

RADIO TEST REPORT

Product : Orbis Datalogger
Model Name : Orbis Datalogger
FCC ID : YQMGS610390
Test Regulation : FCC 47 CFR Part 15 Subpart E (Section 15.407)
Received Date : 2023/8/30
Test Date : 2023/8/31 ~ 2023/9/14
Issued Date : 2023/12/19

Applicant : FARO Technologies, Inc.
125 Technology Park, Lake Mary, FL 32746, USA

Issued By : Underwriters Laboratories Taiwan Co., Ltd.
Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd.,
Zhudong Township, Hsinchu County, Taiwan



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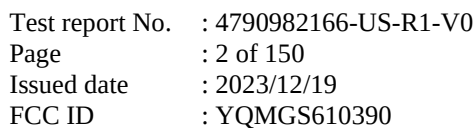
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Doc No: Form-ULID-004739 (DCS:17-EM-F0878) / 6.1



Original Test Report No.: 4790982166-US-R1-V0

[illegible]

Doc No: Form-ULID-004739 (DCS:17-EM-F0878) / 6.1

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1. Attestation of Test Results

APPLICANT: FARO Technologies, Inc.
125 Technology Park, Lake Mary, FL 32746, USA

MANUFACTURER: GeoSLAM Ltd.
Innovation House, Nottingham NG11 6JS, UK

EUT DESCRIPTION: Orbis Datalogger

BRAND: FARO

MODEL: Orbis Datalogger

SAMPLE STAGE: Engineering Verification Test sample

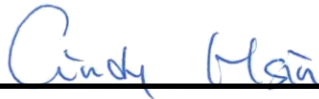
DATE of TESTED: 2023/8/31 ~ 2023/9/14

APPLICABLE STANDARDS	
STANDARD	Test Results
FCC 47 CFR PART 15 Subpart E (Section 15.407)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:



Cindy Hsin
Project Handler

Date : 2023/12/19

Approved and Authorized By:



Eric Lee
Senior Laboratory Engineer

Date : 2023/12/19

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2. Summary of Test Results

Summary of Test Results		
FCC Clause	Test Items	Result
15.407(e)	6dB Bandwidth	PASS
15.403(i)	26dB Bandwidth	PASS
2.1049	Occupied Bandwidth	See Note 1
15.407(a)(1/2/3)	Conducted Output Power	PASS
15.407(a)(1/2/3)	Power Spectral Density	PASS
15.407(g)	Frequency Stability	PASS
15.407(b) (1/2/3/4(i/ii)/9)	Radiated Emissions and Band Edge Measurement	PASS
15.407(b)(9)	AC Power Conducted Emission	See Note 2
15.203	Antenna Requirement	PASS
15.407(h)	Dynamic Frequency Selection & Transmit power control	See Note 3

Note:

1. The Occupied Bandwidth was reference only.
2. The EUT was supplied by battery only, and it was not directly or indirectly connected to the AC main system. So, the test item of AC power conducted emission was not evaluated.
3. The “Dynamic Frequency Selection & Transmit power control measurement” was recorded in Report No.: 4790982166-US-R2-V0

3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB 789033 D02 General UNII Test Procedure New Rules v02r01, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013 and KDB 662911 D01 Multiple Transmitter Output v02r01.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

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5. Measurement Uncertainty

For statement of conformity, simple acceptance (Section 3.1.4 of IEC Guide 115) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.

Determining compliance based on the results of the compliance measurement, not considering measurement instrumentation uncertainty.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	3.1 dB
RF Conducted	9 kHz - 40GHz	2.3 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	3.2 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	6.1 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	5.1 dB

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6. Equipment under Test

6.1. Description of EUT

Product	Orbis Datalogger	
Brand Name	FARO	
Model Name	Orbis Datalogger	
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5720 MHz, 5745 ~ 5825 MHz	
Modulation	1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK	
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to MCS15 802.11ac: up to MCS9 802.11ax: up to MCS11	
Number of Channel	5180 ~ 5240 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
		2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)
		1 for 802.11ac (VHT80), 802.11ax (HE80)
	5260 ~ 5320 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
		2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)
		1 for 802.11ac (VHT80), 802.11ax (HE80)
		1 for 802.11ac (VHT160), 802.11ax (HE160)
	5500 ~ 5720 MHz	9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
		4 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)
		2 for 802.11ac (VHT80), 802.11ax (HE80)
	5745 ~ 5825 MHz	5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
		2 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)
		1 for 802.11ac (VHT80), 802.11ax (HE80)
Maximum Output Power	Non-Beamforming mode: 5180 ~ 5240 MHz: 13.14 dBm	

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	5260 ~ 5320 MHz: 13.69 dBm 5500 ~ 5720 MHz: 11.61 dBm 5745 ~ 5825 MHz: 12.24 dBm Beamforming mode: 5180 ~ 5240 MHz: 12.61 dBm 5260 ~ 5320 MHz: 12.50 dBm 5500 ~ 5720 MHz: 10.05 dBm 5745 ~ 5825 MHz: 11.61 dBm
Normal Voltage	14.8Vdc from battery
S/N	Compliance.06
Sample ID	Conducted Test: 6405690 Radiated Test: 6405690

Note:

- The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	Tx,Rx Function
802.11a	2TX,2RX
802.11n (HT20)	2TX,2RX
802.11n (HT40)	2TX,2RX
802.11ac (VHT20)	2TX,2RX
802.11ac (VHT40)	2TX,2RX
802.11ac (VHT80)	2TX,2RX
802.11ac (VHT160)	2TX,2RX
802.11ax (HE20)	2TX,2RX
802.11ax (HE40)	2TX,2RX
802.11ax (HE80)	2TX,2RX
802.11ax (HE160)	2TX,2RX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40 / VHT80 / VHT160 and 802.11ax mode for HE20 / HE40 / HE80 / HE160, therefore investigated worst case to representative mode in test report.

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2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Mobile Scanner	FARO	Orbis Mobile Scanner	N/A
Orbis main cable	FARO	Orbis Cable	1.5m
RJ45 Cable	FARO	Orbis Cable	2 m
Battery	PAG	9307V	90Wh 14.8V, 6.1Ah
Battery charger	PAG	Micro Charger	5-20V

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual, the laboratory shall not be held responsible.

6.2. Channel List

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
42	5210MHz

FOR 5260 ~ 5320MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
58	5290MHz

1 saddle channel is provided for 802.11ac (VHT160), 802.11ax (HE160):

Channel	Frequency
50	5250MHz

FOR 5500 ~ 5720MHz

9 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	132	5660 MHz
104	5520 MHz	136	5680 MHz
108	5540 MHz	140	5700 MHz
112	5560 MHz	144	5720 MHz
116	5580 MHz	-	-

4 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	134	5670 MHz
110	5550 MHz	142	5710 MHz

2 channels are provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
106	5530MHz
138	5690MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz	-	-

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
155	5775MHz

6.3. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	21~27°C/ 51~66%RH	14.8Vdc	2023/09/07~ 2023/09/14	Rex Chen
Radiated Spurious Emission	966-2	21~28°C/ 51~68%RH	14.8Vdc	2023/08/31~ 2023/09/09	Rex Chen

FCC Test Firm Registration Number: 498077

Sample Calculation:

Antenna Port Conducted Measurement:

- Where relevant, the follow sample calculation is provided:
Result Value (dBm) = Reading Value (dBm) + Attenuator Factor (dB) + Cable Loss (dB).
Example: Result Value (10dBm) = Reading Value (-2dBm) + Attenuator Factor (10dB) + Cable Loss(2dB).
*Test plot only shown the “Result Value”.

Radiated Spurious Emission:

- Where relevant, the follow sample calculation is provided:
Result Value (dBuV/m) = Reading Value (dBuV) + Correction Factor (dB/m).
Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Preamp Factor (dB).
Example: Result Value (34.5dBuV/m) = Reading Value (40.1dBuV) + Antenna Factor (18.7dB/m) + Cable Loss (4.2dB) - Preamp Factor (28.5dB).

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6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)+ (1)	2J	2JF0102P	PCB	3.8

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual, the laboratory shall not be held responsible.

6.5. Test Mode Applicability and Tested Channel Detail

- The fundamental of the EUT was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that Y-Z plane was worst-case. Therefore, all final radiated testing was performed with the EUT in Y-Z plane.
- The EUT only battery mode the AC power line conducted emissions no need.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Non-Beamforming Mode:

Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
Radiated Emissions (Above 1GHz)	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11ax20		OFDMA	36 to 48	36, 44, 48	MCS0 Nss1
	802.11ax40			38 to 46	38, 46	MCS0 Nss1
	802.11ax80			42	42	MCS0 Nss1
	802.11a	5260-5320	OFDM	52 to 64	52, 60, 64	6Mbps
	802.11ax20		OFDMA	52 to 64	52, 60, 64	MCS0 Nss1
	802.11ax40			54 to 62	54, 62	MCS0 Nss1
	802.11ax80			58	58	MCS0 Nss1
	802.11ax160			50	50	MCS0 Nss1
	802.11a	5500-5720	OFDM	100 to 144	100, 116, 140, 144	6Mbps
	802.11ax20		OFDMA	100 to 144	100, 116, 140, 144	MCS0 Nss1
	802.11ax40			102 to 142	102, 110, 134, 142	MCS0 Nss1
	802.11ax80			106, 138	106, 138	MCS0 Nss1
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11ax20		OFDMA	149 to 165	149, 157, 165	MCS0 Nss1
	802.11ax40			151 to 159	151, 159	MCS0 Nss1
	802.11ax80			155	155	MCS0 Nss1
Radiated Emissions (Below 1GHz)	802.11a	5260-5320	OFDM	52 to 64	64	6Mbps

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Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
Antenna Port Conducted Measurement	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11ax20		OFDMA	36 to 48	36, 44, 48	MCS0 Nss1
	802.11ax40			38 to 46	38, 46	MCS0 Nss1
	802.11ax80			42	42	MCS0 Nss1
	802.11a	5260-5320	OFDM	52 to 64	52, 60, 64	6Mbps
	802.11ax20		OFDMA	52 to 64	52, 60, 64	MCS0 Nss1
	802.11ax40			54 to 62	54, 62	MCS0 Nss1
	802.11ax80			58	58	MCS0 Nss1
	802.11ax160			50	50	MCS0 Nss1
	802.11a	5500-5720	OFDM	100 to 144	100, 116, 140, 144	6Mbps
	802.11ax20		OFDMA	100 to 144	100, 116, 140, 144	MCS0 Nss1
	802.11ax40			102 to 142	102, 110, 134, 142	MCS0 Nss1
	802.11ax80			106, 138	106, 138	MCS0 Nss1
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11ax20		OFDMA	149 to 165	149, 157, 165	MCS0 Nss1
	802.11ax40			151 to 159	151, 159	MCS0 Nss1
	802.11ax80			155	155	MCS0 Nss1

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Beamforming Mode:

Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
Antenna Port Conducted Measurement	802.11ax20	5180-5240	OFDMA	36 to 48	36, 44, 48	MCS0 Nss1
	802.11ax40			38 to 46	38, 46	MCS0 Nss1
	802.11ax80			42	42	MCS0 Nss1
	802.11ax20	5260-5320	OFDMA	52 to 64	52, 60, 64	MCS0 Nss1
	802.11ax40			54 to 62	54, 62	MCS0 Nss1
	802.11ax80			58	58	MCS0 Nss1
	802.11ax160			50	50	MCS0 Nss1
	802.11ax20	5500-5720	OFDMA	100 to 144	100, 116, 140, 144	MCS0 Nss1
	802.11ax40			102 to 142	102, 110, 134, 142	MCS0 Nss1
	802.11ax80			106, 138	106, 138	MCS0 Nss1
	802.11ax20	5745-5825	OFDMA	149 to 165	149, 157, 165	MCS0 Nss1
	802.11ax40			151 to 159	151, 159	MCS0 Nss1
	802.11ax80			155	155	MCS0 Nss1

*Note: The worse spurious emissions test and maximum output power was found in Non-Beamforming mode. Therefore Beamforming mode only the test data of the RF output power were recorded in this report.

Simultaneously transmission condition:S

Condition	Technology	
1	WLAN (2.4GHz)	WLAN (5GHz)
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

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6.6. Duty cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle	Duty Factor (dB)	VBW Set (above 1GHz)
802.11a	2.085	2.115	0.9858	N/A	10Hz
802.11ax(HE20)	5.439	5.481	0.9923	N/A	10Hz
802.11ax(HE40)	5.411	5.460	0.9910	N/A	10Hz
802.11ax(HE80)	5.397	5.460	0.9885	N/A	10Hz
802.11ax(HE160)	5.425	5.460	0.9936	N/A	10Hz

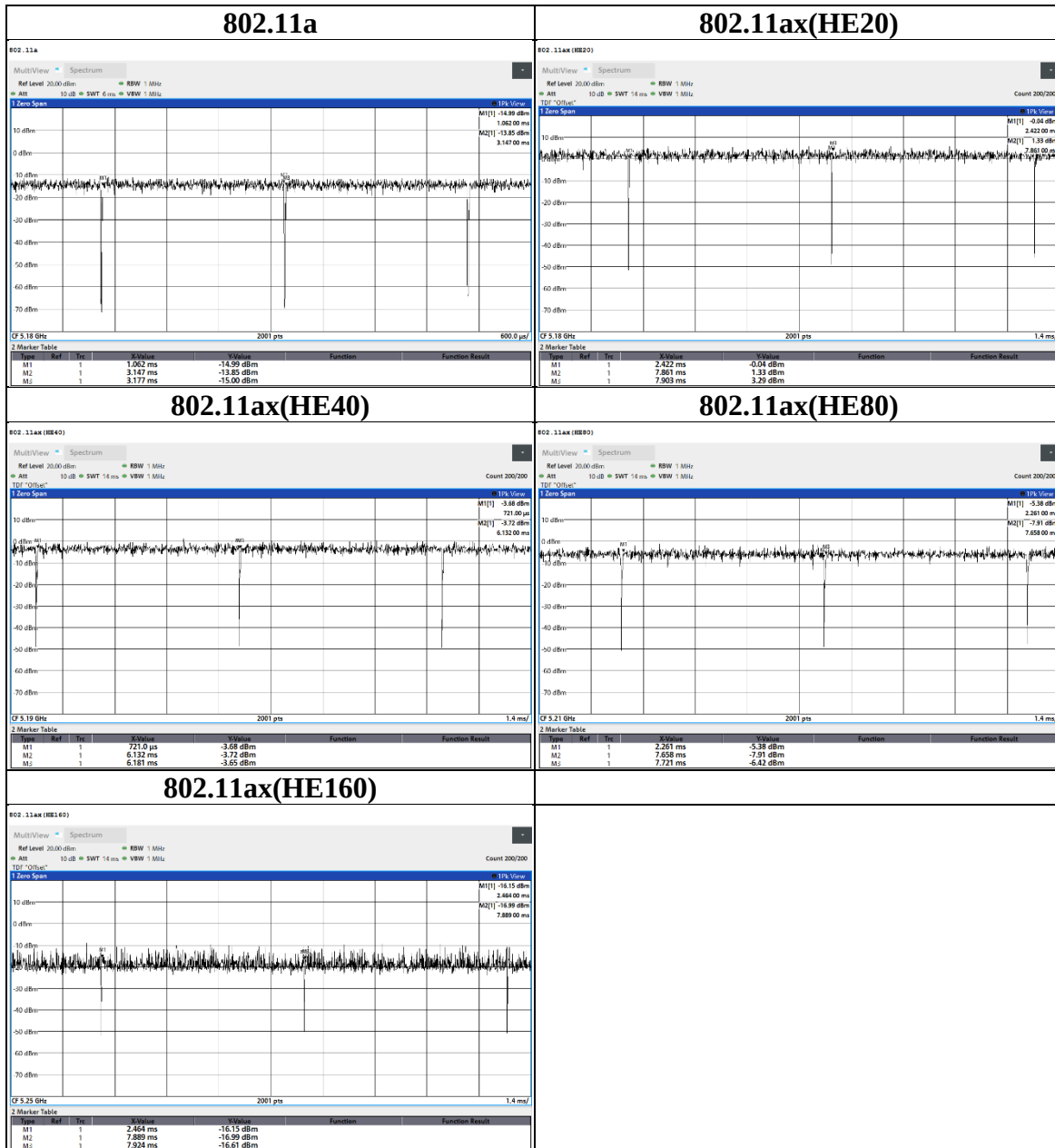
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7. Test Equipment

Test Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired date
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2023/4/7	2024/4/6
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2022/12/13	2023/12/12
Loop Antenna	ETS lindgren	6502	00213440	2023/1/4	2024/1/3
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2023/2/13	2024/2/12
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2022/12/21	2023/12/20
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2022/12/30	2023/12/29
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2023/6/7	2024/6/6
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2023/2/17	2024/2/16
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2023/5/9	2024/5/8
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2022/12/1	2023/11/30
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2022/12/1	2023/11/30
Antenna Port Conducted Measurement					
Spectrum Analyzer	Keysight	N9010A	MY56070834	2022/10/24	2023/10/23
Attenuator	EMCI	EMC-40ATK2W10	17002	2022/12/9	2023/12/8
USB Power Sensor	Anritsu	MA24408A	12031	2023/7/12	2024/7/11
Temperature & Humidity Test Chamber	GIANT FORCE	GTH-150- 40-CP-AR	MAA1701-010	2023/3/8	2024/3/7

UL Software		
Description	Name	Version
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF-Conducted-FCC 15407	ver 1.1

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Doc No: Form-ULID-004739 (DCS:17-EM-F0878) / 6.1

8. Description of Test Setup

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Mobile Scanner	FARO	Orbis Mobile Scanner	NA	Supplied by client
B	USB HUB	FUJIEI	AJ0080	NA	Provided by Lab
C	Battery	PAG	9307V	NA	Supplied by client

I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	Orbis main cable	FARO	Orbis Cable	1.5	Supplied by client
2	RJ45 Cable	FARO	Orbis Cable	2	Supplied by client

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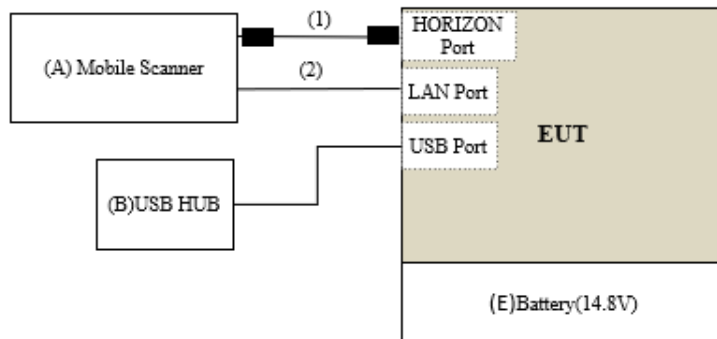
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Test Setup

Controlled using a bespoke application (QRCT_version 4.0.00185.0) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

Setup Diagram for Test



Under Table

Remote Site

9. Test Results

9.1. 6dB Bandwidth

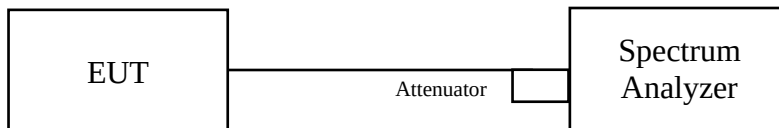
Requirements

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
- The plot of the test result only shows the worst case of channels as a representative.

