



TEST REPORT

No. I21N02633-RLAN

IDEMIA Identity and Security France

ID Screen US

Model Name: MPH-MB003C

with

Hardware Version: V01(M32N)

Software Version: IDEMIA_WM28_V01_210803

FCC ID: ZBW-MPHMB003C

Issued Date: 2021-09-22

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.

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1. Summary of Test Report

1.1. Test Items

| | |
|---------------------|-------------------------------------|
| Description | ID Screen US |
| Model Name | MPH-MB003C |
| Applicant's name | IDEMIA Identity and Security France |
| Manufacturer's Name | IDEMIA Identity and Security France |

1.2. Test Standards

FCC Part15-2019; ANSI C63.10-2013; KDB789033-V02r01

1.3. Test Result

Pass

1.4. Testing Location

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

1.5. Project data

| | |
|---------------------|------------|
| Testing Start Date: | 2020-05-07 |
| Testing End Date: | 2020-07-02 |

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: IDEMIA Identity and Security France
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92400 Courbevoie FRANCE
Contact Person: Christophe SUEUR
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Telephone: +33130201434
Fax: /

2.2. Manufacturer Information

Company Name: IDEMIA Identity and Security France
Address: IDEMIA Identity and Security France 2 place Samuel de Champlain
92400 Courbevoie FRANCE
Contact Person: Christophe SUEUR
E-Mail: christophe.sueur@idemia.com
Telephone: +33130201434
Fax: /



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

3.1. About EUT

| | |
|------------------------------|--|
| Description | ID Screen US |
| Model Name | MPH-MB003C |
| Brand Name | IDEMIA |
| RLAN Frequency Range | ISM Bands: 5150MHz~5250MHz; 5250MHz~5350MHz; 5470MHz~5725MHz; 5725MHz~5850MHz |
| RLAN Protocol | IEEE 802.11a,802.11n-HT20/40,802.11ac-VHT20/40/80 |
| Type of modulation | OFDM |
| Antenna Type | Integrated |
| Antenna Gain | 5150MHz~5350MHz: 1.79dBi 5470MHz~5725MHz: 2.85dBi 5725MHz~5850MHz: 2.52dBi |
| Power Supply | 3.85V DC by Battery |
| FCC ID | ZBW-MPHMB003C |
| Condition of EUT as received | No abnormality in appearance |

3.2. Internal Identification of EUT

| EUT ID* | IMEI | HW Version | SW Version | Receive Date |
|---------|-----------------|------------|------------|--------------|
| UT07aa | 354520110003828 | V01 (M16N) | V01 | 2020-04-21 |
| UT01aa | 354520110005740 | V01 (M16N) | V01 | 2020-04-16 |

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

3.3. Internal Identification of AE

| AE ID* | Description | AE ID* |
|--------|-------------|-------------------------|
| AE1 | Battery | / |
| AE2 | Charger | Aa01a,Aa02a |
| AE3 | Data Cable | Ca01a,Ca02a Cb01a,Cb02a |

AE1

| | |
|-----------------|-------------------------------------|
| Model | MPH-MB003A(178177093) |
| Manufacturer | Zhongshan Tianmao Battery Co., Ltd. |
| Capacity | 5000mAh19.25Wh |
| Nominal Voltage | 3.85V |

AE2

| | |
|--------------|---|
| Model | S008ACM0500200 |
| Manufacturer | Ten Pao Electronics (Huizhou) Co., Ltd. |

AE3

| | |
|--------------|-----------------------------------|
| Model | JWUB1454-M01 |
| Manufacturer | HUIZHOU JUWEI ELECTRONICS CO.,LTD |

*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 ID Screen US with integrated antenna and battery. It consists of normal options: Lithium Battery, Charger and USB Cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

According to the customer's description, MPH-MB003C is a variant product of MPH-MB003A/MPH-MB003B. All results were from the initial model. The initial model report number is I20N00956-RLAN.



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 |
| KDB789033 | 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 | Verdict |
|-----|-----------------------------|-----------------------|-----------|
| 0 | Maximum Output Power | 15.407(a) | P |
| 1 | Power Spectral Density | 15.407(a) | P |
| 2 | Occupied 26dB Bandwidth | 15.407(a) | / |
| 3 | Occupied 6dB Bandwidth | 15.407(e) | P |
| 4 | 99% Occupied Bandwidth | 15.407 | / |
| 5 | Band edge compliance | 15.407 | P |
| 6 | Radiated Spurious Emissions | 15.407 | P |
| 7 | AC Power line Conducted | 15.207 | P |
| 8 | Transmit Power Control | 15.407 | NA |

See **ANNEX A** for details.

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/matrix 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

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 | 2021-12-30 | 1 year |
| 2 | Bluetooth Tester | CBT32 | 100584 | Rohde & Schwarz | 2021-12-30 | 1 year |
| 3 | Power Sensor | U2021XA | MY55430013 | Agilent | 2022-01-13 | 1 year |
| 4 | Data Acquisiton | U2531A | TW55443507 | Agilent | / | / |

Radiated emission test system

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration Due date | Calibration Period |
|-----|-------------------|-----------------------|---------------|--------------|----------------------|--------------------|
| 1 | LISN | ESH2-Z5 | 100196 | R&S | 2022-01-01 | 1 year |
| 2 | Test Receiver | ESCI | 100701 | R&S | 2022-08-04 | 1 year |
| 3 | Loop Antenna | HLA6120 | 35779 | TESEQ | 2022-05-01 | 3 year |
| 4 | BiLog Antenna | VULB9163 | 9163 329 | Schwarzbeck | 2024-02-15 | 3 year |
| 5 | Horn Antenna | 3117 | 00066585 | ETS-Lindgren | 2022-03-04 | 3 year |
| 6 | Test Receiver | ESR7 | 101675 | R&S | 2022-07-16 | 1 year |
| 7 | Spectrum Analyzer | FSP 40 | 100378 | R&S | 2021-12-11 | 1 year |
| 8 | Chamber | FACT5-2.0 | 4166 | ETS-Lindgren | 2024-05-11 | 3 year |
| 9 | Antenna | QSH-SL-1 8-26-S-20 | 17013 | Q-par | 2024-01-13 | 3 year |
| 10 | Antenna | QSH-SL-2 6-40-K-20 | 17014 | Q-par | 2024-01-19 | 3 year |

Test software

| No. | Equipment | Manufacturer | Version |
|-----|------------------|-----------------|----------|
| 1 | TechMgr Software | CAICT | 2.1.1 |
| 2 | EMC32 | Rohde & Schwarz | 8.53.0 |
| 3 | EMC32 | Rohde & Schwarz | 10.01.00 |

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

Semi-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 | > 2MΩ |
| Ground system resistance | < 4 Ω |
| Normalised site attenuation (NSA) | < ±4 dB, 3 m distance, from 30 to 1000 MHz |

Shielded room

| | |
|--------------------------|--|
| Temperature | Min. = 15 °C, Max. = 35 °C |
| Relative humidity | Min. = 20 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz-1MHz> 60 dB; 1MHz-1000MHz>90 dB |
| Electrical insulation | > 2MΩ |
| Ground system resistance | < 4 Ω |

Fully-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 | > 2MΩ |
| Ground system resistance | < 4 Ω |
| 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

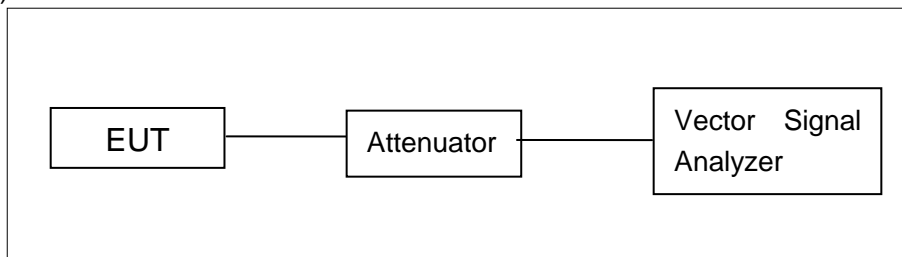
| Test Name | Uncertainty ($k=2$) | |
|--|--|--------|
| 1. RF Output Power - Conducted | 1.32dB | |
| 2. Power Spectral Density - Conducted | 2.32dB | |
| 3. Occupied channel bandwidth - Conducted | ±66Hz | |
| 4. Transmitter Spurious Emission - Conducted | $30\text{MHz} \leq f \leq 1\text{GHz}$ | 1.41dB |
| | $1\text{GHz} \leq f \leq 7\text{GHz}$ | 1.92dB |
| | $7\text{GHz} \leq f \leq 13\text{GHz}$ | 2.31dB |
| | $13\text{GHz} \leq f \leq 26\text{GHz}$ | 2.61dB |
| 5. Transmitter Spurious Emission - Radiated | $9\text{kHz} \leq f \leq 30\text{MHz}$ | 1.70dB |
| | $30\text{MHz} \leq f \leq 1\text{GHz}$ | 4.90dB |
| | $1\text{GHz} \leq f \leq 18\text{GHz}$ | 4.60dB |
| | $18\text{GHz} \leq f \leq 40\text{GHz}$ | 4.10dB |
| 6. AC Power line Conducted Emission | $150\text{kHz} \leq f \leq 30\text{MHz}$ | 3.00dB |

ANNEX A: Detailed Test 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.

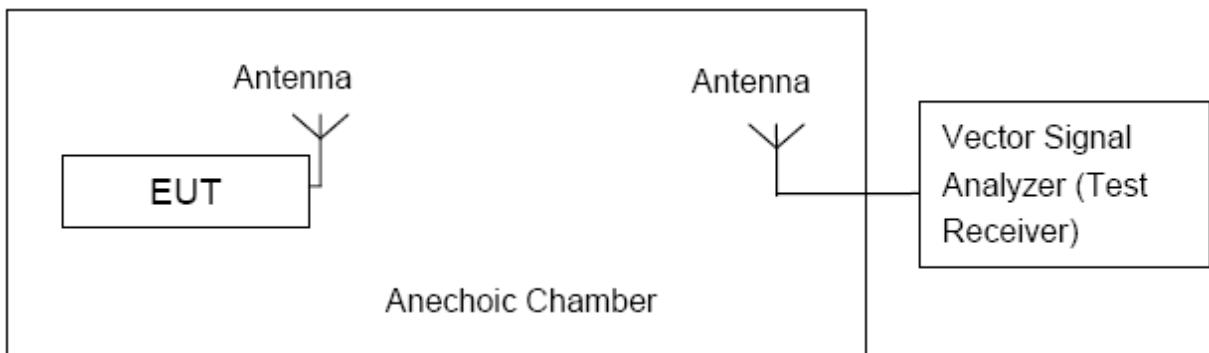


Radiated Emission Measurements

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(a) | 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:

| U-NII Band | Mode | Channel | Frequency (MHz) | Average power (dBm) | Conclusion |
|----------------------|----------------|---------|-----------------|---------------------|------------|
| 5.2GHz Band (UNII-1) | 802.11a | CH 36 | 5180 | 12.67 | P |
| | | CH 40 | 5200 | 12.64 | P |
| | | CH 48 | 5240 | 12.58 | P |
| | 802.11n-HT20 | CH 36 | 5180 | 12.43 | P |
| | | CH 40 | 5200 | 12.60 | P |
| | | CH 48 | 5240 | 12.27 | P |
| | 802.11n-HT40 | CH 38 | 5190 | 12.44 | P |
| | | CH 46 | 5230 | 12.39 | P |
| | 802.11ac-VHT20 | CH 36 | 5180 | 12.63 | P |
| | | CH 40 | 5200 | 12.51 | P |
| | | CH 48 | 5240 | 12.50 | P |
| | 802.11ac-VHT40 | CH 38 | 5190 | 12.51 | P |
| | | CH 46 | 5230 | 12.33 | P |
| | 802.11ac-VHT80 | CH 42 | 5210 | 11.90 | P |



| U-NII Band | Mode | Channel | Frequency (MHz) | Average power (dBm) | Conclusion |
|-----------------------|----------------|---------|-----------------|---------------------|------------|
| 5.3GHz Band (UNII-2A) | 802.11a | CH 52 | 5260 | 12.46 | P |
| | | CH 56 | 5280 | 12.46 | P |
| | | CH 64 | 5320 | 12.42 | P |
| | 802.11n-HT20 | CH 52 | 5260 | 12.31 | P |
| | | CH 56 | 5280 | 12.27 | P |
| | | CH 64 | 5320 | 12.26 | P |
| | 802.11n-HT40 | CH 54 | 5270 | 12.29 | P |
| | | CH 62 | 5310 | 12.29 | P |
| | 802.11ac-VHT20 | CH 52 | 5260 | 12.32 | P |
| | | CH 56 | 5280 | 12.29 | P |
| | | CH 64 | 5320 | 12.25 | P |
| | 802.11ac-VHT40 | CH 54 | 5270 | 12.24 | P |
| CH 62 | | 5310 | 12.29 | P | |
| 802.11ac-VHT80 | CH 58 | 5290 | 11.66 | P | |

| U-NII Band | Mode | Channel | Frequency (MHz) | Average power (dBm) | Conclusion |
|-----------------------|----------------|---------|-----------------|---------------------|------------|
| 5.5GHz Band (UNII-2C) | 802.11a | CH 100 | 5500 | 12.29 | P |
| | | CH 120 | 5600 | 11.89 | P |
| | | CH 140 | 5700 | 11.76 | P |
| | 802.11n-HT20 | CH 100 | 5500 | 12.14 | P |
| | | CH 120 | 5600 | 11.86 | P |
| | | CH 140 | 5700 | 11.38 | P |
| | 802.11n-HT40 | CH 102 | 5510 | 11.67 | P |
| | | CH 118 | 5590 | 11.43 | P |
| | | CH 134 | 5670 | 11.35 | P |
| | 802.11ac-VHT20 | CH 100 | 5500 | 12.13 | P |
| | | CH 120 | 5600 | 11.86 | P |
| | | CH 140 | 5700 | 11.48 | P |
| | 802.11ac-VHT40 | CH 102 | 5510 | 11.57 | P |
| | | CH 118 | 5590 | 11.41 | P |
| | | CH 134 | 5670 | 11.32 | P |
| | 802.11ac-VHT80 | CH 106 | 5530 | 11.92 | P |
| | | CH 122 | 5610 | 11.26 | P |



| U-NII Band | Mode | Channel | Frequency (MHz) | Average power (dBm) | Conclusion |
|----------------------|----------------|---------|-----------------|---------------------|------------|
| 5.8GHz Band (UNII-3) | 802.11a | CH 149 | 5745 | 11.63 | P |
| | | CH 157 | 5785 | 11.55 | P |
| | | CH 165 | 5825 | 11.48 | P |
| | 802.11n-HT20 | CH 149 | 5745 | 11.58 | P |
| | | CH 157 | 5785 | 11.41 | P |
| | | CH 165 | 5825 | 11.40 | P |
| | 802.11n-HT40 | CH 151 | 5755 | 11.28 | P |
| | | CH 159 | 5795 | 11.27 | P |
| | 802.11ac-VHT20 | CH 149 | 5745 | 11.56 | P |
| | | CH 157 | 5785 | 11.43 | P |
| | | CH 165 | 5825 | 11.32 | P |
| | 802.11ac-VHT40 | CH 151 | 5755 | 11.25 | P |
| | | CH 159 | 5795 | 11.18 | P |
| | 802.11ac-VHT80 | CH 155 | 5775 | 10.90 | P |

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 802.11ac-VHT80 modes 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%.

A.3. Peak Power Spectral Density (conducted)

Measurement Limit:

| Standard | Frequency (MHz) | Limit |
|------------------------|-----------------|--------------------|
| FCC CRF Part 15.407(a) | 5150MHz~5250MHz | 11dBm/MHz(FCC) |
| | | 10dBm/MHz EIRP(IC) |
| | 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:

| Mode | Channel | Power Spectral Density (dBm/MHz) | Conclusion |
|---------|----------------|----------------------------------|------------|
| 802.11a | 5180MHz(Ch36) | 6.62 | P |
| | 5200MHz(Ch40) | 6.84 | P |
| | 5240MHz(Ch48) | 6.78 | P |
| | 5260MHz(Ch52) | 6.36 | P |
| | 5280MHz(Ch56) | 6.60 | P |
| | 5320MHz(Ch64) | 6.26 | P |
| | 5500MHz(Ch100) | 6.60 | P |
| | 5580MHz(Ch116) | 6.15 | P |
| | 5700MHz(Ch140) | 5.94 | P |

| Mode | Channel | Power Spectral Density (dBm/MHz) | Conclusion |
|--------------|----------------|----------------------------------|------------|
| 802.11n-HT40 | 5190MHz(Ch38) | 3.95 | P |
| | 5230MHz(Ch46) | 3.80 | P |
| | 5270MHz(Ch54) | 3.20 | P |
| | 5310MHz(Ch62) | 3.28 | P |
| | 5510MHz(Ch102) | 3.65 | P |
| | 5550MHz(Ch110) | 2.83 | P |
| | 5670MHz(Ch134) | 3.00 | P |

| Mode | Channel | Power Spectral Density (dBm/MHz) | Conclusion |
|----------------|----------------|----------------------------------|------------|
| 802.11ac-VHT80 | 5210MHz(Ch42) | 0.56 | P |
| | 5290MHz(Ch58) | 0.13 | P |
| | 5530MHz(Ch106) | 0.25 | P |
| | 5610MHz(Ch122) | -0.04 | P |



5.8GHz Band (UNII-3)

| U-NII Band | Mode | Channel | Frequency (MHz) | Power Spectral Density (dBm/500kHz) | Conclusion |
|----------------------|----------------|----------------|------------------------|--|-------------------|
| 5.8GHz Band (UNII-3) | 802.11a | CH 149 | 5745 | 2.81 | P |
| | | CH 157 | 5785 | 3.56 | P |
| | | CH 165 | 5825 | 3.43 | P |
| | 802.11n-HT40 | CH 151 | 5755 | -0.45 | P |
| | | CH 159 | 5795 | -0.46 | P |
| | 802.11ac-VHT80 | CH 155 | 5775 | -1.60 | P |

Conclusion: PASS

A.4. Occupied 26dB Bandwidth(conducted)

Measurement Limit:

| Standard | Limit (MHz) |
|----------------------------|-------------|
| FCC 47 CFR Part 15.403 (i) | / |

The measurement is made according to KDB 789033

Measurement Result:

| Mode | Channel | Occupied 26dB Bandwidth(MHz) | | Conclusion |
|-----------------|----------------|-------------------------------|-------|------------|
| | | Fig. | Value | |
| 802.11a | 5180MHz(Ch36) | Fig.1 | 20.50 | / |
| | 5200MHz(Ch40) | Fig.2 | 20.50 | / |
| | 5240MHz(Ch48) | Fig.3 | 20.60 | / |
| | 5260MHz(Ch52) | Fig.4 | 20.55 | / |
| | 5280MHz(Ch56) | Fig.5 | 20.50 | / |
| | 5320MHz(Ch64) | Fig.6 | 20.65 | / |
| | 5500MHz(Ch100) | Fig.7 | 20.55 | / |
| | 5580MHz(Ch116) | Fig.8 | 20.40 | / |
| | 5700MHz(Ch140) | Fig.9 | 20.65 | / |
| 802.11n-HT40 | 5190MHz(Ch38) | Fig.10 | 40.96 | / |
| | 5230MHz(Ch46) | Fig.11 | 40.72 | / |
| | 5270MHz(Ch54) | Fig.12 | 40.96 | / |
| | 5310MHz(Ch62) | Fig.13 | 40.80 | / |
| | 5510MHz(Ch102) | Fig.14 | 40.72 | / |
| | 5550MHz(Ch110) | Fig.15 | 40.88 | / |
| | 5670MHz(Ch134) | Fig.16 | 40.80 | / |
| 802.11 ac-VHT80 | 5210MHz(Ch42) | Fig.17 | 81.12 | / |
| | 5290MHz(Ch58) | Fig.18 | 81.12 | / |
| | 5530MHz(Ch106) | Fig.19 | 81.44 | / |
| | 5610MHz(Ch122) | Fig.20 | 81.44 | / |

Conclusion: PASS

Test graphs as below:

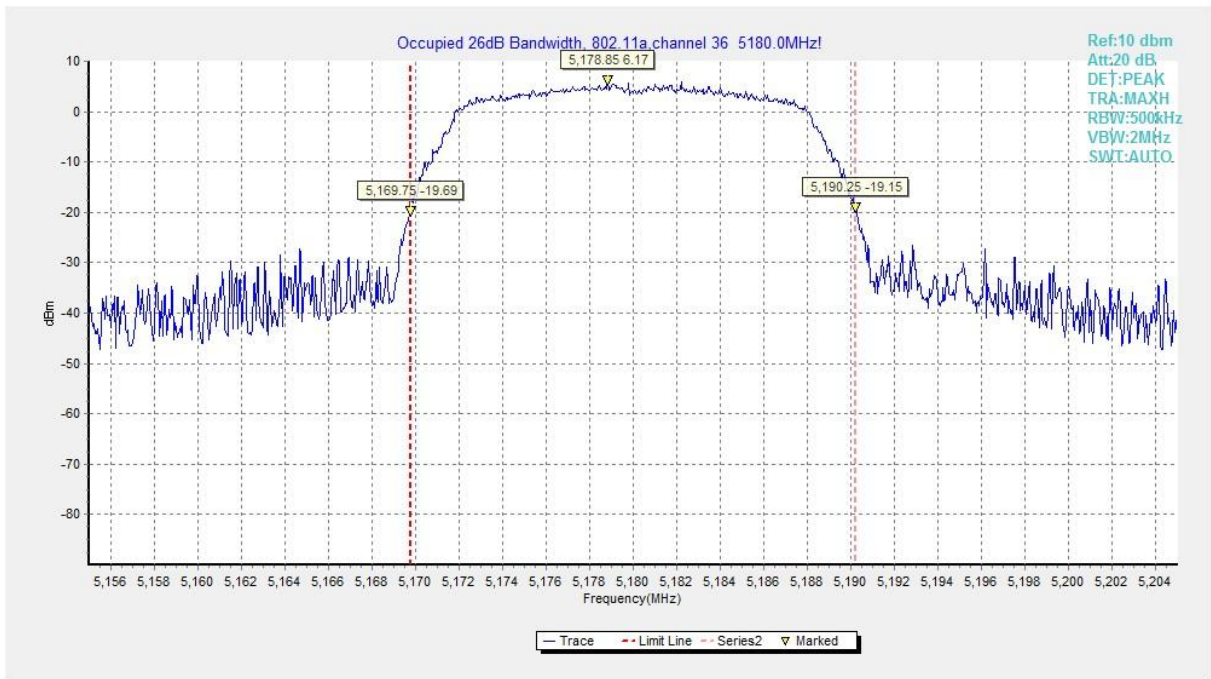


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

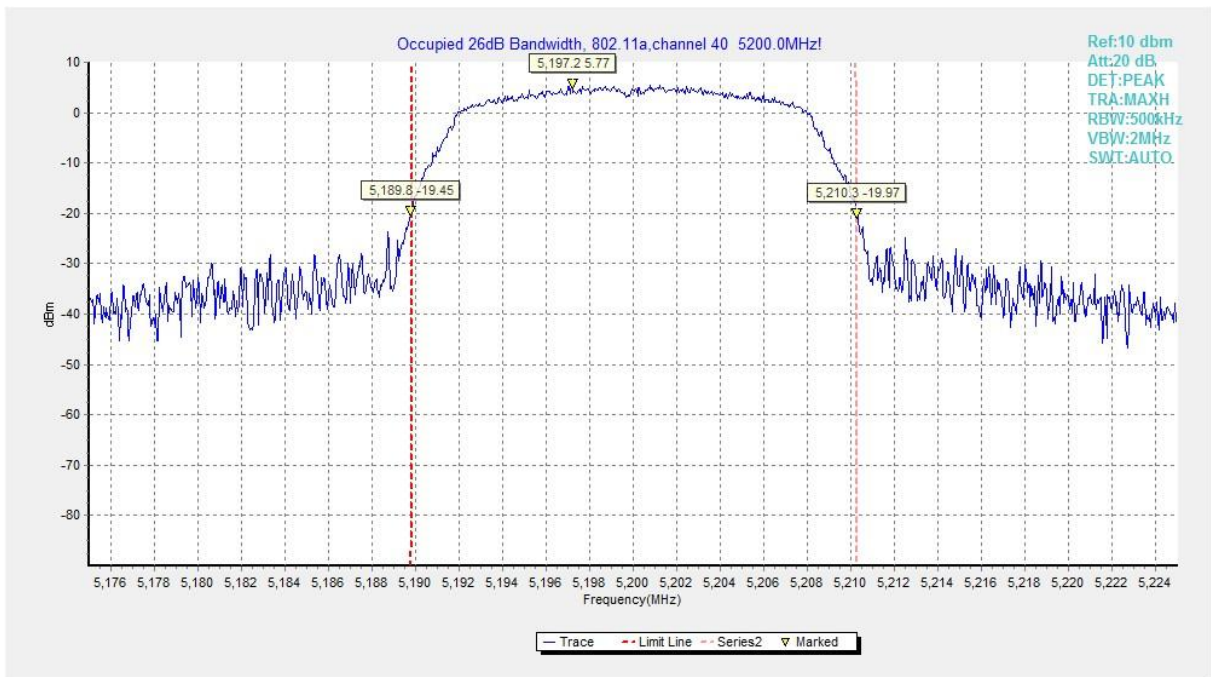


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

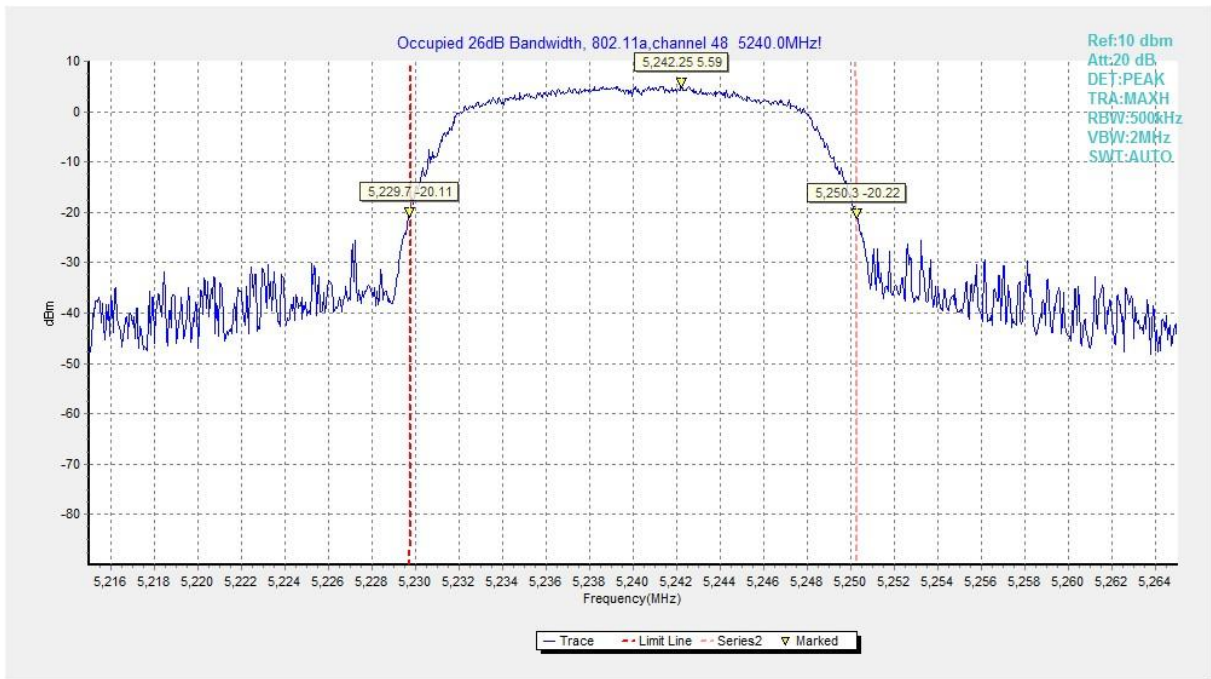


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

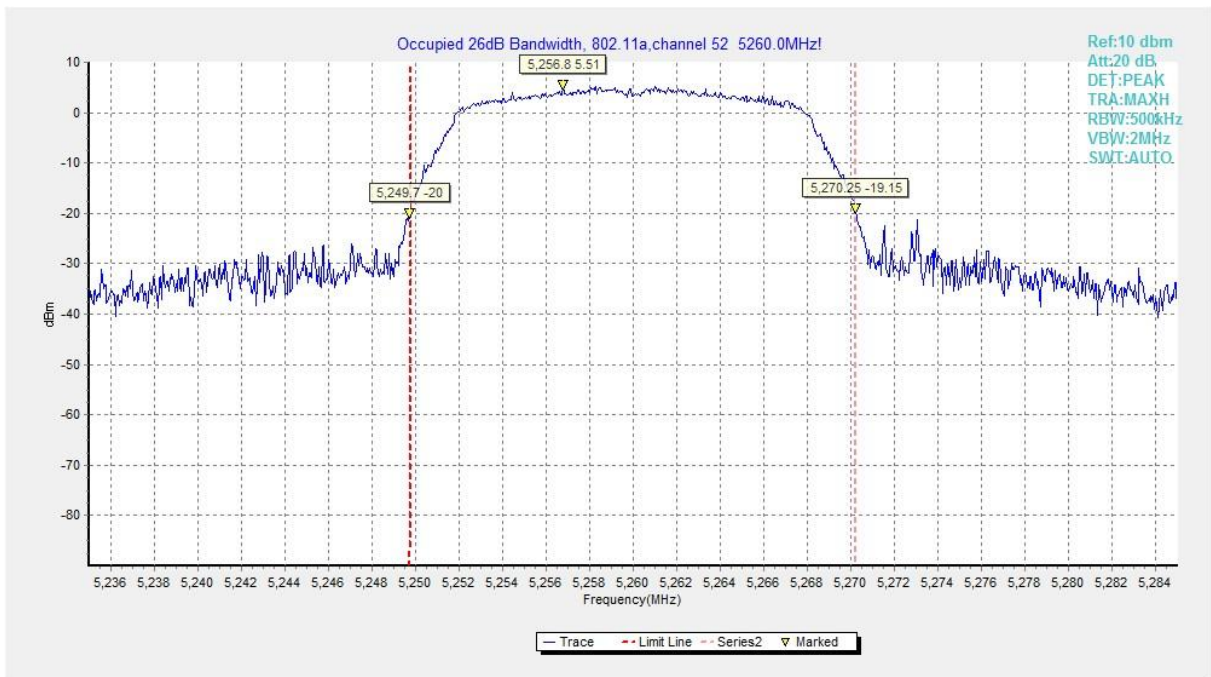


Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

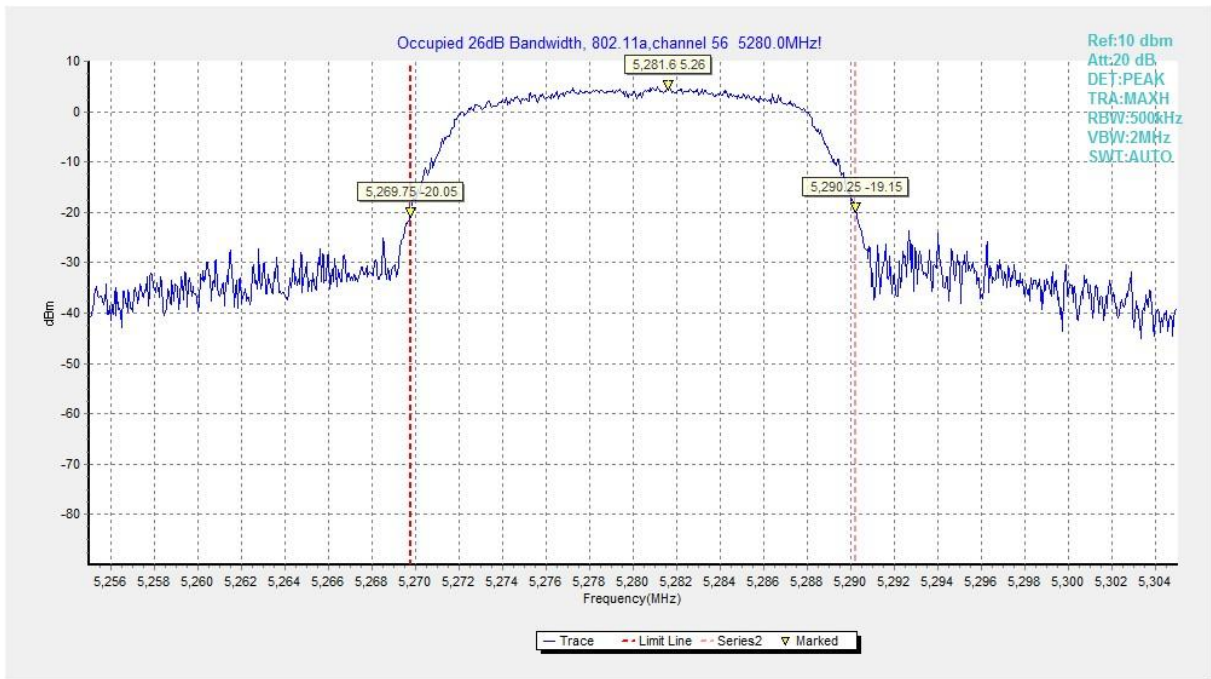


Fig. 5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

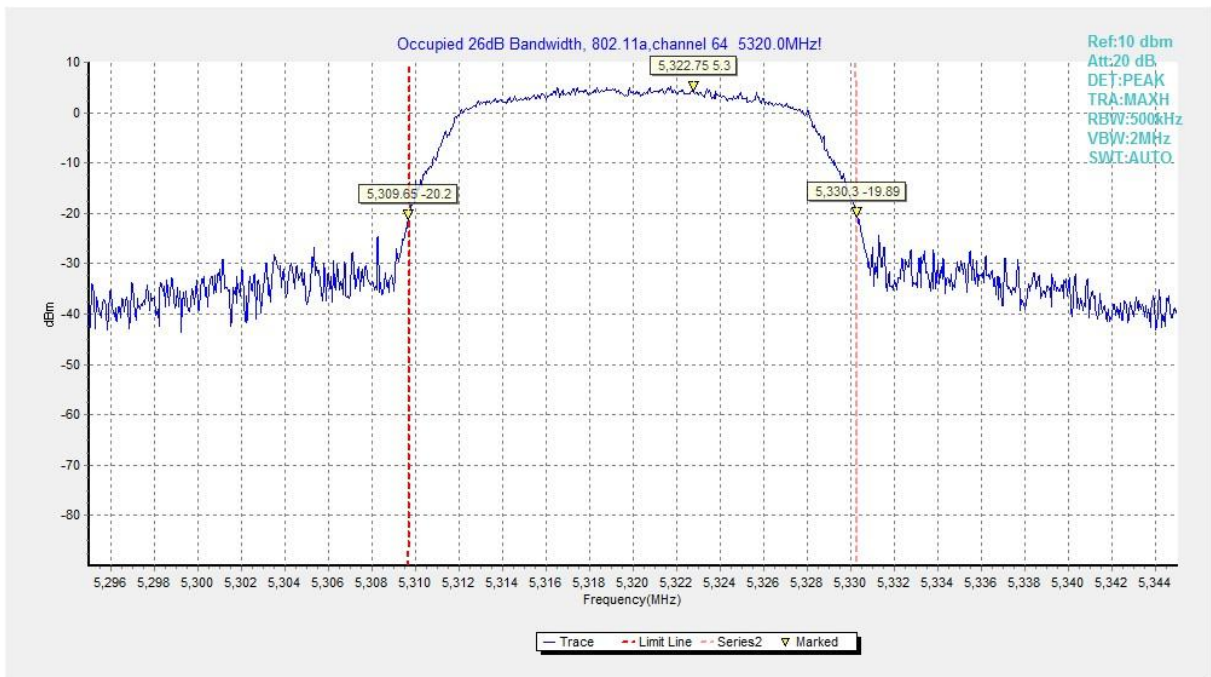


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

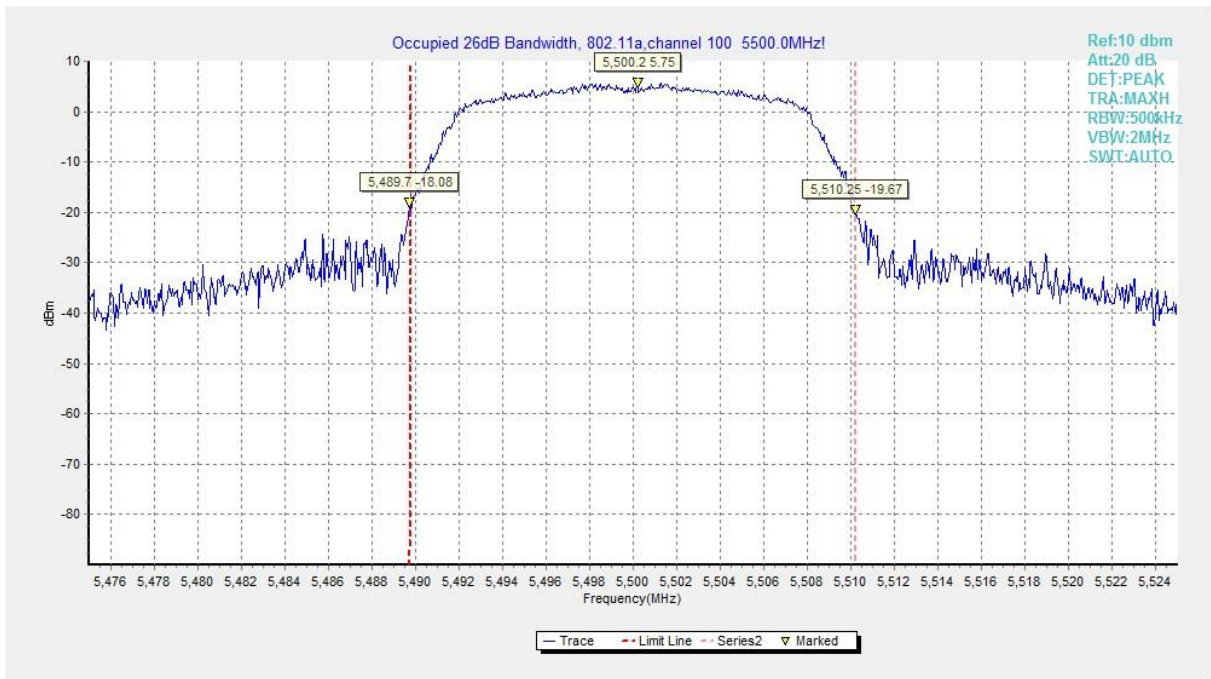


Fig. 7 Occupied 26dB Bandwidth (802. 11a, 5500MHz)

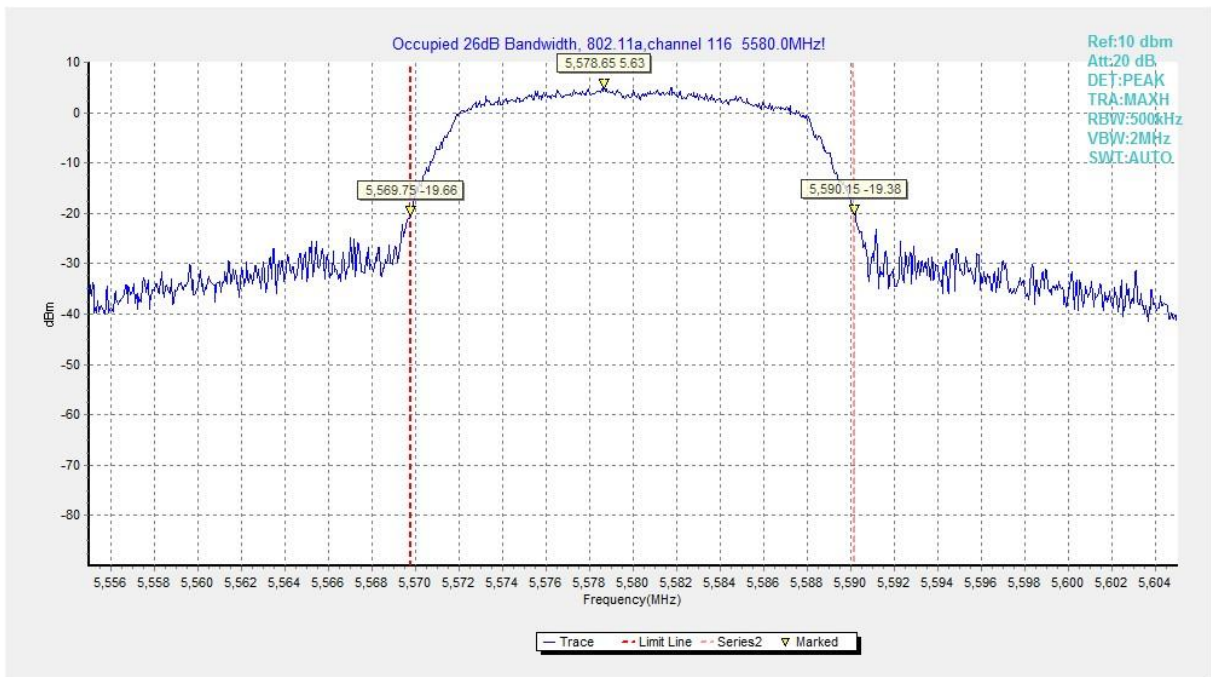


Fig. 8 Occupied 26dB Bandwidth (802. 11a, 5600MHz)

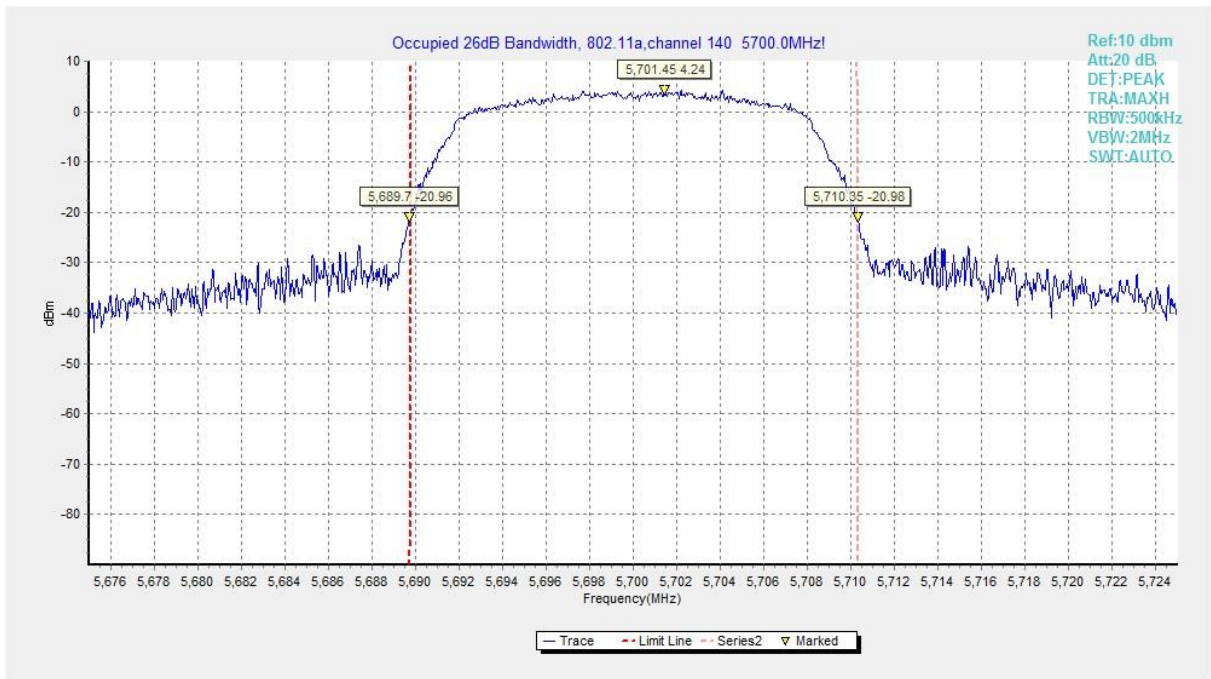


Fig. 9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

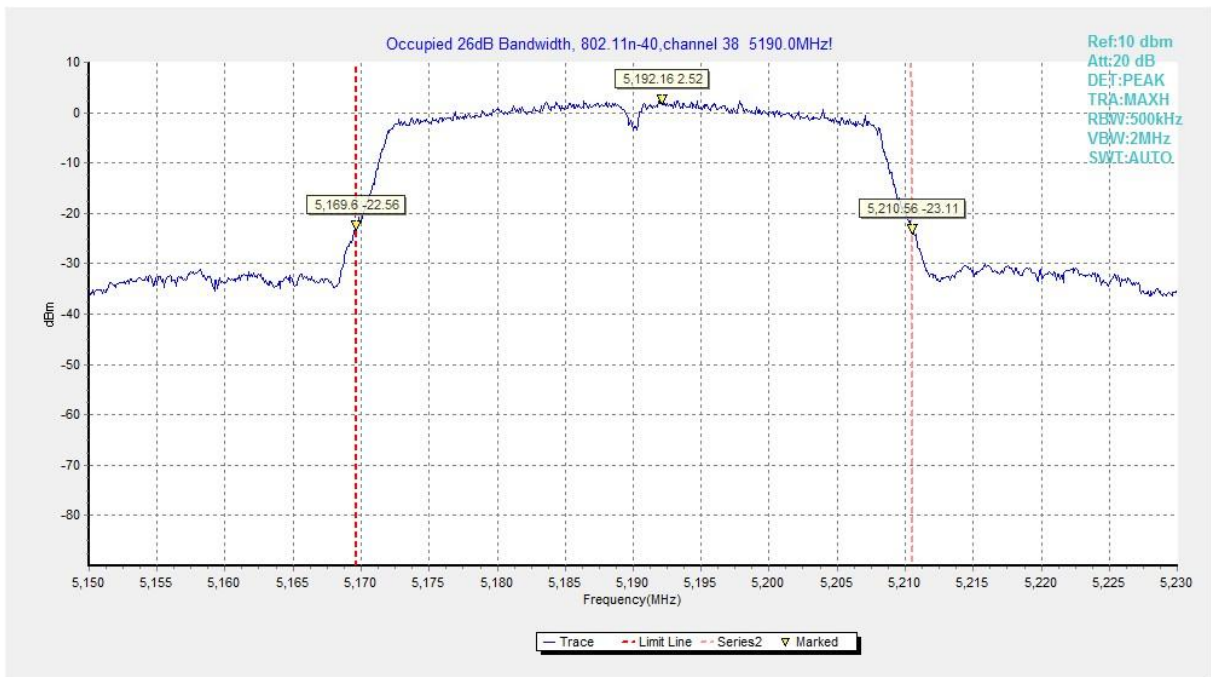


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

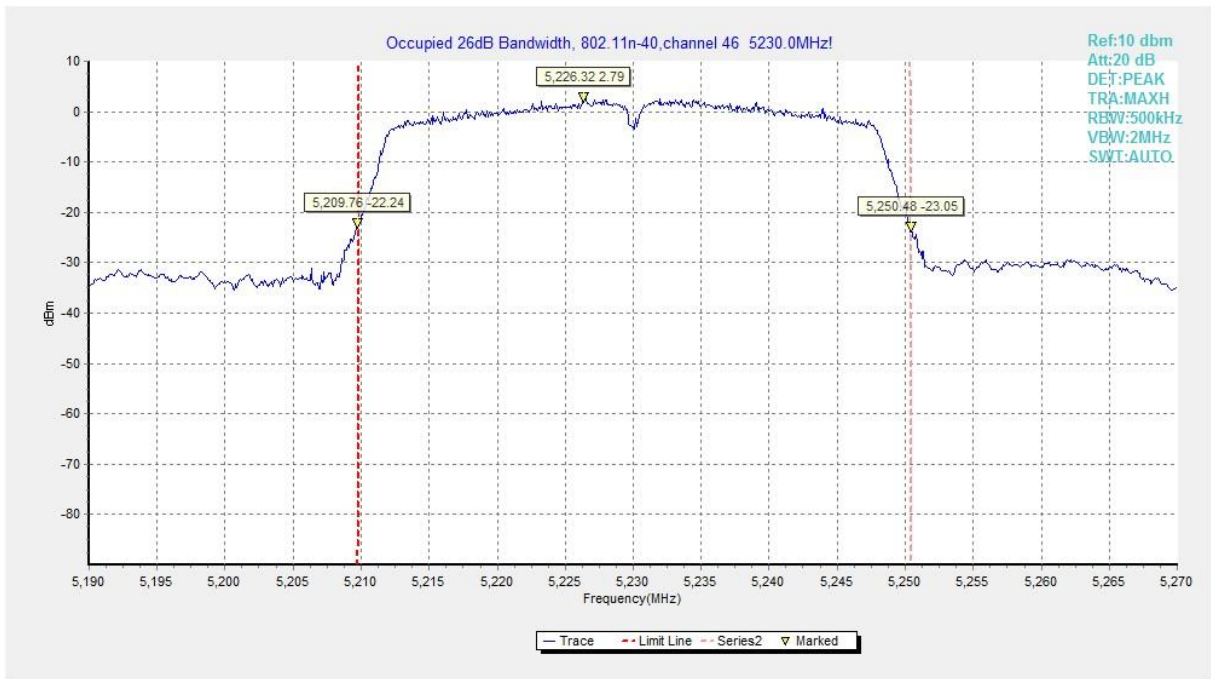


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

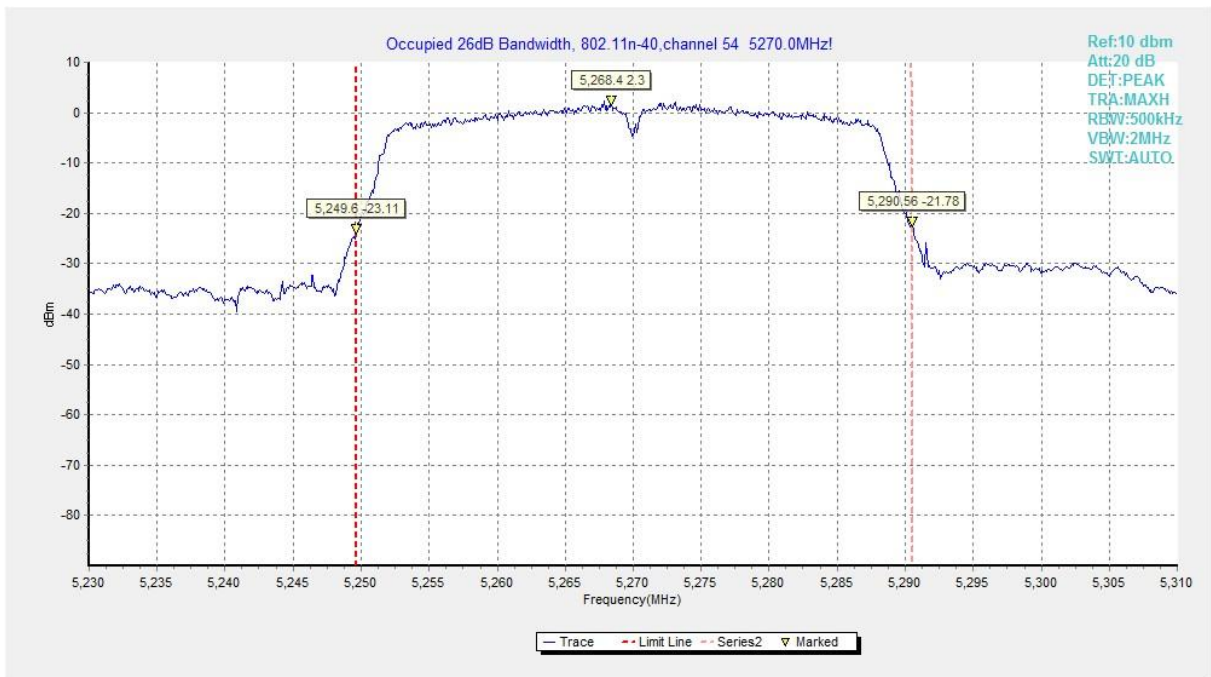


Fig. 12 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

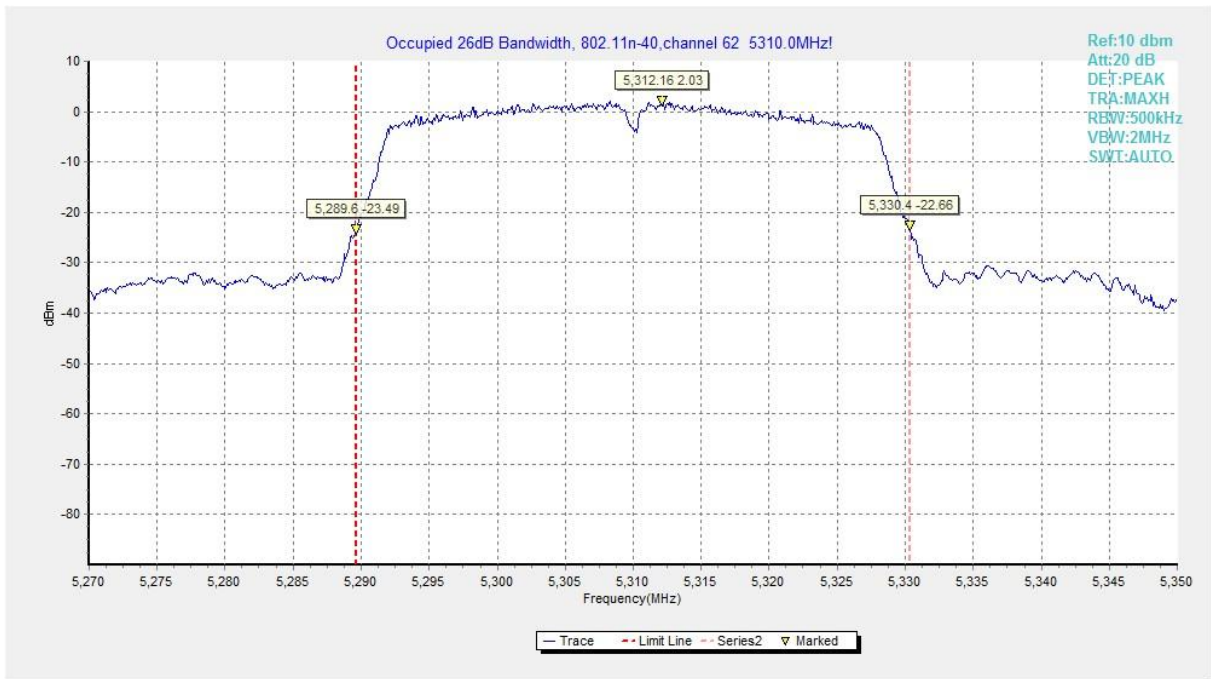


Fig. 13 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

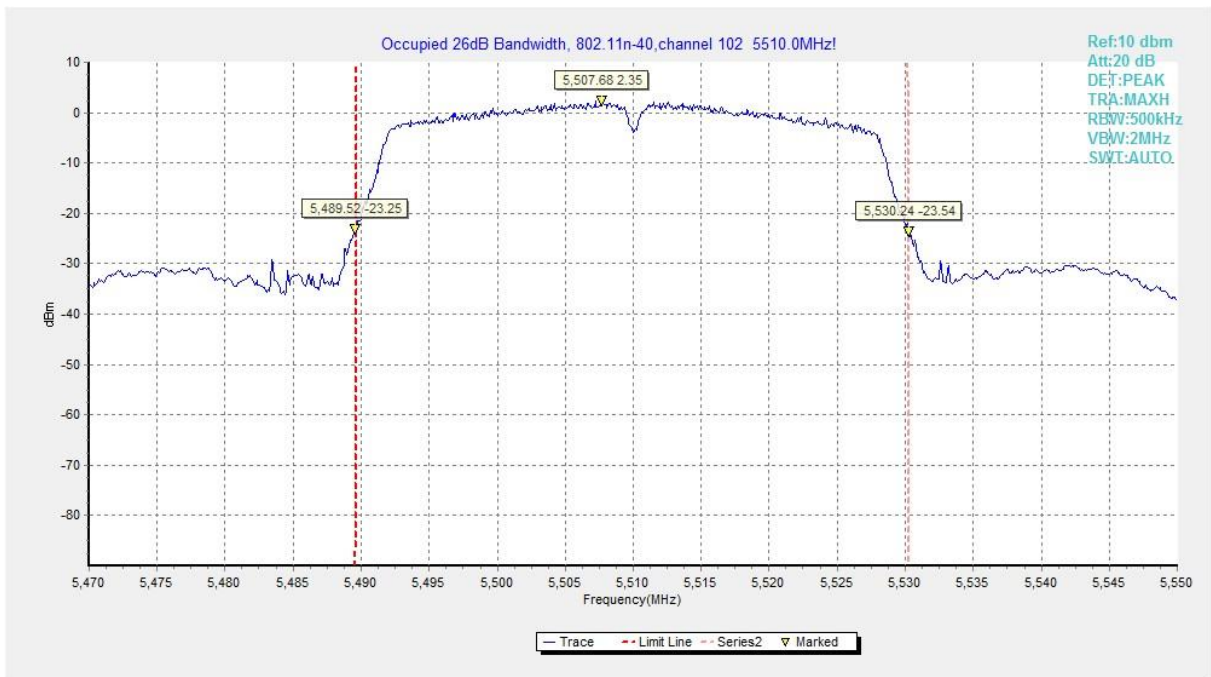


Fig. 14 Occupied 26dB Bandwidth (802.11n-HT40, 5510MHz)

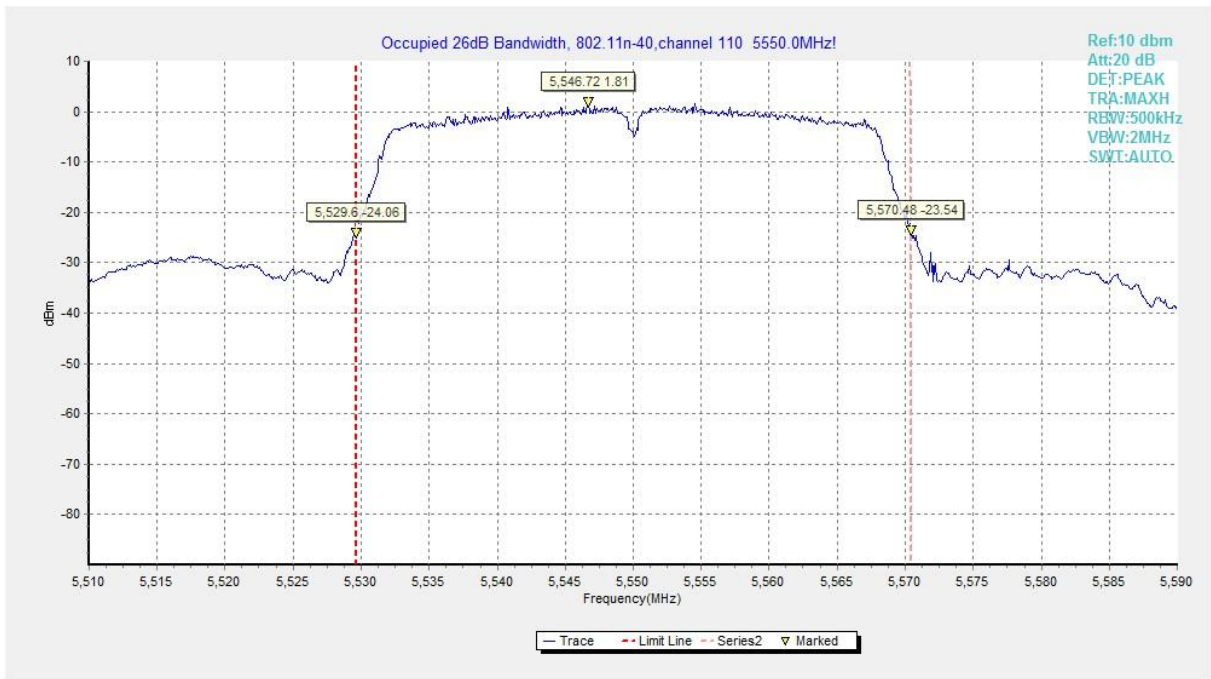


Fig. 15 Occupied 26dB Bandwidth (802. 11n-HT40, 5590MHz)

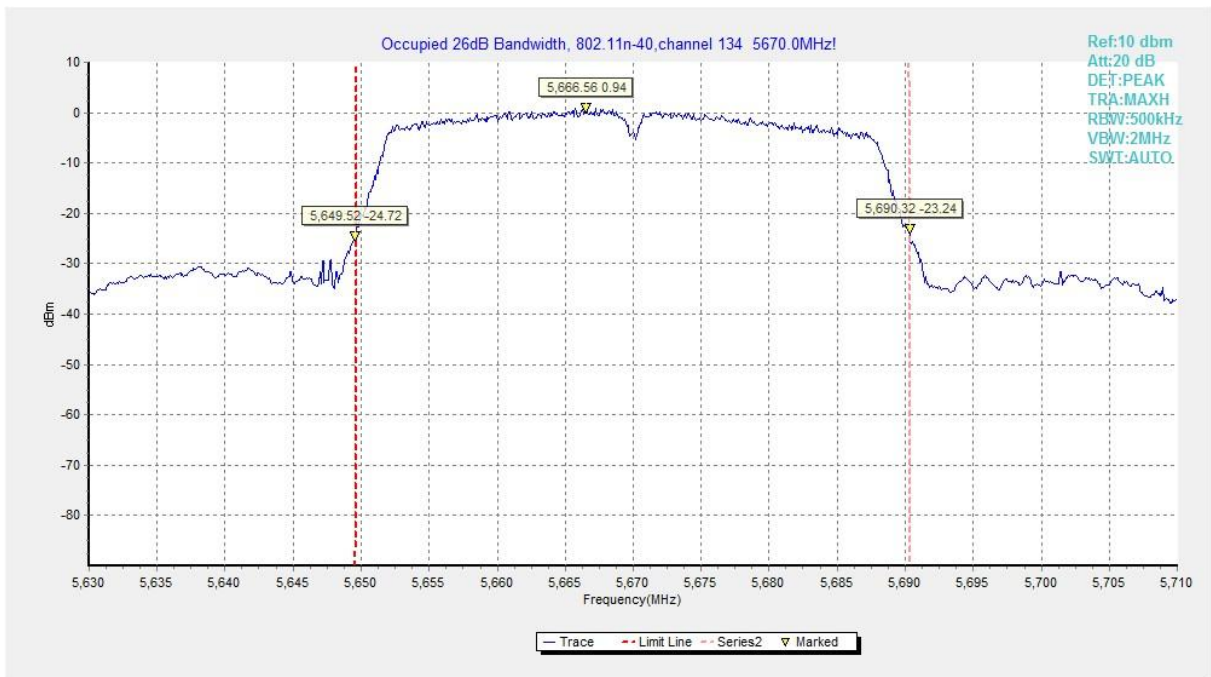


Fig. 16 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

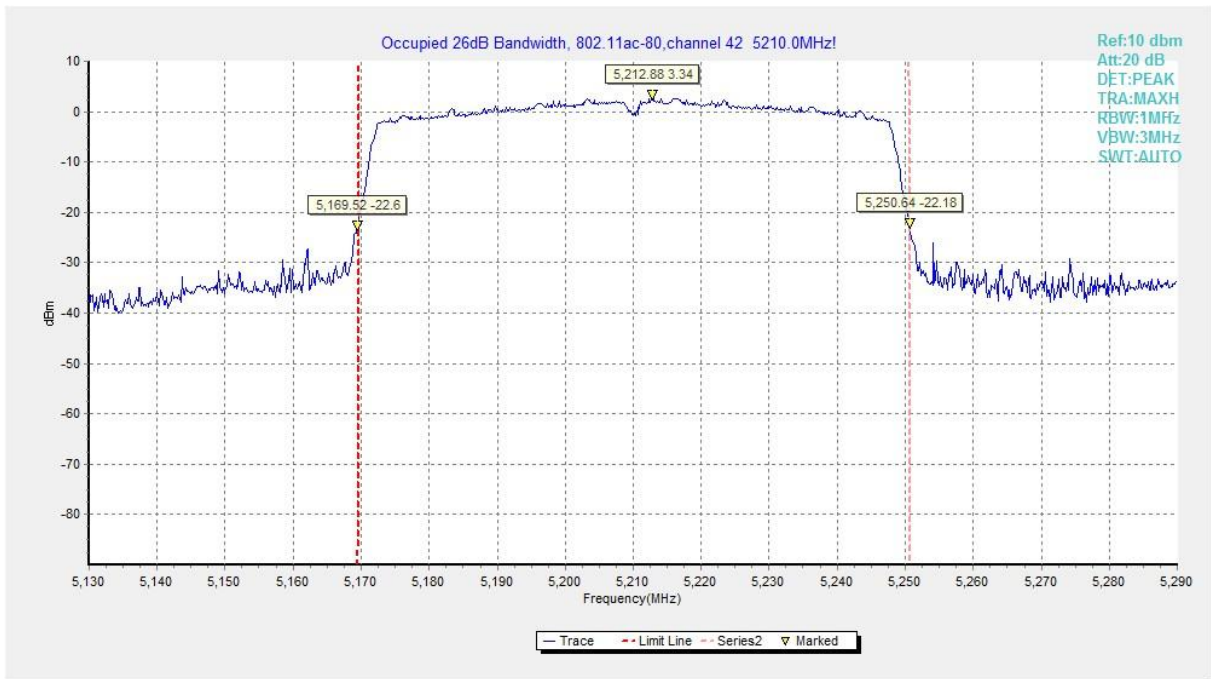


Fig. 17 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5210MHz)

