# HCT CO., LTD.

## CERTIFICATE OF COMPLIANCE

### FCC Certification

**Applicant Name:**
LG Electronics MobileComm U.S.A., Inc.

**Address:**
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

**Date of Issue:**
July 01, 2013

**Test Site/Location:**
HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea

**Report No.:** HCTR1306FR05-3

**HCT FRN:** 0005866421

**FCC ID : ZNFE989**

**APPLICANT : LG Electronics MobileComm U.S.A., Inc.**

| | |
|---|---|
| **FCC Model(s):** | LG-E989 |
| **EUT Type:** | GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 a/b/g/n(2.4/5GHz)/NFC |
| **Max. RF Output Power:** | Wi-Fi 802.11a (5180~5240) (14.24 dBm)/ Wi-Fi 802.11a (5260~5320) (14.17 dBm)/ Wi-Fi 802.11a (5500~5700) (13.60 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (10.30 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(10.28 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(10.54 dBm)/ Wi-Fi 802.11n_40 MHz BW(5190~5230) (9.69 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (11.10 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5670) (10.49 dBm) |
| **Frequency Range:** | 20 MHz BW: 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 3)<br>40 MHz BW: 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 3) |
| **Modulation type** | OFDM |
| **FCC Classification:** | Unlicensed National Information Infrastructure(UNII) |
| **FCC Rule Part(s):** | Part 15.407 |

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

**HCT CO., LTD.** Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

**Report prepared by**
**: Jae Chul Shin**
**Test engineer of RF Team**

**Approved by**
**: Chang Seok Choi**
**Manager of RF Team**

# Version

| TEST REPORT NO. | DATE | DESCRIPTION |
|---|---|---|
| HCTR1306FR05 | June 05, 2013 | - First Approval Report |
| HCTR1306FR05-1 | June 17, 2013 | - Added Duty Cycle in Section 8.1<br>- Retested 802.11a Output Power<br>- Revised PSD in Section 8.4<br>- Revised information on KDB in Section 8.7 |
| HCTR1306FR05-2 | June 26, 2013 | - Updated the Duty Cycle in Section 8.1<br>- Retested the Frequency Stability and added the note in Section 8.6<br>- Add RSE Test with Wireless Charger |
| HCTR1306FR05-3 | July 01, 2013 | - Revised to 'T > 6.25' from 'T < 6.25' |
| | | |

# Table of Contents

# 1. GENERAL INFORMATION

**Applicant:** LG Electronics MobileComm U.S.A., Inc.

**Address:** 1000 Sylvan Avenue, Englewood Cliffs NJ 07632

**FCC ID:** ZNFE989

**EUT Type:** GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 a/b/g/n(2.4/5GHz)/NFC

**Model name(s):** LG-E989

**Date(s) of Tests:** May 20, 2013 ~ June 21, 2013

**Place of Tests:** HCT Co., Ltd.
105-1, Jangam-ri , Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, KOREA.
(IC Recognition No. : 5944A-3)

# 2. EUT DESCRIPTION

| | | |
|---|---|---|
| **EUT Type** | GSM/WCDMA Phone with Bluetooth4.0, WIFI802.11 a/b/g/n(2.4/5GHz)/NFC | |
| **FCC Model Name** | LG-E989 | |
| **Power Supply** | DC 3.8 V | |
| **Frequency Range** | TX_20 MHz BW: | 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 3) where) Not supported 5580 MHz – 5640 MHz |
| | 40 MHz BW: | 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 3) where) Not supported 5580 MHz – 5640 MHz |
| | RX_20 MHz BW: | 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 3) where) Not supported 5580 MHz – 5640 MHz |
| | 40 MHz BW: | 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 3) where) Not supported 5580 MHz – 5640 MHz |
| **Max. RF Output Power:** | Wi-Fi 802.11a (5180~5240) (14.24 dBm)/ Wi-Fi 802.11a (5260~5320) (14.17 dBm)/ Wi-Fi 802.11a (5500~5700) (13.60 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (10.30 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(10.28 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(10.54 dBm)/ Wi-Fi 802.11n_40 MHz BW(5190~5230) (9.69 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (11.10 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5670) (10.49 dBm)dBm) | |
| **Modulation Type** | OFDM(802.11a, 802.11n_20 MHz, 802.11n_40 MHz) | |
| **Antenna Specification** | Manufacturer: Komatech Co., Ltd.<br>Antenna type: Internal Antenna<br>Peak Gain : -1.91 dBi | |

# 3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D01 General UNII Test Procedures v01r02 dated September 26, 2012 entitled " Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) – Part 15, Subpart E" were used in the measurement.

## 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

## 3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

## 3.3 GENERAL TEST PROCEDURES

**Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

**Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

**Conducted Antenna Terminal**

See Section from 8.1 to 8.4.(KDB 789033)

## 3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

# 4. INSTRUMENT CALIBRATION

The. measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards

# 5. FACILITIES AND ACCREDITATIONS

## 5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version : 2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated March 02, 2011 (Registration Number: 90661)

## 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

# 6. ANTENNA REQUIREMENTS

**According to FCC 47 CFR §15.203:**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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.”

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

# 7. SUMMARY OF TEST RESULTS

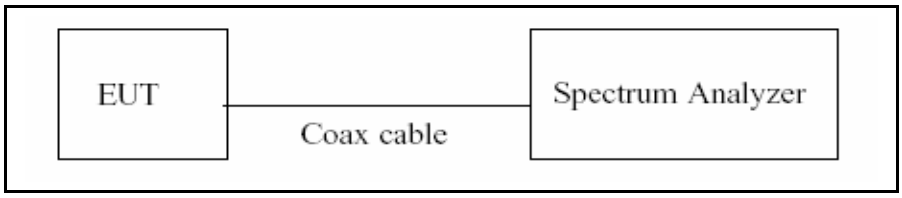
| Test Description | FCC Part Section(s) | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|
| **TRANSMITTER MODE(TX)** | | | CONDUCTED | |
| 26dB Bandwidth | NA | NA | | PASS |
| Maximum Conducted Output Power | §15.407(a)(1) | < 4+10 log $_{10}$ (BW) dBm (5150-5250 MHz)<br>< 11+10 log $_{10}$ (BW) dBm (5250-5350 MHz)<br>< 11+10 log $_{10}$ (BW) dBm (5470-5725 MHz) | | PASS |
| Peak Power Spectral Density | §15.407(a)(1), (5) | <4 dBm/ MHz (5150-5250)<br><11 dBm/ MHz (5250-5350)<br><11 dBm/ MHz (5470-5725) | | PASS |
| Peak Excursion | §15.407(a)(6) | <13 dB/ MHz maximum difference | | PASS |
| Frequency Stability | §15.407(g) | NA | | PASS |
| Undesirable Emissions | §15.407(b)(1), (2), (3) | <-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz) | RADIATED | PASS |
| General Field Strength Limits(Restricted Bands and Radiated Emission Limits) | 15.205, 5.407(b)(1), (5), (6) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | | PASS |
| AC Conducted Emissions 150 kHz-30 MHz | 15.207 | <FCC 15.207 limits | LINE CONDUCTED | PASS |

# 8. TEST RESULT

## 8.1 DUTY CYCLE

The zero-span mode on a spectrum analyzer or EMI receiver ,if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/*T*, where *T* is defined in section B)1)a), and the number of sweep points across duration *T* exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if *T* ≤ 16.7 microseconds.)

### ▣ TEST CONFIGURATION




### ▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We tested accroding to the zero-span measurement method, B)2) in KDB 789033( issued 04/08/2013)
The largest availble value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if T ≤ 6.25 microseconds. (50/6.25 = 8)
The zero-span method was used becaure all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/*T*.

1. RBW = 8 MHz (the largest availble value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure $T_{total}$ and $T_{on}$
8. Calculate Duty Cycle = $T_{on}$/ $T_{total}$ and Duty Cycle Factor = 10*log(1/Duty Cycle)

## Duty Cycle Factor

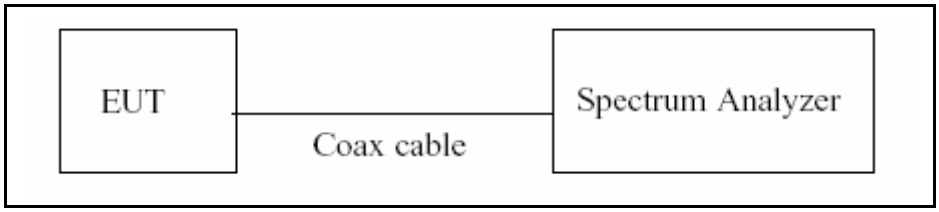
| Mode | Data Rate | $T_{on}$ (ms) | $T_{total}$ (ms) | Duty Cycle | Duty Cycle Factor |
|---|---|---|---|---|---|
| 802.11a Mode | 6 Mbs | 2.064 | 2.166 | 0.95290859 | 0.209 |
| | 9 Mbs | 1.383 | 1.485 | 0.93131313 | 0.309 |
| | 12 Mbs | 1.044 | 1.144 | 0.91258741 | 0.397 |
| | 18 Mbs | 0.704 | 0.804 | 0.87591786 | 0.575 |
| | 24 Mbs | 0.532 | 0.632 | 0.84233022 | 0.745 |
| | 36 Mbs | 0.364 | 0.464 | 0.78448276 | 1.054 |
| | 48 Mbs | 0.276 | 0.375 | 0.73560768 | 1.334 |
| | 54 Mbs | 0.249 | 0.348 | 0.71494253 | 1.457 |
| 802.11n Mode 20 MHz BW | 6.5 Mbs | 1.920 | 2.019 | 0.95096582 | 0.218 |
| | 13 Mbs | 0.981 | 1.080 | 0.90833333 | 0.418 |
| | 19.5 Mbs | 0.666 | 0.764 | 0.87152960 | 0.597 |
| | 26 Mbs | 0.508 | 0.607 | 0.83580369 | 0.779 |
| | 39 Mbs | 0.352 | 0.452 | 0.77876106 | 1.086 |
| | 52 Mbs | 0.273 | 0.372 | 0.73333333 | 1.347 |
| | 58.5 Mbs | 0.249 | 0.348 | 0.71551724 | 1.454 |
| | 65 Mbs | 0.229 | 0.329 | 0.69604863 | 1.574 |
| 802.11n Mode 40 MHz BW | 13.5 Mbps | 0.944 | 1.042 | 0.90595010 | 0.429 |
| | 27 Mbps | 0.493 | 0.590 | 0.83559322 | 0.780 |
| | 40.5 Mbps | 0.341 | 0.438 | 0.77737226 | 1.094 |
| | 54 Mbps | 0.264 | 0.362 | 0.72928177 | 1.371 |
| | 81 Mbps | 0.189 | 0.287 | 0.65794066 | 1.818 |
| | 108 Mbps | 0.153 | 0.250 | 0.61000000 | 2.147 |
| | 121.5 Mbps | 0.140 | 0.238 | 0.58942065 | 2.296 |
| | 135 Mbps | 0.128 | 0.226 | 0.56763926 | 2.459 |

## 8.2 26 dB BANDWIDTH MEASUREMENT

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033(issued 04/08/2013), at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

### ▣ TEST CONFIGURATION




### ▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to( Page 3 in KDB 789033, issued 04/08/2013)

9. RBW = approximately 1 % of the emission bandwidth
10. VBW > RBW
11. Detector = Peak
12. Trace mode = max hold
13. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

## TEST RESULTS

**Conducted 26 dB Bandwidth Measurements for 802.11a**

| 802.11a Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5180 | 36 | 19.25 | N/A | Pass |
| 5200 | 40 | 19.32 | N/A | Pass |
| 5240 | 48 | 19.13 | N/A | Pass |

**Conducted 26 dB Bandwidth Measurements for 802.11a**

| 802.11a Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5260 | 52 | 19.22 | N/A | Pass |
| 5300 | 60 | 19.19 | N/A | Pass |
| 5320 | 64 | 19.25 | N/A | Pass |

**Conducted 26 dB Bandwidth Measurements for 802.11a**

| 802.11a Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5500 | 100 | 19.24 | N/A | Pass |
| 5580 | 116 | 19.16 | N/A | Pass |
| 5700 | 140 | 19.26 | N/A | Pass |

## TEST RESULTS

**20 MHz BW**

**Conducted 26 dB Bandwidth Measurements for 802.11n**

| 802.11n Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5180 | 36 | 19.58 | N/A | Pass |
| 5200 | 40 | 19.60 | N/A | Pass |
| 5240 | 48 | 19.56 | N/A | Pass |

**Conducted 26 dB Bandwidth Measurements for 802.11n**

| 802.11n Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5260 | 52 | 19.51 | N/A | Pass |
| 5300 | 60 | 19.50 | N/A | Pass |
| 5320 | 64 | 19.54 | N/A | Pass |

**Conducted 26 dB Bandwidth Measurements for 802.11n**

| 802.11n Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5500 | 100 | 19.50 | N/A | Pass |
| 5580 | 116 | 19.55 | N/A | Pass |
| 5700 | 140 | 19.49 | N/A | Pass |

**40 MHz BW**

**Conducted 26 dB Bandwidth Measurements for 802.11n**

| 802.11n Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5190 | 38 | 44.200 | N/A | Pass |
| 5230 | 46 | 44.851 | N/A | Pass |

**Conducted 26 dB Bandwidth Measurements for 802.11n**

| 802.11n Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5270 | 54 | 44.042 | N/A | Pass |
| 5310 | 62 | 43.630 | N/A | Pass |

**Conducted 26 dB Bandwidth Measurements for 802.11n**

| 802.11n Mode | | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | |
| 5510 | 102 | 45.045 | N/A | Pass |
| 5550 | 110 | 45.072 | N/A | Pass |
| 5670 | 134 | 45.279 | N/A | Pass |

## RESULT PLOTS

### 26 dB Bandwidth plot (802.11a-CH 36)


### 26 dB Bandwidth plot (802.11a-CH 40)

## 26 dB Bandwidth plot (802.11a-CH 48)


## 26 dB Bandwidth plot (802.11a-CH 52)

## 26 dB Bandwidth plot (802.11a-CH 60)


## 26 dB Bandwidth plot (802.11a-CH 64)

## 26 dB Bandwidth plot (802.11a-CH 100)


## 26 dB Bandwidth plot (802.11a-CH 116)

## 26 dB Bandwidth plot (802.11a-CH 140)

## 20 MHz BW

### 26 dB Bandwidth plot (802.11n-CH 36)


### 26 dB Bandwidth plot (802.11n-CH 40)

## 26 dB Bandwidth plot (802.11n-CH 48)


## 26 dB Bandwidth plot (802.11n-CH 52)

## 26 dB Bandwidth plot (802.11n-CH 60)


## 26 dB Bandwidth plot (802.11n-CH 64)

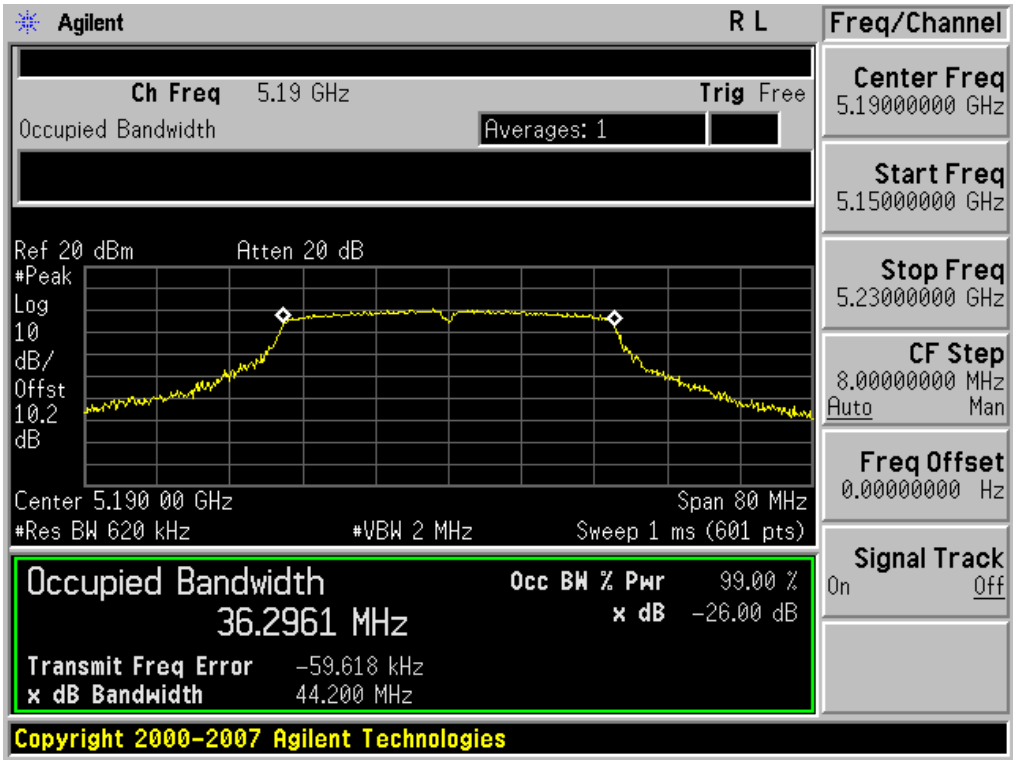
## 6 dB Bandwidth plot (802.11n-CH 100)


## 26 dB Bandwidth plot (802.11n-CH 116)

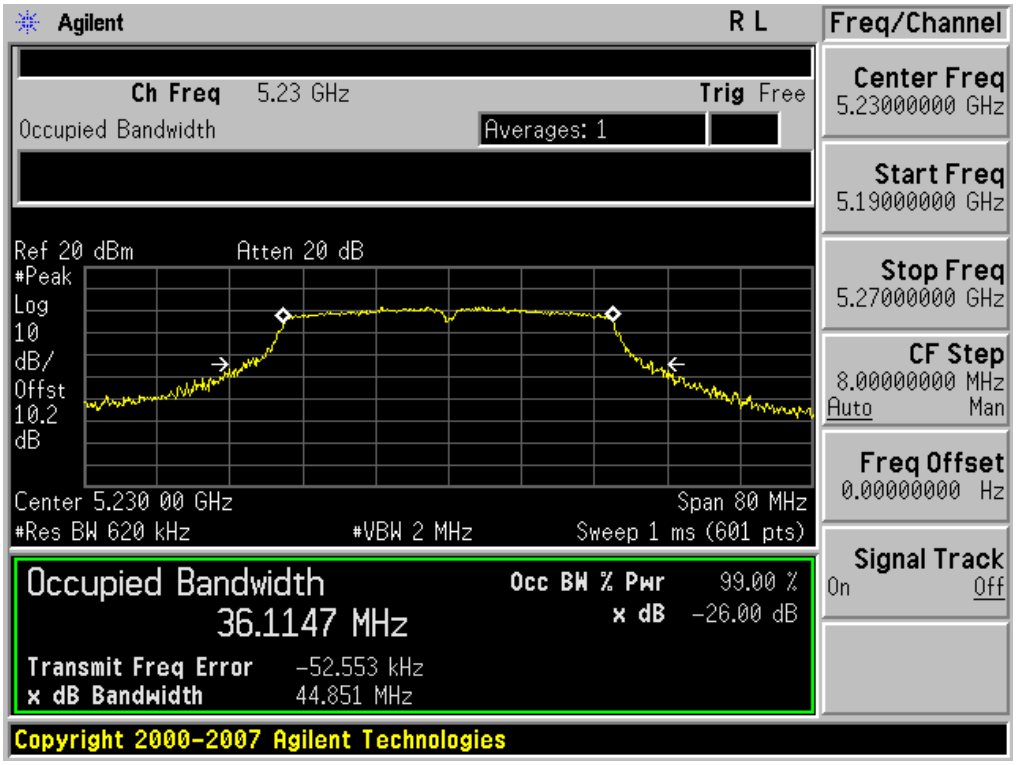
## 26 dB Bandwidth plot (802.11n-CH 140)

## 40 MHz BW

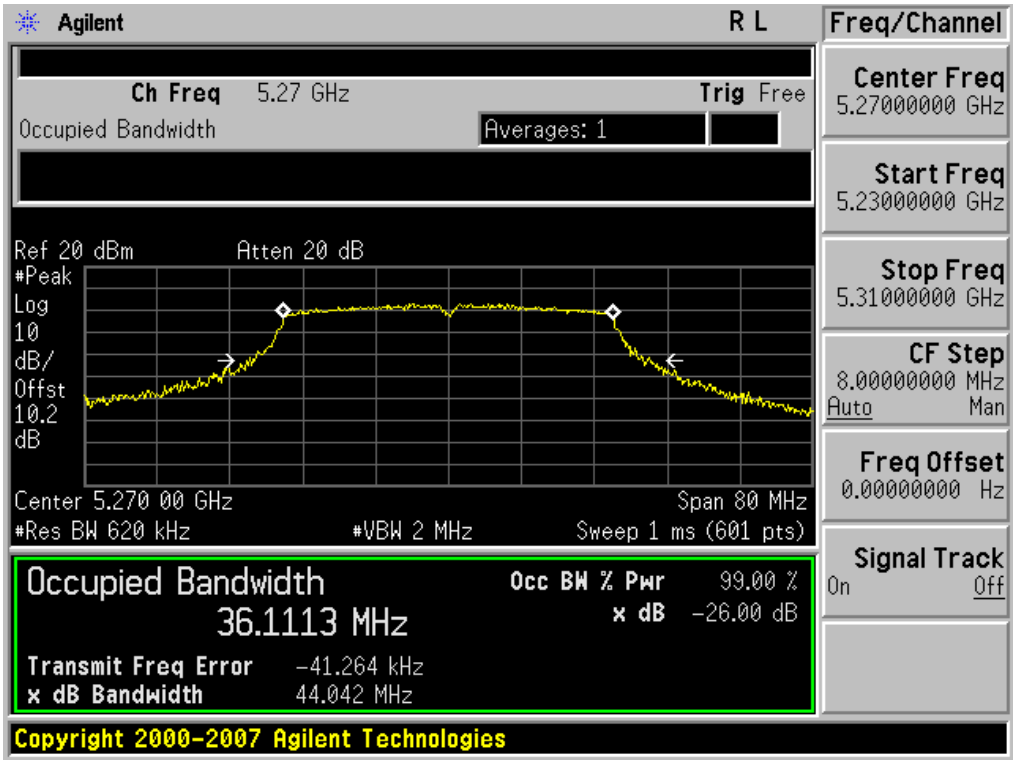
### 26 dB Bandwidth plot (802.11n-CH 38)



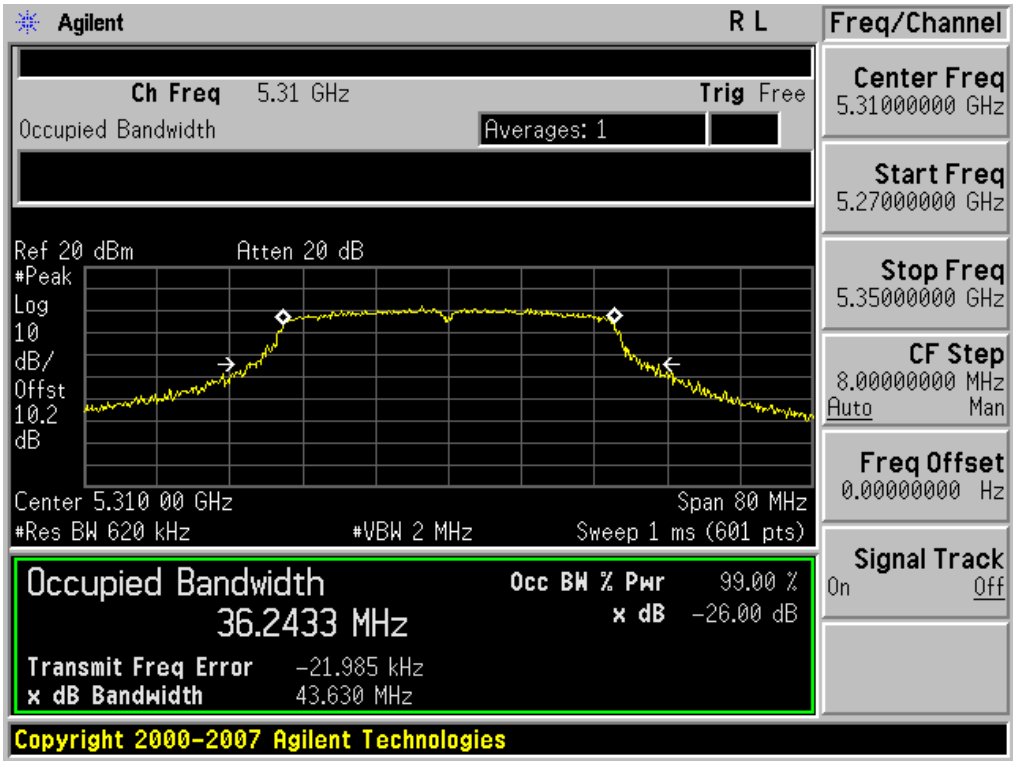

### 26 dB Bandwidth plot (802.11n-CH 46)



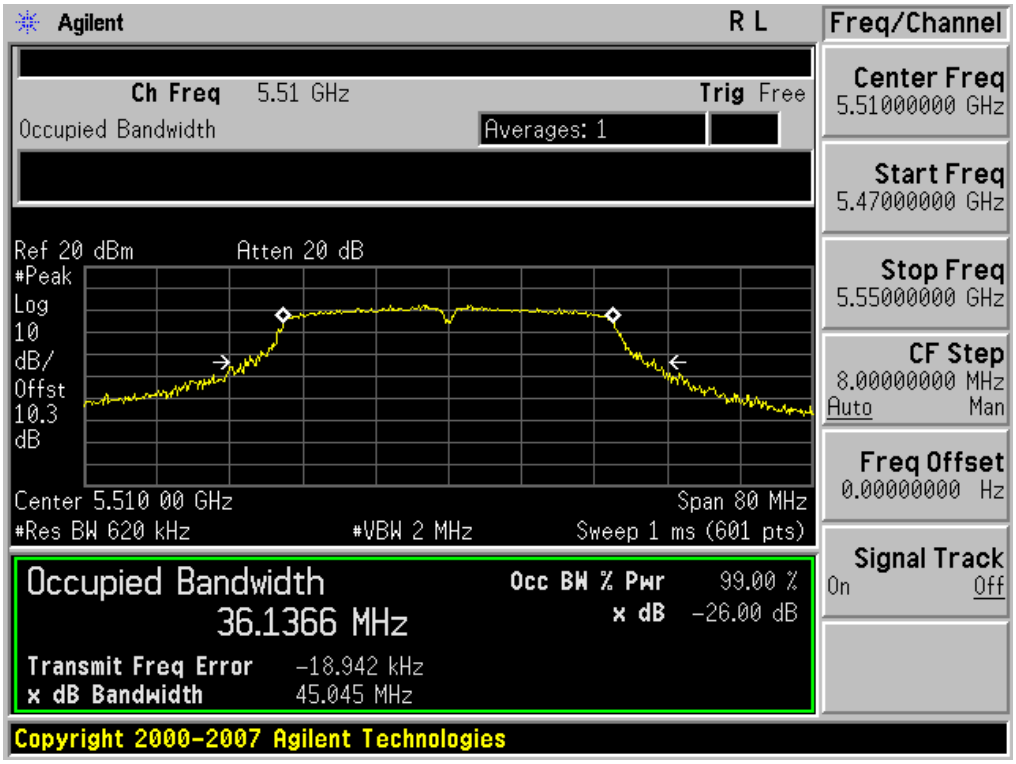
## 26 dB Bandwidth plot (802.11n-CH 54)



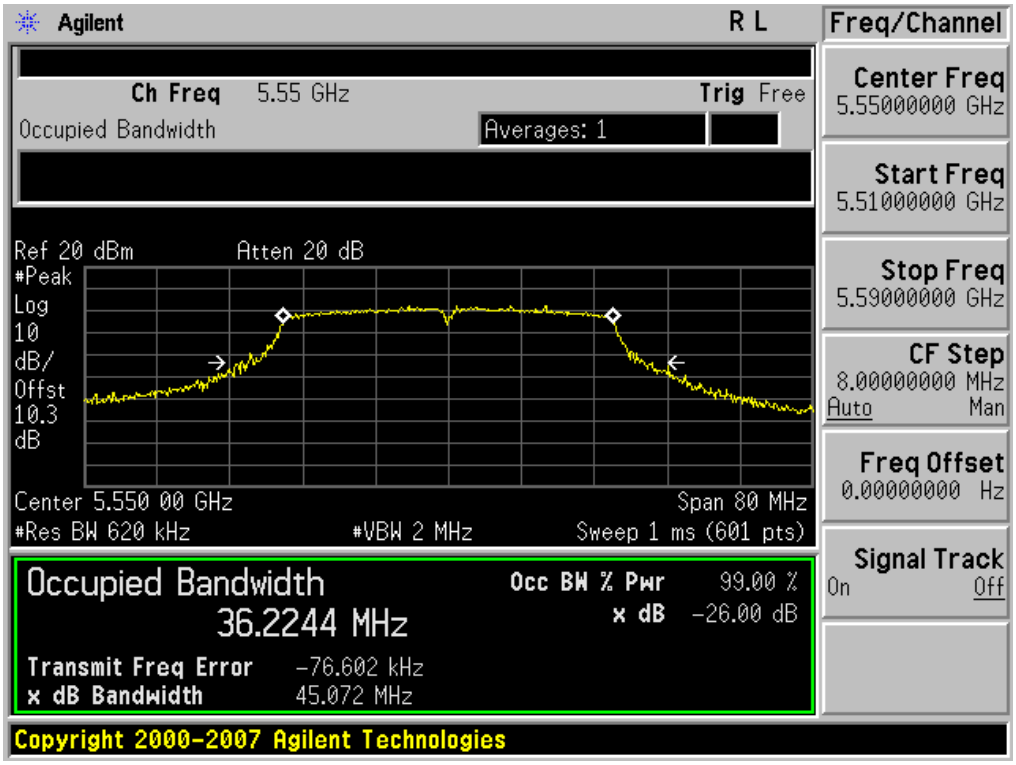

## 26 dB Bandwidth plot (802.11n-CH 62)



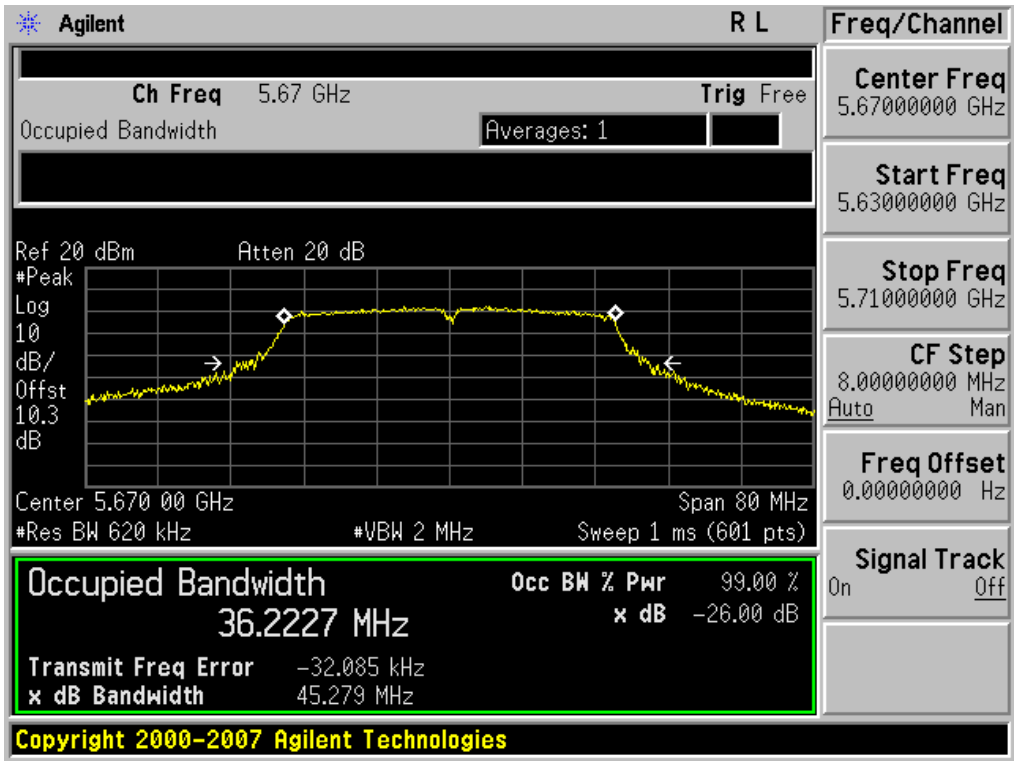
## 26 dB Bandwidth plot (802.11n-CH 102)




## 26 dB Bandwidth plot (802.11n-CH 110)



## 6 dB Bandwidth plot (802.11n-CH 134)



## 8.3 OUTPUT POWER MEASUREMENT

**Test Requirements and limit, §15.247(b)(3)**

A transmitter antenna terminal of EUT is connected to the input of a Spectrum Analyzer. Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies. In the 5.15 – 5.25 GHz band, the maximum permissible conducted output power is the lesser of 50 mW ((16.99 dBm) and 4 dBm + 10 log $_{10}$ (26 dB BW)

frequencies. In the 5.25 – 5.35 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and 11 dBm + 10 log $_{10}$ (26 dB BW)

frequencies. In the 5.47 – 5.725 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and 11 dBm + 10 log $_{10}$ (26 dB BW)

Limit : 802.11a_UNII-1 = 16.86 dBm

802.11n_UNII-1_20 MHz BW = 16.92 dBm

802.11n_UNII-1_40 MHz BW = 16.99 dBm

802.11a_UNII-2 = 23.84 dBm

802.11n_UNII-2_20 MHz BW = 23.90 dBm

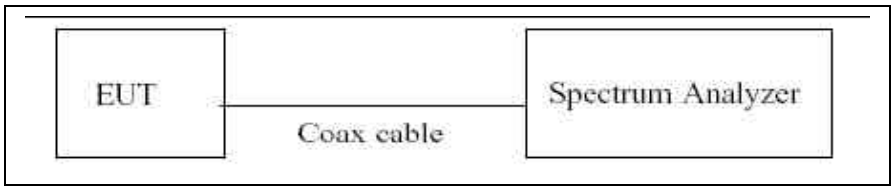
802.11n_UNII-2_40 MHz BW = 23.98 dBm

802.11a_UNII-3 = 23.84 dBm

802.11n_UNII-3_20 MHz BW = 23.91 dBm

802.11n_UNII-3_40 MHz BW = 23.98 dBm

**▣ TEST CONFIGURATION**




**▣ TEST PROCEDURE**

The transmitter output is connected to the Spectrum Analyzer. We use the spectrum analyzer's integrated band power measurement function. We tested according to Method SA-2 in KDB 789033(issued 04/08/2013).