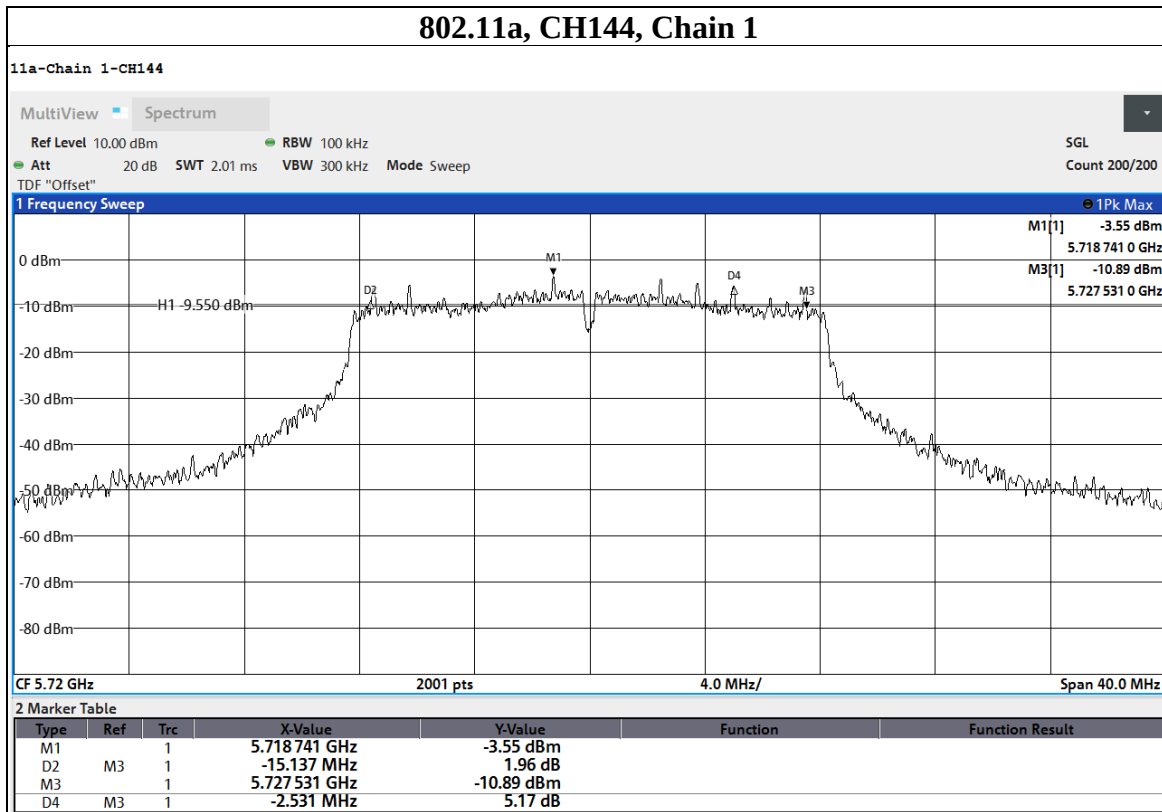
Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11a	144 (U-NII-2C)	5720	12.802	12.606	0.5	PASS
	144 (U-NII-2C+U-NII-3)	5720	15.349	15.137	0.5	PASS
	144 (U-NII-3)	5720	2.547	2.531	0.5	PASS
	149	5745	11.378	13.15	0.5	PASS
	157	5785	12.977	15.295	0.5	PASS
	165	5825	12.62	14.468	0.5	PASS



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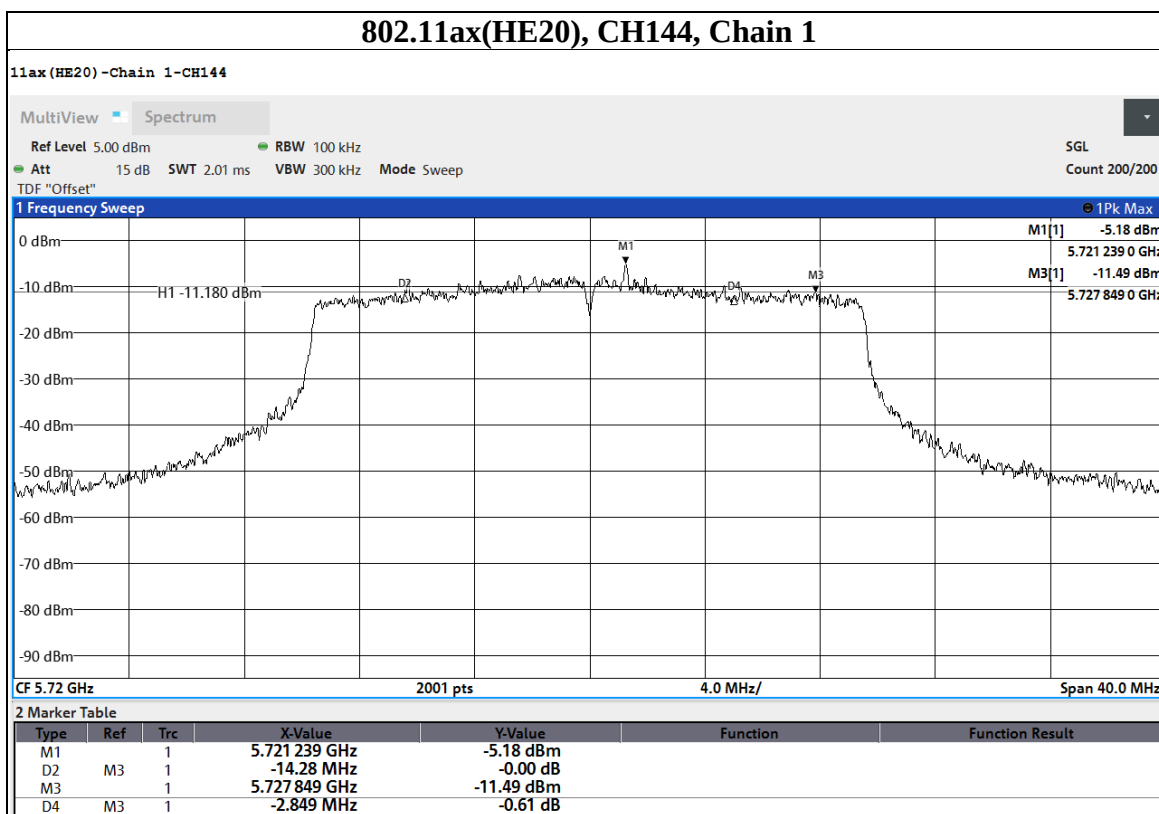
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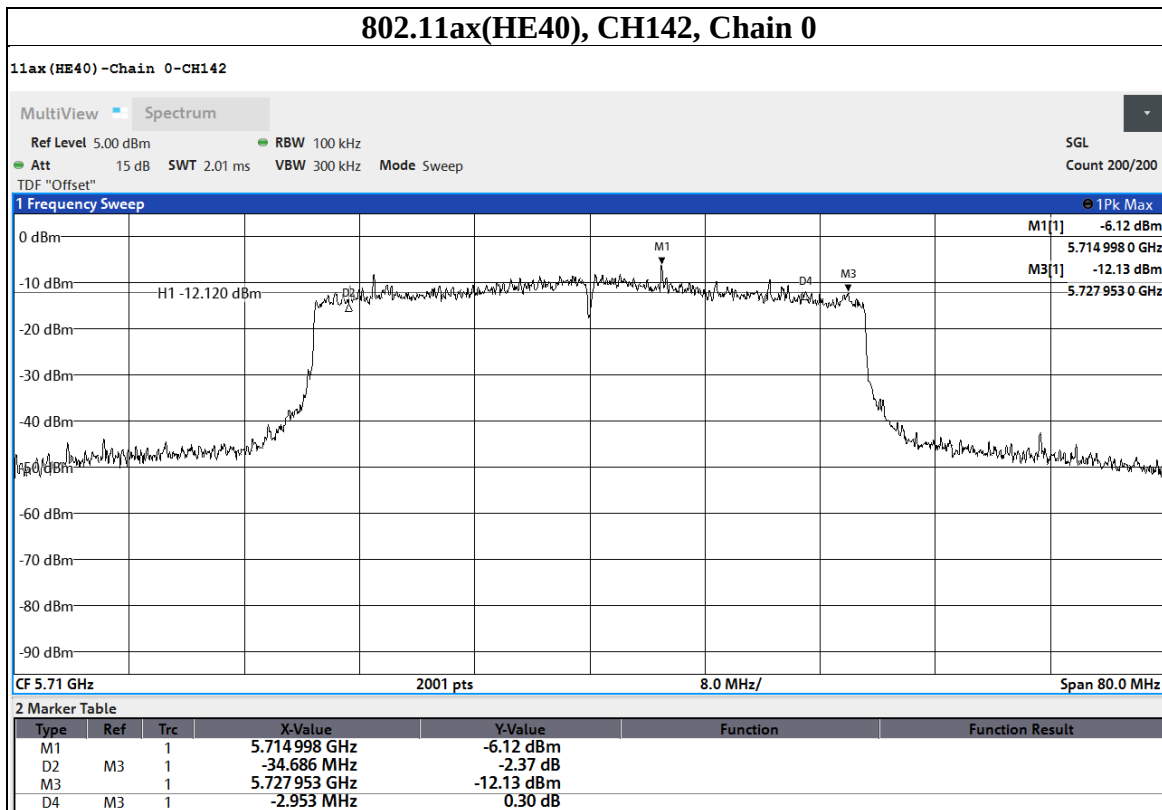
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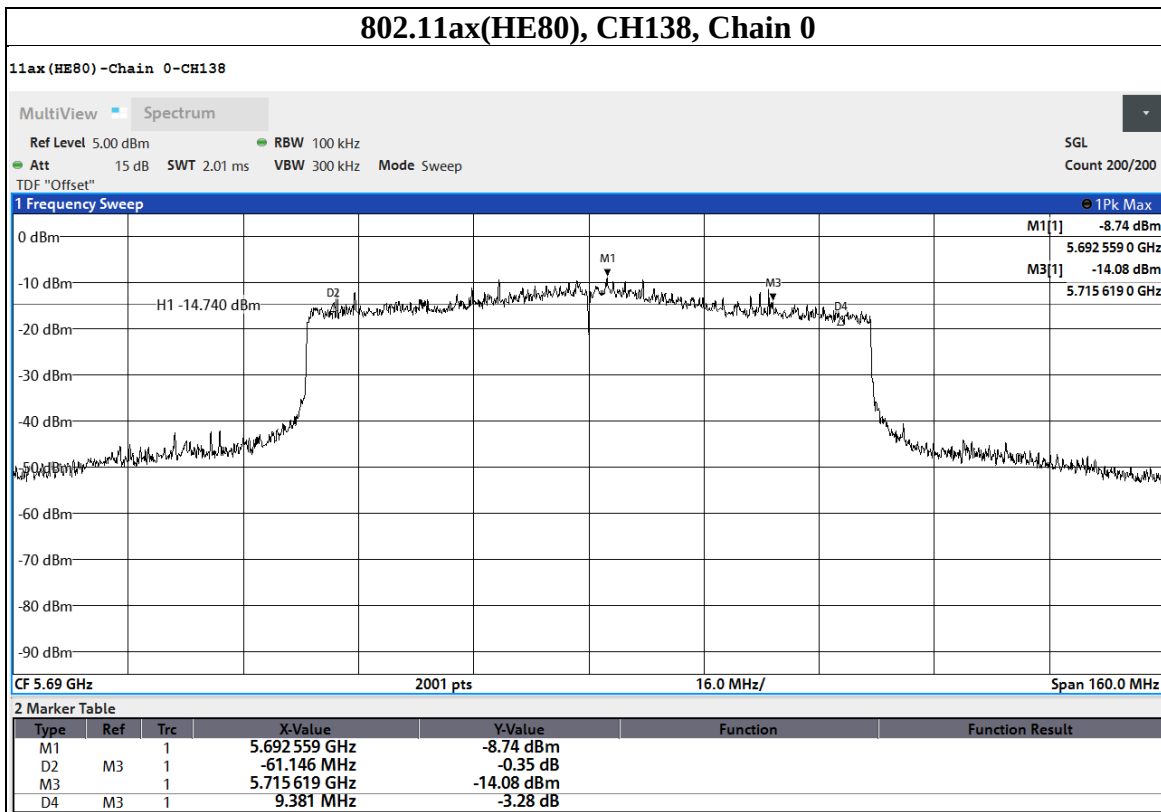
Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE20)	144 (U-NII-2C)	5720	14.491	11.431	0.5	PASS
	144 (U-NII-2C+U-NII-3)	5720	18.856	14.28	0.5	PASS
	144 (U-NII-3)	5720	4.365	2.849	0.5	PASS
	149	5745	18.315	16.635	0.5	PASS
	157	5785	15.145	17.886	0.5	PASS
	165	5825	14.696	17.32	0.5	PASS



Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE40)	142 (U-NII-2C)	5710	31.733	33.04	0.5	PASS
	142 (U-NII-2C+U-NII-3)	5710	34.686	36.606	0.5	PASS
	142 (U-NII-3)	5710	2.953	3.566	0.5	PASS
	151	5755	26.618	26.526	0.5	PASS
	159	5795	31.42	37.023	0.5	PASS



Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE80)	138 (U-NII-2C)	5690	70.527	68.817	0.5	PASS
	138 (U-NII-2C+U-NII-3)	5690	61.146	53.625	0.5	PASS
	138 (U-NII-3)	5690	9.381	15.192	0.5	PASS
	155	5775	69.007	48.91	0.5	PASS



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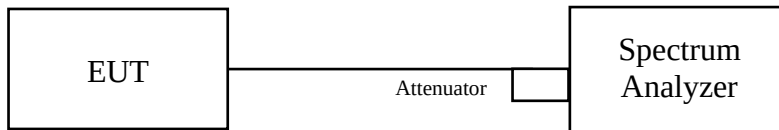
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9.2. 26dB Bandwidth

Test procedure

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the peak 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%.
- The plot of the test result only shows the worst case of channels as a representative.

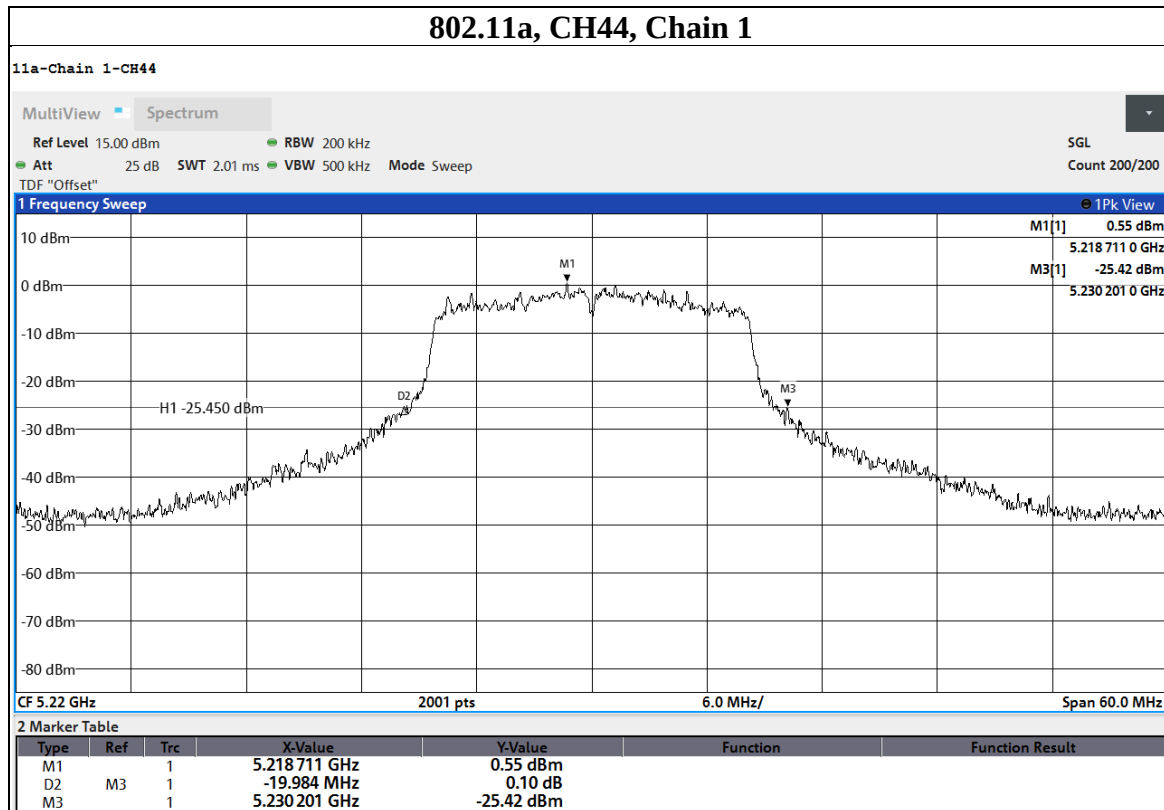
Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11a	36	5180	18.504	19.494	N/A	PASS
	44	5220	19.707	19.984	N/A	PASS
	48	5240	18.407	19.48	N/A	PASS
	52	5260	18.68	19.606	N/A	PASS
	60	5300	19.189	19.635	N/A	PASS
	64	5320	18.568	19.584	N/A	PASS
	100	5500	18.466	18.842	N/A	PASS
	116	5580	18.587	19.224	N/A	PASS
	140	5700	19.711	19.548	N/A	PASS
	144 (U-NII-2C)	5720	14.372	14.884	N/A	PASS
	144 (U-NII-2C+U-NII-3)	5720	18.63	19.367	N/A	PASS
	144 (U-NII-3)	5720	4.258	4.483	N/A	PASS



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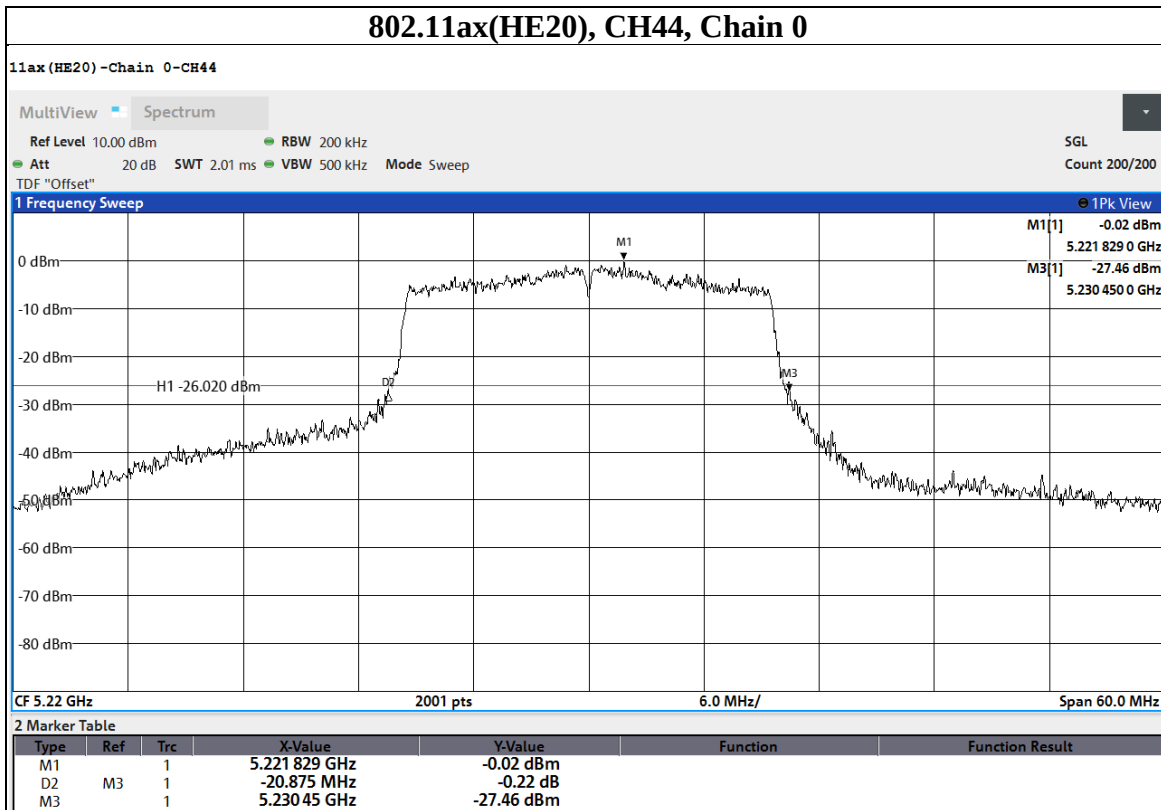
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Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE20)	36	5180	20.8	20.771	N/A	PASS
	44	5220	20.875	20.611	N/A	PASS
	48	5240	20.698	20.551	N/A	PASS
	52	5260	20.406	20.326	N/A	PASS
	60	5300	20.614	20.485	N/A	PASS
	64	5320	20.379	20.564	N/A	PASS
	100	5500	20.75	20.798	N/A	PASS
	116	5580	20.784	20.475	N/A	PASS
	140	5700	20.741	20.466	N/A	PASS
	144 (U-NII-2C)	5720	15.387	15.211	N/A	PASS
	144 (U-NII-2C+U-NII-3)	5720	20.574	20.394	N/A	PASS
	144 (U-NII-3)	5720	5.187	5.183	N/A	PASS



