TEST REPORT

No. I23N00836-WLAN 5GHz

for

Shanghai Sunmi Technology Co., Ltd.

Smart POS Terminal

Model Name: T6721

with

Hardware Version: Bgf6d

Software Version: SP6611A_V003_20230409_sunmi_CS

FCC ID: 2AH25P3MIX

ISED Number: 22621-P3MIX

Issued Date: 2023-07-26

Designation Number: CN1210

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

Test Laboratory:

Shenzhen Academy of Information and Communications Technology

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I23N00836-WLAN 5GHz	Rev.0	1st edition	2023-07-26

Note: the latest revision of the test report supersedes all previous versions.

CONTENTS

1. Summary of Test Report

1.1. Test Items

Description	Smart POS Terminal
Model Name	T6721
Applicant's name	Shanghai Sunmi Technology Co., Ltd.
Manufacturer's Name	Shanghai Sunmi Technology Co., Ltd.

1.2. Test Standards

FCC Part15-2021; ANSI C63.10-2013; RSS-247 Issue 2; RSS-Gen Issue 5
KDB 789033-V02r01

1.3. Test Result

Pass

Please refer to 5.2 Test Results.

1.4. Testing Location

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000

1.5. Project data

Testing Start Date:	2023-05-23
Testing End Date:	2023-06-15

1.6. Signature

Lin Kanfeng
(Prepared this test report)

An Ran
(Reviewed this test report)

Zhang Bojun
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Shanghai Sunmi Technology Co., Ltd.
Address:	Room 505, No.388, Song Hu Road, Yang Pu District, Shanghai, China
Contact Person	Fang Lu
E-Mail	fang.lu@sunmi.com
Telephone:	+86 18501703215
Fax:	/

2.2. Manufacturer Information

Company Name:	Shanghai Sunmi Technology Co., Ltd.
Address:	Room 505, No.388, Song Hu Road, Yang Pu District, Shanghai, China
Contact Person	Fang Lu
E-Mail	fang.lu@sunmi.com
Telephone:	+86 18501703215
Fax:	/

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Smart POS Terminal
Model Name	T6721
RF Protocol	IEEE 802.11a, 802.11n-HT20/40, 802.11ac-VHT20/40/80
WLAN Frequency Range	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz -5725MHz~5850MHz
Type of modulation	OFDM
Antenna Type	Integrated
Antenna Gain	5150MHz~5725MHz: 3.0 dBi; 5725MHz~5850MHz: 3.1 dBi
Power Supply	7.2V DC by Battery
FCC ID	2AH25P3MIX
ISED Number	22621-P3MIX
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of Receipt
UT01aa	868189060008663	Bgf6d	SP6611A_V003_20230409_sunmi_CS	2023-05-16
UT07aa	865506060003027	Bgf6d	SP6611A_V003_20230409_sunmi_CS	2023-05-30

*EUT ID: is used to identify the test sample in the lab internally.

*UT01aa is used for Conduction test; UT07aa is used for radiation test.

3.3. Internal Identification of AE

AE No.	Description	AE ID*
AE1	Battery	/
AE2	Charger	/
AE3	Data Cable	/

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of Smart POS Terminal with integrated antenna and battery. It consists of normal options: Lithium Battery and Charger. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the client.

4. REFERENCE DOCUMENTS

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47,Part 15,Subpart C FCC CFR 47,Part 15,Subpart E	2021
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
RSS-247	Spectrum Management and Telecommunications Radio Standards Specification Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices	Issue 2 February, 2017
RSS-Gen	Spectrum Management and Telecommunications Radio Standards Specification General Requirements for Compliance of Radio Apparatus	Issue 5 A2 February, 2021
KDB 789033	GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E	V02r01

5. Test Results

5.1. Testing Environment

Normal Temperature: 15~35°C

Relative Humidity: 20~75%

5.2. Test Results

No.	Test cases	Sub-clause of Part15E	Sub-clause of IC	Verdict
1	Maximum Output Power	15.407	RSS-247 section 5.4	**P**
2	Power Spectral Density	15.407	RSS-247 section 5.2	**P**
3	Occupied 26dB Bandwidth	15.403	RSS-247 section 5.2	**P**
4	Occupied 6dB Bandwidth	15.407	RSS-247 section 5.2	**P**
5	99% Occupied Bandwidth	15.403	RSS-Gen section 6.7	**P**
6	Band edge compliance	15.209	RSS-247 section 5.5	**P**
7	Transmitter Spurious Emissions	15.407, 15.205	RSS-247 section 5.5/ RSS-Gen section 6.13	**P**
8	AC Power line Conducted	15.107, 15.207	RSS-Gen section 8.8	**P**
9	Transmit Power Control	15.407	/	**NA**

Please refer to **ANNEX A** for detail.

Note: According to the definition of the application description, the device will automatically discontinue transmission in case of either absence of information to transmit or operational failure.

5.3. Statements

SAICT has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.2 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

Disclaimer:

A. After confirmation with the customer, the sample information provided by the customer may affect the validity of the measurement results in this report, and the impact and consequences arising therefrom shall be borne by the customer.

B. The samples in this report are provided by the customer, and the test results are only applicable to the samples received.

The Smart POS Terminal, T6721, manufactured by Shanghai Sunmi Technology Co.,Ltd. is a new product for testing. According to the declaration, there are three configurations, the detail differences description as below, others are the same. We performed testing on configuration 3 only.

Product Name	Model	Configuration		Type	Printer
Smart POS Terminal	T6721	1	P58	financial	58mm tip
		2	P58	financial	58mm fine workmanship
		3	P80	financial	80mm tip

6. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due Date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2023-12-28	1 year
2	Power Sensor	U2021XA	MY55430013	Keysight	2023-12-28	1 year
3	Data Acquisiton	U2531A	TW55443507	Keysight	/	/
4	Shielding Room	S81	CT000986-1344	ETS-Lindgren	2026-09-12	5 years

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Test Receiver	ESR7	101676	Rohde & Schwarz	2023-11-23	1 year
2	Spectrum Analyzer	FSV40	101192	Rohde & Schwarz	2024-01-11	1 year
3	BiLog Antenna	3142E	0224831	ETS-Lindgren	2024-05-27	3 years
4	Horn Antenna	3117	00066577	ETS-Lindgren	2025-04-17	3 years
5	Horn Antenna	QSH-SL-18-26-S-20	17013	Q-par	2026-02-01	3 years
6	Horn Antenna	QSH-SL-18-40-K-SG	15979	Q-par	2026-01-30	3 years
7	Anechoic Chamber	FACT3-2.0	1285	ETS-Lindgren	2025-05-28	2 years
8	Loop Antenna	HLA6120	35779	TESEQ	2025-05-12	3 years
9	Test Receiver	ESCI	100702	Rohde & Schwarz	2024-01-11	1 year
10	LISN	ENV216	102067	Rohde & Schwarz	2024-07-13	1 year

Test software

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1
2	EMC32	Rohde & Schwarz	10.50.40

EUT is engineering software provided by the customer to control the transmitting signal.
The EUT was programmed to be in continuously transmitting mode.

7. Laboratory Environment

Shielded room

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

Anechoic chamber

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3 m distance, from 30 to 1000 MHz
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

8. Measurement Uncertainty

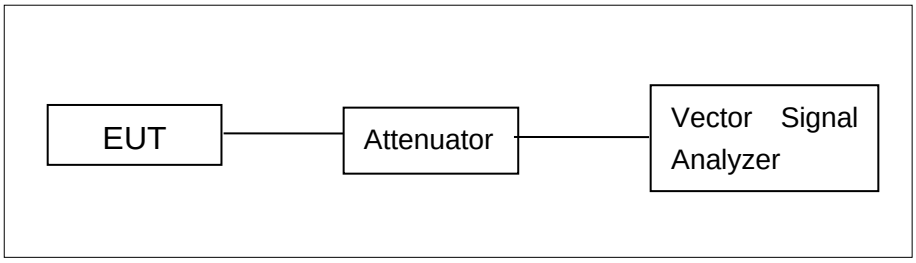
Test Name	Uncertainty (*k=2*)	
1. RF Output Power - Conducted	1.36dB	
2. Power Spectral Density - Conducted	1.36dBm/MHz	
3. Occupied channel bandwidth - Conducted	4.56kHz	
4. Transmitter Spurious Emission - Radiated	9kHz≤f<30MHz	1.79dB
	30MHz≤f<1GHz	4.86dB
	1GHz≤f<18GHz	4.82dB
	18GHz≤f≤40GHz	2.90dB
5. AC Power line Conducted Emission	150kHz≤f≤30MHz	2.62dB

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

Conducted Measurements

1). Connect the EUT to the test system correctly.
2). Set the EUT to the required work mode.
3). Set the EUT to the required channel.
4). Set the spectrum analyzer to start measurement.
5). Record the values.

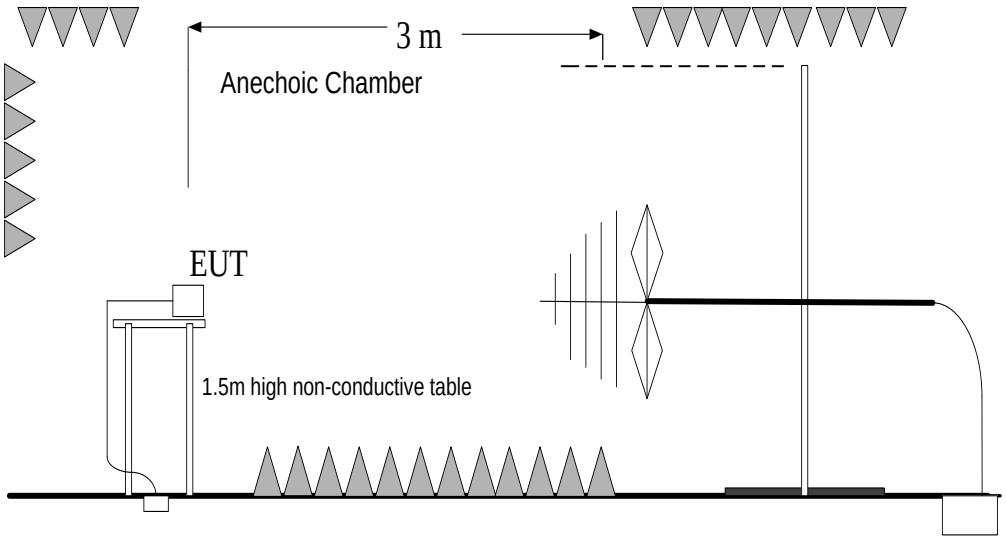


Radiated Emission Measurements

Test setup:

9kHz-30MHz：

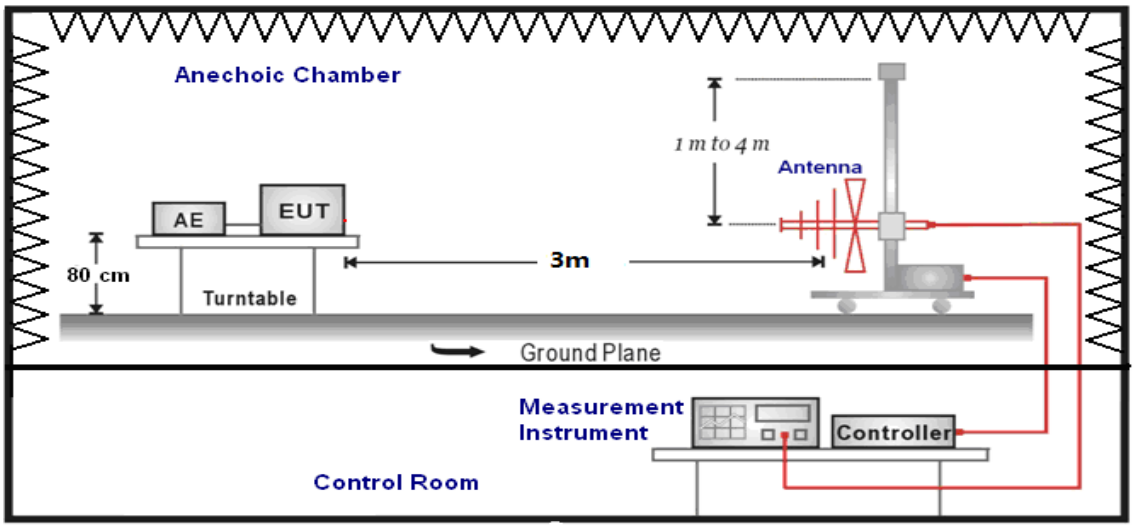
The EUT are measured in a anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiver antenna polarization.



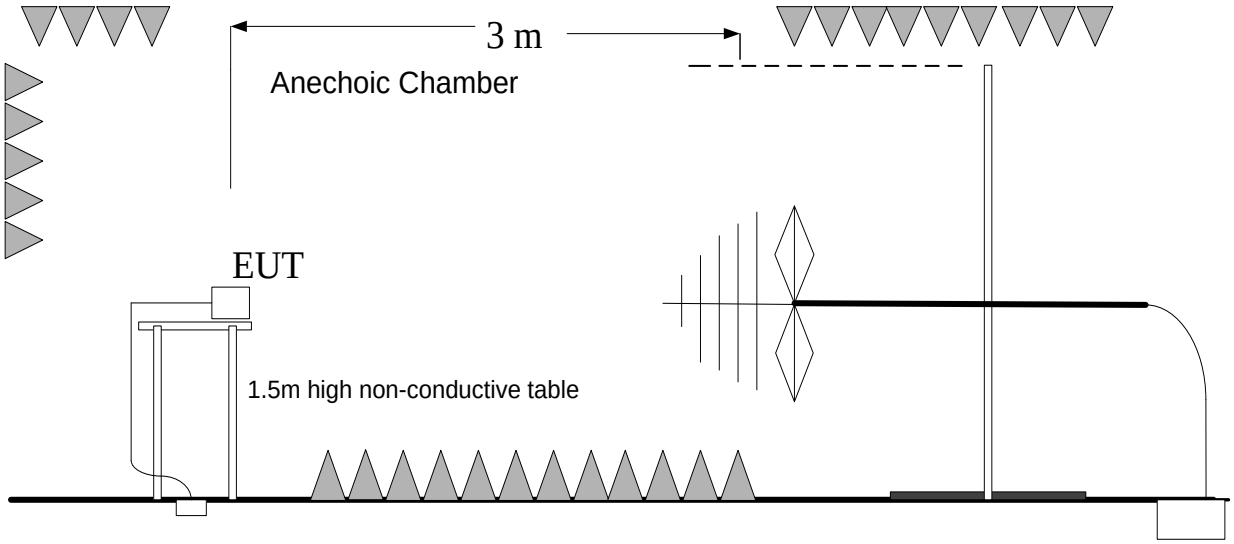
30MHz-40GHz:

The EUT are measured in a anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving antenna is 1.0 meter to 4.0 meter above the ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiver antenna polarization.

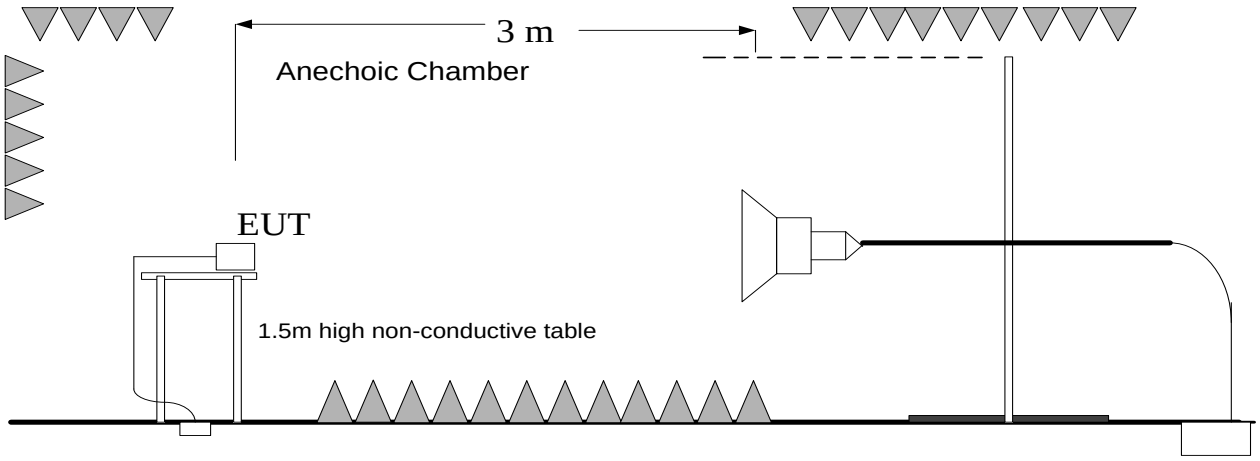
30MHz-1GHz:



1GHz-3GHz:

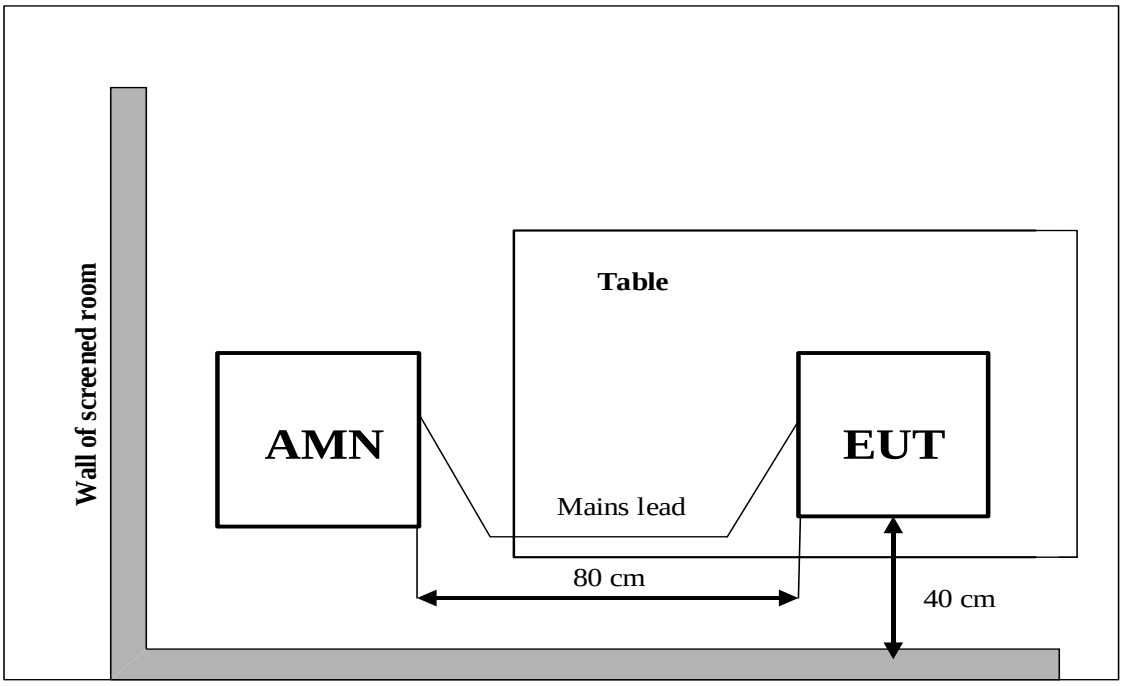


3GHz-40GHz:



AC Power line Conducted Emission Measurement

For WLAN, the EUT is working under test mode. The EUT is commanded to operate at maximum transmitting power.



A.2. Maximum Output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407 & RSS-247 section 5.4	5150MHz~5250MHz	24
	5250MHz~5350MHz	24 or 11+10logB
	5470MHz~5725MHz	24 or 11+10logB
	5725MHz~5850MHz	30

Limit use the less value, and B is the 26dB bandwidth.

Measurement of method: See ANSI C63.10-2013-Clause 12.3.3.2

Method PM-G is a measurement using a gated RF average power meter.

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Measurement Results:

802.11a mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 36	5180 MHz	14.16	17.16
	CH 40	5200 MHz	14.31	17.31
	CH 48	5240 MHz	13.89	16.89
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	13.97	16.97
	CH 56	5280 MHz	13.93	16.93
	CH 64	5320 MHz	14.01	17.01
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	14.85	17.85
	CH 116	5580 MHz	14.71	17.71
	CH 140	5700 MHz	14.74	17.74
5.8GHz Band (UNII-3)	CH 149	5745 MHz	10.09	13.19
	CH 157	5785 MHz	10.12	13.22
	CH 165	5825 MHz	9.45	12.55

802.11n-HT20 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 36	5180 MHz	13.22	16.22
	CH 40	5200 MHz	13.23	16.23
	CH 48	5240 MHz	13.08	16.08
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	13.14	16.14
	CH 56	5280 MHz	13.12	16.12
	CH 64	5320 MHz	13.19	16.19

5.5GHz Band (UNII-2C)	CH 100	5500 MHz	14.02	17.02
	CH 116	5580 MHz	13.89	16.89
	CH 140	5700 MHz	13.93	16.93
5.8GHz Band (UNII-3)	CH 149	5745 MHz	9.98	13.08
	CH 157	5785 MHz	10.01	13.11
	CH 165	5825 MHz	9.38	12.48

802.11n-HT40 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 38	5190 MHz	13.14	16.14
	CH 46	5230 MHz	13.23	16.23
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	12.99	15.99
	CH 62	5310 MHz	12.94	15.94
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	13.96	16.96
	CH 134	5670 MHz	13.75	16.75
5.8GHz Band (UNII-3)	CH 151	5755 MHz	9.95	13.05
	CH 159	5795 MHz	9.41	12.51

802.11ac-VHT20 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 36	5180 MHz	13.14	16.14
	CH 40	5200 MHz	13.26	16.26
	CH 48	5240 MHz	13.11	16.11
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	13.17	16.17
	CH 56	5280 MHz	13.13	16.13
	CH 64	5320 MHz	13.19	16.19
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	13.99	16.99
	CH 116	5580 MHz	13.87	16.87
	CH 140	5700 MHz	13.86	16.86
5.8GHz Band (UNII-3)	CH 149	5745 MHz	10.02	13.12
	CH 157	5785 MHz	10.05	13.15
	CH 165	5825 MHz	9.39	12.49

802.11ac-VHT40 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 38	5190 MHz	11.42	14.42
	CH 46	5230 MHz	11.45	14.45
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	11.19	14.19
	CH 62	5310 MHz	11.20	14.20
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	12.18	15.18
	CH 134	5670 MHz	12.00	15.00
5.8GHz Band (UNII-3)	CH 151	5755 MHz	9.84	12.94
	CH 159	5795 MHz	9.37	12.47

802.11ac-VHT80 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 42	5210 MHz	10.42	13.42
5.3GHz Band (UNII-2A)	CH 58	5290 MHz	10.16	13.16
5.5GHz Band (UNII-2C)	CH 122	5610 MHz	10.99	13.99
5.8GHz Band (UNII-3)	CH 155	5775 MHz	9.84	12.94

Note:

Worst-case data rates as provided by the client were: 6Mbps (802.11a), MCS0 (802.11n), MCS0 (802.11ac). 802.11a, 802.11n-HT40 and 802.11av-VHT80 are selected as the worst case. The following cases and test graphs are performed with this condition. The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

E.I.R.P value= Conducted values (with conducted samples) + Antenna Gain.

Conclusion: PASS

A.3. Peak Power Spectral Density

Measurement of method: See KDB 789033 D02 v02r01, Section F.

Measurement Limit:

Standard	Frequency (MHz)	Limit
FCC CRF Part 15.407 & RSS-247 section 5.2	5150MHz~5250MHz	11dBm/MHz
	5250MHz~5350MHz	11dBm/MHz
	5470MHz~5725MHz	11dBm/MHz
	5725MHz~5850MHz	30dBm/500KHz

The PPSD measurement method SA-1 is made according to KDB 789033.

Measurement Results:

U–NII Band	Mode	Channel	Frequency (MHz)	Test Results (dBm/MHz)
5.2GHz Band (UNII-1)	802.11a	CH 36	5180	3.31
		CH 40	5200	3.08
		CH 48	5240	2.78
	802.11n-HT40	CH 38	5190	-0.95
		CH 46	5230	-0.79
	802.11ac-VHT80	CH 42	5210	-6.44
5.3GHz Band (UNII-2A)	802.11a	CH 52	5260	2.84
		CH 56	5280	2.89
		CH 64	5320	3.26
	802.11n-HT40	CH 54	5270	-1.25
		CH 62	5310	-1.36
	802.11ac-VHT80	CH 58	5290	-7.18
5.5GHz Band (UNII-2C)	802.11a	CH 100	5500	4.12
		CH 116	5580	4.10
		CH 140	5700	3.90
	802.11n-HT40	CH 102	5510	-0.20
		CH 134	5670	-0.28
	802.11ac-VHT80	CH 122	5610	-6.05
5.8GHz Band (UNII-3)	802.11a	CH 149	5745	-3.70
		CH 157	5785	-3.71
		CH 165	5825	-4.52
	802.11n-HT40	CH 151	5755	-7.05
		CH 159	5795	-7.41
	802.11ac-VHT80	CH 155	5775	-10.07

Conclusion: PASS

A.4. Occupied 26dB Bandwidth

Measurement of method: See KDB 789033 D02 v02r01, Section C.1.

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.403 & RSS-247 section 5.2	/

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (MHz)		Conclusion
802.11a	5180MHz (Ch36)	Fig.1	31.90	**P**
	5200MHz (Ch40)	Fig.2	30.25	**P**
	5240MHz (Ch48)	Fig.3	29.40	**P**
	5260MHz (Ch52)	Fig.4	29.75	**P**
	5280MHz (Ch56)	Fig.5	28.15	**P**
	5320MHz (Ch64)	Fig.6	31.55	**P**
	5500MHz (Ch100)	Fig.7	32.90	**P**
	5580MHz (Ch116)	Fig.8	32.85	**P**
	5700MHz (Ch140)	Fig.9	33.00	**P**
802.11n-HT40	5190MHz (Ch38)	Fig.10	42.88	**P**
	5230MHz (Ch46)	Fig.11	47.20	**P**
	5270MHz (Ch54)	Fig.12	42.48	**P**
	5310MHz (Ch62)	Fig.13	42.72	**P**
	5510MHz (Ch102)	Fig.14	55.28	**P**
	5670MHz (Ch134)	Fig.15	58.48	**P**
802.11ac-VHT80	5210MHz (Ch42)	Fig.16	86.72	**P**
	5290MHz (Ch58)	Fig.17	87.52	**P**
	5610MHz (Ch122)	Fig.18	85.92	**P**

Conclusion: PASS

Test graphs as below:

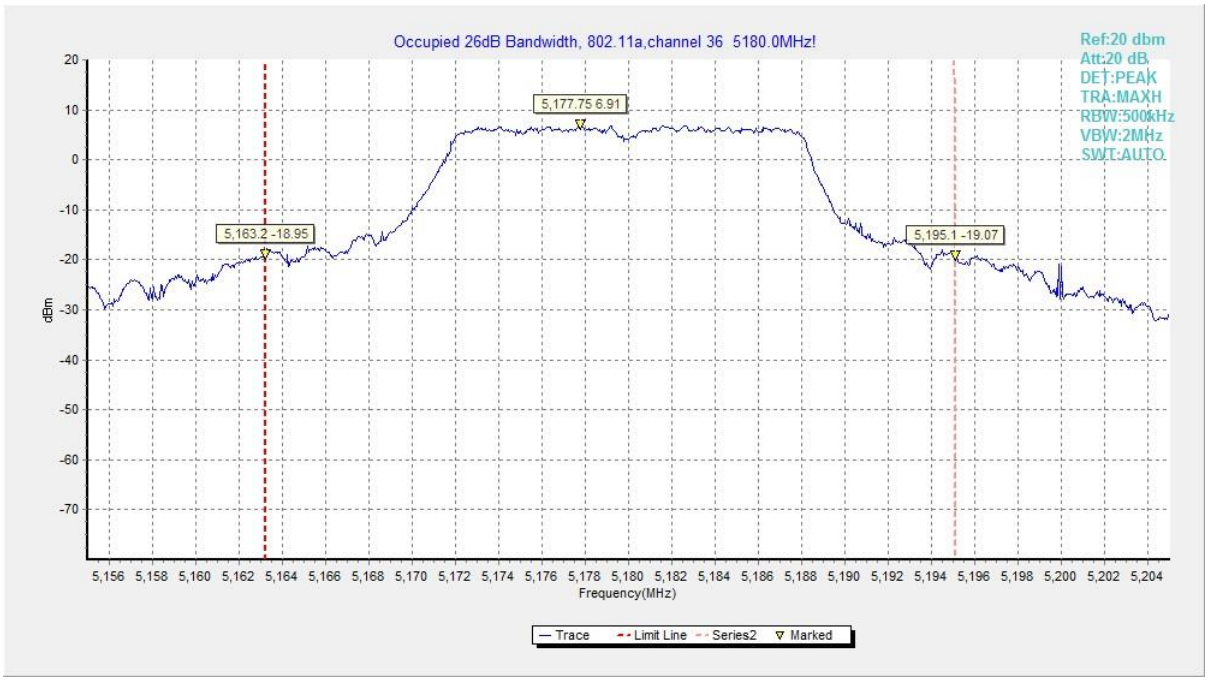


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

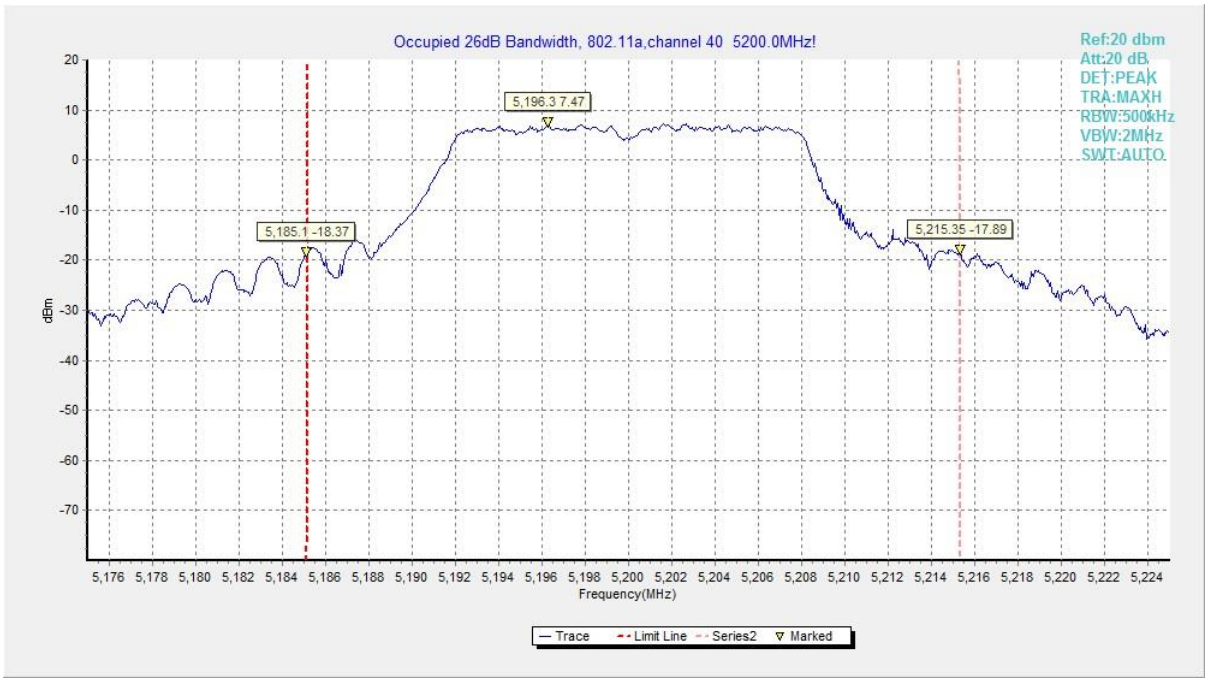


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

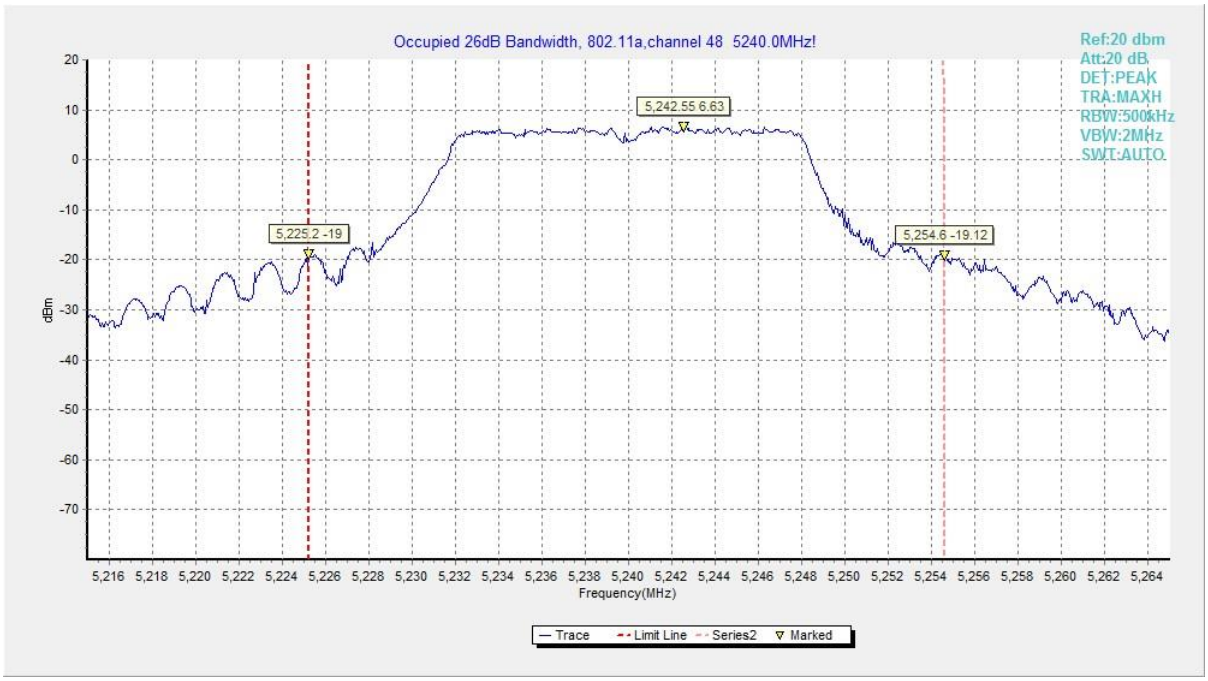


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

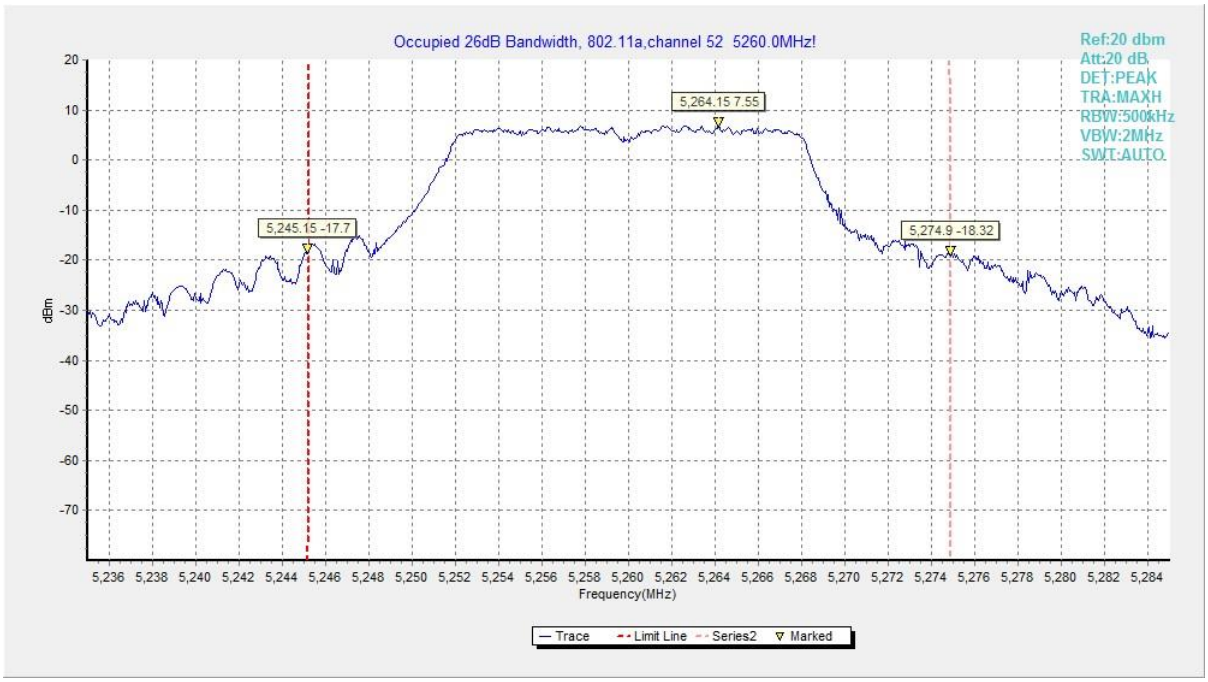


Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

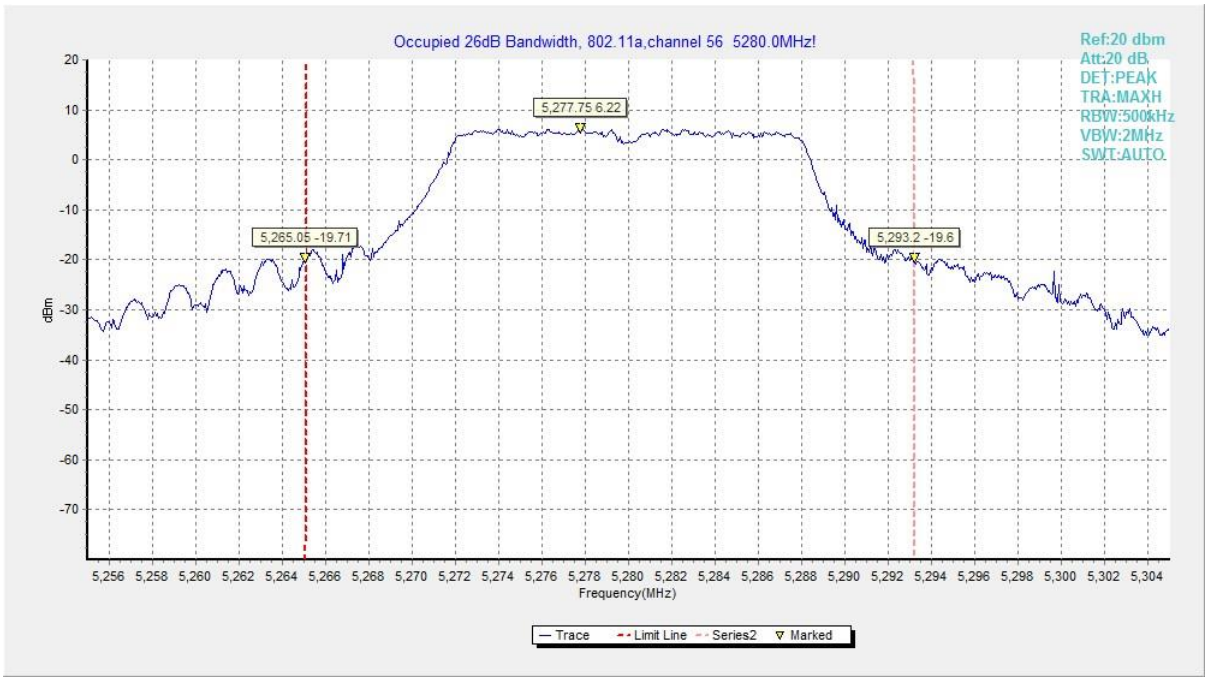


Fig. 5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

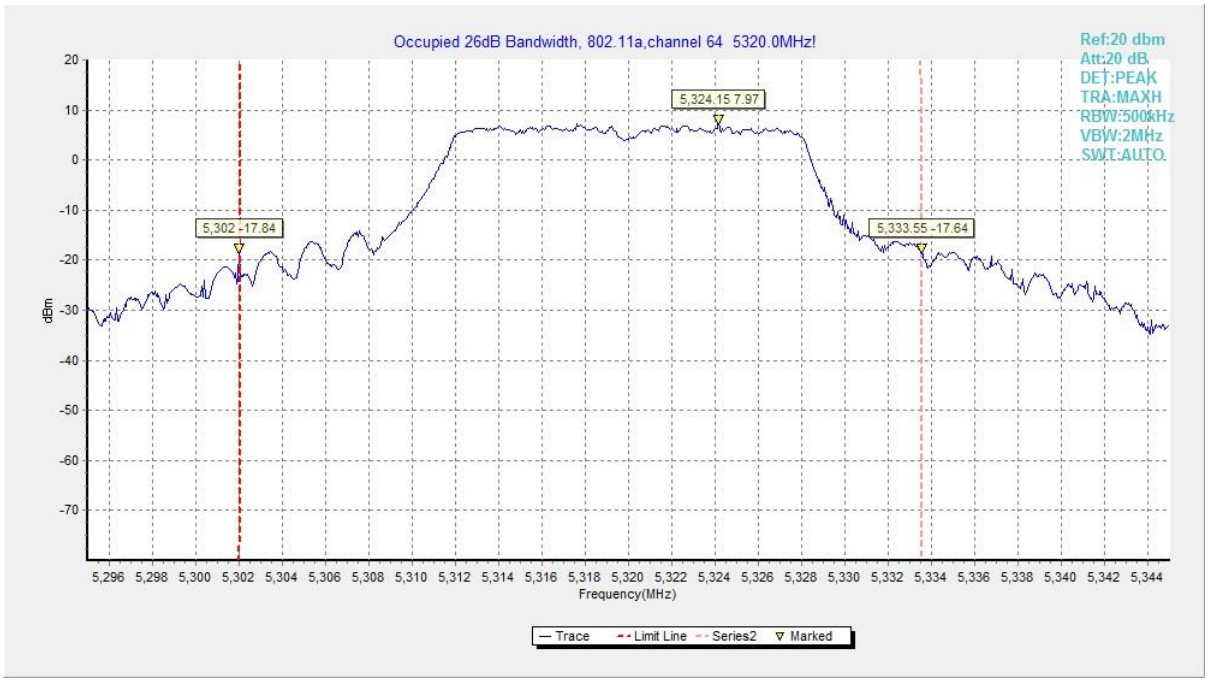


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

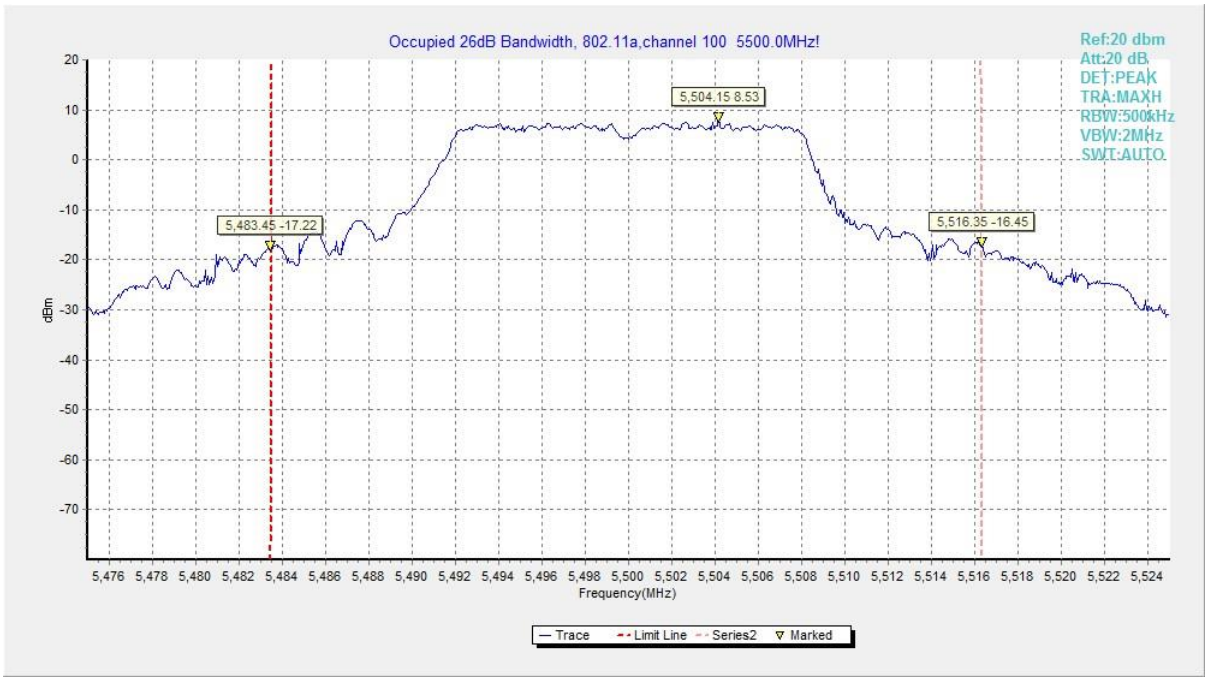


Fig. 7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

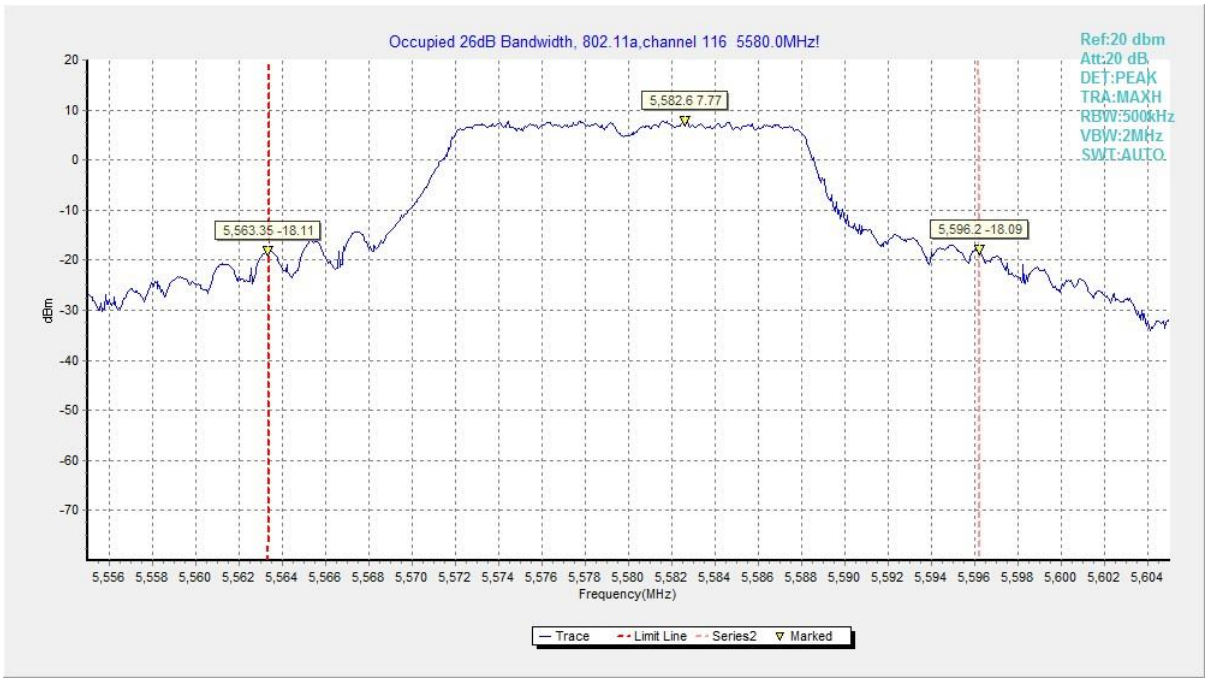


Fig. 8 Occupied 26dB Bandwidth (802.11a, 5580MHz)

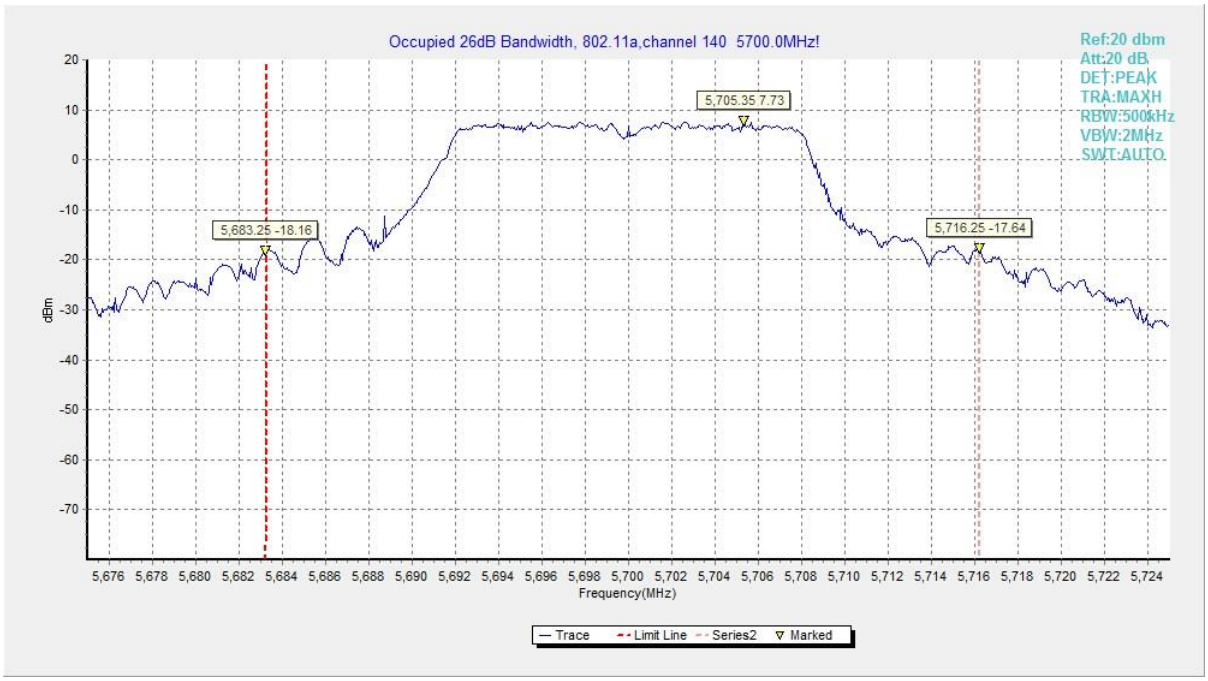


Fig. 9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

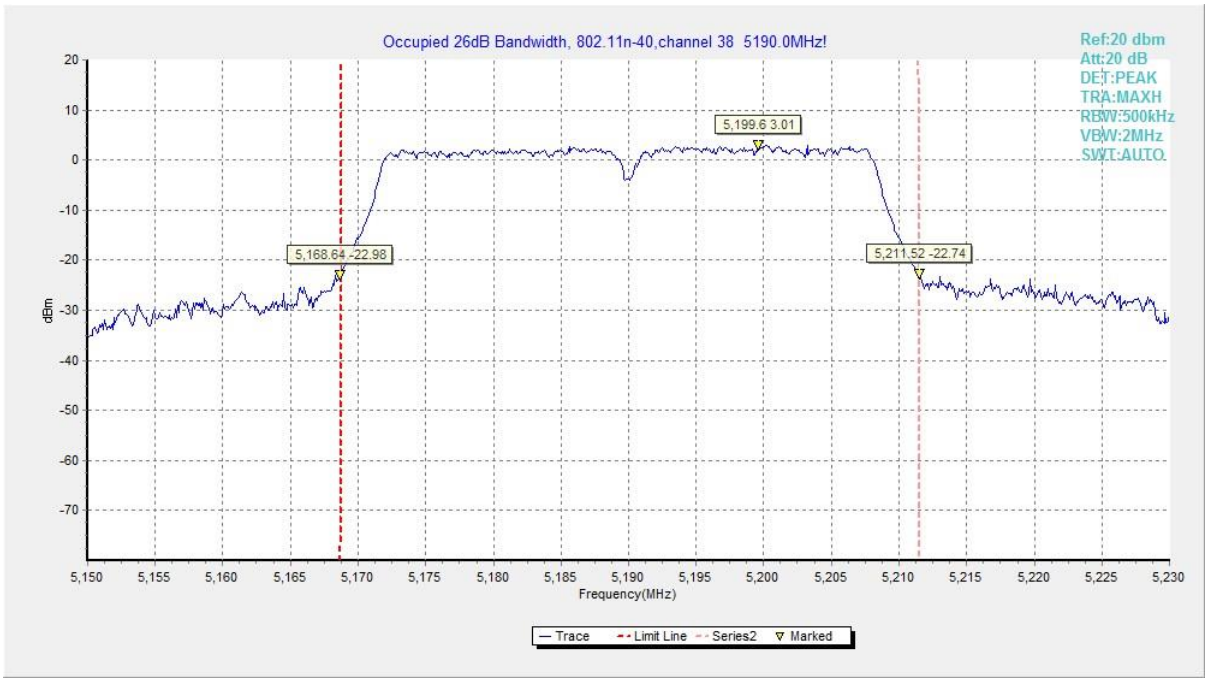


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

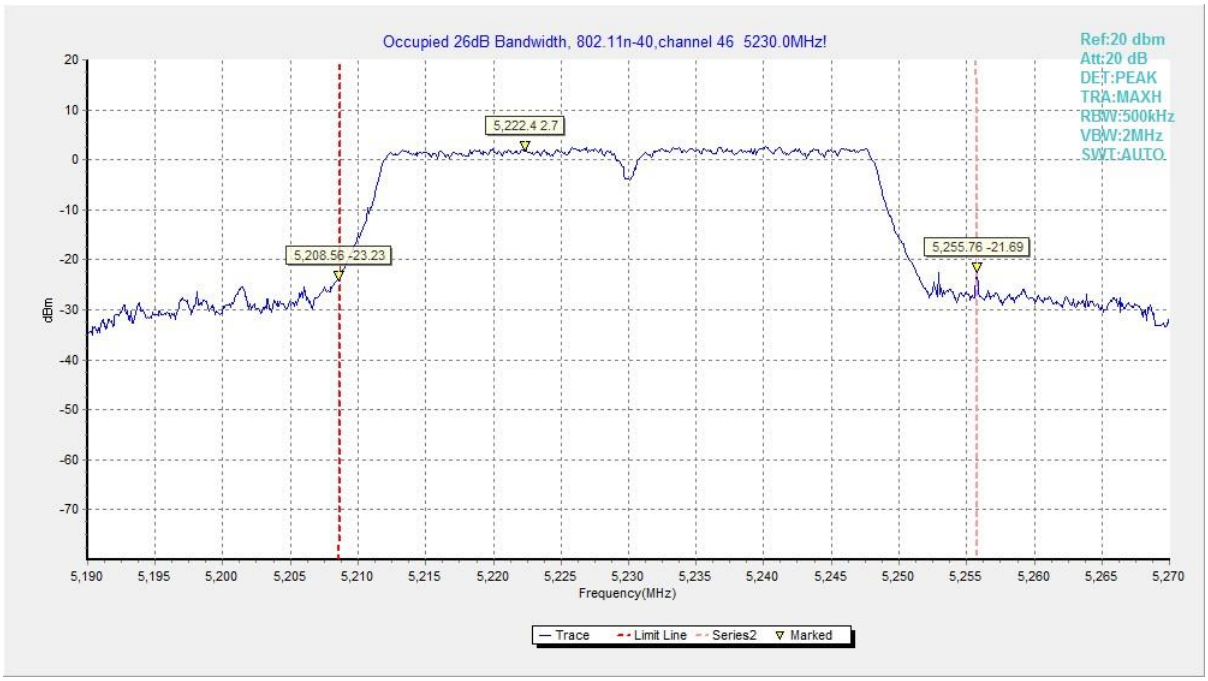


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

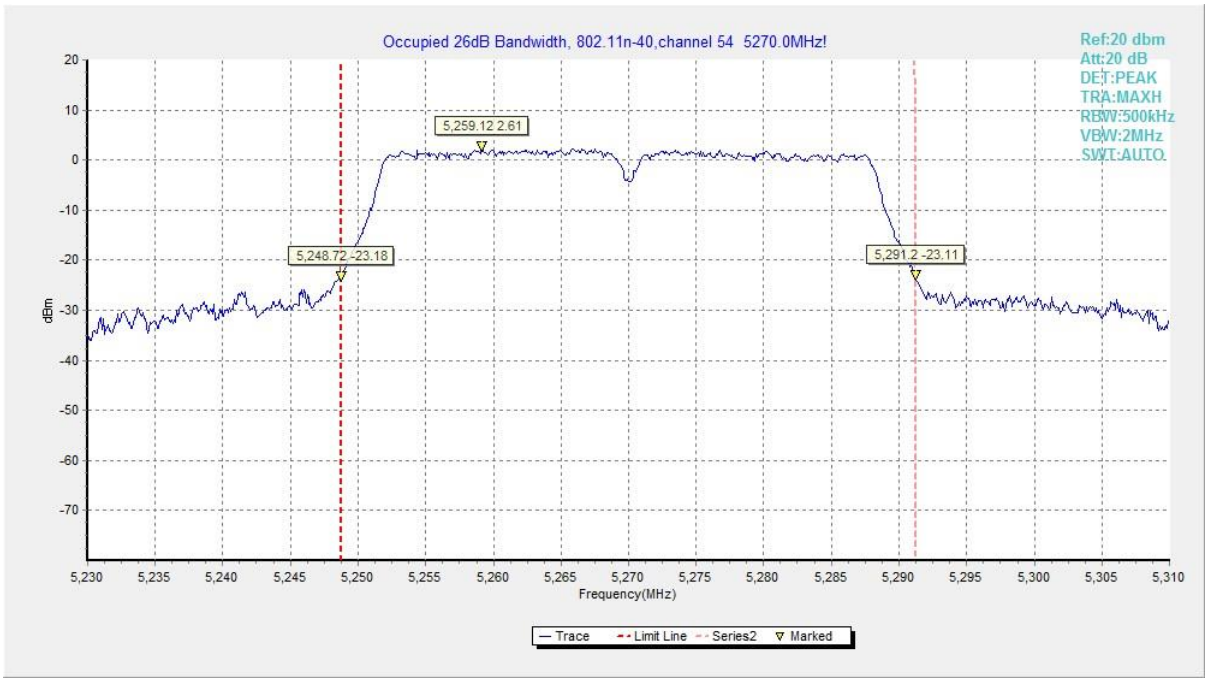


Fig. 12 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

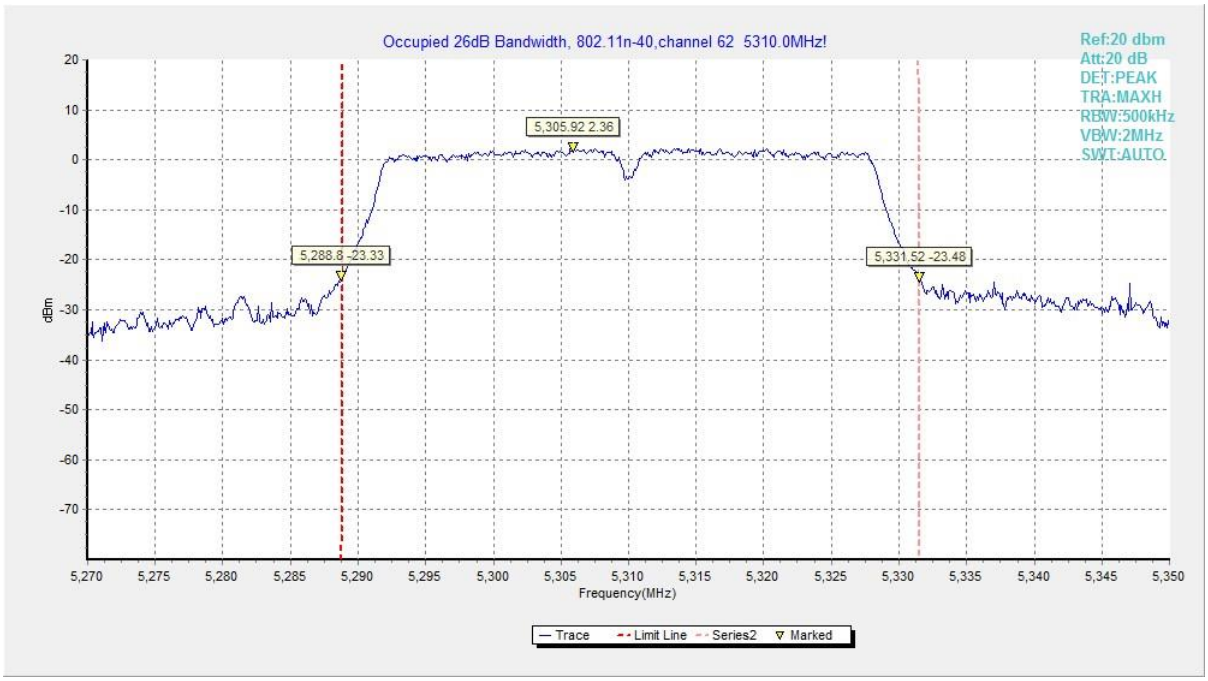


Fig. 13 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

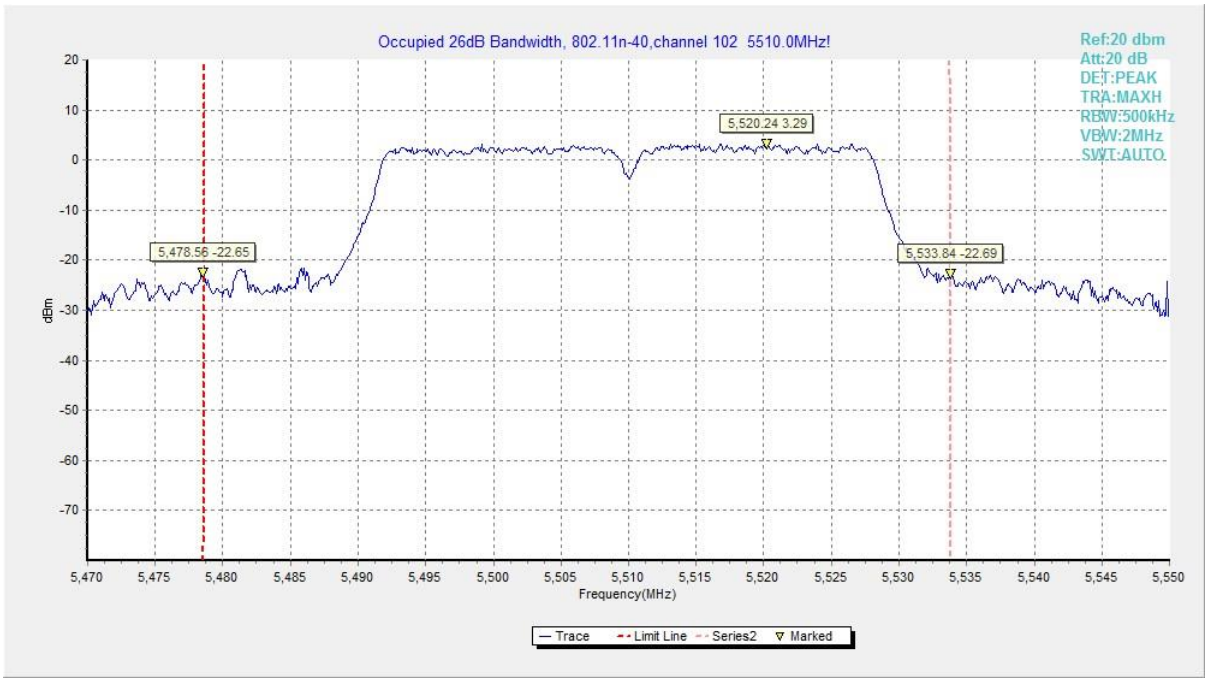


Fig. 14 Occupied 26dB Bandwidth (802.11n-HT40, 5510MHz)

