FCC Part 15.407

TEST REPORT

For

Main Technology Co.,Ltd.

5F.,No.132,Wugong 1st Rd., Wugu Dist.,New Taipei City 24887 , Taiwan R.O.C.

FCC ID: 2A625-BMST1040Y

Report Type:	**Product Type:**
Original Report	MYSHOW-T MULTIMEDIA COMPUTER

Report Producer : Nana Hsu

Report Number : RLK220518001RF03

Report Date : 2022-07-15

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Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RLK220518001	RLK220518001RF03	2022-07-15	Original Report	Nana Hsu

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant	Main Technology Co.,Ltd..
	5F.,No.132,Wugong 1st Rd., Wugu Dist.,New Taipei City 24887 , Taiwan R.O.C.
Manufacturer	Main Technology Co.,Ltd..
	5F.,No.132,Wugong 1st Rd., Wugu Dist.,New Taipei City 24887 , Taiwan R.O.C.
Brand(Trade) Name	MyShow
Product (Equipment)	MYSHOW-T MULTIMEDIA COMPUTER
Main Model Name	BMST1040Y
Series Model Name	BMST1040R、BMST1040B、BMST1040W、BMST1040G、BMST1040P、BMST1040O
Model Discrepancy	The major electrical and mechanical constructions of series models are identical to the basic model, except different appearance color. The model, BMST1040Y is the testing sample, and the final test data are shown on this test report.
Frequency Range	5150 MHz ~ 5250 MHz
Transmit Power	IEEE 802.11a Mode: 14.11dBm (0.026W) IEEE802.11n HT20 Mode: 13.96dBm (0.025W) IEEE 802.11n HT40 Mode: 14.43dBm (0.028W) IEEE 802.11ac VHT80 Mode: 13.46dBm (0.022W)
Modulation Technique	IEEE 802.11a Mode: OFDM IEEE 802.11n HT 20 Mode: OFDM IEEE 802.11n HT 40 Mode: OFDM IEEE 802.11ac VHT80 Mode: OFDM
Power Operation (Voltage Range)	☒ AC 120V/60Hz ☒ Adapter Brand name: K.D. Intellingent Power Model: PDN-60E-120400 I/P:100-240V 1.4A 50-60Hz O/P:12.0V ⎓ 4.0A ☐ By AC Power Cord ☐ PoE
	☐ DC Type ☐ Battery: ☐ DC Power Supply ☐ External from USB Cable ☐ External DC Adapter
	☐ Host System
Received Date	Jun. 08, 2022

Date of Test	Jun. 13, 2022 ~ Jul 11, 2022

**All measurement and test data in this report was gathered from production sample serial number: RLK220518001-01 (Assigned by BACL, Linkou Laboratory).*

1.2 Objective

Part 15, Subparts A, C and E of the Federal Communication Commission This report is prepared on behalf of *Main Technology Co.,Ltd.*in accordance with Part 2, Subpart J,'s rules.
The tests were performed in order to determine compliance with FCC Part 15, Subpart E, and section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 662911 D01 Multiple Transmitter Output v02r01
KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

1.4 Statement of Compliance

Decision Rule: No, (The test results do not include MU judgment)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
The determination of the test results does not require consideration of the uncertainty of the measurement, unless the assessment is required by customer agreement, regulation or standard document specification.
Bay Area Compliance Laboratories Corp. (Linkou Laboratory) is not responsible for the authenticity of the information provided by the applicant that affects the test results.

1.5 Measurement Uncertainty

Parameter		Uncertainty
AC Mains		+/- 2.36 dB
RF output power, conducted		±0.74 dBm
Power Spectral Density, conducted		±1.14 dBm
Occupied Bandwidth		±0.94 MHz
Unwanted Emissions, conducted		±0.66 dBm
Emissions, radiated	±1.36 dBm	+/- 5.46 dB
	±2.3 dBm	+/- 5.24 dB
	±2.23 dBm	+/- 5.62 dB
	±2.23 dBm	+/- 5.86 dB
Temperature		+/- 1.71°C
Humidity		+/- 3.00 %

1.6 Environmental Conditions

Test Site	Test Data	Temperature (℃)	Relative Humidity (%)	ATM Pressure (hPa)	Test Engineer
AC Line Conducted Emissions	2022/7/11	24	58	1010	Sandy Yang
Radiation Spurious Emissions	2022/6/28	27	56	1010	Allen Cheng
Emission Bandwidth And Occupied Bandwidth	2022/6/20	23.2	65	1010	Rory Cheng
Maximum Output Power	2022/6/20	23.2	65	1010	Rory Cheng
Power Spectral Density	2022/6/20	23.2	65	1010	Rory Cheng

1.7 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Linkou Laboratory) to collect test data is located on

☒ No.6, Wende 2Rd., Guishan Dist., Taoyuan City 33382, Taiwan (R.O.C.).

Bay Area Compliance Laboratories Corp. (Linkou Laboratory) Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3546) by Mutual Recognition Agreement (MRA). The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database. The FCC Registration No.: 0027578244. Designation No.: TW1119. The Test Firm Registration No.: 311381.

2 System Test Configuration

2.1 Description of Test Configuration

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

The system support 802.11a/n ht20/n ht40/ ac vht20/ ac vht40/ ac vht80.

When VHT20/VHT40 and HT20/ HT40 in identical parameters, with the power worst of HT20/HT40.

The vht20/vht40 test were reduced (Except Maximum Output Power and Duty Cycle).

For 5150 ~ 5250MHz

3 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)
36	5180
40	5200
48	5240

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)
38	5190
46	5230

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
42	5210

802.11a/ac20/n20 mode Channel 36, 40, 48 were tested.

802.11n40/ac40 mode Channel 38, 46 were tested.

802.11ac80 mode Channel 42 was tested.

2.2 Equipment Modifications

No modification was made to the EUT.

2.3 EUT Exercise Software

The EUT was programmed to be in continuously transmitting mode.

The software was used "MP-Tool RTL819 x3.0".

UNII Band	Mode	Channel	Frequency (MHz)	Power setting	
				Chain 0	Chain 1
UNII-1	802.11a	36	5180	63	63
		40	5200	63	63
		48	5240	58	58
UNII-1	802.11n 20	36	5180	63	63
		40	5200	63	63
		48	5240	58	58
UNII-1	802.11n 40	38	5190	63	63
		46	5230	63	63
UNII-1	802.11 ac20	36	5180	63	63
		40	5200	63	63
		48	5240	58	58
UNII-1	802.11 ac 40	38	5190	63	63
		46	5230	63	63
UNII-1	802.11ac 80	42	5210	63	63

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

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

802.11a: 6Mbps

802.11n20: MCS0

802.11n40: MCS0

802.11ac80: MCS0

2.4 Test Mode

Mode: Full System for all test item.

2.5 Support Equipment List and Details

No.	Description	Manufacturer	Model Number
A	Monitor	DELL	P2415Q
B	SD Card	SanDisk	7204DVGDB0GG
C	USB flash	SanDisk	N/A
D	MIC 1	G&V	GV-MIO01
E	MIC 2	G&V	GV-MIO01
F	AP	D-Link	DIR-850L

2.6 External Cable List and Details

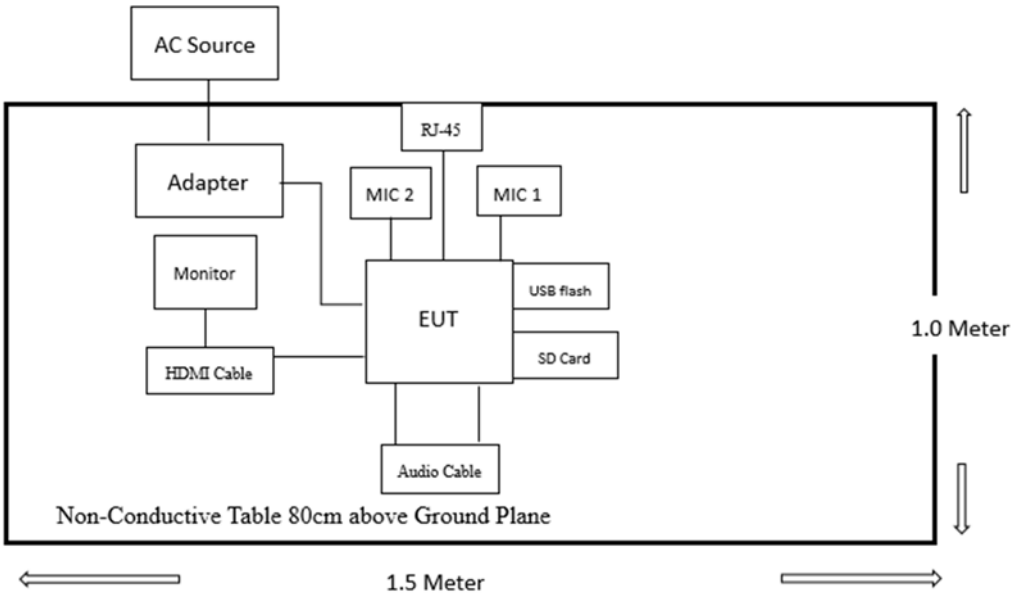
No.	Cable Description	Length (m)	From	To
1	HDMI Cable	1.06M	EUT	Monitor
2	RJ-45 Cable	2M	EUT	PC
3	Audio Cable	1.55M	EUT	EUT
4	MIC 1	5M	EUT	MIC1
5	MIC 2	5M	EUT	MIC2

2.7 Block Diagram of Test Setup

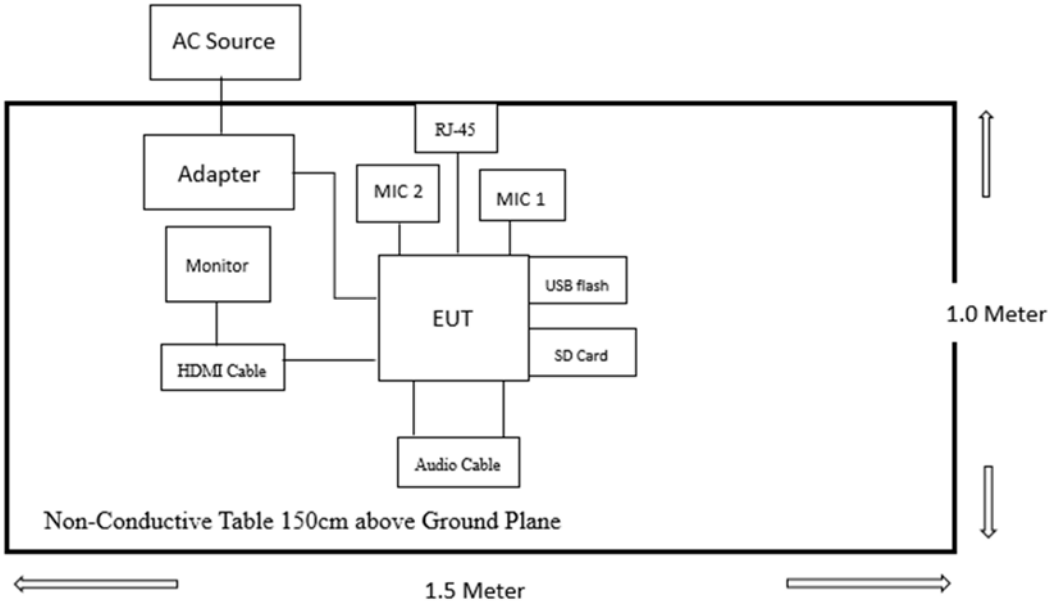
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

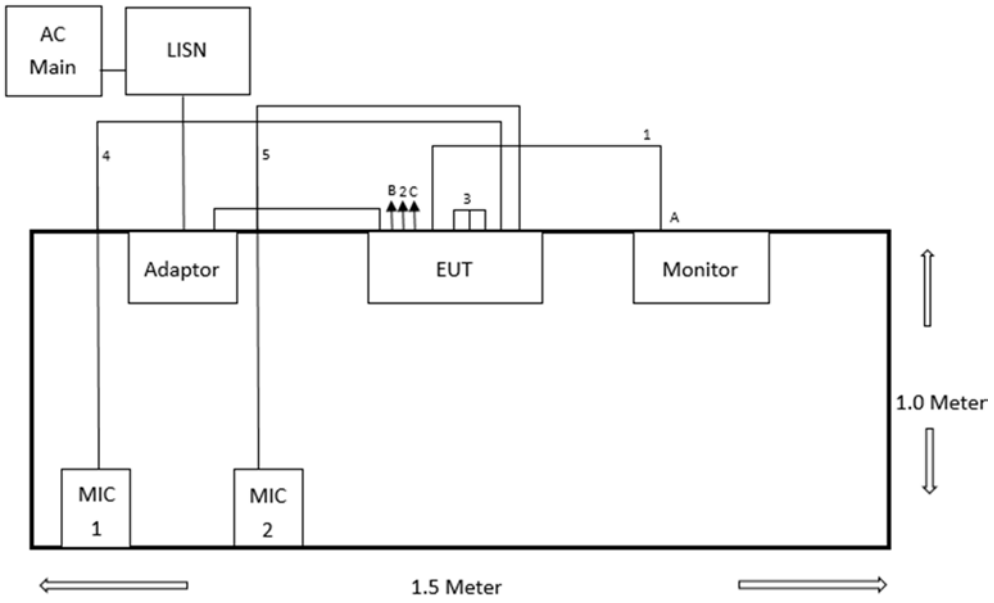
Below 1GHz:



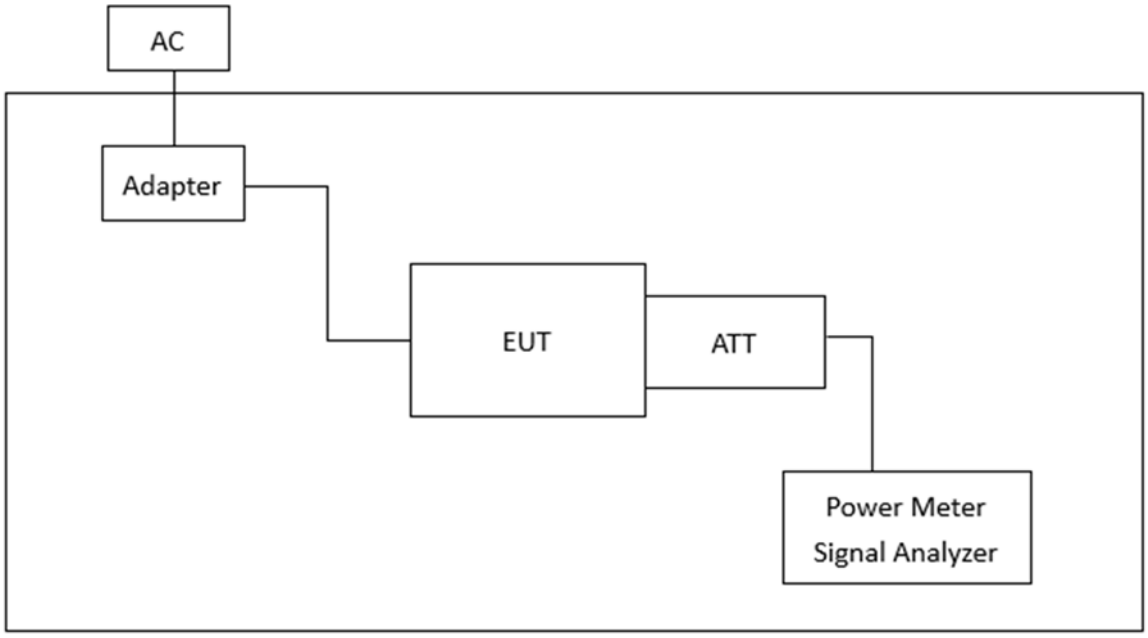
Above 1GHz:



Conduction:



Conducted:



2.8 Duty Cycle

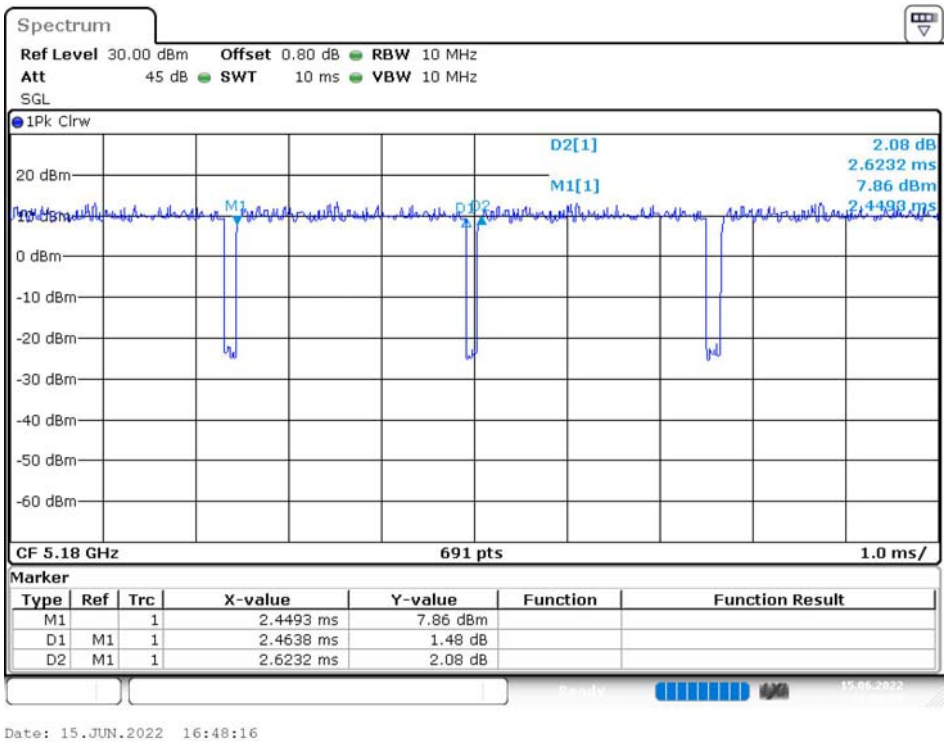
According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section B: Measurements of duty cycle, x, and maximum power transmission duration, T, are required for each tested mode of operation.

Radio Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
CDD Mode				
802.11a	2.46	0.15	94	0.27
802.11n 20	12.34	0.21	98	0.09
802.11n 40	5.94	0.23	96	0.18
802.11ac20	6.19	0.25	96	0.18
802.11ac 40	2.96	0.16	95	0.22
802.11 ac 80	2.75	0.27	91	0.41

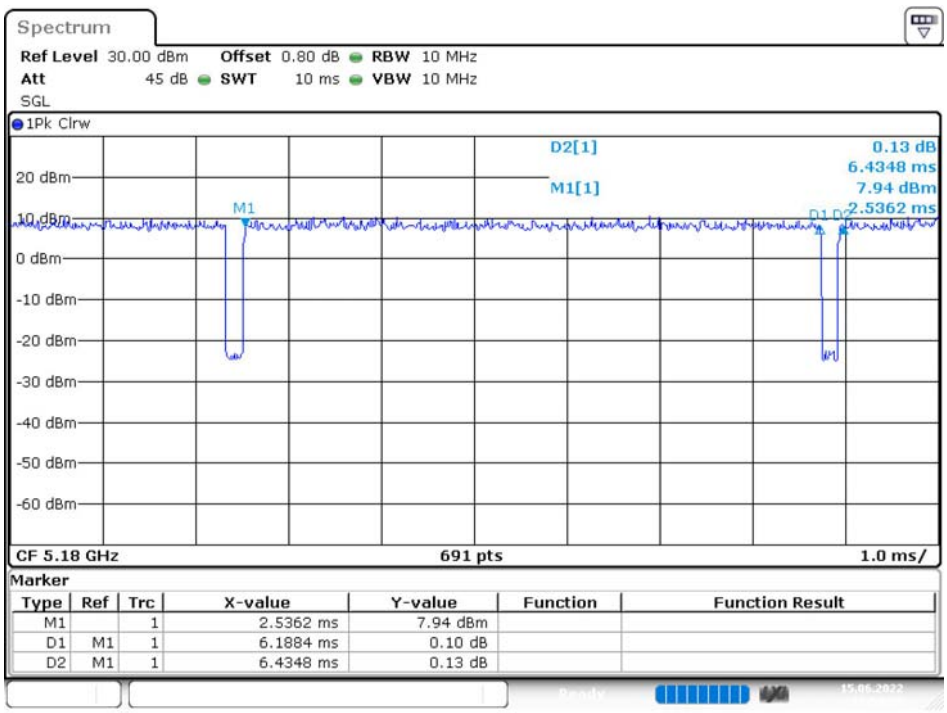
Note: Duty Cycle Correction Factor = 10*log(1/duty cycle)

Please refer to the following plots.

