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

TEST REPORT

For

SHENZHEN TENDA TECHNOLOGY CO.,LTD.

6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052

Test Model: O1-5G

Report Type: Original Report	Product Type: 5GHz 9dBi 11AC 867Mbps Outdoor CPE
Report Number:	DG2220302-06789E-22A
Report Date:	2022-08-03
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		5GHz 9dBi 11AC 867Mbps Outdoor CPE
EUT Model:		O1-5G
EU Adapter Information	Model:	BN073-A12012E
	Input:	100-240Vac 50/60Hz 0.4A
	Output:	12V 1A
UK Adapter Information	Model:	BN073-A12012B
	Input:	100-240Vac 50/60Hz 0.4A
	Output:	12V 1A
Rated Input Voltage:		12Vdc from adapter or 12V from POE
Serial Number:		DG2220302-06789E-RF-S1
EUT Received Date:		2022.03.05
EUT Received Status:		Good

Technical Specification

Operation Frequency Range (MHz):		5150~5250MHz; 5470~5725 MHz
RF Output Power (EIRP) (dBm):		5150~5250MHz: 22.95 dBm 5470~5725 MHz: 25.36 dBm
Number of Chains	Transmit:	2
	Receive:	2
Antenna Gain (dBi)[▲]:		5(Max)
Beamforming Gain(dB)		3
Modulation Type:		OFDM

Objective

This report is prepared on behalf of **SHENZHEN TENDA TECHNOLOGY 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).

Test Methodology

All measurements contained in this report were conducted 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.

Measurement Uncertainty

Parameter	F _{lab}	Maximum allow uncertainty
RF Frequency	$\pm 1 \times 10^{-6}$	$\pm 1 \times 10^{-5}$
RF power conducted	$\pm 0.61\text{dB}$	$\pm 1,5\text{dB}$
RF power radiated	$\pm 3.62\text{dB}$	$\pm 6\text{dB}$
Spurious emissions, conducted	$\pm 2.47\text{dB}$	$\pm 3\text{dB}$
Spurious emissions, radiated	$\pm 3.62\text{dB}$	$\pm 6\text{dB}$
Temperature	$\pm 1^\circ\text{C}$	$\pm 2^\circ\text{C}$
Humidity	$\pm 5\%$	$\pm 5\%$
Time	1%	$\pm 10\%$

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Declarations

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 a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

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

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which is provided by manufacture.

The system support 802.11a/n ht20/n ht40/ac vht20/ac vht40/ac vht80, 802.11a support SISO only; 802.11n, acmodes support MIMO, and Beamforming.

For 5150~5250 MHz band, 7 channels are provided:

Frequency (MHz)	Frequency (MHz)
5180	5220
5190	5230
5200	5240
5210	/

For 802.11a /n/, 5180MHz was tested, for 802.11n, 5190MHz was tested, for 802.11ac, 5210 MHz was tested.

For 5470~5725 MHz band, 18 channels are provided:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580
102	5510	118	5590
104	5520	132	5660
106	5530	134	5670
108	5540	136	5680
110	5550	140	5700
112	5560	/	/

For 802.11a /n, 5500MHz and 5700MHz were tested, for 802.11n, 5510MHz and 5670MHz were tested, for 802.11ac/, 5530 MHz were tested.

The extreme test conditions which were declared by the manufacturer and the normal conditions are as below

NT: Normal Temperature +25℃

LT: Low Temperature -30℃

HT: High Temperature +60℃

EUT Exercise Software

Software “mp_tool_v3.6[▲]” was used and the power level was configured as below. 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 data rates, bandwidths, and modulations[▲].

Band(MHz)	Mode	Frequency (MHz)	Data rate (Mbps)		Power level	
			Ant 1 (Chain 0)	Ant 2 (Chain 1)	Ant 1 (Chain 0)	Ant 2 (Chain 1)
5150-5250	802.11 a	5180	6	6	15	15
		5240	6	6	15	15
	802.11 n20	5180	MCS8	MCS8	17	17
		5240	MCS8	MCS8	17	17
	802.11 n40	5190	MCS8	MCS8	20	20
		5230	MCS8	MCS8	20	20
	802.11 ac20	5180	NSS1 MCS8	NSS1 MCS8	14	14
		5240	NSS1 MCS8	NSS1 MCS8	16	16
	802.11 ac40	5190	NSS1 MCS8	NSS1 MCS8	20	20
		5230	NSS1 MCS8	NSS1 MCS8	23	23
	802.11 ac80	5210	NSS1 MCS8	NSS1 MCS8	30	30
5470-5725	802.11 a	5500	6	6	15	15
		5700	6	6	20	20
	802.11 n20	5500	MCS8	MCS8	15	15
		5700	MCS8	MCS8	17	17
	802.11 n40	5510	MCS8	MCS8	15	15
		5670	MCS8	MCS8	18	18
	802.11 ac20	5500	NSS1 MCS8	NSS1 MCS8	15	15
		5700	NSS1 MCS8	NSS1 MCS8	15	15
	802.11 ac40	5510	NSS1 MCS8	NSS1 MCS8	20	20
		5670	NSS1 MCS8	NSS1 MCS8	20	20
	802.11 ac80	5530	NSS1 MCS8	NSS1 MCS8	20	20

Beamforming:

Band(MHz)	Mode	Frequency (MHz)	Data rate (Mbps)		Power level	
			Ant 1 (Chain 0)	Ant 2 (Chain 1)	Ant 1 (Chain 0)	Ant 2 (Chain 1)
5150-5250	802.11 n20	5180	MCS8	MCS8	3	3
		5240	MCS8	MCS8	3	3
	802.11 n40	5190	MCS8	MCS8	5	5
		5230	MCS8	MCS8	5	5
	802.11 ac20	5180	NSS1 MCS8	NSS1 MCS8	4	4
		5240	NSS1 MCS8	NSS1 MCS8	3	3
	802.11 ac40	5190	NSS1 MCS8	NSS1 MCS8	8	8
		5230	NSS1 MCS8	NSS1 MCS8	8	8
	802.11 ac80	5210	NSS1 MCS8	NSS1 MCS8	11	11
5470-5725	802.11 n20	5500	MCS8	MCS8	59	59
		5700	MCS8	MCS8	67	67
	802.11 n40	5510	MCS8	MCS8	65	65
		5670	MCS8	MCS8	71	71
	802.11 ac20	5500	NSS1 MCS8	NSS1 MCS8	59	59
		5700	NSS1 MCS8	NSS1 MCS8	67	67
	802.11 ac40	5510	NSS1 MCS8	NSS1 MCS8	58	58
		5670	NSS1 MCS8	NSS1 MCS8	70	70
	802.11 ac80	5530	NSS1 MCS8	NSS1 MCS8	57	57

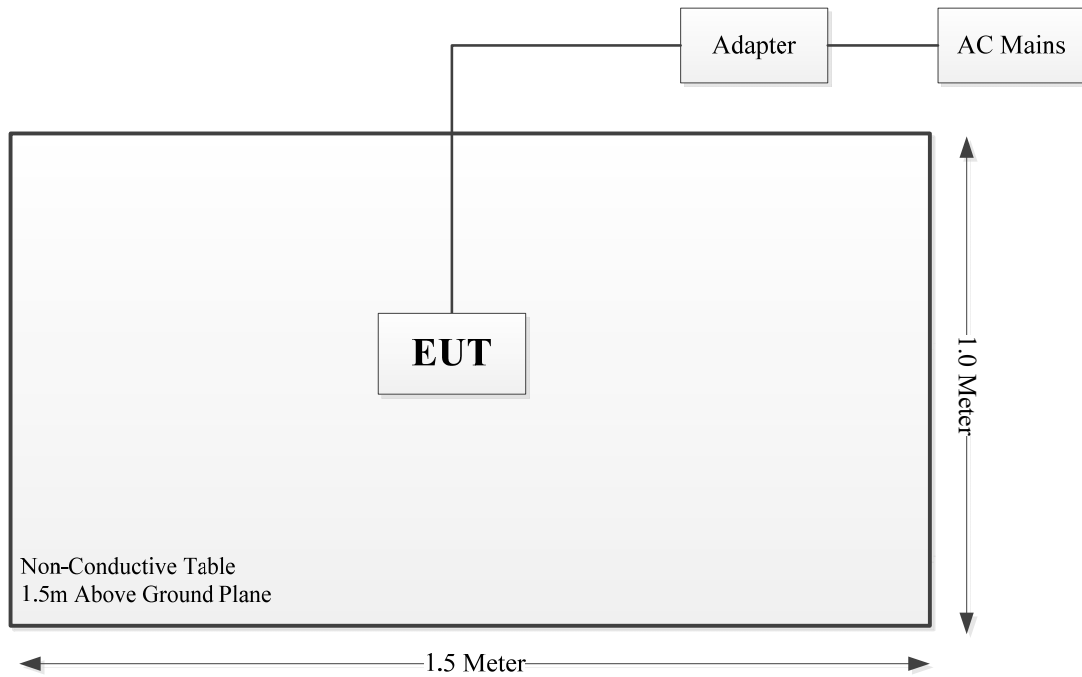
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

Support Cable List and Details

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
DC Cable	No	No	1.8	Adapter	EUT

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated emissions below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2021-10-26	2022-10-25
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2021-08-19	2022-08-18
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2021-08-19	2022-08-18
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2021-08-19	2022-08-18
Sonoma	Amplifier	310N	185914	2021-08-19	2022-08-18
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2021-09-04	2022-09-03
Agilent	Signal Generator	E8247C	MY43321350	2021-04-25	2022-04-24
Radiated emissions above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2021-10-12	2024-10-11
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2020-12-05	2023-12-04
Agilent	Spectrum Analyzer	E4440A	SG43360054	2021-07-22	2022-07-21
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2021-09-04	2022-09-03
AH	Preamplifier	PAM-0118	469	2021-10-13	2022-10-12
TDK RF	Horn Antenna	HRN-0118	130 084	2021-10-12	2024-10-11
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2020-12-05	2023-12-04
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2021-06-27	2022-06-26
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2021-09-04	2022-09-03
Agilent	Signal Generator	E8247C	MY43321350	2021-04-25	2022-04-24
Mini Circuits	High Pass Filter	VHF-6010+	31118	2021-06-16	2022-06-15
RF conducted					
R&S	Spectrum Analyzer	FSV40	101589	2021-07-22	2022-07-21
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	OE01201047	2021-05-06	2022-05-05
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	2021-09-04	2022-09-03
Agilent	USB Wideband Power Sensor	U2022XA	MY5417006	2021-07-22	2022-07-21
R&S	Wideband Radio Communication Tester	CMW500	110479	2021-10-26	2022-10-25
BACL	TEMP&HUMI Test Chamber	BTH-150	30022	2022-02-24	2023-02-23
Keysight	MXA Signal Analyzer	N9020	MY48490137	2021-10-26	2022-10-25
Agilent	MXG Analog Signal Generator	N5181A	MY48180151	2021-10-26	2022-10-25
Agilent	MXG Vector Signal Generator	N5182A	MY49060274	2021-10-26	2022-10-25
Tonscend	RF Control Unit	JS0806-2	19G8060171	2021-10-26	2022-10-25

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

Environmental Conditions

Test Site:	Radiated emissions	RF conducted
Temperature:	23.0~23.8°C	25.7~27.5°C
Relative Humidity:	71~75%	45~52%
ATM Pressure:	101.1~101.2kPa	100.6~101.1kPa
Tester:	Ekko Liao, Leo Yuan	Fan Fan
Test Date:	2022-03-26~2022-03-28	2022-04-08~2022-06-25

SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	EN 301 893 Clause 4.2.1	Carrier frequencies	Compliant
2	EN 301 893 Clause 4.2.2	Nominal channel bandwidth and occupied channel bandwidth	Compliant
3	EN 301 893 Clause 4.2.3	RF output power, Power density	Compliant
3	EN 301 893 Clause 4.2.3	Transmit power control (TPC)	Not applicable
4	EN 301 893 Clause 4.2.4.1	Transmitter unwanted emissions outside the 5 GHz RLAN bands	Compliant
5	EN 301 893 Clause 4.2.4.2	Transmitter unwanted emissions within the 5 GHz RLAN bands	Compliant
6	EN 301 893 Clause 4.2.5	Receiver spurious emissions	Compliant
7	EN 301 893 Clause 4.2.6	Dynamic frequency selection (DFS)	Compliant**
8	EN 301 893 Clause 4.2.7	Adaptivity	Compliant
9	EN 301 893 Clause 4.2.8	Receiver blocking	Compliant
10	EN 301 893 Clause 4.2.9	User access restrictions	Compliant*
11	EN 301 893 Clause 4.2.10	Geo-location capability	Not applicable

Note:

Not applicable: The device without this function.

Compliant*: Please refer to the product information declared by the manufacturer.

Compliant**: Please refer to the DFS report.

1 – CARRIER FREQUENCIES

Definition

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

Limit

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

Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.2

Test Data

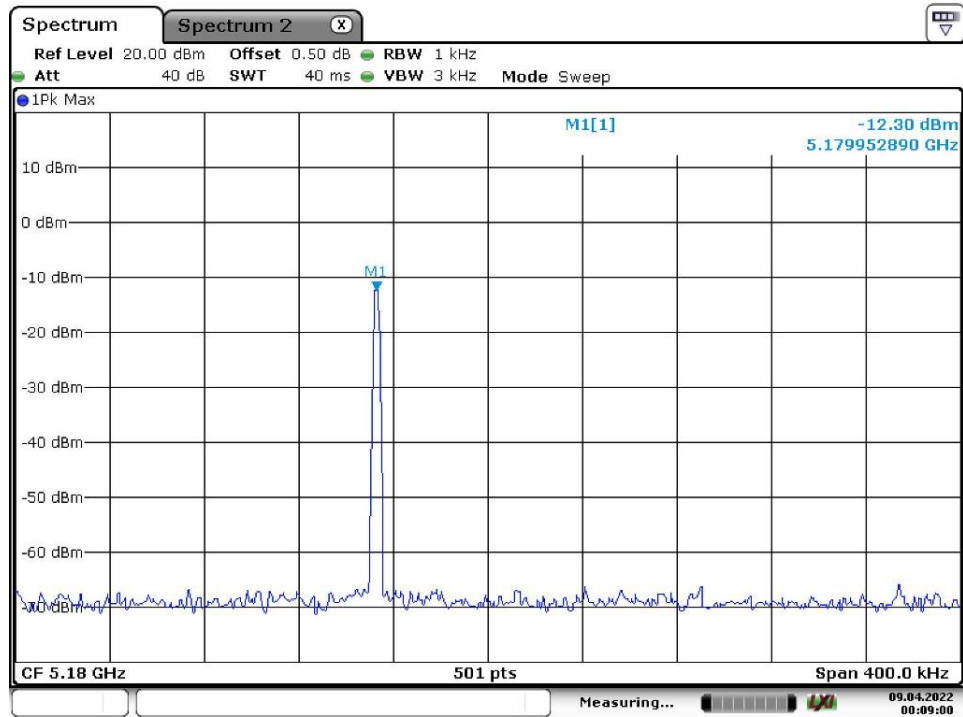
Test was performed with chain0, please refer to following table:

Test Conditon	Frequency Band	Fc (MHz)	Measured Frequency (MHz)	Result (ppm)	Limit (ppm)
NV	W52	5180	5179.95	-9.65	±20
		5240	5239.95	-9.54	
	W56	5500	5499.95	-9.09	
		5700	5699.94	-10.53	
LV	W52	5180	5179.97	-5.79	±20
		5240	5239.97	-5.73	
	W56	5500	5499.97	-5.45	
		5700	5699.96	-7.02	
HV	W52	5180	5179.93	-13.51	±20
		5240	5239.93	-13.36	
	W56	5500	5499.93	-12.73	
		5700	5699.91	-15.79	

Note: Result = (Measured Frequency - Fc)/Fc*10⁶

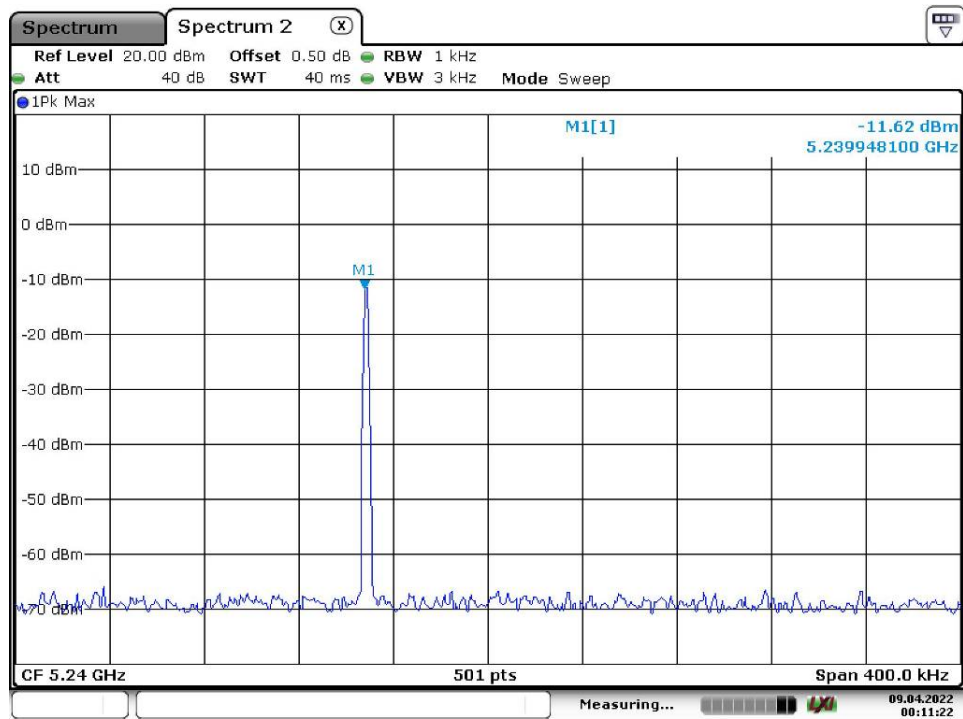
The Normal condition test plots, please refer to following Plots:
5150-5250MHz

802.11 a 5180M



Date: 9.APR.2022 00:09:00

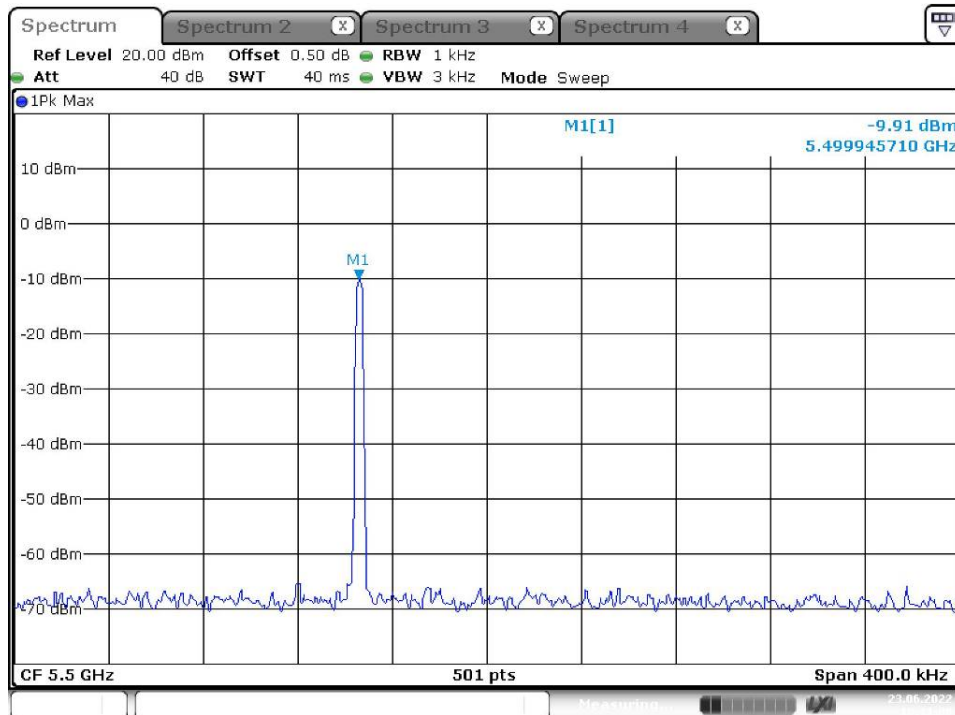
802.11 a 5240M



Date: 9.APR.2022 00:11:22

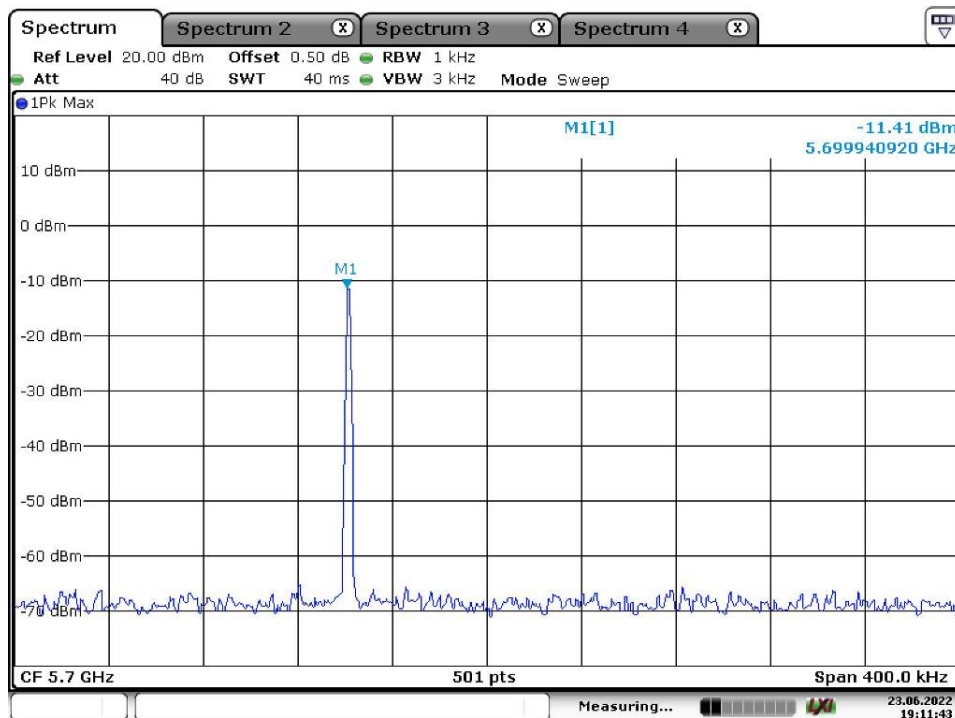
5470-5725 MHz

802.11 a 5500M



Date: 23.JUN.2022 19:11:10

802.11 a 5700M



Date: 23.JUN.2022 19:11:44

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.

Limit

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 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

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.3

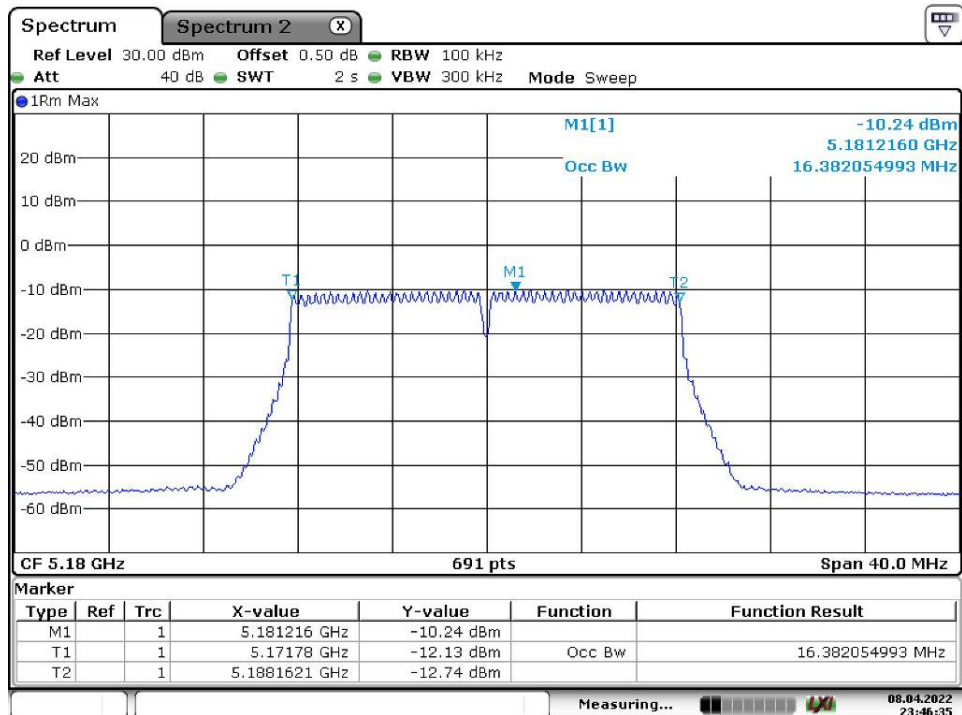
Test Data*Please refer to following table:*

Band	Mode	Fc (MHz)	Nominal Channel Bandwidth (MHz)	Result (MHz)	Limit (MHz)
5150-5250	802.11 a	5180	20	16.38	16~20
		5240		16.32	
	802.11 n20	5180	20	17.60	16~20
		5240		17.60	
	802.11 n40	5190	40	36.12	32~40
		5230		36.01	
	802.11 ac20	5180	20	17.60	16~20
		5240		17.60	
	802.11 ac40	5190	40	36.01	32~40
		5230		36.01	
	802.11 ac80	5210	80	75.02	64~80
5470-5725	802.11 a	5500	20	16.32	16~20
		5700		16.32	
	802.11 n20	5500	20	17.60	16~20
		5700		17.60	
	802.11 n40	5510	40	36.01	32~40
		5670		36.01	
	802.11 ac20	5500	20	17.60	16~20
		5700		17.60	
	802.11 ac40	5510	40	36.01	32~40
		5670		36.01	
	802.11 ac80	5530	80	75.02	64~80

Please refer to following plots:

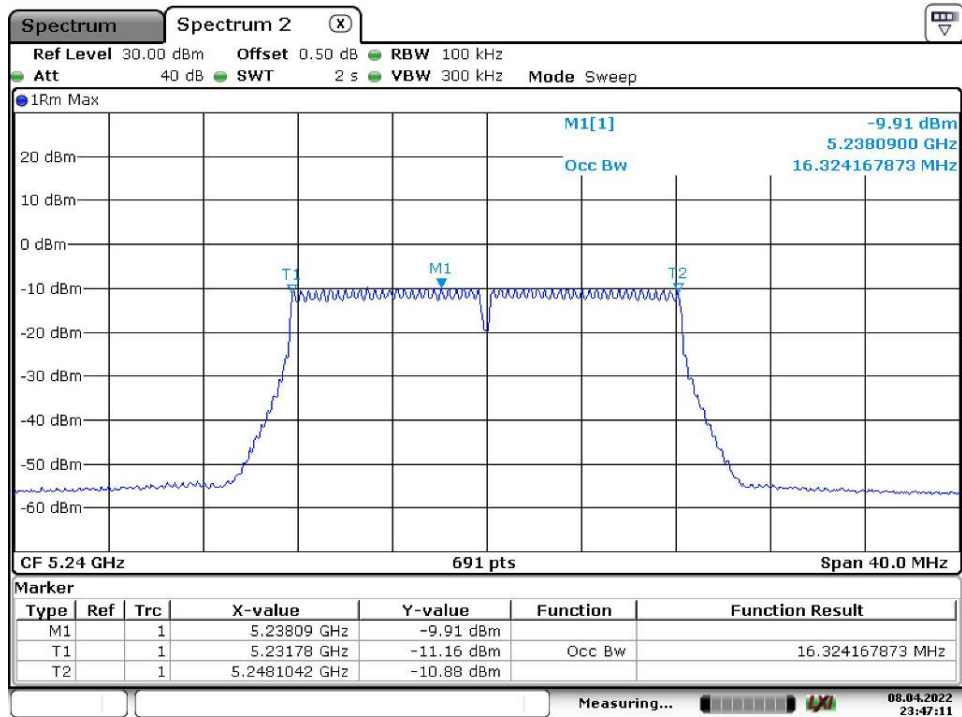
5150-5250MHz

802.11 a Low



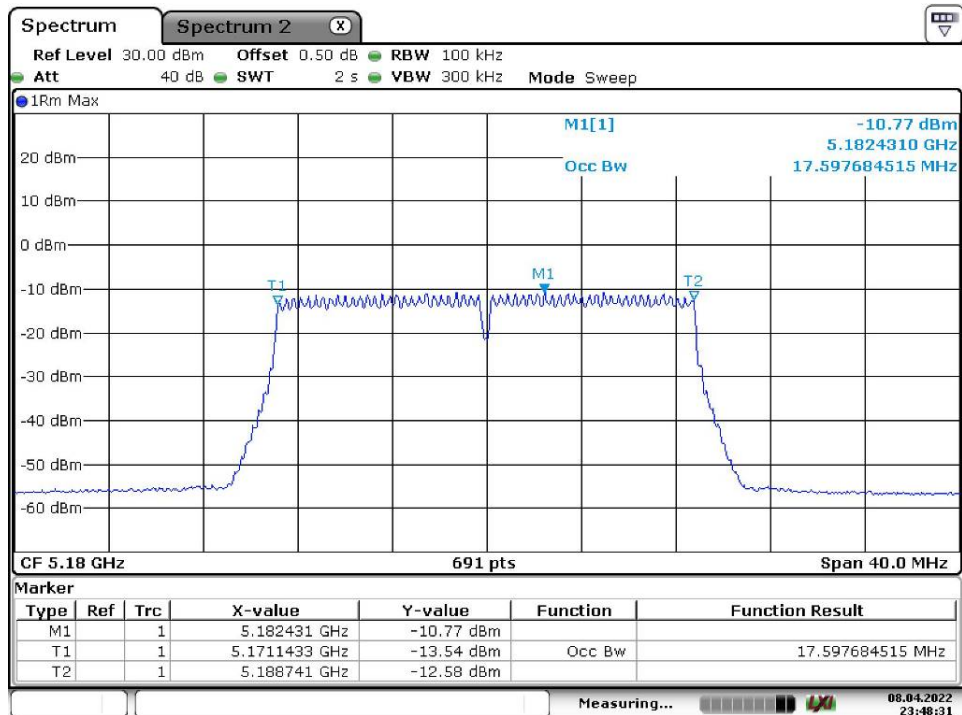
Date: 8.APR.2022 23:46:35

802.11 a High



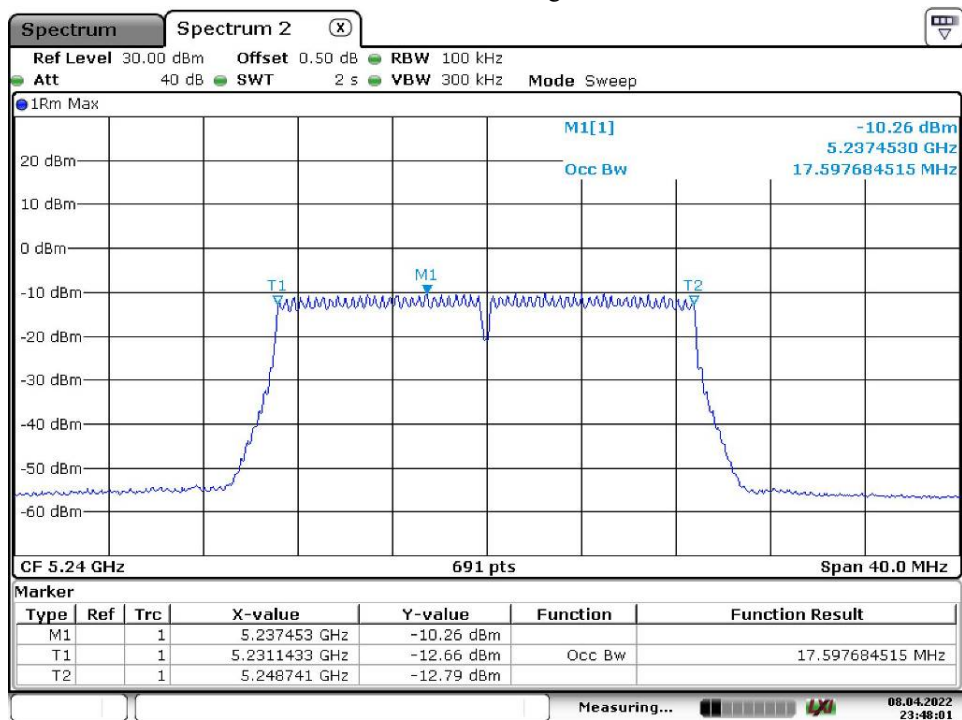
Date: 8.APR.2022 23:47:11

802.11 n20 Low



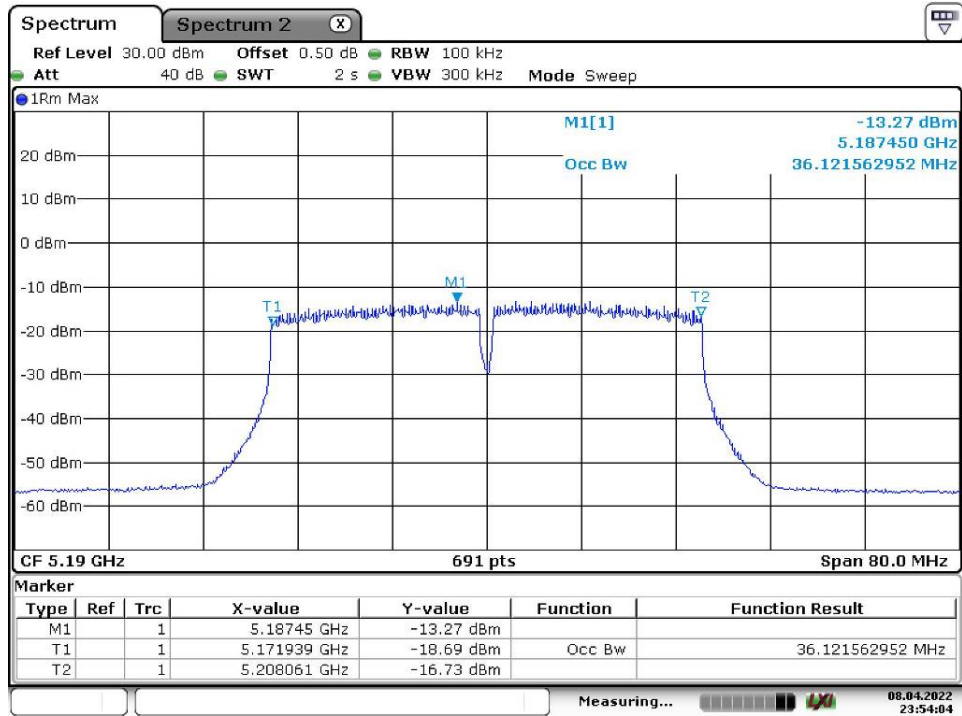
Date: 8.APR.2022 23:48:31

802.11 n20 High



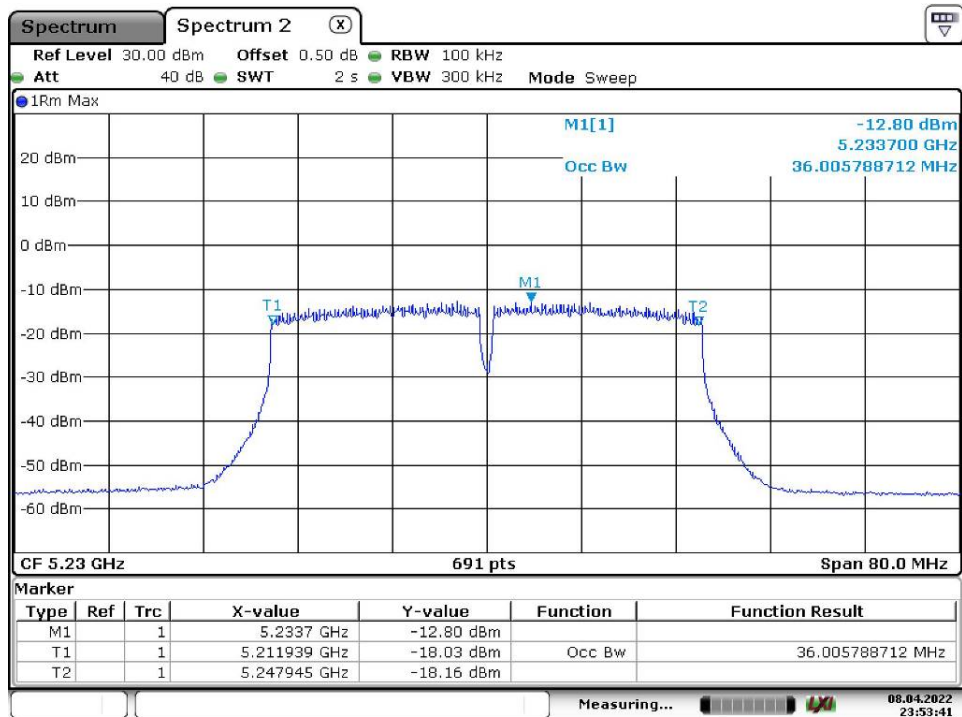
Date: 8.APR.2022 23:48:01

802.11 n40 Low



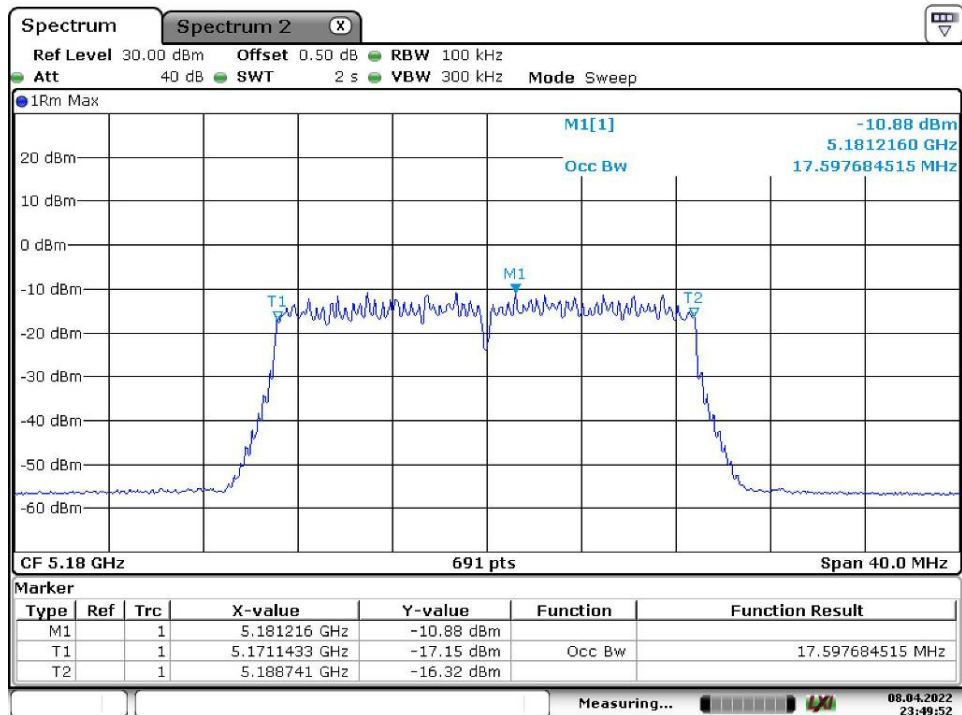
Date: 8.APR.2022 23:54:04

802.11 n40 High



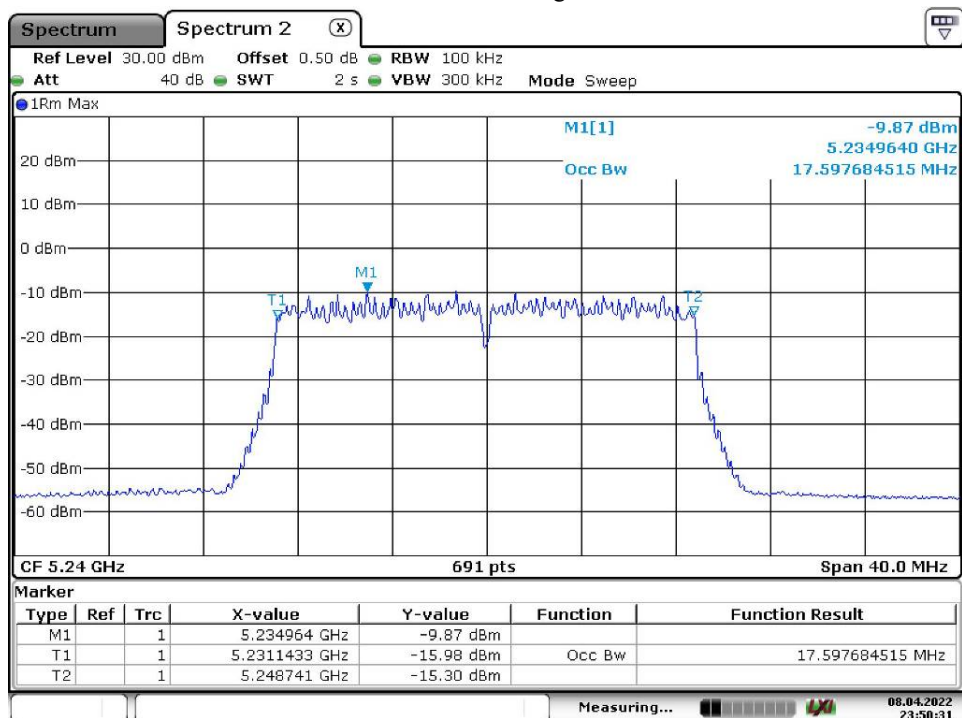
Date: 8.APR.2022 23:53:41

802.11 ac20 Low



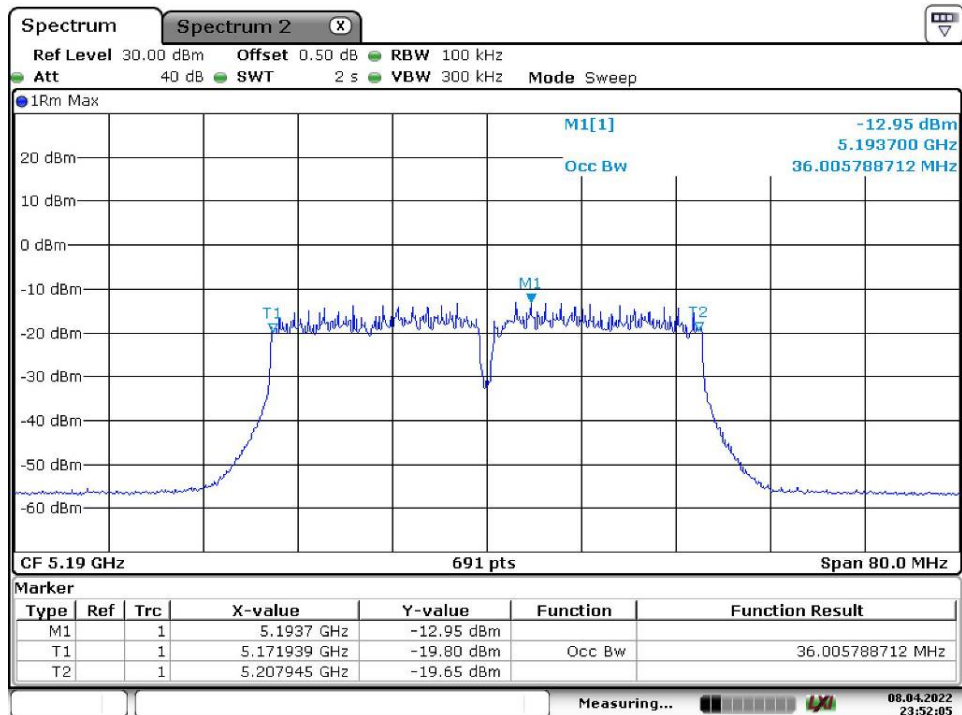
Date: 8.APR.2022 23:49:52

802.11 ac20 High



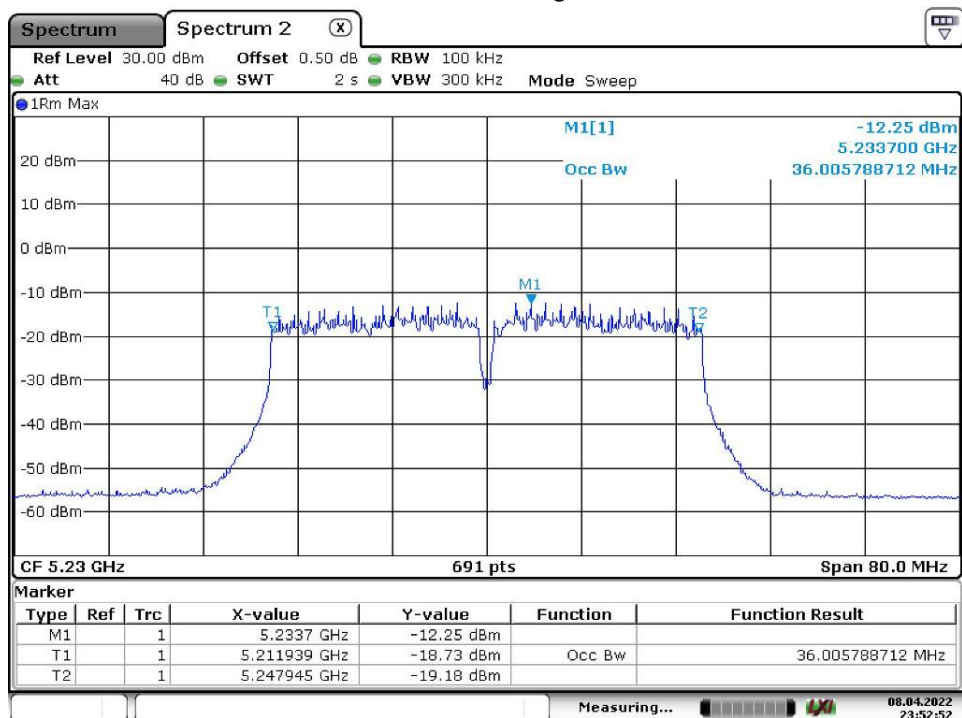
Date: 8.APR.2022 23:50:31

802.11 ac40 Low



Date: 8.APR.2022 23:52:05

802.11 ac40 High



Date: 8.APR.2022 23:52:52

Spectrum **Spectrum 2** ⓧ

Ref Level 30.00 dBm Offset 0.50 dB RBW 100 kHz
 Att 40 dB SWT 2 s VBW 300 kHz Mode Sweep

1Rm Max

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm

M1[1]
Occ Bw
-16.86 dBm
5.227370 GHz
75.021707670 MHz

T1
M1
T2

CF 5.21 GHz 691 pts Span 160.0 MHz

Marker

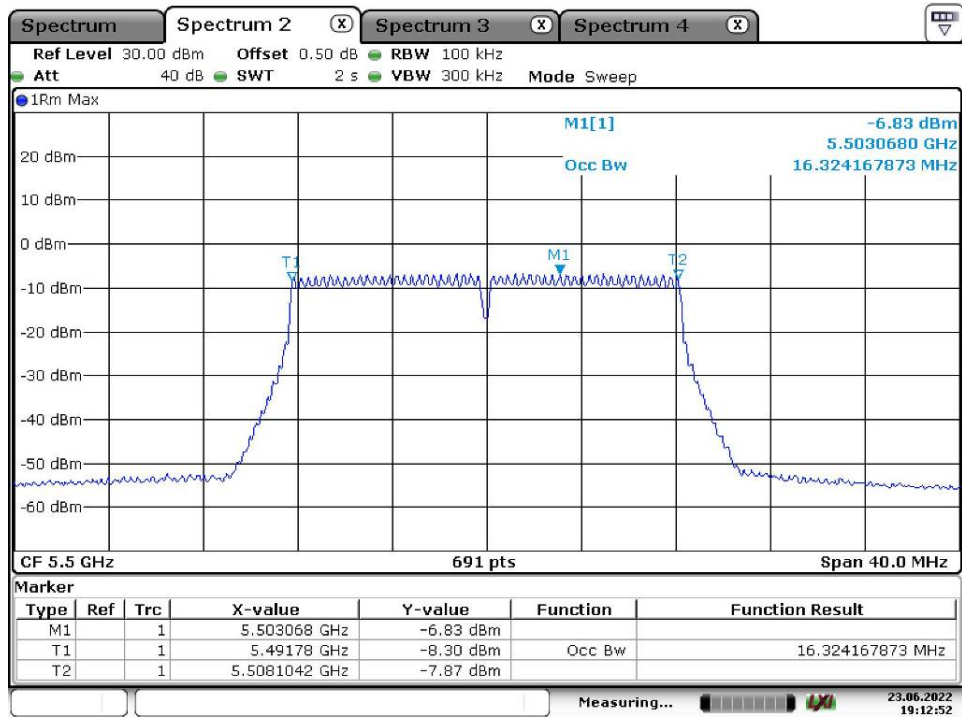
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.22737 GHz	-16.86 dBm		
T1		1	5.172489 GHz	-21.34 dBm	Occ Bw	75.02170767 MHz
T2		1	5.247511 GHz	-20.19 dBm		