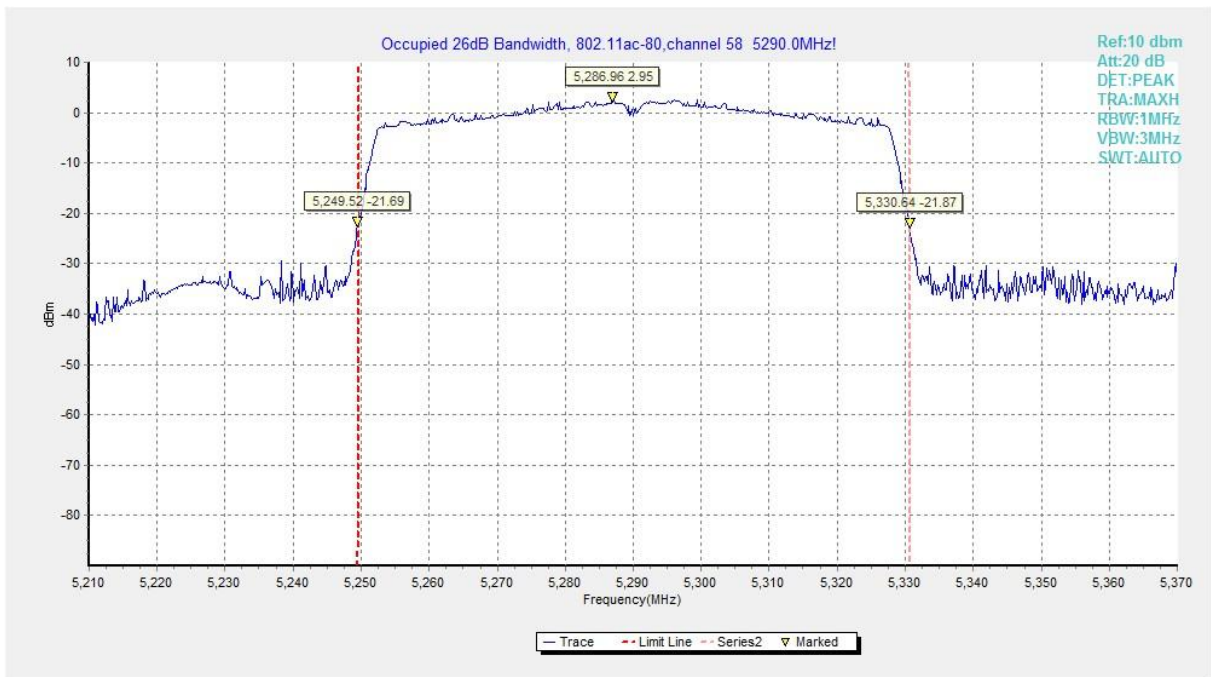


Fig. 18 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5290MHz)

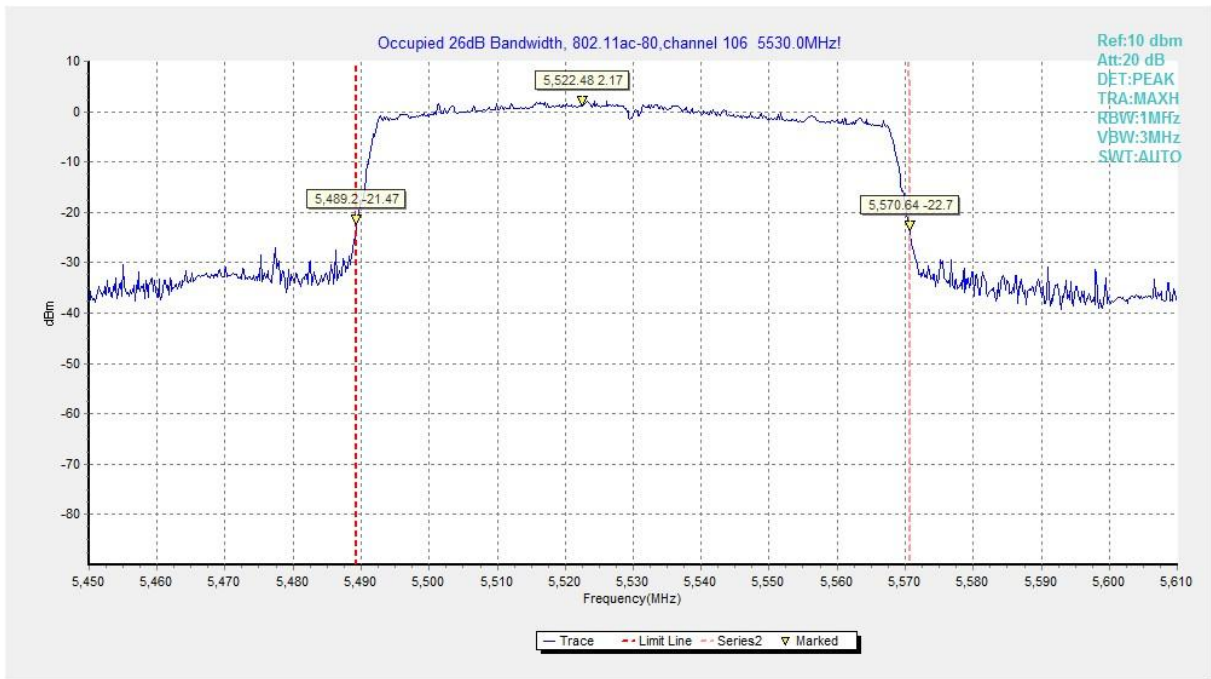


Fig. 19 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5530MHz)

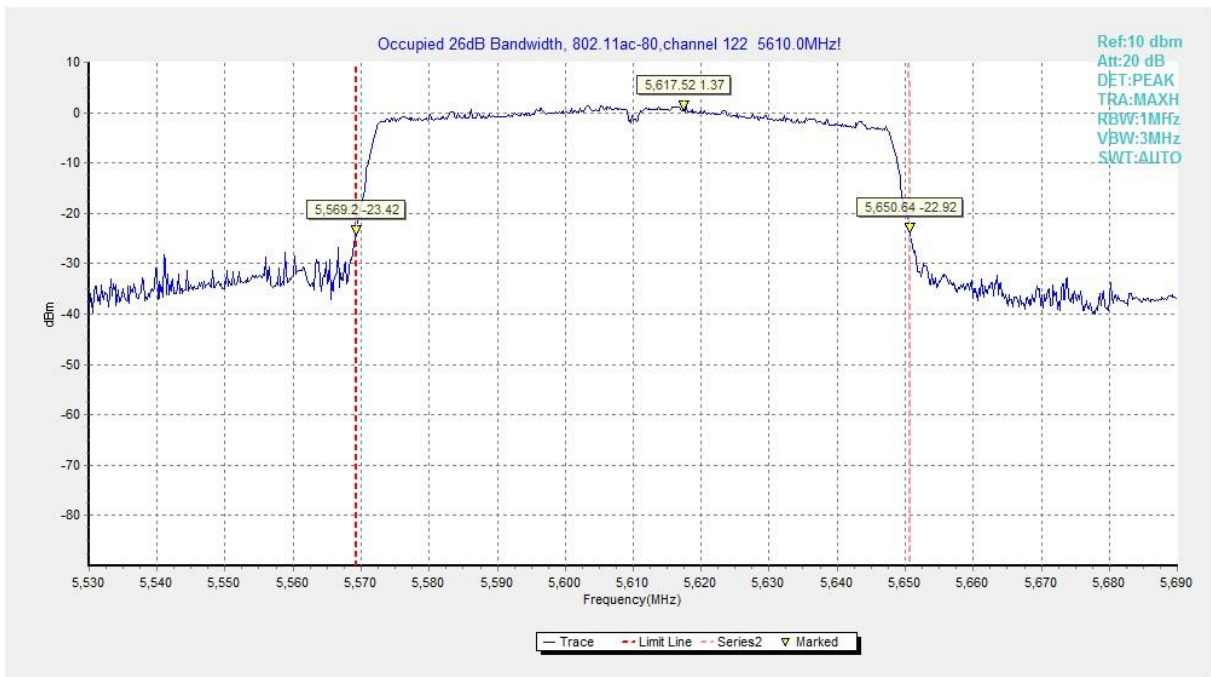


Fig. 20 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5610MHz)

A.5. Occupied 6dB Bandwidth (conducted)

Measurement Limit:

| Standard | Limit (MHz) |
|----------------------------|-------------|
| FCC 47 CFR Part 15.407 (e) | ≥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 | 15.30 | P |
| | 5785MHz(Ch157) | Fig.22 | 15.30 | P |
| | 5825MHz(Ch165) | Fig.23 | 15.10 | P |
| 802.11n-HT40 | 5755MHz(Ch151) | Fig.24 | 35.12 | P |
| | 5795MHz(Ch159) | Fig.25 | 35.20 | P |
| 802.11ac-VHT80 | 5775MHz(Ch155) | Fig.26 | 73.92 | P |

Conclusion: PASS

Test graphs as below:

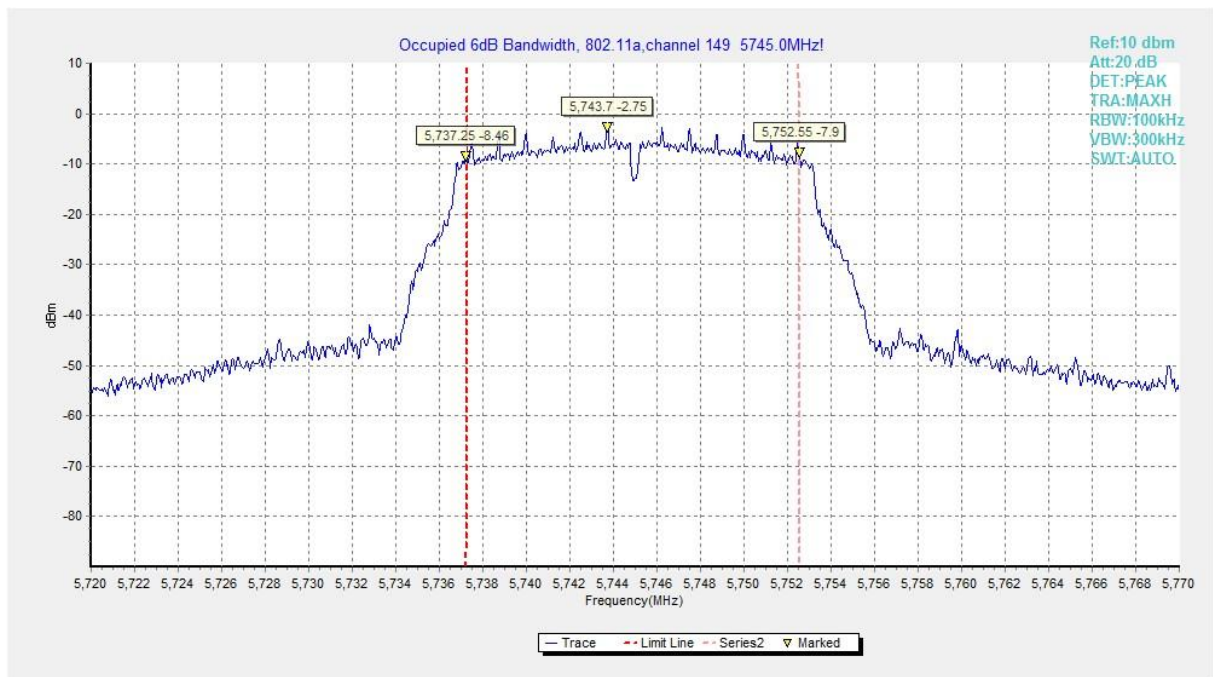


Fig. 21 Occupied 6dB Bandwidth (802.11a, 5745MHz)

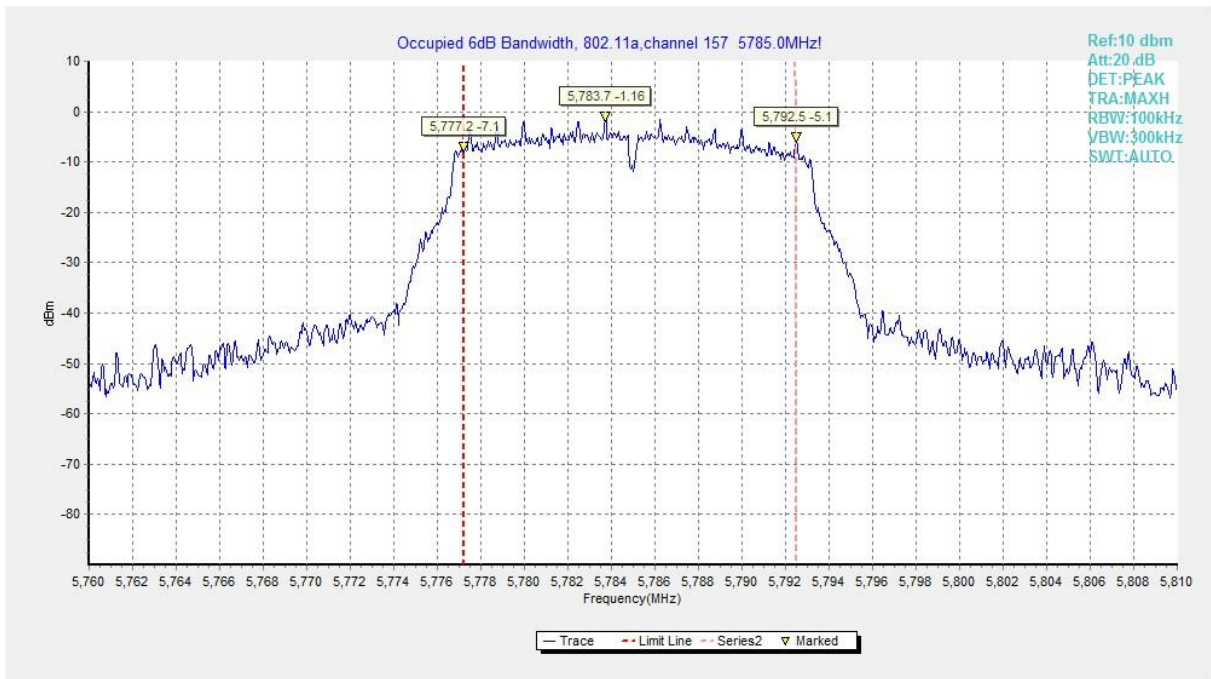


Fig. 22 Occupied 6dB Bandwidth (802.11a, 5785MHz)

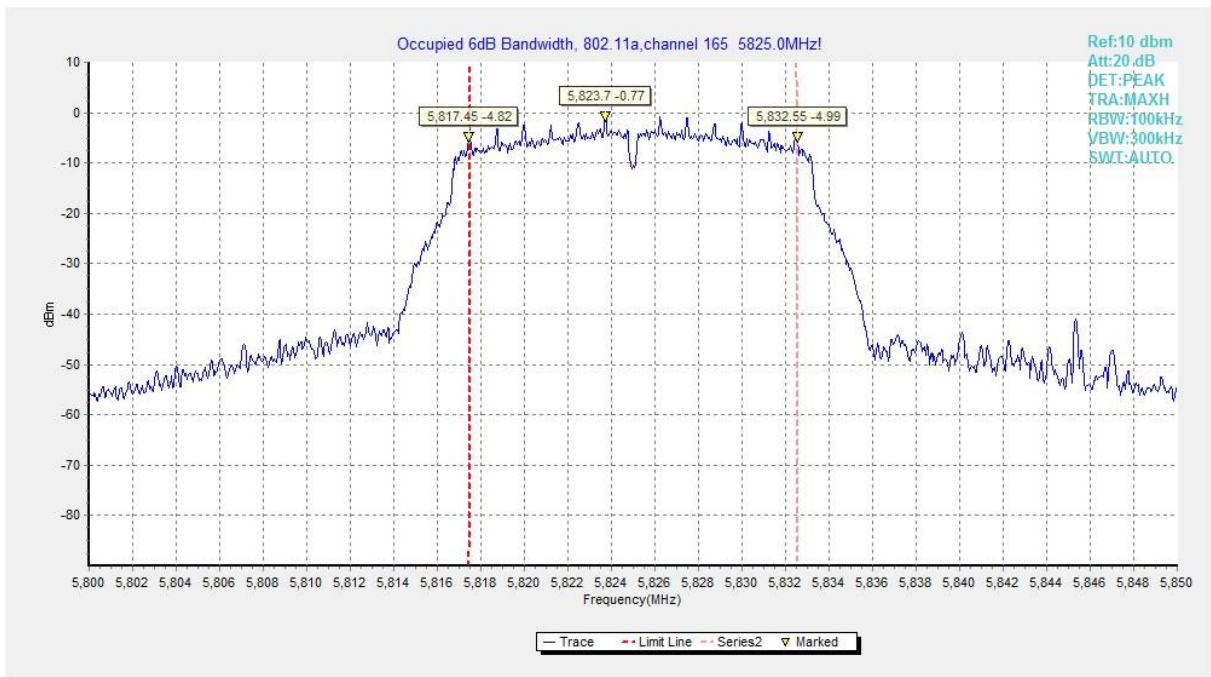


Fig. 23 Occupied 6dB Bandwidth (802.11a, 5825MHz)

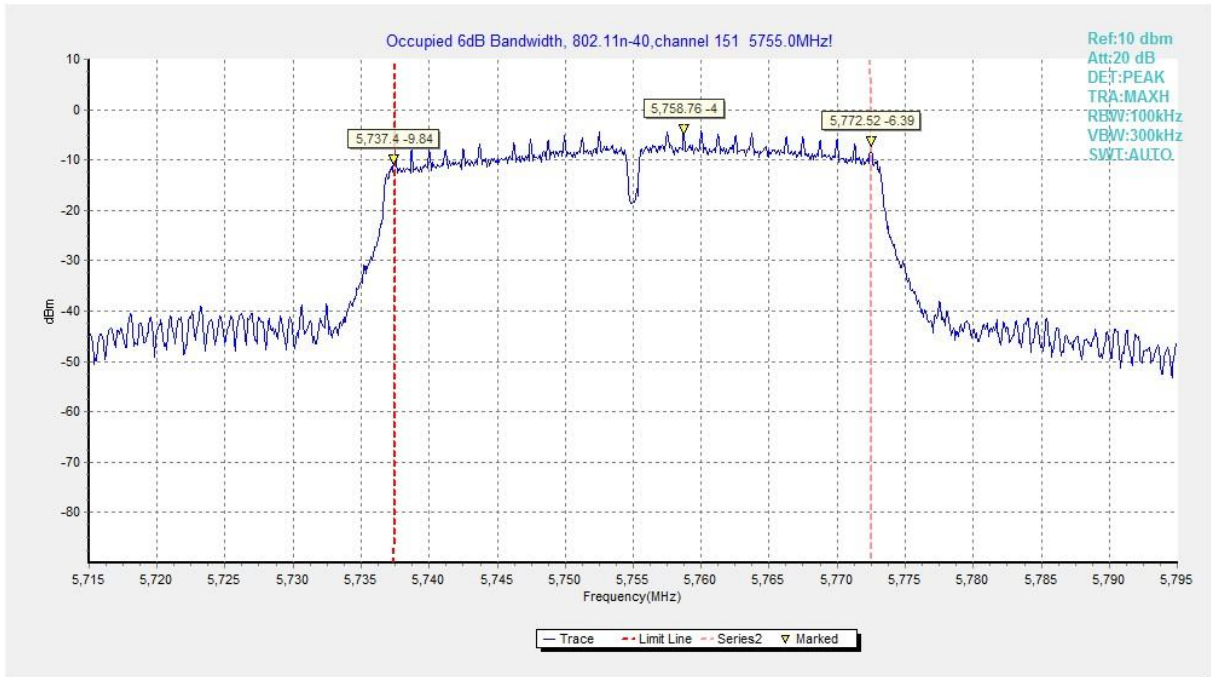


Fig. 24 Occupied 6dB Bandwidth (802.11n-HT40, 5755MHz)

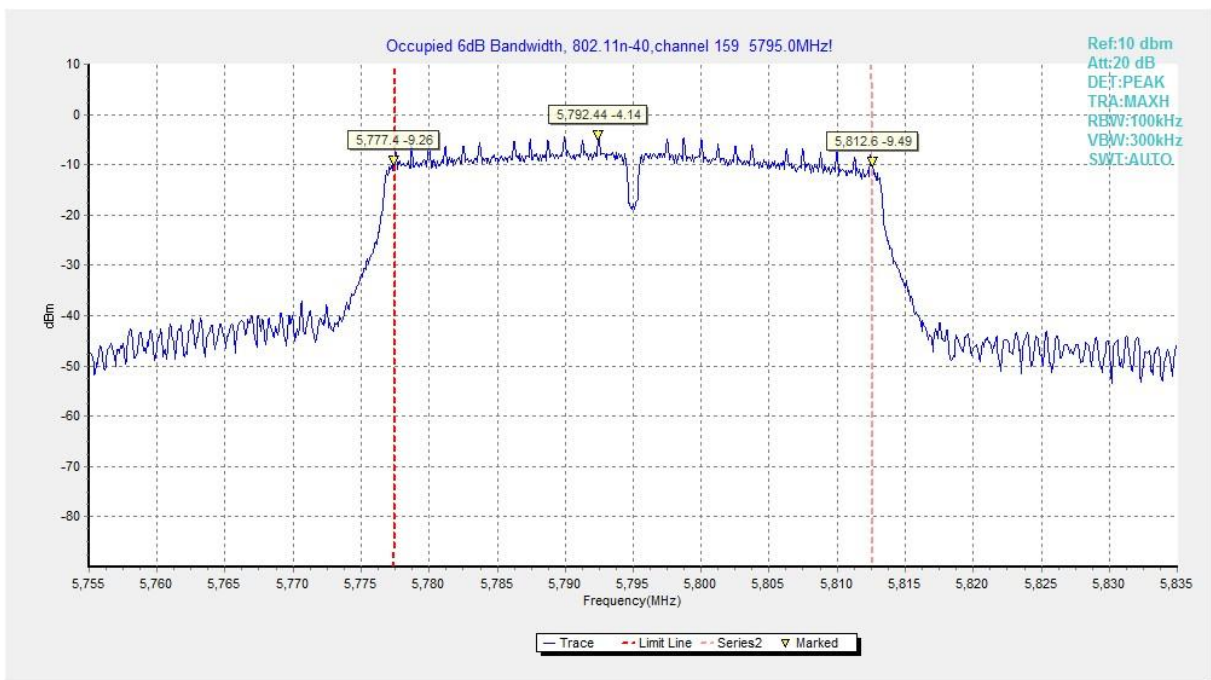


Fig. 25 Occupied 6dB Bandwidth (802.11n-HT40, 5795MHz)

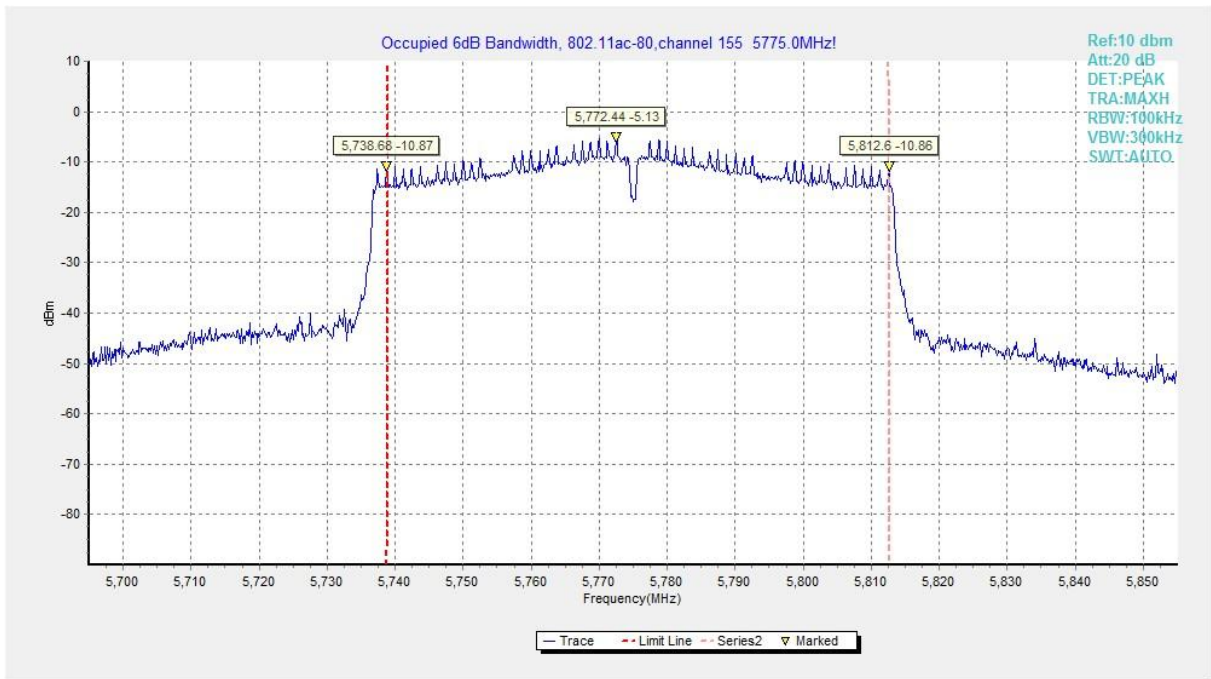


Fig. 26 Occupied 6dB Bandwidth (802.11ac-VHT80, 5775MHz)

A.6. 99% Occupied Bandwidth(conducted)

Measurement Limit:

| Standard | Limit (MHz) |
|------------------------|-------------|
| FCC 47 CFR Part 15.403 | / |

The measurement is made according to KDB 789033

Measurement Result:

| Mode | Channel | 99% Occupied Bandwidth(MHz) | | Conclusion |
|-----------------|----------------|-----------------------------|-------|------------|
| | | Fig. | Value | |
| 802.11a | 5180MHz(Ch36) | Fig.27 | 17.26 | / |
| | 5200MHz(Ch40) | Fig.28 | 17.18 | / |
| | 5240MHz(Ch48) | Fig.29 | 17.10 | / |
| | 5260MHz(Ch52) | Fig.30 | 17.26 | / |
| | 5280MHz(Ch56) | Fig.31 | 17.26 | / |
| | 5320MHz(Ch64) | Fig.32 | 17.26 | / |
| | 5500MHz(Ch100) | Fig.33 | 17.22 | / |
| | 5580MHz(Ch116) | Fig.34 | 17.22 | / |
| 802.11n-HT40 | 5700MHz(Ch140) | Fig.35 | 17.26 | / |
| | 5190MHz(Ch38) | Fig.36 | 36.28 | / |
| | 5230MHz(Ch46) | Fig.37 | 36.12 | / |
| | 5270MHz(Ch54) | Fig.38 | 36.20 | / |
| | 5310MHz(Ch62) | Fig.39 | 36.20 | / |
| | 5510MHz(Ch102) | Fig.40 | 36.12 | / |
| | 5550MHz(Ch110) | Fig.41 | 36.28 | / |
| 802.11 ac-VHT80 | 5670MHz(Ch134) | Fig.42 | 36.20 | / |
| | 5210MHz(Ch42) | Fig.43 | 75.28 | / |
| | 5290MHz(Ch58) | Fig.44 | 75.28 | / |
| | 5530MHz(Ch106) | Fig.45 | 75.28 | / |
| | 5610MHz(Ch122) | Fig.46 | 75.44 | / |

Conclusion: PASS

Test graphs as below:

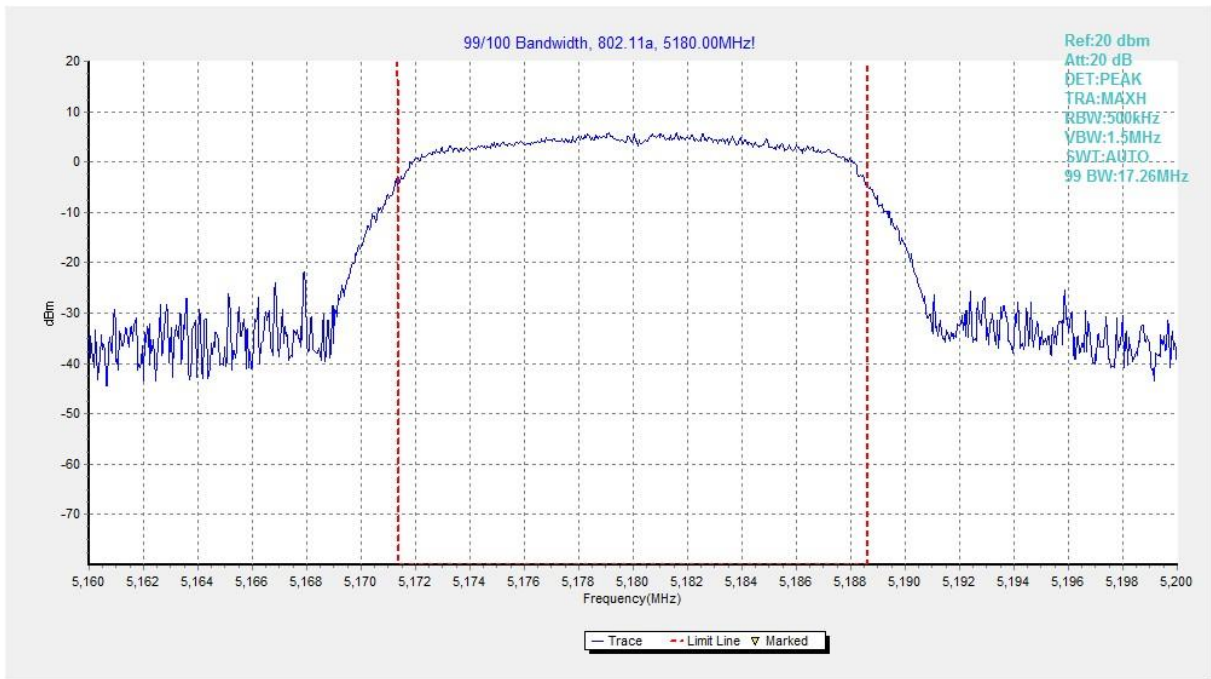


Fig. 27 99% Occupied Bandwidth (802.11a, 5180MHz)