802.11a Mode



802.11ac 20 Mode



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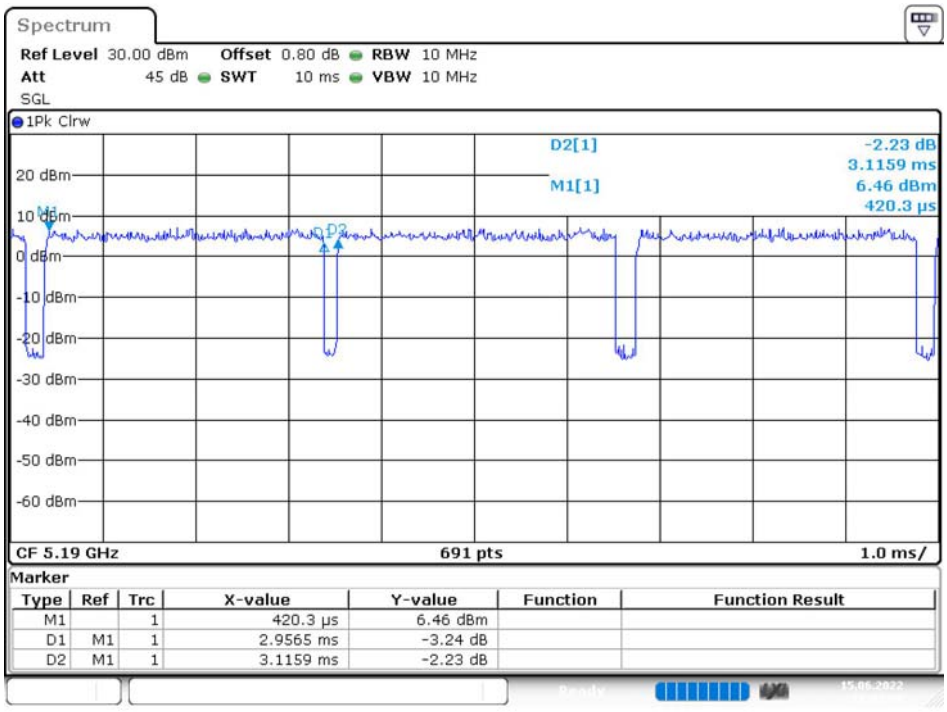
802.11ac 40 Mode



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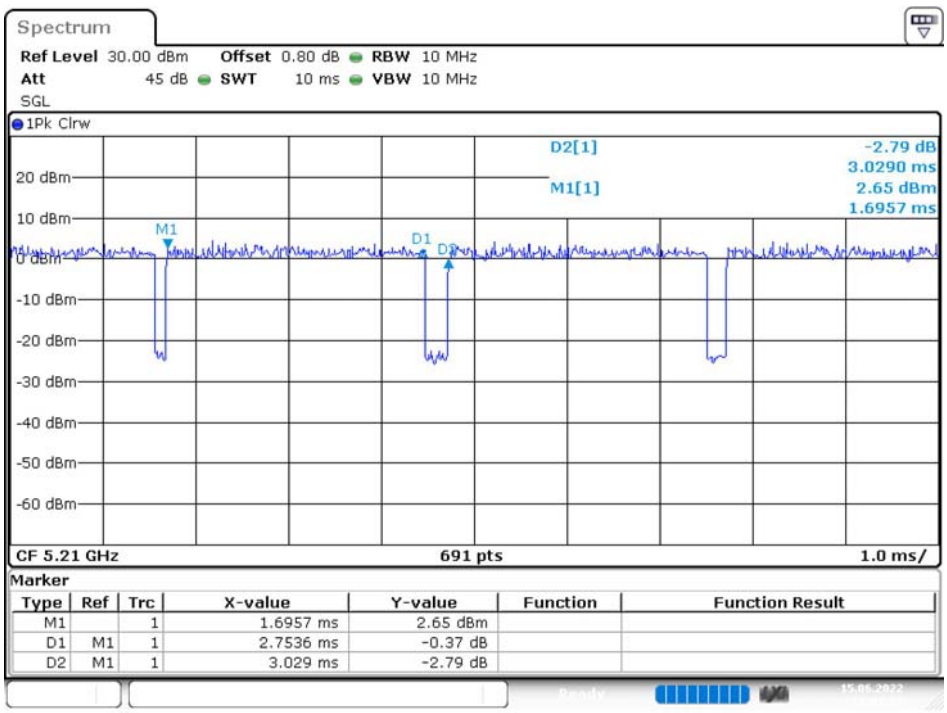
802.11ac 80 Mode



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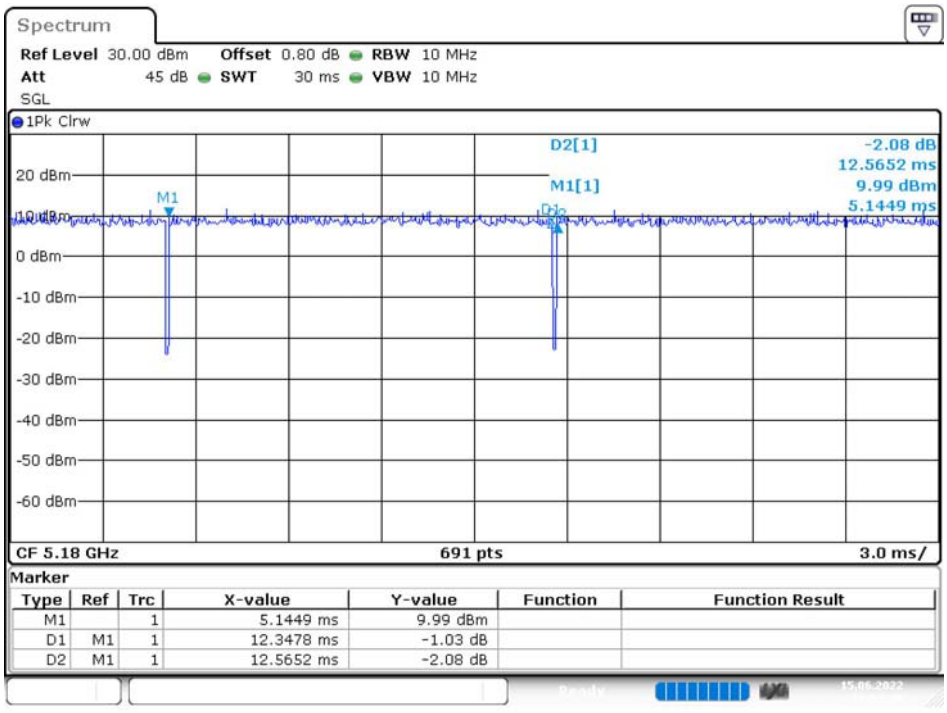
802.11n20 Mode



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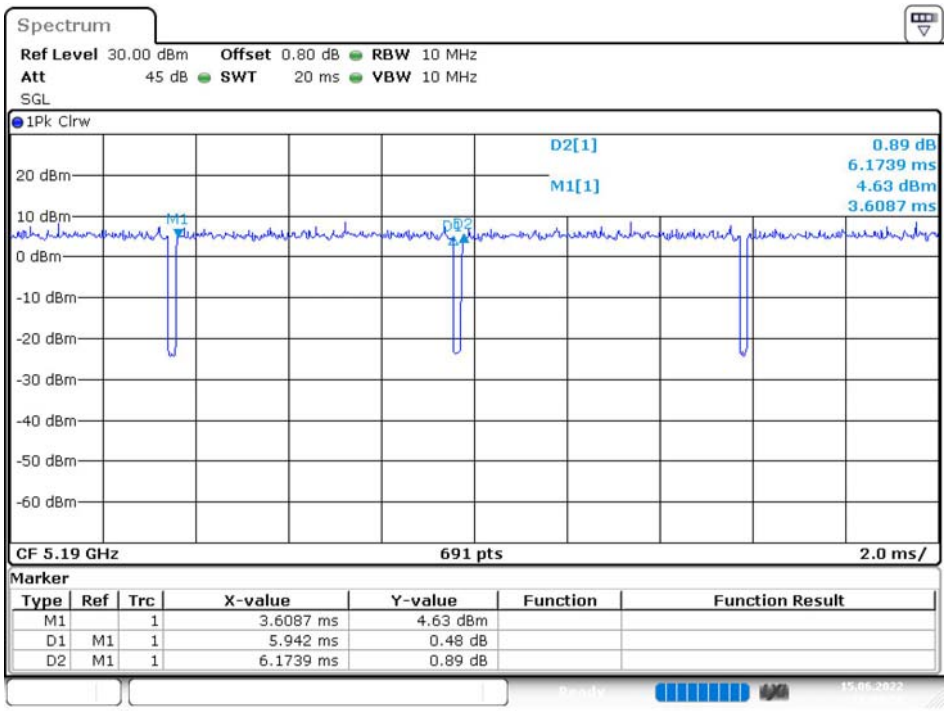
802.11n40 Mode



3 Summary of Test Results

FCC Rules	Description of Test	Results
§15.407(f), §1.1307(b)(3)(i)	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(9) & §15.207(a)	AC Line Conducted Emissions	Compliance
§15.205 & §15.209 & §15.407(b)	Unwanted Emission	Compliance
§15.407(a)(e)	Emission Bandwidth	Compliance
§15.407(a)(1)(3)	Conducted Transmitter Output Power	Compliance
§15.407(a)(1)(3)	Power Spectral Density	Compliance

4 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conduction Room (CON-A)					
Coaxial Cable 5C-2V (1.5M)	PX	P5C-2P-1.5M	PTP246-01	2021/11/5	2022/11/4
Coaxial Cable 5C-2V (3M)	HER YING	RG-10-3M	LKTE059	2021/11/5	2022/11/4
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00432	2021/9/1	2022/8/31
ESR EMI Test Receiver	Rohde & Schwarz	ESR3	102430	2022/04/28	2023/04/27
Line Impedance Stabilization Network	COM-POWER	LI-550C	20140014	2020/9/11	2022/9/10
Line Impedance Stabilization Network	COM-POWER	LI-550C	20140015	2020/9/11	2022/9/10
RF Cable	EMCI	EMCCFD300-BM-BM-8000	180526	2021/8/17	2022/8/16
Two-Line V-Network	Rohde & Schwarz	ENV216	100037	2021/9/10	2022/9/9
Radiated Room					
Bilog Antenna & 6 dB Attenuator	SUNOL SCIENCES & EMCI	JB3 & N-6-06	A111513 & AT-N0668	2022/4/11	2023/4/10
Horn Antenna	ETS-Lindgren	3115	109141	2021/7/12	2022/7/11
Horn Antenna	ETS-Lindgren	3160-09	123852	2021/7/13	2022/7/12
Horn Antenna	ETS-Lindgren	3160-10	123855	2021/7/13	2022/7/12
Spectrum Analyzer	Rohde & Schwarz	FSV40	101940	2021/12/15	2022/12/14
ESR EMI Test Receiver	Rohde & Schwarz	ESR3	102448	2021/9/28	2022/9/27
Preamplifier	A.H. Systems	PAM-1840VH	174	2022/3/23	2023/3/22
Preamplifier with 1W input limiter	A.H. Systems	PAM-0118P	470	2022/3/23	2023/3/22

Microflex Cable (1m)	MTJ	00000-MT26A-100	H0919	2021/8/7	2022/8/6
Microflex Cable (2m)	EMCI	EMC106-SM-SM-2000	180515	2021/8/7	2022/8/6
Microflex Cable (8m)	UTIFLEX	UFA210A-1-3149-300300	MFR 64639 232490-001	2021/8/7	2022/8/6
Band Reject Filter	Xi'an Xingbo	XBLBQ-DZA81	190329-1-08	2022/4/14	2023/4/13
Band Reject Filter	Xi'an Xingbo	XBLBQ-DZA62	190329-1-01	2022/4/14	2023/4/13
Temperature and Humidity Recorder	N/A	HTC-1	N/A	2021/11/5	2022/11/4
Conducted Room					
Signal and Spectrum Analyzer (with B21)	Rohde & Schwarz	FSV40	1321.3008K40-101938-Gt	2021/12/7	2022/12/6
Coaxial Cable	HER YING	RG-10-3M	LKTE059	2021/11/05	2022/11/04
Attenuator	HAEFELY TEST AG	PAT50A & PAT1000	187177 & 187176	2021/10/20	2022/10/19
Power Sensor	AGILENT	E9301A	MY41498915	2022/03/29	2023/03/28

***Statement of Traceability:** BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to the SI System of Units via the R.O.C. Center for Measurement Standards of the Electronics Testing Center, Taiwan (ETC) or to another internationally recognized National Metrology Institute (NMI), and were compliant with the current Taiwan Accreditation Foundation (TAF) requirements

5 FCC §15.407(f), § 1.1307(b)(3)(i) – RF Exposure

5.1 Applicable Standard

According to subpart 15.247(i) and subpart §1.1307(b)(3)(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

For single RF sources (*i.e.,* any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold *Pth* (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). *Pth* is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\,cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\,cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\,cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

The sequence to apply for single portable RF sources includes the following steps:

1) determination of 1 mW blanket exemption under § 1.1307(b)(3)(i)(A)

2) determination of exemption under the MPE-based § 1.1307(b)(3)(i)(C) if 1) is not met

3) determination of exemption under the SAR-based § 1.1307(b)(3)(i)(B) if both 1) and 2) are not met

5.2 RF Exposure Evaluation Result

The EUT can be used in the following modes, selecting the worst mode for evaluation.

Project info

Band	Freq (MHz)	Tune-up (dBm)	Ant Gain (dBi)	Distances (mm)	Duty (%)	Tune-up (mW)	ERP (dBm)	ERP (mW)
WIFI 5G	5230	14.5	3	200	100%	28.18	15.35	34.28

§ 1.1307(b)(3)(i)(A) method is not applicable.

§ 1.1307(b)(3)(i)(C)

Band	Freq (MHz)	λ/2π (mm)	Distances applies	ERP Limit (mW)	Ratio	Result
WIFI 5G	5230	9.13	apply	768.00	0.04	exempt

The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates

ERP (watts) is no more than the calculated value prescribed for that frequency

R must be at least $\lambda/2\pi$

λ is the free-space operating wavelength in meters

Result: The EUT meets exemption requirement

6 FCC §15.203 – Antenna Requirements

6.1 Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna does not exceed 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2 Antenna List and Details

Manufacturer	Model	Antenna Type	Antenna Gain
SHENZHEN FEISHENG	L=300M	FPC Antenna	3.0 dBi

Fulfill the requirement of this section. Please refer to the EUT photos

Result: Compliance

7 FCC §15.407(b)(9) &§15.207(a) – AC Line Conducted Emissions

7.1 Applicable Standard

As per FCC §15.407(b) (9)

Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207

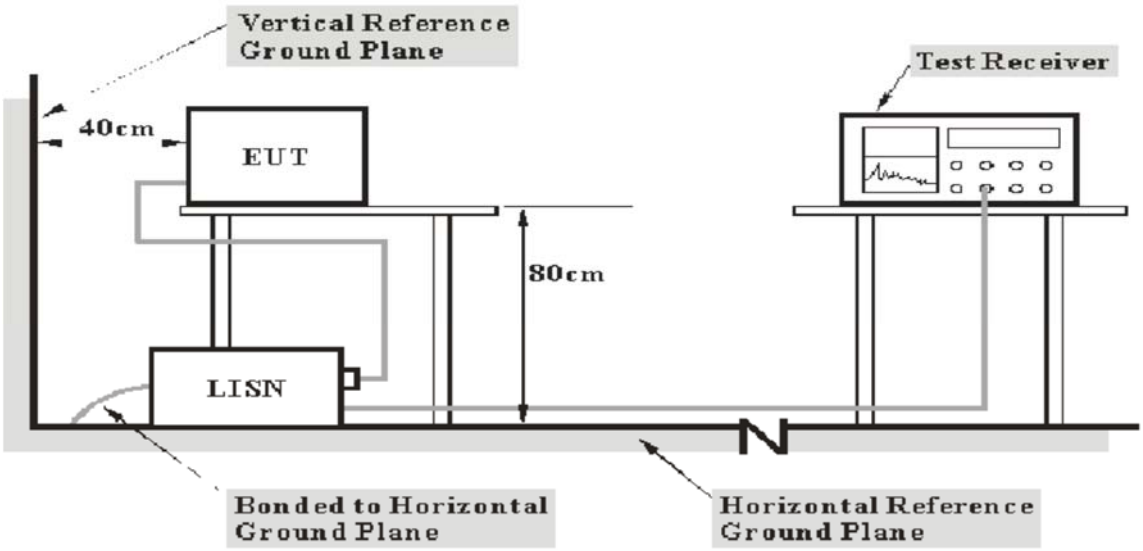
The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note 1	56 to 46 Note 2
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency.

Note 2: A linear average detector is required

7.2 EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.207 limits.

7.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations

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

7.4 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

7.5 Corrected Factor & Margin Calculation

The factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

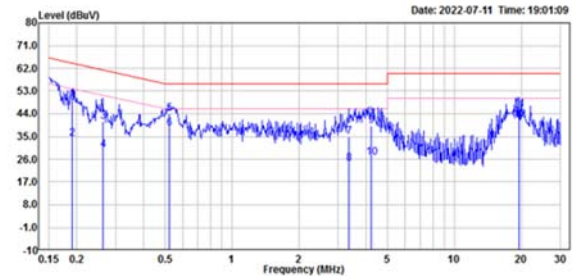
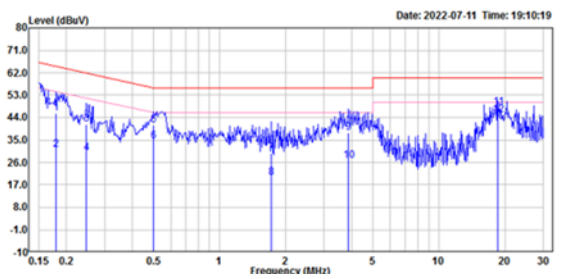
The “Over Limit” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of -7 dB means the emission is 7 dB below the limit. The equation for Over Limit calculation is as follows:

Over Limit = Level – Limit Line

7.6 Test Results

Test Mode: Transmitting

Main: AC120 V, 60 Hz, Line (802.11N40_5230MHz)

Line	Neutral
	

	Freq	Level	Level	Factor	Line	Limit	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	
1	0.191	30.07	49.88	19.81	64.01	-14.13	QP
2	0.191	14.32	34.13	19.81	54.01	-19.88	Average
3	0.262	21.26	41.08	19.82	61.37	-20.29	QP
4	0.262	9.99	29.81	19.82	51.37	-21.56	Average
5 *	0.524	24.09	43.92	19.83	56.00	-12.08	QP
6 *	0.524	18.43	38.26	19.83	46.00	-7.74	Average
7	3.354	14.89	34.88	19.99	56.00	-21.12	QP
8	3.354	4.42	24.41	19.99	46.00	-21.59	Average
9	4.226	19.16	39.18	20.02	56.00	-16.82	QP
10	4.226	6.60	26.62	20.02	46.00	-19.38	Average
11	19.511	25.43	45.76	20.33	60.00	-14.24	QP
12	19.511	21.40	41.73	20.33	50.00	-8.27	Average

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	
1	0.180	25.77	45.58	19.81	64.48	-18.90	QP
2	0.180	11.38	31.19	19.81	54.48	-23.29	Average
3	0.248	21.30	41.13	19.83	61.83	-20.70	QP
4	0.248	9.90	29.73	19.83	51.83	-22.10	Average
5	0.500	21.25	41.09	19.84	56.01	-14.92	QP
6	0.500	14.70	34.54	19.84	46.01	-11.47	Average
7	1.718	9.74	29.66	19.92	56.00	-26.34	QP
8	1.718	0.09	20.01	19.92	46.00	-25.99	Average
9	3.871	17.86	37.88	20.02	56.00	-18.12	QP
10	3.871	6.80	26.82	20.02	46.00	-19.18	Average
11 *	18.600	27.52	47.96	20.44	60.00	-12.04	QP
12 *	18.600	24.50	44.94	20.44	50.00	-5.06	Average

Note:

Wifi measured according to the worst power.

Level = Read Level + Factor

Over Limit = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

8 FCC §15.209, §15.205 , §15.407(b) – Spurious Emissions

8.1 Applicable Standard

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	608 – 614	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	960 – 1240	5.35 – 5. 46
2.1735 – 2.1905	16.80425 – 16.80475	1300 – 1427	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1435 – 1626.5	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1645.5 – 1646.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1660 – 1710	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1718.8 – 1722.2	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	2200 – 2300	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2310 – 2390	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2483.5 – 2500	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2690 – 2900	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	3260 – 3267	22.01 – 23.12
8.41425 – 8.41475	162.0125 –167.17	3.332 – 3.339	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3 3458 – 3 358	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3.600 – 4.400	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4		Above 38.6
13.36 – 13.41	399.9 – 410		

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

Note 1: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per FCC Part 15.407 (b)

- For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
- For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level

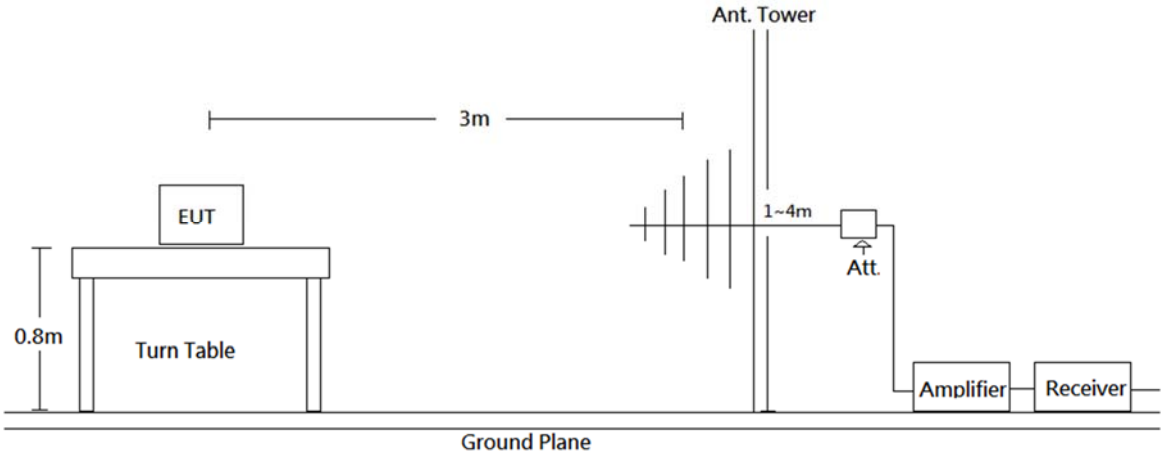
of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge..

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

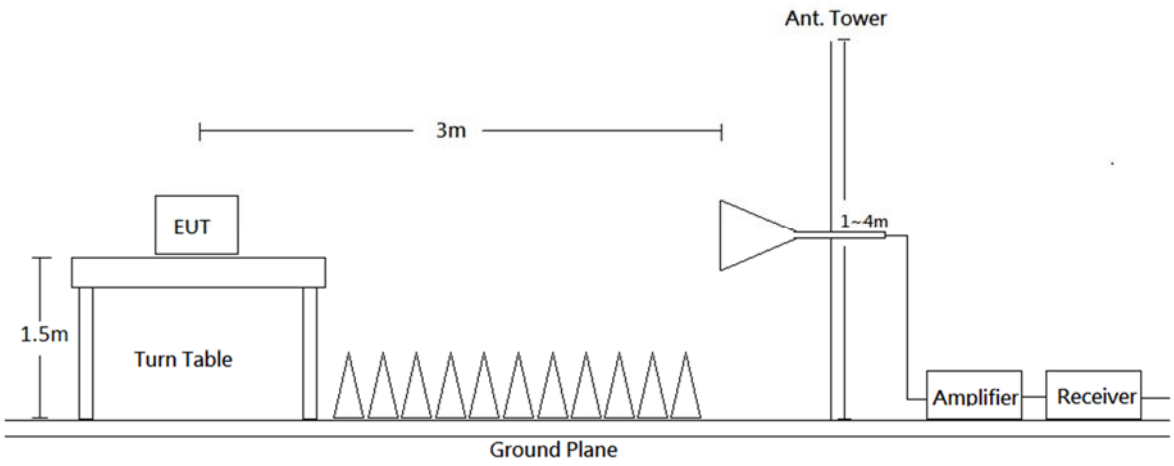
˙Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

8.2 EUT Setup

Below 1 GHz:

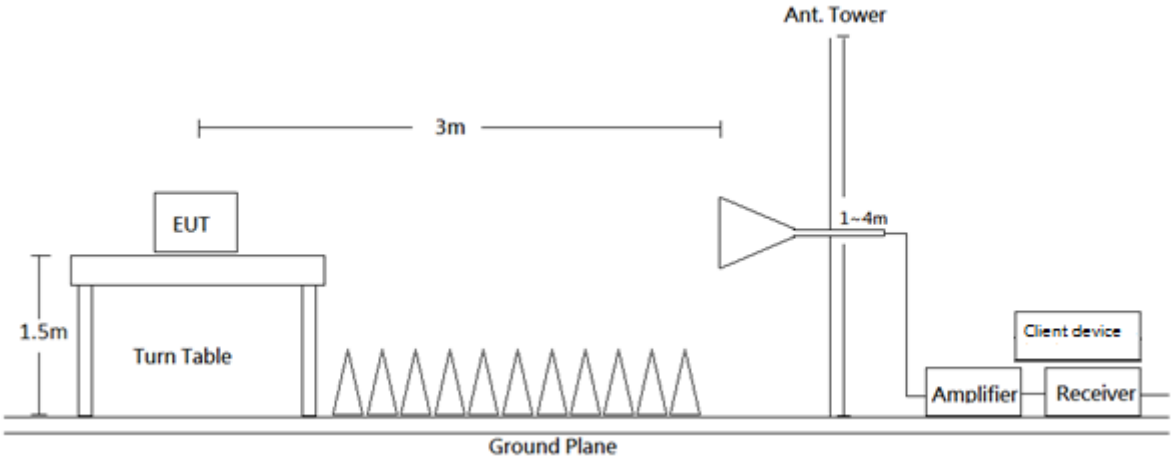


Above 1 GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2020. The specification used was the FCC Part 15.209 and FCC 15.407 Limits.

Beamforming Mode



During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under Telnet.
3. Executed "Lantest.exe" to link with the remote workstation to transmit and receive packet by RX device.
4. The client device is placed behind the receiving antenna to find the maximum field angle.

