RADIO TEST REPORT

Product	:	Wireless SOM Module
Model Name	:	SB35
FCC ID	:	YAISB35
Test Regulation	:	FCC 47 CFR Part 15 Subpart E (Section 15.407)
Received Date	:	2022/6/15
Test Date	:	2022/6/16 ~ 2022/7/6
Issued Date	:	2022/8/9
Applicant	:	InnoComm Mobile Technology Corporation 3F, No. 6, Hsin Ann Rd., Hsinchu Science Park, Hsinchu, Taiwan, 300092
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Testing Laboratory
3398

The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.

REVISION HISTORY

Original Test Report No.: 4790446225-US-R1-V0

Rev.	Test report No.	Date	Page revised	Contents
Original	4790446225-US-R1-V0	2022/8/9	-	Initial issue

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1. Attestation of Test Results

APPLICANT:	InnoComm Mobile Technology Corporation 3F, No. 6, Hsin Ann Rd., Hsinchu Science Park, Hsinchu, Taiwan, 300092
MANUFACTURER:	InnoComm Mobile Technology Corporation 3F, No. 6, Hsin Ann Rd., Hsinchu Science Park, Hsinchu, Taiwan, 300092
EUT DESCRIPTION:	Wireless SOM Module
BRAND:	InnoComm
MODEL:	SB35
SAMPLE STAGE:	Design Verification Test sample
DATE of TESTED:	2022/6/16 ~ 2022/7/6

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:

Sally Lu

Sally Lu Date : 2022/8/9
Project Handler

Approved and Authorized By:

Eric Lee Date : 2022/8/9
Senior Laboratory Engineer

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 Note1
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 Note2

Note:
1. The Occupied Bandwidth was reference only.
2. The "Dynamic Frequency Selection & Transmit power control" measurement was recorded in Report No.: 4790446225-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 B and Building 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.

5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) 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.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	±2.9 dB
RF Conducted	9 kHz - 40GHz	±2.4 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	±1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	±5.8 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	±4.8 dB

6. Equipment under Test

6.1. Description of EUT

Product	Wireless SOM Module	
Brand Name	InnoComm	
Model Name	SB35	
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5700 MHz, 5745 ~ 5825 MHz	
Modulation	256QAM, 64QAM, 16QAM, QPSK, BPSK	
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to MCS15 802.11ac: up to MCS9	
Number of Channel	5180 ~ 5240 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		2 for 802.11n (HT40), 802.11ac (VHT40)
		1 for 802.11ac (VHT80)
	5260 ~ 5320 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		2 for 802.11n (HT40), 802.11ac (VHT40)
		1 for 802.11ac (VHT80)
	5500 ~ 5700 MHz	11 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		5 for 802.11n (HT40), 802.11ac (VHT40)
		2 for 802.11ac (VHT80)
	5745 ~ 5825 MHz	5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		2 for 802.11n (HT40), 802.11ac (VHT40)
		1 for 802.11ac (VHT80)
Maximum Output Power	5180 ~ 5240 MHz: 20.85 dBm 5260 ~ 5320 MHz: 22.31 dBm 5500 ~ 5700 MHz: 22.45 dBm 5745 ~ 5825 MHz: 19.62 dBm	
Normal Voltage	3.8Vdc	
Sample ID	5059965	

Note:

1. 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

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

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

6.2. Channel List

FOR 5180 ~ 5240MHz

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

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):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5260 ~ 5320MHz

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

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):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

FOR 5500 ~ 5700MHz

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

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	-	-

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

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

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	122	5610 MHz

FOR 5745 ~ 5825MHz:

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

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):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

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	20~27°C/ 51~69%RH	3.8Vdc	2022/06/16~ 2022/06/24	Rex Chen
Radiated Spurious Emission	966-2	20~27°C/ 51~69%RH	3.8Vdc	2022/06/16~ 2022/07/06	Rex Chen
AC power Line Conducted Emission	SR1	20~27°C/ 51~69%RH	3.8Vdc	2022/06/16~ 2022/06/24	Rex Chen

FCC Test Firm Registration Number: 498077

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)+(1)	Walsin	RFDPA171300SBLB801	Dipole	2.4GHz: 5 5GHz: 5
2	Chain (0)+(1)	InnoComm	PCA5016-2B	PCB	2.4GHz: 3.78 5GHz: 4.76

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.

6.5. Test Mode Applicability and Tested Channel Detail

- The fundamental of the dipole 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 fundamental of the PCB Antenna was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that X-Y axis were worst-case. Therefore, PCB Antenna all final radiated tests were performed with the X-Y axis.
- 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
	802.11ac20		OFDM	36 to 48	36, 44, 48	MCS0
	802.11ac40			38 to 46	38, 46	MCS0
	802.11ac80			42	42	MCS0
	802.11a	5260-5320	OFDM	52 to 64	52, 60, 64	6Mbps
	802.11ac20		OFDM	52 to 64	52, 60, 64	MCS0
	802.11ac40			54 to 62	54, 62	MCS0
	802.11ac80			58	58	MCS0
	802.11a	5500-5700	OFDM	100 to 140	100, 116, 140	6Mbps
	802.11ac20		OFDM	100 to 140	100, 116, 140	MCS0
	802.11ac40			102 to 134	102, 110, 134	MCS0
	802.11ac80			106, 122	106, 122	MCS0
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11ac20		OFDM	149 to 165	149, 157, 165	MCS0
	802.11ac40			151 to 159	151, 159	MCS0
	802.11ac80			155	155	MCS0
Radiated Emissions (Below 1GHz)	802.11ac80	5500-5700	OFDM	106, 122	122	MSC0
AC Power Line Conducted Emission	802.11ac80	5500-5700	OFDM	106, 122	122	MSC0

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
	802.11ac20		OFDM	36 to 48	36, 44, 48	MCS0
	802.11ac40			38 to 46	38, 46	MCS0
	802.11ac80			42	42	MCS0
	802.11a	5260-5320	OFDM	52 to 64	52, 60, 64	6Mbps
	802.11ac20		OFDM	52 to 64	52, 60, 64	MCS0
	802.11ac40			54 to 62	54, 62	MCS0
	802.11ac80			58	58	MCS0
	802.11a	5500-5700	OFDM	100 to 140	100, 116, 140	6Mbps
	802.11ac20		OFDM	100 to 140	100, 116, 140	MCS0
	802.11ac40			102 to 134	102, 110, 134	MCS0
	802.11ac80			106, 122	106, 122	MCS0
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11ac20		OFDM	149 to 165	149, 157, 165	MCS0
	802.11ac40			151 to 159	151, 159	MCS0
	802.11ac80			155	155	MCS0

Simultaneously transmission condition:

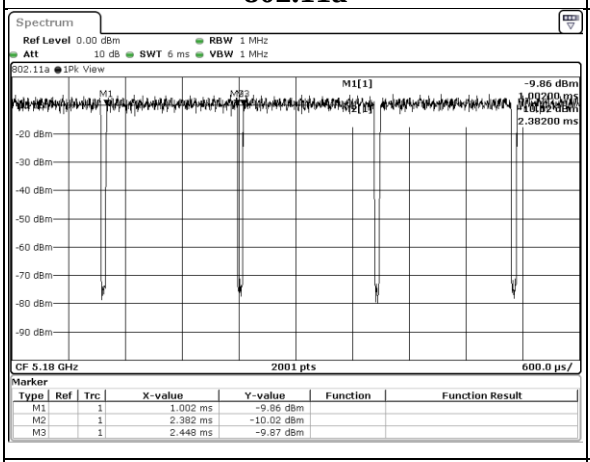
Condition	Technology	
1	BT-LE	WLAN (2GHz)
2	BT-LE	WLAN (5GHz)

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

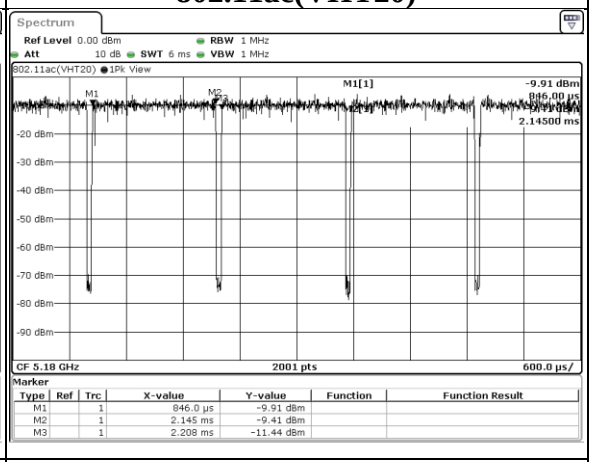
6.6. Duty cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle	Duty Factor (dB)	VBW Set (above 1GHz)
802.11a	1.380	1.446	0.9544	0.20	1kHz
802.11ac(VHT20)	1.299	1.362	0.9537	0.21	1kHz
802.11ac(VHT40)	0.652	0.705	0.9255	0.34	2kHz
802.11ac(VHT80)	0.325	0.377	0.8621	0.64	5.1kHz

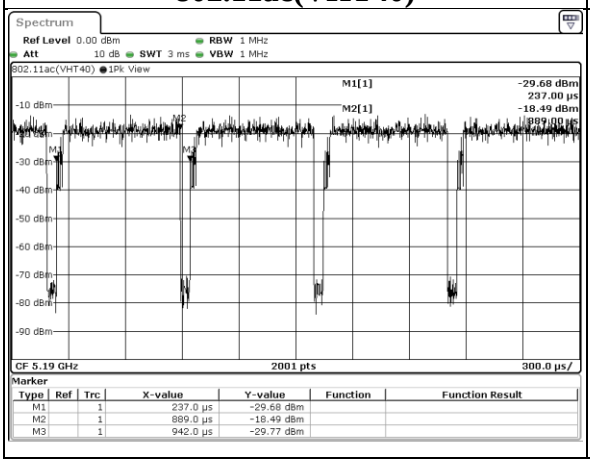
802.11a



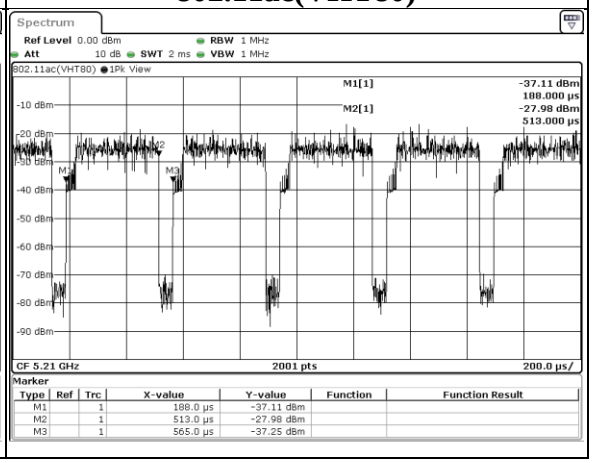
802.11ac(VHT20)



802.11ac(VHT40)



802.11ac(VHT80)



7. Test Equipment

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2021/11/9	2022/11/8
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2021/12/10	2022/12/9
Loop Antenna	ETS lindgren	6502	00213440	2021/12/23	2022/12/22
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2022/2/8	2023/2/7
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2021/12/13	2022/12/12
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2021/12/17	2022/12/16
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2022/6/7	2023/6/6
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2022/2/16	2023/2/15
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2022/5/17	2023/5/16
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2021/12/3	2022/12/2
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2021/12/3	2022/12/2

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Antenna Port Conducted Measurement					
Spectrum Analyzer	Keysight	N9010A	MY56070834	2021/10/29	2022/10/28
USB Power Sensor	Anritsu	MA24408A	12031	2022/3/23	2023/3/22
Temperature &Humidity Test Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA1701-010	2022/3/11	2023/3/10
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2021/11/15	2022/11/14
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2021/8/30	2022/8/29
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2021/8/26	2022/8/25
Cables	TITAN	CFD200	T0732ACFD20020A300-1	2022/3/16	2023/3/15

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_EMC	UL-3A1.2

8. Description of Test Setup

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Laptop	DELL	Latitude E5470	3JFKWF2	Provided by Lab
B	Test Tool	InnoComm	SB52-IO-004	Label	Supplied by client
C	AC Adapter	EDAC	EA10681G-120	NA	Supplied by client

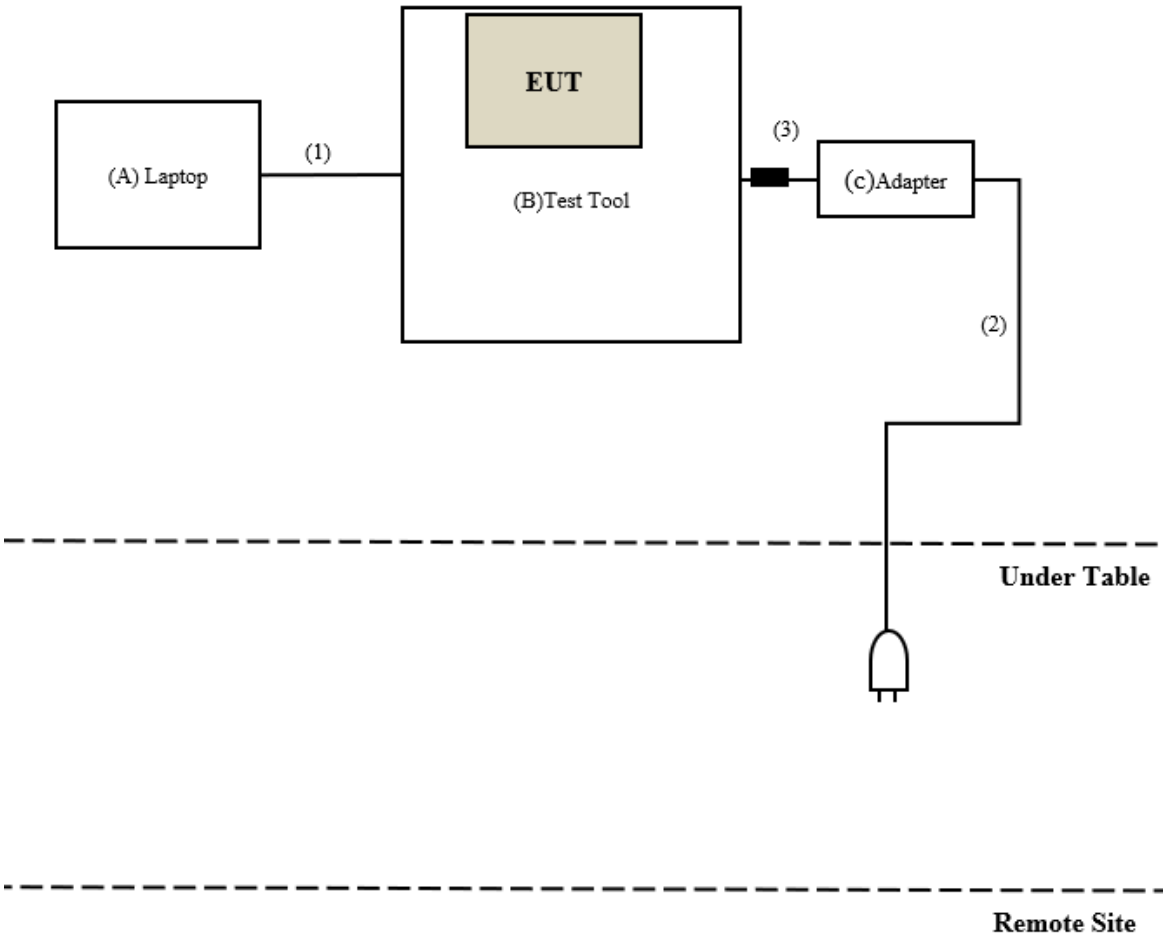
I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	Micro USB Cable	WONDER	WA-W07UA	1.44	Provided by Lab
2	Power Cable	NA	NA	1.75	Supplied by client
3	DC Cable	NA	NA	1	Supplied by client, with core

