# CONFORMANCE TEST REPORT
# FOR
# FCC 47 CFR, Part 15 Subpart E

**Report No.: 11-06-MAS-176-03**

| | |
|---|---|
| Client: | OpenPeak Inc. |
| Product: | Cisco CIUS 4G |
| Model: | CIUS-7-AT-K9 |
| Series Model: | CIUS-7-K9 |
| FCC ID: | VGBCSCO4G710 |
| Manufacturer: | Celestica Thailand Ltd. |
| Date test item received: | 2011/06/13 |
| Date test campaign completed: | 2011/11/24 |
| Date of issue: | 2011/11/25 |


*Total number of pages of this test report: 260 pages*

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| | |
|---|---|
| Client | : OpenPeak Inc. |
| Address | : 1750 Clint Moore Rd. Boca Raton, FL, USA 33487 |
| Manufacturer | : Celestica Thailand Ltd. |
| Address | : 49/18 Moo 5, Laem Chabang Industrial Estate, Tungsukhla Chonburi, Thailand 20230 |
| EUT | : Cisco CIUS 4G |
| Brand/Trade name | : Cisco Systems, Inc. |
| Model No. | : CIUS-7-AT-K9 |
| Series Model No. | : CIUS-7-K9 |
| Power Source | : Adapter 1: (APD / DA-20A05)<br>Input: 100-240Vac, 50-60Hz, 1.0A Max<br>Output: 5V, 4A Max<br>Adapter 2: (ENG / 3A-204DB05)<br>Input: 100-240Vac, 50-60Hz, 0.5A<br>Output: 5V, 4.0A |
| Regulations applied | : FCC 47 CFR, Part 15 Subpart E |

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# 1 GENERAL INFORMATION

## 1.1 Product Description

a) Type of EUT : Cisco CIUS 4G
b) Trade Name : Cisco Systems, Inc.
c) Model No. : CIUS-7-AT-K9
d) Series Model No. : CIUS-7-K9
e) FCC ID : VGBCSCO4G710

## 1.2 Characteristics of Device

The EUT is a Mobile Collaboration Tablet. It conforms to the IEEE 802.11a/b/g/n protocal and operates in the unlicensed ISM Band at 2.4 GHz and 5.8 GHz, and in the unlicensed U-NII Band at 5.2 GHz, 5.3GHz and 5.6GHz.

| | |
|---|---|
| RF chain | 1T1R |
| Frequency Range | IEEE 802.11b/g, 802.11gn HT20: 2412MHz~2462MHz<br>IEEE 802.11gn HT40: 2422MHz~2462MHz<br>IEEE 802.11a, 802.11an HT20:<br>5.2GHz: 5180MHz ~5240MHz, 5.3G: 5260MHz ~5320MHz, 5.6GHz: 5500MHz~5700 MHz, 5.8G: 5745MHz ~5825MHz<br>IEEE 802.11an HT40:<br>5.2GHz: 5190MHz ~5230MHz, 5.3G: 5270MHz ~5310MHz, 5.6GHz: 5510MHz~5670 MHz, 5.8G: 5745MHz ~5825MHz |
| Channel Spacing | IEEE 802.11b/g, 802.11gn HT20/HT40: 5MHz<br>IEEE 802.11a, 802.11an HT20/ 40: 5MHz |
| Channel Number | IEEE 802.11b/g, 802.11gn HT20:13 Channels<br>IEEE 802.11gn HT40: 9 Channels<br>IEEE 802.11a, 802.11an HT20:<br>5.2GHz:13 Channels, 5.3GHz:13 Channels, 5.6GHz: 41Channels, 5.8G: 16Channels<br>IEEE 802.11an HT40:<br>5.2GHz:9 Channels, 5.3GHz:9 Channels, 5.6GHz: 33 Channels,5.8G: 16Channels |
| Transmit Data Rate | IEEE 802.11b: 11, 5.5, 2, 1 Mbps<br>IEEE 802.11g: 54, 48, 36, 24, 18, 12, 11, 9, 6 Mbps<br>IEEE 802.11gn HT20: 65, 58.5, 52, 39, 26, 19.5, 13, 6.5Mbps<br>IEEE 802.11gn HT40: 135, 121.5, 108, 81, 54, 40.5, 27, 13.5 Mbps<br>IEEE 802.11a: 54, 48, 36, 24, 18, 12, 11, 9, 6 Mbps<br>IEEE 802.11an HT20: 65, 58.5, 52, 39, 26, 19.5, 13, 6.5Mbps<br>IEEE 802.11an HT40: 135, 121.5, 108, 81, 54, 40.5, 27, 13.5 Mbps |
| Type of Modulation | IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11gn HT20/40: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11an HT20/40: OFDM (64QAM, 16QAM, QPSK, BPSK) |

One dual band antenna is used for this device:

| | Antenna Type |
|---|---|
| Ant | 802.11a/b/g/n FPC Antenna |

## 1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.4 (2003) and FCC CFR 47 Part 2 and Part 15.

## 1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.

This site has been accreditation as a FCC filing site.

## 1.5 Test Summary

| Requirement | FCC Paragraph # | Test Pass |
|---|---|---|
| Antenna Requirement | 15.203 | ☒ |
| Conducted Emission | 15.207 | ☒ |
| Emission Bandwidth | 15.407 (a)(1)(2) | ☒ |
| Output Power Requirement | 15.407 (a)(1)(2) | ☒ |
| Power Density Requirement | 15.407 (a)(1)(2) | ☒ |
| Peak Excursion | 15.407 (a)(6) | ☒ |
| Spurious Emissions | 15.407 (b) | ☒ |
| Radiated Emission | 15.407 (b), 15.209 | ☒ |
| Transmit Power Control (TPC) | 15.407 (h)(1) | ☒ |
| Dynamic Frequency Selection (DFS) | 15.407 (h)(2) | ☒ |

# 2 PROVISIONS APPLICABLE

## 2.1 Definition

**Unintentional radiator:**
A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:
A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :
A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

**Intentional radiator:**
A device that intentionally generates and emits radio frequency energy by radiation or induction.

## 2.2 Requirement for Compliance

### (1) Conducted Emission Requirement

For unintentional device, according to §15.107(a) Line Conducted Emission Limits is as following:

| Frequency MHz | Quasi Peak dB $\mu$ V | Average dB $\mu$ V |
|---|---|---|
| 0.15 - 0.5 | 66-56* | 56-46* |
| 0.5 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

*Decreases with the logarithm of the frequency.

For intentional device, according to §15.207(a) Line Conducted Emission Limits is same as above table.

### (2) Radiated Emission Requirement

According to §15.407 (b)(6), unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.
According to §15.407 (b), the provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

For unintentional device, according to §15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency MHz | Distance Meters | Radiated dB $\mu$ V/m | Radiated $\mu$ V/m |
|---|---|---|---|
| 30 - 88 | 3 | 40.0 | 100 |
| 88 - 216 | 3 | 43.5 | 150 |
| 216 - 960 | 3 | 46.0 | 200 |
| above 960 | 3 | 54.0 | 500 |

For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

### (3) Antenna Requirement

For intentional device, according to §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.

**(4) Bandwidth Requirement**

None; for reporting purposes only.

**(5) Output Power Requirement**

According to 15.407(a)(1) for the band 5.15-58.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to 15.407(a)(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 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**(6) Spurious Emissions Measurement**

According to 15.407 (b)(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 EIRP of –27 dBm /MHz.

According to 15.407 (b)(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 EIRP of –27 dBm /MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm / MHz in the 5.15-5.25 GHz band.

According to 15.407 (b)(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 EIRP of –27 dBm /MHz.

According to 15.407 (b)(5), the above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

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

According to 15.407 (b)(7), the provisions of Section 15.205 of the part apply to intentional radiators operating under this section.

According to 15.407 (b)(8), when measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

### (7) Power Density Requirement

Refer to Section 2.2(5), Output Power Requirement.

### (8) Peak Excursion Requirement

According to 15.407 (a)(6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### (9) Transmit Power Control (TPC)

According to 15.407 (h)(1), Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

### (10) Dynamic Frequency Selection (DFS)

According to 15.407 (h)(2), Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is -64 dBm. For devices that operate with less than 200 mW e.i.r.p. the minimum detection threshold is -62dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. The DFS process shall be required to provide a uniform spreading of the loading over all the available channels.

(i) Operational Modes. The DFS requirement applies to the following operational modes:

(A) The requirement for channel availability check time applies in the master operational mode.

(B) The requirement for channel move time applies in both the master and slave operational modes.

(ii) Channel Availability Check Time. A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar signal with a power level greater than the interference threshold values listed above is detected within 60 seconds.

(iii) Channel Move Time. After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

(iv) Non-occupancy Period. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

## 2.3 Restricted Bands of Operation

According to 15.205, only spurious emissions are permitted in any of the frequency bands listed below :

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090 - 0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.25 |
| 0.495 - 0.505 ** | 16.69475 - 16.69525 | 608-614 | 5.35-5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 108-121.94 | 1718.8-1722.2 | 13.25-13.4 |
| 6.31175-6.31225 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475 - 156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2655-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | Above 38.6 |
| 13.36-13.41 | | | |

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

## 2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## 2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio / TV technician for help.

# 3. SYSTEM TEST CONFIGURATION

## 3.1 Devices for Tested System

| Device | Manufacture | Model No. | Cable Description |
|---|---|---|---|
| * Cisco CIUS 4G | Celestica Thailand Ltd. | CIUS-7-AT-K9 | 1.8m*1, Unshielded Power Line / Adapter |
| Test Jig | N/A | N/A | 1.8m*1, Unshielded Power Line<br>1.8m*1 Unshielded Signal Line |
| Notebook | HP | nx6320 | 3.1m*1, Unshielded Power Line |

Note:
Remark "*" means equipment under test.

| Equipment | Manufacturer | Model No. | FCC ID |
|---|---|---|---|
| Access Point | Cisco | AIR-AP1252AG-A-K9 | LDK 102061<br>LDK 102062 |

## 3.2 Dscription of Test modes

3.2.1 IEEE 802.11a mode, IEEE 802.11an HT20 mode:

3.2.1.1 5.2GHz Band

There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---|---|
| Low = 36 | 5180 |
| Middle = 40 | 5200 |
| High = 48 | 5240 |

3.2.1.2 5.3GHz Band

There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---|---|
| Low = 52 | 5260 |
| Middle = 60 | 5300 |
| High = 64 | 5320 |

3.2.1.3 5.6GHz Band

There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---|---|
| Low = 100 | 5500 |
| Middle = 120 | 5600 |
| High = 140 | 5700 |

IEEE 802.11a mode: 6 Mbps data rate is the worse case for full testing.

3.2.2 IEEE 802.11an HT40 mode:

3.2.2.1 5.2GHz Band

There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---|---|
| Low = 38 | 5190 |
| High = 46 | 5230 |

3.2.2.2 5.3GHz Band

There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---|---|
| Low = 54 | 5270 |
| High = 62 | 5310 |

3.2.2.3 5.6GHz Band

There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---|---|
| Low = 102 | 5510 |
| Middle = 118 | 5590 |
| High = 134 | 5670 |

IEEE 802.11an HT40 mode: MCS0 13.5 Mbps data rate is the worse case for full testing.

### 3.2.3 Test Mode Description

#### 3.2.3.1 Modulation Type

| Test Mode | Modulation | Note |
|---|---|---|
| A | IEEE 802.11a | - |
| B | IEEE 802.11an HT20 (note1) | - |
| C | IEEE 802.11an HT40 | - |

#### 3.2.3.2 Test Mode and Worse Case Determination

| Item | Test Item | Test Mode | Test Frequency (MHz) |
|---|---|---|---|
| 1 | Conducted Emission | B (note2) | M (Worse Case) |
| 2 | Emission Bandwidth | A，B，C | L，M，H |
| 3 | Output Power Requirement | A，B，C | L，M，H |
| 4 | Power Density Requirement | A，B，C | L，M，H |
| 5 | Spurious Emissions | A，B，C | L，M，H |
| 6 | Radiated Emission | A，B，C | L，M，H |
| 6.1 | Radiated Emission (below 1GHz) | B (note1) | M (Worse Case) |
| 6.2 | Radiated Emission (above 1GHz) | A，B，C | L，M，H |

note:

1. The worse case is determined as the modulation with highest output power.
2. The worse case is determined as the adaptor:1 with highest noise conducted emission. Choose that for final testing and record the result.

# 4 CONDUCTED EMISSION MEASUREMENT

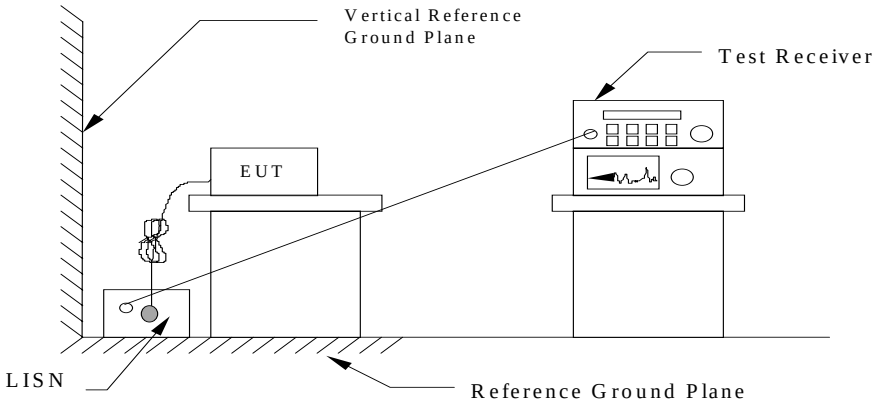
## 4.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to § 15.107(a) and §15.207(a) respectively. Both Limits are identical specification.

## 4.2 Measurement Procedure

1. Setup the configuration per figure 1.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

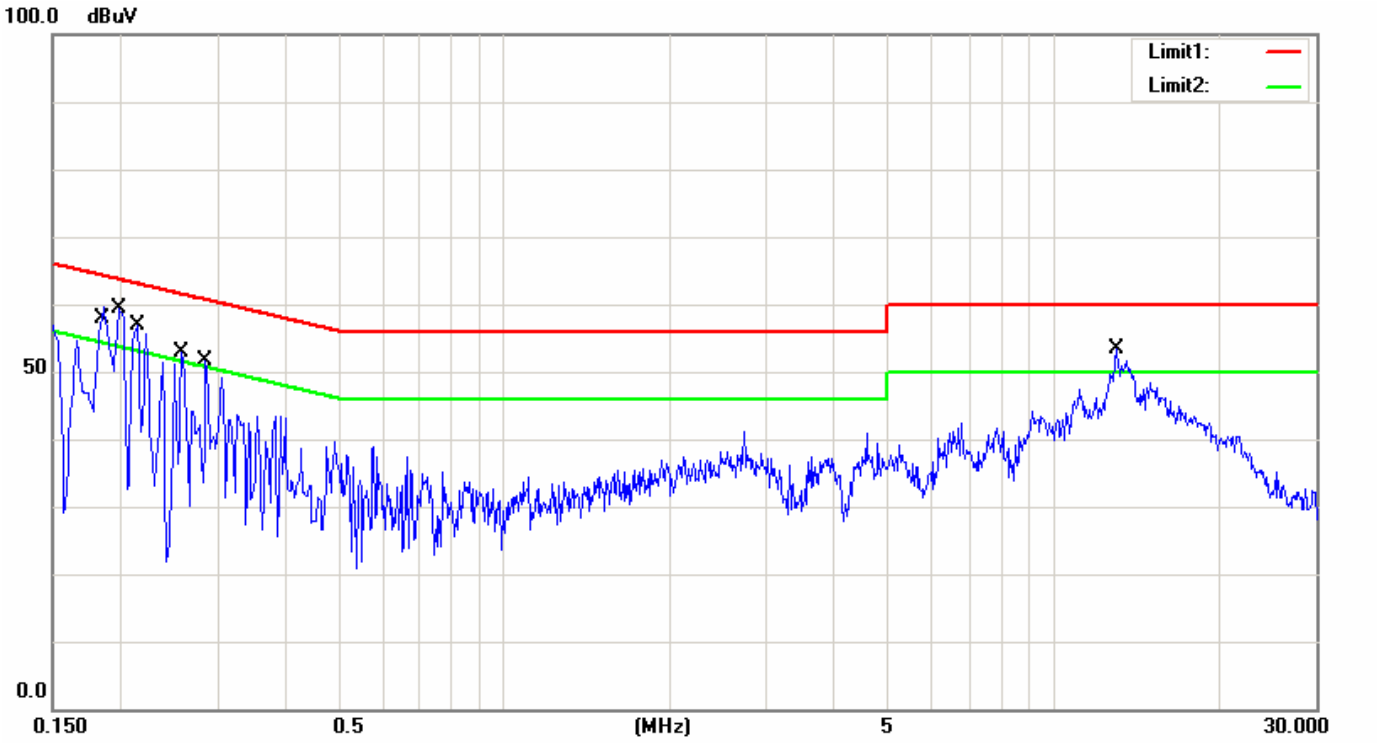
Figure 1 : Conducted emissions measurement configuration



## 4.3 Conducted Emission Data

**File:** 11-06-MAS-176 **Data:** #1 **Date:** 2011/8/18 **Temperature:** 25 ℃

**Time:** pm 06:39:43 **Humidity:** 62 %




**Condition:** **Phase:** L1

**EUT:** **Power:** AC 110V/60Hz

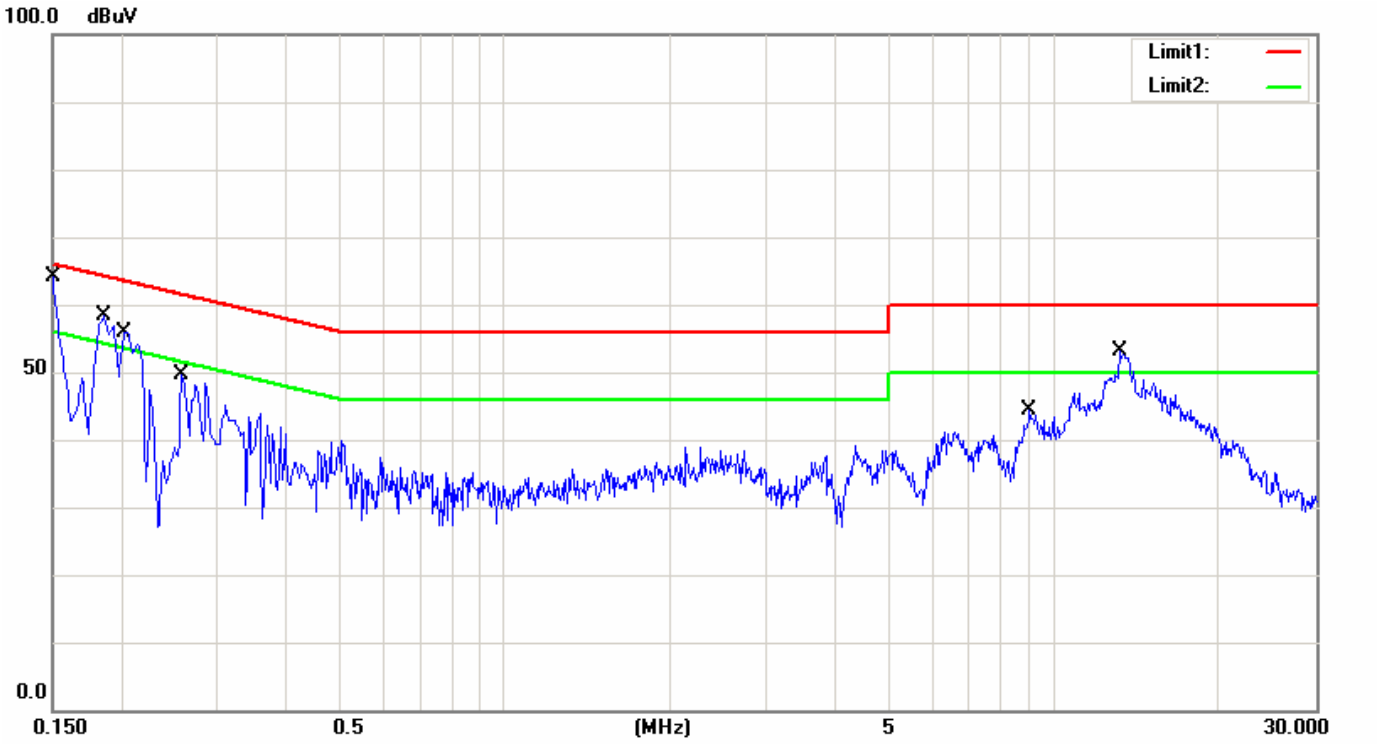
**Model:**

**Test Mode:** Adapter 1: (APD / DA-20A05)

| No. | Frequency | Reading | Detector | Corrected | Result | Limit | Margin |
|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | | dB | (dBuV) | (dBuV) | (dB) |
| 1 | 0.1824 | 49.33 | QP | 9.72 | 59.05 | 64.38 | -5.33 |
| 2 | 0.1824 | 28.11 | AVG | 9.72 | 37.83 | 54.38 | -16.55 |
| 3 | 0.1963 | 47.16 | QP | 9.72 | 56.88 | 63.77 | -6.89 |
| 4 | 0.1963 | 28.23 | AVG | 9.72 | 37.95 | 53.77 | -15.82 |
| 5 | 0.2150 | 43.92 | QP | 9.72 | 53.64 | 63.01 | -9.37 |
| 6 | 0.2150 | 24.28 | AVG | 9.72 | 34.00 | 53.01 | -19.01 |
| 7 | 0.2552 | 38.12 | QP | 9.72 | 47.84 | 61.59 | -13.75 |
| 8 | 0.2552 | 18.45 | AVG | 9.72 | 28.17 | 51.59 | -23.42 |
| 9 | 0.2855 | 38.32 | QP | 9.72 | 48.04 | 60.65 | -12.61 |
| 10 | 0.2855 | 18.00 | AVG | 9.72 | 27.72 | 50.65 | -22.93 |
| 11 | 12.9685 | 34.86 | QP | 9.93 | 44.79 | 60.00 | -15.21 |
| 12 | 12.9685 | 28.11 | AVG | 9.93 | 38.04 | 50.00 | -11.96 |

**File:** 11-06-MAS-176 **Data:** #2 **Date:** 2011/8/18 **Temperature:** 25 ℃

**Time:** pm 06:45:05 **Humidity:** 62 %




**Condition:** CISPR22 Class B Conduction(QP) **Phase:** N

**EUT:** **Power:** AC 110V/60Hz

**Model:**

**Test Mode:** Adapter 1: (APD / DA-20A05)

| No. | Frequency | Reading | Detector | Corrected | Result | Limit | Margin |
|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | | dB | (dBuV) | (dBuV) | (dB) |
| 1 | 0.1500 | 18.60 | QP | 9.69 | 28.29 | 66.03 | -37.74 |
| 2 | 0.1500 | 14.75 | AVG | 9.69 | 24.44 | 56.03 | -31.59 |
| 3 | 0.1853 | 46.40 | QP | 9.68 | 56.08 | 64.24 | -8.16 |
| 4 | 0.1853 | 25.37 | AVG | 9.68 | 35.05 | 54.24 | -19.19 |
| 5 | 0.2002 | 44.29 | QP | 9.68 | 53.97 | 63.60 | -9.63 |
| 6 | 0.2002 | 26.72 | AVG | 9.68 | 36.40 | 53.60 | -17.20 |
| 7 | 0.2592 | 35.96 | QP | 9.68 | 45.64 | 61.46 | -15.82 |
| 8 | 0.2592 | 19.66 | AVG | 9.68 | 29.34 | 51.46 | -22.12 |
| 9 | 9.0462 | 27.60 | QP | 9.86 | 37.46 | 60.00 | -22.54 |
| 10 | 9.0462 | 21.99 | AVG | 9.86 | 31.85 | 50.00 | -18.15 |
| 11 | 13.1598 | 38.75 | QP | 9.94 | 48.69 | 60.00 | -11.31 |
| 12 | 13.1598 | 32.00 | AVG | 9.94 | 41.94 | 50.00 | -8.06 |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. “***” means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. “#” means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

## 4.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

***RESULT = READING + LISN FACTOR (Included Cable Loss)***

## 4.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test.

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| RF Test Receiver | Rohde and Schwarz | ESCS30 | 09/06/2011 |
| LISN | EMCO | 37100/2M | 03/04/2011 |

# 5 ANTENNA REQUIREMENT

## 5.1 Standard Applicable

For intentional device, according to §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.
And according to §15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 5.2 Antenna Construction and Directional Gain

The radio utilizes with one type of antenna, with the maximum gain as table below:

| | Antenna Type | Peak gain (dBi) | | |
|---|---|---|---|---|
| | | 5150~5250MHz | 5250~5350MHz | 5740~5725MHz |
| Ant | 802.11abgn WLAN Antenna | 1.8 | 1.8 | 1.8 |

The highest gains of each type of antennas for all legacy / SISO modes test.

| Band | Ant gain (dBi) |
|---|---|
| 5.2GHz: 5150~5250MHz | 1.8 |
| 5.3GHz: 5250~5350MHz | 1.8 |
| 5.6GHz: 5740~5725MHz | 1.8 |

# 6 EMISSION BANDWIDTH MEASUREMENT

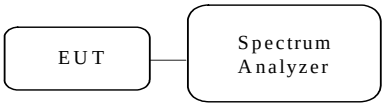
## 6.1 Standard Applicable

None; for reporting purposes only.

## 6.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 26 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Figure 2: Emission bandwidth measurement configuration.




## 6.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | 09/18/2012 |

## 6.4 Measurement Data

### 6.4.1 IEEE 802.11a

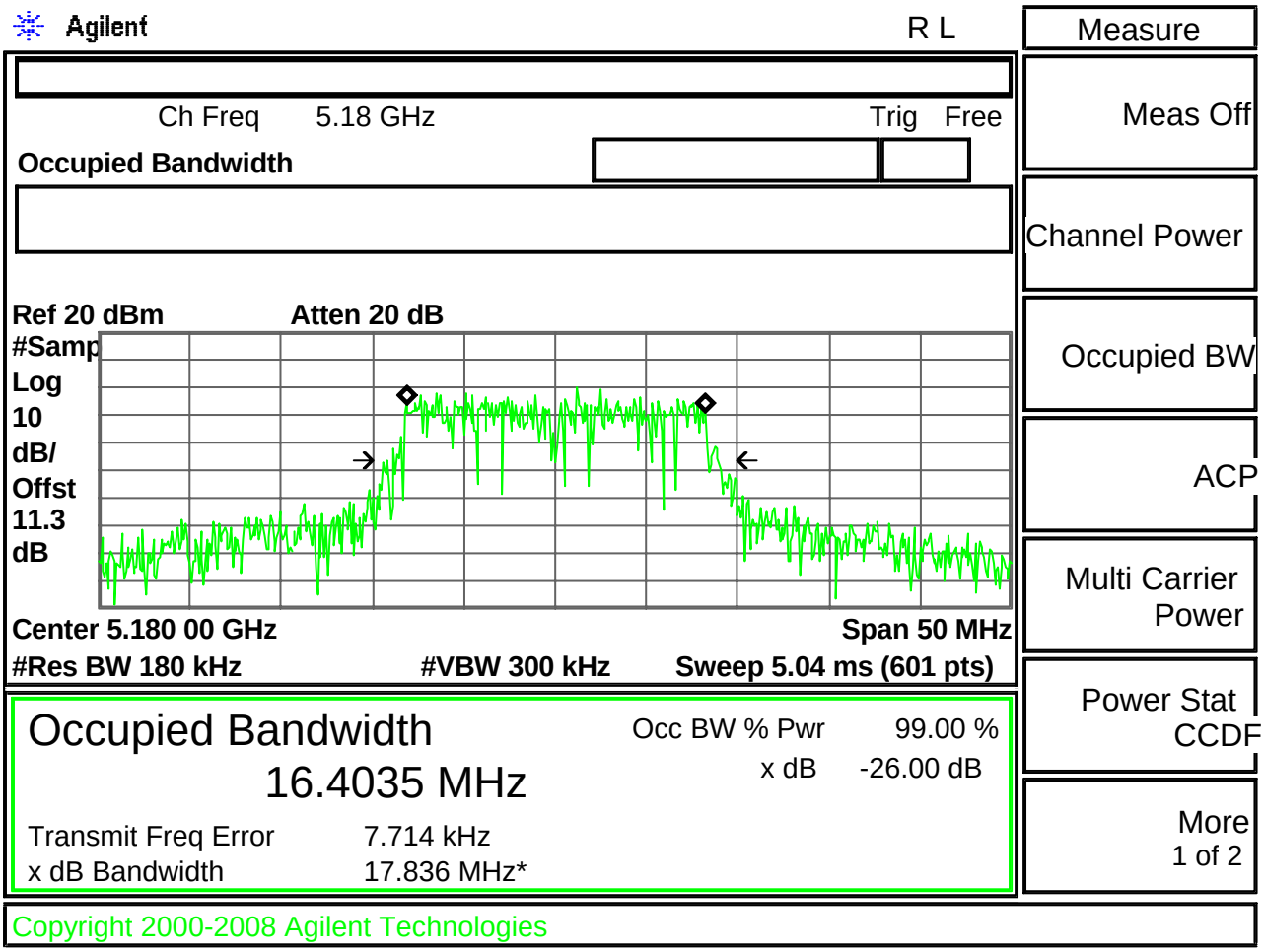
6.4.1.1 5.2GHz

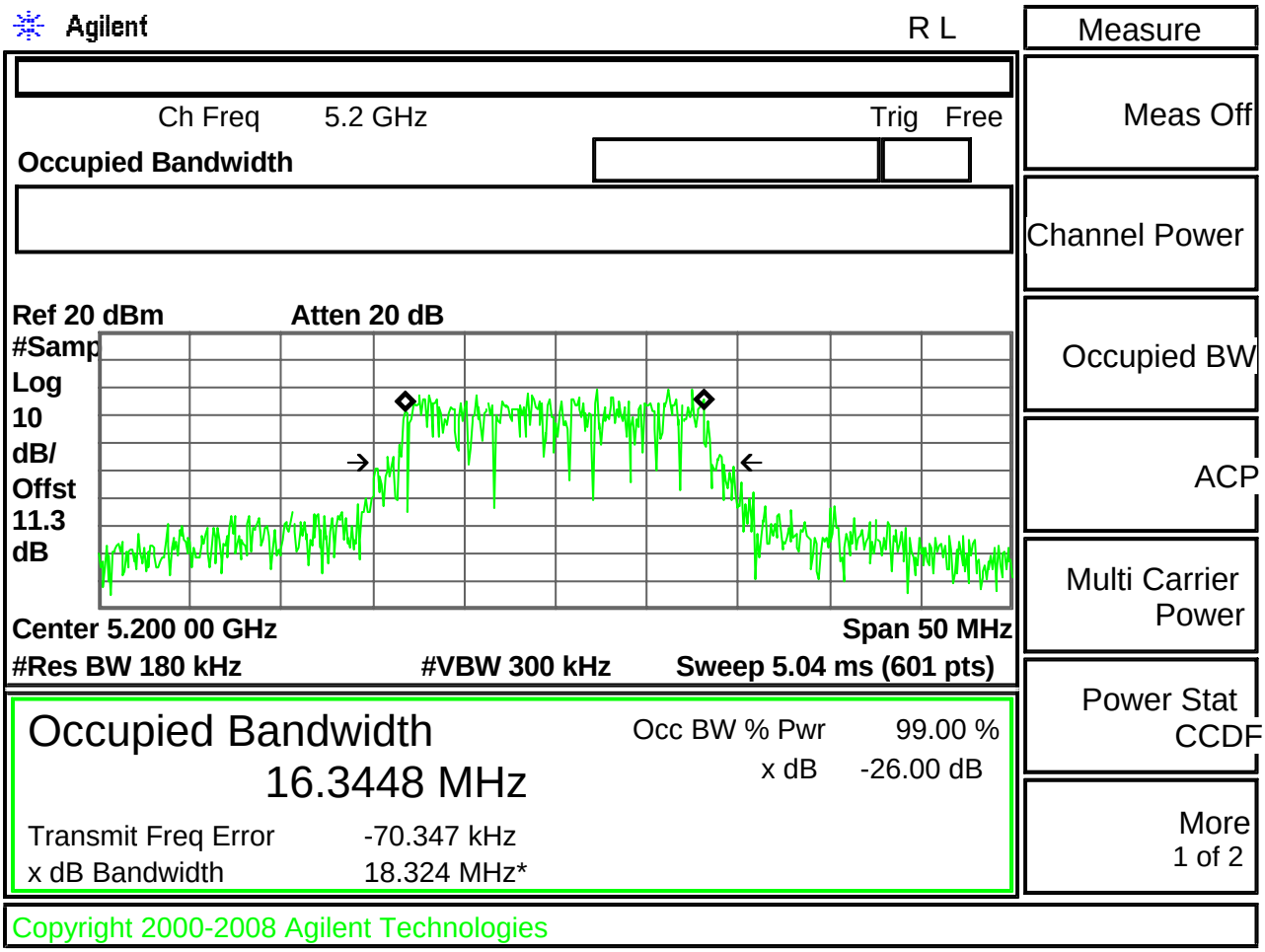
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

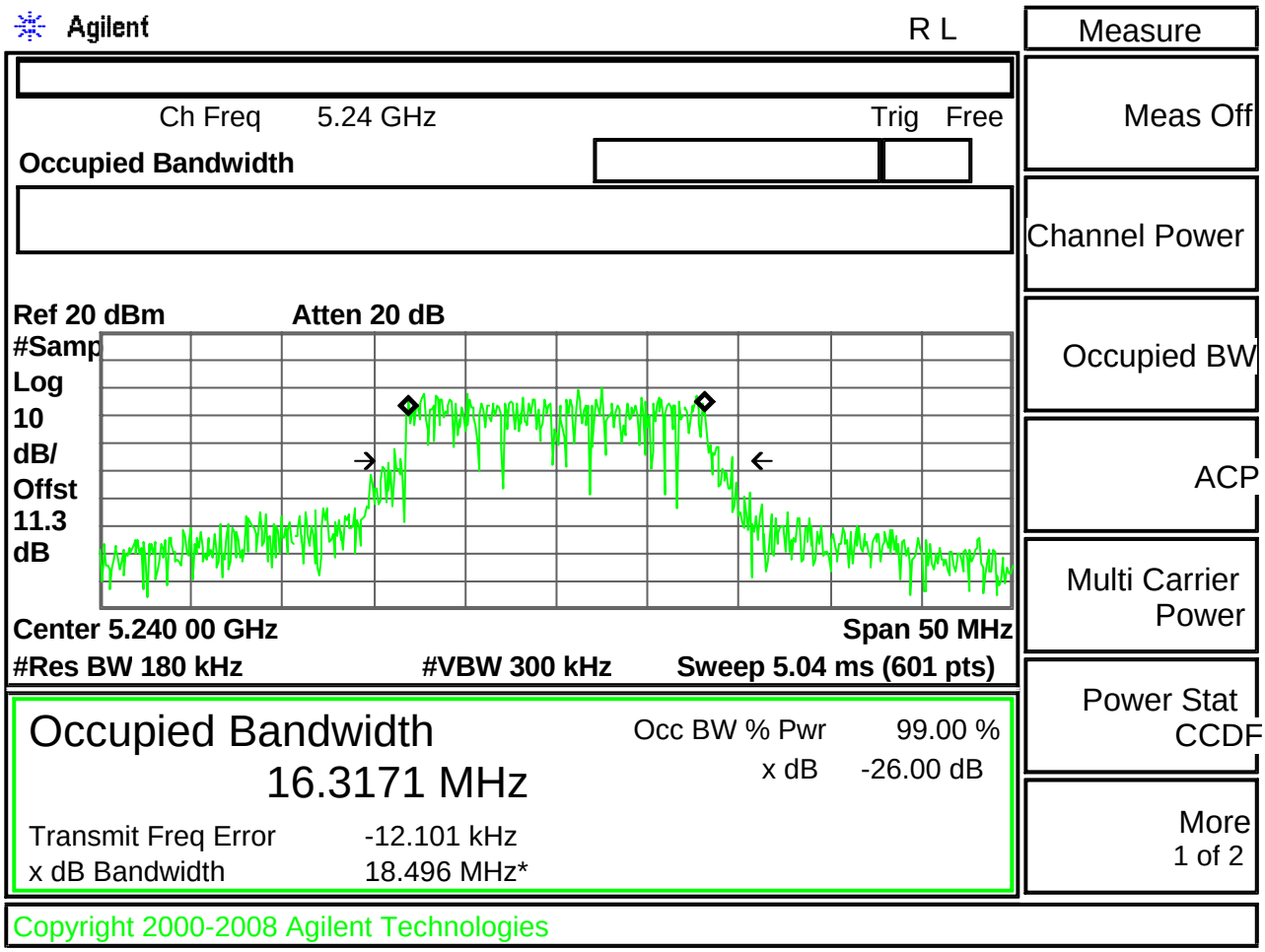
| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 17.836 | Page 24 |
| M | 18.324 | Page 25 |
| H | 18.496 | Page 26 |

***Note:***

*1.Please refer to page 24 to page 26 for chart*
*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*


Agilent
R L
Measure
Ch Freq 5.18 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.180 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Occupied Bandwidth
16.4035 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Power Stat CCDF
Transmit Freq Error 7.714 kHz
x dB Bandwidth 17.836 MHz*
More 1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.2 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.200 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
16.3448 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -70.347 kHz
x dB Bandwidth 18.324 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.24 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.240 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Occupied Bandwidth
16.3171 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Power Stat CCDF
Transmit Freq Error -12.101 kHz
x dB Bandwidth 18.496 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies

6.4.1.2 5.3GHz

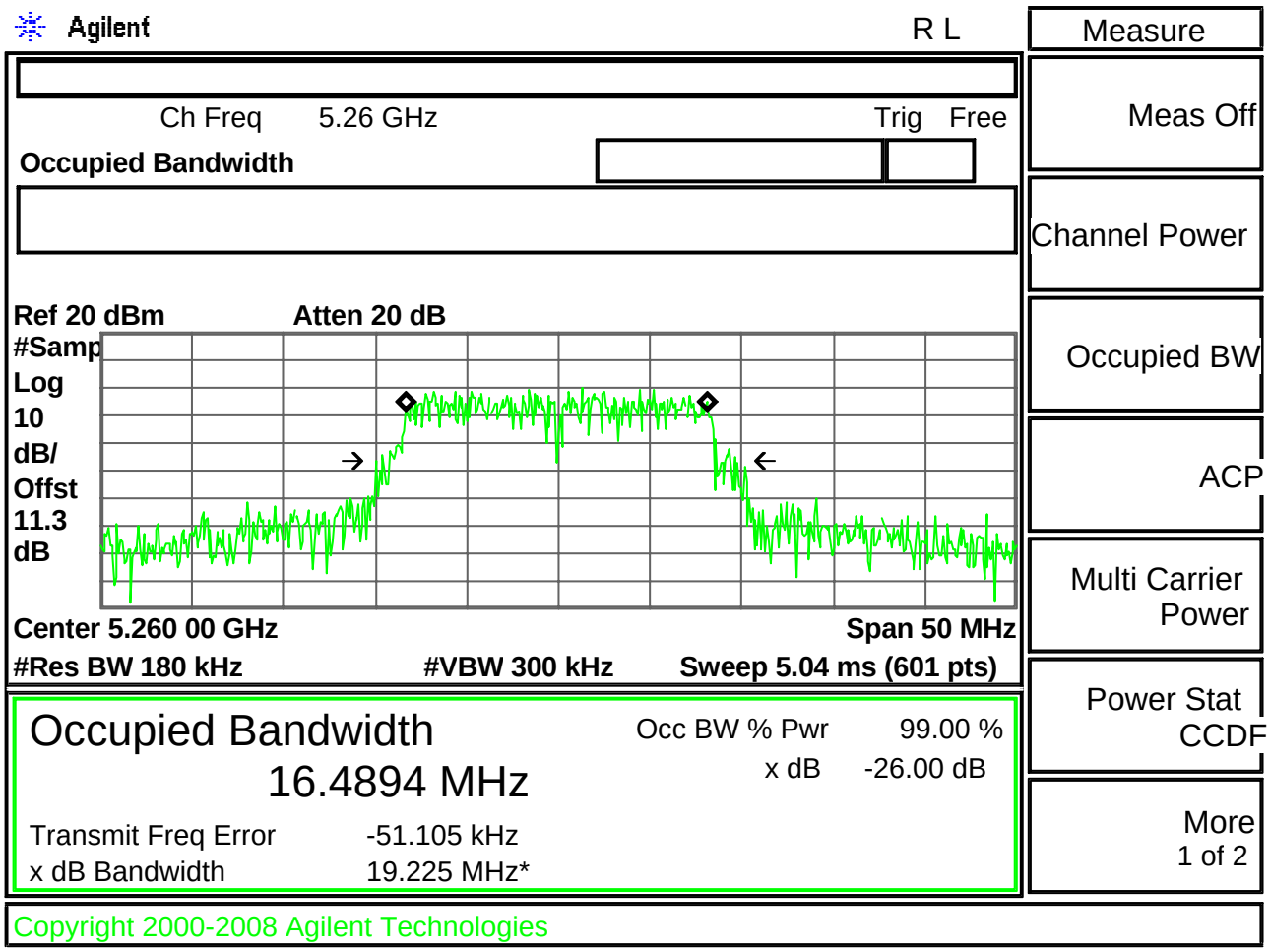
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

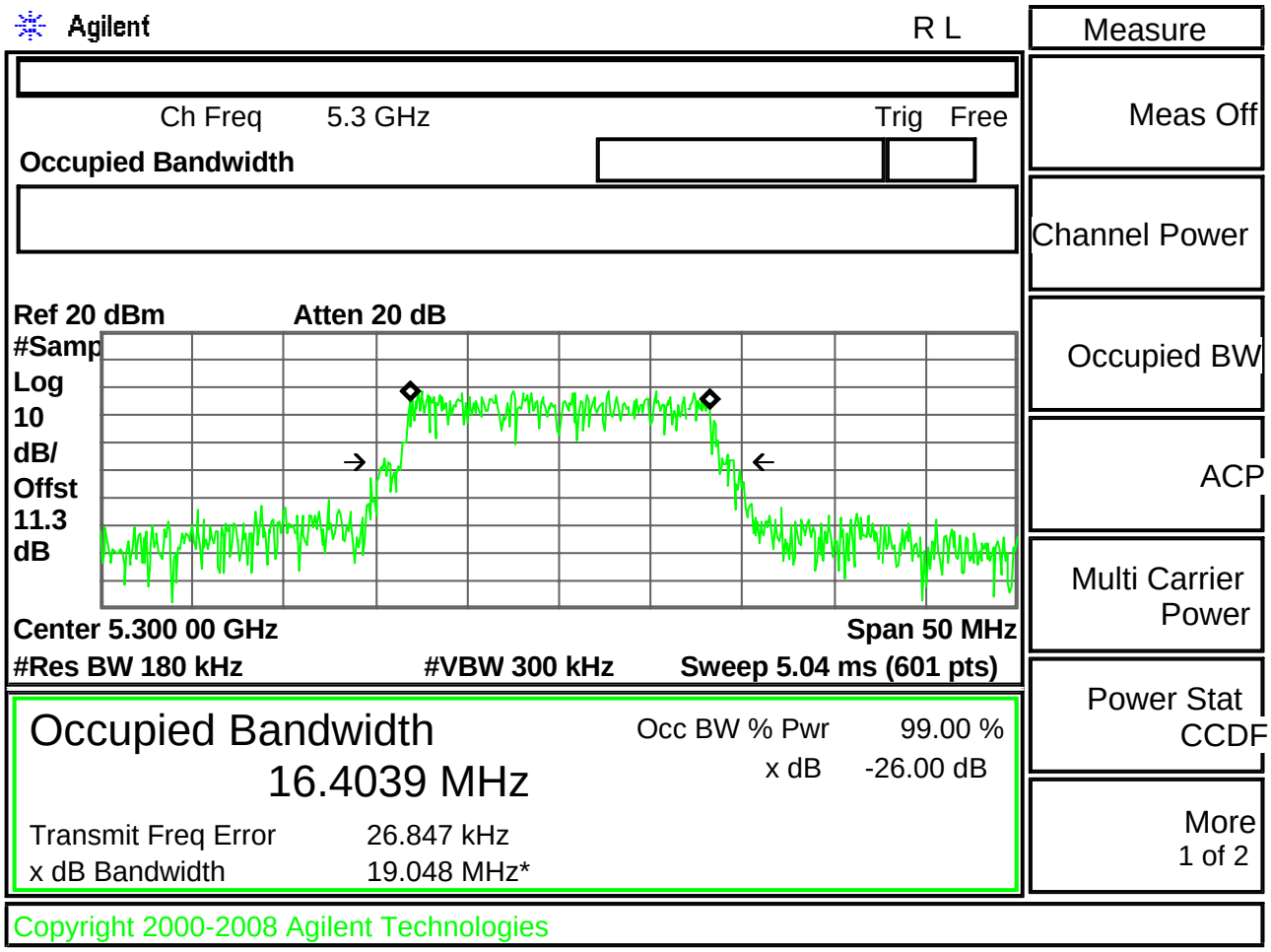
| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 19.225 | Page 28 |
| M | 19.048 | Page 29 |
| H | 18.699 | Page 30 |

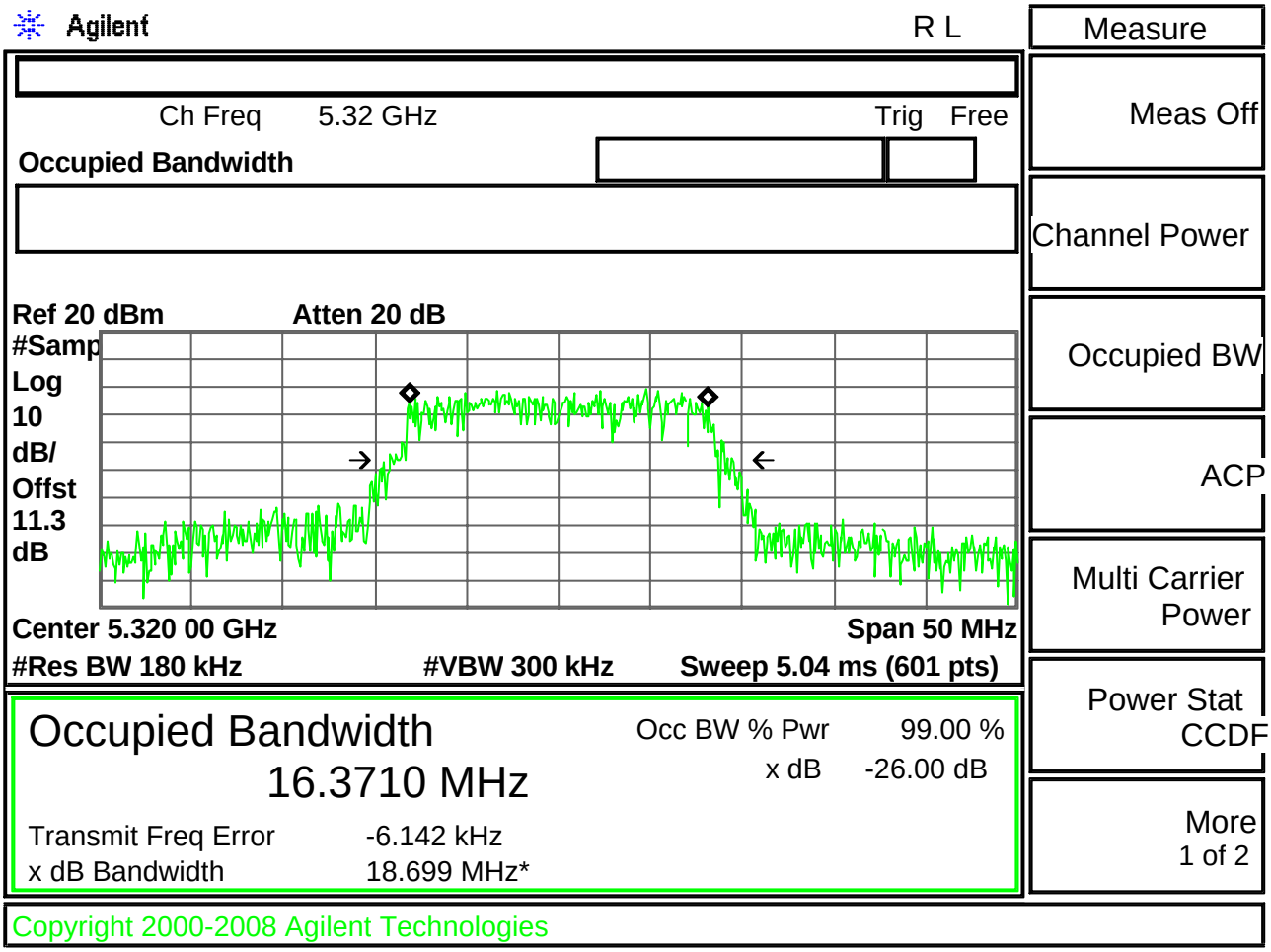
***Note:***

*1.Please refer to page 28 to page 30 for chart*

*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*


Agilent
R L
Measure
Ch Freq 5.26 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.260 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
16.4894 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -51.105 kHz
x dB Bandwidth 19.225 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.3 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.300 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Occupied Bandwidth
16.4039 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 26.847 kHz
x dB Bandwidth 19.048 MHz*
Power Stat CCDF
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.32 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.320 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
16.3710 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -6.142 kHz
x dB Bandwidth 18.699 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies

6.4.1.3 5.6GHz

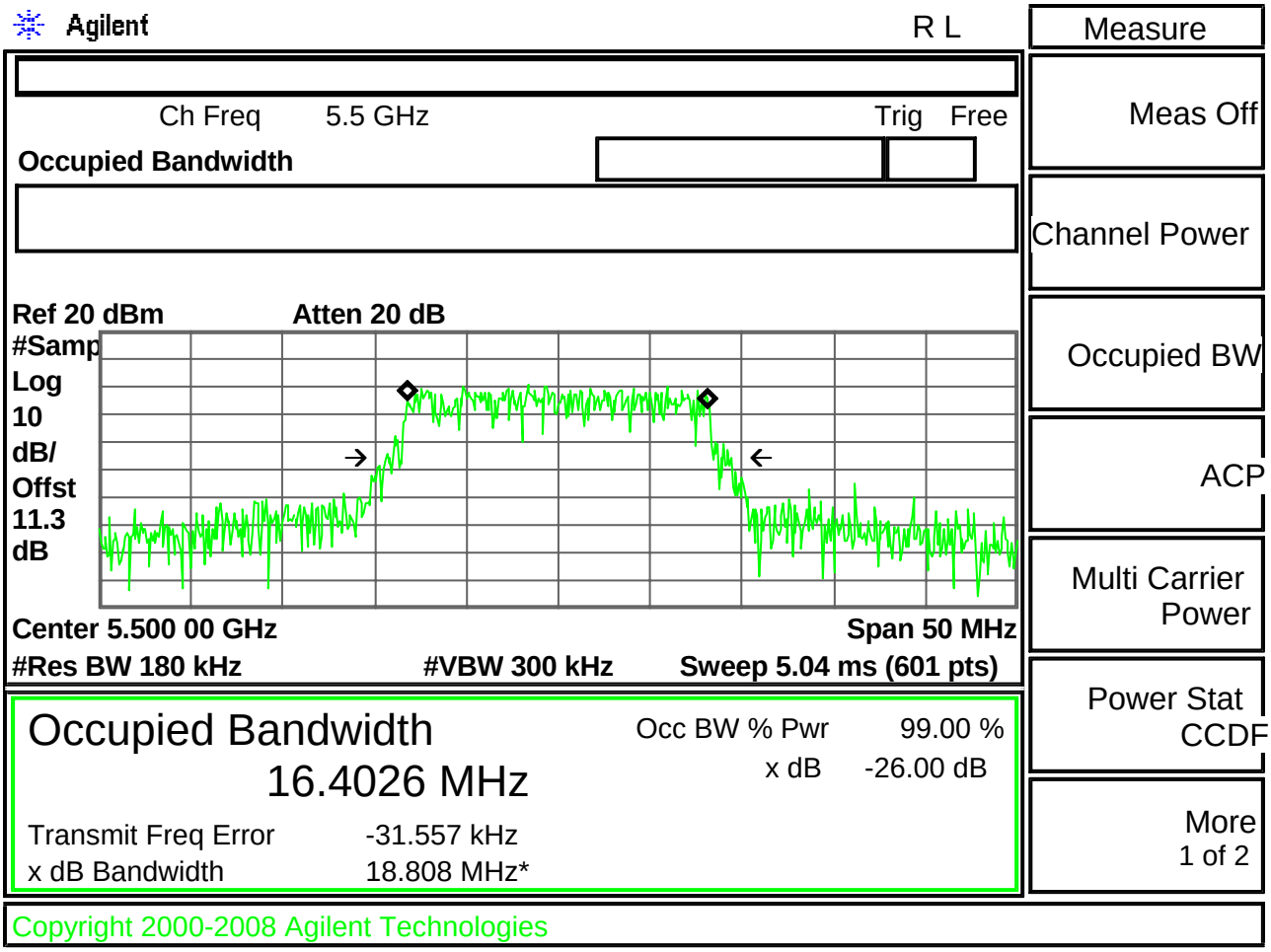
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

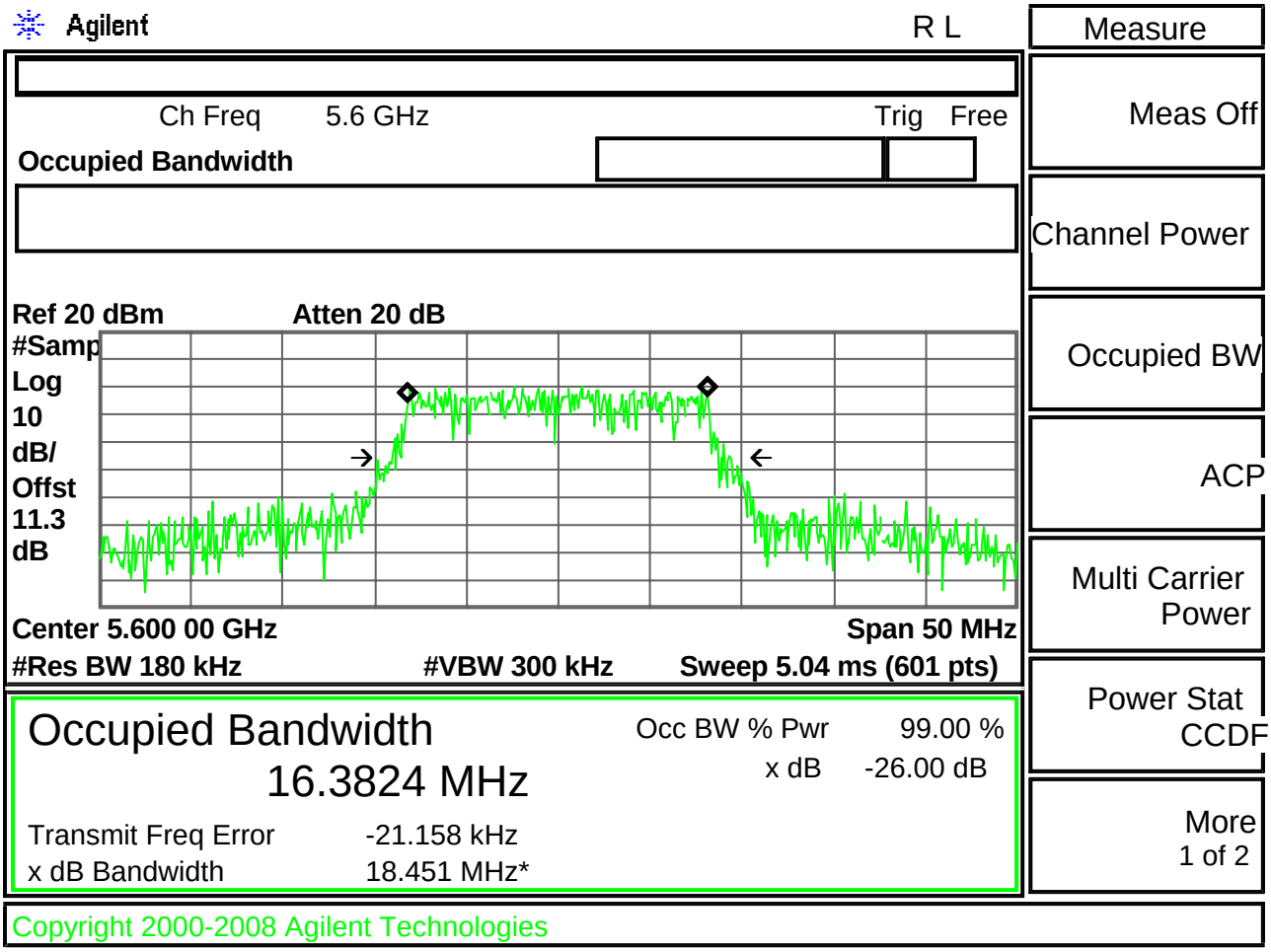
| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 18.808 | Page 32 |
| M | 18.451 | Page 33 |
| H | 18.690 | Page 34 |

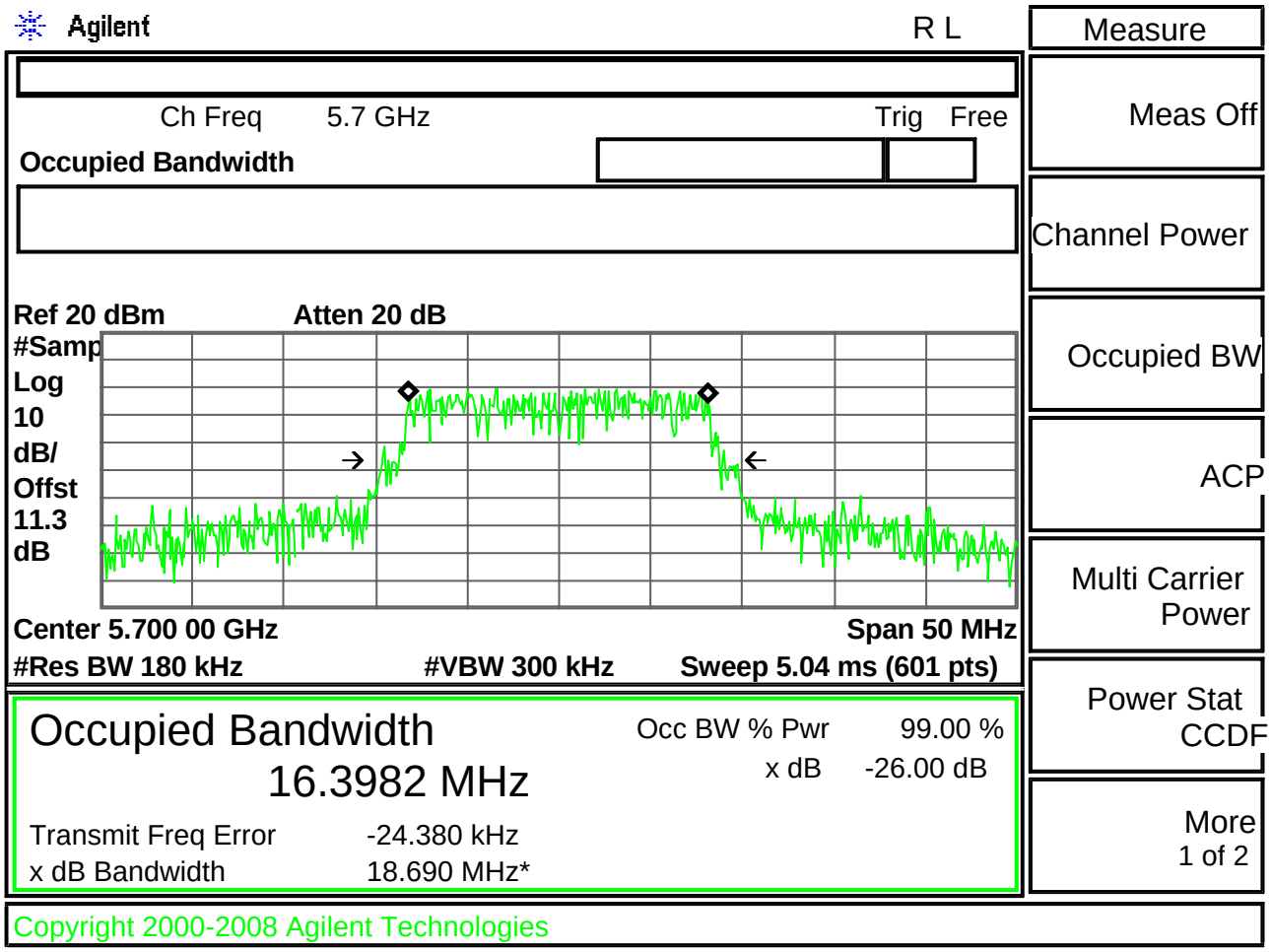
***Note:***

*1.Please refer to page 32 to page 34 for chart*

*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*


Agilent
R L
Measure
Ch Freq 5.5 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.500 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
16.4026 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -31.557 kHz
x dB Bandwidth 18.808 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.6 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.600 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
16.3824 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -21.158 kHz
x dB Bandwidth 18.451 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.7 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.700 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Occupied Bandwidth
16.3982 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -24.380 kHz
x dB Bandwidth 18.690 MHz*
Power Stat CCDF
More
1 of 2
Copyright 2000-2008 Agilent Technologies

### 6.4.2 IEEE 802.11an, HT20

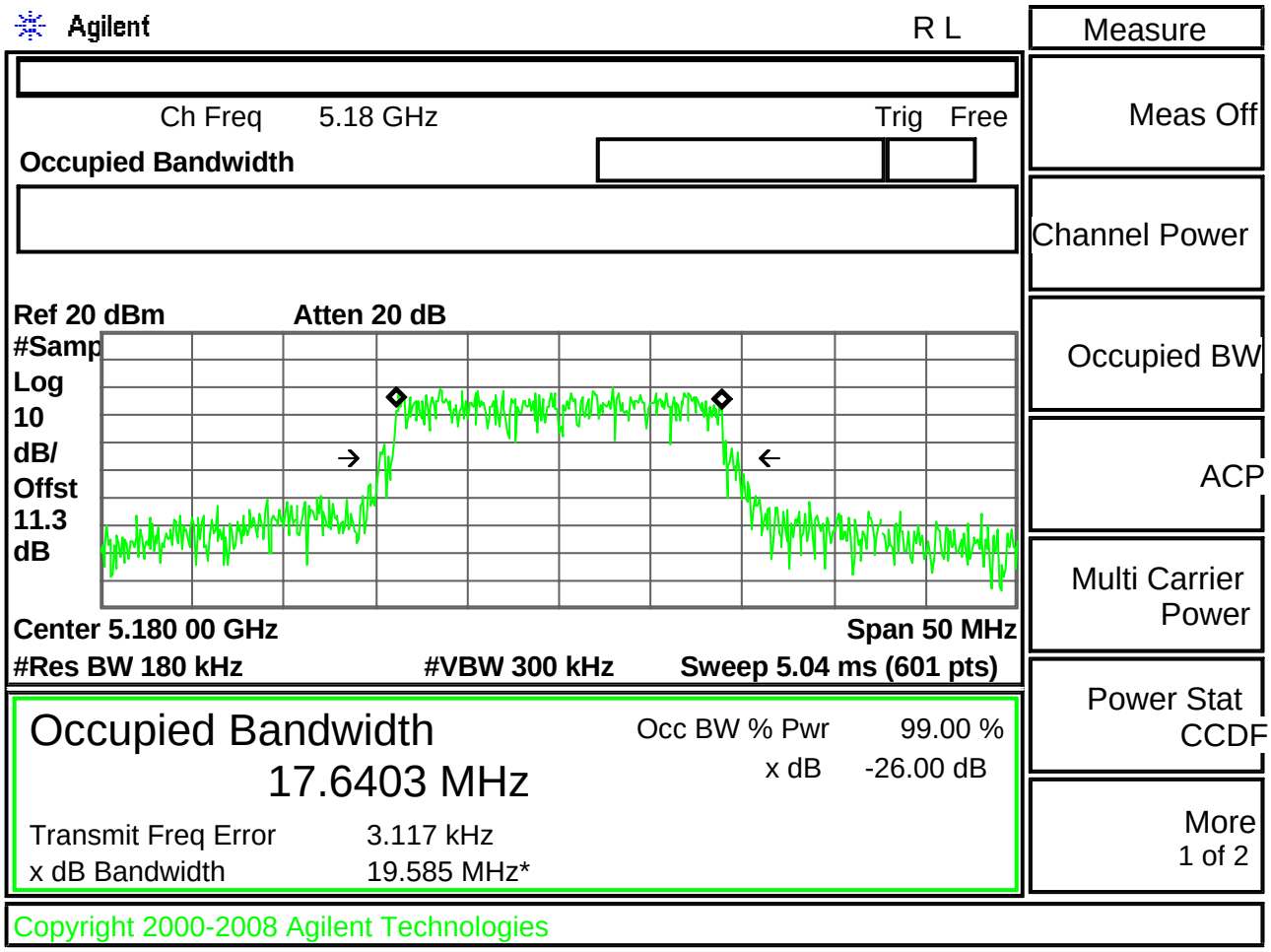
6.4.2.1 5.2GHz

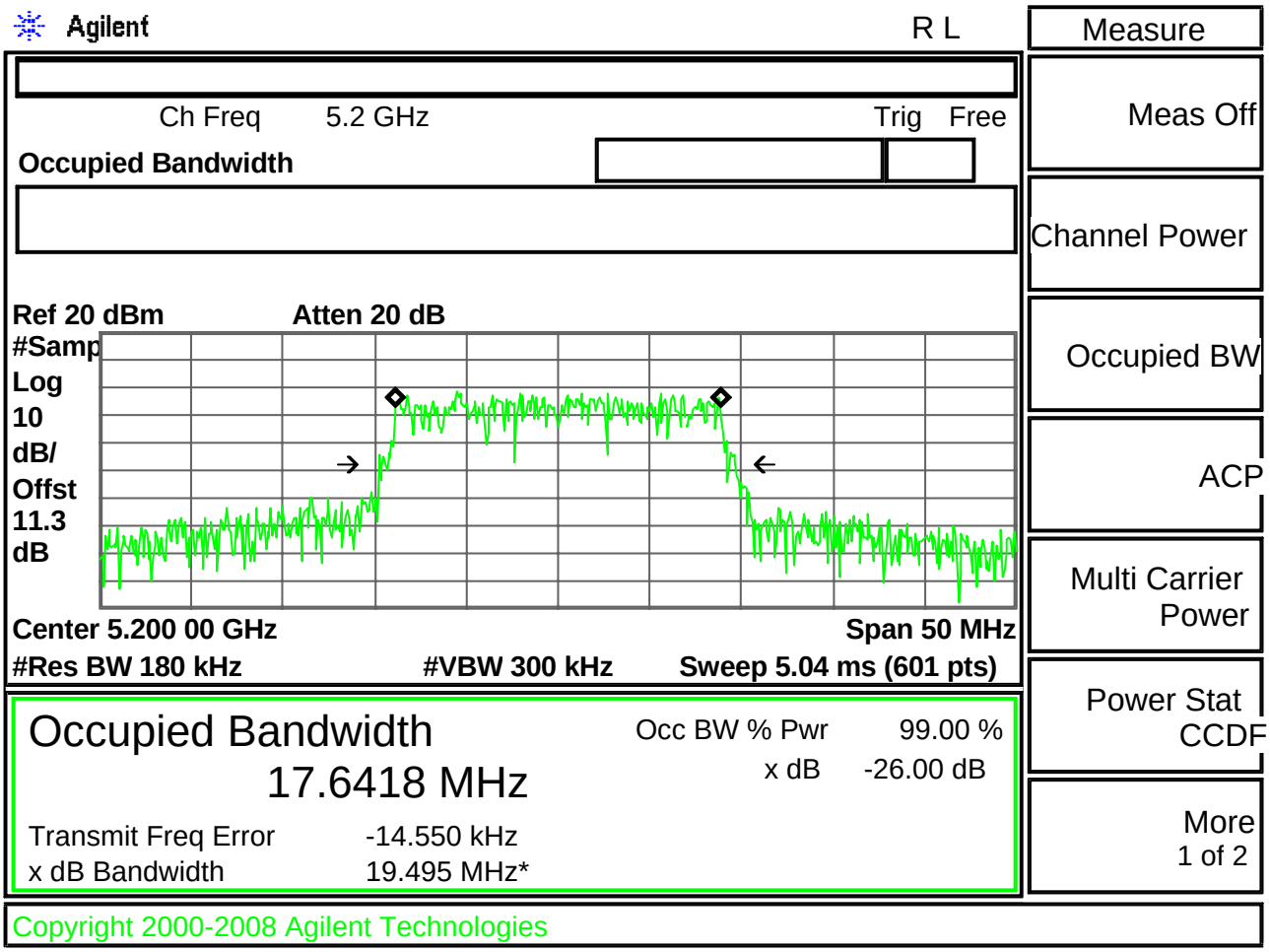
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

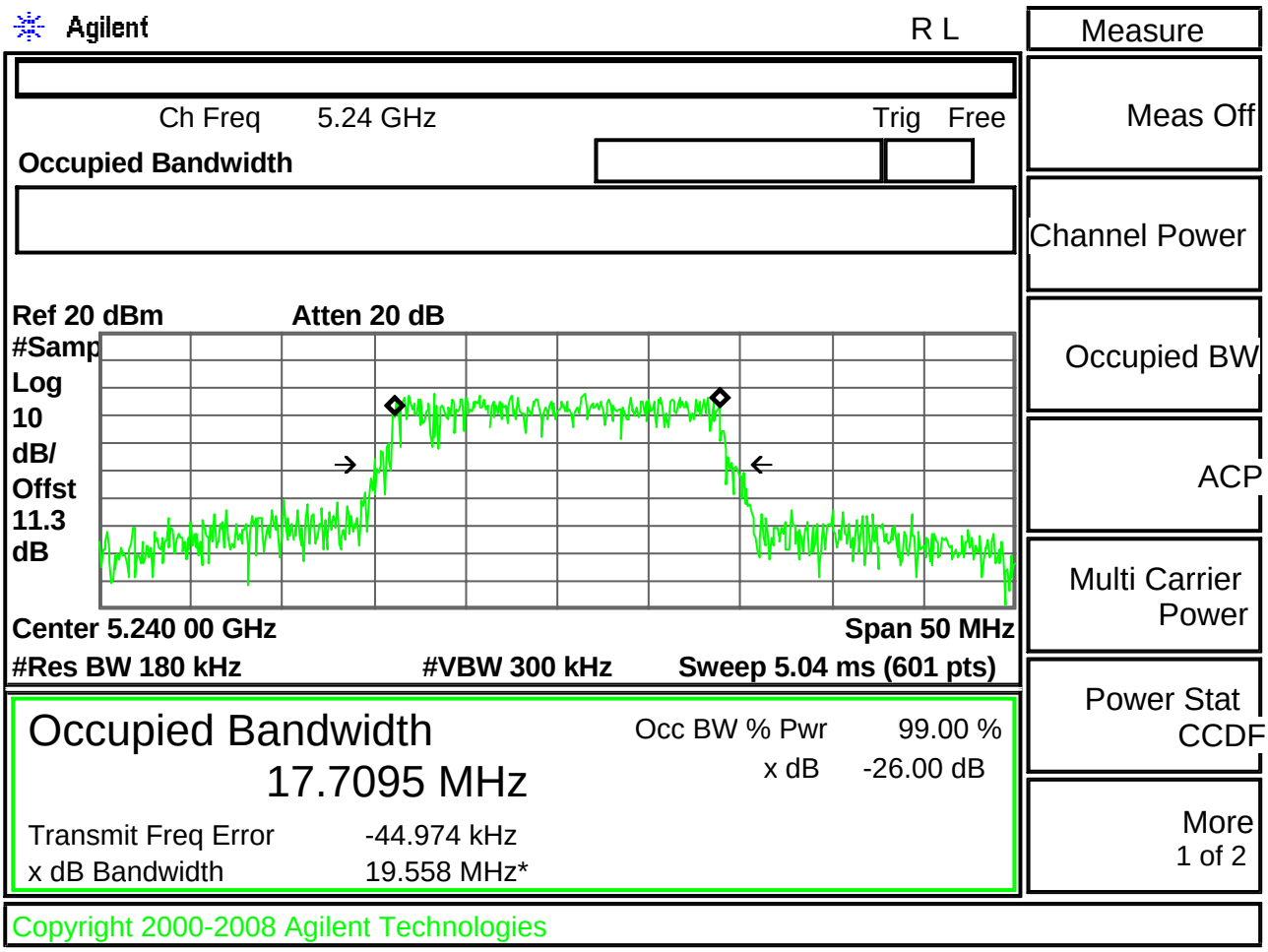
| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 19.585 | Page 36 |
| M | 19.495 | Page 37 |
| H | 19.558 | Page 38 |

***Note:***

*1.Please refer to page 36 to page 38 for chart*
*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*


Agilent
R L
Measure
Ch Freq 5.18 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.180 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Occupied Bandwidth
17.6403 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Power Stat CCDF
Transmit Freq Error 3.117 kHz
x dB Bandwidth 19.585 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.2 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.200 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
17.6418 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -14.550 kHz
x dB Bandwidth 19.495 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.24 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.240 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
17.7095 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -44.974 kHz
x dB Bandwidth 19.558 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies

6.4.2.2 5.3GHz

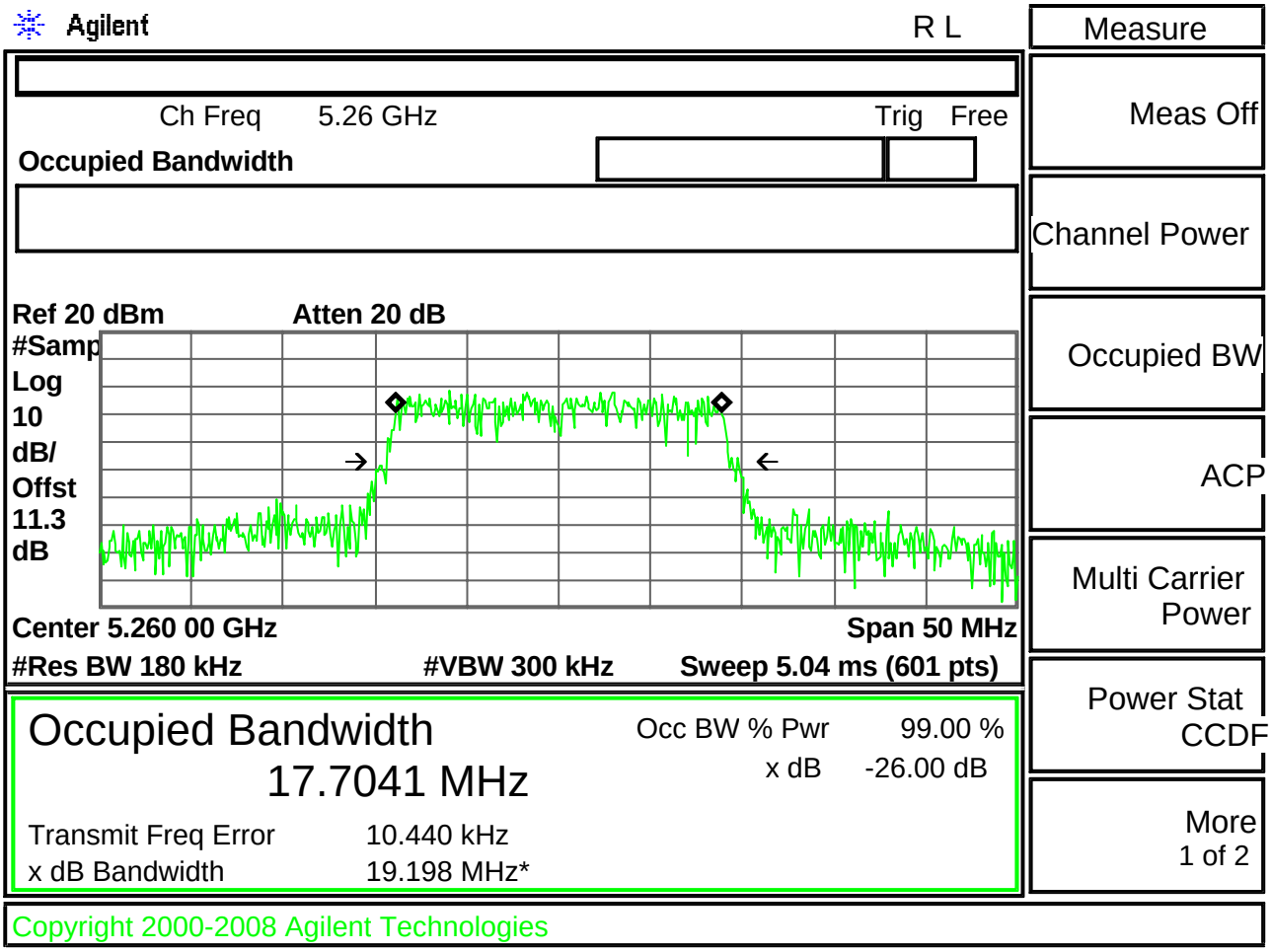
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

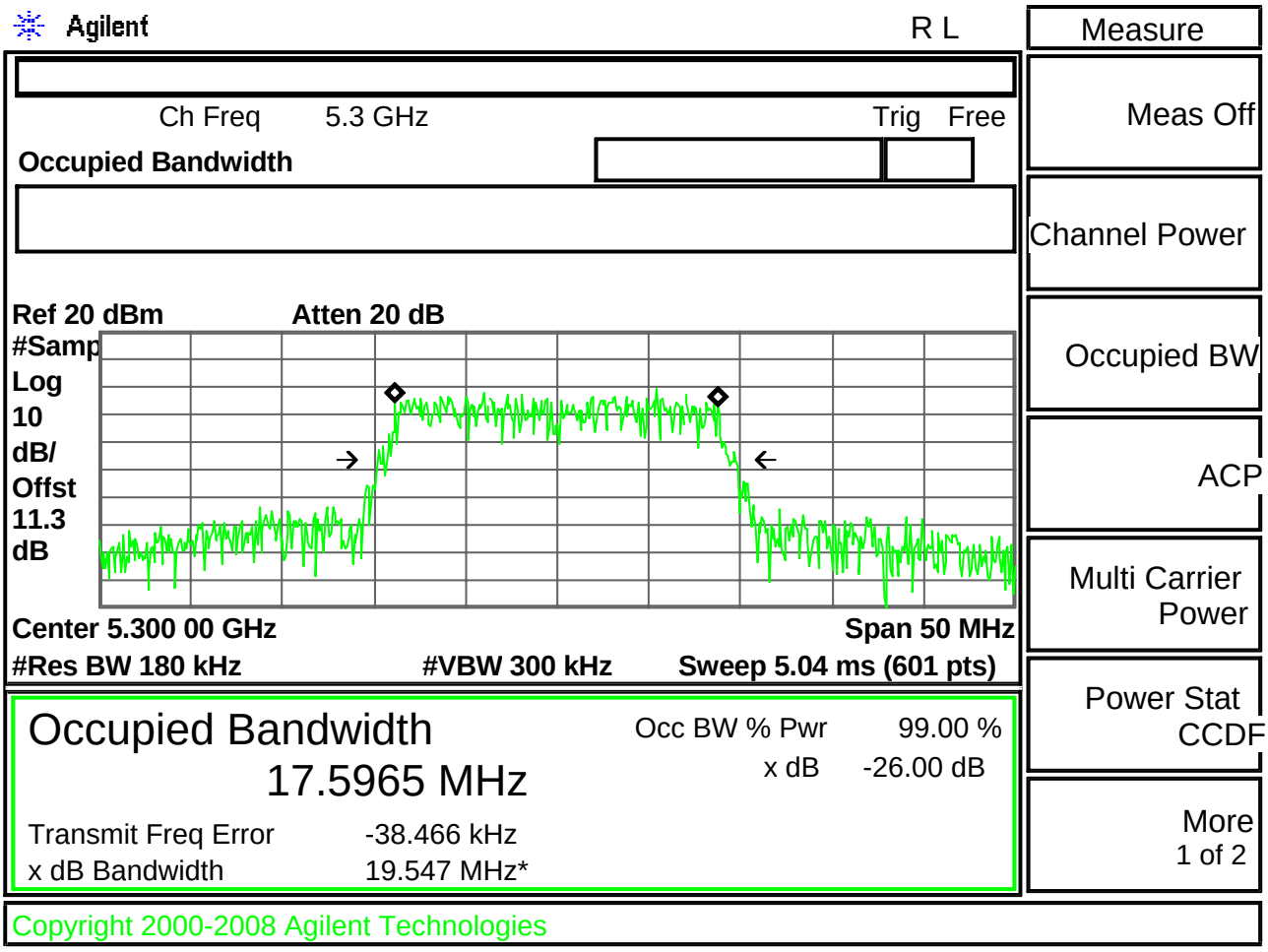
| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 19.198 | Page 40 |
| M | 19.547 | Page 41 |
| H | 19.094 | Page 42 |