8.3 EMI Test Receiver & Spectrum Analyzer Setup

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

Frequency Range	RBW	VBW	Duty cycle	Measurement method
30-1000 MHz	120 kHz	/	/	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	3 MHz	>98%	Ave
	1 MHz	1/T	<98%	Ave

8.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

According to C63.10, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

All emissions under the average limit and under the noise floor have not recorded in the report

8.5 Corrected Factor & Margin Calculation

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

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Margin = Result – Limit

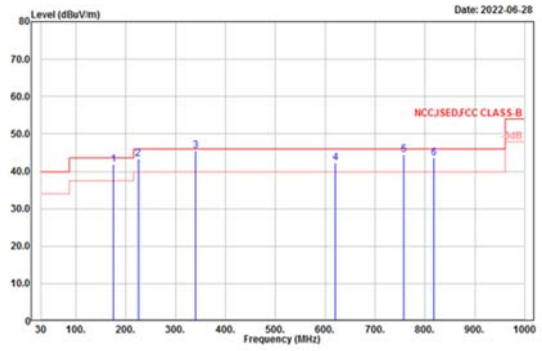
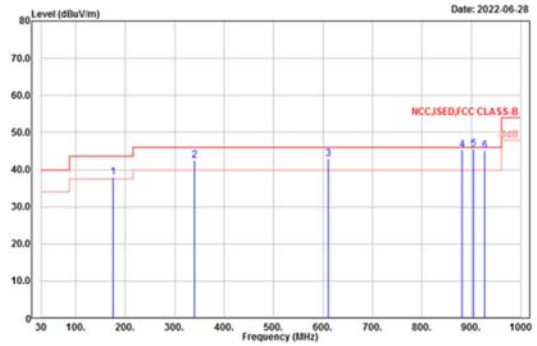
8.6 Test Results

Test Mode: Transmitting

(Pre-scan with three orthogonal axis, and worse case as Y axis.)

Horizontal (worst case is Wi-Fi a20 mode 5180MHz)

30MHz-1GHz:

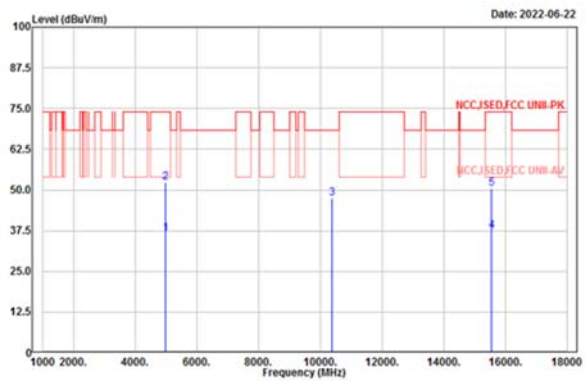
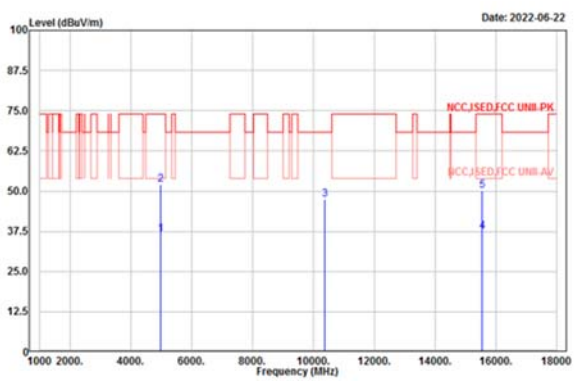
Horizontal	Vertical
	

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	174.530	41.92	43.50	-1.58	63.04	-21.12	Peak
2	224.970	43.29	46.00	-2.71	65.11	-21.82	Peak
3	339.430	45.47	46.00	-0.53	64.36	-18.89	Peak
4	620.730	42.25	46.00	-3.75	55.63	-13.38	Peak
5	756.530	44.42	46.00	-1.58	55.90	-11.48	Peak
6	816.670	43.53	46.00	-2.47	54.32	-10.79	Peak

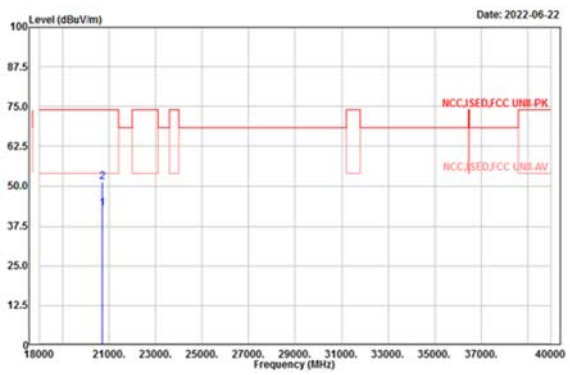
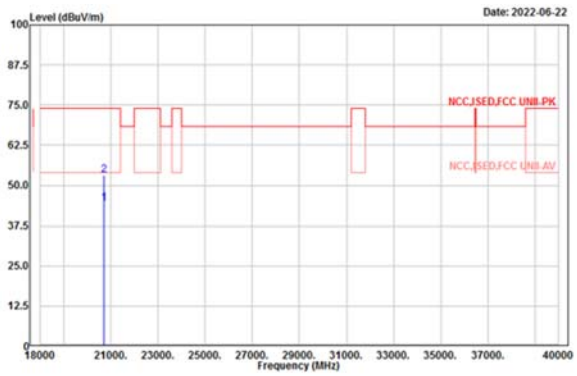
	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	174.530	37.98	43.50	-5.52	59.10	-21.12	Peak
2	339.430	42.44	46.00	-3.56	61.33	-18.89	Peak
3	610.060	42.88	46.00	-3.12	56.48	-13.60	Peak
4	880.690	45.21	46.00	-0.79	55.06	-9.85	Peak
5	903.970	45.43	46.00	-0.57	55.01	-9.58	Peak
6	926.280	45.20	46.00	-0.80	54.50	-9.30	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

1GHz-18GHz:

Horizontal	Vertical
	

18GHz-40GHz:

Horizontal	Vertical
	

For UNII-1 Band I:

Above 1GHz-18GHz

A20-Horizontal

Low channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	36.61	54.00	-17.39	38.85	-2.24	Average
2	4978.000	52.42	74.00	-21.58	54.66	-2.24	Peak
3	10360.000	47.34	68.20	-20.86	39.84	7.50	Peak
4	15540.000	37.39	54.00	-16.61	28.18	9.21	Average
5	15540.000	50.48	74.00	-23.52	41.27	9.21	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5075.800	45.93	54.00	-8.07	48.06	-2.13	Average
2	5075.800	53.56	74.00	-20.44	55.69	-2.13	Peak
3 *	5180.000	92.85			94.93	-2.08	Average
4 *	5180.000	101.35			103.43	-2.08	Peak

Middle channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.42	54.00	-16.58	39.66	-2.24	Average
2	4978.000	53.36	74.00	-20.64	55.60	-2.24	Peak
3	10400.000	47.68	68.20	-20.52	40.13	7.55	Peak
4	15600.000	38.32	54.00	-15.68	28.95	9.37	Average
5	15600.000	49.89	74.00	-24.11	40.52	9.37	Peak

High channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	35.67	54.00	-18.33	37.91	-2.24	Average
2	4978.000	51.42	74.00	-22.58	53.66	-2.24	Peak
3	10480.000	47.12	68.20	-21.08	39.45	7.67	Peak
4	15720.000	38.44	54.00	-15.56	28.77	9.67	Average
5	15720.000	50.73	74.00	-23.27	41.06	9.67	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5129.540	45.96	54.00	-8.04	48.06	-2.10	Average
2	5129.540	53.87	74.00	-20.13	55.97	-2.10	Peak
3 *	5240.000	93.23			95.27	-2.04	Average
4 *	5240.000	102.74			104.78	-2.04	Peak
5	5393.990	46.90	54.00	-7.10	48.46	-1.56	Average
6	5393.990	54.00	74.00	-20.00	55.56	-1.56	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Low channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	36.67	54.00	-17.33	38.91	-2.24	Average
2	4978.000	52.15	74.00	-21.85	54.39	-2.24	Peak
3	10360.000	47.50	68.20	-20.70	40.00	7.50	Peak
4	15540.000	37.39	54.00	-16.61	28.18	9.21	Average
5	15540.000	50.13	74.00	-23.87	40.92	9.21	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5149.000	45.85	54.00	-8.15	47.94	-2.09	Average
2	5149.000	53.88	74.00	-20.12	55.97	-2.09	Peak
3 *	5180.000	89.80			91.88	-2.08	Average
4 *	5180.000	99.08			101.16	-2.08	Peak

Middle channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	34.89	54.00	-19.11	37.13	-2.24	Average
2	4978.000	51.19	74.00	-22.81	53.43	-2.24	Peak
3	10400.000	46.82	68.20	-21.38	39.27	7.55	Peak
4	15600.000	38.23	54.00	-15.77	28.86	9.37	Average
5	15600.000	49.12	74.00	-24.88	39.75	9.37	Peak

High channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.65	54.00	-16.35	39.89	-2.24	Average
2	4978.000	53.91	74.00	-20.09	56.15	-2.24	Peak
3	10480.000	47.57	68.20	-20.63	39.90	7.67	Peak
4	15720.000	38.39	54.00	-15.61	28.72	9.67	Average
5	15720.000	52.21	74.00	-21.79	42.54	9.67	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5104.530	45.92	54.00	-8.08	48.04	-2.12	Average
2	5104.530	53.57	74.00	-20.43	55.69	-2.12	Peak
3 *	5240.000	88.94			90.98	-2.04	Average
4 *	5240.000	97.57			99.61	-2.04	Peak
5	5357.090	46.59	54.00	-7.41	48.27	-1.68	Average
6	5357.090	53.38	74.00	-20.62	55.06	-1.68	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

N20-Horizontal

Low channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.52	54.00	-16.48	39.76	-2.24	Average
2	4978.000	53.73	74.00	-20.27	55.97	-2.24	Peak
3	10360.000	47.14	68.20	-21.06	39.64	7.50	Peak
4	15540.000	36.77	54.00	-17.23	27.56	9.21	Average
5	15540.000	49.52	74.00	-24.48	40.31	9.21	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5144.950	45.43	54.00	-8.57	47.52	-2.09	Average
2	5144.950	53.44	74.00	-20.56	55.53	-2.09	Peak
3 *	5180.000	92.97			95.05	-2.08	Average
4 *	5180.000	103.11			105.19	-2.08	Peak

Middle channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4995.000	37.05	54.00	-16.95	39.23	-2.18	Average
2	4995.000	53.47	74.00	-20.53	55.65	-2.18	Peak
3	10400.000	47.38	68.20	-20.82	39.83	7.55	Peak
4	15600.000	37.84	54.00	-16.16	28.47	9.37	Average
5	15600.000	50.19	74.00	-23.81	40.82	9.37	Peak

High channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.82	54.00	-16.18	40.06	-2.24	Average
2	4978.000	54.05	74.00	-19.95	56.29	-2.24	Peak
3	10480.000	47.40	68.20	-20.80	39.73	7.67	Peak
4	15720.000	37.79	54.00	-16.21	28.12	9.67	Average
5	15720.000	50.35	74.00	-23.65	40.68	9.67	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5097.150	45.35	54.00	-8.65	47.47	-2.12	Average
2	5097.150	54.15	74.00	-19.85	56.27	-2.12	Peak
3 *	5240.000	92.33			94.37	-2.04	Average
4 *	5240.000	102.46			104.50	-2.04	Peak
5	5435.810	46.29	54.00	-7.71	47.71	-1.42	Average
6	5435.810	53.41	74.00	-20.59	54.83	-1.42	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Low channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.29	54.00	-16.71	39.53	-2.24	Average
2	4978.000	53.68	74.00	-20.32	55.92	-2.24	Peak
3	10360.000	47.54	68.20	-20.66	40.04	7.50	Peak
4	15540.000	36.80	54.00	-17.20	27.59	9.21	Average
5	15540.000	50.47	74.00	-23.53	41.26	9.21	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5080.750	45.32	54.00	-8.68	47.45	-2.13	Average
2	5080.750	53.33	74.00	-20.67	55.46	-2.13	Peak
3 *	5180.000	88.21			90.29	-2.08	Average
4 *	5180.000	98.28			100.36	-2.08	Peak

Middle channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.72	54.00	-16.28	39.96	-2.24	Average
2	4978.000	53.01	74.00	-20.99	55.25	-2.24	Peak
3	10400.000	46.77	68.20	-21.43	39.22	7.55	Peak
4	15600.000	37.76	54.00	-16.24	28.39	9.37	Average
5	15600.000	49.85	74.00	-24.15	40.48	9.37	Peak

High channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.58	54.00	-16.42	39.82	-2.24	Average
2	4978.000	53.46	74.00	-20.54	55.70	-2.24	Peak
3	10480.000	47.20	68.20	-21.00	39.53	7.67	Peak
4	15720.000	37.83	54.00	-16.17	28.16	9.67	Average
5	15720.000	51.36	74.00	-22.64	41.69	9.67	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5137.330	45.23	54.00	-8.77	47.33	-2.10	Average
2	5137.330	53.83	74.00	-20.17	55.93	-2.10	Peak
3 *	5240.000	83.69			85.73	-2.04	Average
4 *	5240.000	93.67			95.71	-2.04	Peak
5	5440.320	46.28	54.00	-7.72	47.68	-1.40	Average
6	5440.320	53.76	74.00	-20.24	55.16	-1.40	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

N40-Horizontal

Low channel

		Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1		4995.000	38.70	54.00	-15.30	40.88	-2.18	Average
2		4995.000	54.13	74.00	-19.87	56.31	-2.18	Peak
3		10380.000	47.78	68.20	-20.42	40.25	7.53	Peak
4		15570.000	37.31	54.00	-16.69	28.02	9.29	Average
5		15570.000	50.66	74.00	-23.34	41.37	9.29	Peak

		Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1		5148.835	45.72	54.00	-8.28	47.81	-2.09	Average
2		5148.835	56.03	74.00	-17.97	58.12	-2.09	Peak
3	*	5190.000	89.87			91.94	-2.07	Average
4	*	5190.000	100.15			102.22	-2.07	Peak

High channel

		Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1		4978.000	37.31	54.00	-16.69	39.55	-2.24	Average
2		4978.000	53.50	74.00	-20.50	55.74	-2.24	Peak
3		10460.000	47.49	68.20	-20.71	39.85	7.64	Peak
4		15690.000	37.99	54.00	-16.01	28.39	9.60	Average
5		15690.000	50.43	74.00	-23.57	40.83	9.60	Peak

		Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1		5147.580	45.60	54.00	-8.40	47.69	-2.09	Average
2		5147.580	52.89	74.00	-21.11	54.98	-2.09	Peak
3	*	5230.000	90.69			92.74	-2.05	Average
4	*	5230.000	100.01			102.06	-2.05	Peak
5		5391.940	46.39	54.00	-7.61	47.95	-1.56	Average
6		5391.940	52.78	74.00	-21.22	54.34	-1.56	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Low channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	36.89	54.00	-17.11	39.13	-2.24	Average
2	4978.000	53.48	74.00	-20.52	55.72	-2.24	Peak
3	10380.000	47.11	68.20	-21.09	39.58	7.53	Peak
4	15570.000	37.43	54.00	-16.57	28.14	9.29	Average
5	15570.000	49.41	74.00	-24.59	40.12	9.29	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5092.240	45.49	54.00	-8.51	47.61	-2.12	Average
2	5092.240	53.39	74.00	-20.61	55.51	-2.12	Peak
3 *	5190.000	84.68			86.75	-2.07	Average
4 *	5190.000	94.13			96.20	-2.07	Peak

High channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.83	54.00	-16.17	40.07	-2.24	Average
2	4978.000	53.95	74.00	-20.05	56.19	-2.24	Peak
3	10460.000	47.15	68.20	-21.05	39.51	7.64	Peak
4	15690.000	37.92	54.00	-16.08	28.32	9.60	Average
5	15690.000	51.42	74.00	-22.58	41.82	9.60	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5143.480	45.50	54.00	-8.50	47.59	-2.09	Average
2	5143.480	53.13	74.00	-20.87	55.22	-2.09	Peak
3 *	5230.000	81.82			83.87	-2.05	Average
4 *	5230.000	92.57			94.62	-2.05	Peak
5	5389.890	46.41	54.00	-7.59	47.98	-1.57	Average
6	5389.890	52.74	74.00	-21.26	54.31	-1.57	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

AC80-Horizontal

Low channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	36.48	54.00	-17.52	38.72	-2.24	Average
2	4978.000	51.78	74.00	-22.22	54.02	-2.24	Peak
3	10420.000	47.36	68.20	-20.84	39.77	7.59	Peak
4	15630.000	38.16	54.00	-15.84	28.72	9.44	Average
5	15630.000	50.15	74.00	-23.85	40.71	9.44	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5145.325	45.97	54.00	-8.03	48.06	-2.09	Average
2	5145.325	56.19	74.00	-17.81	58.28	-2.09	Peak
3 *	5210.000	87.49			89.55	-2.06	Average
4 *	5210.000	97.42			99.48	-2.06	Peak

Vertical

Low channel

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4978.000	37.45	54.00	-16.55	39.69	-2.24	Average
2	4978.000	53.25	74.00	-20.75	55.49	-2.24	Peak
3	10420.000	46.27	68.20	-21.93	38.68	7.59	Peak
4	15630.000	38.24	54.00	-15.76	28.80	9.44	Average
5	15630.000	49.66	74.00	-24.34	40.22	9.44	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	5134.870	45.66	54.00	-8.34	47.76	-2.10	Average
2	5134.870	53.10	74.00	-20.90	55.20	-2.10	Peak
3 *	5210.000	81.70			83.76	-2.06	Average
4 *	5210.000	91.26			93.32	-2.06	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

9 FCC §15.407(a)(e) – Emission Bandwidth And Occupied Bandwidth

9.1 Applicable Standard

As per FCC §15.407(a): The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

As per FCC §15.407(e): for equipment operating in the band 5725 – 5850 MHz, the minimum 6 dB bandwidth of U-NII devices shall be 500 kHz.

9.2 Test Procedure

Emission Bandwidth (EBW)

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

9.3 Test Results

Test mode: Transmitting

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)		99% Emission Bandwidth (MHz)		Limit (kHz)	Result
				chain0	chain1	chain0	chain1		
UNII-1	802.11a	36	5180	24.40	18.68	16.38	16.30	≥500	PASS
		40	5200	27.68	20.24	16.42	16.38	≥500	PASS
		48	5240	18.72	18.72	16.38	16.34	≥500	PASS
	802.11 n20	36	5180	22.96	19.96	17.50	17.50	≥500	PASS
		40	5200	29.72	24.76	17.54	17.54	≥500	PASS
		48	5240	30.76	25.12	17.58	17.54	≥500	PASS
	802.11 n40	38	5190	41.92	41.84	36.28	36.20	≥500	PASS
		46	5230	50.00	41.68	36.36	36.28	≥500	PASS
	802.11 ac 80	42	5210	89.12	80.96	74.81	74.49	≥500	PASS

Note: the 99% Occupied Bandwidth have not fall into the band 5250-5350MHz or 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.

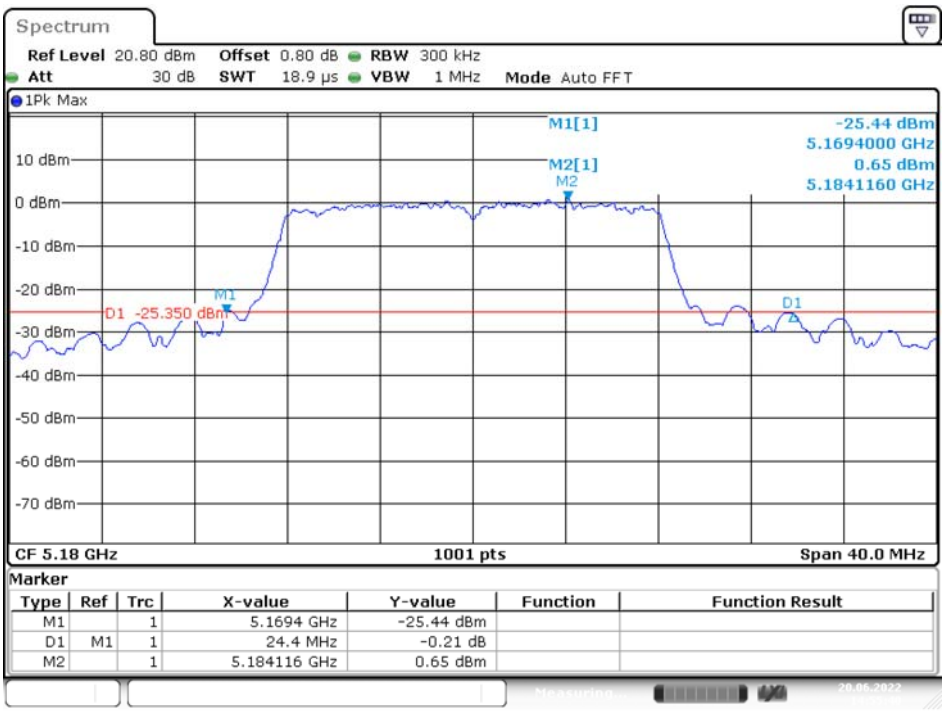
Please refer to the following plots

Transmitting Mode:

UNII-1 Band I / BW 26dBc Chain 0

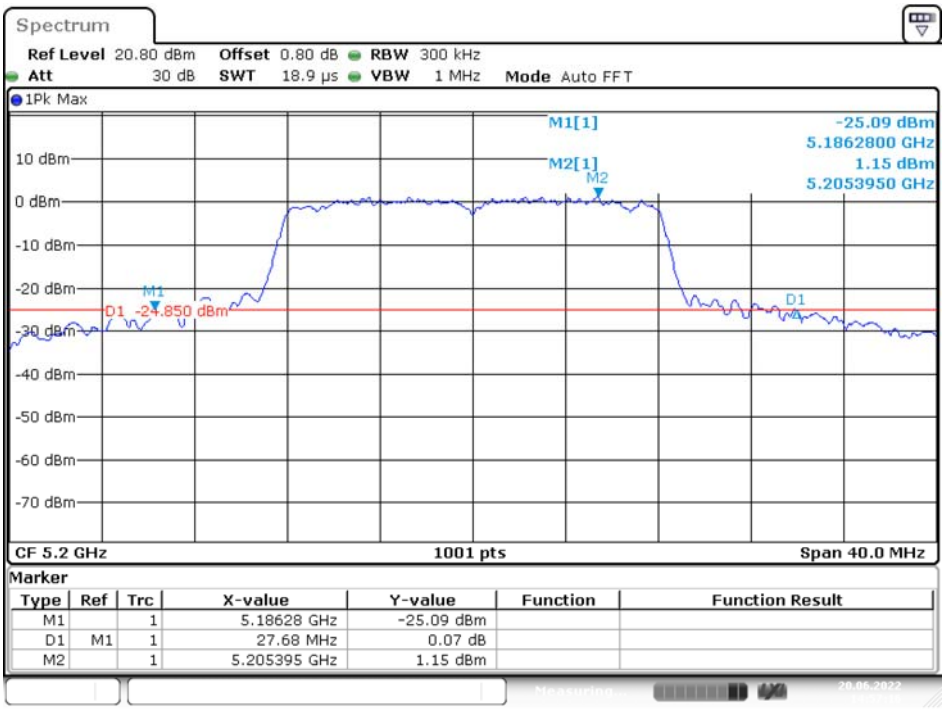
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



