

TEST REPORT

Applicant Name : Shenzhen Junge Yunchuang Technology Co., Ltd.
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Report Number : SZNS220214-04312E-RF-00
FCC ID: 2A3FP-PC006

Test Standard (s)

FCC PART 15.407

Sample Description

Product Type: Tablet
Model No.: TB-JS100A
Multiple Model(s) No.: S7,S8,S10,S31,TB-JS101A,JS10, JS31
(please attach the DOS showing the specific differences)
Trade Mark: N/A
Date Received: 2022/02/14
Report Date: 2022/05/25

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:



Black Ding
EMC Engineer

Approved By:



Robert Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

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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
Maximum Conducted Average Output Power	5150-5250 MHz: 14.97dBm 5725-5850MHz : 10.83dBm
Modulation Technique	OFDM
Antenna Specification*	2.0dBi (provided by the applicant)
Voltage Range	DC 3.8V from battery or DC 5.0V from adapter
Sample serial number	SZNS220214-04312E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter Information	Model:FX2U-050200U Input: AC 100-240V 50/60Hz 0.4A Output: DC 5V 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
Occupied Channel Bandwidth		5%
RF Frequency		0.082×10^{-7}
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz - 40GHz	4.72dB
Temperature		1°C
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 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. 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.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

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 5G Wi-Fi 802.11a/n20/n40/ac20/ac40 modes.

For 5150-5250MHz Band, 6 channels are provided to testing:

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

For 802.11a/n20/ac20 mode: channel 36, 40, 48 were tested;

For 802.11n40/ac40 mode: channel 38, 46 were tested;

For 5725-5850MHz Band, 7 channels are provided to testing:

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

For 802.11a/n20/ac20 mode: channel 149, 157, 165 were tested;

For 802.11n40/ac40 mode: channel 151, 159 were tested;

EUT Exercise Software

EUT was test in engineering mode. The software and power level was provided by the applicant.

The worst case was performed under:

U-NII	Mode	Data rate	Power Level		
			Low Channel	Middle Channel	High Channel
5150 – 5250MHz	802.11a	6Mbps	D8	D8	D8
	802.11n-HT20	MCS0	D8	D8	D8
	802.11n-HT40	MCS0	D8	/	D8
	802.11ac20	MCS0	D8	D8	D8
	802.11ac40	MCS0	D8	/	D8
5725 – 5850MHz	802.11a	6Mbps	D8	D8	D8
	802.11n-HT20	MCS0	D8	D8	D8
	802.11n-HT40	MCS0	D8	/	D8
	802.11ac20	MCS0	D8	D8	D8
	802.11ac40	MCS0	D8	/	D8

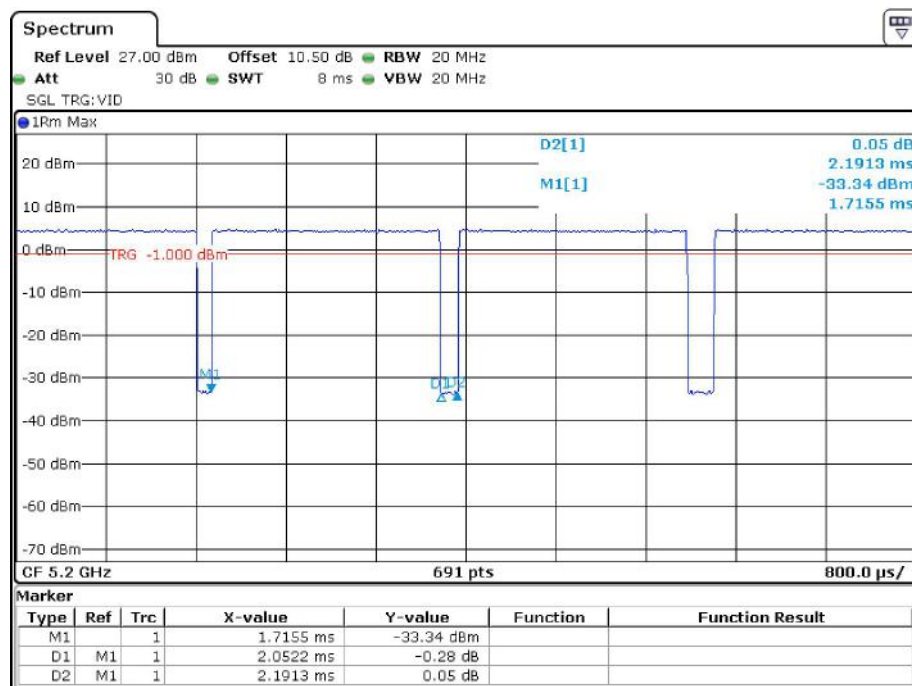
The worse-case data rates are determined to be as follows for each mode based upon investigations by measuring the output power and PSD across all data rated bandwidths, and modulations.

Duty cycle

Mode	Ton(ms)	Ton+Toff (ms)	Duty Cycle (%)	1/T(kHz)
802.11a	2.052	2.191	93.66	0.487
802.11n-HT20	1.923	2.012	95.58	0.520
802.11n-HT40	0.949	1.014	93.59	1.054
802.11ac20	1.923	2.058	93.44	0.520
802.11ac40	0.949	1.058	89.70	1.054

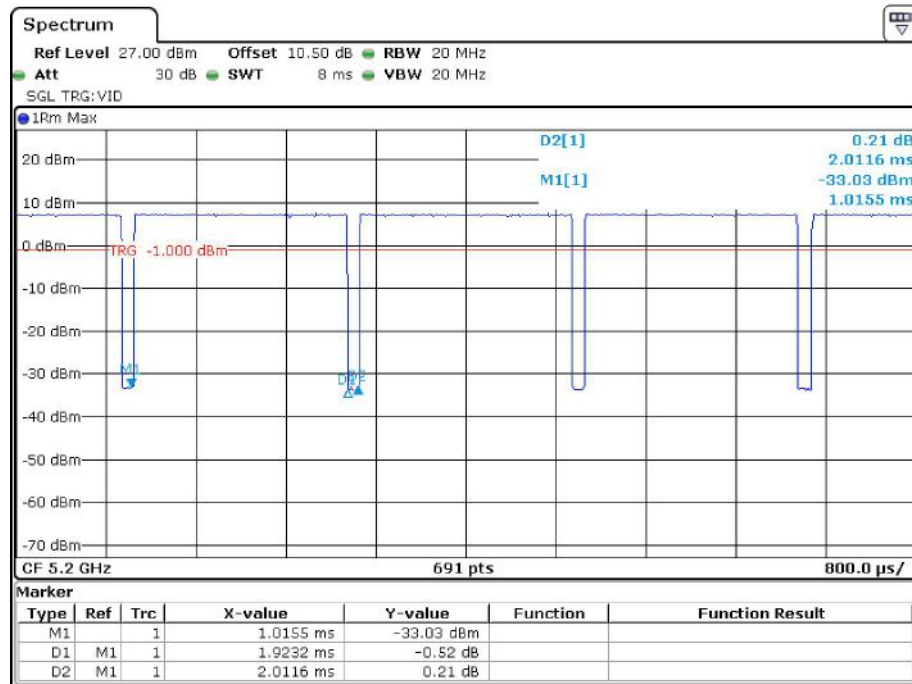
Note: T is minimum transmission duration.

802.11a mode



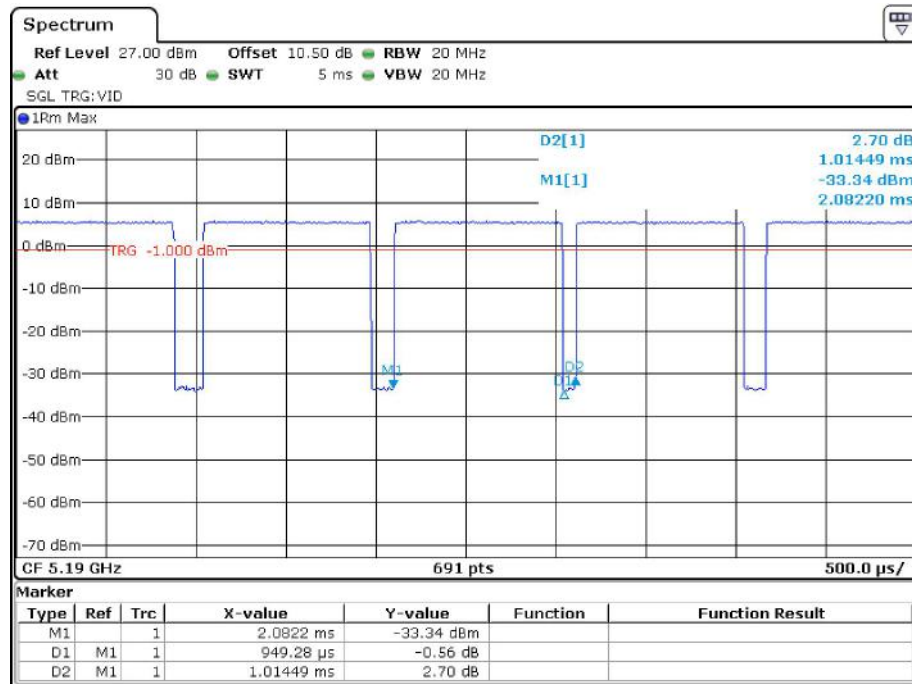
Date: 2.APR.2022 15:18:53

802.11n20 mode



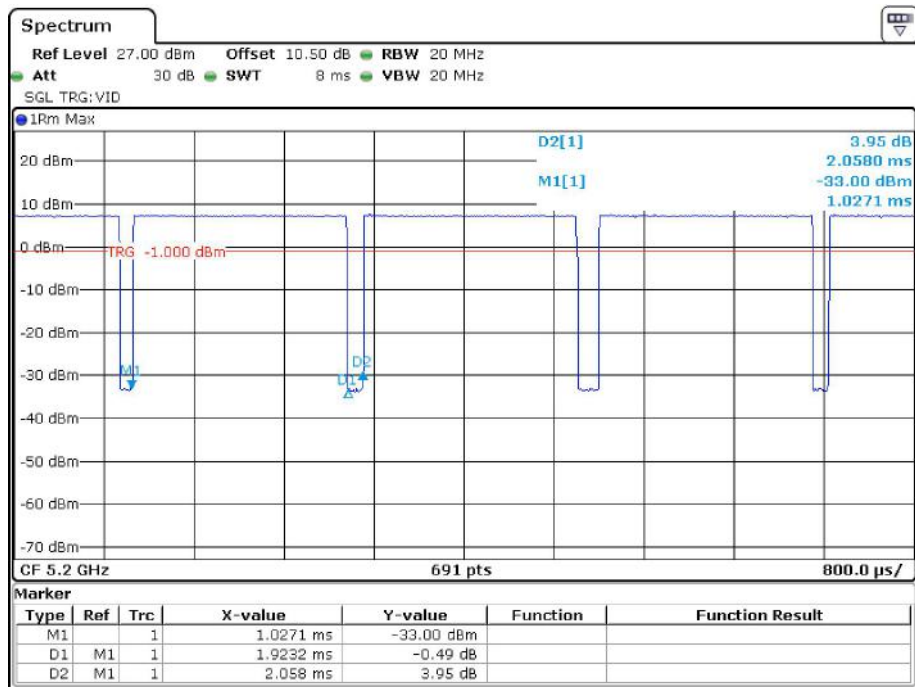
Date: 2.APR.2022 15:16:56

802.11n40 mode



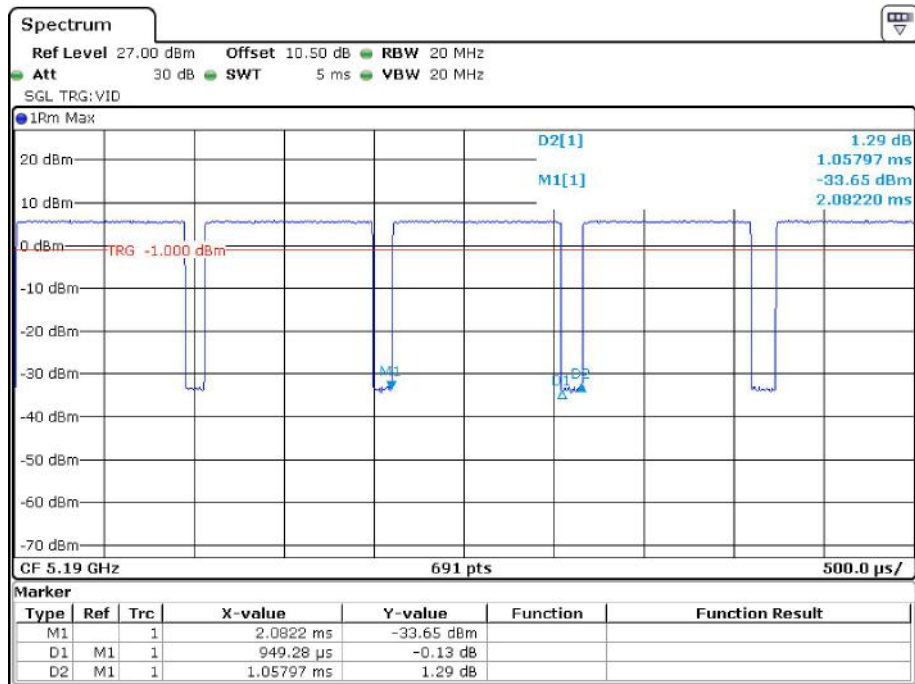
Date: 2.APR.2022 15:16:18

802.11ac20 mode



Date: 2.APR.2022 15:17:27

802.11ac40 mode



Date: 2.APR.2022 15:15:56

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

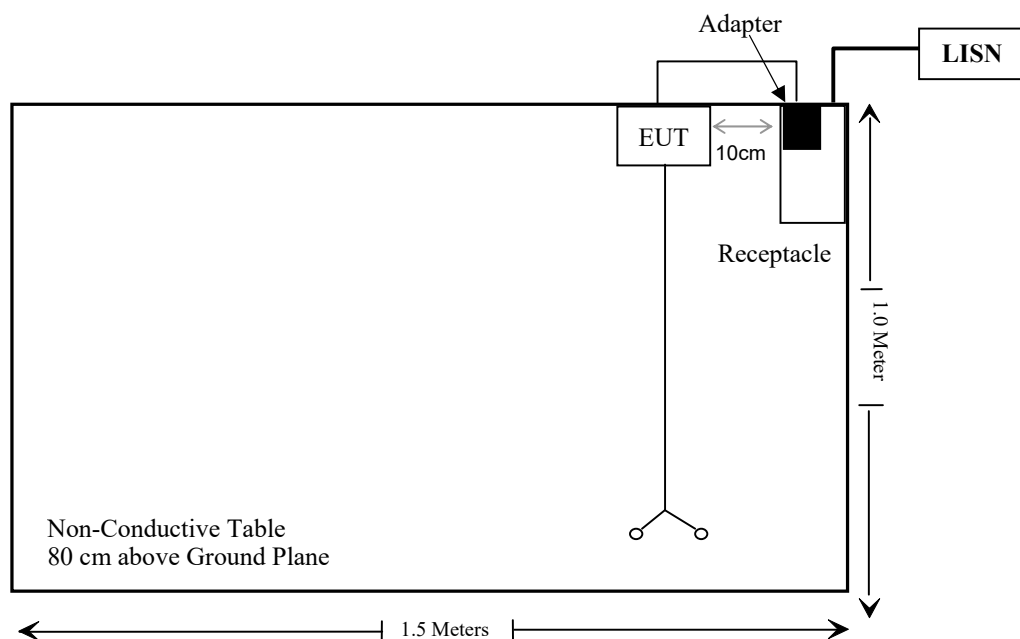
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

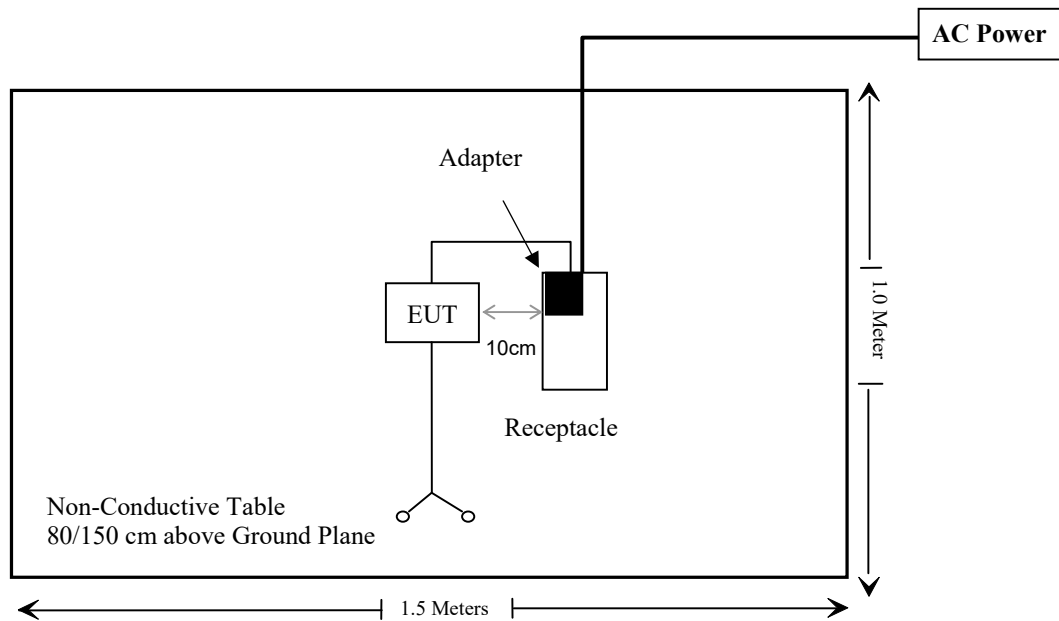
Cable Description	Length (m)	From Port	To
Un-shield Detachable USB Cable	1.0	Adapter	EUT

Block Diagram of Test Setup

For Conducted Emission



For Radiated Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b) (1) & §2.1093	RF Exposure	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 has no TPC function which was declared by the applicant.

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	2021/12/13	2022/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2021/11/09	2022/11/08
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2021/11/11	2022/11/10
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.15	N600	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N650	2021/12/14	2022/12/13
CD	Band Reject Filter	BRM-5.15/5.35g-45	075	2021/12/14	2022/12/13
CD	Band Reject Filter	BRM-5.725/5.875G-45	065	2021/12/14	2022/12/13

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101948	2021/12/13	2022/12/12
Rohde & Schwarz	Open Switch and Control Unit	OSP120 + OSP-B157	101244 + 100866	2021/12/13	2022/12/12
WEINSCHTEL	10dB Attenuator	5324	AU 3842	2021/12/14	2022/12/13
Unknown	RF Cable	Unknown	Unknown	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) (1) & §2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Measurement Result

Please refer to SAR test report: SZNS220214-04312E-20.

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	2dBi	50 Ω	5150-5850MHz

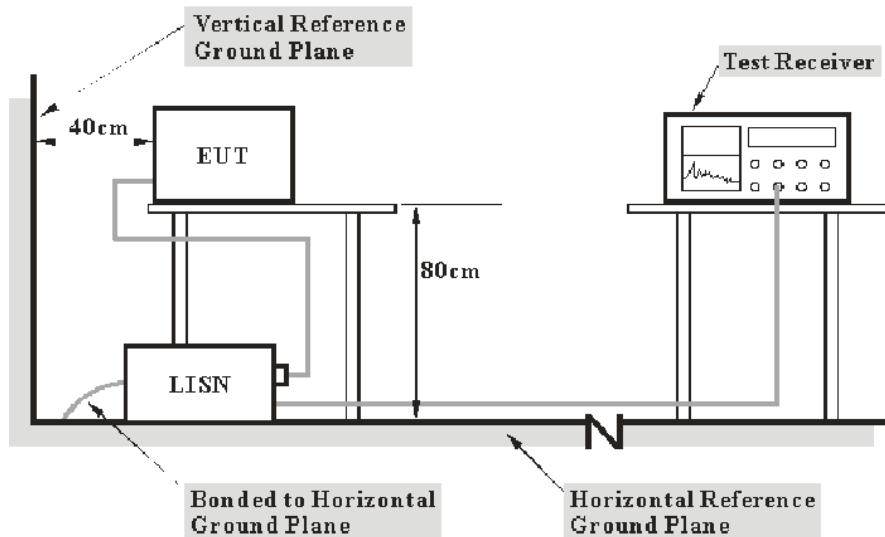
Result: Compliant.

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.