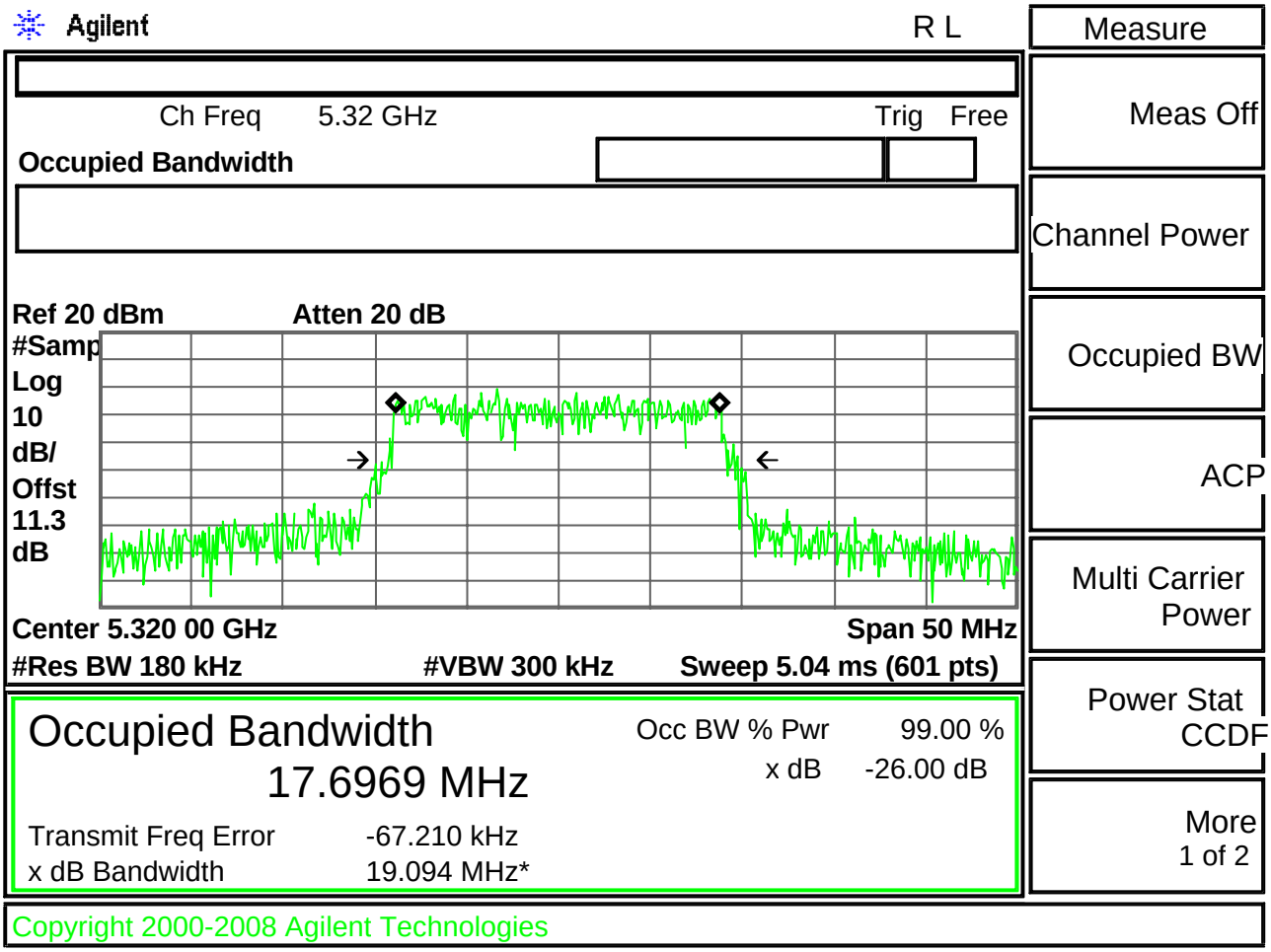
***Note:***

*1.Please refer to page 40 to page 42 for chart*

*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*


Agilent
R L
Measure
Ch Freq 5.26 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.260 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
17.7041 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 10.440 kHz
x dB Bandwidth 19.198 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.3 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.300 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
17.5965 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -38.466 kHz
x dB Bandwidth 19.547 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.32 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.320 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Occupied Bandwidth
17.6969 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Power Stat CCDF
Transmit Freq Error -67.210 kHz
x dB Bandwidth 19.094 MHz*
More 1 of 2
Copyright 2000-2008 Agilent Technologies

6.4.2.3 5.6GHz

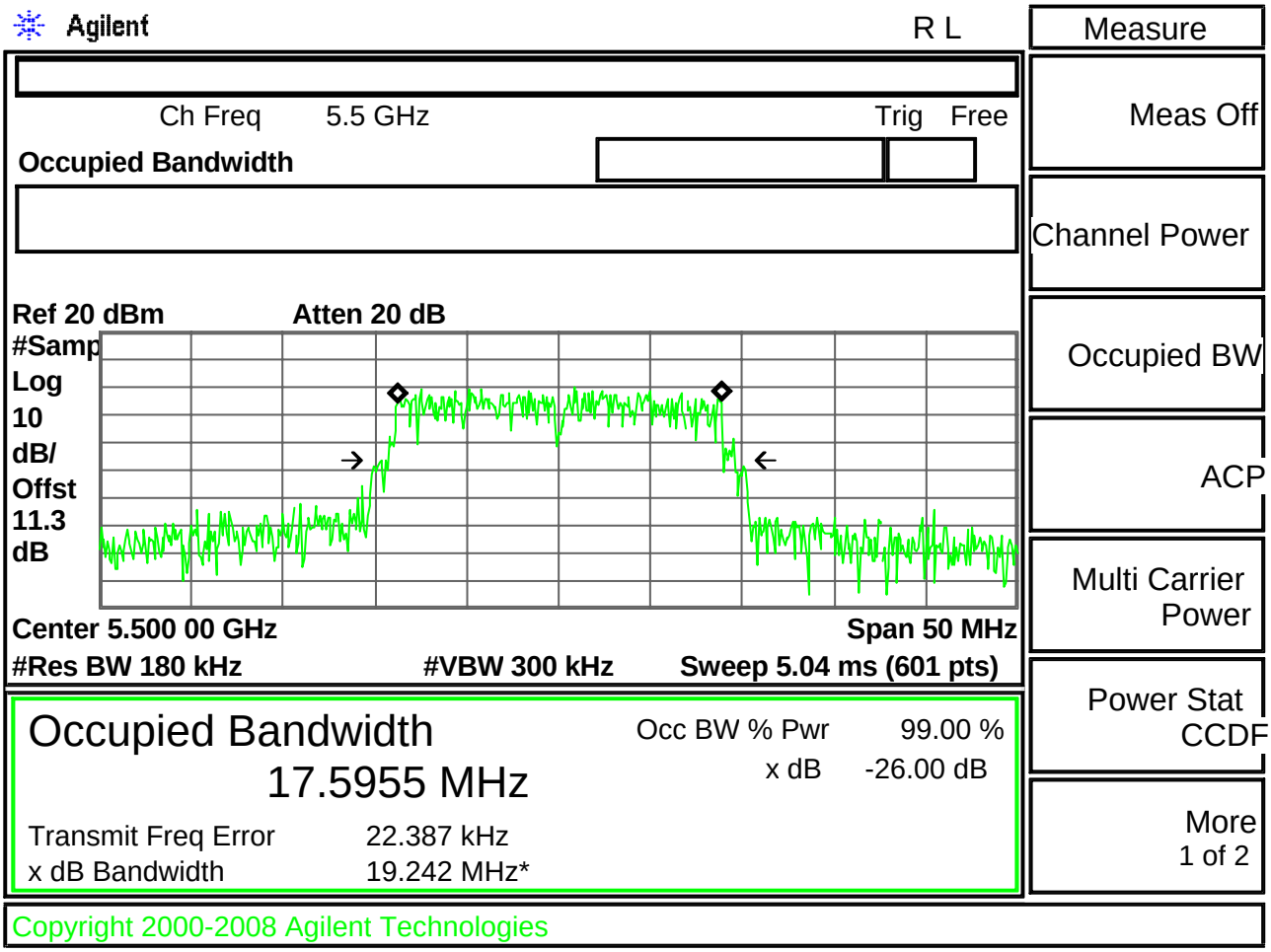
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

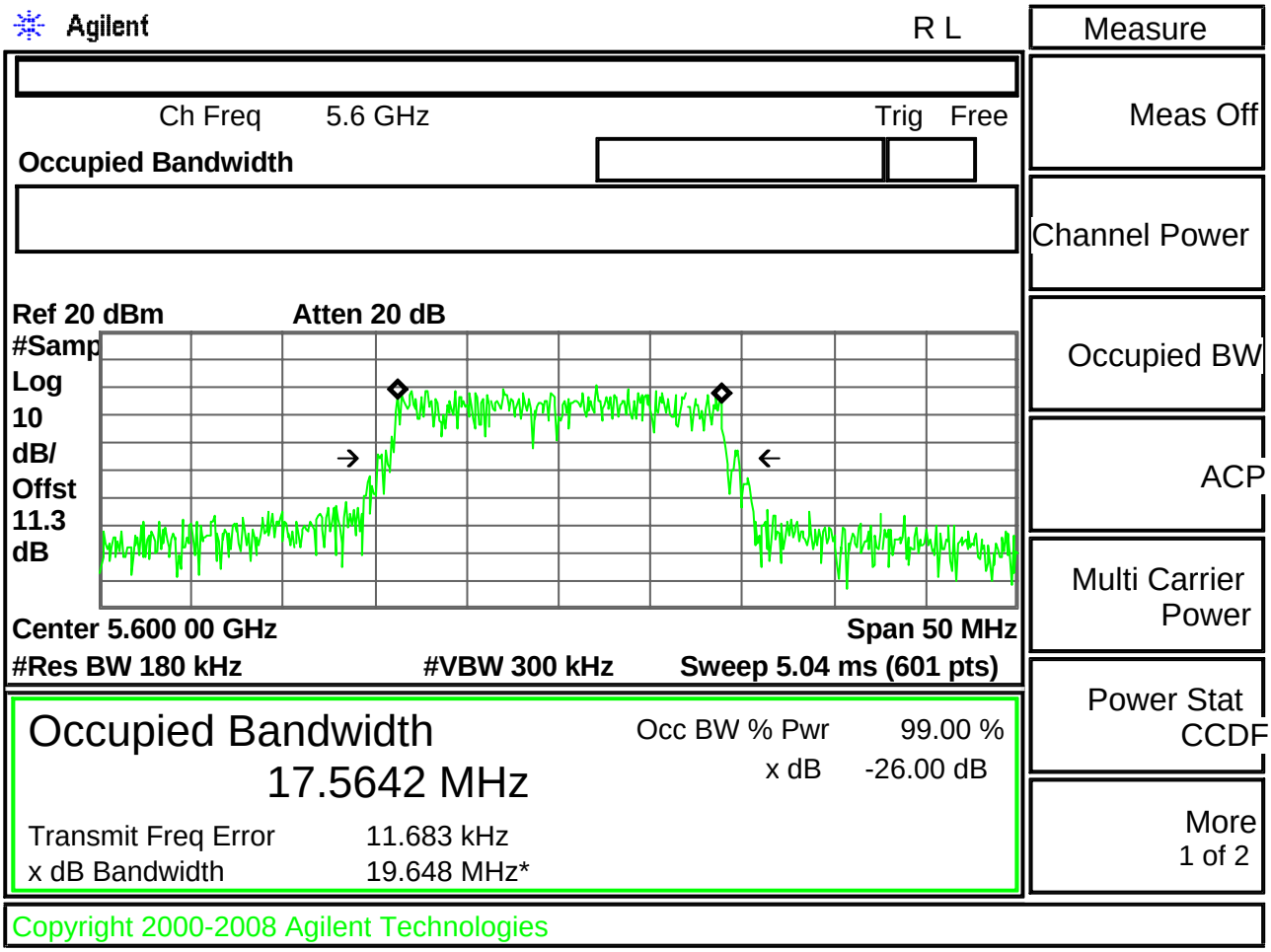
| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 19.242 | Page 44 |
| M | 19.648 | Page 45 |
| H | 19.609 | Page 46 |

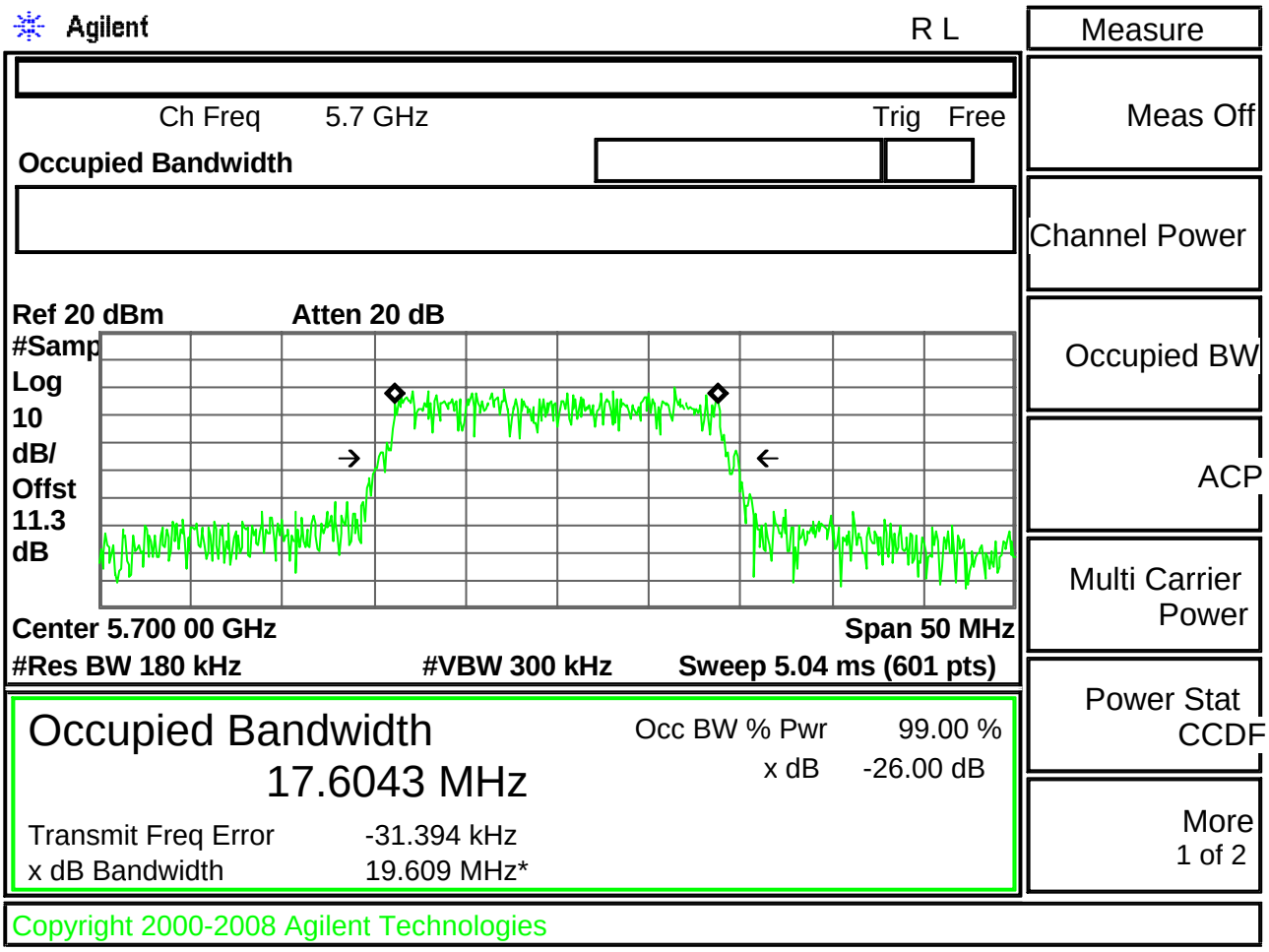
***Note:***

*1.Please refer to page 44 to page 46 for chart*

*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*


Agilent
R L
Measure
Ch Freq 5.5 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.500 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
17.5955 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 22.387 kHz
x dB Bandwidth 19.242 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.6 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.600 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
17.5642 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 11.683 kHz
x dB Bandwidth 19.648 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.7 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.700 00 GHz
Span 50 MHz
#Res BW 180 kHz
#VBW 300 kHz
Sweep 5.04 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
17.6043 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -31.394 kHz
x dB Bandwidth 19.609 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies

### 6.4.3 IEEE 802.11an, HT40

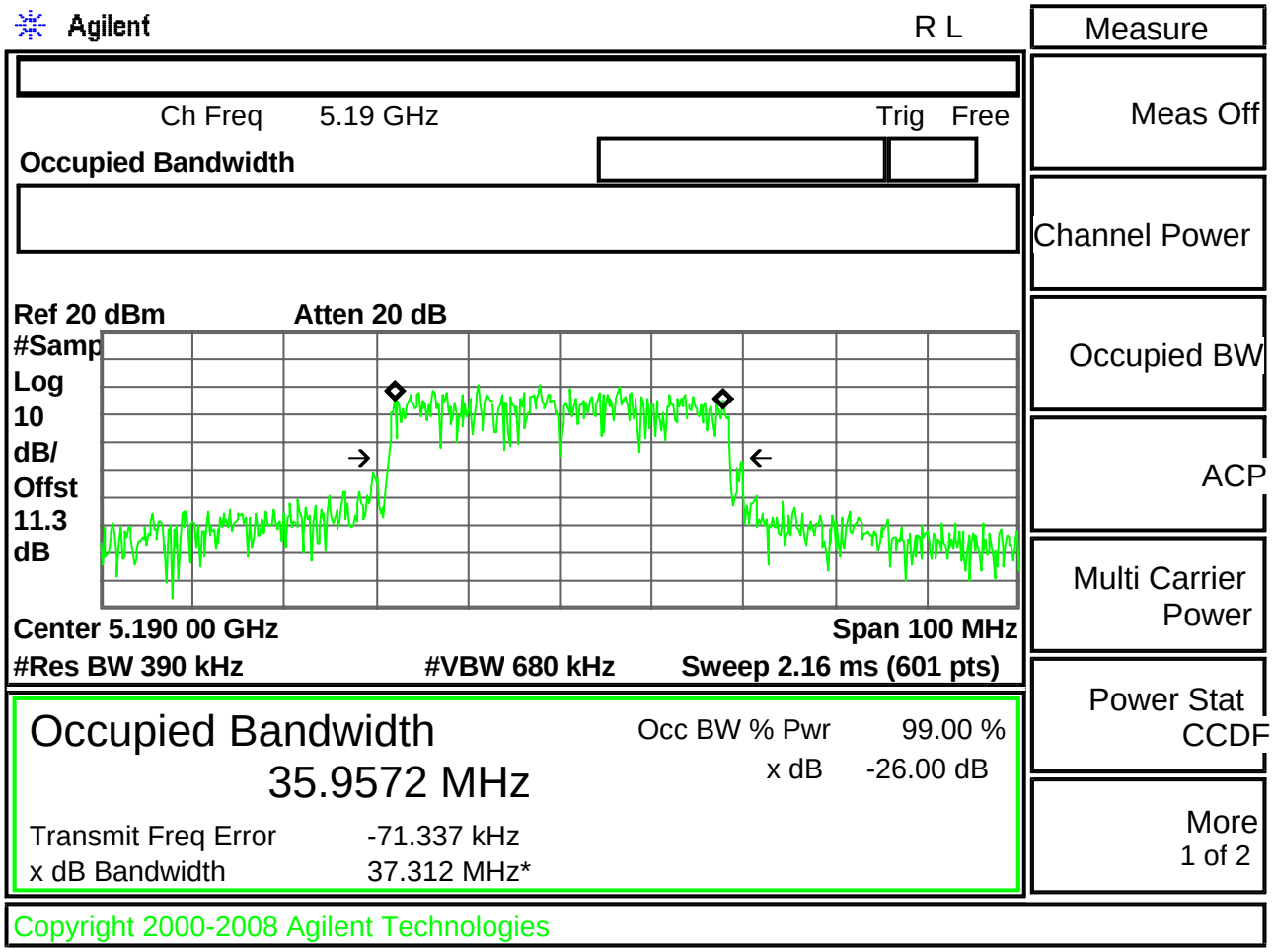
6.4.3.1 5.2GHz

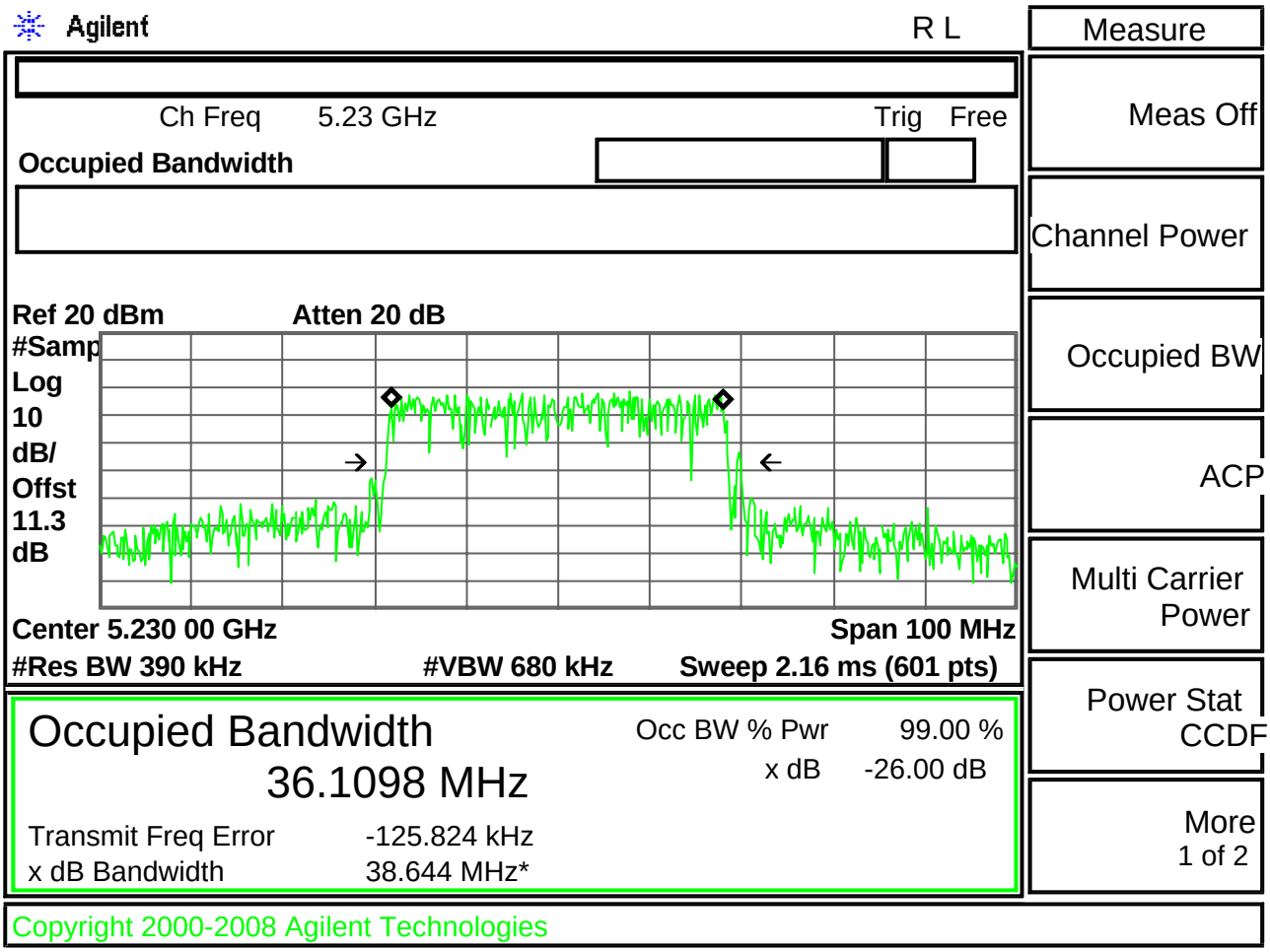
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 37.312 | Page 48 |
| H | 38.644 | Page 49 |

***Note:***

*1.Please refer to page 48 to page 49 for chart*
*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz* $\leqq f \leqq$ *18GHz)*


Agilent
R L
Measure
Ch Freq 5.19 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.190 00 GHz
Span 100 MHz
#Res BW 390 kHz
#VBW 680 kHz
Sweep 2.16 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
35.9572 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -71.337 kHz
x dB Bandwidth 37.312 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.23 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.230 00 GHz
Span 100 MHz
#Res BW 390 kHz
#VBW 680 kHz
Sweep 2.16 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
36.1098 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -125.824 kHz
x dB Bandwidth 38.644 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies

6.4.3.2 5.3GHz

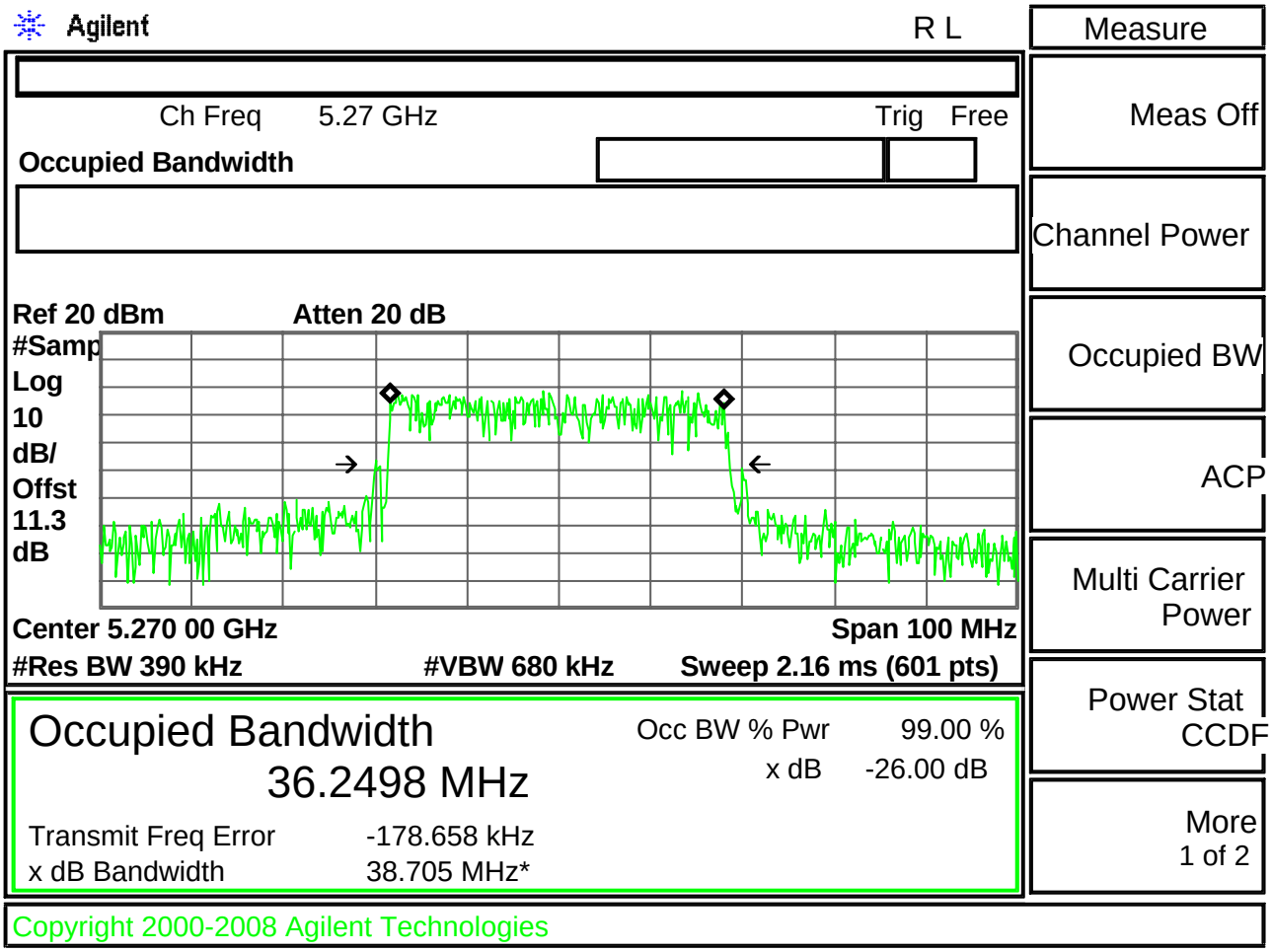
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

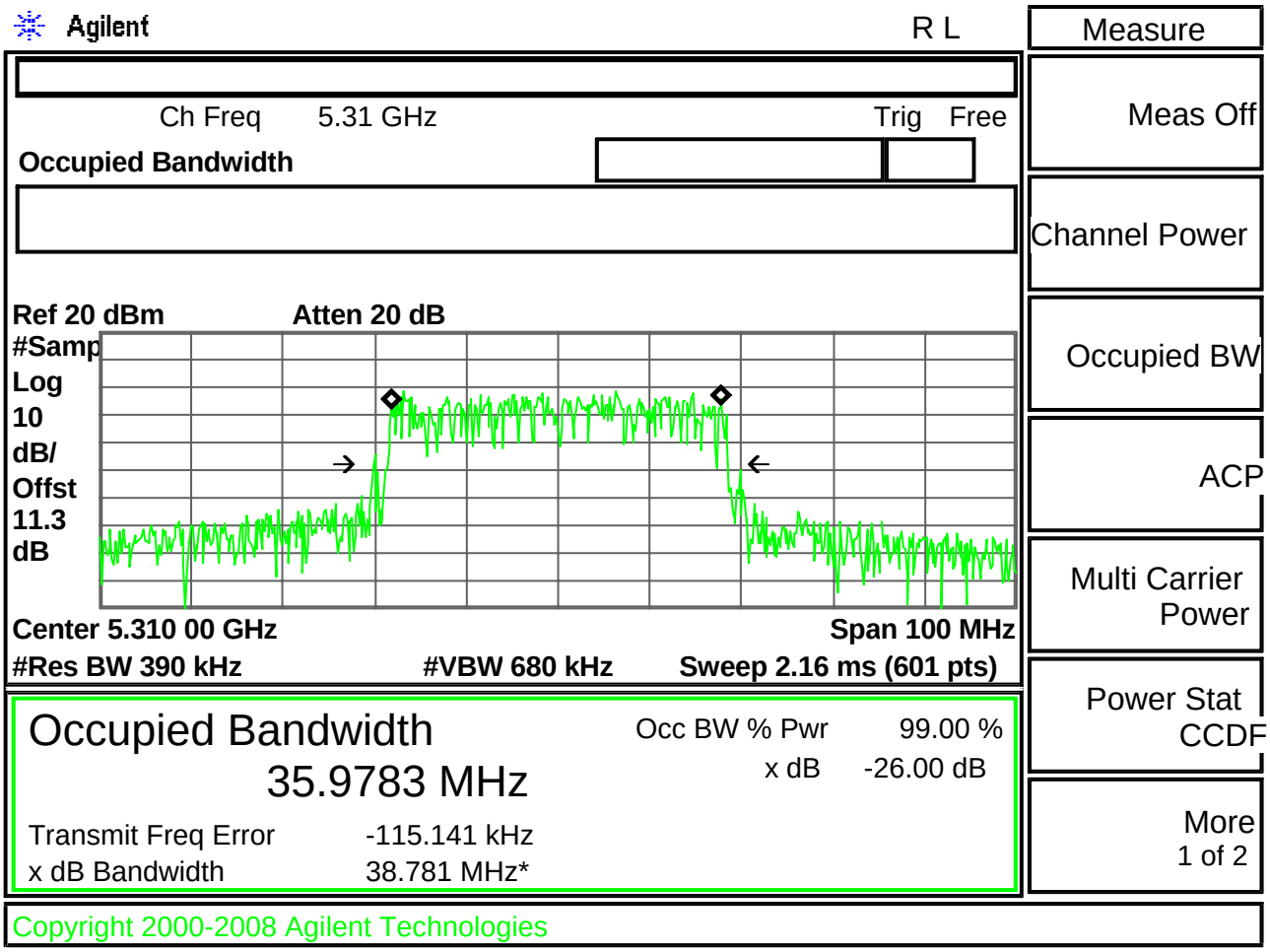
| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 38.705 | Page 51 |
| H | 38.781 | Page 52 |

***Note:***

*1.Please refer to page 51 to page 52 for chart*

*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*


Agilent
R L
Measure
Ch Freq 5.27 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.270 00 GHz
Span 100 MHz
#Res BW 390 kHz
#VBW 680 kHz
Sweep 2.16 ms (601 pts)
Occupied Bandwidth
36.2498 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -178.658 kHz
x dB Bandwidth 38.705 MHz*
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.31 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.310 00 GHz
Span 100 MHz
#Res BW 390 kHz
#VBW 680 kHz
Sweep 2.16 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
35.9783 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -115.141 kHz
x dB Bandwidth 38.781 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies

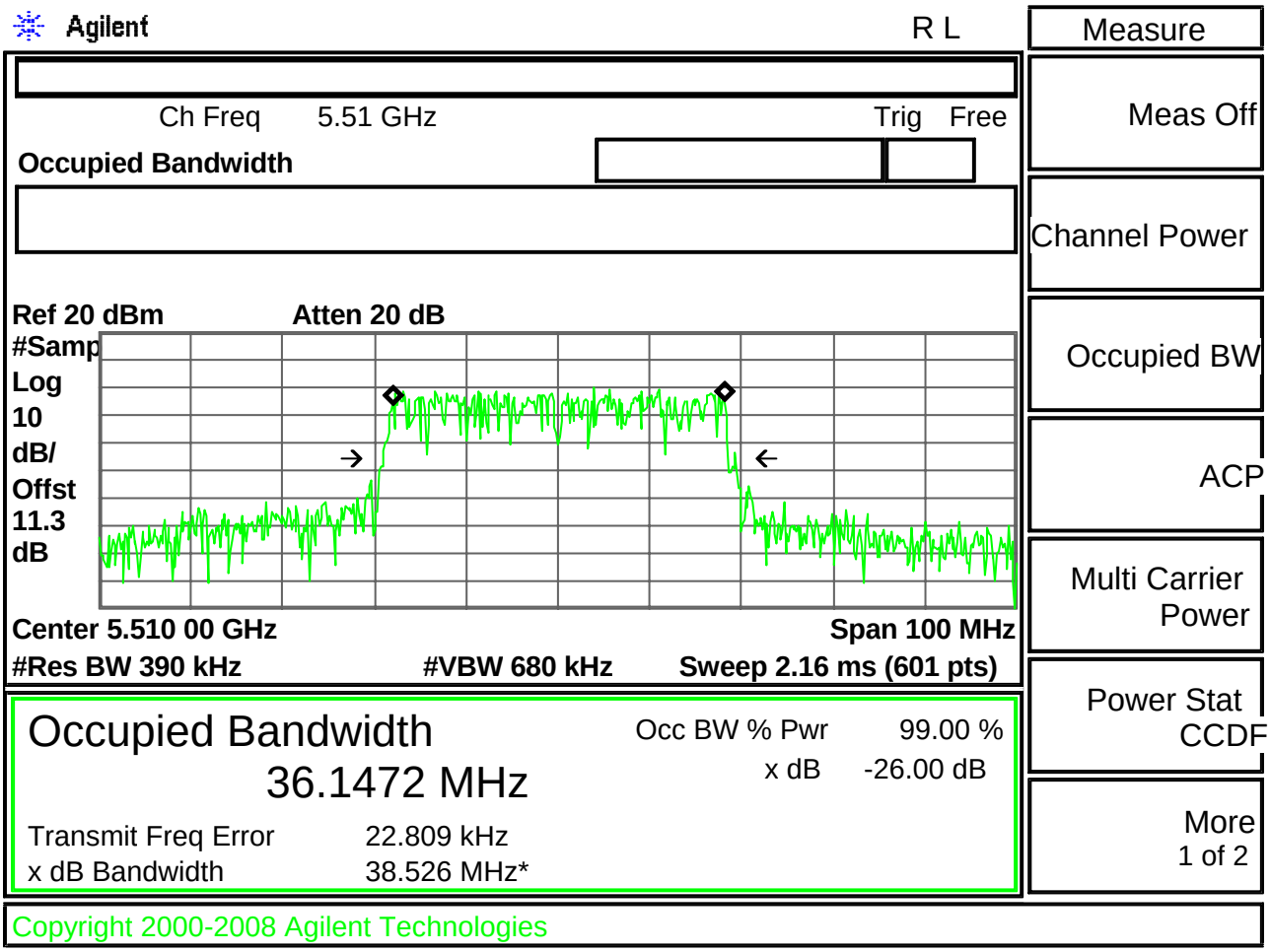
6.4.3.3 5.6GHz

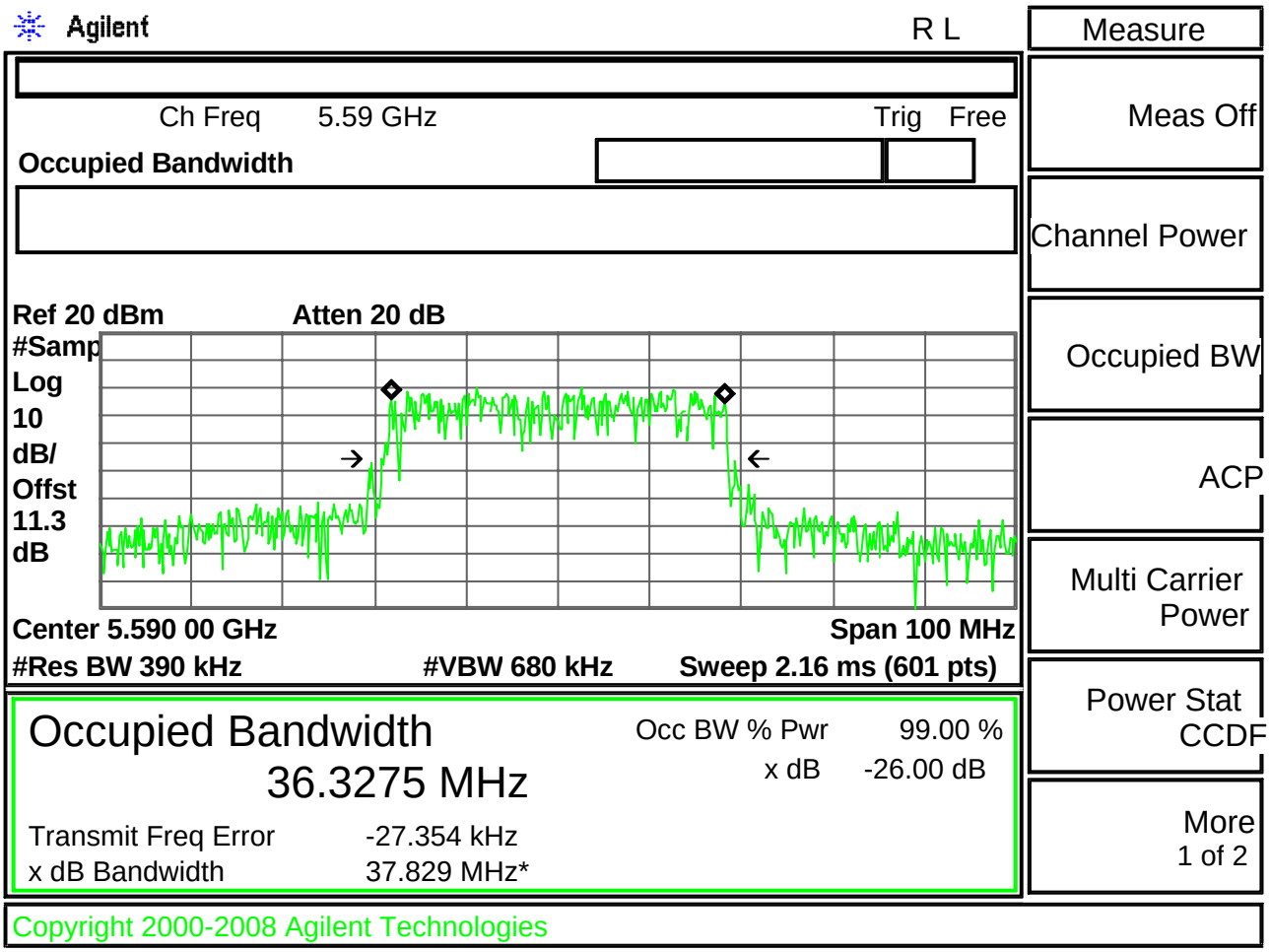
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

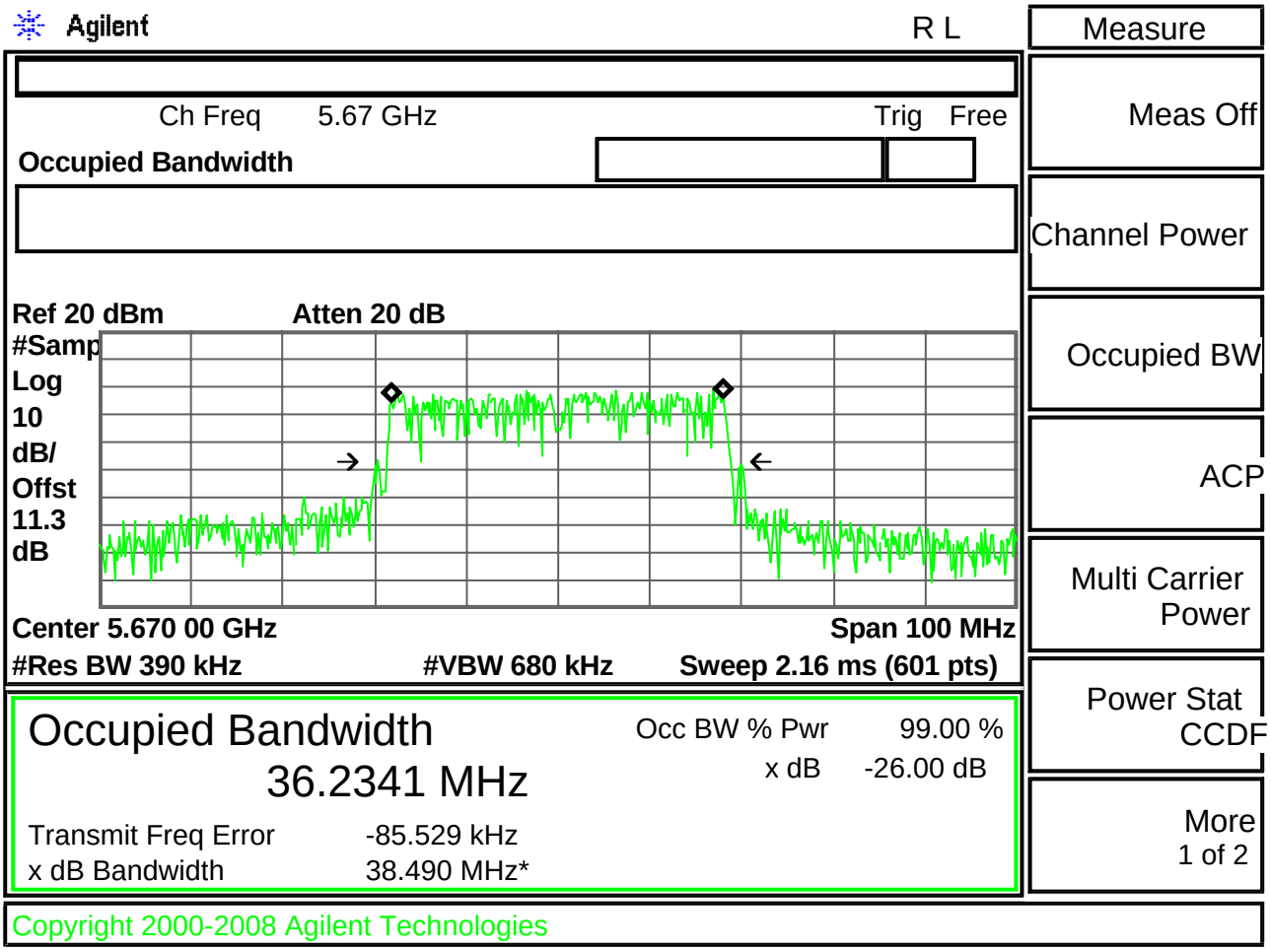
| Channel | 26dB Bandwidth (MHz) | Chart |
|---|---|---|
| L | 38.526 | Page 54 |
| M | 37.829 | Page 55 |
| H | 38.490 | Page 56 |

***Note:***

*1.Please refer to page 54 to page 56 for chart*
*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*


Agilent
R L
Measure
Ch Freq 5.51 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.510 00 GHz
Span 100 MHz
#Res BW 390 kHz
#VBW 680 kHz
Sweep 2.16 ms (601 pts)
Occupied Bandwidth
36.1472 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Power Stat CCDF
Transmit Freq Error 22.809 kHz
x dB Bandwidth 38.526 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.59 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.590 00 GHz
Span 100 MHz
#Res BW 390 kHz
#VBW 680 kHz
Sweep 2.16 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
36.3275 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -27.354 kHz
x dB Bandwidth 37.829 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.67 GHz
Trig Free
Occupied Bandwidth
Meas Off
Channel Power
Ref 20 dBm
Atten 20 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.670 00 GHz
Span 100 MHz
#Res BW 390 kHz
#VBW 680 kHz
Sweep 2.16 ms (601 pts)
Power Stat CCDF
Occupied Bandwidth
36.2341 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -85.529 kHz
x dB Bandwidth 38.490 MHz*
More
1 of 2
Copyright 2000-2008 Agilent Technologies

# 7 OUTPUT POWER MEASUREMENT

## 7.1 Standard Applicable

According to 15.407(a)(1) for the band 5.15-58.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to 15.407(a)(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 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 7.2 Measurement Procedure

1. The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.
2. Position the EUT as shown in figure 2

## 7.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | 09/18/2012 |

## 7.4 Measurement Data

### 7.4.1 IEEE 802.11a

7.4.1.1 5.2GHz

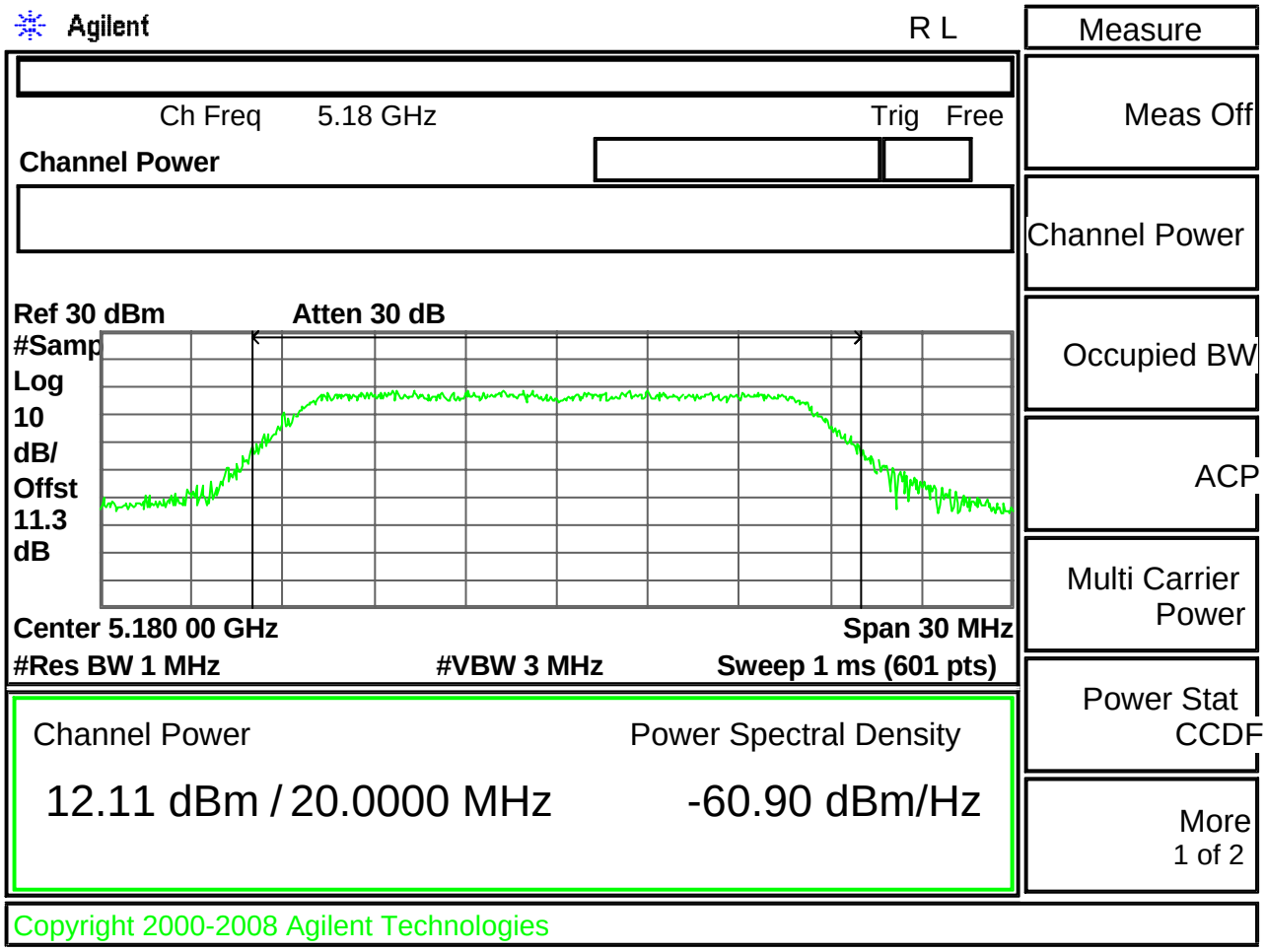
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

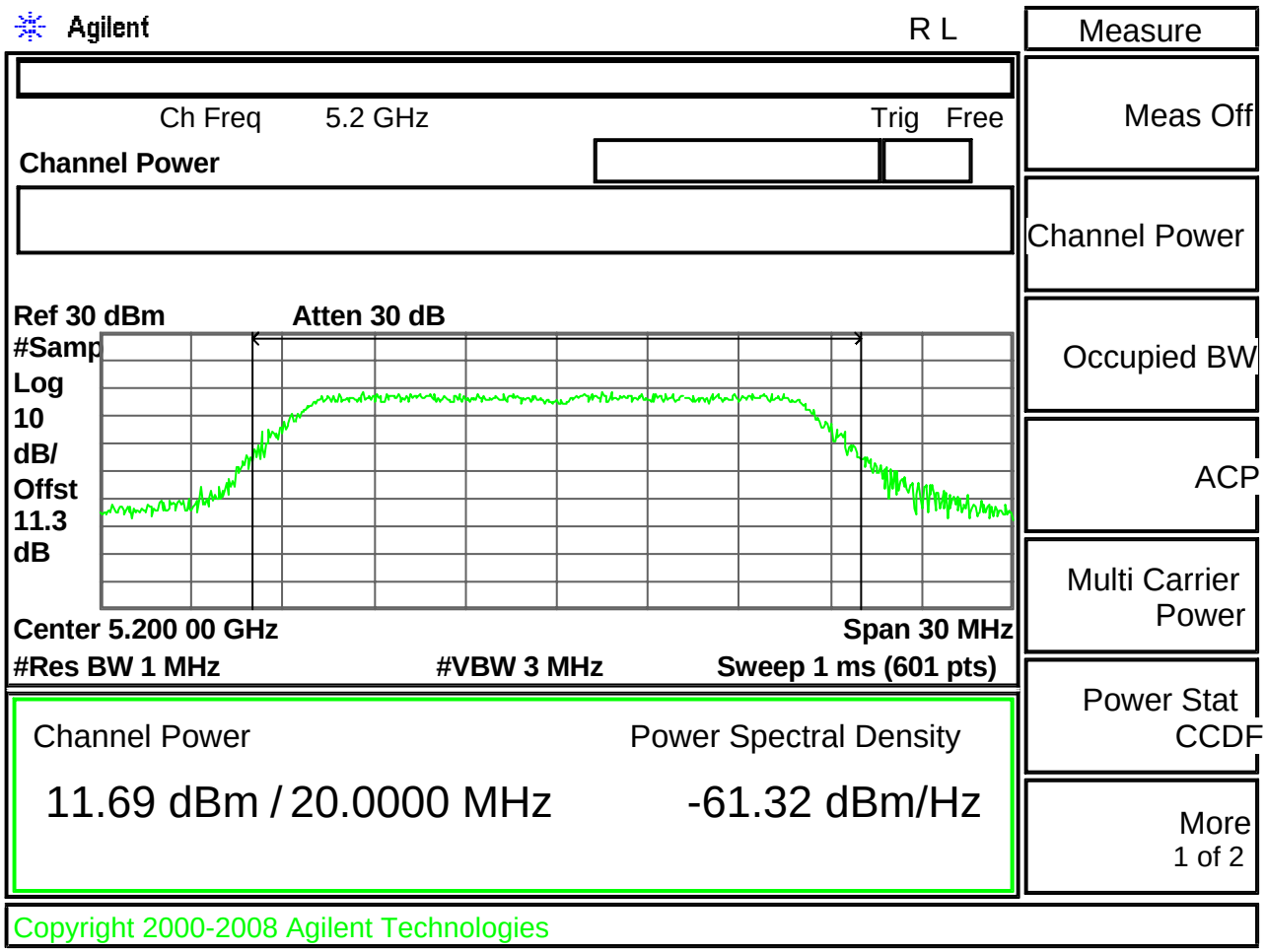
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

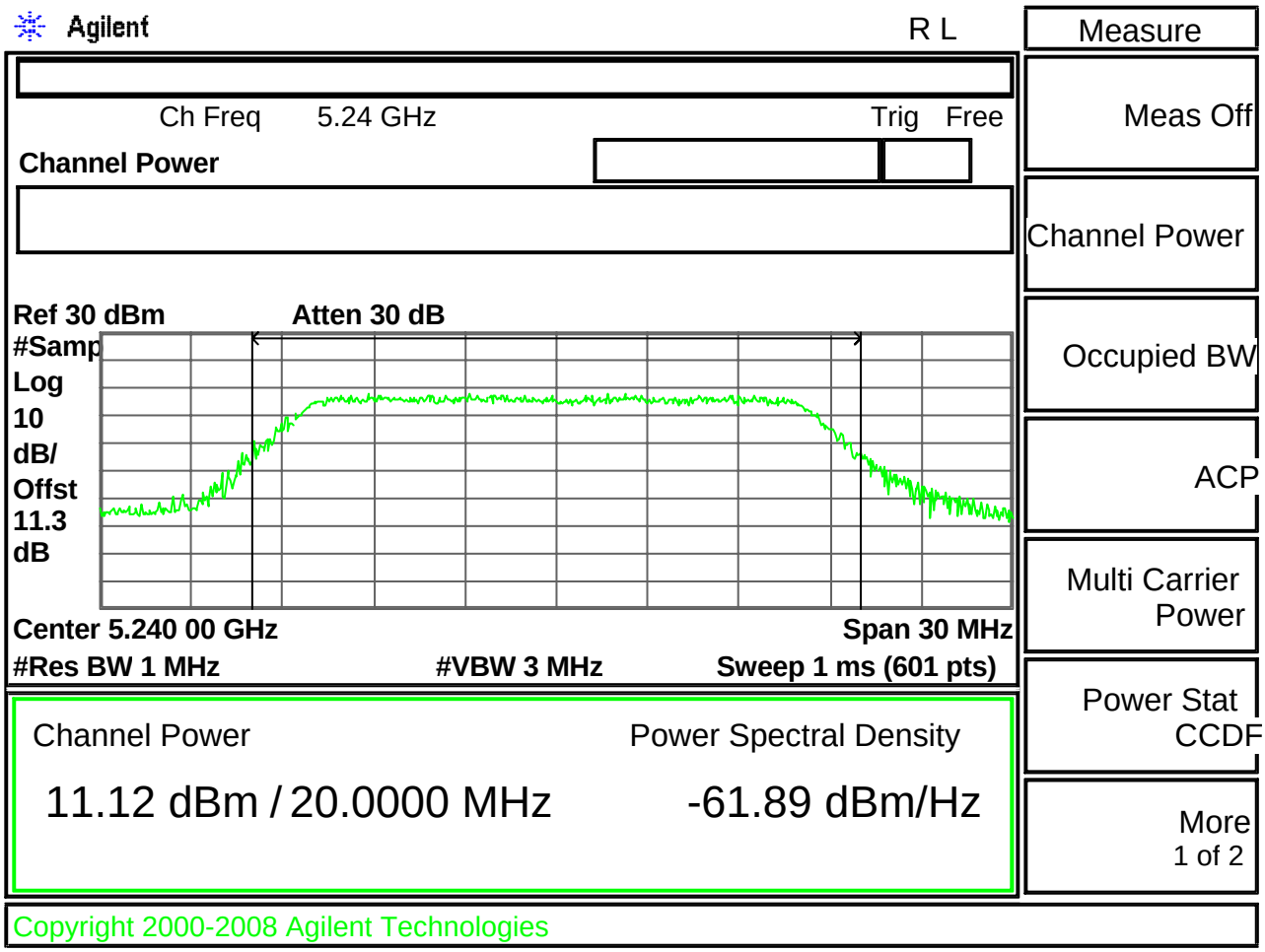
| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 17.836 | 16.51 | 12.11 | 16.51 | Page 59 |
| M | 17 | 18.324 | 16.63 | 11.69 | 16.63 | Page 60 |
| H | 17 | 18.496 | 16.67 | 11.12 | 16.67 | Page 61 |

***Note:***

1. *Please refer to page 59 to page 61 for chart.*
2. *Fixed Limit = 50mW=17dBm*
3. *Caculated Limit = 4dBm + 10 log (26dB BW)*
4. *If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
5. *If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
6. *The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.18 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.180 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Power Stat CCDF
Channel Power
12.11 dBm / 20.0000 MHz
Power Spectral Density
-60.90 dBm/Hz
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.2 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.200 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
11.69 dBm / 20.0000 MHz
Power Spectral Density
-61.32 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.24 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.240 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
11.12 dBm / 20.0000 MHz
Power Spectral Density
-61.89 dBm/Hz
Copyright 2000-2008 Agilent Technologies

7.4.1.2 5.3GHz

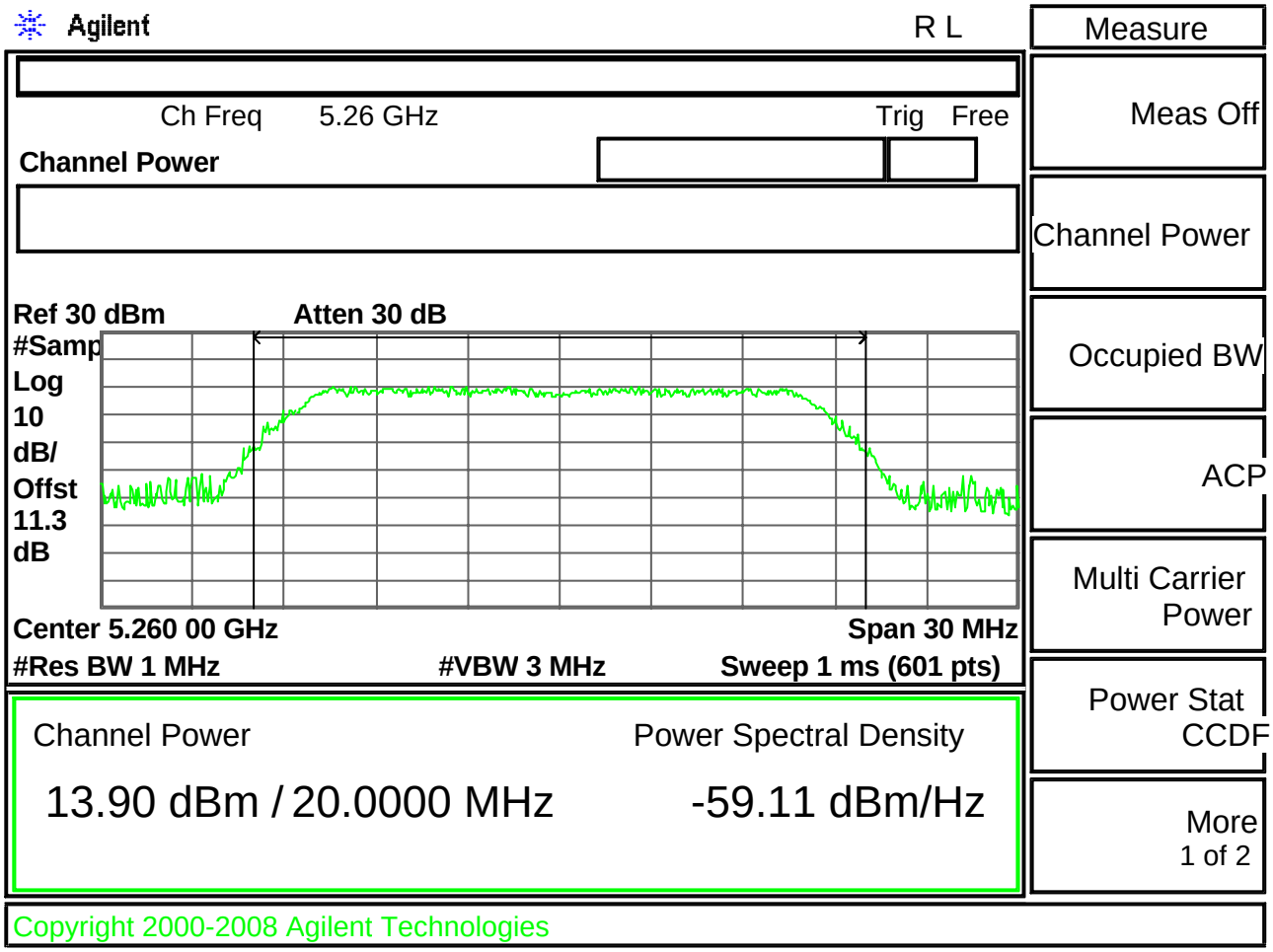
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

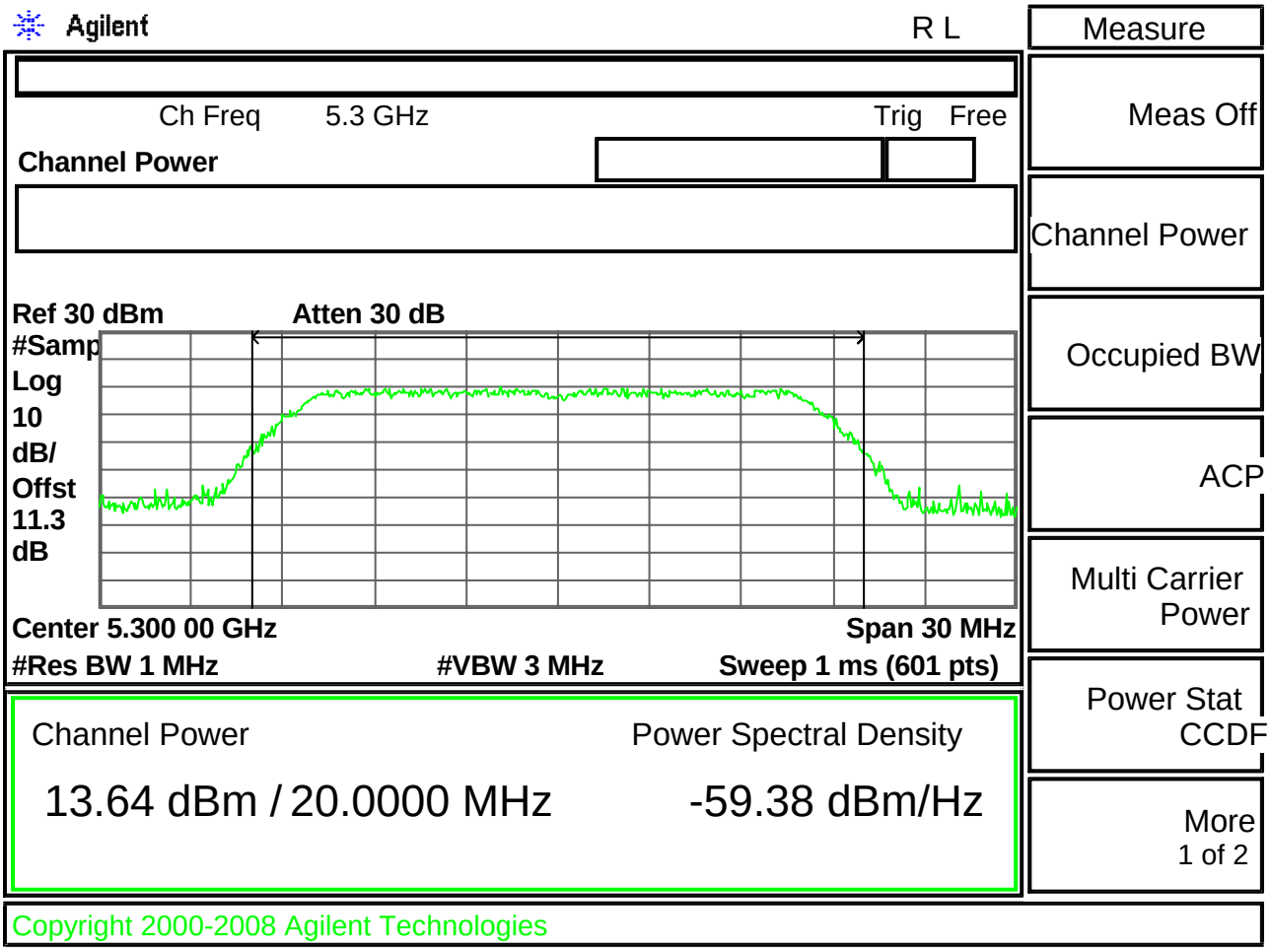
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

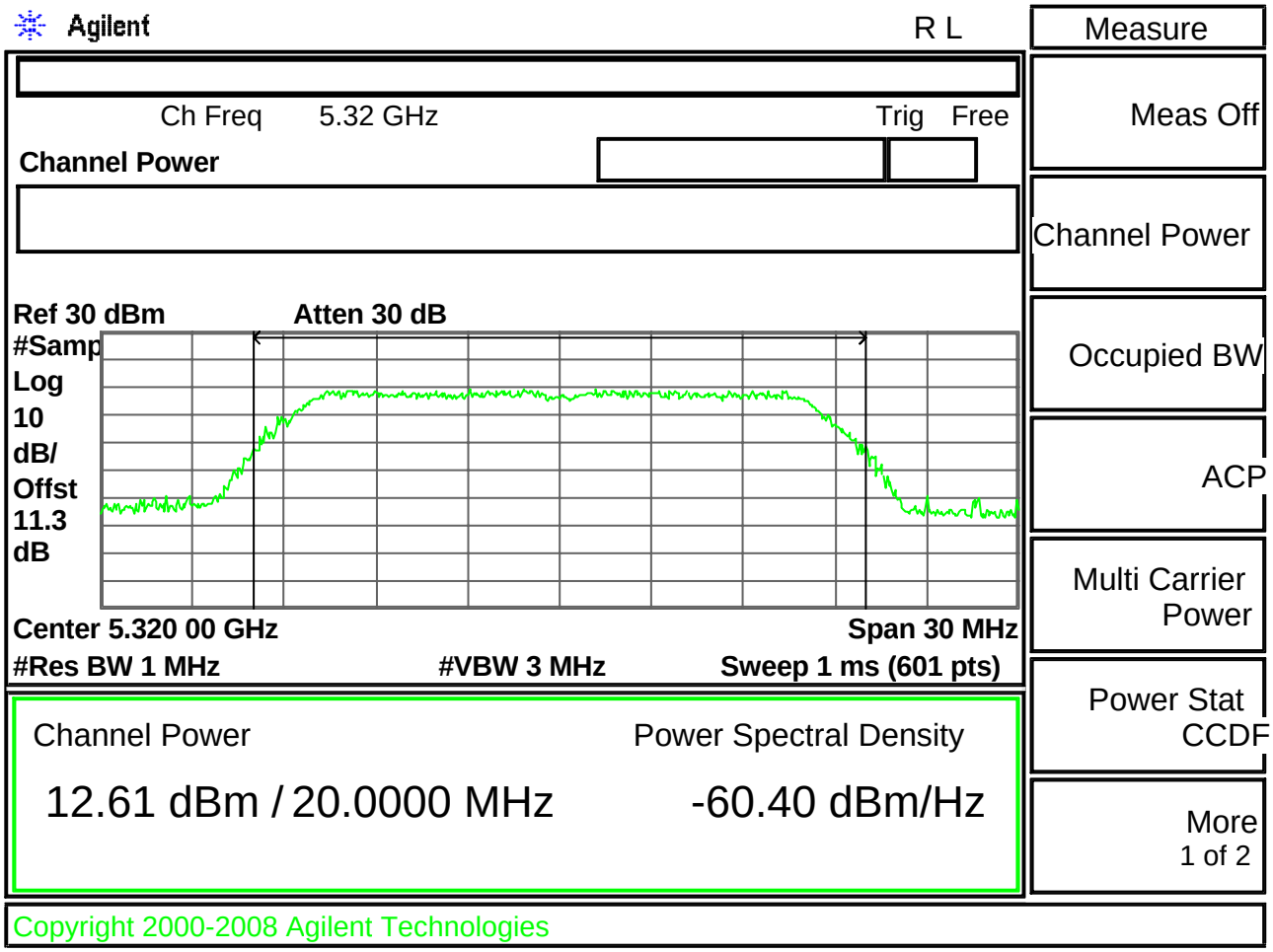
| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 19.225 | 16.84 | 13.90 | 16.84 | Page 63 |
| M | 17 | 19.048 | 16.80 | 13.64 | 16.80 | Page 64 |
| H | 17 | 18.699 | 16.72 | 12.61 | 16.72 | Page 65 |

***Note:***

*1.Please refer to page 63 to page 65 for chart*
*2. Fixed Limit = 50mW=17dBm*
*3. Caculated Limit = 4dBm + 10 log (26dB BW)*
*4. If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
*5. If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
*6. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.26 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.260 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.90 dBm / 20.0000 MHz
Power Spectral Density
-59.11 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.3 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.300 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.64 dBm / 20.0000 MHz
Power Spectral Density
-59.38 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.32 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.320 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.61 dBm / 20.0000 MHz
Power Spectral Density
-60.40 dBm/Hz
Copyright 2000-2008 Agilent Technologies

7.4.1.3 5.6GHz

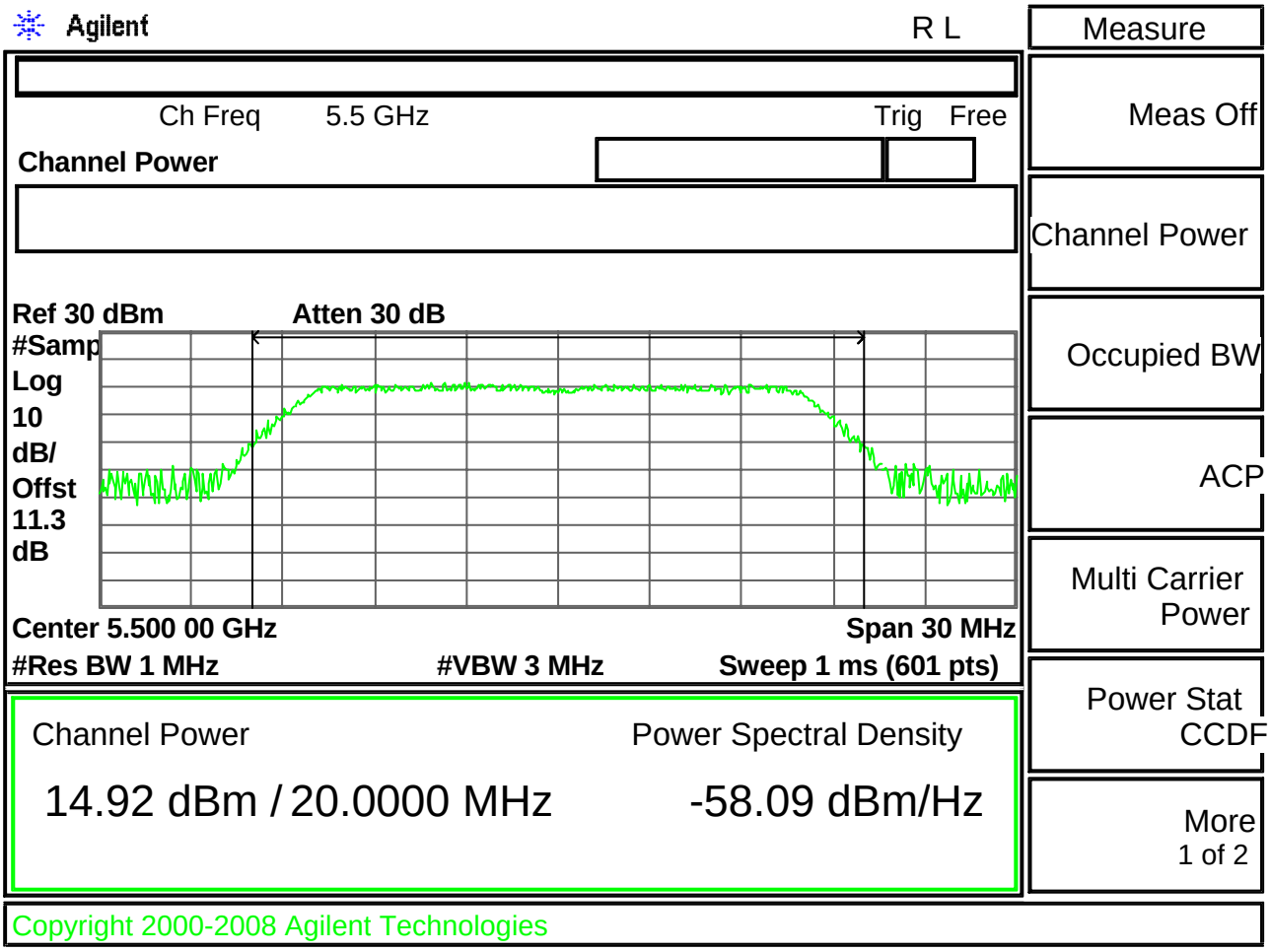
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

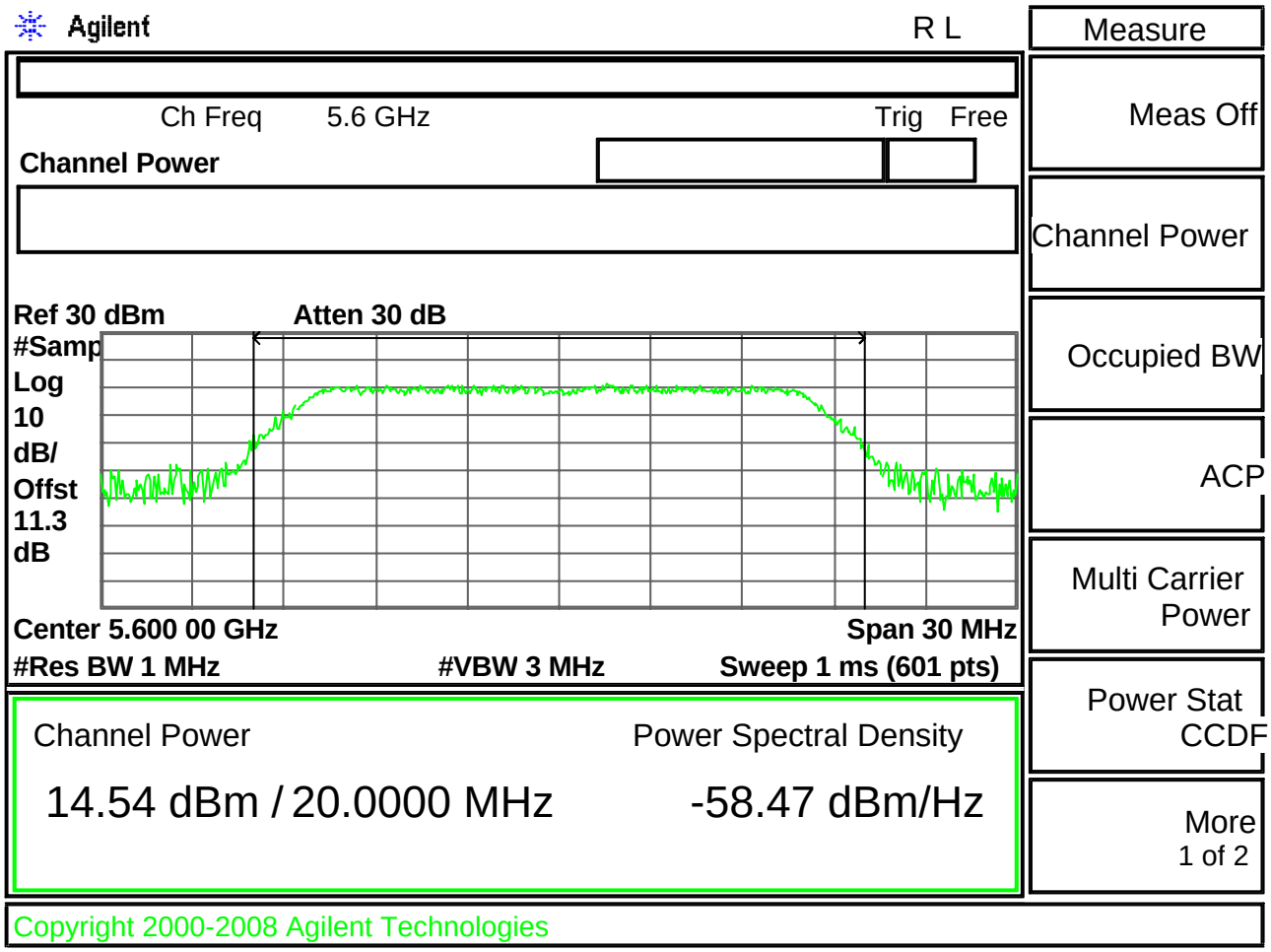
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

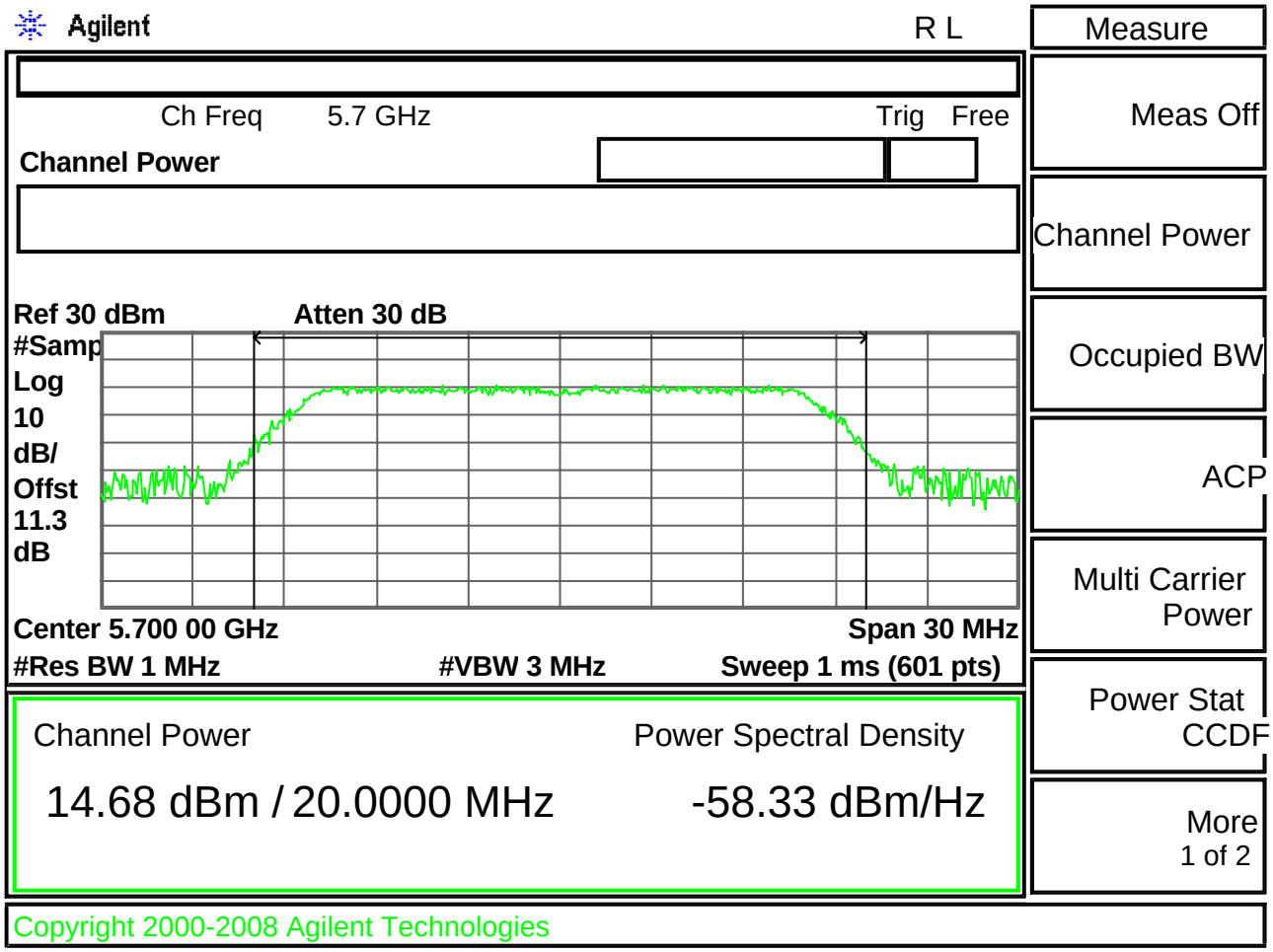
| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 18.808 | 16.74 | 14.92 | 16.74 | Page 67 |
| M | 17 | 18.451 | 16.66 | 14.54 | 16.66 | Page 68 |
| H | 17 | 18.690 | 16.72 | 14.68 | 16.72 | Page 69 |