Test Setup

Controlled using a bespoke application (Typing RF command by adb tool (version 1.0.32)) 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



9. Test Results

9.1. 6dB Bandwidth

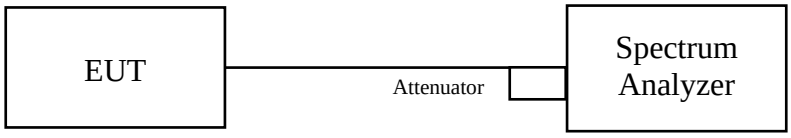
Requirements

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

Test procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. 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

Test Setup

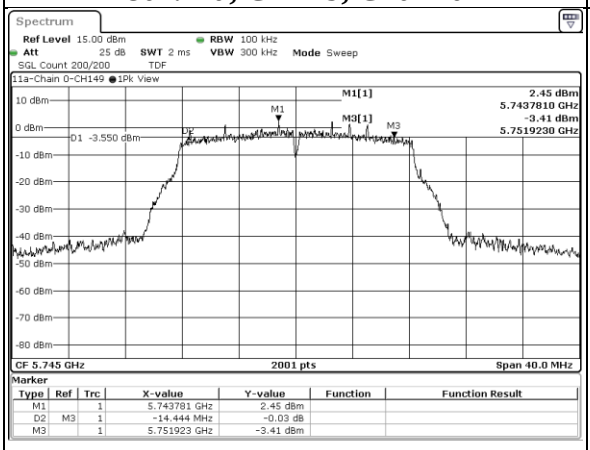


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

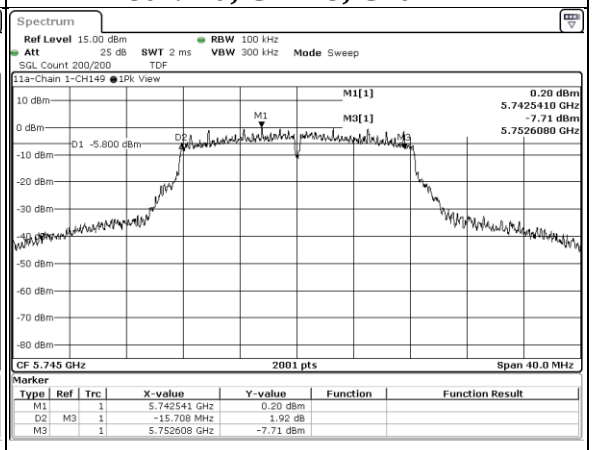
Test Data

Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11a	149	5745	14.444	15.708	0.5	Pass
	157	5785	13.433	14.452	0.5	Pass
	165	5825	15.115	15.914	0.5	Pass

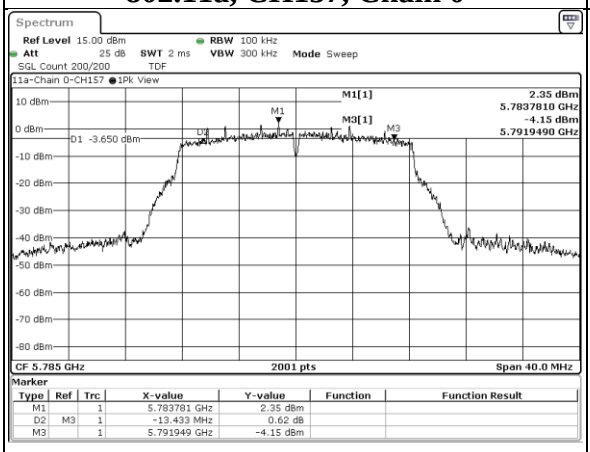
802.11a, CH149, Chain 0



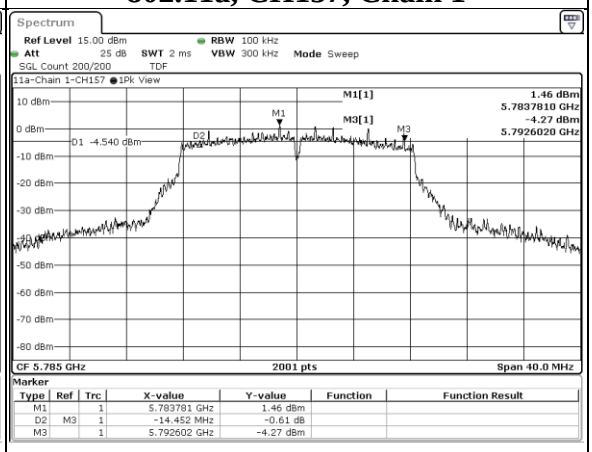
802.11a, CH149, Chain 1



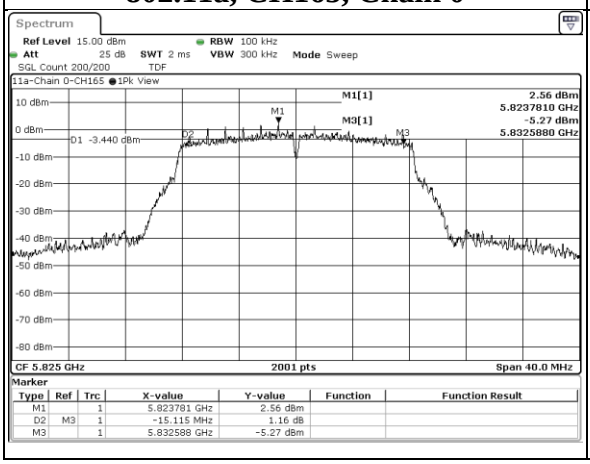
802.11a, CH157, Chain 0



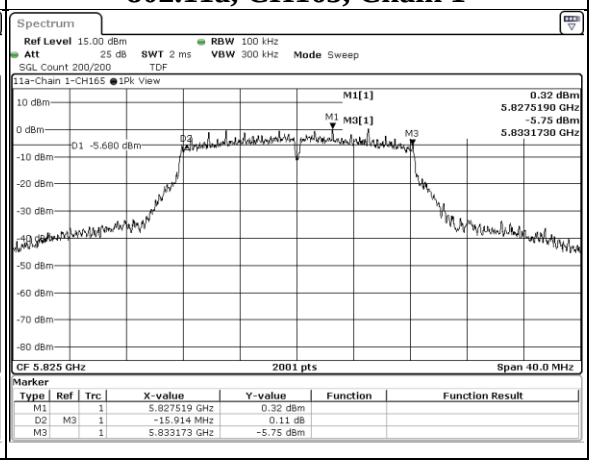
802.11a, CH157, Chain 1



802.11a, CH165, Chain 0

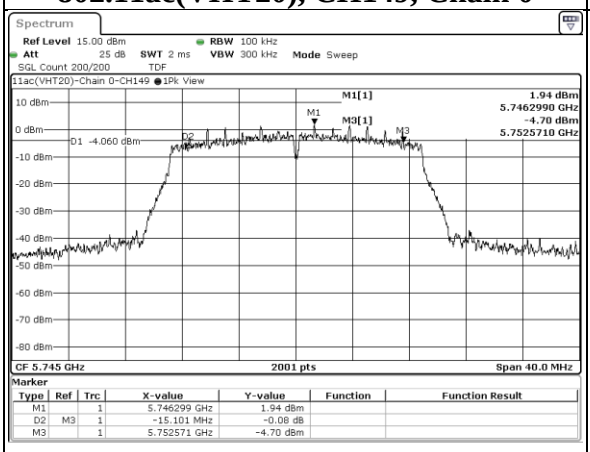


802.11a, CH165, Chain 1

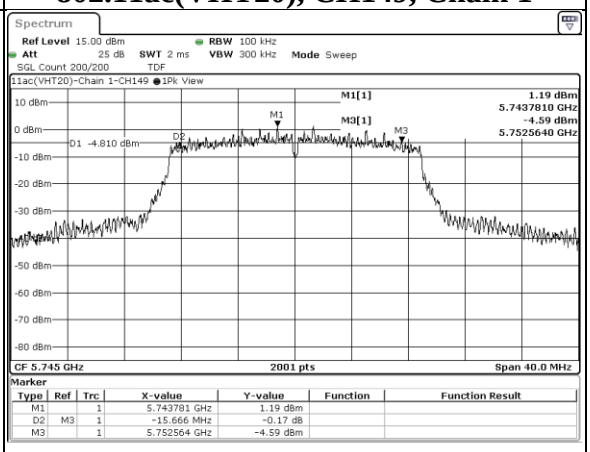


Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ac(VHT20)	149	5745	15.101	15.666	0.5	Pass
	157	5785	14.227	16.334	0.5	Pass
	165	5825	15.137	15.71	0.5	Pass

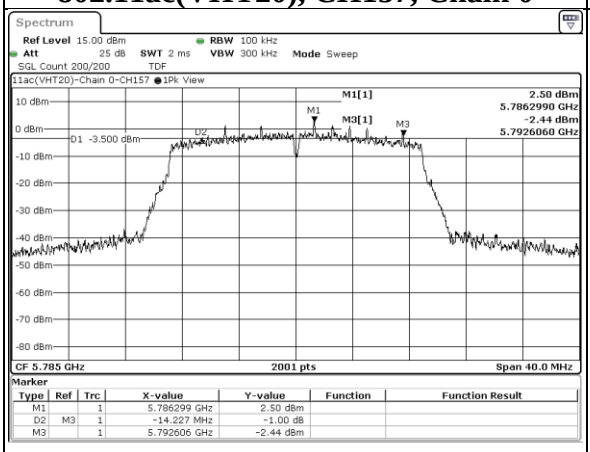
802.11ac(VHT20), CH149, Chain 0



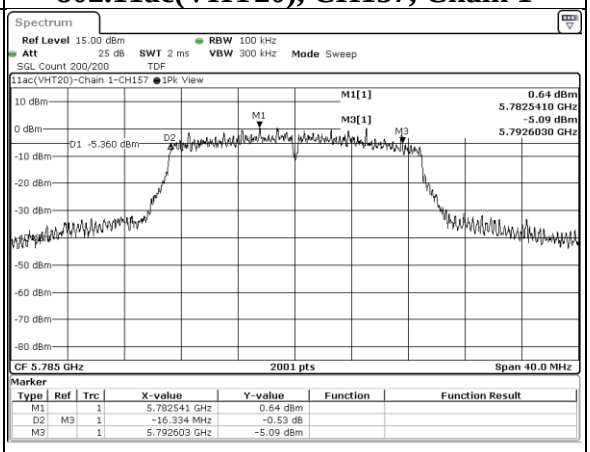
802.11ac(VHT20), CH149, Chain 1



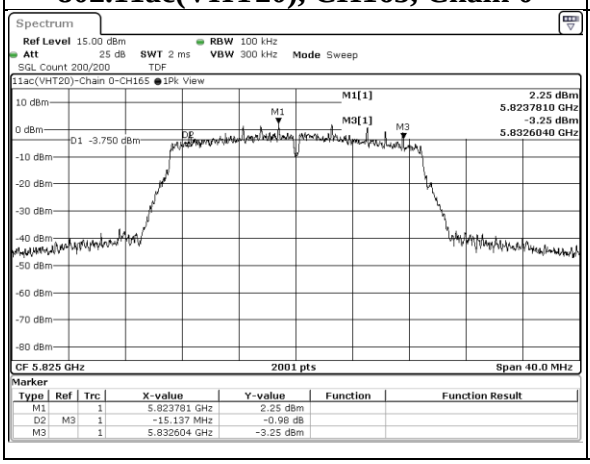
802.11ac(VHT20), CH157, Chain 0



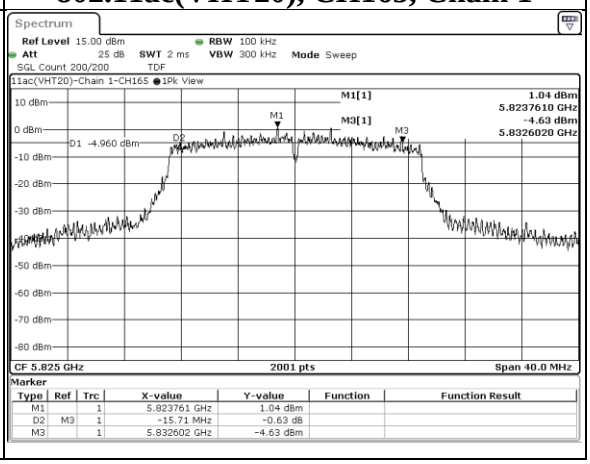
802.11ac(VHT20), CH157, Chain 1



802.11ac(VHT20), CH165, Chain 0

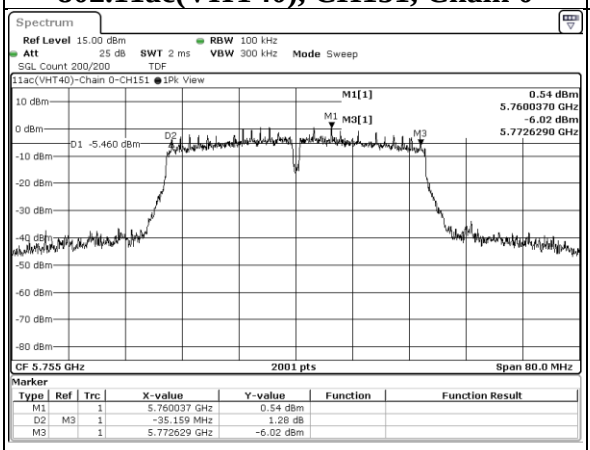


802.11ac(VHT20), CH165, Chain 1

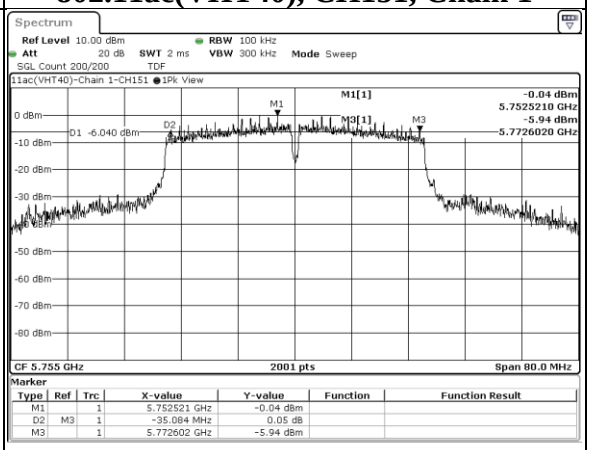


Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ac(VHT40)	151	5755	35.159	35.084	0.5	Pass
	159	5795	35.105	35.109	0.5	Pass

