segmented measurement may need to be performed in order to achieve the required resolution.

•Once the test is completed and the interference signal is removed, the UUT may start transmissions again on any of the Operating Channels used for the multi-channel operation configured in step 1; however, this is not a requirement and, therefore, does not require testing.

Step 4:

•Step 2 and step 3 shall be repeated for each of the interference signals defined in clause B.7.

Test data

Environmental Conditions

Temperature:	24.3 ℃
Relative Humidity:	56 %
ATM Pressure:	101.3kPa

The testing was performed by Carry Cai on 2019-11-18.

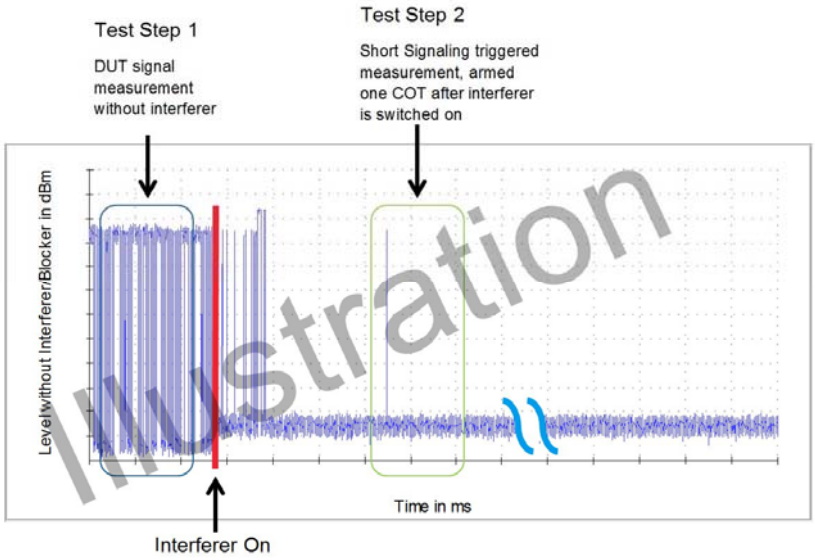
Test mode: Transmitting

Test Definition Results

Manufacturer's Declarations	Units	Result
EUT Payload type	Load/Frame/Both/NA	Load Based
Device Type - 1	Initiating/Responding/Both	Both
Device Type - 2	Supervising/Supervised/Both	Supervising
Multi-channel	Yes/No	No
Energy Detect Mechanism	Option 1/ Option 2	Option 1
802.11 Energy Detect Protocol	Yes/No	Yes
Priority Class	Class 1/ Class 2/ Class 3/ Class 4	Class 2

FINAL

Adaptivity Test schematic graphic



Test Results

5180 MHz Band:

The EUT was tested with 3 types of interference signals

Sub-Band 1:

Test Mode	Antenna	Channel	COT Num [n]	Max. COT [ms]	Limit [ms]	Min.Idel Time[ms]	Limit [ms]
11A	Ant1	5180	10165	0.053	6.000	0.042	0.027

Test Mode	Antenna	Channel	Interference Type	Add interference Time [ms]	Max. Short Control number [n]	Limit [n]	Max. Short Control Time [ms]	Limit [ms]	Verdict
11A	Ant1	5180	AWGN	-2001	2	50	1.60	2.5	PASS
			LTE	-2001	0	50	0.00	2.5	PASS
			OFDM	-2001	0	50	0.00	2.5	PASS

5320 MHz Band:

The EUT was tested with 3 types of interference signals

Sub-Band 1:

Test Mode	Antenna	Channel	COT Num [n]	Max. COT [ms]	Limit [ms]	Min.Idel Time[ms]	Limit [ms]
11A	Ant1	5320	10031	0.278	6.000	0.063	0.027

Test Mode	Antenna	Channel	Interference Type	Add interference Time [ms]	Max. Short Control number [n]	Limit [n]	Max. Short Control Time [ms]	Limit [ms]	Verdict
11A	Ant1	5320	AWGN	2001	0	50	14.60	2.5	PASS
			LTE	2001	0	50	0.00	2.5	PASS
			OFDM	2001	0	50	0.00	2.5	PASS

5500 MHz Band:

The EUT was tested with 3 types of interference signals

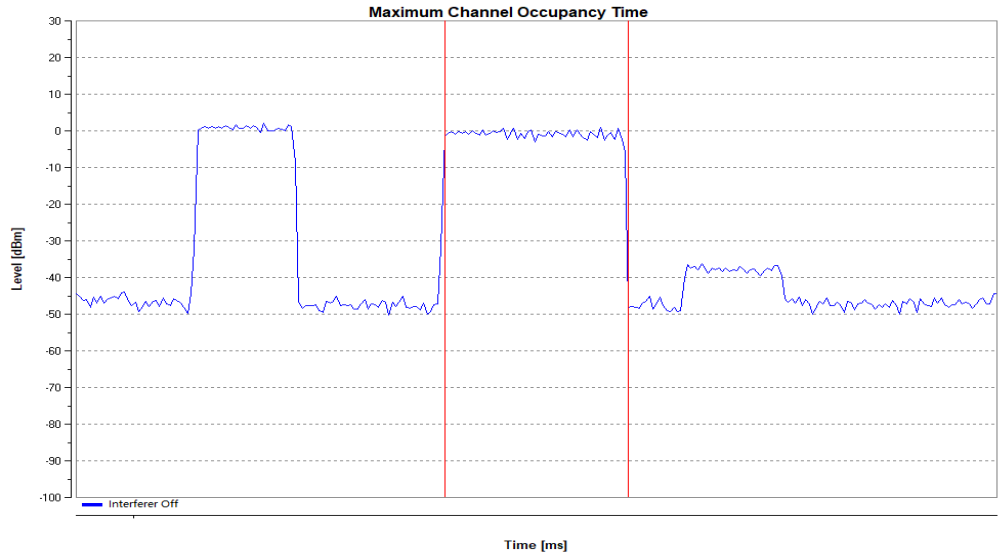
Sub-Band 1:

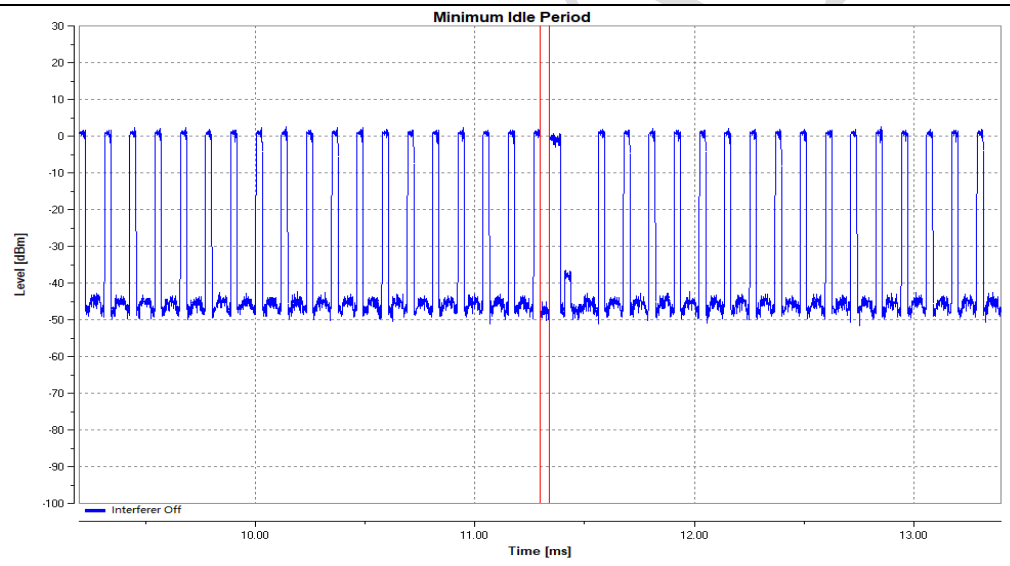
Test Mode	Antenna	Channel	COT Num [n]	Max. COT [ms]	Limit [ms]	Min.Idel Time[ms]	Limit [ms]
11A	Ant1	5500	10074	0.065	2.000	0.042	0.027

