

RADIO TEST REPORT

Product : IEEE 802.11ax/ac/a/b/g/n WiFi6E with BT5.2 Module

Model Name : ACB-QCA206x

Series Model : ACB-QCA2066-0WI1, ACB-QCA2066-0WX1,
ACB-QCA2066-5WI1, ACB-QCA2066-5WX1,
ACB-QCA2066-0WI4, ACB-QCA2066-0WX4,
ACB-QCA2066-5WI4, ACB-QCA2066-5WX4

FCC ID : 2AE3B-ACB-QCA206X

Test Regulation : FCC 47 CFR Part 15 Subpart E (Section 15.407)

Received Date : 2023/6/26

Test Date : 2023/7/1 ~ 2023/8/11

Issued Date : 2023/9/6

Applicant : VOXMICRO LTD
20955 Pathfinder Rd., STE 100, Diamond Bar, California
91765, 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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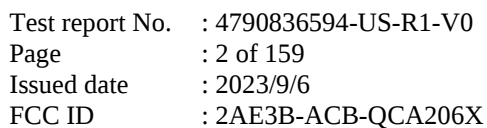
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Doc No: Form-ULID-004739 (DCS:17-EM-F0878) / 6.1



Original Test Report No.: 4790836594-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: VOXMICRO LTD
20955 Pathfinder Rd., STE 100, Diamond Bar, California 91765,
USA

MANUFACTURER: VOXMICRO LTD
8F.-3, No.5, Aly. 22, Ln. 513, Rueiguang Rd., Neihs Dist., Taipei
City 114, Taiwan

EUT DESCRIPTION: IEEE 802.11ax/ac/a/b/g/n WiFi6E with BT5.2 Module

BRAND: AIRETOS

MODEL: ACB-QCA206x

SERIES MODEL: ACB-QCA2066-0WI1, ACB-QCA2066-0WX1,
ACB-QCA2066-5WI1, ACB-QCA2066-5WX1,
ACB-QCA2066-0WI4, ACB-QCA2066-0WX4,
ACB-QCA2066-5WI4, ACB-QCA2066-5WX4

SAMPLE STAGE: Engineering Verification Test sample

DATE of TESTED: 2023/7/1 ~ 2023/8/11

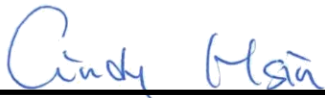
APPLICABLE STANDARDS

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 : 2023/9/6

Approved and Authorized By:

Kent Liu
Senior Laboratory Engineer

Date : 2023/9/6

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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	PASS
15.203	Antenna Requirement	PASS
15.407(h)	Dynamic Frequency Selection & Transmit power control	See Note 2

Note:

1. The Occupied Bandwidth was reference only.
2. The “Dynamic Frequency Selection & Transmit power control measurement” was recorded in Report No.: 4790836594-US-R3-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 4.3.4 of ISO 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

6. Equipment under Test

6.1. Description of EUT

Product	IEEE 802.11ax/ac/a/b/g/n WiFi6E with BT5.2 Module	
Brand Name	AIRETOS	
Model Name	ACB-QCA206x	
Series Model	ACB-QCA2066-0WI1, ACB-QCA2066-0WX1, ACB-QCA2066-5WI1, ACB-QCA2066-5WX1, ACB-QCA2066-0WI4, ACB-QCA2066-0WX4, ACB-QCA2066-5WI4, ACB-QCA2066-5WX4	
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	12 for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20)
		6 for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40)
		3 for 802.11ac (VHT80), 802.11ax (HE80)
		1 for 802.11ac (VHT160), 802.11ax (HE160)

Number of Channel	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	5180 ~ 5240 MHz: 19.07 dBm 5260 ~ 5320 MHz: 19.06 dBm 5500 ~ 5720 MHz: 22.27 dBm 5745 ~ 5825 MHz: 23.12 dBm	
Normal Voltage	3.3 Vdc from host system	
Sample ID	6199534	

Note:

1. The models difference table as below:

Model	Difference
ACB-QCA206x	Market assignment classification for application and grade finish
ACB-QCA2066-0WI1	
ACB-QCA2066-0WX1	
ACB-QCA2066-5WI1	
ACB-QCA2066-5WX1	
ACB-QCA2066-0WI4	
ACB-QCA2066-0WX4	
ACB-QCA2066-5WI4	
ACB-QCA2066-5WX4	

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2. 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.

3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Antenna	OXFORDTEC	WANT-4DBI-SMA	-

4. 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

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

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

Channel	Frequency	Channel	Frequency
106	5530MHz	138	5690MHz
122	5610MHz	-	-

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

Channel	Frequency
114	5570MHz

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	21~28°C/ 51~69%RH	3.3 Vdc from host system	2023/07/18~ 2023/08/11	Rex Chen
Radiated Spurious Emission	966-2	21~28°C/ 51~69%RH	3.3 Vdc from host system	2023/07/01~ 2023/08/11	Rex Chen
AC power Line Conducted Emission	SR1	21~28°C/ 51~69%RH	3.3 Vdc from host system	2023/08/07~ 2023/08/11	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).

AC power Line Conducted Emission:

- Where relevant, the follow sample calculation is provided:
Result Value (dBuV) = Reading Value (dBuV) + Correction Factor (dB).
Correction Factor (dB) = Insertion loss(dB) + Cable loss(dB).
Example: Result Value (53.7dBuV) = Reading Value (35.1dBuV) + Insertion loss(18.1dB) + Cable loss(0.5dB).

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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)	OXFORDTEC	WANT-4DBI-SMA	Omni	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 omni antenna was investigated in two orthogonal (lay and stand), it was determined that stand mode was worst-case. Therefore, all final radiated testing was performed with the dipole antenna in stand mode.
- The EUT has nine types for model: ACB-QCA206x, ACB-QCA2066-0WI1, ACB-QCA2066-0WX1, ACB-QCA2066-5WI1, ACB-QCA2066-5WX1, ACB-QCA2066-0WI4, ACB-QCA2066-0WX4, ACB-QCA2066-5WI4 and ACB-QCA2066-5WX4. The worst case was ACB-QCA206x by pretest. Therefore the test data of the ACB-QCA206x was recorded in this report only.
- 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).

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		OFDM	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		OFDM	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		OFDM	100 to 144	100, 116, 140, 144	MCS0 Nss1
	802.11ax40			102 to 142	102, 110, 134, 142	MCS0 Nss1
	802.11ax80			106, 122, 138	106, 122, 138	MCS0 Nss1
	802.11ax160			114	114	MCS0 Nss1
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11ax20		OFDM	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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Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
Radiated Emissions (Below 1GHz)	802.11a	5745-5825	OFDM	149 to 165	165	MCS0 Nss1
AC Power Line Conducted Emission	802.11a	5745-5825	OFDM	149 to 165	165	MCS0 Nss1
Antenna Port Conducted Measurement	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11ax20		OFDM	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		OFDM	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		OFDM	100 to 144	100, 116, 140, 144	MCS0 Nss1
	802.11ax40			102 to 142	102, 110, 134, 142	MCS0 Nss1
	802.11ax80			106, 122, 138	106, 122, 138	MCS0 Nss1
	802.11ax160			114	114	MCS0 Nss1
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11ax20		OFDM	149 to 165	149, 157, 165	MCS0 Nss1
	802.11ax40			151 to 159	151, 159	MCS0 Nss1
	802.11ax80			155	155	MCS0 Nss1

Simultaneously transmission condition:

Condition	Technology	
1	BT-EDR	WLAN (5GHz)
2	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	1.965	1.998	0.9835	N/A	10Hz
802.11ax(HE20)	5.344	5.376	0.9940	N/A	10Hz
802.11ax(HE40)	4.770	4.818	0.9900	N/A	10Hz
802.11ax(HE80)	2.512	2.576	0.9752	0.11	510Hz
802.11ax(HE160)	2.208	2.226	0.9919	N/A	10Hz

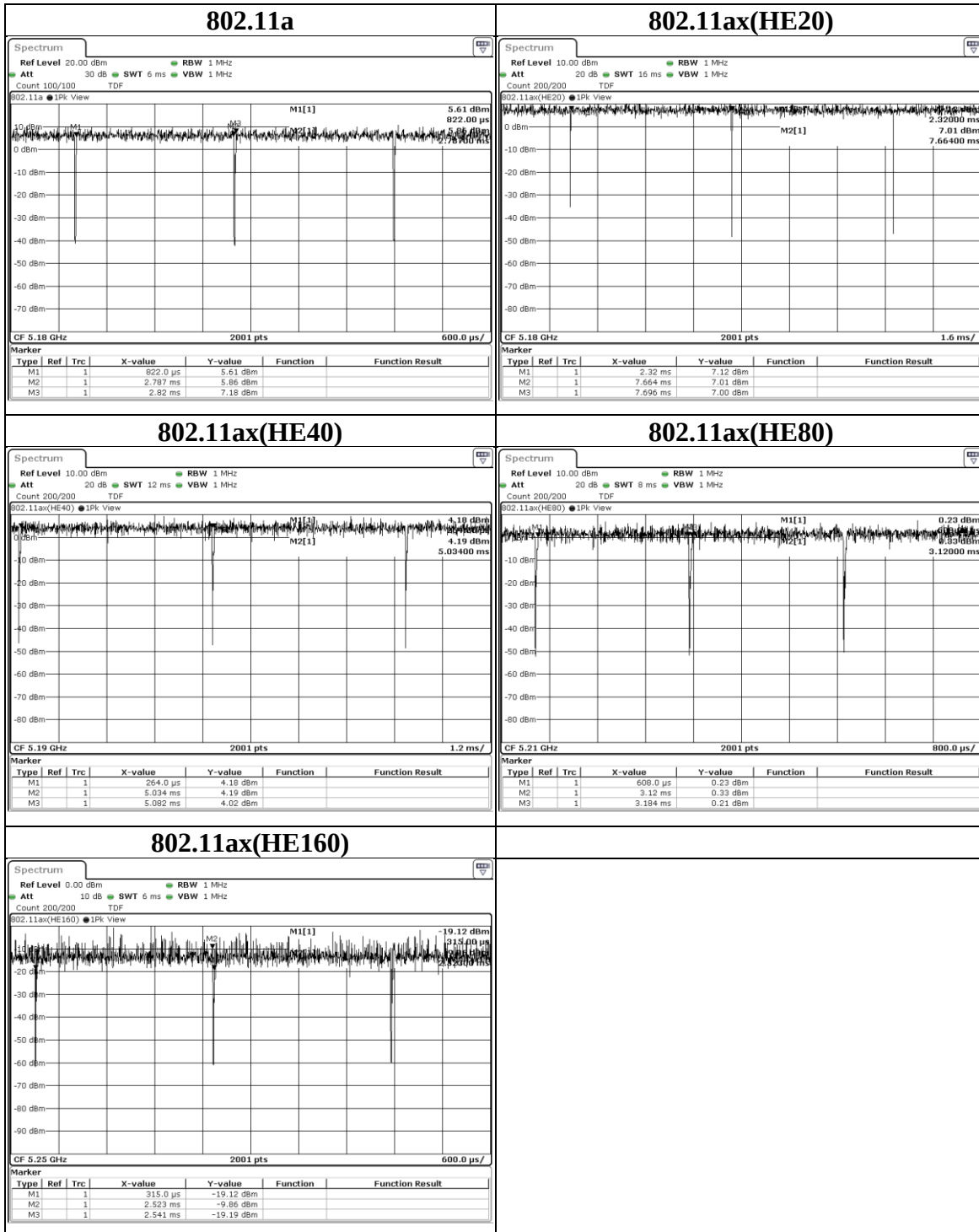
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7. Test Equipment

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

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Test Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired date
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
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2022/11/10	2023/11/9
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2023/5/24	2024/5/23
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2022/8/30	2023/8/29
Cables	TITAN	CFD200	T0732ACFD200 20A300-2	2023/5/23	2024/5/22

UL Software		
Description	Name	Version
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF-Conducted-FCC 15407	ver 1.1
AC power Line Conducted Emission	EZ_EMG	UL-3A1.2

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8. Description of Test Setup

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Test Tool	NA	NA	NA	Supplied by client
B	Monitor	Dell	SE2417HG	NA	Provide by lab
C	Computer	Intel	Intel(R) Core(TW) i7-4790 CPU @ 3.60GHz	NA	Supplied by client
D	Keyboard	Dell	KB216t	NA	Provide by lab
E	Mouse	Dell	MS116p	NA	Provide by lab

I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	HDMI Cable	EATON	P568010	1.44	Provide by lab with one core
2	Fiber Cable	NA	NA	0.5	Supplied by client

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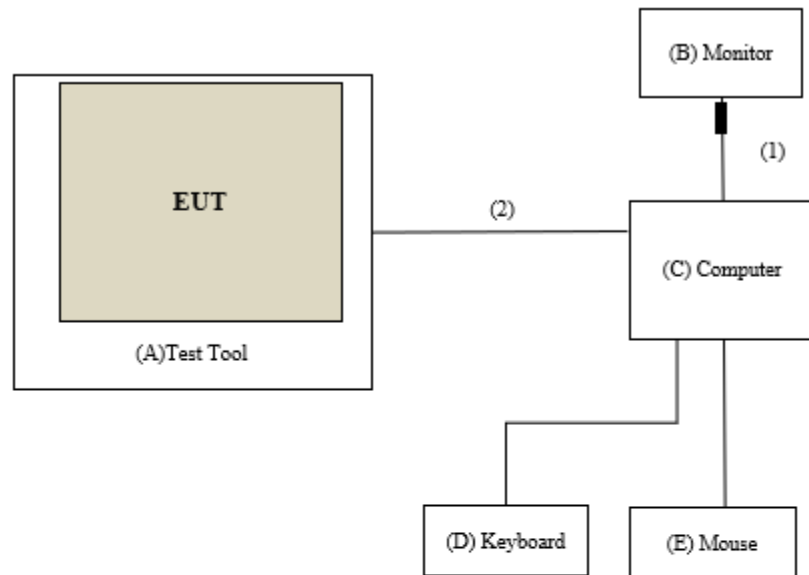
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Test Setup

Controlled using a bespoke application (QSPR Version 5.0-00202) 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



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9. Test Results

9.1. 6dB Bandwidth

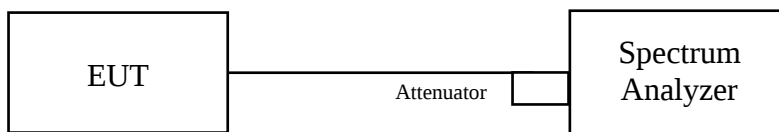
Requirements

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 test spectrum plot only presents the worst-case value.

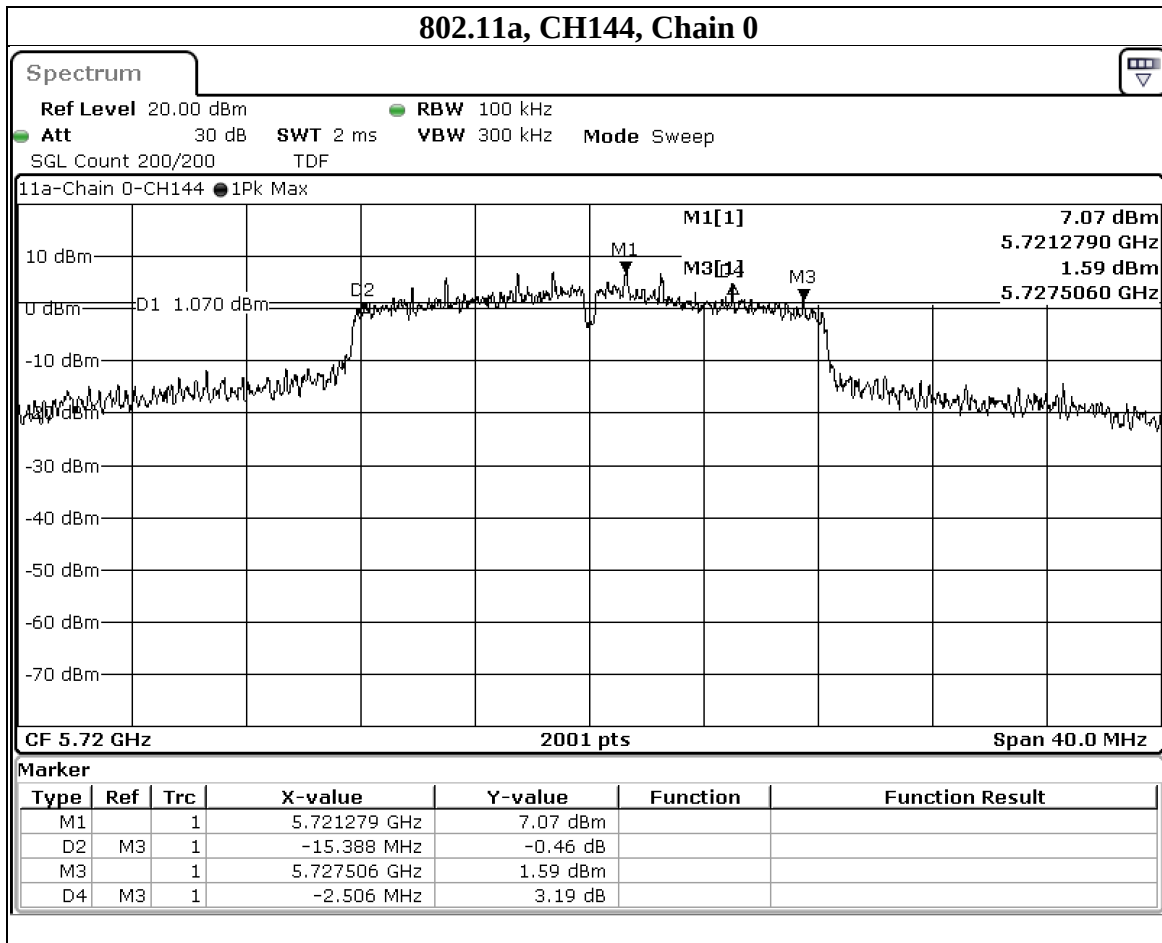
Test Setup



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	12.882	12.242	0.5	PASS
	144 (U-NII-2C+U-NII-3)	5720	15.388	14.82	0.5	PASS
	144 (U-NII-3)	5720	2.506	2.578	0.5	PASS
	149	5745	15.073	15.127	0.5	PASS
	157	5785	15.04	15.121	0.5	PASS
	165	5825	11.921	14.107	0.5	PASS