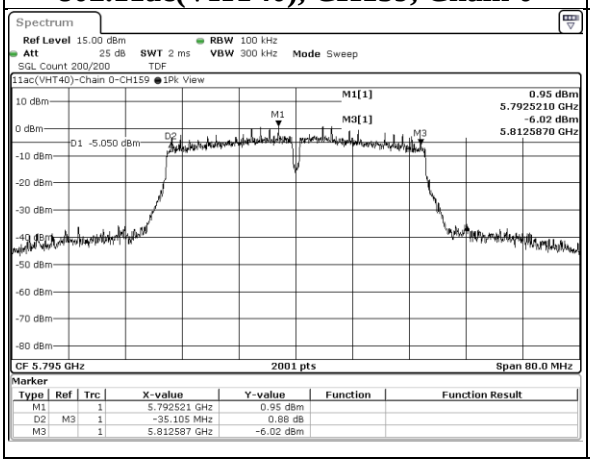
802.11ac(VHT40), CH151, Chain 0



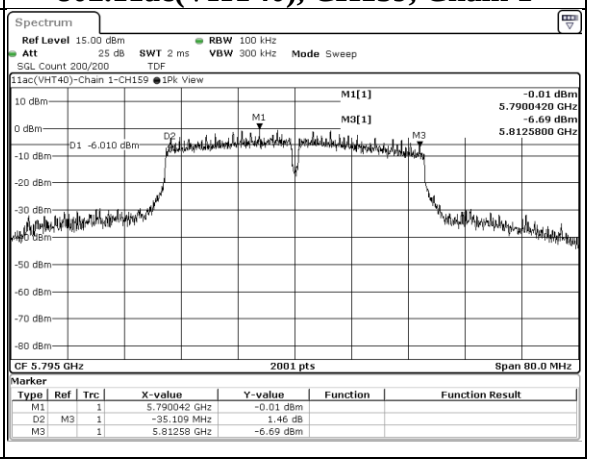
802.11ac(VHT40), CH151, Chain 1



802.11ac(VHT40), CH159, Chain 0

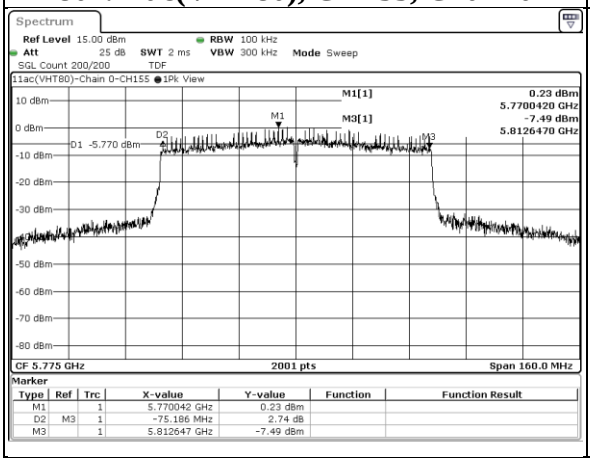


802.11ac(VHT40), CH159, Chain 1

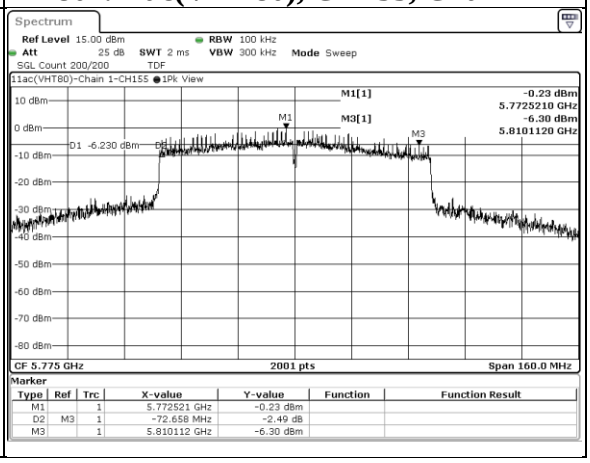


Mode	CH	Freq (MHz)	6dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ac(VHT80)	155	5775	75.186	72.658	0.5	Pass

802.11ac(VHT80), CH155, Chain 0



802.11ac(VHT80), CH155, Chain 1

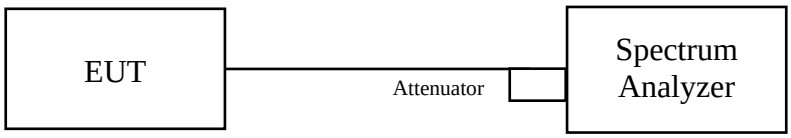


9.2. 26dB Bandwidth

Test procedure

a. Set RBW = approximately 1% of the emission bandwidth.
b. Set the VBW > RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 26 dB down from the 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%.

Test Setup

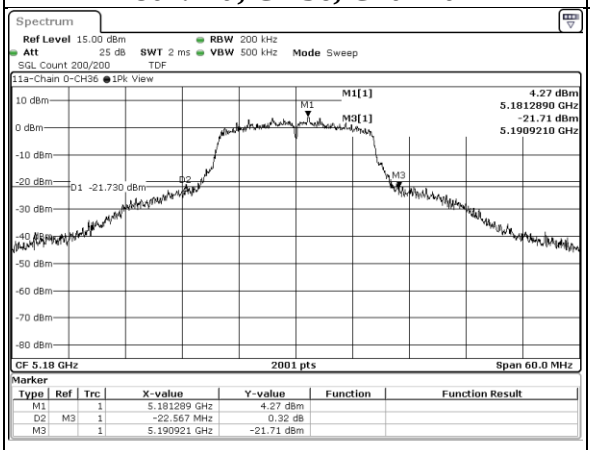


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

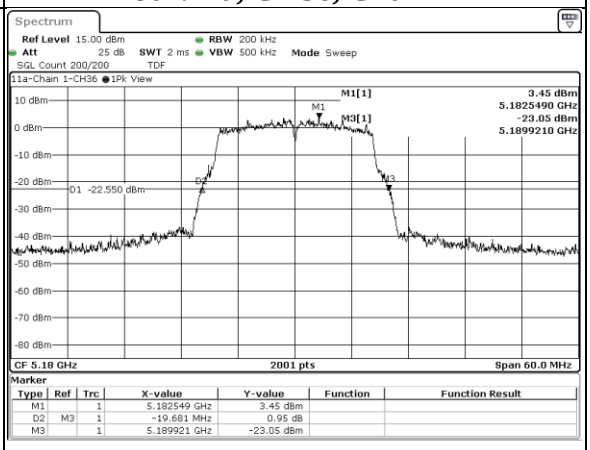
Test Data

Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11a	36	5180	22.567	19.681	N/A	Pass
	44	5220	34.026	30.497	N/A	Pass
	48	5240	30.924	28.365	N/A	Pass
	52	5260	32.299	26.682	N/A	Pass
	60	5300	26.043	20.346	N/A	Pass
	64	5320	20.028	19.731	N/A	Pass
	100	5500	19.79	19.722	N/A	Pass
	116	5580	19.858	19.788	N/A	Pass
	140	5700	19.869	19.708	N/A	Pass

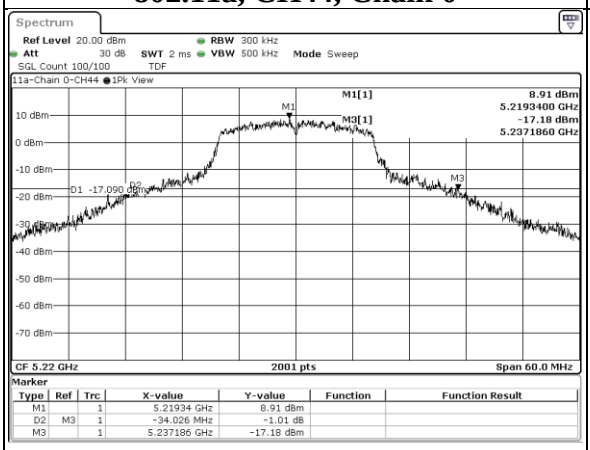
802.11a, CH36, Chain 0



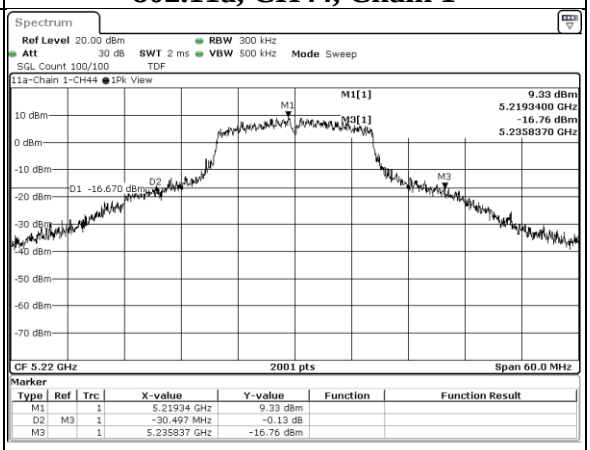
802.11a, CH36, Chain 1



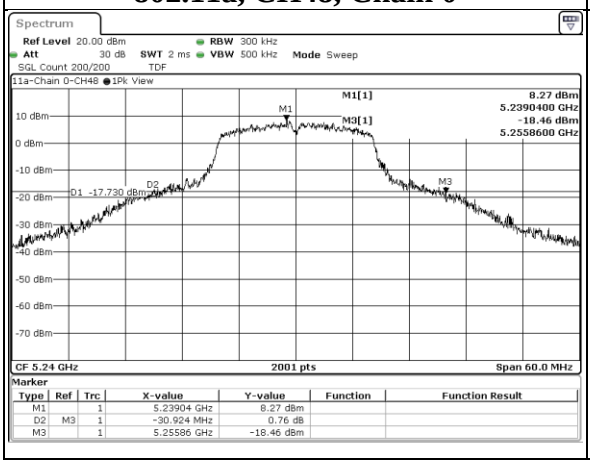
802.11a, CH44, Chain 0



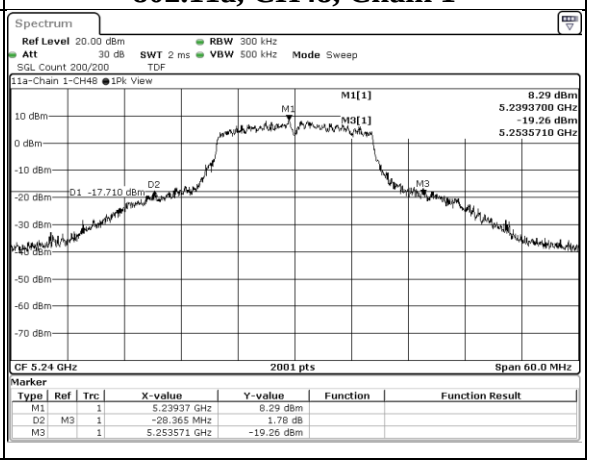
802.11a, CH44, Chain 1



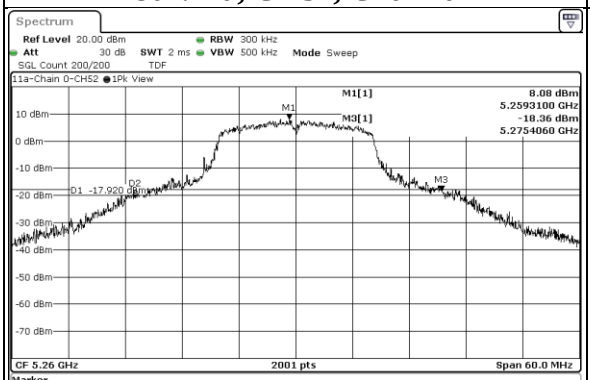
802.11a, CH48, Chain 0



802.11a, CH48, Chain 1



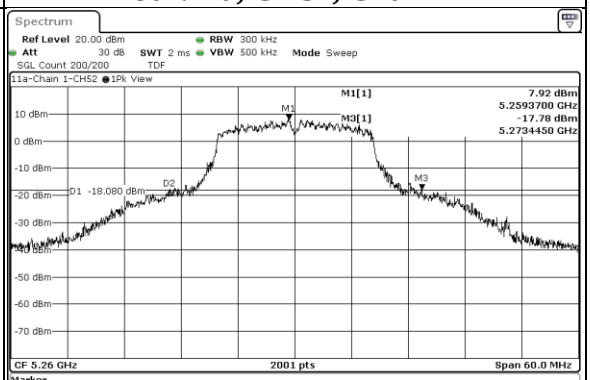
802.11a, CH52, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.25931 GHz	8.08 dBm		
D2	M3	1	-32.299 MHz	0.62 dB		
M3		1	5.275406 GHz	-18.36 dBm		

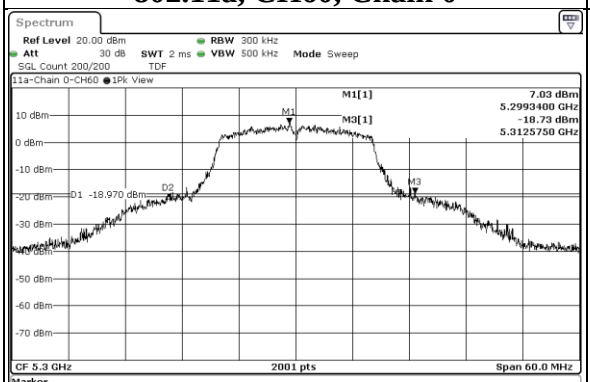
802.11a, CH52, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.25937 GHz	7.92 dBm		
D2	M3	1	-26.682 MHz	-0.04 dB		
M3		1	5.273445 GHz	-17.78 dBm		

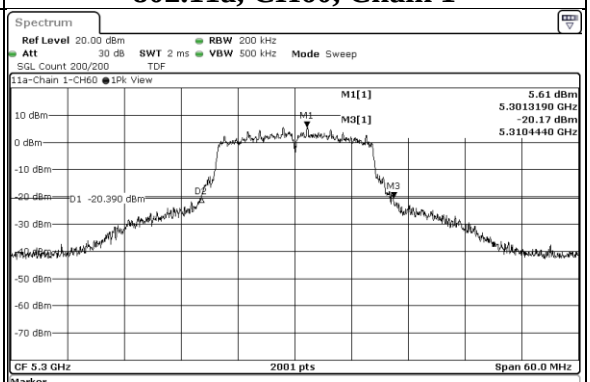
802.11a, CH60, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.29934 GHz	7.03 dBm		
D2	M3	1	-26.043 MHz	-0.26 dB		
M3		1	5.312575 GHz	-18.73 dBm		

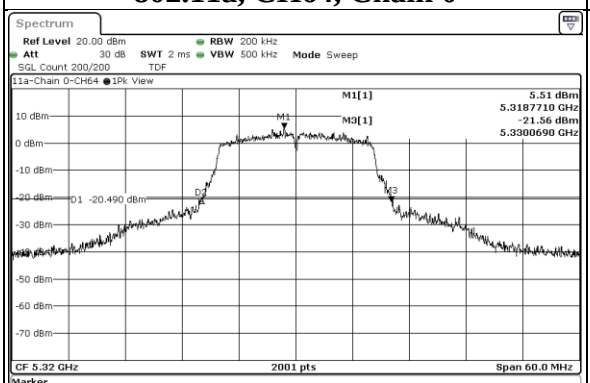
802.11a, CH60, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.301319 GHz	5.61 dBm		
D2	M3	1	-20.346 MHz	-0.15 dB		
M3		1	5.310444 GHz	-20.17 dBm		

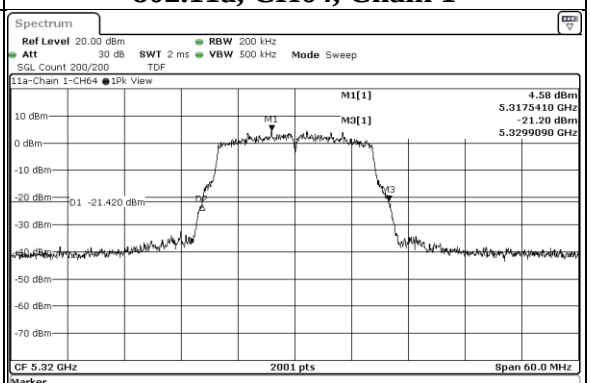
802.11a, CH64, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.318771 GHz	5.51 dBm		
D2	M3	1	-20.028 MHz	1.05 dB		
M3		1	5.330069 GHz	-21.56 dBm		