***Note:***

*1.Please refer to page 67 to page 69 for chart*
*2. Fixed Limit = 50mW=17dBm*
*3. Caculated Limit = 11dBm + 10 log (26dB BW)*
*4. If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
*5. If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
*6. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.5 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.500 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
14.92 dBm / 20.0000 MHz
Power Spectral Density
-58.09 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.6 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.600 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
14.54 dBm / 20.0000 MHz
Power Spectral Density
-58.47 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.7 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.700 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
14.68 dBm / 20.0000 MHz
Power Spectral Density
-58.33 dBm/Hz
Copyright 2000-2008 Agilent Technologies

### 7.4.2 IEEE 802.11an, HT20

7.4.2.1 5.2GHz

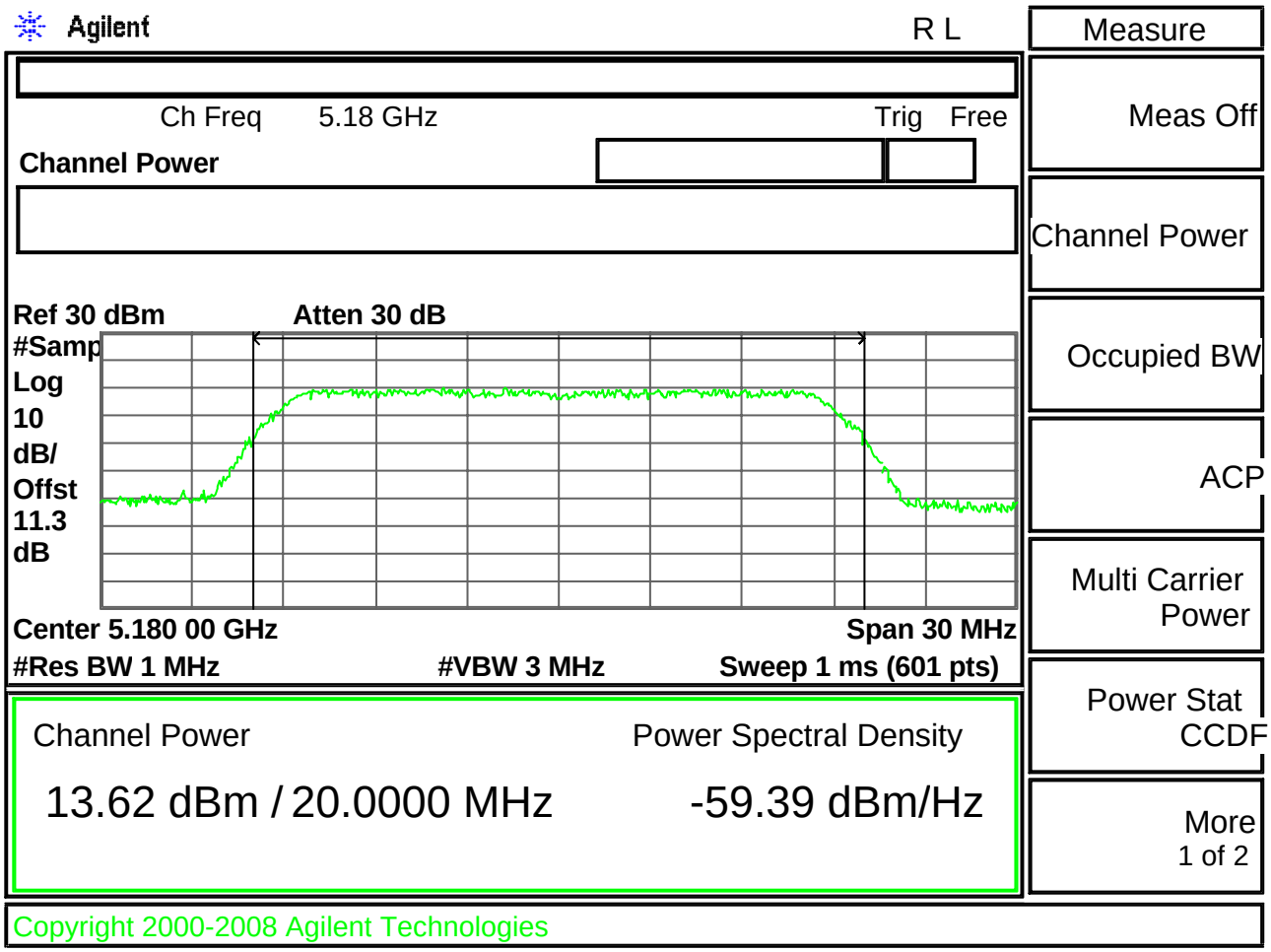
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

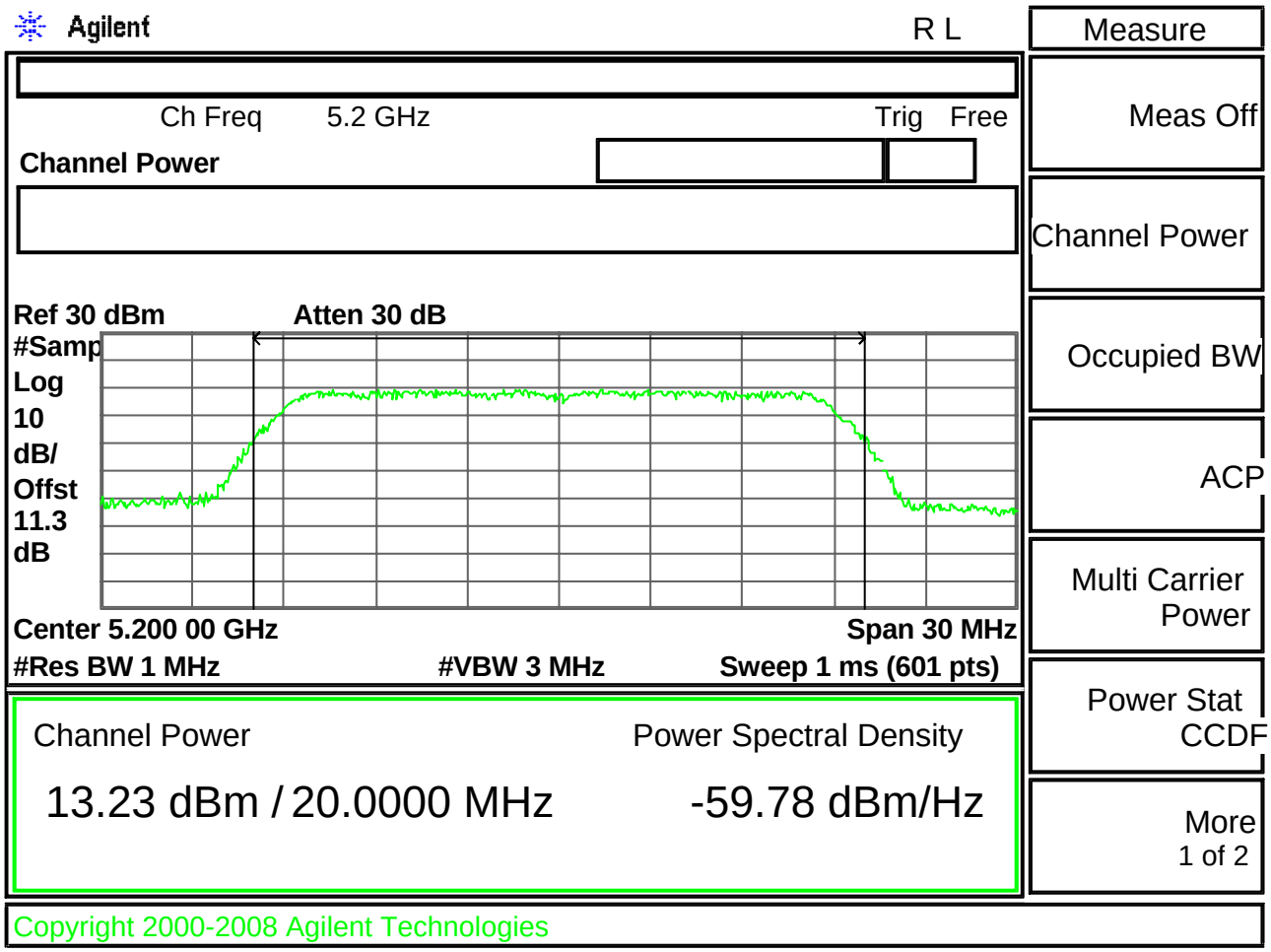
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

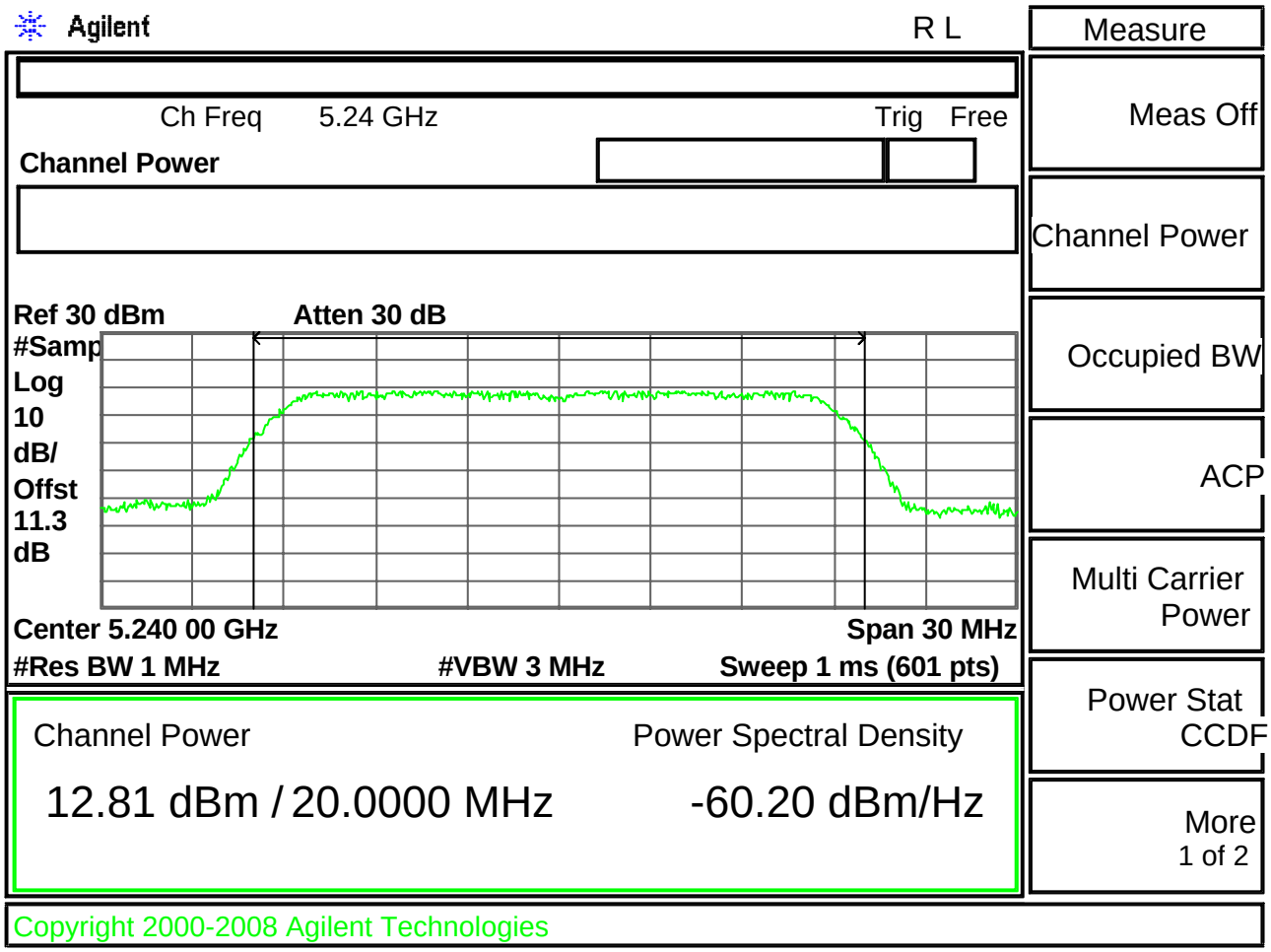
| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 17.640 | 16.47 | 13.62 | 16.47 | Page 71 |
| M | 17 | 17.642 | 16.47 | 13.23 | 16.47 | Page 72 |
| H | 17 | 17.710 | 16.48 | 12.81 | 16.48 | Page 73 |

***Note:***

1. *Please refer to page 71 to page 73 for chart.*
2. *Fixed Limit = 50mW=17dBm*
3. *Caculated Limit = 4dBm + 10 log (26dB BW)*
4. *If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
5. *If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
6. *The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.18 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.180 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.62 dBm / 20.0000 MHz
Power Spectral Density
-59.39 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.2 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.200 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.23 dBm / 20.0000 MHz
Power Spectral Density
-59.78 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.24 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.240 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.81 dBm / 20.0000 MHz
Power Spectral Density
-60.20 dBm/Hz
Copyright 2000-2008 Agilent Technologies

7.4.2.2 5.3GHz

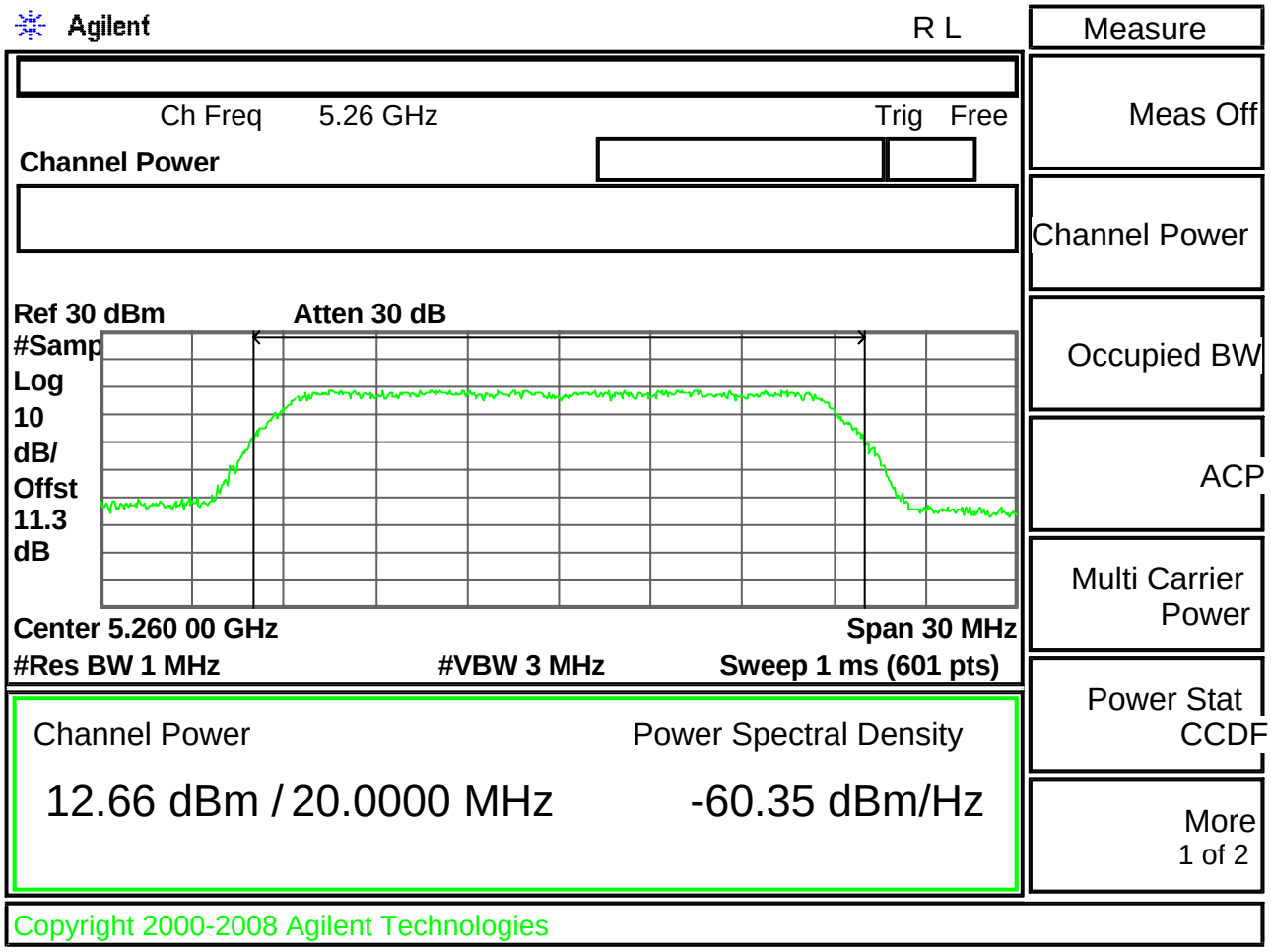
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

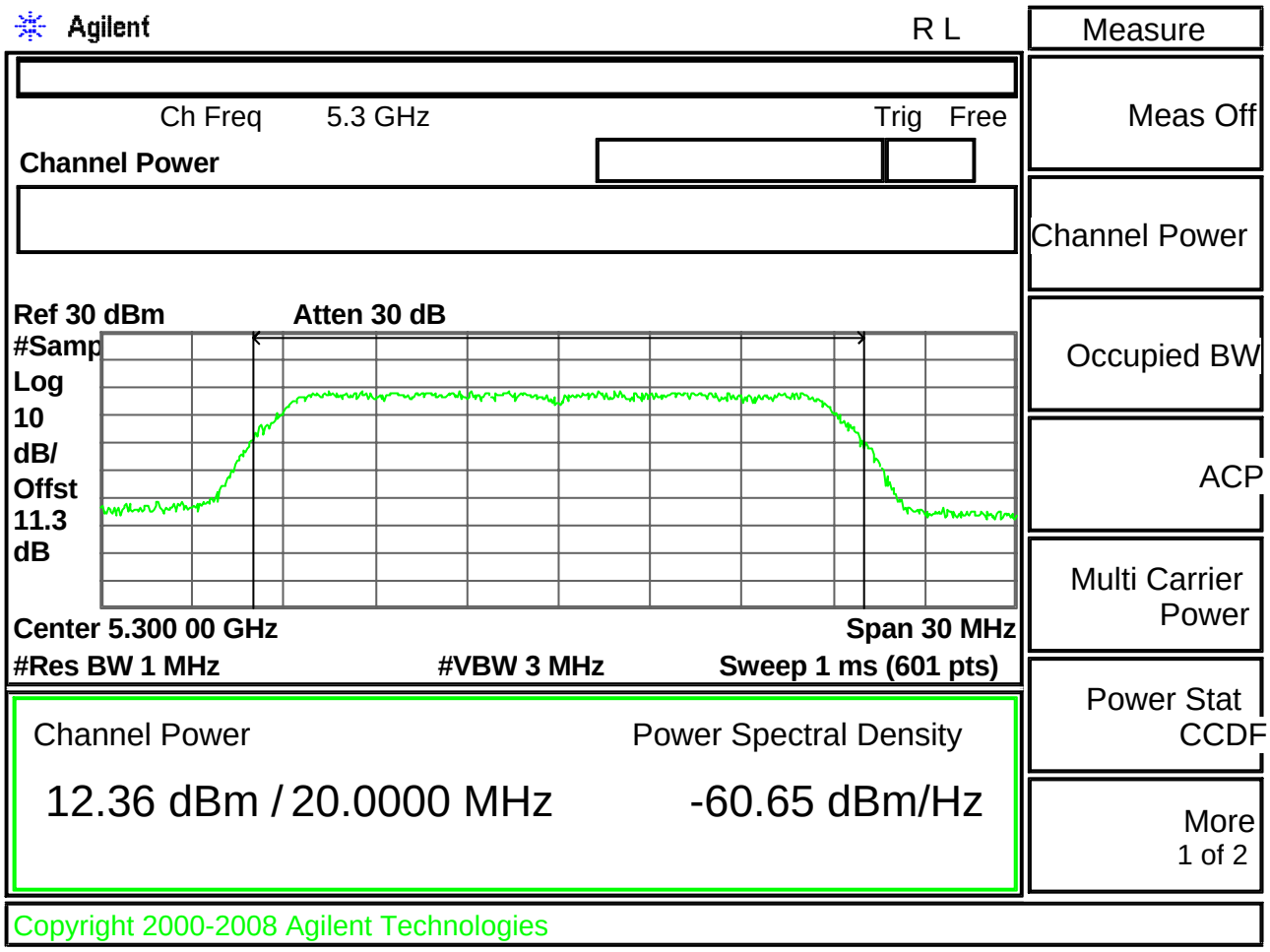
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

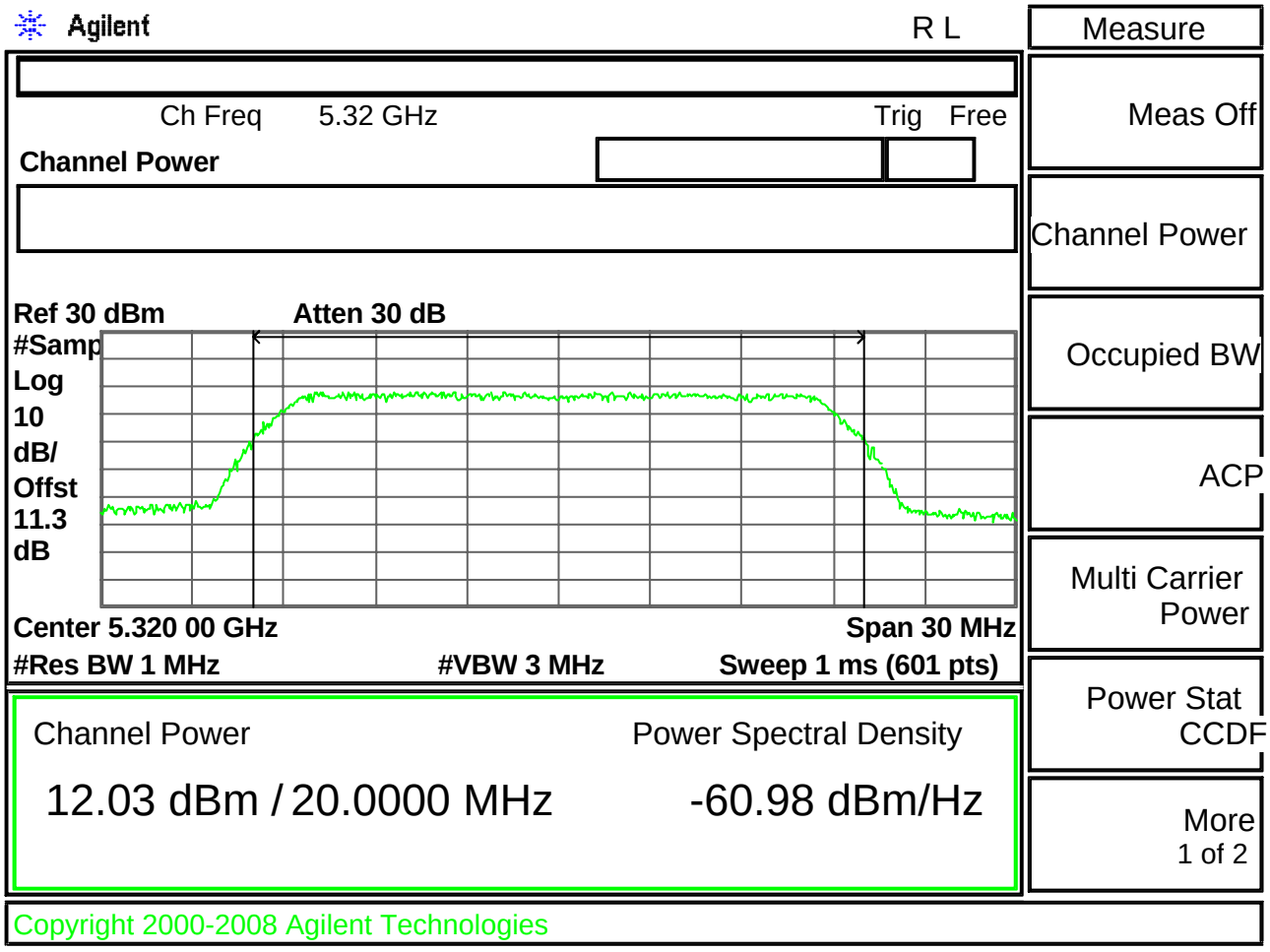
| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 17.704 | 16.48 | 12.66 | 16.48 | Page 75 |
| M | 17 | 17.597 | 16.45 | 12.36 | 16.45 | Page 76 |
| H | 17 | 17.697 | 16.48 | 12.03 | 16.48 | Page 77 |

***Note:***

*1.Please refer to page 75 to page 77 for chart*
*2. Fixed Limit = 50mW=17dBm*
*3. Caculated Limit = 4dBm + 10 log (26dB BW)*
*4. If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
*5. If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
*6. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.26 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.260 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Power Stat CCDF
Channel Power
12.66 dBm / 20.0000 MHz
Power Spectral Density
-60.35 dBm/Hz
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.3 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.300 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.36 dBm / 20.0000 MHz
Power Spectral Density
-60.65 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.32 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.320 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.03 dBm / 20.0000 MHz
Power Spectral Density
-60.98 dBm/Hz
Copyright 2000-2008 Agilent Technologies

7.4.2.3 5.6GHz

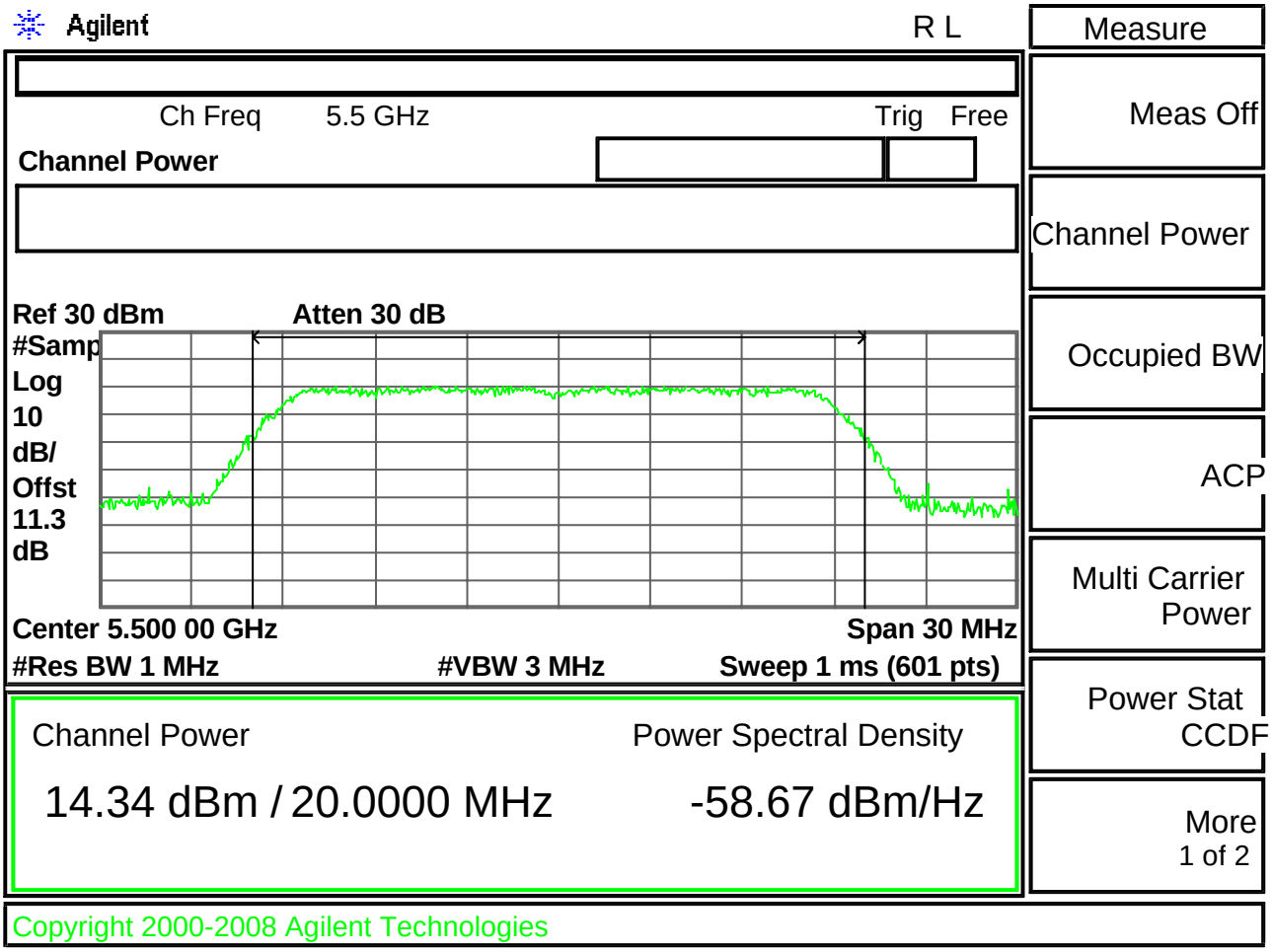
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

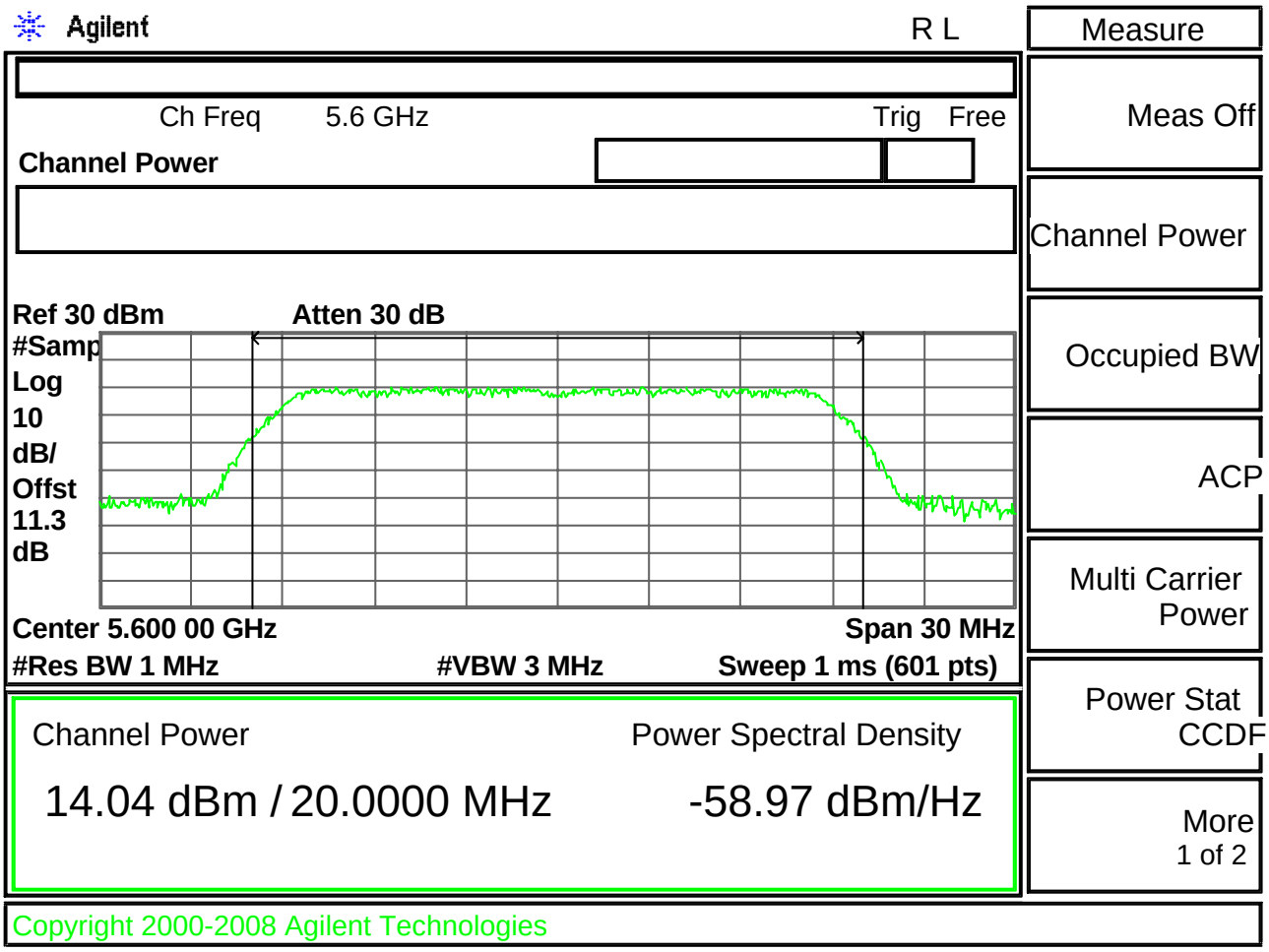
The highest antenna gain is equal to 3.90 dBi, therefore the FCC limit is as follow.

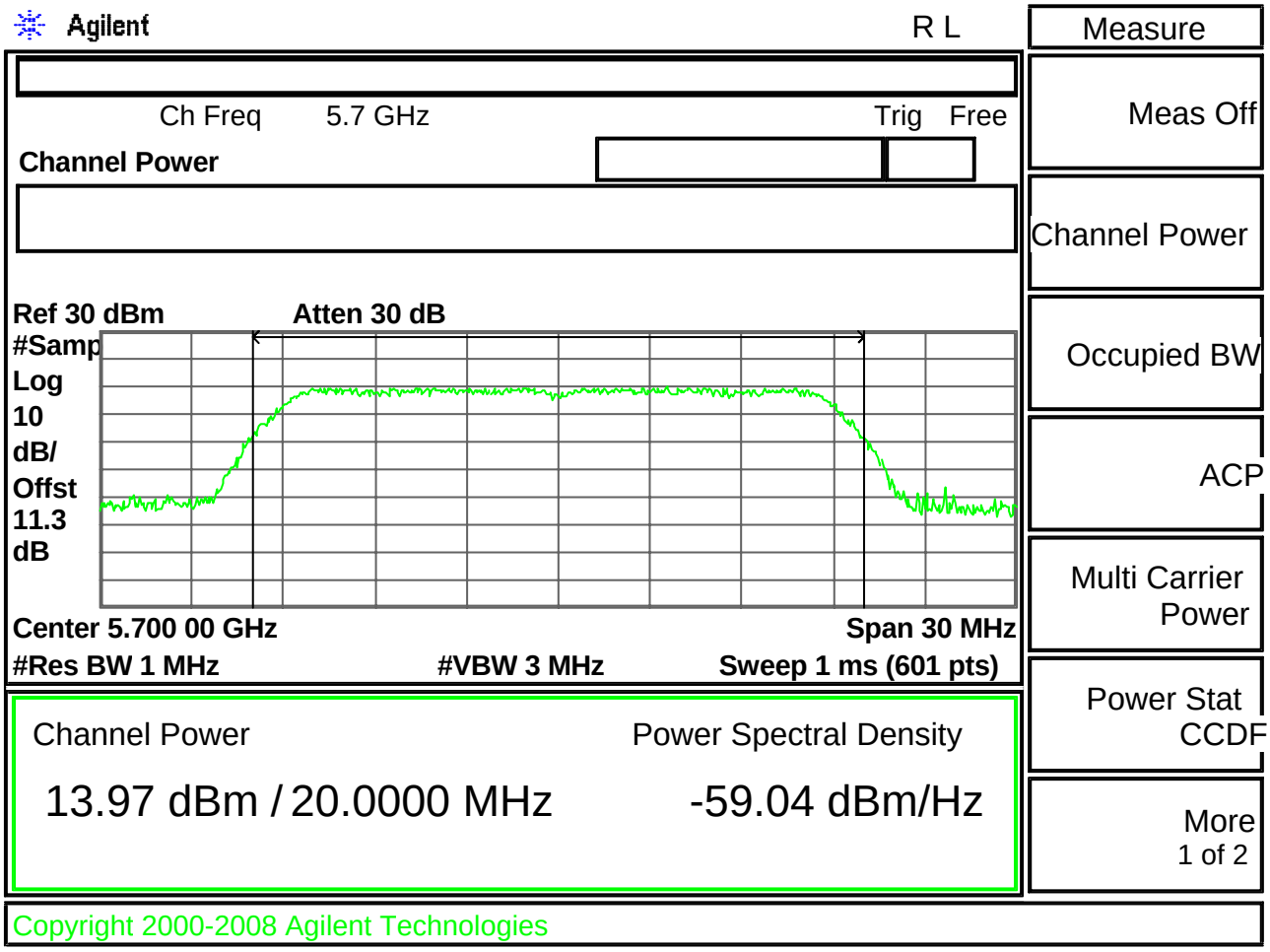
| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 17.596 | 16.45 | 14.34 | 16.45 | Page 79 |
| M | 17 | 17.564 | 16.45 | 14.04 | 16.45 | Page 80 |
| H | 17 | 17.604 | 16.46 | 13.97 | 16.46 | Page 81 |

***Note:***

*1.Please refer to page 79 to page 81 for chart*
*2. Fixed Limit = 50mW=17dBm*
*3. Caculated Limit = 11dBm + 10 log (26dB BW)*
*4. If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
*5. If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
*6. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.5 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.500 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
14.34 dBm / 20.0000 MHz
Power Spectral Density
-58.67 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.6 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.600 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
14.04 dBm / 20.0000 MHz
Power Spectral Density
-58.97 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.7 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.700 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Power Stat CCDF
Channel Power
13.97 dBm / 20.0000 MHz
Power Spectral Density
-59.04 dBm/Hz
More
1 of 2
Copyright 2000-2008 Agilent Technologies

### 7.4.3 IEEE 802.11an, HT40

7.4.3.1 5.2GHz

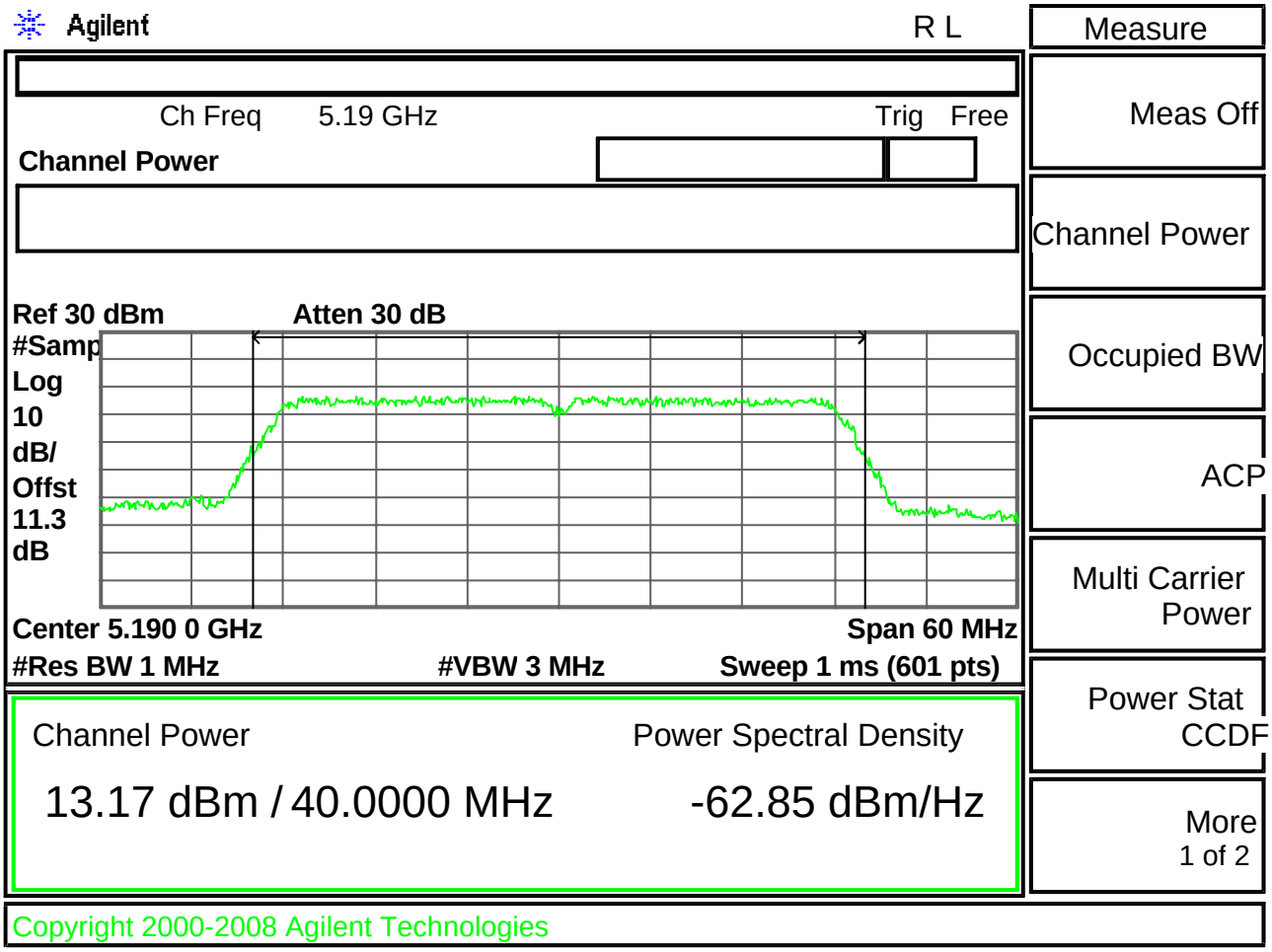
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

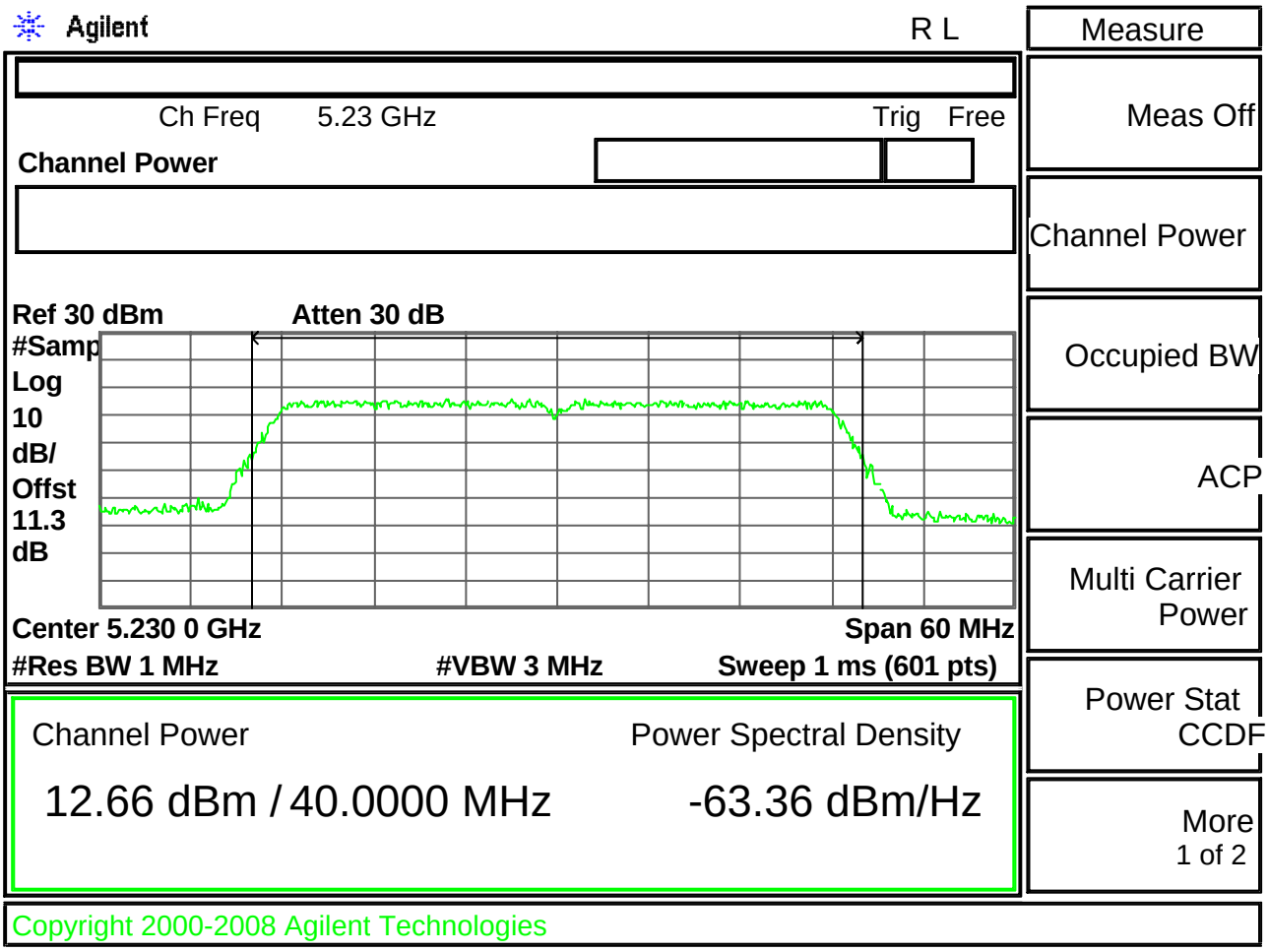
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 37.312 | 19.72 | 13.17 | 17.00 | Page 83 |
| H | 17 | 38.644 | 19.87 | 12.66 | 17.00 | Page 84 |

***Note:***

*1.Please refer to page 83 to page 84 for chart*
*2. Fixed Limit = 50mW=17dBm*
*3. Caculated Limit = 4dBm + 10 log (26dB BW)*
*4. If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
*5. If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
*6. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.19 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.190 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.17 dBm / 40.0000 MHz
Power Spectral Density
-62.85 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.23 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.230 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.66 dBm / 40.0000 MHz
Power Spectral Density
-63.36 dBm/Hz
Copyright 2000-2008 Agilent Technologies

7.4.3.2 5.3GHz

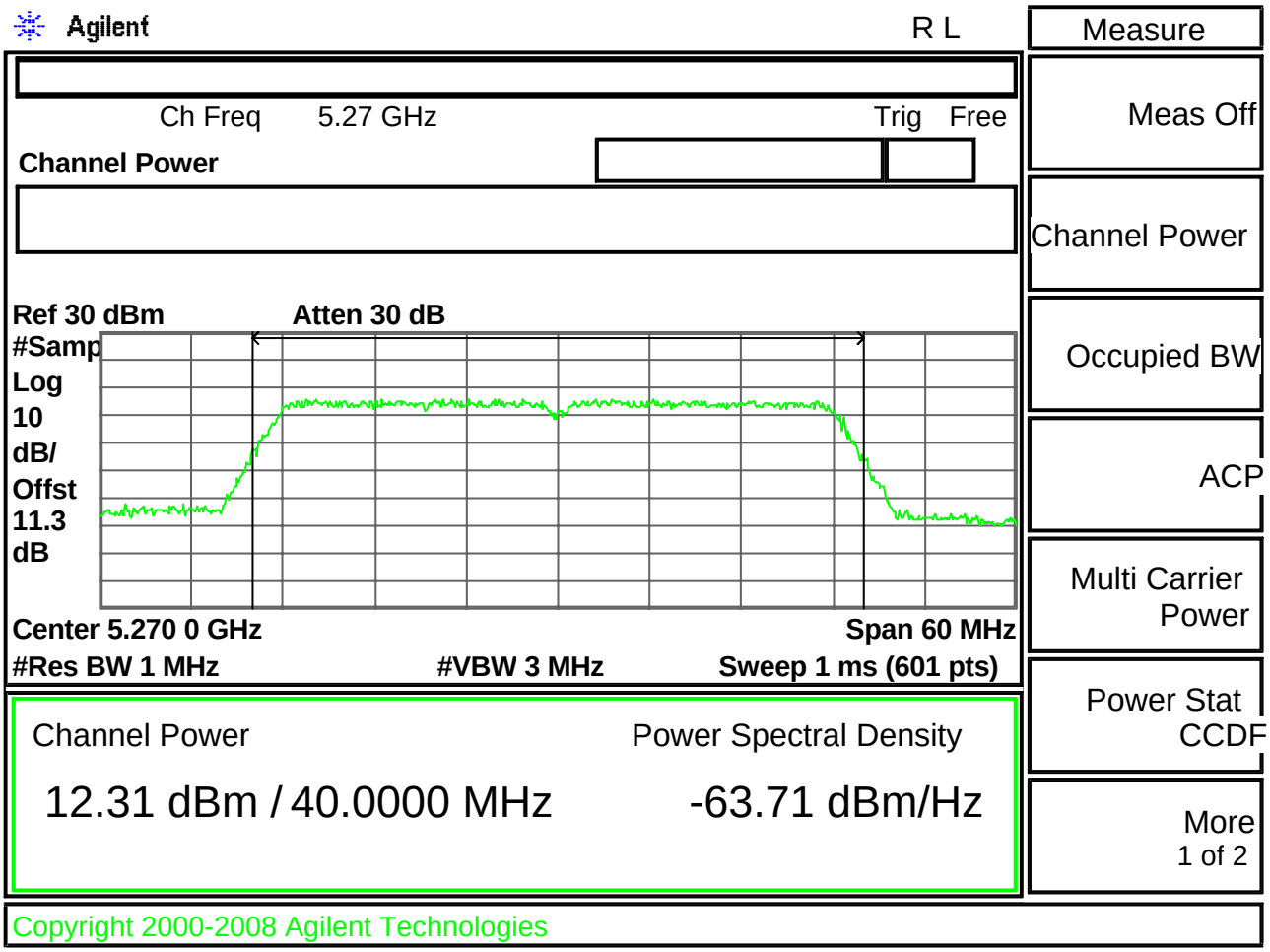
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

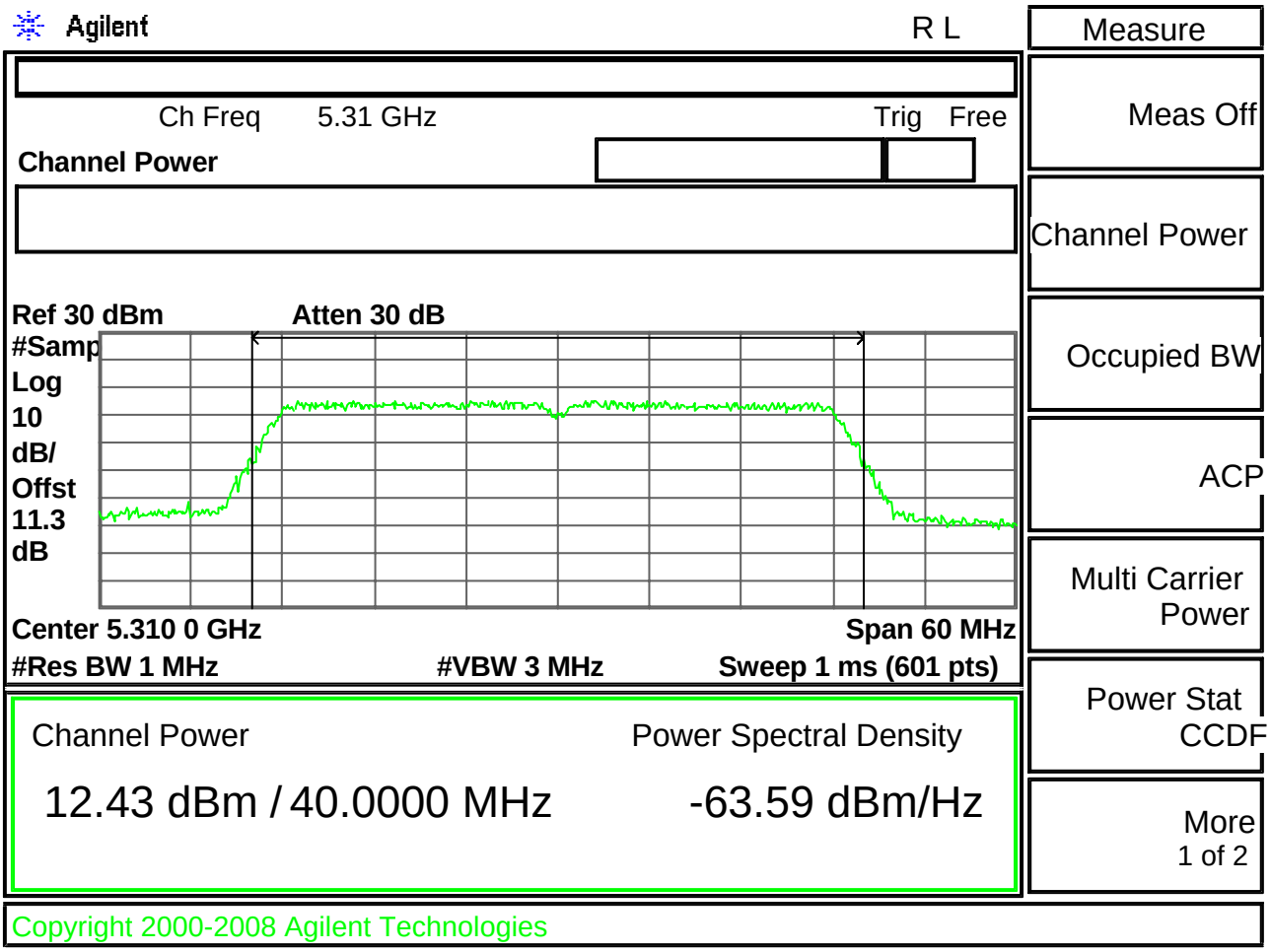
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 38.705 | 19.88 | 12.31 | 17.00 | Page 86 |
| H | 17 | 38.781 | 19.89 | 12.43 | 17.00 | Page 87 |

***Note:***

*1.Please refer to page 86 to page 87 for chart*
*2. Fixed Limit = 50mW=17dBm*
*3. Caculated Limit = 4dBm + 10 log (26dB BW)*
*4. If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
*5. If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
*6. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.27 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.270 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Power Stat CCDF
Channel Power
Power Spectral Density
12.31 dBm / 40.0000 MHz
-63.71 dBm/Hz
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.31 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.310 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.43 dBm / 40.0000 MHz
Power Spectral Density
-63.59 dBm/Hz
Copyright 2000-2008 Agilent Technologies

7.4.3.3 5.6GHz

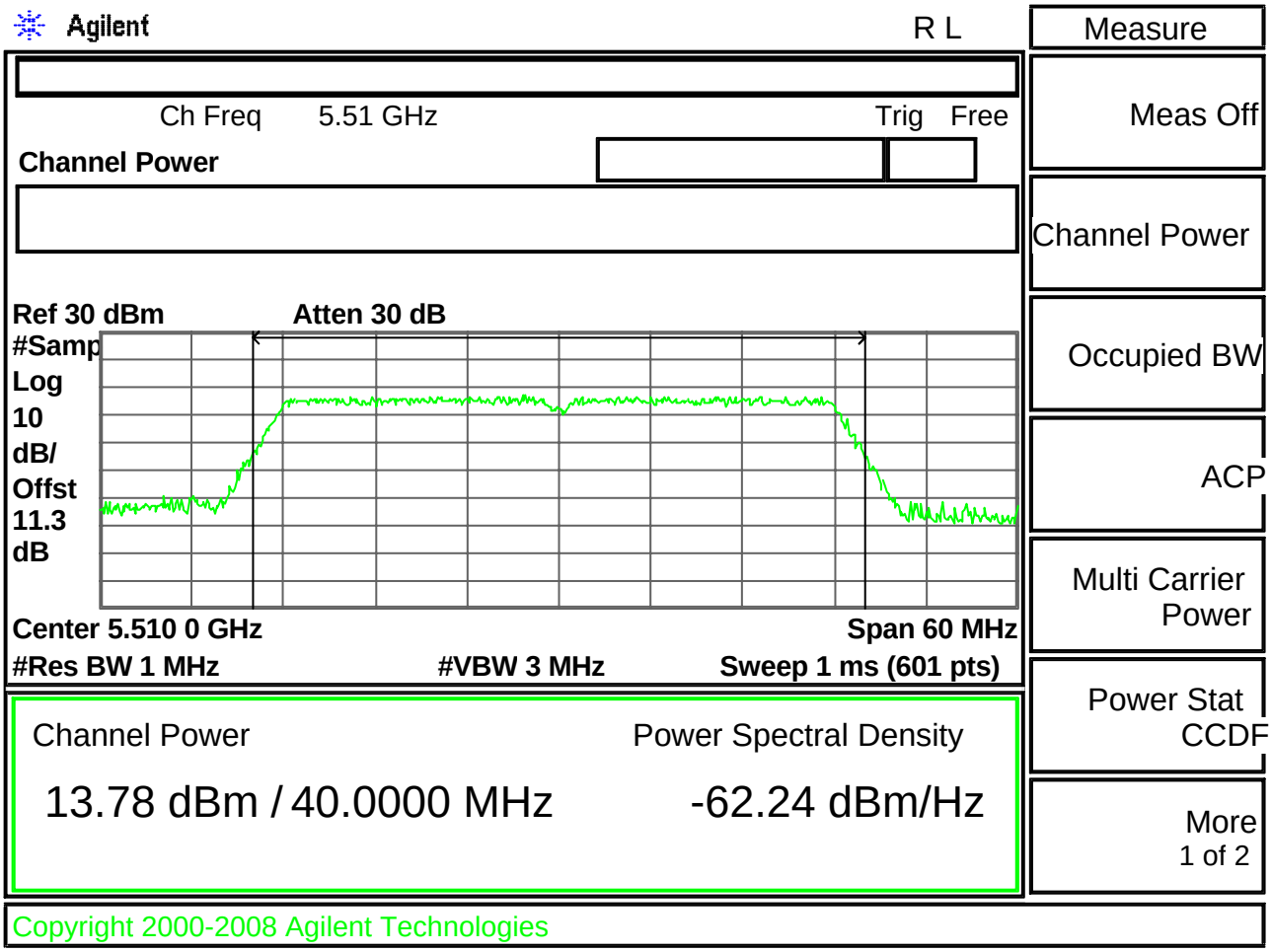
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

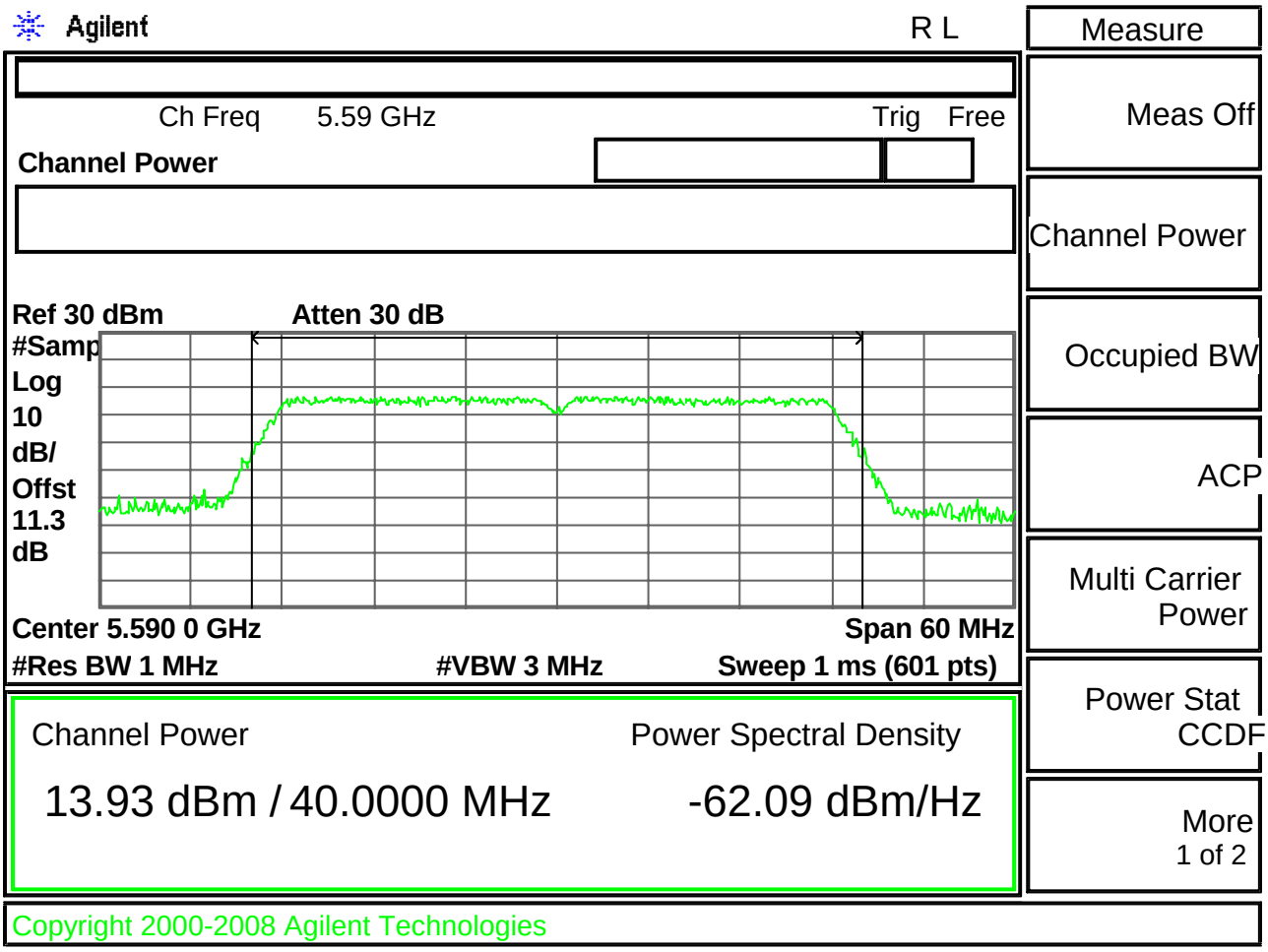
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

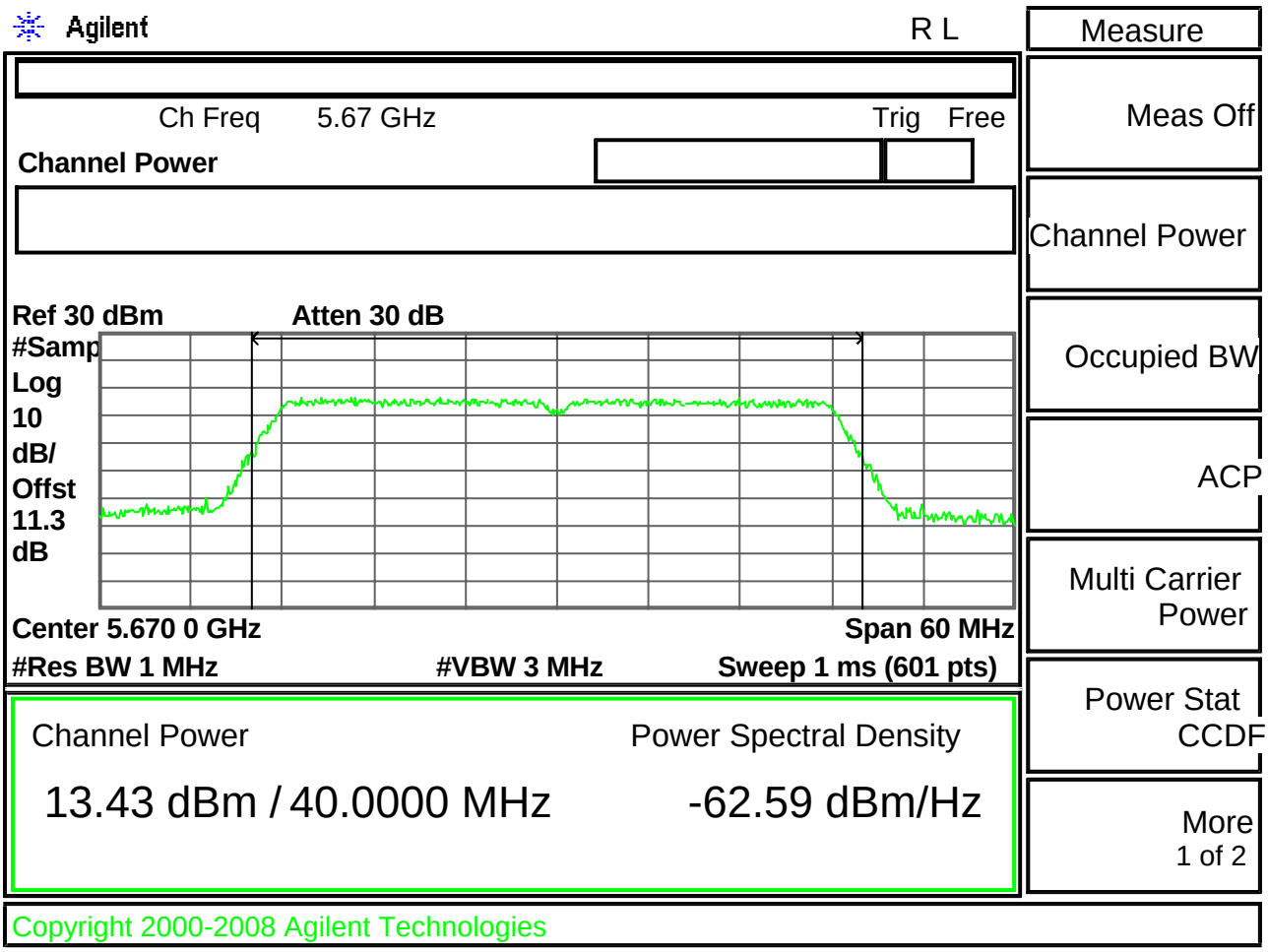
| Channel | Fixd limit (dBm) | 26dB BW (MHz) | Limit (dBm) | Peak Power (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|
| L | 17 | 38.526 | 19.86 | 13.78 | 17.00 | Page 89 |
| M | 17 | 37.829 | 19.78 | 13.93 | 17.00 | Page 90 |
| H | 17 | 38.490 | 19.85 | 13.43 | 17.00 | Page 91 |

***Note:***

*1.Please refer to page 89 to page 91 for chart*
*2. Fixed Limit = 50mW=17dBm*
*3. Caculated Limit = 11dBm + 10 log (26dB BW)*
*4. If antenna gain ≦ 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm*
*5. If antenna gain > 6dBi, FCC Limit = (Minimum of Fixed Limit and Caculated Limit) dBm – (highest antenna gain – 6 dBi)*
*6. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
R L
Measure
Ch Freq 5.51 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.510 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.78 dBm / 40.0000 MHz
Power Spectral Density
-62.24 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.59 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Center 5.590 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.93 dBm / 40.0000 MHz
Power Spectral Density
-62.09 dBm/Hz
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.67 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Ref 30 dBm
Atten 30 dB
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Center 5.670 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Power Stat CCDF
Channel Power
13.43 dBm / 40.0000 MHz
Power Spectral Density
-62.59 dBm/Hz
More
1 of 2
Copyright 2000-2008 Agilent Technologies

# 8 POWER DENSITY MEASUREMENT

## 8.1 Standard Applicable

According to 15.407(a)(1) for the band 5.15-58.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to 15.407(a)(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 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 8.2 Measurement Procedure

1. The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 is used.
2. Position the EUT as shown in figure 2

## 8.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | 09/18/2012 |

# 8.4 Measurement Data

## 8.4.1 IEEE 802.11a

8.4.1.1 5.2GHz

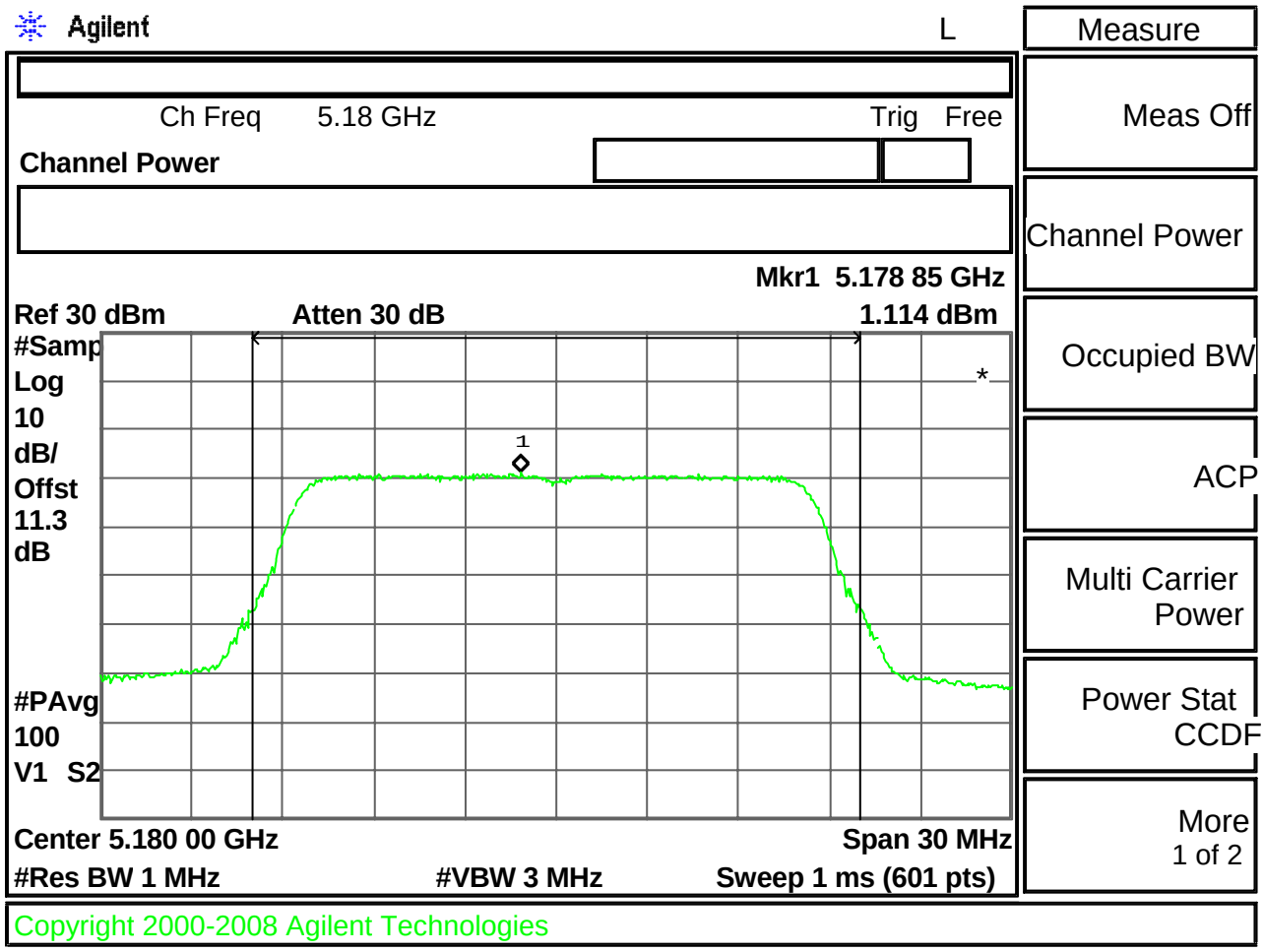
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

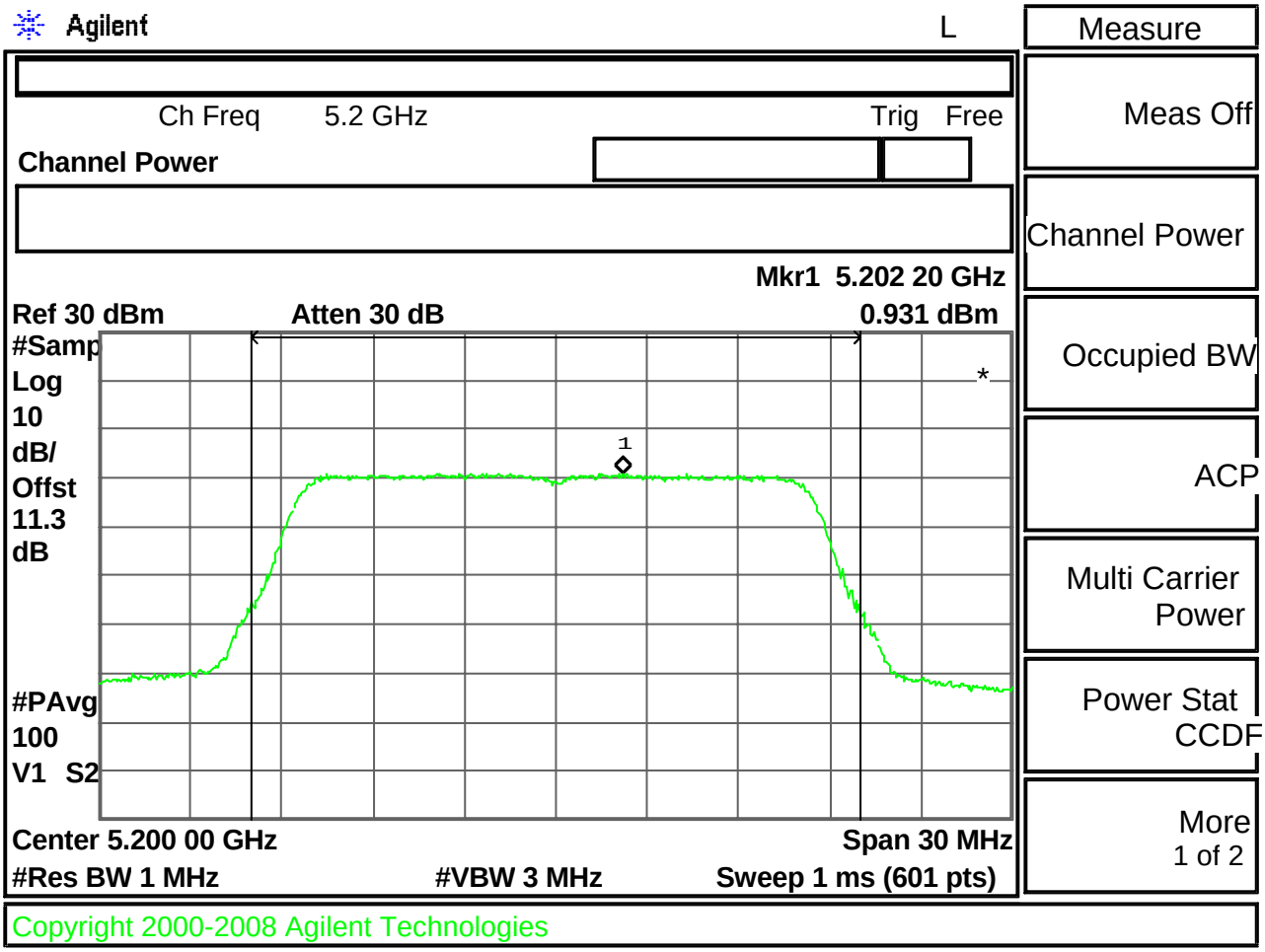
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

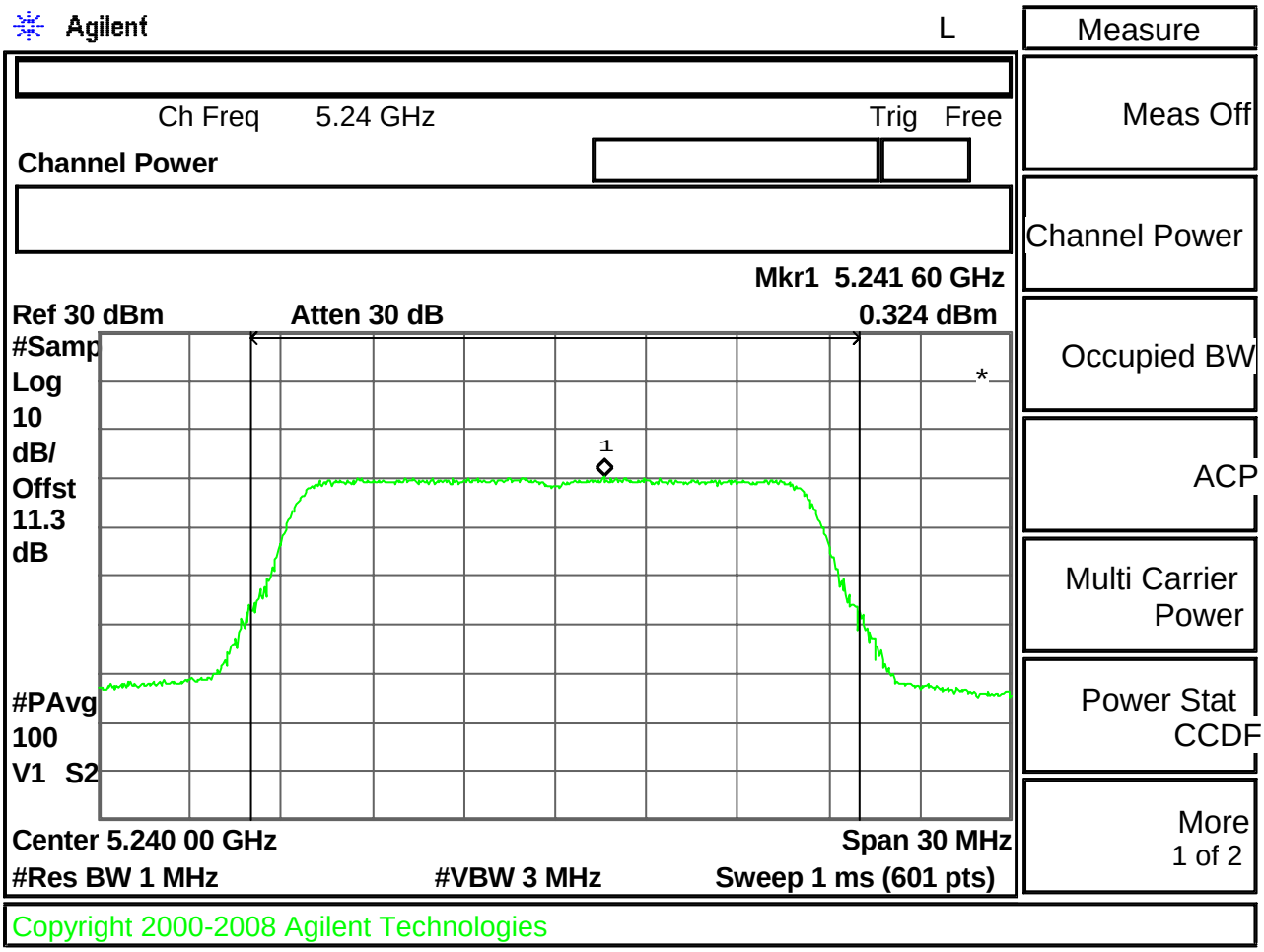
| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | 1.11 | 4 | Page 94 |
| M | 0.93 | 4 | Page 95 |
| H | 0.32 | 4 | Page 96 |

***Note:***

*1. Please refer to page 94 to page 96 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.18 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.178 85 GHz
Ref 30 dBm
Atten 30 dB
1.114 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.180 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.2 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Mkr1 5.202 20 GHz
Ref 30 dBm
Atten 30 dB
0.931 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
#PAvg
100
V1 S2
Power Stat CCDF
Center 5.200 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
More
1 of 2
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.24 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.241 60 GHz
Ref 30 dBm
Atten 30 dB
0.324 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.240 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

