

FCC Part 15E

Measurement and Test Report

For

LM Technologies Ltd.

**Unit 19, Spectrum House, 32-34, Gordon House Road, London, NW5 1LP,
United Kingdom**

FCC ID: VVXLM842

| | |
|--------------------------------------|---|
| FCC Rule(s): | <u>FCC Part 15.407</u> |
| Product Description: | <u>LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter</u> |
| Tested Model: | <u>LM842</u> |
| Report No.: | <u>WTX19X12087485W-1</u> |
| Sample Receipt Date: | <u>Dec.17, 2019</u> |
| Tested Date: | <u>Dec.18, 2019 to Jan.19, 2020</u> |
| Issued Date: | <u>Jan.19, 2020</u> |
| Tested By: | <u>Mike Shi / Engineer</u> |
| Reviewed By: | <u>Silin Chen / EMC Manager</u> |
| Approved & Authorized By: | <u>Jandy So / PSQ Manager</u> |
| Prepared By: | <p>Shenzhen SEM Test Technology Co., Ltd. 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101) Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn</p> |

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permission by Shenzhen SEM Test Technology Co., Ltd.

TABLE OF CONTENTS

| | |
|---|-----------|
| 1. GENERAL INFORMATION | 4 |
| 1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)..... | 4 |
| 1.2 TEST STANDARDS..... | 5 |
| 1.3 TEST METHODOLOGY..... | 5 |
| 1.4 TABLE FOR PARAMETERS OF TEST SOFTWARE SETTING | 5 |
| 1.5 EUT OPERATING DURING TEST | 6 |
| 1.6 TEST FACILITY | 6 |
| 1.7 EUT SETUP AND TEST MODE | 7 |
| 1.8 MEASUREMENT UNCERTAINTY | 8 |
| 1.9 TEST EQUIPMENT LIST AND DETAILS | 9 |
| 2. SUMMARY OF TEST RESULTS | 11 |
| 3. RF EXPOSURE | 12 |
| 3.1 STANDARD APPLICABLE..... | 12 |
| 3.2 TEST RESULT..... | 12 |
| 4. ANTENNA REQUIREMENT | 13 |
| 4.1 STANDARD APPLICABLE..... | 13 |
| 4.2 EVALUATION INFORMATION | 13 |
| 5. CONDUCTED EMISSIONS | 14 |
| 5.1 TEST PROCEDURE..... | 14 |
| 5.2 BASIC TEST SETUP BLOCK DIAGRAM..... | 14 |
| 5.3 TEST RECEIVER SETUP | 14 |
| 5.4 SUMMARY OF TEST RESULTS/PLOTS | 14 |
| 6. POWER SPECTRAL DENSITY | 17 |
| 6.1 STANDARD APPLICABLE..... | 17 |
| 6.2 TEST PROCEDURE..... | 17 |
| 6.3 SUMMARY OF TEST RESULTS/PLOTS | 18 |
| 7. EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH..... | 36 |
| 7.1 STANDARD APPLICABLE..... | 36 |
| 7.2 TEST PROCEDURE..... | 36 |
| 7.3 SUMMARY OF TEST RESULTS/PLOTS | 38 |
| 8. MAXIMUM CONDUCTED OUTPUT POWER..... | 56 |
| 8.1 STANDARD APPLICABLE..... | 56 |
| 8.2 TEST PROCEDURE..... | 56 |
| 8.3 SUMMARY OF TEST RESULTS/PLOTS | 57 |
| 9. RADIATED SPURIOUS EMISSIONS..... | 74 |
| 9.1 STANDARD APPLICABLE..... | 74 |
| 9.2 TEST PROCEDURE..... | 74 |
| 9.3 TEST RECEIVER SETUP | 76 |
| 9.4 CORRECTED AMPLITUDE & MARGIN CALCULATION..... | 76 |
| 9.5 SUMMARY OF TEST RESULTS/PLOTS | 76 |
| 10. FREQUENCY STABILITY | 97 |
| 10.1 STANDARD APPLICABLE..... | 97 |
| 10.2 TEST PROCEDURE..... | 97 |
| 10.3 SUMMARY OF TEST RESULTS/PLOTS | 97 |

Report version

| Version No. | Date of issue | Description |
|-------------|---------------|-------------|
| Rev.00 | Jan.19, 2020 | Original |
| / | / | / |

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: LM Technologies Ltd.

Address of applicant: Unit 19, Spectrum House, 32-34, Gordon House Road,
London, NW5 1LP, United Kingdom

Manufacturer: LM Technologies Ltd.

Address of manufacturer: Unit 19, Spectrum House, 32-34, Gordon House Road,
London, NW5 1LP, United Kingdom

| General Description of EUT | |
|----------------------------|--|
| Product Name: | LM842 WiFi and Bluetooth 5.0 Dual Mode Combination USB Adapter |
| Brand Name: | LM Technologies |
| Model No.: | LM842 |
| Adding Model(s): | 842-8420, 842-8421, 842-8422, 842-8423, 842-8424 |
| Rated Voltage: | DC 5V |
| Power Adapter: | / |
| Software Version: | / |
| Hardware Version: | / |

| Technical Characteristics of EUT | |
|----------------------------------|---|
| Support Standards: | 802.11a, 802.11n(HT20) , 802.11n-HT40, 802.11ac-VH80 |
| Frequency Range: | 5150-5250MHz, 5725-5850MHz |
| RF Output Power (Max.): | 5150-5250MHz:13.71dBm (Conducted) 5725-5850MHz:13.15dBm (Conducted) |
| Type of Modulation: | BPSK, QPSK,16QAM,64QAM, 256QAM |
| Data Rate: | 6-54Mbps, up to 200Mbps |
| Type of Antenna: | Integral Antenna |
| Antenna Gain: | Antenna A: Band 1:3.77dBi; Band 4: 1.22dBi Antenna B: Band 1:3.3dBi; Band 4: 1.53dBi |

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

KDB789033 D02 v02r01: GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB789033 D02 v02r01. The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Table for parameters of Test Software setting

Enter “Win7_MP_Kit RTL11ac_8822CU_USB_v2.00_20190702 for Win7” into the calculator to enter the engineer mode, you can start to test. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

| Mode | Ant. | Test Frequency (MHz) | | | | | | | | | | | | |
|---------------|-------|----------------------|----------|----------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|------|
| | | NCB: 20MHz | | | | | | | | | | | | |
| | | 5180 0 | 520 0 | 524 0 | 526 0 | 5300 0 | 532 0 | 550 0 | 558 0 | 570 0 | 572 0 | 574 5 | 578 5 | 5825 |
| 802.11a | ANT 1 | 70 | 70 | 70 | / | / | / | / | / | / | / | 60 | 60 | 60 |
| | ANT 2 | 62 | 62 | 62 | / | / | / | / | / | / | / | 55 | 55 | 55 |
| 802.11n-HT20 | ANT 1 | 70 | 70 | 70 | / | / | / | / | / | / | / | 60 | 60 | 60 |
| | ANT 2 | 62 | 62 | 62 | / | / | / | / | / | / | / | 55 | 55 | 55 |
| Mode | Ant. | NCB: 40MHz | | | | | | | | | | | | |
| | | 5190 | 5230 | 5270 | 5310 | 5510 | 5550 | 5670 | 5710 | 5755 | 5795 | | | |
| 802.11n-HT40 | ANT 1 | 72 | 72 | / | / | / | / | / | / | / | / | 70 | 70 | |
| | ANT 2 | 64 | 64 | / | / | / | / | / | / | / | / | 81 | 81 | |
| Mode | Ant. | NCB: 80MHz | | | | | | | | | | | | |
| | | 5210 | 5290 | 5530 | 5610 | 5690 | 5775 | | | | | | | |
| 802.11ac-VH80 | ANT 1 | 72 | / | / | / | / | / | / | / | / | / | 66 | | |
| | ANT 2 | 64 | / | / | / | / | / | / | / | / | / | 81 | | |

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

1.6 Test Facility

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

| Test Mode List | | |
|----------------|---------------|---|
| Test Mode | Description | Remark |
| TM1 | 802.11a | 5180MHz,5200MHz,5240MHz, 5745MHz, 5785MHz,5825MHz |
| TM2 | 802.11n-HT20 | 5180MHz,5200MHz,5240MHz,5745MHz, 5785MHz,5825MHz |
| TM3 | 802.11n-HT40 | 5190MHz,5230MHz, 5755MHz,5795MHz |
| TM4 | 802.11ac-VH80 | 5210MHz ,5775 MHz |

| Test Conditions | |
|--------------------|-----------|
| Temperature: | 22~25 °C |
| Relative Humidity: | 50~55 %. |
| ATM Pressure: | 1019 mbar |

| EUT Cable List and Details | | | |
|----------------------------|------------|---------------------|------------------------|
| Cable Description | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| | | | |

| Special Cable List and Details | | | |
|--------------------------------|------------|---------------------|------------------------|
| Cable Description | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| USB extension cable | 1.2 | Shielded | With Ferrite |

| Auxiliary Equipment List and Details | | | |
|--------------------------------------|--------------|-------|---------------|
| Description | Manufacturer | Model | Serial Number |
| Notebook | Lenovo | E445 | / |

1.8 Measurement Uncertainty

| Measurement uncertainty | | |
|--------------------------------|------------|---------------------|
| Parameter | Conditions | Uncertainty |
| RF Output Power | Conducted | ± 0.42dB |
| Occupied Bandwidth | Conducted | ± 1.5% |
| Power Spectral Density | Conducted | ± 1.8dB |
| Conducted Spurious Emission | Conducted | ± 2.17dB |
| Conducted Emissions | Conducted | 9-150kHz ± 3.74dB |
| | | 0.15-30MHz ± 3.34dB |
| Transmitter Spurious Emissions | Radiated | 30-200MHz ± 4.52dB |
| | | 0.2-1GHz ± 5.56dB |
| | | 1-6GHz ± 3.84dB |
| | | 6-18GHz ± 3.92dB |

1.9 Test Equipment List and Details

| No. | Description | Manufacturer | Model | Serial No. | Cal Date | Due Date |
|-----------|-------------------|------------------------|-----------------------|-------------|------------|------------|
| SEMT-1072 | Spectrum Analyzer | Agilent | E4407B | MY41440400 | 2019-04-30 | 2020-04-29 |
| SEMT-1031 | Spectrum Analyzer | Rohde & Schwarz | FSP30 | 836079/035 | 2019-04-30 | 2020-04-29 |
| SEMT-1007 | EMI Test Receiver | Rohde & Schwarz | ESVB | 825471/005 | 2019-04-30 | 2020-04-29 |
| SEMT-1008 | Amplifier | Agilent | 8447F | 3113A06717 | 2019-04-30 | 2020-04-29 |
| SEMT-1043 | Amplifier | C&D | PAP-1G18 | 2002 | 2019-04-30 | 2020-04-29 |
| SEMT-1011 | Broadband Antenna | Schwarz beck | VULB9163 | 9163-333 | 2019-05-05 | 2021-05-04 |
| SEMT-1042 | Horn Antenna | ETS | 3117 | 00086197 | 2019-05-05 | 2021-05-04 |
| SEMT-1121 | Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170582 | 2019-05-05 | 2021-05-04 |
| SEMT-1069 | Loop Antenna | Schwarz beck | FMZB 1516 | 9773 | 2019-05-05 | 2021-05-04 |
| SEMT-1001 | EMI Test Receiver | Rohde & Schwarz | ESPI | 101611 | 2019-04-30 | 2020-04-29 |
| SEMT-1003 | L.I.S.N | Schwarz beck | NSLK8126 | 8126-224 | 2019-04-30 | 2020-04-29 |
| SEMT-1002 | Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100911 | 2019-04-30 | 2020-04-29 |
| SEMT-1168 | Pre-amplifier | Direction Systems Inc. | PAP-0126 | 14141-12838 | 2019-04-30 | 2020-04-29 |
| SEMT-1169 | Pre-amplifier | Direction Systems Inc. | PAP-2640 | 14145-14153 | 2019-04-30 | 2020-04-29 |
| SEMT-1163 | Spectrum Analyzer | Rohde & Schwarz | FSP40 | 100612 | 2019-04-30 | 2020-04-29 |
| SEMT-1170 | DRG Horn Antenna | A.H. SYSTEMS | SAS-574 | 571 | 2019-05-05 | 2021-05-04 |
| SEMT-1166 | Power Limiter | Agilent | N9356B | MY45450376 | 2019-04-30 | 2020-04-29 |
| SEMT-1048 | RF Limiter | ATTEN | AT-BSF-2400~2500 | / | 2019-04-30 | 2020-04-29 |
| SEMT-1076 | RF Switcher | Top Precision | RCS03-A2 | / | 2019-04-30 | 2020-04-29 |
| SEMT-C001 | Cable | Zheng DI | LL142-07-07-10M(A) | / | 2019-03-18 | 2020-03-17 |
| SEMT-C002 | Cable | Zheng DI | ZT40-2.92J-2.92J-6M | / | 2019-03-18 | 2020-03-17 |
| SEMT-C003 | Cable | Zheng DI | ZT40-2.92J-2.92J-2.5M | / | 2019-03-18 | 2020-03-17 |
| SEMT-C004 | Cable | Zheng DI | 2M0RFC | / | 2019-03-18 | 2020-03-17 |
| SEMT-C005 | Cable | Zheng DI | 1M0RFC | / | 2019-03-18 | 2020-03-17 |
| SEMT-C006 | Cable | Zheng DI | 1M0RFC | / | 2019-03-18 | 2020-03-17 |

| Software List | | | |
|--|---------------------|--------------|----------------|
| Description | Manufacturer | Model | Version |
| EMI Test Software (Radiated Emission)* | Farad | EZ-EMC | RA-03A1 |
| EMI Test Software (Conducted Emission)* | Farad | EZ-EMC | RA-03A1 |

*Remark: indicates software version used in the compliance certification testing

2. SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test Item | Result |
|--------------------------------|---|-----------|
| §15.203; §15.405 | Antenna Requirement | Compliant |
| §15.207; §15.407(b)(6) | Conducted Emission | Compliant |
| §15.407(a)(1),(2) | Power Spectral Density | Compliant |
| §15.407(e) | Emission Bandwidth and Occupied Bandwidth | Compliant |
| §15.407(a)(1),(2) | Maximum Conducted Output Power | Compliant |
| §15.407(b)(1),(2),(3),(4) | Undesirable emission | Compliant |
| §15.205; §15.407(b)(1),(2),(3) | Radiated Emission | Compliant |
| §15.407(g) | Frequency Stability | Compliant |
| §15.407(h) | Dynamic Frequency Selection (DFS) | Compliant |

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to §1.1307 and §2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the MPE Report.



4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has two integral antennas, fulfill the requirement of this section.

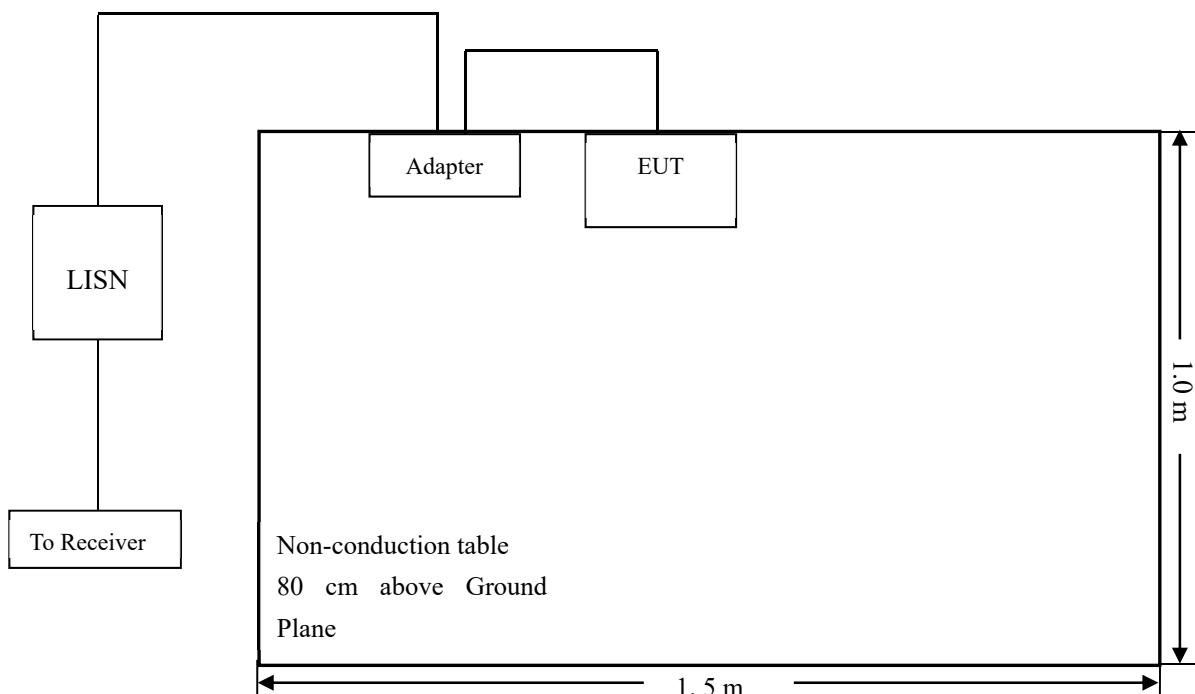
5. Conducted Emissions

5.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

5.2 Basic Test Setup Block Diagram



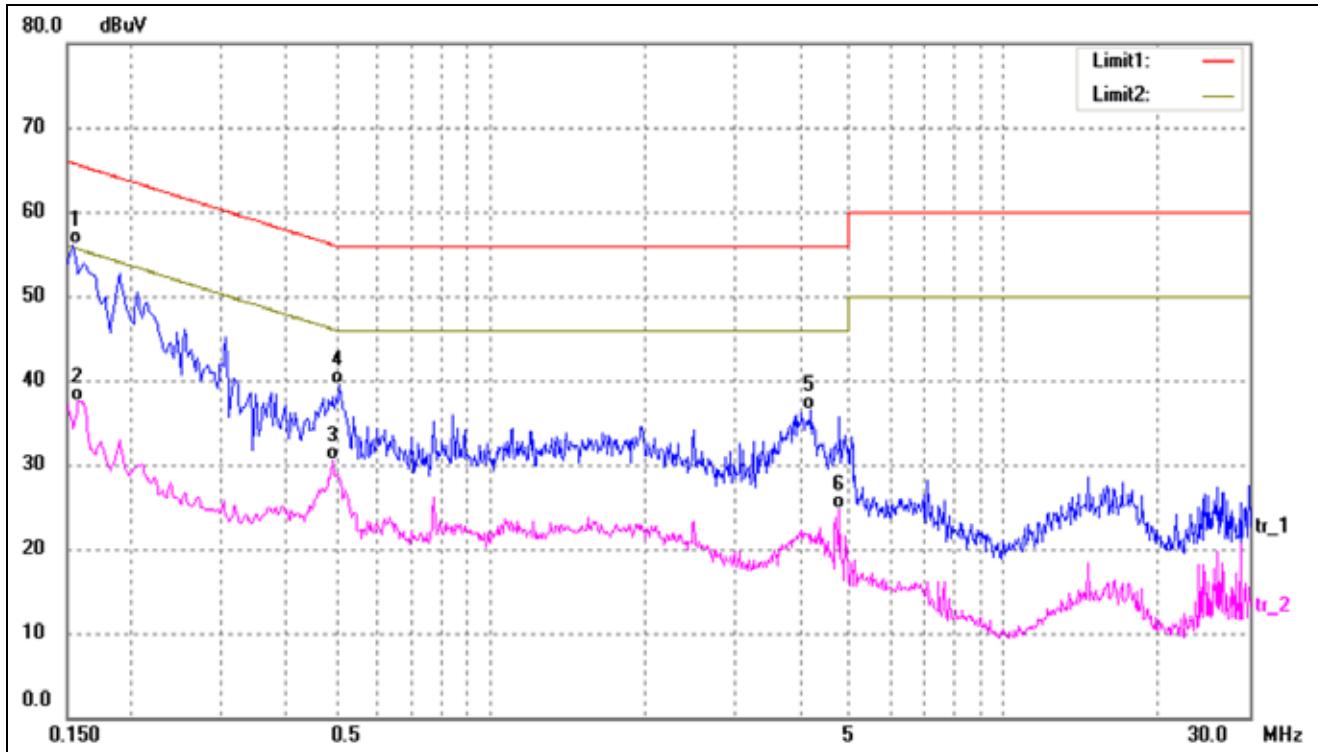
5.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

| | |
|------------------------------------|---------|
| Start Frequency | 150 kHz |
| Stop Frequency | 30 MHz |
| Sweep Speed | Auto |
| IF Bandwidth..... | 10 kHz |
| Quasi-Peak Adapter Bandwidth | 9 kHz |
| Quasi-Peak Adapter Mode | Normal |

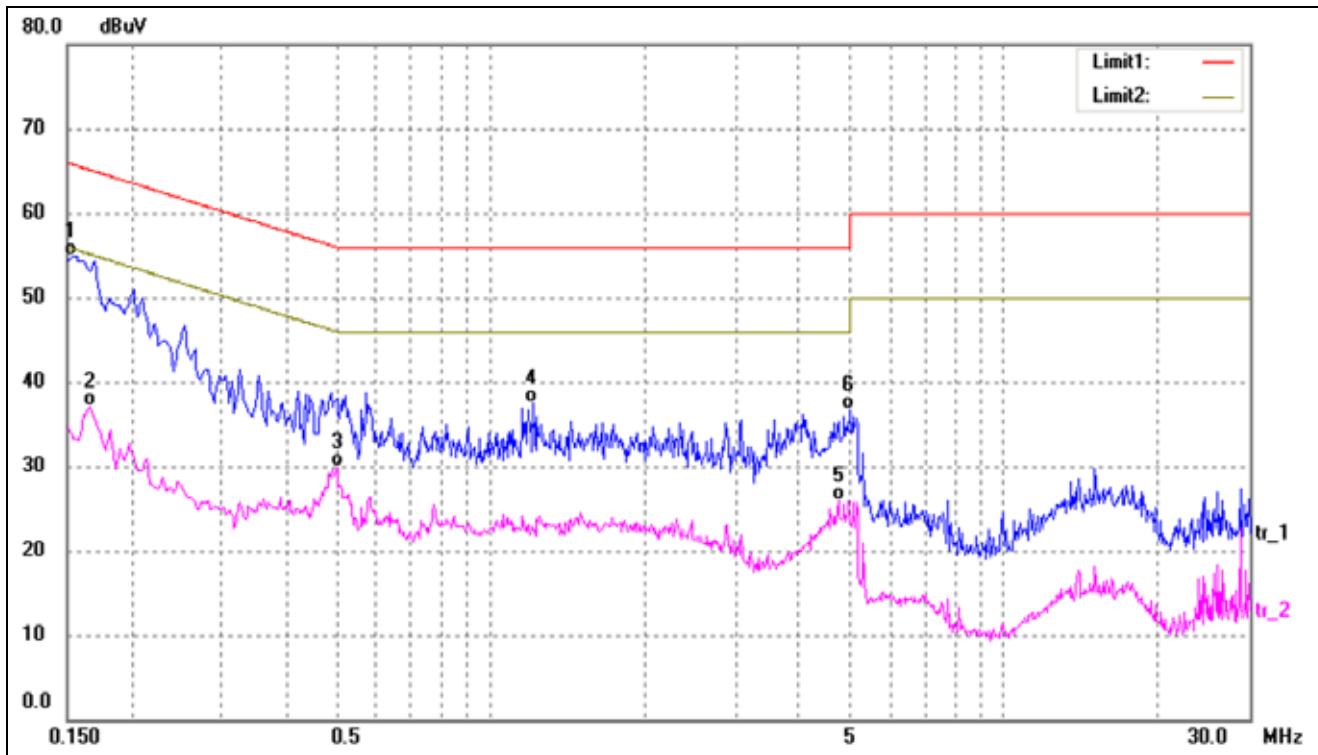
5.4 Summary of Test Results/Plots

| | | | | |
|-----------|---------------|-------------|-----------|---------|
| Test Mode | Communication | AC120V 60Hz | Polarity: | Neutral |
|-----------|---------------|-------------|-----------|---------|



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|--------------------|-------------------|-------------------|------------------|-----------------|----------------|----------|
| 1* | 0.1540 | 46.13 | 9.95 | 56.08 | 65.78 | -9.70 | QP |
| 2 | 0.1580 | 27.55 | 9.95 | 37.50 | 55.57 | -18.07 | AVG |
| 3 | 0.4940 | 20.53 | 10.02 | 30.55 | 46.10 | -15.55 | AVG |
| 4 | 0.5100 | 29.39 | 10.02 | 39.41 | 56.00 | -16.59 | QP |
| 5 | 4.2020 | 26.17 | 10.31 | 36.48 | 56.00 | -19.52 | QP |
| 6 | 4.7900 | 14.31 | 10.37 | 24.68 | 46.00 | -21.32 | AVG |

| | | | | |
|-----------|---------------|-------------|-----------|------|
| Test Mode | Communication | AC120V 60Hz | Polarity: | Line |
|-----------|---------------|-------------|-----------|------|



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|--------------------|-------------------|-------------------|------------------|-----------------|----------------|----------|
| 1* | 0.1540 | 45.01 | 9.95 | 54.96 | 65.78 | -10.82 | QP |
| 2 | 0.1660 | 27.13 | 9.95 | 37.08 | 55.16 | -18.08 | AVG |
| 3 | 0.5020 | 19.81 | 10.02 | 29.83 | 46.00 | -16.17 | AVG |
| 4 | 1.2140 | 27.18 | 10.38 | 37.56 | 56.00 | -18.44 | QP |
| 5 | 4.7500 | 15.59 | 10.36 | 25.95 | 46.00 | -20.05 | AVG |
| 6 | 5.0260 | 26.39 | 10.38 | 36.77 | 60.00 | -23.23 | QP |

6. Power Spectral Density

6.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2 Test Procedure

According to 789033 D02 v02r01 General UNII Test Procedures New Rules v02, the following is the measurement procedure.

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500kHz bandwidth, the following adjustments to the procedures apply:

- a) Set RBW $1/T$, where T is defined in section II.B.1.a).
- b) Set VBW 3 RBW.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/\text{RBW})$ to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10\log(1\text{MHz}/\text{RBW})$ to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW=100 kHz is available on nearly all spectrum analyzers.

6.3 Summary of Test Results/Plots

| U-NII-1:5150-5250MHz (Antenna A) | | | |
|---|--------------|-----------------------------------|--------------------|
| Operating mode | Test Channel | Power Spectral Density dBm/MHz | Limit (dBm/MHz) |
| 802.11a | 5180 | 5.36 | 11 |
| | 5200 | 5.32 | 11 |
| | 5240 | 5.38 | 11 |

| U-NII-1:5150-5250MHz (Antenna B) | | | |
|---|--------------|-----------------------------------|--------------------|
| Operating mode | Test Channel | Power Spectral Density dBm/MHz | Limit (dBm/MHz) |
| 802.11a | 5180 | 5.67 | 11 |
| | 5200 | 6.23 | 11 |
| | 5240 | 5.77 | 11 |

| Operating mode | Test Channel | ANT A Power Spectral Density dBm/MHz | ANT B Power Spectral Density dBm/MHz | ANT A+B Power Spectral Density dBm/MHz | Limit (dBm/MHz) |
|----------------|--------------|---|---|---|--------------------|
| 802.11n-HT20 | 5180 | 5.28 | 6.03 | 8.68 | 11 |
| | 5200 | 5.45 | 6.08 | 8.79 | 11 |
| | 5240 | 5.70 | 5.93 | 8.83 | 11 |
| 802.11n-HT40 | 5190 | 1.63 | 2.84 | 5.29 | 11 |
| | 5230 | 1.59 | 3.42 | 5.61 | 11 |
| 802.11ac-HT80 | 5210 | -0.88 | 0.37 | 2.80 | 11 |

U-NII-3: 5725-5850MHz(Antenna A)

| Operating mode | Test Channel | Power Spectral Density dBm/300kHz | Factor | Power Spectral Density* dBm/500kHz | Limit dBm/500kHz |
|----------------|--------------|-----------------------------------|--------|------------------------------------|------------------|
| 802.11a | 5745 | 1.36 | 2.22 | 3.58 | 30 |
| | 5785 | 1.46 | 2.22 | 3.68 | 30 |
| | 5825 | 1.54 | 2.22 | 3.76 | 30 |

*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22

U-NII-3: 5725-5850MHz (Antenna B)

| Operating mode | Test Channel | Power Spectral Density dBm/300kHz | Factor | Power Spectral Density* dBm/500kHz | Limit dBm/500kHz |
|----------------|--------------|-----------------------------------|--------|------------------------------------|------------------|
| 802.11a | 5745 | 2.31 | 2.22 | 4.53 | 30 |
| | 5785 | 1.55 | 2.22 | 3.77 | 30 |
| | 5825 | 2.55 | 2.22 | 4.77 | 30 |

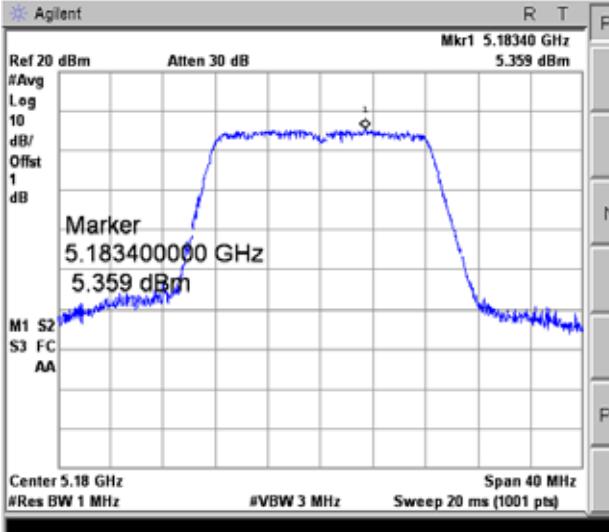
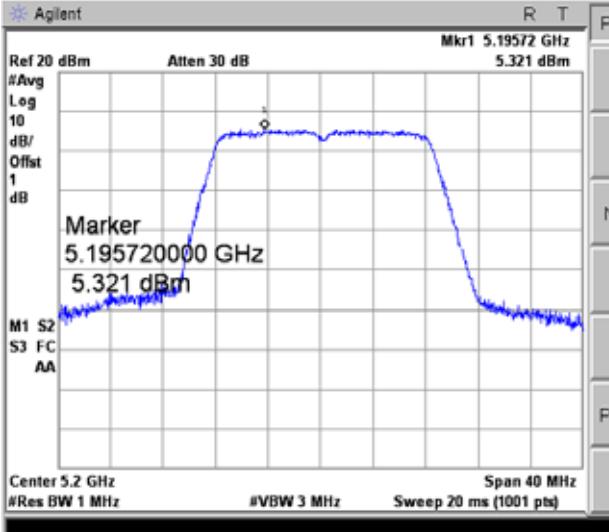
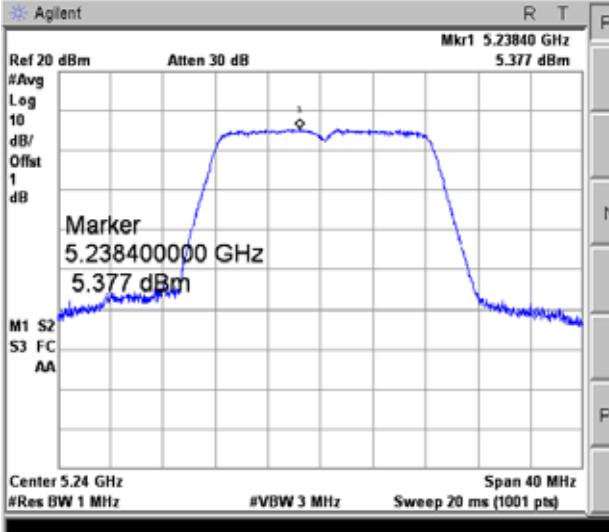
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22

