CERTIFICATE #3478.01

TEST REPORT

EUT Description	**WLAN and BT, 1x1 PCIe M.2 1216 adapter card**
Brand Name	**Intel® Wi-Fi AX101**
Model Name	**AX101D2W**
FCC ID	**PD9AX101D2**
Date of Test Start/End	**2020-11-11 / 2020-11-24**
Features	**802.11ax, Dual Band, 1x1 Wi-Fi + Bluetooth® 5,1 Diversity Antenna** (see section 5)

Applicant	**Intel Mobile Communications**
Address	**100 Center Point Circle, Suite 200** **Columbia, South Carolina 29210** **USA**
Contact Person	**Steven Hackett**
Telephone/Fax/ Email	**steven.c.hackett@intel.com**

Reference Standards	**FCC CFR Title 47 Part 15 E** (see section 1)

Test Report identification	**200928-04.TR01**
Revision Control	**Rev. 00** **This test report revision replaces any previous test report revision** (see section 8)

The test results relate only to the samples tested.
This report shall not be reproduced, except in full, without the written approval of the laboratory.
Reference to accreditation shall be used only by full reproduction of test report.

Issued by	Reviewed by
Digitally signed by Khodor RIDA Date: 2021.02.03 17:05:08 +01'00'	Digitally signed by In Cheiel Date: 2021.02.04 13:25:40 +01'00'
Khodor RIDA (Test Engineer Lead)	Cheiel IN (Technical Manager)

Intel Corporation S.A.S – WRF Lab
425 rue de Goa – Le Cargo B6 - 06600, Antibes, France
Tel. +33493001400 / Fax +33493001401

Table of Contents

1. Standards, reference documents and applicable test methods 3
2. General conditions, competences and guarantees 3
3. Environmental Conditions 3
4. Test samples 4
5. EUT Features 5
6. Remarks and comments 5
7. Test Verdicts summary 6
7.1. 802.11 a/n/ac/ax – U-NII-1 6
7.2. 802.11 a/n/ac/ax – U-NII-2A 6
8. Document Revision History 6
A.1 Measurement System 7
A.2 Test Equipment List 9
A.3 Measurement Uncertainty Evaluation 10
B.1 Test Conditions 11
B.2 Test Results Tables U-NII-1 12
B.2.1 26dB & 99% Bandwidth 12
B.2.2 Power Limits. Maximum Output power & Maximum power spectral density 14
B.2.3 Undesirable emission limits : out of band (Conducted) 20
B.2.4 Radiated spurious emission 21
B.3 Test Results Tables U-NII-2A 33
B.3.1 26dB & 99% Bandwidth 33
B.3.2 Power Limits. Maximum Output power & Maximum power spectral density 35
B.3.3 Undesirable emissions limits : out of band (Conducted) 39
B.3.4 Radiated spurious emission 40
B.3.5 26dB and 99% bandwidth 52
B.3.6 Maximum output power 58
B.3.7 Undesirable emission limits: out of band (Conducted) 64
C.1 Test Setup 70
C.2 Test Sample 72

1. Standards, reference documents and applicable test methods

1. FCC Title 47 CFR part 15 – Subpart E – Unlicensed National Information Infrastructure Devices. 2019-10-01 Edition
2. FCC Title 47 CFR part 15 - Subpart C – §15.209 Radiated emission limits; general requirements. 2019-10-01 Edition
3. FCC OET KDB 789033 D02 v02r01 General U-NII Test Procedures New Rules – Guidelines for compliance testing of Unlicensed National Information Infrastructure (U-NII) Devices (Part 15, Subpart E).
4. FCC OET KDB 662911 D01 v02r01 - Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
5. ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

2. General conditions, competences and guarantees

- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an ISO/IEC 17025:2017 laboratory accredited by the American Association for Laboratory Accreditation (A2LA) with the certificate number 3478.01.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an Accredited Test Firm recognized by the FCC, with Designation Number FR0011.
- ✓ Intel WRF Lab declines any responsibility with respect to the identified information provided by the customer and that may affect the validity of results.
- ✓ Intel WRF Lab only provides testing services and is committed to providing reliable, unbiased test results and interpretations.
- ✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.
- ✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
- ✓ This report is only referred to the item that has undergone the test.
- ✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.
- ✓ Complete or partial reproduction of the report cannot be made without written permission of Intel WRF Lab.

3. Environmental Conditions

- ✓ At the site where the measurements were performed the following limits were not exceeded during the tests:

Temperature	20.2ºC ± 3.4ºC
Humidity	44% ± 17.5%

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of receipt	Note
#1	200928-04.S09	RF Module	AX101D2W	WFM: D8F8834C5810	2020-11-03	RF Conducted
	180000-01.S06	Adapter 1216SD to M.2	HrP Adapter M2	N/A	2017-05-11	
	170000-01.S02	Laptop	Latitude E5450	21HTPF2	2017-03-28	
	180717-03.S14	Extender	PCB00651_01	6510818-132	2018-08-21	
#2	200928-04.S06	RF Module	AX101D2W	WFM:D8F8834C57E8	2020-11-03	Used for 30MHz-18GHz Radiated Spurious Emissions tests except test cases in #4
	180717-03.S13	Extender	PCB00651_01	6510818-131	2018-08-21	
	180000-01.S02	Socket	JfP Adapter M2	-	2017-08-09	
	170000-01.S16	Laptop	Latitude E5470	C2HTPF2	2017-06-13	
	200611-03.S28	Main Antenna	Skycross	-	2020-07-01	
	200611-03.S29	Aux Antenna	Skycross	-	2020-07-01	
#3	200928-04.S06	RF Module	AX101D2W	WFM:D8F8834C57E8	2020-11-03	Used for 18GHz-40GHz Radiated Spurious Emissions tests
	200102-01.S03	Extender	ADEXELEC	-	2020-01-02	
	200928-02.S11	Adaptor	HrP M2 Adaptor 1216	6961919-172	2020-10-27	
	200715-03.S06	Absorber	MCS material	-	2020-07-23	
	180000-01.S02	Socket	JfP Adapter M2	-	2017-08-09	
	170801-01.S10	Laptop	Latitude E7470	7KNOXF2	2017-09-08	
	200611-03.S28	Main Antenna	Skycross	-	2020-07-01	
	200611-03.S29	Aux Antenna	Skycross	-	2020-07-01	
#4	200928-04.S11	RF Module	AX101D2W	WFM18CC18F1C18D	2020-11-03	Used for 6.4-18 GHz Radiated Spurious Emissions tests for 802.11a-Ch56-Ant1 802.11n20-Ch52-Ant1 802.11n20-Ch56-Ant1 802.11ac80-Ch58ac80-Ant1
	180717-03.S13	Extender	PCB00651_01	6510818-131	2018-08-21	
	180000-01.S02	Socket	JfP Adapter M2	-	2017-08-09	
	170000-01.S16	Laptop	Latitude E5470	C2HTPF2	2017-06-13	
	200611-03.S28	Main Antenna	Skycross	-	2020-07-01	
	200611-03.S29	Aux Antenna	Skycross	-	2020-07-01	

5. EUT Features

The herein information is provided by the customer

Brand Name	Intel® Wi-Fi AX101
Model Name	AX101D2W
Software Version	DRTU 01594_99_3500_51W
Driver Version	99.0.58.2
Prototype / Production	Production
Supported Radios	802.11b/g/n/ax 2.4GHz (2400.0 – 2483.5 MHz) 802.11a/n/ac/ax 5.2GHz (5150.0 – 5350.0 MHz) 5.6GHz (5470.0 – 5725.0 MHz) 5.8GHz (5725.0 – 5850.0 MHz) Bluetooth 5.1 2.4GHz (2400.0 – 2483.5 MHz)
Antenna Information	

Transmitter	Main (chain A DIV 1)	Aux (chain A Div 2)
Manufacturer	SkyCross	Skycross
Antenna type	PIFA antenna	PIFA antenna
Part number	N/A	N/A
Declared antenna gain (dBi)	+5	+5

Document

Filename	Date of receipt
Intel_Ref_Antenna data_HMC-M2 Ant_Spec_Universe_SkyCross Antenna	2013-01-28

6. Remarks and comments

1. No deviations were made from the test methods listed in section 1 of this report

7. Test Verdicts summary

The statement of conformity to applicable standards in the table below are based on the measured values, without taking into account the measurement uncertainties.

7.1. 802.11 a/n/ac/ax – U-NII-1

FCC part	Test name	Verdict
15.407 (a) (1)	Power Limits. Maximum output power	P
15.407 (a) (1)	Power spectral density	P
15.407 (b) (1) 15.209	Undesirable emissions limits: Band Edge (conducted)	P
15.407 (b) (1) 15.209	Undesirable emissions limits: Spurious emissions (radiated)	P

7.2. 802.11 a/n/ac/ax – U-NII-2A

FCC part	Test name	Verdict
15.407 (a) (2)	Power Limits. Maximum output power	P
15.407 (a) (2)	Power spectral density	P
15.407 (b) (2) 15.209	Undesirable emissions limits: Band Edge (conducted)	P
15.407 (b) (2) 15.209	Undesirable emissions limits: Spurious emissions (radiated)	P

P: Pass
F: Fail
NM: Not Measured
NA: Not Applicable

8. Document Revision History

Revision #	Modified by	Revision Details
Rev. 00	C.Requin	First Issue

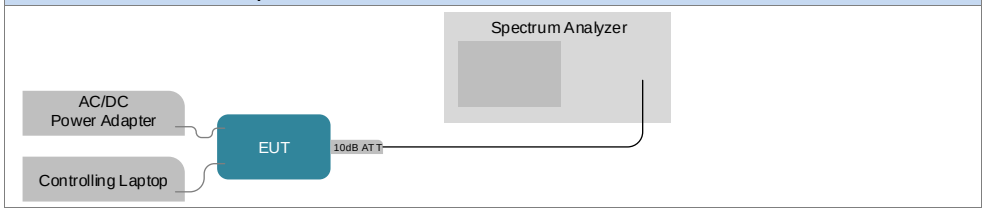
Annex A. Test & System Description

A.1 Measurement System

Measurements were performed using the following setups, made in accordance to the general provisions of FCC OET KDB 789033 D02 General UNII Test Procedures.

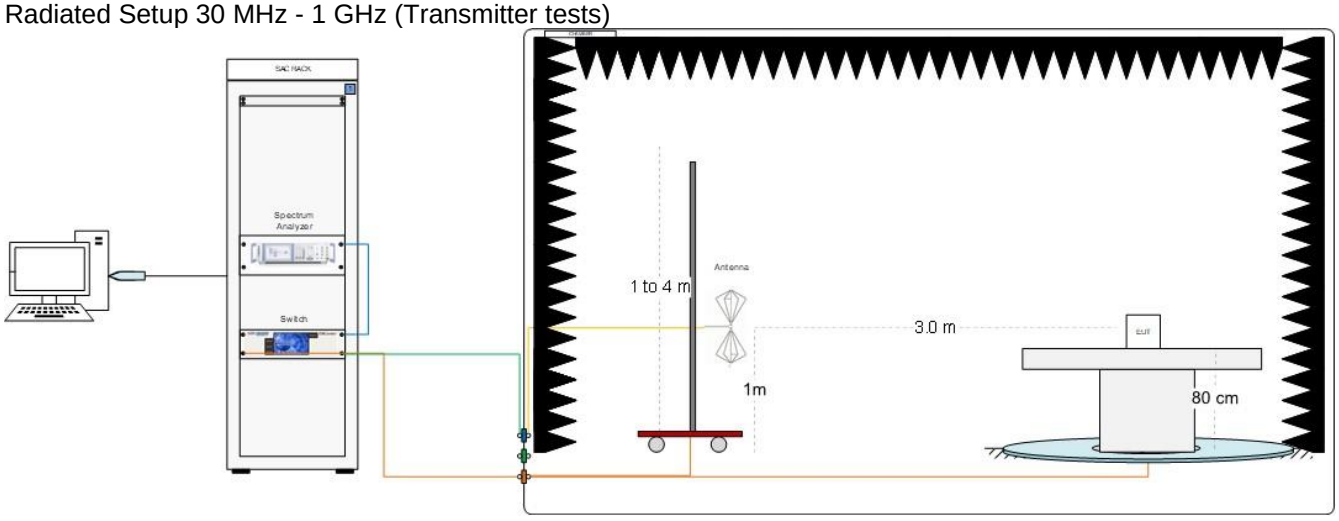
The DUT was installed in a test fixture and this test fixture is connected to a laptop computer and AC/DC power adapter. The laptop computer was used to configure the EUT to continuously transmit at a specified output power using all different modes and modulation schemes, using the Intel proprietary tool DRTU.

Conducted test setup

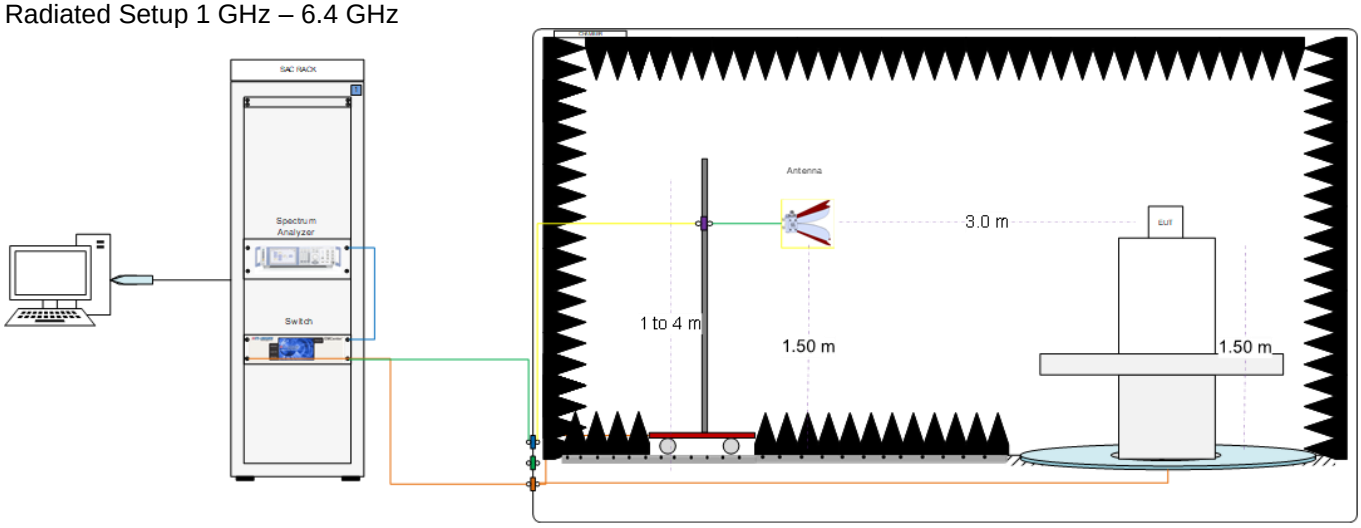


Radiated test setup

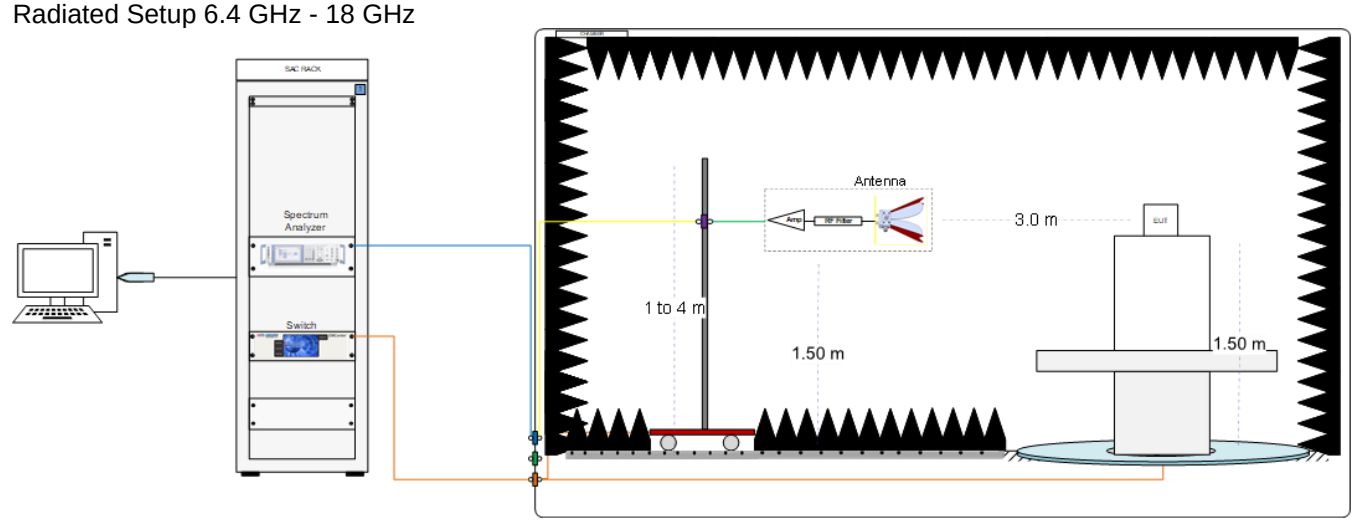
Radiated Setup 30 MHz - 1 GHz (Transmitter tests)



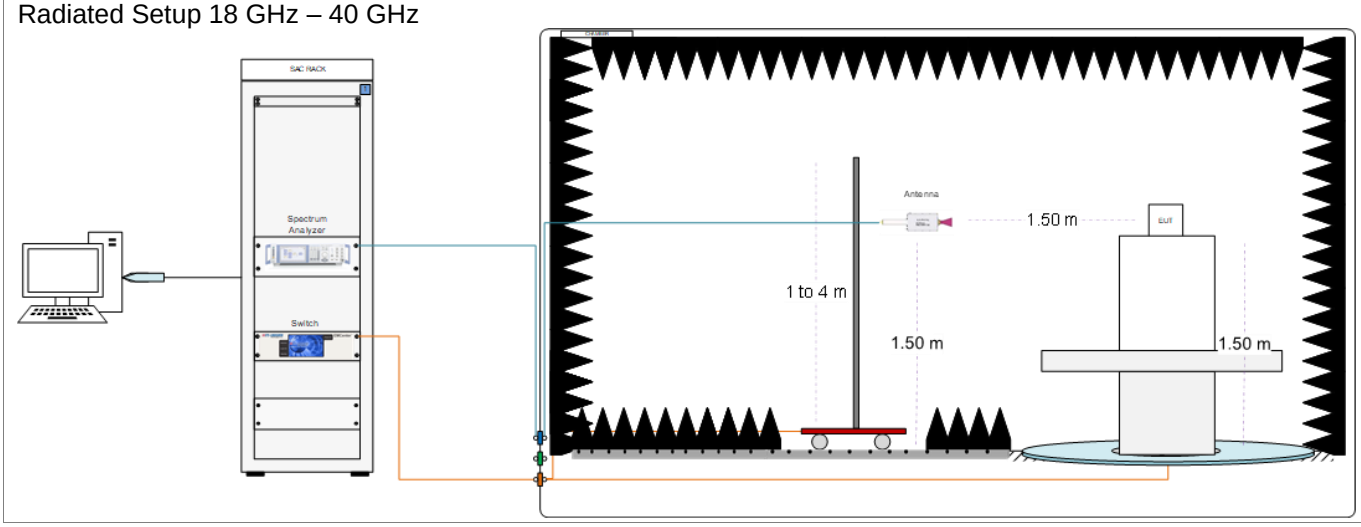
Radiated Setup 1 GHz – 6.4 GHz



Radiated Setup 6.4 GHz - 18 GHz



Radiated Setup 18 GHz – 40 GHz



Sample Calculation

The spurious received voltage V(dBµV) in the spectrum Analyzer is converted to Electric field strength using the transducer factor F corresponding to the Rx path Loss:

F (dB/m)= Rx Antenna Factor (dB/m) + Cable losses (dB) – Amplifiers Gain (dBi)
E (dBµV/m) = V(dBµV) + F (dB/m)