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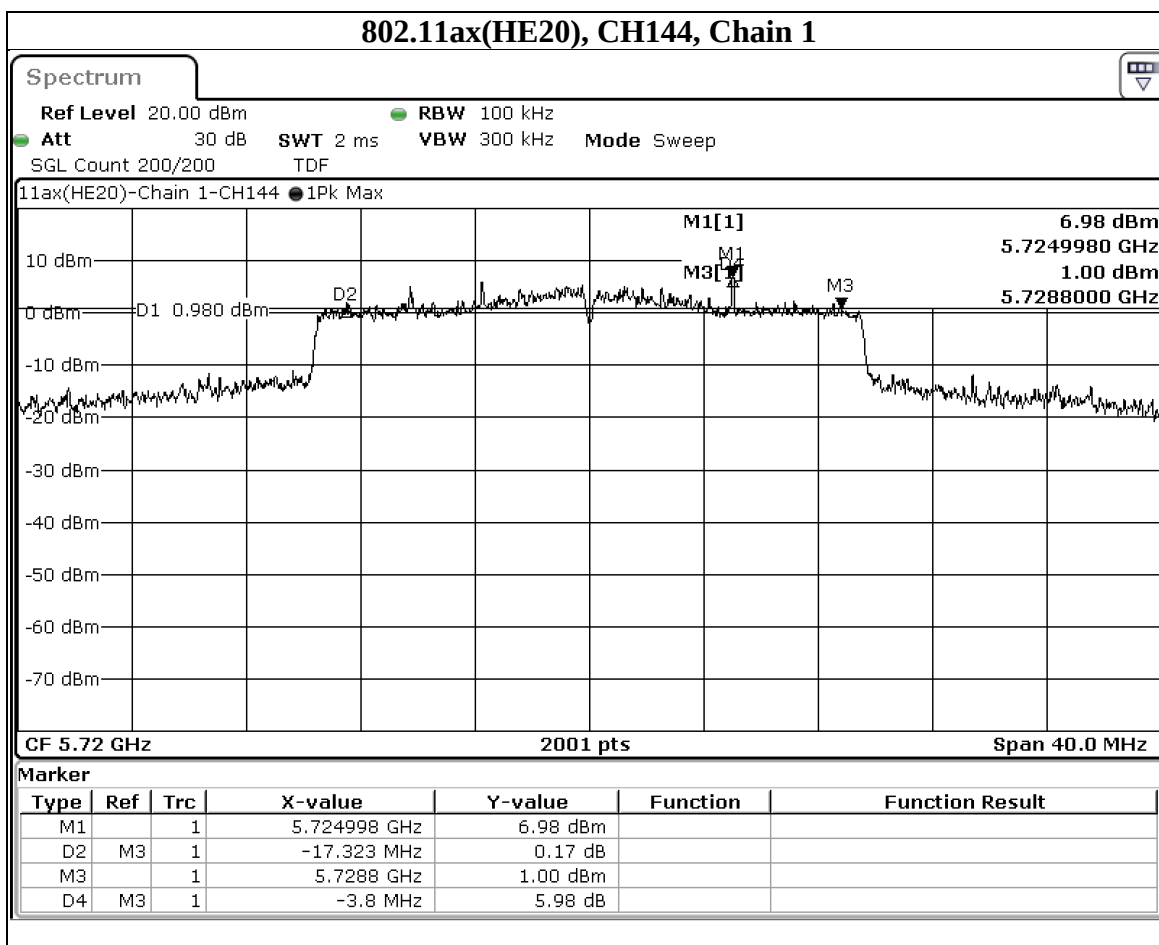
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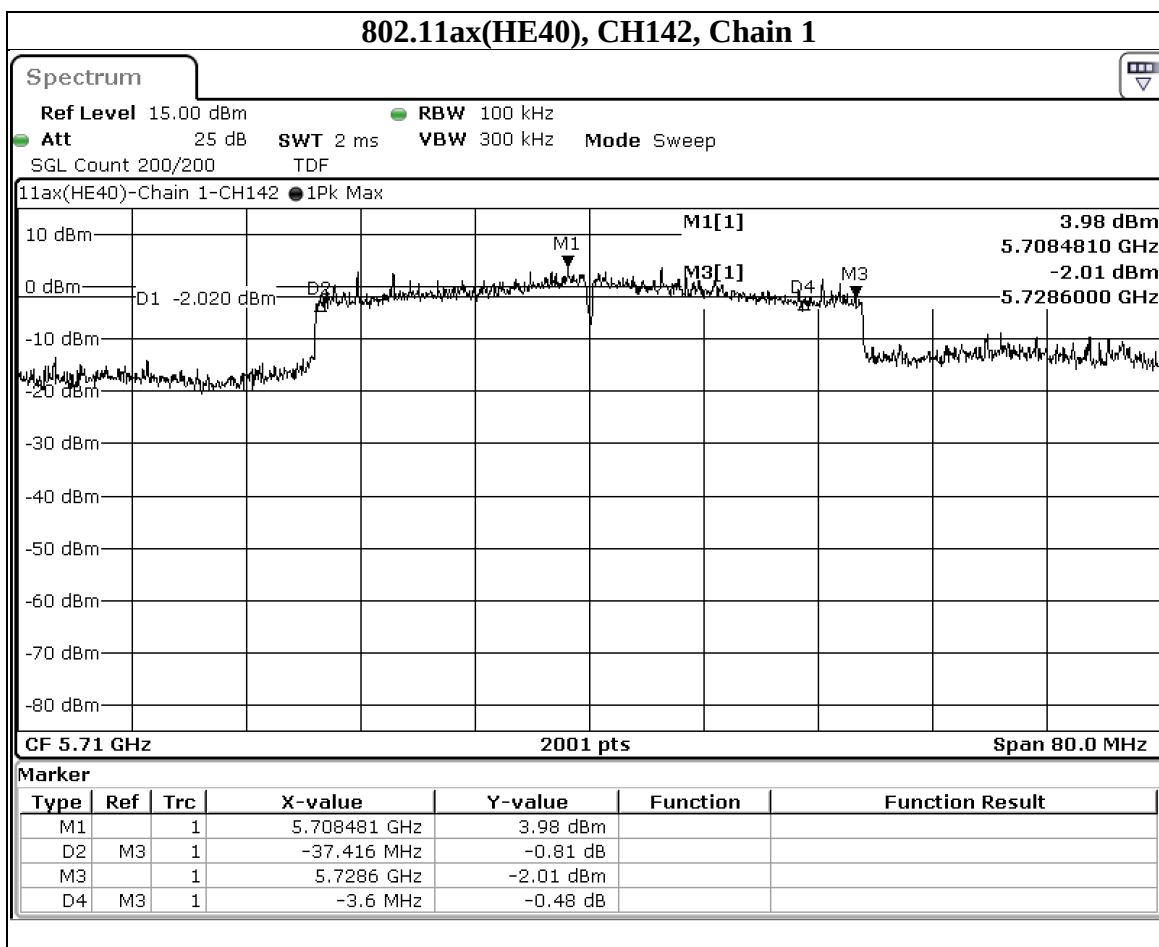
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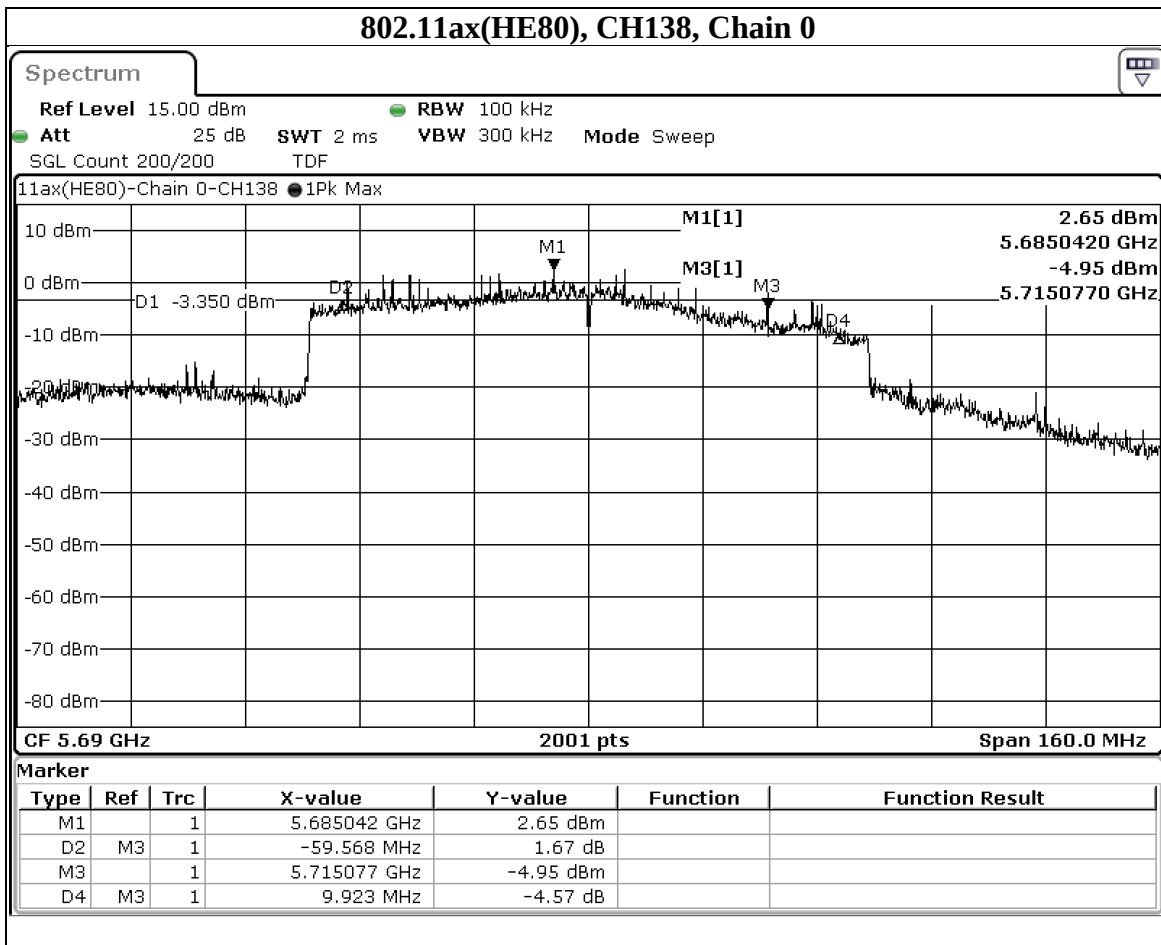
Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE20)	144 (U-NII-2C)	5720	14.264	13.523	0.5	PASS
	144 (U-NII-2C+U-NII-3)	5720	18.468	17.323	0.5	PASS
	144 (U-NII-3)	5720	4.204	3.8	0.5	PASS
	149	5745	15.068	12.658	0.5	PASS
	157	5785	15.15	13.469	0.5	PASS
	165	5825	18.4	17.413	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	34.035	33.816	0.5	PASS
	142 (U-NII-2C+U-NII-3)	5710	30.396	37.416	0.5	PASS
	142 (U-NII-3)	5710	3.639	3.6	0.5	PASS
	151	5755	37.695	34.385	0.5	PASS
	159	5795	32.971	32.636	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	69.491	66.296	0.5	PASS
	138 (U-NII-2C+U-NII-3)	5690	59.568	56.373	0.5	PASS
	138 (U-NII-3)	5690	9.923	9.923	0.5	PASS
	155	5775	52.658	60.155	0.5	PASS

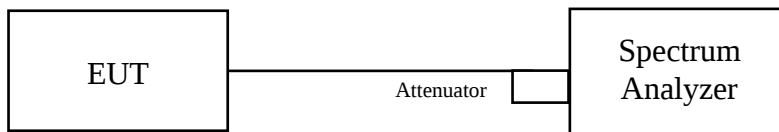


9.2. 26dB Bandwidth

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 test spectrum plot only presents the worst-case value.

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	18.58	19.341	N/A	PASS
	44	5220	19.476	18.989	N/A	PASS
	48	5240	22.363	19.266	N/A	PASS
	52	5260	21.639	26.612	N/A	PASS
	60	5300	18.573	18.588	N/A	PASS
	64	5320	18.763	18.985	N/A	PASS
	100	5500	19.354	19.485	N/A	PASS
	116	5580	32.617	42.002	N/A	PASS
	140	5700	19.573	19.214	N/A	PASS
	144 (U-NII-2C)	5720	27.561	26.951	N/A	PASS
	144 (U-NII-2C+U-NII-3)	5720	48.663	46.226	N/A	PASS
	144 (U-NII-3)	5720	21.102	19.275	N/A	PASS

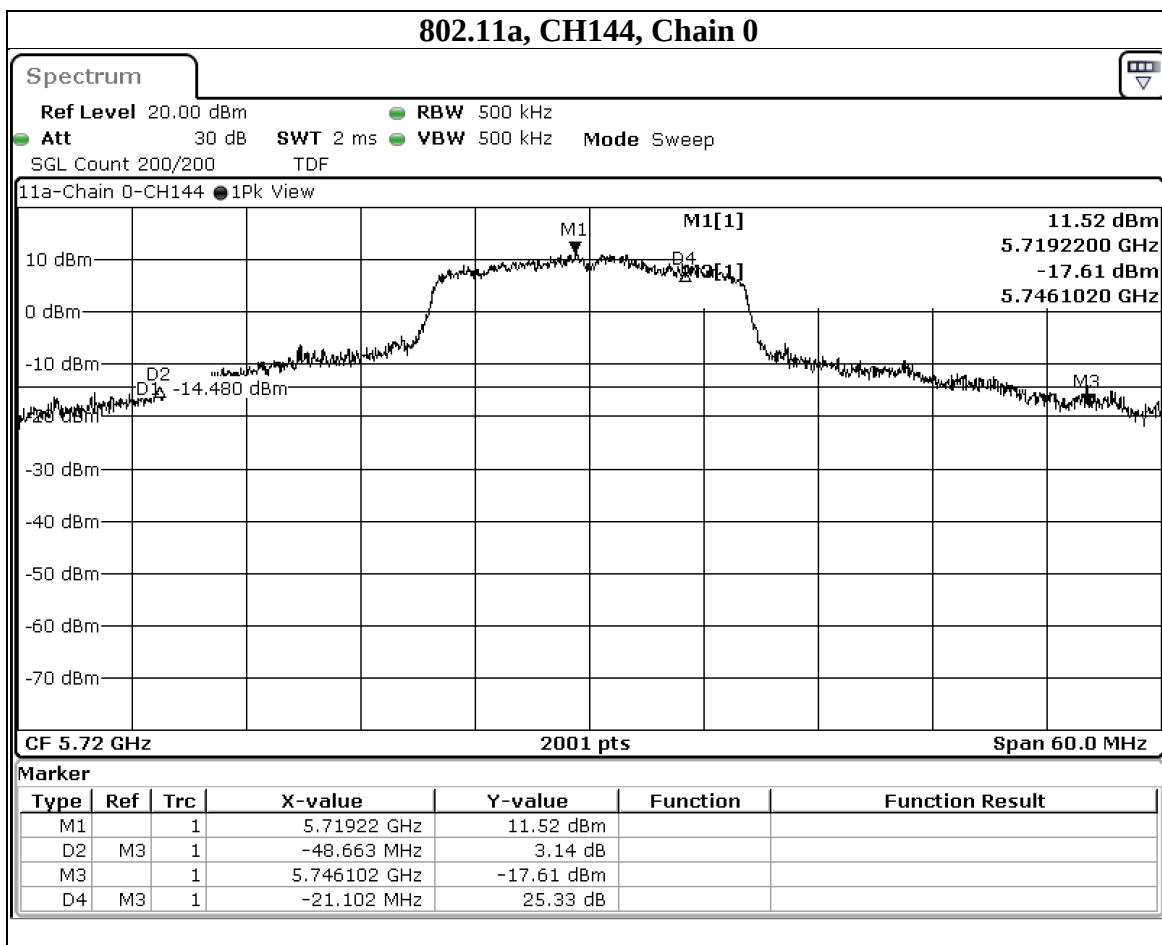
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Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE20)	36	5180	20.635	21.727	N/A	PASS
	44	5220	20.751	20.695	N/A	PASS
	48	5240	23.326	22.746	N/A	PASS
	52	5260	20.557	20.941	N/A	PASS
	60	5300	20.501	20.684	N/A	PASS
	64	5320	21.01	20.8	N/A	PASS
	100	5500	20.574	20.991	N/A	PASS
	116	5580	36.048	44.643	N/A	PASS
	140	5700	20.714	20.936	N/A	PASS
	144 (U-NII-2C)	5720	27.572	28.266	N/A	PASS
	144 (U-NII-2C+U-NII-3)	5720	46.292	46.69	N/A	PASS
	144 (U-NII-3)	5720	18.72	18.424	N/A	PASS