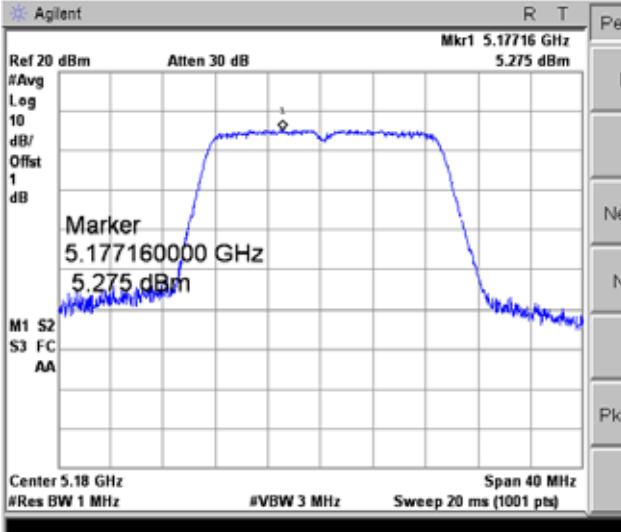
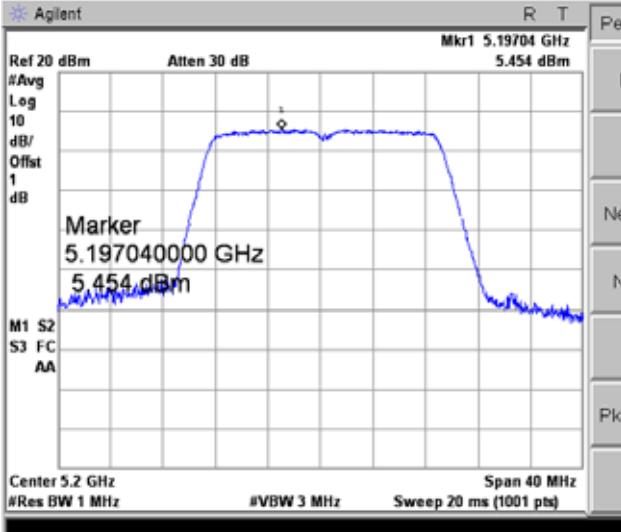
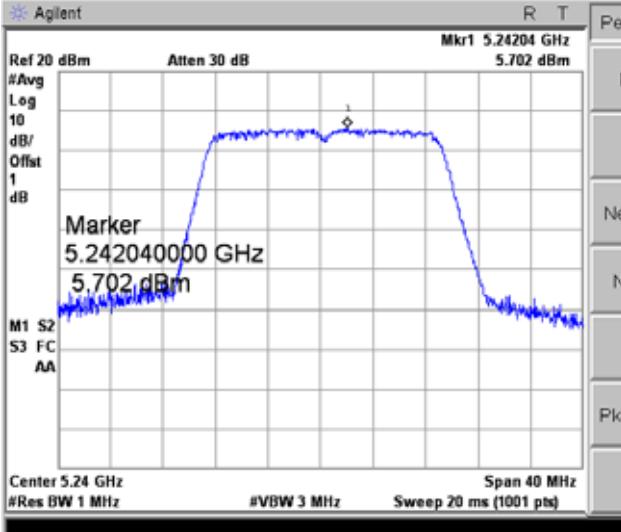
U-NII-3: 5725-5850MHz (Antenna A+ Antenna B)

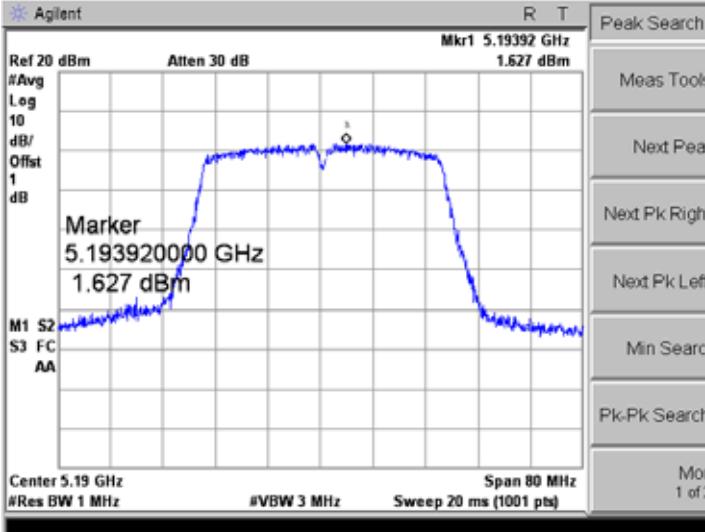
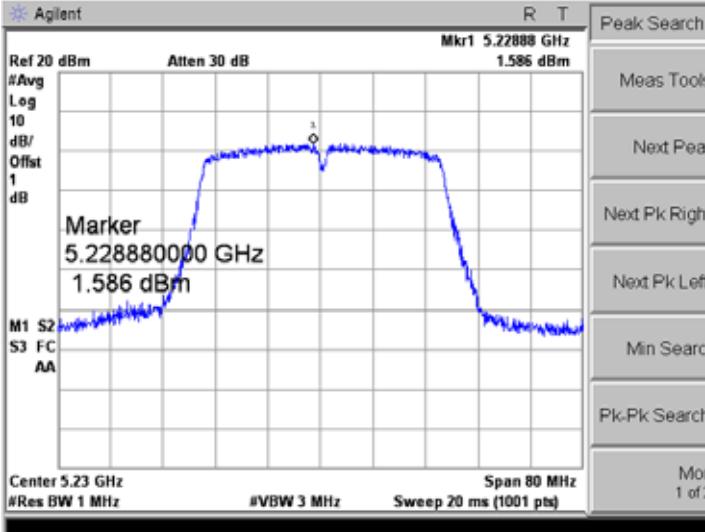
| Operating mode | Test Channel | ANT A Power Spectral Density dBm/300kHz | ANT B Power Spectral Density dBm/300kHz | Factor | ANT A+B Power Spectral Density* dBm/500kHz | Limit dBm/500kHz |
|----------------|--------------|---|---|--------|--|------------------|
| 802.11n-HT20 | 5745 | 1.58 | 0.93 | 2.22 | 3.80 | 30 |
| | 5785 | 0.29 | 1.21 | 2.22 | 2.51 | 30 |
| | 5825 | 0.76 | 1.20 | 2.22 | 2.98 | 30 |
| 802.11n HT40 | 5755 | -1.52 | -1.87 | 2.22 | 0.70 | 30 |
| | 5795 | -1.86 | -2.47 | 2.22 | 0.36 | 30 |
| 802.11ac VH80 | 5775 | -5.19 | -4.94 | 2.22 | -2.97 | 30 |

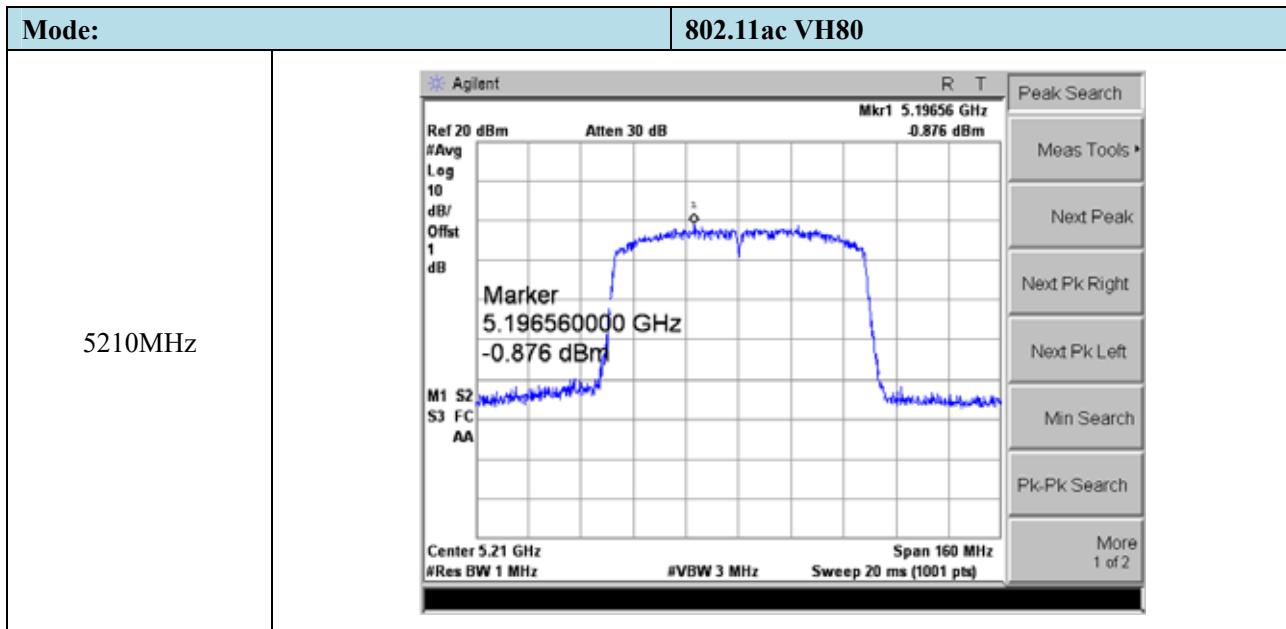
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22

➤ Antenna A: 5150-5250MHz

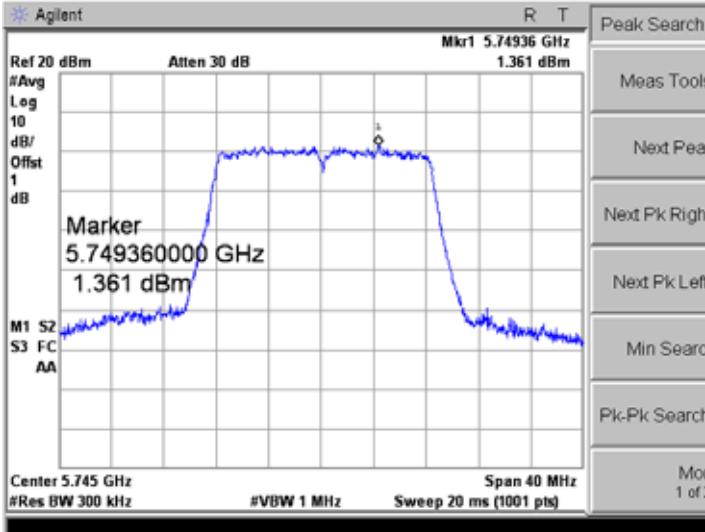
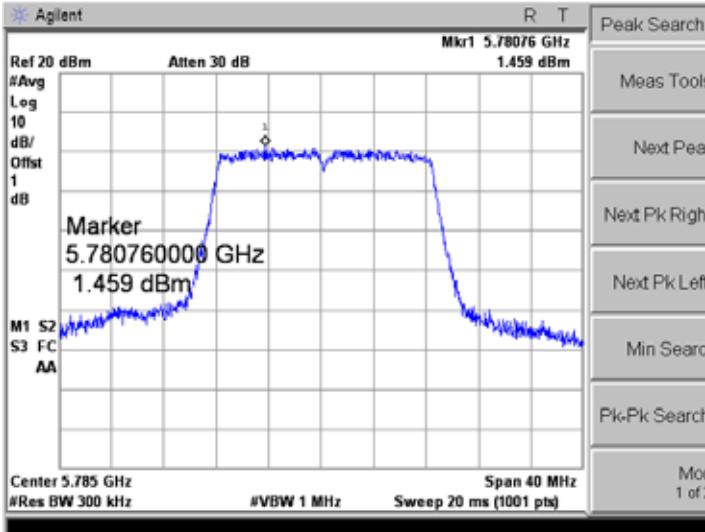
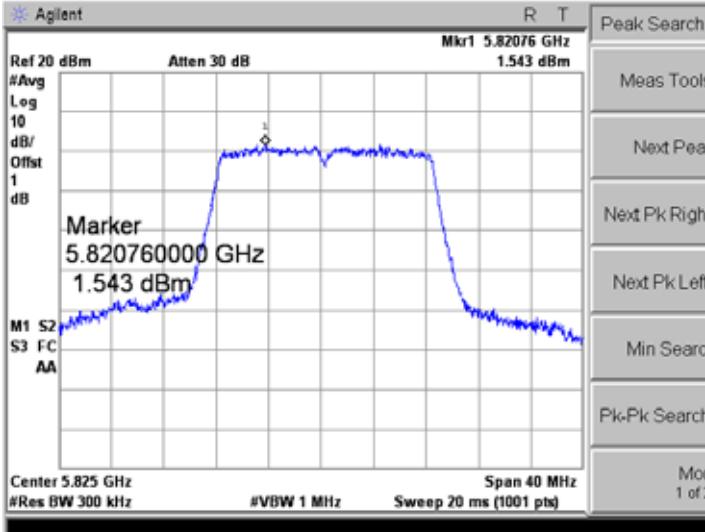
| Mode: | 802.11a |
|---------|---|
| 5180MHz |  <p>Agilent Spectrum Analyzer Plot Ref 20 dBm Atten 30 dB Mkr1 5.18340 GHz 5.359 dBm #Avg 10 Leg 10 dB/Offset 1 dB Marker 5.183400000 GHz 5.359 dBm M1 S2 S3 FC AA Center 5.18 GHz Span 40 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |
| 5200MHz |  <p>Agilent Spectrum Analyzer Plot Ref 20 dBm Atten 30 dB Mkr1 5.19572 GHz 5.321 dBm #Avg 10 Leg 10 dB/Offset 1 dB Marker 5.195720000 GHz 5.321 dBm M1 S2 S3 FC AA Center 5.2 GHz Span 40 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |
| 5240MHz |  <p>Agilent Spectrum Analyzer Plot Ref 20 dBm Atten 30 dB Mkr1 5.23840 GHz 5.377 dBm #Avg 10 Leg 10 dB/Offset 1 dB Marker 5.238400000 GHz 5.377 dBm M1 S2 S3 FC AA Center 5.24 GHz Span 40 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |

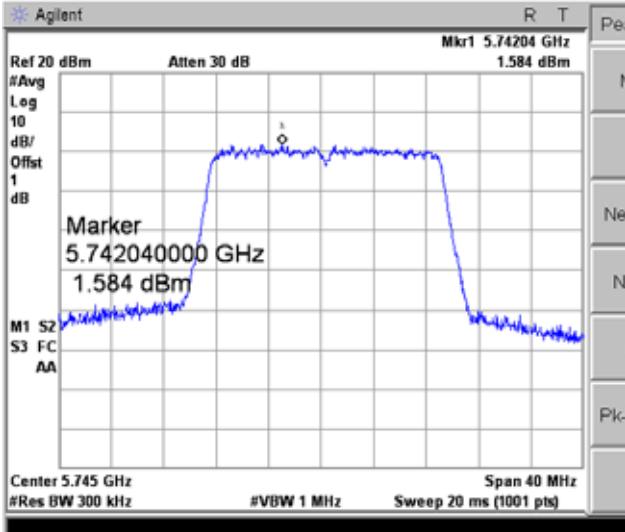
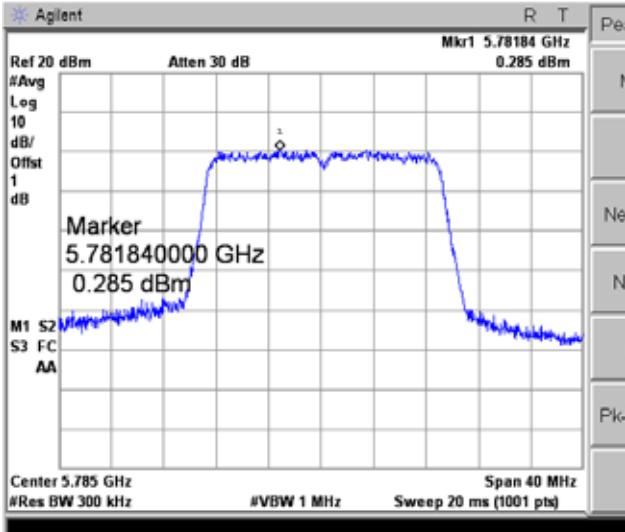
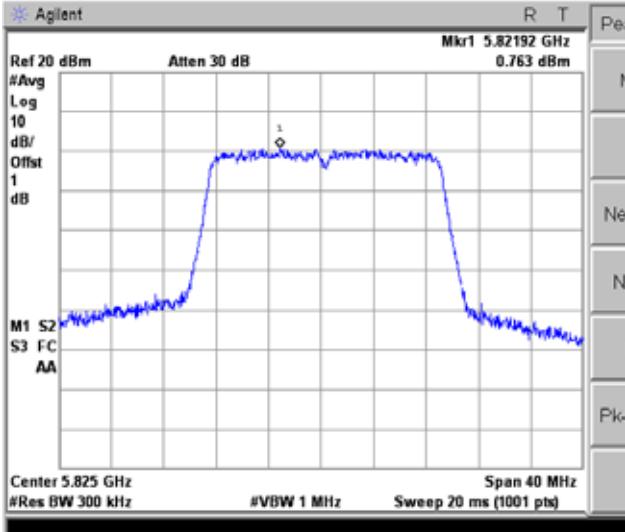
| Mode: | | 802.11n-HT20 |
|---------|--|---|
| 5180MHz | |  <p>Agilent R T</p> <p>Mkr1 5.17716 GHz 5.275 dBm</p> <p>Marker 5.177160000 GHz 5.275 dBm</p> <p>Center 5.18 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Leg 10 dB/Offset 1 dB</p> <p>M1 S2 S3 FC AA</p> <p>Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2</p> |
| 5200MHz | |  <p>Agilent R T</p> <p>Mkr1 5.19704 GHz 5.454 dBm</p> <p>Marker 5.197040000 GHz 5.454 dBm</p> <p>Center 5.2 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Leg 10 dB/Offset 1 dB</p> <p>M1 S2 S3 FC AA</p> <p>Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2</p> |
| 5240MHz | |  <p>Agilent R T</p> <p>Mkr1 5.24204 GHz 5.702 dBm</p> <p>Marker 5.242040000 GHz 5.702 dBm</p> <p>Center 5.24 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Leg 10 dB/Offset 1 dB</p> <p>M1 S2 S3 FC AA</p> <p>Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2</p> |

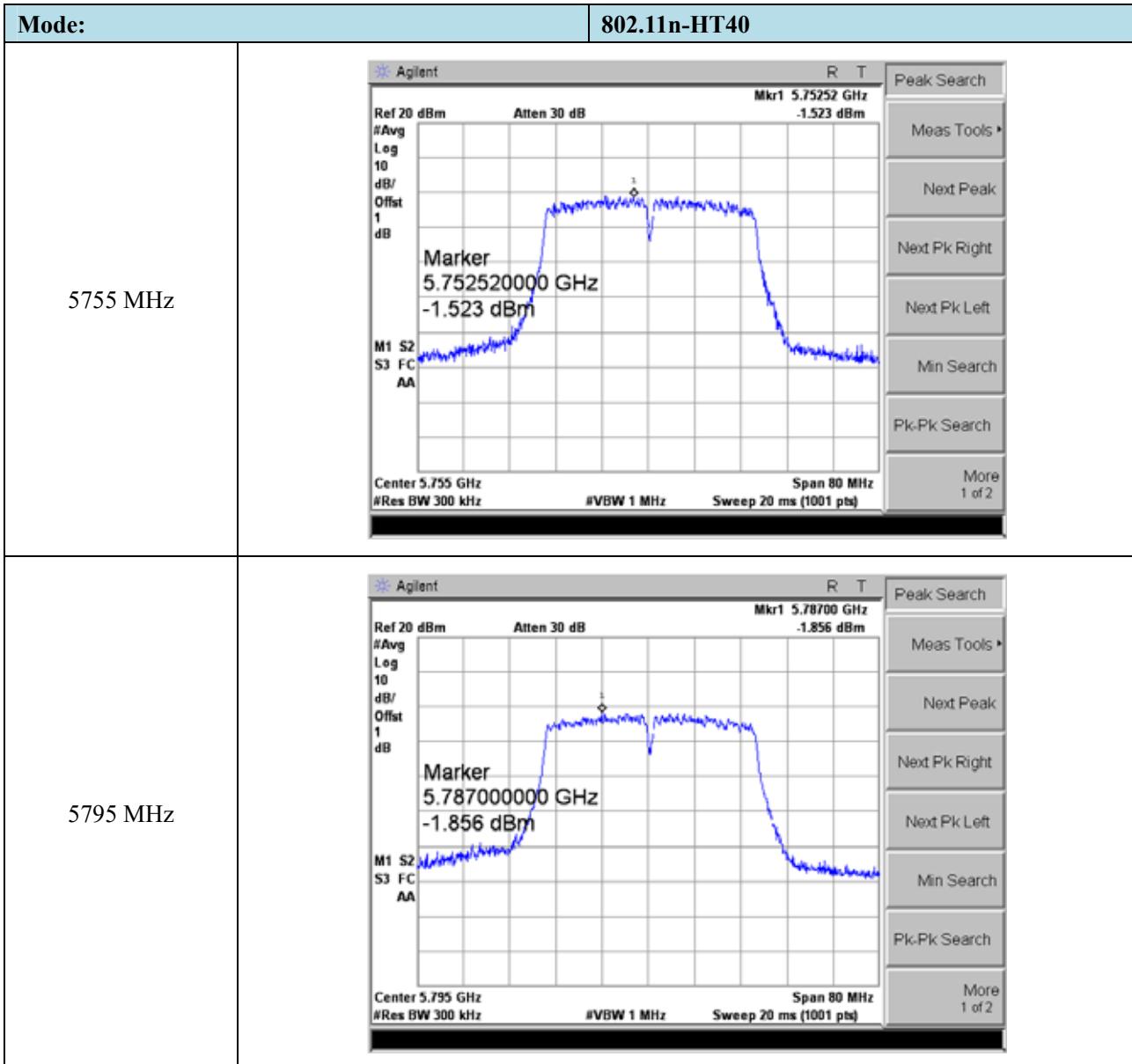
| | |
|----------|---|
| Mode: | 802.11n-HT40 |
| 5190 MHz |  <p>Agilent Spectrum Analysis Graph Ref 20 dBm Atten 30 dB Mkr1 5.19392 GHz 1.627 dBm #Avg Leg 10 dB/ Offst 1 dB Marker 5.193920000 GHz 1.627 dBm M1 S2 S3 FC AA Center 5.19 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 80 MHz</p> |
| 5230 MHz |  <p>Agilent Spectrum Analysis Graph Ref 20 dBm Atten 30 dB Mkr1 5.22888 GHz 1.586 dBm #Avg Leg 10 dB/ Offst 1 dB Marker 5.228880000 GHz 1.586 dBm M1 S2 S3 FC AA Center 5.23 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 80 MHz</p> |

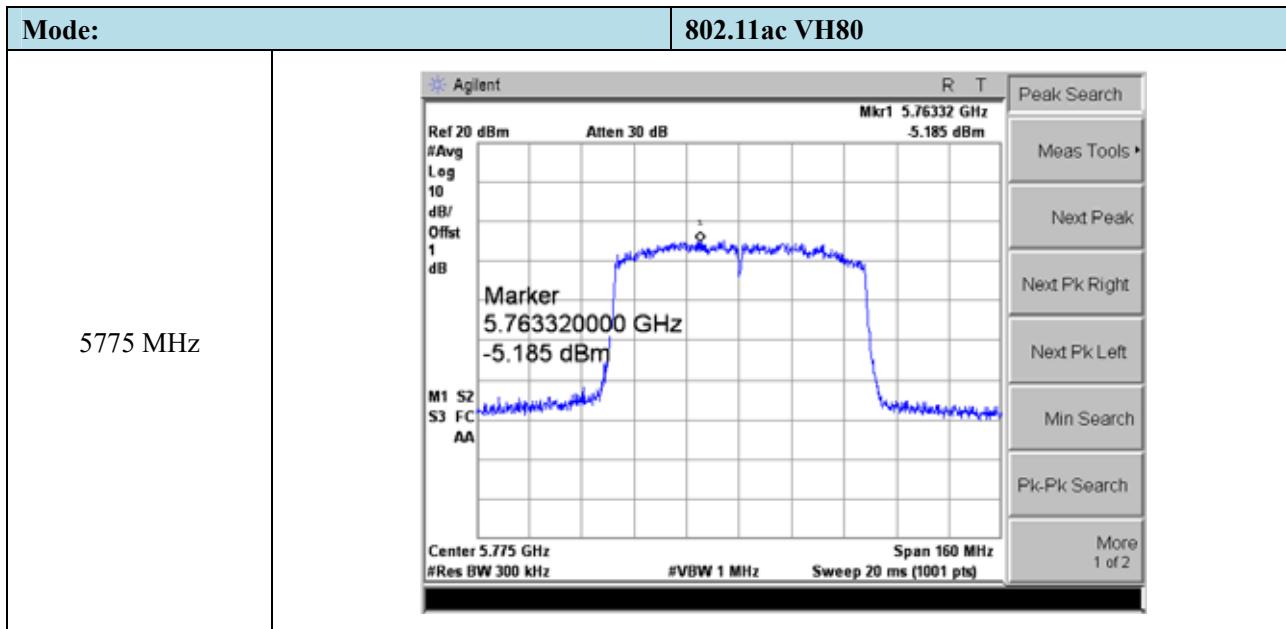


➤ Antenna A: 5725-5850MHz

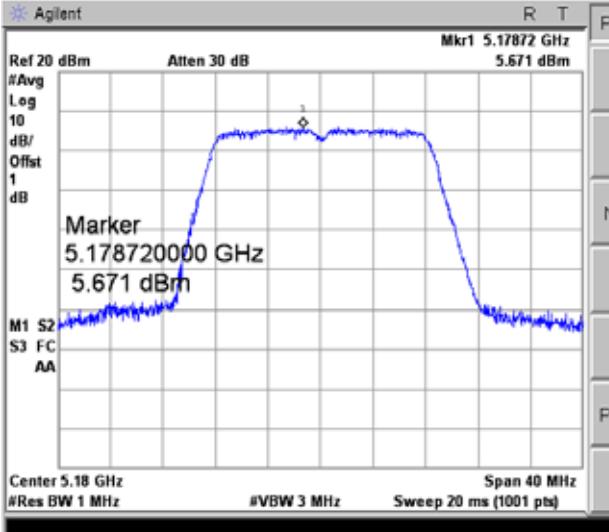
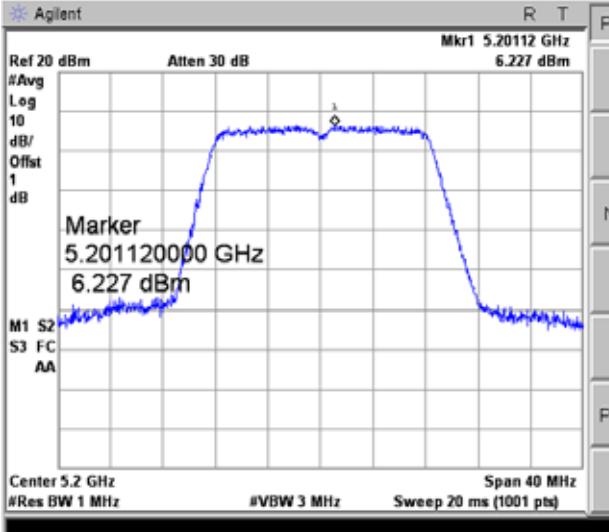
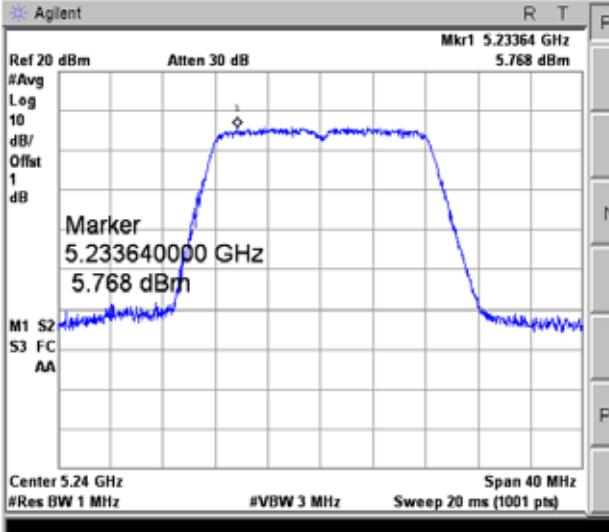
| Mode: | 802.11a |
|---------|---|
| 5745MHz |  <p>Marker 5.74936000 GHz 1.361 dBm</p> |
| 5785MHz |  <p>Marker 5.78076000 GHz 1.459 dBm</p> |
| 5825MHz |  <p>Marker 5.82076000 GHz 1.543 dBm</p> |

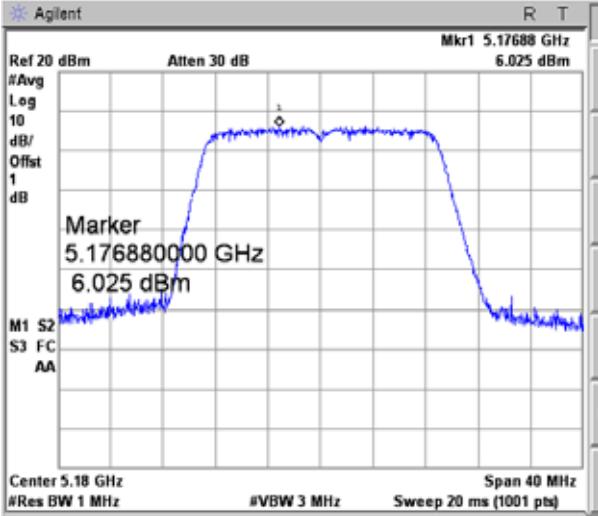
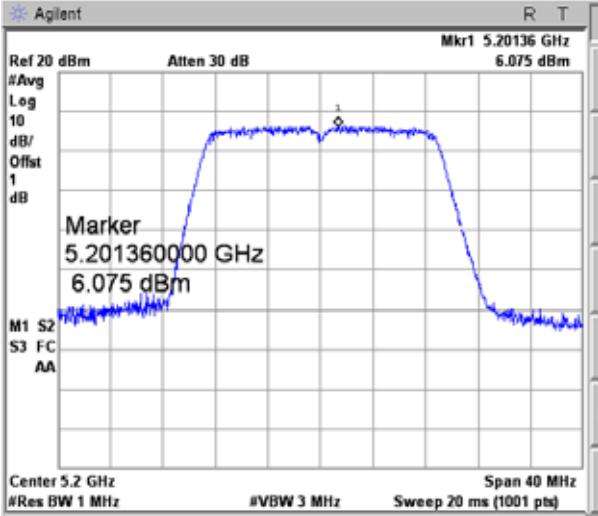
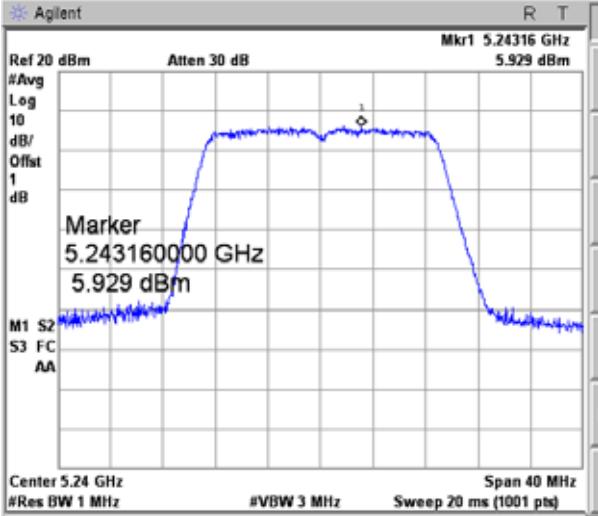
| Mode: | | 802.11n-HT20 |
|---------|--|--|
| 5745MHz | |  <p>Agilent R T Ref 20 dBm Atten 30 dB Mkr1 5.74204 GHz 1.584 dBm #Avg Log 10 dB/ Offst 1 dB Marker 5.742040000 GHz 1.584 dBm M1 S2 S3 FC AA Center 5.745 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> |
| 5785MHz | |  <p>Agilent R T Ref 20 dBm Atten 30 dB Mkr1 5.78184 GHz 0.285 dBm #Avg Log 10 dB/ Offst 1 dB Marker 5.781840000 GHz 0.285 dBm M1 S2 S3 FC AA Center 5.785 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> |
| 5825MHz | |  <p>Agilent R T Ref 20 dBm Atten 30 dB Mkr1 5.82192 GHz 0.763 dBm #Avg Log 10 dB/ Offst 1 dB Marker 5.821920000 GHz 0.763 dBm M1 S2 S3 FC AA Center 5.825 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> |