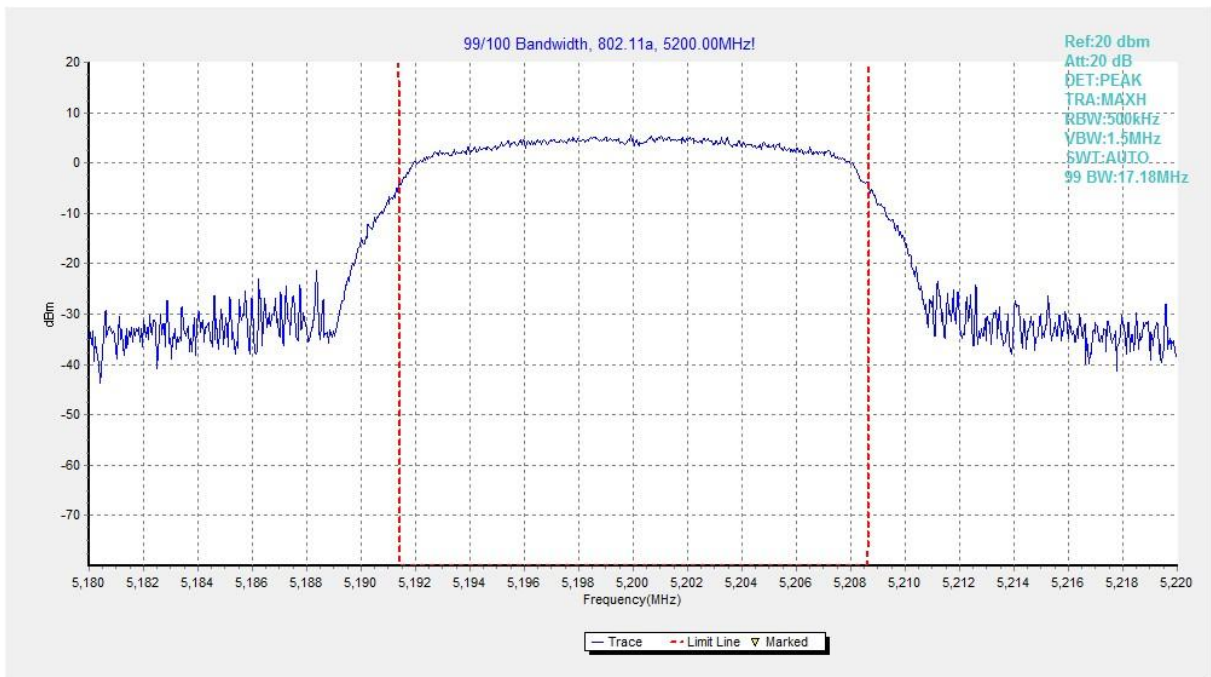


Fig. 28 99% Occupied Bandwidth (802.11a, 5200MHz)

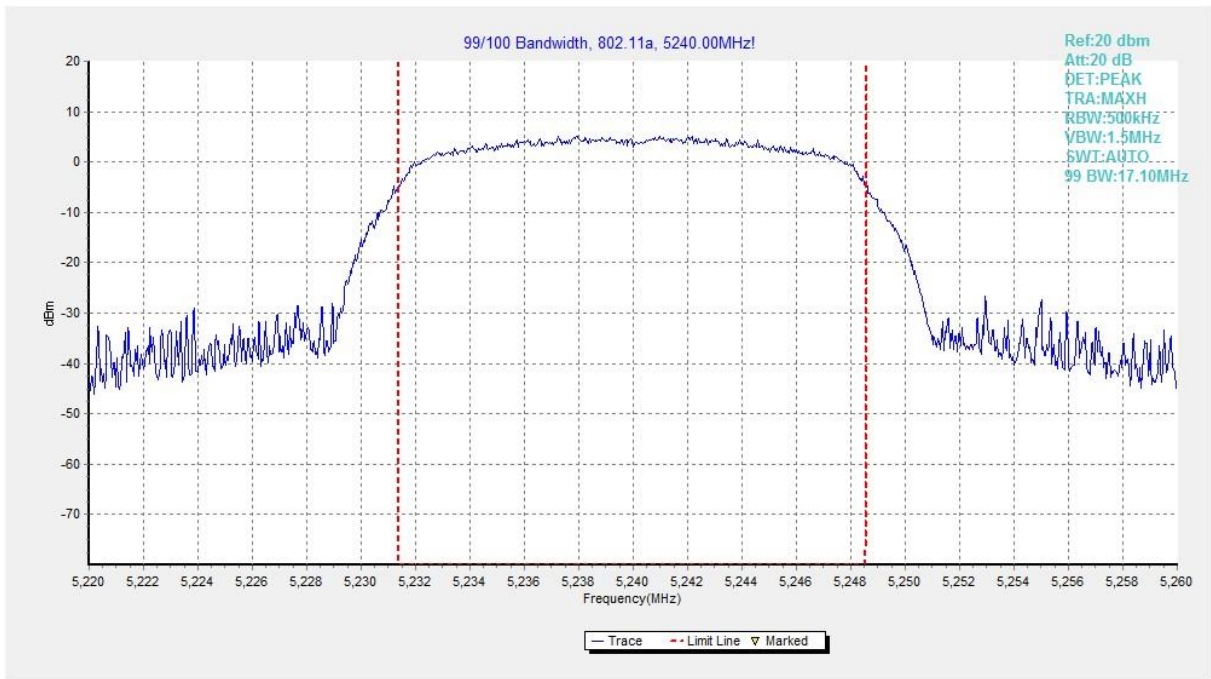


Fig. 29 99% Occupied Bandwidth (802.11a, 5240MHz)

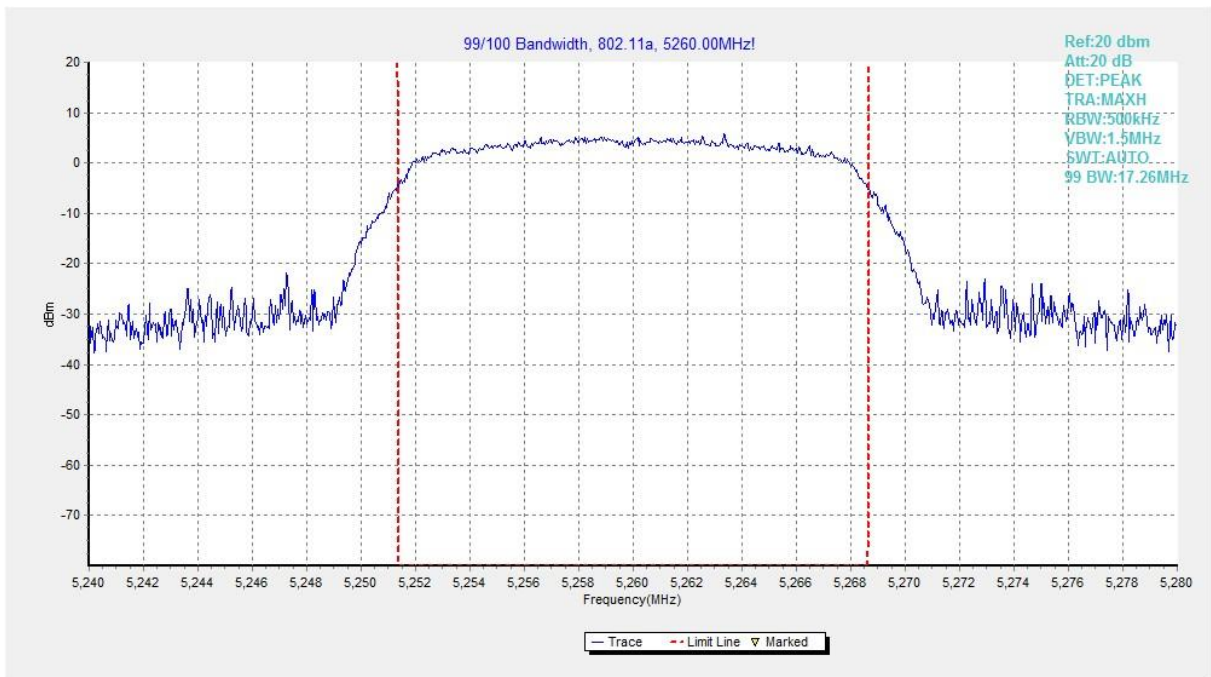


Fig. 30 99% Occupied Bandwidth (802.11a, 5260MHz)

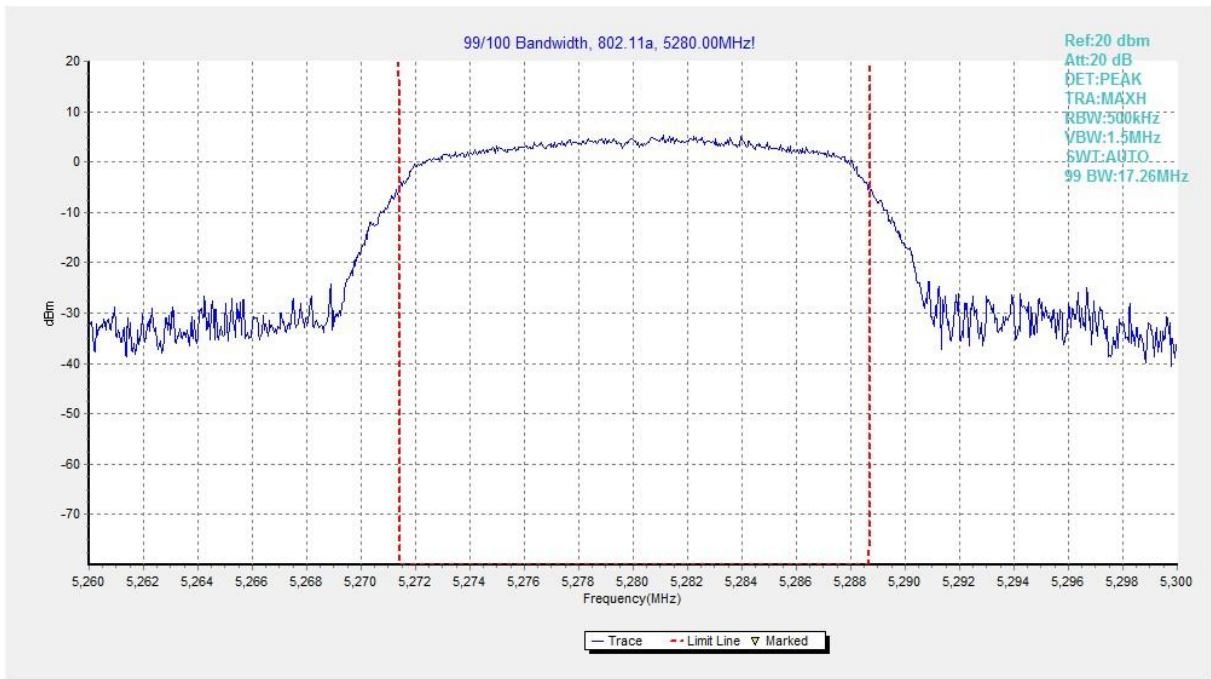


Fig. 31 99% Occupied Bandwidth (802.11a, 5280MHz)

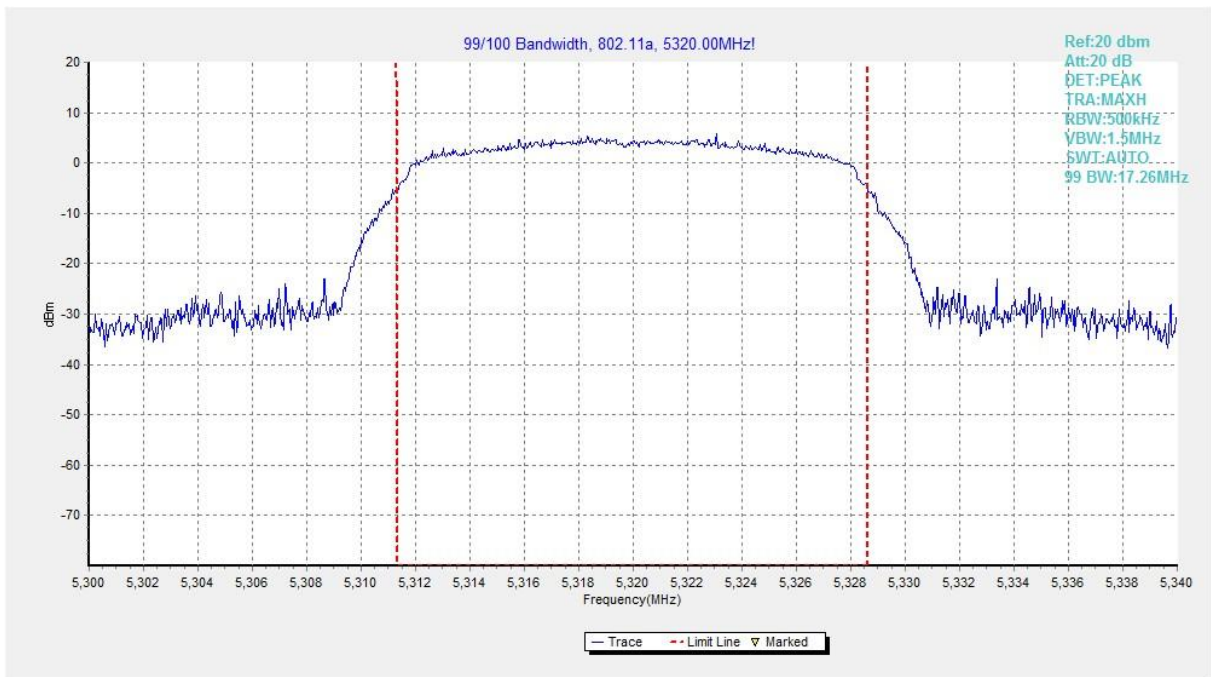


Fig. 32 99% Occupied Bandwidth (802.11a, 5320MHz)

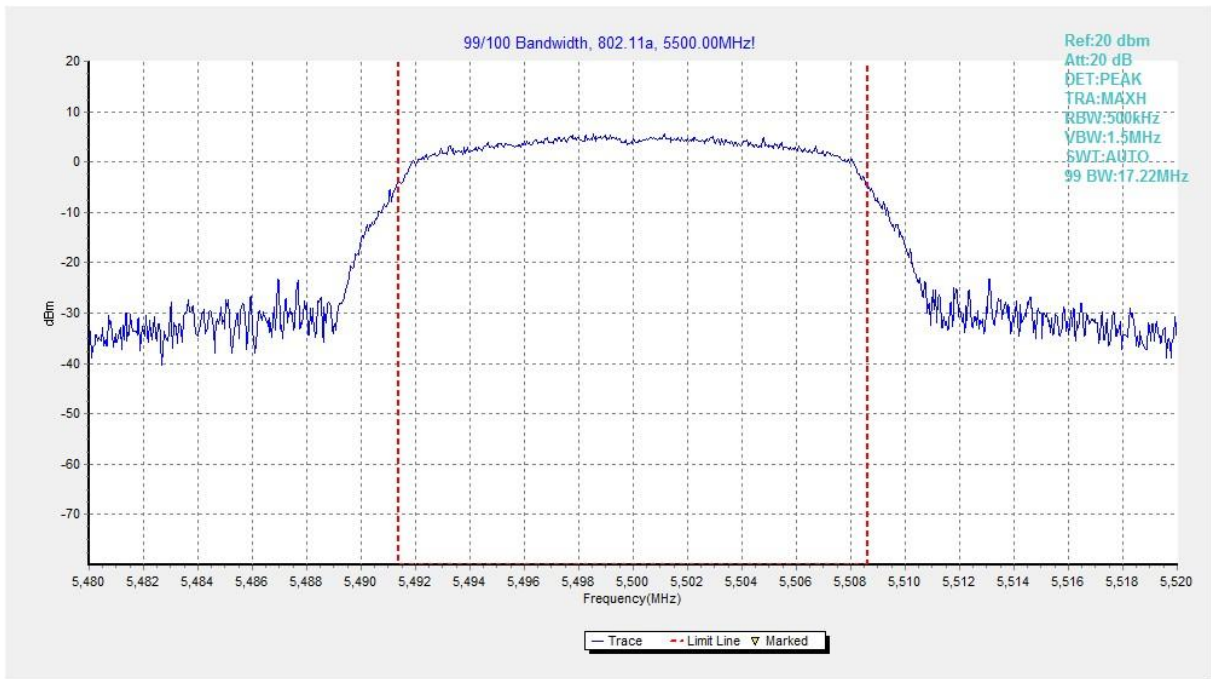


Fig. 33 99% Occupied Bandwidth (802. 11a, 5500MHz)

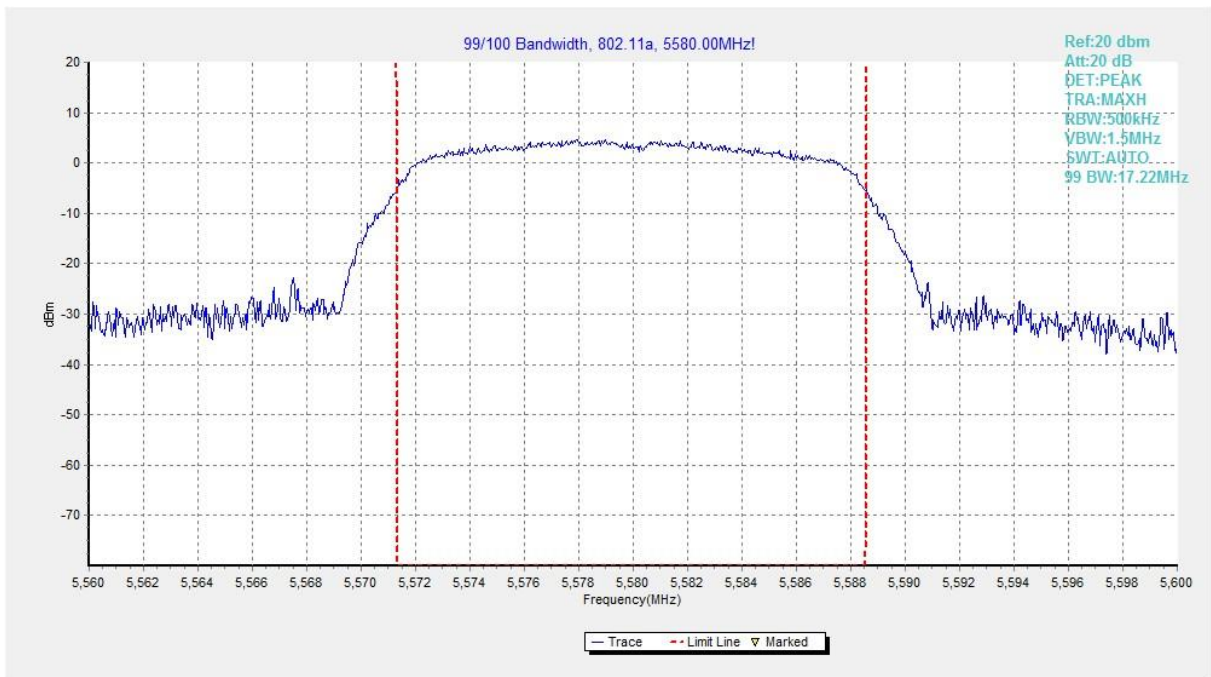


Fig. 34 99% Occupied Bandwidth (802. 11a, 5580MHz)

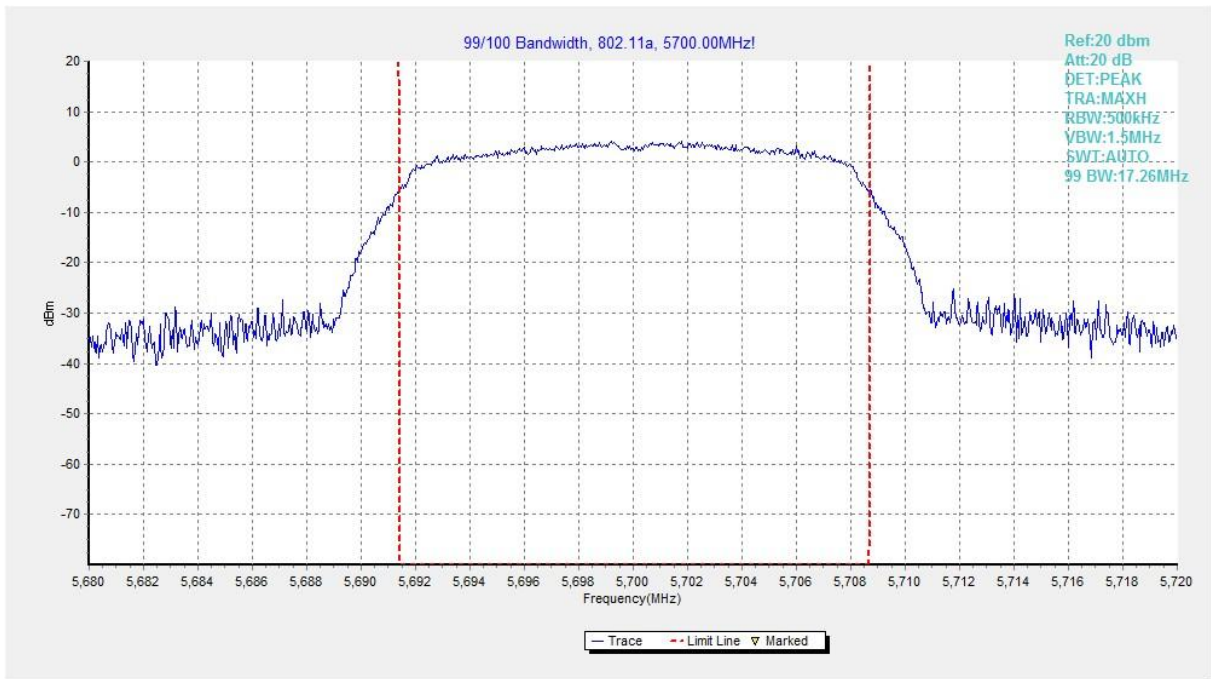


Fig. 35 99% Occupied Bandwidth (802. 11a, 5700MHz)

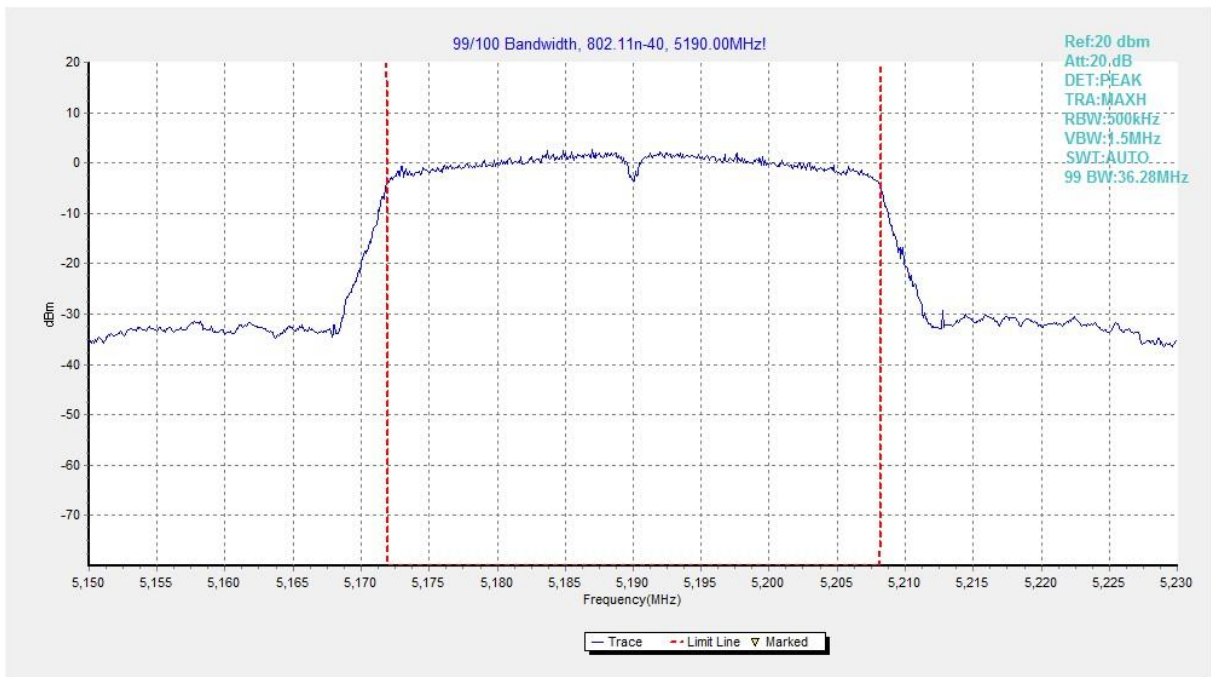


Fig. 36 99% Occupied Bandwidth (802.11n-HT40, 5190MHz)

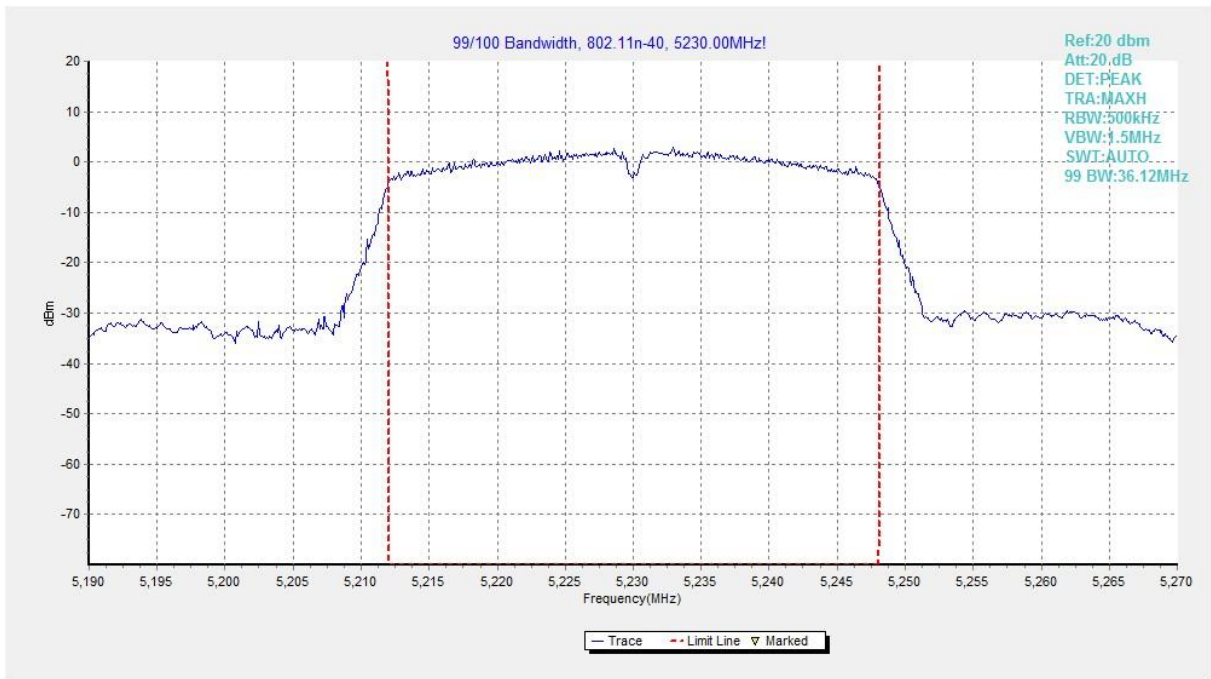


Fig. 37 99% Occupied Bandwidth (802.11n-HT40, 5230MHz)

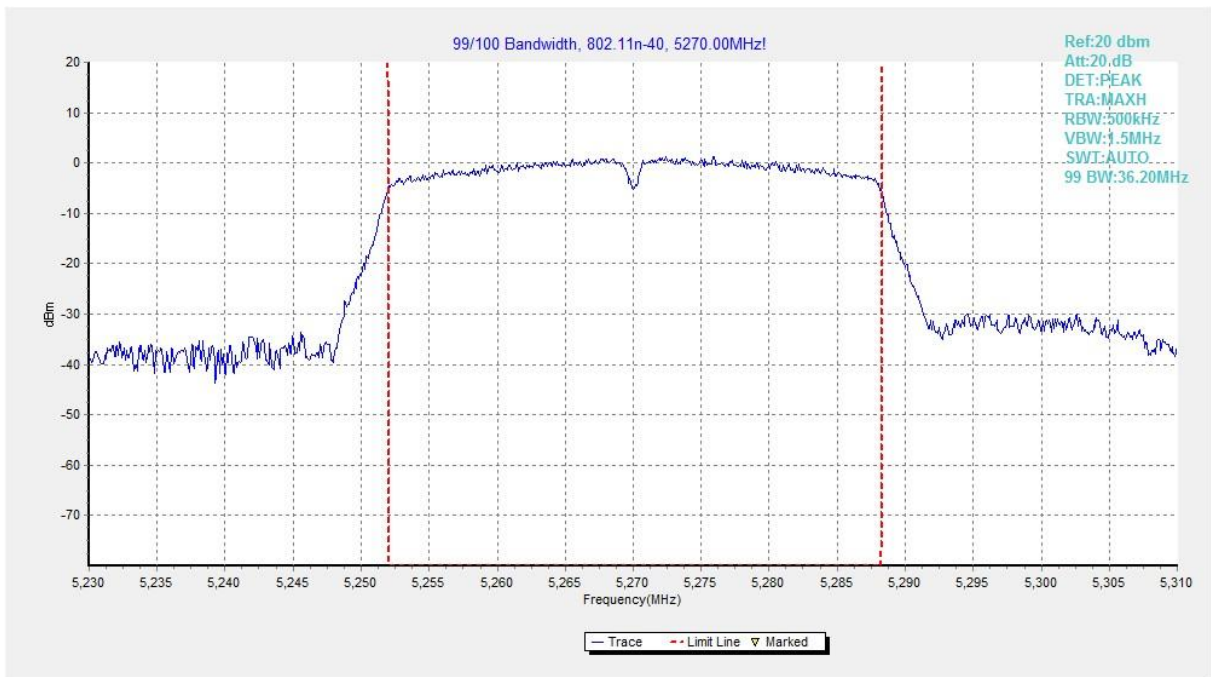


Fig. 38 99% Occupied Bandwidth (802.11n-HT40, 5270MHz)

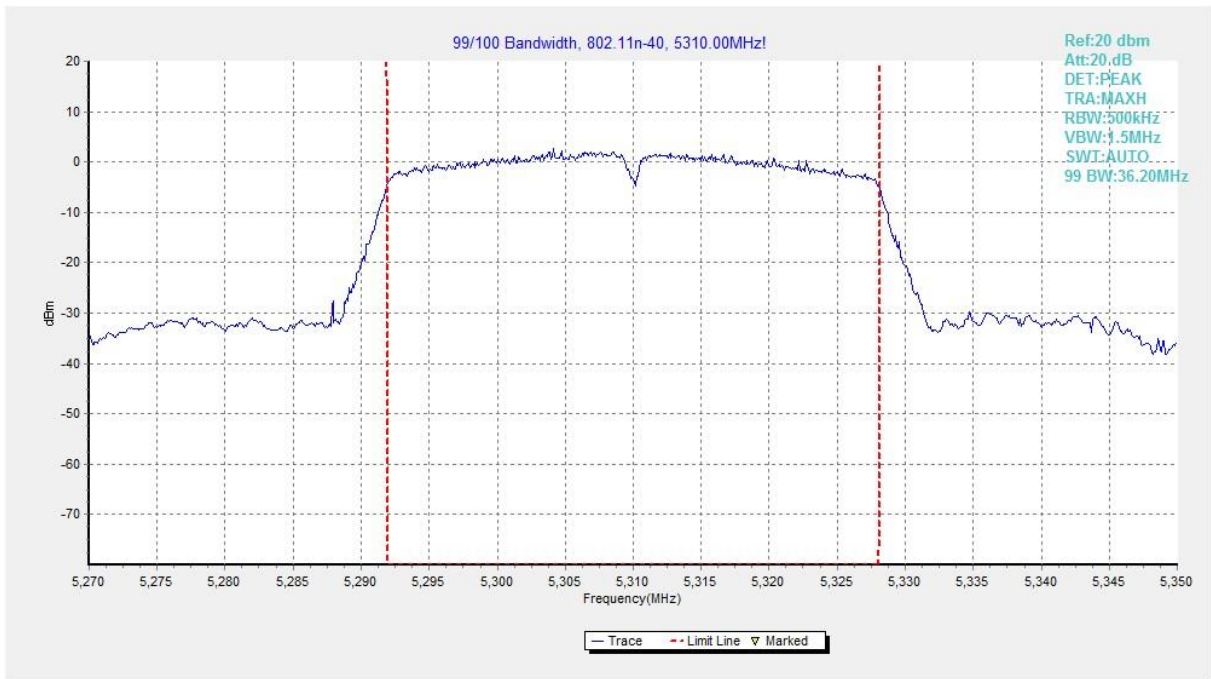


Fig. 39 99% Occupied Bandwidth (802.11n-HT40, 5310MHz)