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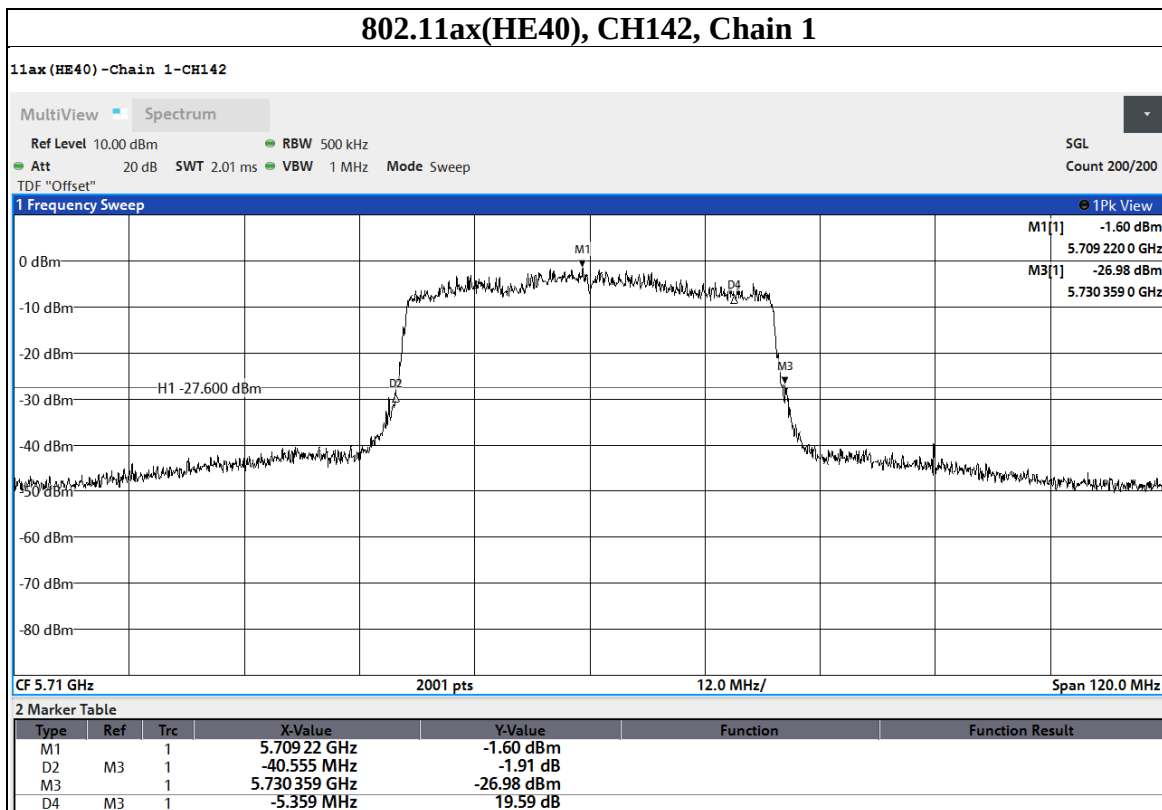
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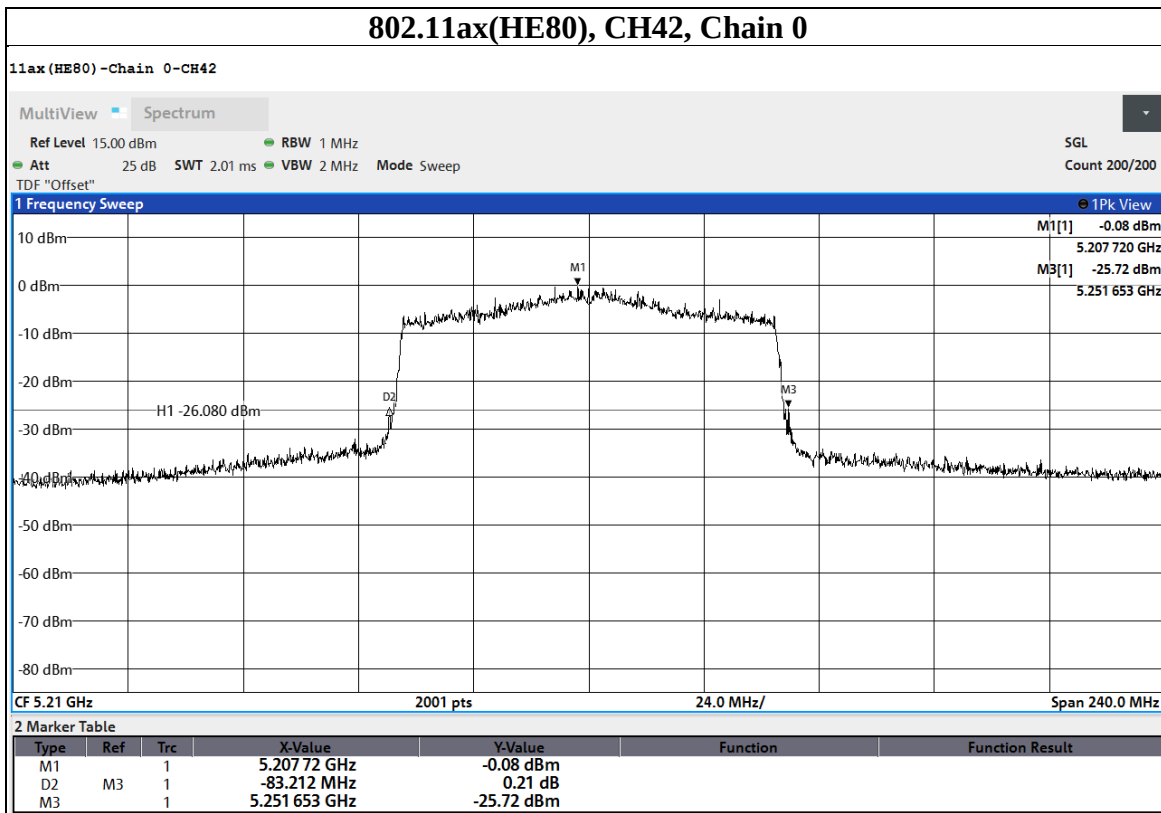
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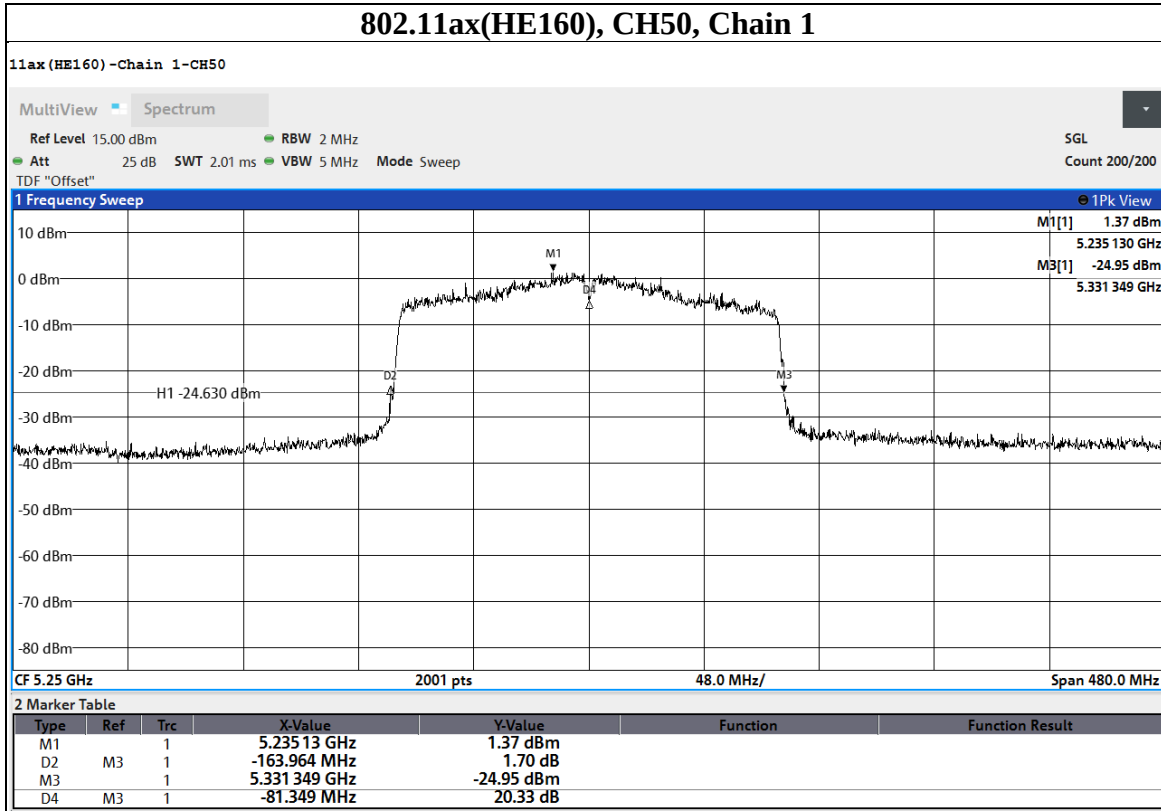
Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE40)	38	5190	40.065	40.016	N/A	PASS
	46	5230	39.919	40.515	N/A	PASS
	54	5270	40.349	40.042	N/A	PASS
	62	5310	40.028	40.502	N/A	PASS
	102	5510	40.396	40.205	N/A	PASS
	110	5550	40.127	40.229	N/A	PASS
	134	5670	40.189	40.451	N/A	PASS
	142 (U-NII-2C)	5710	35.465	35.196	N/A	PASS
	142 (U-NII-2C+U-NII-3)	5710	40.435	40.555	N/A	PASS
	142 (U-NII-3)	5710	4.97	5.359	N/A	PASS



Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE80)	42	5210	83.212	81.161	N/A	PASS
	58	5290	81.671	81.871	N/A	PASS
	106	5530	81.314	81.722	N/A	PASS
	138 (U-NII-2C)	5690	75.978	76.201	N/A	PASS
	138 (U-NII-2C+U-NII-3)	5690	81.486	81.862	N/A	PASS
	138 (U-NII-3)	5690	5.508	5.661	N/A	PASS



Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(H E160)	50 (U-NII-1)	5250	163.244	163.964	N/A	PASS

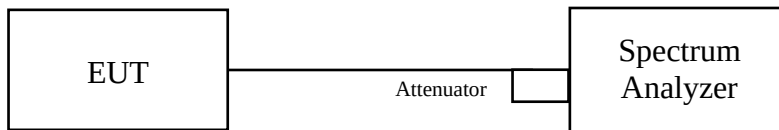


9.3. Occupied Bandwidth

Test procedure

- a. Set center frequency to the nominal EUT channel center frequency.
- b. Set span = 1.5 times to 5.0 times the OBW.
- c. Set RBW = 1% to 5% of the OBW
- d. Set VBW $\geq 3 \times$ RBW
- e. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f. Use the 99% power bandwidth function of the instrument (if available).
- g. If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.
- h. The plot of the test result only shows the worst case of channels as a representative.

Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11a	36	5180	16.5	16.522	N/A	PASS
	44	5220	16.527	16.519	N/A	PASS
	48	5240	16.528	16.517	N/A	PASS
	52	5260	16.515	16.538	N/A	PASS
	60	5300	16.483	16.555	N/A	PASS
	64	5320	16.531	16.531	N/A	PASS
	100	5500	16.543	16.499	N/A	PASS
	116	5580	16.507	16.495	N/A	PASS
	140	5700	16.544	16.526	N/A	PASS
	144 (U-NII-2C)	5720	13.275	13.281	N/A	PASS
	144 (U-NII-2C+U-NII-3)	5720	16.515	16.532	N/A	PASS
	144 (U-NII-3)	5720	3.24	3.251	N/A	PASS
	149	5745	16.521	16.529	N/A	PASS
	157	5785	16.504	16.548	N/A	PASS
	165	5825	16.534	16.547	N/A	PASS

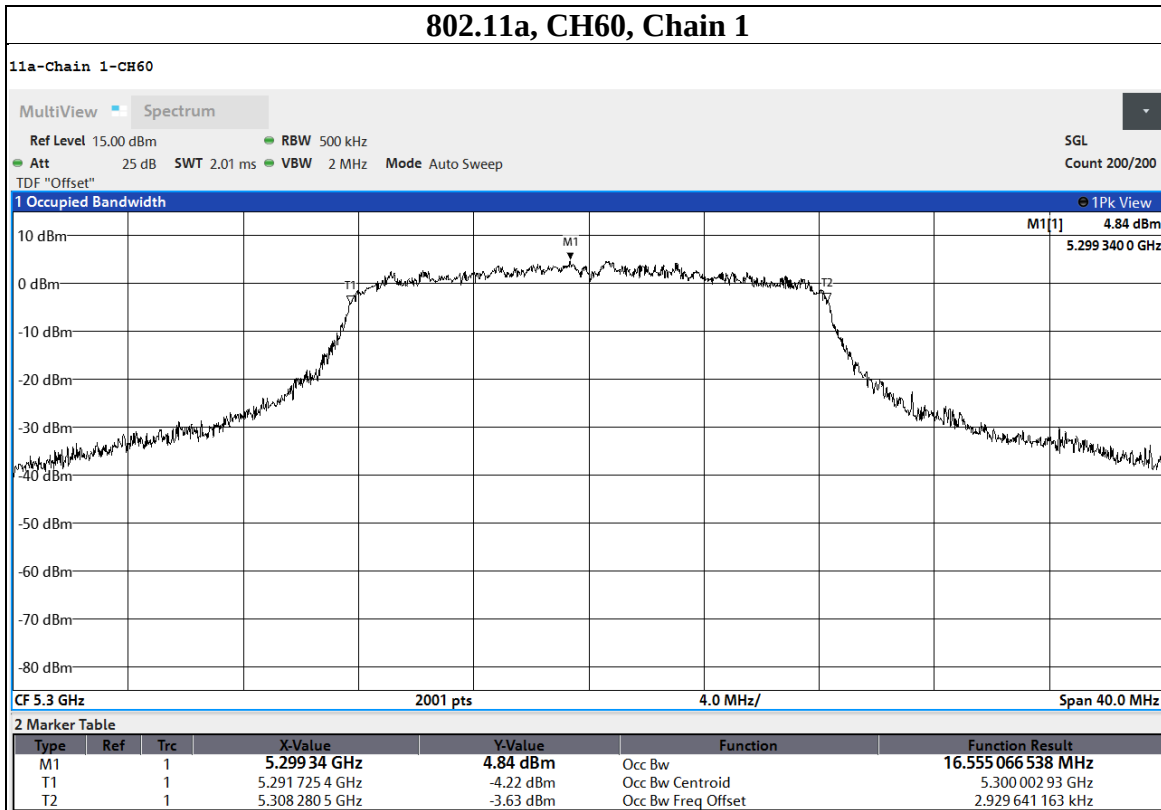
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Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE20)	36	5180	18.947	18.964	N/A	PASS
	44	5220	18.941	18.955	N/A	PASS
	48	5240	18.947	18.947	N/A	PASS
	52	5260	18.958	18.944	N/A	PASS
	60	5300	18.923	18.976	N/A	PASS
	64	5320	18.915	18.959	N/A	PASS
	100	5500	18.886	18.964	N/A	PASS
	116	5580	18.926	18.896	N/A	PASS
	140	5700	18.924	18.885	N/A	PASS
	144 (U-NII-2C)	5720	14.491	14.462	N/A	PASS
	144 (U-NII-2C+U-NII-3)	5720	18.954	18.879	N/A	PASS
	144 (U-NII-3)	5720	4.463	4.417	N/A	PASS
	149	5745	18.915	18.919	N/A	PASS
	157	5785	18.918	18.904	N/A	PASS
	165	5825	18.866	18.968	N/A	PASS

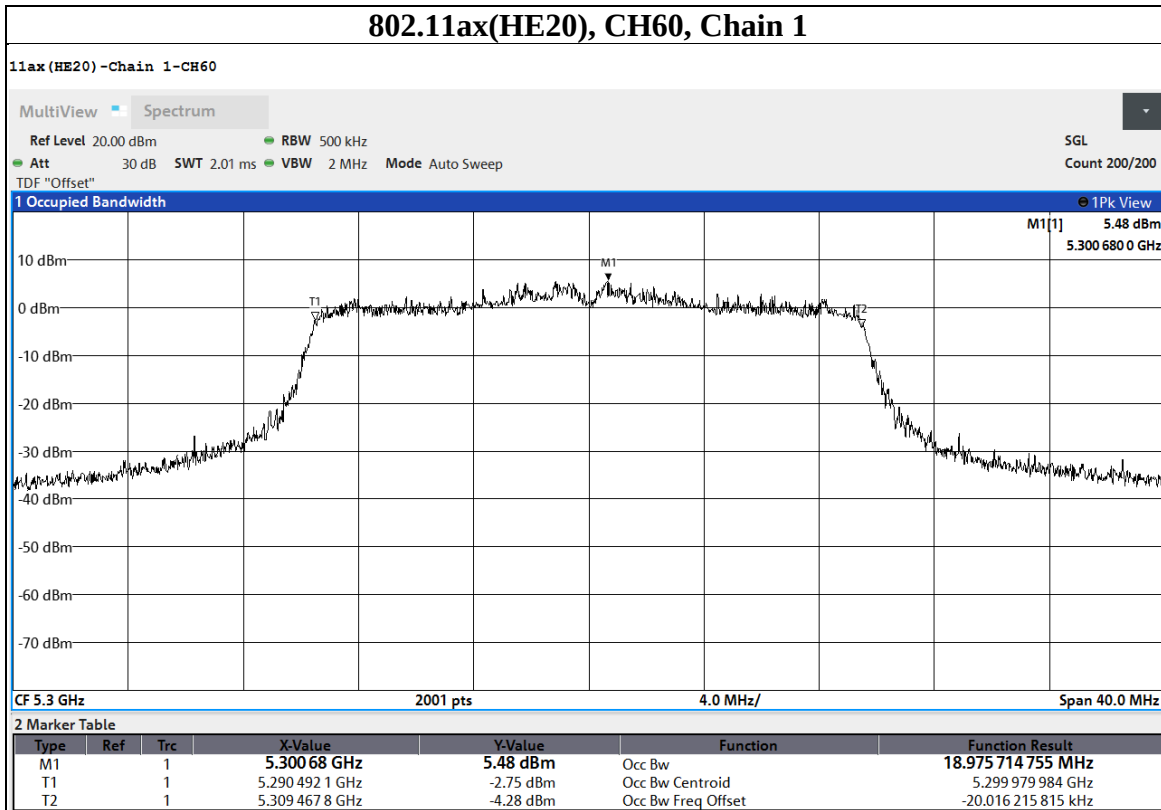
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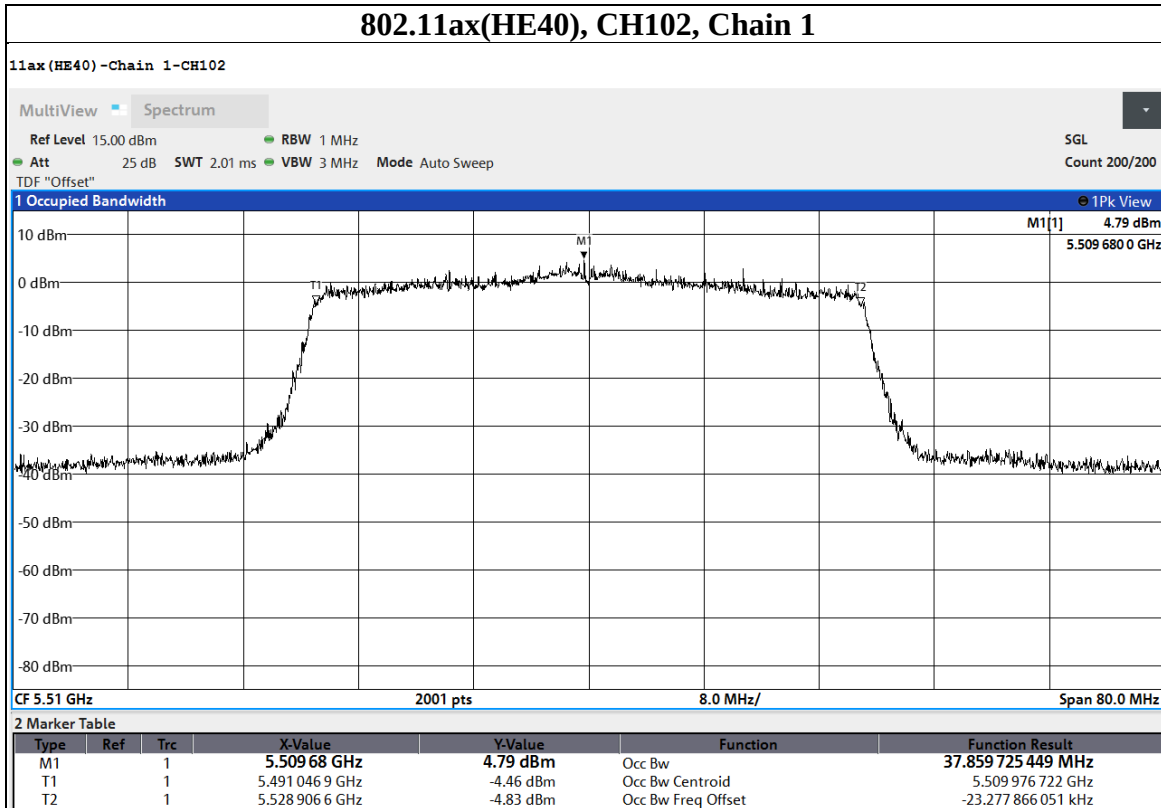
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Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE40)	38	5190	37.722	37.817	N/A	PASS
	46	5230	37.719	37.804	N/A	PASS
	54	5270	37.723	37.788	N/A	PASS
	62	5310	37.73	37.842	N/A	PASS
	102	5510	37.631	37.86	N/A	PASS
	110	5550	37.704	37.74	N/A	PASS
	134	5670	37.792	37.726	N/A	PASS
	142 (U-NII-2C)	5710	33.849	33.841	N/A	PASS
	142 (U-NII-2C+U-NII-3)	5710	37.654	37.681	N/A	PASS
	142 (U-NII-3)	5710	3.804	3.839	N/A	PASS
	151	5755	37.721	37.754	N/A	PASS
	159	5795	37.691	37.812	N/A	PASS