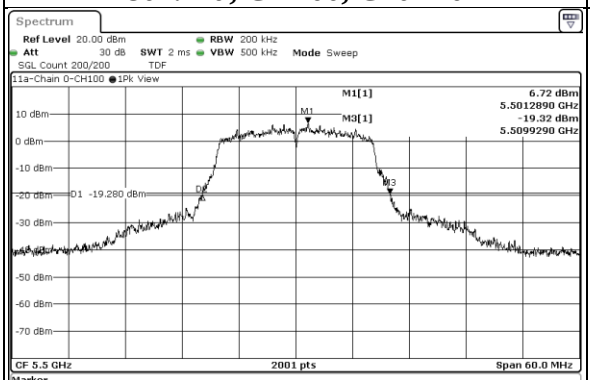
802.11a, CH64, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.317541 GHz	4.58 dBm		
D2	M3	1	-19.731 MHz	-1.56 dB		
M3		1	5.329909 GHz	-21.20 dBm		

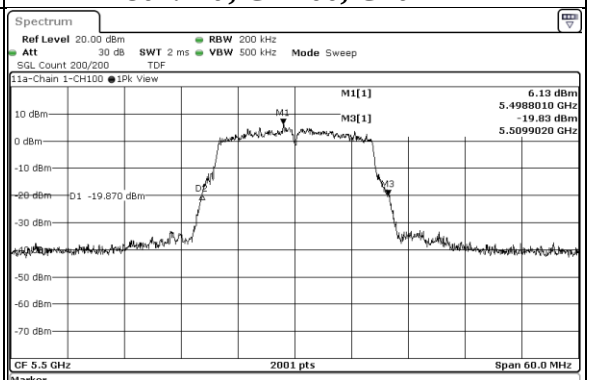
802.11a, CH100, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.501289 GHz	6.72 dBm		
D2	M3	1	-19.79 MHz	-0.53 dB		
M3		1	5.509929 GHz	-19.32 dBm		

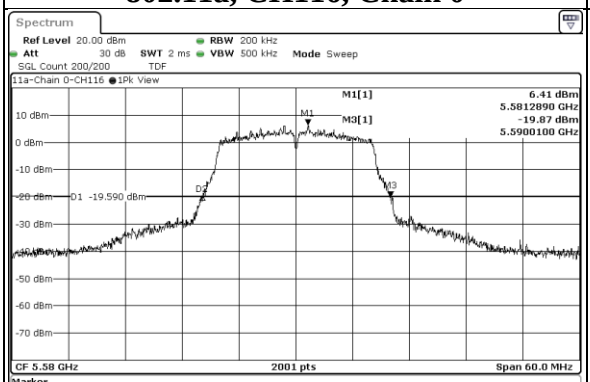
802.11a, CH100, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.498801 GHz	6.13 dBm		
D2	M3	1	-19.722 MHz	0.20 dB		
M3		1	5.509902 GHz	-19.83 dBm		

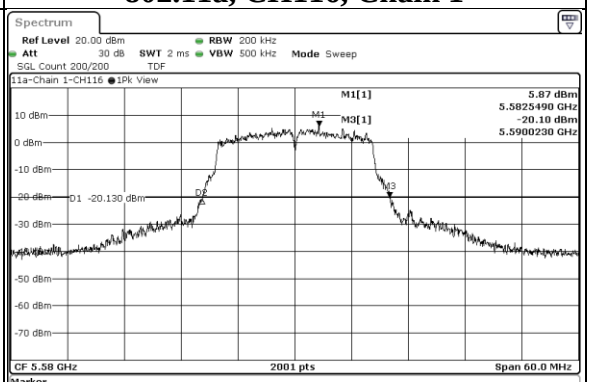
802.11a, CH116, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.581289 GHz	6.41 dBm		
D2	M3	1	-19.858 MHz	0.45 dB		
M3		1	5.59001 GHz	-19.87 dBm		

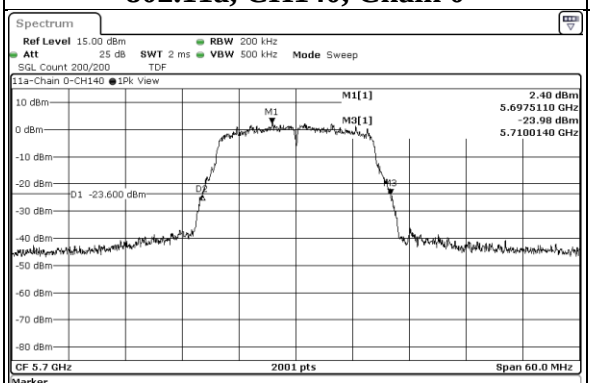
802.11a, CH116, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.582549 GHz	5.87 dBm		
D2	M3	1	-19.788 MHz	-0.67 dB		
M3		1	5.590023 GHz	-20.10 dBm		

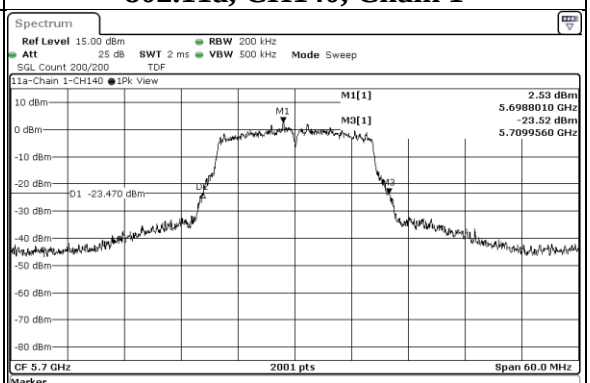
802.11a, CH140, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.697511 GHz	2.40 dBm		
D2	M3	1	-19.869 MHz	-0.15 dB		
M3		1	5.710014 GHz	-23.98 dBm		

802.11a, CH140, Chain 1

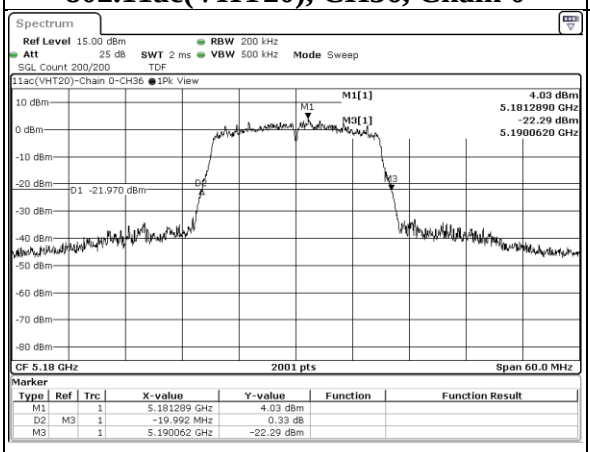


Marker

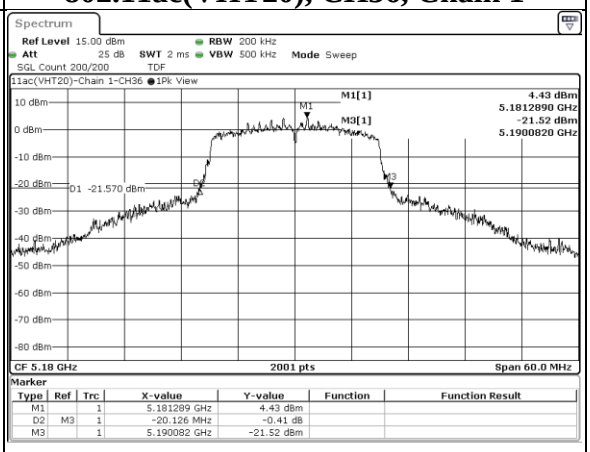
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.698801 GHz	2.53 dBm		
D2	M3	1	-19.708 MHz	0.11 dB		
M3		1	5.709956 GHz	-23.52 dBm		

Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ac(VHT20)	36	5180	19.992	20.126	N/A	Pass
	44	5220	35.53	33.415	N/A	Pass
	48	5240	32.149	29.121	N/A	Pass
	52	5260	33.401	26.023	N/A	Pass
	60	5300	29.99	20.813	N/A	Pass
	64	5320	20.21	19.888	N/A	Pass
	100	5500	20.047	19.874	N/A	Pass
	116	5580	19.958	19.983	N/A	Pass
	140	5700	19.95	19.923	N/A	Pass