The Spectrum Analyzer is set to

▪ Average Power

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW ≥ 3 MHz.
5. Number of points in sweep ≥ 2*span/RBW.
6. Sweep time = auto.
7. Detector = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode

10. Integrated bandwidth = OBW
11. Add 10log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

**▣ Sample Calculation**

Output Power = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

Output Power = 10 dBm + 10 dB + 0.8 dB + 0.21 dB = 21.01 dBm

Note :

1. Spectrum reading values are not plot data. The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

| Band | Frequency(MHz) | Loss(dB) |
|---|---|---|
| UNII 1 | 5180 | 10.26 |
| | 5190 | 10.22 |
| | 5200 | 10.18 |
| | 5230 | 10.19 |
| | 5240 | 10.19 |
| UNII 2 | 5260 | 10.18 |
| | 5270 | 10.17 |
| | 5300 | 10.14 |
| | 5310 | 10.11 |
| | 5320 | 10.09 |
| UNII 3 | 5500 | 10.20 |
| | 5510 | 10.20 |
| | 5550 | 10.23 |
| | 5580 | 10.24 |
| | 5670 | 10.36 |

(Actual value of loss for the attenuator and cable combination)

## TEST RESULTS

**Conducted Output Power Measurements (802.11a Mode: 5180~5240)**

| 802.11a Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5180 | 36 | 6 Mbps | 13.89 | 0.21 | 14.10 | 16.86 |
| | | 9 Mbps | 13.69 | 0.31 | 14.00 | 16.86 |
| | | 12 Mbps | 13.62 | 0.4 | 14.02 | 16.86 |
| | | 18 Mbps | 13.39 | 0.58 | 13.97 | 16.86 |
| | | 24 Mbps | 13.22 | 0.75 | 13.97 | 16.86 |
| | | 36 Mbps | 12.83 | 1.05 | 13.88 | 16.86 |
| | | 48 Mbps | 12.62 | 1.33 | 13.95 | 16.86 |
| | | 54 Mbps | 12.44 | 1.46 | 13.90 | 16.86 |
| 5200 | 40 | 6 Mbps | 14.02 | 0.21 | 14.23 | 16.86 |
| | | 9 Mbps | 13.75 | 0.31 | 14.06 | 16.86 |
| | | 12 Mbps | 13.65 | 0.4 | 14.05 | 16.86 |
| | | 18 Mbps | 13.54 | 0.58 | 14.12 | 16.86 |
| | | 24 Mbps | 13.31 | 0.75 | 14.06 | 16.86 |
| | | 36 Mbps | 12.98 | 1.05 | 14.03 | 16.86 |
| | | 48 Mbps | 12.63 | 1.33 | 13.96 | 16.86 |
| | | 54 Mbps | 12.51 | 1.46 | 13.97 | 16.86 |
| 5240 | 48 | 6 Mbps | 14.03 | 0.21 | 14.24 | 16.86 |
| | | 9 Mbps | 13.7 | 0.31 | 14.01 | 16.86 |
| | | 12 Mbps | 13.65 | 0.4 | 14.05 | 16.86 |
| | | 18 Mbps | 13.5 | 0.58 | 14.08 | 16.86 |
| | | 24 Mbps | 13.29 | 0.75 | 14.04 | 16.86 |
| | | 36 Mbps | 12.92 | 1.05 | 13.97 | 16.86 |
| | | 48 Mbps | 12.56 | 1.33 | 13.89 | 16.86 |
| | | 54 Mbps | 12.48 | 1.46 | 13.94 | 16.86 |

## Conducted Output Power Measurements (802.11a Mode: 5260~5320)

| 802.11a Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5260 | 52 | 6 Mbps | 13.92 | 0.21 | 14.13 | 23.84 |
| | | 9 Mbps | 13.86 | 0.31 | 14.17 | 23.84 |
| | | 12 Mbps | 13.7 | 0.4 | 14.10 | 23.84 |
| | | 18 Mbps | 13.58 | 0.58 | 14.16 | 23.84 |
| | | 24 Mbps | 13.37 | 0.75 | 14.12 | 23.84 |
| | | 36 Mbps | 13.08 | 1.05 | 14.13 | 23.84 |
| | | 48 Mbps | 12.78 | 1.33 | 14.11 | 23.84 |
| | | 54 Mbps | 12.65 | 1.46 | 14.11 | 23.84 |
| 5300 | 60 | 6 Mbps | 13.12 | 0.21 | 13.33 | 23.84 |
| | | 9 Mbps | 12.74 | 0.31 | 13.05 | 23.84 |
| | | 12 Mbps | 12.79 | 0.4 | 13.19 | 23.84 |
| | | 18 Mbps | 12.77 | 0.58 | 13.35 | 23.84 |
| | | 24 Mbps | 12.51 | 0.75 | 13.26 | 23.84 |
| | | 36 Mbps | 12.13 | 1.05 | 13.18 | 23.84 |
| | | 48 Mbps | 11.88 | 1.33 | 13.21 | 23.84 |
| | | 54 Mbps | 11.67 | 1.46 | 13.13 | 23.84 |
| 5320 | 64 | 6 Mbps | 13.11 | 0.21 | 13.32 | 23.84 |
| | | 9 Mbps | 13.01 | 0.31 | 13.32 | 23.84 |
| | | 12 Mbps | 12.91 | 0.4 | 13.31 | 23.84 |
| | | 18 Mbps | 12.72 | 0.58 | 13.30 | 23.84 |
| | | 24 Mbps | 12.53 | 0.75 | 13.28 | 23.84 |
| | | 36 Mbps | 12.24 | 1.05 | 13.29 | 23.84 |
| | | 48 Mbps | 12.02 | 1.33 | 13.35 | 23.84 |
| | | 54 Mbps | 11.79 | 1.46 | 13.25 | 23.84 |

## Conducted Output Power Measurements (802.11a Mode: 5500~5700)

| 802.11a Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5500 | 100 | 6 Mbps | 13.23 | 0.21 | 13.44 | 23.84 |
| | | 9 Mbps | 13.06 | 0.31 | 13.37 | 23.84 |
| | | 12 Mbps | 13.03 | 0.4 | 13.43 | 23.84 |
| | | 18 Mbps | 12.84 | 0.58 | 13.42 | 23.84 |
| | | 24 Mbps | 12.68 | 0.75 | 13.43 | 23.84 |
| | | 36 Mbps | 12.35 | 1.05 | 13.40 | 23.84 |
| | | 48 Mbps | 12.01 | 1.33 | 13.34 | 23.84 |
| | | 54 Mbps | 11.86 | 1.46 | 13.32 | 23.84 |
| 5580 | 116 | 6 Mbps | 13.32 | 0.21 | 13.53 | 23.84 |
| | | 9 Mbps | 13.19 | 0.31 | 13.50 | 23.84 |
| | | 12 Mbps | 13.2 | 0.4 | 13.60 | 23.84 |
| | | 18 Mbps | 12.97 | 0.58 | 13.55 | 23.84 |
| | | 24 Mbps | 12.74 | 0.75 | 13.49 | 23.84 |
| | | 36 Mbps | 12.41 | 1.05 | 13.46 | 23.84 |
| | | 48 Mbps | 12.17 | 1.33 | 13.50 | 23.84 |
| | | 54 Mbps | 11.95 | 1.46 | 13.41 | 23.84 |
| 5700 | 140 | 6 Mbps | 12.49 | 0.21 | 12.70 | 23.84 |
| | | 9 Mbps | 12.38 | 0.31 | 12.69 | 23.84 |
| | | 12 Mbps | 12.46 | 0.4 | 12.86 | 23.84 |
| | | 18 Mbps | 12.18 | 0.58 | 12.76 | 23.84 |
| | | 24 Mbps | 11.98 | 0.75 | 12.73 | 23.84 |
| | | 36 Mbps | 11.6 | 1.05 | 12.65 | 23.84 |
| | | 48 Mbps | 11.33 | 1.33 | 12.66 | 23.84 |
| | | 54 Mbps | 11.17 | 1.46 | 12.63 | 23.84 |

**20 MHz BW**

**Conducted Output Power Measurements (802.11n Mode: 5180~5240)**

| 802.11n Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5180 | 36 | 6.5 Mbps | 8.24 | 0.22 | 8.46 | 16.92 |
| | | 13 Mbps | 7.90 | 0.42 | 8.32 | 16.92 |
| | | 19.5 Mbps | 7.47 | 0.60 | 8.07 | 16.92 |
| | | 26 Mbps | 7.34 | 0.78 | 8.12 | 16.92 |
| | | 39 Mbps | 7.08 | 1.09 | 8.17 | 16.92 |
| | | 52 Mbps | 6.75 | 1.35 | 8.10 | 16.92 |
| | | 58.5 Mbps | 6.56 | 1.45 | 8.01 | 16.92 |
| | | 65 Mbps | 6.52 | 1.57 | 8.09 | 16.92 |
| 5200 | 40 | 6.5 Mbps | 8.83 | 0.22 | 9.05 | 16.92 |
| | | 13 Mbps | 8.57 | 0.42 | 8.99 | 16.92 |
| | | 19.5 Mbps | 8.33 | 0.60 | 8.93 | 16.92 |
| | | 26 Mbps | 8.23 | 0.78 | 9.01 | 16.92 |
| | | 39 Mbps | 7.91 | 1.09 | 9.00 | 16.92 |
| | | 52 Mbps | 7.56 | 1.35 | 8.91 | 16.92 |
| | | 58.5 Mbps | 7.37 | 1.45 | 8.82 | 16.92 |
| | | 65 Mbps | 7.30 | 1.57 | 8.87 | 16.92 |
| 5240 | 48 | 6.5 Mbps | 10.08 | 0.22 | 10.30 | 16.92 |
| | | 13 Mbps | 9.86 | 0.42 | 10.28 | 16.92 |
| | | 19.5 Mbps | 9.67 | 0.60 | 10.27 | 16.92 |
| | | 26 Mbps | 9.46 | 0.78 | 10.24 | 16.92 |
| | | 39 Mbps | 9.17 | 1.09 | 10.26 | 16.92 |
| | | 52 Mbps | 8.75 | 1.35 | 10.10 | 16.92 |
| | | 58.5 Mbps | 8.74 | 1.45 | 10.19 | 16.92 |
| | | 65 Mbps | 8.60 | 1.57 | 10.17 | 16.92 |

## Conducted Output Power Measurements (802.11n Mode: 5260~5320)

| 802.11n Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5260 | 52 | 6.5 Mbps | 9.99 | 0.22 | 10.21 | 23.90 |
| | | 13 Mbps | 9.77 | 0.42 | 10.19 | 23.90 |
| | | 19.5 Mbps | 9.62 | 0.60 | 10.22 | 23.90 |
| | | 26 Mbps | 9.50 | 0.78 | 10.28 | 23.90 |
| | | 39 Mbps | 9.17 | 1.09 | 10.26 | 23.90 |
| | | 52 Mbps | 8.85 | 1.35 | 10.20 | 23.90 |
| | | 58.5 Mbps | 8.70 | 1.45 | 10.15 | 23.90 |
| | | 65 Mbps | 8.56 | 1.57 | 10.13 | 23.90 |
| 5300 | 60 | 6.5 Mbps | 8.67 | 0.22 | 8.89 | 23.90 |
| | | 13 Mbps | 8.52 | 0.42 | 8.94 | 23.90 |
| | | 19.5 Mbps | 8.31 | 0.60 | 8.91 | 23.90 |
| | | 26 Mbps | 8.07 | 0.78 | 8.85 | 23.90 |
| | | 39 Mbps | 7.76 | 1.09 | 8.85 | 23.90 |
| | | 52 Mbps | 7.50 | 1.35 | 8.85 | 23.90 |
| | | 58.5 Mbps | 7.31 | 1.45 | 8.76 | 23.90 |
| | | 65 Mbps | 7.18 | 1.57 | 8.75 | 23.90 |
| 5320 | 64 | 6.5 Mbps | 8.59 | 0.22 | 8.81 | 23.90 |
| | | 13 Mbps | 8.34 | 0.42 | 8.76 | 23.90 |
| | | 19.5 Mbps | 8.21 | 0.60 | 8.81 | 23.90 |
| | | 26 Mbps | 7.95 | 0.78 | 8.73 | 23.90 |
| | | 39 Mbps | 7.65 | 1.09 | 8.74 | 23.90 |
| | | 52 Mbps | 7.32 | 1.35 | 8.67 | 23.90 |
| | | 58.5 Mbps | 7.22 | 1.45 | 8.67 | 23.90 |
| | | 65 Mbps | 7.17 | 1.57 | 8.74 | 23.90 |

## Conducted Output Power Measurements (802.11n Mode: 5500~5700)

| 802.11n Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5500 | 100 | 6.5 Mbps | 7.35 | 0.22 | 7.57 | 23.91 |
| | | 13 Mbps | 7.25 | 0.42 | 7.67 | 23.91 |
| | | 19.5 Mbps | 7.14 | 0.60 | 7.74 | 23.91 |
| | | 26 Mbps | 6.91 | 0.78 | 7.69 | 23.91 |
| | | 39 Mbps | 6.59 | 1.09 | 7.68 | 23.91 |
| | | 52 Mbps | 6.33 | 1.35 | 7.68 | 23.91 |
| | | 58.5 Mbps | 6.22 | 1.45 | 7.67 | 23.91 |
| | | 65 Mbps | 6.16 | 1.57 | 7.73 | 23.91 |
| 5580 | 116 | 6.5 Mbps | 10.27 | 0.22 | 10.49 | 23.91 |
| | | 13 Mbps | 10.12 | 0.42 | 10.54 | 23.91 |
| | | 19.5 Mbps | 9.89 | 0.60 | 10.49 | 23.91 |
| | | 26 Mbps | 9.70 | 0.78 | 10.48 | 23.91 |
| | | 39 Mbps | 9.39 | 1.09 | 10.48 | 23.91 |
| | | 52 Mbps | 9.12 | 1.35 | 10.47 | 23.91 |
| | | 58.5 Mbps | 9.05 | 1.45 | 10.50 | 23.91 |
| | | 65 Mbps | 8.90 | 1.57 | 10.47 | 23.91 |
| 5700 | 140 | 6.5 Mbps | 8.56 | 0.22 | 8.78 | 23.91 |
| | | 13 Mbps | 8.31 | 0.42 | 8.73 | 23.91 |
| | | 19.5 Mbps | 8.16 | 0.60 | 8.76 | 23.91 |
| | | 26 Mbps | 7.97 | 0.78 | 8.75 | 23.91 |
| | | 39 Mbps | 7.64 | 1.09 | 8.73 | 23.91 |
| | | 52 Mbps | 7.39 | 1.35 | 8.74 | 23.91 |
| | | 58.5 Mbps | 7.28 | 1.45 | 8.73 | 23.91 |
| | | 65 Mbps | 7.14 | 1.57 | 8.71 | 23.91 |

**40 MHz BW**

**Conducted Output Power Measurements (802.11n Mode: 5190~5230)**

| 802.11n Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5190 | 38 | 13.5 Mbps | 8.53 | 0.43 | 8.96 | 16.99 |
| | | 27 Mbps | 7.73 | 0.78 | 8.51 | 16.99 |
| | | 40.5 Mbps | 7.36 | 1.09 | 8.45 | 16.99 |
| | | 54 Mbps | 7.01 | 1.37 | 8.38 | 16.99 |
| | | 81 Mbps | 6.55 | 1.82 | 8.37 | 16.99 |
| | | 108 Mbps | 6.13 | 2.15 | 8.28 | 16.99 |
| | | 121.5 Mbps | 5.95 | 2.30 | 8.25 | 16.99 |
| | | 135 Mbps | 5.80 | 2.46 | 8.26 | 16.99 |
| 5230 | 46 | 13.5 Mbps | 9.26 | 0.43 | 9.69 | 16.99 |
| | | 27 Mbps | 8.86 | 0.78 | 9.64 | 16.99 |
| | | 40.5 Mbps | 8.51 | 1.09 | 9.60 | 16.99 |
| | | 54 Mbps | 8.15 | 1.37 | 9.52 | 16.99 |
| | | 81 Mbps | 7.67 | 1.82 | 9.49 | 16.99 |
| | | 108 Mbps | 7.32 | 2.15 | 9.47 | 16.99 |
| | | 121.5 Mbps | 7.10 | 2.30 | 9.40 | 16.99 |
| | | 135 Mbps | 6.93 | 2.46 | 9.39 | 16.99 |

## Conducted Output Power Measurements (802.11n Mode: 5270~5310)

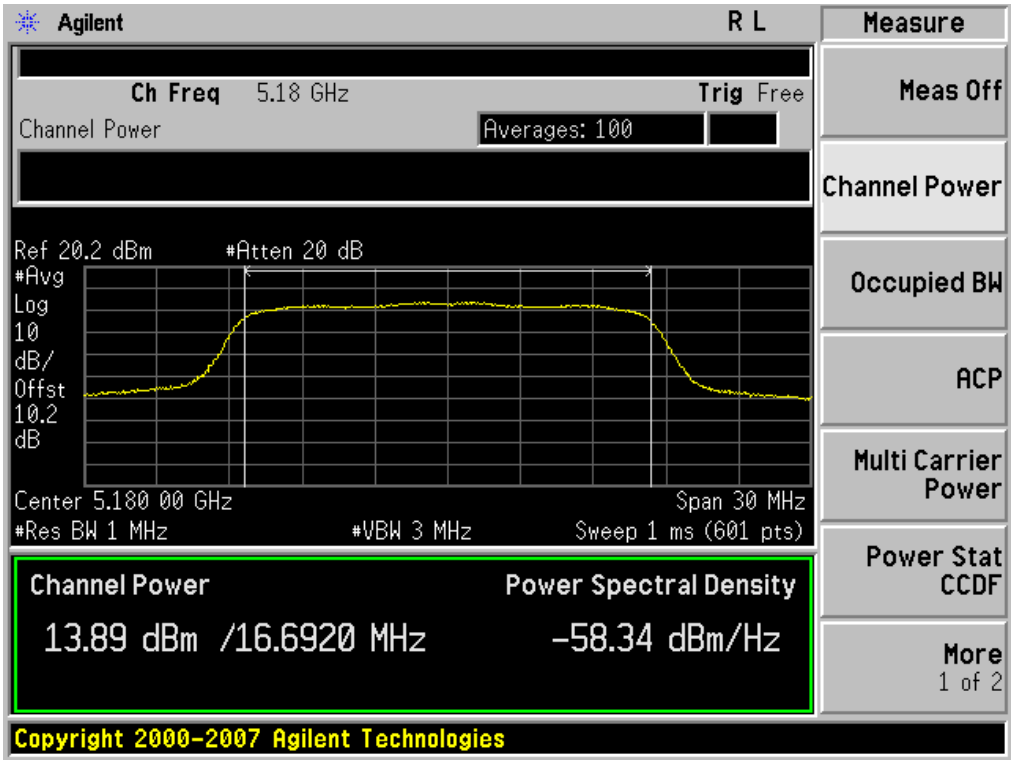
| 802.11n Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5270 | 54 | 13.5 Mbps | 10.64 | 0.43 | 11.07 | 23.98 |
| | | 27 Mbps | 10.32 | 0.78 | 11.10 | 23.98 |
| | | 40.5 Mbps | 9.99 | 1.09 | 11.08 | 23.98 |
| | | 54 Mbps | 9.65 | 1.37 | 11.02 | 23.98 |
| | | 81 Mbps | 9.15 | 1.82 | 10.97 | 23.98 |
| | | 108 Mbps | 8.78 | 2.15 | 10.93 | 23.98 |
| | | 121.5 Mbps | 8.63 | 2.30 | 10.93 | 23.98 |
| | | 135 Mbps | 8.41 | 2.46 | 10.87 | 23.98 |
| 5310 | 62 | 13.5 Mbps | 8.50 | 0.43 | 8.93 | 23.98 |
| | | 27 Mbps | 8.09 | 0.78 | 8.87 | 23.98 |
| | | 40.5 Mbps | 7.72 | 1.09 | 8.81 | 23.98 |
| | | 54 Mbps | 7.45 | 1.37 | 8.82 | 23.98 |
| | | 81 Mbps | 6.92 | 1.82 | 8.74 | 23.98 |
| | | 108 Mbps | 6.60 | 2.15 | 8.75 | 23.98 |
| | | 121.5 Mbps | 6.41 | 2.30 | 8.71 | 23.98 |
| | | 135 Mbps | 6.19 | 2.46 | 8.65 | 23.98 |

**Conducted Output Power Measurements (802.11n Mode: 5510~5670)**

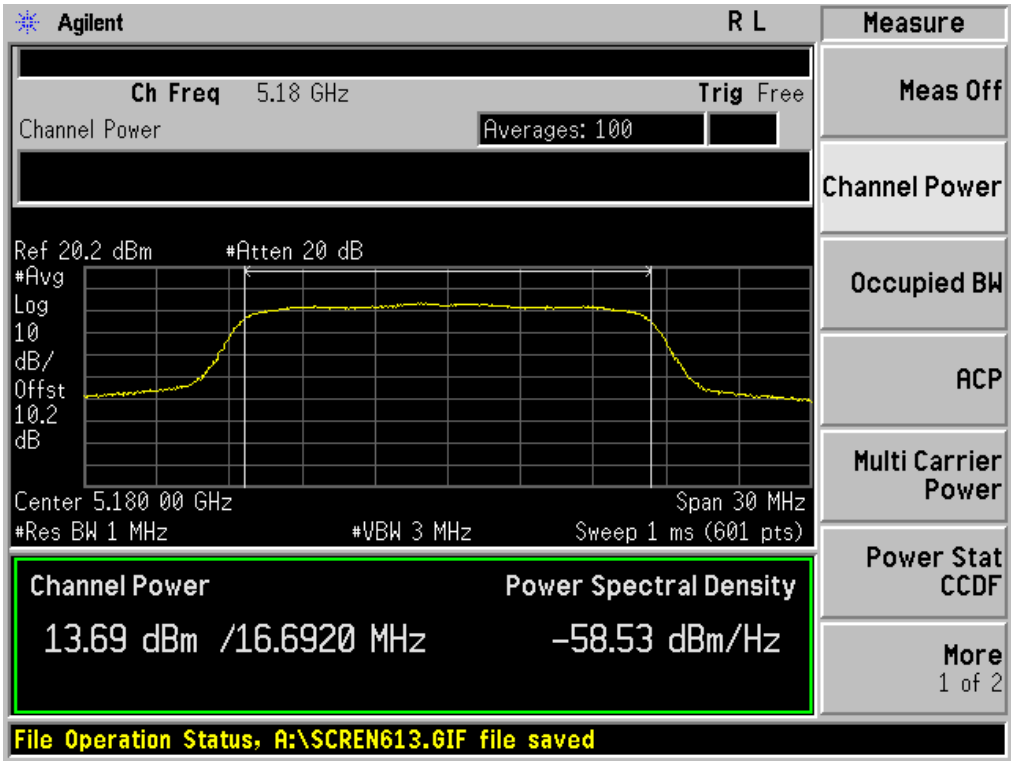
| 802.11n Mode | | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|---|---|---|---|---|---|---|
| Frequency [MHz] | Channel No. | | | | | |
| 5510 | 102 | 13.5 Mbps | 9.58 | 0.43 | 10.01 | 23.98 |
| | | 27 Mbps | 9.21 | 0.78 | 9.99 | 23.98 |
| | | 40.5 Mbps | 8.85 | 1.09 | 9.94 | 23.98 |
| | | 54 Mbps | 8.58 | 1.37 | 9.95 | 23.98 |
| | | 81 Mbps | 8.09 | 1.82 | 9.91 | 23.98 |
| | | 108 Mbps | 7.64 | 2.15 | 9.79 | 23.98 |
| | | 121.5 Mbps | 7.53 | 2.30 | 9.83 | 23.98 |
| | | 135 Mbps | 7.29 | 2.46 | 9.75 | 23.98 |
| 5550 | 110 | 13.5 Mbps | 9.85 | 0.43 | 10.28 | 23.98 |
| | | 27 Mbps | 9.45 | 0.78 | 10.23 | 23.98 |
| | | 40.5 Mbps | 9.00 | 1.09 | 10.09 | 23.98 |
| | | 54 Mbps | 8.7 | 1.37 | 10.07 | 23.98 |
| | | 81 Mbps | 8.24 | 1.82 | 10.06 | 23.98 |
| | | 108 Mbps | 7.76 | 2.15 | 9.91 | 23.98 |
| | | 121.5 Mbps | 7.62 | 2.30 | 9.92 | 23.98 |
| | | 135 Mbps | 7.47 | 2.46 | 9.93 | 23.98 |
| 5670 | 134 | 13.5 Mbps | 10.06 | 0.43 | 10.49 | 23.98 |
| | | 27 Mbps | 9.66 | 0.78 | 10.44 | 23.98 |
| | | 40.5 Mbps | 9.35 | 1.09 | 10.44 | 23.98 |
| | | 54 Mbps | 8.94 | 1.37 | 10.31 | 23.98 |
| | | 81 Mbps | 8.52 | 1.82 | 10.34 | 23.98 |
| | | 108 Mbps | 8.13 | 2.15 | 10.28 | 23.98 |
| | | 121.5 Mbps | 7.92 | 2.30 | 10.22 | 23.98 |
| | | 135 Mbps | 7.77 | 2.46 | 10.23 | 23.98 |