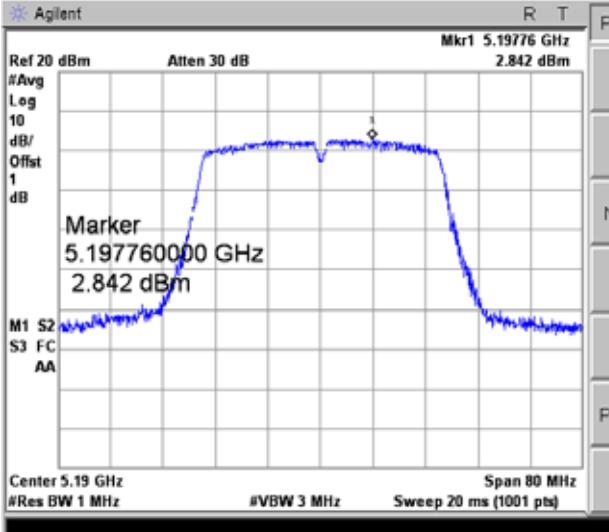
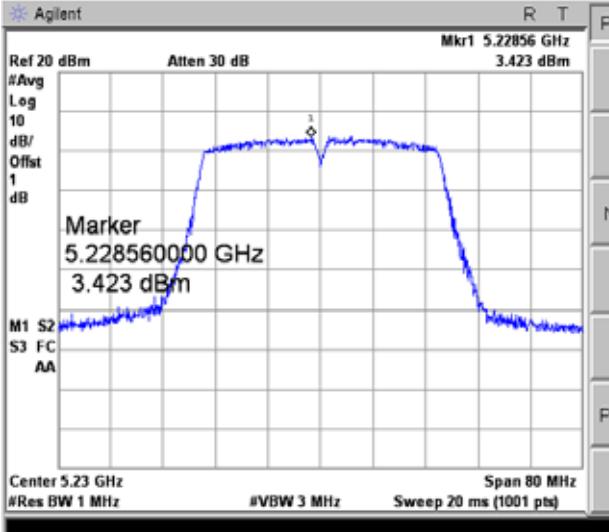


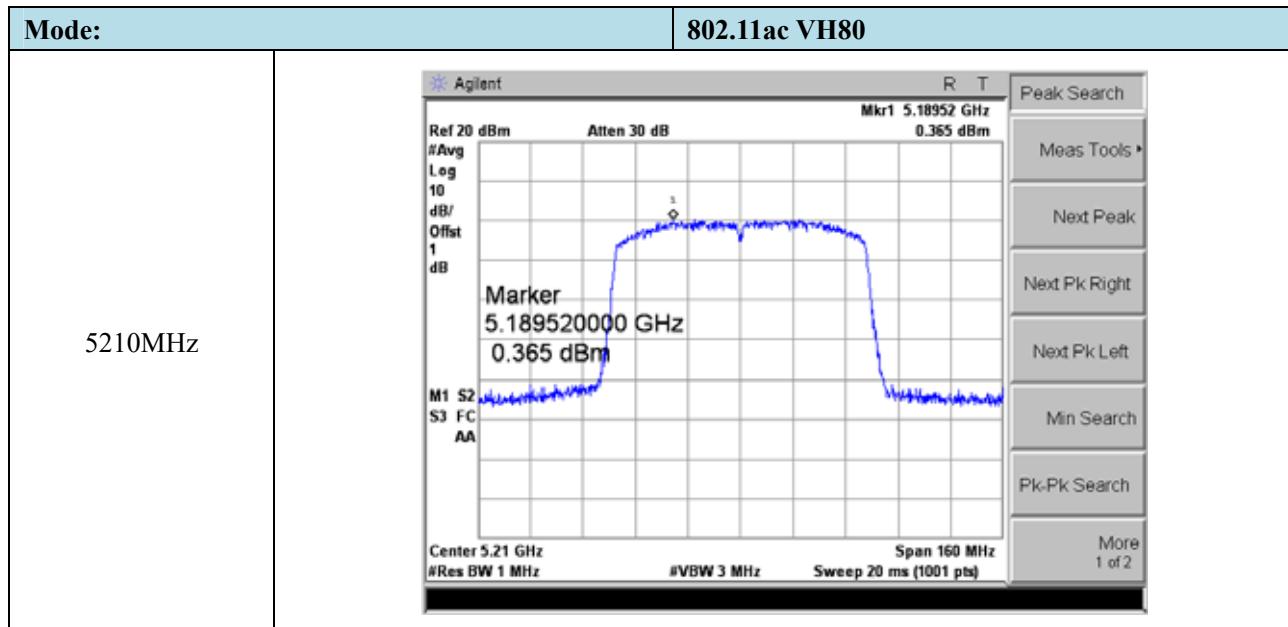


➤ Antenna B: 5150-5250MHz

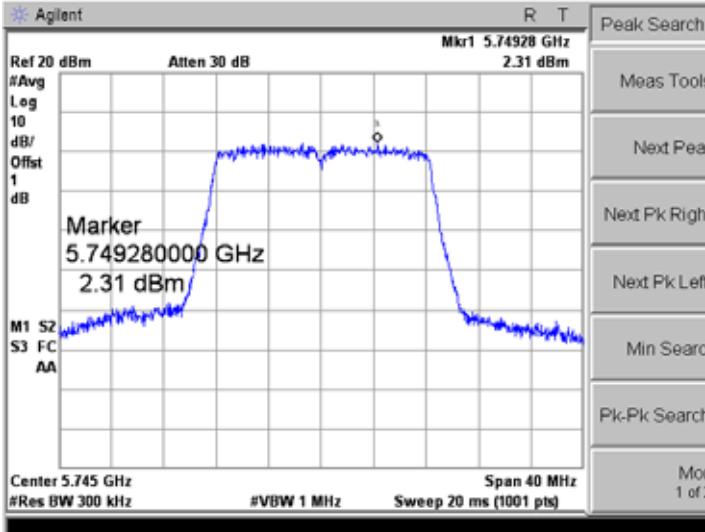
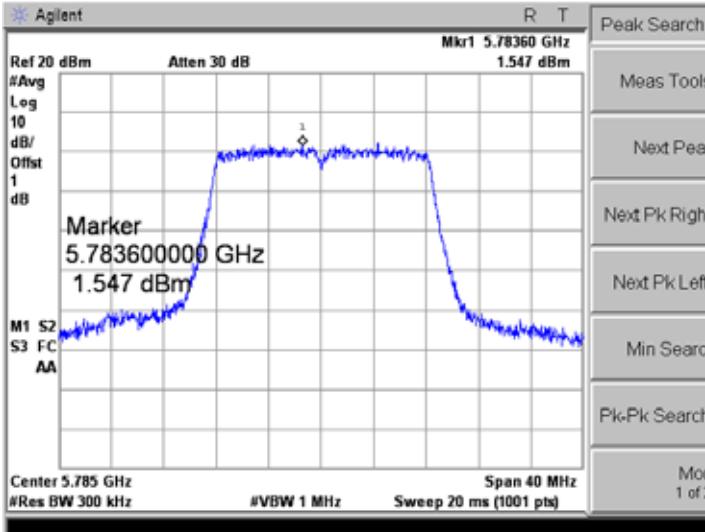
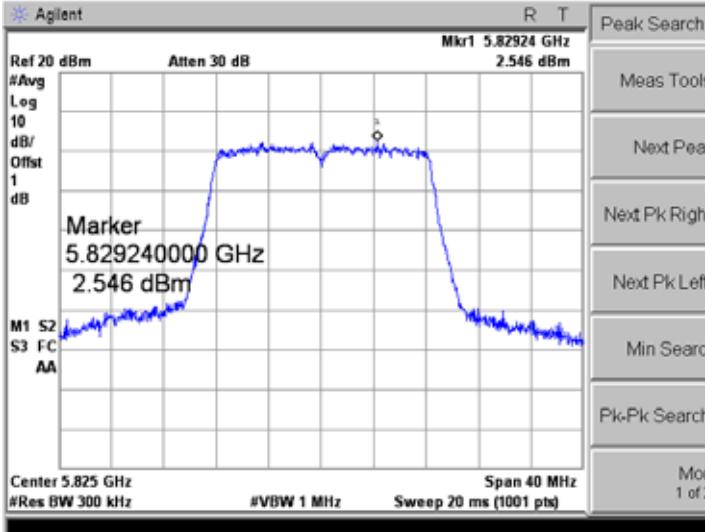
| Mode: | 802.11a |
|---------|---|
| 5180MHz |  <p>Marker 5.178720000 GHz 5.671 dBm</p> <p>Center 5.18 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |
| 5200MHz |  <p>Marker 5.201120000 GHz 6.227 dBm</p> <p>Center 5.2 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |
| 5240MHz |  <p>Marker 5.233640000 GHz 5.768 dBm</p> <p>Center 5.24 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |

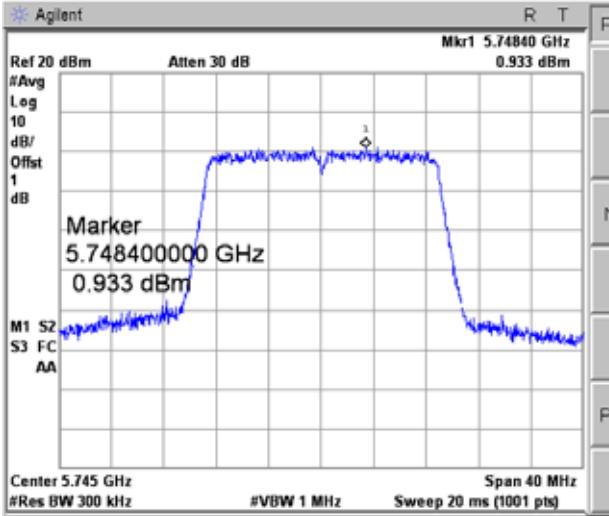
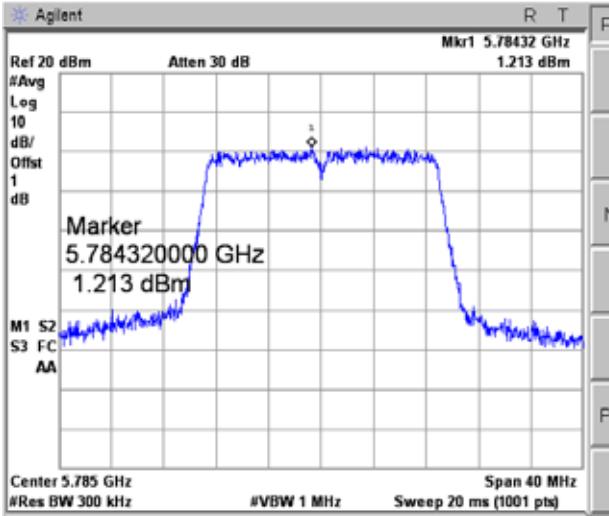
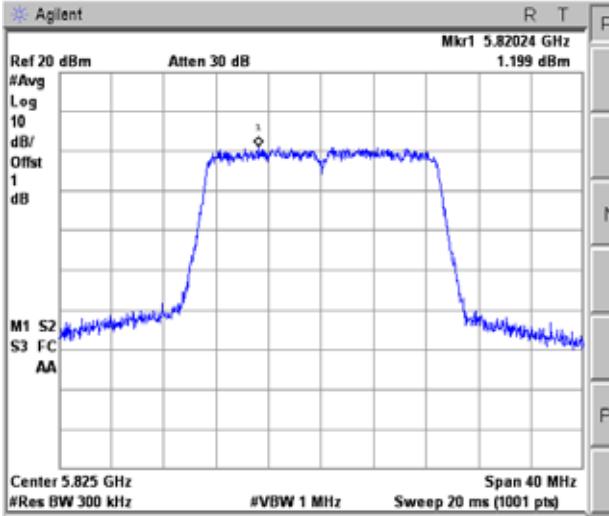
| Mode: | 802.11n-HT20 |
|---------|---|
| 5180MHz |  <p>Marker 5.176880000 GHz 6.025 dBm</p> <p>Center 5.18 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |
| 5200MHz |  <p>Marker 5.201360000 GHz 6.075 dBm</p> <p>Center 5.2 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |
| 5240MHz |  <p>Marker 5.243160000 GHz 5.929 dBm</p> <p>Center 5.24 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |

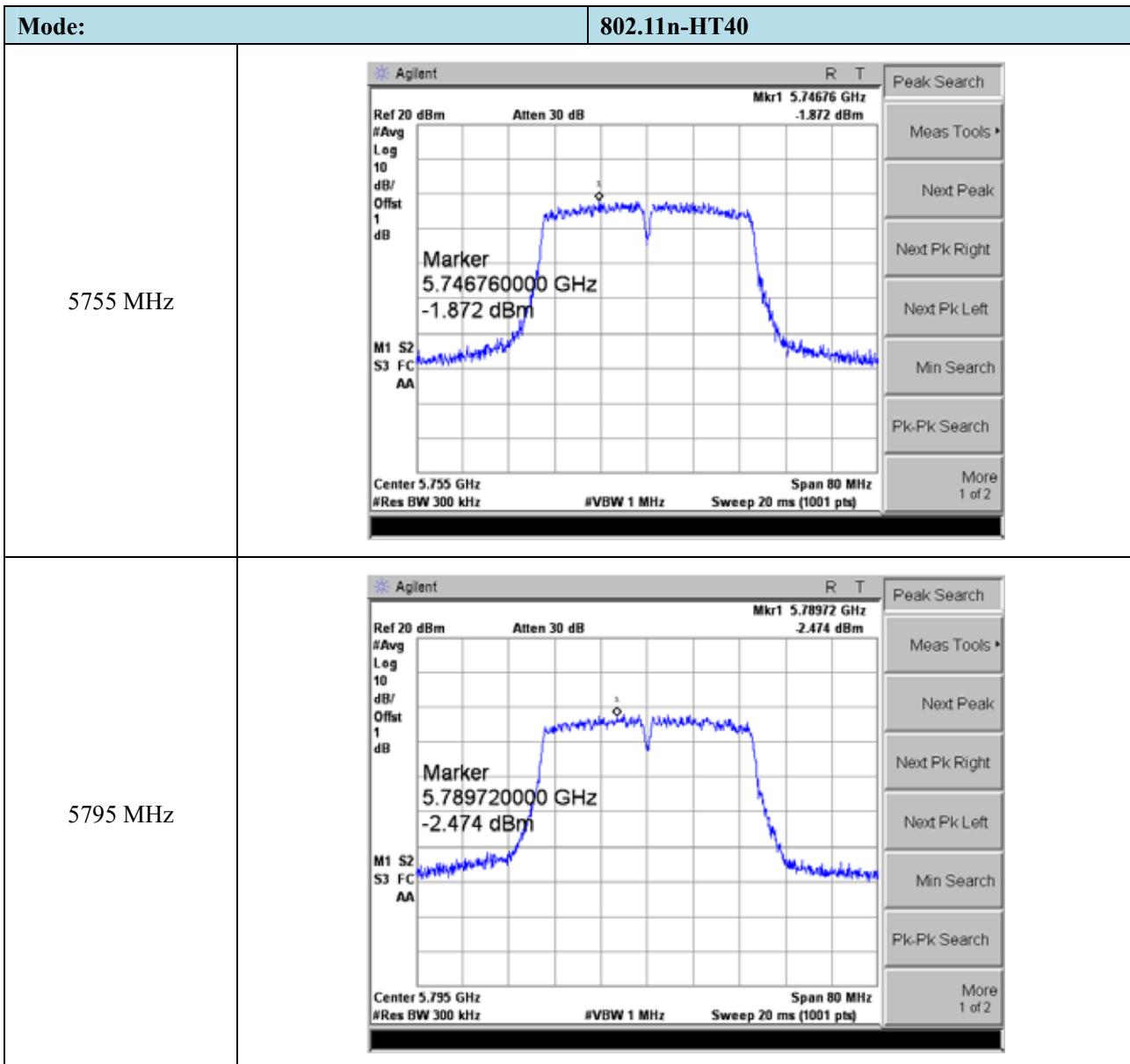
| | |
|----------|---|
| Mode: | 802.11n-HT40 |
| 5190 MHz |  <p>Marker 5.197760000 GHz 2.842 dBm</p> <p>Center 5.19 GHz Span 80 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |
| 5230 MHz |  <p>Marker 5.228560000 GHz 3.423 dBm</p> <p>Center 5.23 GHz Span 80 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> |

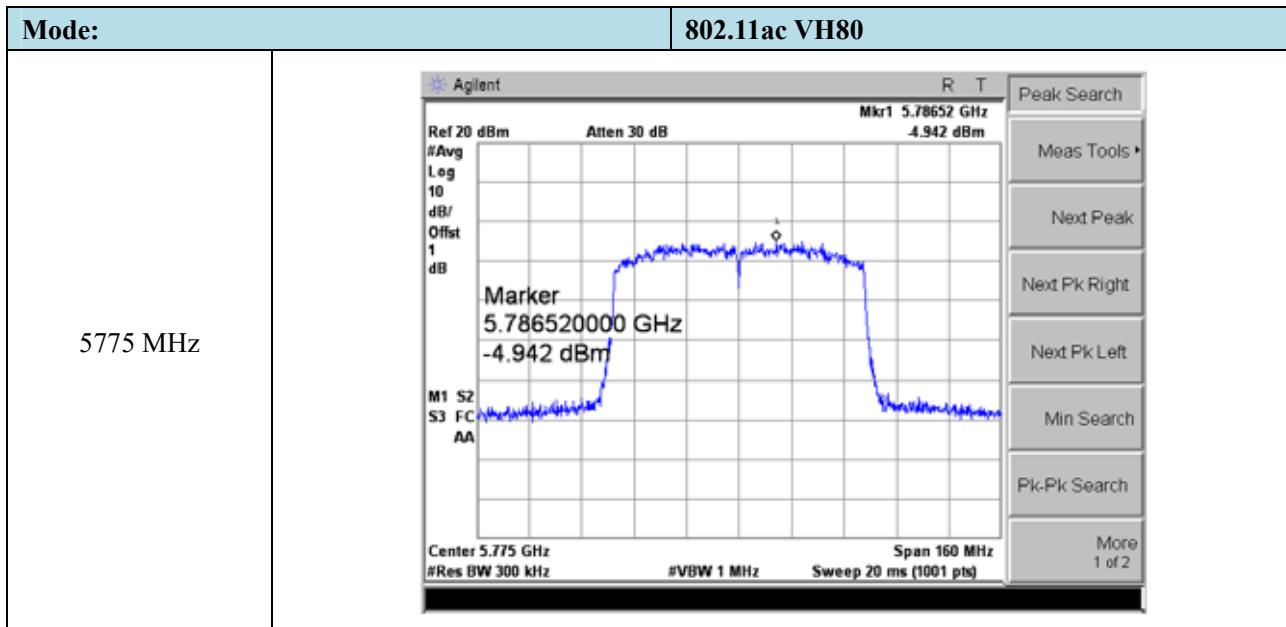


➤ Antenna 1: 5725-5850MHz

| Mode: | 802.11a |
|---------|--|
| 5745MHz |  <p>Marker 5.749280000 GHz 2.31 dBm</p> |
| 5785MHz |  <p>Marker 5.783600000 GHz 1.547 dBm</p> |
| 5825MHz |  <p>Marker 5.829240000 GHz 2.546 dBm</p> |

| Mode: | | 802.11n-HT20 |
|---------|--|--|
| 5745MHz | |  <p>Agilent R T Ref 20 dBm Atten 30 dB Mkr1 5.74840 GHz 0.933 dBm #Avg Log 10 dB/ Offst 1 dB Marker 5.748400000 GHz 0.933 dBm M1 S2 S3 FC AA Center 5.745 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> |
| 5785MHz | |  <p>Agilent R T Ref 20 dBm Atten 30 dB Mkr1 5.78432 GHz 1.213 dBm #Avg Log 10 dB/ Offst 1 dB Marker 5.784320000 GHz 1.213 dBm M1 S2 S3 FC AA Center 5.785 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> |
| 5825MHz | |  <p>Agilent R T Ref 20 dBm Atten 30 dB Mkr1 5.82024 GHz 1.199 dBm #Avg Log 10 dB/ Offst 1 dB Marker 5.820240000 GHz 1.199 dBm M1 S2 S3 FC AA Center 5.825 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (1001 pts)</p> |





7. Emission Bandwidth and Occupied Bandwidth

7.1 Standard Applicable

According to 15.407(a) and (e):

- (1) For the band 5.15-5.25 GHz.
 - (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
- (e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

7.2 Test Procedure

According to 789033 D02 v02r0r section C&D, the following is the measurement procedure.

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

this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission.

Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v02r01 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $3 * RBW$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

7.3 Summary of Test Results/Plots

| U-NII-1:5150-5250MHz(Antenna A) | | | | |
|--|-------------------------|----------------------------|--------------------------|----------------|
| Test Mode | Test Channel MHz | 26 dB Bandwidth MHz | 99% Bandwidth MHz | verdict |
| 802.11a | 5180 | 18.215 | 16.3202 | Pass |
| | 5200 | 18.174 | 16.3583 | Pass |
| | 5240 | 18.235 | 16.3211 | Pass |
| 802.11n-HT20 | 5180 | 19.269 | 17.5475 | Pass |
| | 5200 | 19.323 | 17.5802 | Pass |
| | 5240 | 19.280 | 17.5483 | Pass |
| 802.11n-HT40 | 5190 | 39.600 | 35.9410 | Pass |
| | 5230 | 39.323 | 35.9544 | Pass |
| 802.11ac-HT80 | 5210 | 78.741 | 74.6519 | Pass |

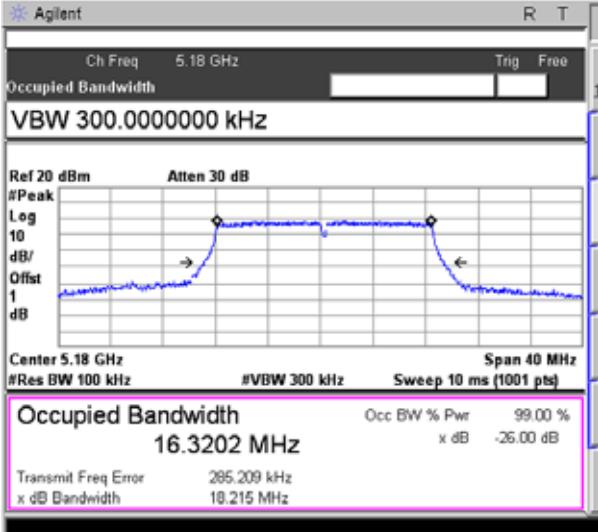
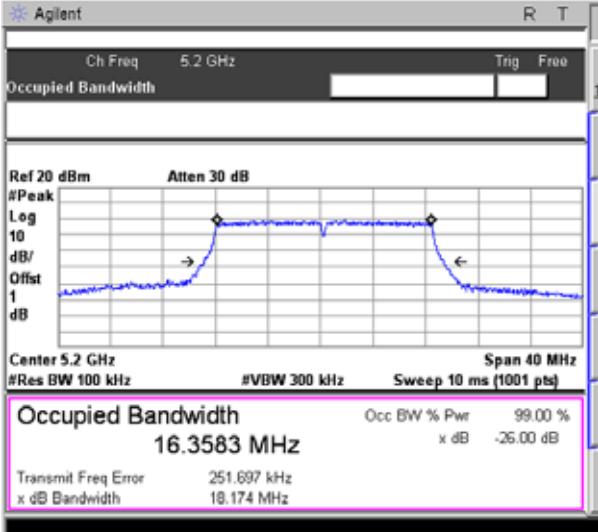
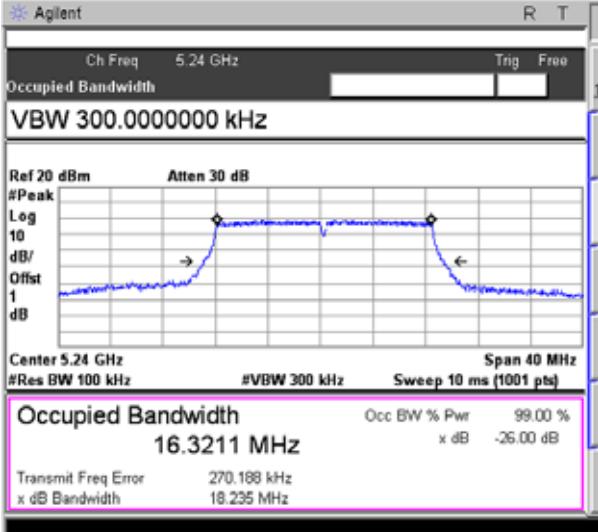
| U-NII-3: 5725-5850MHz(Antenna A) | | | | |
|---|-------------------------|---------------------------|--------------------------|------------------|
| Test Mode | Test Channel MHz | 6 dB Bandwidth MHz | 99% Bandwidth MHz | Limit kHz |
| 802.11a | 5745 | 16.452 | 16.3265 | ≥500 |
| | 5785 | 16.429 | 16.3140 | ≥500 |
| | 5825 | 16.424 | 16.3251 | ≥500 |
| 802.11n-HT20 | 5745 | 17.668 | 17.5282 | ≥500 |
| | 5785 | 17.653 | 17.5362 | ≥500 |
| | 5825 | 17.656 | 17.5403 | ≥500 |
| 802.11n-HT40 | 5755 | 36.403 | 35.9303 | ≥500 |
| | 5795 | 36.411 | 35.9483 | ≥500 |
| 802.11ac VH80 | 5775 | 74.697 | 74.6269 | ≥500 |

| U-NII-1:5150-5250MHz(Antenna B) | | | | |
|--|-------------------------|----------------------------|--------------------------|----------------|
| Test Mode | Test Channel MHz | 26 dB Bandwidth MHz | 99% Bandwidth MHz | verdict |
| 802.11a | 5180 | 18.153 | 16.3151 | Pass |
| | 5200 | 18.200 | 16.3153 | Pass |
| | 5240 | 18.125 | 16.3243 | Pass |
| 802.11n-HT20 | 5180 | 19.280 | 17.5330 | Pass |
| | 5200 | 19.264 | 17.5333 | Pass |
| | 5240 | 19.189 | 17.5338 | Pass |
| 802.11n-HT40 | 5190 | 39.284 | 35.9340 | Pass |
| | 5230 | 39.049 | 35.9191 | Pass |
| 802.11ac-HT80 | 5210 | 78.815 | 74.5969 | Pass |

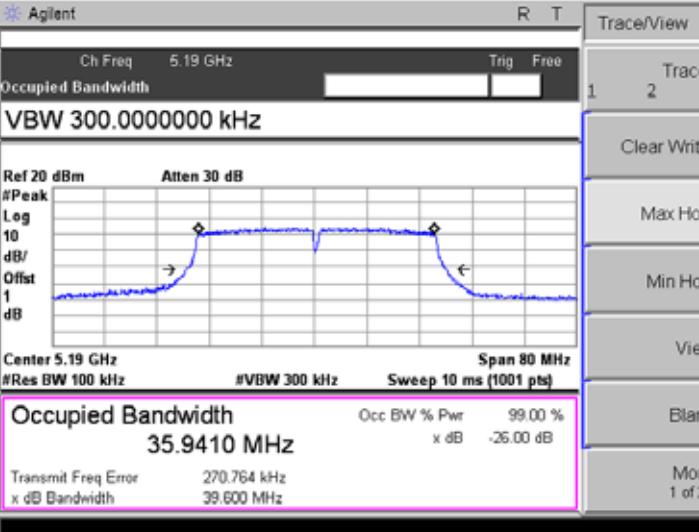
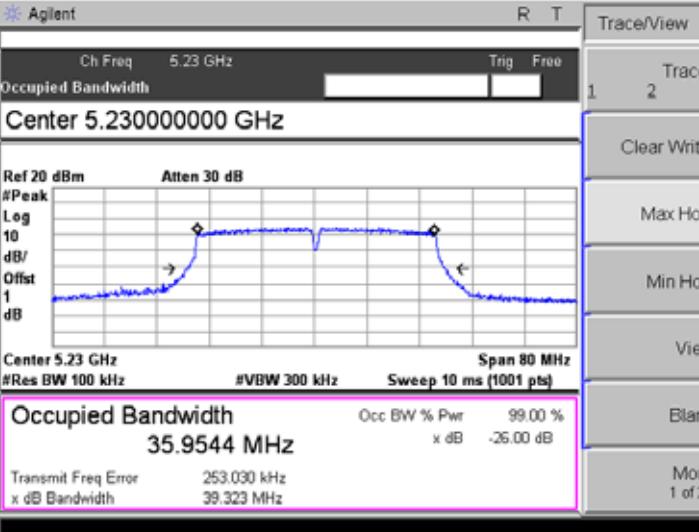
U-NII-3: 5725-5850MHz(Antenna 1)

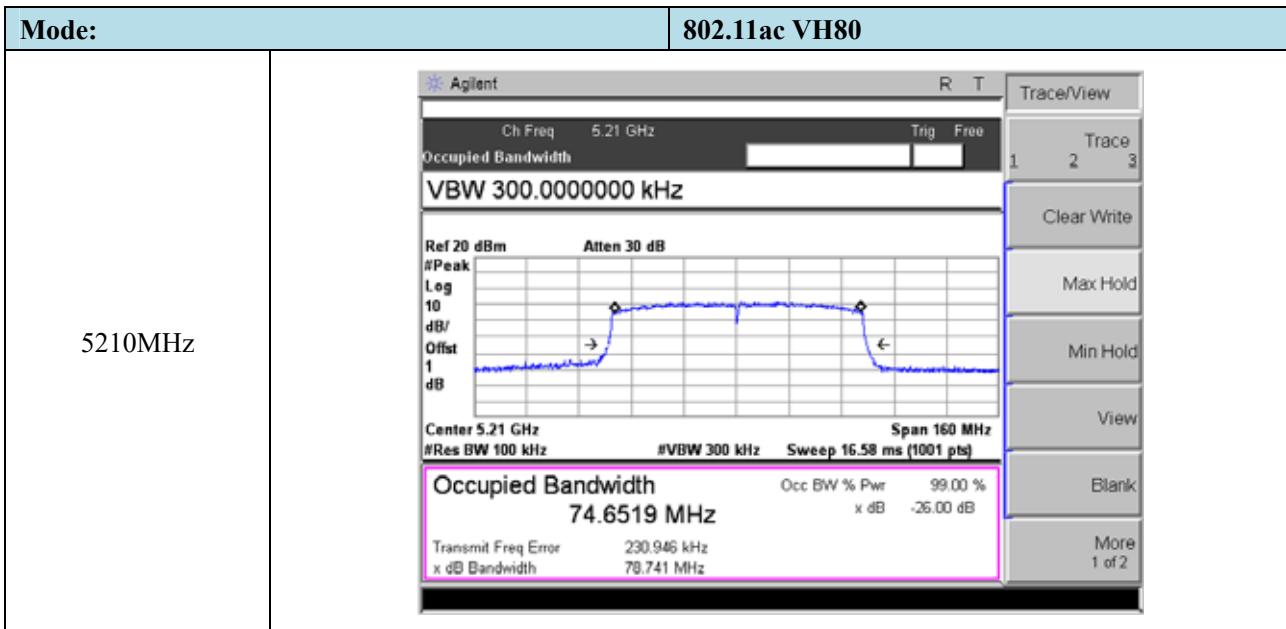
| Test Mode | Test Channel MHz | 6 dB Bandwidth MHz | 99% Bandwidth MHz | Limit kHz |
|------------------|-----------------------------|-------------------------------|------------------------------|----------------------|
| 802.11a | 5745 | 16.425 | 16.3086 | ≥500 |
| | 5785 | 16.440 | 16.3204 | ≥500 |
| | 5825 | 16.422 | 16.3159 | ≥500 |
| 802.11n-HT20 | 5745 | 17.699 | 17.5408 | ≥500 |
| | 5785 | 17.687 | 17.5411 | ≥500 |
| | 5825 | 17.669 | 17.5360 | ≥500 |
| 802.11n-HT40 | 5755 | 36.387 | 35.9313 | ≥500 |
| | 5795 | 36.376 | 35.9271 | ≥500 |
| 802.11ac VH80 | 5775 | 75.228 | 74.6697 | ≥500 |