For field strength measurements made at other than the distance at which the applicable limit is specified, the field strength of the emission at the distance specified by the limit is deduced as follows:

$$E_{SpecLimit} = E_{Meas} + 20*\log(D_{Meas}/D_{SpecLimit})$$

where

$E_{SpecLimit}$ is the field strength of the emission at the distance specified by the limit, in dBµV/m
E_{Meas} is the field strength of the emission at the measurement distance, in dBµV/m
D_{Meas} is the measurement distance, in m
$D_{SpecLimit}$ is the distance specified by the limit, in m

A.2 Test Equipment List

Conducted setup

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0316	Spectrum Analyzer	FSV30	103309	Rohde & Schwarz	2019-09-02	2021-09-02
0442	RF cable 50cm	Coax 2.92mm Male To 2.92mm Male	N/A	PASTERNACK	2020-08-26	2021-02-26
1044	10dB Attenuator + MH4	N/A	N/A	N/A	N/A	N/A
0583	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-B9D6E	AVITECH	2019-09-06	2021-09-06
1002	Measurement SW v1.5.4.2	Octopi	N/A	Step AT	N/A	N/A

Radiated Setup #1

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0135	Anechoic Chamber	FACT3	5720	ETS-Lindgren	2020-07-06	2022-01-07
0136	Turn Table	ETS	-	ETS-Lindgren	N/A	N/A
0147	Switch & Positioning systems	EMC Center	00159757	ETS-Lindgren	N/A	N/A
0530	Measurement SW	EMC32, v10.40.10	100623	Rohde & Schwarz	N/A	N/A
1033	Boresight antenna mast	BAM 4.0-P	P/278/2890.01	Maturo	N/A	N/A
0420	Spectrum Analyzer	FSV40	101556	Rohde & Schwarz	2020-05-25	2022-05-25
0993	Biconical antenna 30 MHz – 1 GHz	UBAA9115 + BBVU9135 + DGA9552N	0286 + CH 9044	Schwarzbeck	2019-11-22	2021-11-22
0325	Horn antenna	3117	00157734	ETS-Lindgren	2019-08-12	2021-08-12
0141	Horn Antenna + Amplifier + HPF6.4	3117	00157736	ETS-Lindgren	2020-04-02	2022-04-02
0334	Double-Ridged Waveguide Horn with Pre-Amplifier 18 GHz to 40 GHz	3116C+PA	00169308bis + 00196308	ETS-Lindgren	2019-07-24	2021-07-24
0202	Cable 1m - 30MHz to 18 GHz	UFB311A-0-3360-50U300	MFR 64639223229-001	Micro-coax	2020-08-25	2021-02-25
0206	Cable 1.2m – 18 to 40 GHz	UFA147A-0-0480-200200	MFR 64639223720-003	Micro-coax	2020-08-25	2021-02-25
0263	Cable 1m - 1GHz to 18GHz	UFA147A	-	Utilflex	2020-08-25	2021-02-25
0369	Cable 2m - 26.5GHz to 40GHz	794-9191-2000A	E00327	Atem	2020-08-25	2021-02-25
0371	Cable 1m – 30 MHz - 18GHz	UFB311A-0-0590-50U50U	MFR 64639 223230-001	Micro-coax	2020-08-25	2021-02-25
0758	Cable 7.5m - 30MHz to 18GHz	0501051057000GX	18.23.181	Radiall	2020-08-25	2021-02-25
0809	Cable 7m - 18GHz to 40GHz	R286304009	-	Radiall	2020-08-25	2021-02-25
0859	Cable 2.5m - 30MHz to 18GHz	0500990992500KE	19.23.395	Radiall	2020-08-25	2021-02-25
0797	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-D0EB1A	Avtech	2019-07-04	2021-07-04

N/A: Not Applicable

Radiated Setup #2

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0337	Anechoic chamber	RFD-FA-100	5996	ETS Lindgren	2020-07-06	2022-07-06
0238	Switch & Positioner	EMCenter	00151232	ETS Lindgren	N/A	N/A
0382	Antenna Tower	2171B-3.0M	00150123	ETS Lindgren	N/A	N/A
0383	Turntable	-	-	ETS Lindgren	N/A	N/A
0329	Measurement SW	EMC32, v10.50.10	100401	Rohde & Schwarz	N/A	N/A
0133	Spectrum Analyzer	FSV40	101358	Rohde & Schwarz	2020-02-25	2022-02-25
0138	Double Ridge Horn (1- 18GHz)	3117	00152266	ETS Lindgren	2020-03-08	2022-03-08
0141	Horn Antenna 3117 + Amplifier + HPF6.4	3117	00157736	ETS-Lindgren	2020-04-02	2022-04-02
0334	Double Horn Ridged antenna	3116C-PA	00169308bis + 00196308	ETS-Lindgren	2019-07-24	2021-07-24
0871	RF Cable 1-18GHz, 1.5 m	0501050991200GX	19.21.710	Radiall	2020-08-20	2021-02-20
0860	RF Cable 1-18GHz, 1.2 m	2301761761200PJ	12.22.1104	Radiall	2020-08-20	2021-02-20
0275	RF Cable 1-18GHz - 6.5m	140-8500-11-51	001	Spectrum	2020-08-20	2021-02-20
0684	RF Cable 1GHz-18GHz 1.5m	-	-	Spirent	2020-08-20	2021-02-20
0679	RF Cable 18-40 GHz 6m	R286304009	1747364	Radiall	2020-08-20	2021-02-20
0028	RF Cable 1.2m 40MHz-40GHz	794-9191-1200A	DA585	Atem	2020-08-20	2021-02-20
0725	RF Cable 1-9.5GHz 1.2m	0500990991200KE	-	Radiall	2020-08-20	2021-02-20
0796	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-D4F316	Avtech	2019-07-05	2021-07-05

N/A: Not Applicable

Radiated Setup - shared equipments

Shared Radiated Equipment

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0616	Power Sensor	NRP-Z81	104385	Rohde & Schwarz	2020-04-08	2022-04-08
0617	Power Sensor	NRP-Z81	104386	Rohde & Schwarz	2020-04-08	2022-04-08
0618	Power Sensor	NRP-Z81	104382	Rohde & Schwarz	2020-04-08	2022-04-08

A.3 Measurement Uncertainty Evaluation

The system uncertainty evaluation is shown in the table below with a coverage factor of k = 2 to indicate a 95% level of confidence:

Measurement type	Uncertainty	Unit
Timing	±0.12	%
Power Spectral density	±1.47	dB
Occupied bandwidth	±2.07	%
Conducted Power	±1.03	dB
Conducted Spurious Emission <40 GHz	±3.45	dB
Radiated tests <1GHz	±5.26	dB
Radiated tests 1GHz – 40 GHz	±4.85	dB

Annex B. Test Results U-NII-1 & U-NII-2A

The herein test results were performed by:

Test case measurement	Test Engineer
26dB & 99% bandwidth	C.Requin
Power Limits. Maximum output power	C.Requin
Power spectral density	C.Requin
Undesirable emissions limits: Band Edge (conducted)	C.Requin
Undesirable emissions limits (radiated)	A.Lounes, N.Bui

B.1 Test Conditions

For all modes, the EUT can transmit at both CHAIN A DIV1 and CHAIN A DIV2 RF outputs individually, but not simultaneously.

The following data rates were selected based on preliminary testing that identified those rates as the worst cases for output power and spurious levels at the band edges:

Transmission	Mode	Bandwidth (MHz)	Worst Case Data Rate
CHAIN A – DIV 1/ DIV 2	802.11a	20	6Mbps
	802.11n	20	HT0
		40	HT0
	802.11ac	80	VHT0
	802.11ax	20	HE0
		40	HE0
		80	HE0

B.2 Test Results Tables U-NII-1

B.2.1 26dB & 99% Bandwidth

Test procedure

The conducted setup shown in section was used to measure the 26dB & 99% Bandwidth. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

Results tables

Mode	Rate	Antenna	Channel	Freq [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11a	6Mbps	CHAIN A DIV1	36	5180	23.65	16.48
			40	5200	23.90	16.64
			48	5240	34.20	19.92
		CHAIN A DIV2	36	5180	24.35	16.64
			40	5200	23.45	16.56
			48	5240	34.80	20.36
802.11n20	HT0	CHAIN A DIV1	36	5180	23.95	17.68
			40	5200	24.15	17.68
			48	5240	33.80	19.52
		CHAIN A DIV2	36	5180	24.35	17.84
			40	5200	24.20	17.72
			48	5240	35.70	20.48
802.11n40	HT0	CHAIN A DIV1	38	5190	42.75	36.08
			46	5230	43.47	36.08
		CHAIN A DIV2	38	5190	43.56	36.00
			46	5230	43.56	36.08
802.11ac80	VHT0	CHAIN A DIV1	42	5210	88.54	75.00
		CHAIN A DIV2			89.11	75.00

Max Value

Mode	Rate	Antenna	Channel	Freq [MHz]	RU config.	26dB BW [MHz]	99% BW [MHz]
802.11ax20	HE0	CHAIN A DIV1	36	5180	Full	23.35	18.92
					26/0	20.55	18.36
					52/37	22.05	18.36
					106/53	23.05	18.28
			40	5200	Full	23.10	18.92
			48	5240	Full	31.80	19.36
		CHAIN A DIV2	36	5180	Full	23.95	18.88
					26/0	20.65	18.44
					52/37	21.40	18.44
					106/53	23.00	18.24
			40	5200	Full	23.35	18.88
			48	5240	Full	35.15	19.80
802.11ax40	HE0	CHAIN A DIV1	38	5190	Full	42.48	37.60
					242/61	24.21	18.88
			46	5230	Full	42.84	37.60
		CHAIN A DIV2	38	5190	Full	42.39	37.44
					242/61	23.58	18.72
			46	5230	Full	42.30	37.52
802.11ax80	HE0	CHAIN A DIV1	42	5210	Full	84.55	76.80
					484/65	43.32	37.44
		CHAIN A DIV2	42	5210	Full	85.69	76.80
					484/65	42.94	37.44

Max Value

See Section B.3.5 for the screenshot results

B.2.2 Power Limits. Maximum Output power & Maximum power spectral density

Test limits

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

Test procedure

The Maximum Conducted Output Power was measured using the channel integration method according to section E) 2) e) (Method SA-2 Alternative) of FCC OET KDB 789033 D02
The maximum power spectral density (PSD) was measured using the method according to section F) (Method SA-2 Alternative) of FCC OET KDB 789033 D02

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

The conducted setup shown in section was used to measure the maximum conducted output power and power spectral density. The antenna terminal of the EUT is connected to the spectrum analyser through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

Results tables

Duty cycle

Mode	Rate	Antenna	Duty Cycle [%]
802.11a	6Mbps	CHAIN A DIV1	94.90%
		CHAIN A DIV2	94.90%
802.11n20	HT0	CHAIN A DIV1	98.68%
		CHAIN A DIV2	98.68%
802.11ax20	HE0	CHAIN A DIV1	98.68%
		CHAIN A DIV2	98.68%
802.11n40	HT0	CHAIN A DIV1	98.68%
		CHAIN A DIV2	98.68%
802.11ax40	HE0	CHAIN A DIV1	98.68%
		CHAIN A DIV2	98.68%
802.11ac80	VHT0	CHAIN A DIV1	98.60%
		CHAIN A DIV2	98.60%
802.11ax80	HE0	CHAIN A DIV1	98.60%
		CHAIN A DIV2	98.60%

Maximum output power

Mode	Rate	Channel	Freq [MHz]	Antenna	Average Conducted Ouput Power [dBm]	Avg Max* Conducted Ouput Power [dBm]	Avg Max*. EIRP [dBm]	Avg Max* Conducted Power [mW]
802.11a	6Mbps	36	5180	CHAIN A DIV1	15.61	15.84	20.84	38.35
				CHAIN A DIV2	15.45	15.68	20.68	36.96
		40	5200	CHAIN A DIV1	17.63	17.86	22.86	61.06
				CHAIN A DIV2	17.37	17.60	22.60	57.51
		48	5240	CHAIN A DIV1	21.18	21.41	26.41	138.27
				CHAIN A DIV2	21.32	21.55	26.55	142.80
802.11n20	HT0	36	5180	CHAIN A DIV1	15.57	15.57	20.57	36.06
				CHAIN A DIV2	15.35	15.35	20.35	34.28
		40	5200	CHAIN A DIV1	17.56	17.56	22.56	57.02
				CHAIN A DIV2	17.49	17.49	22.49	56.10
		48	5240	CHAIN A DIV1	21.14	21.14	26.14	130.02
				CHAIN A DIV2	21.19	21.19	26.19	131.52
802.11n40	HT0	38	5190	CHAIN A DIV1	14.96	14.96	19.96	31.33
				CHAIN A DIV2	14.77	14.77	19.77	29.99
		46	5230	CHAIN A DIV1	16.63	16.63	21.63	46.03
				CHAIN A DIV2	16.40	16.40	21.40	43.65
802.11ac80	VHT0	42	5210	CHAIN A DIV1	14.22	14.22	19.22	26.42
				CHAIN A DIV2	14.52	14.52	19.52	28.31

*Maximum values are the duty cycle compensated values calculated from the average (measured) values

Max Value

Min Value

Mode	Rate	Channel	Freq [MHz]	Antenna	RU config.	Average Conducted Ouput Power [dBm]	Avg Max* Conducted Ouput Power [dBm]	Avg Max*. EIRP [dBm]	Avg Max* Conducted Power [mW]
802.11ax20	HE0	36	5180	CHAIN A DIV1	Full	15.35	15.35	20.35	34.28
					26/0	13.66	13.66	18.66	23.23
					52/37	16.33	16.33	21.33	42.95
					106/53	16.11	16.11	21.11	40.83
				CHAIN A DIV2	Full	15.18	15.18	20.18	32.96
					26/0	13.83	13.83	18.83	24.15
					52/37	15.83	15.83	20.83	38.28
					106/53	15.98	15.98	20.98	39.63
		40	5200	CHAIN A DIV1	Full	17.57	17.57	22.57	57.15
				CHAIN A DIV2	Full	17.64	17.64	22.64	58.08
		48	5240	CHAIN A DIV1	Full	21.09	21.09	26.09	128.53
				CHAIN A DIV2	Full	21.18	21.18	26.18	131.22
802.11ax40	HE0	38	5190	CHAIN A DIV1	Full	14.70	14.70	19.70	29.51
					242/61	15.57	15.57	20.57	36.06
				CHAIN A DIV2	Full	14.56	14.56	19.56	28.58
					242/61	15.06	15.06	20.06	32.06
		46	5230	CHAIN A DIV1	Full	16.49	16.49	21.49	44.57
				CHAIN A DIV2	Full	16.48	16.48	21.48	44.46
802.11ax80	HE0	42	5210	CHAIN A DIV1	Full	14.51	14.51	19.51	28.25
					484/65	14.16	14.16	19.16	26.06
				CHAIN A DIV2	Full	14.48	14.48	19.48	28.05
					484/65	14.14	14.14	19.14	25.94

*Maximum values are the duty cycle compensated values calculated from the average (measured) values

Max Value

Min Value

Maximum power spectral Density (PSD)

Mode	Rate	Channel	Freq [MHz]	Antenna	Average conducted PSD [dBm/MHz]	Maximum* conducted PSD [dBm/MHz]
802.11a	6Mbps	36	5180	CHAIN A DIV1	4.88	5.11
				CHAIN A DIV2	4.64	4.87
		40	5200	CHAIN A DIV1	6.84	7.07
				CHAIN A DIV2	6.57	6.80
		48	5240	CHAIN A DIV1	10.34	10.57
				CHAIN A DIV2	10.47	10.70
802.11n20	HT0	36	5180	CHAIN A DIV1	4.55	4.55
				CHAIN A DIV2	4.32	4.32
		40	5200	CHAIN A DIV1	6.56	6.56
				CHAIN A DIV2	6.48	6.48
		48	5240	CHAIN A DIV1	10.10	10.10
				CHAIN A DIV2	10.14	10.14
802.11n40	HT0	38	5190	CHAIN A DIV1	0.57	0.57
				CHAIN A DIV2	0.37	0.37
		46	5230	CHAIN A DIV1	2.18	2.18
				CHAIN A DIV2	1.93	1.93
802.11ac80	VHT0	42	5210	CHAIN A DIV1	-3.25	-3.25
				CHAIN A DIV2	-2.99	-2.99

* Maximum values are the duty cycle compensated values calculated from the measured average values

Mode	Rate	#Ch	Freq [MHz]	Antenna	RU config.	Average cond.PSD [dBm/MHz]	Max*cond.PSD [dBm/MHz]
802.11ax20	HE0	36	5180	CHAIN A DIV1	Full	4.16	4.16
					26/0	10.82	10.82
					52/37	10.56	10.56
					106/53	7.26	7.26
				CHAIN A DIV2	Full	4.00	4.00
					26/0	10.99	10.99
					52/37	10.07	10.07
					106/53	7.14	7.14
		40	5200	CHAIN A DIV1	Full	6.38	6.38
				CHAIN A DIV2	Full	6.44	6.44
		48	5240	CHAIN A DIV1	Full	9.88	9.88
				CHAIN A DIV2	Full	9.96	9.96
802.11ax40	HE0	38	5190	CHAIN A DIV1	Full	0.07	0.07
					242/61	4.29	4.29
				CHAIN A DIV2	Full	-0.06	-0.06
					242/61	3.78	3.78
		46	5230	CHAIN A DIV1	Full	1.86	1.86
				CHAIN A DIV2	Full	1.84	1.84
802.11ax80	HE0	42	5210	CHAIN A DIV1	Full	-3.05	-3.05
					484/65	-0.41	-0.41
				CHAIN A DIV2	Full	-3.11	-3.11
					484/65	-0.41	-0.41

* Maximum values are the duty cycle compensated values calculated from the measured average values

See Section B.3.6 for the screenshot results

B.2.3 Undesirable emission limits : out of band (Conducted)

Test limits

<table>
<tr><th>FCC part</th><th>Limits</th></tr>
<tr><td>15.407 (b) (1)</td><td>For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.</td></tr>
<tr><td>15.209</td><td>Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):
<table>
<tr><th>Freq Range (MHz)</th><th>Field Strength (µV/m)</th><th>Field Strength (dBµV/m)</th><th>Meas. Distance (m)</th></tr>
<tr><td>30-88</td><td>100</td><td>40</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>43.5</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>46</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>54</td><td>3</td></tr>
</table>
The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.</td></tr>
</table>

Test procedure

The conducted setup shown in section was used to measure undesirable emissions on the out of band domain. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss and the declared antenna gain.

Both lower and upper side of the out of band were performed using the integration method as defined in the out of band measurements section (paragraph II.G.3.d) of 789033 D02 v02r01

In case of out of band measurements falling in restricted bands, the declared antenna gain is also compensated in the graph.

For out of band measurements falling in restricted bands, the following limits in dBm were applied for the average detector after the conversion from the limits detailed above in dBµV/m, according to FCC 47 CFR part 15 - Subpart C – §15.209(a). The limits in dBm for peak detector are 20dB above the indicated values in the table.

§15.209(a)			Converted values	
Freq Range (MHz)	Distance (m)	Field strength (microvolts/meter)	Field strength (dB microvolts/meter)	Power (dBm)
Above 960	3	500	54.0	-41.2

See Section B.3.7 for the screenshot results.

B.2.4 Radiated spurious emission

Standard references

<table>
<tr><th>FCC part</th><th>Limits</th></tr>
<tr><td>15.407 (b) (1)</td><td>For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.</td></tr>
<tr><td>15.209</td><td>Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):
<table>
<tr><th>Freq Range (MHz)</th><th>Field Strength (µV/m)</th><th>Field Strength (dBµV/m)</th><th>Meas. Distance (m)</th></tr>
<tr><td>30-88</td><td>100</td><td>40</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>43.5</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>46</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>54</td><td>3</td></tr>
</table>
The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.</td></tr>
</table>

Test procedure

The radiated setup shown in section was used to measure the radiated spurious emissions.
Depending of the frequency range and bands being tested, different antennas and filters were used.
The final measurement is done by varying the antenna height, the EUT azimuth over 360º and for both Vertical and Horizontal polarizations.

The radiated spurious emission was measured on the worst case configuration selected from the section B.1 and using the low, middle and high channels.

