TEST REPORT

No. I22N02185-WLAN 5GHz

for

unitech electronics co., ltd.

Rugged Handheld Computer

Model Name: PA768

with

Hardware Version: FH09_MB_PCB_V1.3

Software Version: RAYA_V03.25b02_20221010

FCC ID: HLEPA768BWNW

IC: 6724A-PA768BWNW

Issued Date: 2022-12-15

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

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

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I22N02185-WLAN 5GHz	Rev.0	1st edition	2022-12-15

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

CONTENTS

1. Summary of Test Report

1.1. Test Items

Description	Rugged Handheld Computer
Model Name	PA768
Applicant's name	unitech electronics co., ltd.
Manufacturer's Name	unitech electronics co., ltd.

1.2. Test Standards

FCC Part15-2019; 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:	2022-10-26
Testing End Date:	2022-12-09

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:	unitech electronics co., ltd.
Address:	5F., No. 136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City 231028 , Taiwan
Contact Person	Ben Chiang
E-Mail	BenC@tw.ute.com
Telephone:	886-2-8912-1122
Fax:	886-2-89121391

2.2. Manufacturer Information

Company Name:	unitech electronics co., ltd.
Address:	5F., No. 136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City 231028 , Taiwan
Contact Person	Ben Chiang
E-Mail	BenC@tw.ute.com
Telephone:	886-2-8912-1122
Fax:	886-2-89121391

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

3.1. About EUT

Description	Rugged Handheld Computer
Model Name	PA768
WLAN Frequency Range	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz -5725MHz~5850MHz
WLAN Protocol	IEEE 802.11a, 802.11n-HT20/40, 802.11ac-VHT20/40/80/160, 802.11ax-HE20/40/80/160
Type of modulation	OFDM
Antenna Type	Integrated
Antenna Gain	Antenna 0 = 0.6 dBi; Antenna 1 = -2.3 dBi
Power Supply	3.85V DC by Battery
FCC ID	HLEPA768BWNW
IC	6724A-PA768BWNW
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
UT05aa	358585240001857	FH09_MB_PCB_V1.3	RAYA_V03.25b02_20221010	2022-10-26
UT09aa	358585240001550	FH09_MB_PCB_V1.3	RAYA_V03.25b02_20221010	2022-10-26

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

*UT05aa is used for Conduction test; UT09aa is used for radiation test and AC Power line Conducted Emission test.

3.3. Internal Identification of AE

AE No.	Description	AE ID*
AE1	Battery	1400-900069G
AE2	Charger	S018BYU12000150

*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 Rugged Handheld Computer 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	2019
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.

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.

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	2022-12-29	1 year
2	Power Sensor	U2021XA	MY55430013	Keysight	2022-12-29	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	R&S	2023-11-23	1 year
2	Spectrum Analyzer	FSV40	101192	R&S	2023-01-12	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	2023-01-06	3 years
6	Horn Antenna	QSH-SL-18-40-K-SG	15979	Q-par	2023-01-06	3 years
7	Anechoic Chamber	FACT3-2.0	1285	ETS-Lindgren	2023-05-29	2 years
8	Loop Antenna	HLA6120	35779	TESEQ	2025-05-10	3 years
9	Test Receiver	ESCI	100702	R&S	2023-01-12	1 year
10	LISN	ENV216	102067	R&S	2023-07-14	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.

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren

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

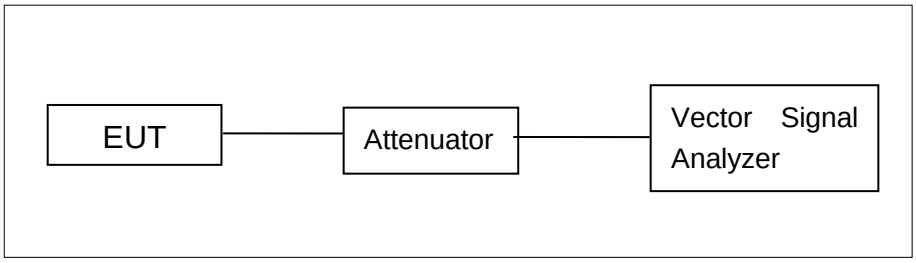
Test Name	Uncertainty (*k*=2)	
1. RF Output Power - Conducted	1.36dB	
2. Power Spectral Density - Conducted	1.36dBm/MHz	
3. Occupied channel bandwidth - Conducted	4.56kHz	
4. Transmitter Spurious Emission - Radiated	9kHz≤f<30MHz	1.79dB
	30MHz≤f<1GHz	4.86dB
	1GHz≤f<18GHz	4.50dB
	18GHz≤f≤40GHz	2.90dB
5. AC Power line Conducted Emission	150kHz≤f≤30MHz	2.62dB

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

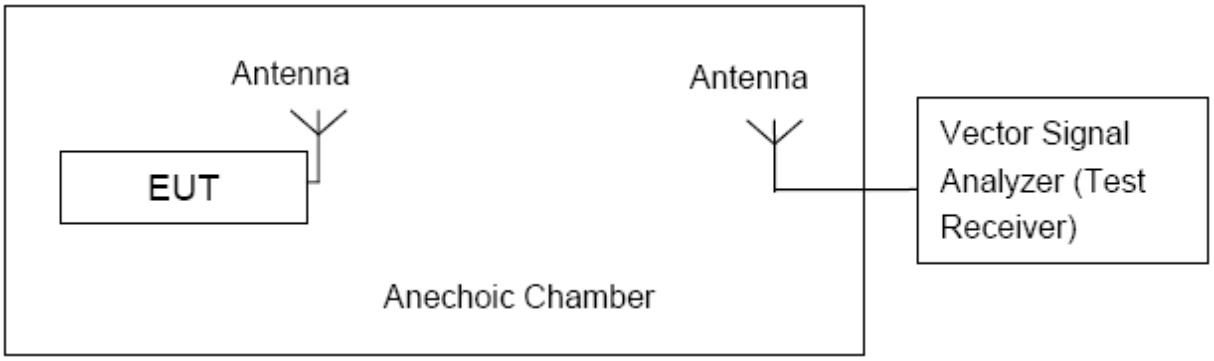
Conducted Measurements

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

In the case of radiated emission, the used settings are as follows:
Sweep frequency from 30 MHz to 1 GHz, RBW = 100 KHz, VBW = 300 KHz;
Sweep frequency from 1 GHz to 26 GHz, RBW = 1 MHz, VBW = 10 Hz;



The measurement is made according to KDB 789033.
The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

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:

Antenna 0 (SISO)

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	15.55	16.15
	CH 40	5200 MHz	15.67	16.27
	CH 48	5240 MHz	15.41	16.01
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	15.72	16.32
	CH 56	5280 MHz	15.86	16.46
	CH 64	5320 MHz	15.61	16.21
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	16.02	16.62
	CH 116	5580 MHz	15.68	16.28
	CH 140	5700 MHz	16.68	17.28
5.8GHz Band (UNII-3)	CH 149	5745 MHz	16.12	16.72
	CH 157	5785 MHz	16.06	16.66
	CH 165	5825 MHz	15.56	16.16

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	14.21	14.81
	CH 40	5200 MHz	14.55	15.15

	CH 48	5240 MHz	14.28	14.88
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	14.42	15.02
	CH 56	5280 MHz	14.51	15.11
	CH 64	5320 MHz	14.57	15.17
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	15.39	15.99
	CH 116	5580 MHz	14.95	15.55
	CH 140	5700 MHz	15.95	16.55
5.8GHz Band (UNII-3)	CH 149	5745 MHz	15.25	15.85
	CH 157	5785 MHz	15.09	15.69
	CH 165	5825 MHz	14.75	15.35

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	12.48	13.08
	CH 46	5230 MHz	12.29	12.89
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	12.51	13.11
	CH 62	5310 MHz	12.16	12.76
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	12.75	13.35
	CH 134	5670 MHz	12.84	13.44
5.8GHz Band (UNII-3)	CH 151	5755 MHz	12.62	13.22
	CH 159	5795 MHz	12.77	13.37

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	12.45	13.05
	CH 40	5200 MHz	12.61	13.21
	CH 48	5240 MHz	12.45	13.05
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	12.58	13.18
	CH 56	5280 MHz	12.61	13.21
	CH 64	5320 MHz	12.30	12.90
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	13.19	13.79
	CH 116	5580 MHz	12.58	13.18
	CH 140	5700 MHz	13.49	14.09
5.8GHz Band (UNII-3)	CH 149	5745 MHz	12.96	13.56
	CH 157	5785 MHz	12.82	13.42
	CH 165	5825 MHz	12.58	13.18

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	11.48	12.08
	CH 46	5230 MHz	11.37	11.97
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	11.61	12.21
	CH 62	5310 MHz	11.35	11.95
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	11.94	12.54
	CH 134	5670 MHz	12.03	12.63
5.8GHz Band (UNII-3)	CH 151	5755 MHz	11.88	12.48
	CH 159	5795 MHz	11.97	12.57

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	10.41	11.01
5.3GHz Band (UNII-2A)	CH 58	5290 MHz	10.71	11.31
5.5GHz Band (UNII-2C)	CH 122	5610 MHz	10.73	11.33
5.8GHz Band (UNII-3)	CH 155	5775 MHz	10.88	11.48

802.11ac-VHT160 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 50	5250 MHz	9.22	9.82
5.5GHz Band (UNII-2C)	CH 114	5570 MHz	9.18	9.78

802.11ax-HE20 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 36	5180 MHz	12.56	13.16
	CH 40	5200 MHz	12.51	13.11
	CH 48	5240 MHz	12.28	12.88
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	12.38	12.98
	CH 56	5280 MHz	12.36	12.96
	CH 64	5320 MHz	12.33	12.93
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	13.11	13.71
	CH 116	5580 MHz	12.57	13.17
	CH 140	5700 MHz	13.13	13.73
5.8GHz Band (UNII-3)	CH 149	5745 MHz	12.78	13.38
	CH 157	5785 MHz	12.83	13.43
	CH 165	5825 MHz	12.35	12.95

802.11ax-HE40 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 38	5190 MHz	11.65	12.25
	CH 46	5230 MHz	11.61	12.21
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	11.78	12.38
	CH 62	5310 MHz	11.52	12.12
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	11.97	12.57
	CH 134	5670 MHz	12.25	12.85
5.8GHz Band (UNII-3)	CH 151	5755 MHz	11.97	12.57
	CH 159	5795 MHz	12.06	12.66

802.11ax-HE80 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	11.02
5.3GHz Band (UNII-2A)	CH 58	5290 MHz	10.84	11.44
5.5GHz Band (UNII-2C)	CH 122	5610 MHz	10.82	11.42
5.8GHz Band (UNII-3)	CH 155	5775 MHz	10.96	11.56

802.11ax-HE160 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 50	5250 MHz	9.32	9.92
5.5GHz Band (UNII-2C)	CH 114	5570 MHz	9.25	9.85

Antenna 1 (SISO)

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	15.07	12.77
	CH 40	5200 MHz	15.08	12.78
	CH 48	5240 MHz	15.04	12.74
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	15.03	12.73
	CH 56	5280 MHz	15.02	12.72
	CH 64	5320 MHz	15.40	13.10
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	15.26	12.96
	CH 116	5580 MHz	15.31	13.01
	CH 140	5700 MHz	15.35	13.05
5.8GHz Band (UNII-3)	CH 149	5745 MHz	15.11	12.81
	CH 157	5785 MHz	14.90	12.60
	CH 165	5825 MHz	15.24	12.94

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	14.06	11.76
	CH 40	5200 MHz	14.24	11.94
	CH 48	5240 MHz	13.91	11.61
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	13.83	11.53
	CH 56	5280 MHz	14.24	11.94
	CH 64	5320 MHz	14.25	11.95
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	14.69	12.39
	CH 116	5580 MHz	14.56	12.26
	CH 140	5700 MHz	14.77	12.47
5.8GHz Band (UNII-3)	CH 149	5745 MHz	14.48	12.18
	CH 157	5785 MHz	14.02	11.72
	CH 165	5825 MHz	14.55	12.25

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	11.66	9.36
	CH 46	5230 MHz	12.05	9.75
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	12.07	9.77
	CH 62	5310 MHz	12.02	9.72
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	11.63	9.33
	CH 134	5670 MHz	12.36	10.06
5.8GHz Band (UNII-3)	CH 151	5755 MHz	12.31	10.01
	CH 159	5795 MHz	12.36	10.06

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	11.69	9.39
	CH 40	5200 MHz	11.91	9.61
	CH 48	5240 MHz	11.63	9.33
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	11.78	9.48
	CH 56	5280 MHz	12.22	9.92
	CH 64	5320 MHz	12.21	9.91
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	12.05	9.75
	CH 116	5580 MHz	11.87	9.57
	CH 140	5700 MHz	12.87	10.57

5.8GHz Band (UNII-3)	CH 149	5745 MHz	12.81	10.51
	CH 157	5785 MHz	12.38	10.08
	CH 165	5825 MHz	12.11	9.81

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	10.35	8.05
	CH 46	5230 MHz	10.45	8.15
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	10.56	8.26
	CH 62	5310 MHz	10.97	8.67
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	10.74	8.44
	CH 134	5670 MHz	11.04	8.74
5.8GHz Band (UNII-3)	CH 151	5755 MHz	11.48	9.18
	CH 159	5795 MHz	11.54	9.24

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	9.64	7.34
5.3GHz Band (UNII-2A)	CH 58	5290 MHz	10.27	7.97
5.5GHz Band (UNII-2C)	CH 122	5610 MHz	10.48	8.18
5.8GHz Band (UNII-3)	CH 155	5775 MHz	10.24	7.94

802.11ac-VHT160 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 50	5250 MHz	8.72	6.42
5.5GHz Band (UNII-2C)	CH 114	5570 MHz	9.03	6.73

802.11ax-HE20 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 36	5180 MHz	11.47	9.17
	CH 40	5200 MHz	11.75	9.45
	CH 48	5240 MHz	11.44	9.14
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	11.57	9.27
	CH 56	5280 MHz	11.79	9.49
	CH 64	5320 MHz	12.17	9.87
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	12.02	9.72
	CH 116	5580 MHz	12.01	9.71
	CH 140	5700 MHz	12.66	10.36

5.8GHz Band (UNII-3)	CH 149	5745 MHz	12.50	10.20
	CH 157	5785 MHz	12.07	9.77
	CH 165	5825 MHz	12.08	9.78

802.11ax-HE40 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 38	5190 MHz	10.57	8.27
	CH 46	5230 MHz	10.65	8.35
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	10.52	8.22
	CH 62	5310 MHz	11.04	8.74
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	10.94	8.64
	CH 134	5670 MHz	11.28	8.98
5.8GHz Band (UNII-3)	CH 151	5755 MHz	11.18	8.88
	CH 159	5795 MHz	11.69	9.39

802.11ax-HE80 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 42	5210 MHz	9.99	7.69
5.3GHz Band (UNII-2A)	CH 58	5290 MHz	10.47	8.17
5.5GHz Band (UNII-2C)	CH 122	5610 MHz	10.81	8.51
5.8GHz Band (UNII-3)	CH 155	5775 MHz	10.47	8.17

802.11ax-HE160 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 50	5250 MHz	8.87	6.57
5.5GHz Band (UNII-2C)	CH 114	5570 MHz	9.33	7.03

Antenna 01 (MIMO)

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	16.57	17.17
	CH 40	5200 MHz	16.50	17.10
	CH 48	5240 MHz	16.24	16.84
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	16.49	17.09
	CH 56	5280 MHz	16.63	17.23
	CH 64	5320 MHz	16.66	17.26
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	17.22	17.82
	CH 116	5580 MHz	17.15	17.75

	CH 140	5700 MHz	17.27	17.87
5.8GHz Band (UNII-3)	CH 149	5745 MHz	17.31	17.91
	CH 157	5785 MHz	17.16	17.76
	CH 165	5825 MHz	17.24	17.84

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	15.05	15.65
	CH 46	5230 MHz	15.16	15.76
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	15.29	15.89
	CH 62	5310 MHz	15.14	15.74
5.5GHz Band (UNII-2C)	CH 102	5510 MHz	15.27	15.87
	CH 134	5670 MHz	15.59	16.19
5.8GHz Band (UNII-3)	CH 151	5755 MHz	15.52	16.12
	CH 159	5795 MHz	15.63	16.23

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	14.95	15.55
	CH 40	5200 MHz	14.96	15.56
	CH 48	5240 MHz	14.75	15.35
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	14.84	15.44
	CH 56	5280 MHz	15.11	15.71
	CH 64	5320 MHz	14.99	15.59
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	15.23	15.83
	CH 116	5580 MHz	15.09	15.69
	CH 140	5700 MHz	15.83	16.43
5.8GHz Band (UNII-3)	CH 149	5745 MHz	15.69	16.29
	CH 157	5785 MHz	15.51	16.11
	CH 165	5825 MHz	15.19	15.79

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	13.93	14.53
	CH 46	5230 MHz	13.89	14.49
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	14.06	14.66
	CH 62	5310 MHz	14.07	14.67
5.5GHz Band	CH 102	5510 MHz	14.09	14.69

(UNII-2C)	CH 134	5670 MHz	14.54	15.14
5.8GHz Band (UNII-3)	CH 151	5755 MHz	14.57	15.17
	CH 159	5795 MHz	14.63	15.23

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	13.12	13.72
5.3GHz Band (UNII-2A)	CH 58	5290 MHz	13.44	14.04
5.5GHz Band (UNII-2C)	CH 122	5610 MHz	13.58	14.18
5.8GHz Band (UNII-3)	CH 155	5775 MHz	13.63	14.23

802.11ac-VHT160 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 50	5250 MHz	11.97	12.57
5.5GHz Band (UNII-2C)	CH 114	5570 MHz	12.13	12.73

802.11ax-HE20 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 36	5180 MHz	14.98	15.58
	CH 40	5200 MHz	15.03	15.63
	CH 48	5240 MHz	14.65	15.25
5.3GHz Band (UNII-2A)	CH 52	5260 MHz	14.71	15.31
	CH 56	5280 MHz	14.87	15.47
	CH 64	5320 MHz	14.99	15.59
5.5GHz Band (UNII-2C)	CH 100	5500 MHz	15.47	16.07
	CH 116	5580 MHz	15.27	15.87
	CH 140	5700 MHz	15.67	16.27
5.8GHz Band (UNII-3)	CH 149	5745 MHz	15.46	16.06
	CH 157	5785 MHz	15.33	15.93
	CH 165	5825 MHz	15.22	15.82

802.11ax-HE40 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 38	5190 MHz	14.13	14.73
	CH 46	5230 MHz	14.00	14.60
5.3GHz Band (UNII-2A)	CH 54	5270 MHz	14.10	14.70
	CH 62	5310 MHz	14.12	14.72
5.5GHz Band	CH 102	5510 MHz	14.45	15.05

(UNII-2C)	CH 134	5670 MHz	14.61	15.21
5.8GHz Band (UNII-3)	CH 151	5755 MHz	14.54	15.14
	CH 159	5795 MHz	14.62	15.22

802.11ax-HE80 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 42	5210 MHz	13.42	14.02
5.3GHz Band (UNII-2A)	CH 58	5290 MHz	13.70	14.30
5.5GHz Band (UNII-2C)	CH 122	5610 MHz	13.87	14.47
5.8GHz Band (UNII-3)	CH 155	5775 MHz	13.74	14.34

802.11ax-HE160 mode

U–NII Band	Channel	Frequency (MHz)	Test Result (dBm)	E.I.R.P (dBm)
5.2GHz Band (UNII-1)	CH 50	5250 MHz	12.09	12.69
5.5GHz Band (UNII-2C)	CH 114	5570 MHz	12.30	12.90

Conclusion: PASS

Note:

Worst-case data rates as provided by the client were: 6Mbps (802.11a), MCS0 (802.11n), MCS0 (802.11ac), MCS0 (802.11ax). 802.11a, 802.11n-HT40, 802.11ax-HE80 and 802.11ax-HE160 modes (SISO-Antenna 0) are selected as the worst case. 802.11n-HT20, 802.11n-HT40, 802.11ax-HE80 and 802.11ax-HE160 modes (MIMO) 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.

A.3. Peak Power Spectral Density

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:

SISO

U–NII Band	Mode	Channel	Frequency (MHz)	Test Results (dBm/MHz)
5.2GHz Band (UNII-1)	802.11a	CH 36	5180	3.90
		CH 40	5200	3.89
		CH 48	5240	3.56
	802.11n-HT40	CH 38	5190	-0.85
		CH 46	5230	-0.99
	802.11ax-HE80	CH 42	5210	-5.99
	802.11ax-HE160	CH 50	5250	-9.45
5.3GHz Band (UNII-2A)	802.11a	CH 52	5260	3.46
		CH 56	5280	3.30
		CH 64	5320	3.33
	802.11n-HT40	CH 54	5270	-1.07
		CH 62	5310	-1.15
	802.11ax-HE80	CH 58	5290	-6.03
5.5GHz Band (UNII-2C)	802.11a	CH 100	5500	4.73
		CH 116	5580	3.29
		CH 140	5700	4.88
	802.11n-HT40	CH 102	5510	-0.10
		CH 134	5670	0.40
	802.11ax-HE80	CH 122	5610	-5.55
	802.11ax-HE160	CH 114	5570	-9.54
5.8GHz Band (UNII-3)	802.11a	CH 149	5745	1.29
		CH 157	5785	1.78
		CH 165	5825	1.43
	802.11n-HT40	CH 151	5755	-2.71
		CH 159	5795	-2.25
	802.11ax-HE80	CH 155	5775	-7.60

MIMO

U–NII Band	Mode	Channel	Frequency (MHz)	Test Results (dBm/MHz)
5.2GHz Band (UNII-1)	802.11n-HT20	CH 36	5180	4.94
		CH 40	5200	5.47
		CH 48	5240	5.26
	802.11n-HT40	CH 38	5190	1.36
		CH 46	5230	1.44
	802.11ax-HE80	CH 42	5210	-3.84
	802.11ax-HE160	CH 50	5250	-7.46
5.3GHz Band (UNII-2A)	802.11n-HT20	CH 52	5260	5.07
		CH 56	5280	5.00
		CH 64	5320	4.98
	802.11n-HT40	CH 54	5270	0.87
		CH 62	5310	1.14
	802.11ax-HE80	CH 58	5290	-3.55
5.5GHz Band (UNII-2C)	802.11n-HT20	CH 100	5500	5.21
		CH 116	5580	4.48
		CH 140	5700	5.45
	802.11n-HT40	CH 102	5510	1.54
		CH 134	5670	2.11
	802.11ax-HE80	CH 122	5610	-3.30
	802.11ax-HE160	CH 114	5570	-7.08
5.8GHz Band (UNII-3)	802.11n-HT20	CH 149	5745	1.96
		CH 157	5785	2.40
		CH 165	5825	2.23
	802.11n-HT40	CH 151	5755	-1.64
		CH 159	5795	-0.94
	802.11ax-HE80	CH 155	5775	-5.79

Conclusion: PASS

A.4. Occupied 26dB Bandwidth

Measurement Limit:

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

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (MHz)		Conclusion
802.11a	5180MHz (Ch36)	Fig.1	20.20	**P**
	5200MHz (Ch40)	Fig.2	20.15	**P**
	5240MHz (Ch48)	Fig.3	20.25	**P**
	5260MHz (Ch52)	Fig.4	20.00	**P**
	5280MHz (Ch56)	Fig.5	20.25	**P**
	5320MHz (Ch64)	Fig.6	20.10	**P**
	5500MHz (Ch100)	Fig.7	20.05	**P**
	5580MHz (Ch116)	Fig.8	20.35	**P**
	5700MHz (Ch140)	Fig.9	20.10	**P**
802.11n-HT40	5190MHz (Ch38)	Fig.10	40.00	**P**
	5230MHz (Ch46)	Fig.11	40.00	**P**
	5270MHz (Ch54)	Fig.12	39.76	**P**
	5310MHz (Ch62)	Fig.13	39.92	**P**
	5510MHz (Ch102)	Fig.14	40.16	**P**
	5670MHz (Ch134)	Fig.15	40.16	**P**
802.11ax-HE80	5210MHz (Ch42)	Fig.16	81.92	**P**
	5290MHz (Ch58)	Fig.17	82.24	**P**
	5610MHz (Ch122)	Fig.18	82.24	**P**
802.11ax-HE160	5250MHz (Ch50)	Fig.19	164.48	**P**
	5570MHz (Ch114)	Fig.20	165.12	**P**

Conclusion: PASS

Test graphs as below:

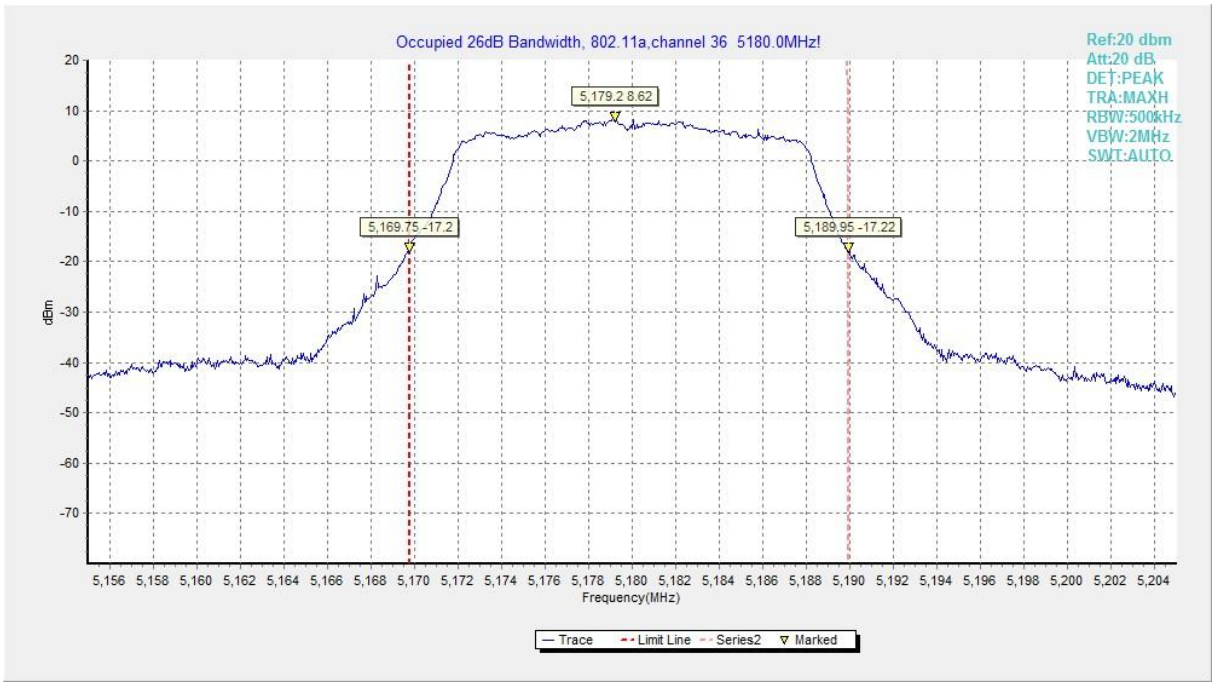


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

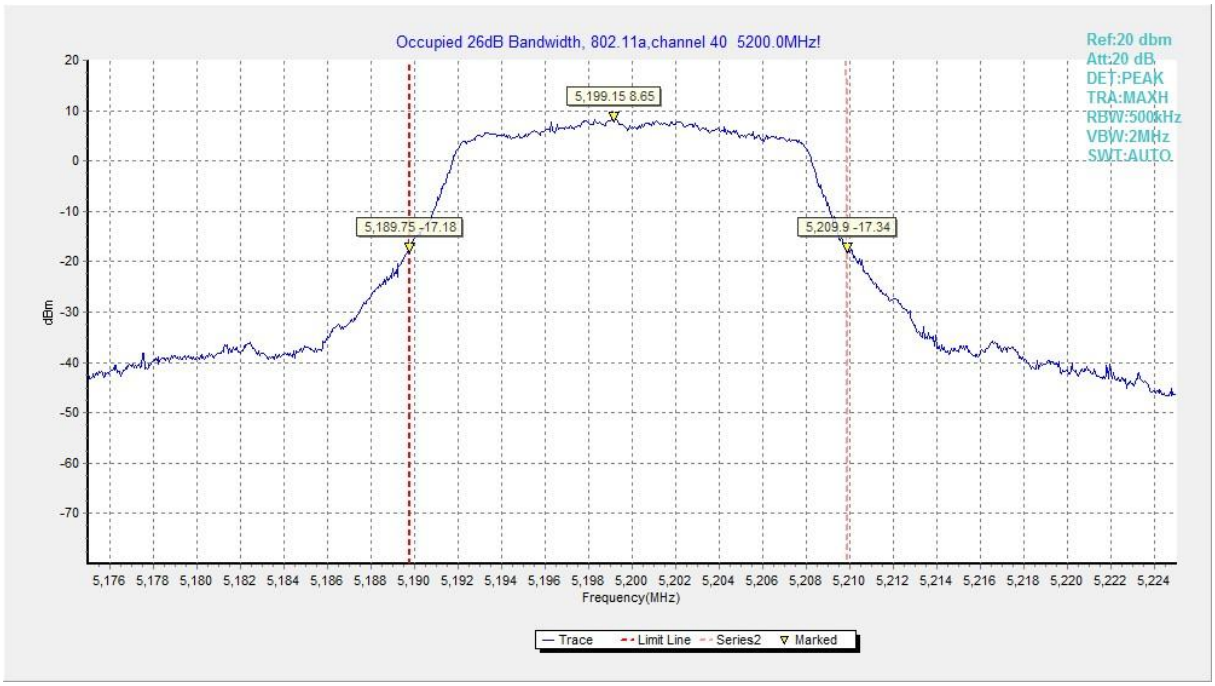


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

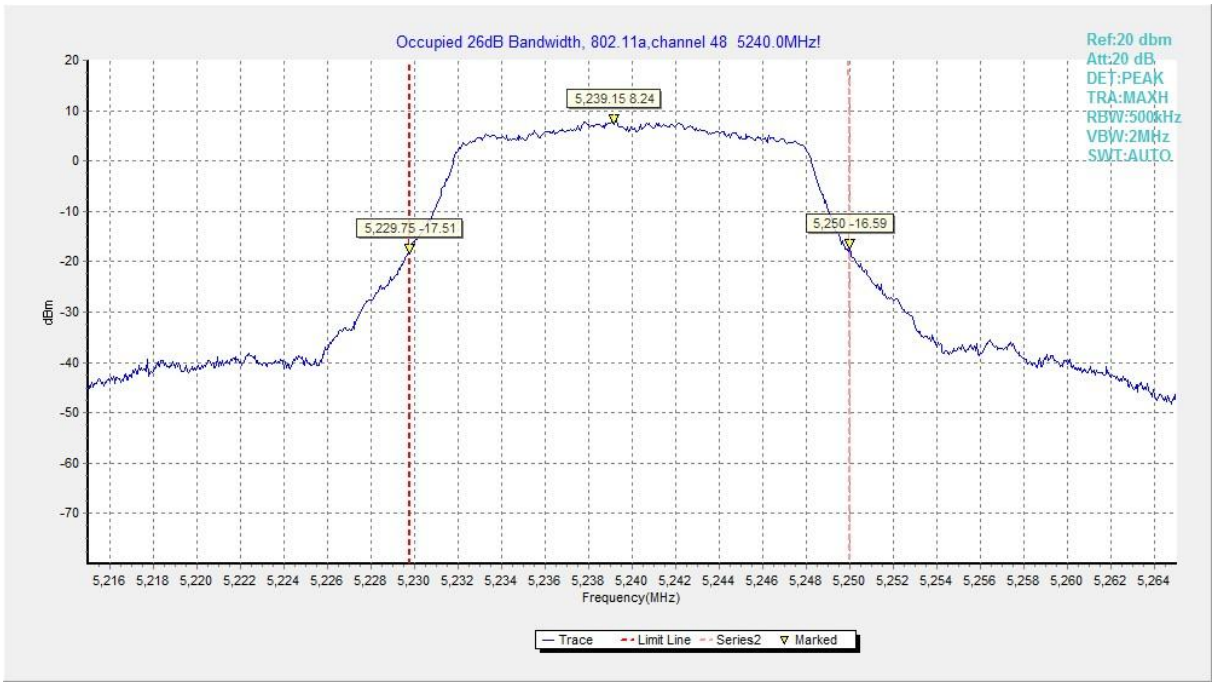


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

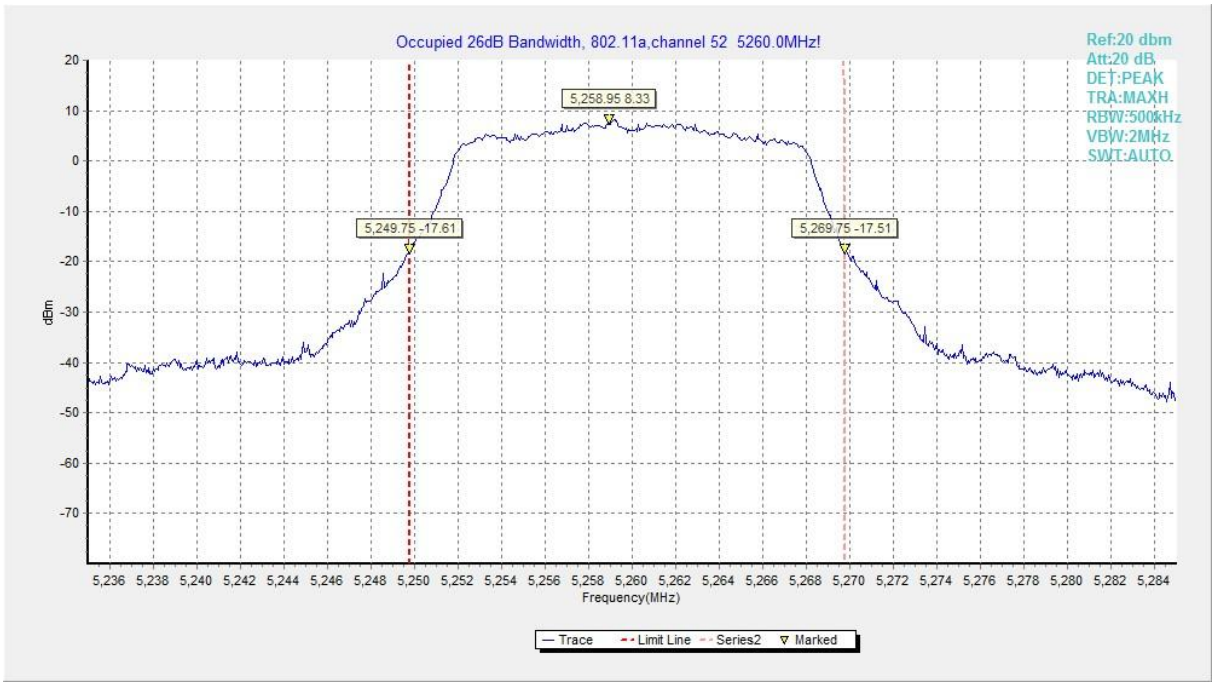


Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

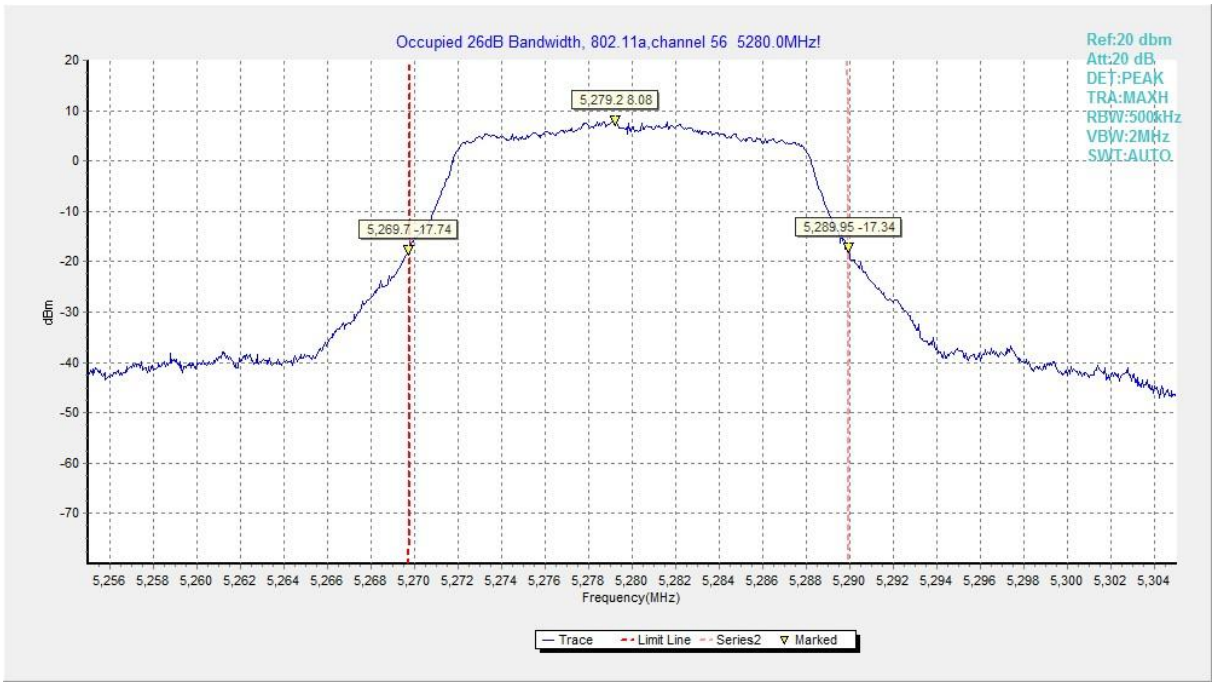


Fig. 5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

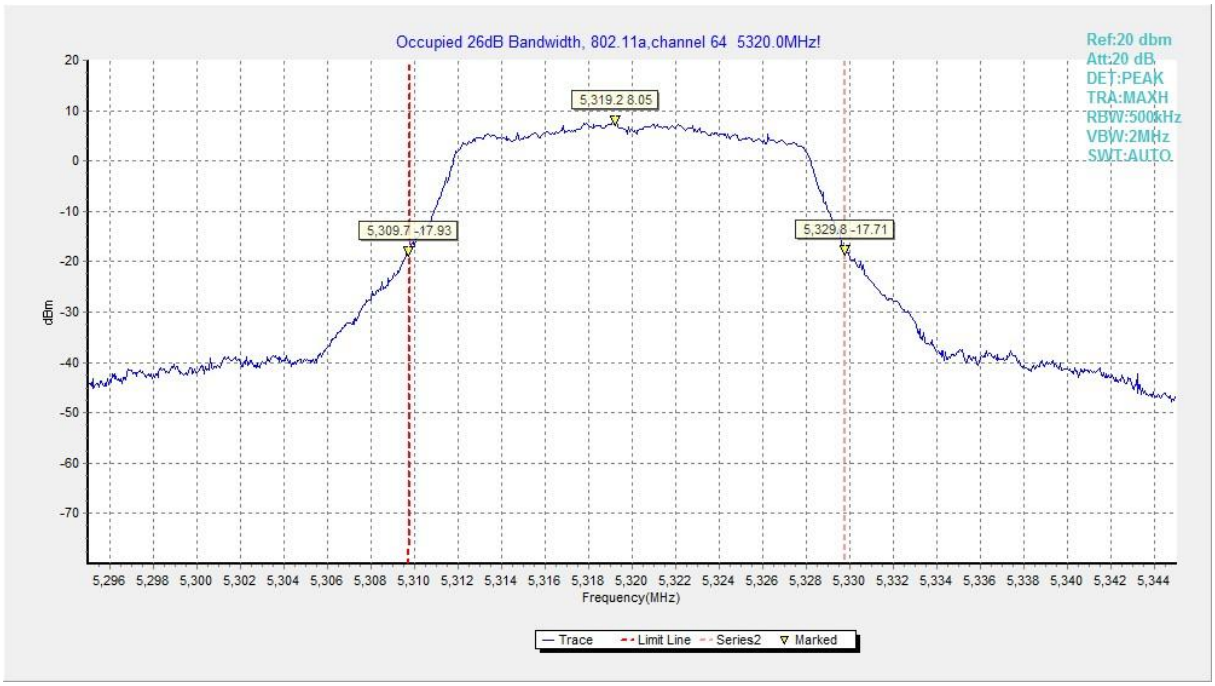


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

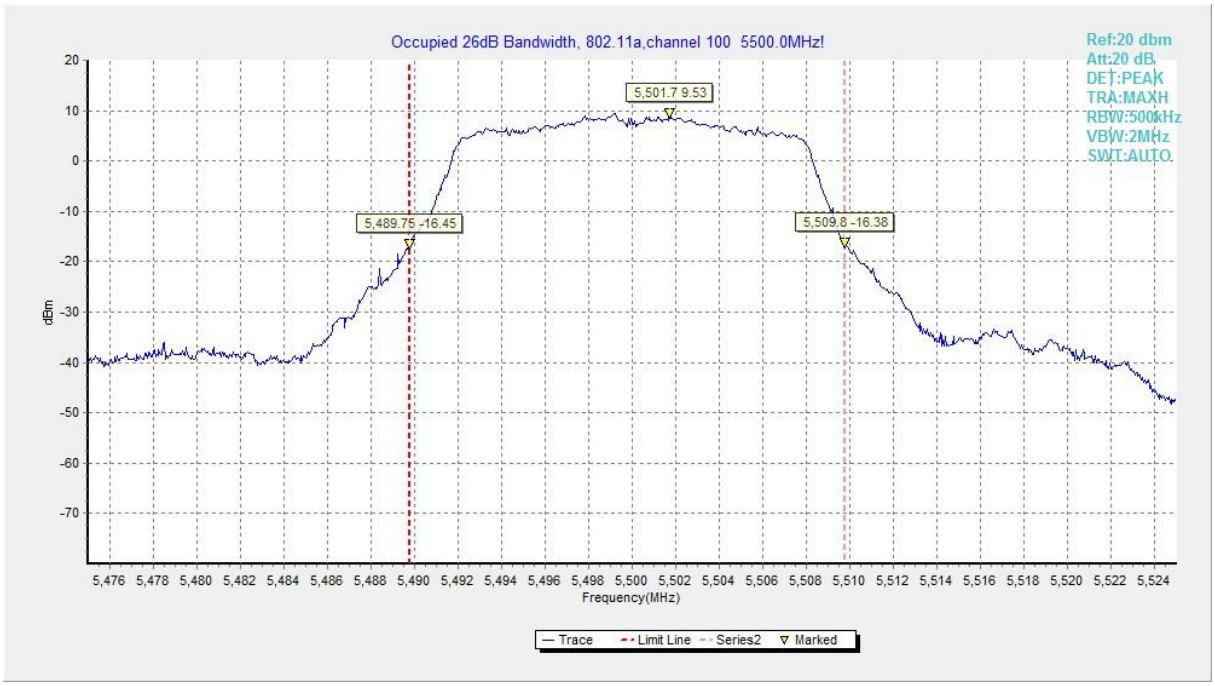


Fig. 7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

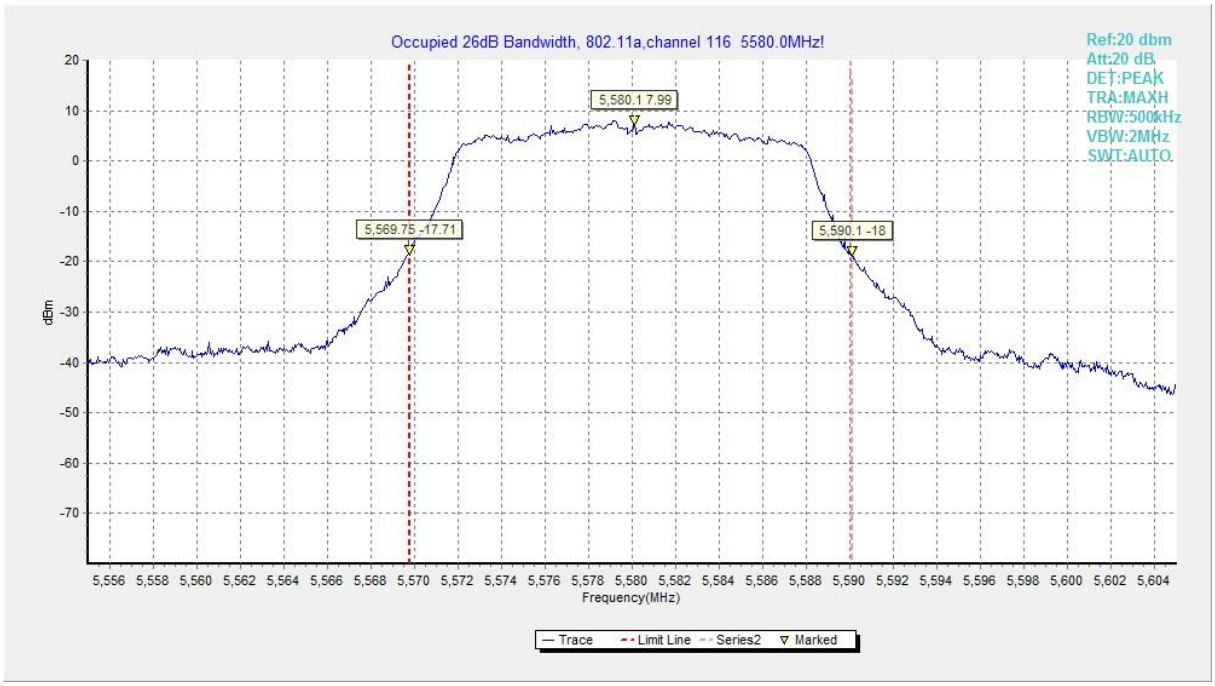


Fig. 8 Occupied 26dB Bandwidth (802.11a, 5580MHz)

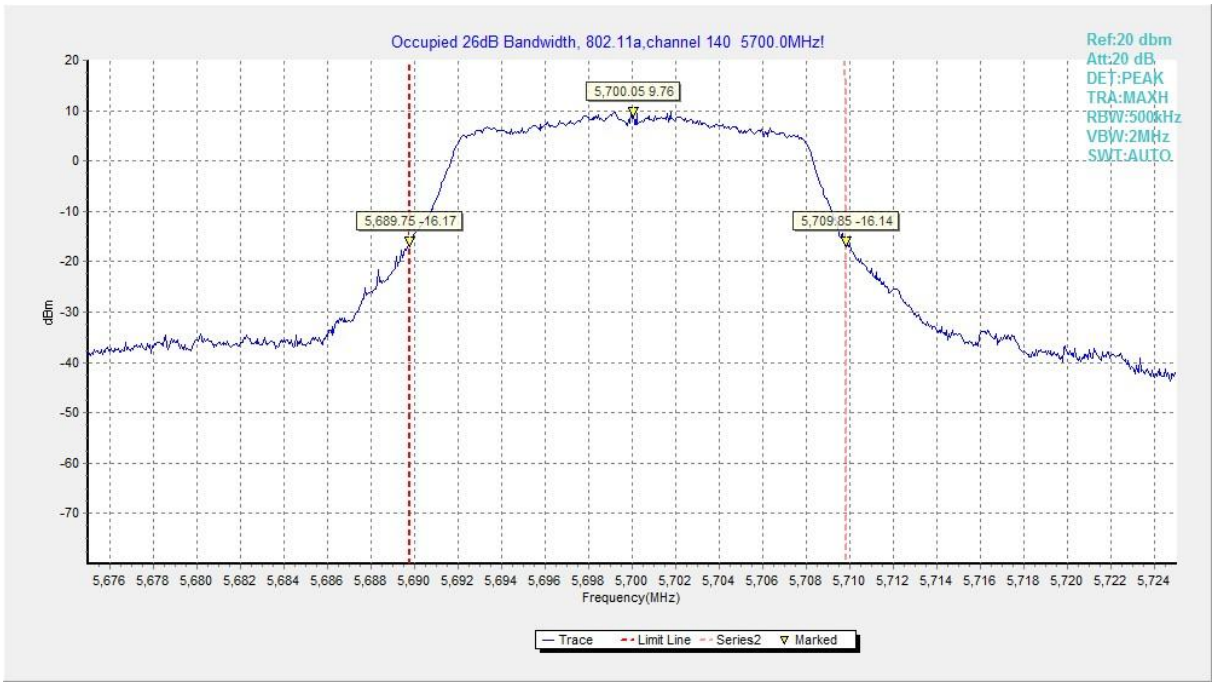


Fig. 9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

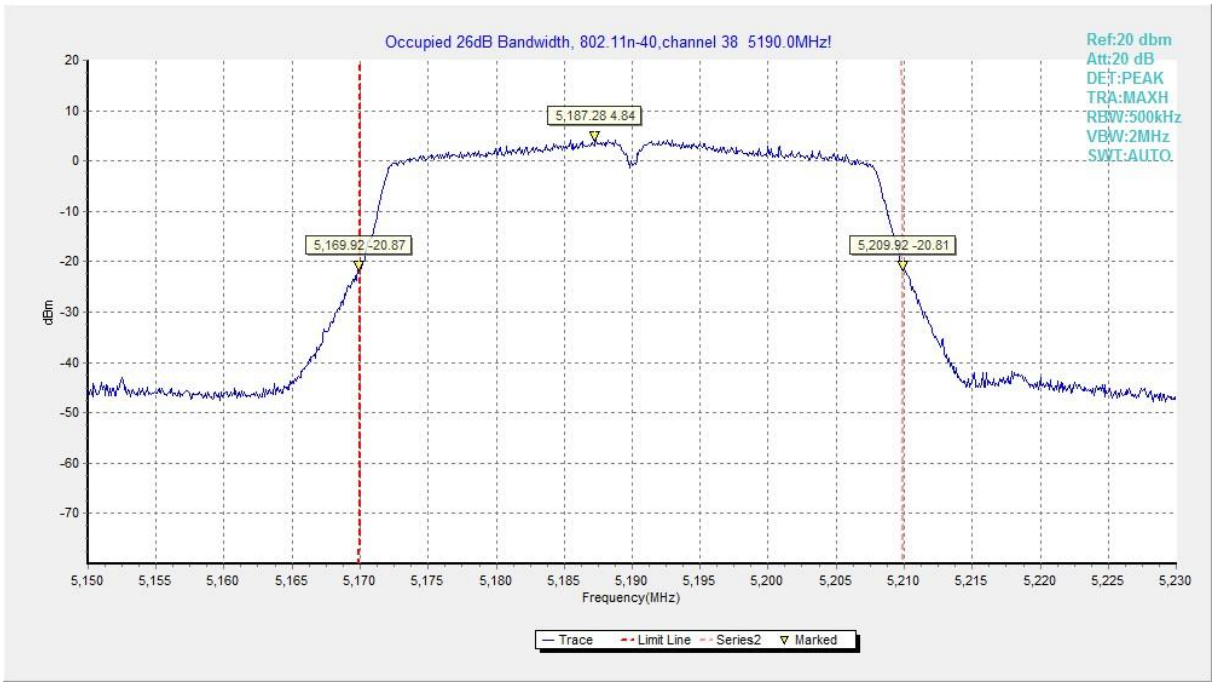


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

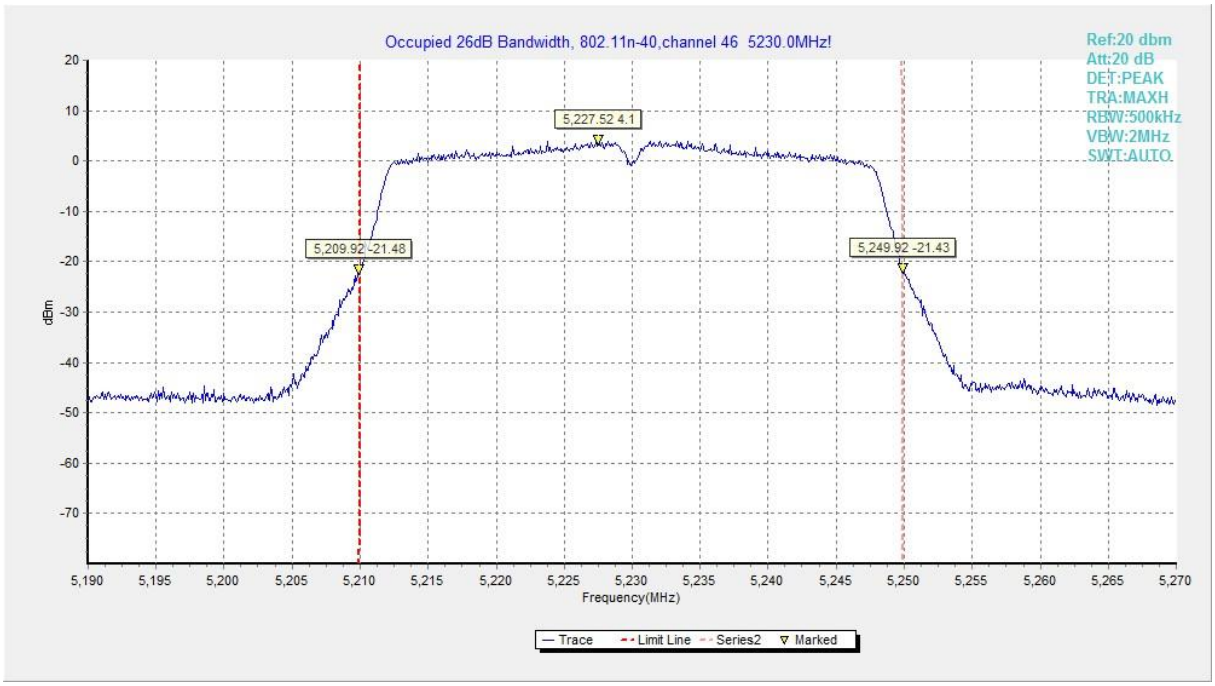


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

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

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

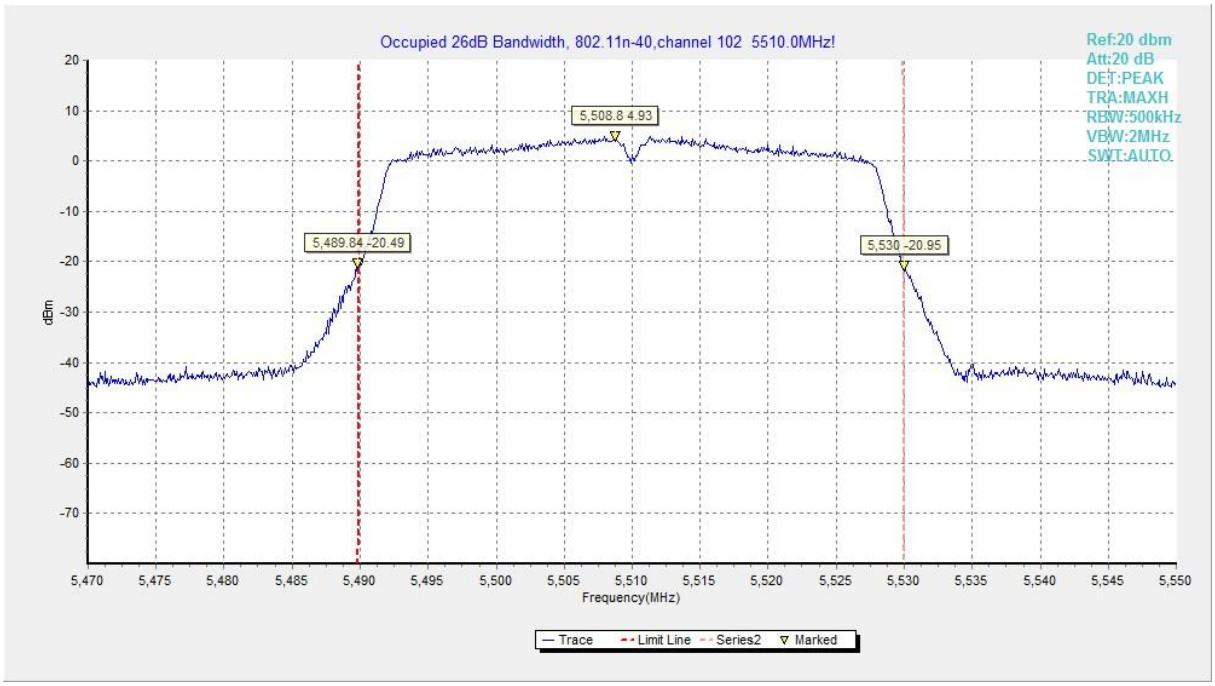


Fig. 14 Occupied 26dB Bandwidth (802.11n-HT40, 5510MHz)

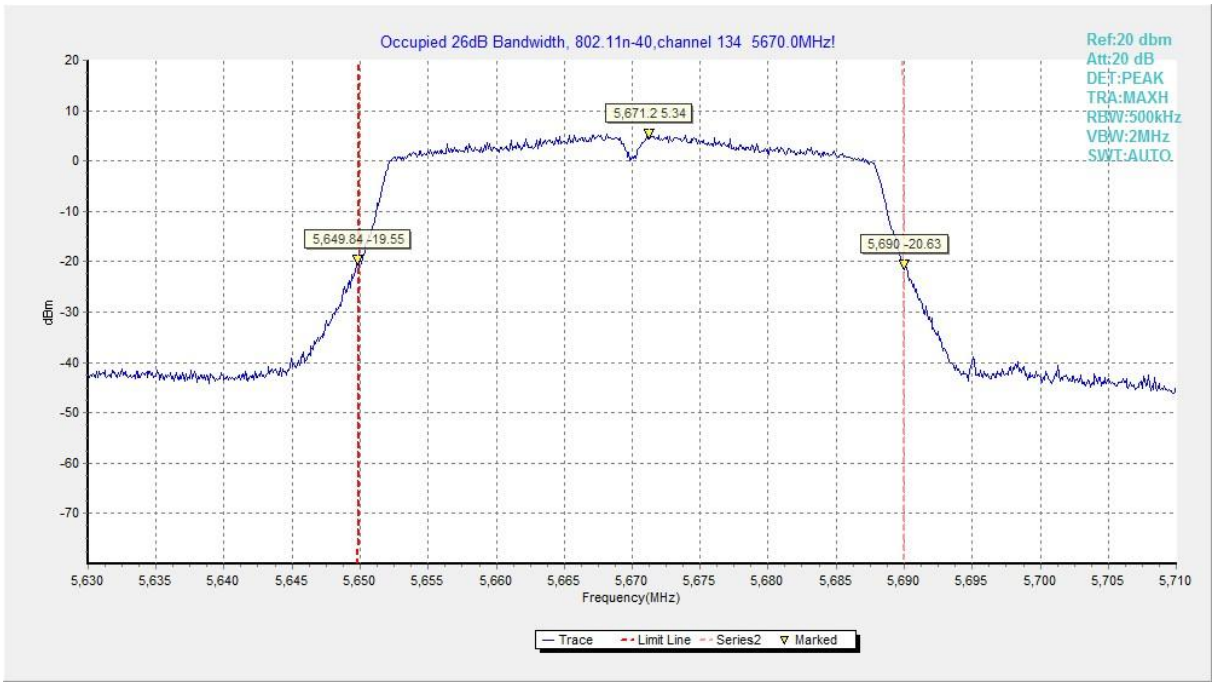


Fig. 15 Occupied 26dB Bandwidth (802.11n-HT40, 5670MHz)

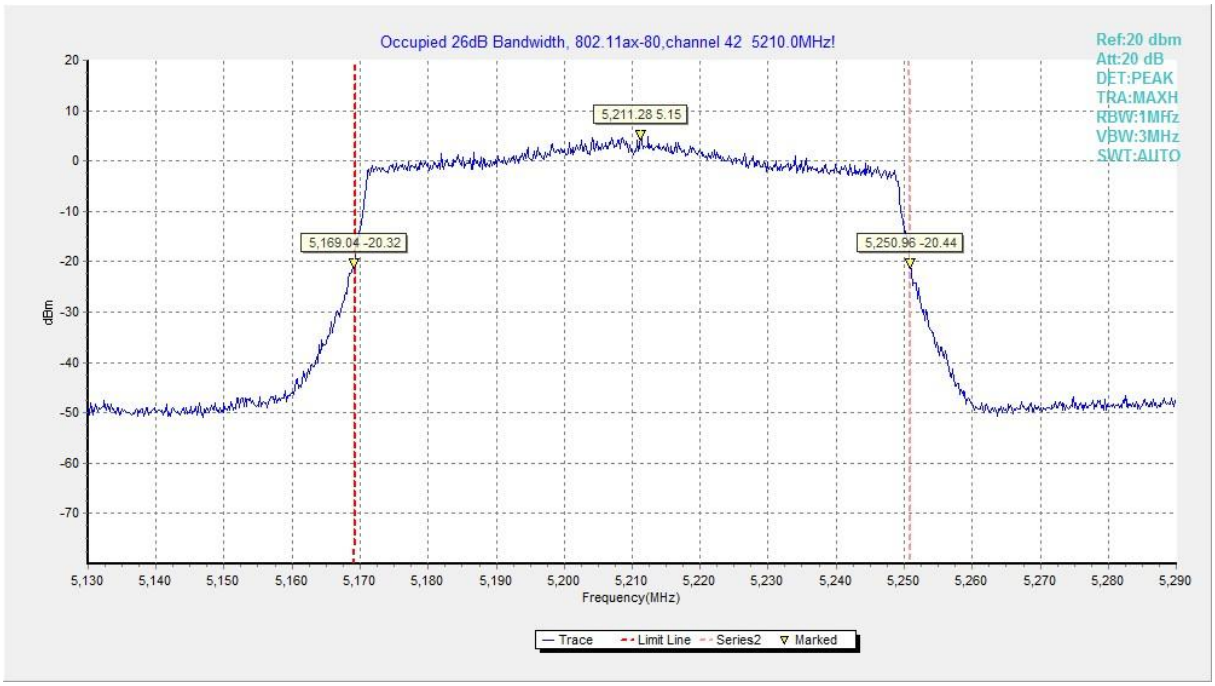


Fig. 16 Occupied 26dB Bandwidth (802. 11ax-HE80, 5210MHz)

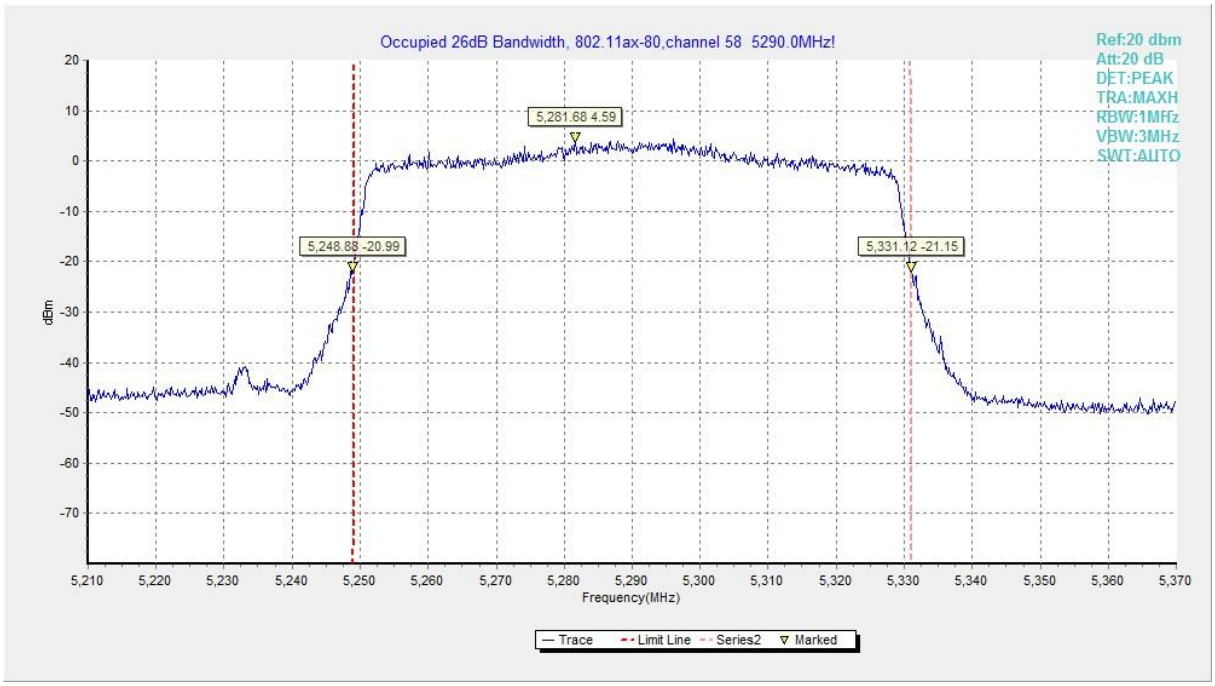


Fig. 17 Occupied 26dB Bandwidth (802. 11ax-HE80, 5290MHz)