➤ Antenna A: 5150-5250MHz

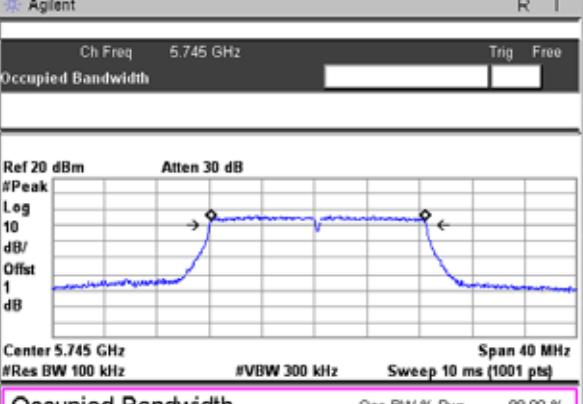
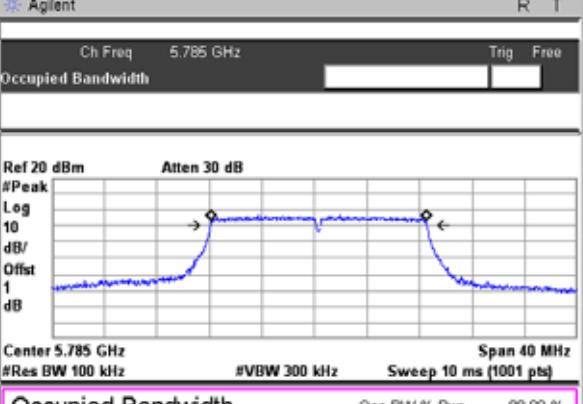
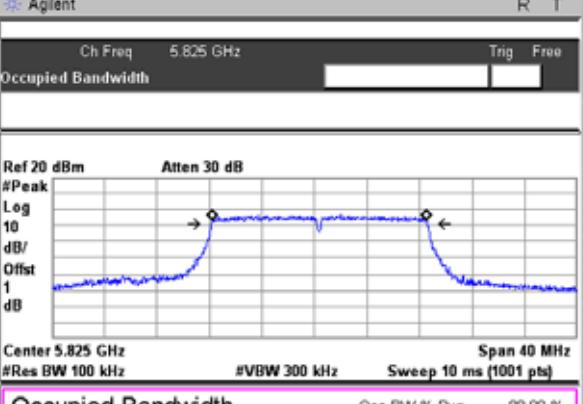
| Mode: | 802.11a |
|---------|---|
| 5180MHz |  <p>Agilent R T</p> <p>Ch Freq 5.18 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.18 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 16.3202 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 285.209 kHz x dB Bandwidth 18.215 MHz</p> |
| 5200MHz |  <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.2 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 16.3583 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 251.697 kHz x dB Bandwidth 18.174 MHz</p> |
| 5240MHz |  <p>Agilent R T</p> <p>Ch Freq 5.24 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.24 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 16.3211 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 270.188 kHz x dB Bandwidth 18.235 MHz</p> |

| Mode: | 802.11n-HT20 |
|---------|--|
| 5180MHz | <p>Agilent R T</p> <p>Ch Freq 5.18 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 5.180000000 GHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.18 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 % 17.5475 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 220.777 kHz x dB Bandwidth 19.269 MHz</p> <p>Trace/View 1 Trace 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2</p> |
| 5200MHz | <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 5.2000000 GHz</p> <p>Start Freq 5.1800000 GHz</p> <p>Stop Freq 5.2200000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 5.2 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 % 17.5802 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 177.399 kHz x dB Bandwidth 19.323 MHz</p> |
| 5240MHz | <p>Agilent R T</p> <p>Ch Freq 5.24 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 5.2400000 GHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.24 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 % 17.5483 MHz x dB -26.00 dB</p> <p>Transmit Freq Error 220.660 kHz x dB Bandwidth 19.280 MHz</p> <p>Trace/View 1 Trace 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2</p> |

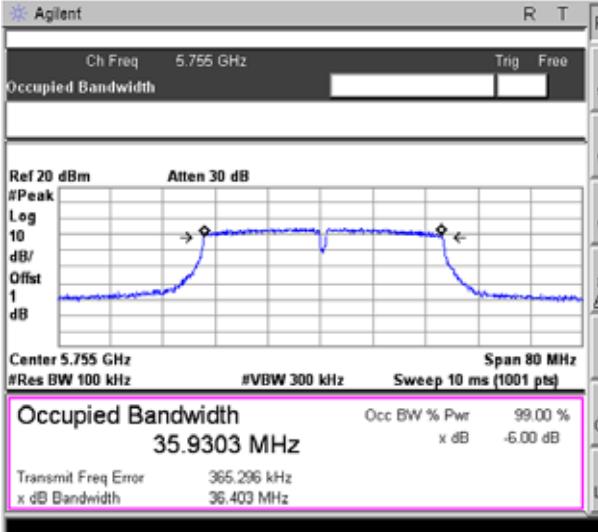
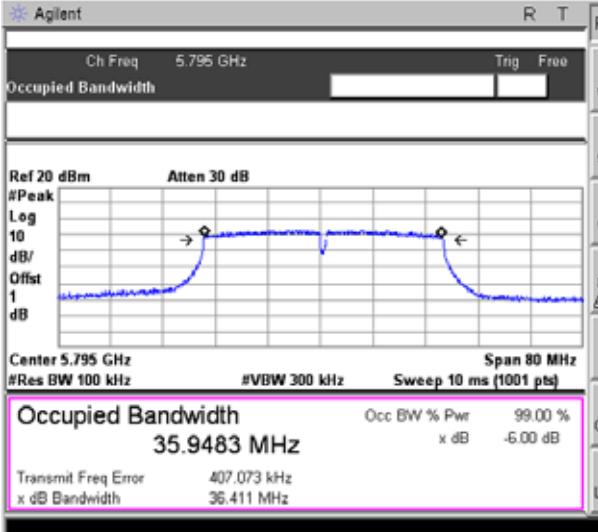
| | |
|----------|--|
| Mode: | 802.11n-HT40 |
| 5190 MHz |  <p>Agilent R T</p> <p>Ch Freq 5.19 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.19 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 80 MHz</p> <p>Occupied Bandwidth 35.9410 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 270.764 kHz x dB Bandwidth 39.600 MHz</p> <p>Trace/View</p> <ul style="list-style-type: none"> 1 Trace 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2 |
| 5230 MHz |  <p>Agilent R T</p> <p>Ch Freq 5.23 GHz Trig Free</p> <p>Occupied Bandwidth Center 5.230000000 GHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.23 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 80 MHz</p> <p>Occupied Bandwidth 35.9544 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 253.030 kHz x dB Bandwidth 39.323 MHz</p> <p>Trace/View</p> <ul style="list-style-type: none"> 1 Trace 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2 |

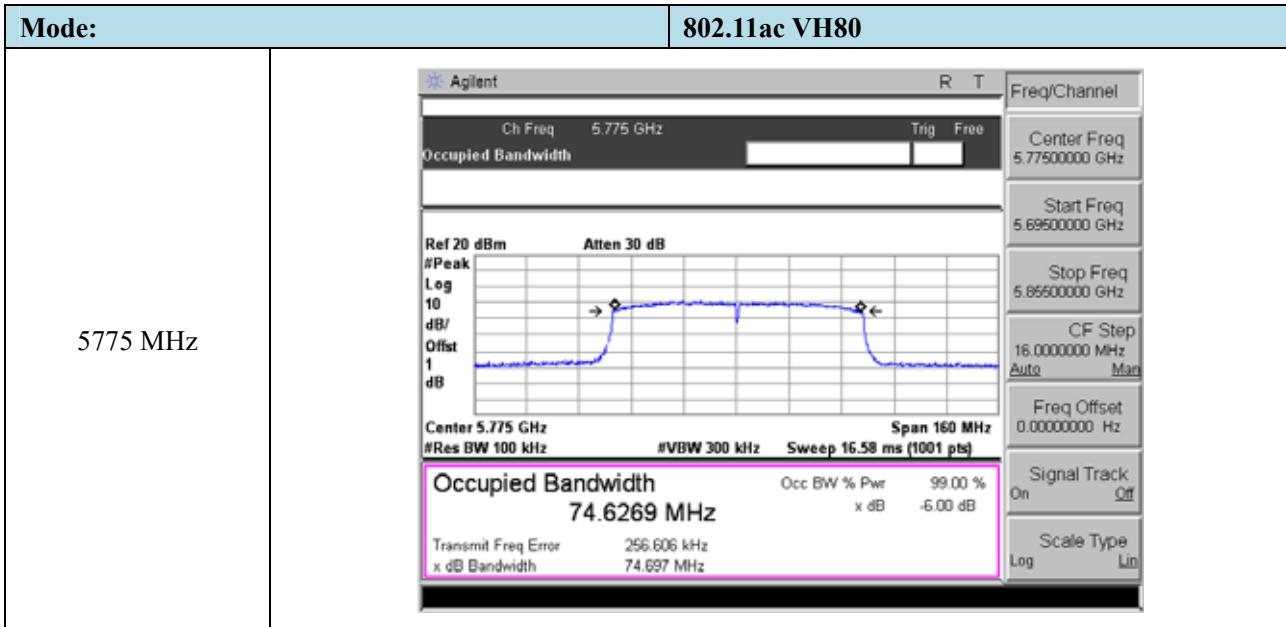


➤ Antenna A: 5725-5850MHz

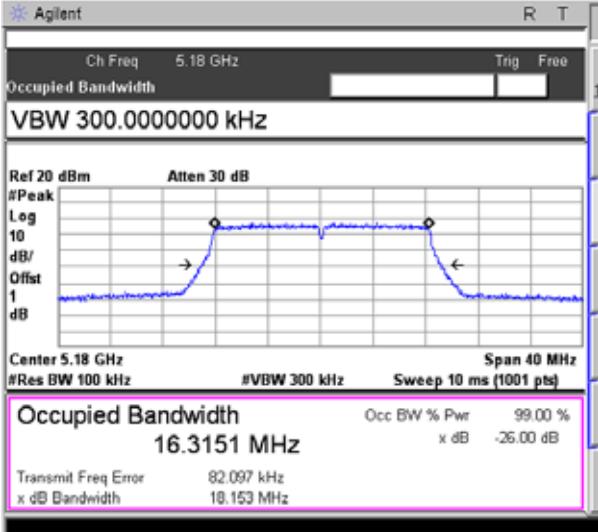
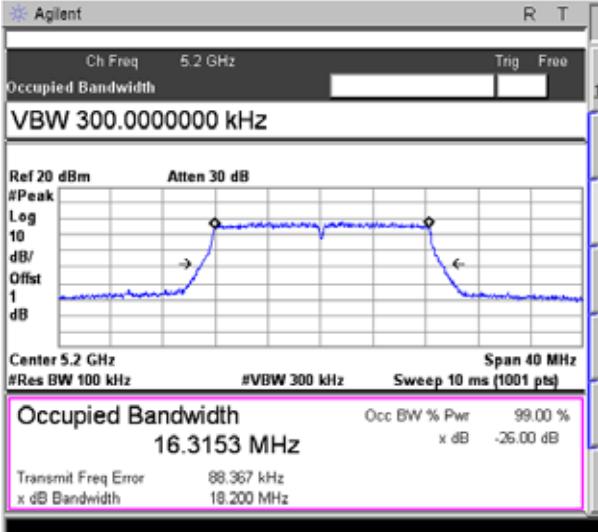
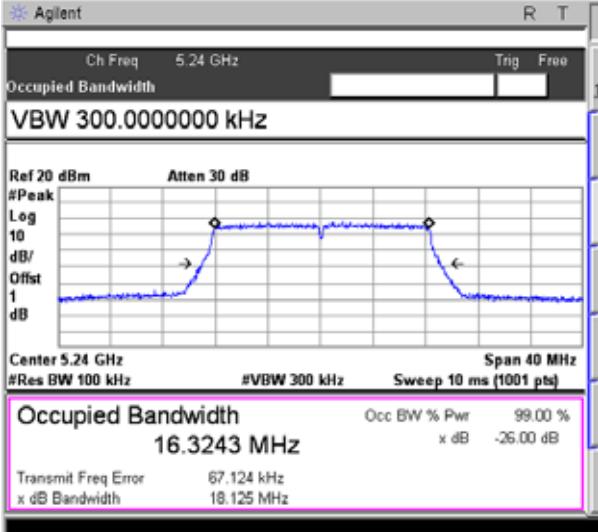
| Mode: | 802.11a |
|---------|---|
| 5745MHz | <p>Agilent R T</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Occupied Bandwidth</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.745 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth 16.3265 MHz</p> <p>Transmit Freq Error 252.778 kHz x dB Bandwidth 16.452 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.7450000 GHz</p> <p>Start Freq 5.7250000 GHz</p> <p>Stop Freq 5.7660000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |
| 5785MHz | <p>Agilent R T</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Occupied Bandwidth</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.785 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth 16.3140 MHz</p> <p>Transmit Freq Error 315.193 kHz x dB Bandwidth 16.429 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.7850000 GHz</p> <p>Start Freq 5.7660000 GHz</p> <p>Stop Freq 5.8050000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |
| 5825MHz | <p>Agilent R T</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Occupied Bandwidth</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.825 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth 16.3251 MHz</p> <p>Transmit Freq Error 375.212 kHz x dB Bandwidth 16.424 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.8250000 GHz</p> <p>Start Freq 5.8050000 GHz</p> <p>Stop Freq 5.8460000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |

| Mode: | 802.11n-HT20 |
|---------|---|
| 5745MHz | <p>Agilent R T</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.745 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 17.5282 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 386.346 kHz x dB Bandwidth 17.666 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.7450000 GHz</p> <p>Start Freq 5.7250000 GHz</p> <p>Stop Freq 5.7660000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |
| 5785MHz | <p>Agilent R T</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.785 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 17.5362 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 329.626 kHz x dB Bandwidth 17.653 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.7850000 GHz</p> <p>Start Freq 5.7660000 GHz</p> <p>Stop Freq 5.8050000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |
| 5825MHz | <p>Agilent R T</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.825 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 17.5403 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 383.231 kHz x dB Bandwidth 17.656 MHz</p> <p>Freq/Channel</p> <p>Center Freq 5.8250000 GHz</p> <p>Start Freq 5.8050000 GHz</p> <p>Stop Freq 5.8450000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |

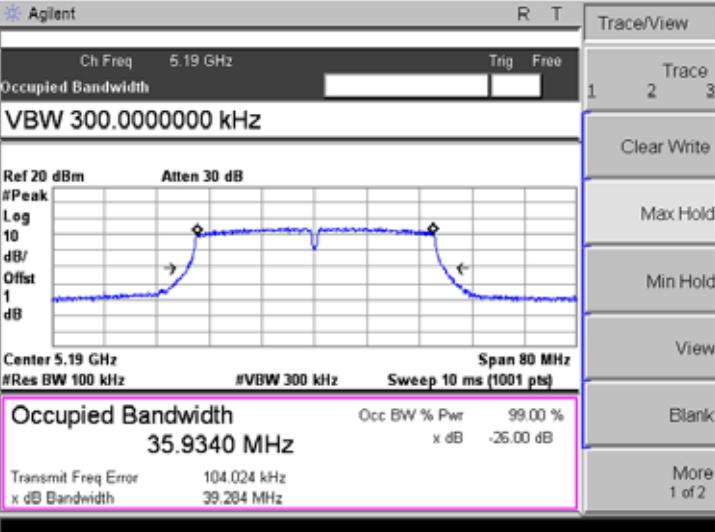
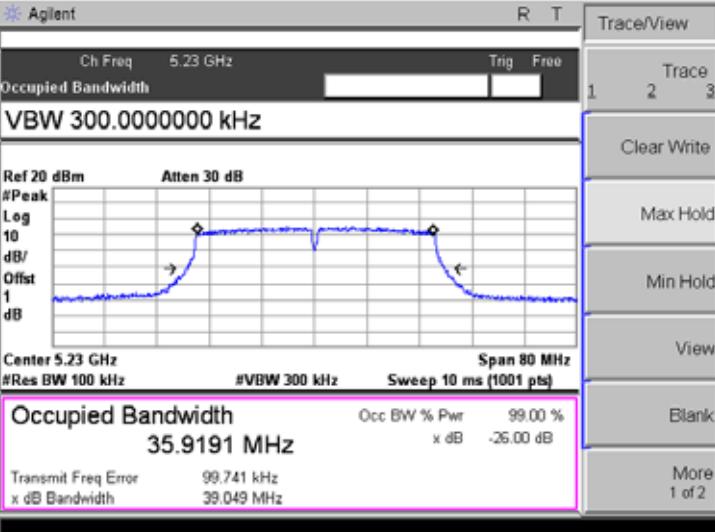
| Mode: | | 802.11n-HT40 | |
|----------|--|--|--|
| 5755 MHz |  <p>Agilent Ch Freq 5.755 GHz Trig Free Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 5.755 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 80 MHz</p> <p>Occupied Bandwidth 35.9303 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 365.296 kHz x dB Bandwidth 36.403 MHz</p> | <input type="checkbox"/> Freq/Channel Center Freq 5.7550000 GHz <input type="checkbox"/> Start Freq 5.7150000 GHz <input type="checkbox"/> Stop Freq 5.7950000 GHz <input type="checkbox"/> CF Step 8.0000000 MHz Auto Man <input type="checkbox"/> Freq Offset 0.0000000 Hz <input type="checkbox"/> Signal Track On Off <input type="checkbox"/> Scale Type Log Lin | |
| 5795 MHz |  <p>Agilent Ch Freq 5.795 GHz Trig Free Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 5.795 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 80 MHz</p> <p>Occupied Bandwidth 35.9483 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 407.073 kHz x dB Bandwidth 36.411 MHz</p> | <input type="checkbox"/> Freq/Channel Center Freq 5.7950000 GHz <input type="checkbox"/> Start Freq 5.7550000 GHz <input type="checkbox"/> Stop Freq 5.8350000 GHz <input type="checkbox"/> CF Step 8.0000000 MHz Auto Man <input type="checkbox"/> Freq Offset 0.0000000 Hz <input type="checkbox"/> Signal Track On Off <input type="checkbox"/> Scale Type Log Lin | |

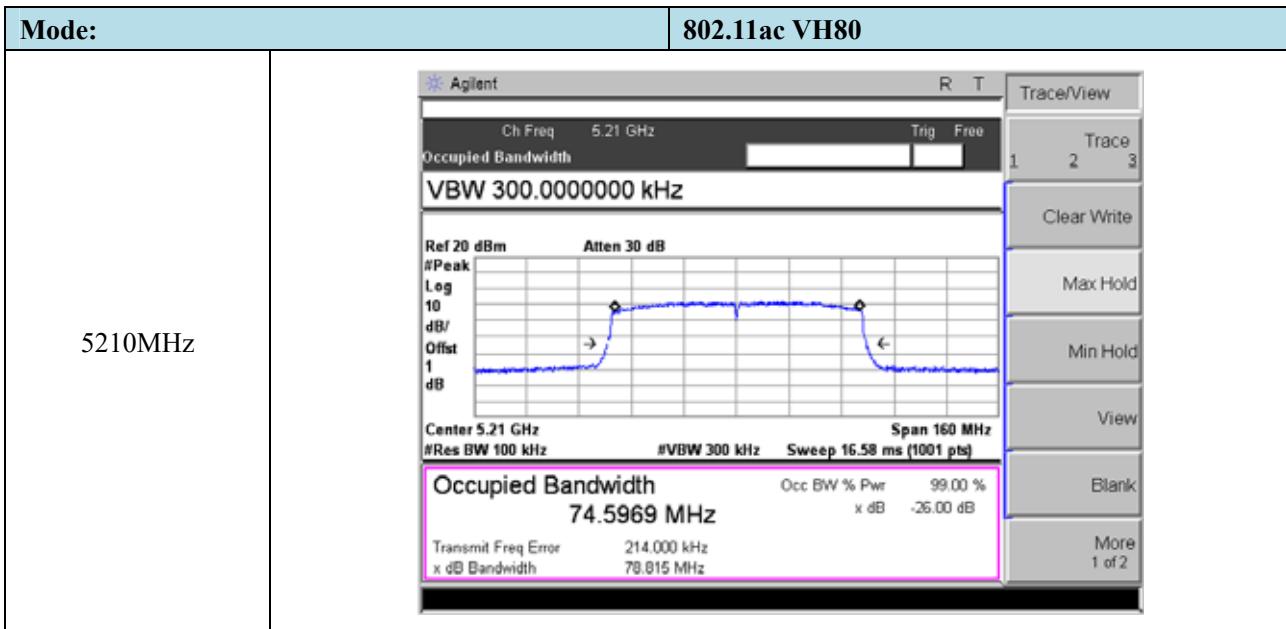


➤ Antenna 1: 5150-5250MHz

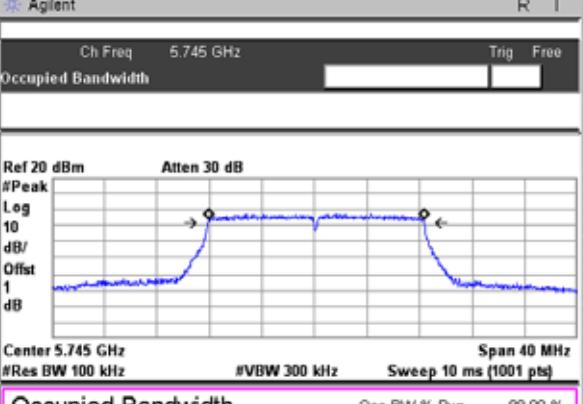
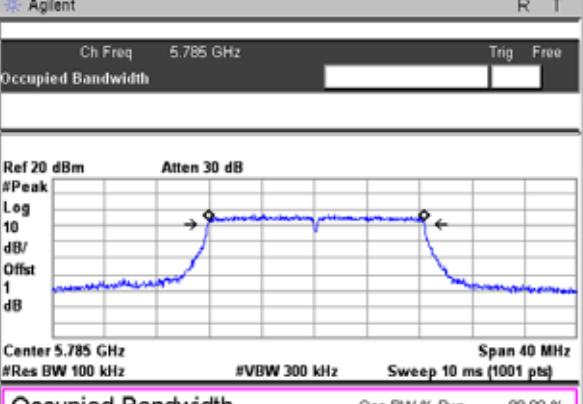
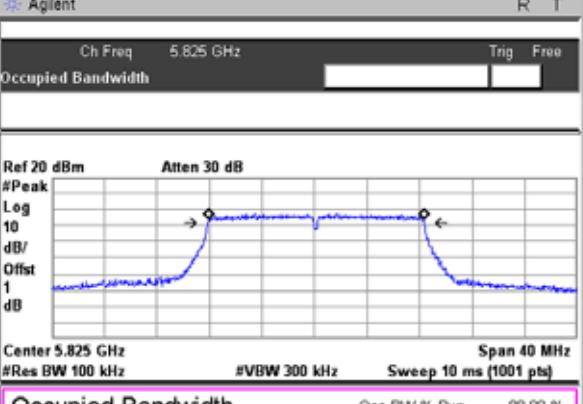
| Mode: | 802.11a |
|---------|---|
| 5180MHz |  <p>Agilent R T</p> <p>Ch Freq 5.18 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.18 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 16.3151 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 82.097 kHz x dB Bandwidth 18.153 MHz</p> |
| 5200MHz |  <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.2 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 16.3153 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 88.367 kHz x dB Bandwidth 18.200 MHz</p> |
| 5240MHz |  <p>Agilent R T</p> <p>Ch Freq 5.24 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.24 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 16.3243 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 67.124 kHz x dB Bandwidth 18.125 MHz</p> |

| Mode: | 802.11n-HT20 |
|---------|--|
| 5180MHz | <p>Agilent R T</p> <p>Ch Freq 5.18 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.18 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 17.5330 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 91.474 kHz x dB Bandwidth 19.280 MHz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5200MHz | <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.2 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 17.5333 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 86.365 kHz x dB Bandwidth 19.264 MHz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5240MHz | <p>Agilent R T</p> <p>Ch Freq 5.24 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Log 10 dB/ Offst 1 dB</p> <p>Center 5.24 GHz #Res BW 100 kHz #VBW 300 kHz Span 40 MHz Sweep 10 ms (1001 pts)</p> <p>Occupied Bandwidth 17.5338 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 84.583 kHz x dB Bandwidth 19.189 MHz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

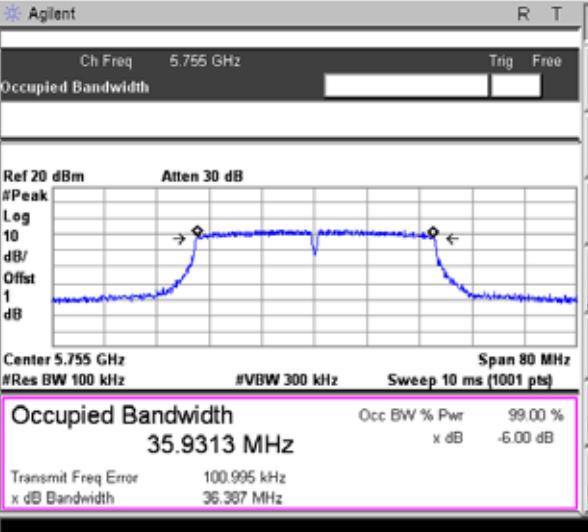
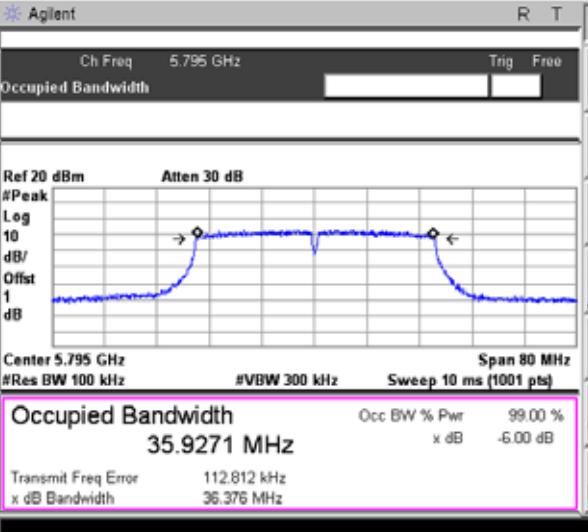
| | | |
|----------|---|---|
| Mode: | 802.11n-HT40 | |
| 5190 MHz |  <p>Agilent R T</p> <p>Ch Freq 5.19 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Leg 10 dB/ Offst 1 dB</p> <p>Center 5.19 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 80 MHz</p> <p>Occupied Bandwidth 35.9340 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 104.024 kHz x dB Bandwidth 39.284 MHz</p> | <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5230 MHz |  <p>Agilent R T</p> <p>Ch Freq 5.23 GHz Trig Free</p> <p>Occupied Bandwidth VBW 300.0000000 kHz</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Peak Leg 10 dB/ Offst 1 dB</p> <p>Center 5.23 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 80 MHz</p> <p>Occupied Bandwidth 35.9191 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 99.741 kHz x dB Bandwidth 39.049 MHz</p> | <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

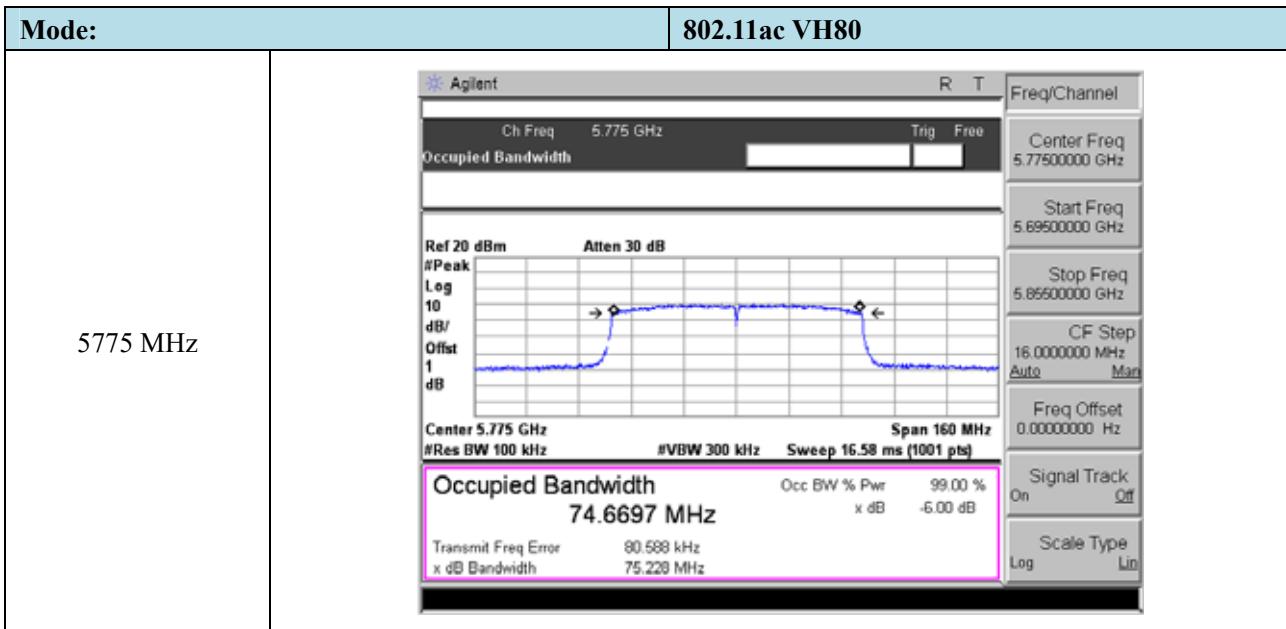


➤ Antenna B: 5725-5850MHz

| Mode: | 802.11a |
|---------|---|
| 5745MHz | <p>Agilent R T</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Occupied Bandwidth</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.745 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth 16.3086 MHz</p> <p>Transmit Freq Error 109.305 kHz x dB Bandwidth 16.425 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.7450000 GHz</p> <p>Start Freq 5.7250000 GHz</p> <p>Stop Freq 5.7660000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |
| 5785MHz | <p>Agilent R T</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Occupied Bandwidth</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.785 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth 16.3204 MHz</p> <p>Transmit Freq Error 111.081 kHz x dB Bandwidth 16.440 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.7850000 GHz</p> <p>Start Freq 5.7660000 GHz</p> <p>Stop Freq 5.8050000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |
| 5825MHz | <p>Agilent R T</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Occupied Bandwidth</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.825 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 40 MHz</p> <p>Occupied Bandwidth 16.3159 MHz</p> <p>Transmit Freq Error 109.198 kHz x dB Bandwidth 16.422 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.8250000 GHz</p> <p>Start Freq 5.8050000 GHz</p> <p>Stop Freq 5.8460000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |

| Mode: | 802.11n-HT20 |
|---------|---|
| 5745MHz | <p>Agilent R T</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.745 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 17.5408 MHz</p> <p>Transmit Freq Error 101.271 kHz</p> <p>x dB Bandwidth 17.699 MHz</p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.7450000 GHz</p> <p>Start Freq 5.7250000 GHz</p> <p>Stop Freq 5.7660000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |
| 5785MHz | <p>Agilent R T</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.785 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 17.5411 MHz</p> <p>Transmit Freq Error 107.768 kHz</p> <p>x dB Bandwidth 17.687 MHz</p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.7850000 GHz</p> <p>Start Freq 5.7660000 GHz</p> <p>Stop Freq 5.8050000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |
| 5825MHz | <p>Agilent R T</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.825 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Occupied Bandwidth 17.5360 MHz</p> <p>Transmit Freq Error 107.600 kHz</p> <p>x dB Bandwidth 17.669 MHz</p> <p>Occ BW % Pwr 99.00 %</p> <p>x dB -6.00 dB</p> <p>Freq/Channel</p> <p>Center Freq 5.8250000 GHz</p> <p>Start Freq 5.8050000 GHz</p> <p>Stop Freq 5.8450000 GHz</p> <p>CF Step 4.0000000 MHz Auto Man</p> <p>Freq Offset 0.0000000 Hz</p> <p>Signal Track On Off</p> <p>Scale Type Log Lin</p> |

| Mode: | | 802.11n-HT40 | |
|----------|--|---|---|
| 5755 MHz |  <p>Agilent Spectrum Analyzer Data for 5755 MHz:</p> <p>Ch Freq: 5.755 GHz Occupied Bandwidth: 35.9313 MHz Transmit Freq Error: 100.995 kHz x dB Bandwidth: 36.387 MHz</p> <p>Other parameters: Ref 20 dBm, Alten 30 dB, Log scale, 10 dB/Offset, 1 dB. Center 5.755 GHz, #VBW 300 kHz, Sweep 10 ms (1001 pts), Span 80 MHz.</p> | <input type="checkbox"/> R <input type="checkbox"/> T | Freq/Channel Center Freq 5.7550000 GHz Start Freq 5.7150000 GHz Stop Freq 5.7950000 GHz CF Step 8.0000000 MHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off Scale Type Log Lin |
| 5795 MHz |  <p>Agilent Spectrum Analyzer Data for 5795 MHz:</p> <p>Ch Freq: 5.795 GHz Occupied Bandwidth: 35.9271 MHz Transmit Freq Error: 112.812 kHz x dB Bandwidth: 36.376 MHz</p> <p>Other parameters: Ref 20 dBm, Alten 30 dB, Log scale, 10 dB/Offset, 1 dB. Center 5.795 GHz, #VBW 300 kHz, Sweep 10 ms (1001 pts), Span 80 MHz.</p> | <input type="checkbox"/> R <input type="checkbox"/> T | Freq/Channel Center Freq 5.7950000 GHz Start Freq 5.7550000 GHz Stop Freq 5.8350000 GHz CF Step 8.0000000 MHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off Scale Type Log Lin |



8. Maximum Conducted Output Power

8.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

8.2 Test Procedure

According to KDB789033 D02 v02r01 section E, the following is the measurement procedure.

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW \geq 3 MHz.