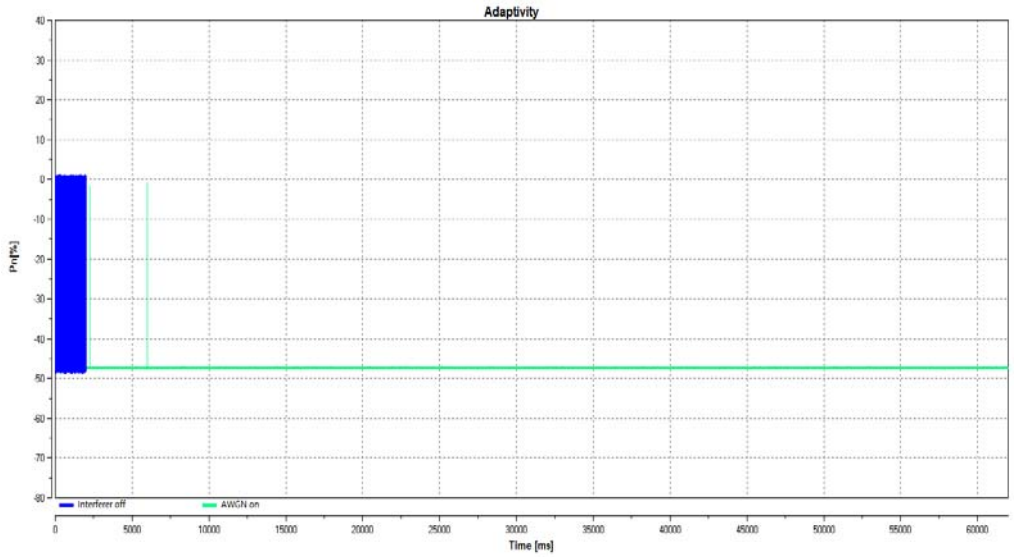
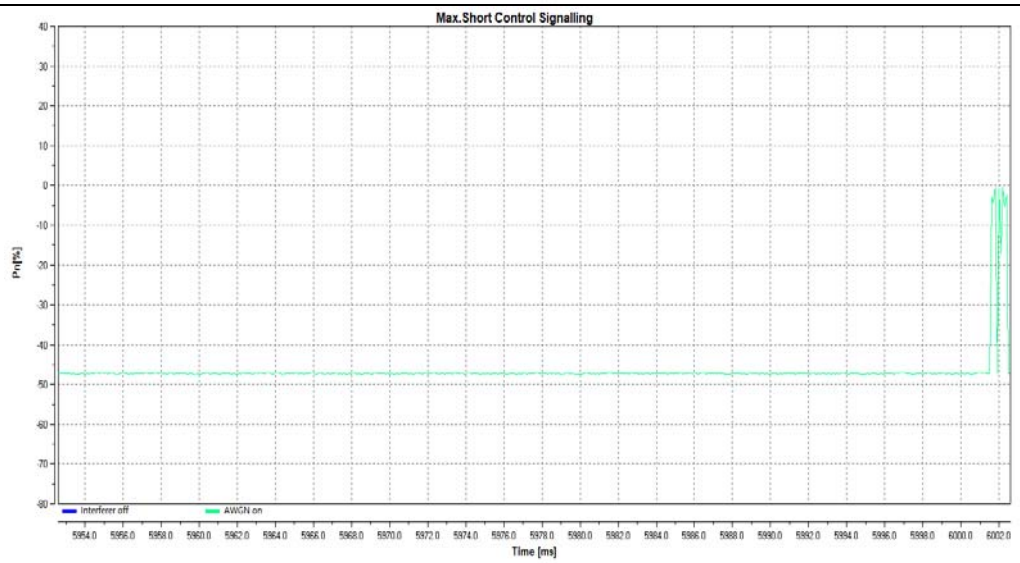
Test Mode	Antenna	Channel	Interference Type	Add interference Time [ms]	Max. Short Control number [n]	Limit [n]	Max. Short Control Time [ms]	Limit [ms]	Verdict
11A	Ant1	5500	AWGN	2001	0	50	0.00	2.5	PASS
			LTE	2001	0	50	0.00	2.5	PASS
			OFDM	-2001	0	50	0.00	2.5	PASS