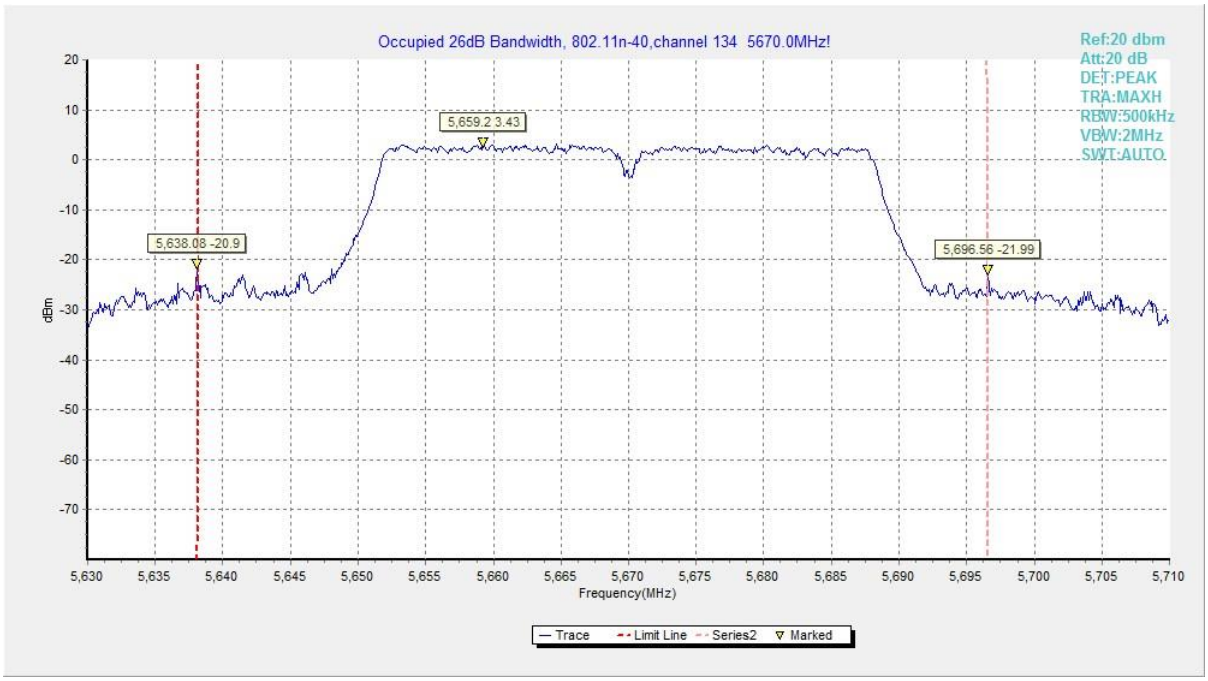


Fig. 15 Occupied 26dB Bandwidth (802.11n-HT40, 5670MHz)

Fig. 16 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5210MHz)

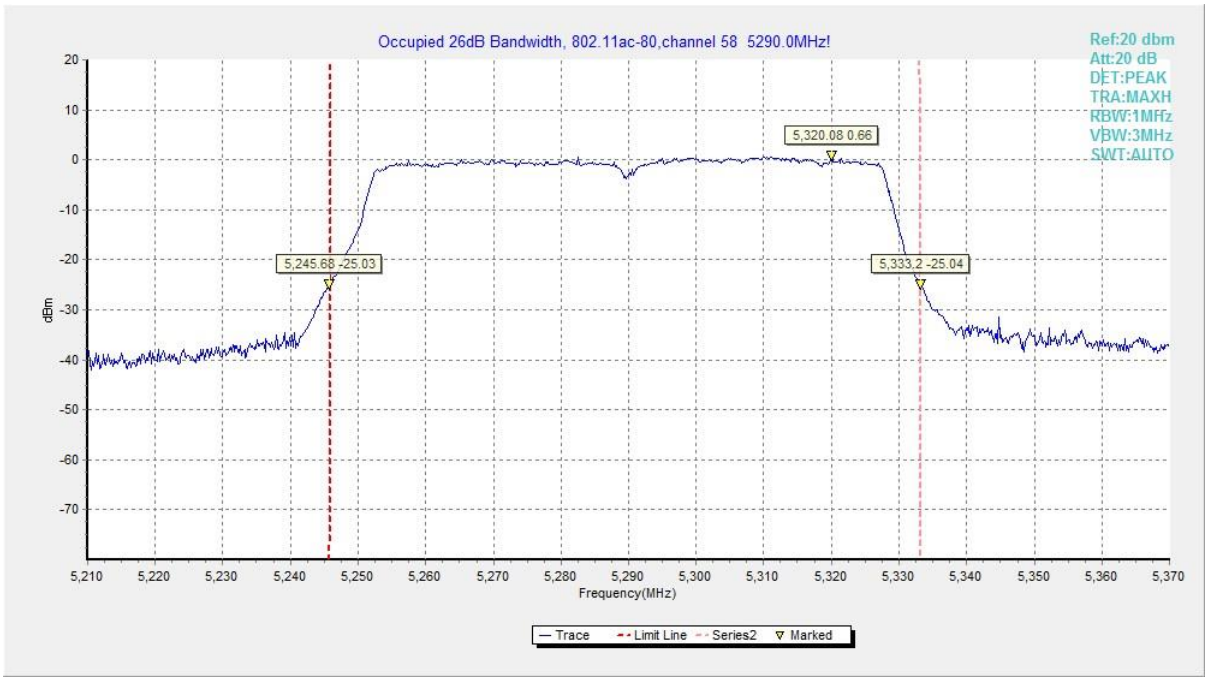


Fig. 17 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5290MHz)

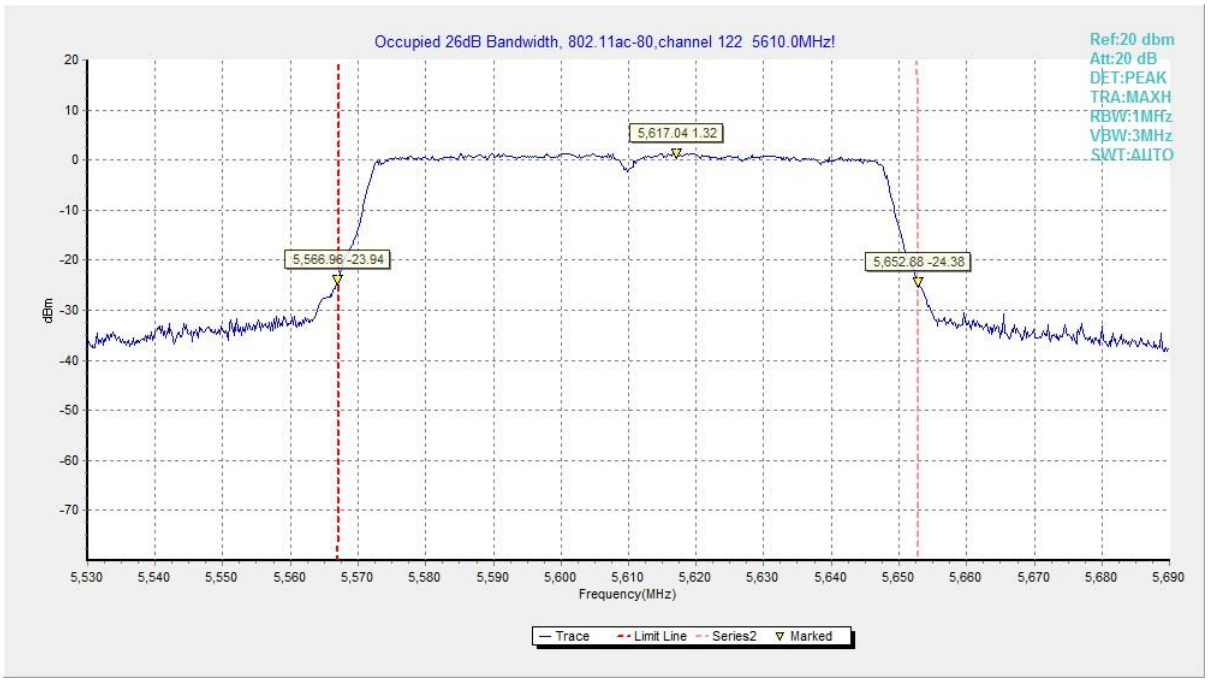


Fig. 18 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5610MHz)

A.5. Occupied 6dB Bandwidth

Measurement of method: See KDB 789033 D02 v02r01, Section C.2.

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.407 & RSS-247 section 5.2	⩾0.5

Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (MHz)		Conclusion
802.11a	5745MHz (Ch149)	Fig.19	16.35	**P**
	5785MHz (Ch157)	Fig.20	16.35	**P**
	5825MHz (Ch165)	Fig.21	16.35	**P**
802.11n-HT40	5755MHz (Ch151)	Fig.22	35.92	**P**
	5795MHz (Ch159)	Fig.23	36.32	**P**
802.11ac-VHT80	5775MHz (Ch155)	Fig.24	75.84	**P**

Test graphs as below:

Conclusion: PASS

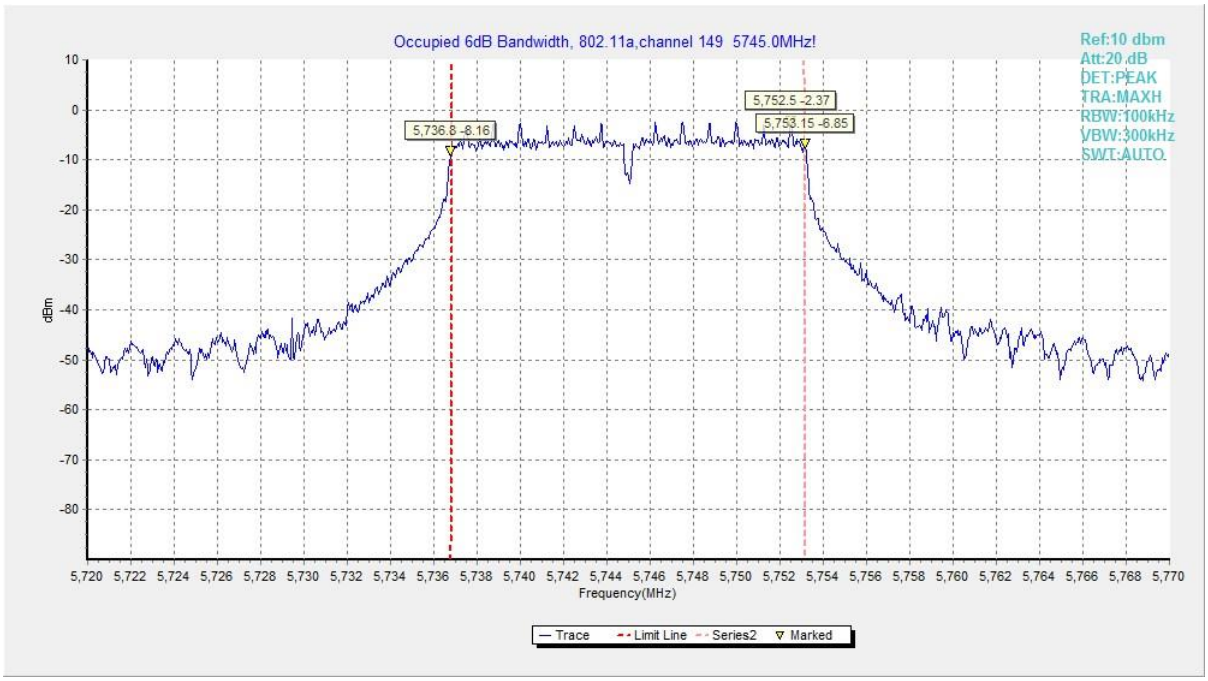


Fig. 19 Occupied 6dB Bandwidth (802.11a, 5745MHz)

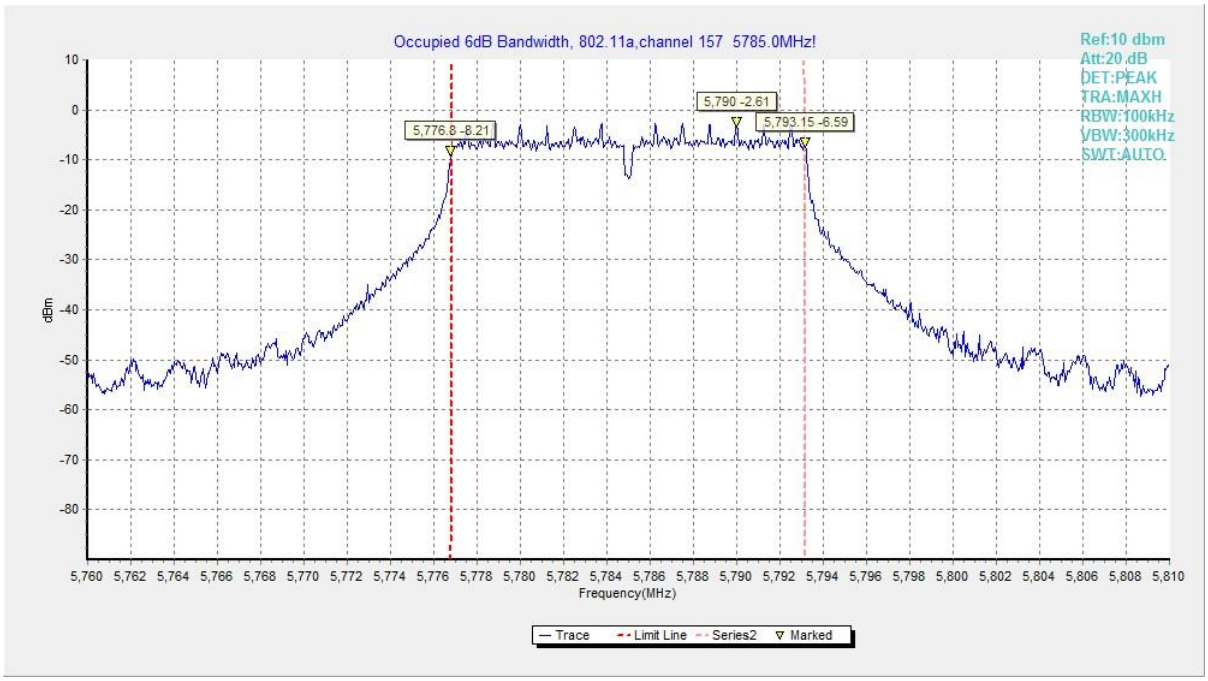


Fig. 20 Occupied 6dB Bandwidth (802.11a, 5785MHz)

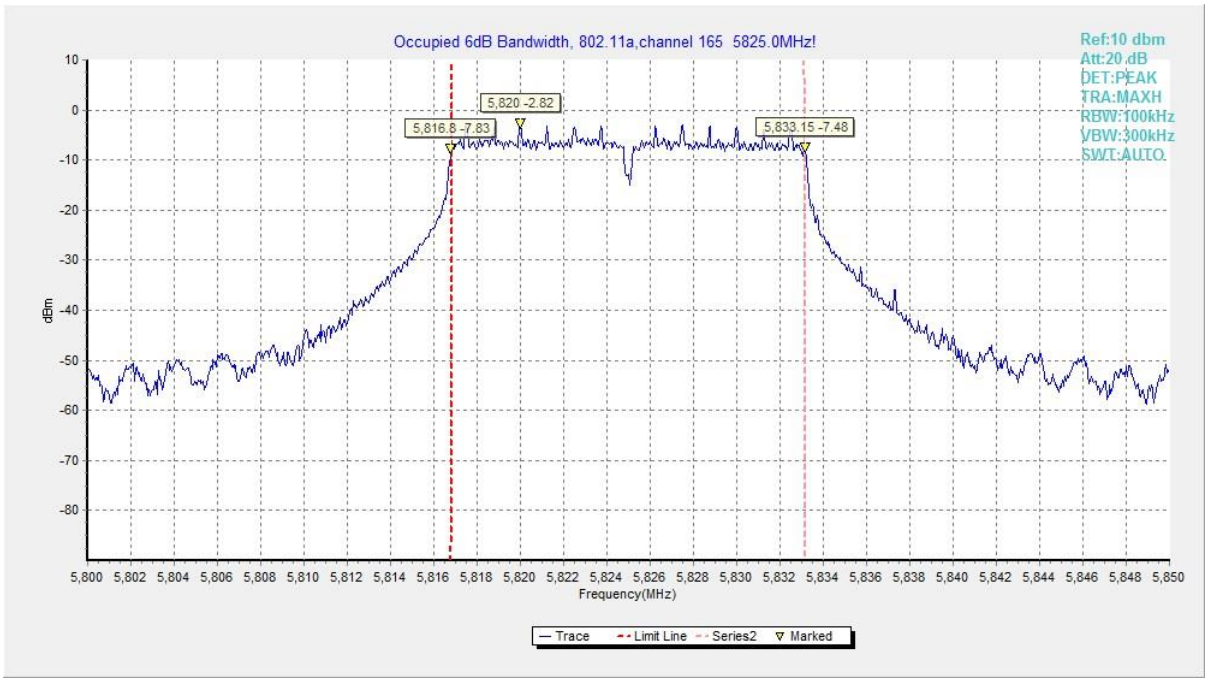


Fig. 21 Occupied 6dB Bandwidth (802.11a, 5825MHz)

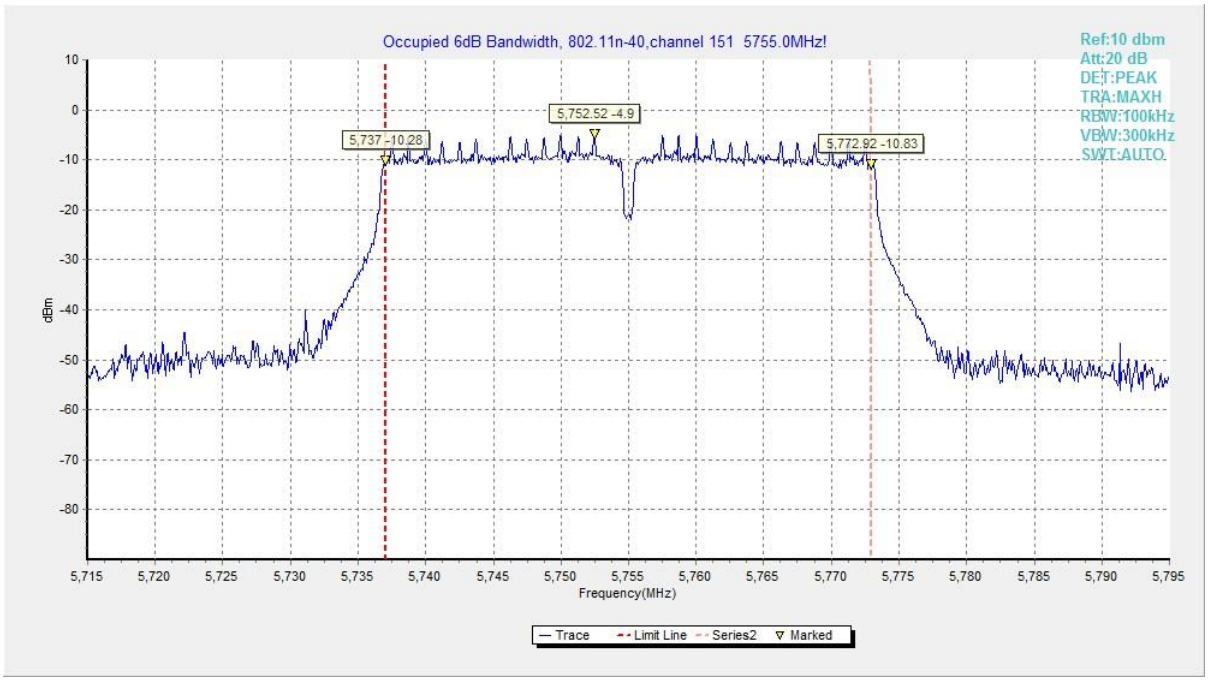


Fig. 22 Occupied 6dB Bandwidth (802.11n-HT40, 5755MHz)

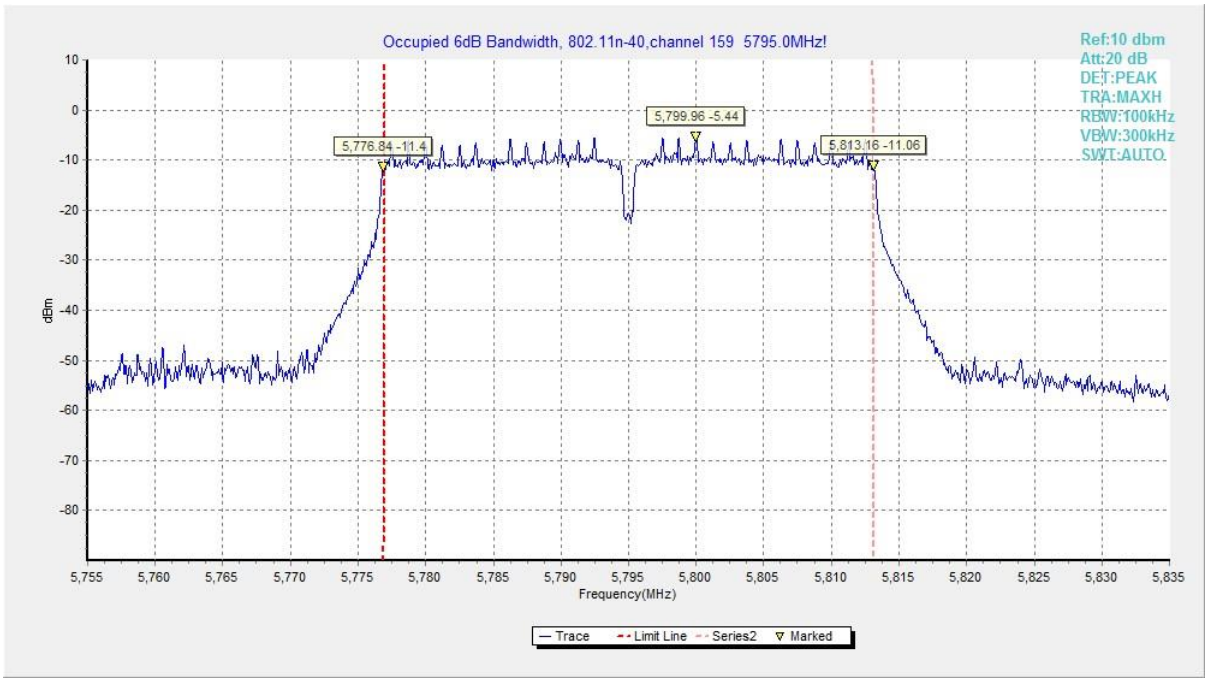


Fig. 23 Occupied 6dB Bandwidth (802.11n-HT40, 5795MHz)

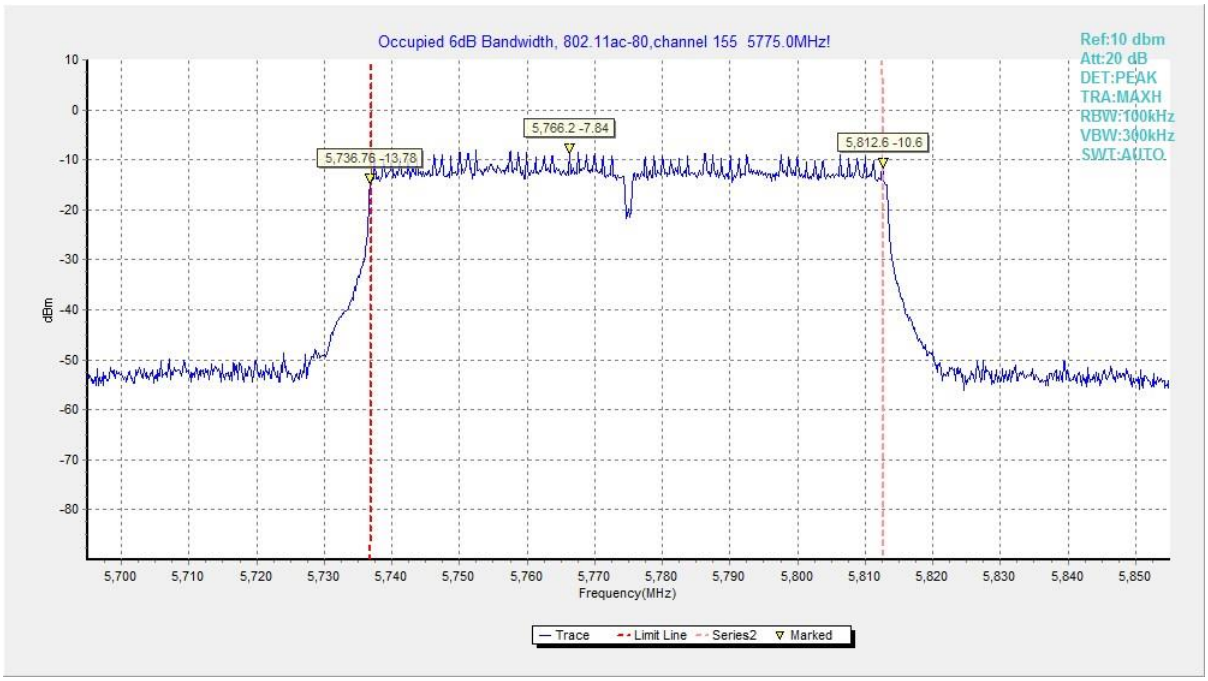


Fig. 24 Occupied 6dB Bandwidth (802.11ac-VHT80, 5775MHz)

A.6. 99% Occupied Bandwidth

Measurement of method: See KDB 789033 D02 v02r01, Section D.