Measuring... ██████████ 08.04.2022 23:41:59

Page 23 of 128

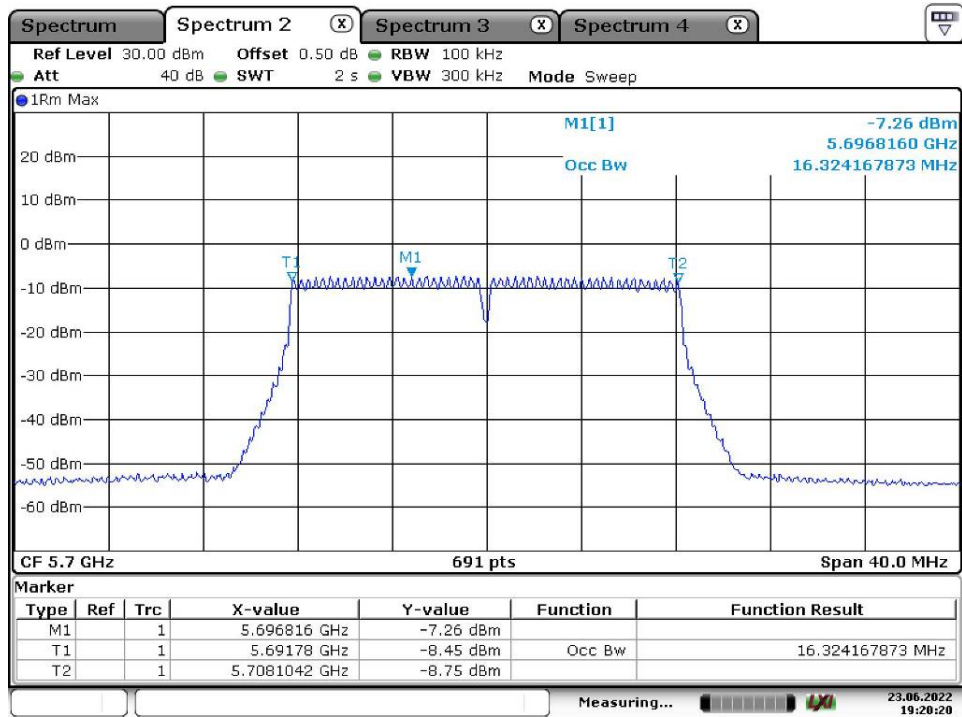
5470-5725MHz

802.11 a Low



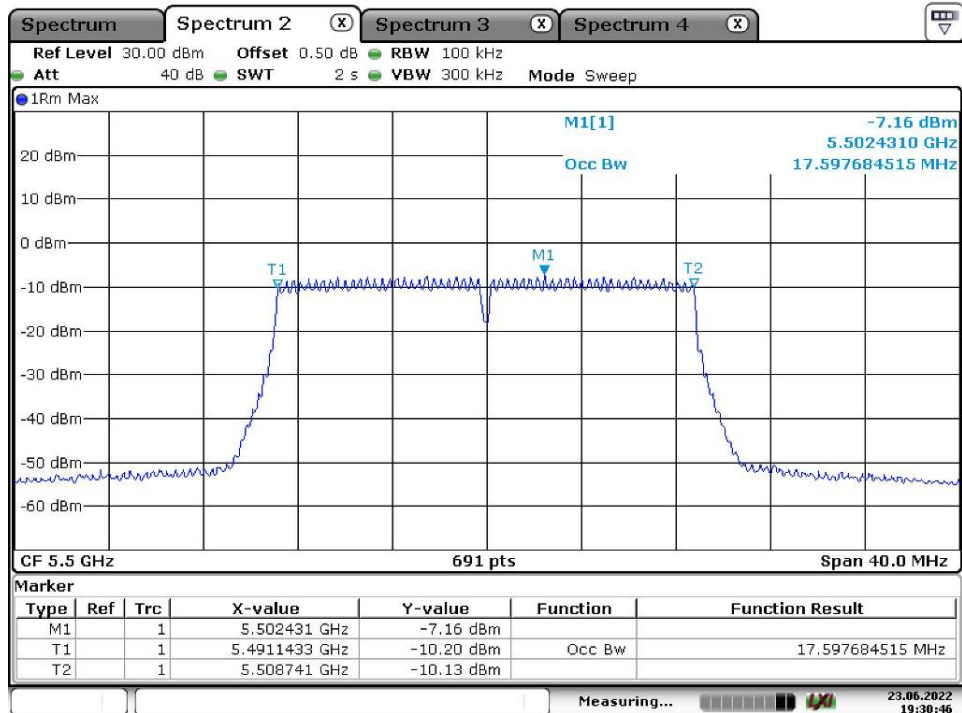
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802.11 a High



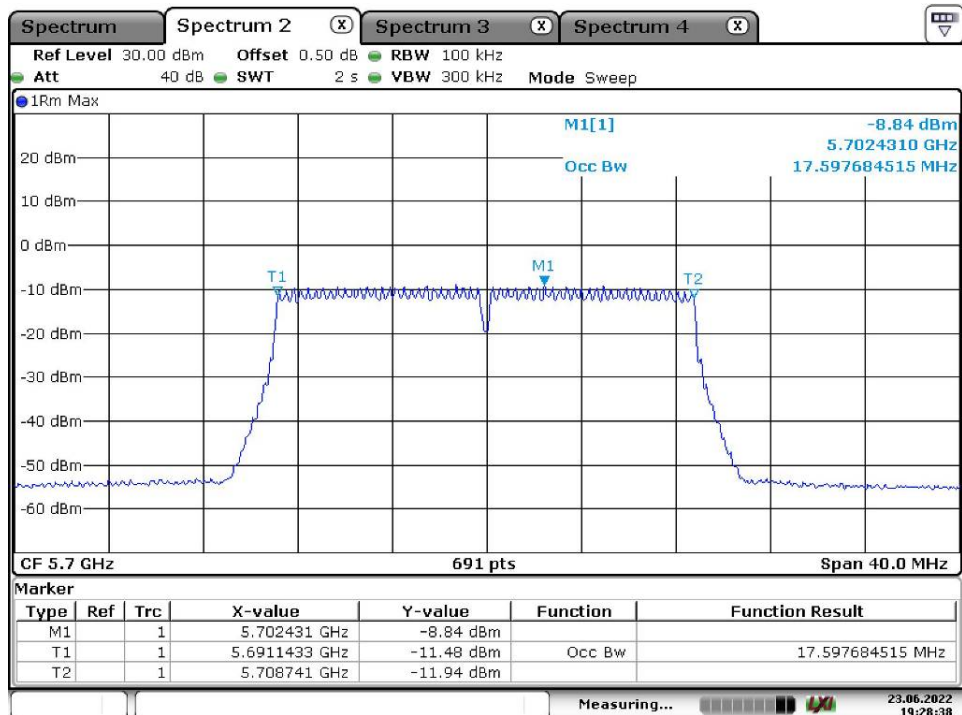
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802.11 n20 Low



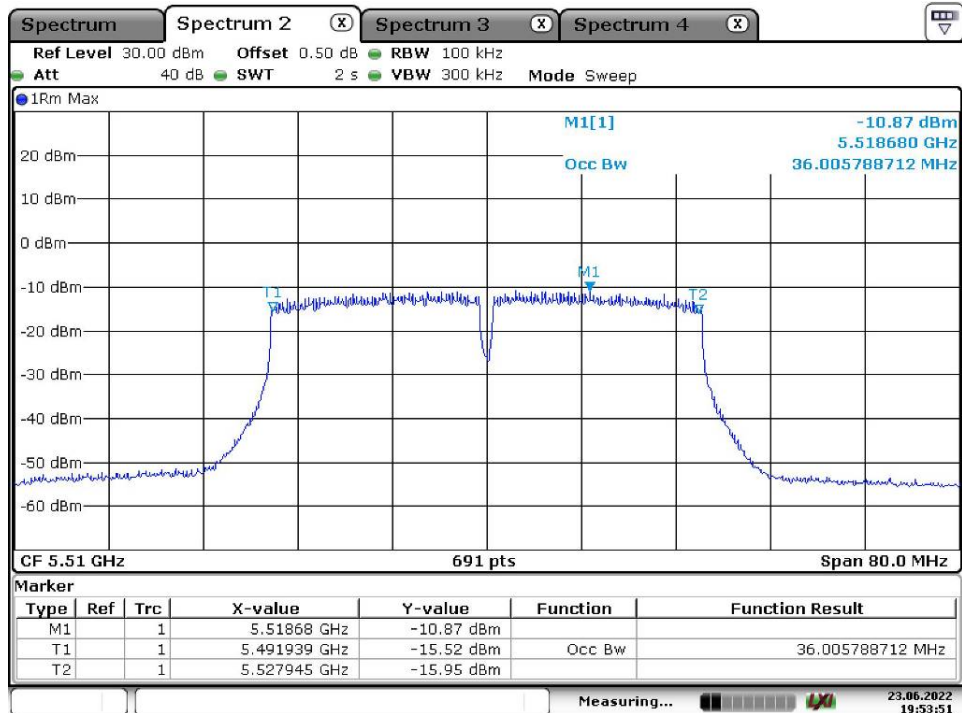
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802.11 n20 High



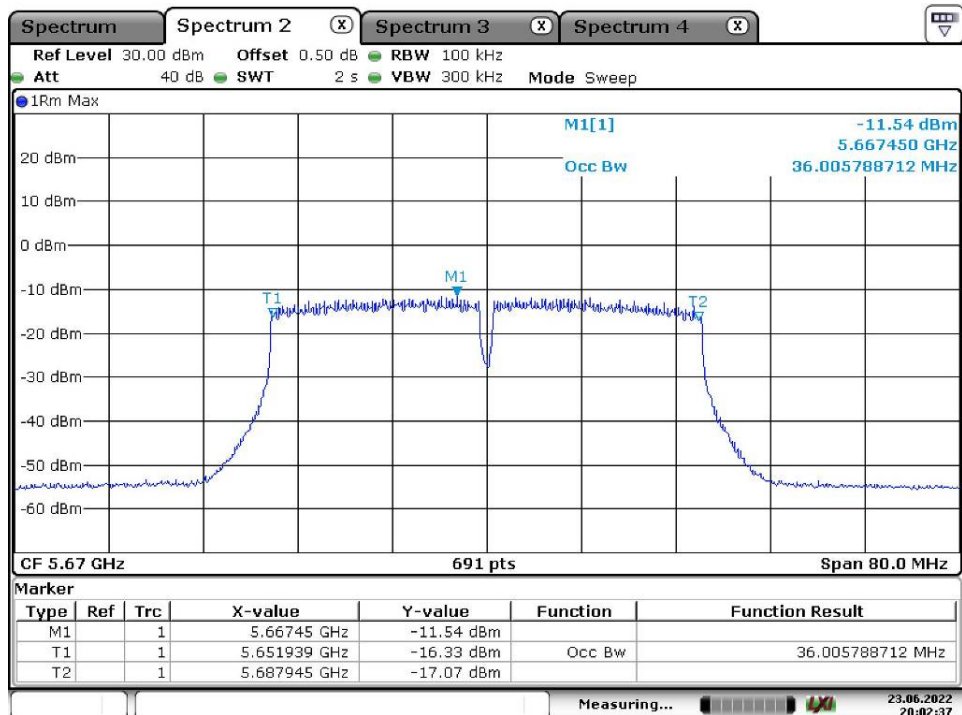
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802.11 n40 Low



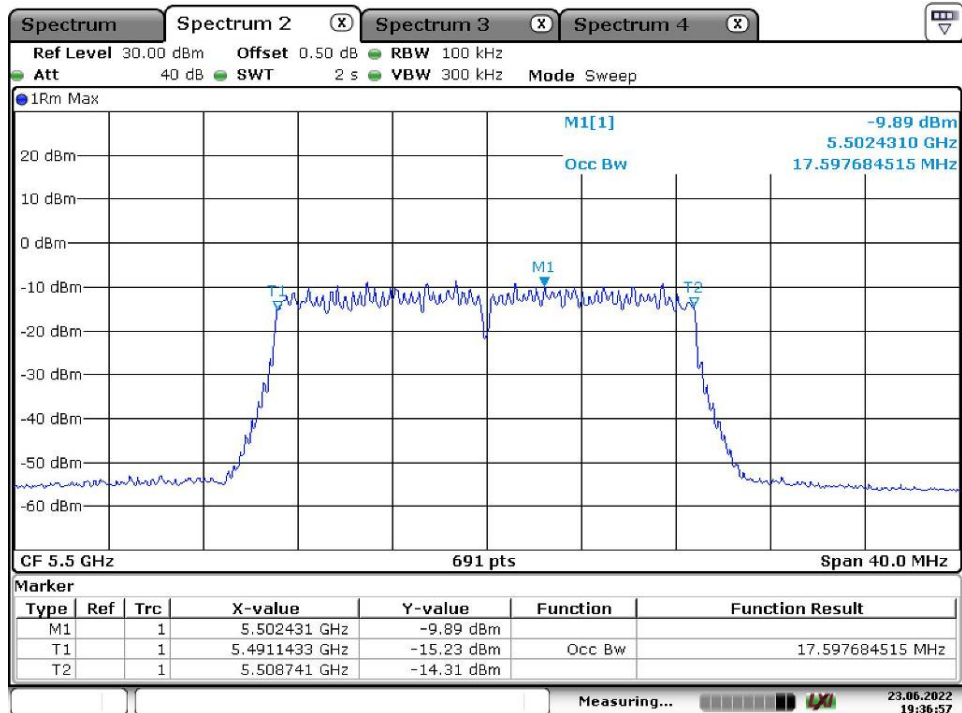
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802.11 n40 High



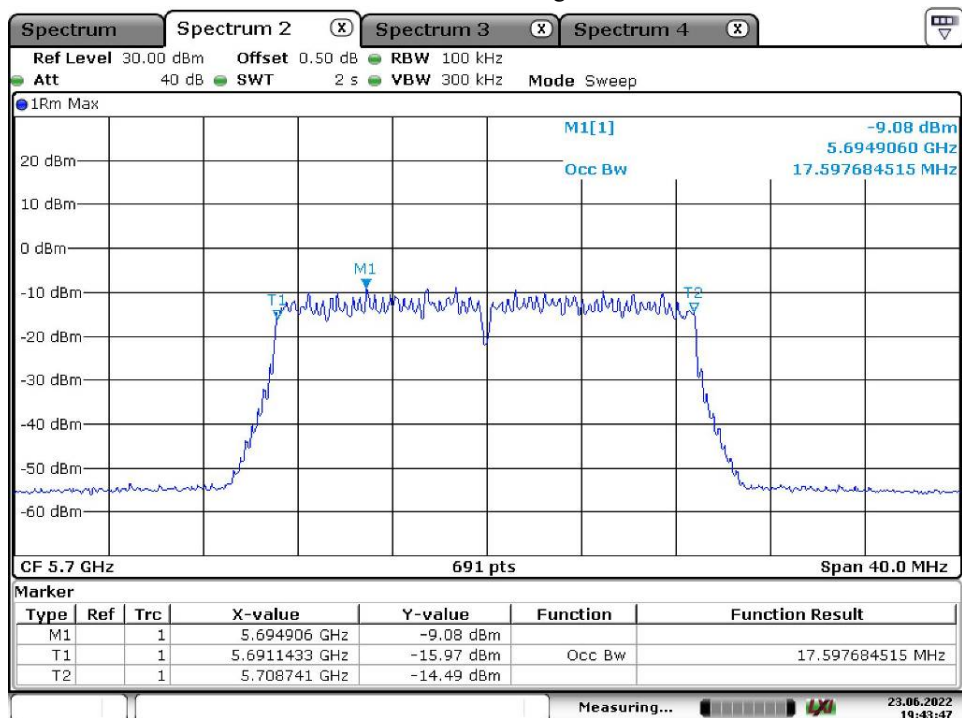
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802.11 ac20 Low



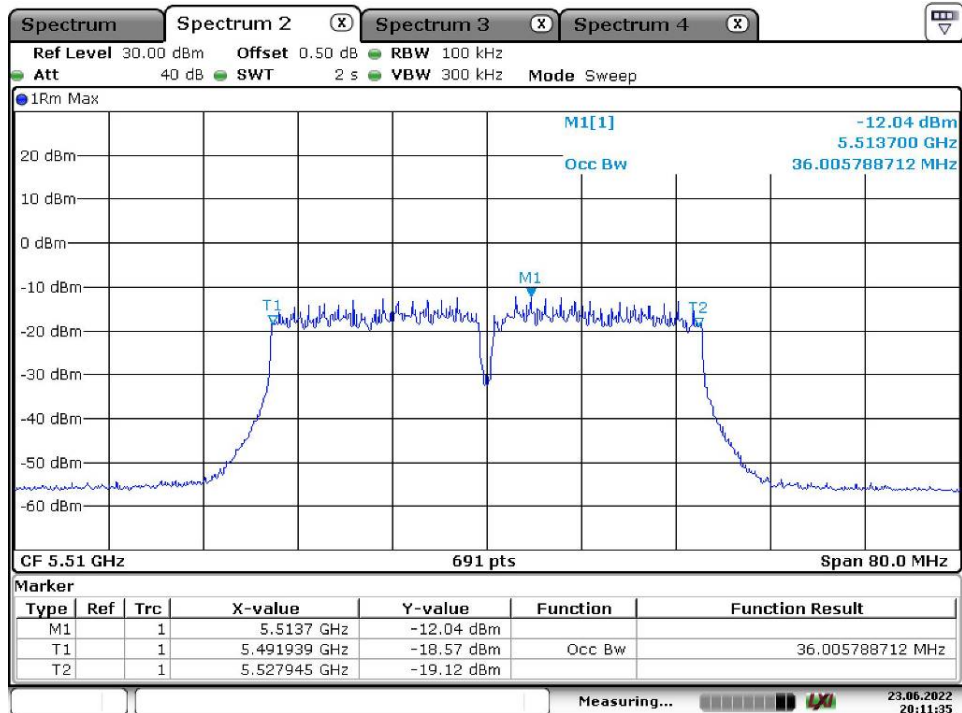
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802.11 ac20 High



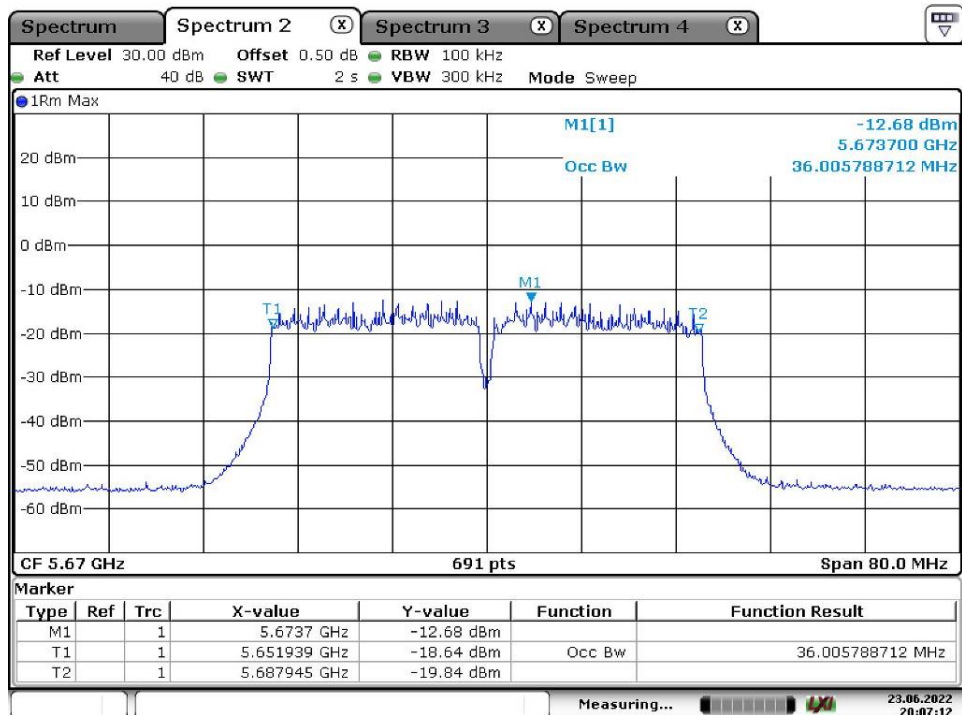
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802.11 ac40 Low



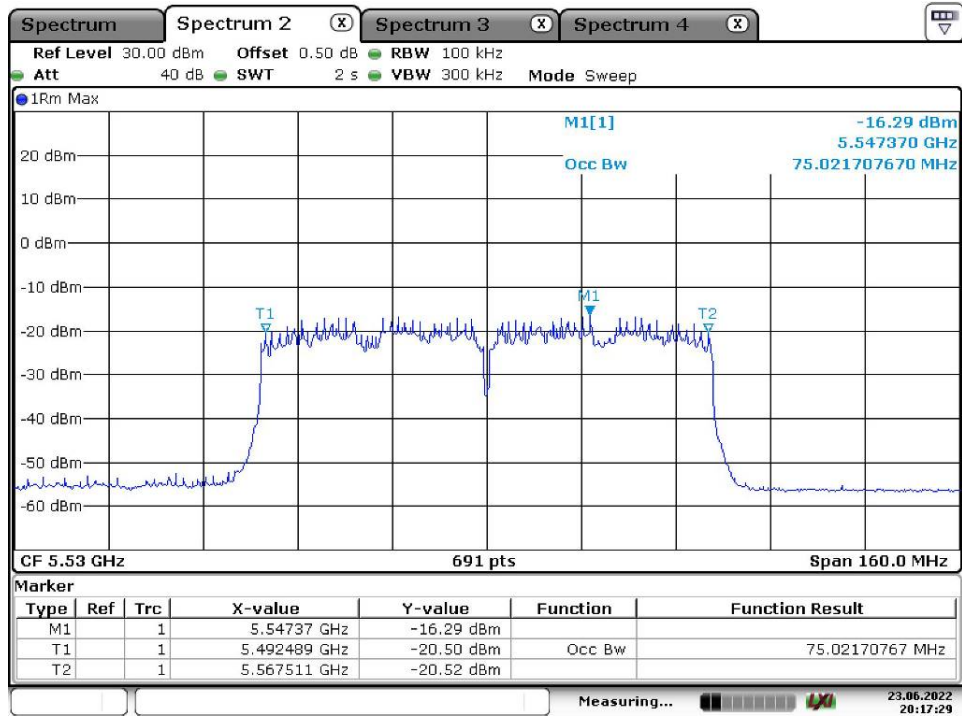
Date: 23.JUN.2022 20:11:36

802.11 ac40 High



Date: 23.JUN.2022 20:07:13

802.11 ac80



Date: 23.JUN.2022 20:17:30

3 – RF OUTPUT POWER, TRANSMIT POWER CONTROL (TPC), 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.

Limit

TPC is not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 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 MHz	Mean e.i.r.p. limit dBm		Mean e.i.r.p. density limit dBm/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 7dBm/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 10dBm/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.

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) §5.4.4

Test Data

Please refer to following table:

RF Output Power: 802.11 a

Band (MHz)	Fc (MHz)	Test condition	Conducted output power (dBm)		Result (dBm)		Limit (dBm)
			Chain 0	Chain 1	Chain 0	Chain 1	
5150-5250	5180	NT	11.73	11.85	19.73	19.85	23
		LT	11.75	11.87	19.75	19.87	
		HT	11.71	11.83	19.71	19.83	
	5240	NT	11.76	11.83	19.76	19.83	23
		LT	11.78	11.85	19.78	19.85	
		HT	11.74	11.81	19.74	19.81	
5470-5725	5500	NT	14.47	14.54	22.47	22.54	27
		LT	14.49	14.56	22.49	22.56	
		HT	14.45	14.52	22.45	22.52	
	5700	NT	13.66	13.46	21.66	21.46	27
		LT	13.68	13.48	21.68	21.48	
		HT	13.64	13.44	21.64	21.44	

RF output power: 802.11 n20

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5250	5180	NT	11.42	11.45	22.45	23
		LT	11.44	11.47	22.47	
		HT	11.4	11.43	22.43	
	5240	NT	11.48	11.47	22.49	23
		LT	11.5	11.49	22.51	
		HT	11.46	11.45	22.47	
5470-5725	5500	NT	13.67	13.84	24.77	27
		LT	13.69	13.86	24.79	
		HT	13.65	13.82	24.75	
	5700	NT	12.22	12.49	23.37	27
		LT	12.25	12.51	23.39	
		HT	12.20	12.47	23.35	

RF output power: 802.11 n40

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5250	5190	NT	11.94	11.88	22.92	23
		LT	11.96	11.91	22.95	
		HT	11.92	11.86	22.9	
	5230	NT	11.96	11.85	22.92	23
		LT	11.98	11.87	22.94	
		HT	11.94	11.83	22.9	
5470-5725	5510	NT	14.19	14.46	25.34	27
		LT	14.21	14.48	25.36	
		HT	14.17	14.44	25.32	
	5670	NT	13.27	13.14	24.22	27
		LT	13.29	13.16	24.24	
		HT	13.25	13.12	24.2	

RF output power: 802.11 ac20

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5250	5180	NT	11.42	11.45	22.45	23
		LT	11.44	11.47	22.47	
		HT	11.4	11.43	22.43	
	5240	NT	11.46	11.41	22.45	23
		LT	11.48	11.43	22.47	
		HT	11.44	11.4	22.43	
5470-5725	5500	NT	13.35	13.11	24.24	27
		LT	13.37	13.13	24.26	
		HT	13.33	13.09	24.22	
	5700	NT	12.83	12.33	23.6	27
		LT	12.85	12.35	23.62	
		HT	12.81	12.31	23.58	

RF output power: 802.11 ac40

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5250	5190	NT	11.73	11.67	22.71	23
		LT	11.75	11.69	22.73	
		HT	11.71	11.65	22.69	
	5230	NT	11.82	11.65	22.75	23
		LT	11.84	11.67	22.77	
		HT	11.8	11.63	22.73	
5470-5725	5510	NT	12.58	12.55	23.58	27
		LT	12.61	12.57	23.6	
		HT	12.56	12.53	23.56	
	5670	NT	13.46	12.17	23.87	27
		LT	13.48	12.19	23.89	
		HT	13.44	12.15	23.85	

RF output power: 802.11 ac80

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5350	5210	NT	9.54	9.41	20.49	23
		LT	9.56	9.43	20.51	
		HT	9.52	9.38	20.46	
5470-5725	5530	NT	11.01	10.71	21.87	27
		LT	11.03	10.73	21.89	
		HT	10.98	10.69	21.85	

Beamforming:**RF output power: 802.11 n20**

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5250	5180	NT	8.88	8.86	22.88	23
		LT	8.9	8.88	22.9	
		HT	8.86	8.84	22.86	
	5240	NT	8.66	8.81	22.75	23
		LT	8.68	8.83	22.77	
		HT	8.64	8.79	22.73	
5470-5725	5500	NT	10.31	10.25	24.29	27
		LT	10.33	10.27	24.31	
		HT	10.28	10.23	24.27	
	5700	NT	9.19	9.29	23.25	27
		LT	9.21	9.31	23.27	
		HT	9.17	9.27	23.23	

RF output power: 802.11 n40

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5250	5190	NT	8.85	8.83	22.85	23
		LT	8.87	8.85	22.87	
		HT	8.83	8.81	22.83	
	5230	NT	8.88	8.87	22.89	23
		LT	8.9	8.89	22.91	
		HT	8.86	8.85	22.87	
5470-5725	5510	NT	11.46	11.32	25.4	27
		LT	11.48	11.34	25.42	
		HT	11.44	11.29	25.38	
	5670	NT	10.15	10.43	24.3	27
		LT	10.17	10.45	24.32	
		HT	10.13	10.41	24.28	

RF output power: 802.11 ac20

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5250	5180	NT	8.87	8.84	22.87	23
		LT	8.89	8.86	22.89	
		HT	8.85	8.82	22.85	
	5240	NT	8.78	8.83	22.82	23
		LT	8.81	8.85	22.84	
		HT	8.76	8.81	22.8	
5470-5725	5500	NT	10.35	10.37	24.37	27
		LT	10.37	10.39	24.39	
		HT	10.33	10.35	24.35	
	5700	NT	9.31	9.51	23.42	27
		LT	9.33	9.53	23.44	
		HT	9.28	9.48	23.39	

RF output power: 802.11 ac40

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5250	5190	NT	8.88	8.62	22.76	23
		LT	8.91	8.64	22.79	
		HT	8.86	8.6	22.74	
	5230	NT	8.87	8.68	22.79	23
		LT	8.89	8.7	22.81	
		HT	8.86	8.66	22.77	
5470-5725	5510	NT	9.43	9.51	23.48	27
		LT	9.45	9.53	23.5	
		HT	9.41	9.48	23.46	
	5670	NT	9.37	9.41	23.4	27
		LT	9.39	9.43	23.42	
		HT	9.35	9.39	23.38	

RF output power: 802.11 ac80

Band (MHz)	Fc (MHz)	Test condition	Result (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
5150-5350	5210	NT	8.79	8.45	22.63	23
		LT	8.81	8.47	22.65	
		HT	8.78	8.43	22.62	
5470-5725	5530	NT	7.29	7.54	21.43	27
		LT	7.31	7.56	21.45	
		HT	7.27	7.53	21.41	

Power Density

Band (MHz)	Mode	Fc (MHz)	Conducted power density (dBm/MHz)		Result (dBm/MHz)		Limit (dBm/MHz)
			Chain 0	Chain 1	Chain 0	Chain 1	
5150- 5250	802.11 a	5180	-2.59	-2.43	5.44	5.60	10
		5240	-2.26	-2.01	5.77	6.02	
	802.11 n20	5180	-3.42	-3.00	7.87		
		5240	-3.16	-3.39	7.80		
	802.11 n40	5190	-5.92	-6.22	5.13		
		5230	-5.88	-6.03	5.25		
	802.11 ac20	5180	-5.15	-4.78	6.11		
		5240	-4.35	-4.36	6.72		
	802.11 ac40	5190	-7.48	-8.72	3.14		
		5230	-7.27	-8.84	3.22		
	802.11 ac80	5210	-12.30	-12.71	-1.13		
5470- 5725	802.11 a	5500	-1.69	-0.44	6.34	7.59	14
		5700	-2.28	-2.34	5.75	5.69	
	802.11 n20	5500	-3.04	-2.49	8.32		
		5700	-4.42	-5.19	6.29		
	802.11 n40	5510	-6.36	-5.88	5.09		
		5670	-7.09	-8.00	3.68		
	802.11 ac20	5500	-5.66	-6.31	5.10		
		5700	-5.84	-7.60	4.44		
	802.11 ac40	5510	-9.23	-9.91	1.64		
		5670	-9.43	-10.79	1.14		
	802.11 ac80	5530	-13.48	-14.87	-2.75		

Note: The antenna gain and the duty cycle factor were added to the result.

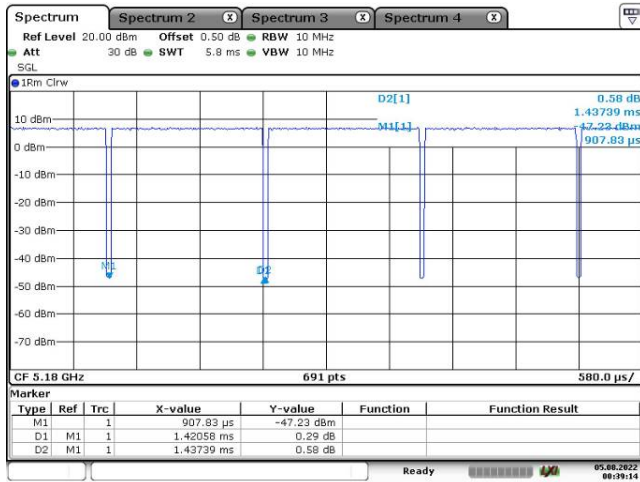
Duty Cycle:

Mode	T _{on} (ms)	T _{on+off} (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
802.11 a	1.42	1.43	0.03	0.99
802.11 n20	1.32	1.34	0.07	0.99
802.11 n40	0.67	0.70	0.19	0.96
802.11 ac20	1.34	1.36	0.06	0.99
802.11 ac40	0.67	0.70	0.19	0.96
802.11 ac80	0.35	0.38	0.36	0.92

Duty cycle factor = $10 \cdot \log(100/\text{duty cycle})$

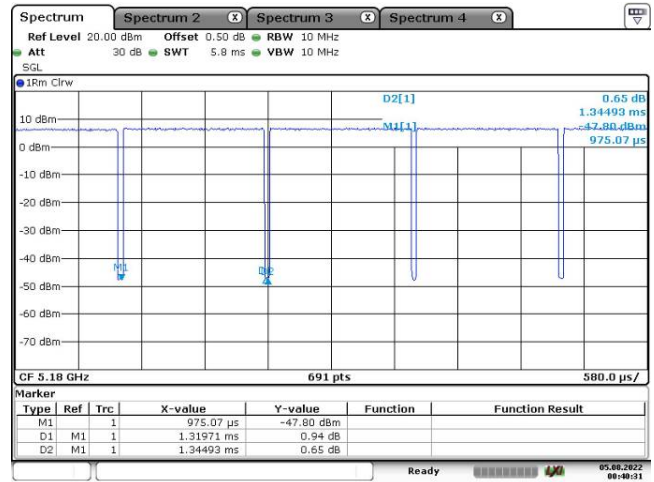
Duty Cycle:

802.11 a



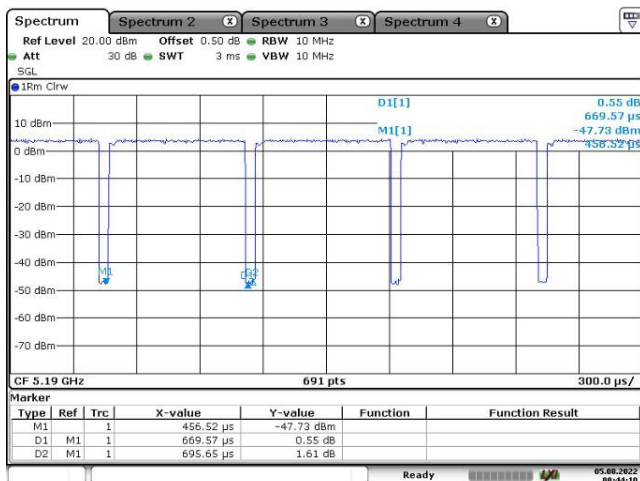
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802.11 n20



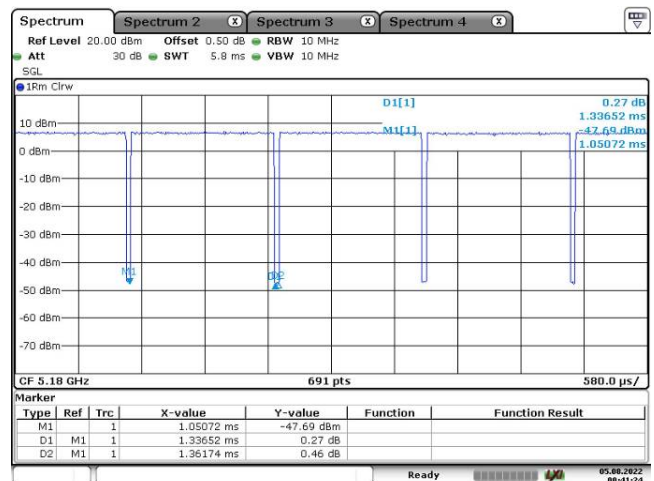
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802.11 n40



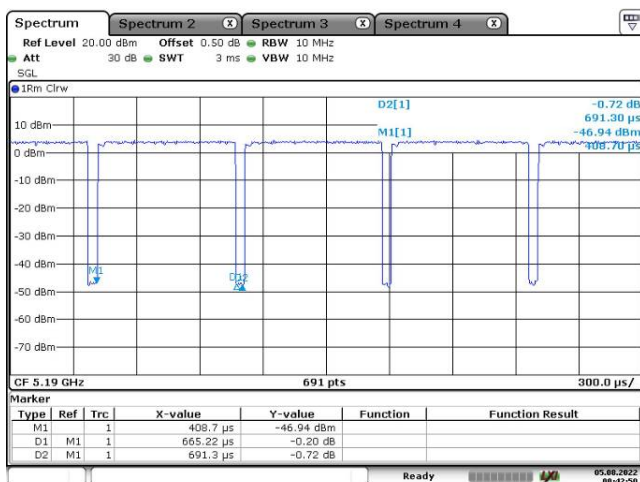
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802.11 ac20



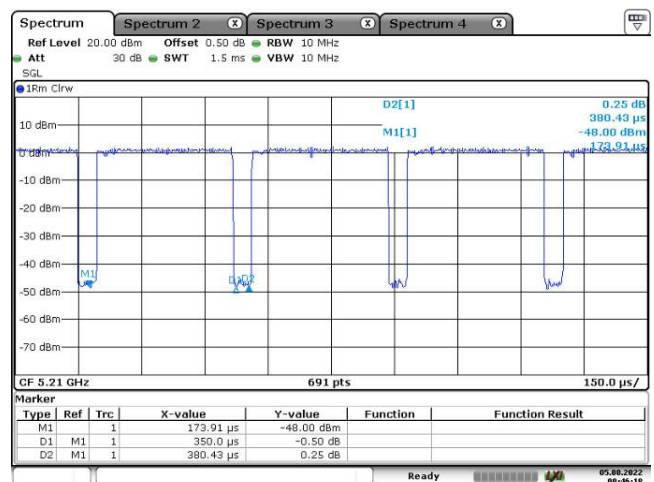
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802.11 ac40



Date: 5.AUG.2022 00:42:50

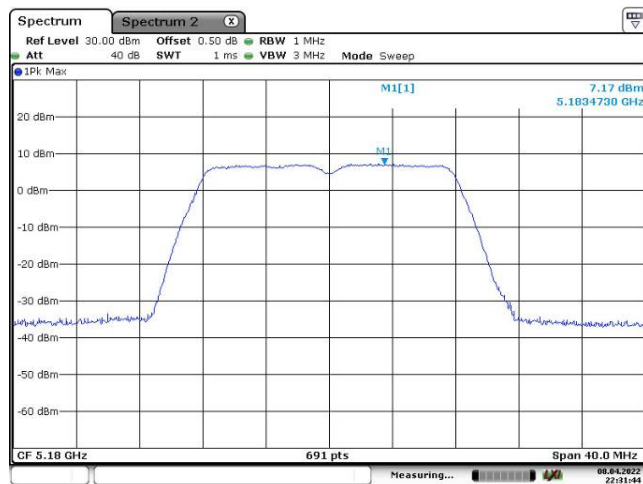
802.11 ac80



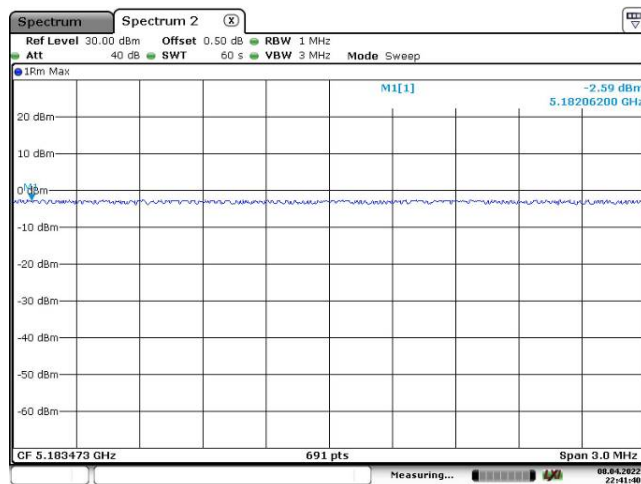
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**PSD:
Chain0**

802.11 a-5180 MHz

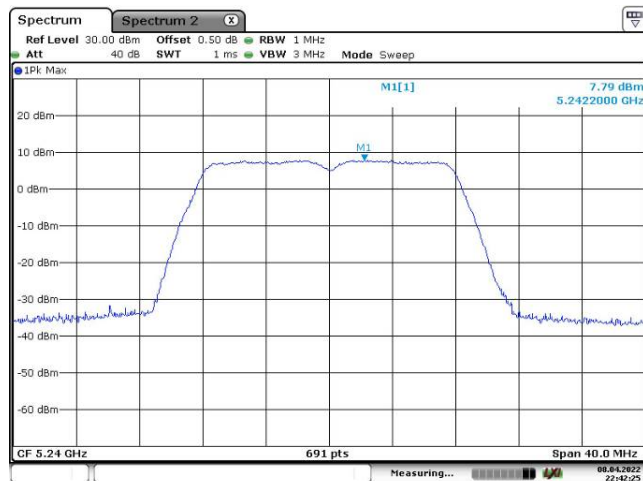


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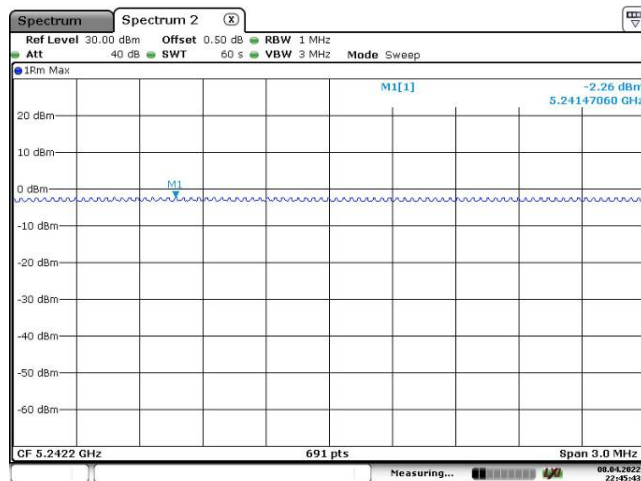


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802.11 a- 5240MHz

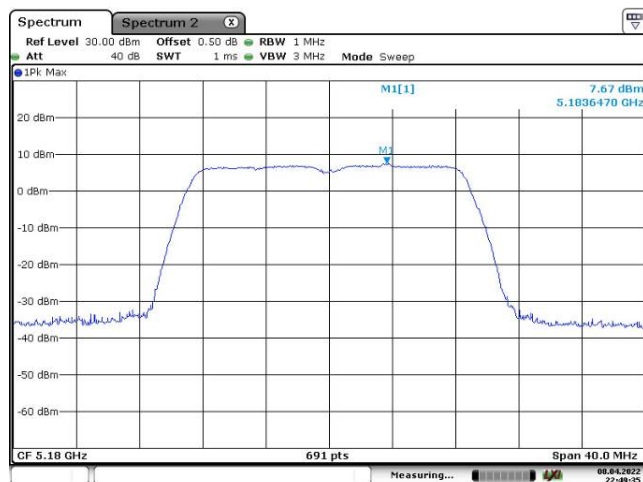


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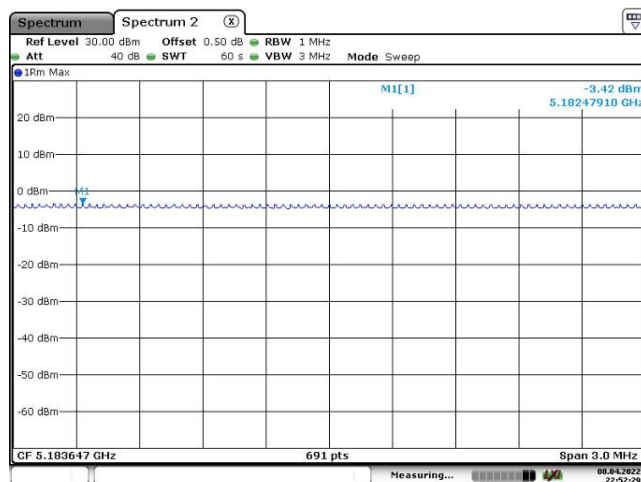


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802.11 n20-5180 MHz

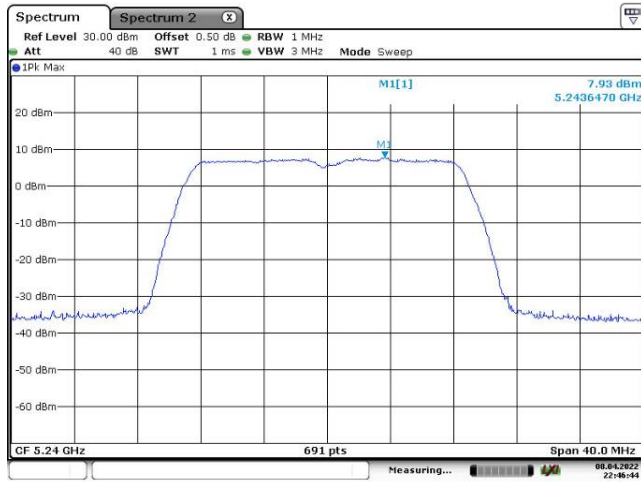


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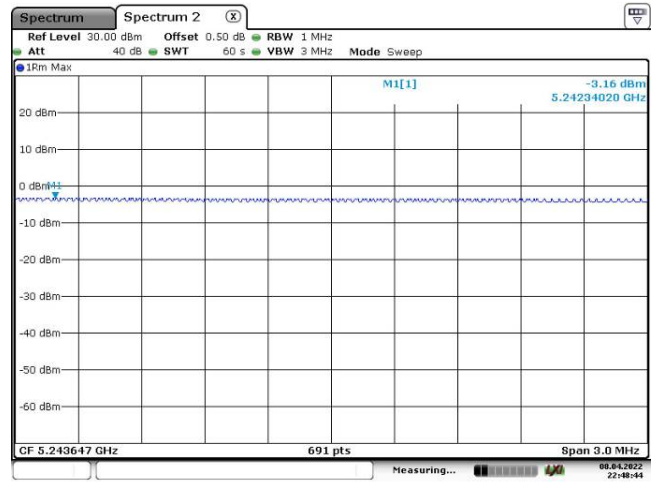


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802.11 n20- 5240MHz

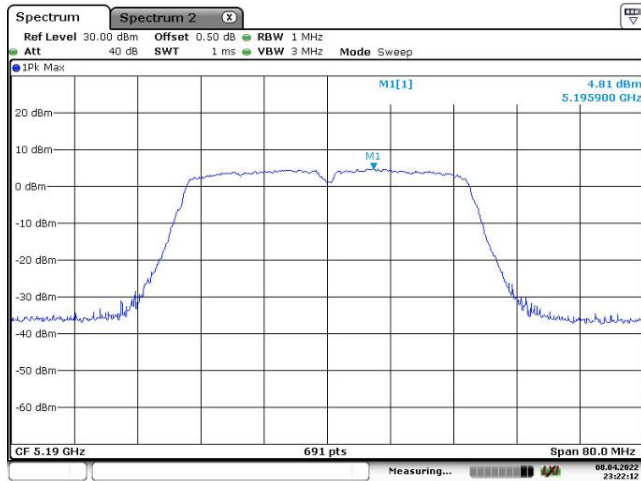


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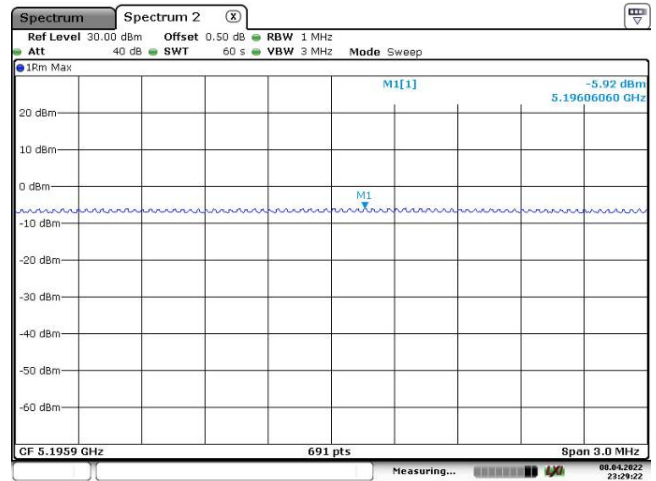


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802.11 n40-5190 MHz

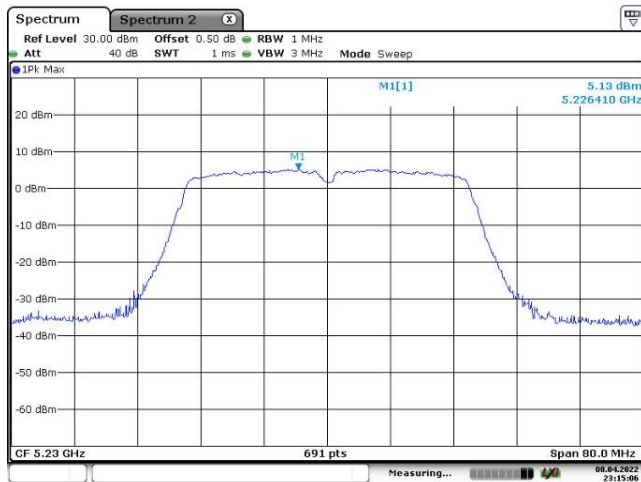


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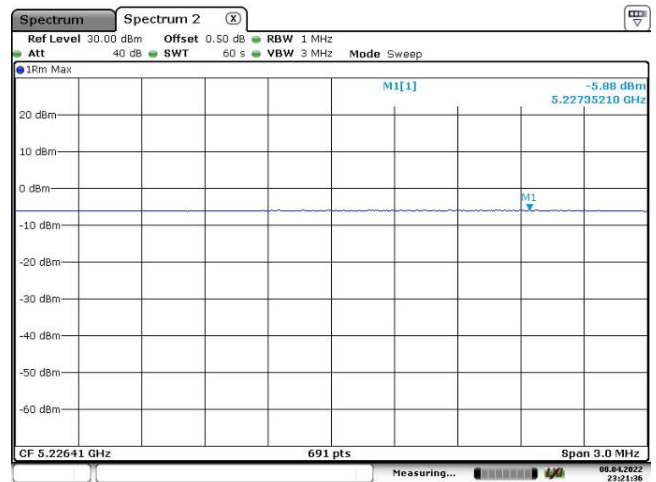