## ▣ RESULT PLOTS (5180 MHz ~5240 MHz)

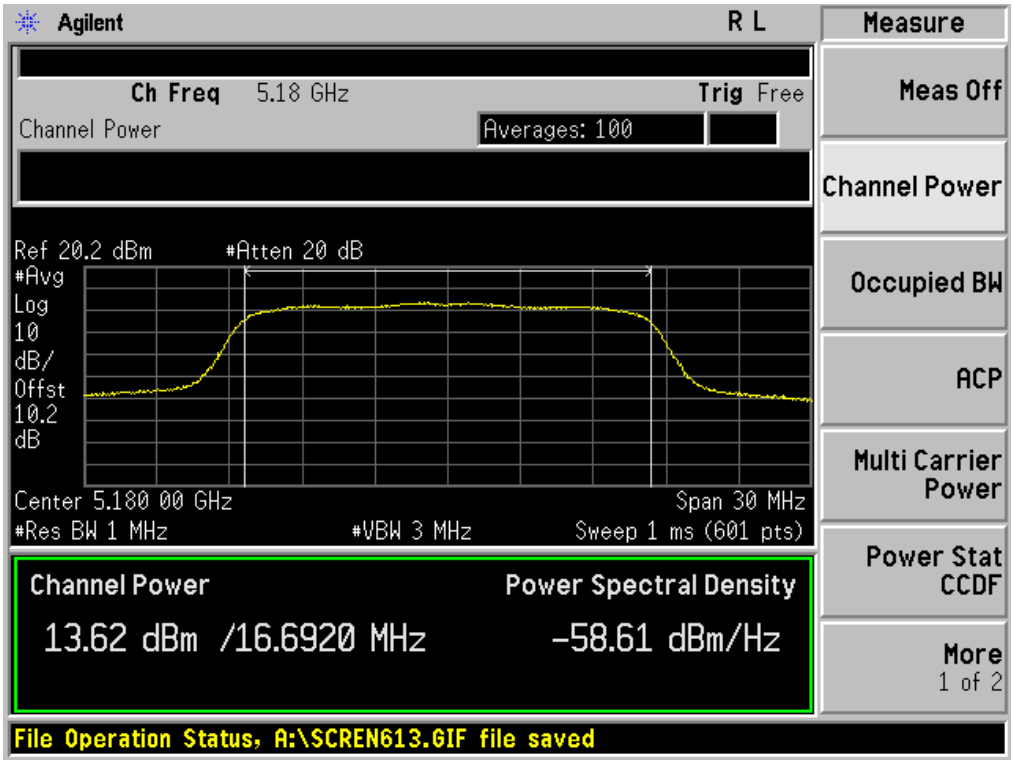
### Conducted Output Power (802.11a-CH 36) 6 Mbps



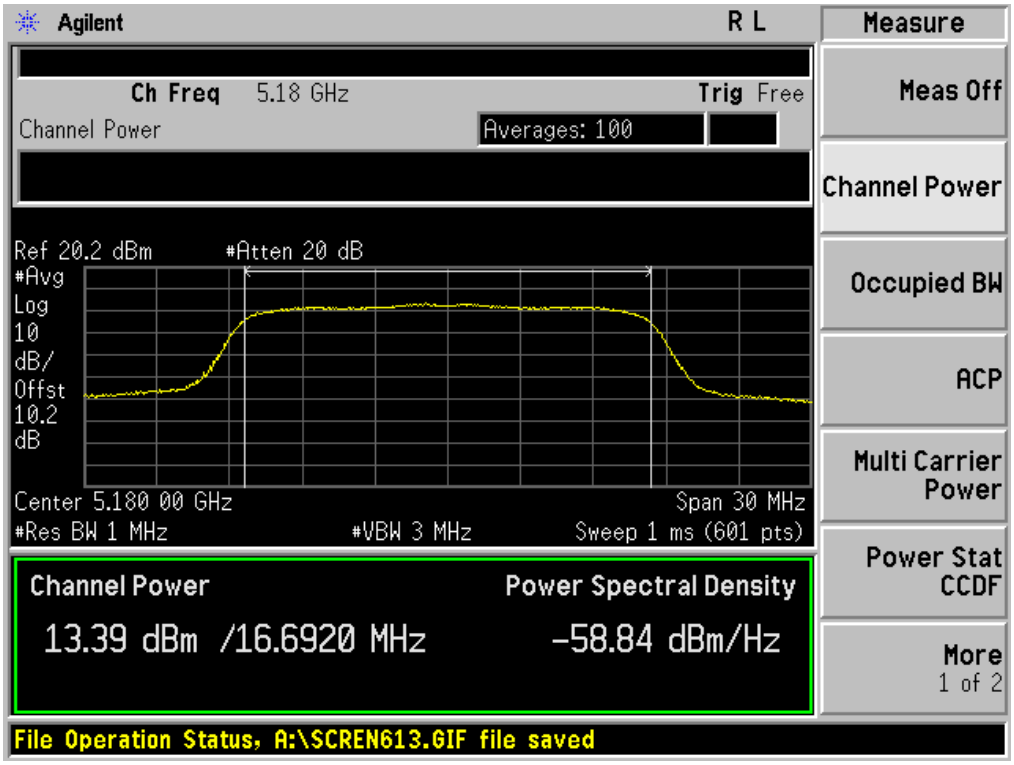

### Conducted Output Power (802.11a-CH 36) 9 Mbps



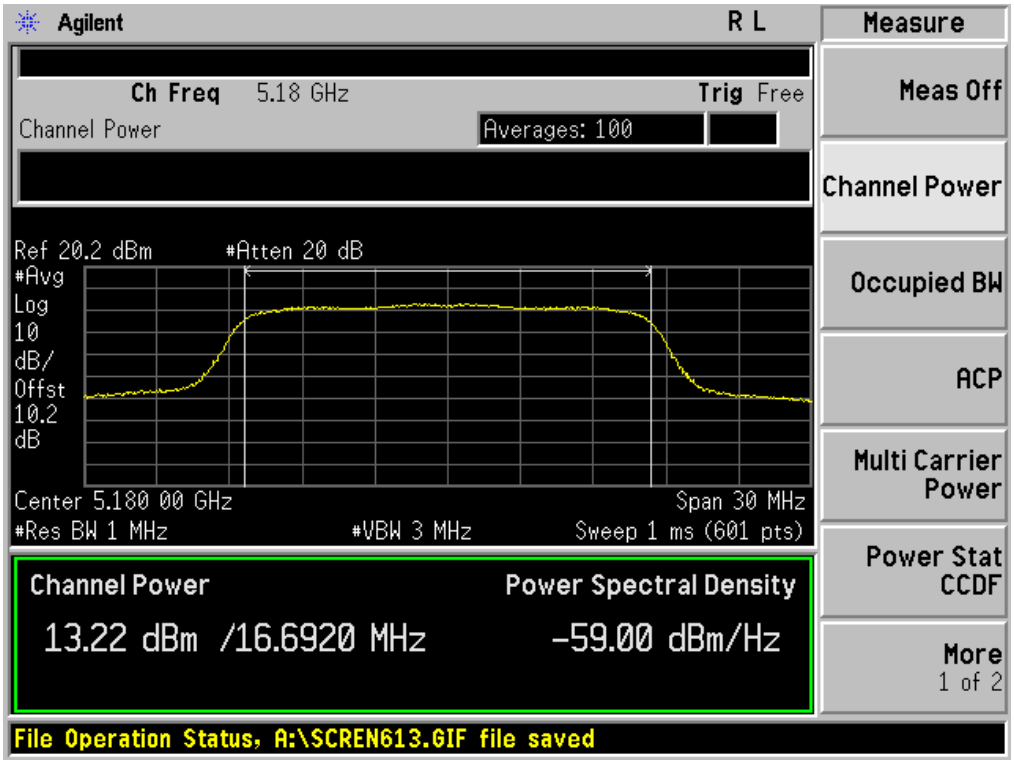
## Conducted Output Power (802.11a-CH 36) 12 Mbps



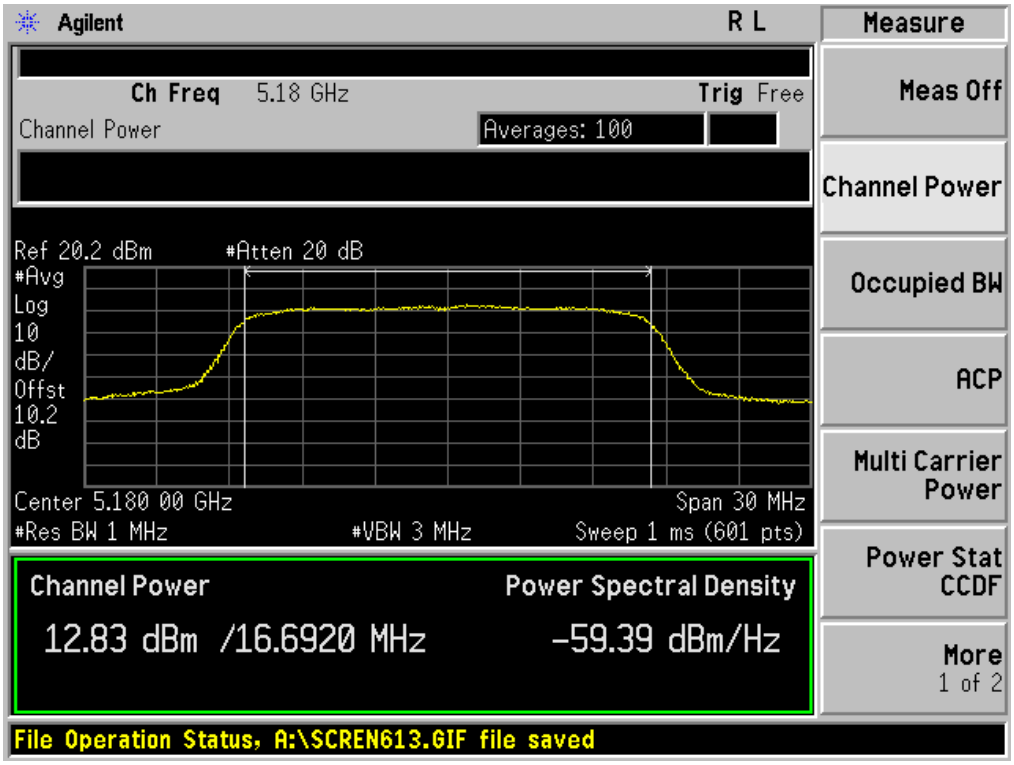

## Conducted Output Power (802.11a-CH 36) 18 Mbps



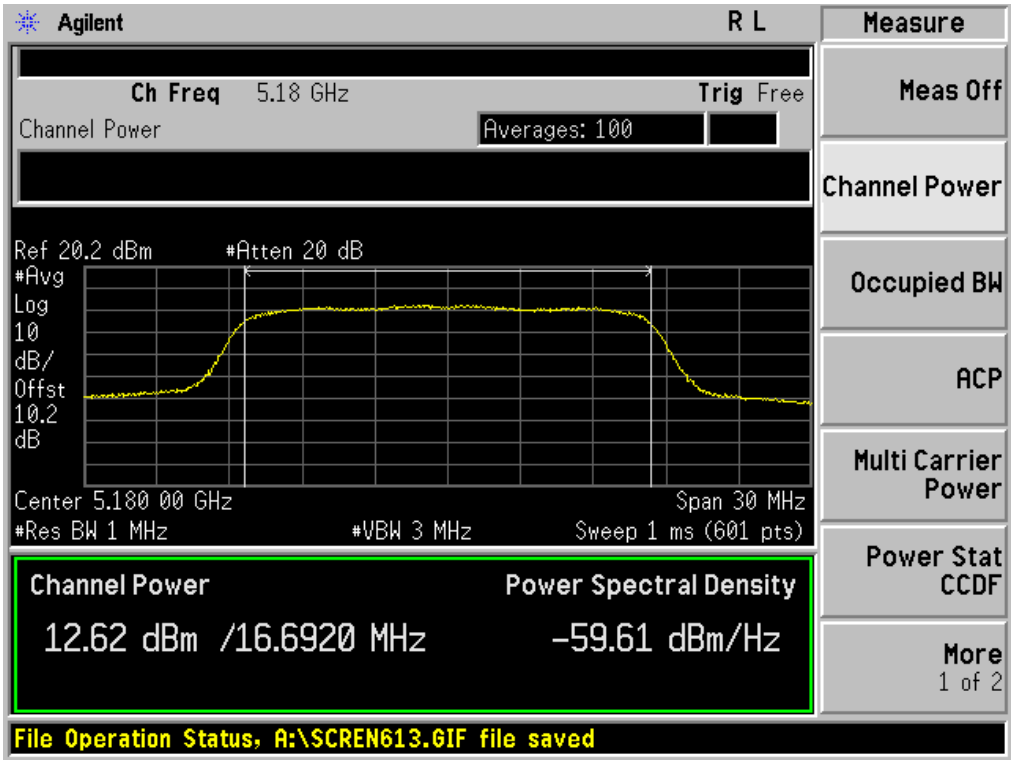
## Conducted Output Power (802.11a-CH 36) 24 Mbps



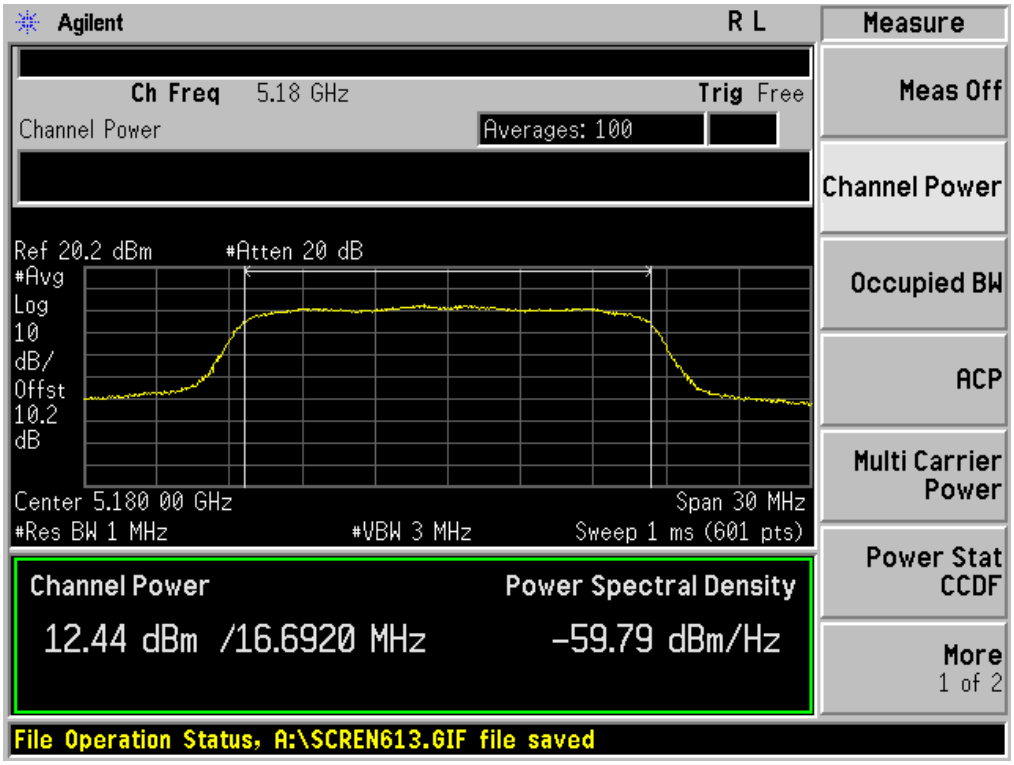

## Conducted Output Power (802.11a-CH 36) 36 Mbps



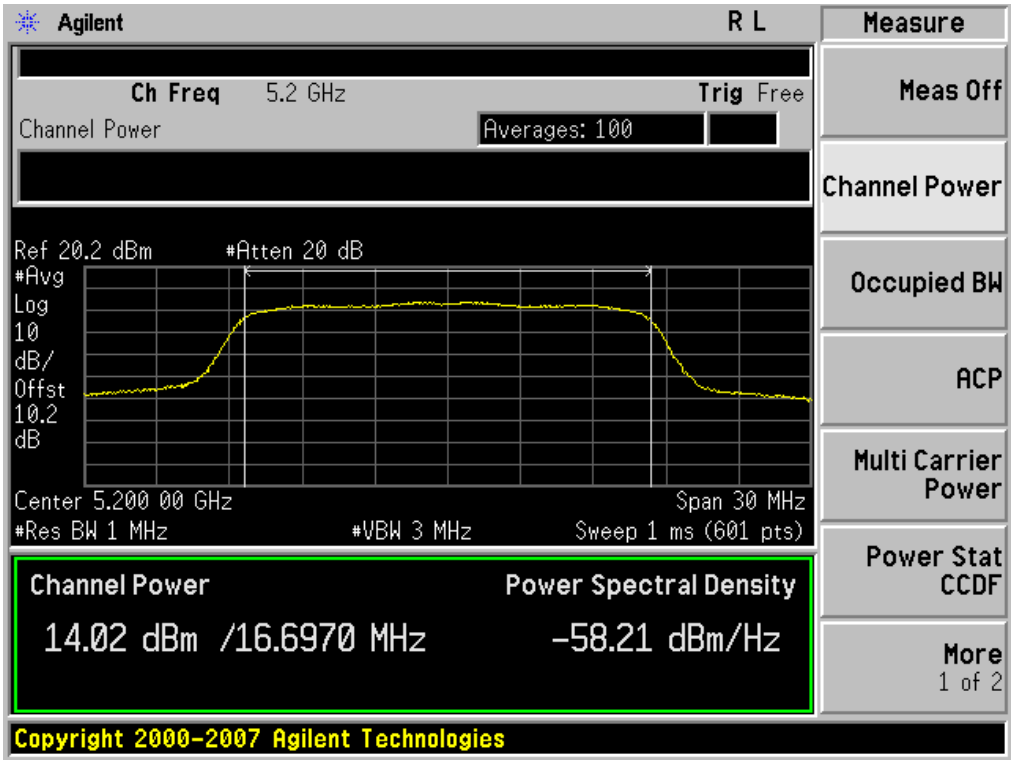
## Conducted Output Power (802.11a-CH 36) 48 Mbps



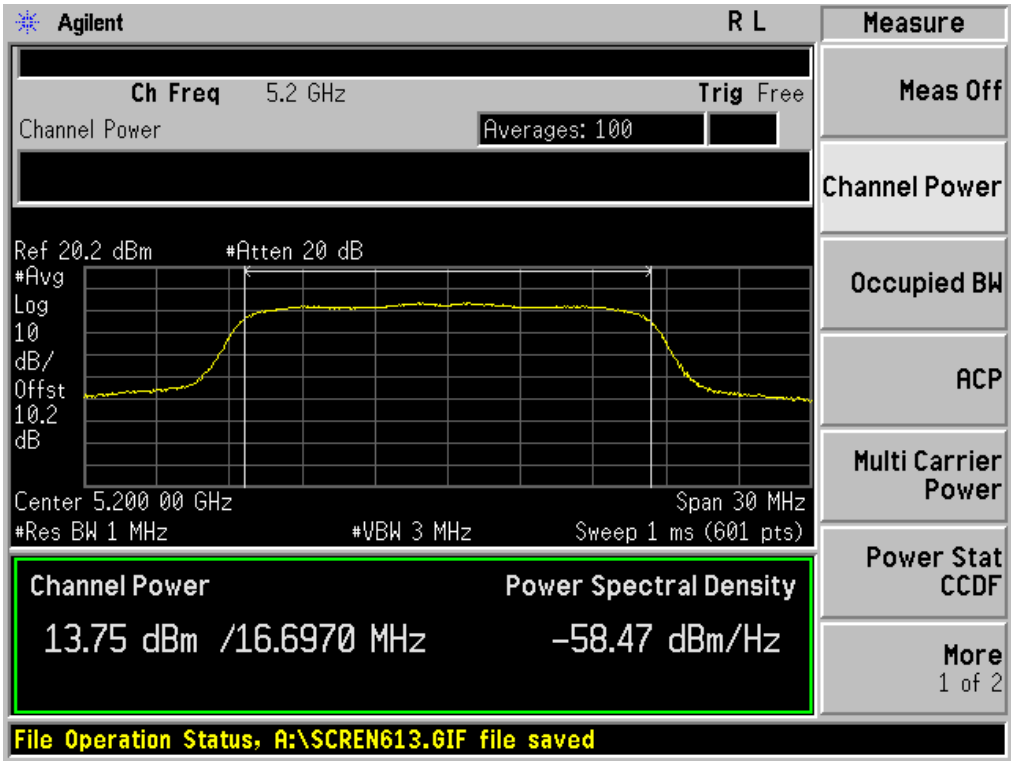

## Conducted Output Power (802.11a-CH 36) 54 Mbps



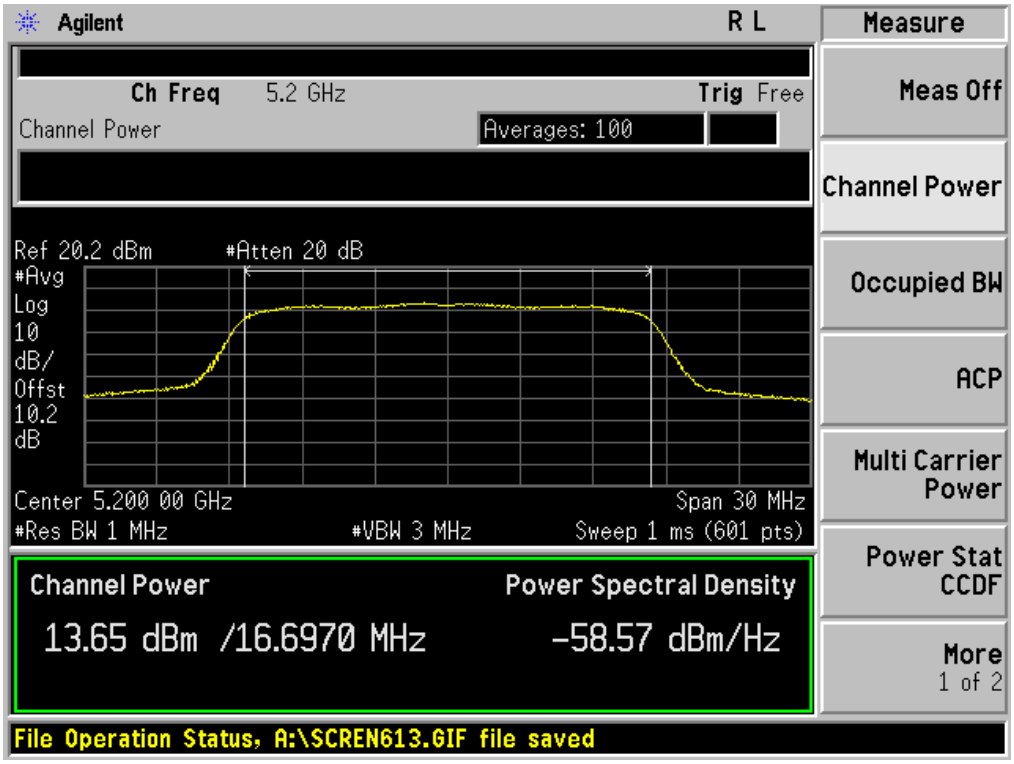
## Conducted Output Power (802.11a-CH 40) 6 Mbps



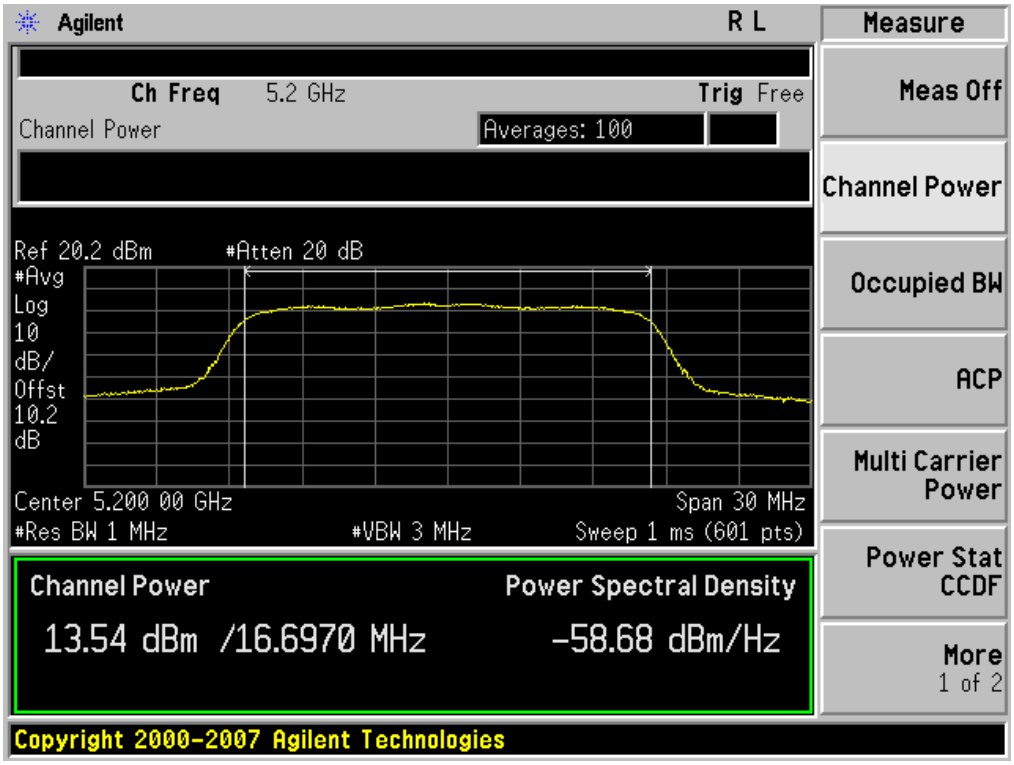

## Conducted Output Power (802.11a-CH 40) 9 Mbps



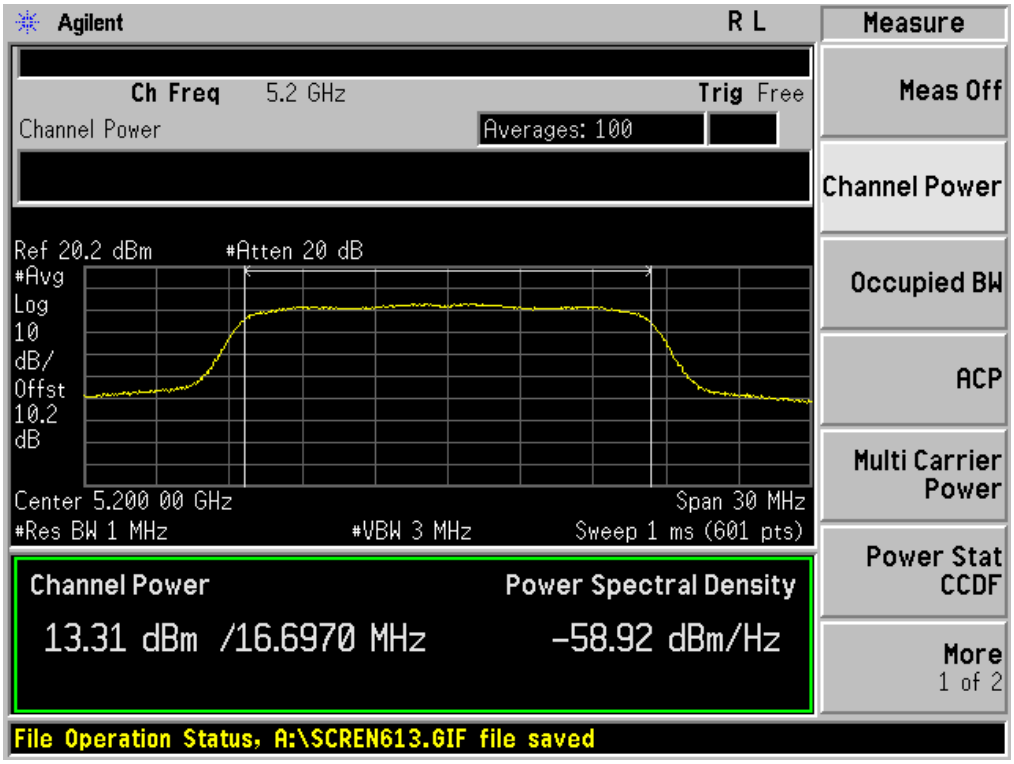
## Conducted Output Power (802.11a-CH 40) 12 Mbps