(iv) Number of points in sweep \geq 2 Span / RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

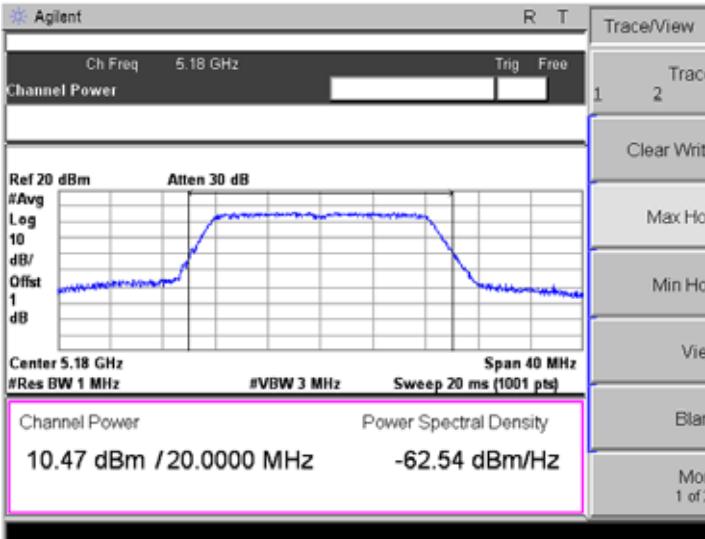
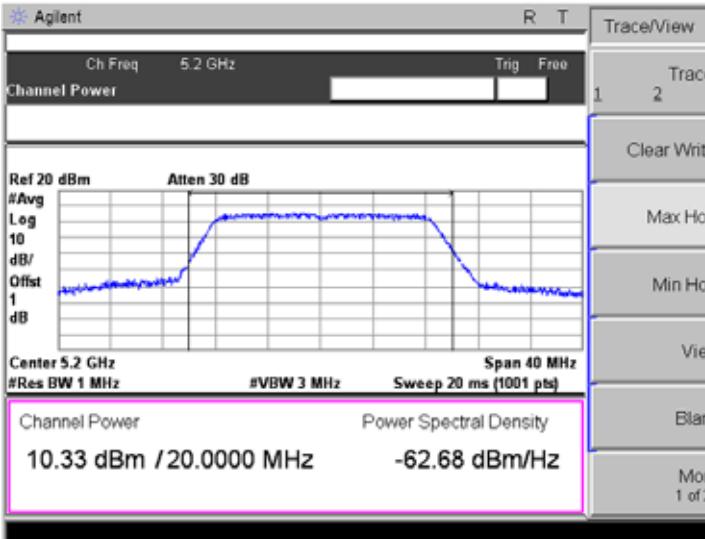
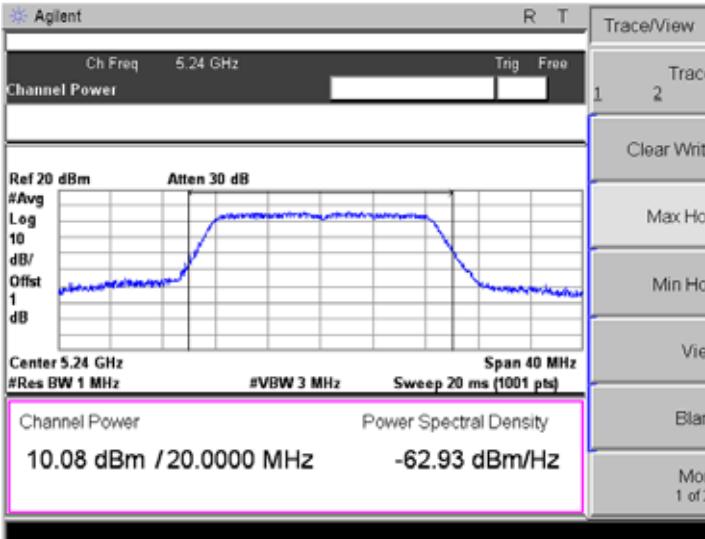
- (vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- (vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle \geq 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
- (viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

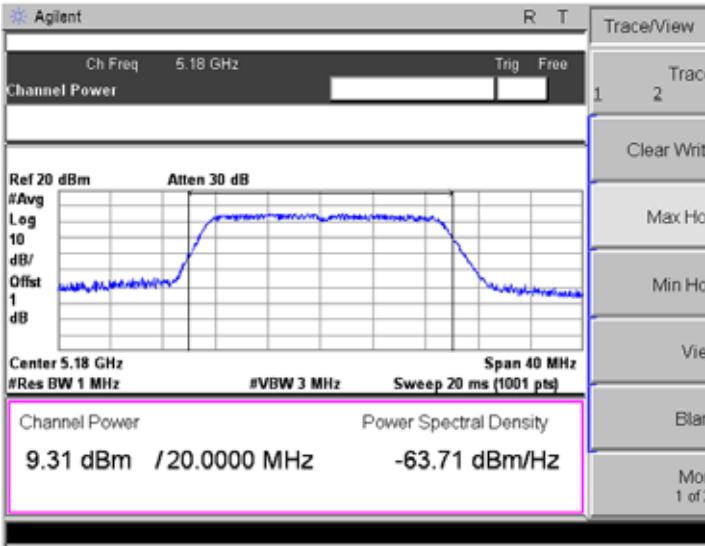
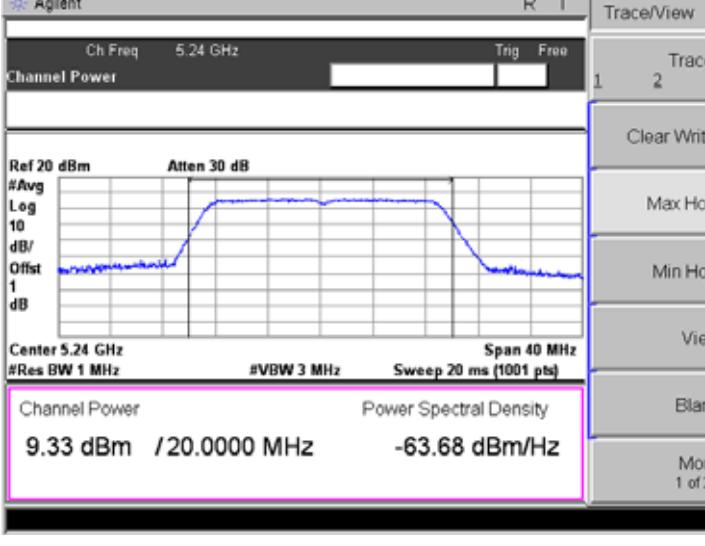
8.3 Summary of Test Results/Plots

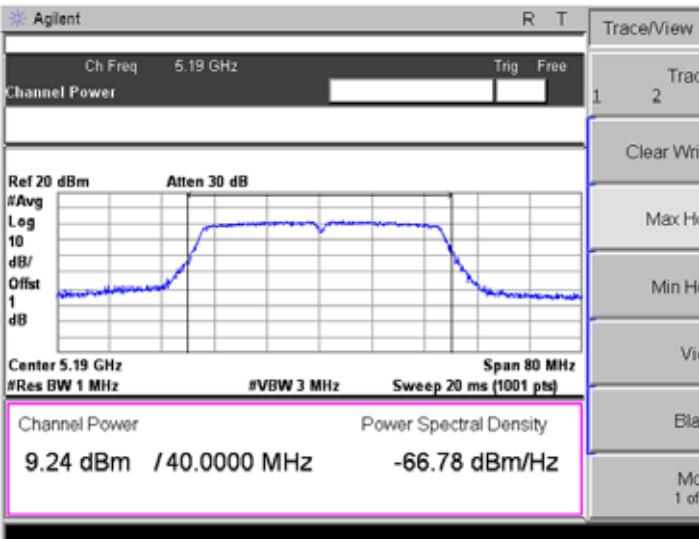
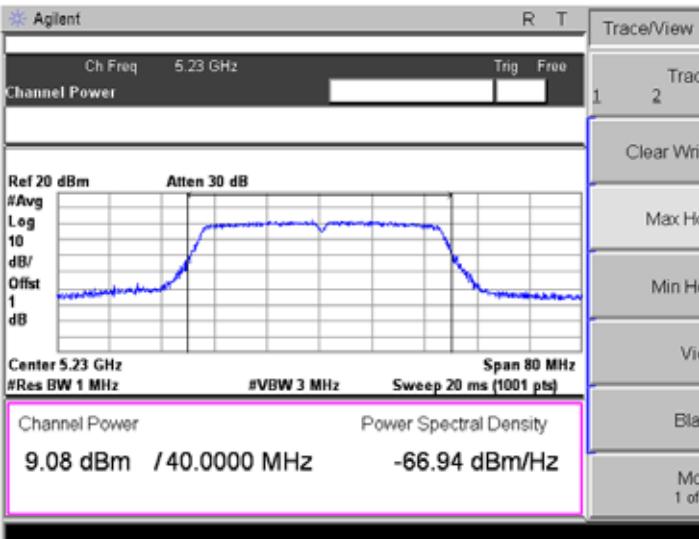
| U-NII-1:5150-5250MHz | | | | | | | | |
|----------------------|------------------|-----------------------|-----------------------|----------------------|----------------------|-----------------------|-----------------------|----------|
| Test mode | Frequency MHz | ANT A Power dBm | ANT B Power dBm | ANT A Power mW | ANT B Power mW | Total Power dBm | Output Power mW | Limit mW |
| 802.11a | 5180 | 10.47 | 10.95 | 11.14 | 12.45 | / | / | 250 |
| | 5200 | 10.33 | 10.58 | 10.79 | 11.43 | / | / | 250 |
| | 5240 | 10.08 | 10.70 | 10.19 | 11.75 | / | / | 250 |
| 802.11n-HT20 | 5180 | 9.31 | 10.55 | 8.53 | 11.35 | 12.98 | 19.88 | 250 |
| | 5200 | 10.70 | 10.70 | 11.75 | 11.75 | 13.71 | 23.50 | 250 |
| | 5240 | 9.33 | 10.20 | 8.57 | 10.47 | 12.80 | 19.04 | 250 |
| 802.11n-HT40 | 5190 | 9.24 | 10.67 | 8.39 | 11.67 | 13.02 | 20.06 | 250 |
| | 5230 | 9.08 | 10.69 | 8.09 | 11.72 | 12.97 | 19.81 | 250 |
| 802.11ac VH80 | 5210 | 8.58 | 10.60 | 7.21 | 11.48 | 12.72 | 18.69 | 250 |

| U-NII-3: 5725-5850MHz | | | | | | | | |
|-----------------------|------------------|-----------------------|-----------------------|----------------------|----------------------|-----------------------|-----------------------|----------|
| Test mode | Frequency MHz | ANT A Power dBm | ANT B Power dBm | ANT A Power mW | ANT B Power mW | Total Power dBm | Output Power mW | Limit mW |
| 802.11a | 5745 | 9.80 | 10.41 | 9.55 | 10.99 | / | / | 250 |
| | 5785 | 9.78 | 9.94 | 9.51 | 9.86 | / | / | 250 |
| | 5825 | 10.23 | 10.61 | 10.54 | 11.51 | / | / | 250 |
| 802.11n-HT20 | 5745 | 9.48 | 10.72 | 8.87 | 11.80 | 13.15 | 20.67 | 250 |
| | 5785 | 9.96 | 9.41 | 9.91 | 8.73 | 12.70 | 18.64 | 250 |
| | 5825 | 10.06 | 9.27 | 10.14 | 8.45 | 12.69 | 18.59 | 250 |
| 802.11n-HT40 | 5755 | 10.17 | 9.39 | 10.40 | 8.69 | 12.81 | 19.09 | 250 |
| | 5795 | 9.20 | 9.54 | 8.32 | 8.99 | 12.38 | 17.31 | 250 |
| 802.11ac VH80 | 5775 | 9.59 | 9.32 | 9.10 | 8.55 | 12.47 | 17.65 | 250 |

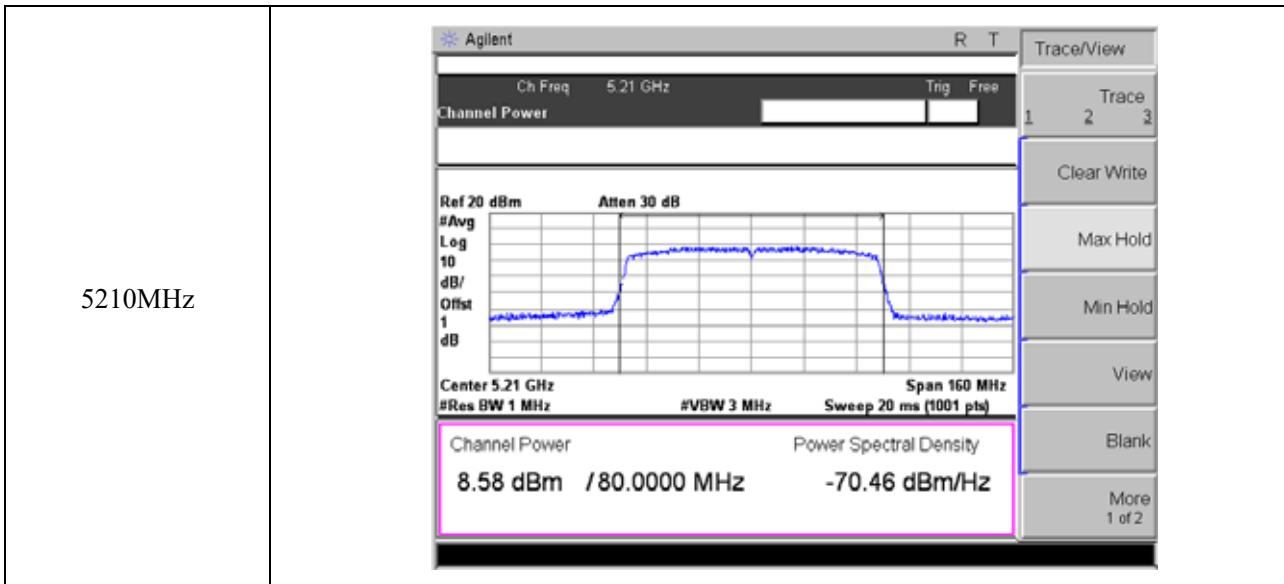
➤ Antenna A: 5150-5250MHz

| Mode: | 802.11a |
|---------|--|
| 5180MHz |  <p>Channel Power: 10.47 dBm / 20.0000 MHz Power Spectral Density: -62.54 dBm/Hz</p> |
| 5200MHz |  <p>Channel Power: 10.33 dBm / 20.0000 MHz Power Spectral Density: -62.68 dBm/Hz</p> |
| 5240MHz |  <p>Channel Power: 10.08 dBm / 20.0000 MHz Power Spectral Density: -62.93 dBm/Hz</p> |

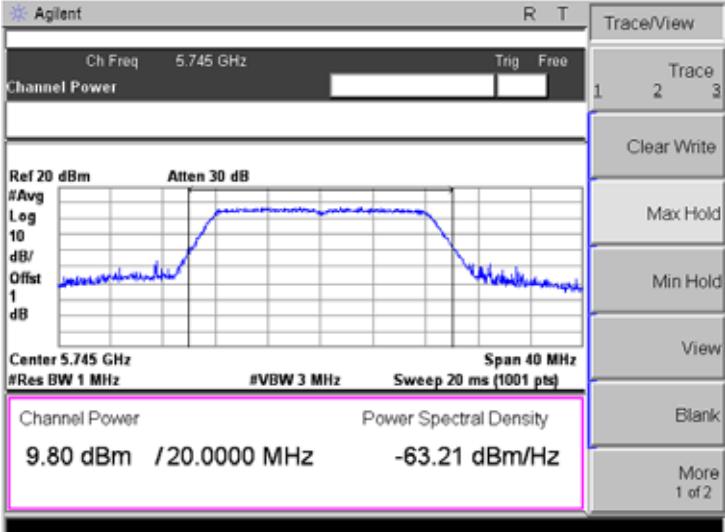
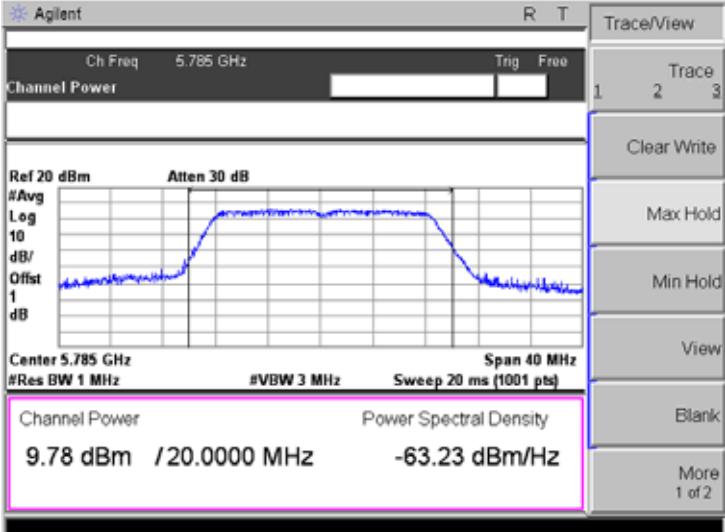
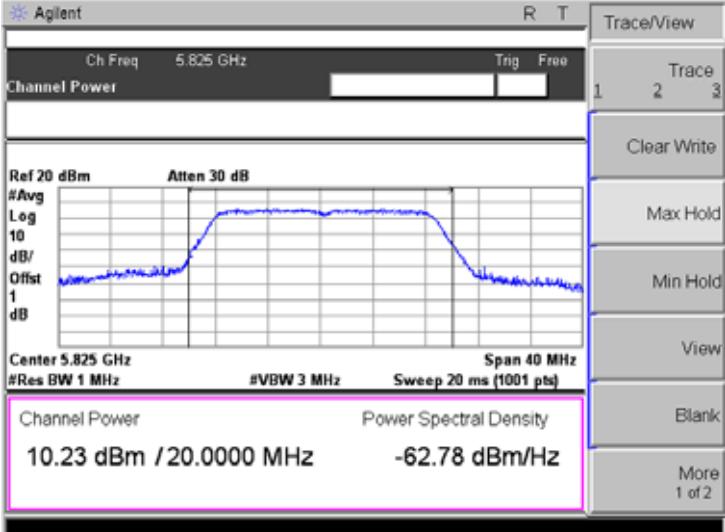
| Mode: | 802.11n-HT20 |
|---------|--|
| 5180MHz |  <p>Agilent R T</p> <p>Ch Freq 5.18 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.18 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density 9.31 dBm /20.0000 MHz -63.71 dBm/Hz</p> <p>Trace/View 1 Trace 2 Clear Write 3 Max Hold Min Hold View Blank More 1 of 2</p> |
| 5200MHz |  <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.2 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density 10.70 dBm /20.0000 MHz -62.31 dBm/Hz</p> <p>Trace/View 1 Trace 2 Clear Write 3 Max Hold Min Hold View Blank More 1 of 2</p> |
| 5240MHz |  <p>Agilent R T</p> <p>Ch Freq 5.24 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.24 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density 9.33 dBm /20.0000 MHz -63.68 dBm/Hz</p> <p>Trace/View 1 Trace 2 Clear Write 3 Max Hold Min Hold View Blank More 1 of 2</p> |

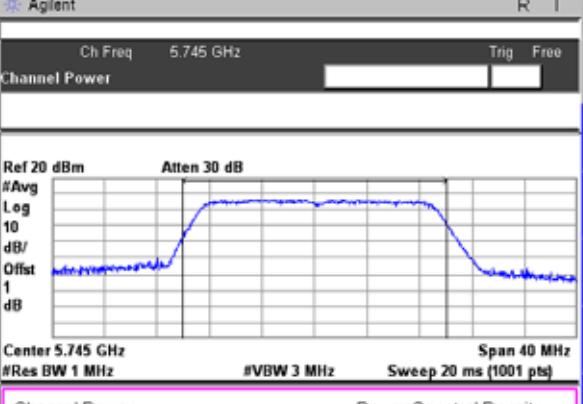
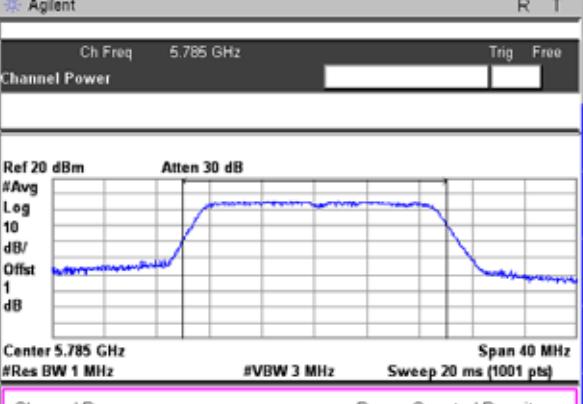
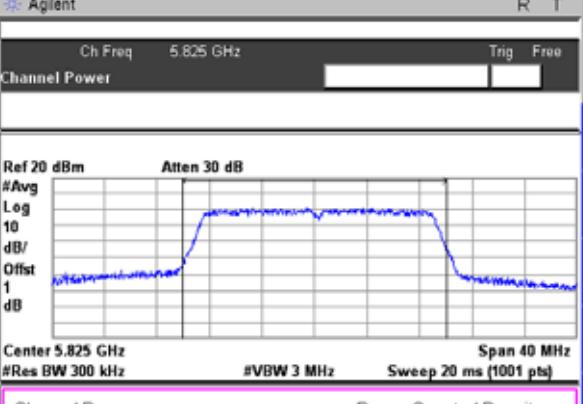
| | | |
|----------|---|--|
| Mode: | 802.11n-HT40 | |
| 5190 MHz |  <p>Ref 20 dBm Atten 30 dB #Avg 10 Log 10 dB/Offset 1 dB Ch Freq 5.19 GHz Center 5.19 GHz Span 80 MHz Channel Power #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Power Spectral Density 9.24 dBm / 40.0000 MHz -66.78 dBm/Hz</p> | <p>R T</p> <p>Trace/View</p> <p>1 Trace 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5230 MHz |  <p>Ref 20 dBm Atten 30 dB #Avg 10 Log 10 dB/Offset 1 dB Ch Freq 5.23 GHz Center 5.23 GHz Span 80 MHz Channel Power #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Power Spectral Density 9.08 dBm / 40.0000 MHz -66.94 dBm/Hz</p> | <p>R T</p> <p>Trace/View</p> <p>1 Trace 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

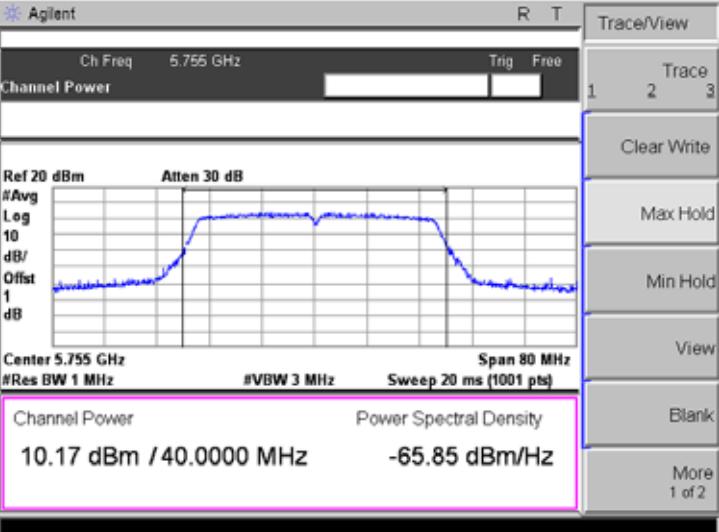
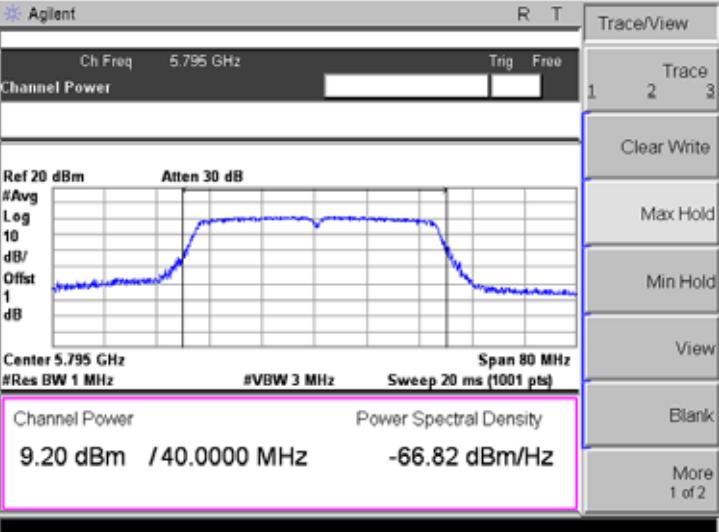
| | |
|-------|---------------|
| Mode: | 802.11ac VH80 |
|-------|---------------|

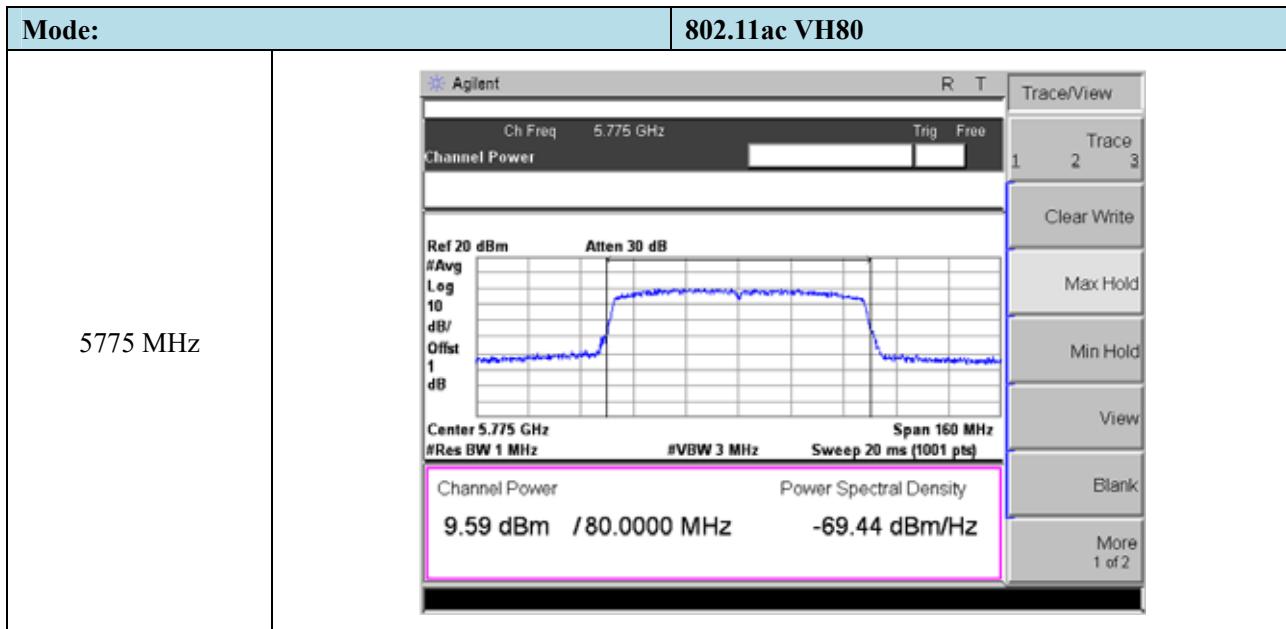


➤ Antenna A: 5725-5850MHz

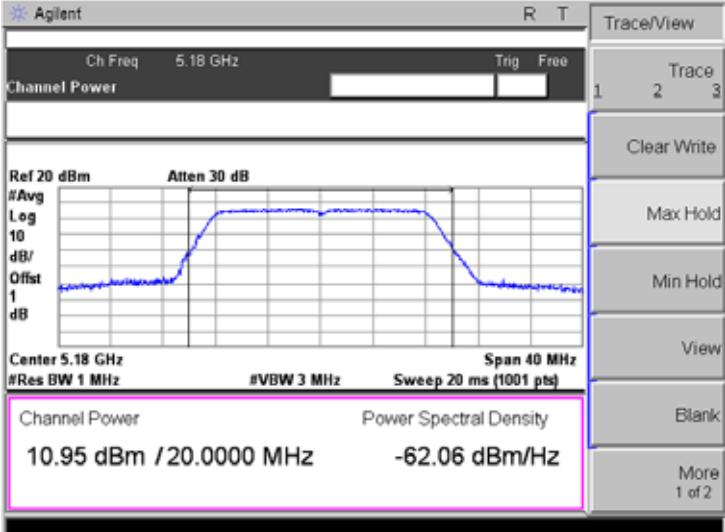
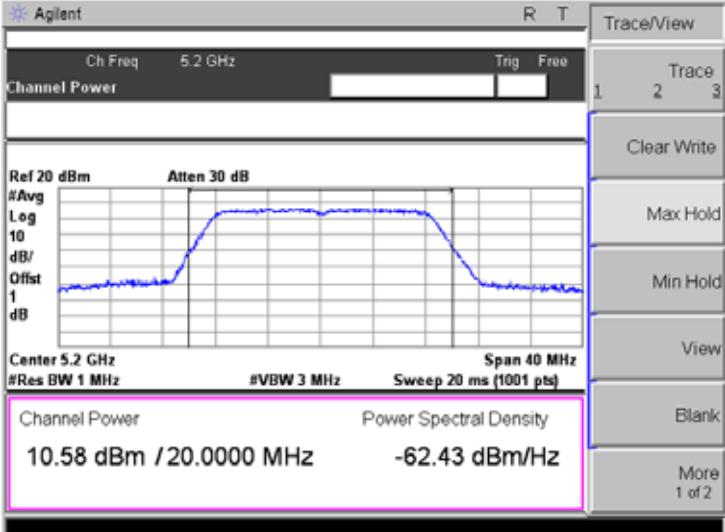
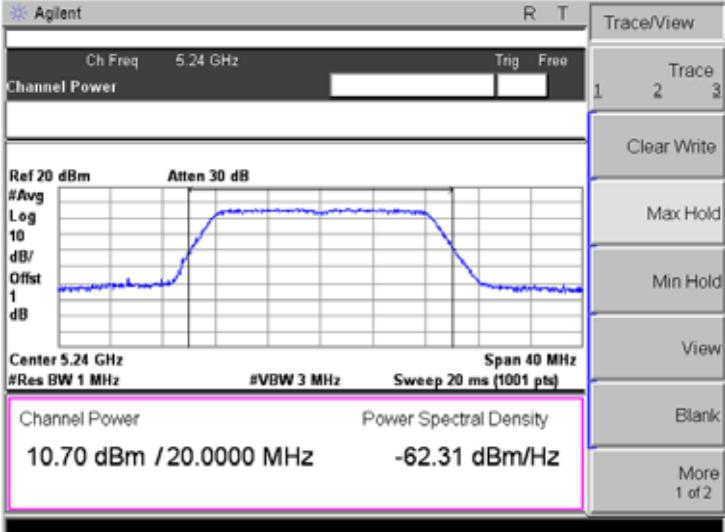
| Mode: | 802.11a |
|---------|---|
| 5745MHz |  <p>Agilent R T</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.745 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>9.80 dBm /20.0000 MHz -63.21 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5785MHz |  <p>Agilent R T</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.785 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>9.78 dBm /20.0000 MHz -63.23 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5825MHz |  <p>Agilent R T</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.825 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>10.23 dBm /20.0000 MHz -62.78 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