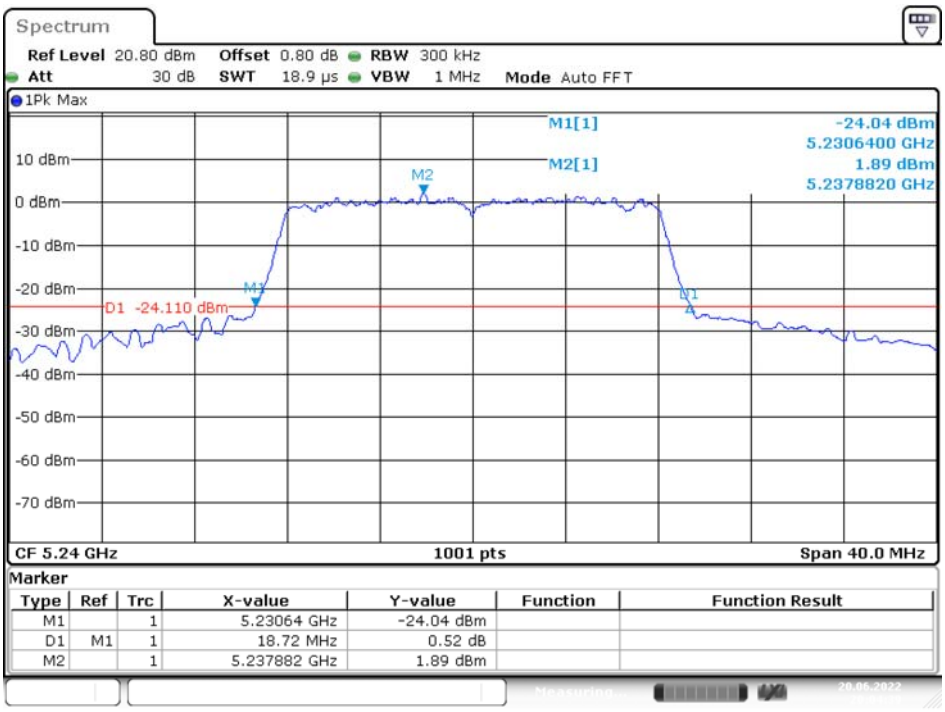
Date: 20.JUN.2022 14:55:40

5200MHz



Date: 20.JUN.2022 14:57:16

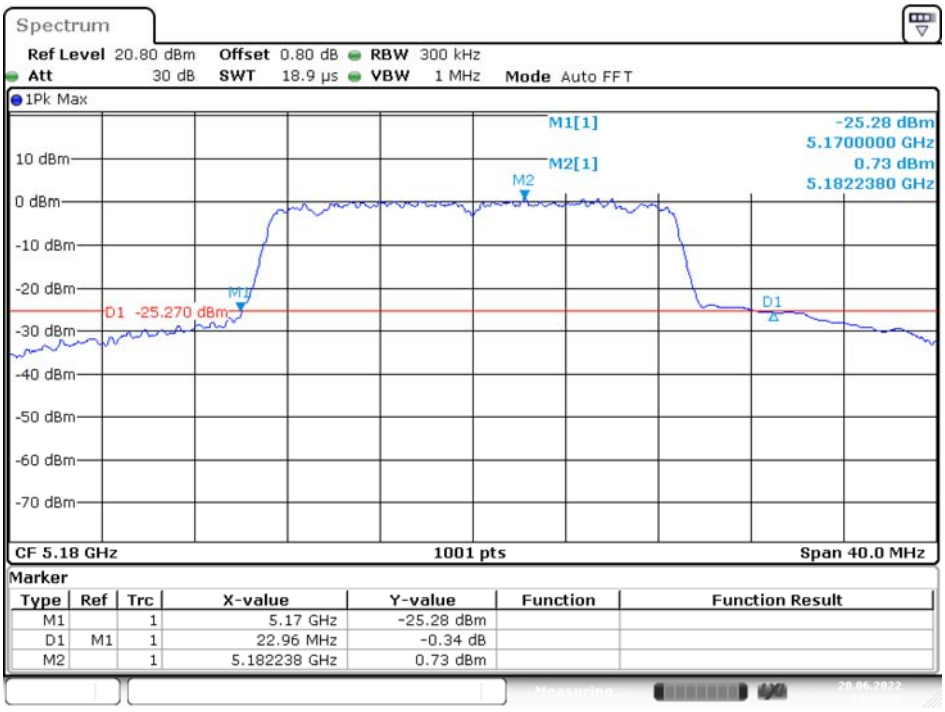
5240MHz



Date: 20.JUN.2022 20:04:39

IEEE 802.11n HT20 Mode / 5150 ~ 5250MHz

5180MHz



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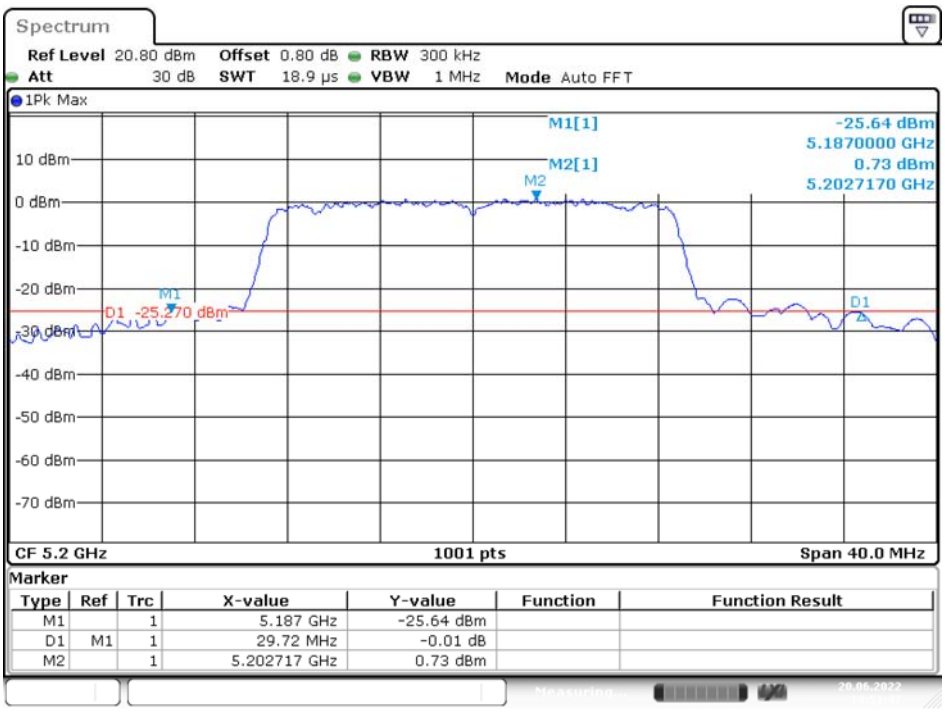
5200MHz



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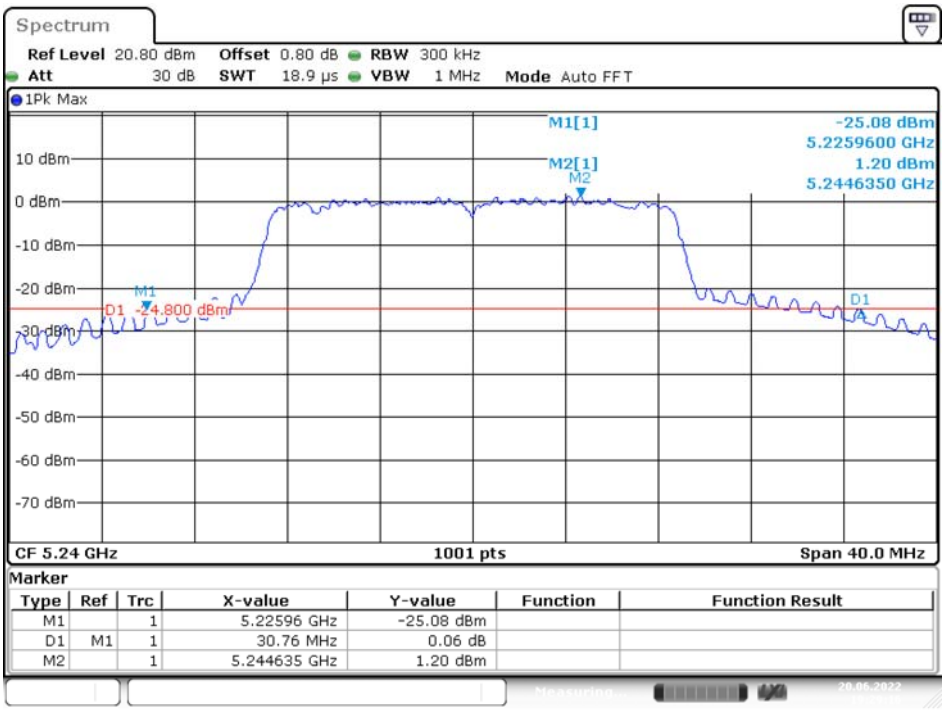
5240MHz



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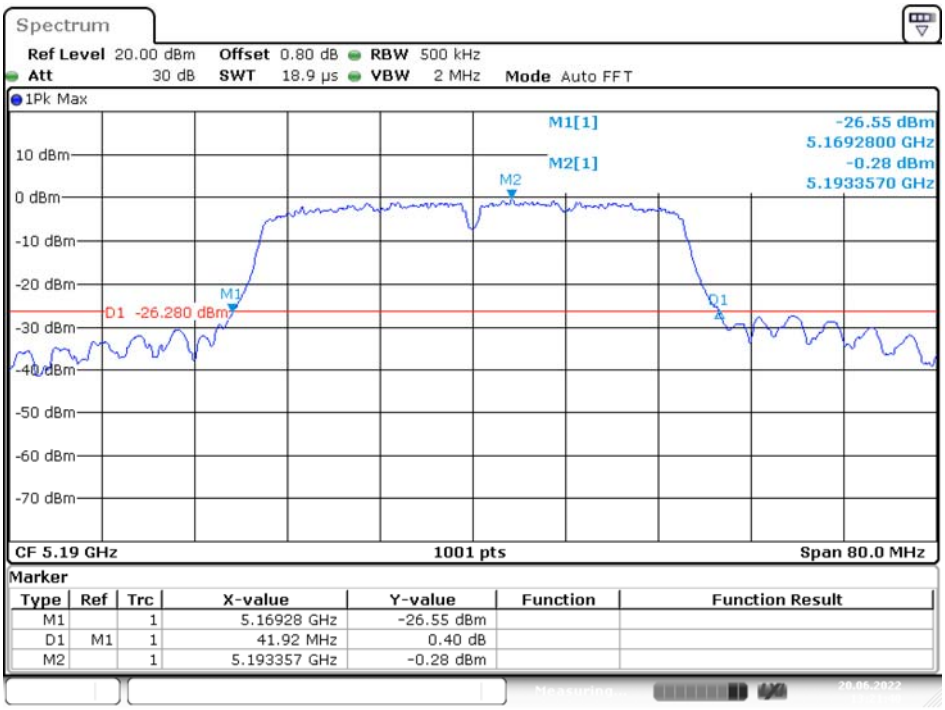
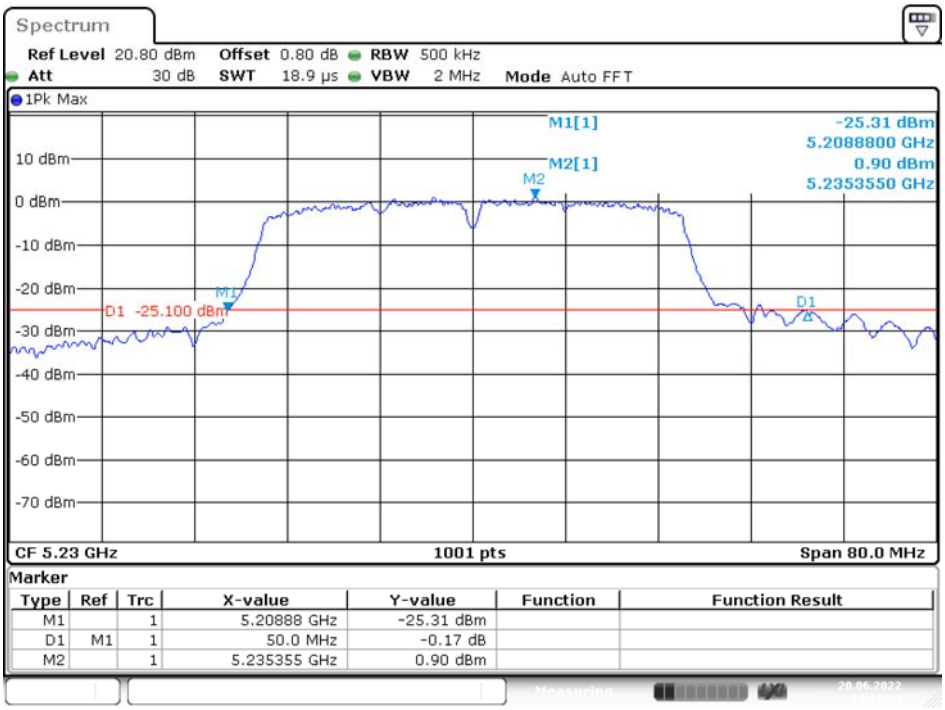
IEEE 802.11n HT40 Mode / 5150 ~ 5250MHz

5190MHz



Date: 20.JUN.2022 13:21:41

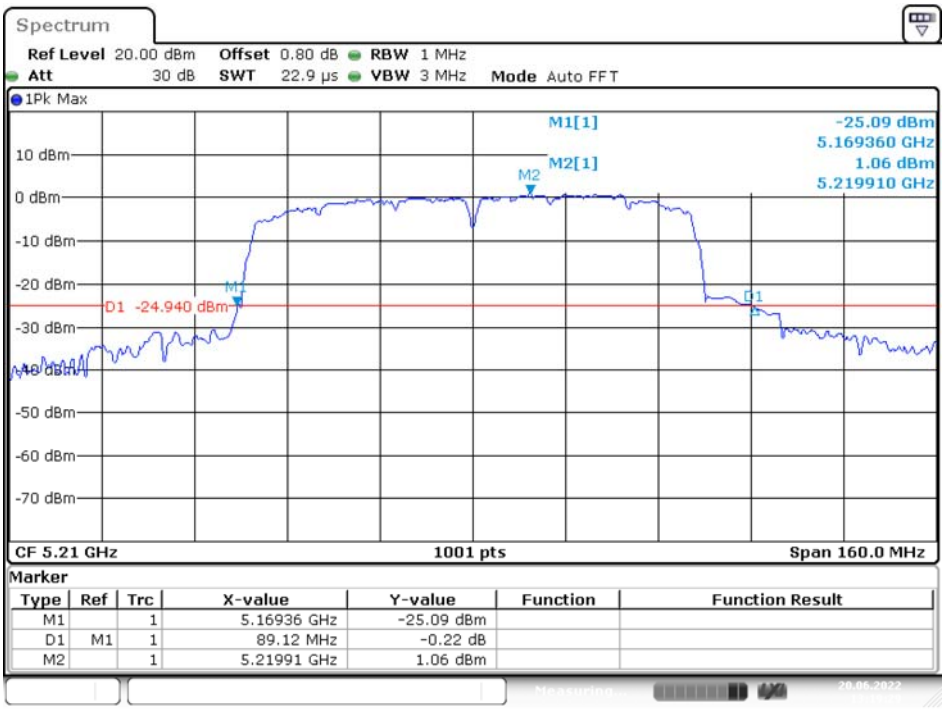
5230MHz



Date: 20.JUN.2022 14:19:24

IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

5210MHz



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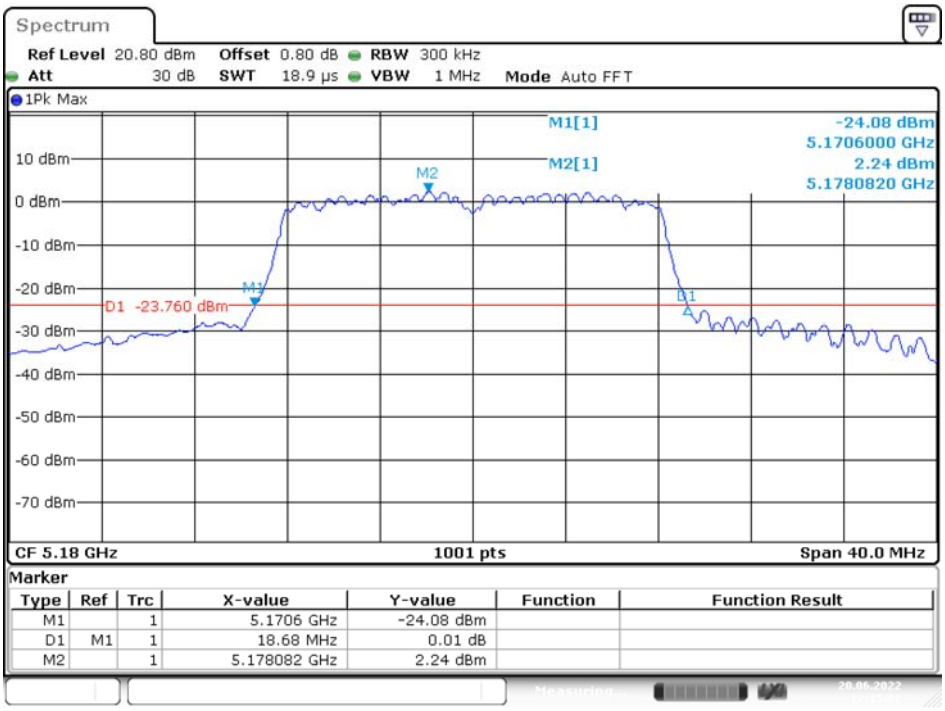
UNII-1 Band I / BW 26dBc Chain 1

IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



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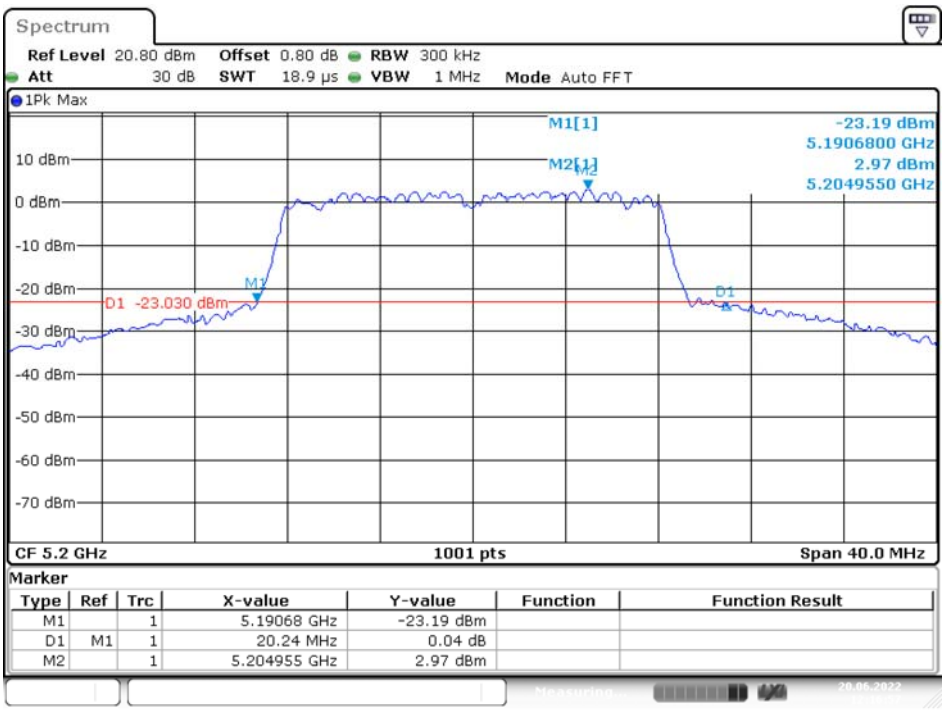
5200MHz



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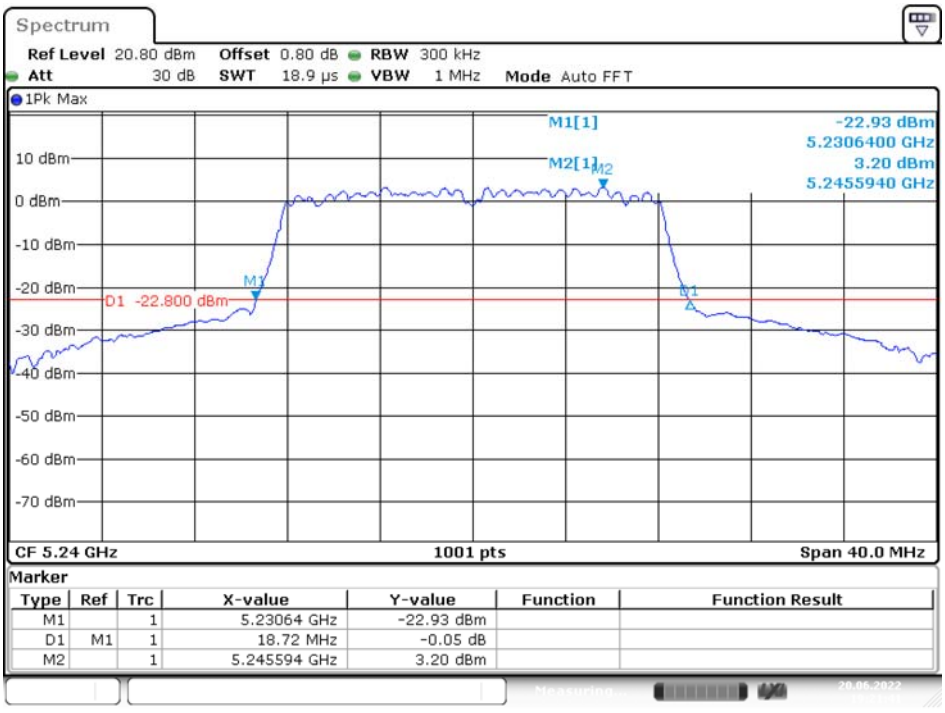
5240MHz



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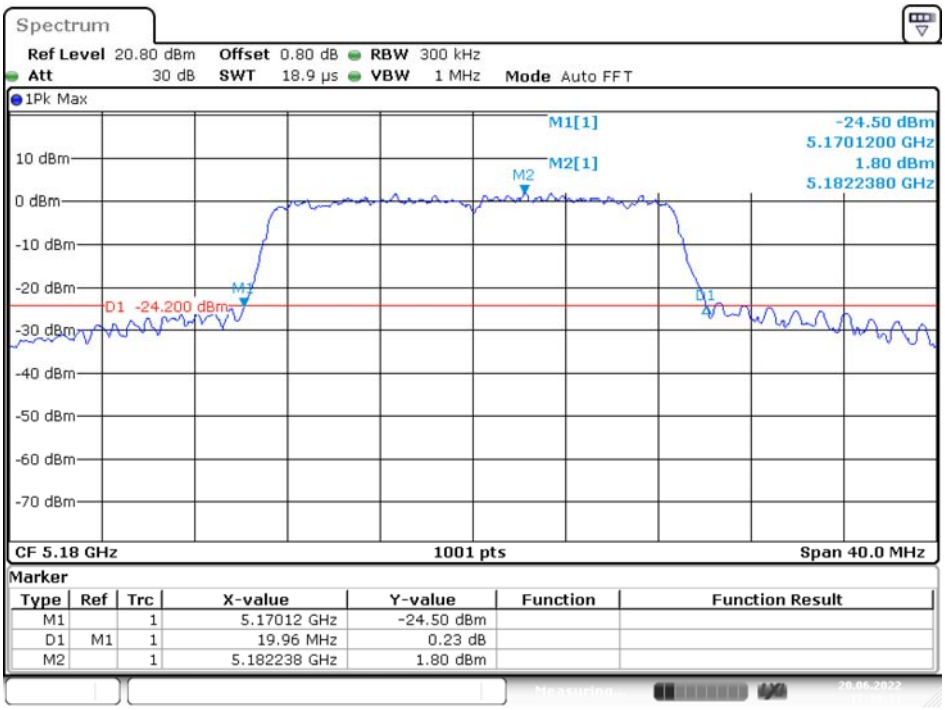
IEEE 802.11n HT20 Mode / 5150 ~ 5250MHz