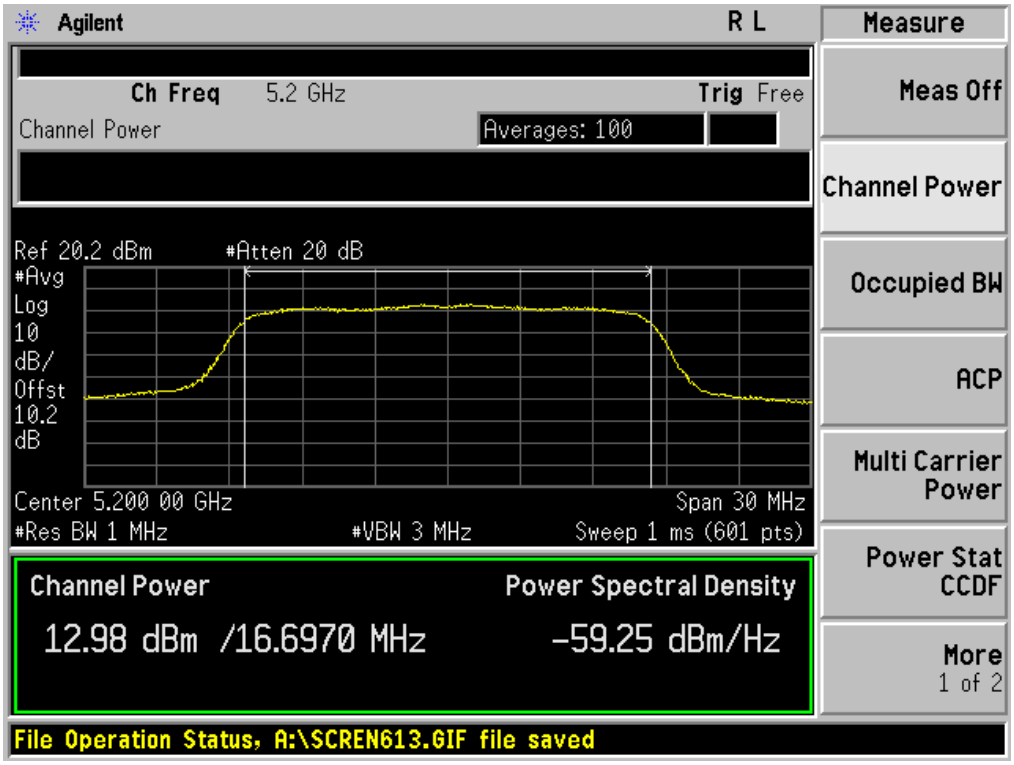

## Conducted Output Power (802.11a-CH 40) 18 Mbps



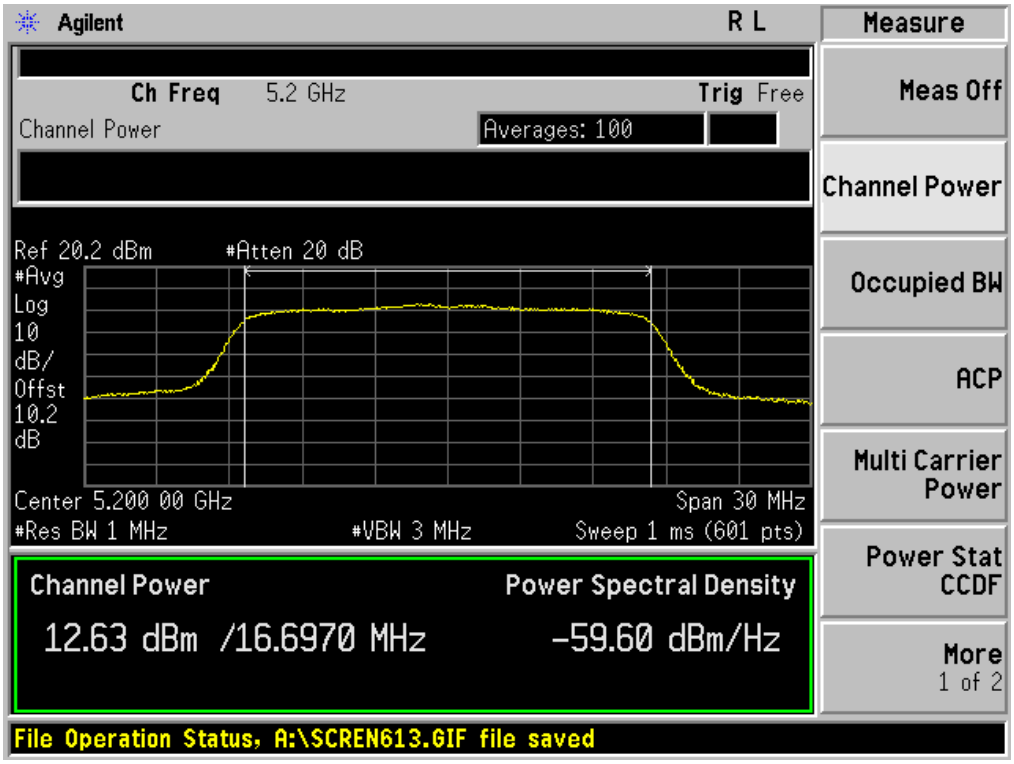
## Conducted Output Power (802.11a-CH 40) 24 Mbps



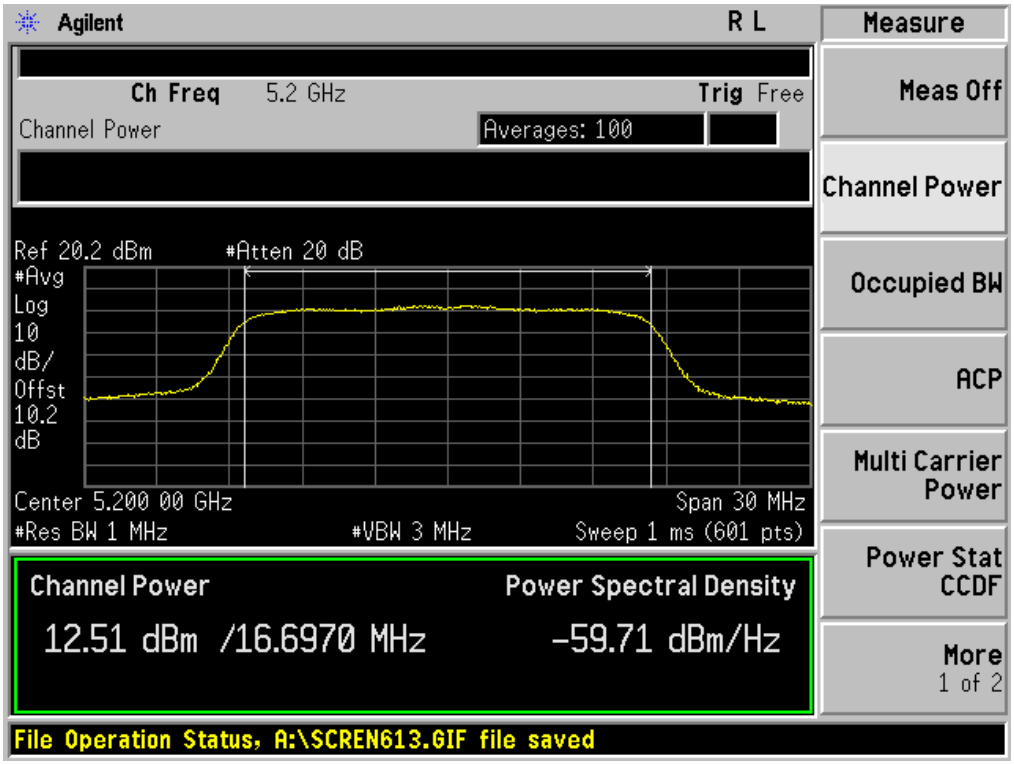

## Conducted Output Power (802.11a-CH 40) 36 Mbps



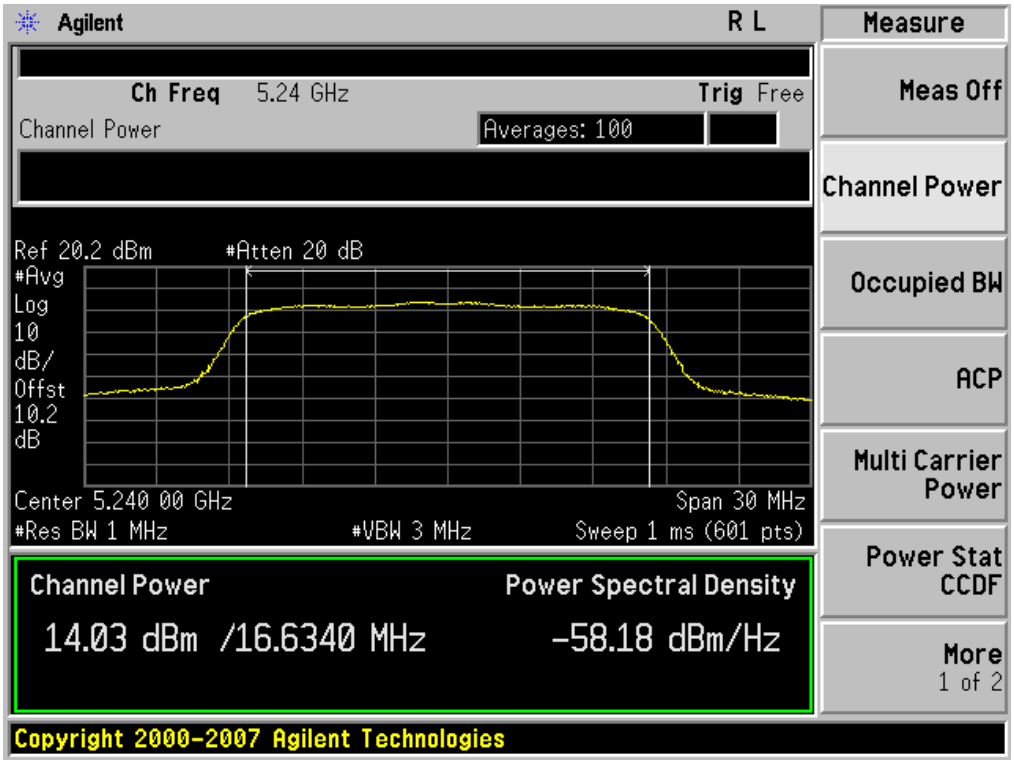
## Conducted Output Power (802.11a-CH 40) 48 Mbps



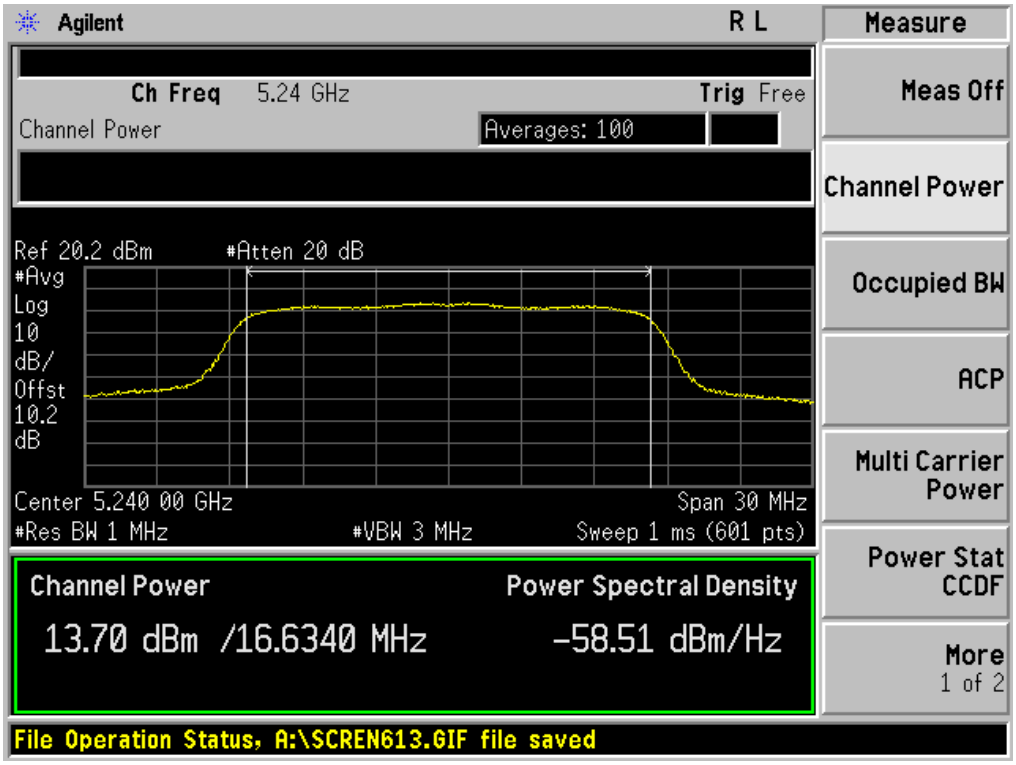

## Conducted Output Power (802.11a-CH 40) 54 Mbps



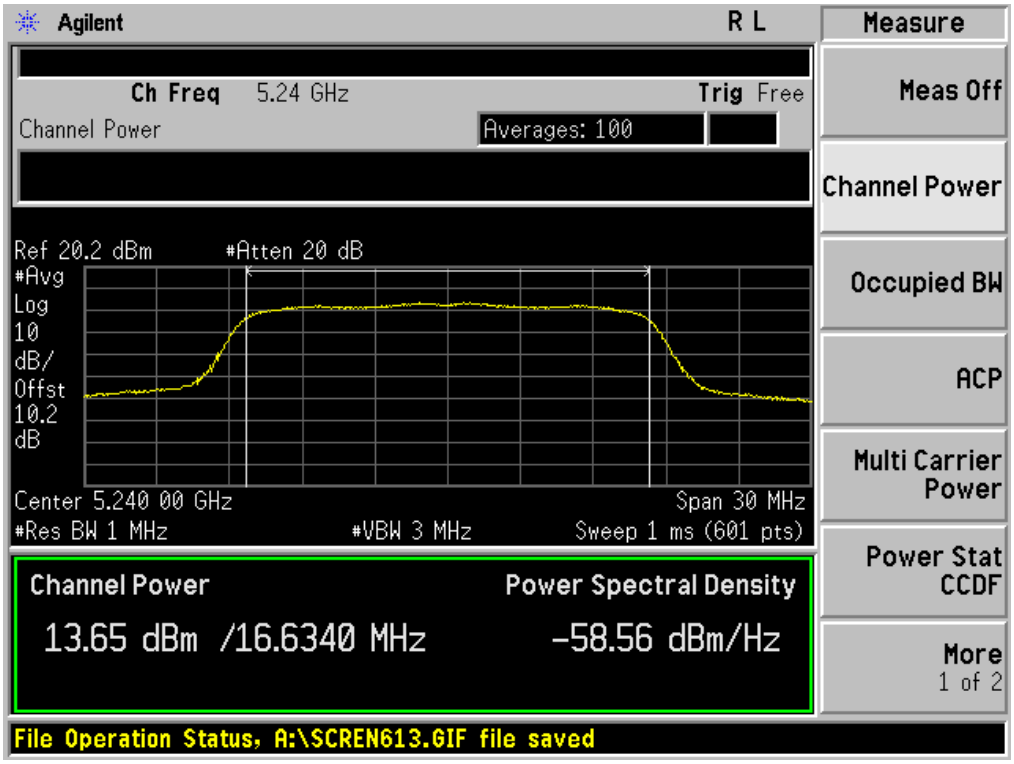
## Conducted Output Power (802.11a-CH 48) 6 Mbps



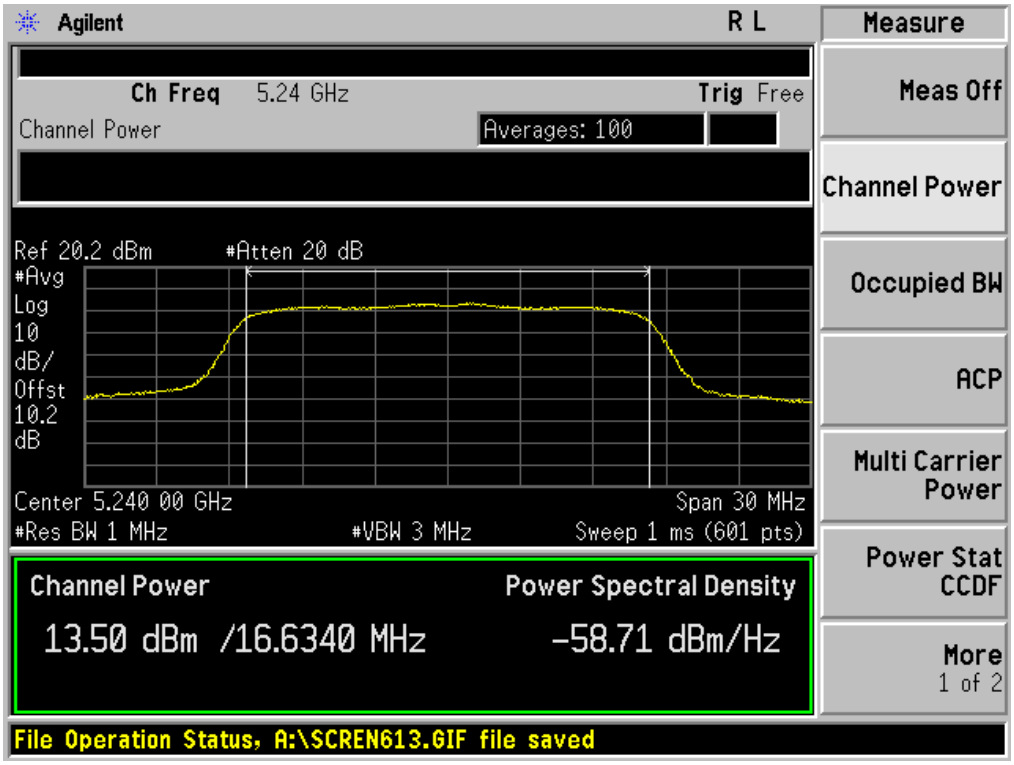

## Conducted Output Power (802.11a-CH 48) 9 Mbps



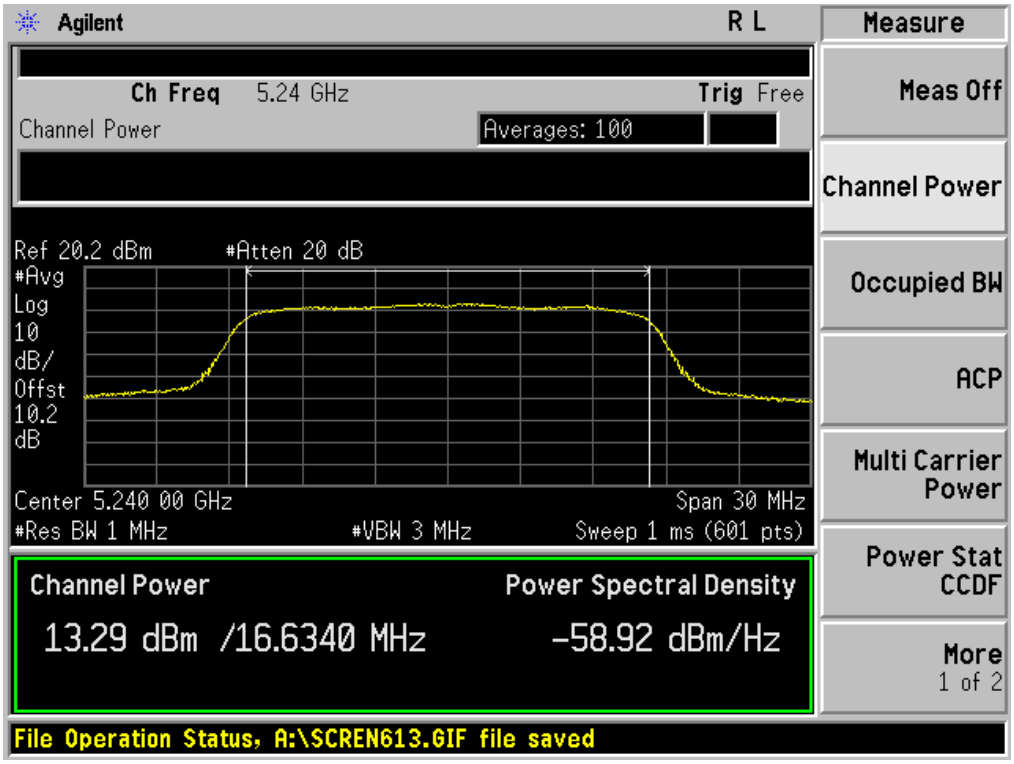
## Conducted Output Power (802.11a-CH 48) 12 Mbps



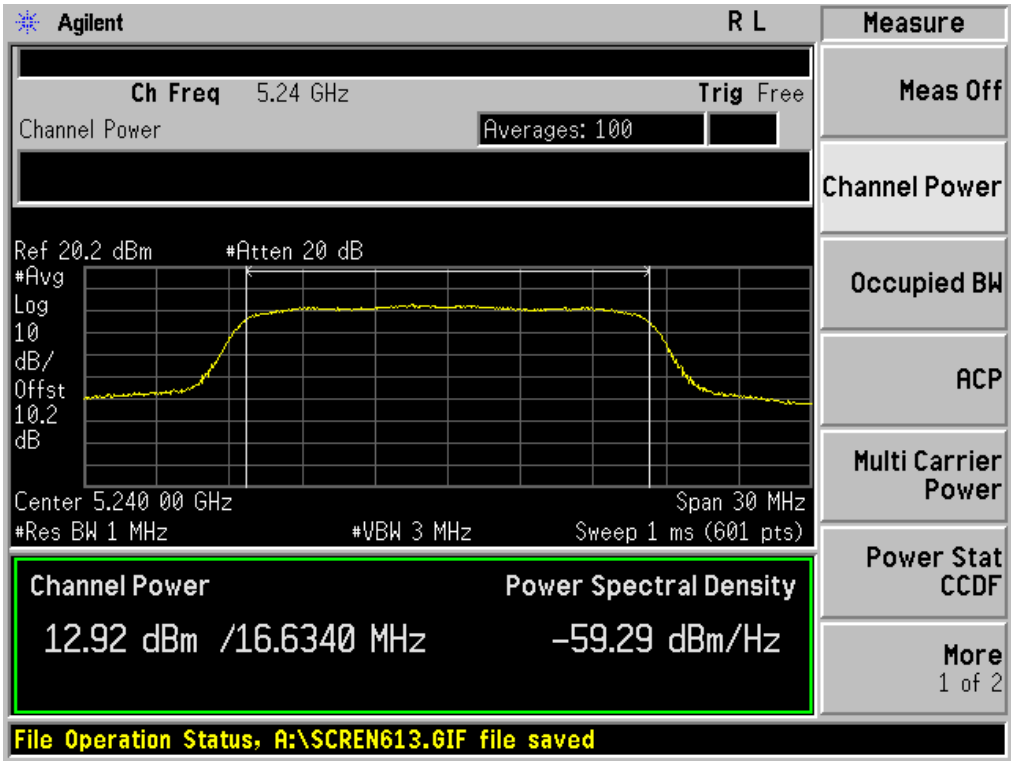

## Conducted Output Power (802.11a-CH 48) 18 Mbps



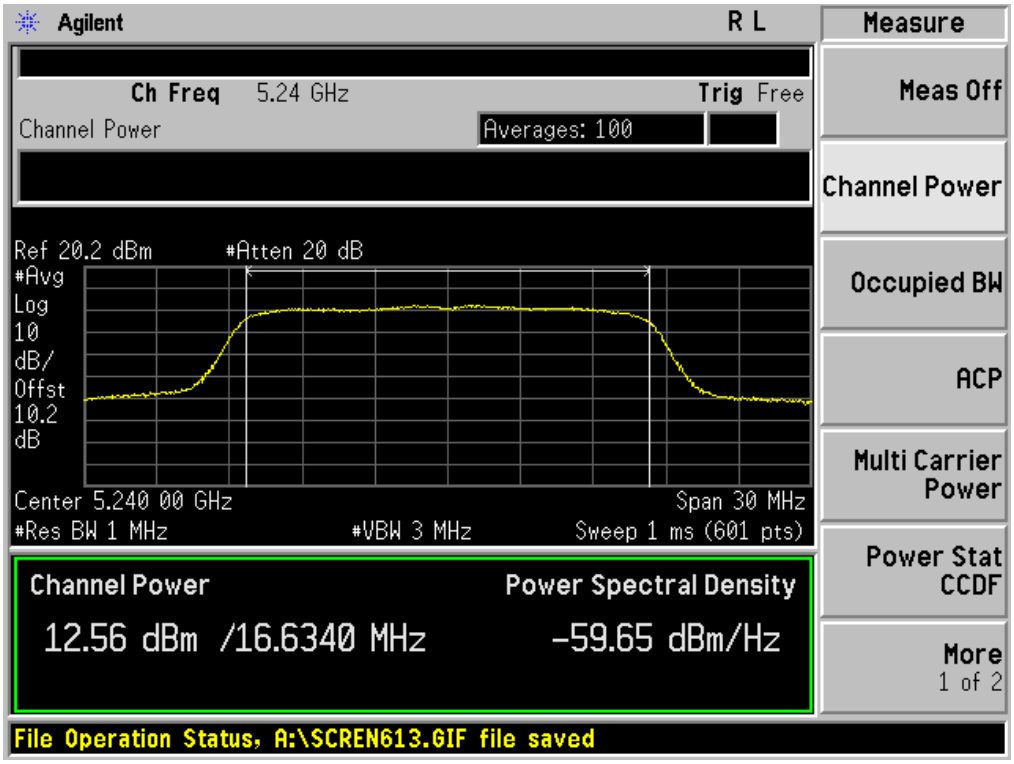
## Conducted Output Power (802.11a-CH 48) 24 Mbps



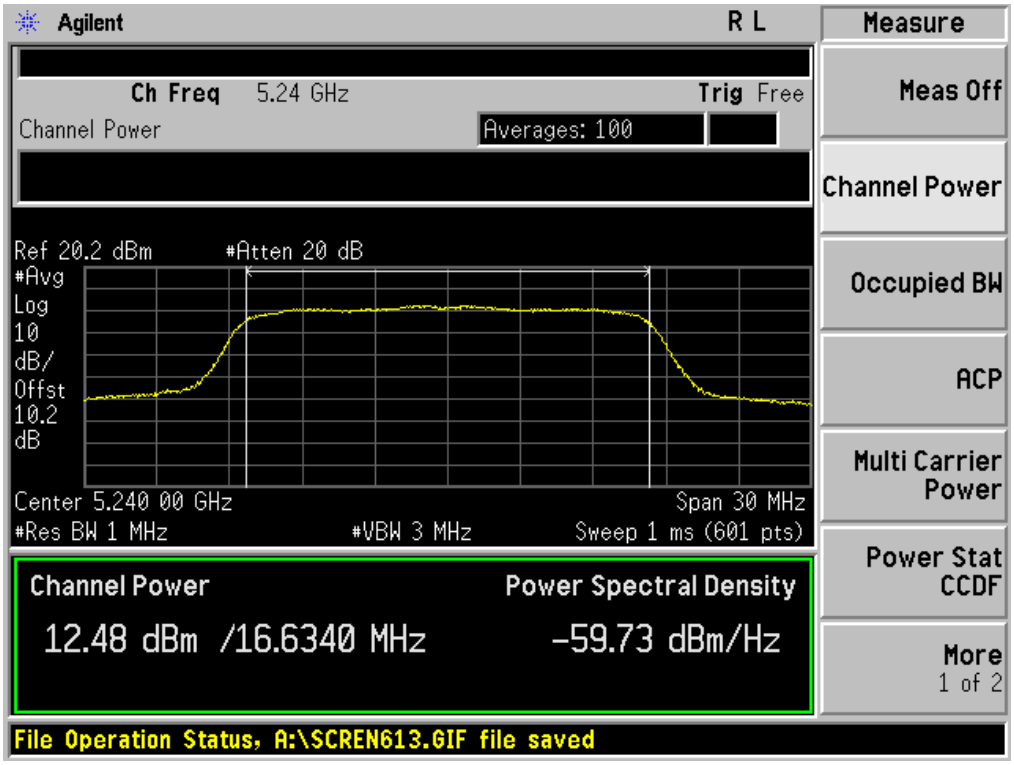

## Conducted Output Power (802.11a-CH 48) 36 Mbps



## Conducted Output Power (802.11a-CH 48) 48 Mbps

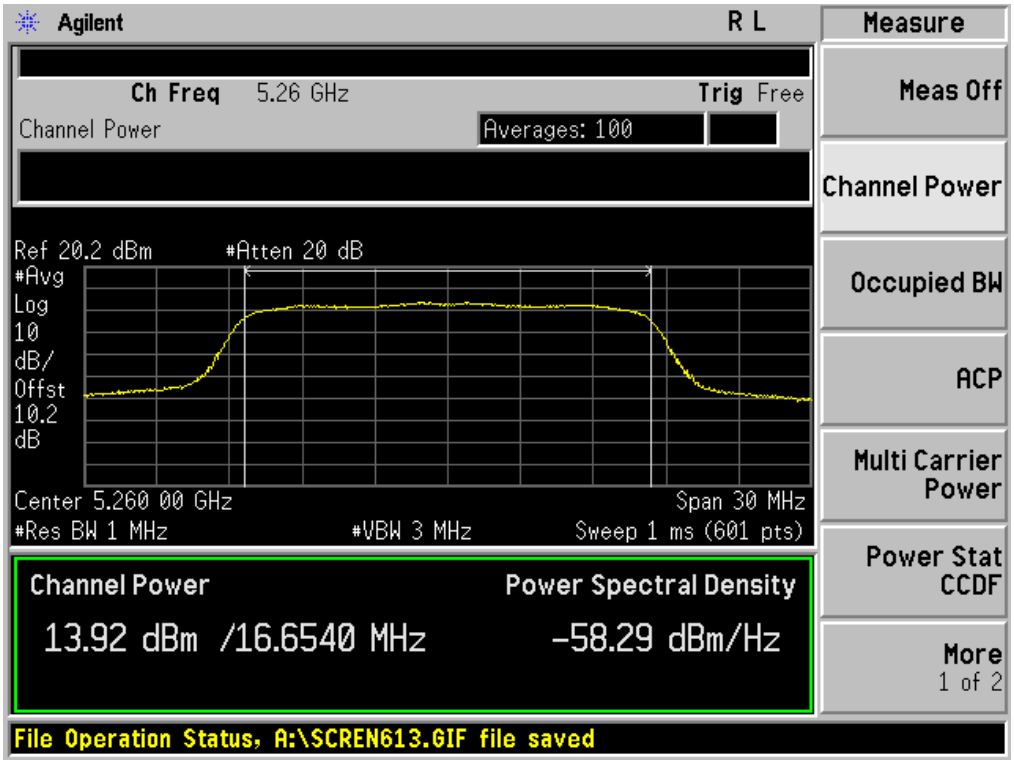



## Conducted Output Power (802.11a-CH 48) 54 Mbps

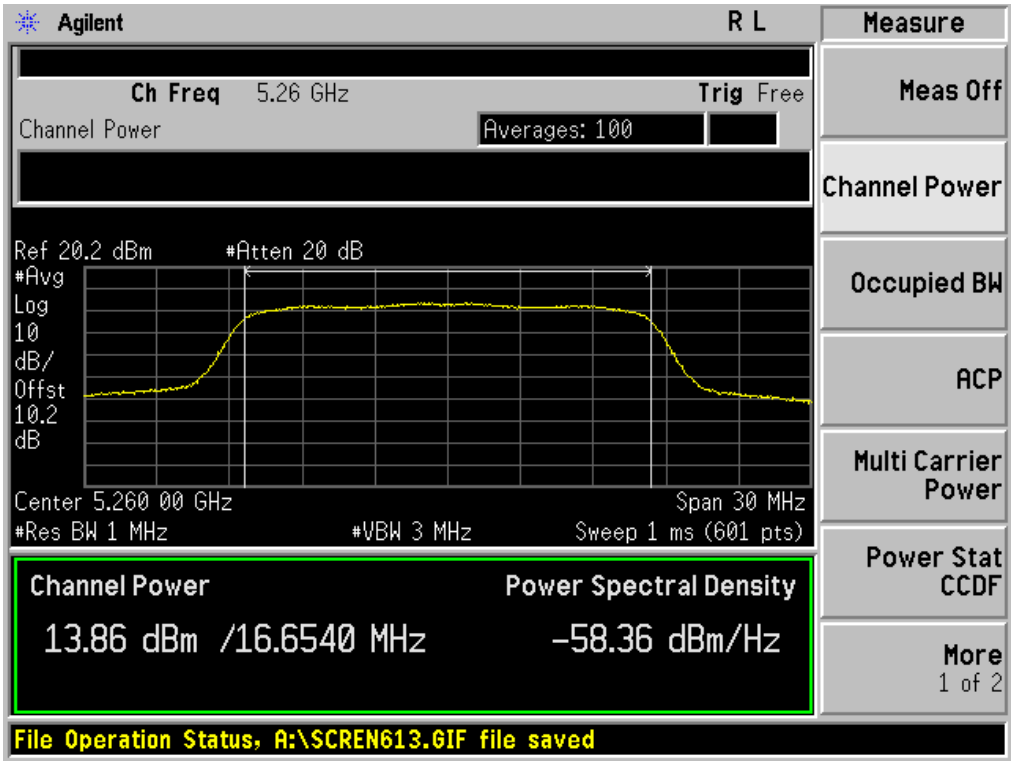


## ▣ RESULT PLOTS (5260 MHz ~5320 MHz)

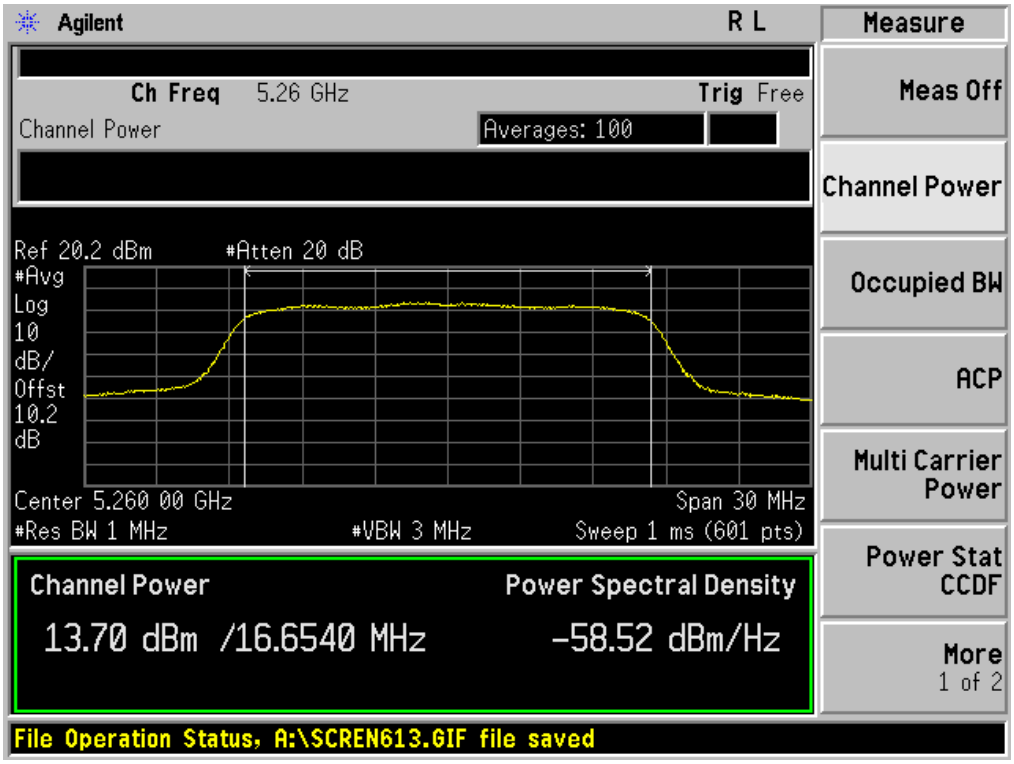
### Conducted Output Power (802.11a-CH 52) 6 Mbps