Transd Factor & Margin Calculation

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

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss}$$

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:

$$\begin{aligned}\text{Over Limit} &= \text{Level} - \text{Limit} \\ \text{Level} &= \text{Read Level} + \text{Factor}\end{aligned}$$

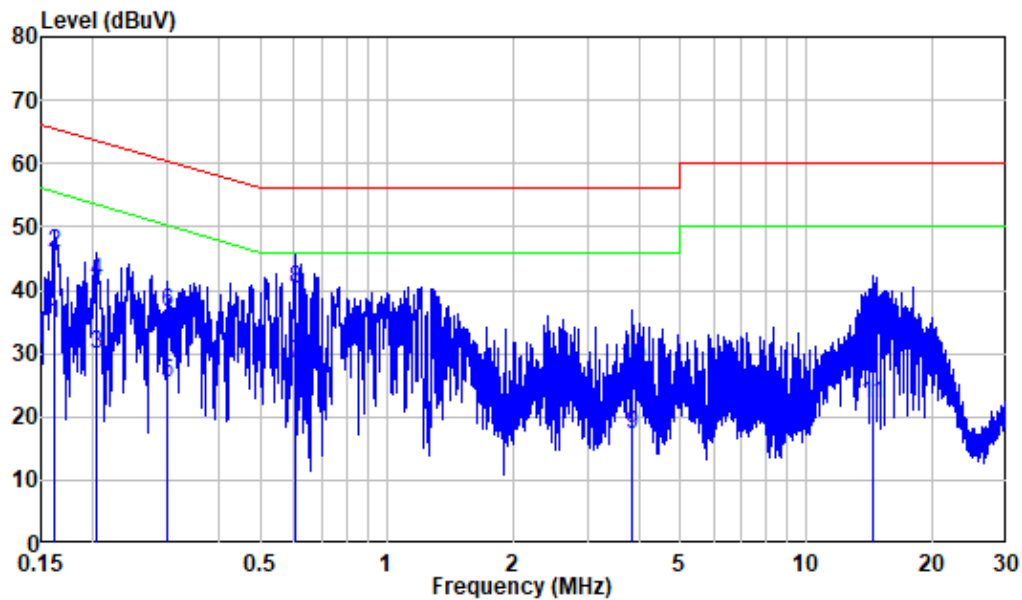
Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	49 %
ATM Pressure:	101.0 kPa

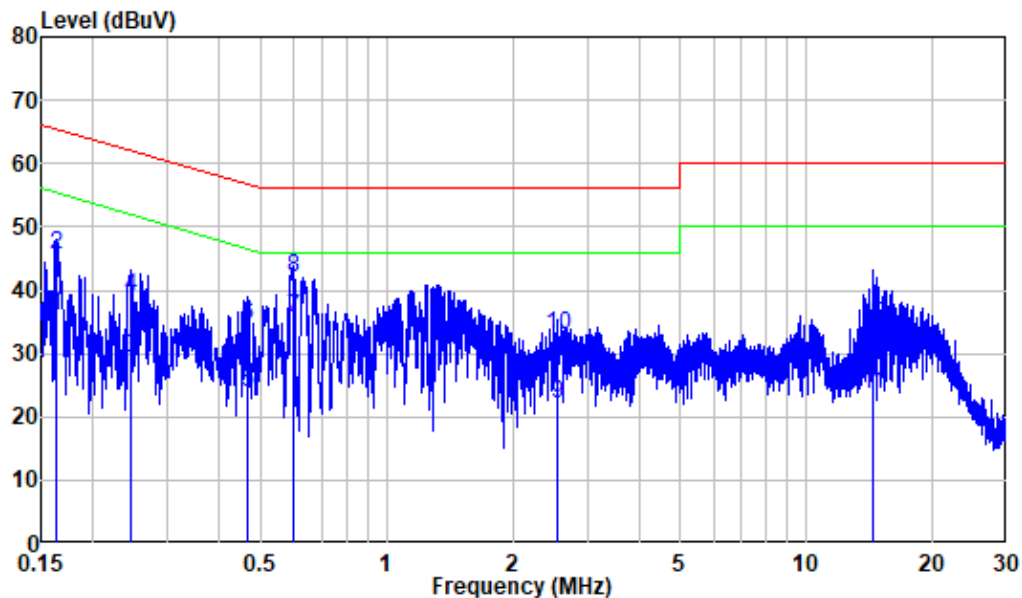
The testing was performed by Caro Hu on 2022-04-18

EUT operation mode: Transmitting (worst case is 802.11ac20, 5200MHz)

AC 120V/60 Hz, Line:

Site : Shielding Room
 Condition: Line
 Mode : 5G WiFi
 Model : TB-JS100A
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.161	9.80	25.04	34.84	55.39	-20.55	Average
2	0.161	9.80	35.97	45.77	65.39	-19.62	QP
3	0.203	9.80	20.17	29.97	53.48	-23.51	Average
4	0.203	9.80	31.58	41.38	63.48	-22.10	QP
5	0.300	9.80	15.56	25.36	50.24	-24.88	Average
6	0.300	9.80	26.71	36.51	60.24	-23.73	QP
7	0.604	9.81	18.69	28.50	46.00	-17.50	Average
8	0.604	9.81	30.44	40.25	56.00	-15.75	QP
9	3.822	9.84	7.35	17.19	46.00	-28.81	Average
10	3.822	9.84	17.84	27.68	56.00	-28.32	QP
11	14.364	9.94	12.24	22.18	50.00	-27.82	Average
12	14.364	9.94	24.94	34.88	60.00	-25.12	QP

AC 120V/60 Hz, Neutral:

Site : Shielding Room
 Condition: Neutral
 Mode : 5G WiFi
 Model : TB-JS100A
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.163	9.80	26.00	35.80	55.33	-19.53	Average
2	0.163	9.80	35.78	45.58	65.33	-19.75	QP
3	0.245	9.80	19.44	29.24	51.93	-22.69	Average
4	0.245	9.80	29.01	38.81	61.93	-23.12	QP
5	0.467	9.80	14.05	23.85	46.56	-22.71	Average
6	0.467	9.80	24.52	34.32	56.56	-22.24	QP
7	0.598	9.81	25.89	35.70	46.00	-10.30	Average
8	0.598	9.81	32.10	41.91	56.00	-14.09	QP
9	2.543	9.83	12.29	22.12	46.00	-23.88	Average
10	2.543	9.83	22.98	32.81	56.00	-23.19	QP
11	14.364	10.04	13.39	23.43	50.00	-26.57	Average
12	14.364	10.04	24.46	34.50	60.00	-25.50	QP

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

Applicable Standard

FCC §15.407 (b); §15.209; §15.205;

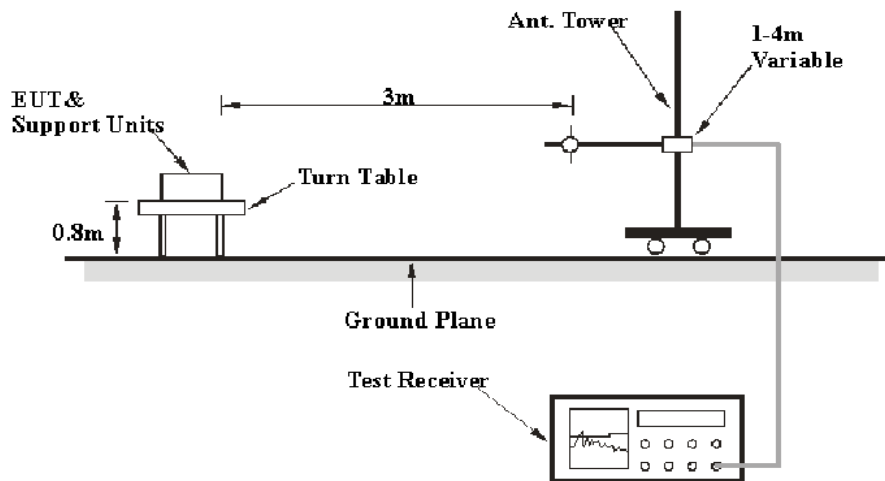
(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

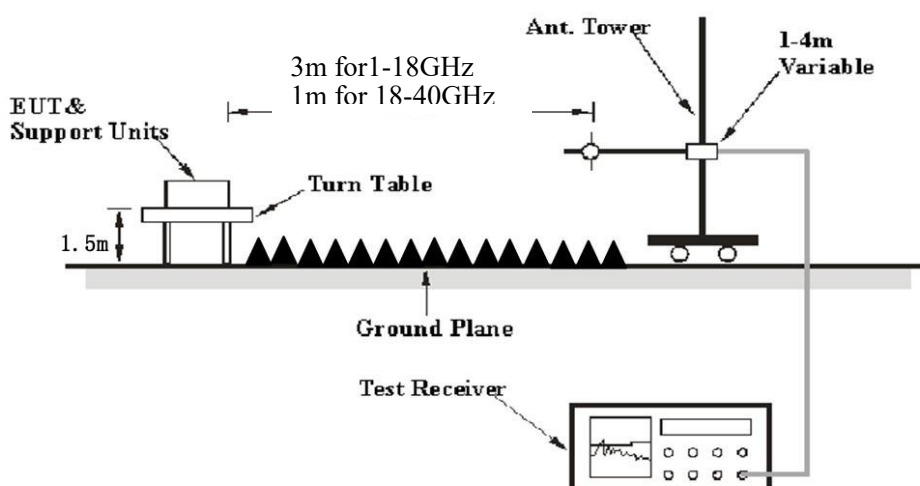
- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (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;

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

where

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

So the extrapolation factor of 1m is $20 \cdot \log(1/3) = -9.5$ 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:

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\begin{aligned} \text{Over Limit/Margin} &= \text{Level / Corrected Amplitude} - \text{Limit} \\ \text{Level / Corrected Amplitude} &= \text{Read Level} + \text{Factor} \end{aligned}$$

Test Data

Environmental Conditions

Temperature:	25~25.1 °C
Relative Humidity:	50~55 %
ATM Pressure:	101.0 kPa

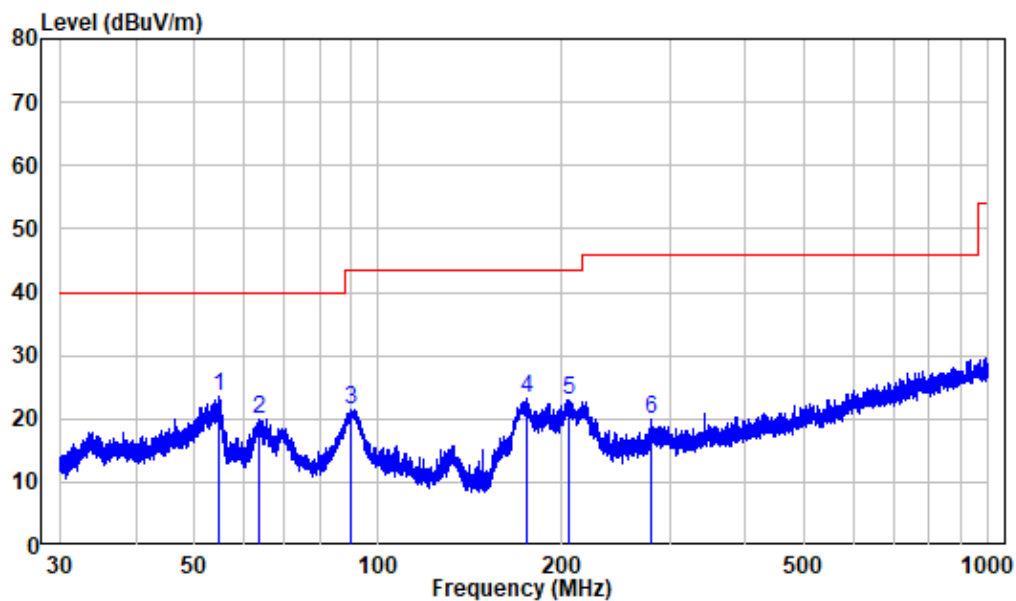
The testing was performed by Nick Fang on 2022-04-16 for below 1GHz, Amy Cao on 2022-03-13 and Nick Fang 2022-04-21 for above 1GHz.

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

30 MHz – 1 GHz: (worst case is 802.11ac20, 5200MHz)

Note: When the test result of peak was less than the limit of QP more than 6dB, just peak value were recorded.

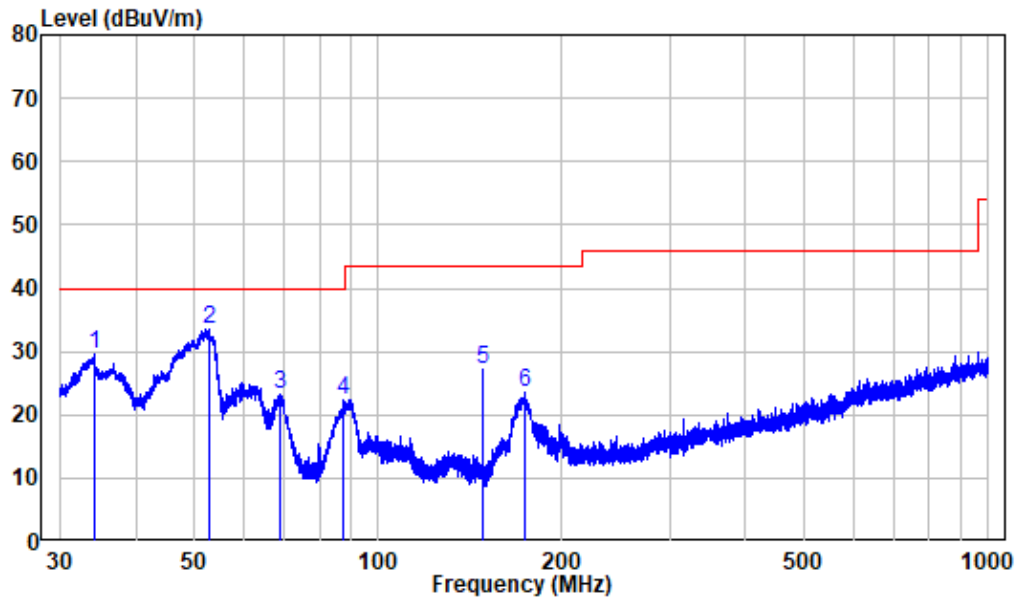
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : SZNS220214-04312E-RF
Test Mode: 5G WIFI

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	54.739	-10.29	33.74	23.45	40.00	-16.55	Peak
2	63.815	-12.09	32.04	19.95	40.00	-20.05	Peak
3	90.141	-13.97	35.47	21.50	43.50	-22.00	Peak
4	174.730	-13.13	36.25	23.12	43.50	-20.38	Peak
5	205.946	-11.84	34.91	23.07	43.50	-20.43	Peak
6	279.656	-9.60	29.65	20.05	46.00	-25.95	Peak

Vertical



Site : chamber

Condition: 3m VERTICAL

Job No. : SZNS220214-04312E-RF

Test Mode: 5G WIFI

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	34.216	-11.79	41.27	29.48	40.00	-10.52	Peak
2	52.714	-10.11	43.72	33.61	40.00	-6.39	Peak
3	69.144	-14.36	37.57	23.21	40.00	-16.79	Peak
4	87.763	-14.64	36.90	22.26	40.00	-17.74	Peak
5	148.376	-15.36	42.54	27.18	43.50	-16.32	Peak
6	173.509	-13.23	36.64	23.41	43.50	-20.09	Peak

Above 1GHz:**5150-5250 MHz:**

Frequency (MHz)	Receiver		Turn- Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/AV	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5180 MHz									
4500	62.66	PK	344	2.2	H	-4.72	57.94	74	-16.06
4500	49.95	AV	344	2.2	H	-4.72	45.23	54	-8.77
4500	62.7	PK	5	2.1	V	-4.72	57.98	74	-16.02
4500	49.99	AV	5	2.1	V	-4.72	45.27	54	-8.73
5150	63.22	PK	216	1.4	H	-2.73	60.49	74	-13.51
5150	50.36	AV	216	1.4	H	-2.73	47.63	54	-6.37
5150	63.48	PK	264	1.1	V	-2.73	60.75	74	-13.25
5150	50.2	AV	264	1.1	V	-2.73	47.47	54	-6.53
10360	43.04	PK	198	1.1	H	8.1	51.14	68.2	-17.06
10360	42.91	PK	2	1.8	V	8.1	51.01	68.2	-17.19
802.11a, 5200MHz									
10400	42.8	PK	180	1.4	H	8.24	51.04	68.2	-17.16
10400	42.79	PK	77	1.7	V	8.24	51.03	68.2	-17.17
5240 MHz									
5350	63.05	PK	62	1.3	H	-2.33	60.72	74	-13.28
5350	50.43	AV	62	1.3	H	-2.33	48.1	54	-5.9
5350	62.98	PK	182	1.1	V	-2.33	60.65	74	-13.35
5350	50.79	AV	182	1.1	V	-2.33	48.46	54	-5.54
5460	64.49	PK	129	1.1	H	-2.3	62.19	74	-11.81
5460	50.8	AV	129	1.1	H	-2.3	48.5	54	-5.5
5460	64.02	PK	257	1.4	V	-2.3	61.72	74	-12.28
5460	51.04	AV	257	1.4	V	-2.3	48.74	54	-5.26
10480	42.44	PK	230	1.7	H	8.6	51.04	68.2	-17.16
10480	42.64	PK	6	1.2	V	8.6	51.24	68.2	-16.96

Frequency (MHz)	Receiver		Turn- Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/AV	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n20									
5180MHz									
4500	62.87	PK	15	2	H	-4.72	58.15	74	-15.85
4500	50.19	AV	15	2	H	-4.72	45.47	54	-8.53
4500	63.06	PK	38	1.7	V	-4.72	58.34	74	-15.66
4500	50.12	AV	38	1.7	V	-4.72	45.4	54	-8.6
5150	63.57	PK	349	1.3	H	-2.73	60.84	74	-13.16
5150	50.27	AV	349	1.3	H	-2.73	47.54	54	-6.46
5150	63.15	PK	36	2.1	V	-2.73	60.42	74	-13.58
5150	50.3	AV	36	2.1	V	-2.73	47.57	54	-6.43
10360	43.23	PK	67	2.4	H	8.1	51.33	68.2	-16.87
10360	43.15	PK	41	1.4	V	8.1	51.25	68.2	-16.95
5200MHz									
10400	43.28	PK	184	1.8	H	8.24	51.52	68.2	-16.68
10400	43.23	PK	210	1.8	V	8.24	51.47	68.2	-16.73
5240MHz									
5350	63.03	PK	332	1.2	H	-2.33	60.7	74	-13.3
5350	50.53	AV	332	1.2	H	-2.33	48.2	54	-5.8
5350	62.99	PK	138	1.5	V	-2.33	60.66	74	-13.34
5350	50.84	AV	138	1.5	V	-2.33	48.51	54	-5.49
5460	64.32	PK	20	2	H	-2.3	62.02	74	-11.98
5460	51.13	AV	20	2	H	-2.3	48.83	54	-5.17
5460	63.96	PK	215	1.3	V	-2.3	61.66	74	-12.34
5460	50.71	AV	215	1.3	V	-2.3	48.41	54	-5.59
10480	42.29	PK	324	1.3	H	8.6	50.89	68.2	-17.31
10480	42.51	PK	204	1.2	V	8.6	51.11	68.2	-17.09

Frequency (MHz)	Receiver		Turn- Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/AV	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n40									
5190MHz									
4500	62.91	PK	204	1.7	H	-4.72	58.19	74	-15.81
4500	51.25	AV	204	1.7	H	-4.72	46.53	54	-7.47
4500	63.47	PK	352	1.9	V	-4.72	58.75	74	-15.25
4500	51.19	AV	352	1.9	V	-4.72	46.47	54	-7.53
5150	63.42	PK	351	2.4	H	-2.73	60.69	74	-13.31
5150	50.89	AV	351	2.4	H	-2.73	48.16	54	-5.84
5150	63.47	PK	95	2.3	V	-2.73	60.74	74	-13.26
5150	51.23	AV	95	2.3	V	-2.73	48.5	54	-5.5
10380	41.99	PK	102	1.6	H	8.2	50.19	68.2	-18.01
10380	42	PK	201	1.6	V	8.2	50.2	68.2	-18
5230MHz									
5350	64.04	PK	55	1.1	H	-2.33	61.71	74	-12.29
5350	50.34	AV	55	1.1	H	-2.33	48.01	54	-5.99
5350	64.04	PK	38	1.7	V	-2.33	61.71	74	-12.29
5350	50.26	AV	38	1.7	V	-2.33	47.93	54	-6.07
5460	64.16	PK	174	2.3	H	-2.3	61.86	74	-12.14
5460	51.44	AV	174	2.3	H	-2.3	49.14	54	-4.86
5460	63.97	PK	229	2.3	V	-2.3	61.67	74	-12.33
5460	51.56	AV	229	2.3	V	-2.3	49.26	54	-4.74
10460	41.3	PK	255	2.3	H	8.6	49.9	68.2	-18.3
10460	41.5	PK	312	1.9	V	8.6	50.1	68.2	-18.1

Frequency (MHz)	Receiver		Turn- Table Angle Degree	Rx Antenna		Correcte d Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac20									
5180 MHz									
4500	63	PK	300	2.5	H	-4.72	58.28	74	-15.72
4500	50.16	AV	300	2.5	H	-4.72	45.44	54	-8.56
4500	63.32	PK	348	1.4	V	-4.72	58.6	74	-15.4
4500	50.04	AV	348	1.4	V	-4.72	45.32	54	-8.68
5150	63.43	PK	174	1.9	H	-2.73	60.7	74	-13.3
5150	50.43	AV	174	1.9	H	-2.73	47.7	54	-6.3
5150	63.56	PK	37	1.6	V	-2.73	60.83	74	-13.17
5150	50.33	AV	37	1.6	V	-2.73	47.6	54	-6.4
10360	43.05	PK	338	1.9	H	8.1	51.15	68.2	-17.05
10360	42.99	PK	98	2.2	V	8.1	51.09	68.2	-17.11
5200MHz									
10400	43.2	PK	118	1.9	H	8.24	51.44	68.2	-16.76
10400	42.96	PK	212	1.9	V	8.24	51.2	68.2	-17
5240MHz									
5350	63.05	PK	332	2.4	H	-2.33	60.72	74	-13.28
5350	50.48	AV	332	2.4	H	-2.33	48.15	54	-5.85
5350	63.03	PK	306	2.1	V	-2.33	60.7	74	-13.3
5350	50.5	AV	306	2.1	V	-2.33	48.17	54	-5.83
5460	64.26	PK	186	1.3	H	-2.3	61.96	74	-12.04
5460	50.93	AV	186	1.3	H	-2.3	48.63	54	-5.37
5460	64.04	PK	157	1.7	V	-2.3	61.74	74	-12.26
5460	50.99	AV	157	1.7	V	-2.3	48.69	54	-5.31
10480	42.45	PK	212	2.4	H	8.6	51.05	68.2	-17.15
10480	42.52	PK	308	1.3	V	8.6	51.12	68.2	-17.08

Frequency (MHz)	Receiver		Turn- Table	Rx Antenna		Correcte d Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac40									
5190 MHz									
4500	63.35	PK	267	1.2	H	-4.72	58.63	74	-15.37
4500	51.18	AV	267	1.2	H	-4.72	46.46	54	-7.54
4500	63.19	PK	304	2.3	V	-4.72	58.47	74	-15.53
4500	51.36	AV	304	2.3	V	-4.72	46.64	54	-7.36
5150	63.28	PK	65	1.5	H	-2.73	60.55	74	-13.45
5150	50.84	AV	65	1.5	H	-2.73	48.11	54	-5.89
5150	63.48	PK	160	1.5	V	-2.73	60.75	74	-13.25
5150	51.18	AV	160	1.5	V	-2.73	48.45	54	-5.55
10380	41.95	PK	34	2.2	H	8.2	50.15	68.2	-18.05
10380	41.92	PK	172	1	V	8.2	50.12	68.2	-18.08
5230MHz									
5350	62.97	PK	69	1	H	-2.33	60.64	74	-13.36
5350	50.78	AV	69	1	H	-2.33	48.45	54	-5.55
5350	63.19	PK	285	2	V	-2.33	60.86	74	-13.14
5350	50.62	AV	285	2	V	-2.33	48.29	54	-5.71
5460	64.33	PK	359	2.4	H	-2.3	62.03	74	-11.97
5460	51.57	AV	359	2.4	H	-2.3	49.27	54	-4.73
5460	63.98	PK	187	2.3	V	-2.3	61.68	74	-12.32
5460	51.57	AV	187	2.3	V	-2.3	49.27	54	-4.73
10460	41.2	PK	311	2.4	H	8.6	49.8	68.2	-18.4
10460	41.29	PK	1	2.1	V	8.6	49.89	68.2	-18.31

5725-5850 MHz:

Frequency (MHz)	Receiver		Turn- Table	Rx Antenna		Correcte d Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/AV	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5745 MHz									
5650	64.8	PK	145	1.1	H	-1.95	62.85	68.2	-5.35
5650	63.53	PK	22	2.4	V	-1.95	61.58	68.2	-6.62
5700	65.1	PK	323	1.3	H	-2.02	63.08	105.2	-42.12
5700	64.57	PK	290	1.5	V	-2.02	62.55	105.2	-42.65
5720	65.33	PK	137	1.1	H	-1.97	63.36	110.8	-47.44
5720	64.11	PK	175	1.1	V	-1.97	62.14	110.8	-48.66
5725	65.46	PK	327	1.5	H	-1.96	63.5	122.2	-58.7
5725	65.07	PK	274	2	V	-1.96	63.11	122.2	-59.09
11490	43.99	PK	277	1.6	H	6.63	50.62	74	-23.38
11490	43.72	PK	200	2.1	V	6.63	50.35	74	-23.65
5785MHz									
11570	43.74	PK	174	2.5	H	6.59	50.33	74	-23.67
11570	43.31	PK	55	2.4	V	6.59	49.9	74	-24.1
5825MHz									
5850	66.94	PK	231	1.6	H	-1.81	65.13	122.2	-57.07
5850	66.43	PK	13	2.5	V	-1.81	64.62	122.2	-57.58
5855	66.14	PK	316	2.2	H	-1.82	64.32	110.8	-46.48
5855	65.83	PK	80	1	V	-1.82	64.01	110.8	-46.79
5875	66.65	PK	13	2.4	H	-1.84	64.81	105.2	-40.39
5875	66.22	PK	359	2.2	V	-1.84	64.38	105.2	-40.82
5925	66.3	PK	201	1.8	H	-1.82	64.48	68.2	-3.72
5925	66.07	PK	249	2.3	V	-1.82	64.25	68.2	-3.95
11650	42.87	PK	298	2.1	H	6.7	49.57	74	-24.43
11650	42.76	PK	345	2	V	6.7	49.46	74	-24.54