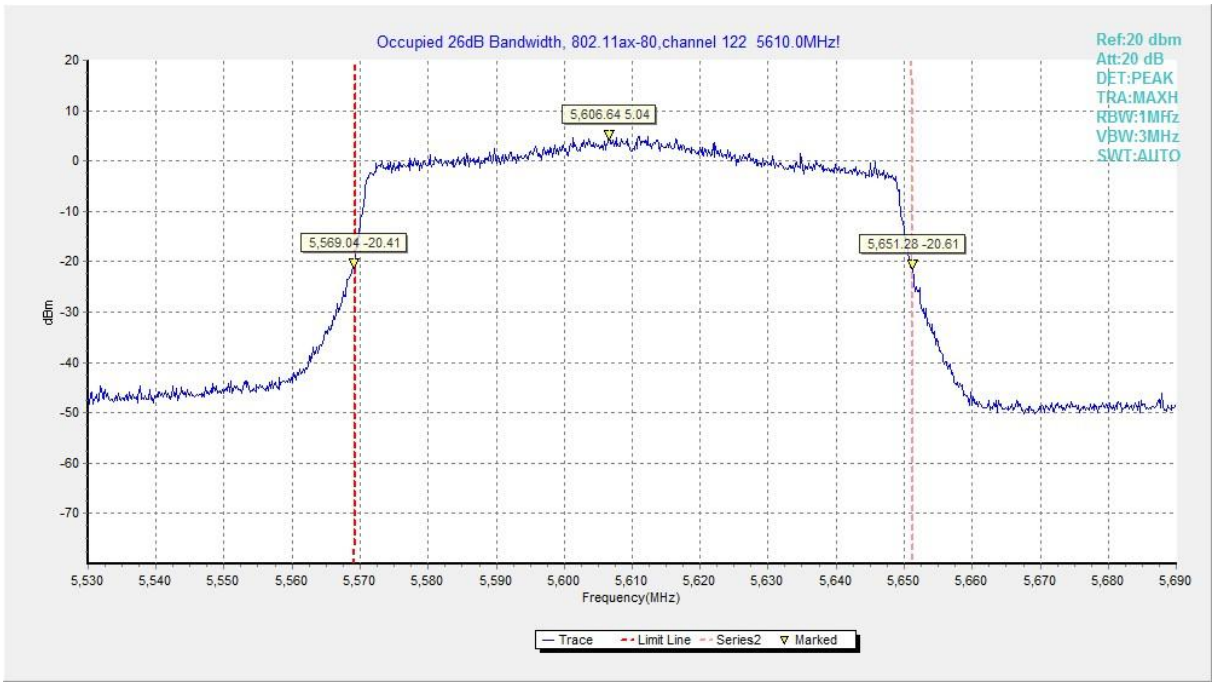


Fig. 18 Occupied 26dB Bandwidth (802. 11ax-HE80, 5610MHz)

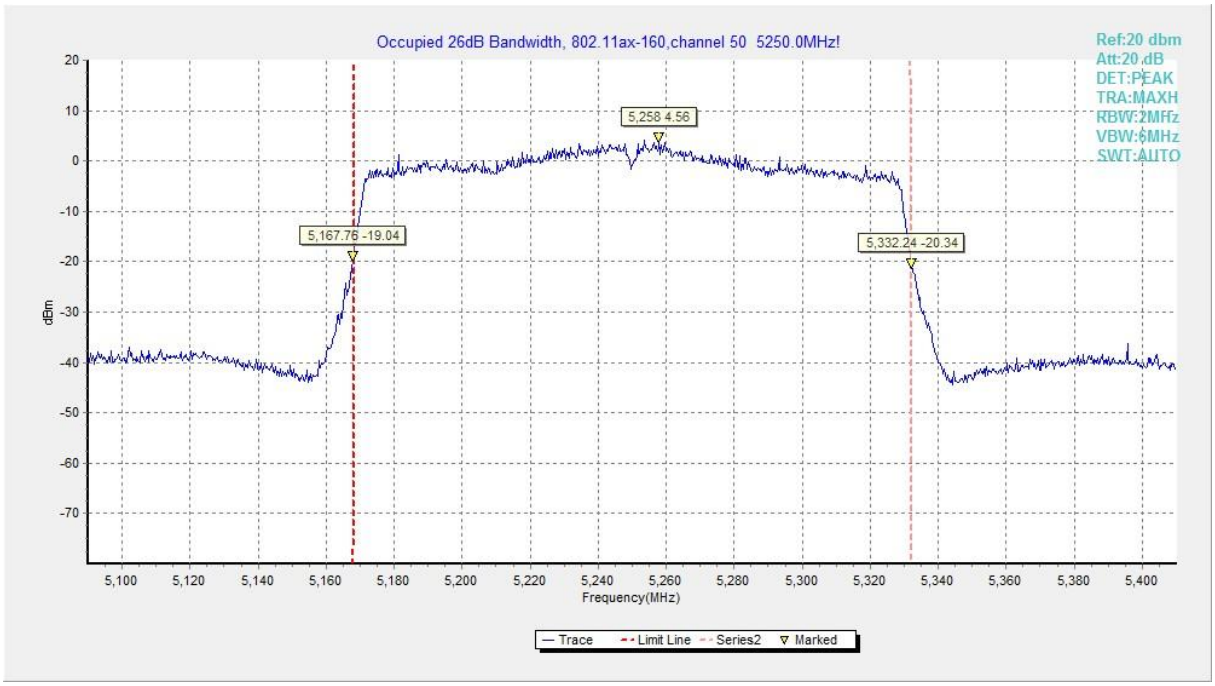


Fig. 19 Occupied 26dB Bandwidth (802. 11ax-HE160, 5250MHz)

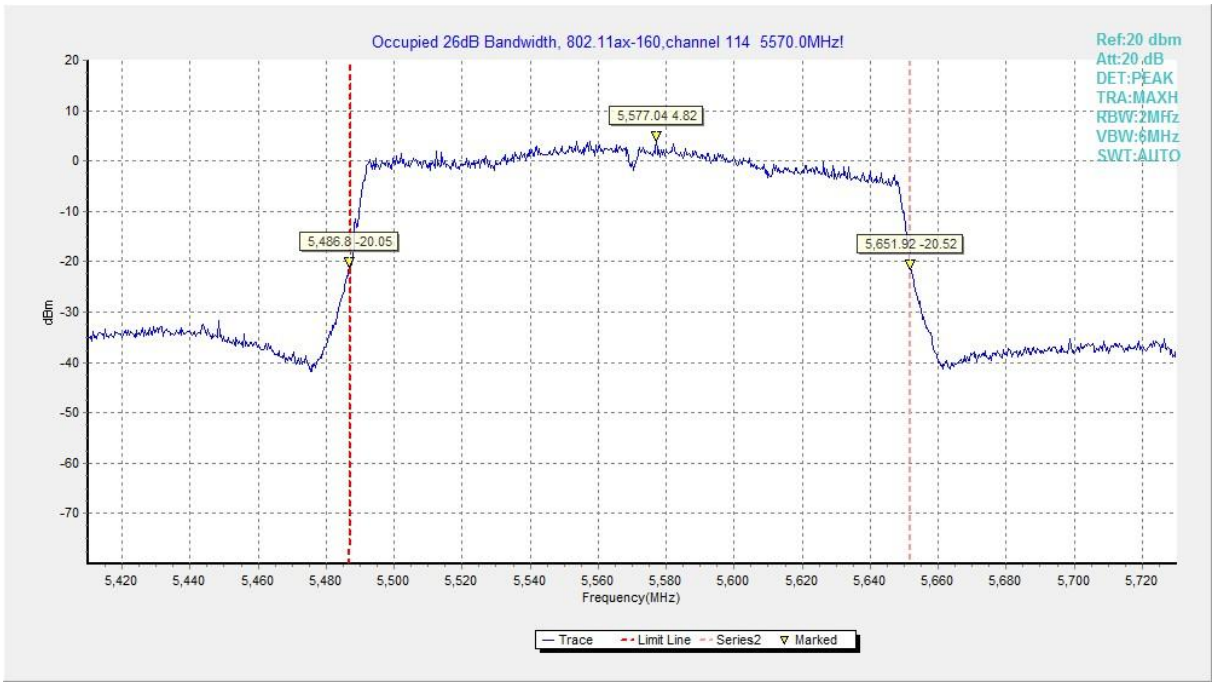


Fig. 20 Occupied 26dB Bandwidth (802. 11ax-HE160, 5570MHz)

A.5. Occupied 6dB Bandwidth

Measurement Limit:

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

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (MHz)		Conclusion
802.11a	5745MHz (Ch149)	Fig.21	15.15	**P**
	5785MHz (Ch157)	Fig.22	15.15	**P**
	5825MHz (Ch165)	Fig.23	15.05	**P**
802.11n-HT40	5755MHz (Ch151)	Fig.24	35.04	**P**
	5795MHz (Ch159)	Fig.25	35.12	**P**
802.11ax-HE80	5775MHz (Ch155)	Fig.26	72.64	**P**

Conclusion: PASS

Test graphs as below:

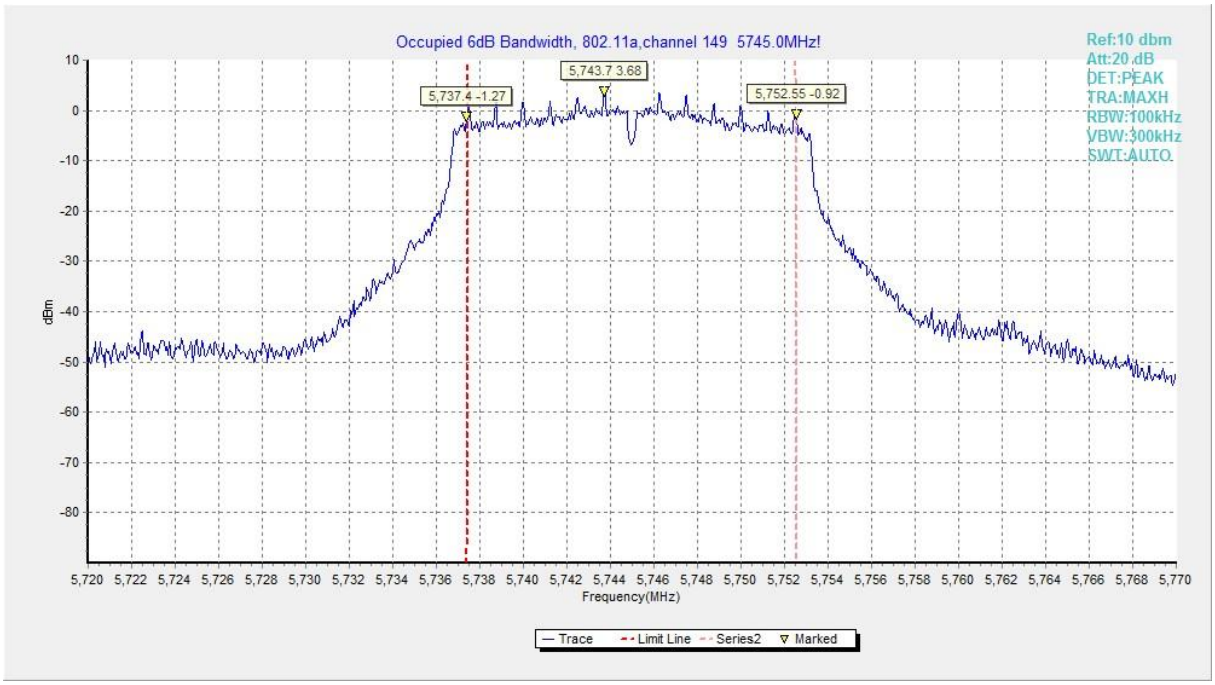


Fig. 21 Occupied 6dB Bandwidth (802.11a, 5745MHz)

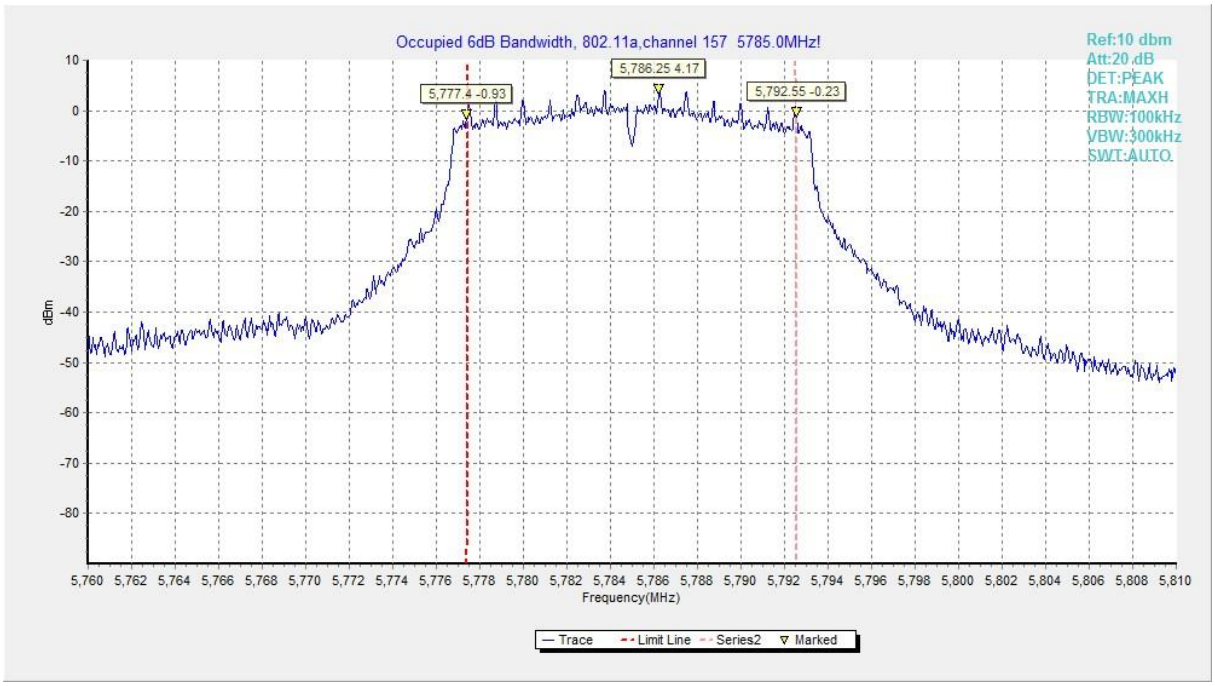


Fig. 22 Occupied 6dB Bandwidth (802.11a, 5785MHz)

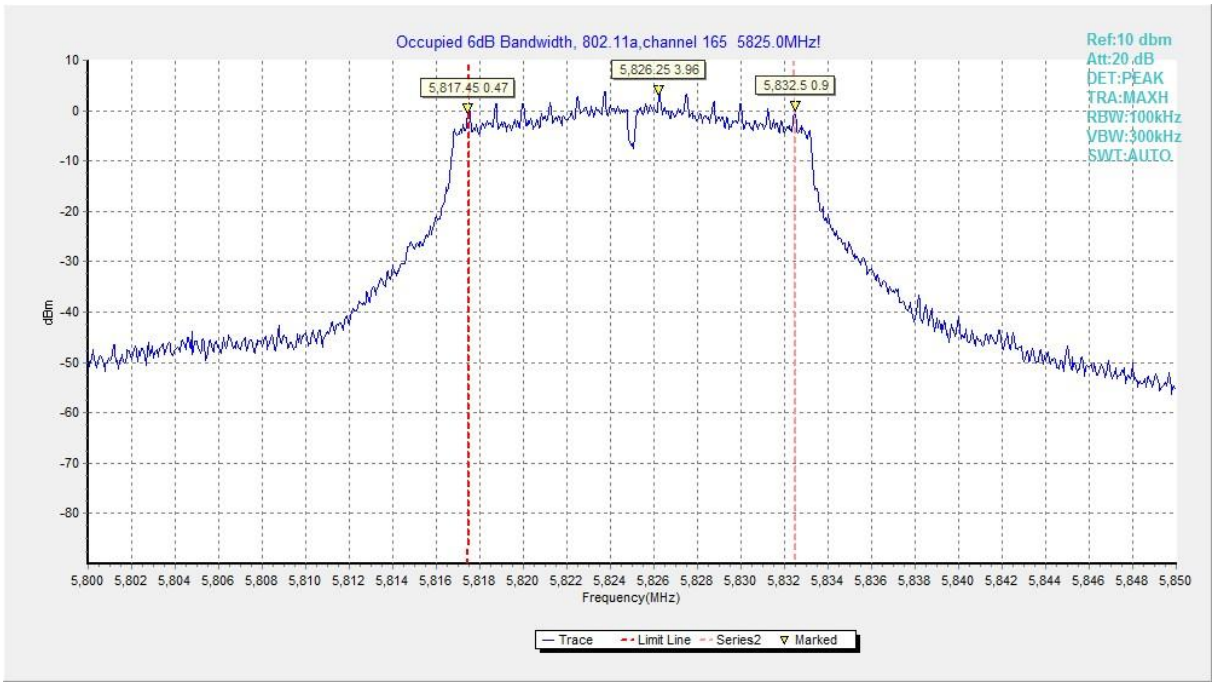


Fig. 23 Occupied 6dB Bandwidth (802.11a, 5825MHz)

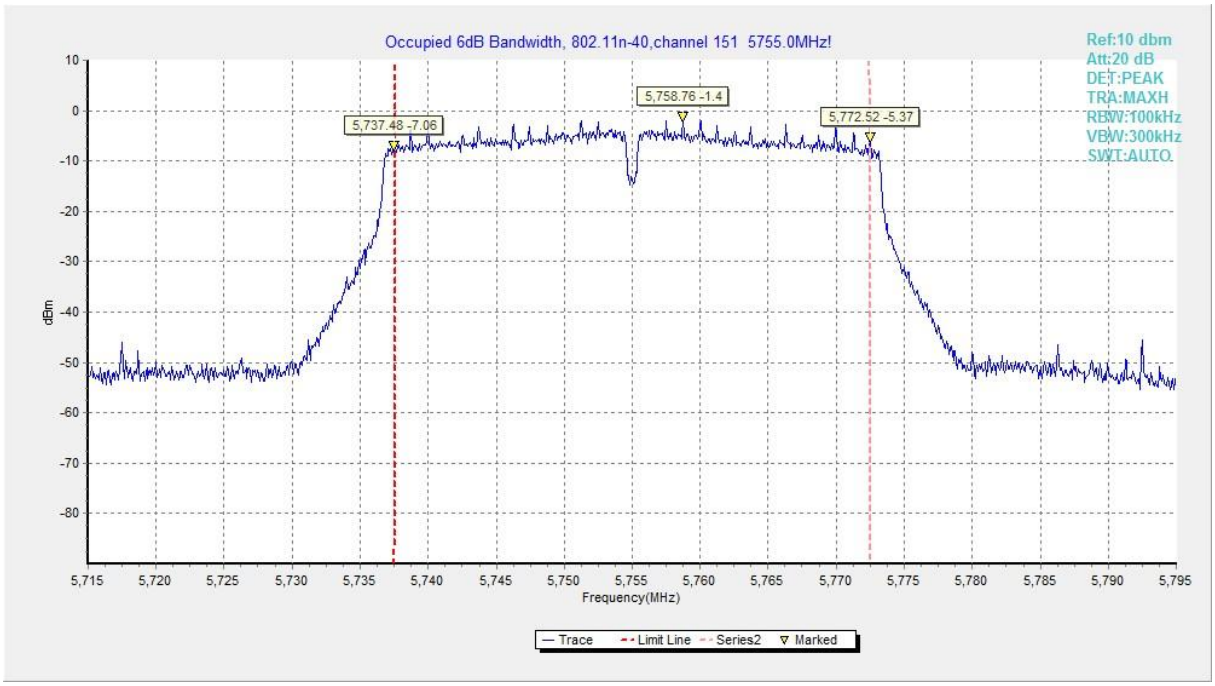


Fig. 24 Occupied 6dB Bandwidth (802.11n-HT40, 5755MHz)

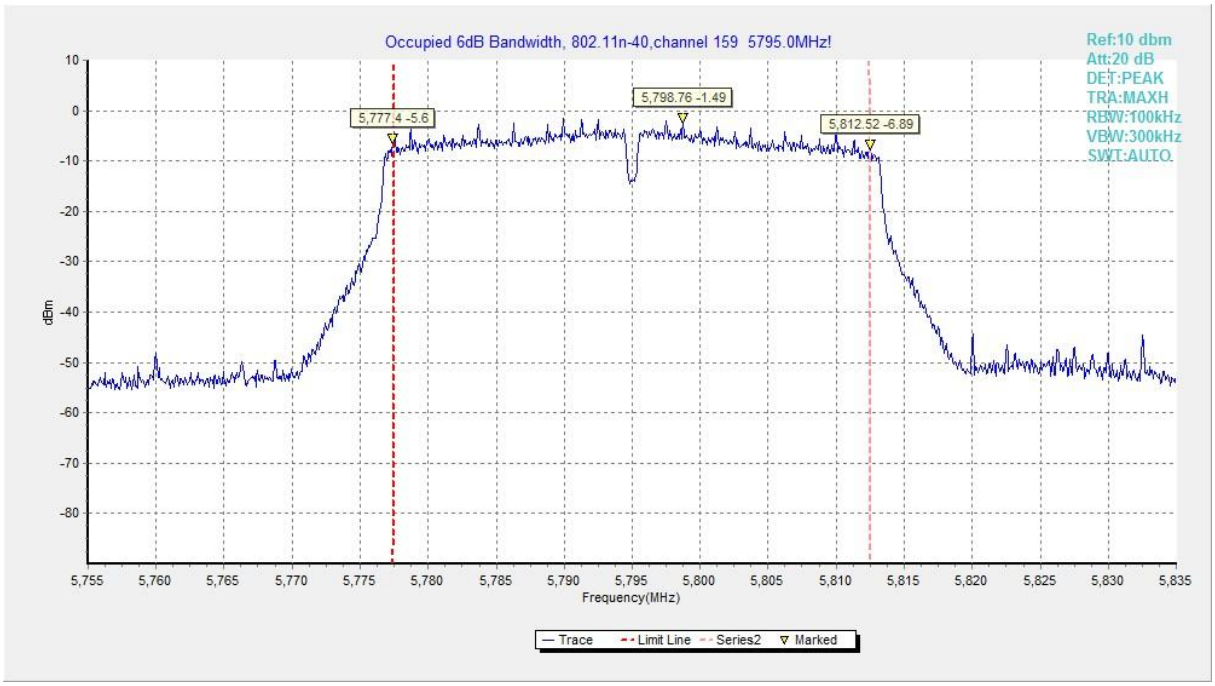


Fig. 25 Occupied 6dB Bandwidth (802.11n-HT40, 5795MHz)

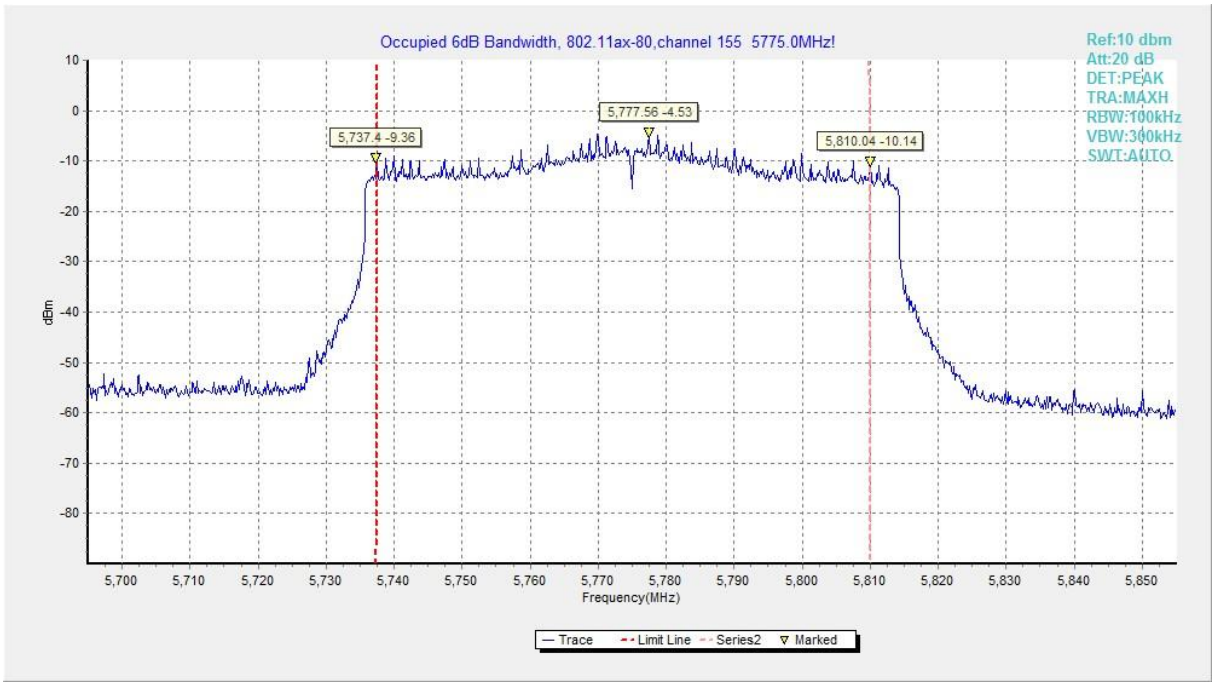


Fig. 26 Occupied 6dB Bandwidth (802.11ax-HE80, 5775MHz)

A.6. 99% Occupied Bandwidth

Measurement Limit:

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

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	99% Occupied Bandwidth (MHz)		Conclusion
802.11a	5180MHz (Ch36)	Fig.27	16.60	**P**
	5200MHz (Ch40)	Fig.28	16.56	**P**
	5240MHz (Ch48)	Fig.29	16.56	**P**
	5260MHz (Ch52)	Fig.30	16.60	**P**
	5280MHz (Ch56)	Fig.31	16.60	**P**
	5320MHz (Ch64)	Fig.32	16.60	**P**
	5500MHz (Ch100)	Fig.33	16.60	**P**
	5580MHz (Ch116)	Fig.34	16.60	**P**
	5700MHz (Ch140)	Fig.35	16.60	**P**
	5745MHz (Ch149)	Fig.36	16.60	**P**
	5785MHz (Ch157)	Fig.37	16.60	**P**
	5825MHz (Ch165)	Fig.38	16.60	**P**
802.11n-HT40	5190MHz (Ch38)	Fig.39	35.92	**P**
	5230MHz (Ch46)	Fig.40	36.00	**P**
	5270MHz (Ch54)	Fig.41	35.92	**P**
	5310MHz (Ch62)	Fig.42	35.84	**P**
	5510MHz (Ch102)	Fig.43	35.92	**P**
	5670MHz (Ch134)	Fig.44	35.92	**P**
	5755MHz (Ch151)	Fig.45	36.00	**P**
	5795MHz (Ch159)	Fig.46	35.92	**P**
802.11ax-HE80	5210MHz (Ch42)	Fig.47	77.12	**P**
	5290MHz (Ch58)	Fig.48	76.96	**P**
	5610MHz (Ch122)	Fig.49	76.80	**P**
	5775MHz (Ch155)	Fig.50	76.96	**P**
802.11ax-HE160	5250MHz (Ch50)	Fig.51	155.84	**P**
	5570MHz (Ch114)	Fig.52	155.20	**P**

Conclusion: PASS

Test graphs as below:

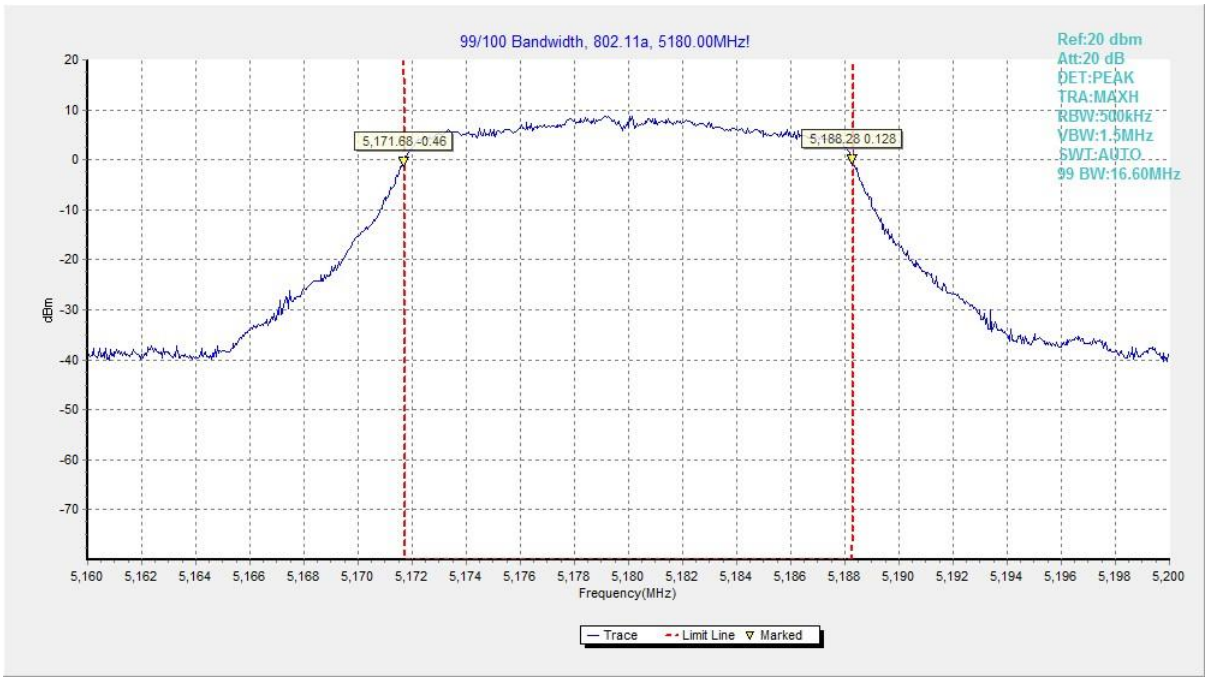


Fig. 27 99% Occupied Bandwidth (802.11a, 5180MHz)