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.403 & RSS-Gen section 6.7	/

Measurement Result:

Mode	Channel	99% Occupied Bandwidth (MHz)		Conclusion
802.11a	5180MHz (Ch36)	Fig.25	18.04	**P**
	5200MHz (Ch40)	Fig.26	17.80	**P**
	5240MHz (Ch48)	Fig.27	17.80	**P**
	5260MHz (Ch52)	Fig.28	17.84	**P**
	5280MHz (Ch56)	Fig.29	17.76	**P**
	5320MHz (Ch64)	Fig.30	17.92	**P**
	5500MHz (Ch100)	Fig.31	18.40	**P**
	5580MHz (Ch116)	Fig.32	17.92	**P**
	5700MHz (Ch140)	Fig.33	17.96	**P**
	5745MHz (Ch149)	Fig.34	17.56	**P**
	5785MHz (Ch157)	Fig.35	17.60	**P**
	5825MHz (Ch165)	Fig.36	17.56	**P**
802.11n-HT40	5190MHz (Ch38)	Fig.37	36.88	**P**
	5230MHz (Ch46)	Fig.38	36.80	**P**
	5270MHz (Ch54)	Fig.39	36.80	**P**
	5310MHz (Ch62)	Fig.40	36.72	**P**
	5510MHz (Ch102)	Fig.41	36.96	**P**
	5670MHz (Ch134)	Fig.42	36.88	**P**
	5755MHz (Ch151)	Fig.43	36.72	**P**
	5795MHz (Ch159)	Fig.44	36.64	**P**
802.11ac-VHT80	5210MHz (Ch42)	Fig.45	76.16	**P**
	5290MHz (Ch58)	Fig.46	76.16	**P**
	5610MHz (Ch122)	Fig.47	76.16	**P**
	5775MHz (Ch155)	Fig.48	76.16	**P**

Conclusion: PASS

Test graphs as below:

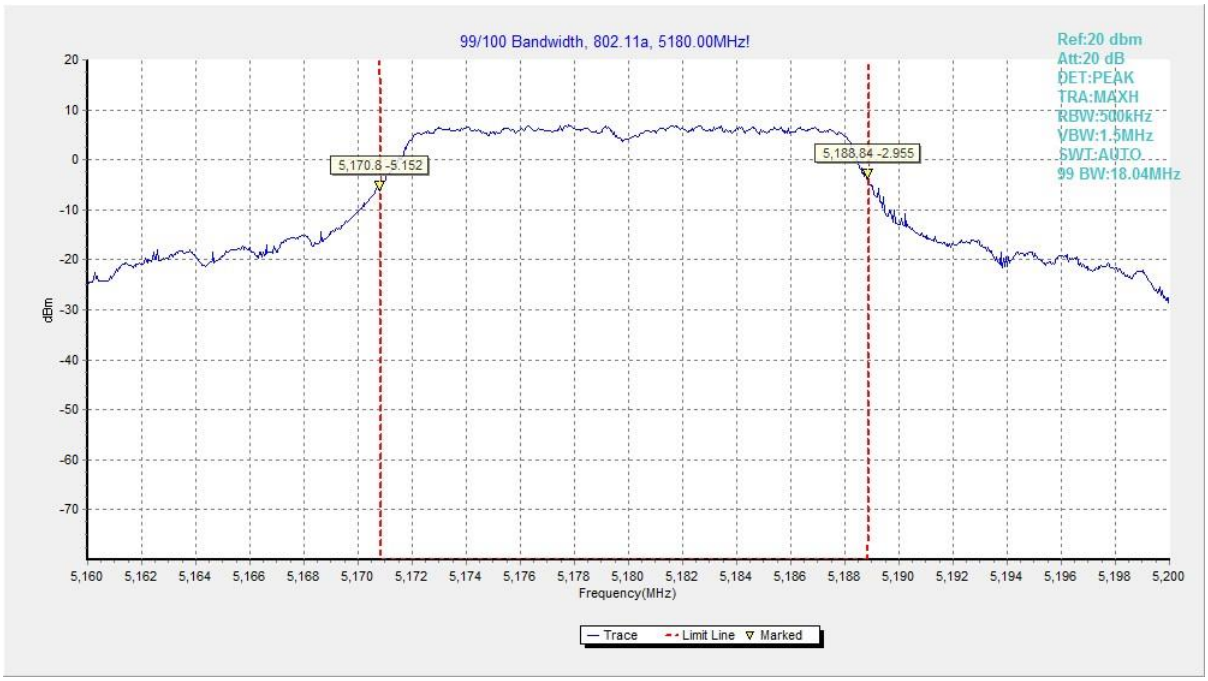


Fig. 25 99% Occupied Bandwidth (802.11a, 5180MHz)

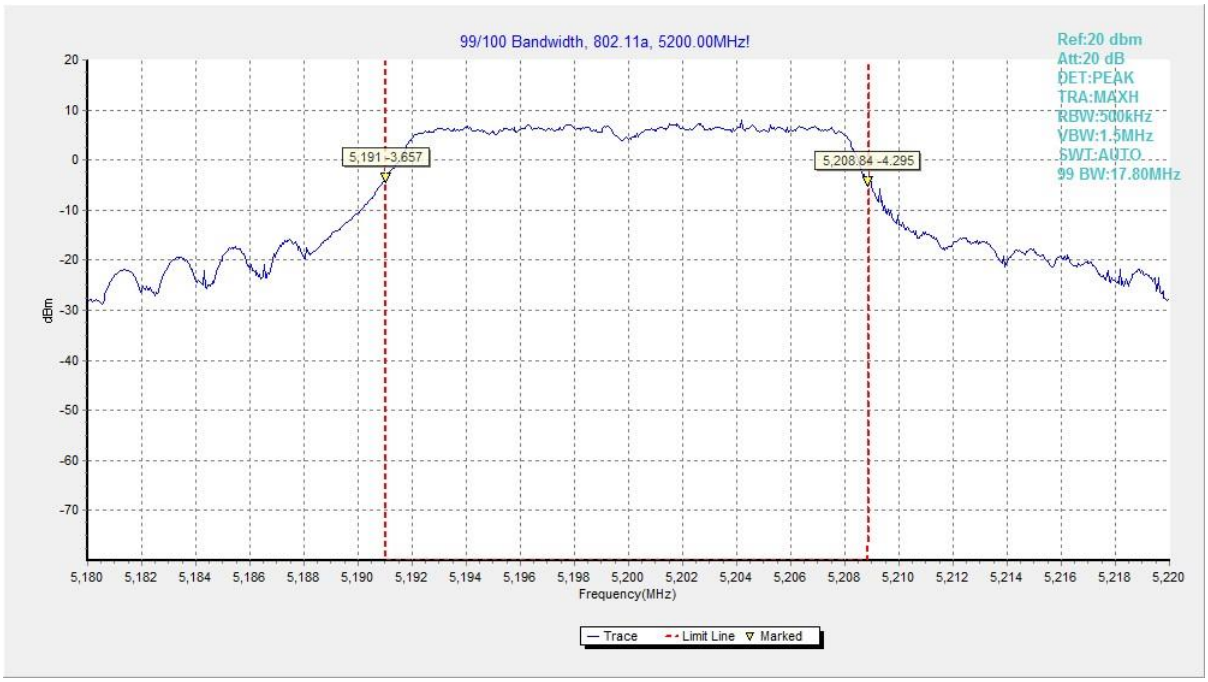


Fig. 26 99% Occupied Bandwidth (802.11a, 5200MHz)

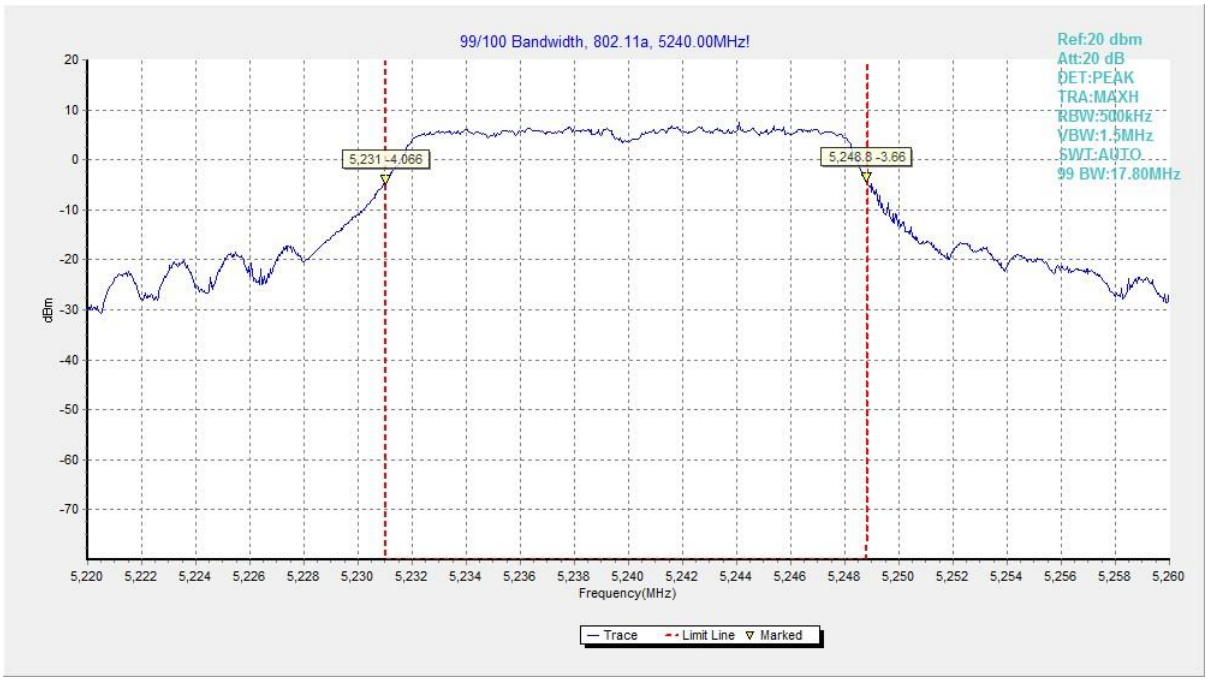


Fig. 27 99% Occupied Bandwidth (802.11a, 5240MHz)

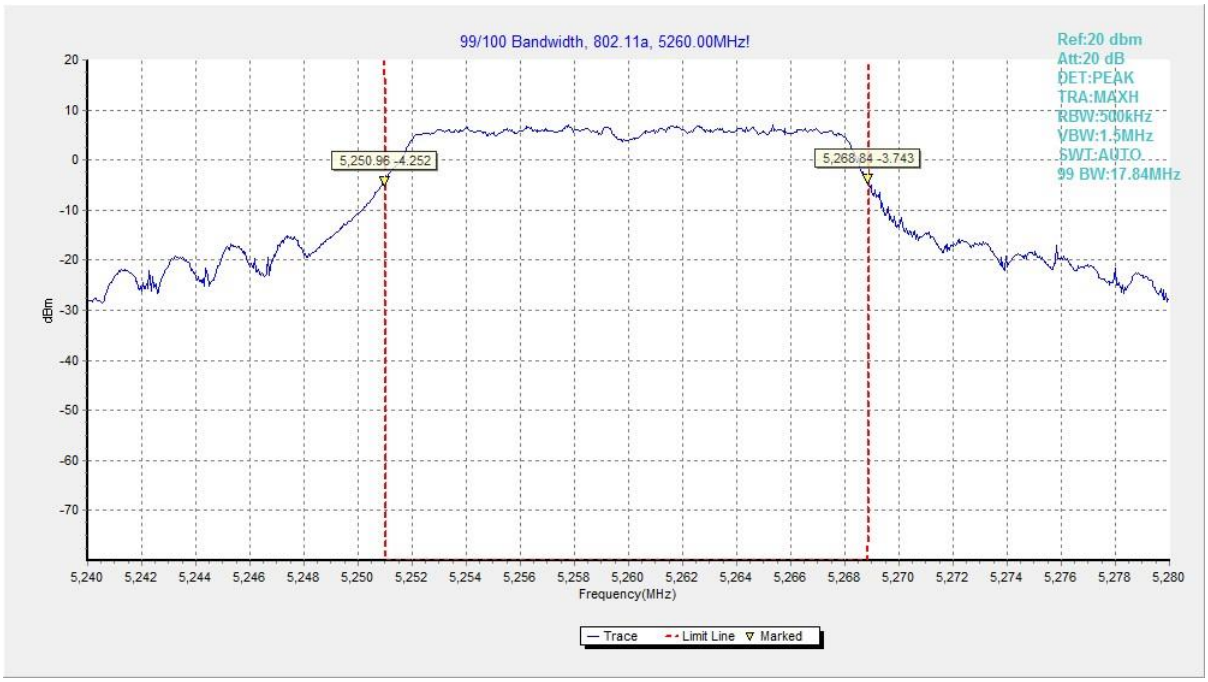


Fig. 28 99% Occupied Bandwidth (802.11a, 5260MHz)

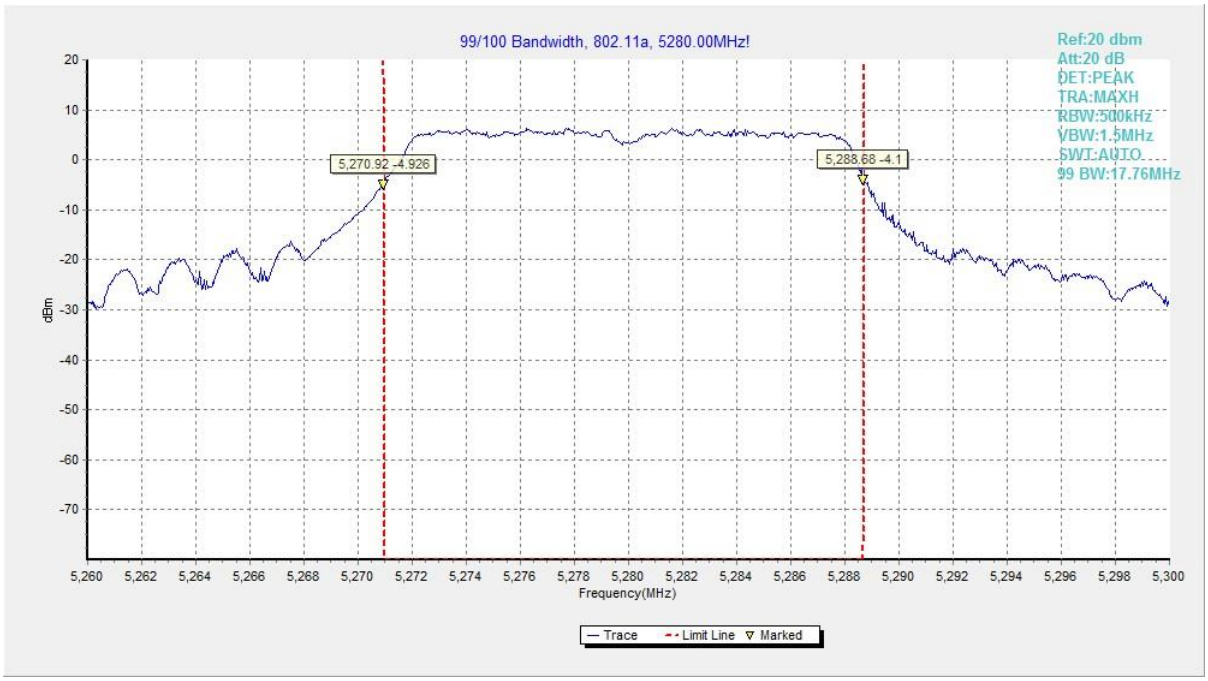


Fig. 29 99% Occupied Bandwidth (802.11a, 5280MHz)

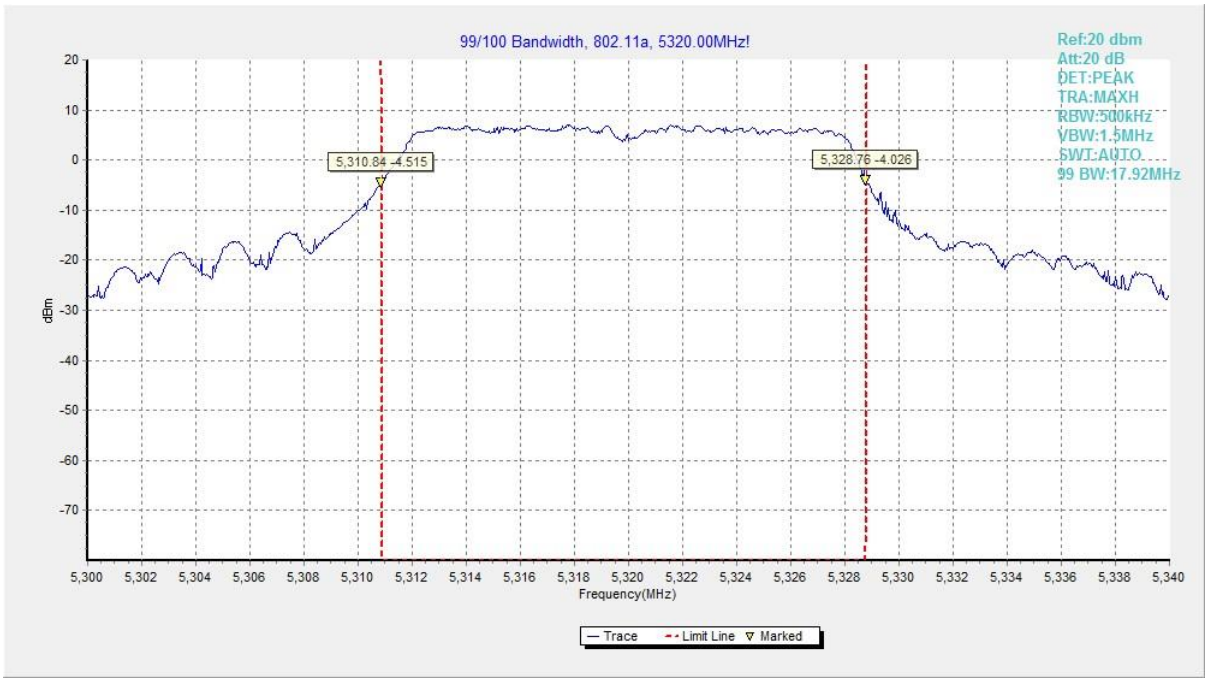


Fig. 30 99% Occupied Bandwidth (802.11a, 5320MHz)

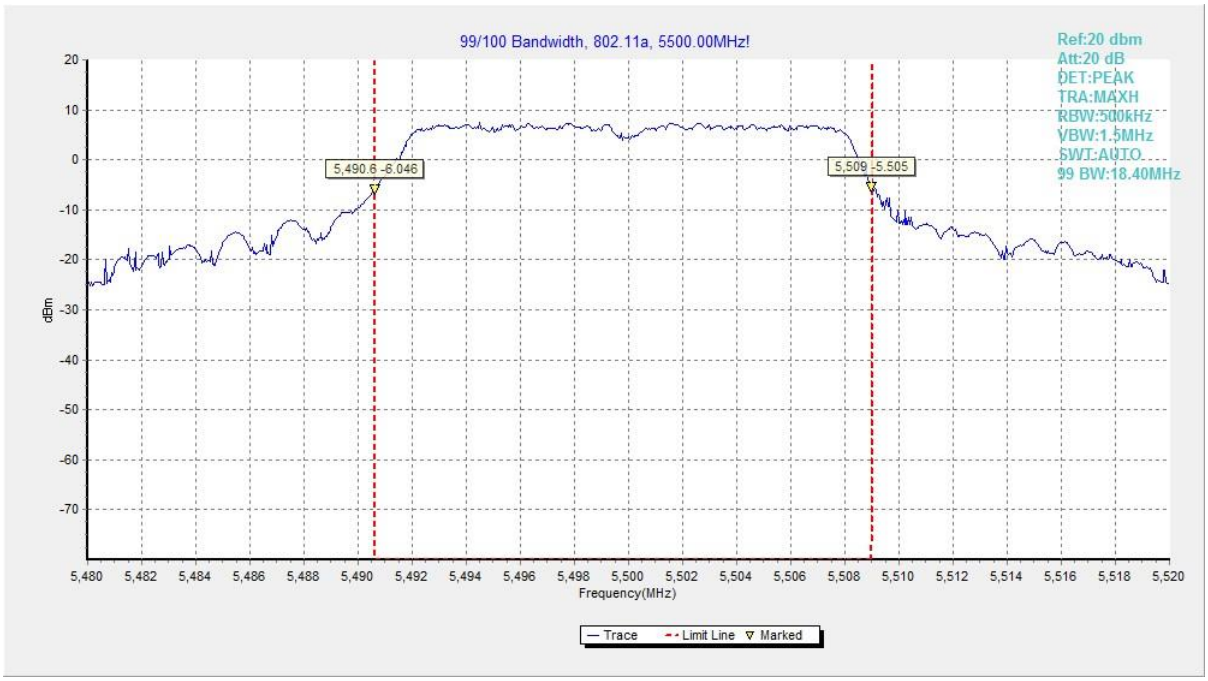


Fig. 31 99% Occupied Bandwidth (802.11a, 5500MHz)

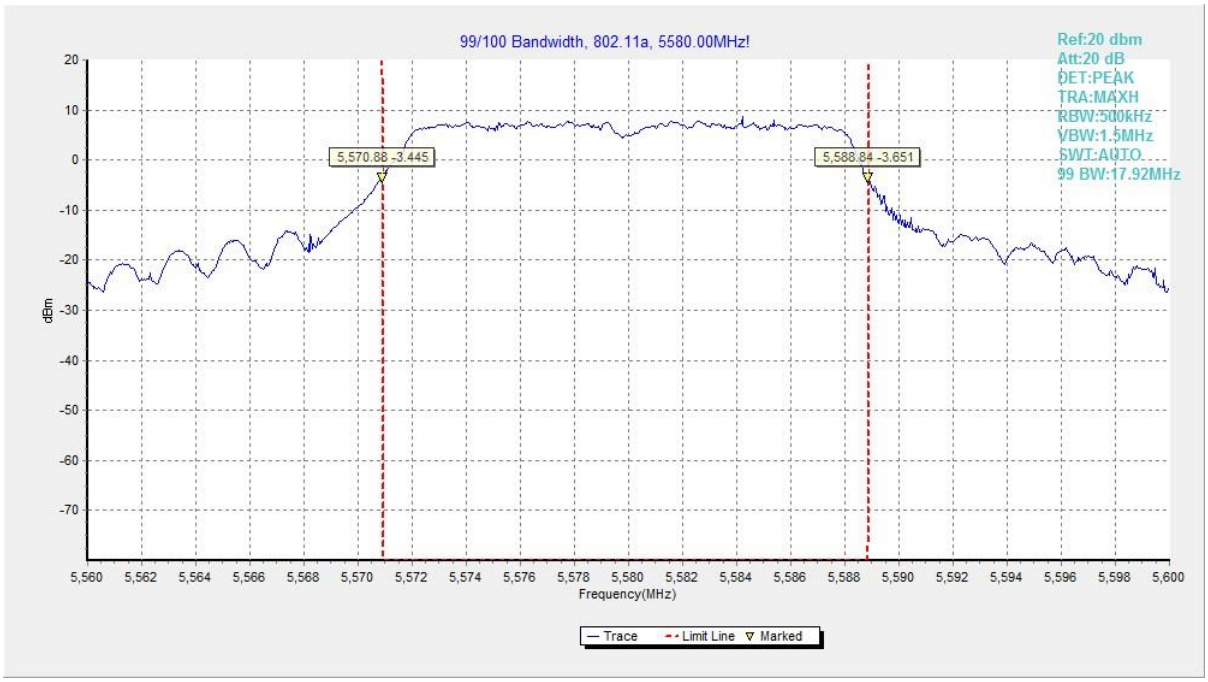


Fig. 32 99% Occupied Bandwidth (802.11a, 5580MHz)

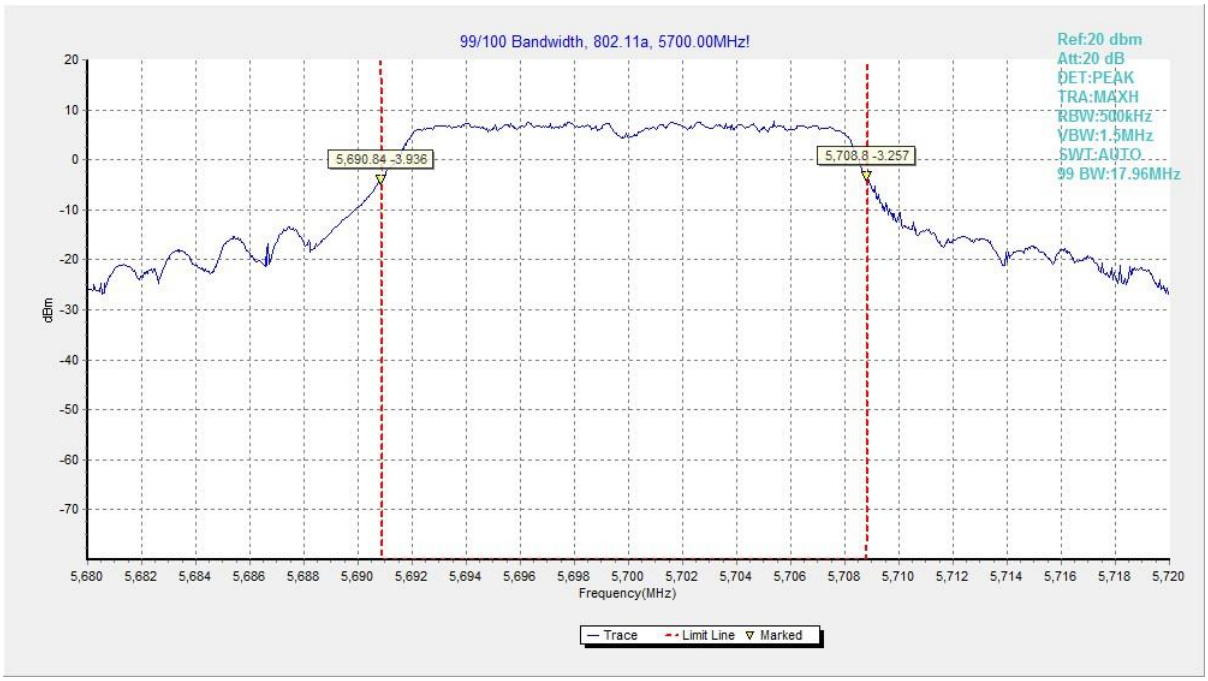


Fig. 33 99% Occupied Bandwidth (802.11a, 5700MHz)

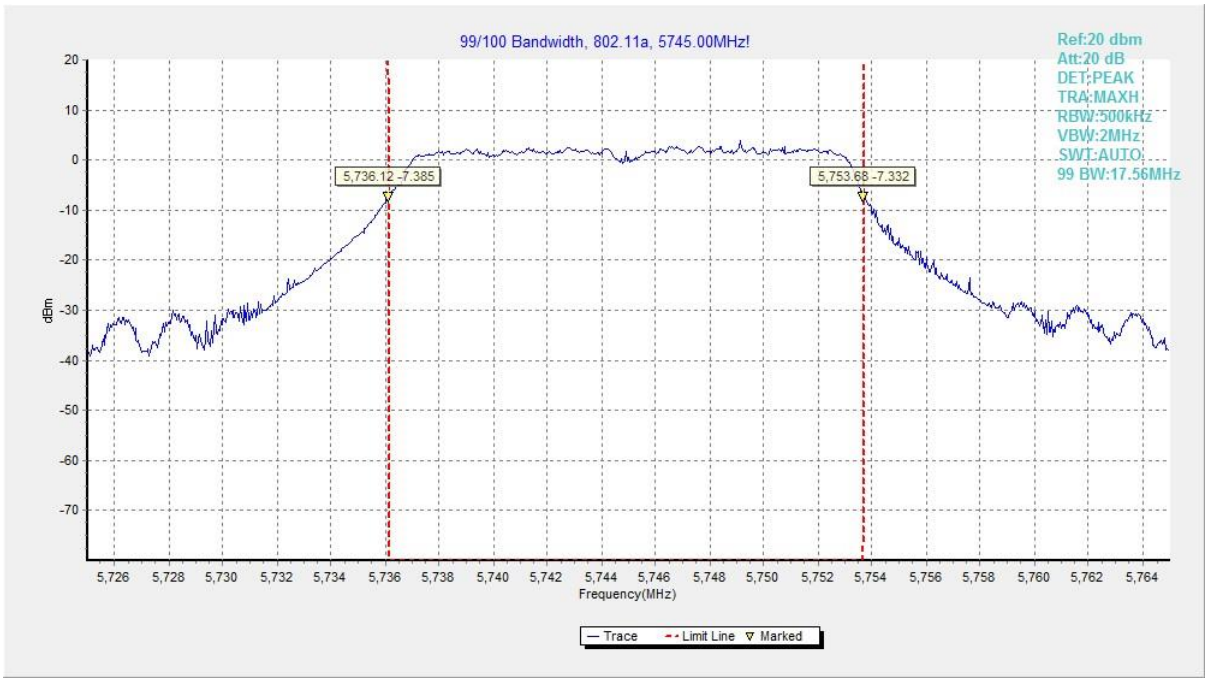


Fig. 34 99% Occupied Bandwidth (802.11a, 5745MHz)

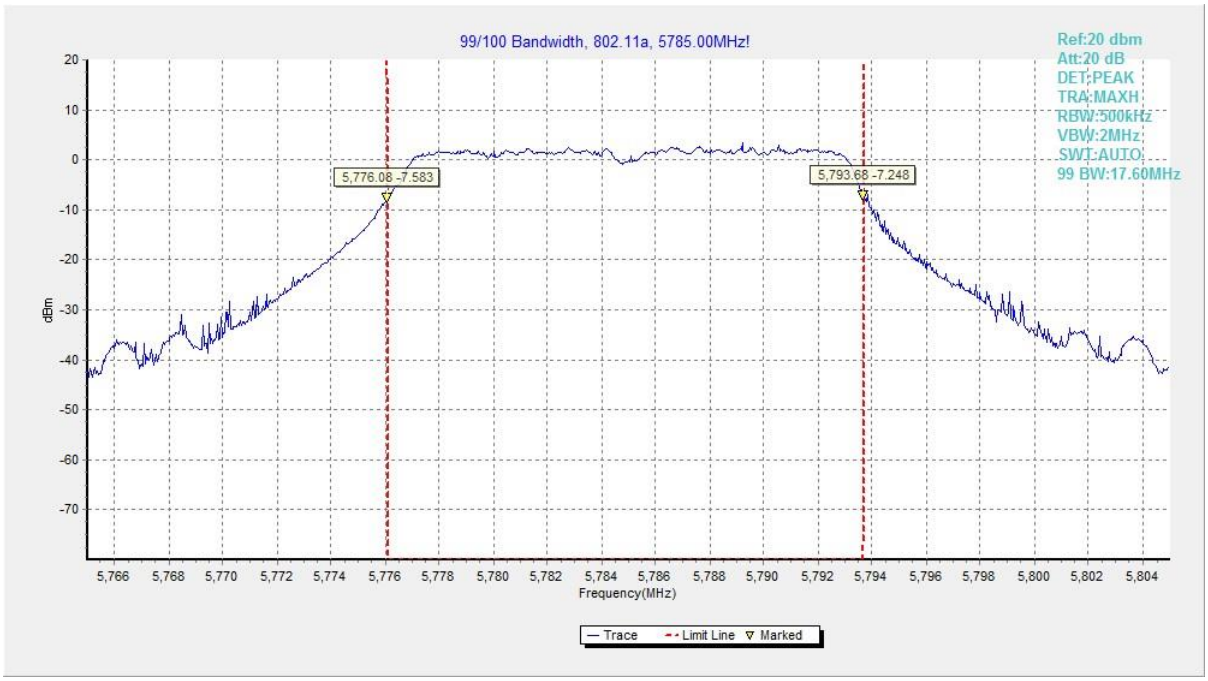


Fig. 35 99% Occupied Bandwidth (802.11a, 5785MHz)

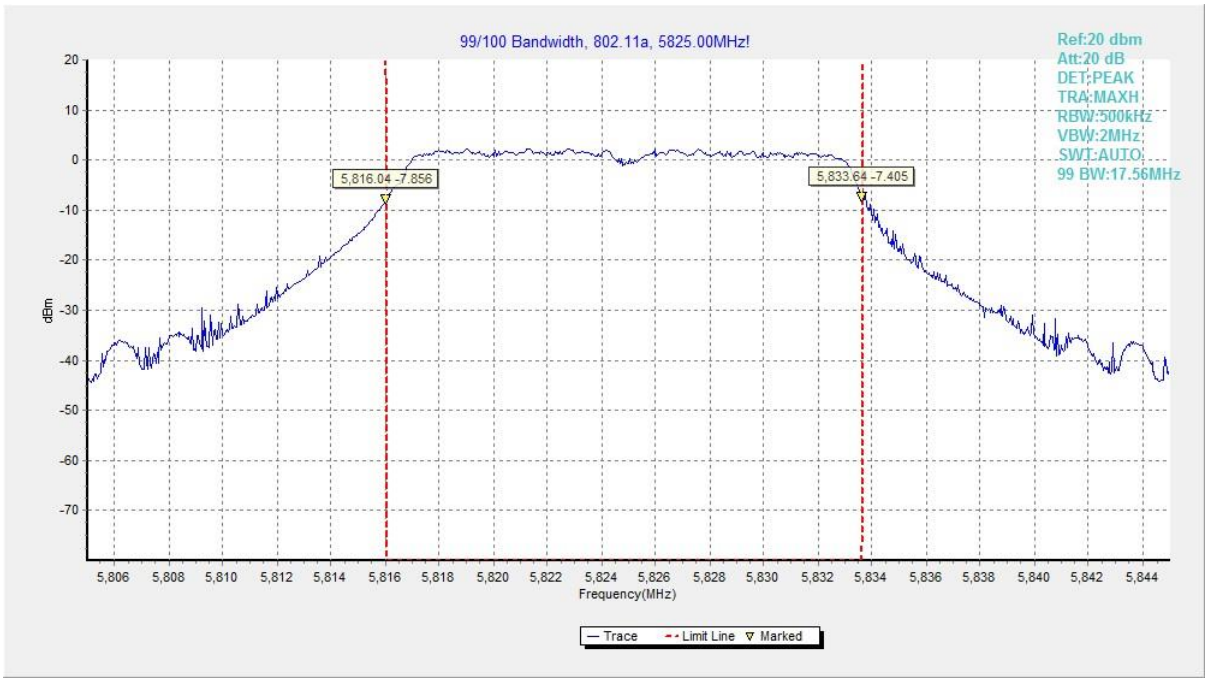


Fig. 36 99% Occupied Bandwidth (802.11a, 5825MHz)