5180 MHz Band:

11A_Ant1_5180

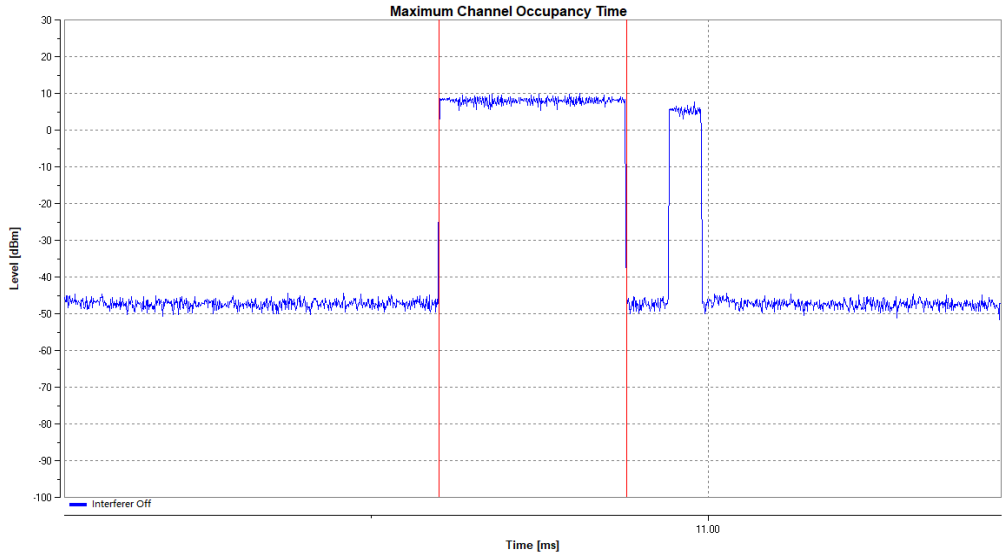


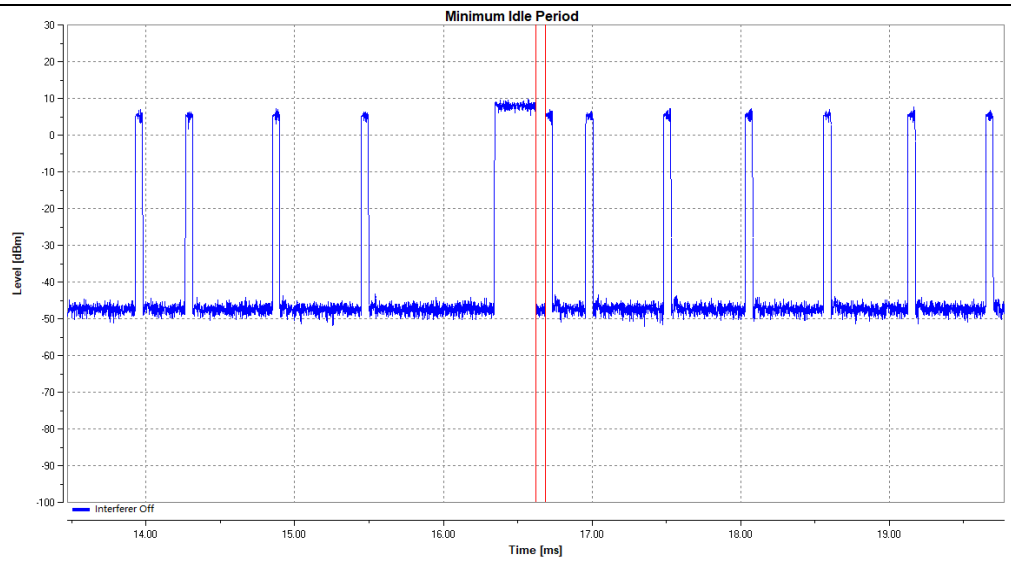


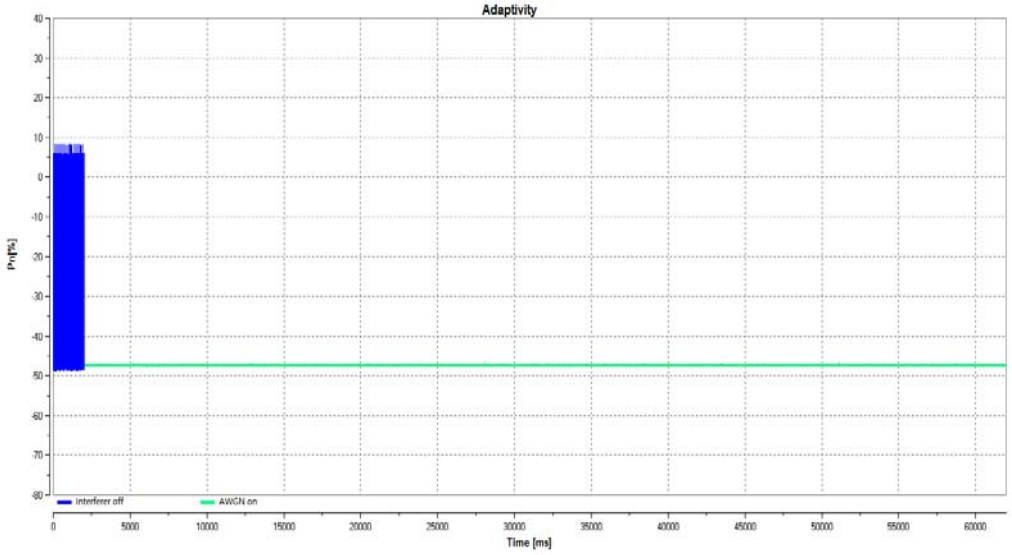
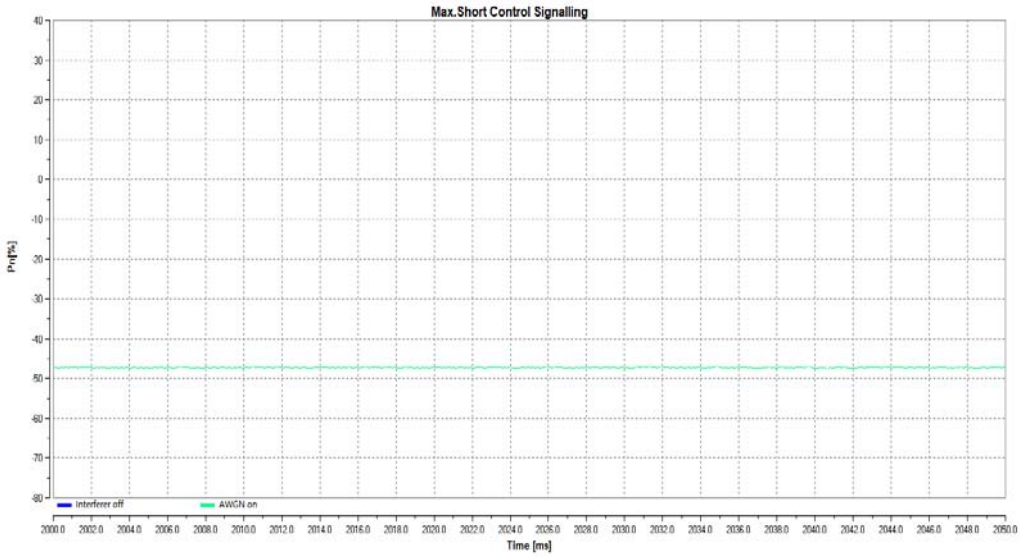
11A_Ant1_5180