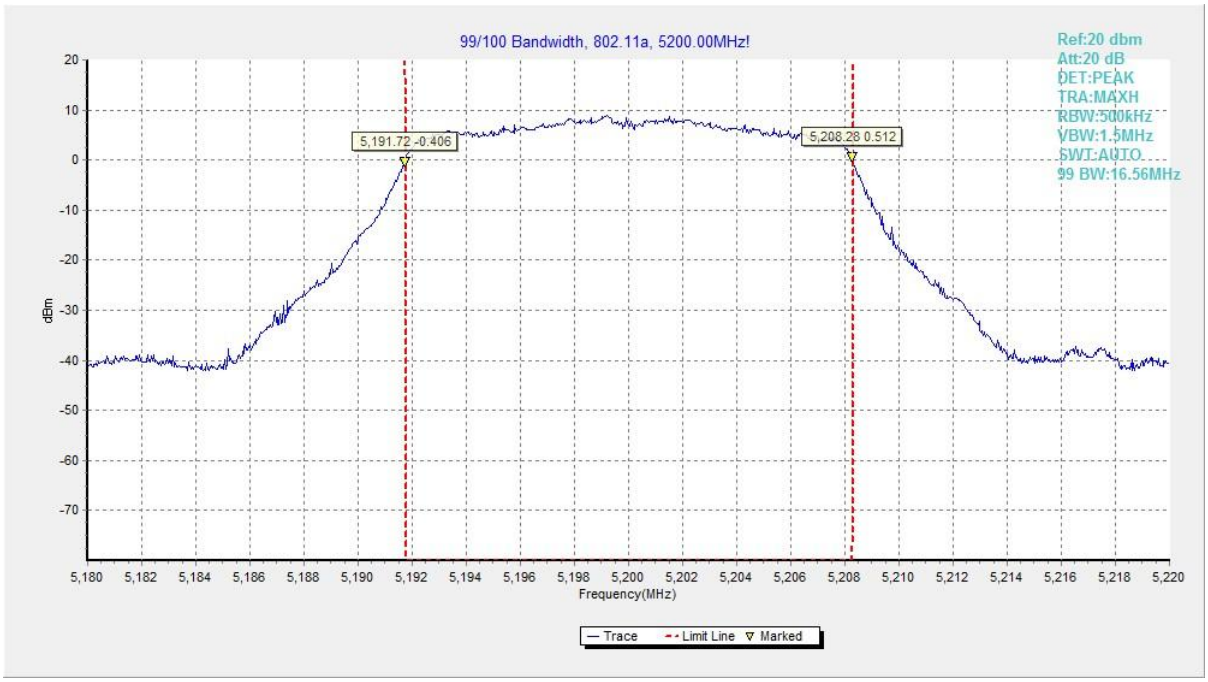


Fig. 28 99% Occupied Bandwidth (802.11a, 5200MHz)

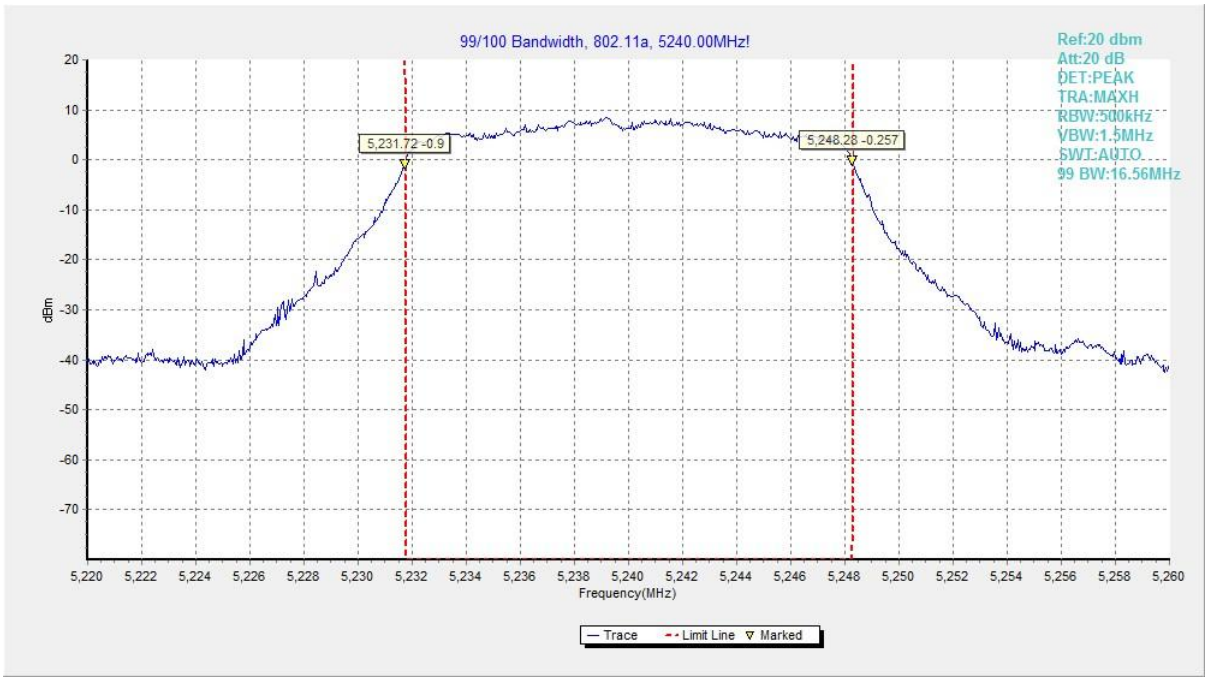


Fig. 29 99% Occupied Bandwidth (802.11a, 5240MHz)

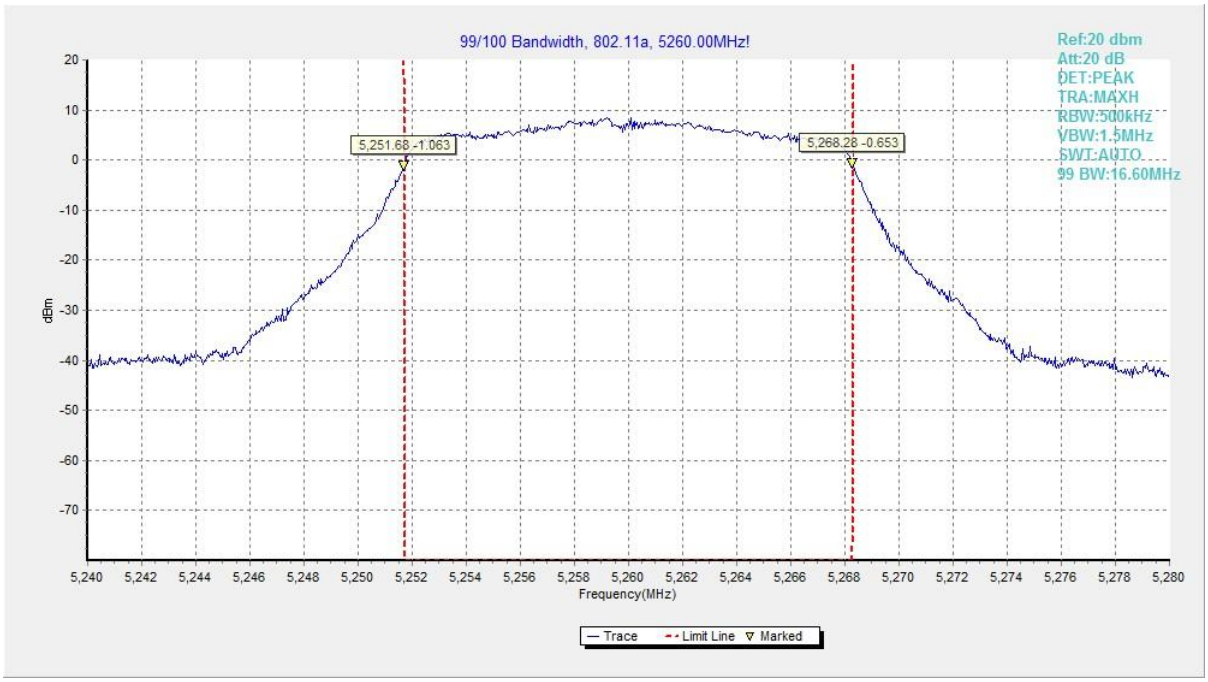


Fig. 30 99% Occupied Bandwidth (802.11a, 5260MHz)

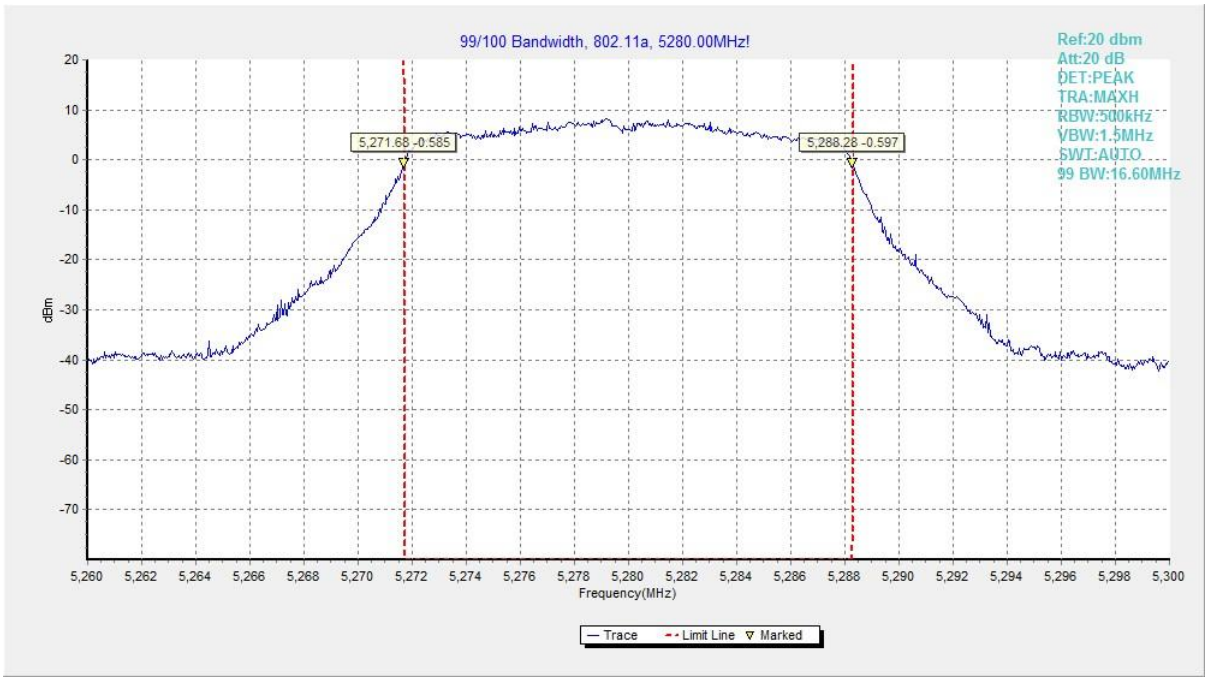


Fig. 31 99% Occupied Bandwidth (802.11a, 5280MHz)

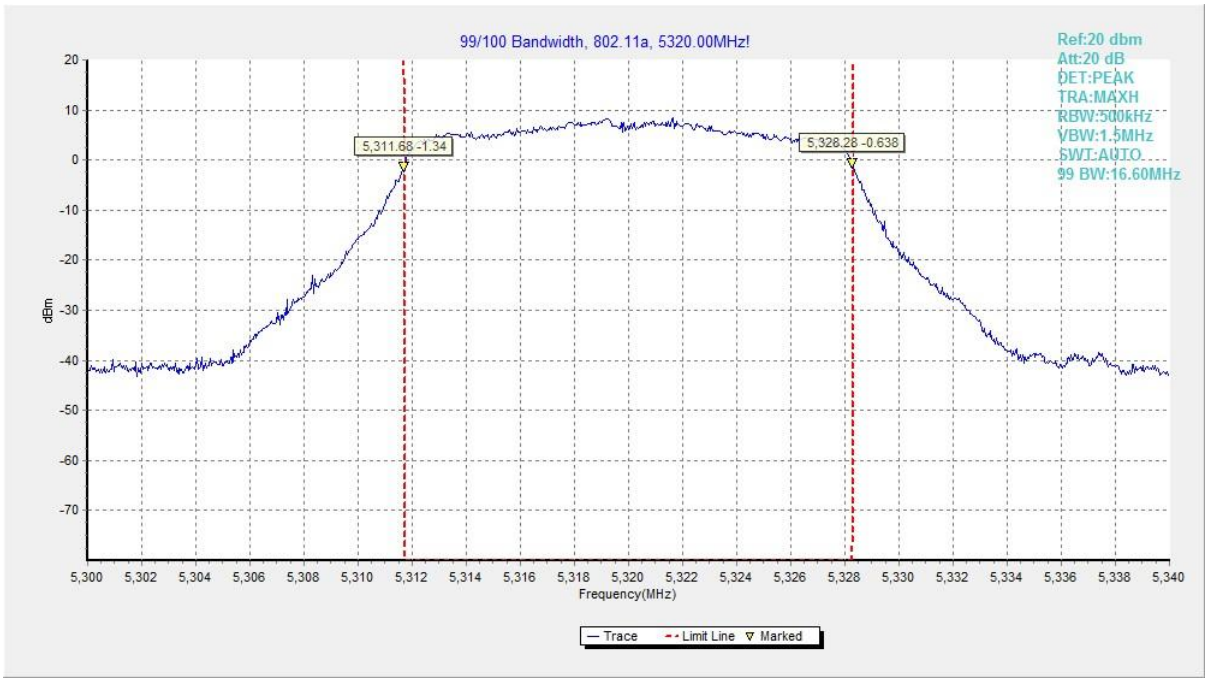


Fig. 32 99% Occupied Bandwidth (802.11a, 5320MHz)

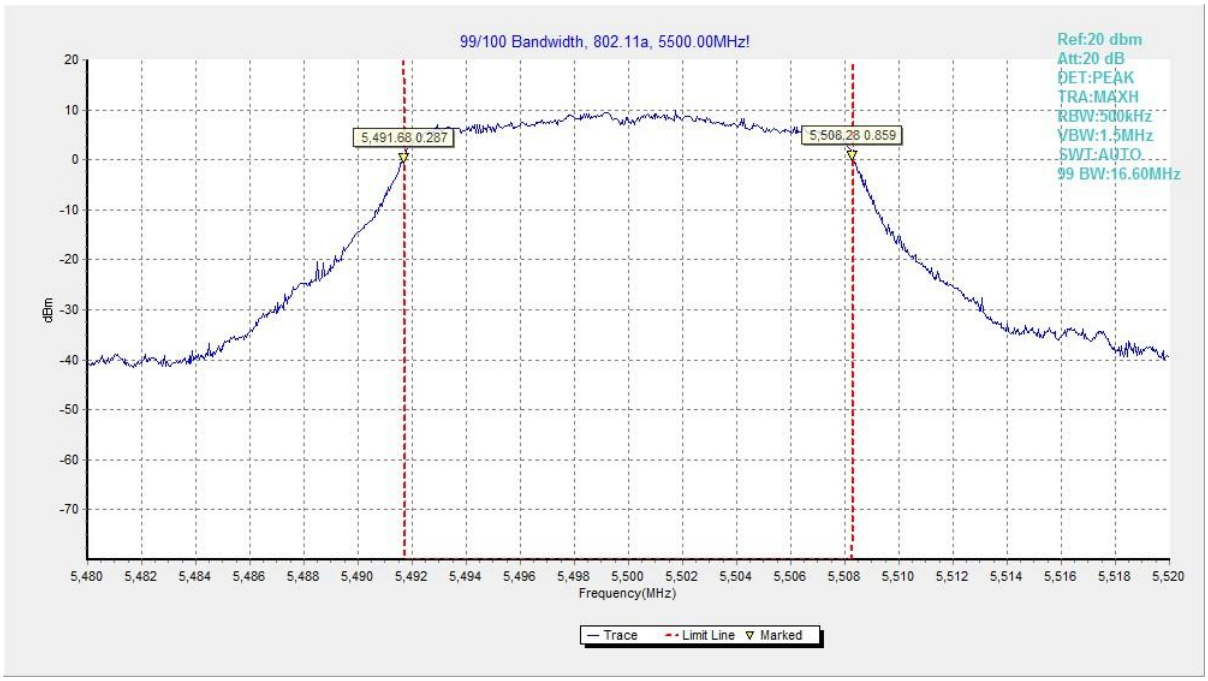


Fig. 33 99% Occupied Bandwidth (802.11a, 5500MHz)

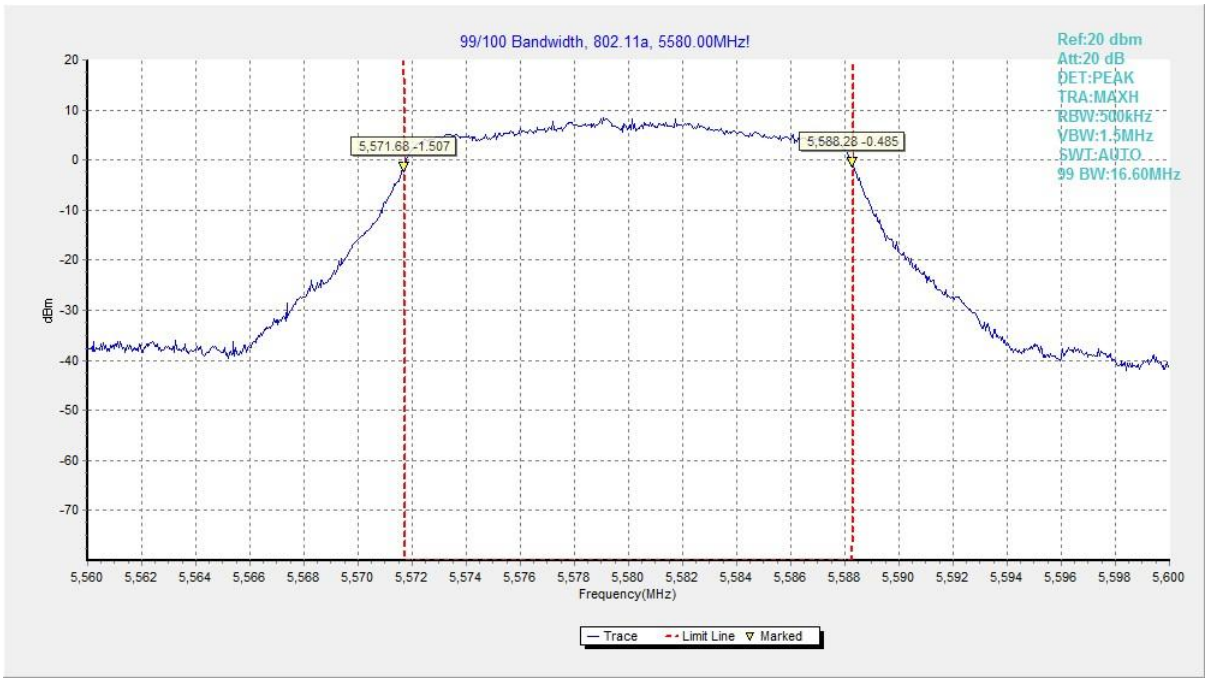


Fig. 34 99% Occupied Bandwidth (802.11a, 5580MHz)

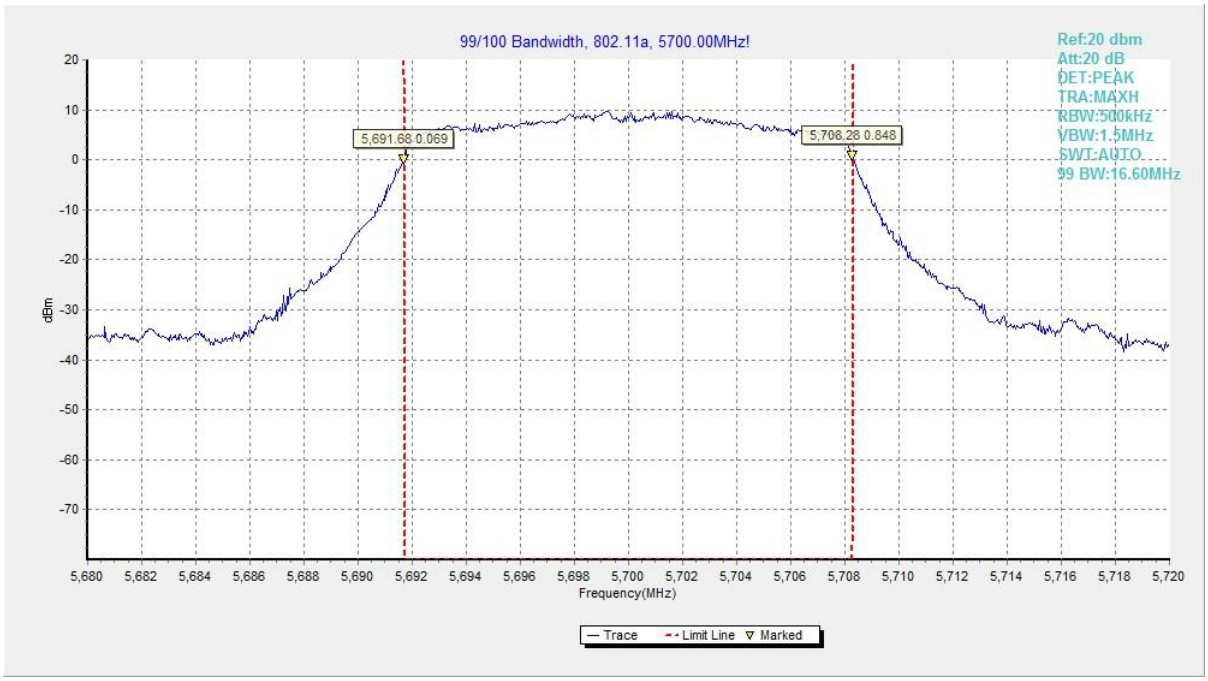


Fig. 35 99% Occupied Bandwidth (802.11a, 5700MHz)

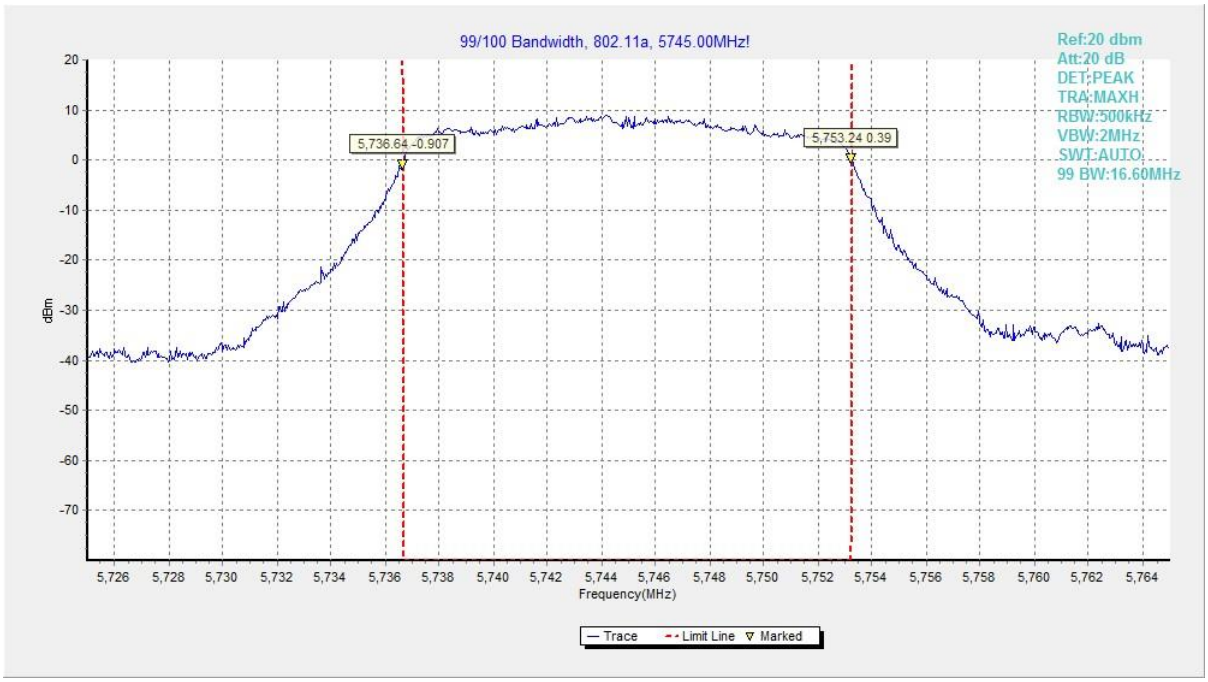


Fig. 36 99% Occupied Bandwidth (802.11a, 5745MHz)

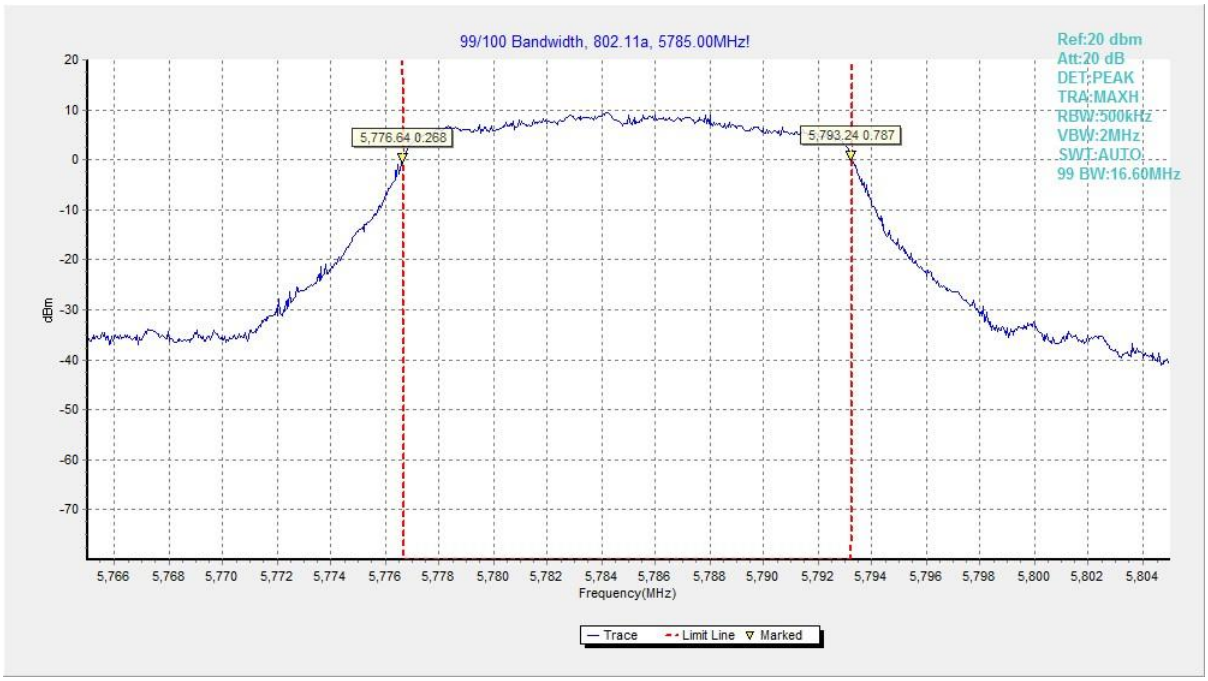


Fig. 37 99% Occupied Bandwidth (802.11a, 5785MHz)

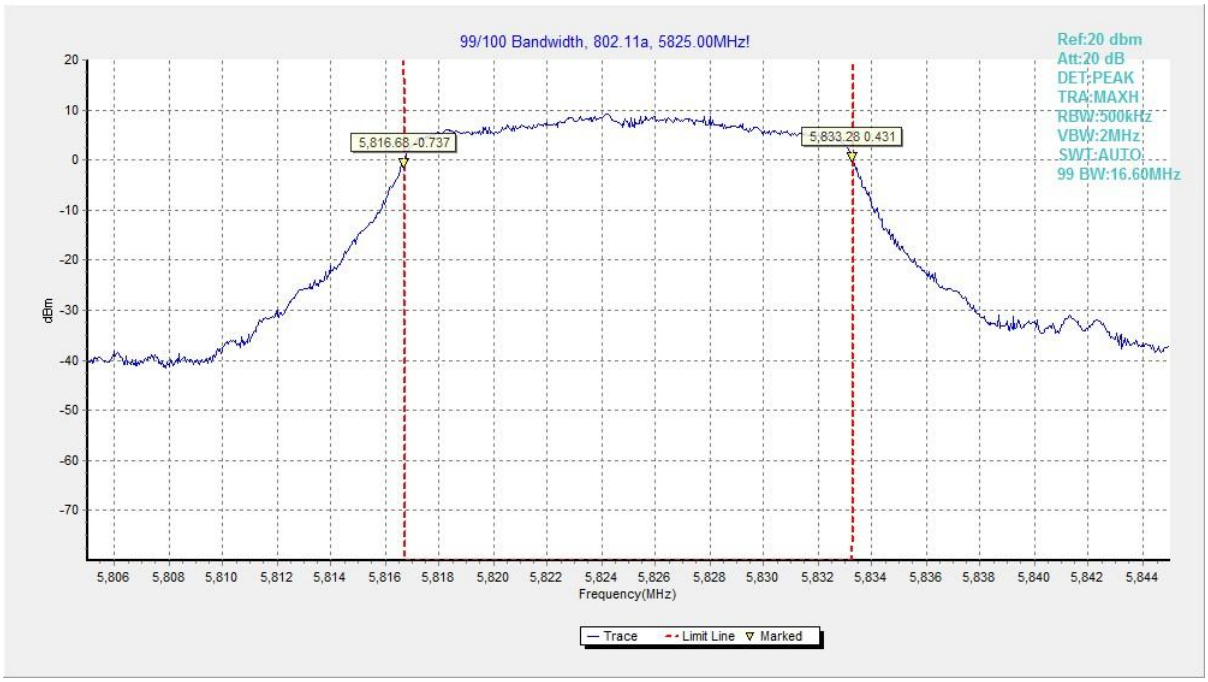


Fig. 38 99% Occupied Bandwidth (802.11a, 5825MHz)

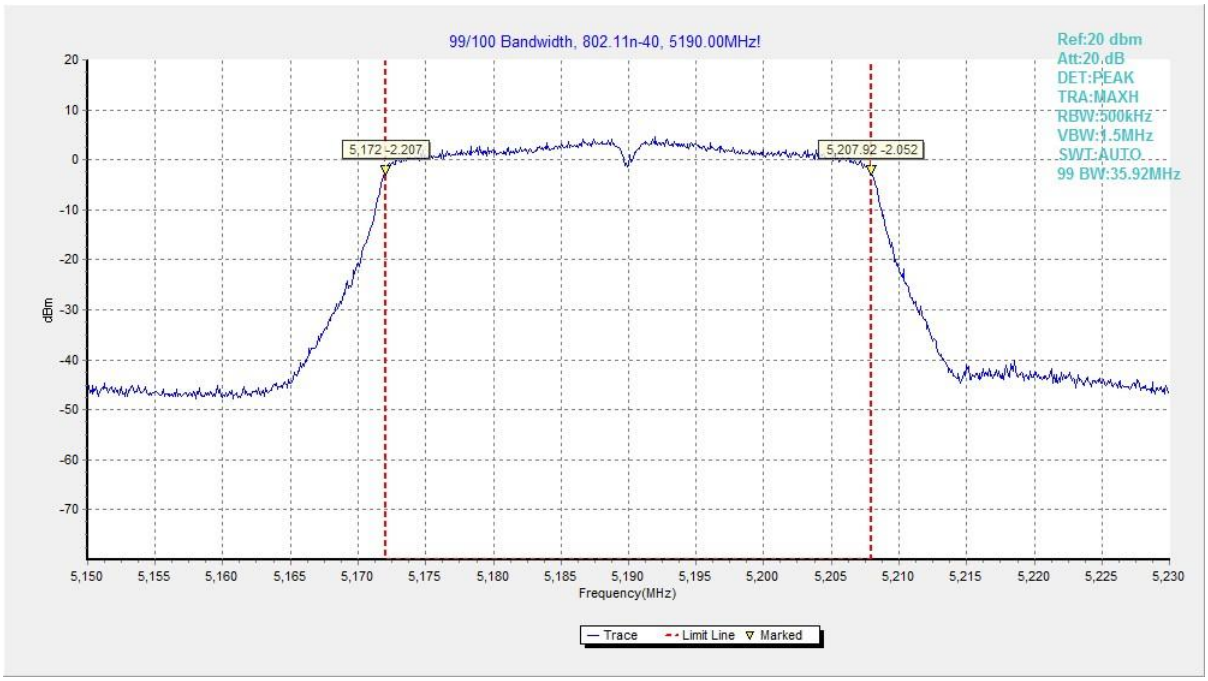


Fig. 39 99% Occupied Bandwidth (802.11n-HT40, 5190MHz)