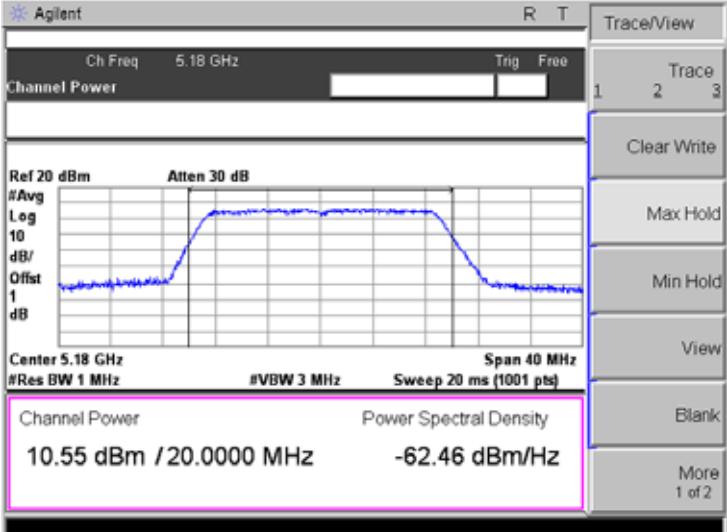
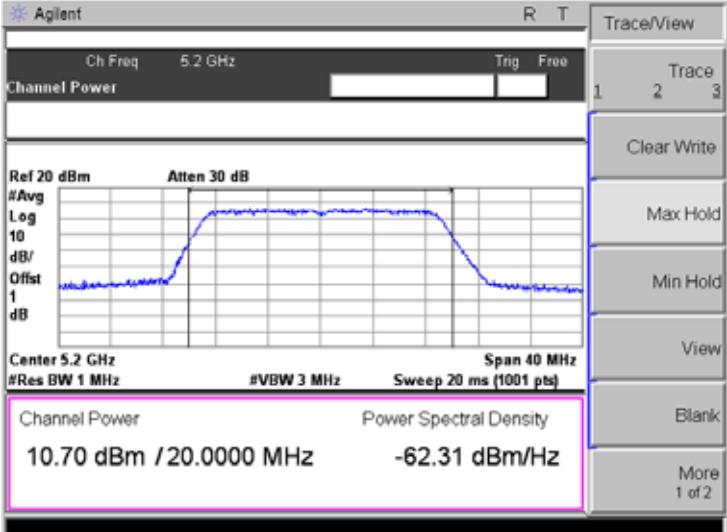
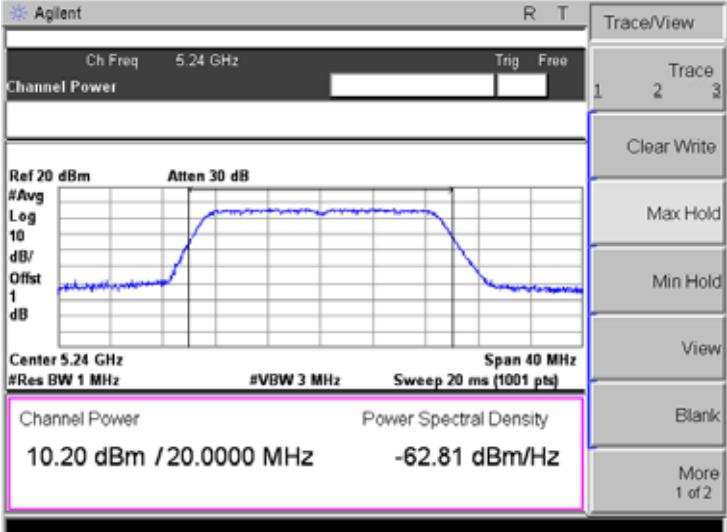
| Mode: | 802.11n-HT20 |
|---------|---|
| 5745MHz | <p>Agilent</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Channel Power</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.745 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density</p> <p>9.48 dBm / 20.0000 MHz -63.53 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5785MHz | <p>Agilent</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Channel Power</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.785 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density</p> <p>9.96 dBm / 20.0000 MHz -63.05 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5825MHz | <p>Agilent</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Channel Power</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.825 GHz #Res BW 300 kHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density</p> <p>10.06 dBm / 20.0000 MHz -62.96 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

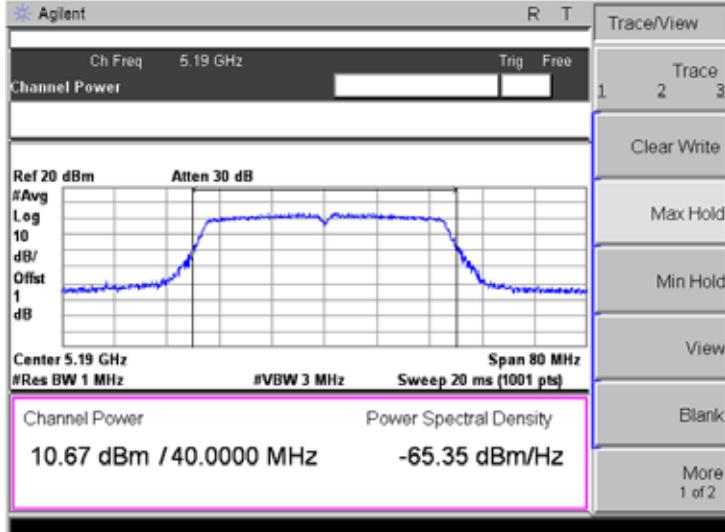
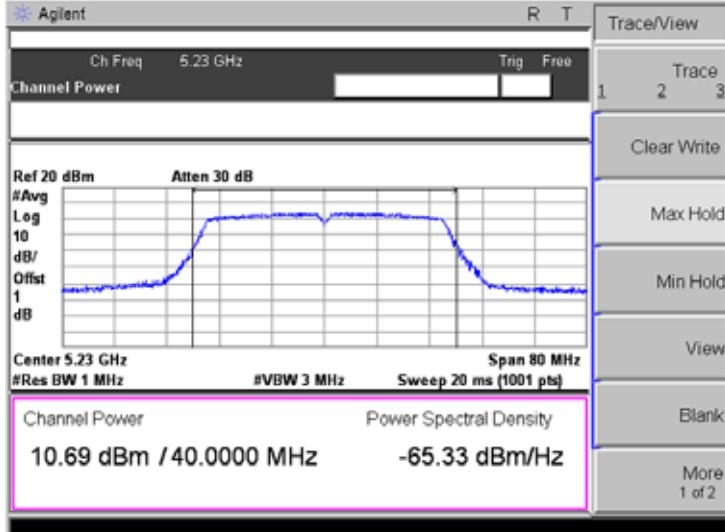
| Mode: | | 802.11n-HT40 |
|----------|--|--------------|
| 5755 MHz |  <p>Agilent R T</p> <p>Ch Freq 5.755 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.755 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 80 MHz</p> <p>Channel Power Power Spectral Density</p> <p>10.17 dBm / 40.0000 MHz -65.85 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> | |
| 5795 MHz |  <p>Agilent R T</p> <p>Ch Freq 5.795 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.795 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 80 MHz</p> <p>Channel Power Power Spectral Density</p> <p>9.20 dBm / 40.0000 MHz -66.82 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> | |

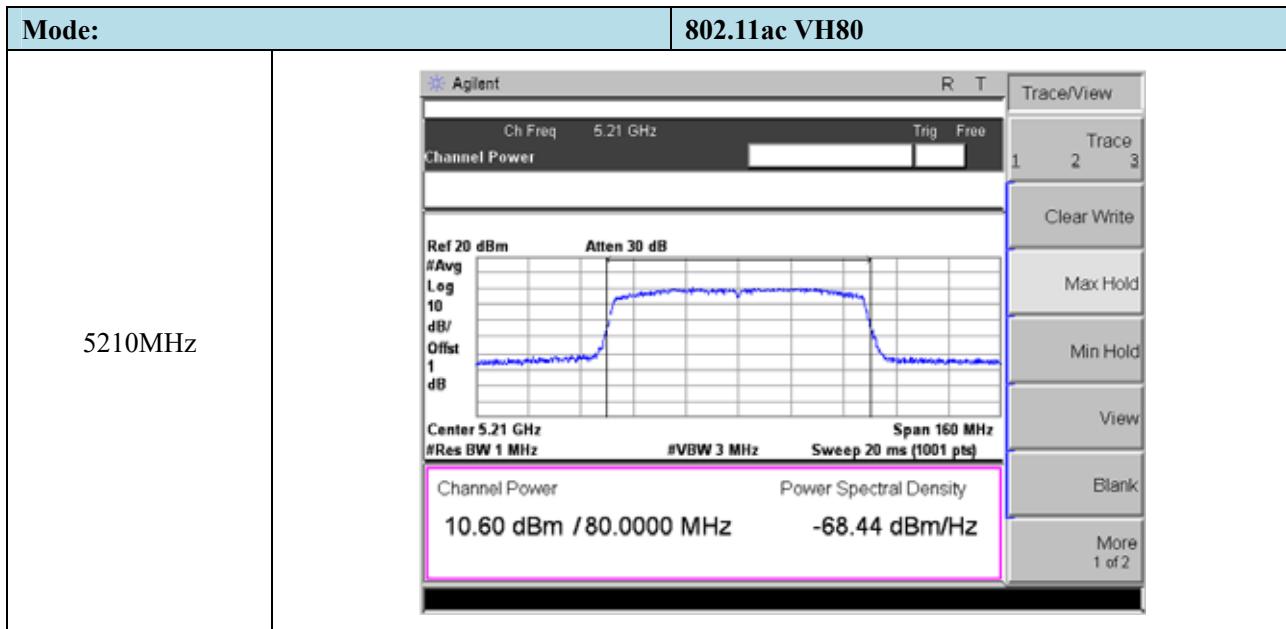


➤ Antenna B: 5150-5250MHz

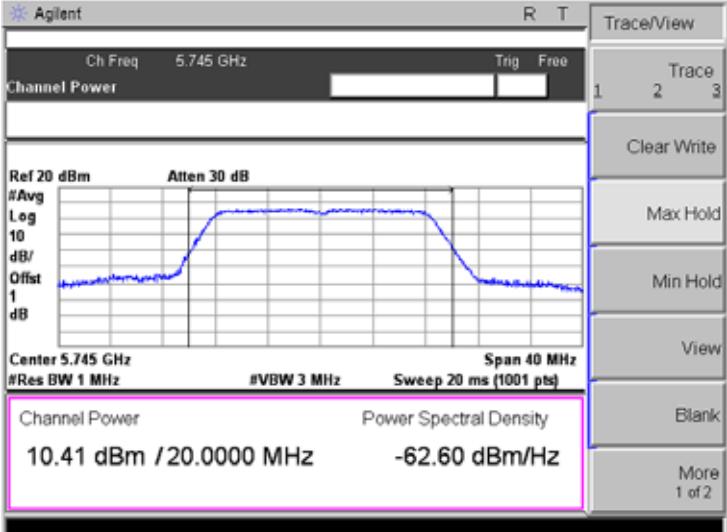
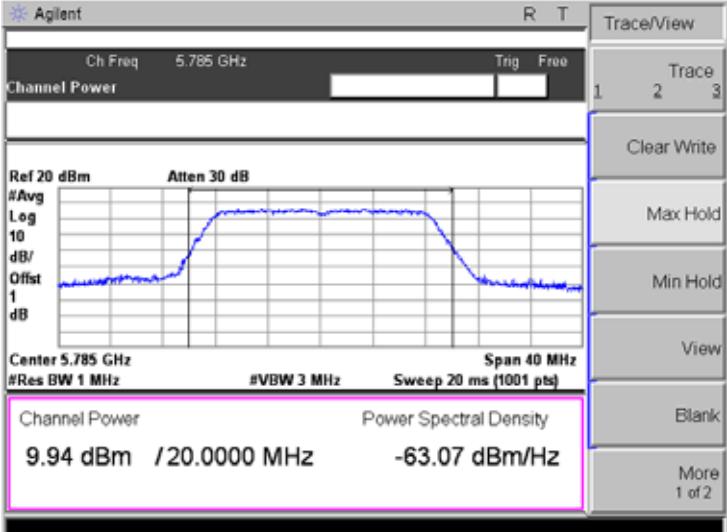
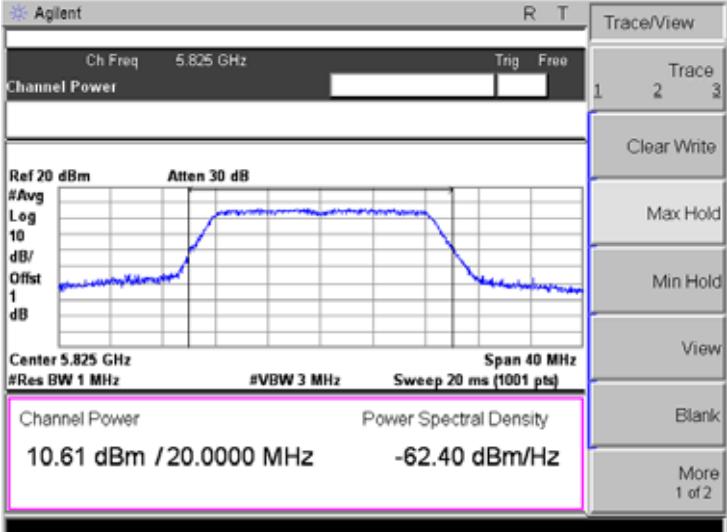
| Mode: | 802.11a |
|---------|--|
| 5180MHz |  <p>Agilent R T</p> <p>Ch Freq 5.18 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.18 GHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density</p> <p>10.95 dBm / 20.0000 MHz -62.06 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5200MHz |  <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.2 GHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density</p> <p>10.58 dBm / 20.0000 MHz -62.43 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5240MHz |  <p>Agilent R T</p> <p>Ch Freq 5.24 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.24 GHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Channel Power Power Spectral Density</p> <p>10.70 dBm / 20.0000 MHz -62.31 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

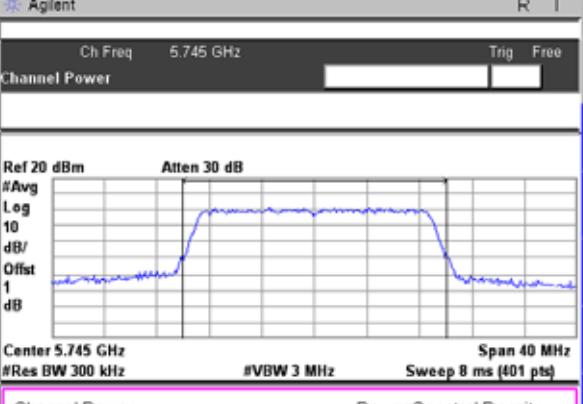
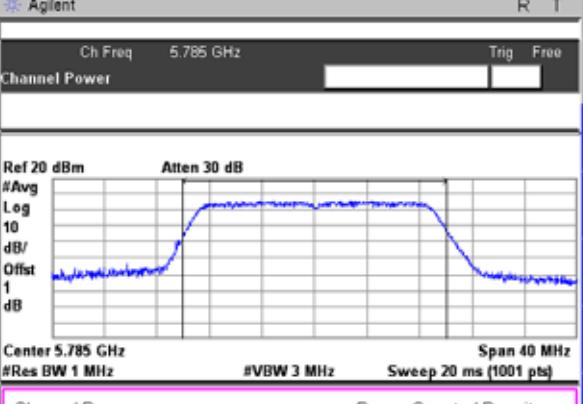
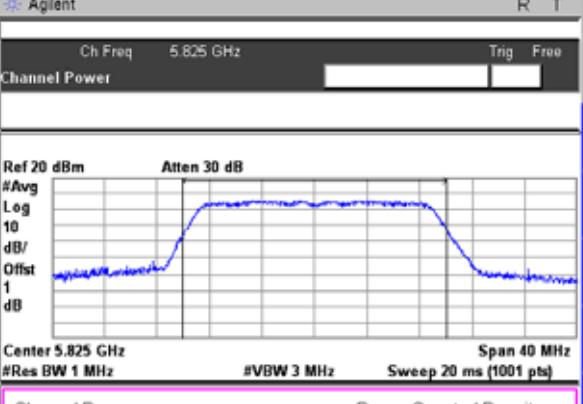
| Mode: | 802.11n-HT20 |
|---------|--|
| 5180MHz |  <p>Agilent R T</p> <p>Ch Freq 5.18 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.18 GHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Power Spectral Density 10.55 dBm / 20.0000 MHz -62.46 dBm/Hz</p> <p>Trace/View 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2</p> |
| 5200MHz |  <p>Agilent R T</p> <p>Ch Freq 5.2 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.2 GHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Power Spectral Density 10.70 dBm / 20.0000 MHz -62.31 dBm/Hz</p> <p>Trace/View 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2</p> |
| 5240MHz |  <p>Agilent R T</p> <p>Ch Freq 5.24 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.24 GHz #VBW 3 MHz Sweep 20 ms (1001 pts) Span 40 MHz</p> <p>Power Spectral Density 10.20 dBm / 20.0000 MHz -62.81 dBm/Hz</p> <p>Trace/View 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2</p> |

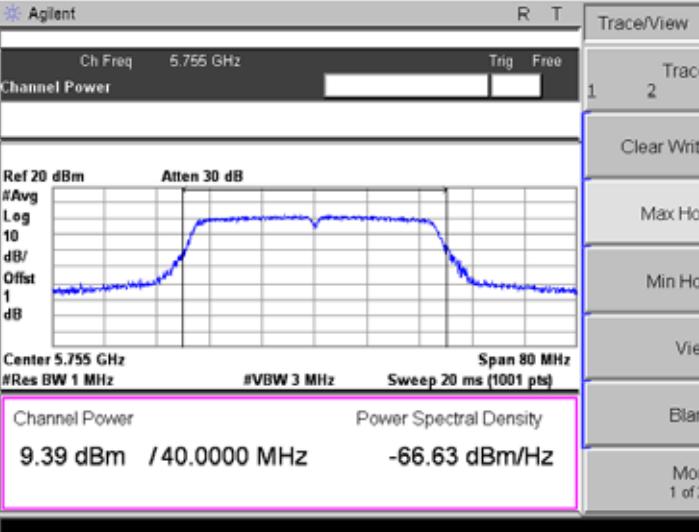
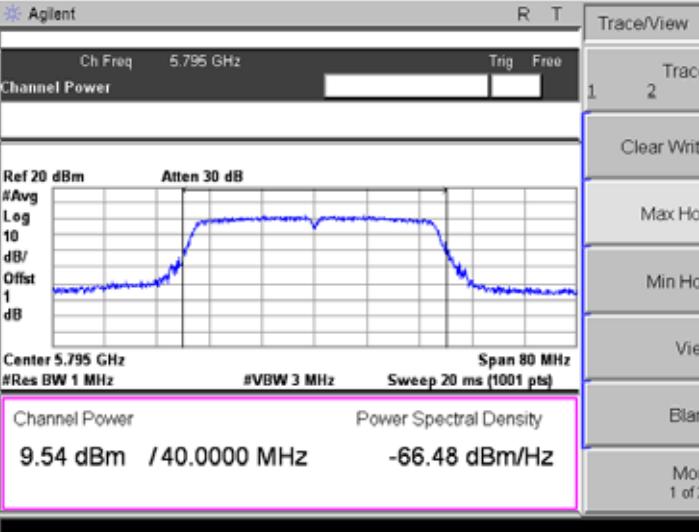
| | |
|----------|--|
| Mode: | 802.11n-HT40 |
| 5190 MHz |  <p>Agilent R T</p> <p>Ch Freq 5.19 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/Offset 1 dB</p> <p>Center 5.19 GHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Span 80 MHz</p> <p>Channel Power Power Spectral Density</p> <p>10.67 dBm / 40.0000 MHz -65.35 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5230 MHz |  <p>Agilent R T</p> <p>Ch Freq 5.23 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/Offset 1 dB</p> <p>Center 5.23 GHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Span 80 MHz</p> <p>Channel Power Power Spectral Density</p> <p>10.69 dBm / 40.0000 MHz -65.33 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

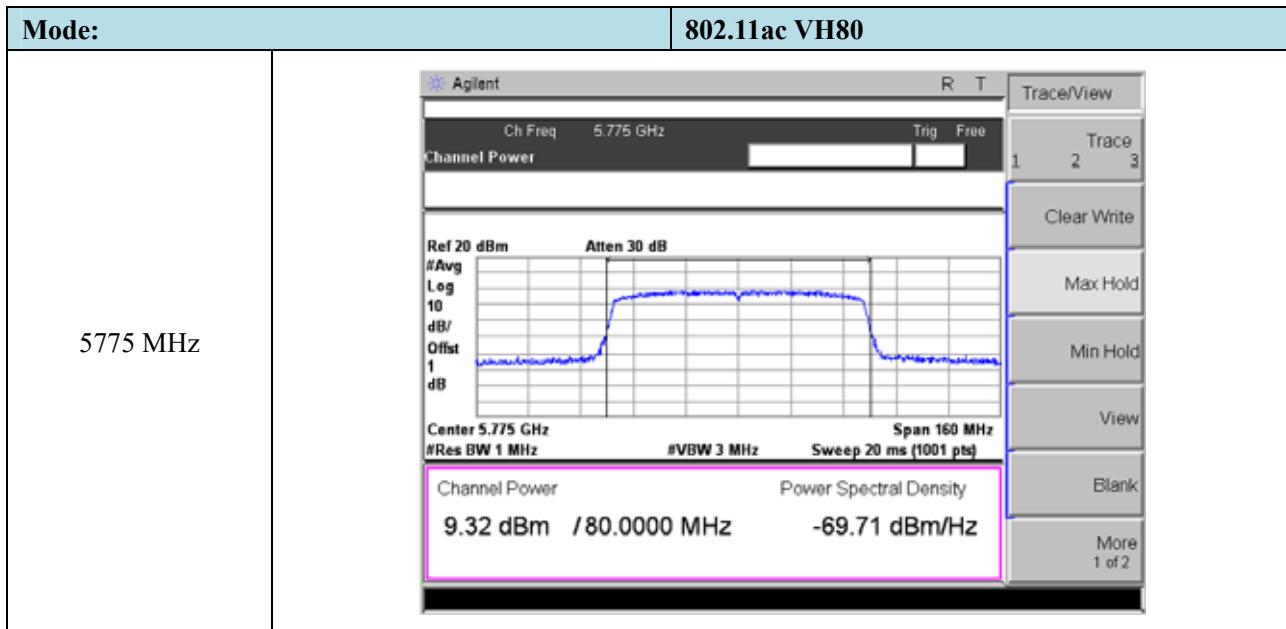


➤ Antenna B: 5725-5850MHz

| Mode: | 802.11a |
|---------|--|
| 5745MHz |  <p>Agilent R T</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.745 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>10.41 dBm / 20.0000 MHz -62.60 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5785MHz |  <p>Agilent R T</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.785 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>9.94 dBm / 20.0000 MHz -63.07 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5825MHz |  <p>Agilent R T</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/ Offst 1 dB</p> <p>Center 5.825 GHz #Res BW 1 MHz #VBW 3 MHz Span 40 MHz Sweep 20 ms (1001 pts)</p> <p>Channel Power Power Spectral Density</p> <p>10.61 dBm / 20.0000 MHz -62.40 dBm/Hz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

| Mode: | | 802.11n-HT20 |
|---------|--|---|
| 5745MHz | | <p>Agilent</p> <p>Ch Freq 5.745 GHz Trig Free</p> <p>Channel Power</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.745 GHz #Res BW 300 kHz #VBW 3 MHz Sweep 8 ms (401 pts)</p> <p>Span 40 MHz</p> <p>Power Spectral Density -62.29 dBm/Hz</p> <p>Channel Power 10.72 dBm / 20.0000 MHz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5785MHz | | <p>Agilent</p> <p>Ch Freq 5.785 GHz Trig Free</p> <p>Channel Power</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.785 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Power Spectral Density -63.60 dBm/Hz</p> <p>Channel Power 9.41 dBm / 20.0000 MHz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5825MHz | | <p>Agilent</p> <p>Ch Freq 5.825 GHz Trig Free</p> <p>Channel Power</p>  <p>Ref 20 dBm Alten 30 dB</p> <p>Log 10 dB/Offset 1 dB</p> <p>Center 5.825 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Span 40 MHz</p> <p>Power Spectral Density -63.74 dBm/Hz</p> <p>Channel Power 9.27 dBm / 20.0000 MHz</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |

| Mode: | | 802.11n-HT40 |
|----------|--|--|
| 5755 MHz |  <p>Agilent</p> <p>Ch Freq 5.755 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/Offst 1 dB</p> <p>Center 5.755 GHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Span 80 MHz</p> <p>Channel Power Power Spectral Density</p> <p>9.39 dBm / 40.0000 MHz -66.63 dBm/Hz</p> | <p>R T</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |
| 5795 MHz |  <p>Agilent</p> <p>Ch Freq 5.795 GHz Trig Free</p> <p>Channel Power</p> <p>Ref 20 dBm Alten 30 dB</p> <p>#Avg Log 10 dB/Offst 1 dB</p> <p>Center 5.795 GHz #VBW 3 MHz Sweep 20 ms (1001 pts)</p> <p>Span 80 MHz</p> <p>Channel Power Power Spectral Density</p> <p>9.54 dBm / 40.0000 MHz -66.48 dBm/Hz</p> | <p>R T</p> <p>Trace/View</p> <p>1 2 3</p> <p>Clear Write</p> <p>Max Hold</p> <p>Min Hold</p> <p>View</p> <p>Blank</p> <p>More 1 of 2</p> |



9. Radiated Spurious Emissions

9.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

According to §15.407(b)(6), Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.
789033 D02 v02r01 General UNII Test Procedures New Rules v01

If radiated measurements are performed, field strength is then converted to EIRP as follows:

$$\text{EIRP} = ((\text{E}^* \text{d})^2) / 30$$

where:

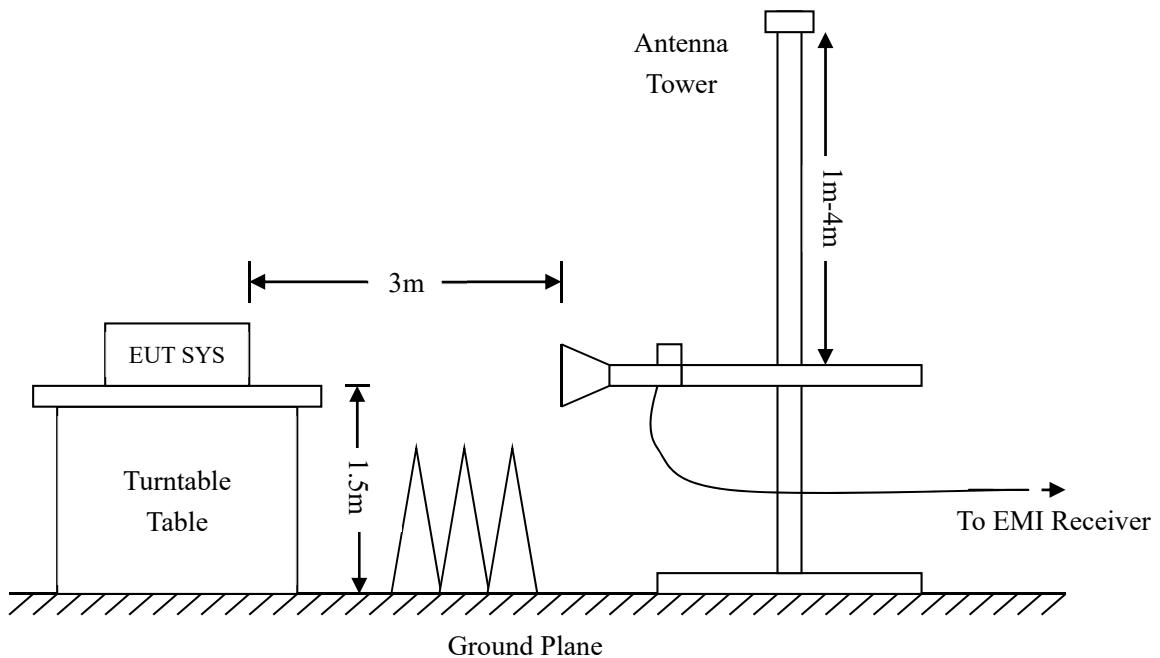
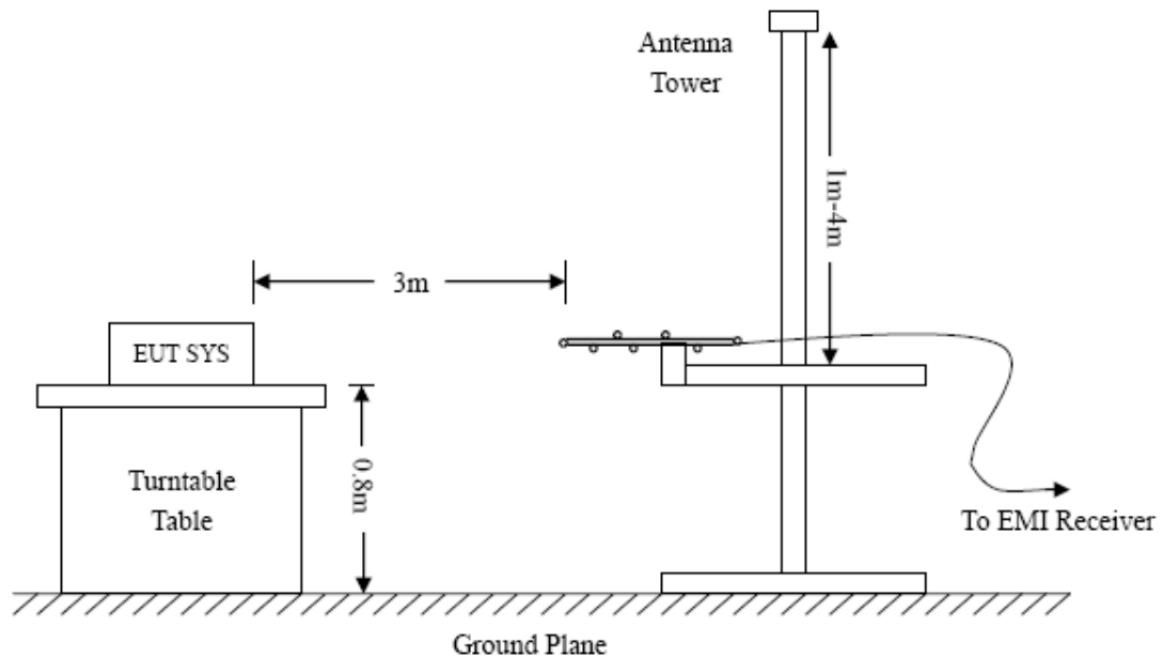
- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

9.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



9.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:

RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:

RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

9.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

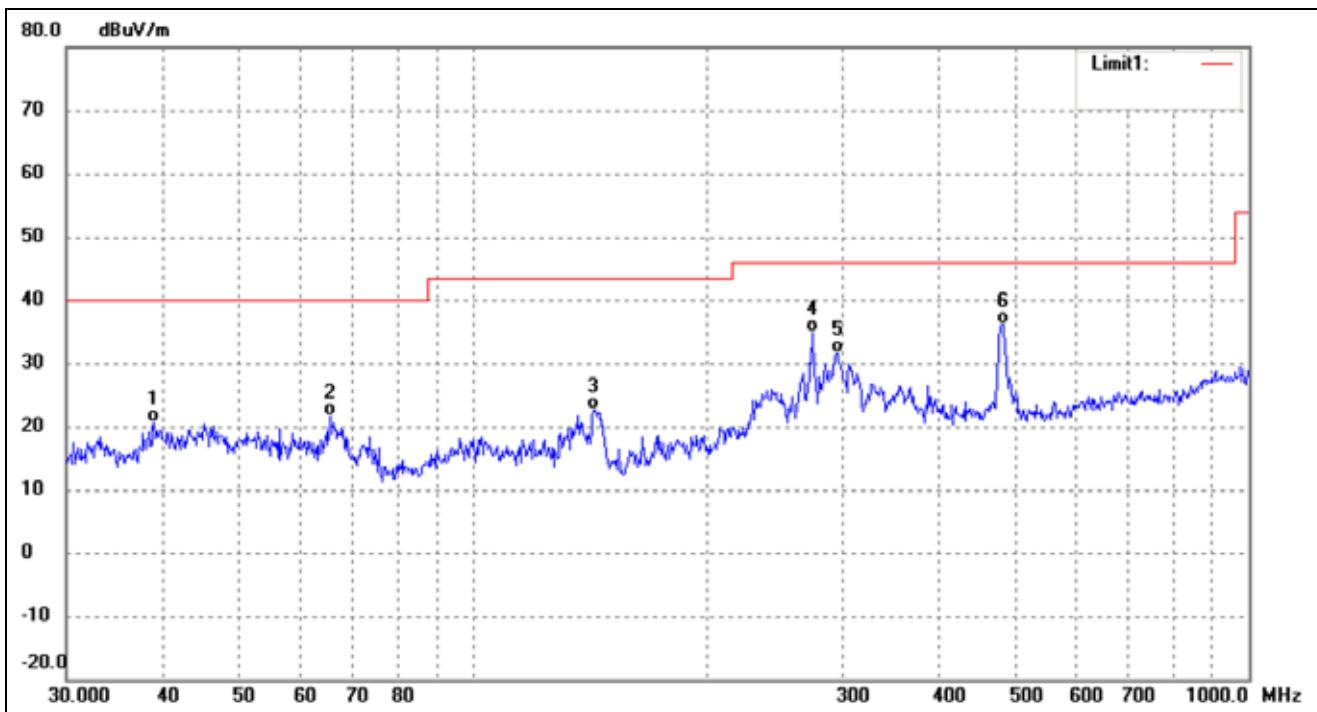
9.5 Summary of Test Results/Plots

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

- Spurious Emission From 30 MHz to 1 GHz
- Worst case Antenna B
- 5150-5250MHz

802.11a

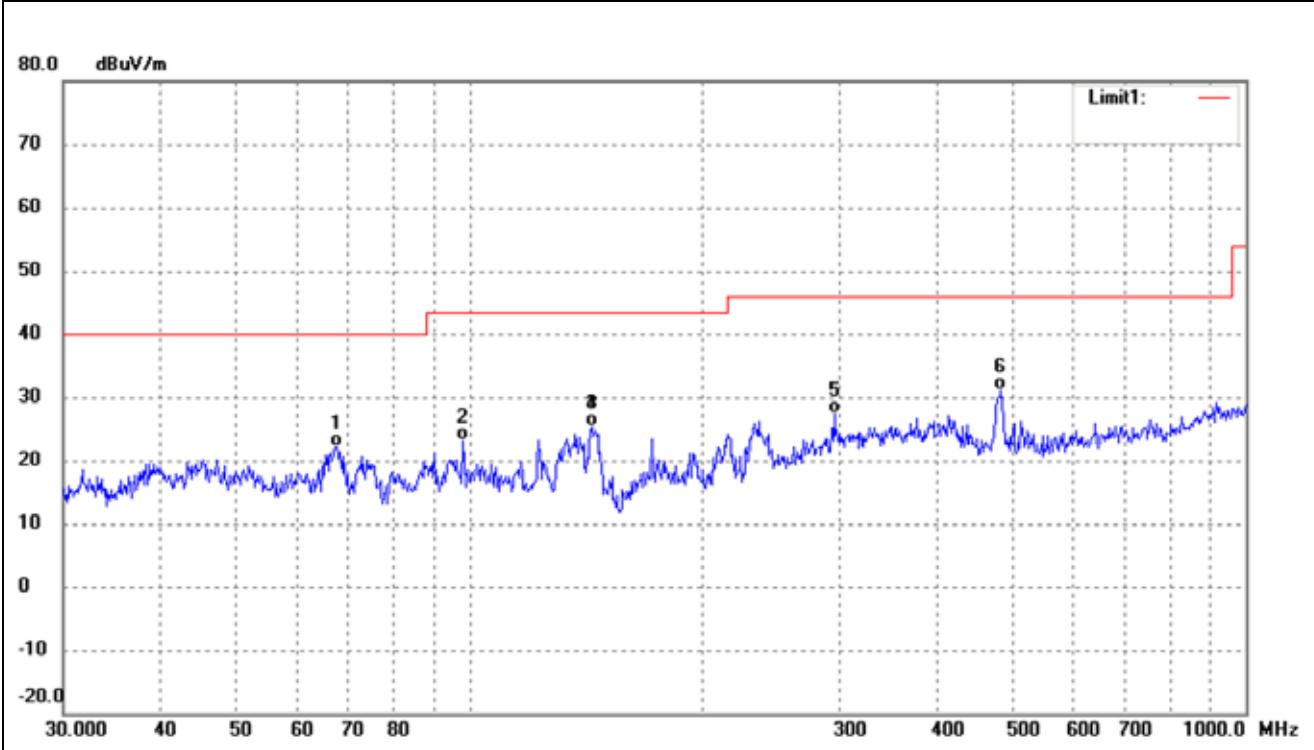
| | | | |
|--------------|---------------------|-----------|------------|
| Test Channel | 5180MHz(Worst case) | Polarity: | Horizontal |
|--------------|---------------------|-----------|------------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 38.8879 | 35.25 | -14.59 | 20.66 | 40.00 | -19.34 | QP |
| 2 | 65.5727 | 37.87 | -16.21 | 21.66 | 40.00 | -18.34 | QP |
| 3 | 143.3261 | 39.71 | -16.99 | 22.72 | 43.50 | -20.78 | QP |
| 4 | 274.1939 | 44.90 | -10.02 | 34.88 | 46.00 | -11.12 | QP |
| 5 | 295.1469 | 39.86 | -8.24 | 31.62 | 46.00 | -14.38 | QP |
| 6 | 482.2156 | 44.23 | -8.04 | 36.19 | 46.00 | -9.81 | QP |

802.11a

| | | | |
|--------------|---------------------|-----------|----------|
| Test Channel | 5180MHz(Worst case) | Polarity: | Vertical |
|--------------|---------------------|-----------|----------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 67.4382 | 38.72 | -16.49 | 22.23 | 40.00 | -17.77 | QP |
| 2 | 98.1419 | 38.45 | -15.29 | 23.16 | 43.50 | -20.34 | QP |
| 3 | 143.8295 | 42.33 | -16.94 | 25.39 | 43.50 | -18.11 | QP |
| 4 | 143.8295 | 42.33 | -16.94 | 25.39 | 43.50 | -18.11 | QP |
| 5 | 295.1469 | 35.73 | -8.24 | 27.49 | 46.00 | -18.51 | QP |
| 6 | 483.9094 | 39.04 | -8.02 | 31.02 | 46.00 | -14.98 | QP |

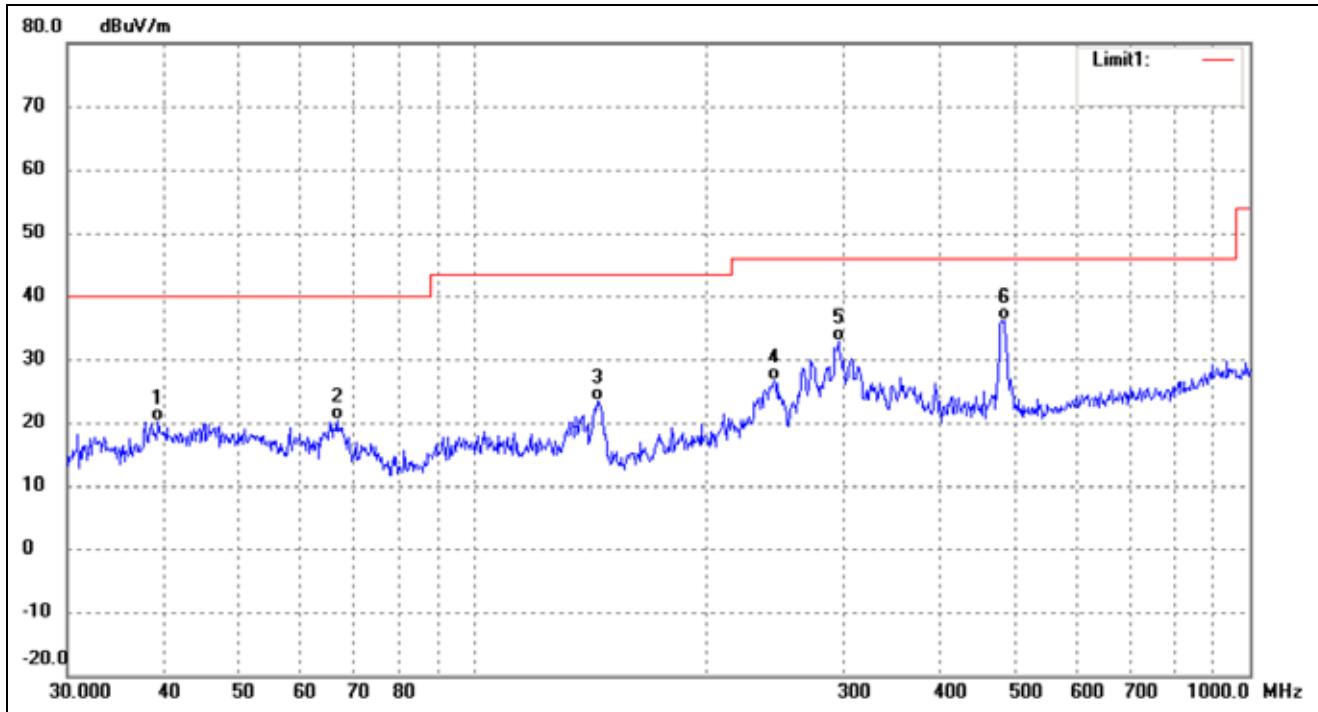
802.11n-HT40

Test Channel

5190MHz(worst case)

Polarity:

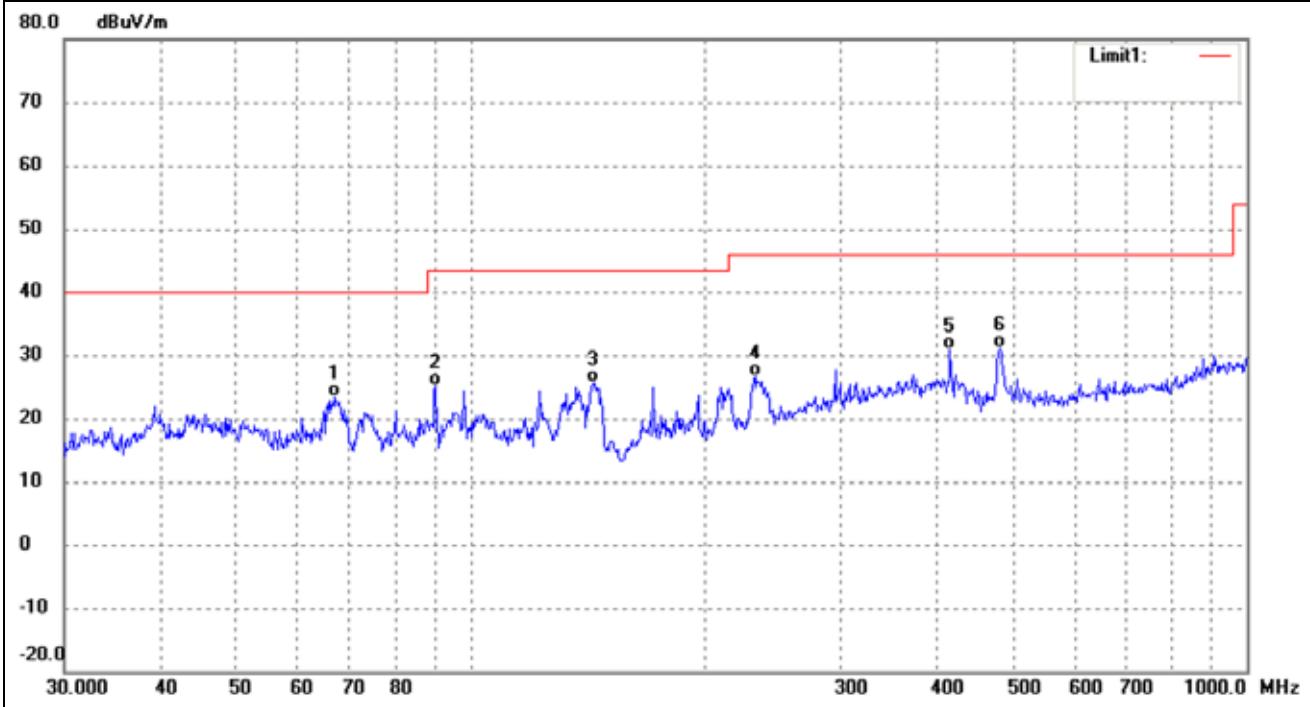
Horizontal



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 39.2991 | 34.67 | -14.42 | 20.25 | 40.00 | -19.75 | QP |
| 2 | 66.7325 | 36.72 | -16.39 | 20.33 | 40.00 | -19.67 | QP |
| 3 | 144.3348 | 40.28 | -16.89 | 23.39 | 43.50 | -20.11 | QP |
| 4 | 244.2321 | 37.45 | -10.87 | 26.58 | 46.00 | -19.42 | QP |
| 5 | 295.1469 | 41.03 | -8.24 | 32.79 | 46.00 | -13.21 | QP |
| 6 | 482.2156 | 44.26 | -8.04 | 36.22 | 46.00 | -9.78 | QP |

802.11n-HT40

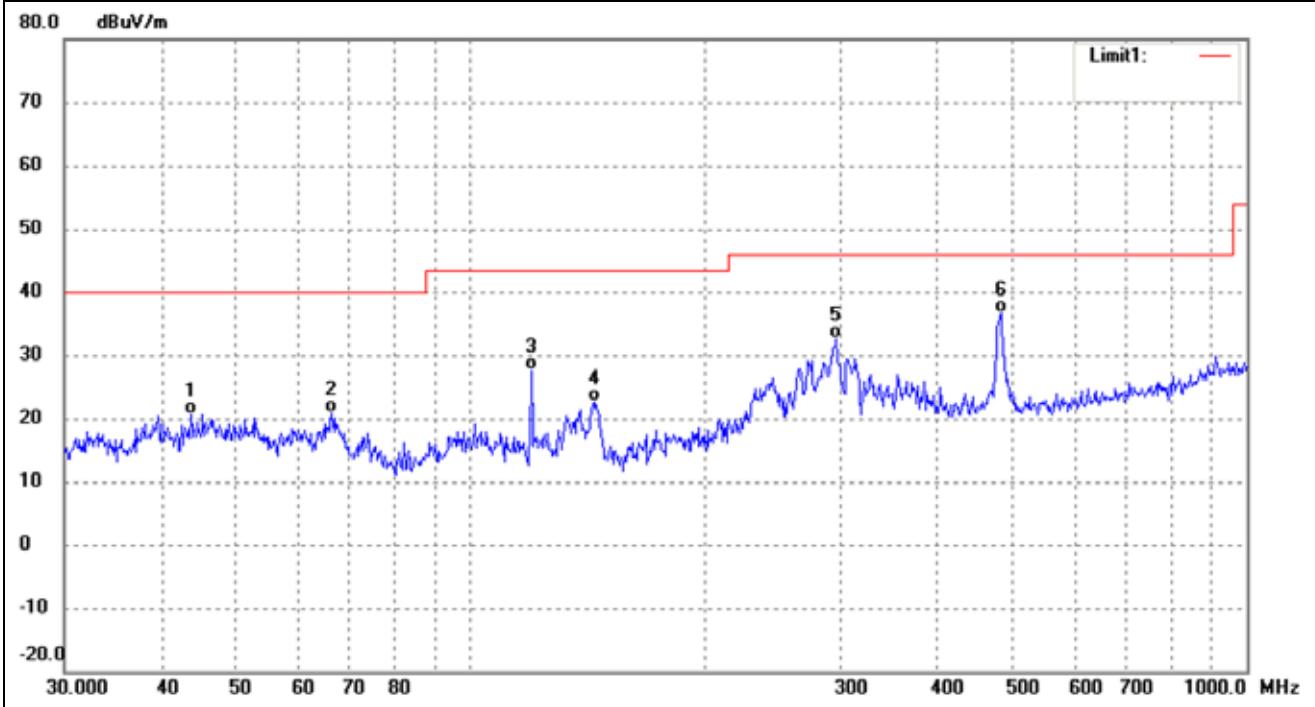
| | | | |
|--------------|---------------------|-----------|----------|
| Test Channel | 5190MHz(worst case) | Polarity: | Vertical |
|--------------|---------------------|-----------|----------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 66.7325 | 39.71 | -16.39 | 23.32 | 40.00 | -16.68 | QP |
| 2 | 90.2205 | 41.99 | -16.86 | 25.13 | 43.50 | -18.37 | QP |
| 3 | 143.8295 | 42.58 | -16.94 | 25.64 | 43.50 | -17.86 | QP |
| 4 | 233.3487 | 38.11 | -11.53 | 26.58 | 46.00 | -19.42 | QP |
| 5 | 414.7223 | 38.65 | -7.89 | 30.76 | 46.00 | -15.24 | QP |
| 6 | 480.5276 | 39.09 | -8.05 | 31.04 | 46.00 | -14.96 | QP |

802.11ac-HT80

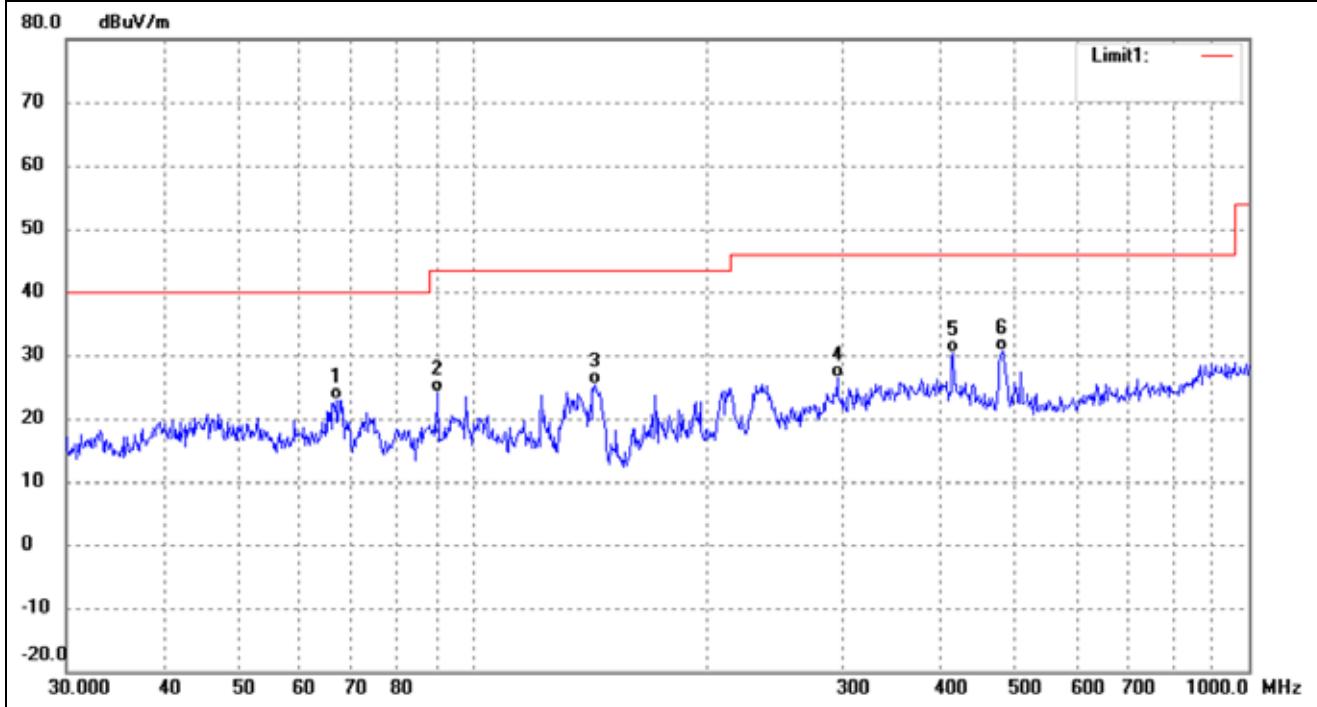
| | | | |
|--------------|---------------------|-----------|------------|
| Test Channel | 5210MHz(worst case) | Polarity: | Horizontal |
|--------------|---------------------|-----------|------------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 43.6585 | 34.59 | -13.99 | 20.60 | 40.00 | -19.40 | QP |
| 2 | 66.2662 | 37.28 | -16.32 | 20.96 | 40.00 | -19.04 | QP |
| 3 | 119.8556 | 43.14 | -15.61 | 27.53 | 43.50 | -15.97 | QP |
| 4 | 144.8418 | 39.49 | -16.84 | 22.65 | 43.50 | -20.85 | QP |
| 5 | 296.1836 | 40.77 | -8.15 | 32.62 | 46.00 | -13.38 | QP |
| 6 | 482.2156 | 44.63 | -8.04 | 36.59 | 46.00 | -9.41 | QP |

802.11ac-HT80

| | | | |
|--------------|---------------------|-----------|----------|
| Test Channel | 5210MHz(worst case) | Polarity: | Vertical |
|--------------|---------------------|-----------|----------|

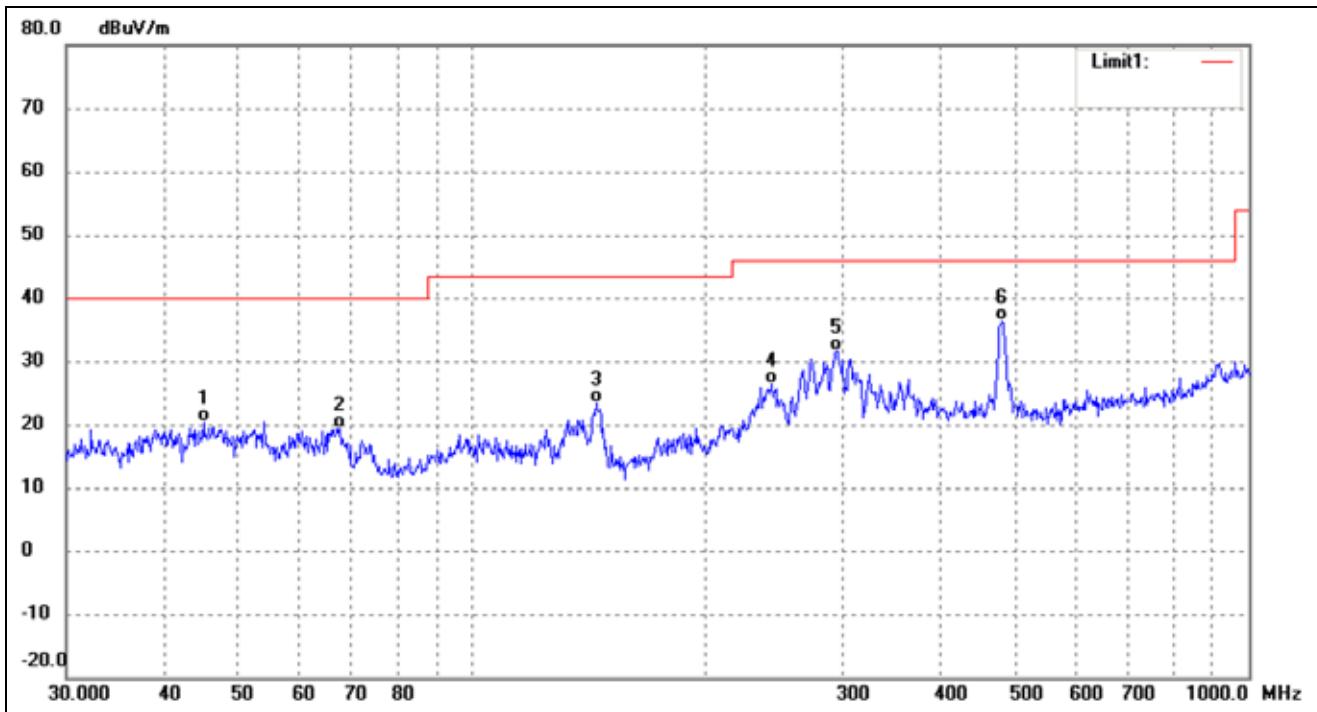


| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 66.7325 | 39.23 | -16.39 | 22.84 | 40.00 | -17.16 | QP |
| 2 | 90.2205 | 41.02 | -16.86 | 24.16 | 43.50 | -19.34 | QP |
| 3 | 143.8295 | 42.37 | -16.94 | 25.43 | 43.50 | -18.07 | QP |
| 4 | 295.1469 | 34.70 | -8.24 | 26.46 | 46.00 | -19.54 | QP |
| 5 | 416.1791 | 38.18 | -7.89 | 30.29 | 46.00 | -15.71 | QP |
| 6 | 480.5276 | 38.76 | -8.05 | 30.71 | 46.00 | -15.29 | QP |

➤ Antenna B: 5725-5850MHz

802.11a

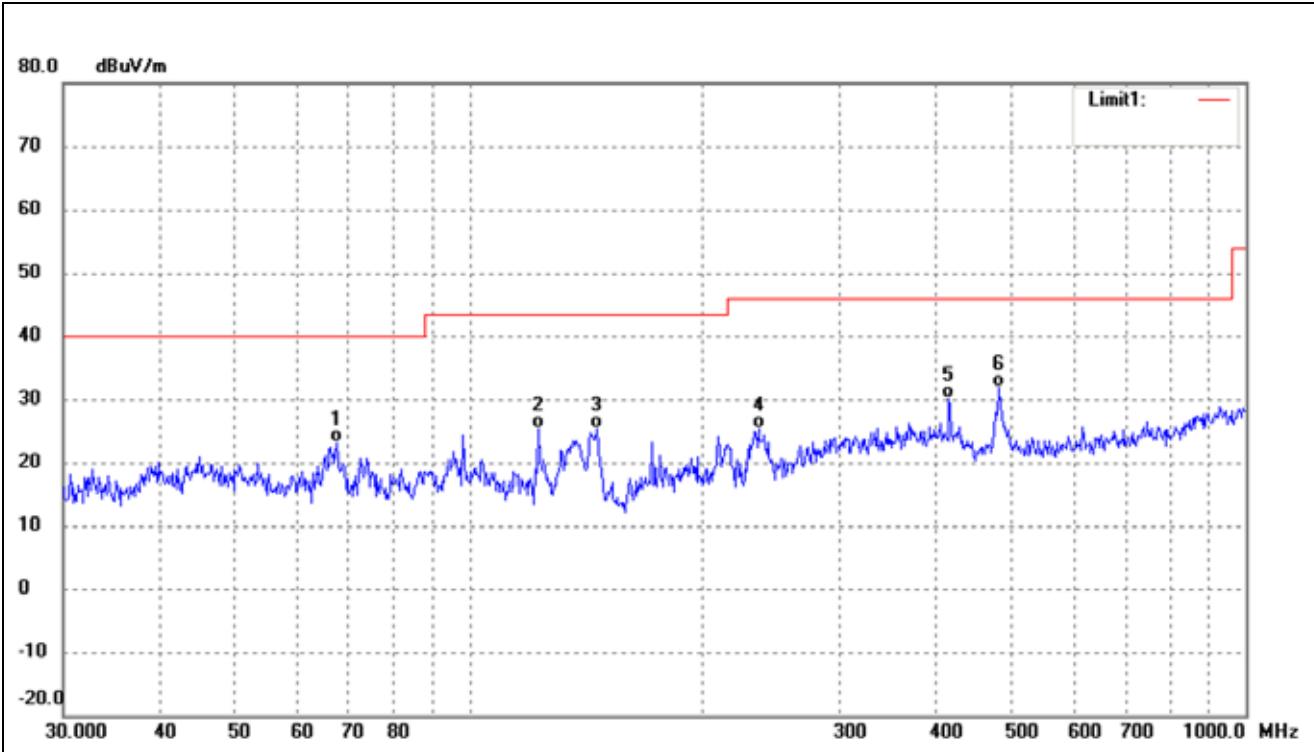
| | | | |
|--------------|---------------------|-----------|------------|
| Test Channel | 5745MHz(worst case) | Polarity: | Horizontal |
|--------------|---------------------|-----------|------------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 45.0583 | 34.23 | -13.93 | 20.30 | 40.00 | -19.70 | QP |
| 2 | 67.4382 | 35.93 | -16.49 | 19.44 | 40.00 | -20.56 | QP |
| 3 | 144.3348 | 40.23 | -16.89 | 23.34 | 43.50 | -20.16 | QP |
| 4 | 243.3772 | 37.25 | -10.92 | 26.33 | 46.00 | -19.67 | QP |
| 5 | 294.1137 | 40.02 | -8.34 | 31.68 | 46.00 | -14.32 | QP |
| 6 | 480.5276 | 44.42 | -8.05 | 36.37 | 46.00 | -9.63 | QP |

802.11a

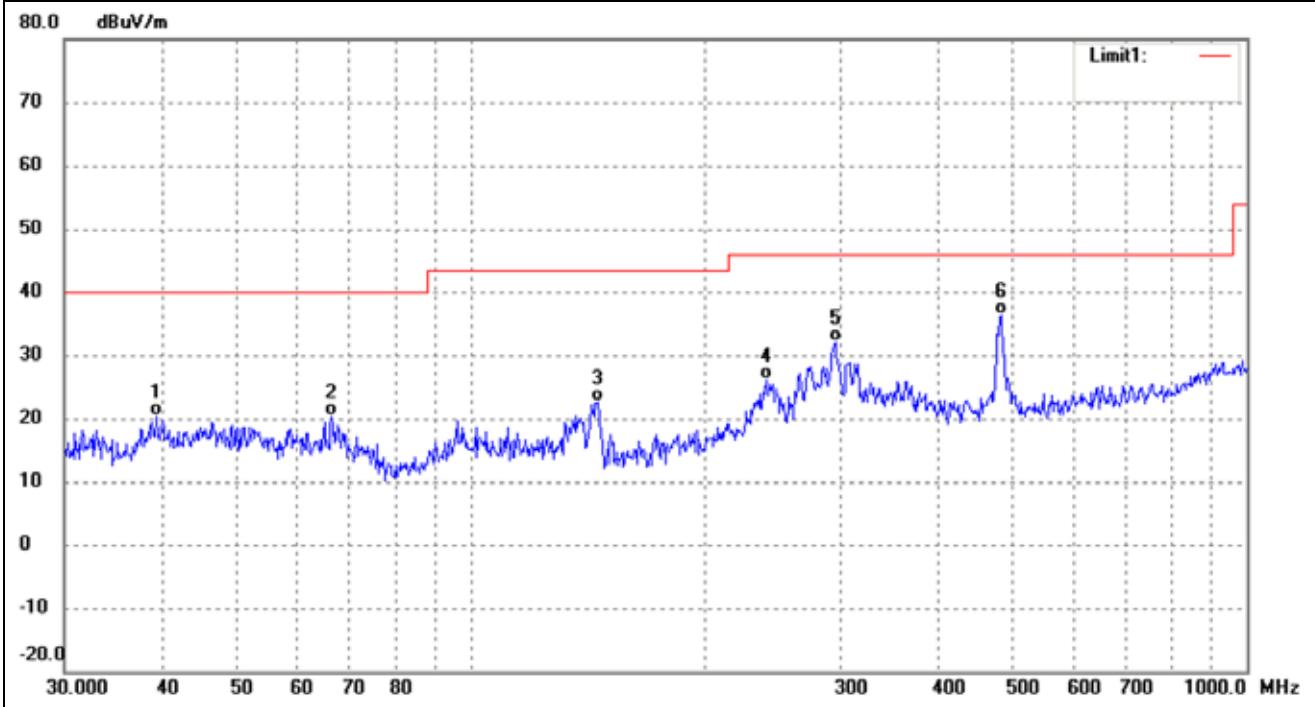
| | | | |
|--------------|---------------------|-----------|----------|
| Test Channel | 5745MHz(worst case) | Polarity: | Vertical |
|--------------|---------------------|-----------|----------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 67.4382 | 39.51 | -16.49 | 23.02 | 40.00 | -16.98 | QP |
| 2 | 122.8340 | 41.73 | -16.34 | 25.39 | 43.50 | -18.11 | QP |
| 3 | 145.8611 | 42.23 | -16.75 | 25.48 | 43.50 | -18.02 | QP |
| 4 | 235.8164 | 36.85 | -11.38 | 25.47 | 46.00 | -20.53 | QP |
| 5 | 414.7223 | 38.05 | -7.89 | 30.16 | 46.00 | -15.84 | QP |
| 6 | 480.5276 | 39.82 | -8.05 | 31.77 | 46.00 | -14.23 | QP |

802.11ac-HT80

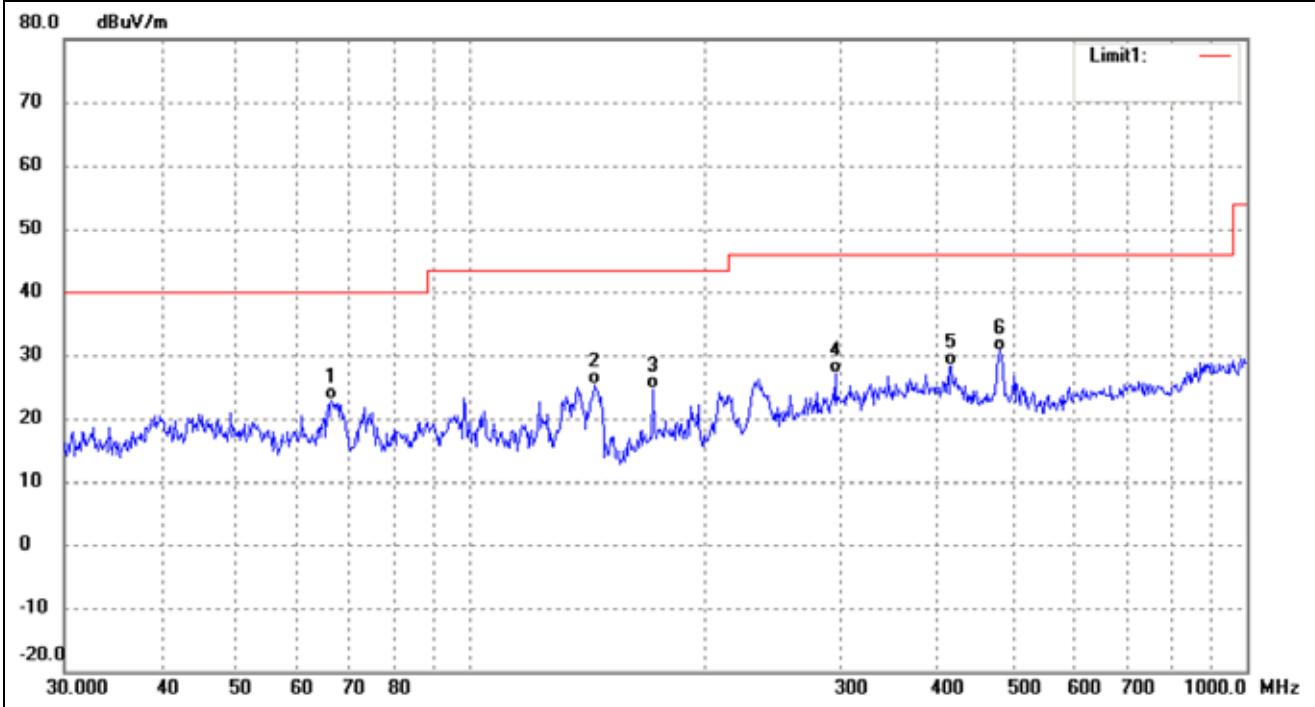
| | | | |
|--------------|---------------------|-----------|------------|
| Test Channel | 5775MHz(worst case) | Polarity: | Horizontal |
|--------------|---------------------|-----------|------------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 39.4372 | 34.70 | -14.37 | 20.33 | 40.00 | -19.67 | QP |
| 2 | 66.2662 | 36.71 | -16.32 | 20.39 | 40.00 | -19.61 | QP |
| 3 | 145.8611 | 39.48 | -16.75 | 22.73 | 43.50 | -20.77 | QP |
| 4 | 240.8304 | 37.18 | -11.07 | 26.11 | 46.00 | -19.89 | QP |
| 5 | 295.1469 | 40.33 | -8.24 | 32.09 | 46.00 | -13.91 | QP |
| 6 | 482.2156 | 44.31 | -8.04 | 36.27 | 46.00 | -9.73 | QP |