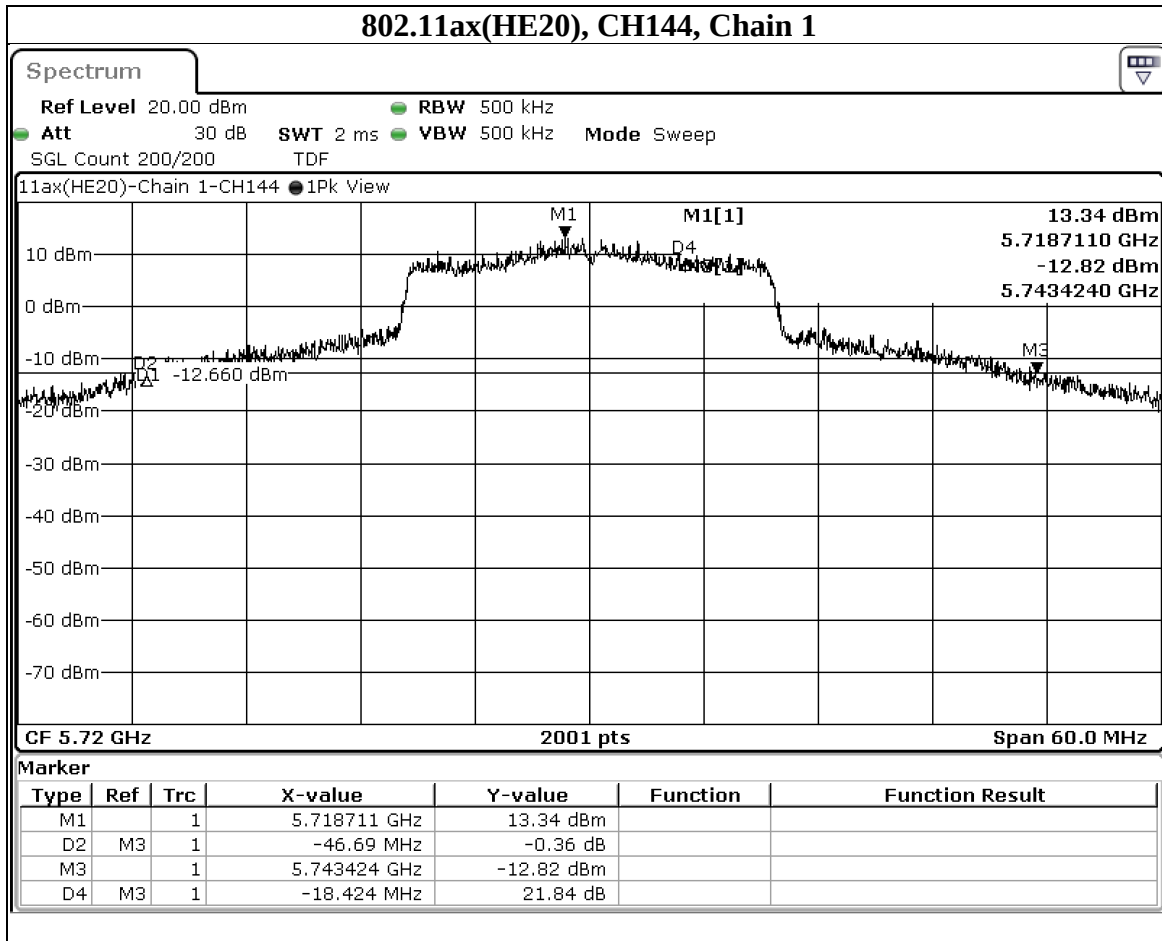
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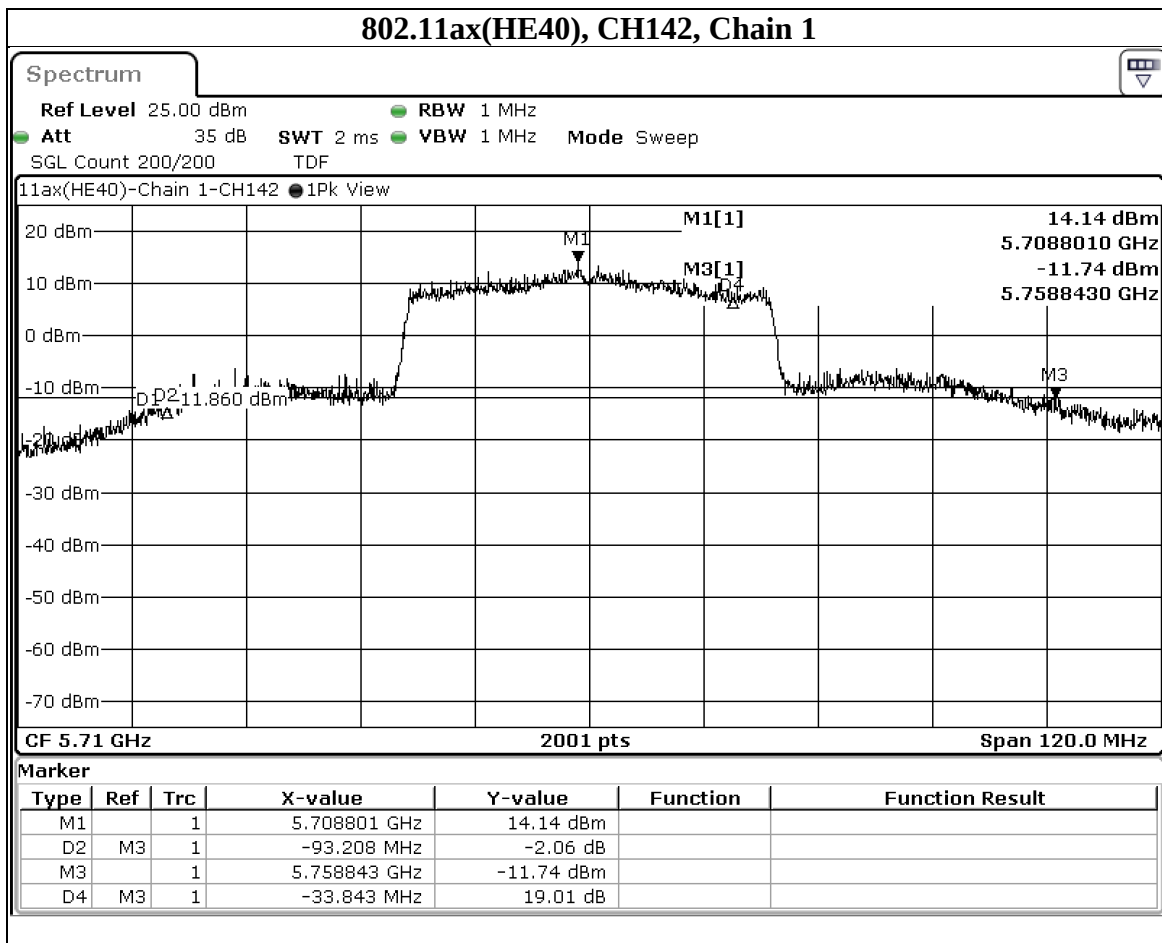
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Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE40)	38	5190	39.936	40.403	N/A	PASS
	46	5230	40.568	40.372	N/A	PASS
	54	5270	40.221	40.636	N/A	PASS
	62	5310	40.058	40.188	N/A	PASS
	102	5510	40.162	40.119	N/A	PASS
	110	5550	40.444	40.901	N/A	PASS
	134	5670	40.353	40.305	N/A	PASS
	142 (U-NII-2C)	5710	58.803	59.365	N/A	PASS
	142 (U-NII-2C+U-NII-3)	5710	88.455	93.208	N/A	PASS
	142 (U-NII-3)	5710	29.652	33.843	N/A	PASS



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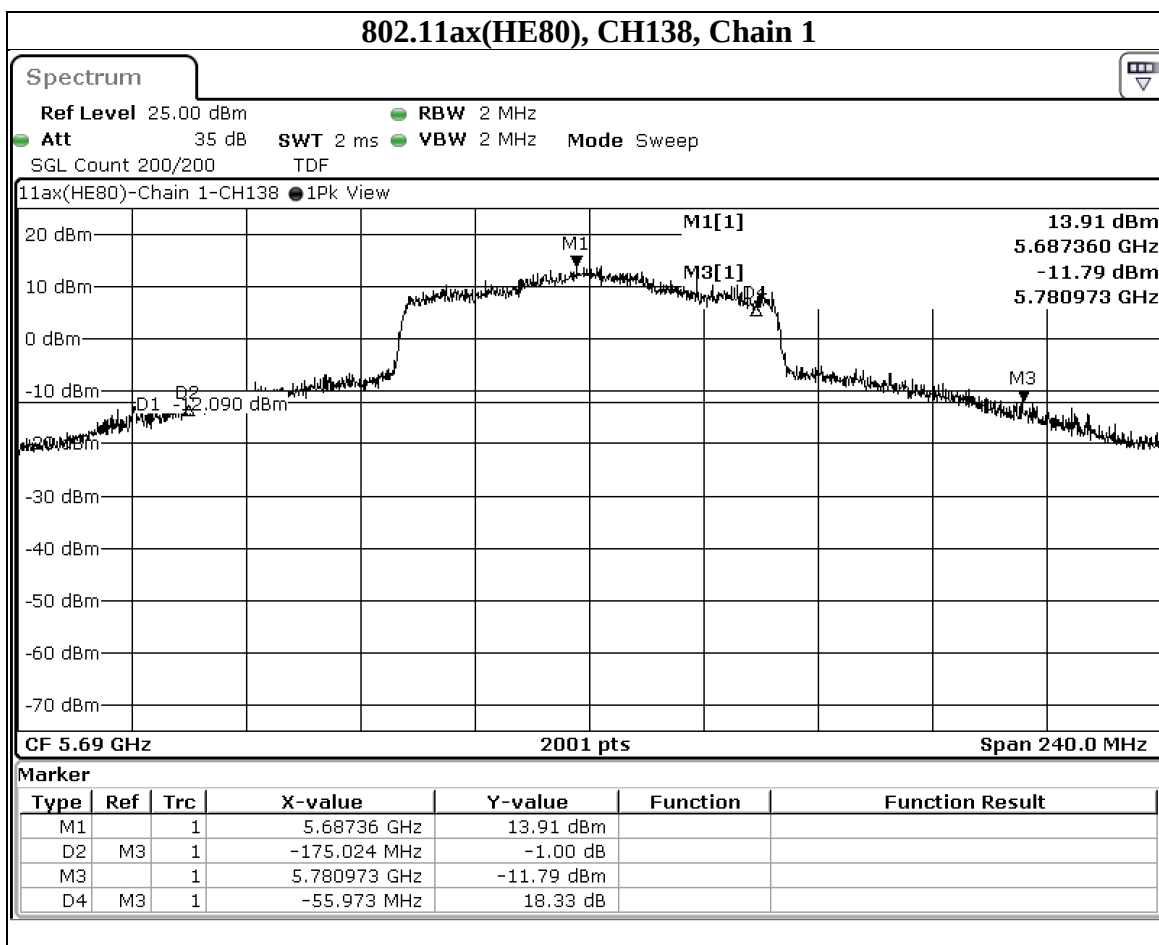
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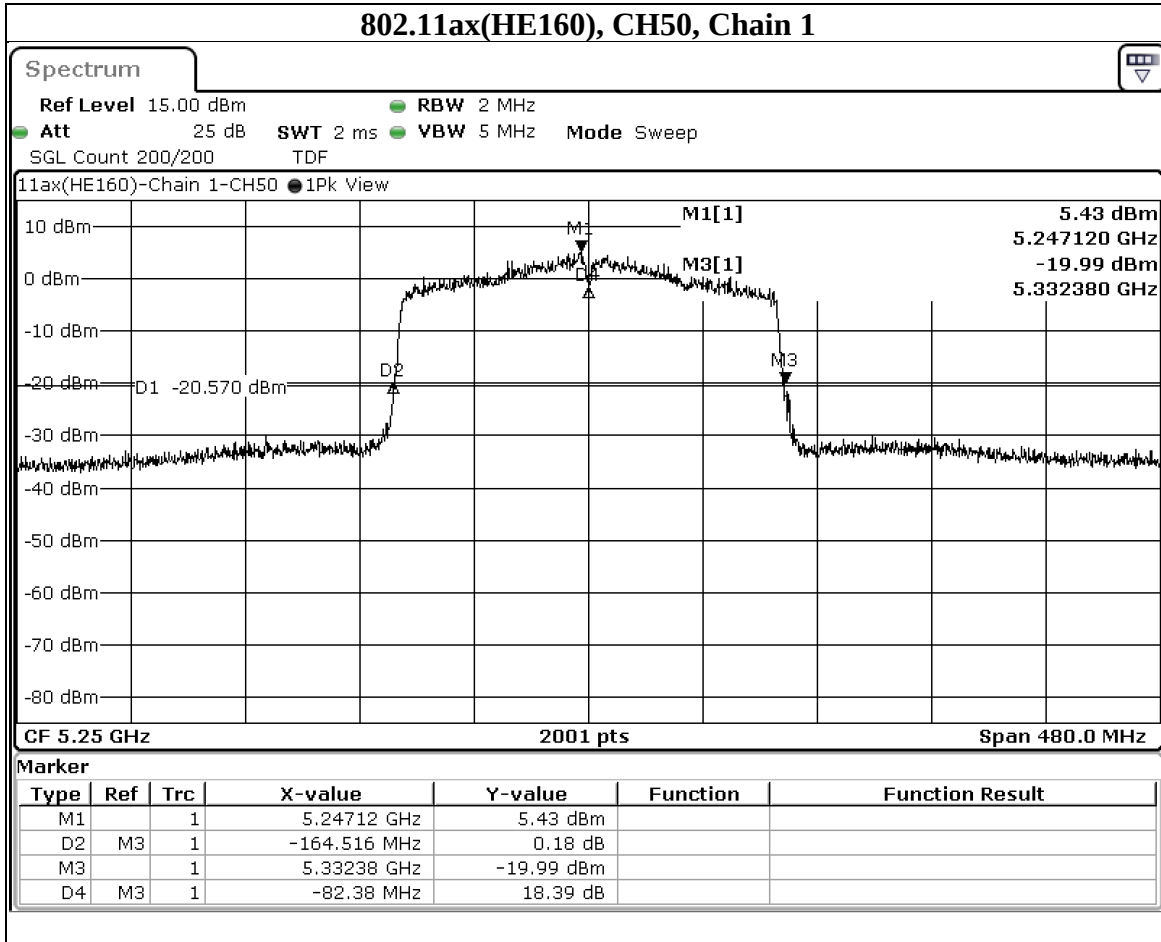
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Doc No: Form-ULID-004739 (DCS:17-EM-F0878) / 6.1

Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE80)	42	5210	81.753	81.608	N/A	PASS
	58	5290	81.39	81.337	N/A	PASS
	106	5530	81.677	80.507	N/A	PASS
	122	5610	81.91	96.261	N/A	PASS
	138 (U-NII-2C)	5690	131.659	119.051	N/A	PASS
	138 (U-NII-2C+U-NII-3)	5690	168.48	175.024	N/A	PASS
	138 (U-NII-3)	5690	36.821	55.973	N/A	PASS



Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE160)	50 (U-NII-1)	5250	163.539	164.516	N/A	PASS
	114	5570	163.395	164.161	N/A	PASS

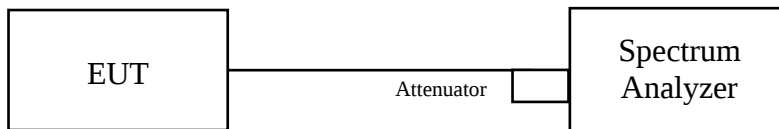


9.3. Occupied Bandwidth

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 test spectrum plot only presents the worst-case value.

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	16.529	16.545	N/A	PASS
	44	5220	16.562	16.488	N/A	PASS
	48	5240	16.795	16.507	N/A	PASS
	52	5260	16.67	16.842	N/A	PASS
	60	5300	16.488	16.529	N/A	PASS
	64	5320	16.541	16.524	N/A	PASS
	100	5500	16.612	16.555	N/A	PASS
	116	5580	18.057	26.639	N/A	PASS
	140	5700	16.547	16.486	N/A	PASS
	144 (U-NII-2C)	5720	20.027	20.796	N/A	PASS
	144 (U-NII-2C+U-NII-3)	5720	29.211	32.123	N/A	PASS
	144 (U-NII-3)	5720	9.184	11.327	N/A	PASS
	149	5745	20.467	33.222	N/A	PASS
	157	5785	18.887	19.923	N/A	PASS
	165	5825	17.125	30.469	N/A	PASS

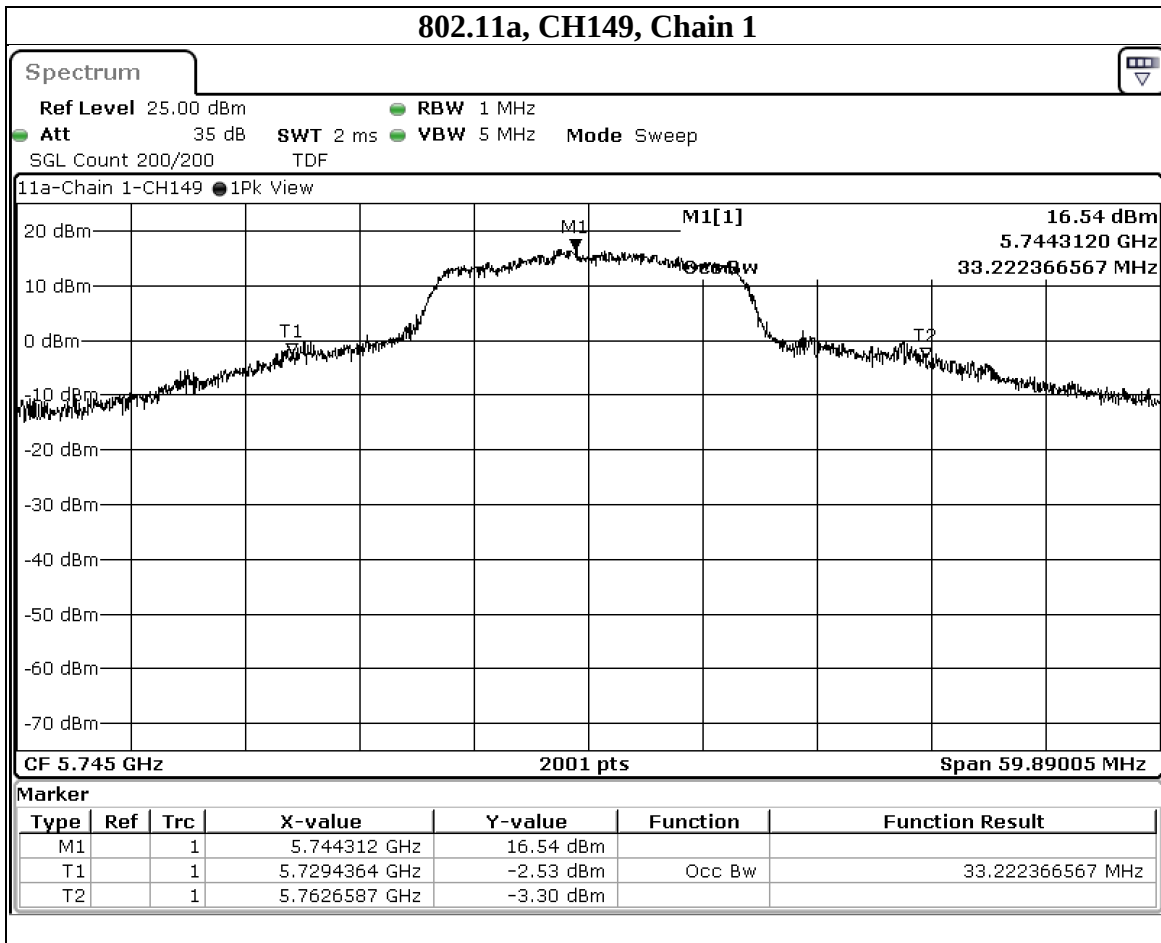
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Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE20)	36	5180	18.981	18.977	N/A	PASS
	44	5220	18.984	18.977	N/A	PASS
	48	5240	19.123	19.02	N/A	PASS
	52	5260	18.997	18.959	N/A	PASS
	60	5300	18.924	18.998	N/A	PASS
	64	5320	18.956	18.959	N/A	PASS
	100	5500	18.988	18.991	N/A	PASS
	116	5580	20.054	30.37	N/A	PASS
	140	5700	18.977	19.037	N/A	PASS
	144 (U-NII-2C)	5720	21.694	21.959	N/A	PASS
	144 (U-NII-2C+U-NII-3)	5720	34.341	34.129	N/A	PASS
	144 (U-NII-3)	5720	12.648	12.171	N/A	PASS
	149	5745	19.757	35.776	N/A	PASS
	157	5785	20.117	20.098	N/A	PASS
	165	5825	19.288	31.709	N/A	PASS

