TESTREPORT

Applicant Name :	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address :	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Report Number:	RA230324-14508E-RF-00B
FCC ID:	2ATZ4-G3MECHA

Test Standard (s)

FCC PART 15.407

Sample Description

Product Type:	Smart phone
Model No.:	G3 Mecha
Multiple Model(s) No.:	N/A
Trade Mark:	UMIDIGI
Date Received:	2023/03/24
Report Date:	2023/04/23

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Roger Ling
EMC Engineer

Approved By:

Candy Li
EMC Engineer

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230324-14508E-RF-00B	Original Report	2023/04/23

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	5G Wi-Fi: 5150-5250MHz; 5725-5850MHz
Mode	802.11a/n20/n40/ac20/ac40/ac80
Maximum Conducted Average Output Power	5150-5250 MHz: 10.97dBm 5725-5850 MHz: 9.89dBm
Modulation Technique	OFDM
Antenna Specification*	1.23dBi (It is provided by the applicant)
Voltage Range	DC 3.87V from battery or DC 5V from adapter
Sample serial number	RE&CE: 23MG-2 RF: 23N5-2 (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter 1 information	Model: HJ-0502000W2-US Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 2A
Adapter 2 information	Model: HF-0502000U Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2A

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

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. And KDB789033 D02 General U-NII Test Procedures New Rules v02r01.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Harmonic Current		0.512%, k=2
Occupied Channel Bandwidth		5%
RF Frequency		$0.082*10^{-7}$
RF output power, conducted		0.71dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions	9k-30MHz	2.74dB, k=2
	150kHz-30MHz	2.92dB, k=2
Audio Frequency Response		0.1dB
Low Pass Filter Response		1.2dB
Modulation Limiting		1%
Emissions, Radiated	9kHz - 30MHz	2.06dB
	30MHz - 1GHz	5.08dB
	1GHz - 18GHz	4.96dB
	18GHz - 26.5GHz	5.16dB
	26.5GHz - 40GHz	4.64dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

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

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China

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, FCC Registration No.: 708358, the FCC Designation No.: CN1189.

Accredited by American Association for Laboratory Accreditation (A2LA). The Certificate Number is 4297.01

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

The device support 802.11a/n20/n40/ac20/ac40/ac80 mode, the 802.11n20/n40 mode was reduce test as it identical to 802.11ac20/ac40 mode

For 5150-5250MHz Band, 7 channels are provided to testing:

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

For 802.11a/ ac20 mode: channel 36, 40, 48 were tested;
For 802.11ac40 mode: channel 38, 46 were tested;
For 802.11ac80 mode, channel 42 was tested.

For 5725-5850MHz Band, 8 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785
151	5755	159	5795
153	5765	161	5805
155	5775	165	5825

For 802.11a/ ac20 mode: channel 149, 157, 165 were tested;
For 802.11ac40 mode: channel 151, 159 were tested;
For 802.11ac80 mode, channel 155 was tested.

EUT Exercise Software

EUT was test in engineering mode.

The worst case was performed under:

U-NII	Mode	Data rate	Power Level*		
			Low Channel	Middle Channel	High Channel
5150 – 5250MHz	802.11a	6Mbps	Default	Default	Default
	802.11ac20	MCS0	Default	Default	Default
	802.11ac40	MCS0	Default	/	Default
	802.11ac80	MCS0	/	Default	/
5725 – 5850MHz	802.11a	6Mbps	Default	Default	Default
	802.11ac20	MCS0	Default	Default	Default
	802.11ac40	MCS0	Default	/	Default
	802.11ac80	MCS0	/	Default	/

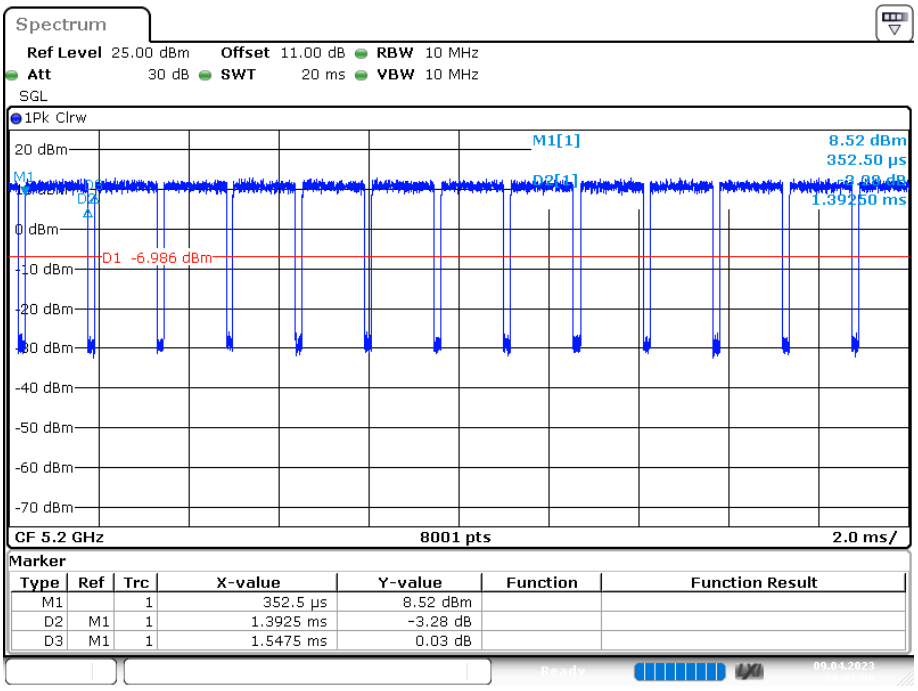
The worse-case data rates are determined to be as follows for each mode based upon investigations by measuring the output power and PSD across all data rated bandwidths, and modulations.

The power level was provided by the applicant.

Duty cycle

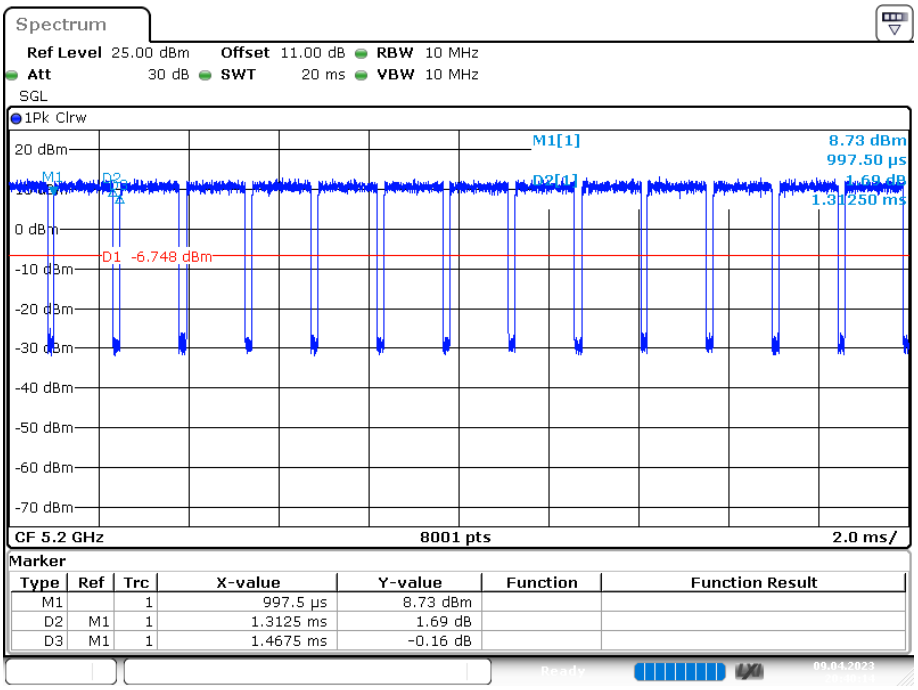
Mode	Ton (ms)	Ton+off (ms)	Duty Cycle (%)	Duty cycle factor (dB)	1/T minimum VBW setting (kHz)
802.11A	1.393	1.548	89.99	0.46	0.718
802.11AC-VHT20	1.313	1.468	89.44	0.48	0.762
802.11AC-VHT40	0.653	0.800	81.63	0.88	1.531
802.11AC-VHT80	0.323	0.470	68.72	1.63	3.095

802.11a mode



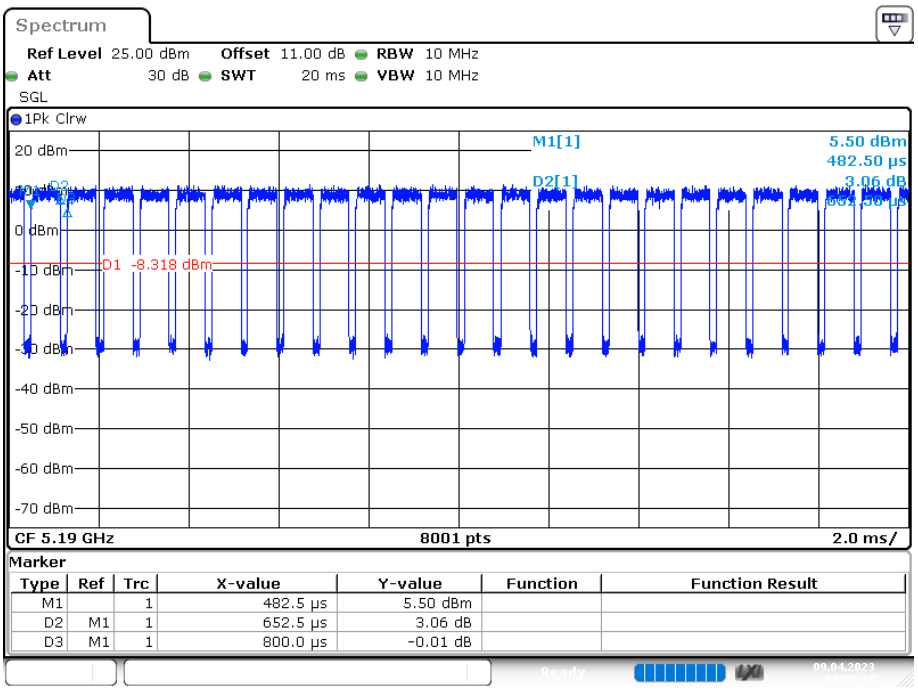
Date: 9.APR.2023 20:02:01

802.11ac20 mode



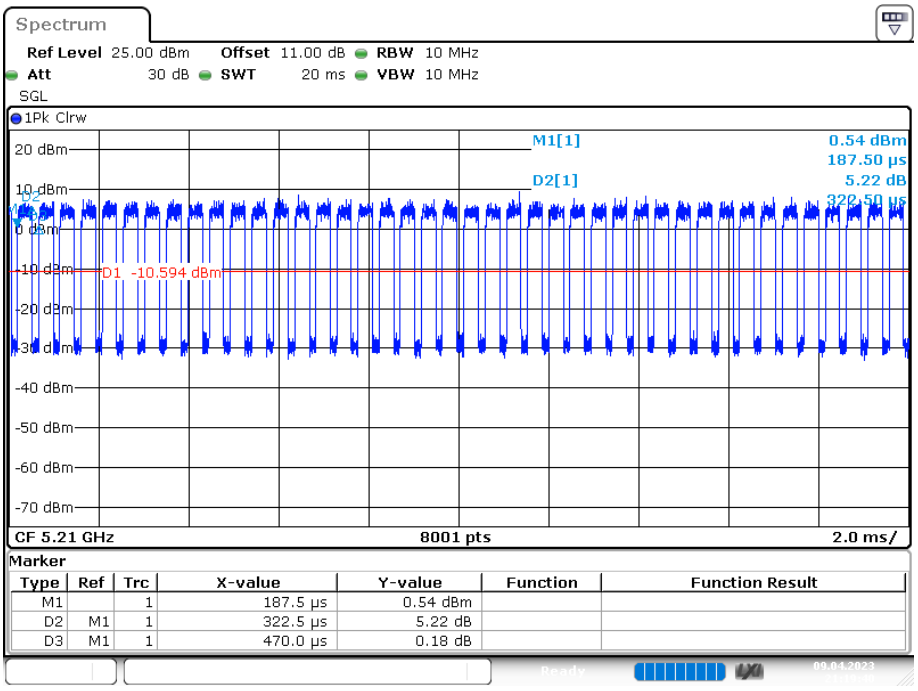
Date: 9.APR.2023 20:40:14

802.11ac40 mode



Date: 9.APR.2023 21:02:13

802.11ac80 Mode



Date: 9.APR.2023 21:19:40

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

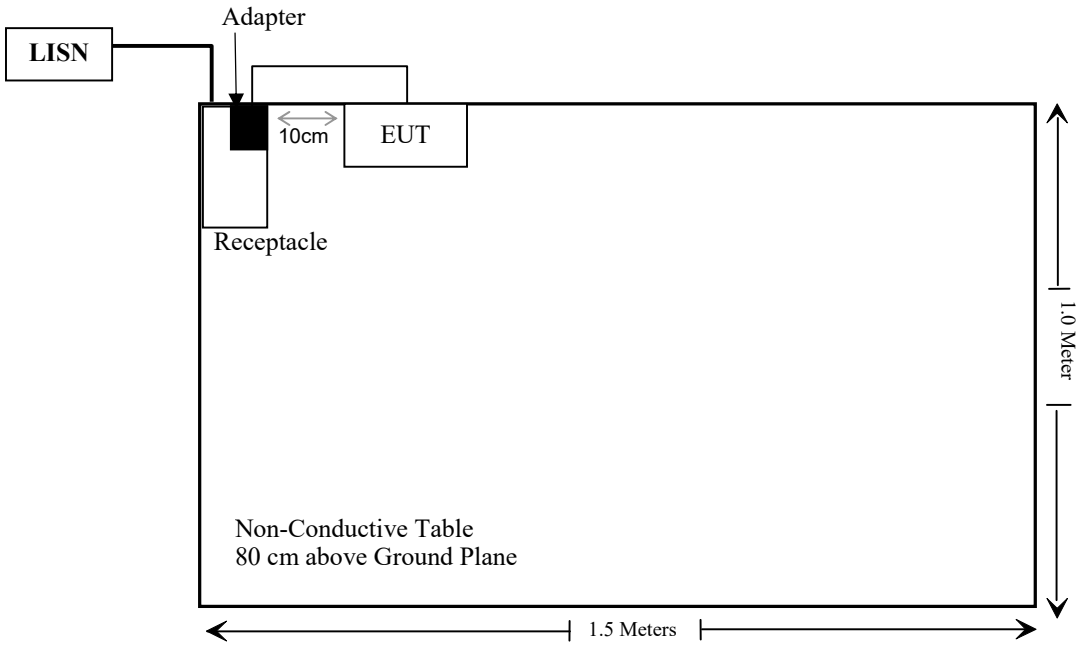
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

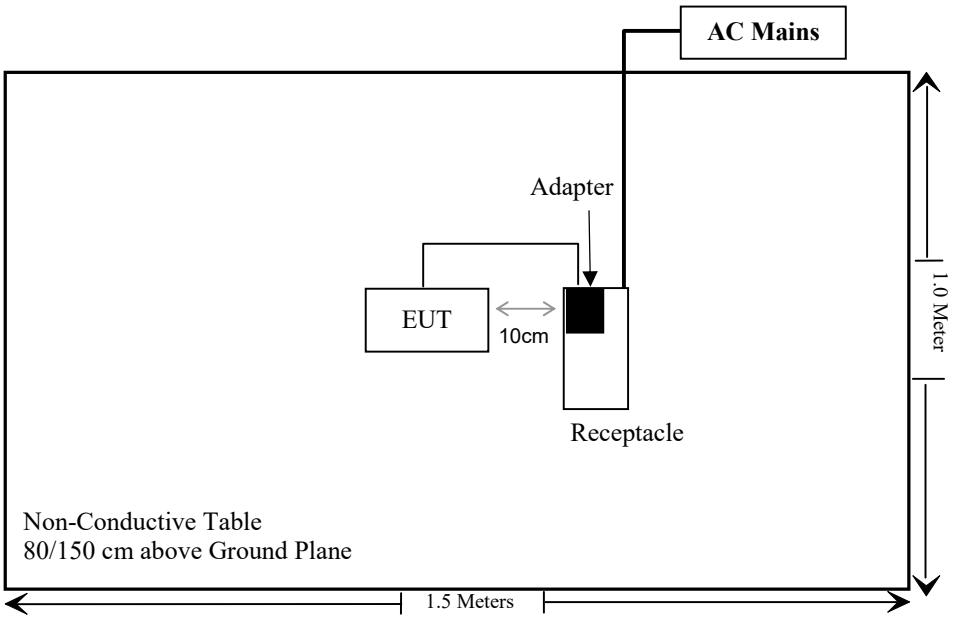
Cable Description	Length (m)	From/Port	To
Un-shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

For conducted emissions:



For Radiated Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 ,§2.1093	RF Exposure (SAR)	Compliant
§15.203	Antenna Requirement	Compliant
§15.407(b)(9)& §15.207(a)	Conducted Emissions	Compliant
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliant
§15.407(a) (e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliant
§15.407(a)	Conducted Transmitter Output Power	Compliant
§15.407 (a)	Power Spectral Density	Compliant
§15.407 (h)	Transmit Power Control (TPC)	Not Applicable
§15.407 (h)	Dynamic Frequency Selection (DFS)	Not Applicable

Not Applicable: the EUT not operating within frequency range of 5250-5350MHz&5470-5725MHz.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2022/11/25	2023/11/24
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.17	N0350	2022/11/25	2023/11/24
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2022/12/07	2023/12/06
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2022/11/30	2025/11/29
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2022/12/26	2025/12/25
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.15	N600	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.16	N650	2022/11/25	2023/11/24
CD	Band Reject Filter	BRM-5.15/5.35g-45	075	2022/11/25	2023/11/24
CD	Band Reject Filter	BRM-5.725/5.875G-45	065	2022/11/25	2023/11/24

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101948	2022/11/25	2023/11/24
Agilent	USB wideband power sensor	U2021XA	MY54250003	2022/6/27	2023/6/26
Rohde&Schwarz	Spectrum Analyzer	FSU26	200982	2022/07/04	2023/07/03
WEINSCHEL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.31	RF-01	Each time	Each time

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: RA230324-14508E-20A.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one internal antenna arrangement for 5G Wi-Fi which were permanently attached. Please refer to the EUT photos.

Type	Antenna Gain	Impedance	Frequency Range
FPC	1.23dBi	50 Ω	5150-5850MHz

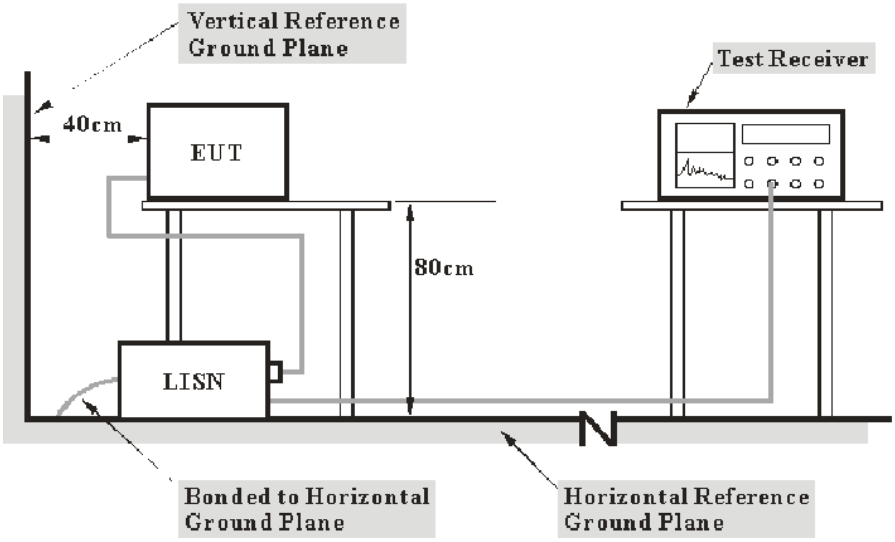
Result: Compliant.

FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207, §15.407(b) (6)

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 C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter was connected to 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.

Corrected Factor & Margin Calculation

The Transd factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

Transd Factor = LISN VDF + Cable Loss

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 calculation is as follows:

Over Limit = Level – Limit
Level = Read Level + Factor

Test Data

Environmental Conditions

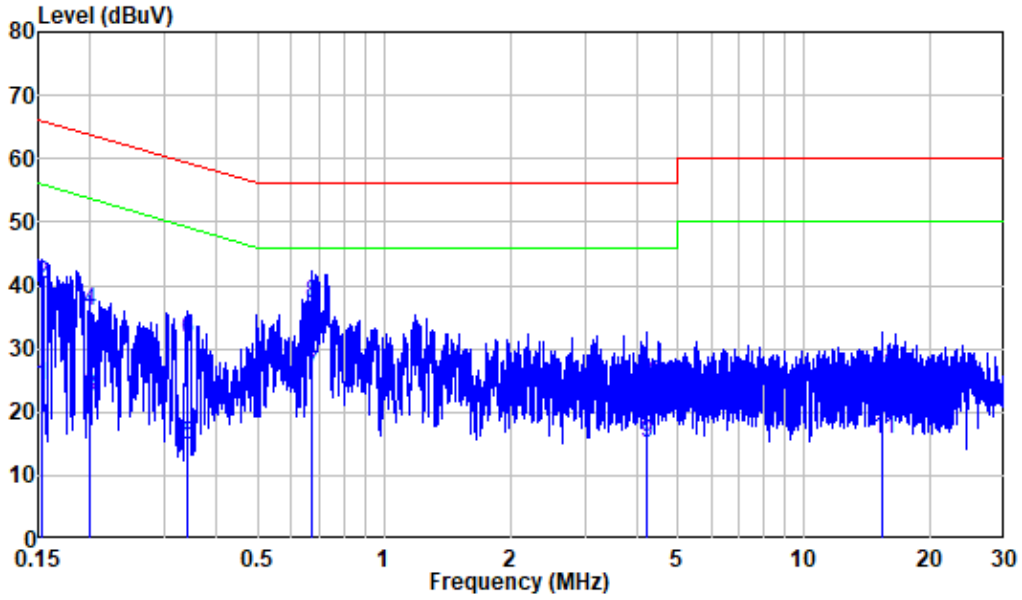
Temperature:	24°C
Relative Humidity:	52%
ATM Pressure:	101.0 kPa

The testing was performed by Jerry on 2023-04-07.