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802.11 n40- 5230 MHz

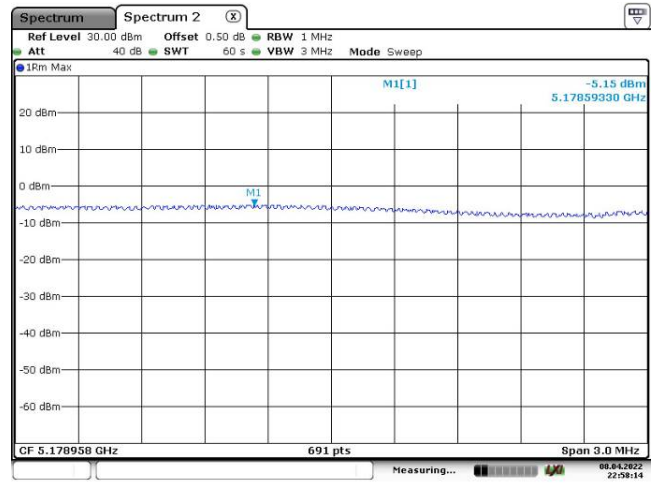
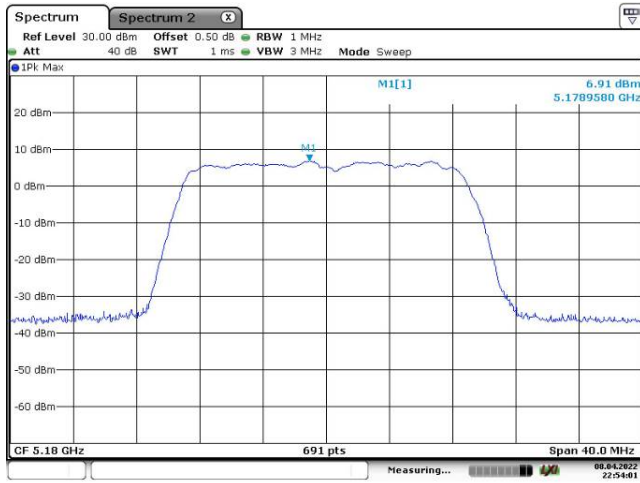


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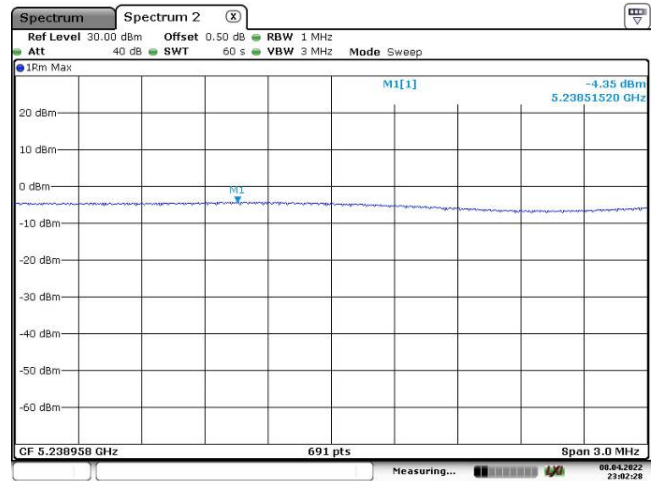
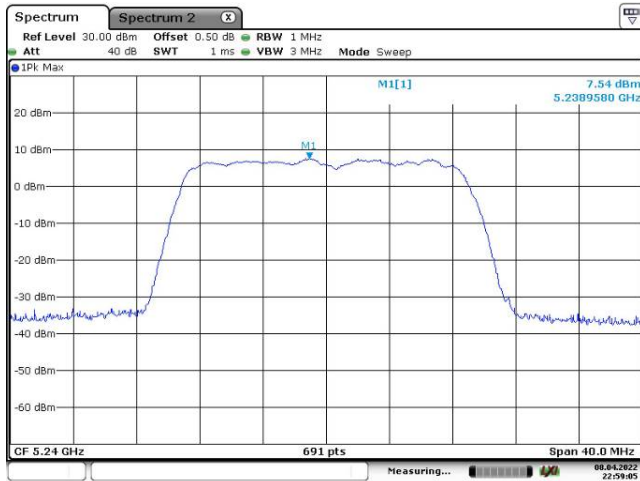


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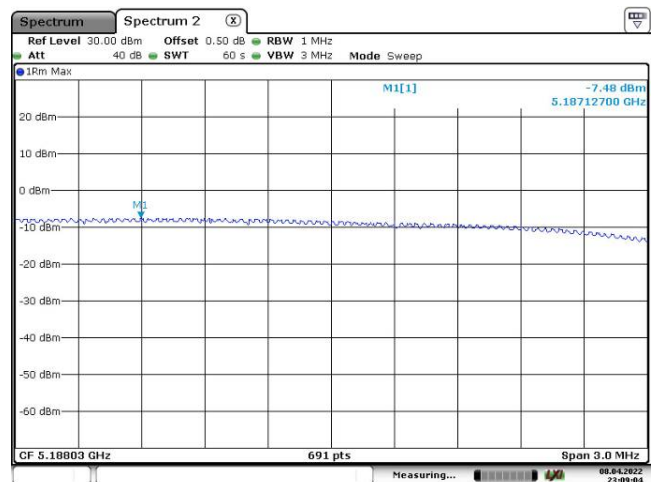
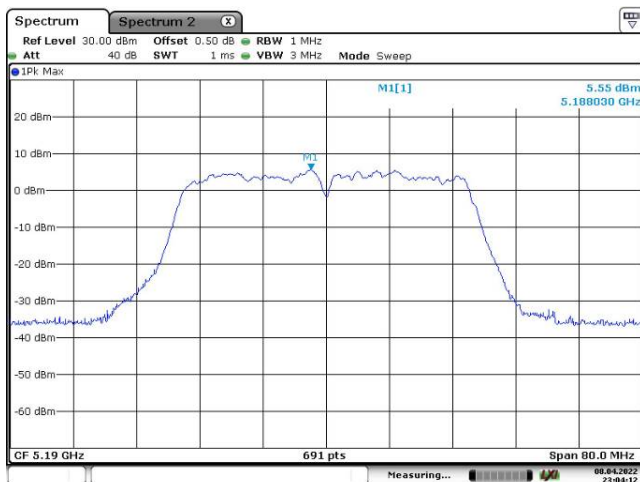
802.11 ac20-5180 MHz



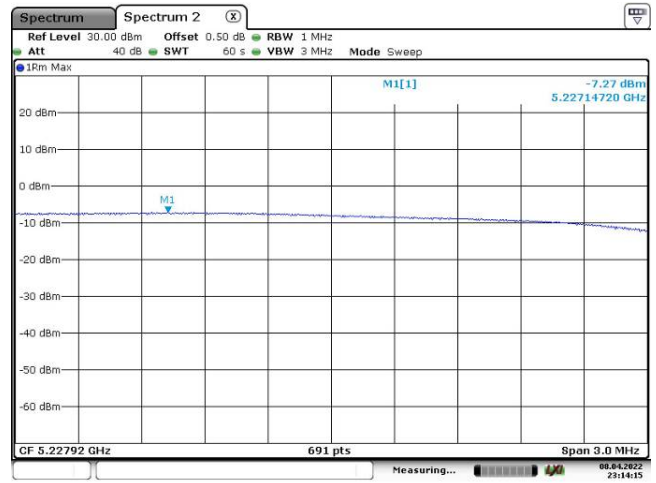
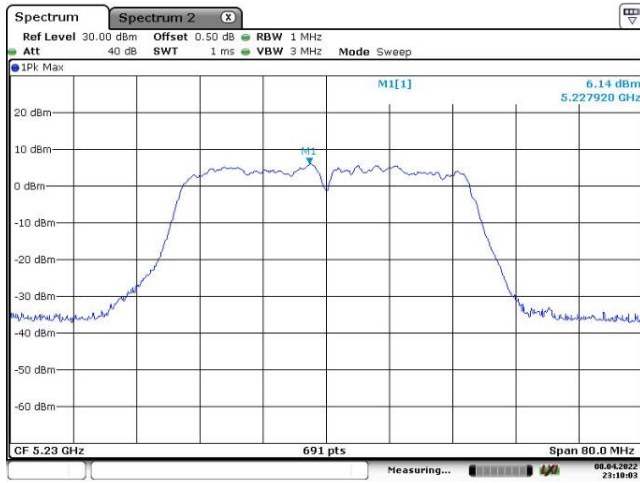
802.11 ac20- 5240 MHz



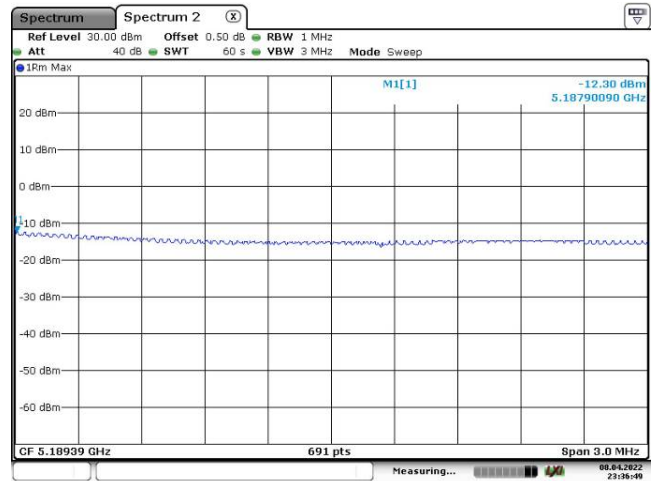
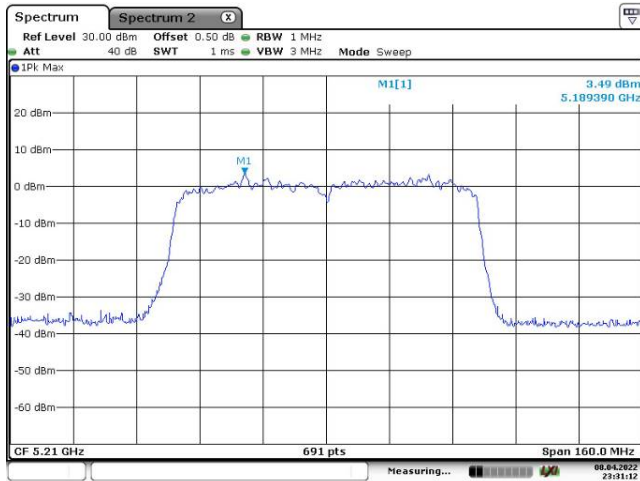
802.11 ac40-5190 MHz



802.11 ac40- 5230 MHz

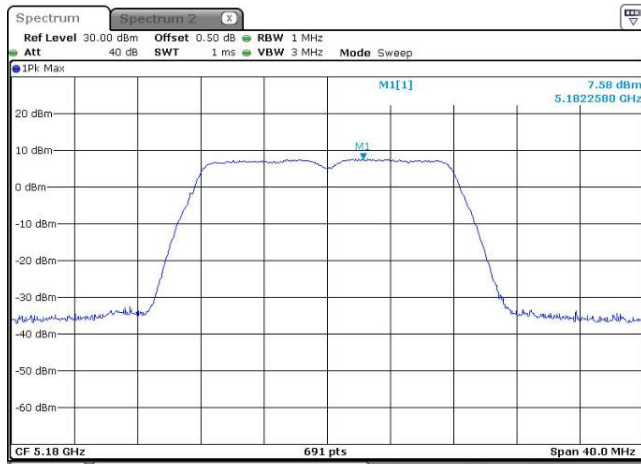


802.11 ac80-5210 MHz

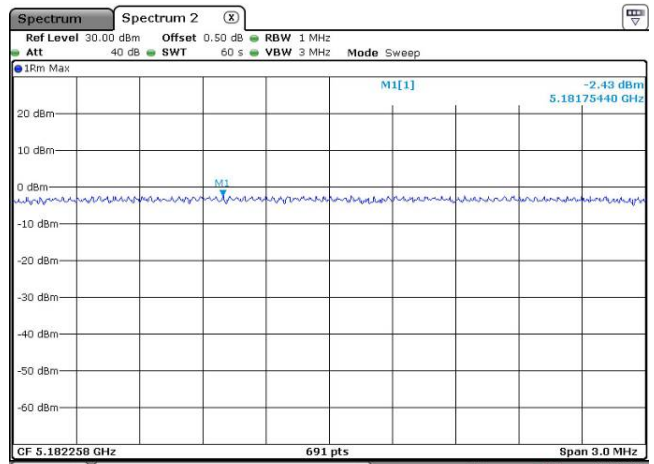


Chain1

802.11 a-5180 MHz

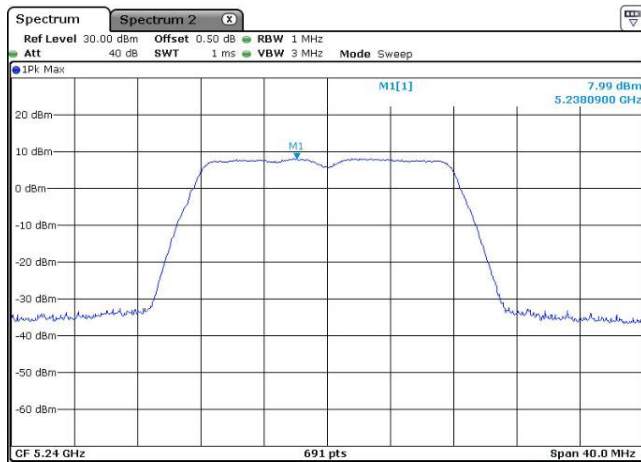


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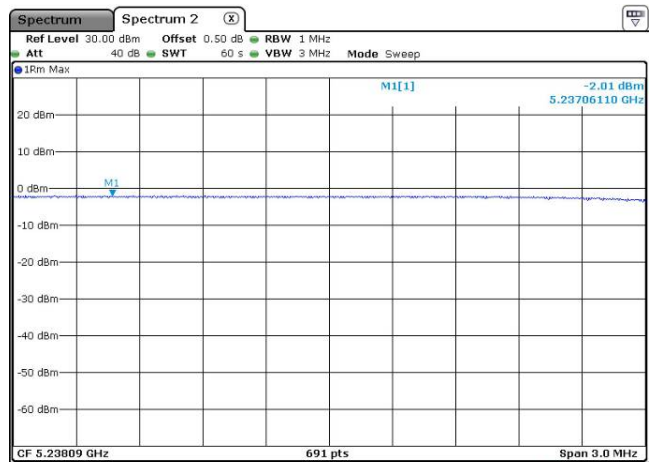


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802.11 a- 5240MHz

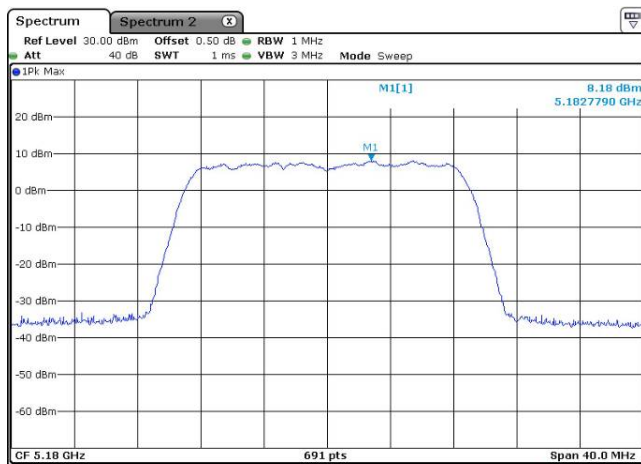


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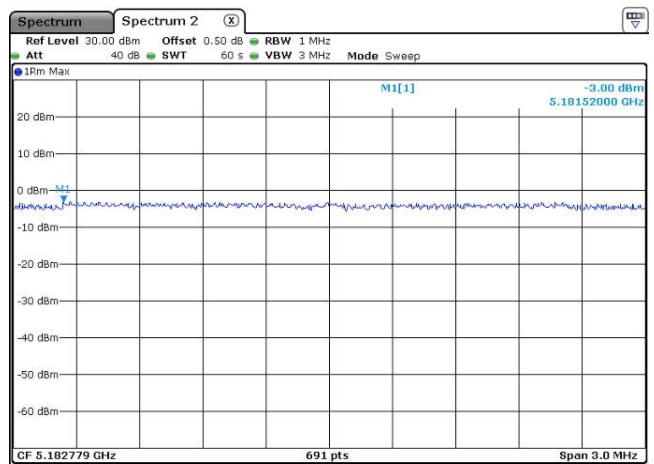


Date: 9.APR.2022 17:08:22

802.11 n20-5180 MHz

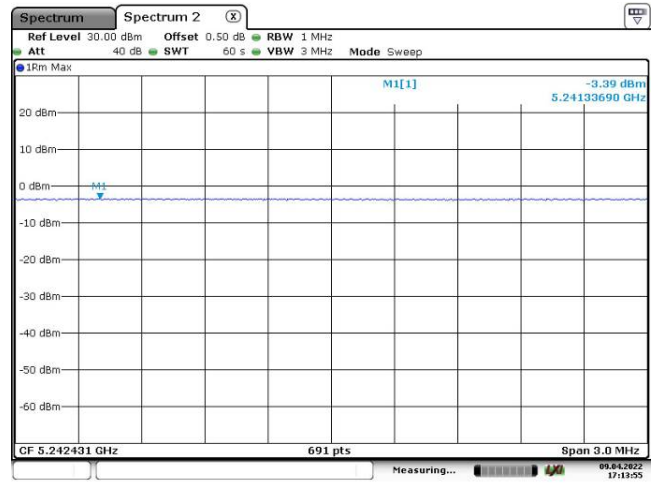
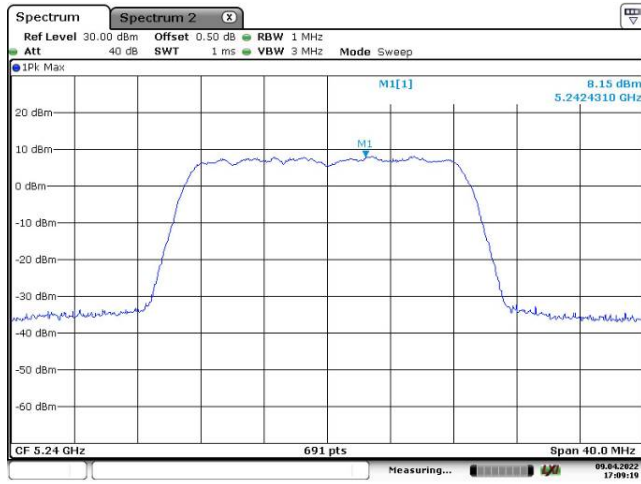


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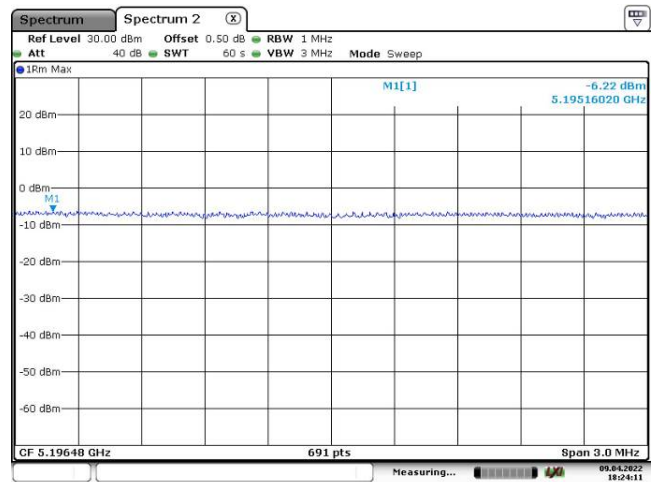
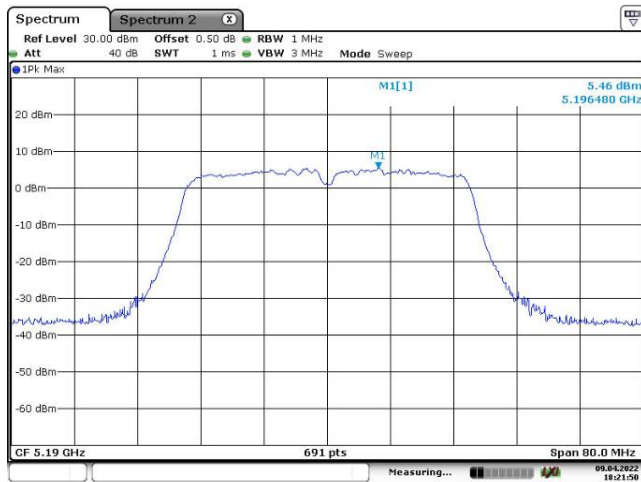


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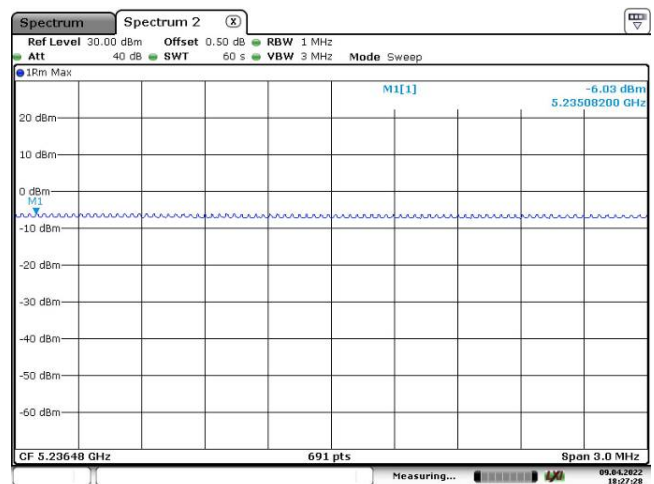
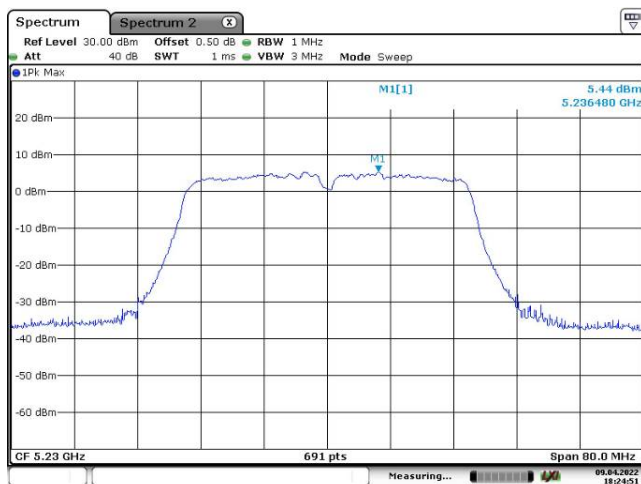
802.11 n20- 5240MHz



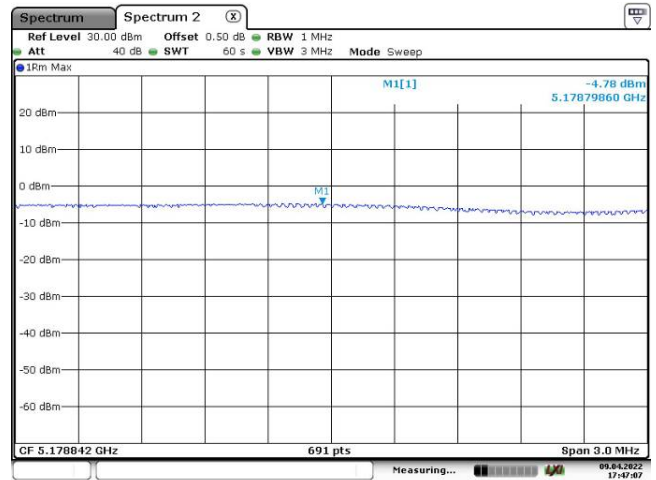
802.11 n40-5190 MHz



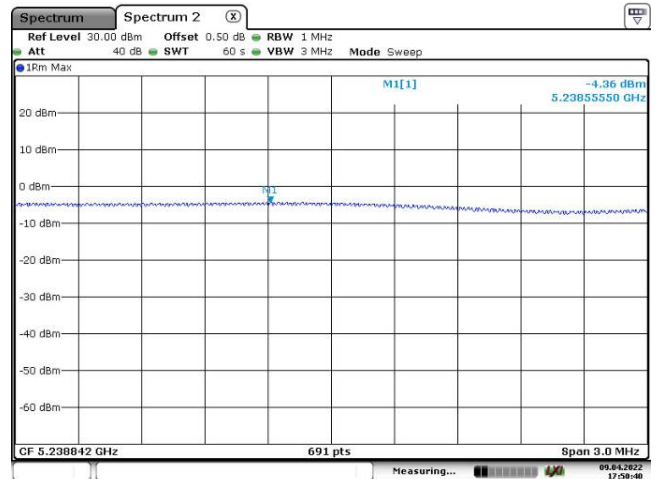
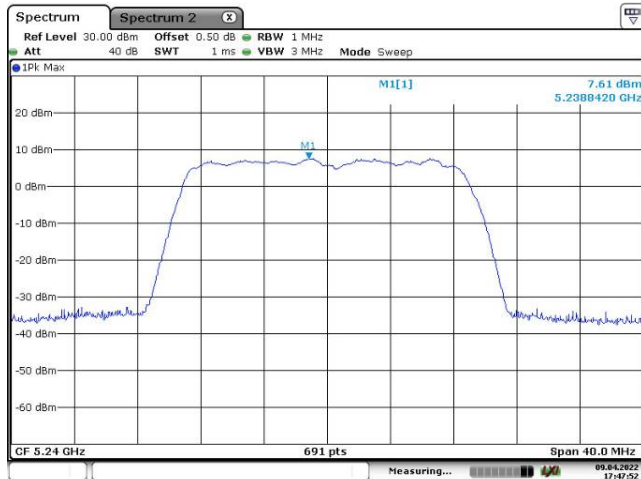
802.11 n40- 5230 MHz



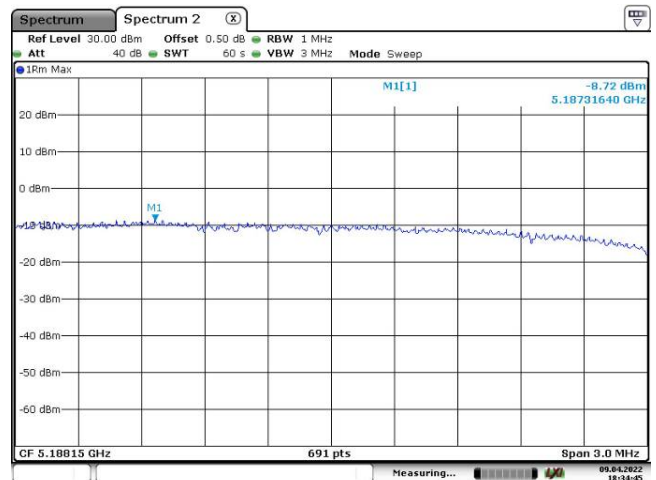
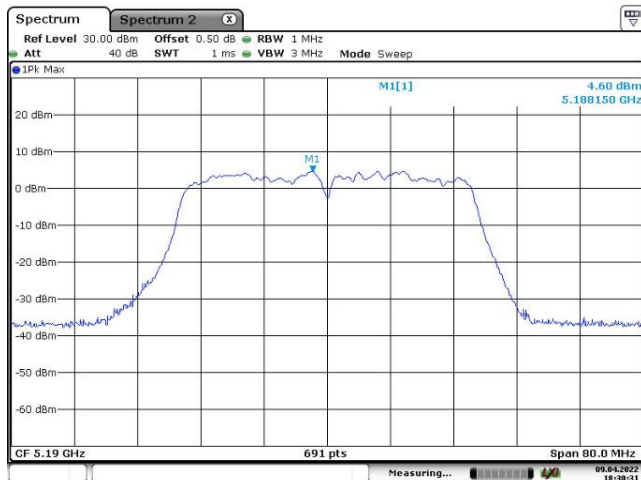
802.11 ac20-5180 MHz



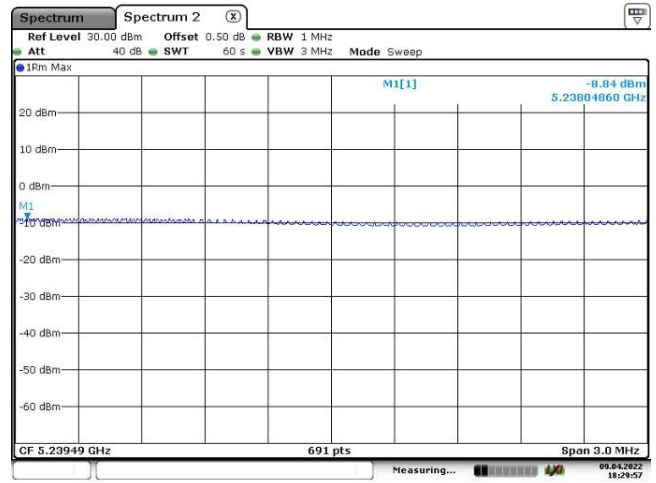
802.11 ac20- 5240 MHz



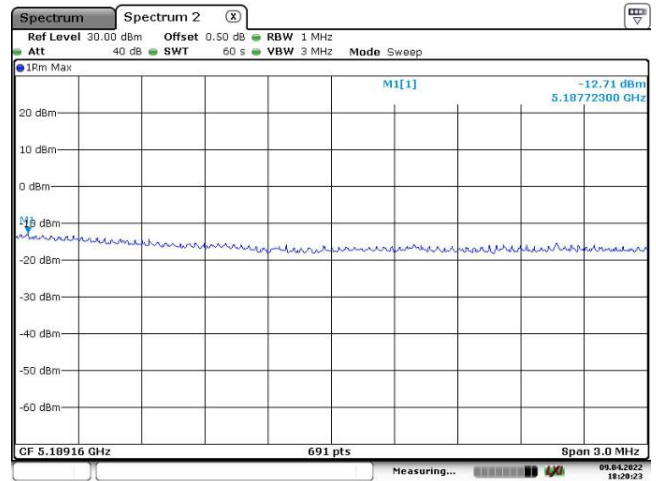
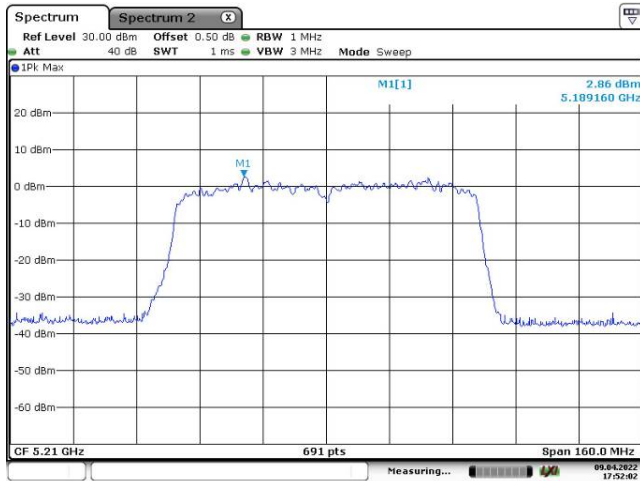
802.11 ac40-5190 MHz



802.11 ac40- 5230 MHz

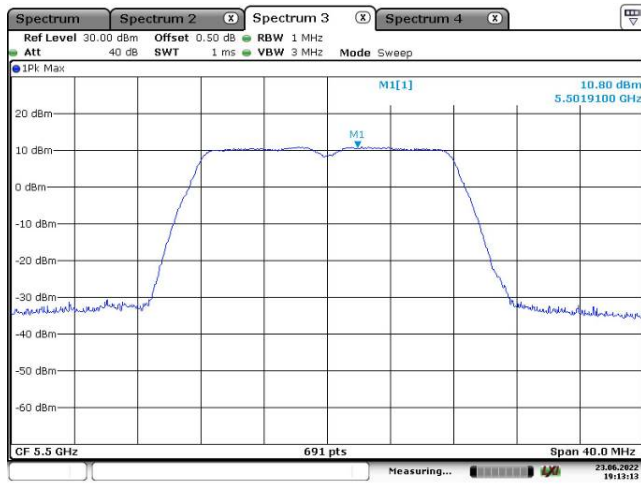


802.11 ac80-5210 MHz

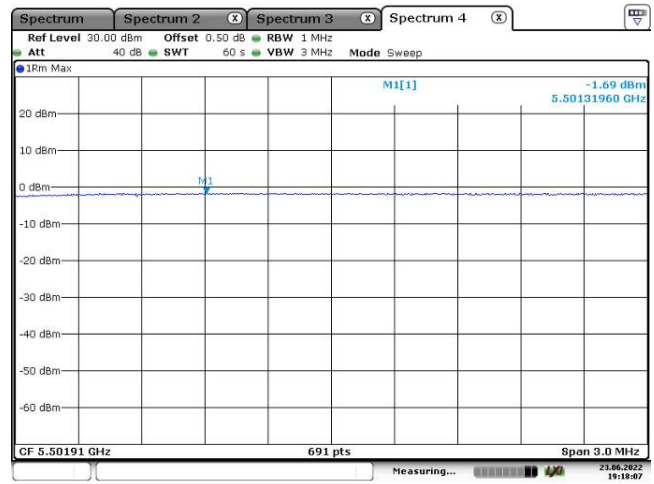


Chain0

802.11 a- 5500MHz

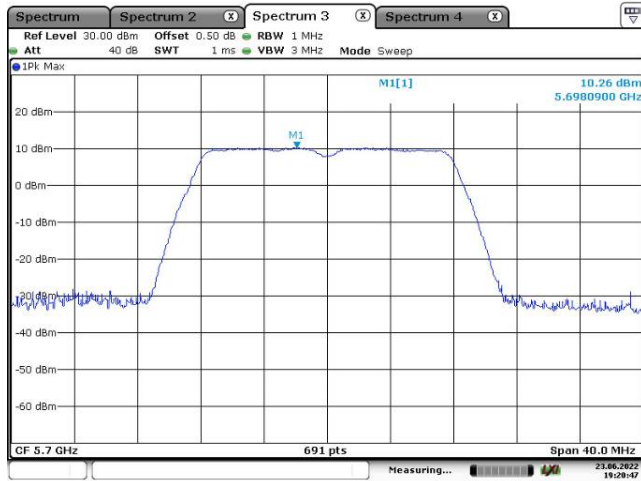


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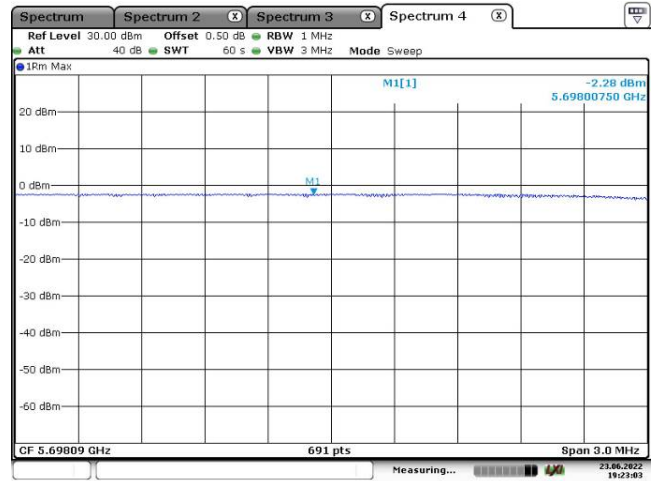


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802.11 a- 5700 MHz

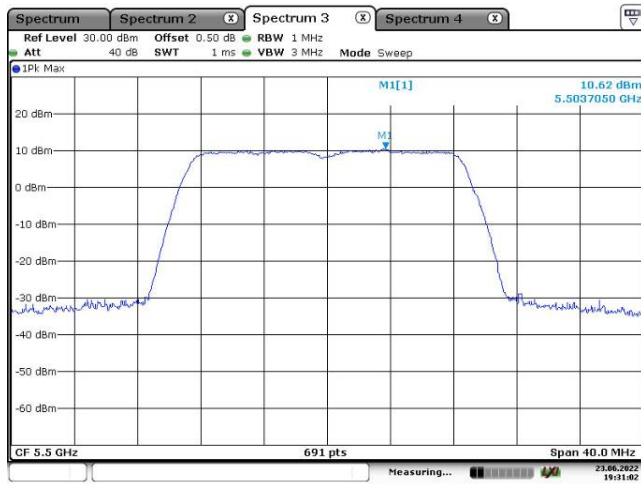


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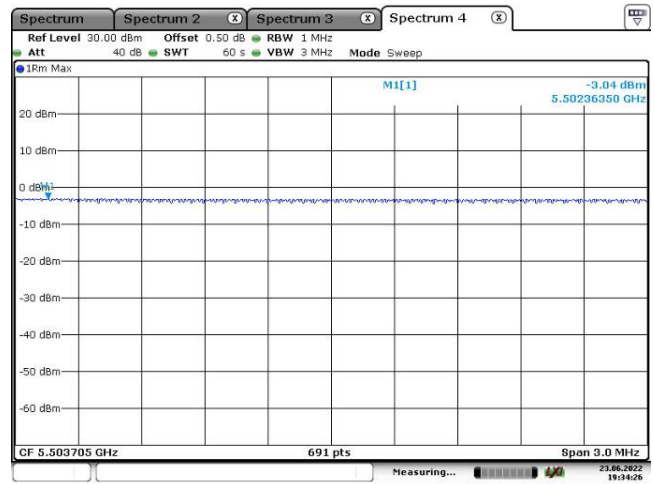


Date: 23.JUN.2022 19:23:03

802.11 n20-5500 MHz

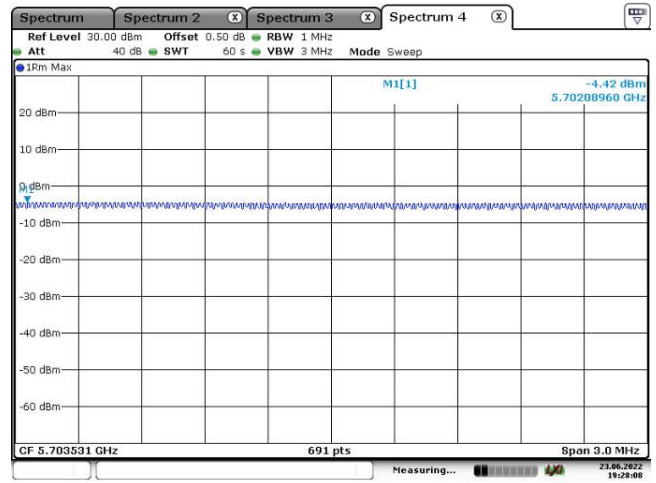
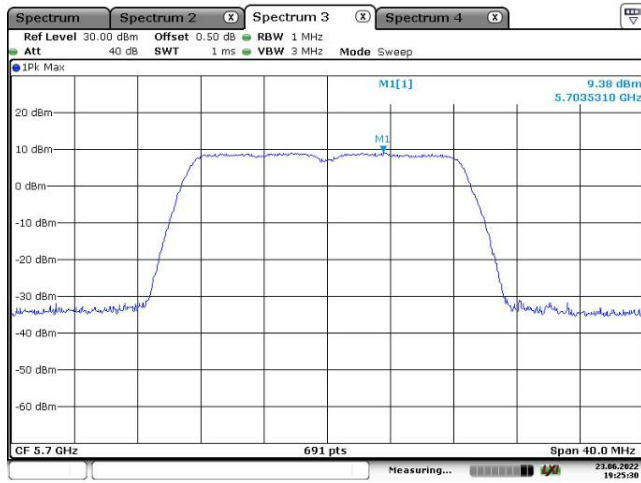


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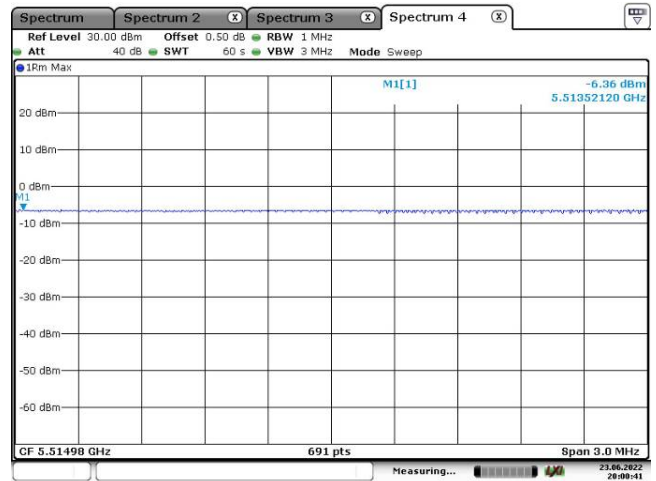
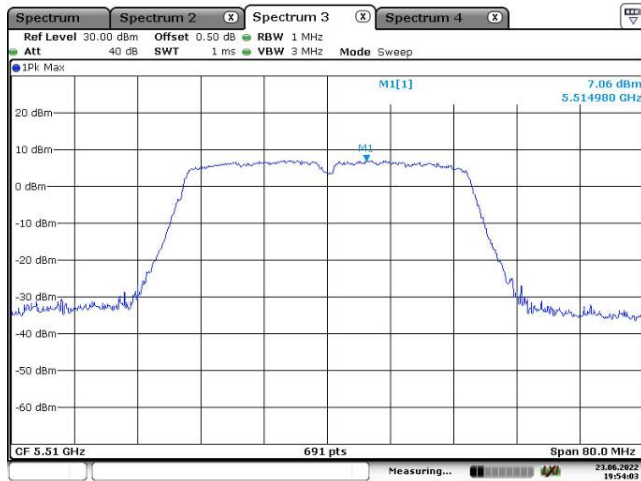


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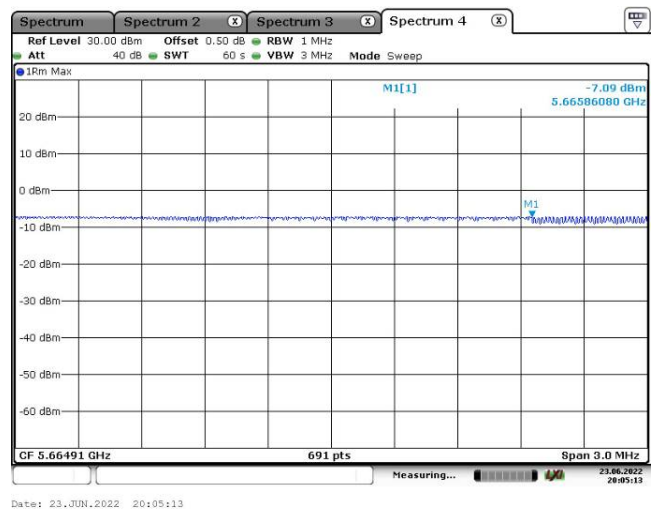
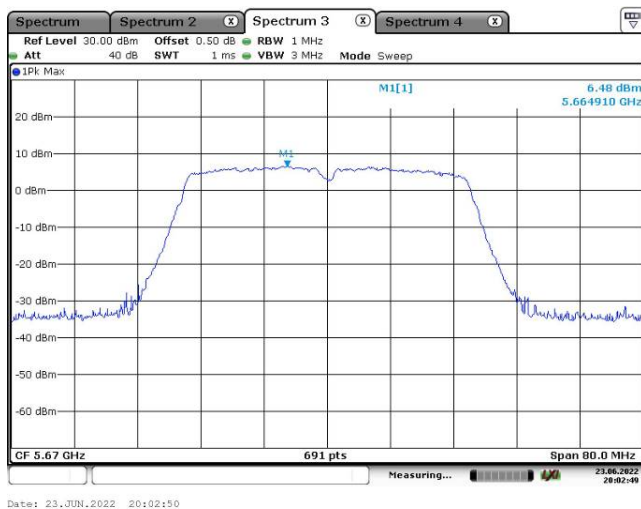
802.11 n20-5700 MHz



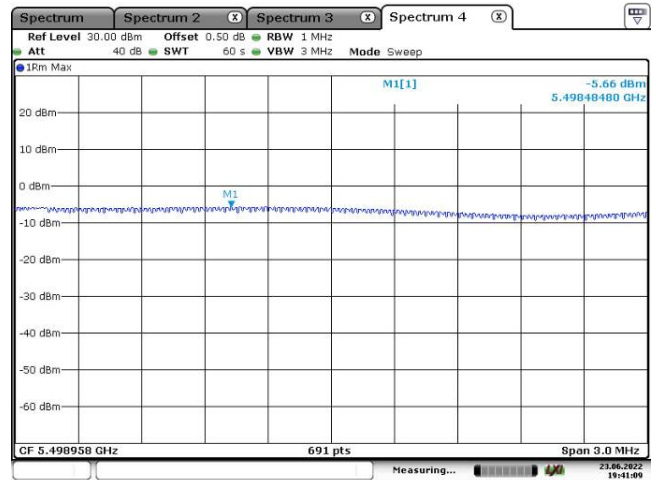
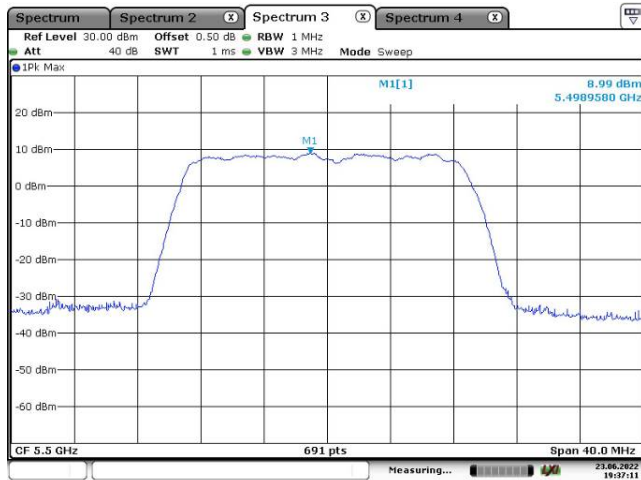
802.11 n40-5510 MHz



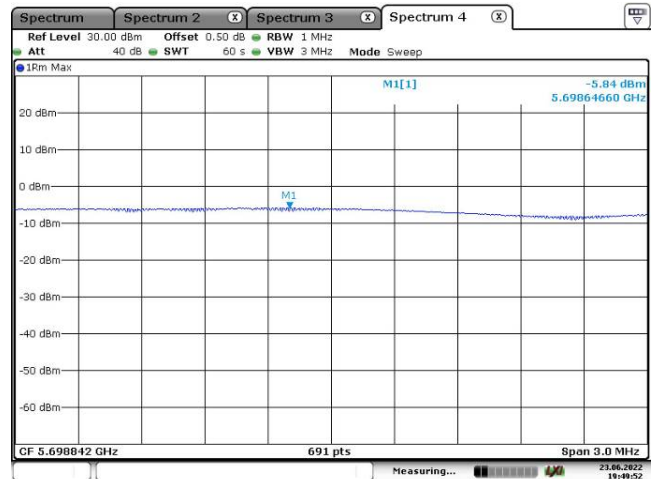
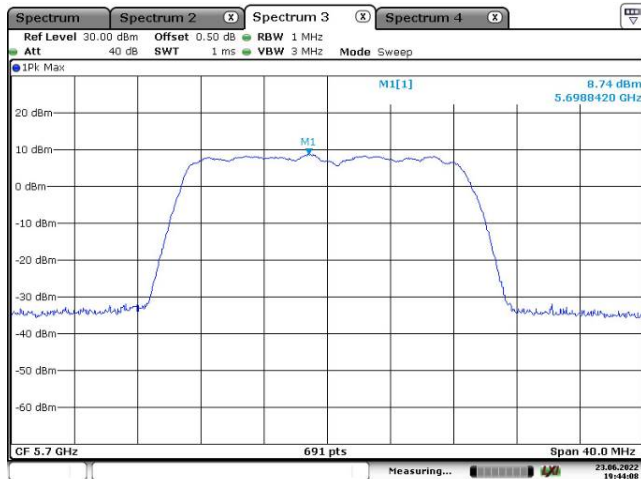
802.11 n40-5670 MHz



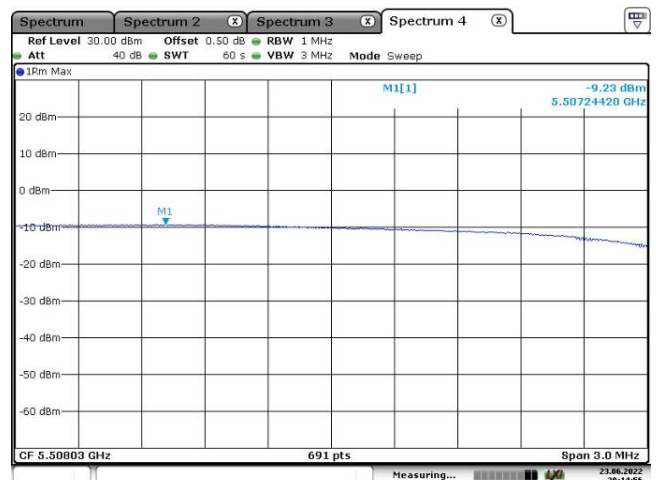
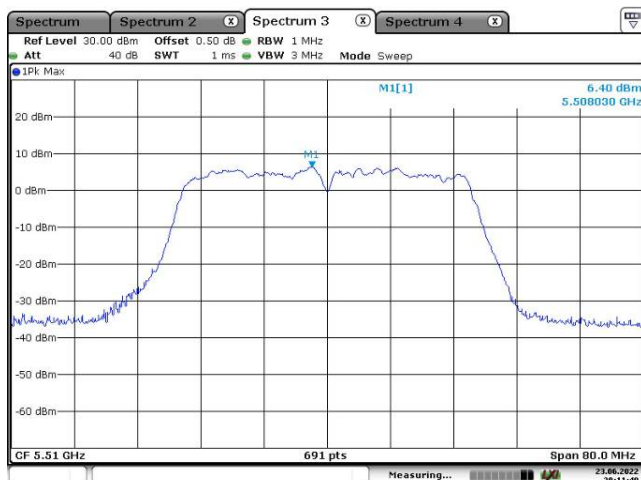
802.11 ac 20-5500 MHz