Test Results

Radiated spurious - 30 MHz – 1 GHz

Radiated Spurious – All modes

Frequency	Quasi-Peak	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dB	---
37.8	30.0	40.0	10.0	V
74.9	31.4	40.0	8.6	V
136.9	38.1	43.5	5.4	H
261.5	40.5	46.0	5.5	H

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

802.11a

1 GHz – 40 GHz, 802.11a, 6Mbps, Chain A DIV1

Radiated Spurious – CH36

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3379.5	59.3	---	68.2	8.9	V
10360.4	51.4	---	68.2	16.8	V
15544.2	52.0	---	74.0	22.0	V
15544.2	---	43.4	54.0	10.6	V
39756.5	56.9	---	74.0	17.1	V
39756.5	---	45.6	54.0	8.4	H

Radiated Spurious – CH40

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3369.5	58.5	---	68.2	9.7	H
10403.5	54.0	---	68.2	14.2	V
15597.4	53.7	---	74.0	20.3	H
15597.4	---	44.5	54.0	9.5	V
39595.5	---	46.5	54.0	7.5	V
39596.9	57.6	---	74.0	16.4	V

Radiated Spurious – CH48

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3377.5	58.9	---	68.2	9.3	V
10476.9	50.9	---	68.2	17.3	V
15722.0	55.3	---	74.0	18.7	V
15722.0	---	47.3	54.0	**6.7**	V
20956.6	---	38.2	54.0	15.8	V
20960.8	51.6	---	74.0	22.4	V

1 GHz – 40 GHz, 802.11a, 6Mbps, Chain A DIV2

Radiated Spurious – CH36

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3392.0	59.0	---	68.2	9.2	H
10361.4	54.6	---	68.2	13.6	H
15544.2	53.9	---	74.0	20.1	V
15544.2	---	44.4	54.0	9.6	V
39676.5	58.1	---	74.0	15.9	H
39676.5	---	45.9	54.0	8.1	V

Radiated Spurious – CH40

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3368.5	59.0	---	68.2	9.2	H
10397.6	53.3	---	68.2	14.9	H
15599.3	53.5	---	74.0	20.5	V
15599.3	---	46.8	54.0	7.2	V
20799.8	---	38.1	54.0	15.9	V
20800.3	48.0	---	74.0	26.0	V

Radiated Spurious – CH48

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3375.5	58.8	---	68.2	9.4	H
10479.3	52.3	---	68.2	15.9	H
15722.0	56.1	---	74.0	17.9	V
15722.0	---	47.3	54.0	6.7	V
20960.8	---	40.9	54.0	13.2	V
20963.2	52.0	---	74.0	22.0	V
31442.0	53.2	---	74.0	20.8	H
31442.0	---	43.4	54.0	10.6	H

802.11n

1 GHz – 40 GHz, 802.11n20, HT0, Chain A DIV1

Radiated Spurious – CH36

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3298.0	58.9	---	68.2	9.3	V
10361.4	52.2	---	68.2	16.0	H
15541.8	53.3	---	74.0	20.7	V
15541.8	---	43.1	54.0	10.9	V
20720.0	---	37.4	54.0	16.6	V
20724.7	47.0	---	74.0	27.0	H

Radiated Spurious – CH40

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3378.0	58.9	---	68.2	9.3	H
10401.5	55.2	---	68.2	13.0	V
15603.6	53.3	---	74.0	20.7	V
15603.6	---	44.6	54.0	9.4	V
39678.4	57.9	---	74.0	16.1	H
39679.4	---	46.2	54.0	7.8	V

Radiated Spurious – CH48

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3137.5	59.5	---	68.2	8.8	V
10480.3	51.6	---	68.2	16.6	V
15722.0	55.8	---	74.0	18.2	V
15722.0	---	47.0	54.0	7.0	V
20965.1	---	38.4	54.0	15.6	V
20968.9	50.4	---	74.0	23.6	V

1 GHz – 40 GHz, 802.11n20, HT0, Chain A DIV2

Radiated Spurious – CH36

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3390.0	58.8	---	68.2	9.4	V
10363.3	56.6	---	68.2	11.6	H
15545.1	53.6	---	74.0	20.4	V
15545.1	---	44.2	54.0	9.8	V
39670.2	57.6	---	74.0	16.4	V
39670.7	---	46.5	54.0	7.5	H

Radiated Spurious – CH40

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3377.0	59.0	---	68.2	9.2	V
10405.9	53.9	---	68.2	14.3	H
15599.3	55.8	---	74.0	18.2	V
15599.3	---	47.0	54.0	7.0	V
20796.0	---	36.7	54.0	17.3	V
20803.1	48.4	---	74.0	25.6	V

Radiated Spurious – CH48

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3309.5	59.3	---	68.2	8.9	V
10478.4	51.1	---	68.2	17.1	H
15725.0	58.2	---	74.0	15.8	V
15725.0	---	47.7	54.0	**6.3**	V
20962.7	---	41.1	54.0	12.9	V
20967.4	52.2	---	74.0	21.8	V
31435.7	54.0	---	74.0	20.0	H
31436.7	---	43.4	54.0	10.6	H

1 GHz– 40 GHz, 802.11n40, HT0, Chain A DIV1

Radiated Spurious – CH38

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3296.0	58.9	---	68.2	9.3	H
10379.8	49.7	---	68.2	18.5	V
15593.5	50.5	---	74.0	23.5	H
15593.5	---	41.8	54.0	12.2	V
39443.6	57.6	---	74.0	16.4	V
39451.8	---	45.5	54.0	8.5	H

Radiated Spurious – CH46

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3316.0	58.9	---	68.2	9.3	H
10455.6	50.6	---	68.2	17.6	V
15692.6	51.3	---	74.0	22.7	V
15692.6	---	43.5	54.0	10.5	V
39616.7	57.0	---	74.0	16.9	H
39616.7	---	45.6	54.0	8.4	H

1 GHz – 40 GHz, 802.11n40, HT0, Chain A DIV2

Radiated Spurious – CH38

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3377.0	59.6	---	68.2	8.6	H
10373.5	51.6	---	68.2	16.6	H
15575.1	---	42.5	54.0	11.6	V
15575.1	55.6	---	74.0	18.4	V
39597.9	57.4	---	74.0	16.6	H
39598.9	---	45.8	54.0	8.2	H

Radiated Spurious – CH46

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3250.0	59.1	---	68.2	9.1	H
10463.9	48.5	---	68.2	19.7	H
15703.2	52.8	---	74.0	21.2	V
15703.2	---	44.8	54.0	9.2	V
39701.1	57.3	---	74.0	16.7	H
39701.6	---	45.8	54.0	**8.2**	V

802.11ac

1 GHz – 40 GHz, 802.11ac80, VHT0, Chain A DIV1

Radiated Spurious – CH42

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3375.5	59.8	---	68.2	8.4	H
10403.9	49.0	---	68.2	19.2	V
15639.9	57.7	---	74.0	16.3	V
15639.9	---	49.5	54.0	**4.5**	V
20839.9	---	38.4	54.0	15.7	V
20843.2	47.7	---	74.0	26.3	V

1 GHz – 40 GHz, 802.11ac80, VHT0, Chain A DIV2

Radiated Spurious – CH42

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3295.0	59.2	---	68.2	9.0	H
10412.1	48.8	---	68.2	19.4	H
15638.4	51.6	---	74.0	22.4	V
15638.4	---	42.8	54.0	11.2	V
20870.6	---	37.5	54.0	16.5	V
20871.6	49.1	---	74.0	24.9	V

802.11ax

1 GHz – 40 GHz, 802.11ax20, HE0, Chain A DIV1

Radiated Spurious – CH36

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3311.5	59.1	---	68.2	9.1	V
10344.0	60.0	---	68.2	8.2	H
15514.7	56.7	---	74.0	17.3	V
15514.7	---	49.4	54.0	4.6	V
39485.6	57.1	---	74.0	16.9	H
39486.0	---	45.1	54.0	8.9	V

Radiated Spurious – CH40

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3287.0	60.1	---	68.2	8.1	V
12508.4	---	36.6	54.0	17.4	H
12508.4	51.2	---	74.0	22.8	H
15574.6	55.8	---	74.0	18.2	H
15574.6	---	48.8	54.0	5.2	H
39702.5	57.1	---	74.0	16.9	V
39702.5	---	45.7	54.0	8.3	H

Radiated Spurious – CH48

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3387.5	59.1	---	68.2	9.1	V
10463.9	47.6	---	68.2	20.6	H
15695.0	56.0	---	74.0	18.0	V
15695.0	---	49.8	54.0	4.2	H
39528.9	57.4	---	74.0	16.6	H
39528.9	---	45.0	54.0	9.0	H

1 GHz – 40 GHz, 802.11ax20, HE0, Chain A DIV2

Radiated Spurious – CH36

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3153.5	59.6	---	68.2	8.6	H
10344.0	62.7	---	68.2	5.5	H
15514.7	57.6	---	74.0	16.4	V
15514.7	---	50.5	54.0	**3.5**	V
39621.5	57.8	---	74.0	16.2	V
39621.5	---	45.6	54.0	8.4	V

Radiated Spurious – CH40

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3398.5	60.0	---	68.2	8.2	H
10383.6	51.0	---	68.2	17.2	H
15574.1	54.6	---	74.0	19.4	V
15574.1	---	47.7	54.0	6.3	H
39706.9	57.7	---	74.0	16.3	V
39710.7	---	45.8	54.0	8.2	V

Radiated Spurious – CH48

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5471.0	54.0	---	68.2	14.2	H
10463.9	47.5	---	68.2	20.7	V
15694.5	58.5	---	74.0	15.5	V
15694.5	---	50.2	54.0	3.8	H
39714.6	57.7	---	74.0	16.3	H
39714.6	---	45.7	54.0	8.3	V

1 GHz – 40 GHz, 802.11ax40, HE0, Chain A DIV1

Radiated Spurious – CH38F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3368.0	59.5	---	68.2	8.7	V
10344.0	57.5	---	68.2	10.7	H
15516.1	56.1	---	74.0	17.9	V
15516.1	---	49.2	54.0	4.8	V
39683.2	---	46.0	54.0	8.0	H
39683.7	57.4	---	74.0	16.6	H

Radiated Spurious – CH46

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5452.2	53.0	---	74.0	21.0	H
5452.2	---	42.7	54.0	11.3	H
15636.5	56.5	---	74.0	17.5	V
15636.5	---	47.2	54.0	6.8	V
39618.6	57.2	---	74.0	16.8	H
39619.1	---	46.2	54.0	7.8	H

1 GHz – 40 GHz, 802.11ax40, HE0, Chain A DIV2

Radiated Spurious – CH38

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3236.0	59.0	---	68.2	9.2	H
10344.0	61.6	---	68.2	6.6	H
15516.1	---	51.3	54.0	**2.7**	V
15516.6	58.3	---	74.0	15.7	V
39609.9	57.8	---	74.0	16.2	H
39609.9	---	46.2	54.0	7.8	H

Radiated Spurious – CH46

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5452.2	54.0	---	74.0	20.0	V
5452.2	---	43.3	54.0	10.7	V
10423.3	48.7	---	68.2	19.5	V
15636.5	58.2	---	74.0	15.8	H
15636.5	---	48.7	54.0	5.3	H
39930.6	57.9	---	74.0	16.1	V
39930.6	---	45.8	54.0	8.2	V

1 GHz – 40 GHz, 802.11ax80, HE0, Chain A DIV1

Radiated Spurious – CH42

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3388.0	59.0	---	68.2	9.2	H
15515.7	53.7	---	74.0	20.3	H
15515.7	---	47.0	54.0	**7.0**	H
39519.8	57.0	---	74.0	17.0	H
39519.8	---	45.3	54.0	8.7	V

1 GHz – 40 GHz, 802.11ax80, HE0, Chain A DIV2

Radiated Spurious – CH42

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3874.5	50.5	---	74.0	23.6	V
3874.5	---	41.2	54.0	12.8	V
6487.0	47.2	---	68.2	21.0	H
10344.0	48.6	---	68.2	19.6	H
15515.7	---	42.6	54.0	11.3	H
15515.7	52.2	---	74.0	21.8	H
39579.6	57.1	---	74.0	16.9	H
39592.6	---	46.0	54.0	8.1	H

B.3 Test Results Tables U-NII-2A

B.3.1 26dB & 99% Bandwidth

Test procedure

The conducted setup shown in section was used to measure the 26dB & 99% Bandwidth. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

Results tables

Mode	Rate	Antenna	Channel	Freq [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11a	6Mbps	CHAIN A DIV1	52	5260	34.80	19.48
			56	5280	29.40	18.80
			64	5320	23.60	16.56
		CHAIN A DIV2	52	5260	32.60	19.40
			56	5280	29.80	18.72
			64	5320	23.75	16.64
802.11n20	HT0	CHAIN A DIV1	52	5260	34.55	19.52
			56	5280	32.80	18.48
			64	5320	23.80	17.64
		CHAIN A DIV2	52	5260	35.75	20.96
			56	5280	29.90	18.44
			64	5320	23.85	17.76
802.11n40	HT0	CHAIN A DIV1	54	5270	43.29	36.16
			62	5310	43.29	36.08
		CHAIN A DIV2	54	5270	43.02	36.16
			62	5310	43.47	36.08
802.11ac80	VHT0	CHAIN A DIV1	58	5290	88.35	75.00
		CHAIN A DIV2			87.21	75.00

Max Value

Mode	Rate	Antenna	Channel	Freq [MHz]	RU config.	26dB BW [MHz]	99% BW [MHz]
802.11ax20	HE0	CHAIN A DIV1	52	5260	Full	32.15	19.44
			56	5280	Full	27.70	19.04
			64	5320	Full	23.15	19.00
					26/8	21.00	18.32
					52/40	21.80	18.28
					106/54	23.05	17.52
		CHAIN A DIV2	52	5260	Full	32.20	19.60
			56	5280	Full	28.80	19.08
			64	5320	Full	23.55	18.92
					26/8	20.90	18.12
					52/40	22.40	18.40
					106/54	23.20	18.28
802.11ax40	HE0	CHAIN A DIV1	54	5270	Full	42.93	37.52
			62	5310	Full	42.66	37.60
					242/62	23.58	18.80
		CHAIN A DIV2	54	5270	Full	42.12	37.52
			62	5310	Full	42.93	37.44
					242/62	23.40	18.80
802.11ax80	HE0	CHAIN A DIV1	58	5290	Full	83.79	76.80
					484/66	43.13	37.44
		CHAIN A DIV2			Full	83.03	76.68
					484/66	42.94	37.44

Max Value

See Section B.3.5 for the screenshot results

B.3.2 Power Limits. Maximum Output power & Maximum power spectral density

Test limits

FCC part	Limits
15.407 (a) (2)	For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band.

Test procedure

The Maximum Conducted Output Power was measured using the channel integration method according to section E) 2) e) (Method SA-2 Alternative) of FCC OET KDB 789033 D02
The maximum power spectral density (PSD) was measured using the method according to section F) (Method SA-2 Alternative) of FCC OET KDB 789033 D02

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

The conducted setup shown in section was used to measure the maximum conducted output power and power spectral density. The antenna terminal of the EUT is connected to the spectrum analyser through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

Results tables

Duty cycle

Mode	Rate	Antenna	Duty Cycle [%]
802.11a	6Mbps	CHAIN A DIV1	94.90%
		CHAIN A DIV2	94.90%
802.11n20	HT0	CHAIN A DIV1	98.68%
		CHAIN A DIV2	98.68%
802.11ax20	HE0	CHAIN A DIV1	98.68%
		CHAIN A DIV2	98.68%
802.11n40	HT0	CHAIN A DIV1	98.68%
		CHAIN A DIV2	98.68%
802.11ax40	HE0	CHAIN A DIV1	98.68%
		CHAIN A DIV2	98.68%
802.11ac80	VHT0	CHAIN A DIV1	98.60%
		CHAIN A DIV2	98.60%
802.11ax80	HE0	CHAIN A DIV1	98.60%
		CHAIN A DIV2	98.60%

Maximum output power

Mode	Rate	Channel	Freq [MHz]	Antenna	Average Conducted Ouput Power [dBm]	Avg Max* Conducted Ouput Power [dBm]	Avg Max*. EIRP [dBm]	Avg Max* Conducted Power [mW]
802.11a	6Mbps	52	5260	CHAIN A DIV1	21.22	21.45	26.45	139.55
				CHAIN A DIV2	20.99	21.22	26.22	132.35
		56	5280	CHAIN A DIV1	20.97	21.20	26.20	131.74
				CHAIN A DIV2	20.76	20.99	25.99	125.53
		64	5320	CHAIN A DIV1	16.73	16.96	21.96	49.63
				CHAIN A DIV2	16.50	16.73	21.73	47.07
802.11n20	HT0	52	5260	CHAIN A DIV1	21.17	21.17	26.17	130.92
				CHAIN A DIV2	21.27	21.27	26.27	133.97
		56	5280	CHAIN A DIV1	20.91	20.91	25.91	123.31
				CHAIN A DIV2	20.67	20.67	25.67	116.68
		64	5320	CHAIN A DIV1	16.64	16.64	21.64	46.13
				CHAIN A DIV2	16.46	16.46	21.46	44.26
802.11n40	HT0	54	5270	CHAIN A DIV1	17.62	17.62	22.62	57.81
				CHAIN A DIV2	17.54	17.54	22.54	56.75
		62	5310	CHAIN A DIV1	15.00	15.00	20.00	31.62
				CHAIN A DIV2	15.07	15.07	20.07	32.14
802.11ac80	VHT0	58	5290	CHAIN A DIV1	15.67	15.67	20.67	36.90
				CHAIN A DIV2	15.56	15.56	20.56	35.97

*Maximum values are the duty cycle compensated values calculated from the average (measured) values

Max Value

Min Value

Mode	Rate	Channel	Freq [MHz]	Antenna	RU config.	Average Conducted Ouput Power [dBm]	Avg Max* Conducted Ouput Power [dBm]	Avg Max*. EIRP [dBm]	Avg Max* Conducted Power [mW]
802.11ax20	HE0	52	5260	CHAIN A DIV1	Full	21.08	21.08	26.08	128.23
				CHAIN A DIV2	Full	21.26	21.26	26.26	133.66
		56	5280	CHAIN A DIV1	Full	20.61	20.61	25.61	115.08
				CHAIN A DIV2	Full	20.47	20.47	25.47	111.43
		64	5320	CHAIN A DIV1	Full	16.37	16.37	21.37	43.35
					26/8	13.81	13.81	18.81	24.04
					52/40	16.44	16.44	21.44	44.06
					106/54	16.41	16.41	21.41	43.75
				CHAIN A DIV2	Full	15.65	15.65	20.65	36.73
					26/8	13.75	13.75	18.75	23.71
					52/40	16.65	16.65	21.65	46.24
					106/54	16.46	16.46	21.46	44.26
802.11ax40	HE0	54	5270	CHAIN A DIV1	Full	17.51	17.51	22.51	56.36
				CHAIN A DIV2	Full	17.59	17.59	22.59	57.41
		62	5310	CHAIN A DIV1	Full	15.01	15.01	20.01	31.70
					242/62	16.60	16.60	21.60	45.71
				CHAIN A DIV2	Full	15.17	15.17	20.17	32.89
					242/62	16.52	16.52	21.52	44.87
802.11ax80	HE0	58	5290	CHAIN A DIV1	Full	15.52	15.52	20.52	35.65
					484/66	15.10	15.10	20.10	32.36
				CHAIN A DIV2	Full	15.24	15.24	20.24	33.42
					484/66	15.07	15.07	20.07	32.14

*Maximum values are the duty cycle compensated values calculated from the average (measured) values

Max Value

Min Value

Maximum Power Spectral Density (PSD)

Mode	Rate	Channel	Freq [MHz]	Antenna	Average conducted PSD [dBm/MHz]	Maximum* conducted PSD [dBm/MHz]
802.11a	6Mbps	52	5260	CHAIN A DIV1	10.38	10.61
				CHAIN A DIV2	10.15	10.38
		56	5280	CHAIN A DIV1	10.13	10.36
				CHAIN A DIV2	9.93	10.16
		64	5320	CHAIN A DIV1	5.92	6.15
				CHAIN A DIV2	5.71	5.94
802.11n20	HT0	52	5260	CHAIN A DIV1	10.13	10.13
				CHAIN A DIV2	10.20	10.20
		56	5280	CHAIN A DIV1	9.88	9.88
				CHAIN A DIV2	9.65	9.65
		64	5320	CHAIN A DIV1	5.64	5.64
				CHAIN A DIV2	5.44	5.44
802.11n40	HT0	54	5270	CHAIN A DIV1	3.16	3.16
				CHAIN A DIV2	3.06	3.06
		62	5310	CHAIN A DIV1	0.60	0.60
				CHAIN A DIV2	0.62	0.62
802.11ac80	VHT0	58	5290	CHAIN A DIV1	-1.85	-1.85
				CHAIN A DIV2	-1.97	-1.97

* Maximum values are the duty cycle compensated values calculated from the measured average values

Mode	Rate	#Ch	Freq [MHz]	Antenna	RU config.	Average conducted PSD [dBm/MHz]	Maximum* conducted PSD [dBm/MHz]
802.11ax20	HE0	52	5260	CHAIN A DIV1	Full	9.87	9.87
				CHAIN A DIV2	Full	10.03	10.03
		56	5280	CHAIN A DIV1	Full	9.42	9.42
				CHAIN A DIV2	Full	9.28	9.28
		64	5320	CHAIN A DIV1	Full	5.16	5.16
					26/8	10.98	10.98
					52/40	10.68	10.68
					106/54	7.58	7.58
				CHAIN A DIV2	Full	4.44	4.44
					26/8	10.92	10.92
					52/40	10.88	10.88
					106/54	7.62	7.62
802.11ax40	HE0	54	5270	CHAIN A DIV1	Full	2.88	2.88
				CHAIN A DIV2	Full	2.97	2.97
		62	5310	CHAIN A DIV1	Full	0.44	0.44
					242/62	5.28	5.28
				CHAIN A DIV2	Full	0.55	0.55
					242/62	5.19	5.19
802.11ax80	HE0	58	5290	CHAIN A DIV1	Full	-2.07	-2.07
					484/66	0.45	0.45
				CHAIN A DIV2	Full	-2.39	-2.39
					484/66	0.52	0.52

* Maximum values are the duty cycle compensated values calculated from the measured average values

See Section B.3.6 for the screenshot results

B.3.3 Undesirable emissions limits : out of band (Conducted)

Test limits

<table>
<tr><th>FCC part</th><th>Limits</th></tr>
<tr><td>15.407 (b) (2)</td><td>For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz.</td></tr>
<tr><td>15.209</td><td>Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):
<table>
<tr><th>Freq Range (MHz)</th><th>Field Strength (µV/m)</th><th>Field Strength (dBµV/m)</th><th>Meas. Distance (m)</th></tr>
<tr><td>30-88</td><td>100</td><td>40</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>43.5</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>46</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>54</td><td>3</td></tr>
</table>
The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.</td></tr>
</table>

Test procedure

The conducted setup shown in section was used to measure undesirable emissions on the Band Edge domain. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss and the declared antenna gain.