5180MHz



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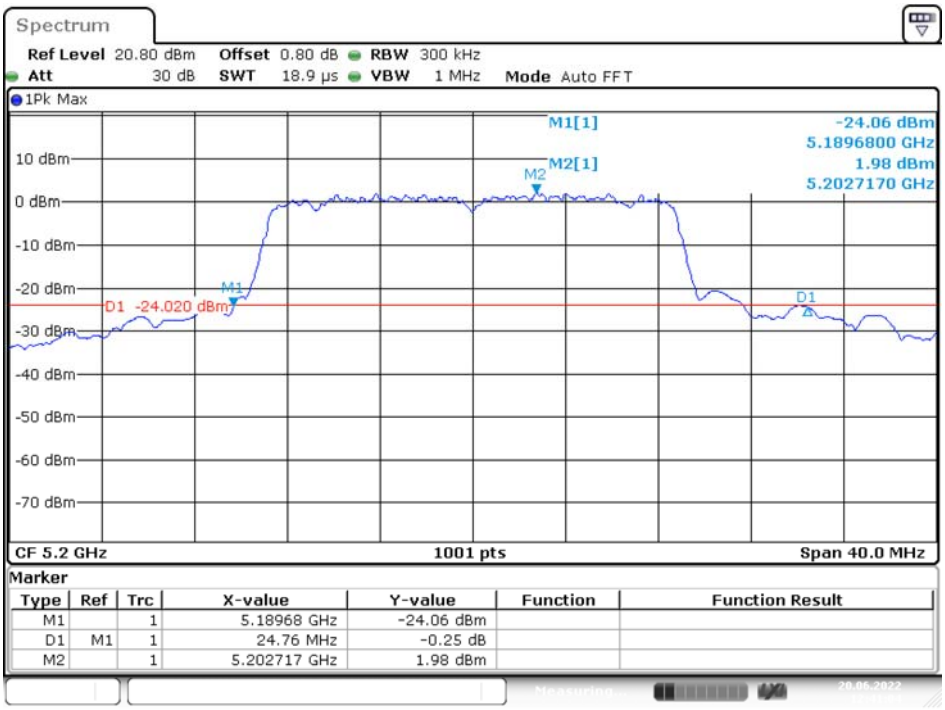
5200MHz



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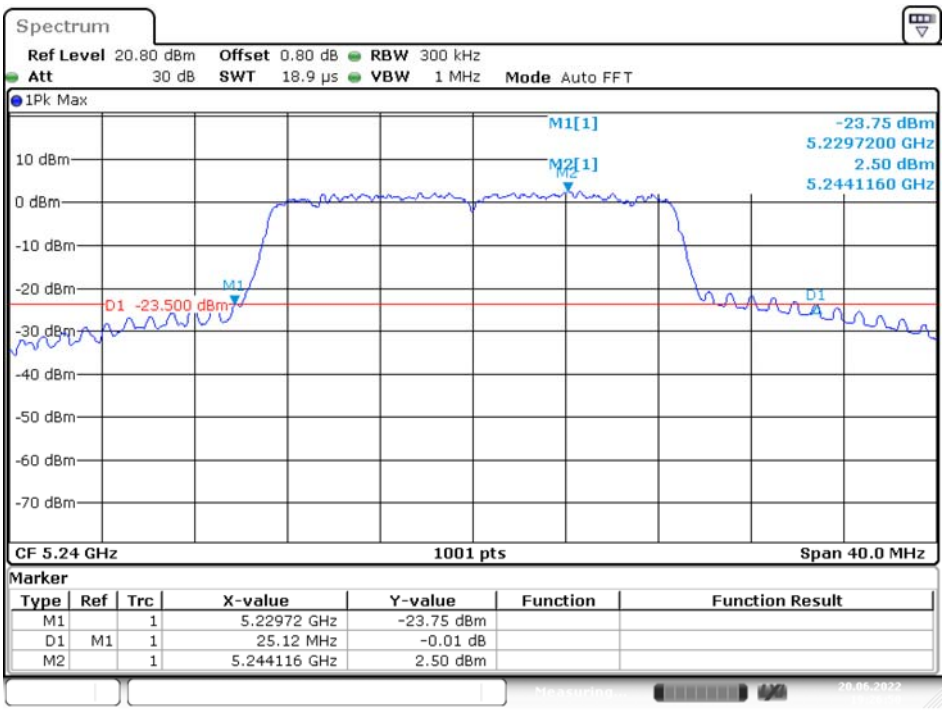
5240MHz



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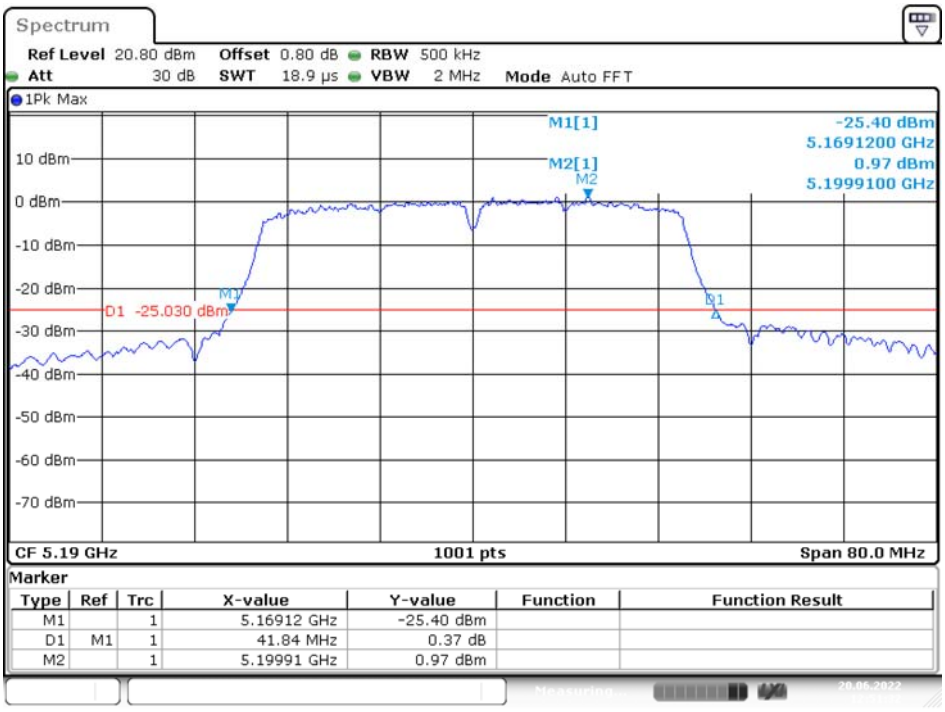
IEEE 802.11n HT40 Mode / 5150 ~ 5250MHz

5190MHz



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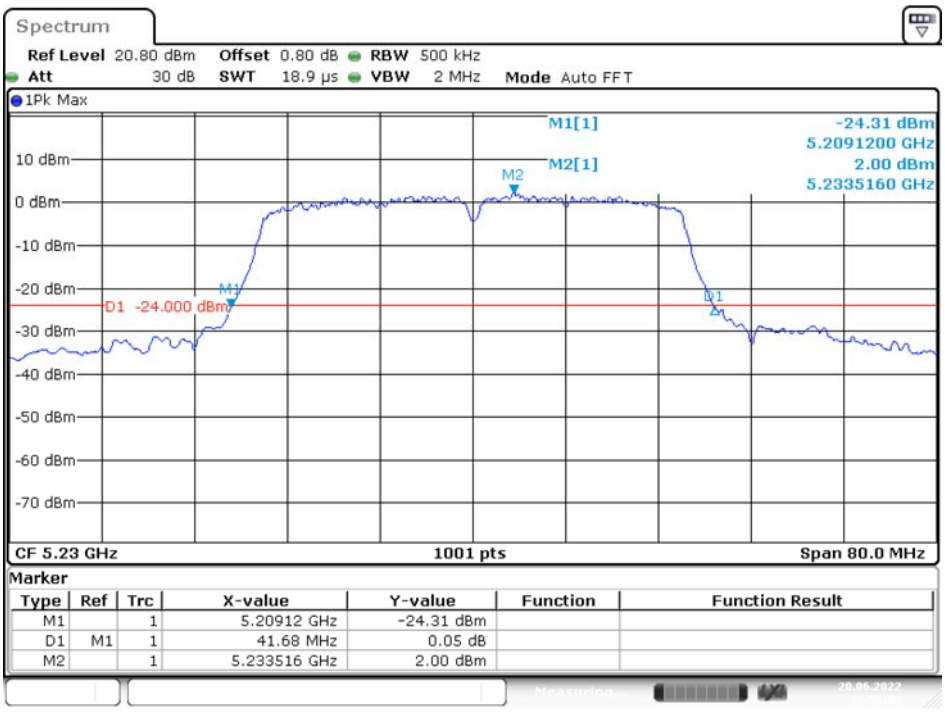
5230MHz



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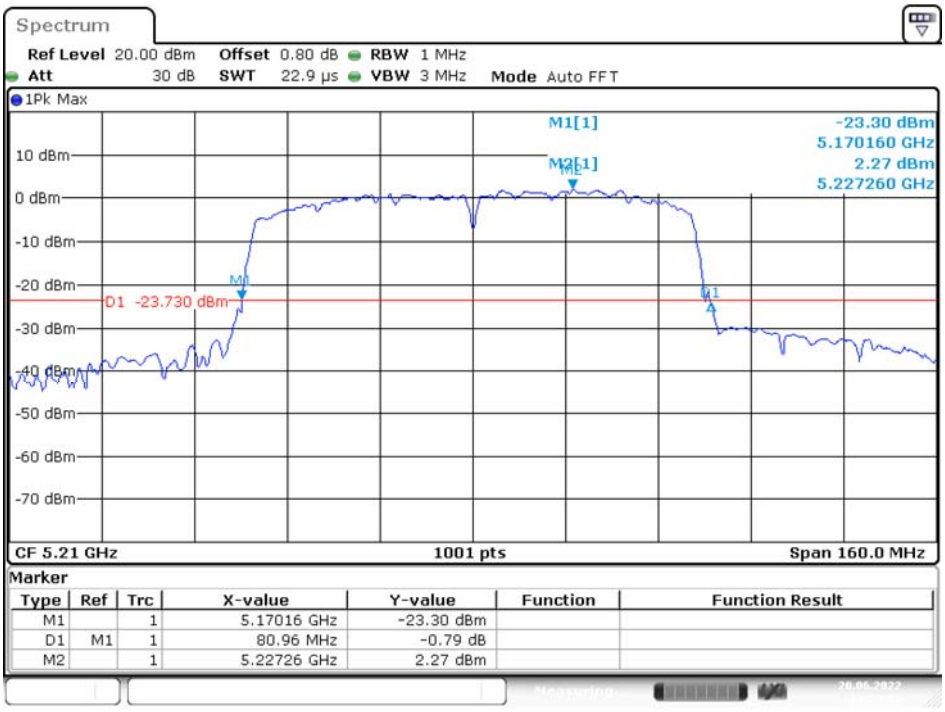
IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

5210MHz



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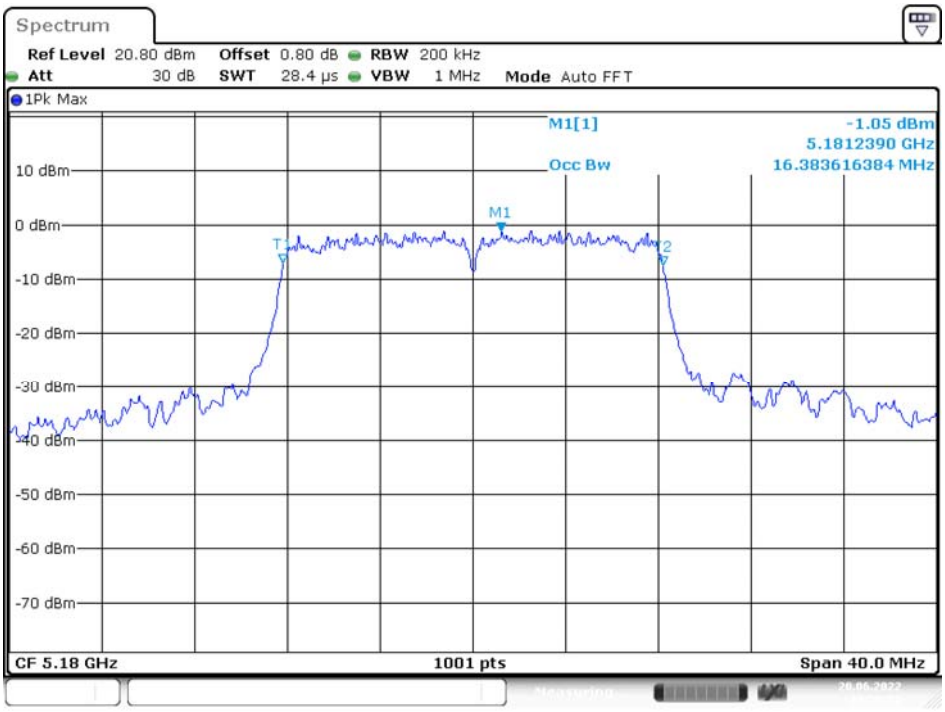
UNII-1 Band I / OBW 99% Chain 0
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



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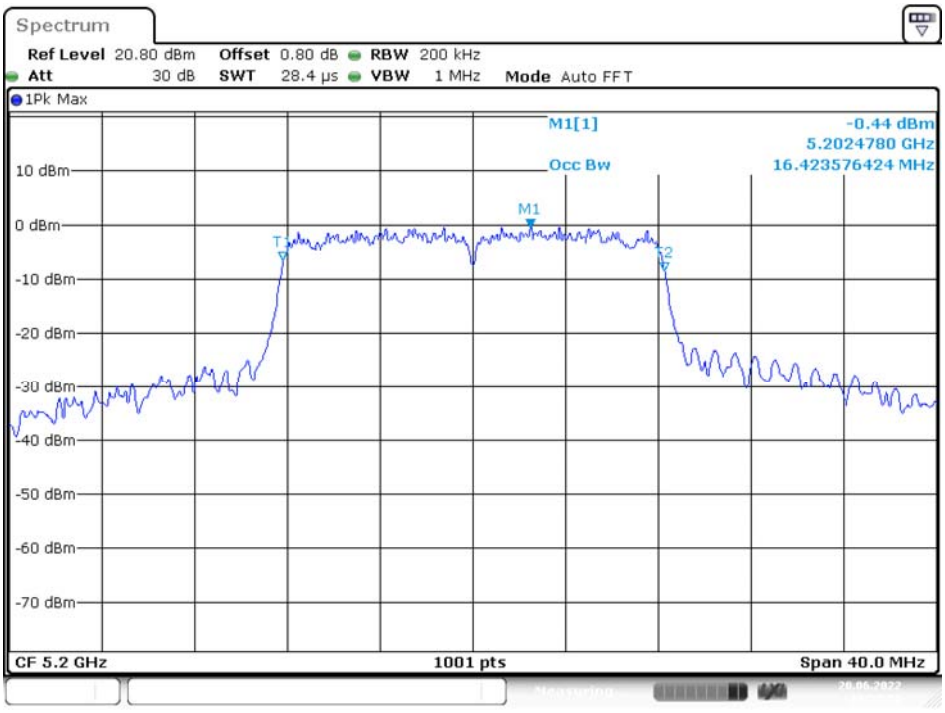
5200MHz



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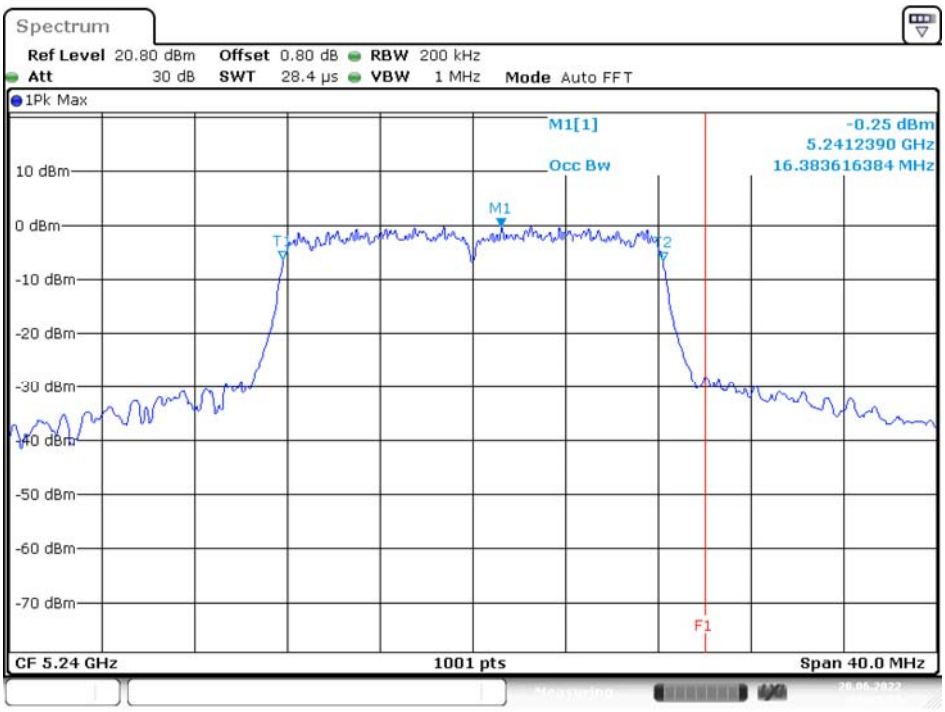
5240MHz



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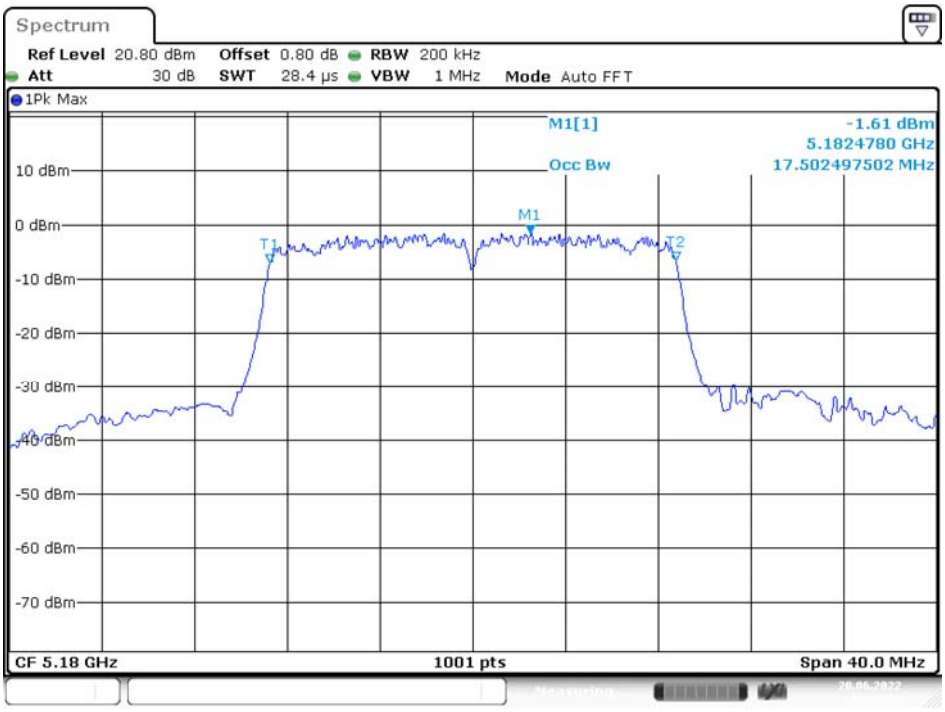
IEEE 802.11n HT20 Mode / 5150 ~ 5250MHz

5180MHz



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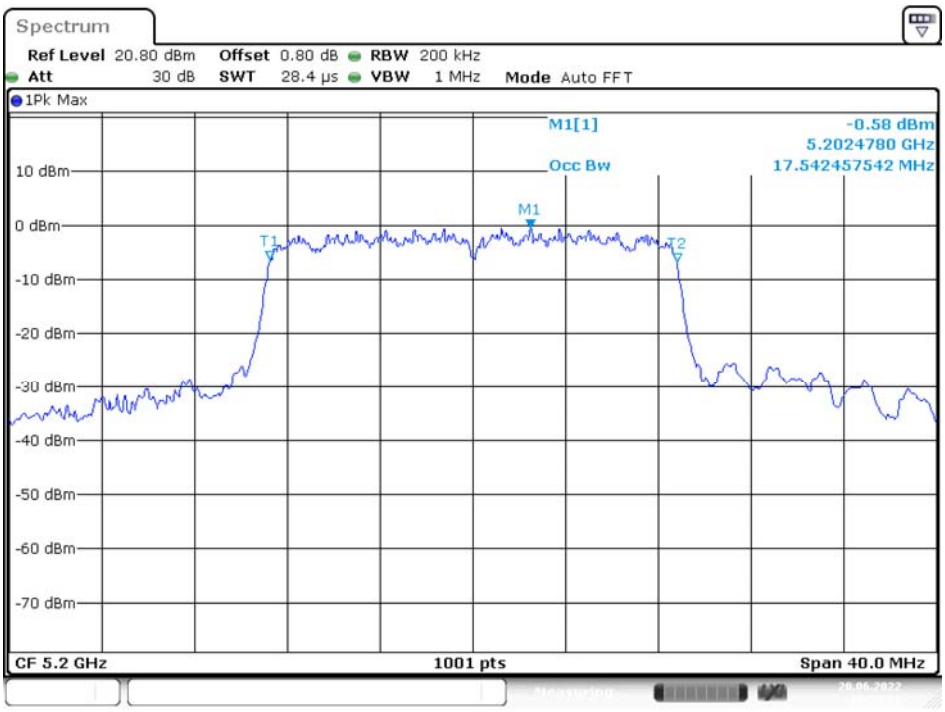
5200MHz