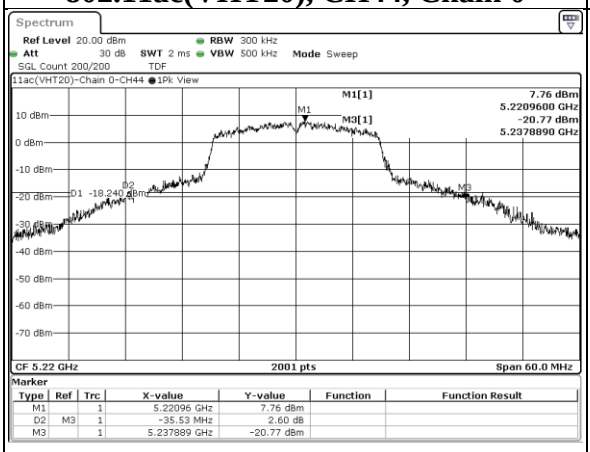
802.11ac(VHT20), CH36, Chain 0



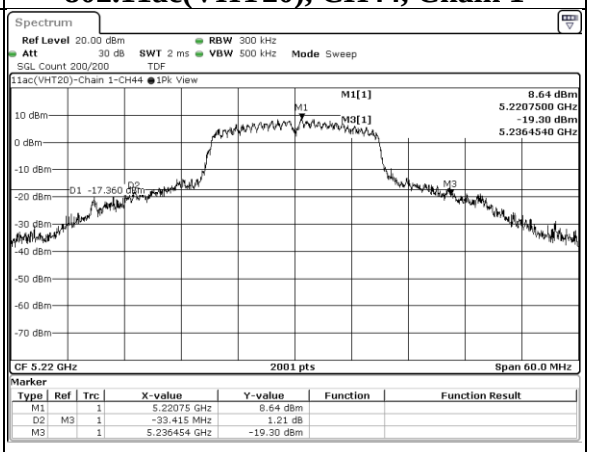
802.11ac(VHT20), CH36, Chain 1



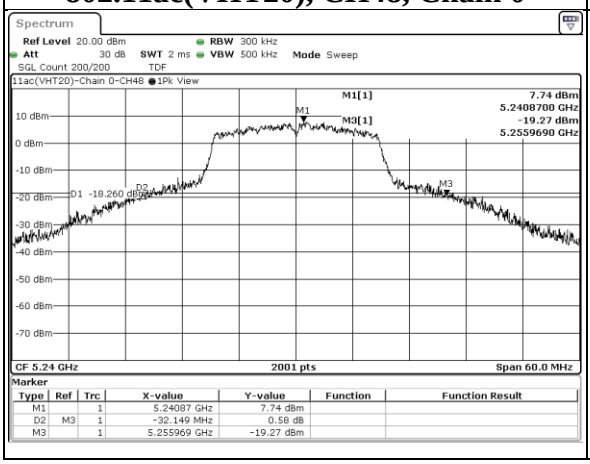
802.11ac(VHT20), CH44, Chain 0



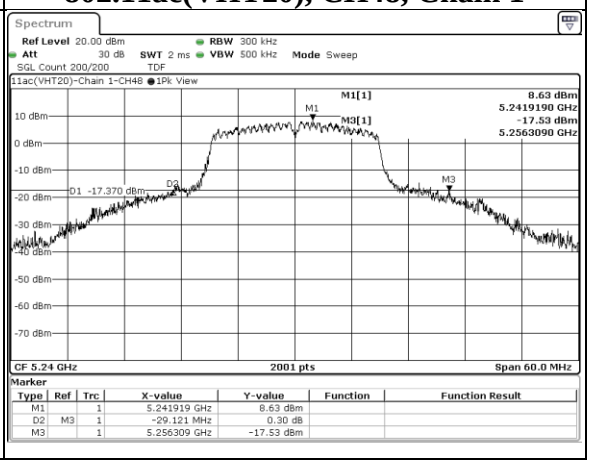
802.11ac(VHT20), CH44, Chain 1



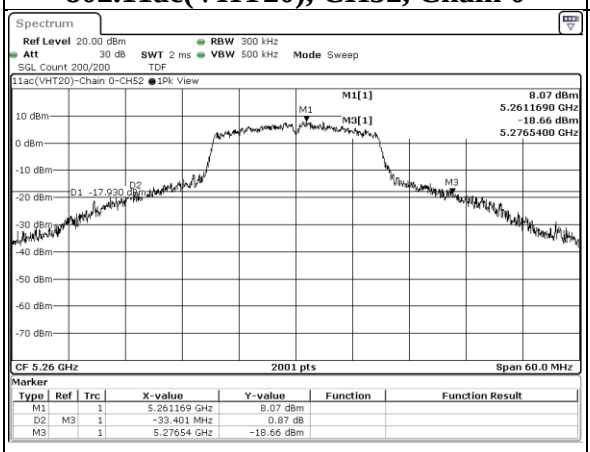
802.11ac(VHT20), CH48, Chain 0



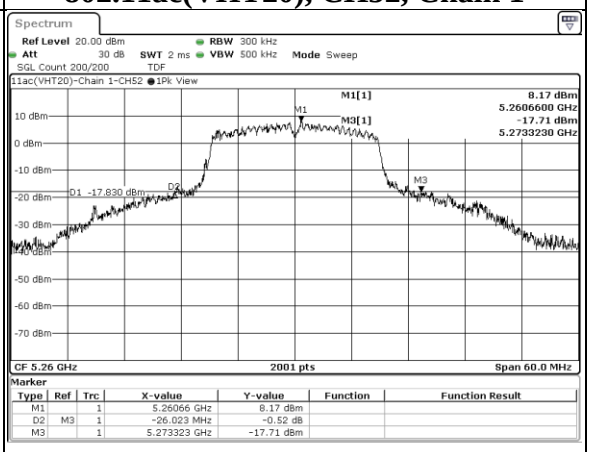
802.11ac(VHT20), CH48, Chain 1



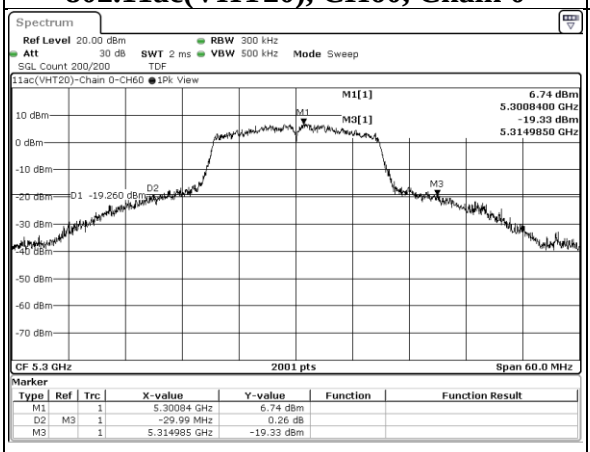
802.11ac(VHT20), CH52, Chain 0



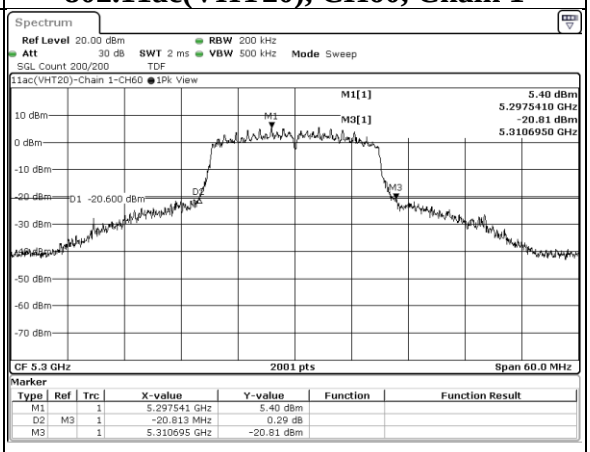
802.11ac(VHT20), CH52, Chain 1



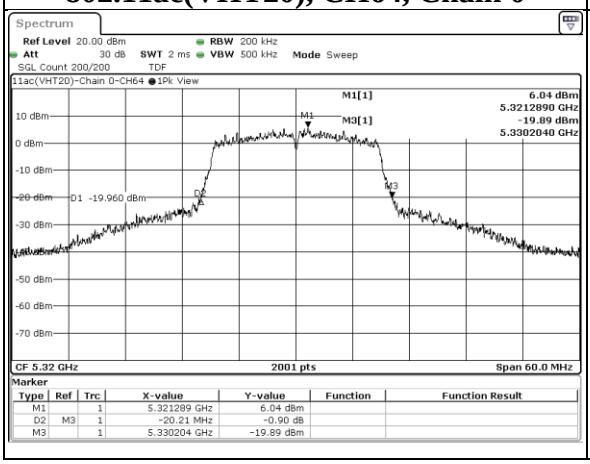
802.11ac(VHT20), CH60, Chain 0



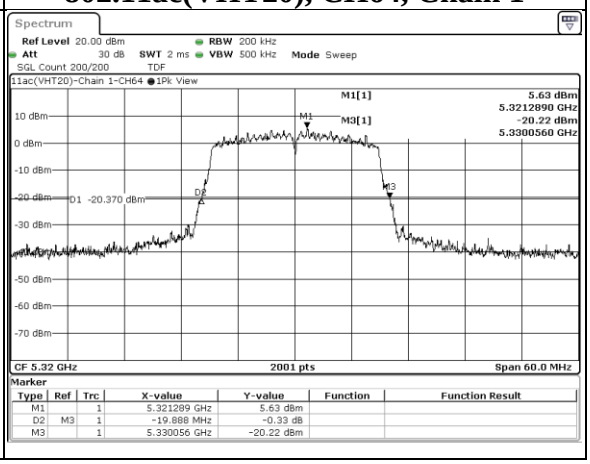
802.11ac(VHT20), CH60, Chain 1



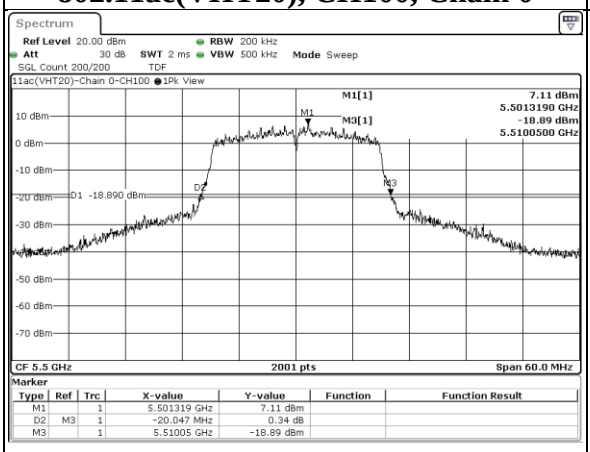
802.11ac(VHT20), CH64, Chain 0



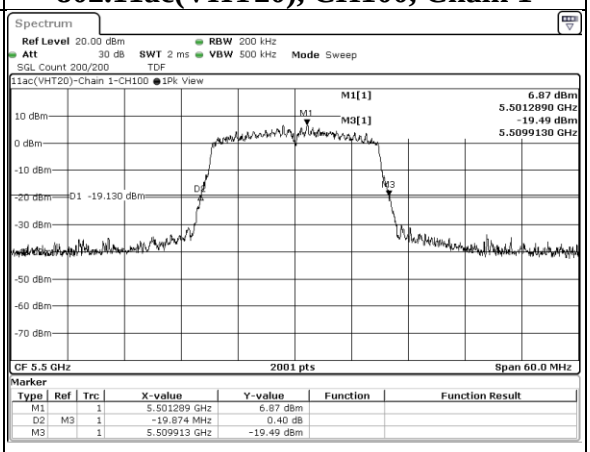
802.11ac(VHT20), CH64, Chain 1



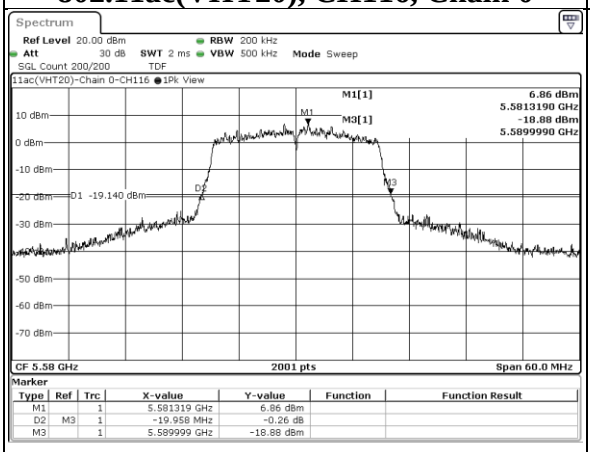
802.11ac(VHT20), CH100, Chain 0



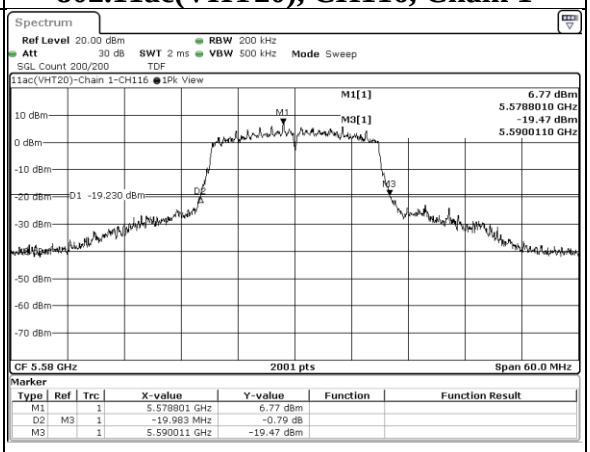
802.11ac(VHT20), CH100, Chain 1



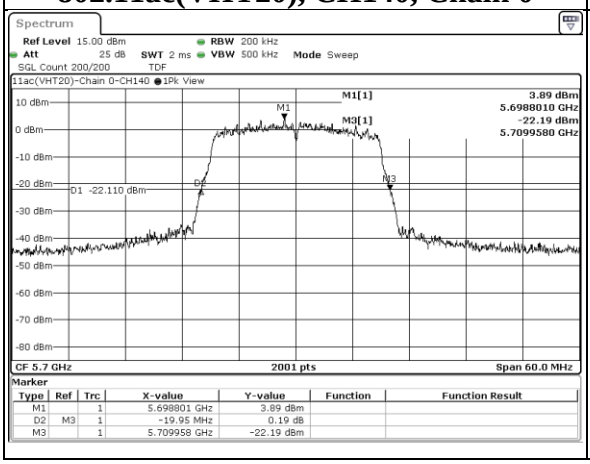
802.11ac(VHT20), CH116, Chain 0



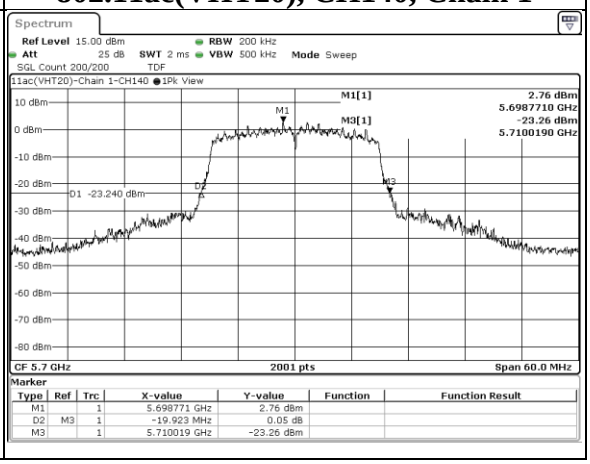
802.11ac(VHT20), CH116, Chain 1



802.11ac(VHT20), CH140, Chain 0

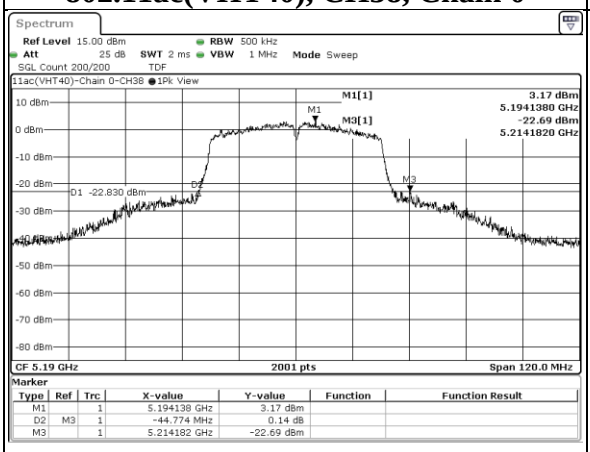


802.11ac(VHT20), CH140, Chain 1

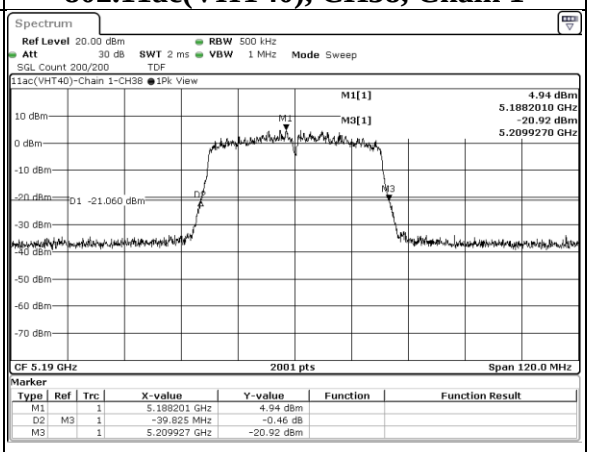


Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ac(VHT40)	38	5190	44.774	39.825	N/A	Pass
	46	5230	72.918	59.673	N/A	Pass
	54	5270	77.123	67.06	N/A	Pass
	62	5310	40.812	40.702	N/A	Pass
	102	5510	40.883	39.853	N/A	Pass
	110	5550	49.207	40.309	N/A	Pass
	134	5670	42.755	63.318	N/A	Pass