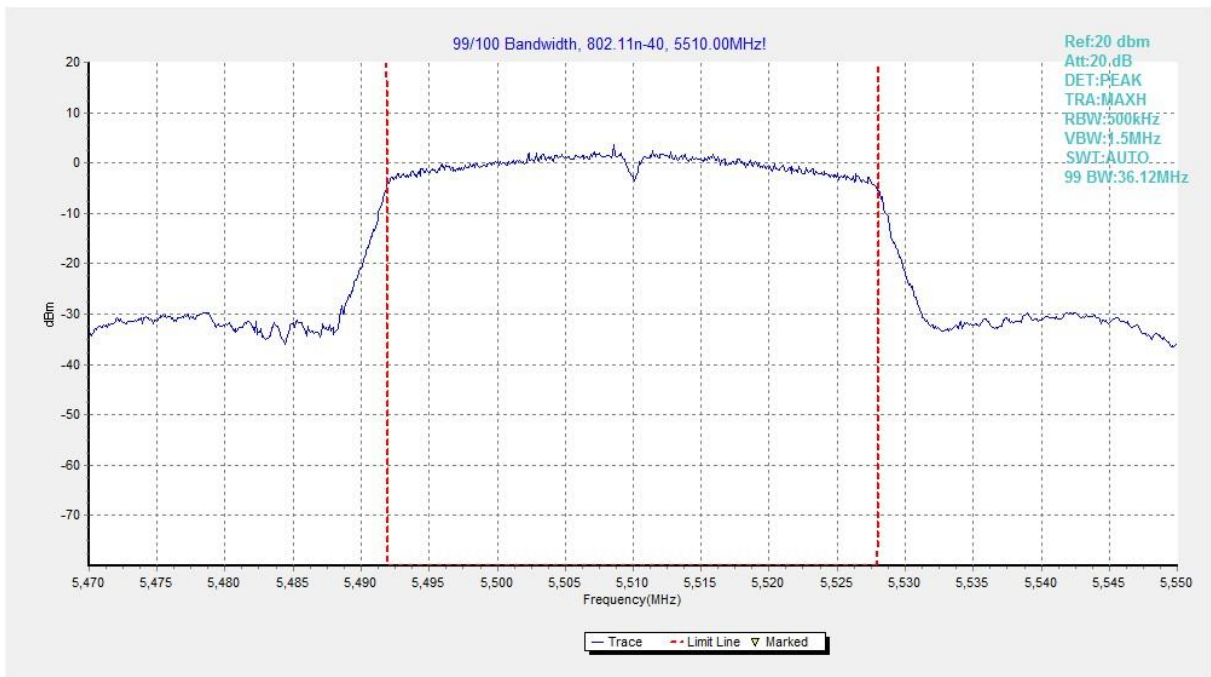


Fig. 40 99% Occupied Bandwidth (802.11n-HT40, 5510MHz)

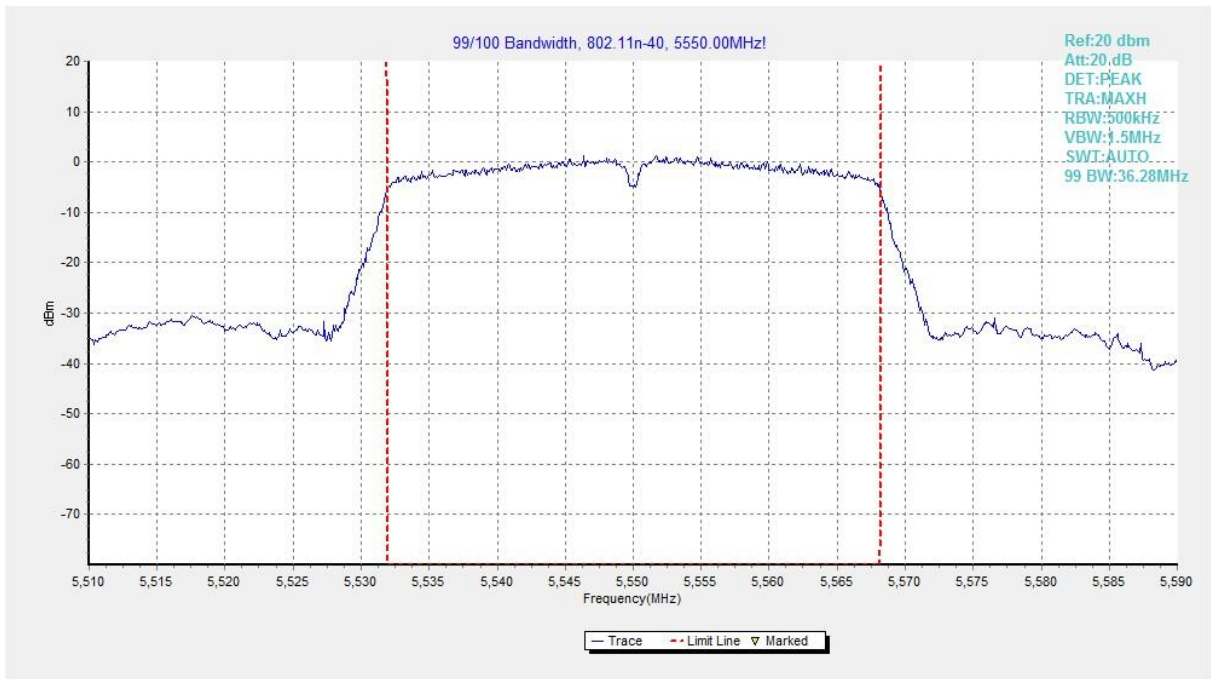


Fig. 41 99% Occupied Bandwidth (802.11n-HT40, 5550MHz)

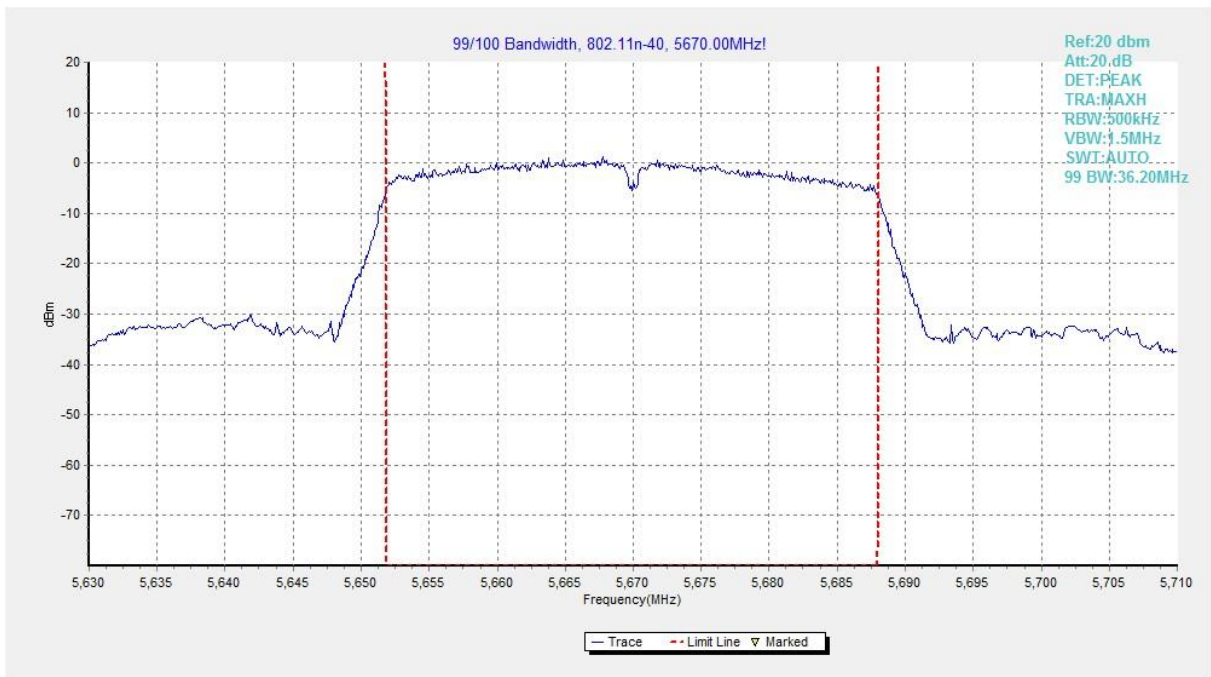


Fig. 42 99% Occupied Bandwidth (802.11n-HT40, 5670MHz)

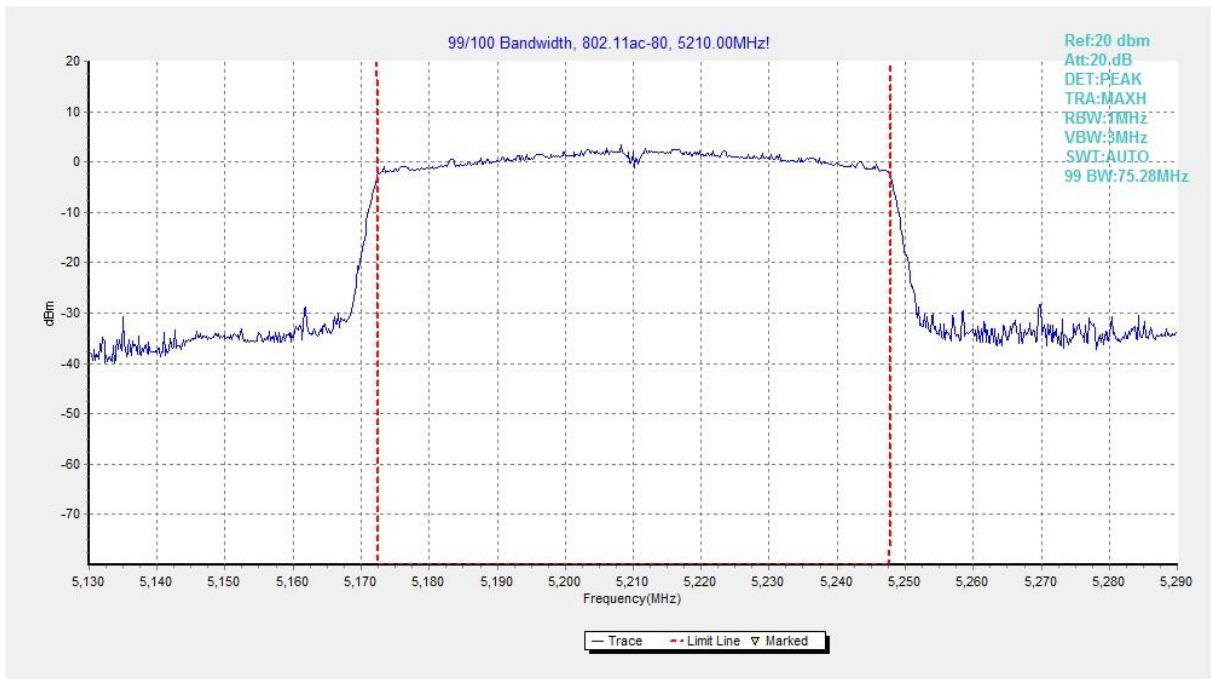


Fig. 43 99% Occupied Bandwidth (802. 11ac-VHT80, 5210MHz)

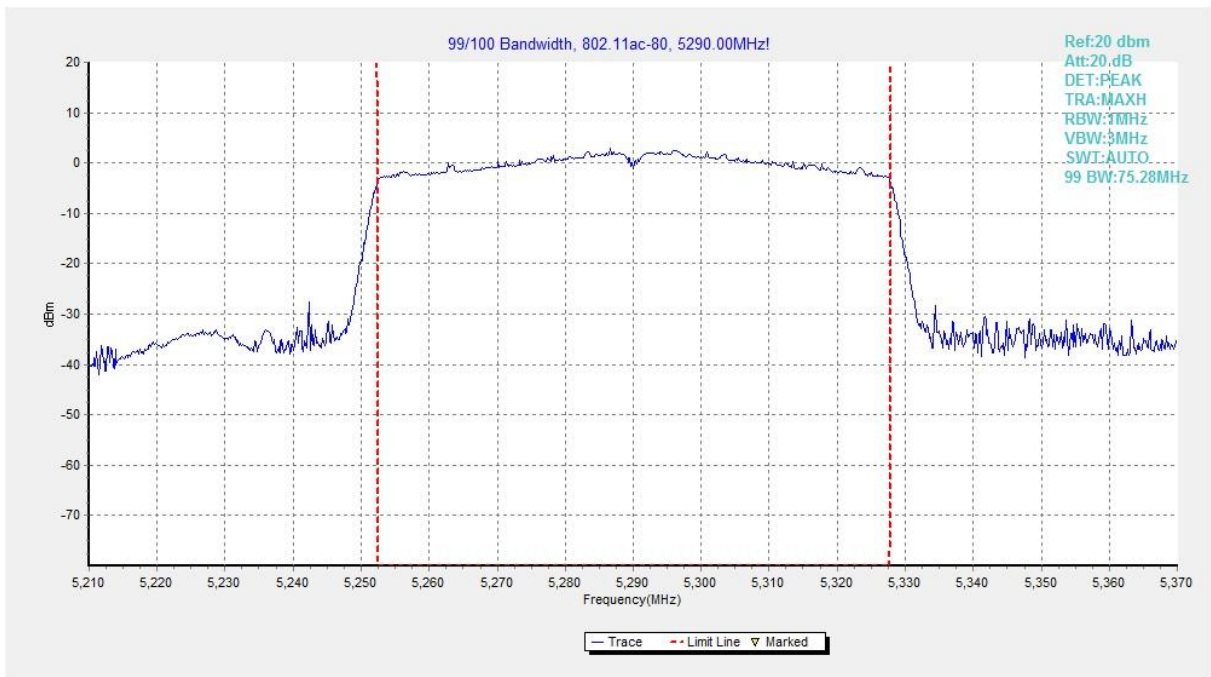


Fig. 44 99% Occupied Bandwidth (802. 11ac-VHT80, 5290MHz)

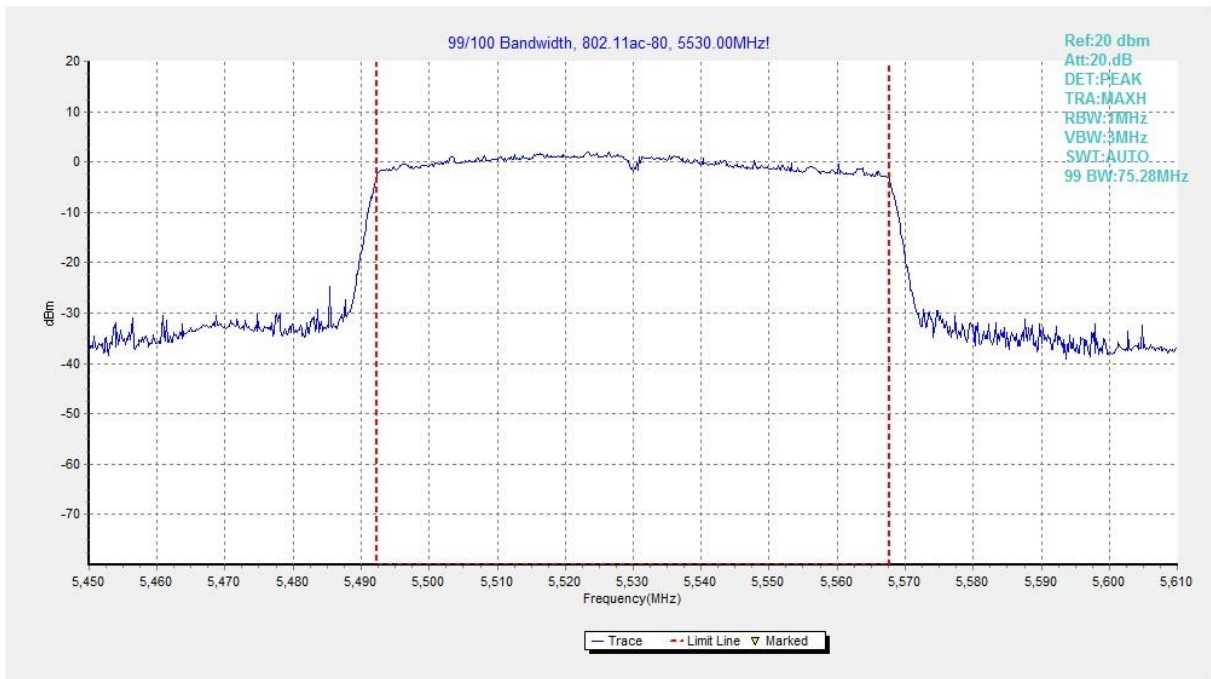


Fig. 45 99% Occupied Bandwidth (802. 11ac-VHT80, 5530MHz)

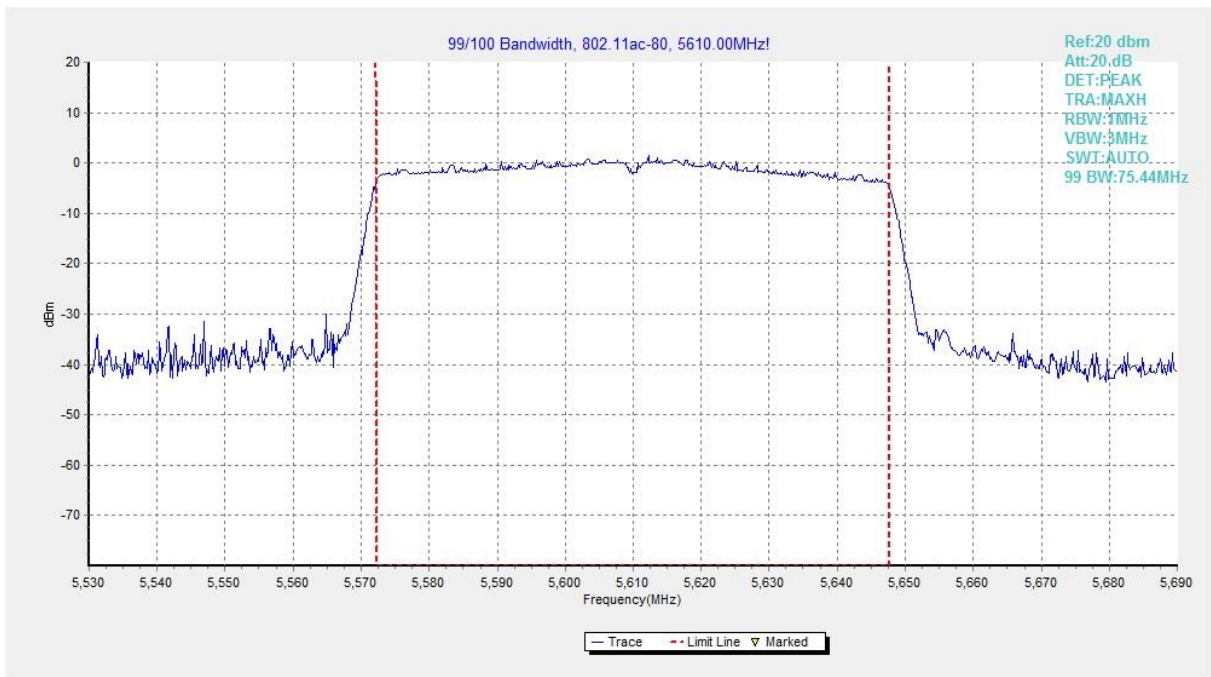


Fig. 46 99% Occupied Bandwidth (802. 11ac-VHT80, 5610MHz)



A.7. Band Edges Compliance

Measurement Limit:

| Standard | Frequency (MHz) | Limit (dBm/MHz) |
|------------------------|---|-----------------|
| FCC 47 CFR Part 15.407 | 5150MHz~5250MHz; 5250MHz~5350MHz; 5470MHz~5725MHz | < -27 |

| Standard | Frequency (MHz) | Limit (dBUV/m) | |
|------------------------|-----------------|----------------|----|
| FCC 47 CFR Part 15.209 | 5725MHz~5850MHz | Peak | 74 |
| | | Average | 54 |

The measurement is made according to KDB 789033

Measurement Result:

| Mode | Channel | Test Results | Conclusion |
|----------------|-----------------|--------------|------------|
| 802.11a | 5180 MHz(CH36) | Fig.47 | P |
| | 5320 MHz(CH64) | Fig.48 | P |
| | 5500 MHz(CH100) | Fig.49 | P |
| | 5700 MHz(CH140) | Fig.50 | P |
| | 5745 MHz(CH149) | Fig.51 | P |
| | 5825 MHz(CH165) | Fig.52 | P |
| 802.11n-HT40 | 5190 MHz(CH38) | Fig.53 | P |
| | 5310 MHz(CH62) | Fig.54 | P |
| | 5510 MHz(CH102) | Fig.55 | P |
| | 5670 MHz(CH134) | Fig.56 | P |
| | 5755 MHz(CH151) | Fig.57 | P |
| | 5795 MHz(CH159) | Fig.58 | P |
| 802.11ac-VHT80 | 5210 MHz(CH42) | Fig.59 | P |
| | 5290 MHz(CH58) | Fig.60 | P |
| | 5530 MHz(CH106) | Fig.61 | P |
| | 5775 MHz(CH155) | Fig.62 | P |

Conclusion: PASS

Test graphs as below:

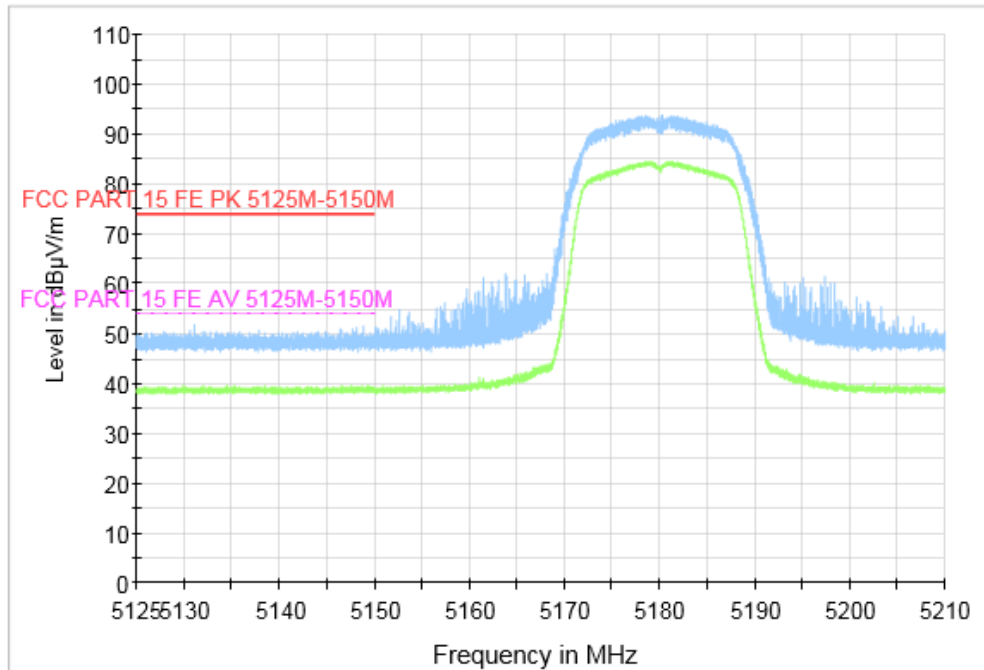


Fig. 47 Band Edges (802.11a, CH36 5180MHz)

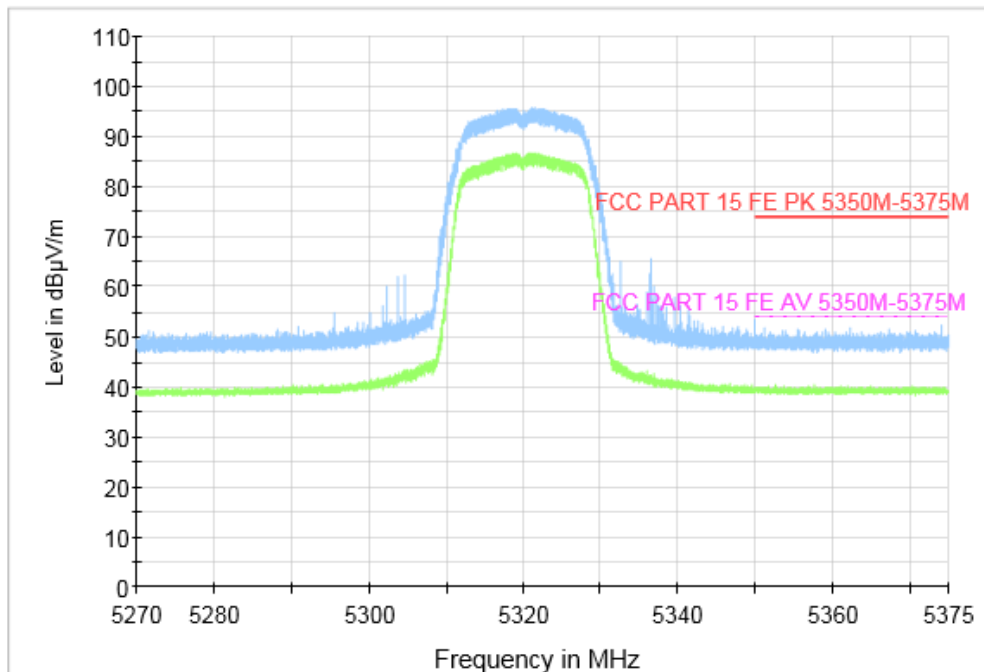


Fig. 48 Band Edges (802.11a, CH64 5320MHz)

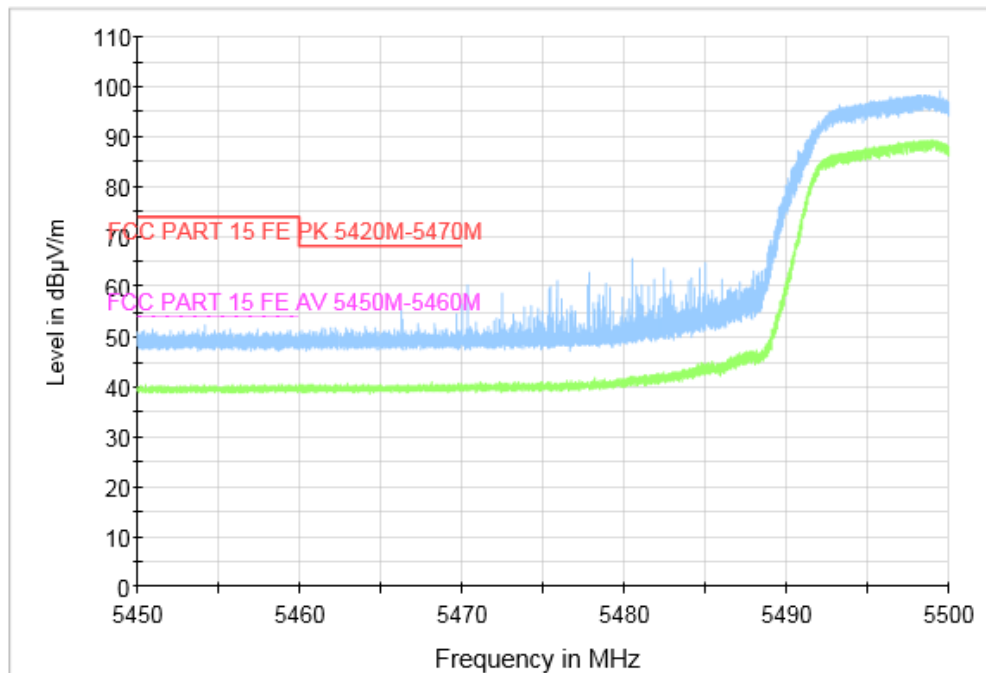


Fig. 49 Band Edges (802.11a, CH100 5500MHz)

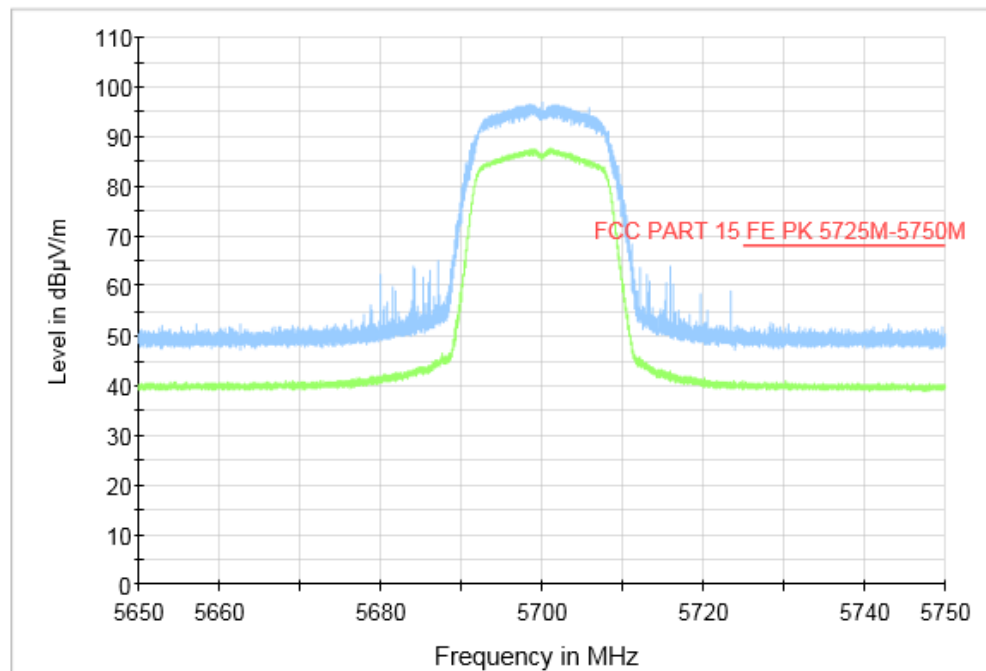


Fig. 50 Band Edges (802.11a, CH140 5700MHz)