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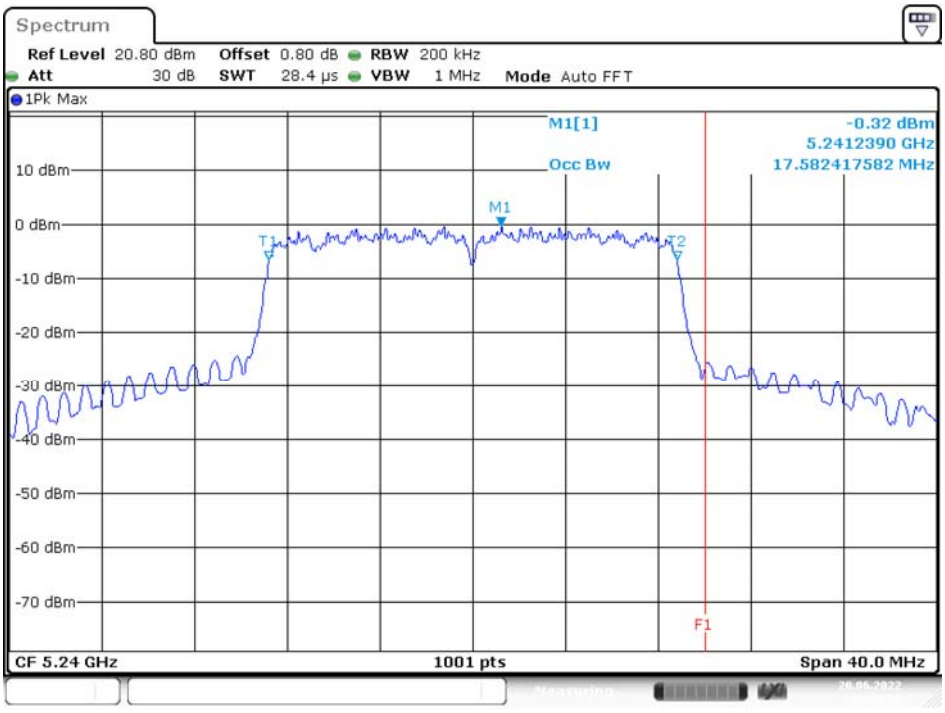
5240MHz



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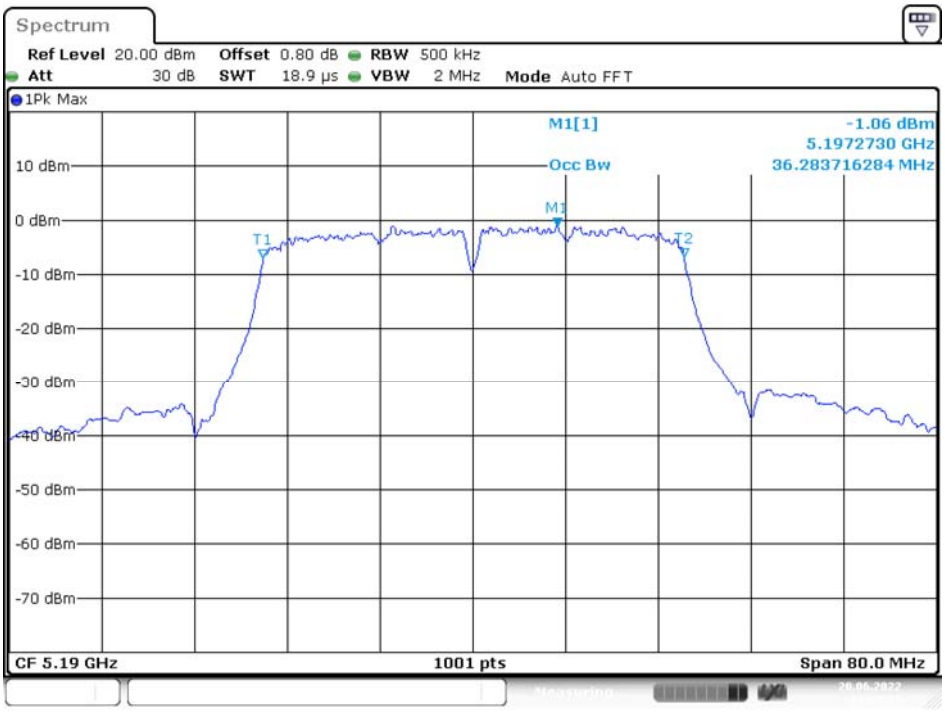
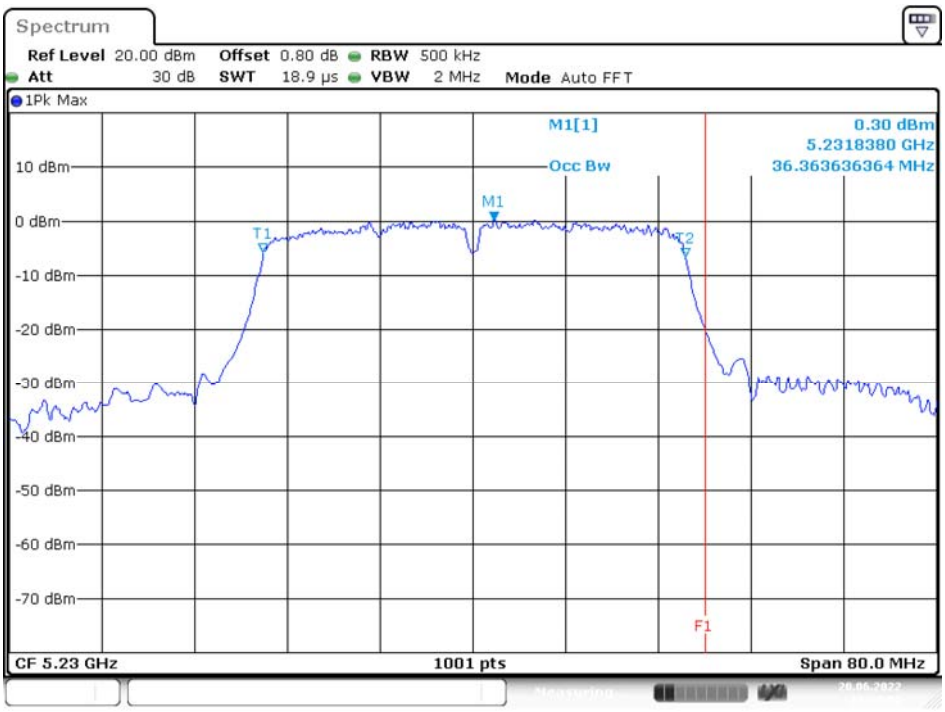
IEEE 802.11n HT40 Mode / 5150 ~ 5250MHz

5190MHz

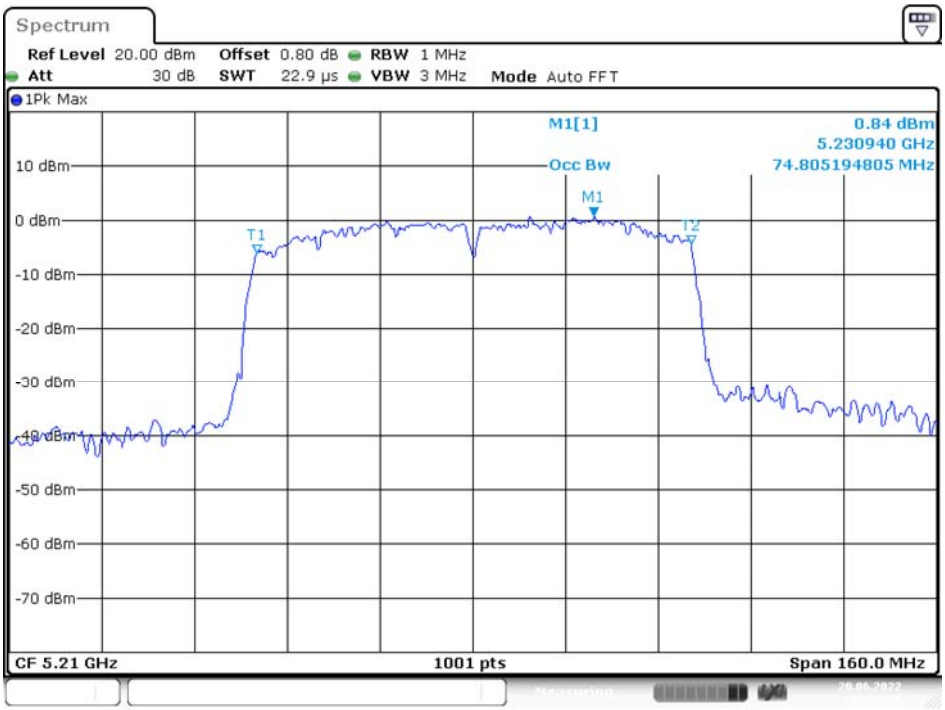


5230MHz



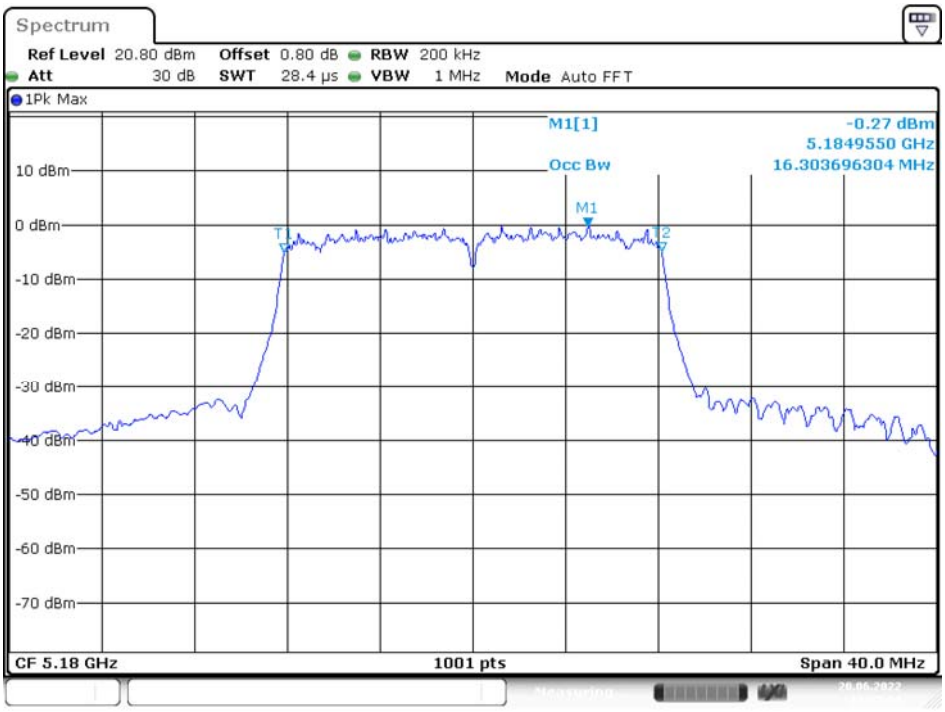
IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

5210MHz



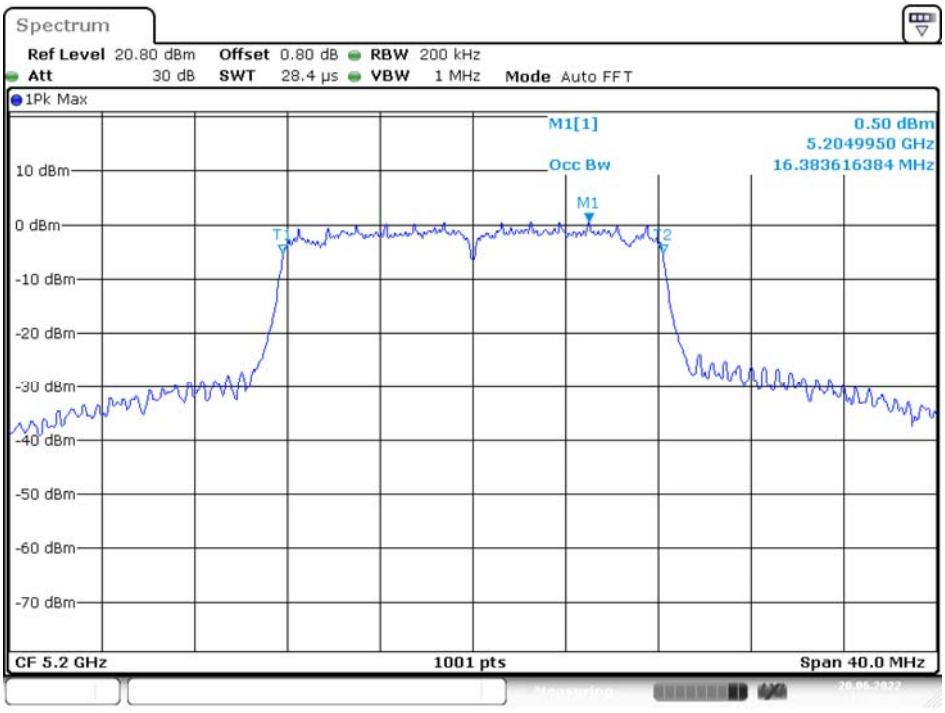
UNII-1 Band I / OBW 99% Chain 1
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



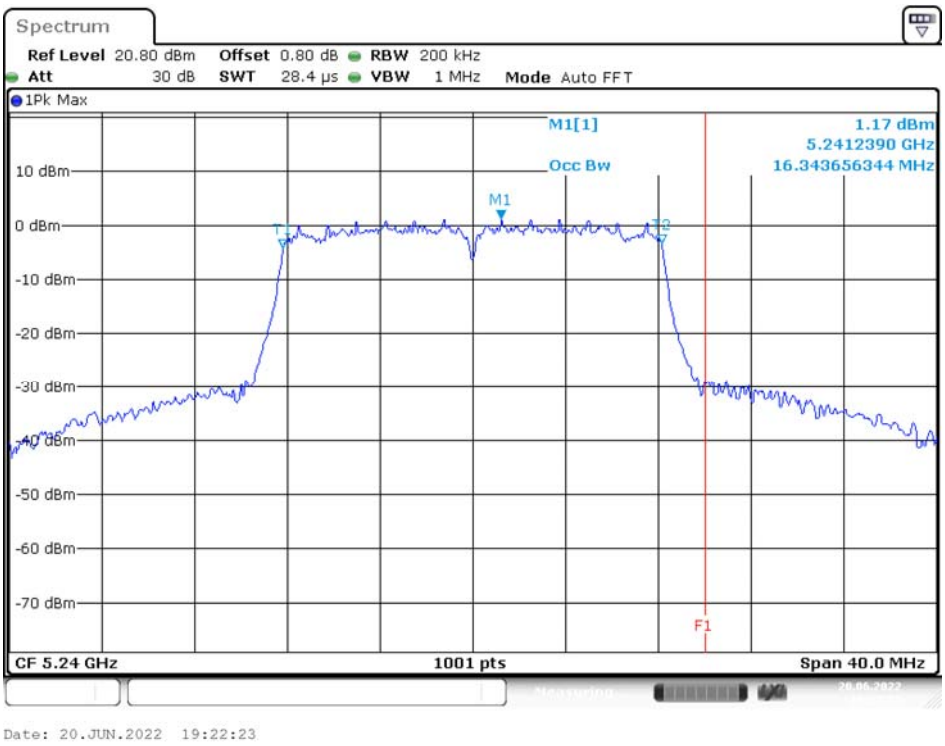
Date: 20.JUN.2022 12:15:44

5200MHz



Date: 20.JUN.2022 12:17:39

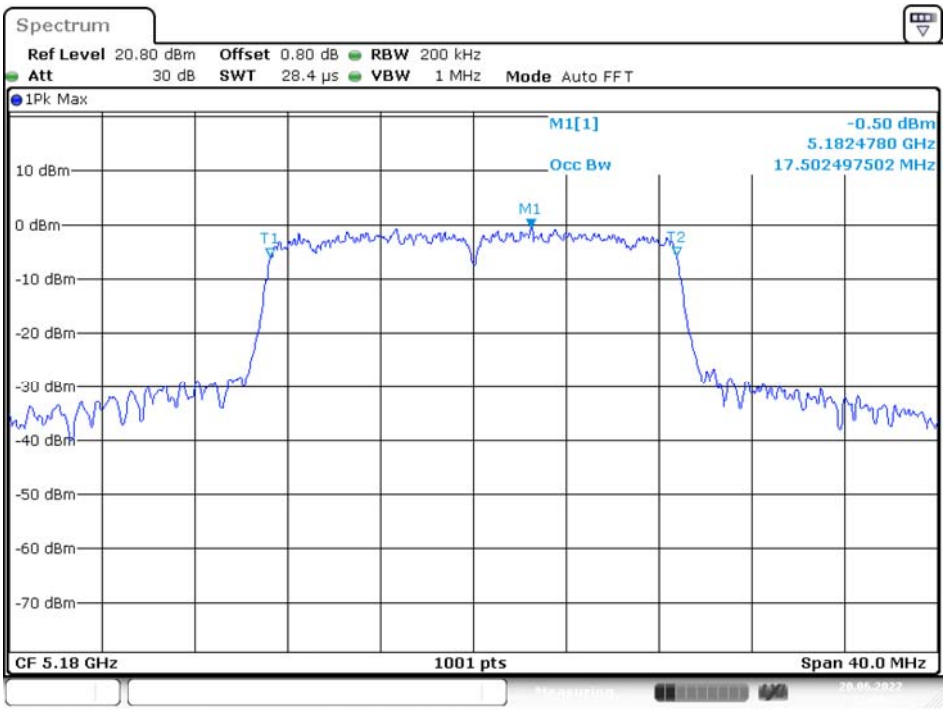
5240MHz



Date: 20.JUN.2022 19:22:23

IEEE 802.11n HT20 Mode / 5150 ~ 5250MHz

5180MHz



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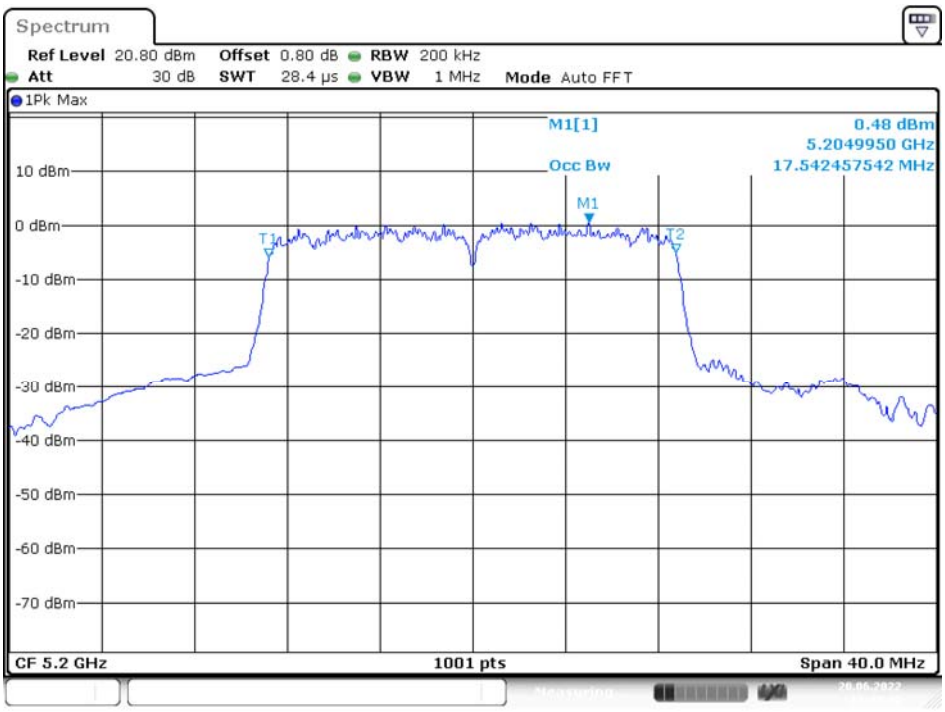
5200MHz



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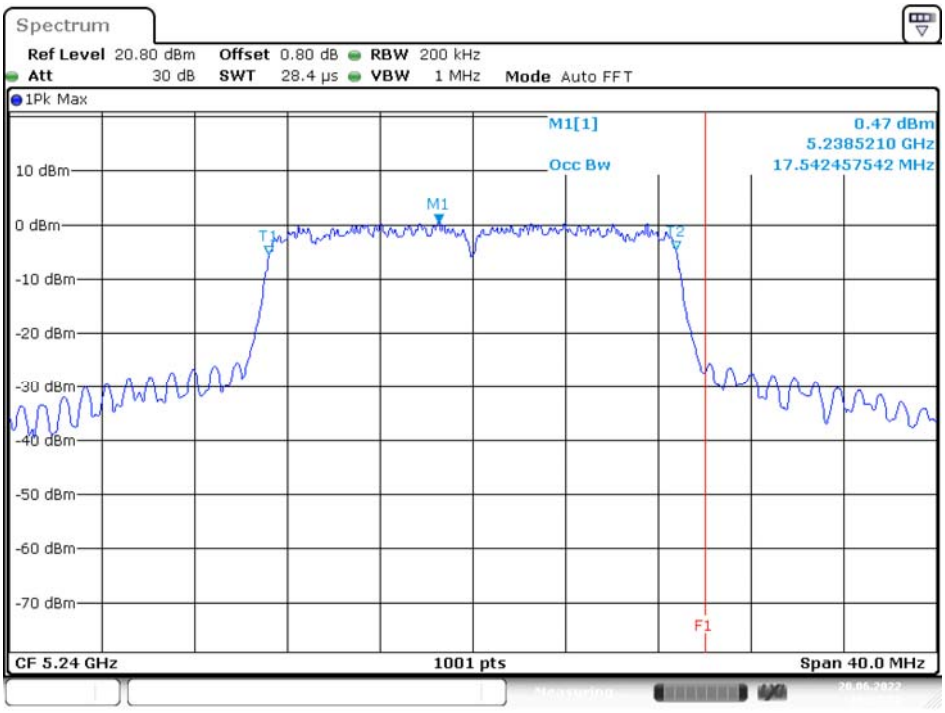
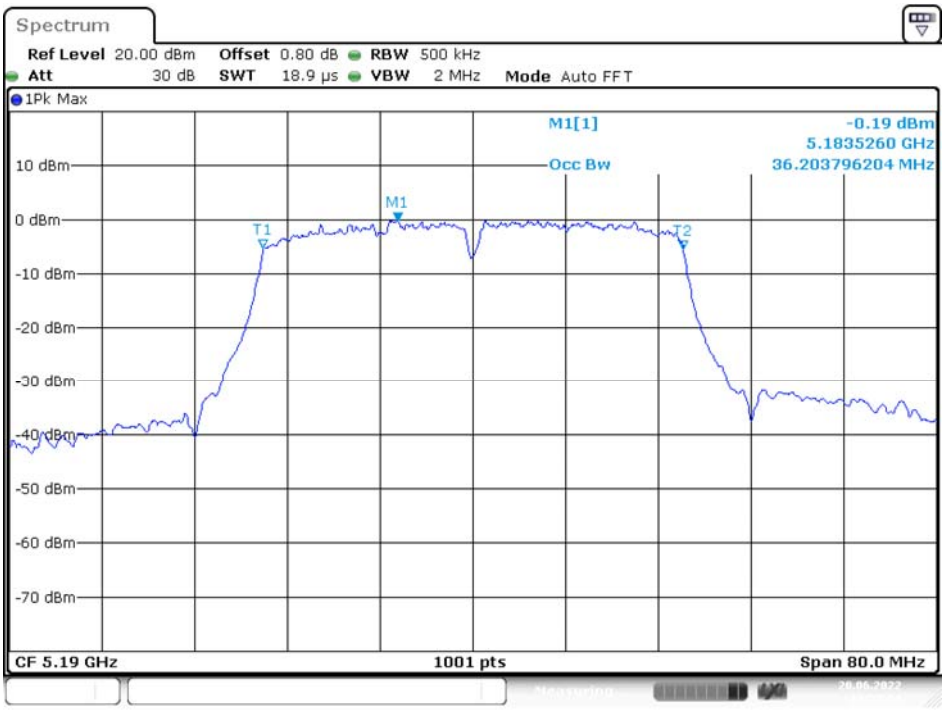
5240MHz