EUT operation mode: Transmitting (worst case is 802.11a, 5180MHz)

For Adapter 1(HJ-0502000W2-US)：

AC 120V/60 Hz, Line:

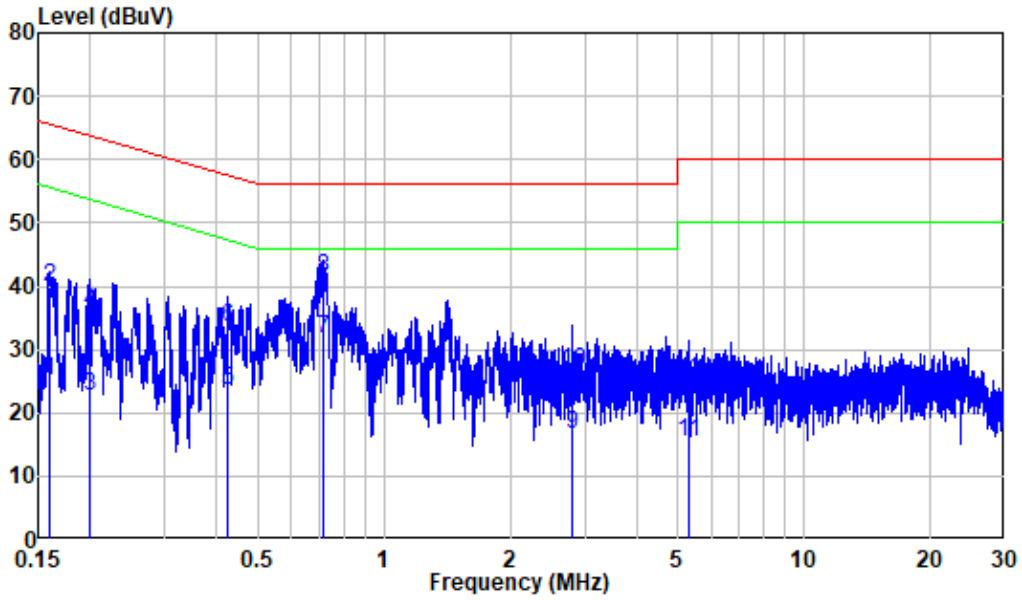


Site : Shielding Room
Condition: Line

Mode : 5G WIFI Transmitting
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.154	10.21	13.94	24.15	55.80	-31.65	Average
2	0.154	10.21	29.90	40.11	65.80	-25.69	QP
3	0.200	10.30	11.97	22.27	53.61	-31.34	Average
4	0.200	10.30	25.52	35.82	63.61	-27.79	QP
5	0.341	10.30	4.35	14.65	49.19	-34.54	Average
6	0.341	10.30	21.13	31.43	59.19	-27.76	QP
7	0.675	10.40	15.63	26.03	46.00	-19.97	Average
8	0.675	10.40	26.68	37.08	56.00	-18.92	QP
9	4.219	10.43	4.56	14.99	46.00	-31.01	Average
10	4.219	10.43	14.12	24.55	56.00	-31.45	QP
11	15.368	10.23	5.56	15.79	50.00	-34.21	Average
12	15.368	10.23	15.29	25.52	60.00	-34.48	QP

AC 120V/60 Hz, Neutral:



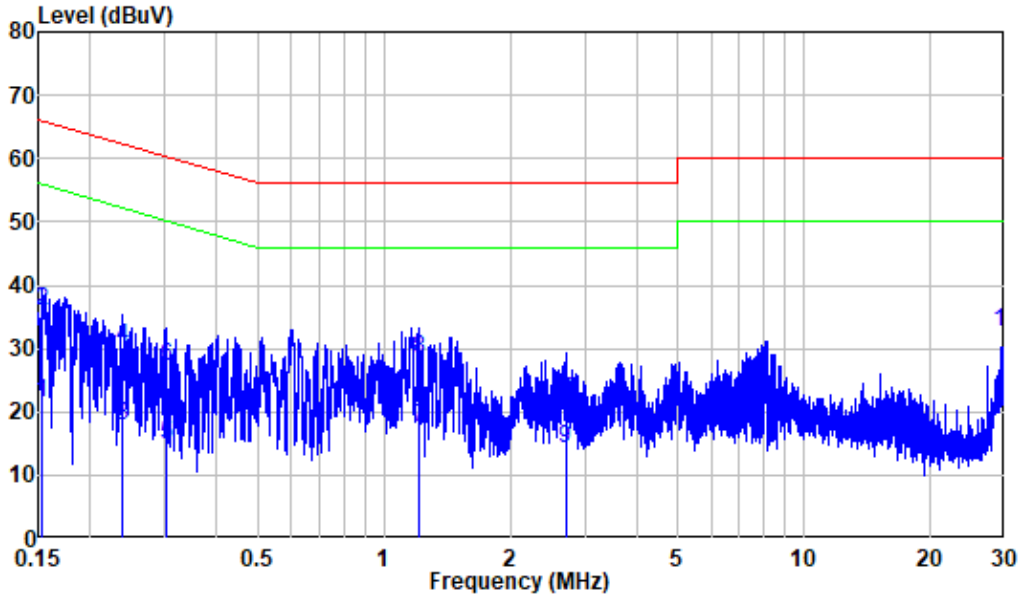
Site : Shielding Room
Condition: Neutral

Mode : 5G WIFI Transmitting
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.159	9.80	15.21	25.01	55.51	-30.50	Average
2	0.159	9.80	30.10	39.90	65.51	-25.61	QP
3	0.200	9.80	12.89	22.69	53.62	-30.93	Average
4	0.200	9.80	26.03	35.83	63.62	-27.79	QP
5	0.426	9.80	13.63	23.43	47.34	-23.91	Average
6	0.426	9.80	23.71	33.51	57.34	-23.83	QP
7	0.718	9.81	21.93	31.74	46.00	-14.26	Average
8	0.718	9.81	31.63	41.44	56.00	-14.56	QP
9	2.796	9.83	6.89	16.72	46.00	-29.28	Average
10	2.796	9.83	16.62	26.45	56.00	-29.55	QP
11	5.287	9.85	5.50	15.35	50.00	-34.65	Average
12	5.287	9.85	14.94	24.79	60.00	-35.21	QP

For Adapter 2(HF-0502000U):

AC 120V/60 Hz, Line:

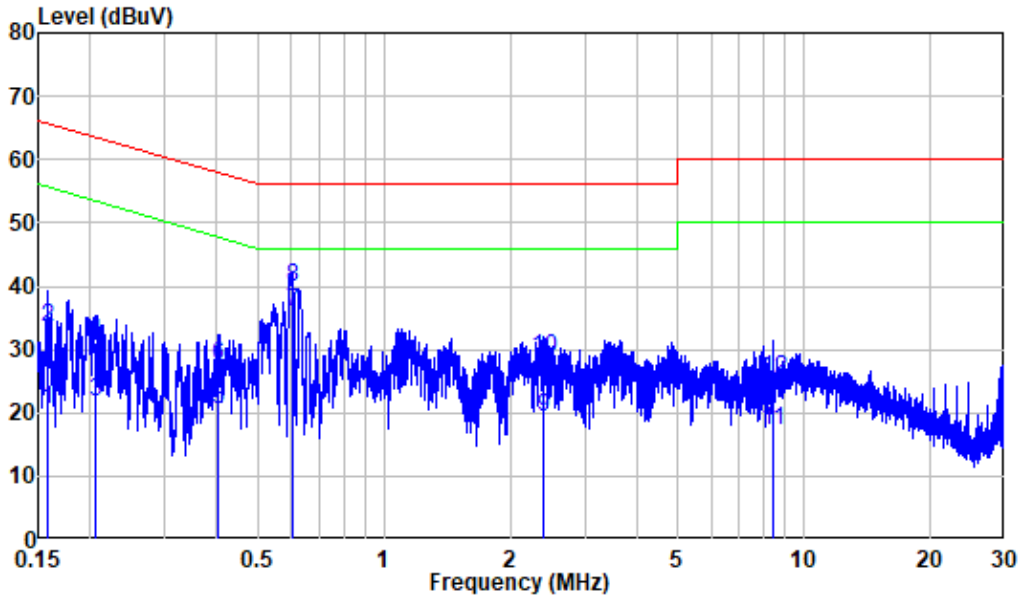


Site : Shielding Room
Condition: Line

Mode : 5G WIFI Transmitting
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.154	10.21	11.36	21.57	55.79	-34.22	Average
2	0.154	10.21	25.85	36.06	65.79	-29.73	QP
3	0.237	10.30	7.47	17.77	52.20	-34.43	Average
4	0.237	10.30	19.88	30.18	62.20	-32.02	QP
5	0.302	10.30	4.37	14.67	50.19	-35.52	Average
6	0.302	10.30	16.87	27.17	60.19	-33.02	QP
7	1.208	10.41	6.96	17.37	46.00	-28.63	Average
8	1.208	10.41	17.89	28.30	56.00	-27.70	QP
9	2.701	10.43	3.63	14.06	46.00	-31.94	Average
10	2.701	10.43	11.39	21.82	56.00	-34.18	QP
11	29.901	9.80	12.06	21.86	50.00	-28.14	Average
12	29.901	9.80	22.92	32.72	60.00	-27.28	QP

AC 120V/60 Hz, Neutral:



Site : Shielding Room
Condition: Neutral

Mode : 5G WIFI Transmitting
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.158	9.80	10.81	20.61	55.56	-34.95	Average
2	0.158	9.80	23.69	33.49	65.56	-32.07	QP
3	0.206	9.80	11.96	21.76	53.37	-31.61	Average
4	0.206	9.80	21.24	31.04	63.37	-32.33	QP
5	0.404	9.80	10.85	20.65	47.77	-27.12	Average
6	0.404	9.80	17.64	27.44	57.77	-30.33	QP
7	0.603	9.81	26.19	36.00	46.00	-10.00	Average
8	0.603	9.81	30.09	39.90	56.00	-16.10	QP
9	2.406	9.82	9.60	19.42	46.00	-26.58	Average
10	2.406	9.82	18.76	28.58	56.00	-27.42	QP
11	8.412	9.88	7.35	17.23	50.00	-32.77	Average
12	8.412	9.88	15.61	25.49	60.00	-34.51	QP

§15.205 & §15.209 & §15.407(B)– UNDESIRABLE EMISSION

Applicable Standard

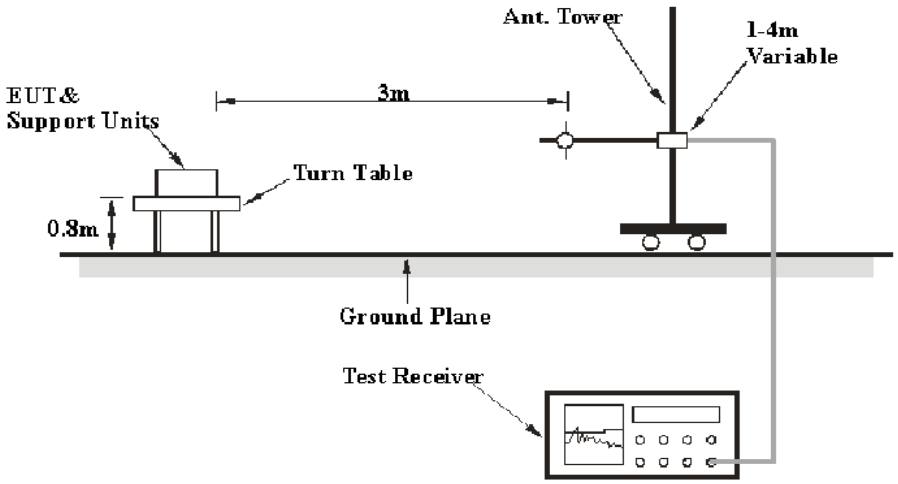
FCC §15.407 (b); §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) 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.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band:
(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

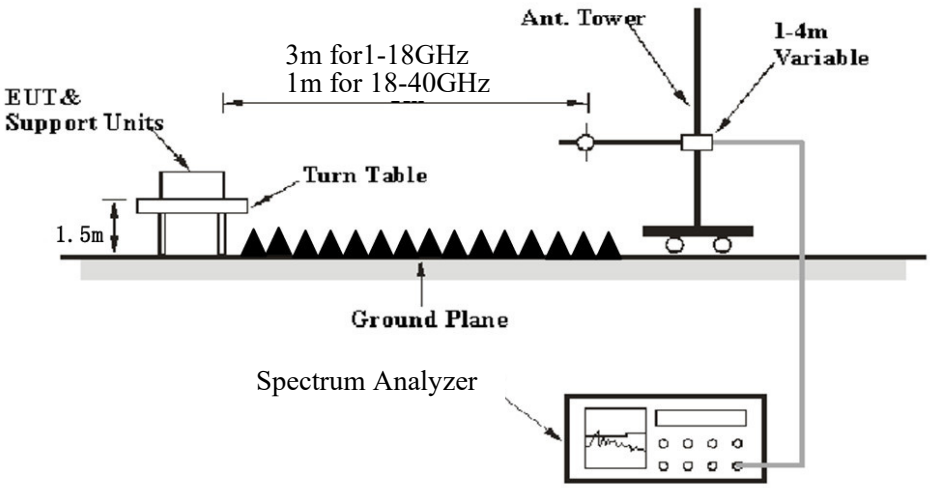
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

EUT Setup

Below 1 GHz:



Above 1 GHz:



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC 15.209 and FCC 15.407 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

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 & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1MHz	10 Hz Note 1	/	Average
	1MHz	＞1/T Note 2	/	Average

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%

Test Procedure

Radiated Spurious Emission

During the radiated emission test, the adapter was connected to the AC floor outlet.

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

According to ANSI C63.10-2013,9.4: For field strength measurements made at other than the distance at which the applicable limit is specified,extrapolate the measured field strength to the field strength at the distance specified by the limit using an inverse distance correction factor (20 dB/decade of distance). In some cases, a different distance correction factor may be required;

$$E_{\mathrm{SpecLimit}} = E_{\mathrm{Meas}} + 20\log\left(\frac{d_{\mathrm{Meas}}}{d_{\mathrm{SpecLimit}}}\right)$$

where

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

So the extrapolation factor of 1m is 20*log(1/3)= -9.5 dB, for 18-40GHz range, the limit of 1m distance was added by 9.5dB from limit of 3m to compared with the result measurement at 1m distance.

Factor & Margin Calculation

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

Factor = Antenna Factor + Cable Loss - Amplifier Gain

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

Over Limit/Margin = Level / Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	24~26.5 ℃
Relative Humidity:	56~57%
ATM Pressure:	101.0 kPa

The testing was performed by Jimi Zheng on 2023-04-06 for below 1GHz, by Jimi Zheng on 2023-04-14 for above 1GHz.

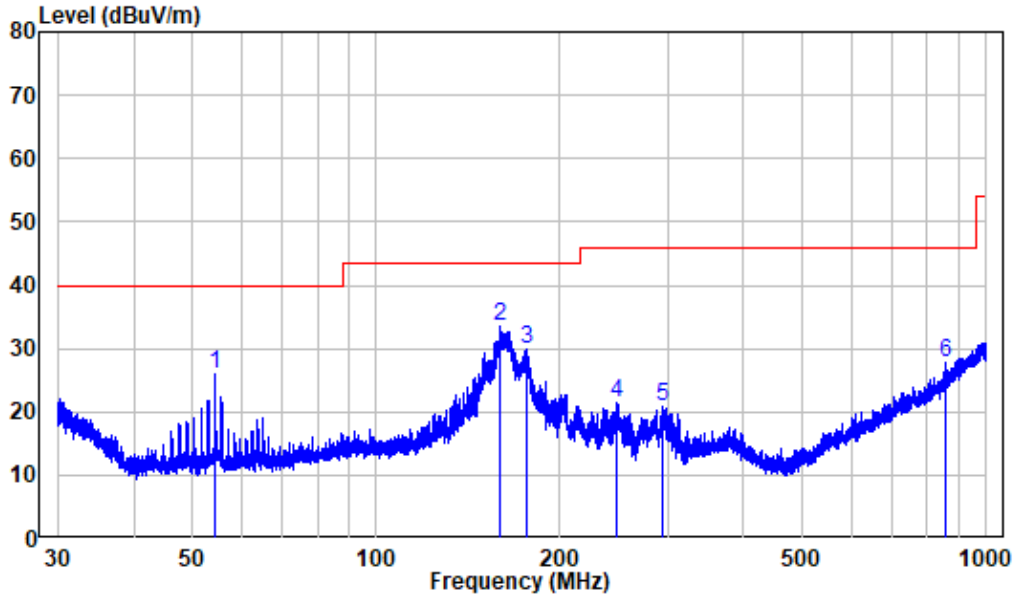
EUT operation mode: Transmitting (Pre-scan in the X,Y and Z axes of orientation, the worst case of X-axes orientation was recorded)

30 MHz – 1 GHz: *(worst case is 802.11a, 5180MHz)*

Note: When the test result of Peak was more than 6dB below the limit of QP, just the Peak value was recorded.

For Adapter 1(HJ-0502000W2-US)：

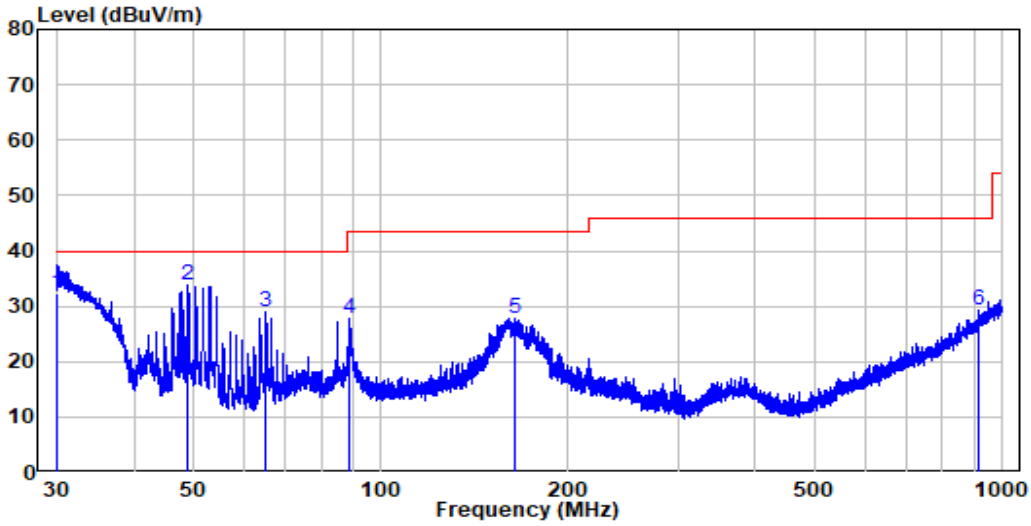
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA230324-14508E-RF
Test Mode: 5G WIFI
Note : HJ-0502000W2-US

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	54.380	-14.14	40.07	25.93	40.00	-14.07	Peak
2	159.086	-10.30	43.79	33.49	43.50	-10.01	Peak
3	176.114	-10.38	40.31	29.93	43.50	-13.57	Peak
4	247.573	-12.37	33.75	21.38	46.00	-24.62	Peak
5	294.114	-15.77	36.67	20.90	46.00	-25.10	Peak
6	859.282	-2.06	29.98	27.92	46.00	-18.08	Peak

Vertical

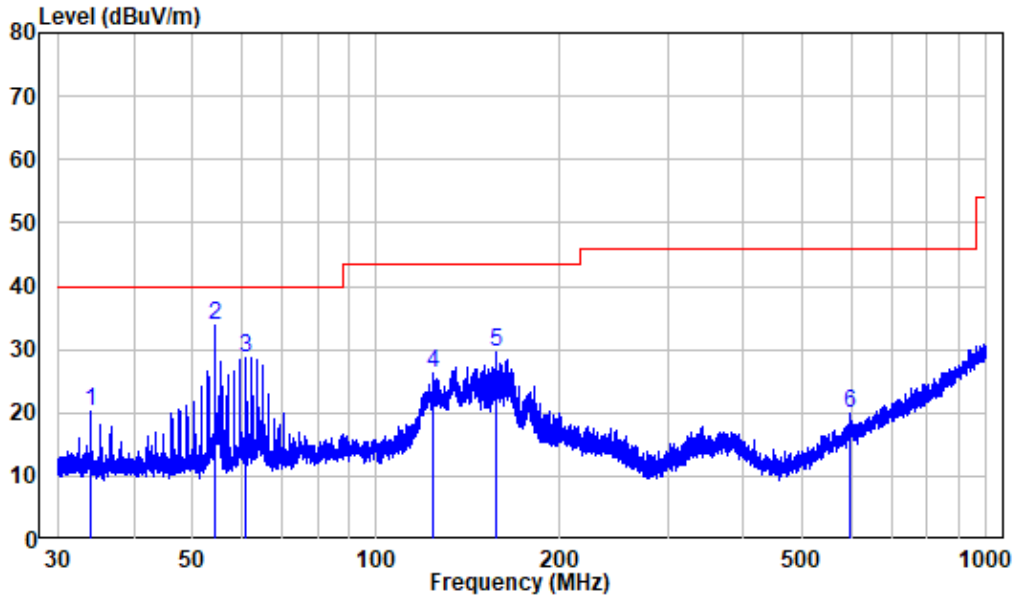


Site : chamber
Condition: 3m VERTICAL
Job No. : RA230324-14508E-RF
Test Mode: 5G WIFI
Note : HJ-0502000W2-US

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	30.066	-14.31	46.70	32.39	40.00	-7.61	QP
2	48.886	-14.31	47.97	33.66	40.00	-6.34	Peak
3	65.257	-13.76	42.68	28.92	40.00	-11.08	Peak
4	89.003	-12.55	40.24	27.69	43.50	-15.81	Peak
5	164.546	-10.29	38.19	27.90	43.50	-15.60	Peak
6	915.266	-0.19	29.55	29.36	46.00	-16.64	Peak

For Adapter 2(HF-0502000U)：

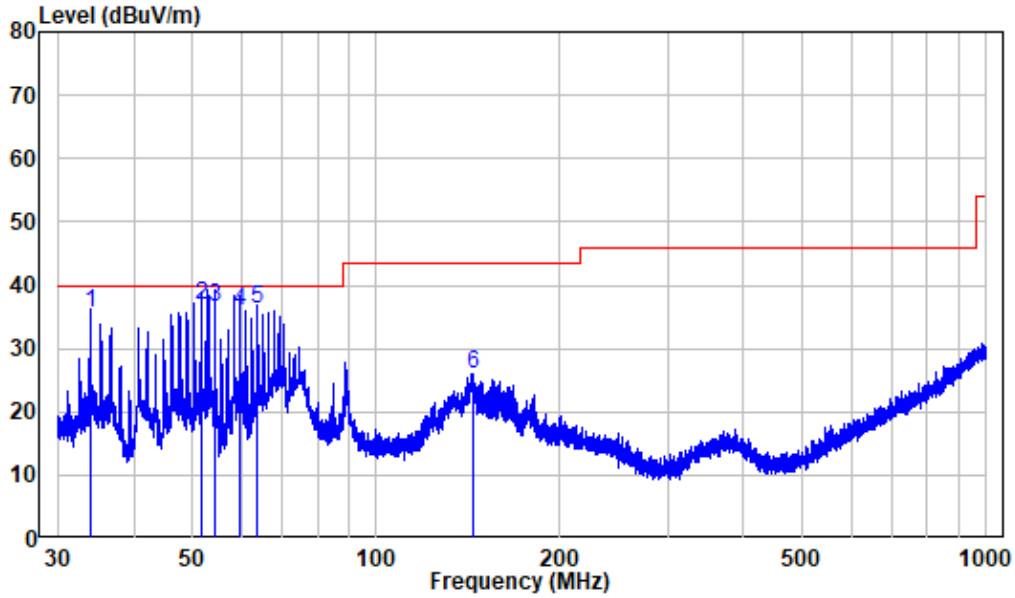
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA230324-14508E-RF
Test Mode: 5G WIFI
Note : HF-0502000U

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	33.947	-14.44	34.72	20.28	40.00	-19.72	Peak
2	54.309	-14.14	47.95	33.81	40.00	-6.19	Peak
3	61.105	-13.83	42.47	28.64	40.00	-11.36	Peak
4	123.590	-10.85	37.18	26.33	43.50	-17.17	Peak
5	157.559	-10.30	39.94	29.64	43.50	-13.86	Peak
6	598.534	-9.81	29.80	19.99	46.00	-26.01	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA230324-14508E-RF
Test Mode: 5G WIFI
Note : HF-0502000U

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	33.962	-14.45	50.20	35.75	40.00	-4.25	QP
2	51.616	-14.28	51.00	36.72	40.00	-3.28	QP
3	54.309	-14.14	50.70	36.56	40.00	-3.44	QP
4	59.754	-13.83	49.80	35.97	40.00	-4.03	QP
5	63.843	-13.77	50.00	36.23	40.00	-3.77	QP
6	144.019	-10.52	36.60	26.08	43.50	-17.42	Peak

Above 1GHz: (worst case adapter 2)