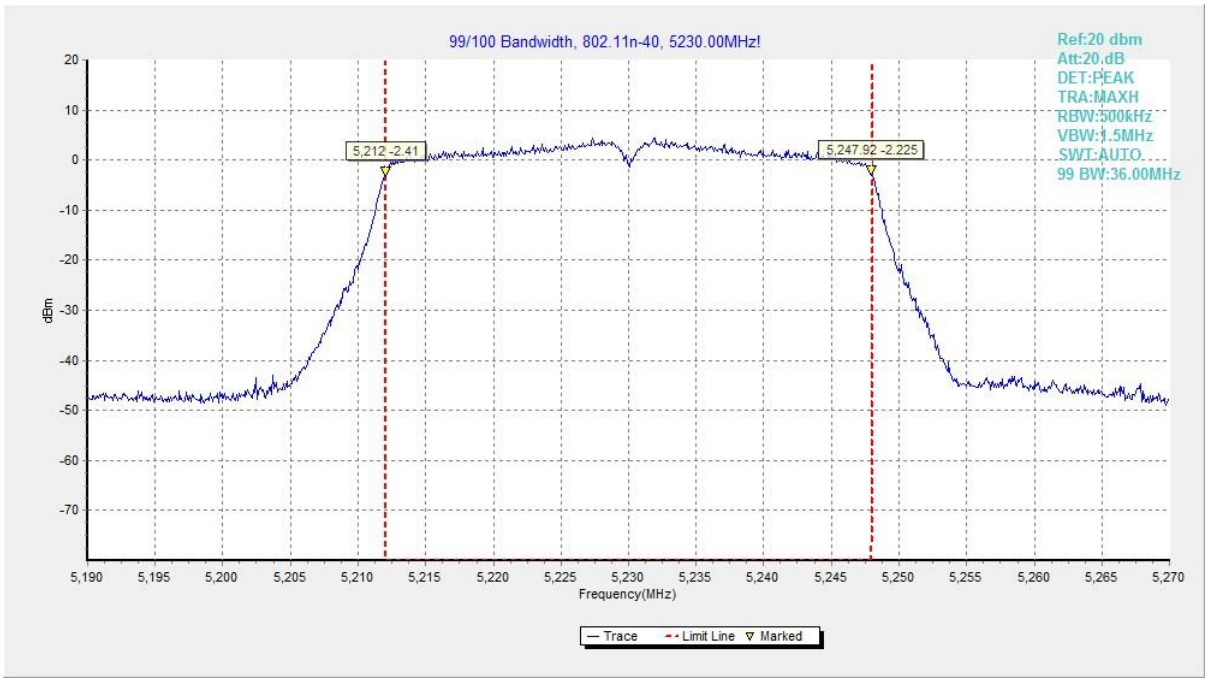


Fig. 40 99% Occupied Bandwidth (802.11n-HT40, 5230MHz)

Fig. 41 99% Occupied Bandwidth (802.11n-HT40, 5270MHz)

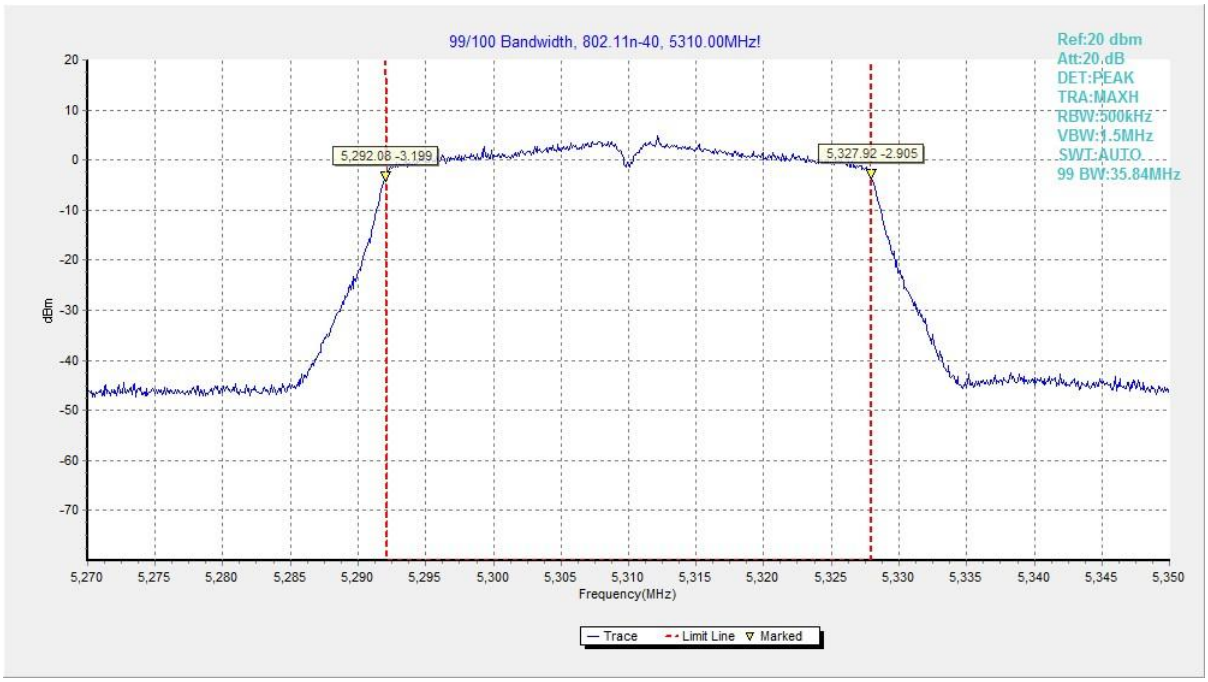


Fig. 42 99% Occupied Bandwidth (802.11n-HT40, 5310MHz)

Fig. 43 99% Occupied Bandwidth (802.11n-HT40, 5510MHz)

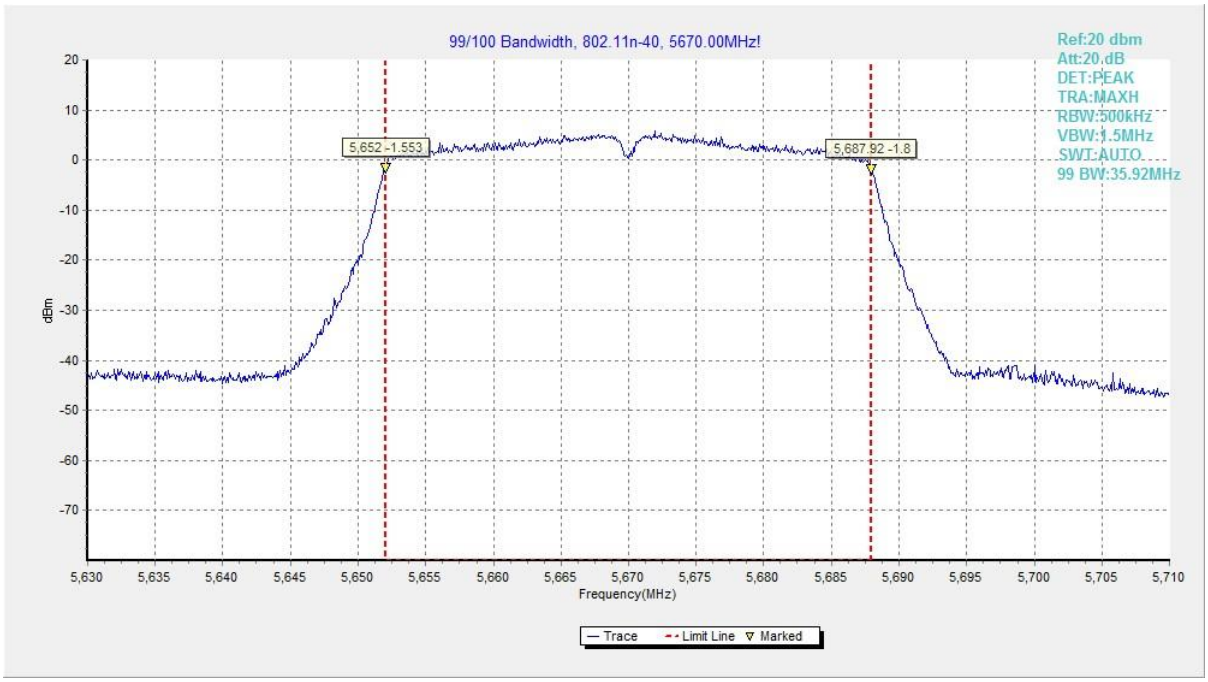


Fig. 44 99% Occupied Bandwidth (802.11n-HT40, 5670MHz)

Fig. 45 99% Occupied Bandwidth (802.11n-HT40, 5755MHz)

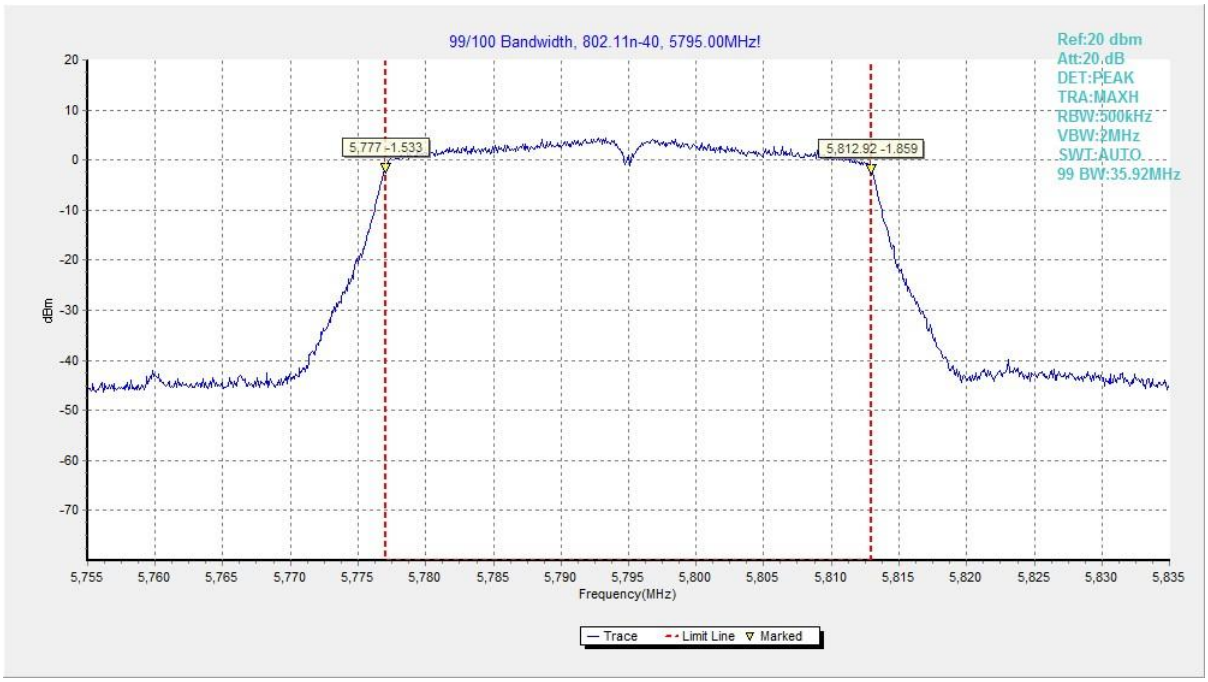


Fig. 46 99% Occupied Bandwidth (802.11n-HT40, 5795MHz)

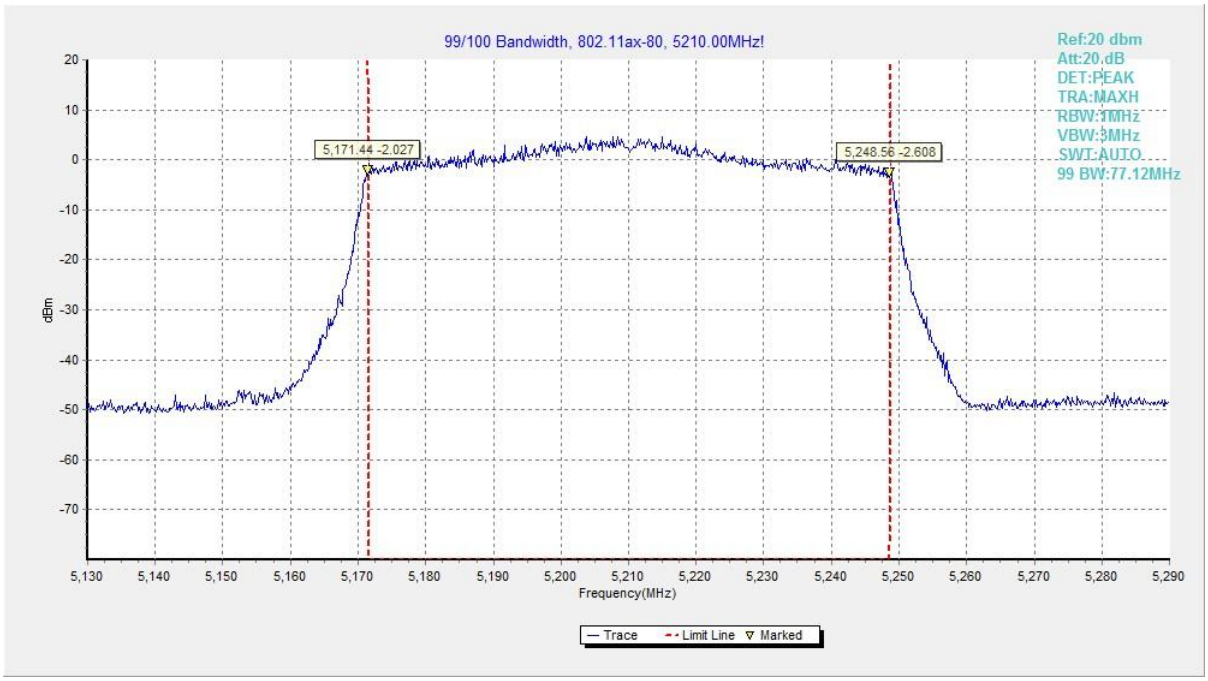


Fig. 47 99% Occupied Bandwidth (802. 11ax-HE80, 5210MHz)

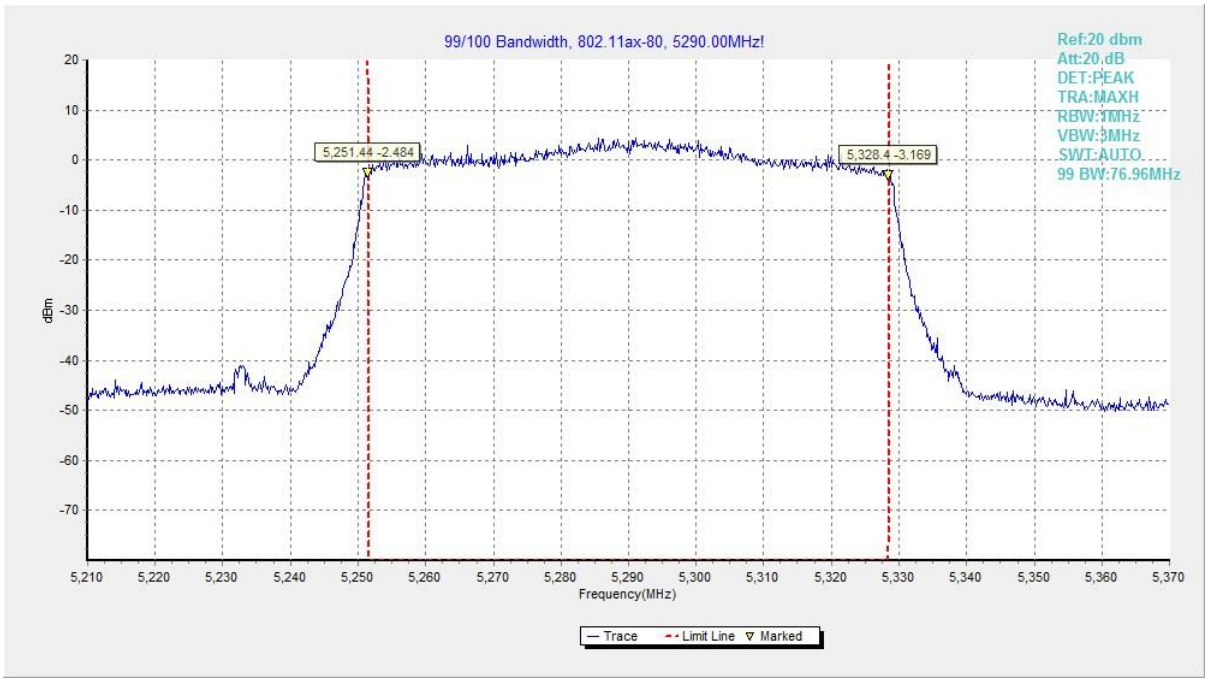


Fig. 48 99% Occupied Bandwidth (802. 11ax-HE80, 5290MHz)

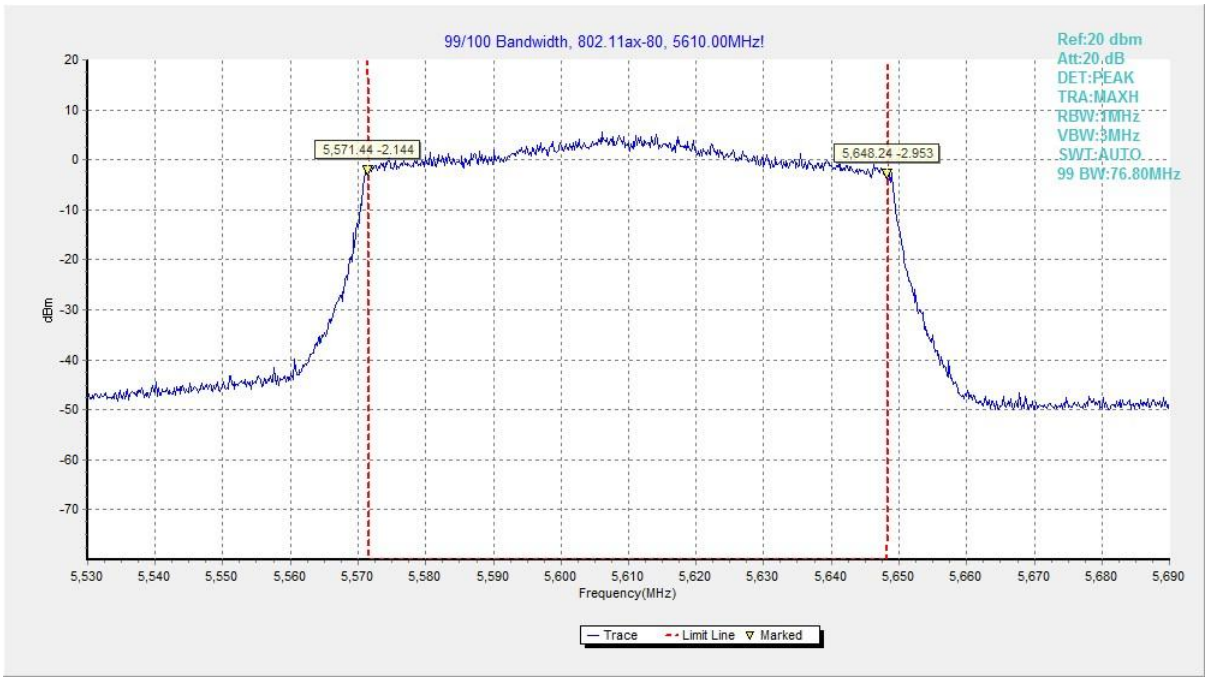


Fig. 49 99% Occupied Bandwidth (802. 11ax-HE80, 5610MHz)

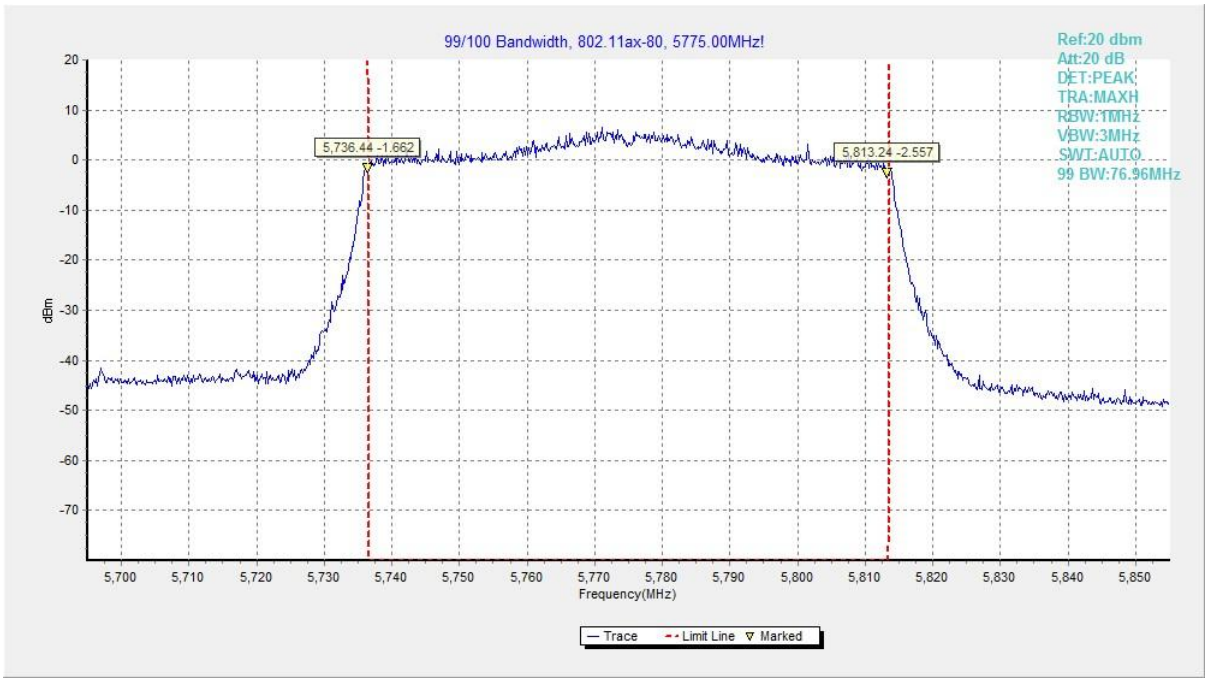


Fig. 50 99% Occupied Bandwidth (802. 11ax-HE80, 5775MHz)

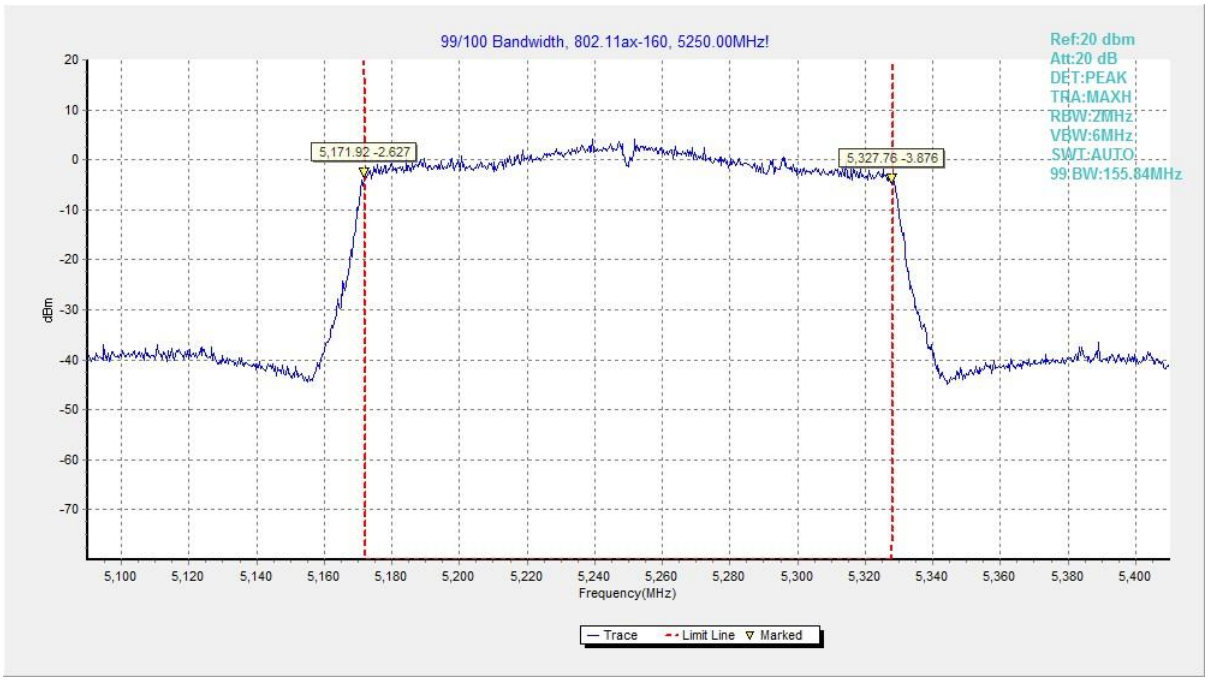


Fig. 51 99% Occupied Bandwidth (802. 11ax-HE160, 5250MHz)

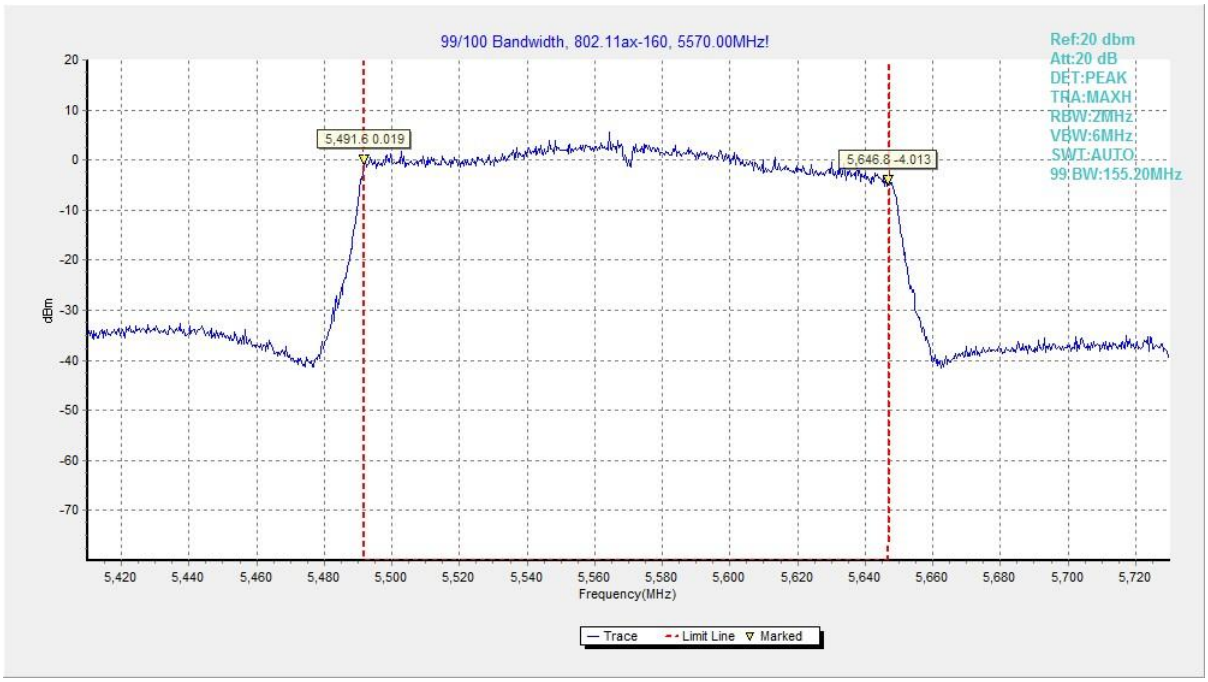


Fig. 52 99% Occupied Bandwidth (802. 11ax-HE160, 5570MHz)

A.7. Band Edges Compliance

Measurement Limit:

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

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180MHz (CH36)	Fig.53	**P**
	5320MHz (CH64)	Fig.54	**P**
	5500MHz (CH100)	Fig.55	**P**
	5700MHz (CH140)	Fig.56	**P**
	5745MHz (CH149)	Fig.57	**P**
	5825MHz (CH165)	Fig.58	**P**
802.11n-HT40	5190MHz (CH38)	Fig.59	**P**
	5310MHz (CH62)	Fig.60	**P**
	5510MHz (CH102)	Fig.61	**P**
	5670MHz (CH134)	Fig.62	**P**
	5755MHz (CH151)	Fig.63	**P**
	5795MHz (CH159)	Fig.64	**P**
802.11ax-HE80	5210MHz (CH42)	Fig.65	**P**
	5290MHz (CH58)	Fig.66	**P**
	5610MHz (Ch122)	Fig.67	**P**
	5775MHz (CH155)	Fig.68	**P**
802.11ax-HE160	5250MHz (Ch50)	Fig.69	**P**
	5570MHz (CH114)	Fig.70	**P**

Conclusion: PASS

Test graphs as below:

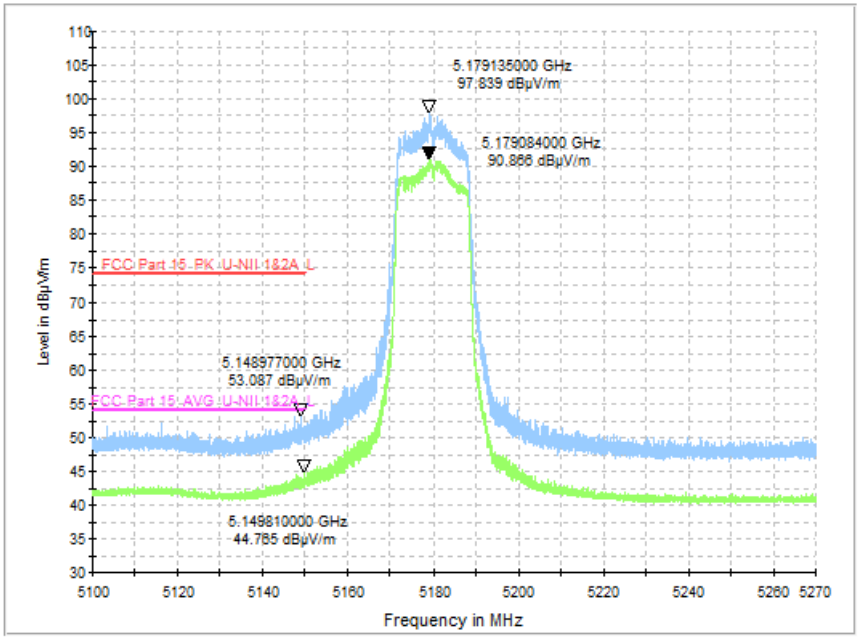


Fig. 53 Band Edges (802.11a, CH36 5180MHz)