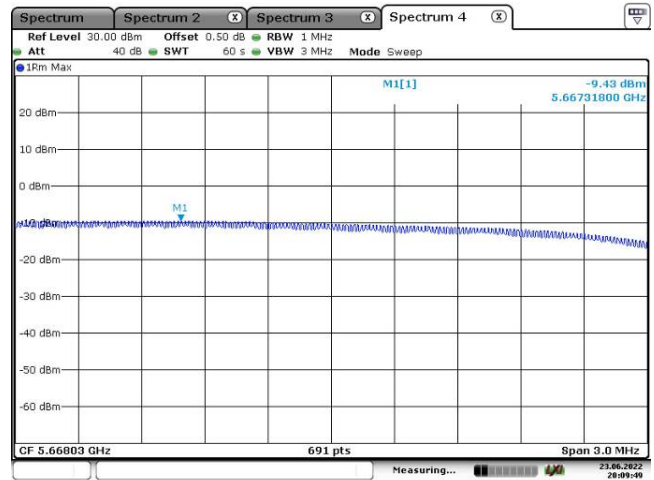
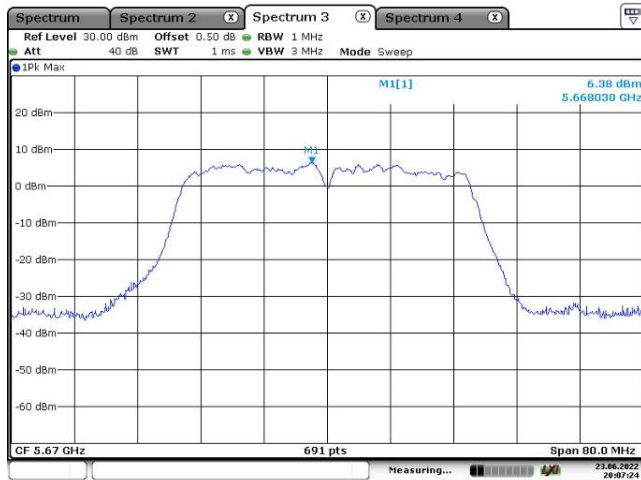
802.11 n ac 20-5700 MHz



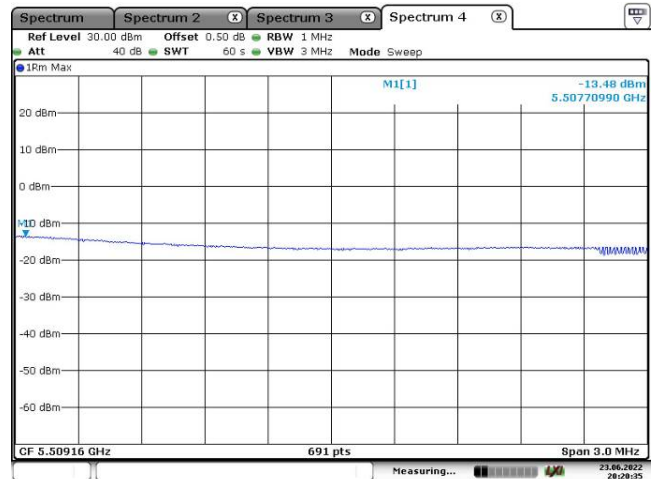
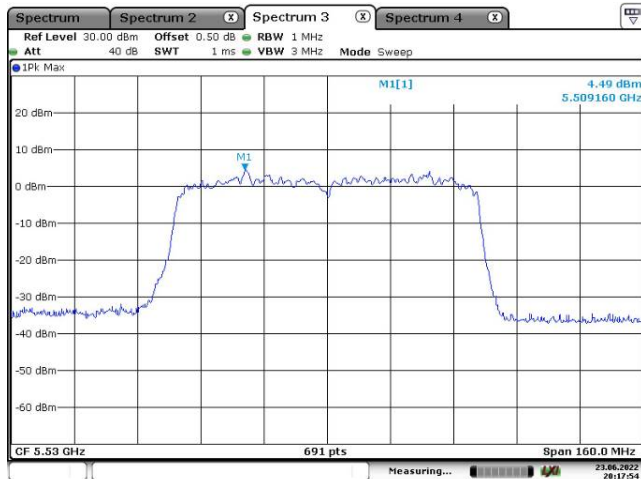
802.11 ac 40-5510 MHz



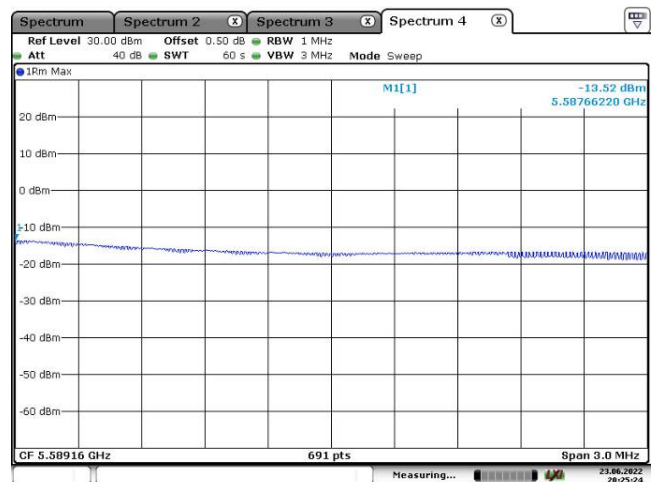
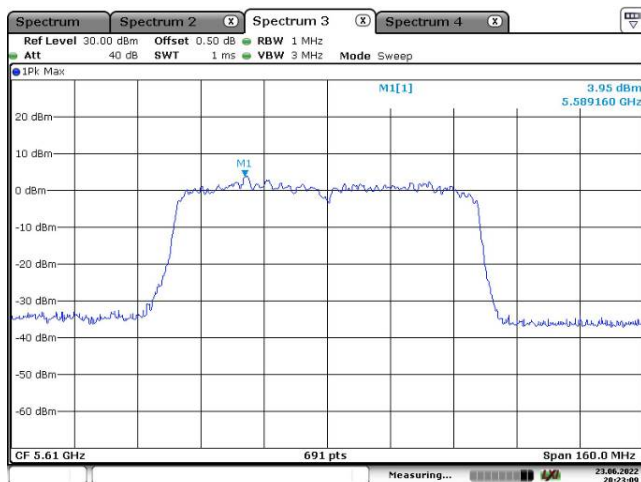
802.11 ac 40-5670 MHz



802.11 ac80-5530 MHz

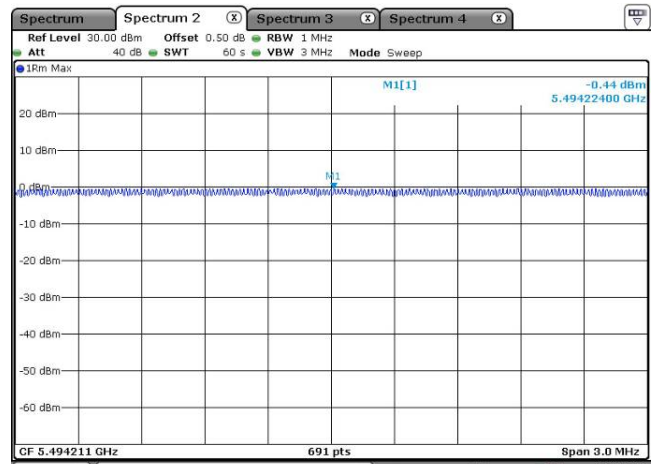
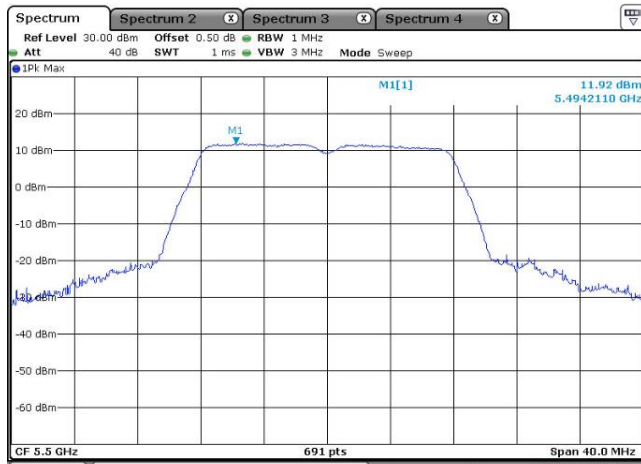


802.11 ac80-5610 MHz

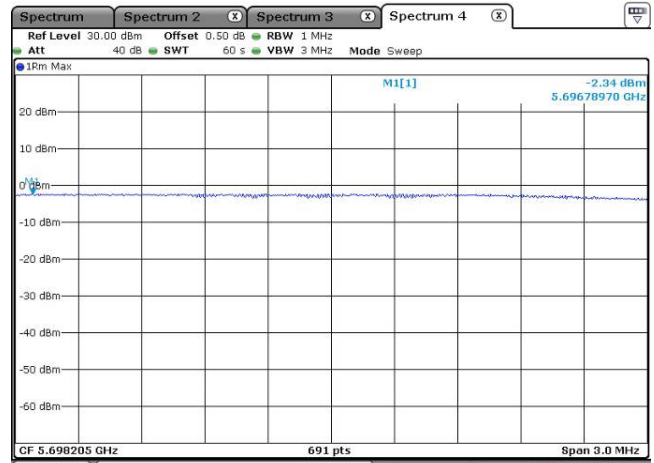
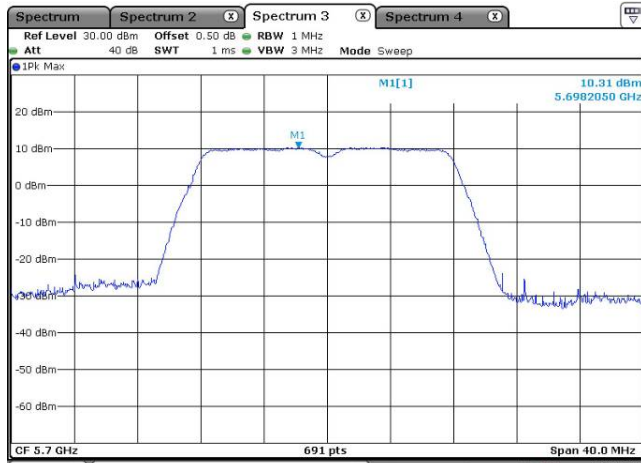


Chain1

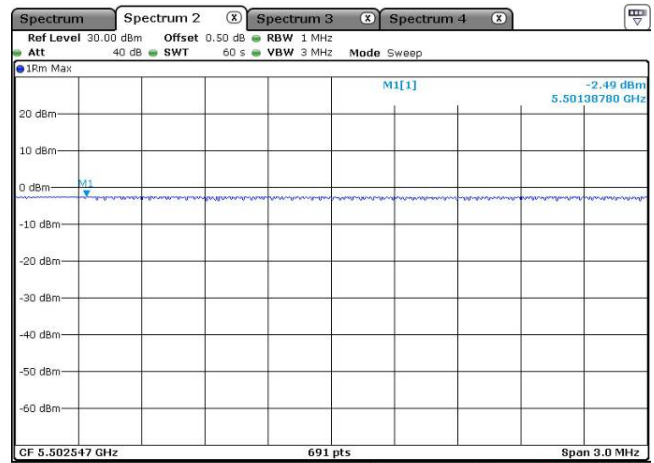
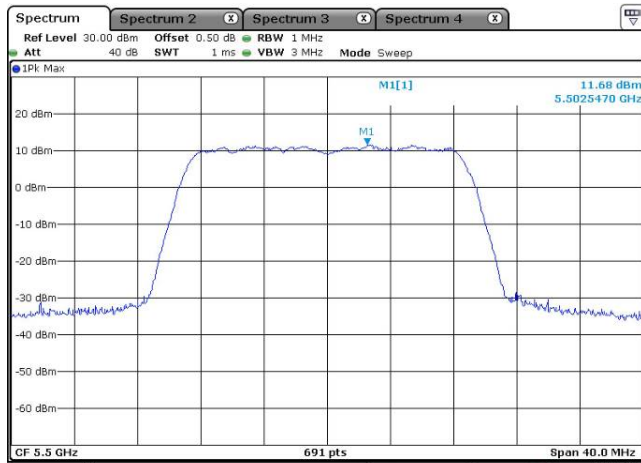
802.11 a- 5500MHz



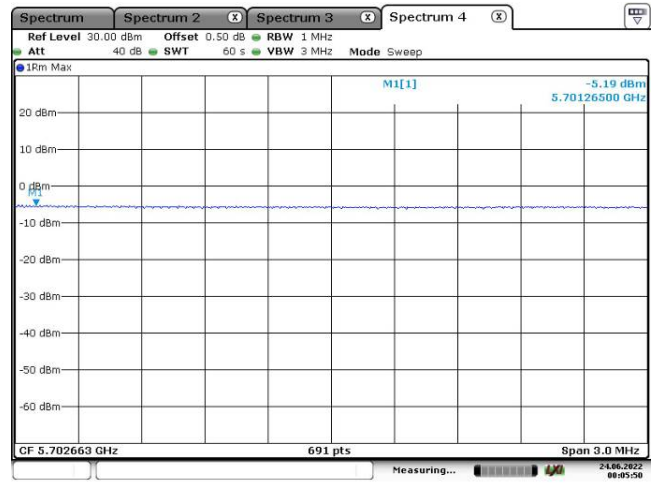
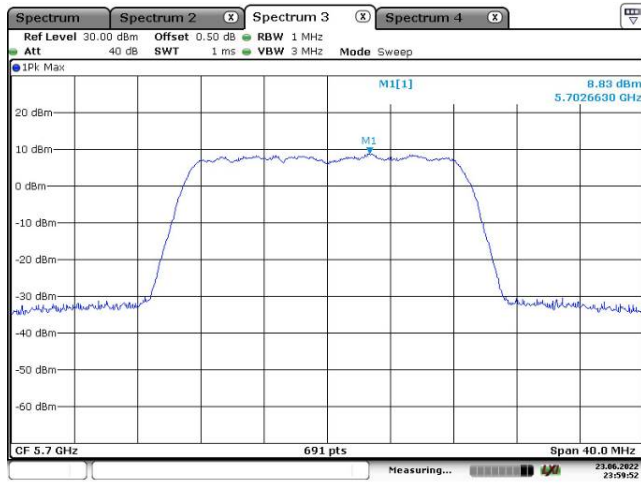
802.11 a- 5700 MHz



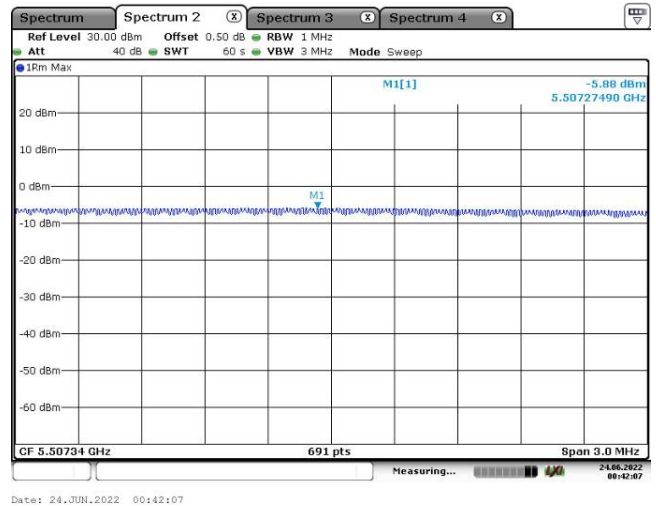
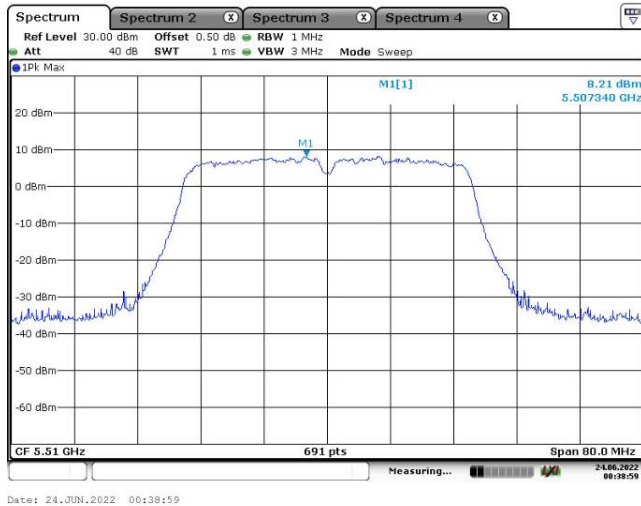
802.11 n20-5500 MHz



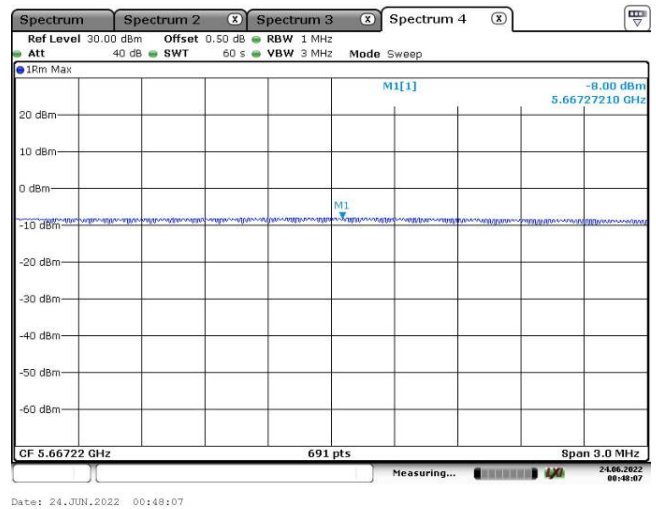
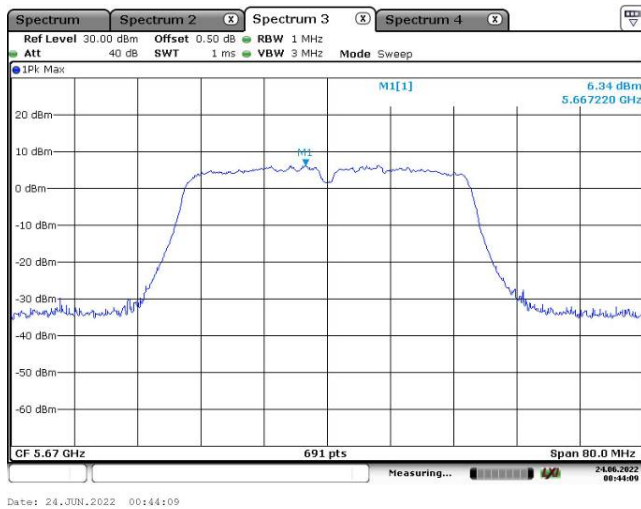
802.11 n20-5700 MHz



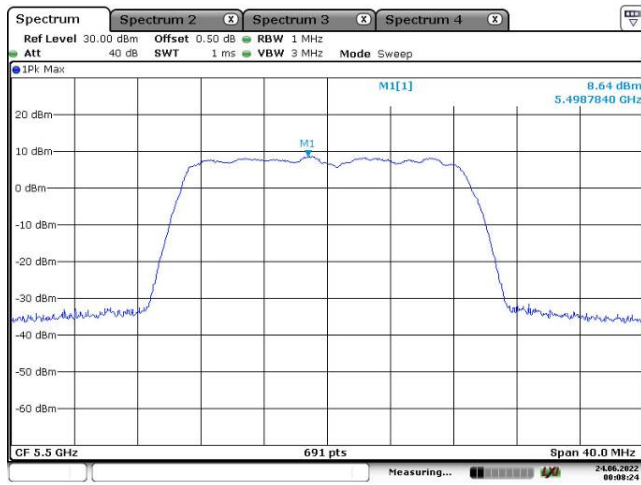
802.11 n40-5510 MHz



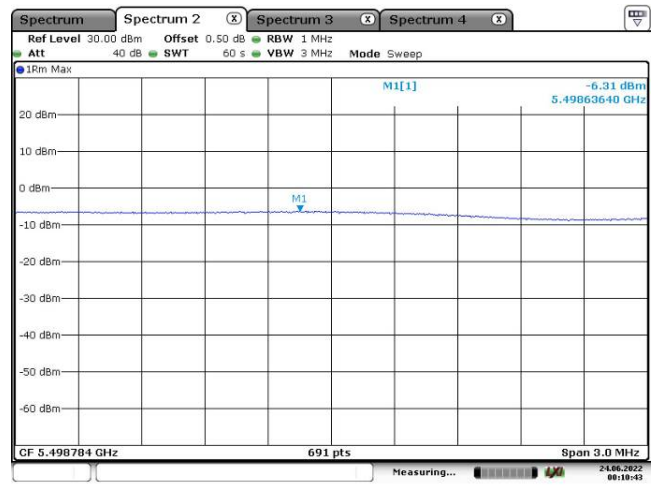
802.11 n40-5670 MHz



802.11 ac 20-5500 MHz

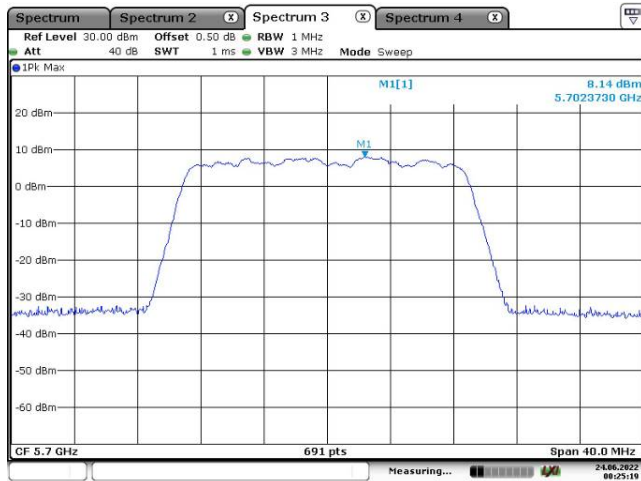


Date: 24 JUN 2022 00:08:24

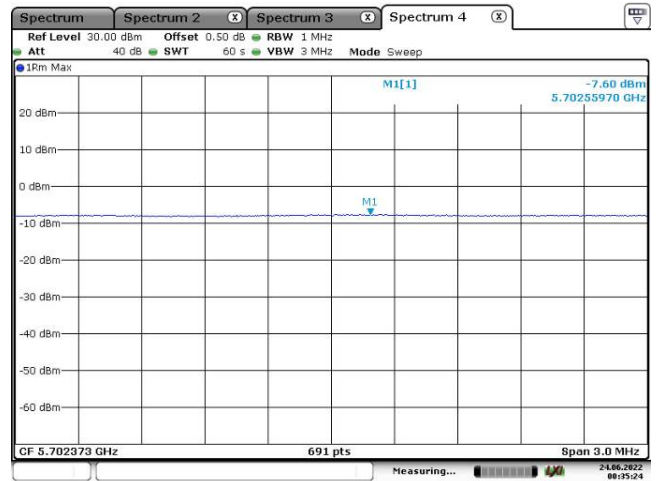


Date: 24 JUN 2022 00:10:43

802.11 n ac 20-5700 MHz

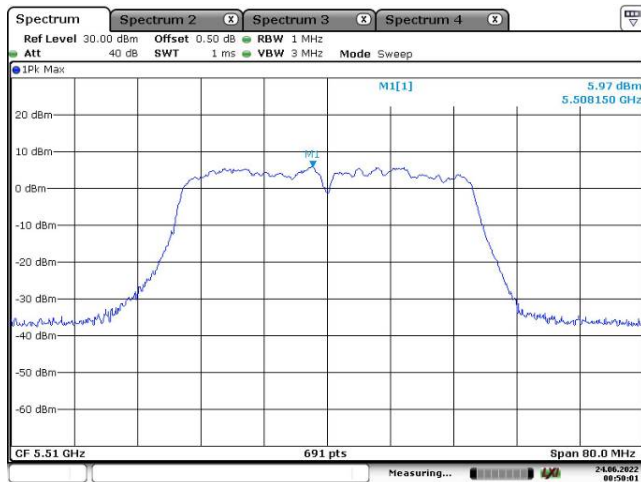


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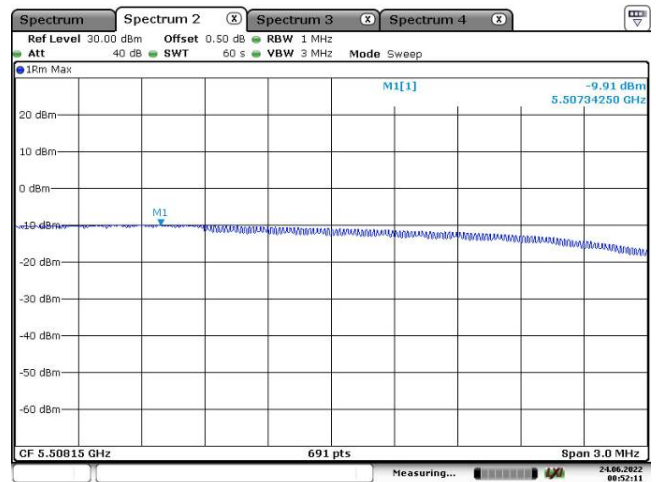


Date: 24 JUN 2022 00:35:24

802.11 ac 40-5510 MHz

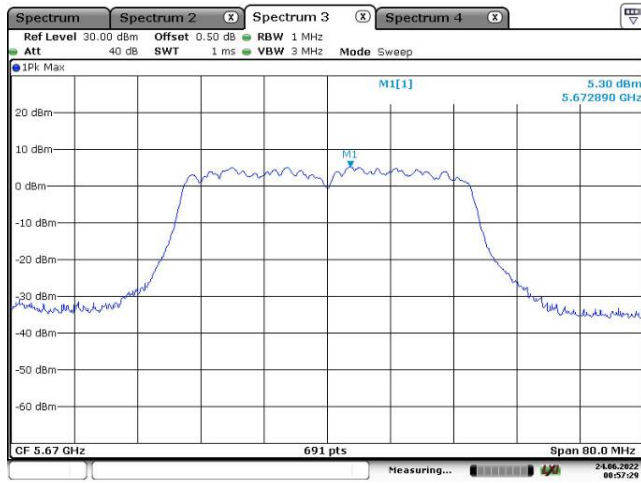


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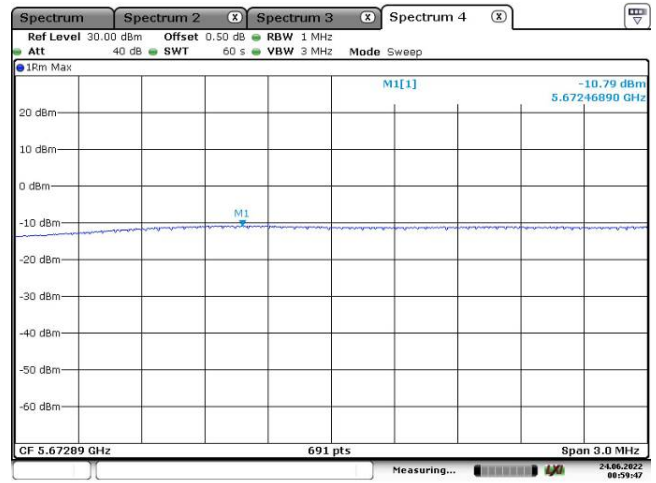


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802.11 ac 40-5670 MHz

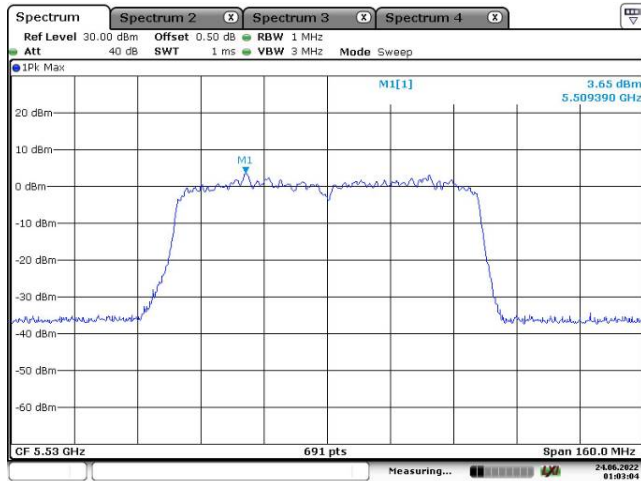


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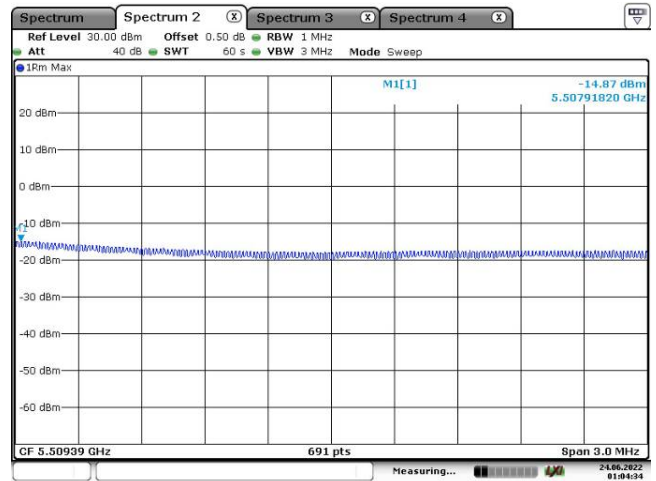


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802.11 ac80-5530 MHz

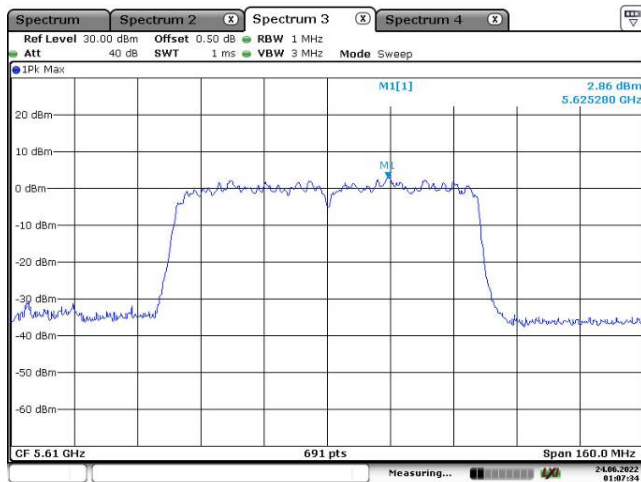


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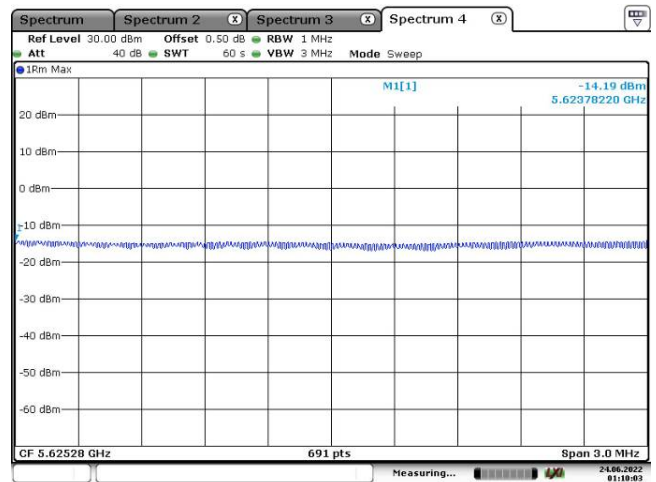


Date: 24.JUN.2022 01:04:34

802.11 ac80-5610 MHz



Date: 24.JUN.2022 01:07:34



Date: 24.JUN.2022 01:10:04

4 – 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.

Limit

The level of transmitter unwanted emissions outside the 5 GHz RLAN bands shall not exceed the limits given in table 4.

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) §5.4.5

Test Data*Please refer to following table:***802.11 a low channel Chain 0 5180 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10360.00	H	55.84	-43.90	13.48	0.40	-30.82	-30.00	0.82
10360.00	V	51.48	-47.70	13.48	0.40	-34.62	-30.00	4.62
93.39	H	43.69	-71.41	0.00	0.33	-71.74	-54.00	17.74
50.40	V	41.62	-65.81	-14.72	0.21	-80.74	-54.00	26.74

802.11 a low channel Chain 0 5240 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10480.00	H	51.84	-47.90	13.32	0.30	-34.88	-30.00	4.88
10480.00	V	49.42	-49.58	13.32	0.30	-36.56	-30.00	6.56
93.40	H	43.98	-71.12	0.00	0.33	-71.45	-54.00	17.45
50.14	V	42.32	-64.95	-14.84	0.21	-80.00	-54.00	26.00

802.11 a low channel Chain 0 5500 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11000.00	H	46.39	-52.16	13.10	0.82	-39.88	-30.00	9.88
11000.00	V	46.74	-51.19	13.10	0.82	-38.91	-30.00	8.91
93.25	H	43.41	-71.75	0.00	0.33	-72.08	-54.00	18.08
50.35	V	42.10	-65.30	-14.74	0.21	-80.25	-54.00	26.25

802.11 a high channel Chain 0 5700 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11400.00	H	50.28	-48.98	13.00	1.57	-37.55	-30.00	7.55
11400.00	V	44.96	-52.89	13.00	1.57	-41.46	-30.00	11.46
93.34	H	42.98	-72.14	0.00	0.33	-72.47	-54.00	18.47
50.14	V	42.74	-64.53	-14.84	0.21	-79.58	-54.00	25.58

802.11 a low channel Chain 1 5180 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10360.00	H	49.74	-50.00	13.48	0.40	-36.92	-30.00	6.92
10360.00	V	47.48	-51.70	13.48	0.40	-38.62	-30.00	8.62
93.37	H	43.77	-71.34	0.00	0.33	-71.67	-54.00	17.67
50.54	V	43.52	-63.99	-14.65	0.21	-78.85	-54.00	24.85

802.11 a high channel Chain1 5240 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10480.00	H	45.99	-53.75	13.32	0.30	-40.73	-30.00	10.73
10480.00	V	46.78	-52.22	13.32	0.30	-39.20	-30.00	9.20
93.44	H	44.91	-70.17	0.00	0.33	-70.50	-54.00	16.50
50.45	V	43.99	-63.47	-14.69	0.21	-78.37	-54.00	24.37

802.11 a low channel Chain 5500 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11000.00	H	44.76	-53.79	13.10	0.82	-41.51	-30.00	11.51
11000.00	V	43.29	-54.64	13.10	0.82	-42.36	-30.00	12.36
93.22	H	45.41	-69.76	0.00	0.33	-70.09	-54.00	16.09
50.28	V	44.15	-63.21	-14.77	0.21	-78.19	-54.00	24.19

802.11 a high channel Chain 5700 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11400.00	H	46.84	-52.42	13.00	1.57	-40.99	-30.00	10.99
11400.00	V	44.52	-53.33	13.00	1.57	-41.90	-30.00	11.90
93.36	H	45.66	-69.46	0.00	0.33	-69.79	-54.00	15.79
50.11	V	44.85	-62.41	-14.85	0.21	-77.47	-54.00	23.47

802.11 n20_low channel**5180 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10360.00	H	51.84	-47.90	13.48	0.40	-34.82	-30.00	4.82
10360.00	V	49.06	-50.12	13.48	0.40	-37.04	-30.00	7.04
93.33	H	42.69	-72.44	0.00	0.33	-72.77	-54.00	18.77
51.41	V	42.52	-65.51	-14.25	0.21	-79.97	-54.00	25.97

802.11 n20_high channel**5240 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10480.00	H	52.69	-47.05	13.32	0.30	-34.03	-30.00	4.03
10480.00	V	47.85	-51.15	13.32	0.30	-38.13	-30.00	8.13
93.25	H	43.74	-71.42	0.00	0.33	-71.75	-54.00	17.75
50.69	V	43.52	-64.08	-14.58	0.21	-78.87	-54.00	24.87

802.11 n20_low channel**5500 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11000.00	H	47.42	-51.13	13.10	0.82	-38.85	-30.00	8.85
11000.00	V	45.48	-52.45	13.10	0.82	-40.17	-30.00	10.17
93.84	H	42.52	-72.39	0.00	0.32	-72.71	-54.00	18.71
50.40	V	42.41	-65.02	-14.72	0.21	-79.95	-54.00	25.95

802.11 n20_high channel**5700 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11400.00	H	48.76	-50.50	13.00	1.57	-39.07	-30.00	9.07
11400.00	V	45.92	-51.93	13.00	1.57	-40.50	-30.00	10.50
93.88	H	43.48	-71.41	0.00	0.32	-71.73	-54.00	17.73
50.15	V	43.56	-63.72	-14.83	0.21	-78.76	-54.00	24.76

802.11 n40_low channel**5190 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10380.00	H	49.47	-50.27	13.44	0.38	-37.21	-30.00	7.21
10380.00	V	46.83	-52.32	13.44	0.38	-39.26	-30.00	9.26
92.88	H	42.65	-72.67	0.00	0.33	-73.00	-54.00	19.00
50.68	V	41.84	-65.75	-14.59	0.21	-80.55	-54.00	26.55

802.11 n40_high channel**5230 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10460.00	H	50.19	-49.55	13.34	0.31	-36.52	-30.00	6.52
10460.00	V	49.46	-49.57	13.34	0.31	-36.54	-30.00	6.54
93.54	H	43.77	-71.27	0.00	0.32	-71.59	-54.00	17.59
50.36	V	42.74	-64.66	-14.73	0.21	-79.60	-54.00	25.60

802.11 n40_low channel**5510 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11020.00	H	44.08	-54.51	13.04	0.86	-42.33	-30.00	12.33
11020.00	V	44.97	-52.96	13.04	0.86	-40.78	-30.00	10.78
93.88	H	42.55	-72.34	0.00	0.32	-72.66	-54.00	18.66
51.63	V	41.25	-66.91	-14.15	0.21	-81.27	-54.00	27.27

802.11 n40_high channel**5670 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11340.00	H	47.53	-51.63	12.94	1.46	-40.15	-30.00	10.15
11340.00	V	46.46	-51.40	12.94	1.46	-39.92	-30.00	9.92
94.44	H	43.99	-70.67	0.00	0.32	-70.99	-54.00	16.99
52.52	V	42.63	-66.06	-13.74	0.22	-80.02	-54.00	26.02

802.11 ac20 low channel**5180 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10360.00	H	48.42	-51.32	13.48	0.40	-38.24	-30.00	8.24
10360.00	V	45.39	-53.79	13.48	0.40	-40.71	-30.00	10.71
94.11	H	42.22	-72.58	0.00	0.32	-72.90	-54.00	18.90
50.32	V	43.55	-63.83	-14.75	0.21	-78.79	-54.00	24.79

802.11 ac20 high channel**5240 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10480.00	H	47.65	-52.09	13.32	0.30	-39.07	-30.00	9.07
10480.00	V	44.59	-54.41	13.32	0.30	-41.39	-30.00	11.39
93.55	H	43.87	-71.16	0.00	0.32	-71.48	-54.00	17.48
50.74	V	44.47	-63.16	-14.56	0.21	-77.93	-54.00	23.93

802.11 ac20 low channel**5500 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11000.00	H	43.68	-54.87	13.10	0.82	-42.59	-30.00	12.59
11000.00	V	41.53	-56.40	13.10	0.82	-44.12	-30.00	14.12
93.88	H	41.44	-73.45	0.00	0.32	-73.77	-54.00	19.77
50.21	V	41.64	-65.67	-14.80	0.21	-80.68	-54.00	26.68

802.11 ac20 high channel**5700 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11400.00	H	44.83	-54.43	13.00	1.57	-43.00	-30.00	13.00
11400.00	V	43.61	-54.24	13.00	1.57	-42.81	-30.00	12.81
93.98	H	43.89	-70.96	0.00	0.32	-71.28	-54.00	17.28
50.42	V	42.85	-64.59	-14.71	0.21	-79.51	-54.00	25.51

802.11 ac40_low channel**5190 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10380.00	H	47.56	-52.18	13.44	0.38	-39.12	-30.00	9.12
10380.00	V	46.35	-52.80	13.44	0.38	-39.74	-30.00	9.74
93.74	H	43.88	-71.07	0.00	0.32	-71.39	-54.00	17.39
50.63	V	43.51	-64.05	-14.61	0.21	-78.87	-54.00	24.87

802.11 ac40_high channel**5230 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10460.00	H	47.38	-52.36	13.34	0.31	-39.33	-30.00	9.33
10460.00	V	44.81	-54.22	13.34	0.31	-41.19	-30.00	11.19
93.11	H	44.52	-70.70	0.00	0.33	-71.03	-54.00	17.03
50.84	V	44.74	-62.95	-14.51	0.21	-77.67	-54.00	23.67

802.11 ac40_low channel**5510 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11020.00	H	42.50	-56.09	13.04	0.86	-43.91	-30.00	13.91
11020.00	V	41.73	-56.20	13.04	0.86	-44.02	-30.00	14.02
93.77	H	41.77	-73.17	0.00	0.32	-73.49	-54.00	19.49
50.66	V	42.21	-65.37	-14.60	0.21	-80.18	-54.00	26.18

802.11 ac40_high channel**5670 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11340.00	H	45.00	-54.16	12.94	1.46	-42.68	-30.00	12.68
11340.00	V	42.00	-55.86	12.94	1.46	-44.38	-30.00	14.38
93.25	H	43.69	-71.47	0.00	0.33	-71.80	-54.00	17.80
50.74	V	41.62	-66.01	-14.56	0.21	-80.78	-54.00	26.78

802.11 ac80**5210 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
10420.00	H	46.24	-53.50	13.38	0.35	-40.47	-30.00	10.47
10420.00	V	44.06	-55.03	13.38	0.35	-42.00	-30.00	12.00
93.14	H	42.25	-72.96	0.00	0.33	-73.29	-54.00	19.29
51.14	V	42.44	-65.43	-14.38	0.21	-80.02	-54.00	26.02

802.11 ac80**5530 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
11060.00	H	38.77	-59.89	12.92	0.93	-47.90	-30.00	17.90
11060.00	V	39.42	-58.50	12.92	0.93	-46.51	-30.00	16.51
93.37	H	44.45	-70.66	0.00	0.33	-70.99	-54.00	16.99
50.60	V	44.52	-63.03	-14.62	0.21	-77.86	-54.00	23.86

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit - Absolute Level

5 – 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.