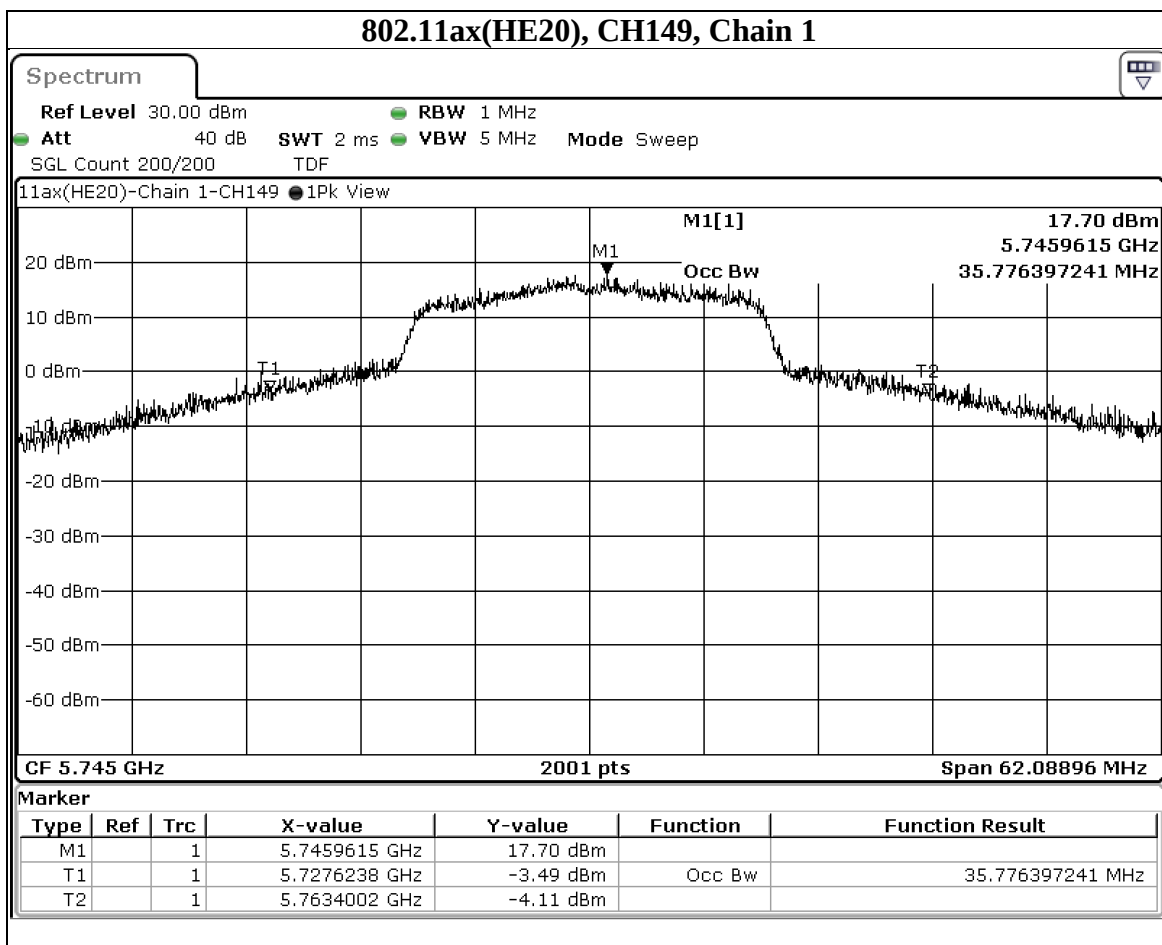
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Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE40)	38	5190	37.521	37.711	N/A	PASS
	46	5230	37.862	37.825	N/A	PASS
	54	5270	37.712	37.903	N/A	PASS
	62	5310	37.713	37.636	N/A	PASS
	102	5510	37.75	37.713	N/A	PASS
	110	5550	37.861	38.042	N/A	PASS
	134	5670	37.789	37.864	N/A	PASS
	142 (U-NII-2C)	5710	34.323	34.144	N/A	PASS
	142 (U-NII-2C+U-NII-3)	5710	39.082	39.219	N/A	PASS
	142 (U-NII-3)	5710	4.76	5.075	N/A	PASS
	151	5755	38.575	38.279	N/A	PASS
	159	5795	38.18	47.267	N/A	PASS

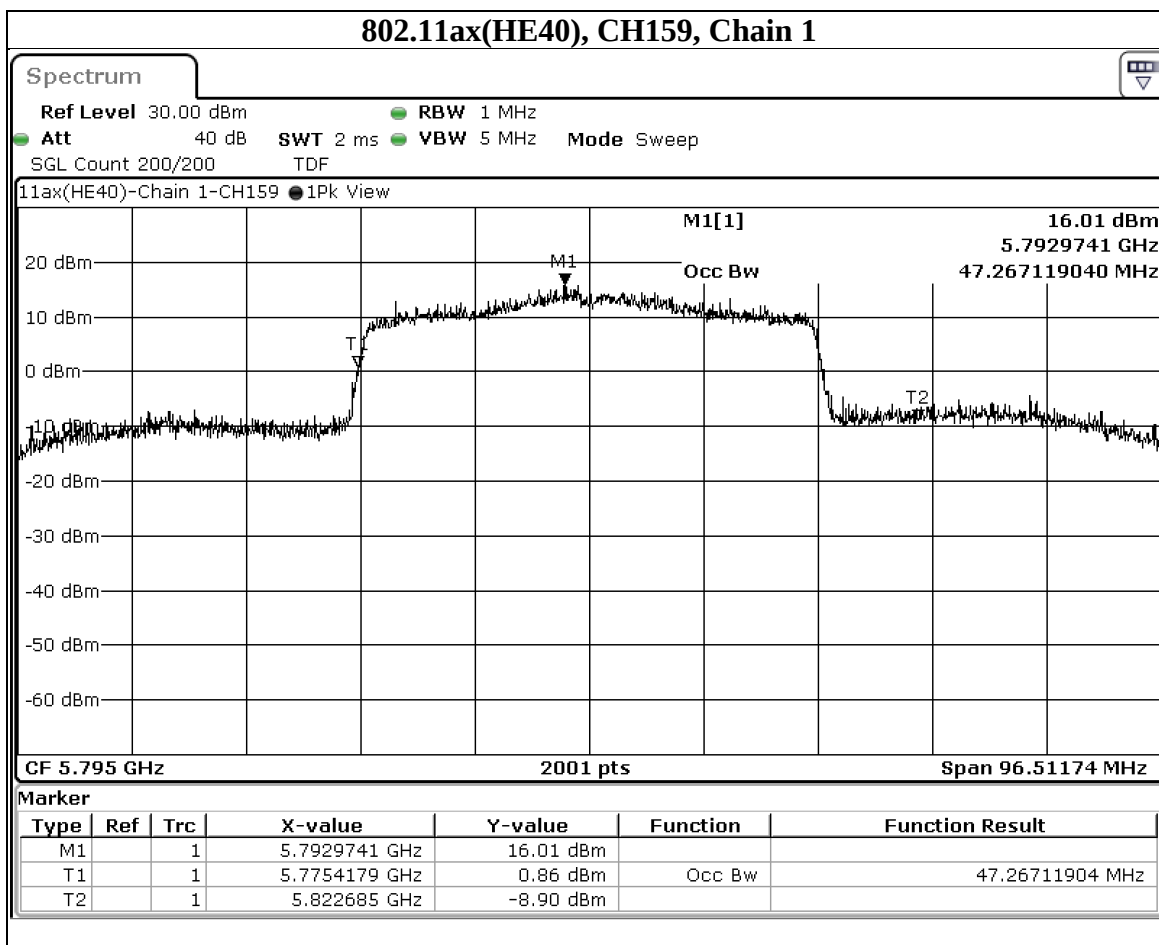
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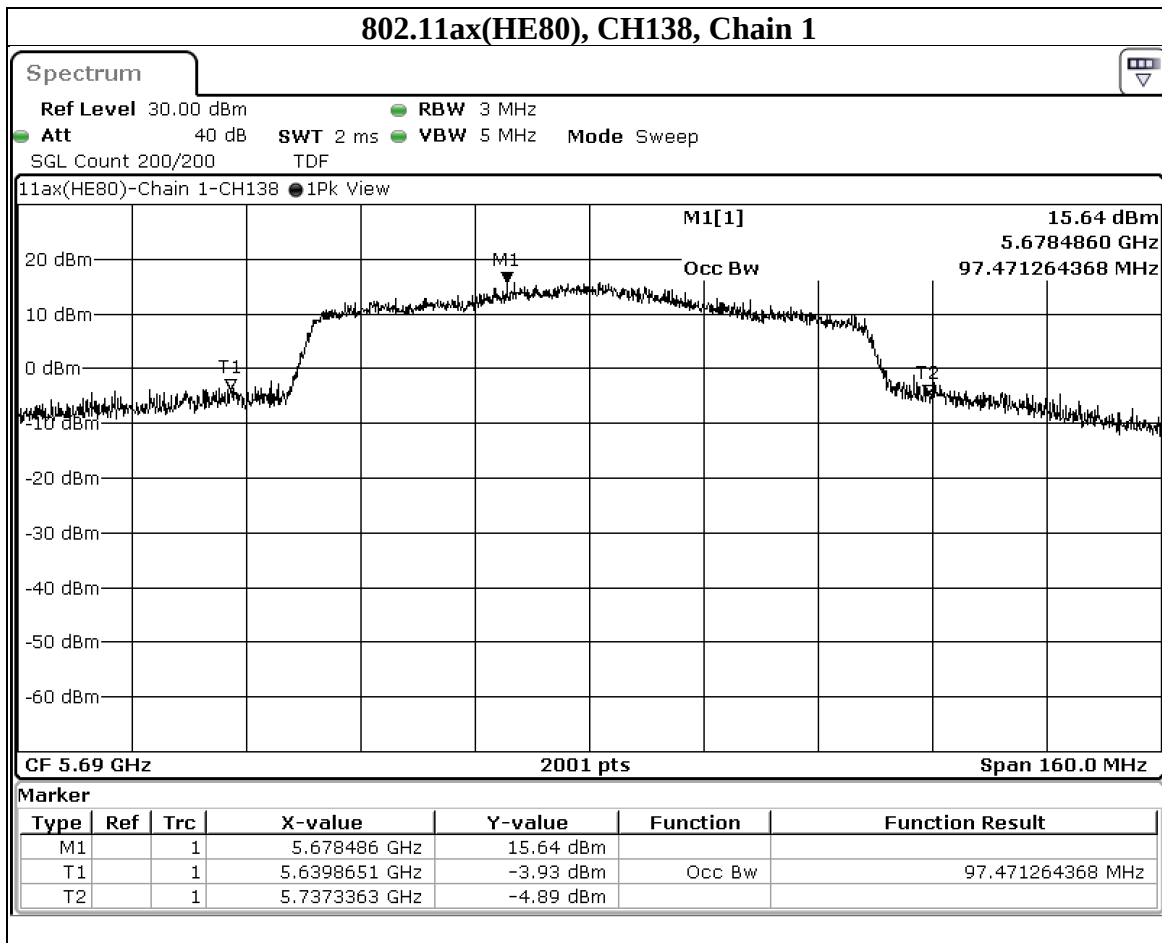
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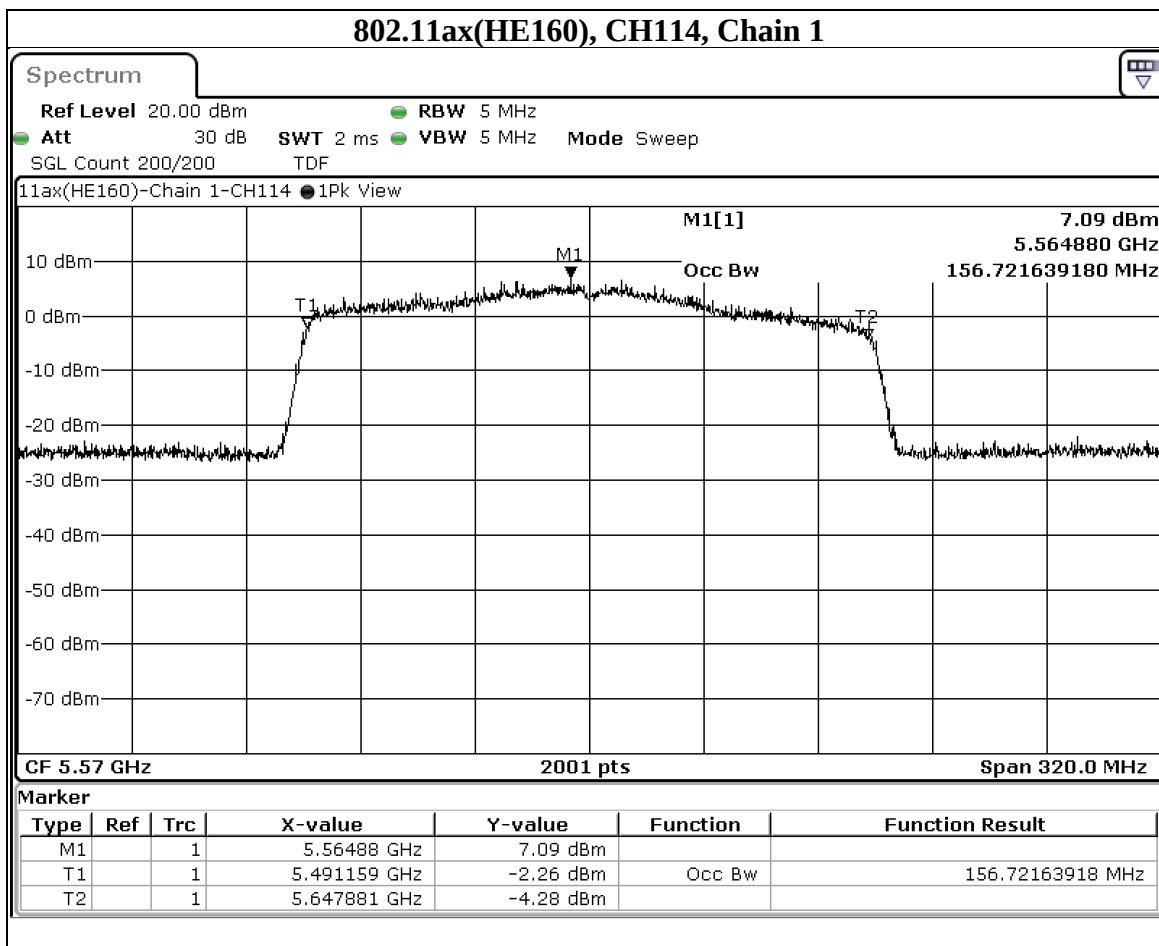
Doc No: Form-ULID-004739 (DCS:17-EM-F0878) / 6.1



Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE80)	42	5210	77.721	77.561	N/A	PASS
	58	5290	77.561	77.641	N/A	PASS
	106	5530	77.401	75.882	N/A	PASS
	122	5610	77.721	78.681	N/A	PASS
	138 (U-NII-2C)	5690	76.099	85.135	N/A	PASS
	138 (U-NII-2C+U-NII-3)	5690	79.32	97.471	N/A	PASS
	138 (U-NII-3)	5690	3.221	12.336	N/A	PASS
	155	5775	77.801	79.56	N/A	PASS



Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ax(HE160)	50 (U-NII-1)	5250	155.602	155.602	N/A	PASS
	114	5570	156.402	156.722	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 $\leq 125\text{mW}$ (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 5 dBi / 3dBi, so if it was used for TxBF power measurement
Directional Gain = $10 \log[(10^{5/20} + 10^{3/20})^2 / 2]$ dBi = 7.07 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 = 5 dBi + Array Gain = 5 dBi + 0 dB = 5 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

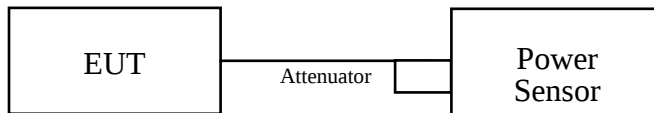
For Average Power Measurement

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

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	14.59	15.18	61.802	17.91	23.98	PASS
44	5220	14.77	15.54	65.766	18.18	23.98	PASS
48	5240	14.67	15.45	64.417	18.09	23.98	PASS
52	5260	16.06	16.00	80.168	19.04	23.98	PASS
60	5300	15.94	15.97	78.886	18.97	23.68	PASS
64	5320	15.91	15.89	77.804	18.91	23.73	PASS
100	5500	17.10	17.74	110.662	20.44	23.86	PASS
116	5580	18.51	18.56	142.889	21.55	23.98	PASS
140	5700	16.67	16.07	86.896	19.39	23.83	PASS
144*	5720	18.85	19.18	159.588	22.03	23.98	PASS
144 (U-NII-2c Band)	5720	16.38	16.84	91.833	19.63	23.98	PASS
144 (U-NII-3 Band)	5720	15.22	15.38	67.764	18.31	30	PASS
149	5745	19.74	19.75	188.799	22.76	30	PASS
157	5785	20.01	19.91	198.153	22.97	30	PASS
165	5825	19.64	20.53	205.116	23.12	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	14.90	15.45	65.917	18.19	23.98	PASS
44	5220	14.62	15.49	64.417	18.09	23.98	PASS
48	5240	14.85	15.33	64.714	18.11	23.98	PASS
52	5260	15.90	15.87	77.625	18.90	23.98	PASS
60	5300	15.71	15.76	74.989	18.75	23.98	PASS
64	5320	15.83	15.76	76.033	18.81	23.98	PASS
100	5500	15.96	16.69	86.099	19.35	23.98	PASS
116	5580	18.30	18.26	134.586	21.29	23.98	PASS
140	5700	16.48	16.04	84.723	19.28	23.98	PASS
144*	5720	18.51	19.13	152.757	21.84	23.98	PASS
144 (U-NII-2c Band)	5720	16.26	16.95	91.833	19.63	23.98	PASS
144 (U-NII-3 Band)	5720	14.58	15.09	60.954	17.85	30	PASS
149	5745	19.79	19.45	183.231	22.63	30	PASS
157	5785	19.81	19.66	188.365	22.75	30	PASS
165	5825	19.48	20.39	198.153	22.97	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	15.19	15.78	70.958	18.51	23.98	PASS
46	5230	15.71	16.38	80.724	19.07	23.98	PASS
54	5270	16.04	16.06	80.538	19.06	23.98	PASS
62	5310	14.99	15.27	65.163	18.14	23.98	PASS
102	5510	14.33	15.01	58.749	17.69	23.98	PASS
110	5550	17.66	18.56	130.017	21.14	23.98	PASS
134	5670	15.98	16.52	84.528	19.27	23.98	PASS
142*	5710	19.10	19.41	168.655	22.27	23.98	PASS
142 (U-NII-2c Band)	5710	16.88	17.35	103.039	20.13	23.98	PASS
142 (U-NII-3 Band)	5710	15.13	15.19	65.615	18.17	30	PASS
151	5755	19.04	19.88	177.419	22.49	30	PASS
159	5795	19.32	20.16	189.234	22.77	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.