Both lower and upper side of the out of band were performed using the integration method as defined in the out of band measurements section (paragraph II.G.3.d) of 789033 D02 v02r01.
In case of out of band measurements falling in restricted bands, the declared antenna gain is also compensated in the graph.

For out of band measurements falling in restricted bands, the following limits in dBm were applied for the average detector after the conversion from the limits detailed above in dBµV/m, according to FCC 47 CFR part 15 - Subpart C – §15.209(a). The limits in dBm for peak detector are 20dB above the indicated values in the table.

§15.209(a)			Converted values	
Freq Range (MHz)	Distance (m)	Field strength (microvolts/meter)	Field strength (dB microvolts/meter)	Power (dBm)
960-25000	3	500	53.98	-41.2

See Section B.3.7 for the screenshot results.

B.3.4 Radiated spurious emission

Standard references

<table>
<tr><th>FCC part</th><th>Limits</th></tr>
<tr><td>15.407 (a) (2)</td><td>For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band.</td></tr>
<tr><td>15.209</td><td>Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):
<table>
<tr><th>Freq Range (MHz)</th><th>Field Strength (µV/m)</th><th>Field Strength (dBµV/m)</th><th>Meas. Distance (m)</th></tr>
<tr><td>30-88</td><td>100</td><td>40</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>43.5</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>46</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>54</td><td>3</td></tr>
</table>
The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.</td></tr>
</table>

Test procedure

The radiated setups shown in section were used to measure the radiated spurious emissions.
Depending of the frequency range and bands being tested, different antennas and filters were used.
The final measurement is done by varying the antenna height, the EUT azimuth over 360º and for both Vertical and Horizontal polarizations.

The radiated spurious emission was measured on the worst case configuration selected from the section B.2.2 and using the low, middle and high channels.

Test Results

Radiated spurious - 30 MHz to 1 GHz

Radiated Spurious – All modes

Frequency	Quasi-Peak	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dB	---
37.5	30.5	40.0	9.5	V
74.9	31.3	40.0	8.7	V
136.9	37.9	43.5	5.7	H
261.5	40.6	46.0	5.4	H

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

1 GHz – 40 GHz, 802.11a, 6Mbps, Chain A DIV1

Radiated Spurious – CH52

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3387.0	59.2	---	68.2	8.9	H
10520.4	49.4	---	68.2	18.8	V
15777.1	59.5	---	74.0	14.5	H
15777.1	---	50.7	54.0	**3.3**	H
21039.7	---	38.1	54.0	15.9	V
21041.6	49.5	---	74.0	24.5	V

Radiated Spurious – CH56

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3384.5	58.4	---	68.2	9.8	V
10560.0	50.4	---	68.2	17.8	H
15841.4	55.5	---	74.0	18.5	V
15841.4	---	47.9	54.0	6.1	V
21120.0	48.5	---	74.0	25.5	V
21122.8	---	38.8	54.0	15.2	V

Radiated Spurious – CH64

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3358.5	59.8	---	68.2	8.4	V
15960.8	53.3	---	74.0	20.7	V
15960.8	---	43.8	54.0	10.2	V
39636.5	---	46.3	54.0	7.7	H
39636.5	57.4	---	74.0	16.6	V

1 GHz – 40 GHz, 802.11a, 6Mbps, Chain A DIV2

Radiated Spurious – CH52

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3374.0	59.4	---	68.2	8.8	V
10519.9	48.1	---	68.2	20.1	H
15780.5	55.3	---	74.0	18.7	V
15780.5	---	46.6	54.0	7.4	V
21043.9	---	41.3	54.0	12.7	V
21051.0	52.2	---	74.0	21.8	V
31562.5	---	42.8	54.0	11.2	H
31562.5	52.5	---	74.0	21.5	H

Radiated Spurious – CH56

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3364.5	58.9	---	68.2	9.3	H
10564.4	49.6	---	68.2	18.6	H
15844.3	53.6	---	74.0	20.4	V
15844.3	---	45.5	54.0	8.5	V
21124.2	---	38.3	54.0	15.7	V
21124.2	49.3	---	74.0	24.7	V
31675.8	51.3	---	74.0	22.7	H
31690.3	---	41.6	54.0	12.4	H

Radiated Spurious – CH64

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3343.5	58.9	---	68.2	9.3	V
10641.2	48.7	---	74.0	25.3	V
10641.2	---	40.5	54.0	13.6	V
15960.3	52.6	---	74.0	21.4	H
15960.3	---	43.9	54.0	10.1	H
39854.4	58.1	---	74.0	15.9	H
39854.9	---	45.7	54.0	8.3	H

1 GHz – 40 GHz, 802.11n20, HT0, Chain A DIV1

Radiated Spurious – CH52

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3393.0	58.7	---	68.2	9.5	H
10520.4	50.4	---	68.2	17.8	V
15781.0	---	47.2	54.0	**6.8**	V
15781.0	53.8	---	74.0	20.2	V
21037.3	48.8	---	74.0	25.2	V
21039.7	---	38.7	54.0	15.3	V

Radiated Spurious – CH56

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3294.5	59.2	---	68.2	9.0	V
10563.4	50.9	---	68.2	17.3	H
15844.8	56.7	---	74.0	17.3	V
15844.8	---	46.4	54.0	7.6	V
21120.0	---	39.1	54.0	14.9	V
21123.8	49.6	---	74.0	24.4	V

Radiated Spurious – CH64

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3290.0	58.9	---	68.2	9.3	H
15962.3	---	46.0	54.0	8.0	V
15964.7	57.1	---	74.0	16.9	V
39631.2	---	46.0	54.0	8.0	H
39636.0	56.3	---	74.0	17.7	H

1 GHz – 40 GHz, 802.11n20, HT0, Chain A DIV2

Radiated Spurious – CH52

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3293.0	59.1	---	68.2	9.1	V
10519.5	48.5	---	68.2	19.7	H
15780.0	---	44.9	54.0	9.1	V
15780.5	54.1	---	74.0	19.9	H
21035.4	---	40.5	54.0	13.5	V
21035.9	50.1	---	74.0	23.9	V
31563.0	---	43.0	54.0	11.0	H
31566.8	53.6	---	74.0	20.4	H

Radiated Spurious – CH56

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3286.0	59.1	---	68.2	9.1	V
10560.0	48.6	---	68.2	19.6	H
15841.0	---	45.1	54.0	8.9	V
15841.4	53.1	---	74.0	20.9	V
21120.4	50.1	---	74.0	23.9	V
21120.4	---	40.0	54.0	14.0	V
31682.6	---	42.0	54.0	12.0	H
31687.4	51.6	---	74.0	22.4	H

Radiated Spurious – CH64

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3178.0	59.5	---	68.2	8.7	V
10641.7	---	40.4	54.0	13.6	V
10641.7	50.4	---	74.0	23.6	V
15962.8	53.5	---	74.0	20.4	V
15962.8	---	44.8	54.0	9.2	V
39528.9	57.2	---	74.0	16.8	H
39529.4	---	44.7	54.0	9.3	V

1 GHz – 40 GHz, 802.11n40, HT0, Chain A DIV1

Radiated Spurious – CH54

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3371.5	59.1	---	68.2	9.1	H
10549.4	48.1	---	68.2	20.1	V
15814.4	---	43.9	54.0	10.1	V
15820.2	53.9	---	74.0	20.1	V
21079.8	45.6	---	74.0	28.4	H
21079.8	---	37.3	54.0	16.7	V

Radiated Spurious – CH62

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3296.0	59.5	---	68.2	8.7	H
15938.1	---	42.8	54.0	11.2	V
15938.1	53.6	---	74.0	20.4	H
39630.2	---	46.1	54.0	**7.9**	H
39647.6	56.6	---	74.0	17.4	H

1 GHz – 40 GHz, 802.11n40, HT0, Chain A DIV2

Radiated Spurious – CH54

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
2983.0	59.8	---	68.2	8.4	V
10545.5	47.7	---	68.2	20.5	H
15798.4	52.3	---	74.0	21.7	V
15799.4	---	42.0	54.0	12.0	V
39672.6	---	45.1	54.0	8.9	V
39672.6	56.9	---	74.0	17.1	H

Radiated Spurious – CH62

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3394.0	59.4	---	68.2	8.8	H
10621.0	47.9	---	74.0	26.1	V
10623.9	---	38.5	54.0	15.5	V
15917.8	52.5	---	74.0	21.5	V
15940.0	---	41.9	54.0	12.2	V
39648.5	---	46.1	54.0	7.9	H
39650.9	56.1	---	74.0	17.9	V

1 GHz – 40 GHz, 802.11ac80, VHT0, Chain A DIV1

Radiated Spurious – CH58

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3043.5	59.7	---	68.2	8.5	H
10563.4	50.6	---	68.2	17.6	V
15863.2	51.3	---	74.0	22.8	V
15863.2	---	42.5	54.0	11.5	V
39639.8	---	46.0	54.0	8.1	H
39644.7	57.1	---	74.0	16.9	H

1 GHz – 40 GHz, 802.11ac80, VHT0, Chain A DIV2

Radiated Spurious – CH58

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3300.5	59.4	---	68.2	8.8	V
15870.9	49.7	---	74.0	24.3	V
15870.9	---	41.3	54.0	12.7	V
39719.4	---	46.1	54.0	**7.9**	H
39721.8	55.6	---	74.0	18.4	H

1 GHz – 40 GHz, 802.11ax20, HE0, Chain A DIV1

Radiated Spurious – CH52

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5003.0	53.3	---	74.0	20.7	H
5012.1	---	42.8	54.0	11.2	H
5493.2	53.8	---	68.2	14.4	V
15754.4	55.1	---	74.0	18.9	V
15754.4	---	47.9	54.0	6.1	V
39658.6	---	46.5	54.0	7.5	H
39660.6	56.4	---	74.0	17.6	V

Radiated Spurious – CH56

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5030.0	52.6	---	74.0	21.4	V
5031.3	---	42.5	54.0	11.5	H
5512.3	53.0	---	68.2	15.2	V
15814.9	51.9	---	74.0	22.1	H
15814.9	---	43.6	54.0	10.4	H
39637.9	56.3	---	74.0	17.7	H
39637.9	---	46.4	54.0	7.6	H

Radiated Spurious – CH64

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5552.4	53.6	---	68.2	14.6	V
15934.7	54.5	---	74.0	19.5	H
15934.7	---	48.7	54.0	5.3	V
39895.4	---	44.2	54.0	9.8	H
39895.4	56.8	---	74.0	17.2	H

1 GHz – 40 GHz, 802.11ax20, HE0, Chain A DIV2

Radiated Spurious – CH52

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5491.4	54.4	---	68.2	13.8	V
15754.9	58.6	---	74.0	15.4	H
15754.9	---	50.1	54.0	**3.9**	H
39652.4	---	46.3	54.0	7.7	V
39661.5	57.4	---	74.0	16.6	H

Radiated Spurious – CH56

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5511.0	53.1	---	68.2	15.1	H
15814.9	56.3	---	74.0	17.7	H
15814.9	---	48.5	54.0	5.5	V
39984.6	---	46.3	54.0	7.7	V
39986.0	55.8	---	74.0	18.2	H

Radiated Spurious – CH64

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5551.6	54.7	---	68.2	13.5	V
15934.7	52.6	---	74.0	21.4	V
15934.7	---	45.4	54.0	8.6	V
39640.8	---	45.5	54.0	8.5	V
39640.8	57.3	---	74.0	16.7	V

1 GHz – 40 GHz, 802.11ax40, HE0, Chain A DIV1

Radiated Spurious – CH54

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5006.9	53.2	---	74.0	20.8	V
5011.3	---	43.0	54.0	11.0	H
5497.1	54.5	---	68.2	13.7	H
15755.9	55.8	---	74.0	18.2	H
15755.9	---	48.4	54.0	5.6	V
39646.1	---	46.1	54.0	7.9	H
39691.4	56.8	---	74.0	17.2	V

Radiated Spurious – CH62

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
4716.7	---	42.3	54.0	11.7	H
4717.6	52.3	---	74.0	21.7	V
5552.0	54.6	---	68.2	13.6	V
15876.2	54.9	---	74.0	19.1	V
15876.2	---	45.4	54.0	8.7	V
39534.7	56.6	---	74.0	17.4	H
39647.6	---	46.0	54.0	8.0	H

1 GHz – 40 GHz, 802.11ax40, HE0, Chain A DIV2

Radiated Spurious – CH54

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5491.4	54.4	---	68.2	13.8	V
15755.4	57.3	---	74.0	16.7	V
15755.4	---	50.7	54.0	**3.3**	H
39653.3	---	45.9	54.0	8.1	H
39654.8	55.8	---	74.0	18.2	V

Radiated Spurious – CH62

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5538.5	54.0	---	68.2	14.2	H
15876.2	54.9	---	74.0	19.1	H
15876.2	---	45.9	54.0	8.1	V
39660.6	---	46.1	54.0	7.9	H
39663.9	56.6	---	74.0	17.4	V

1 GHz – 40 GHz, 802.11ax80, HE0, Chain A DIV1

Radiated Spurious – CH58

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5492.3	53.5	---	68.2	14.7	H
10563.4	50.6	---	68.2	17.6	V
15863.2	51.3	---	74.0	22.8	V
15863.2	---	42.5	54.0	11.5	V
39541.0	57.9	---	74.0	16.1	H
39542.0	---	44.9	54.0	9.1	V

1 GHz – 40 GHz, 802.11ax80, HE0, Chain A DIV2

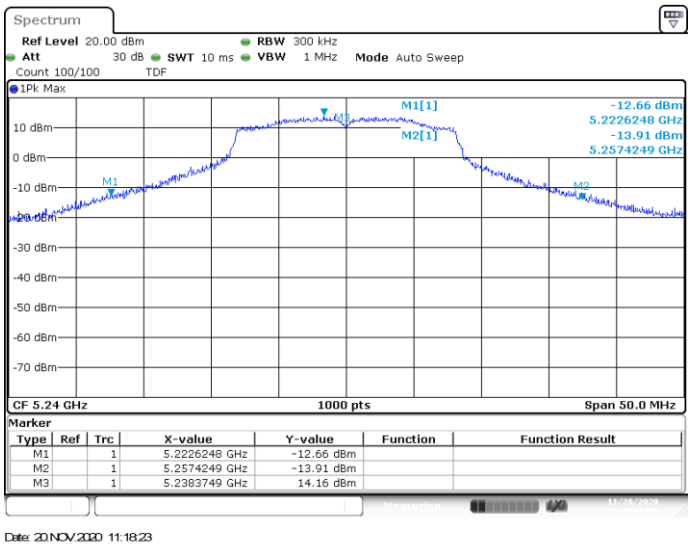
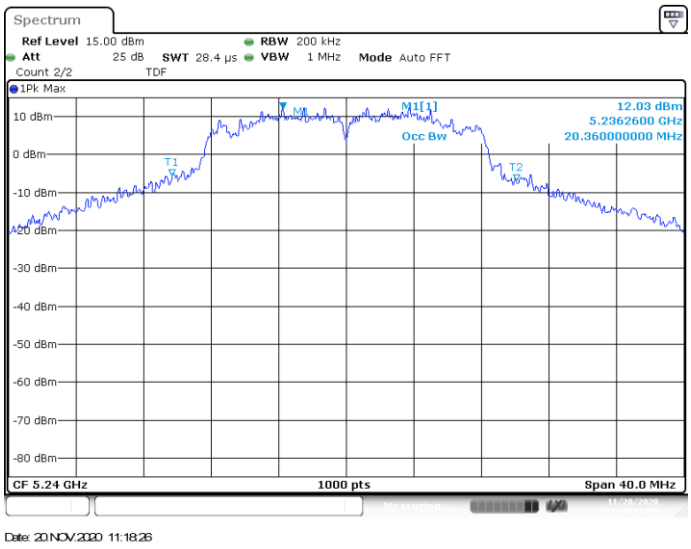
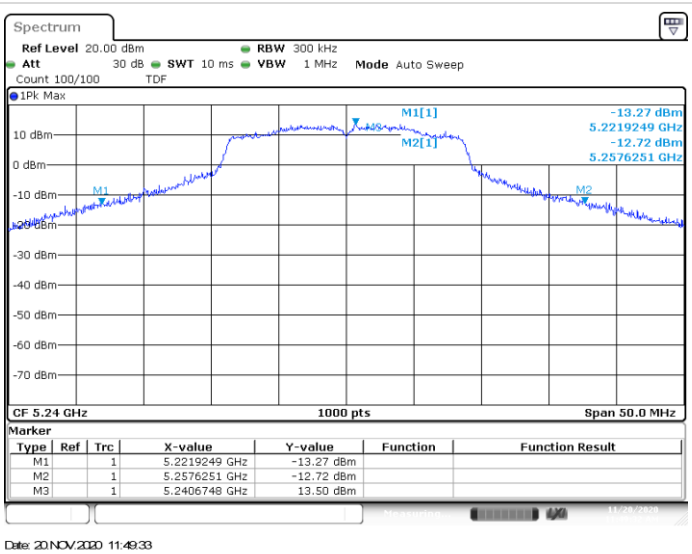
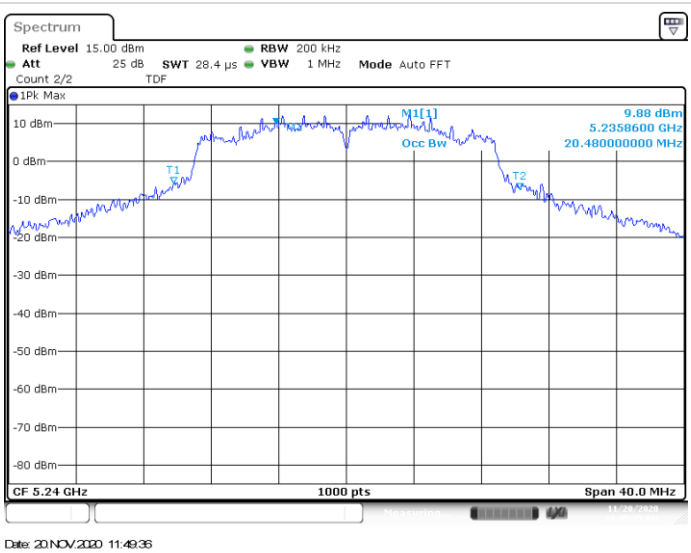
Radiated Spurious – CH58