Limit

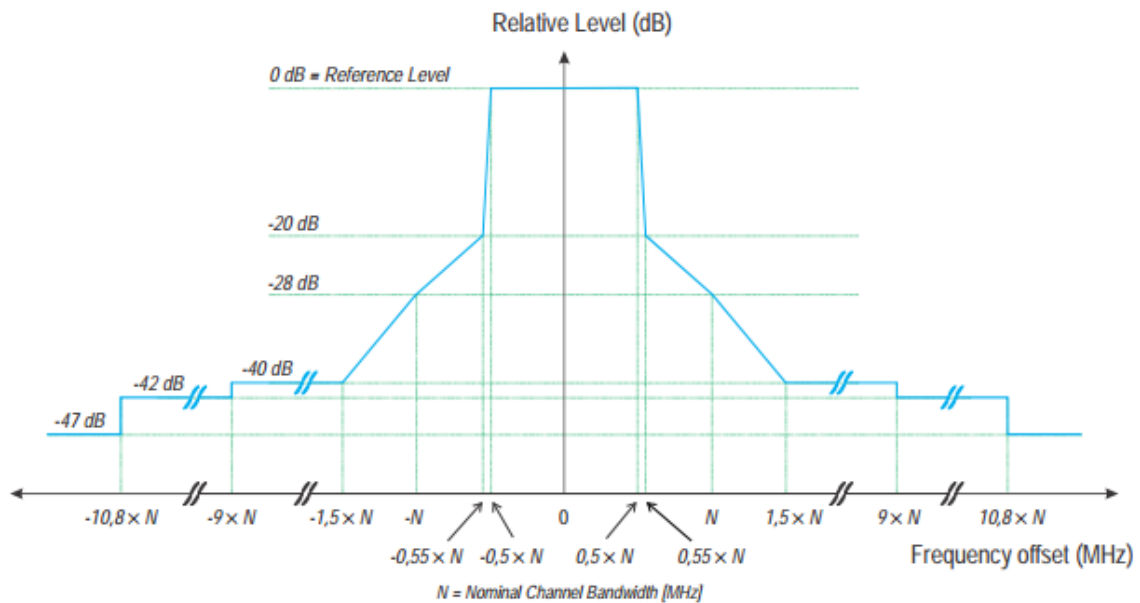


Figure 1: Transmit spectral power mask

Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.6

Test Data, Please refer to following plots:

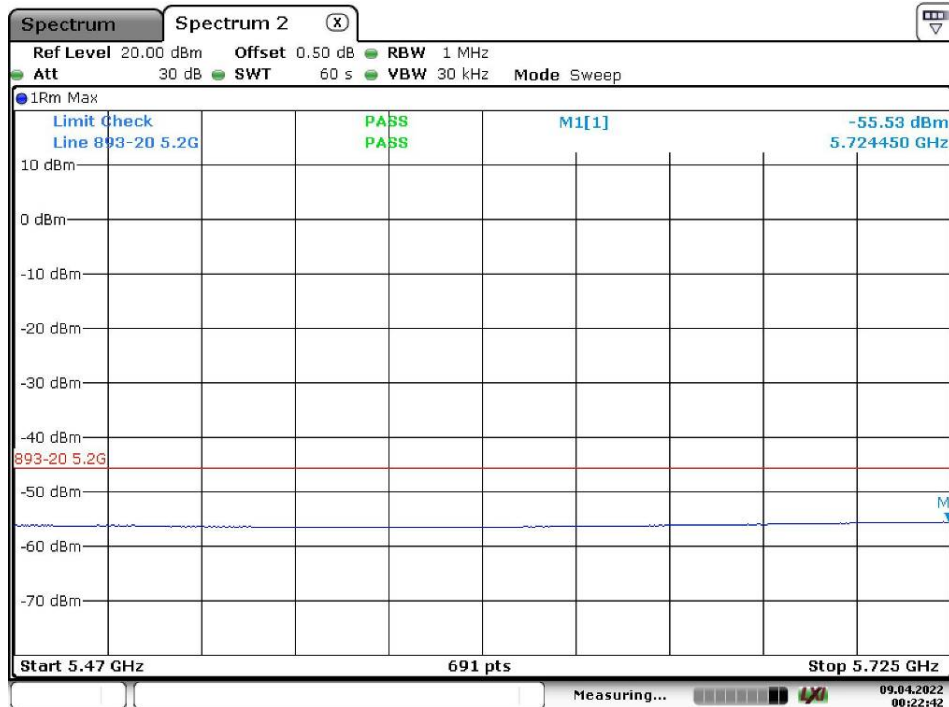
5150-5250MHz, Chain 0

802.11 a Low-1



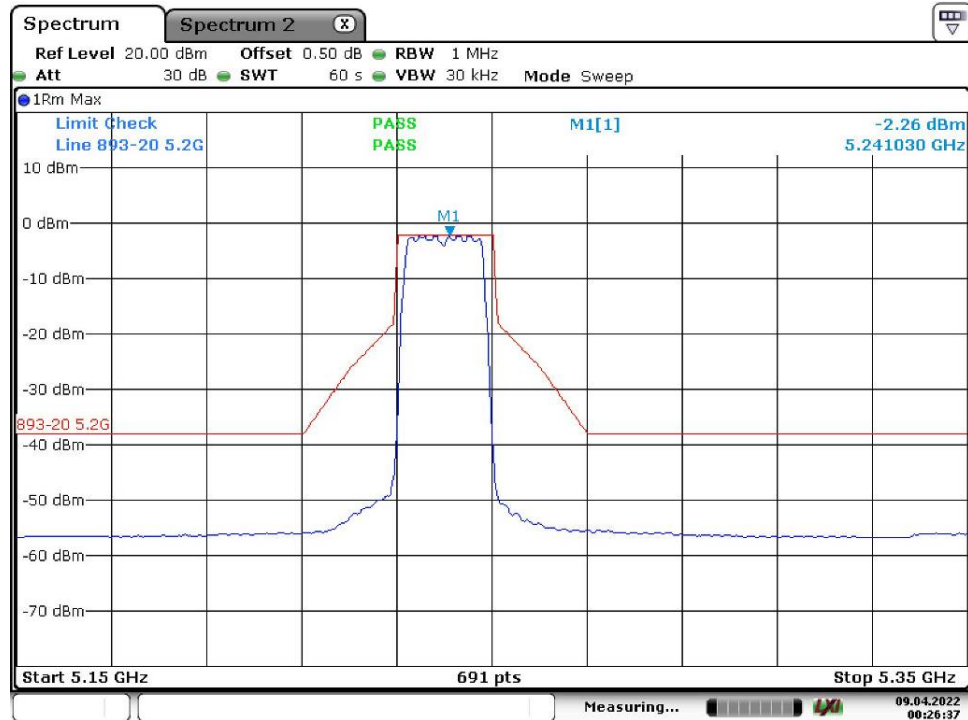
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802.11 a Low-2



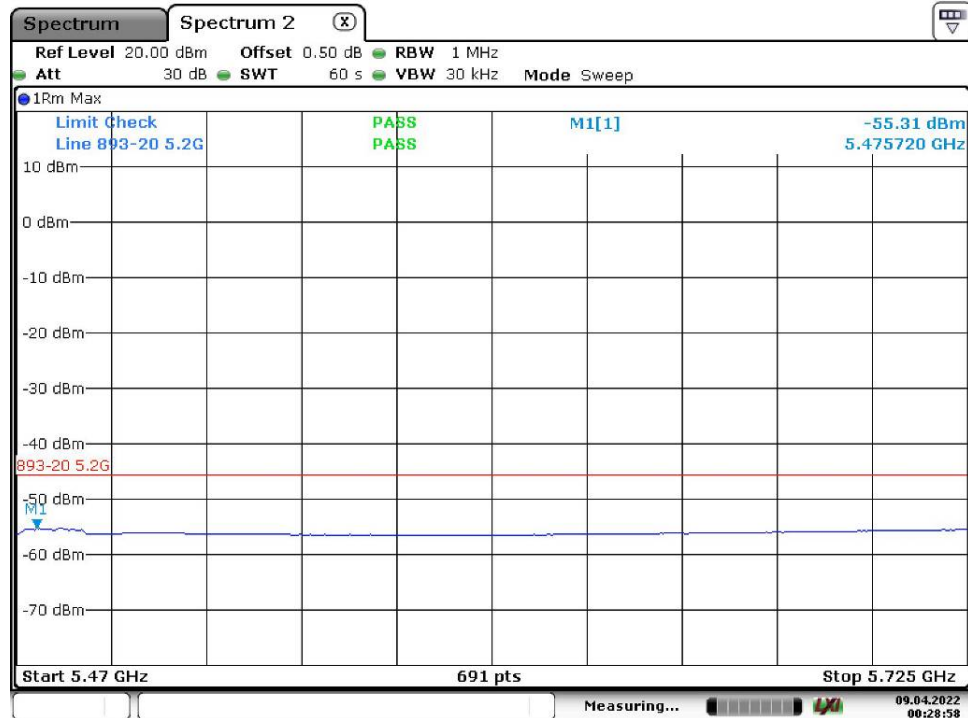
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802.11 a High-1



Date: 9.APR.2022 00:26:37

802.11 a High-2



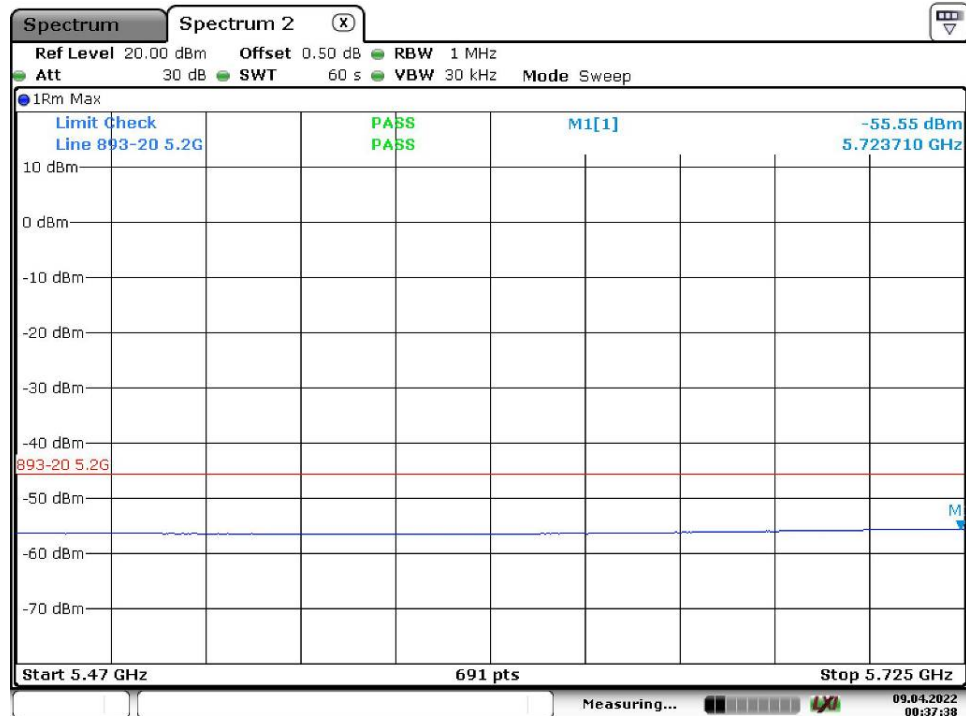
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802.11 n20 Low-1



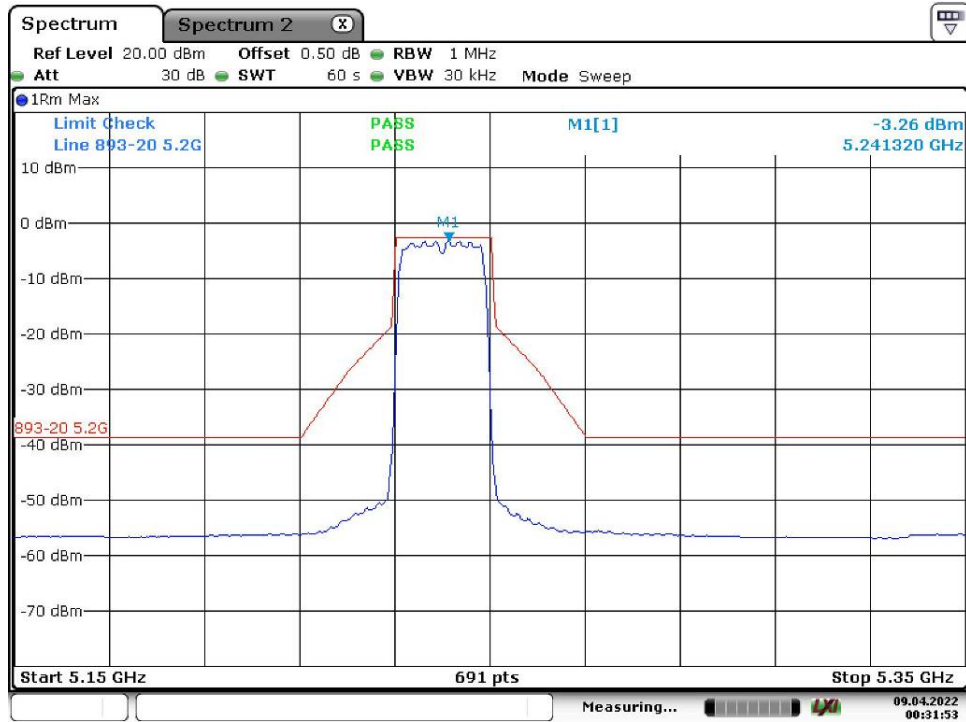
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802.11 n20 Low-2



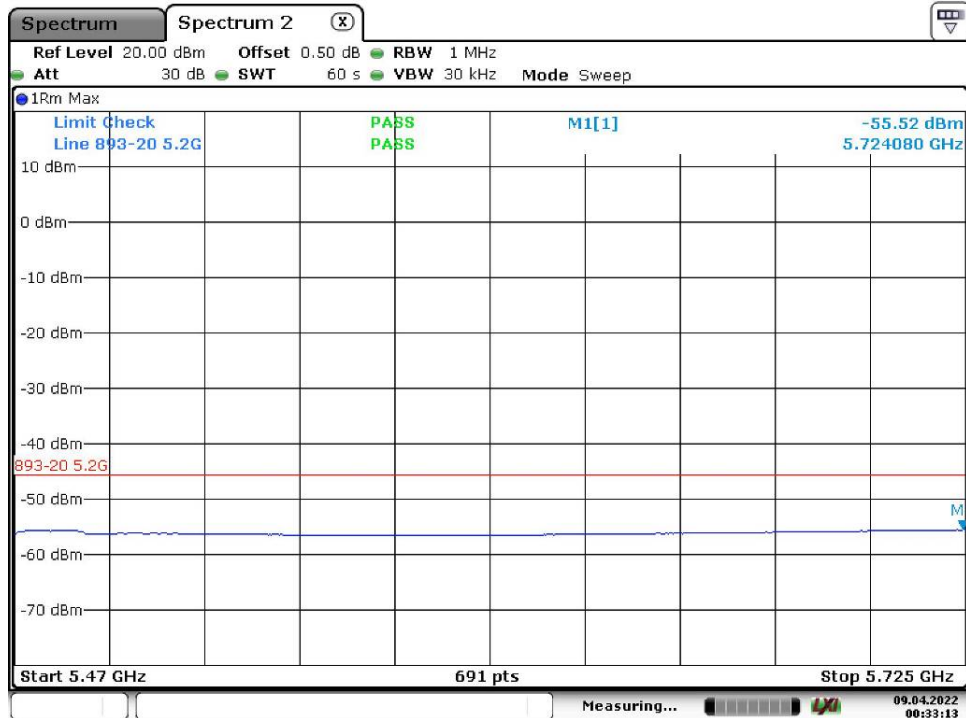
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802.11 n20 High-1



Date: 9.APR.2022 00:31:53

802.11 n20 High-2

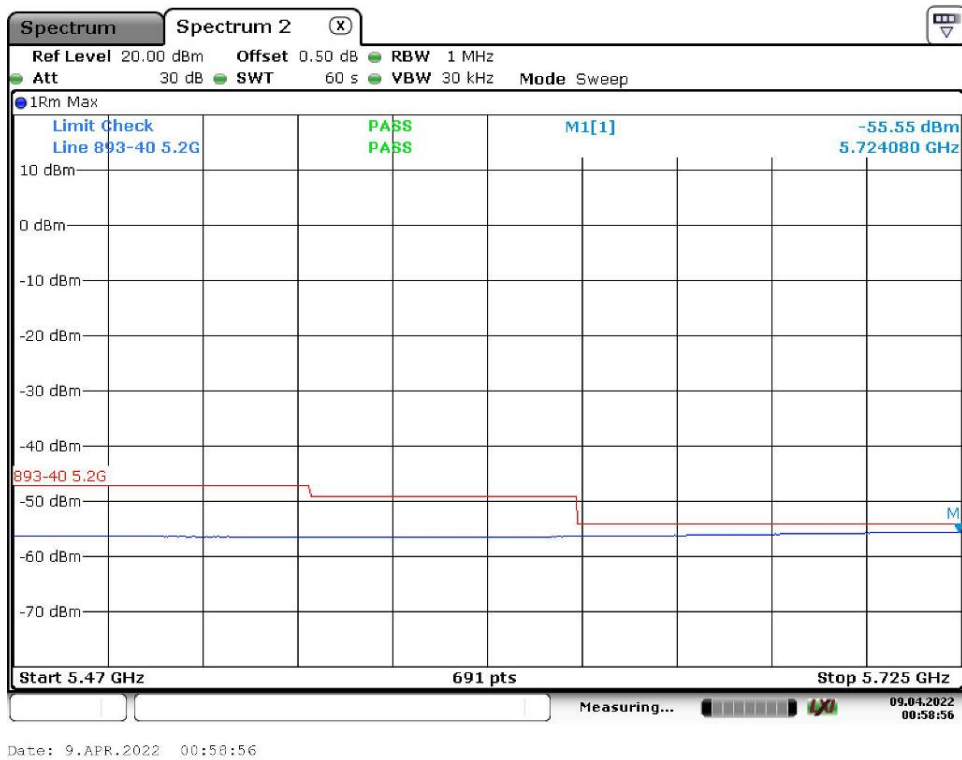


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802.11 n40 Low-1



802.11 n40 Low-2

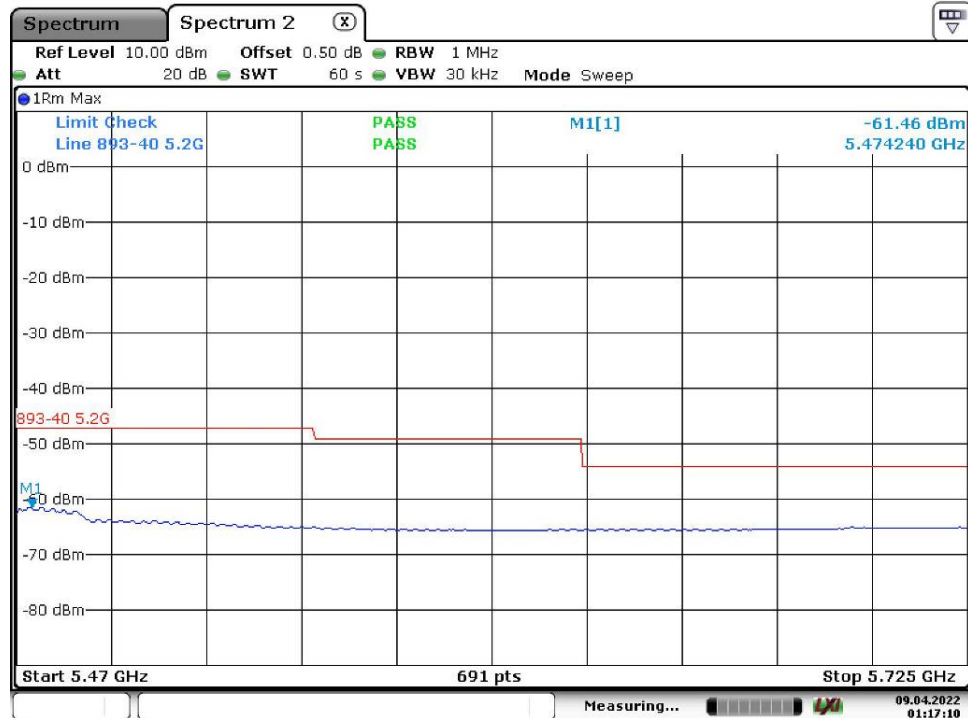


802.11 n40 High-1



Date: 9.APR.2022 01:14:27

802.11 n40 High-2



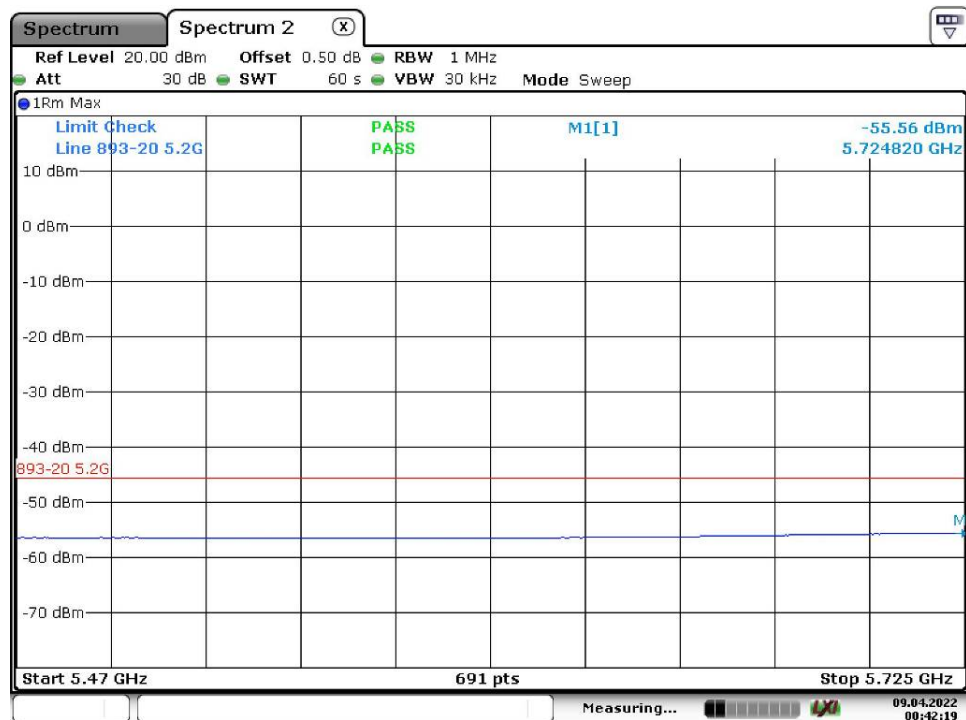
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802.11 ac20 Low-1



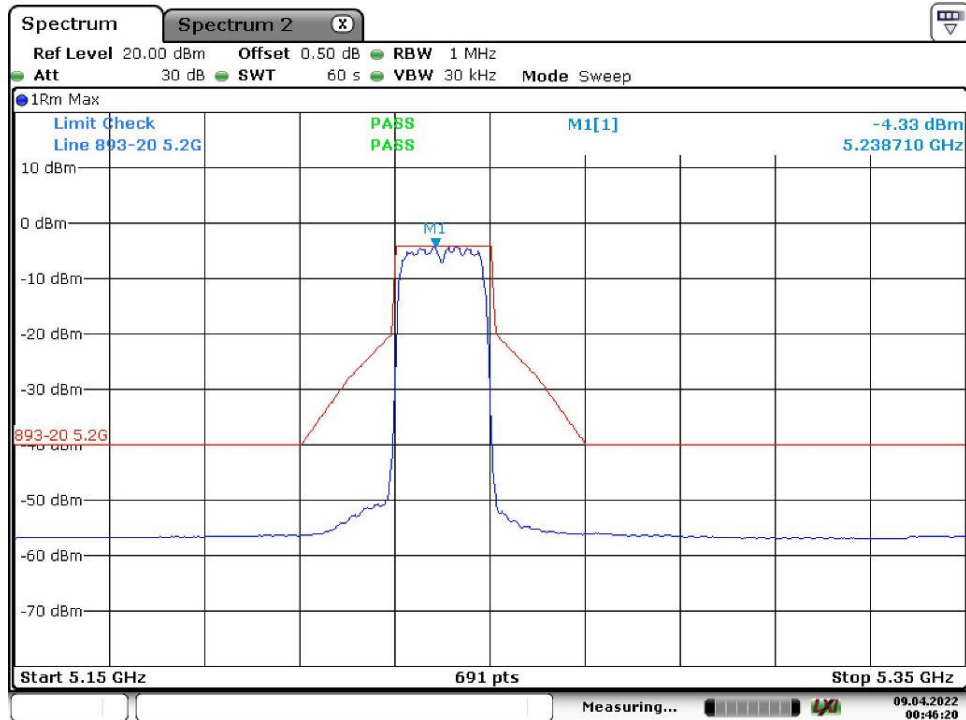
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802.11 ac20 Low-2



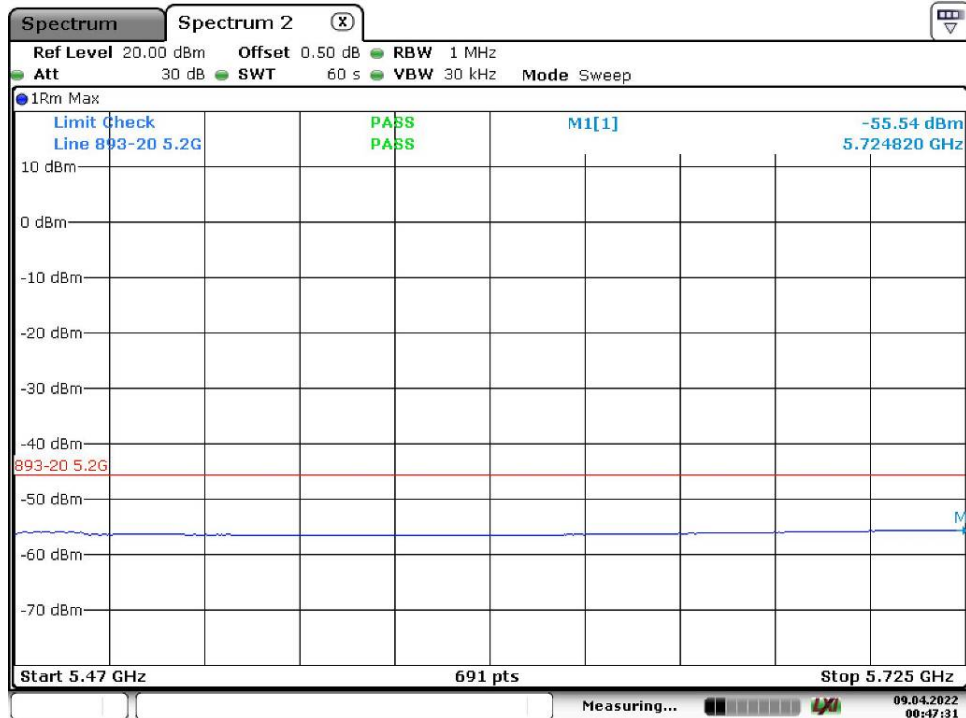
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802.11 ac20 High-1



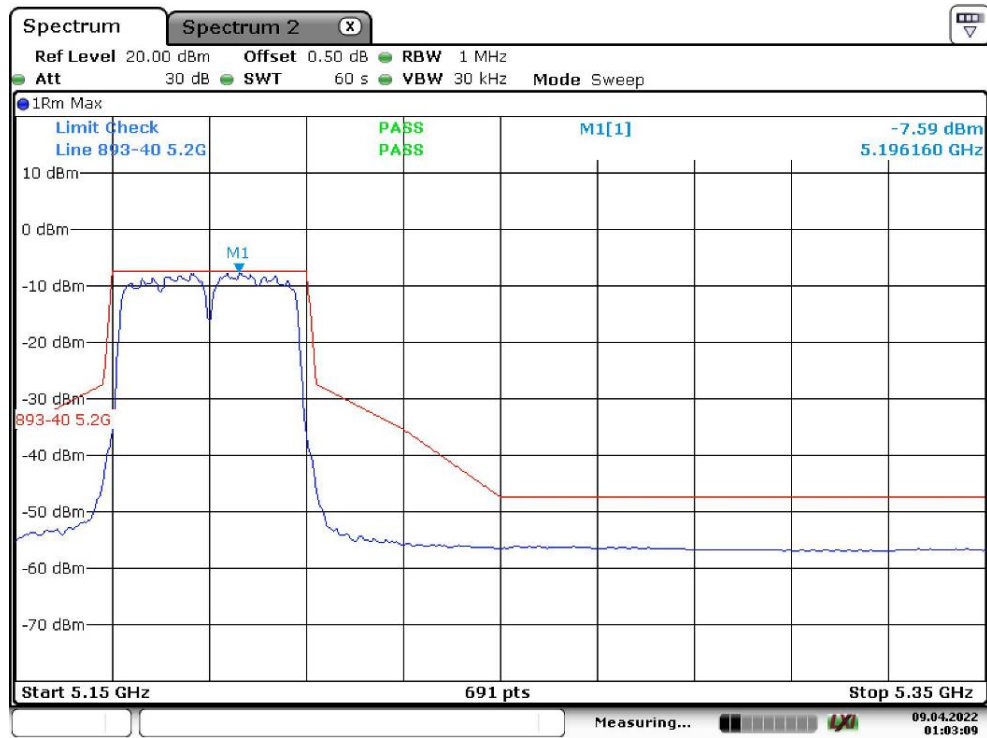
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802.11 ac20 High-2



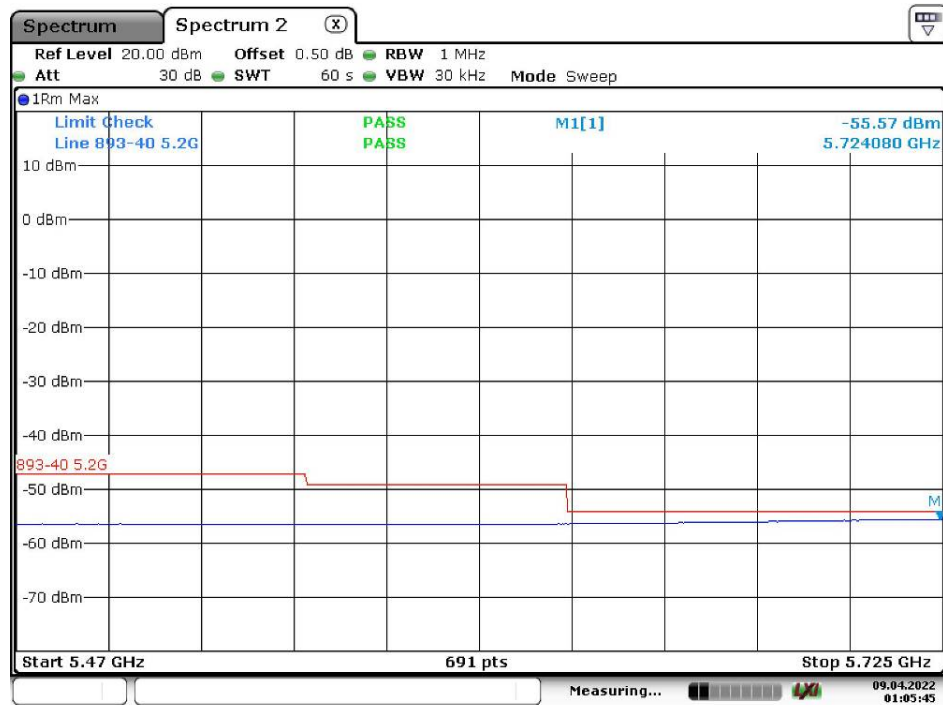
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802.11 ac40 Low-1



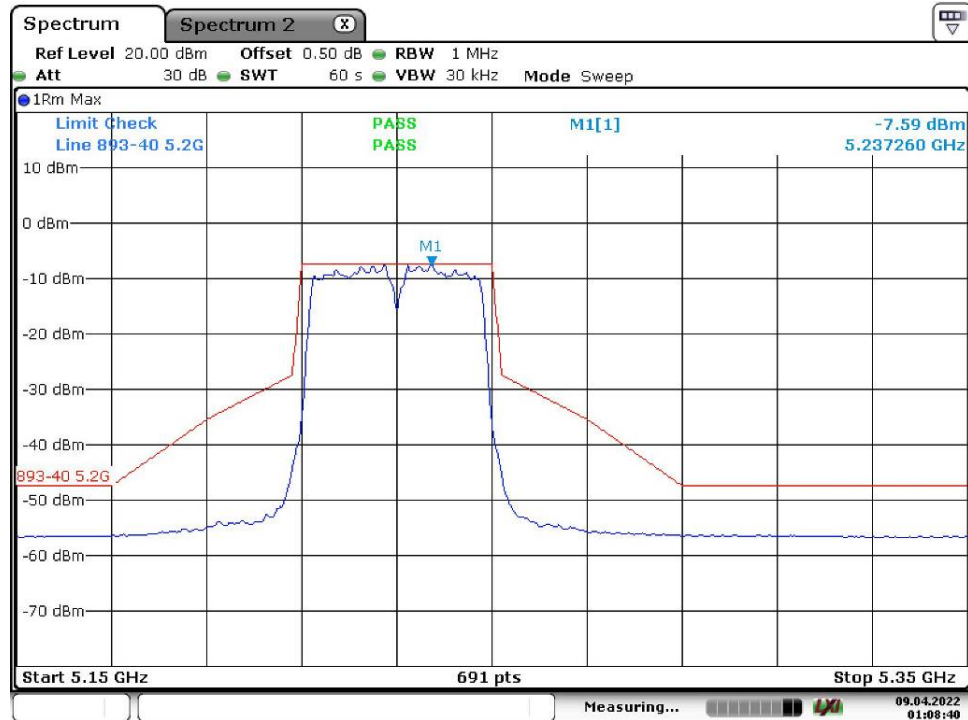
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802.11 ac40 Low-2



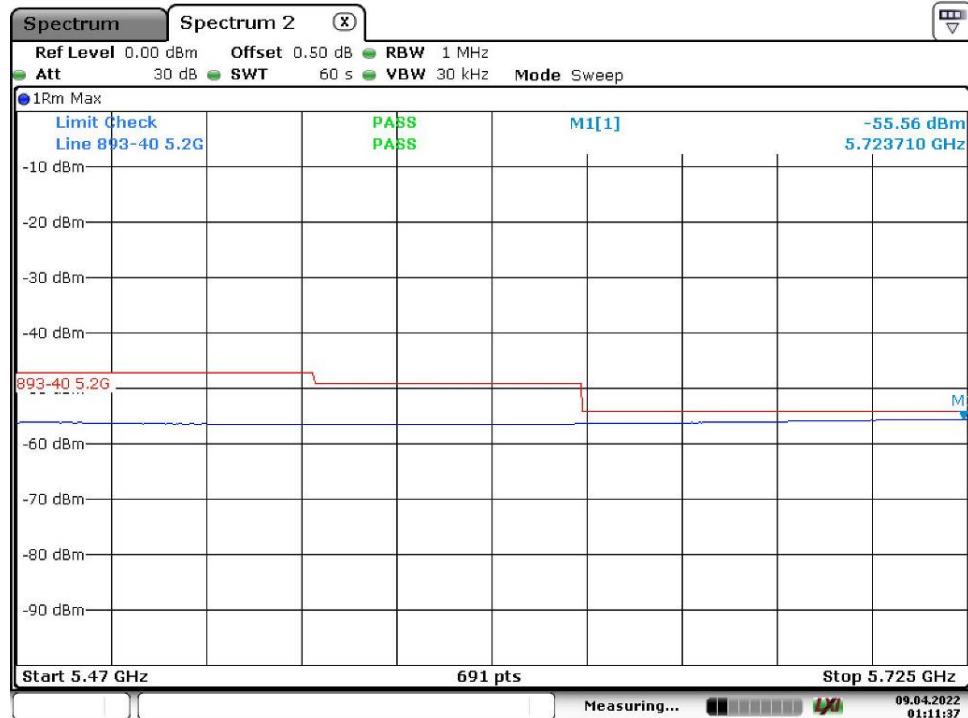
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802.11 ac40 High-1



Date: 9.APR.2022 01:08:40

802.11 ac40 High-2



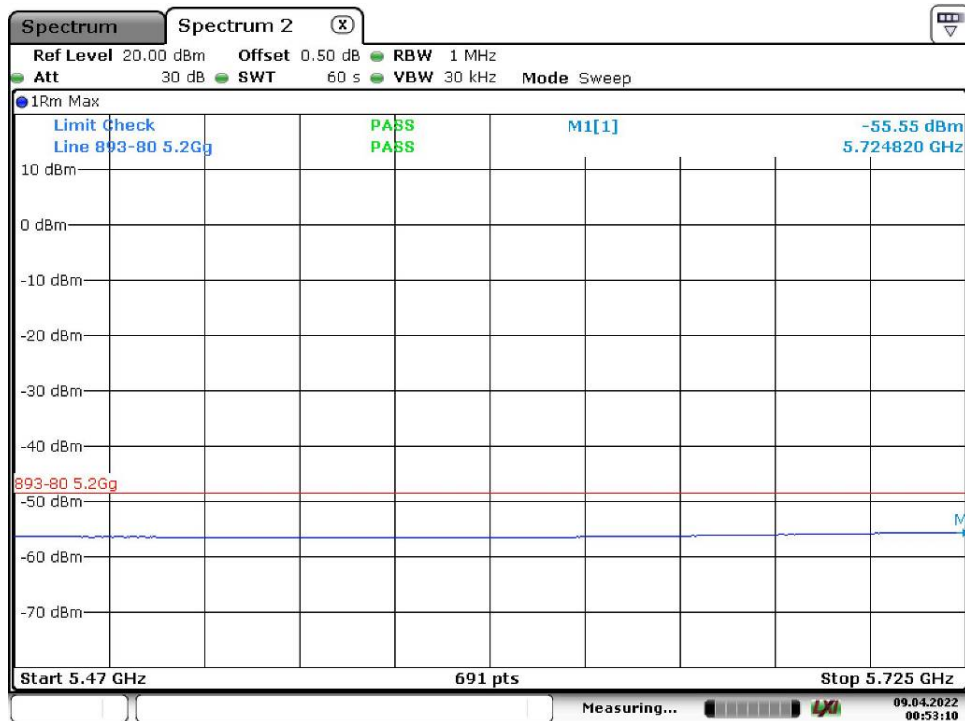
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802.11 ac80-1



Date: 9.APR.2022 00:51:38

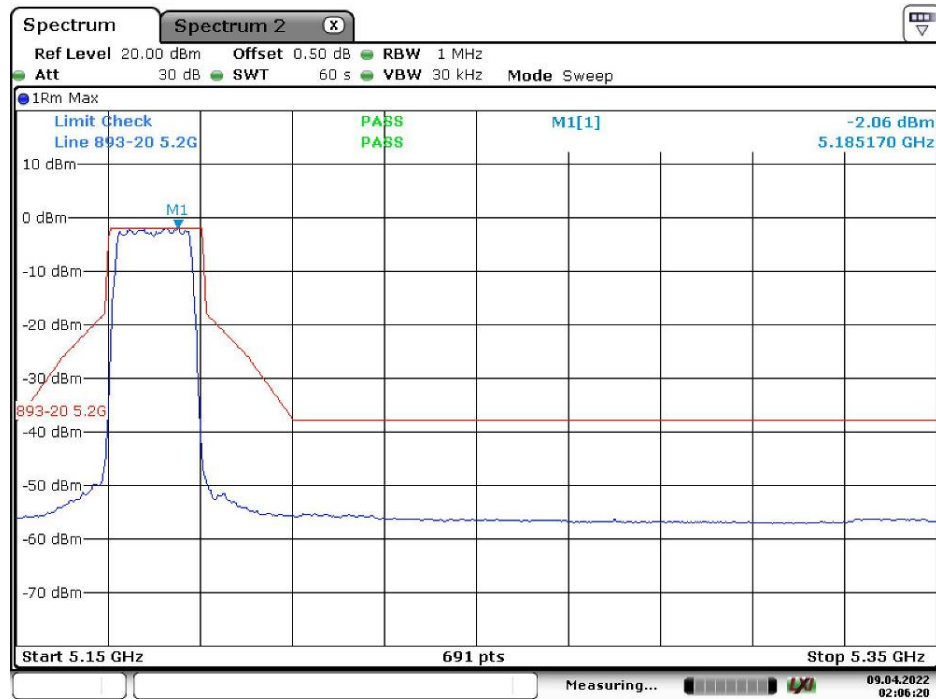
802.11 ac80-2



Date: 9.APR.2022 00:53:10

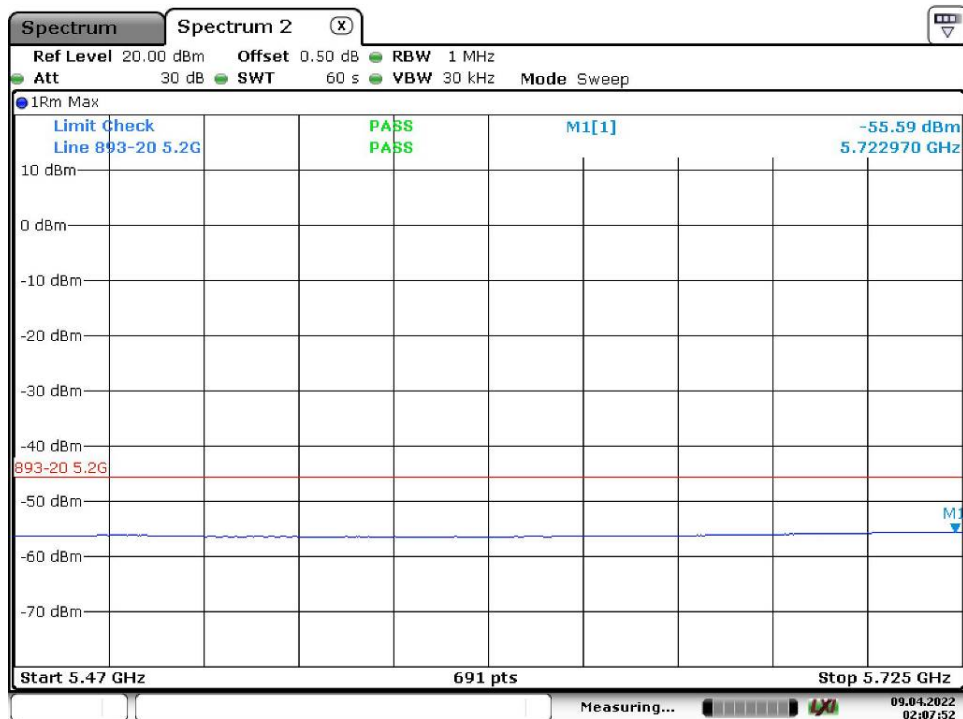
Chain 1:

802.11 a Low-1



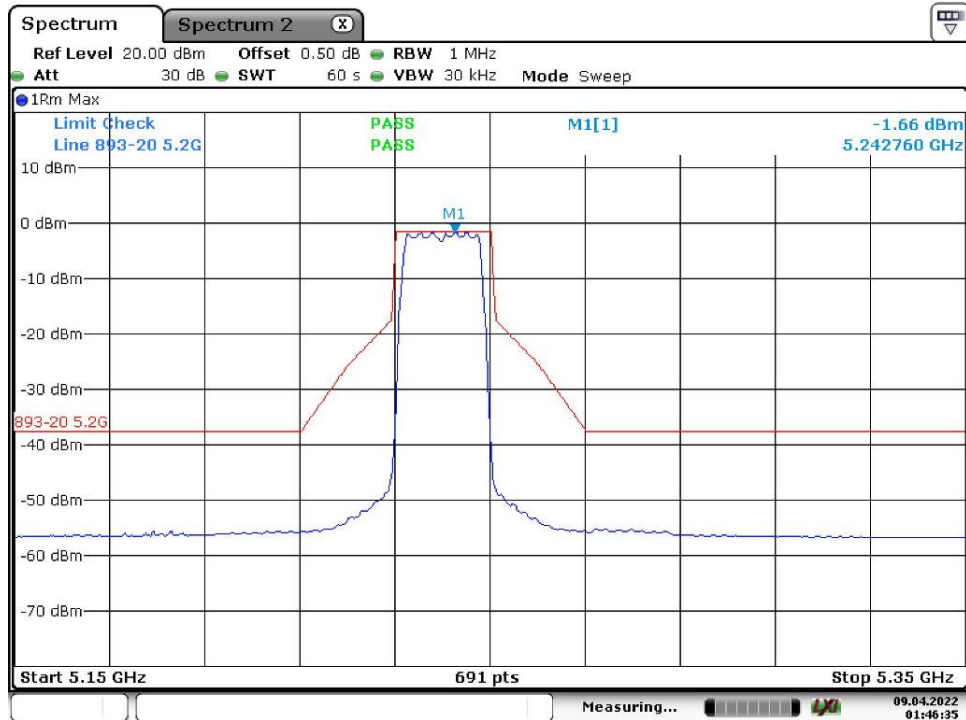
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802.11 a Low-2



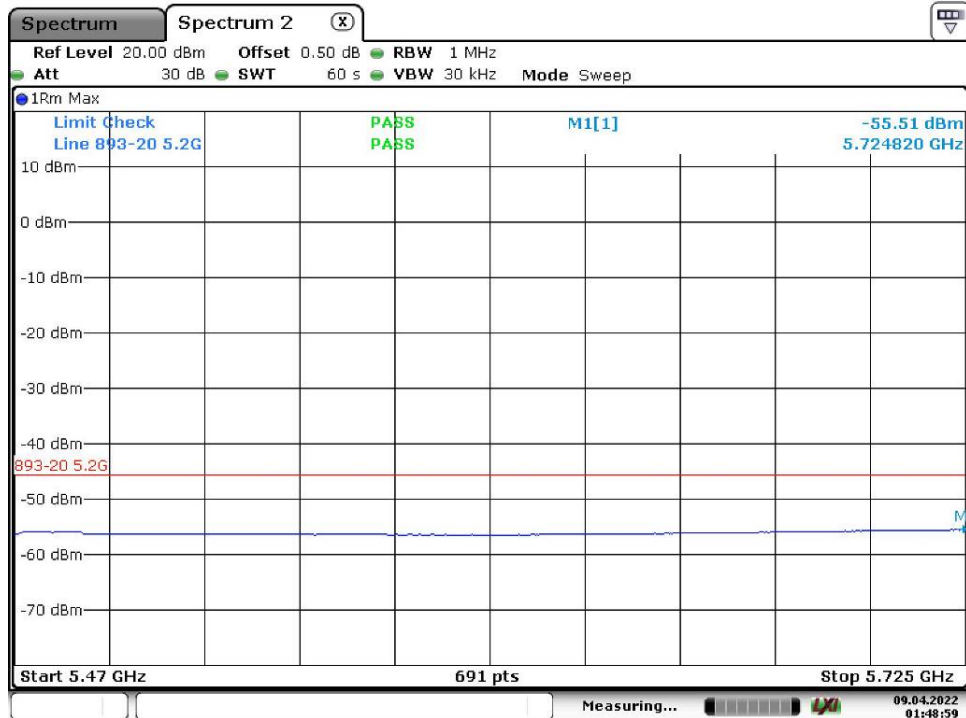
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802.11 a High-1



Date: 9.APR.2022 01:46:35

802.11 a High-2



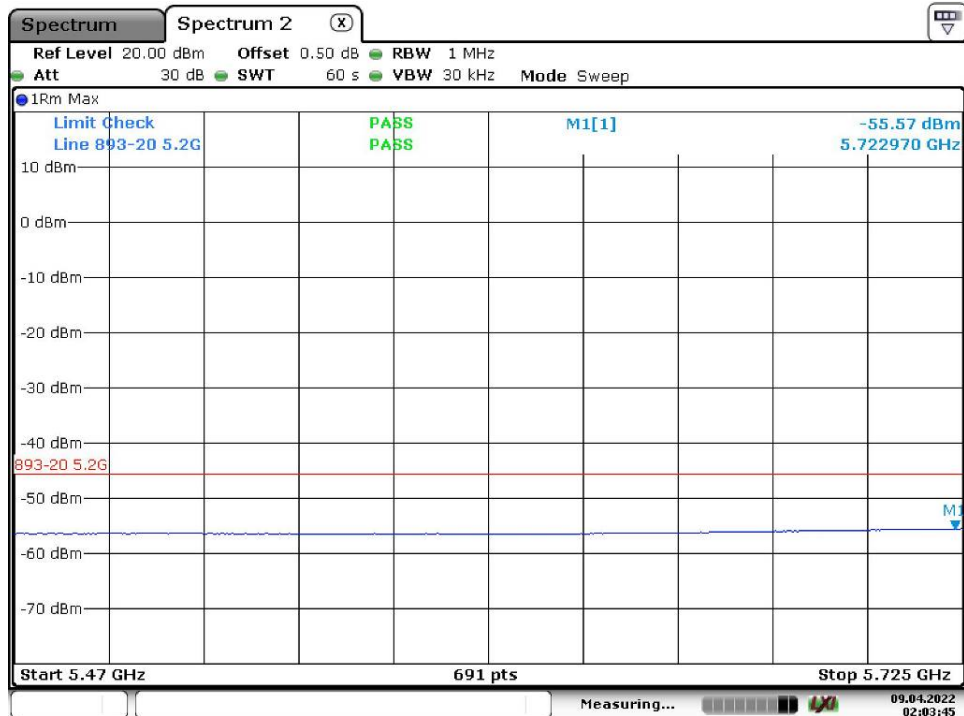
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802.11 n20 Low-1