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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	14.01	14.77	55.208	17.42	23.98	PASS
58	5290	14.68	14.98	60.814	17.84	23.98	PASS
106	5530	10.57	11.41	25.235	14.02	23.98	PASS
122	5610	15.60	15.76	73.961	18.69	23.98	PASS
138*	5690	18.74	19.19	157.761	21.98	23.98	PASS
138 (U-NII-2c Band)	5690	16.84	17.29	101.859	20.08	23.98	PASS
138 (U-NII-3 Band)	5690	14.23	14.68	55.847	17.47	30	PASS
155	5775	17.38	17.71	113.763	20.56	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 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	11.70	12.40	32.137	15.07	23.98	PASS
50 (U-NII-2c Band)	5250	8.71	9.38	16.106	12.07	23.98	PASS
50 (U-NII-3 Band)	5250	8.67	9.40	16.069	12.06	23.98	PASS
114	5570	10.07	10.50	21.38	13.30	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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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 5 dBi / 3dBi, so if it was used for power density measurement
Directional Gain = $10 \log[(10^{5/20} + 10^{3/20})^2 / 2]$ dBi = 7.07 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:

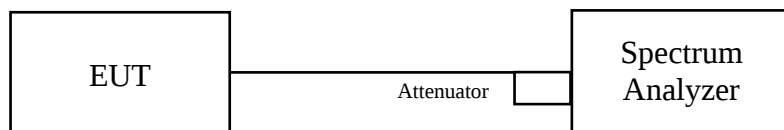
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW $\geq$ 3 RBW, Detector = RMS
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value. (if Duty cycle <98 %, add 10 log (1/duty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

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 test spectrum plot only presents the worst-case value.

Test Setup



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

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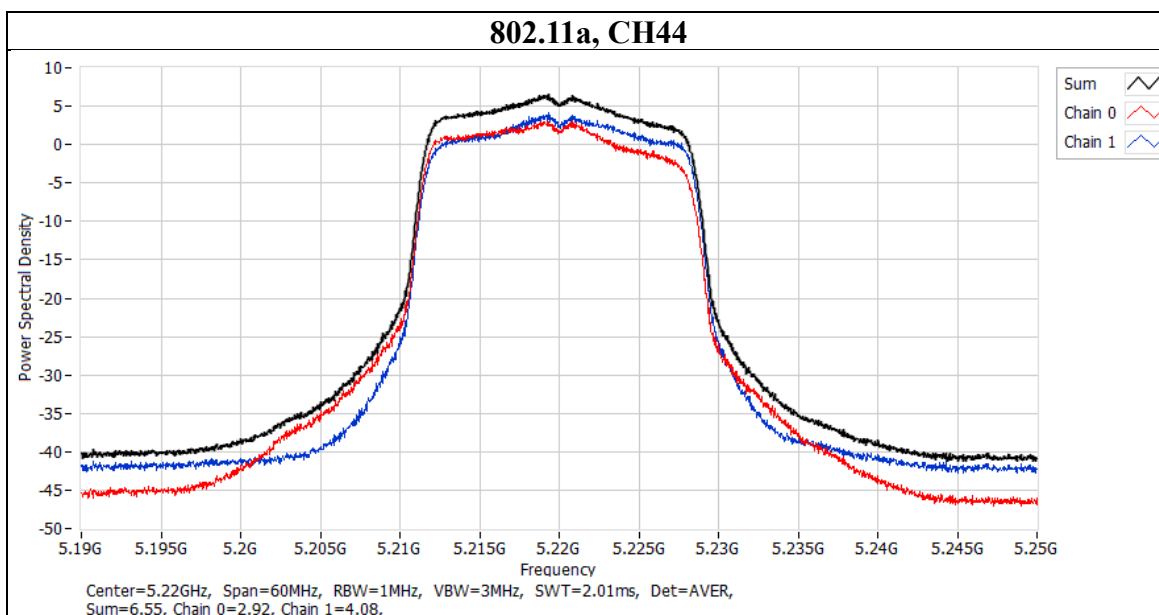
Facsimile (FAX) : +886-3-583-7948

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

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	6.21	10.19	PASS
	44	5220	6.81	6.55	10.19	PASS
	48	5240	6.81	6.41	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11a	36	5180	3.114	3.392
	44	5220	3.041	4.082
	48	5240	3.244	3.899



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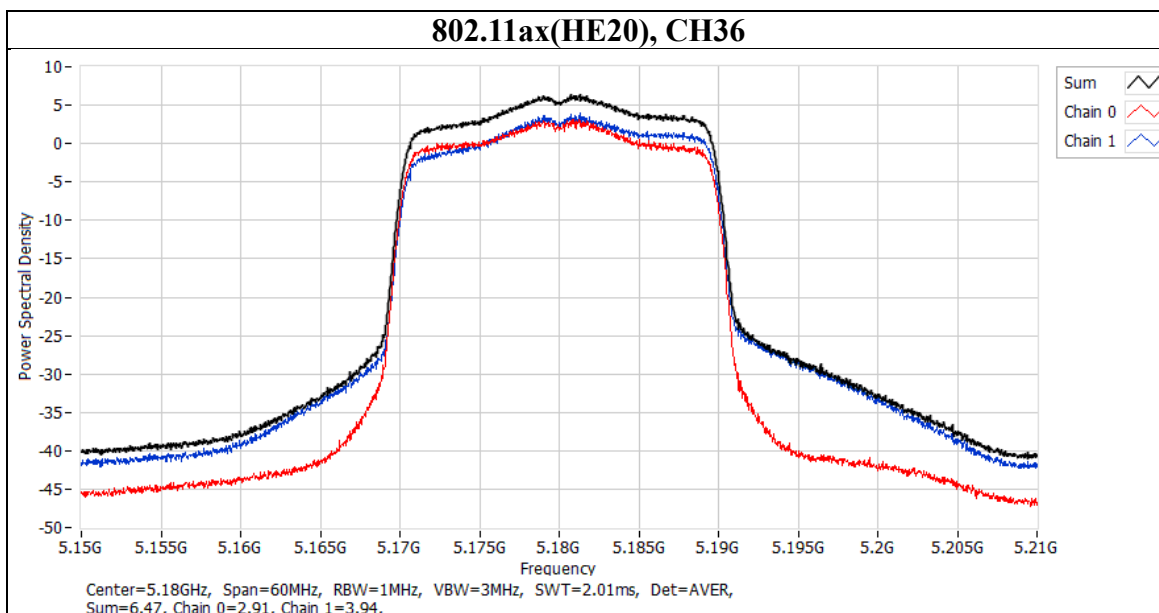
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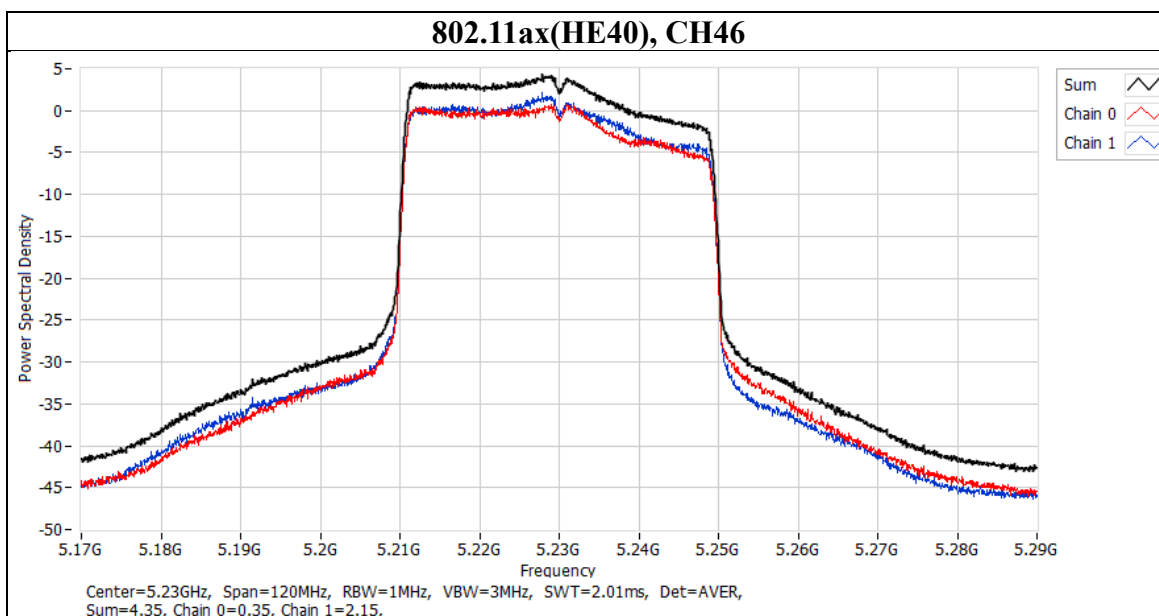
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE20)	36	5180	6.81	6.47	10.19	PASS
	44	5220	6.81	6.31	10.19	PASS
	48	5240	6.81	6.13	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE20)	36	5180	3.196	3.944
	44	5220	2.883	3.89
	48	5240	3.084	3.682



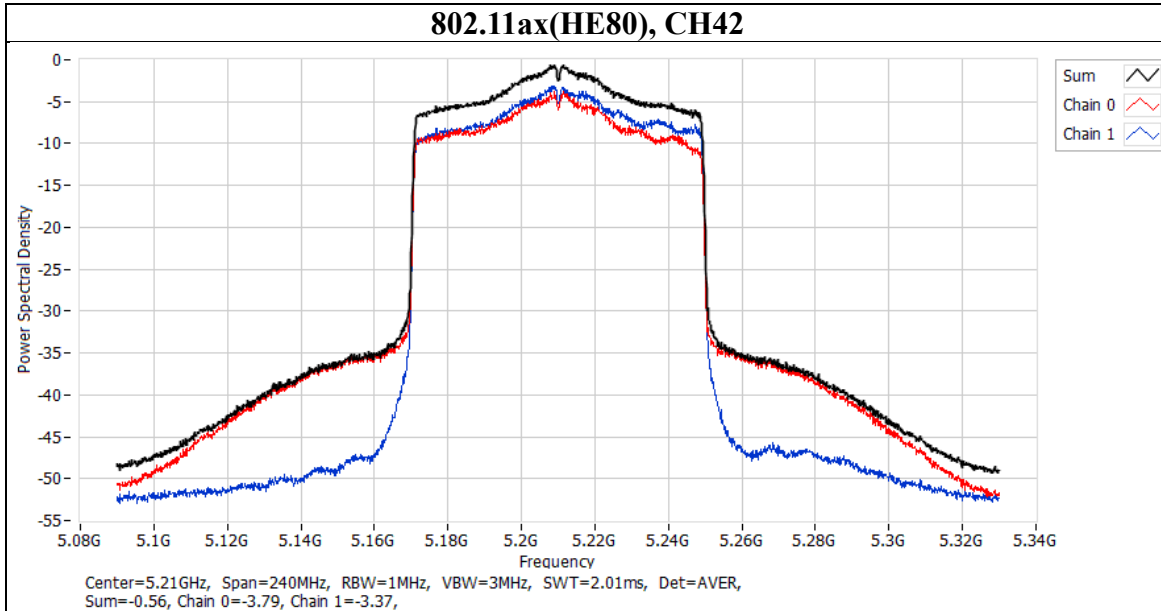
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE40)	38	5190	6.81	2.37	10.19	PASS
	46	5230	6.81	4.35	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE40)	38	5190	-0.888	-0.401
	46	5230	0.822	2.148



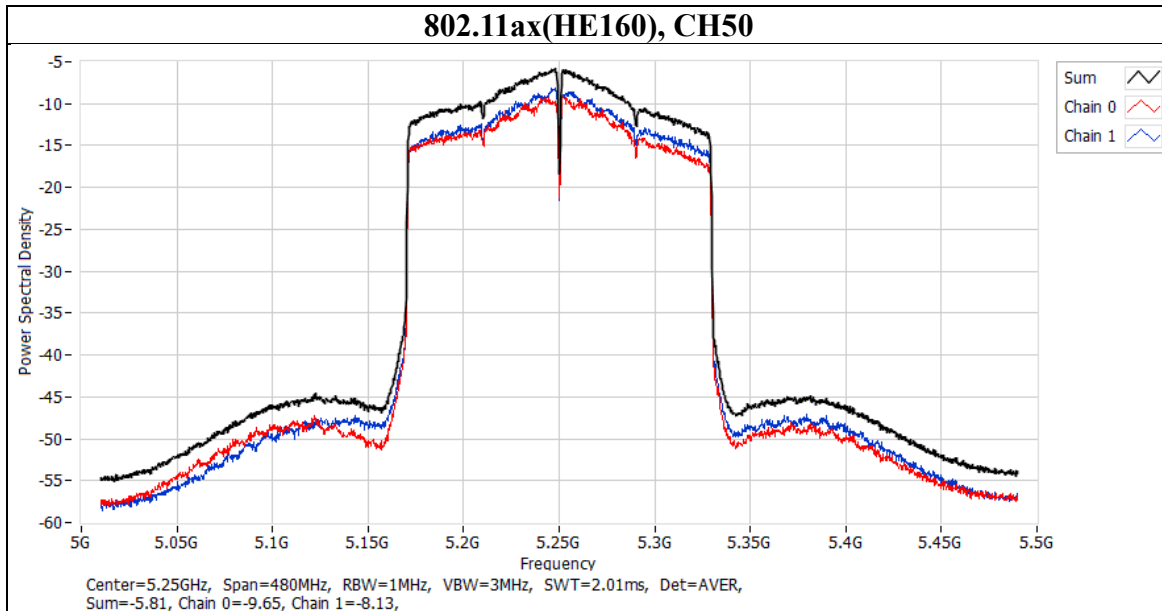
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE80)	42	5210	6.81	-0.56	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE80)	42	5210	-3.765	-3.185



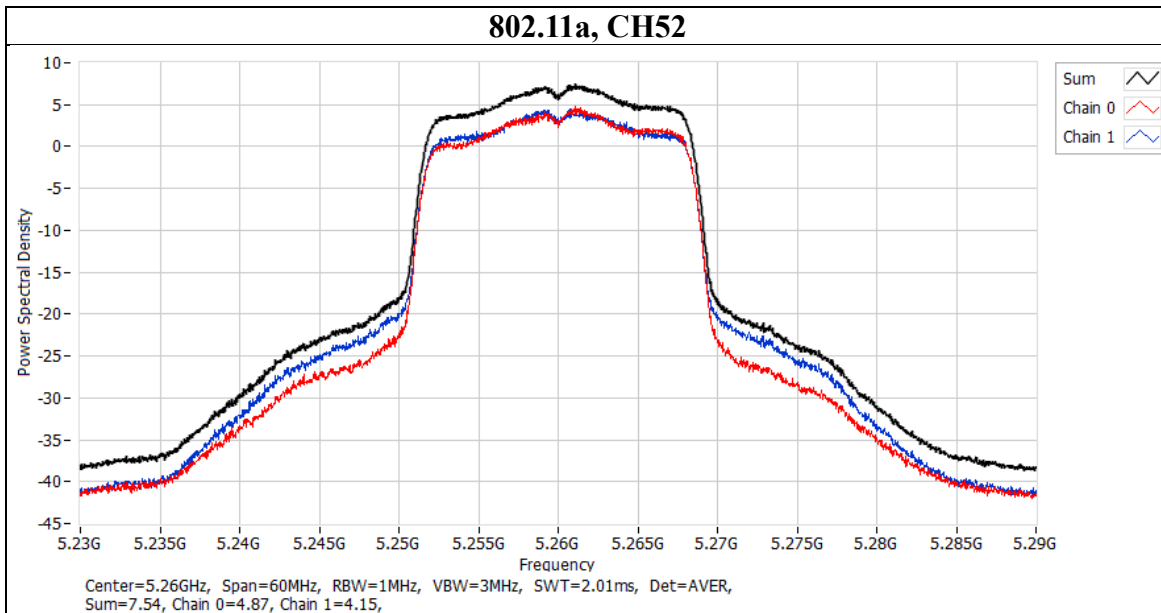
Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE160)	50	5250	6.81	-5.81	10.19	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE160)	50	5250	-9.042	-8.128



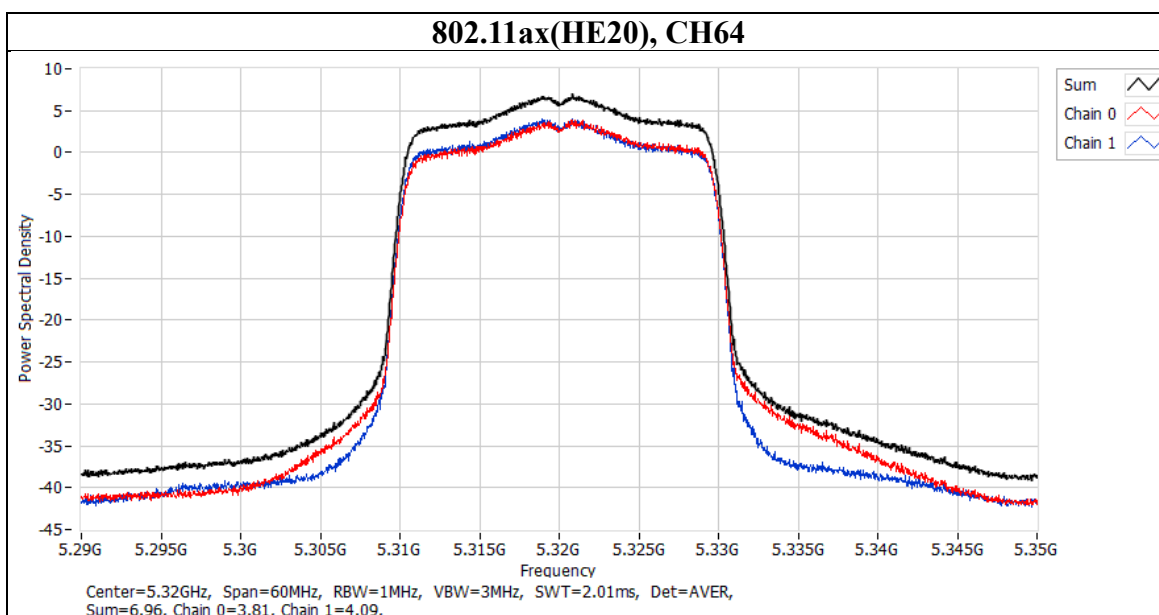
Mode (U-NII-2A)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	52	5260	6.81	7.54	10.19	PASS
	60	5300	6.81	7.11	10.19	PASS
	64	5320	6.81	7.14	10.19	PASS

Mode (U-NII-2A)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11a	52	5260	4.874	4.421
	60	5300	4.353	4.36
	64	5320	4.417	4.246