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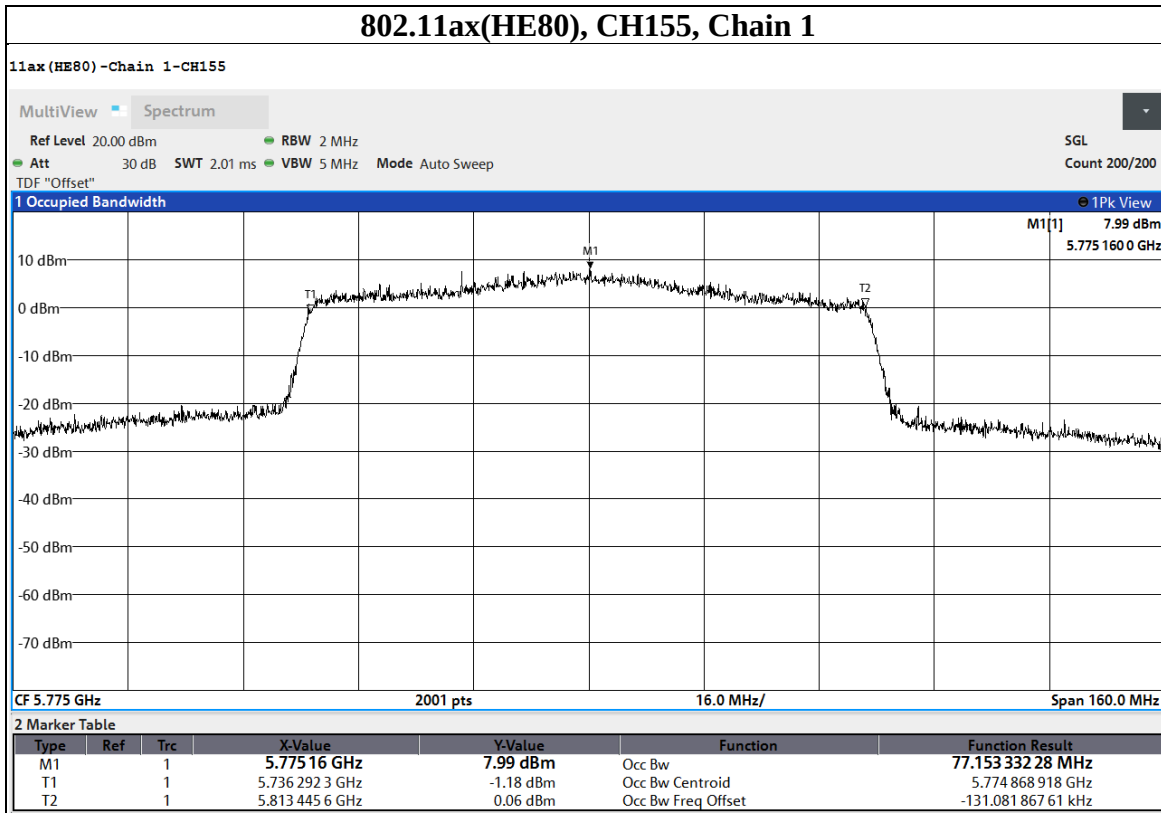
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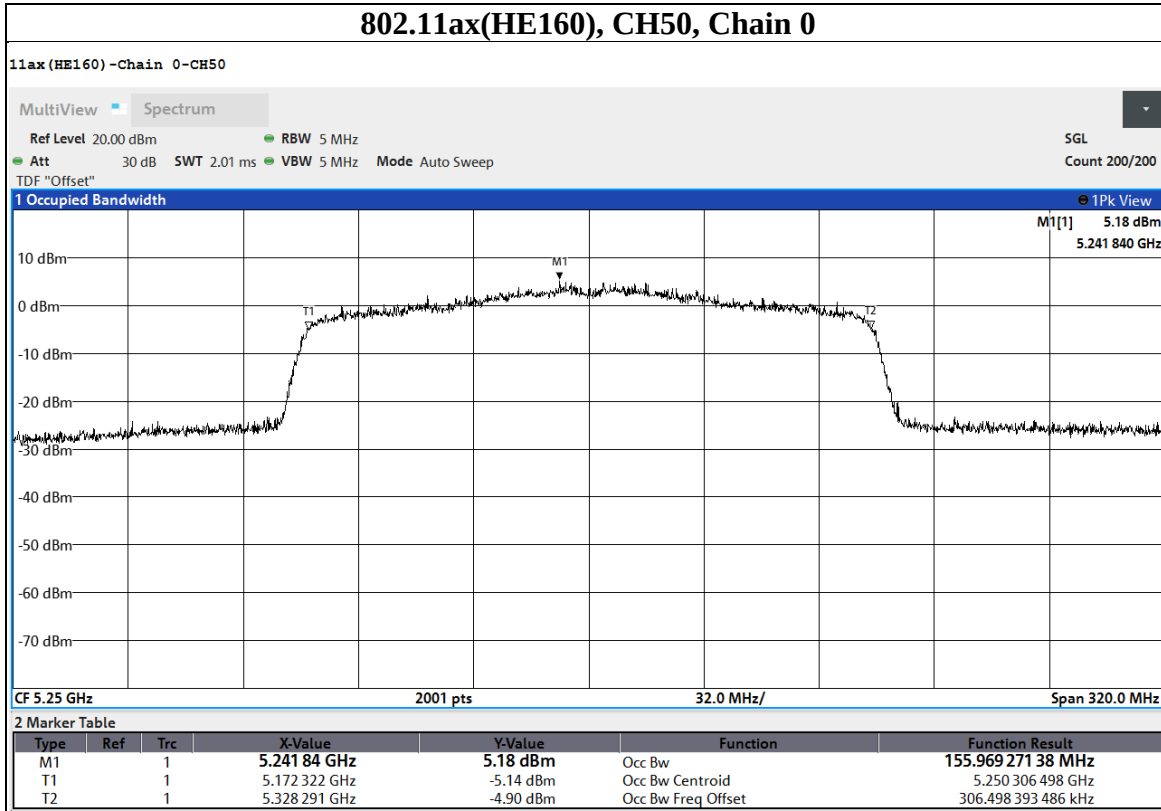
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Doc No: Form-ULID-004739 (DCS:17-EM-F0878) / 6.1

Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE80)	42	5210	77.027	76.902	N/A	PASS
	58	5290	76.986	77.084	N/A	PASS
	106	5530	76.906	77.027	N/A	PASS
	138 (U-NII-2C)	5690	73.6	73.698	N/A	PASS
	138 (U-NII-2C+U-NII-3)	5690	76.926	77.033	N/A	PASS
	138 (U-NII-3)	5690	3.325	3.335	N/A	PASS
	155	5775	76.86	77.153	N/A	PASS



Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE160)	50 (U-NII-1)	5250	155.969	155.559	N/A	PASS



9.4. Conducted output power

Requirements

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
		Fixed point-to-point Access Point	1 Watt (30 dBm) If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$
		Indoor Access Point	1 Watt (30 dBm) If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
	√	Client device	250mW (24 dBm) If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B* If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-2C	√		250mW (24 dBm) or 11 dBm+10 log B* If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-3	√		For Point-to-multipoint systems (P2M): 1 Watt (30 dBm). If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ For Point-to-point systems (P2P): 1 Watt (30 dBm)

Note:

- P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi, B is the 26 dB emission bandwidth in megahertz
- Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20})^2 / N_{ant}]$ dBi.
 N_{ant} : Number of Transmit Antennas
 $G1, G2, \dots, Gn$: Gain of Individual Antennas
Example: two antenna and gain 3.8 dBi / 3.8 dBi, so if it was used for TxBF power measurement
Directional Gain = $10 \log[(10^{3.8/20} + 10^{3.8/20})^2 / 2]$ dBi = 6.81 dBi
- Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices, CDD
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.
Example: Maximum antenna gain = 5 dBi and $N_{ANT} \leq 4$, so if it was used for CDD power measurement
Directional Gain = 3.8 dBi + Array Gain = 3.8 dBi + 0 dB = 3.8 dBi
- For power measurement of KDB 662911 is used with multiple transmitter output. Total conducted power is the sum of the conducted power levels measured at the various output ports.
- Straddle Channel Power in each band = Straddle Channel Total Power * (Each band EBW / Straddle Channel Total EBW).
Example: if CH144 EBW (Total) = 20MHz, within UNII-2C Band is 15MHz, within UNII-3 Band is 5MHz, Total Power = 20dBm.
Calculation for UNII-2C Band Power = 20dBm * (5/20) = 13.97 dBm
Calculation for UNII-3 Band Power = 20dBm * (15/20) = 18.75 dBm.

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Test Procedure

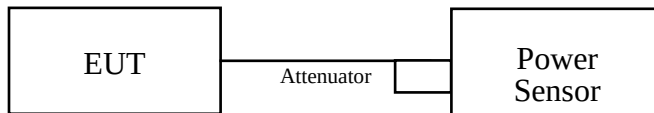
For Average Power Measurement

Test method PM

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to AVERAGE. Duty factor is not added to measured value.

Test Setup

For Average Power Measurement



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.

Test Data

Non-Beamforming Mode:

802.11a

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	9.62	10.25	19.77	12.96	23.98	PASS
44	5220	9.76	10.47	20.606	13.14	23.98	PASS
48	5240	9.65	9.92	19.055	12.80	23.98	PASS
52	5260	10.65	10.71	23.388	13.69	23.71	PASS
60	5300	10.78	10.39	22.909	13.60	23.83	PASS
64	5320	10.46	10.50	22.336	13.49	23.68	PASS
100	5500	8.96	8.21	14.488	11.61	23.66	PASS
116	5580	8.93	8.02	14.158	11.51	23.69	PASS
140	5700	8.83	6.33	11.94	10.77	23.91	PASS
144*	5720	8.92	6.29	12.05	10.81	23.7	PASS
144 (U-NII-2c Band)	5720	7.79	5.15	9.29	9.68	22.57	PASS
144 (U-NII-3 Band)	5720	2.51	-0.06	2.767	4.42	30	PASS
149	5745	10.25	7.88	16.749	12.24	30	PASS
157	5785	10.13	7.75	16.255	12.11	30	PASS
165	5825	9.77	8.33	16.293	12.12	30	PASS

Note:

1. The directional gain = 3.8 dBi < 6 dBi, so the power limit shall not be reduced.
2. Record the total power CH144* value for reference only.

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802.11ax (HE20)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	9.61	10.15	19.498	12.90	23.98	PASS
44	5220	9.63	10.41	20.184	13.05	23.98	PASS
48	5240	9.68	10.04	19.364	12.87	23.98	PASS
52	5260	9.55	9.54	18.03	12.56	23.98	PASS
60	5300	9.78	9.64	18.707	12.72	23.98	PASS
64	5320	9.59	9.47	17.947	12.54	23.98	PASS
100	5500	7.75	6.91	10.864	10.36	23.98	PASS
116	5580	7.67	6.44	10.257	10.11	23.98	PASS
140	5700	7.53	5.19	8.974	9.53	23.98	PASS
144*	5720	7.52	5.08	8.872	9.48	23.98	PASS
144 (U-NII-2c Band)	5720	6.26	3.81	6.622	8.21	22.82	PASS
144 (U-NII-3 Band)	5720	1.54	-0.87	2.244	3.51	30	PASS
149	5745	9.98	7.67	15.812	11.99	30	PASS
157	5785	9.89	7.77	15.74	11.97	30	PASS
165	5825	9.63	7.74	15.136	11.80	30	PASS

Note:

1. The directional gain = 3.8 dBi < 6 dBi, so the power limit shall not be reduced.
2. Record the total power CH144* value for reference only.

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802.11ax (HE40)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
38	5190	8.29	10.19	17.179	12.35	23.98	PASS
46	5230	9.77	10.20	19.953	13.00	23.98	PASS
54	5270	9.95	9.84	19.543	12.91	23.98	PASS
62	5310	9.94	9.78	19.364	12.87	23.98	PASS
102	5510	7.92	6.77	10.94	10.39	23.98	PASS
110	5550	7.89	6.49	10.617	10.26	23.98	PASS
134	5670	7.70	5.27	9.247	9.66	23.98	PASS
142*	5710	7.71	5.02	9.078	9.58	23.98	PASS
142 (U-NII-2c Band)	5710	7.14	4.40	7.925	8.99	23.98	PASS
142 (U-NII-3 Band)	5710	-1.39	-3.77	1.146	0.59	30	PASS
151	5755	9.94	7.67	15.704	11.96	30	PASS
159	5795	9.83	7.66	15.453	11.89	30	PASS

Note:

1. The directional gain = 3.8 dBi < 6 dBi, so the power limit shall not be reduced.
2. Record the total power CH142* value for reference only.

802.11ax (HE80)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
42	5210	6.85	7.36	10.28	10.12	23.98	PASS
58	5290	8.84	8.41	14.588	11.64	23.98	PASS
106	5530	7.98	6.71	10.965	10.40	23.98	PASS
138*	5690	7.84	5.63	9.727	9.88	23.98	PASS
138 (U-NII-2c Band)	5690	7.54	5.32	9.078	9.58	23.98	PASS
138 (U-NII-3 Band)	5690	-3.86	-5.97	0.664	-1.78	30	PASS
155	5775	9.97	7.74	15.885	12.01	30	PASS

Note:

1. The directional gain = 3.8dBi < 6 dBi, so the power limit shall not be reduced.
2. Record the total power CH138* value for reference only.

802.11ax (HE160)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
50	5250	7.67	7.62	11.641	10.66	23.98	PASS
50 (U-NII-2c Band)	5250	4.63	4.64	5.821	7.65	30	PASS
50 (U-NII-3 Band)	5250	4.68	4.58	5.808	7.64	23.98	PASS

Note:

1. The directional gain = 3.8 dBi < 6 dBi, so the power limit shall not be reduced.

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Beamforming Mode:

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	9.15	9.84	17.865	12.52	23.17	PASS
44	5220	9.25	9.93	18.239	12.61	23.17	PASS
48	5240	9.34	9.66	17.824	12.51	23.17	PASS
52	5260	9.17	9.24	16.672	12.22	23.17	PASS
60	5300	9.37	9.16	16.904	12.28	23.17	PASS
64	5320	9.22	8.98	16.255	12.11	23.17	PASS
100	5500	7.36	6.47	9.886	9.95	23.17	PASS
116	5580	7.30	6.10	9.441	9.75	23.17	PASS
140	5700	7.17	4.79	8.222	9.15	23.17	PASS
144*	5720	7.17	4.61	8.11	9.09	23.17	PASS
144 (U-NII-2c Band)	5720	5.91	3.34	6.053	7.82	22.01	PASS
144 (U-NII-3 Band)	5720	1.19	-1.34	2.046	3.11	29.19	PASS
149	5745	9.55	7.25	14.322	11.56	29.19	PASS
157	5785	9.53	7.30	14.355	11.57	29.19	PASS
165	5825	9.19	7.38	13.772	11.39	29.19	PASS

Note:

1. The directional gain = 6.81 dBi > 6 dBi, so the power limit shall be reduced.
2. Record the total power CH144* value for reference only.

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802.11ax (HE40)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
38	5190	7.80	9.89	15.776	11.98	23.17	PASS
46	5230	9.35	9.76	18.072	12.57	23.17	PASS
54	5270	9.51	9.41	17.66	12.47	23.17	PASS
62	5310	9.62	9.36	17.783	12.50	23.17	PASS
102	5510	7.55	6.45	10.116	10.05	23.17	PASS
110	5550	7.46	6.11	9.661	9.85	23.17	PASS
134	5670	7.33	4.82	8.433	9.26	23.17	PASS
142*	5710	7.36	4.69	8.395	9.24	23.17	PASS
142 (U-NII-2c Band)	5710	6.79	4.07	7.328	8.65	23.17	PASS
142 (U-NII-3 Band)	5710	-1.74	-4.10	1.059	0.25	29.19	PASS
151	5755	9.60	7.29	14.488	11.61	29.19	PASS
159	5795	9.45	7.36	14.256	11.54	29.19	PASS

Note:

1. The directional gain = 6.81 dBi > 6 dBi, so the power limit shall be reduced.
2. Record the total power CH142* value for reference only.

802.11ax (HE80)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
42	5210	6.48	6.87	9.311	9.69	23.17	PASS
58	5290	8.45	7.97	13.274	11.23	23.17	PASS
106	5530	7.61	6.37	10.093	10.04	23.17	PASS
138*	5690	7.49	5.16	8.892	9.49	23.17	PASS
138 (U-NII-2c Band)	5690	7.19	4.85	8.279	9.18	23.17	PASS
138 (U-NII-3 Band)	5690	-4.21	-6.44	0.607	-2.17	29.19	PASS
155	5775	9.54	7.32	14.388	11.58	29.19	PASS

Note:

- The directional gain = 6.81 dBi > 6 dBi, so the power limit shall be reduced.
- Record the total power CH138* value for reference only.

802.11ax (HE160)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
50	5250	7.23	7.26	10.617	10.26	23.17	PASS
50 (U-NII-2c Band)	5250	4.19	4.28	5.309	7.25	29.19	PASS
50 (U-NII-3 Band)	5250	4.24	4.22	5.297	7.24	23.17	PASS

Note:

- The directional gain = 6.81 dBi > 6 dBi, so the power limit shall be reduced.

9.5. Power Spectral Density

Requirements

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 17 - (G_{TX} - 6)$
		Fixed point-to-point Access Point	17dBm/ MHz If $G_{TX} > 23$ dBi, then $PSD = 17 - (G_{TX} - 23)$
		Indoor Access Point	17dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 17 - (G_{TX} - 6)$
	√	Client device	11dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 11 - (G_{TX} - 6)$
U-NII-2A	√		11dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 11 - (G_{TX} - 6)$
U-NII-2C	√		11dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 11 - (G_{TX} - 6)$
U-NII-3	√		For Point-to-multipoint systems (P2M): 30dBm/ 500kHz. If $G_{TX} > 6$ dBi, then $PSD = 30 - (G_{TX} - 6)$ For Point-to-point systems (P2P): 30dBm/ 500kHz

Note:

- PSD = power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz
- G_{TX} = the maximum transmitting antenna directional gain in dBi.
- Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20})^2 / Nant]$ dBi.
Nant: Number of Transmit Antennas
G1, G2,..., Gn: Gain of Individual Antennas
Example: two antenna and gain 3.8 dBi / 3.8 dBi, so if it was used for power density measurement
Directional Gain = $10 \log[(10^{3.8/20} + 10^{3.8/20})^2 / 2]$ dBi = 6.81 dBi
- "PSD per chain" of the report shown is maximum value for each chain, at the "Total PSD" is summing entire spectra across corresponding frequency bins on the various outputs by computer, refer KDB 662911 Method a) for calculating total power density.
- Method a) of power density measurement of KDB 662911 is used for calculating total power density with multiple transmitter output. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Refer to section 6.6 for duty cycle spectrum plot. (If duty cycle<98%)

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Test procedure

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method as below:

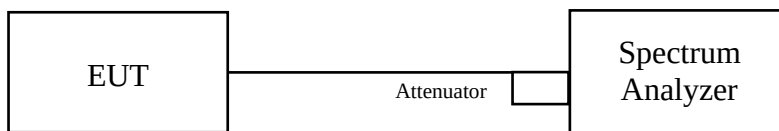
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW $\geq$ 3 RBW, Detector = RMS
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value. (if Duty cycle <98 %, add 10 log (1/duty cycle)).
- The plot of the test result only shows the worst case of channels as a representative

For U-NII-3 band:

Using method as below:

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
- Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log (500 \text{ kHz}/300\text{kHz})$
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value. (if Duty cycle <98 %, add 10 log (1/duty cycle)).
- The plot of the test result only shows the worst case of channels as a representative.

Test Setup

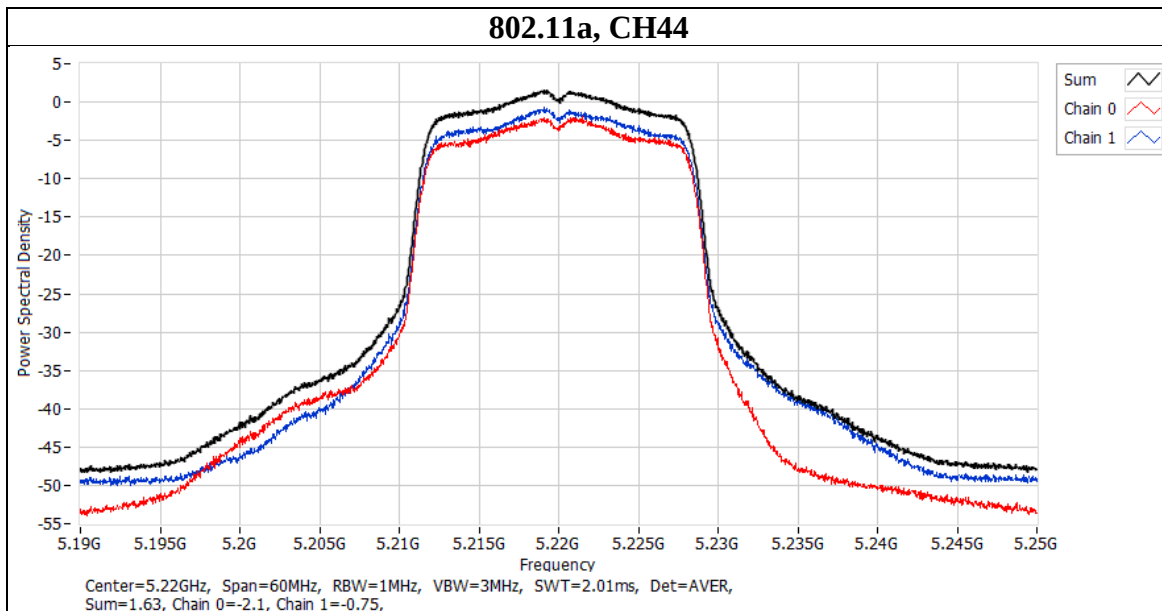


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

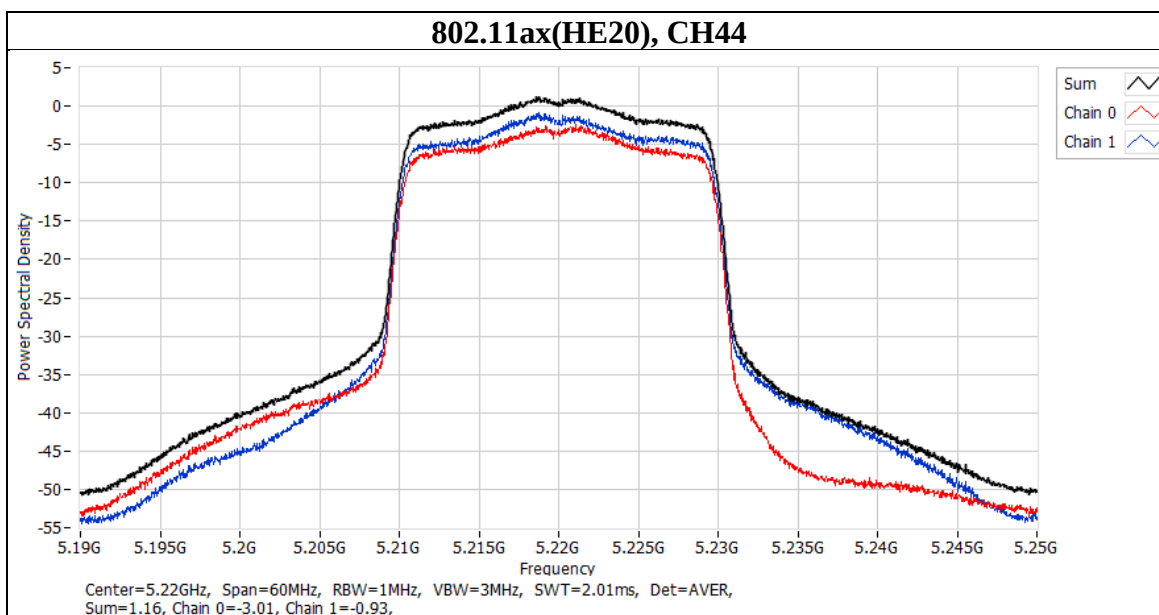
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	36	5180	6.81	1.53	10.19	PASS
	44	5220	6.81	1.63	10.19	PASS
	48	5240	6.81	1.34	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11a	36	5180	-1.951	-0.873
	44	5220	-1.921	-0.755
	48	5240	-2.117	-1.124