Frequency (MHz)	Receiver		Turn- Table	Rx Antenna		Correcte d Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/AV	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n20									
5745 MHz									
5650	64.68	PK	278	2.1	H	-1.95	62.73	68.2	-5.47
5650	64.15	PK	340	1.8	V	-1.95	62.2	68.2	-6
5700	65.23	PK	225	2	H	-2.02	63.21	105.2	-41.99
5700	65.03	PK	318	1.3	V	-2.02	63.01	105.2	-42.19
5720	64.74	PK	300	1.1	H	-1.97	62.77	110.8	-48.03
5720	64.52	PK	290	1.9	V	-1.97	62.55	110.8	-48.25
5725	65.48	PK	212	1.1	H	-1.96	63.52	122.2	-58.68
5725	65.6	PK	193	1.9	V	-1.96	63.64	122.2	-58.56
11490	43.54	PK	283	2.3	H	6.63	50.17	74	-23.83
11490	43.45	PK	291	1.2	V	6.63	50.08	74	-23.92
5785MHz									
11570	44.46	PK	209	1.5	H	6.59	51.05	74	-22.95
11570	44.54	PK	123	1.2	V	6.59	51.13	74	-22.87
5825MHz									
5850	66.25	PK	310	1.6	H	-1.81	64.44	122.2	-57.76
5850	66.66	PK	167	1.5	V	-1.81	64.85	122.2	-57.35
5855	66.19	PK	121	1.3	H	-1.82	64.37	110.8	-46.43
5855	66.04	PK	293	2.3	V	-1.82	64.22	110.8	-46.58
5875	65.8	PK	168	1.7	H	-1.84	63.96	105.2	-41.24
5875	66	PK	352	1.4	V	-1.84	64.16	105.2	-41.04
5925	65.9	PK	251	2.1	H	-1.82	64.08	68.2	-4.12
5925	65.71	PK	117	1	V	-1.82	63.89	68.2	-4.31
11650	42.29	PK	183	1.5	H	6.7	48.99	74	-25.01
11650	42.49	PK	238	1.4	V	6.7	49.19	74	-24.81

Frequency (MHz)	Receiver		Turn- Table	Rx Antenna		Correcte d Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n40									
5755 MHz									
5650	64.68	PK	243	1.6	H	-1.95	62.73	68.2	-5.47
5650	64.96	PK	349	1.5	V	-1.95	63.01	68.2	-5.19
5700	65.56	PK	199	1.9	H	-2.02	63.54	105.2	-41.66
5700	65.16	PK	36	1.5	V	-2.02	63.14	105.2	-42.06
5720	65.37	PK	7	2.1	H	-1.97	63.4	110.8	-47.4
5720	64.95	PK	9	1.1	V	-1.97	62.98	110.8	-47.82
5725	65.87	PK	132	1.9	H	-1.96	63.91	122.2	-58.29
5725	65.63	PK	189	1.4	V	-1.96	63.67	122.2	-58.53
11510	43.89	PK	172	2.2	H	6.59	50.48	74	-23.52
11510	46.28	PK	173	1.2	V	6.59	52.87	74	-21.13
5795MHz									
5850	65.97	PK	158	1.6	H	-1.81	64.16	122.2	-58.04
5850	65.84	PK	272	1.1	V	-1.81	64.03	122.2	-58.17
5855	66.77	PK	344	1.2	H	-1.82	64.95	110.8	-45.85
5855	66.31	PK	239	2.4	V	-1.82	64.49	110.8	-46.31
5875	66.13	PK	52	2.3	H	-1.84	64.29	105.2	-40.91
5875	66.14	PK	126	2.4	V	-1.84	64.3	105.2	-40.9
5925	65.78	PK	279	1.6	H	-1.82	63.96	68.2	-4.24
5925	65.85	PK	145	1.2	V	-1.82	64.03	68.2	-4.17
11590	42.89	PK	286	1.1	H	6.57	49.46	74	-24.54
11590	44.2	PK	60	2	V	6.57	50.77	74	-23.23

Frequency (MHz)	Receiver		Turn- Table Angle Degree	Rx Antenna		Correcte d Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac20									
5745 MHz									
5650	64.52	PK	224	1.9	H	-1.95	62.57	68.2	-5.63
5650	64.36	PK	65	1.8	V	-1.95	62.41	68.2	-5.79
5700	65.03	PK	77	1.8	H	-2.02	63.01	105.2	-42.19
5700	66	PK	75	1.9	V	-2.02	63.98	105.2	-41.22
5720	65.06	PK	64	1.8	H	-1.97	63.09	110.8	-47.71
5720	65.34	PK	8	2.5	V	-1.97	63.37	110.8	-47.43
5725	65.47	PK	163	1	H	-1.96	63.51	122.2	-58.69
5725	65.17	PK	30	1.2	V	-1.96	63.21	122.2	-58.99
11490	43.67	PK	4	2	H	6.63	50.3	74	-23.7
11490	43.43	PK	109	1	V	6.63	50.06	74	-23.94
5785MHz									
11570	44.02	PK	88	2	H	6.59	50.61	74	-23.39
11570	46.94	PK	115	2.2	V	6.59	53.53	74	-20.47
5825MHz									
5850	66.76	PK	285	1.1	H	-1.81	64.95	122.2	-57.25
5850	66.6	PK	72	1.9	V	-1.81	64.79	122.2	-57.41
5855	66.75	PK	149	1.6	H	-1.82	64.93	110.8	-45.87
5855	66.44	PK	69	1.7	V	-1.82	64.62	110.8	-46.18
5875	65.59	PK	37	1.3	H	-1.84	63.75	105.2	-41.45
5875	65.83	PK	63	2.3	V	-1.84	63.99	105.2	-41.21
5925	65.57	PK	251	2.3	H	-1.82	63.75	68.2	-4.45
5925	65.25	PK	40	1.7	V	-1.82	63.43	68.2	-4.77
11650	41.81	PK	155	1.6	H	6.7	48.51	74	-25.49
11650	46.26	PK	333	1.7	V	6.7	52.96	74	-21.04

Frequency (MHz)	Receiver		Turn- Table	Rx Antenna		Correcte d Factor (dB/m)	Corrected Amplitude (dBµV/m)	FCC Part15.407	
	Reading (dBµV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBµV/m)	Margin (dB)
802.11ac40									
5755 MHz									
5650	64.5	PK	305	1.7	H	-1.95	62.55	68.2	-5.65
5650	64.19	PK	305	1.7	V	-1.95	62.24	68.2	-5.96
5700	64.71	PK	275	1	H	-2.02	62.69	105.2	-42.51
5700	64.45	PK	275	1	V	-2.02	62.43	105.2	-42.77
5720	64.76	PK	98	2	H	-1.97	62.79	110.8	-48.01
5720	64.98	PK	98	2	V	-1.97	63.01	110.8	-47.79
5725	64.28	PK	3	2.3	H	-1.96	62.32	122.2	-59.88
5725	64.34	PK	3	2.3	V	-1.96	62.38	122.2	-59.82
11510	43.41	PK	126	2.4	H	6.59	50	74	-24
11510	45.15	PK	126	2.4	V	6.59	51.74	74	-22.26
5795MHz									
5850	66.1	PK	40	1.4	H	-1.81	64.29	122.2	-57.91
5850	65.8	PK	12	2.3	V	-1.81	63.99	122.2	-58.21
5855	65.97	PK	199	1.5	H	-1.82	64.15	110.8	-46.65
5855	65.54	PK	310	1.6	V	-1.82	63.72	110.8	-47.08
5875	65.91	PK	201	2.4	H	-1.84	64.07	105.2	-41.13
5875	65.79	PK	301	1.4	V	-1.84	63.95	105.2	-41.25
5925	66.61	PK	325	1.3	H	-1.82	64.79	68.2	-3.41
5925	66.01	PK	305	2.4	V	-1.82	64.19	68.2	-4.01
11590	42.89	PK	299	1.6	H	6.57	49.46	74	-24.54
11590	44.2	PK	93	1.9	V	6.57	50.77	74	-23.23

Note:

Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Corrected Amplitude = Corrected Factor + Reading

Margin = Corrected. Amplitude - Limit

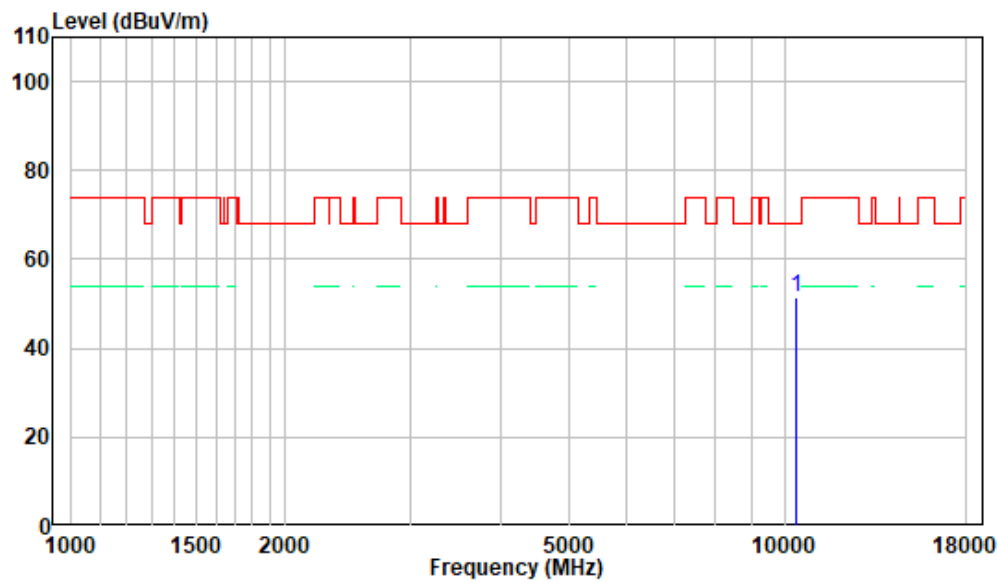
The other spurious emission which is in the noise floor level was not recorded.

The test result of peak was less than the limit of average, so just peak value were recorded.

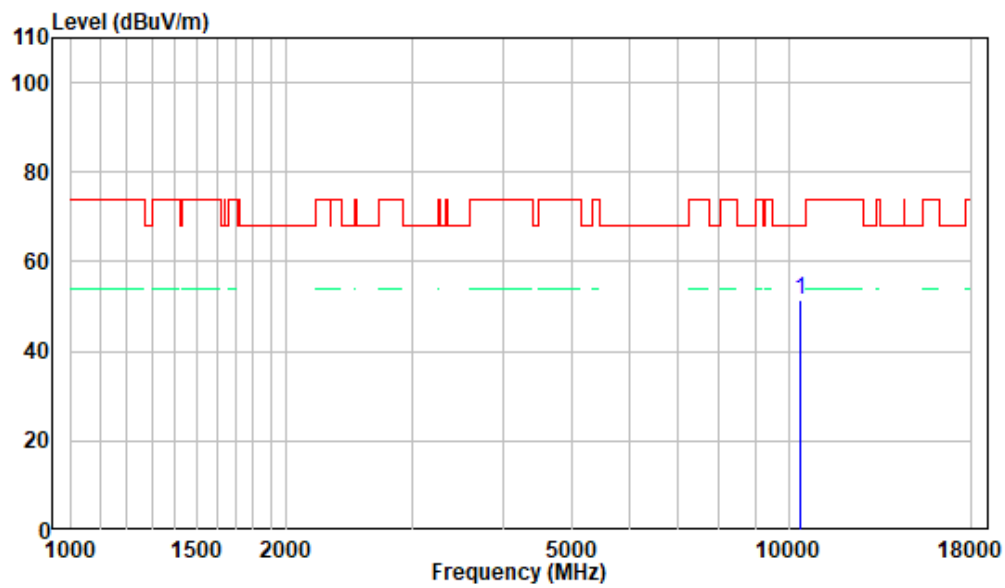
1 GHz - 18 GHz: (Pre-Scan plots)

802.11 n20, 5200MHz

Horizontal



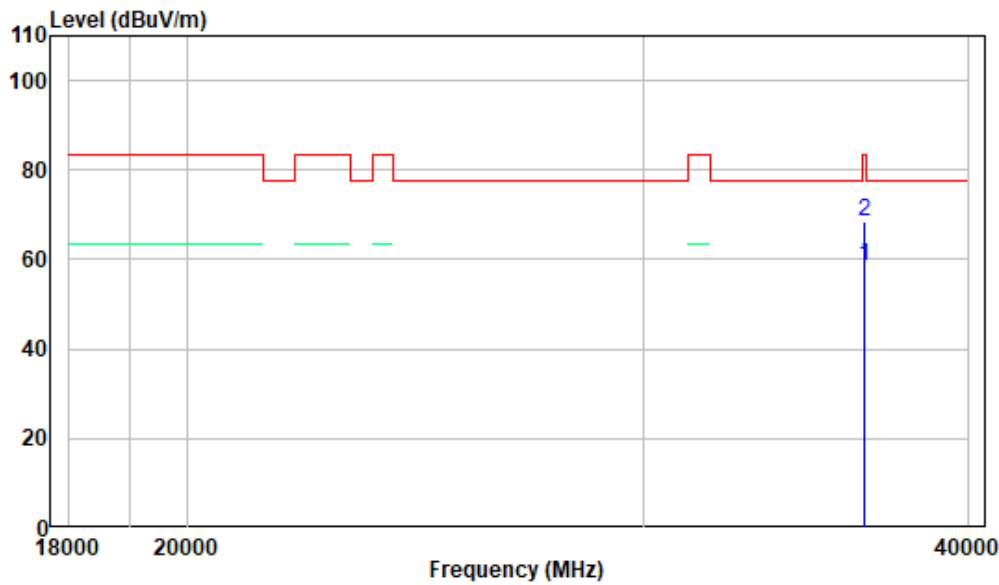
Vertical



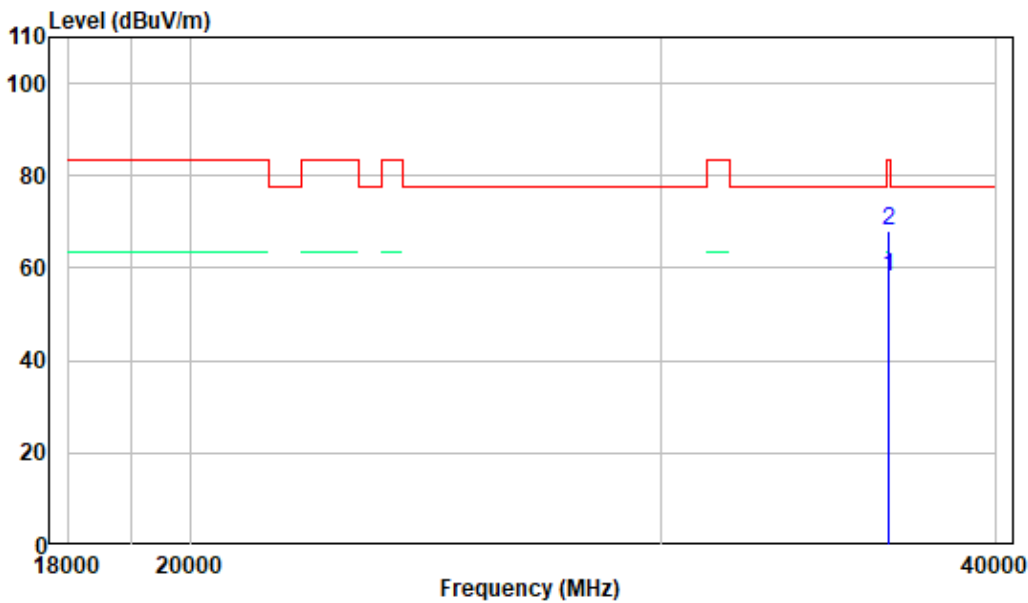
18-40GHz: (Pre-Scan plots)

802.11 n20, 5200MHz

Horizontal



Vertical



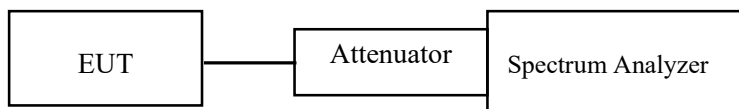
FCC §15.407(a),(e) –EMISSION BANDWIDTH& 99% OCCUPIED BANDWIDTH

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.

Test Procedure

- 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%.
- f) for the 99% occupied bandwidth, use the OBW function of spectrum analyzer.



Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	43 %
ATM Pressure:	101.3 kPa

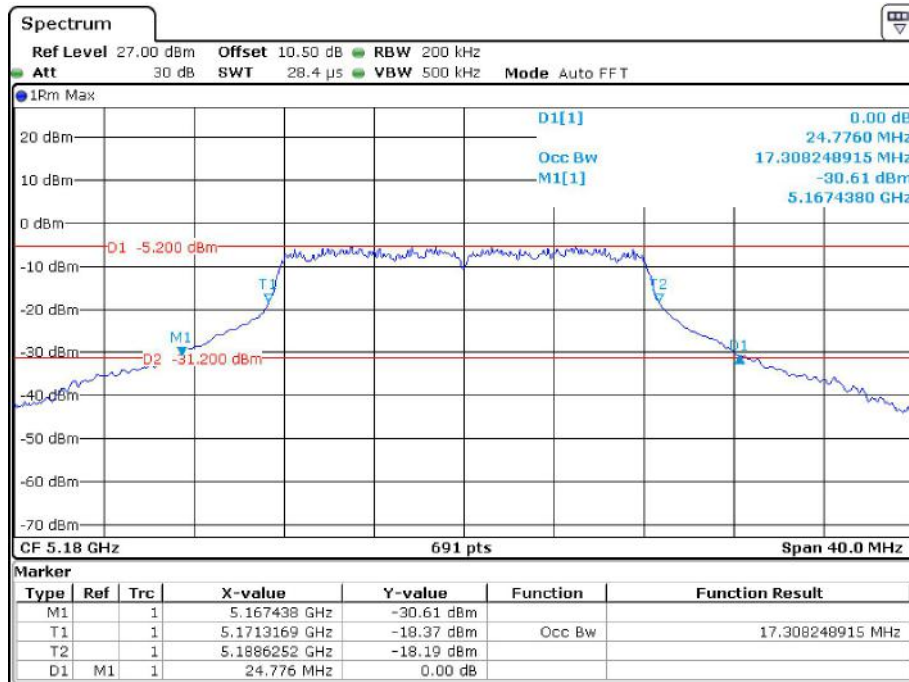
The testing was performed by Key Pei on 2022-04-02 and 2022-05-20.

EUT operation mode: Transmitting

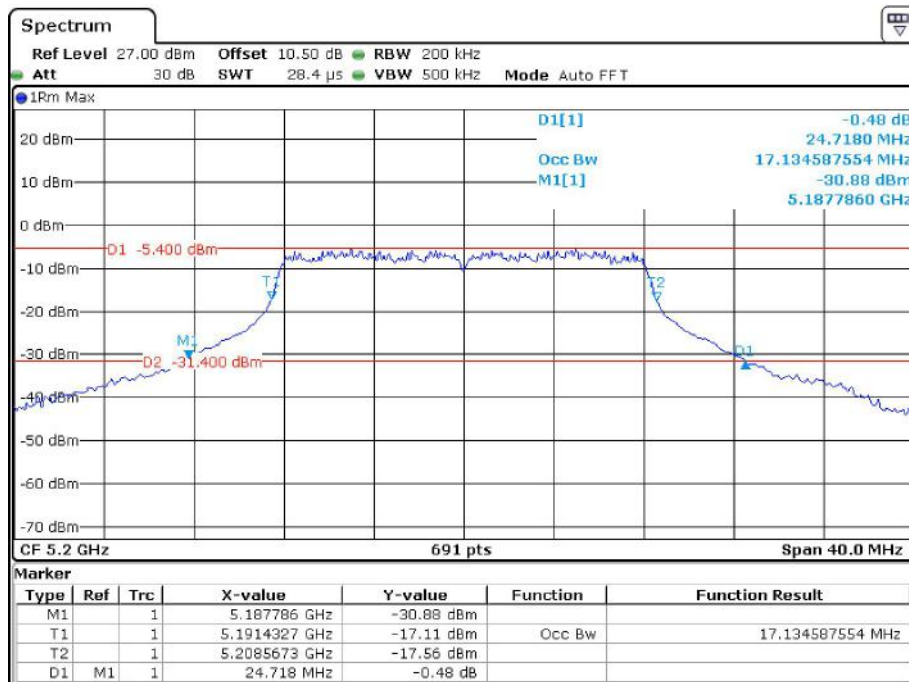
Test Result: Pass; please refer to the following tables and plots.