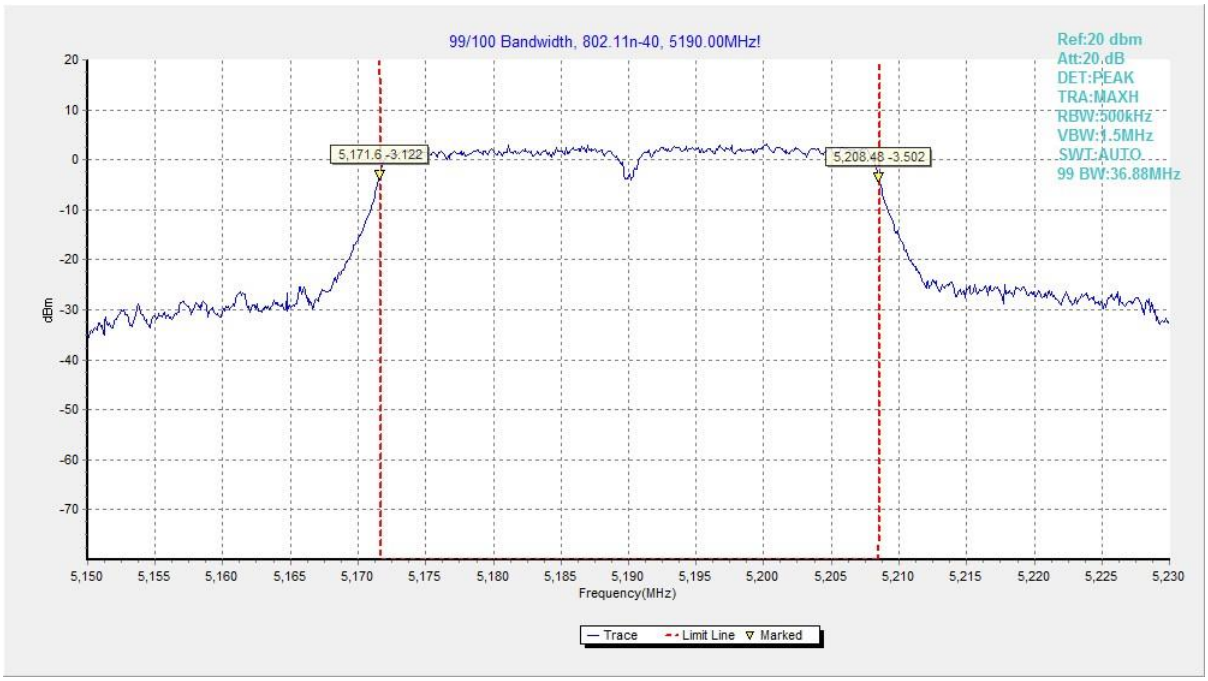


Fig. 37 99% Occupied Bandwidth (802.11n-HT40, 5190MHz)

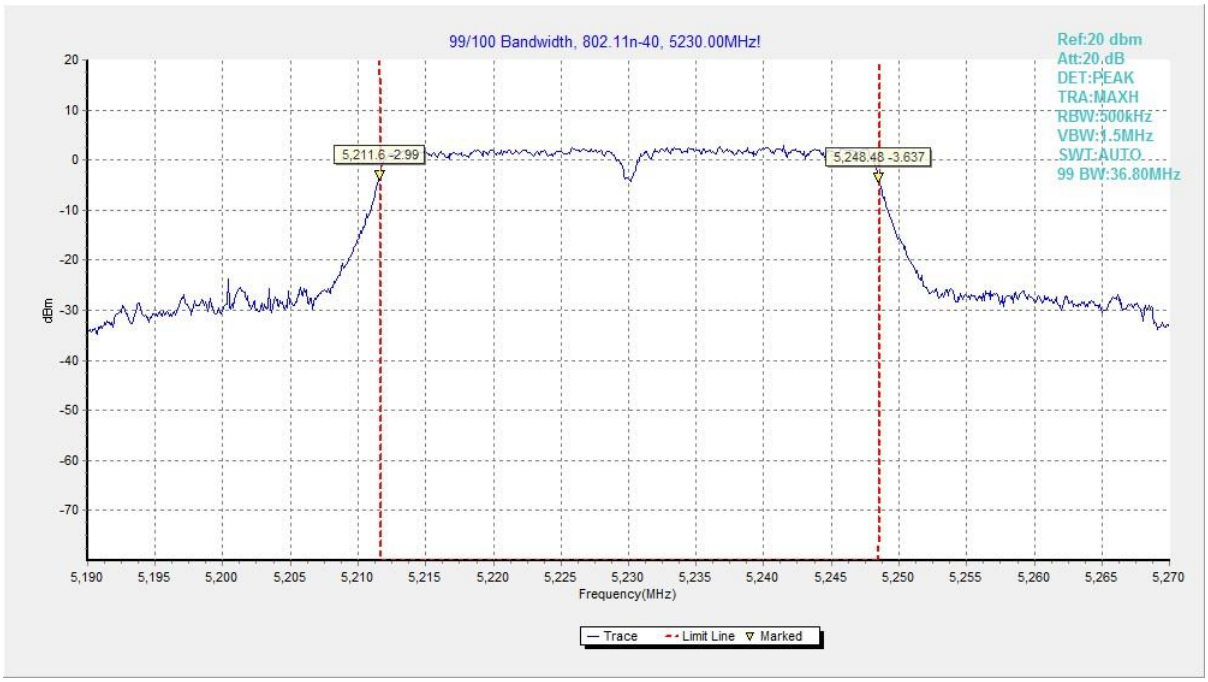


Fig. 38 99% Occupied Bandwidth (802.11n-HT40, 5230MHz)

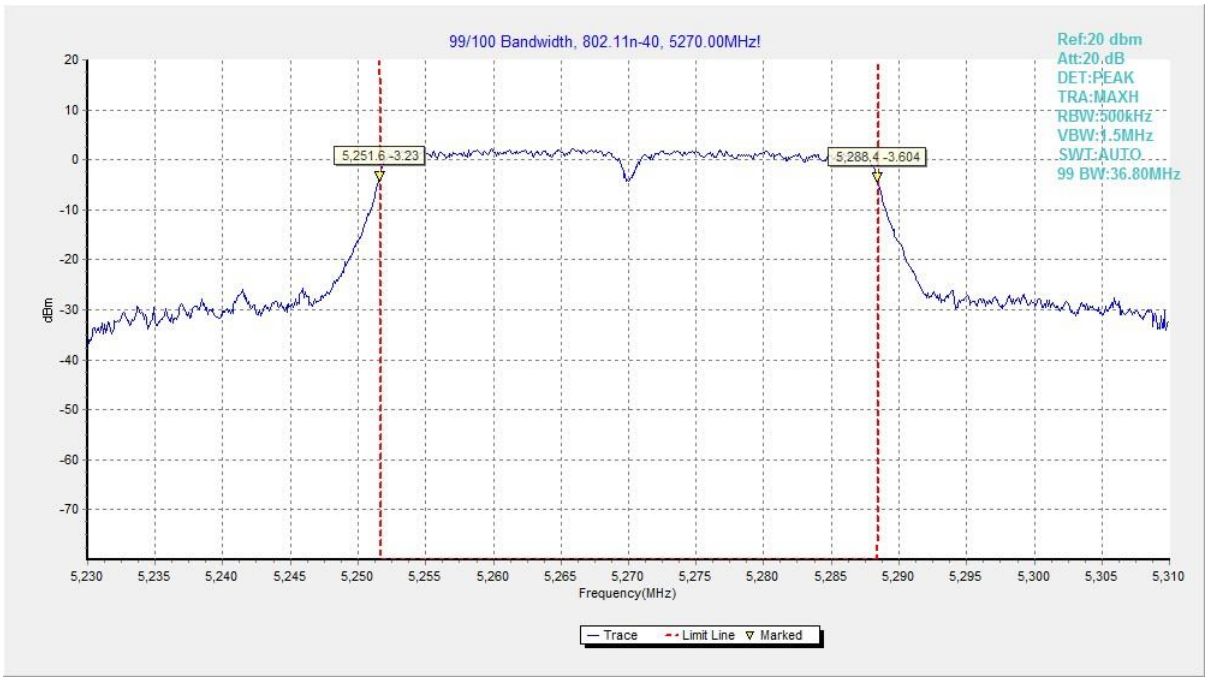


Fig. 39 99% Occupied Bandwidth (802.11n-HT40, 5270MHz)

Fig. 40 99% Occupied Bandwidth (802.11n-HT40, 5310MHz)

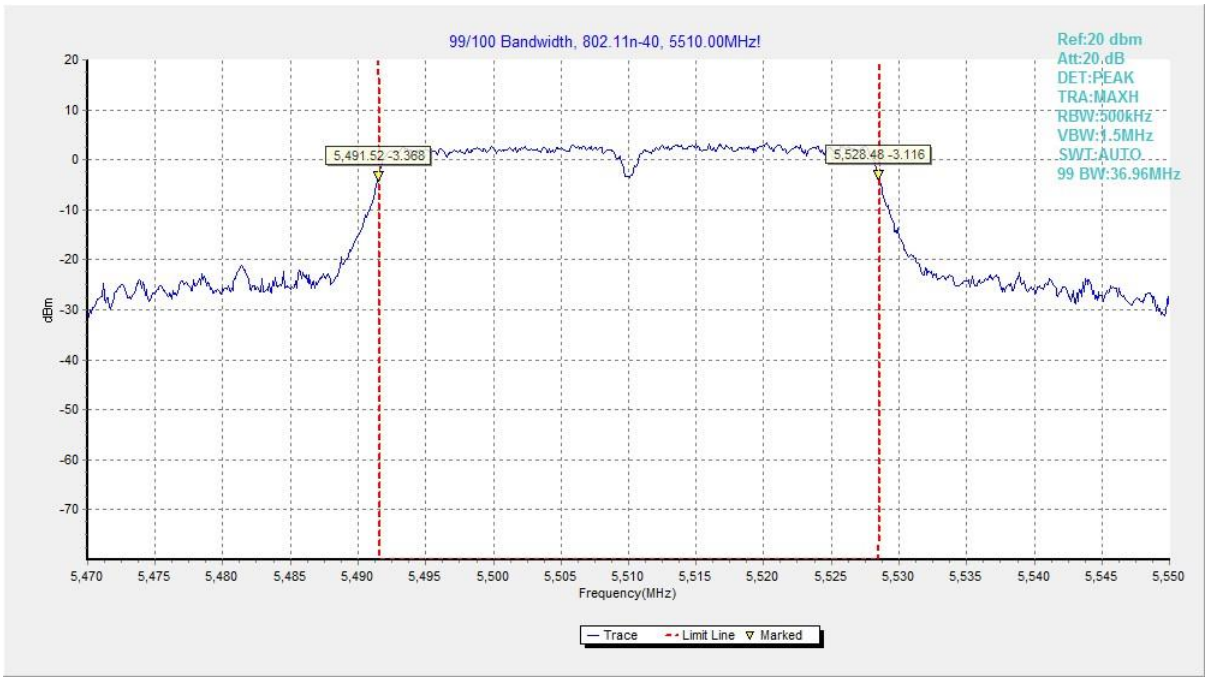


Fig. 41 99% Occupied Bandwidth (802.11n-HT40, 5510MHz)

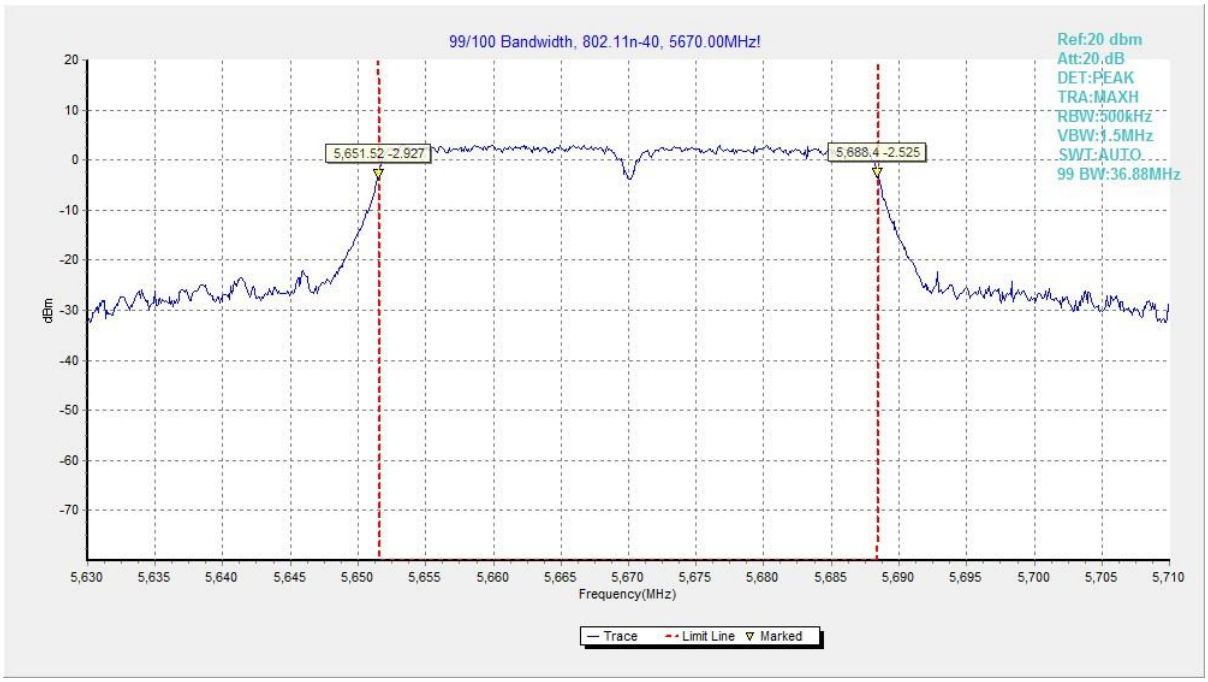


Fig. 42 99% Occupied Bandwidth (802.11n-HT40, 5670MHz)

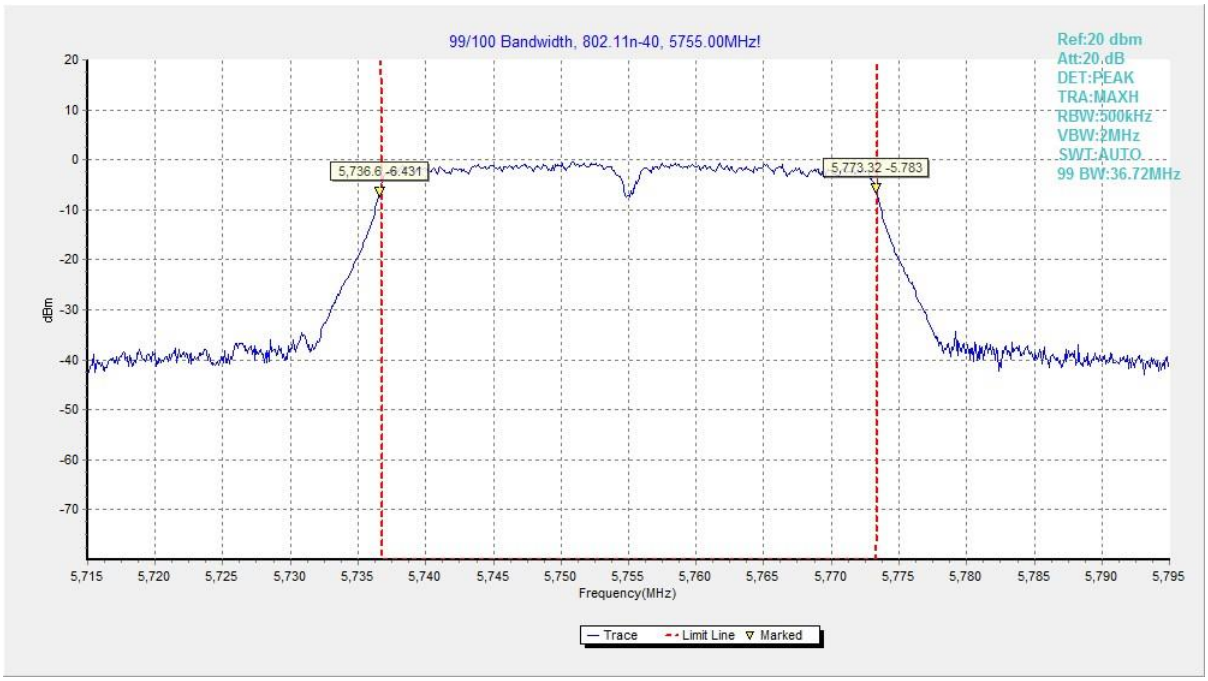


Fig. 43 99% Occupied Bandwidth (802.11n-HT40, 5755MHz)

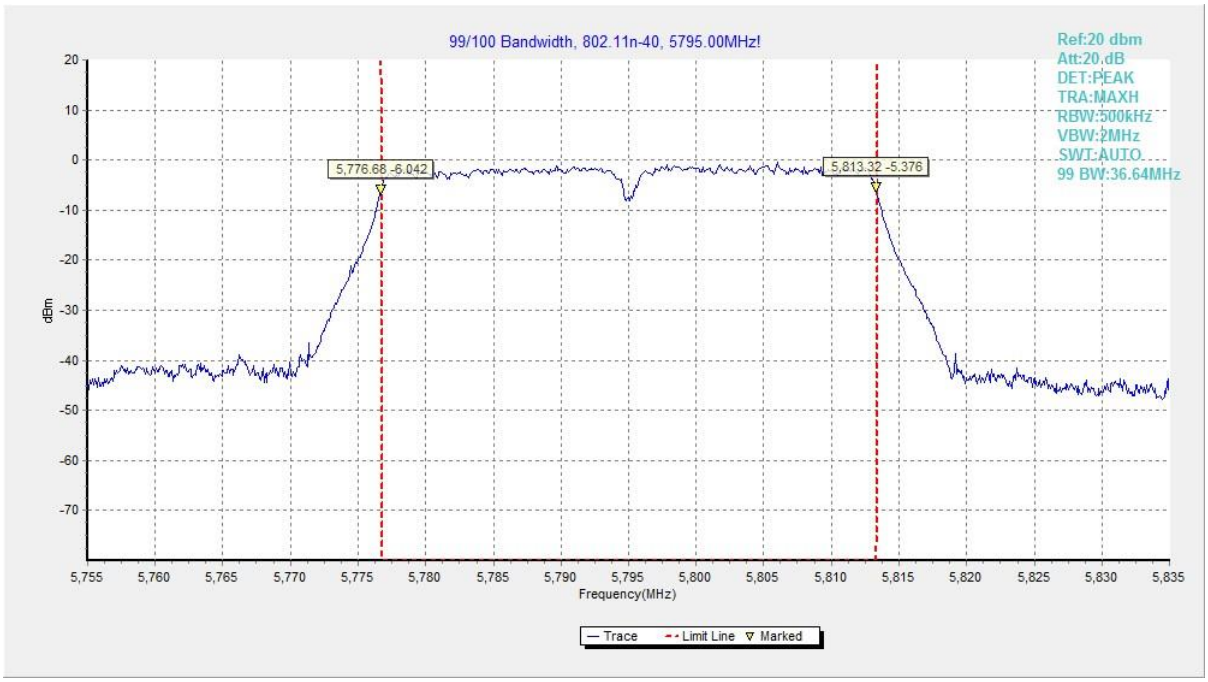


Fig. 44 99% Occupied Bandwidth (802.11n-HT40, 5795MHz)

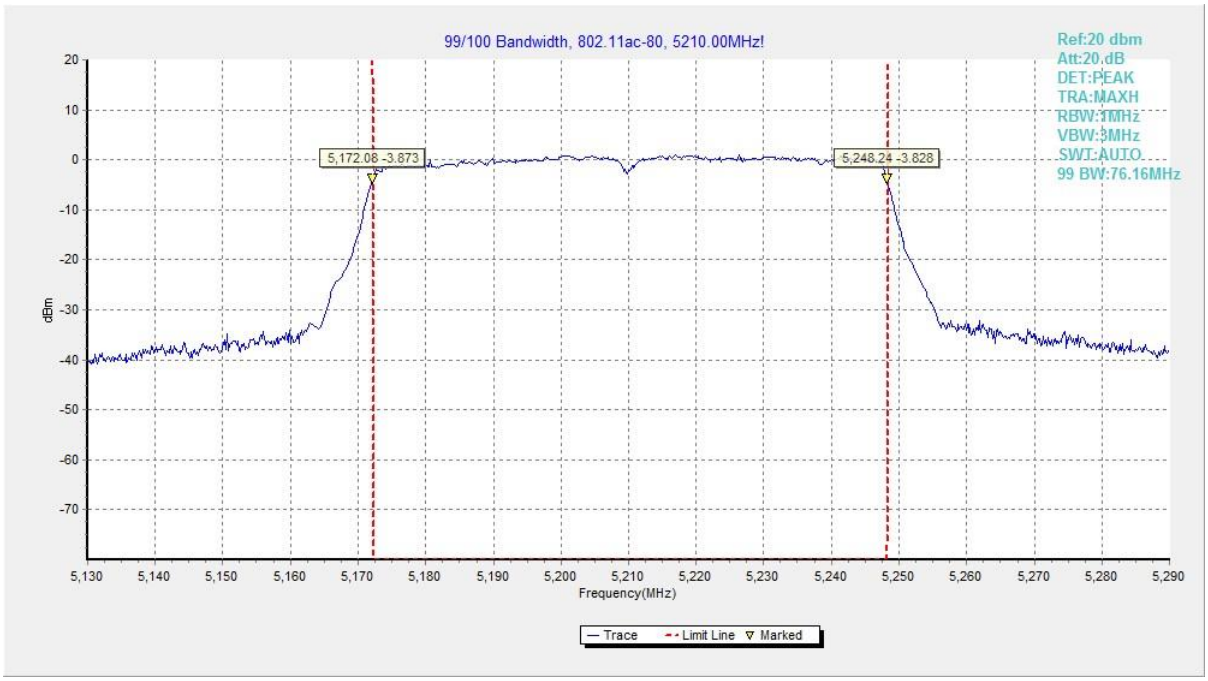


Fig. 45 99% Occupied Bandwidth (802. 11ac-VHT80, 5210MHz)

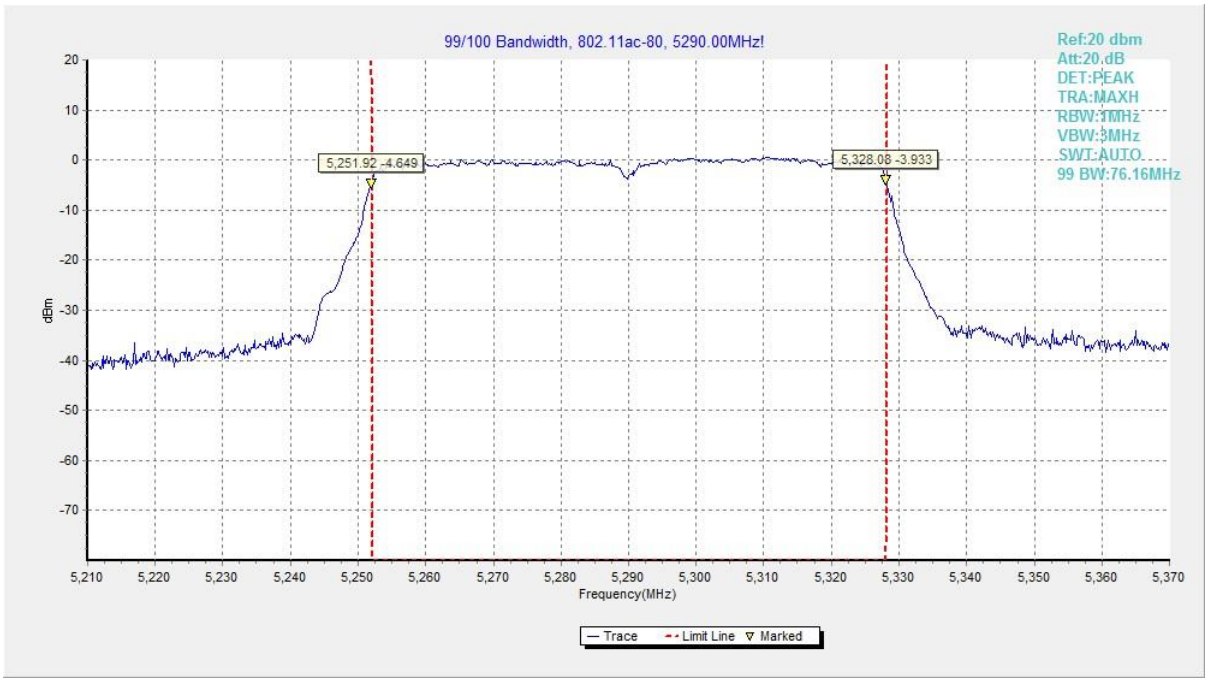


Fig. 46 99% Occupied Bandwidth (802. 11ac-VHT80, 5290MHz)

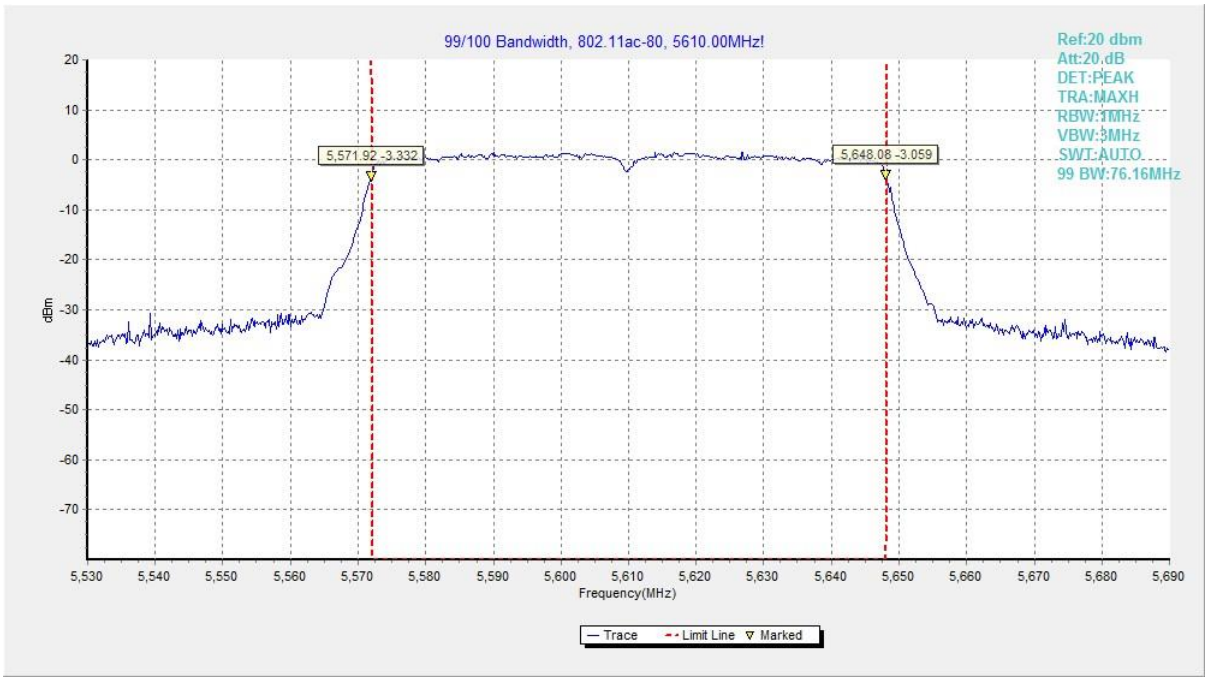


Fig. 47 99% Occupied Bandwidth (802. 11ac-VHT80, 5610MHz)

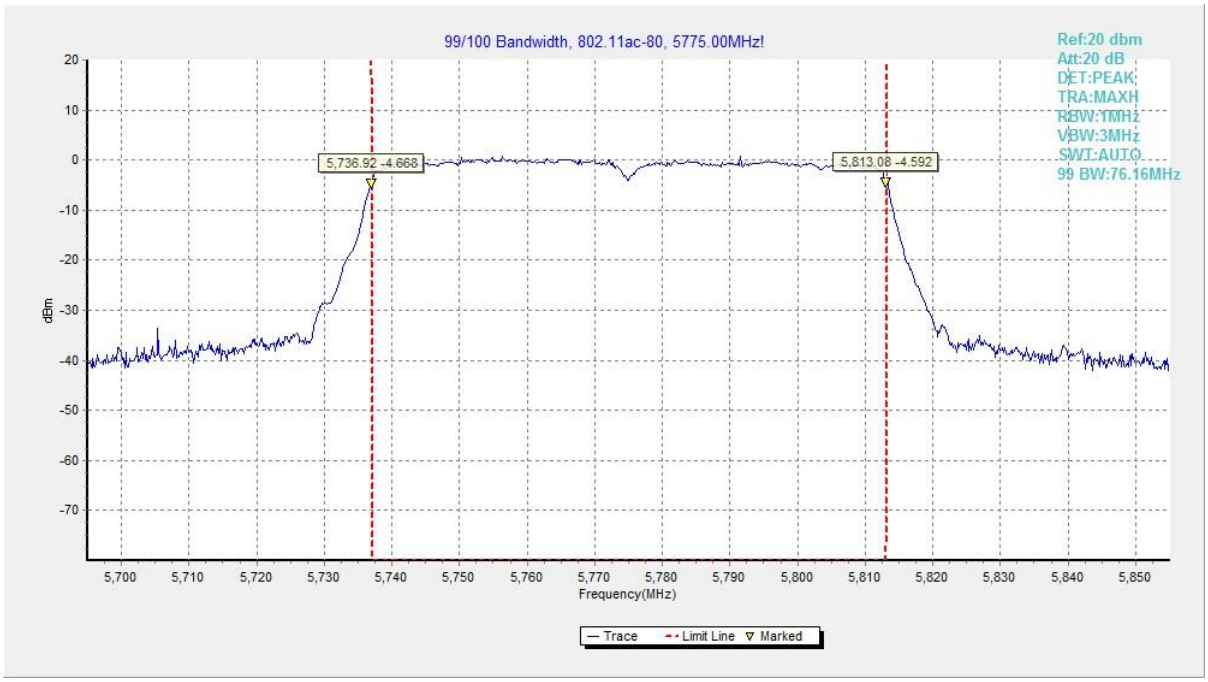


Fig. 48 99% Occupied Bandwidth (802. 11ac-VHT80, 5775MHz)

A.7. Band Edges Compliance

Method of Measurement: See ANSI C63.10-clause 6.10.