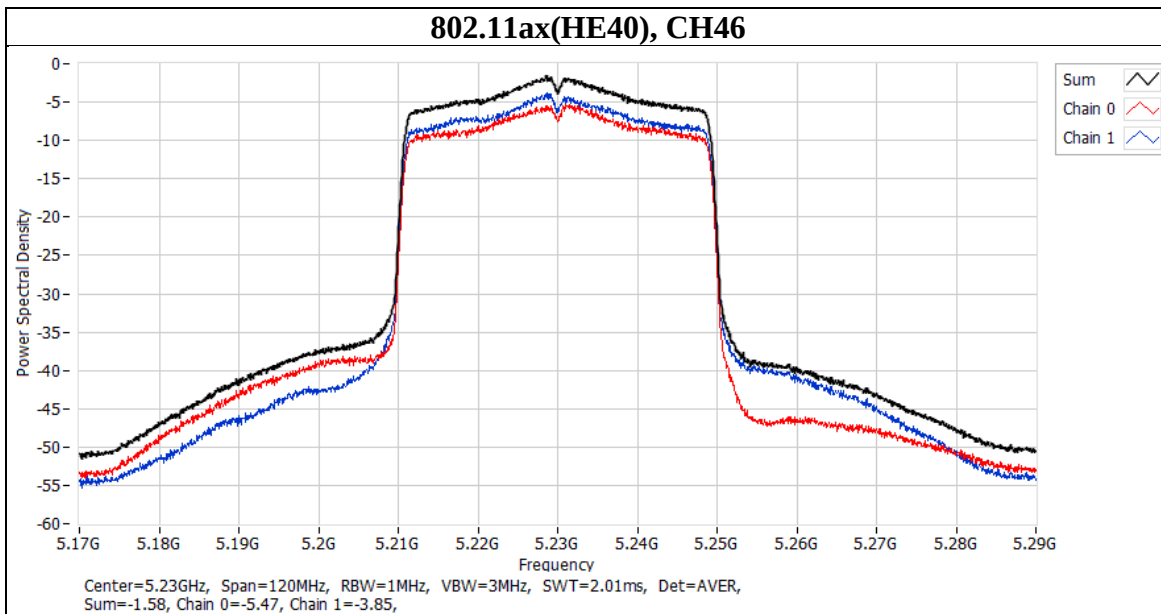
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE20)	36	5180	6.81	1.11	10.19	PASS
	44	5220	6.81	1.16	10.19	PASS
	48	5240	6.81	0.78	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE20)	36	5180	-2.144	-1.02
	44	5220	-2.431	-0.93
	48	5240	-2.708	-1.309



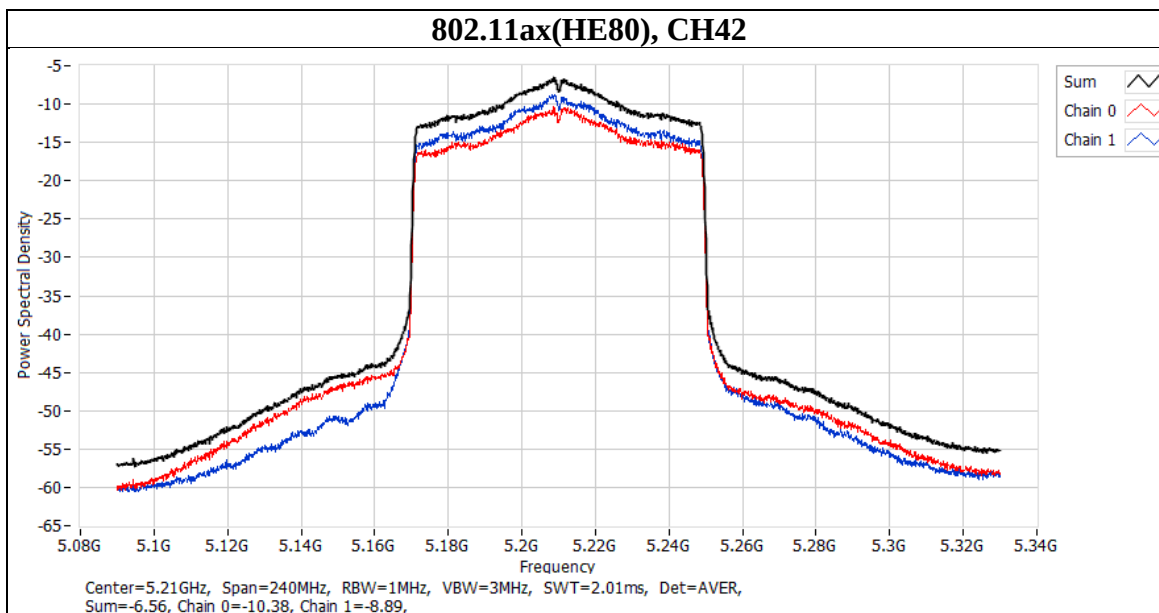
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE40)	38	5190	6.81	-3.04	10.19	PASS
	46	5230	6.81	-1.58	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE40)	38	5190	-6.446	-5.235
	46	5230	-5.278	-3.854



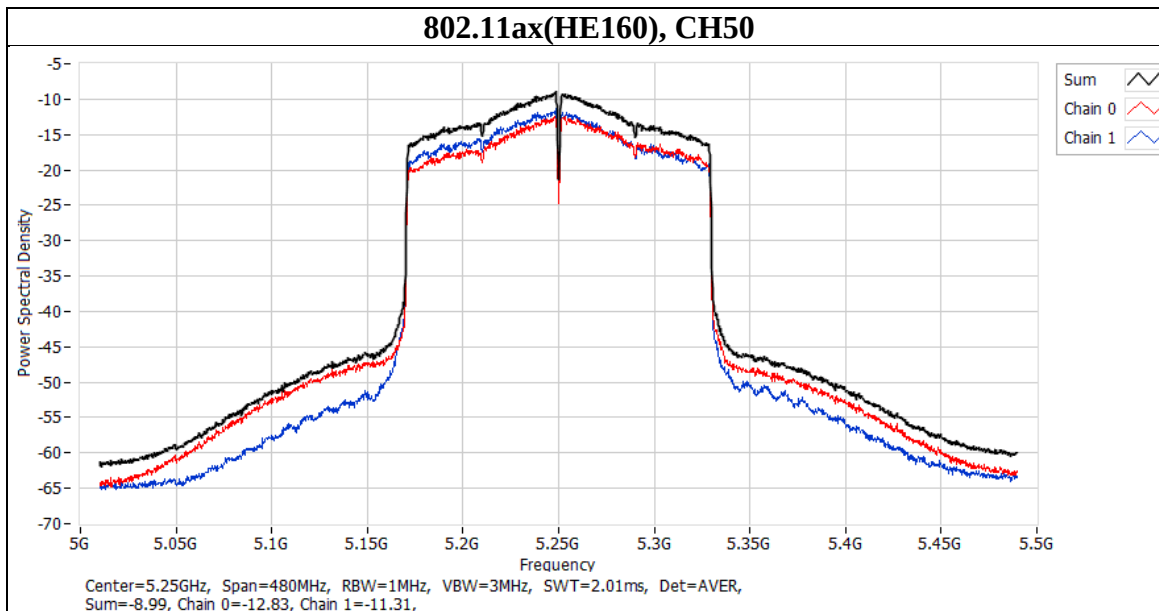
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE80)	42	5210	6.81	-6.56	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE80)	42	5210	-10.378	-8.76



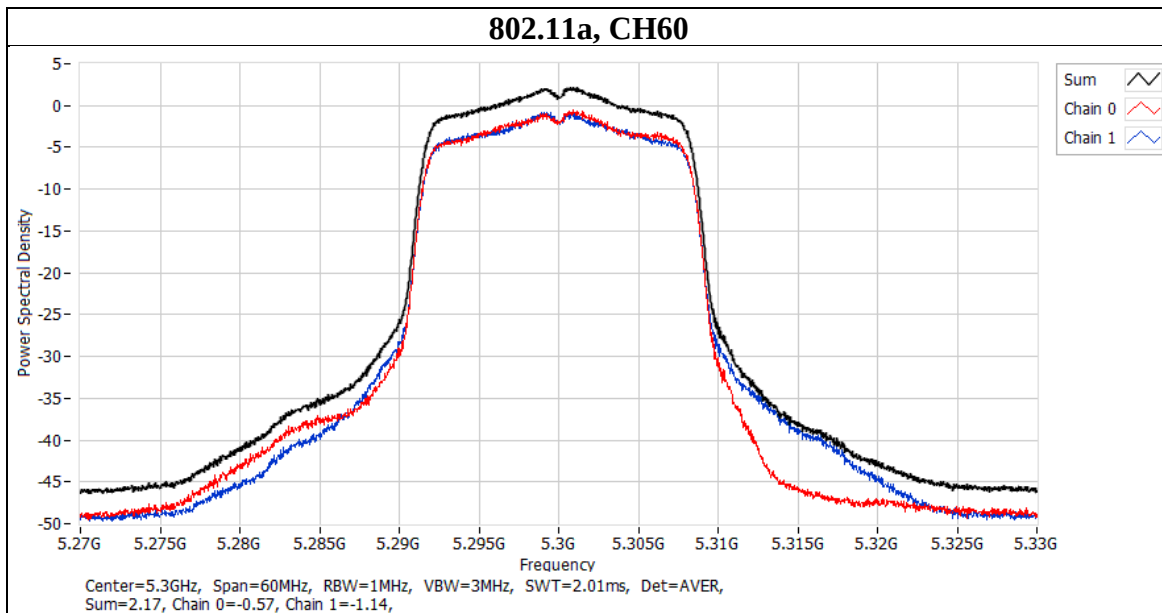
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE160)	50	5250	6.81	-8.99	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE160)	50	5250	-12.414	-11.306



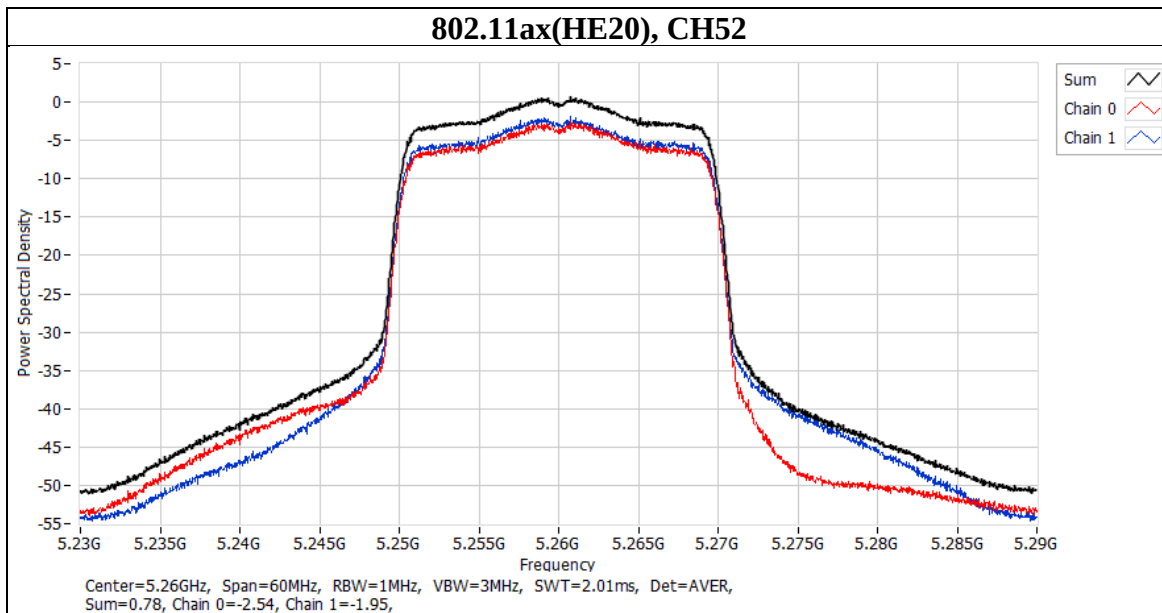
Mode (U-NII-2A)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	52	5260	6.81	2.1	10.19	PASS
	60	5300	6.81	2.17	10.19	PASS
	64	5320	6.81	2.11	10.19	PASS

Mode (U-NII-2A)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11a	52	5260	-1.121	-0.491
	60	5300	-0.571	-0.817
	64	5320	-0.763	-0.425



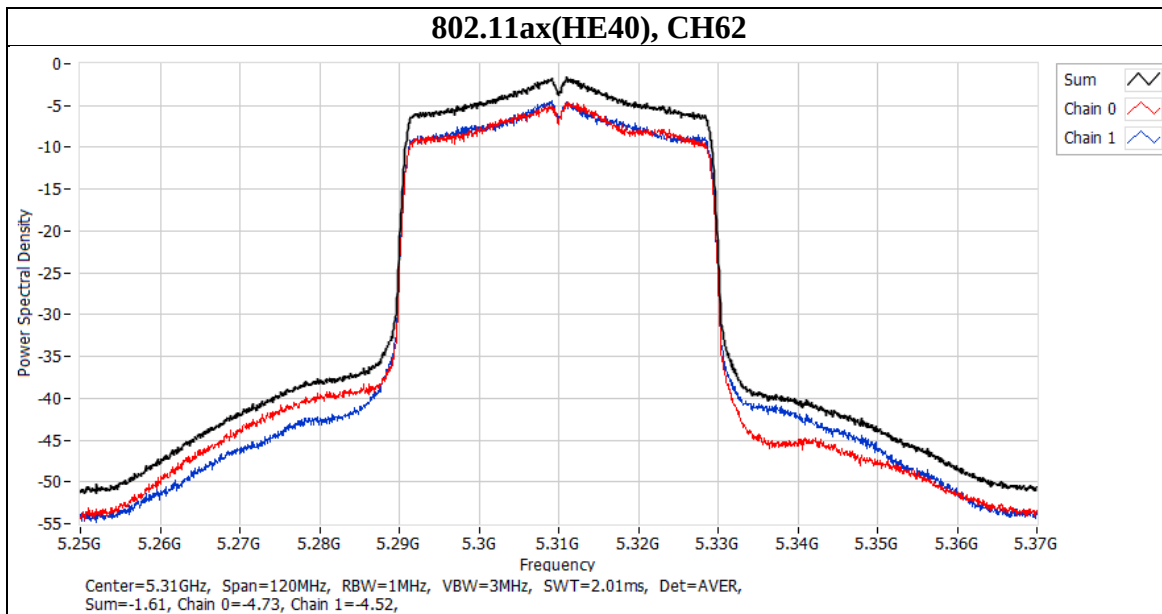
Mode (U-NII-2A)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE20)	52	5260	6.81	0.78	10.19	PASS
	60	5300	6.81	0.73	10.19	PASS
	64	5320	6.81	0.63	10.19	PASS

Mode (U-NII-2A)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE20)	52	5260	-2.538	-1.946
	60	5300	-1.952	-2.214
	64	5320	-2.219	-2.359



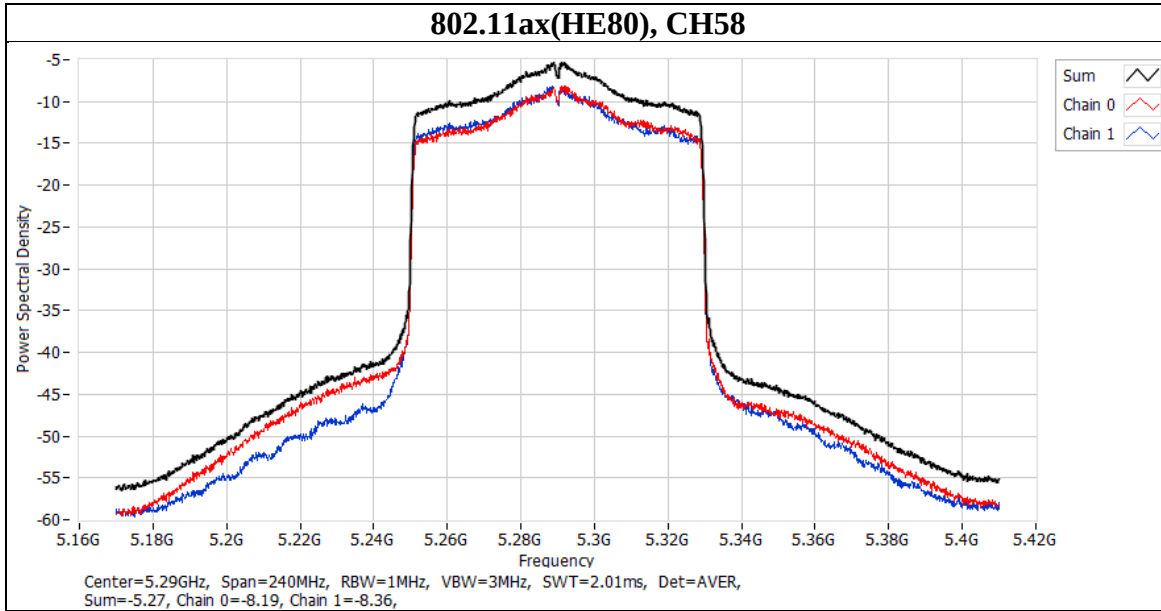
Mode (U-NII-2A)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE40)	54	5270	6.81	-1.84	10.19	PASS
	62	5310	6.81	-1.61	10.19	PASS

Mode (U-NII-2A)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE40)	54	5270	-4.93	-4.388
	62	5310	-4.623	-4.437



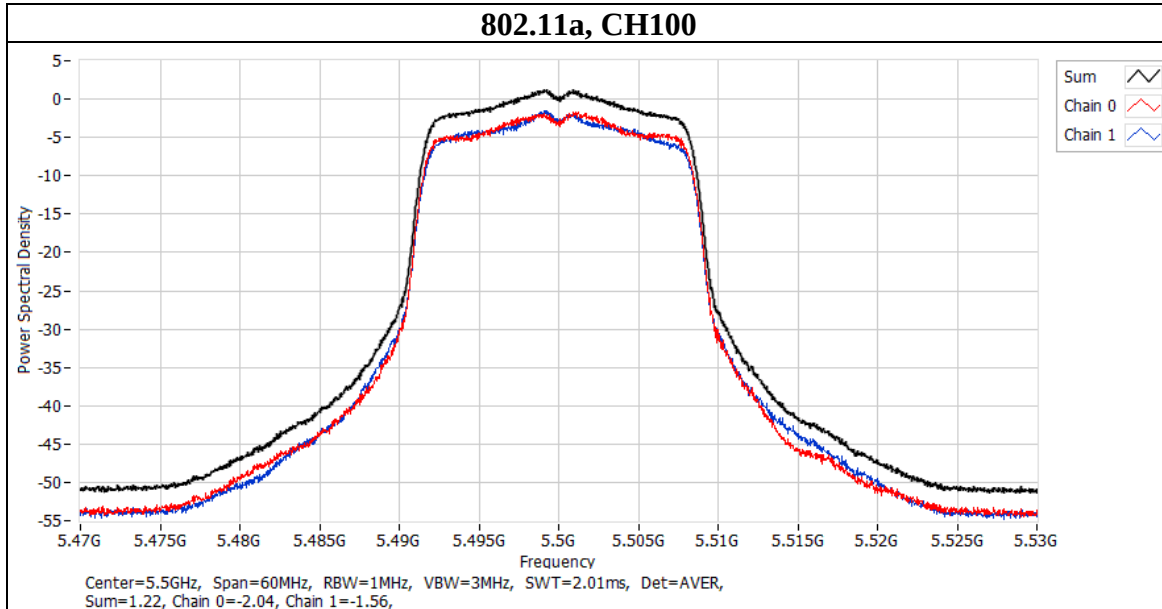
Mode (U-NII-2A)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE80)	58	5290	6.81	-5.27	10.19	PASS

Mode (U-NII-2A)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE80)	58	5290	-8.081	-8.095