5150 MHz - 5250 MHz:

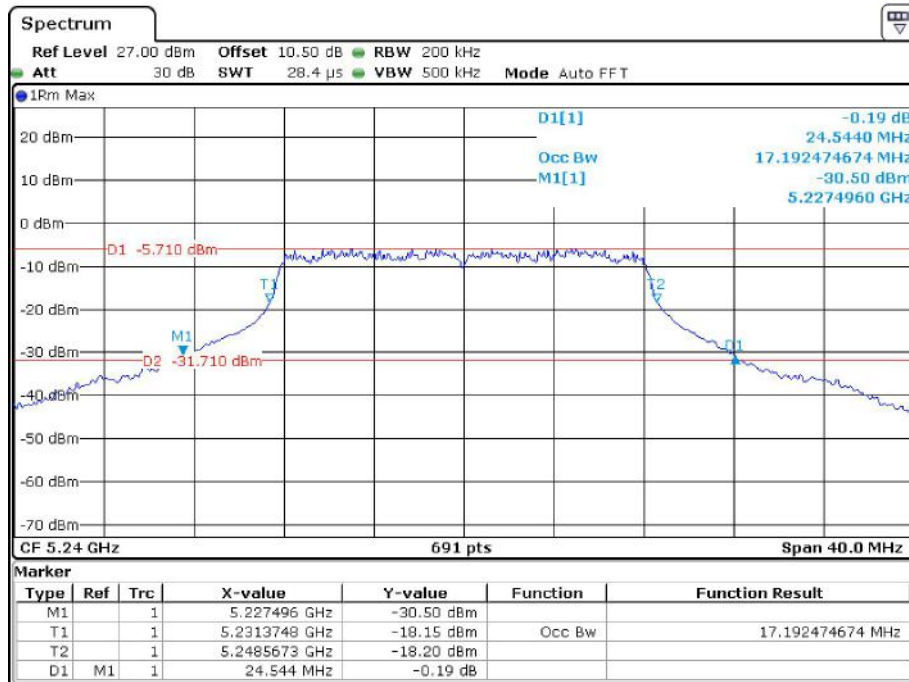
Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)	Remark
802.11a			No transmitted signal in the 99% bandwidth extends into the U-NII-2A band
5180	24.776	17.308	
5200	24.718	17.135	
5240	24.544	17.192	
802.11n20			
5180	25.702	18.292	
5200	25.586	18.177	
5240	25.470	18.234	
802.11n40			
5190	45.040	36.237	
5230	45.500	36.353	
802.11ac20			
5180	25.702	18.234	
5200	25.412	18.292	
5240	25.239	18.119	
802.11ac40			
5190	44.690	36.237	
5230	44.340	36.237	

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5180 MHz

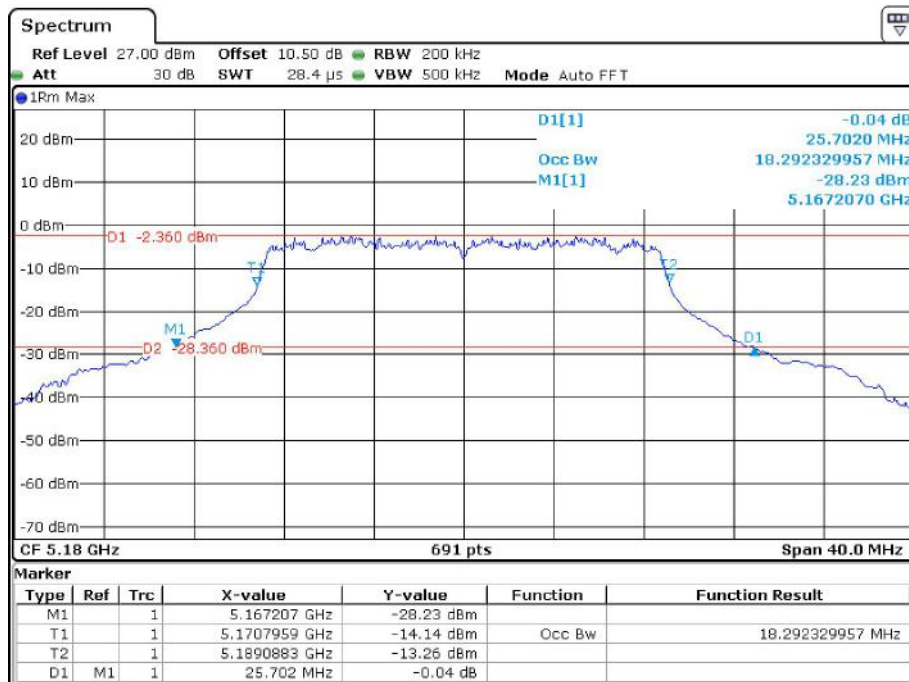
Date: 2.APR.2022 15:07:02

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5200 MHz

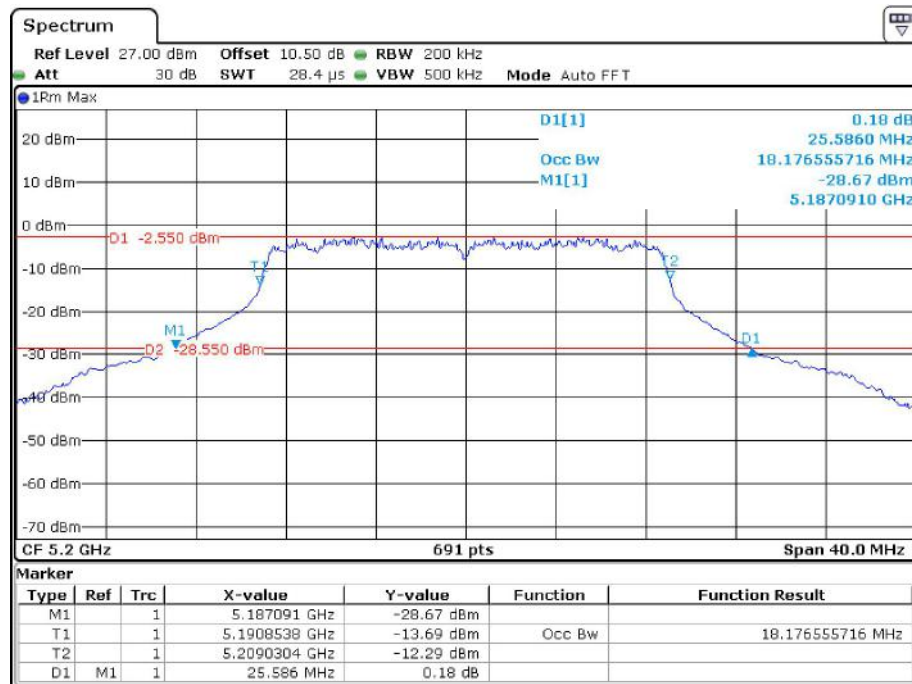
Date: 2.APR.2022 15:06:18

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5240 MHz

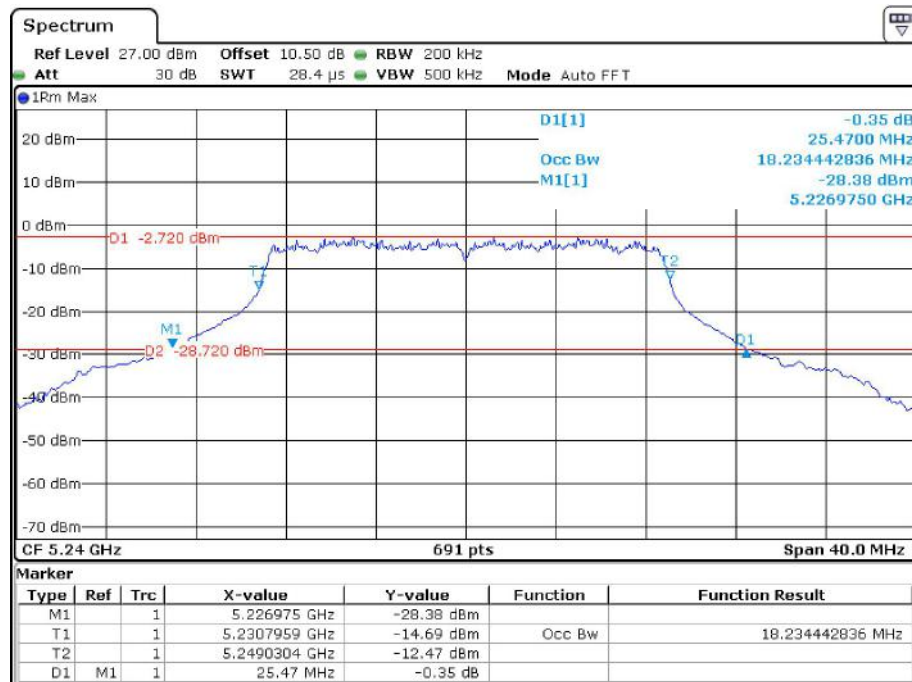
Date: 2.APR.2022 15:05:41

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5180 MHz

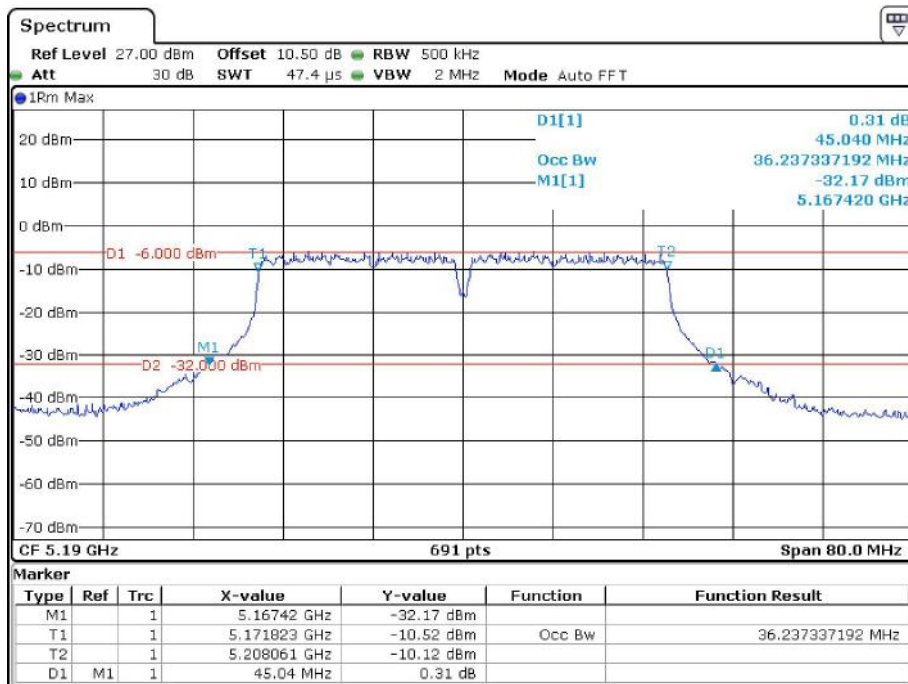
Date: 2.APR.2022 15:02:32

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5200 MHz

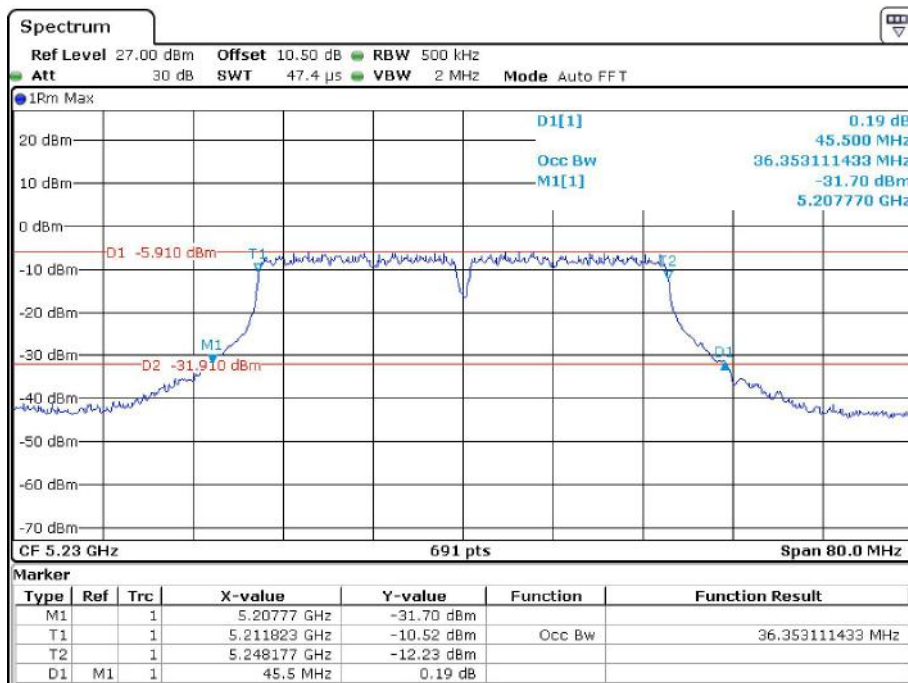
Date: 2.APR.2022 15:03:51

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5240 MHz

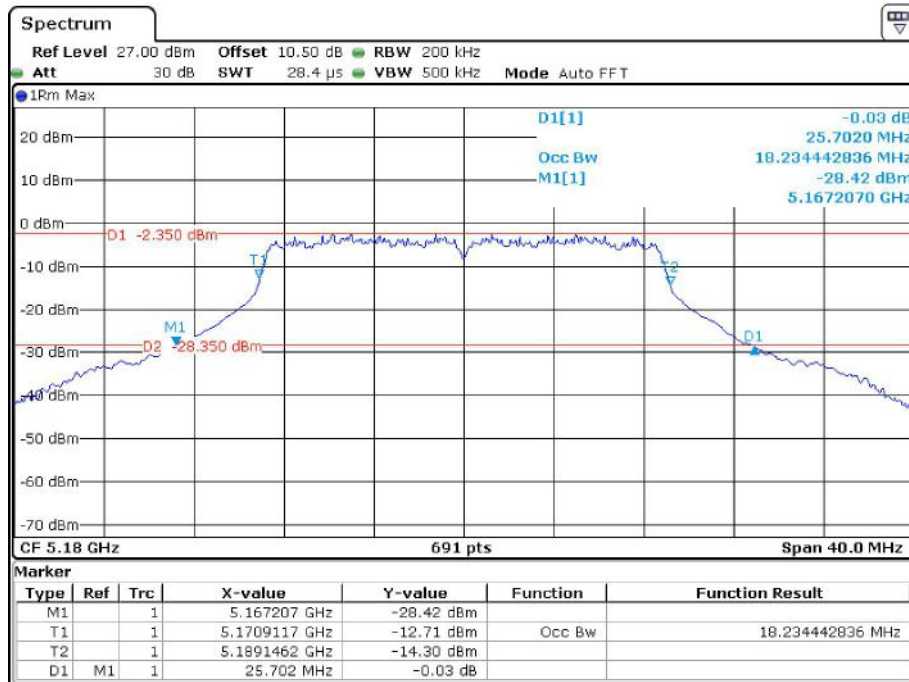
Date: 2.APR.2022 15:04:39

802.11n40 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5180 MHz

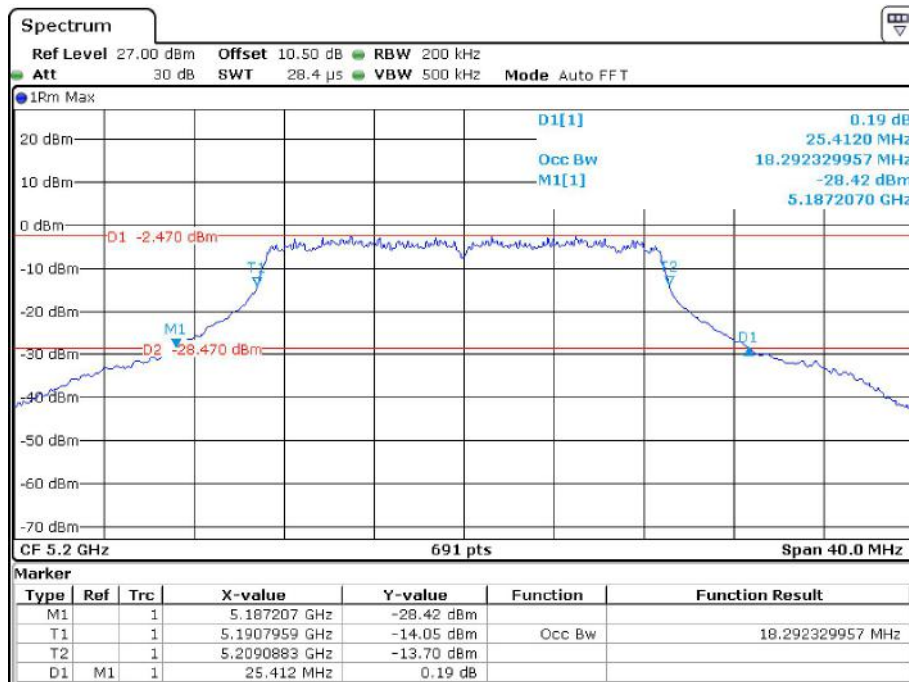
Date: 2.APR.2022 15:10:57

802.11n40 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5240 MHz

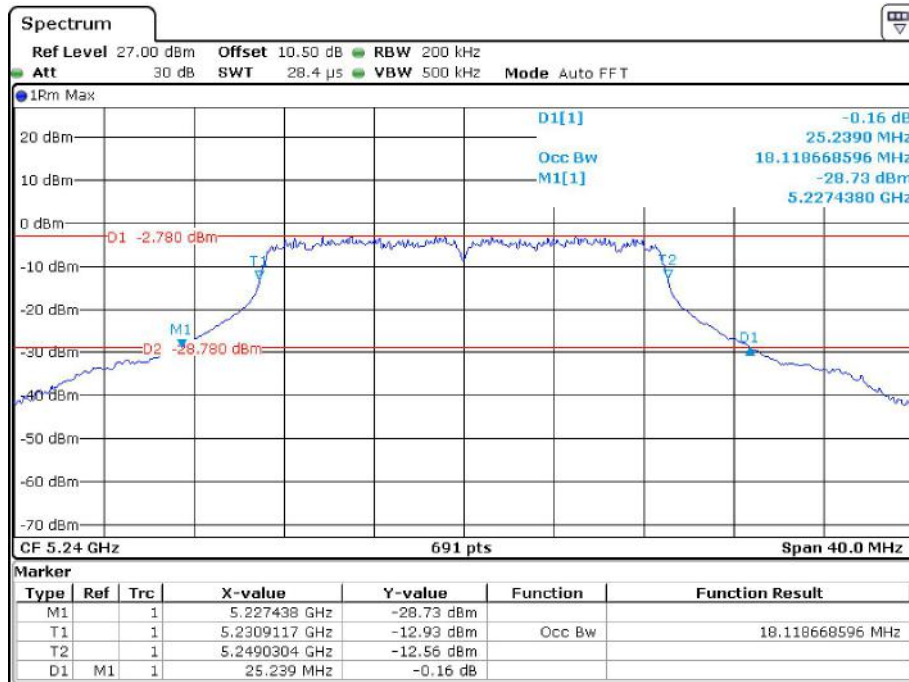
Date: 2.APR.2022 15:10:18

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5180 MHz

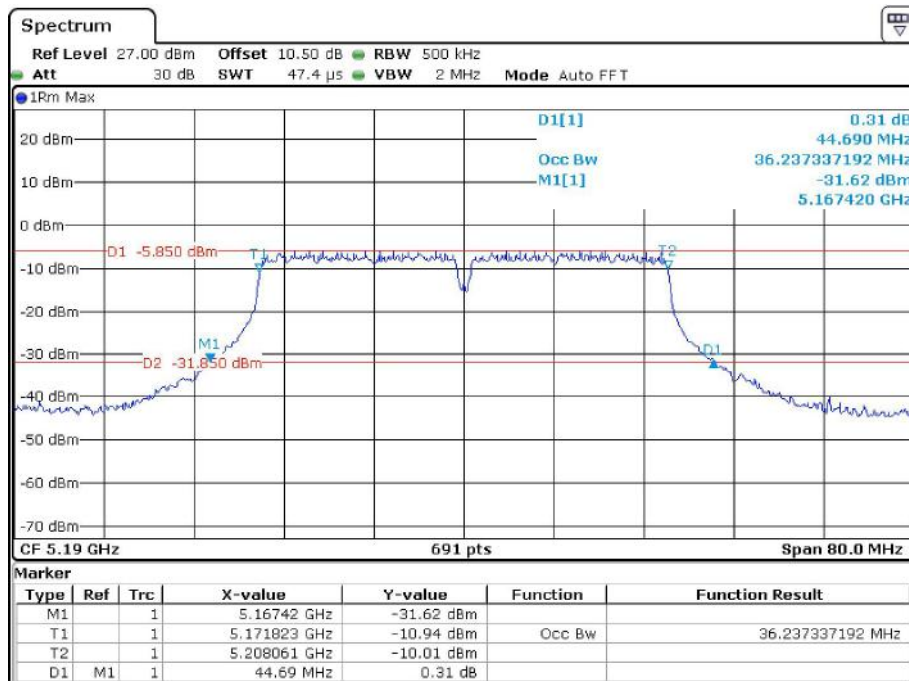
Date: 2.APR.2022 15:01:43

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5200 MHz

Date: 2.APR.2022 15:00:59

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5240 MHz

Date: 2.APR.2022 15:00:10

802.11ac40 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5180 MHz

Date: 2.APR.2022 15:08:11

Spectrum

Ref Level 27.00 dBm Offset 10.50 dB RBW 500 kHz

Att 30 dB SWT 47.4 μ s VBW 2 MHz Mode Auto FFT

1Rm Max

20 dBm

10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

D1[1] -0.01 dBm

Occ Bw 36.237337192 MHz

M1[1] -32.04 dBm

5.207660 GHz

D1 -6.050 dBm

D2 -32.050 dBm

D3

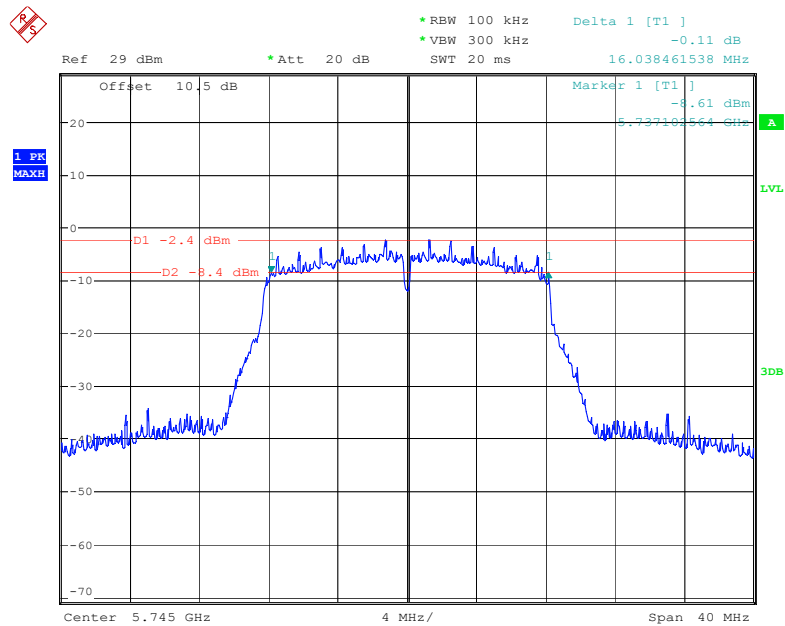
CF 5.23 GHz 691 pts Span 80.0 MHz

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.20766 GHz	-32.04 dBm		
T1		1	5.211823 GHz	-11.13 dBm	Occ Bw	36.237337192 MHz
T2		1	5.248061 GHz	-10.32 dBm		
D1	M1	1	44.34 MHz	-0.01 dB		

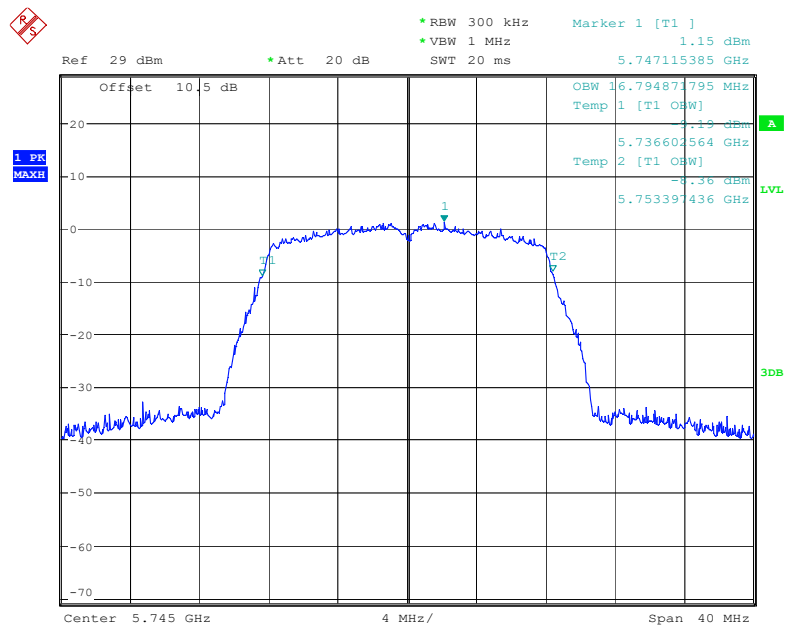
Date: 2.APR.2022 15:09:02

5725 MHz - 5850 MHz:

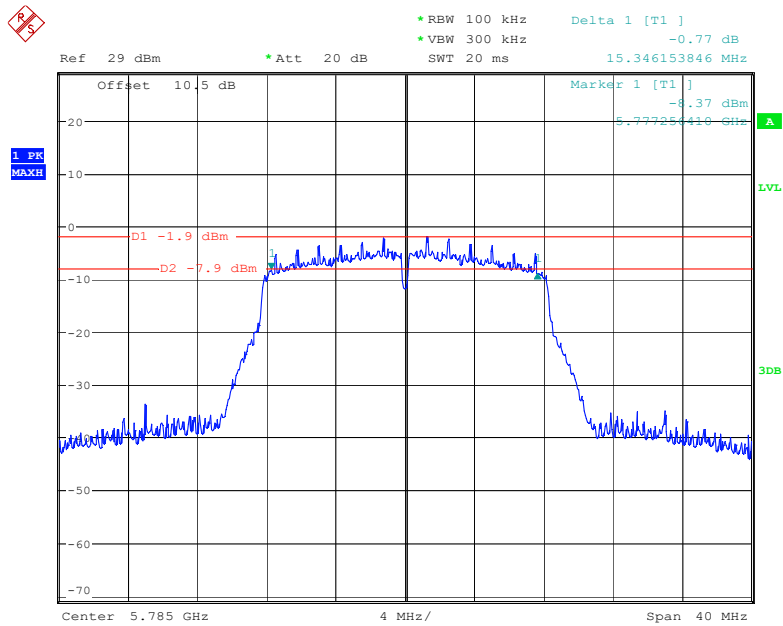
Frequency (MHz)	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	Remark
802.11a			No transmitted signal in the 99% bandwidth extends into the U-NII-2C band
5745	16.038	16.795	
5785	15.346	16.795	
5825	15.526	16.795	
802.11n20			
5745	15.449	17.821	
5785	15.449	17.756	
5825	15.526	17.756	
802.11n40			
5755	35.256	36.026	
5795	35.256	36.026	
802.11ac20			
5745	15.615	17.821	
5785	15.321	17.821	
5825	15.205	17.756	
802.11ac40			
5755	35.205	36.026	
5795	35.128	36.026	