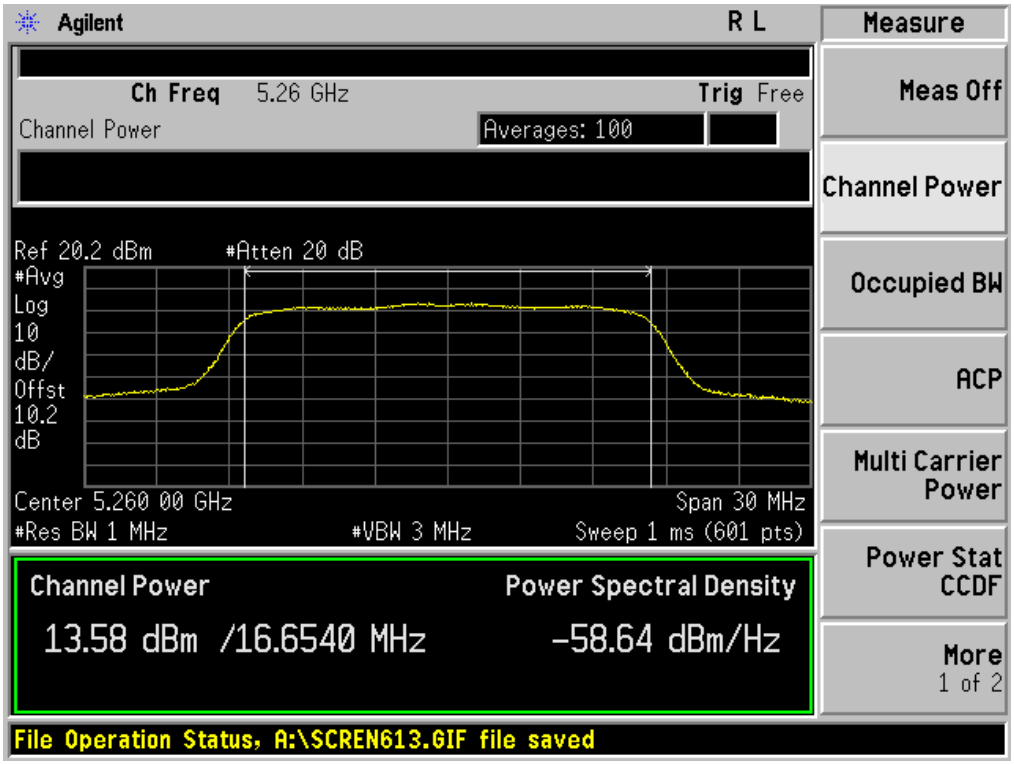

### Conducted Output Power (802.11a-CH 52) 9 Mbps



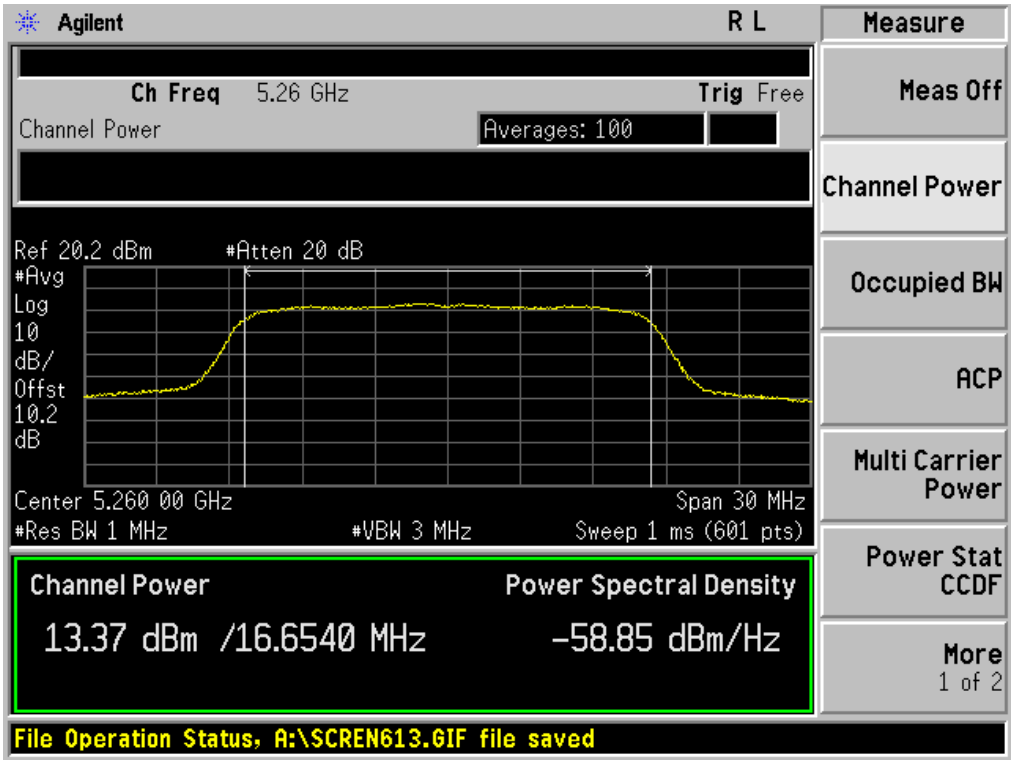
## Conducted Output Power (802.11a-CH 52) 12 Mbps



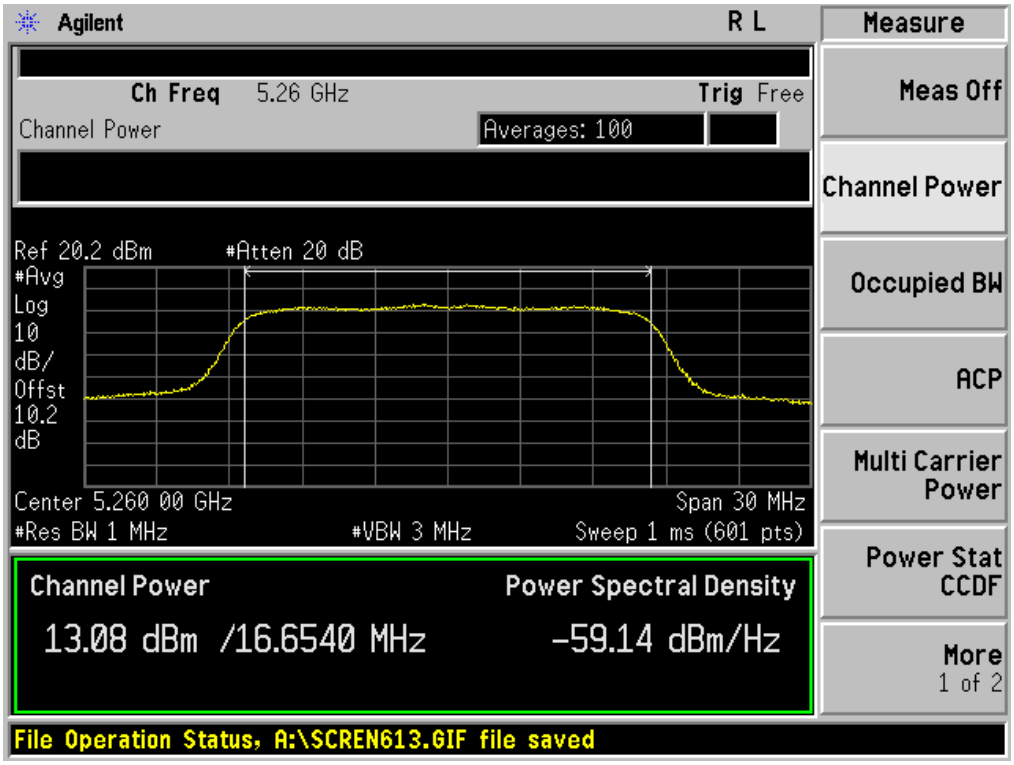

## Conducted Output Power (802.11a-CH 52) 18 Mbps



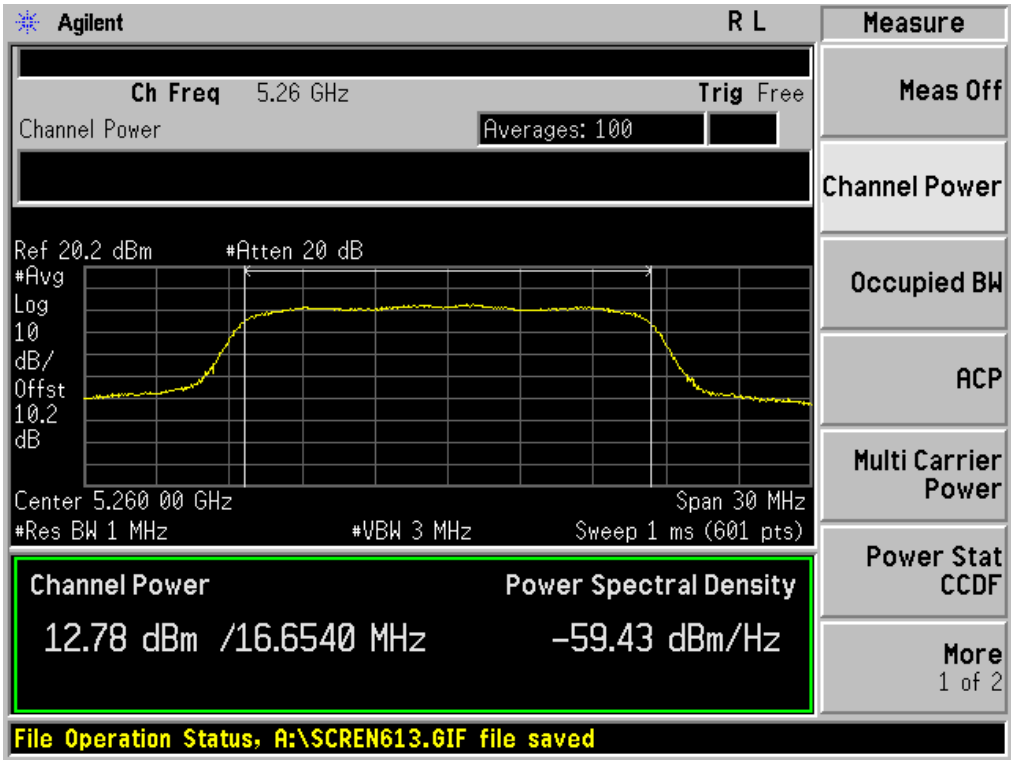
## Conducted Output Power (802.11a-CH 52) 24 Mbps



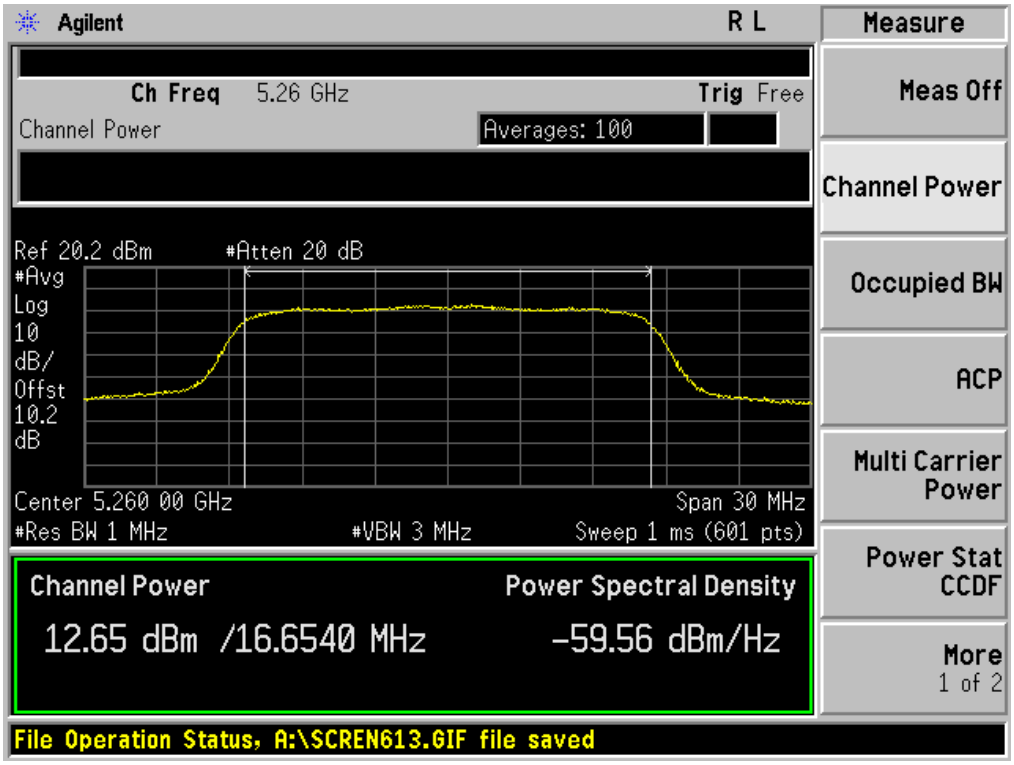

## Conducted Output Power (802.11a-CH 52) 36 Mbps



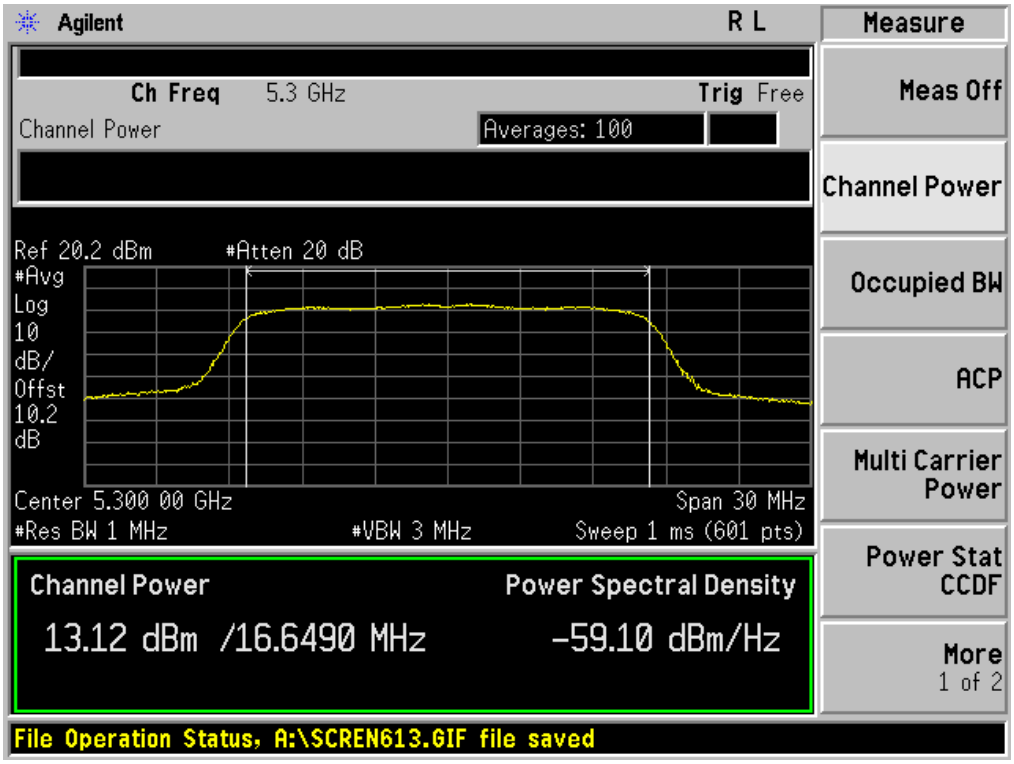
## Conducted Output Power (802.11a-CH 52) 48 Mbps



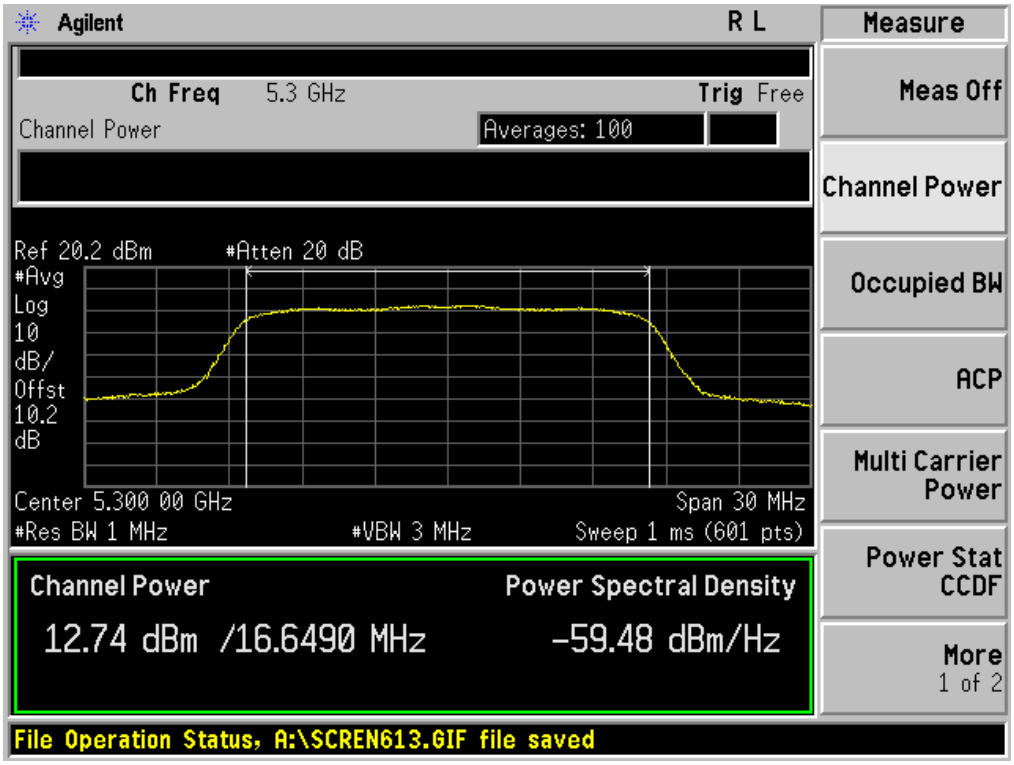

## Conducted Output Power (802.11a-CH 52) 54 Mbps



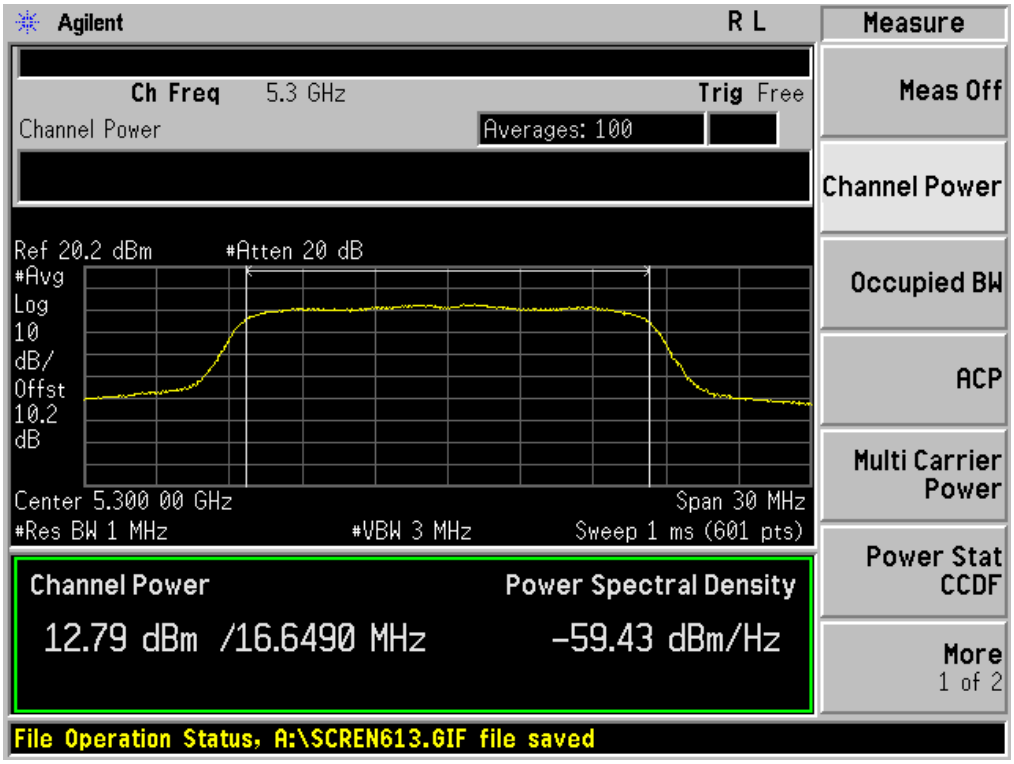
## Conducted Output Power (802.11a-CH 60) 6 Mbps



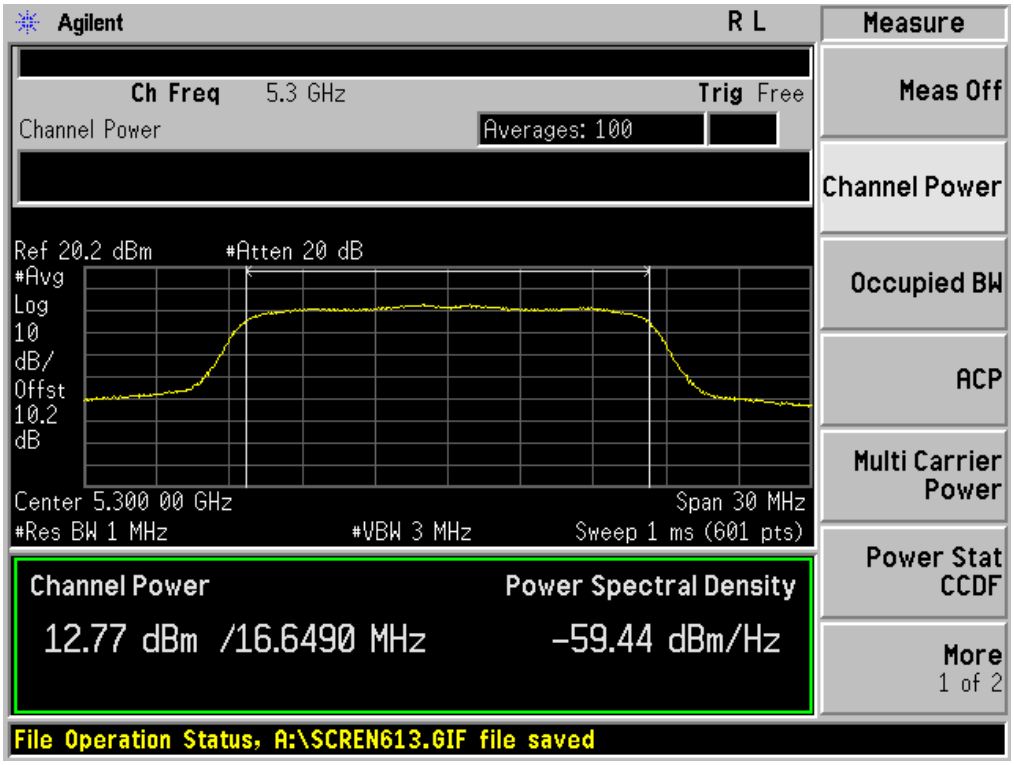

## Conducted Output Power (802.11a-CH 60) 9 Mbps



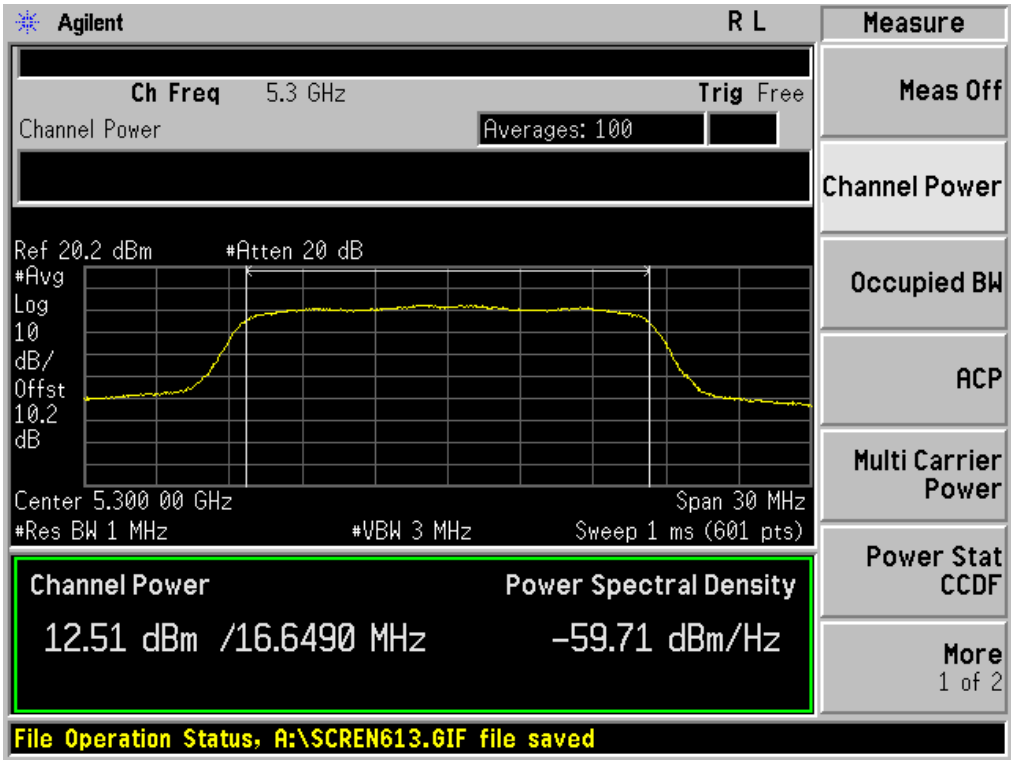
## Conducted Output Power (802.11a-CH 60) 12 Mbps