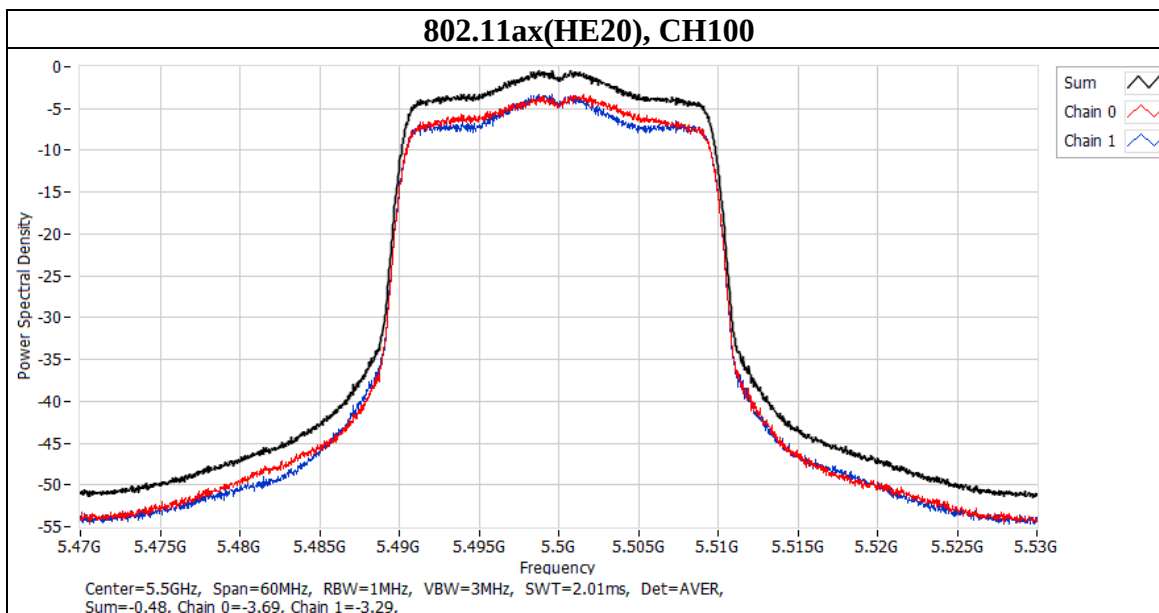
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	100	5500	6.81	1.22	10.19	PASS
	116	5580	6.81	0.89	10.19	PASS
	140	5700	6.81	0.34	10.19	PASS
	144	5720	6.81	0.6	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11a	100	5500	-1.688	-1.561
	116	5580	-1.385	-2.795
	140	5700	-1.766	-3.551
	144	5720	-1.276	-3.767



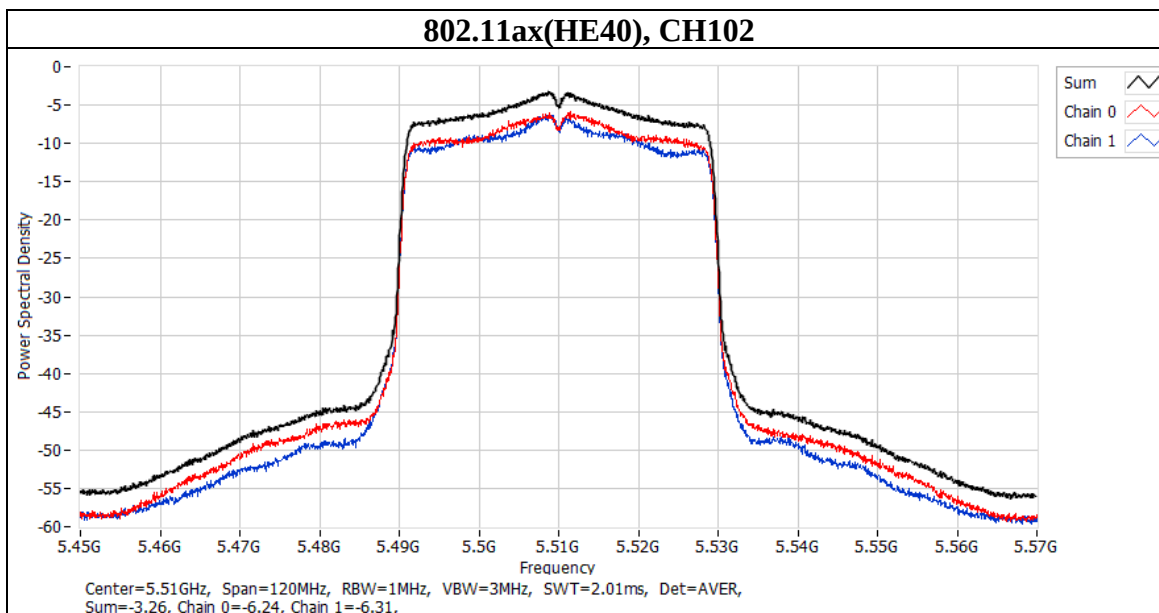
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE20)	100	5500	6.81	-0.48	10.19	PASS
	116	5580	6.81	-0.92	10.19	PASS
	140	5700	6.81	-1.38	10.19	PASS
	144	5720	6.81	-1.16	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE20)	100	5500	-3.356	-3.293
	116	5580	-3.099	-4.585
	140	5700	-3.323	-5.224
	144	5720	-3.183	-5.391



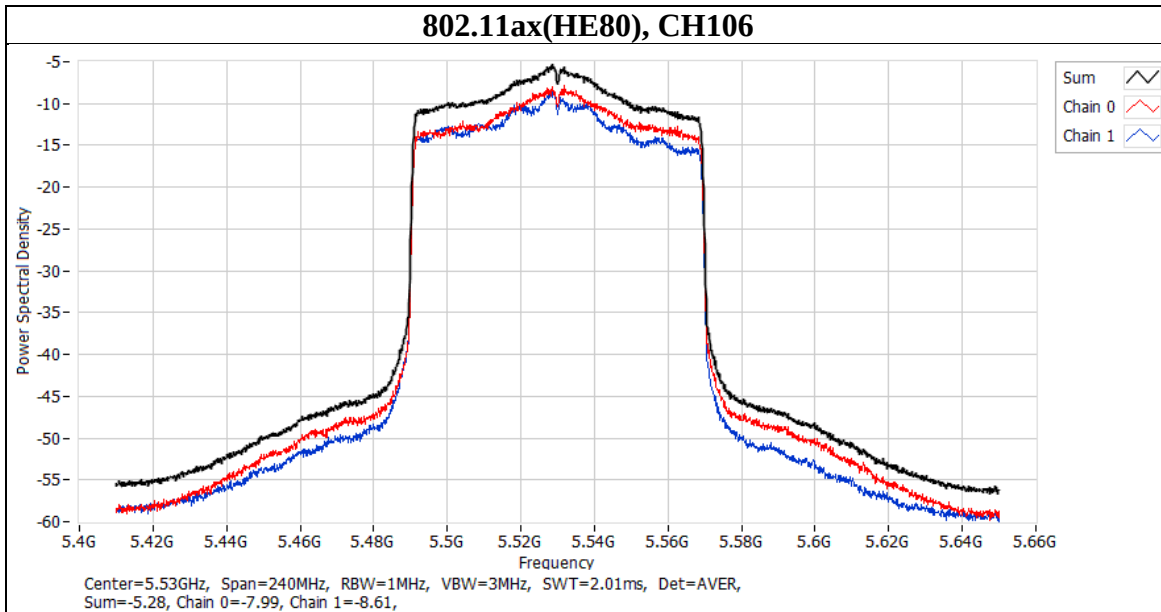
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE40)	102	5510	6.81	-3.26	10.19	PASS
	110	5550	6.81	-3.41	10.19	PASS
	134	5670	6.81	-4.13	10.19	PASS
	142	5710	6.81	-4.13	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE40)	102	5510	-5.931	-6.312
	110	5550	-5.86	-6.797
	134	5670	-6.065	-8.053
	142	5710	-6.06	-8.217



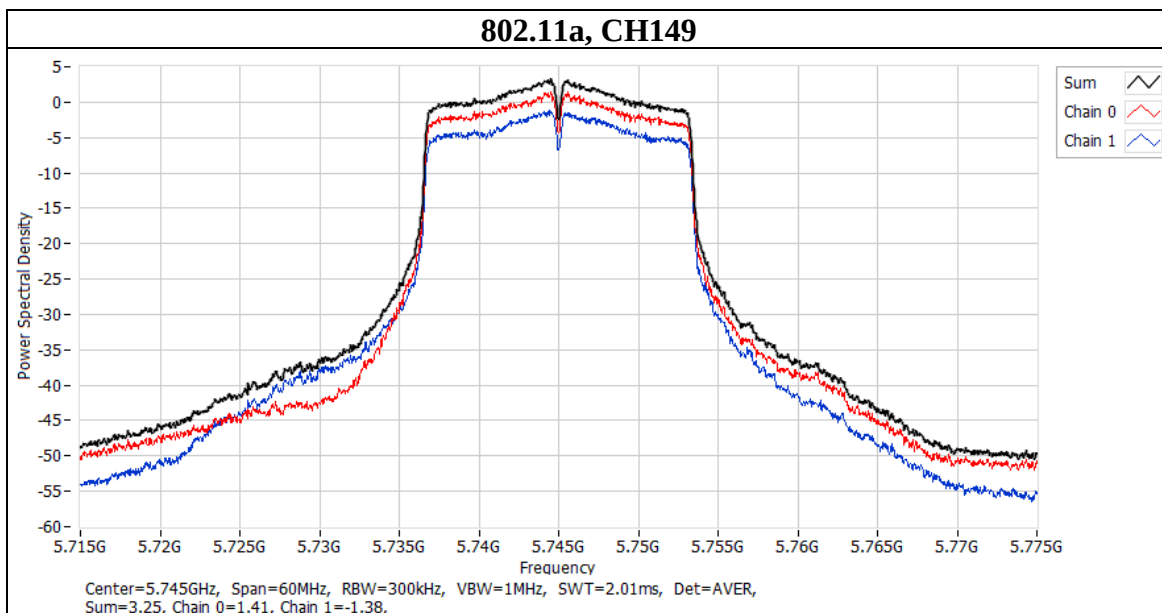
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE80)	106	5530	6.81	-5.28	10.19	PASS
	138	5690	6.81	-5.93	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE80)	106	5530	-7.887	-8.606
	138	5690	-8.069	-9.751



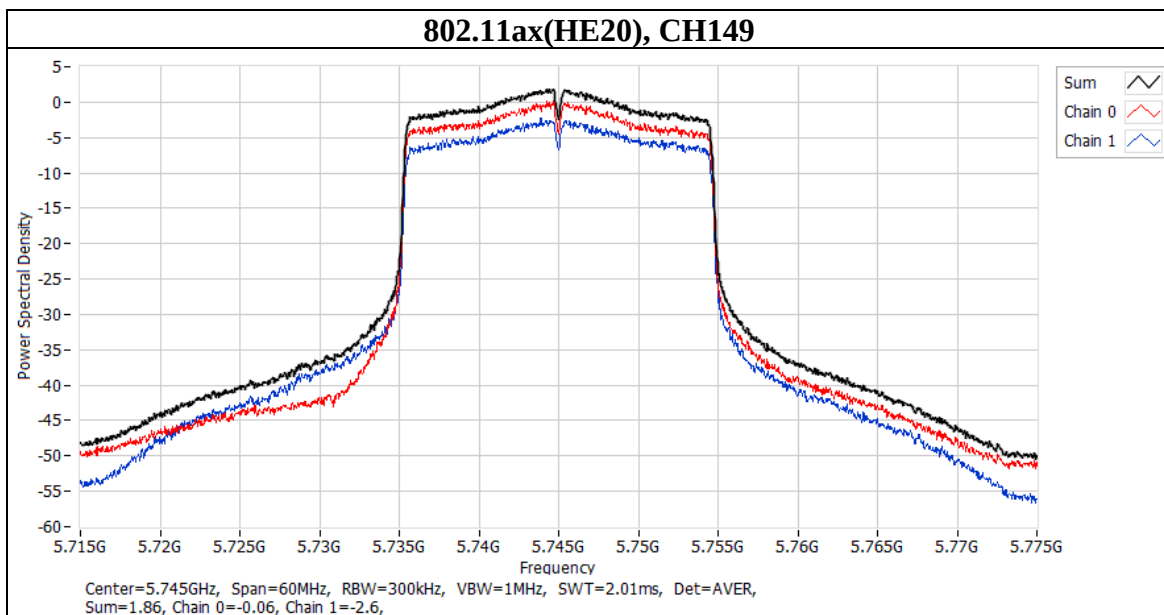
Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500k Hz)	Limit (dBm/500k Hz)	Result
802.11a	144	5720	2.22	6.81	0.43	29.19	PASS
	149	5745	2.22	6.81	5.46	29.19	PASS
	157	5785	2.22	6.81	5.09	29.19	PASS
	165	5825	2.22	6.81	4.77	29.19	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)	
			Chain 0	Chain 1
802.11a	144	5720	-3.679	-6.08
	149	5745	1.431	-1.213
	157	5785	1.019	-1.544
	165	5825	0.202	-0.898



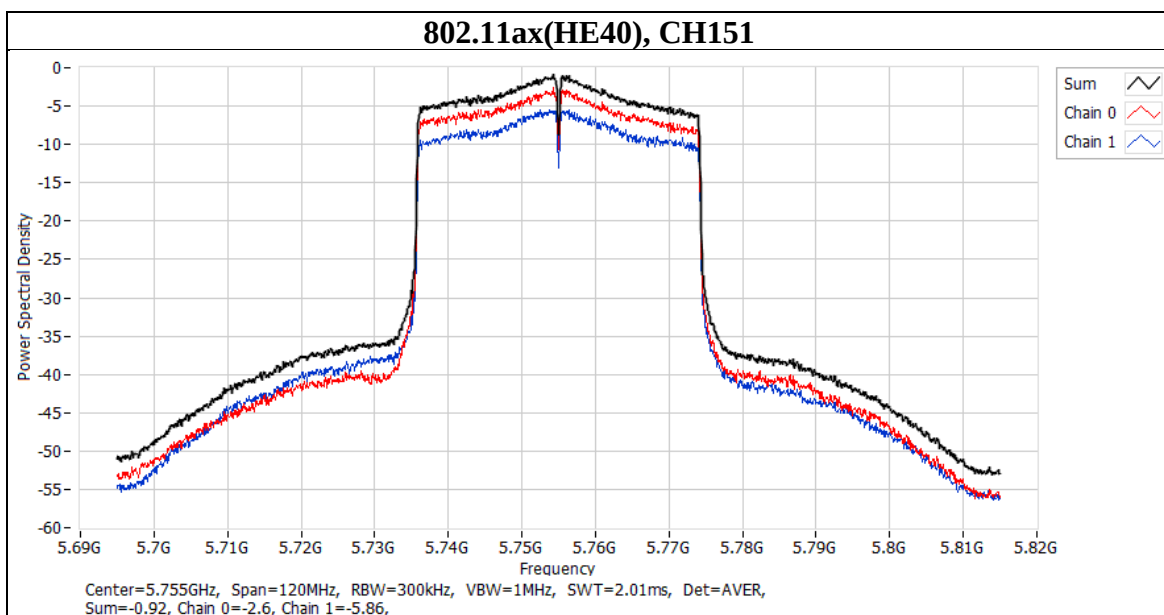
Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11ax(HE20)	144	5720	2.22	6.81	-1.55	29.19	PASS
	149	5745	2.22	6.81	4.08	29.19	PASS
	157	5785	2.22	6.81	4.03	29.19	PASS
	165	5825	2.22	6.81	3.66	29.19	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)	
			Chain 0	Chain 1
802.11ax(HE20)	144	5720	-5.717	-7.792
	149	5745	0.09	-2.31
	157	5785	-0.094	-2.484
	165	5825	-0.99	-1.904



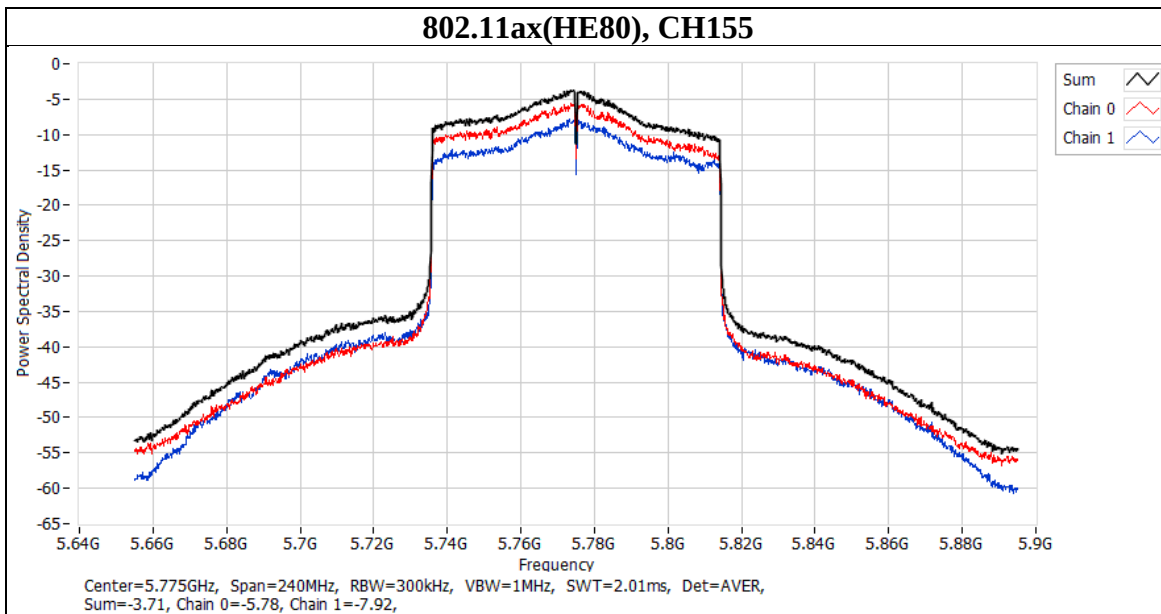
Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11ax(HE40)	142	5710	2.22	6.81	-4.3	29.19	PASS
	151	5755	2.22	6.81	1.3	29.19	PASS
	159	5795	2.22	6.81	1.07	29.19	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)	
			Chain 0	Chain 1
802.11ax(HE40)	142	5710	-8.358	-10.503
	151	5755	-2.601	-5.461
	159	5795	-3.043	-5.311



Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11ax(HE80)	138	5690	2.22	6.81	-6.32	29.19	PASS
	155	5775	2.22	6.81	-1.49	29.19	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)	
			Chain 0	Chain 1
802.11ax(HE80)	138	5690	-10.672	-12.262
	155	5775	-5.665	-7.743



9.6. Frequency Stability

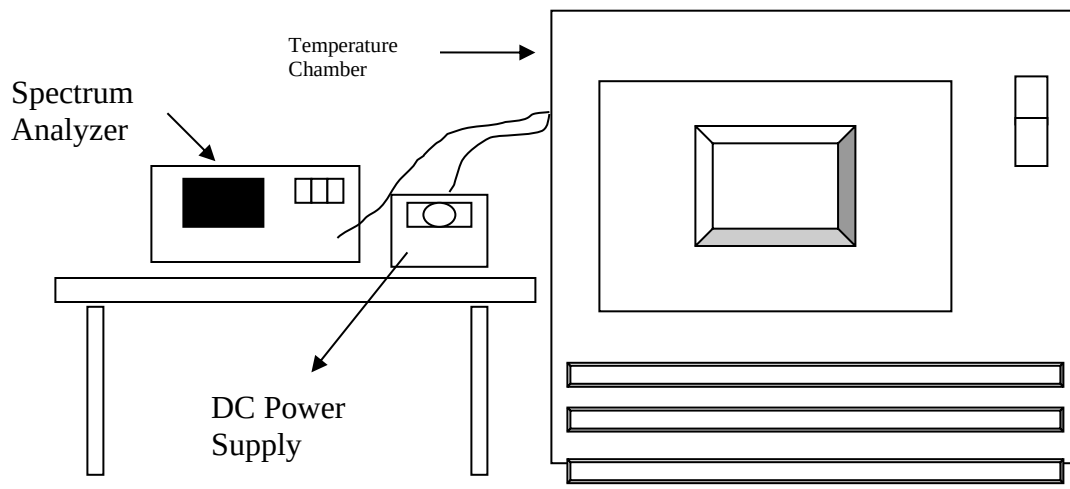
Requirements

The frequency of the carrier signal shall be maintained within band of operation.

Test procedure

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

Test Setup



Test Data

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)
40	14.8	5179.9903	-1.87	5179.9942	-1.12	5179.9907	-1.80	5179.9902	-1.89
30	14.8	5180.0118	2.28	5180.012	2.32	5180.0116	2.24	5180.0116	2.24
20	14.8	5179.9876	-2.39	5179.9876	-2.39	5179.9875	-2.41	5179.9833	-3.22
10	14.8	5180.0095	1.83	5180.0102	1.97	5180.0093	1.80	5180.011	2.12
0	14.8	5180.0271	5.23	5180.0258	4.98	5180.0252	4.86	5180.0232	4.48
TEMP. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)
20	17.02	5179.9878	-2.36	5179.9872	-2.47	5179.9872	-2.47	5179.9832	-3.24
20	14.8	5179.9876	-2.39	5179.9876	-2.39	5179.9875	-2.41	5179.9833	-3.22
20	12.58	5179.9868	-2.55	5179.9868	-2.55	5179.9885	-2.22	5179.9833	-3.22

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9.7. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

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Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8(dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
*1 beyond 75 MHz or more above of the band edge. *2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. *3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. *4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.			