5150-5250 MHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11a									
5180 MHZ									
4500	68.95	PK	289	1.3	H	-6.44	62.51	74	-11.49
4500	54.87	AV	289	1.3	H	-6.44	48.43	54	-5.57
4500	66.96	PK	289	1.1	V	-6.44	60.52	74	-13.48
4500	54.09	AV	289	1.1	V	-6.44	47.65	54	-6.35
5150	69.83	PK	346	1.5	H	-4.91	64.92	74	-9.08
5150	55.72	AV	346	1.5	H	-4.91	50.81	54	-3.19
5150	67.66	PK	107	1.8	V	-4.91	62.75	74	-11.25
5150	54.95	AV	107	1.8	V	-4.91	50.04	54	-3.96
10360	58.90	PK	221	1.2	H	5.36	64.26	68.2	-3.94
10360	57.99	PK	98	1.2	V	5.36	63.35	68.2	-4.85
5200 MHZ									
10400	59.00	PK	29	1.3	H	5.66	64.66	68.2	-3.54
10400	58.23	PK	269	1.3	V	5.66	63.89	68.2	-4.31
5240 MHZ									
5350	65.67	PK	241	1.6	H	-3.89	61.78	74	-12.22
5350	50.58	AV	241	1.6	H	-3.89	46.69	54	-7.31
5350	64.51	PK	218	1.6	V	-3.89	60.62	74	-13.38
5350	49.99	AV	218	1.6	V	-3.89	46.10	54	-7.90
5460	63.36	PK	277	2.5	H	-3.24	60.12	74	-13.88
5460	48.33	AV	277	2.5	H	-3.24	45.09	54	-8.91
5460	62.15	PK	217	1.8	V	-3.24	58.91	74	-15.09
5460	48.06	AV	217	1.8	V	-3.24	44.82	54	-9.18
10480	59.56	PK	277	1.2	H	5.52	65.08	68.2	-3.12
10480	59.27	PK	102	1.2	V	5.52	64.79	68.2	-3.41

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac20									
5180 MHz									
4500	66.42	PK	309	1	H	-6.44	59.98	74	-14.02
4500	53.77	AV	309	1	H	-6.44	47.33	54	-6.67
4500	64.95	PK	124	2.1	V	-6.44	58.51	74	-15.49
4500	53.06	AV	124	2.1	V	-6.44	46.62	54	-7.38
5150	67.92	PK	161	2.2	H	-4.91	63.01	74	-10.99
5150	55.06	AV	161	2.2	H	-4.91	50.15	54	-3.85
5150	67.34	PK	300	1.7	V	-4.91	62.43	74	-11.57
5150	55.24	AV	300	1.7	V	-4.91	50.33	54	-3.67
10360	59.82	PK	105	1.4	H	5.36	65.18	68.2	-3.02
10360	58.78	PK	158	1.4	V	5.36	64.14	68.2	-4.06
5200 MHz									
10400	59.10	PK	150	1.8	H	5.66	64.76	68.2	-3.44
10400	58.29	PK	113	1.8	V	5.66	63.95	68.2	-4.25
5240 MHz									
5350	64.07	PK	268	2	H	-3.89	60.18	74	-13.82
5350	50.55	AV	268	2	H	-3.89	46.66	54	-7.34
5350	63.69	PK	302	1.1	V	-3.89	59.80	74	-14.20
5350	50.57	AV	302	1.1	V	-3.89	46.68	54	-7.32
5460	62.57	PK	353	1	H	-3.24	59.33	74	-14.67
5460	48.53	AV	353	1	H	-3.24	45.29	54	-8.71
5460	61.12	PK	208	1.5	V	-3.24	57.88	74	-16.12
5460	48.28	AV	208	1.5	V	-3.24	45.04	54	-8.96
10480	59.33	PK	196	2.2	H	5.52	64.85	68.2	-3.35
10480	58.52	PK	131	2.2	V	5.52	64.04	68.2	-4.16

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac40									
5190 MHz									
4500	65.79	PK	186	1.7	H	-6.44	59.35	74	-14.65
4500	54.50	AV	186	1.7	H	-6.44	48.06	54	-5.94
4500	65.38	PK	348	1.6	V	-6.44	58.94	74	-15.06
4500	53.99	AV	348	1.6	V	-6.44	47.55	54	-6.45
5150	67.49	PK	237	2.1	H	-4.91	62.58	74	-11.42
5150	55.55	AV	237	2.1	H	-4.91	50.64	54	-3.36
5150	67.34	PK	166	1.4	V	-4.91	62.43	74	-11.57
5150	55.67	AV	166	1.4	V	-4.91	50.76	54	-3.24
10380	58.77	PK	331	1.6	H	5.51	64.28	68.2	-3.92
10380	56.98	PK	82	1.6	V	5.51	62.49	68.2	-5.71
5230 MHz									
5350	63.94	PK	38	1.1	H	-3.89	60.05	74	-13.95
5350	51.07	AV	38	1.1	H	-3.89	47.18	54	-6.82
5350	63.66	PK	360	1.3	V	-3.89	59.77	74	-14.23
5350	50.88	AV	360	1.3	V	-3.89	46.99	54	-7.01
5460	62.72	PK	136	2	H	-3.24	59.48	74	-14.52
5460	49.57	AV	136	2	H	-3.24	46.33	54	-7.67
5460	61.29	PK	264	1.3	V	-3.24	58.05	74	-15.95
5460	49.05	AV	264	1.3	V	-3.24	45.81	54	-8.19
10460	58.99	PK	163	2	H	5.51	64.50	68.2	-3.70
10460	57.23	PK	220	2	V	5.51	62.74	68.2	-5.46

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac80									
5210MHz									
4500	64.74	PK	219	1.9	H	-6.44	58.30	74	-15.70
4500	54.67	AV	219	1.9	H	-6.44	48.23	54	-5.77
4500	67.20	PK	302	1.6	V	-6.44	60.76	74	-13.24
4500	54.08	AV	302	1.6	V	-6.44	47.64	54	-6.36
5150	66.15	PK	262	1.3	H	-4.91	61.24	74	-12.76
5150	55.62	AV	262	1.3	H	-4.91	50.71	54	-3.29
5150	68.59	PK	282	2.4	V	-4.91	63.68	74	-10.32
5150	55.83	AV	282	2.4	V	-4.91	50.92	54	-3.08
5350	63.81	PK	221	2.4	H	-3.89	59.92	74	-14.08
5350	51.79	AV	221	2.4	H	-3.89	47.90	54	-6.10
5350	63.52	PK	265	1.6	V	-3.89	59.63	74	-14.37
5350	51.74	AV	265	1.6	V	-3.89	47.85	54	-6.15
5460	62.47	PK	230	2.1	H	-3.24	59.23	74	-14.77
5460	50.44	AV	230	2.1	H	-3.24	47.20	54	-6.80
5460	60.92	PK	50	1.5	V	-3.24	57.68	74	-16.32
5460	50.01	AV	50	1.5	V	-3.24	46.77	54	-7.23
10420	57.92	PK	263	2.2	H	5.60	63.52	68.2	-4.68
10420	56.41	PK	86	2.2	V	5.60	62.01	68.2	-6.19

5725-5850 MHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11a									
5745 MHZ									
5650	62.03	PK	347	1.8	H	-3.64	58.39	68.2	-9.81
5700	61.12	PK	270	2	H	-2.30	58.82	105.2	-46.38
5720	64.41	PK	253	1.5	H	-2.64	61.77	110.8	-49.03
5725	72.23	PK	269	2	H	-2.73	69.50	122.2	-52.70
5650	61.95	PK	268	1.5	V	-3.64	58.31	68.2	-9.89
5700	60.83	PK	76	1.2	V	-2.30	58.53	105.2	-46.67
5720	64.11	PK	171	2	V	-2.64	61.47	110.8	-49.33
5725	71.25	PK	275	2.1	V	-2.73	68.52	122.2	-53.68
11490	54.25	PK	311	1.4	H	7.00	61.25	74	-12.75
11490	43.04	AV	302	1.4	H	7.00	50.04	54	-3.96
11490	53.77	PK	198	2.1	V	7.00	60.77	74	-13.23
11490	41.91	AV	257	2.1	V	7.00	48.91	54	-5.09
5785 MHZ									
11570	56.02	PK	12	1.1	H	6.60	62.62	74	-11.38
11570	43.44	AV	32	1.1	H	6.60	50.04	54	-3.96
11570	55.11	PK	354	1.3	V	6.60	61.71	74	-12.29
11570	42.40	AV	8	1.3	V	6.60	49.00	54	-5.00
5825 MHZ									
5850	65.52	PK	28	1.1	H	-1.37	64.15	122.2	-58.05
5855	61.48	PK	58	2.3	H	-1.25	60.23	110.8	-50.57
5875	60.83	PK	94	1.1	H	-0.75	60.08	105.2	-45.12
5925	60.33	PK	238	2.3	H	-0.46	59.87	68.2	-8.33
5850	65.27	PK	197	1.8	V	-1.37	63.90	122.2	-58.30
5855	61.42	PK	24	1.2	V	-1.25	60.17	110.8	-50.63
5875	60.77	PK	199	2.4	V	-0.75	60.02	105.2	-45.18
5925	59.88	PK	275	1.8	V	-0.46	59.42	68.2	-8.78
11650	57.10	PK	8	1.2	H	5.55	62.65	74	-11.35
11650	43.76	AV	251	1.2	H	5.55	49.31	54	-4.69
11650	56.57	PK	79	2	V	5.55	62.12	74	-11.88
11650	42.68	AV	353	2	V	5.55	48.23	54	-5.77

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac20									
5745 MHz									
5650	62.83	PK	349	1.7	H	-3.64	59.19	68.2	-9.01
5700	61.76	PK	77	2.1	H	-2.30	59.46	105.2	-45.74
5720	67.50	PK	206	2.3	H	-2.64	64.86	110.8	-45.94
5725	74.00	PK	334	1.5	H	-2.73	71.27	122.2	-50.93
5650	62.40	PK	15	1.1	V	-3.64	58.76	68.2	-9.44
5700	61.29	PK	299	2.3	V	-2.30	58.99	105.2	-46.21
5720	67.43	PK	28	1.4	V	-2.64	64.79	110.8	-46.01
5725	73.61	PK	190	2.2	V	-2.73	70.88	122.2	-51.32
11490	54.71	PK	209	1.9	H	7.00	61.71	74	-12.29
11490	42.82	AV	108	1.9	H	7.00	49.82	54	-4.18
11490	54.04	PK	277	1.4	V	7.00	61.04	74	-12.96
11490	40.97	AV	239	1.4	V	7.00	47.97	54	-6.03
5785 MHz									
11570	55.67	PK	238	2.5	H	6.60	62.27	74	-11.73
11570	43.40	AV	277	2.5	H	6.60	50.00	54	-4.00
11570	55.25	PK	342	2.2	V	6.60	61.85	74	-12.15
11570	42.76	AV	266	2.2	V	6.60	49.36	54	-4.64
5825 MHz									
5850	67.23	PK	274	1.1	H	-1.37	65.86	122.2	-56.34
5855	62.37	PK	156	1.1	H	-1.25	61.12	110.8	-49.68
5875	61.28	PK	25	1.3	H	-0.75	60.53	105.2	-44.67
5925	60.50	PK	264	1.1	H	-0.46	60.04	68.2	-8.16
5850	66.95	PK	7	1.6	V	-1.37	65.58	122.2	-56.62
5855	61.92	PK	8	1.2	V	-1.25	60.67	110.8	-50.13
5875	61.04	PK	289	1.7	V	-0.75	60.29	105.2	-44.91
5925	60.33	PK	328	1.8	V	-0.46	59.87	68.2	-8.33
11650	56.56	PK	335	2	H	5.55	62.11	74	-11.89
11650	44.00	AV	155	2	H	5.55	49.55	54	-4.45
11650	56.12	PK	132	1.8	V	5.55	61.67	74	-12.33
11650	43.57	AV	196	1.8	V	5.55	49.12	54	-4.88

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11AC40									
5755 MHz									
5650	62.91	PK	133	1.3	H	-3.64	59.27	68.2	-8.93
5700	61.90	PK	163	2.2	H	-2.30	59.60	105.2	-45.60
5720	73.36	PK	287	1.1	H	-2.64	70.72	110.8	-40.08
5725	73.73	PK	140	1.6	H	-2.73	71.00	122.2	-51.20
5650	62.64	PK	113	1.3	V	-3.64	59.00	68.2	-9.20
5700	61.45	PK	22	1.9	V	-2.30	59.15	105.2	-46.05
5720	73.05	PK	310	2.1	V	-2.64	70.41	110.8	-40.39
5725	73.21	PK	100	2.2	V	-2.73	70.48	122.2	-51.72
11510	55.49	PK	105	2.3	H	7.06	62.55	74	-11.45
11510	43.91	AV	24	2.3	H	7.06	50.97	54	-3.03
11510	54.55	PK	95	2.3	V	7.06	61.61	74	-12.39
11510	43.30	AV	264	2.3	V	7.06	50.36	54	-3.64
5795 MHz									
5850	61.97	PK	326	2.3	H	-1.37	60.60	122.2	-61.60
5855	61.41	PK	14	2.1	H	-1.25	60.16	110.8	-50.64
5875	60.67	PK	60	1.3	H	-0.75	59.92	105.2	-45.28
5925	60.21	PK	88	1.3	H	-0.46	59.75	68.2	-8.45
5850	61.60	PK	312	2	V	-1.37	60.23	122.2	-61.97
5855	61.35	PK	228	1.7	V	-1.25	60.10	110.8	-50.70
5875	60.64	PK	186	1.7	V	-0.75	59.89	105.2	-45.31
5925	60.07	PK	133	2.3	V	-0.46	59.61	68.2	-8.59
11590	55.88	PK	50	1.1	H	6.43	62.31	74	-11.69
11590	44.51	AV	119	1.1	H	6.43	50.94	54	-3.06
11590	55.62	PK	1	1.7	V	6.43	62.05	74	-11.95
11590	43.70	AV	48	1.7	V	6.43	50.13	54	-3.87

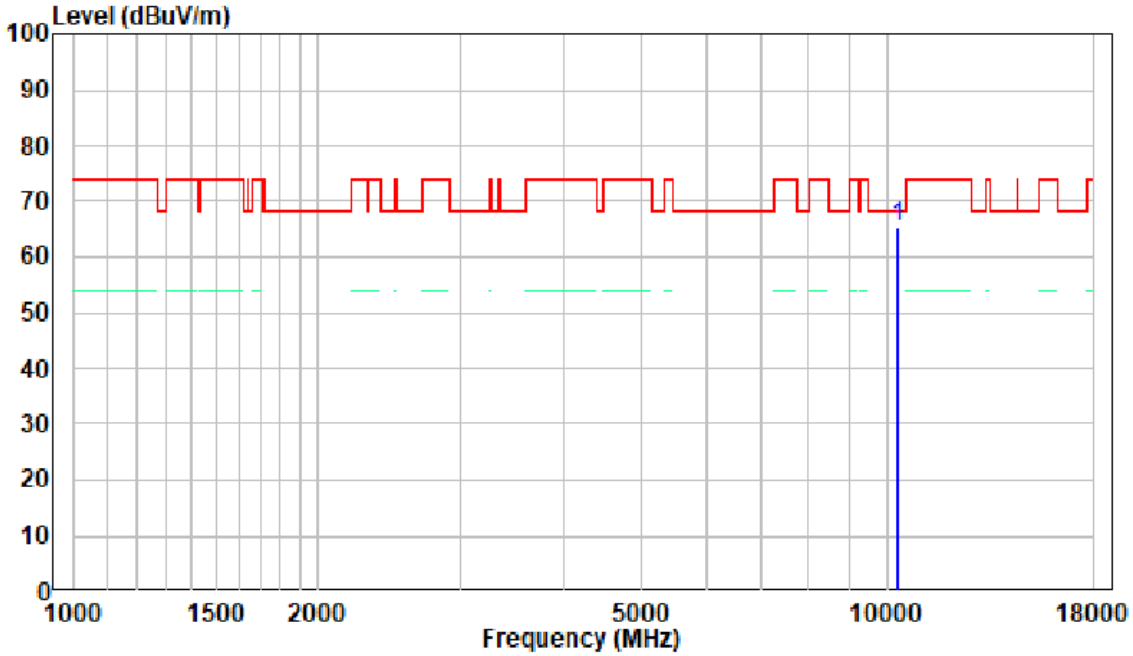
Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11AC80									
5650	62.92	PK	331	1.2	H	-3.64	59.28	68.2	-8.92
5700	62.10	PK	219	1.8	H	-2.30	59.80	105.2	-45.40
5720	67.85	PK	212	2.2	H	-2.64	65.21	110.8	-45.59
5725	68.67	PK	191	1.9	H	-2.73	65.94	122.2	-56.26
5650	62.80	PK	36	1.5	V	-3.64	59.16	68.2	-9.04
5700	61.84	PK	116	1.9	V	-2.30	59.54	105.2	-45.66
5720	67.70	PK	299	2	V	-2.64	65.06	110.8	-45.74
5725	68.39	PK	18	1.6	V	-2.73	65.66	122.2	-56.54
5850	63.15	PK	187	2.2	H	-1.37	61.78	122.2	-60.42
5855	62.19	PK	341	1.4	H	-1.25	60.94	110.8	-49.86
5875	61.57	PK	312	1.6	H	-0.75	60.82	105.2	-44.38
5925	60.71	PK	354	1.9	H	-0.46	60.25	68.2	-7.95
5850	63.03	PK	291	1.1	V	-1.37	61.66	122.2	-60.54
5855	61.69	PK	279	1.9	V	-1.25	60.44	110.8	-50.36
5875	61.13	PK	120	1.4	V	-0.75	60.38	105.2	-44.82
5925	60.58	PK	108	2.3	V	-0.46	60.12	68.2	-8.08
11550	55.03	PK	252	2.1	H	6.77	61.80	74	-12.20
11550	44.19	AV	187	2.1	H	6.77	50.96	54	-3.04
11550	54.46	PK	249	1.9	V	6.77	61.23	74	-12.77
11550	42.64	AV	168	1.9	V	6.77	49.41	54	-4.59

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.

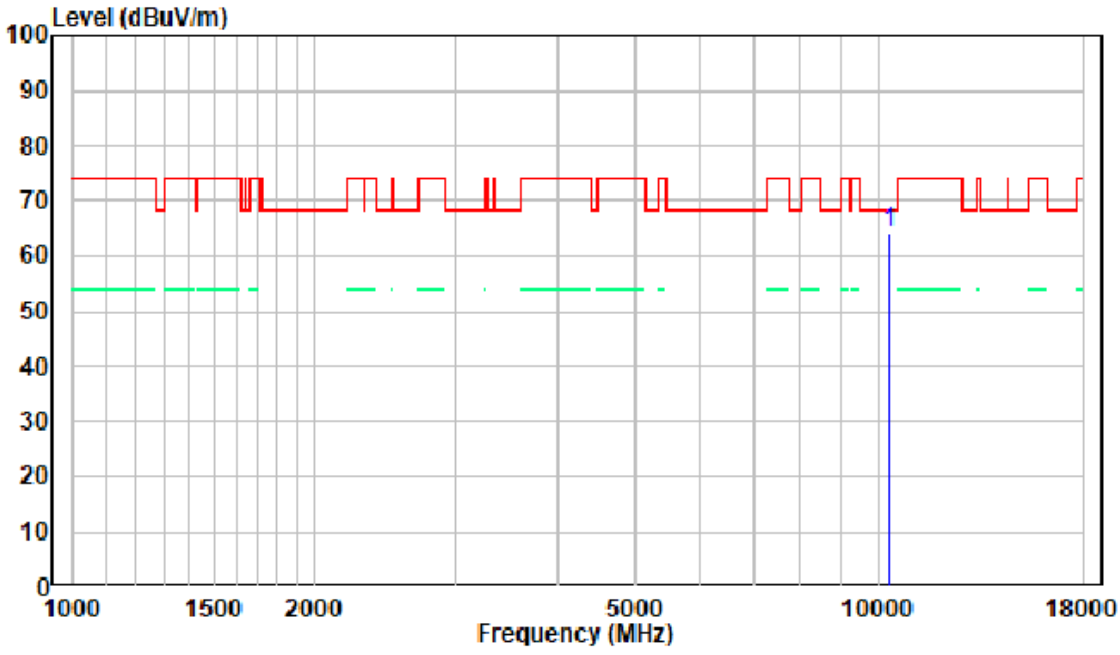
1 GHz - 18 GHz: (Pre-Scan plots)

802.11 ac20, 5180MHz

Horizontal



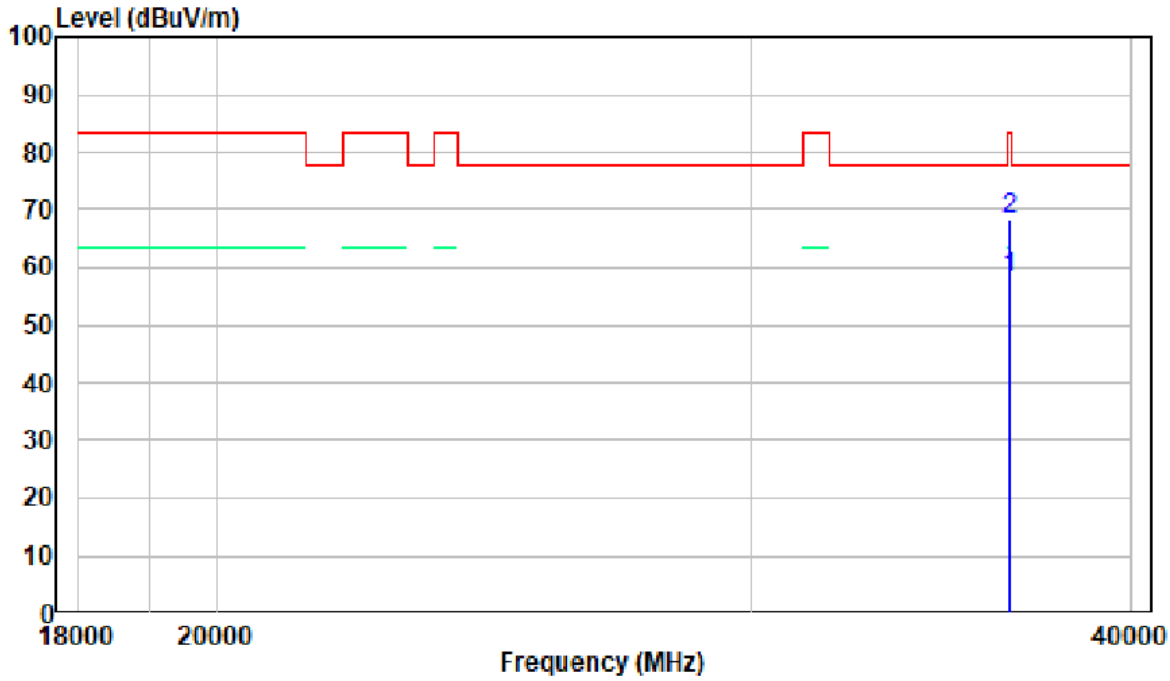
Vertical



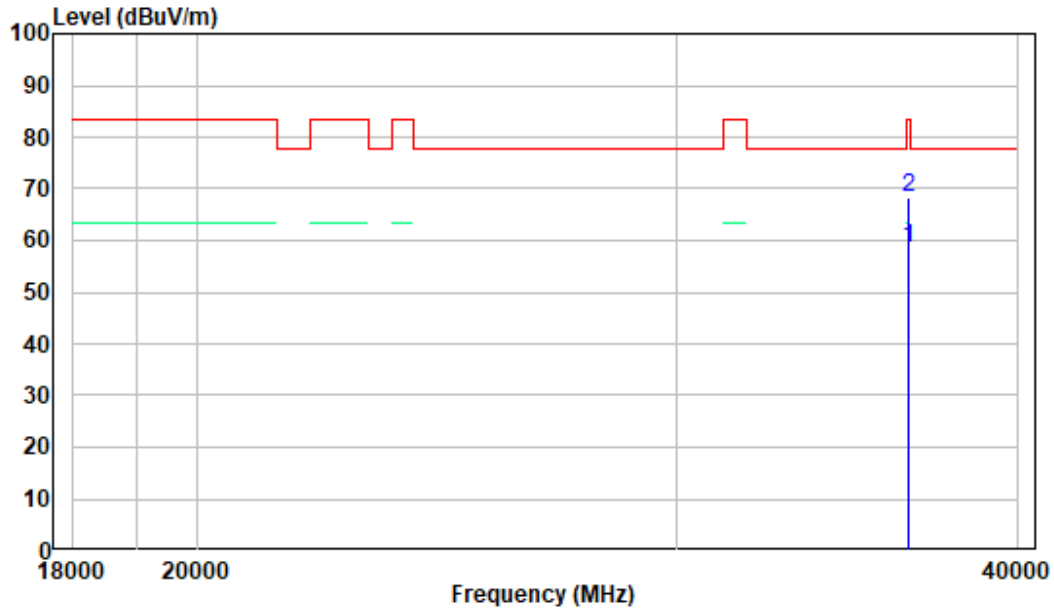
18-40GHz: (Pre-Scan plots)

802.11 ac20, 5180MHz

Horizontal



Vertical



FCC §15.407(a),(e) – 26 dB & 6dB EMISSION BANDWIDTH

Applicable Standard

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.