Measurement Limit:

Standard	Limit (dBuV/m)	
FCC 47 CFR Part 15.209 & RSS-247 section 5.5	Peak	74
	Average	54

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180MHz (CH36)	Fig.49	**P**
	5320MHz (CH64)	Fig.50	**P**
	5500MHz (CH100)	Fig.51	**P**
	5700MHz (CH140)	Fig.52	**P**
	5745MHz (CH149)	Fig.53	**P**
	5825MHz (CH165)	Fig.54	**P**
802.11n-HT40	5190MHz (CH38)	Fig.55	**P**
	5310MHz (CH62)	Fig.56	**P**
	5510MHz (CH102)	Fig.57	**P**
	5670MHz (CH134)	Fig.58	**P**
	5755MHz (CH151)	Fig.59	**P**
	5795MHz (CH159)	Fig.60	**P**
802.11ac-VHT80	5210MHz (CH42)	Fig.61	**P**
	5290MHz (CH58)	Fig.62	**P**
	5610MHz (Ch122)	Fig.63	**P**
	5775MHz (CH155)	Fig.64	**P**

Conclusion: PASS

Test graphs as below:

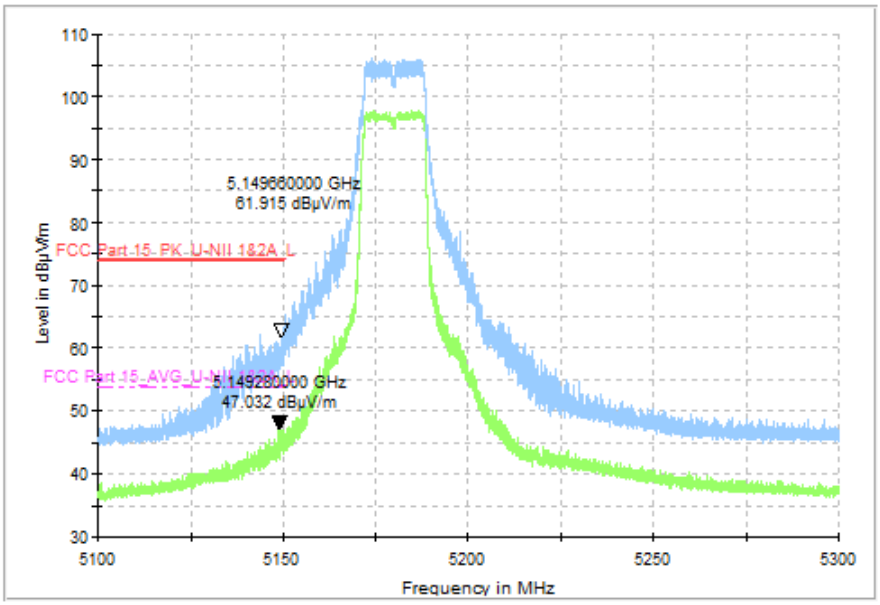


Fig. 49 Band Edges (802.11a, CH36 5180MHz)

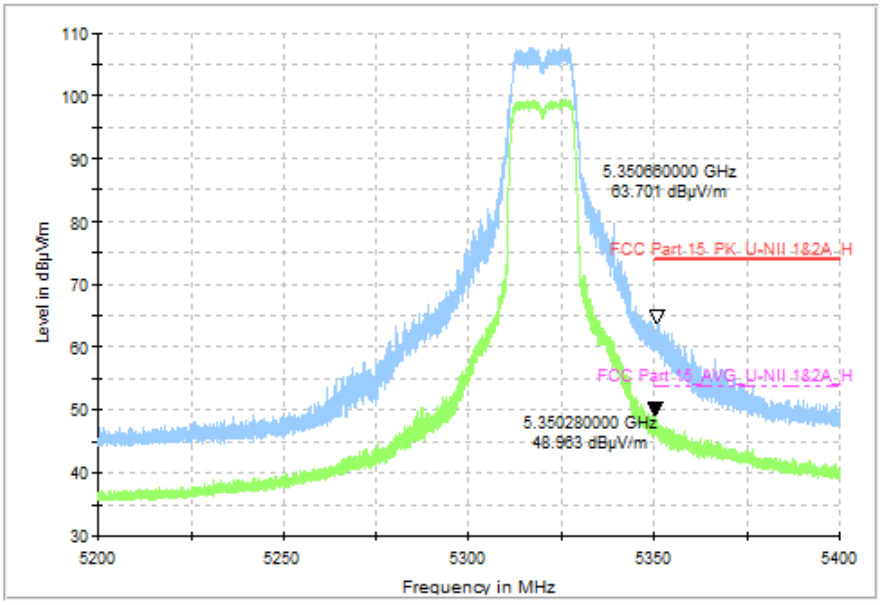


Fig. 50 Band Edges (802.11a, CH64 5320MHz)

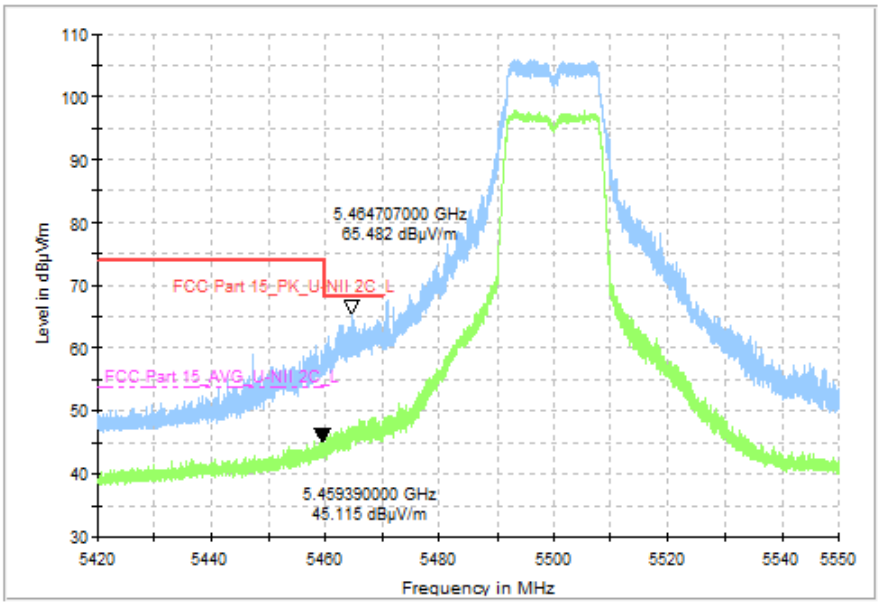


Fig. 51 Band Edges (802.11a, CH100 5500MHz)

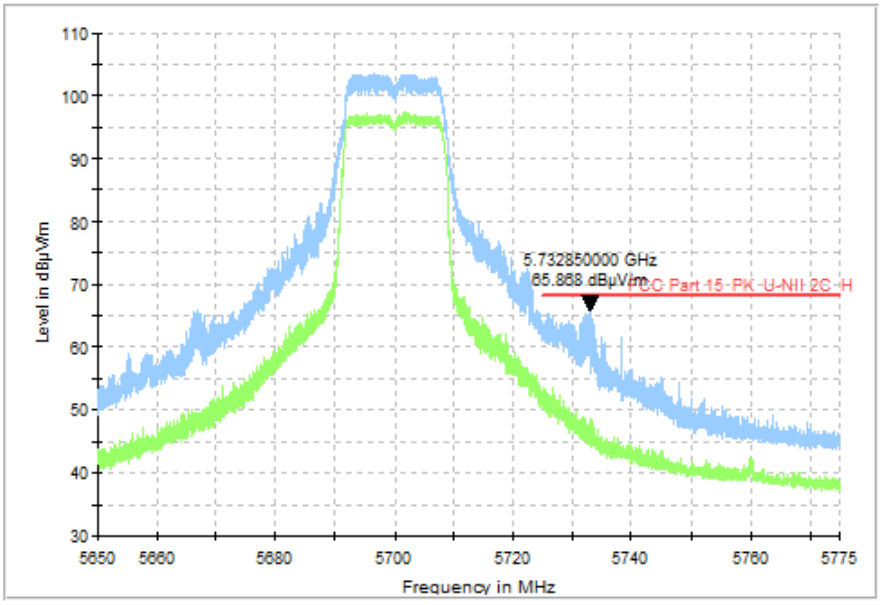


Fig. 52 Band Edges (802.11a, CH140 5700MHz)

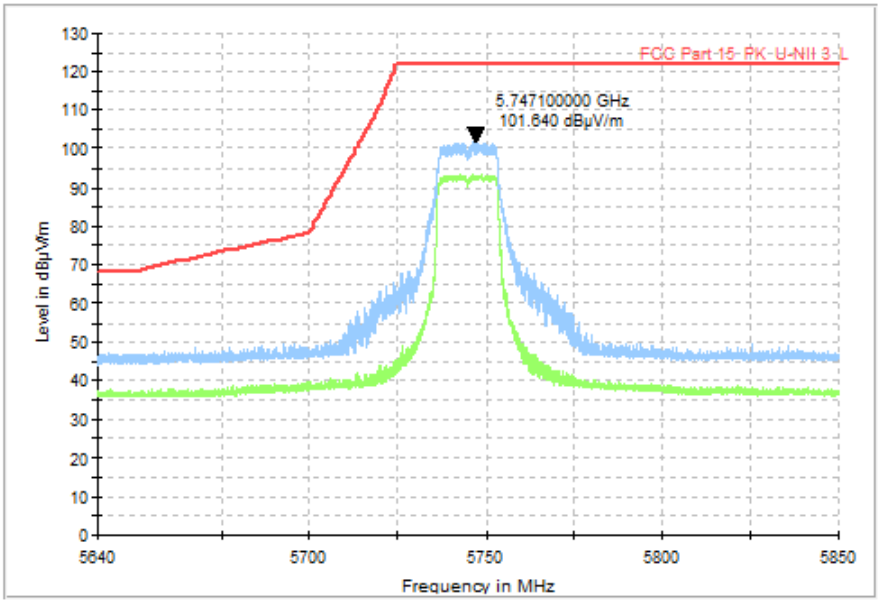


Fig. 53 Band Edges (802.11a, CH149 5745MHz)

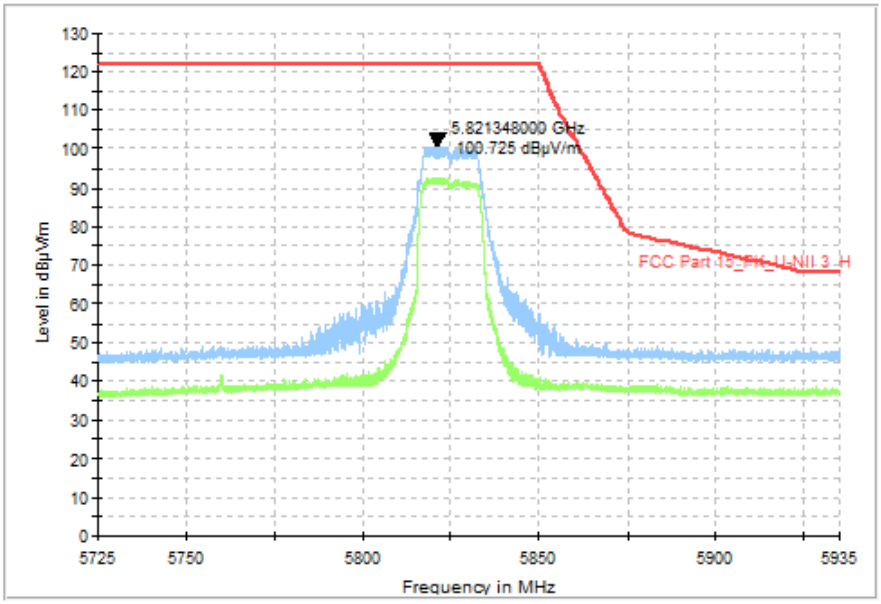


Fig. 54 Band Edges (802.11a, CH165 5825MHz)

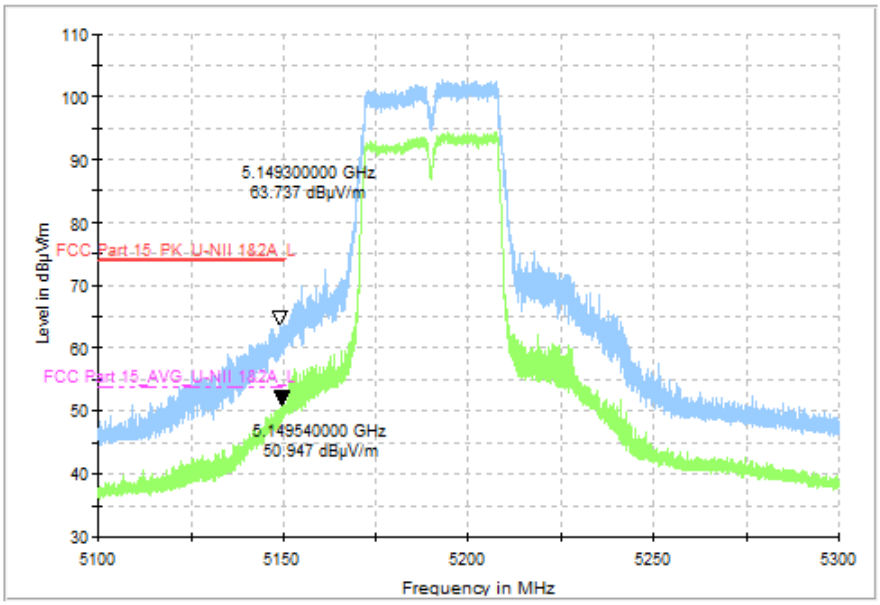


Fig. 55 Band Edges (802.11n-HT40, CH38 5190MHz)

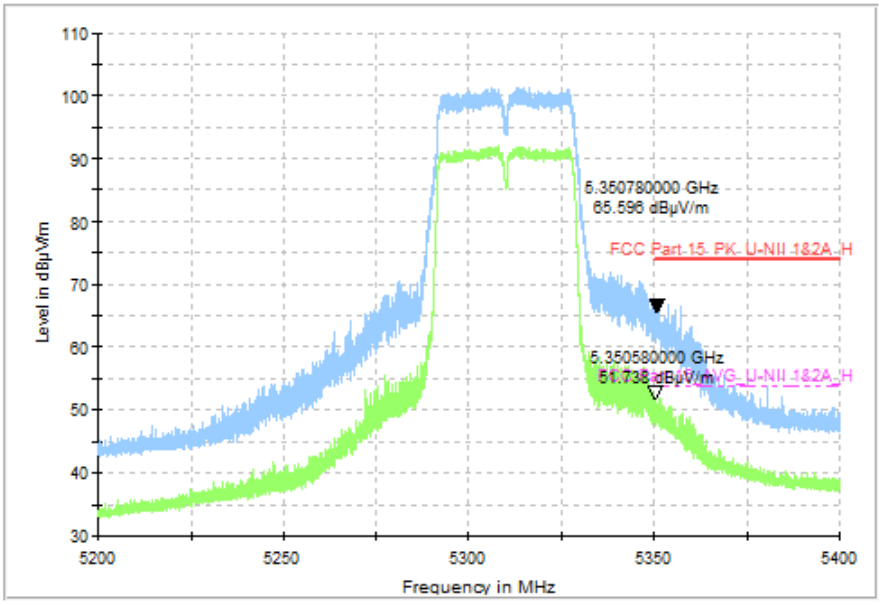


Fig. 56 Band Edges (802.11n-HT40, CH62 5310MHz)

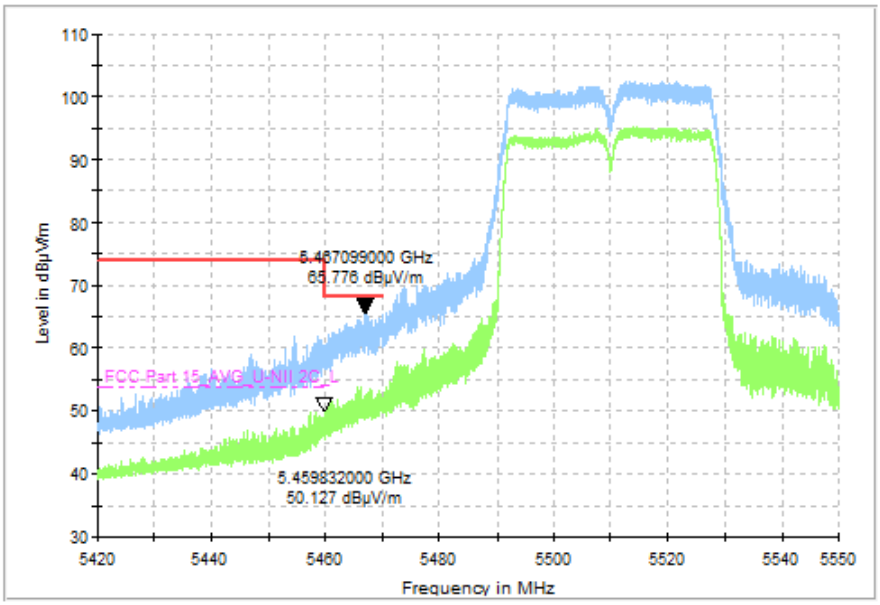


Fig. 57 Band Edges (802.11n-HT40, CH102 5510MHz)

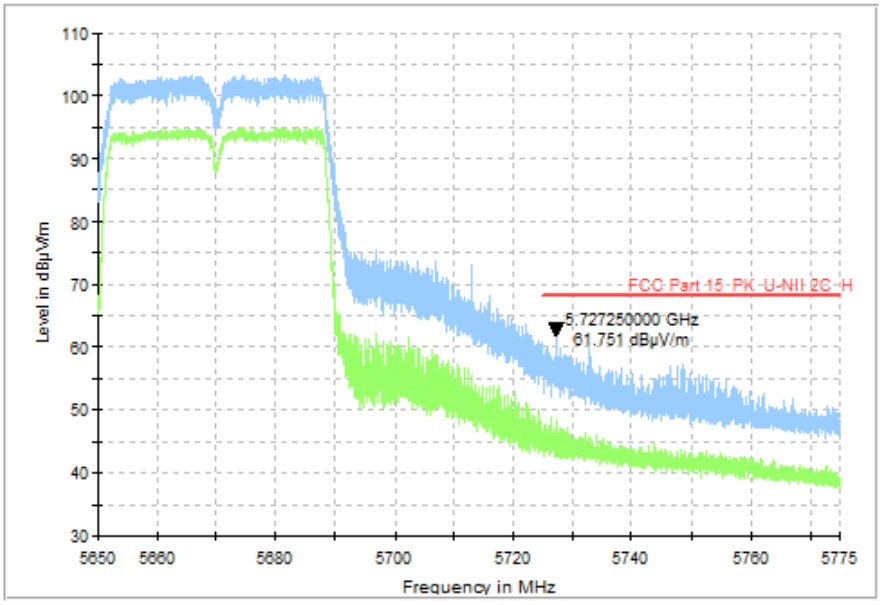


Fig. 58 Band Edges (802.11n-HT40, CH134 5670MHz)

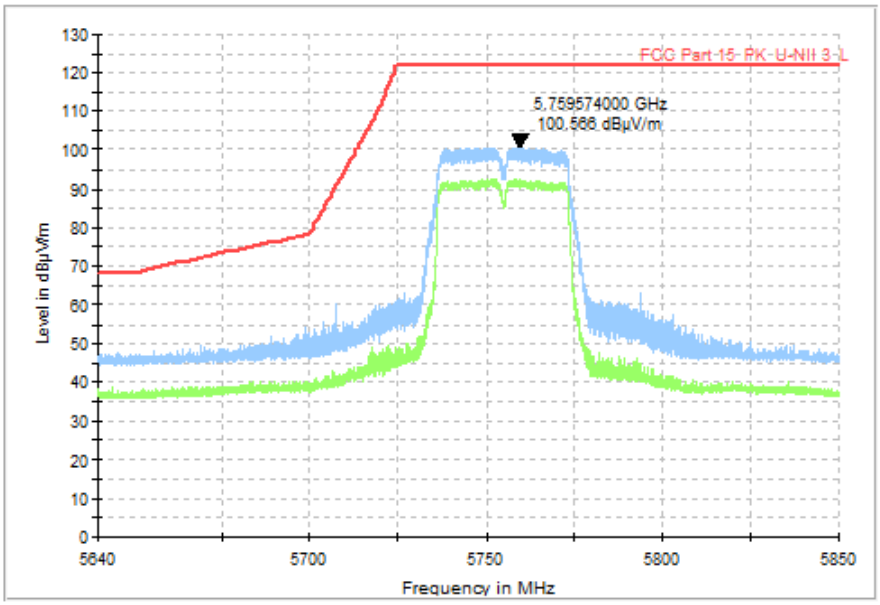


Fig. 59 Band Edges (802.11n-HT40, CH151 5755MHz)

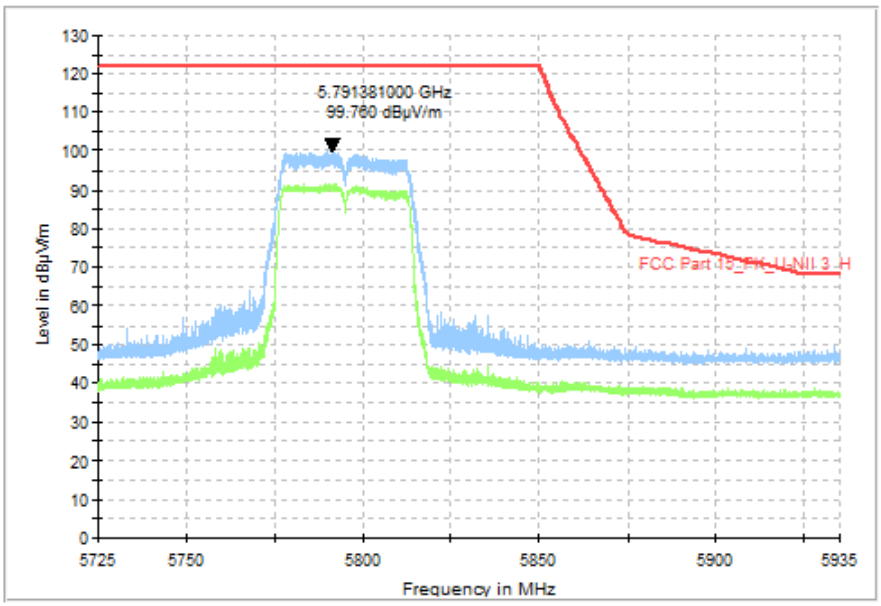


Fig. 60 Band Edges (802.11n-HT40, CH159 5795MHz)

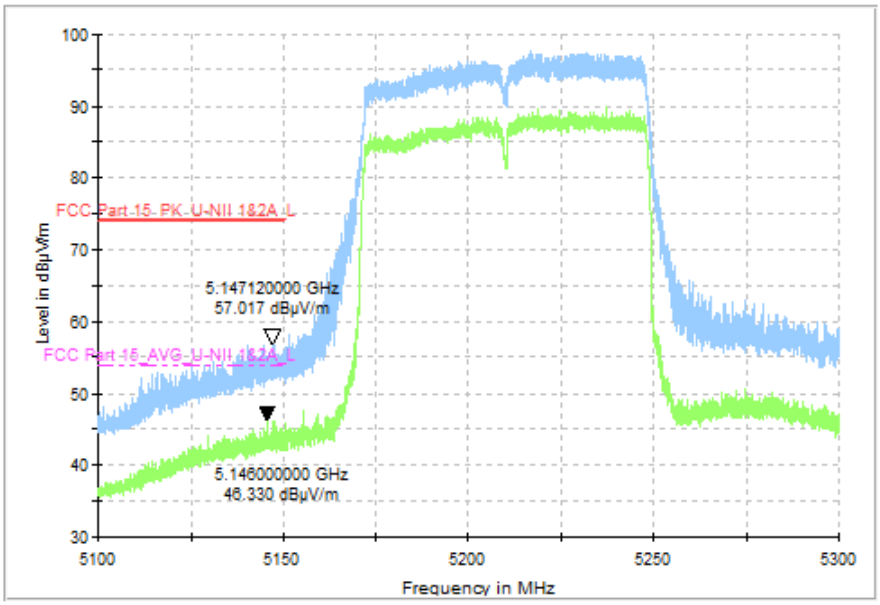


Fig. 61 Band Edges (802.11ac-VHT80, CH42 5210MHz)

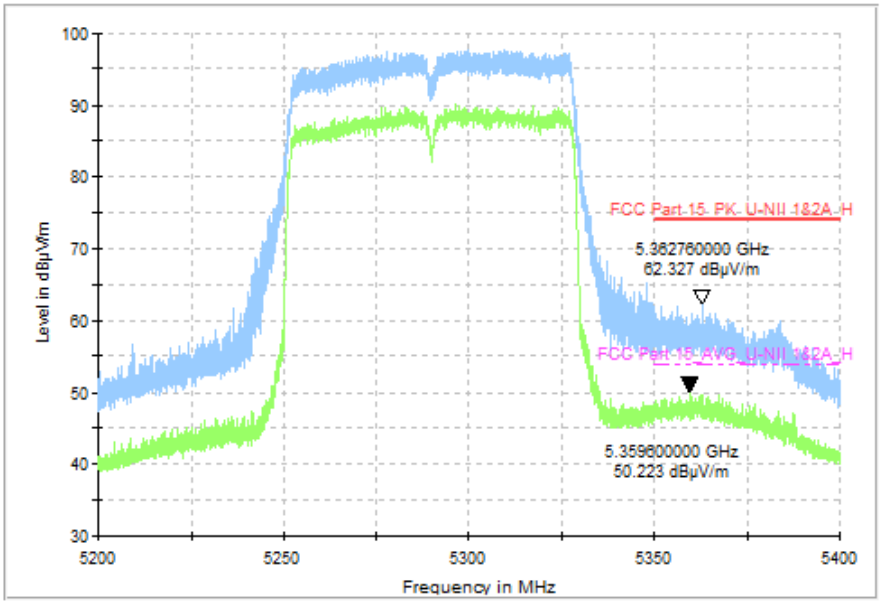


Fig. 62 Band Edges (802.11ac-VHT80, CH58 5290MHz)

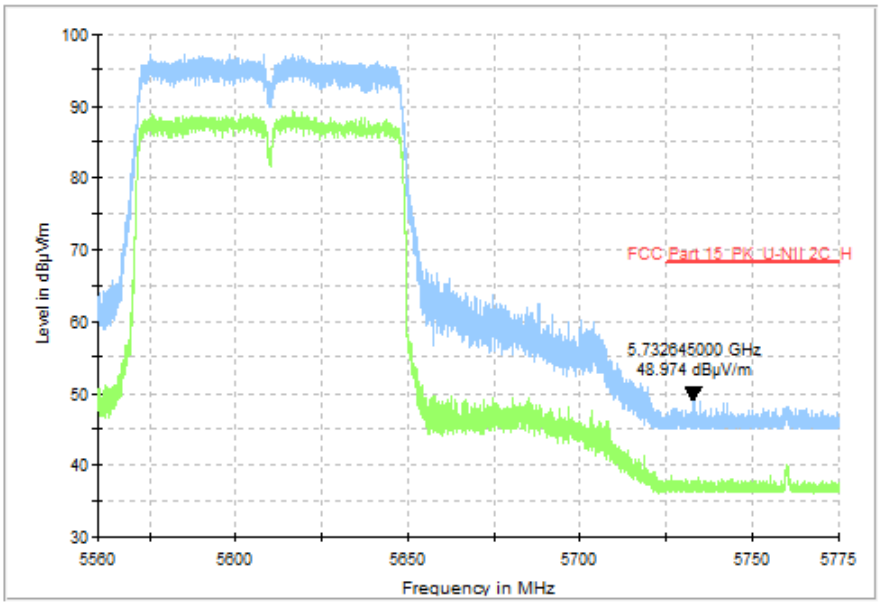


Fig. 63 Band Edges (802.11ac-VHT80, CH122 5610MHz)

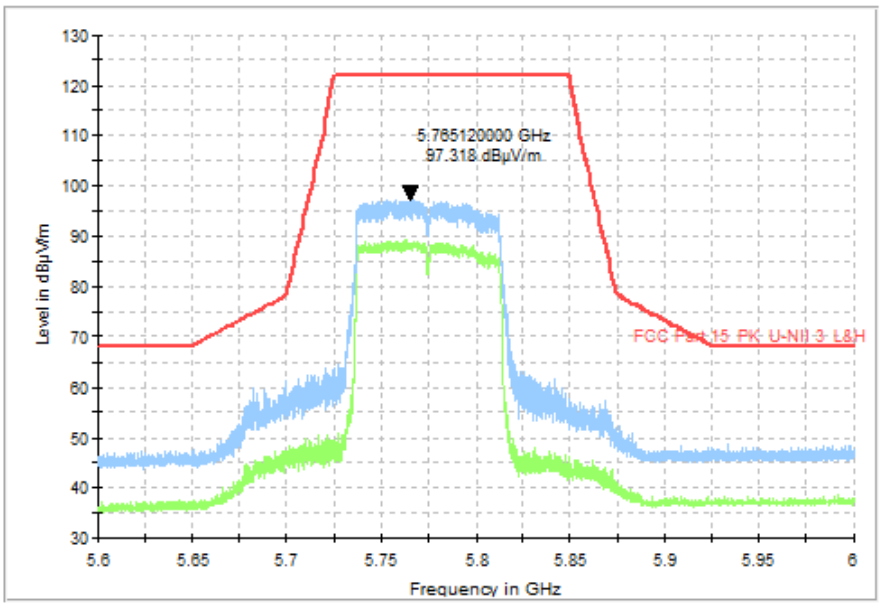


Fig. 64 Band Edges (802.11ac-VHT80, CH155 5775MHz)

A.8. Transmitter Spurious Emission

Measurement of method: See KDB 789033 D02 v02r01, Section G.3, G.4, G.5 and G.6.

Measurement Limit:

Standard	Limit (dBm/MHz)
FCC 47 CFR Part 15.407, 15.205 & RSS-247 section 5.5/RSS-Gen section 6.13	< -27

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength (dBμV/m)	Measurement distance (m)
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

Note: For frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m.