8.4.1.2 5.3GHz

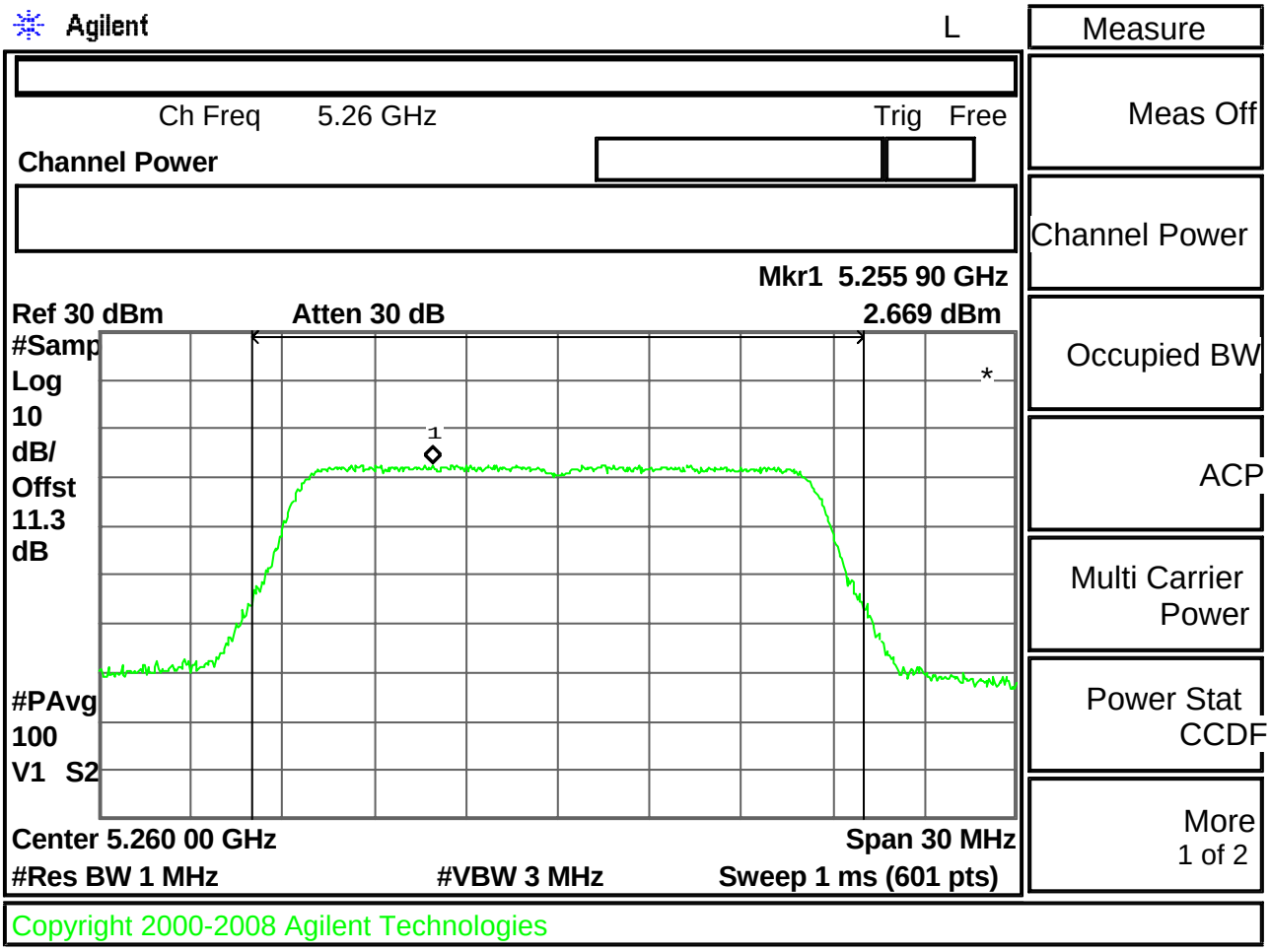
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

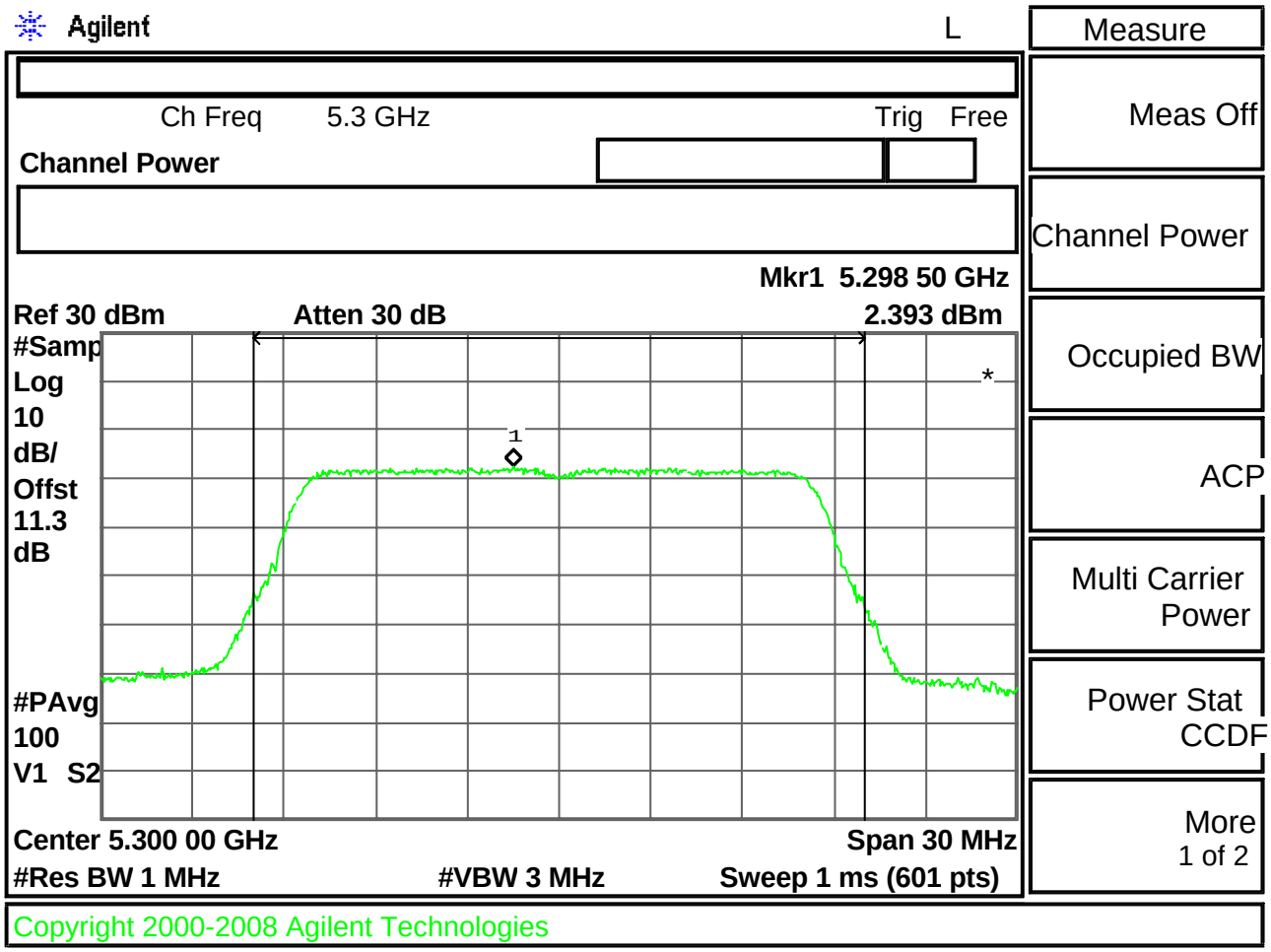
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

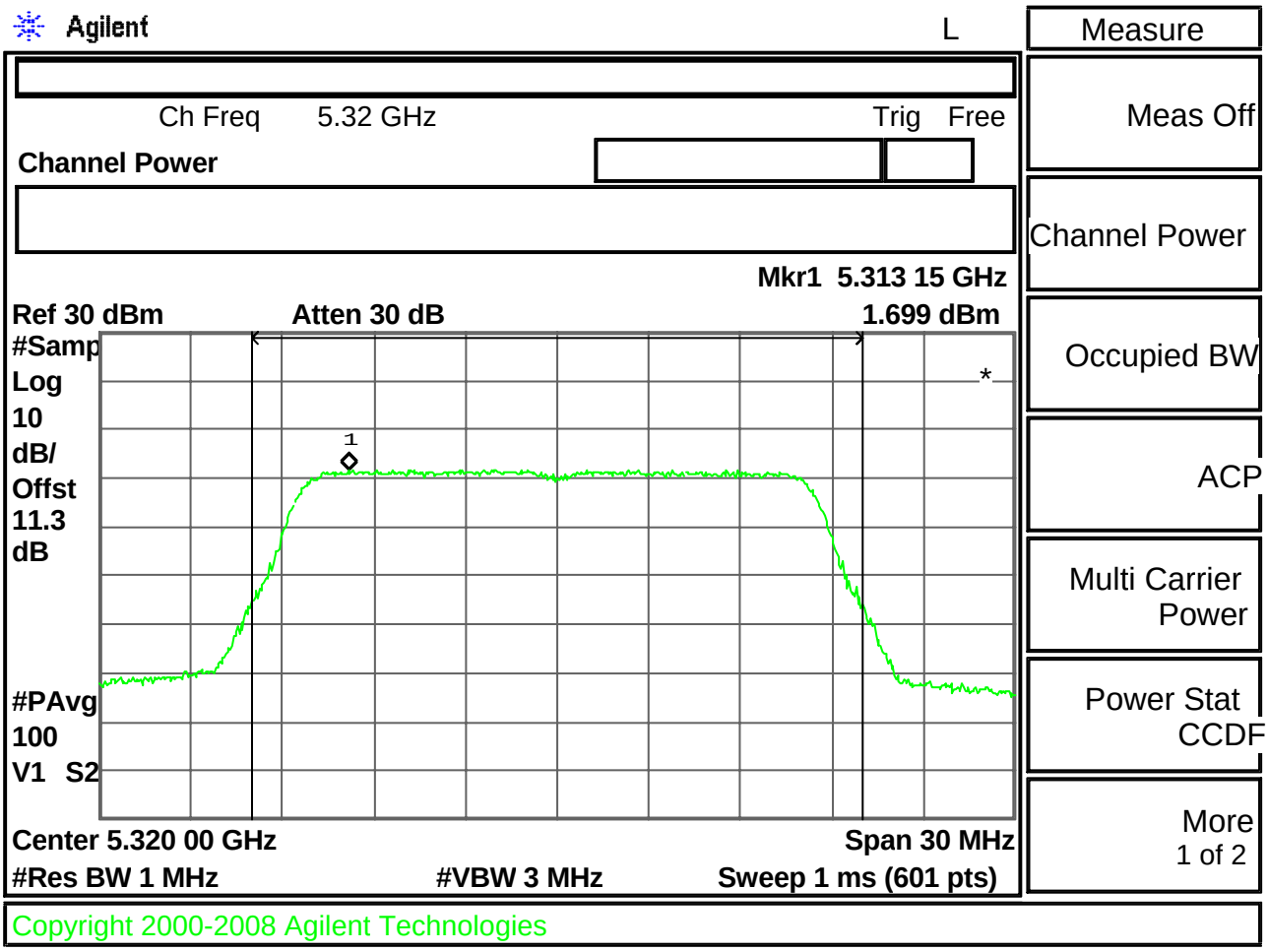
| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | 2.67 | 11 | Page 98 |
| M | 2.39 | 11 | Page 99 |
| H | 1.70 | 11 | Page 100 |

***Note:***

*1. Please refer to page 98 to page 100 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.26 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.255 90 GHz
Ref 30 dBm
Atten 30 dB
2.669 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.260 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.3 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.298 50 GHz
Ref 30 dBm
Atten 30 dB
2.393 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.300 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.32 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.313 15 GHz
Ref 30 dBm
Atten 30 dB
1.699 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.320 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

8.4.1.3 5.6GHz

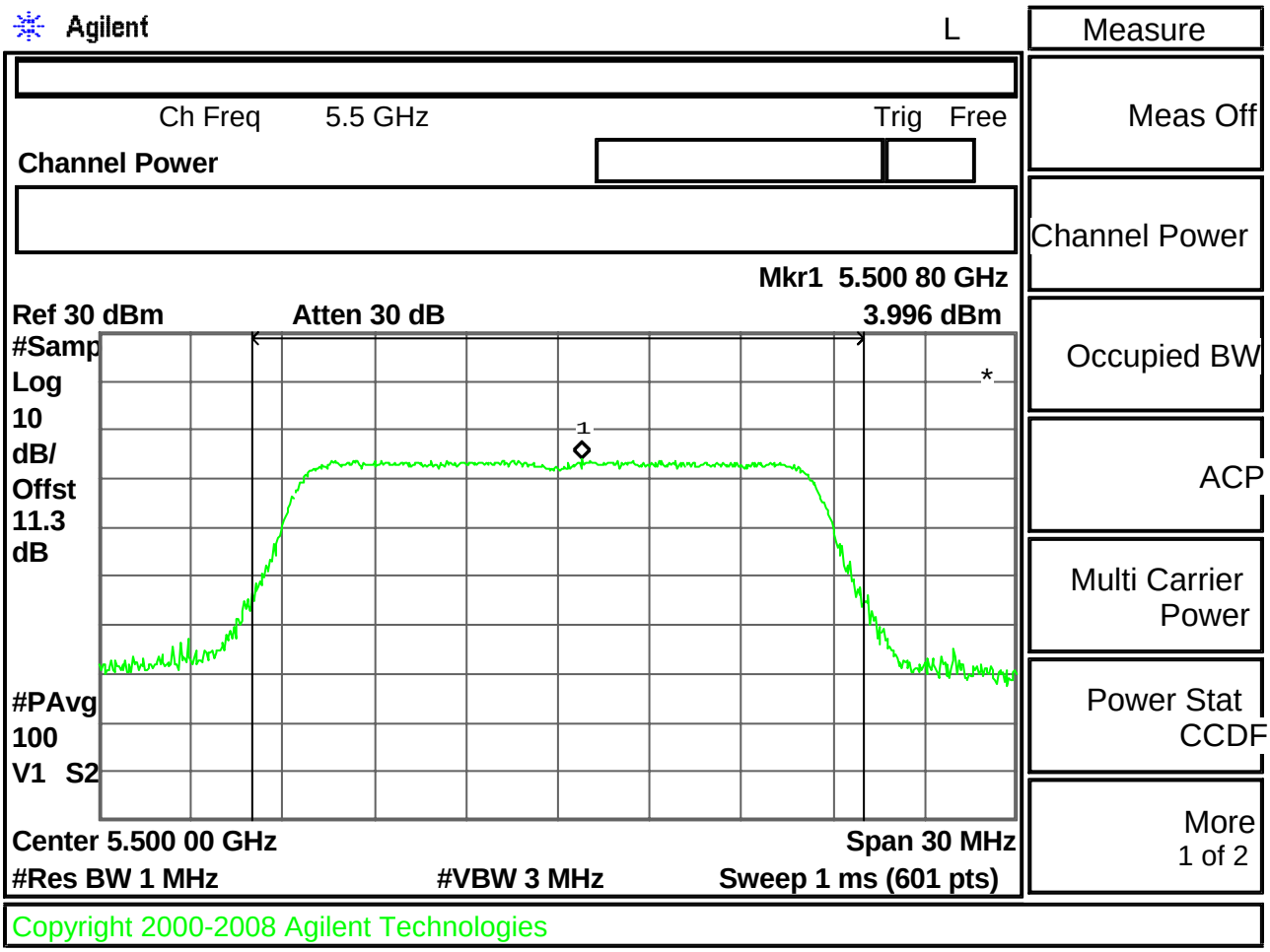
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

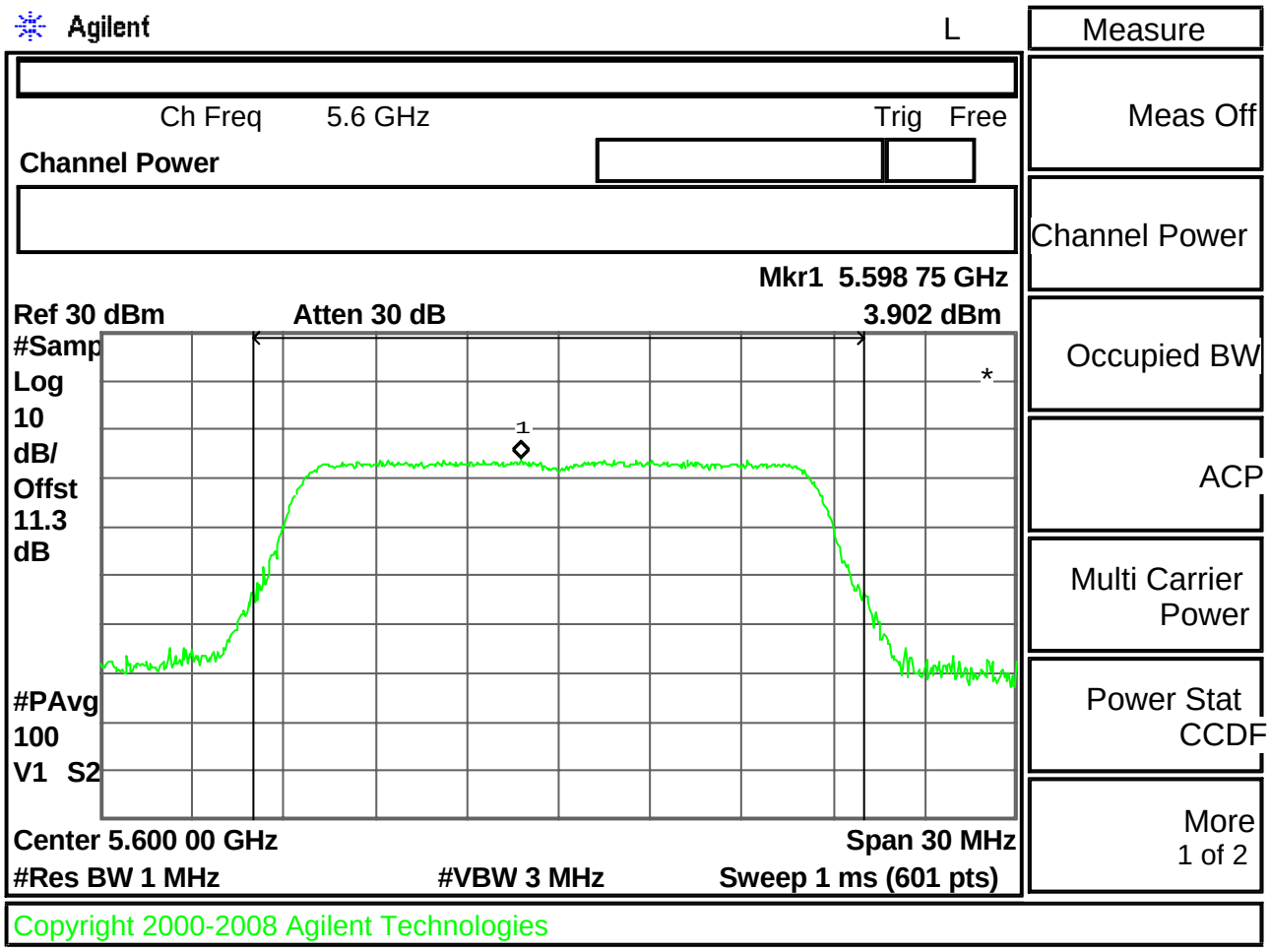
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

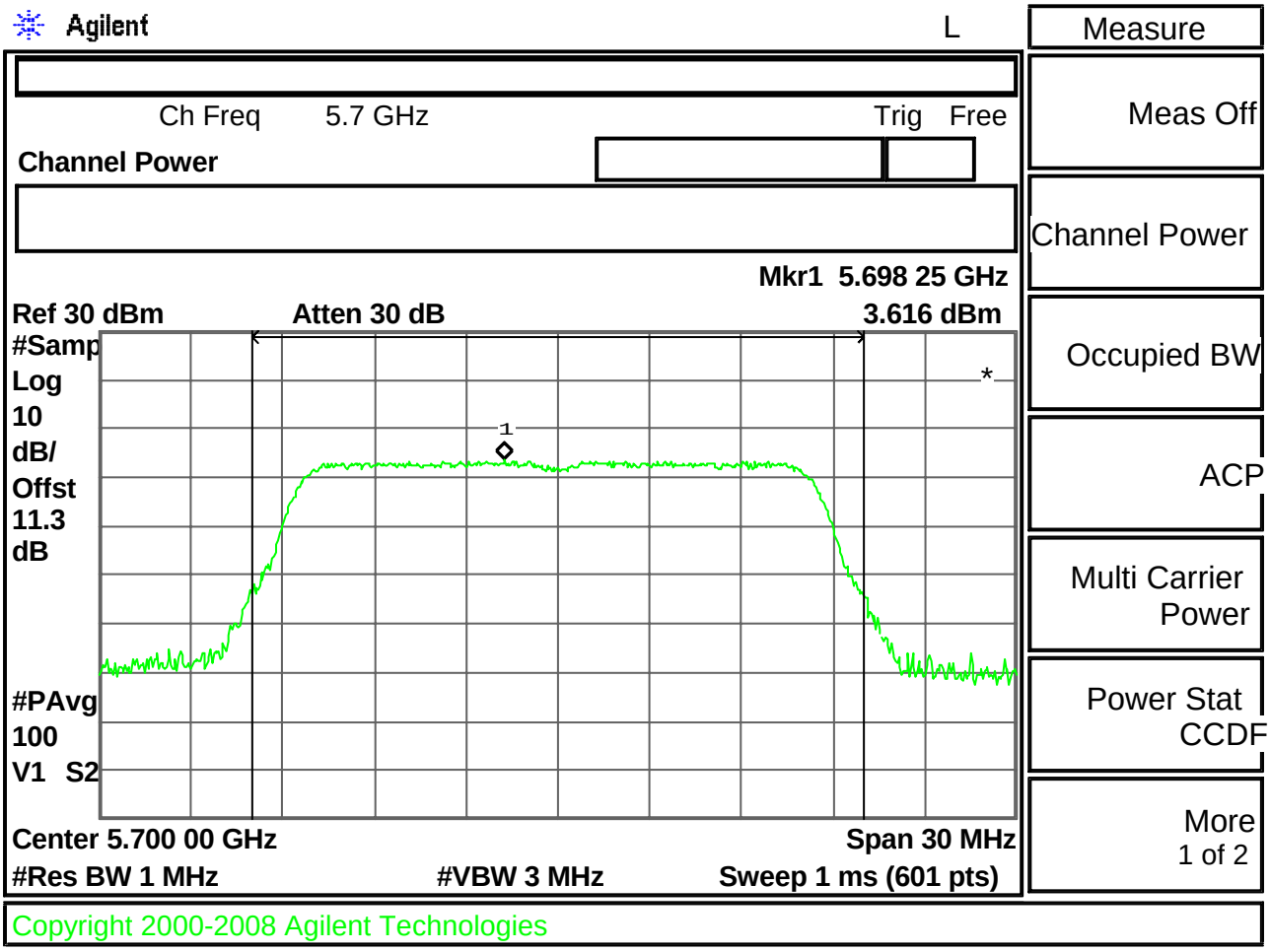
| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | 4.00 | 11 | Page 102 |
| M | 3.90 | 11 | Page 103 |
| H | 3.62 | 11 | Page 104 |

***Note:***

*1. Please refer to pae 102 to page 104 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.5 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.500 80 GHz
Ref 30 dBm
Atten 30 dB
3.996 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.500 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.6 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.598 75 GHz
Ref 30 dBm
Atten 30 dB
3.902 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.600 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.7 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.698 25 GHz
Ref 30 dBm
Atten 30 dB
3.616 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.700 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

## 8.4.2 IEEE 802.11an, HT20

### 8.4.2.1 5.2GHz

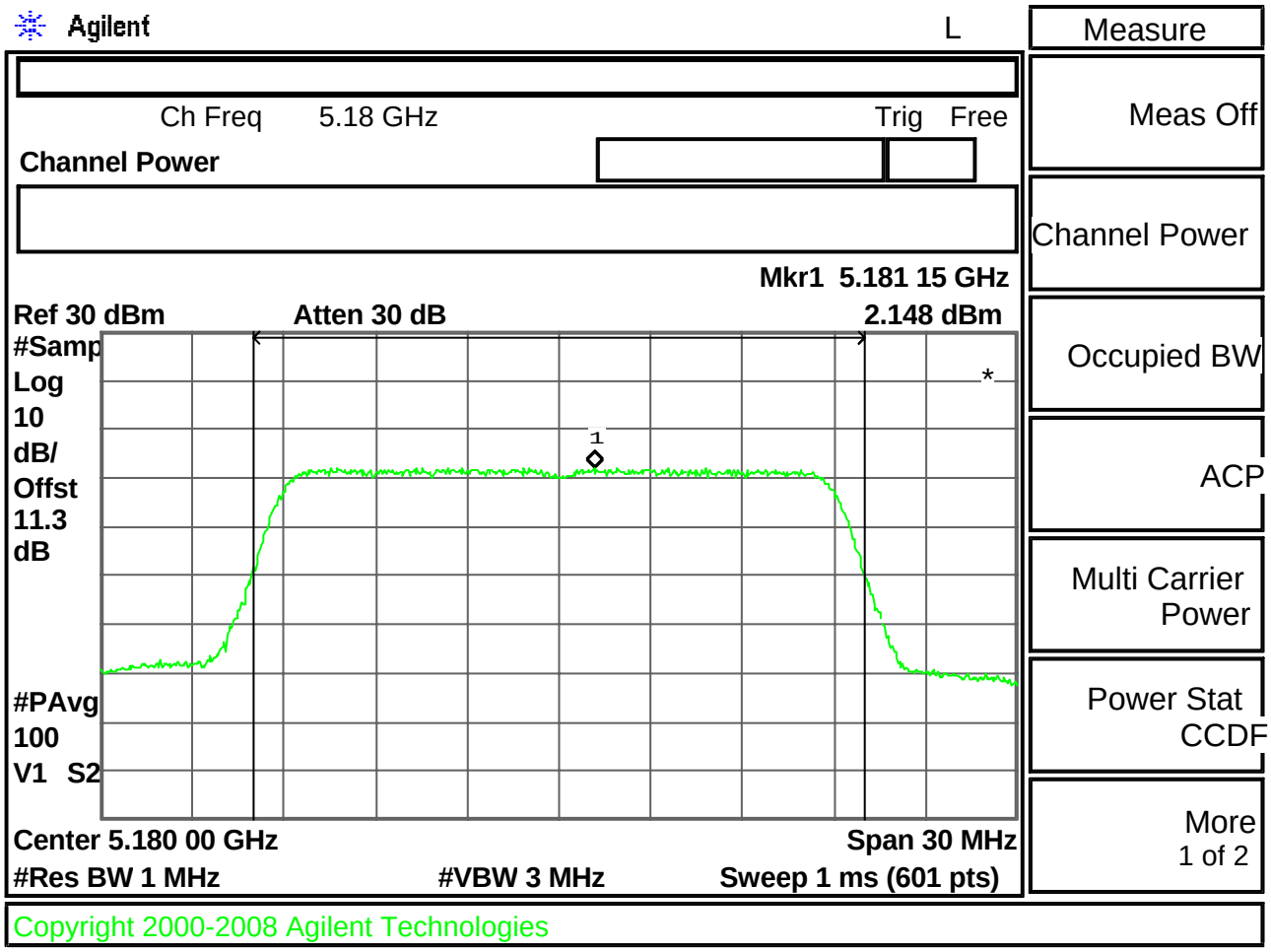
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

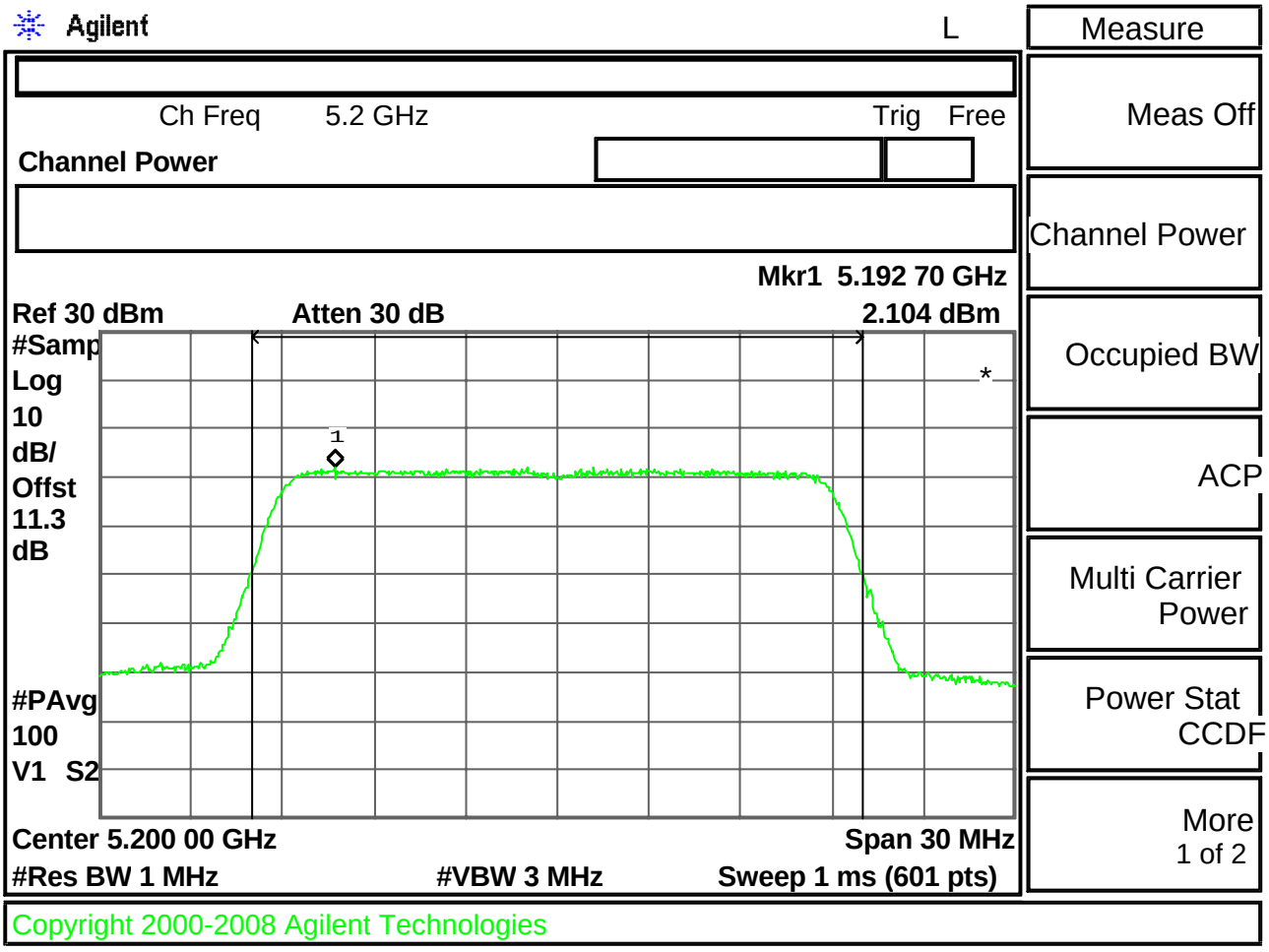
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

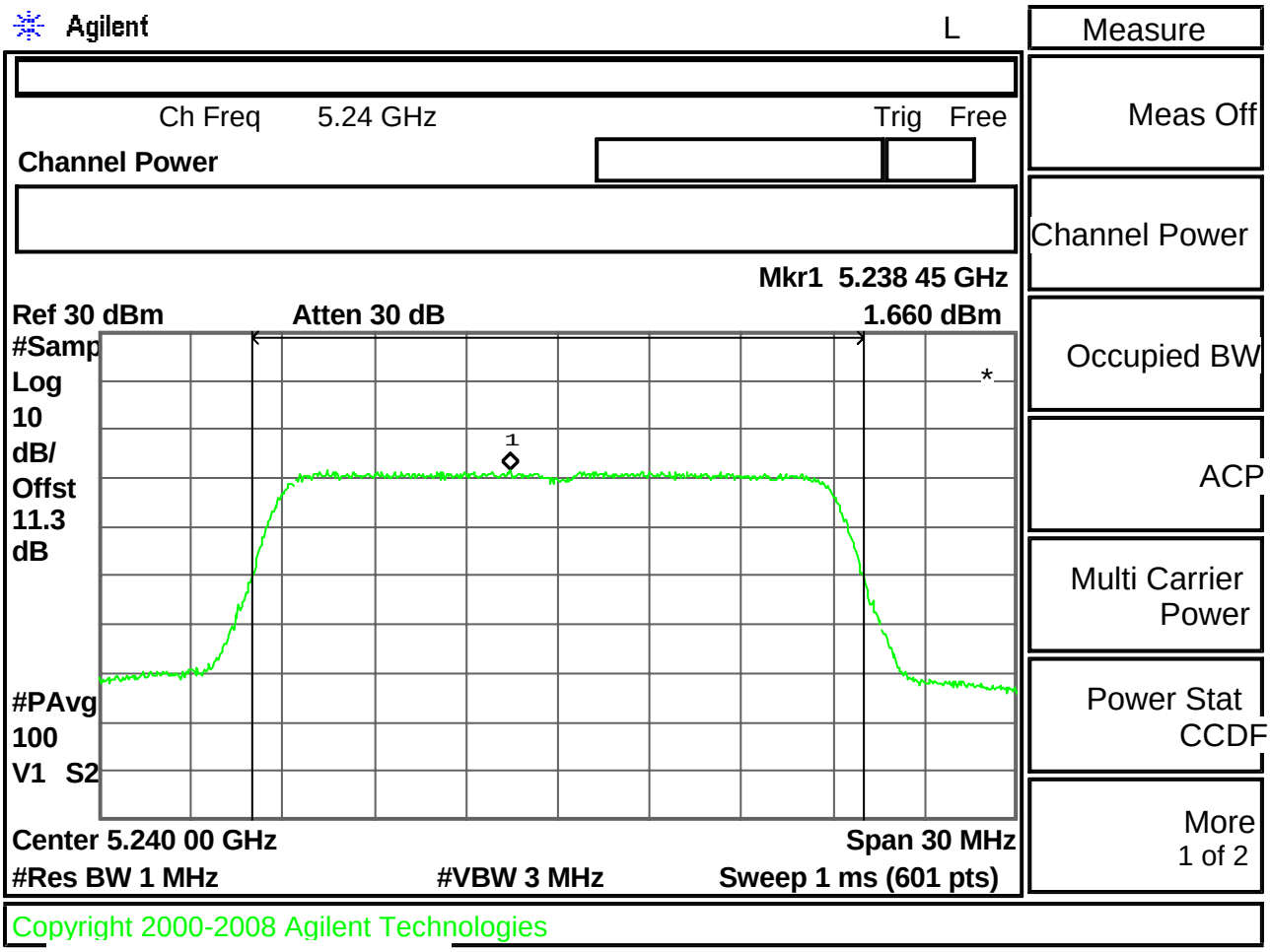
| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | 2.15 | 4 | Page 106 |
| M | 2.10 | 4 | Page 107 |
| H | 1.66 | 4 | Page 108 |

***Note:***

*1. Please refer to page 106 to page 108 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.18 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.181 15 GHz
Ref 30 dBm
Atten 30 dB
2.148 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.180 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.2 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.192 70 GHz
Ref 30 dBm
Atten 30 dB
2.104 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.200 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.24 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.238 45 GHz
Ref 30 dBm
Atten 30 dB
1.660 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.240 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

8.4.2.2 5.3GHz

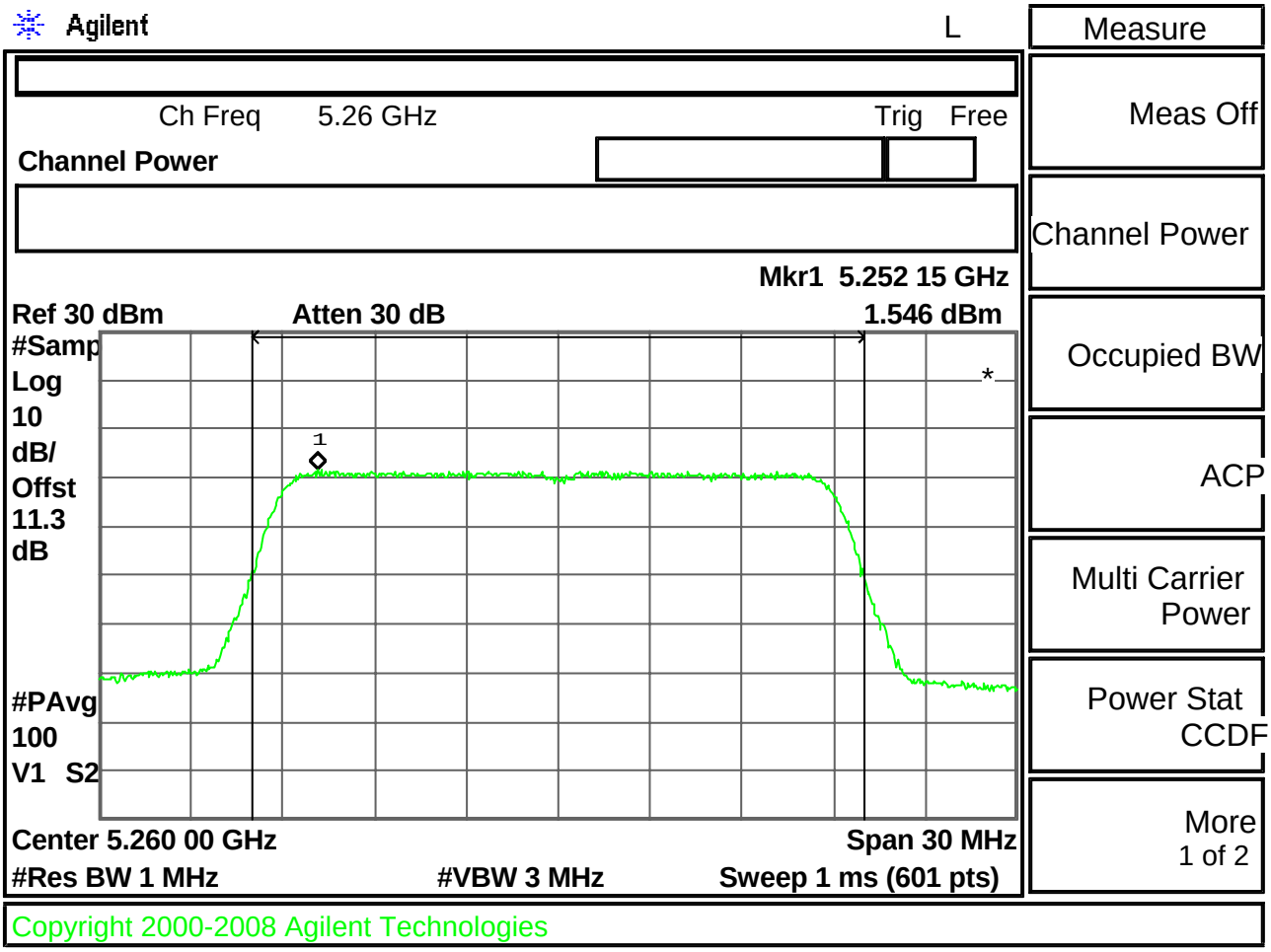
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

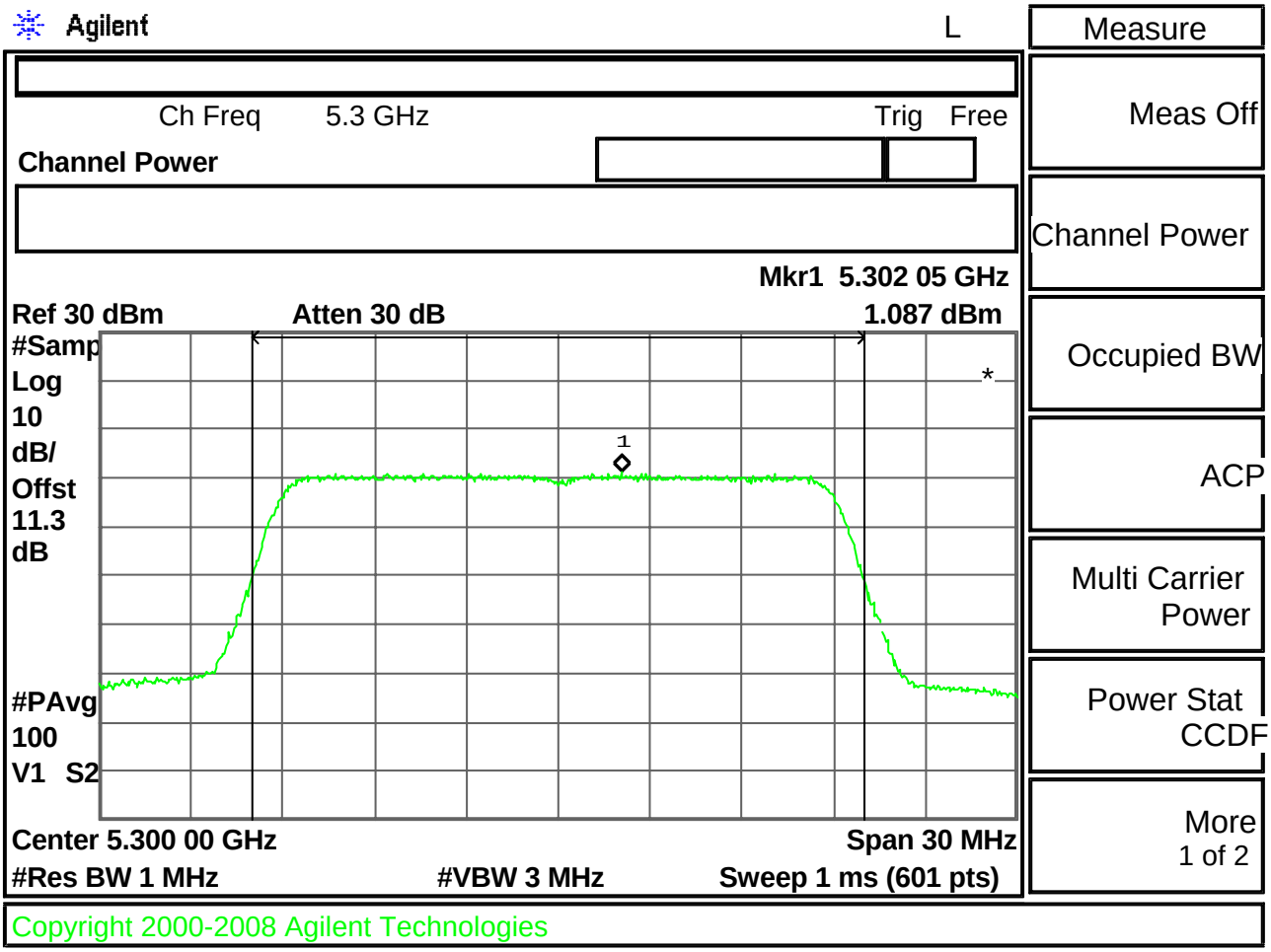
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

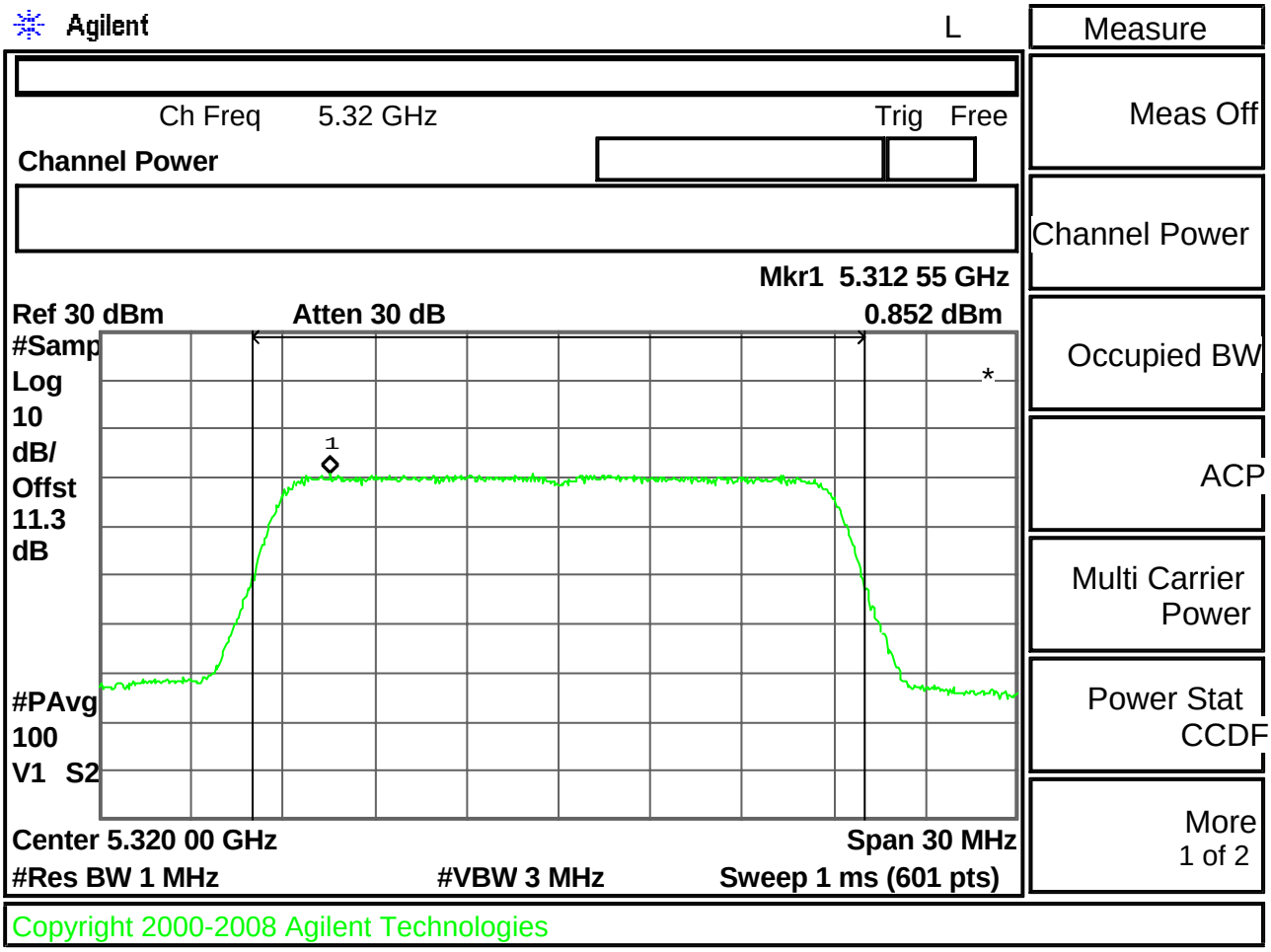
| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | 1.55 | 11 | Page 110 |
| M | 1.09 | 11 | Page 111 |
| H | 0.85 | 11 | Page 112 |

***Note:***

*1. Please refer to page 110 to page 112 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.26 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.252 15 GHz
Ref 30 dBm
Atten 30 dB
1.546 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.260 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.3 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.302 05 GHz
Ref 30 dBm
Atten 30 dB
1.087 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.300 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.32 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.312 55 GHz
Ref 30 dBm
Atten 30 dB
0.852 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.320 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

8.4.2.3 5.6GHz

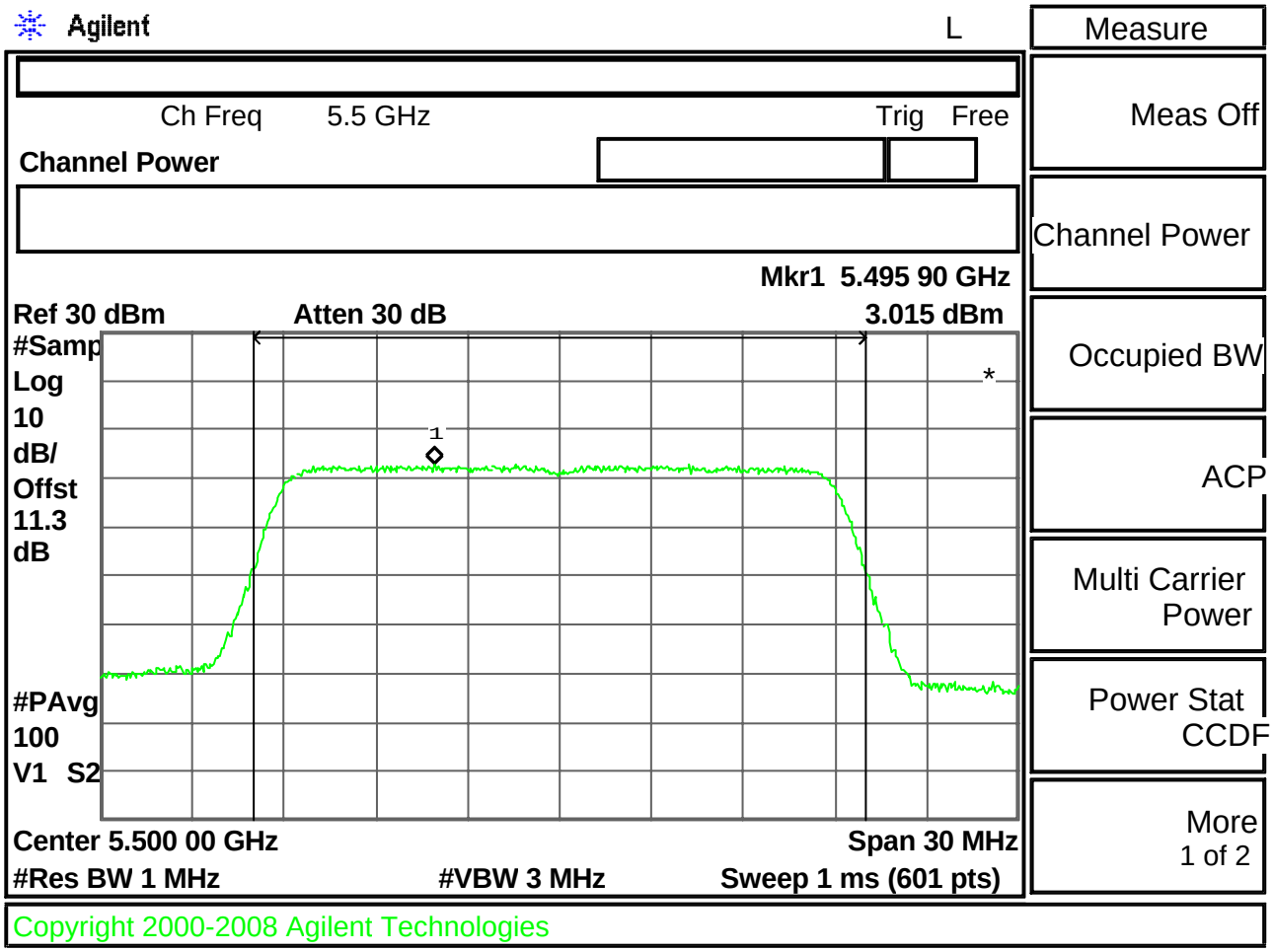
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

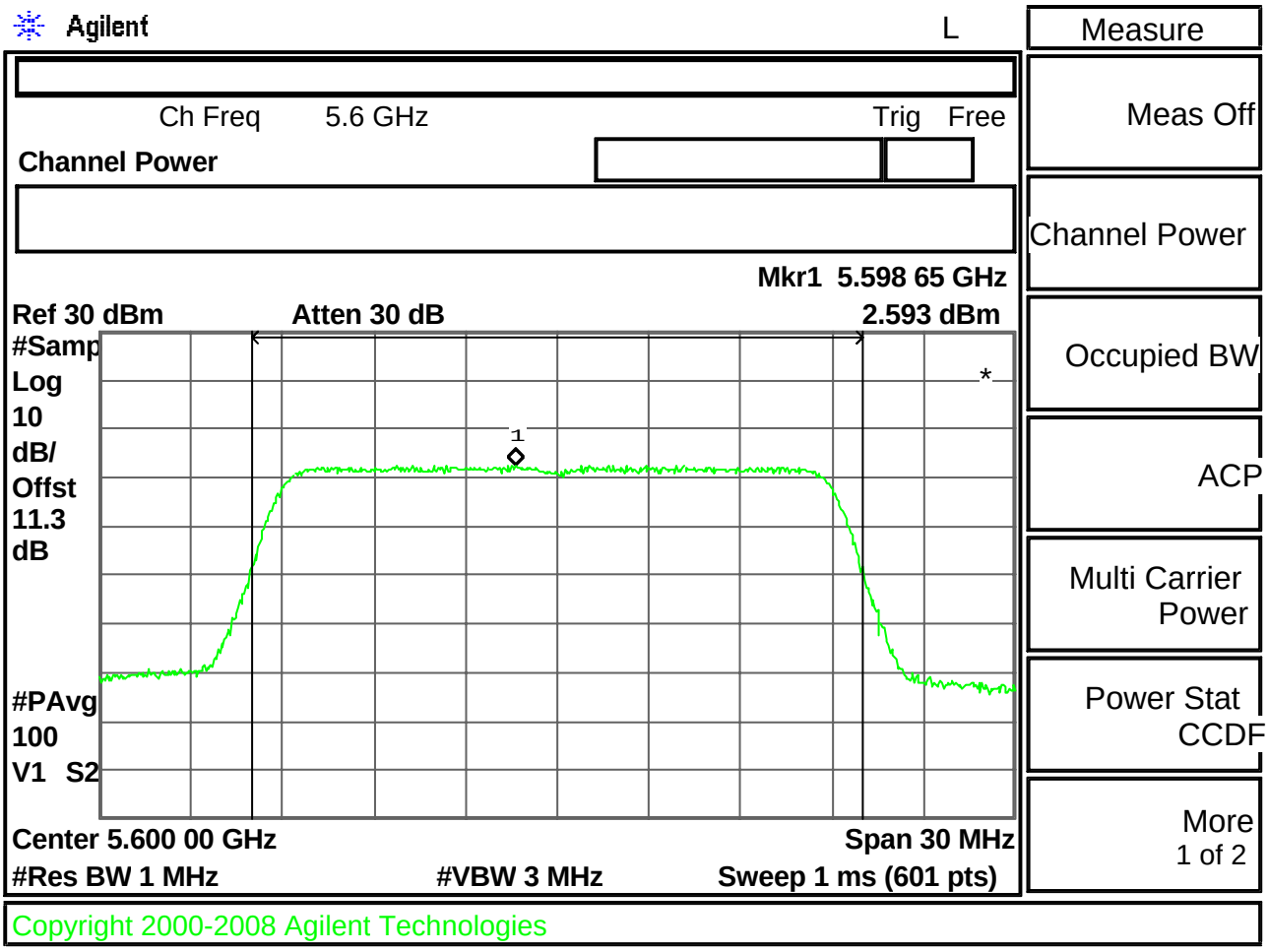
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

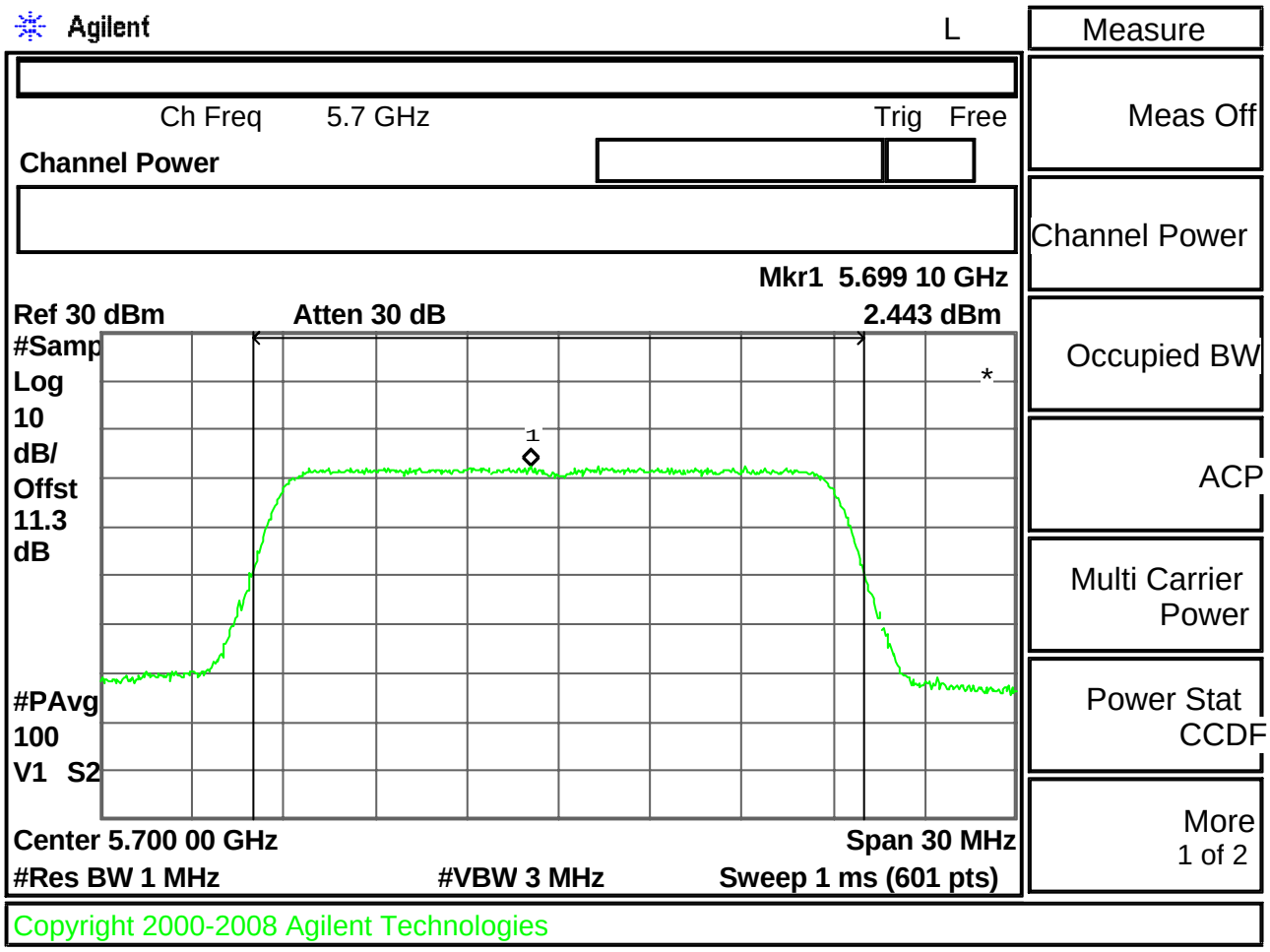
| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | 3.02 | 11 | Page 114 |
| M | 2.95 | 11 | Page 115 |
| H | 2.44 | 11 | Page 116 |

***Note:***

*1. Please refer to page 114 to page 116 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.5 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.495 90 GHz
Ref 30 dBm
Atten 30 dB
3.015 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.500 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.6 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.598 65 GHz
Ref 30 dBm
Atten 30 dB
2.593 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.600 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.7 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.699 10 GHz
Ref 30 dBm
Atten 30 dB
2.443 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.700 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

### 8.4.3 IEEE 802.11an, HT40

8.4.3.1 5.2GHz

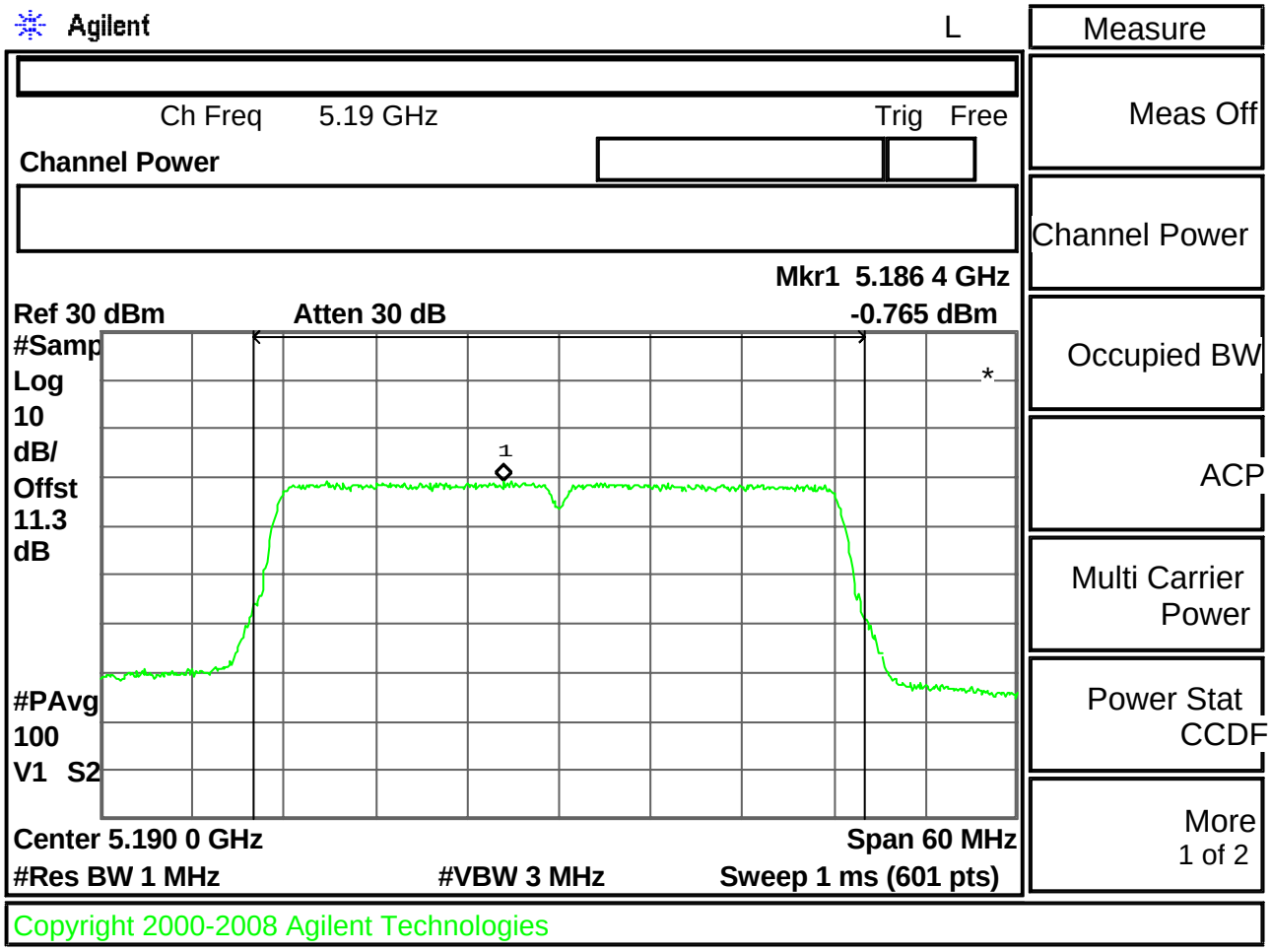
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

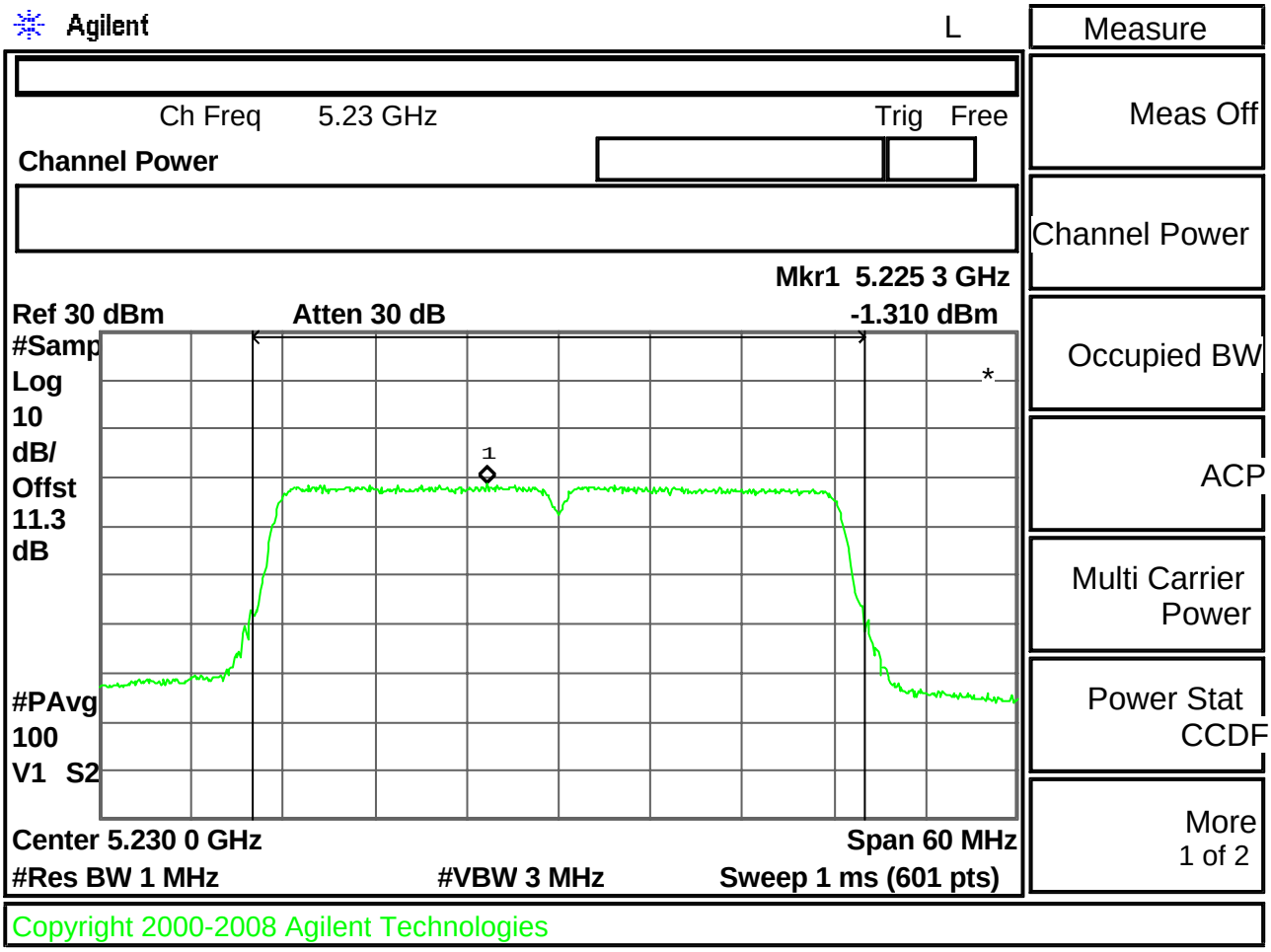
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | -0.77 | 4 | Page 118 |
| H | -1.31 | 4 | Page 119 |

***Note:***

*1. Please refer to page 118 to page 119 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.19 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.186 4 GHz
Ref 30 dBm
Atten 30 dB
-0.765 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.190 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.23 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.225 3 GHz
Ref 30 dBm
Atten 30 dB
-1.310 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.230 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

8.4.3.2 5.3GHz

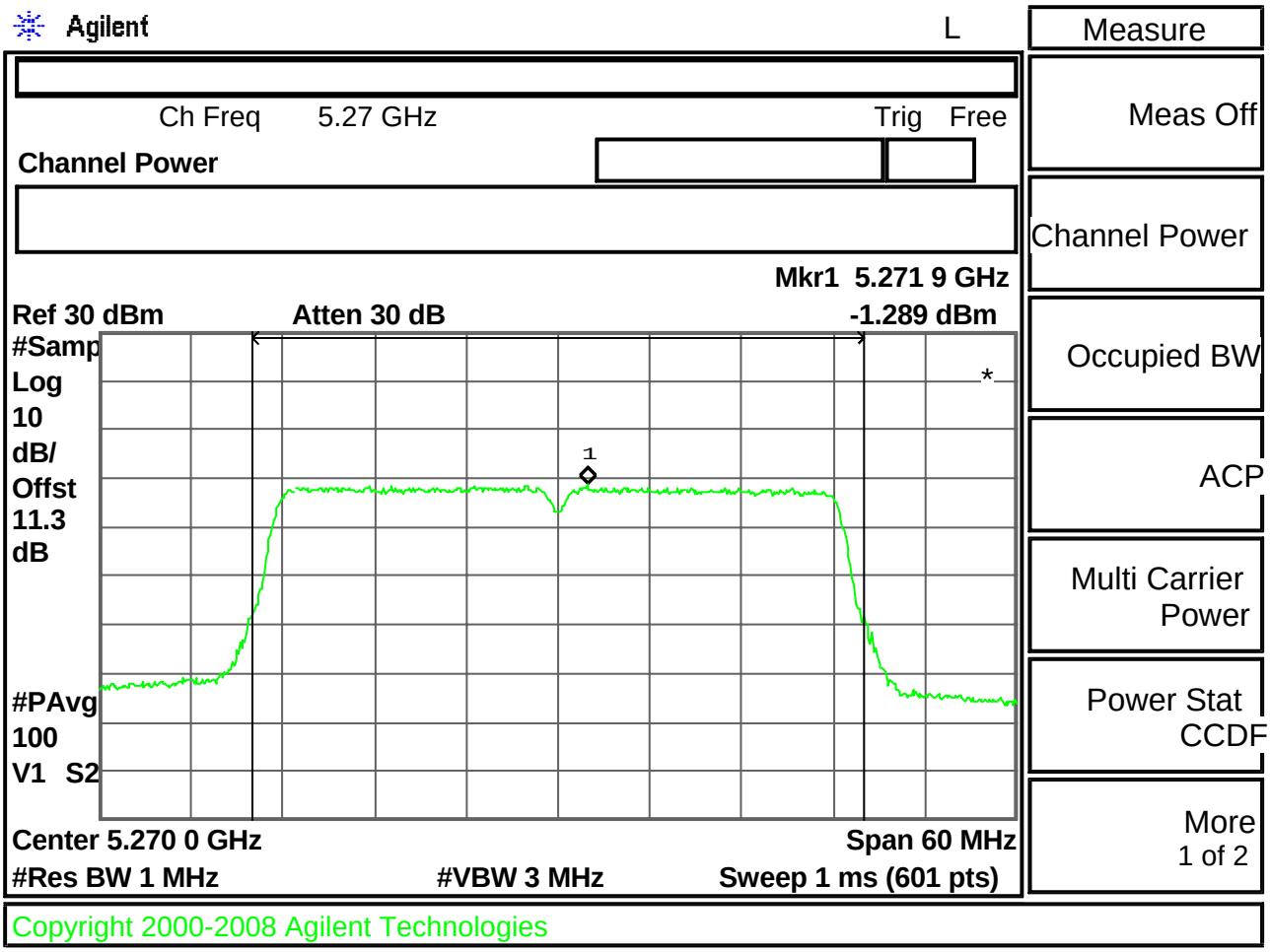
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

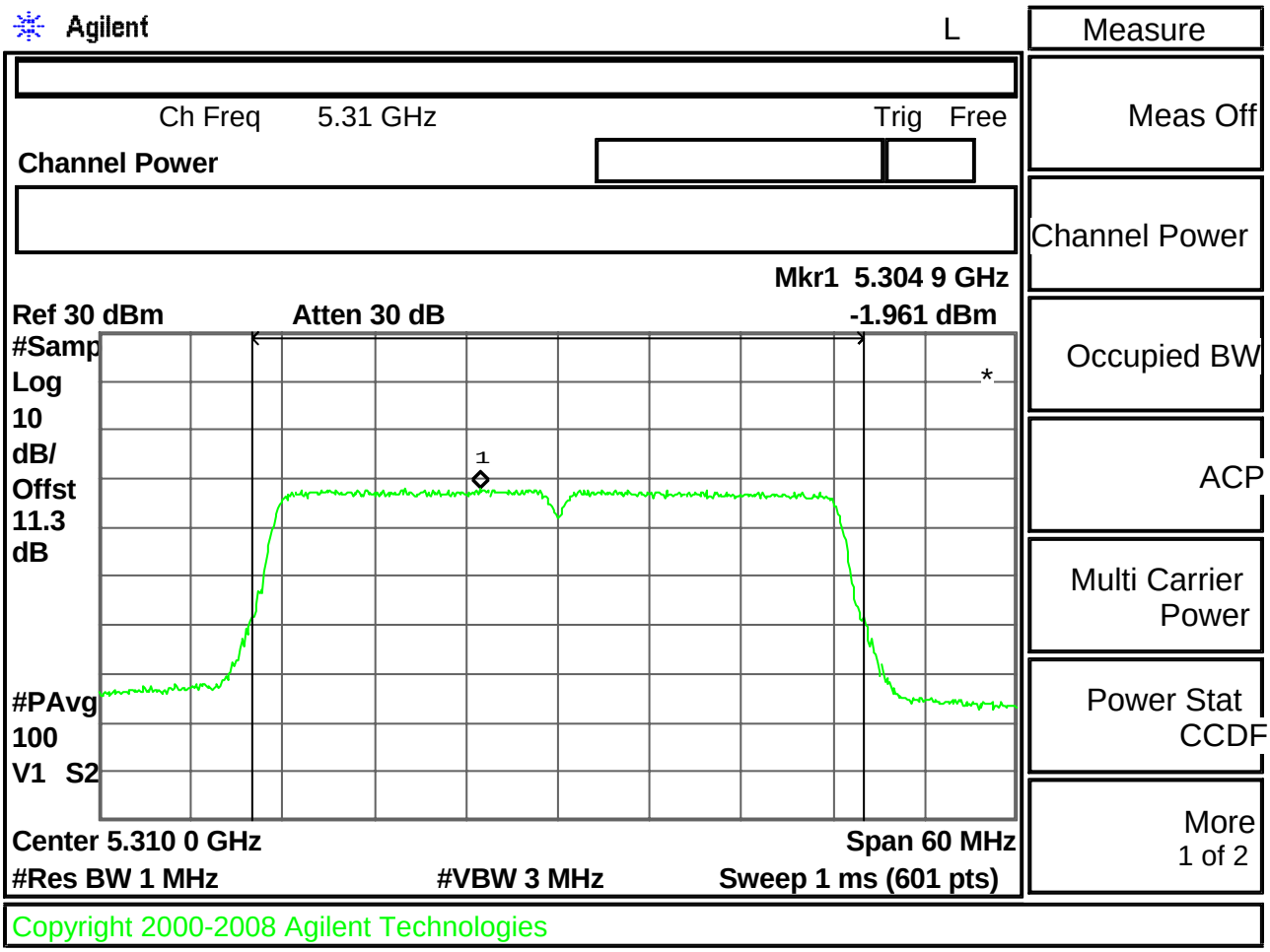
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | -1.29 | 11 | Page 121 |
| H | -1.96 | 11 | Page 122 |

***Note:***

*1. Please refer to page 121 to page 122 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.27 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.271 9 GHz
Ref 30 dBm
Atten 30 dB
-1.289 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.270 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.31 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.304 9 GHz
Ref 30 dBm
Atten 30 dB
-1.961 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.310 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

8.4.3.3 5.6GHz

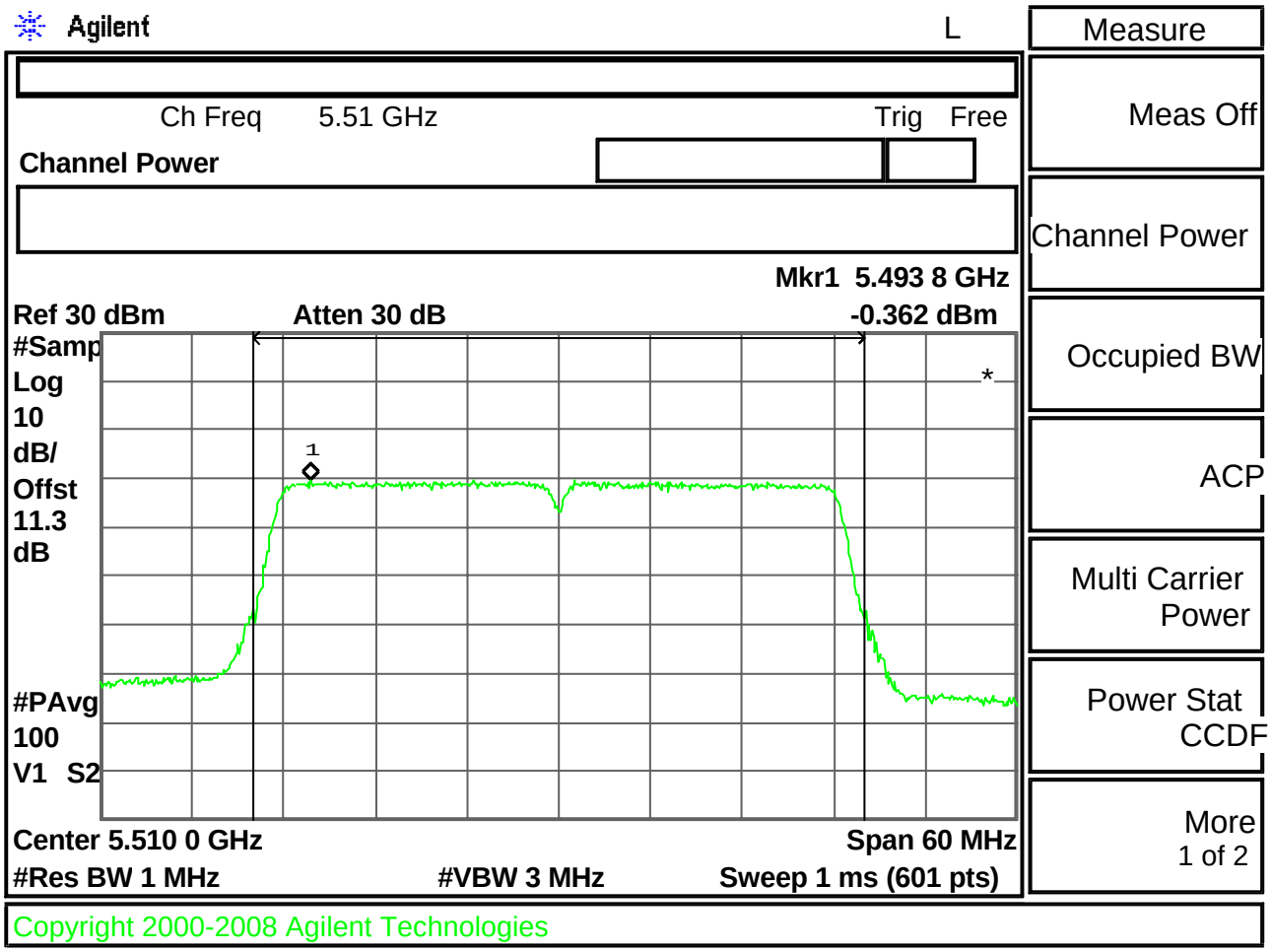
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

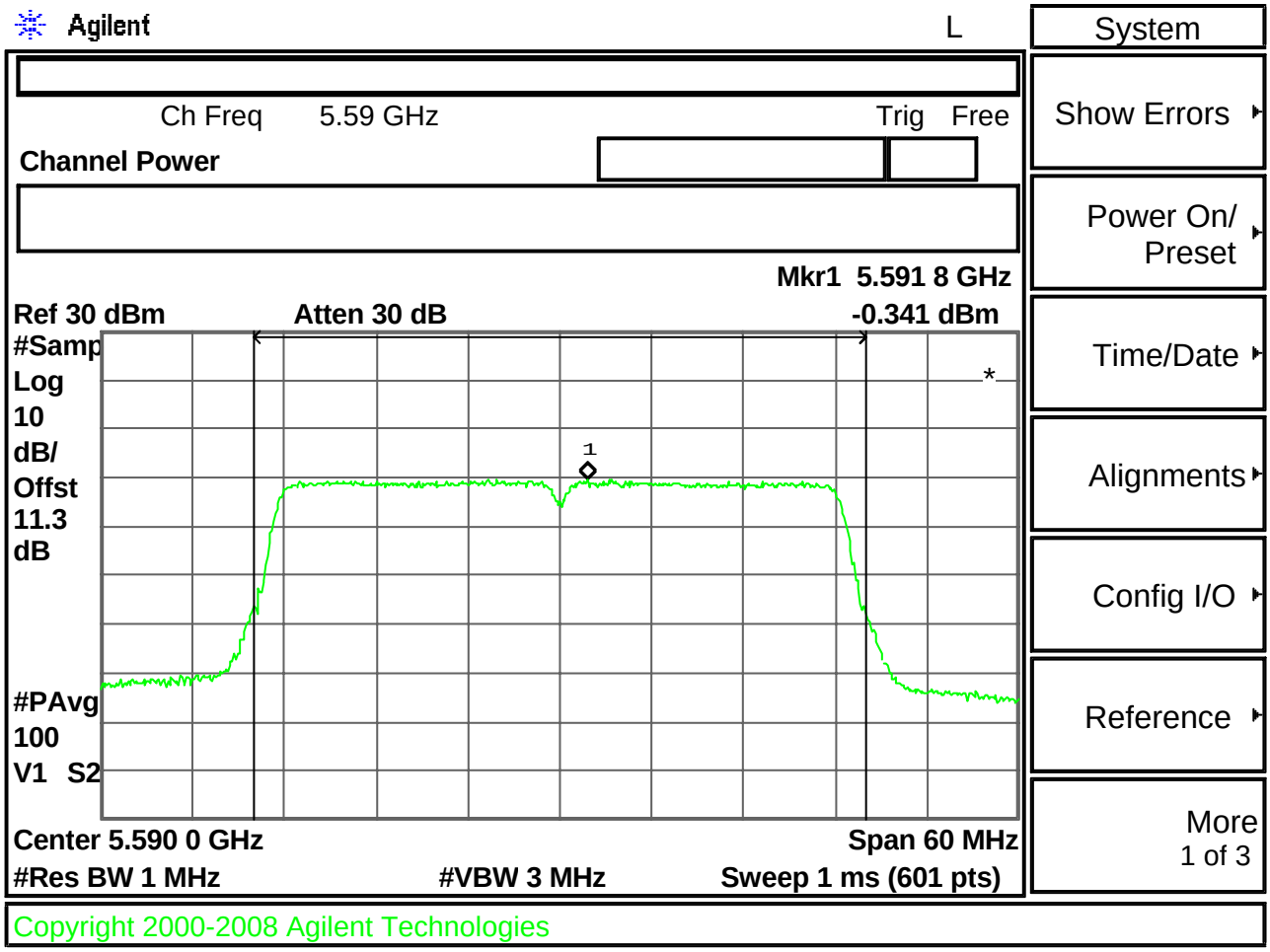
The highest antenna gain is equal to 1.8 dBi, therefore the FCC limit is as follow.