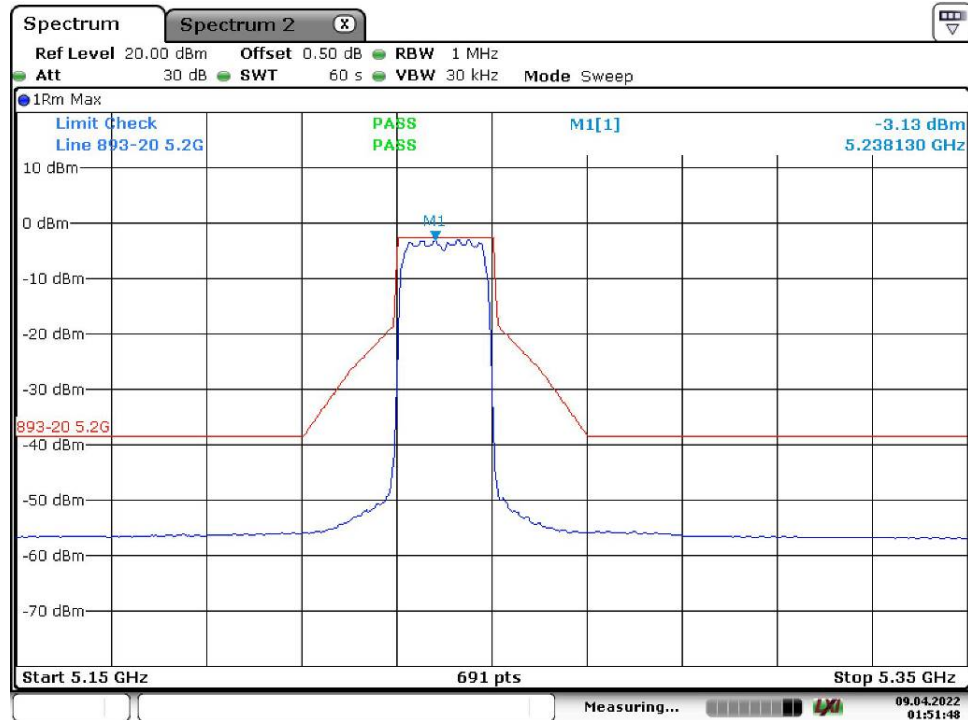
Date: 9.APR.2022 02:02:34

802.11 n20 Low-2



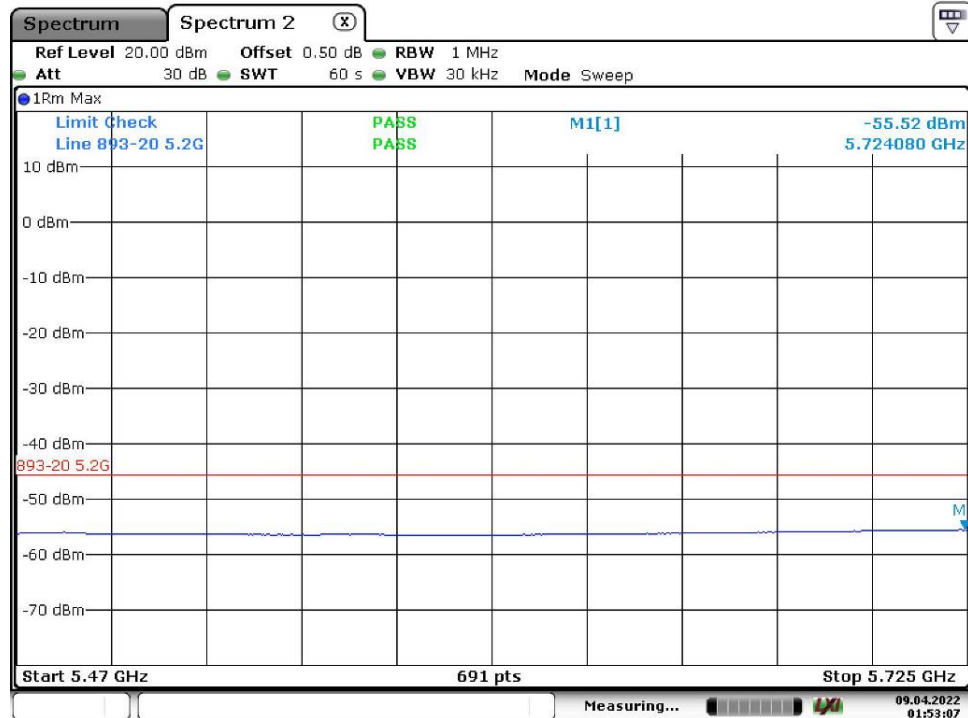
Date: 9.APR.2022 02:03:45

802.11 n20 High-1



Date: 9.APR.2022 01:51:48

802.11 n20 High-2

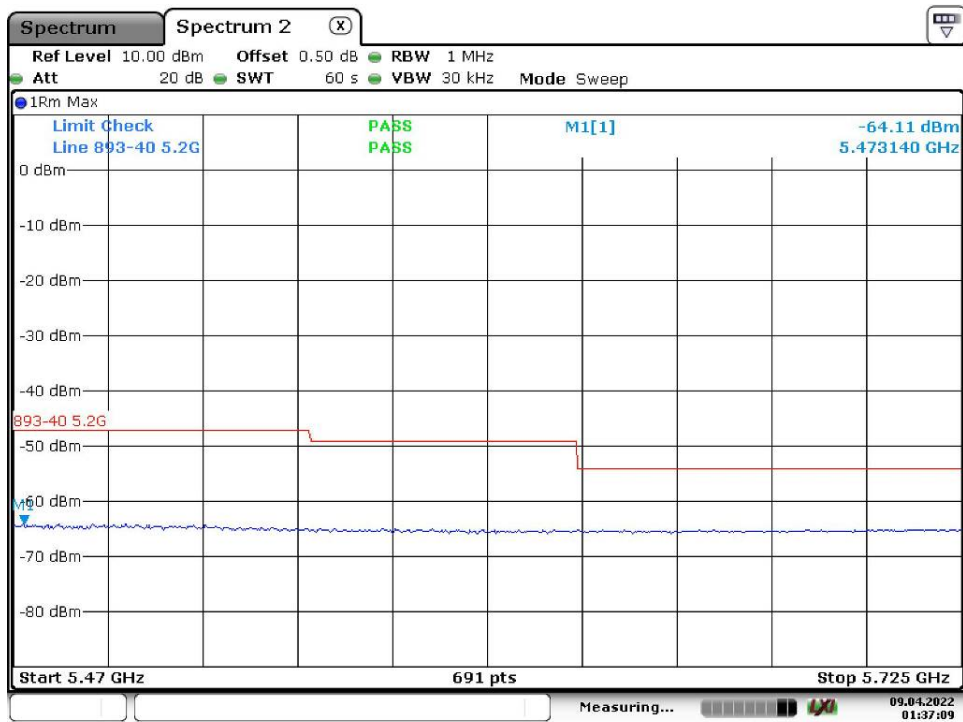


Date: 9.APR.2022 01:53:07

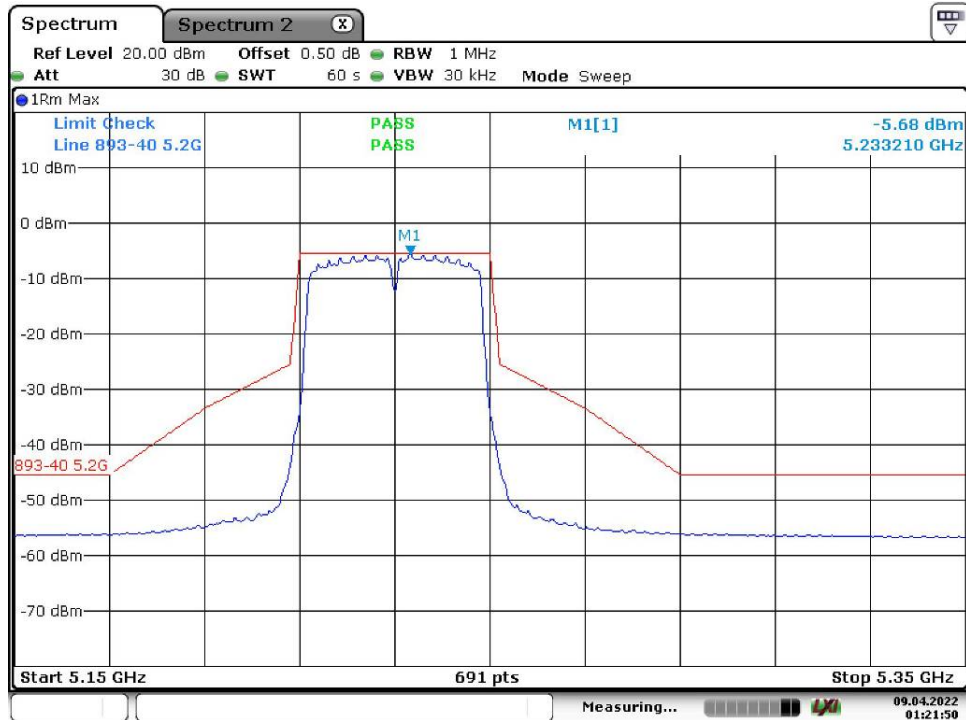
802.11 n40 Low-1



802.11 n40 Low-2

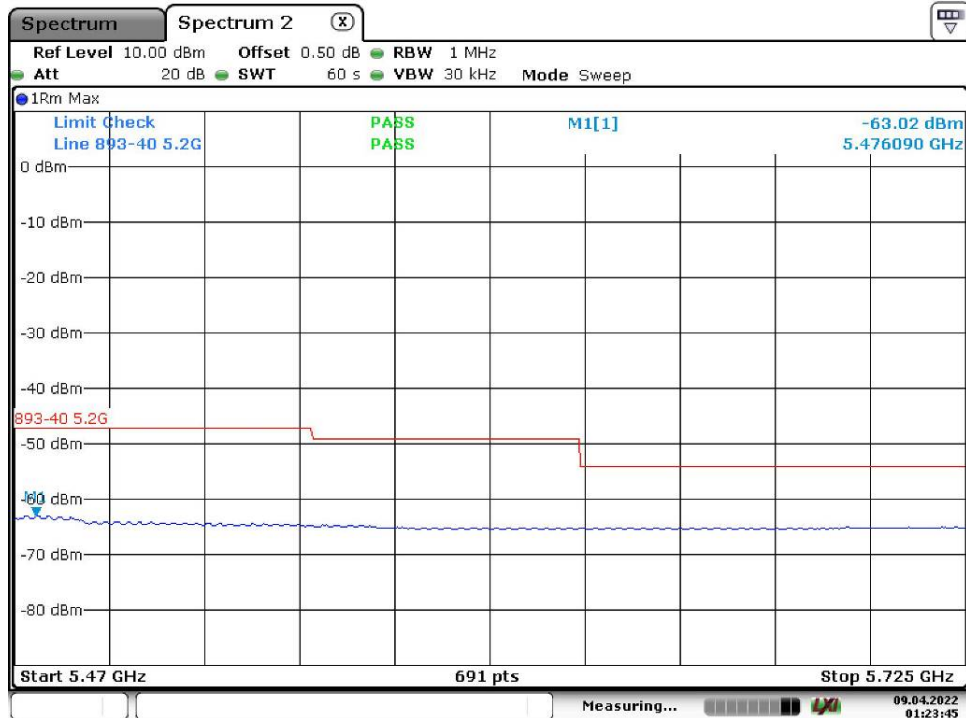


802.11 n40 High-1



Date: 9.APR.2022 01:21:50

802.11 n40 High-2



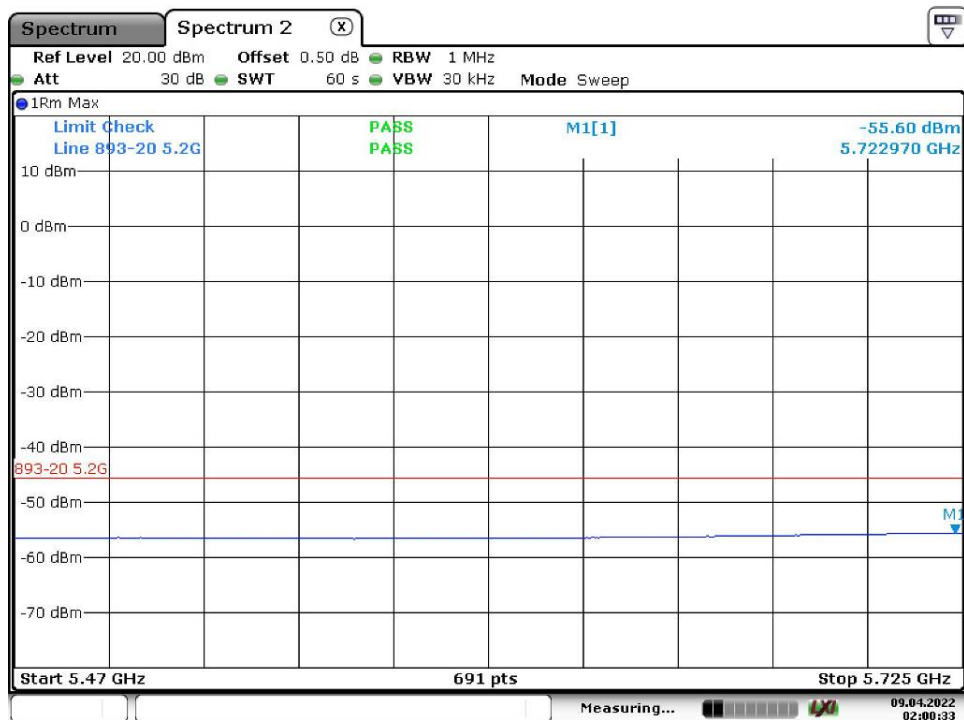
Date: 9.APR.2022 01:23:45

802.11 ac20 Low-1



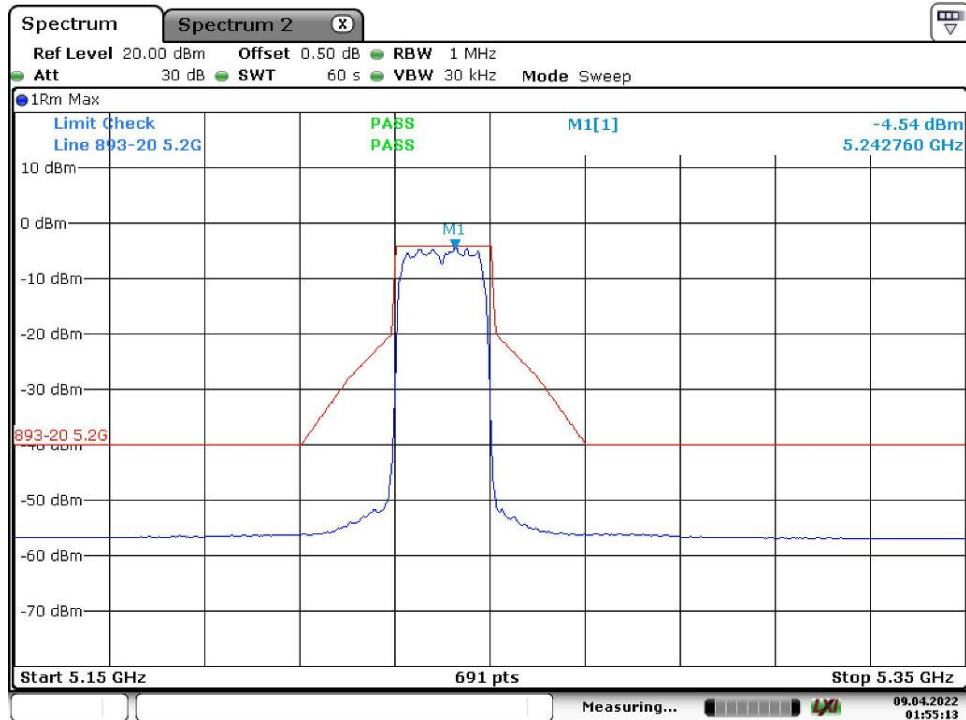
Date: 9.APR.2022 01:59:06

802.11 ac20 Low-2



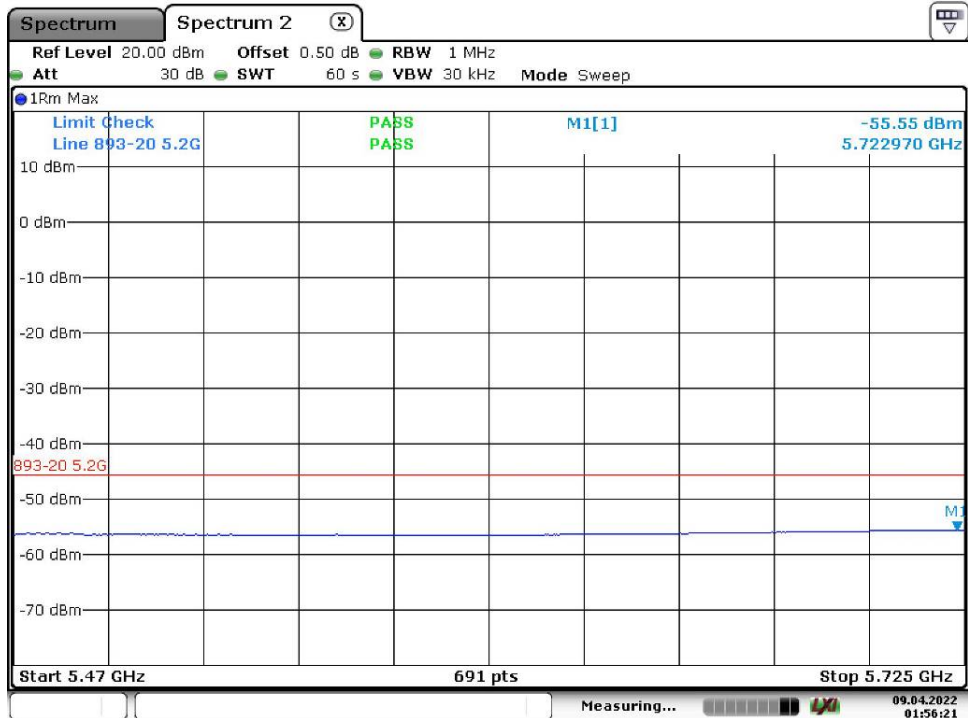
Date: 9.APR.2022 02:00:33

802.11 ac20 High-1



Date: 9.APR.2022 01:55:13

802.11 ac20 High-2



Date: 9.APR.2022 01:56:21

802.11 ac40 Low-1



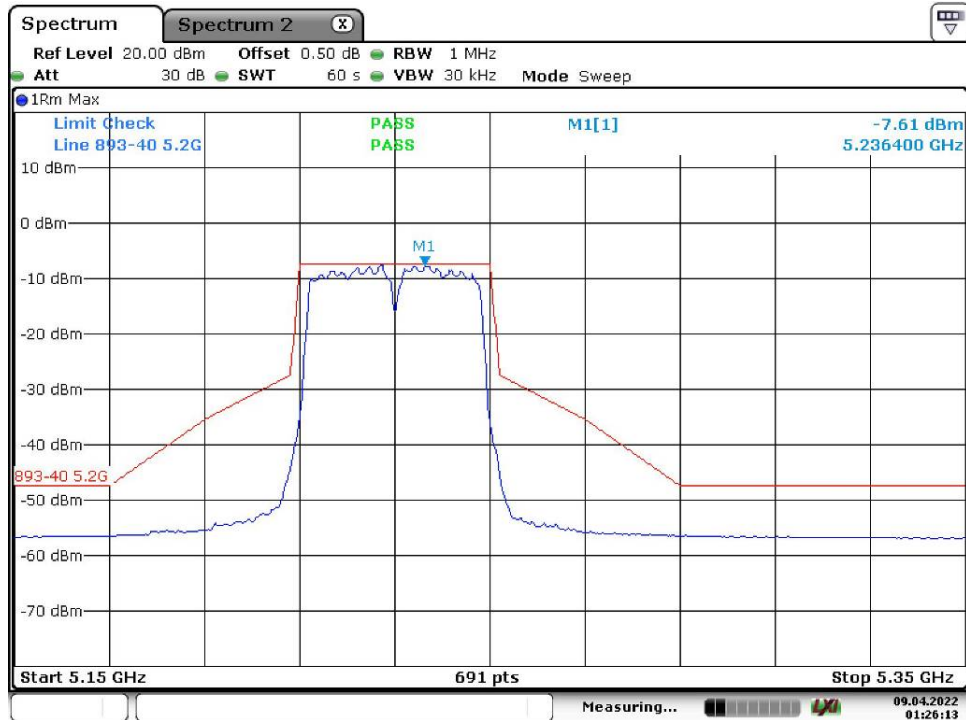
Date: 9.APR.2022 01:31:04

802.11 ac40 Low-2



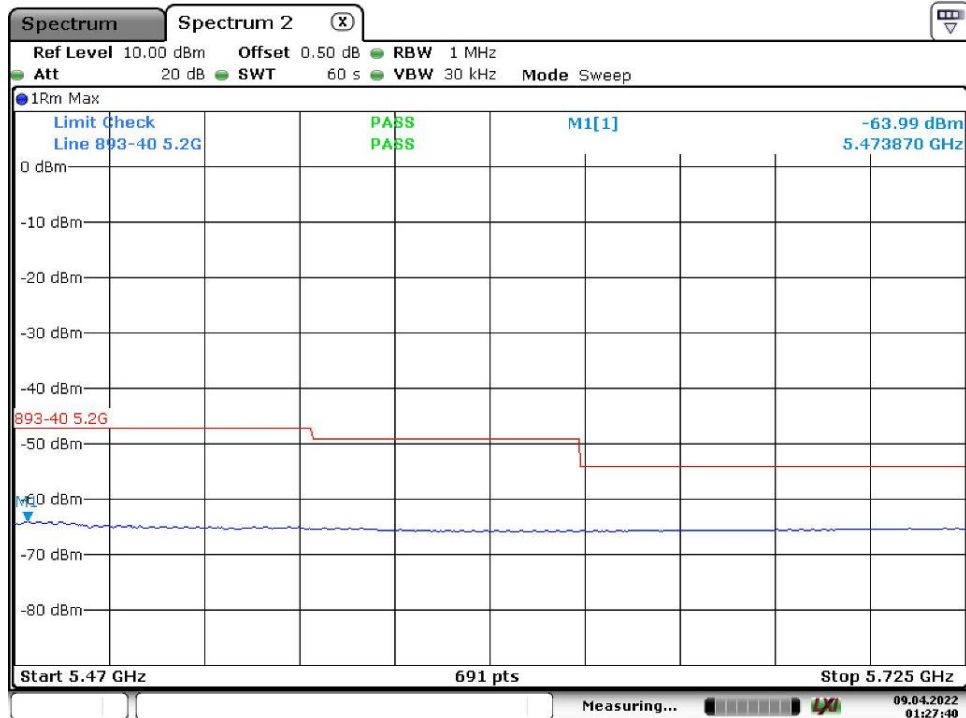
Date: 9.APR.2022 01:32:49

802.11 ac40 High-1



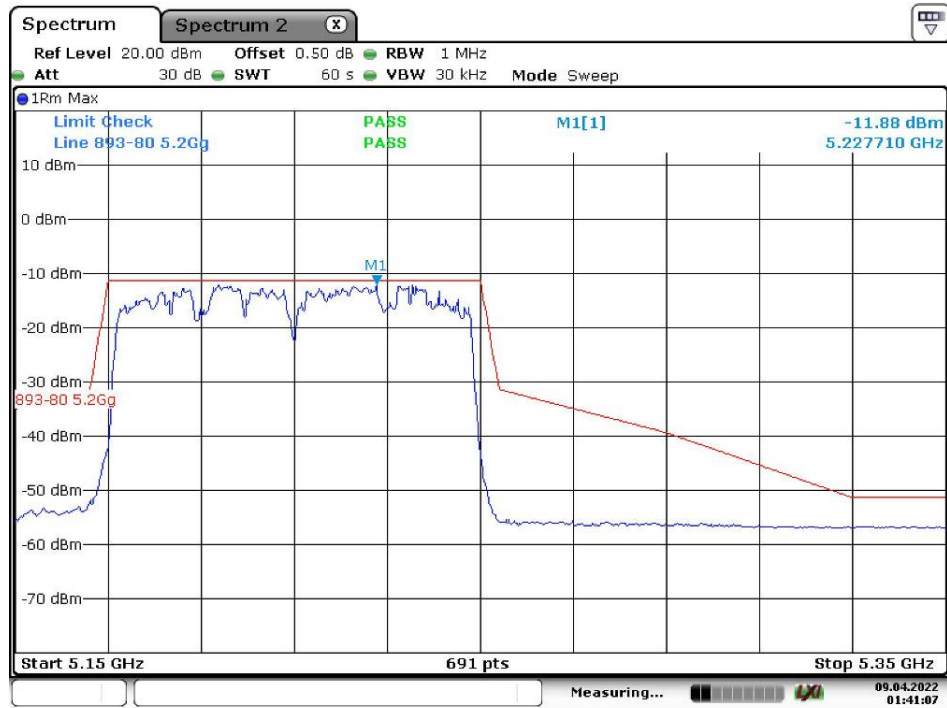
Date: 9.APR.2022 01:26:13

802.11 ac40 High-2



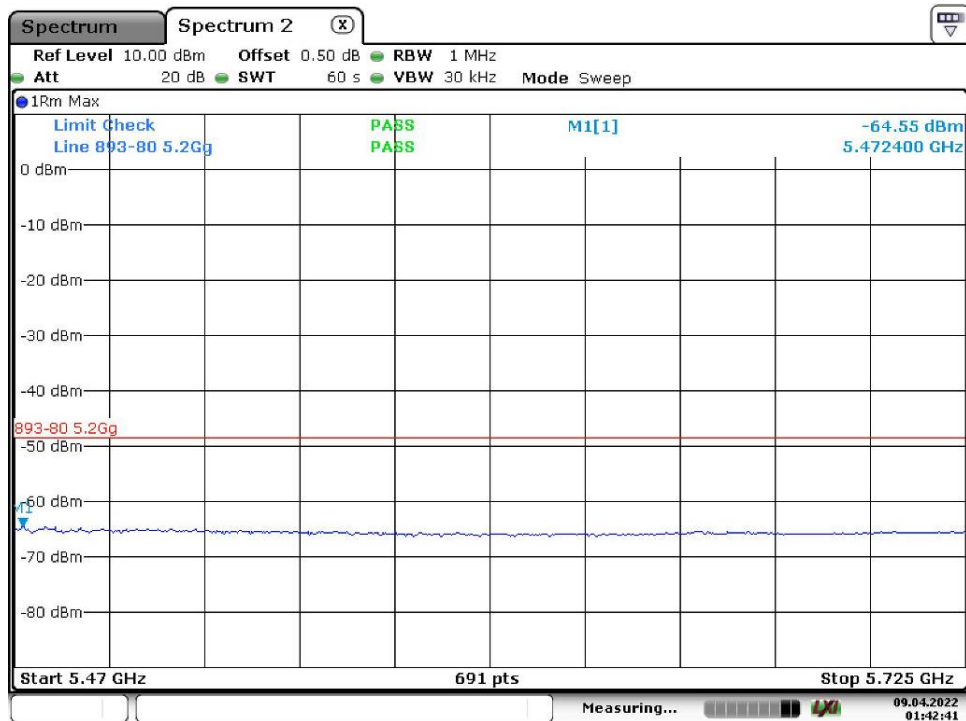
Date: 9.APR.2022 01:27:40

802.11 ac80-1



Date: 9.APR.2022 01:41:07

802.11 ac80-2

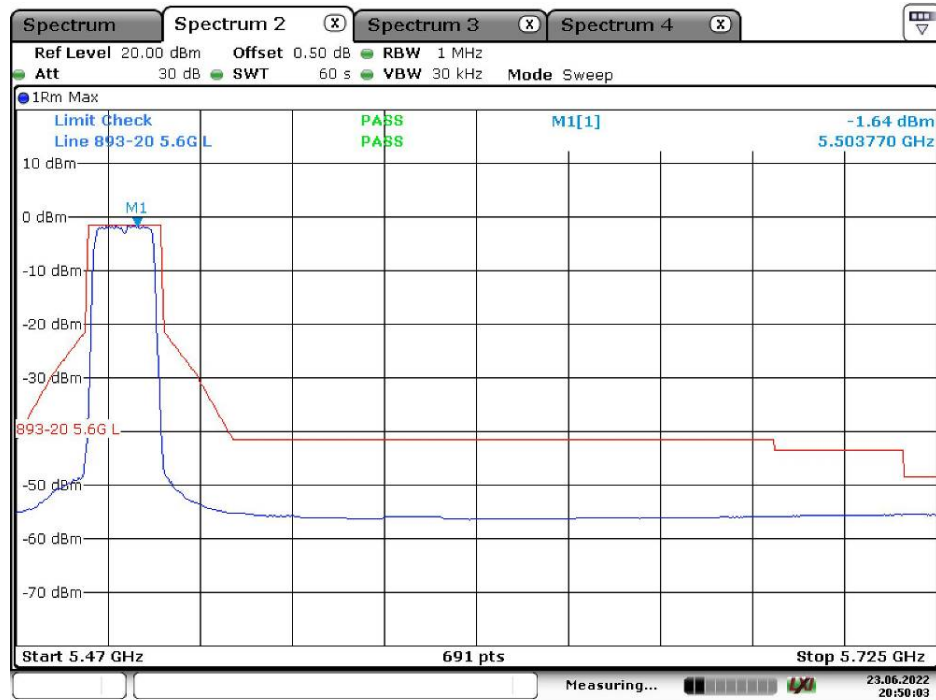


Date: 9.APR.2022 01:42:41

5470-5725MHz

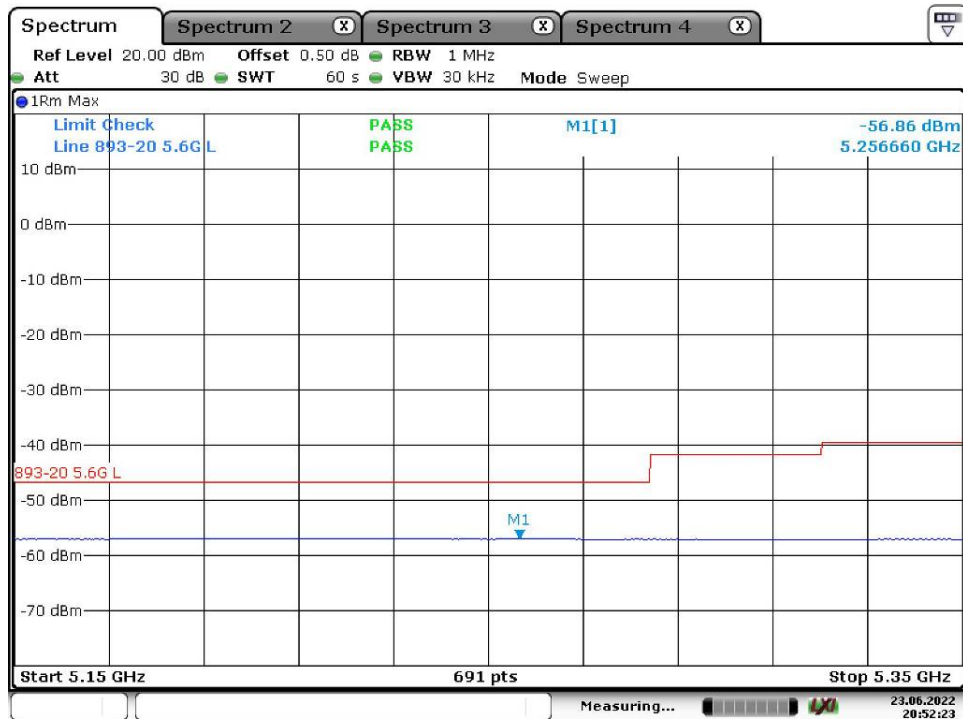
Chain 0

802.11 a Low-1



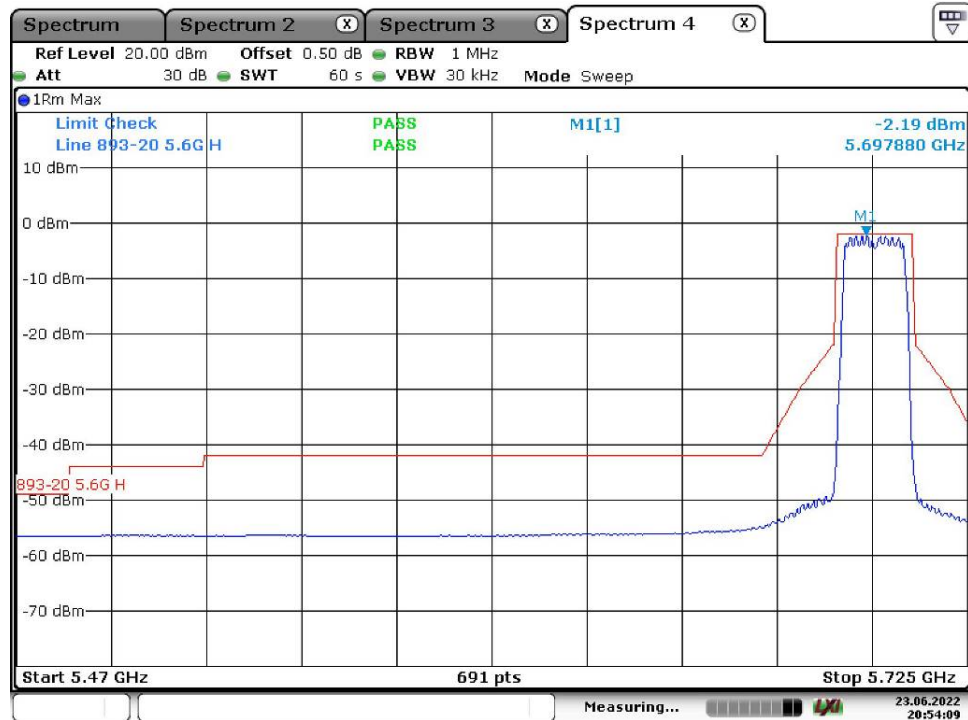
Date: 23.JUN.2022 20:50:03

802.11 a Low-2



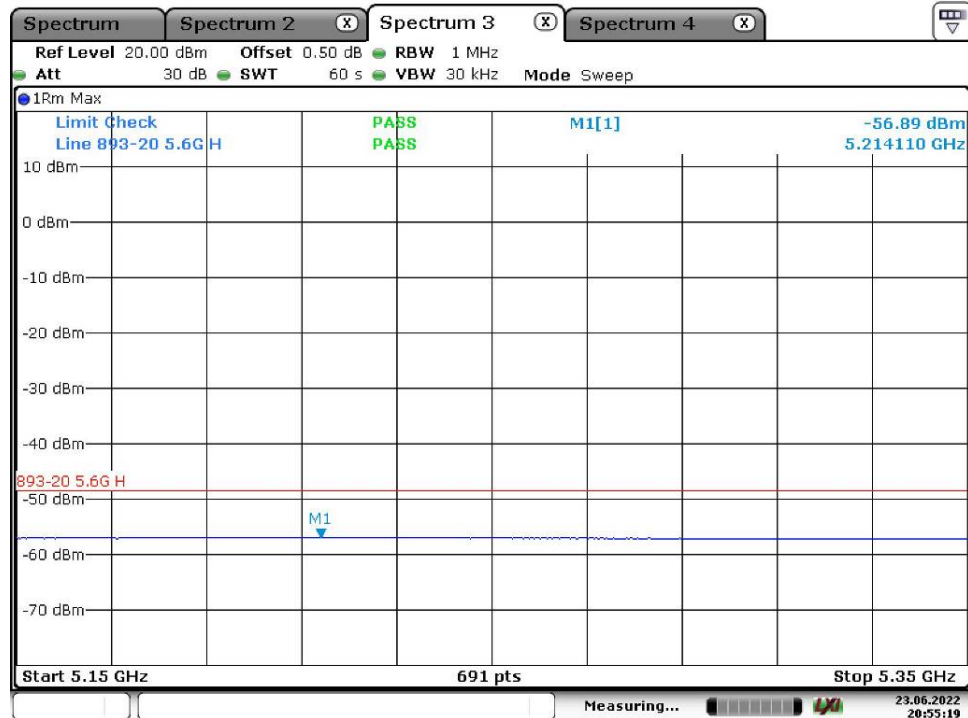
Date: 23.JUN.2022 20:52:23

802.11 a High-1



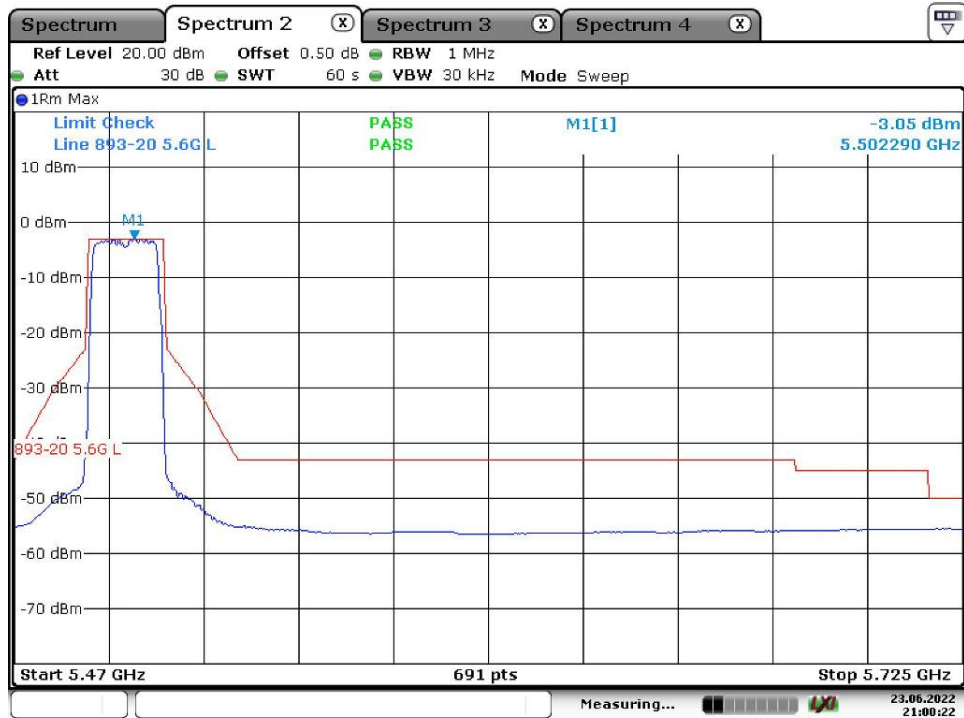
Date: 23.JUN.2022 20:54:08

802.11 a High-2



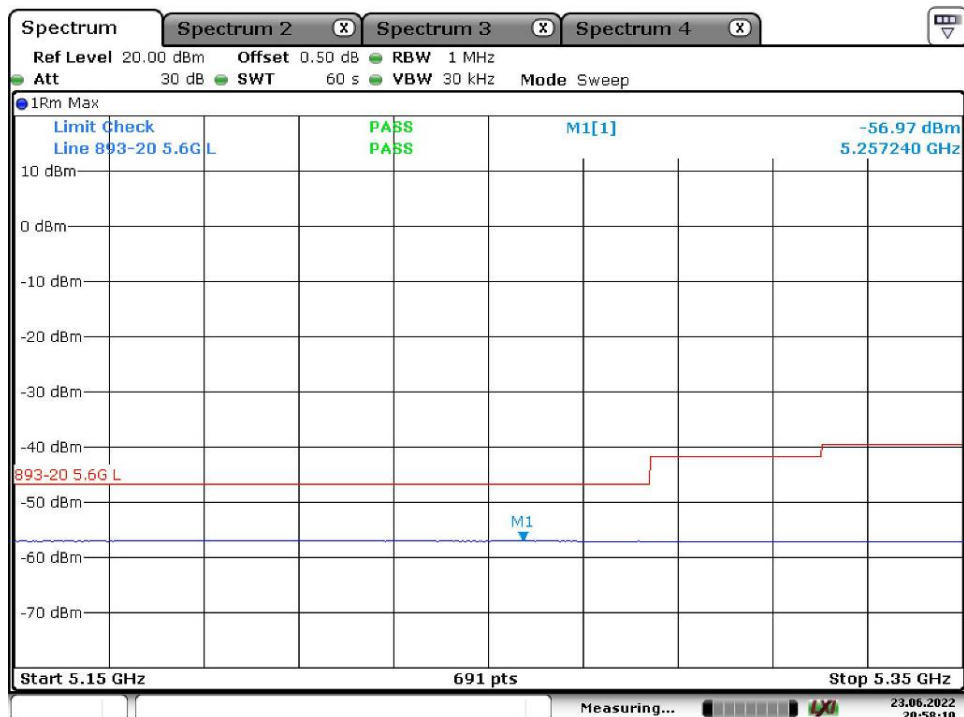
Date: 23.JUN.2022 20:55:18

802.11 n20 Low-1



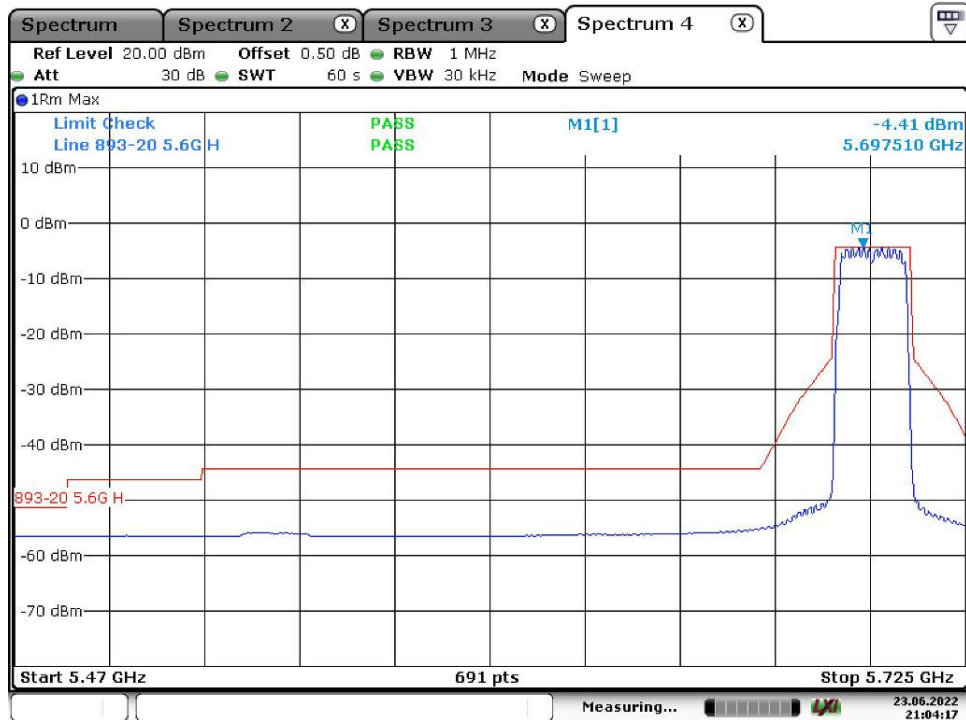
Date: 23.JUN.2022 21:00:22

802.11 n20 Low-2



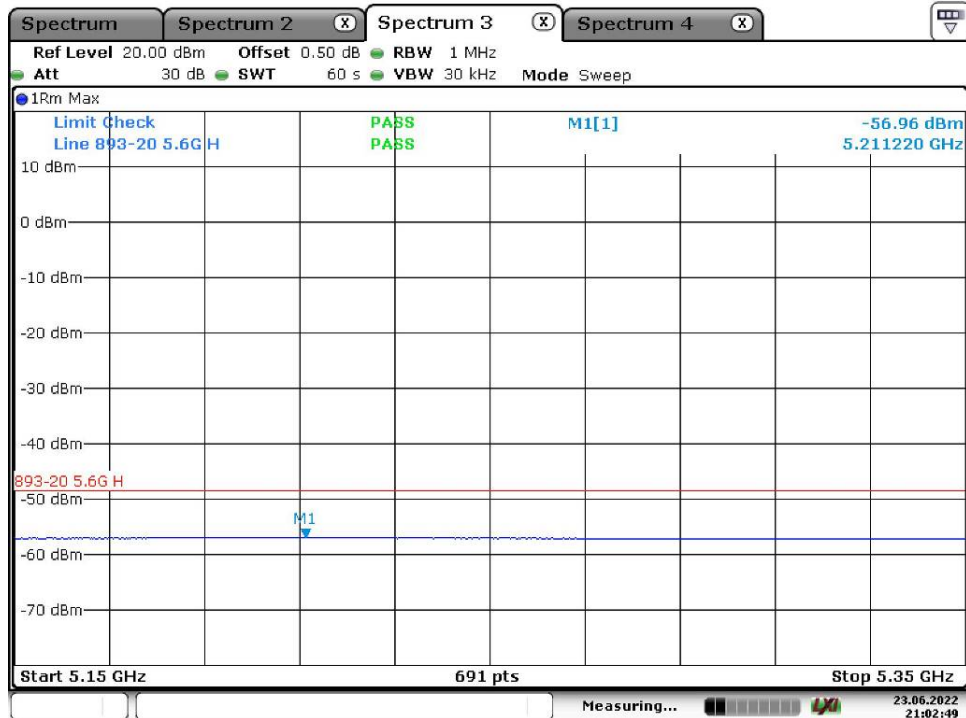
Date: 23.JUN.2022 20:56:10

802.11 n20 High-1



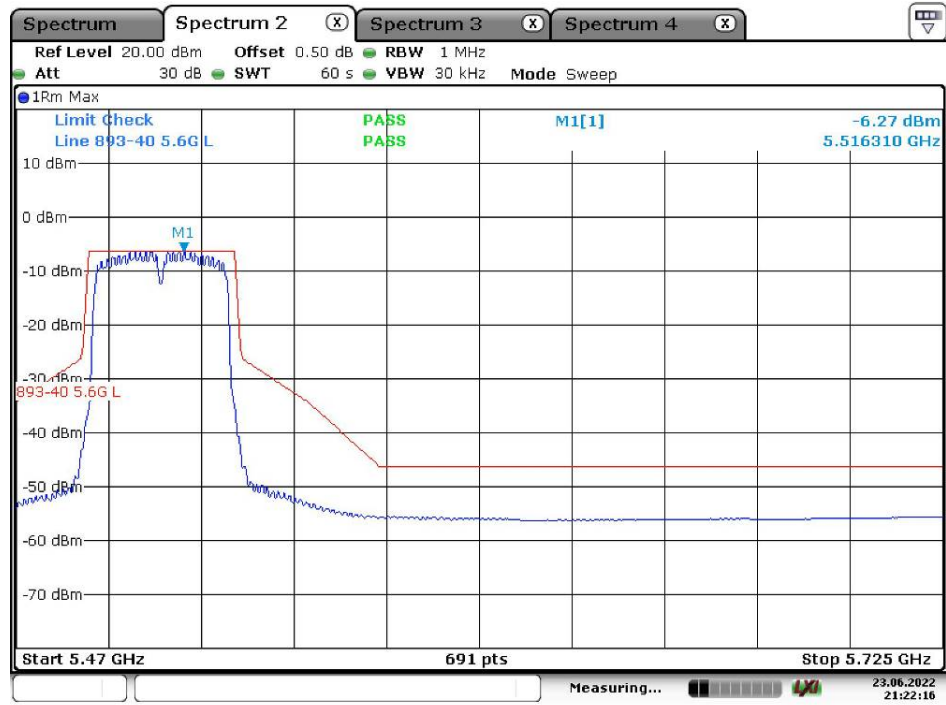
Date: 23.JUN.2022 21:04:17

802.11 n20 High-2

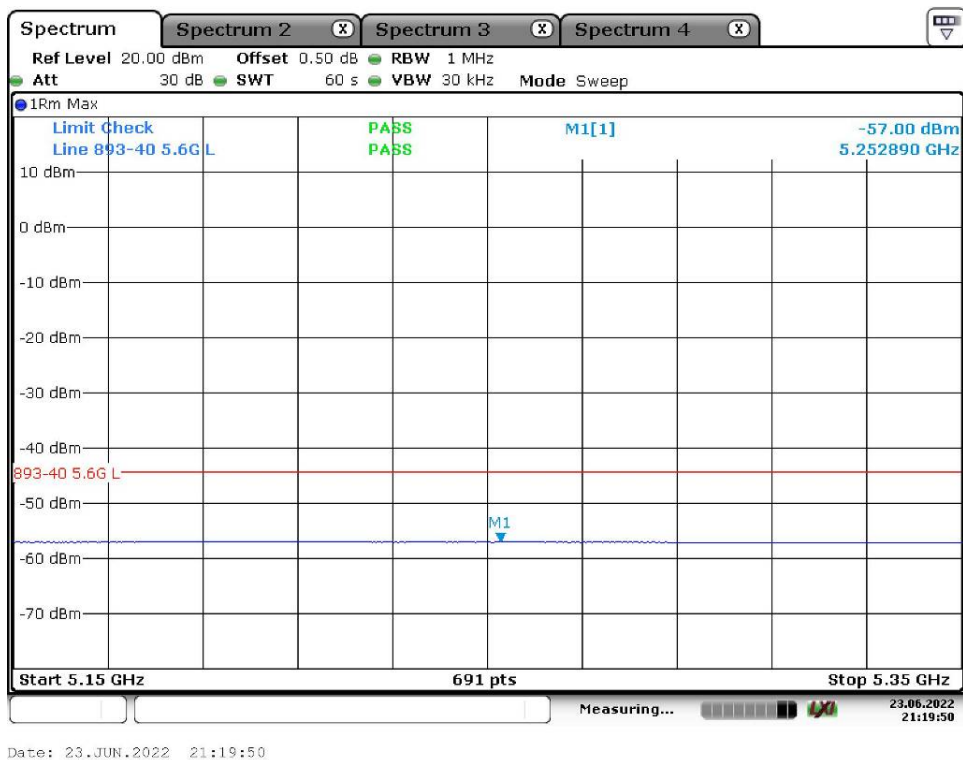


Date: 23.JUN.2022 21:02:49

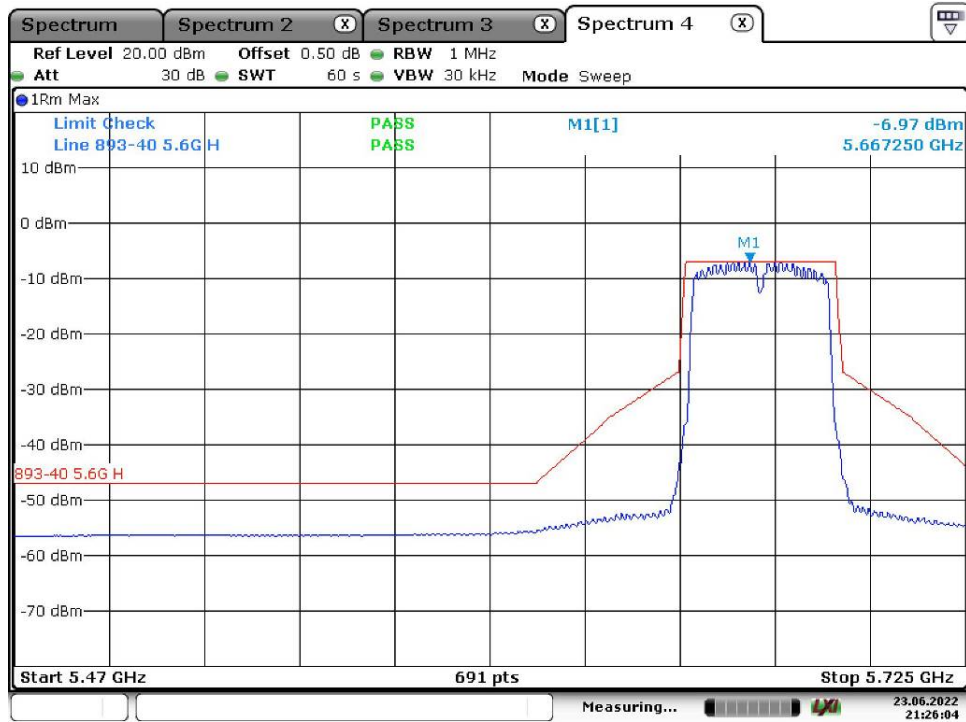
802.11 n40 Low-1



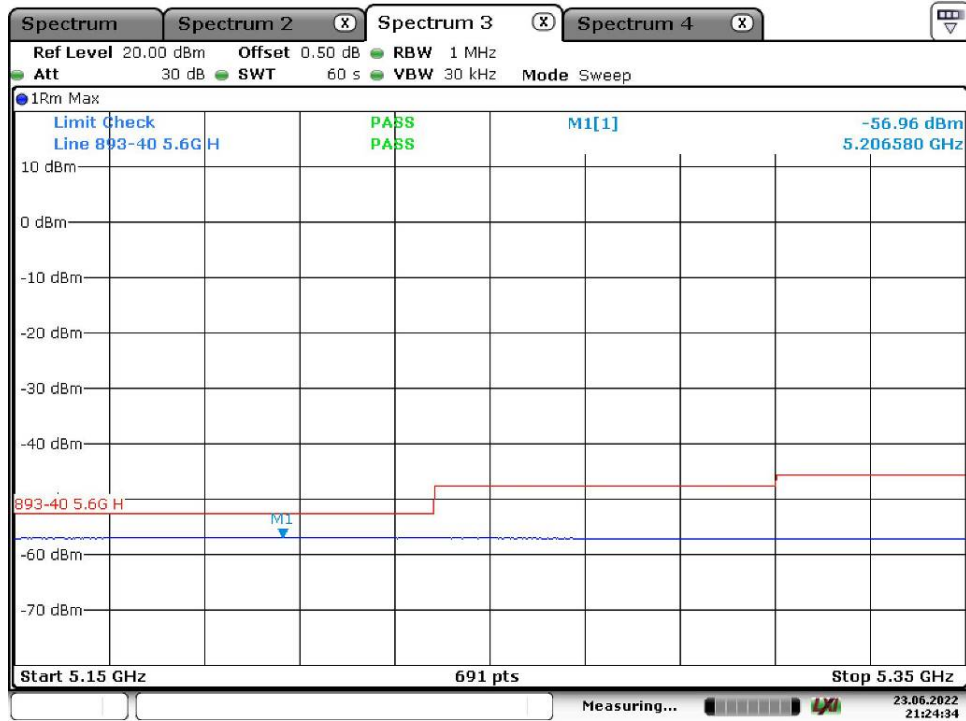
802.11 n40 Low-2



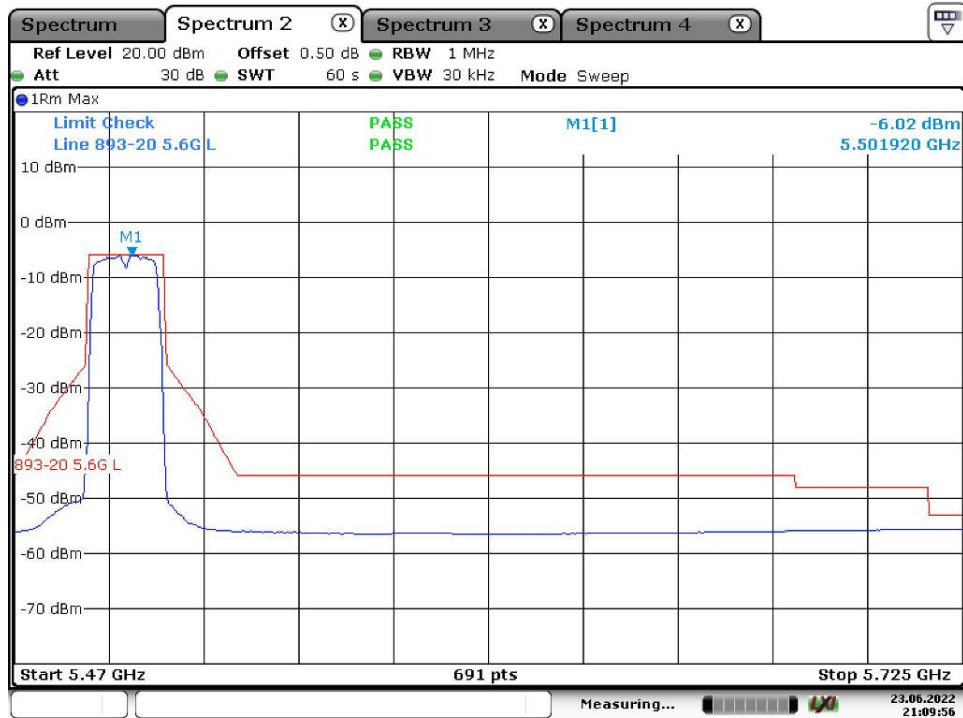
802.11 n40 High-1



802.11 n40 High-2

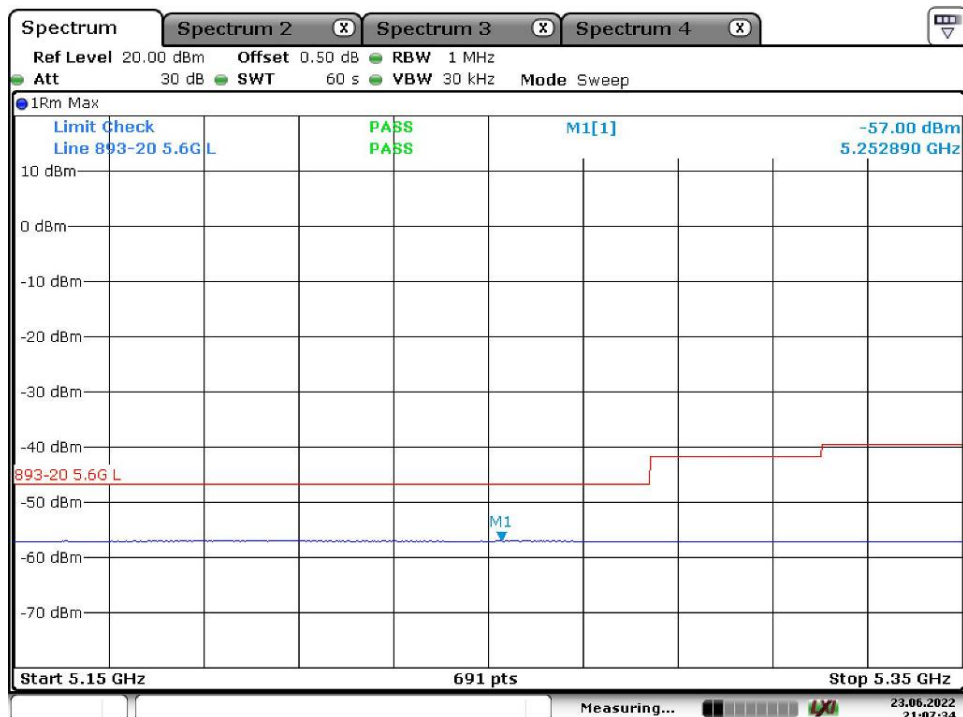


802.11 ac20 Low-1



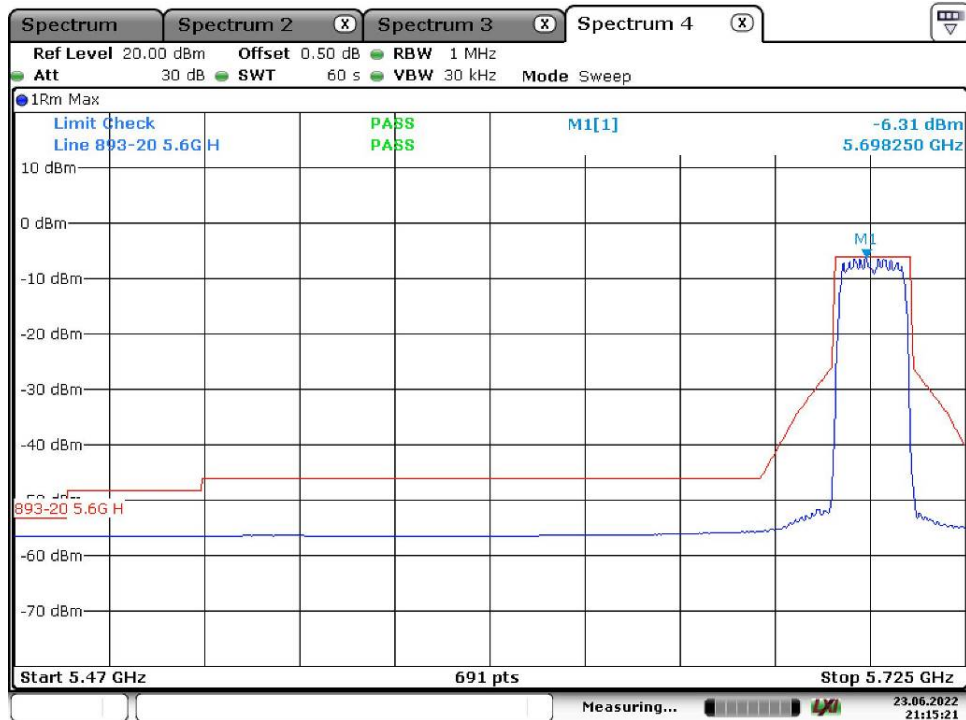
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802.11 ac20 Low-2