5320 MHz Band:

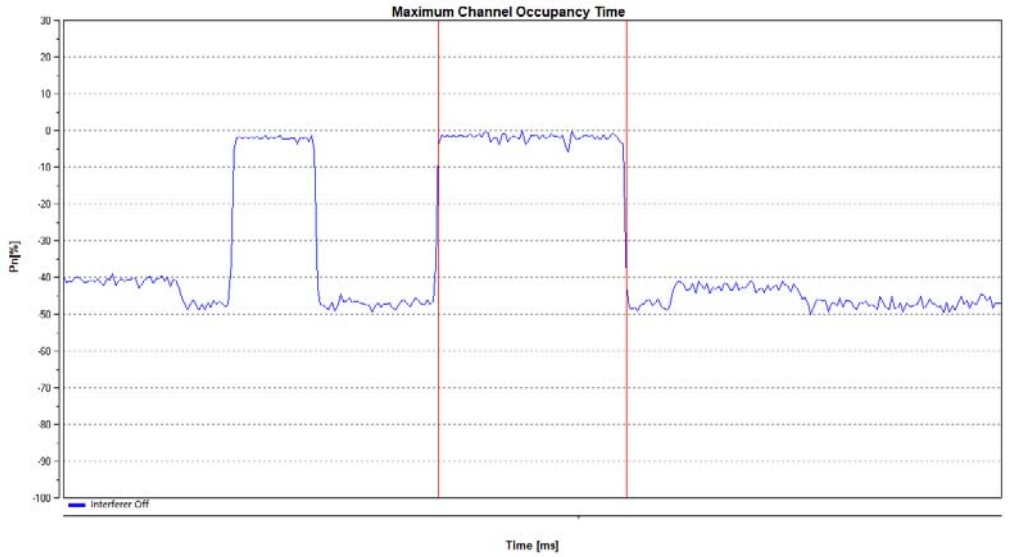
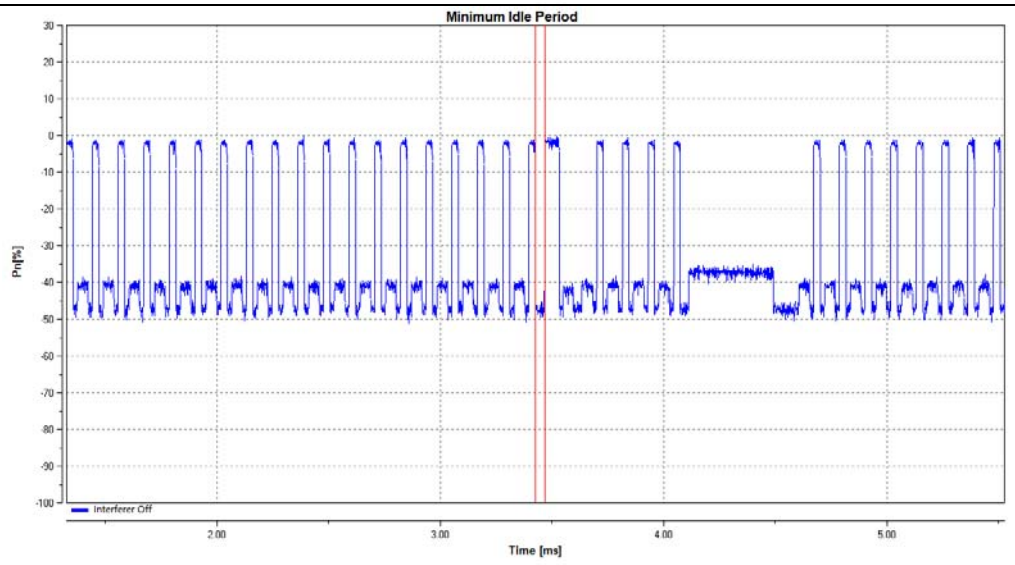
11A_Ant1_5320

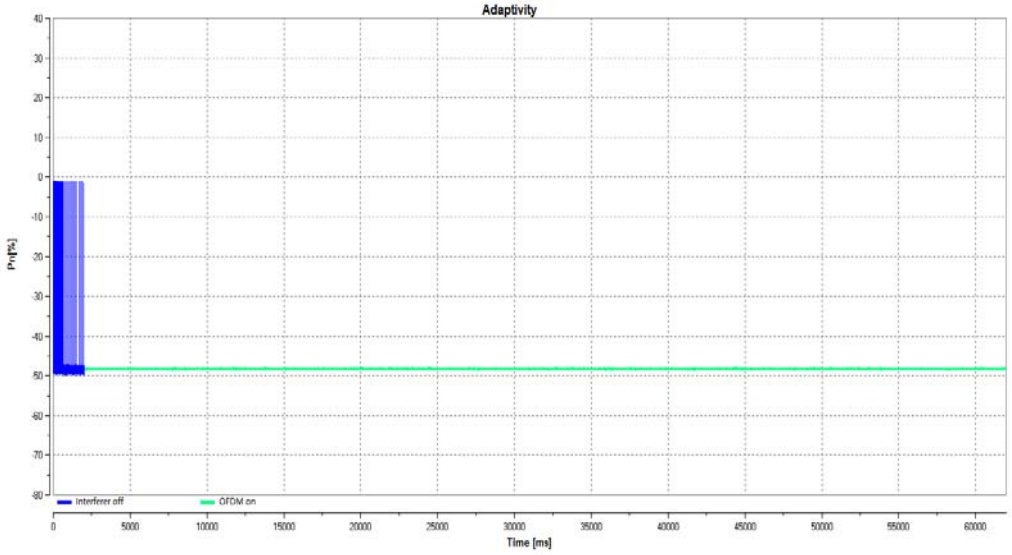
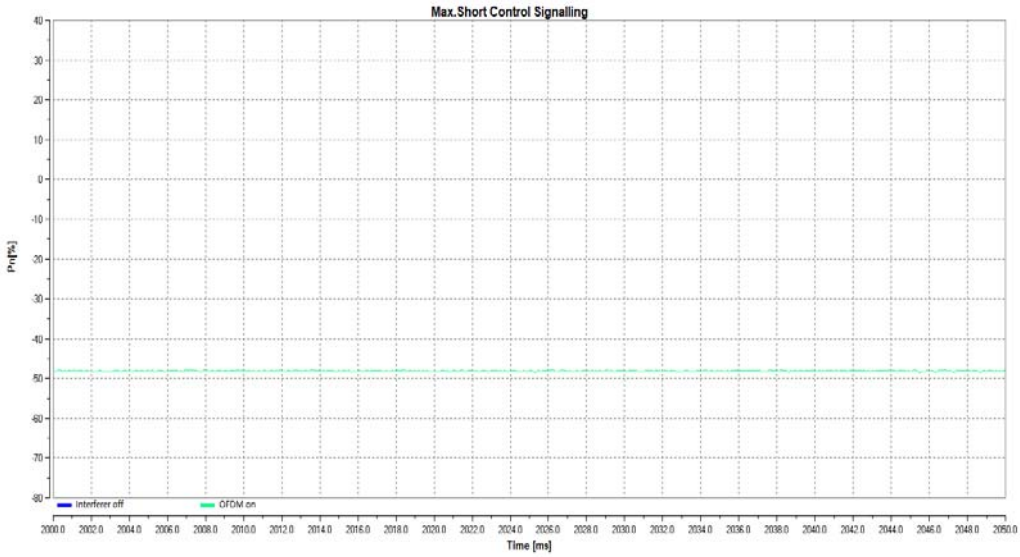




11A_Ant1_5320



5500 MHz Band:

11A_Ant1_5500



11A_Ant1_5500



ETSI EN 301 893 V2.1.1 (2017-05) Clause 4.2.8 – RECEIVER BLOCKING

Definition

Receiver blocking is a measure of the capability of the equipment to receive a wanted signal on its operating channel without exceeding a given degradation due to the presence of an unwanted input signal (blocking signal) on frequencies other than those of the operating bands provided in table 1.

The minimum performance criterion shall be a PER of less than or equal to 10 %. The manufacturer may declare alternative performance criteria as long as that is appropriate for the intended use of the equipment (see clause 5.4.1, item t)).

Limits

While maintaining the minimum performance criteria as defined in clause 4.2.8.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined in table 9.

Table 9: Receiver Blocking parameters

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)		Type of blocking signal
		Master or Slave with radar detection (see table D.2, note 2)	Slave without radar detection (see table D.2, note 2)	
Pmin + 6 dB	5 100	-53	-59	Continuous Wave
Pmin + 6 dB	4 900 5 000 5 975	-47	-53	Continuous Wave
NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined clause 4.2.8.3 in the absence of any blocking signal. NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.				

Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.10.