The measurement results include the horizontal polarization and vertical polarization measurements. For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

Measurement Result:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	5180MHz (Ch36)	1 GHz ~ 18 GHz	Fig.65	**P**
	5200MHz (Ch40)	1 GHz ~ 18 GHz	Fig.66	**P**
	5240MHz (Ch48)	1 GHz ~ 18 GHz	Fig.67	**P**
	5260MHz (Ch52)	1 GHz ~ 18 GHz	Fig.68	**P**
	5280MHz (Ch56)	1 GHz ~ 18 GHz	Fig.69	**P**
	5320MHz (Ch64)	1 GHz ~ 18 GHz	Fig.70	**P**
	5500MHz (Ch100)	1 GHz ~ 18 GHz	Fig.71	**P**
	5580MHz (Ch116)	1 GHz ~ 18 GHz	Fig.72	**P**
	5700MHz (Ch140)	1 GHz ~ 18 GHz	Fig.73	**P**
	5745MHz (Ch149)	1 GHz ~ 18 GHz	Fig.74	**P**
	5785MHz (Ch157)	1 GHz ~ 18 GHz	Fig.75	**P**
	5825MHz (Ch165)	1 GHz ~ 18 GHz	Fig.76	**P**
802.11n-HT40	5190MHz (Ch38)	1 GHz ~ 18 GHz	Fig.77	**P**
	5230MHz (Ch46)	1 GHz ~ 18 GHz	Fig.78	**P**
	5270MHz (Ch54)	1 GHz ~ 18 GHz	Fig.79	**P**
	5310MHz (Ch62)	1 GHz ~ 18 GHz	Fig.80	**P**
	5510MHz (Ch102)	1 GHz ~ 18 GHz	Fig.81	**P**
	5670MHz (Ch134)	1 GHz ~ 18 GHz	Fig.82	**P**
	5755MHz (Ch151)	1 GHz ~ 18 GHz	Fig.83	**P**
	5795MHz (Ch159)	1 GHz ~ 18 GHz	Fig.84	**P**
802.11ac-VHT80	5210MHz (Ch42)	1 GHz ~ 18 GHz	Fig.85	**P**
	5290MHz (Ch58)	1 GHz ~ 18 GHz	Fig.86	**P**
	5610MHz (Ch122)	1 GHz ~ 18 GHz	Fig.87	**P**
	5775MHz (Ch155)	1 GHz ~ 18 GHz	Fig.88	**P**
All channels		30MHz ~ 1GHz	Fig.89	**P**
		18GHz ~ 26.5GHz	Fig.90	**P**
		26.5GHz ~ 40GHz	Fig.91	**P**

Conclusion: PASS

Test graphs as below:

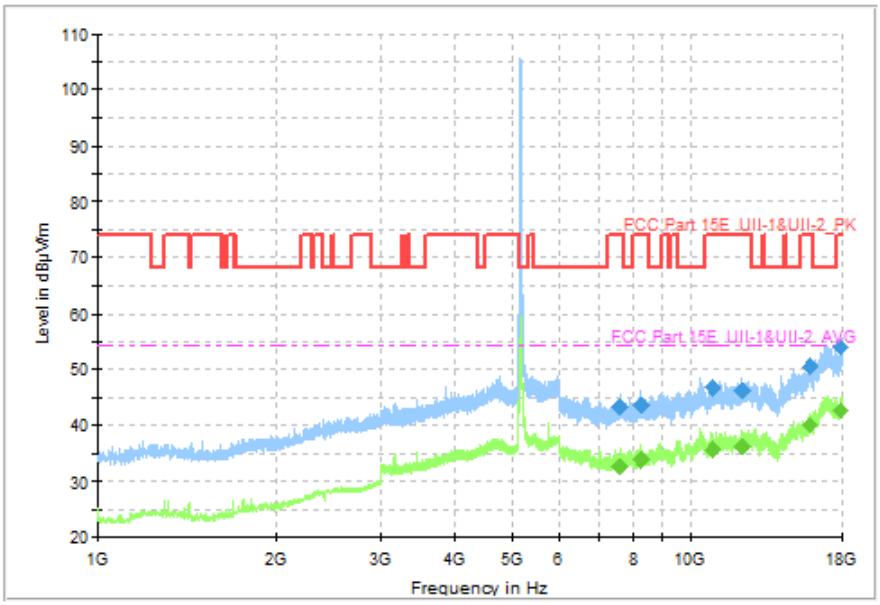


Fig. 65 Transmitter Spurious Emission (802.11a, CH36 5180MHz)

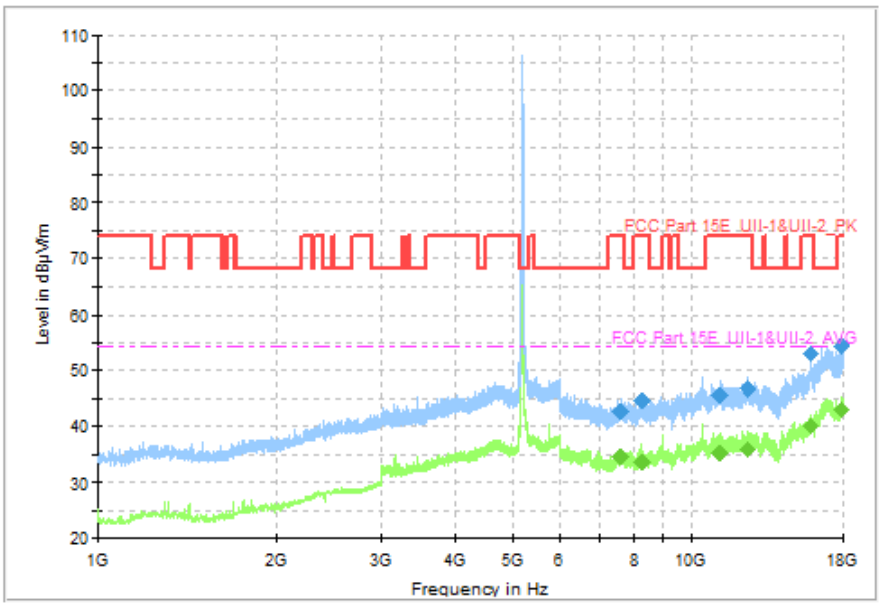


Fig. 66 Transmitter Spurious Emission (802.11a, CH40 5200MHz)

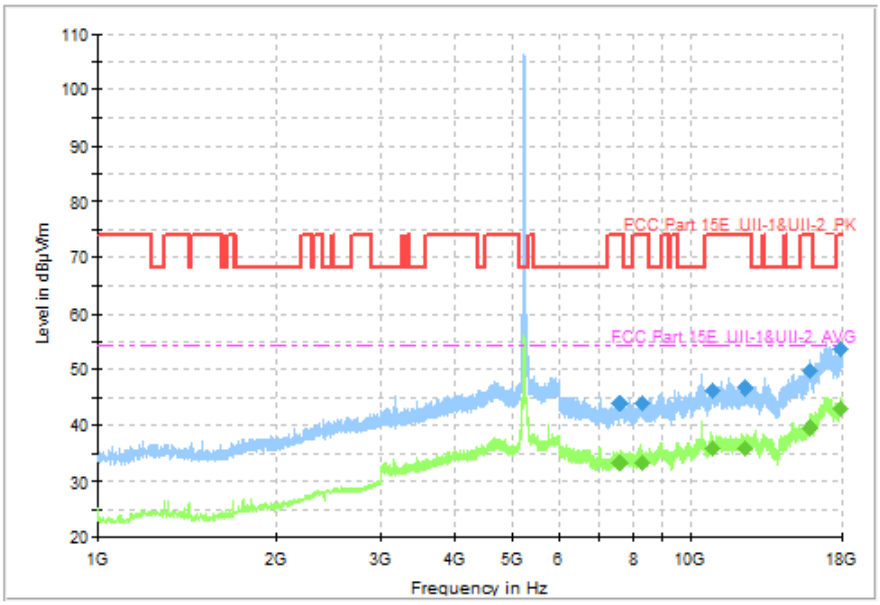


Fig. 67 Transmitter Spurious Emission (802.11a, CH48 5240MHz)

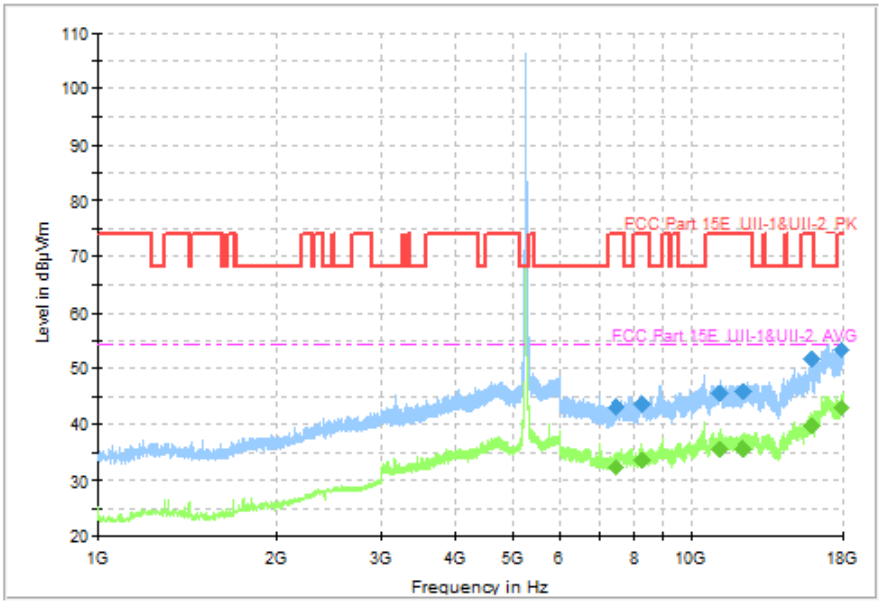


Fig. 68 Transmitter Spurious Emission (802.11a, CH52 5260MHz)

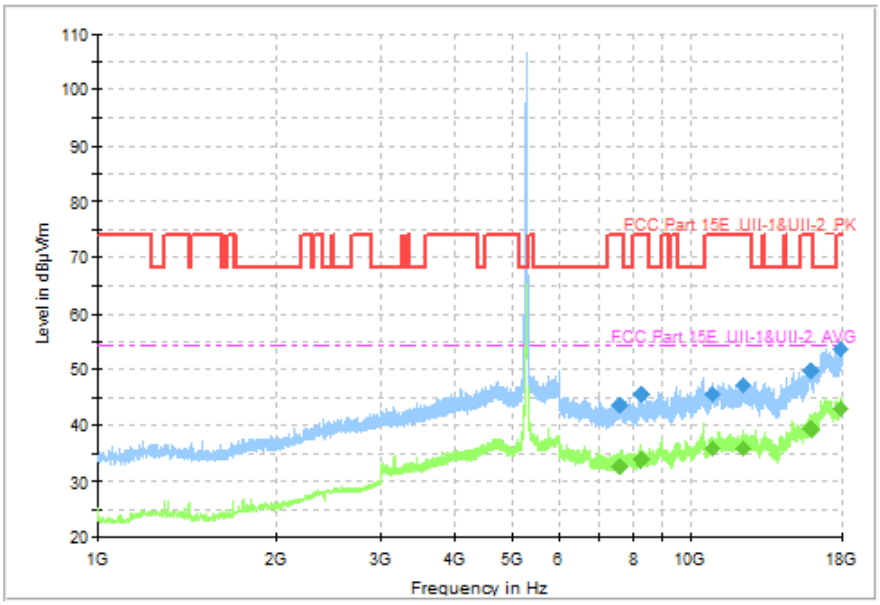


Fig. 69 Transmitter Spurious Emission (802.11a, CH56 5280MHz)

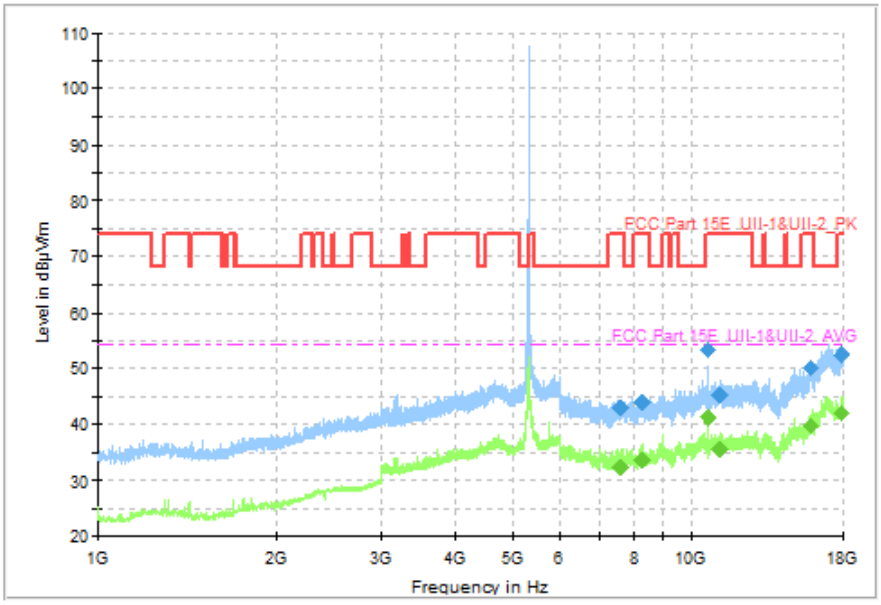


Fig. 70 Transmitter Spurious Emission (802.11a, CH64 5320MHz)

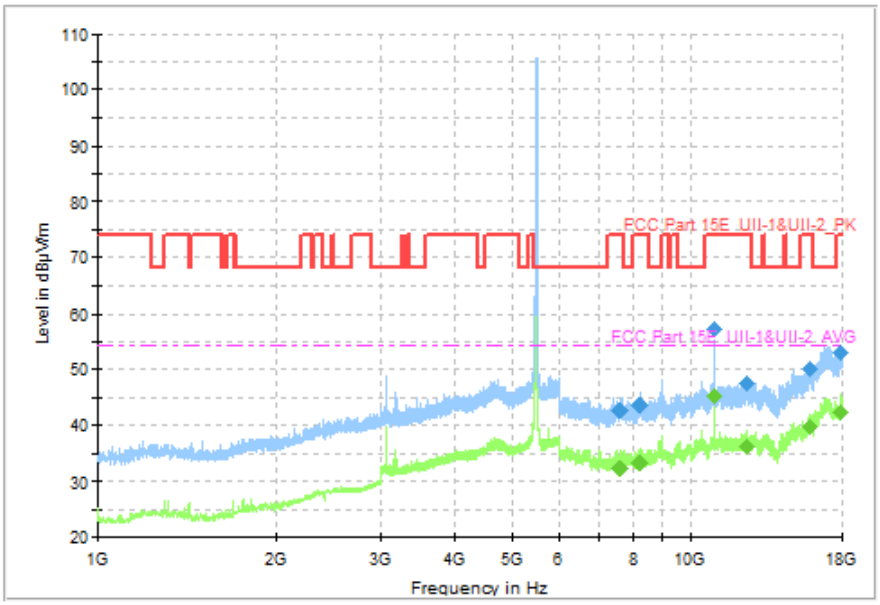


Fig. 71 Transmitter Spurious Emission (802.11a, CH100 5500MHz)

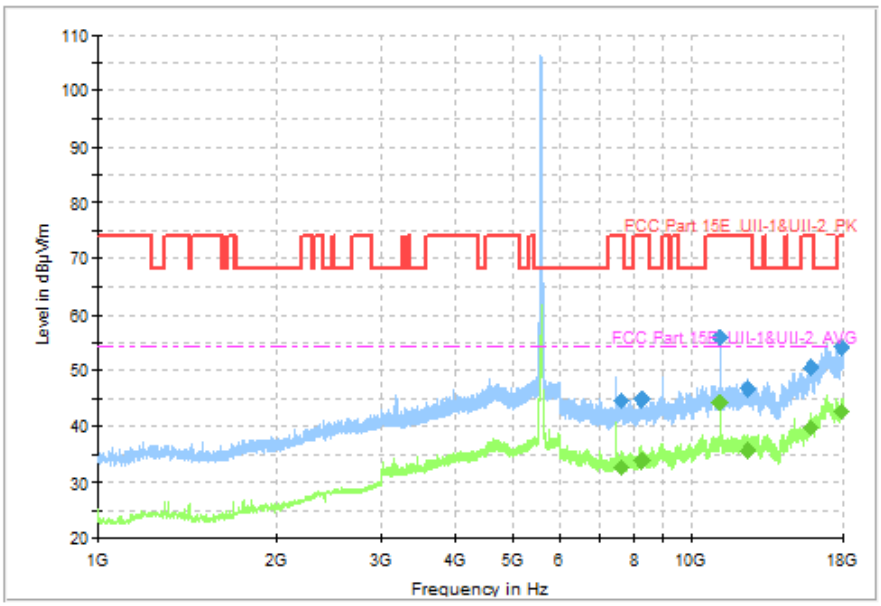


Fig. 72 Transmitter Spurious Emission (802.11a, CH116 5580MHz)

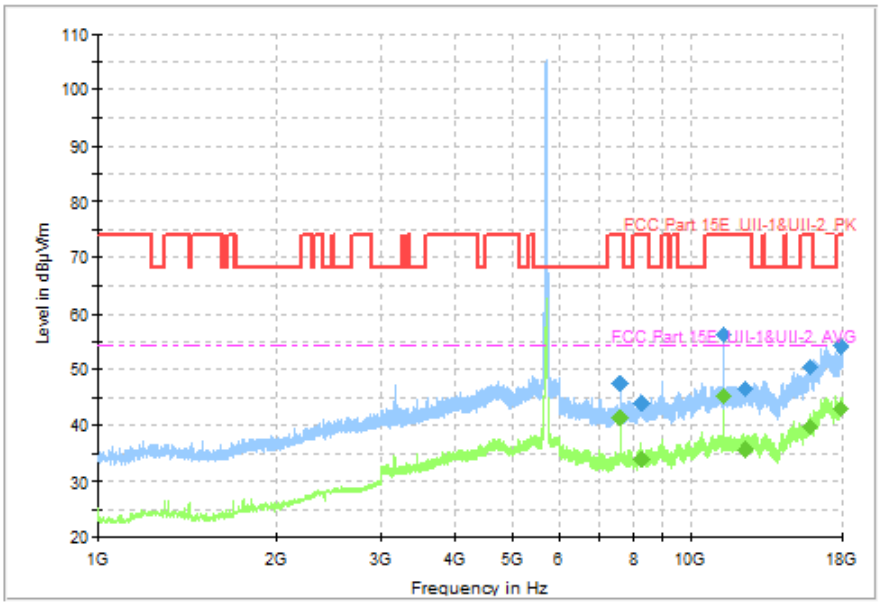


Fig. 73 Transmitter Spurious Emission (802.11a, CH140 5700MHz)

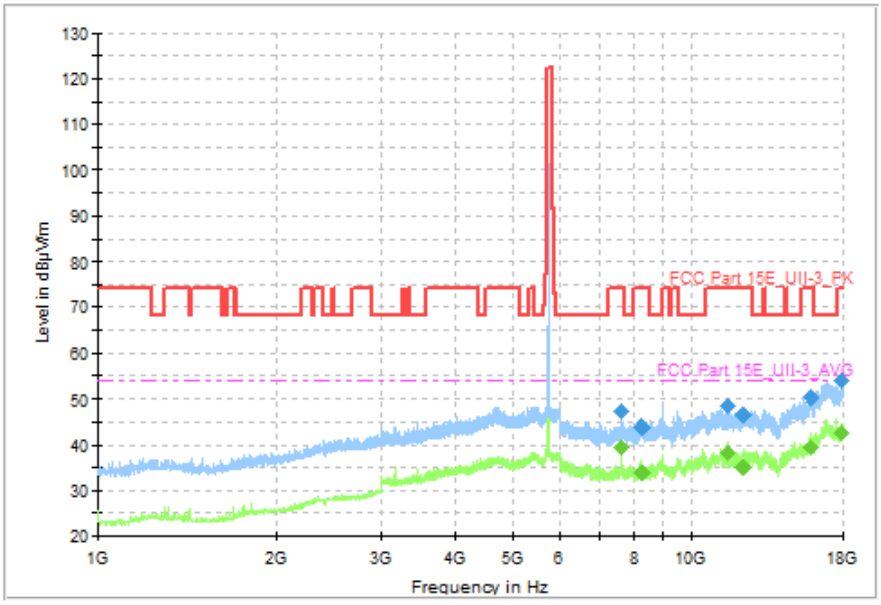


Fig. 74 Transmitter Spurious Emission (802. 11a, CH149 5745MHz)

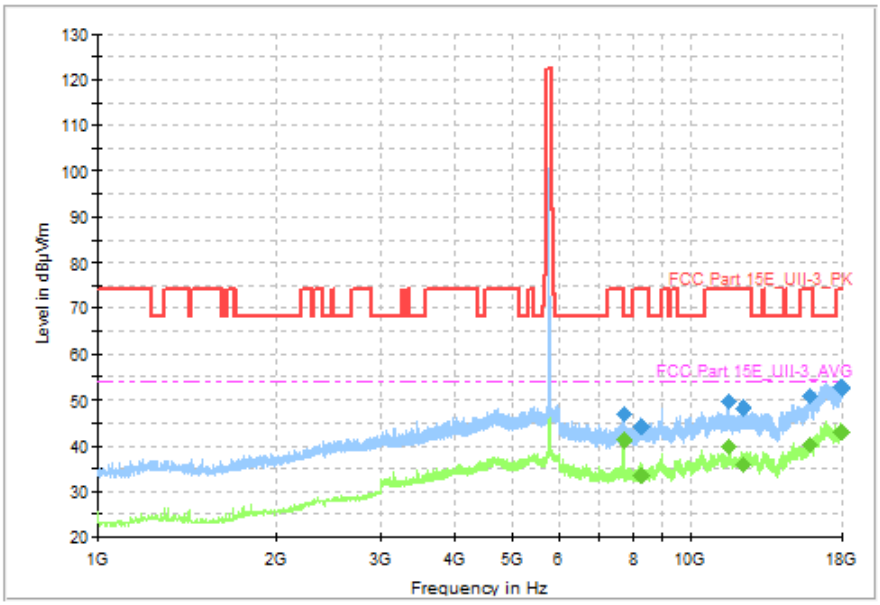


Fig. 75 Transmitter Spurious Emission (802. 11a, CH157 5785MHz)

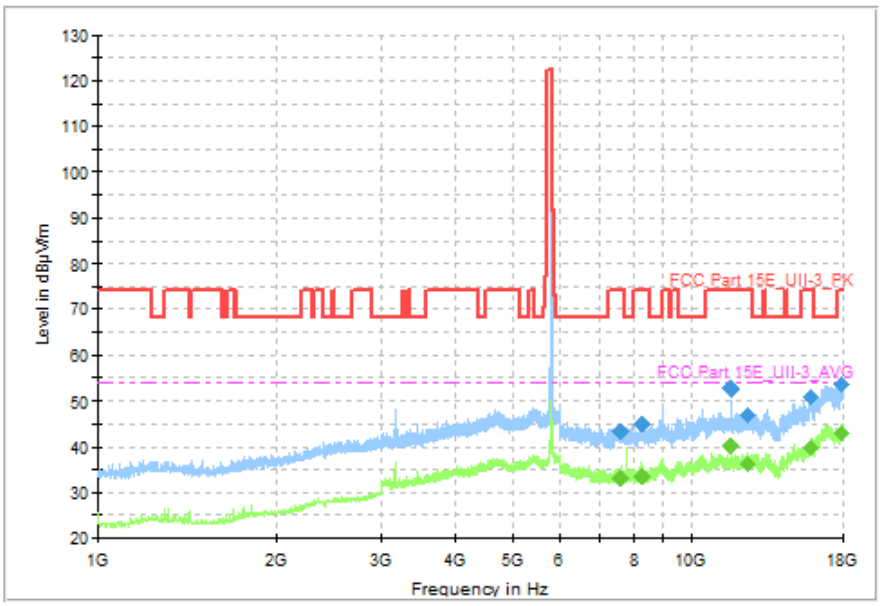


Fig. 76 Transmitter Spurious Emission (802. 11a, CH165 5825MHz)

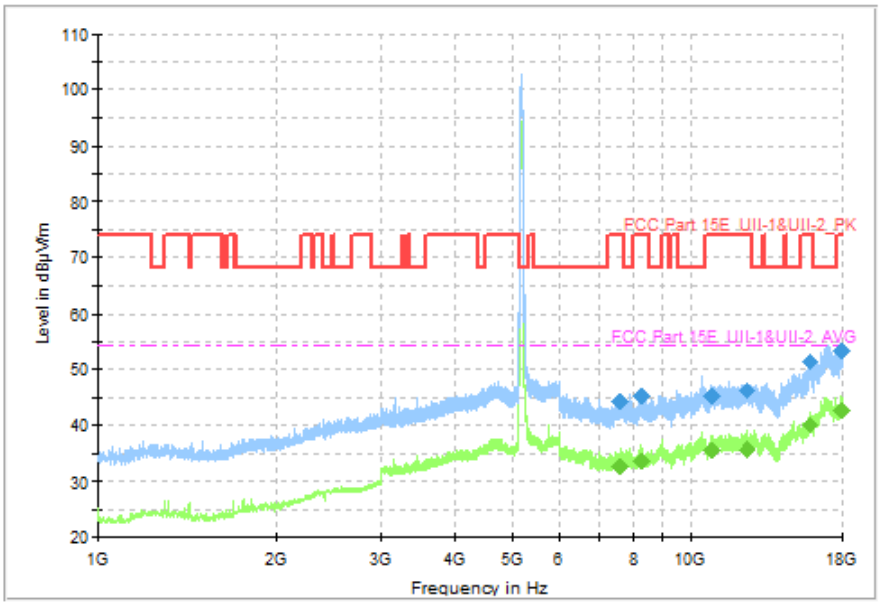


Fig. 77 Transmitter Spurious Emission (802.11n-HT40, CH38 5190MHz)

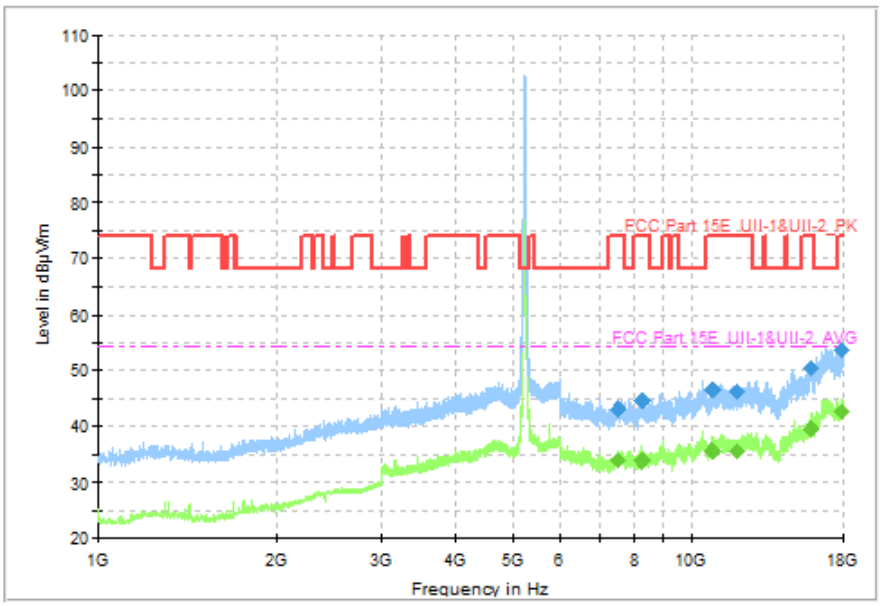


Fig. 78 Transmitter Spurious Emission (802.11n-HT40, CH46 5230MHz)

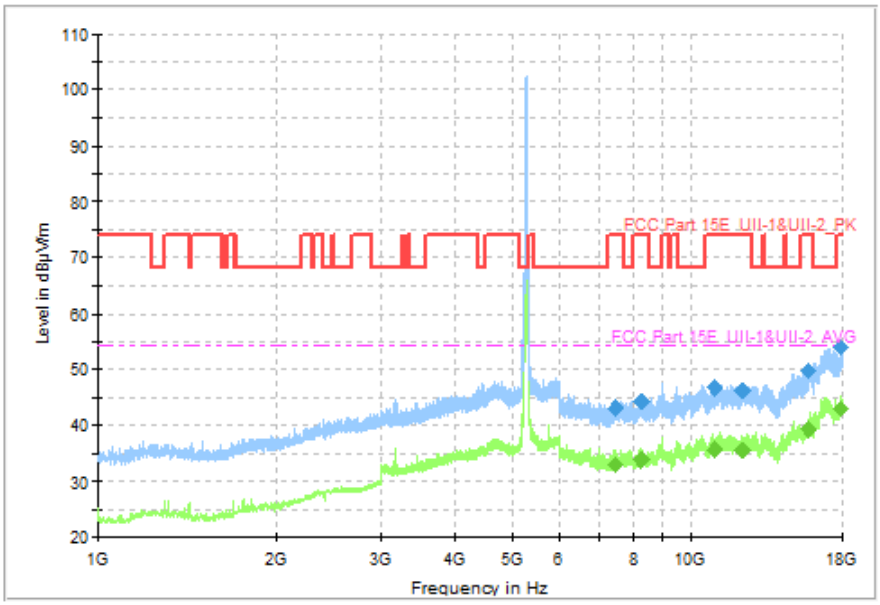


Fig. 79 Transmitter Spurious Emission (802.11n-HT40, CH54 5270MHz)

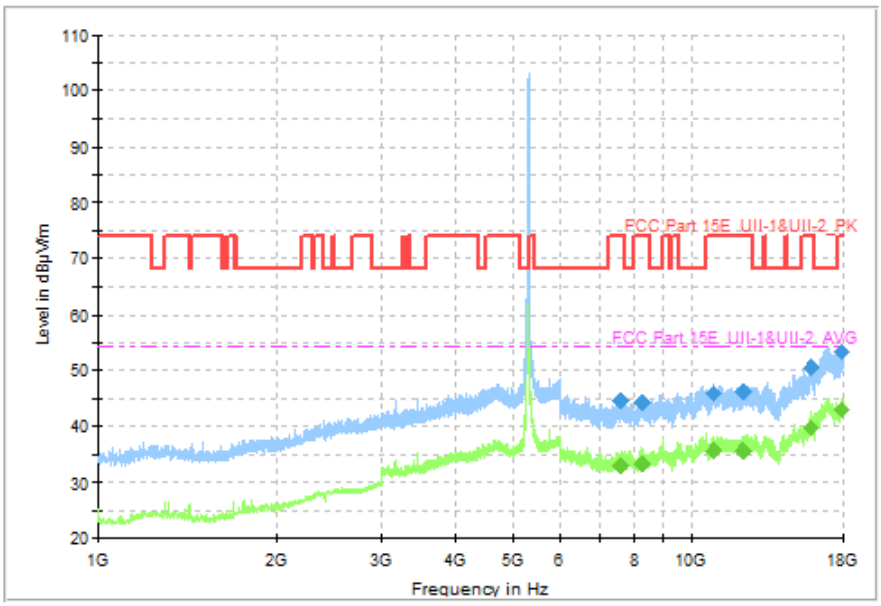


Fig. 80 Transmitter Spurious Emission (802.11n-HT40, CH62 5310MHz)