802.11a mode, 6 dB Emission Bandwidth, 5745 MHz

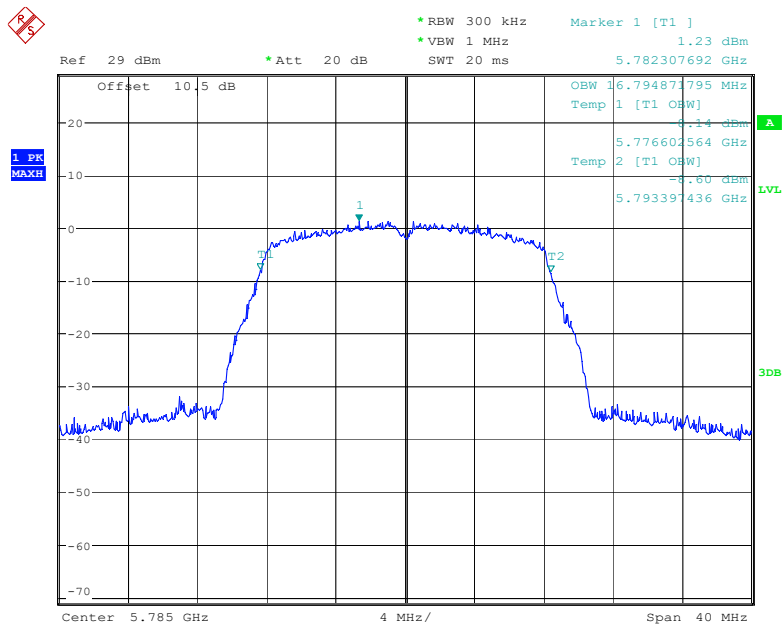
Date: 20.MAY.2022 21:13:44

802.11a mode, 99% Occupied Bandwidth, 5745 MHz

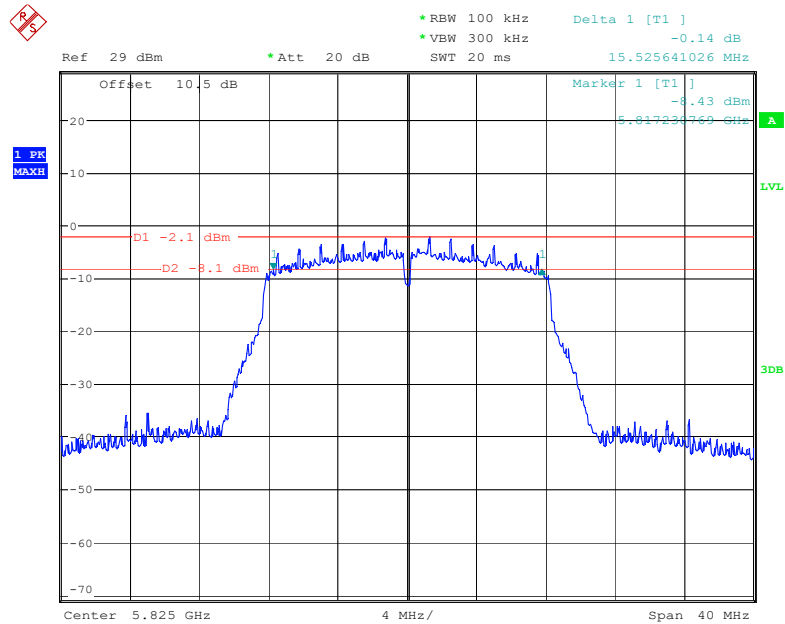
Date: 20.MAY.2022 21:54:56

802.11a mode, 6 dB Emission Bandwidth, 5785 MHz

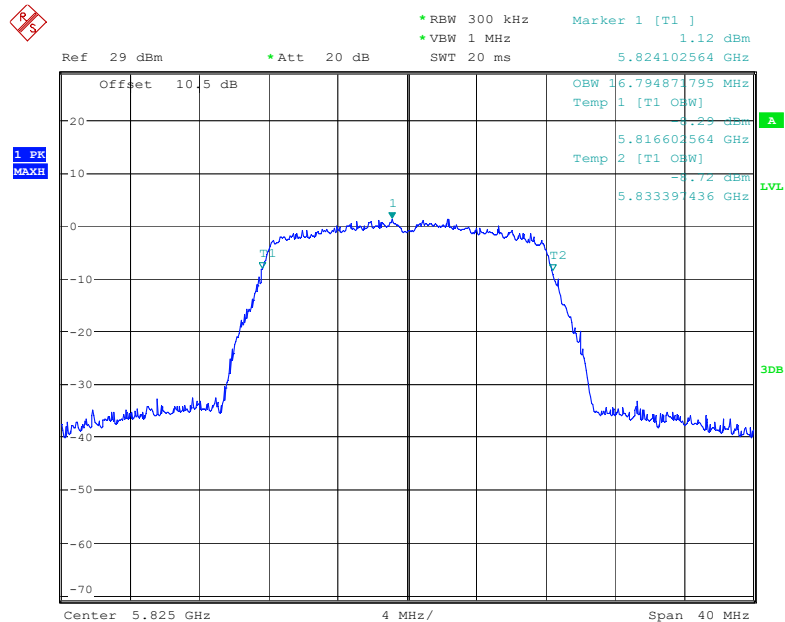
Date: 20.MAY.2022 21:15:22

802.11a mode, 99% Occupied Bandwidth, 5785 MHz

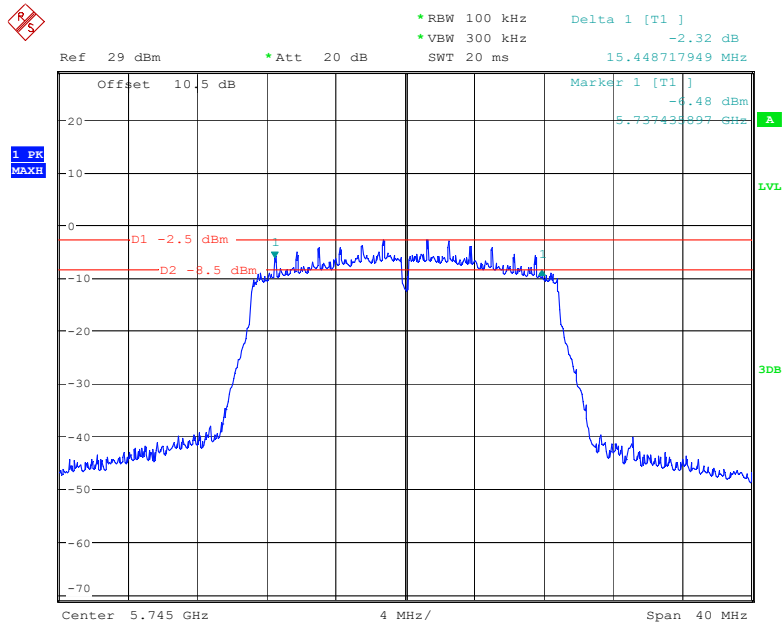
Date: 20.MAY.2022 21:55:20

802.11a mode, 6 dB Emission Bandwidth, 5825 MHz

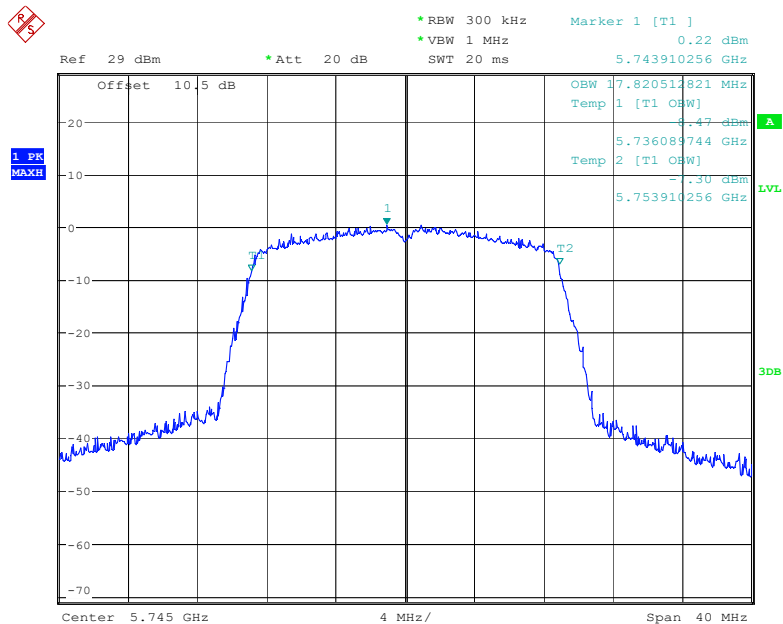
Date: 20.MAY.2022 21:17:09

802.11a mode, 99% Occupied Bandwidth, 5825 MHz

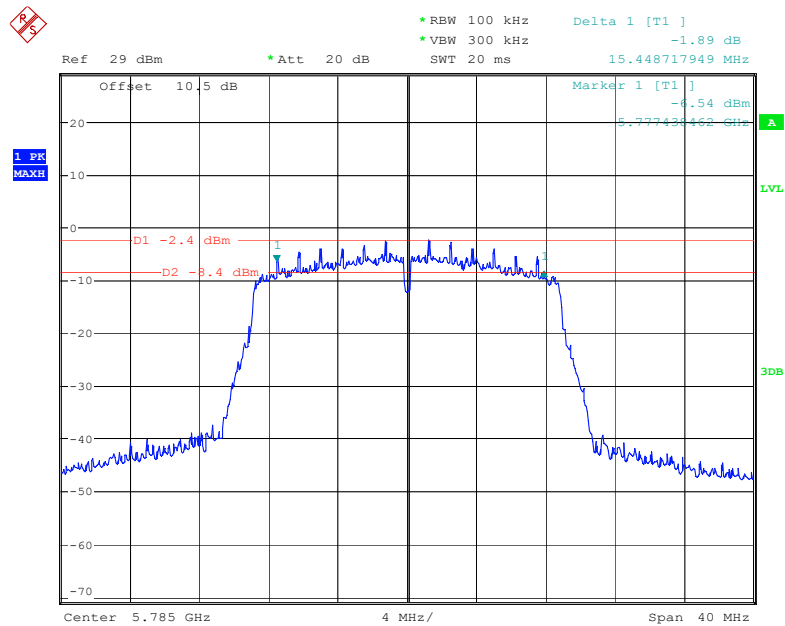
Date: 20.MAY.2022 21:55:41

802.11n20 mode, 6 dB Emission Bandwidth, 5745 MHz

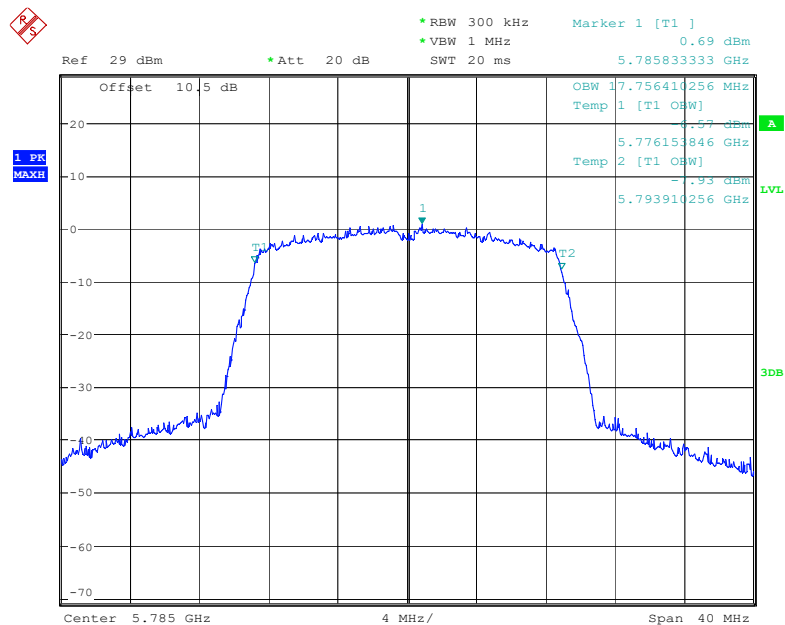
Date: 20.MAY.2022 21:19:39

802.11n20 mode, 99% Occupied Bandwidth, 5745 MHz

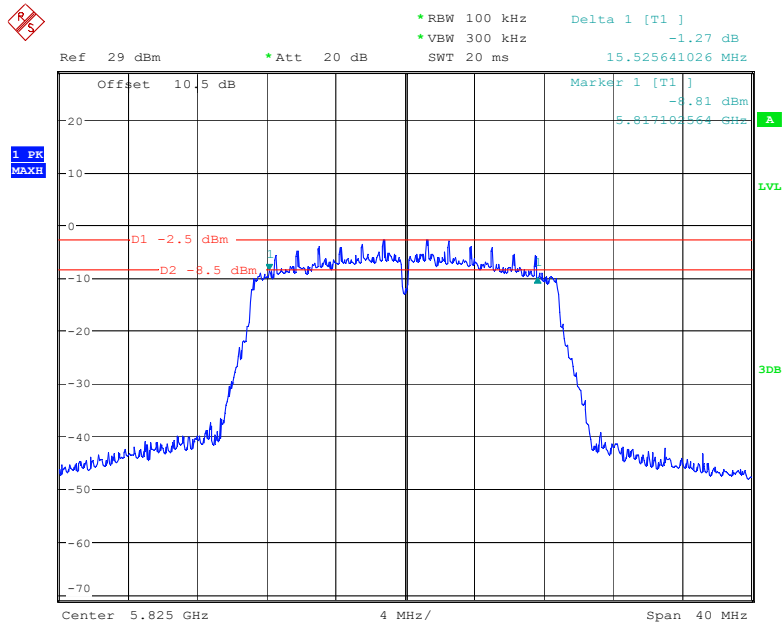
Date: 20.MAY.2022 21:56:47

802.11n20 mode, 6 dB Emissions Bandwidth, 5785 MHz

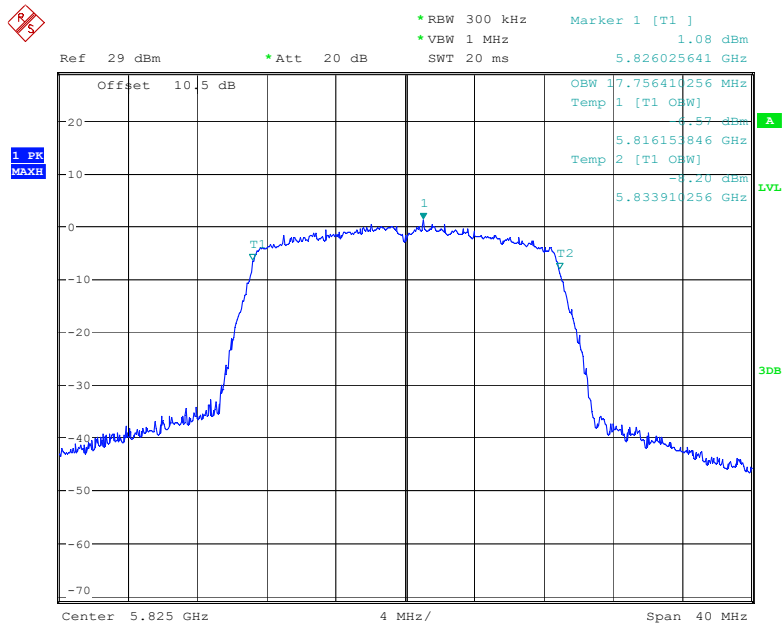
Date: 20.MAY.2022 21:21:11

802.11n20 mode, 99% Occupied Bandwidth, 5785 MHz

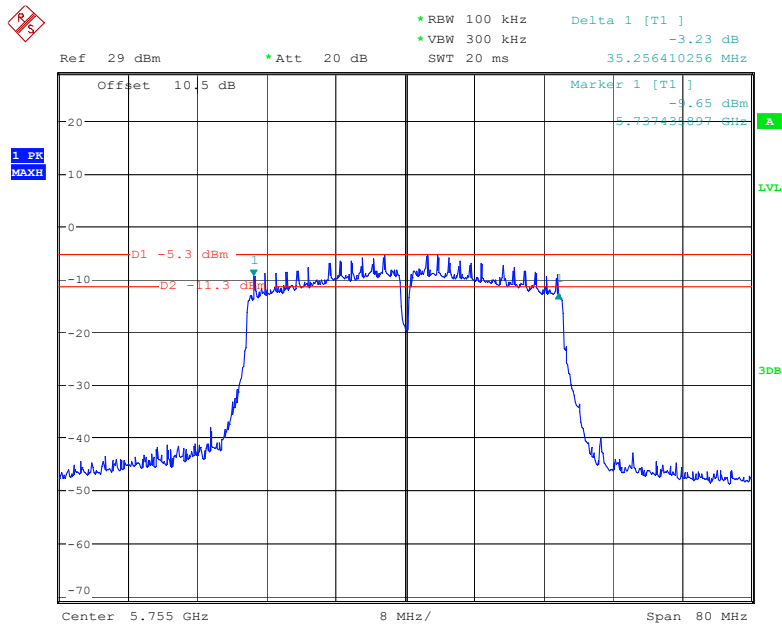
Date: 20.MAY.2022 21:56:26

802.11n20 mode, 6 dB Emission Bandwidth, 5825 MHz

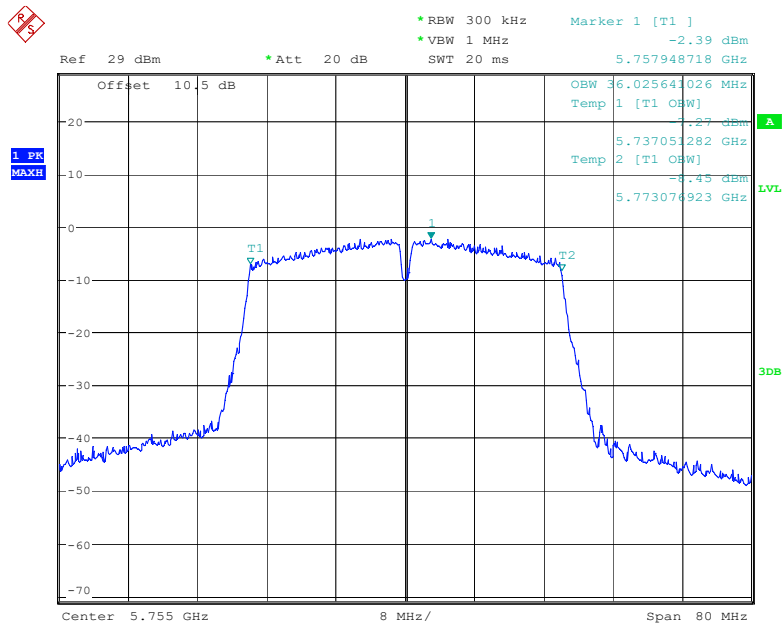
Date: 20.MAY.2022 21:17:56

802.11n20 mode, 99% Occupied Bandwidth, 5825 MHz

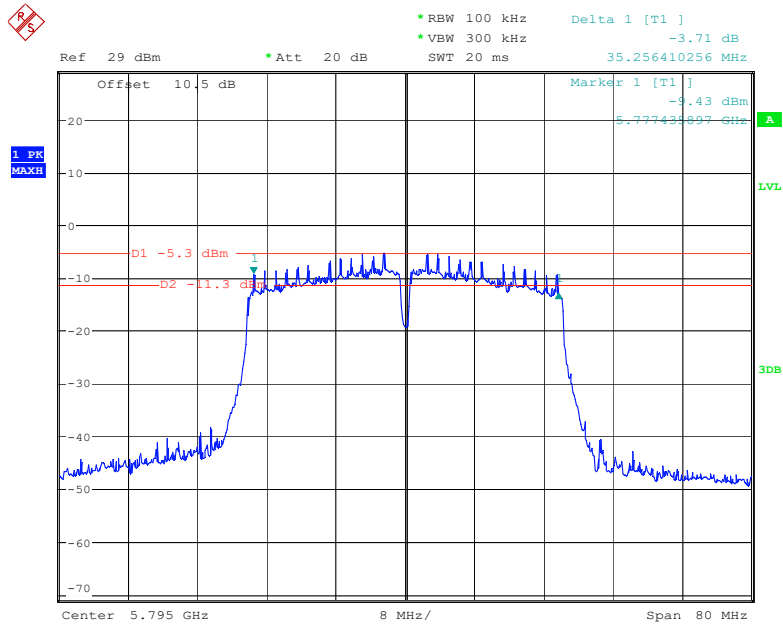
Date: 20.MAY.2022 21:56:02

802.11n40 mode, 6 dB Emission Bandwidth, 5755 MHz

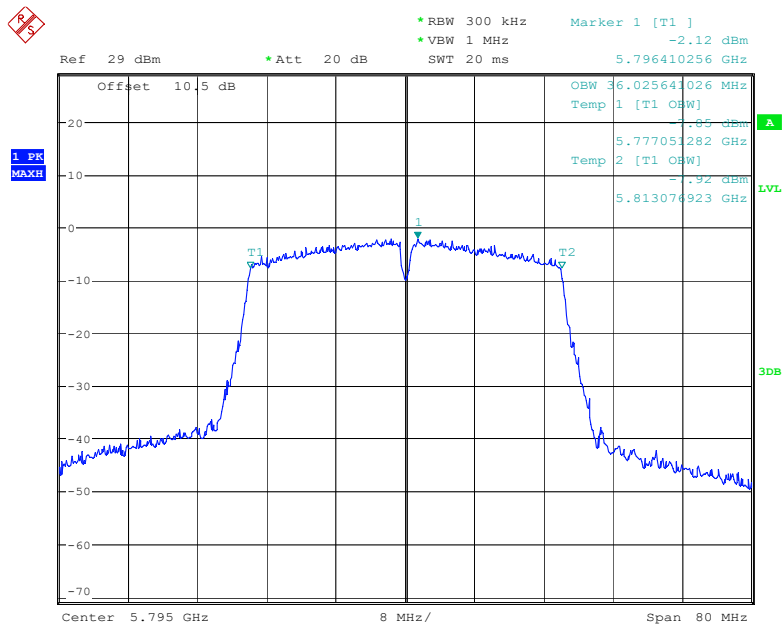
Date: 20.MAY.2022 21:28:16

802.11n40 mode, 99% Occupied Bandwidth, 5755 MHz

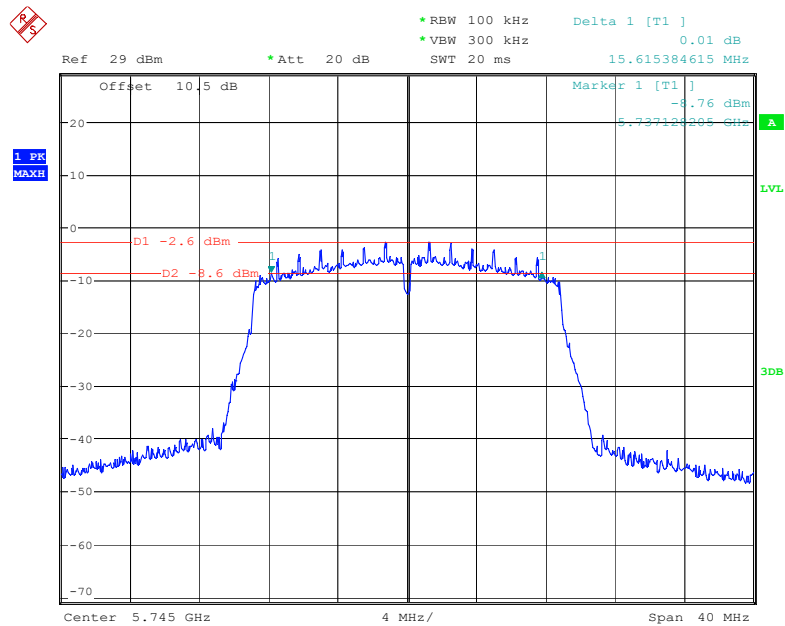
Date: 20.MAY.2022 22:00:16

802.11n40 mode, 6 dB Emission Bandwidth, 5795 MHz

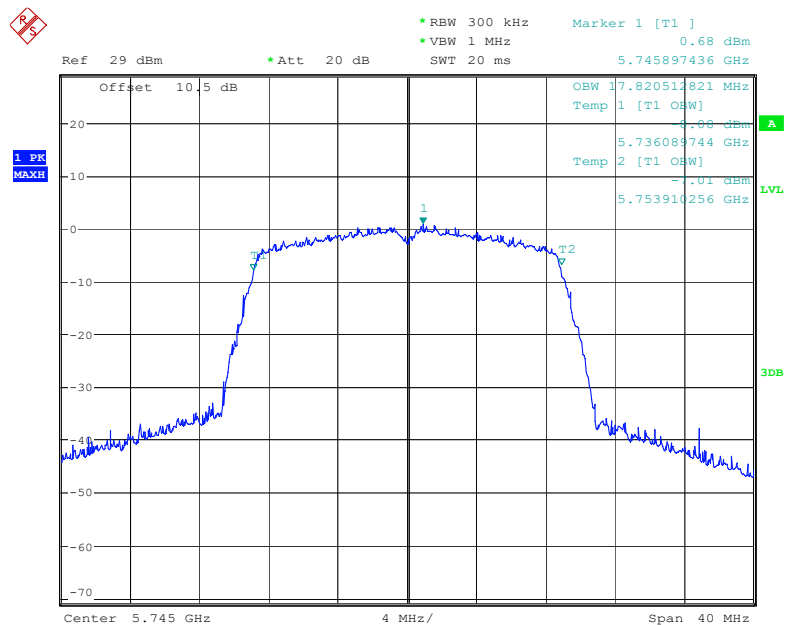
Date: 20.MAY.2022 21:27:07

802.11n40 mode, 99% Occupied Bandwidth, 5795 MHz

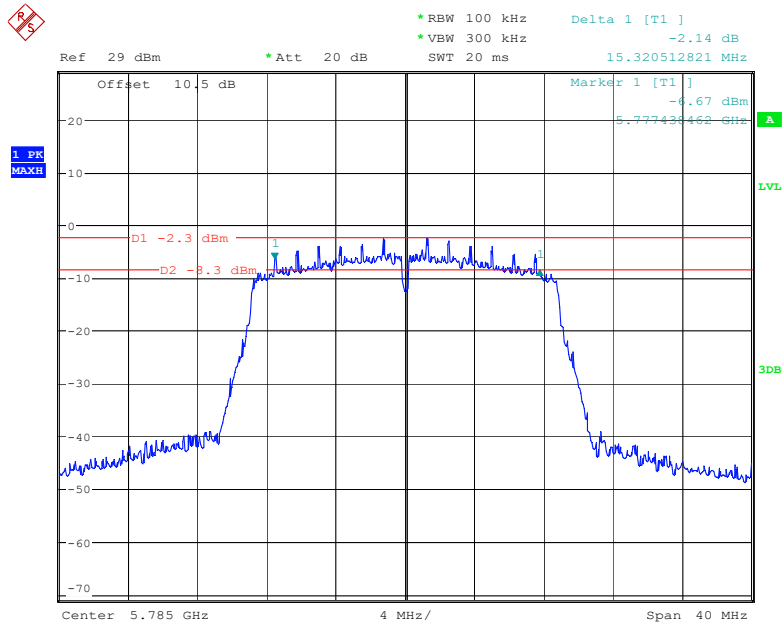
Date: 20.MAY.2022 21:59:47

802.11ac20 mode, 6 dB Emission Bandwidth, 5745 MHz

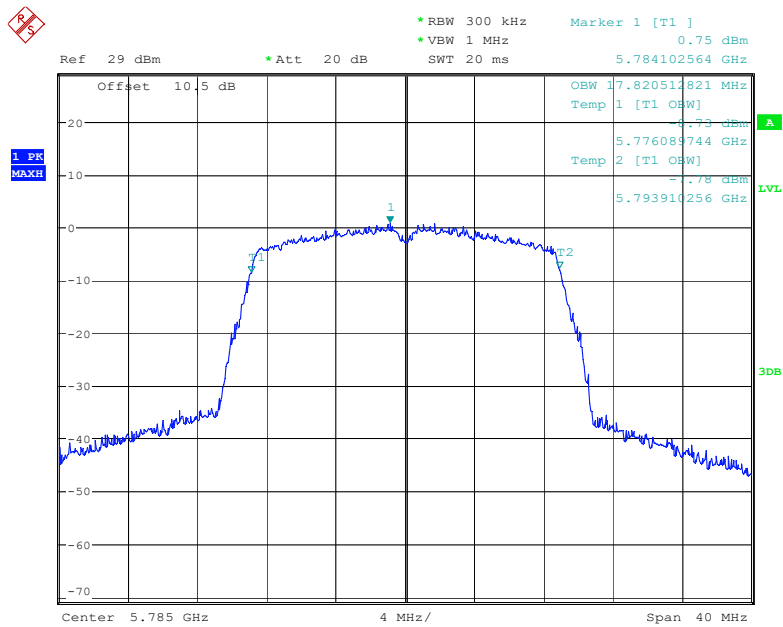
Date: 20.MAY.2022 21:22:51

802.11ac20 mode, 99% Occupied Bandwidth, 5745 MHz

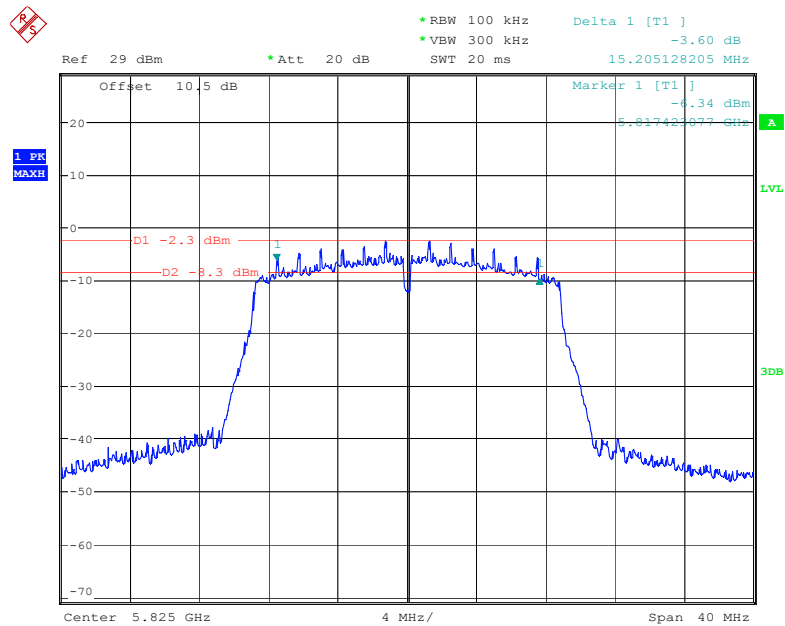
Date: 20.MAY.2022 21:57:07

802.11ac20 mode, 6 dB Emission Bandwidth, 5785 MHz

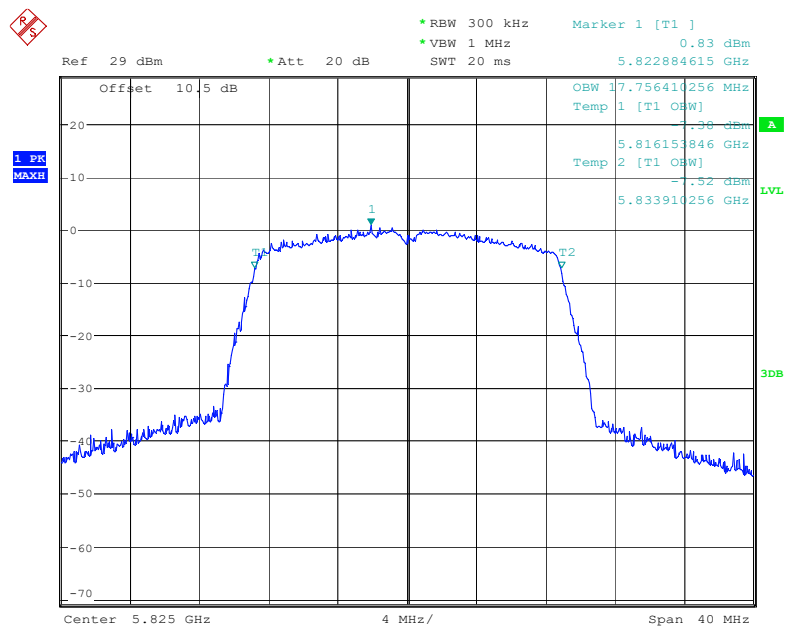
Date: 20.MAY.2022 21:21:58

802.11ac20 mode, 99% Occupied Bandwidth, 5785 MHz

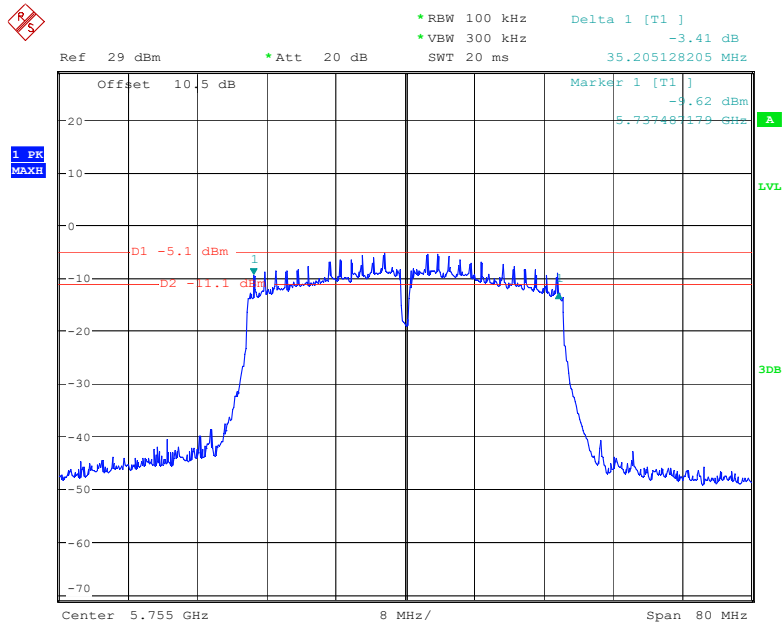
Date: 20.MAY.2022 21:57:32

802.11ac20 mode, 6 dB Emission Bandwidth, 5825 MHz

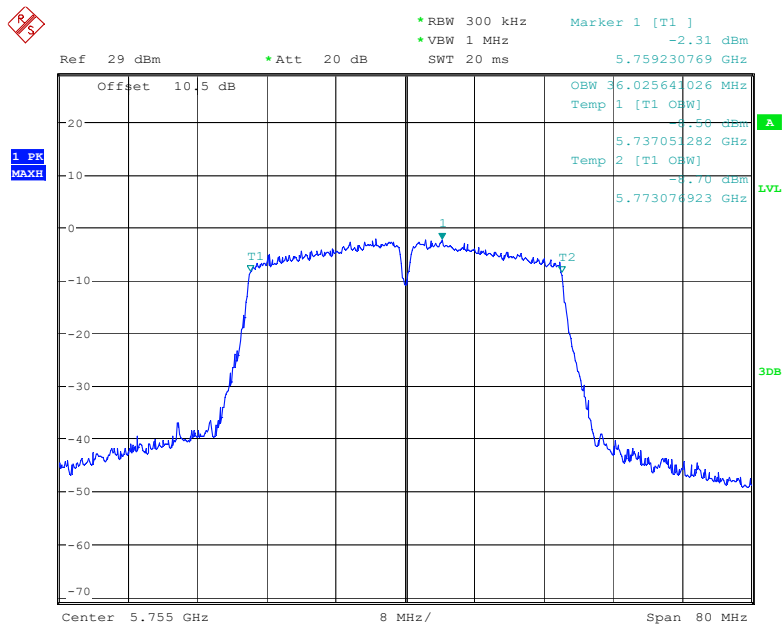
Date: 20.MAY.2022 21:24:32

802.11ac20 mode, 99% Occupied Bandwidth, 5825 MHz

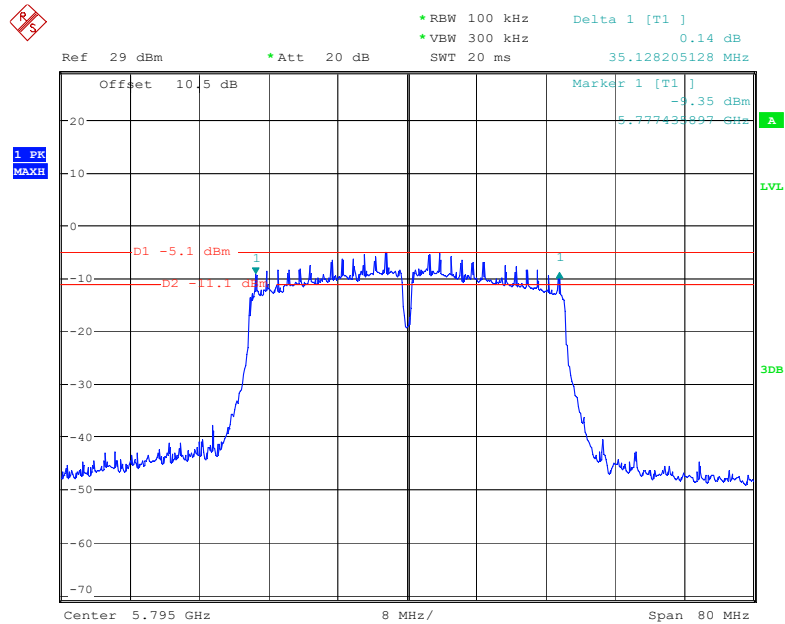
Date: 20.MAY.2022 21:57:53

802.11ac40 mode, 6 dB Emission Bandwidth, 5755 MHz

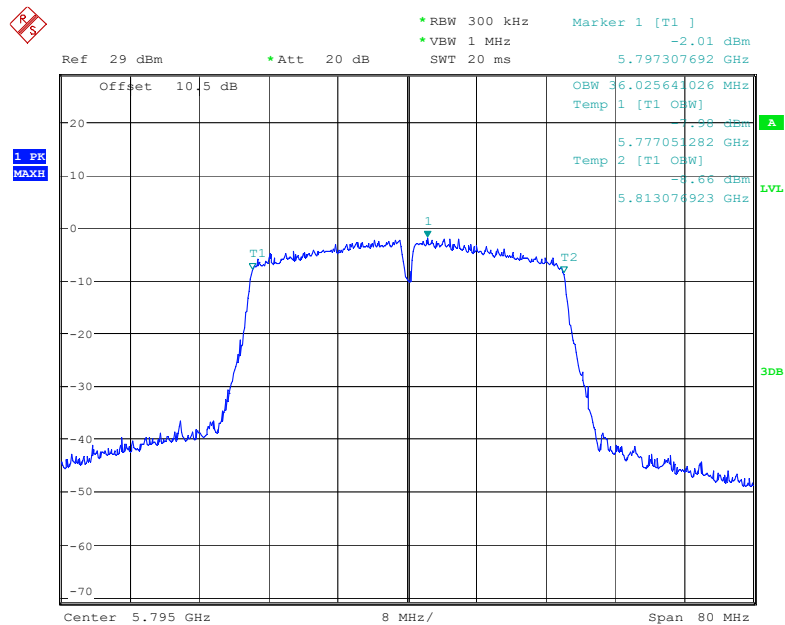
Date: 20.MAY.2022 21:25:27