Test Setup Block diagram

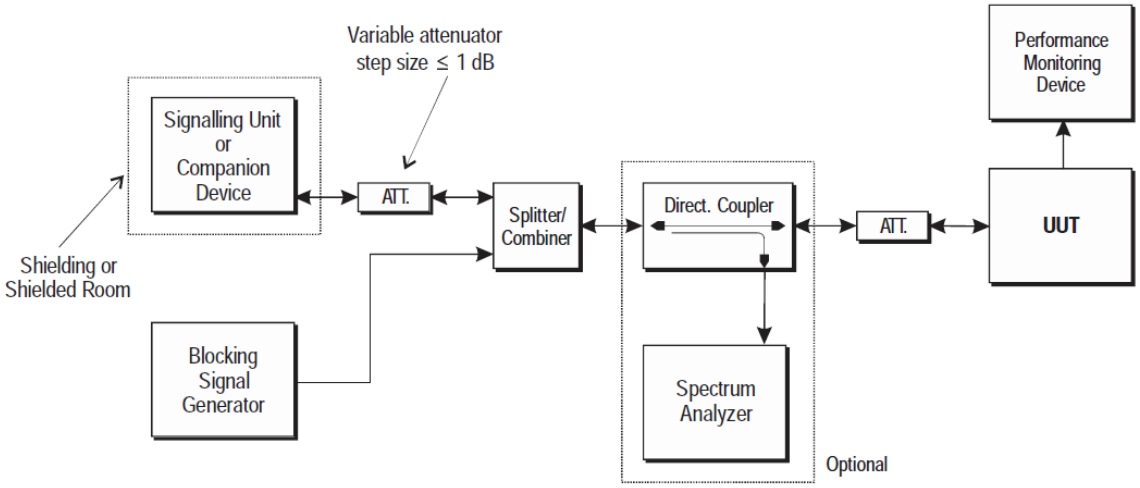


Figure 18: Test Set-up for receiver blocking

Test data

Environmental Conditions

Temperature:	24.3 ℃
Relative Humidity:	50 %
ATM Pressure:	101.3kPa

The testing was performed by Carry Cai on 2019-11-11.

Test Mode: Receiving in 802.11a mode.

Test Result: Compliant.

FINAL

Band1 &2:

Channel	Pmin (dBm)	Wanted signal Power from companion device (dBm)	Blocking signal Frequency (MHz)	Blocking signal Power(dBm)	PER (%)	Limit (%)
Low	-90	-84	5100	-53	0.17	≤10.00
			4900	-47	0.14	≤10.00
			5000	-47	0.13	≤10.00
			5975	-47	0.19	≤10.00
	-90	-84	5100	-53	0.12	≤10.00
			4900	-47	0.11	≤10.00
			5000	-47	0.15	≤10.00
			5975	-47	0.17	≤10.00
Note: PER monitored by the software *CMW500*.						

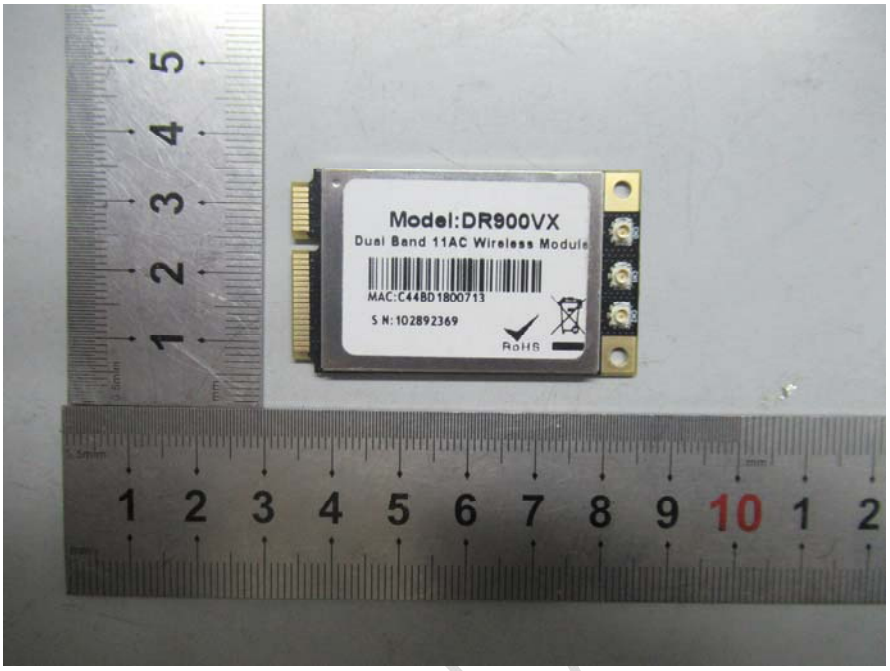
Band3:

Channel	Pmin (dBm)	Wanted signal Power from companion device (dBm)	Blocking signal Frequency (MHz)	Blocking signal Power(dBm)	PER (%)	Limit (%)
Low	-90	-84	5100	-53	0.16	≤10.00
			4900	-47	0.13	≤10.00
			5000	-47	0.2	≤10.00
			5975	-47	0.16	≤10.00
	-90	-84	5100	-53	0.12	≤10.00
			4900	-47	0.11	≤10.00
			5000	-47	0.11	≤10.00
			5975	-47	0.17	≤10.00
Note: PER monitored by the software *CMW500*.						