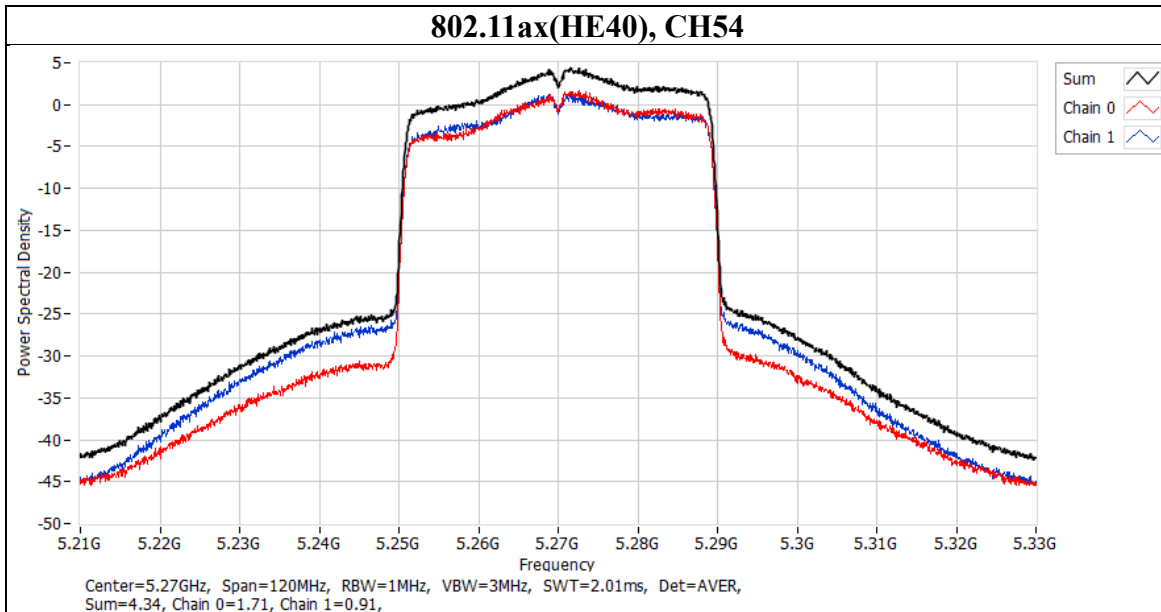
Mode (U-NII-2A)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE20)	52	5260	6.81	6.9	10.19	PASS
	60	5300	6.81	6.89	10.19	PASS
	64	5320	6.81	6.96	10.19	PASS

Mode (U-NII-2A)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE20)	52	5260	4.308	4.163
	60	5300	4.088	3.972
	64	5320	3.825	4.09



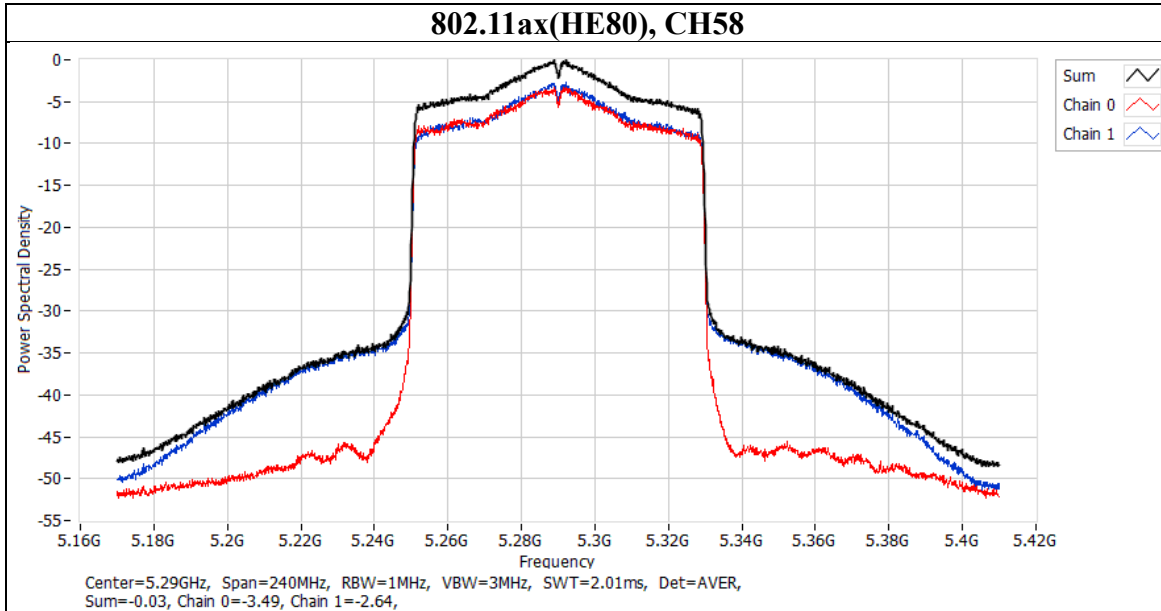
Mode (U-NII-2A)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE40)	54	5270	6.81	4.34	10.19	PASS
	62	5310	6.81	2.29	10.19	PASS

Mode (U-NII-2A)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE40)	54	5270	1.711	1.205
	62	5310	-0.922	-0.403



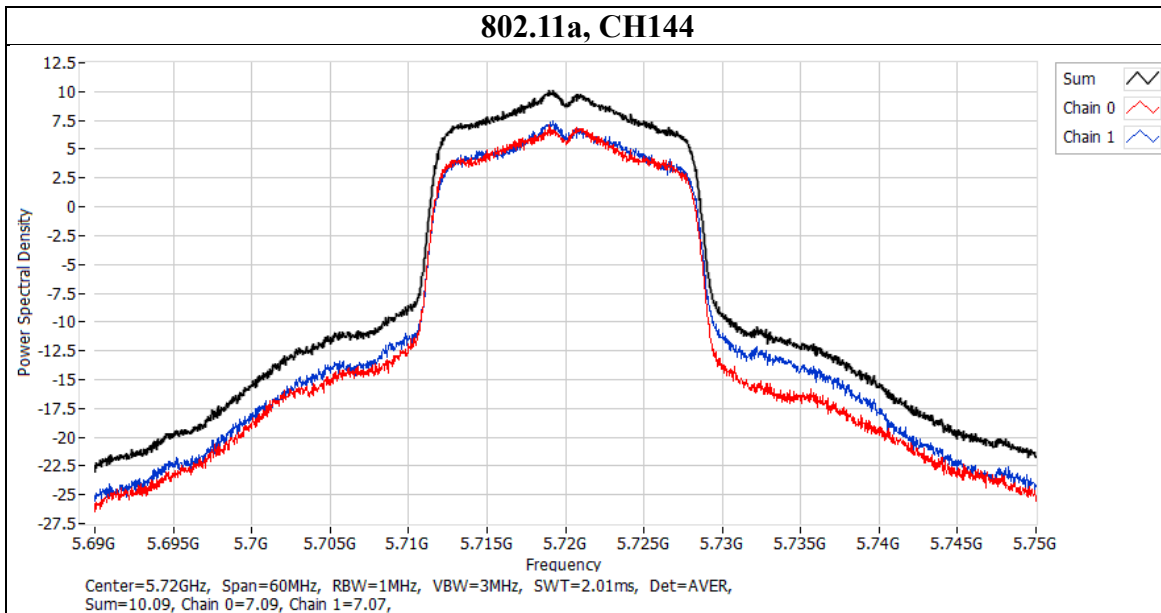
Mode (U-NII-2A)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE80)	58	5290	6.81	-0.03	10.19	PASS

Mode (U-NII-2A)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE80)	58	5290	-3.245	-2.64



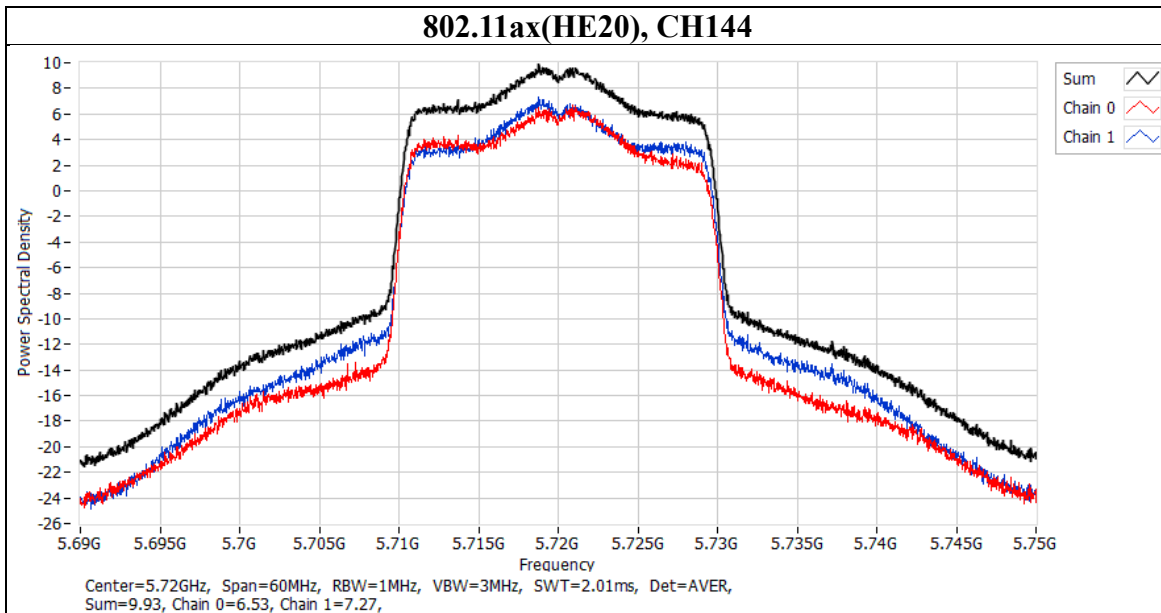
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	100	5500	6.81	8.5	10.19	PASS
	116	5580	6.81	8.75	10.19	PASS
	140	5700	6.81	6.82	10.19	PASS
	144	5720	6.81	10.09	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11a	100	5500	4.992	6.042
	116	5580	5.477	6.29
	140	5700	3.835	4.079
	144	5720	7.089	7.419



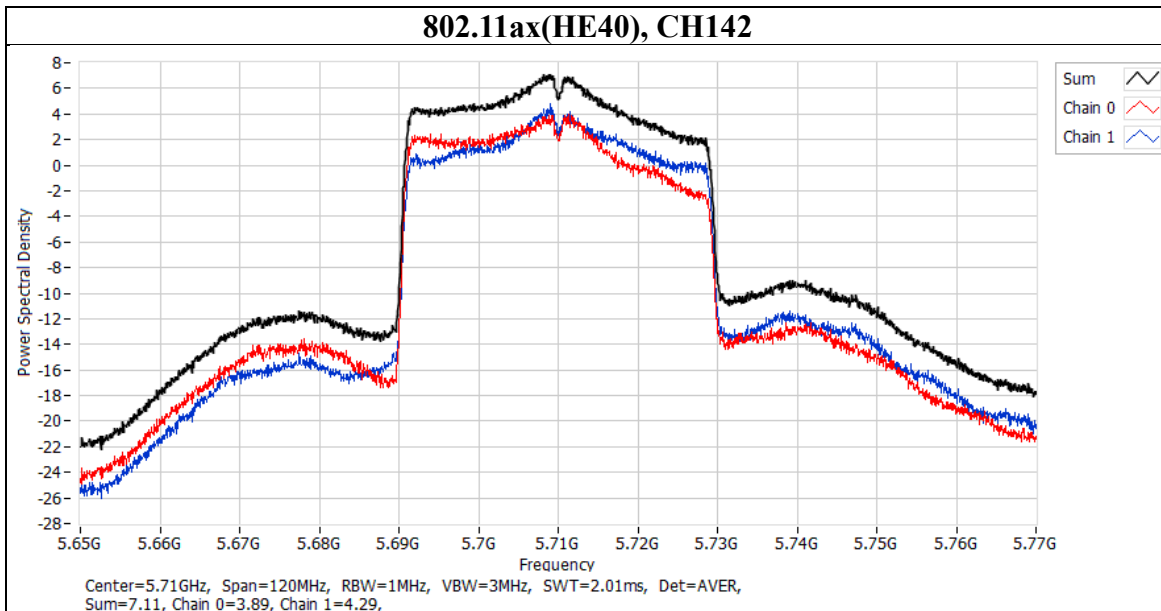
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE20)	100	5500	6.81	7.05	10.19	PASS
	116	5580	6.81	8.28	10.19	PASS
	140	5700	6.81	6.39	10.19	PASS
	144	5720	6.81	9.93	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE20)	100	5500	3.76	4.551
	116	5580	4.987	5.751
	140	5700	3.493	3.532
	144	5720	6.675	7.27



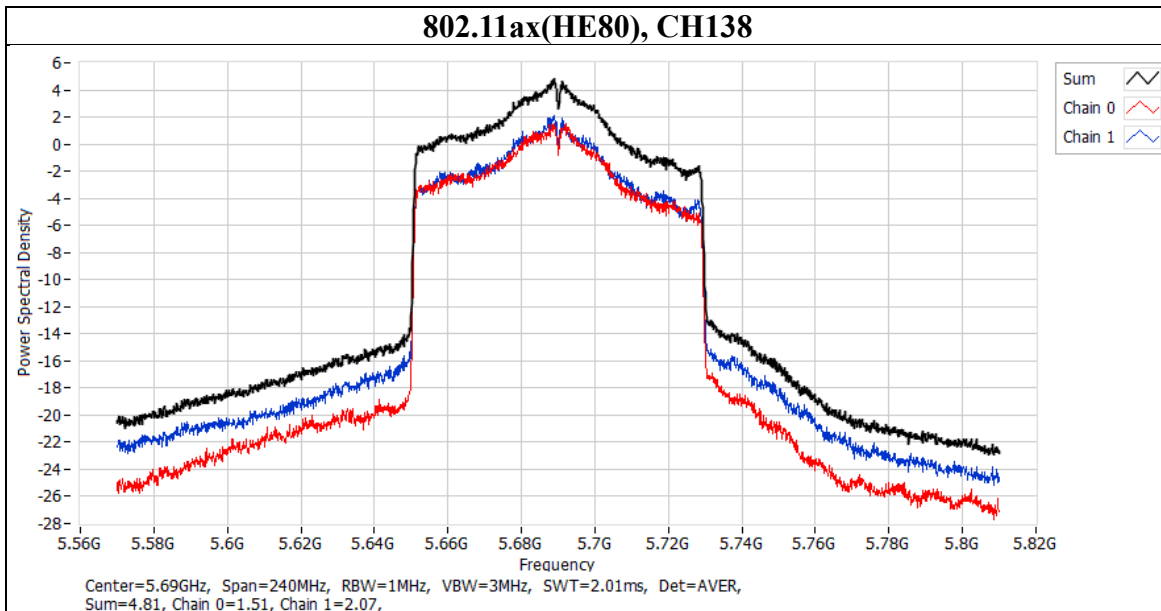
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE40)	102	5510	6.81	2.75	10.19	PASS
	110	5550	6.81	5.59	10.19	PASS
	134	5670	6.81	3.7	10.19	PASS
	142	5710	6.81	7.11	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE40)	102	5510	-0.742	0.455
	110	5550	2.34	3.086
	134	5670	0.325	1.019
	142	5710	3.983	4.817



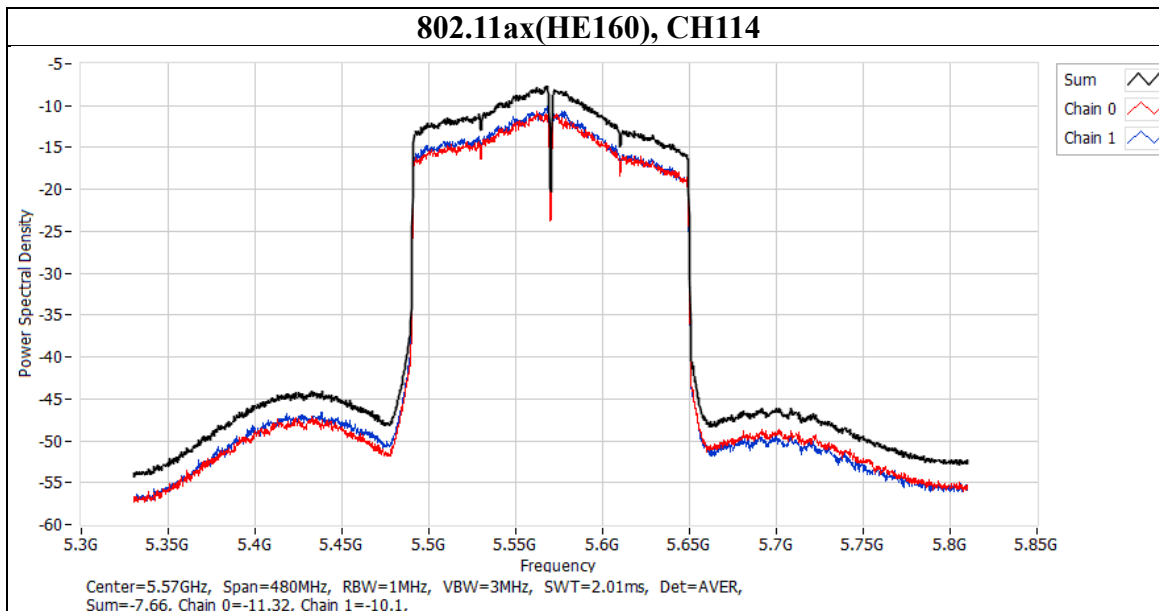
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE80)	106	5530	6.81	-3.47	10.19	PASS
	122	5610	6.81	0.68	10.19	PASS
	138	5690	6.81	4.81	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE80)	106	5530	-6.9	-5.87
	122	5610	-2.651	-1.867
	138	5690	1.507	2.072



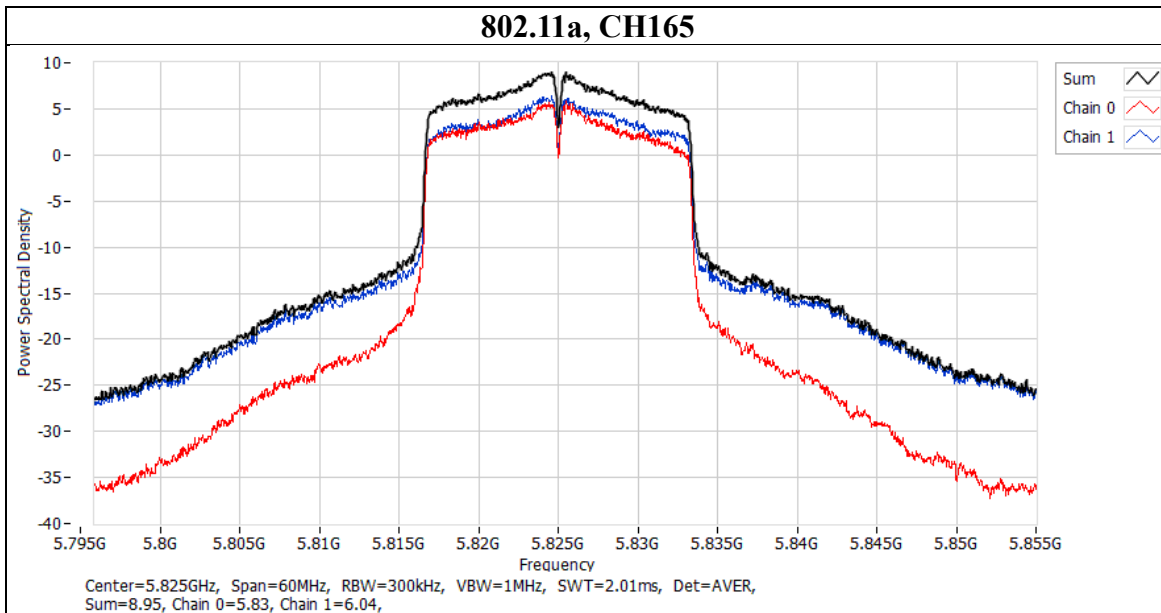
Mode (U-NII-2C)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ax(HE160)	114	5570	6.81	-7.66	10.19	PASS