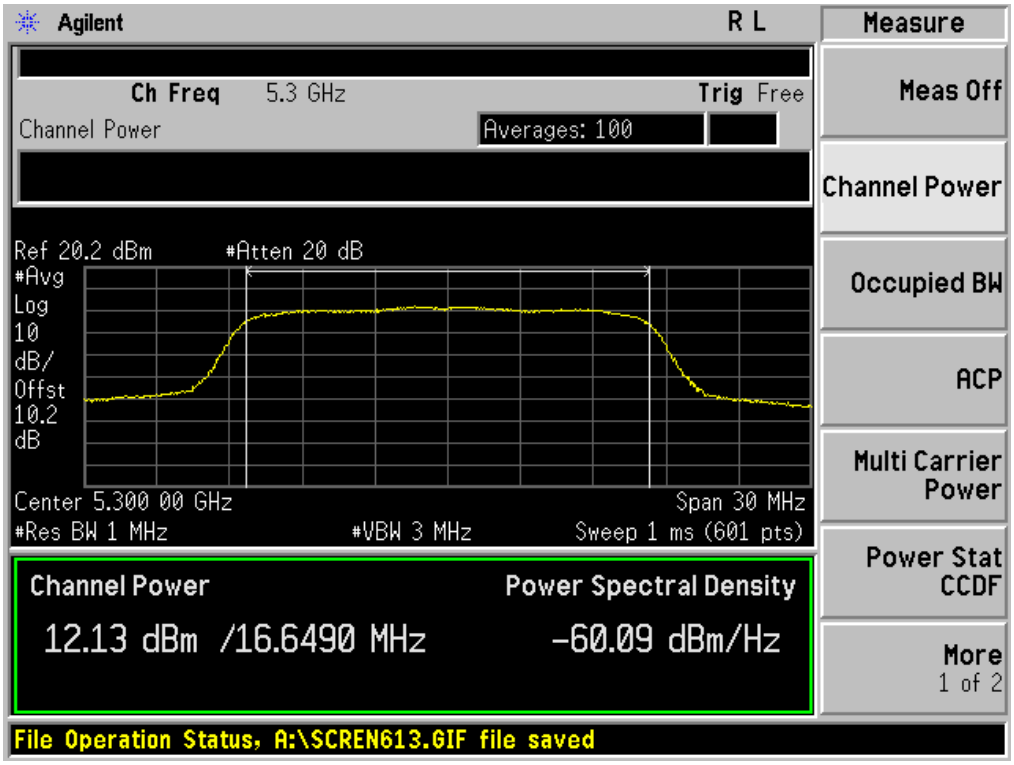

## Conducted Output Power (802.11a-CH 60) 18 Mbps



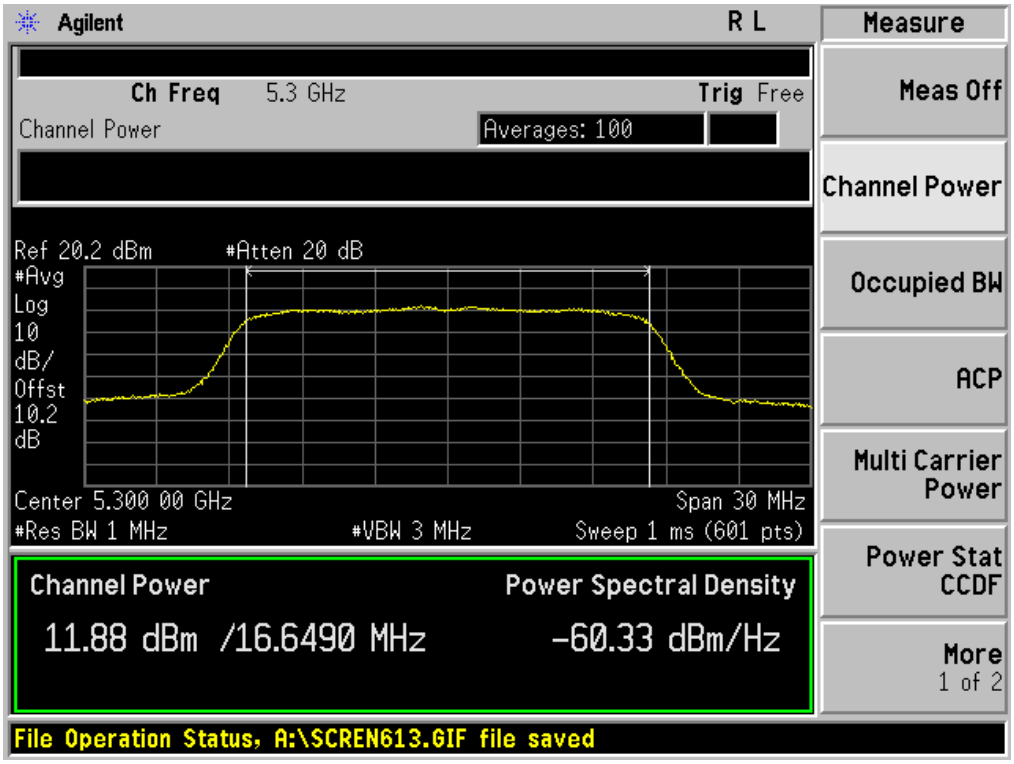
## Conducted Output Power (802.11a-CH 60) 24 Mbps



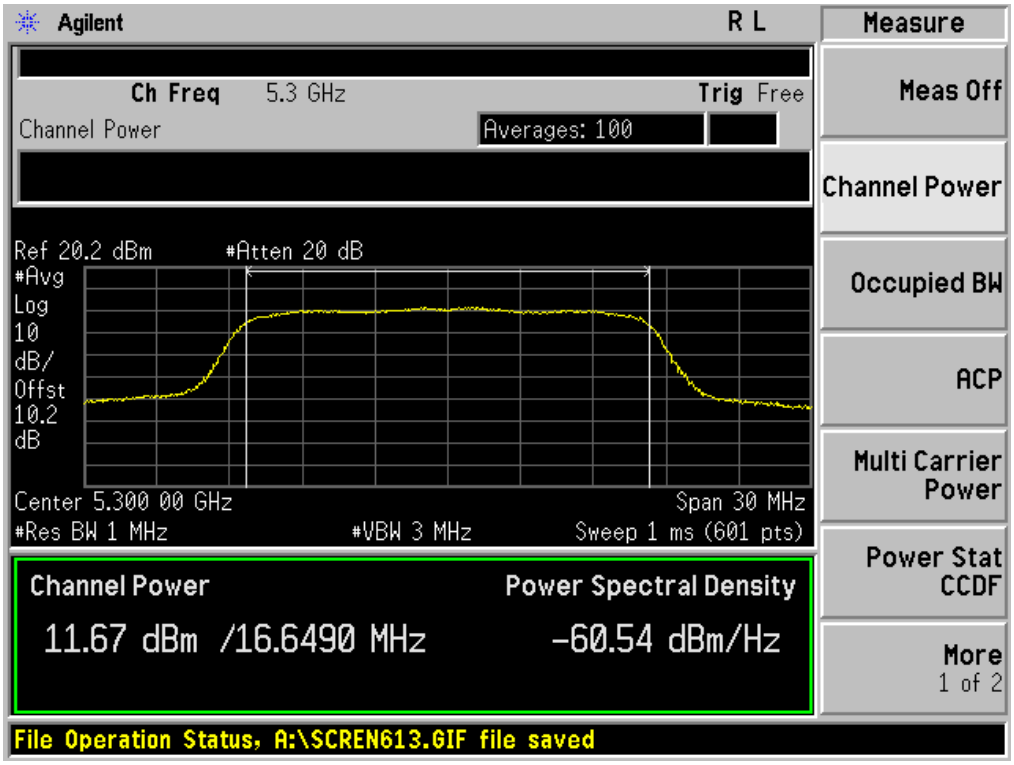

## Conducted Output Power (802.11a-CH 60) 36 Mbps



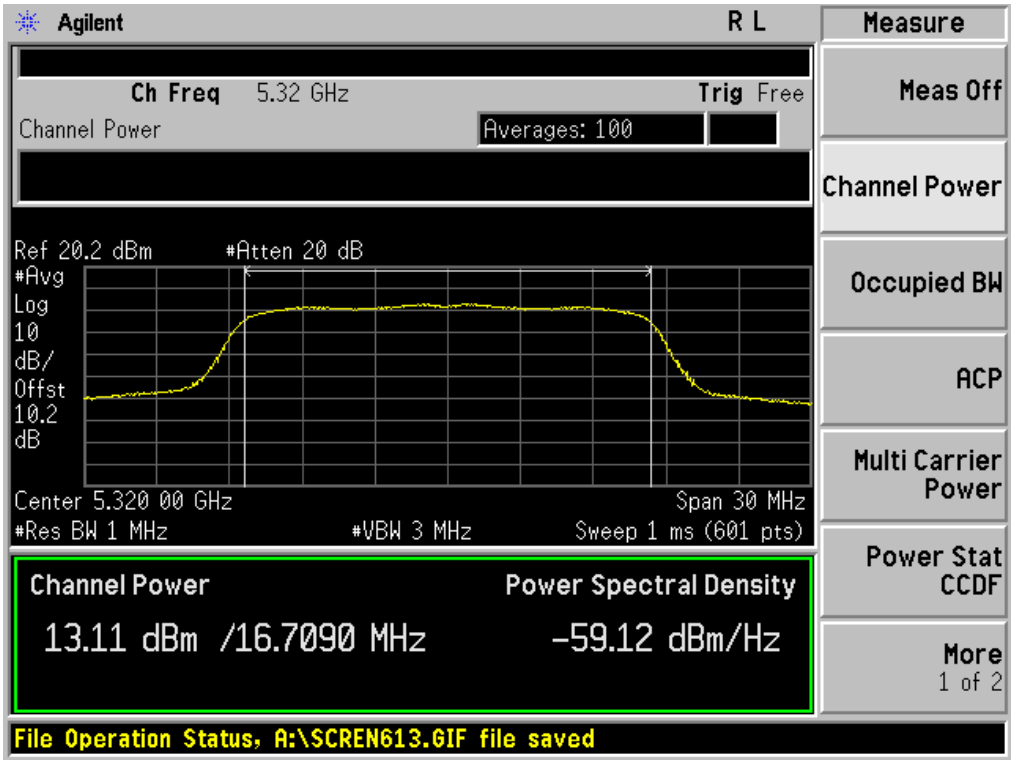
## Conducted Output Power (802.11a-CH 60) 48 Mbps



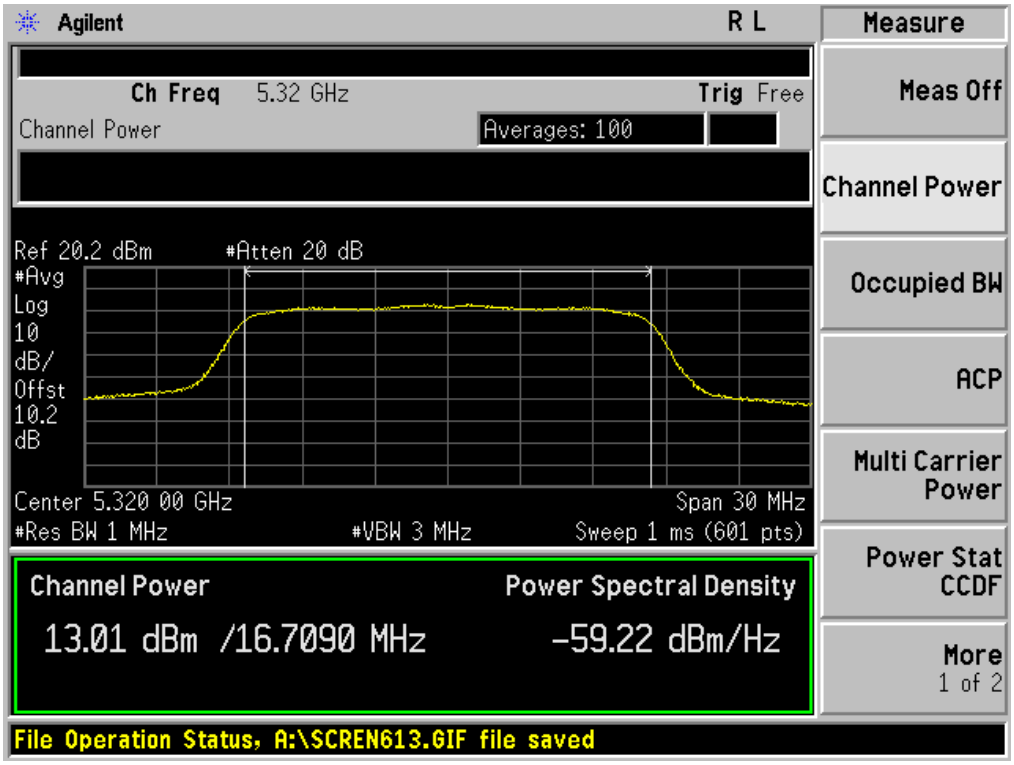

## Conducted Output Power (802.11a-CH 60) 54 Mbps



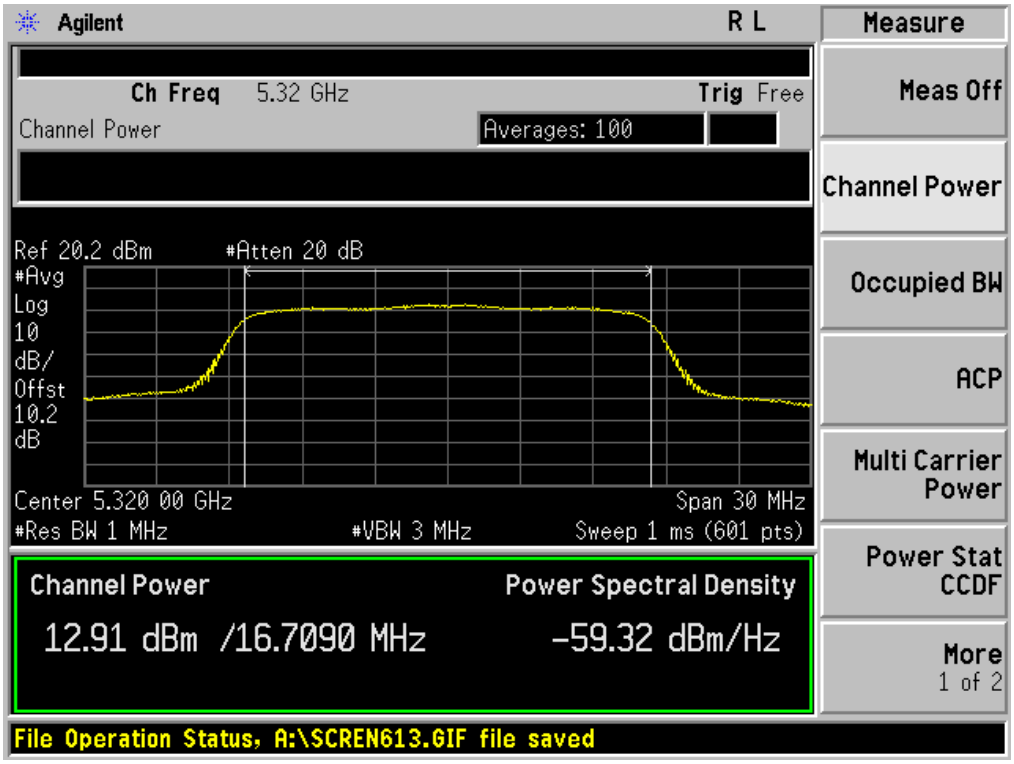
## Conducted Output Power (802.11a-CH 64) 6 Mbps



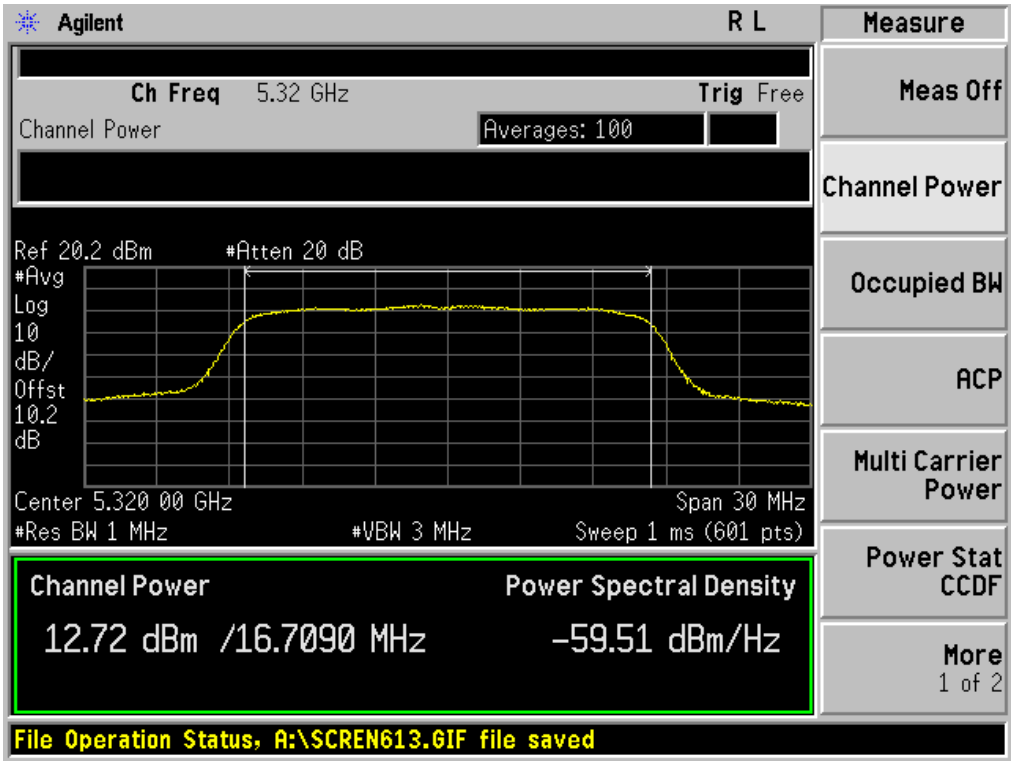

## Conducted Output Power (802.11a-CH 64) 9 Mbps



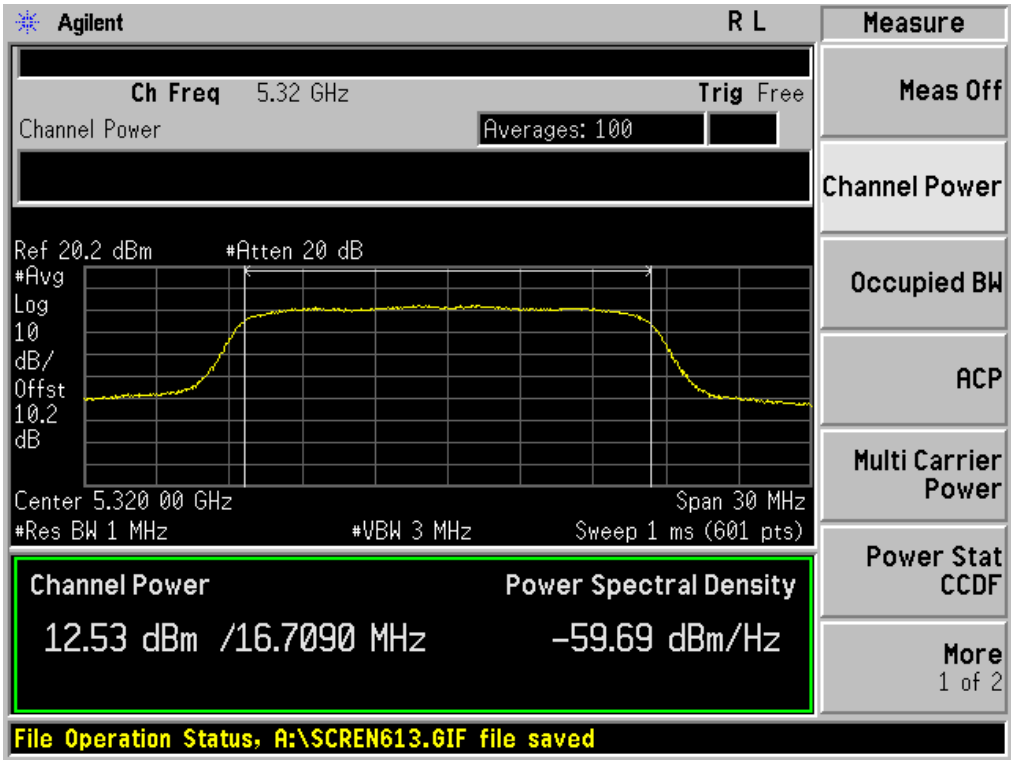
## Conducted Output Power (802.11a-CH 64) 12 Mbps



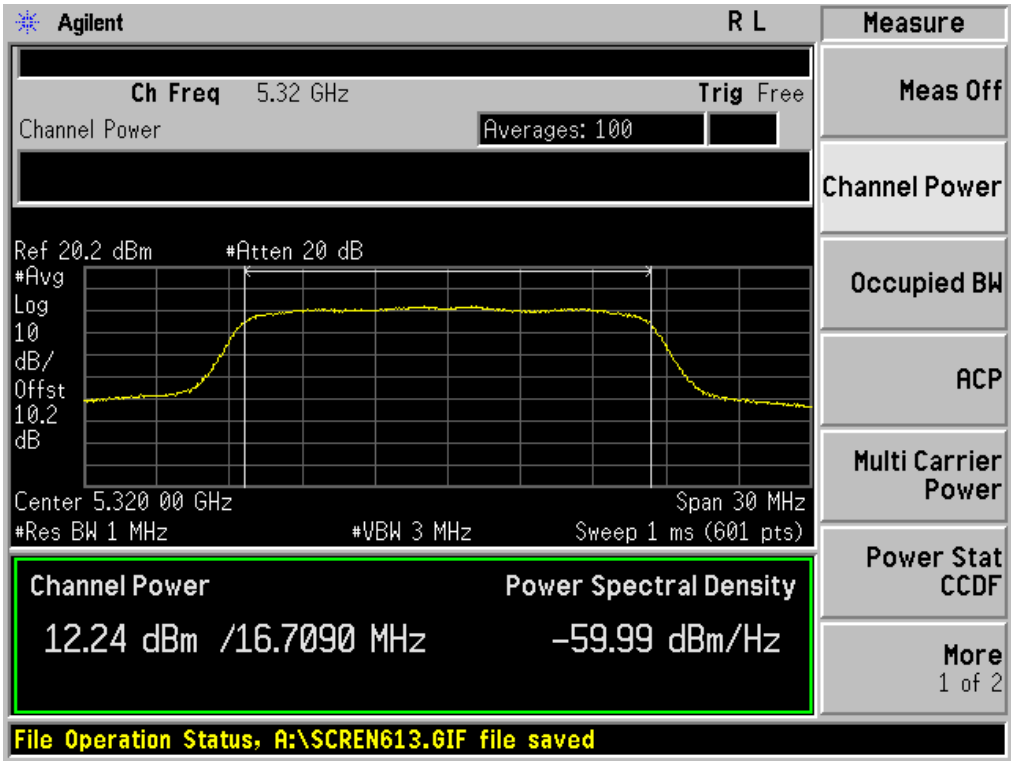

## Conducted Output Power (802.11a-CH 64) 18 Mbps



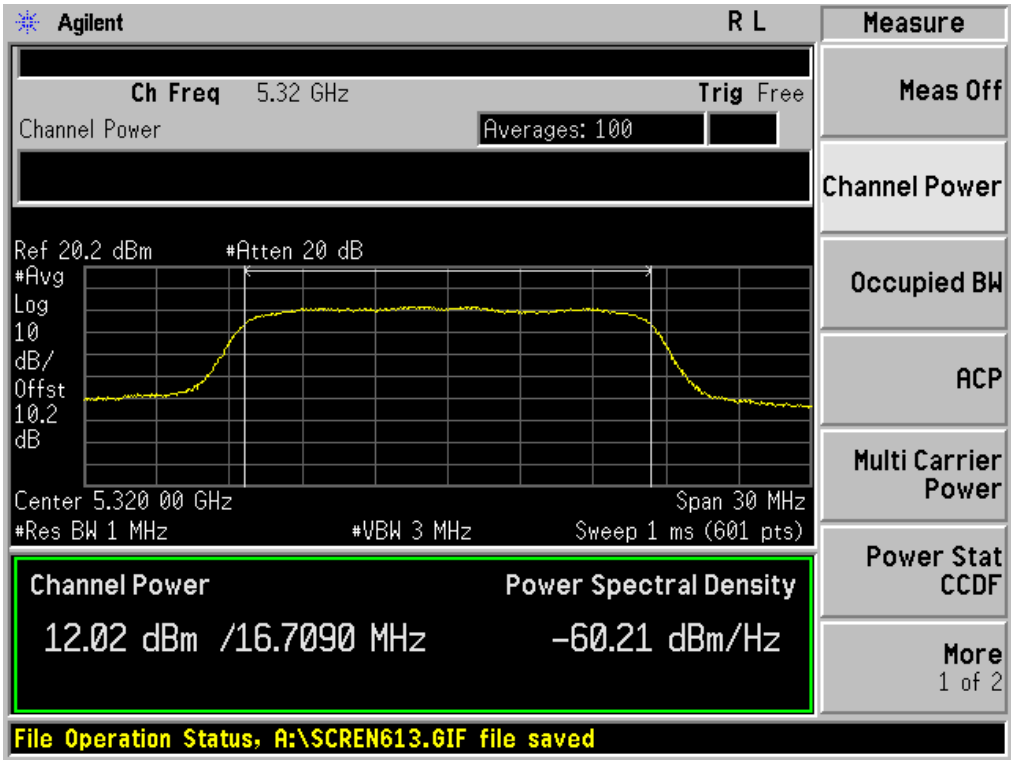
## Conducted Output Power (802.11a-CH 64) 24 Mbps