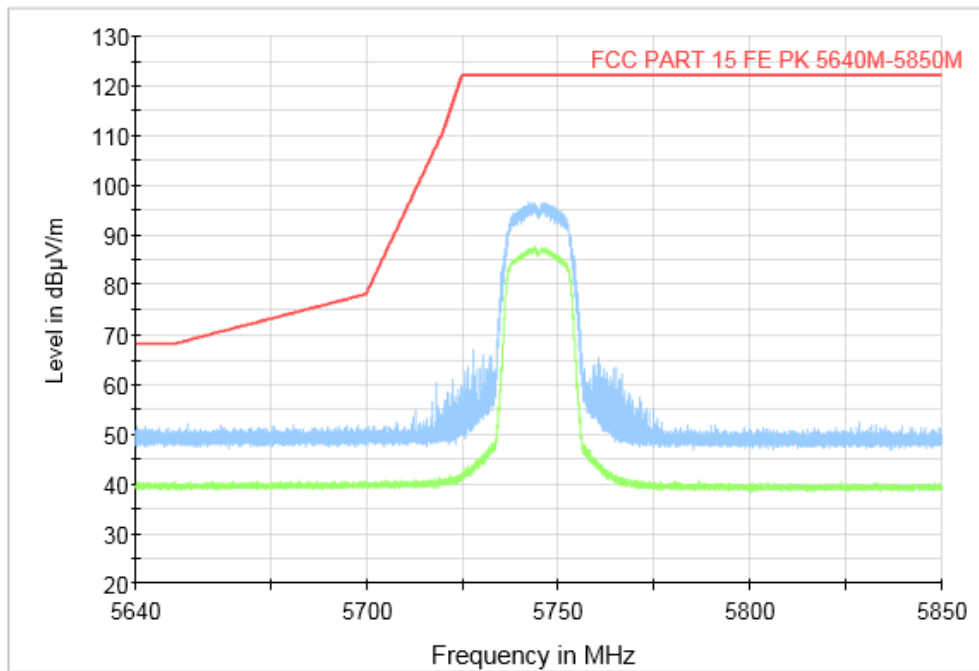


Fig. 51 Band Edges (802.11a, CH149 5745MHz)

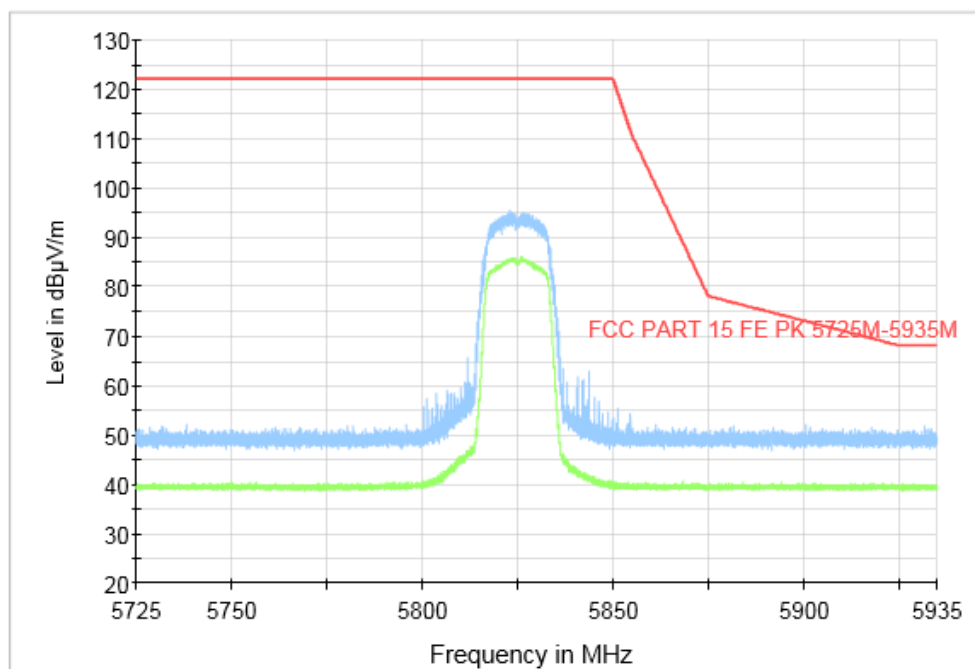


Fig. 52 Band Edges (802.11a, CH165 5825MHz)

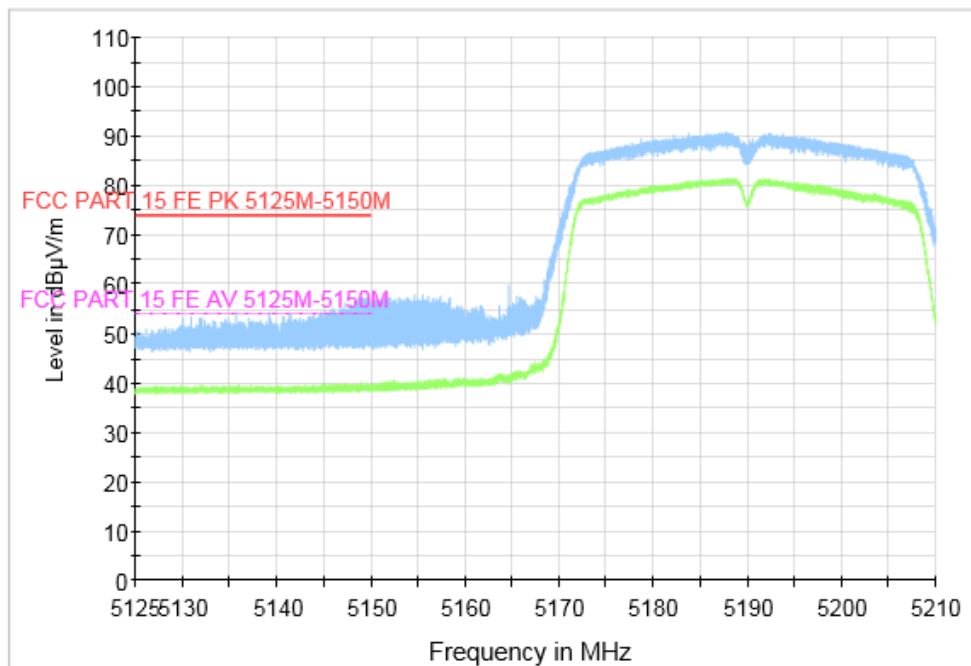


Fig. 53 Band Edges (802.11n-HT40, CH38 5190MHz)

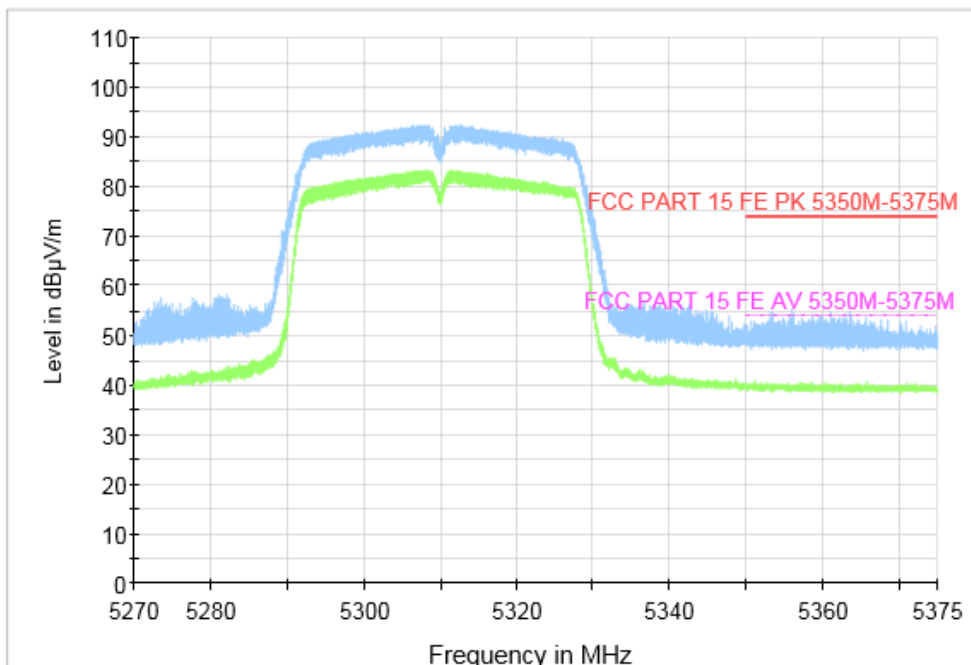


Fig. 54 Band Edges (802.11n-HT40, CH62 5310MHz)

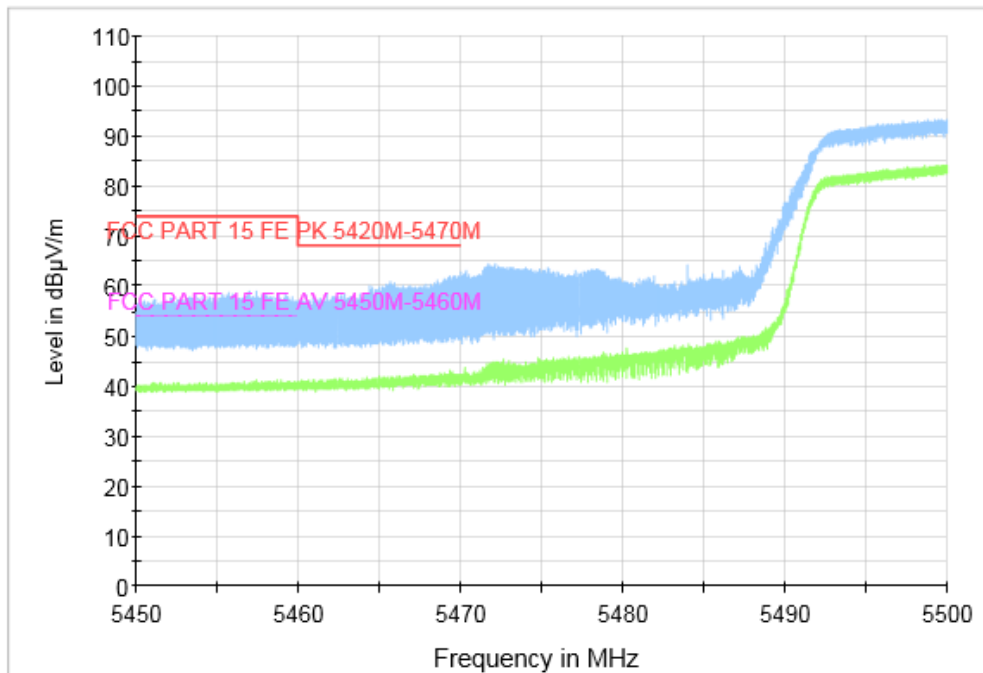


Fig. 55 Band Edges (802.11n-HT40, CH102 5510MHz)

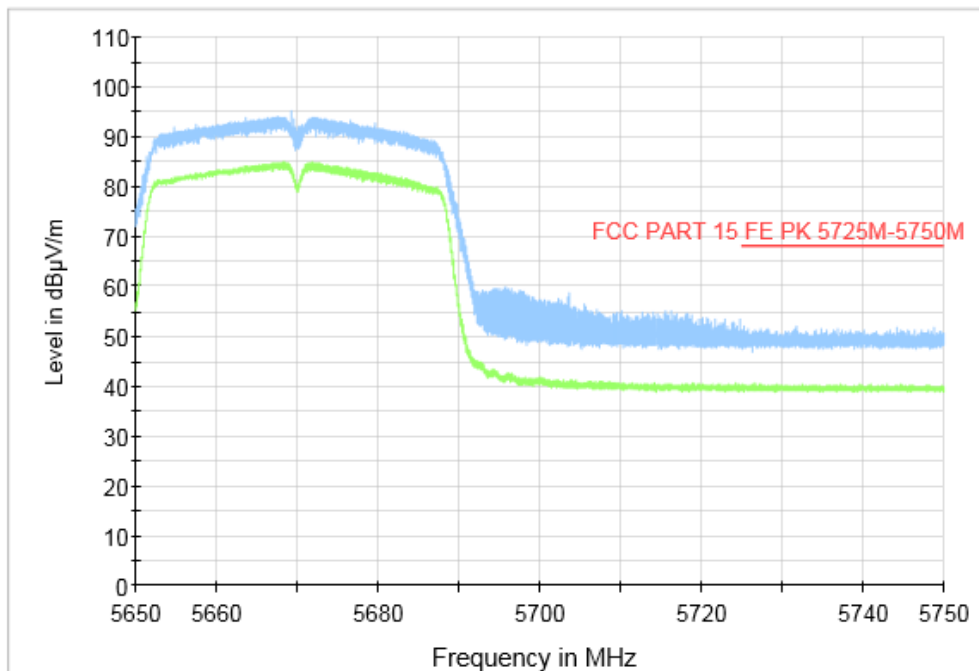


Fig. 56 Band Edges (802.11n-HT40, CH134 5670MHz)

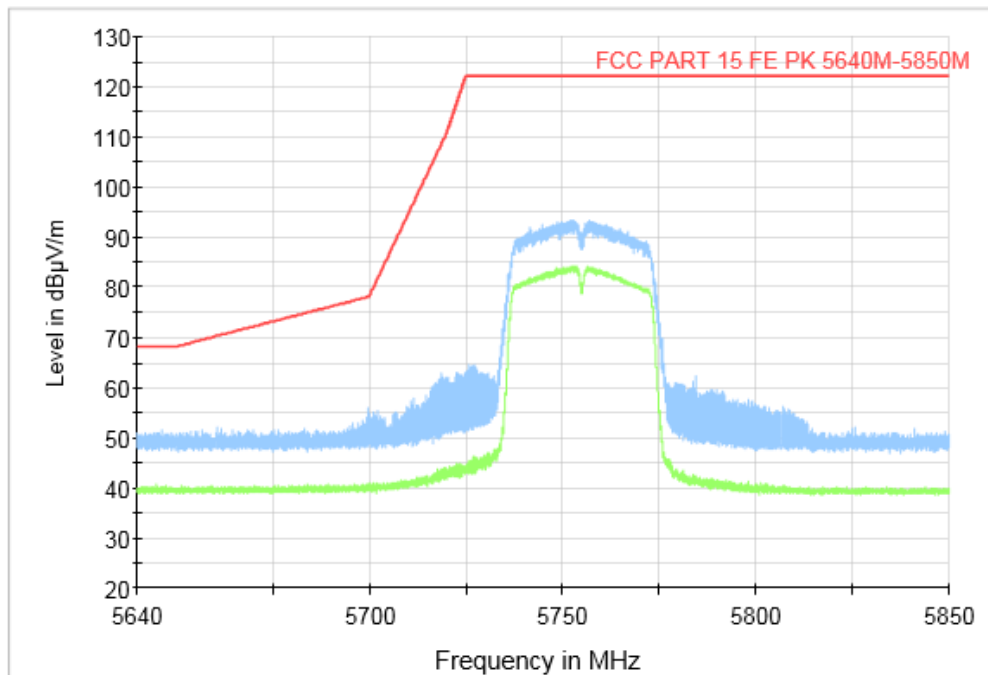


Fig. 57 Band Edges (802.11n-HT40, CH151 5755MHz)

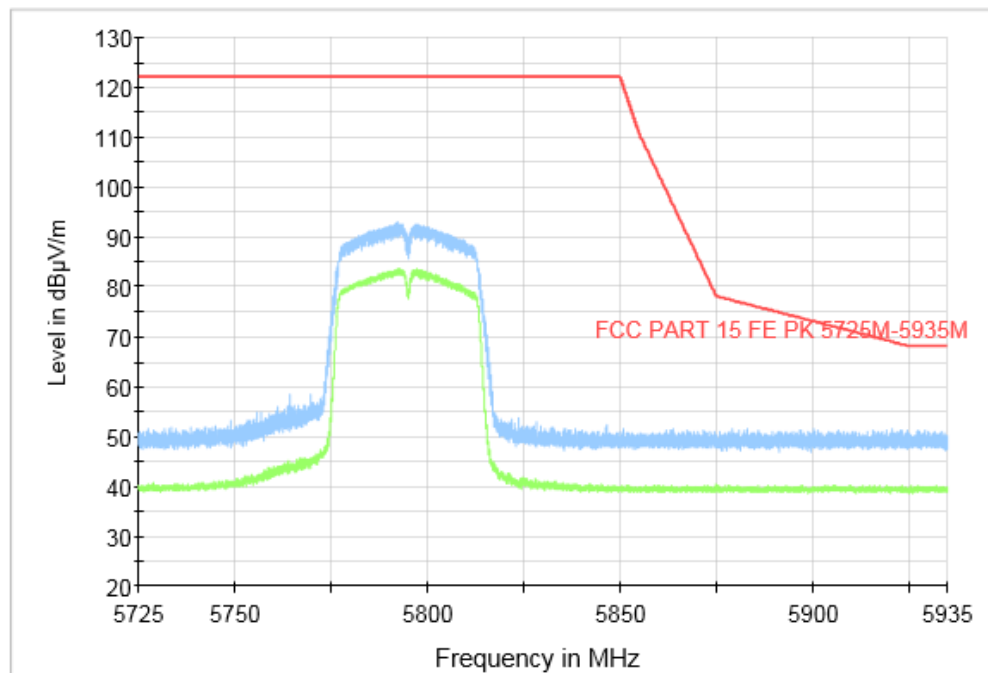


Fig. 58 Band Edges (802.11n-HT40, CH159 5795MHz)

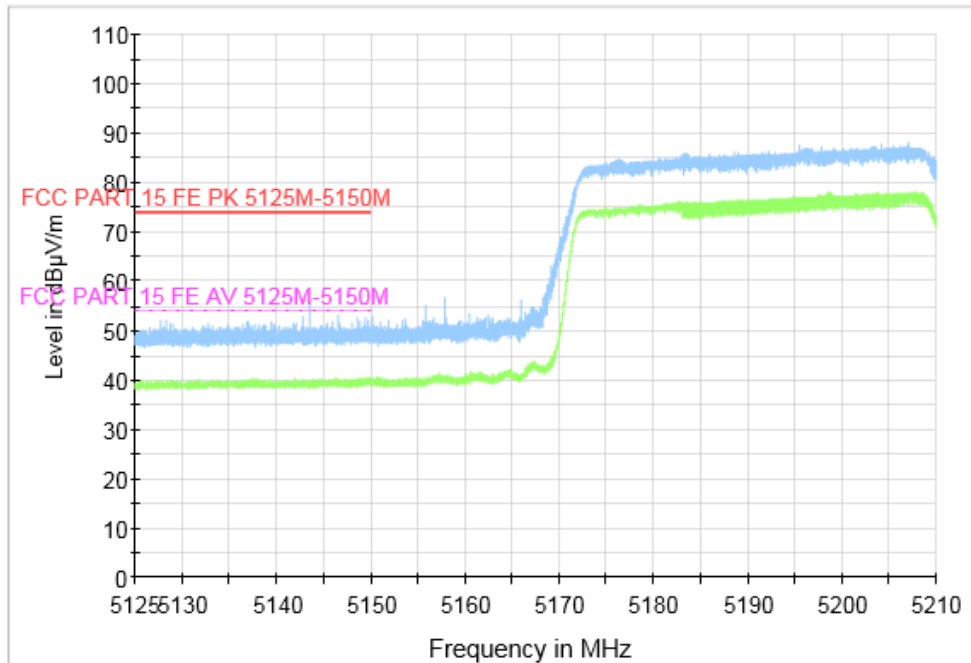


Fig. 59 Band Edges (802.11ac-VHT80, CH42 5210MHz)

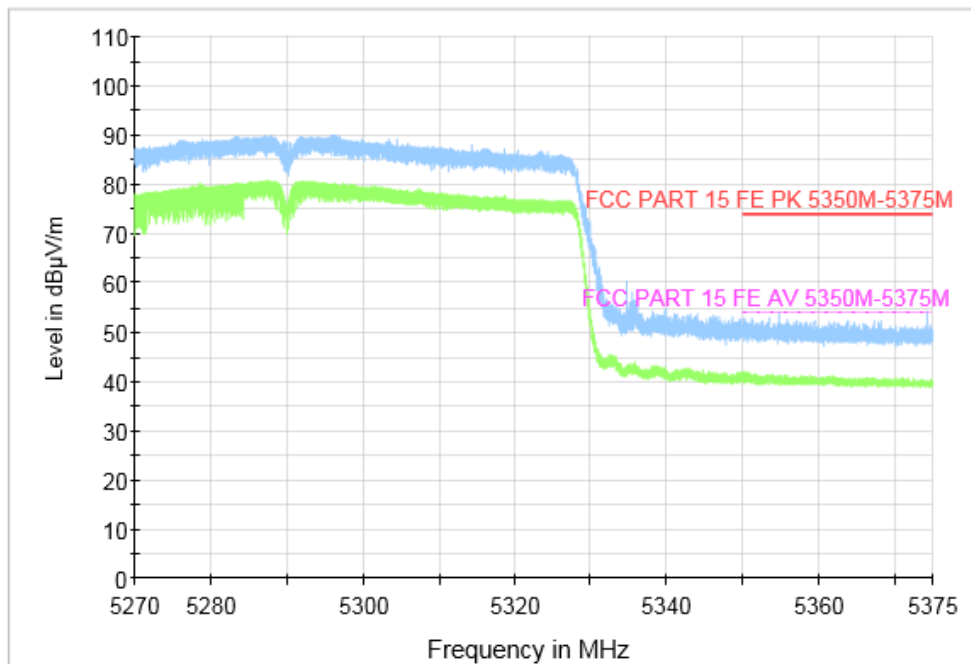


Fig. 60 Band Edges (802.11ac-VHT80, CH58 5290MHz)

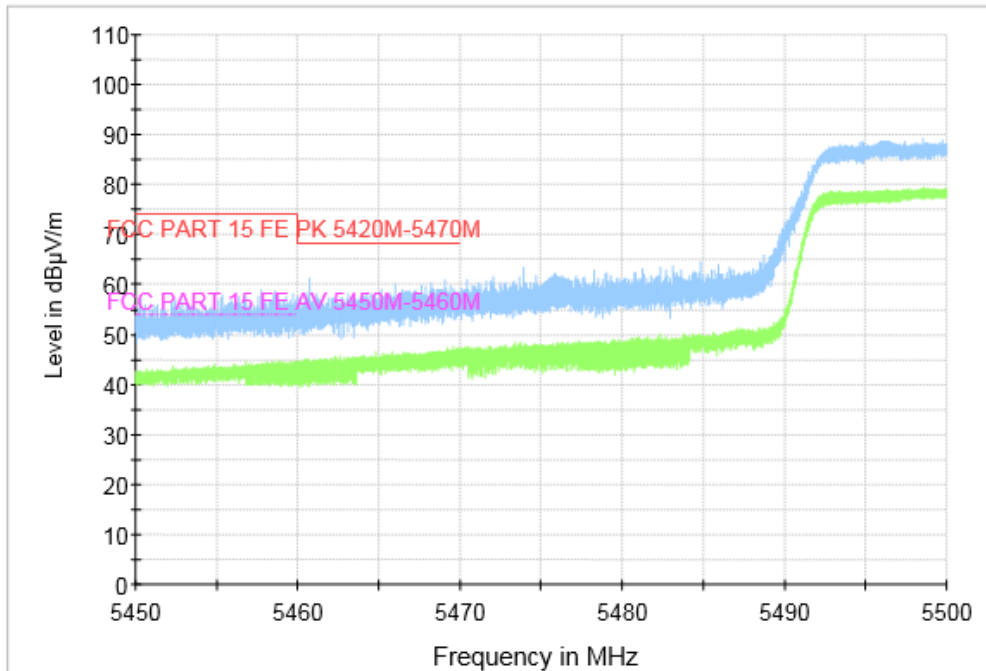


Fig. 61 Band Edges (802.11ac-VHT80, CH106 5530MHz)

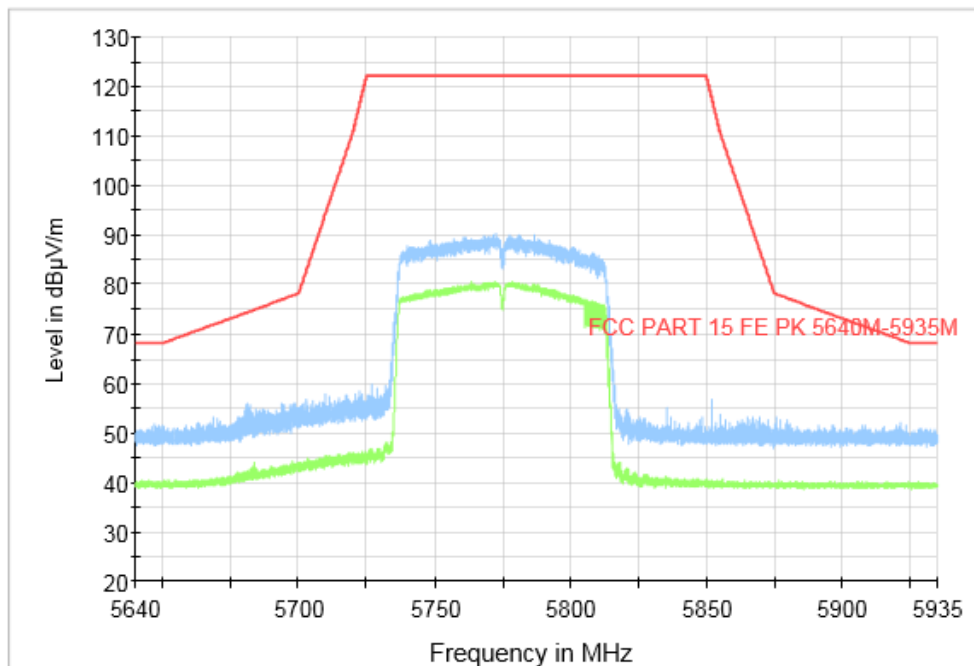


Fig. 62 Band Edges (802.11ac-VHT80, CH155 5775MHz)

A.8. Transmitter Spurious Emission

Measurement Limit:

| Standard | Frequency (MHz) | Limit (dBm/MHz) |
|------------------------|---|-----------------|
| FCC 47 CFR Part 15.407 | 5150MHz~5250MHz; 5250MHz~5350MHz; 5470MHz~5725MHz | < -27 |

| Standard | Frequency (MHz) | Limit (dBuV/m) | |
|------------------------|-----------------|----------------|----|
| FCC 47 CFR Part 15.209 | 5725MHz~5850MHz | Peak | 74 |
| | | Average | 54 |

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) | 3 GHz ~7 GHz | Fig.63 | P |
| | | 7 GHz ~18 GHz | Fig.64 | P |
| | 5200MHz(Ch40) | 3 GHz ~7 GHz | Fig.65 | P |
| | | 7 GHz ~18 GHz | Fig.66 | P |
| | 5240MHz(Ch48) | 3 GHz ~7 GHz | Fig.67 | P |
| | | 7 GHz ~18 GHz | Fig.68 | P |
| | 5260MHz(Ch52) | 3 GHz ~7 GHz | Fig.69 | P |
| | | 7 GHz ~18 GHz | Fig.70 | P |
| | 5280MHz(Ch56) | 3 GHz ~7 GHz | Fig.71 | P |
| | | 7 GHz ~18 GHz | Fig.72 | P |
| | 5320MHz(Ch64) | 3 GHz ~7 GHz | Fig.73 | P |
| | | 7 GHz ~18 GHz | Fig.74 | P |
| | 5500MHz(Ch100) | 3 GHz ~7 GHz | Fig.75 | P |
| | | 7 GHz ~18 GHz | Fig.76 | P |

| | | | | | |
|-------------------|------------------|------------------|---------------|--------|---|
| | 5600MHz(Ch120) | 3 GHz ~7 GHz | Fig.77 | P | |
| | | 7 GHz ~18 GHz | Fig.78 | P | |
| | 5700MHz(Ch140) | 3 GHz ~7 GHz | Fig.79 | P | |
| | | 7 GHz ~18 GHz | Fig.80 | P | |
| | 5745MHz(Ch149) | 3 GHz ~7 GHz | Fig.81 | P | |
| | | 7 GHz ~18 GHz | Fig.82 | P | |
| | 5785MHz(Ch157) | 3 GHz ~7 GHz | Fig.83 | P | |
| | | 7 GHz ~18 GHz | Fig.84 | P | |
| | 5825MHz(Ch165) | 3 GHz ~7 GHz | Fig.85 | P | |
| | | 7 GHz ~18 GHz | Fig.86 | P | |
| | 802.11n- HT40 | 5190MHz(Ch38) | 3 GHz ~7 GHz | Fig.87 | P |
| | | | 7 GHz ~18 GHz | Fig.88 | P |
| 5230MHz(Ch46) | | 3 GHz ~7 GHz | Fig.89 | P | |
| | | 7 GHz ~18 GHz | Fig.90 | P | |
| 5270MHz(Ch54) | | 3 GHz ~7 GHz | Fig.91 | P | |
| | | 7 GHz ~18 GHz | Fig.92 | P | |
| 5310MHz(Ch62) | | 3 GHz ~7 GHz | Fig.93 | P | |
| | | 7 GHz ~18 GHz | Fig.94 | P | |
| 5510MHz(Ch102) | | 3 GHz ~7 GHz | Fig.95 | P | |
| | | 7 GHz ~18 GHz | Fig.96 | P | |
| 5580MHz(Ch118) | | 3 GHz ~7 GHz | Fig.97 | P | |
| | | 7 GHz ~18 GHz | Fig.98 | P | |
| 5670MHz(Ch134) | | 3 GHz ~7 GHz | Fig.99 | P | |
| | | 7 GHz ~18 GHz | Fig.100 | P | |
| 5755MHz(Ch151) | | 3 GHz ~7 GHz | Fig.101 | P | |
| | | 7 GHz ~18 GHz | Fig.102 | P | |
| 5795MHz(Ch159) | | 3 GHz ~7 GHz | Fig.103 | P | |
| | | 7 GHz ~18 GHz | Fig.104 | P | |
| 802.11a- VHT80 | 5210MHz(Ch42) | 3 GHz ~7 GHz | Fig.105 | P | |
| | | 7 GHz ~18 GHz | Fig.106 | P | |
| | 5290MHz(Ch58) | 3 GHz ~7 GHz | Fig.107 | P | |
| | | 7 GHz ~18 GHz | Fig.108 | P | |
| | 5530MHz(Ch106) | 3 GHz ~7 GHz | Fig.109 | P | |
| | | 7 GHz ~18 GHz | Fig.110 | P | |
| | 5610MHz(Ch122) | 3 GHz ~7 GHz | Fig.111 | P | |
| | | 7 GHz ~18 GHz | Fig.112 | P | |
| | 5775MHz(Ch155) | 3 GHz ~7 GHz | Fig.113 | P | |
| | | 7 GHz ~18 GHz | Fig.114 | P | |
| All channels | | 30 MHz ~1 GHz | Fig.115 | P | |
| | | 1 GHz ~3 GHz | Fig.116 | P | |
| | | 18 GHz ~26.5 GHz | Fig.117 | P | |
| | | 26.5GHz~40GHz | Fig.118 | P | |



Worst Case Result

802.11a CH36

| Frequency (MHz) | Max Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------|----------------|-------------|-----|------------|
| 12982.533333 | 47.53 | 68.20 | 20.67 | H | 8.3 |
| 13574.700000 | 47.73 | 68.20 | 20.47 | H | 8.6 |
| 14165.033333 | 48.65 | 68.20 | 19.55 | V | 10.7 |
| 14862.066667 | 48.76 | 68.20 | 19.44 | H | 10.9 |
| 16719.233333 | 52.26 | 68.20 | 15.94 | V | 14.9 |
| 17612.433333 | 51.40 | 68.20 | 16.80 | H | 15.6 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----|------------|
| 10848.166667 | 34.14 | 54.00 | 19.86 | H | 5.3 |
| 11676.100000 | 35.09 | 54.00 | 18.91 | H | 7.0 |
| 12523.466667 | 35.76 | 54.00 | 18.24 | V | 8.0 |
| 15501.900000 | 37.10 | 54.00 | 16.90 | H | 11.9 |
| 15947.033333 | 38.07 | 54.00 | 15.93 | H | 13.3 |
| 17961.866667 | 39.77 | 54.00 | 14.23 | H | 16.1 |