Mode (U-NII-2C)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)	
			Chain 0	Chain 1
802.11ax(HE160)	114	5570	-10.653	-10.101



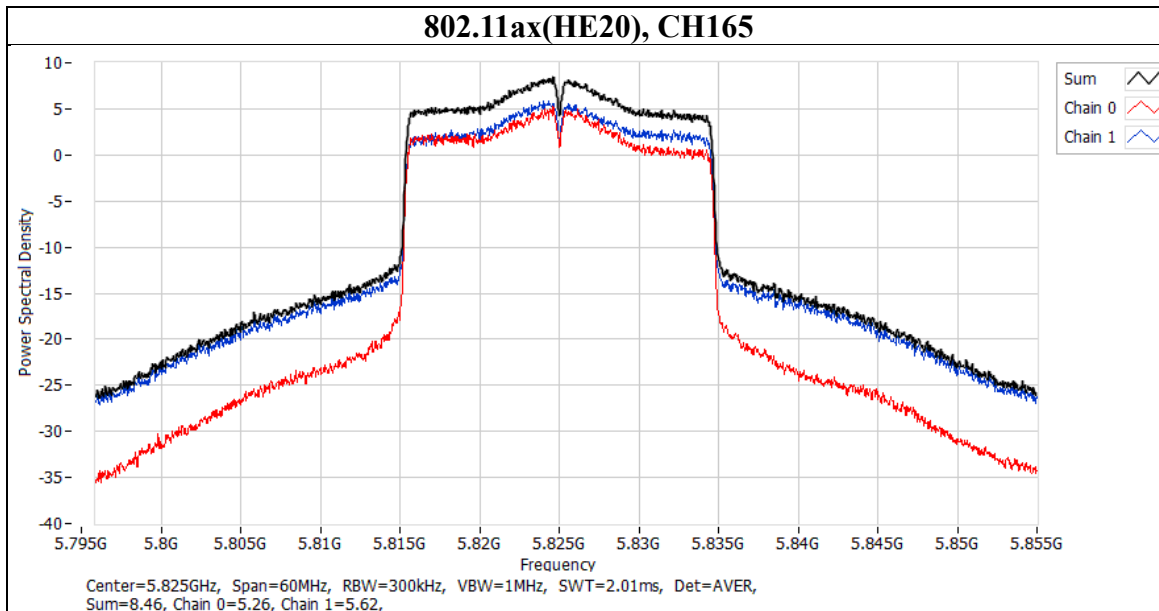
Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500k Hz)	Limit (dBm/500k Hz)	Result
802.11a	144	5720	2.22	6.81	10.02	29.19	PASS
	149	5745	2.22	6.81	10.8	29.19	PASS
	157	5785	2.22	6.81	10.85	29.19	PASS
	165	5825	2.22	6.81	11.17	29.19	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)	
			Chain 0	Chain 1
802.11a	144	5720	4.789	5.123
	149	5745	5.769	5.716
	157	5785	6.076	5.567
	165	5825	5.835	6.405



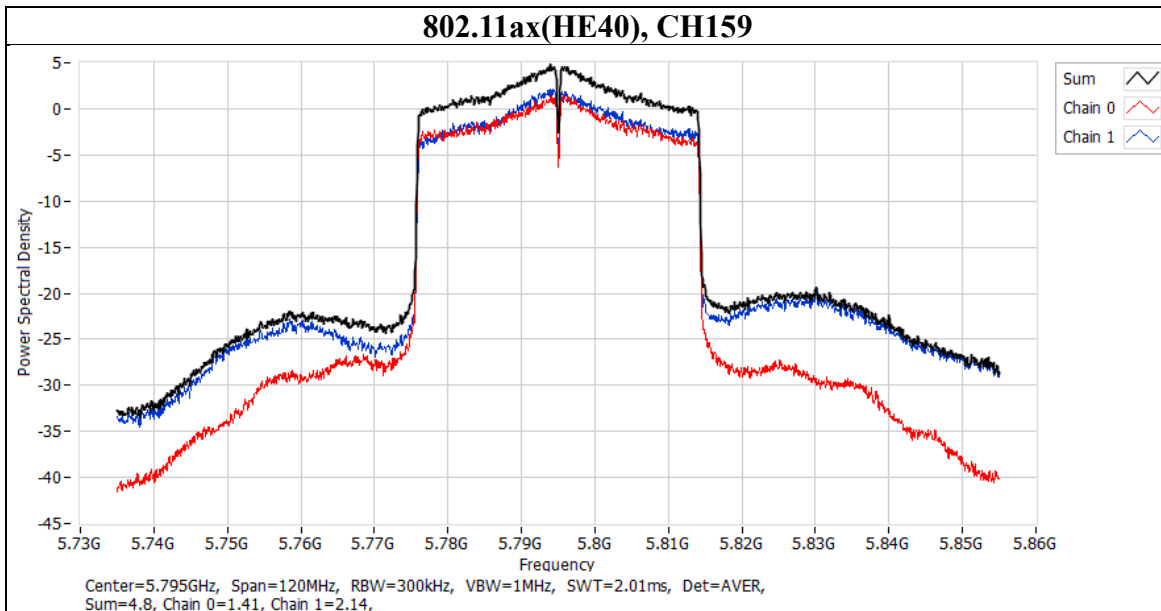
Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11ax(HE20)	144	5720	2.22	6.81	9.62	29.19	PASS
	149	5745	2.22	6.81	10.07	29.19	PASS
	157	5785	2.22	6.81	10.45	29.19	PASS
	165	5825	2.22	6.81	10.68	29.19	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)	
			Chain 0	Chain 1
802.11ax(HE20)	144	5720	4.115	4.724
	149	5745	5.015	5.173
	157	5785	5.664	5.066
	165	5825	5.265	5.84



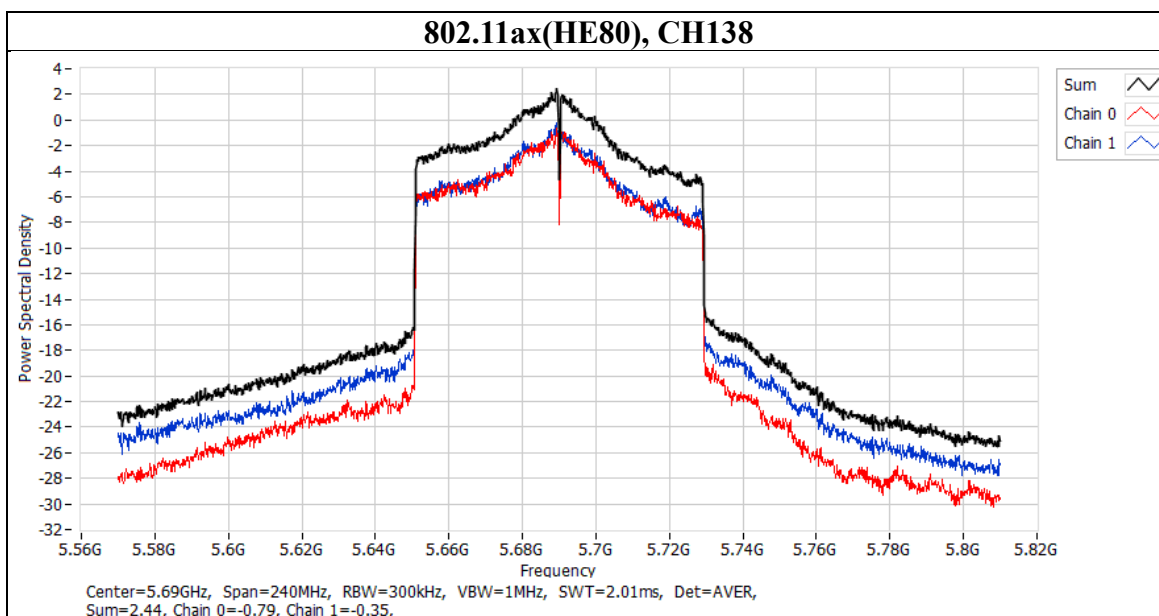
Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11ax(HE40)	142	5710	2.22	6.81	6.88	29.19	PASS
	151	5755	2.22	6.81	6.7	29.19	PASS
	159	5795	2.22	6.81	7.02	29.19	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)	
			Chain 0	Chain 1
802.11ax(HE40)	142	5710	1.325	2.214
	151	5755	1.855	1.504
	159	5795	1.575	2.143



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	4.66	29.19	PASS
	155	5775	2.22	6.81	2.64	29.19	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)	
			Chain 0	Chain 1
802.11ax(HE80)	138	5690	-0.664	-0.245
	155	5775	-2.784	-2.144



9.6. Frequency Stability

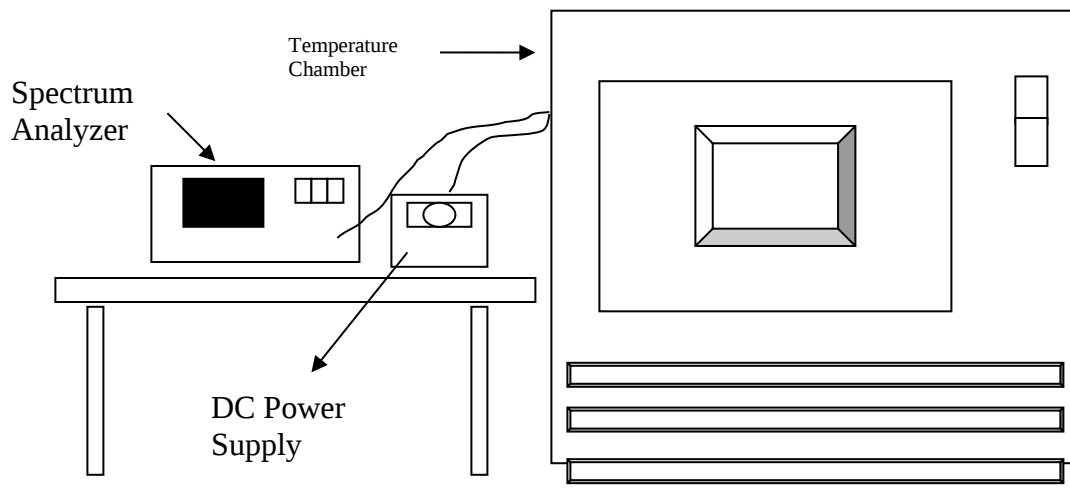
Requirements

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)
85	3.3	5180.0232	4.48	5180.0226	4.36	5180.025	4.83	5180.0218	4.21
80	3.3	5179.988	-2.32	5179.9875	-2.41	5179.9894	-2.05	5179.9902	-1.89
70	3.3	5179.9822	-3.44	5179.9783	-4.19	5179.9776	-4.32	5179.9789	-4.07
60	3.3	5180.0187	3.61	5180.0202	3.90	5180.0193	3.73	5180.0217	4.19
50	3.3	5180.0132	2.55	5180.0108	2.08	5180.011	2.12	5180.0112	2.16
40	3.3	5179.9928	-1.39	5179.9927	-1.41	5179.9935	-1.25	5179.991	-1.74
30	3.3	5180.009	1.74	5180.0083	1.60	5180.0056	1.08	5180.0059	1.14
20	3.3	5179.9964	-0.69	5179.9983	-0.33	5179.9969	-0.60	5179.9979	-0.41
10	3.3	5179.9746	-4.90	5179.9771	-4.42	5179.9762	-4.59	5179.976	-4.63
0	3.3	5180.0009	0.17	5180.002	0.39	5180.0033	0.64	5180.0038	0.73
-10	3.3	5180.0102	1.97	5180.0105	2.03	5180.012	2.32	5180.0145	2.80
-20	3.3	5179.9898	-1.97	5179.9911	-1.72	5179.9874	-2.43	5179.9877	-2.37
-30	3.3	5180.0068	1.31	5180.0053	1.02	5180.0079	1.53	5180.0069	1.33
-40	3.3	5180.0067	1.29	5180.0105	2.03	5180.0089	1.72	5180.0069	1.33
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	3.8	5179.9971	-0.56	5179.9981	-0.37	5179.9977	-0.44	5179.9972	-0.54
20	3.3	5179.9964	-0.69	5179.9983	-0.33	5179.9969	-0.60	5179.9979	-0.41
20	2.8	5179.9965	-0.68	5179.9979	-0.41	5179.9967	-0.64	5179.9977	-0.44

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

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:

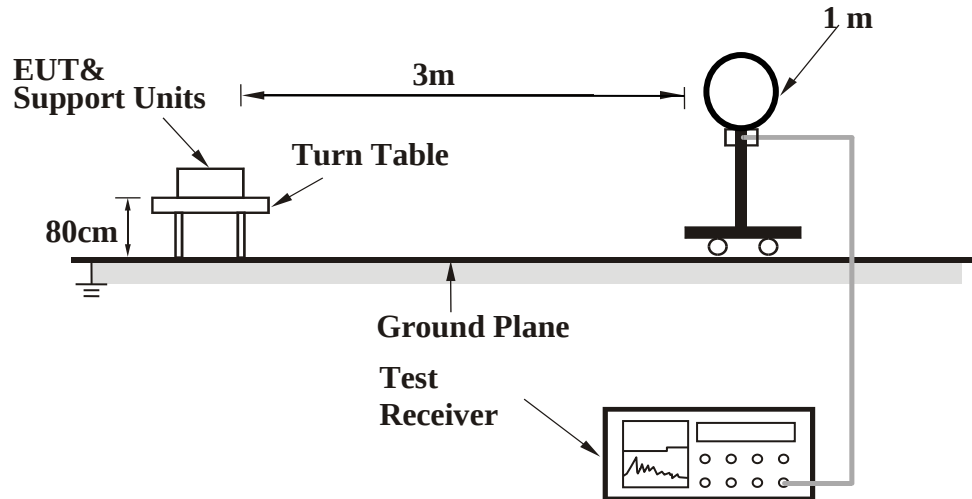
- a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- c. 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)		

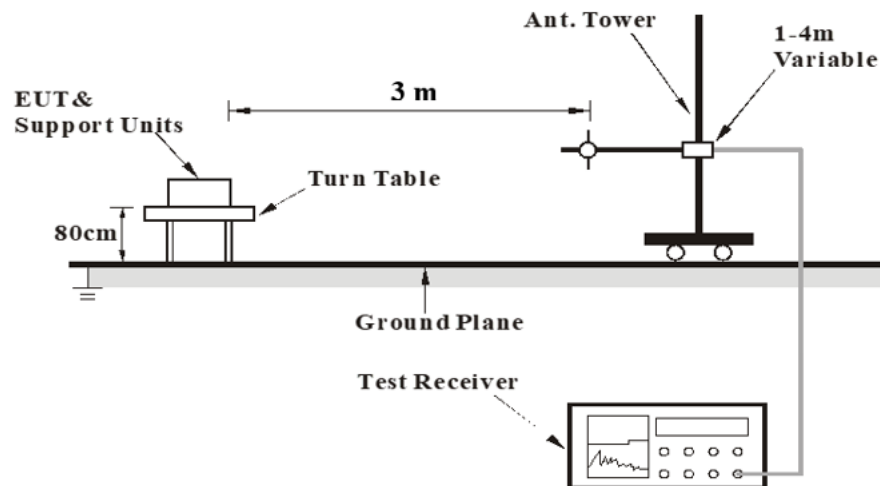
- d. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
- e. Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
- f. Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
- g. Test data of Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
- h. Test data of Notation "@" = Fundamental Frequency
- i. 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.