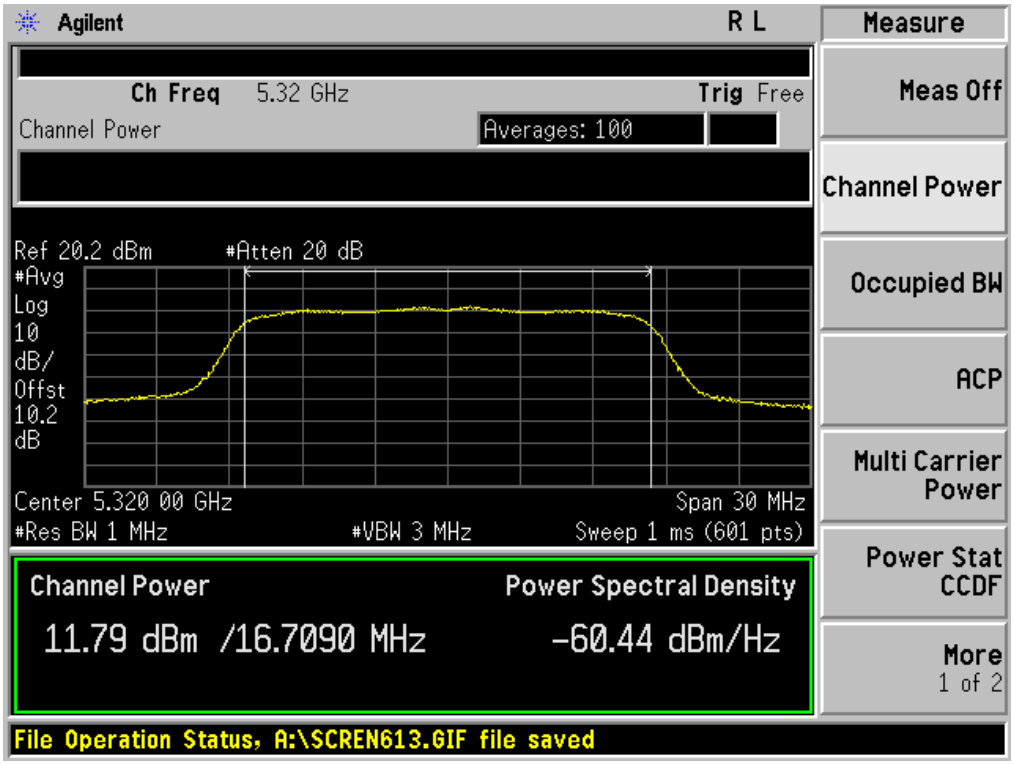

## Conducted Output Power (802.11a-CH 64) 36 Mbps



## Conducted Output Power (802.11a-CH 64) 48 Mbps

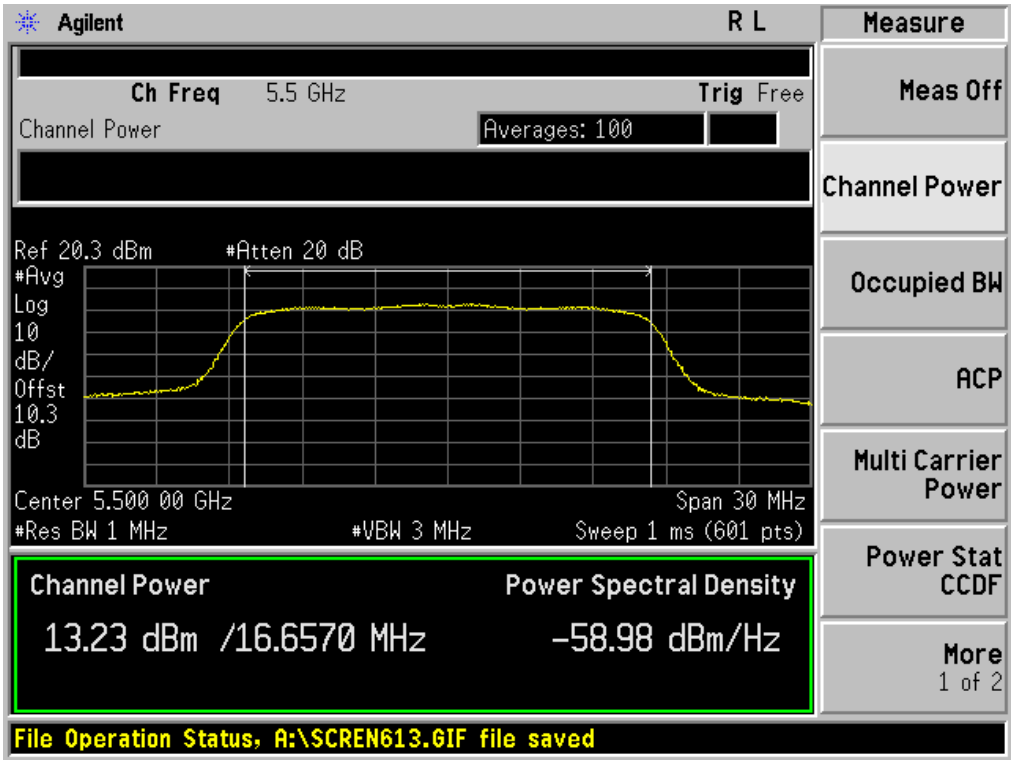



## Conducted Output Power (802.11a-CH 64) 54 Mbps

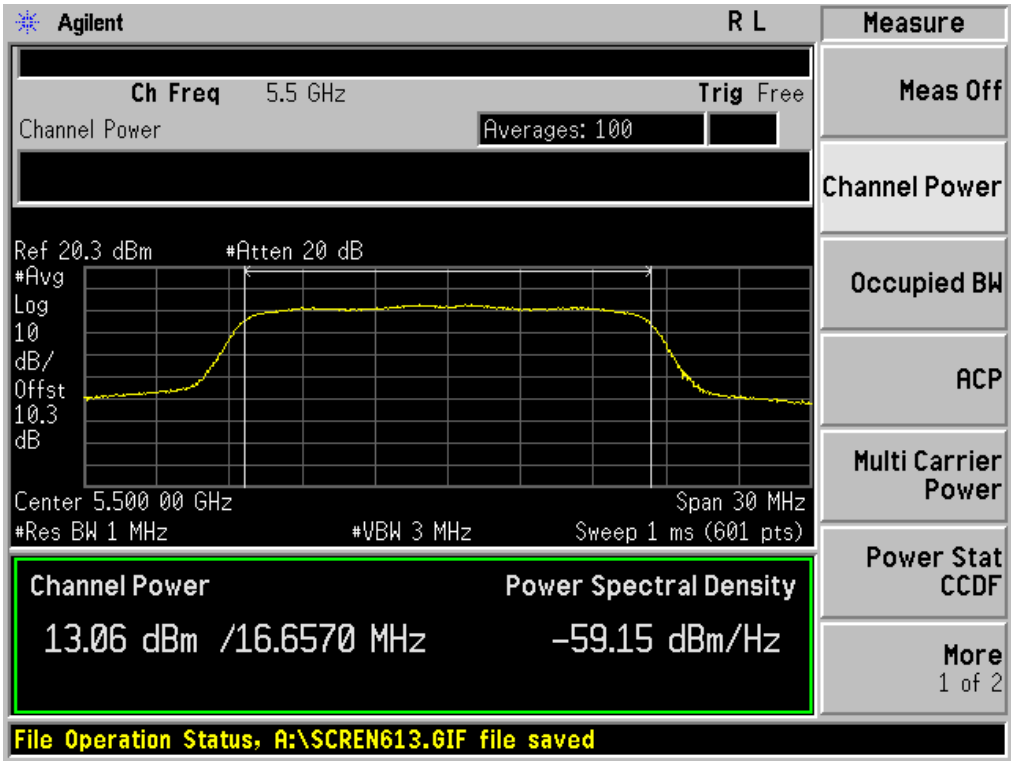


## ▣ RESULT PLOTS (5500 MHz ~5700 MHz)

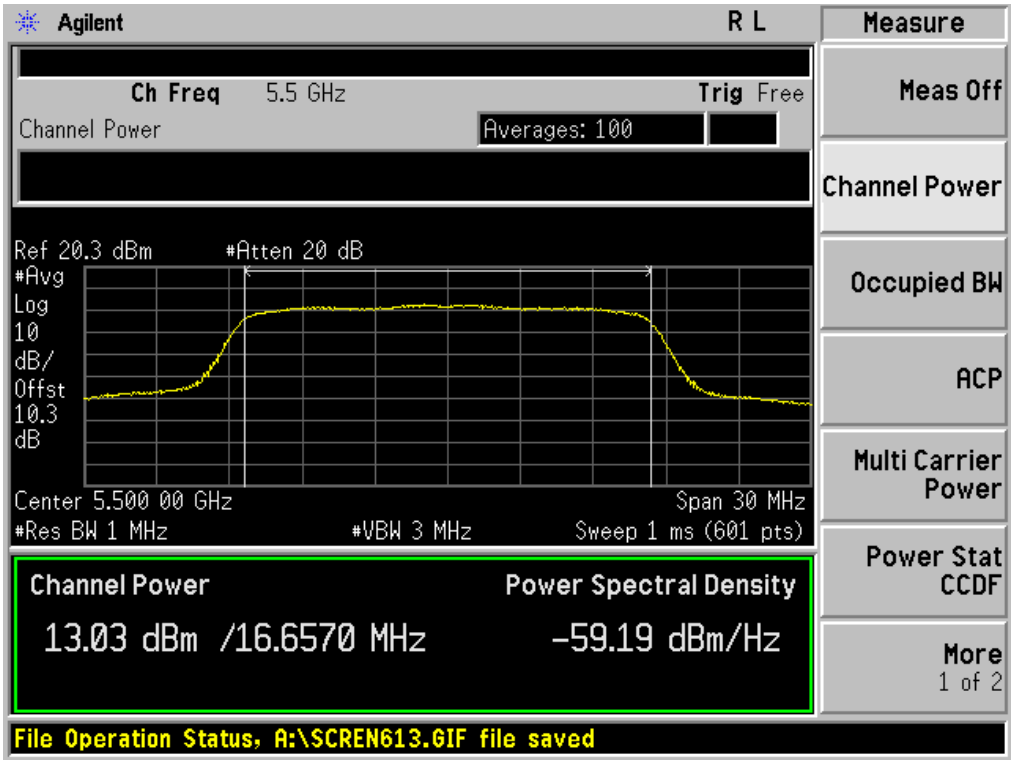
### Conducted Output Power (802.11a-CH 100) 6 Mbps



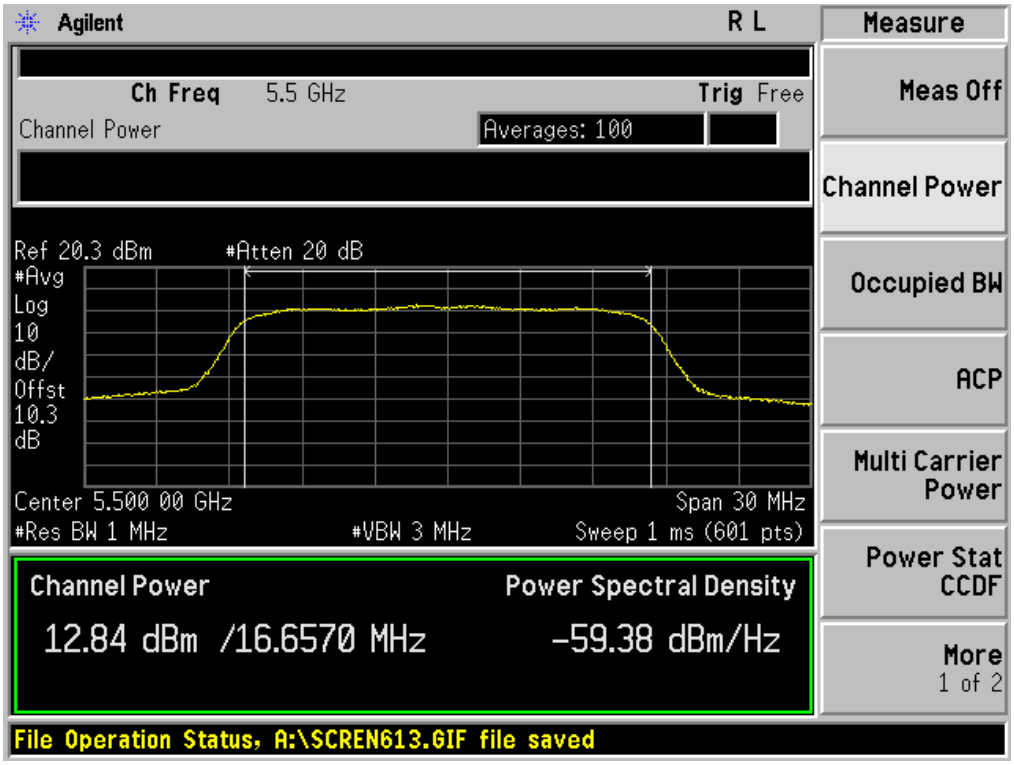

### Conducted Output Power (802.11a-CH 100) 9 Mbps



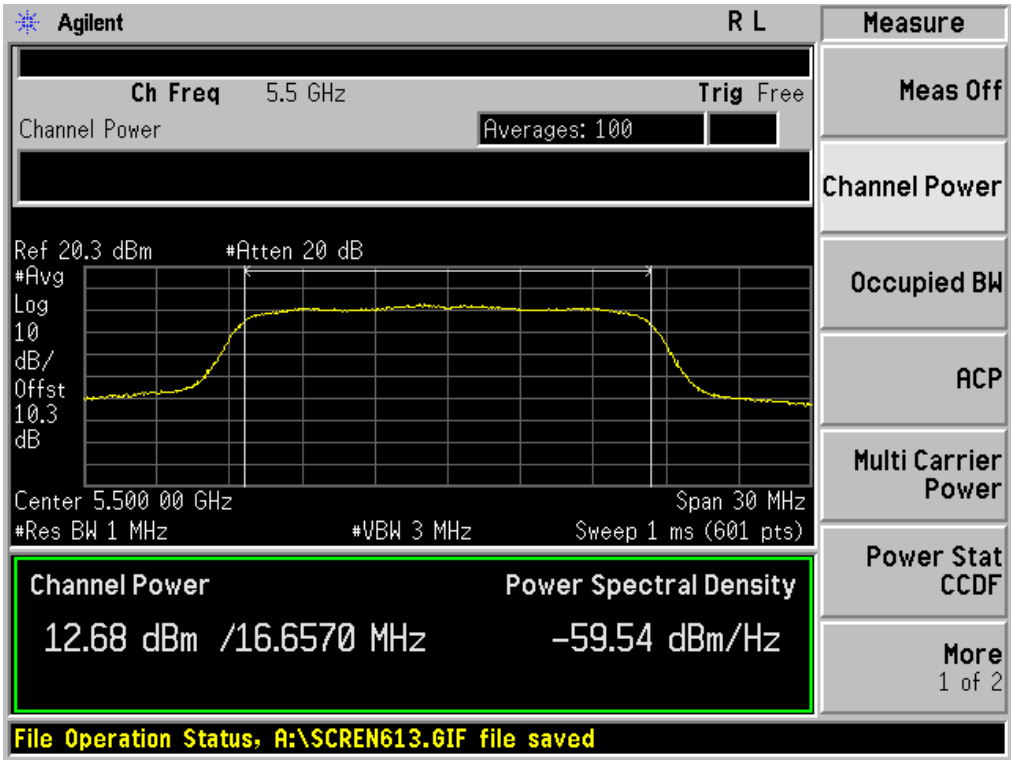
## Conducted Output Power (802.11a-CH 100) 12 Mbps



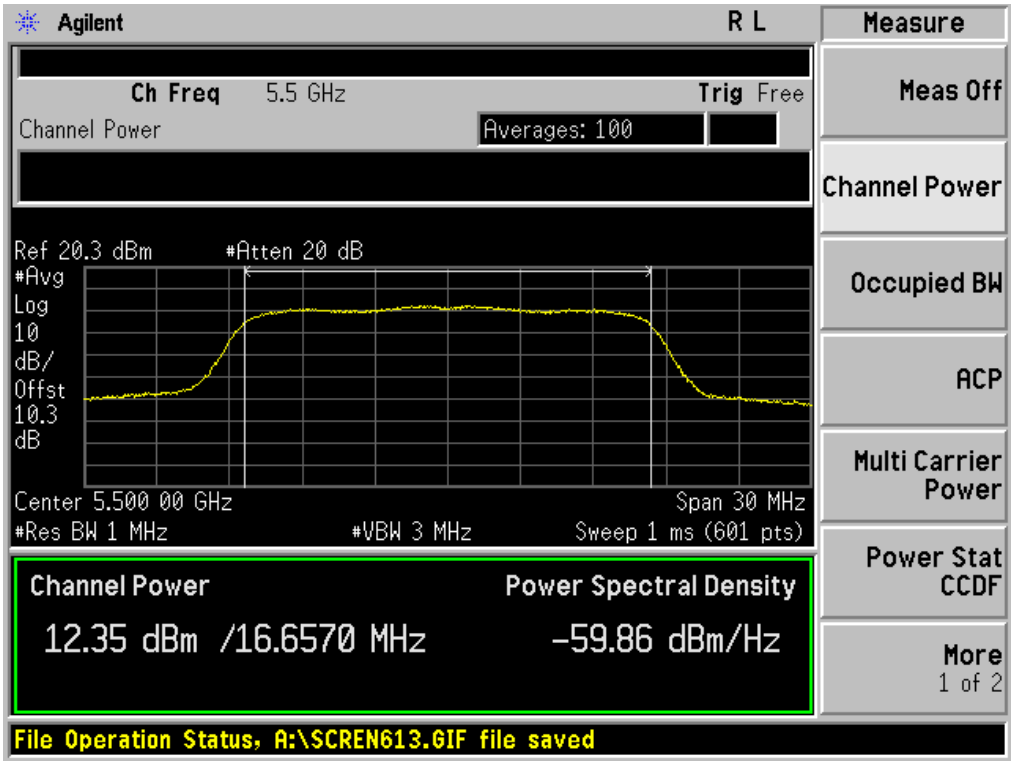

## Conducted Output Power (802.11a-CH 100) 18 Mbps



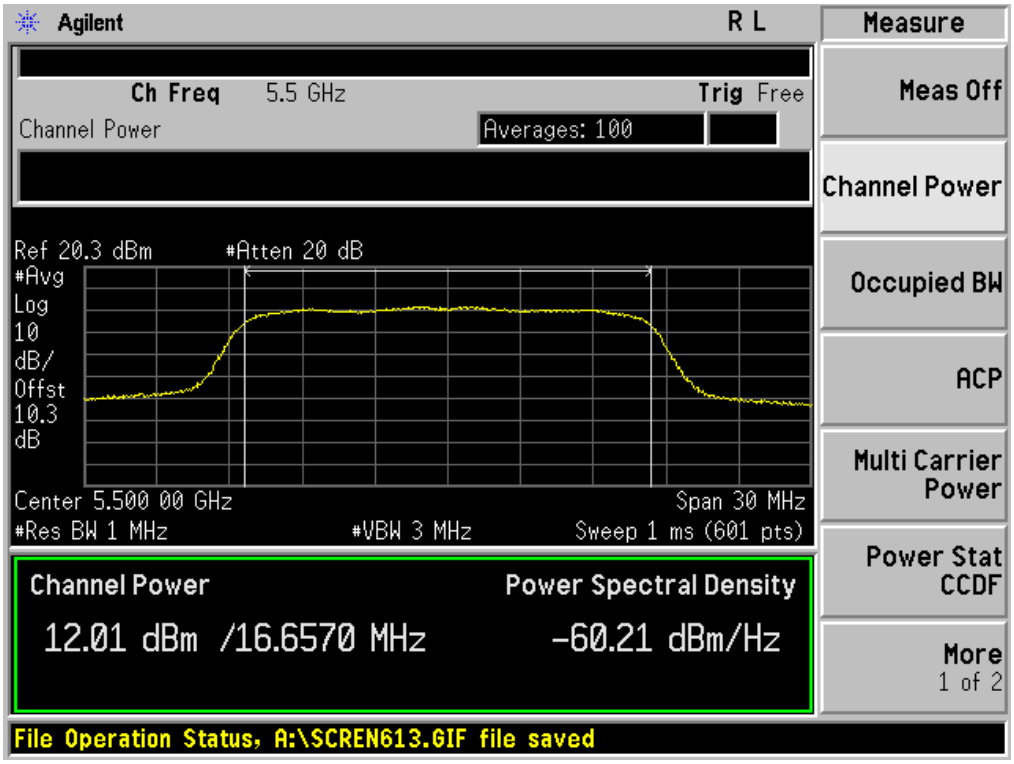
## Conducted Output Power (802.11a-CH 100) 24 Mbps



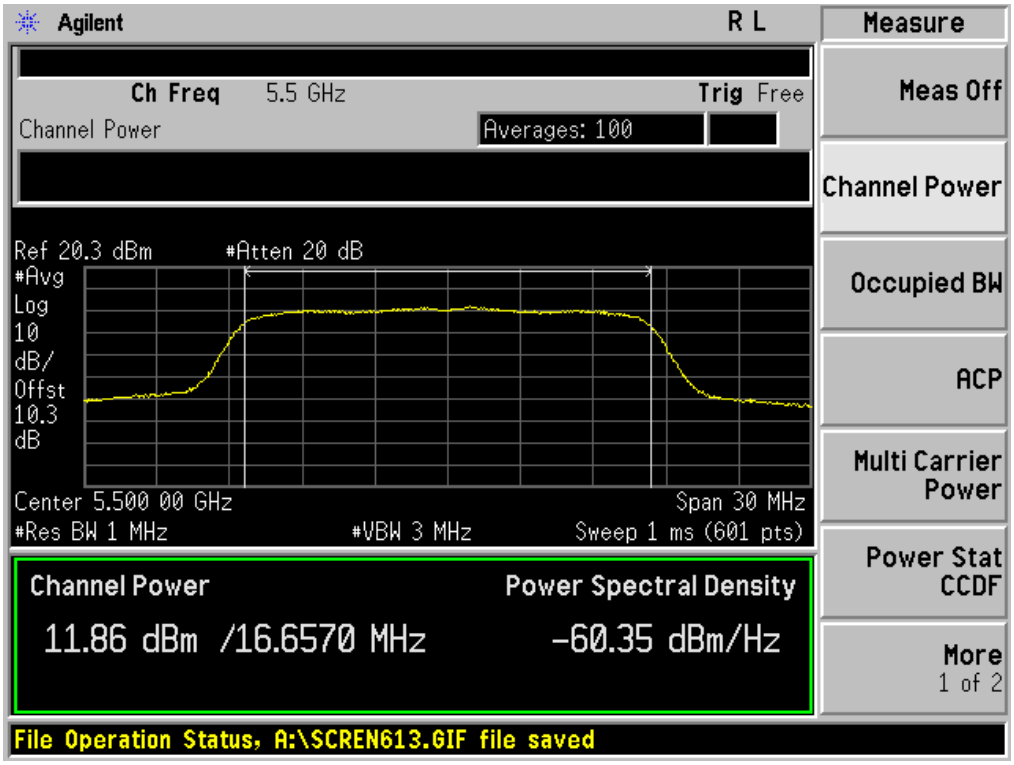

## Conducted Output Power (802.11a-CH 100) 36 Mbps



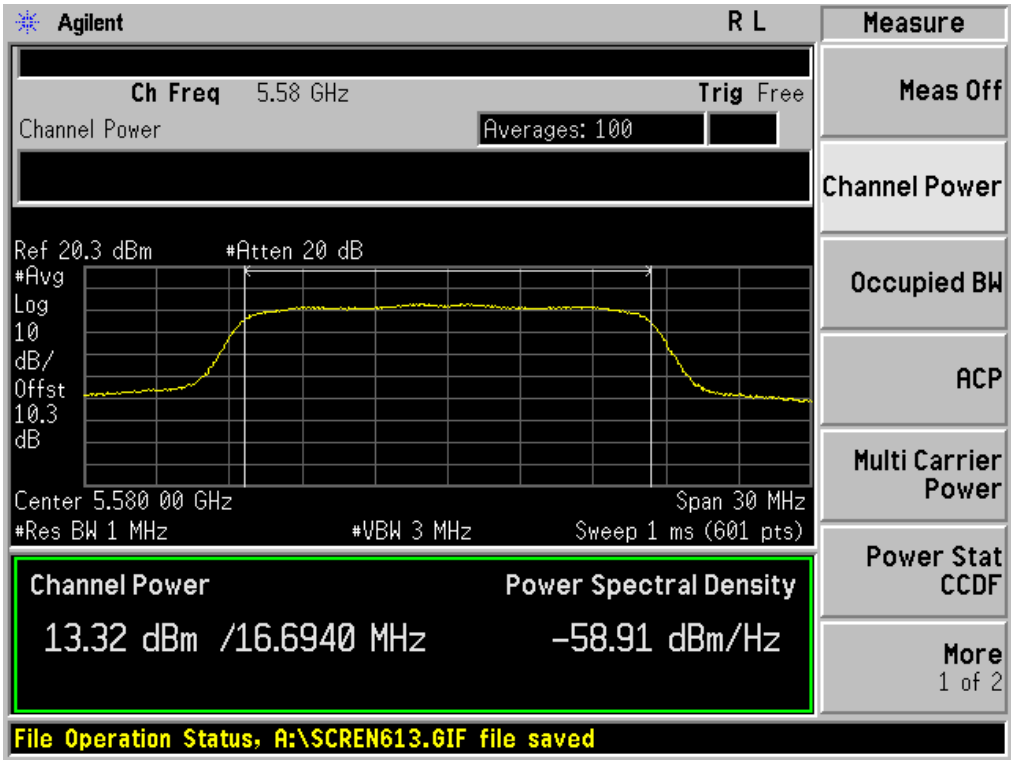
## Conducted Output Power (802.11a-CH 100) 48 Mbps



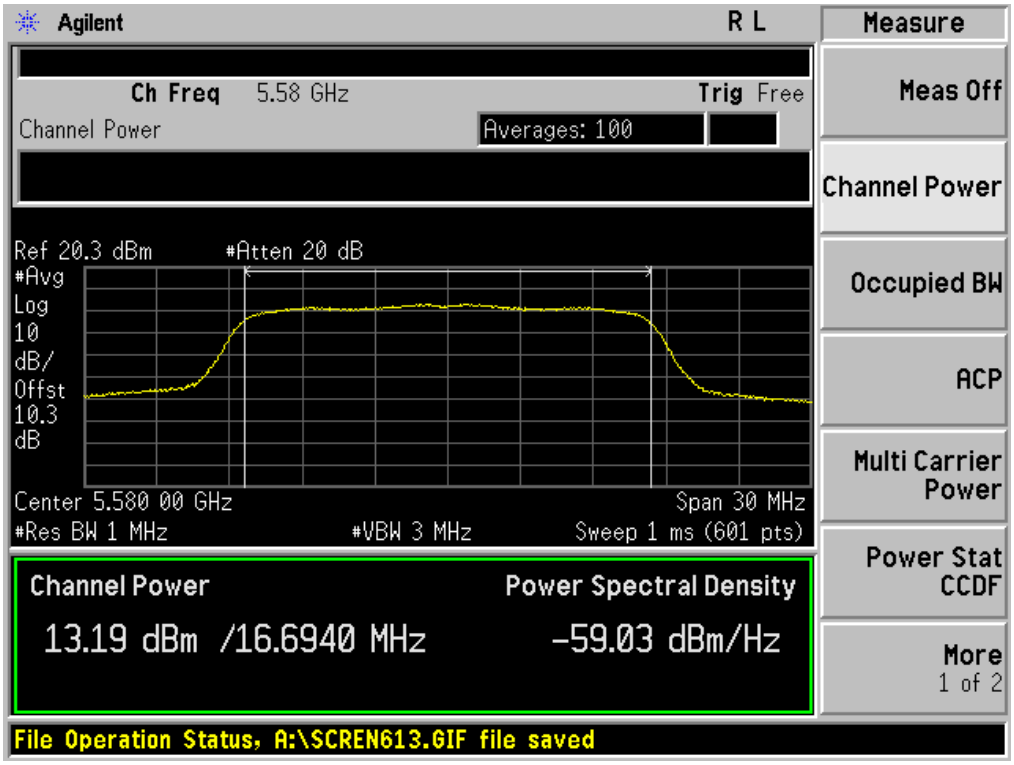

## Conducted Output Power (802.11a-CH 100) 54 Mbps



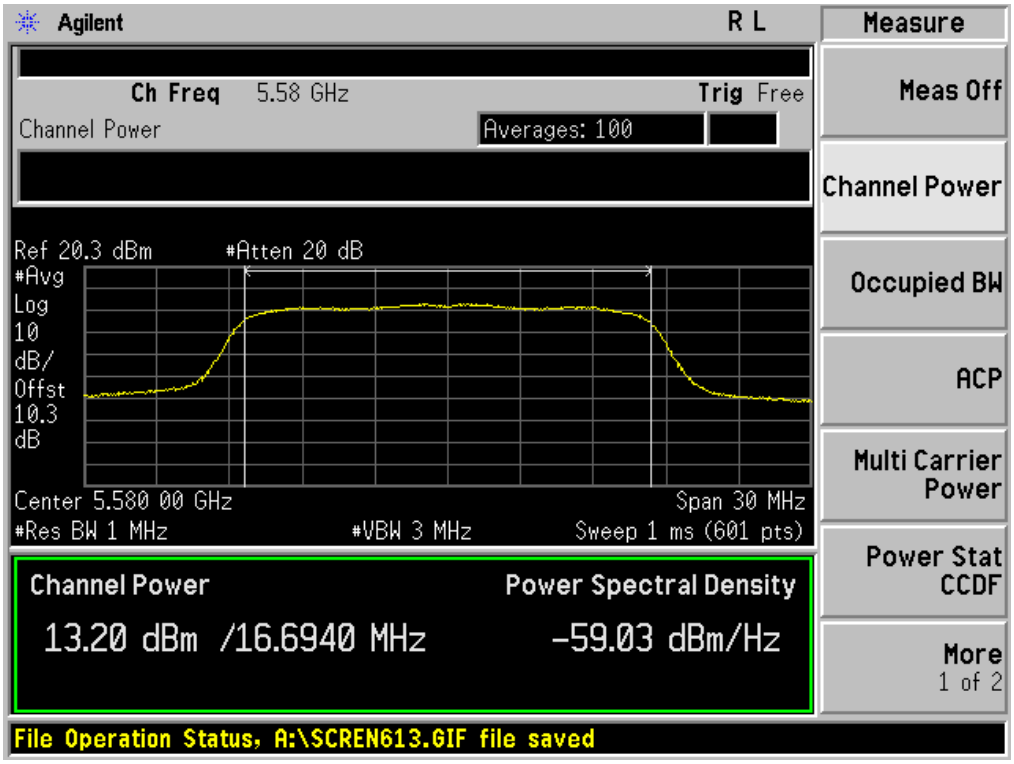
## Conducted Output Power (802.11a-CH 116) 6 Mbps



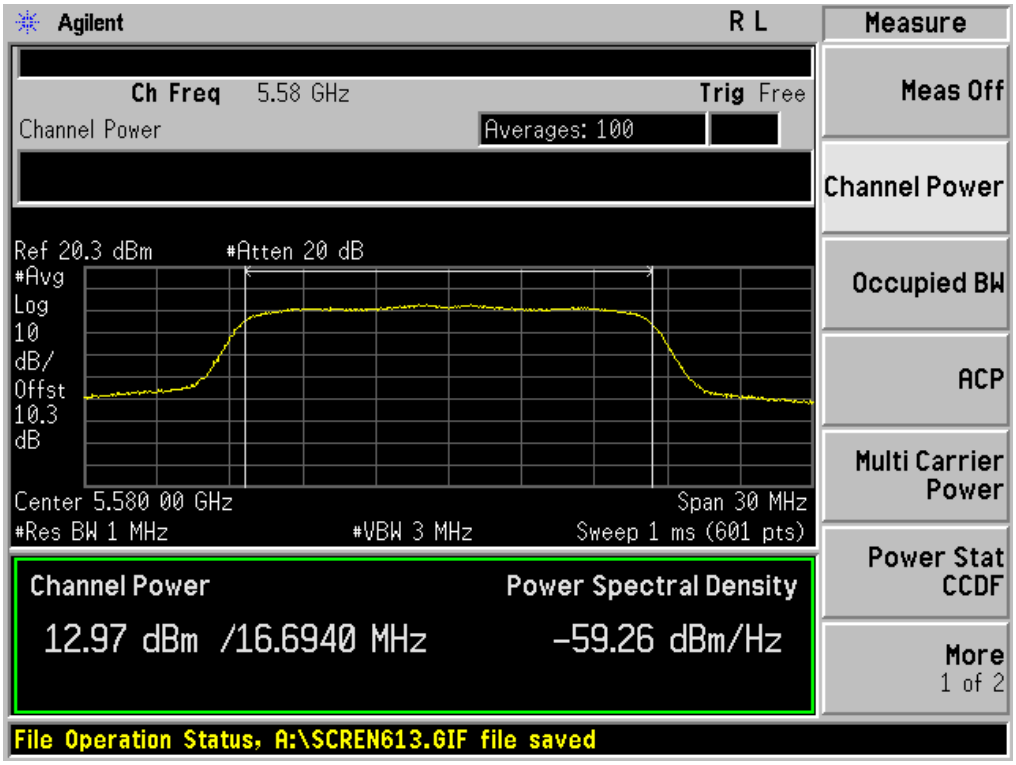

## Conducted Output Power (802.11a-CH 116) 9 Mbps



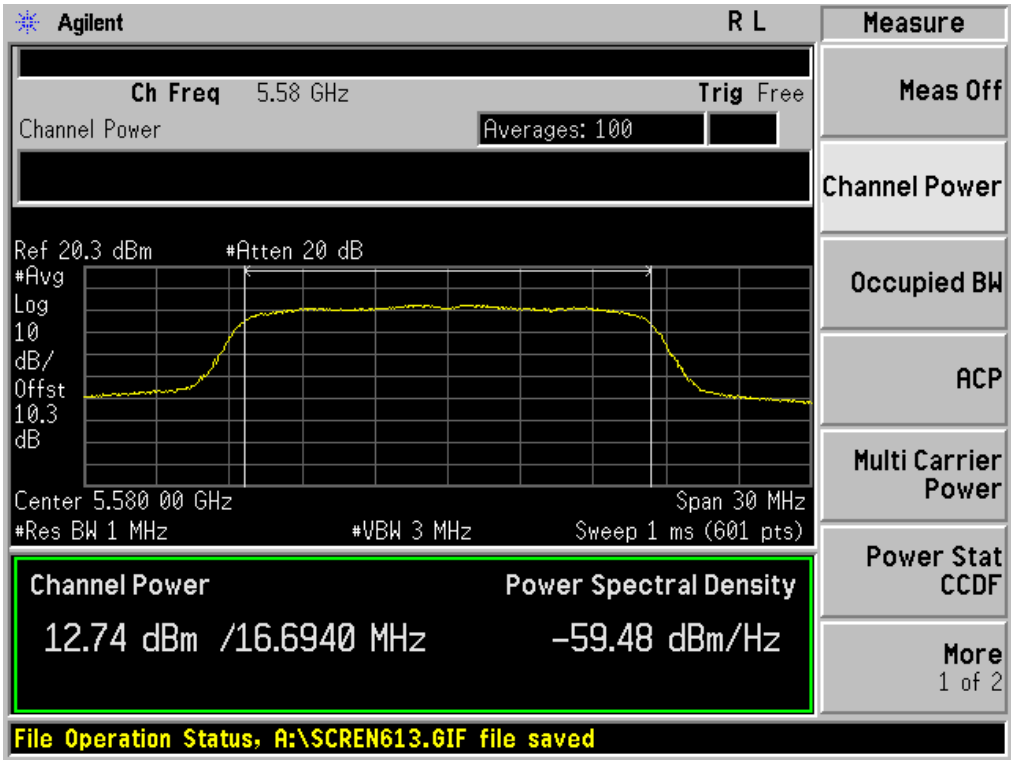
## Conducted Output Power (802.11a-CH 116) 12 Mbps