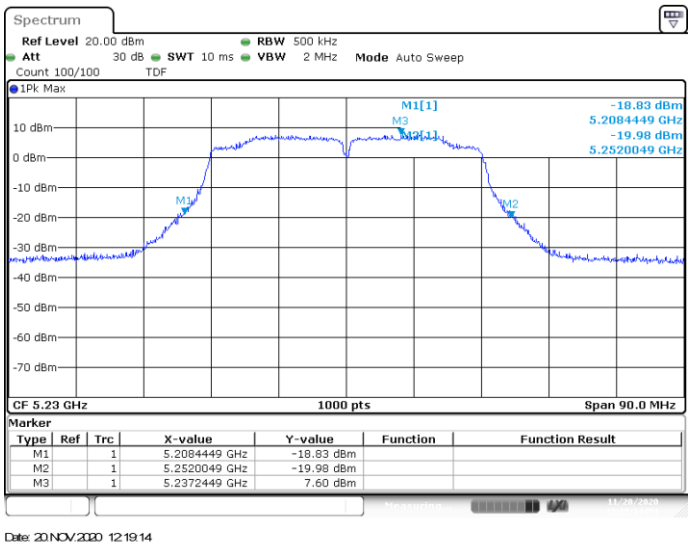
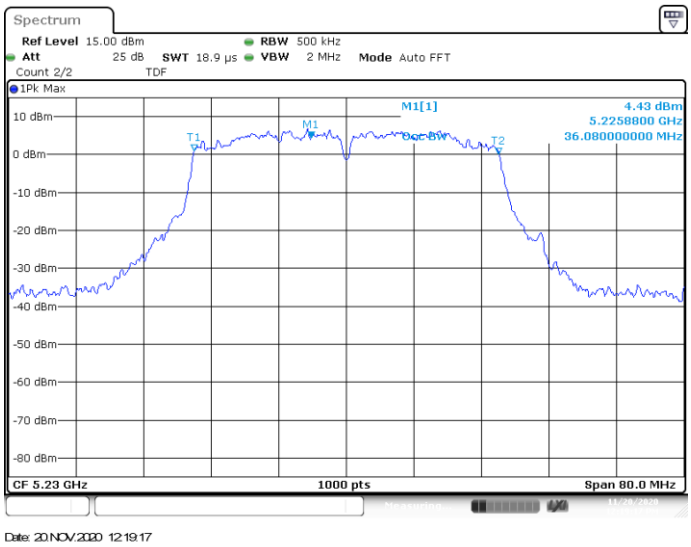
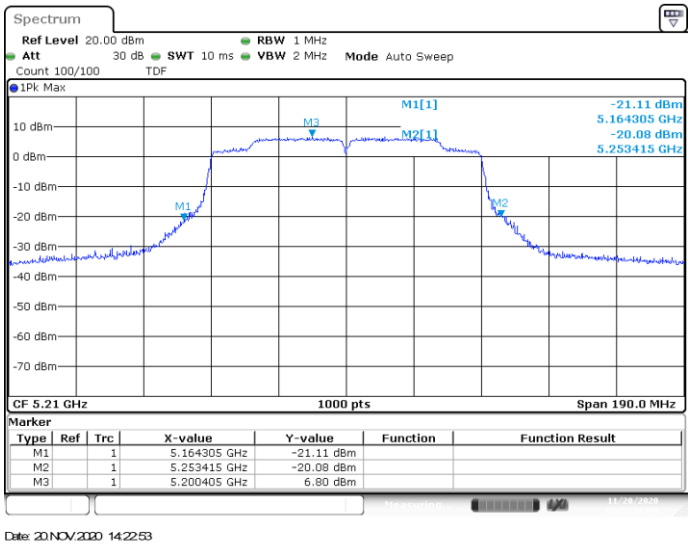
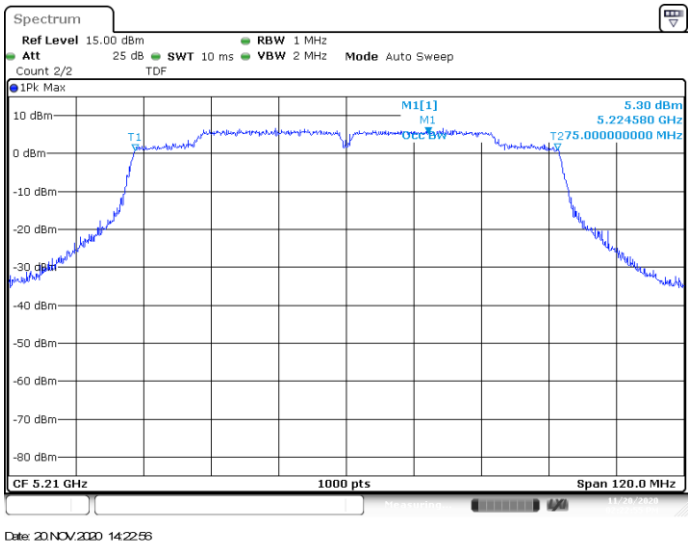
Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
5492.3	54.4	---	68.2	13.8	V
15755.9	55.3	---	74.0	18.7	H
15755.9	---	50.3	54.0	**3.7**	H
39598.9	57.1	---	74.0	16.9	V
39599.3	---	45.0	54.0	8.9	V

System Plots

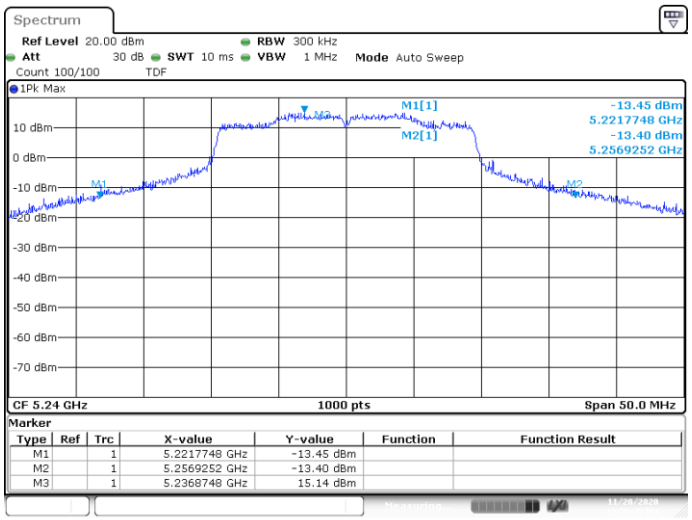
B.3.5 26dB and 99% bandwidth

U-NII-1

26dB bandwidth	99% bandwidth
	
CHAIN A DIV2-802.11a-20MHz-48-5240-6	CHAIN A DIV2-802.11a-20MHz-48-5240-6
	
CHAIN A DIV2-802.11n-20MHz-48-5240-HT0	CHAIN A DIV2-802.11n-20MHz-48-5240-HT0

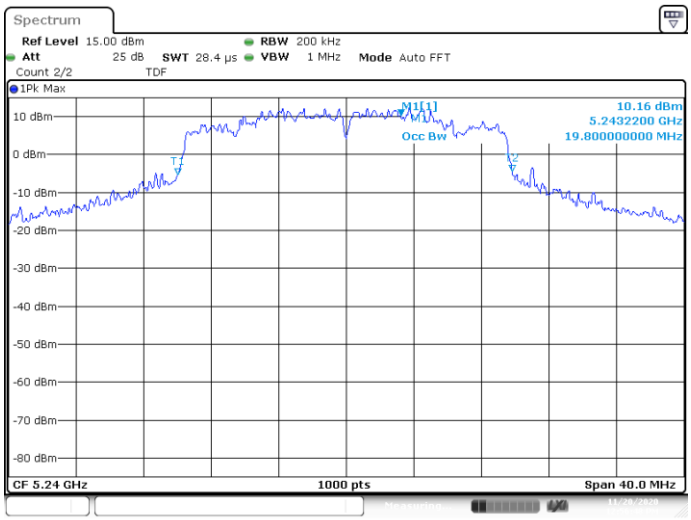
26dB bandwidth	99% bandwidth
	
CHAIN A DIV2-802.11n-40MHz-46-5230-HT0	CHAIN A DIV2-802.11n-40MHz-46-5230-HT0
	
CHAIN A DIV2-802.11ac-80MHz-42-5210-VHT0	CHAIN A DIV2-802.11ac-80MHz-42-5210-VHT0

26dB bandwidth

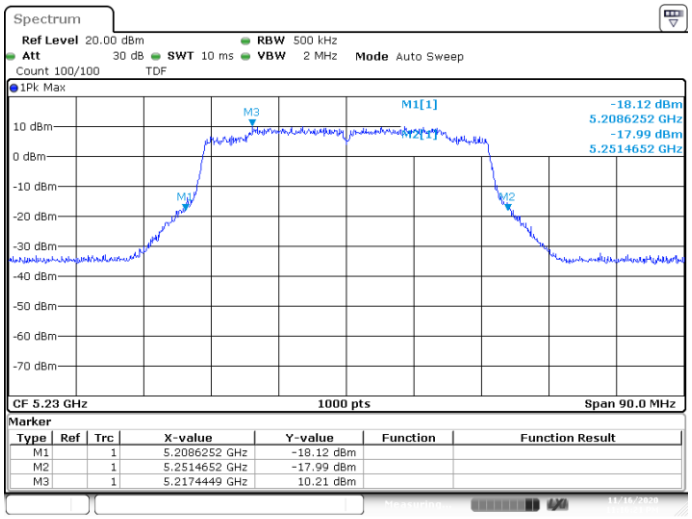


CHAIN A DIV2-802.11ax-20MHz-48-5240-HE0

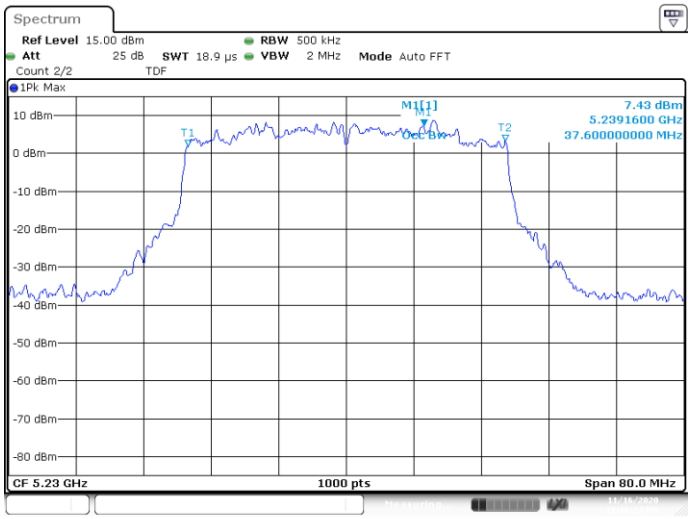
99% bandwidth



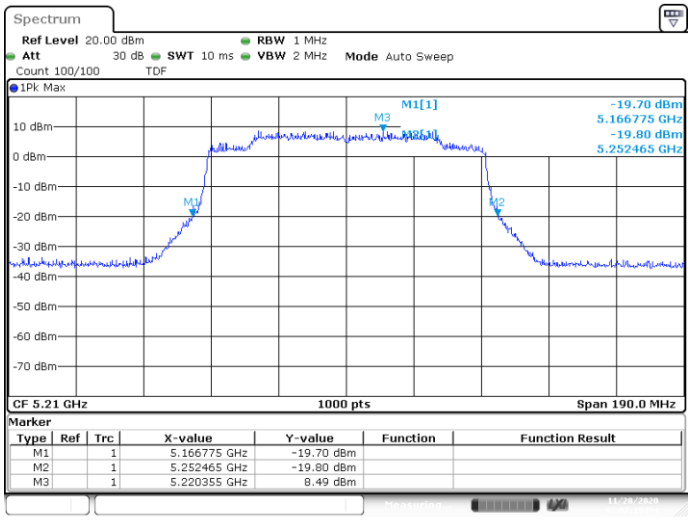
CHAIN A DIV2-802.11ax-20MHz-48-5240-HE0



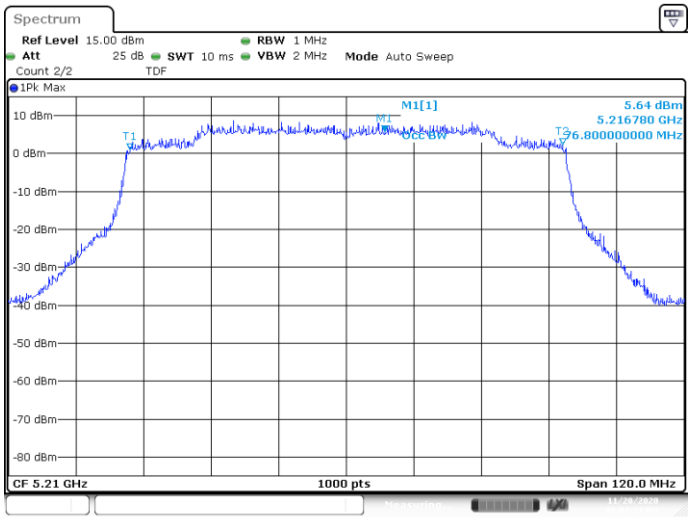
CHAIN A DIV1-802.11ax-40MHz-46-5230-HE0



CHAIN A DIV1-802.11ax-40MHz-46-5230-HE0

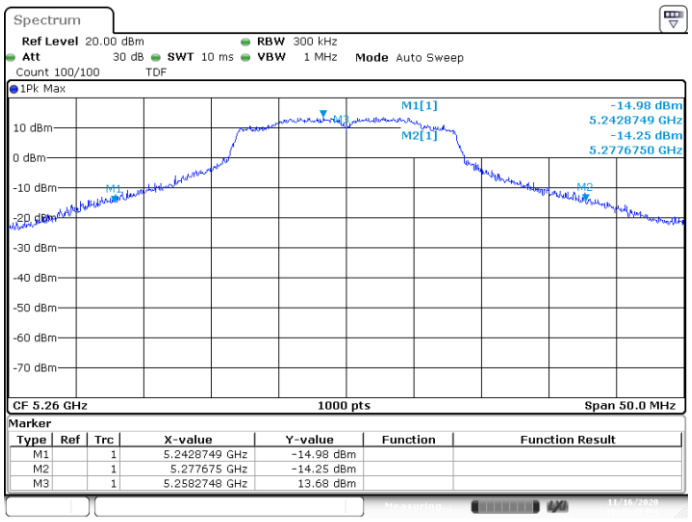
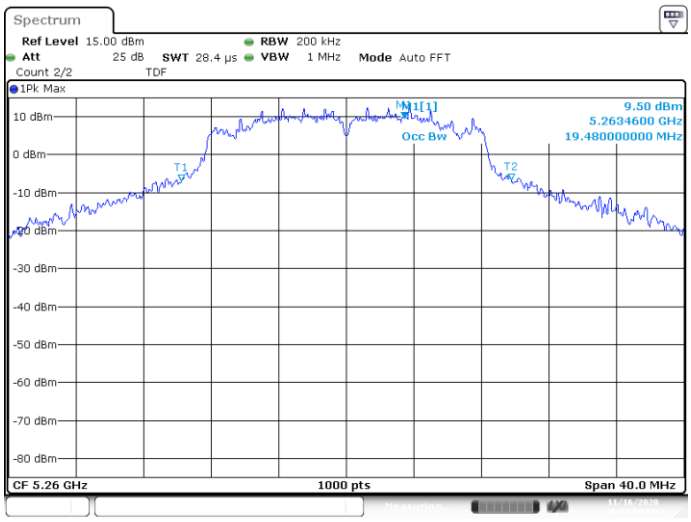
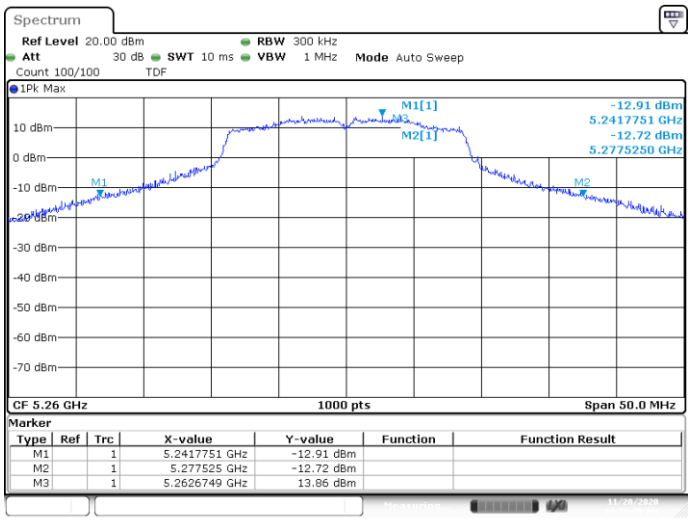
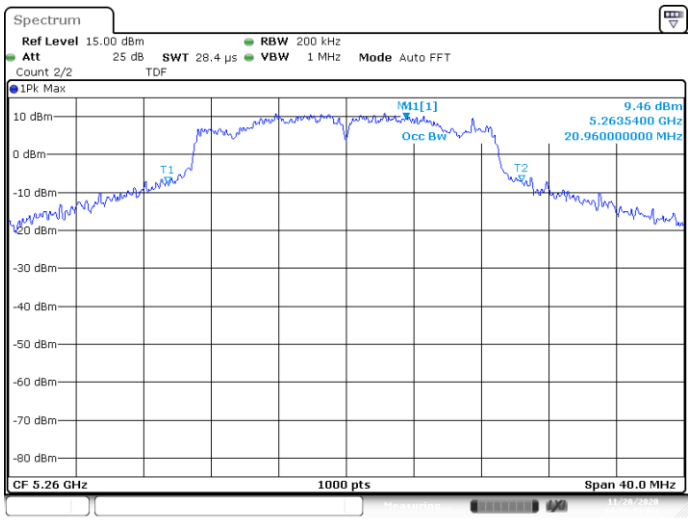
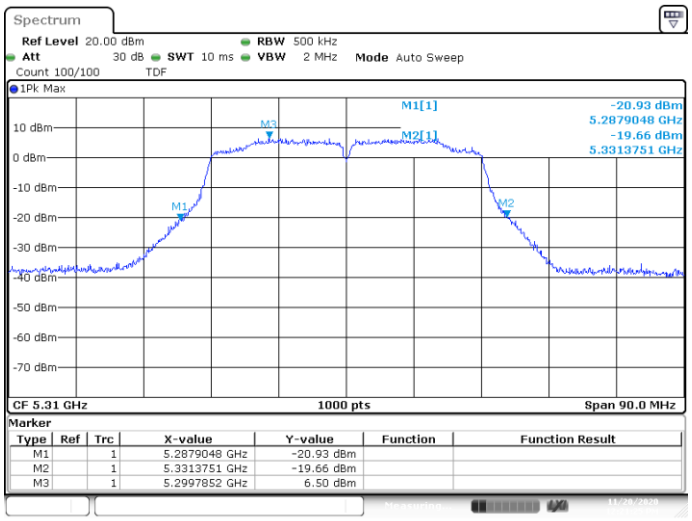
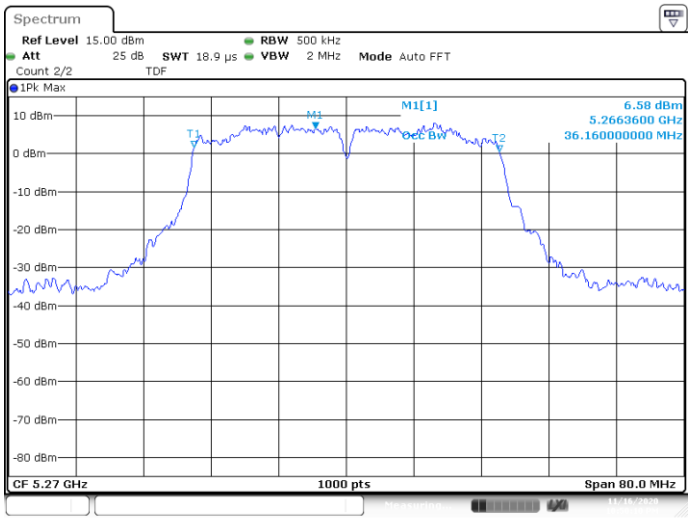