802.11ac-HT80

| | | | |
|--------------|---------------------|-----------|----------|
| Test Channel | 5775MHz(worst case) | Polarity: | Vertical |
|--------------|---------------------|-----------|----------|



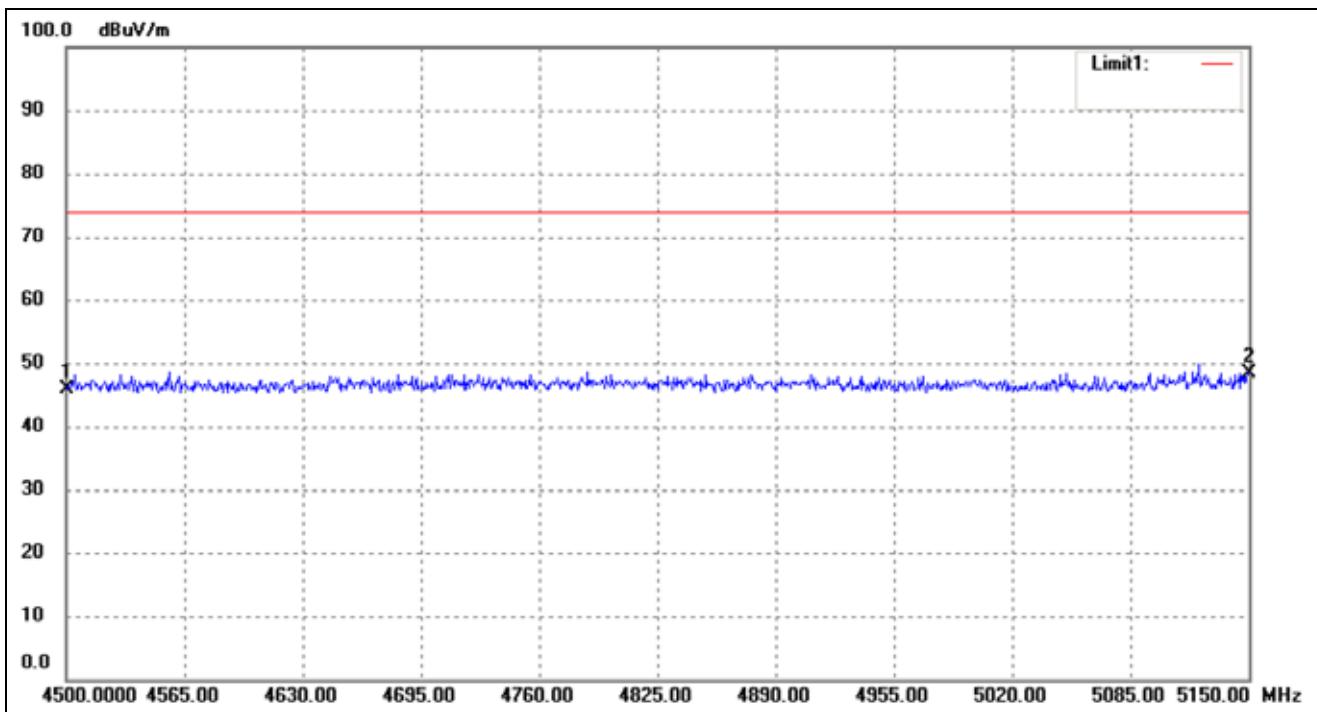
| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 66.2662 | 39.18 | -16.32 | 22.86 | 40.00 | -17.14 | QP |
| 2 | 144.3348 | 42.20 | -16.89 | 25.31 | 43.50 | -18.19 | QP |
| 3 | 171.9946 | 40.13 | -15.51 | 24.62 | 43.50 | -18.88 | QP |
| 4 | 295.1469 | 35.45 | -8.24 | 27.21 | 46.00 | -18.79 | QP |
| 5 | 416.1791 | 36.21 | -7.89 | 28.32 | 46.00 | -17.68 | QP |
| 6 | 480.5276 | 38.80 | -8.05 | 30.75 | 46.00 | -15.25 | QP |

➤ Spurious Emission above 1GHz

Worst case at 802.11a

➤ Antenna A

| 802.11a- Restricted Bandedge | | | |
|------------------------------|-------------------|-----------|----------------------|
| Test Channel | band 5.15-5.25GHz | Polarity: | Vertical(worst case) |



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 4500.000 | 50.69 | -4.71 | 45.98 | 74.00 | -28.02 | peak |
| 2 | 5150.000 | 52.65 | -4.32 | 48.33 | 74.00 | -25.67 | peak |

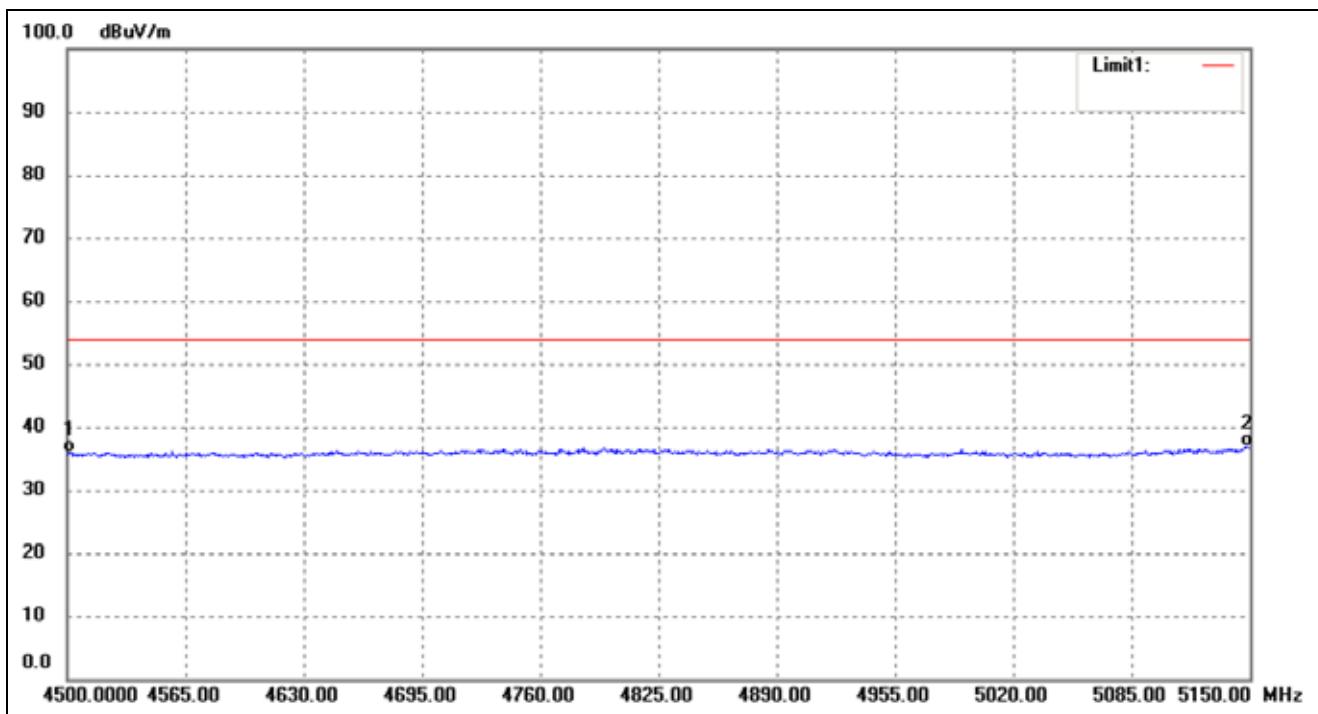
802.11a- Restricted Bandedge

Test Channel

band 5.35-5.46GHz

Polarity:

Vertical(worst case)



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 4500.000 | 40.50 | -4.71 | 35.79 | 54.00 | -18.21 | AVG |
| 2 | 5150.000 | 41.12 | -4.32 | 36.80 | 54.00 | -17.20 | AVG |

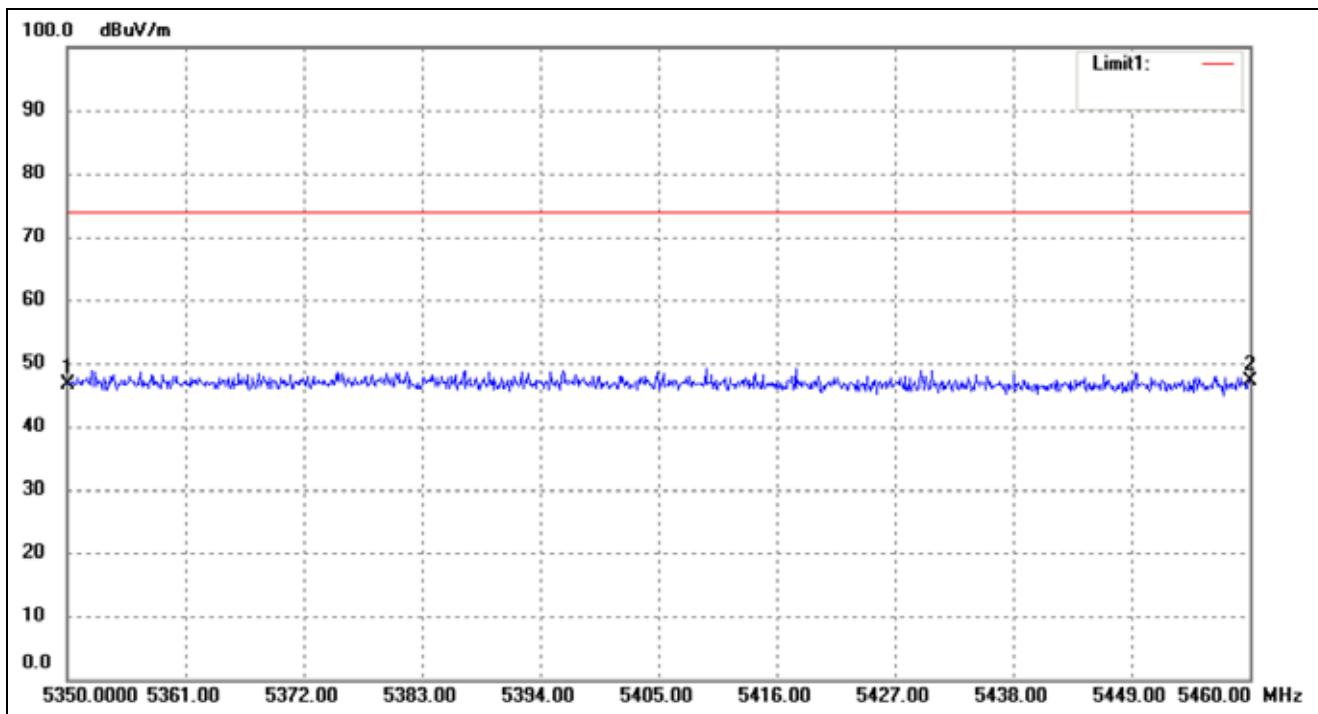
802.11a- Restricted Bandedge

Test Channel

band 5.35-5.46GHz

Polarity:

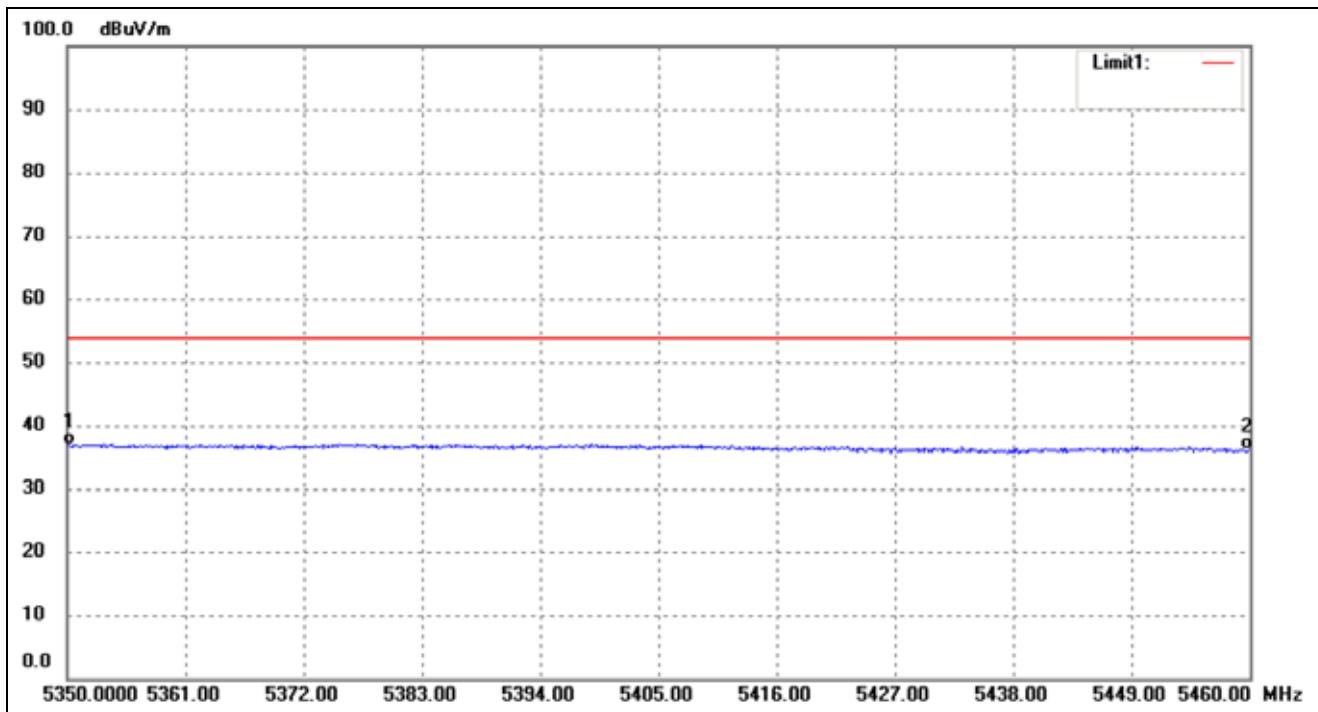
Vertical(worst case)



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 5350.000 | 50.84 | -4.21 | 46.63 | 74.00 | -27.37 | peak |
| 2 | 5460.000 | 51.37 | -4.16 | 47.21 | 74.00 | -26.79 | peak |

802.11a- Restricted Bandedge

| | | | |
|--------------|-------------------|-----------|----------------------|
| Test Channel | band 5.35-5.46GHz | Polarity: | Vertical(worst case) |
|--------------|-------------------|-----------|----------------------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|--------|
| 1 | 5350.000 | 41.14 | -4.21 | 36.93 | 54.00 | -17.07 | AVG |
| 2 | 5460.000 | 40.35 | -4.16 | 36.19 | 54.00 | -17.81 | AVG |

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11a)
- Worst case
- Antenna B
- Harmonics And Spurious Emissions

| Frequency (MHz) | Reading (dBuV/m) | Correct dB | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar | Detector |
|--------------------------|---------------------|---------------|--------------------|-------------------|----------------|-------|----------|
| Low Channel (5180MHz) | | | | | | | |
| 10360 | 57.24 | 7.11 | 64.35 | 74 | -9.65 | H | PK |
| 15540 | 39.29 | 8.22 | 47.51 | 54 | -6.49 | H | AV |
| 10360 | 58.94 | 7.11 | 66.05 | 74 | -7.95 | V | PK |
| 15540 | 37.75 | 8.22 | 45.97 | 54 | -8.03 | V | AV |
| Middle Channel (5200MHz) | | | | | | | |
| 10400 | 57.56 | 7.22 | 64.78 | 74 | -9.22 | H | PK |
| 15600 | 35.42 | 8.67 | 44.09 | 54 | -9.91 | H | AV |
| 10400 | 57.11 | 7.22 | 64.33 | 74 | -9.67 | V | PK |
| 15600 | 38.16 | 8.67 | 46.83 | 54 | -7.17 | V | AV |
| High Channel (5240MHz) | | | | | | | |
| 10480 | 55.74 | 7.69 | 63.43 | 74 | -10.57 | H | PK |
| 15720 | 38.98 | 8.93 | 47.91 | 54 | -6.09 | H | AV |
| 10480 | 60.31 | 7.69 | 68.00 | 74 | -6.00 | V | PK |
| 15720 | 39.46 | 8.93 | 48.39 | 54 | -5.61 | V | AV |

| Frequency (MHz) | Reading (dBuV/m) | Correct dB | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar | Detector |
|--------------------------|---------------------|---------------|--------------------|-------------------|----------------|-------|----------|
| Low Channel (5745MHz) | | | | | | | |
| 11490 | 57.27 | 9.45 | 66.72 | 74 | -7.28 | H | PK |
| 17235 | 34.91 | 10.36 | 45.27 | 54 | -8.73 | H | AV |
| 11490 | 55.37 | 9.45 | 64.82 | 74 | -9.18 | V | PK |
| 17235 | 36.25 | 10.36 | 46.61 | 54 | -7.39 | V | AV |
| Middle Channel (5785MHz) | | | | | | | |
| 11570 | 57.87 | 9.62 | 67.49 | 74 | -6.51 | H | PK |
| 17355 | 36.61 | 10.67 | 47.28 | 54 | -6.72 | H | AV |
| 11570 | 57.53 | 9.62 | 67.15 | 74 | -6.85 | V | PK |
| 17355 | 36.09 | 10.67 | 46.76 | 54 | -7.24 | V | AV |
| High Channel (5825MHz) | | | | | | | |
| 11650 | 55.96 | 9.84 | 65.80 | 74 | -8.20 | H | PK |
| 17475 | 33.17 | 10.95 | 44.12 | 54 | -9.88 | H | AV |
| 11650 | 55.24 | 9.84 | 65.08 | 74 | -8.92 | V | PK |
| 17475 | 36.62 | 10.95 | 47.57 | 54 | -6.43 | V | AV |

- Out of Band edge for 5150-5250MHz

| Test CH. | Test Segment | Result | Limit |
|----------|--------------|---------|---------|
| | MHz | dBm/MHz | dBm/MHz |
| Lowest | Below 5150 | -35.74 | -27 |
| Highest | Above 5350 | -42.68 | -27 |

Note: the data just list the worst cases

- Out of Band edge for 5725-5850MHz

| Test CH. | Test Segment | Result | Limit |
|----------|--------------|---------|---------|
| | MHz | dBm/MHz | dBm/MHz |
| Lowest | Below 5715 | -37.39 | -27 |
| | 5715 to 5725 | -40.45 | -17 |
| Highest | 5850 to 5860 | -40.56 | -17 |
| | Above 5860 | -43.49 | -27 |

Note: the data just list the worst cases

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11HT20)

- Antenna A & Antenna B
- Harmonics And Spurious Emissions

| Frequency (MHz) | Reading (dBuV/m) | Correct dB | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar | Detector |
|--------------------------|---------------------|---------------|--------------------|-------------------|----------------|-------|----------|
| Low Channel (5180MHz) | | | | | | | |
| 10360 | 56.42 | 7.11 | 63.53 | 74 | -10.47 | H | PK |
| 15540 | 39.72 | 8.22 | 47.94 | 54 | -6.06 | H | AV |
| 10360 | 60.47 | 7.11 | 67.58 | 74 | -6.42 | V | PK |
| 15540 | 38.43 | 8.22 | 46.65 | 54 | -7.35 | V | AV |
| Middle Channel (5200MHz) | | | | | | | |
| 10400 | 59.86 | 7.22 | 67.08 | 74 | -6.92 | H | PK |
| 15600 | 35.71 | 8.67 | 44.38 | 54 | -9.62 | H | AV |
| 10400 | 57.40 | 7.22 | 64.62 | 74 | -9.38 | V | PK |
| 15600 | 37.04 | 8.67 | 45.71 | 54 | -8.29 | V | AV |
| High Channel (5240MHz) | | | | | | | |
| 10480 | 55.21 | 7.69 | 62.90 | 74 | -11.10 | H | PK |
| 15720 | 39.25 | 8.93 | 48.18 | 54 | -5.82 | H | AV |
| 10480 | 60.20 | 7.69 | 67.89 | 74 | -6.11 | V | PK |
| 15720 | 38.00 | 8.93 | 46.93 | 54 | -7.07 | V | AV |

| Frequency (MHz) | Reading (dBuV/m) | Correct dB | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar H/V | Detector |
|--------------------------|---------------------|---------------|--------------------|-------------------|----------------|--------------|----------|
| Low Channel (5745MHz) | | | | | | | |
| 11490 | 57.47 | 9.45 | 66.92 | 74 | -7.08 | H | PK |
| 17235 | 36.69 | 10.36 | 47.05 | 54 | -6.95 | H | AV |
| 11490 | 55.31 | 9.45 | 64.76 | 74 | -9.24 | V | PK |
| 17235 | 36.40 | 10.36 | 46.76 | 54 | -7.24 | V | AV |
| Middle Channel (5785MHz) | | | | | | | |
| 11570 | 57.03 | 9.62 | 66.65 | 74 | -7.35 | H | PK |
| 17355 | 35.19 | 10.67 | 45.86 | 54 | -8.14 | H | AV |
| 11570 | 56.45 | 9.62 | 66.07 | 74 | -7.93 | V | PK |
| 17355 | 37.21 | 10.67 | 47.88 | 54 | -6.12 | V | AV |
| High Channel (5825MHz) | | | | | | | |
| 11650 | 55.23 | 9.84 | 65.07 | 74 | -8.93 | H | PK |
| 17475 | 34.84 | 10.95 | 45.79 | 54 | -8.21 | H | AV |
| 11650 | 57.01 | 9.84 | 66.85 | 74 | -7.15 | V | PK |
| 17475 | 36.64 | 10.95 | 47.59 | 54 | -6.41 | V | AV |

➤ Out of Band edge for 5150-5250MHz

| Test CH. | Test Segment | Result | Limit |
|----------|--------------|---------|---------|
| | MHz | dBm/MHz | dBm/MHz |
| Lowest | Below 5150 | -32.14 | -27 |
| Highest | Above 5350 | -37.76 | -27 |

Note: the data just list the worst cases

➤ Out of Band edge for 5725-5850MHz

| Test CH. | Test Segment | Result | Limit |
|----------|--------------|---------|---------|
| | MHz | dBm/MHz | dBm/MHz |
| Lowest | Below 5715 | -46.34 | -27 |
| | 5715 to 5725 | -34.78 | -17 |
| Highest | 5850 to 5860 | -35.70 | -17 |
| | Above 5860 | -41.45 | -27 |

Note: the data just list the worst cases

- For the frequency band 5.15-5.25GHz5.725-5.850GHz (802.11n HT40)
- Antenna A & Antenna B
- Harmonics And Spurious Emissions

| Frequency (MHz) | Reading (dBuV/m) | Correct dB | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar | Detector |
|------------------------|---------------------|---------------|--------------------|-------------------|----------------|-------|----------|
| Low Channel (5190MHz) | | | | | | | |
| 10380 | 59.19 | 7.25 | 66.44 | 74 | -7.56 | H | PK |
| 15570 | 37.51 | 8.33 | 45.84 | 54 | -8.16 | H | AV |
| 10380 | 59.44 | 7.25 | 66.69 | 74 | -7.31 | V | PK |
| 15570 | 38.80 | 8.33 | 47.13 | 54 | -6.87 | V | AV |
| High Channel (5230MHz) | | | | | | | |
| 10460 | 57.34 | 7.54 | 64.88 | 74 | -9.12 | H | PK |
| 15690 | 39.47 | 8.86 | 48.33 | 54 | -5.67 | H | AV |
| 10460 | 60.81 | 7.54 | 68.35 | 74 | -5.65 | V | PK |
| 15690 | 37.43 | 8.86 | 46.29 | 54 | -7.71 | V | AV |

| Frequency (MHz) | Reading (dBuV/m) | Correct dB | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar | Detector |
|------------------------|---------------------|---------------|--------------------|-------------------|----------------|-------|----------|
| Low Channel (5755MHz) | | | | | | | |
| 11510 | 55.60 | 9.65 | 65.25 | 74 | -8.75 | H | PK |
| 17265 | 36.81 | 10.87 | 47.68 | 54 | -6.32 | H | AV |
| 11510 | 57.22 | 9.65 | 66.87 | 74 | -7.13 | V | PK |
| 17265 | 36.34 | 10.87 | 47.21 | 54 | -6.79 | V | AV |
| High Channel (5795MHz) | | | | | | | |
| 11590 | 55.62 | 9.81 | 65.43 | 74 | -8.57 | H | PK |
| 17385 | 33.77 | 10.89 | 44.66 | 54 | -9.34 | H | AV |
| 11590 | 57.74 | 9.81 | 67.55 | 74 | -6.45 | V | PK |
| 17385 | 36.69 | 10.89 | 47.58 | 54 | -6.42 | V | AV |

- Out of Band edge 5150-5250MHz

| Test CH. | Test Segment | | Result dBm/MHz | Limit dBm/MHz |
|----------|--------------|--|-------------------|------------------|
| | MHz | | | |
| Lowest | Below 5150 | | -36.79 | -27 |
| Highest | Above 5350 | | -40.55 | -27 |

Note: the data just list the worst cases

➤ Out of Band edge for 5725-5850MHz

| Test CH. | Test Segment | Result | Limit |
|----------|--------------|---------|---------|
| | MHz | dBm/MHz | dBm/MHz |
| Lowest | Below 5715 | -40.25 | -27 |
| | 5715 to 5725 | -40.65 | -17 |
| Highest | 5850 to 5860 | -42.88 | -17 |
| | Above 5860 | -40.54 | -27 |

Note: the data just list the worst cases

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

➤ For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11ac VHT80)

➤ Antenna A & Antenna B

➤ Harmonics And Spurious Emissions

➤

| Frequency (MHz) | Reading (dBuV/m) | Correct dB | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar | Detector |
|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------|----------|
| 5210MHz | | | | | | | |
| 10420 | 58.48 | 7.33 | 65.81 | 74 | -8.19 | H | PK |
| 15630 | 36.17 | 8.75 | 44.92 | 54 | -9.08 | H | AV |
| 10420 | 57.39 | 7.33 | 64.72 | 74 | -9.28 | V | PK |
| 15630 | 36.15 | 8.75 | 44.90 | 54 | -9.10 | V | AV |

➤

| Frequency (MHz) | Reading (dBuV/m) | Correct dB | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Polar | Detector |
|--------------------|---------------------|---------------|--------------------|-------------------|----------------|-------|----------|
| 5775MHz | | | | | | | |
| 11550 | 56.52 | 9.54 | 66.06 | 74 | -7.94 | H | PK |
| 17325 | 37.91 | 10.59 | 48.50 | 54 | -5.50 | H | AV |
| 11550 | 56.72 | 9.54 | 66.26 | 74 | -7.74 | V | PK |
| 17325 | 34.40 | 10.59 | 44.99 | 54 | -9.01 | V | AV |

➤ Out of Band edge for 5150-5250MHz

| Test CH. | Test Segment | Result | Limit |
|----------|--------------|---------|---------|
| | MHz | dBm/MHz | dBm/MHz |
| Lowest | Below 5150 | -32.37 | -27 |
| Highest | Above 5350 | -31.81 | -27 |

Note: the data just list the worst cases

➤ Out of Band edge for 5725-5850MHz

| Test CH. | Test Segment | Result | Limit |
|----------|--------------|---------|---------|
| | MHz | dBm/MHz | dBm/MHz |
| Lowest | Below 5715 | -43.81 | -27 |
| | 5715 to 5725 | -31.45 | -17 |
| Highest | 5850 to 5860 | -29.63 | -17 |
| | Above 5860 | -39.04 | -27 |

Note: the data just list the worst cases

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

10. Frequency Stability

10.1 Standard Applicable

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

10.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

10.3 Summary of Test Results/Plots

ANT A

| U-NII-1:5150-5250MHz worst case at 802.11a middle channel | | | | |
|---|------------|----------|--------------|-----------|
| Voltage(%) | Power(VDC) | TEMP(°C) | Freq.Dev(Hz) | Deviation |
| 100% | 5 | -30 | 109 | 0.0209 |
| 100% | | -20 | 130 | 0.0249 |
| 100% | | -10 | 137 | 0.0264 |
| 100% | | 0 | 129 | 0.0248 |
| 100% | | +10 | 128 | 0.0246 |
| 100% | | +20 | 154 | 0.0295 |
| 100% | | +30 | 90 | 0.0173 |
| 100% | | +40 | 150 | 0.0288 |
| 100% | | +50 | 89 | 0.0170 |
| Low Battery power | 4.5 | +20 | 161 | 0.0310 |
| High Battery power | 5.5 | +20 | 141 | 0.0271 |

U-NII-1:5725-5850MHz worst case at 802.11a middle channel

| Voltage(%) | Power(VDC) | TEMP(°C) | Freq.Dev(Hz) | Deviation |
|--------------------|------------|----------|--------------|-----------|
| 100% | 5 | -30 | 86 | 0.0148 |
| 100% | | -20 | 125 | 0.0216 |
| 100% | | -10 | 137 | 0.0236 |
| 100% | | 0 | 127 | 0.0220 |
| 100% | | +10 | 115 | 0.0198 |
| 100% | | +20 | 151 | 0.0261 |
| 100% | | +30 | 98 | 0.0169 |
| 100% | | +40 | 155 | 0.0268 |
| 100% | | +50 | 84 | 0.0146 |
| Low Battery power | 4.5 | +20 | 156 | 0.0270 |
| High Battery power | 5.5 | +20 | 145 | 0.0251 |

ANT B
U-NII-1:5150-5250MHz worst case at 802.11a middle channel

| Voltage(%) | Power(VDC) | TEMP(°C) | Freq.Dev(Hz) | Deviation |
|--------------------|------------|----------|--------------|-----------|
| 100% | 5 | -30 | 88 | 0.0170 |
| 100% | | -20 | 127 | 0.0244 |
| 100% | | -10 | 143 | 0.0275 |
| 100% | | 0 | 133 | 0.0256 |
| 100% | | +10 | 120 | 0.0230 |
| 100% | | +20 | 150 | 0.0288 |
| 100% | | +30 | 102 | 0.0196 |
| 100% | | +40 | 155 | 0.0297 |
| 100% | | +50 | 81 | 0.0156 |
| Low Battery power | 4.5 | +20 | 155 | 0.0297 |
| High Battery power | 5.5 | +20 | 148 | 0.0284 |

| U-NII-1:5725-5850MHz worst case at 802.11a middle channel | | | | |
|--|------------|----------|--------------|-----------|
| Voltage(%) | Power(VDC) | TEMP(°C) | Freq.Dev(Hz) | Deviation |
| 100% | 5 | -30 | 94 | 0.0162 |
| 100% | | -20 | 121 | 0.0208 |
| 100% | | -10 | 143 | 0.0246 |
| 100% | | 0 | 133 | 0.0230 |
| 100% | | +10 | 116 | 0.0201 |
| 100% | | +20 | 152 | 0.0263 |
| 100% | | +30 | 104 | 0.0179 |
| 100% | | +40 | 156 | 0.0269 |
| 100% | | +50 | 84 | 0.0145 |
| Low Battery power | 4.5 | +20 | 155 | 0.0268 |
| High Battery power | 5.5 | +20 | 144 | 0.0248 |

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