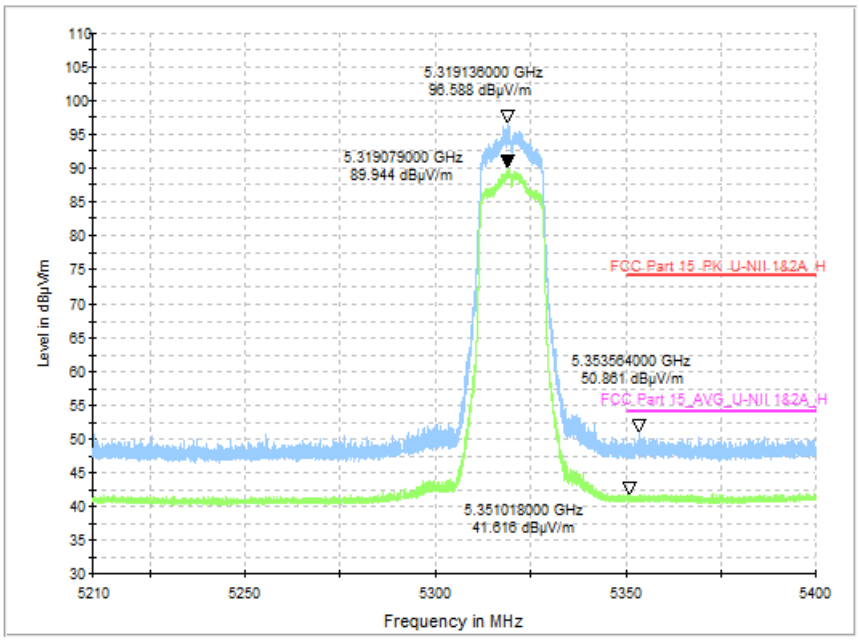


Fig. 54 Band Edges (802.11a, CH64 5320MHz)

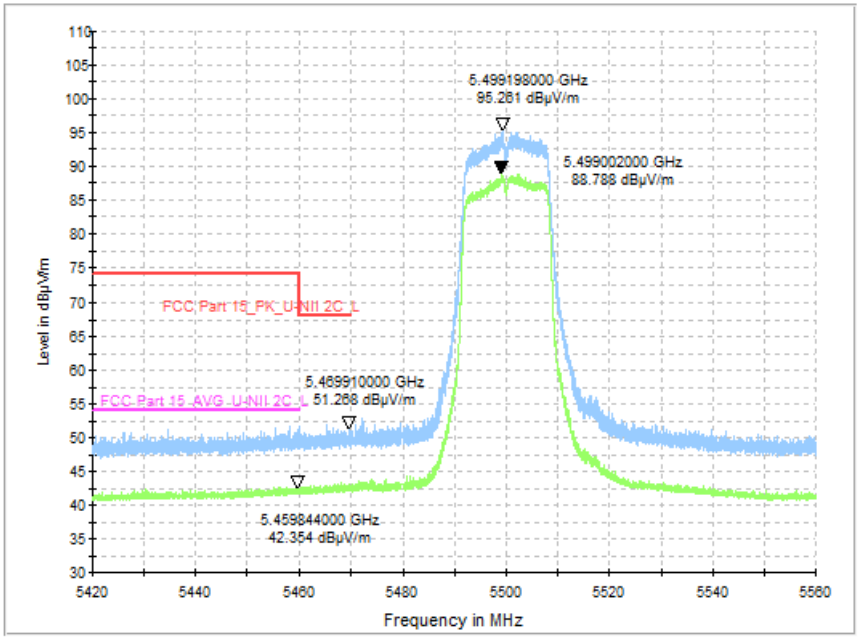


Fig. 55 Band Edges (802.11a, CH100 5500MHz)

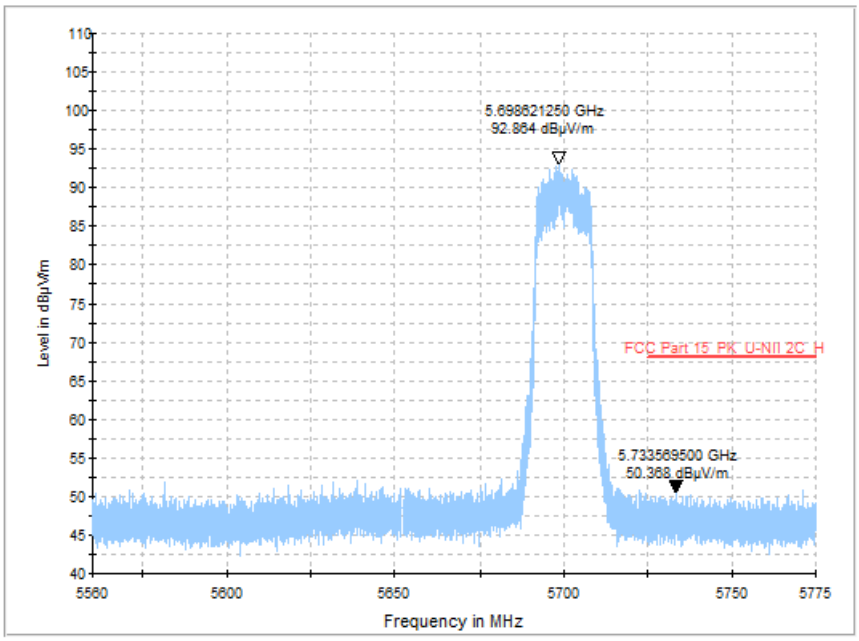


Fig. 56 Band Edges (802.11a, CH140 5700MHz)

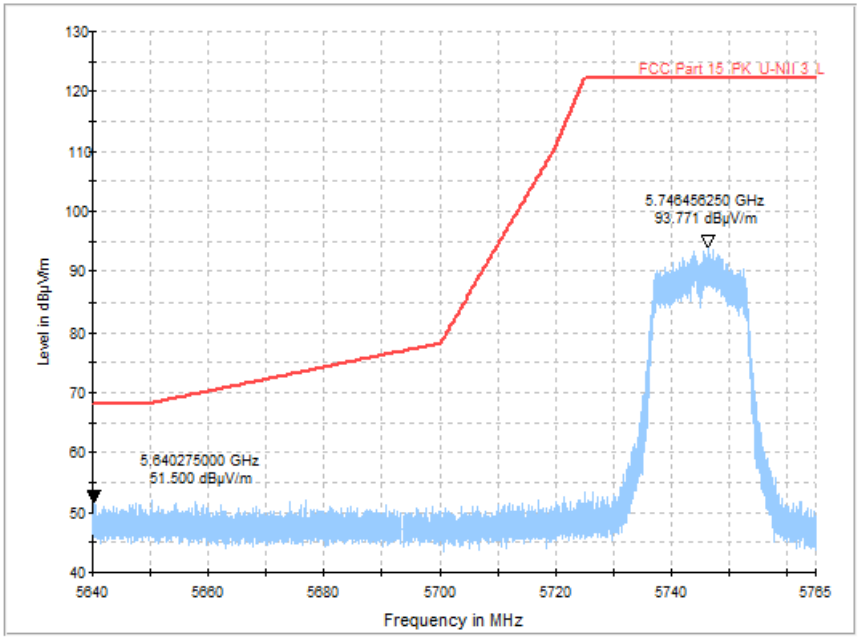


Fig. 57 Band Edges (802.11a, CH149 5745MHz)

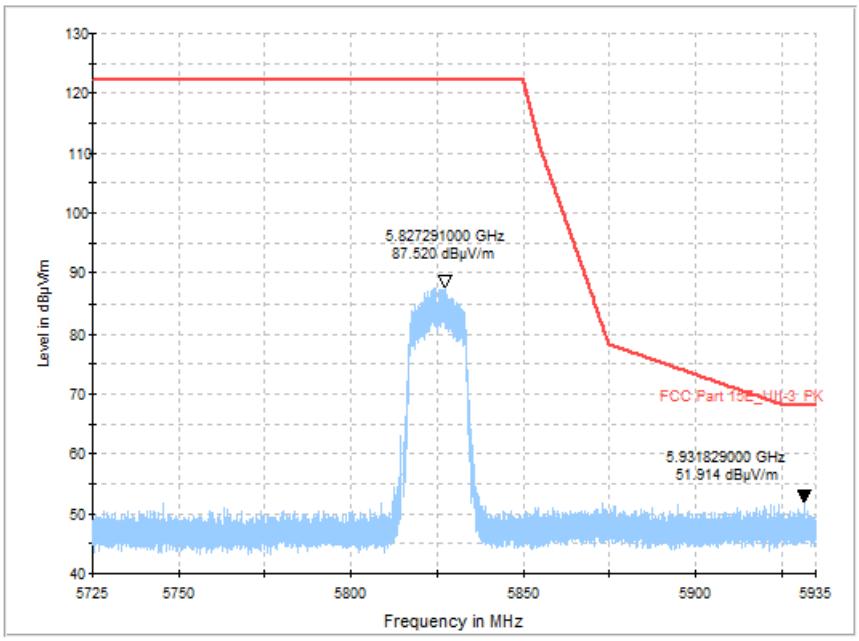


Fig. 58 Band Edges (802.11a, CH165 5825MHz)

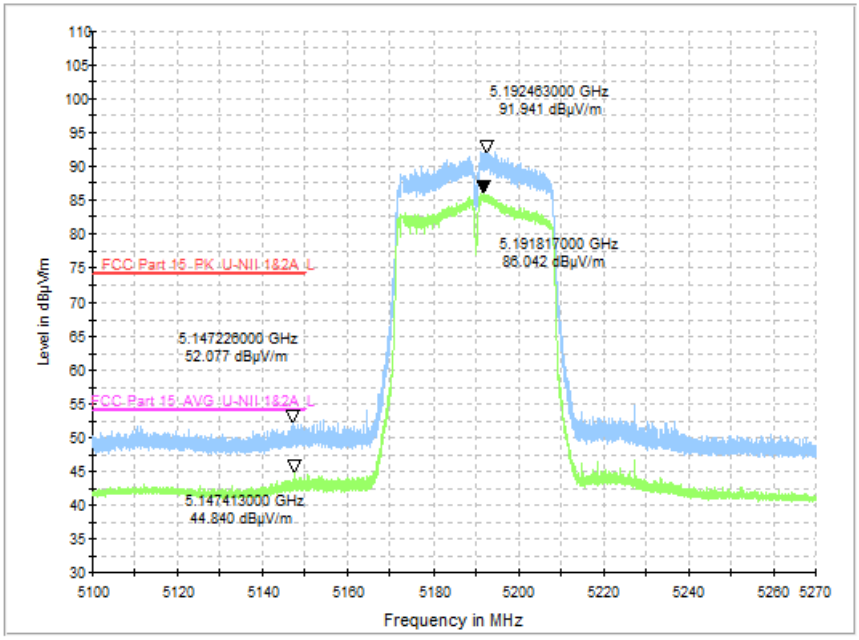


Fig. 59 Band Edges (802.11n-HT40, CH38 5190MHz)

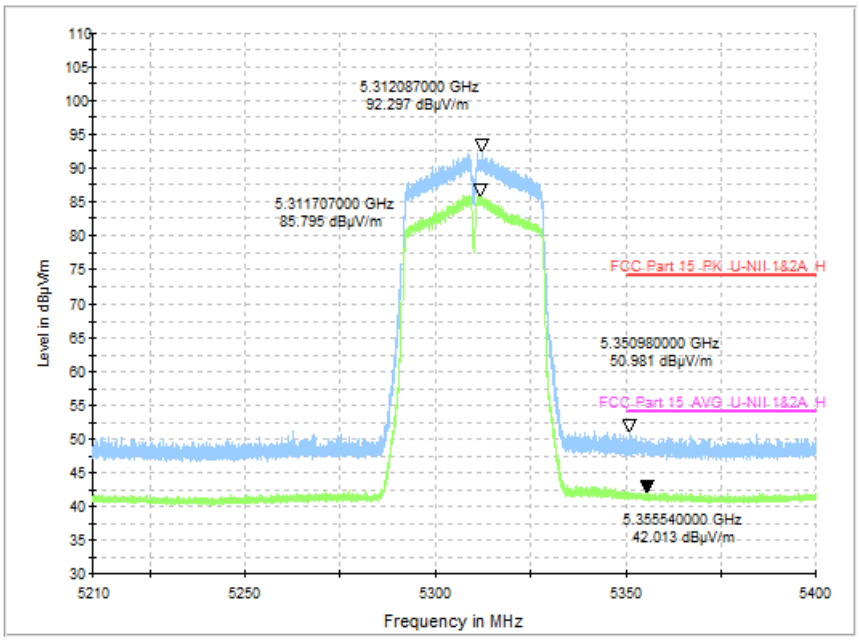


Fig. 60 Band Edges (802.11n-HT40, CH62 5310MHz)

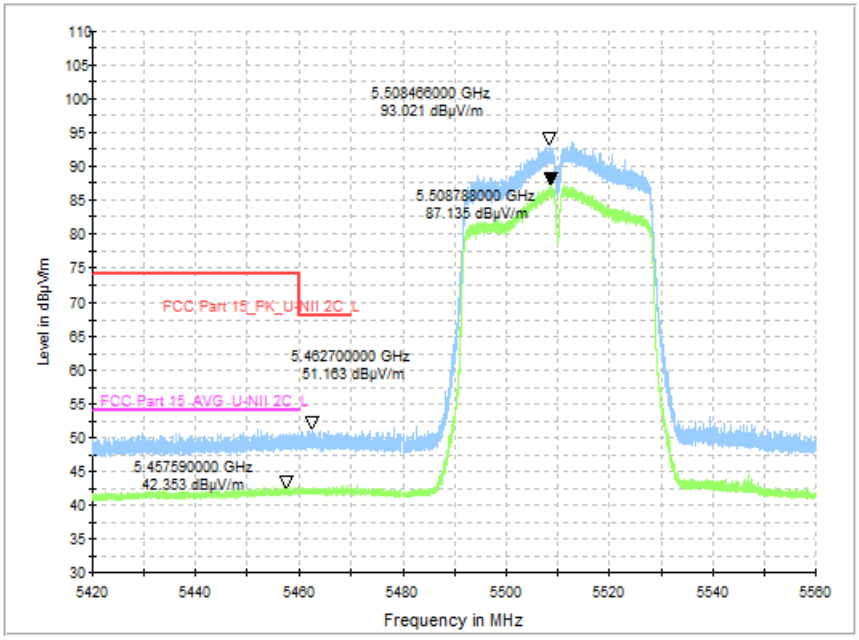


Fig. 61 Band Edges (802.11n-HT40, CH102 5510MHz)

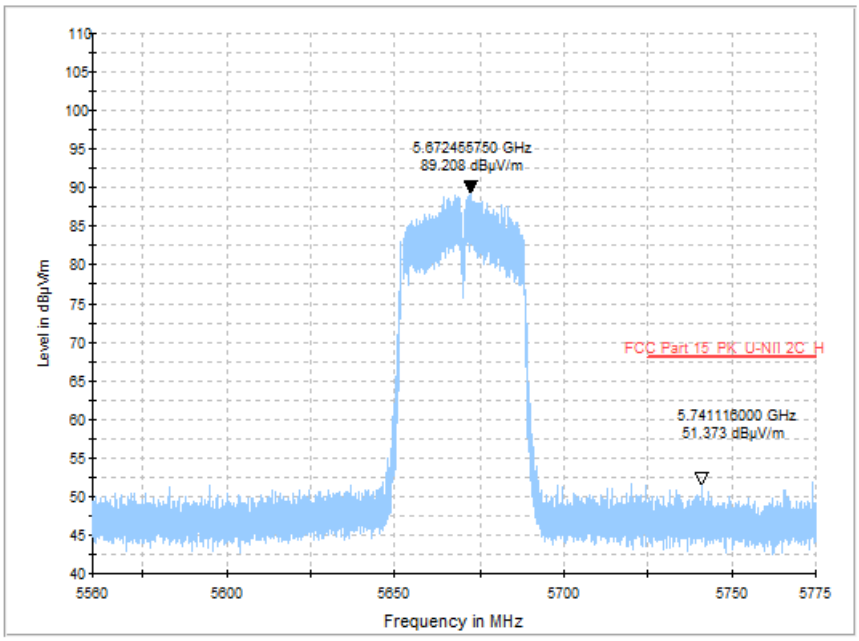


Fig. 62 Band Edges (802.11n-HT40, CH134 5670MHz)

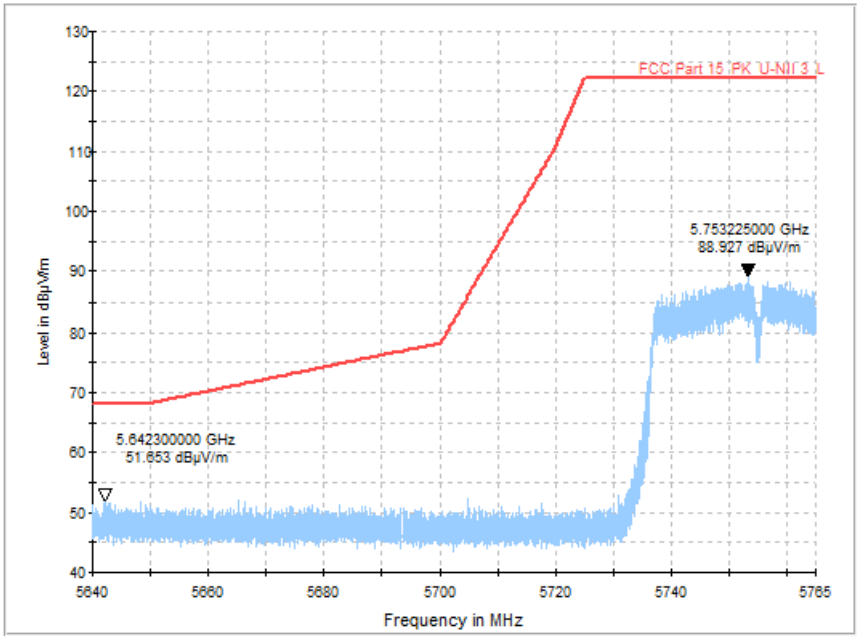


Fig. 63 Band Edges (802.11n-HT40, CH151 5755MHz)

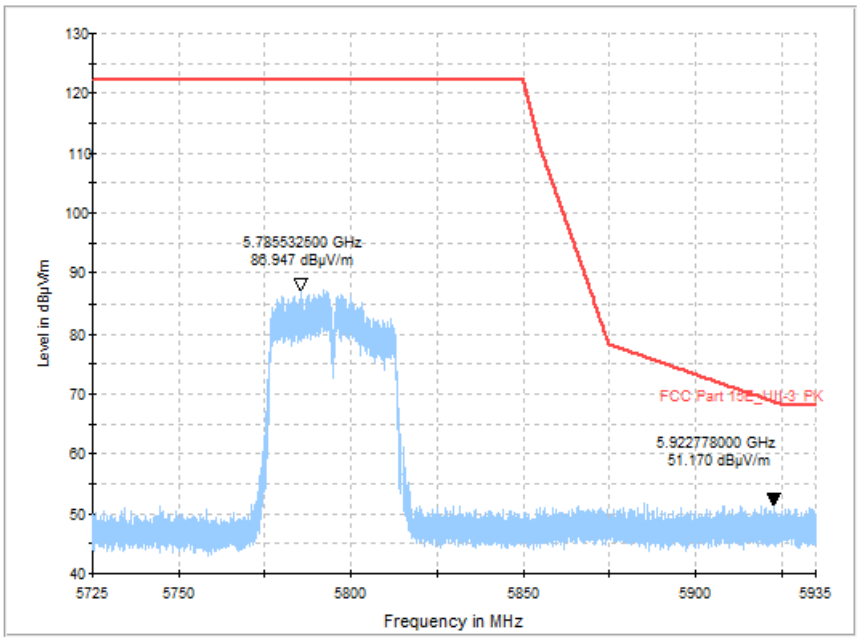


Fig. 64 Band Edges (802.11n-HT40, CH159 5795MHz)

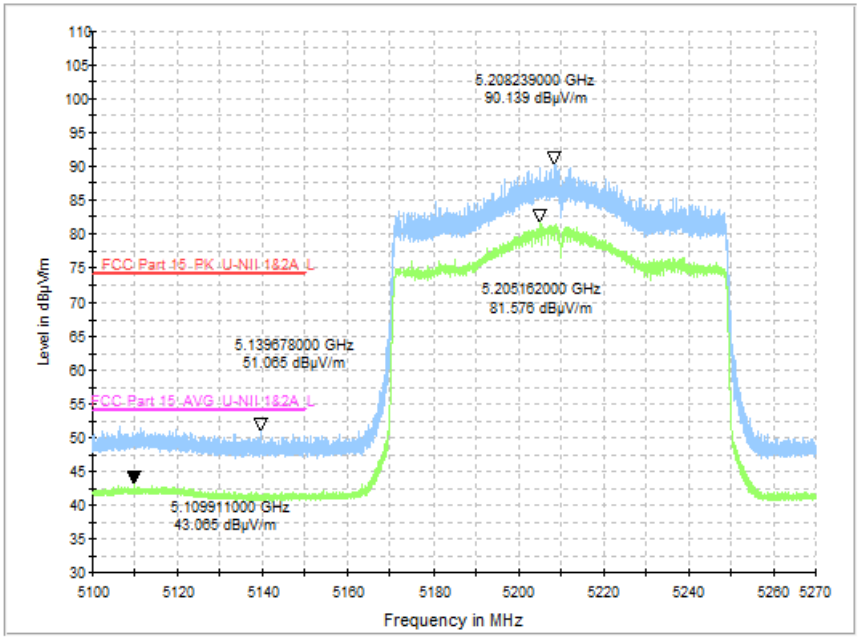


Fig. 65 Band Edges (802.11ax-HE80, CH42 5210MHz)

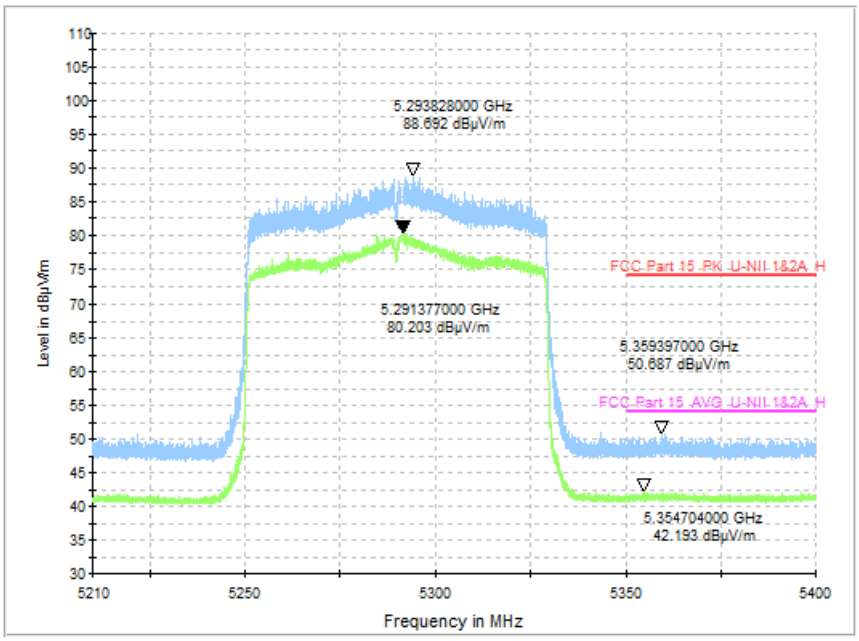


Fig. 66 Band Edges (802.11ax-HE80, CH58 5290MHz)

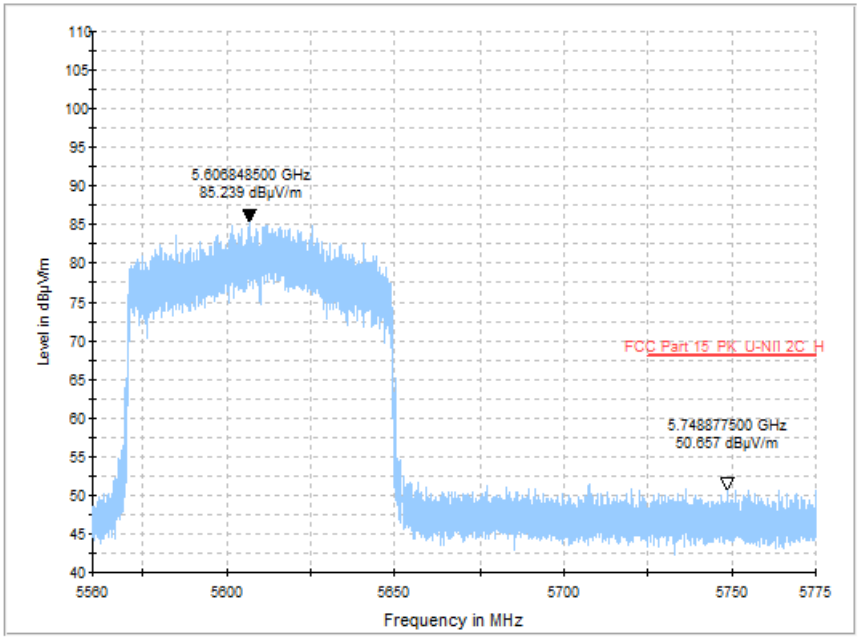


Fig. 67 Band Edges (802.11ax-HE80, CH122 5610MHz)

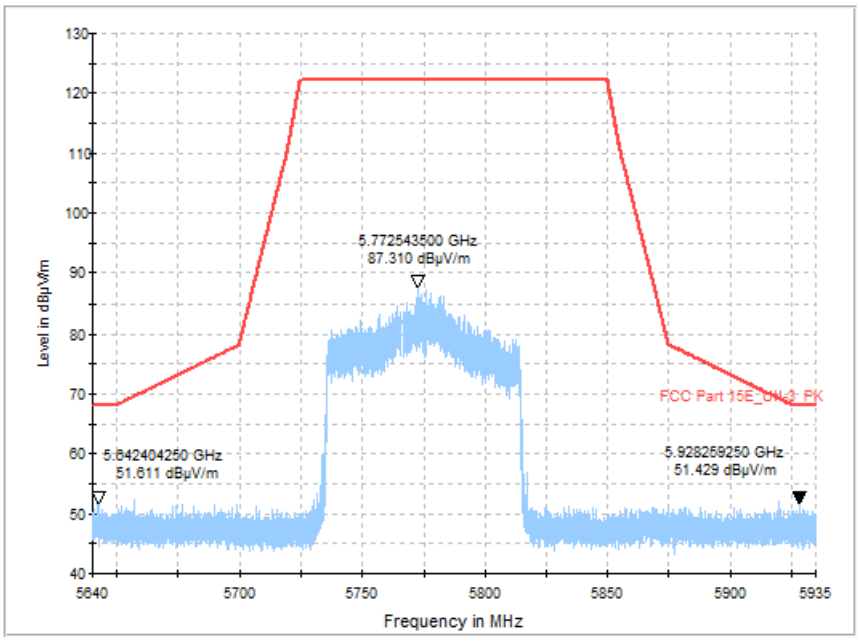


Fig. 68 Band Edges (802.11ax-HE80, CH155 5775MHz)

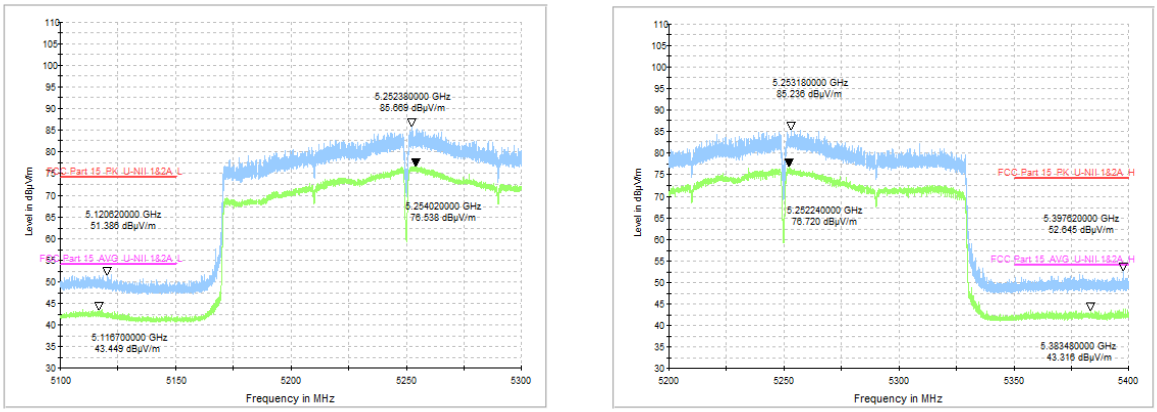


Fig. 69 Band Edges (802.11ax-HE160, CH50 5250MHz)

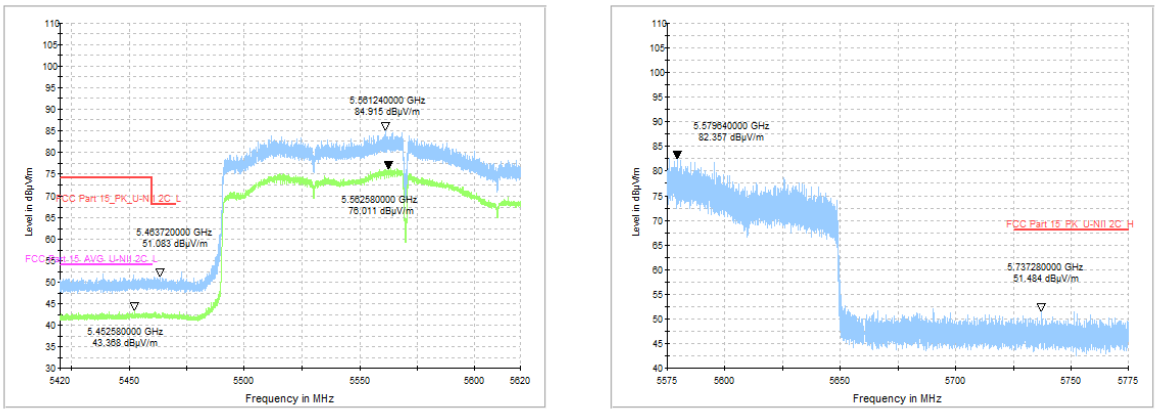


Fig. 70 Band Edges (802.11ax-HE160, CH114 5570MHz)

A.8. Transmitter Spurious Emission

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

The measurement is made according to KDB 789033.

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.