Note:

The following formula is used to convert the effective isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

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Test Procedures

[For 9 kHz ~ 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
- f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

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Note:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

Configuration	Average	
	RBW	VBW
802.11a	1MHz	Refer to section 6.6 for duty cycle.
802.11ax (HE20)		
802.11ax (HE40)		
802.11ax (HE80)		
802.11ax (HE160)		

- All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
- Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
- Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
- Test data of Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
- Test data of Notation "@" = Fundamental Frequency
- Test data of Notation "*" = Only required peak limit or the peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

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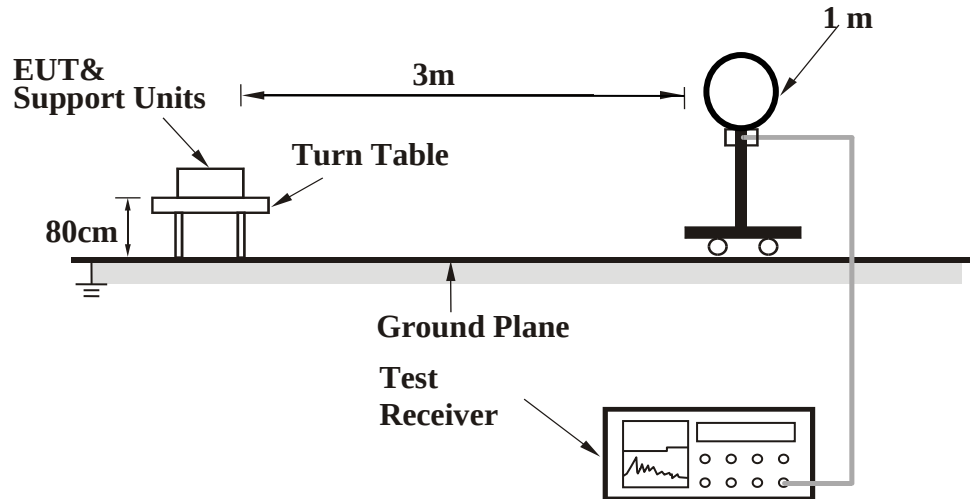
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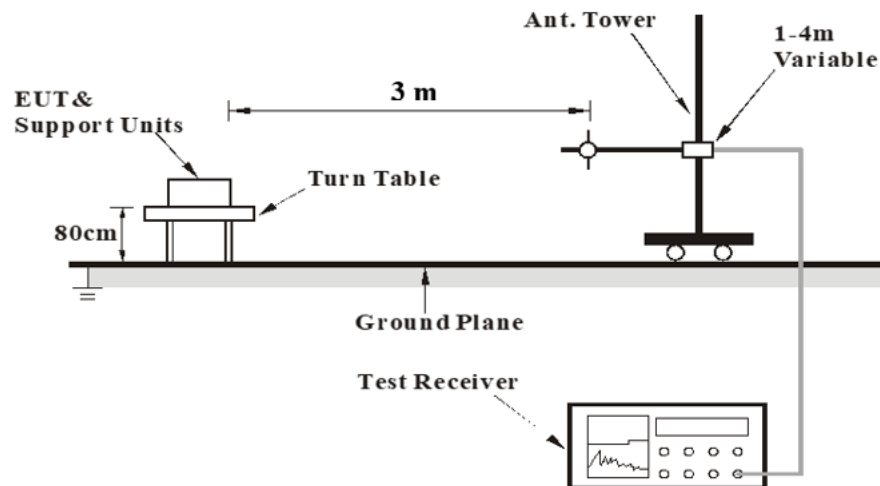
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Test Setup

<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



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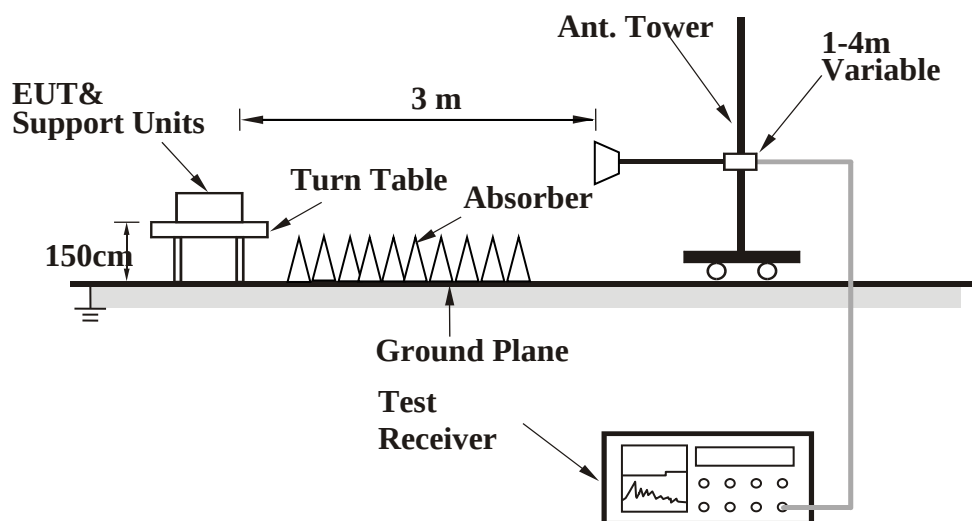
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<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Setup Configurations.

Test Data

Above 1 GHz

Mode	802.11a	Channel	36
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5086.8	42.25	19.19	61.44	74	-12.56	PK
		5149.8	30.48	19.22	49.7	54	-4.3	AVG
	@	5180	88.68	19.14	107.82	N/A	N/A	PK
	@	5180	80.17	19.14	99.31	N/A	N/A	AVG
	*	10360	33.99	17.03	51.02	68.2	-17.18	PK
Vertical		5147.7	44.04	19.22	63.26	74	-10.74	PK
		5149.8	32.41	19.22	51.63	54	-2.37	AVG
	@	5180	89.61	19.14	108.75	N/A	N/A	PK
	@	5180	81.74	19.14	100.88	N/A	N/A	AVG
	*	10360	32.7	17.03	49.73	68.2	-18.47	PK

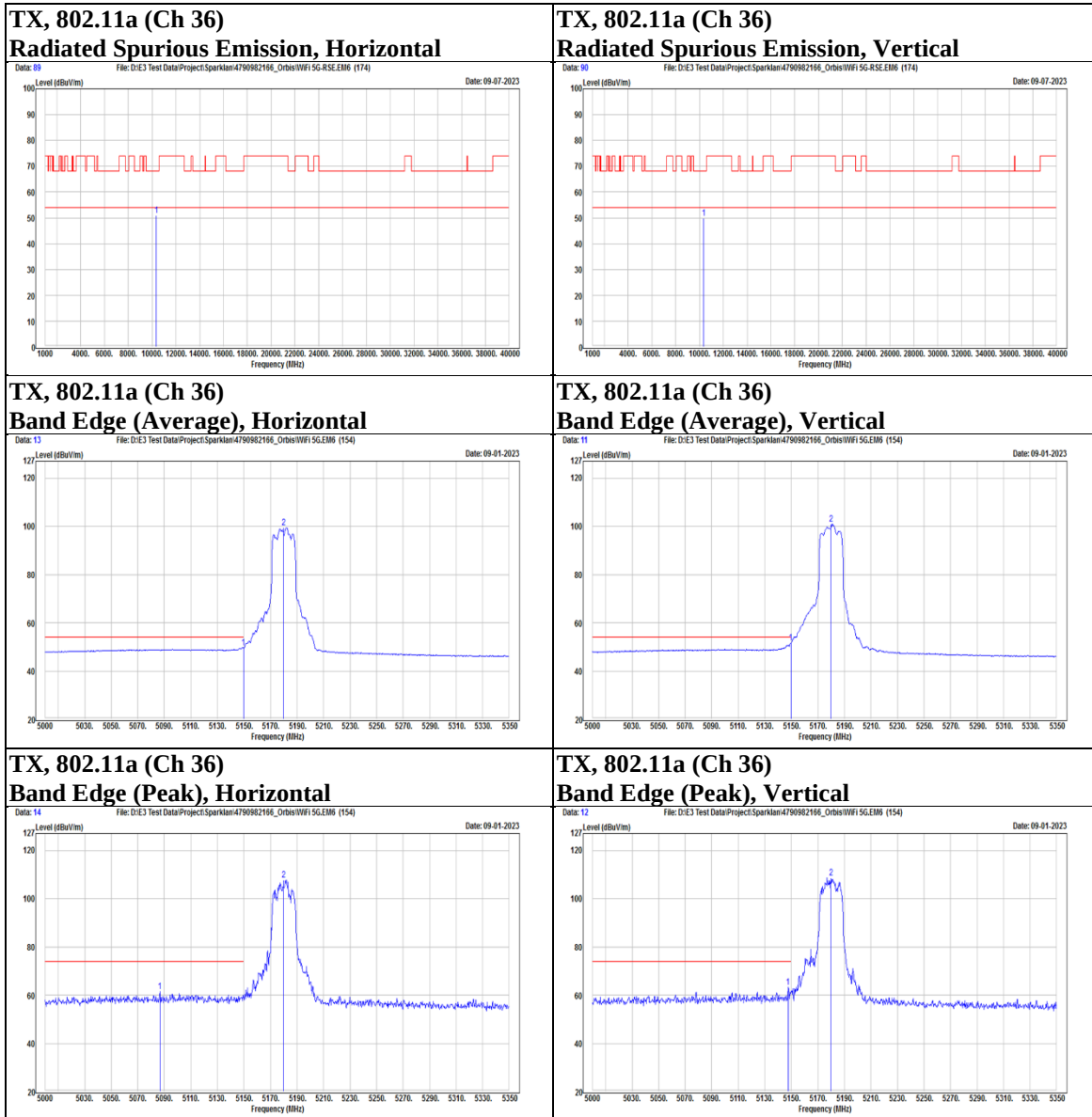
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Mode	802.11a	Channel	44
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5059.15	41.54	19.03	60.57	74	-13.43	PK
		5099.05	29.67	19.25	48.92	54	-5.08	AVG
	@	5220	85.96	19.04	105	N/A	N/A	PK
	@	5220	79.63	19.04	98.67	N/A	N/A	AVG
	*	10440	32.88	17.45	50.33	68.2	-17.87	PK
Vertical		5063.35	41.49	19.05	60.54	74	-13.46	PK
		5096.25	29.68	19.22	48.9	54	-5.1	AVG
	@	5220	90.21	19.04	109.25	N/A	N/A	PK
	@	5220	82.17	19.04	101.21	N/A	N/A	AVG
	*	10440	31.52	17.45	48.97	68.2	-19.23	PK

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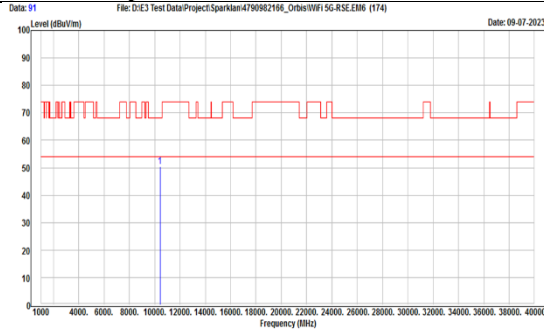
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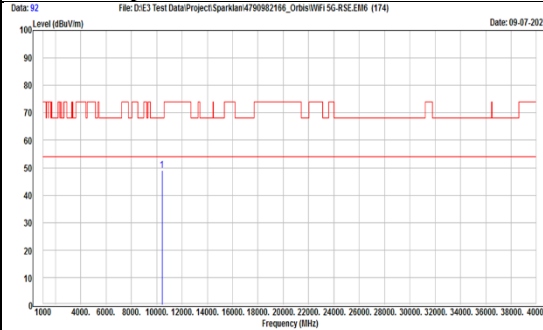
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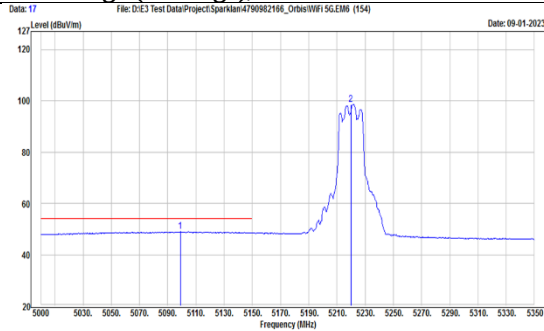
TX, 802.11a (Ch 44)
Radiated Spurious Emission, Horizontal



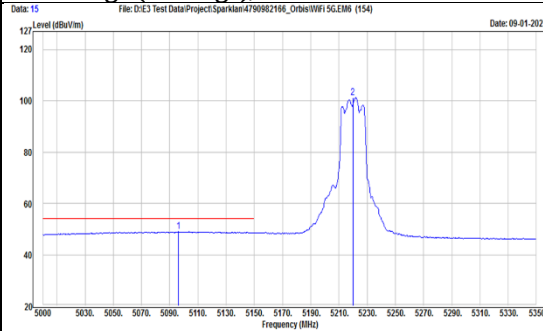
TX, 802.11a (Ch 44)
Radiated Spurious Emission, Vertical



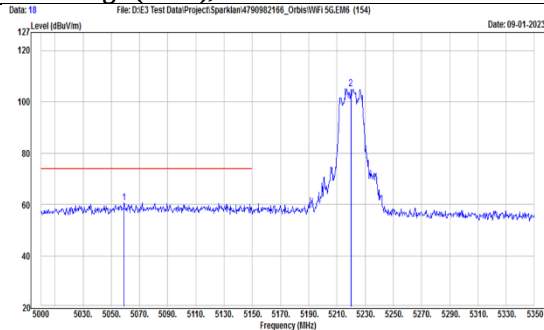
TX, 802.11a (Ch 44)
Band Edge (Average), Horizontal



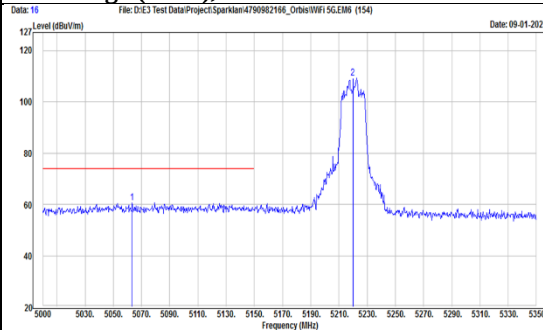
TX, 802.11a (Ch 44)
Band Edge (Average), Vertical



TX, 802.11a (Ch 44)
Band Edge (Peak), Horizontal



TX, 802.11a (Ch 44)
Band Edge (Peak), Vertical



Mode	802.11a	Channel	48
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5057.05	41.92	19.03	60.95	74	-13.05	PK
		5086.1	29.74	19.18	48.92	54	-5.08	AVG
	@	5240	87.58	18.99	106.57	N/A	N/A	PK
	@	5240	79.51	18.99	98.5	N/A	N/A	AVG
	*	10480	31.64	17.55	49.19	68.2	-19.01	PK
Vertical		5106.05	42.52	19.25	61.77	74	-12.23	PK
		5109.9	29.69	19.24	48.93	54	-5.07	AVG
	@	5240	88.33	18.99	107.32	N/A	N/A	PK
	@	5240	80.59	18.99	99.58	N/A	N/A	AVG
	*	10480	31.57	17.55	49.12	68.2	-19.08	PK

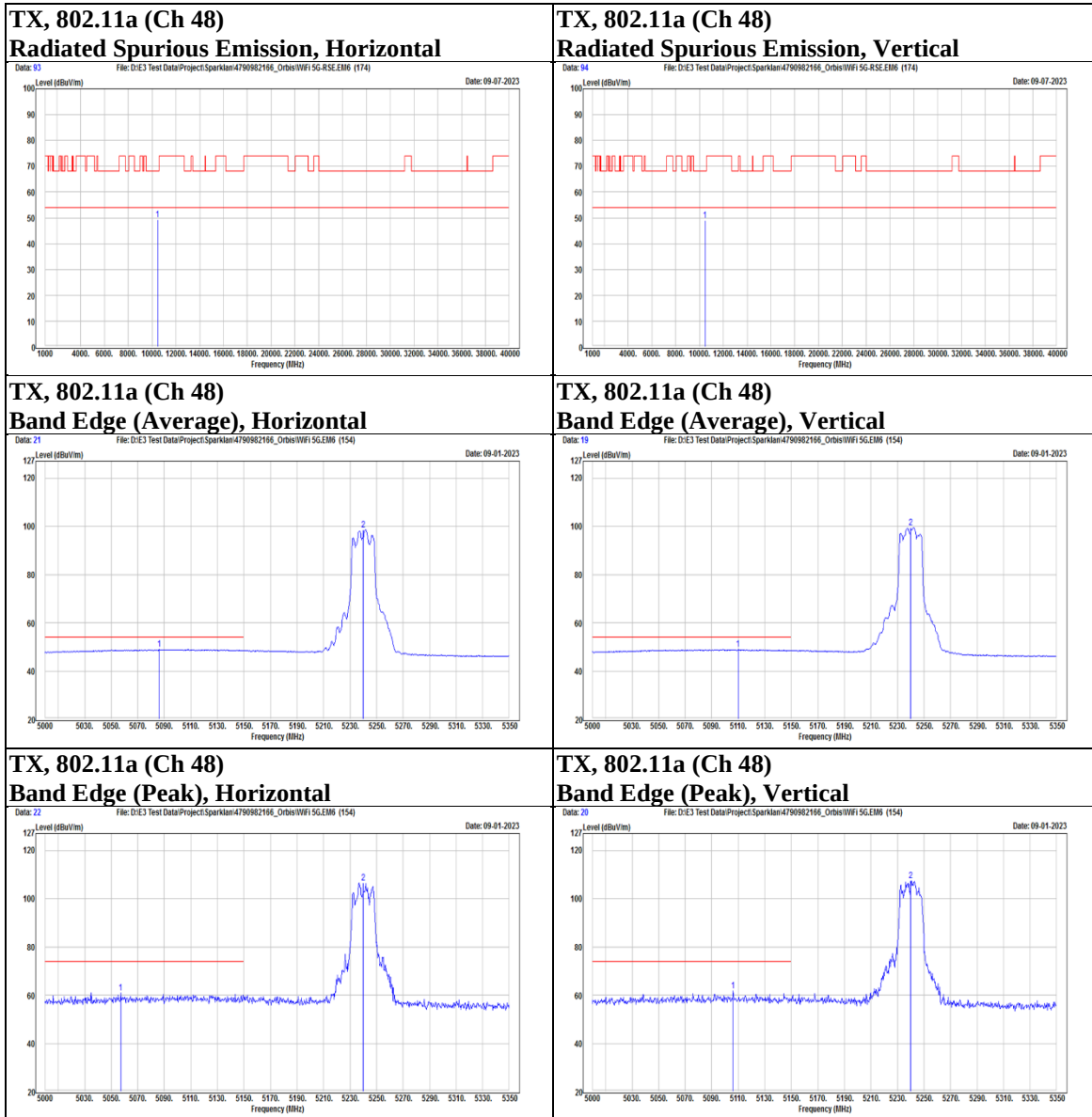
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Mode	802.11a	Channel	52
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	5260	86.14	18.91	105.05	N/A	N/A	PK
	@	5260	79.65	18.91	98.56	N/A	N/A	AVG
		5413.2	41.17	19.28	60.45	74	-13.55	PK
		5452.2	27.96	19.63	47.59	54	-6.41	AVG
	*	10520	30.71	17.63	48.34	68.2	-19.86	PK
Vertical	@	5260	86.83	18.91	105.74	N/A	N/A	PK
	@	5260	80.42	18.91	99.33	N/A	N/A	AVG
		5460	39.55	19.64	59.19	68.2	-9.01	PK
		5460	27.96	19.64	47.6	54	-6.4	AVG
	*	10520	29.97	17.63	47.6	68.2	-20.6	PK