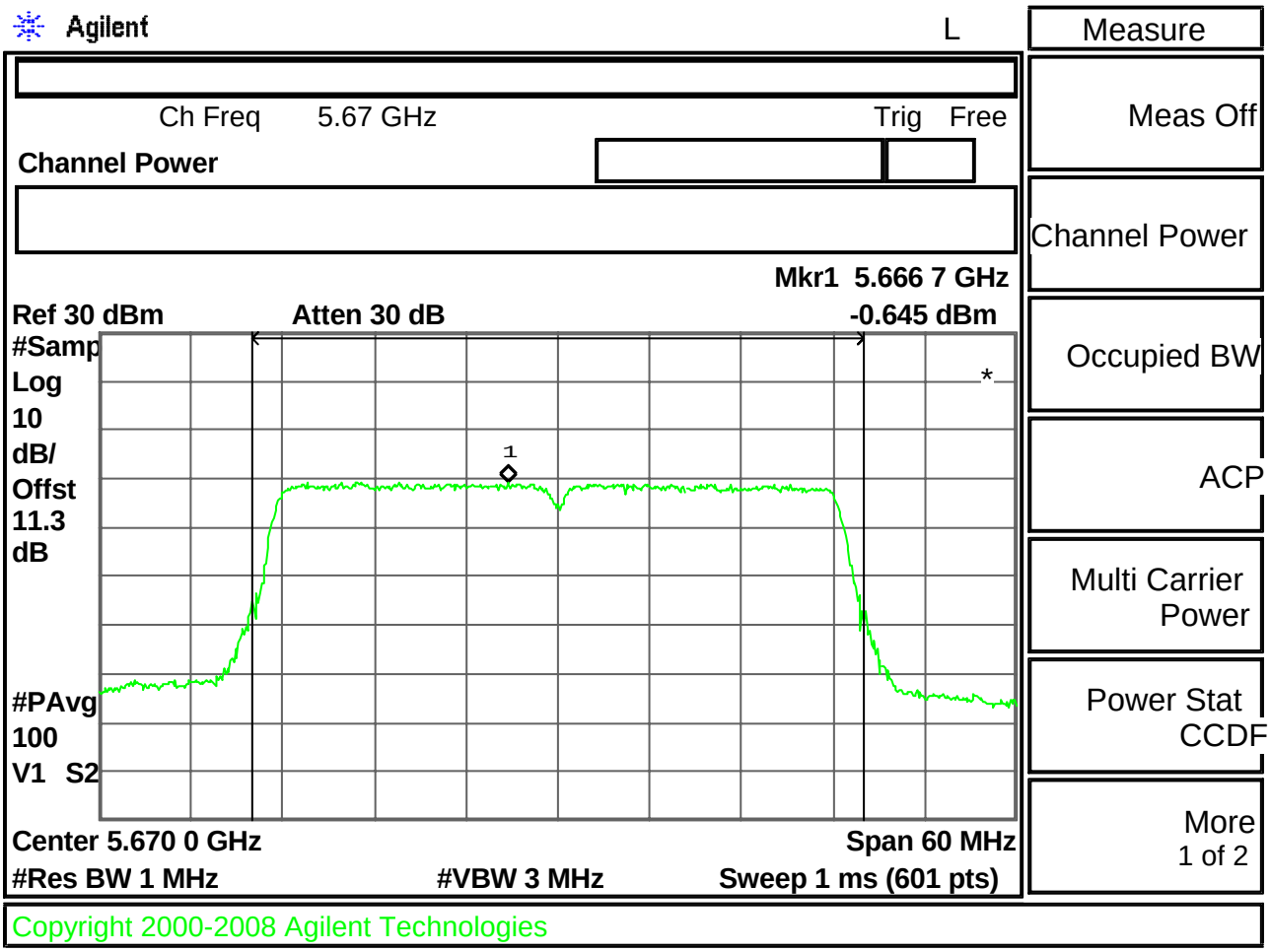
| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|
| L | -0.36 | 11 | Page 124 |
| M | -0.34 | 11 | Page 125 |
| H | -0.65 | 11 | Page 126 |

***Note:***

*1. Please refer to page 124 to page 126 for chart*
*2. If antenna gain ≦ 6dBi, FCC Limit =4 dBm*
*3. If antenna gain > 6dBi, FCC Limit =4 dBm – (highest antenna gain – 6 dBi)*
*4. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)*


Agilent
L
Measure
Ch Freq 5.51 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.493 8 GHz
Ref 30 dBm
Atten 30 dB
-0.362 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.510 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
System
Ch Freq 5.59 GHz
Trig Free
Channel Power
Show Errors
Power On/ Preset
Mkr1 5.591 8 GHz
Ref 30 dBm
Atten 30 dB
-0.341 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
Time/Date
Alignments
Config I/O
Reference
#PAvg
100
V1 S2
More
1 of 3
Center 5.590 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
L
Measure
Ch Freq 5.67 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Mkr1 5.666 7 GHz
Ref 30 dBm
Atten 30 dB
-0.645 dBm
#Samp
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 S2
Center 5.670 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

# 9 PEAK EXCURSION MEASUREMENT

## 9.1 Standard Applicable

According to 15.407 (a)(6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

## 9.2 Measurement Procedure

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 is used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

## 9.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | 09/18/2012 |

## 9.4 Measurement Data

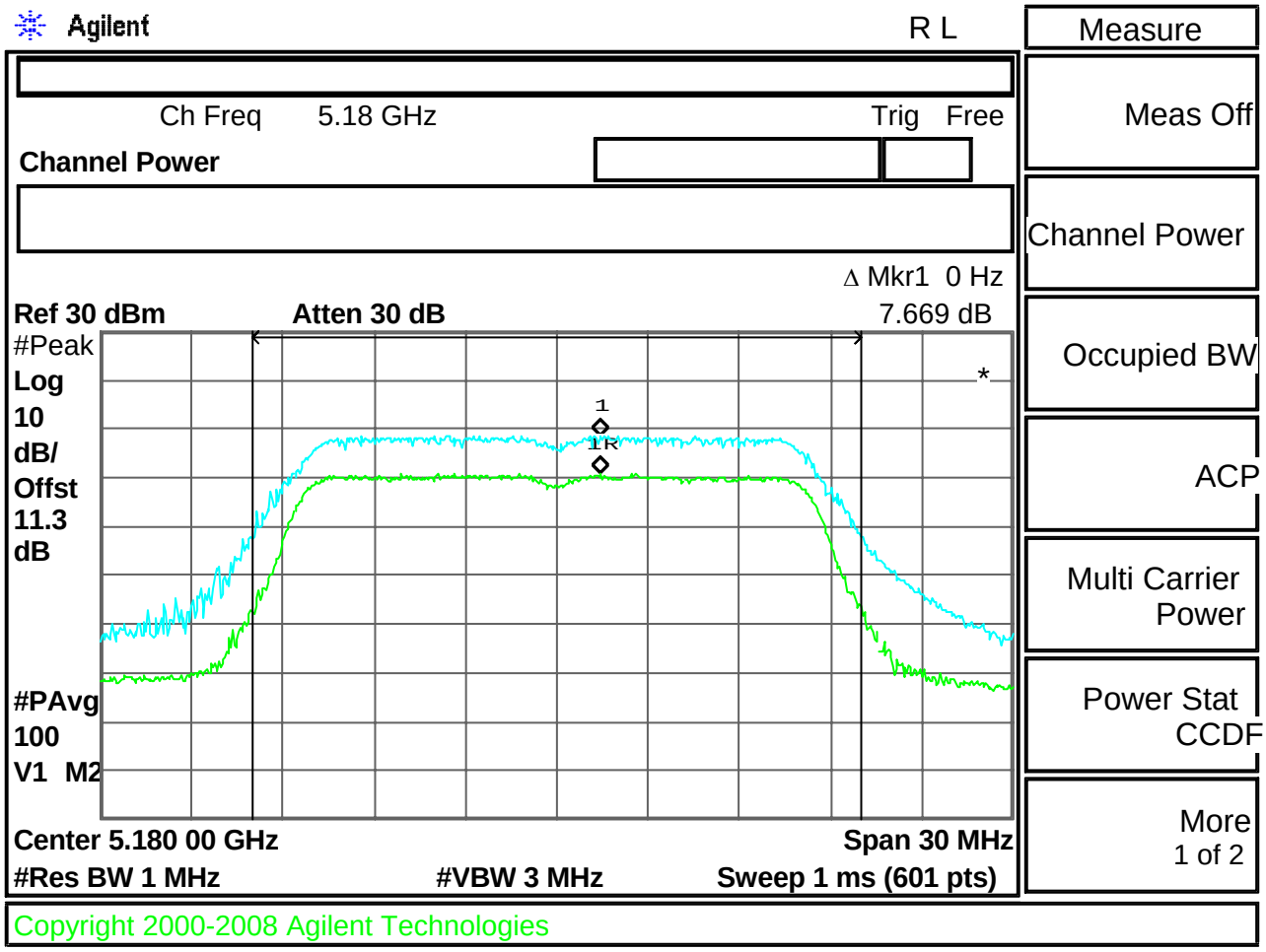
### 9.4.1 IEEE 802.11a

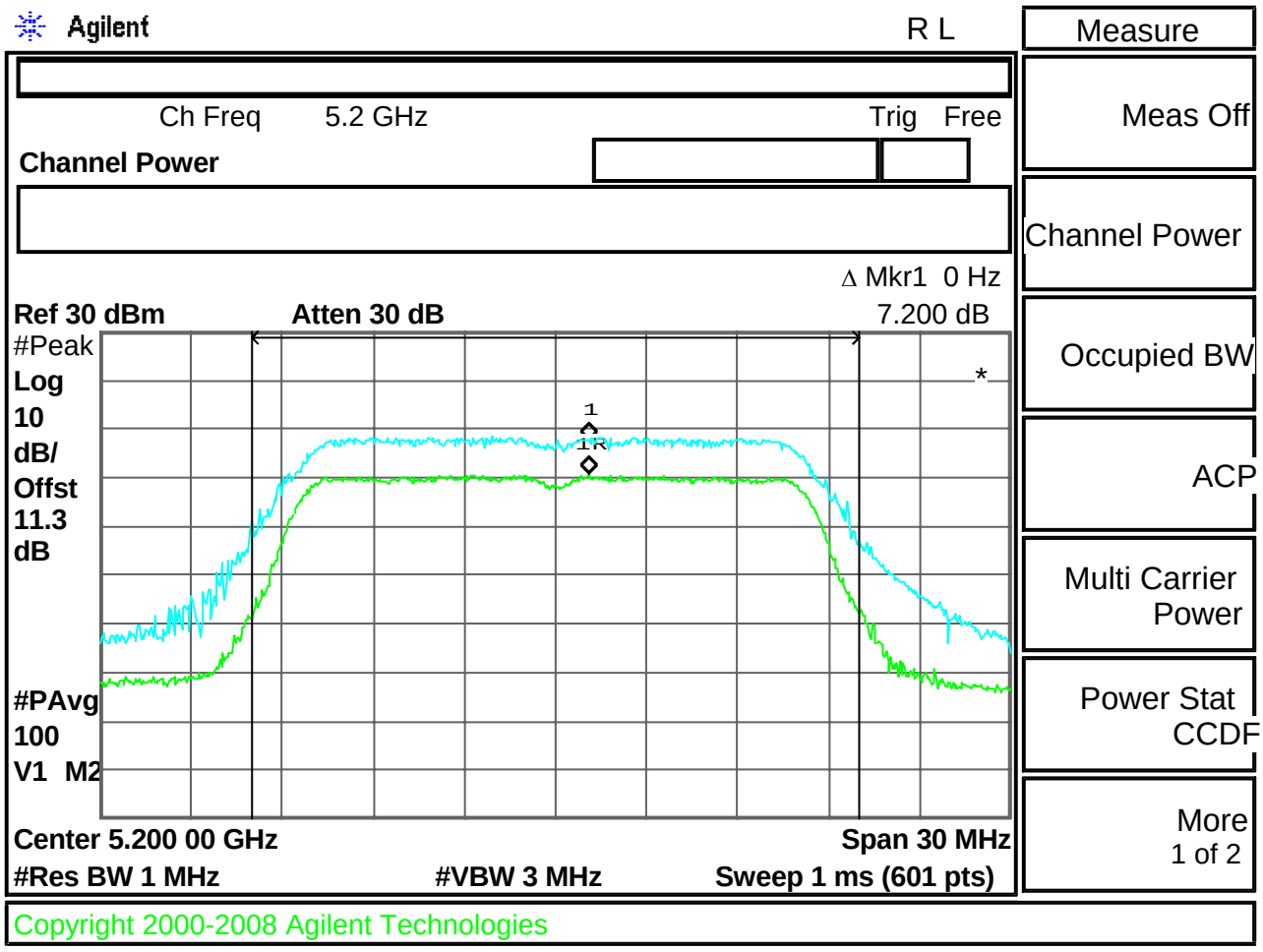
9.4.1.1 5.2GHz

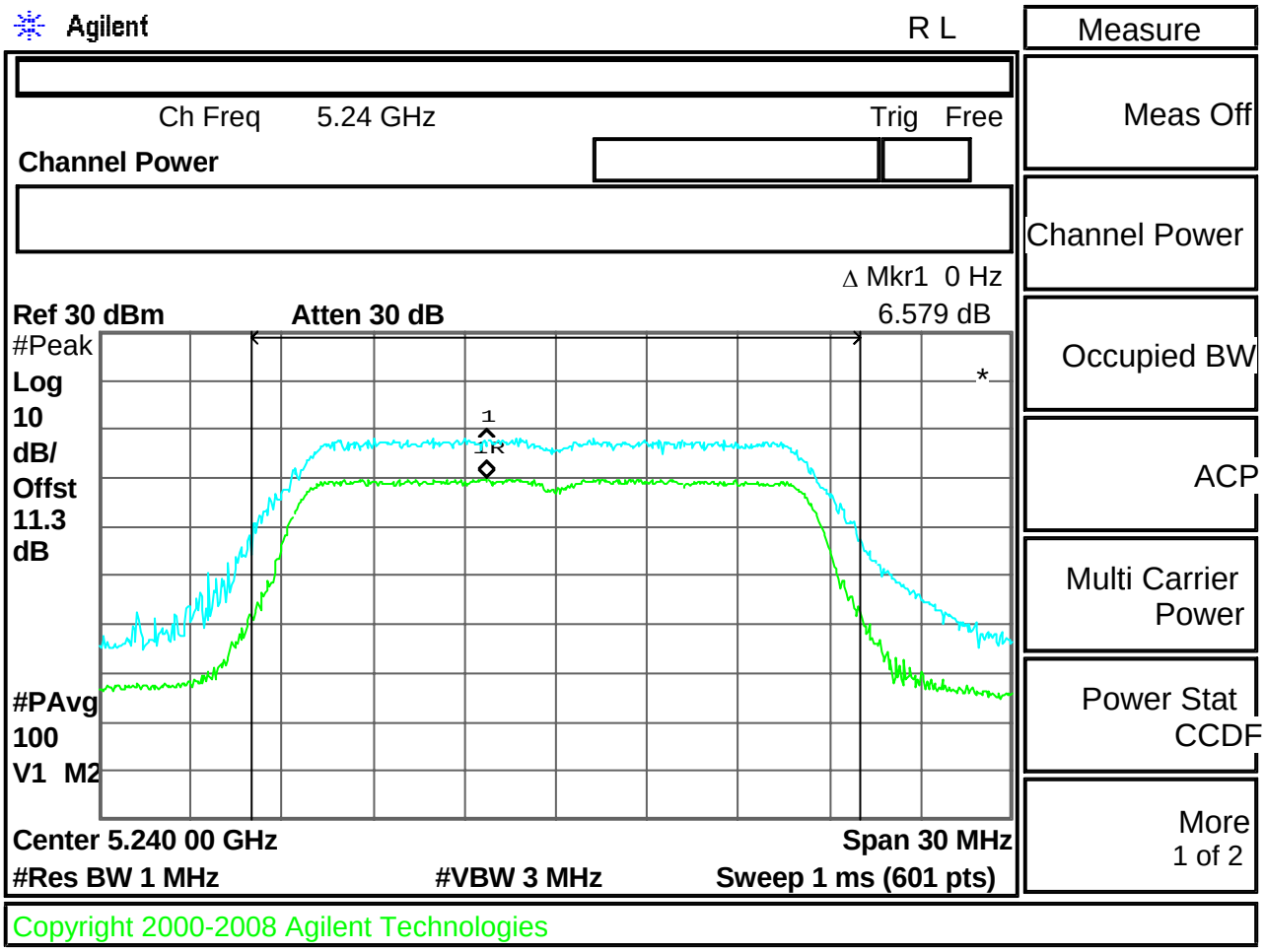
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 7.669 | 13 | Page 129 |
| M | 7.200 | 13 | Page 130 |
| H | 6.579 | 13 | Page 131 |

***Note: Please refer to page 129 to page 131 for chart***


Agilent
R L
Measure
Ch Freq 5.18 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Δ Mkr1 0 Hz
Ref 30 dBm
Atten 30 dB
7.669 dB
#Peak
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
#PAvg
100
V1 M2
Power Stat CCDF
More 1 of 2
Center 5.180 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.2 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Δ Mkr1 0 Hz
Ref 30 dBm
Atten 30 dB
7.200 dB
#Peak
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
#PAvg
100
V1 M2
Power Stat CCDF
More
1 of 2
Center 5.200 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

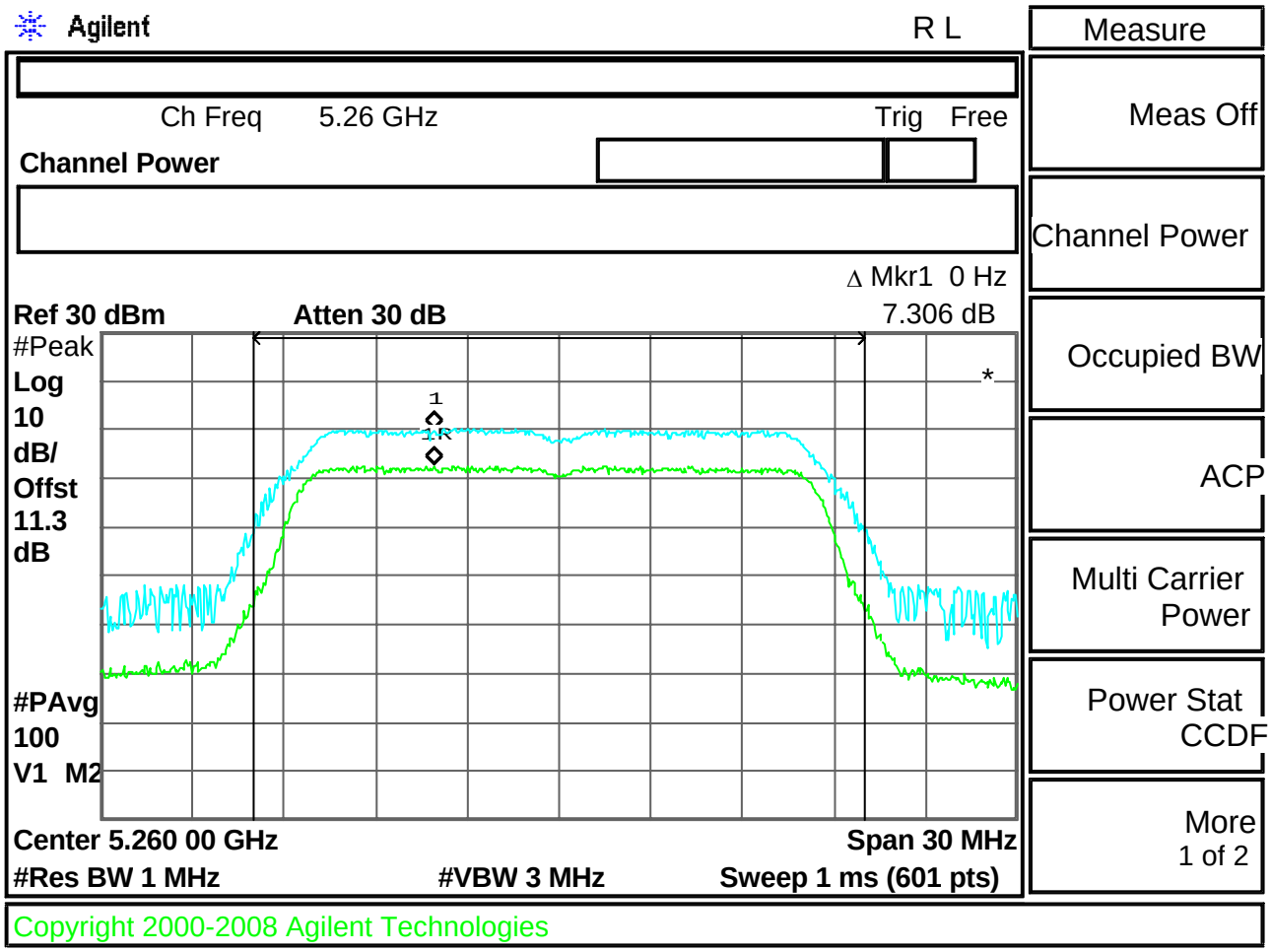

Agilent
R L
Measure
Ch Freq 5.24 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
Ref 30 dBm
Atten 30 dB
6.579 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.240 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

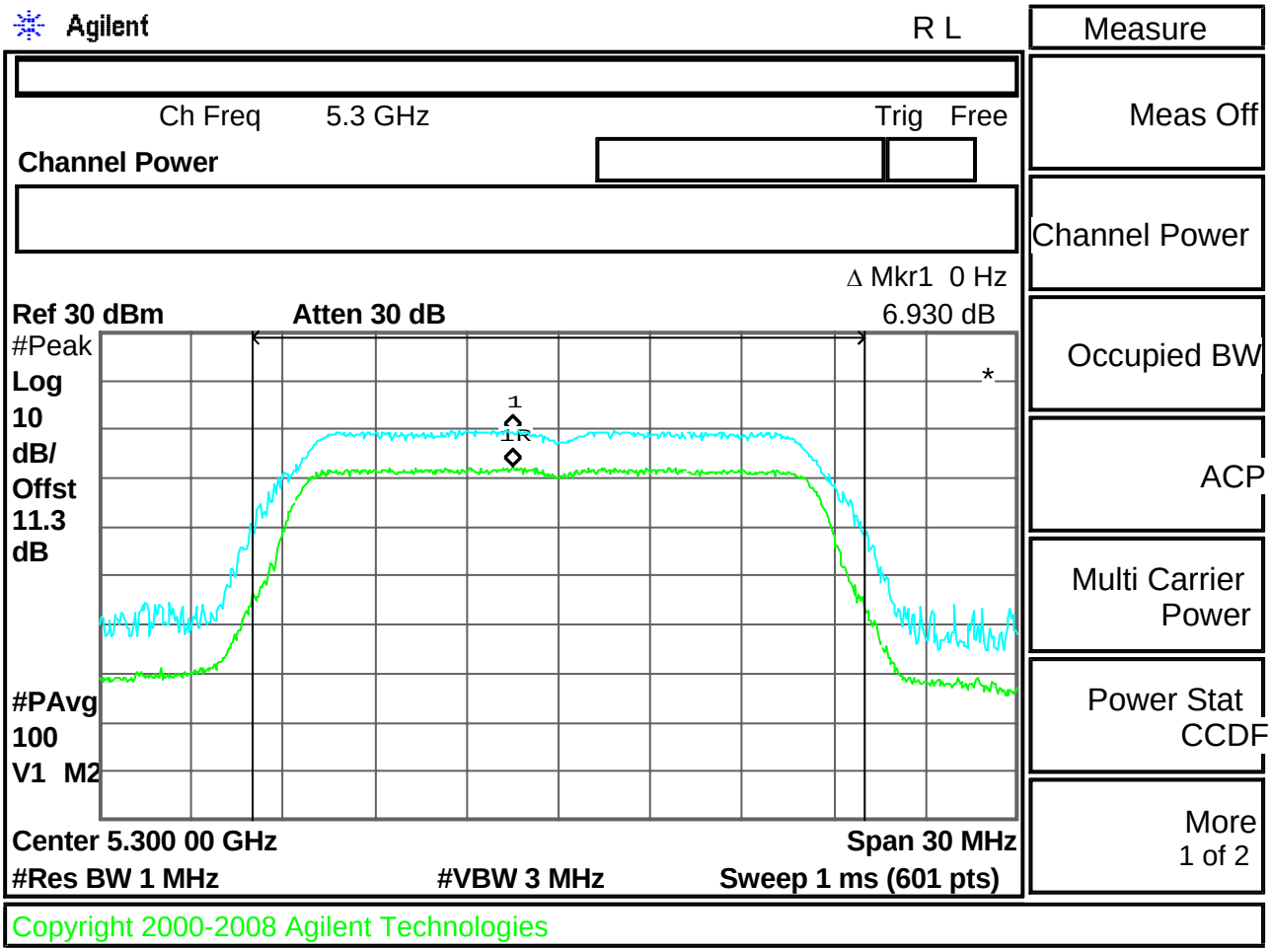
9.4.1.2 5.3GHz

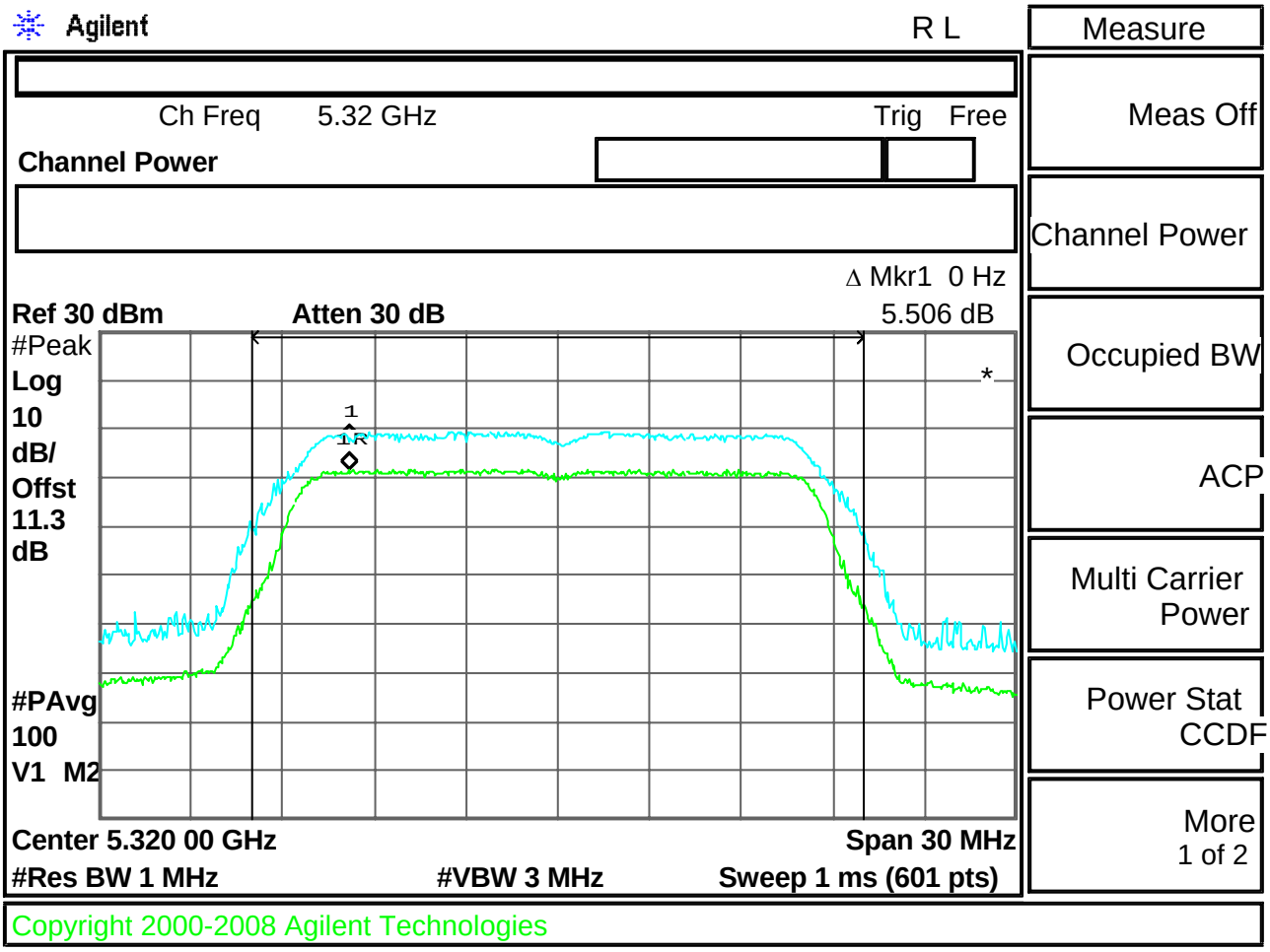
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 7.306 | 13 | Page 133 |
| M | 6.930 | 13 | Page 134 |
| H | 5.506 | 13 | Page 135 |

***Note: Please refer to page 133 to page 135 for chart***


Agilent
R L
Measure
Ch Freq 5.26 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
7.306 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.260 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.3 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
6.930 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.300 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

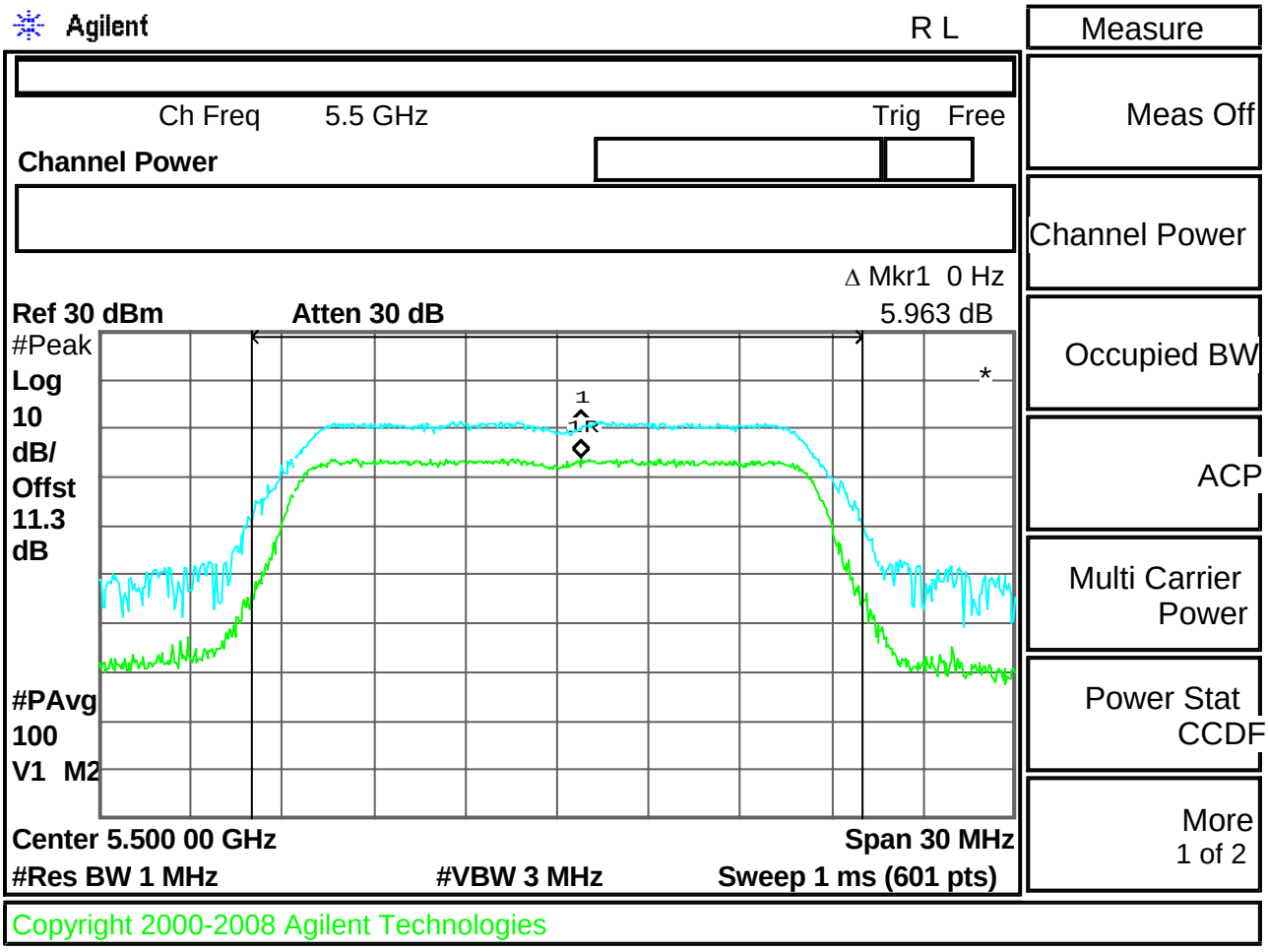

Agilent
R L
Measure
Ch Freq 5.32 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
5.506 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.320 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

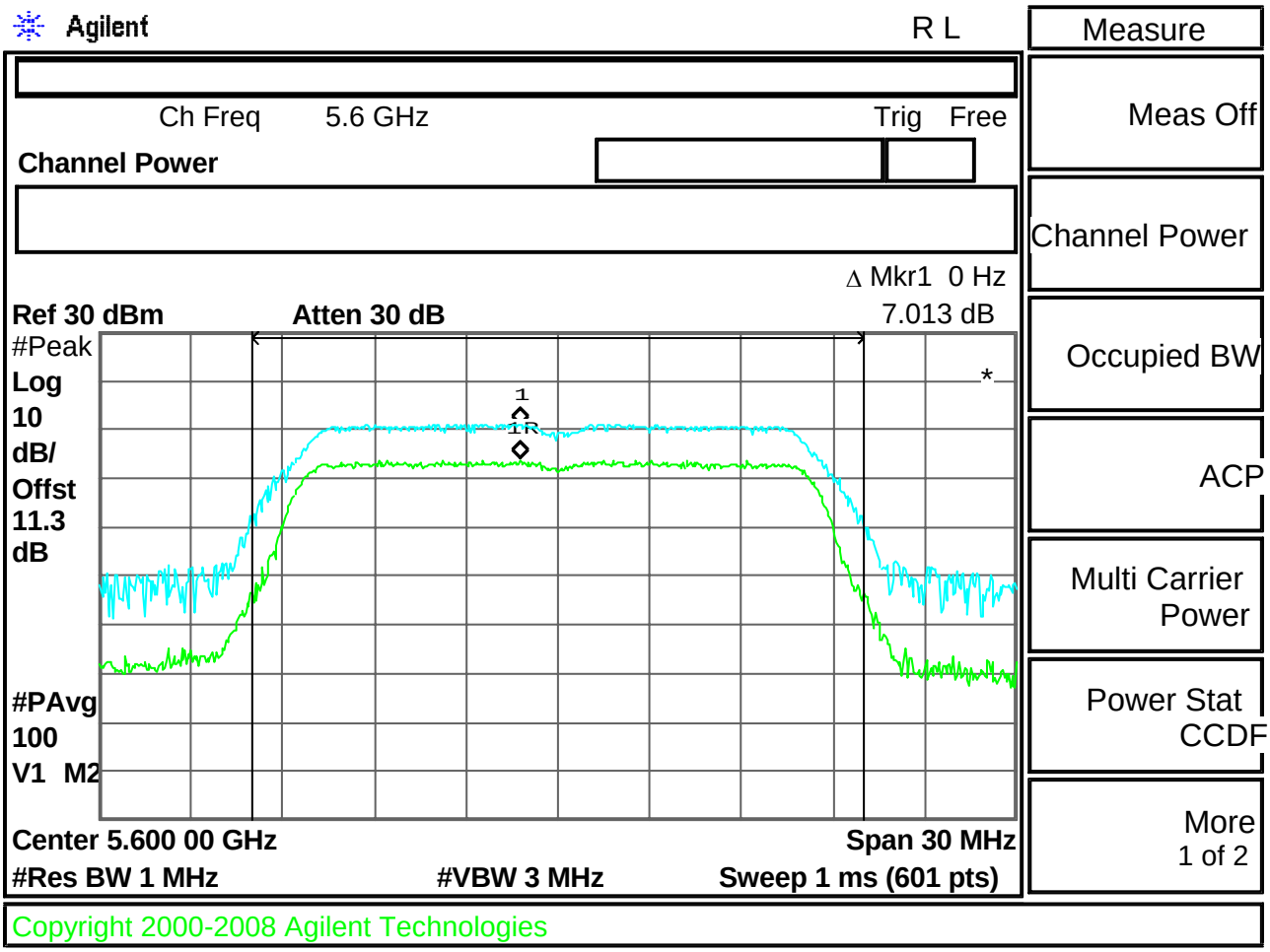
9.4.1.3 5.6GHz

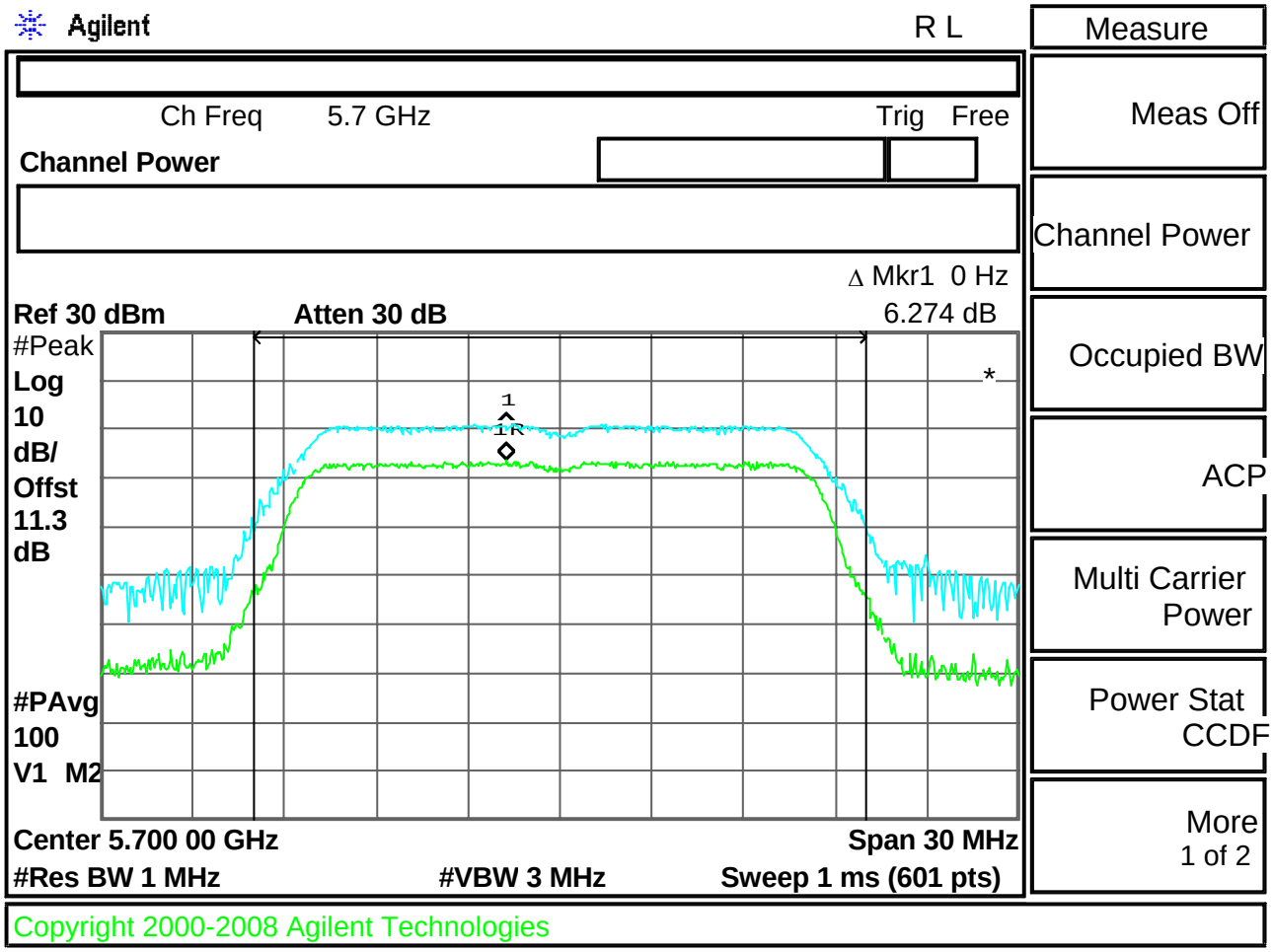
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 5.963 | 13 | Page 137 |
| M | 7.013 | 13 | Page 138 |
| H | 6.274 | 13 | Page 139 |

*Note: Please refer to page 137 to page 139 for chart*


Agilent
R L
Measure
Ch Freq 5.5 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
5.963 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.500 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.6 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Δ Mkr1 0 Hz
7.013 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
#PAvg
100
V1 M2
More
1 of 2
Center 5.600 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Ch Freq 5.7 GHz
Trig Free
Channel Power
Δ Mkr1 0 Hz
6.274 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.700 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Measure
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More
1 of 2
Copyright 2000-2008 Agilent Technologies

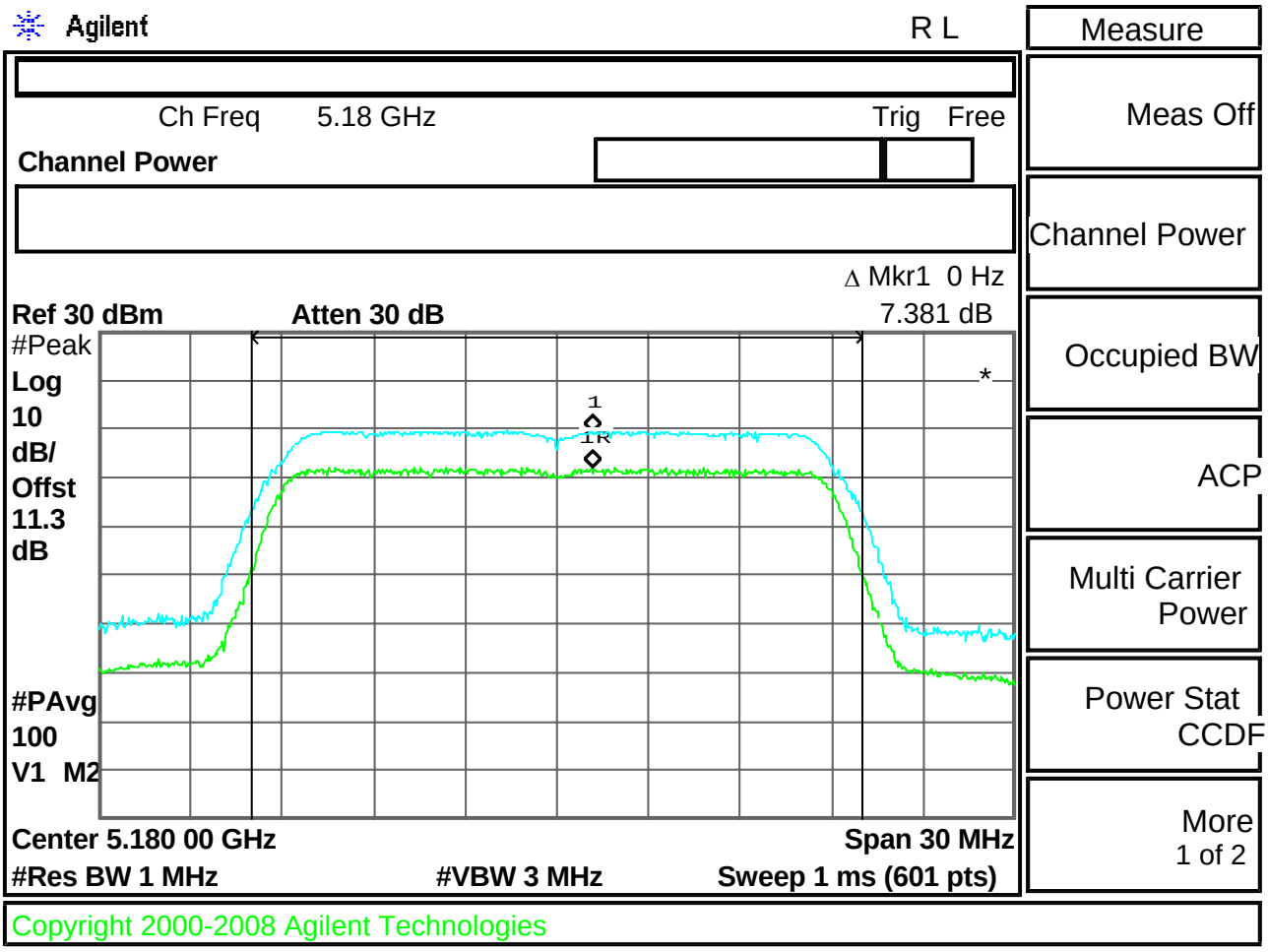
### 9.4.2 IEEE 802.11a , HT20

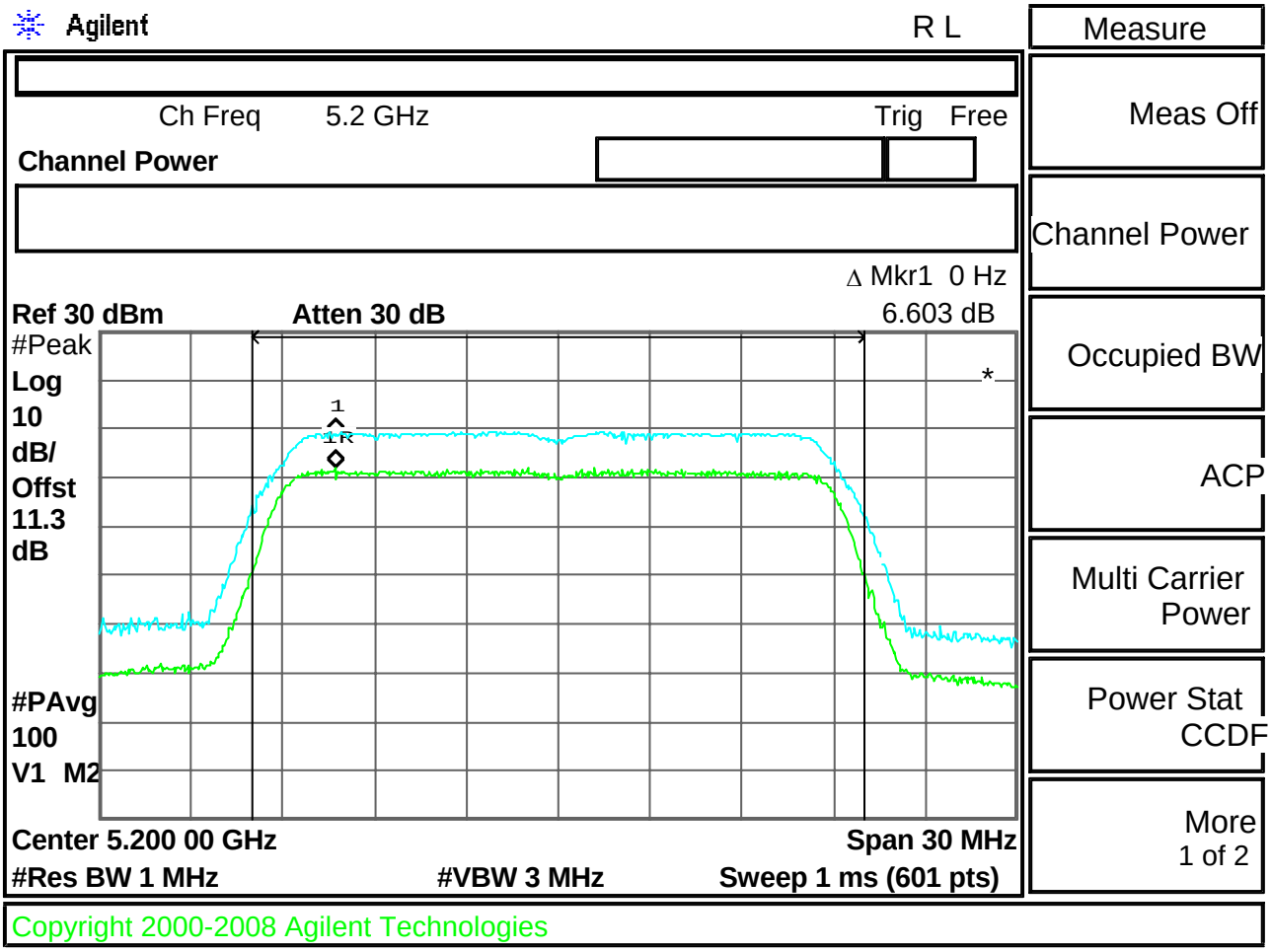
9.4.2 .1 5.2GHz

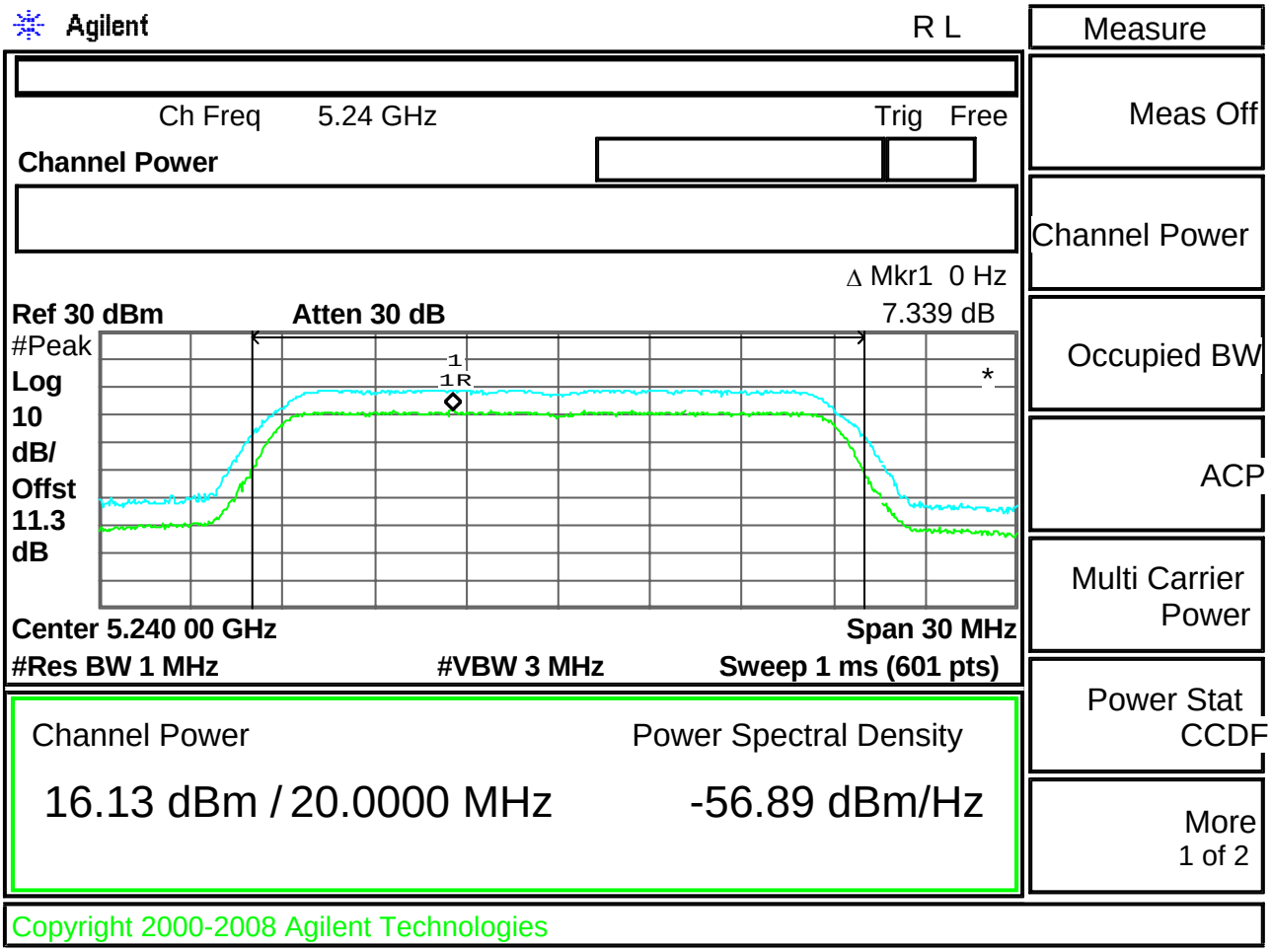
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 7.381 | 13 | Page 141 |
| M | 6.603 | 13 | Page 142 |
| H | 7.339 | 13 | Page 143 |

***Note: Please refer to page 141 to page 143 for chart***


Agilent
R L
Measure
Ch Freq 5.18 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
7.381 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.180 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.2 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
6.603 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.200 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

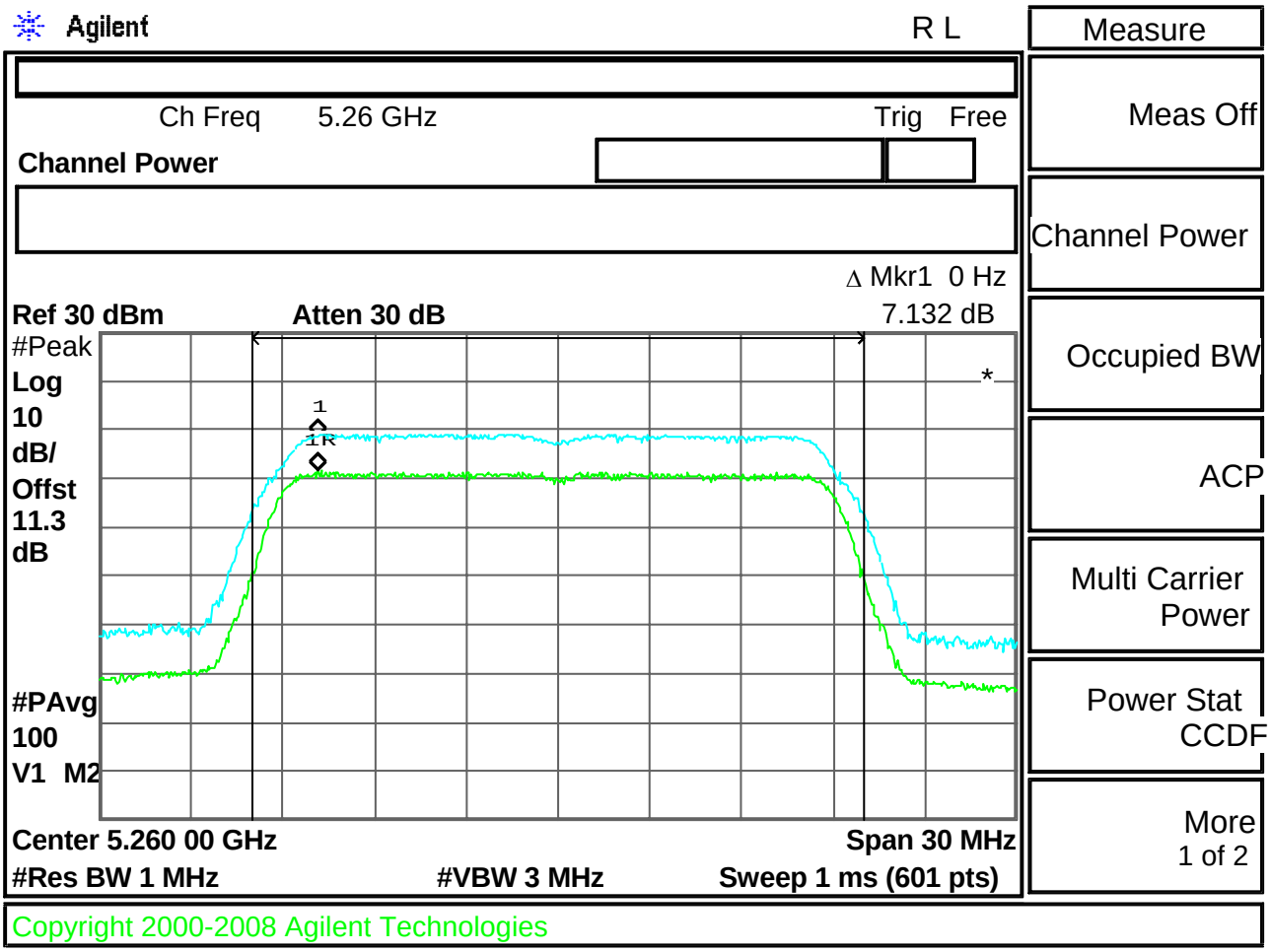

Agilent
R L
Measure
Ch Freq 5.24 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
7.339 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
1
1R
*
Center 5.240 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
16.13 dBm / 20.0000 MHz
Power Spectral Density
-56.89 dBm/Hz
Copyright 2000-2008 Agilent Technologies

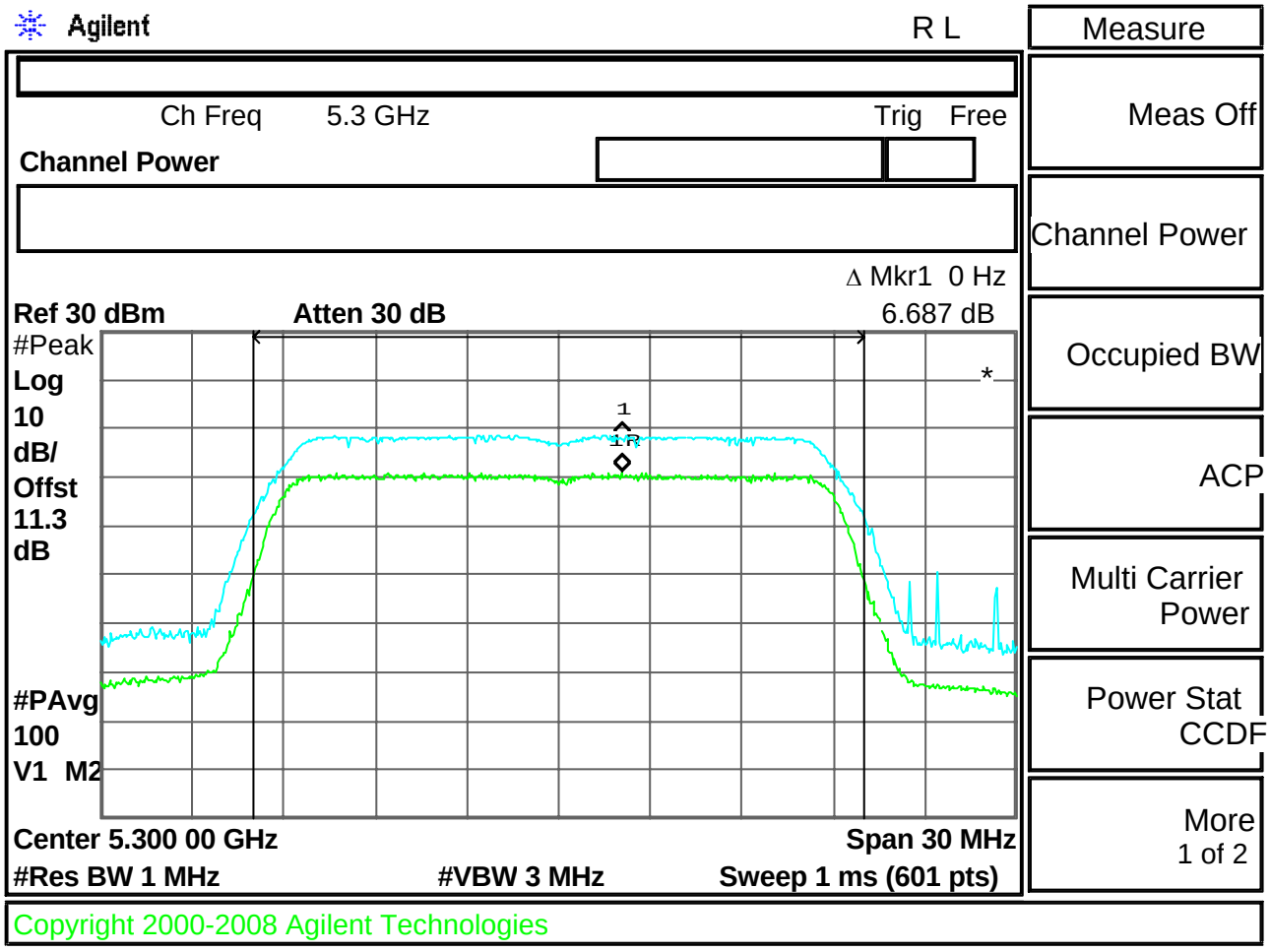
9.4.2.2 5.3GHz

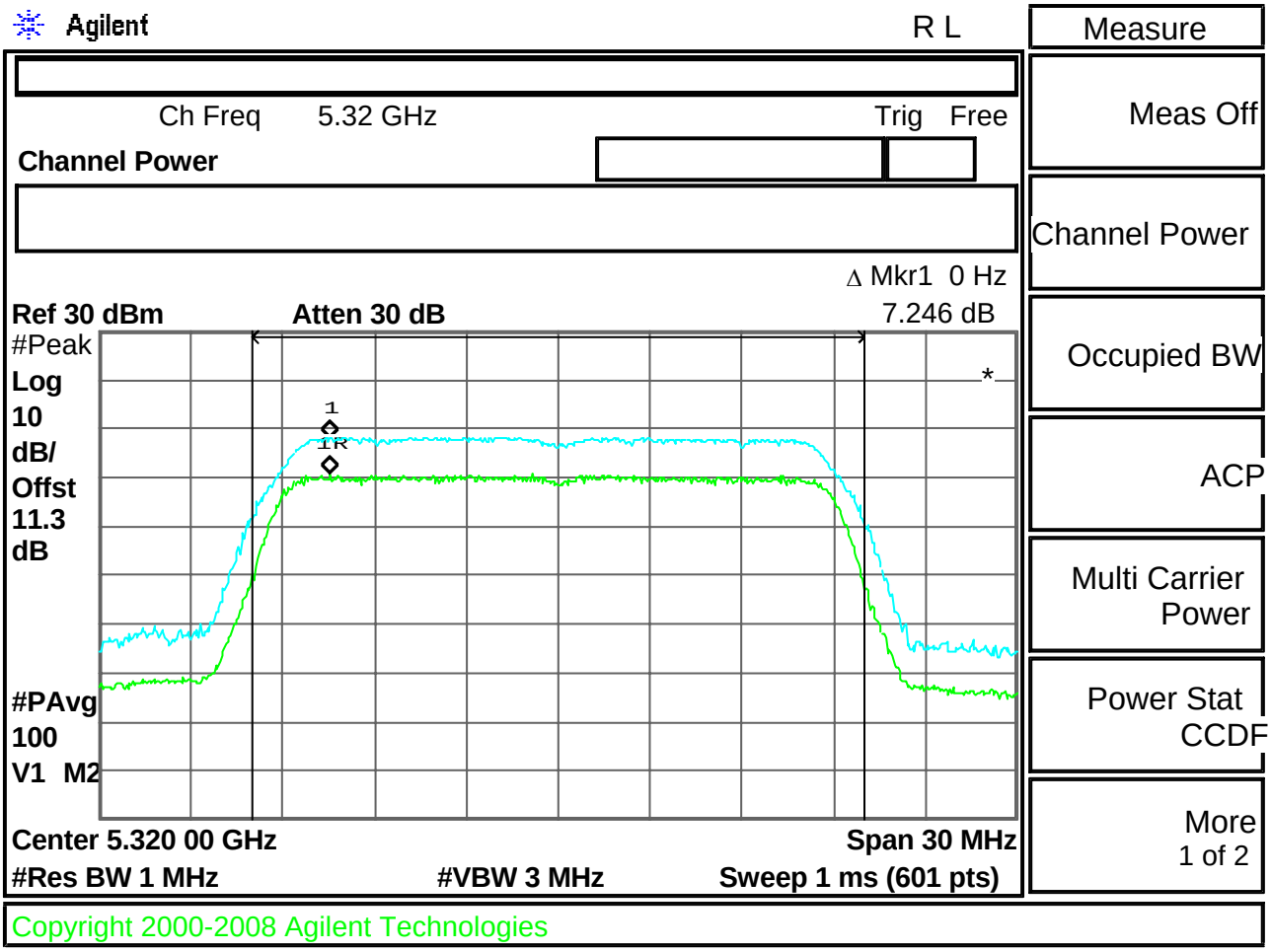
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 7.132 | 13 | Page 145 |
| M | 6.687 | 13 | Page 146 |
| H | 7.246 | 13 | Page 147 |

***Note: Please refer to page 145 to page 147 for chart***


Agilent
R L
Measure
Ch Freq 5.26 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
7.132 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.260 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.3 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
6.687 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.300 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

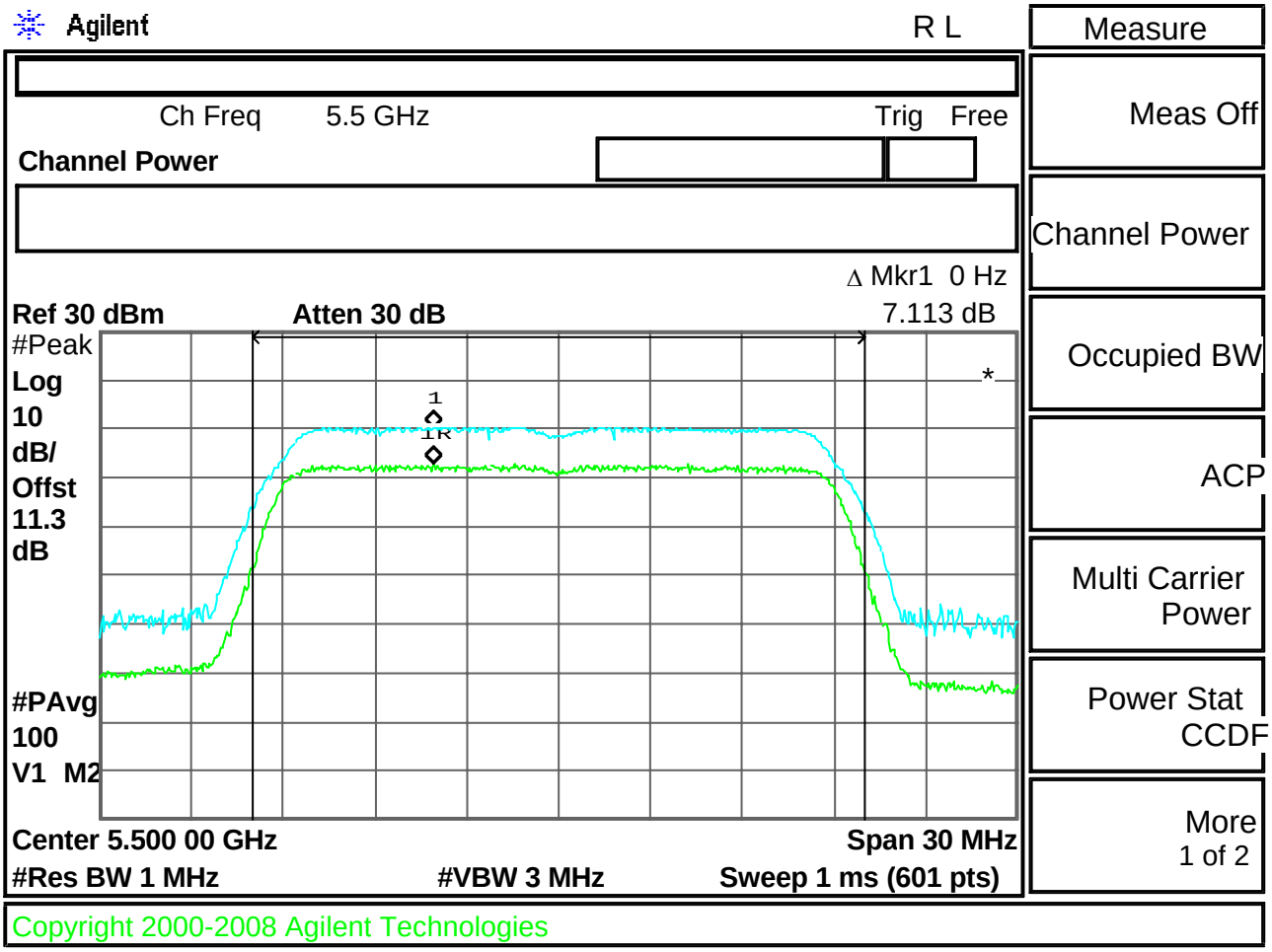

Agilent
R L
Measure
Ch Freq 5.32 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
7.246 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.320 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

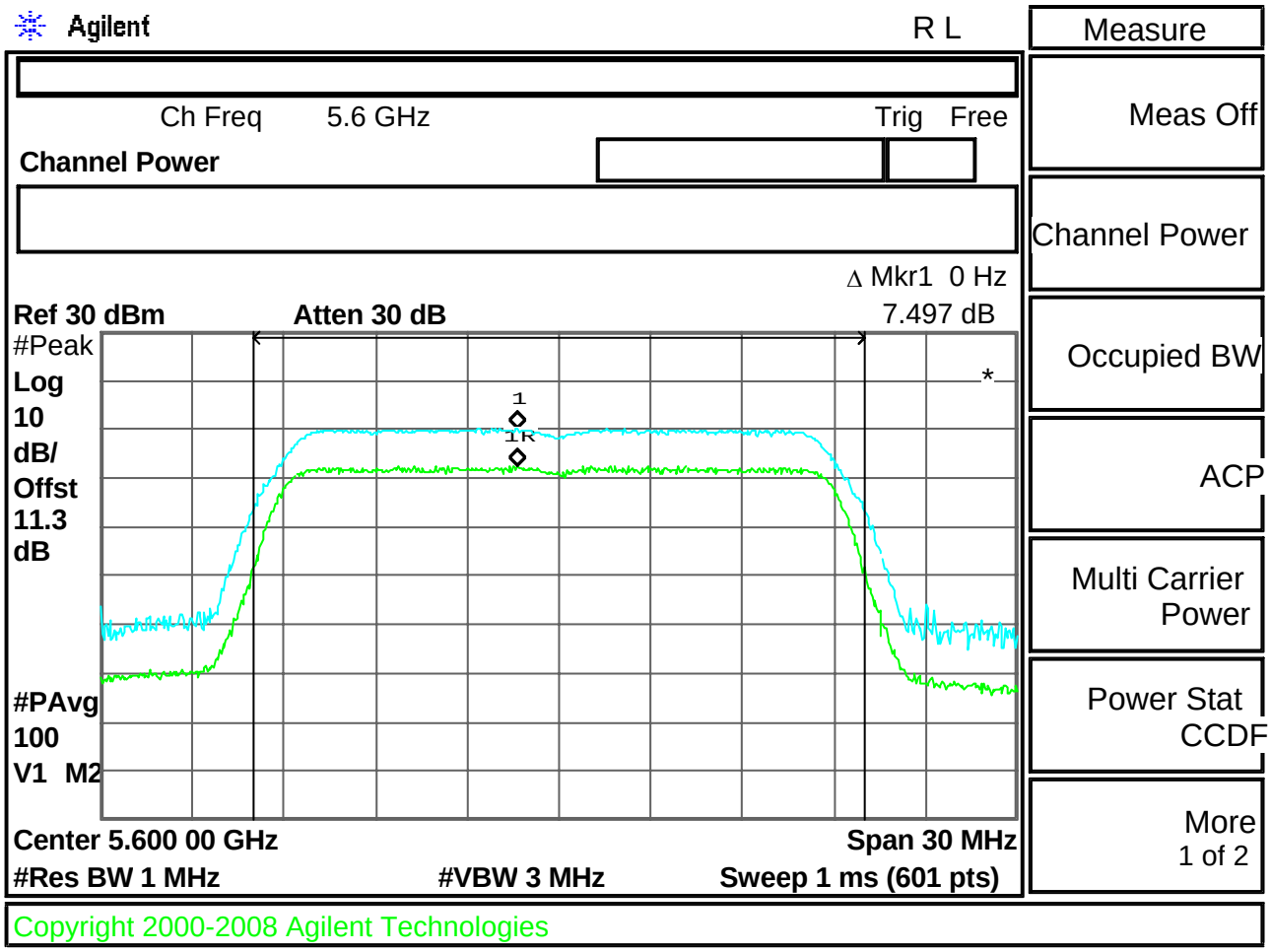
9.4.2.3 5.6GHz

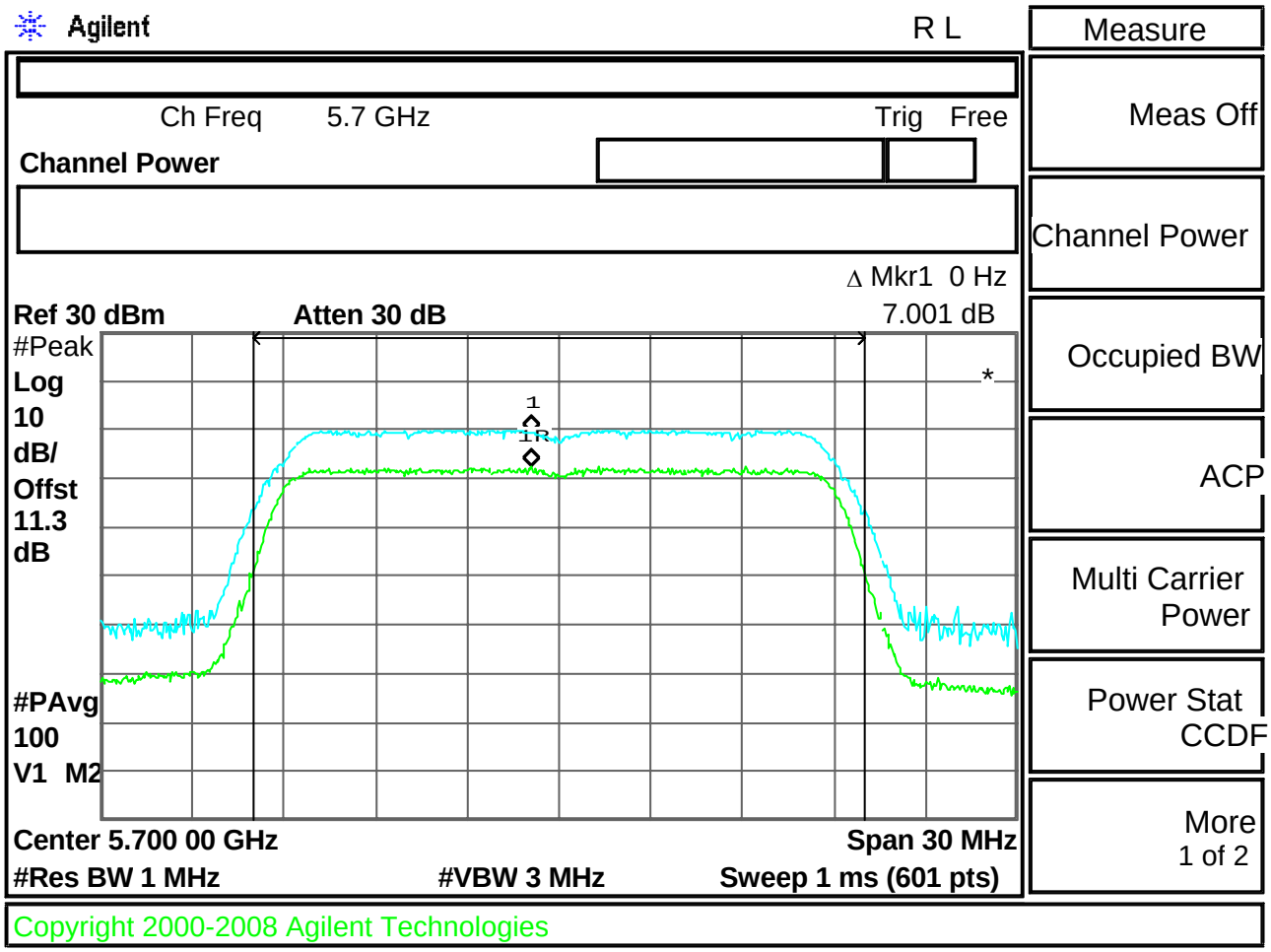
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 7.113 | 13 | Page 149 |
| M | 7.497 | 13 | Page 150 |
| H | 7.001 | 13 | Page 151 |

*Note: Please refer to page 149 to page 151 for chart*


Agilent
R L
Measure
Ch Freq 5.5 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
7.113 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.500 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.6 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Δ Mkr1 0 Hz
Ref 30 dBm
Atten 30 dB
7.497 dB
Occupied BW
#Peak
Log
10
dB/
Offst
11.3
dB
1
1R
ACP
Multi Carrier Power
#PAvg
100
V1 M2
Power Stat CCDF
Center 5.600 00 GHz
Span 30 MHz
More 1 of 2
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.7 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
Ref 30 dBm
Atten 30 dB
7.001 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.700 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