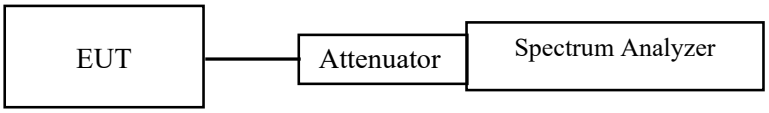
Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

According to KDB789033 D02 section II.C and section II.D

1. 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%.

2. **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 5.725-5.85 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.



Test Data

Environmental Conditions

Temperature:	26.2-26.8 ℃
Relative Humidity:	52-54%
ATM Pressure:	101.0 kPa

The testing was performed by Roger Ling from 2023-04-09 to 2023-04-18.

EUT operation mode: Transmitting

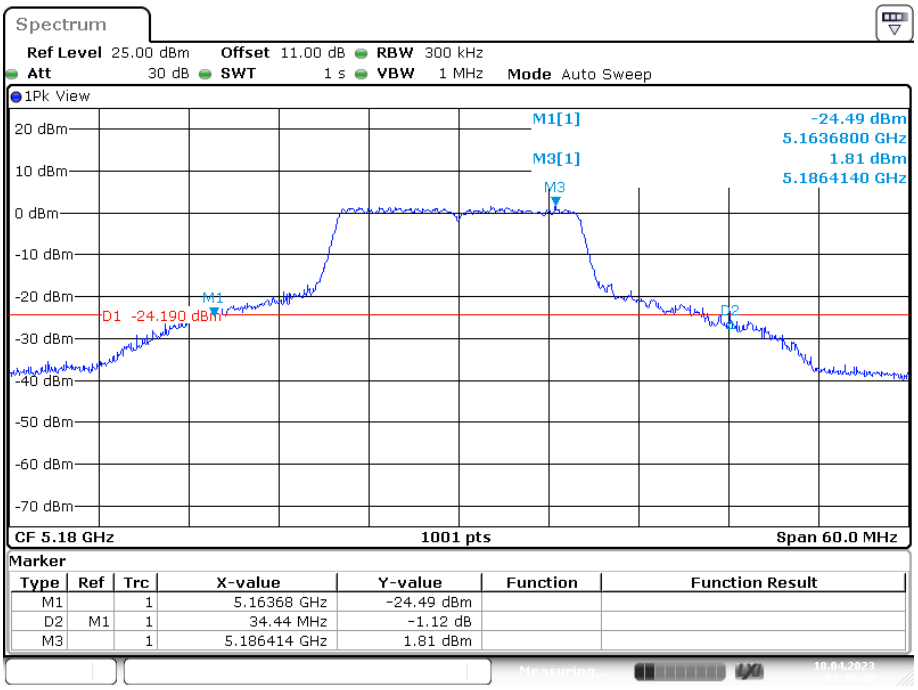
Test Result: *Pass , Please refer to the test data and plots as follows:*

5150 MHz - 5250 MHz:

Frequency (MHz)	Antenna Port	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)	Remark
802.11a				No transmitted signal in the 99% bandwidth extends into the U-NII-2A band
5180	Ant1	34.44	17.42	
5200	Ant1	33.96	17.42	
5240	Ant1	34.80	17.34	
802.11ac20				
5180	Ant1	37.56	18.26	
5200	Ant1	37.08	18.22	
5240	Ant1	36.96	18.22	
802.11ac40				
5190	Ant1	72.72	36.76	
5230	Ant1	72.60	36.68	
11ac80				
5210	Ant1	124.32	75.92	

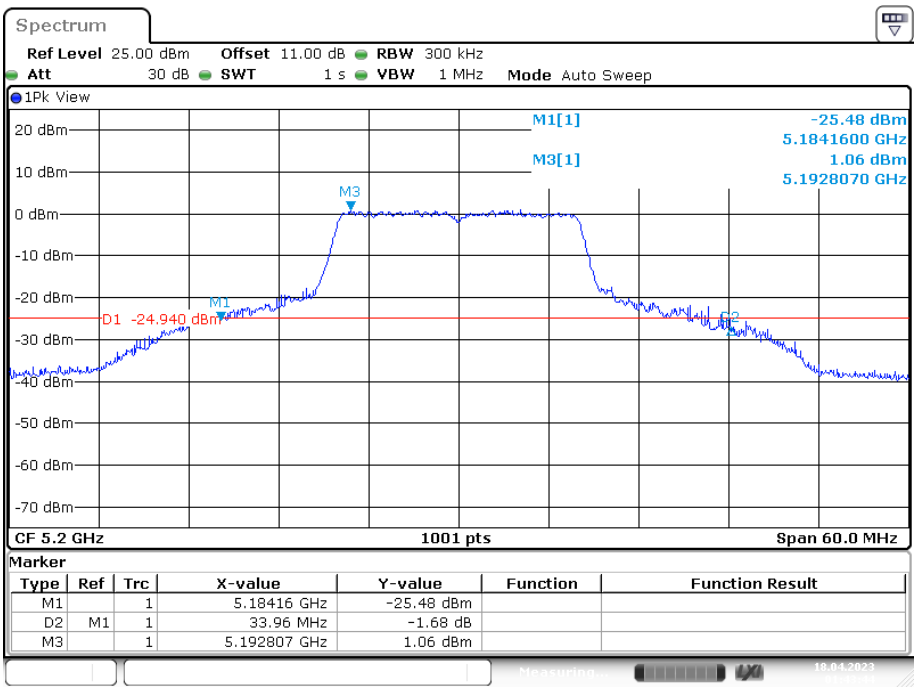
26 dB Emissions Bandwidth:

802.11a mode, 5180 MHz



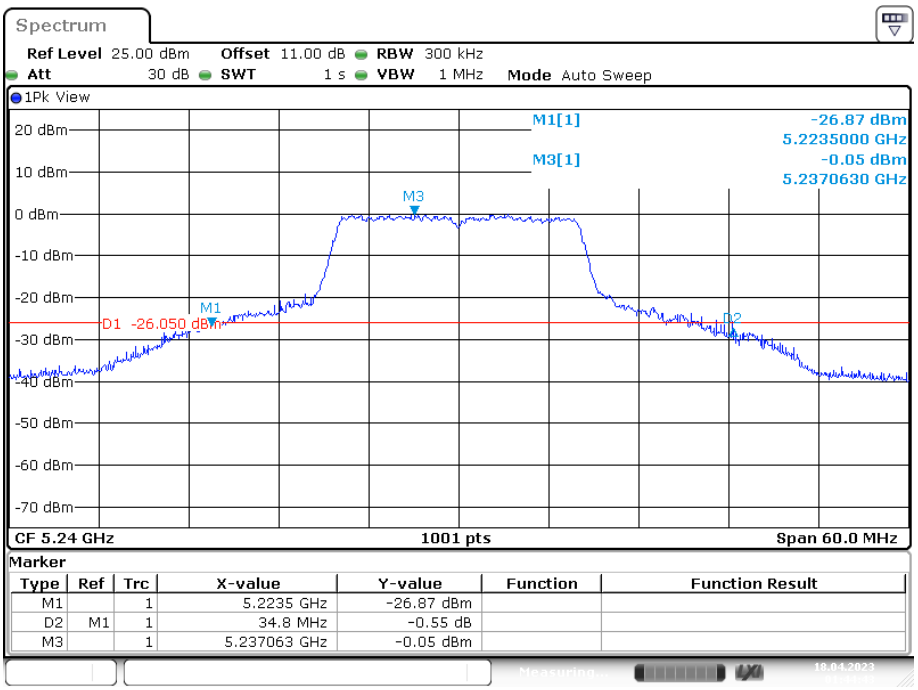
Date: 18.APR.2023 01:42:42

802.11a mode, 5200 MHz



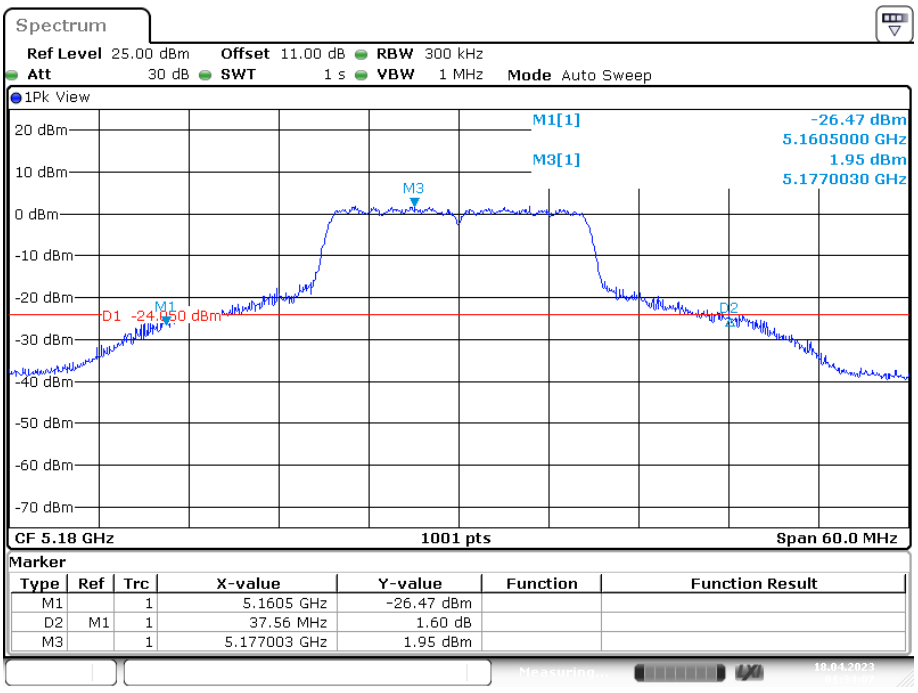
Date: 18.APR.2023 01:43:45

802.11a mode, 5240 MHz



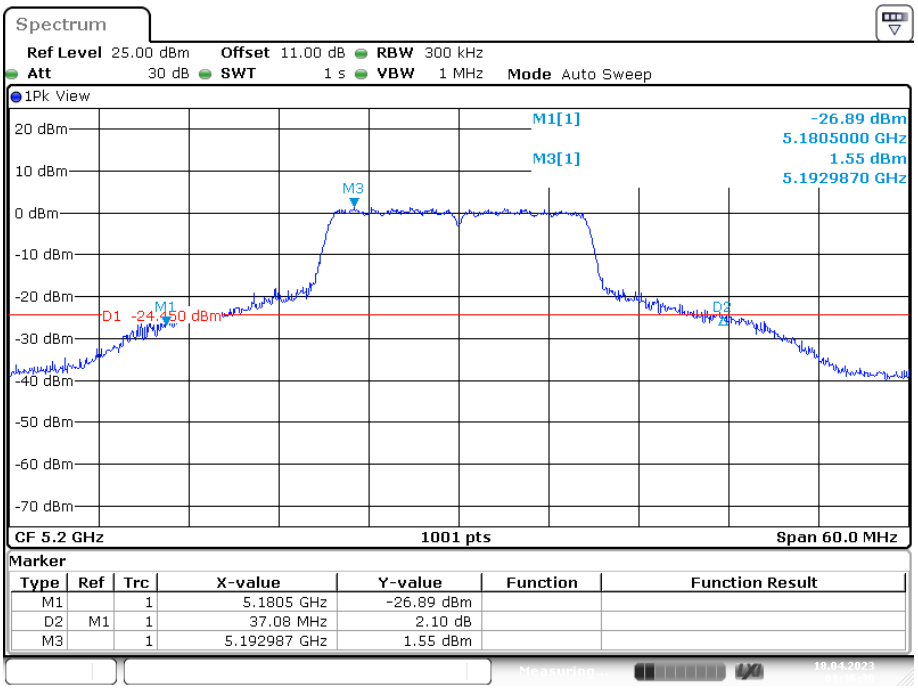
Date: 18.APR.2023 01:44:44

802.11ac20 mode, 5180 MHz



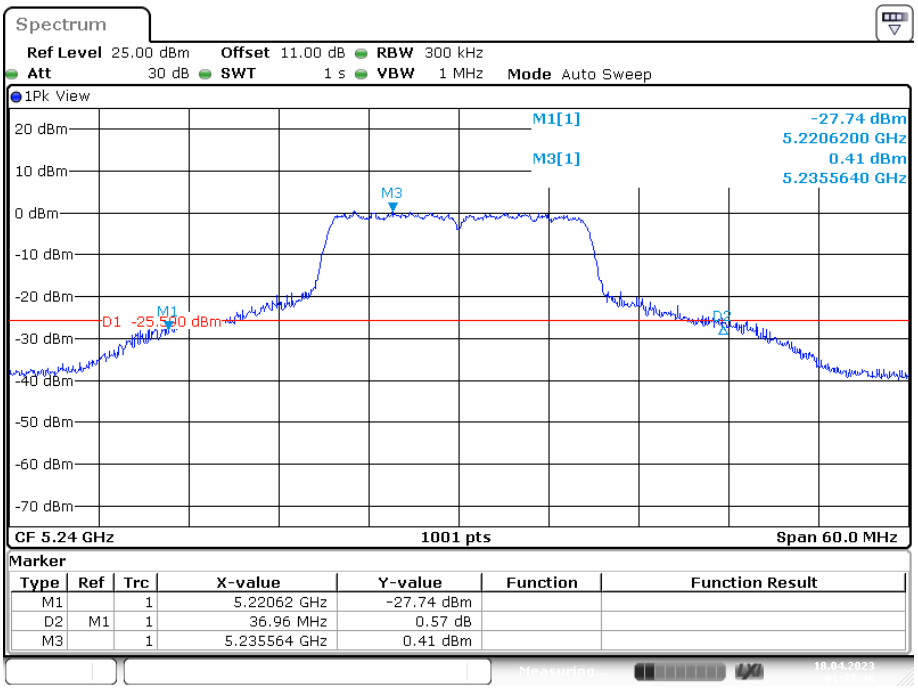
Date: 18.APR.2023 01:34:08

802.11ac20 mode, 5200 MHz



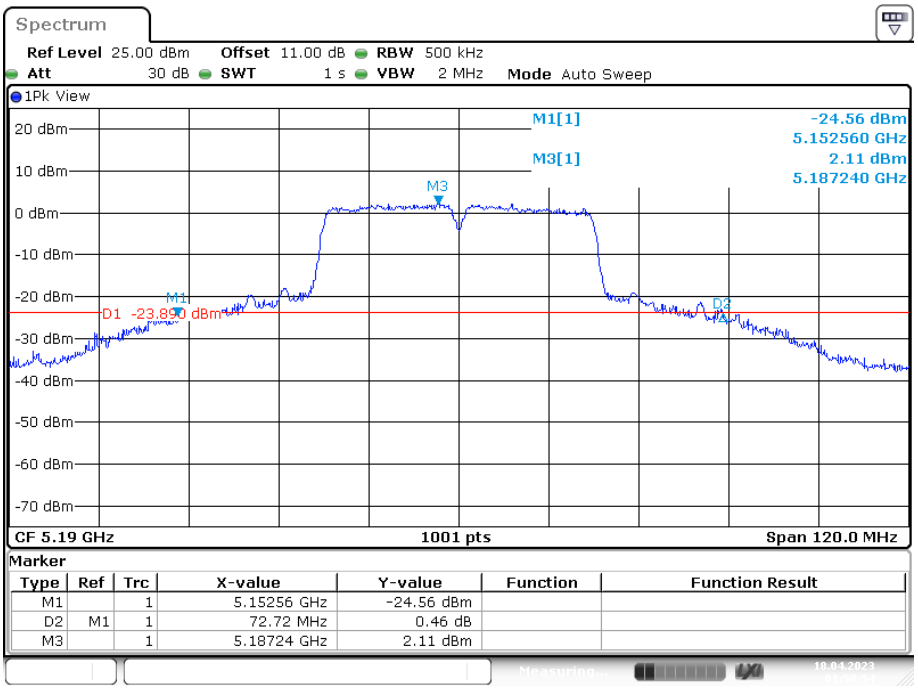
Date: 18.APR.2023 01:36:31

802.11ac20 mode, 5240 MHz



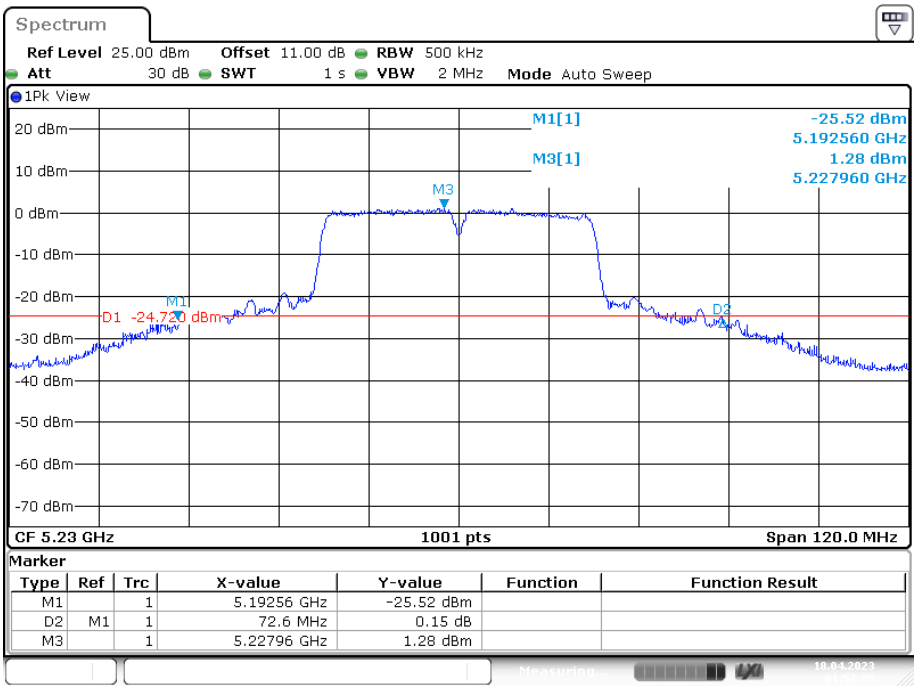
Date: 18.APR.2023 01:37:47

802.11ac40 mode, 5190 MHz



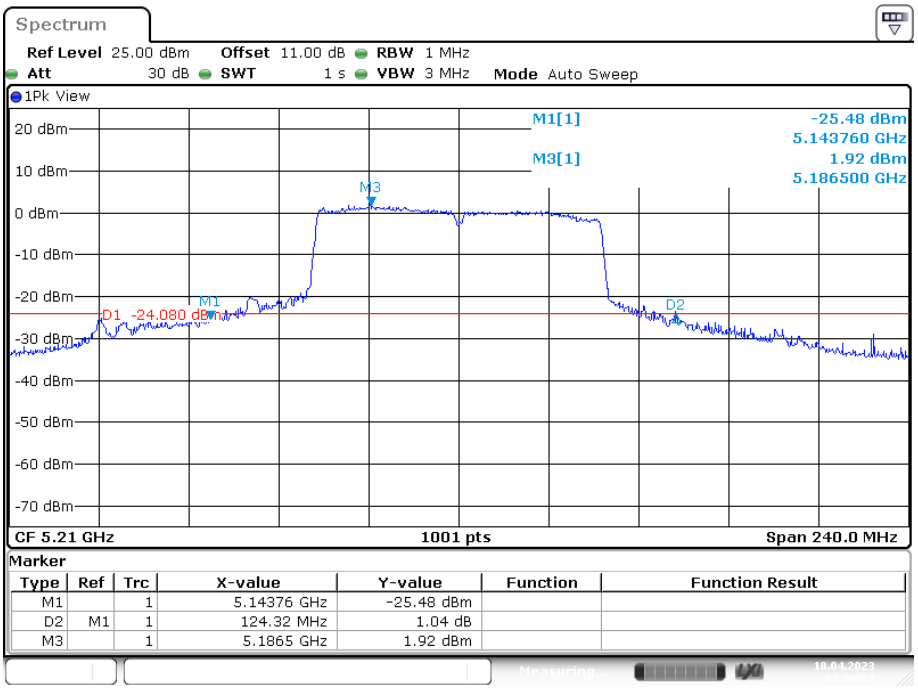
Date: 18.APR.2023 01:50:55

802.11ac40 mode, 5230 MHz



Date: 18.APR.2023 01:52:05

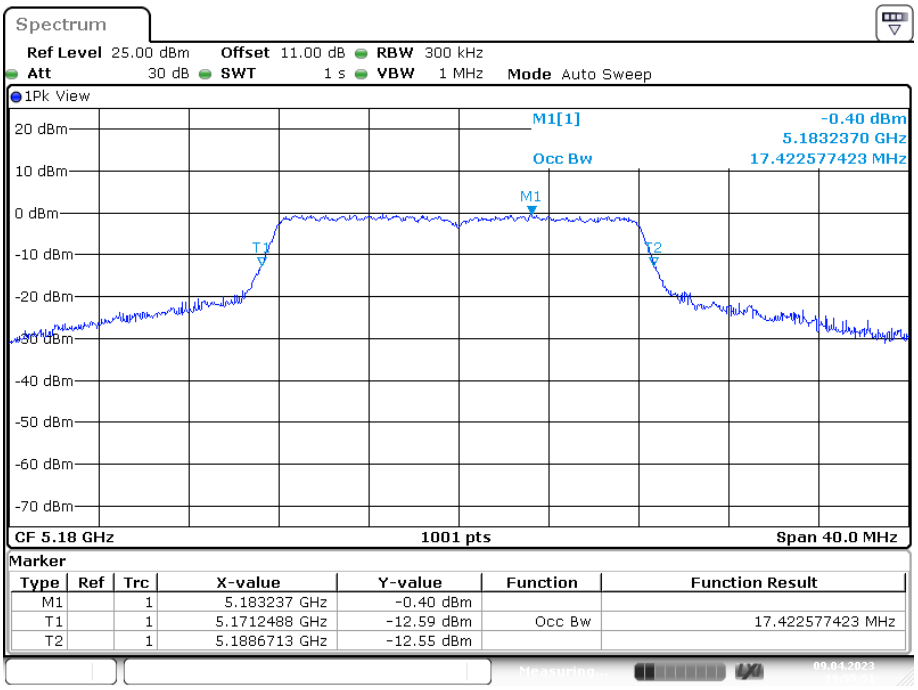
802.11ac80 mode, 5210 MHz



Date: 18.APR.2023 01:56:32

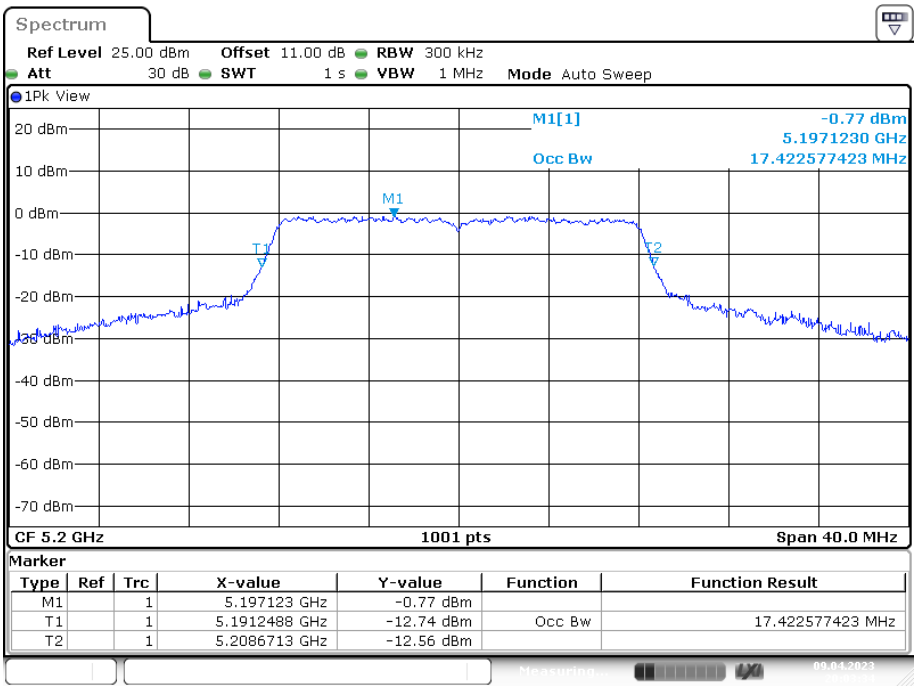
99% Bandwidth:

802.11a mode, 5180 MHz



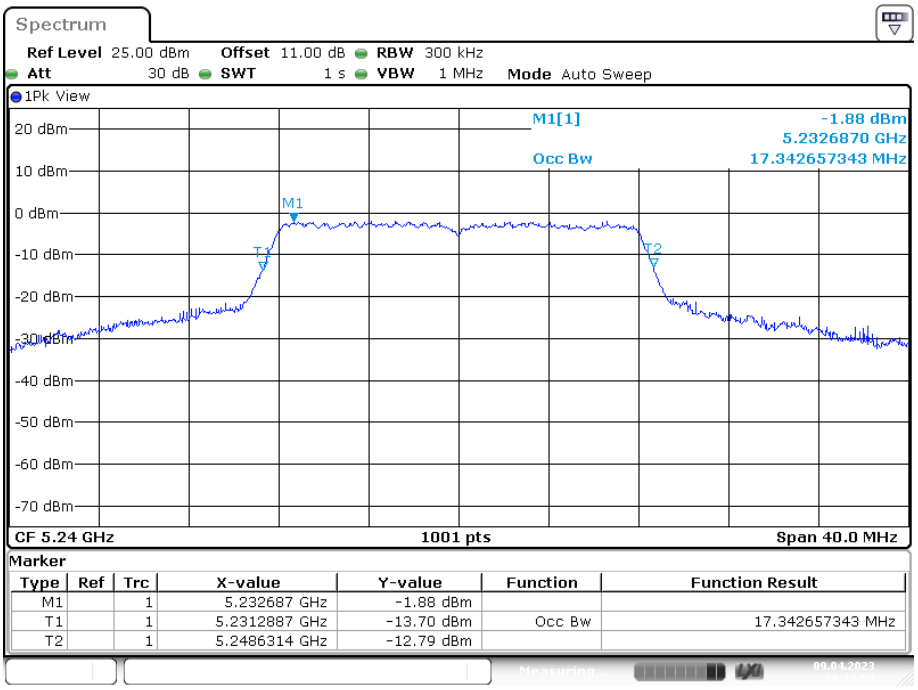
Date: 9.APR.2023 19:55:52

802.11a mode, 5200 MHz



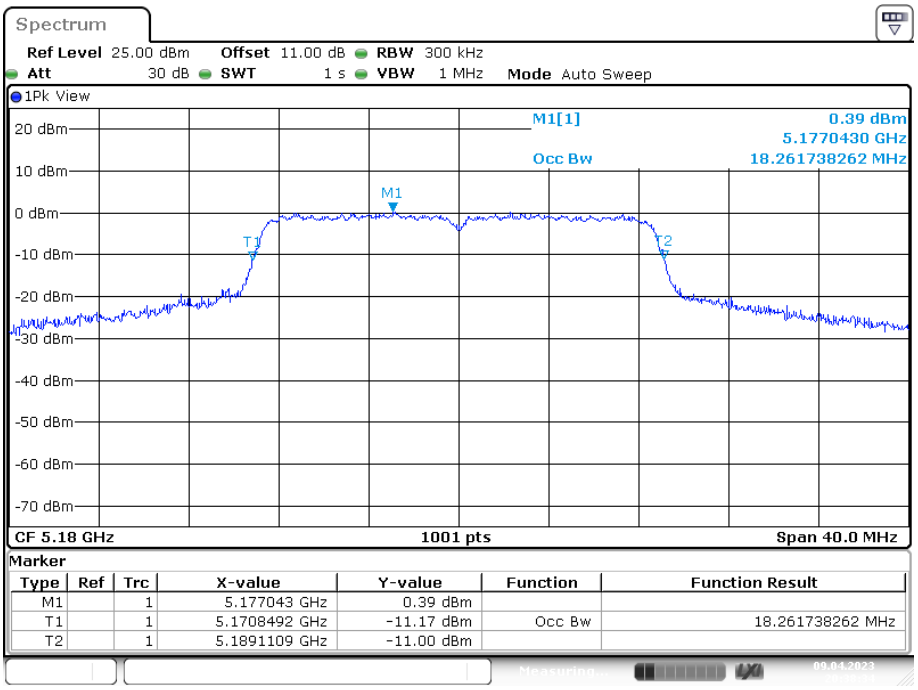
Date: 9.APR.2023 20:03:34

802.11a mode, 5240 MHz



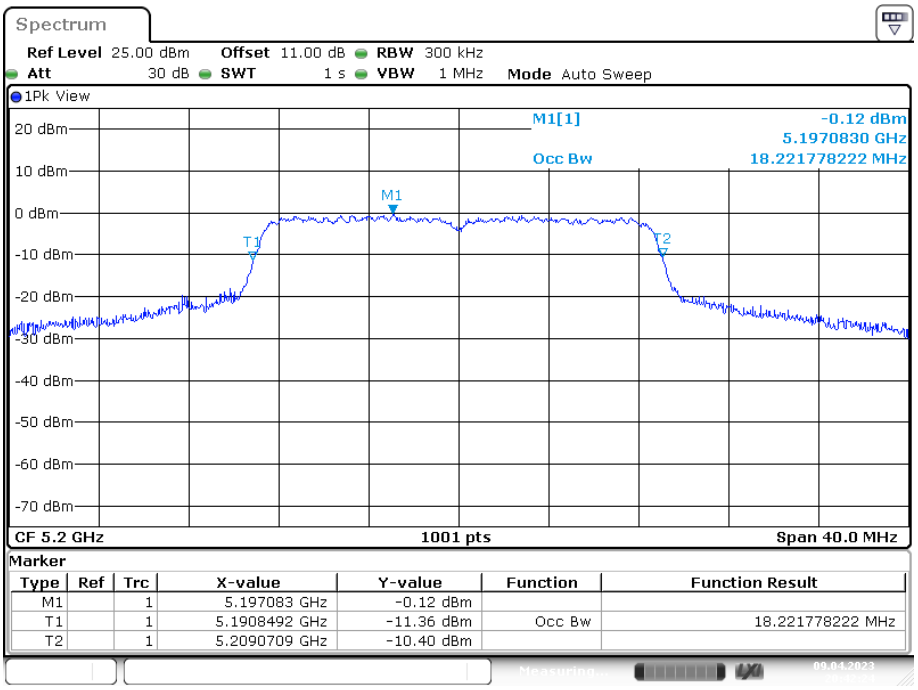
Date: 9.APR.2023 20:13:55

802.11ac20 mode, 5180 MHz



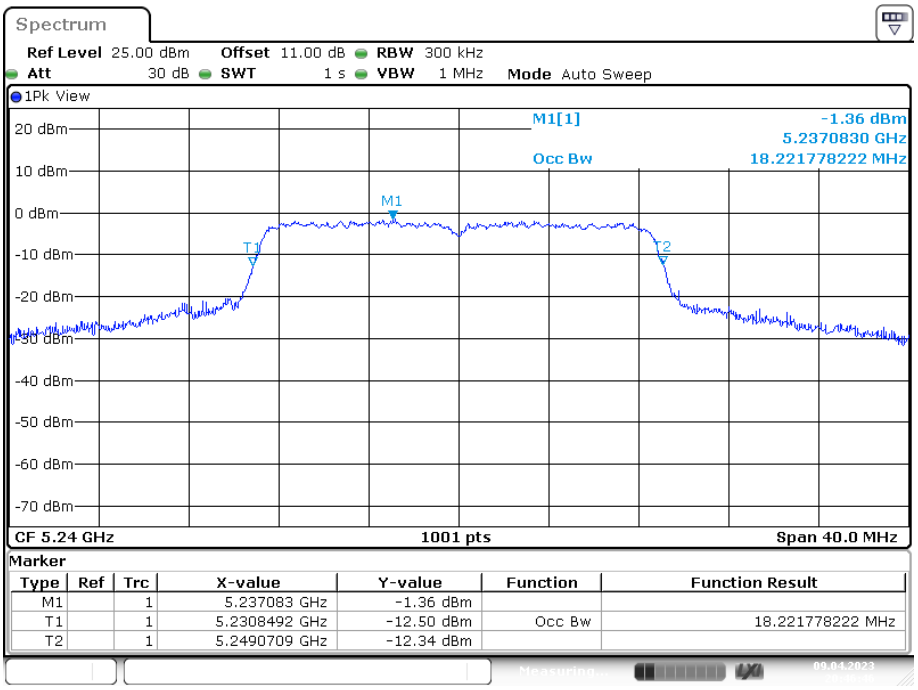
Date: 9.APR.2023 20:38:34

802.11ac20 mode, 5200 MHz



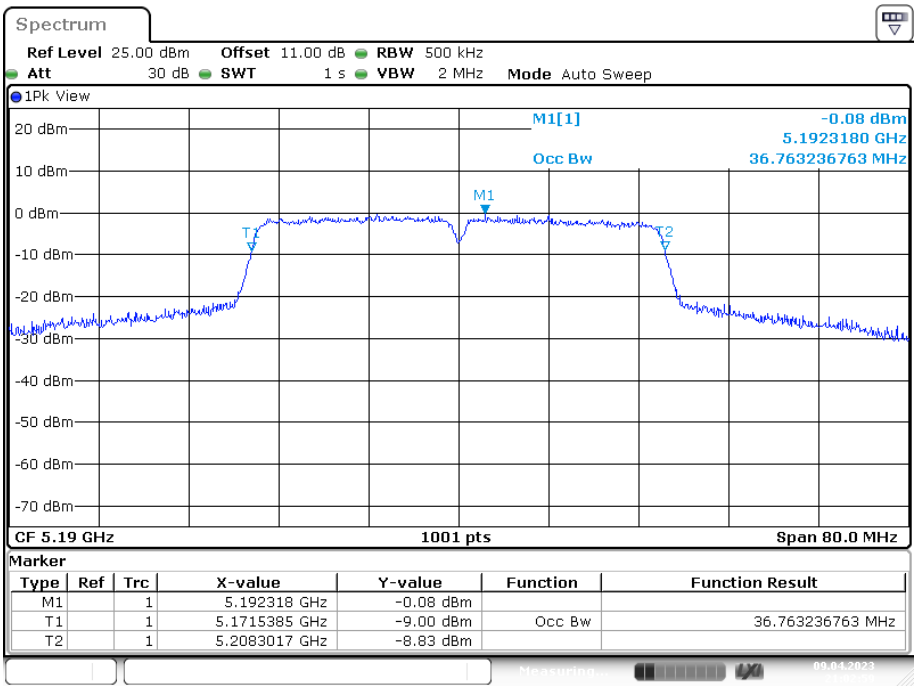
Date: 9.APR.2023 20:42:24

802.11ac20 mode, 5240 MHz



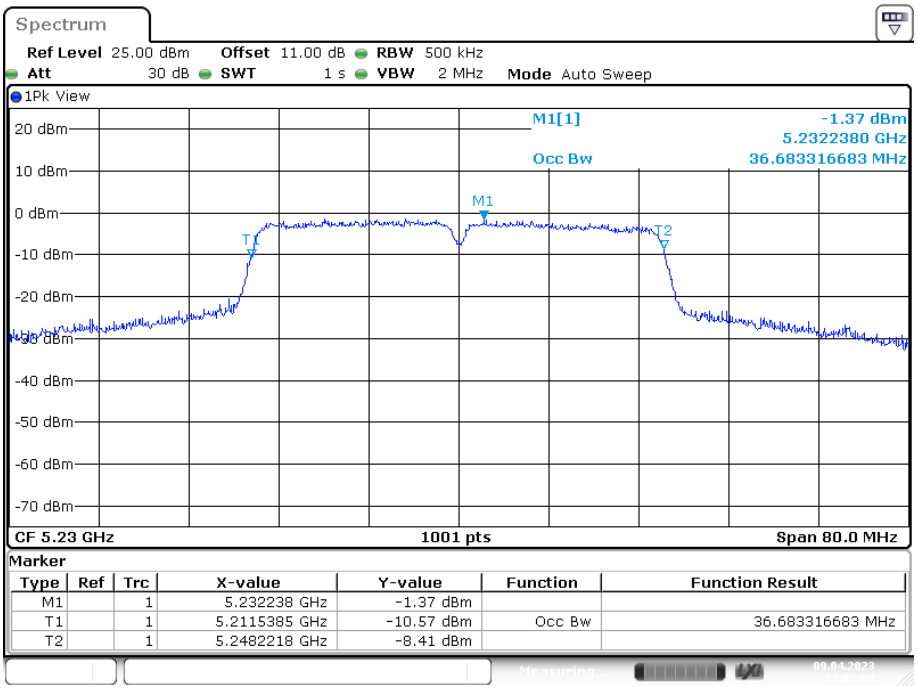
Date: 9.APR.2023 20:46:46

802.11ac40 mode, 5190 MHz



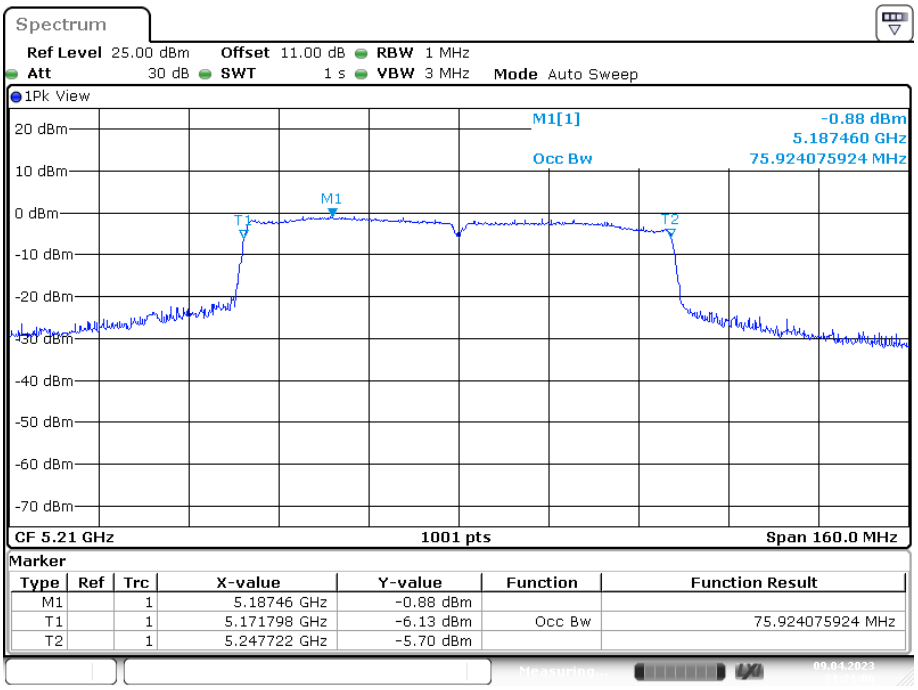
Date: 9.APR.2023 21:03:00

802.11ac40 mode, 5230 MHz



Date: 9.APR.2023 21:07:04

802.11ac80 mode, 5210 MHz



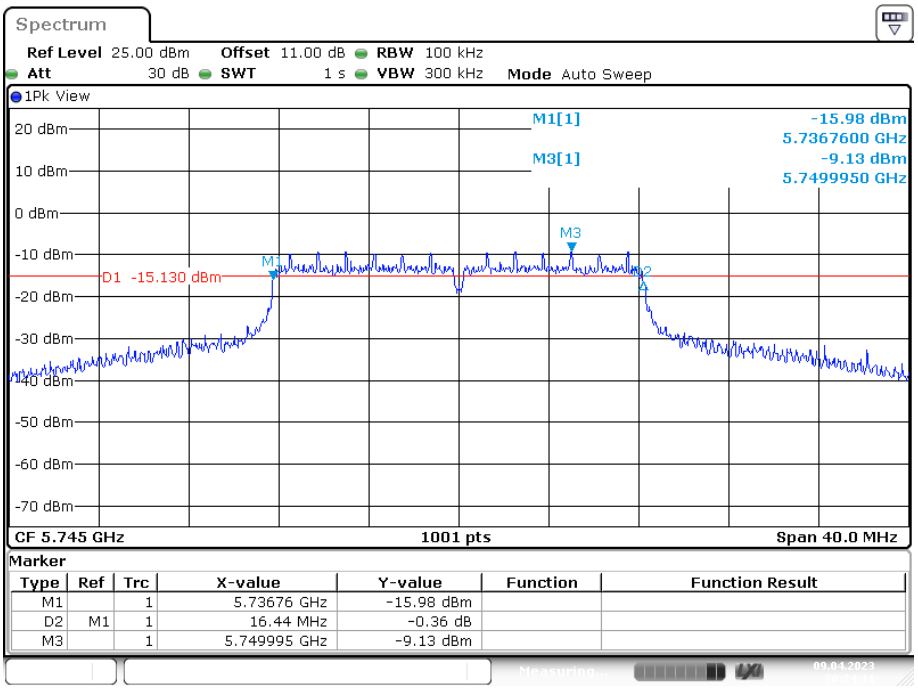
Date: 9.APR.2023 21:21:07

5725 MHz – 5850 MHz:

Frequency (MHz)	Antenna Port	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Remark
802.11a					No transmitted signal in the 99% bandwidth extends into the U-NII-2C band
5745	Ant1	16.44	21.46	0.5	
5785	Ant1	16.44	21.30	0.5	
5825	Ant1	16.44	20.26	0.5	
802.11ac20					
5745	Ant1	17.60	22.06	0.5	
5785	Ant1	17.40	21.38	0.5	
5825	Ant1	17.32	21.24	0.5	
802.11ac40					
5755	Ant1	35.68	44.12	0.5	
5795	Ant1	35.36	42.44	0.5	
11ac80					
5775	Ant1	75.72	85.67	0.5	

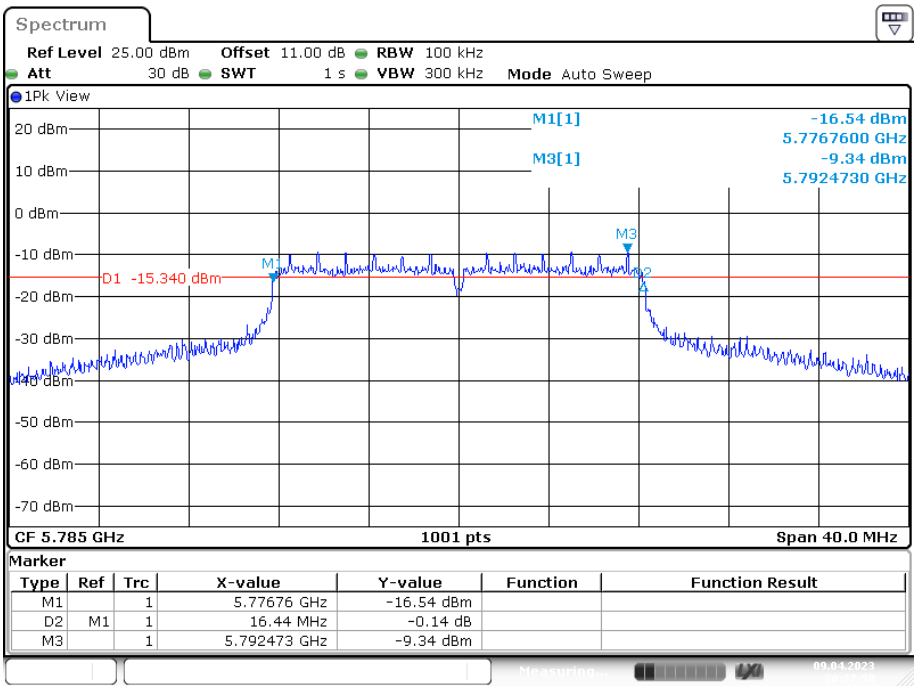
6dB Emission Bandwidth:

802.11a mode, 5745 MHz



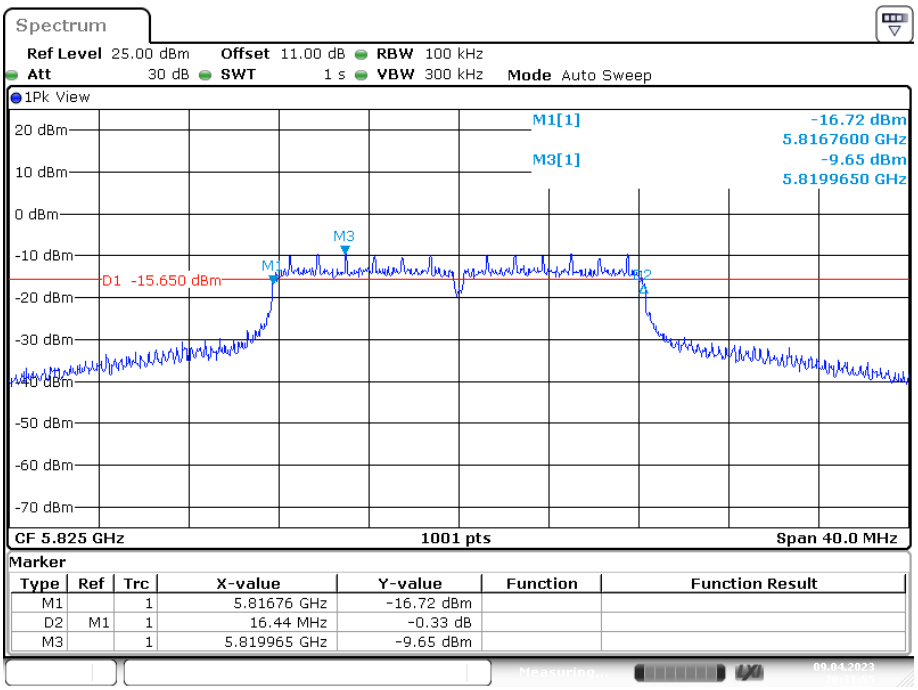
Date: 9.APR.2023 20:24:11

802.11a mode, 5785 MHz



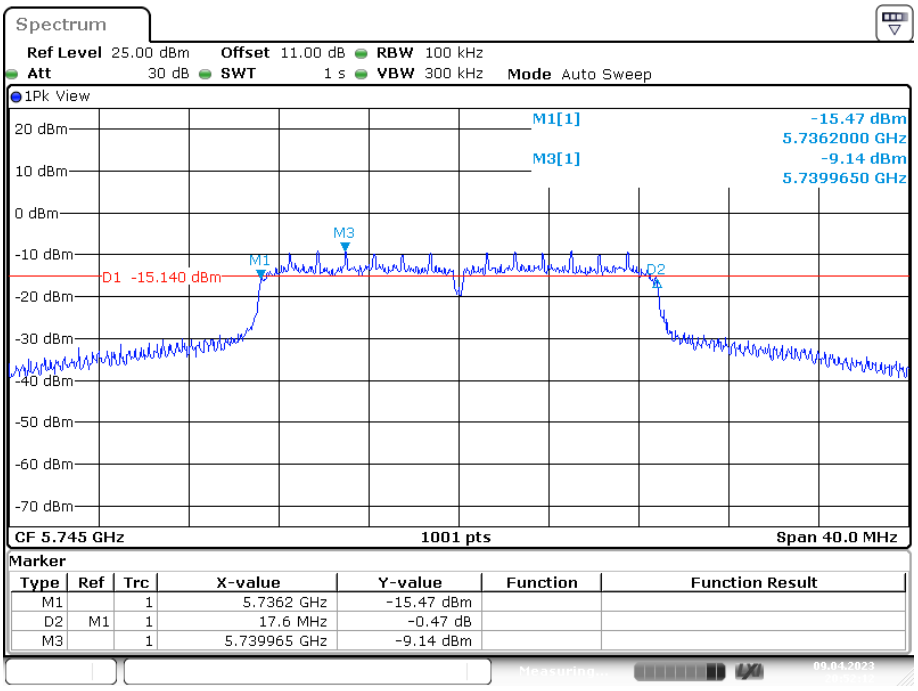
Date: 9.APR.2023 20:27:58

802.11a mode, 5825 MHz



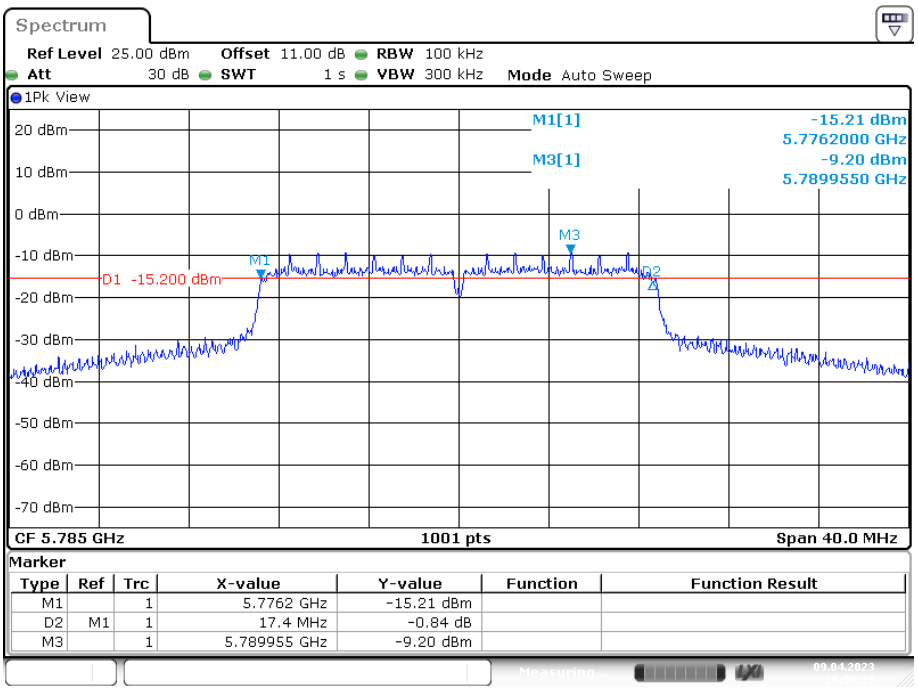
Date: 9.APR.2023 20:31:56

802.11ac20 mode, 5745 MHz



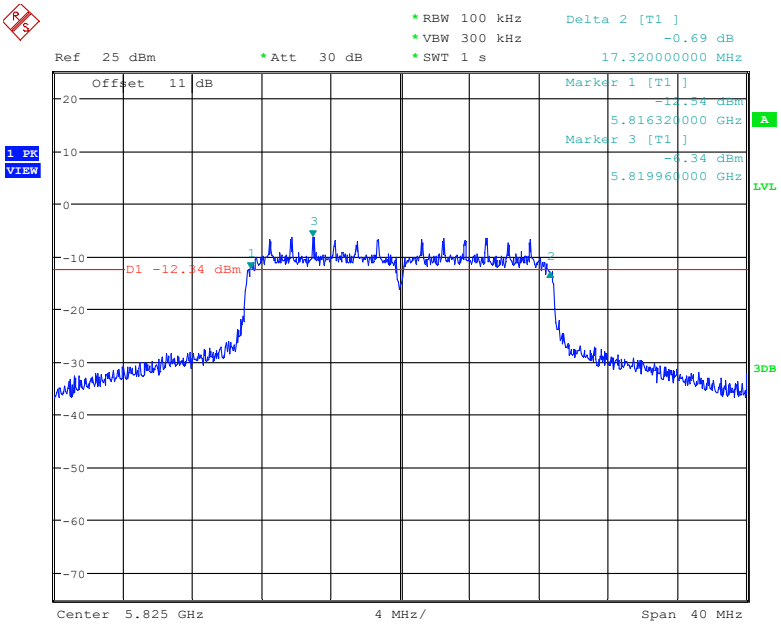
Date: 9.APR.2023 20:52:12

802.11ac20 mode, 5785 MHz



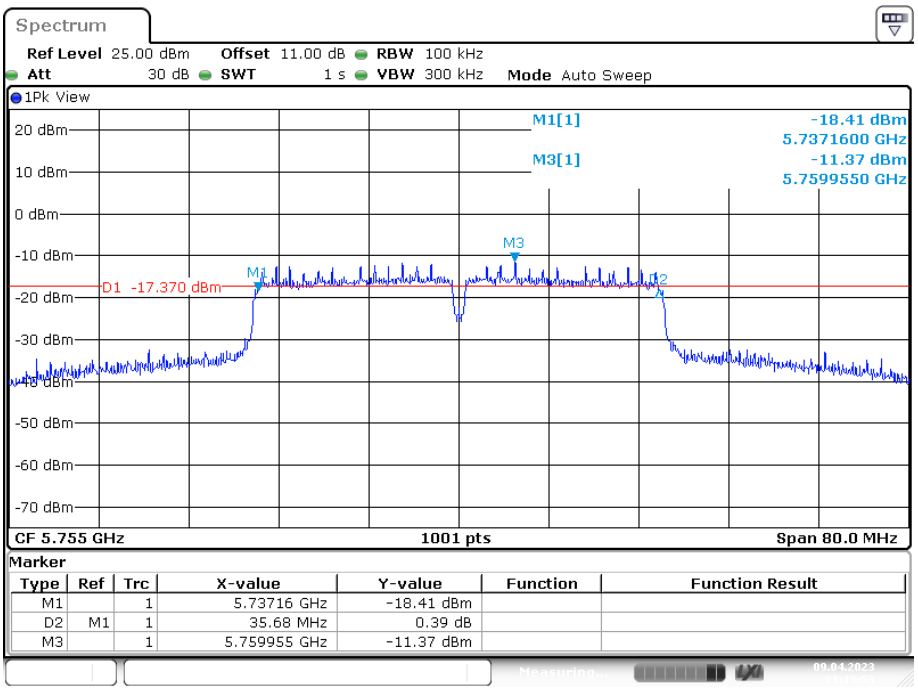
Date: 9.APR.2023 20:59:22

802.11ac20 mode, 5825MHz



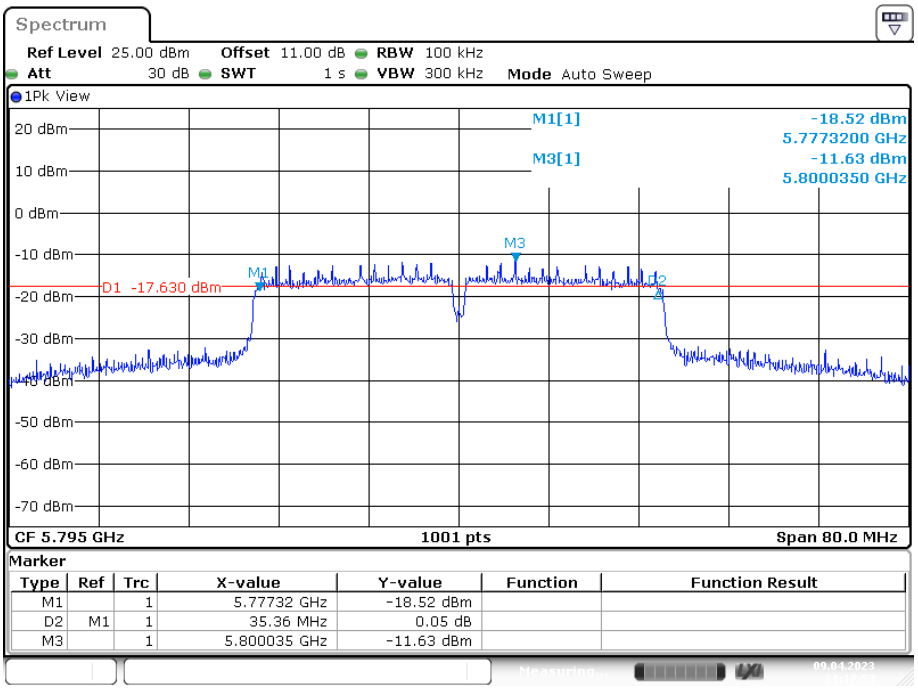
Date: 18.APR.2023 17:21:52

802.11ac40 mode, 5755 MHz



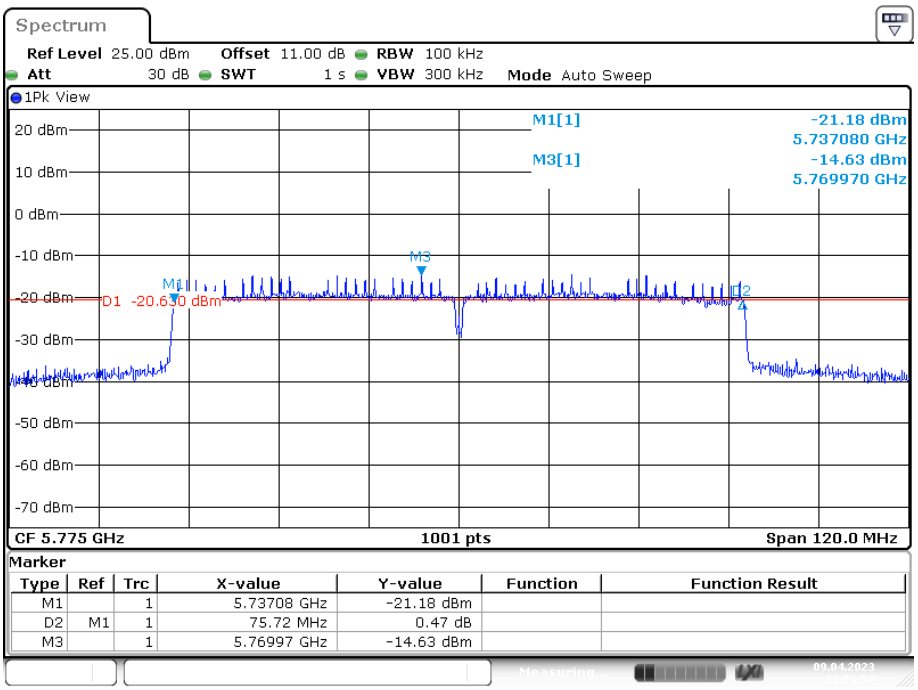
Date: 9.APR.2023 21:13:54

802.11ac40 mode, 5795 MHz



Date: 9.APR.2023 21:17:53

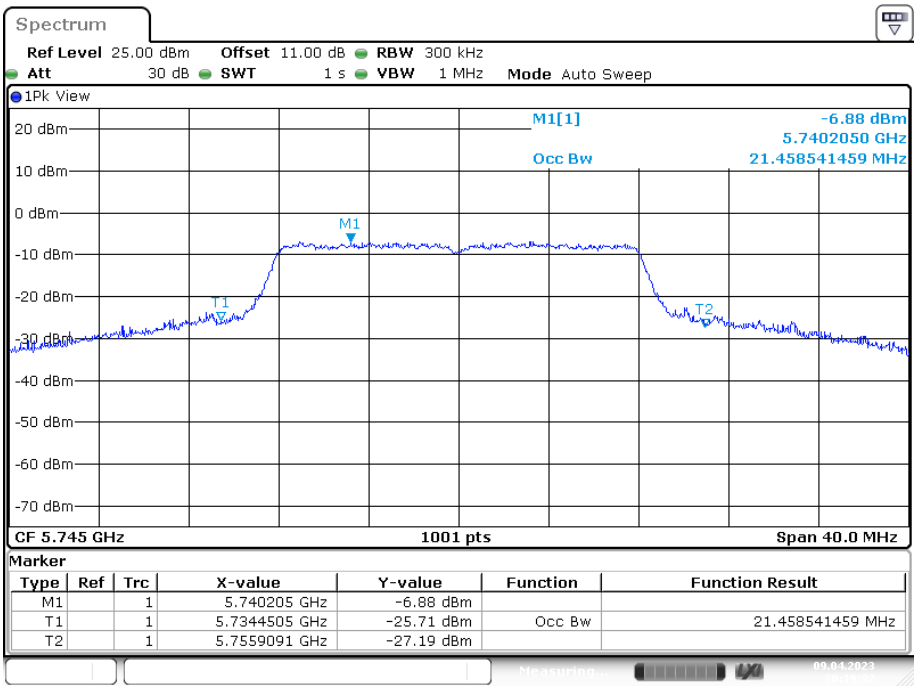
802.11ac80 mode, 5775 MHz



Date: 9.APR.2023 21:25:52

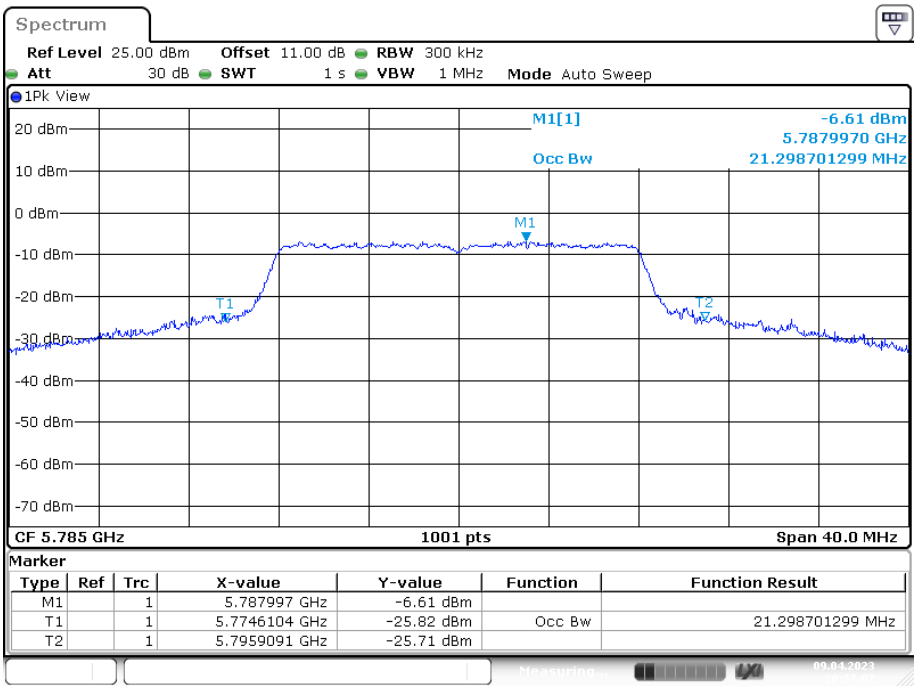
99% Bandwidth:

802.11a mode, 5745 MHz



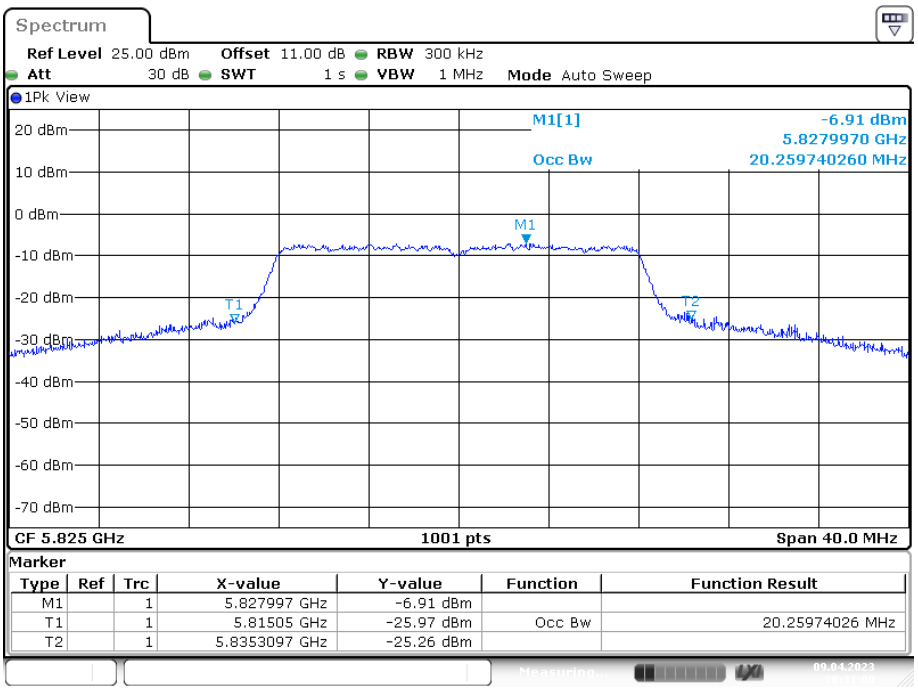
Date: 9.APR.2023 20:19:32

802.11a mode, 5785 MHz



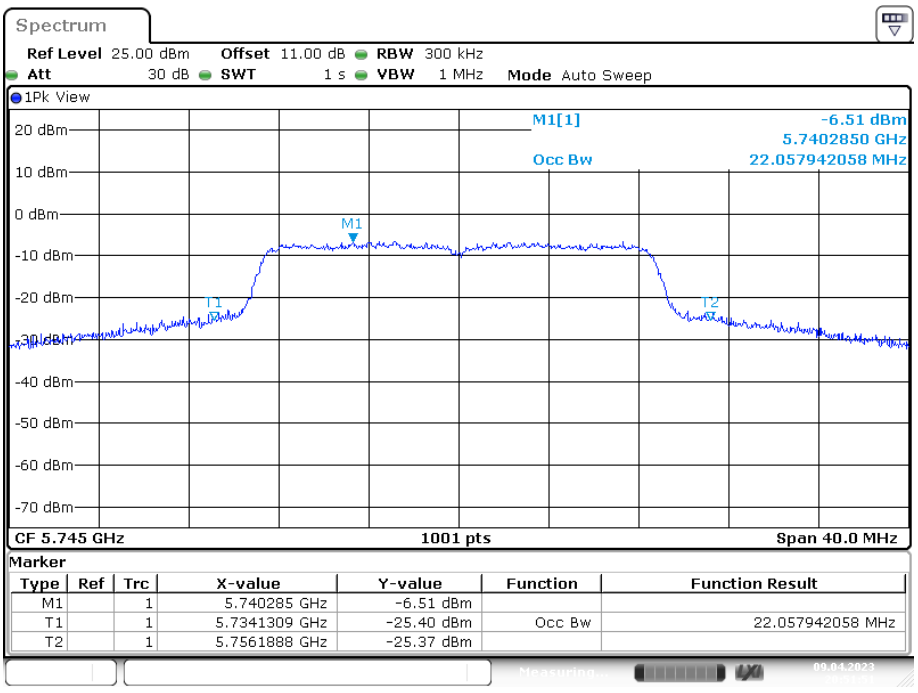
Date: 9.APR.2023 20:27:02

802.11a mode, 5825 MHz



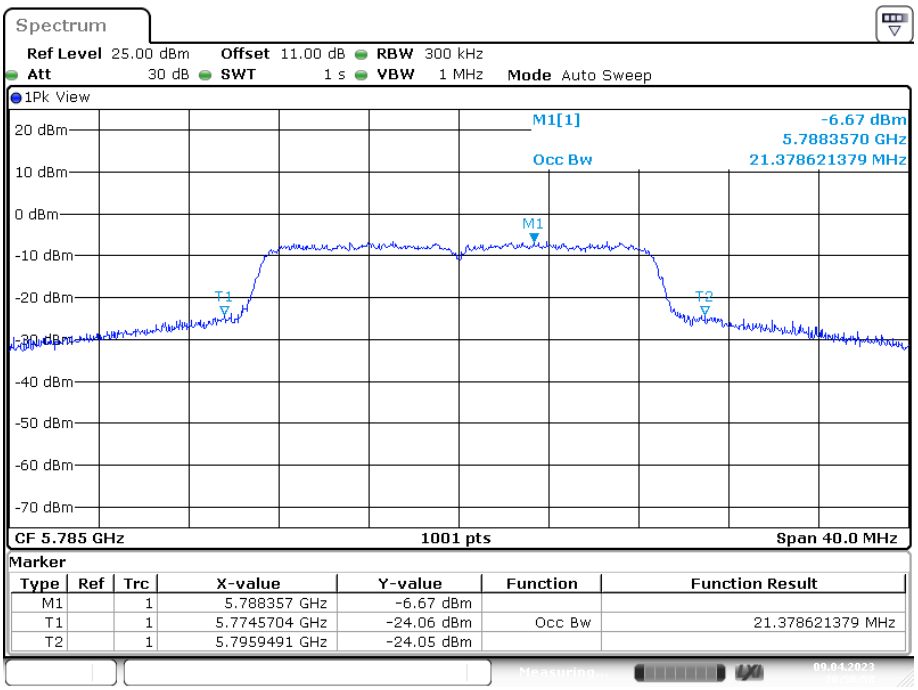
Date: 9.APR.2023 20:31:00

802.11ac20 mode, 5745 MHz



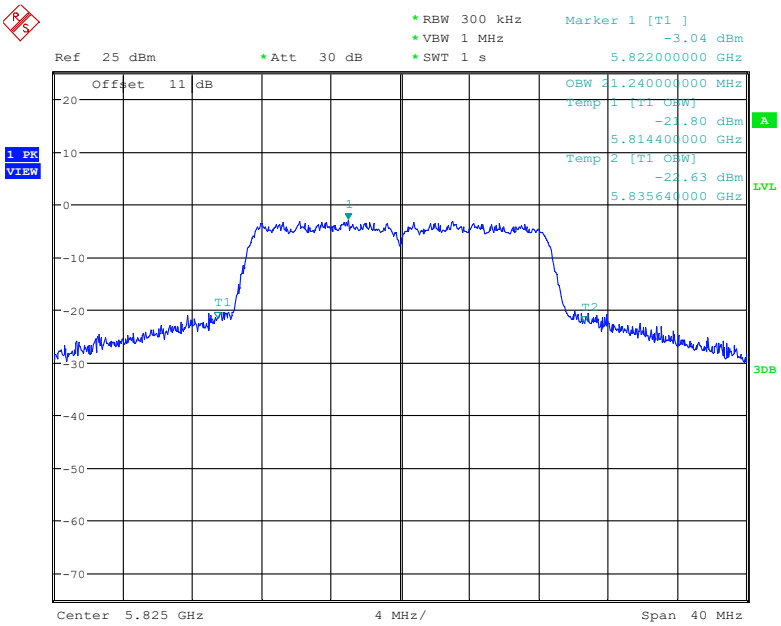
Date: 9.APR.2023 20:51:52

802.11ac20 mode, 5785 MHz



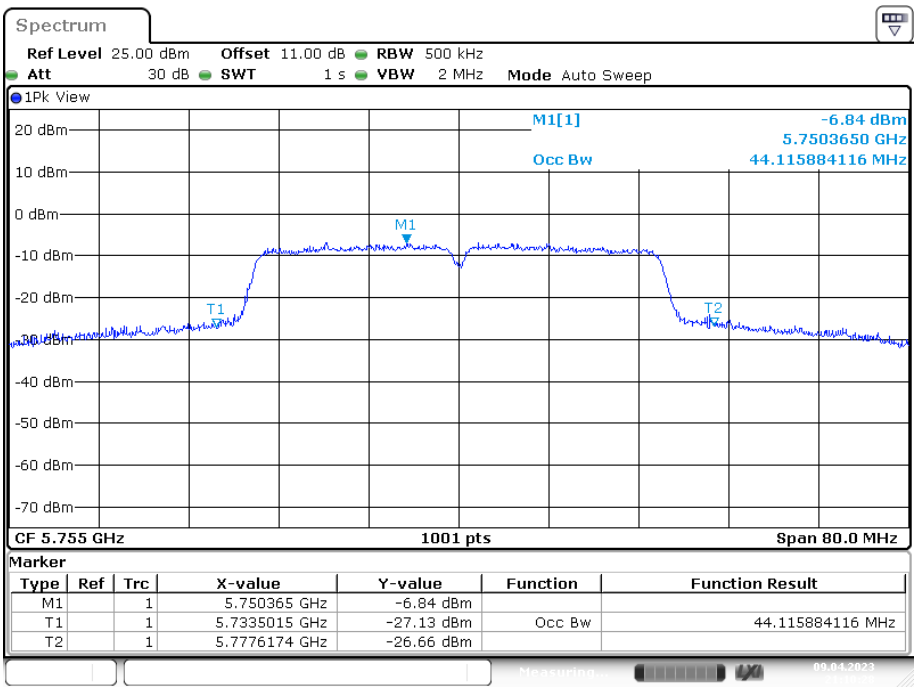
Date: 9.APR.2023 20:58:58

802.11ac20 mode, 5825 MHz



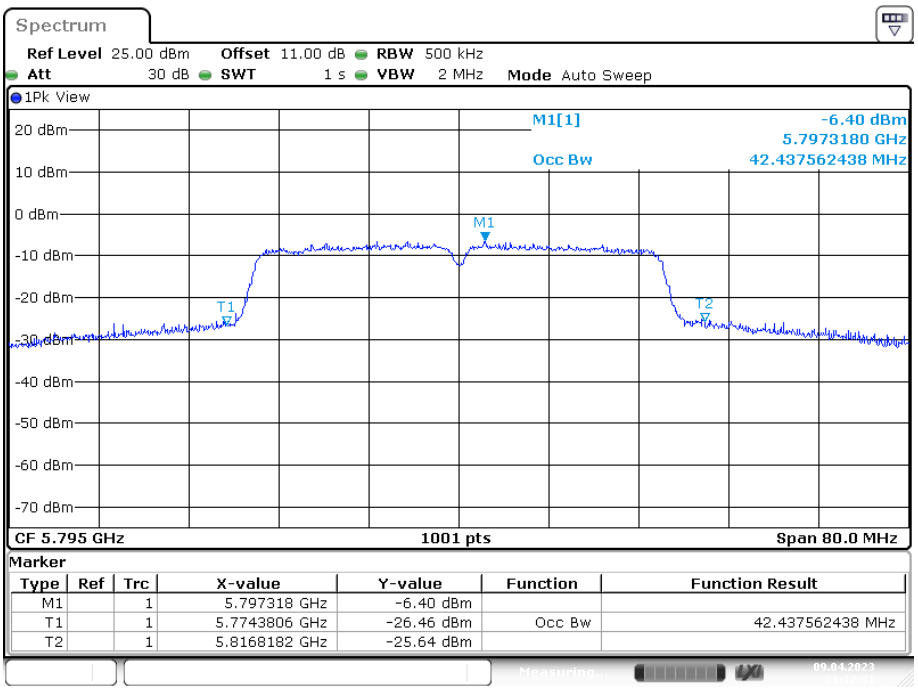
Date: 18.APR.2023 17:25:19

802.11ac40 mode, 5755 MHz



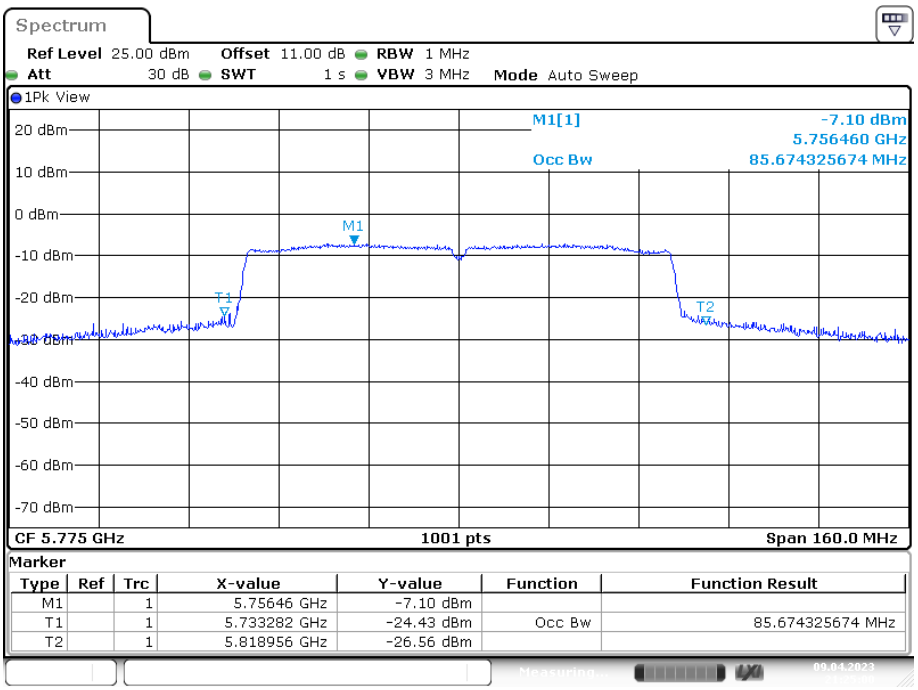
Date: 9.APR.2023 21:10:28

802.11ac40 mode, 5795 MHz



Date: 9.APR.2023 21:17:32

802.11ac80 mode, 5775 MHz



Date: 9.APR.2023 21:25:00

FCC §15.407(a) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 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.

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.

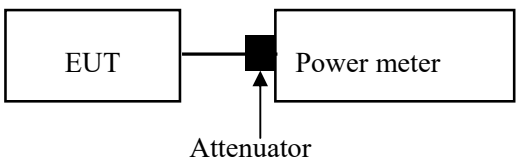
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 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.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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. 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.

Test Procedure

According to ANSI C63.10-2013 section 12.3.3.2

c. Place the EUT on a bench and set it in transmitting mode.
d. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
e. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	26.8 ℃
Relative Humidity:	52%
ATM Pressure:	101.0 kPa

The testing was performed by Roger Ling on 2023-04-18.

EUT operation mode: Transmitting

Test Result: Pass

5150 MHz – 5250 MHz

Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
802.11a		
5180	10.97	24
5200	10.44	24
5240	9.22	24
802.11ac20		
5180	9.94	24
5200	9.47	24
5240	8.48	24
802.11ac40		
5190	10.06	24
5230	9.06	24
802.11ac80		
5210	9.59	24

5725 MHz – 5850 MHz

Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
802.11a		
5745	9.89	30
5785	8.97	30
5825	8.62	30
802.11ac20		
5745	9.65	30
5785	9.18	30
5825	8.69	30
802.11ac40		
5755	9.60	30
5795	9.07	30
802.11ac80		
5775	9.25	30

FCC §15.407(a) - POWER SPECTRAL DENSITY

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.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the 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.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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. 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.

Test Procedure

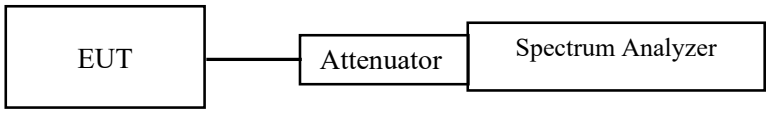
According to KDB789033 D02 section II.F.

The rules requires “maximum power spectral density” measurements where the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission. Refer to III.A for additional guidance for devices that use channel aggregation.

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
3. Make the following adjustments to the peak value of the spectrum, if applicable:
a) If Method SA-2 or SA-2 Alternative was used, add 10 log (1/x), where x is the duty cycle, to the peak of the spectrum.
b) If Method SA-3 Alternative was used and the linear mode was used in II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4. The result is the Maximum PSD over 1 MHz reference bandwidth.

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.



Test Data

Environmental Conditions

Temperature:	26.8 ℃
Relative Humidity:	52%
ATM Pressure:	101.0 kPa

The testing was performed by Roger Ling on 2023-04-18 and 2023-04-21.

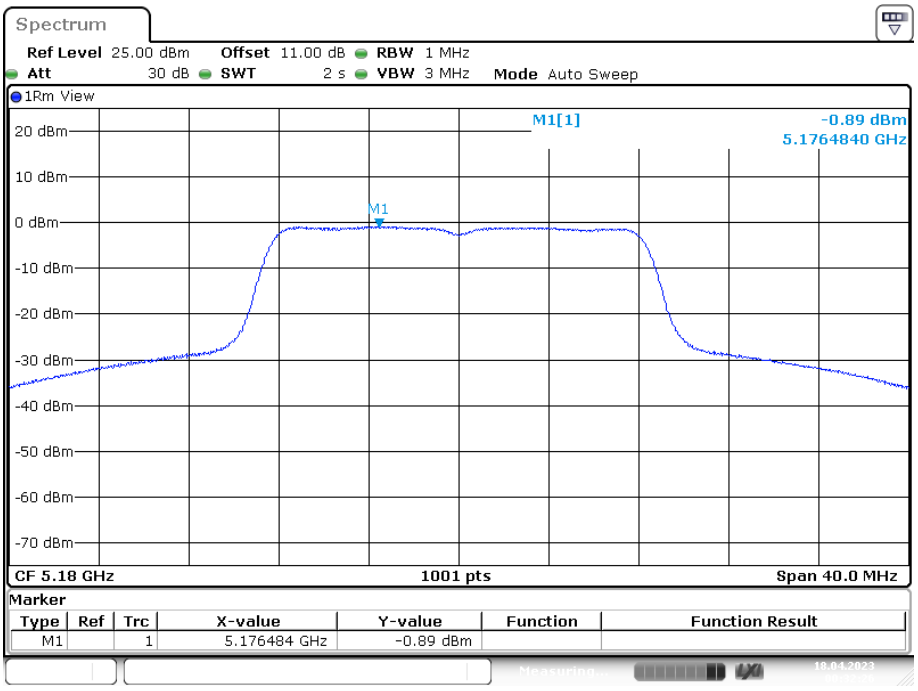
EUT operation mode: Transmitting

Test Result: Pass *Please refer to the test data and plots as follows:*

5150 MHz – 5250 MHz:

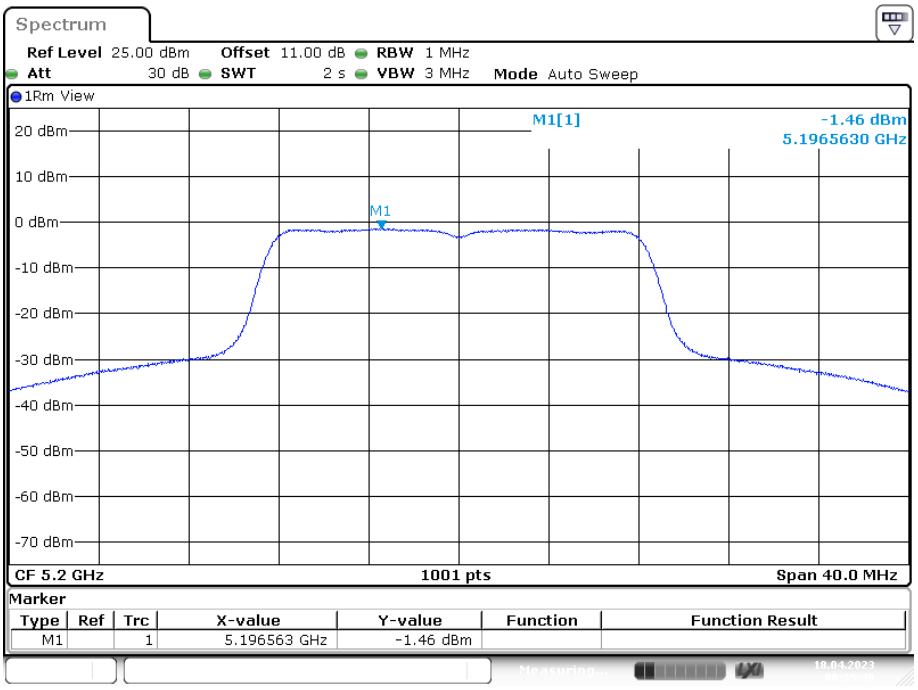
Frequency (MHz)	Reading (dBm/MHz)	Duty Cycle Factor (dB)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
802.11a				
5180	-0.89	0.46	-0.43	11
5200	-1.46	0.46	-1.00	11
5240	-2.64	0.46	-2.18	11
802.11ac20				
5180	-2.21	0.48	-1.73	11
5200	-2.71	0.48	-2.23	11
5240	-3.67	0.48	-3.19	11
802.11ac40				
5190	-8.16	0.88	-7.28	11
5230	-8.52	0.88	-7.64	11
802.11ac80				
5210	-11.96	1.63	-10.33	11