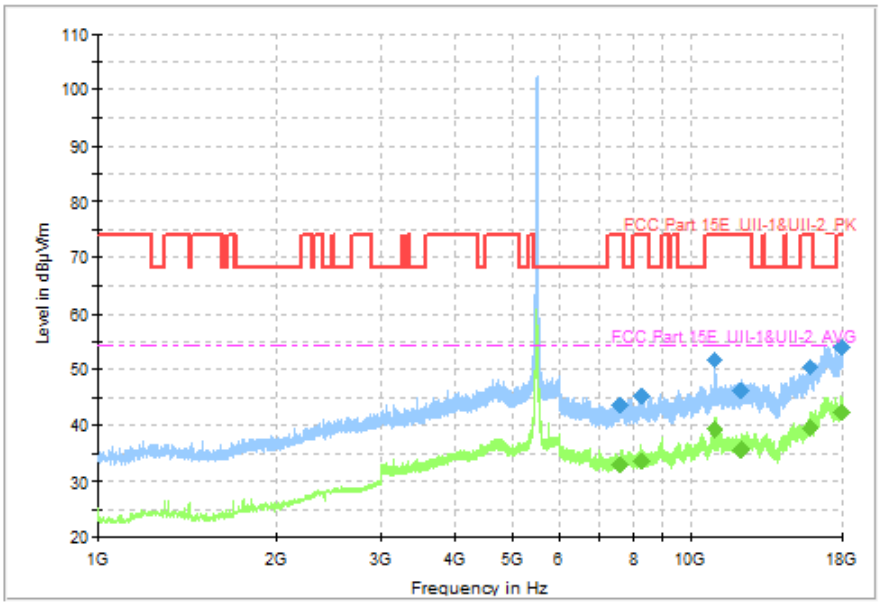


Fig. 81 Transmitter Spurious Emission (802.11n-HT40, CH102 5510MHz)

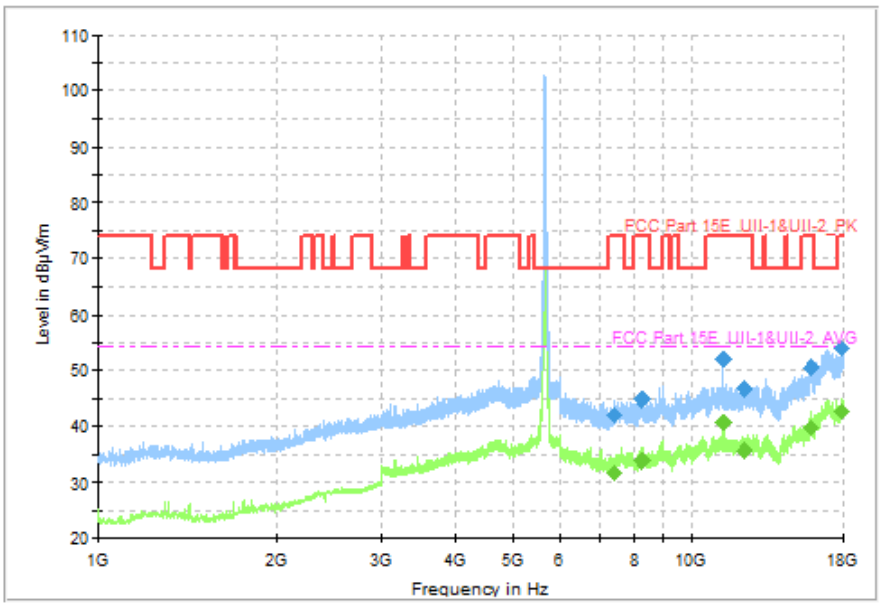


Fig. 82 Transmitter Spurious Emission (802.11n-HT40, CH134 5670MHz)

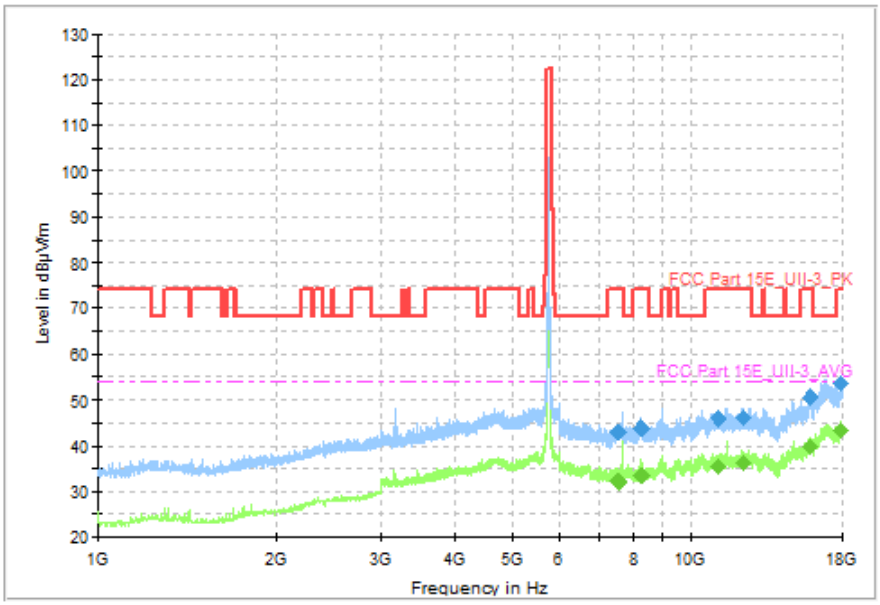


Fig. 83 Transmitter Spurious Emission (802. 11n-HT40, CH151 5755MHz)

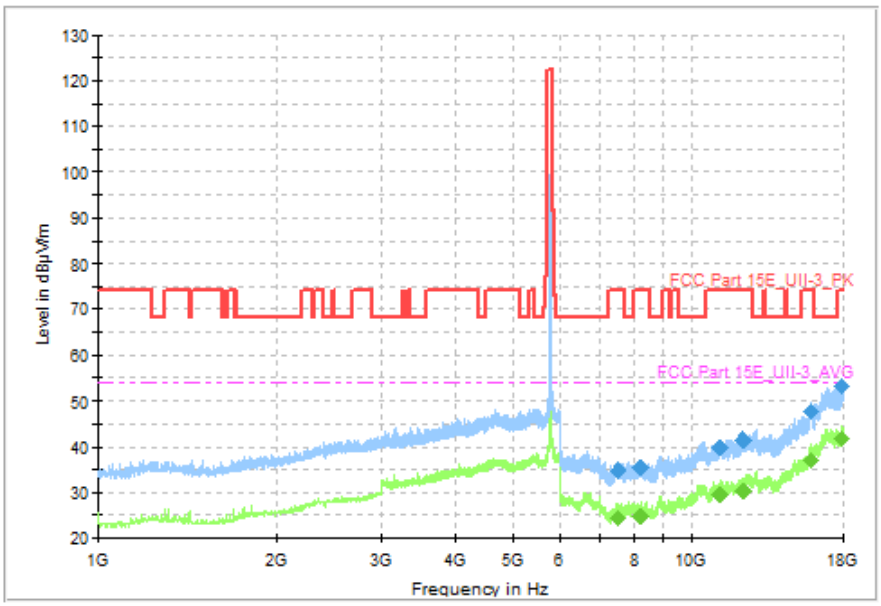


Fig. 84 Transmitter Spurious Emission (802. 11n-HT40, CH159 5795MHz)

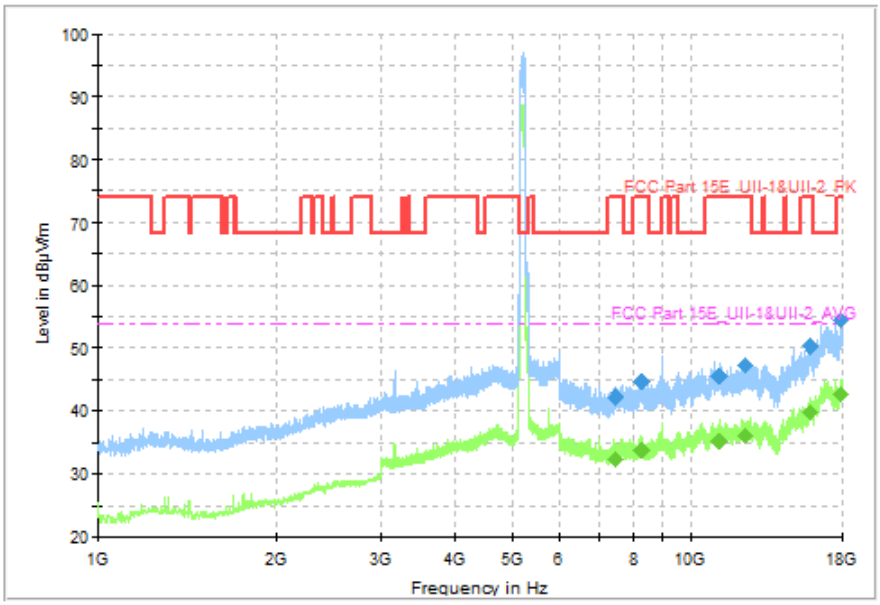


Fig. 85 Transmitter Spurious Emission (802. 11ac-VHT80, CH42 5210MHz)

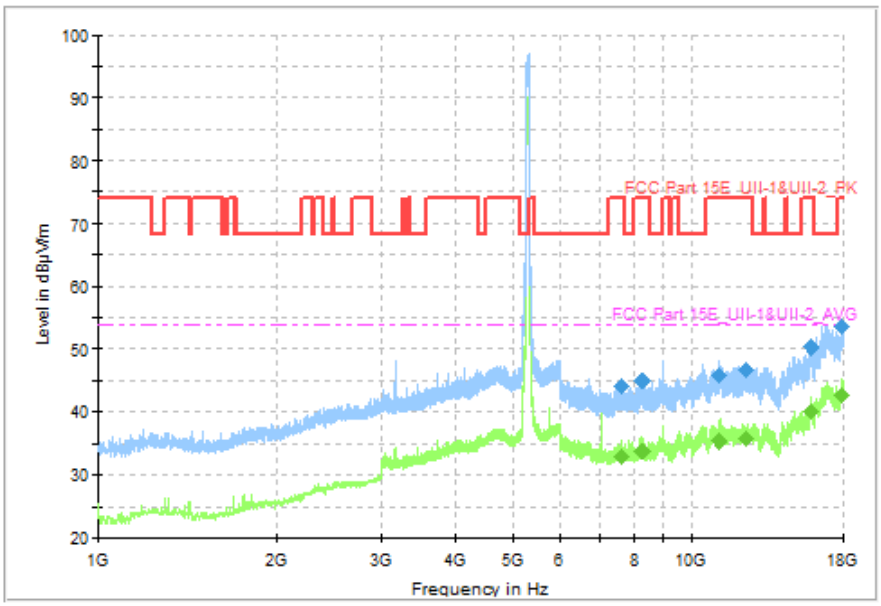


Fig. 86 Transmitter Spurious Emission (802. 11ac-VHT80, CH58 5290MHz)

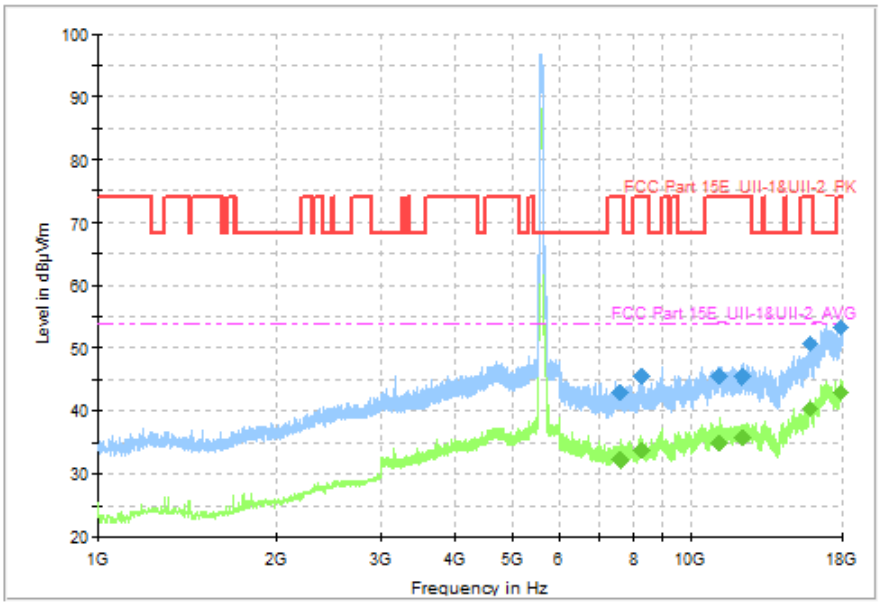


Fig. 87 Transmitter Spurious Emission (802. 11ac-VHT80, CH122 5610MHz)

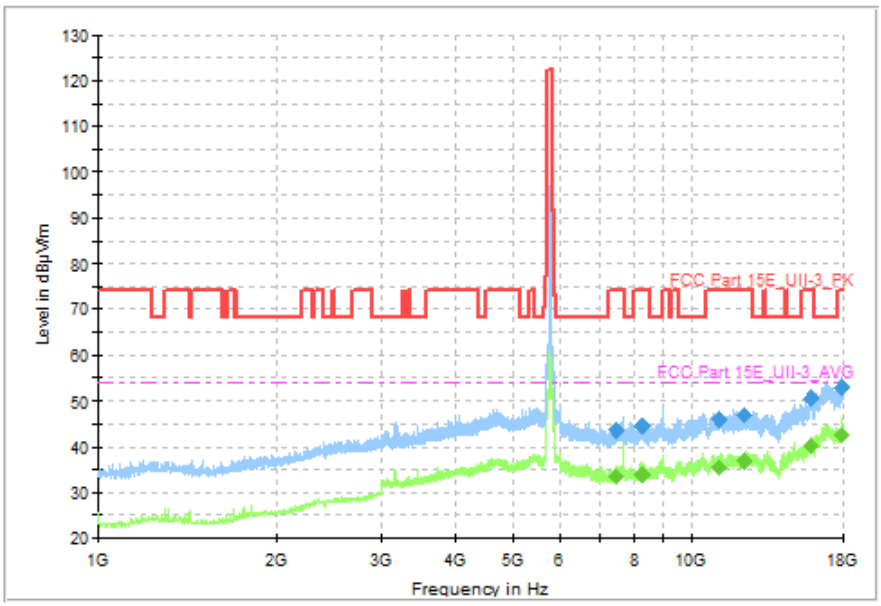


Fig. 88 Transmitter Spurious Emission (802. 11ac-VHT80, CH155 5775MHz)

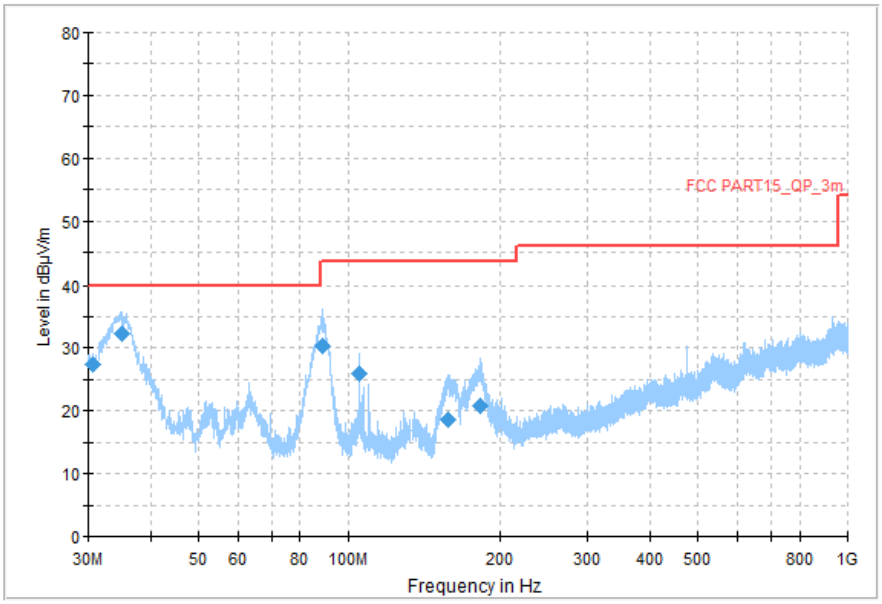


Fig. 89 Transmitter Spurious Emission (All channel, 30MHz~1GHz)

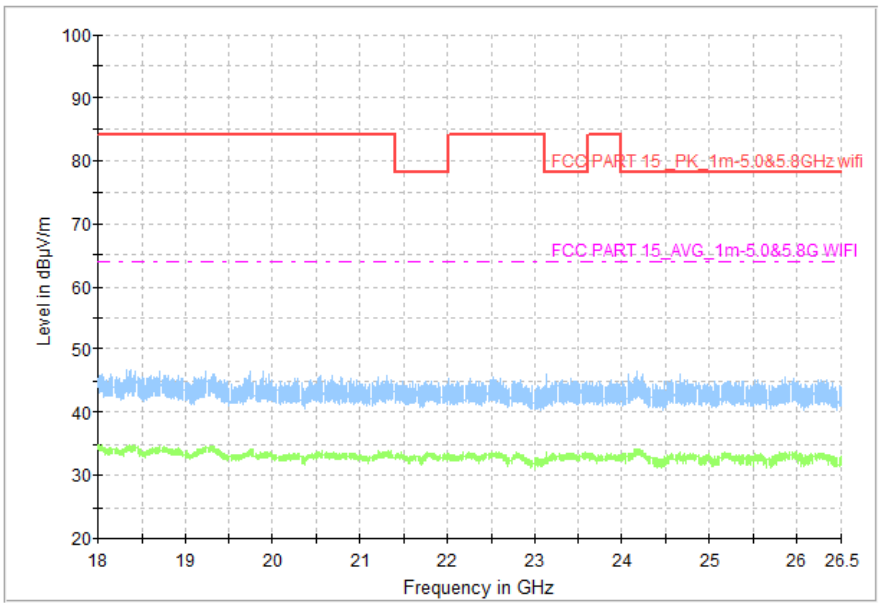


Fig. 90 Transmitter Spurious Emission (All channel, 18GHz~26.5GHz)

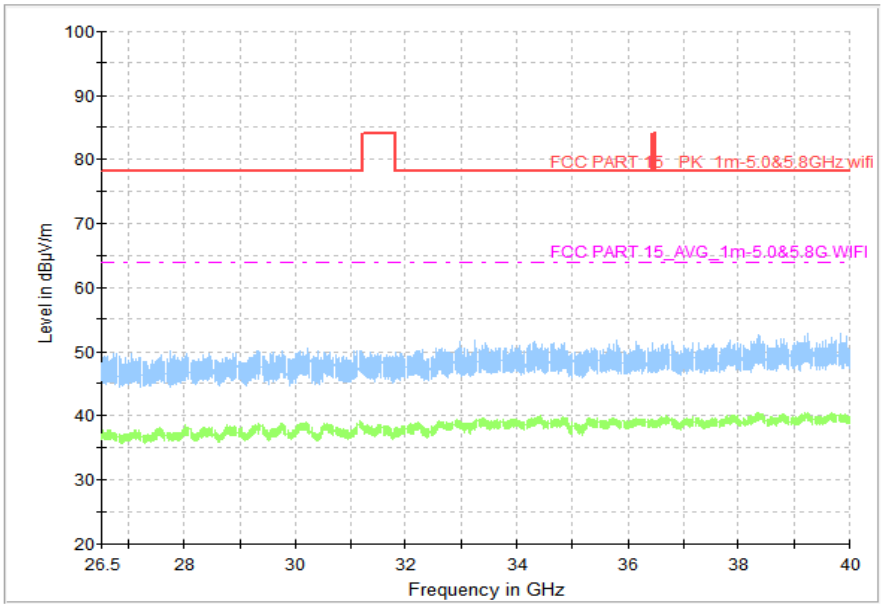


Fig. 91 Transmitter Spurious Emission (All channel, 26.5GHz~40GHz)

Worst Case Result

802.11a CH100

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7578.461539	42.68	74.00	31.32	H	5.6
8224.615385	43.57	74.00	30.43	V	5.9
11000.769231	57.29	74.00	16.71	H	9.7
12456.461539	47.42	74.00	26.58	V	11.4
15907.846154	50.01	74.00	23.99	V	14.1
17896.615385	53.02	74.00	20.98	H	18.8

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7578.461539	32.48	54.00	21.52	H	5.6
8224.615385	33.22	54.00	20.78	V	5.9
11000.769231	45.45	54.00	8.55	H	9.7
12456.461539	36.16	54.00	17.84	V	11.4
15907.846154	39.75	54.00	14.25	V	14.1
17896.615385	42.26	54.00	11.74	H	18.8

802.11n-HT40 CH102

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7606.615385	43.55	74.00	30.45	V	5.7
8269.384616	45.40	74.00	28.60	V	5.9
11014.615385	51.52	74.00	22.48	H	9.7
12180.000000	46.14	74.00	27.86	V	10.8
15891.230769	50.21	74.00	23.79	V	14.0
17968.615385	53.89	74.00	20.11	H	19.1

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7606.615385	32.89	54.00	21.11	V	5.7
8269.384616	33.61	54.00	20.39	V	5.9
11014.615385	39.18	54.00	14.82	H	9.7
12180.000000	35.60	54.00	18.40	V	10.8
15891.230769	39.55	54.00	14.45	V	14.0
17968.615385	42.35	54.00	11.65	H	19.1

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Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7584.923077	42.88	74.00	31.12	V	5.7
8268.461539	45.72	74.00	28.28	V	5.9
11167.846154	45.67	74.00	28.33	V	9.7
12252.000000	45.54	74.00	28.46	V	10.9
15857.538462	50.82	74.00	23.18	V	14.0
17916.923077	53.23	74.00	20.77	V	18.9

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7584.923077	32.31	54.00	21.69	V	5.7
8268.461539	33.77	54.00	20.23	V	5.9
11167.846154	35.03	54.00	18.97	V	9.7
12252.000000	35.95	54.00	18.05	V	10.9
15857.538462	40.23	54.00	13.77	V	14.0
17916.923077	42.94	54.00	11.06	V	18.9

Note: A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss. P_{Mea} is the field strength recorded from the instrument. The measurement results are obtained as described below: Result = P_{Mea} + A_{Rpl} = P_{Mea} + Cable Loss + Antenna Factor

A.9. Radiated Spurious Emissions < 30MHz

Method of Measurement: See ANSI C63.10-clause 6.4.

Measurement Limit (15.209, 9kHz-30MHz):

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30

Note: The measurement distance during the test is 3m. The limit used in plots recalculated based on the extrapolation factor of 40 dB/decade.

Measurement Result:

Channel	Frequency Range	Test Results	Conclusion
All Channel	9kHz ~ 30MHz	Fig.92	**P**

Conclusion: PASS

Test graphs as below:

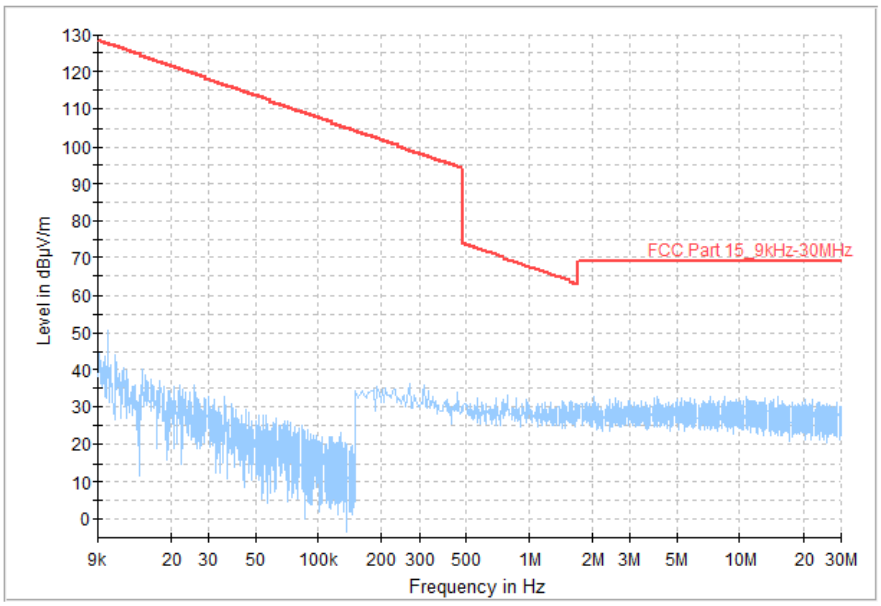

Fig. 92 Radiated Spurious Emission (All Channel, 9kHz ~ 30MHz)

A.10. AC Power Line Conducted Emission

Method of Measurement: See ANSI C63.10-clause 6.2.

Test Condition:

Voltage(V)	Frequency (Hz)
120	60

Measurement Result and limit:

WLAN (Quasi-peak Limit) - AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.93	Fig.94	**P**
0.5 to 5	56			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

WLAN (Average Limit) - AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.93	Fig.94	**P**
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Note: The measurement results include the L1 and N measurements.

Conclusion: PASS

Test graphs as below:

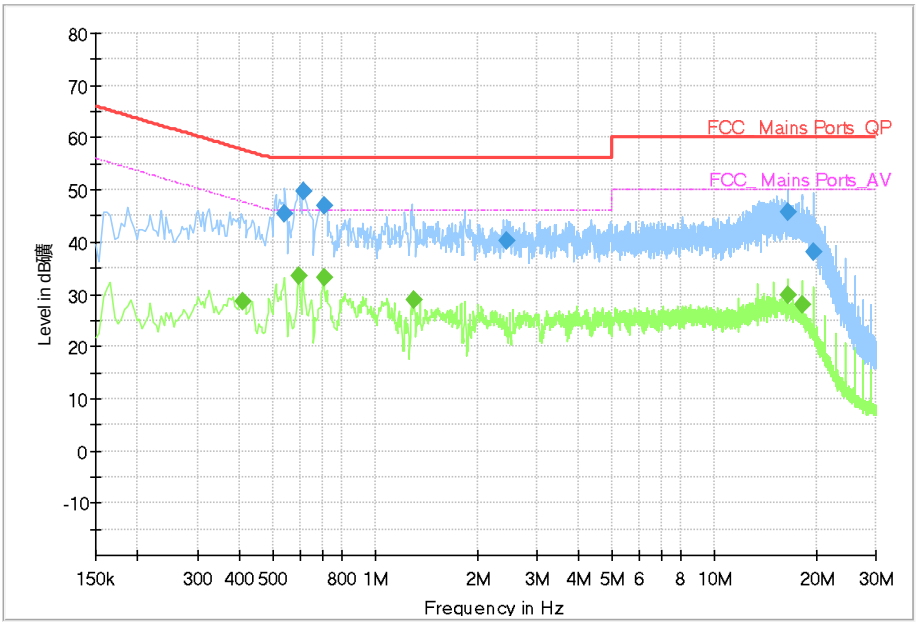

Fig. 93 AC Power line Conducted Emission (Traffic)

Measurement Result: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.542000	45.57	56.00	10.43	N	ON	10
0.614000	49.59	56.00	6.41	N	ON	10
0.706000	47.11	56.00	8.89	N	ON	10
2.446000	40.16	56.00	15.84	N	ON	10
16.554000	45.88	60.00	14.12	N	ON	11
19.698000	38.14	60.00	21.86	N	ON	11

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	28.54	47.73	19.19	N	ON	10
0.598000	33.52	46.00	12.48	N	ON	10
0.706000	33.33	46.00	12.67	N	ON	10
1.302000	29.01	46.00	16.99	N	ON	10
16.550000	29.72	50.00	20.28	N	ON	11
18.126000	28.11	50.00	21.89	N	ON	11

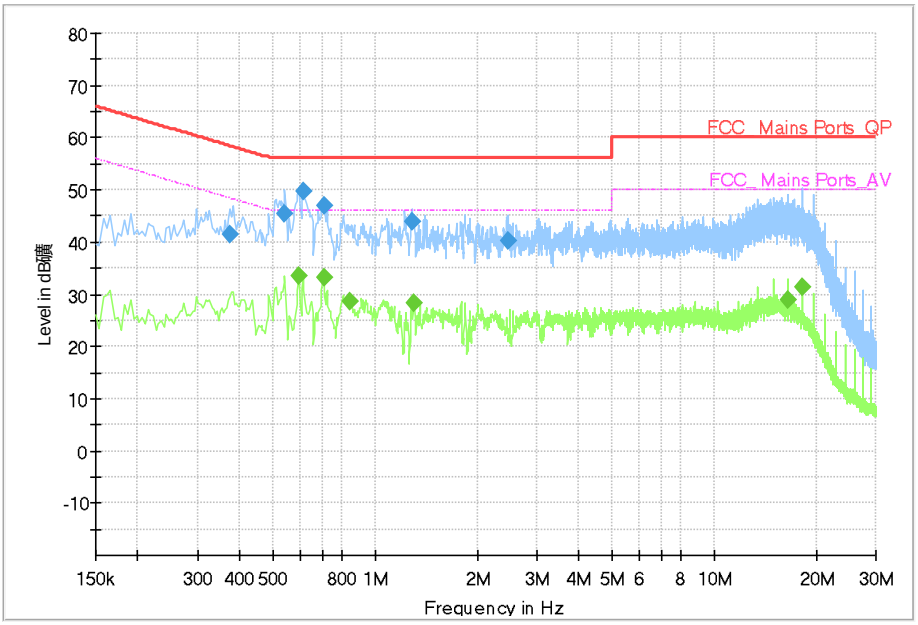

Fig. 94 AC Power line Conducted Emission (Idle)

Measurement Result: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.374000	41.35	58.41	17.06	N	ON	10
0.542000	45.55	56.00	10.46	N	ON	10
0.614000	49.83	56.00	6.17	N	ON	10
0.706000	47.03	56.00	8.97	N	ON	10
1.282000	43.80	56.00	12.20	N	ON	10
2.462000	40.36	56.00	15.64	N	ON	10

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.598000	33.65	46.00	12.35	N	ON	10
0.706000	33.36	46.00	12.64	N	ON	10
0.842000	28.68	46.00	17.32	N	ON	10
1.306000	28.34	46.00	17.66	N	ON	10
16.554000	28.94	50.00	21.06	N	ON	11
18.134000	31.22	50.00	18.78	N	ON	11

A.11. Power control

A Transmission Power Control mechanism is not required for systems with an e.i.r.p. of less than 27dBm (500mW).

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