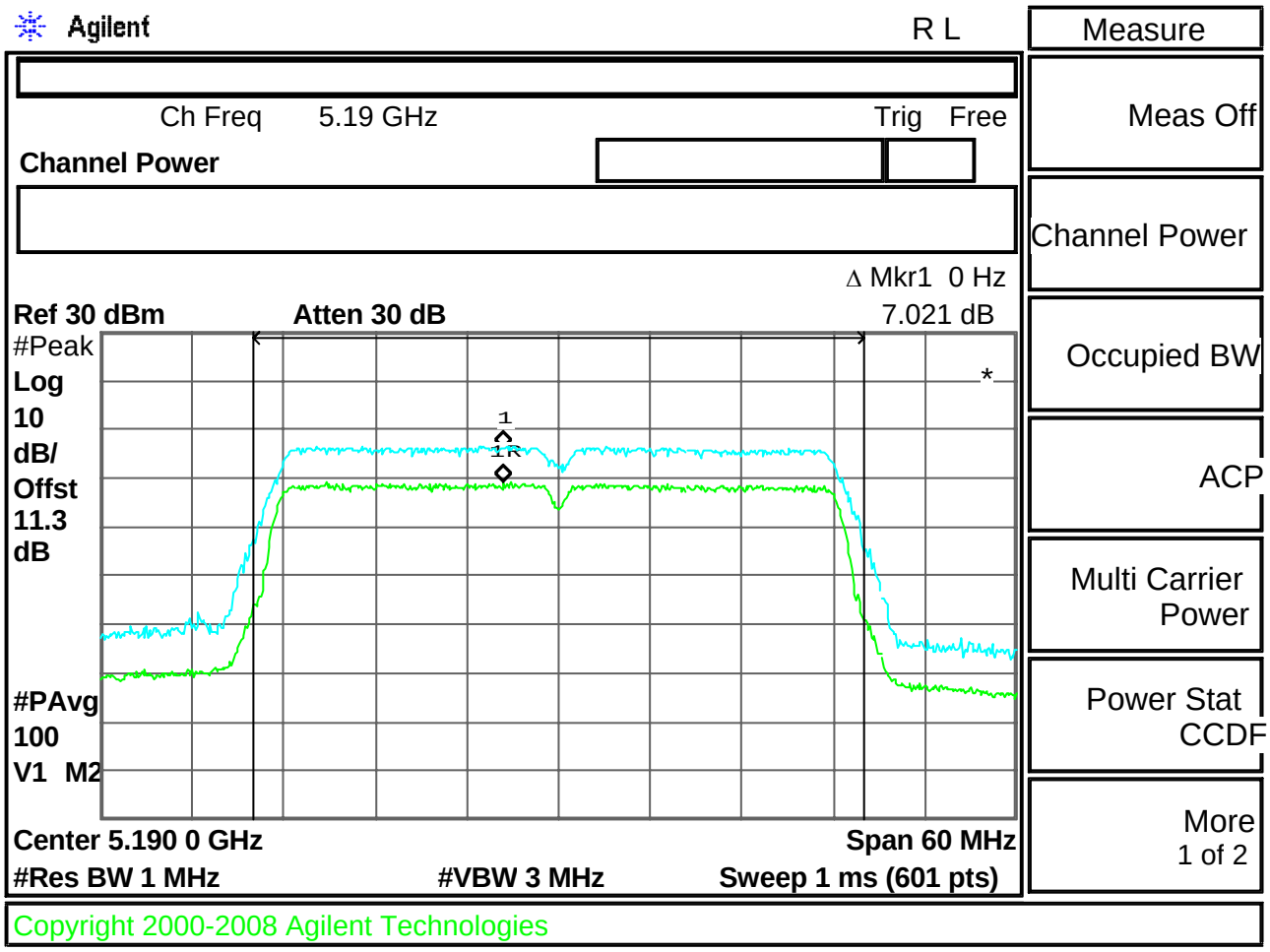
### 9.4.3 IEEE 802.11a , HT40

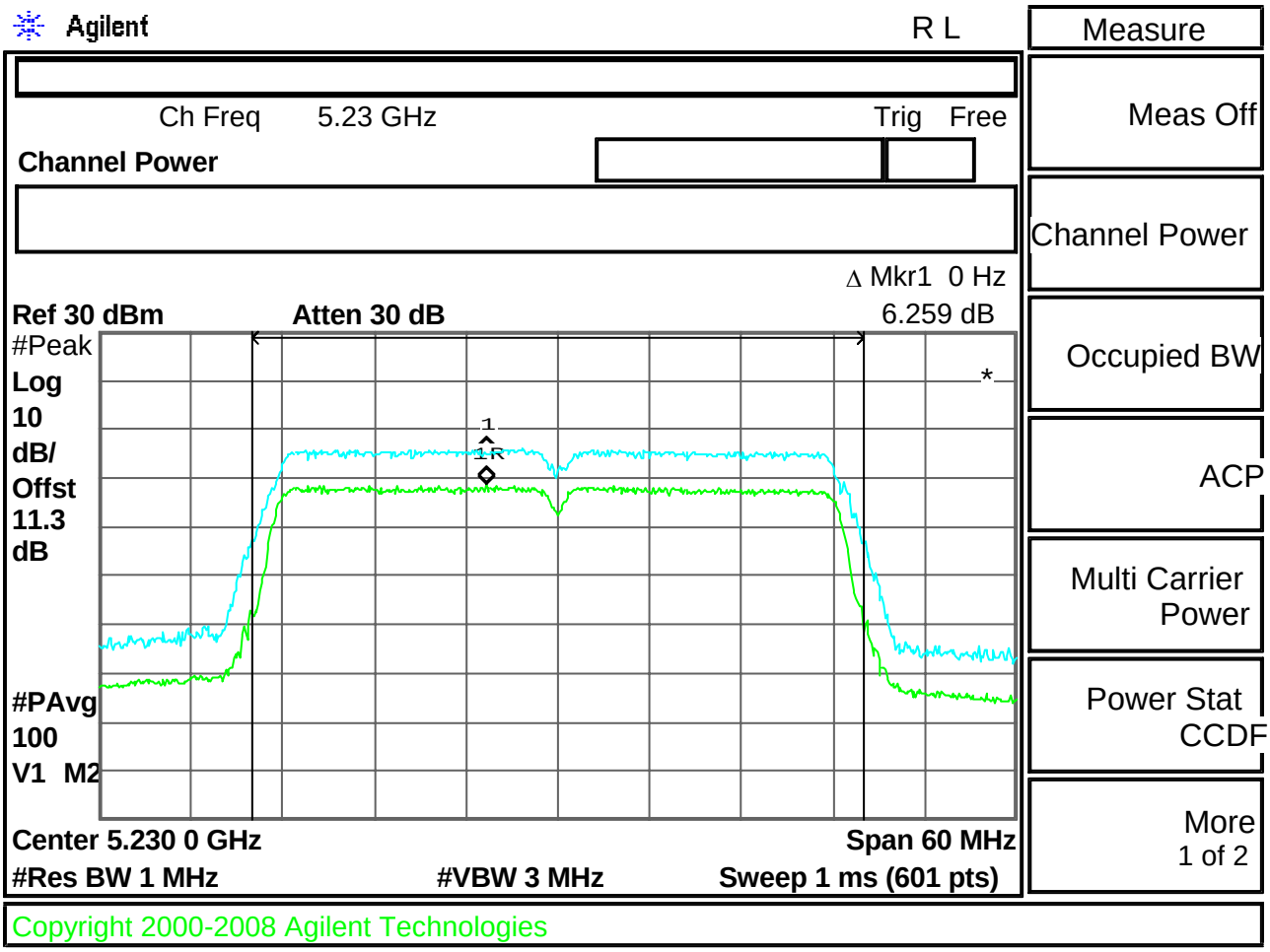
9.4.3.1 5.2GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 7.021 | 13 | Page 153 |
| H | 6.259 | 13 | Page 154 |

***Note: Please refer to page 153 to page 154 for chart***


Agilent
R L
Measure
Ch Freq 5.19 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Δ Mkr1 0 Hz
Ref 30 dBm
Atten 30 dB
7.021 dB
#Peak
Log
10
dB/
Offst
11.3
dB
1
1R
*
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
#PAvg
100
V1 M2
Center 5.190 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
More
1 of 2
Copyright 2000-2008 Agilent Technologies

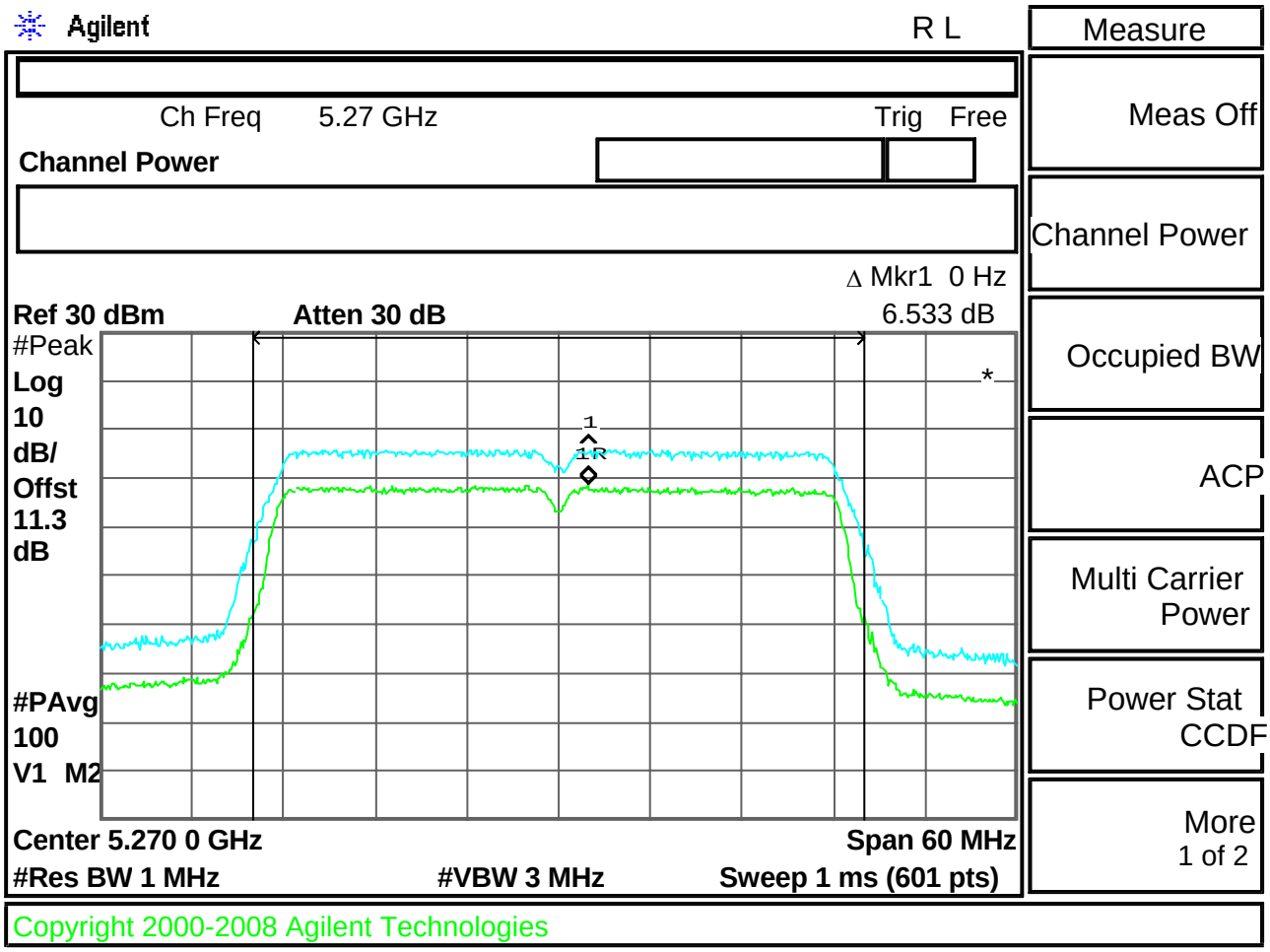

Agilent
R L
Measure
Ch Freq 5.23 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Δ Mkr1 0 Hz
6.259 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
Occupied BW
ACP
Multi Carrier Power
#PAvg
100
V1 M2
Power Stat CCDF
More
1 of 2
Center 5.230 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

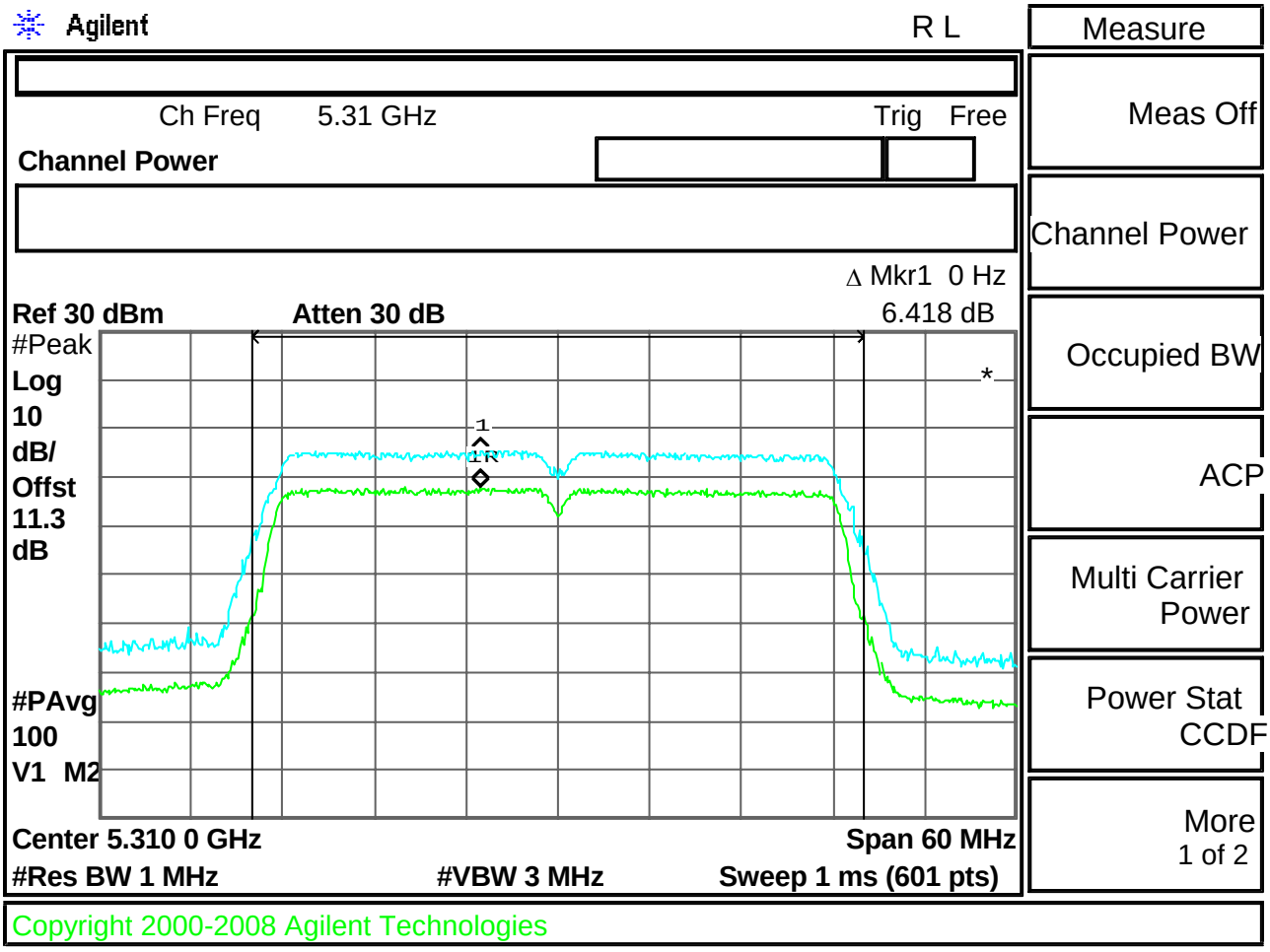
9.4.3.2 5.3GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 6.533 | 13 | Page 156 |
| H | 6.418 | 13 | Page 157 |

***Note: Please refer to page 156 to page 157 for chart***


Agilent
R L
Measure
Ch Freq 5.27 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
6.533 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.270 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

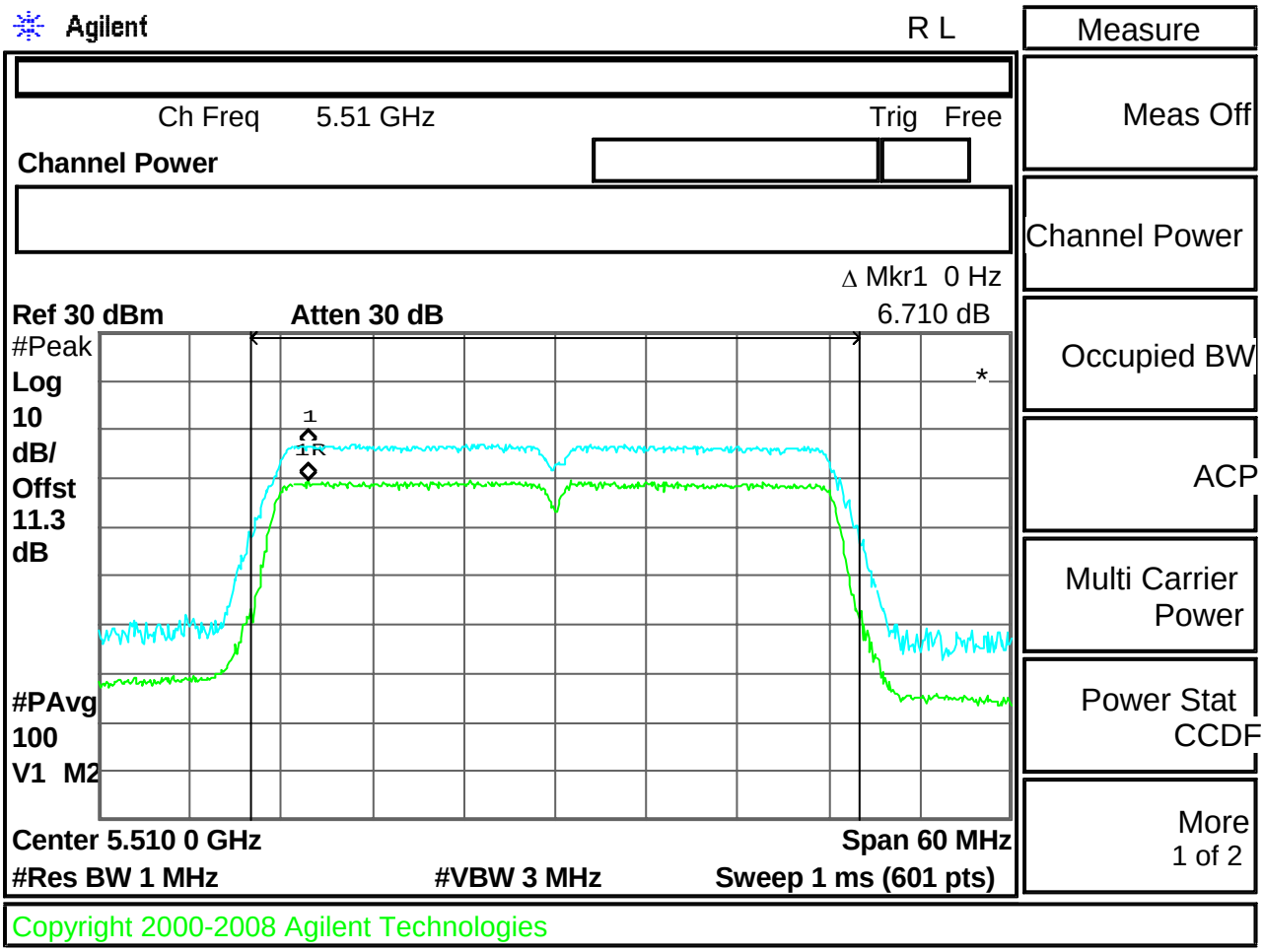

Agilent
R L
Measure
Ch Freq 5.31 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
6.418 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.310 0 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

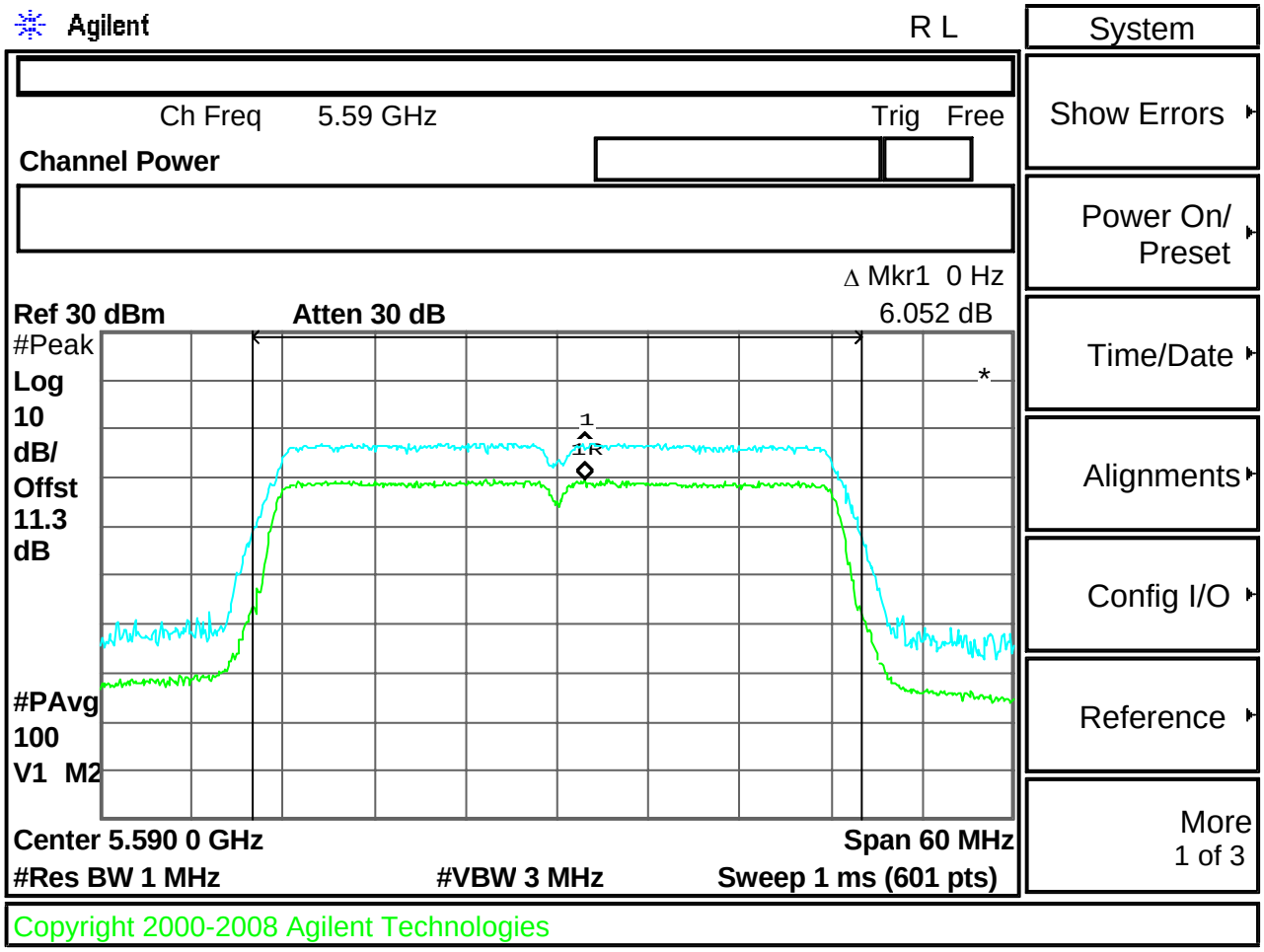
9.4.3.3 5.6GHz

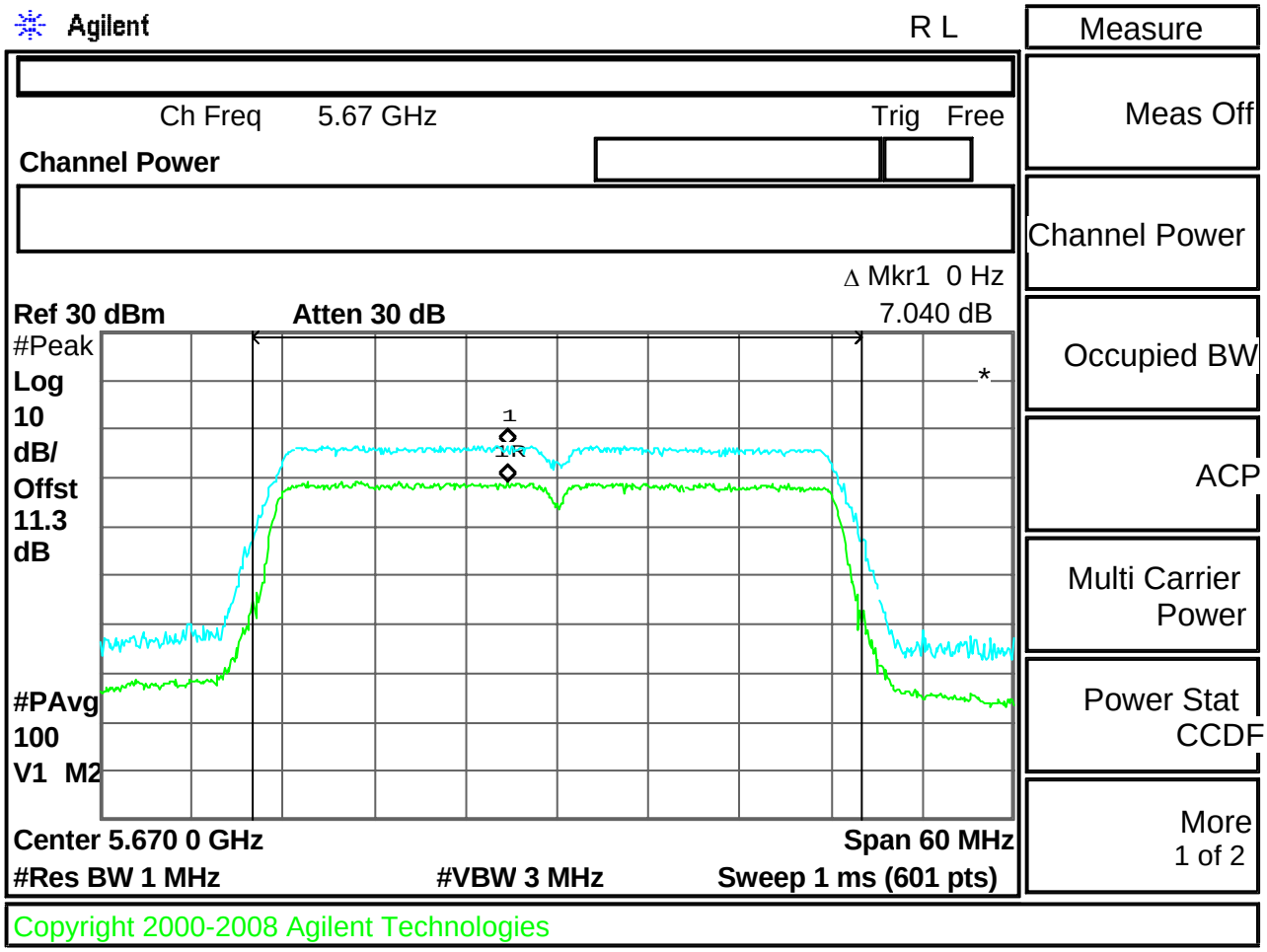
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Peak Excursion (dB) | FCC Limit (dB) | Chart |
|---|---|---|---|
| L | 6.710 | 13 | Page 159 |
| M | 6.052 | 13 | Page 160 |
| H | 7.040 | 13 | Page 161 |

*Note: Please refer to page 159 to page 161 for chart*


Agilent
R L
Measure
Ch Freq 5.51 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
6.710 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.510 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Ch Freq 5.59 GHz
Trig Free
Channel Power
Δ Mkr1 0 Hz
Ref 30 dBm
Atten 30 dB
6.052 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.590 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
System
Show Errors
Power On/ Preset
Time/Date
Alignments
Config I/O
Reference
More
1 of 3
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Measure
Ch Freq 5.67 GHz
Trig Free
Channel Power
Meas Off
Channel Power
Occupied BW
ACP
Multi Carrier Power
Power Stat CCDF
More 1 of 2
Δ Mkr1 0 Hz
7.040 dB
Ref 30 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
11.3
dB
#PAvg
100
V1 M2
Center 5.670 0 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2008 Agilent Technologies

# 10 SPURIOUS EMISSION - RF CONDUCTED MEASUREMENT

## 10.1 Standard Applicable

According to 15.407 (b)(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 EIRP of –27 dBm /MHz.

According to 15.407 (b)(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 EIRP of –27 dBm /MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm / MHz in the 5.15-5.25 GHz band.

According to 15.407 (b)(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 EIRP of –27 dBm /MHz.

According to 15.407 (b)(5), the above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

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

According to 15.407 (b)(7), the provisions of Section 15.205 of the part apply to intentional radiators operating under this section.

According to 15.407 (b)(8), when measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

## 10.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 1MHz with a convenient frequency span including 1MHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

## 10.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | 09/18/2012 |

## 10.4 Measurement Data-Emission

### 10.4.1 IEEE 802.11a

10.4.1.1 5.2GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 36 | 5180 | Page 166, Page 167 |
| 40 | 5200 | Page 168, Page 169 |
| 48 | 5240 | Page 170, Page 171 |

Frequency Band: 5150 MHz ~ 5250 MHz

All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1. Please refer to page 166 to page 171 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

10.4.1.2 5.3GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 52 | 5260 | Page 172, Page 173 |
| 60 | 5300 | Page 174, Page 175 |
| 64 | 5320 | Page 176, Page 177 |

Frequency Band: 5250 MHz ~ 5350 MHz

All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1. Please refer to page 172 to page 177 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

10.4.1.3 5.6GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 100 | 5500 | Page 178, Page 179 |
| 120 | 5600 | Page 180, Page 181 |
| 140 | 5700 | Page 182, Page 183 |

Frequency Band: 5470 MHz ~ 5725 MHz

All out-of –band conducted emissions were more than EIRP of –27 dBm /MHz.

*Note: 1.Please refer to page 178 to page 183 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

## 10.4.2 IEEE 802.11an, HT20

### 10.4.2.1 5.2GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 36 | 5180 | Page 184, Page 185 |
| 40 | 5200 | Page 186, Page 187 |
| 48 | 5240 | Page 188, Page 189 |

Frequency Band: 5150 MHz ~ 5250 MHz

All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1. Please refer to page 184 to page 189 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

### 10.4.2.2 5.3GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 52 | 5260 | Page 190, Page 191 |
| 60 | 5300 | Page 192, Page 193 |
| 64 | 5320 | Page 194, Page 195 |

Frequency Band: 5250 MHz ~ 5350 MHz

All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1. Please refer to page 190 to page 195 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

### 10.4.2.3 5.6GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 100 | 5500 | Page 196, Page 197 |
| 120 | 5600 | Page 198, Page 199 |
| 140 | 5700 | Page 200, Page 201 |

Frequency Band: 5470 MHz ~ 5725 MHz

All out-of –band conducted emissions were more than EIRP of –27 dBm /MHz.

*Note: 1.Please refer to page 196 to page 201 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

### 10.4.3 IEEE 802.11an, HT40

10.4.3.1 5.2GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 38 | 5190 | Page 202, Page 203 |
| 46 | 5230 | Page 204, Page 205 |

Frequency Band: 5150 MHz ~ 5250 MHz
All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1.Please refer to page 202 to page 205 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

10.4.3.2 5.3GHz

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 54 | 5270 | Page 206, Page 207 |
| 62 | 5310 | Page 208, Page 209 |

Frequency Band: 5250 MHz ~ 5350 MHz
All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1.Please refer to page 206 to page 209 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

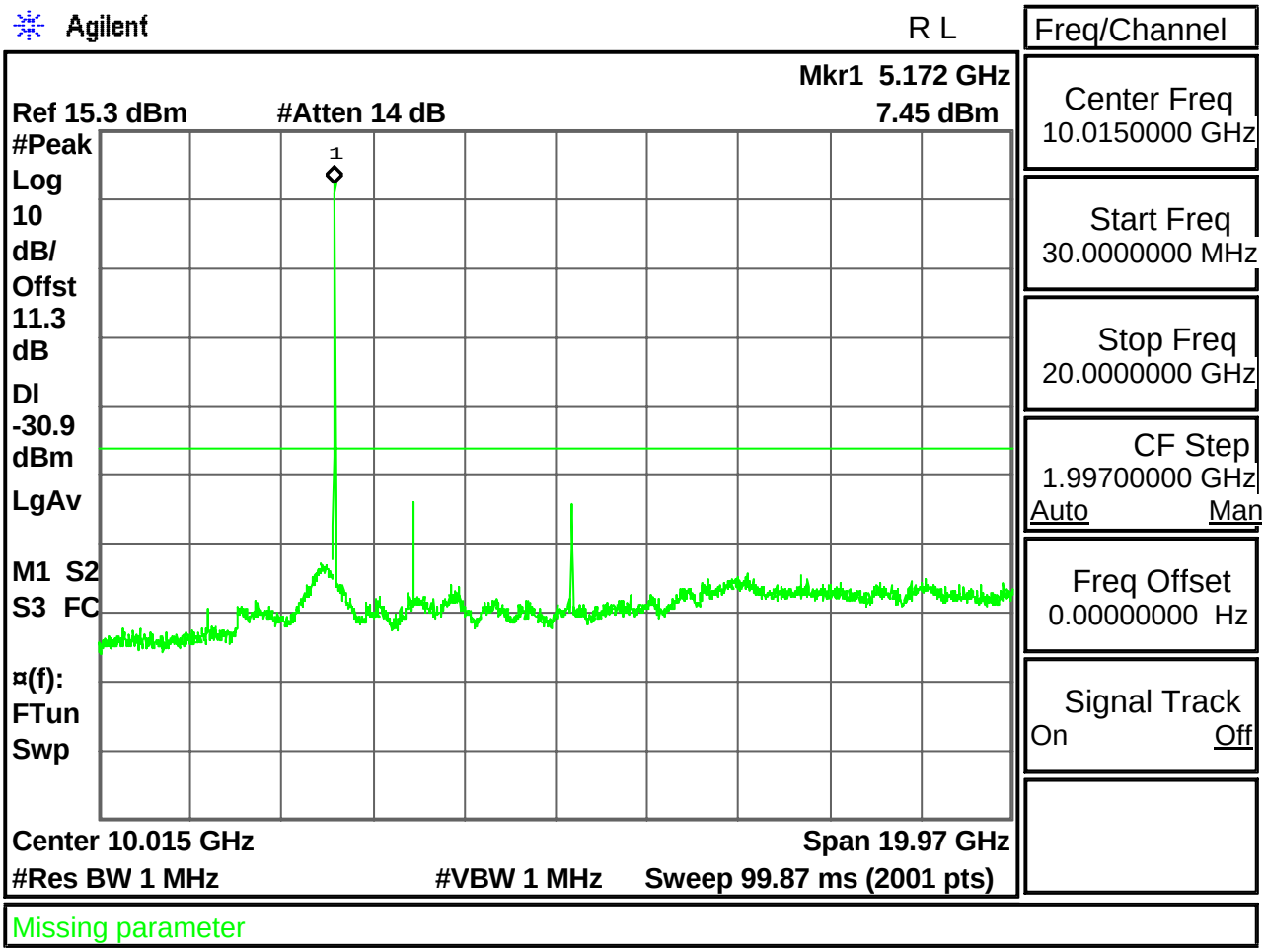
10.4.3.3 5.6GHz

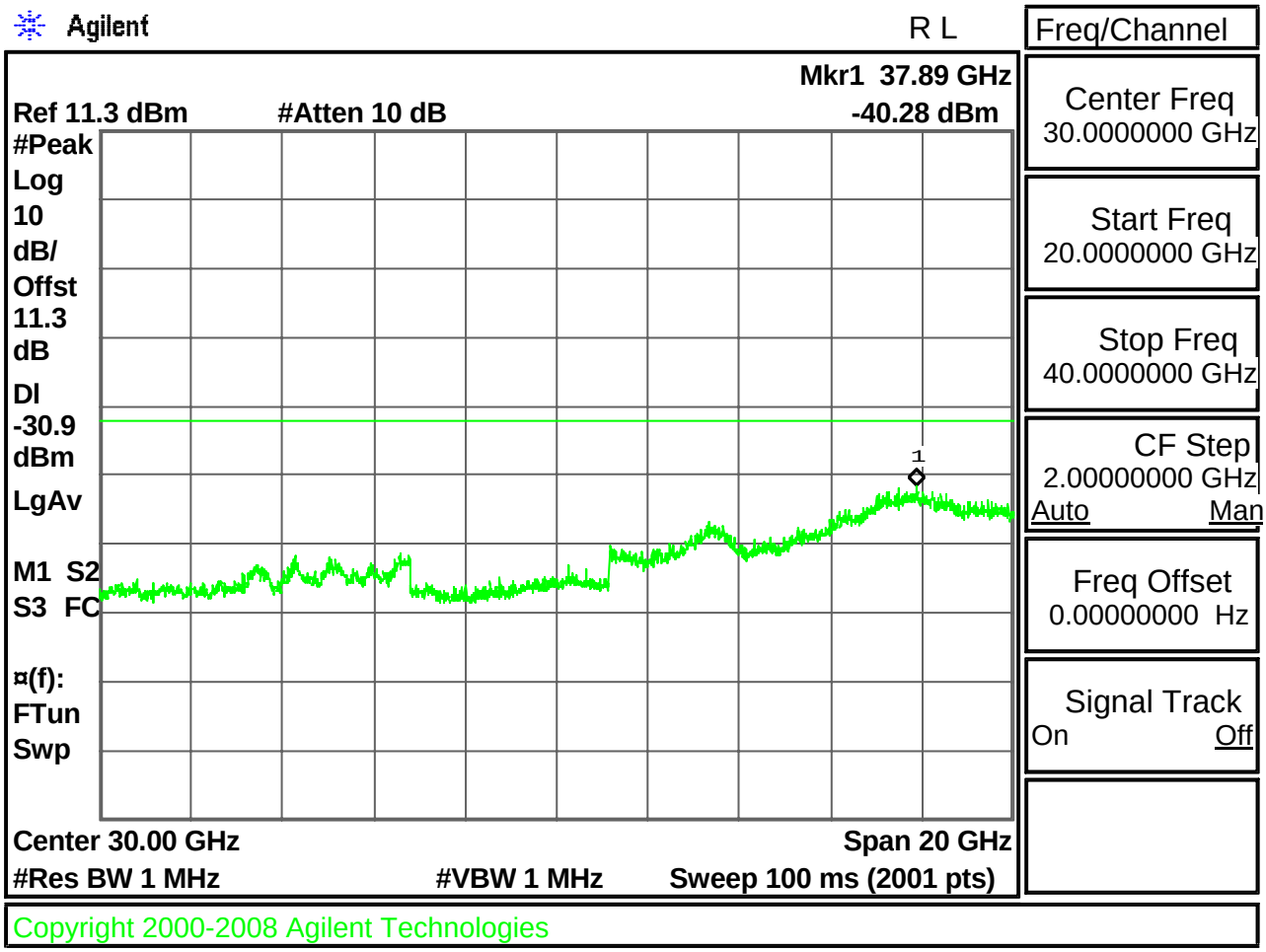
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

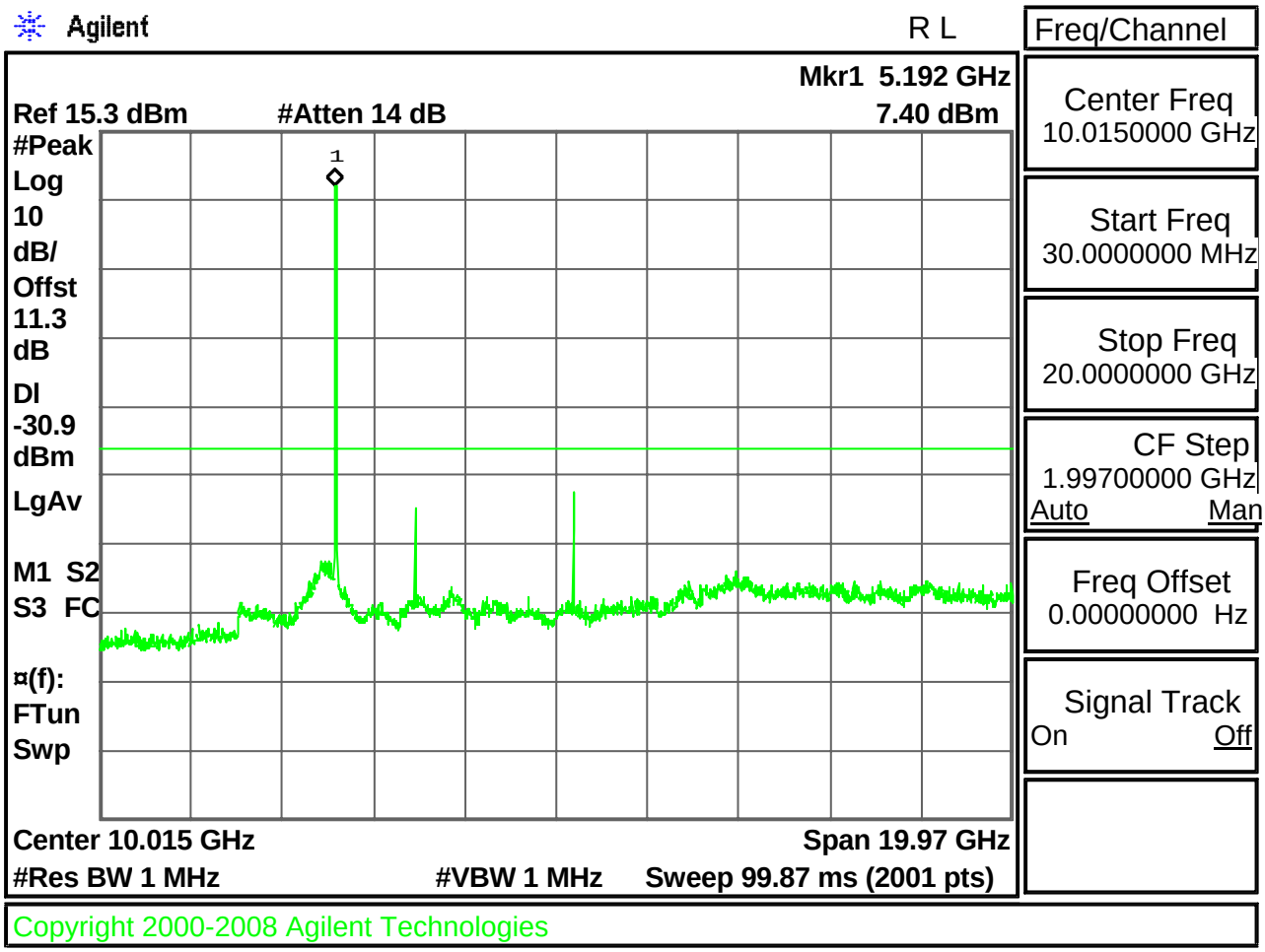
| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 102 | 5510 | Page 210, Page 211 |
| 118 | 5590 | Page 212, Page 213 |
| 134 | 5670 | Page 214, Page 215 |

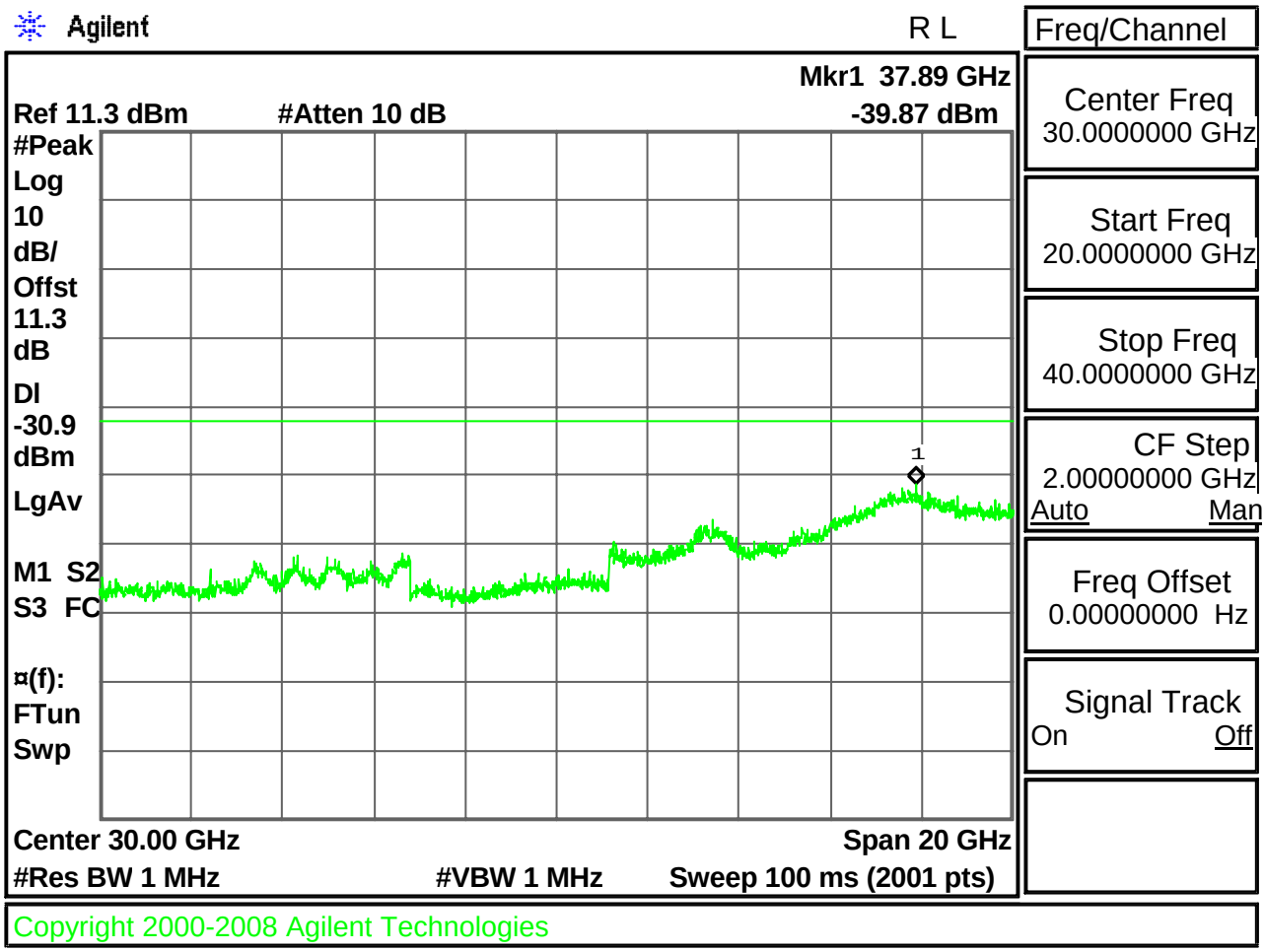
Frequency Band: 5470 MHz ~ 5725 MHz
All out-of –band conducted emissions were more than EIRP of –27 dBm /MHz.

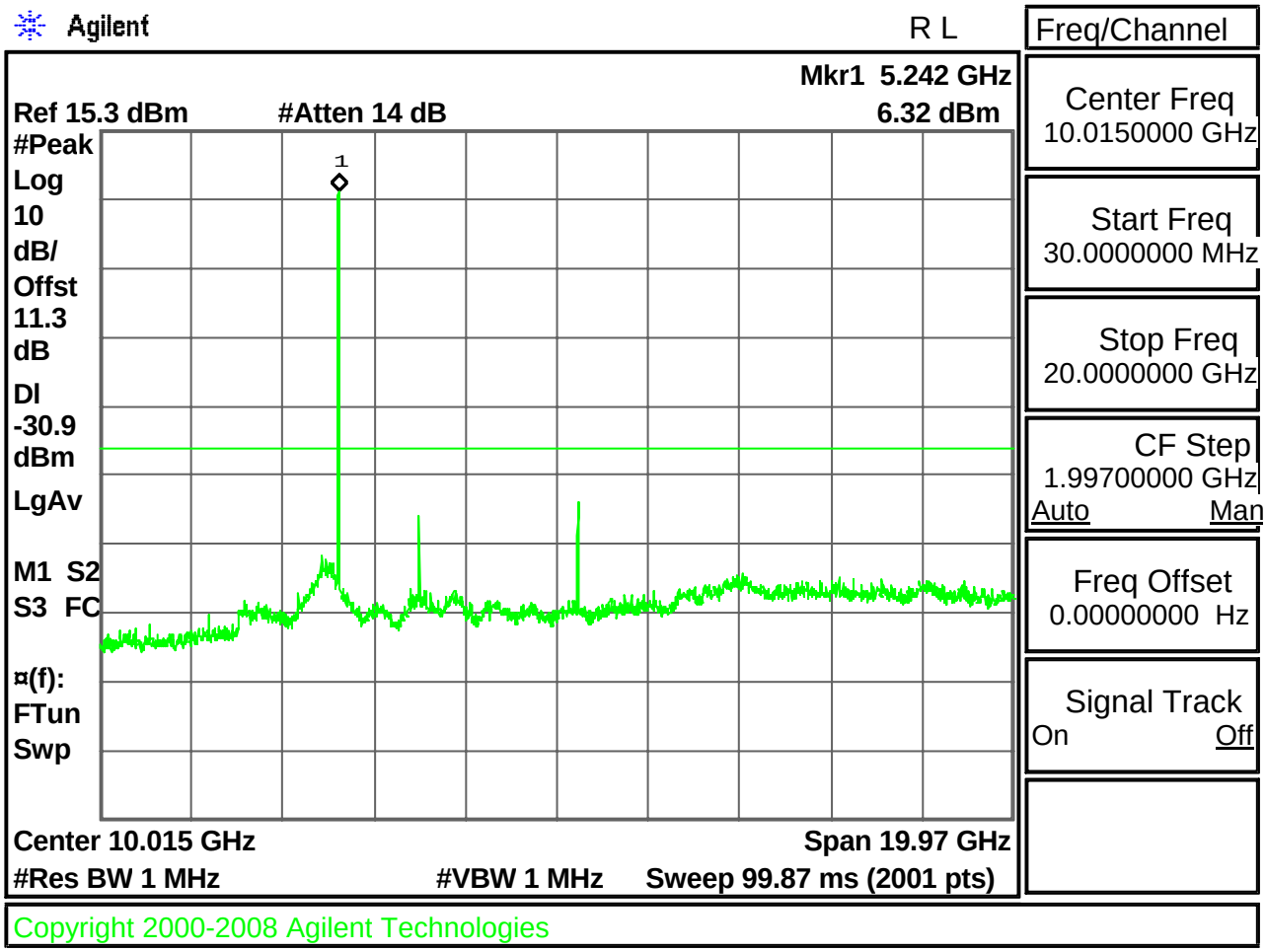
*Note: 1.Please refer to page 210 to page 215 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

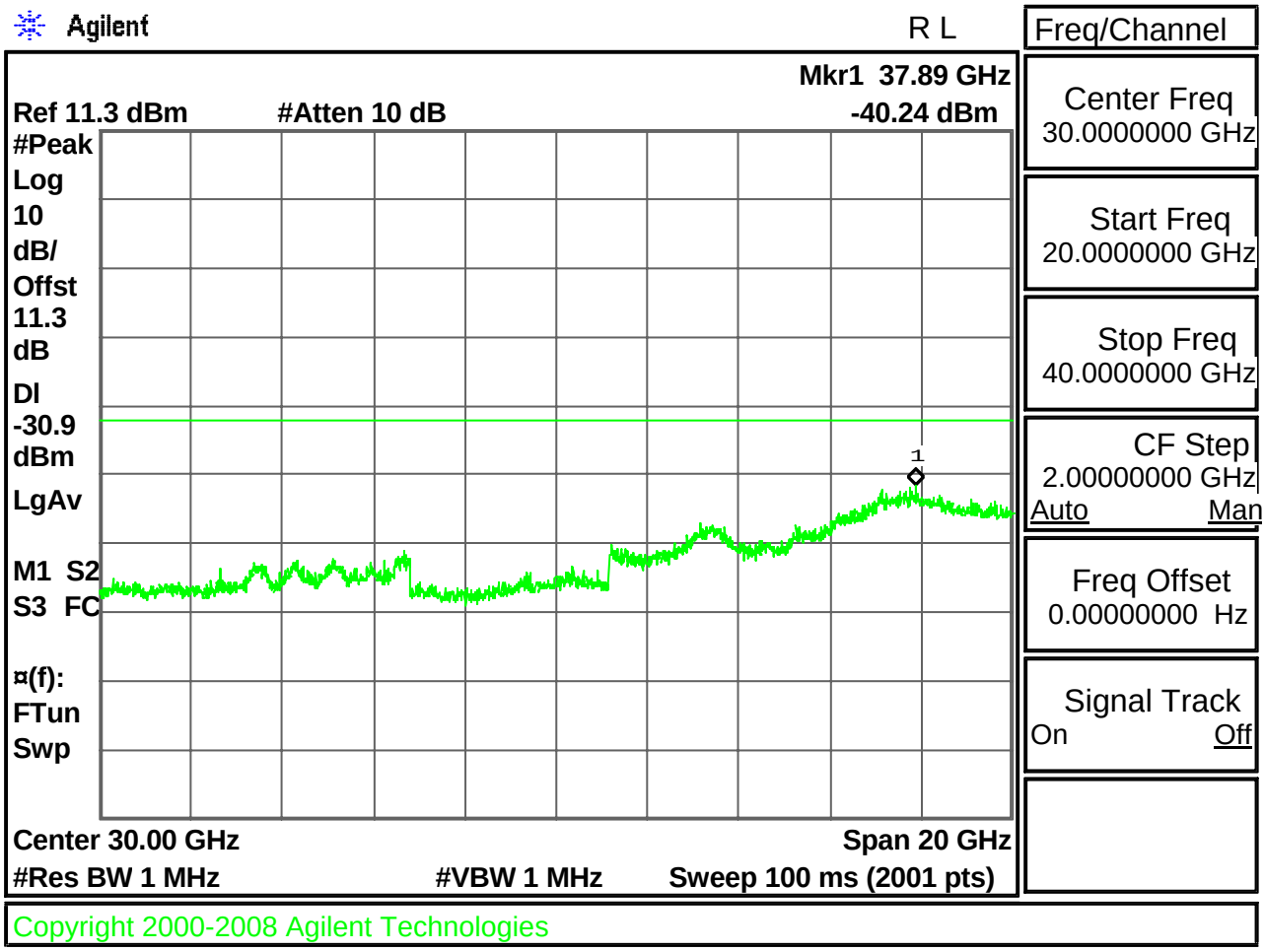

Agilent
R L
Freq/Channel
Mkr1 5.172 GHz
Ref 15.3 dBm
#Atten 14 dB
7.45 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
¤(f):
FTun
Swp
1
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Missing parameter

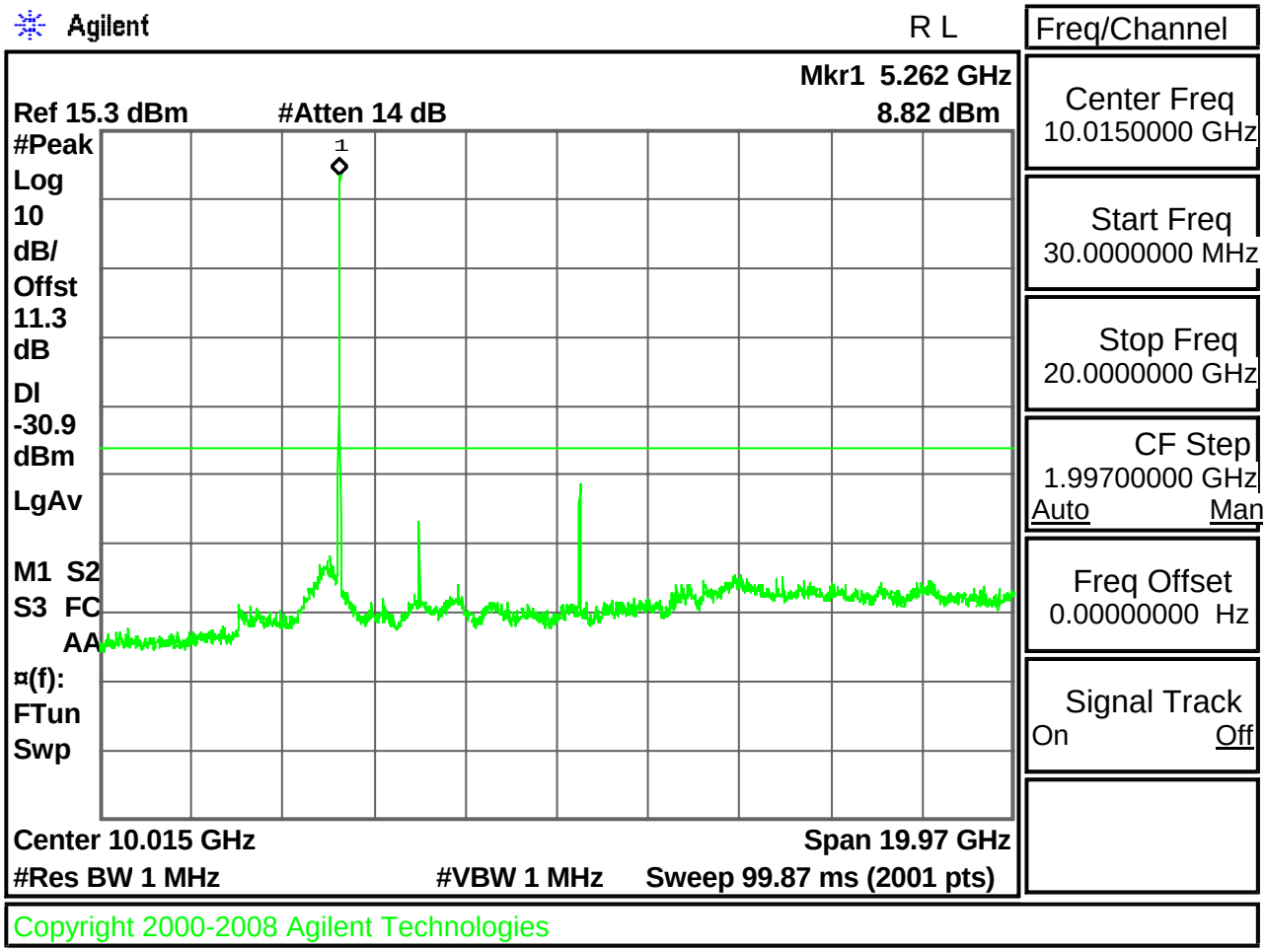

Agilent
R L
Freq/Channel
Mkr1 37.89 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.28 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

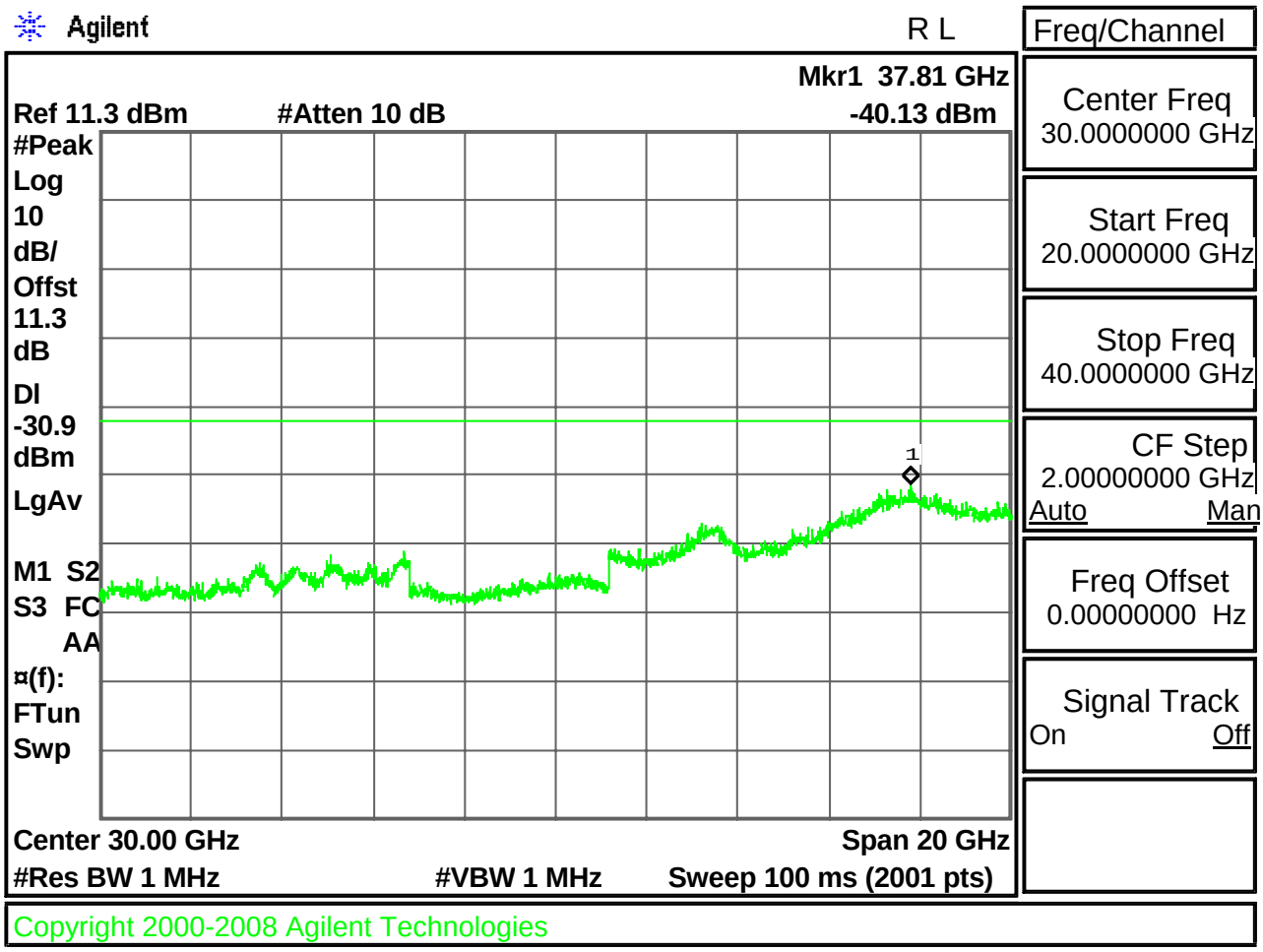

Agilent
R L
Freq/Channel
Mkr1 5.192 GHz
Ref 15.3 dBm
#Atten 14 dB
7.40 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
¤(f):
FTun
Swp
1
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

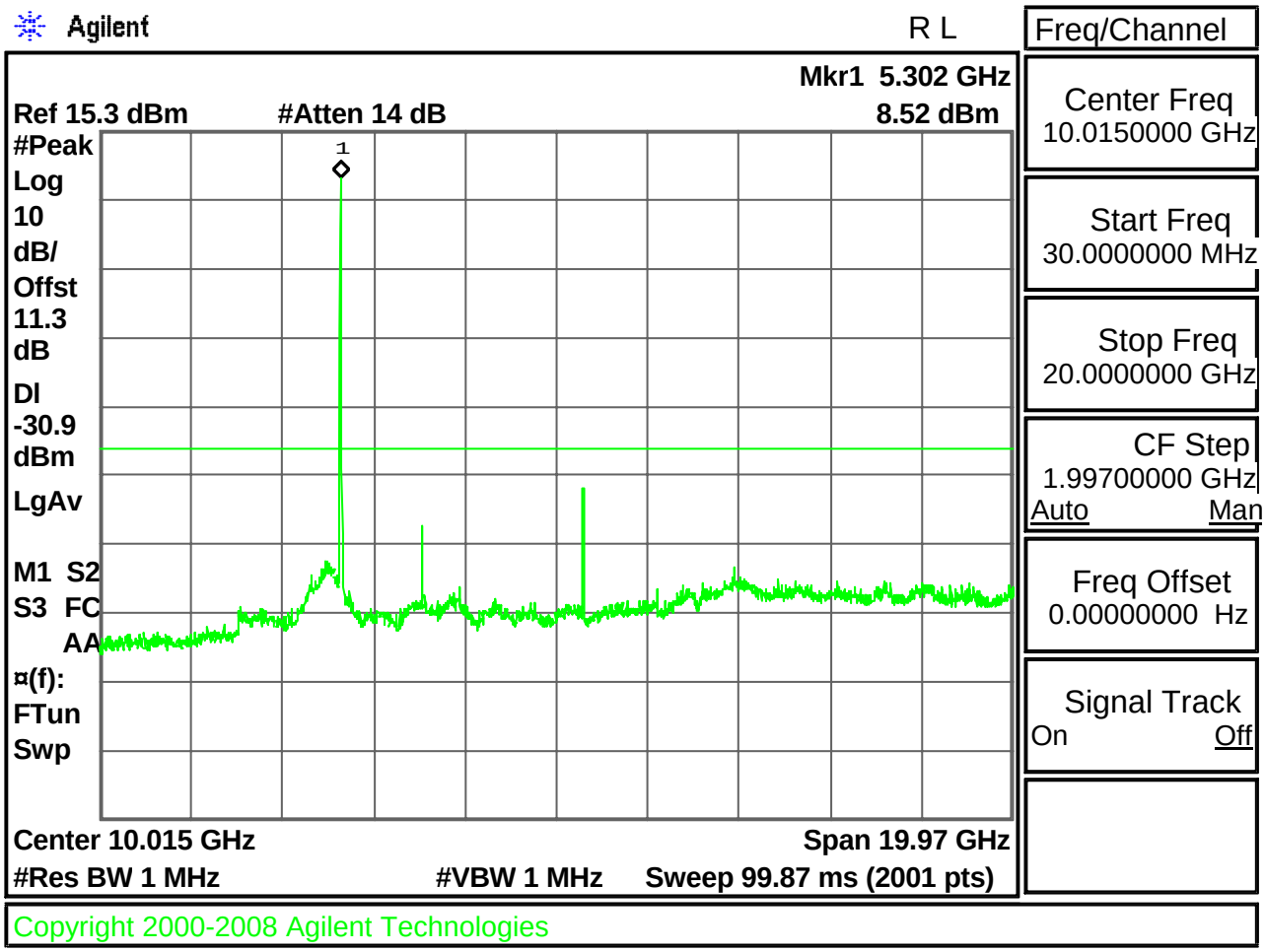

Agilent
R L
Freq/Channel
Mkr1 37.89 GHz
Ref 11.3 dBm
#Atten 10 dB
-39.87 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
¤(f):
FTun
Swp
1
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

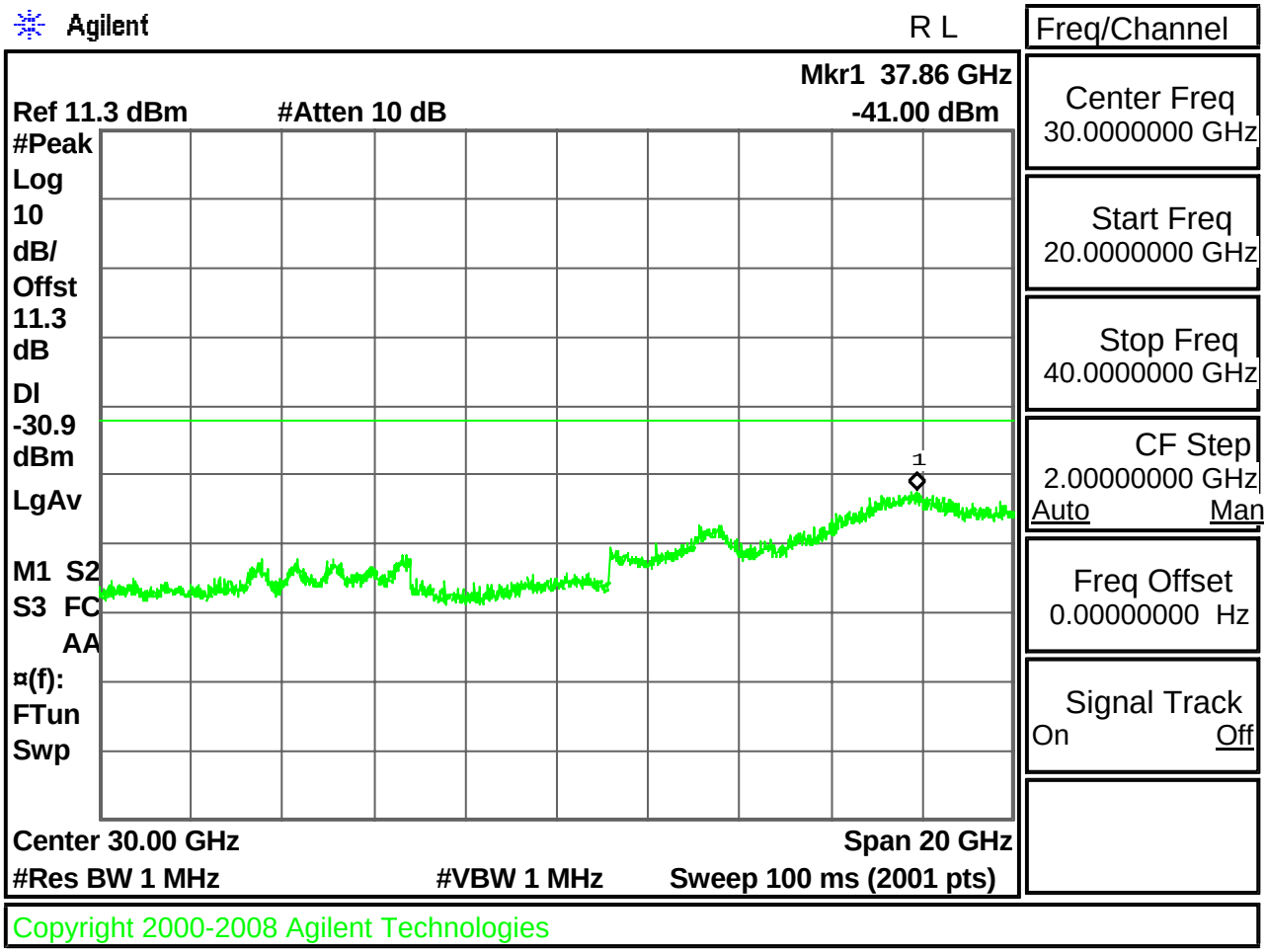

Agilent
R L
Freq/Channel
Mkr1 5.242 GHz
Ref 15.3 dBm
#Atten 14 dB
6.32 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

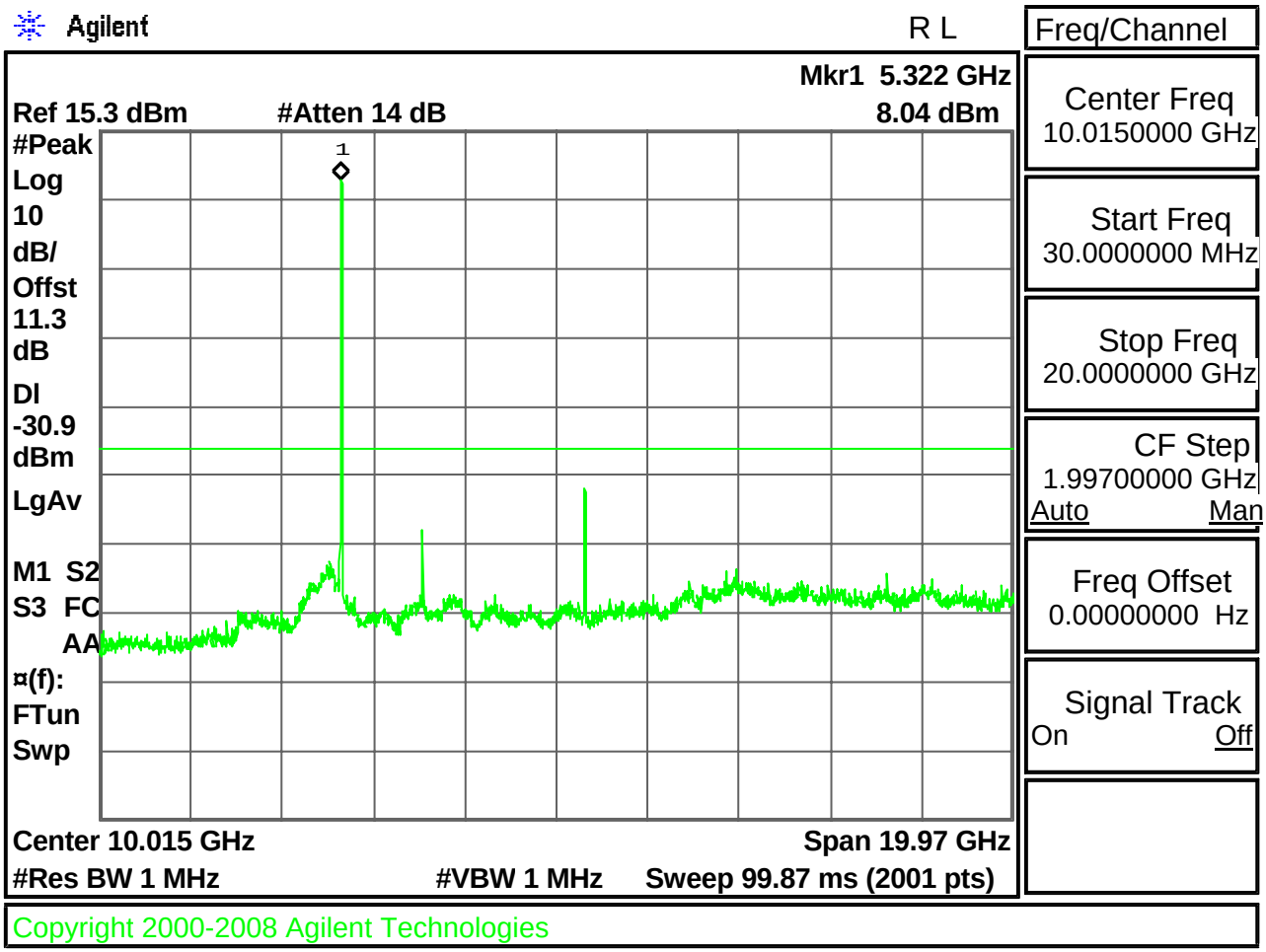

Agilent
R L
Freq/Channel
Mkr1 37.89 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.24 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
¤(f):
FTun
Swp
1
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

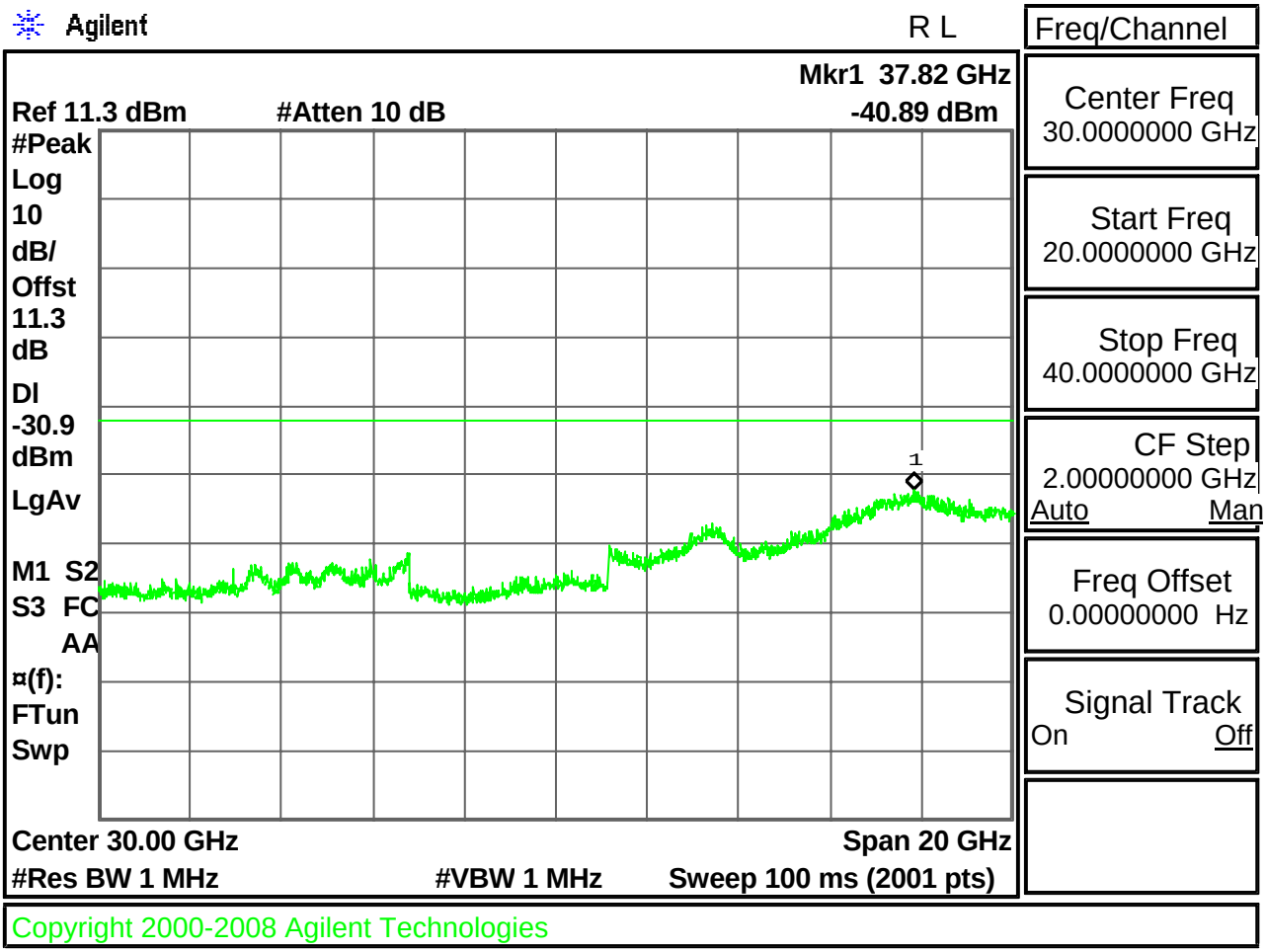

Agilent
R L
Freq/Channel
Mkr1 5.262 GHz
Ref 15.3 dBm
#Atten 14 dB
8.82 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

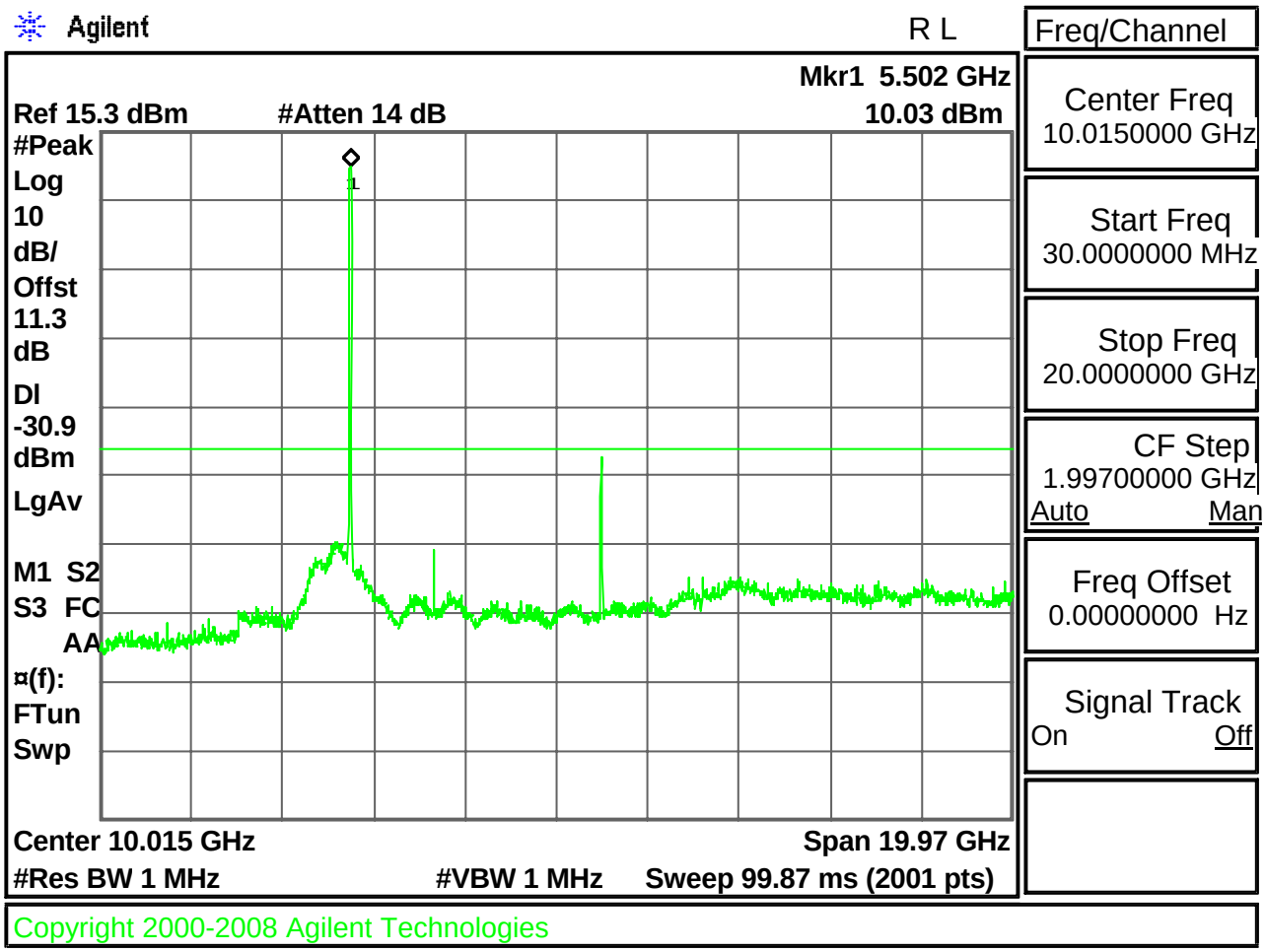

Agilent
R L
Freq/Channel
Mkr1 37.81 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.13 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