802.11a mode, Power Spectral Density, 5180 MHz



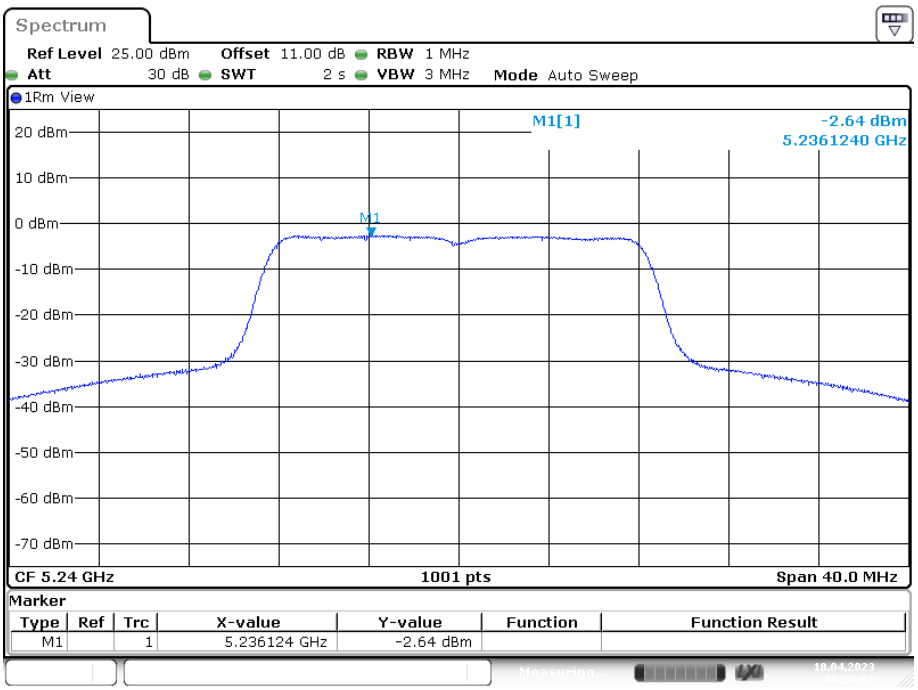
Date: 18.APR.2023 00:32:26

802.11a mode, Power Spectral Density, 5200 MHz



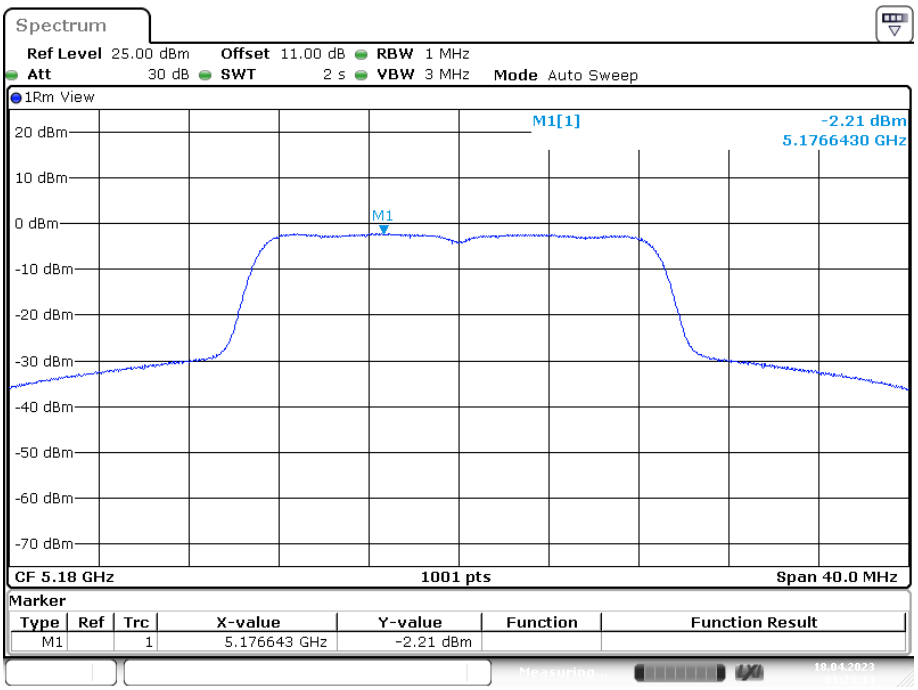
Date: 18.APR.2023 00:35:50

802.11a mode, Power Spectral Density, 5240 MHz



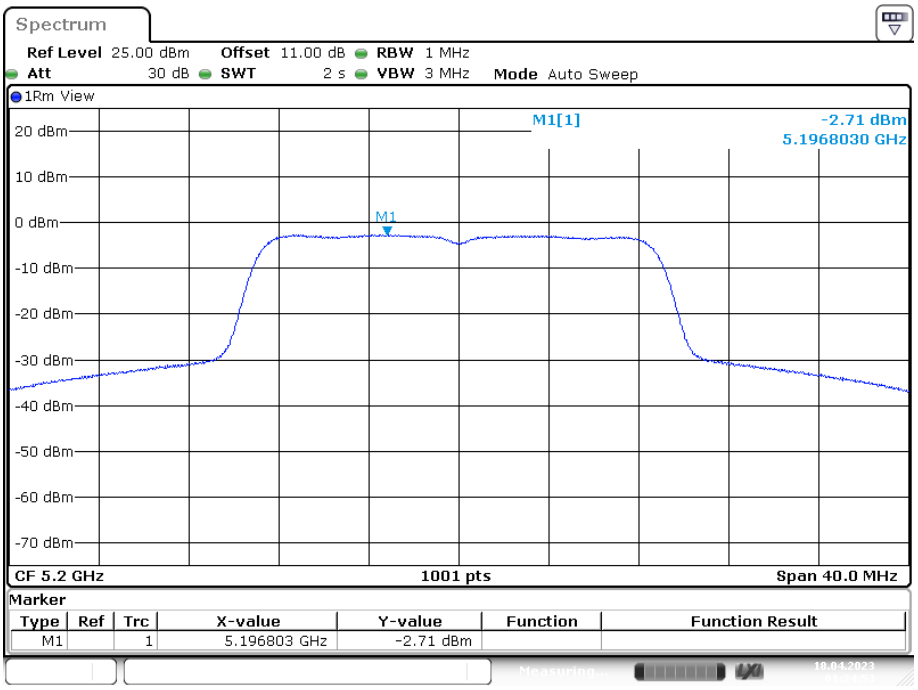
Date: 18.APR.2023 00:38:01

802.11ac20 mode, Power Spectral Density, 5180 MHz



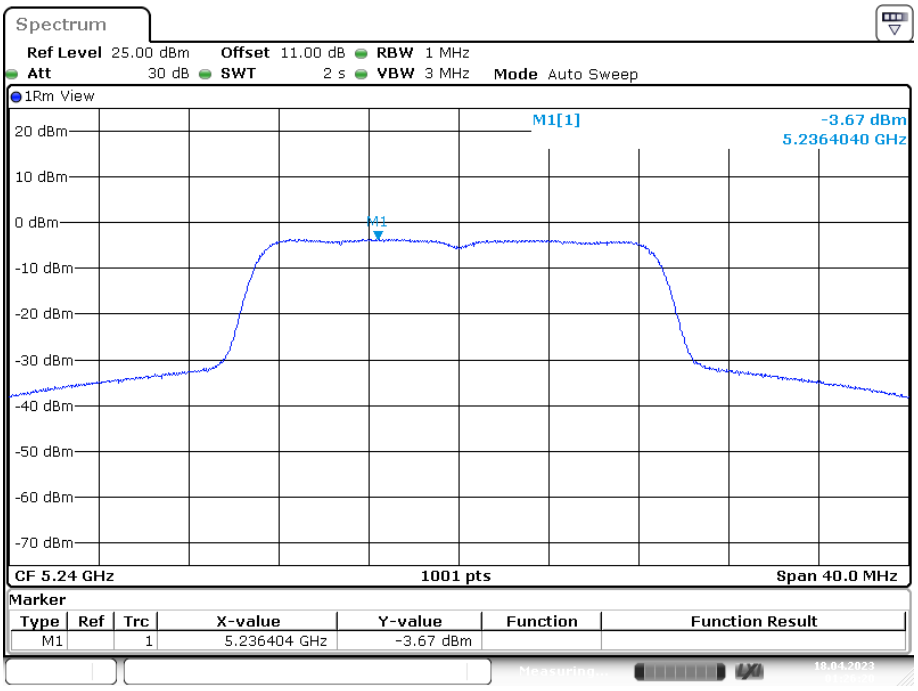
Date: 18.APR.2023 01:23:12

802. 11ac20 mode, Power Spectral Density, 5200 MHz



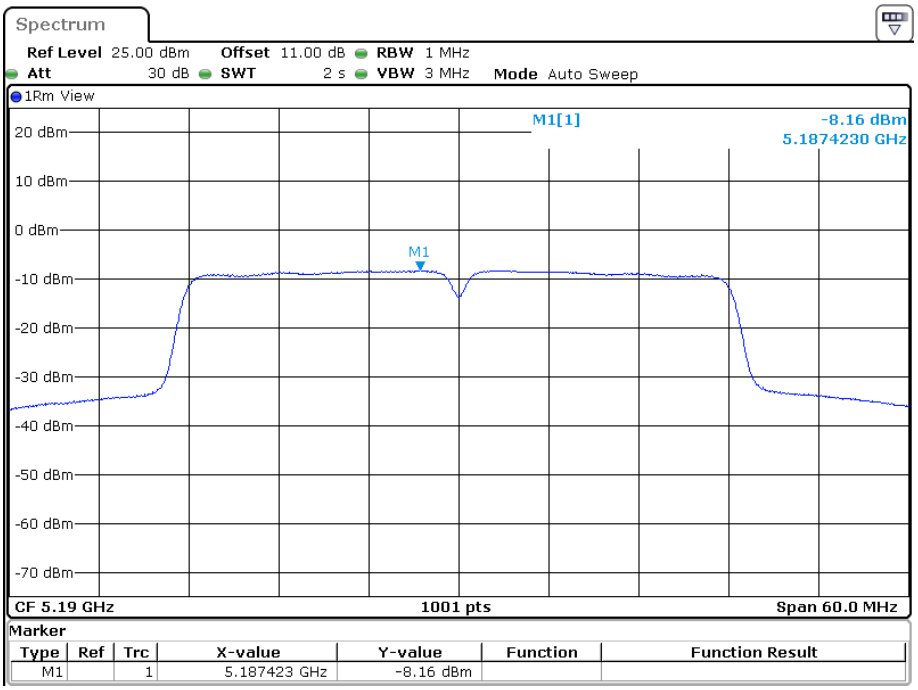
Date: 18.APR.2023 01:24:53

802. 11ac20 mode, Power Spectral Density, 5240 MHz



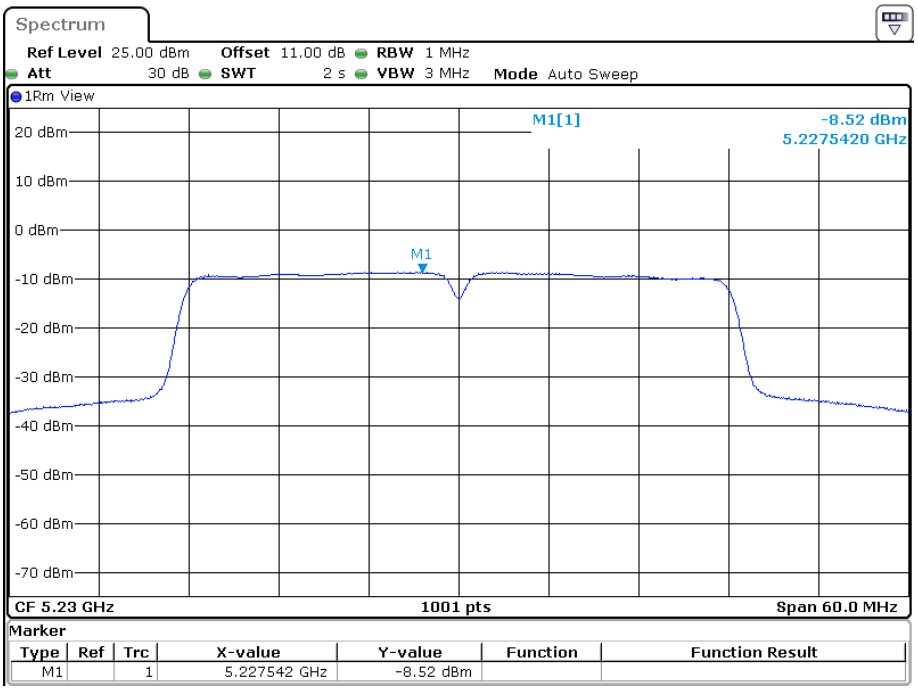
Date: 18.APR.2023 01:26:21

802. 11ac40 mode, Power Spectral Density, 5190 MHz



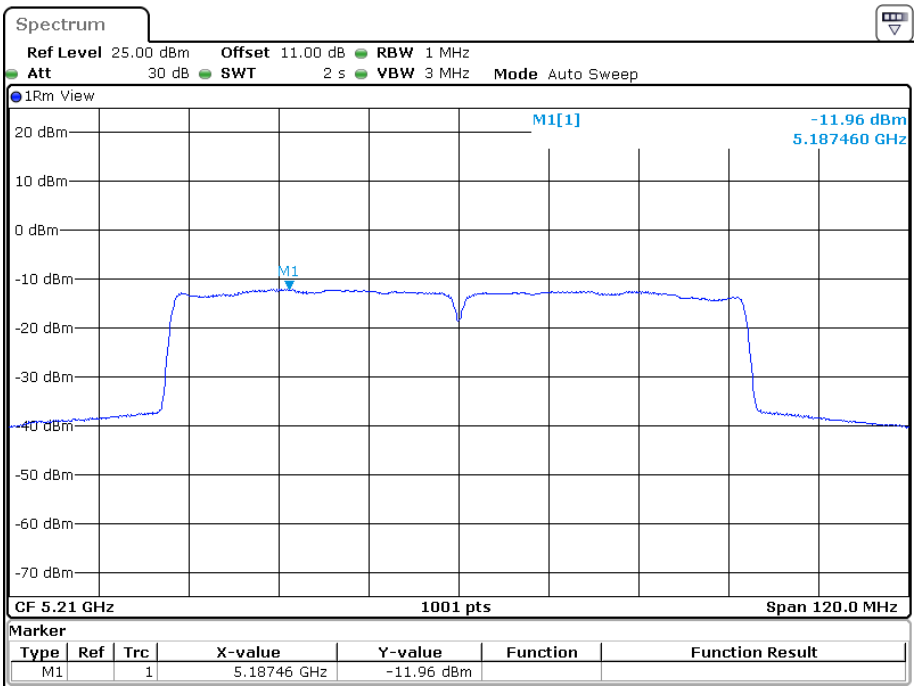
Date: 21.APR.2023 22:58:44

802. 11ac40 mode, Power Spectral Density, 5230 MHz



Date: 21.APR.2023 23:00:18

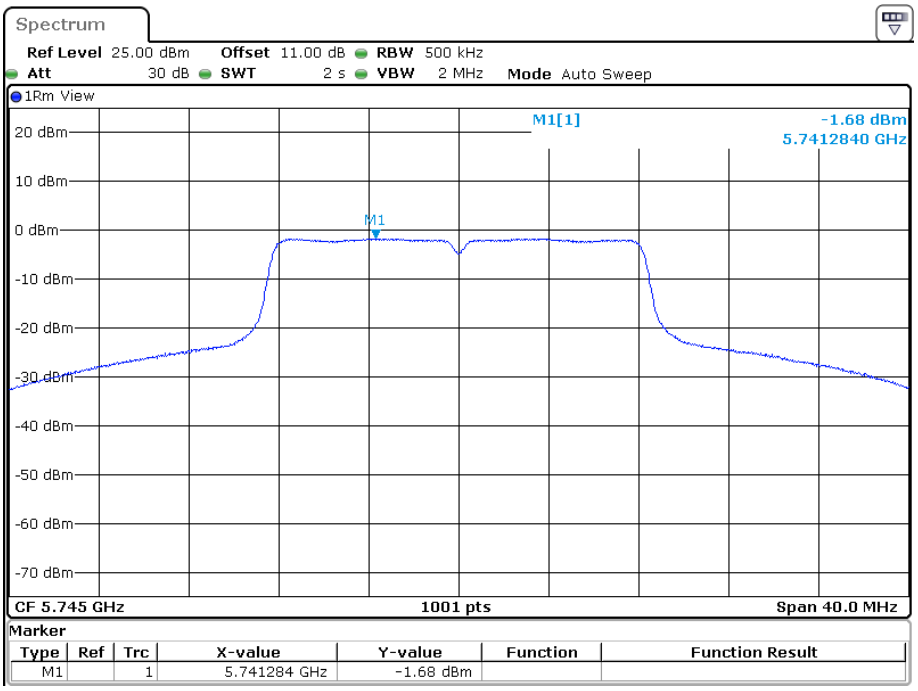
802. 11ac80 mode, Power Spectral Density, 5210 MHz



5725 MHz – 5850 MHz:

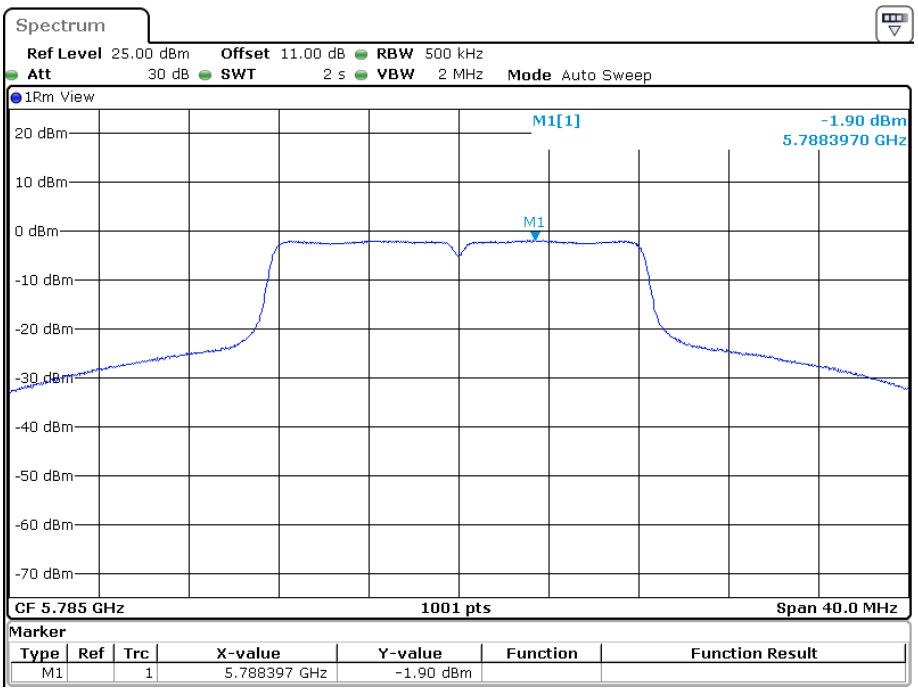
Frequency (MHz)	Reading (dBm/MHz)	Duty Cycle Factor (dB)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)
802.11a				
5745	-1.68	0.46	-1.22	30
5785	-1.90	0.46	-1.44	30
5825	-1.62	0.46	-1.16	30
802.11ac20				
5745	-2.10	0.48	-1.62	30
5785	-2.32	0.48	-1.84	30
5825	-4.67	0.48	-4.19	30
802.11ac40				
5755	-8.56	0.88	-7.68	30
5795	-9.37	0.88	-8.49	30
802.11ac80				
5775	-12.83	1.63	-11.20	30

802.11a mode, Power Spectral Density, 5745 MHz



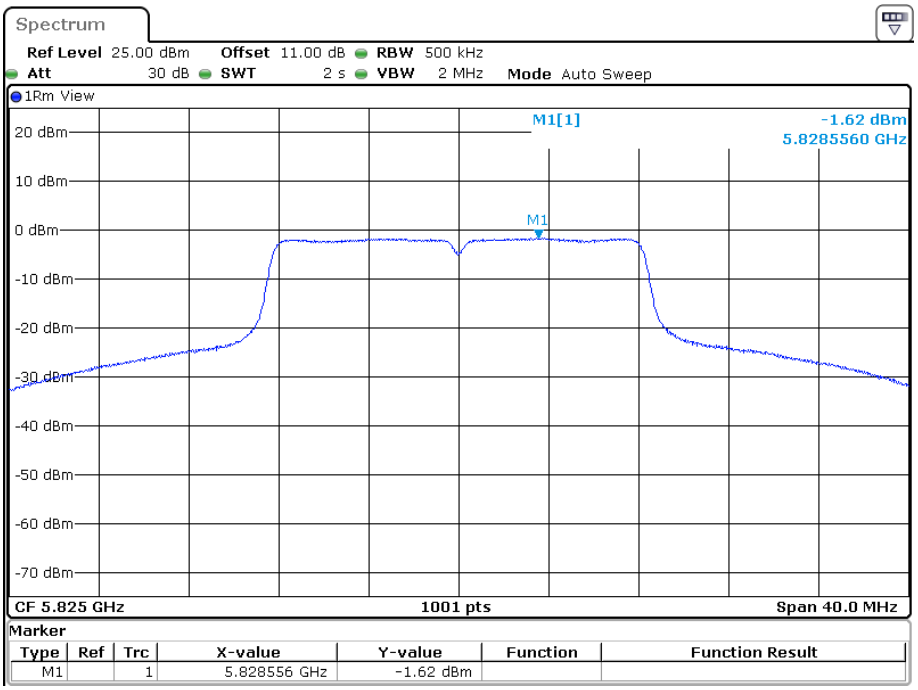
Date: 21.APR.2023 23:09:18

802.11a mode, Power Spectral Density, 5785 MHz



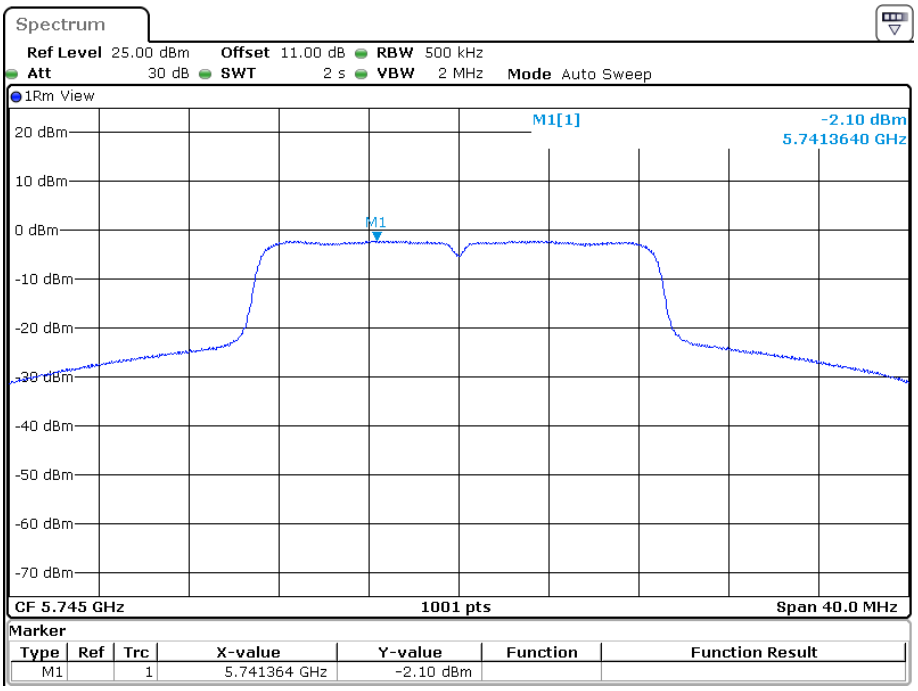
Date: 21.APR.2023 23:10:18

802.11a mode, Power Spectral Density, 5825 MHz



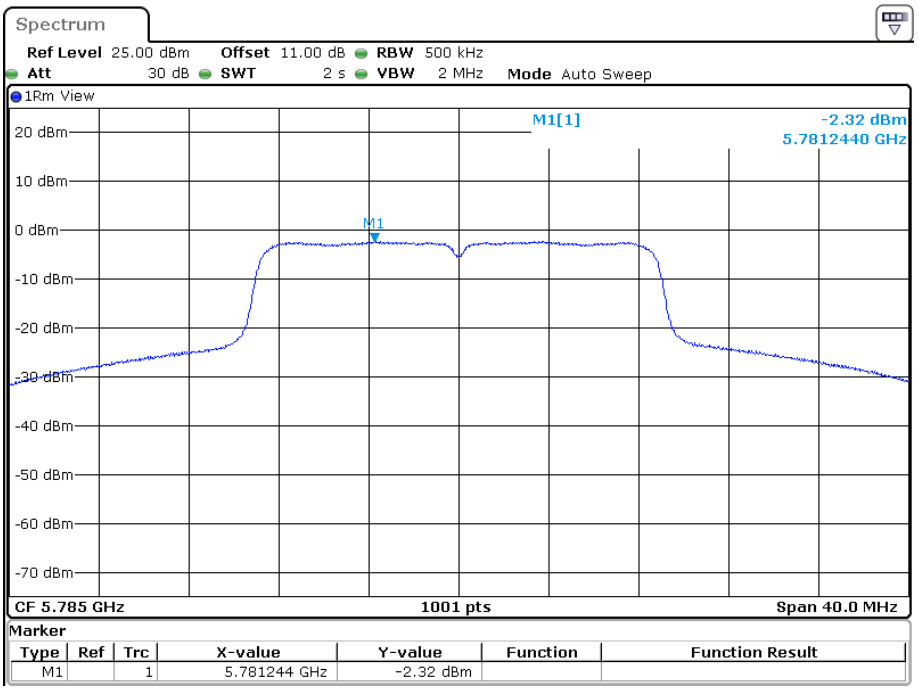
Date: 21.APR.2023 23:13:30

02.11ac20 mode, Power Spectral Density, 5745 MHz



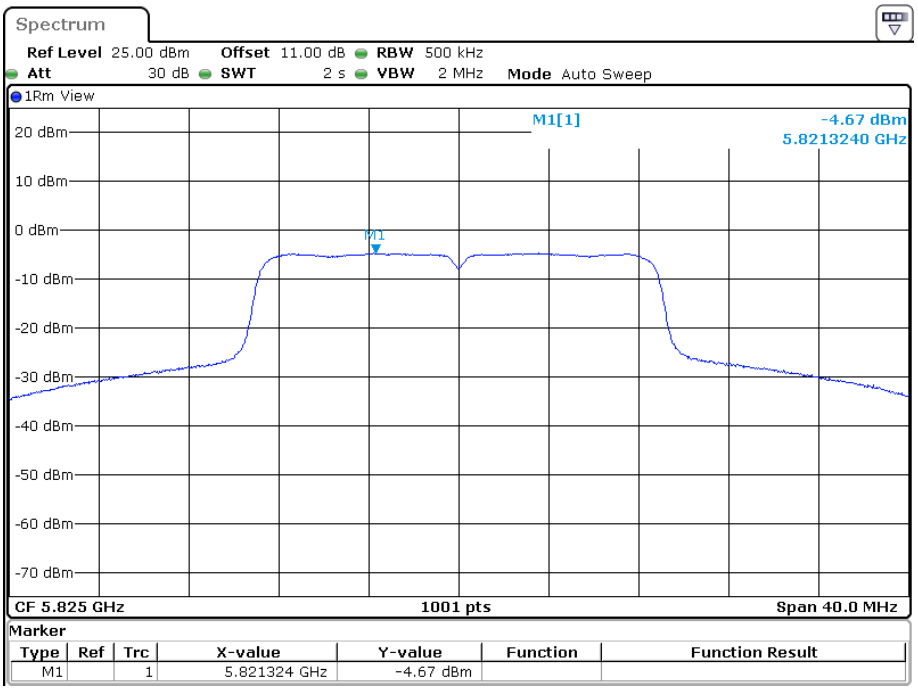
Date: 21.APR.2023 23:14:51

802. 11ac20 mode, Power Spectral Density, 5785 MHz



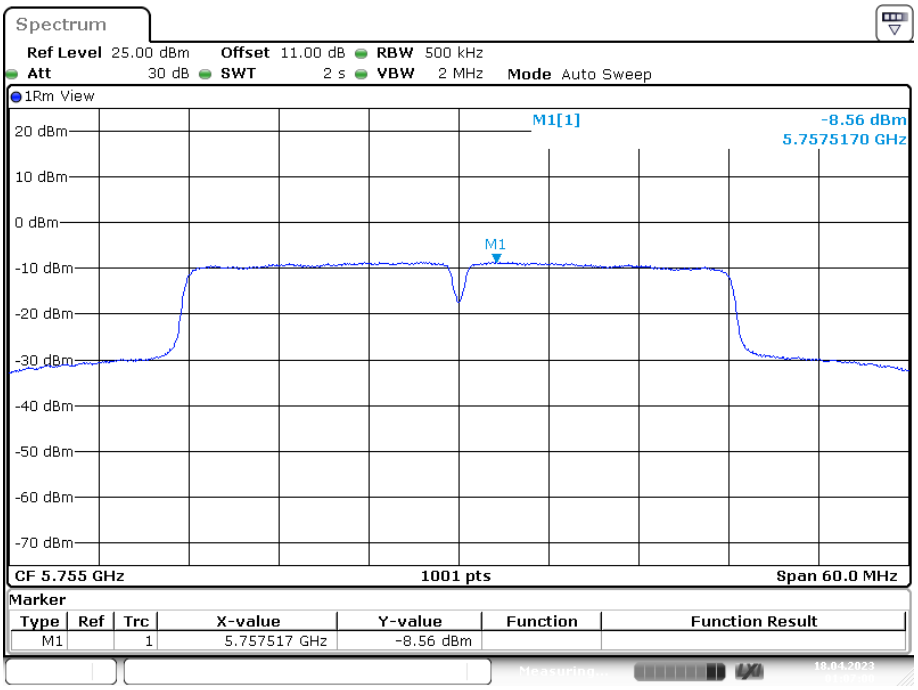
Date: 21.APR.2023 23:15:36

802. 11ac20 mode, Power Spectral Density, 5825 MHz



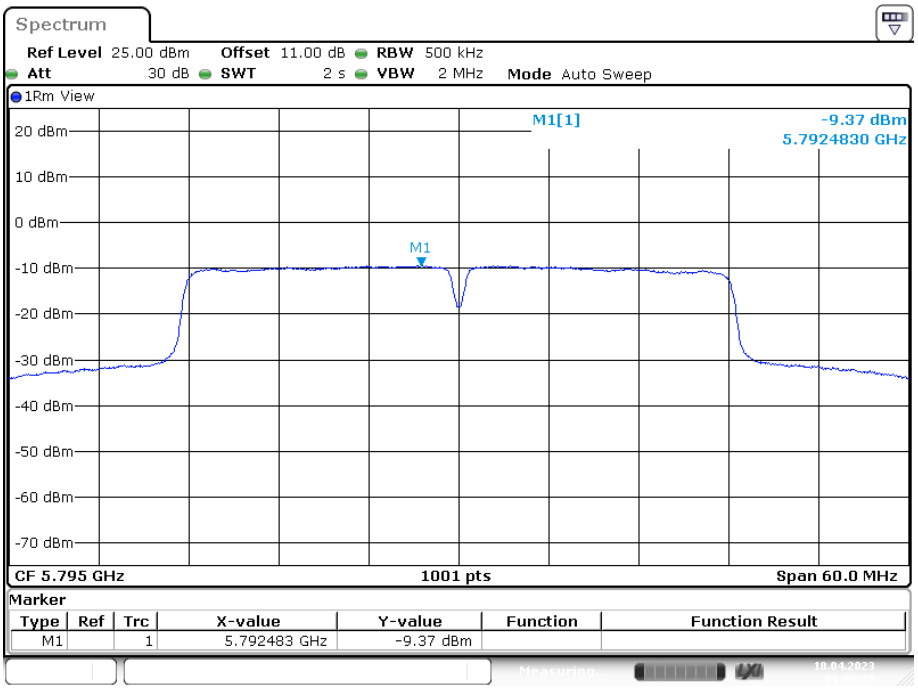
Date: 21.APR.2023 23:23:47

802. 11ac40 mode, Power Spectral Density, 5755 MHz



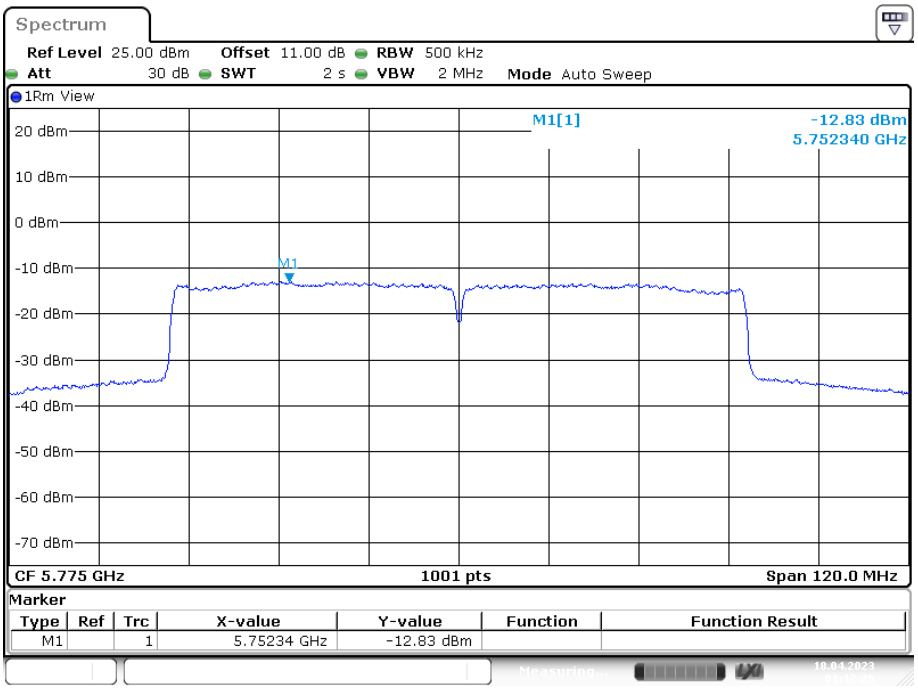
Date: 18.APR.2023 01:07:00

802. 11ac40 mode, Power Spectral Density, 5795 MHz



Date: 18.APR.2023 01:09:27

802. 11ac80 mode, Power Spectral Density, 5775 MHz



Date: 18.APR.2023 01:12:26

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