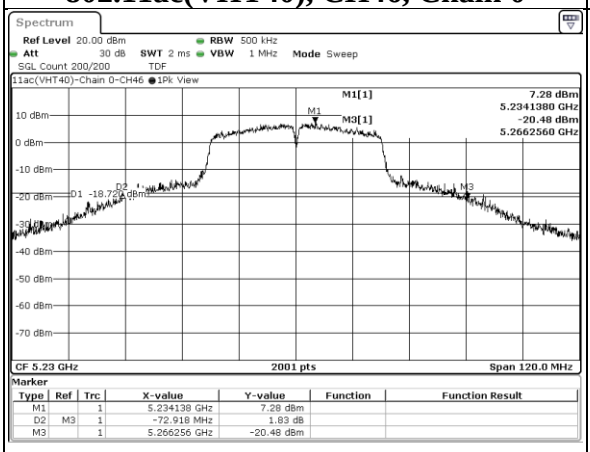
802.11ac(VHT40), CH38, Chain 0



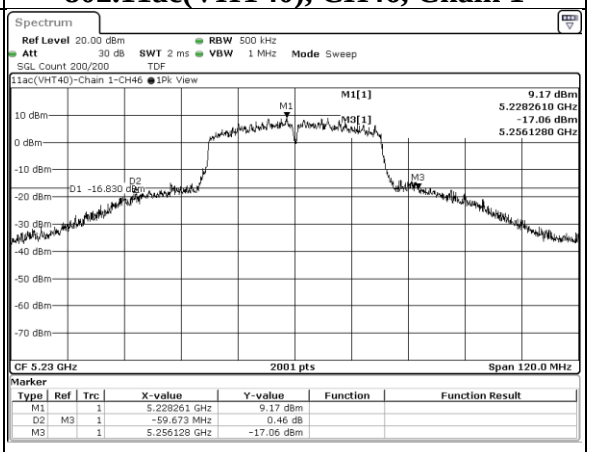
802.11ac(VHT40), CH38, Chain 1



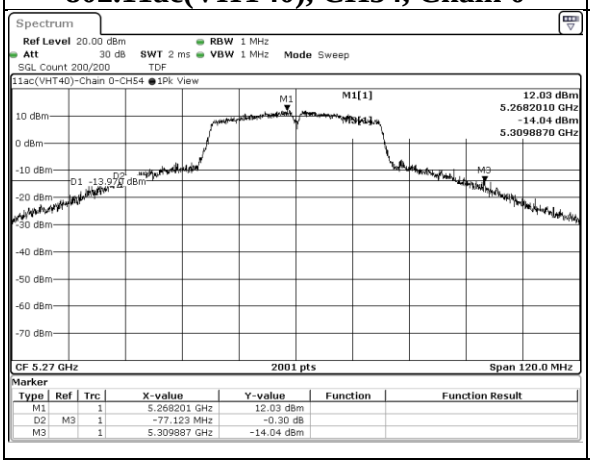
802.11ac(VHT40), CH46, Chain 0



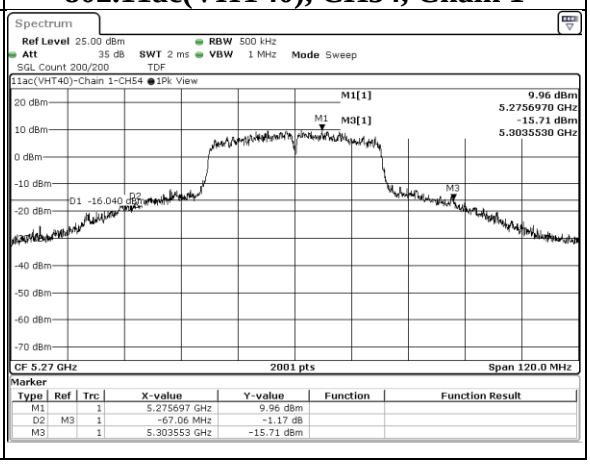
802.11ac(VHT40), CH46, Chain 1



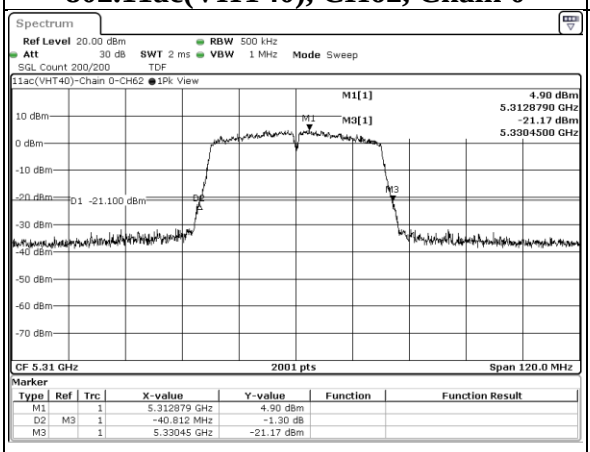
802.11ac(VHT40), CH54, Chain 0



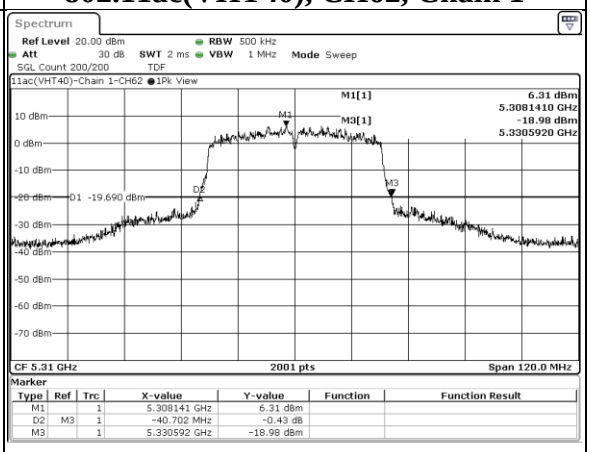
802.11ac(VHT40), CH54, Chain 1



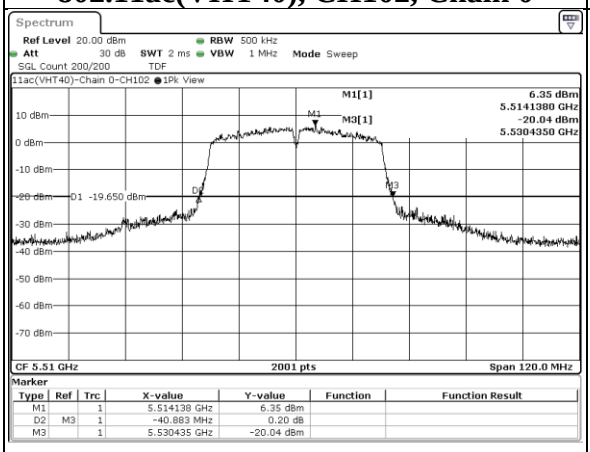
802.11ac(VHT40), CH62, Chain 0



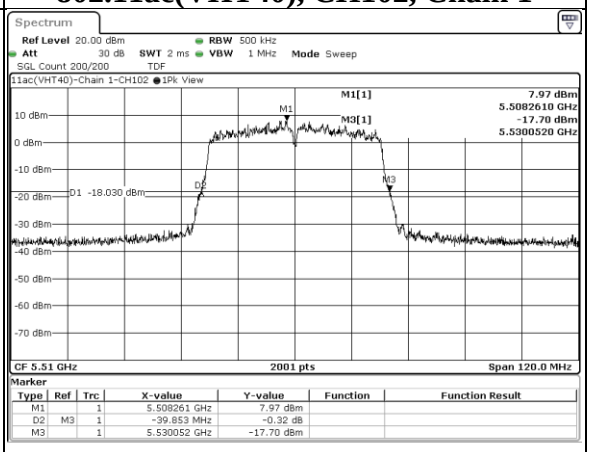
802.11ac(VHT40), CH62, Chain 1



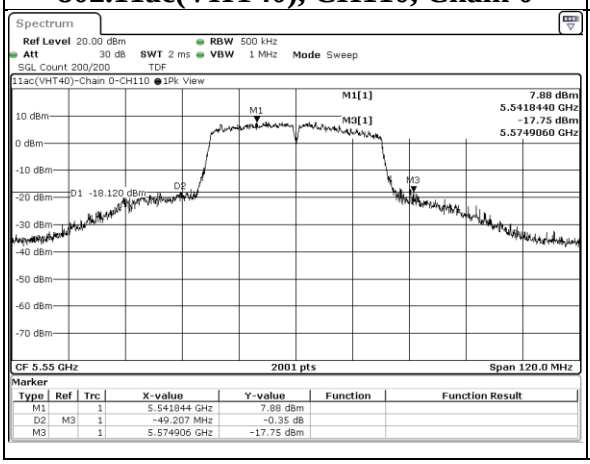
802.11ac(VHT40), CH102, Chain 0



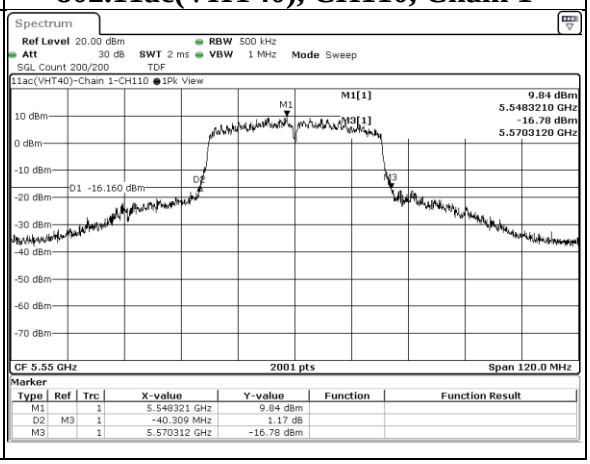
802.11ac(VHT40), CH102, Chain 1



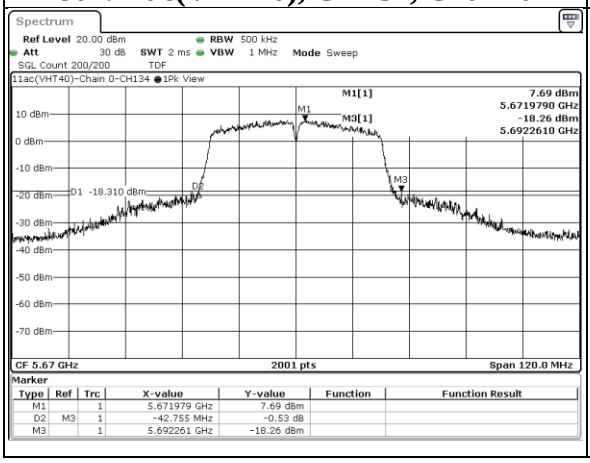
802.11ac(VHT40), CH110, Chain 0



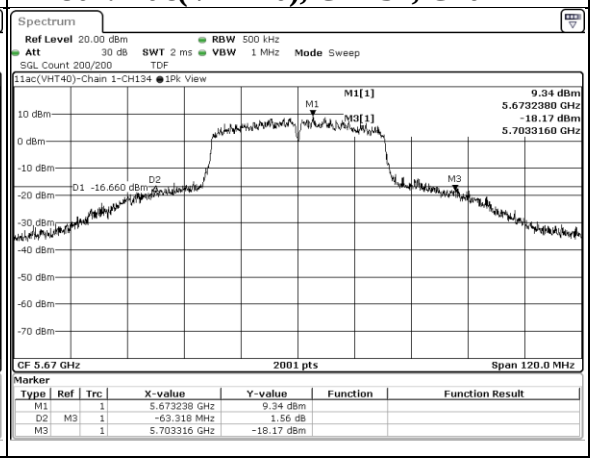
802.11ac(VHT40), CH110, Chain 1



802.11ac(VHT40), CH134, Chain 0

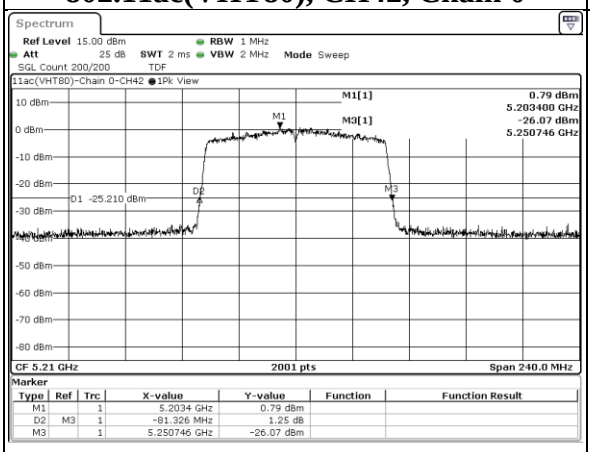


802.11ac(VHT40), CH134, Chain 1

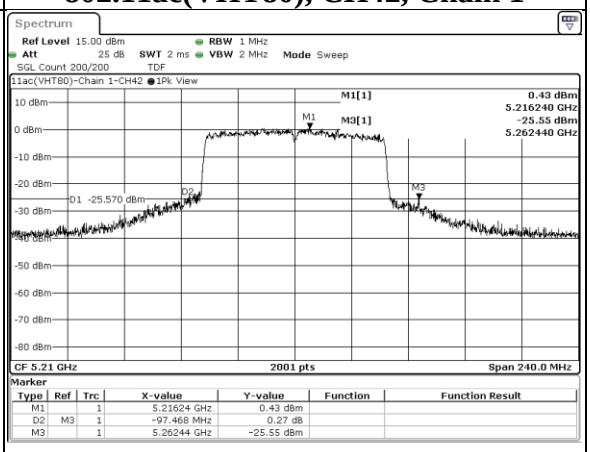


Mode	CH	Freq (MHz)	26dB BW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ac(VHT80)	42	5210	81.326	97.468	N/A	Pass
	58	5290	81.31	80.075	N/A	Pass
	106	5530	81.131	80.32	N/A	Pass
	122	5610	87.22	110.441	N/A	Pass

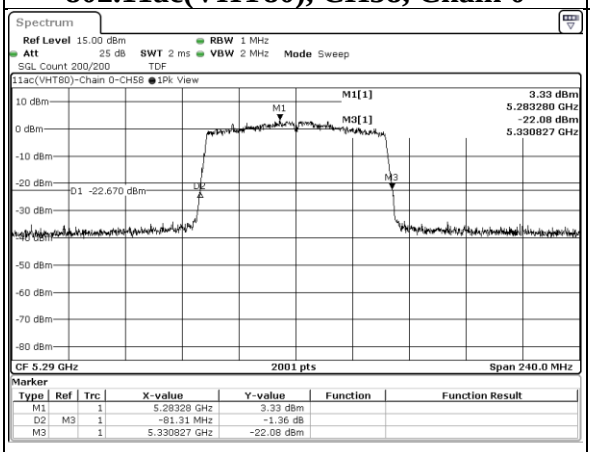
802.11ac(VHT80), CH42, Chain 0



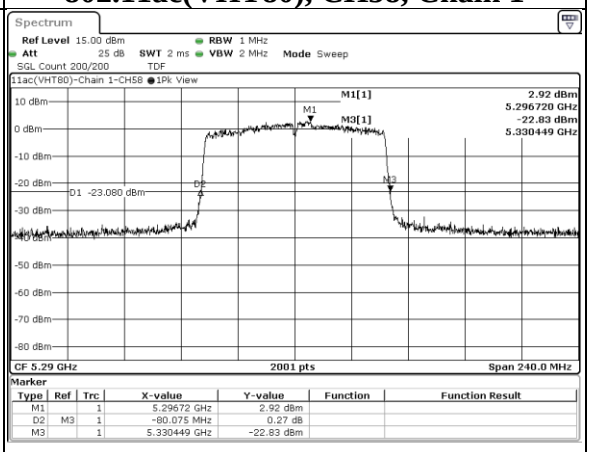
802.11ac(VHT80), CH42, Chain 1



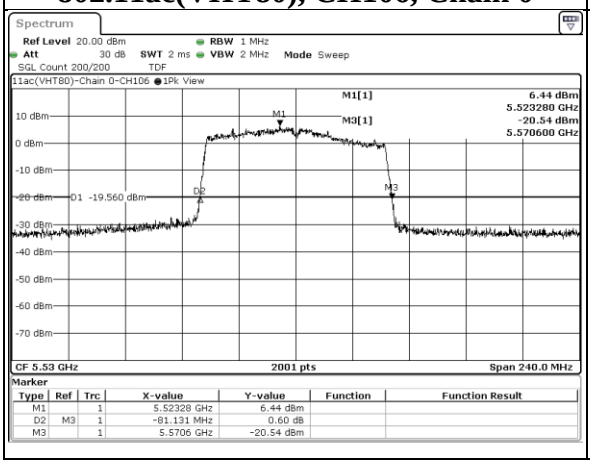
802.11ac(VHT80), CH58, Chain 0



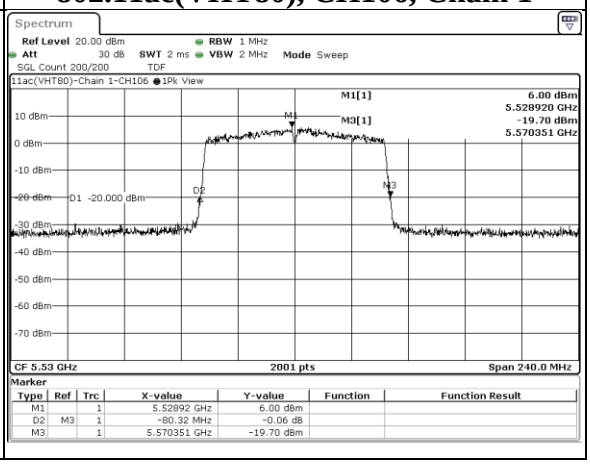
802.11ac(VHT80), CH58, Chain 1



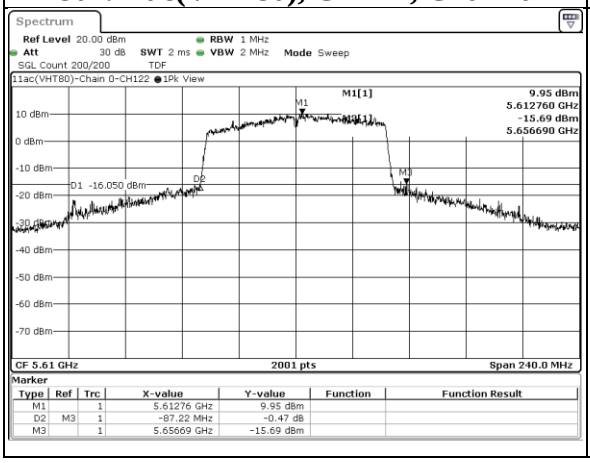
802.11ac(VHT80), CH106, Chain 0



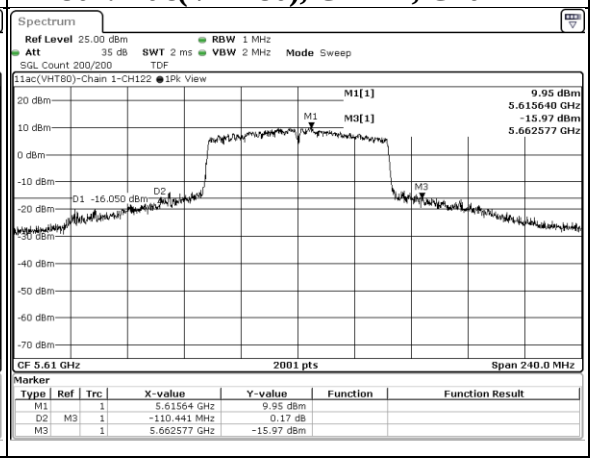
802.11ac(VHT80), CH106, Chain 1



802.11ac(VHT80), CH122, Chain 0



802.11ac(VHT80), CH122, Chain 1

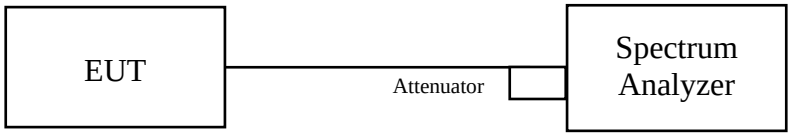


9.3. Occupied Bandwidth

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 ≥ 3 x 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.