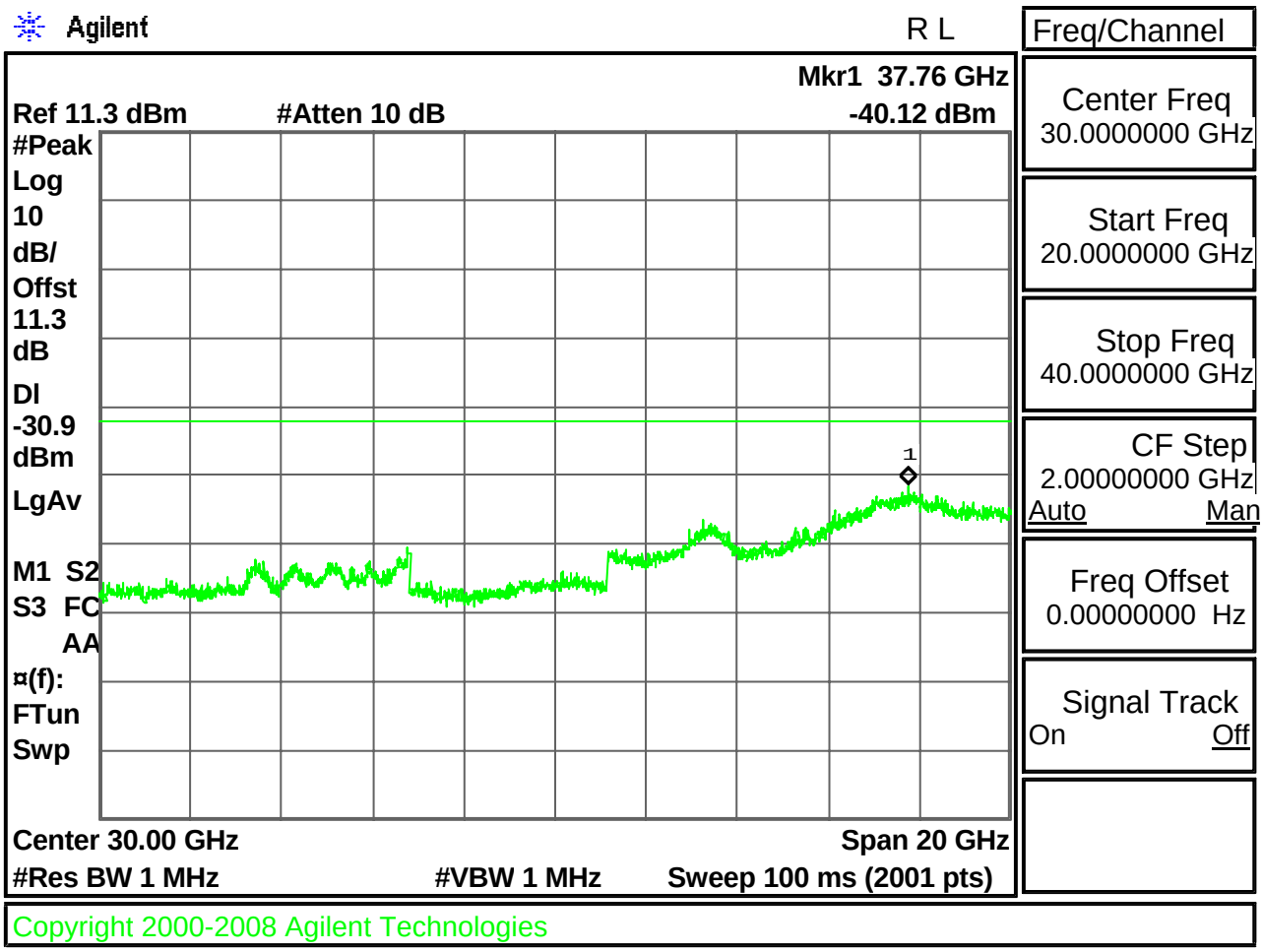

Agilent
R L
Freq/Channel
Mkr1 5.302 GHz
Ref 15.3 dBm
#Atten 14 dB
8.52 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

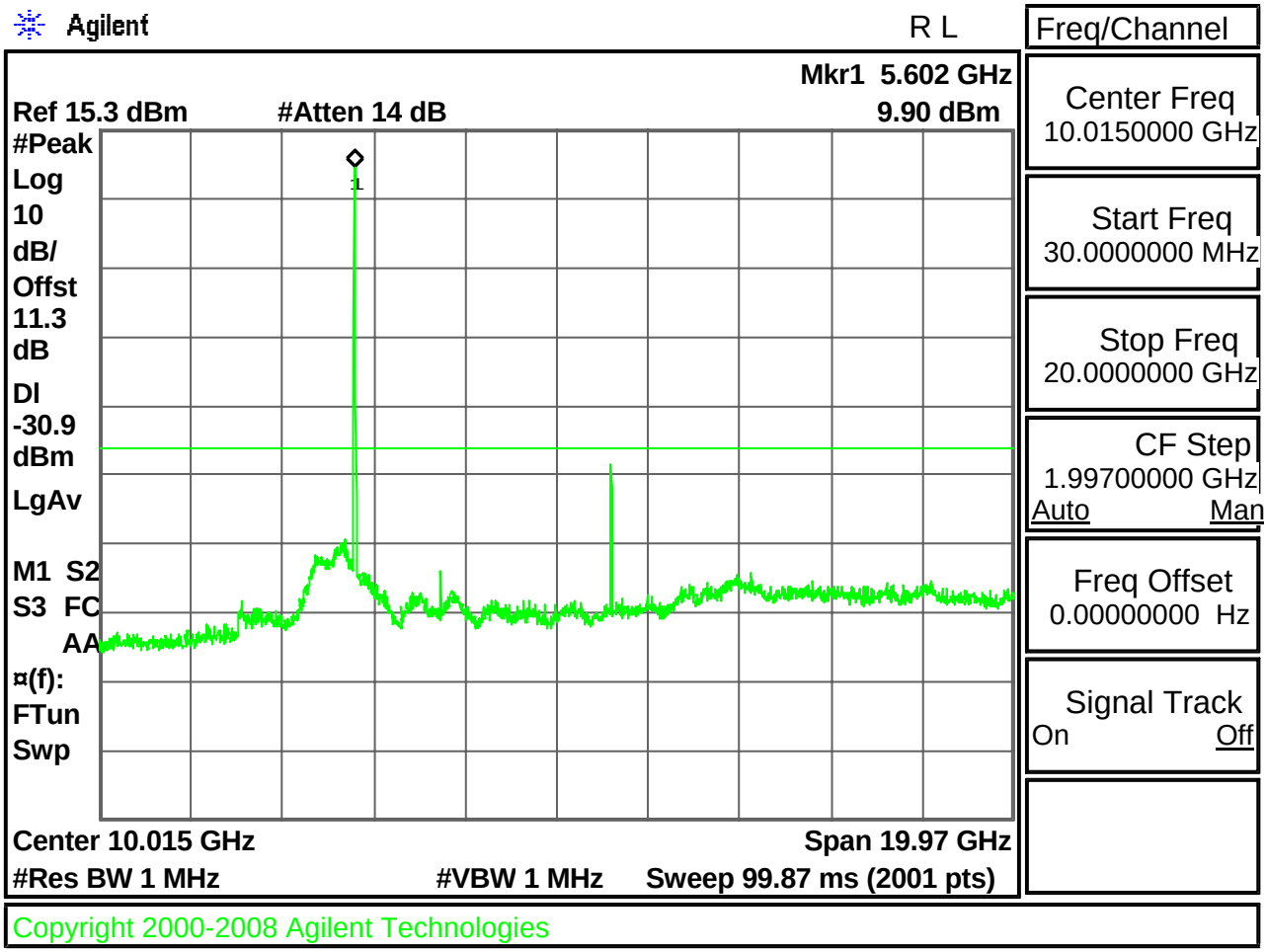

Agilent
R L
Freq/Channel
Mkr1 37.86 GHz
Ref 11.3 dBm
#Atten 10 dB
-41.00 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

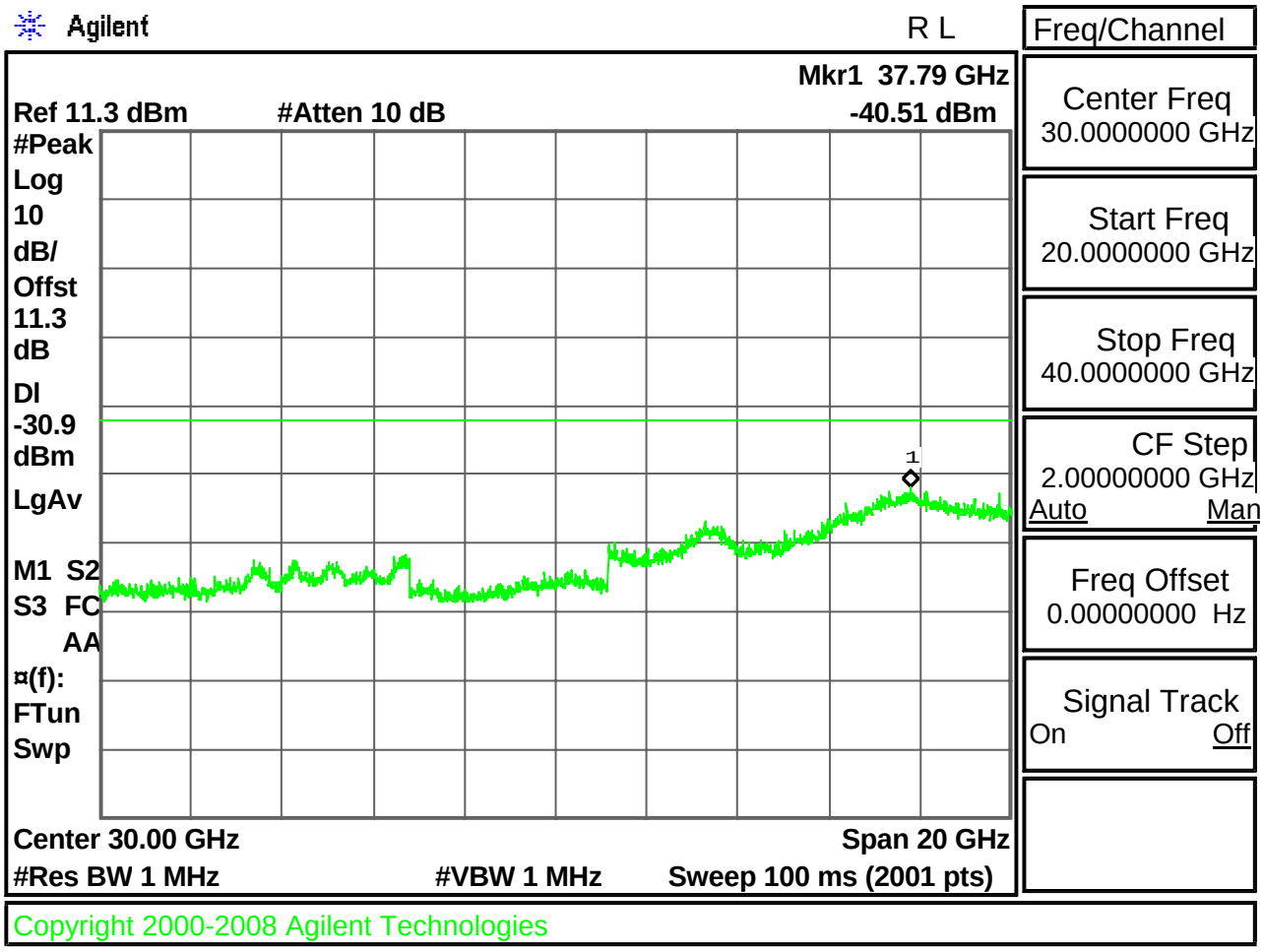

Agilent
R L
Mkr1 5.322 GHz
Ref 15.3 dBm
#Atten 14 dB
8.04 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

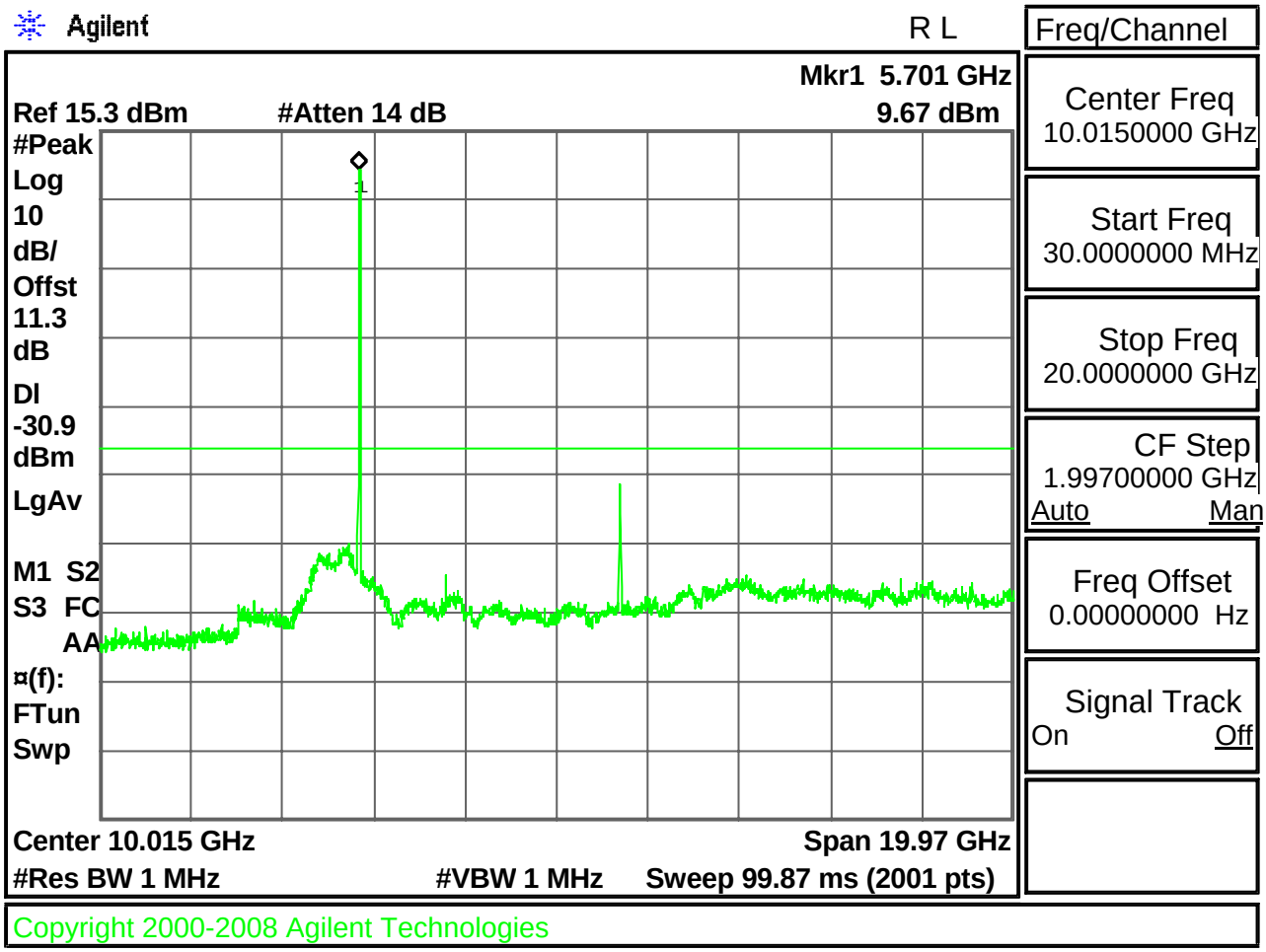


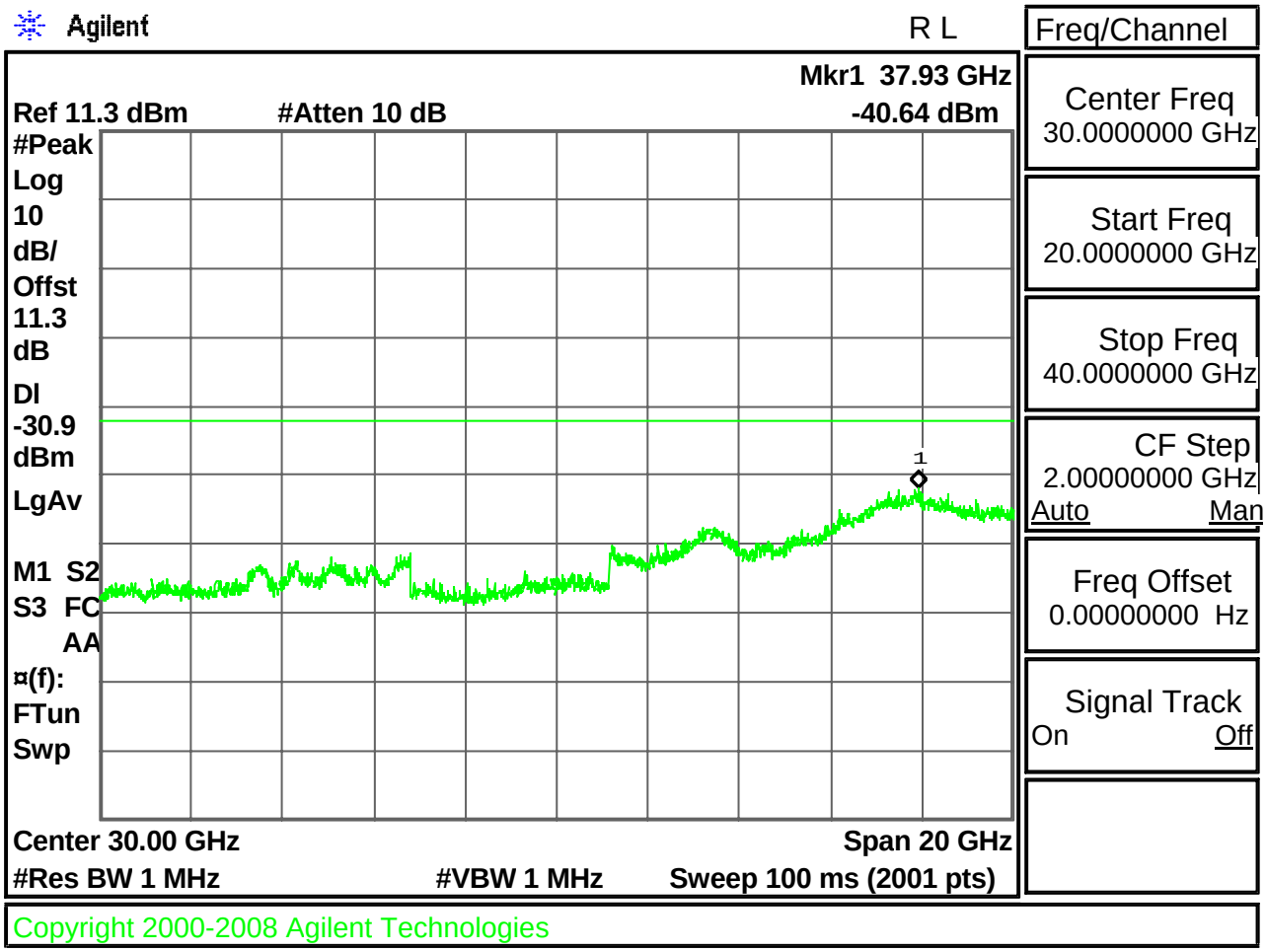

Agilent
R L
Mkr1 5.502 GHz
Ref 15.3 dBm
#Atten 14 dB
10.03 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

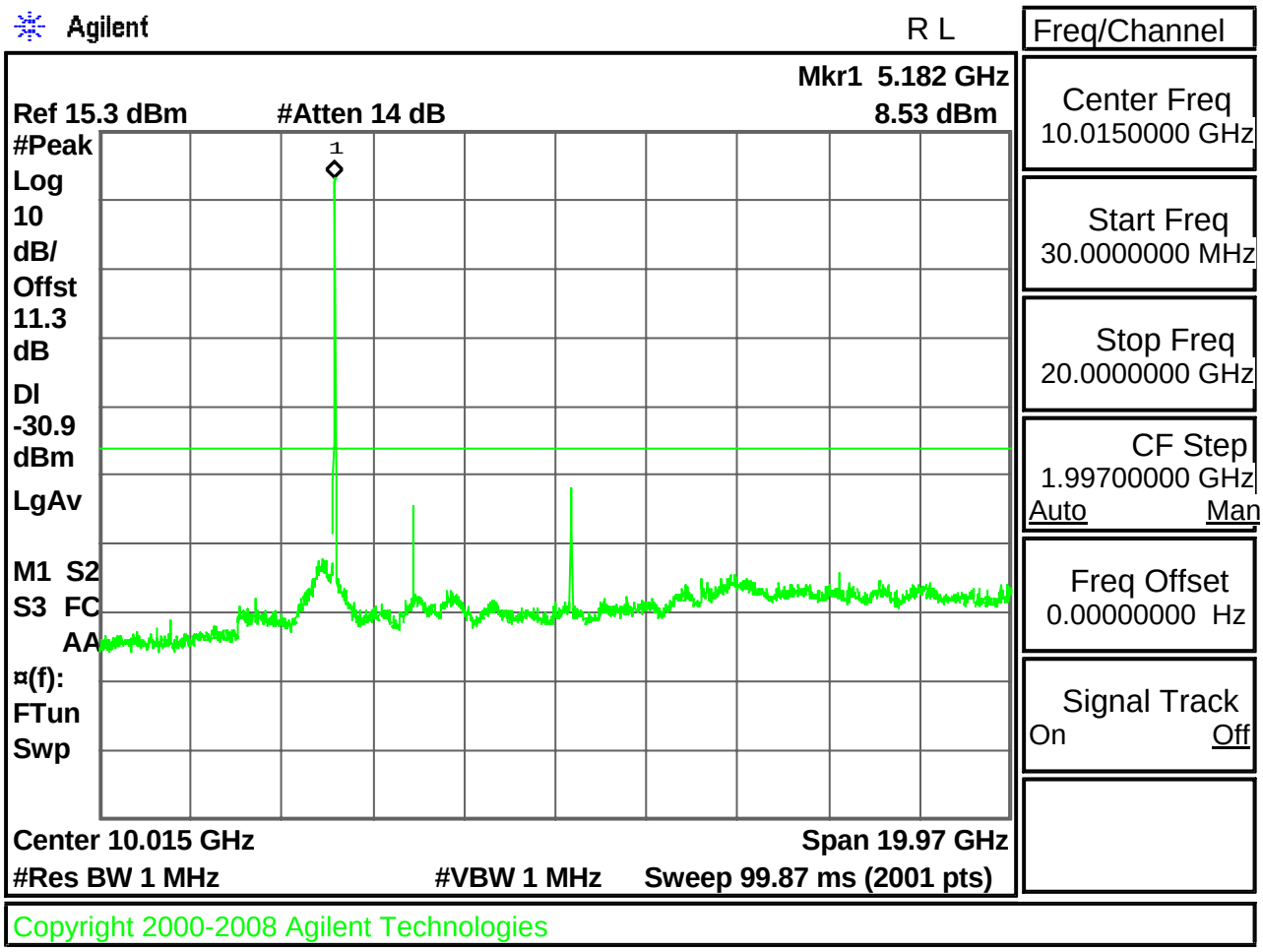

Agilent
R L
Freq/Channel
Mkr1 37.76 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.12 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

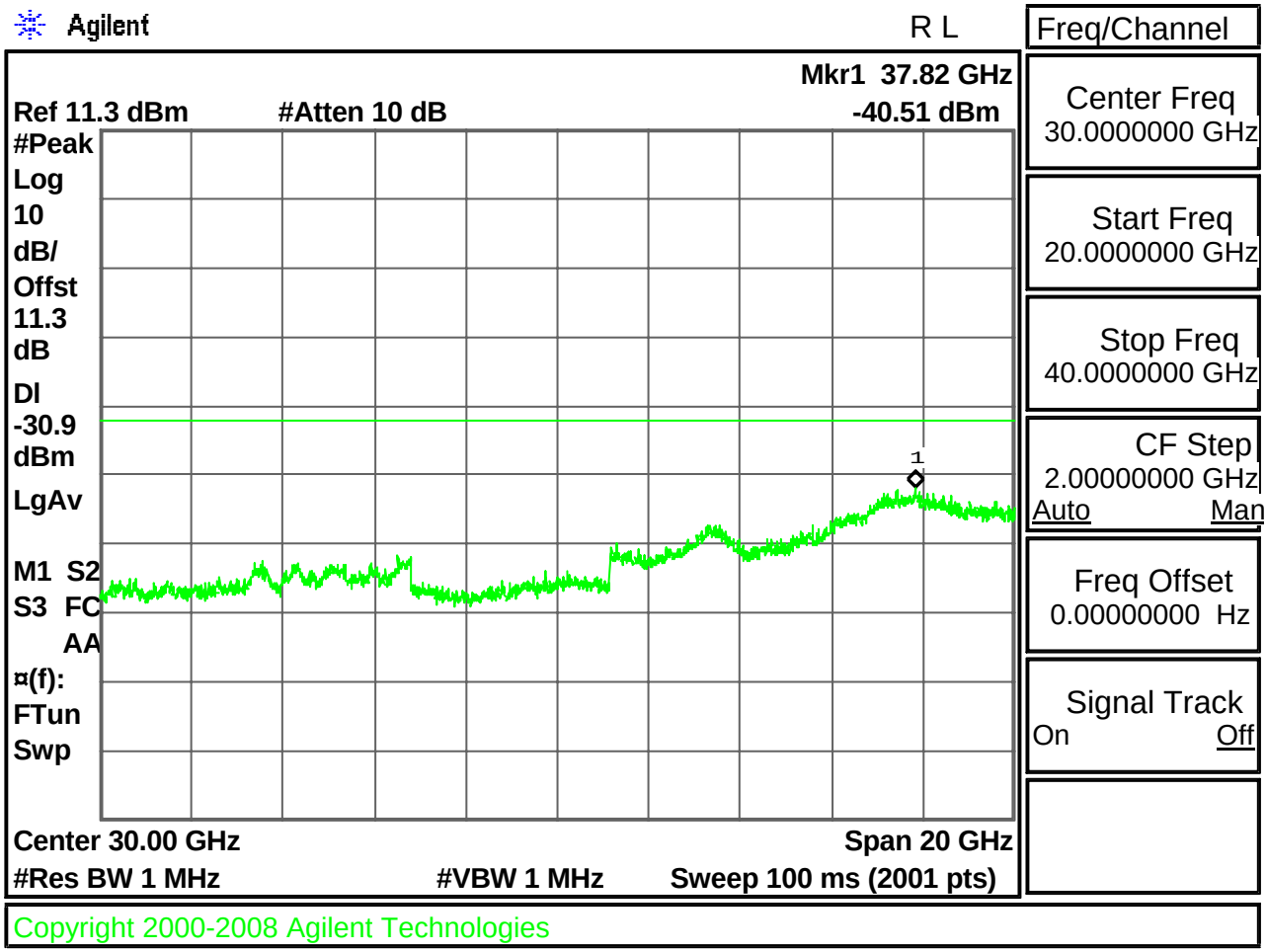

Agilent
R L
Freq/Channel
Mkr1 5.602 GHz
9.90 dBm
Ref 15.3 dBm
#Atten 14 dB
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

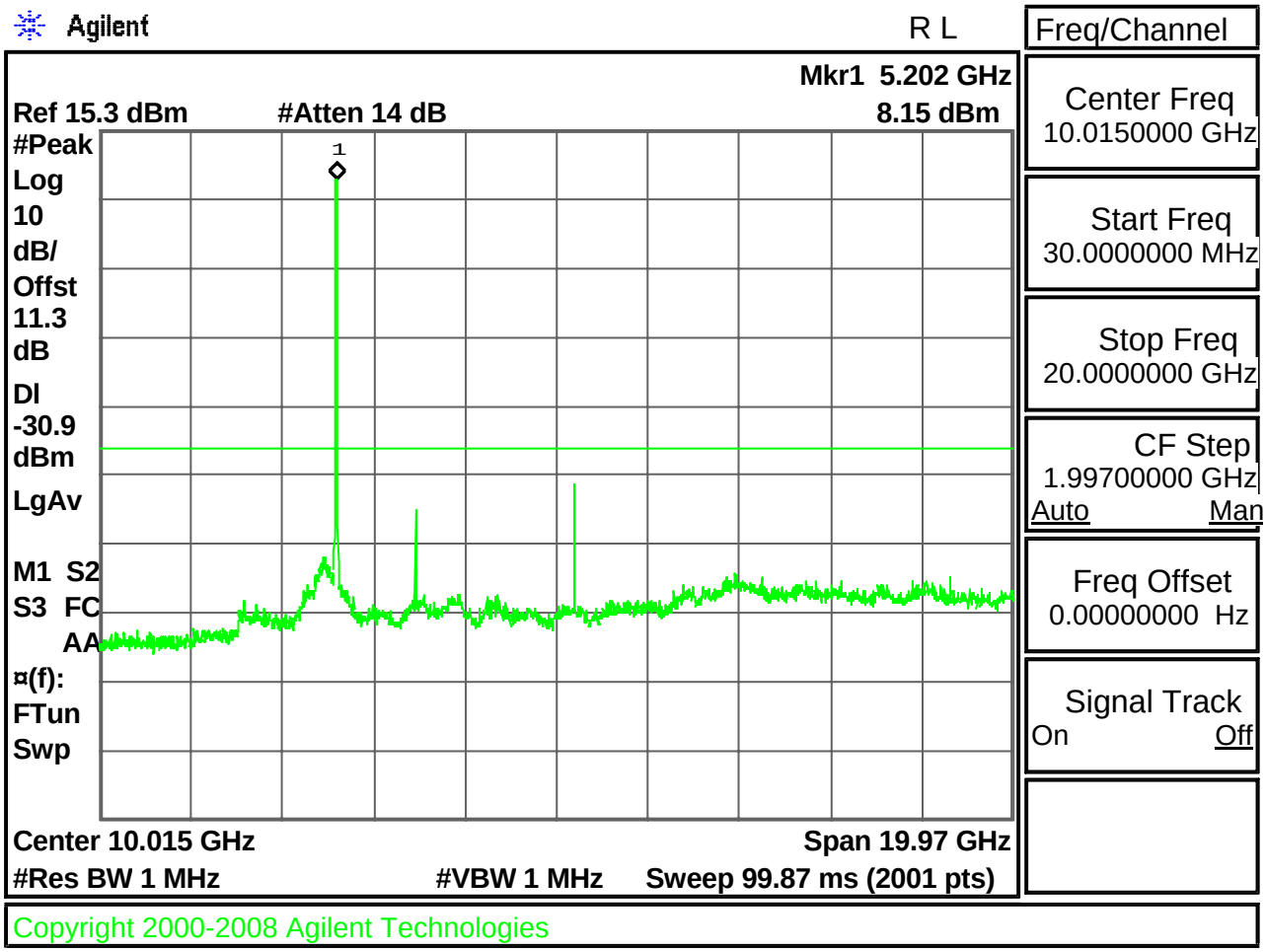

Agilent
R L
Freq/Channel
Mkr1 37.79 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.51 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

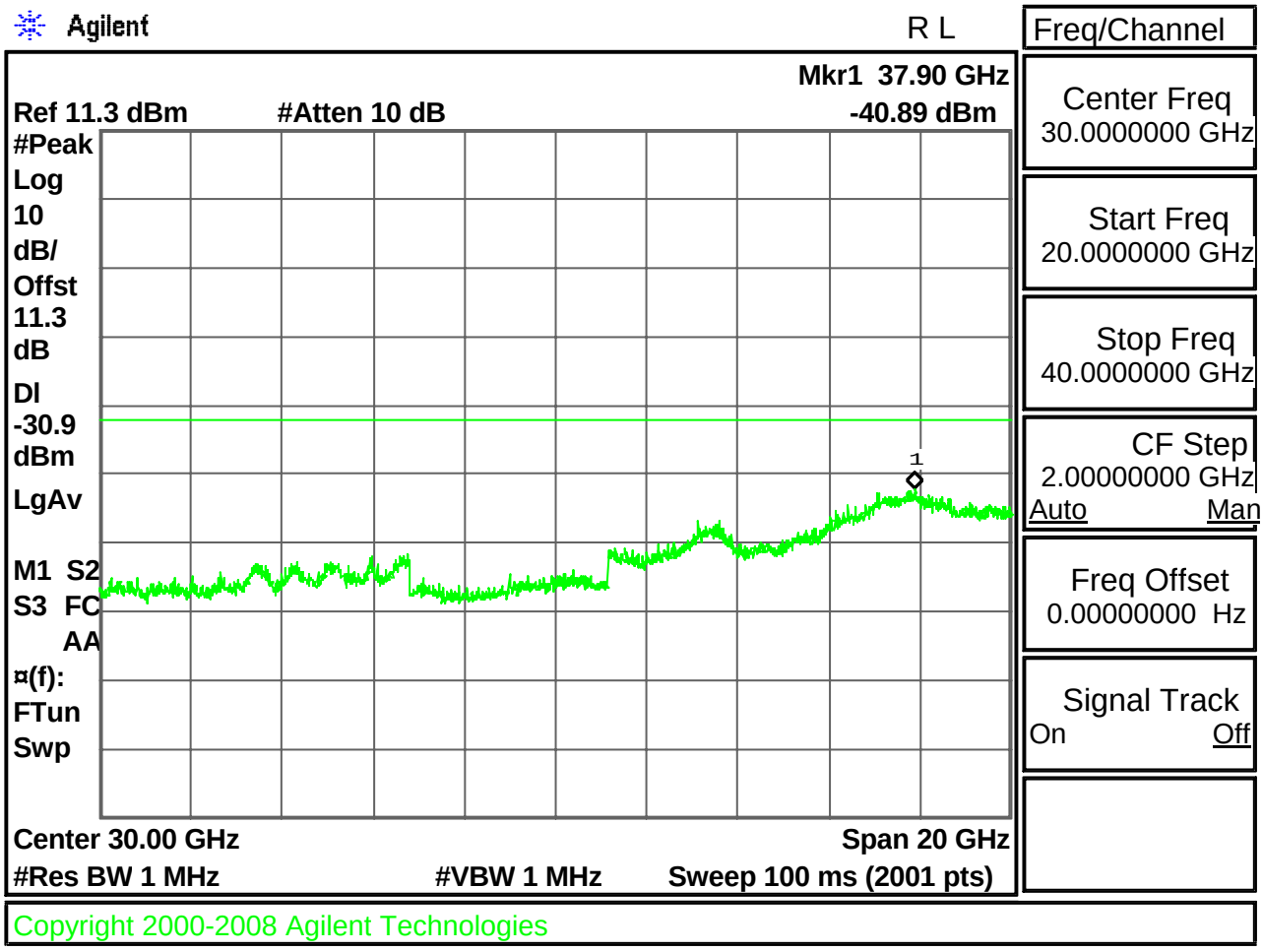

Agilent
R L
Freq/Channel
Mkr1 5.701 GHz
Ref 15.3 dBm
#Atten 14 dB
9.67 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

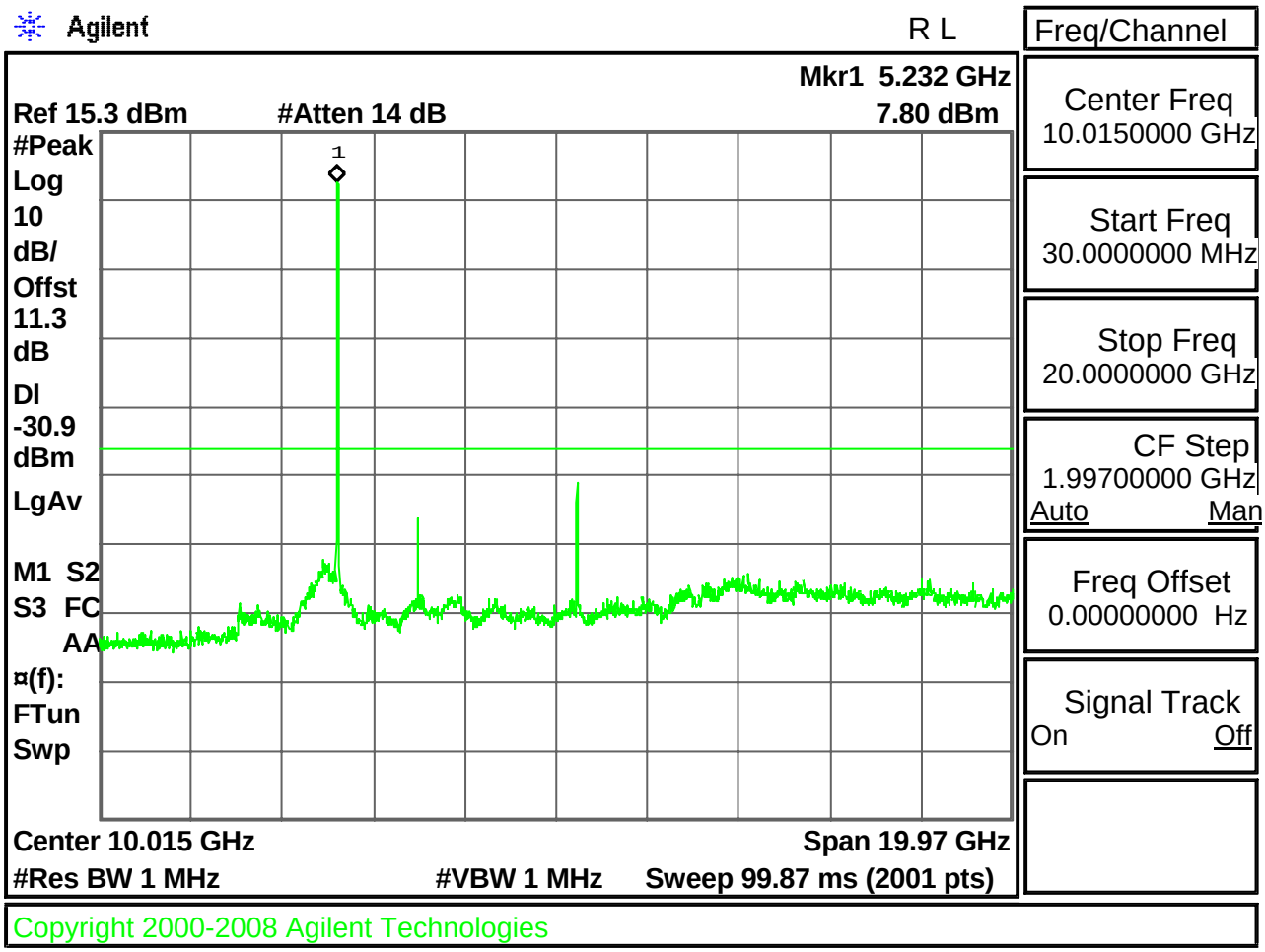

Agilent
R L
Freq/Channel
Mkr1 37.93 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.64 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

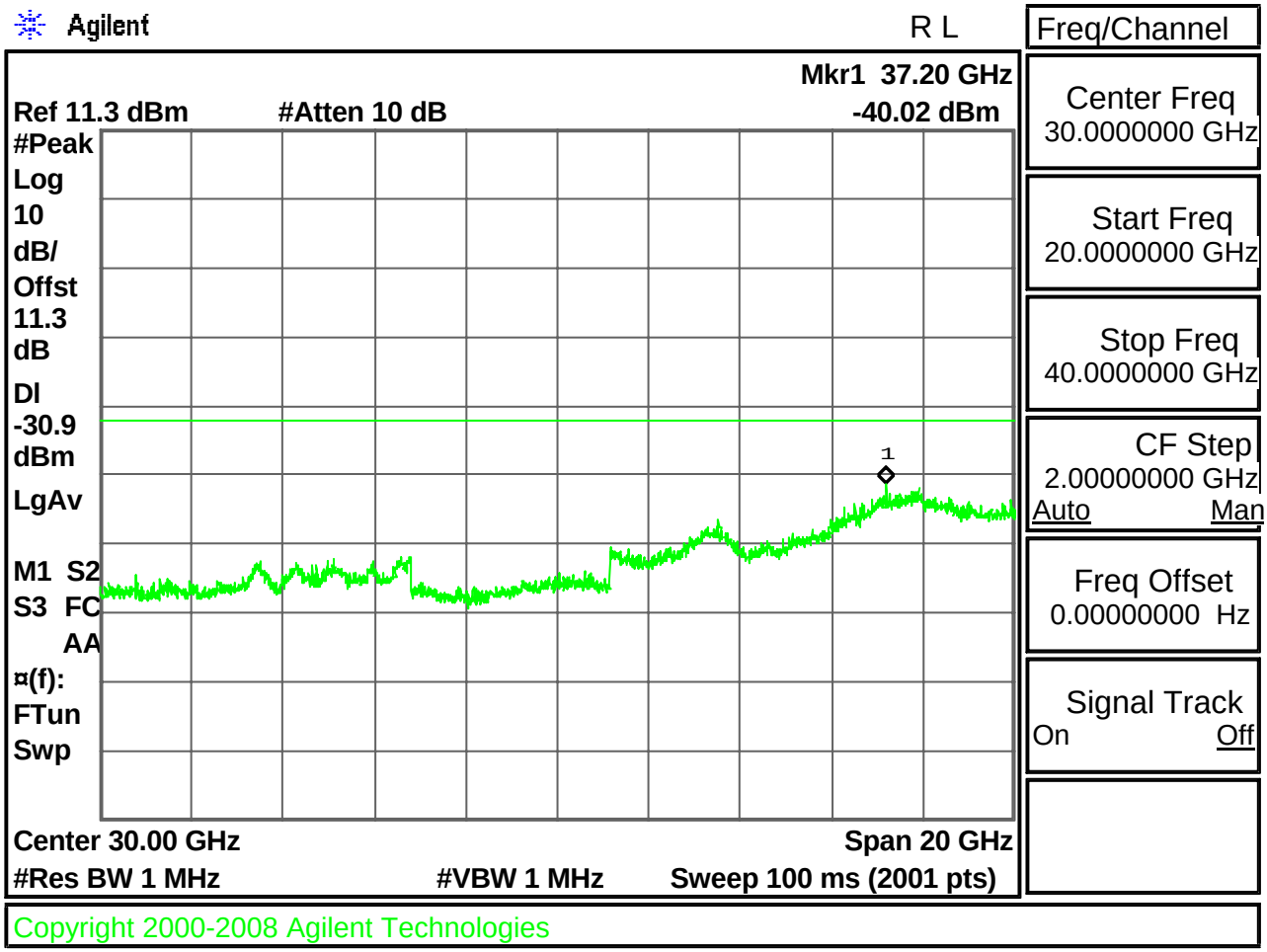

Agilent
R L
Mkr1 5.182 GHz
Ref 15.3 dBm
#Atten 14 dB
8.53 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

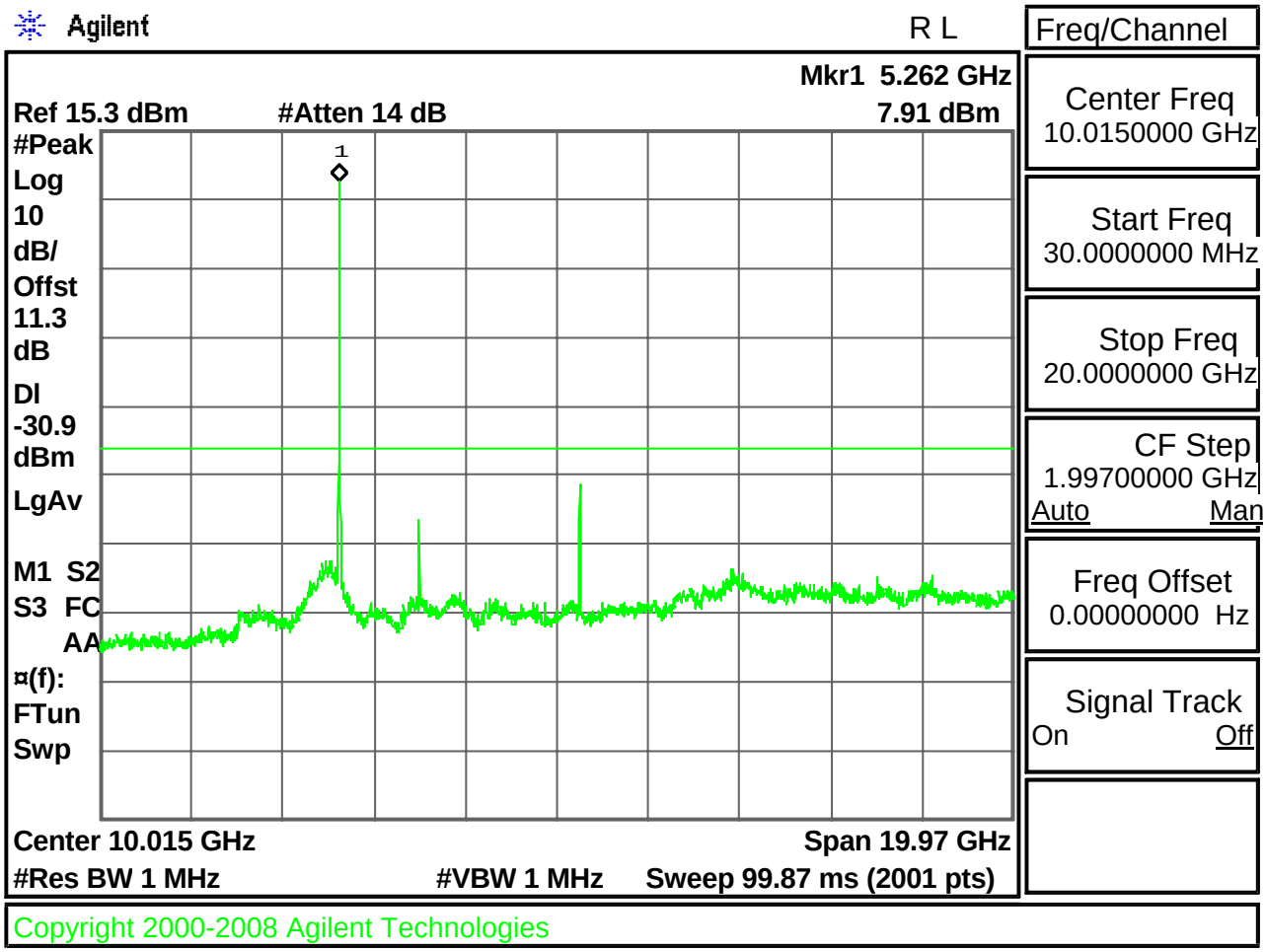

Agilent
R L
Freq/Channel
Mkr1 37.82 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.51 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

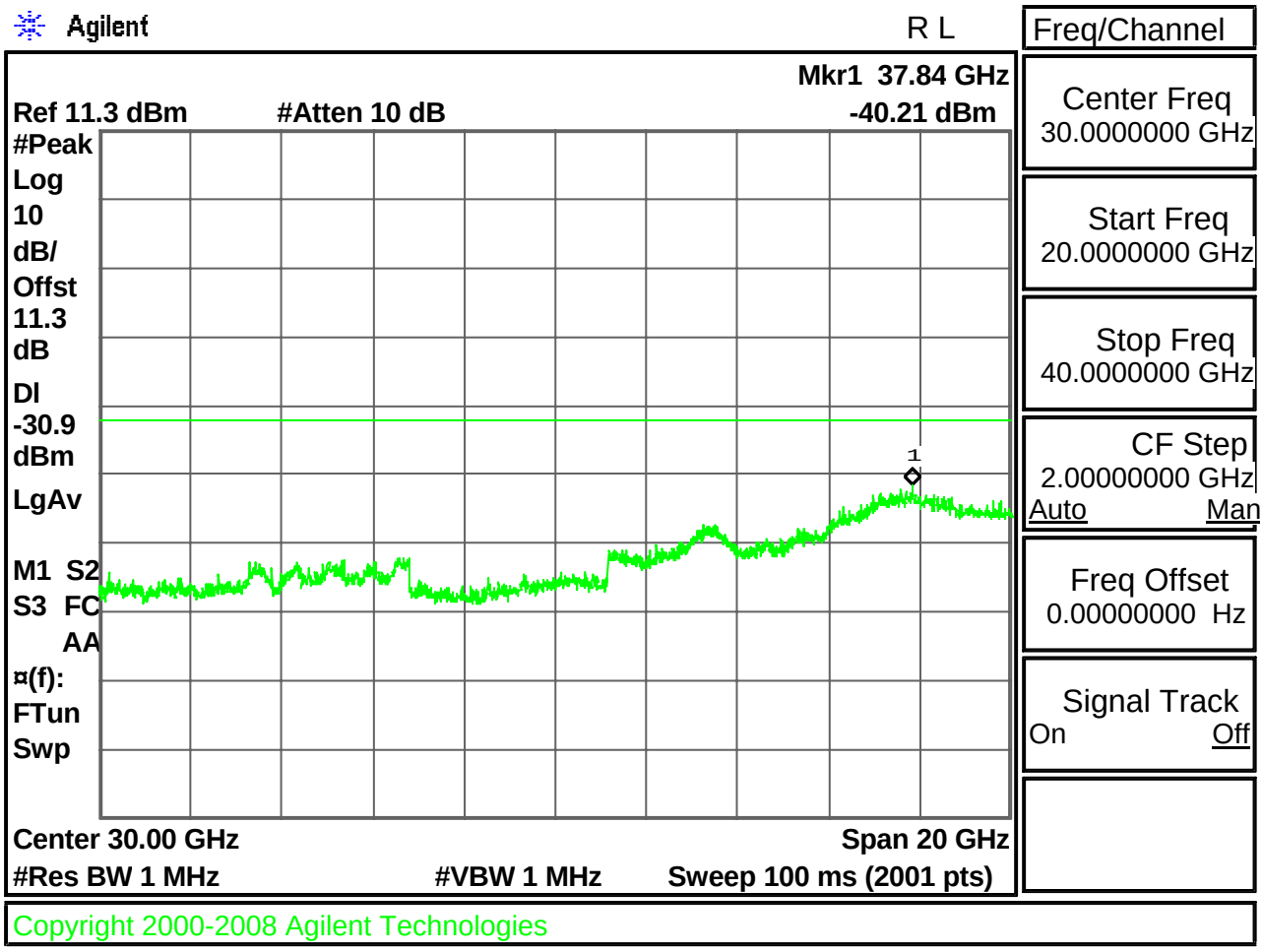


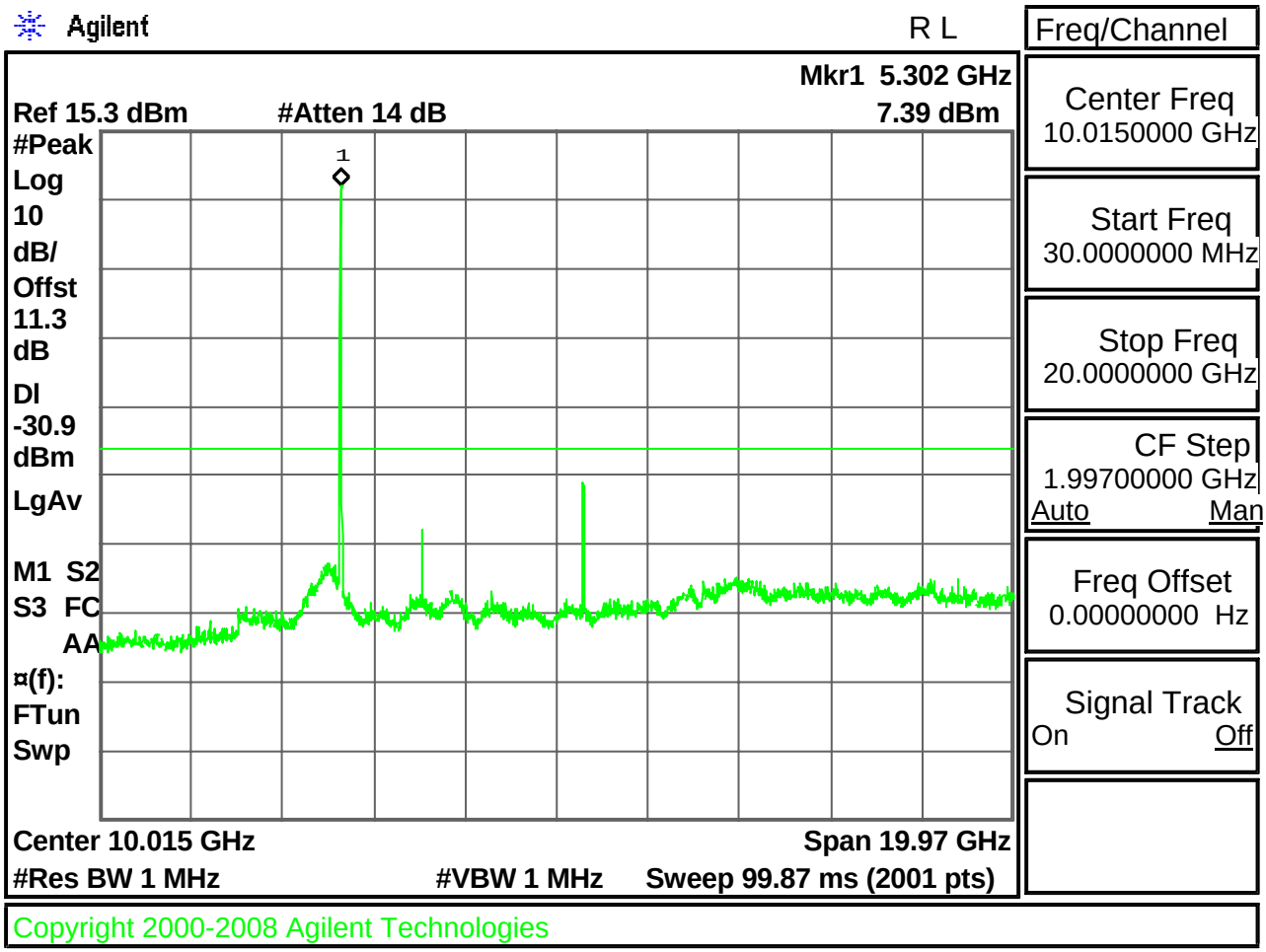

Agilent
R L
Freq/Channel
Mkr1 37.90 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.89 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

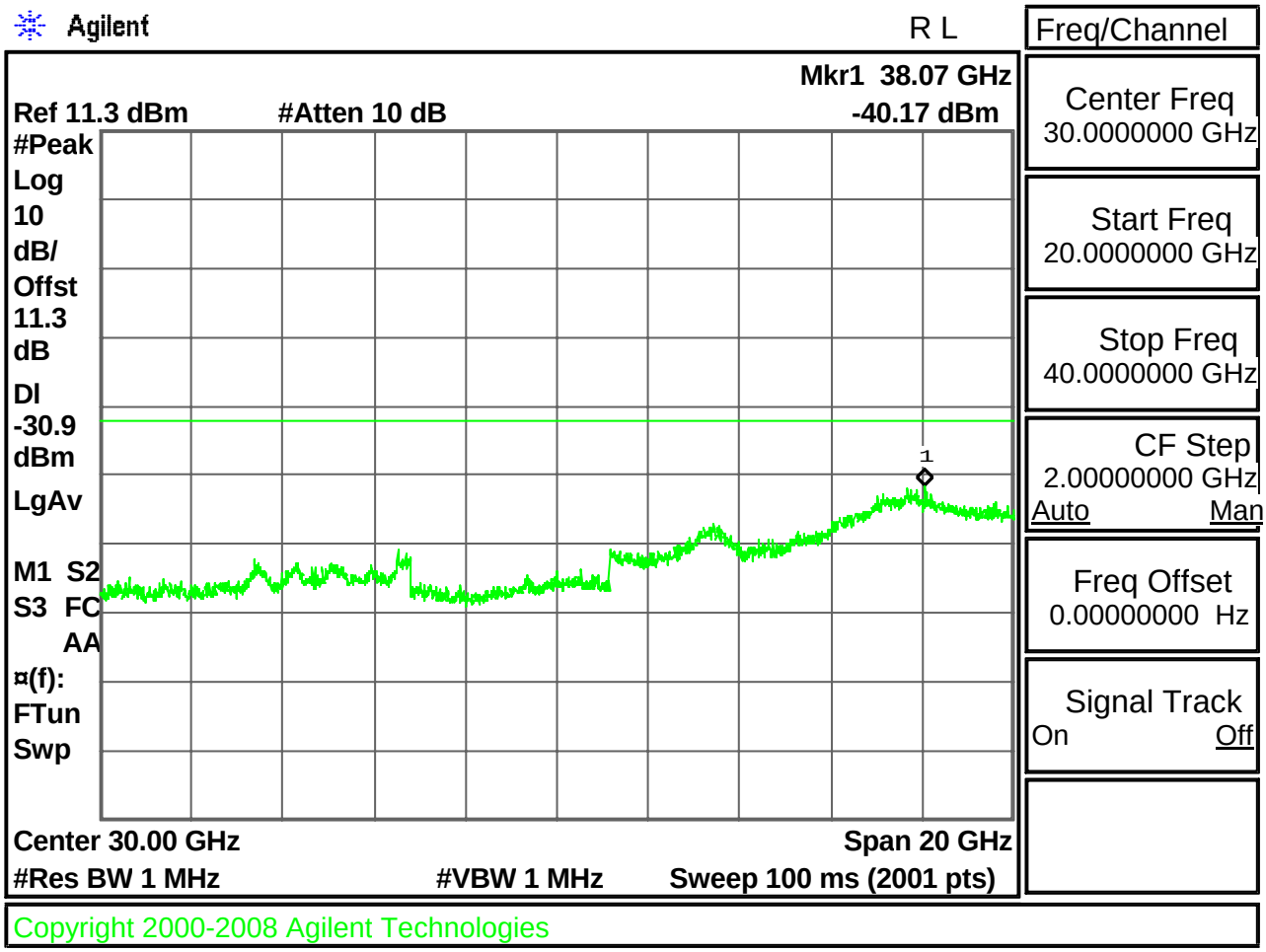

Agilent
R L
Freq/Channel
Mkr1 5.232 GHz
Ref 15.3 dBm
#Atten 14 dB
7.80 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

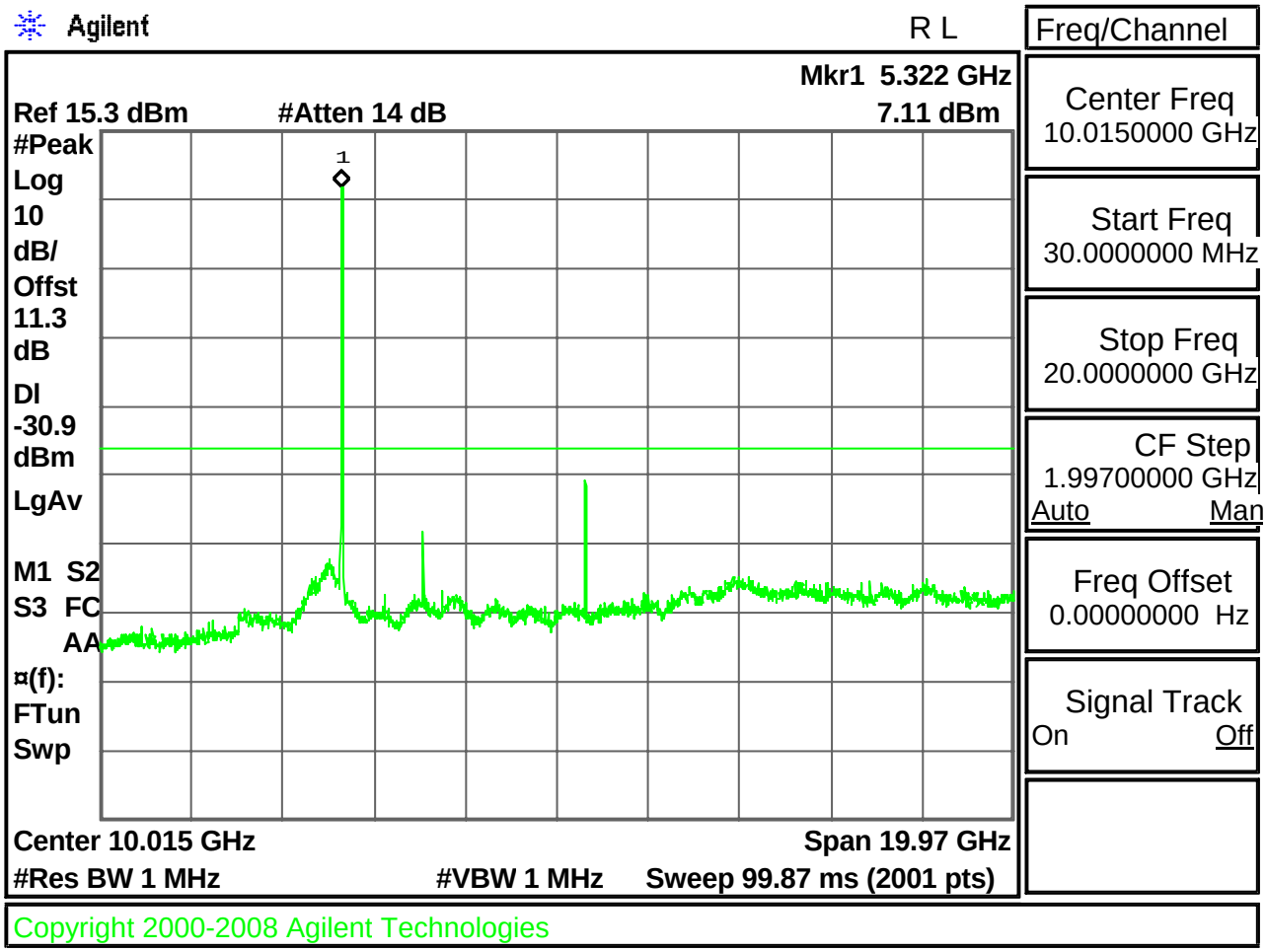

Agilent
R L
Mkr1 37.20 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.02 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Freq/Channel
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

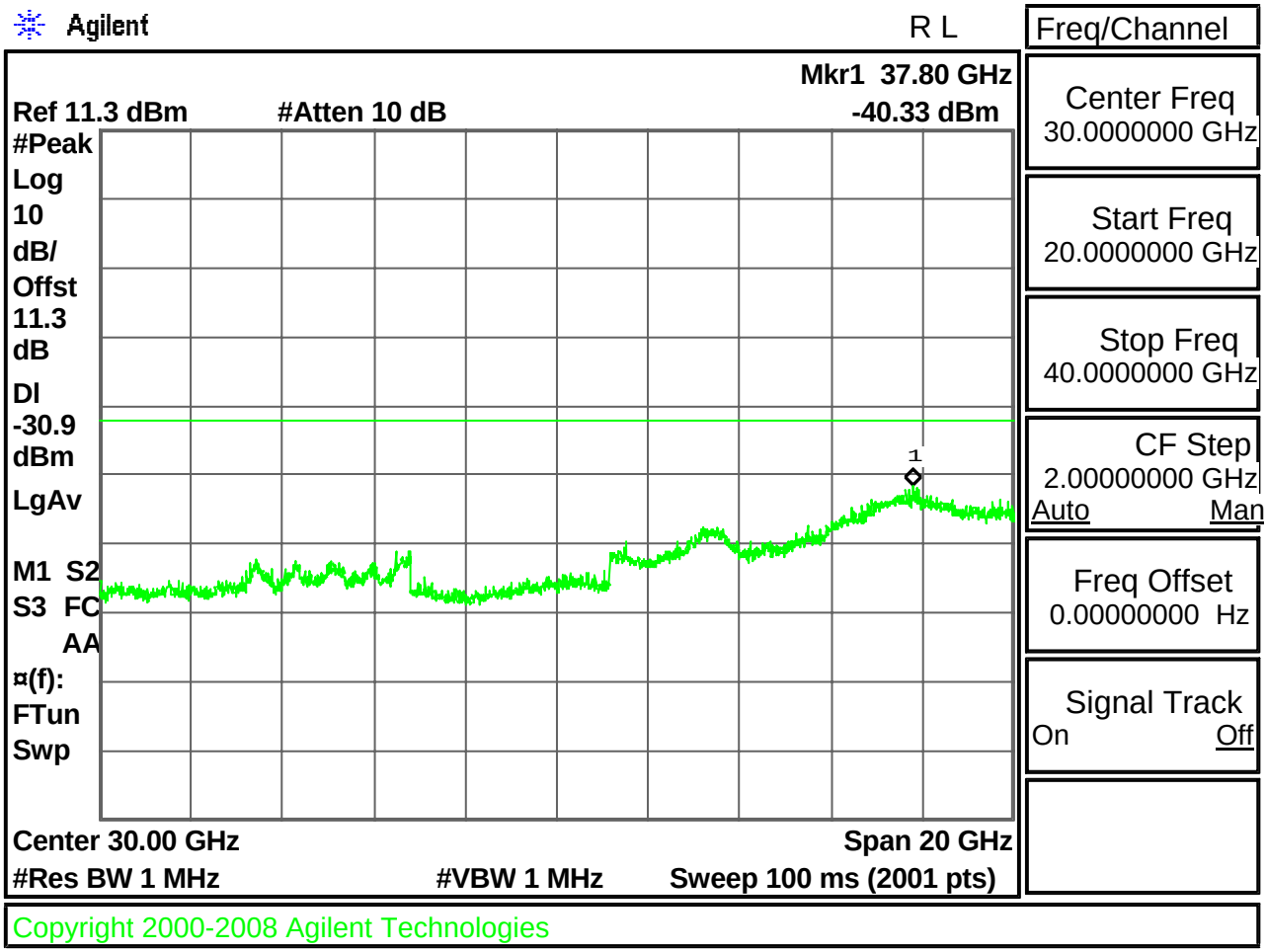

Agilent
R L
Mkr1 5.262 GHz
Ref 15.3 dBm
#Atten 14 dB
7.91 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

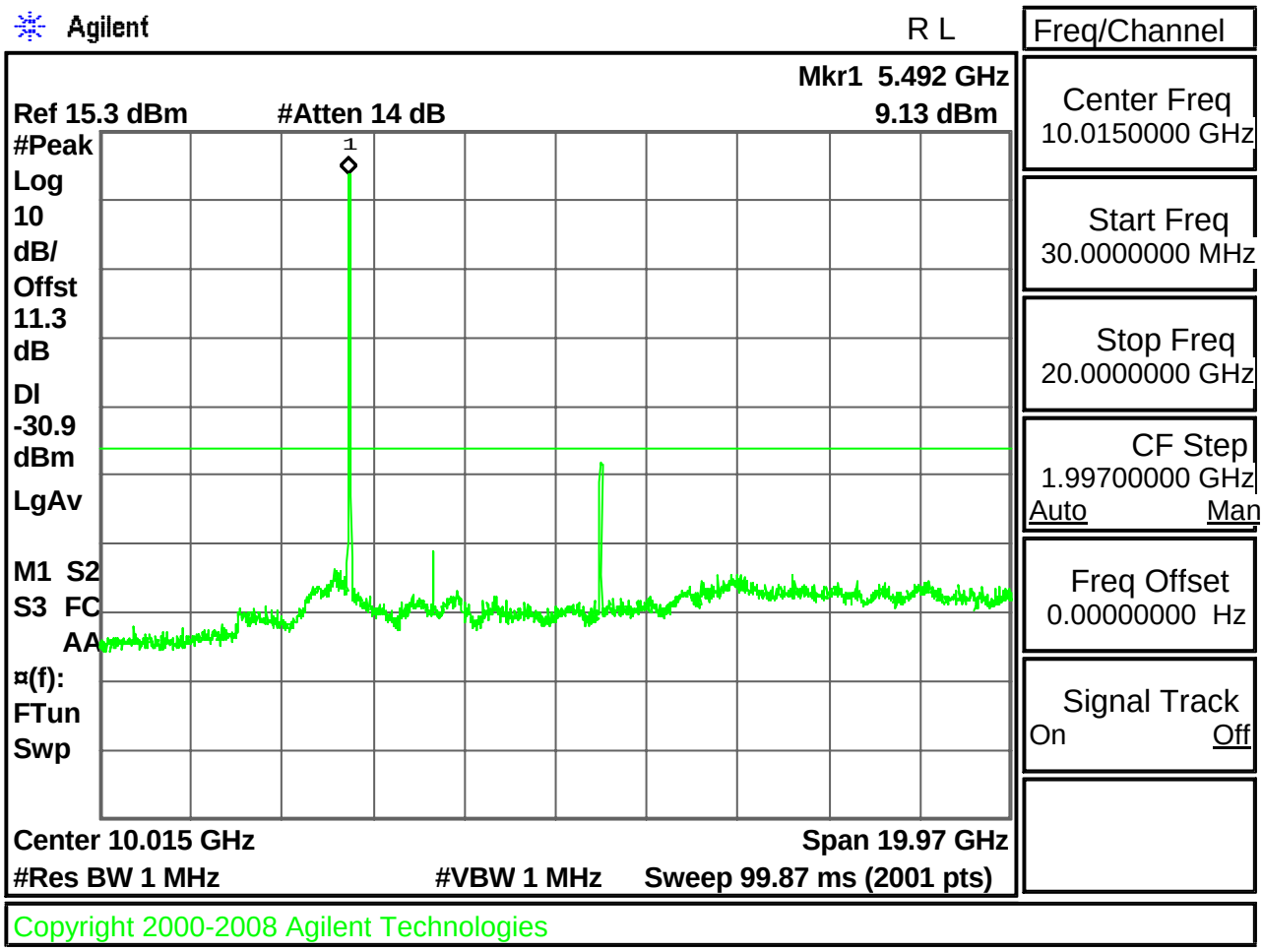

Agilent
R L
Mkr1 37.84 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.21 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Freq/Channel
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

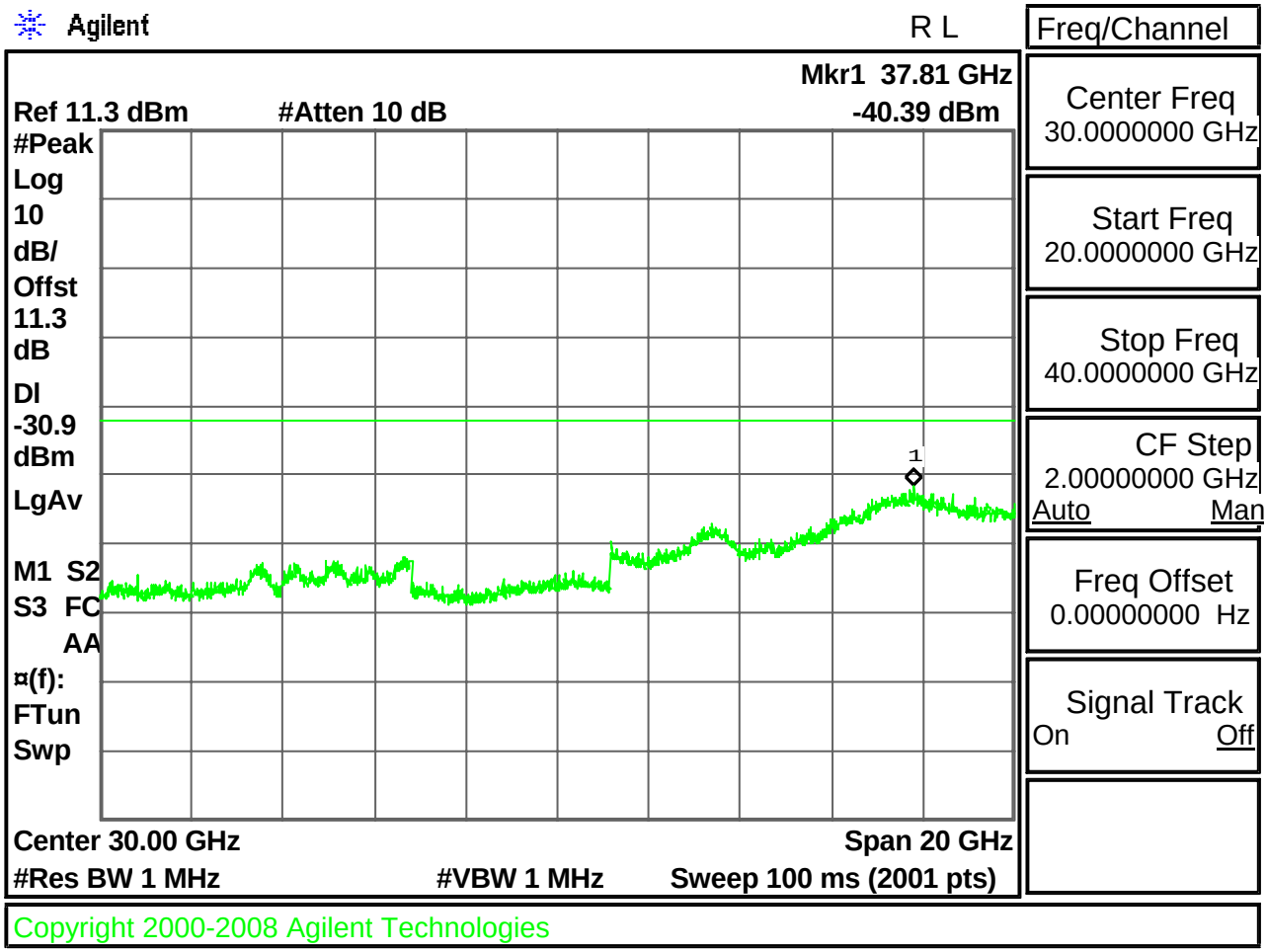

Agilent
R L
Mkr1 5.302 GHz
Ref 15.3 dBm
#Atten 14 dB
7.39 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

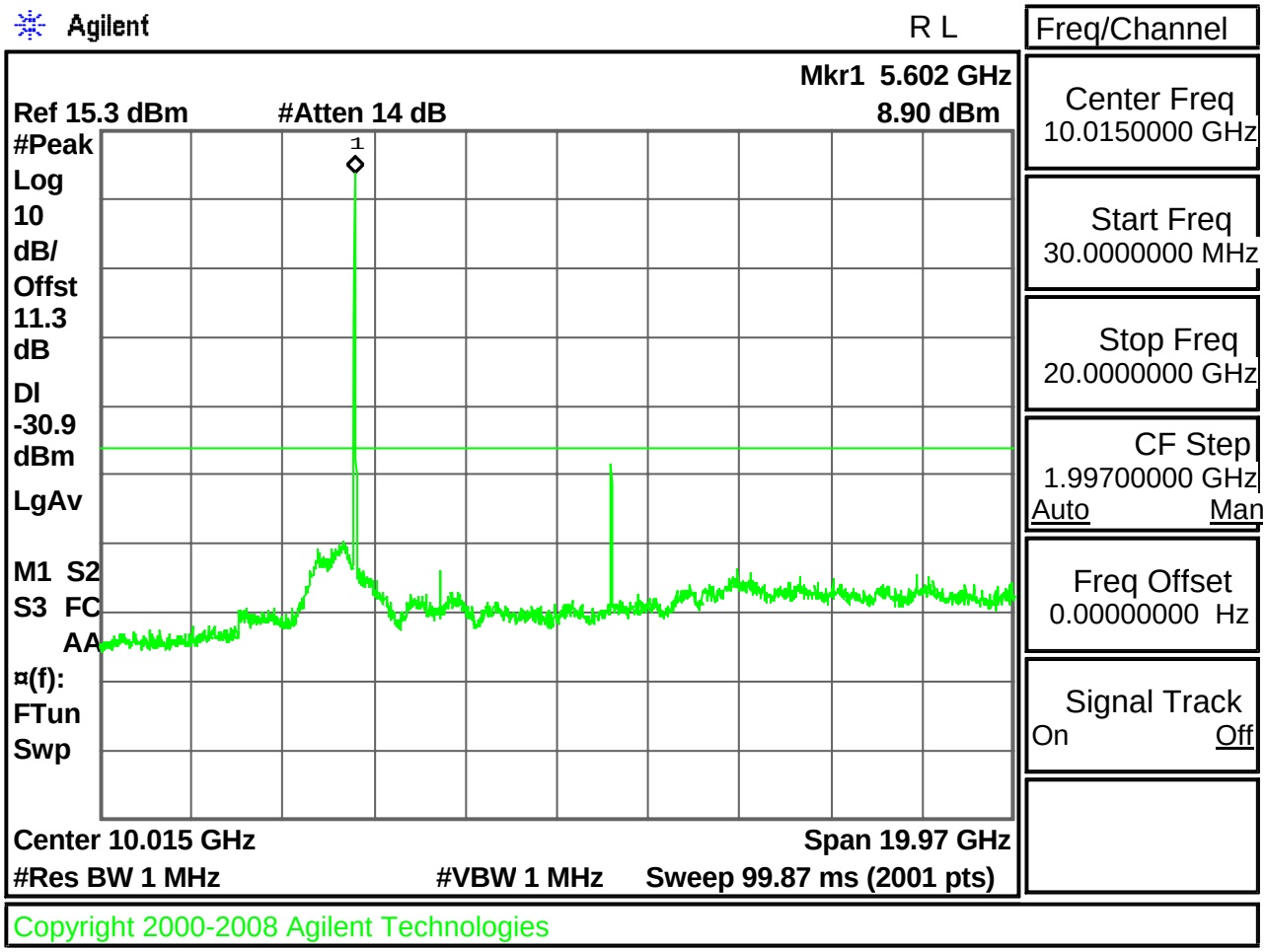

Agilent
R L
Freq/Channel
Mkr1 38.07 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.17 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

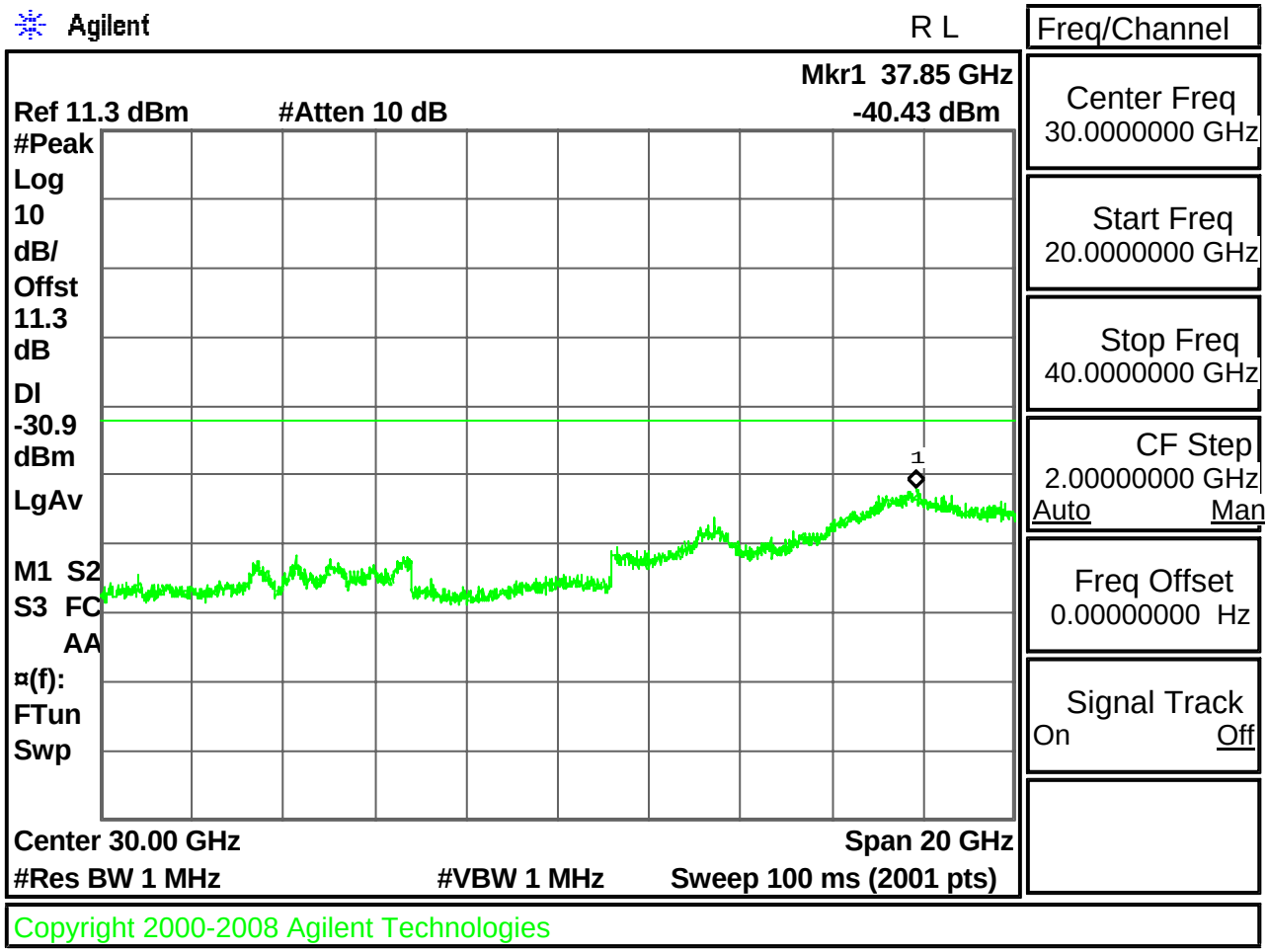

Agilent
R L
Mkr1 5.322 GHz
Ref 15.3 dBm
#Atten 14 dB
7.11 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