Date: 20.JUN.2022 19:27:32

IEEE 802.11n HT40 Mode / 5150 ~ 5250MHz

5190MHz



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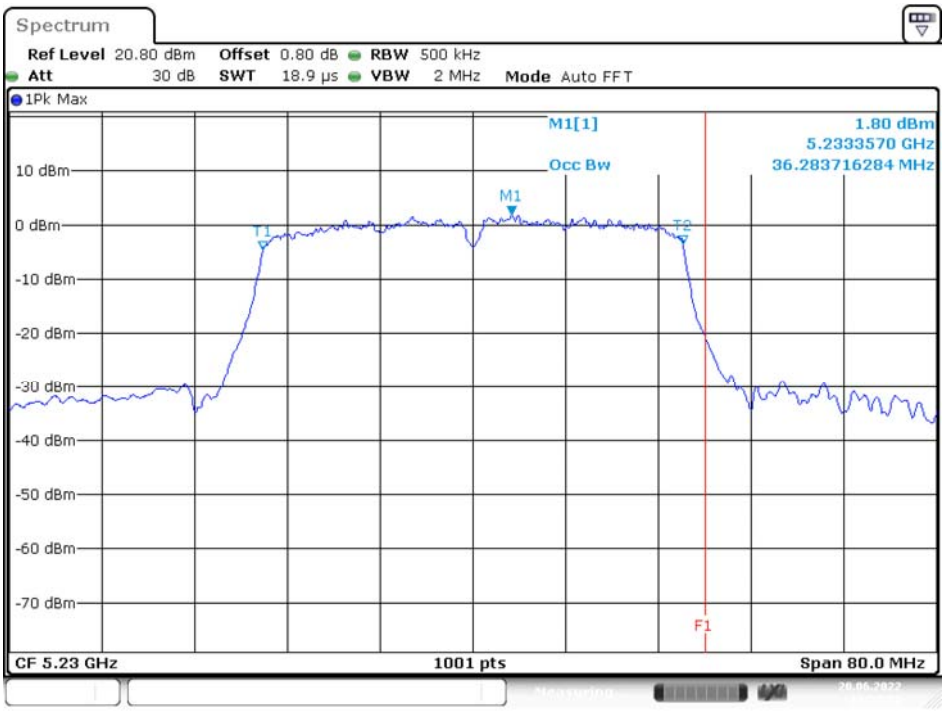
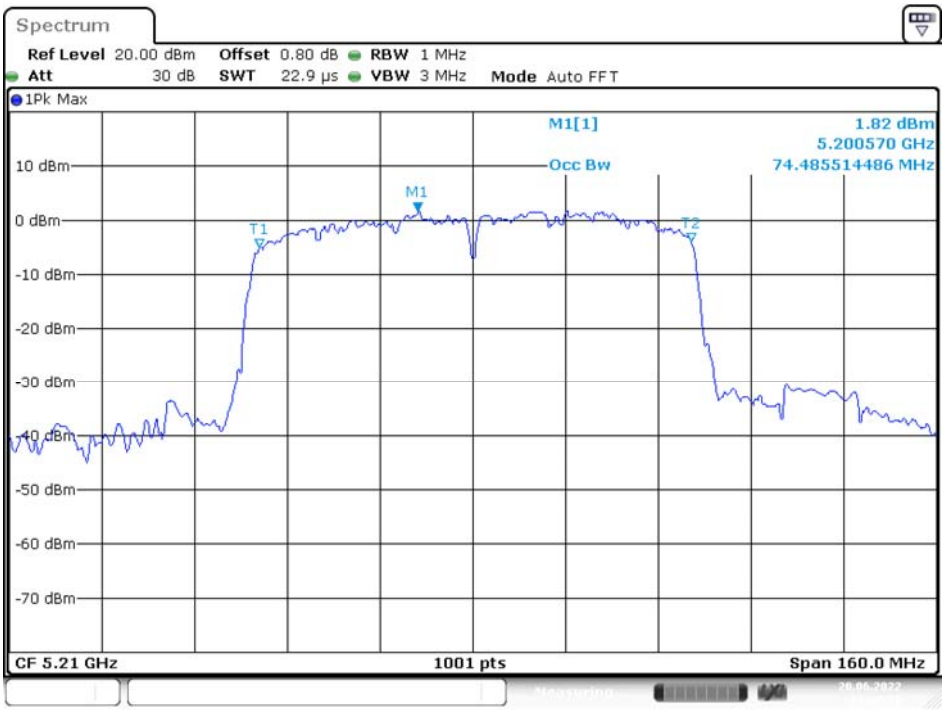
5230MHz



Date: 20.JUN.2022 12:57:12

IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

5210MHz



10 FCC §15.407(a) – Maximum Output Power

10.1 Applicable Standard

According to FCC §15.407(a):

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

10.2 Test Procedure

The use Power Meter

1. Place the EUT on a bench and set it in transmitting mode.

2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Power sensor.

Test Results

Test Mode: Transmitting

UNII-1

Mode	Channel	Frequency (MHz)	Maximum Conducted Average Output Power (dBm)			Duty Factor (dB)	Total Maximum Conducted Average Output Power With Duty Factor (dBm)	Limit (dBm)
			Chain 0	Chain 1	Total			
802.11a	36	5180	9.85	10.47	13.18	0.27	13.45	23.99
	40	5200	9.83	11.08	13.51	0.27	13.78	23.99
	48	5240	10.02	11.51	13.84	0.27	14.11	23.99
802.11 n20	36	5180	10.34	10.60	13.48	0.09	13.57	23.99
	40	5200	10.43	11.25	13.87	0.09	13.96	23.99
	48	5240	10.11	11.13	13.66	0.09	13.75	23.99
802.11 n40	38	5190	9.52	10.66	13.14	0.18	13.32	23.99
	46	5230	10.72	11.70	14.25	0.18	14.43	23.99
802.11 ac20	36	5180	9.95	10.29	13.13	0.18	13.31	23.99
	40	5200	10.33	11.13	13.76	0.18	13.94	23.99
	48	5240	9.97	11.01	13.53	0.18	13.71	23.99
802.11 ac40	38	5190	9.40	10.63	13.07	0.22	13.29	23.99
	46	5230	10.50	11.70	14.15	0.22	14.37	23.99
802.11 ac80	42	5210	9.45	10.55	13.05	0.41	13.46	23.99

According to FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For power measurements on IEEE 802.11 devices, Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

The device have four antenna, so array gain is 0 dB.

11 FCC §15.407(a) – Power Spectral Density

11.1 Applicable Standard

According to FCC §15.407(a):

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

11.2 Test Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedyres New Rules v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section F: Maximum power spectral density (PPSD)

Test Results

Test Mode: Transmitting

UNII-1

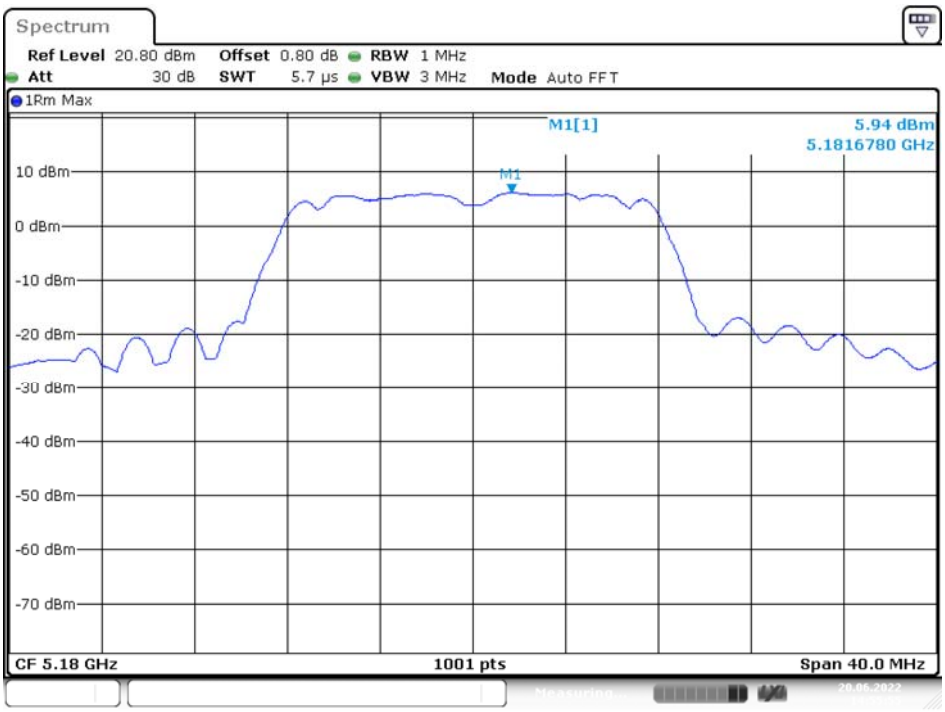
Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm)			Duty Factor (dB)	Power Spectral Density with duty factor (dBm/MHz)	Limit (dBm)
			Chain 0	Chain 1	Total			
802.11a	36	5180	5.94	7.82	9.99	0.27	10.26	10.99
	40	5200	6.47	7.96	10.29	0.27	10.56	10.99
	48	5240	6.64	8.13	10.46	0.27	10.73	10.99
802.11 n20	36	5180	5.71	6.81	9.31	0.09	9.40	10.99
	40	5200	6.07	7.08	9.61	0.09	9.70	10.99
	48	5240	6.20	7.84	10.11	0.09	10.20	10.99
802.11 n40	38	5190	2.69	3.87	6.33	0.18	6.51	10.99
	46	5230	4.14	5.08	7.65	0.18	7.83	10.99
802.11 ac80	42	5210	0.23	1.61	3.98	0.41	4.39	10.99

Please refer to the following plots

Test Mode: Transmitting

UNII-1 Band I PSD Chain 0
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



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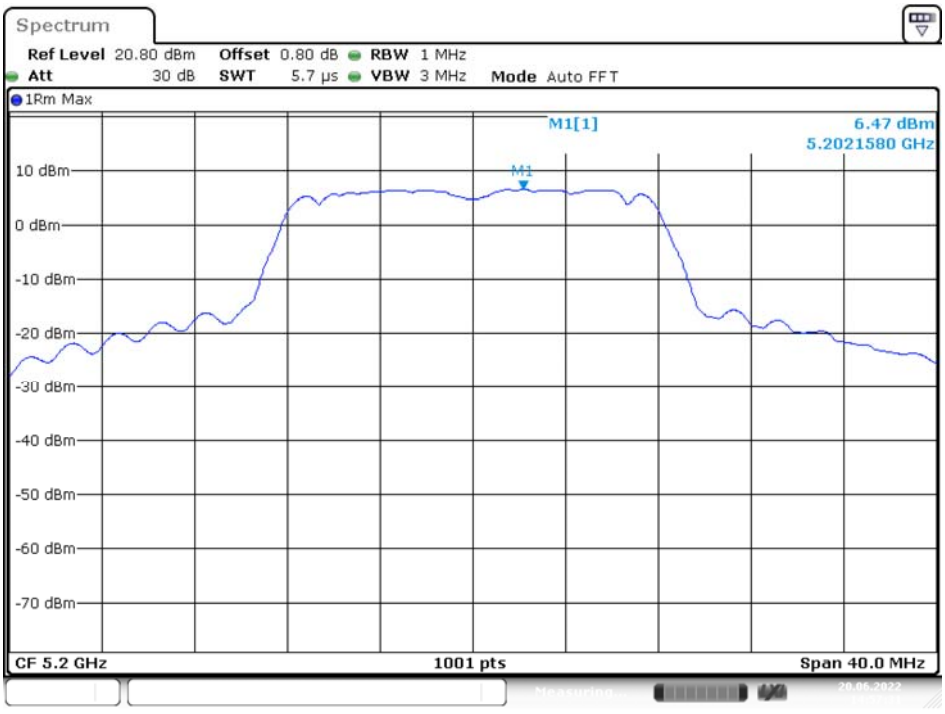
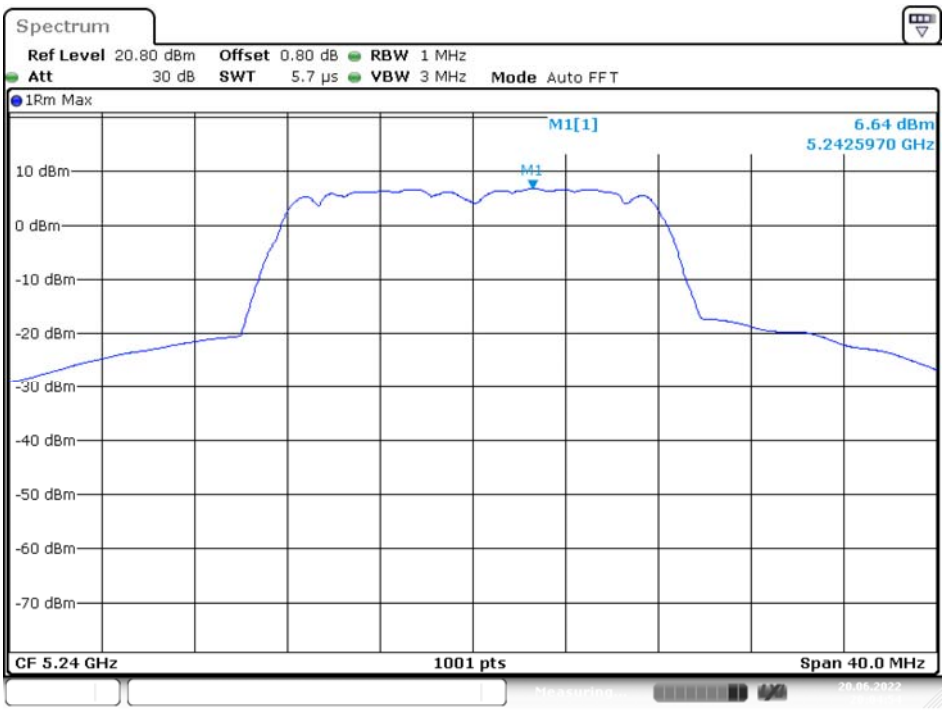
5200MHz



Date: 20.JUN.2022 14:57:31

5240MHz



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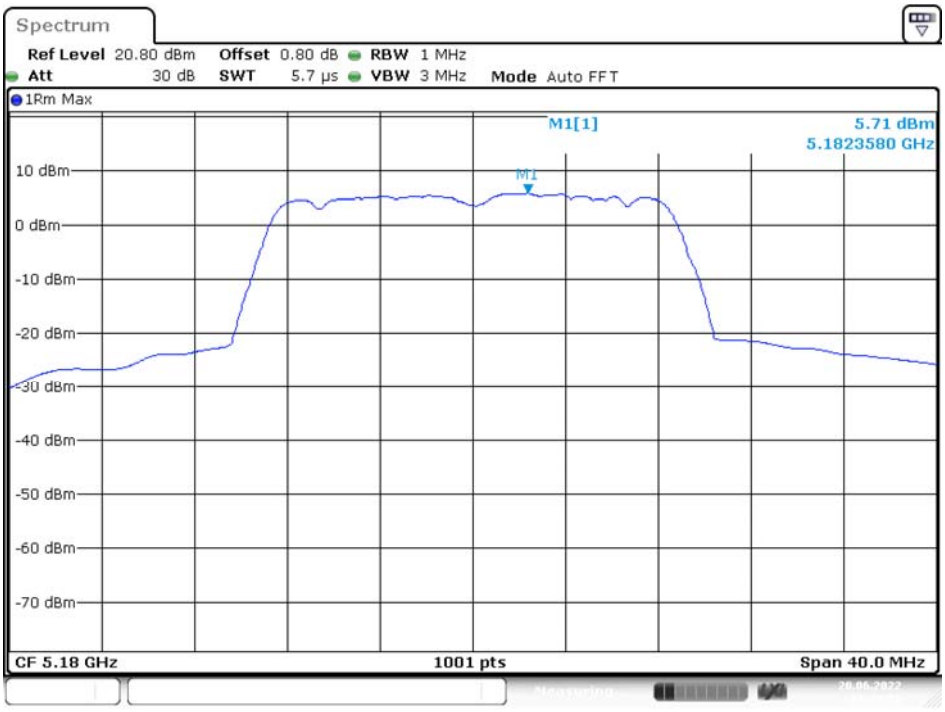
IEEE 802.11n HT20 Mode / 5150 ~ 5250MHz

5180MHz



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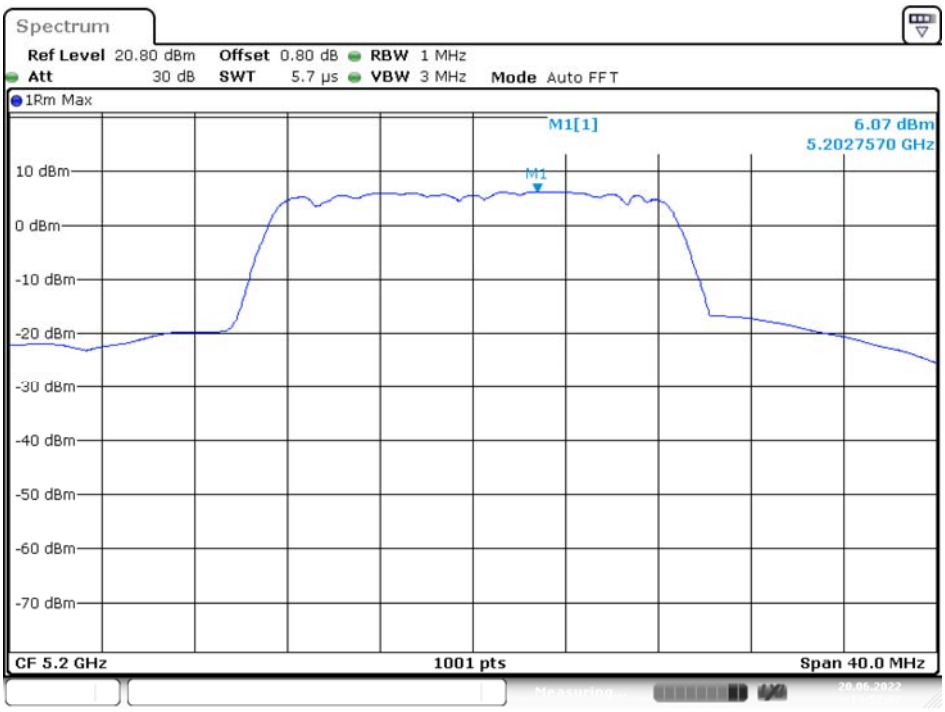
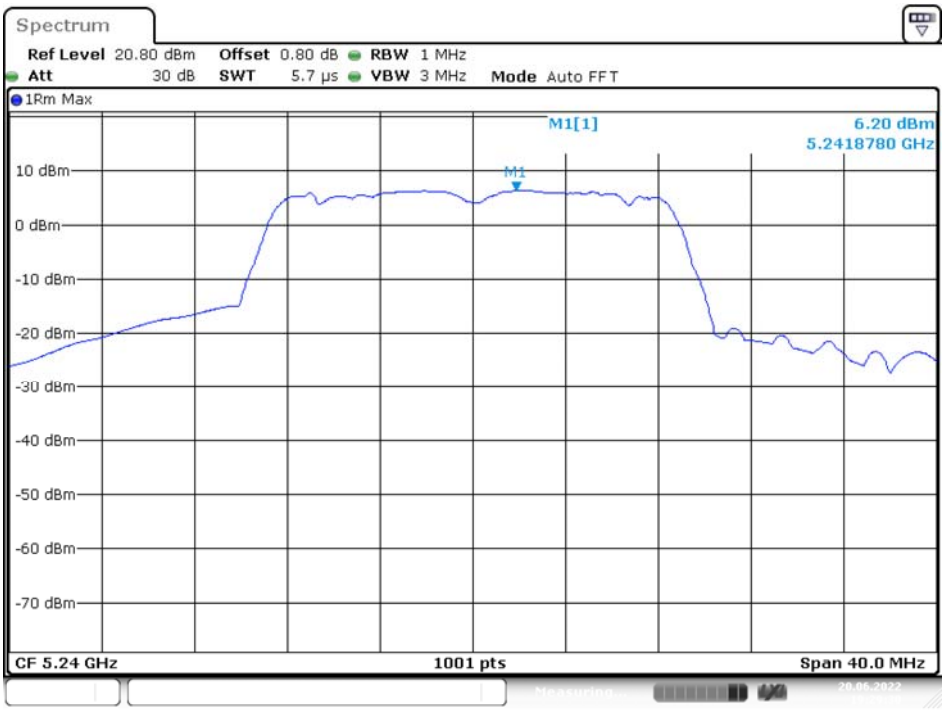
5200MHz



Date: 20.JUN.2022 14:52:02

5240MHz



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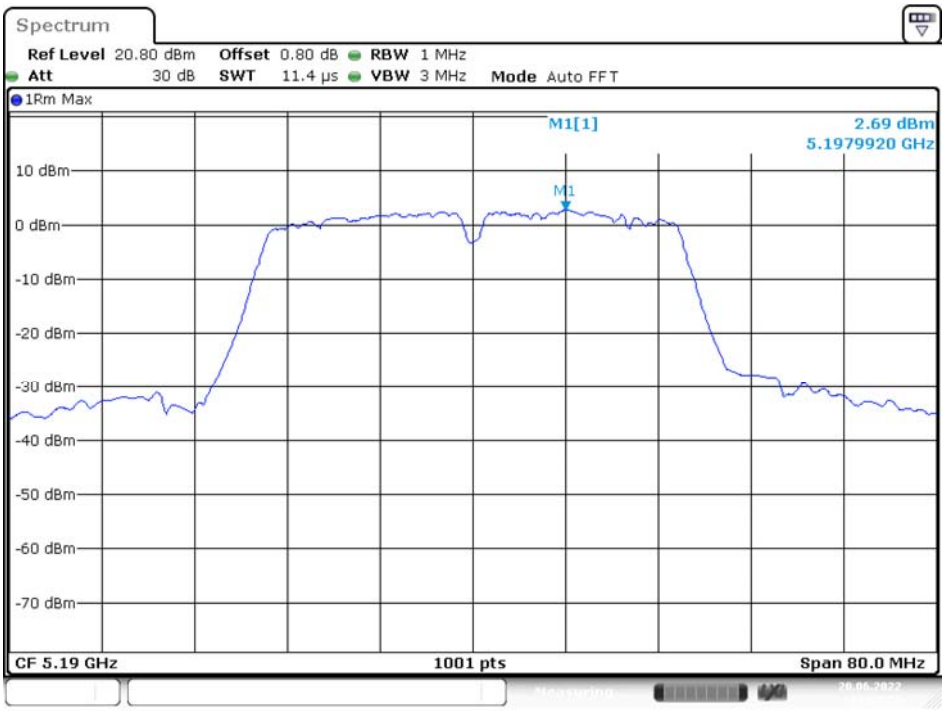
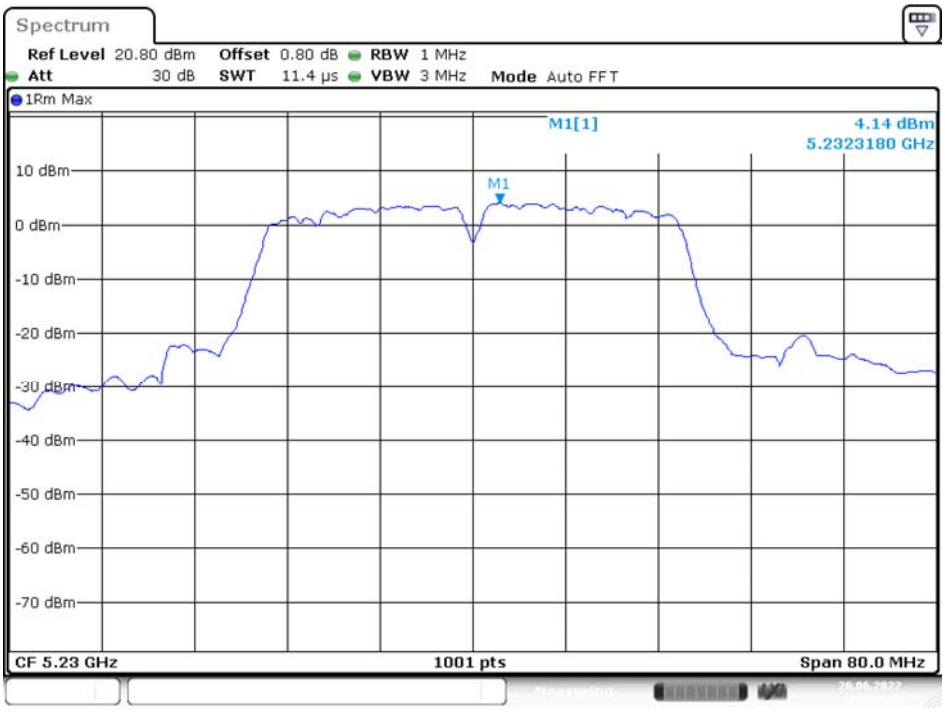
IEEE 802.11n HT40 Mode / 5150 ~ 5250MHz