CHAIN A DIV2-802.11ax-80MHz-42-5210-HE0

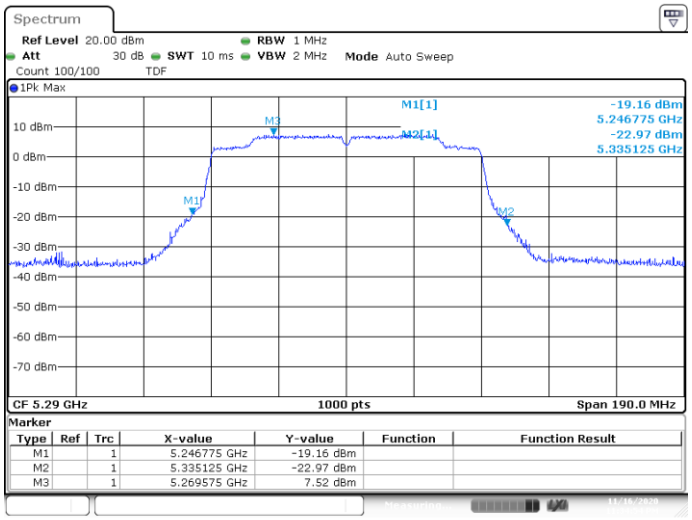


CHAIN A DIV2-802.11ax-80MHz-42-5210-HE0

U-NII-2A

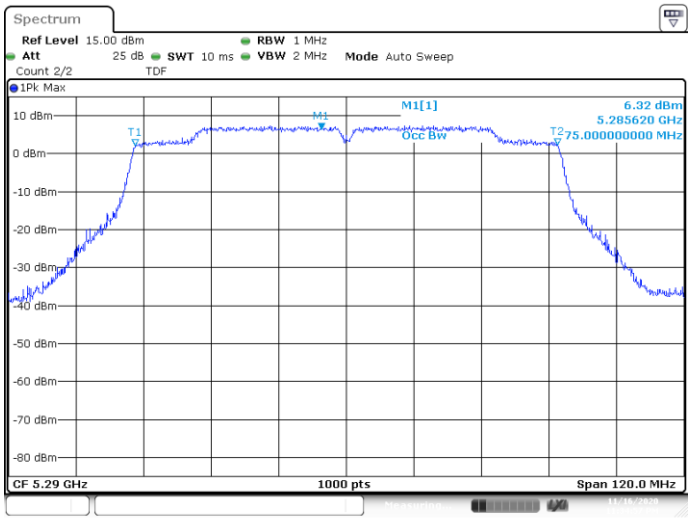
26dB bandwidth	99% bandwidth
	
CHAIN A DIV1-802.11a-20MHz-52-5260-6	CHAIN A DIV1-802.11a-20MHz-52-5260-6
	
CHAIN A DIV1-802.11n-20MHz-56-5280-HT0	CHAIN A DIV1-802.11n-20MHz-56-5280-HT0
	
CHAIN A DIV2-802.11n-40MHz-62-5310-HT0	CHAIN A DIV1-802.11n-40MHz-54-5270-HT0

26dB bandwidth

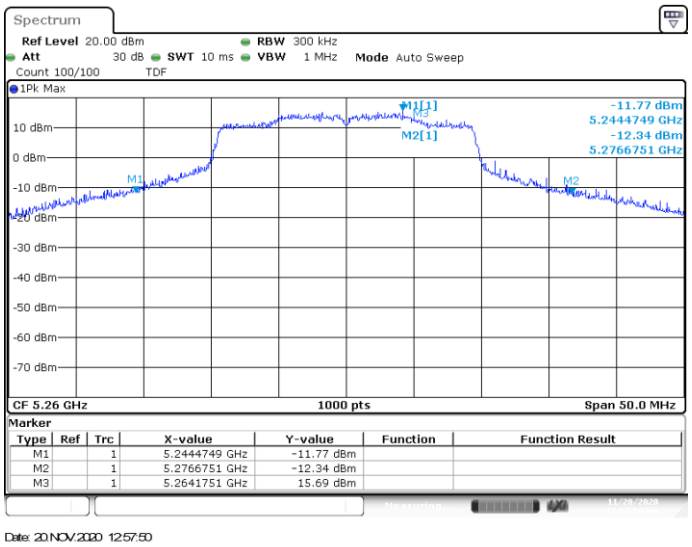


CHAIN A DIV1-802.11ac-80MHz-58-5290-VHT0

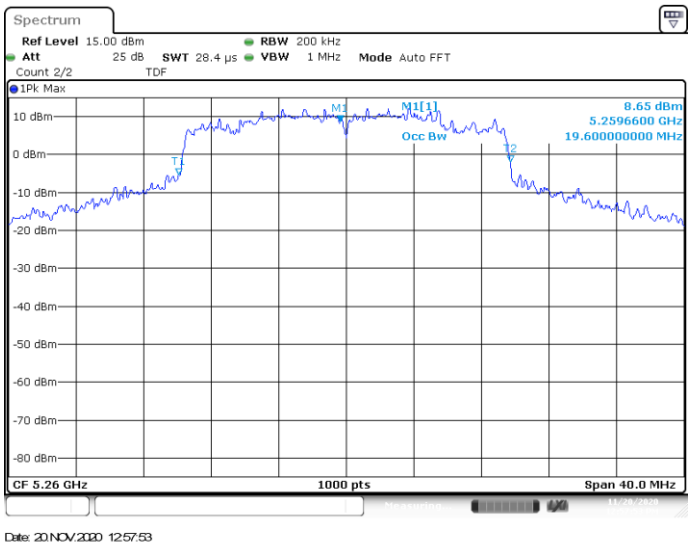
99% bandwidth



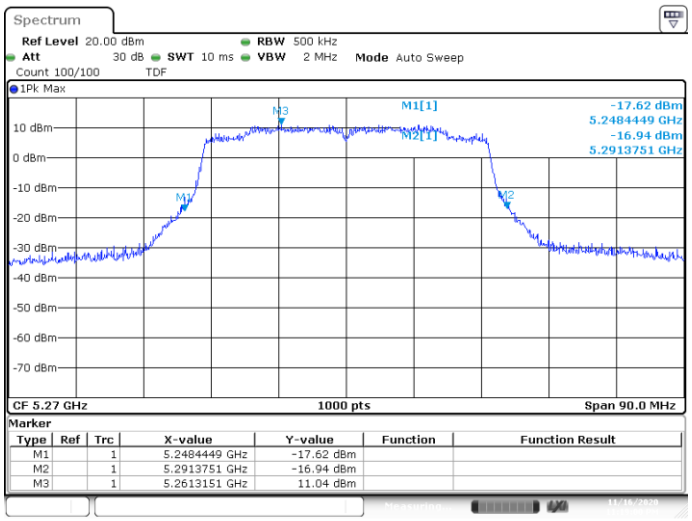
CHAIN A DIV1-802.11ac-80MHz-58-5290-VHT0



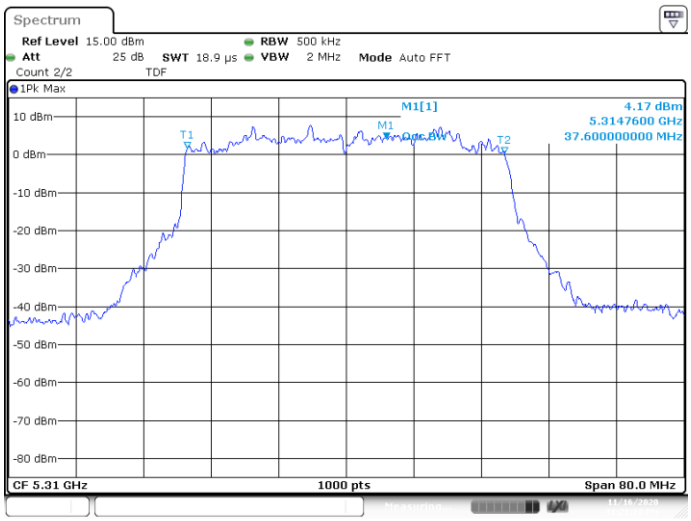
CHAIN A DIV1-802.11ax-20MHz-52-5260-HE0



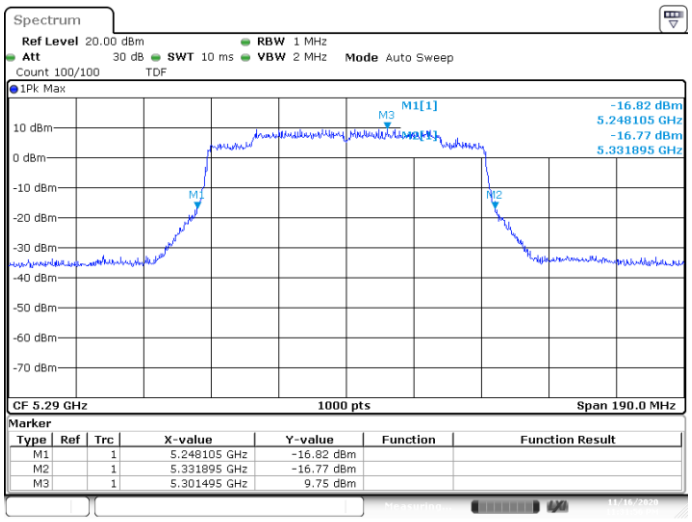
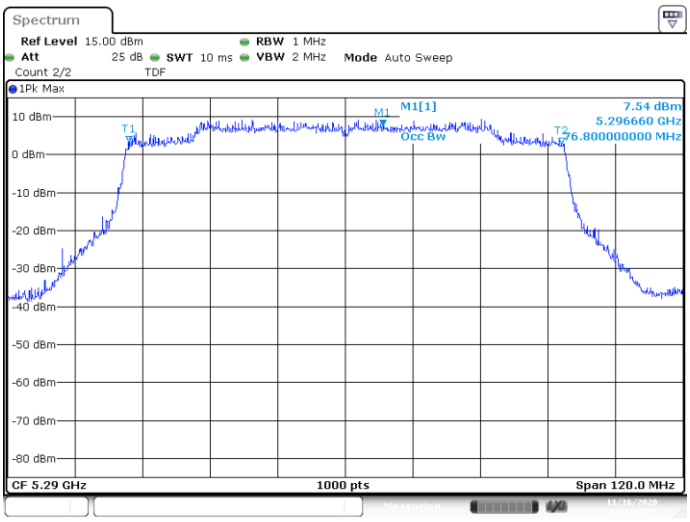
CHAIN A DIV1-802.11ax-20MHz-52-5260-HE0