802.11a CH52

| Frequency (MHz) | Max Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------|----------------|-------------|-----|------------|
| 12966.033333 | 46.91 | 68.20 | 21.29 | H | 8.5 |
| 13917.900000 | 48.01 | 68.20 | 20.19 | H | 9.4 |
| 14276.133333 | 48.19 | 68.20 | 20.01 | H | 10.9 |
| 15060.433333 | 48.39 | 68.20 | 19.81 | H | 11.1 |
| 16705.300000 | 51.21 | 68.20 | 16.99 | H | 14.9 |
| 17350.633333 | 50.81 | 68.20 | 17.39 | V | 14.7 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----|------------|
| 10921.133333 | 33.75 | 54.00 | 20.25 | H | 5.2 |
| 11418.333333 | 33.74 | 54.00 | 20.26 | H | 5.6 |
| 11941.566667 | 34.97 | 54.00 | 19.03 | H | 7.0 |
| 12472.500000 | 35.00 | 54.00 | 19.00 | H | 7.9 |
| 15900.833333 | 37.84 | 54.00 | 16.16 | H | 13.2 |
| 17953.066667 | 39.50 | 54.00 | 14.50 | H | 16.1 |



802.11a CH100

| Frequency (MHz) | Max Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------|----------------|-------------|-----|------------|
| 12942.933333 | 47.70 | 68.20 | 20.50 | H | 8.6 |
| 13707.433333 | 45.97 | 68.20 | 22.23 | H | 8.6 |
| 14107.100000 | 47.77 | 68.20 | 20.43 | H | 10.3 |
| 14926.966667 | 47.46 | 68.20 | 20.74 | H | 11.2 |
| 16577.333333 | 50.28 | 68.20 | 17.92 | V | 14.8 |
| 17228.900000 | 50.11 | 68.20 | 18.09 | H | 14.8 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----|------------|
| 10995.933333 | 33.07 | 54.00 | 20.93 | V | 5.1 |
| 11431.166667 | 33.08 | 54.00 | 20.92 | H | 5.7 |
| 11941.566667 | 34.42 | 54.00 | 19.58 | V | 7.0 |
| 12486.066667 | 34.57 | 54.00 | 19.43 | V | 8.0 |
| 15903.766667 | 37.13 | 54.00 | 16.87 | H | 13.2 |
| 17961.866667 | 38.57 | 54.00 | 15.43 | H | 16.1 |

802.11a CH149

| Frequency (MHz) | Max Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------|----------------|-------------|-----|------------|
| 12965.300000 | 46.82 | 68.20 | 21.38 | V | 8.5 |
| 13658.666667 | 46.46 | 68.20 | 21.74 | V | 8.5 |
| 14137.533333 | 48.03 | 68.20 | 20.17 | V | 10.5 |
| 15064.466667 | 47.68 | 68.20 | 20.52 | V | 11.1 |
| 16621.333333 | 49.91 | 68.20 | 18.29 | H | 14.9 |
| 17131.366667 | 50.65 | 68.20 | 17.55 | V | 15.0 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----|------------|
| 11260.300000 | 33.24 | 54.00 | 20.76 | V | 5.5 |
| 11729.266667 | 33.91 | 54.00 | 20.09 | H | 6.8 |
| 12360.666667 | 34.26 | 54.00 | 19.74 | H | 7.5 |
| 15524.266667 | 35.67 | 54.00 | 18.33 | H | 12.0 |
| 15914.400000 | 37.23 | 54.00 | 16.77 | H | 13.3 |
| 17986.433333 | 38.40 | 54.00 | 15.60 | V | 15.9 |



802.11n HT40 CH38

| Frequency (MHz) | Max Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------|----------------|-------------|-----|------------|
| 12941.100000 | 47.11 | 68.20 | 21.09 | V | 8.6 |
| 13774.533333 | 45.99 | 68.20 | 22.21 | V | 8.6 |
| 14205.733333 | 47.92 | 68.20 | 20.28 | V | 10.9 |
| 15089.400000 | 48.37 | 68.20 | 19.83 | V | 11.2 |
| 16571.833333 | 50.61 | 68.20 | 17.59 | H | 14.8 |
| 17209.100000 | 50.38 | 68.20 | 17.82 | V | 14.8 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----|------------|
| 11147.366667 | 32.86 | 54.00 | 21.14 | V | 5.1 |
| 11626.233333 | 34.18 | 54.00 | 19.82 | V | 6.9 |
| 12363.600000 | 34.37 | 54.00 | 19.63 | H | 7.4 |
| 15552.866667 | 35.74 | 54.00 | 18.26 | H | 11.8 |
| 16101.033333 | 37.79 | 54.00 | 16.21 | H | 14.0 |
| 17932.166667 | 39.06 | 54.00 | 14.94 | V | 16.1 |

802.11n HT40 CH54

| Frequency (MHz) | Max Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------|----------------|-------------|-----|------------|
| 12966.400000 | 46.63 | 68.20 | 21.57 | H | 8.5 |
| 13751.433333 | 45.89 | 68.20 | 22.31 | V | 8.7 |
| 14227.000000 | 47.86 | 68.20 | 20.34 | H | 11.0 |
| 15082.800000 | 48.18 | 68.20 | 20.02 | V | 11.2 |
| 17040.433333 | 50.78 | 68.20 | 17.42 | V | 15.0 |
| 17602.533333 | 51.43 | 68.20 | 16.77 | H | 15.5 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----|------------|
| 11258.833333 | 33.50 | 54.00 | 20.50 | H | 5.5 |
| 11745.033333 | 33.93 | 54.00 | 20.07 | H | 6.9 |
| 12341.966667 | 34.39 | 54.00 | 19.61 | H | 7.3 |
| 15694.033333 | 36.13 | 54.00 | 17.87 | H | 12.3 |
| 16135.500000 | 38.02 | 54.00 | 15.98 | H | 14.2 |
| 17960.033333 | 39.00 | 54.00 | 15.00 | V | 16.1 |

**802.11n HT40 CH102**

| Frequency (MHz) | Max Peak (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------------|----------------------|-------------|-----|------------|
| 12947.700000 | 46.69 | 68.20 | 21.51 | V | 8.6 |
| 13778.566667 | 46.14 | 68.20 | 22.06 | H | 8.7 |
| 14200.966667 | 47.98 | 68.20 | 20.22 | V | 10.9 |
| 15030.733333 | 47.76 | 68.20 | 20.44 | H | 10.9 |
| 16628.300000 | 50.47 | 68.20 | 17.73 | H | 14.9 |
| 17372.266667 | 50.42 | 68.20 | 17.78 | H | 14.6 |

| Frequency (MHz) | Average (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------------|----------------------|-------------|-----|------------|
| 10929.566667 | 33.05 | 54.00 | 20.95 | H | 5.1 |
| 11428.966667 | 33.53 | 54.00 | 20.47 | V | 5.7 |
| 12139.566667 | 34.83 | 54.00 | 19.17 | V | 7.3 |
| 15696.233333 | 35.99 | 54.00 | 18.01 | V | 12.3 |
| 15975.633333 | 37.46 | 54.00 | 16.54 | V | 13.4 |
| 17935.100000 | 39.04 | 54.00 | 14.96 | H | 16.1 |

802.11n HT40 CH151

| Frequency (MHz) | Max Peak (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------------|----------------------|-------------|-----|------------|
| 12921.300000 | 46.66 | 68.20 | 21.54 | H | 8.6 |
| 13677.000000 | 46.23 | 68.20 | 21.97 | V | 8.5 |
| 14186.666667 | 47.89 | 68.20 | 20.31 | V | 10.9 |
| 15081.333333 | 47.46 | 68.20 | 20.74 | H | 11.2 |
| 16605.933333 | 49.88 | 68.20 | 18.32 | H | 14.8 |
| 17251.633333 | 50.34 | 68.20 | 17.86 | H | 14.8 |

| Frequency (MHz) | Average (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------------|----------------------|-------------|-----|------------|
| 11211.900000 | 33.43 | 54.00 | 20.57 | V | 5.4 |
| 11687.100000 | 34.29 | 54.00 | 19.71 | V | 7.1 |
| 12278.533333 | 34.13 | 54.00 | 19.87 | H | 7.1 |
| 15552.133333 | 35.84 | 54.00 | 18.16 | H | 11.8 |
| 16106.166667 | 37.82 | 54.00 | 16.18 | H | 14.0 |
| 17954.533333 | 39.26 | 54.00 | 14.74 | H | 16.1 |



802.11ac VHT80 CH42

| Frequency (MHz) | Max Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------|----------------|-------------|-----|------------|
| 12989.500000 | 46.93 | 68.20 | 21.27 | V | 8.3 |
| 13763.900000 | 46.71 | 68.20 | 21.49 | V | 8.6 |
| 14177.866667 | 48.91 | 68.20 | 19.29 | H | 10.8 |
| 14939.800000 | 46.97 | 68.20 | 21.23 | H | 11.1 |
| 16656.166667 | 49.98 | 68.20 | 18.22 | H | 14.9 |
| 17371.533333 | 50.25 | 68.20 | 17.95 | V | 14.6 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----|------------|
| 8336.133333 | 34.19 | 54.00 | 19.81 | H | 3.1 |
| 11691.133333 | 34.69 | 54.00 | 19.31 | H | 7.1 |
| 12301.266667 | 34.24 | 54.00 | 19.76 | H | 7.1 |
| 15577.433333 | 35.41 | 54.00 | 18.59 | H | 11.8 |
| 15933.833333 | 37.49 | 54.00 | 16.51 | H | 13.4 |
| 17935.100000 | 39.72 | 54.00 | 14.28 | V | 16.1 |

802.11ac VHT80 CH106

| Frequency (MHz) | Max Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|-------------------|----------------|-------------|-----|------------|
| 12968.233333 | 46.86 | 68.20 | 21.34 | H | 8.5 |
| 13653.533333 | 45.99 | 68.20 | 22.21 | H | 8.6 |
| 14058.333333 | 48.71 | 68.20 | 19.49 | V | 9.8 |
| 14819.533333 | 48.46 | 68.20 | 19.74 | V | 10.7 |
| 16508.766667 | 52.16 | 68.20 | 16.04 | V | 14.7 |
| 17370.433333 | 50.59 | 68.20 | 17.61 | H | 14.6 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----|------------|
| 10923.333333 | 33.43 | 54.00 | 20.57 | V | 5.2 |
| 11556.200000 | 34.43 | 54.00 | 19.57 | V | 6.5 |
| 12146.533333 | 34.96 | 54.00 | 19.04 | H | 7.3 |
| 15619.233333 | 35.71 | 54.00 | 18.29 | H | 11.8 |
| 16001.666667 | 37.36 | 54.00 | 16.64 | H | 13.4 |
| 17917.500000 | 39.27 | 54.00 | 14.73 | V | 16.2 |

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:

$$\text{Result} = P_{Mea} + A_{Rpl} = P_{Mea} + \text{Cable Loss} + \text{Antenna Factor}$$

Conclusion: PASS

Test graphs as below:

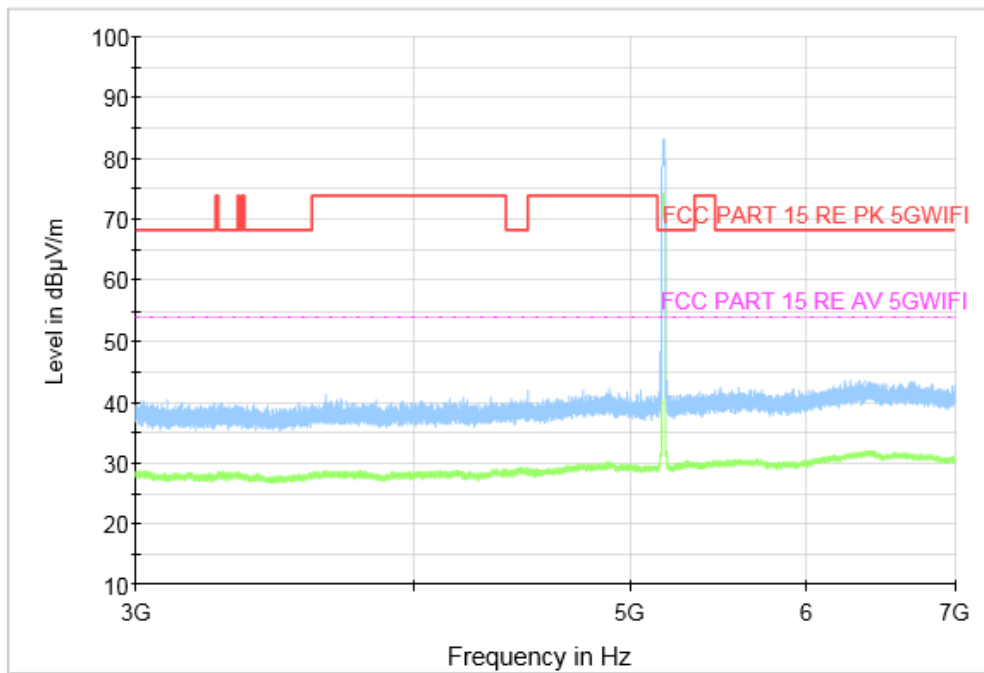


Fig. 63 Transmitter Spurious Emission (802.11a, CH36 5180MHz, 3 GHz-7 GHz)

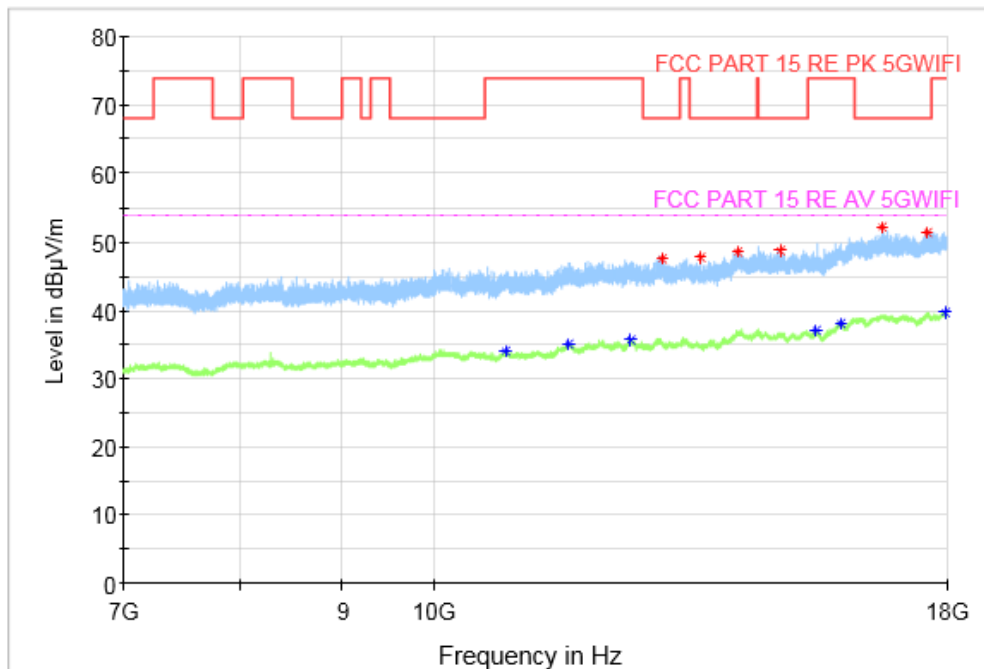


Fig. 64 Transmitter Spurious Emission (802.11a, CH36 5180MHz, 7 GHz-18 GHz)

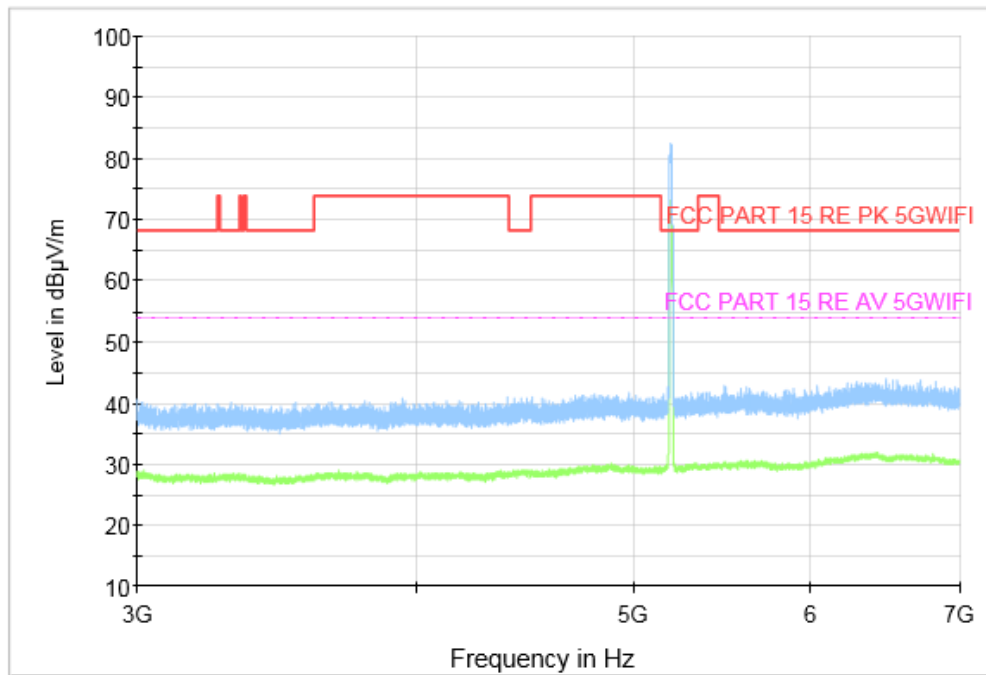


Fig. 65 Transmitter Spurious Emission (802.11a, CH40 5200MHz, 3 GHz-7 GHz)

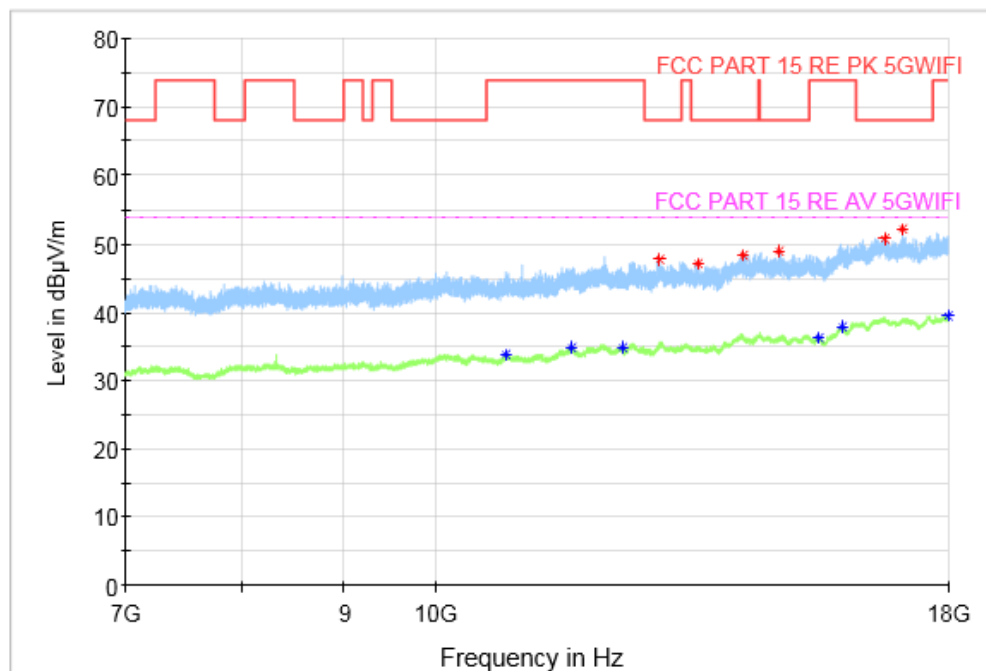


Fig. 66 Transmitter Spurious Emission (802.11a, CH40 5200MHz, 7 GHz-18 GHz)

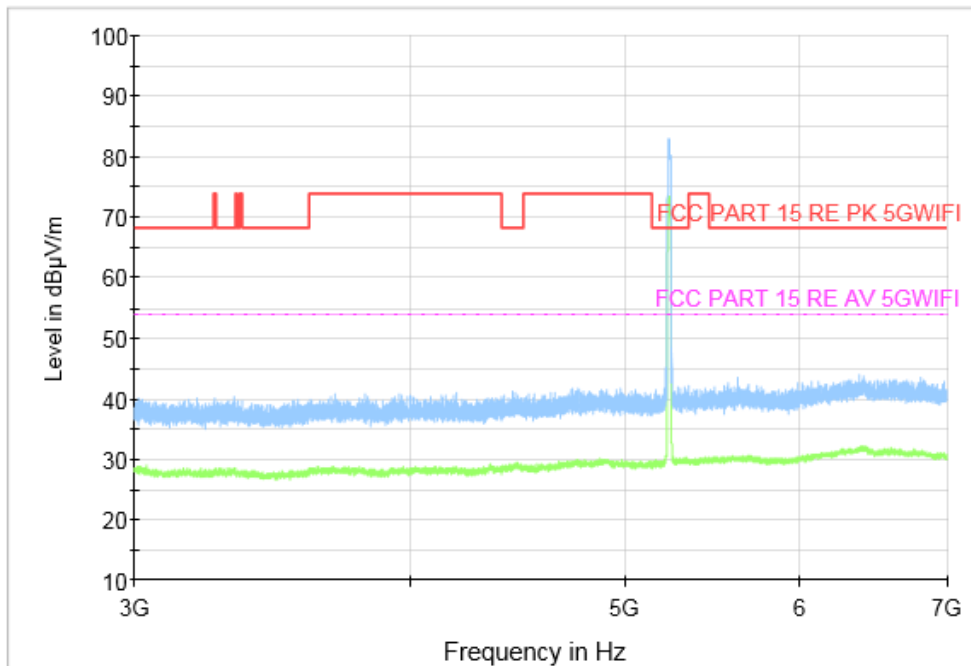


Fig. 67 Transmitter Spurious Emission (802.11a, CH48 5240MHz, 3 GHz-7 GHz)

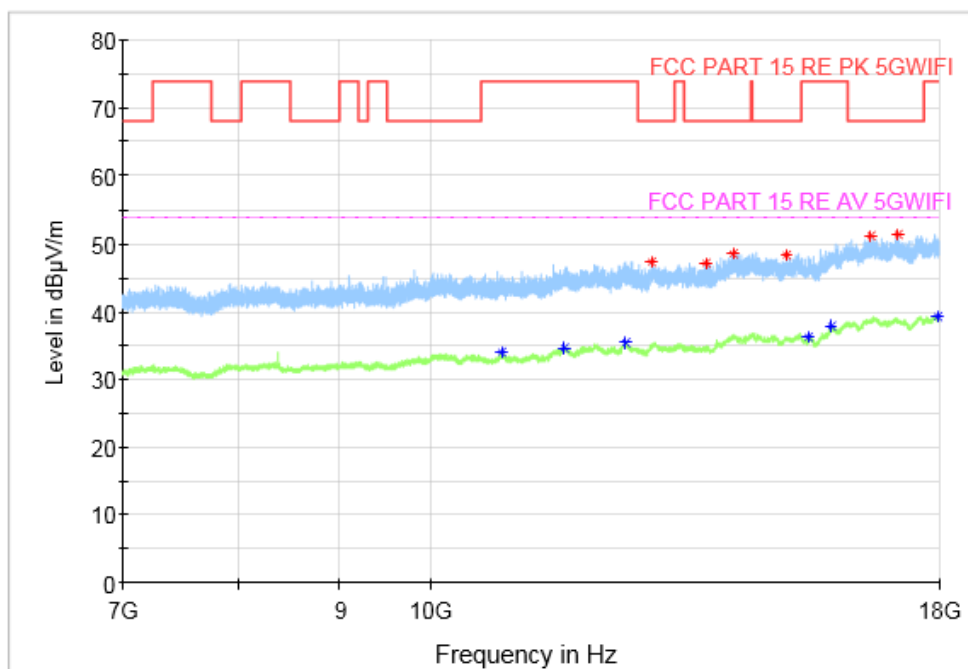


Fig. 68 Transmitter Spurious Emission (802.11a, CH48 5240MHz, 7 GHz-18 GHz)

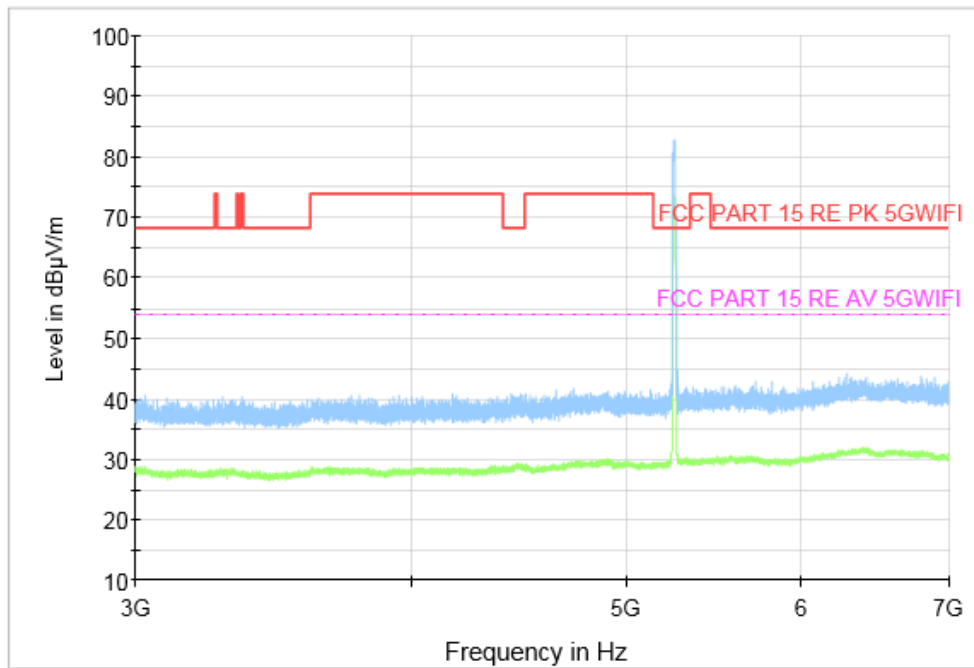


Fig. 69 Transmitter Spurious Emission (802.11a, CH52 5260MHz, 3 GHz-7 GHz)

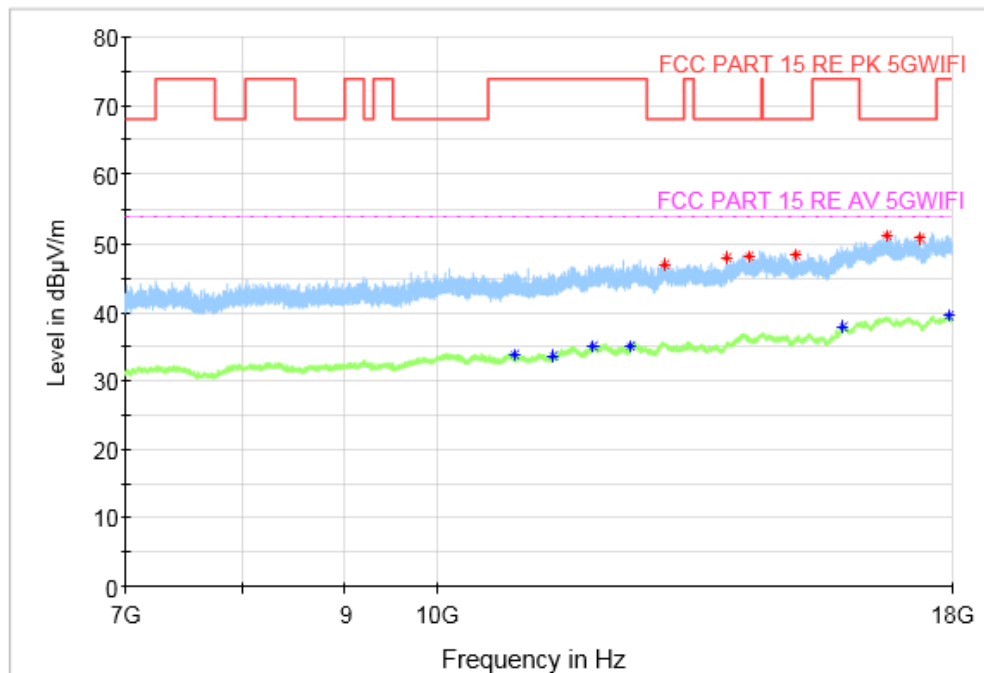


Fig. 70 Transmitter Spurious Emission (802.11a, CH52 5260MHz, 7 GHz-18 GHz)

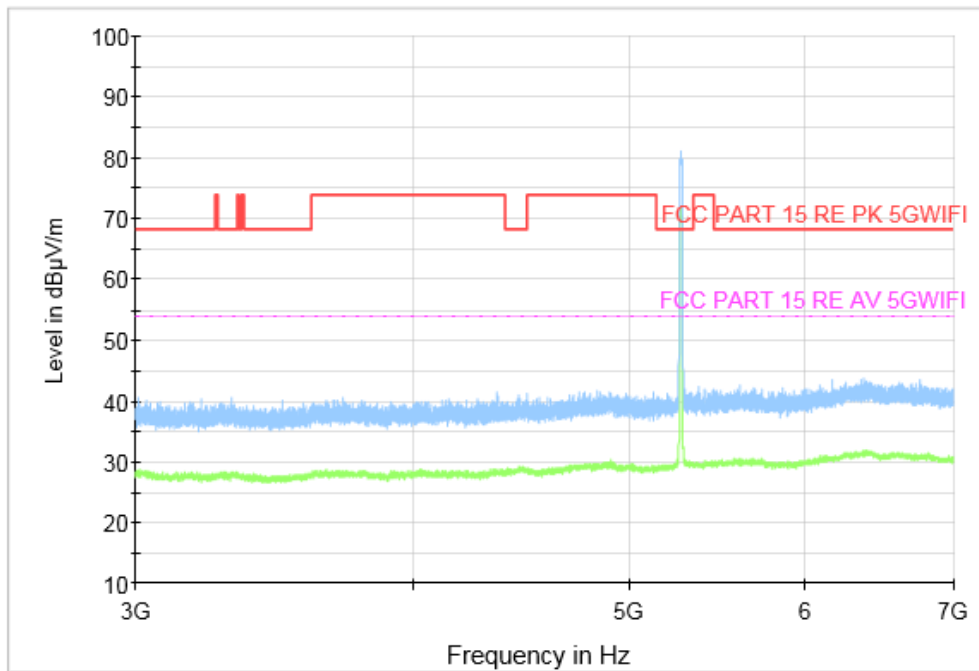


Fig. 71 Transmitter Spurious Emission (802.11a, CH56 5280MHz, 3 GHz-7 GHz)

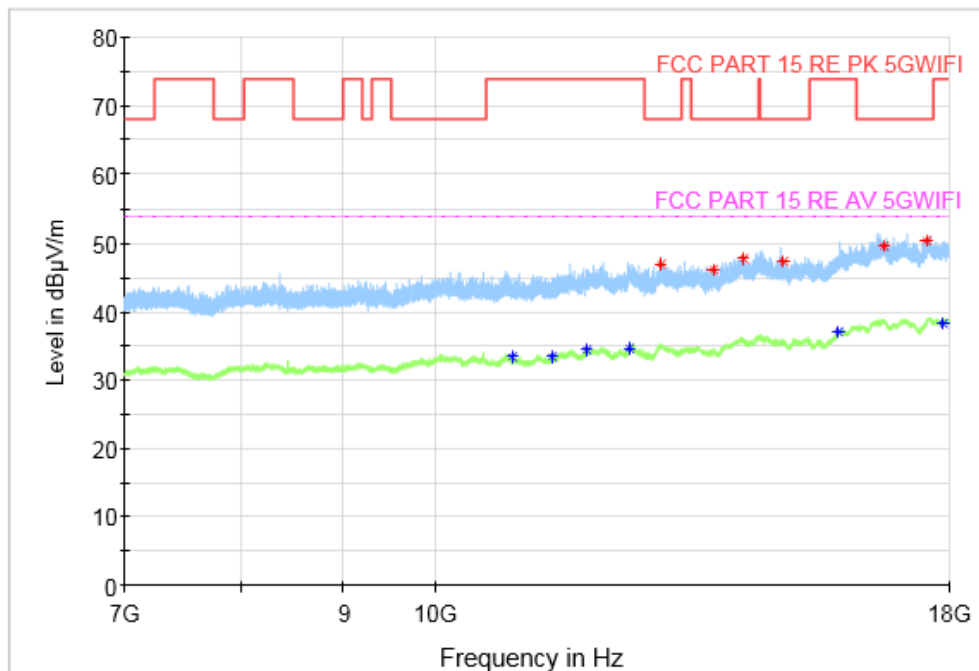


Fig. 72 Transmitter Spurious Emission (802.11a, CH56 5280MHz, 7 GHz-18 GHz)