Measurement Result:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	5180MHz (Ch36)	1 GHz ~ 18 GHz	Fig.71	**P**
	5200MHz (Ch40)	1 GHz ~ 18 GHz	Fig.72	**P**
	5240MHz (Ch48)	1 GHz ~ 18 GHz	Fig.73	**P**
	5260MHz (Ch52)	1 GHz ~ 18 GHz	Fig.74	**P**
	5280MHz (Ch56)	1 GHz ~ 18 GHz	Fig.75	**P**
	5320MHz (Ch64)	1 GHz ~ 18 GHz	Fig.76	**P**
	5500MHz (Ch100)	1 GHz ~ 18 GHz	Fig.77	**P**
	5580MHz (Ch116)	1 GHz ~ 18 GHz	Fig.78	**P**
	5700MHz (Ch140)	1 GHz ~ 18 GHz	Fig.79	**P**
	5745MHz (Ch149)	1 GHz ~ 18 GHz	Fig.80	**P**
	5785MHz (Ch157)	1 GHz ~ 18 GHz	Fig.81	**P**
	5825MHz (Ch165)	1 GHz ~ 18 GHz	Fig.82	**P**
802.11n-HT40	5190MHz (Ch38)	1 GHz ~ 18 GHz	Fig.83	**P**
	5230MHz (Ch46)	1 GHz ~ 18 GHz	Fig.84	**P**
	5270MHz (Ch54)	1 GHz ~ 18 GHz	Fig.85	**P**
	5310MHz (Ch62)	1 GHz ~ 18 GHz	Fig.86	**P**
	5510MHz (Ch102)	1 GHz ~ 18 GHz	Fig.87	**P**
	5670MHz (Ch134)	1 GHz ~ 18 GHz	Fig.88	**P**
	5755MHz (Ch151)	1 GHz ~ 18 GHz	Fig.89	**P**

	5795MHz (Ch159)	1 GHz ~ 18 GHz	Fig.90	**P**
802.11ax-VHT80	5210MHz (Ch42)	1 GHz ~ 18 GHz	Fig.91	**P**
	5290MHz (Ch58)	1 GHz ~ 18 GHz	Fig.92	**P**
	5610MHz (Ch122)	1 GHz ~ 18 GHz	Fig.93	**P**
	5775MHz (Ch155)	1 GHz ~ 18 GHz	Fig.94	**P**
802.11ax-HE80	5250MHz (Ch50)	1 GHz ~ 18 GHz	Fig.95	**P**
	5570MHz (Ch114)	1 GHz ~ 18 GHz	Fig.96	**P**
All channels		30MHz ~ 1GHz	Fig.97	**P**
		18GHz ~ 26.5GHz	Fig.98	**P**
		26.5GHz ~ 40GHz	Fig.99	**P**

Conclusion: PASS

Test graphs as below:

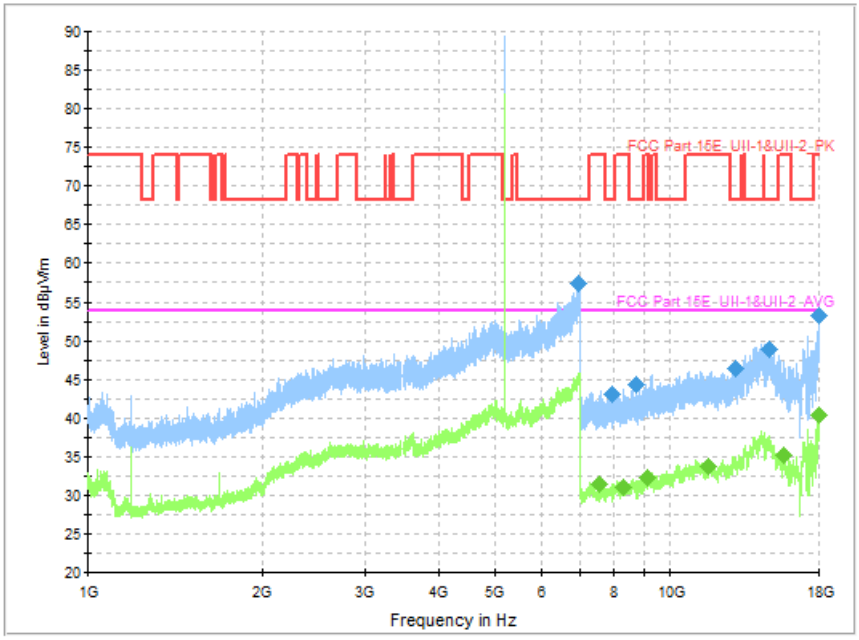


Fig. 71 Transmitter Spurious Emission (802.11a, CH36 5180MHz)

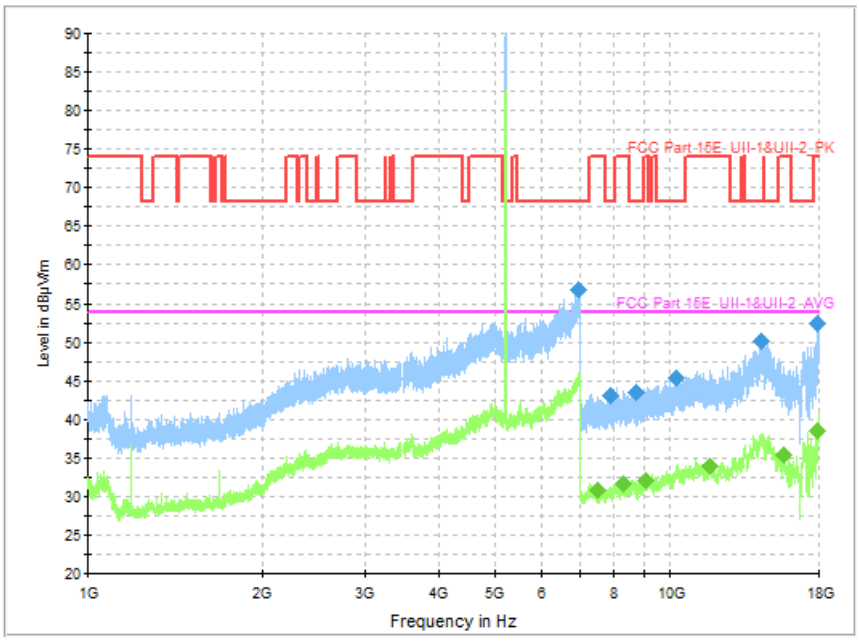


Fig. 72 Transmitter Spurious Emission (802.11a, CH40 5200MHz)

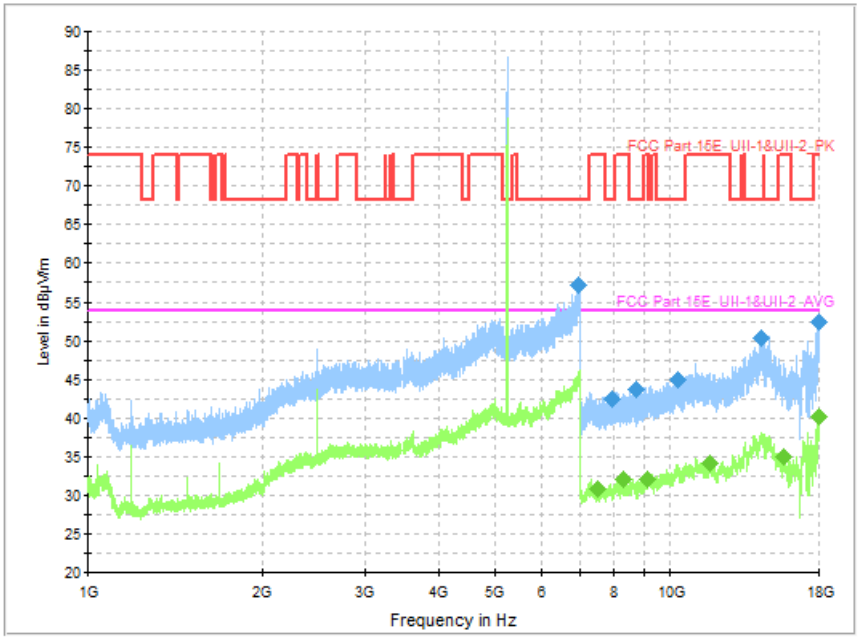


Fig. 73 Transmitter Spurious Emission (802.11a, CH48 5240MHz)

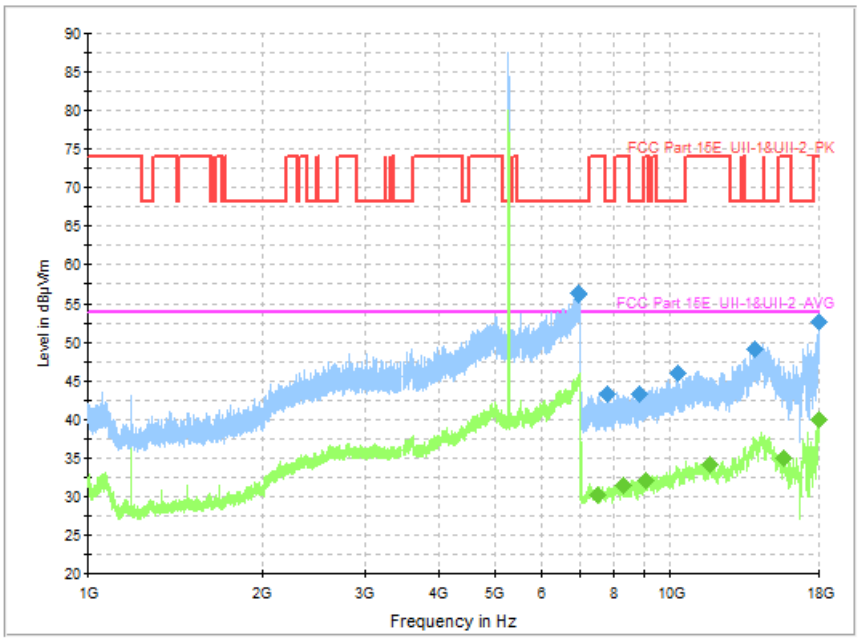


Fig. 74 Transmitter Spurious Emission (802.11a, CH52 5260MHz)

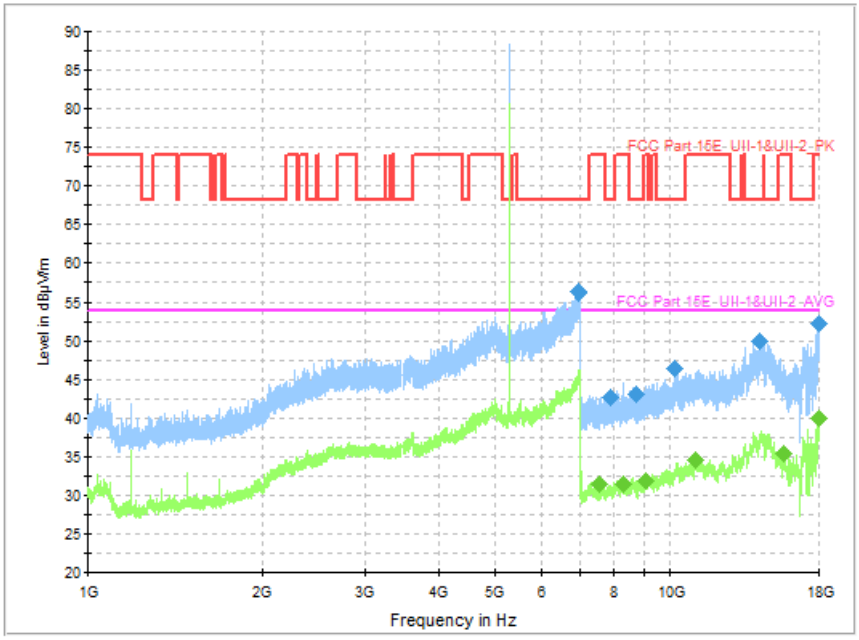


Fig. 75 Transmitter Spurious Emission (802.11a, CH56 5280MHz)

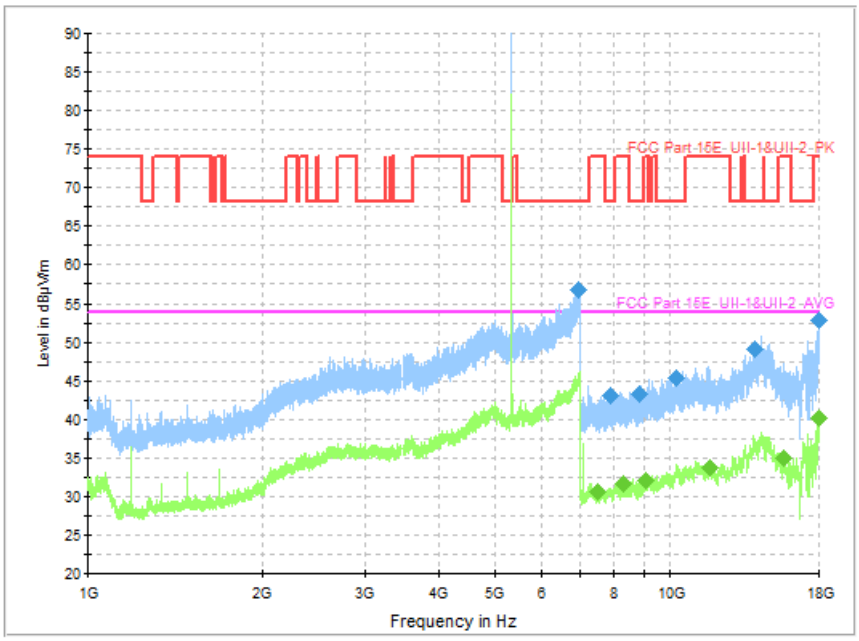


Fig. 76 Transmitter Spurious Emission (802.11a, CH64 5320MHz)

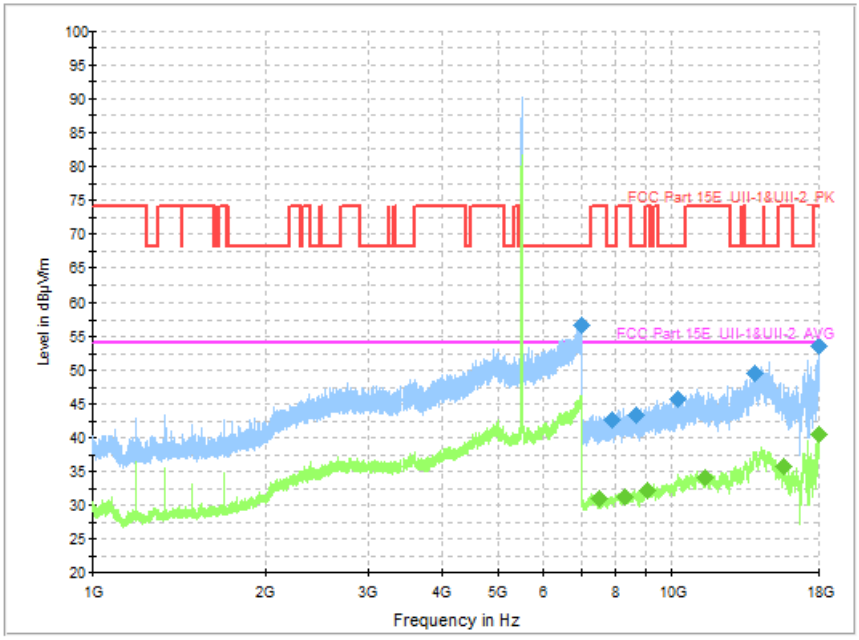


Fig. 77 Transmitter Spurious Emission (802.11a, CH100 5500MHz)

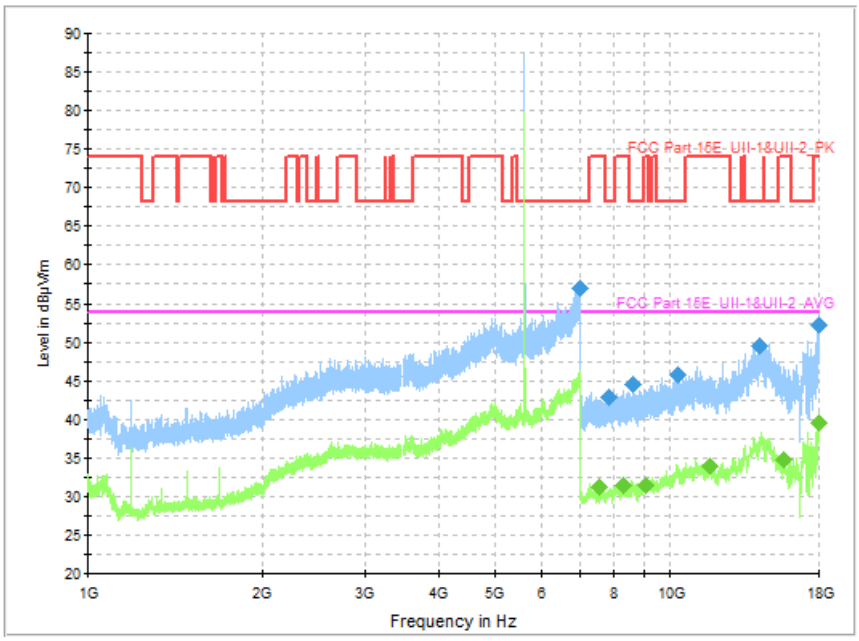


Fig. 78 Transmitter Spurious Emission (802.11a, CH116 5580MHz)

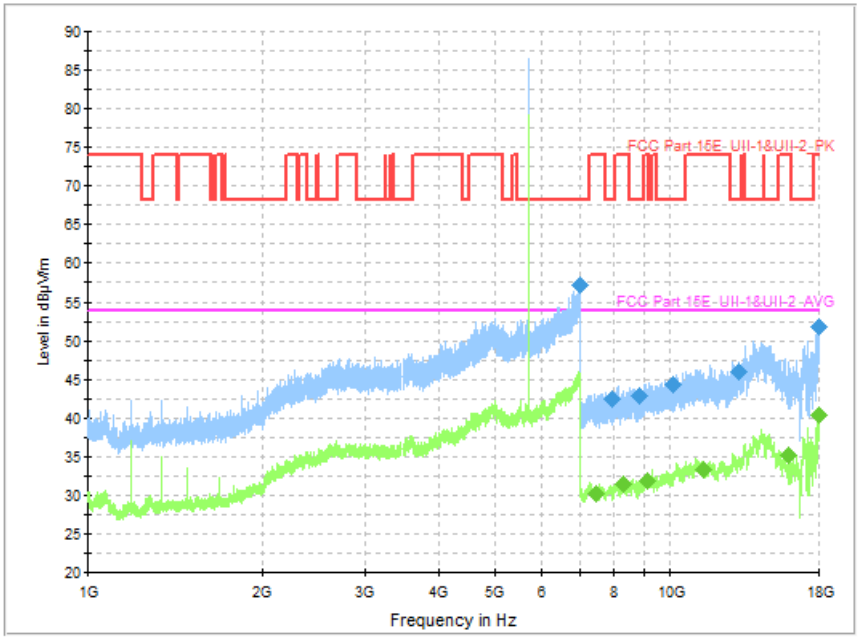


Fig. 79 Transmitter Spurious Emission (802.11a, CH140 5700MHz)

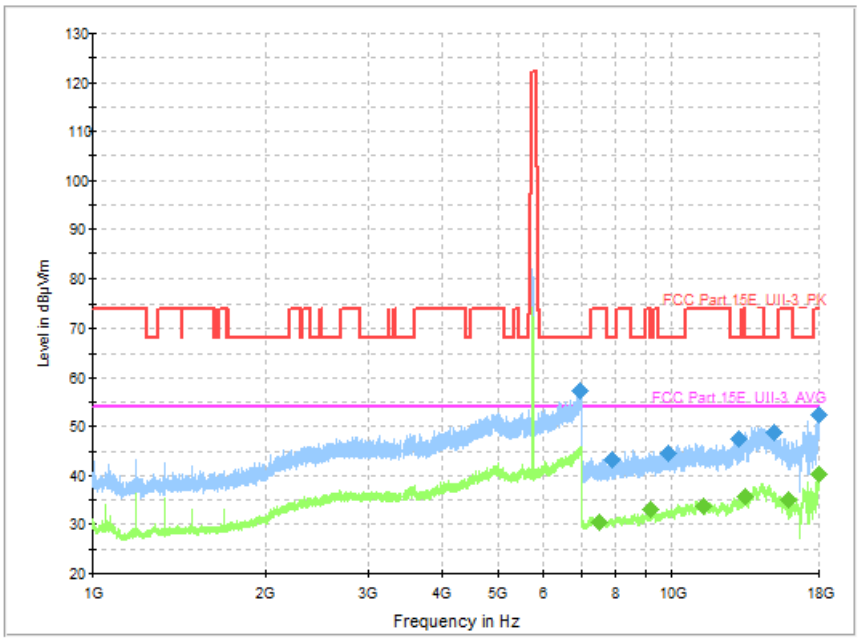


Fig. 80 Transmitter Spurious Emission (802. 11a, CH149 5745MHz)

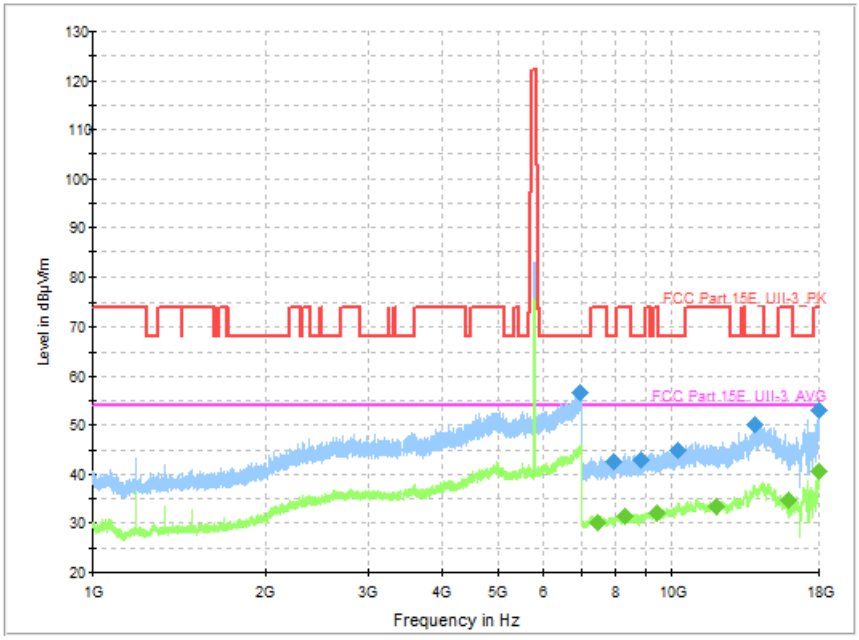


Fig. 81 Transmitter Spurious Emission (802. 11a, CH157 5785MHz)

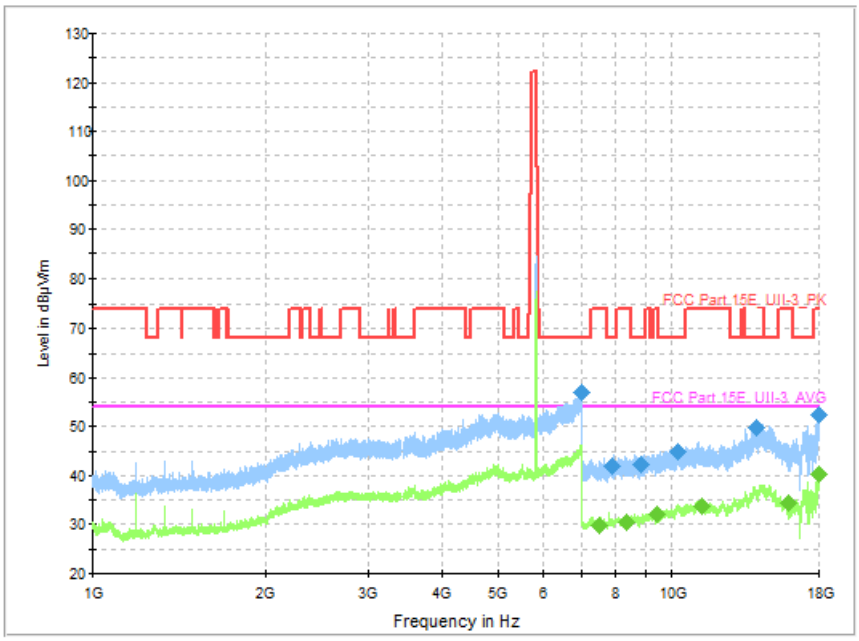


Fig. 82 Transmitter Spurious Emission (802. 11a, CH165 5825MHz)

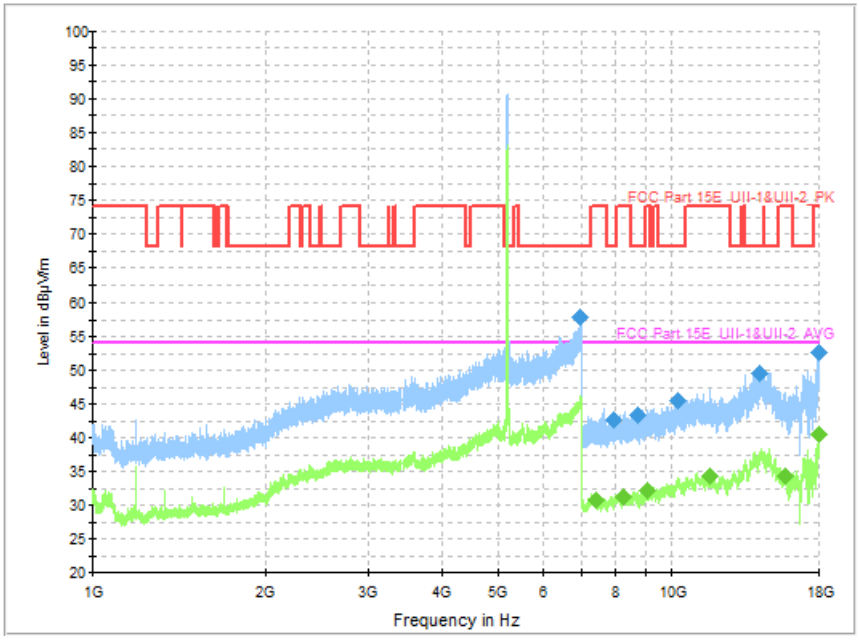


Fig. 83 Transmitter Spurious Emission (802.11n-HT40, CH38 5190MHz)

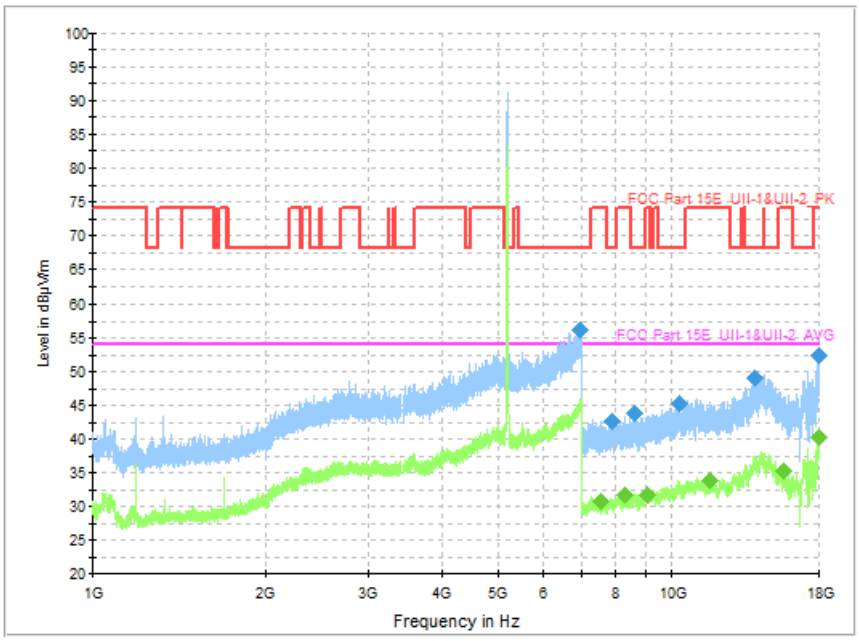


Fig. 84 Transmitter Spurious Emission (802.11n-HT40, CH46 5230MHz)

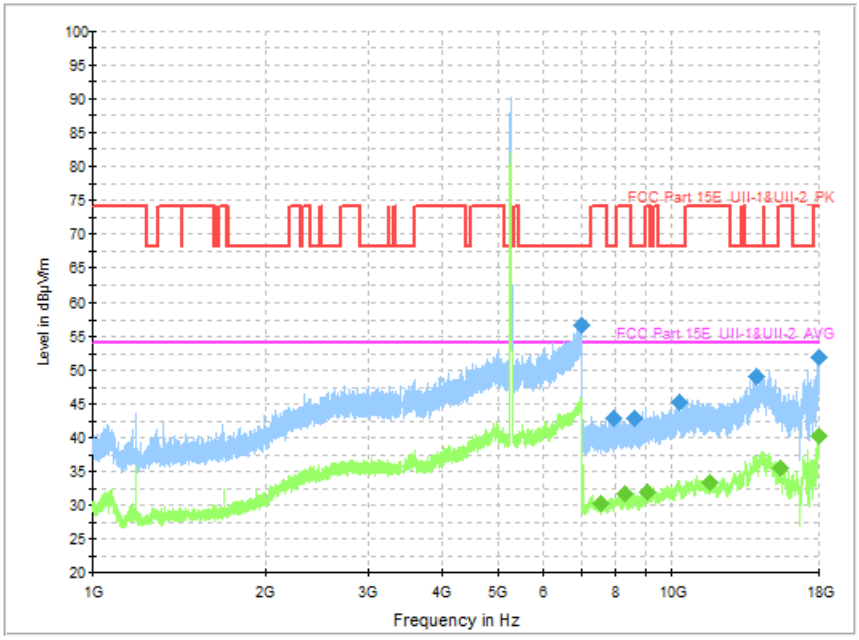


Fig. 85 Transmitter Spurious Emission (802.11n-HT40, CH54 5270MHz)

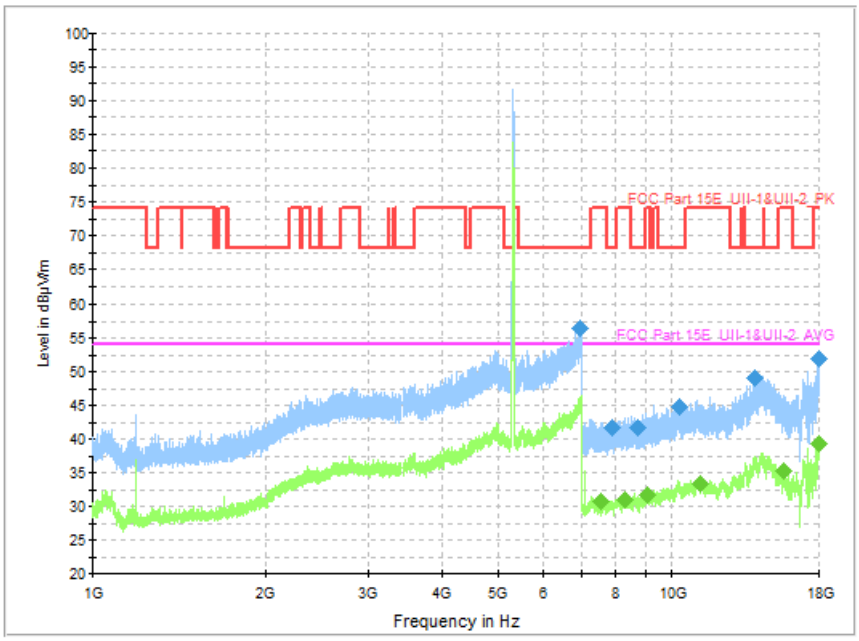


Fig. 86 Transmitter Spurious Emission (802.11n-HT40, CH62 5310MHz)

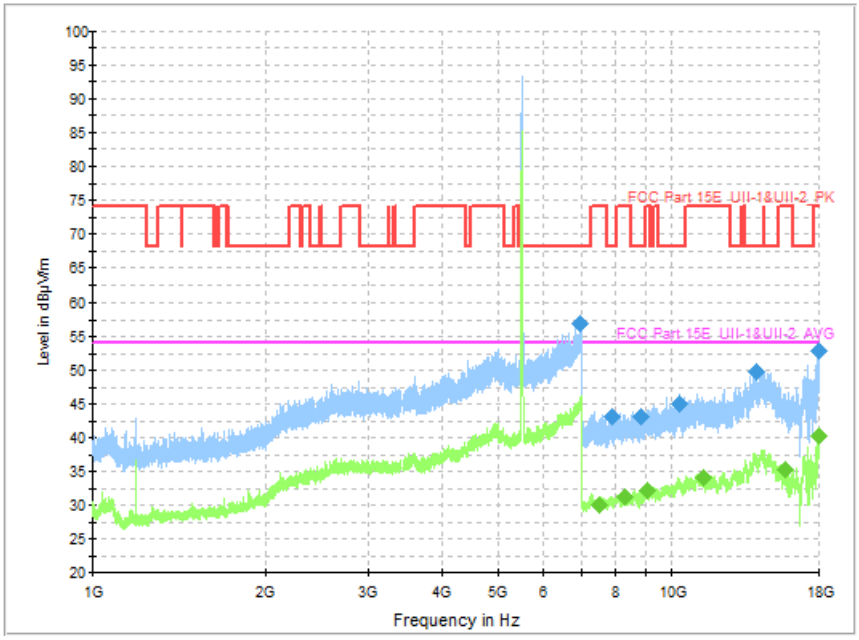


Fig. 87 Transmitter Spurious Emission (802.11n-HT40, CH102 5510MHz)