802.11ac40 mode, 99% Occupied Bandwidth, 5755 MHz

Date: 20.MAY.2022 21:58:20

802.11ac40 mode, 6 dB Emission Bandwidth, 5795 MHz

Date: 20.MAY.2022 21:26:16

802.11ac40 mode, 99% Occupied Bandwidth, 5795 MHz

Date: 20.MAY.2022 21:58:52

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.

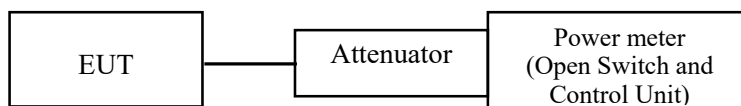
For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting 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 $11 \text{ dBm} + 10 \log B$, 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

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



Note: the Open Switch and Control Unit has a built-in power sensor.

Test Data**Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	43 %
ATM Pressure:	101.3 kPa

The testing was performed by Key Pei on 2022-04-02.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

5150-5250MHz:

Frequency (MHz)	Conducted Average Output Power (dBm)	Limit (dBm)
802.11a		
5180	12.37	24
5200	12.28	24
5240	12.31	24
802.11n20		
5180	14.97	24
5200	13.17	24
5240	13.20	24
802.11n40		
5190	13.56	24
5230	13.56	24
802.11ac20		
5180	14.64	24
5200	14.26	24
5240	13.89	24
802.11ac40		
5190	13.39	24
5230	13.23	24

Note: the duty cycle factor has added into result.

5725-5850MHz:

Frequency (MHz)	Conducted Average Output Power (dBm)	Limit (dBm)
802.11a		
5745	10.51	30
5785	10.77	30
5825	10.83	30
802.11n20		
5745	9.32	30
5785	9.55	30
5825	9.54	30
802.11n40		
5755	9.91	30
5795	9.82	30
802.11ac20		
5745	9.47	30
5785	9.67	30
5825	9.55	30
802.11ac40		
5755	9.73	30
5795	9.91	30

Note: the duty cycle factor has added into result.

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.

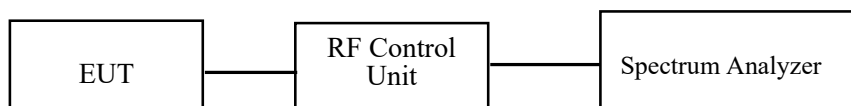
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not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

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 ($< 1 \text{ MHz}$, or $< 500 \text{ kHz}$) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

- a) Set $\text{RBW} \geq 1/T$, where T is defined in section II.B.1.a).
- b) Set $\text{VBW} \geq 3 \text{ RBW}$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz}/\text{RBW})$ to the measured result, whereas $\text{RBW} (< 500 \text{ kHz})$ 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 $10 \log (1\text{MHz}/\text{RBW})$ to the measured result, whereas $\text{RBW} (< 1 \text{ MHz})$ 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 °C
Relative Humidity:	43 %
ATM Pressure:	101.3 kPa

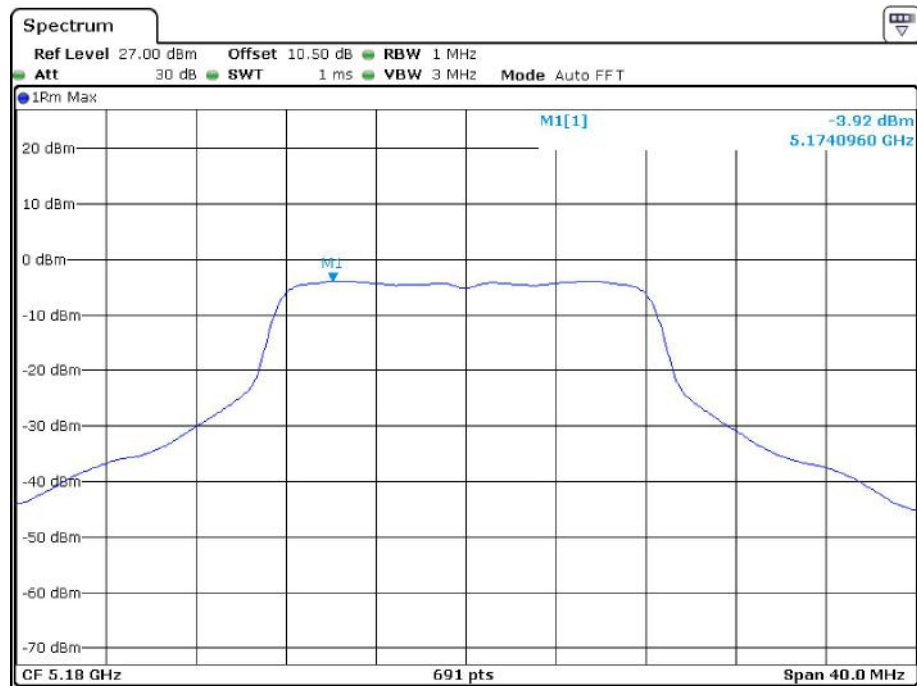
The testing was performed by Key Pei from 2022-04-02 to 2022-05-20.

EUT operation mode: Transmitting

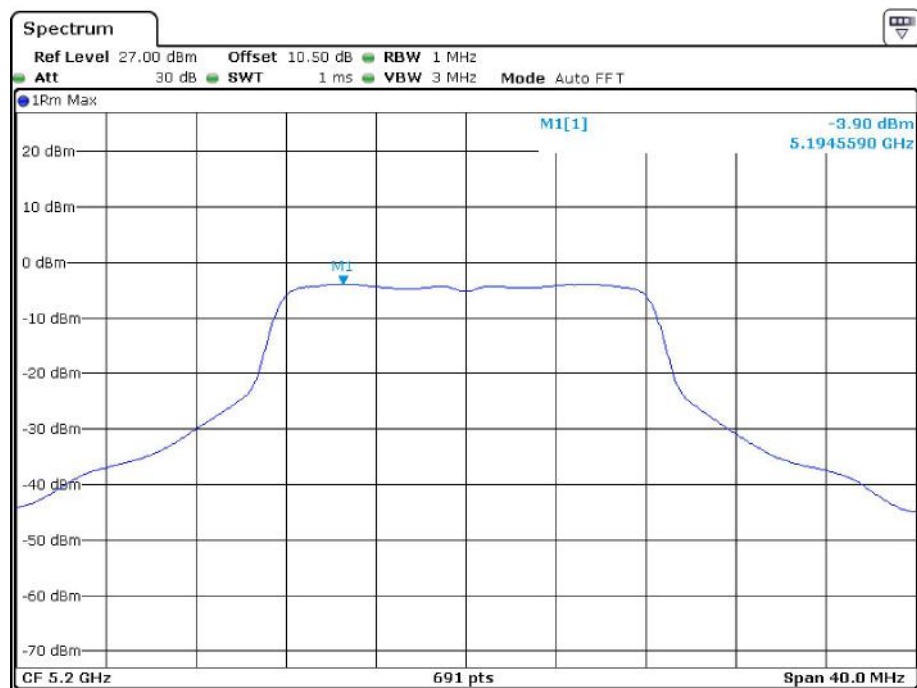
Test Result: Pass

Please refer to the following tables and plots.