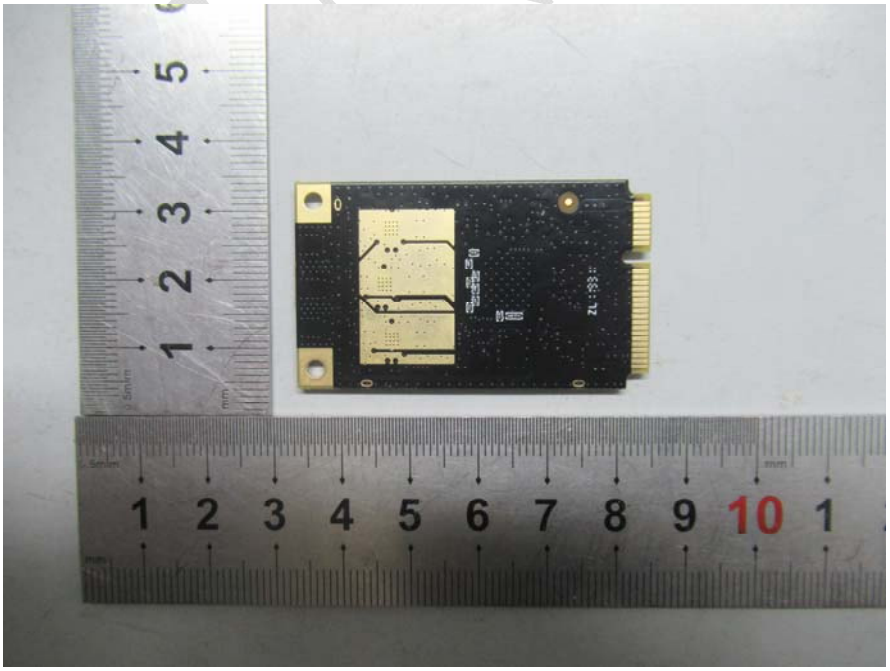
FINAL

EXHIBIT A - EUT PHOTOGRAPHS

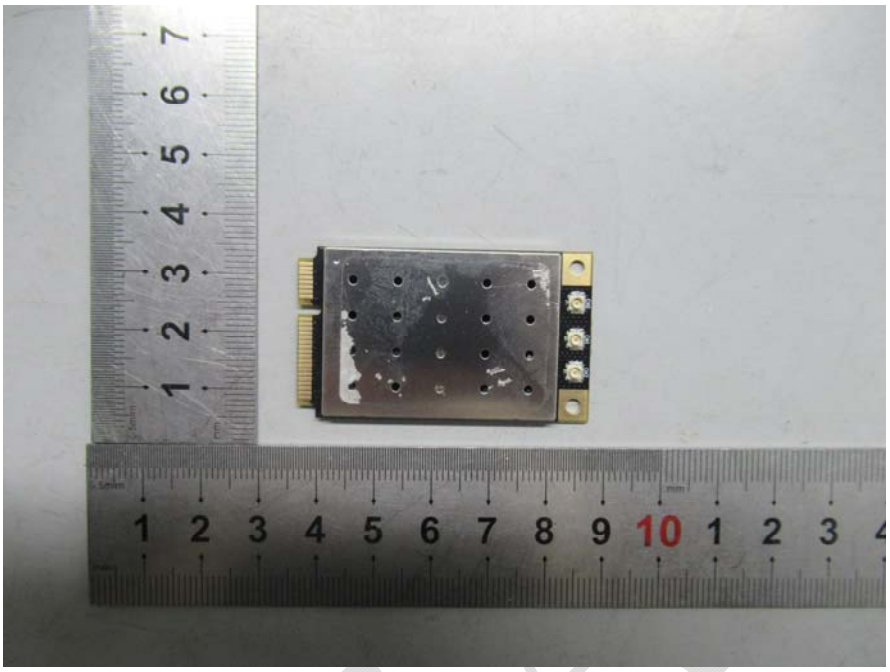
EUT – Top View



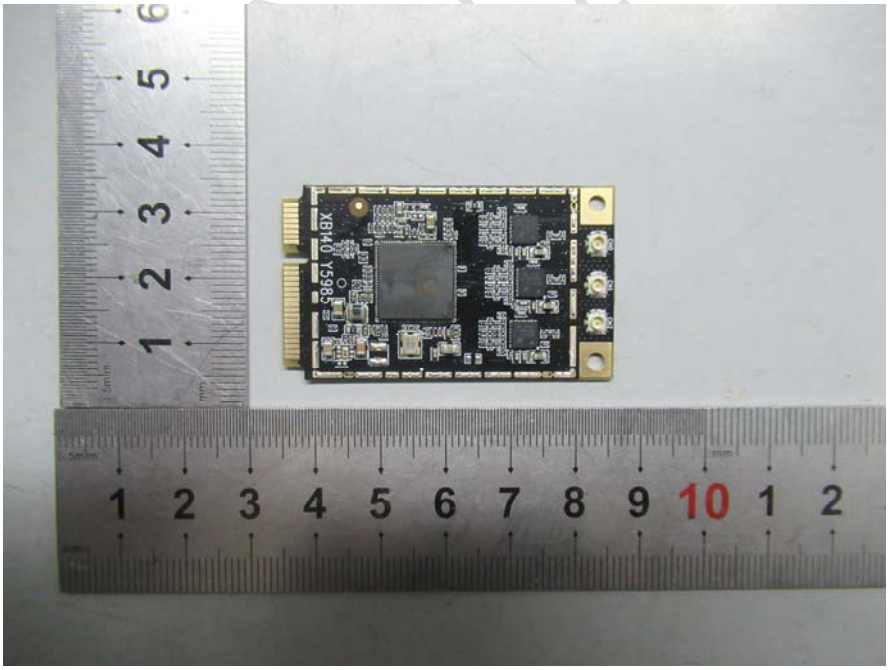
EUT – Bottom View



EUT – PCB Top View

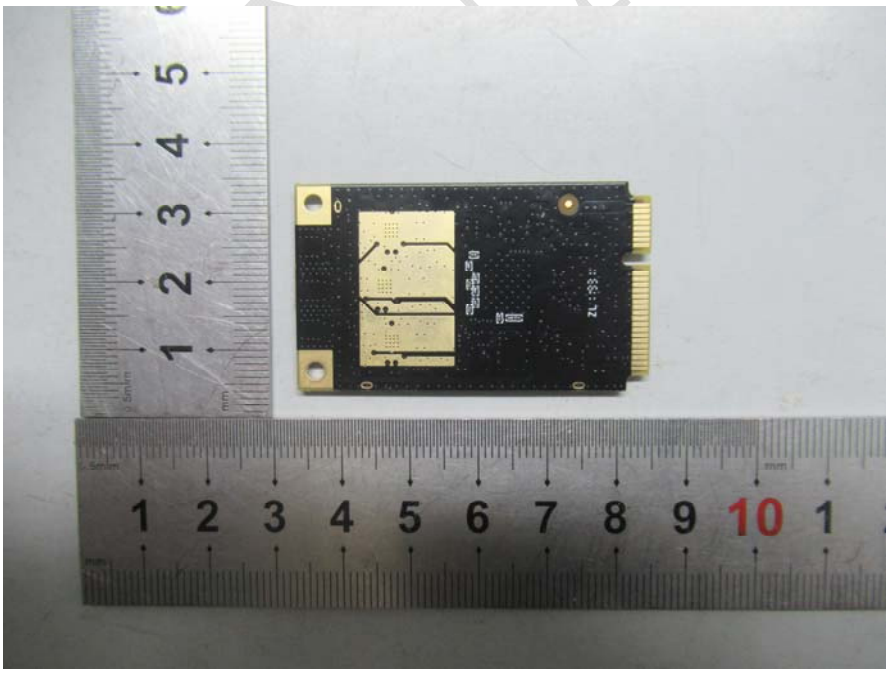


EUT – PCB Top Shielding off View

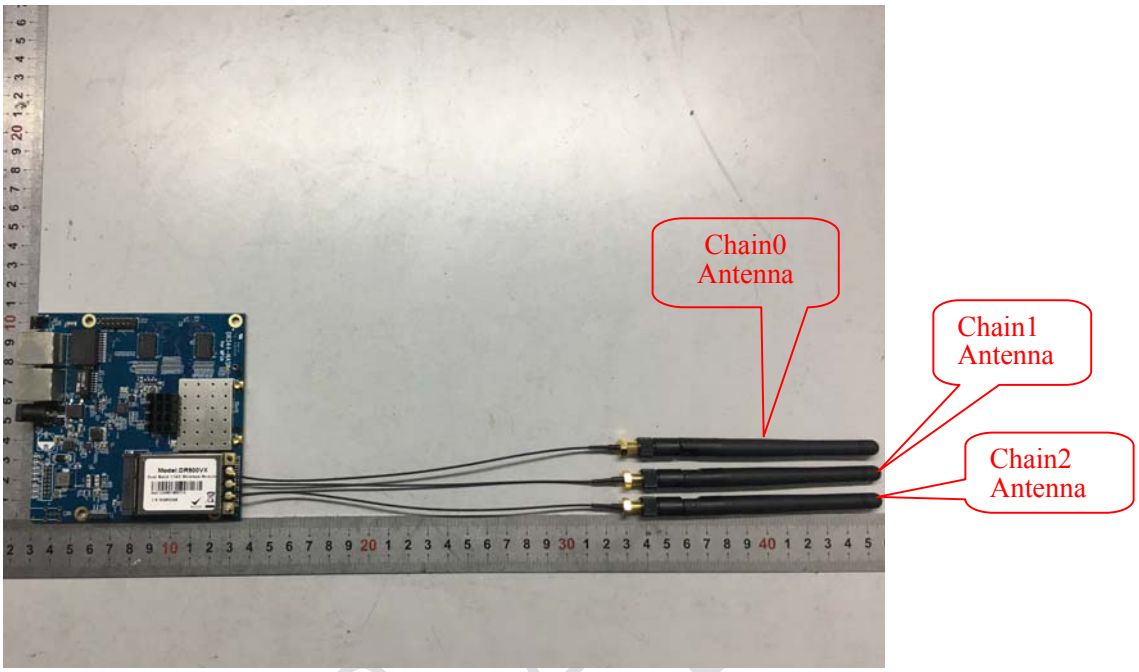


EUT – PCB Top Chip View

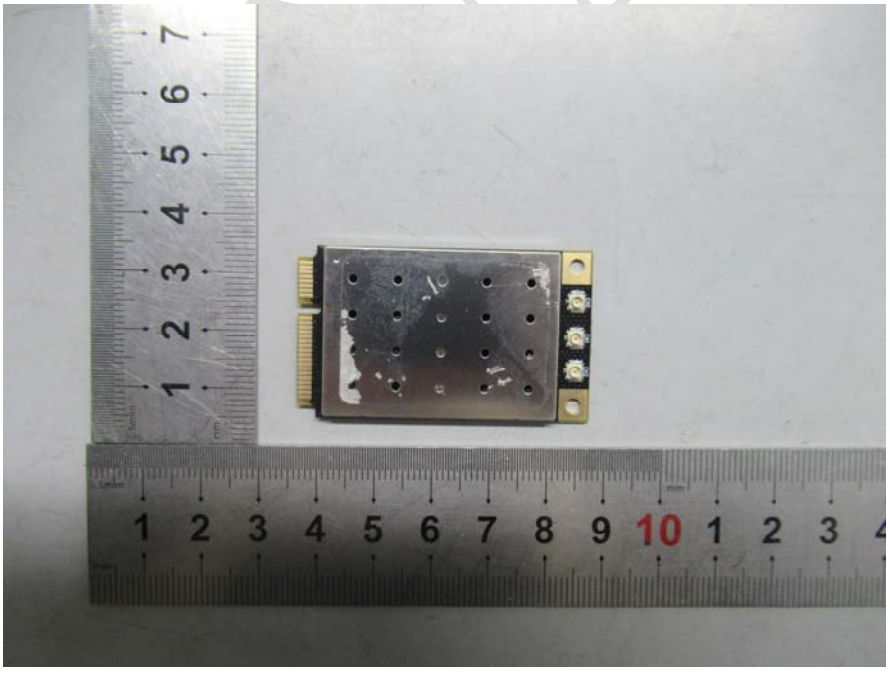
EUT – PCB Bottom View



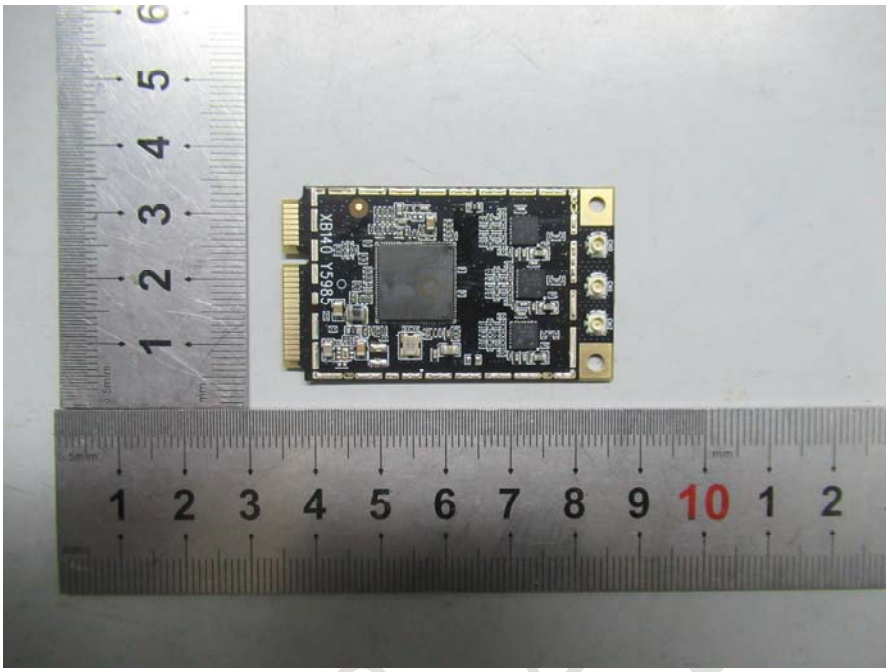
EUT with Base plate View



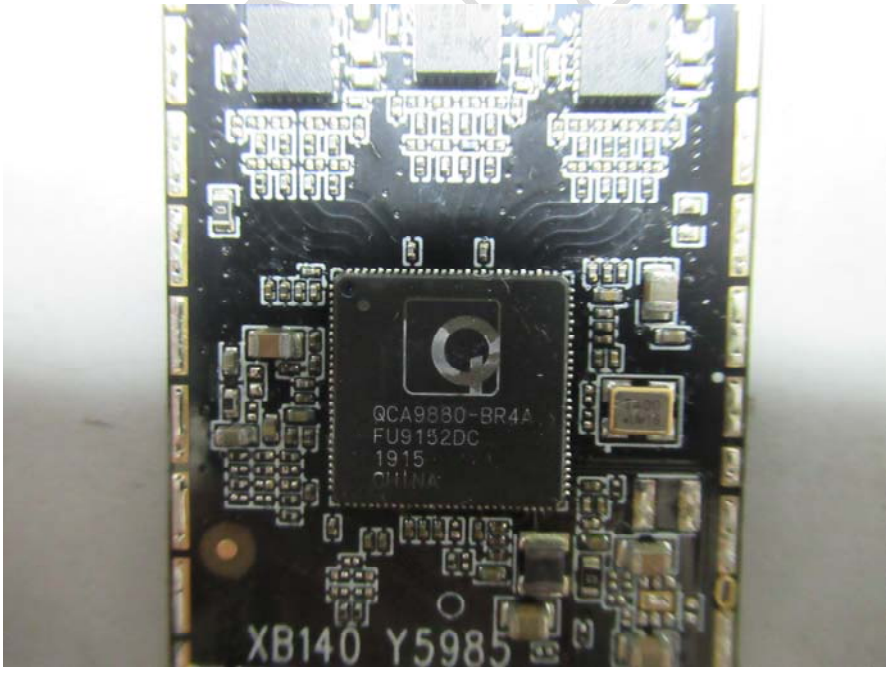
EUT – PCB Top View



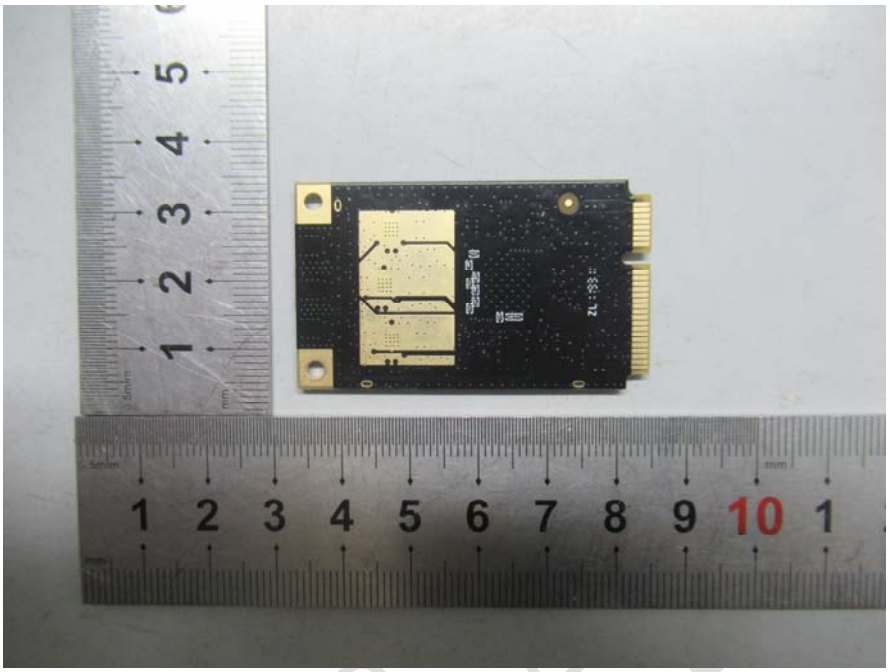
EUT – PCB Top Shielding off View