5190MHz

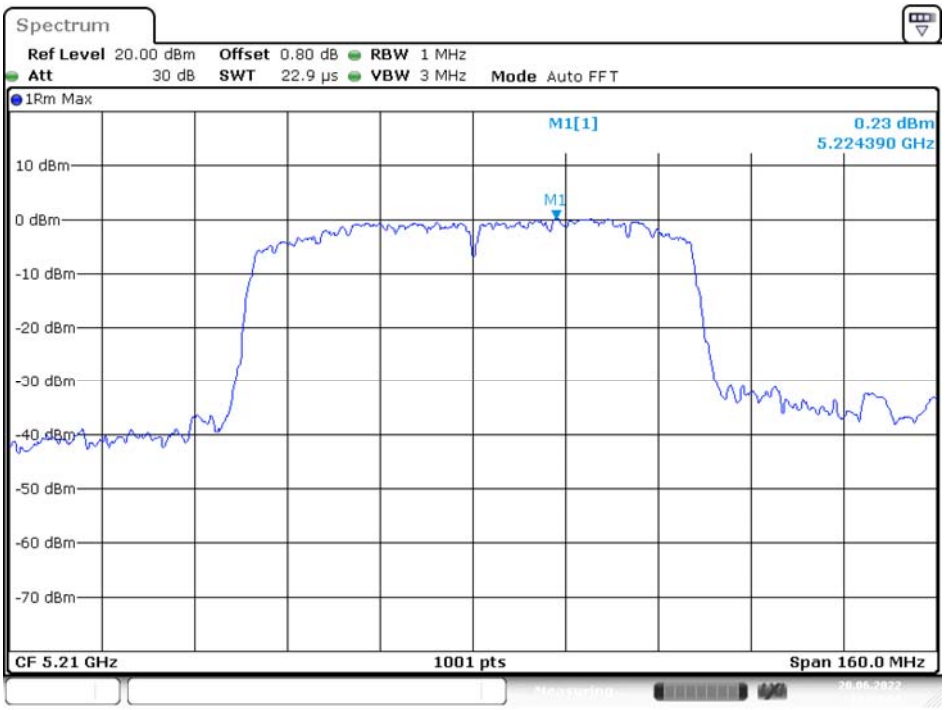


5230MHz



IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

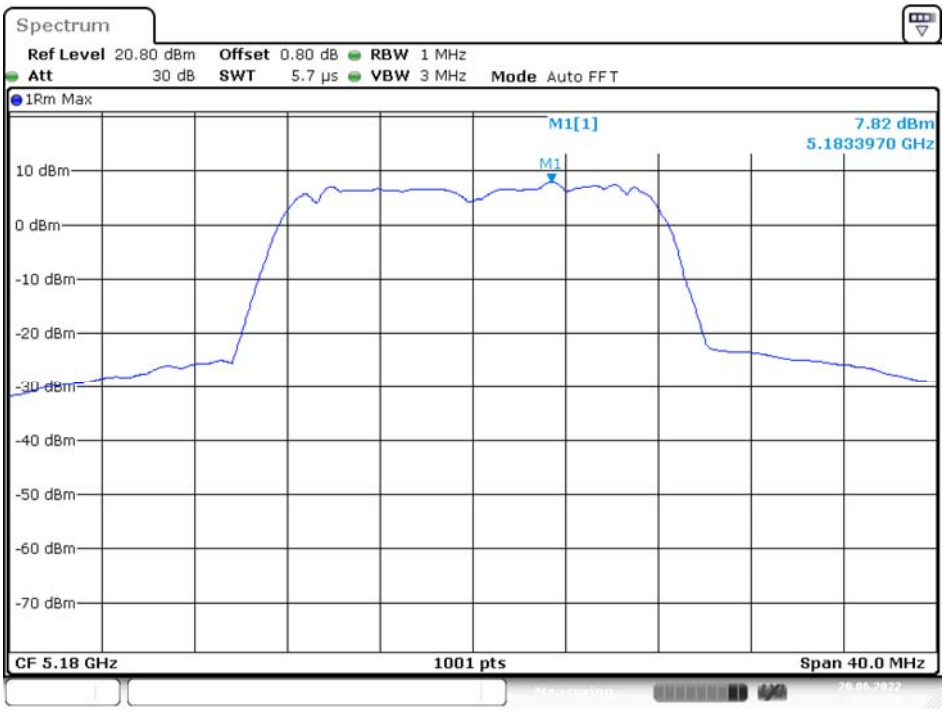
5210MHz



Date: 20.JUN.2022 13:19:44

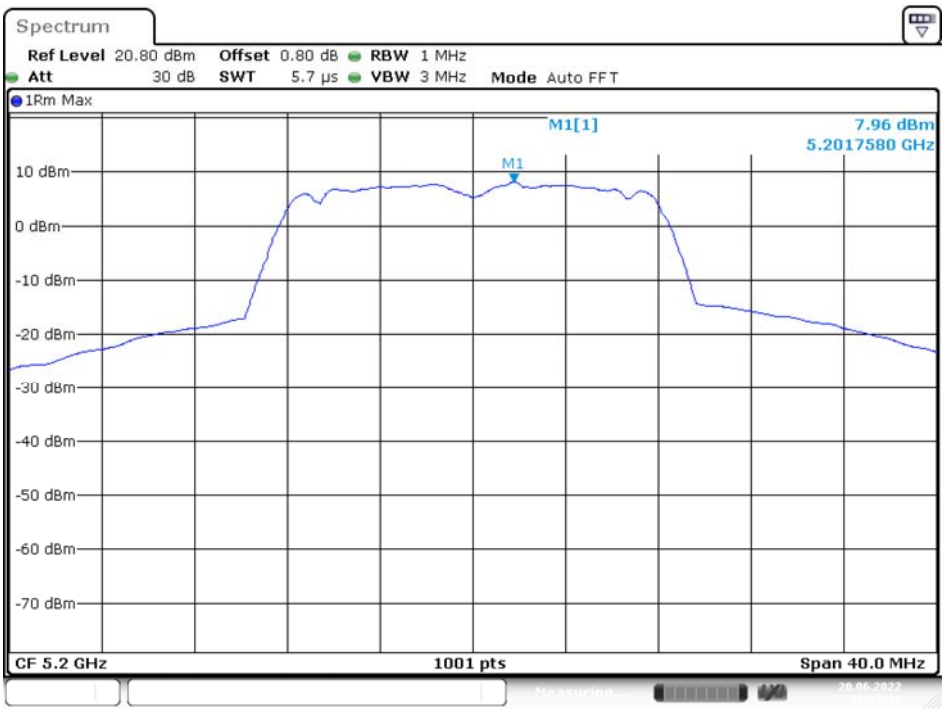
UNII-1 Band I PSD Chain 1
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



Date: 20.JUN.2022 12:15:16

5200MHz



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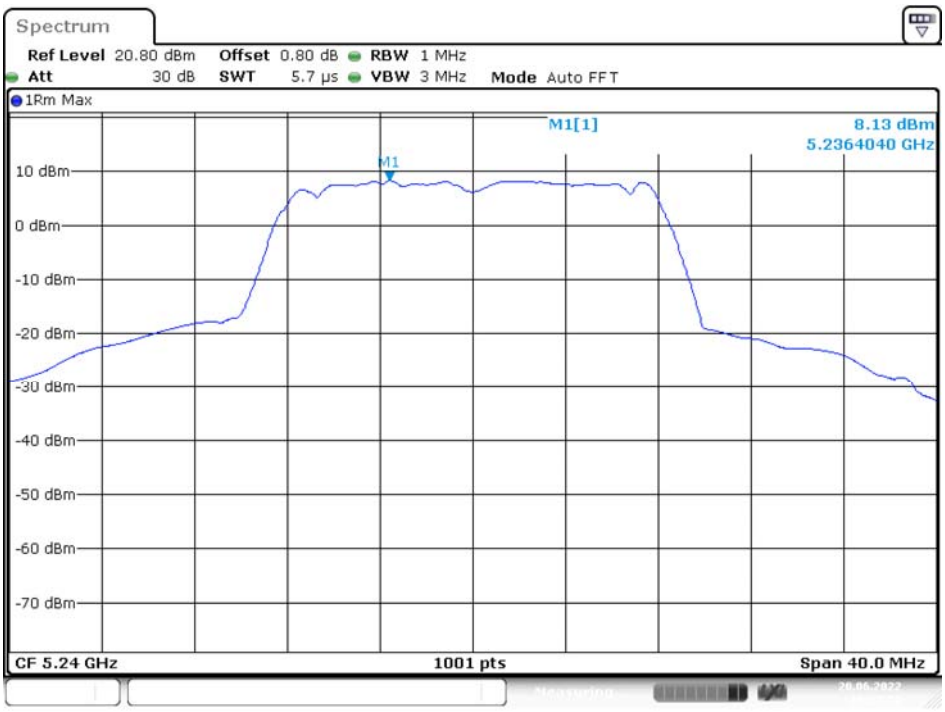
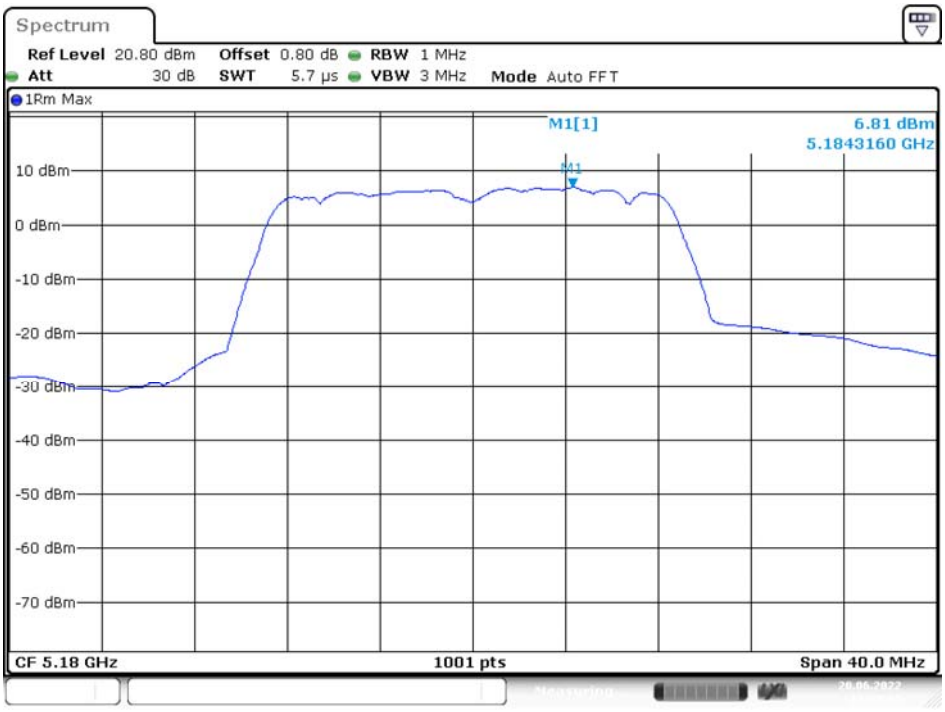
5240MHz

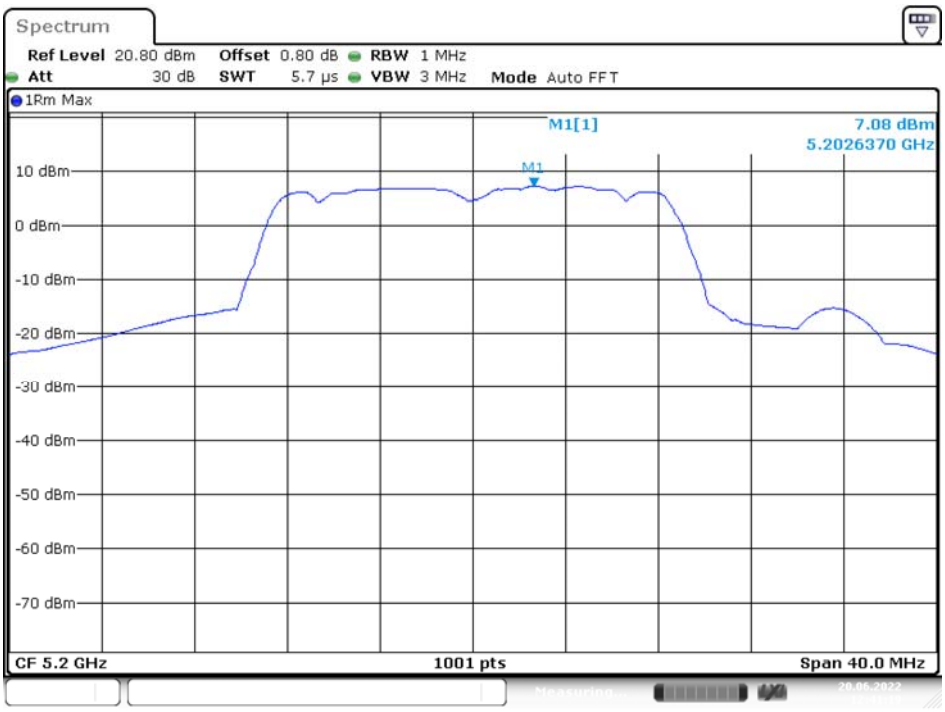


IEEE 802.11n HT20 Mode / 5150 ~ 5250MHz

5180MHz



5200MHz



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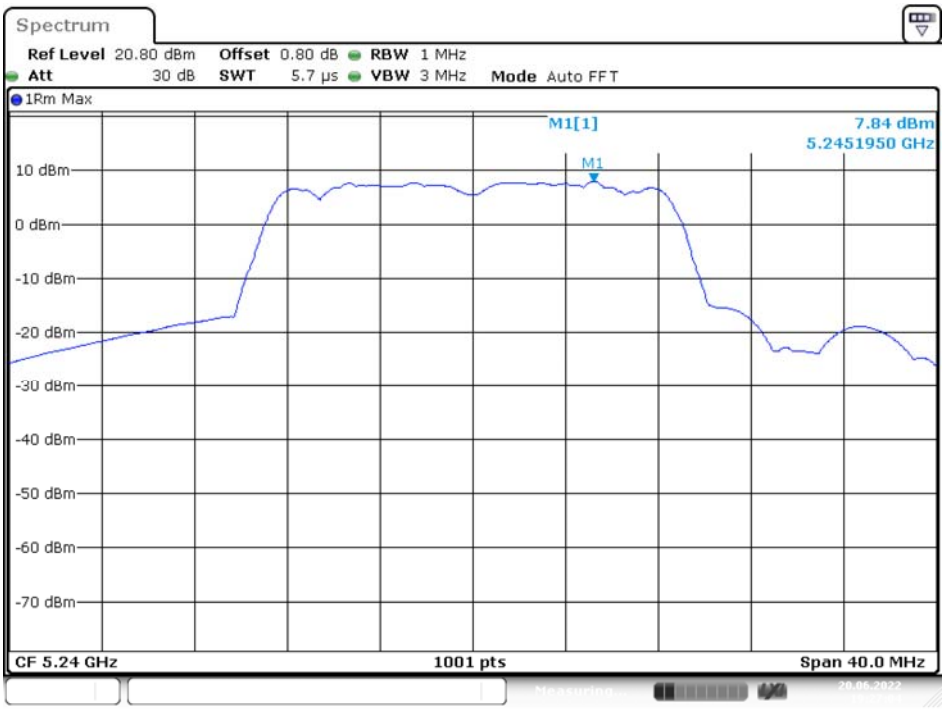
5240MHz



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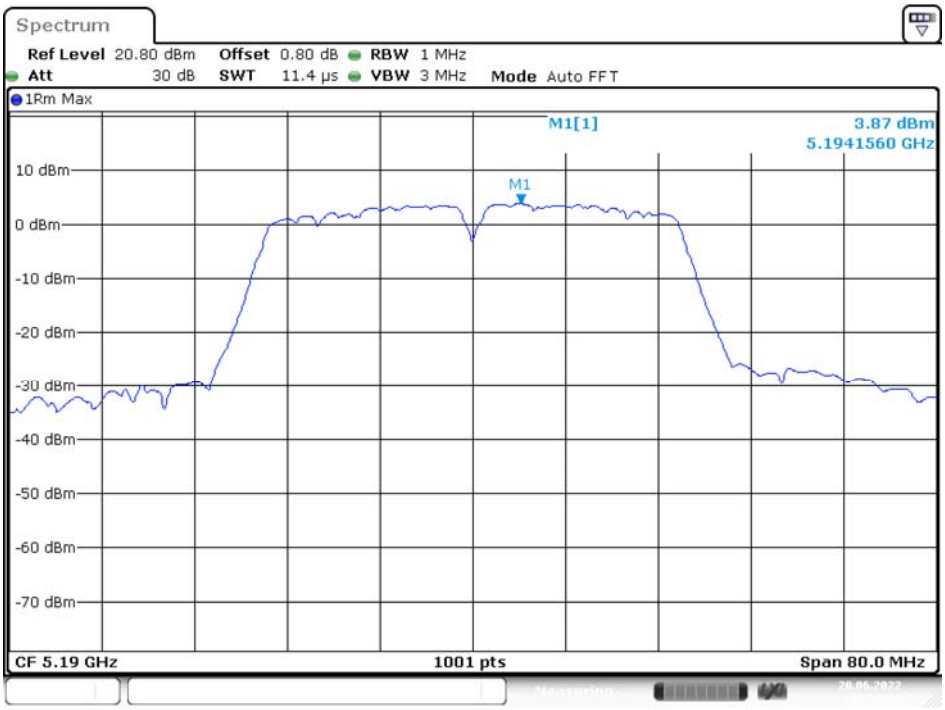
IEEE 802.11n HT40 Mode / 5150 ~ 5250MHz

5190MHz



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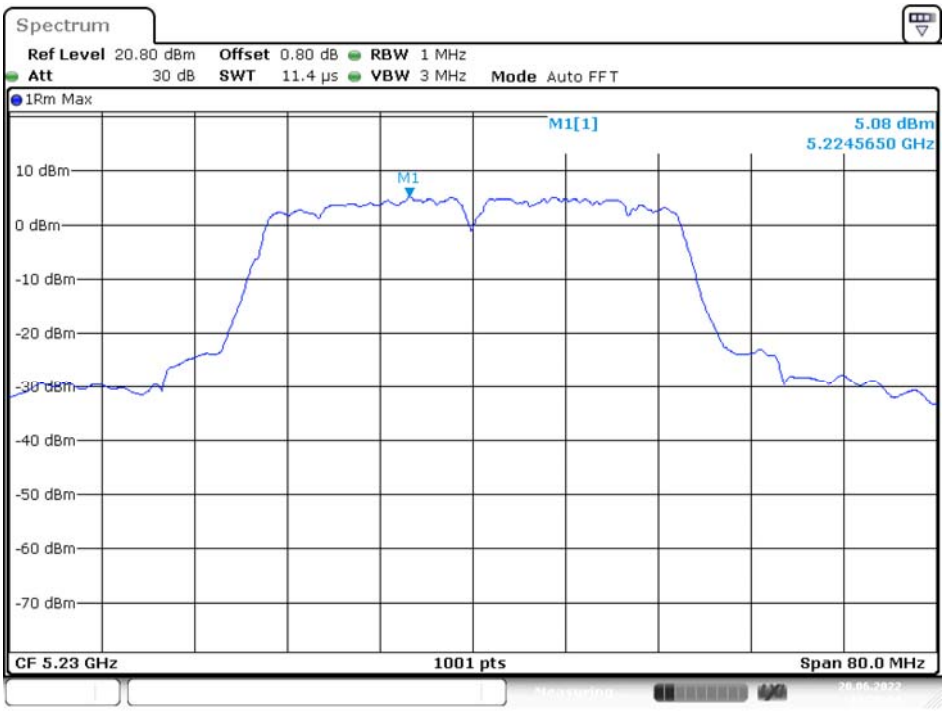
5230MHz



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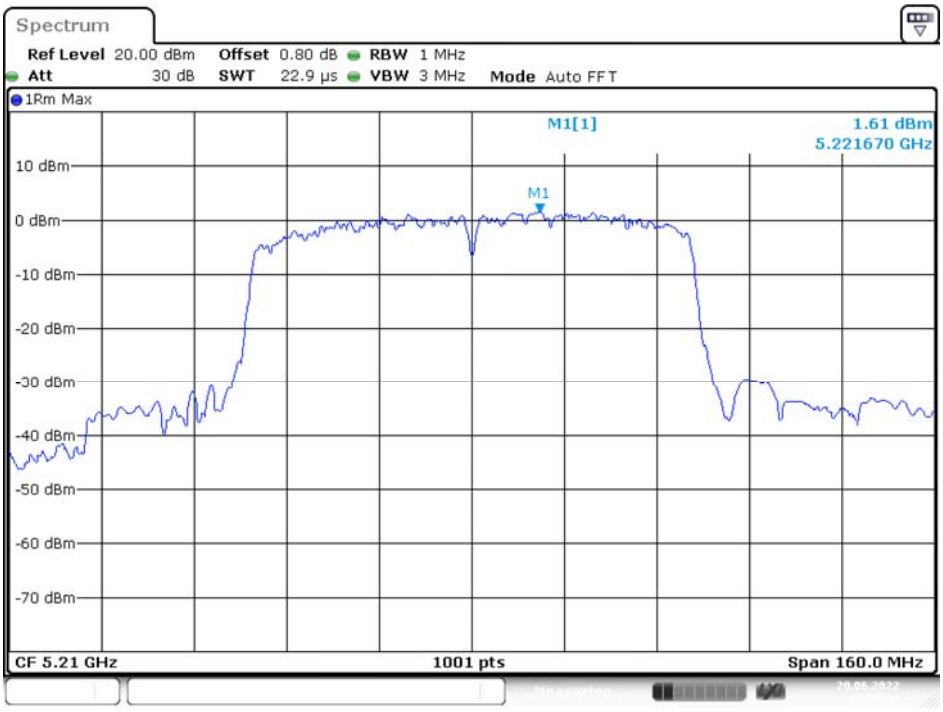
IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz
5210MHz



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