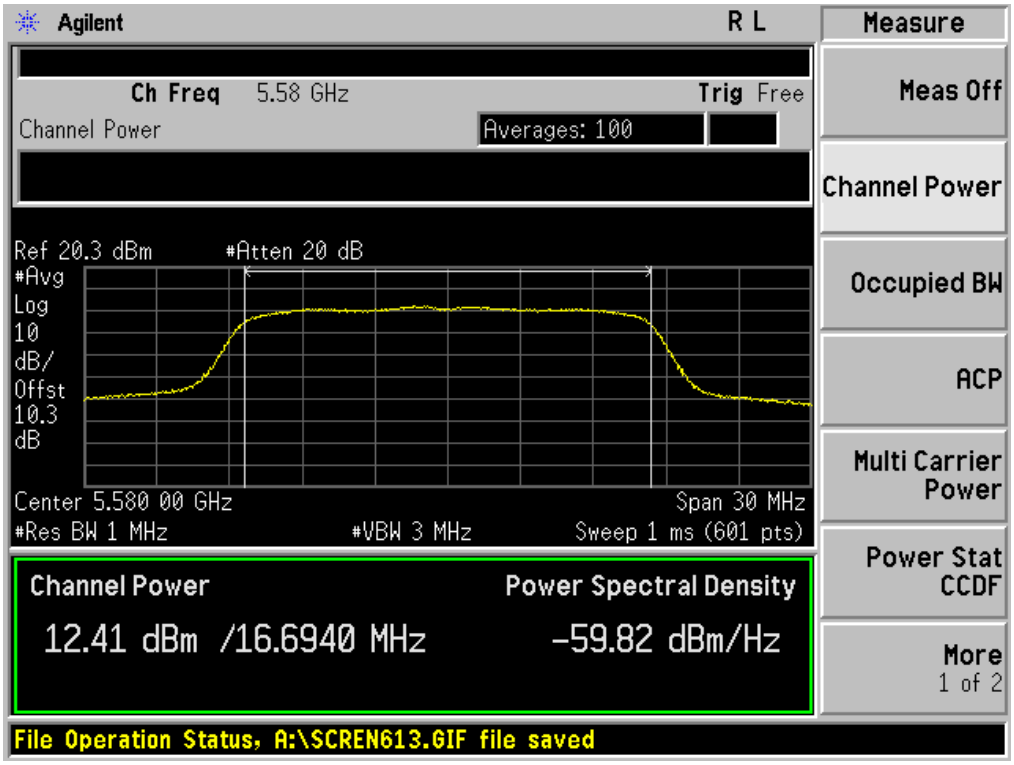

## Conducted Output Power (802.11a-CH 116) 18 Mbps



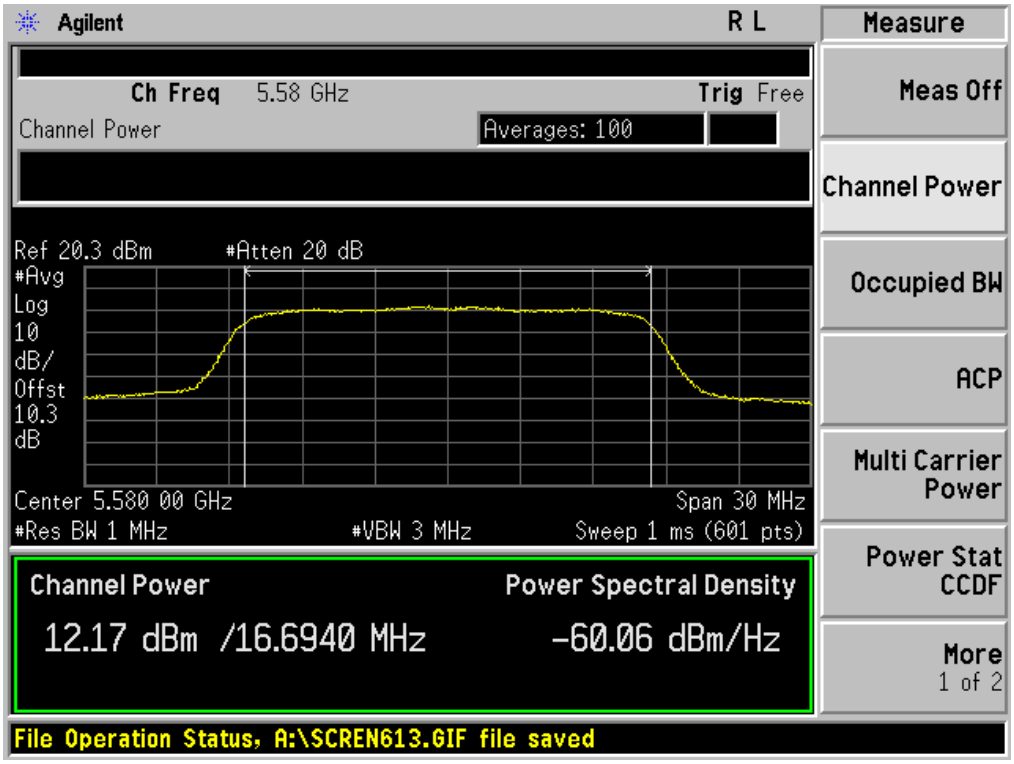
## Conducted Output Power (802.11a-CH 116) 24 Mbps



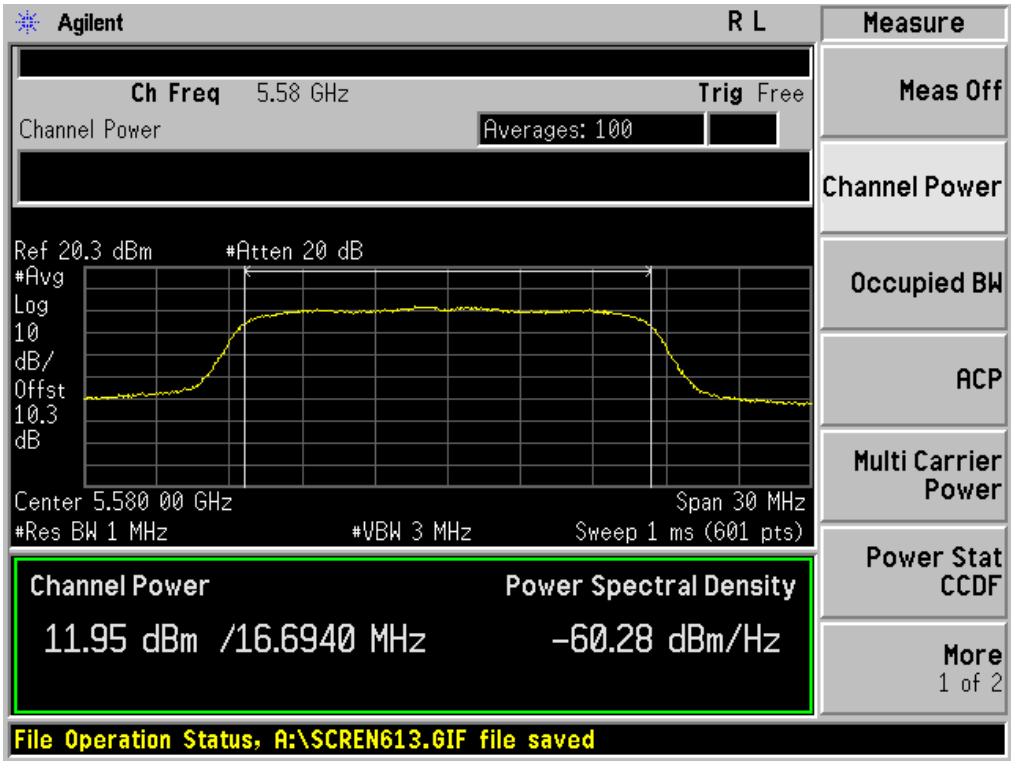

## Conducted Output Power (802.11a-CH 116) 36 Mbps



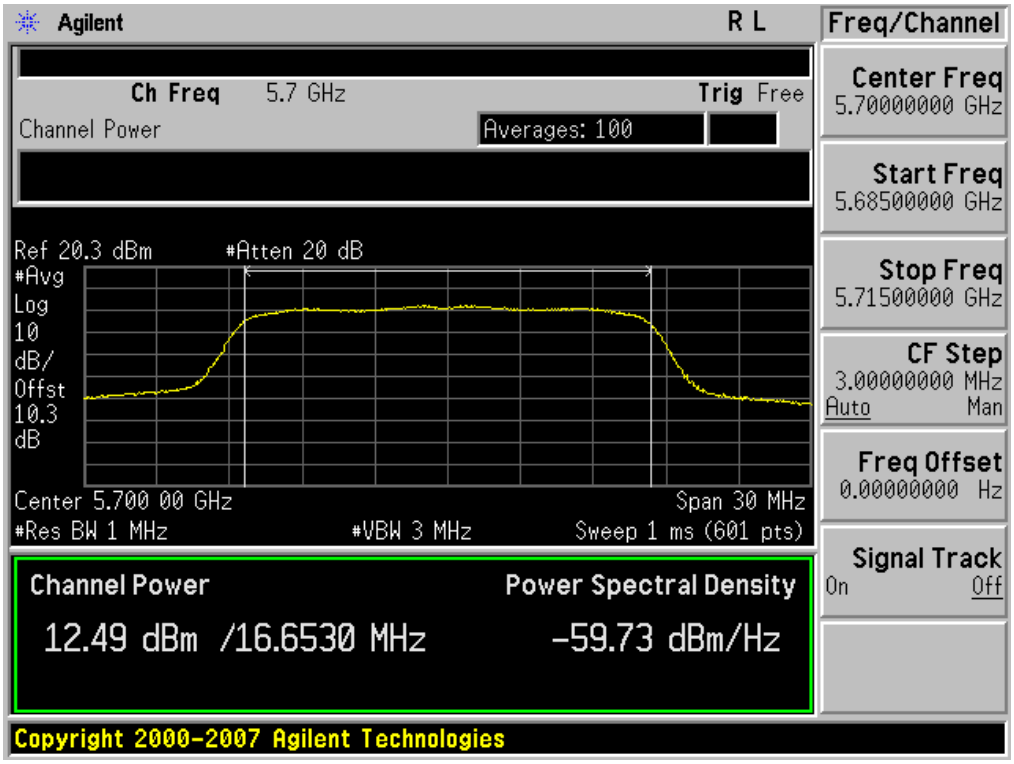
## Conducted Output Power (802.11a-CH 116) 48 Mbps



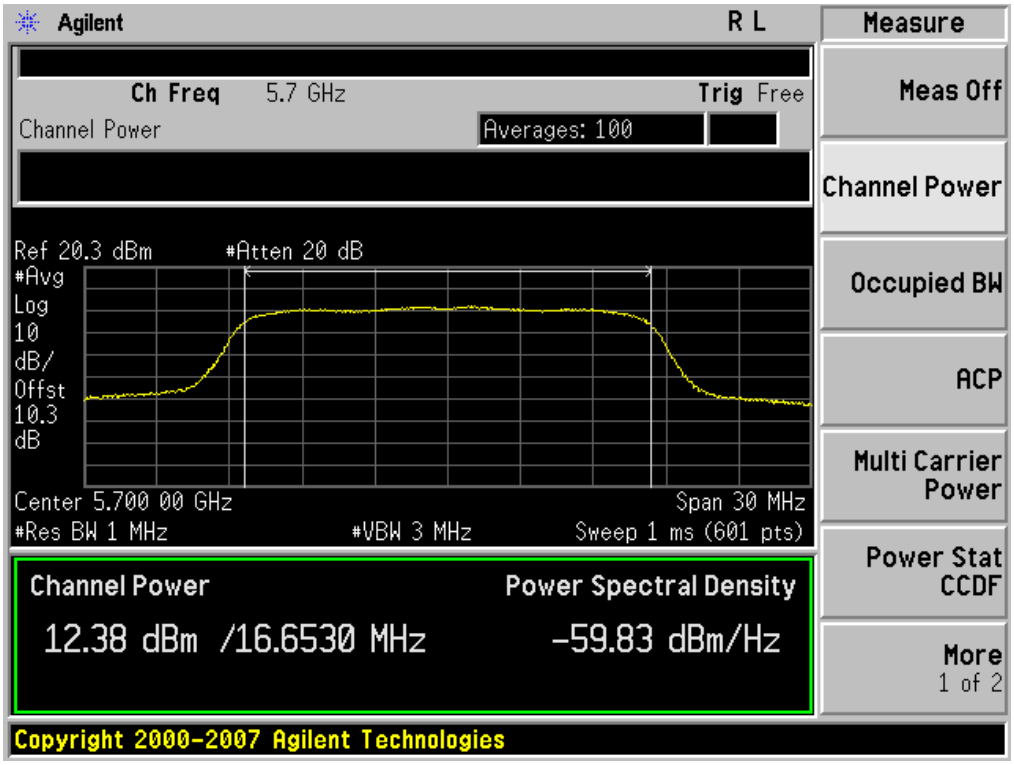

## Conducted Output Power (802.11a-CH 116) 54 Mbps



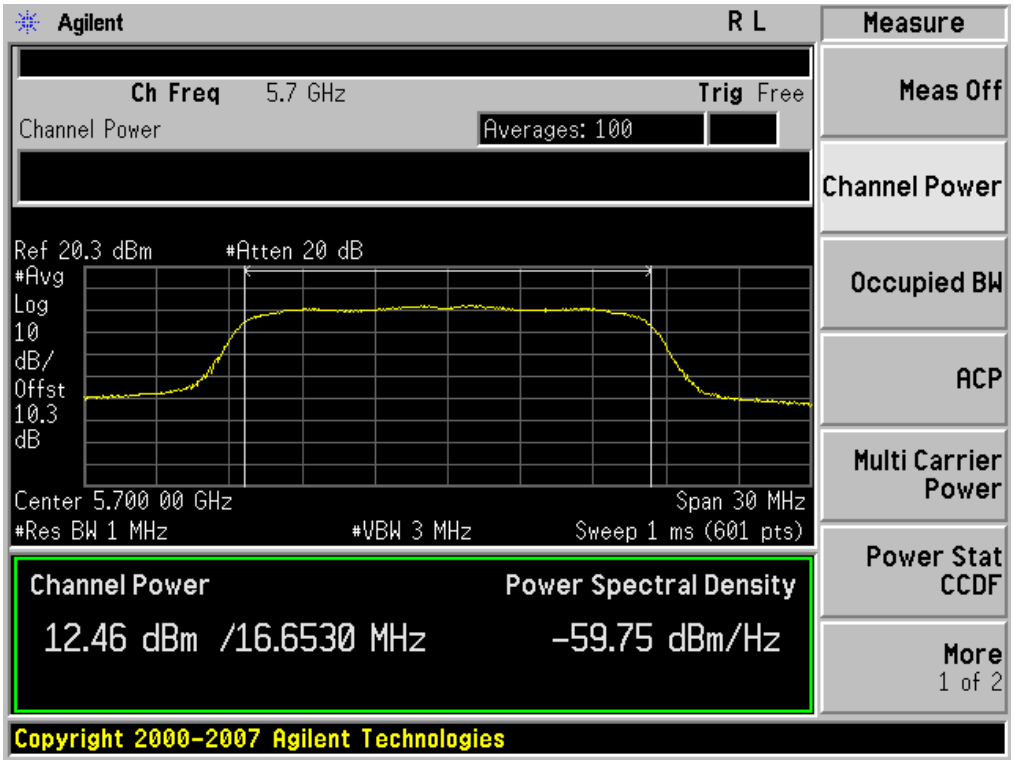
## Conducted Output Power (802.11a-CH 140) 6 Mbps



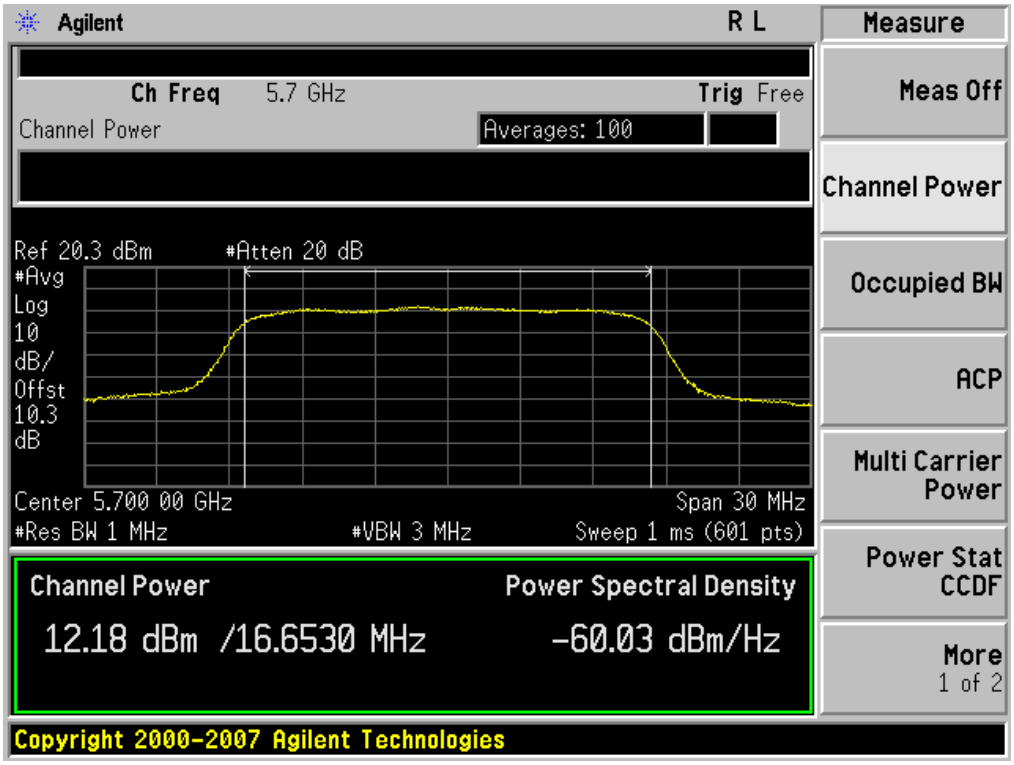

## Conducted Output Power (802.11a-CH 140) 9 Mbps



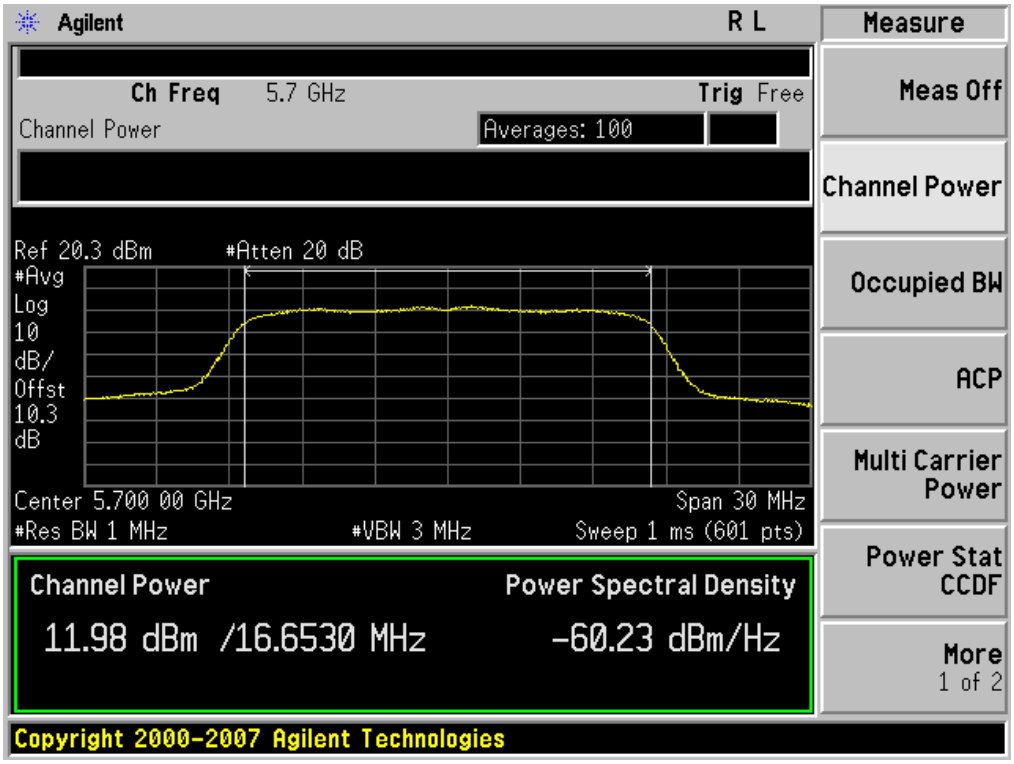
## Conducted Output Power (802.11a-CH 140) 12 Mbps



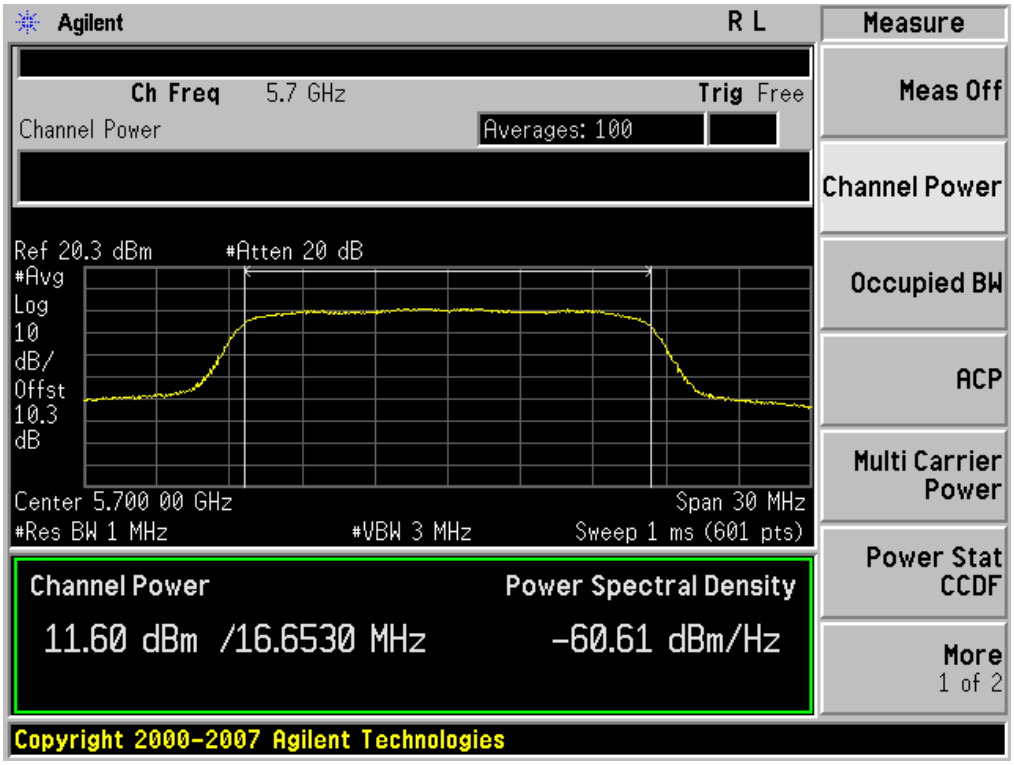

## Conducted Output Power (802.11a-CH 140) 18 Mbps



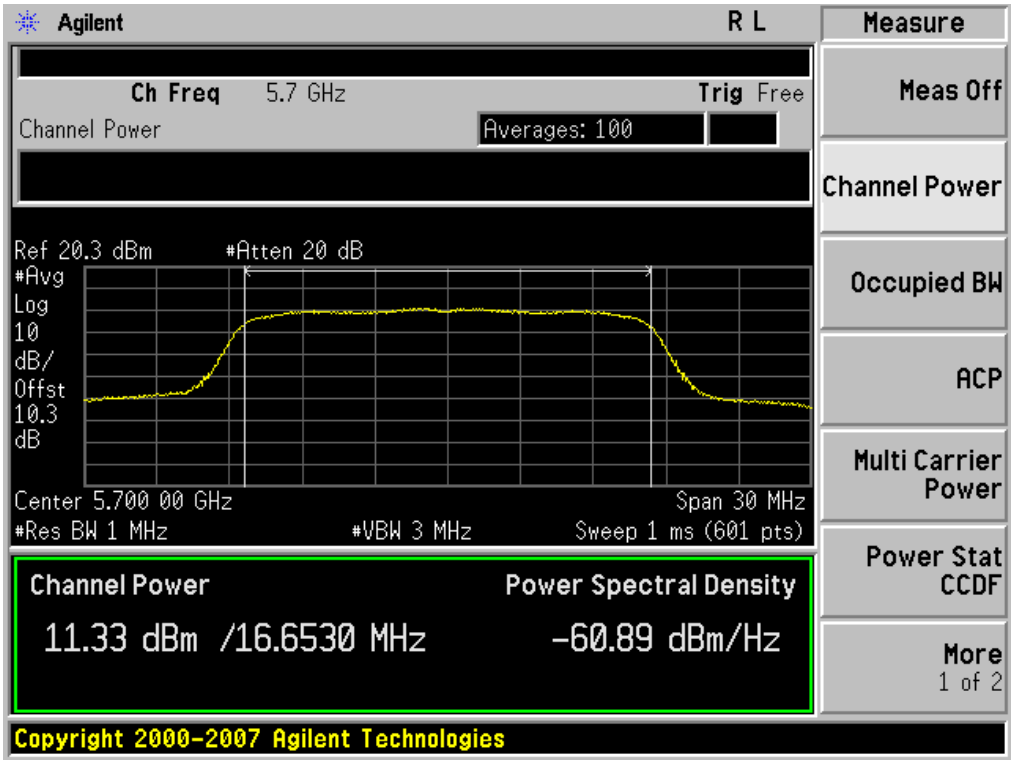
## Conducted Output Power (802.11a-CH 140) 24 Mbps



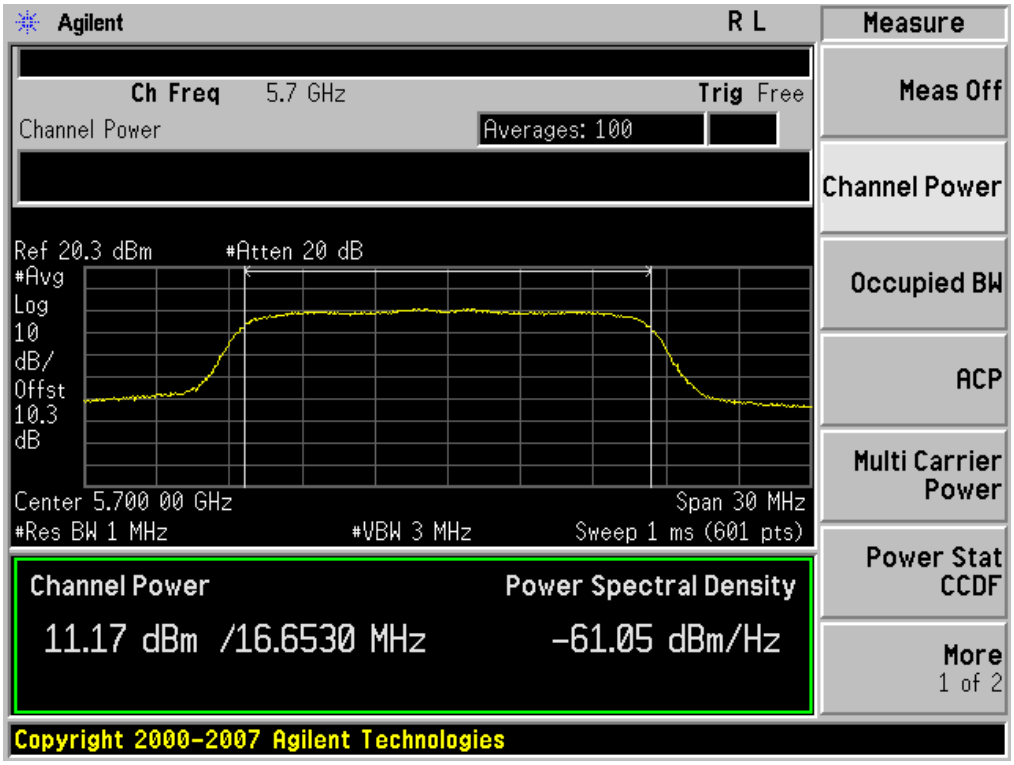

## Conducted Output Power (802.11a-CH 140) 36 Mbps



## Conducted Output Power (802.11a-CH 140) 48 Mbps




## Conducted Output Power (802.11a-CH 140) 54 Mbps



## 20 MHz BW

### ▣ RESULT PLOTS (5180 MHz ~5240 MHz)

**Conducted Output Power (802.11n-CH 36) 6.5 Mbps**


**Conducted Output Power (802.11n-CH 36) 13 Mbps**

## Conducted Output Power (802.11n-CH 36) 19.5 Mbps


## Conducted Output Power (802.11n-CH 36) 26 Mbps

## Conducted Output Power (802.11n-CH 36) 39 Mbps


## Conducted Output Power (802.11n-CH 36) 52 Mbps

## Conducted Output Power (802.11n-CH 36) 58.5 Mbps


## Conducted Output Power (802.11n-CH 36) 65 Mbps

## Conducted Output Power (802.11n-CH 40) 6.5 Mbps


## Conducted Output Power (802.11n-CH 40) 13 Mbps

## Conducted Output Power (802.11n-CH 40) 19.5 Mbps


## Conducted Output Power (802.11n-CH 40) 26 Mbps

## Conducted Output Power (802.11n-CH 40) 39 Mbps


## Conducted Output Power (802.11n-CH 40) 52 Mbps

## Conducted Output Power (802.11n-CH 40) 58.5 Mbps


## Conducted Output Power (802.11n-CH 40) 65 Mbps

## Conducted Output Power (802.11n-CH 48) 6.5 Mbps


## Conducted Output Power (802.11n-CH 48) 13 Mbps

## Conducted Output Power (802.11n-CH 48) 19.5 Mbps


## Conducted Output Power (802.11n-CH 48) 26 Mbps

## Conducted Output Power (802.11n-CH 48) 39 Mbps


## Conducted Output Power (802.11n-CH 48) 52 Mbps