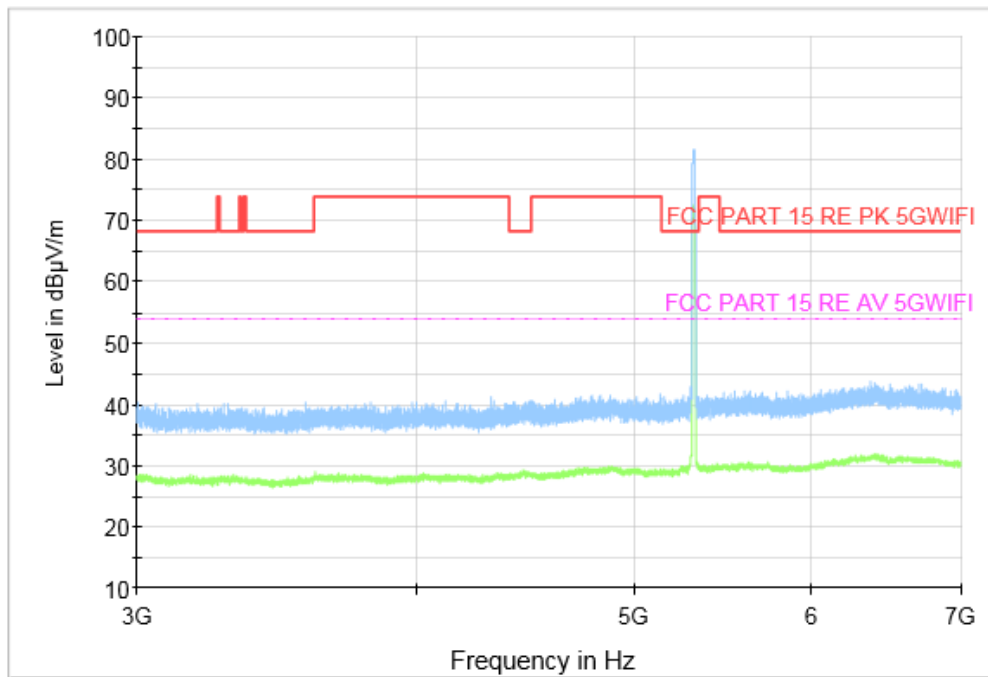


Fig. 73 Transmitter Spurious Emission (802.11a, CH64 5320MHz, 3 GHz-7 GHz)

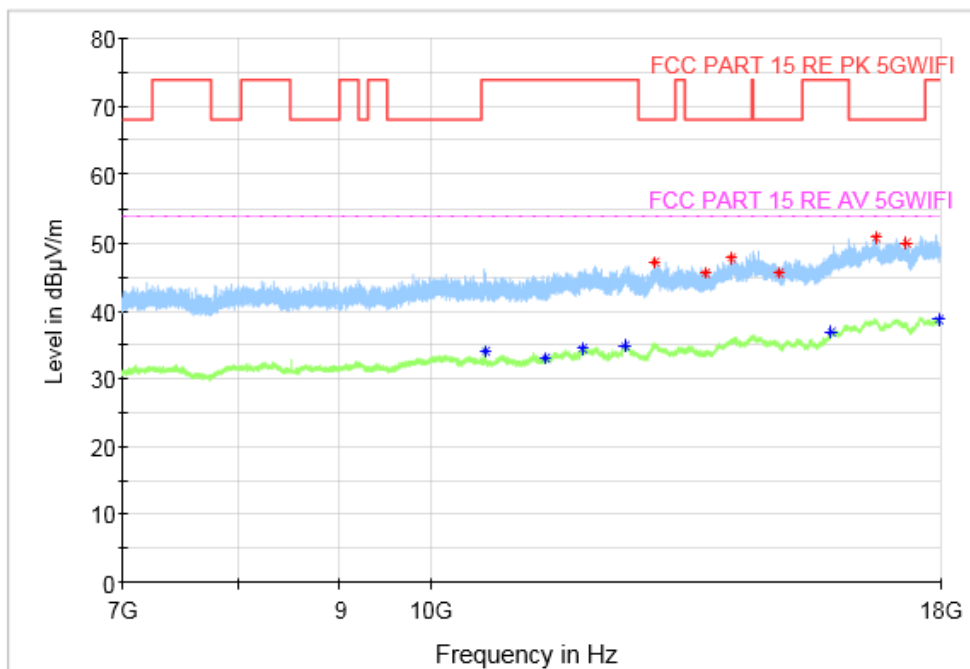


Fig. 74 Transmitter Spurious Emission (802.11a, CH64 5320MHz, 7 GHz-18 GHz)

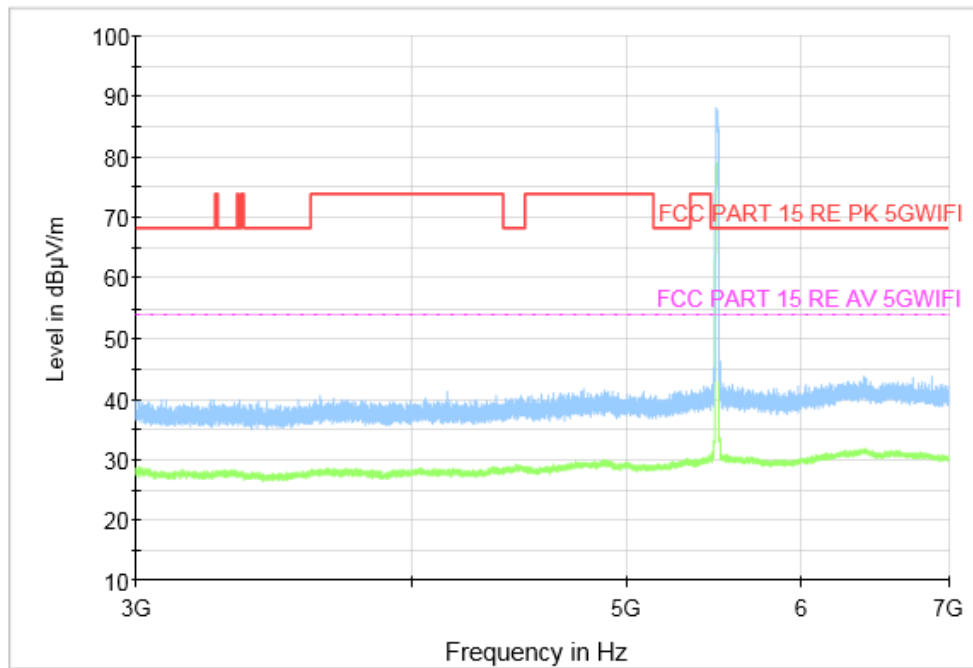


Fig. 75 Transmitter Spurious Emission (802. 11a, CH100 5500MHz, 3 GHz-7 GHz)

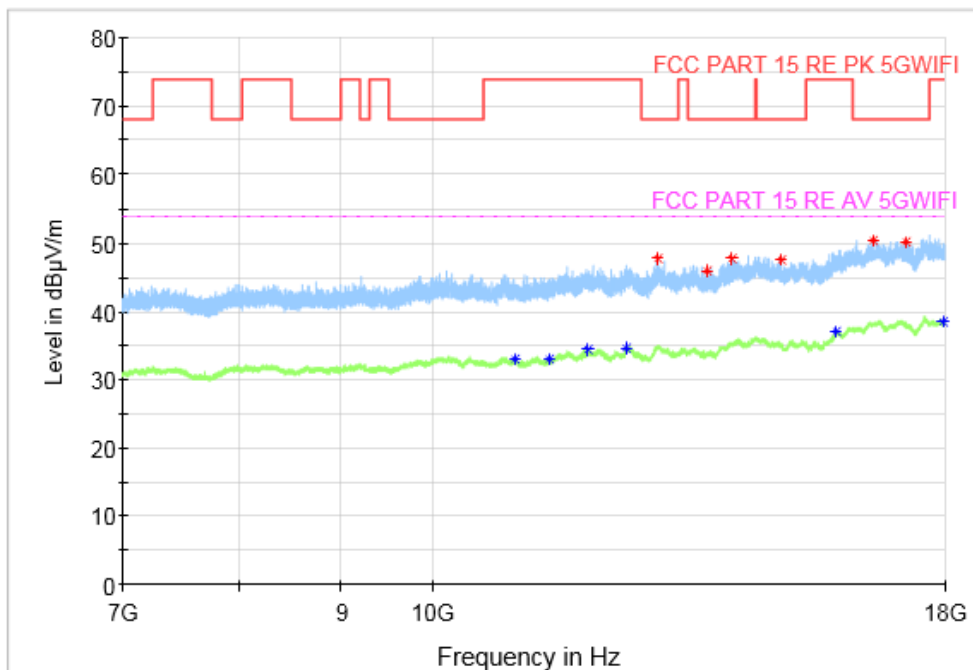


Fig. 76 Transmitter Spurious Emission (802. 11a, CH100 5500MHz, 7 GHz-18 GHz)

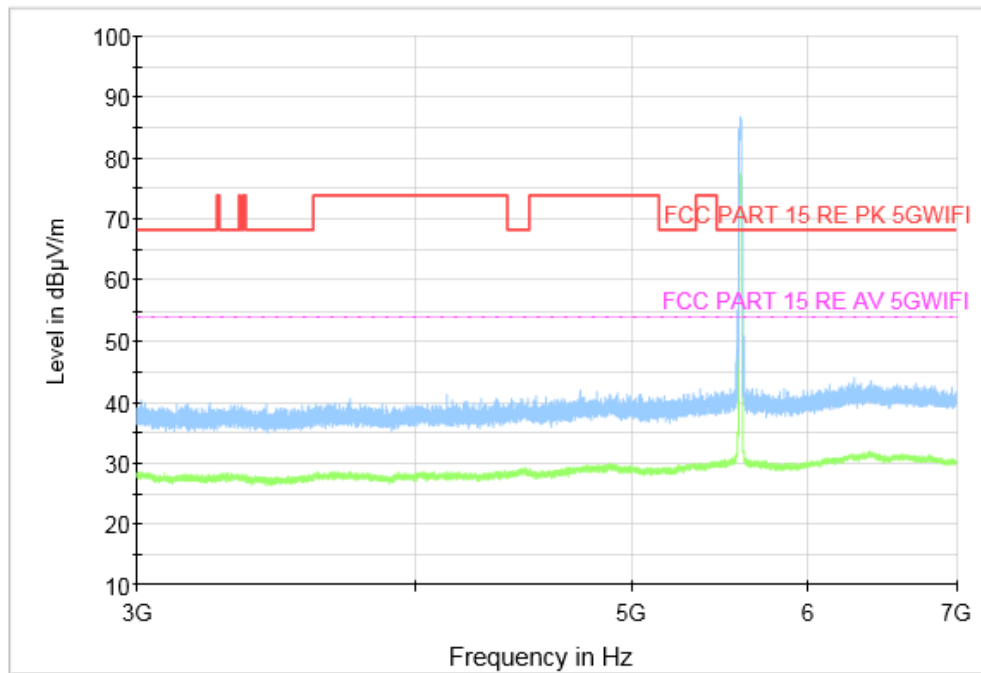


Fig. 77 Transmitter Spurious Emission (802. 11a, CH120 5600MHz, 3 GHz-7 GHz)

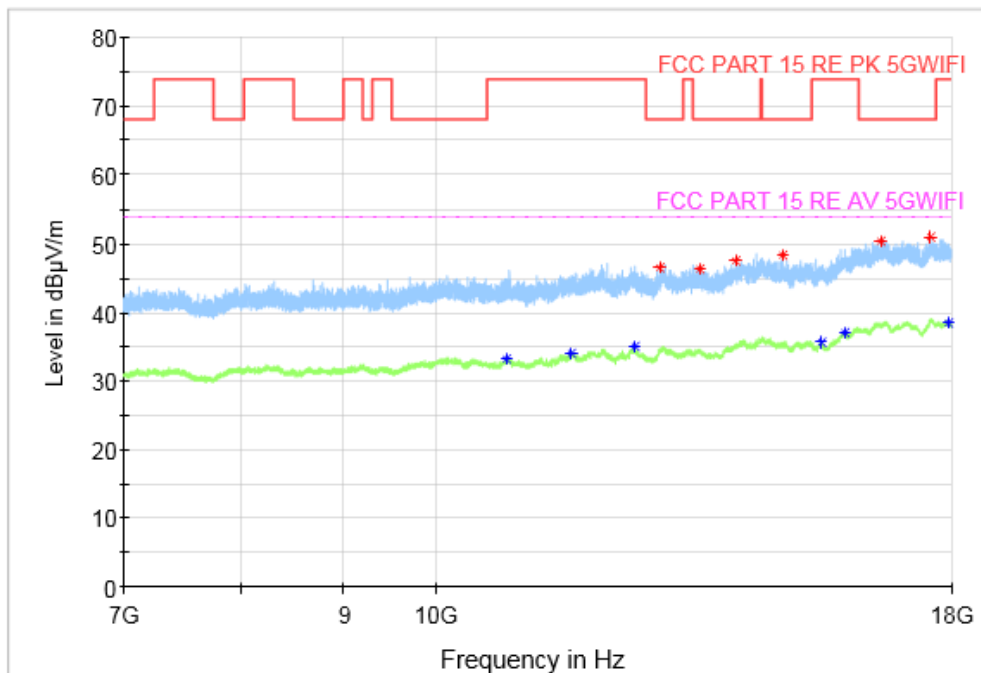


Fig. 78 Transmitter Spurious Emission (802. 11a, CH120 5600MHz, 7 GHz-18 GHz)

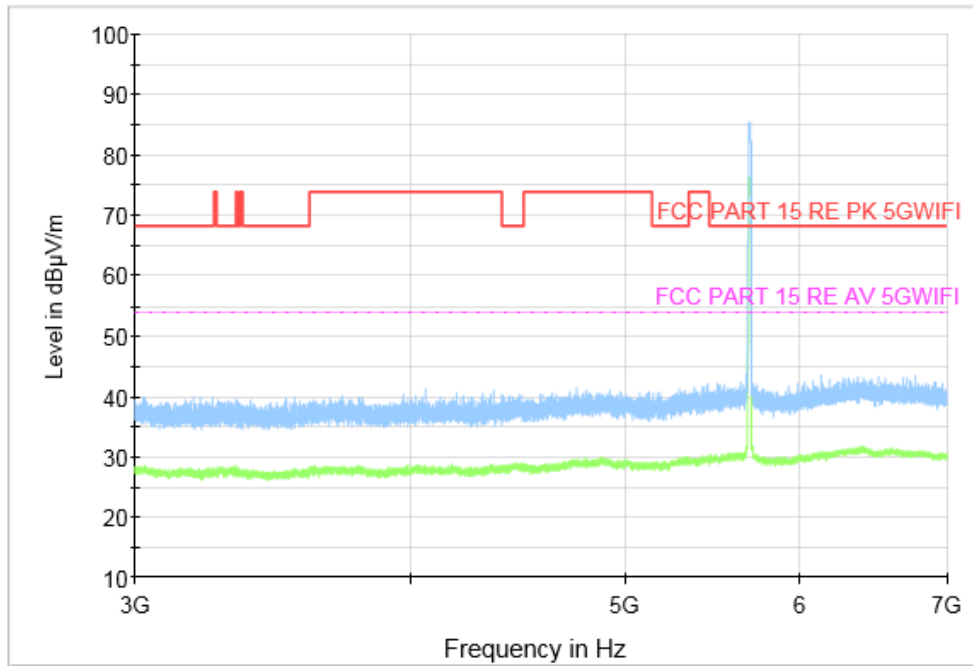


Fig. 79 Transmitter Spurious Emission (802. 11a, CH140 5700MHz, 3 GHz-7 GHz)

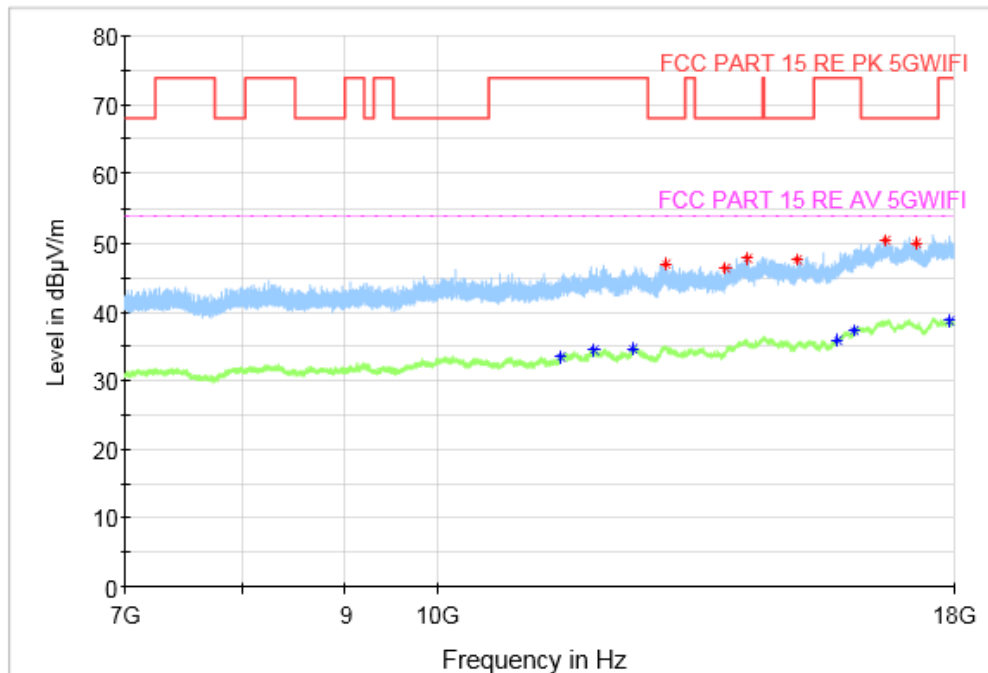


Fig. 80 Transmitter Spurious Emission (802. 11a, CH140 5700MHz, 7 GHz-18 GHz)

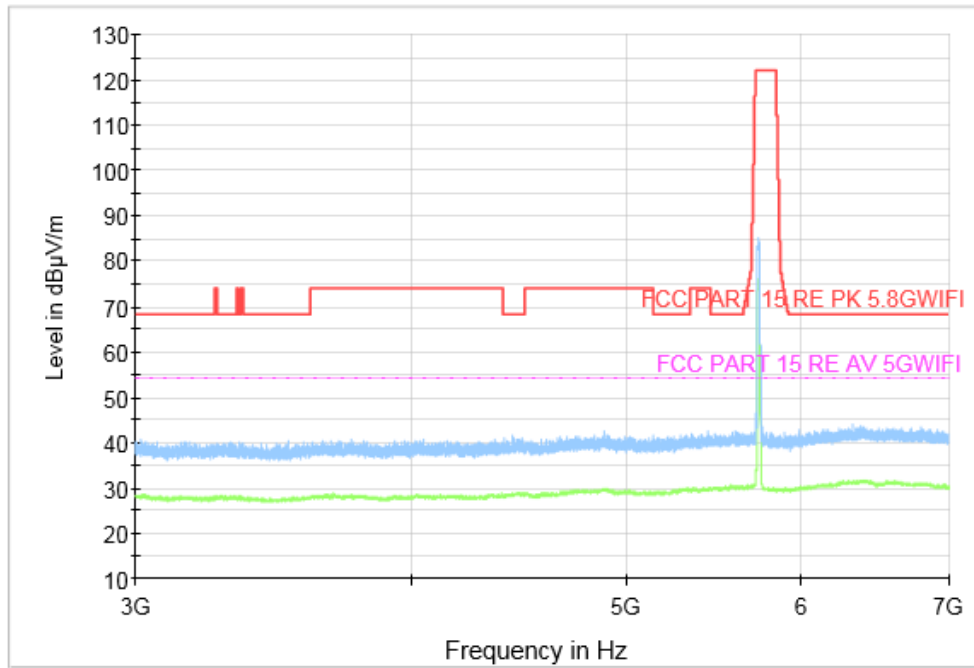


Fig. 81 Transmitter Spurious Emission (802. 11a, CH149 5745MHz, 3 GHz-7 GHz)

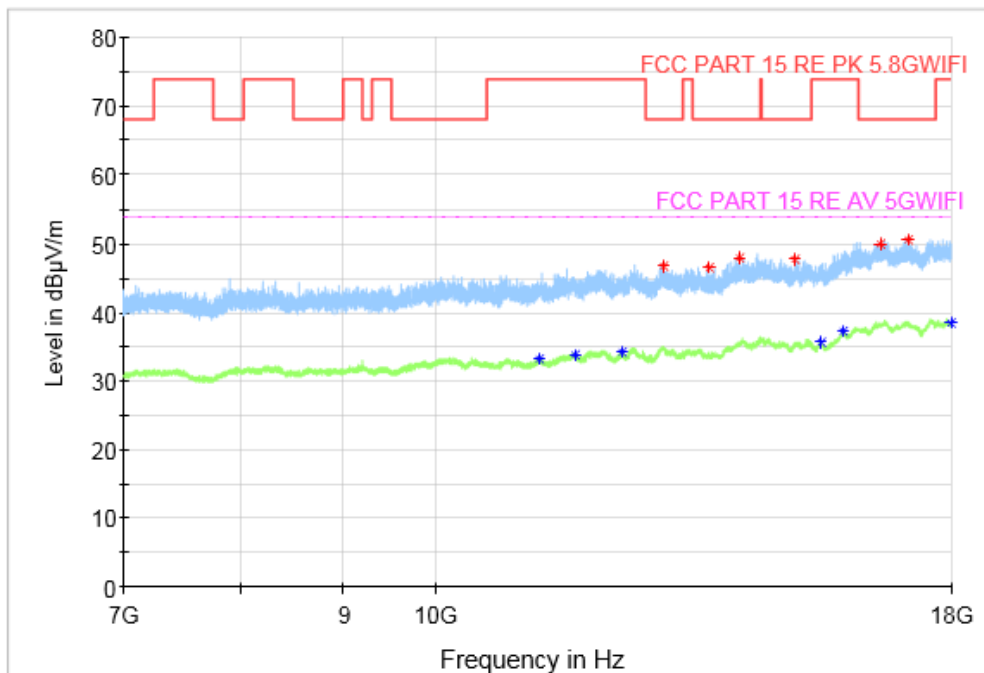


Fig. 82 Transmitter Spurious Emission (802. 11a, CH149 5745MHz, 7 GHz-18 GHz)

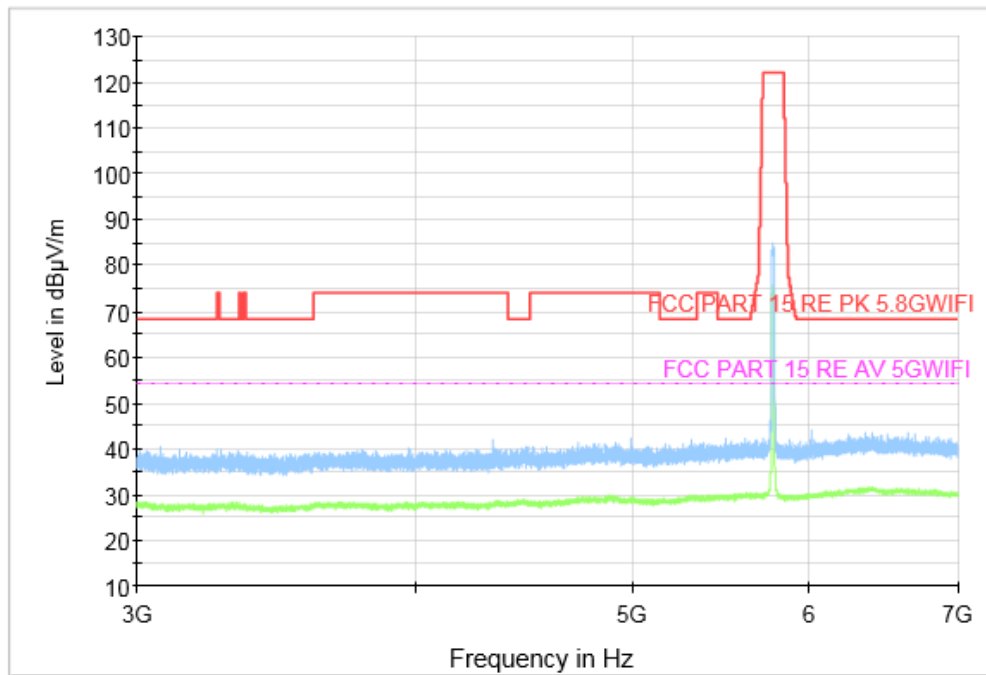


Fig. 83 Transmitter Spurious Emission (802. 11a, CH157 5785MHz, 3 GHz-7 GHz)

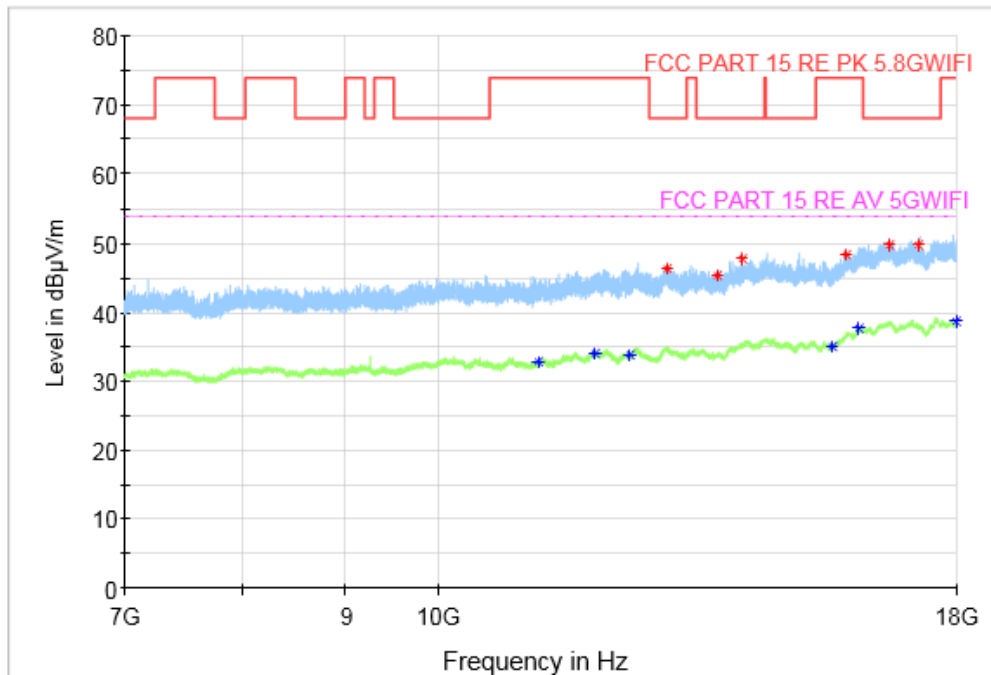


Fig. 84 Transmitter Spurious Emission (802. 11a, CH157 5785MHz, 7 GHz-18 GHz)

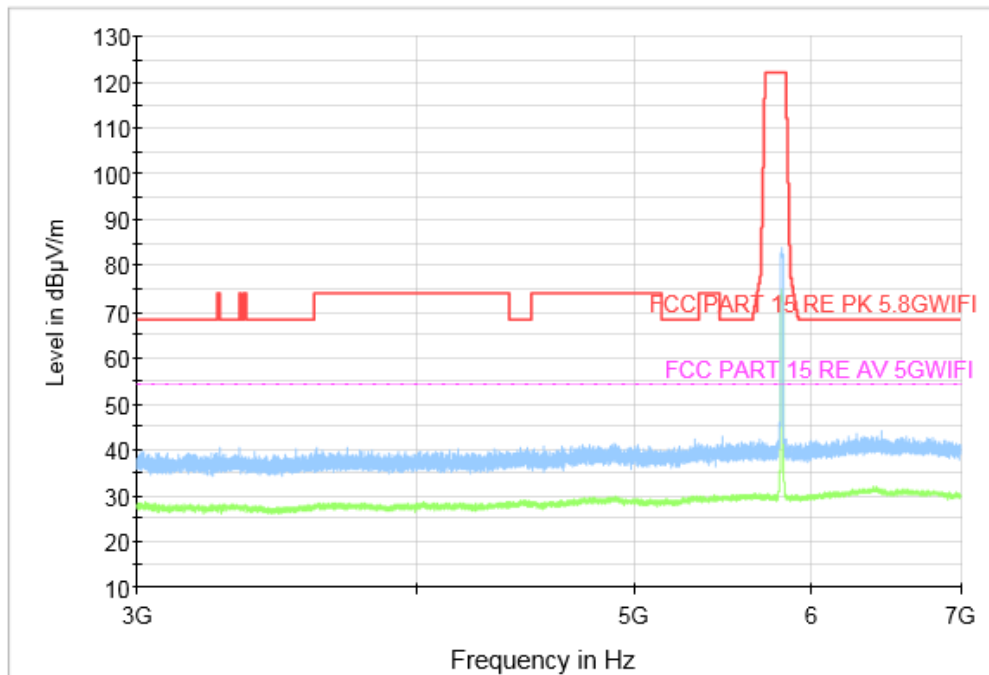


Fig. 85 Transmitter Spurious Emission (802. 11a, CH165 5825MHz, 3 GHz-7 GHz)

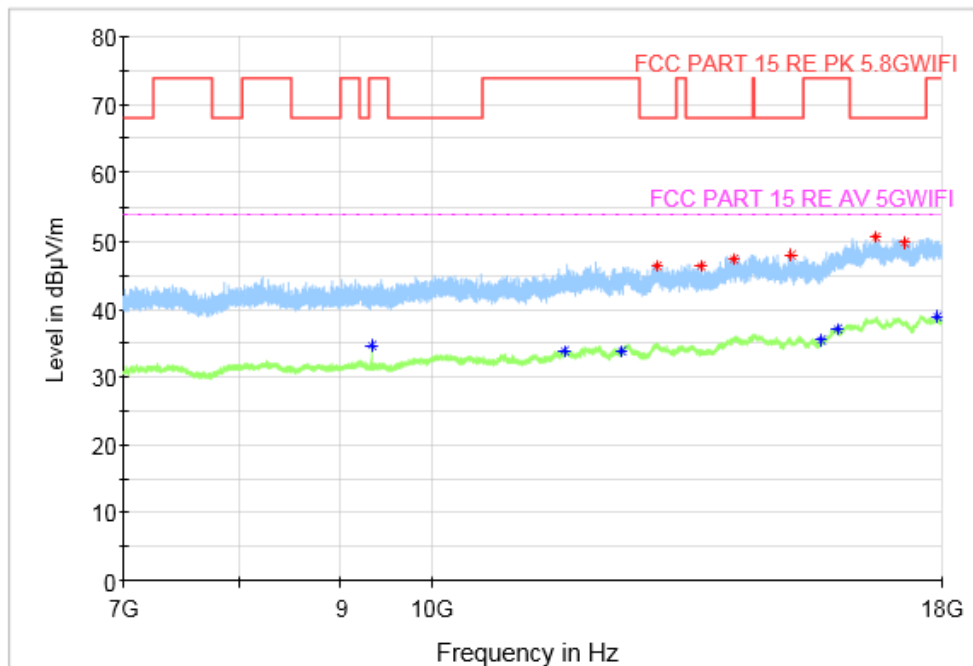


Fig. 86 Transmitter Spurious Emission (802. 11a, CH165 5825MHz, 7 GHz-18 GHz)