Test Setup

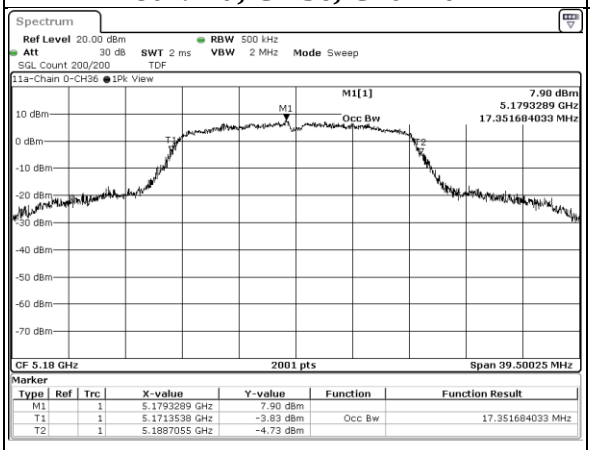


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

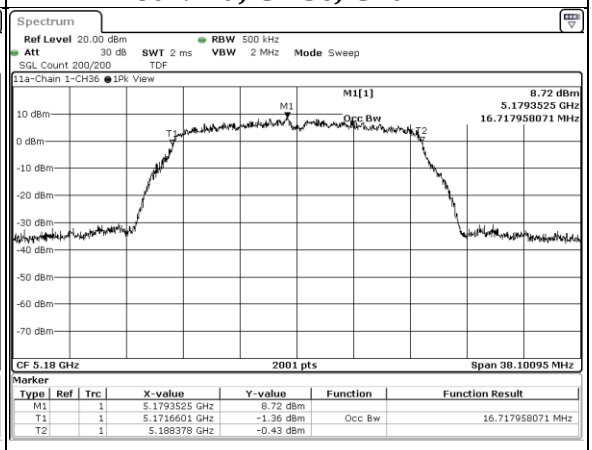
Test Data

Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11a	36	5180	17.352	16.718	N/A	Pass
	44	5220	18.722	17.779	N/A	Pass
	48	5240	18.16	17.328	N/A	Pass
	52	5260	18.142	17.214	N/A	Pass
	60	5300	17.408	16.911	N/A	Pass
	64	5320	17.194	16.815	N/A	Pass
	100	5500	17.118	16.778	N/A	Pass
	116	5580	17.116	16.818	N/A	Pass
	140	5700	16.996	16.825	N/A	Pass
	149	5745	17.07	16.82	N/A	Pass
	157	5785	17.071	16.876	N/A	Pass
	165	5825	17.068	16.816	N/A	Pass

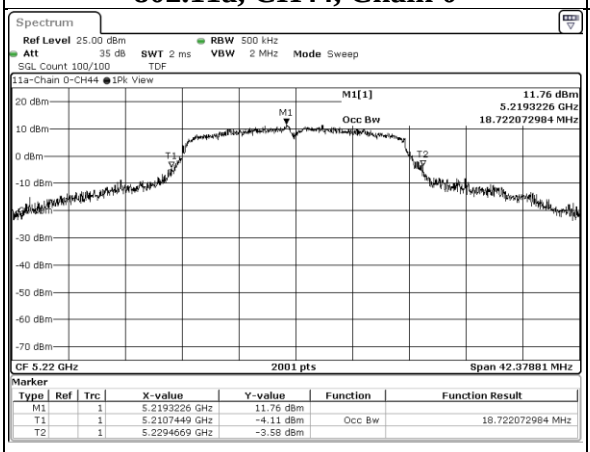
802.11a, CH36, Chain 0



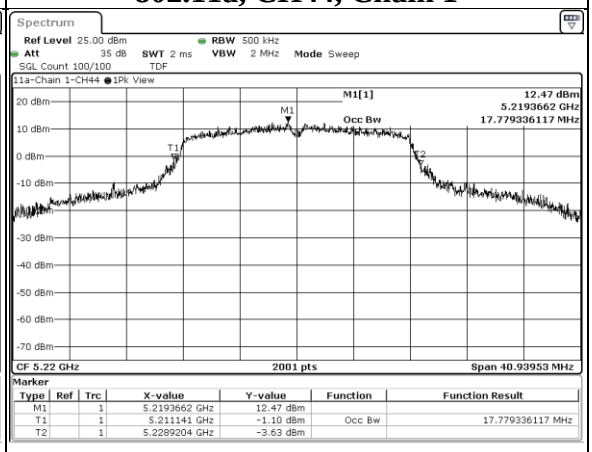
802.11a, CH36, Chain 1



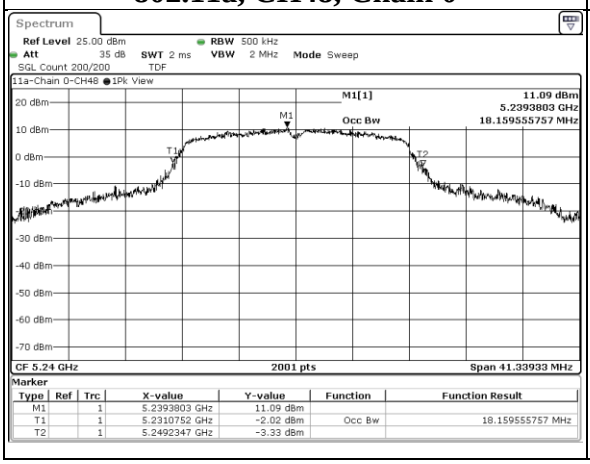
802.11a, CH44, Chain 0



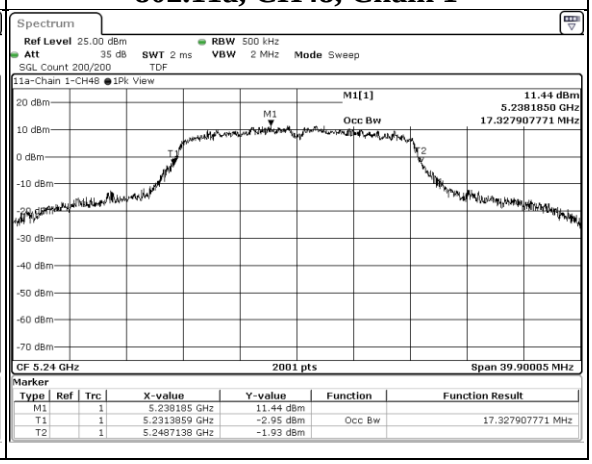
802.11a, CH44, Chain 1



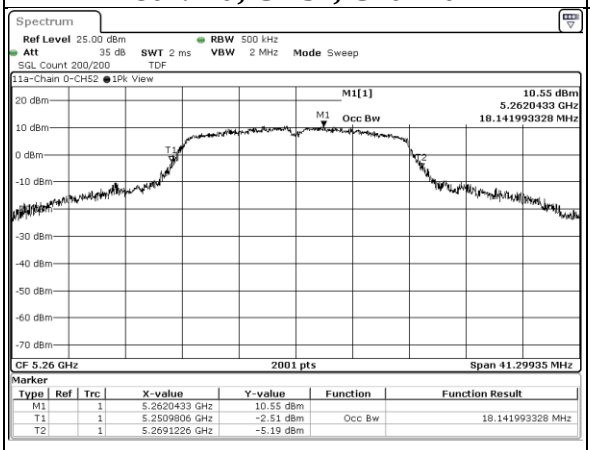
802.11a, CH48, Chain 0



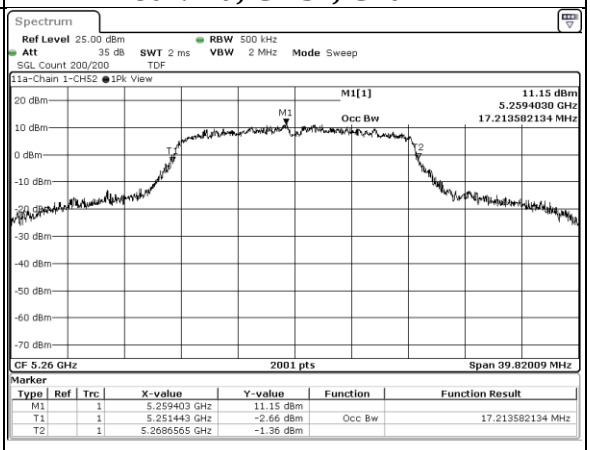
802.11a, CH48, Chain 1



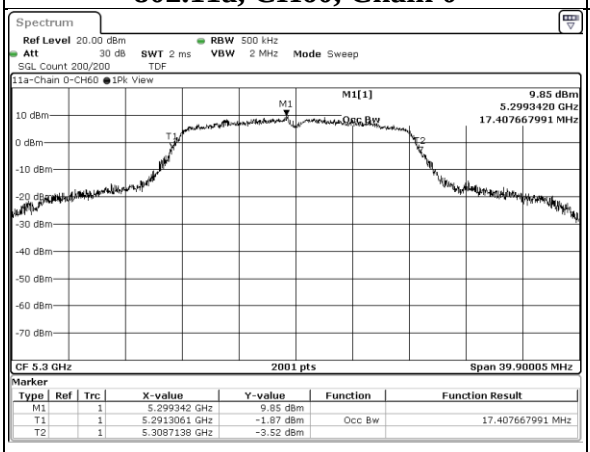
802.11a, CH52, Chain 0



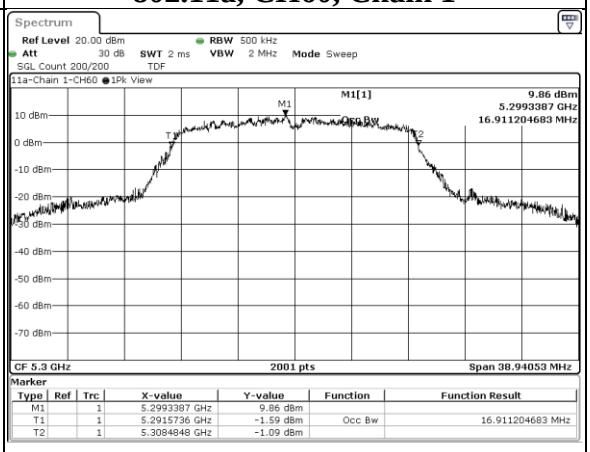
802.11a, CH52, Chain 1



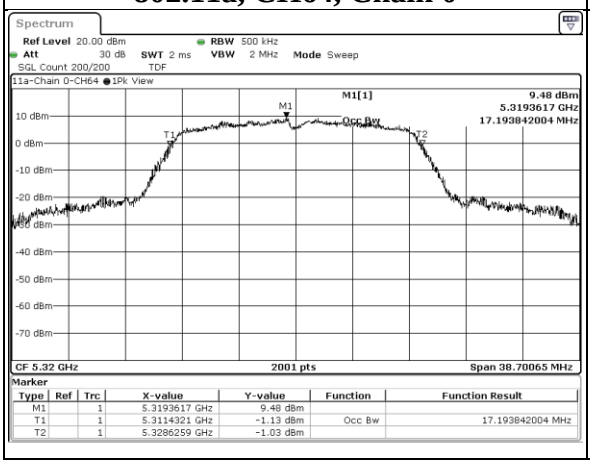
802.11a, CH60, Chain 0



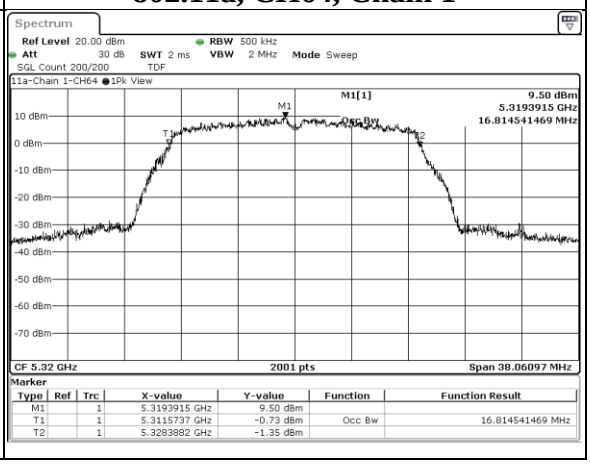
802.11a, CH60, Chain 1



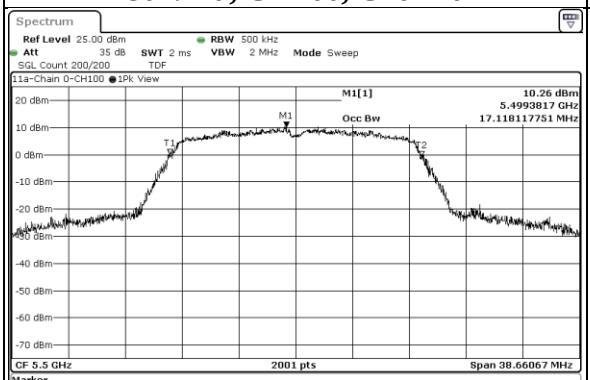
802.11a, CH64, Chain 0



802.11a, CH64, Chain 1



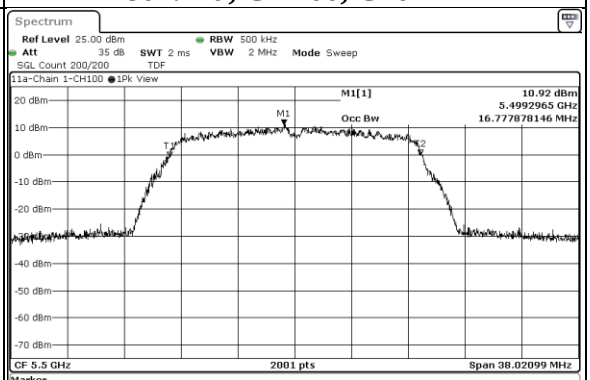
802.11a, CH100, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.4993817 GHz	10.26 dBm		
T1		1	5.4914409 GHz	0.06 dBm	Occ Bw	17.118117751 MHz
T2		1	5.5085591 GHz	-0.56 dBm		

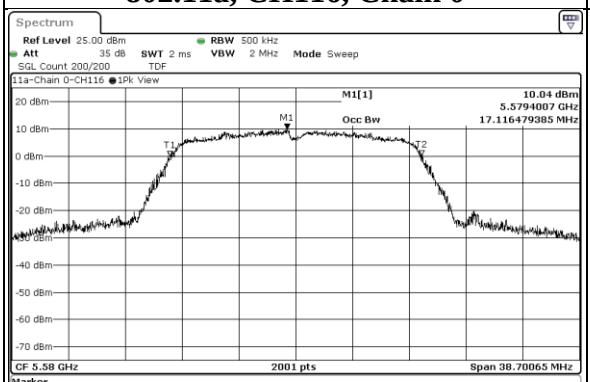
802.11a, CH100, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.4992965 GHz	10.92 dBm		
T1		1	5.4916206 GHz	-0.92 dBm	Occ Bw	16.777878146 MHz
T2		1	5.5083984 GHz	-0.17 dBm		