Test Setup

<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



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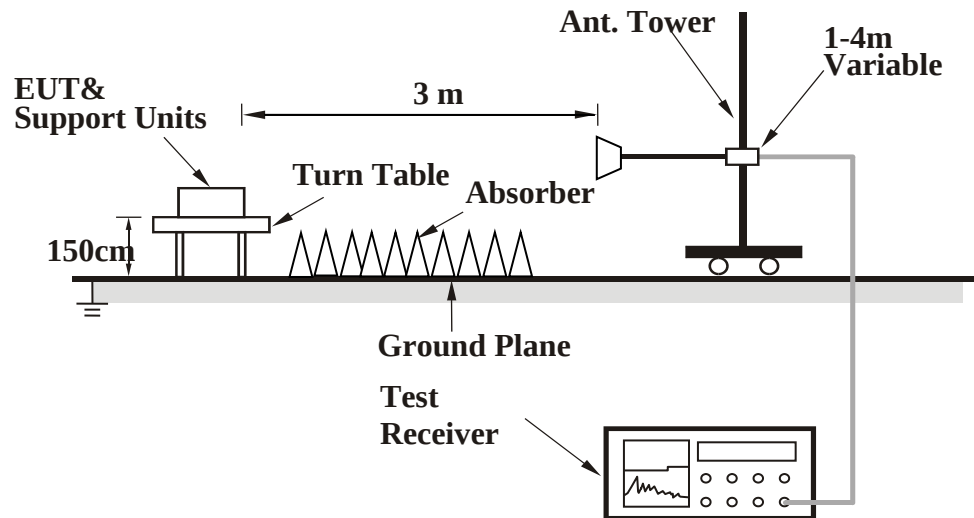
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<Frequency Range above 1 GHz>



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		5068.95	41.27	19.09	60.36	74	-13.64	PK
		5094.15	29.65	19.23	48.88	54	-5.12	AVG
	@	5180	77.12	19.14	96.26	N/A	N/A	PK
	@	5180	71.43	19.14	90.57	N/A	N/A	AVG
	*	10360	31.62	17.03	48.65	68.2	-19.55	PK
Vertical		5112.7	41.65	19.24	60.89	74	-13.11	PK
		5148.4	31.24	19.22	50.46	54	-3.54	AVG
	@	5180	92.4	19.14	111.54	N/A	N/A	PK
	@	5180	83.61	19.14	102.75	N/A	N/A	AVG
	*	10360	32.31	17.03	49.34	68.2	-18.86	PK

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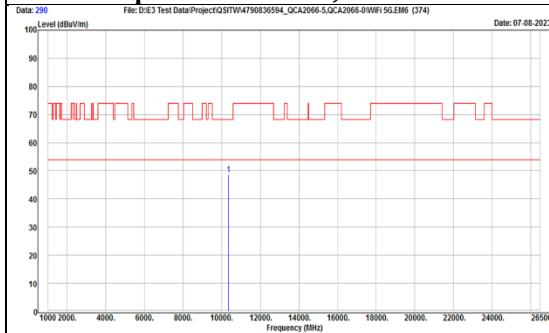
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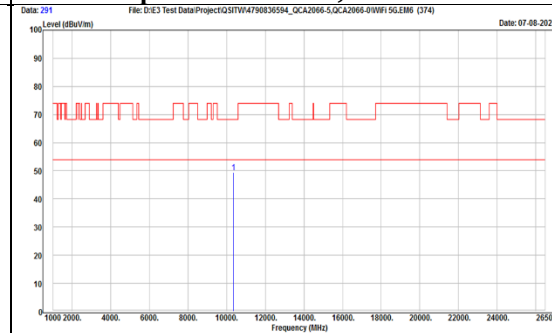
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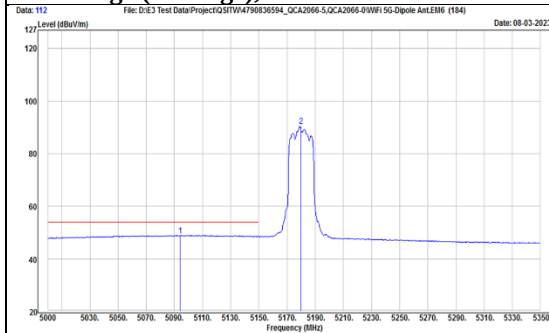
TX, 802.11a (Ch 36)
Radiated Spurious Emission, Horizontal



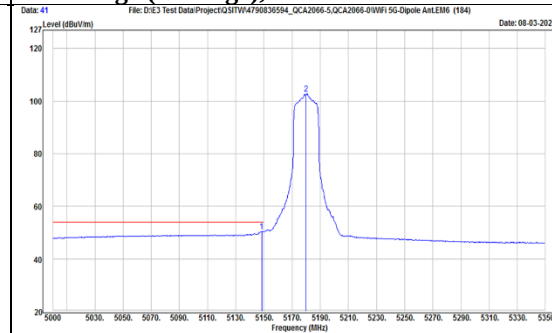
TX, 802.11a (Ch 36)
Radiated Spurious Emission, Vertical



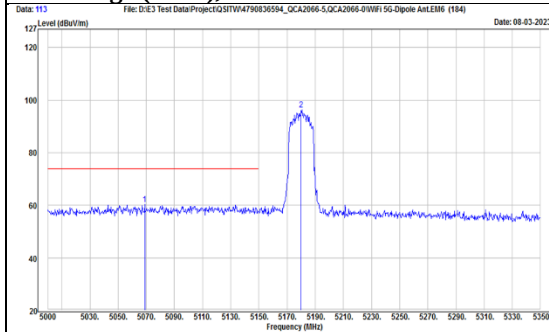
TX, 802.11a (Ch 36)
Band Edge (Average), Horizontal



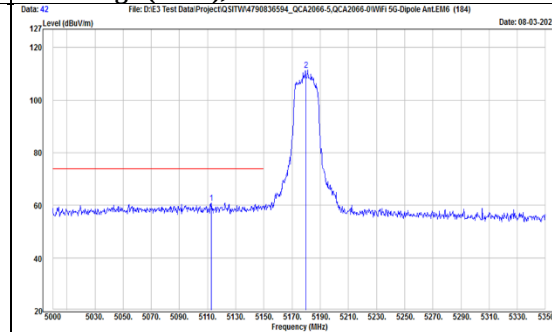
TX, 802.11a (Ch 36)
Band Edge (Average), Vertical



TX, 802.11a (Ch 36)
Band Edge (Peak), Horizontal



TX, 802.11a (Ch 36)
Band Edge (Peak), Vertical



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		5072.8	41.51	19.1	60.61	74	-13.39	PK
		5116.2	29.57	19.25	48.82	54	-5.18	AVG
	@	5220	79.06	19.04	98.1	N/A	N/A	PK
	@	5220	70.12	19.04	89.16	N/A	N/A	AVG
	*	10440	29.84	17.45	47.29	68.2	-20.91	PK
Vertical		5092.05	29.71	19.22	48.93	54	-5.07	AVG
		5106.05	42.44	19.25	61.69	74	-12.31	PK
	@	5220	90.9	19.04	109.94	N/A	N/A	PK
	@	5220	83.57	19.04	102.61	N/A	N/A	AVG
	*	10440	30.36	17.45	47.81	68.2	-20.39	PK

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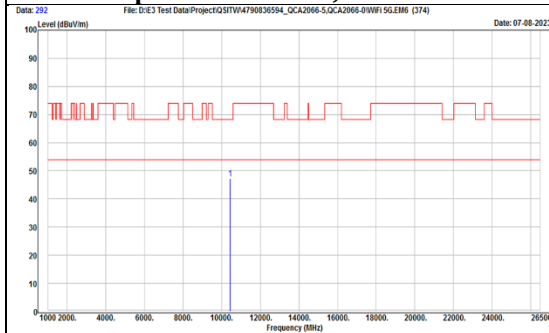
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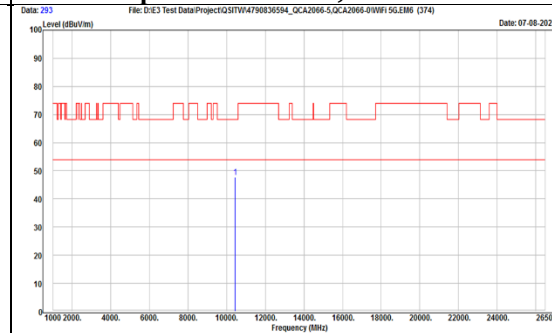
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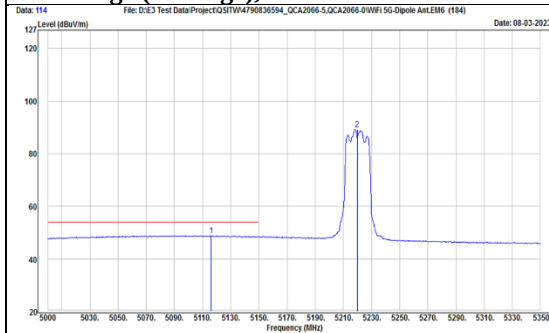
TX, 802.11a (Ch 44)
Radiated Spurious Emission, Horizontal



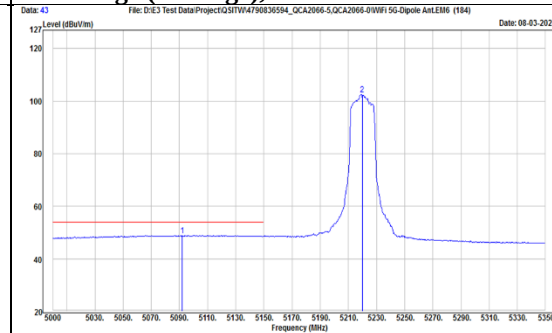
TX, 802.11a (Ch 44)
Radiated Spurious Emission, Vertical



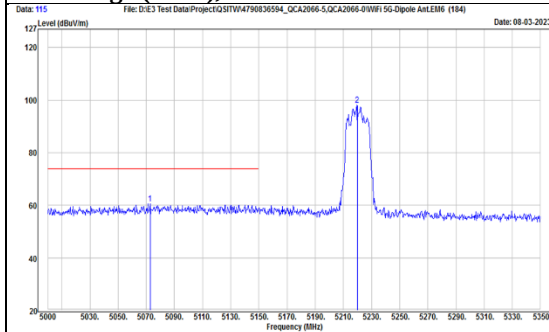
TX, 802.11a (Ch 44)
Band Edge (Average), Horizontal



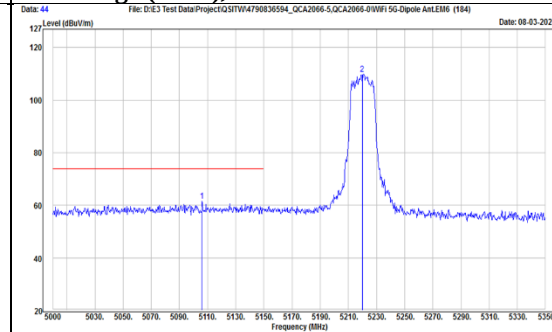
TX, 802.11a (Ch 44)
Band Edge (Average), Vertical



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		5049.35	41.77	18.97	60.74	74	-13.26	PK
		5099.05	29.72	19.25	48.97	54	-5.03	AVG
	@	5240	77.11	18.99	96.1	N/A	N/A	PK
	@	5240	69.53	18.99	88.52	N/A	N/A	AVG
	*	10480	30.75	17.55	48.3	68.2	-19.9	PK
Vertical		5081.55	41.96	19.16	61.12	74	-12.88	PK
		5092.4	29.75	19.22	48.97	54	-5.03	AVG
	@	5240	90.9	18.99	109.89	N/A	N/A	PK
	@	5240	83.3	18.99	102.29	N/A	N/A	AVG
	*	10480	29.92	17.55	47.47	68.2	-20.73	PK

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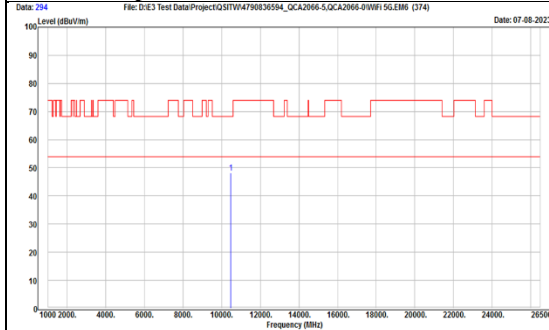
Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

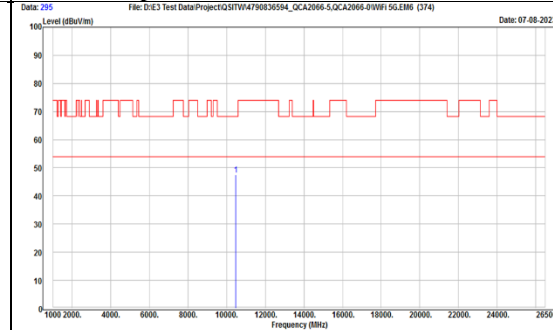
Facsimile (FAX) : +886-3-583-7948

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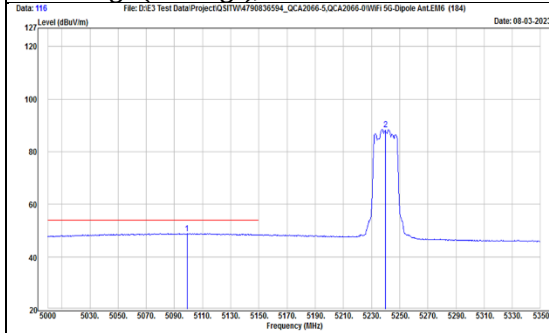
TX, 802.11a (Ch 48)
Radiated Spurious Emission, Horizontal



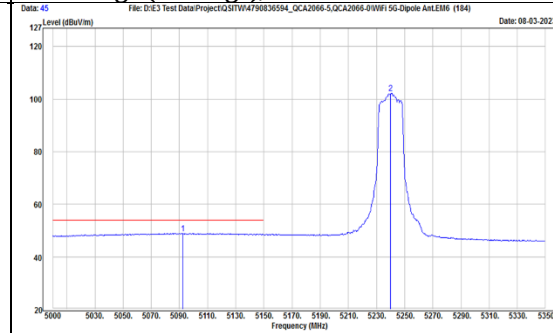
TX, 802.11a (Ch 48)
Radiated Spurious Emission, Vertical



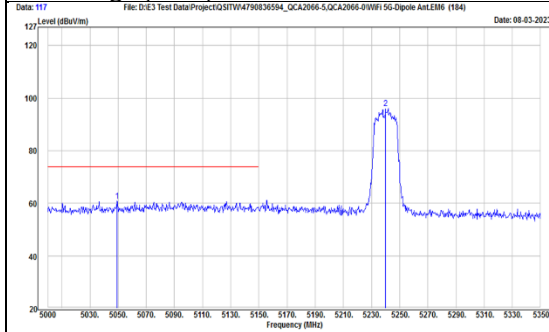
TX, 802.11a (Ch 48)
Band Edge (Average), Horizontal



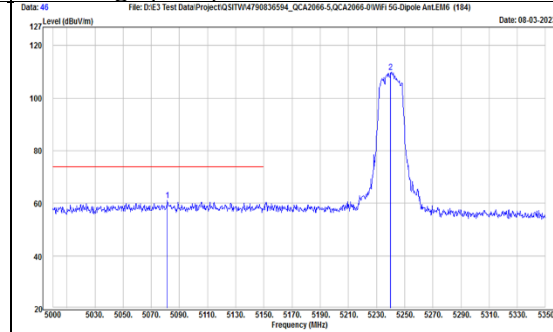
TX, 802.11a (Ch 48)
Band Edge (Average), Vertical



TX, 802.11a (Ch 48)
Band Edge (Peak), Horizontal



TX, 802.11a (Ch 48)
Band Edge (Peak), Vertical



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	79.4	18.91	98.31	N/A	N/A	PK
	@	5260	70.85	18.91	89.76	N/A	N/A	AVG
		5454.3	39.38	19.63	59.01	74	-14.99	PK
		5459.7	27.94	19.64	47.58	54	-6.42	AVG
	*	10520	30.23	17.63	47.86	68.2	-20.34	PK
Vertical	@	5260	92.33	18.91	111.24	N/A	N/A	PK
	@	5260	85.22	18.91	104.13	N/A	N/A	AVG
		5422.5	40.44	19.37	59.81	74	-14.19	PK
		5450.7	27.83	19.62	47.45	54	-6.55	AVG
	*	10520	30.86	17.63	48.49	68.2	-19.71	PK

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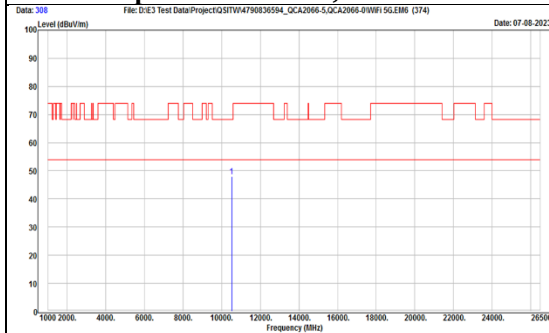
Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

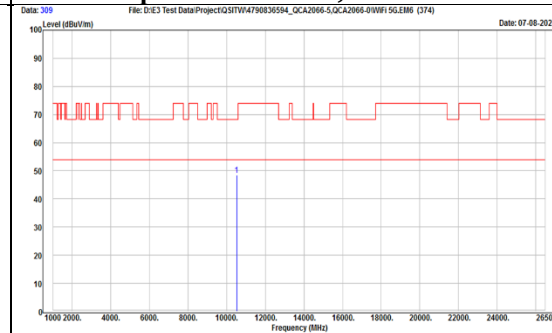
Facsimile (FAX) : +886-3-583-7948

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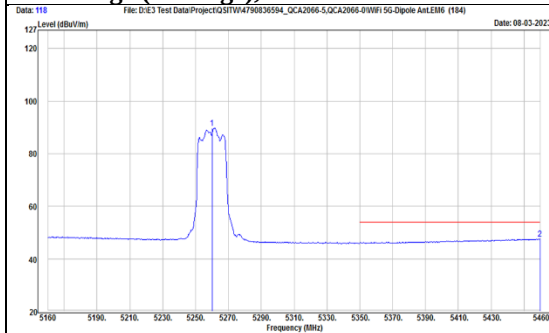
TX, 802.11a (Ch 52)
Radiated Spurious Emission, Horizontal



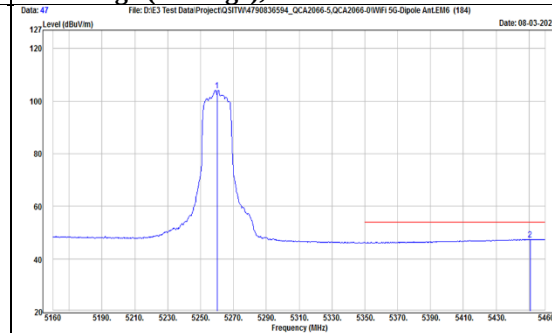
TX, 802.11a (Ch 52)
Radiated Spurious Emission, Vertical



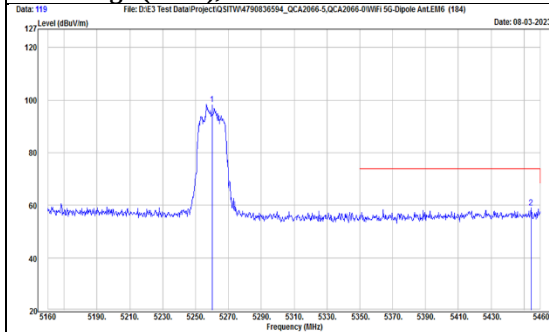
TX, 802.11a (Ch 52)
Band Edge (Average), Horizontal



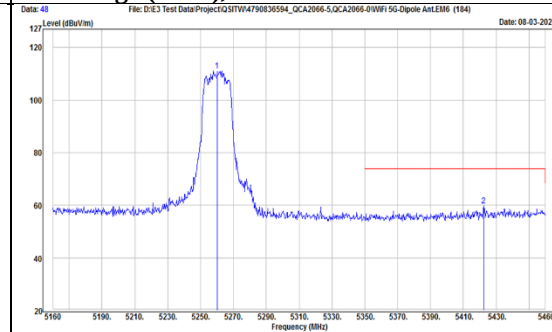
TX, 802.11a (Ch 52)
Band Edge (Average), Vertical



TX, 802.11a (Ch 52)
Band Edge (Peak), Horizontal



TX, 802.11a (Ch 52)
Band Edge (Peak), Vertical



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	78.38	18.73	97.11	N/A	N/A	PK
	@	5300	70.81	18.73	89.54	N/A	N/A	AVG
		5431.5	39.34	19.45	58.79	74	-15.21	PK
		5454.6	27.86	19.63	47.49	54	-6.51	AVG
	*	10600	30.21	17.71	47.92	74	-26.08	PK
Vertical	@	5300	92.1	18.73	110.83	N/A	N/A	PK
	@	5300	84.63	18.73	103.36	N/A	N/A	AVG
		5445.9	39.24	19.59	58.83	74	-15.17	PK
		5455.2	28.05	19.63	47.68	54	-6.32	AVG
	*	10600	29.7	17.71	47.41	74	-26.59	PK

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