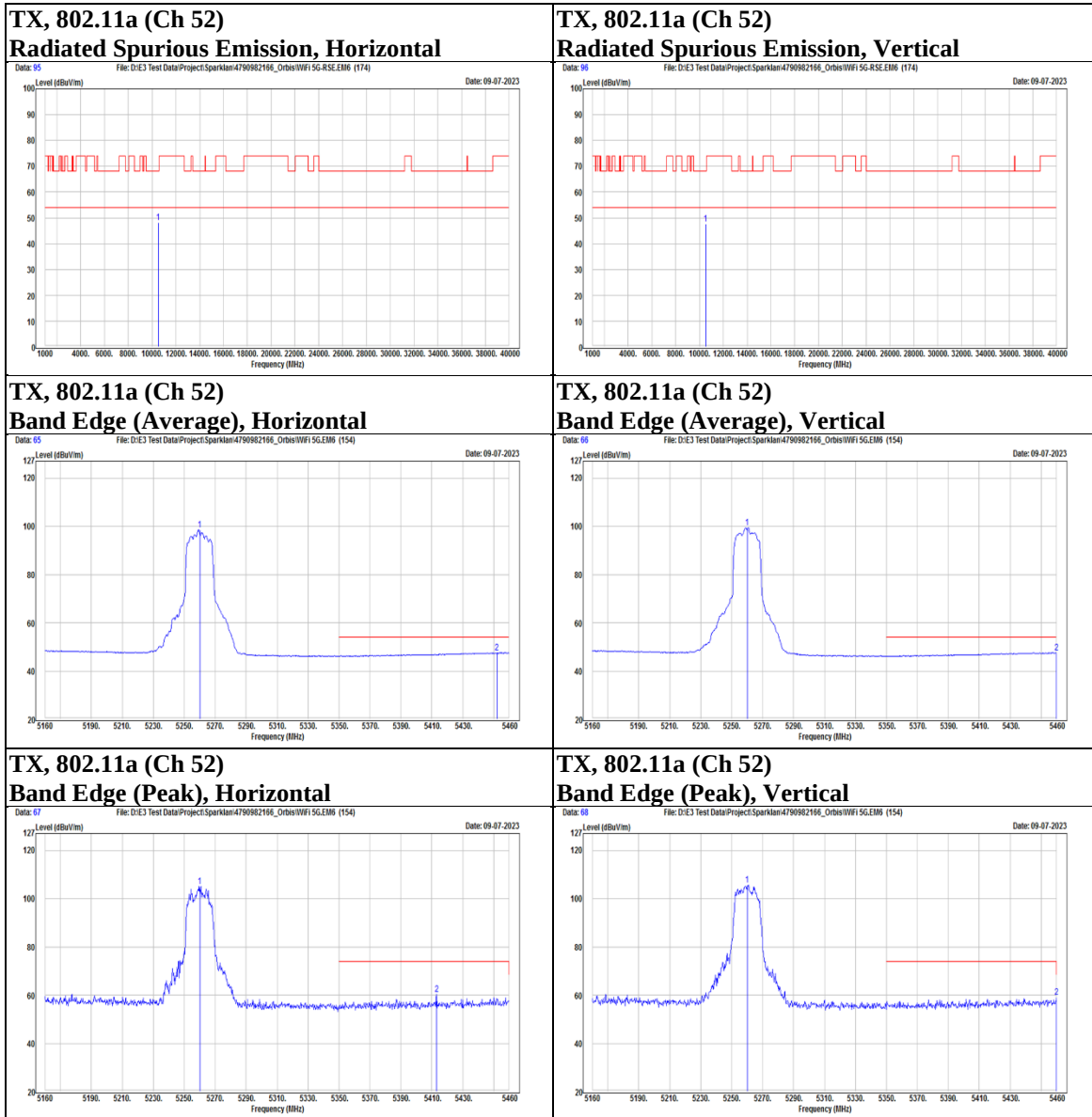
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Mode	802.11a	Channel	60
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	5300	85.51	18.73	104.24	N/A	N/A	PK
	@	5300	79.85	18.73	98.58	N/A	N/A	AVG
		5453.7	39.02	19.63	58.65	74	-15.35	PK
		5457.6	27.97	19.63	47.6	54	-6.4	AVG
	*	10600	30.23	17.71	47.94	74	-26.06	PK
Vertical	@	5300	87.72	18.73	106.45	N/A	N/A	PK
	@	5300	80.2	18.73	98.93	N/A	N/A	AVG
		5453.7	27.96	19.63	47.59	54	-6.41	AVG
		5459.7	40.51	19.64	60.15	74	-13.85	PK
	*	10600	30.6	17.71	48.31	74	-25.69	PK

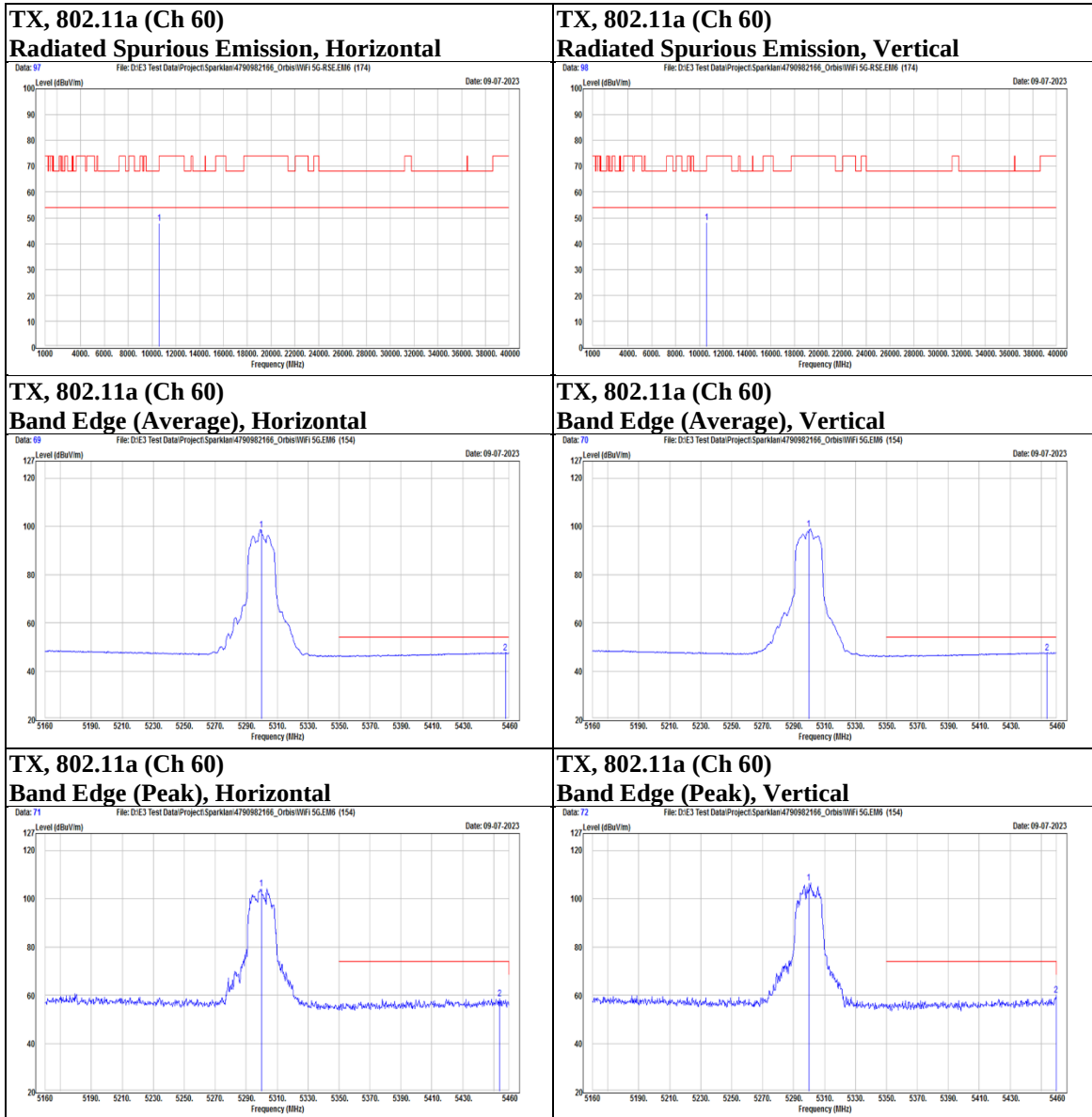
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Mode	802.11a	Channel	64
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	5320	87.01	18.72	105.73	N/A	N/A	PK
	@	5320	79.33	18.72	98.05	N/A	N/A	AVG
		5455.5	28.01	19.63	47.64	54	-6.36	AVG
		5457.6	39.41	19.63	59.04	74	-14.96	PK
	*	10640	30.95	17.67	48.62	74	-25.38	PK
Vertical	@	5320	87.29	18.72	106.01	N/A	N/A	PK
	@	5320	79.75	18.72	98.47	N/A	N/A	AVG
		5436.9	39.59	19.51	59.1	74	-14.9	PK
		5457	27.86	19.63	47.49	54	-6.51	AVG
	*	10640	29.71	17.67	47.38	74	-26.62	PK

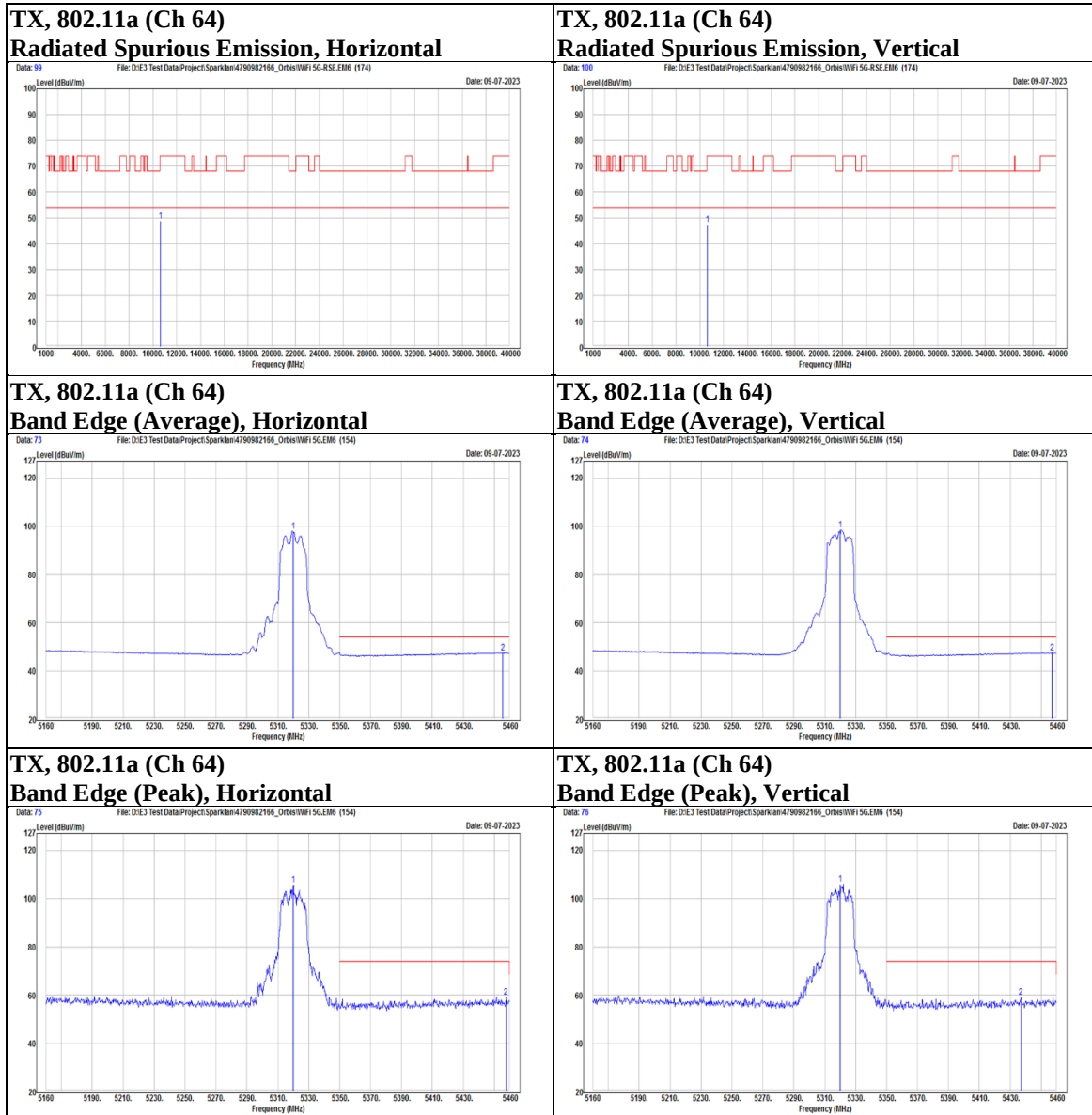
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Mode	802.11a	Channel	100
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5438.15	39.47	19.52	58.99	74	-15.01	PK
		5453.55	27.94	19.63	47.57	54	-6.43	AVG
		5469.3	39.13	19.65	58.78	68.2	-9.42	PK
	@	5500	86.3	19.69	105.99	N/A	N/A	PK
	@	5500	80.48	19.69	100.17	N/A	N/A	AVG
	*	11000	30.95	17.88	48.83	74	-25.17	PK
Vertical		5451.8	28.03	19.63	47.66	54	-6.34	AVG
		5457.75	39.05	19.63	58.68	74	-15.32	PK
		5468.95	39.79	19.65	59.44	68.2	-8.76	PK
	@	5500	88.48	19.69	108.17	N/A	N/A	PK
	@	5500	80.07	19.69	99.76	N/A	N/A	AVG
	*	11000	30.1	17.88	47.98	74	-26.02	PK

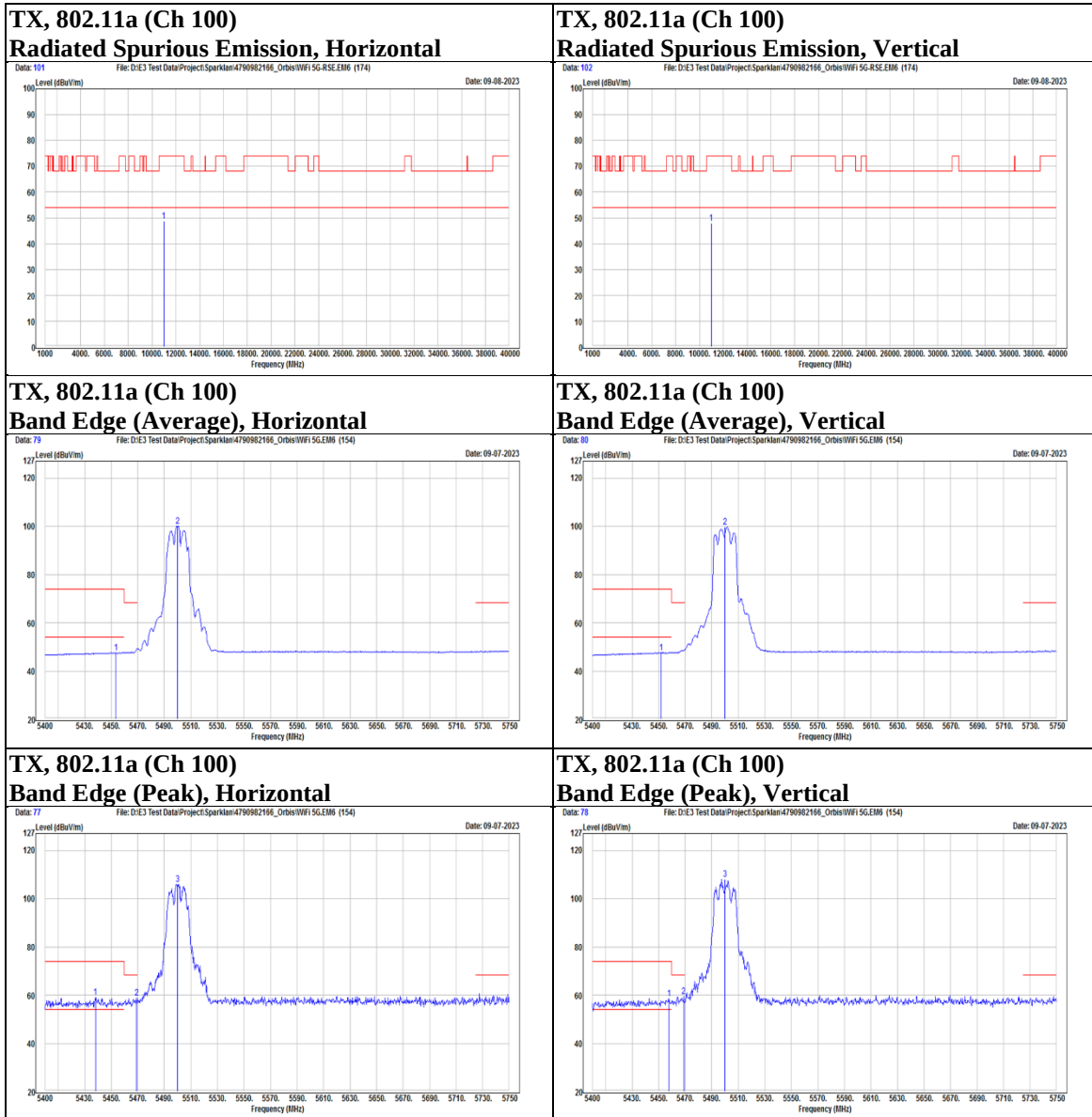
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Mode	802.11a	Channel	116
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5457.4	39.33	19.63	58.96	74	-15.04	PK
		5459.5	28.09	19.64	47.73	54	-6.27	AVG
		5466.15	39.4	19.65	59.05	68.2	-9.15	PK
	@	5580	88.43	19.58	108.01	N/A	N/A	PK
	@	5580	81.23	19.58	100.81	N/A	N/A	AVG
		5736.7	39.23	19.93	59.16	68.2	-9.04	PK
	*	11160	30.1	18.05	48.15	74	-25.85	PK
Vertical		5454.6	40.48	19.63	60.11	74	-13.89	PK
		5459.85	28.03	19.64	47.67	54	-6.33	AVG
		5467.9	38.87	19.65	58.52	68.2	-9.68	PK
	@	5580	88.72	19.58	108.3	N/A	N/A	PK
	@	5580	80.82	19.58	100.4	N/A	N/A	AVG
		5748.25	39.86	20.04	59.9	68.2	-8.3	PK
	*	11160	29.63	18.05	47.68	74	-26.32	PK

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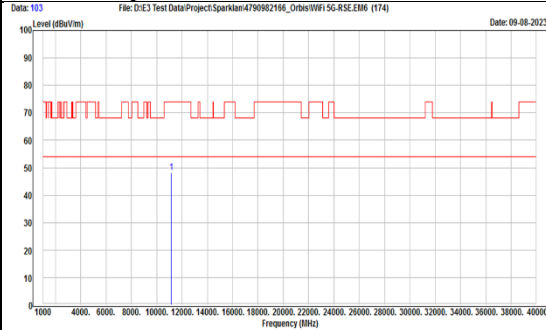
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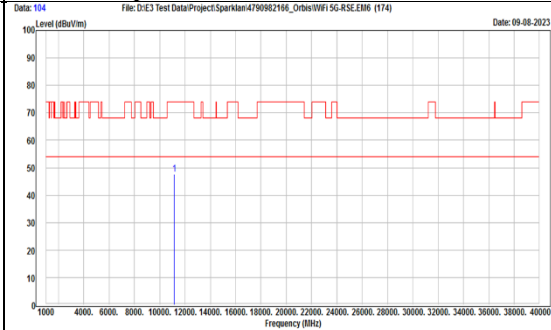
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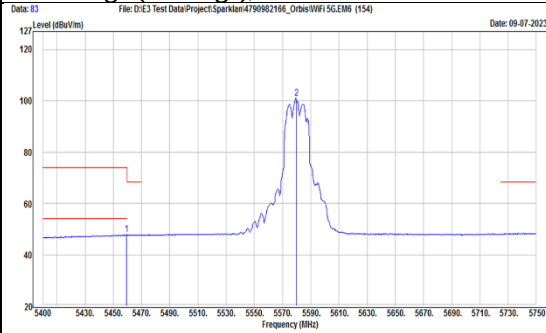
TX, 802.11a (Ch 116)
Radiated Spurious Emission, Horizontal



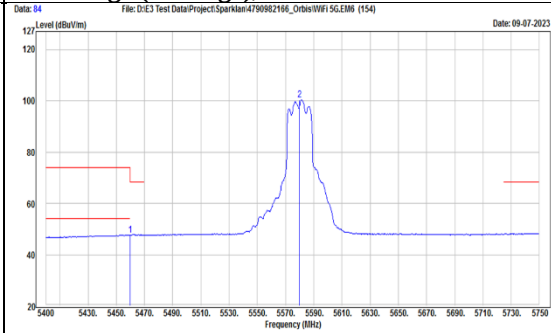
TX, 802.11a (Ch 116)
Radiated Spurious Emission, Vertical



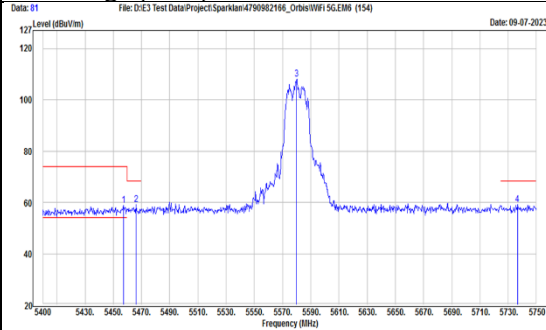
TX, 802.11a (Ch 116)
Band Edge (Average), Horizontal



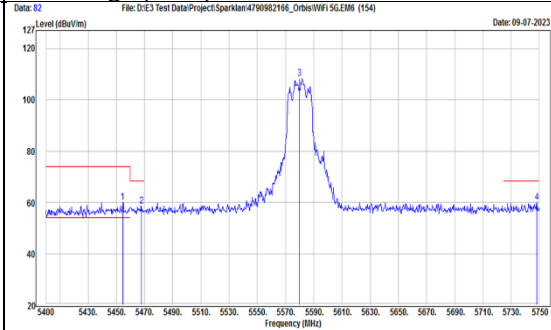
TX, 802.11a (Ch 116)
Band Edge (Average), Vertical



TX, 802.11a (Ch 116)
Band Edge (Peak), Horizontal



TX, 802.11a (Ch 116)
Band Edge (Peak), Vertical



Mode	802.11a	Channel	140
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Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5430.1	39.53	19.44	58.97	74	-15.03	PK
		5456.35	27.87	19.63	47.5	54	-6.5	AVG
		5463.35	38.23	19.64	57.87	68.2	-10.33	PK
	@	5700	87.45	19.6	107.05	N/A	N/A	PK
	@	5700	79.64	19.6	99.24	N/A	N/A	AVG
		5749.3	39.29	20.05	59.34	68.2	-8.86	PK
	*	11400	29.08	18.46	47.54	74	-26.46	PK
Vertical		5422.4	39.37	19.37	58.74	74	-15.26	PK
		5458.1	27.96	19.64	47.6	54	-6.4	AVG
		5468.6	38.9	19.65	58.55	68.2	-9.65	PK
	@	5700	86.64	19.6	106.24	N/A	N/A	PK
	@	5700	79.08	19.6	98.68	N/A	N/A	AVG
		5745.45	39.89	20.01	59.9	68.2	-8.3	PK
	*	11400	29.26	18.46	47.72	74	-26.28	PK

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