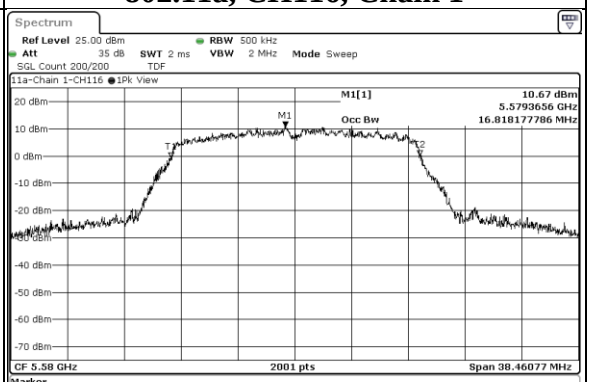
802.11a, CH116, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.5794007 GHz	10.04 dBm		
T1		1	5.5714514 GHz	-0.10 dBm	Occ Bw	17.116479385 MHz
T2		1	5.5885679 GHz	0.13 dBm		

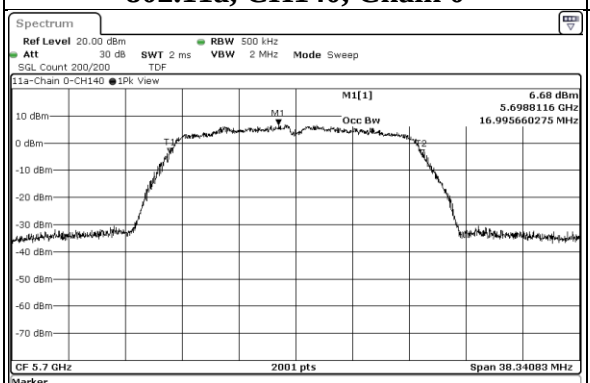
802.11a, CH116, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.5793656 GHz	10.67 dBm		
T1		1	5.571639 GHz	-0.63 dBm	Occ Bw	16.818177786 MHz
T2		1	5.5884571 GHz	0.08 dBm		

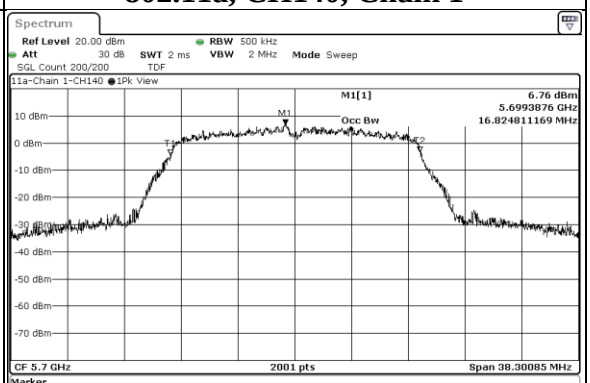
802.11a, CH140, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.6988116 GHz	6.68 dBm		
T1		1	5.6914926 GHz	-3.78 dBm	Occ Bw	16.995660275 MHz
T2		1	5.7084882 GHz	-4.22 dBm		

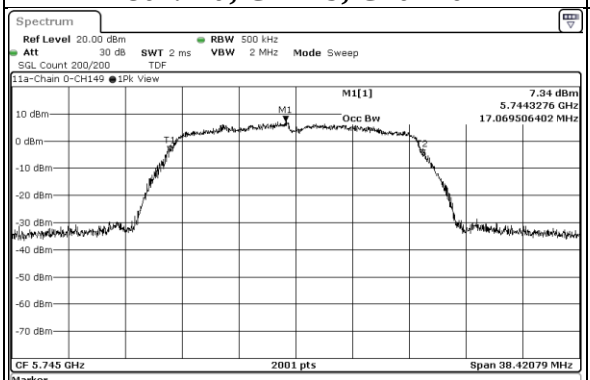
802.11a, CH140, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.6993876 GHz	6.76 dBm		
T1		1	5.6916163 GHz	-4.27 dBm	Occ Bw	16.824811169 MHz
T2		1	5.7084411 GHz	-3.32 dBm		

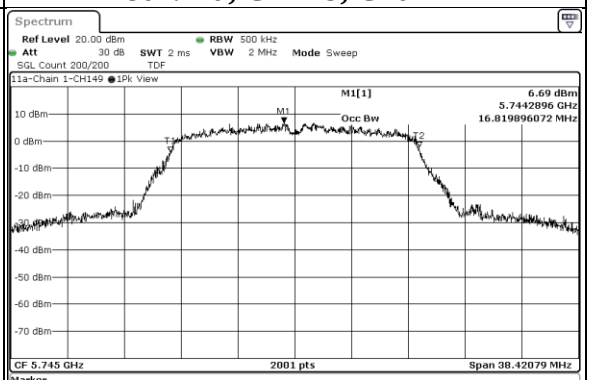
802.11a, CH149, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7443276 GHz	7.34 dBm		
T1		1	5.7364748 GHz	-3.88 dBm	Occ Bw	17.069506402 MHz
T2		1	5.7535444 GHz	-5.17 dBm		

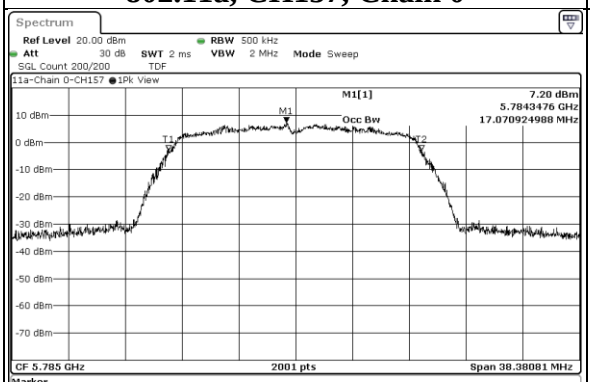
802.11a, CH149, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7442896 GHz	6.69 dBm		
T1		1	5.7365901 GHz	-3.99 dBm	Occ Bw	16.819896072 MHz
T2		1	5.7534099 GHz	-2.35 dBm		

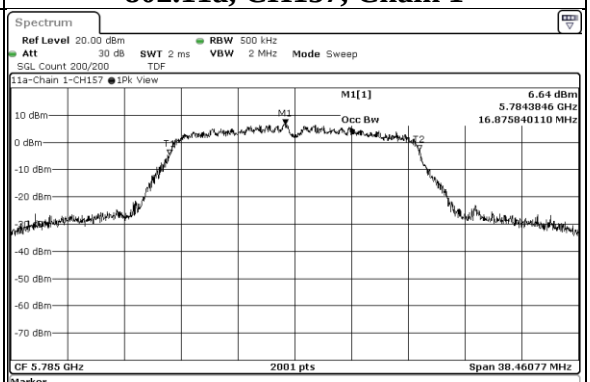
802.11a, CH157, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7843476 GHz	7.20 dBm		
T1		1	5.7764262 GHz	-3.14 dBm	Occ Bw	17.070924988 MHz
T2		1	5.7934971 GHz	-3.11 dBm		

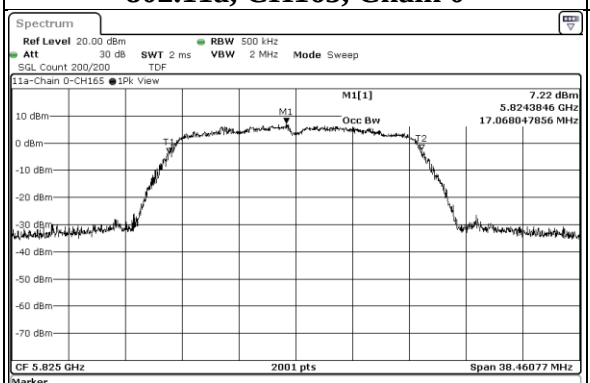
802.11a, CH157, Chain 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7843846 GHz	6.64 dBm		
T1		1	5.7765236 GHz	-4.60 dBm	Occ Bw	16.87584011 MHz
T2		1	5.7933995 GHz	-3.04 dBm		

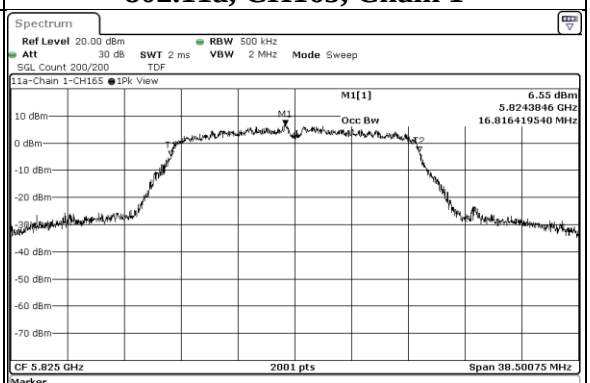
802.11a, CH165, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.8243846 GHz	7.22 dBm		
T1		1	5.8164468 GHz	-3.69 dBm	Occ Bw	17.068047856 MHz
T2		1	5.8335148 GHz	-2.50 dBm		

802.11a, CH165, Chain 1

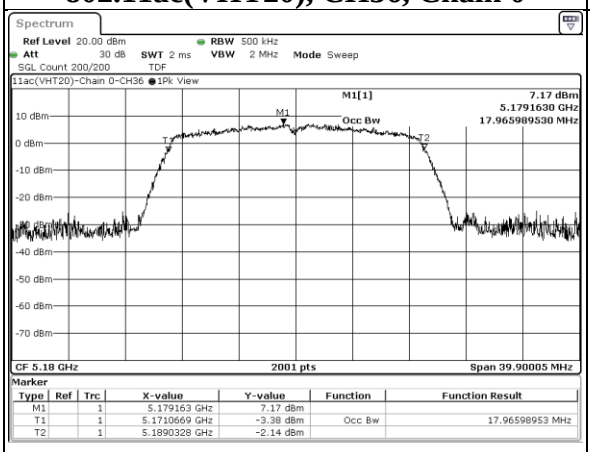


Marker

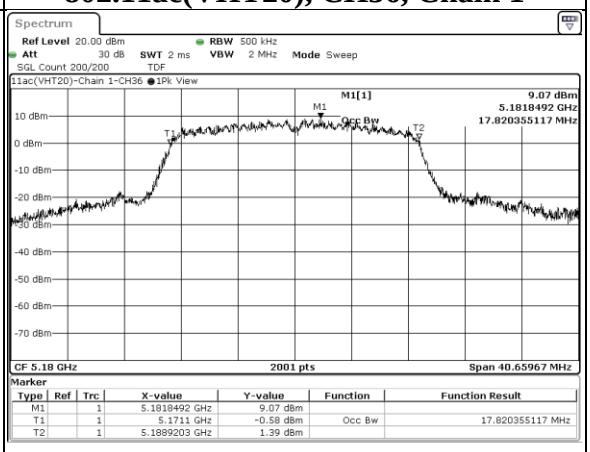
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.8243846 GHz	6.55 dBm		
T1		1	5.816611 GHz	-4.79 dBm	Occ Bw	16.81641954 MHz
T2		1	5.8334275 GHz	-3.28 dBm		

Mode	CH	Freq (MHz)	OBW (MHz)		Limit (MHz)	Result
			Chain 0	Chain 1		
802.11ac(VHT20)	36	5180	17.966	17.82	N/A	Pass
	44	5220	19.609	18.3	N/A	Pass
	48	5240	19.028	18.095	N/A	Pass
	52	5260	19.081	18.051	N/A	Pass
	60	5300	18.556	17.884	N/A	Pass
	64	5320	18.076	17.691	N/A	Pass
	100	5500	18.025	17.713	N/A	Pass
	116	5580	18.005	17.771	N/A	Pass
	140	5700	17.926	17.728	N/A	Pass
	149	5745	17.966	17.758	N/A	Pass
	157	5785	17.944	17.741	N/A	Pass
	165	5825	17.944	17.778	N/A	Pass

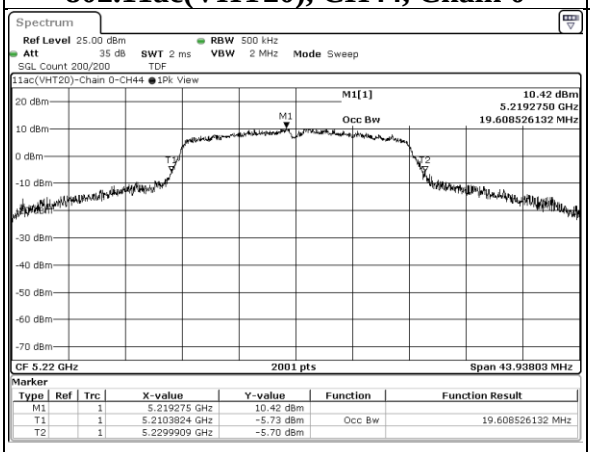
802.11ac(VHT20), CH36, Chain 0



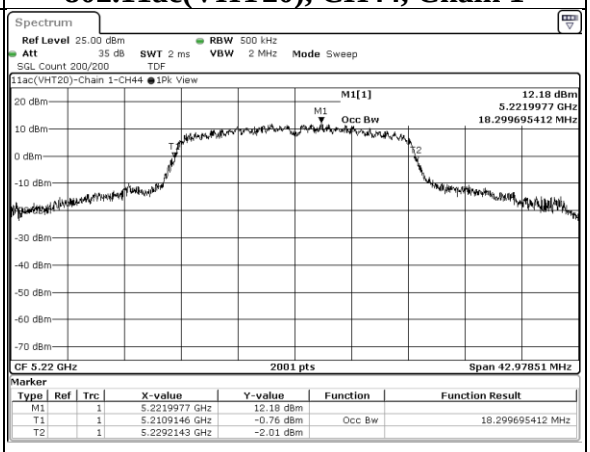
802.11ac(VHT20), CH36, Chain 1



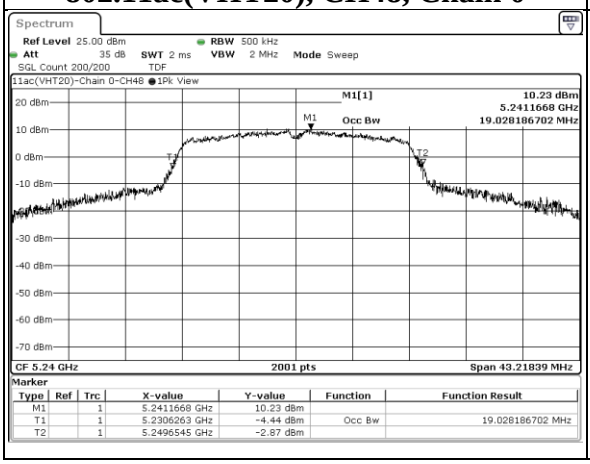
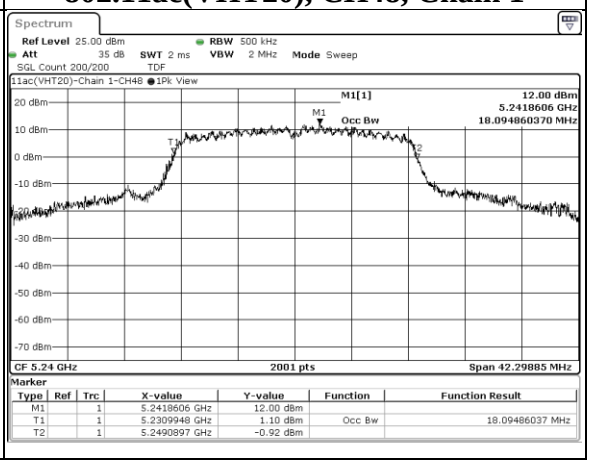
802.11ac(VHT20), CH44, Chain 0



802.11ac(VHT20), CH44, Chain 1



802.11ac(VHT20), CH48, Chain 0



802.11ac(VHT20), CH48, Chain 1