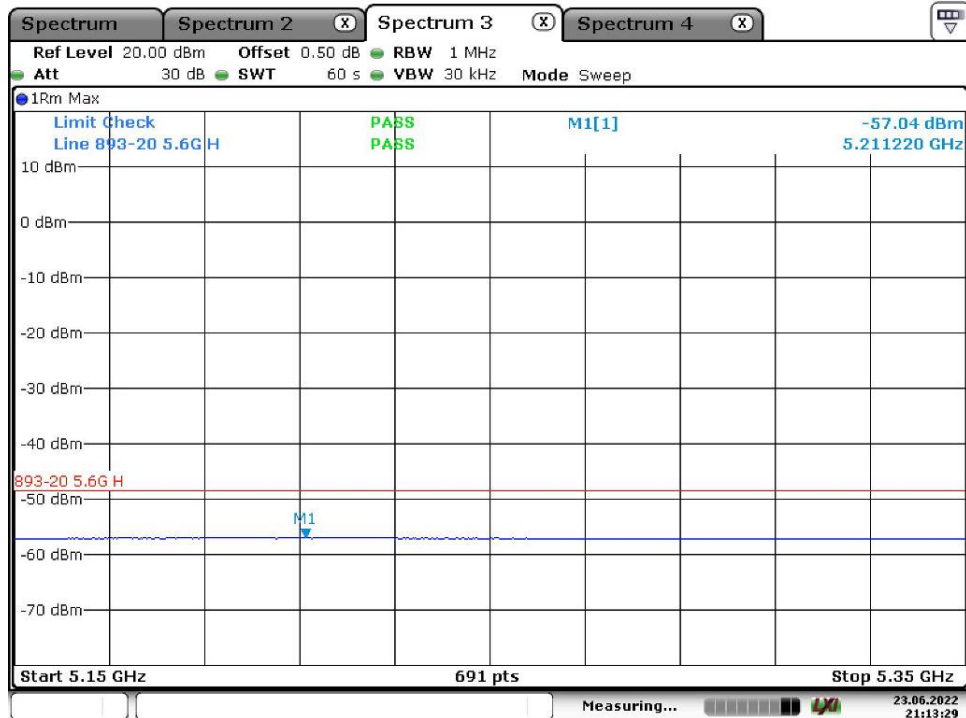
Date: 23.JUN.2022 21:07:34

802.11 ac20 High-1



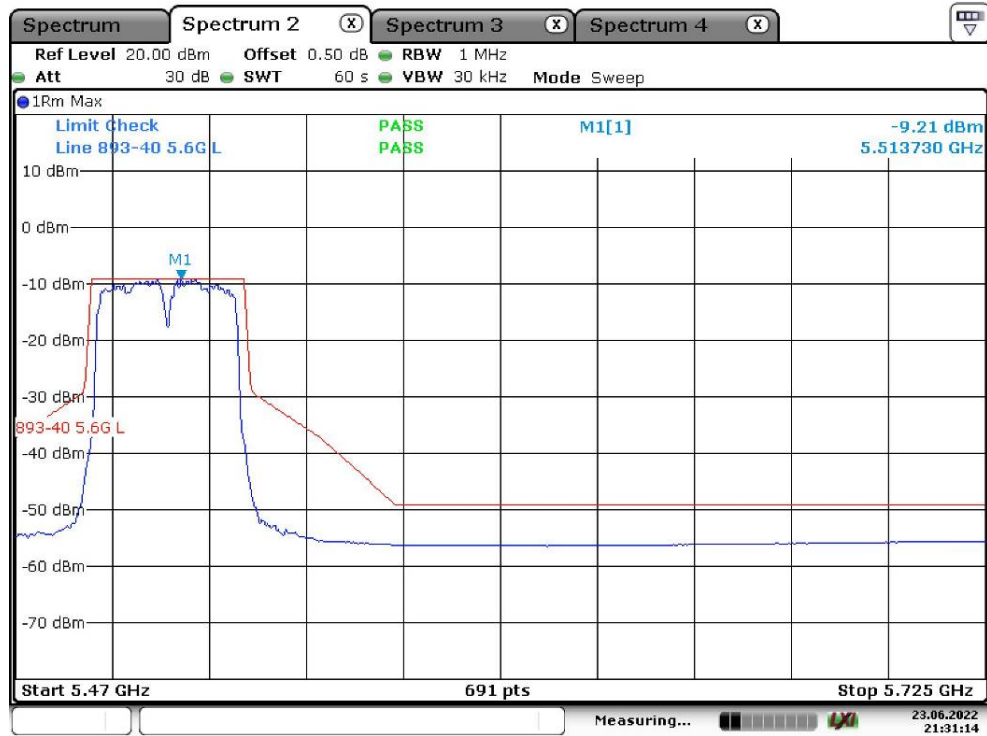
Date: 23.JUN.2022 21:15:21

802.11 ac20 High-2



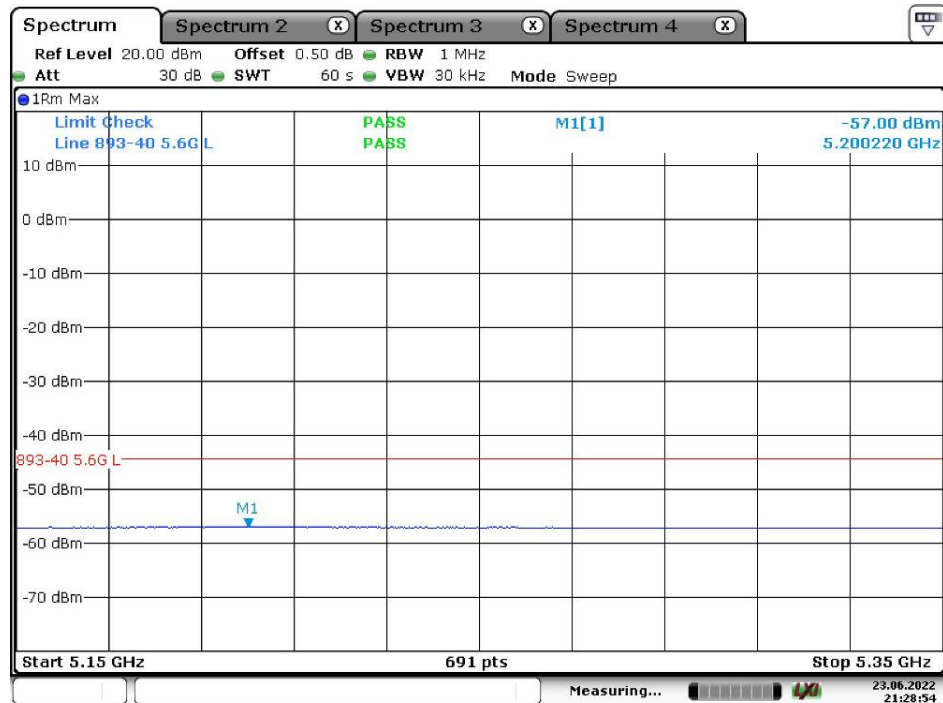
Date: 23.JUN.2022 21:13:29

802.11 ac40 Low-1



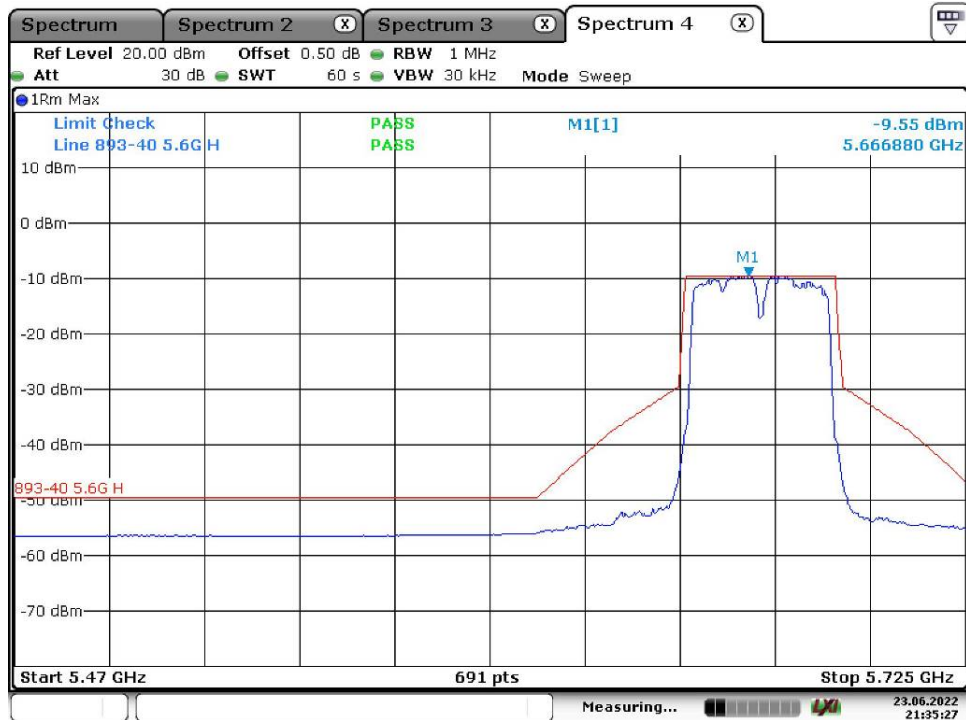
Date: 23.JUN.2022 21:31:14

802.11 ac40 Low-2



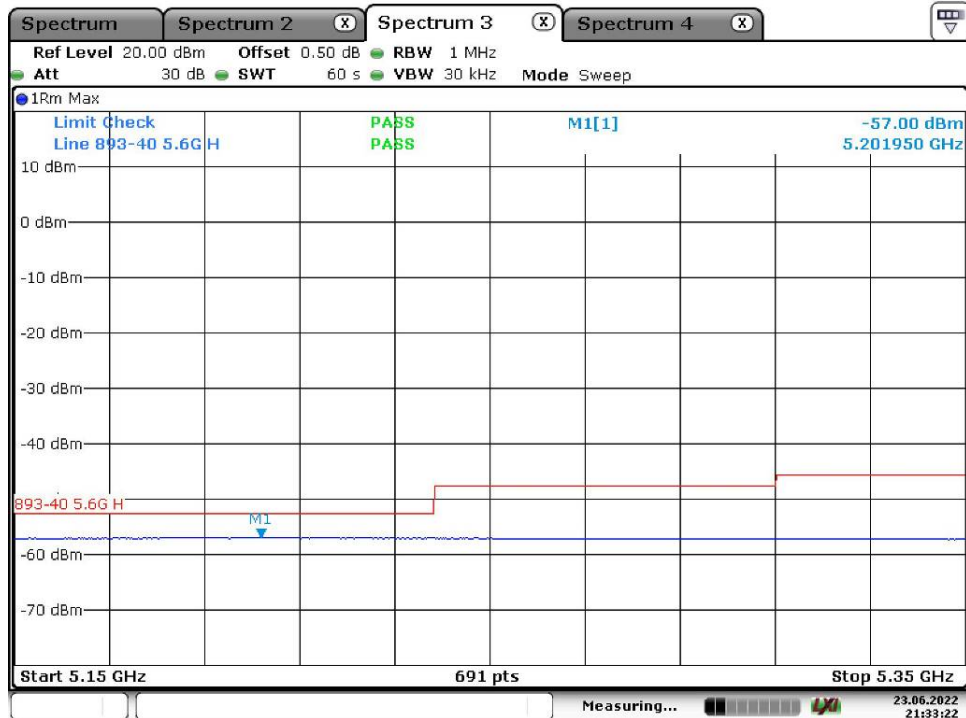
Date: 23.JUN.2022 21:28:54

802.11 ac40 High-1



Date: 23.JUN.2022 21:35:28

802.11 ac40 High-2



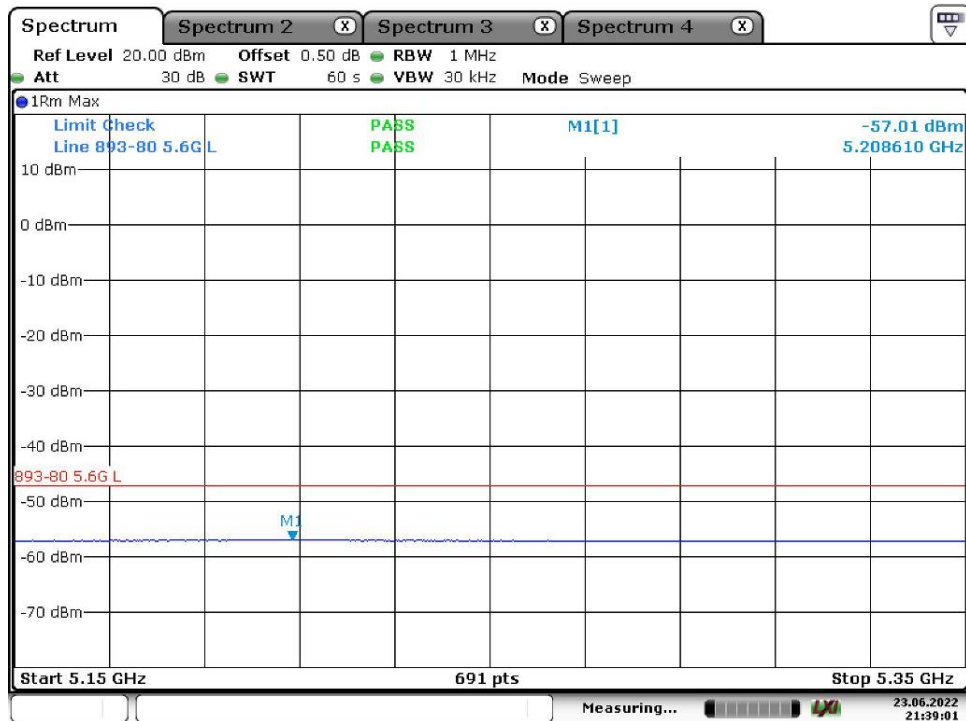
Date: 23.JUN.2022 21:33:22

802.11 ac80



Date: 23.JUN.2022 21:42:20

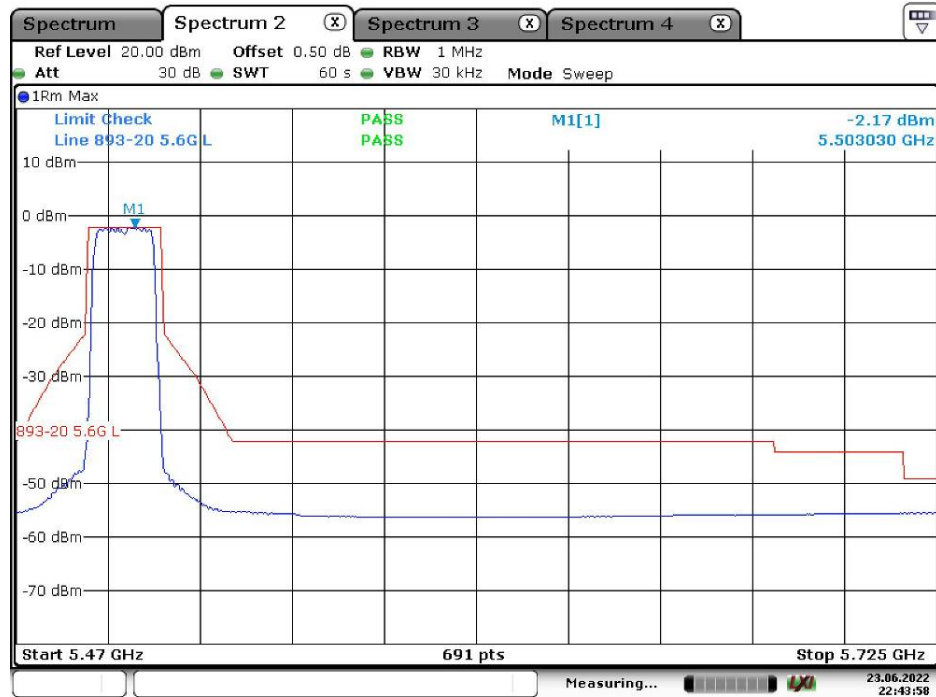
802.11 ac80



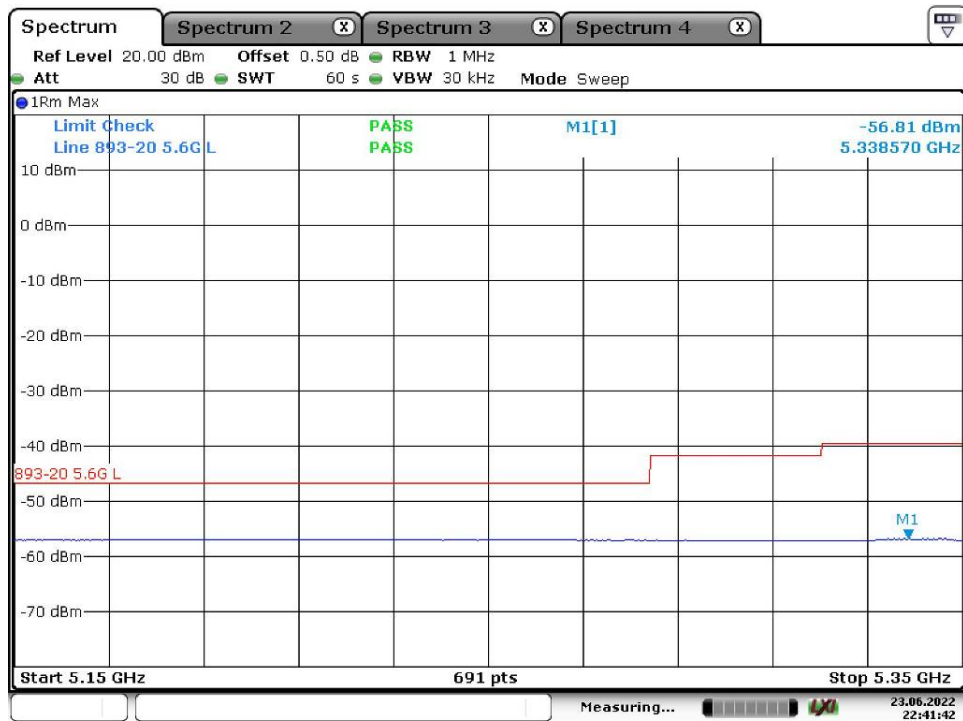
Date: 23.JUN.2022 21:39:02

Chain 1:

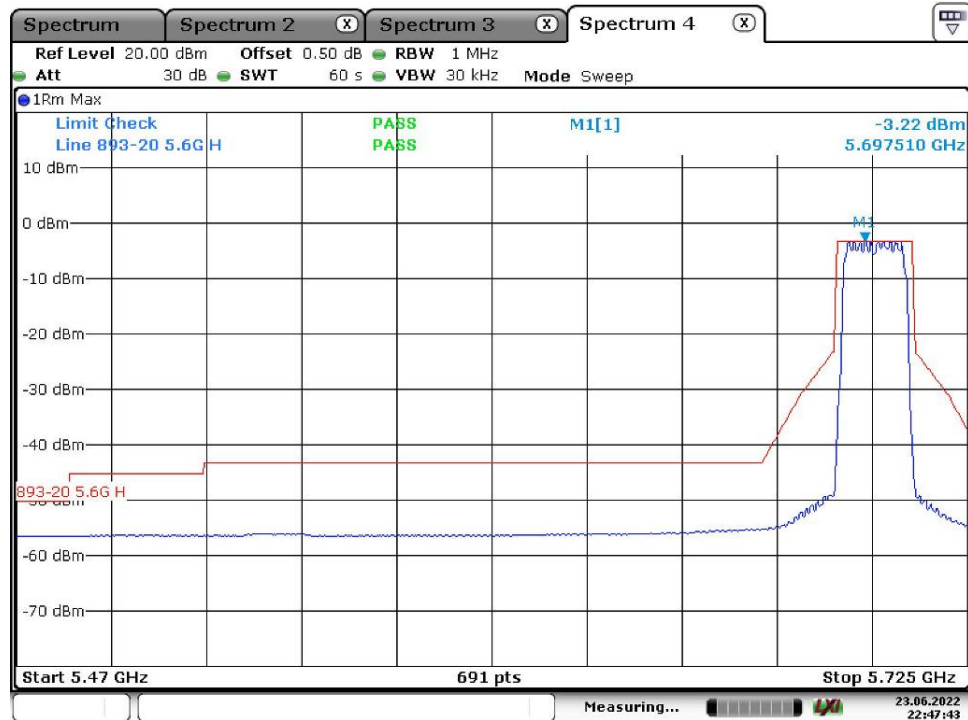
802.11 a – Low 1



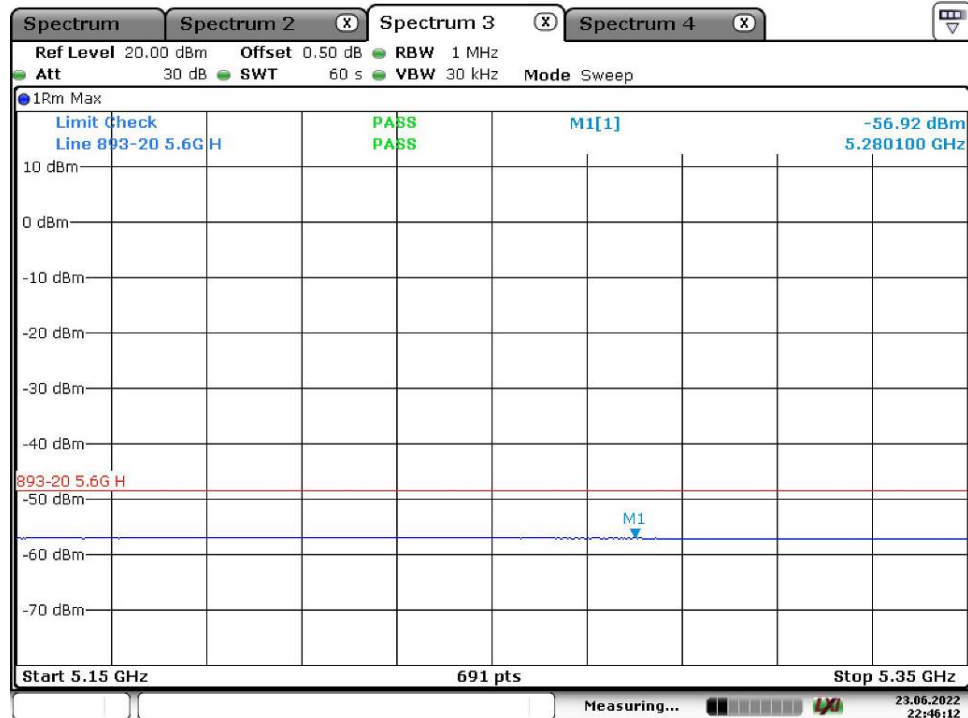
802.11 a - Low2



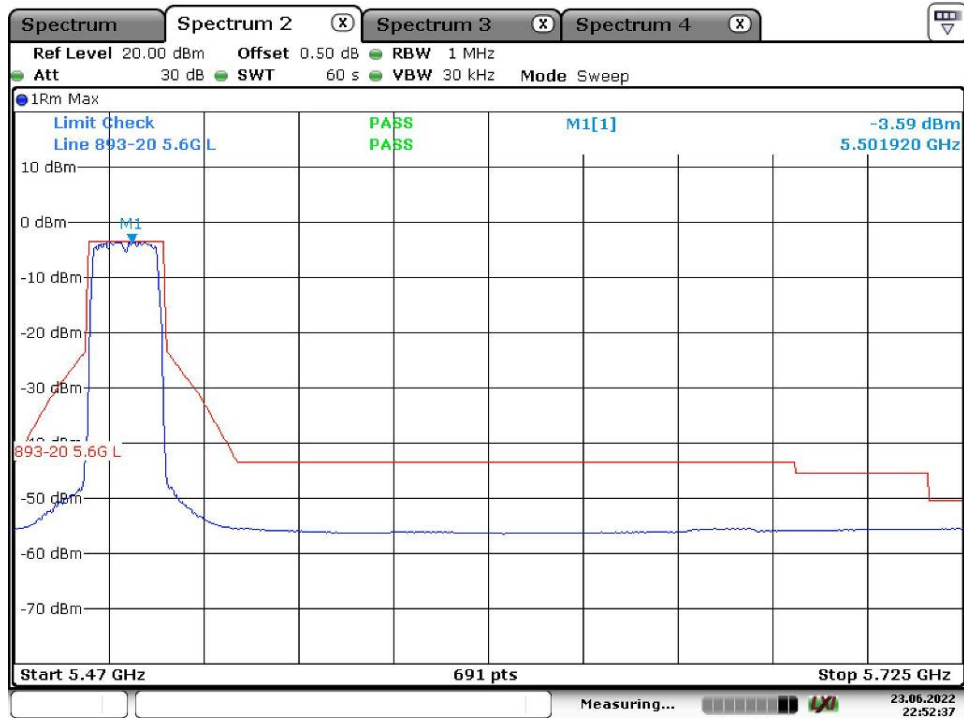
802.11 a High-1



802.11 a High-2

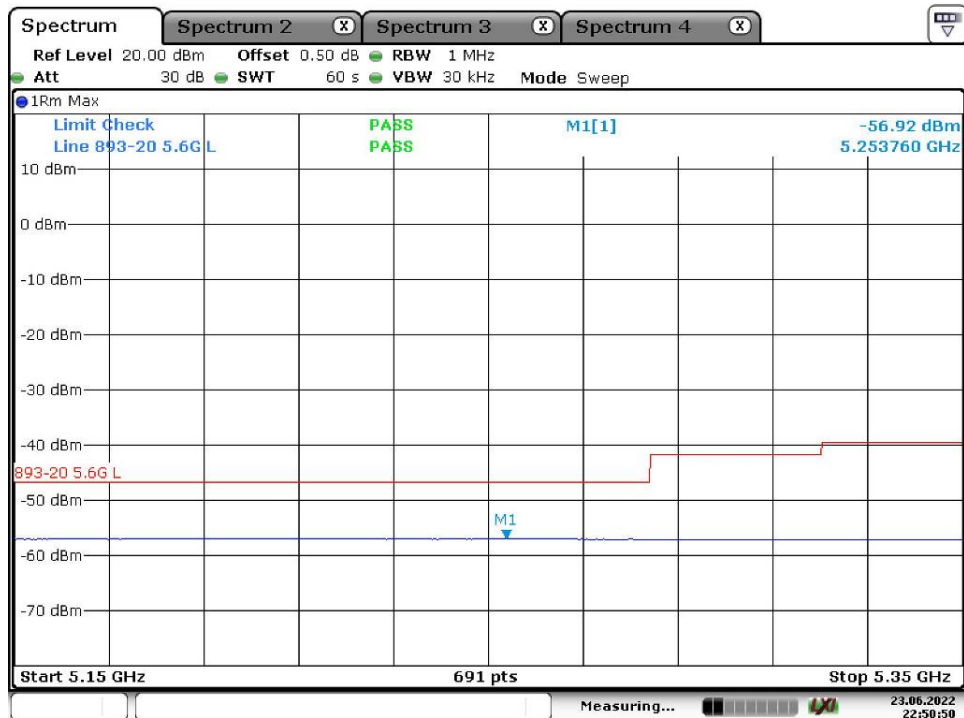


802.11 n20 Low-1



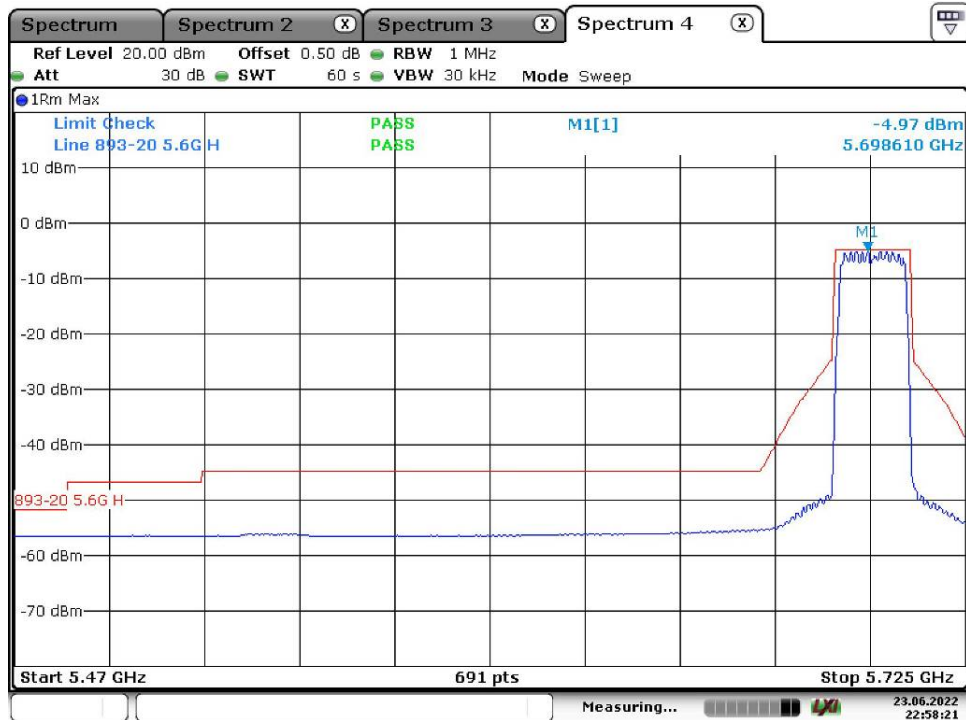
Date: 23.JUN.2022 22:52:38

802.11 n20 Low-2



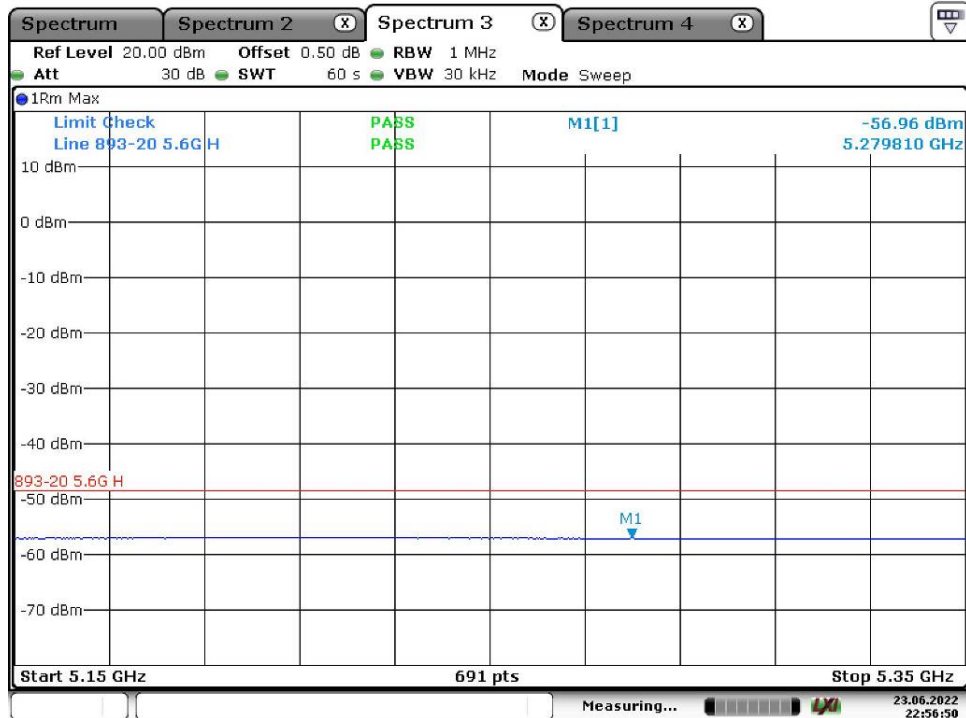
Date: 23.JUN.2022 22:50:50

802.11 n20 High-1



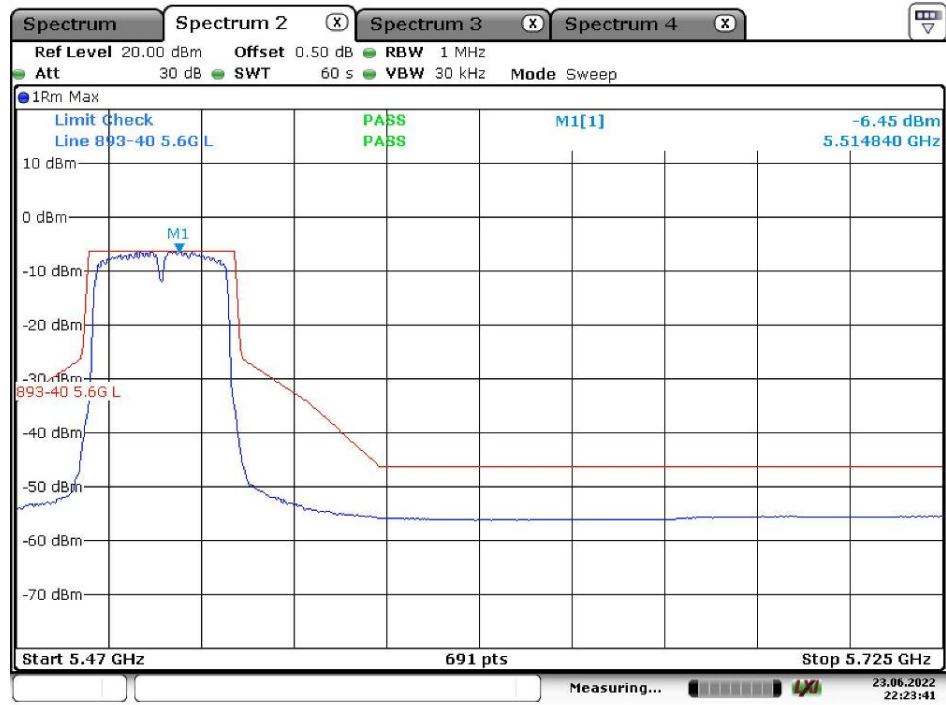
Date: 23.JUN.2022 22:58:21

802.11 n20 High-2



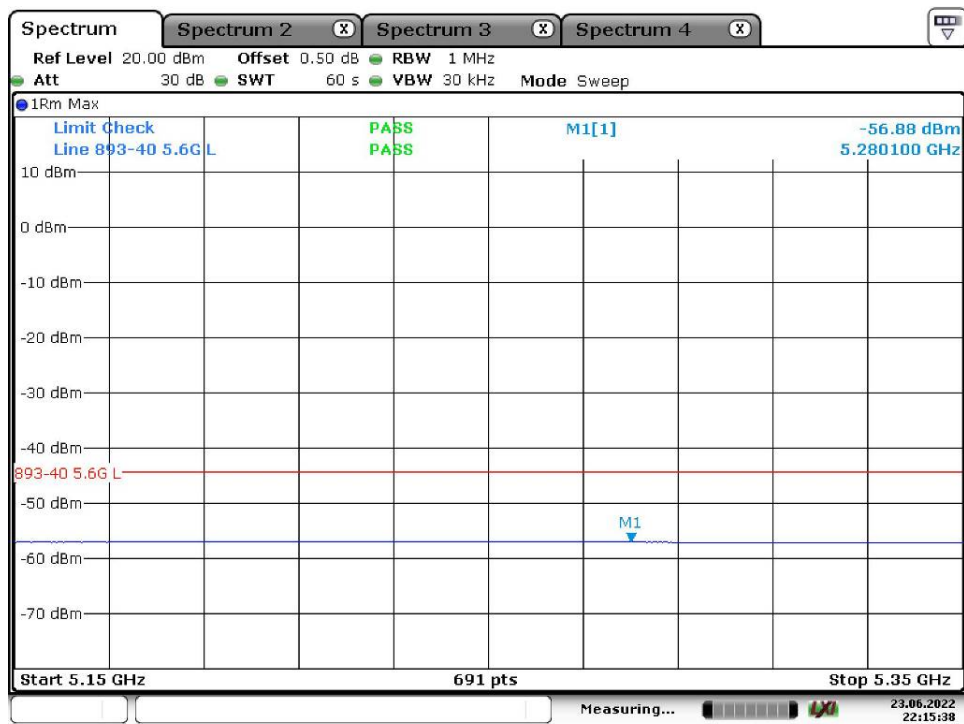
Date: 23.JUN.2022 22:56:50

802.11 n40 Low-1



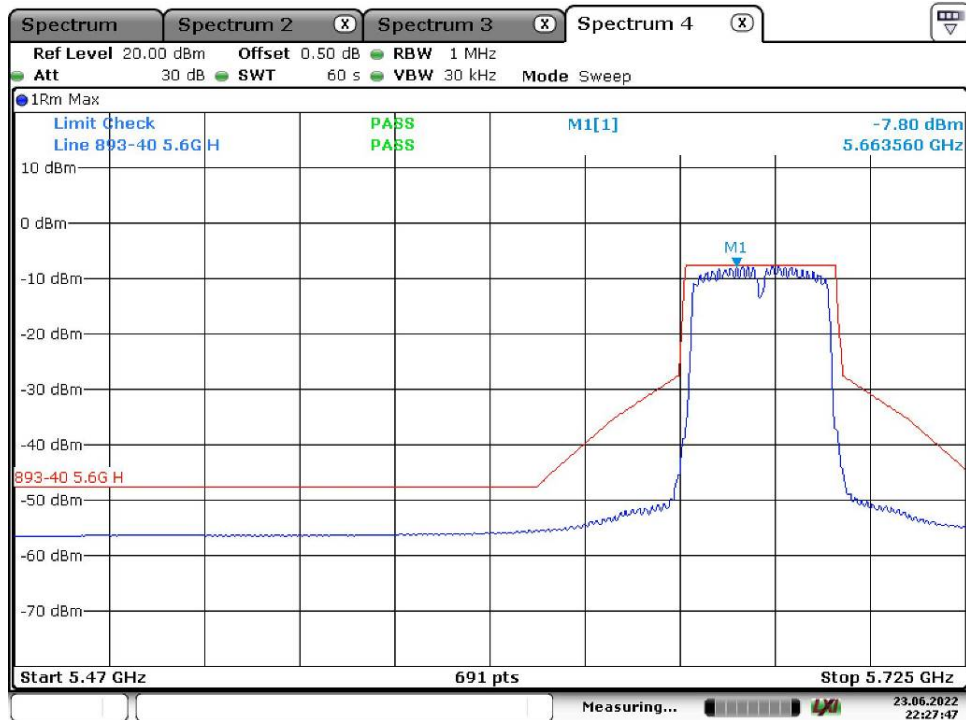
Date: 23.JUN.2022 22:23:41

802.11 n40 Low-2



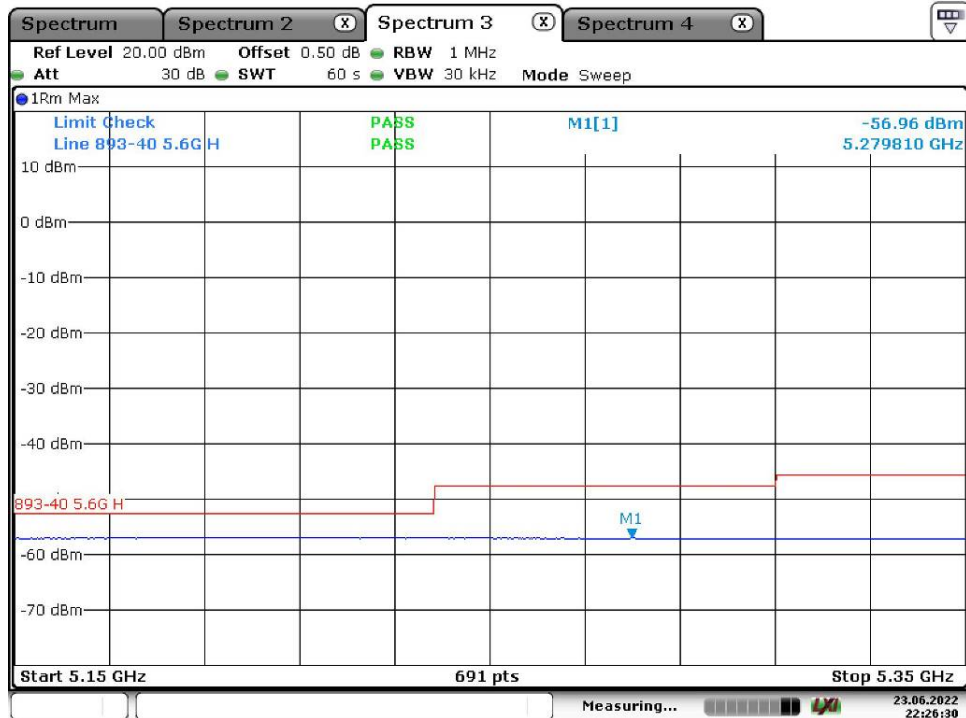
Date: 23.JUN.2022 22:15:38

802.11 n40 High-1



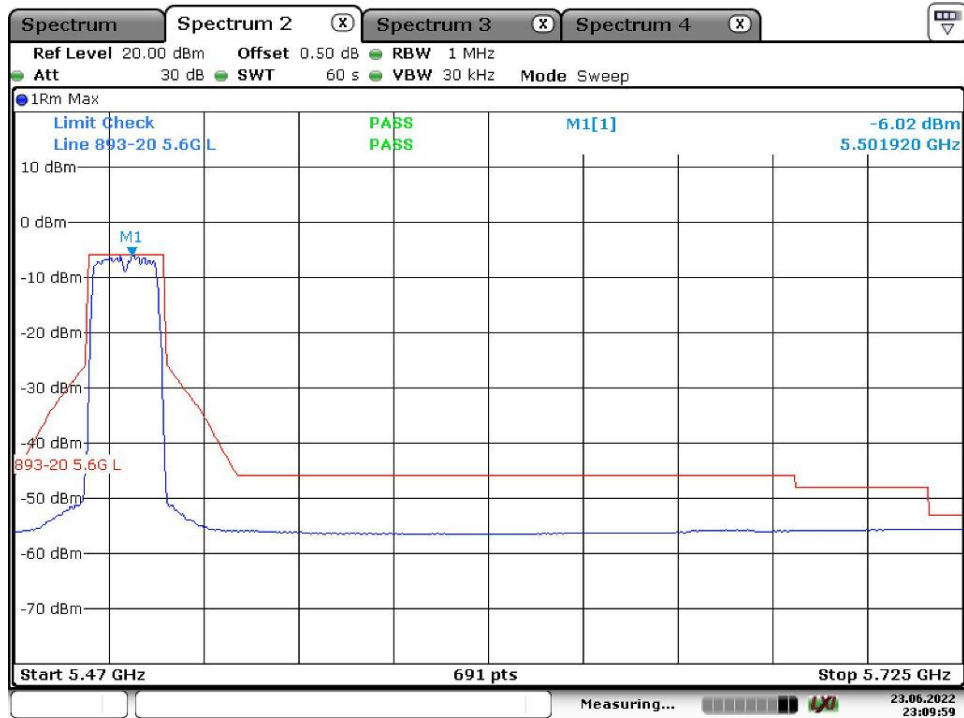
Date: 23.JUN.2022 22:27:47

802.11 n40 High-2



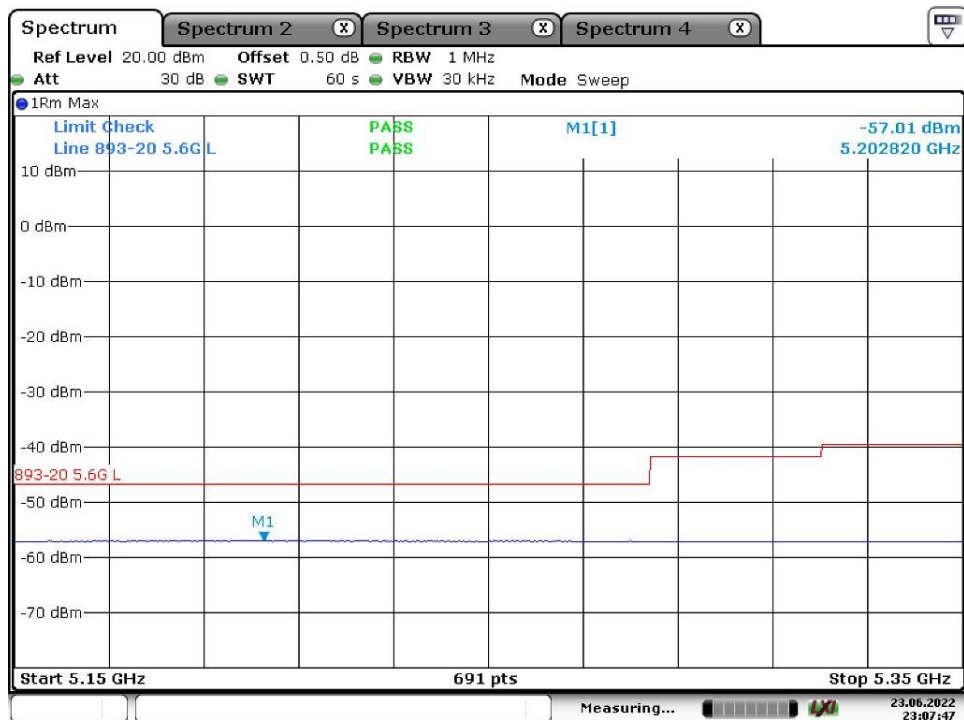
Date: 23.JUN.2022 22:26:31

802.11 ac20 Low-1



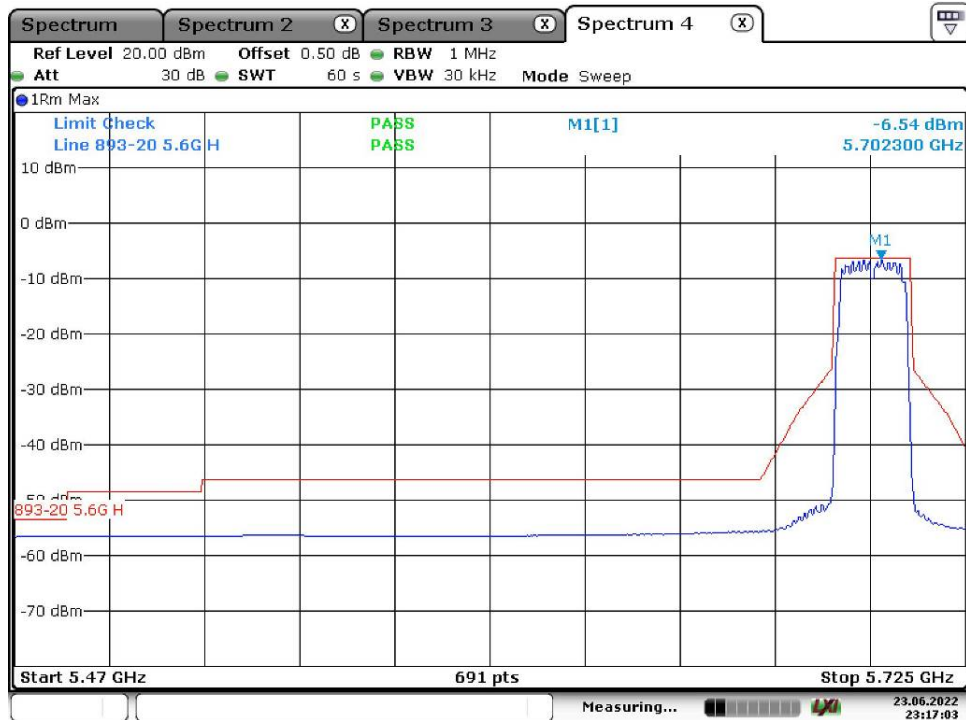
Date: 23.JUN.2022 23:09:59

802.11 ac20 Low-2



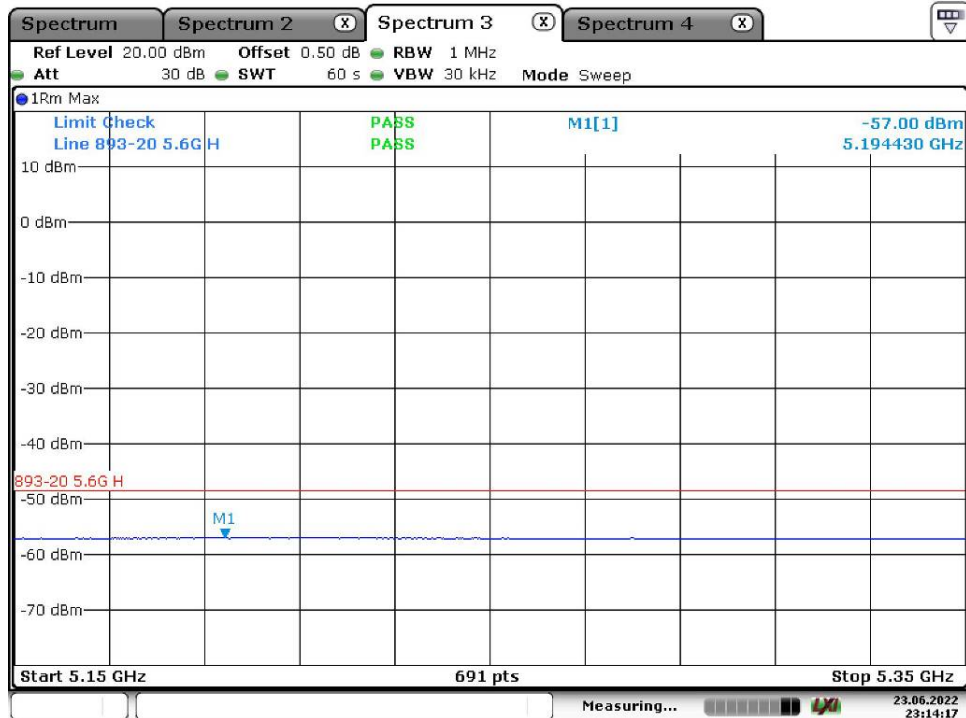
Date: 23.JUN.2022 23:07:47

802.11 ac20 High-1



Date: 23.JUN.2022 23:17:03

802.11 ac20 High-2



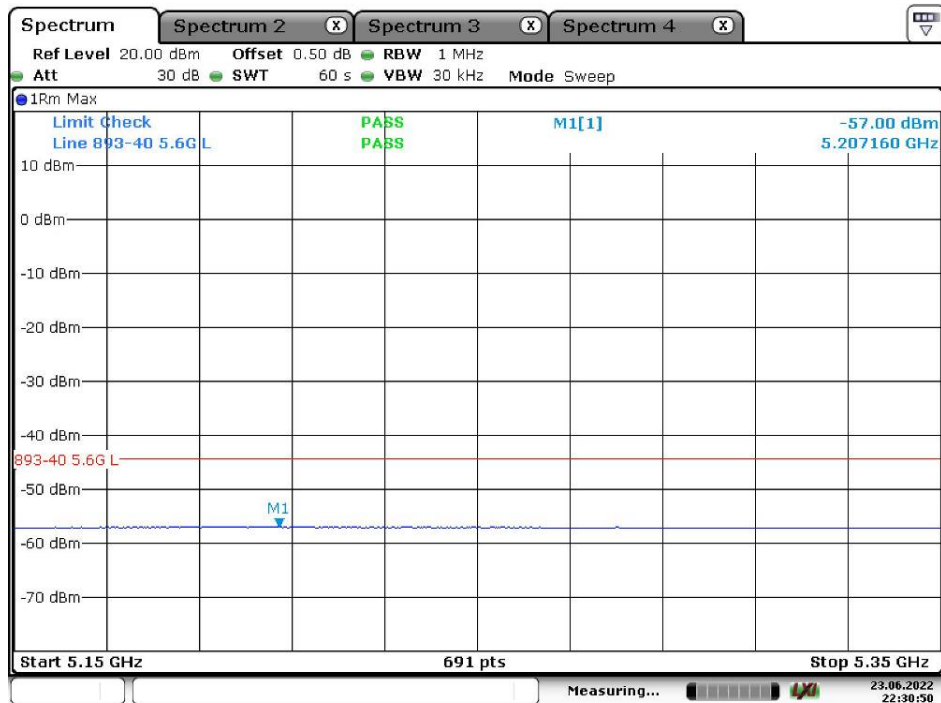
Date: 23.JUN.2022 23:14:17

802.11 ac40 Low-1



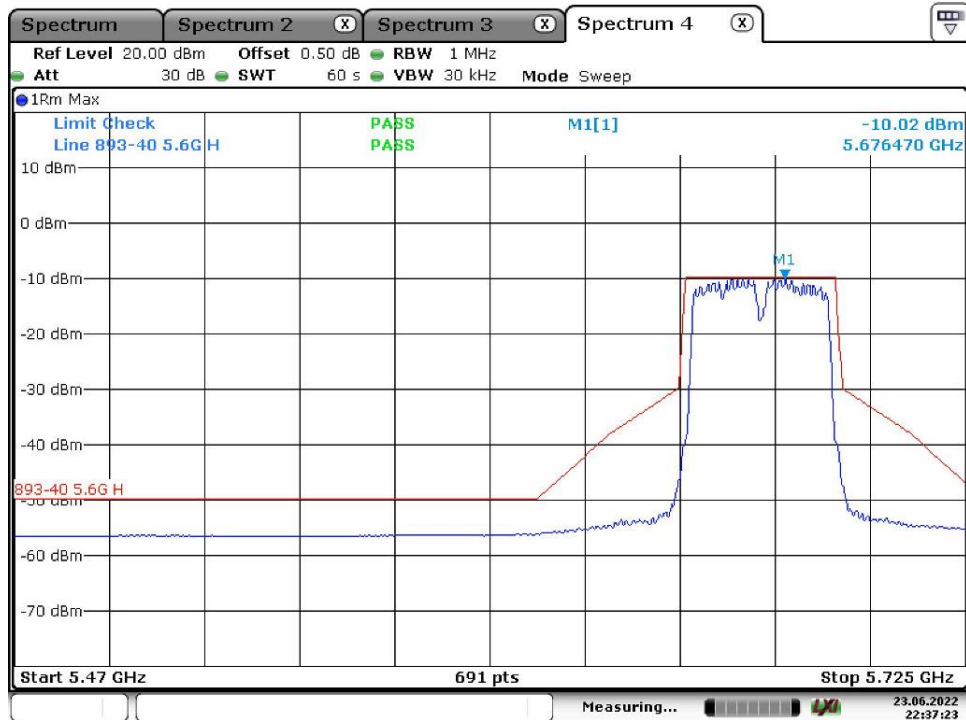
Date: 23.JUN.2022 22:33:09

802.11 ac40 Low-2



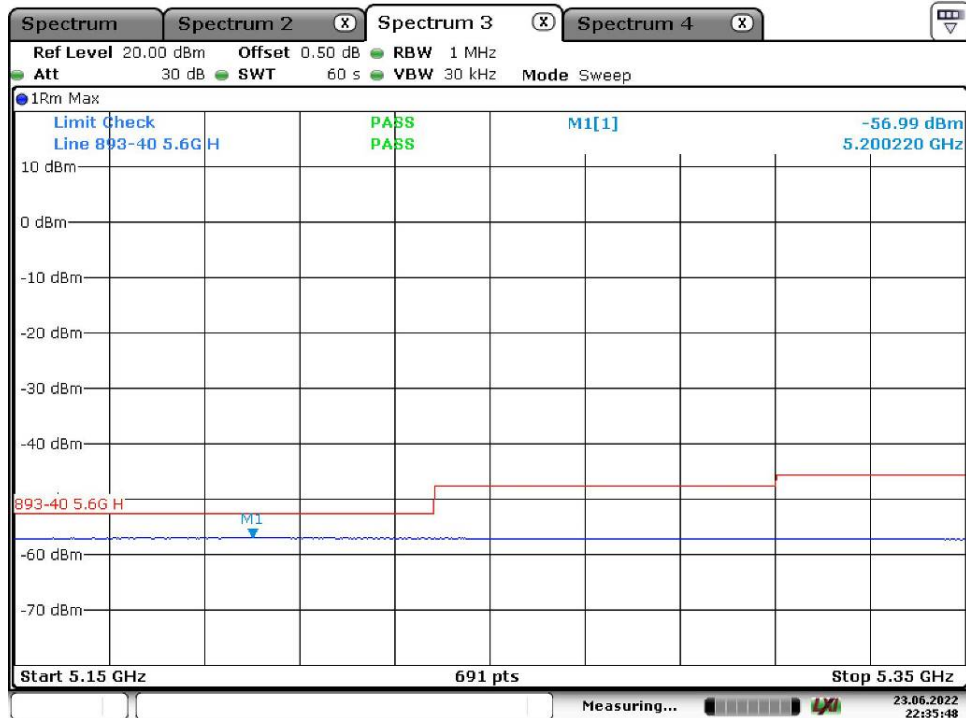
Date: 23.JUN.2022 22:30:50

802.11 ac40 High-1



Date: 23.JUN.2022 22:37:23

802.11 ac40 High-2



Date: 23.JUN.2022 22:35:48

The screenshot displays a Spectrum Analyzer interface with the following details:

- Top Panel:**
 - Tabs: Spectrum, Spectrum 2, Spectrum 3, Spectrum 4.
 - Parameters: Ref Level 20.00 dBm, Offset 0.50 dB, RBW 1 MHz, Att 30 dB, SWT 60 s, VBW 30 kHz, Mode Sweep.
- Main Plot Area:**
 - Y-axis: Power level in dBm, ranging from -70 dBm to 10 dBm.
 - X-axis: Frequency in GHz, ranging from 5.47 GHz to 5.725 GHz.
 - Trace: A blue line representing the spectrum, showing a signal between 5.47 GHz and 5.66 GHz, and a lower-level signal between 5.66 GHz and 5.725 GHz.
 - Limit Check: A red line representing the limit, which is flat at -13.62 dBm from 5.47 GHz to 5.66 GHz and then slopes down to -55 dBm at 5.725 GHz.
 - Annotations:
 - "1Rm Max" in the top left.
 - "Limit Check" and "Line 893-80 5.6G L" in the top left.
 - "PASS" in green text in the top center.
 - "M1[1]" in blue text in the top center.
 - "-13.62 dBm" and "5.507460 GHz" in blue text in the top right.
 - "893-80 5.6G L" in red text on the left side of the plot.
- Bottom Panel:**
 - Start 5.47 GHz, 691 pts, Stop 5.725 GHz.
 - Measuring... status bar.
 - Date and Time: 23.06.2022 21:53:59.

The screenshot displays a Spectrum Analyzer interface with the following details:

- Tabs:** Spectrum 2, Spectrum 3, Spectrum 4.
- Parameters:**
 - Ref Level: 20.00 dBm
 - Offset: 0.50 dB
 - RBW: 1 MHz
 - Att: 30 dB
 - SWT: 60 s
 - VBW: 30 kHz
 - Mode: Sweep
- Display:**
 - Frequency range: 5.15 GHz to 5.35 GHz.
 - Power range: -70 dBm to 10 dBm.
 - Signal label: M1 (blue arrow pointing to a signal at approximately 5.198 GHz).
 - Limit check: Line 893-80 5.6G L (red line at -57.00 dBm).
 - Measurement: -57.00 dBm, 5.198190 GHz.
- Status Bar:**
 - Start: 5.15 GHz
 - 691 pts
 - Stop: 5.35 GHz
 - Measuring...
 - Date/Time: 23.06.2022 21:50:23

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6 – RECEIVER SPURIOUS EMISSIONS

Definition

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

Limit

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) §5.4.7

Test Data*Please refer to following table:***802.11 a_low channel Chain 0****5180 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1852.00	H	50.36	-66.78	11.46	0.86	-56.18	-47.00	9.18
1623.00	V	51.27	-67.83	10.26	0.70	-58.27	-47.00	11.27
77.00	H	41.19	-79.57	-1.50	0.34	-81.41	-57.00	24.41
50.40	V	42.70	-64.73	-14.72	0.21	-79.66	-57.00	22.66

802.11 a_high channel Chain 0**5240 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1742.00	H	50.49	-67.06	10.93	0.72	-56.85	-47.00	9.85
1632.00	V	51.44	-67.52	10.32	0.70	-57.90	-47.00	10.90
83.00	H	40.95	-79.14	0.00	0.37	-79.51	-57.00	22.51
52.30	V	41.85	-66.71	-13.84	0.21	-80.76	-57.00	23.76

802.11 a_low channel Chain 0**5500 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2409.00	H	51.07	-64.68	12.37	1.29	-53.60	-47.00	6.60
1632.00	V	51.34	-67.62	10.32	0.70	-58.00	-47.00	11.00
78.60	H	42.36	-78.85	-0.70	0.36	-79.91	-57.00	22.91
55.20	V	43.15	-67.13	-12.51	0.22	-79.86	-57.00	22.86

802.11 a_high channel Chain 0**5700 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2314.00	H	51.77	-63.82	11.35	1.24	-53.71	-47.00	6.71
1562.00	V	51.66	-67.83	9.87	0.93	-58.89	-47.00	11.89
75.40	H	41.98	-78.33	-2.30	0.32	-80.95	-57.00	23.95
53.00	V	43.21	-65.76	-13.52	0.22	-79.50	-57.00	22.50

802.11 a_low channel Chain 1 5180 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1625.00	H	51.22	-67.25	10.28	0.70	-57.67	-47.00	10.67
1742.00	V	50.98	-67.17	10.93	0.72	-56.96	-47.00	9.96
92.30	H	44.30	-71.26	0.00	0.34	-71.60	-57.00	14.60
60.70	V	43.68	-69.90	-9.93	0.23	-80.06	-57.00	23.06

802.11 a_high channel Chain 1 5240 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1685.00	H	51.78	-65.79	10.70	0.74	-55.83	-47.00	8.83
1537.00	V	52.47	-67.05	9.72	1.10	-58.43	-47.00	11.43
85.20	H	43.56	-75.41	0.00	0.37	-75.78	-57.00	18.78
62.40	V	42.79	-71.88	-9.03	0.23	-81.14	-57.00	24.14

802.11 a_low channel Chain 1 5500 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2409.00	H	52.11	-63.64	12.37	1.29	-52.56	-47.00	5.56
1629.00	V	51.96	-67.05	10.30	0.70	-57.45	-47.00	10.45
88.40	H	42.56	-74.79	0.00	0.36	-75.15	-57.00	18.15
55.40	V	41.98	-68.42	-12.42	0.22	-81.06	-57.00	24.06

802.11 a_high channel Chain 1 5700 MHz

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2364.00	H	52.14	-63.52	11.90	1.27	-52.89	-47.00	5.89
1742.00	V	51.22	-66.93	10.93	0.72	-56.72	-47.00	9.72
78.50	H	42.67	-78.52	-0.75	0.36	-79.63	-57.00	22.63
65.20	V	43.32	-73.14	-7.54	0.24	-80.92	-57.00	23.92

802.11 n20 low channel**5180 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1685.00	H	50.28	-67.29	10.70	0.74	-57.33	-47.00	10.33
1547.00	V	51.45	-68.05	9.78	1.04	-59.31	-47.00	12.31
88.20	H	42.78	-74.67	0.00	0.36	-75.03	-57.00	18.03
65.40	V	43.56	-73.03	-7.44	0.24	-80.71	-57.00	23.71

802.11 n20 high channel**5240 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1765.00	H	50.98	-66.69	11.00	0.70	-56.39	-47.00	9.39
1632.00	V	51.34	-67.62	10.32	0.70	-58.00	-47.00	11.00
75.60	H	41.95	-78.41	-2.20	0.32	-80.93	-57.00	23.93
53.30	V	42.68	-66.47	-13.38	0.22	-80.07	-57.00	23.07

802.11 n20 low channel**5500 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1844.00	H	51.48	-65.77	11.41	0.83	-55.19	-47.00	8.19
1362.00	V	52.34	-65.63	8.73	1.20	-58.10	-47.00	11.10
87.40	H	42.78	-75.08	0.00	0.37	-75.45	-57.00	18.45
64.90	V	41.68	-74.59	-7.70	0.23	-82.52	-57.00	25.52

802.11 n20 high channel**5700 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1872.00	H	51.26	-65.61	11.60	0.92	-54.93	-47.00	7.93
1699.00	V	52.11	-65.85	10.79	0.75	-55.81	-47.00	8.81
95.40	H	42.58	-71.67	0.00	0.31	-71.98	-57.00	14.98
68.20	V	43.62	-74.76	-5.95	0.24	-80.95	-57.00	23.95

802.11 n40 low channel**5190 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2409.00	H	52.65	-63.10	12.37	1.29	-52.02	-47.00	5.02
1685.00	V	50.24	-67.93	10.70	0.74	-57.97	-47.00	10.97
82.00	H	42.85	-77.75	0.00	0.38	-78.13	-57.00	21.13
64.00	V	43.78	-71.91	-8.18	0.23	-80.32	-57.00	23.32

802.11 n40 high channel**5230 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2368.00	H	52.14	-63.52	11.95	1.27	-52.84	-47.00	5.84
1542.00	V	50.48	-69.03	9.75	1.07	-60.35	-47.00	13.35
72.40	H	42.65	-76.81	-3.80	0.27	-80.88	-57.00	23.88
54.80	V	43.52	-66.52	-12.69	0.22	-79.43	-57.00	22.43

802.11 n40 low channel**5510 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1523.00	H	50.87	-68.45	9.64	1.20	-60.01	-47.00	13.01
1664.00	V	51.64	-66.84	10.55	0.72	-57.01	-47.00	10.01
74.50	H	42.89	-77.16	-2.75	0.30	-80.21	-57.00	23.21
55.80	V	43.62	-67.02	-12.23	0.22	-79.47	-57.00	22.47

802.11 n40 high channel**5670 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1632.00	H	50.26	-68.10	10.32	0.70	-58.48	-47.00	11.48
1578.00	V	51.34	-68.13	9.97	0.83	-58.99	-47.00	11.99
79.50	H	42.74	-78.73	-0.25	0.37	-79.35	-57.00	22.35
52.90	V	43.68	-65.23	-13.57	0.22	-79.02	-57.00	22.02

802.11 ac20 low channel**5180 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1632.00	H	50.34	-68.02	10.32	0.70	-58.40	-47.00	11.40
2409.00	V	50.27	-65.66	12.37	1.29	-54.58	-47.00	7.58
98.40	H	42.61	-70.37	0.00	0.28	-70.65	-57.00	13.65
68.20	V	43.81	-74.57	-5.95	0.24	-80.76	-57.00	23.76

802.11 ac20 high channel**5240 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1745.00	H	50.74	-66.83	10.94	0.72	-56.61	-47.00	9.61
2354.00	V	50.41	-65.30	11.79	1.26	-54.77	-47.00	7.77
84.40	H	42.73	-76.65	0.00	0.37	-77.02	-57.00	20.02
63.30	V	43.62	-71.62	-8.55	0.23	-80.40	-57.00	23.40

802.11 ac20 low channel**5500 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2409.00	H	50.96	-64.79	12.37	1.29	-53.71	-47.00	6.71
1632.00	V	51.24	-67.72	10.32	0.70	-58.10	-47.00	11.10
87.40	H	42.67	-75.19	0.00	0.37	-75.56	-57.00	18.56
66.70	V	42.85	-74.57	-6.75	0.24	-81.56	-57.00	24.56

802.11 ac20 high channel**5700 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2345.00	H	50.87	-64.76	11.70	1.26	-54.32	-47.00	7.32
1547.00	V	51.64	-67.86	9.78	1.04	-59.12	-47.00	12.12
74.20	H	43.26	-76.71	-2.90	0.30	-79.91	-57.00	22.91
63.50	V	44.12	-71.25	-8.45	0.23	-79.93	-57.00	22.93

802.11 ac40 low channel**5190 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2410.00	H	52.10	-63.65	12.38	1.29	-52.56	-47.00	5.56
1362.00	V	50.48	-67.49	8.73	1.20	-59.96	-47.00	12.96
93.40	H	43.85	-71.25	0.00	0.33	-71.58	-57.00	14.58
64.50	V	43.72	-72.29	-7.92	0.23	-80.44	-57.00	23.44

802.11 ac40 high channel**5230 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2354.00	H	52.30	-63.34	11.79	1.26	-52.81	-47.00	5.81
1687.00	V	51.34	-66.80	10.71	0.74	-56.83	-47.00	9.83
79.40	H	42.57	-78.87	-0.30	0.37	-79.54	-57.00	22.54
56.40	V	43.62	-67.37	-11.96	0.22	-79.55	-57.00	22.55

802.11 ac40 low channel**5510 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1996.00	H	51.46	-66.99	11.99	1.13	-56.13	-47.00	9.13
1587.00	V	52.34	-67.12	10.02	0.77	-57.87	-47.00	10.87
77.60	H	42.78	-78.15	-1.20	0.35	-79.70	-57.00	22.70
55.90	V	43.26	-67.43	-12.19	0.22	-79.84	-57.00	22.84

802.11 ac40 high channel**5670 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1874.00	H	51.89	-64.95	11.62	0.93	-54.26	-47.00	7.26
1632.00	V	52.14	-66.82	10.32	0.70	-57.20	-47.00	10.20
75.40	H	42.73	-77.58	-2.30	0.32	-80.20	-57.00	23.20
53.70	V	43.78	-65.61	-13.20	0.22	-79.03	-57.00	22.03

802.11 ac80 low channel**5210 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2420.00	H	52.64	-63.17	12.46	1.28	-51.99	-47.00	4.99
1532.00	V	50.34	-69.18	9.69	1.14	-60.63	-47.00	13.63
76.40	H	41.62	-78.97	-1.80	0.33	-81.10	-57.00	24.10
58.40	V	42.98	-69.20	-11.04	0.23	-80.47	-57.00	23.47

802.11 ac80 low channel**5530 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1862.00	H	50.74	-66.26	11.53	0.89	-55.62	-47.00	8.62
1478.00	V	51.48	-67.68	9.39	1.32	-59.61	-47.00	12.61
72.40	H	42.56	-76.90	-3.80	0.27	-80.97	-57.00	23.97
65.80	V	43.16	-73.68	-7.23	0.24	-81.15	-57.00	24.15

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

8 – ADAPTIVITY

Applicable Standard

Adaptivity (Channel Access Mechanism) is an automatic mechanism by which a device limits its transmissions and gains access to an Operating Channel.

§4.2.7.3.1 Frame Based Equipment:

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

§4.2.7.3.2 Load Based Equipment:

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

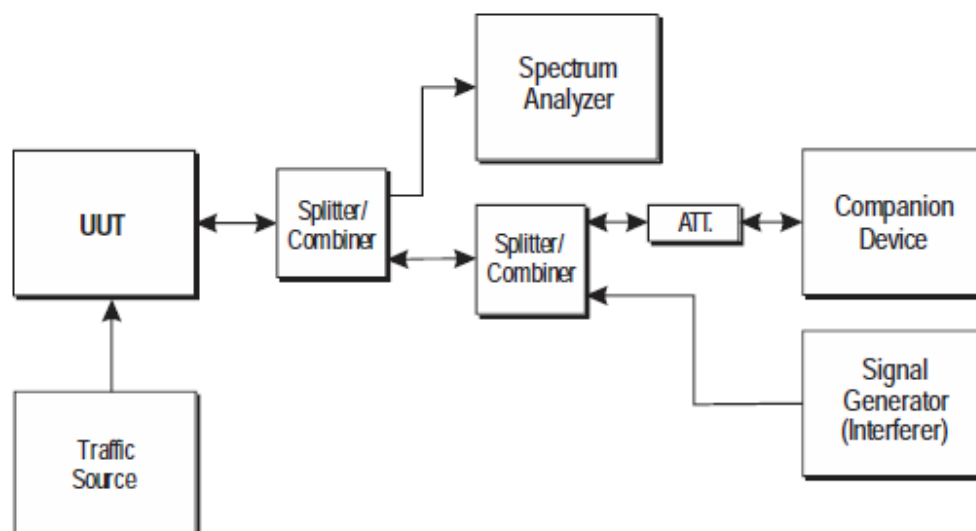
Limit

According to ETSI EN 301 893 V2.1.1 (2017-05) §4.2.7.3.1&§4.2.7.3.2

Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.9

Block Diagram of Test Setup

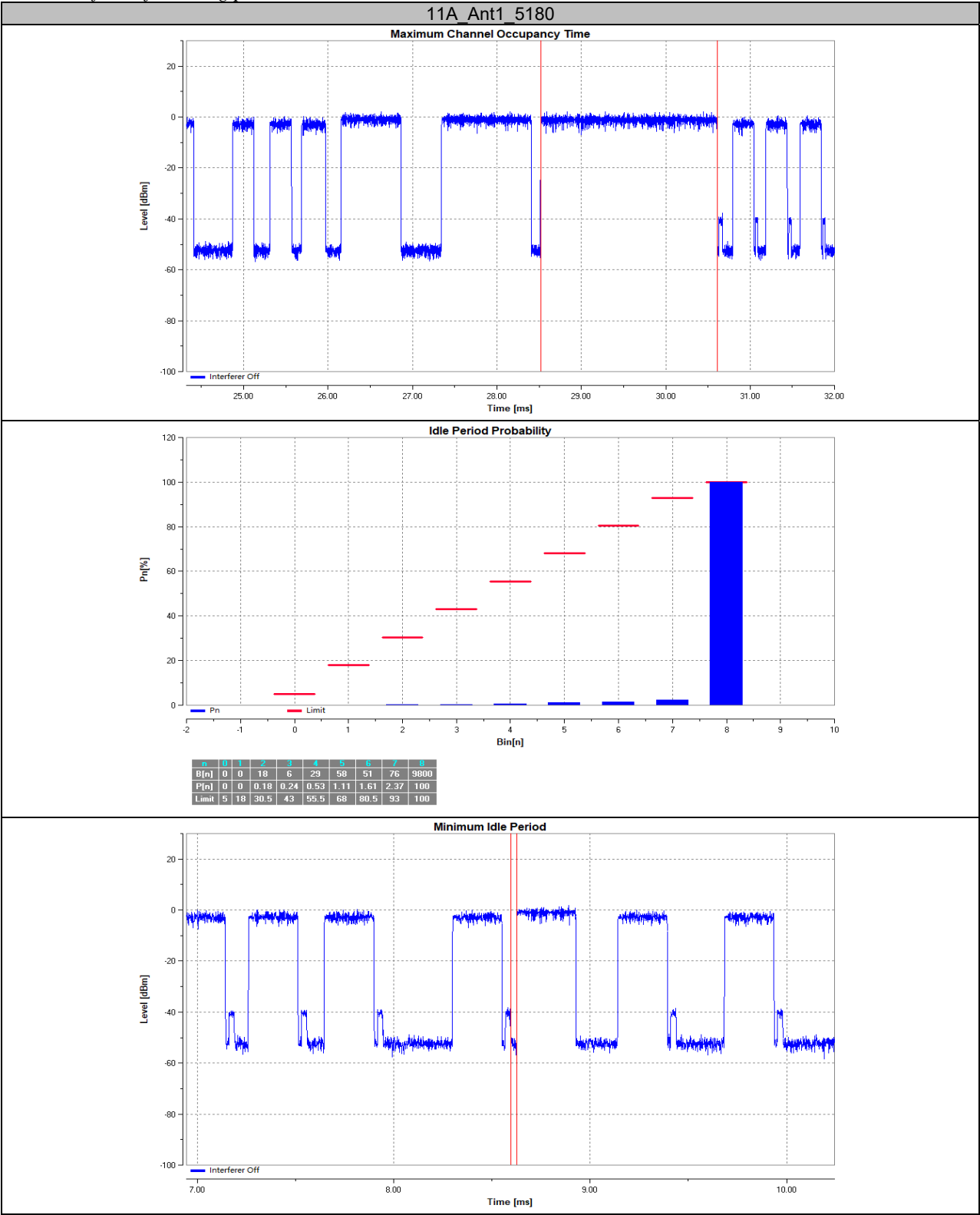


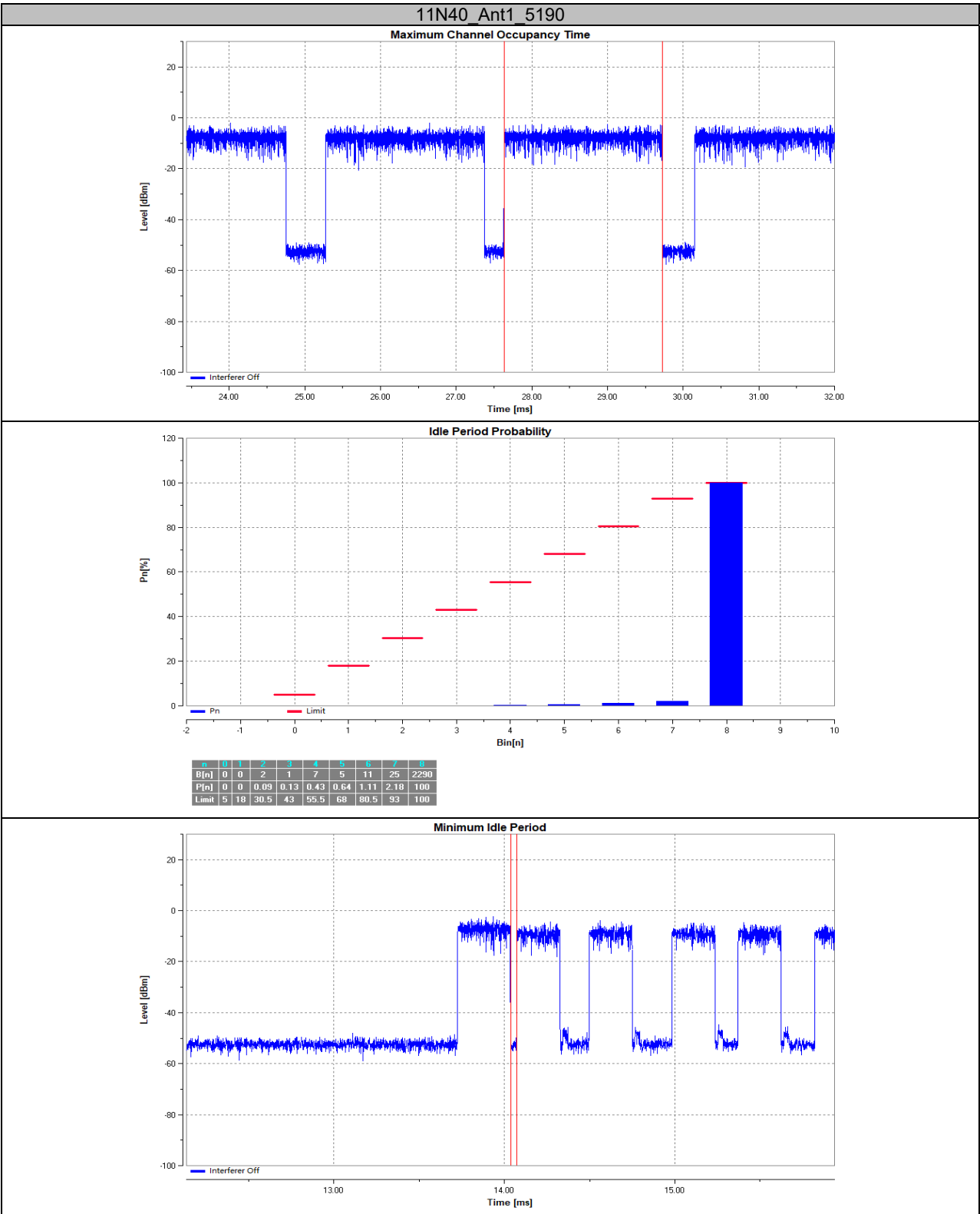
Test Data*Please refer to following table:*

TestMode	Channel	Priority Class	COT Num [n]	Max. COT[ms]	Limit [ms]	Min.Idle Time[ms]	Limit [ms]	Idle Period probability	Verdict
11A	5180	3	10061	2.098	6.000	0.033	0.027	See the graph	PASS
11N40	5190	3	10014	4.894	6.000	0.043	0.027	See the graph	PASS

TestMode	Channel	Interference Type	Add interference Time	Interference	Max.	Limit	Max.	Limit	Verdict
			[ms]	Level	Short Control number	[n]	Short Control Time	[ms]	
				[dBm/MHz]	[n]		[ms]		
11A	5180	AWGN	2100	-75	3	50	0.8	2.5	PASS
		OFDM	2100	-75	4	50	0.8	2.5	PASS
		LTE	2100	-75	4	50	0.9	2.5	PASS
11N40	5190	AWGN	2100	-75	3	50	0.9	2.5	PASS

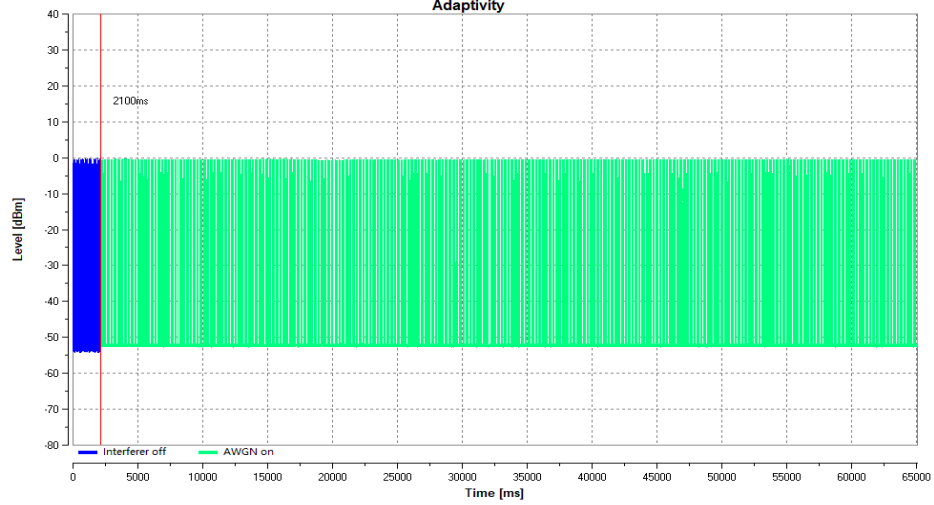
Please refer to following plots:





11A_Ant1_5180 AWGN

Adaptivity

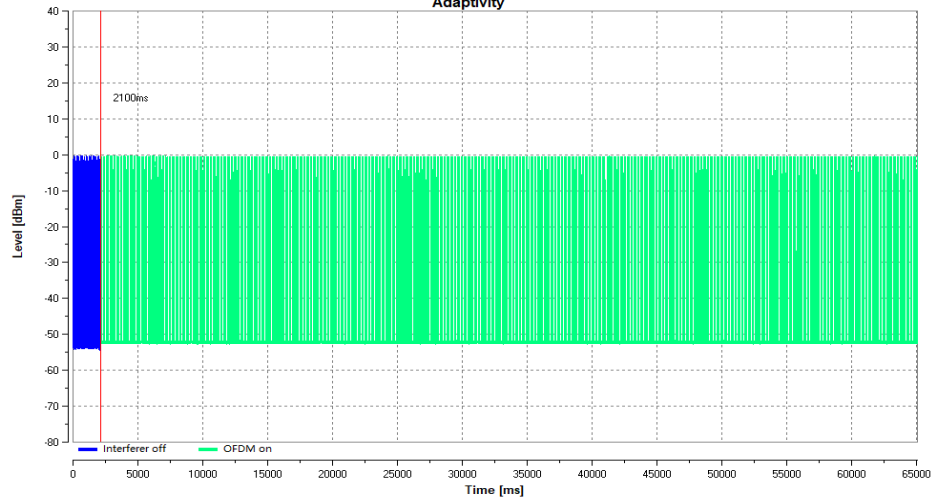


Max.Short Control Signalling

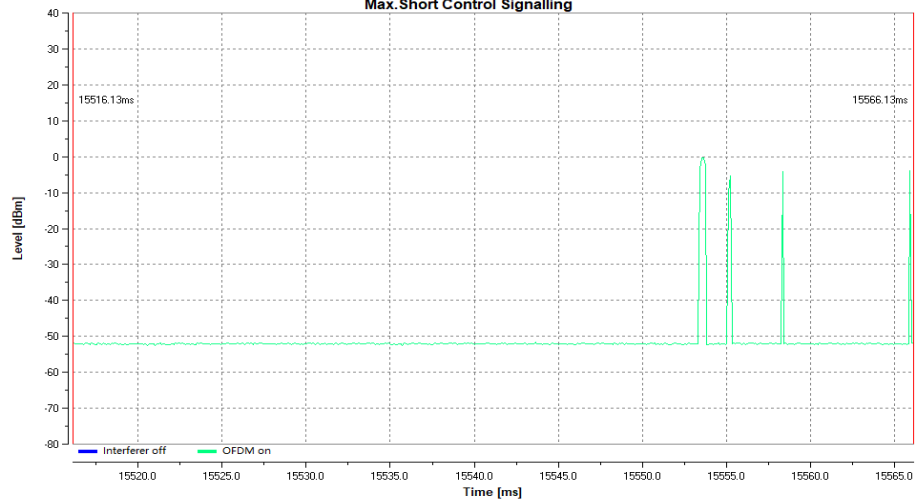


11A_Ant1_5180_OFDM

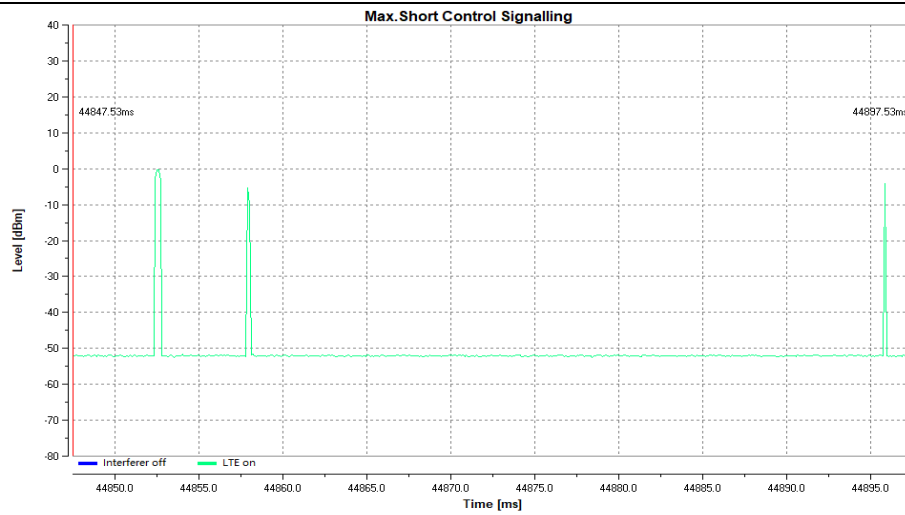
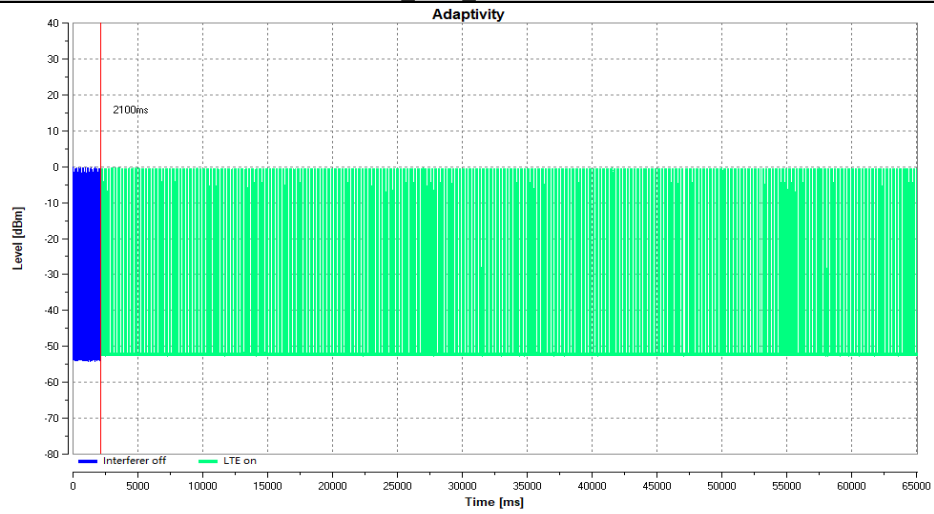
Adaptivity



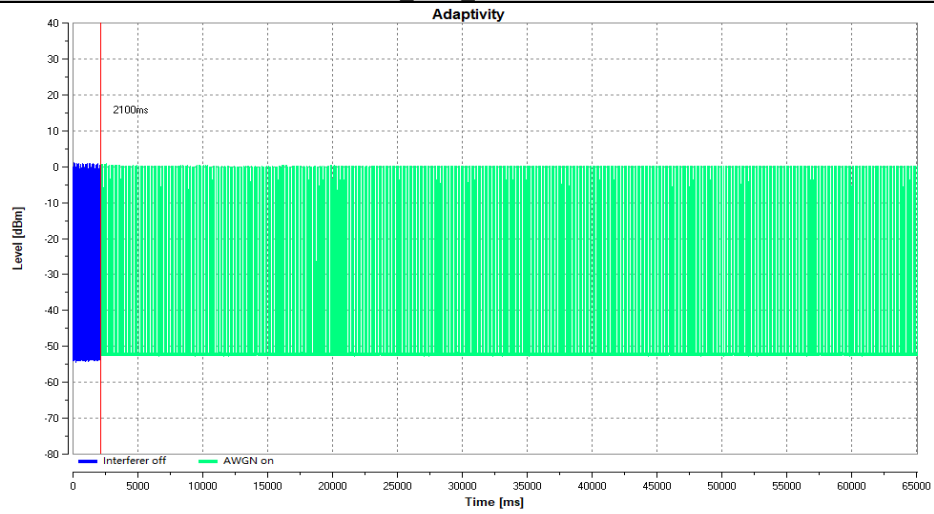
Max.Short Control Signalling



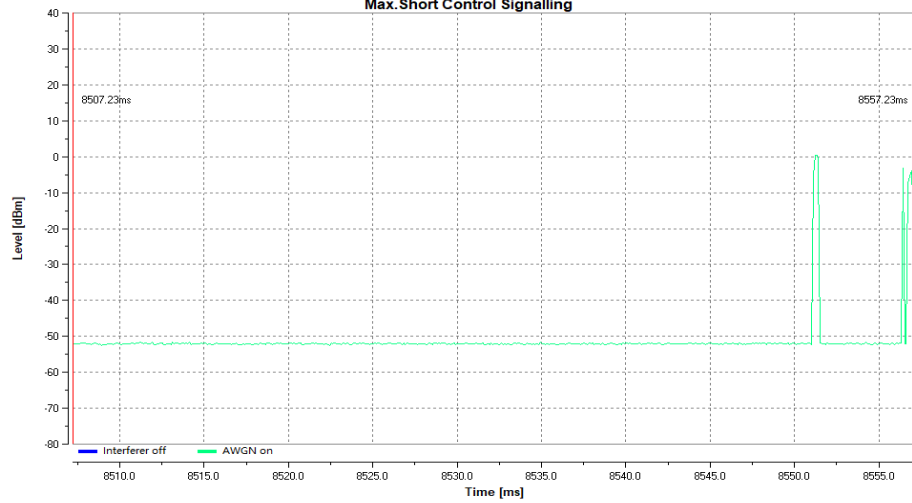
11A_Ant1_5180 LTE



11N40_Ant1_5190 AWGN



Max.Short Control Signalling



9 – RECEIVER BLOCKING

Applicable Standard

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.

Limit

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

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)	
P _{min} + 6 dB	5 100	-53	-59	Continuous Wave
P _{min} + 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

Block Diagram of Test Setup

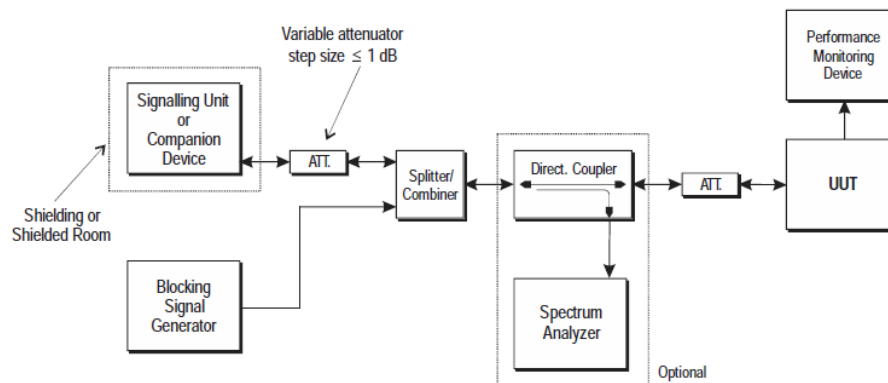


Figure 14: Test Set-up for receiver blocking

Test Data

Please refer to following table:

Test Mode	Pmin (dBm)	Wanted signal Power from companion device (dBm)	Blocking Signal Frequency (MHz)	Blocking Signal Power (dBm)	Max Blocking Signal Power (dBm)	PER (%)	Limit (%)
802.11 a (5180 MHz)	-92	-86	5100	-53	-46	2.3	≤ 10
			4900	-47	-39	3.5	
			5000	-47	-41	2.6	
			5975	-47	-38	3.1	
802.11 a (5500 MHz)	-90	-84	5100	-53	-44	2.7	≤ 10
			4900	-47	-39	3.2	
			5000	-47	-37	2.4	
			5975	-47	-40	3.6	

Note: CMW 500 was used to monitor PER.

EXHIBIT A – EUT PHOTOGRAPHS

For photos in this section, please refer to report No.: DG2220302-06789E-02.

EXHIBIT B – TEST SET UP PHOTOGRAPHS

RE below 1GHz



RE above 1GHz



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