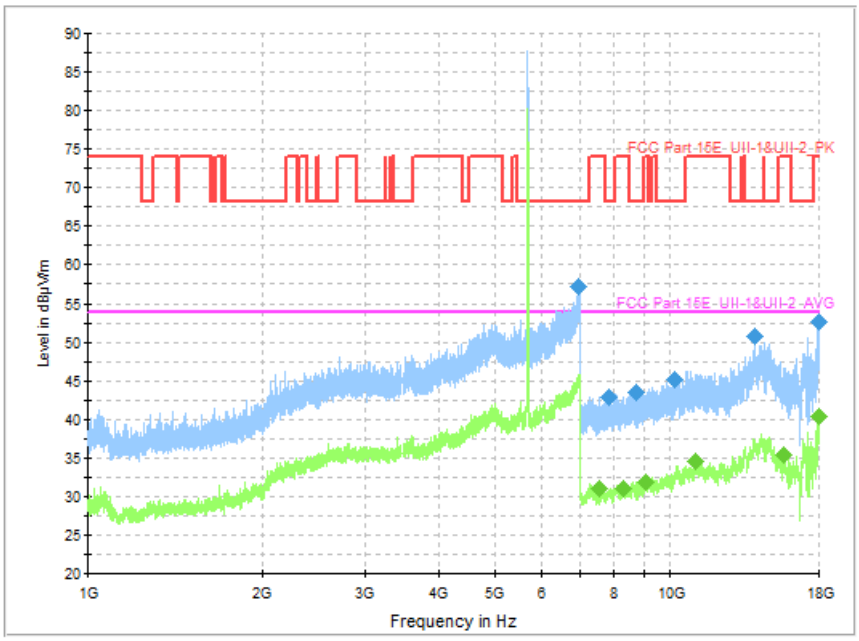


Fig. 88 Transmitter Spurious Emission (802.11n-HT40, CH134 5670MHz)

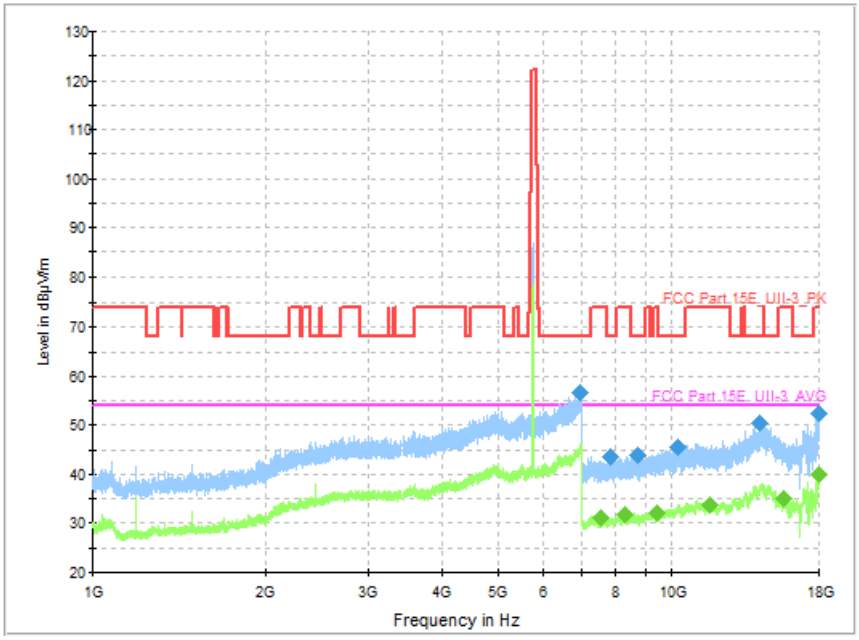


Fig. 89 Transmitter Spurious Emission (802. 11n-HT40, CH151 5755MHz)

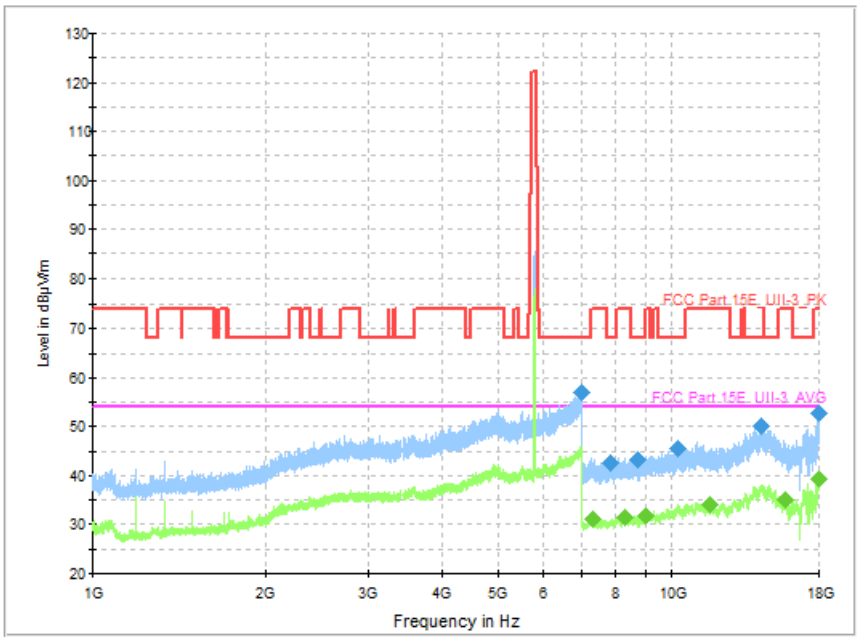


Fig. 90 Transmitter Spurious Emission (802. 11n-HT40, CH159 5795MHz)

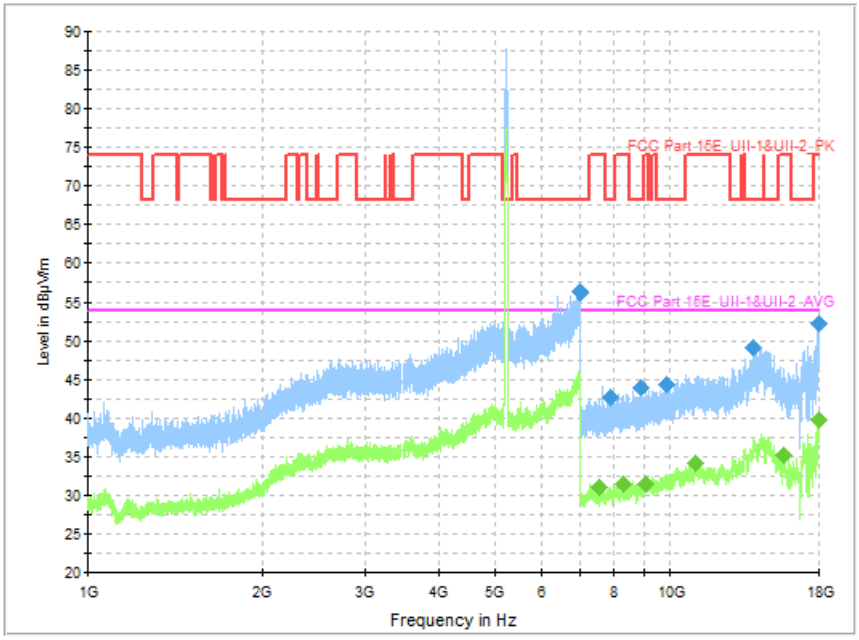


Fig. 91 Transmitter Spurious Emission (802. 11ax-HE80, CH42 5210MHz)

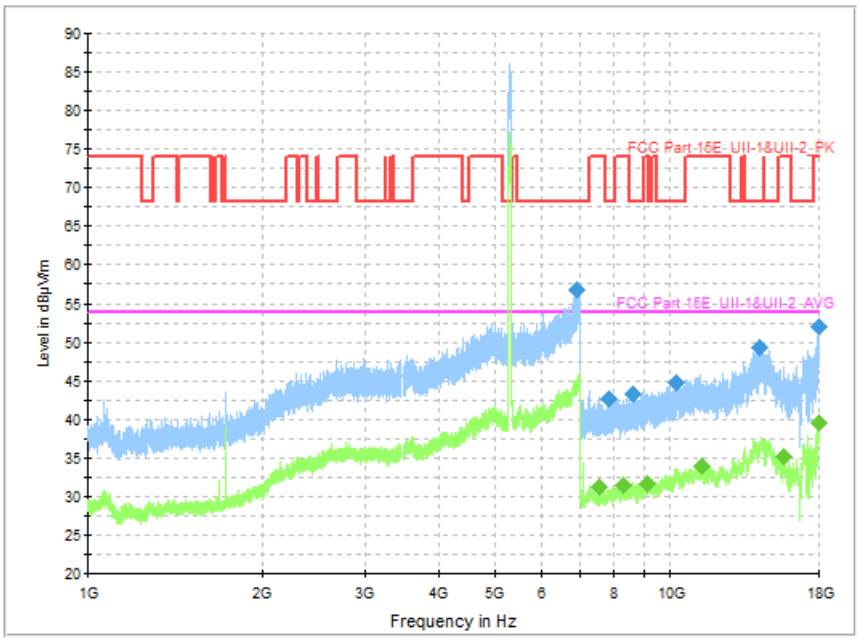


Fig. 92 Transmitter Spurious Emission (802. 11ax-HE80, CH58 5290MHz)

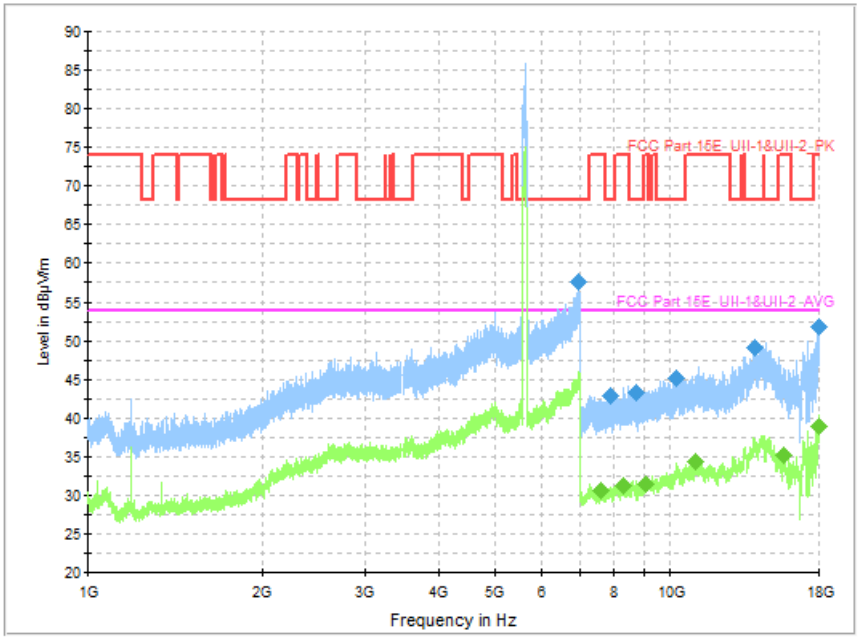


Fig. 93 Transmitter Spurious Emission (802. 11ax-HE80, CH122 5610MHz)

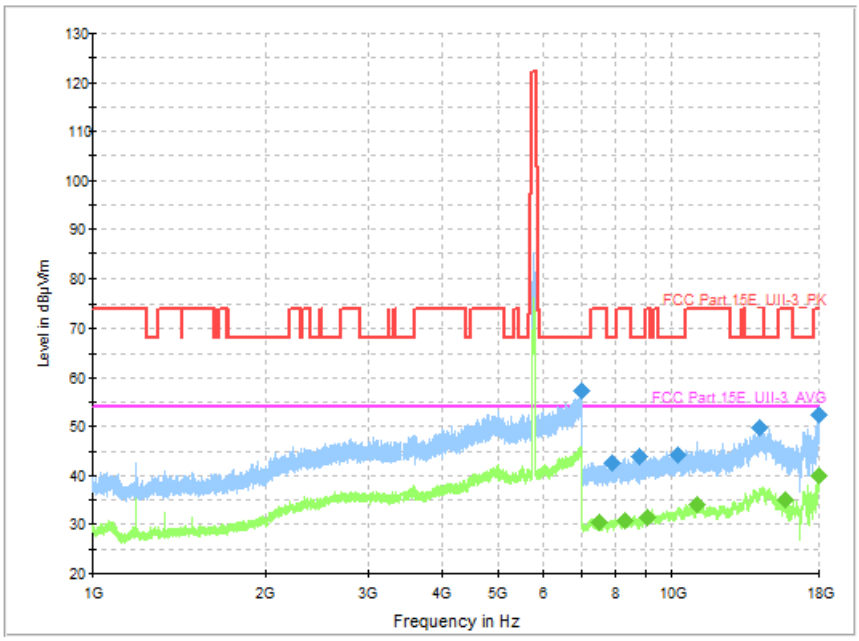


Fig. 94 Transmitter Spurious Emission (802. 11ax-HE80, CH155 5775MHz)

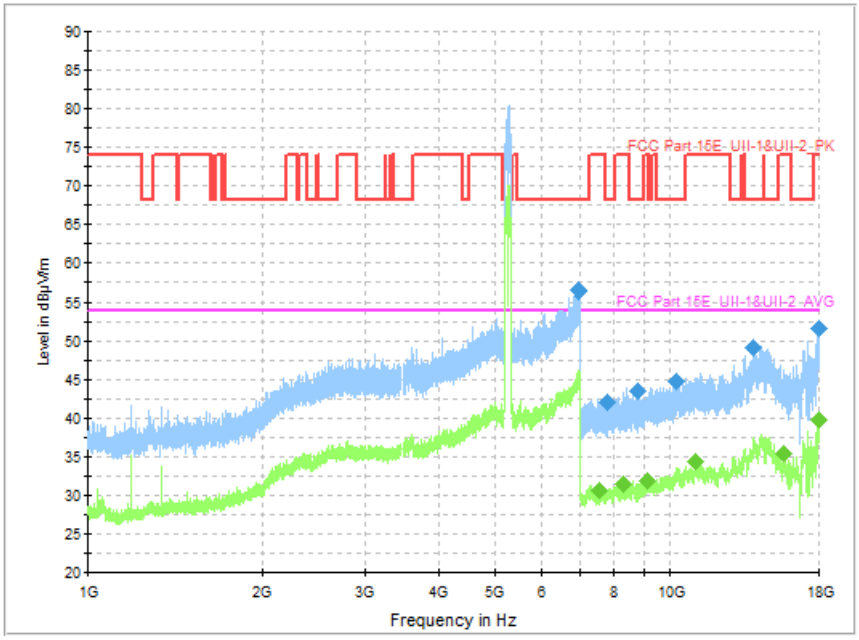


Fig. 95 Transmitter Spurious Emission (802. 11ax-HE160, CH50 5250MHz)

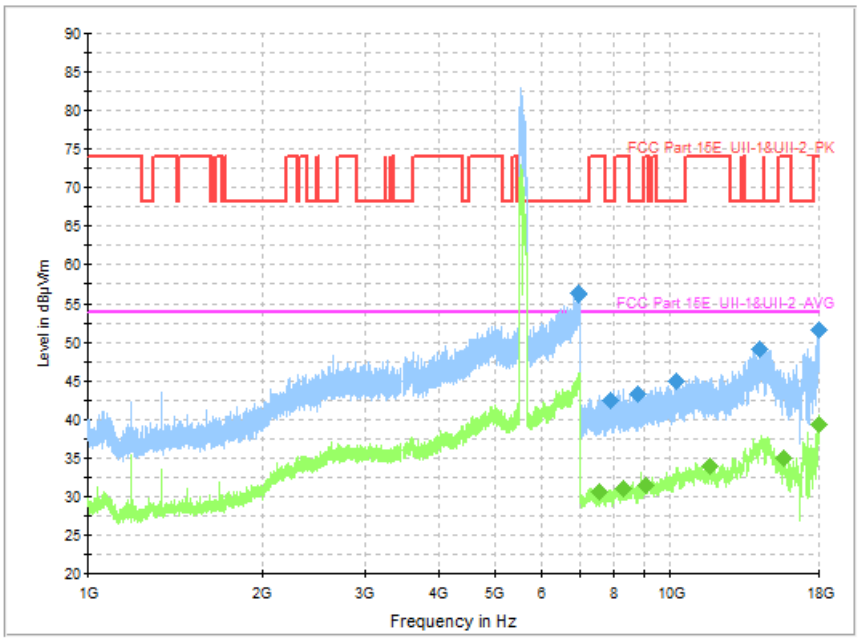


Fig. 96 Transmitter Spurious Emission (802. 11ax-HE160, CH114 5570MHz)

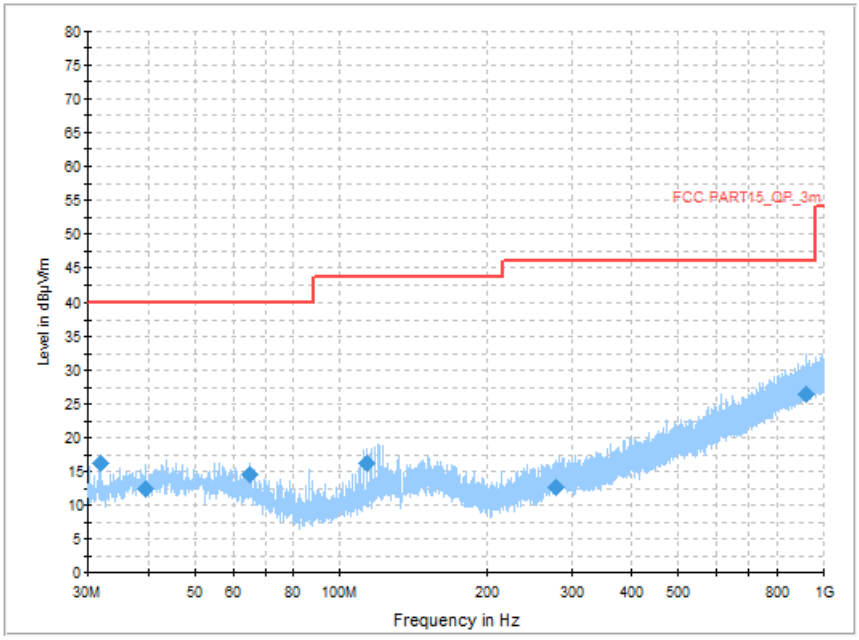


Fig. 97 Transmitter Spurious Emission (All channel, 30MHz~1GHz)

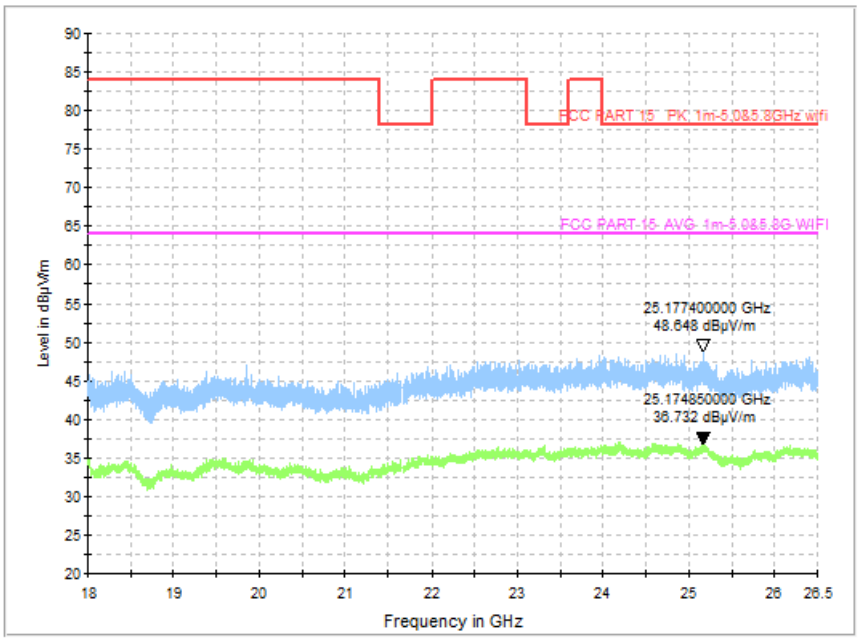


Fig. 98 Transmitter Spurious Emission (All channel, 18GHz~26.5GHz)

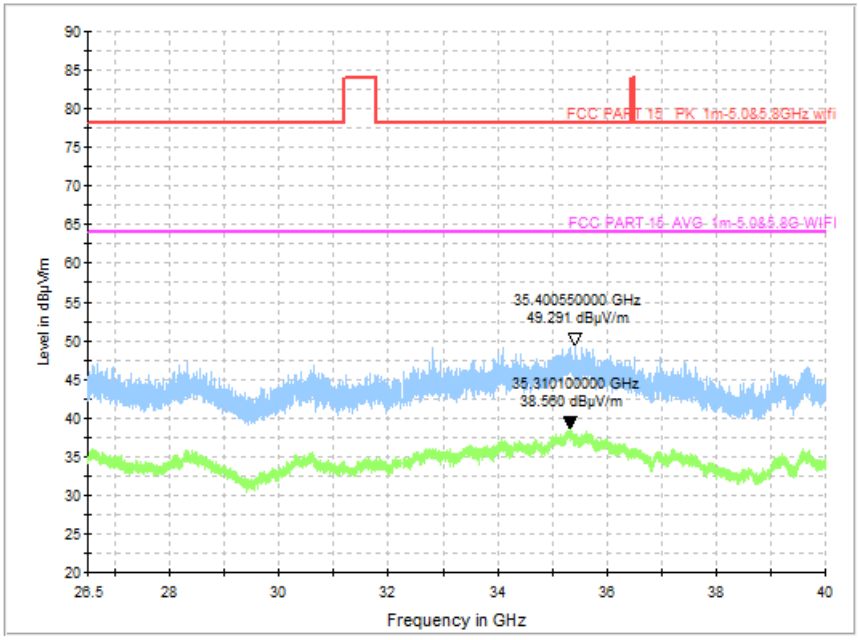


Fig. 99 Transmitter Spurious Emission (All channel, 26.5GHz~40GHz)

Worst Case Result

802.11a CH140

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
6979.900000	57.15	68.20	11.05	H	21.18
7926.700000	42.58	68.20	25.62	H	-1.97
8808.700000	42.90	68.20	25.30	V	-1.63
10104.400000	44.47	68.20	23.73	H	-0.24
13072.000000	46.08	68.20	22.12	H	2.60
17980.800000	51.95	74.00	22.05	V	13.21

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7445.500000	30.23	54.00	23.77	V	-2.27
8311.900000	31.43	54.00	22.57	H	-2.11
9139.000000	31.83	54.00	22.17	V	-1.45
11397.400000	33.39	54.00	20.61	V	1.41
15915.100000	35.22	54.00	18.78	V	2.42
17980.800000	40.33	54.00	13.67	V	13.21

802.11n-HT40 CH134

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
6936.100000	57.02	68.20	11.18	V	20.77
7851.100000	42.90	68.20	25.30	H	-2.44
8750.800000	43.57	68.20	24.63	V	-1.57
10164.100000	45.12	68.20	23.08	H	-0.13
13999.900000	50.90	68.20	17.30	V	4.91
17982.000000	52.76	74.00	21.24	H	13.19

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7557.400000	31.09	54.00	22.91	V	-2.18
8278.900000	31.09	54.00	22.91	H	-2.14
9070.300000	31.97	54.00	22.03	V	-1.42
11050.300000	34.54	54.00	19.46	V	1.70
15688.600000	35.41	54.00	18.59	H	2.84
17982.000000	40.40	54.00	13.60	H	13.19

802.11ax-HE80 CH155

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
6984.400000	57.29	68.20	10.91	V	21.11
7892.500000	42.53	68.20	25.67	H	-1.97
8767.600000	44.00	68.20	24.20	V	-1.59
10245.700000	44.34	68.20	23.86	H	0.74
14243.500000	49.69	68.20	18.51	H	5.78
17946.800000	52.45	74.00	21.55	V	13.55

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7495.900000	30.34	54.00	23.66	V	-2.33
8314.600000	30.87	54.00	23.13	H	-2.13
9080.500000	31.34	54.00	22.66	V	-1.39
11087.800000	34.13	54.00	19.87	H	1.46
15691.000000	35.04	54.00	18.96	H	2.85
17946.800000	39.85	54.00	14.15	V	13.55

802.11ax-HE160 CH50

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
6951.700000	56.53	68.20	11.67	H	20.86
7763.800000	42.14	68.20	26.06	H	-2.41
8768.800000	43.50	68.20	24.70	H	-1.59
10242.100000	44.81	68.20	23.39	V	0.69
13914.700000	49.19	68.20	19.01	V	4.97
17984.000000	51.76	74.00	22.24	V	13.16

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7542.100000	30.62	54.00	23.38	H	-2.18
8295.700000	31.56	54.00	22.44	V	-2.08
9106.000000	31.79	54.00	22.21	H	-1.37
11044.300000	34.32	54.00	19.68	H	1.71
15691.000000	35.40	54.00	18.60	V	2.85
17984.000000	39.87	54.00	14.13	V	13.16

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

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

The measurement is made according to KDB 789033.

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.100	**P**

Conclusion: PASS

Test graphs as below:

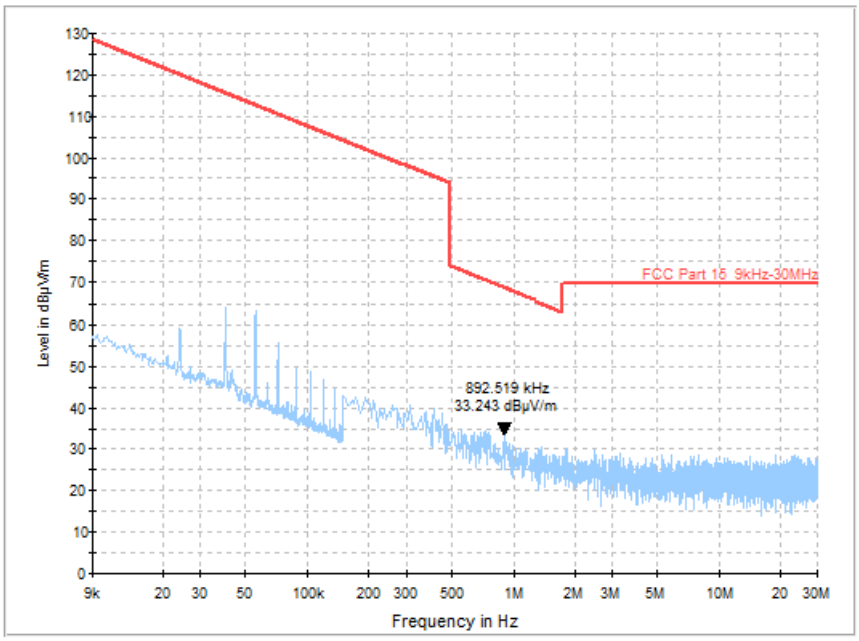


Fig. 100 Radiated Spurious Emission (All Channel, 9kHz ~ 30MHz)

A.10. AC Power Line Conducted Emission

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.101	Fig.102	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.101	Fig.102	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:

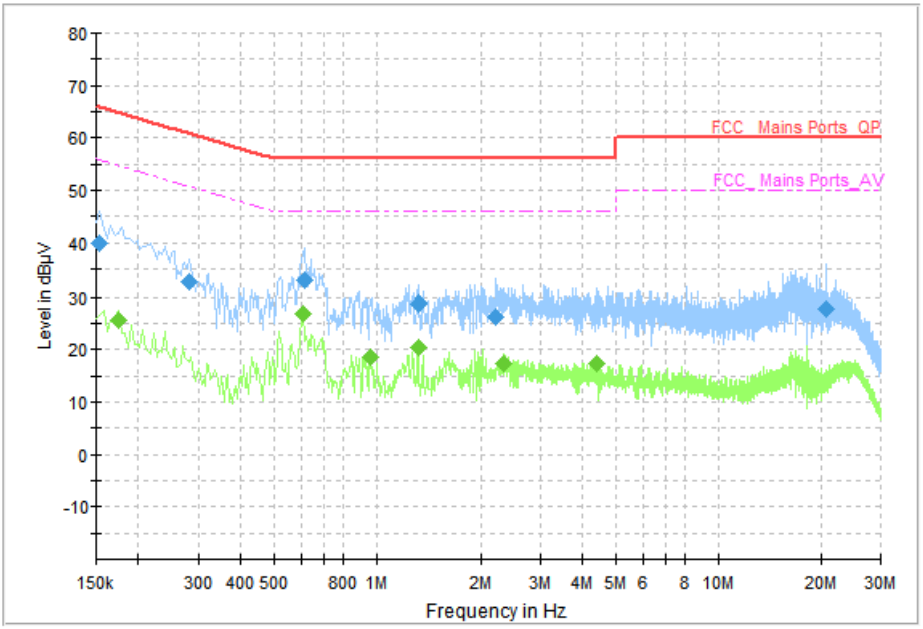


Fig. 101 AC Power line Conducted Emission (Traffic)

Measurement Result: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154000	40.09	65.78	25.69	N	ON	10
0.282000	32.50	60.76	28.26	L1	ON	10
0.614000	32.98	56.00	23.02	L1	ON	10
1.330000	28.48	56.00	27.52	L1	ON	10
2.226000	26.18	56.00	29.82	N	ON	10
20.762000	27.77	60.00	32.23	N	ON	11

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.174000	25.57	54.77	29.20	N	ON	10
0.606000	26.86	46.00	19.14	L1	ON	10
0.958000	18.46	46.00	27.54	L1	ON	10
1.326000	20.25	46.00	25.75	L1	ON	10
2.330000	17.31	46.00	28.69	L1	ON	10
4.414000	17.37	46.00	28.63	L1	ON	10

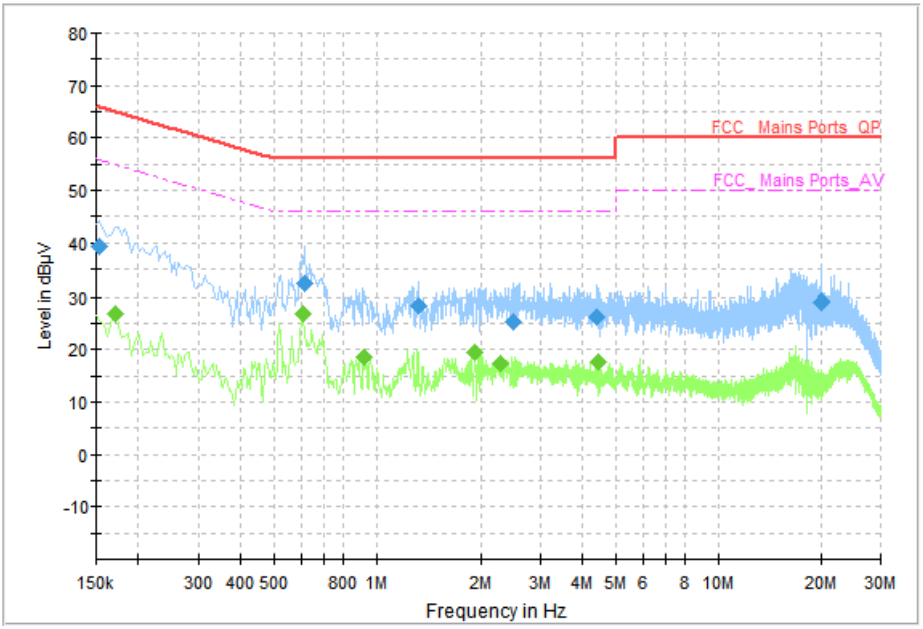


Fig. 102 AC Power line Conducted Emission (Idle)

Measurement Result: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154000	39.48	65.78	26.30	N	ON	10
0.618000	32.44	56.00	23.56	N	ON	10
1.330000	28.46	56.00	27.54	L1	ON	10
2.506000	25.39	56.00	30.61	L1	ON	10
4.382000	26.09	56.00	29.92	N	ON	10
20.098000	29.07	60.00	30.93	N	ON	11

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170000	26.87	54.96	28.09	N	ON	10
0.606000	26.86	46.00	19.14	L1	ON	10
0.918000	18.55	46.00	27.45	L1	ON	10
1.930000	19.42	46.00	26.58	L1	ON	10
2.282000	17.31	46.00	28.69	L1	ON	10
4.458000	17.63	46.00	28.37	L1	ON	10

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** ***