EUT – PCB Top Chip View



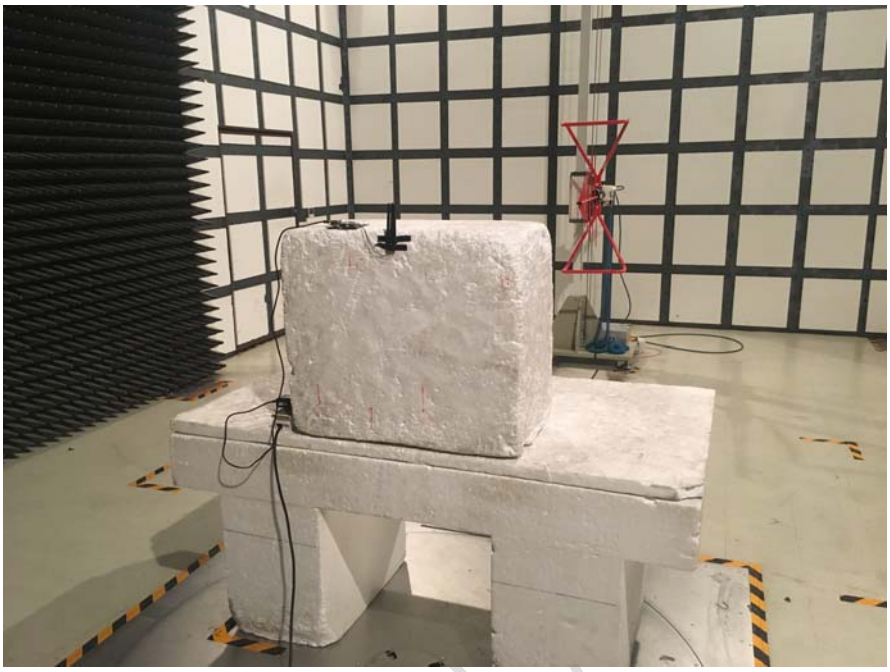
EUT – PCB Bottom View



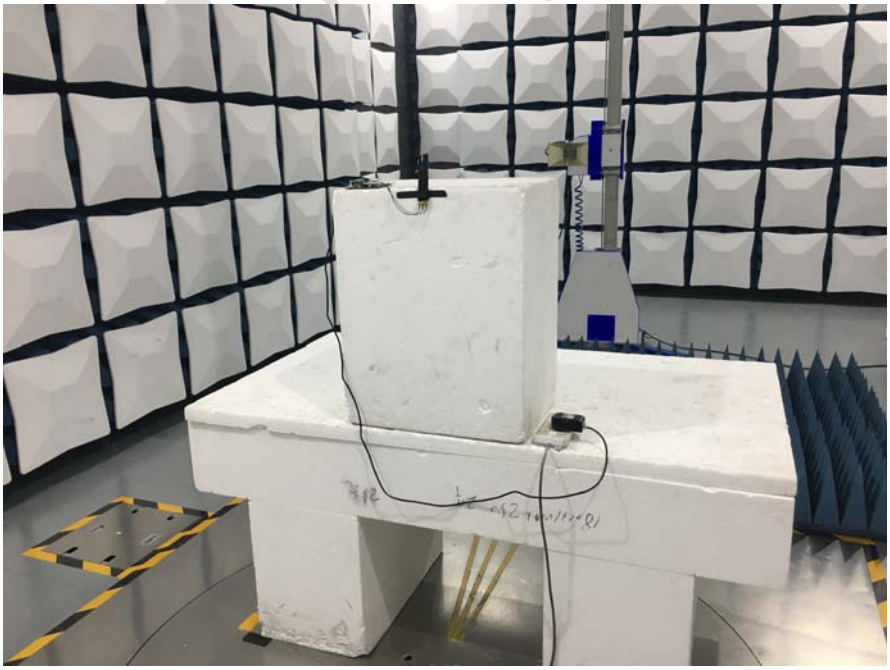
FINAL

EXHIBIT B - TEST SETUP PHOTOGRAPHS

Radiated Spurious Emissions Test View (Below 1GHz)



Radiated Spurious Emissions Test View (Above 1GHz)



PRODUCT SIMILARITY DECLARATION LETTER

Wallys Communications（SuZhou）Co.,LTD
Add: Room 2723,Le Jia building,Jia Rui Xiang No.8, Suzhou Industrial Park, Suzhou, P.R Suzhou, 215000 China
Tel: 18913094531
Fax: 0512-62815802
Mail: richard_zhu@wallystech.com
Date: 2019-10-20

DECLARATION OF SIMILARITY

Dear Sir or Madam:

We, Wallys Communications（SuZhou）Co.,LTD, hereby declare that product:
Dual Band 11AC wireless Module , as following models: DR900VX, DR900VX-4.9, DR600VX,DR600VX-4.9,DR900VX-MX,DR600VX-MX.And only DR900VX was tested by BACL with the same electromagnetic emissions and electromagnetic compatibility characteristics.

The detail differences description as below:
All the products are the different model name, with the same appearance, structure, power and size, and schematic and PCB design.
Please contact me if there is need for any additional clarification or information.

Best Regards,
Signature: 

Contact Person: Richard
Title: Engineer

******* END OF REPORT *******