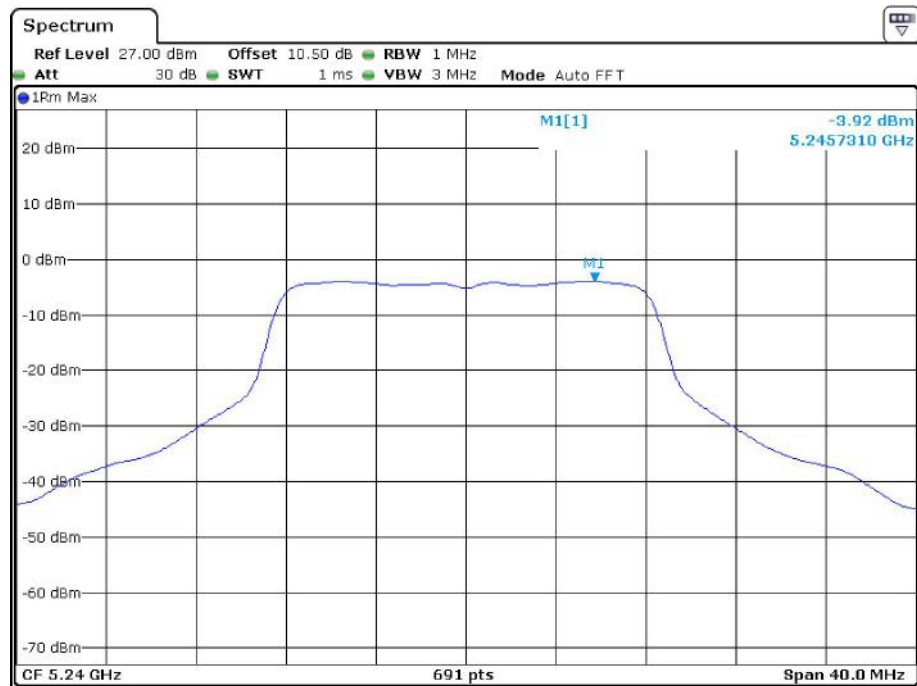
Frequency (MHz)	Power SpectralDensity (dBm/MHz)	Limit (dBm/MHz)
802.11a		
5180	-3.92	11
5200	-3.90	11
5240	-3.92	11
802.11n20		
5180	-3.11	11
5200	-3.22	11
5240	-3.01	11
802.11n40		
5190	-4.58	11
5230	-4.54	11
802.11ac20		
5180	-3.26	11
5200	-3.22	11
5240	-3.42	11
802.11ac40		
5190	-4.94	11
5230	-4.60	11