CHAIN A DIV1-802.11ax-40MHz-54-5270-HE0

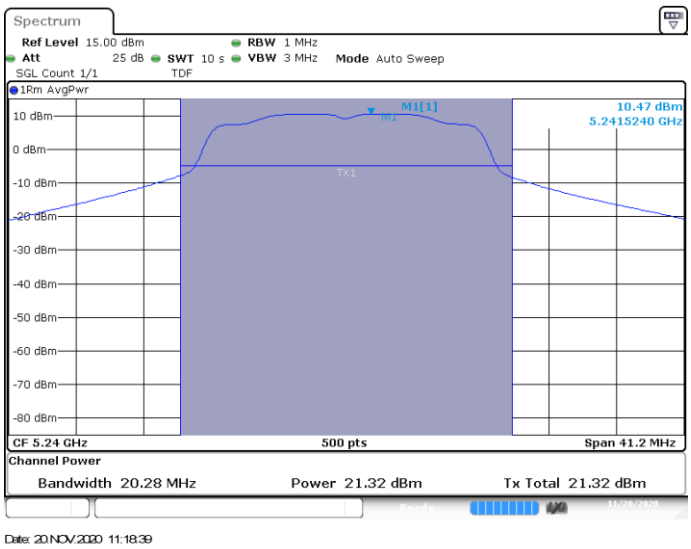


CHAIN A DIV1-802.11ax-40MHz-62-5310-HE0

26dB bandwidth	99% bandwidth
	
CHAIN A DIV1-802.11ax-80MHz-58-5290-HE0	CHAIN A DIV1-802.11ax-80MHz-58-5290-HE0

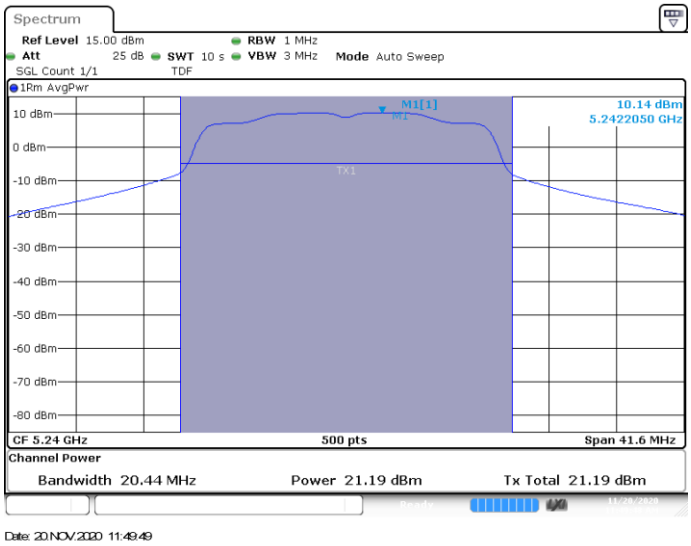
B.3.6 Maximum output power

U-NII-1



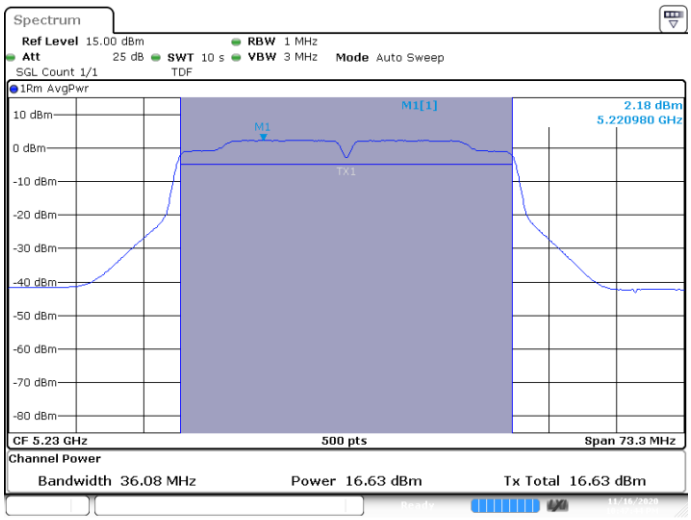
Date: 20.NOV.2020 11:18:39

CHAIN A DIV2-802.11a-20MHz-Ch48-5240MHz-6

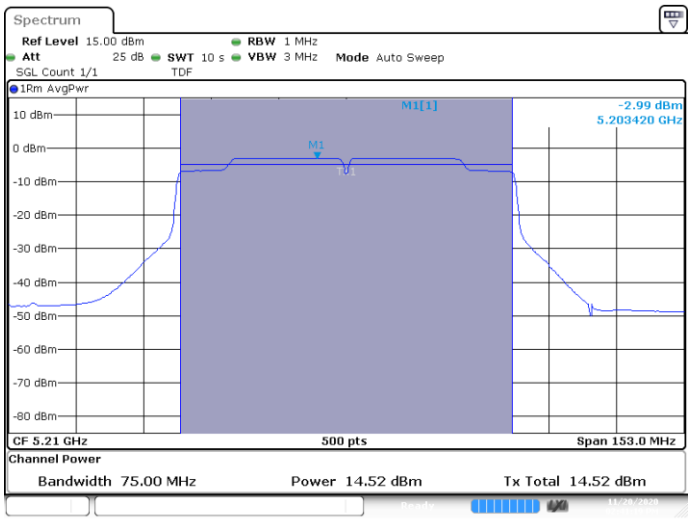


Date: 20.NOV.2020 11:49:49

CHAIN A DIV2-802.11n-20MHz-Ch48-5240MHz-HT0

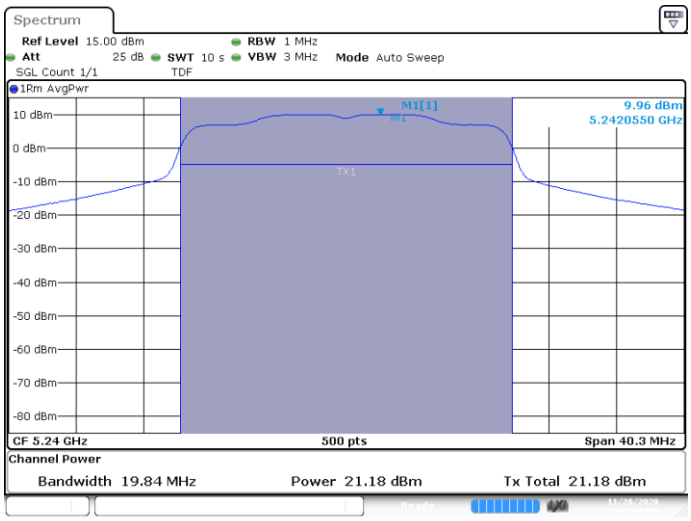


CHAIN A DIV1-802.11n-40MHz-Ch46-5230MHz-HT0



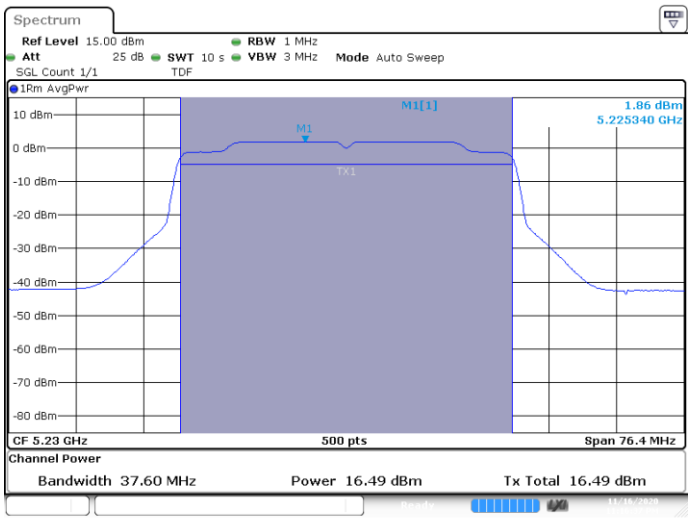
Date: 20.NOV.2020 14:41:18

CHAIN A DIV2-802.11ac-80MHz-Ch42-5210MHz-VHT0

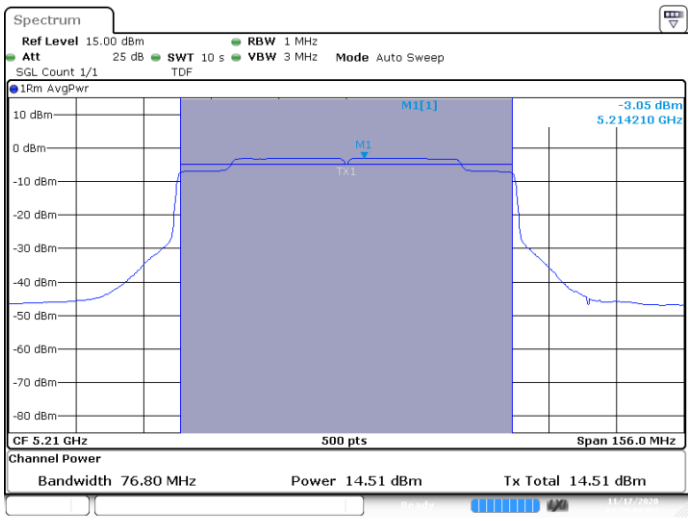


Date: 20.NOV.2020 12:57:01

CHAIN A DIV2-802.11ax-20MHz-Ch48-5240MHz-HE0

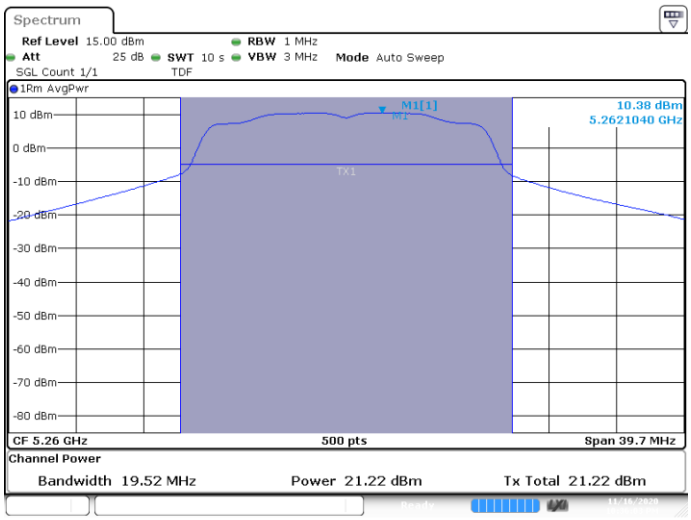


CHAIN A DIV1-802.11ax-40MHz-Ch46-5230MHz-HE0

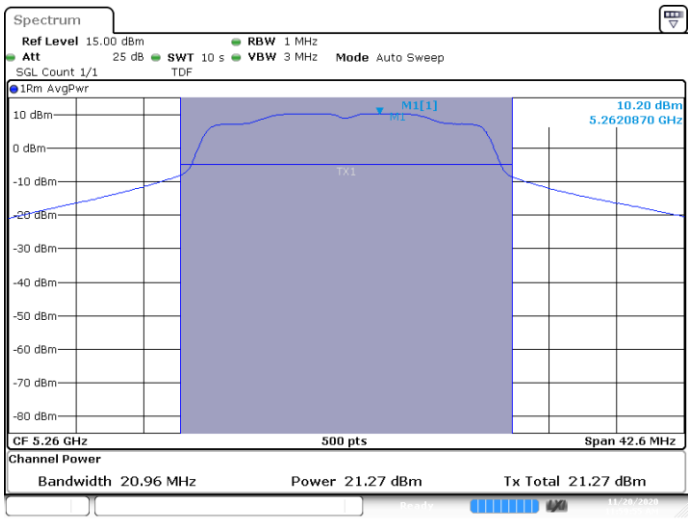


CHAIN A DIV1-802.11ax-80MHz-Ch42-5210MHz-HE0

U-NII-2A

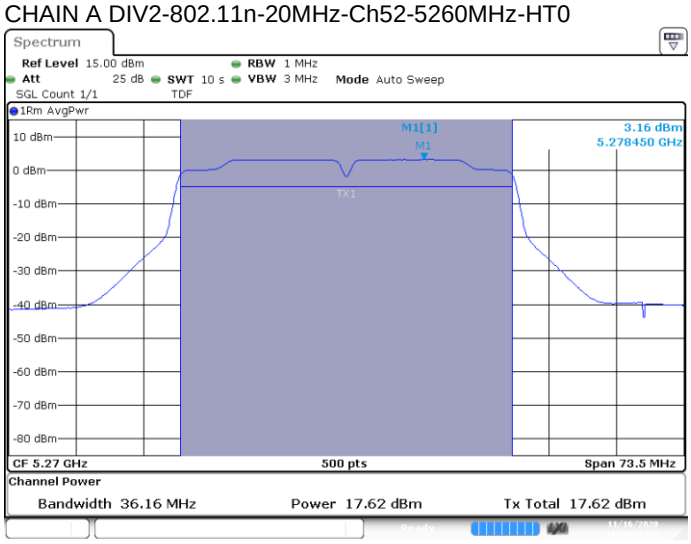


CHAIN A DIV1-802.11a-20MHz-Ch52-5260MHz-6

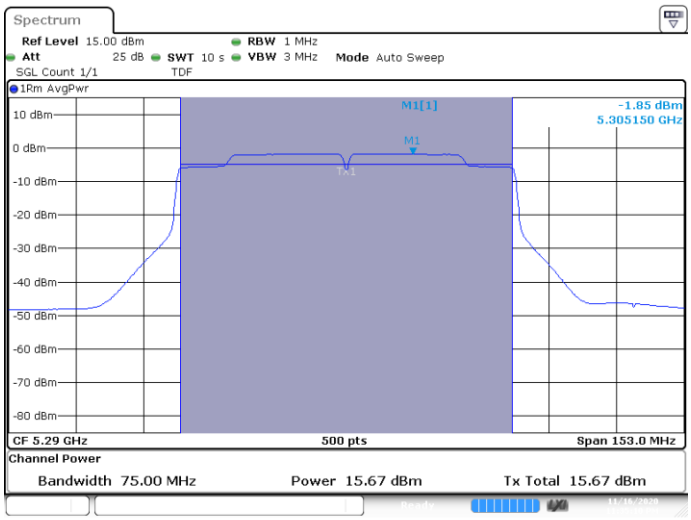


Date: 20 NOV 2020 11:59:56

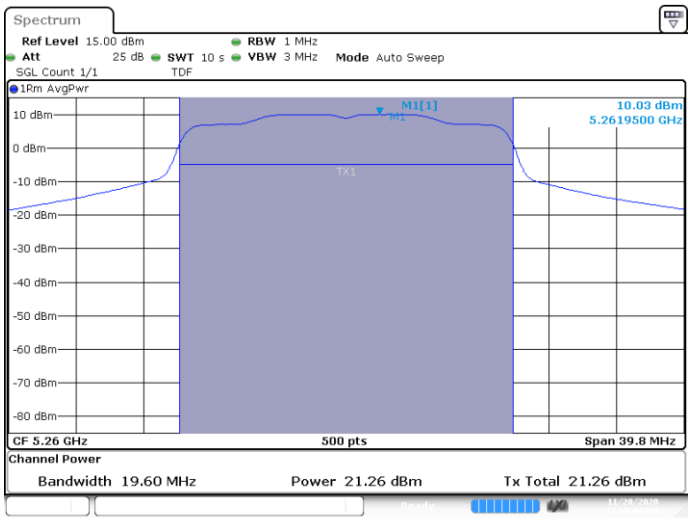
CHAIN A DIV2-802.11n-20MHz-Ch52-5260MHz-HT0



CHAIN A DIV1-802.11n-40MHz-Ch54-5270MHz-HT0

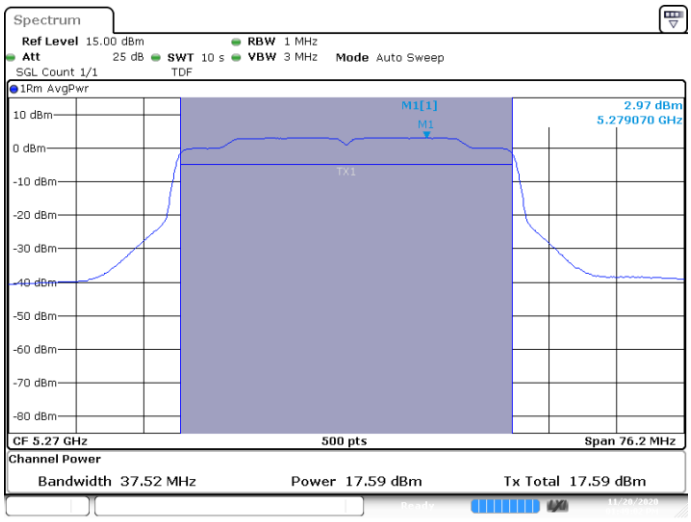


CHAIN A DIV1-802.11ac-80MHz-Ch58-5290MHz-VHT0



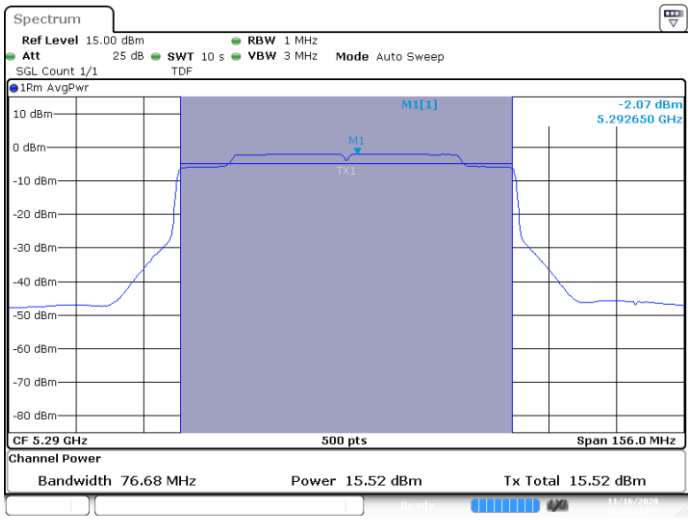
Date: 20.NOV.2020 12:58:06

CHAIN A DIV2-802.11ax-20MHz-Ch52-5260MHz-HE0



Date: 20.NOV.2020 13:49:02

CHAIN A DIV2-802.11ax-40MHz-Ch54-5270MHz-HE0

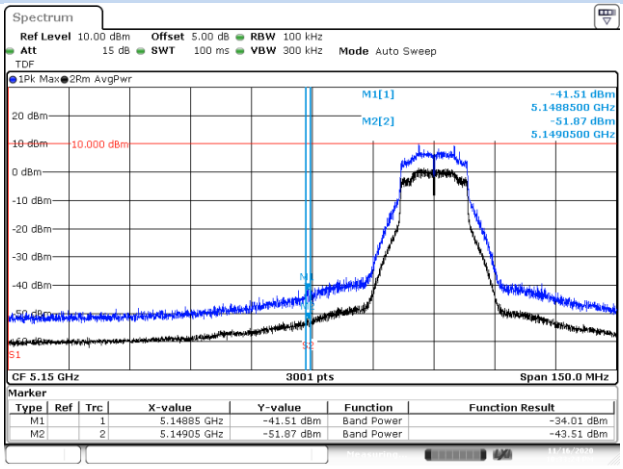


CHAIN A DIV1-802.11ax-80MHz-Ch58-5290MHz-HE0

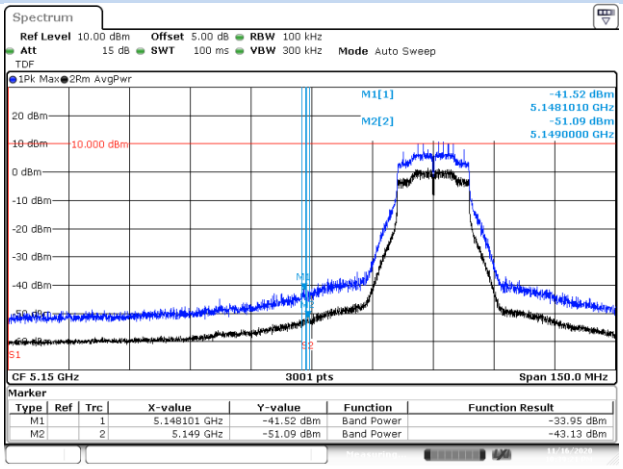
B.3.7 Undesirable emission limits: out of band (Conducted)