802.11a mode, Power Spectral Density, 5180 MHz

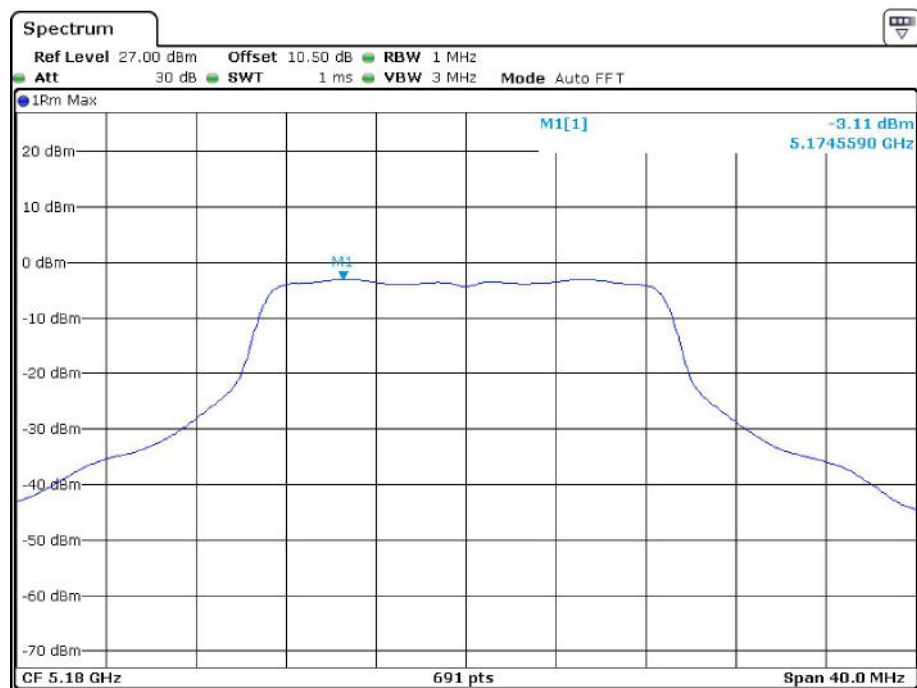
Date: 19.APR.2022 15:30:36

802.11a mode, Power Spectral Density, 5200 MHz

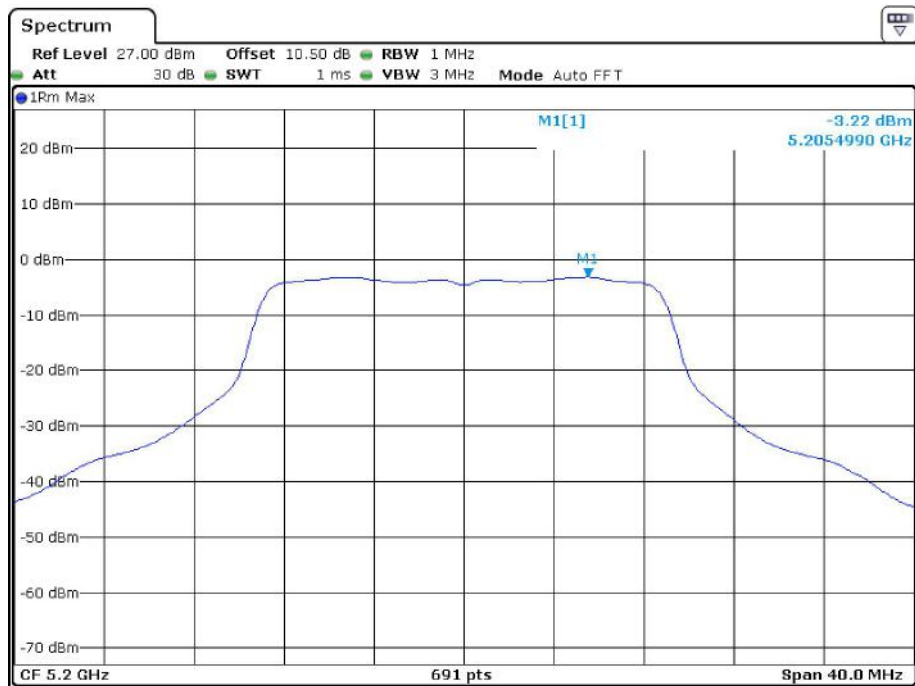
Date: 19.APR.2022 15:30:47

802.11a mode, Power Spectral Density, 5240 MHz

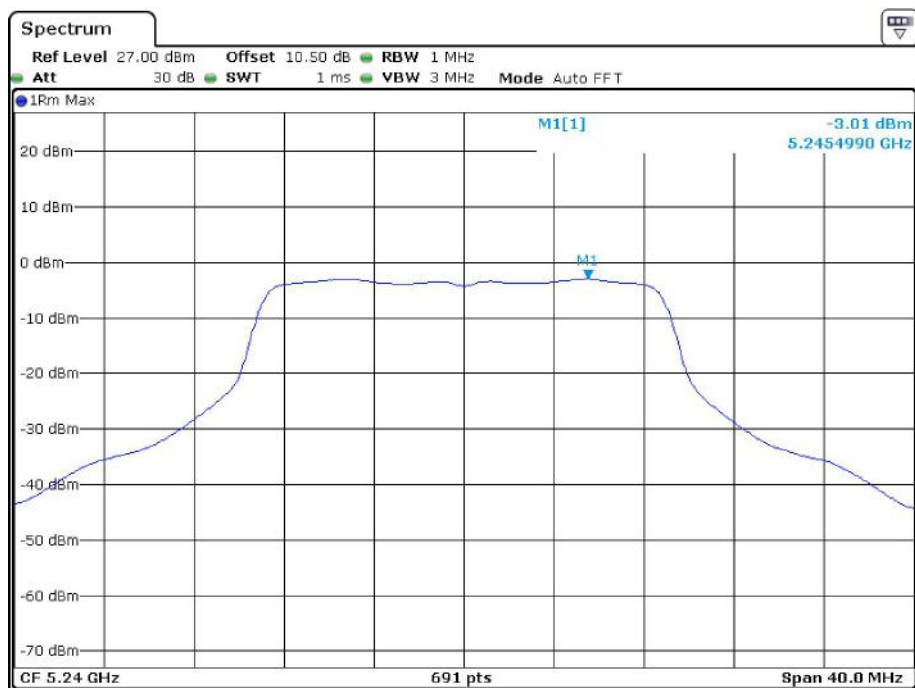
Date: 19.APR.2022 15:30:59

802.11n20 mode, Power Spectral Density, 5180 MHz

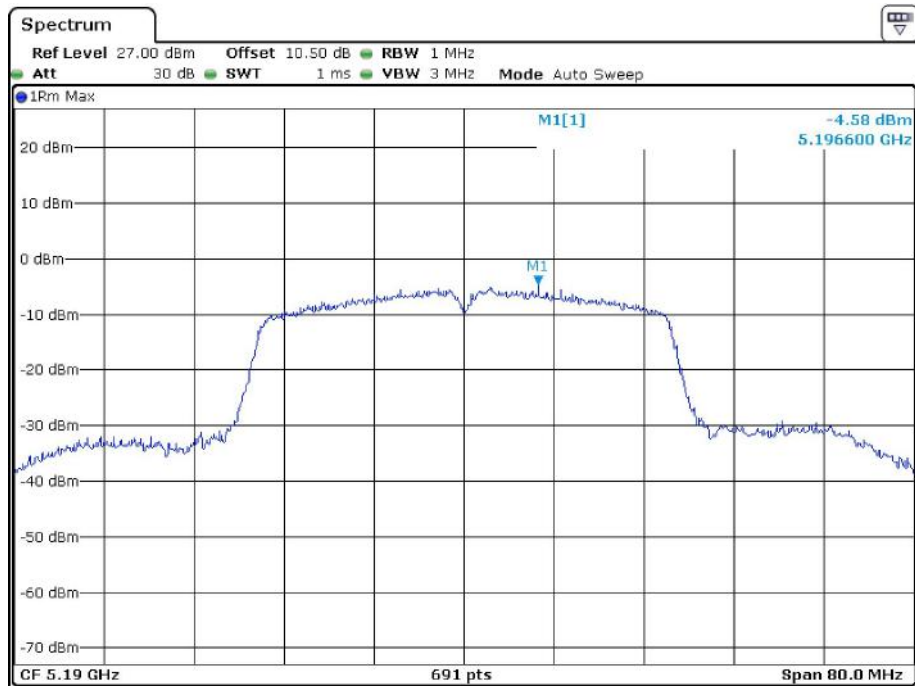
Date: 2.APR.2022 14:49:04

802.11n20 mode, Power Spectral Density, 5200 MHz

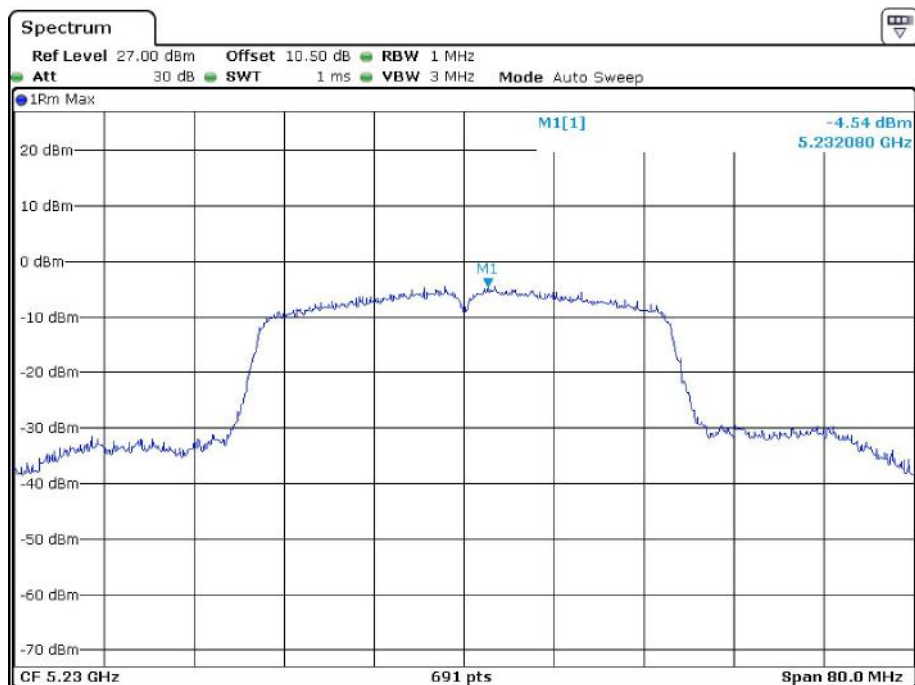
Date: 2.APR.2022 14:48:39

802.11n20 mode, Power Spectral Density, 5240 MHz

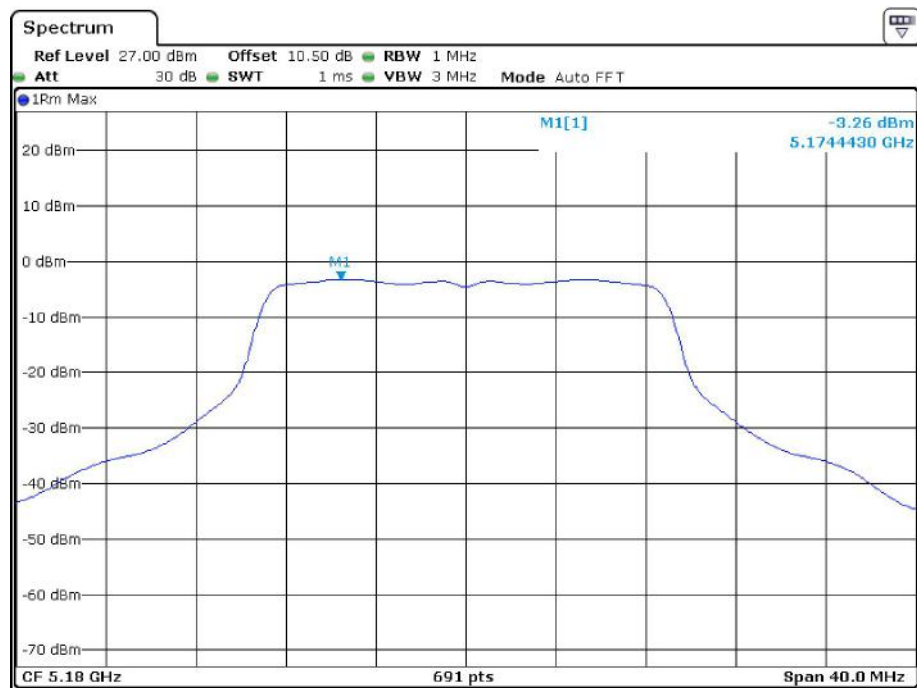
Date: 2.APR.2022 14:48:21

802.11n40 mode, Power Spectral Density, 5190 MHz

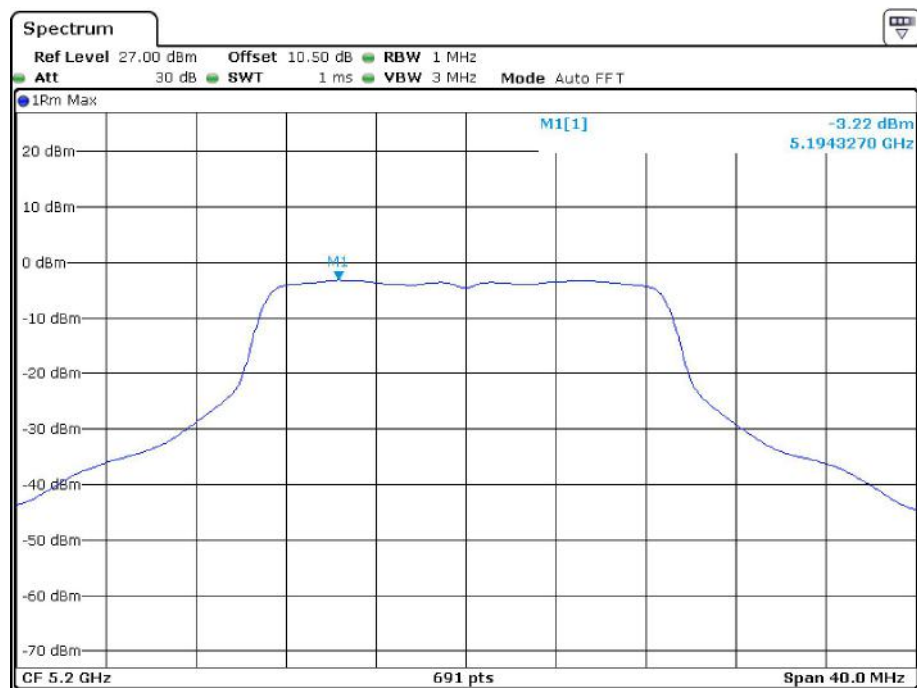
Date: 19.APR.2022 17:21:50

802.11n40 mode, Power Spectral Density, 5230 MHz

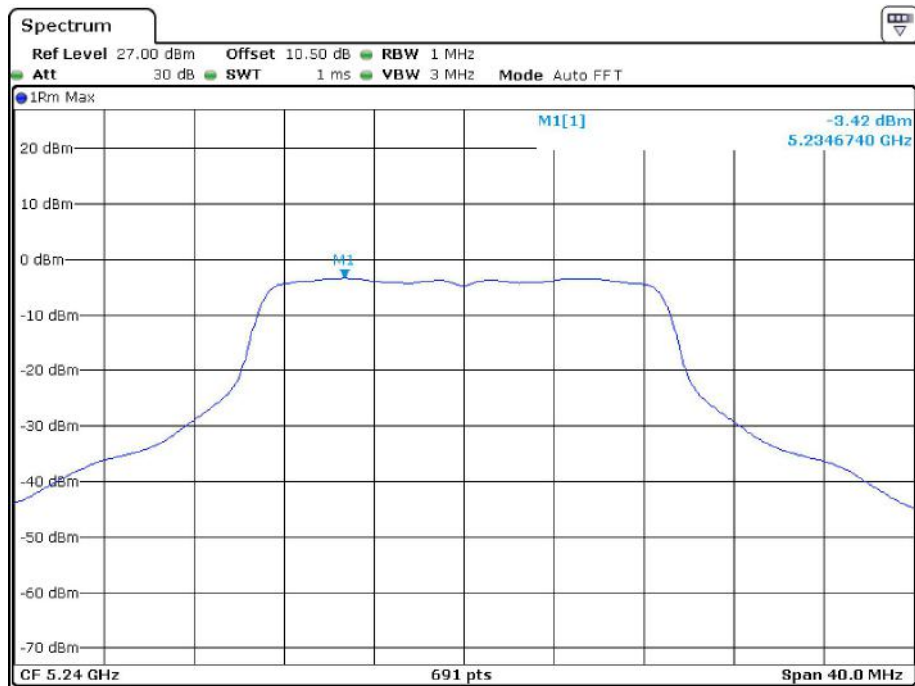
Date: 19.APR.2022 17:21:20

802.11ac20 mode, Power Spectral Density, 5180 MHz

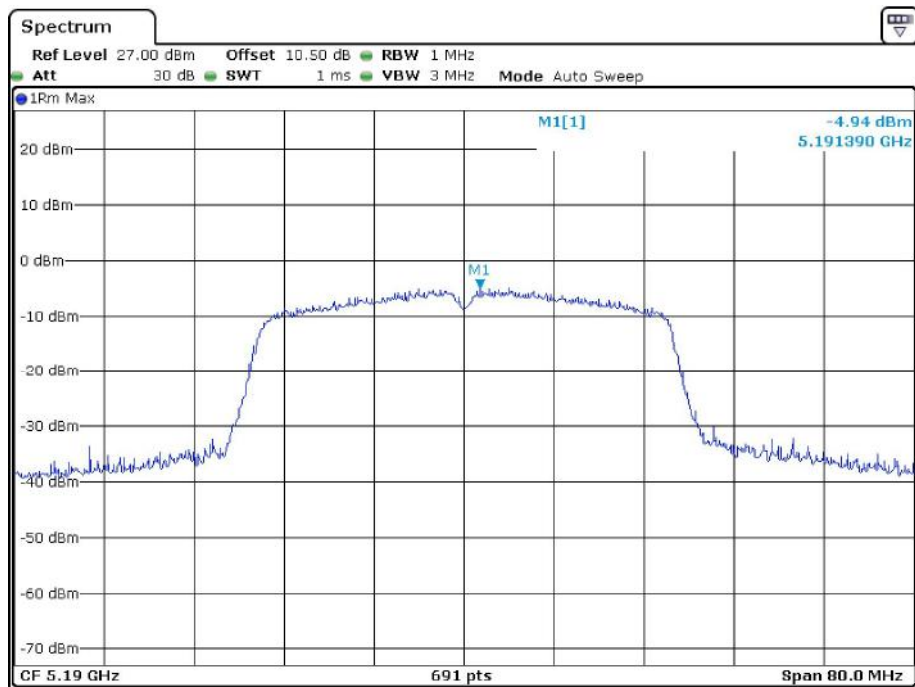
Date: 2.APR.2022 14:52:21

802.11ac20 mode, Power Spectral Density, 5200 MHz

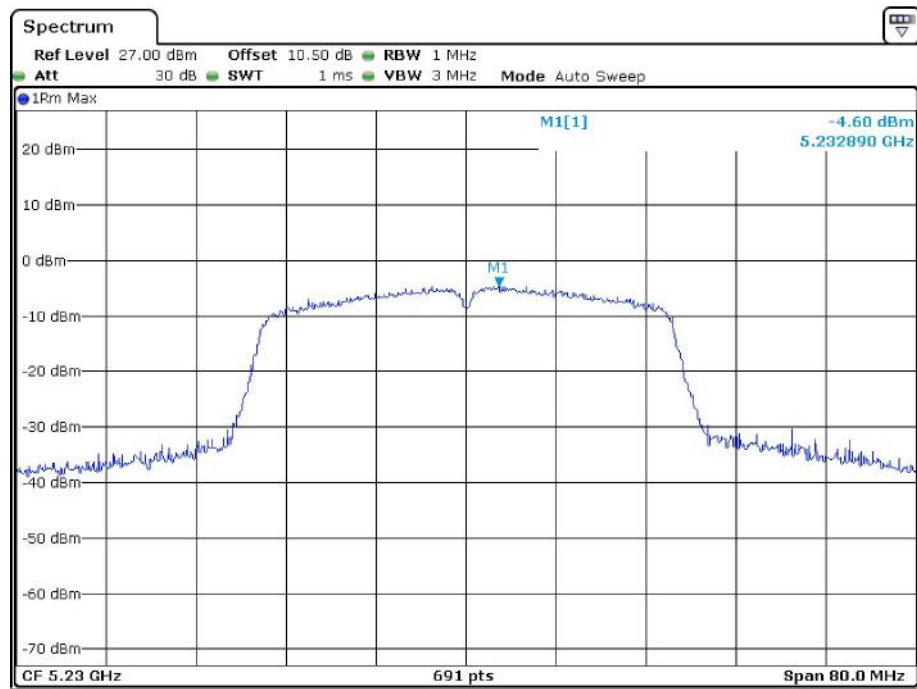
Date: 2.APR.2022 14:52:47

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

Date: 2.APR.2022 14:53:08

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

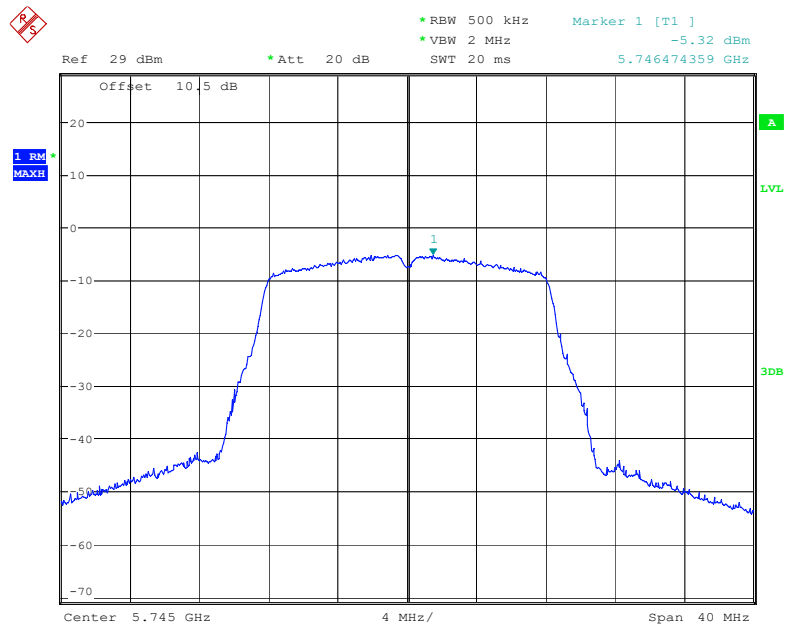
Date: 2.APR.2022 14:44:08

802.11ac40 mode, Power Spectral Density, 5230 MHz

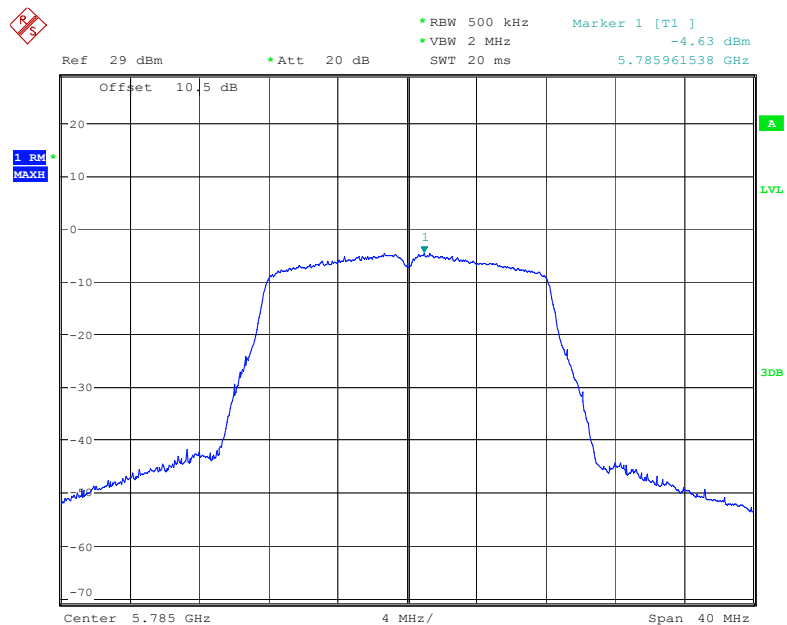
Date: 2.APR.2022 14:42:42

57250 MHz – 5850 MHz:

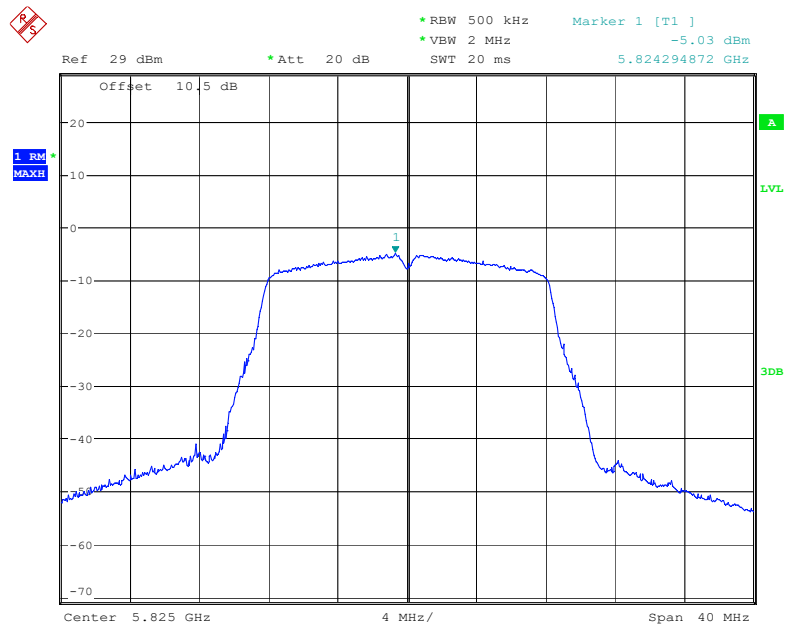
Frequency (MHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)
802.11a		
5745	-5.32	30
5785	-4.63	30
5825	-5.03	30
802.11n20		
5745	-5.75	30
5785	-5.96	30
5825	-5.96	30
802.11n40		
5755	-8.53	30
5795	-8.41	30
802.11ac20		
5745	-5.82	30
5785	-5.85	30
5825	-6.13	30
802.11ac40		
5755	-8.74	30
5795	-8.66	30

802.11a mode, Power Spectral Density, 5745 MHz

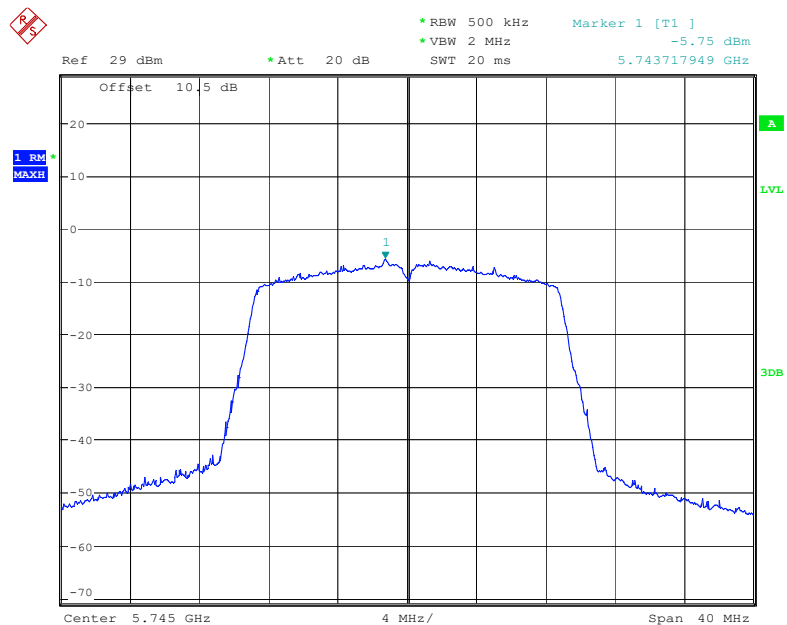
Date: 20.MAY.2022 21:02:14

802.11a mode, Power Spectral Density, 5785 MHz

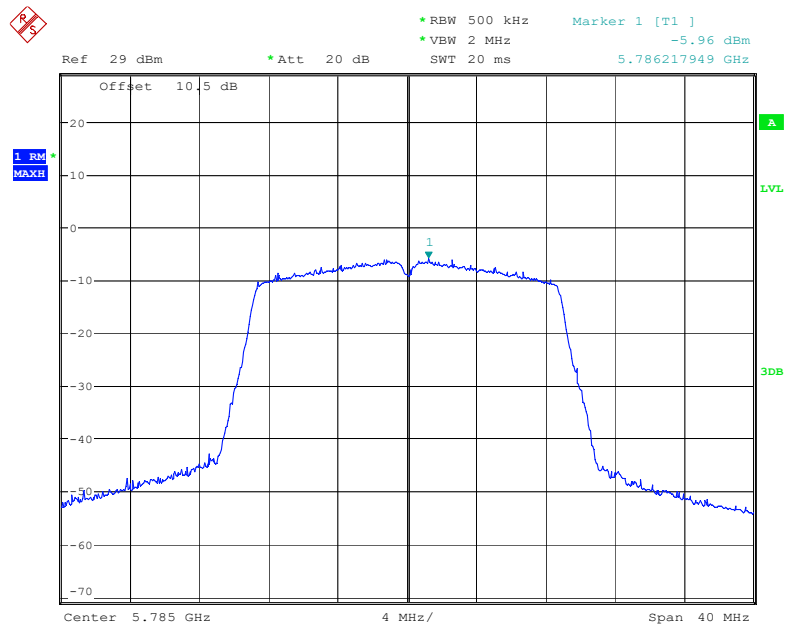
Date: 20.MAY.2022 21:01:48

802.11a mode, Power Spectral Density, 5825 MHz

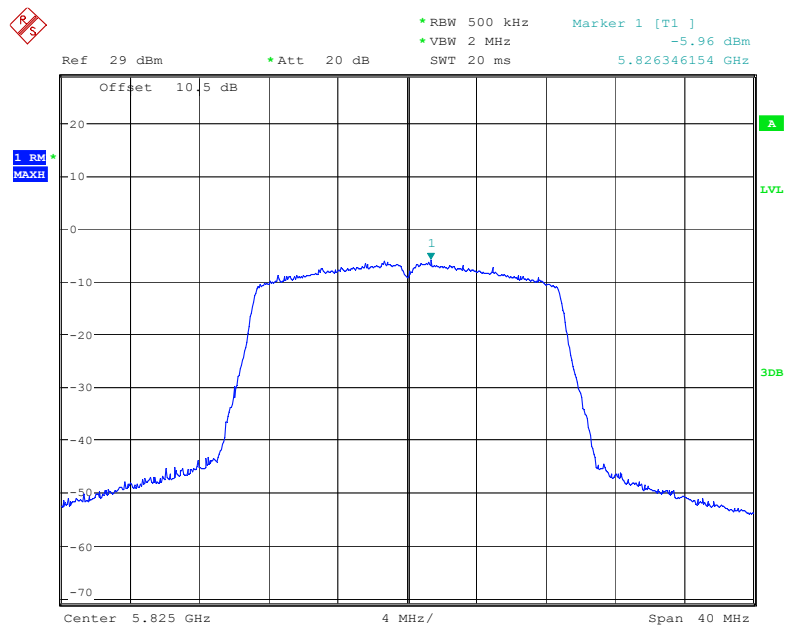
Date: 20.MAY.2022 21:03:14

802.11n20 mode, Power Spectral Density, 5745 MHz

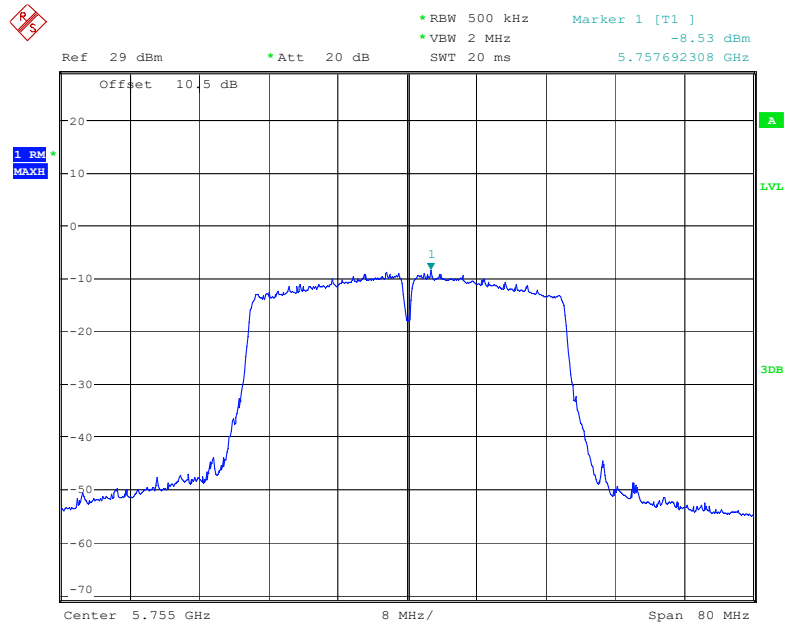
Date: 20.MAY.2022 21:04:45

802.11n20 mode, Power Spectral Density, 5785 MHz

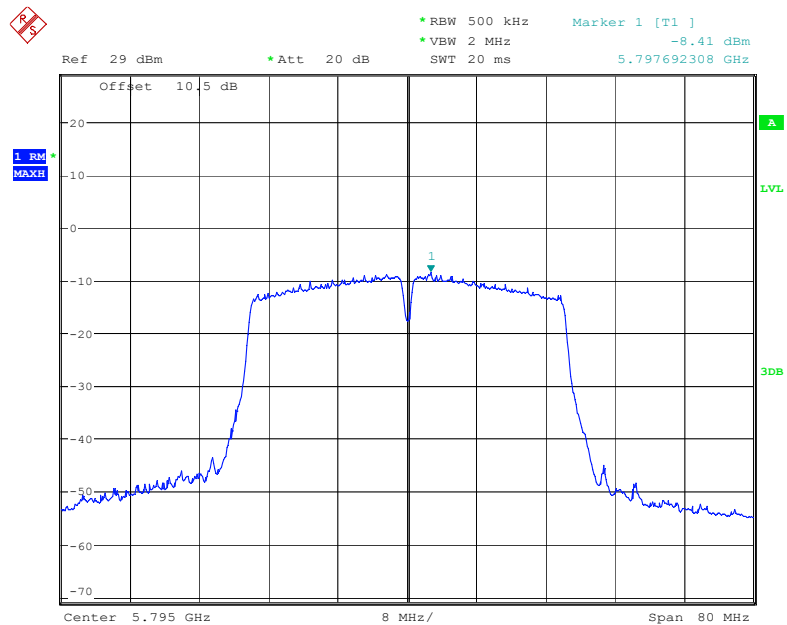
Date: 20.MAY.2022 21:04:18

802.11n20 mode, Power Spectral Density, 5825 MHz

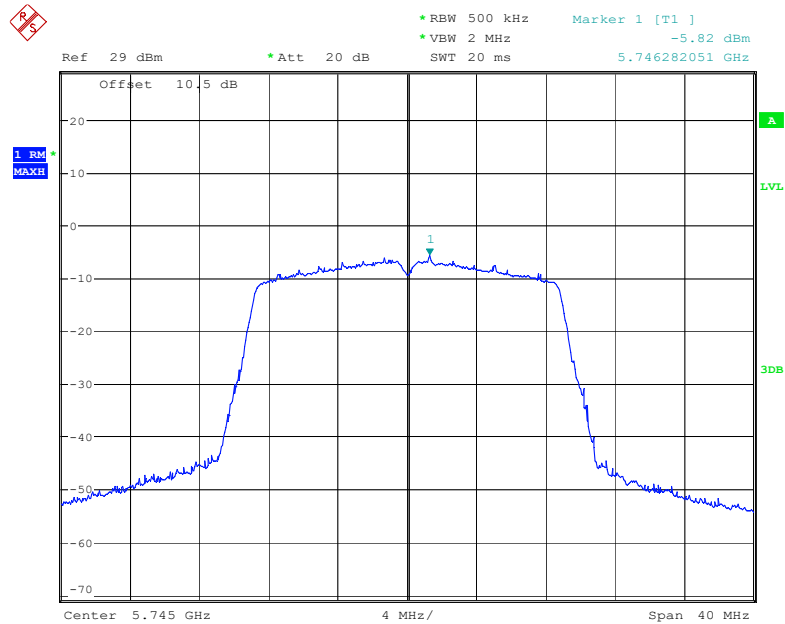
Date: 20.MAY.2022 21:03:54

802.11n40 mode, Power Spectral Density, 5755 MHz

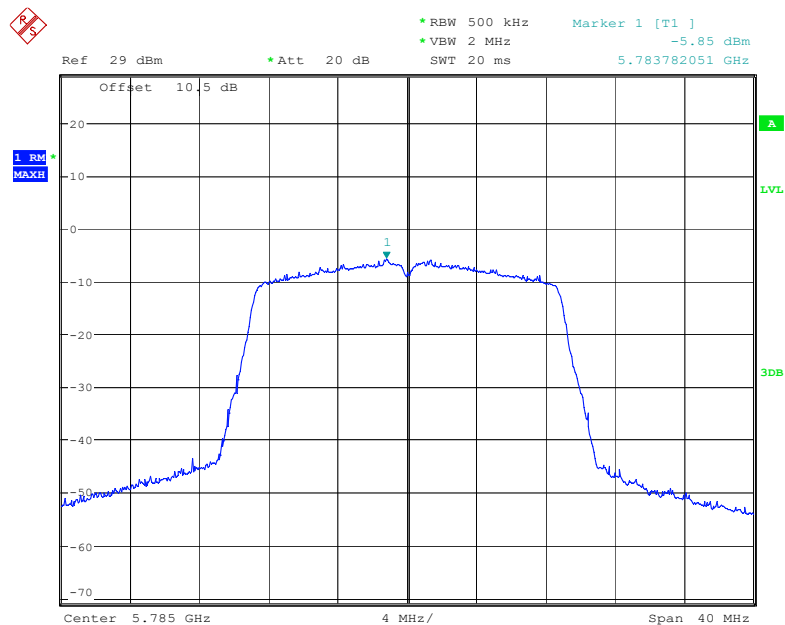
Date: 20.MAY.2022 21:10:39

802.11n40 mode, Power Spectral Density, 5795 MHz

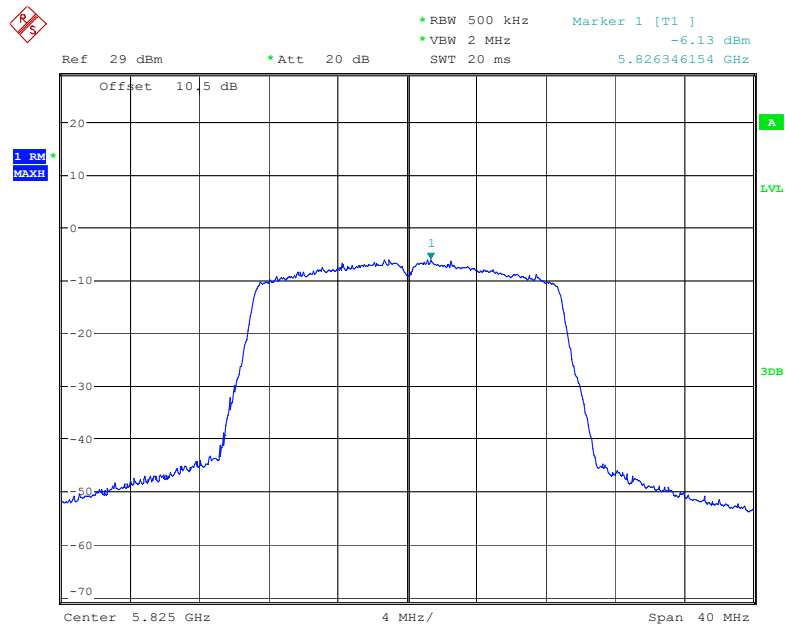
Date: 20.MAY.2022 21:09:53

802.11ac20 mode, Power Spectral Density, 5745 MHz

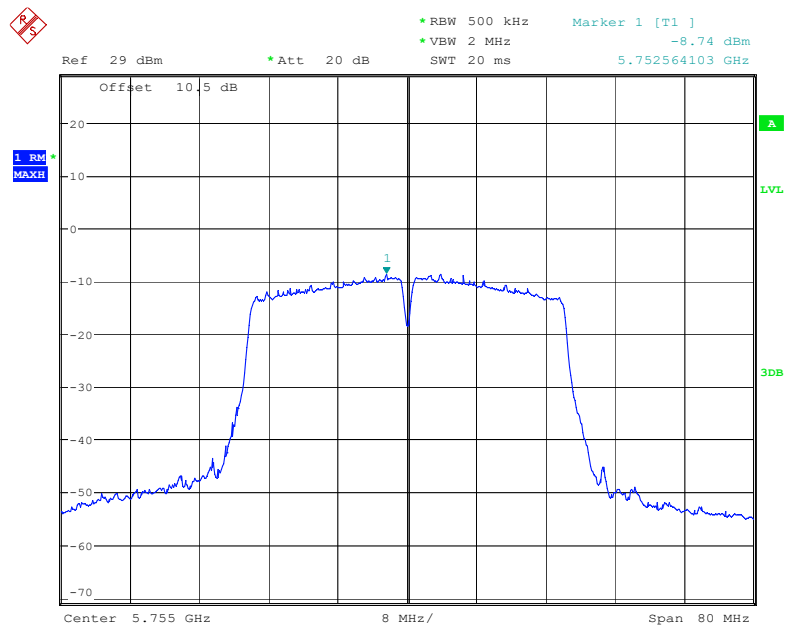
Date: 20.MAY.2022 21:05:10

802.11ac20 mode, Power Spectral Density, 5785 MHz

Date: 20.MAY.2022 21:05:38

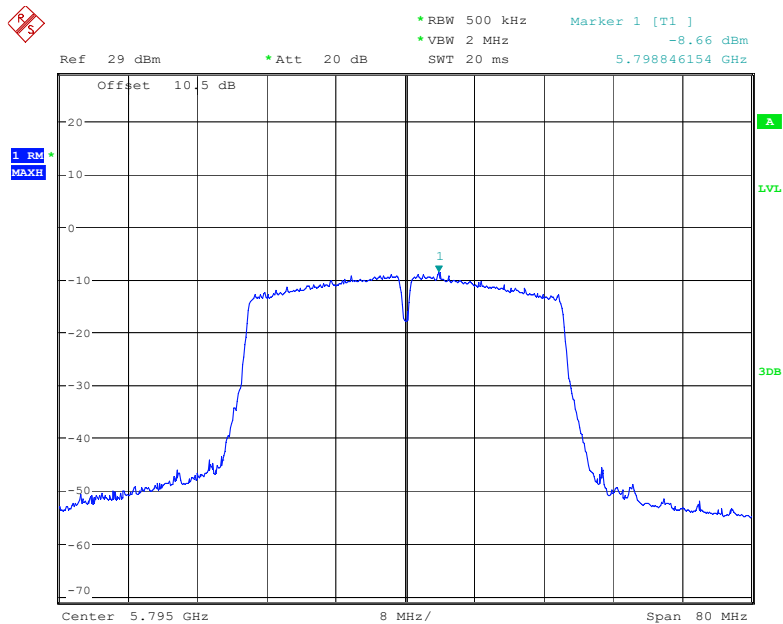
802.11ac20 mode, Power Spectral Density, 5825 MHz

Date: 20.MAY.2022 21:06:05

802.11ac40 mode, Power Spectral Density, 5755 MHz

Date: 20.MAY.2022 21:08:39

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



Date: 20.MAY.2022 21:09:05

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