U-NII-1

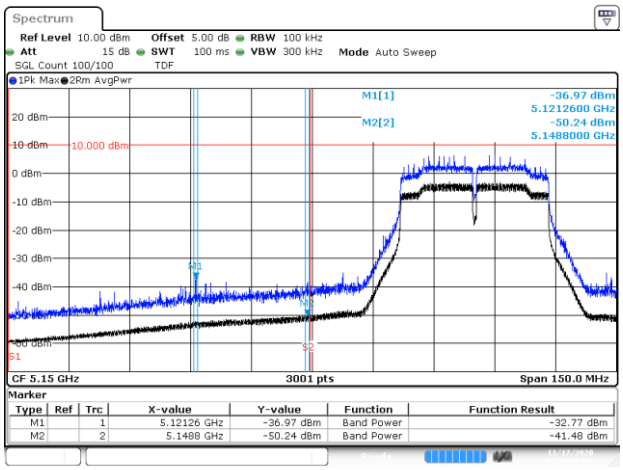
CHAIN A DIV1



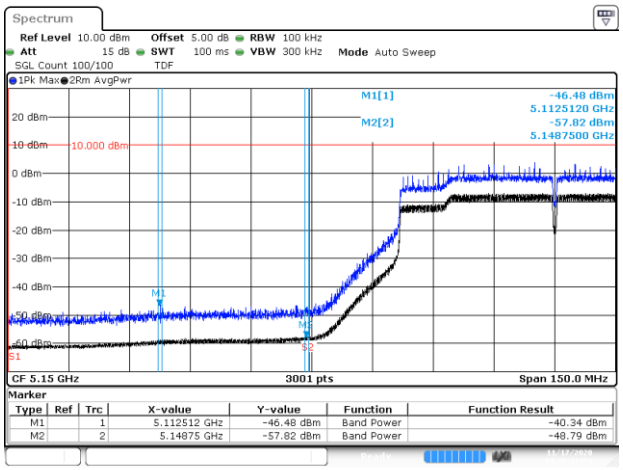
BE-R-LOW, DIV-1, 802.11a20-6Mbps, Ch36



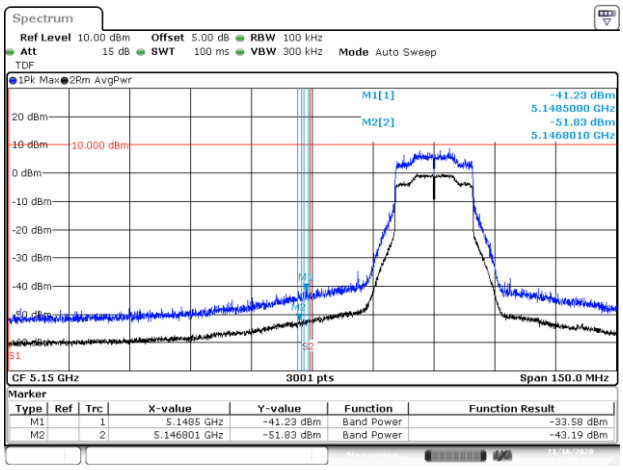
BE-R-LOW, DIV-1, 802.11n20-HT0, Ch36



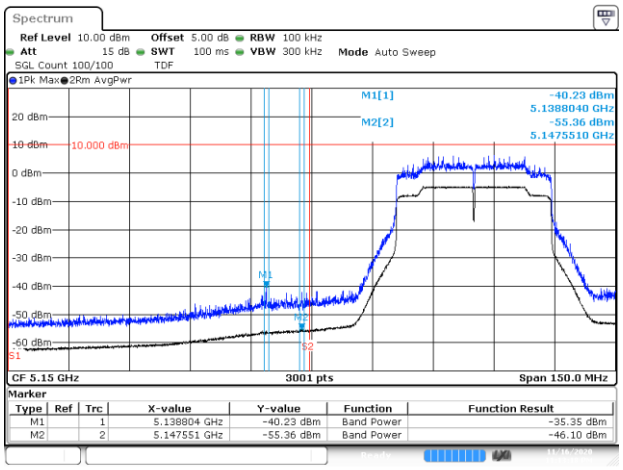
BE-R-LOW, DIV-1, 802.11n40-HT0, Ch38



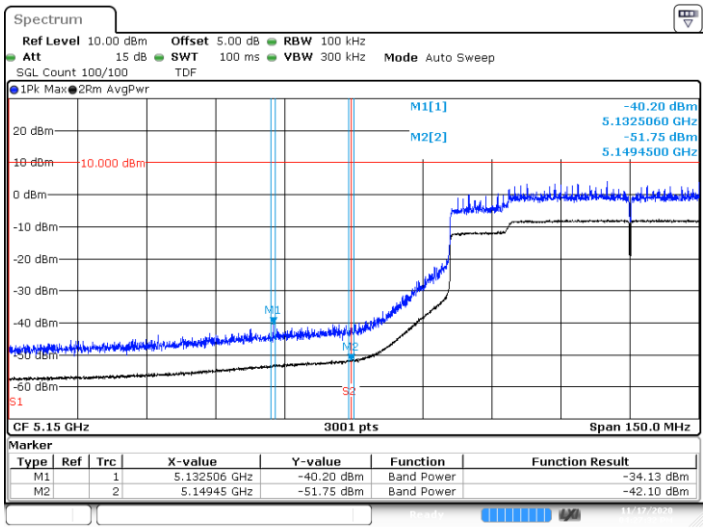
BE-R-LOW, DIV-1, 802.11ac80-VHT0, Ch42



BE-R-LOW, DIV-1, 802.11ax20-HE0, Ch36

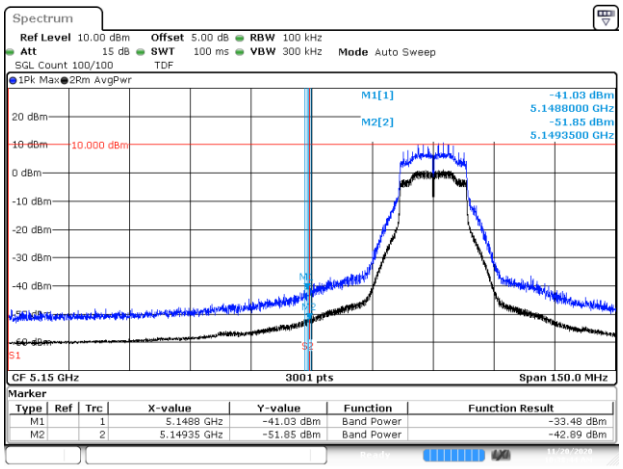


BE-R-LOW, DIV-1, 802.11ax40-HE0, Ch38



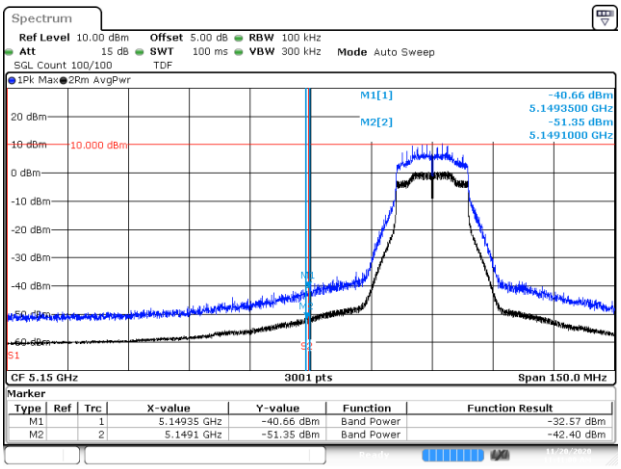
BE-R-LOW, DIV-1, 802.11ac80-HE0, Ch42

CHAIN A DIV2



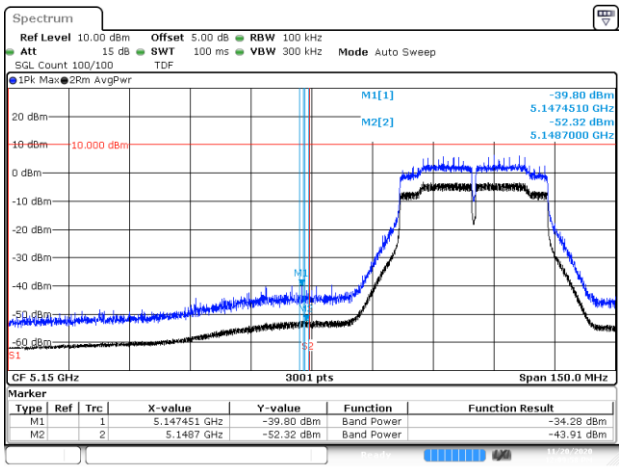
Date: 20.NOV.2020 10:38:45

BE-R-LOW, DIV-2, 802.11a20-6Mbps, Ch36



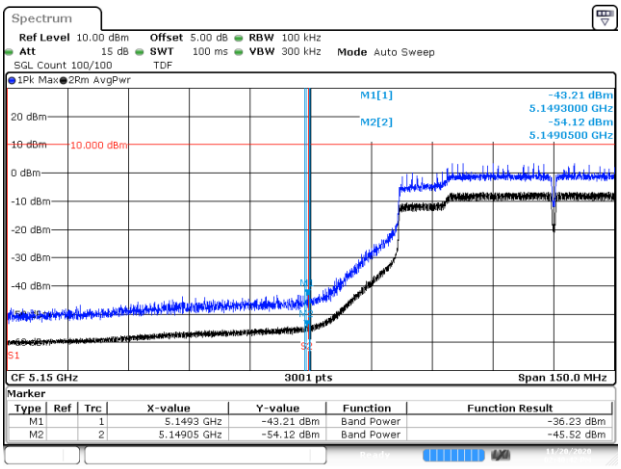
Date: 20.NOV.2020 11:41:01

BE-R-LOW, DIV-2, 802.11n20-HT0, Ch36



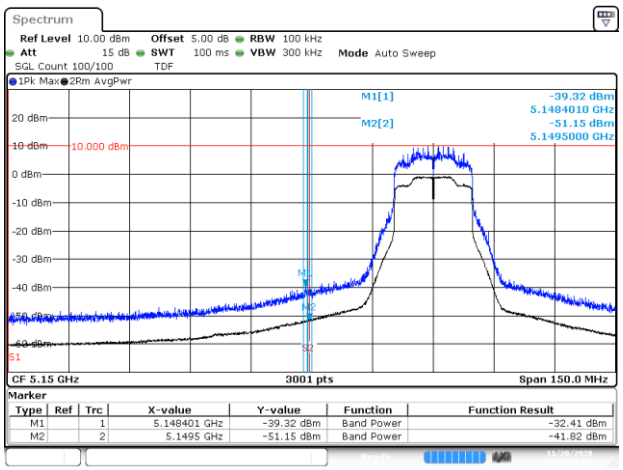
Date: 20.NOV.2020 12:09:58

BE-R-LOW, DIV-2, 802.11n40-HT0, Ch38



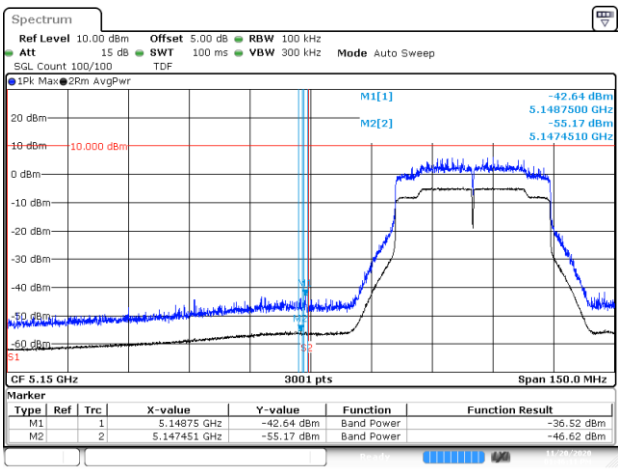
Date: 20.NOV.2020 14:40:43

BE-R-LOW, DIV-2, 802.11ac80-VHT0, Ch42



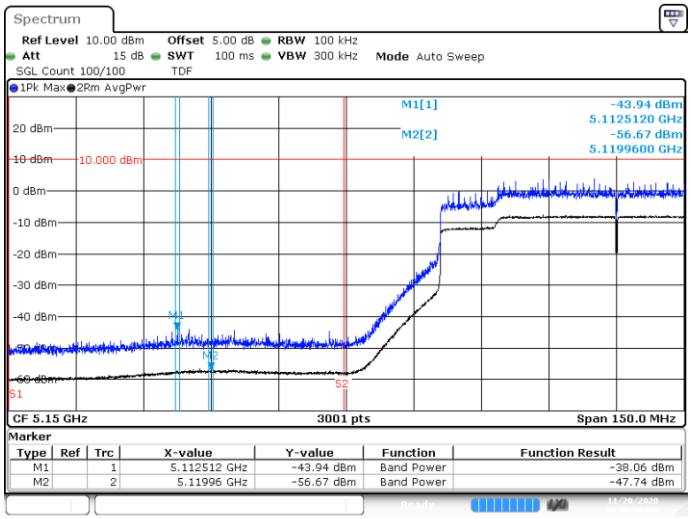
Date: 20.NOV.2020 12:37:33

BE-R-LOW, DIV-2, 802.11ax20-HE0, Ch36



Date: 20.NOV.2020 13:46:11

BE-R-LOW, DIV-2, 802.11ax40-HE0, Ch38

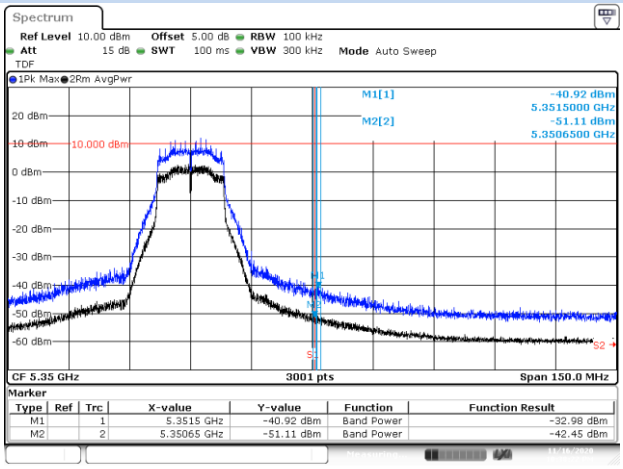


Date: 20.NOV.2020 14:08:00

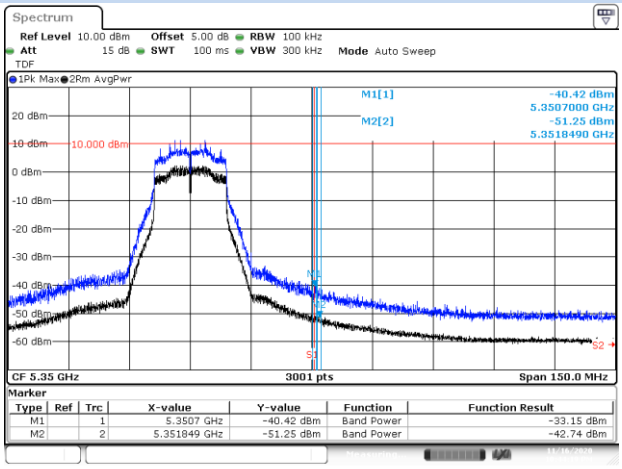
BE-R-LOW, DIV-2, 802.11ac80-HE0, Ch42

U-NII-2a

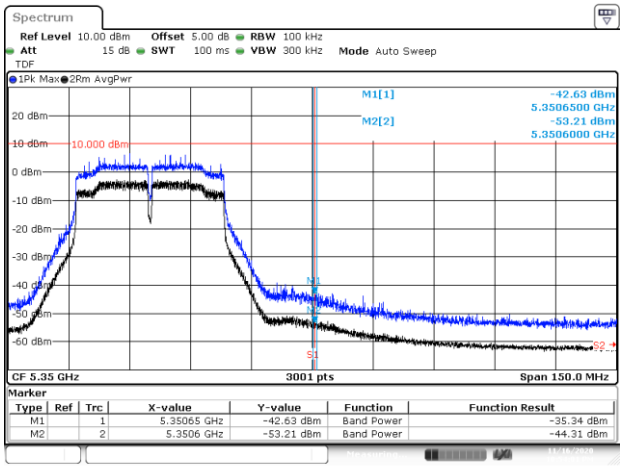
CHAIN A DIV1



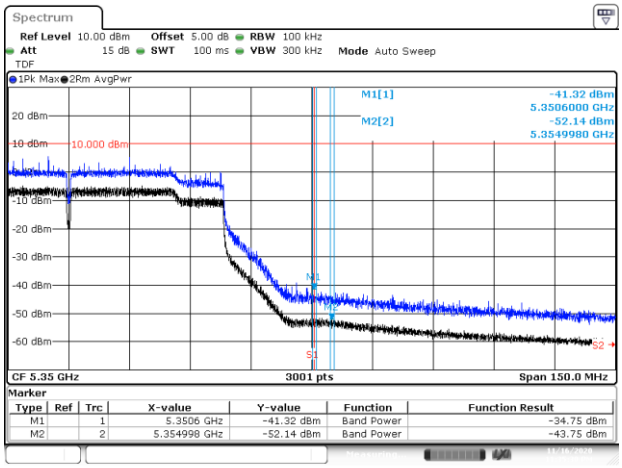
BE-R-HIGH, DIV-1, 802.11a20-6Mbps, Ch64



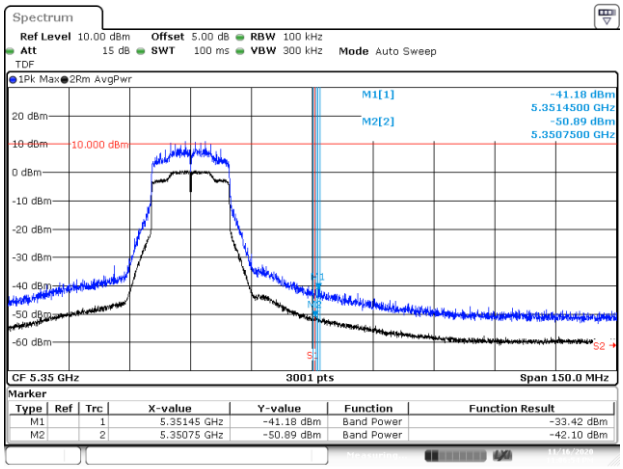
BE-R-HIGH, DIV-1, 802.11n20-HT0, Ch64



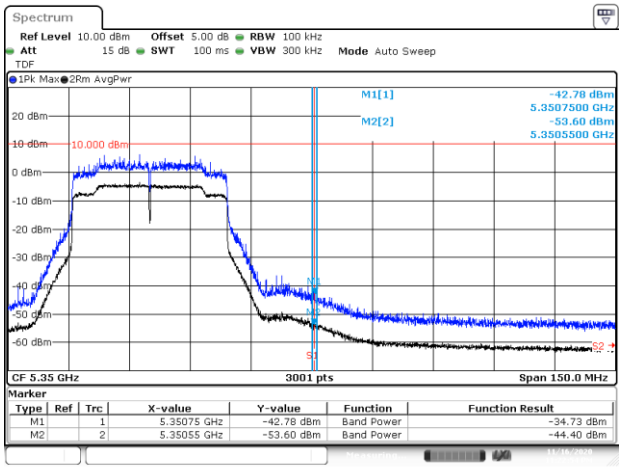
BE-R-HIGH, DIV-1, 802.11n40-HT0, Ch62



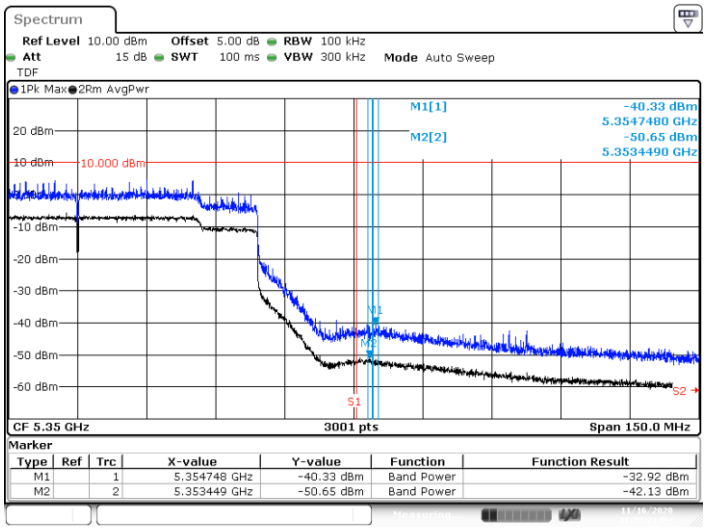
BE-R-HIGH, DIV-1, 802.11ac80-VHT0, Ch58



BE-R-HIGH, DIV-1, 802.11ax20-HE0, Ch64

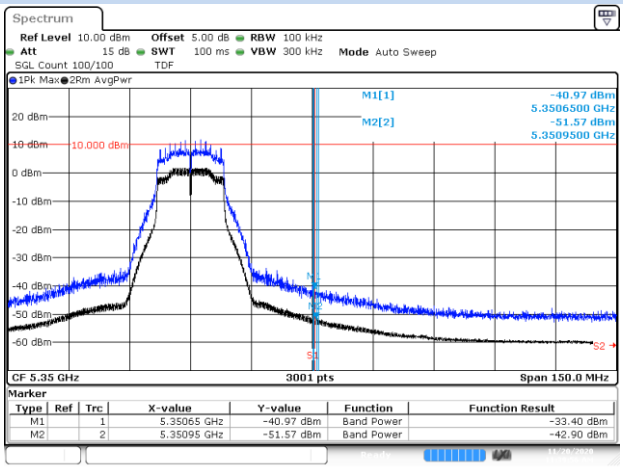


BE-R-HIGH, DIV-1, 802.11ax40-HE0, Ch62



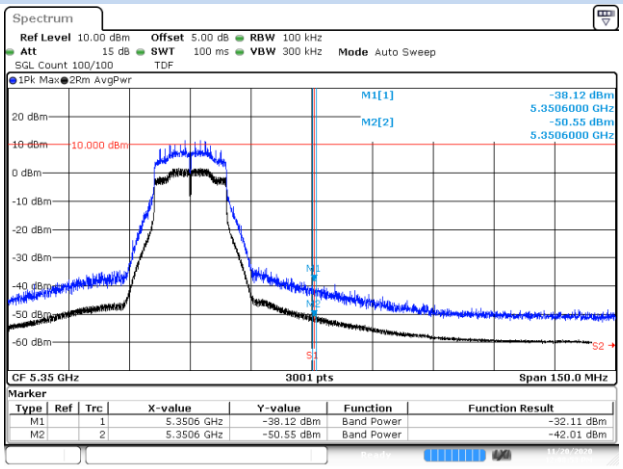
BE-R-HIGH, DIV-1, 802.11ac80-HE0, Ch58

CHAIN A DIV2



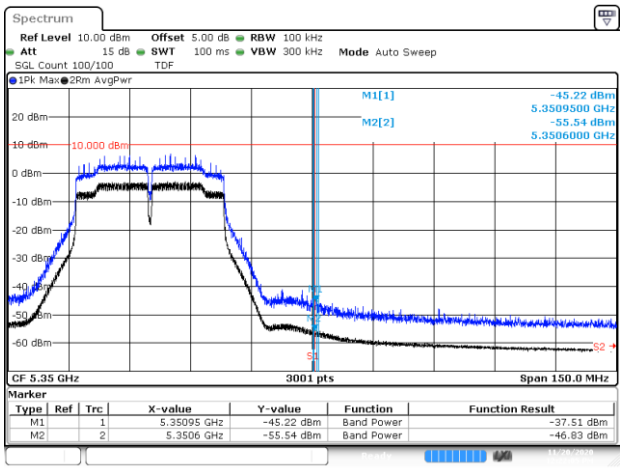
Date: 20.NOV.2020 11:39:56

BE-R-HIGH, DIV-2, 802.11a20-6Mbps, Ch64



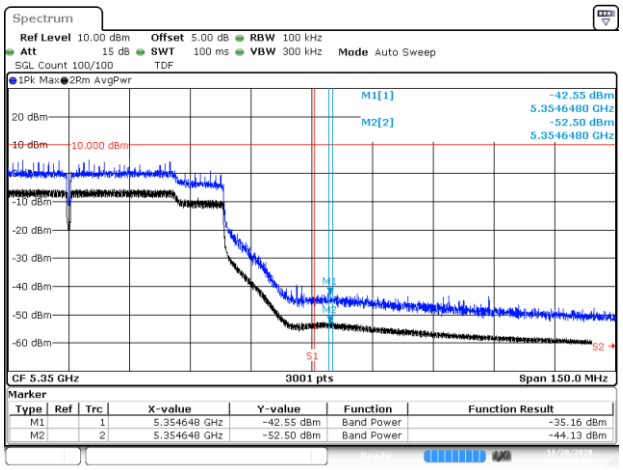
Date: 20.NOV.2020 12:08:53

BE-R-HIGH, DIV-2, 802.11n20-HT0, Ch64



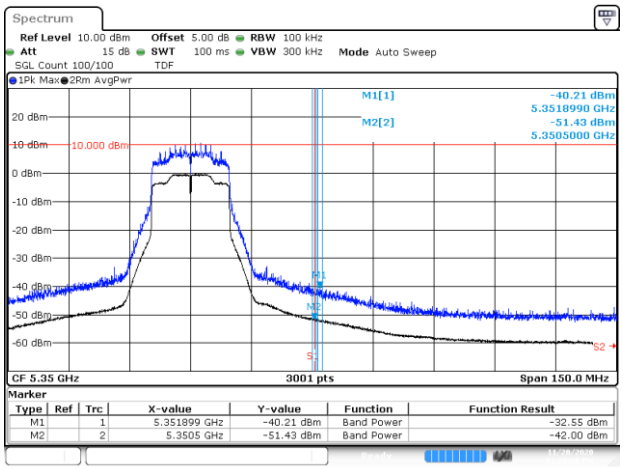
Date: 20.NOV.2020 12:22:03

BE-R-HIGH, DIV-2, 802.11n40-HT0, Ch62



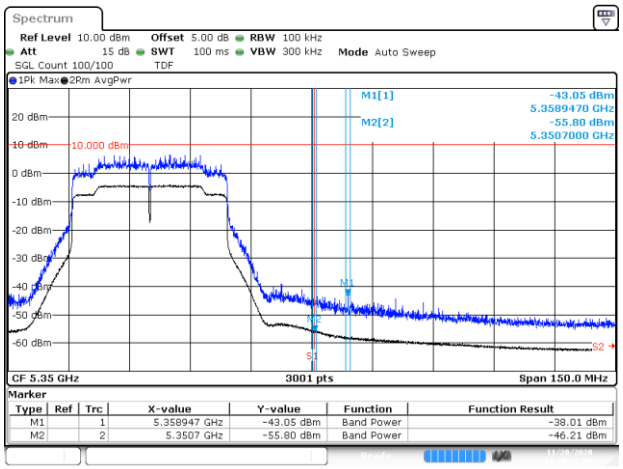
Date: 20.NOV.2020 14:24:39

BE-R-HIGH, DIV-2, 802.11ac80-VHT0, Ch58



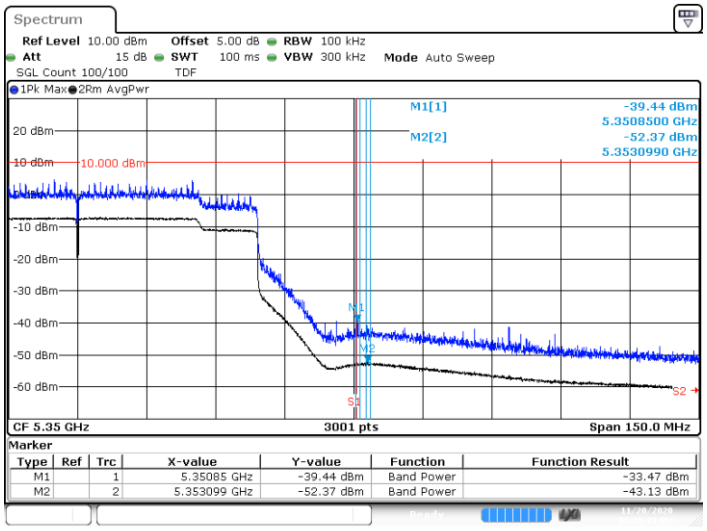
Date: 20.NOV.2020 13:20:21

BE-R-HIGH, DIV-2, 802.11ax20-HE0, Ch64



Date: 20.NOV.2020 13:50:33

BE-R-HIGH, DIV-2, 802.11ax40-HE0, Ch62



Date: 20.NOV.2020 14:10:11

BE-R-HIGH, DIV-2, 802.11ac80-HE0, Ch58