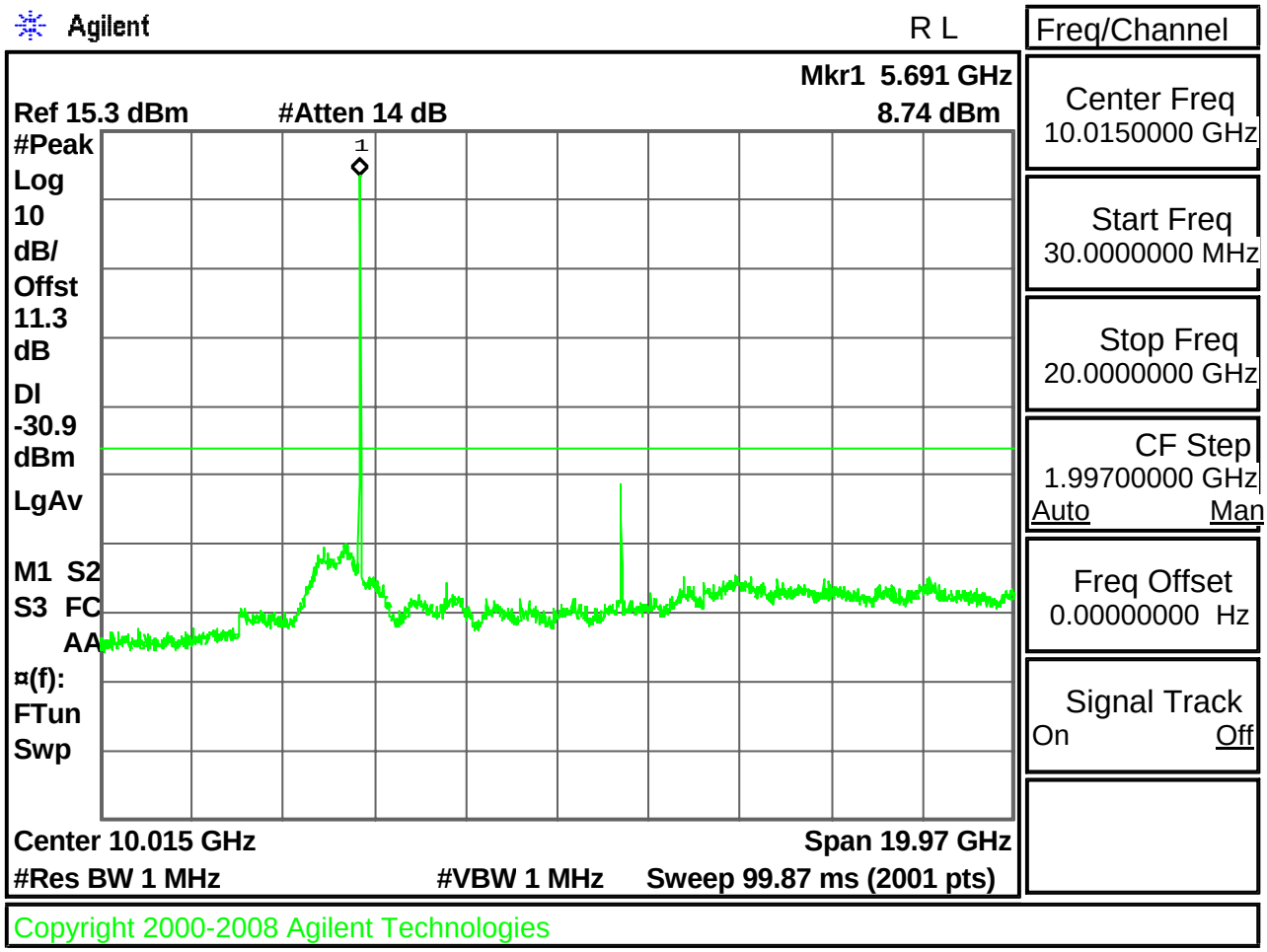

Agilent
R L
Freq/Channel
Mkr1 37.80 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.33 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

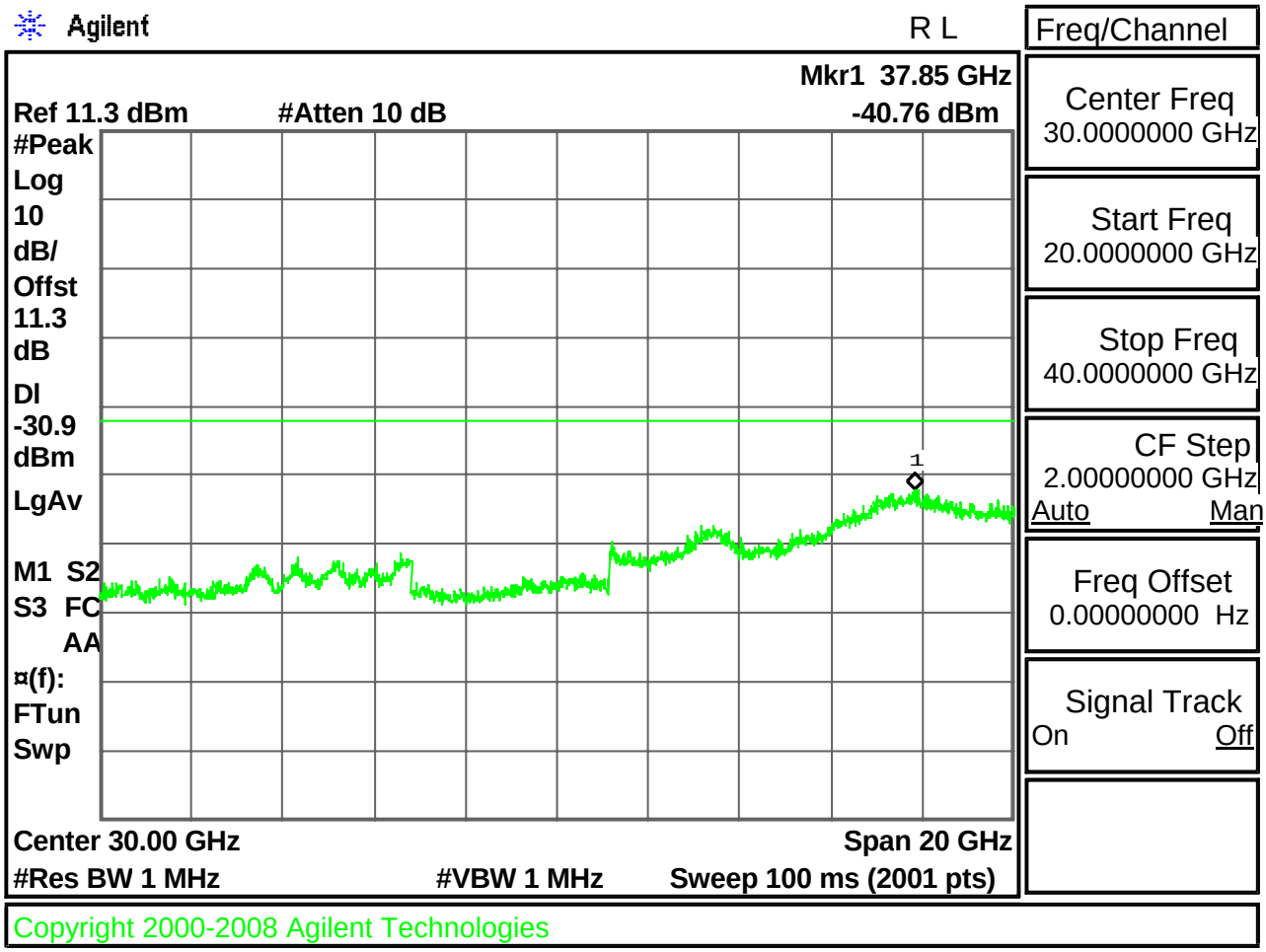

Agilent
R L
Mkr1 5.492 GHz
Ref 15.3 dBm
#Atten 14 dB
9.13 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

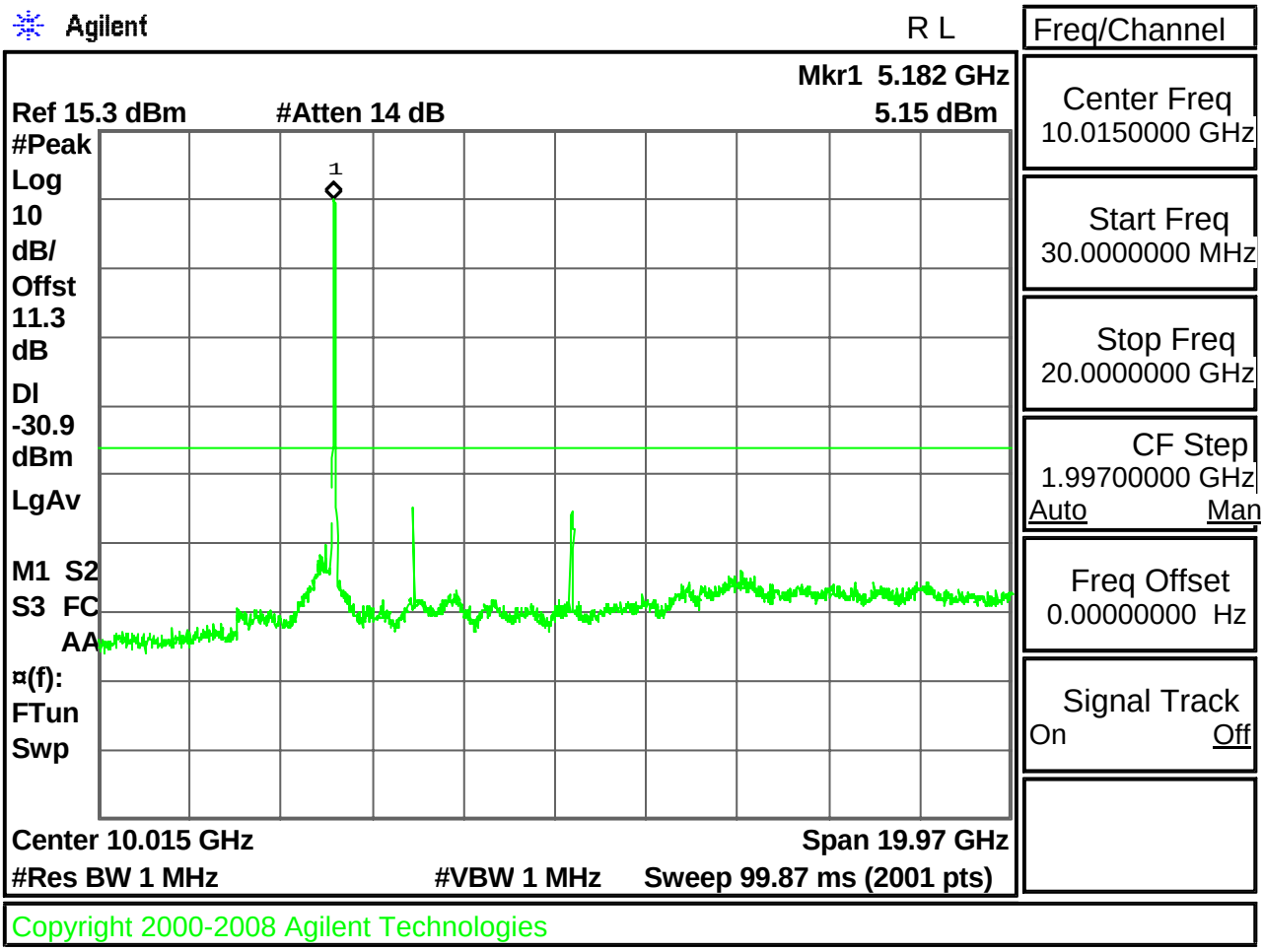

Agilent
R L
Freq/Channel
Mkr1 37.81 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.39 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

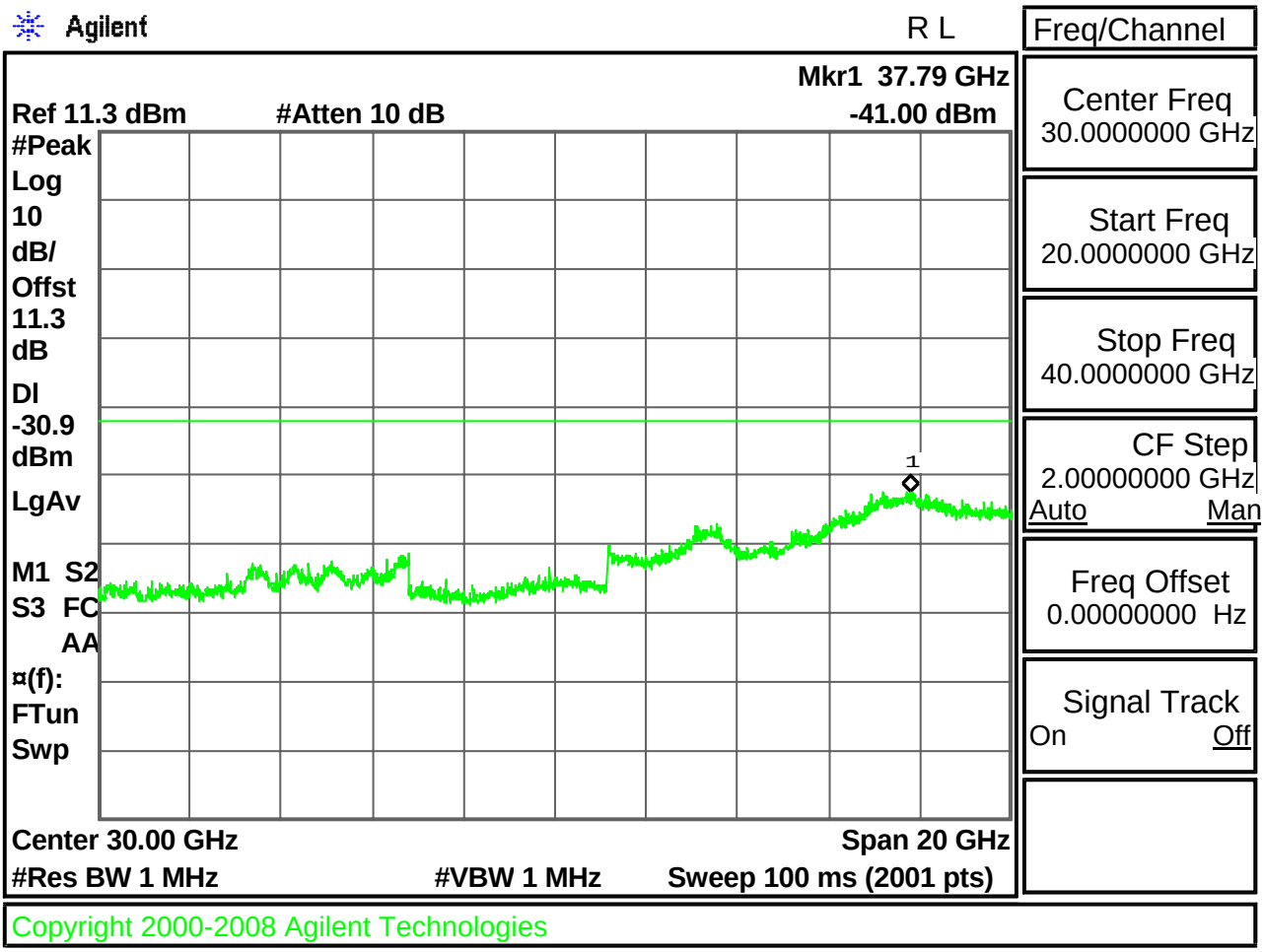

Agilent
R L
Mkr1 5.602 GHz
Ref 15.3 dBm
#Atten 14 dB
8.90 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

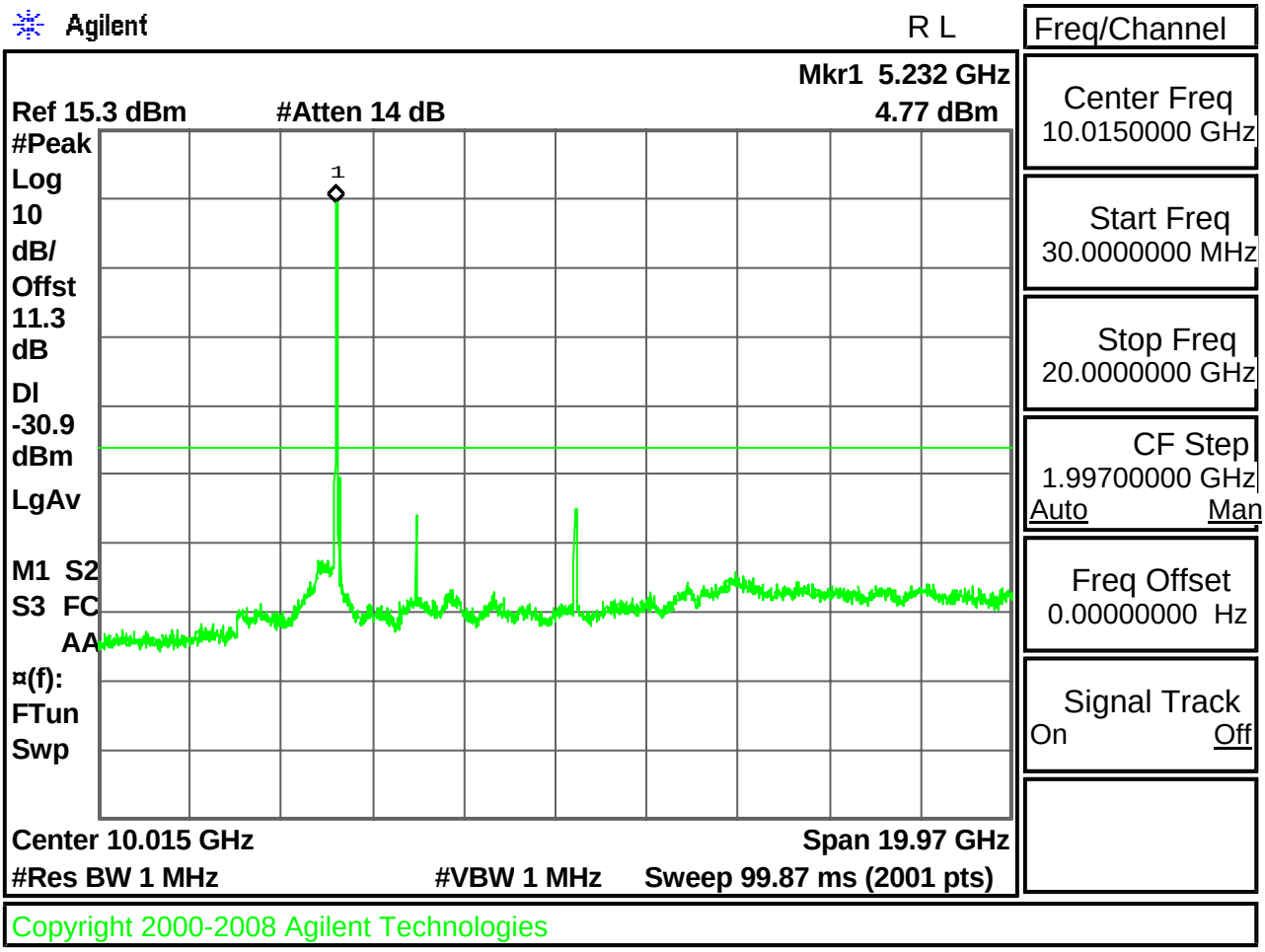

Agilent
R L
Freq/Channel
Mkr1 37.85 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.43 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

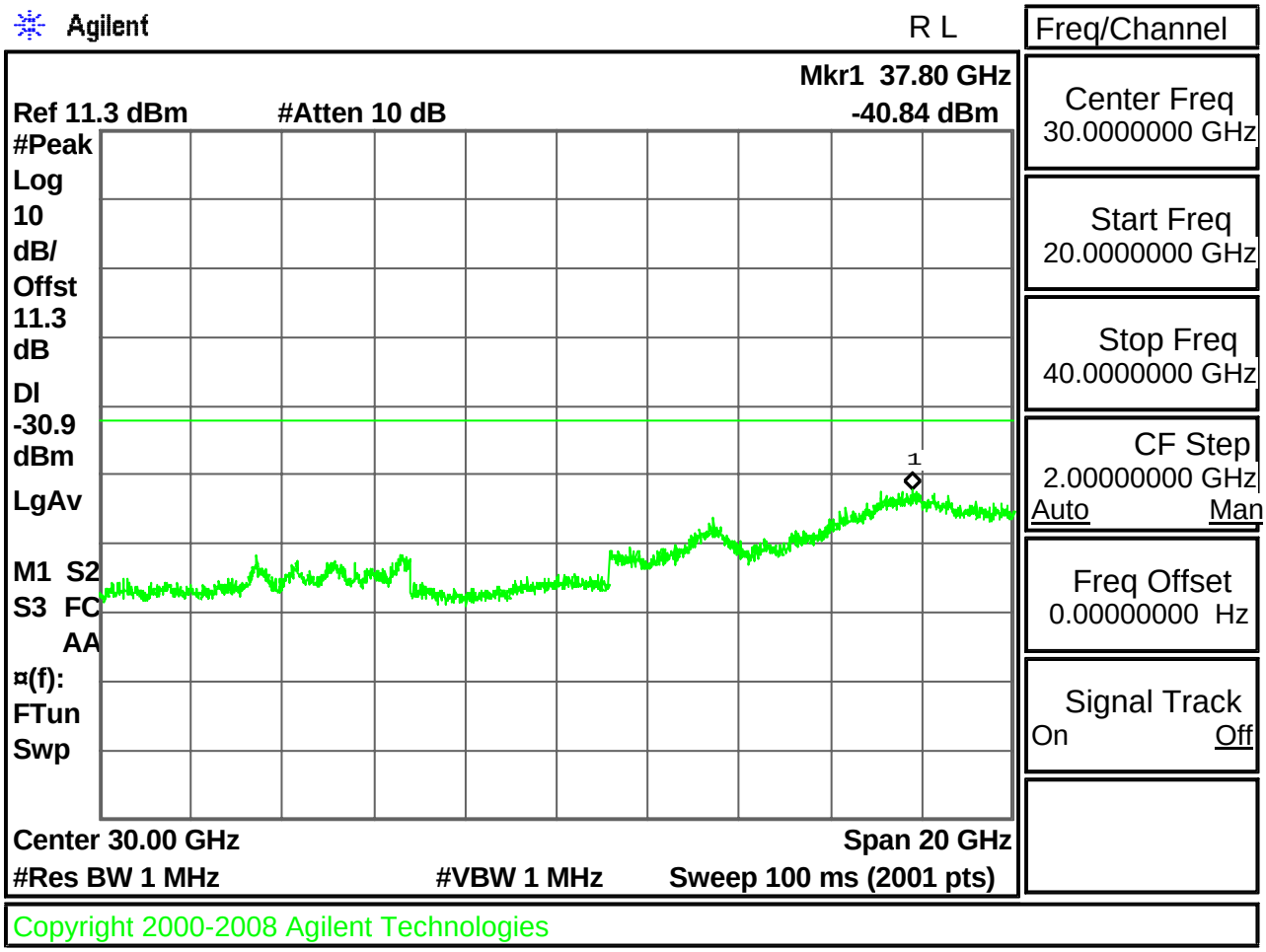

Agilent
R L
Freq/Channel
Mkr1 5.691 GHz
Ref 15.3 dBm
#Atten 14 dB
8.74 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

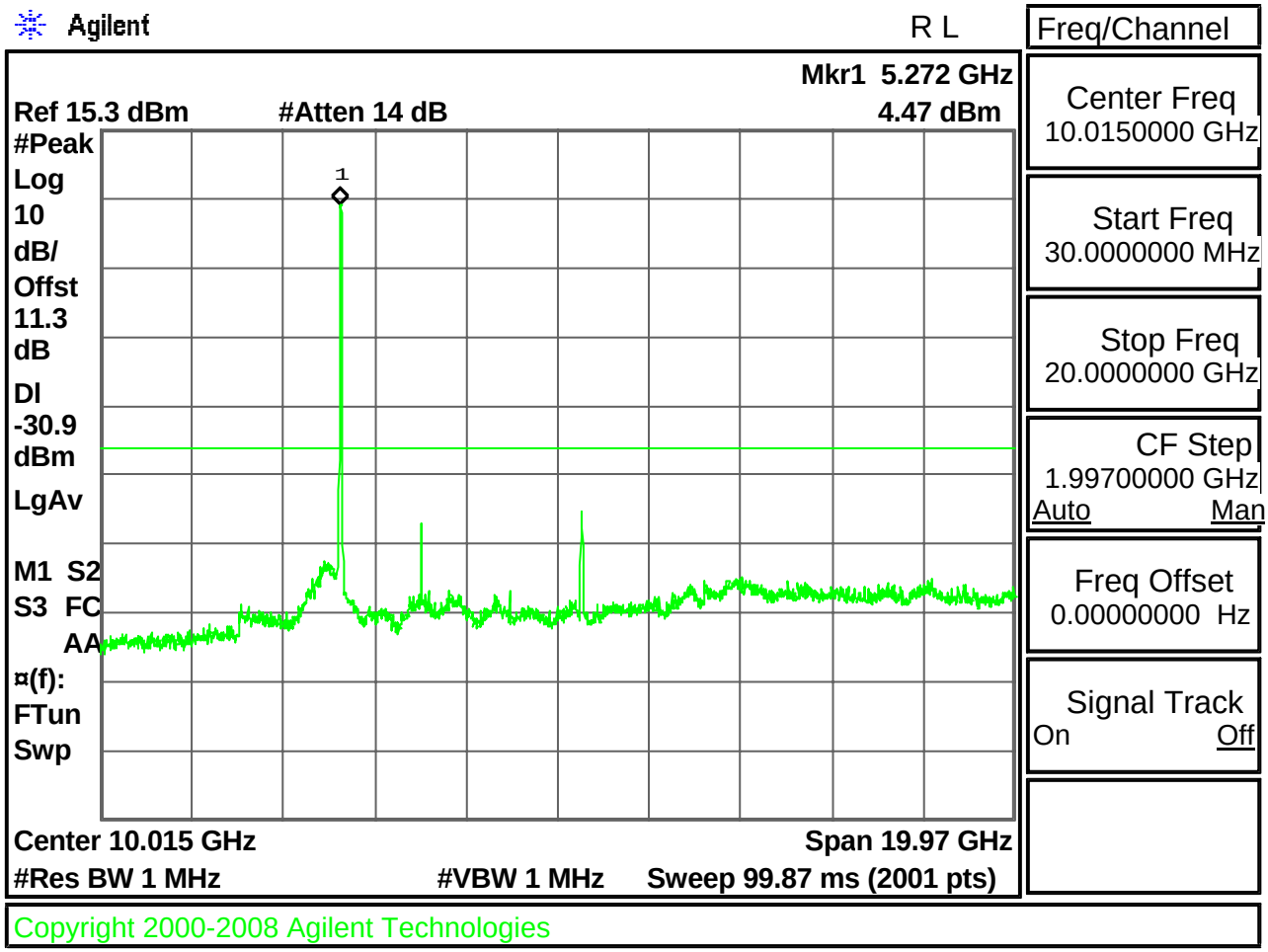

Agilent
R L
Freq/Channel
Mkr1 37.85 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.76 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

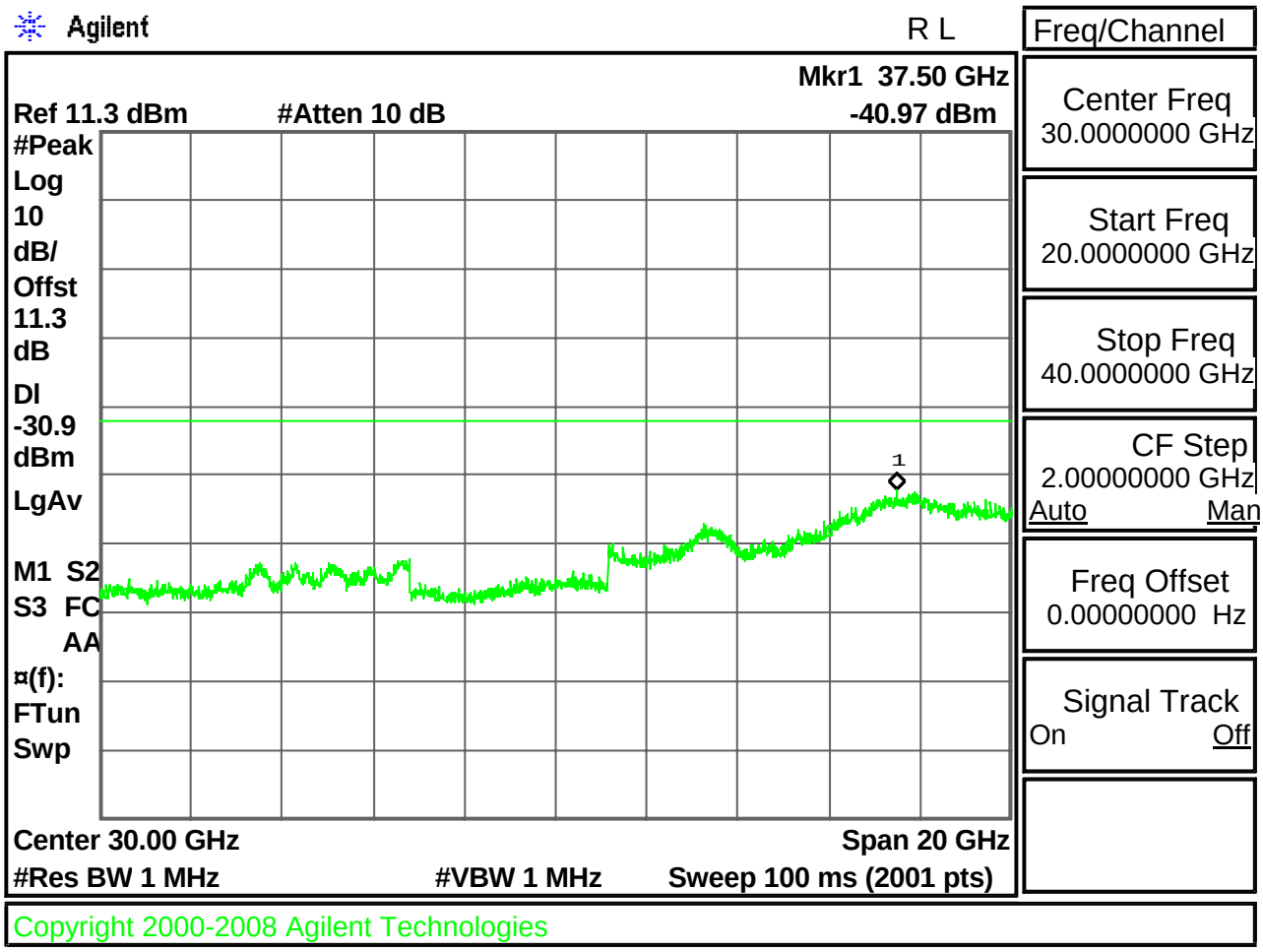

Agilent
R L
Mkr1 5.182 GHz
Ref 15.3 dBm
#Atten 14 dB
5.15 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

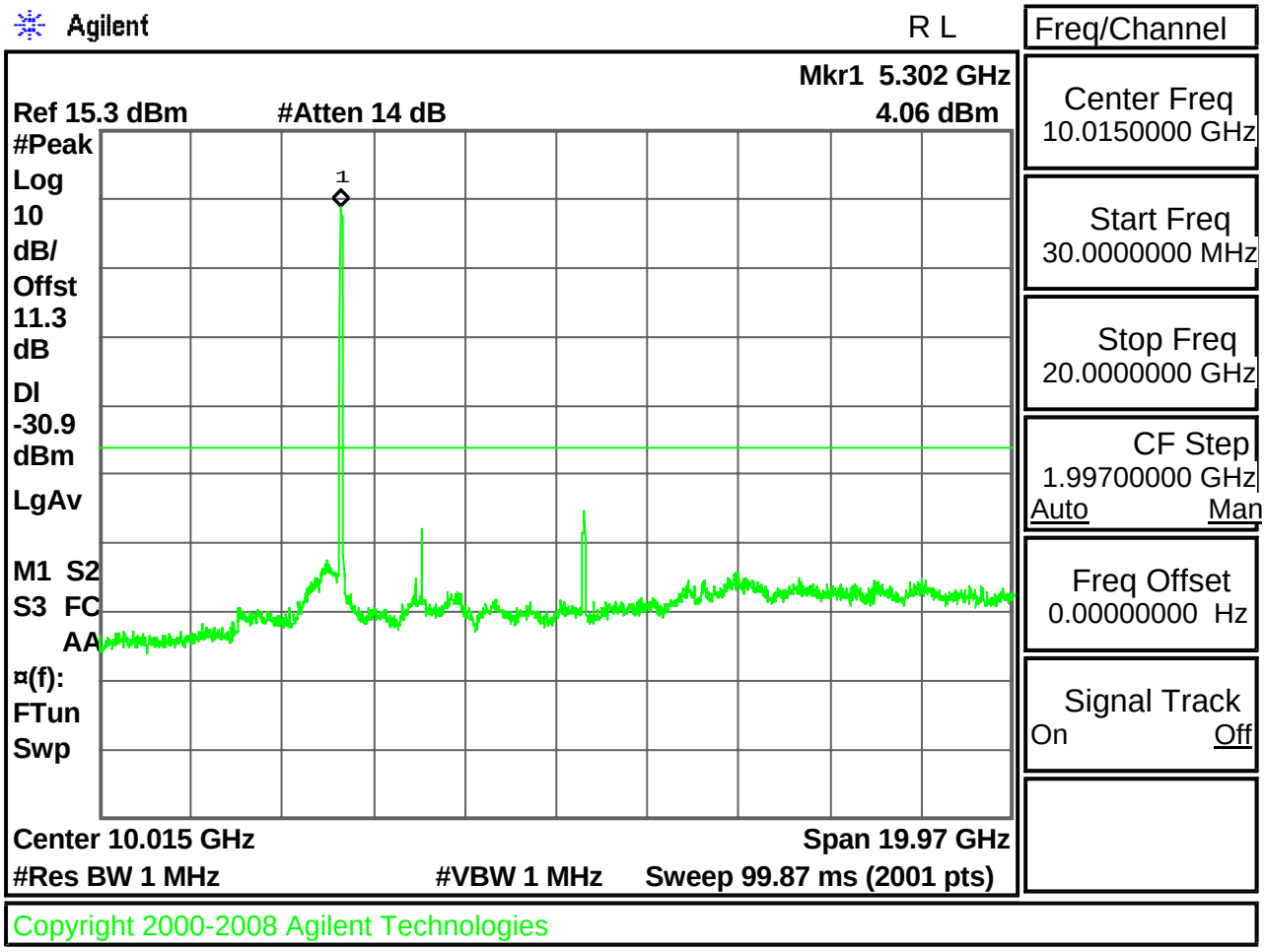

Agilent
R L
Mkr1 37.79 GHz
Ref 11.3 dBm
#Atten 10 dB
-41.00 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Freq/Channel
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

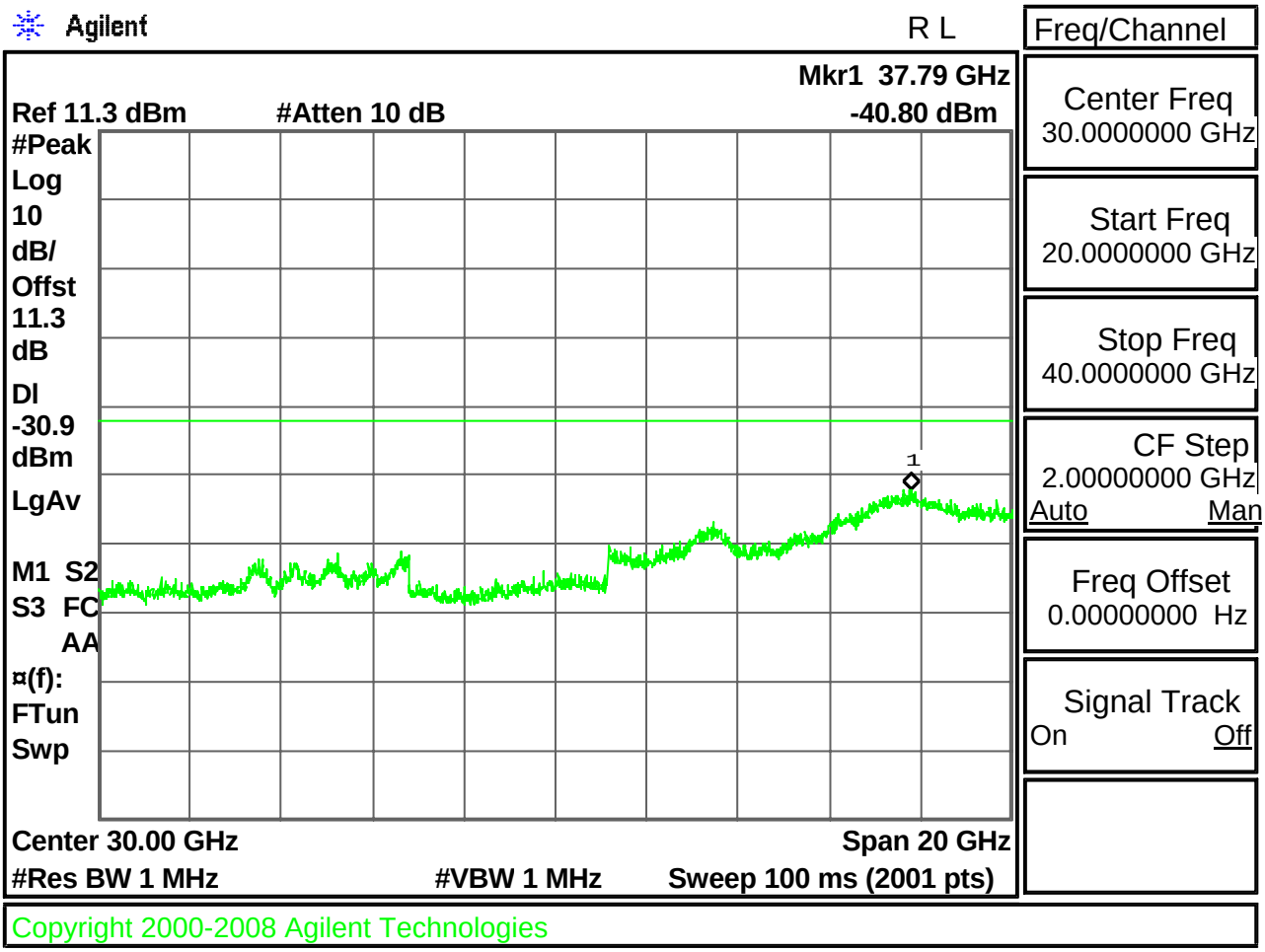

Agilent
R L
Freq/Channel
Mkr1 5.232 GHz
Ref 15.3 dBm
#Atten 14 dB
4.77 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

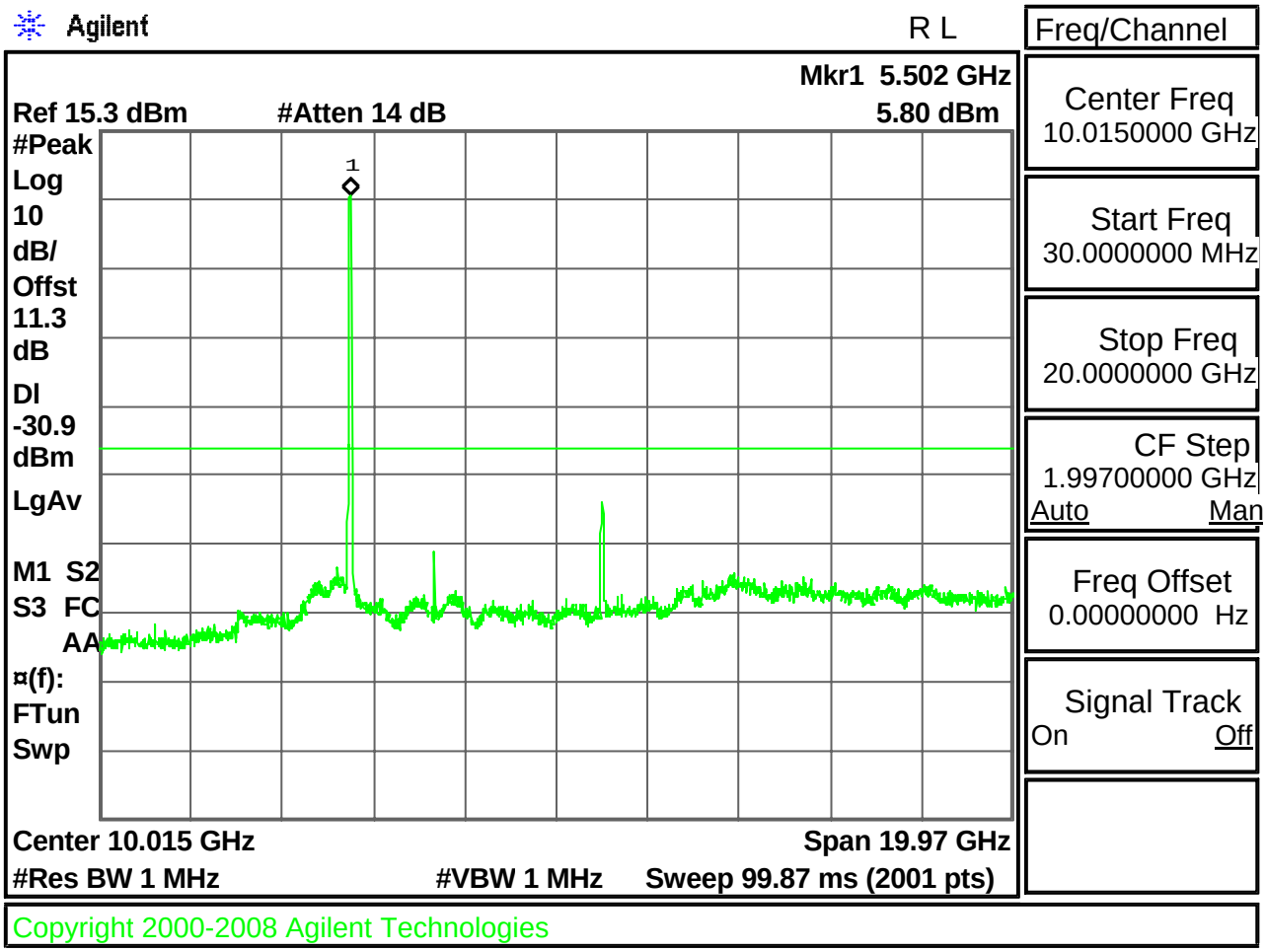

Agilent
R L
Freq/Channel
Mkr1 37.80 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.84 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

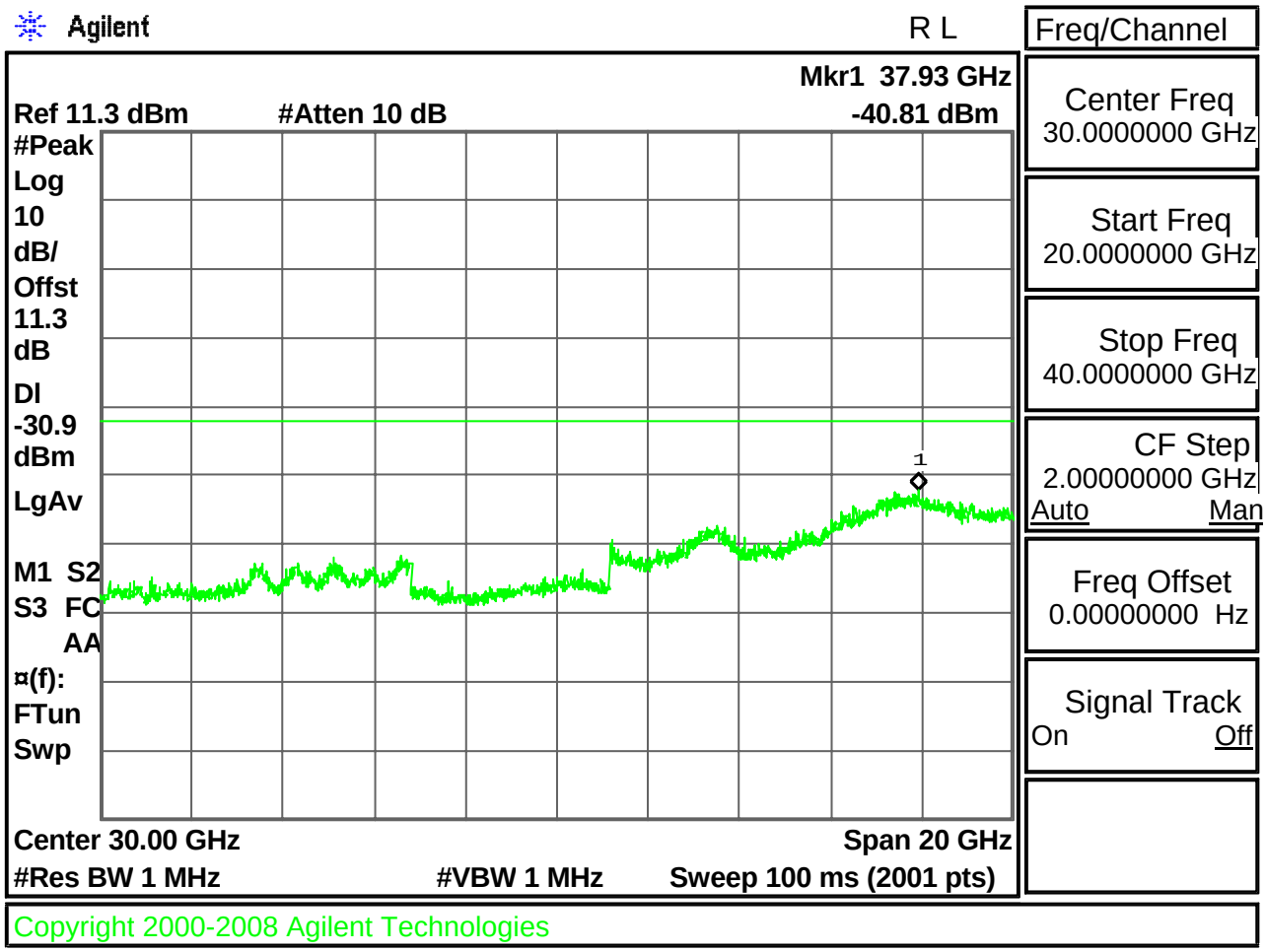

Agilent
R L
Freq/Channel
Mkr1 5.272 GHz
Ref 15.3 dBm
#Atten 14 dB
4.47 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

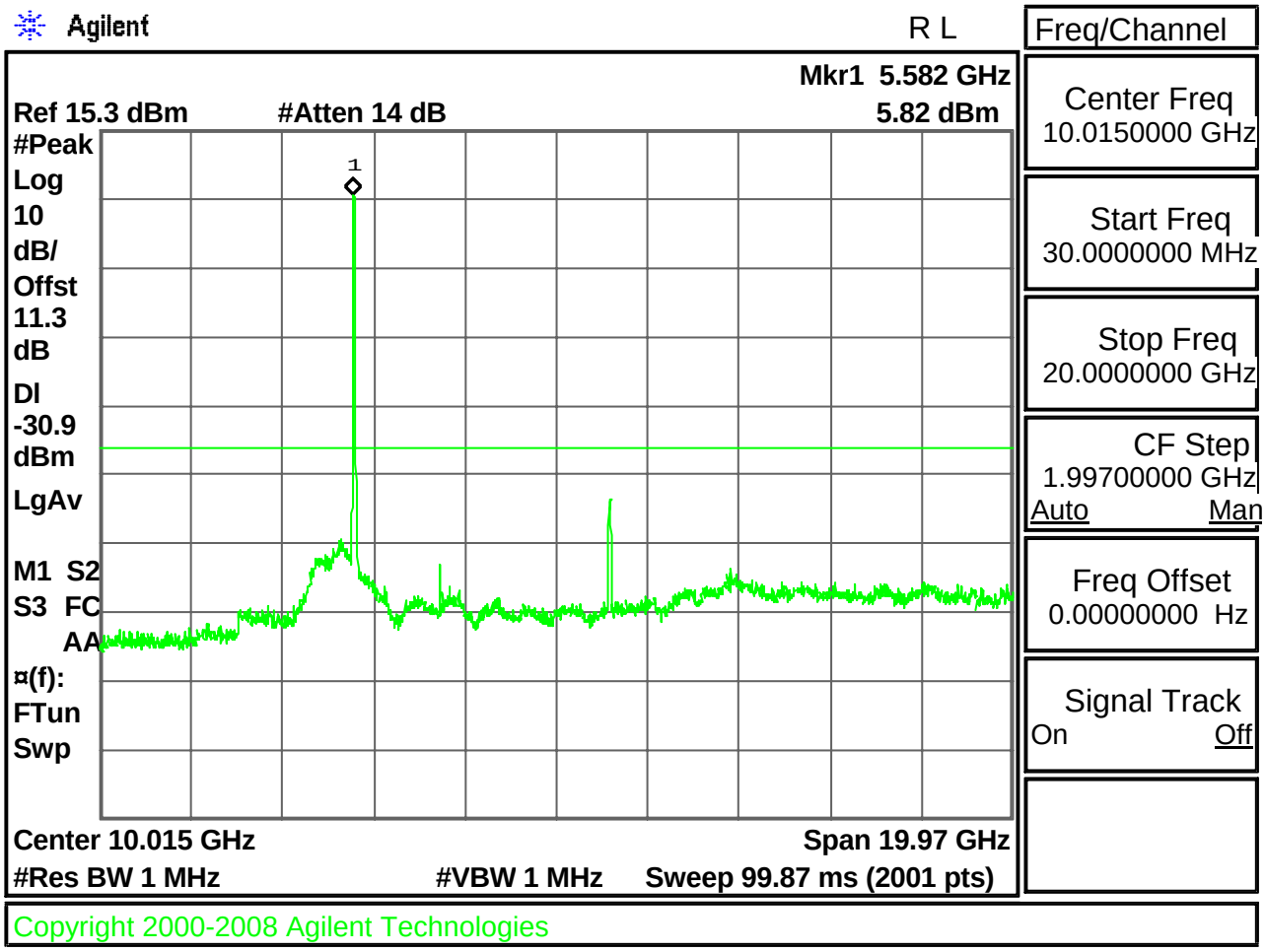

Agilent
R L
Freq/Channel
Mkr1 37.50 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.97 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

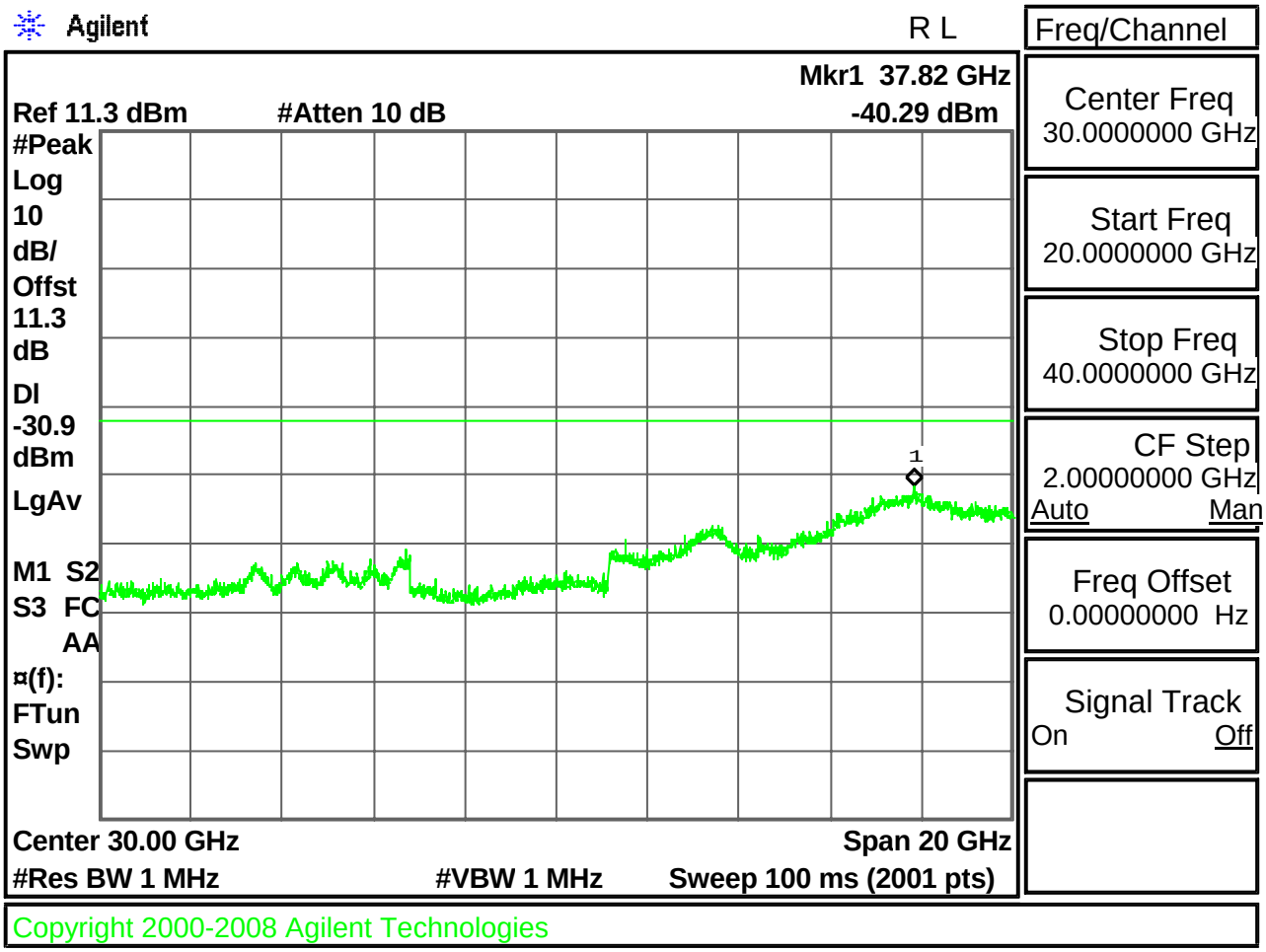

Agilent
R L
Freq/Channel
Mkr1 5.302 GHz
Ref 15.3 dBm
#Atten 14 dB
4.06 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

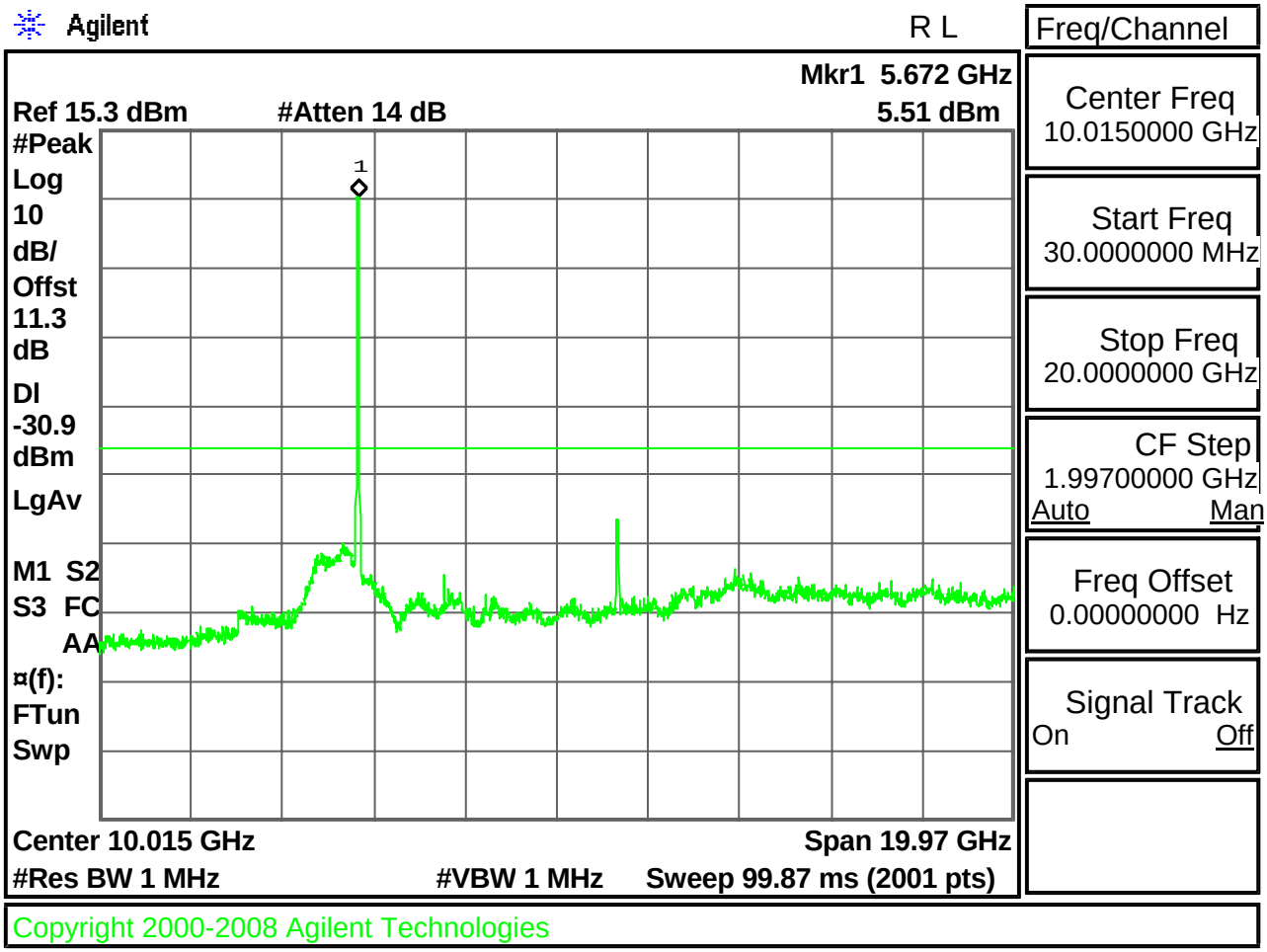

Agilent
R L
Freq/Channel
Mkr1 37.79 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.80 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

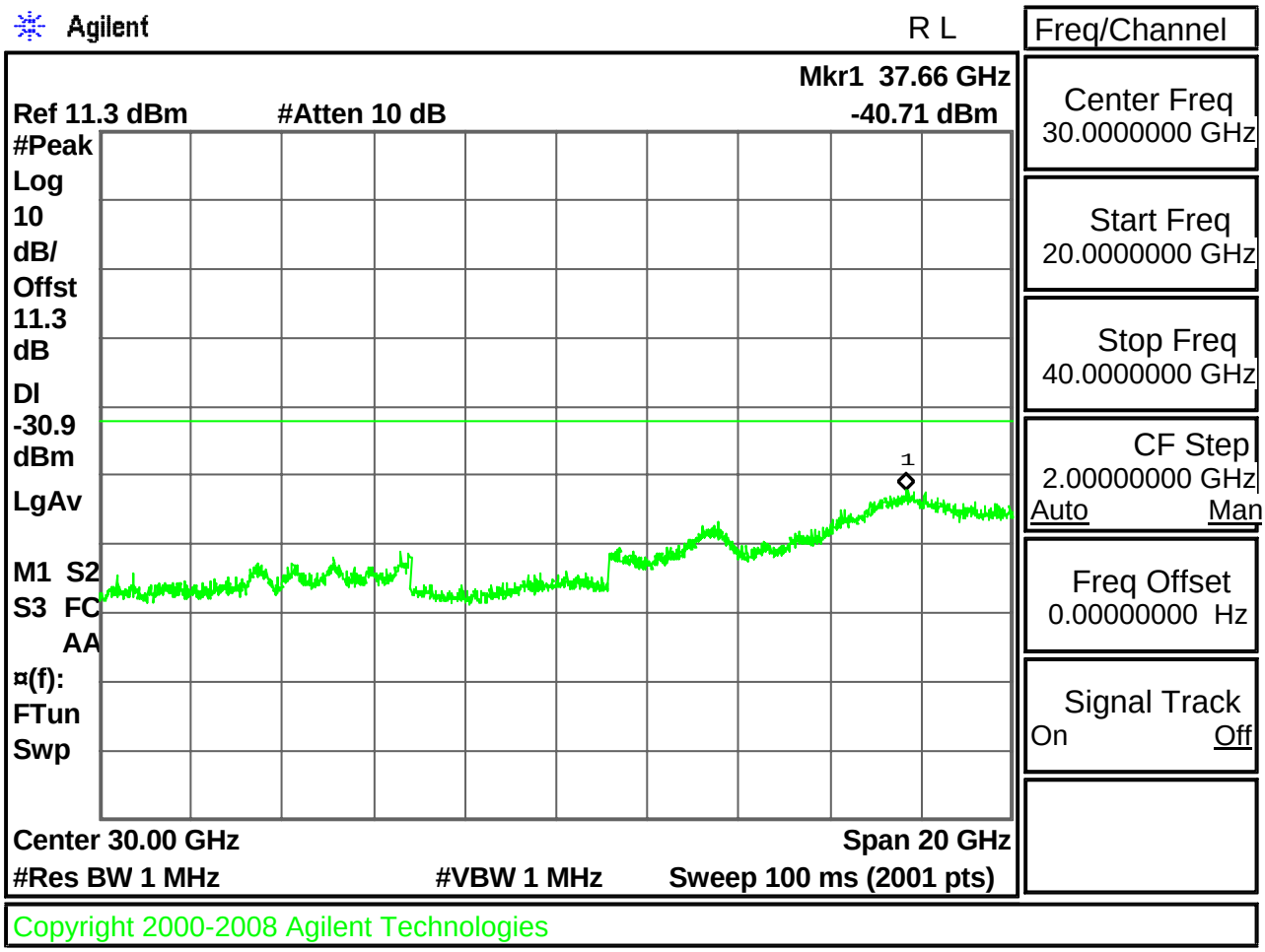

Agilent
R L
Mkr1 5.502 GHz
Ref 15.3 dBm
#Atten 14 dB
5.80 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Mkr1 37.93 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.81 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Freq/Channel
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Mkr1 5.582 GHz
Ref 15.3 dBm
#Atten 14 dB
5.82 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Freq/Channel
Mkr1 37.82 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.29 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Mkr1 5.672 GHz
Ref 15.3 dBm
#Atten 14 dB
5.51 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 10.015 GHz
Span 19.97 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 99.87 ms (2001 pts)
Freq/Channel
Center Freq
10.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
20.0000000 GHz
CF Step
1.99700000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies


Agilent
R L
Freq/Channel
Mkr1 37.66 GHz
Ref 11.3 dBm
#Atten 10 dB
-40.71 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 30.00 GHz
Span 20 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 100 ms (2001 pts)
Center Freq
30.0000000 GHz
Start Freq
20.0000000 GHz
Stop Freq
40.0000000 GHz
CF Step
2.00000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

## 10.5 Measurement Data-Bandedges

### 10.5.1 IEEE 802.11a

10.5.1.1 5.2GHz

Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 36 | 5180 | Page 219 |

Frequency Band: 5150 MHz ~ 5250 MHz

All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1. Please refer to page 219 for chart*

*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

10.5.1.2 5.3GHz

Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 64 | 5320 | Page 220 |

Frequency Band: 5250 MHz ~ 5350 MHz

All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1. Please refer to page 220 for chart*

*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

10.5.1.3 5.6GHz

Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 100 | 5500 | Page 221 |
| 140 | 5700 | Page 222 |

Frequency Band: 5470 MHz ~ 5725 MHz

All out-of –band conducted emissions were more than EIRP of –27 dBm /MHz.

*Note: 1.Please refer to page 221 to page 222 for chart*

*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

### 10.5.2 IEEE 802.11an, HT20

10.5.2.1 5.2GHz

Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 36 | 5180 | Page 223 |

Frequency Band: 5150 MHz ~ 5250 MHz

All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1. Please refer to page 223 for chart*

*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

10.5.2.2 5.3GHz

Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 64 | 5320 | Page 224 |

Frequency Band: 5250 MHz ~ 5350 MHz

All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1. Please refer to page 224 for chart*

*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

10.5.2.3 5.6GHz

Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 100 | 5500 | Page 225 |
| 140 | 5700 | Page 226 |

Frequency Band: 5470 MHz ~ 5725 MHz

All out-of –band conducted emissions were more than EIRP of –27 dBm /MHz.

*Note: 1.Please refer to page 225 to page 226 for chart*

*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

### 10.5.3 IEEE 802.11an, HT40

10.5.3.1 5.2GHz

Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 38 | 5190 | Page 227 |

Frequency Band: 5150 MHz ~ 5250 MHz
All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.

*Note: 1.Please refer to page 227 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

10.5.3.2 5.3GHz

Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 62 | 5310 | Page 228 |

Frequency Band: 5250 MHz ~ 5350 MHz
All emissions outside of the51.5-5.35 GHz band shell not exceed an EIRP of –27 dBm /MHz.
*Note: 1.Please refer to page 228 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

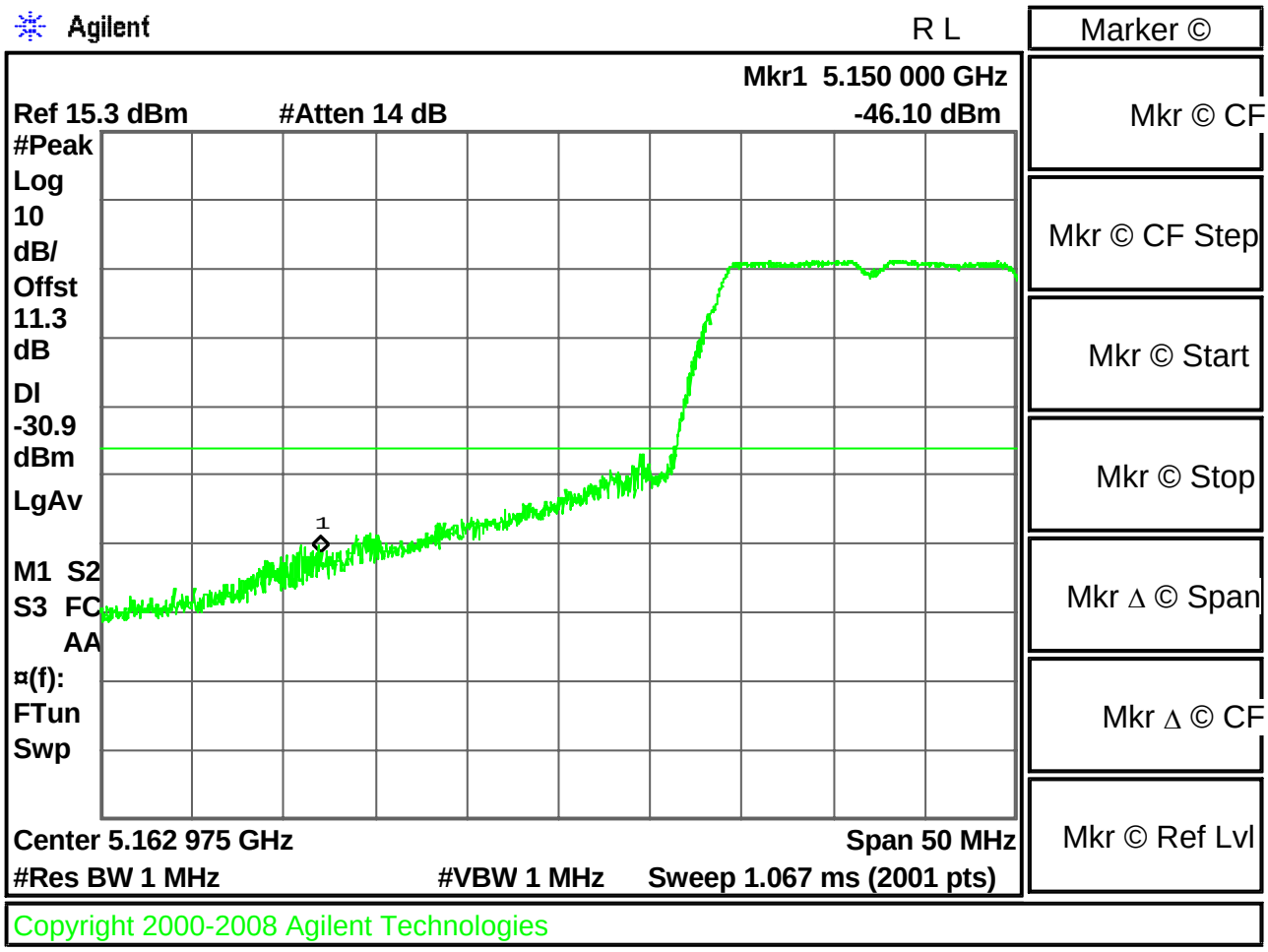
10.5.3.3 5.6GHz

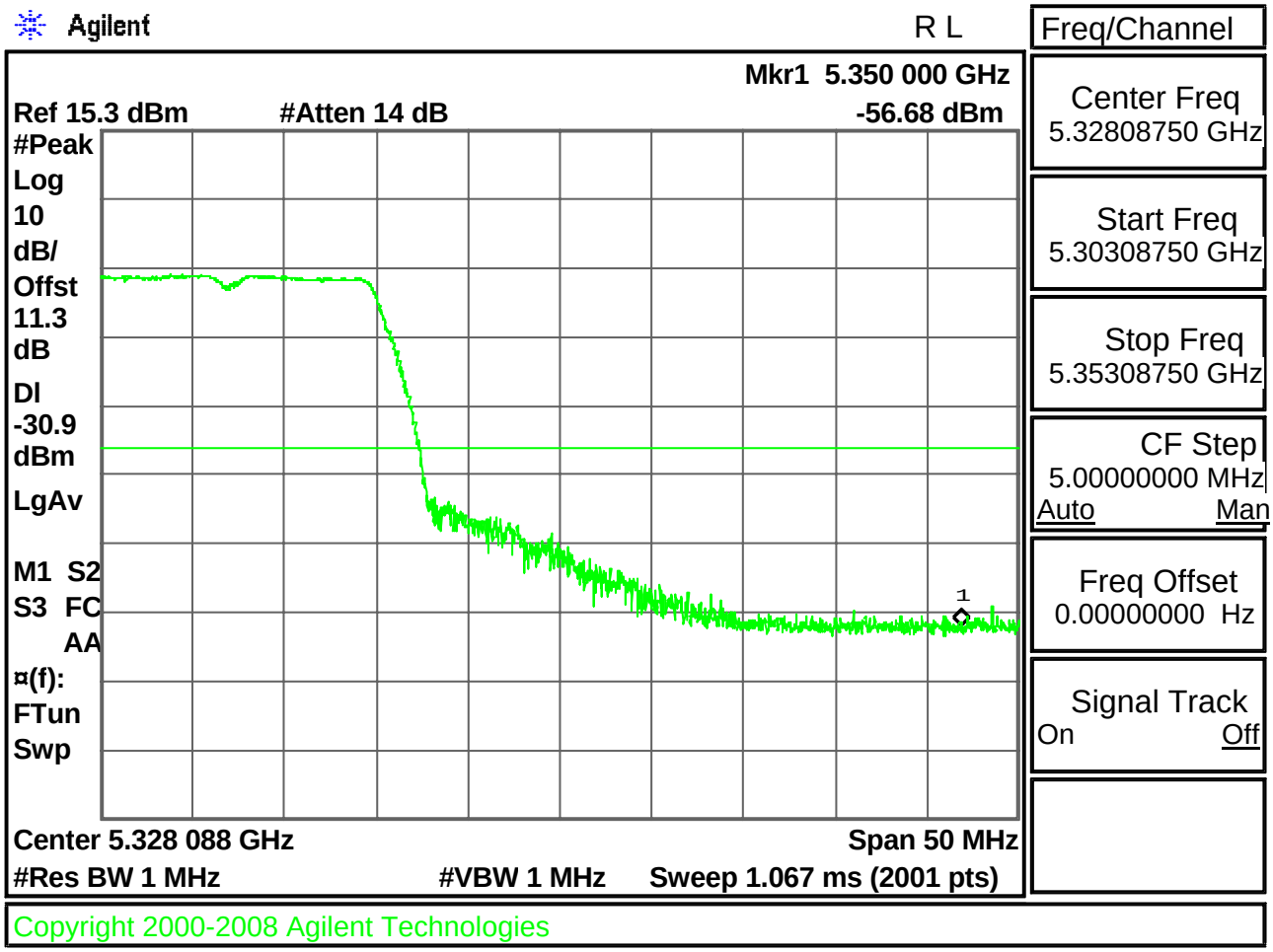
Test Date: Nov. 24, 2011 Temperature: 28℃ Humidity: 55%

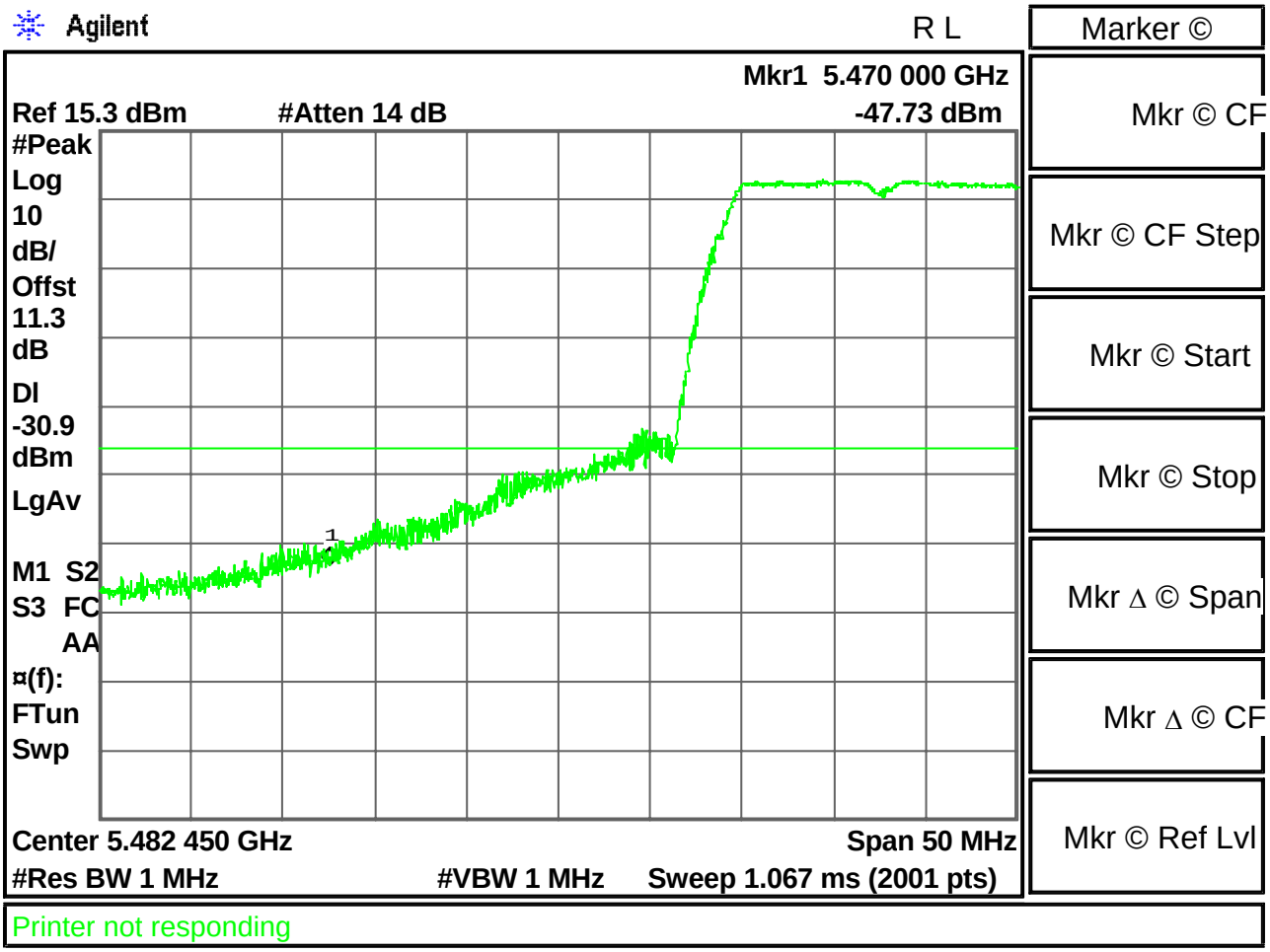
| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 102 | 5510 | Page 229 |
| 134 | 5670 | Page 230 |

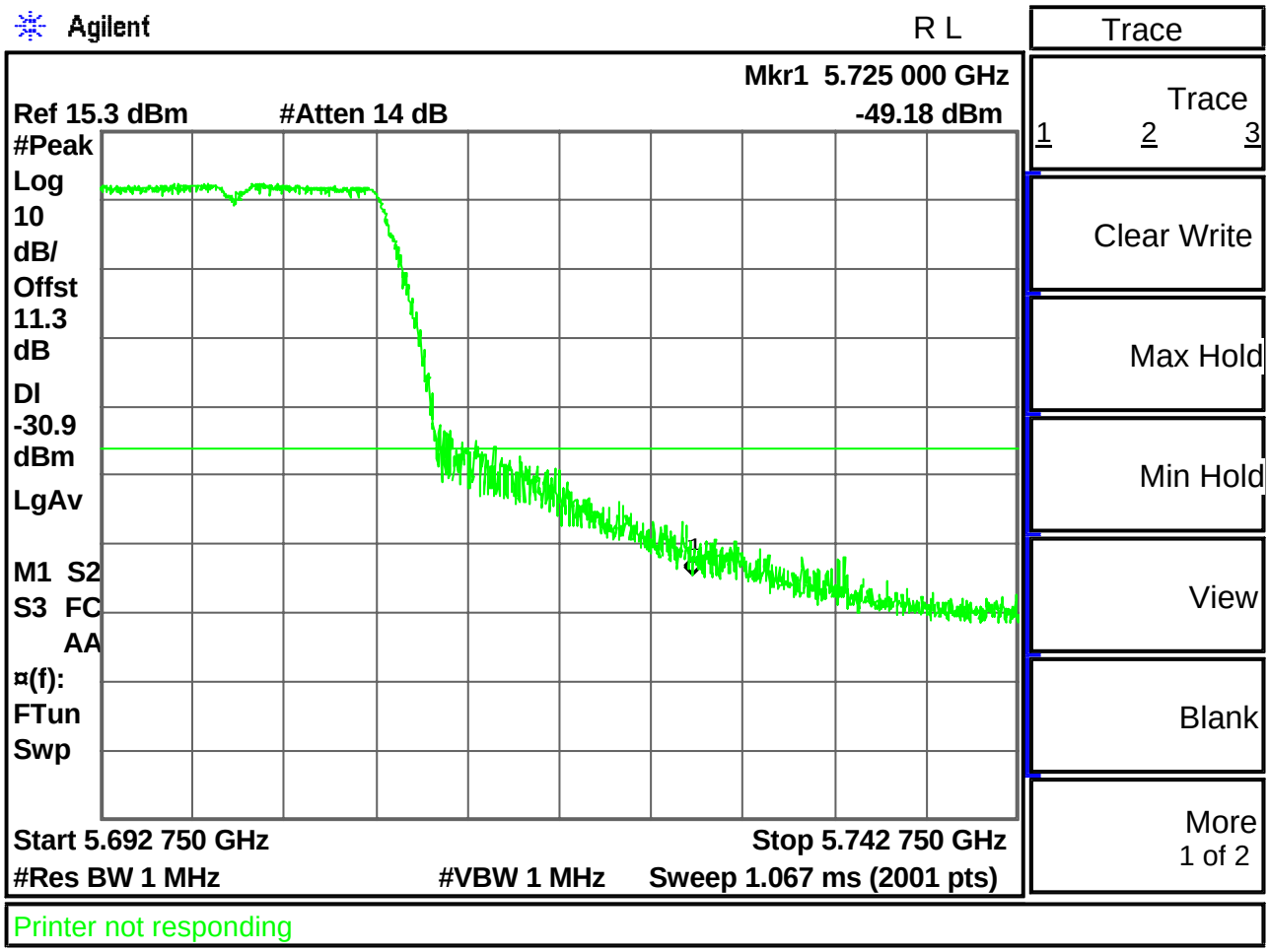
Frequency Band: 5470 MHz ~ 5725 MHz
All out-of –band conducted emissions were more than EIRP of –27 dBm /MHz.

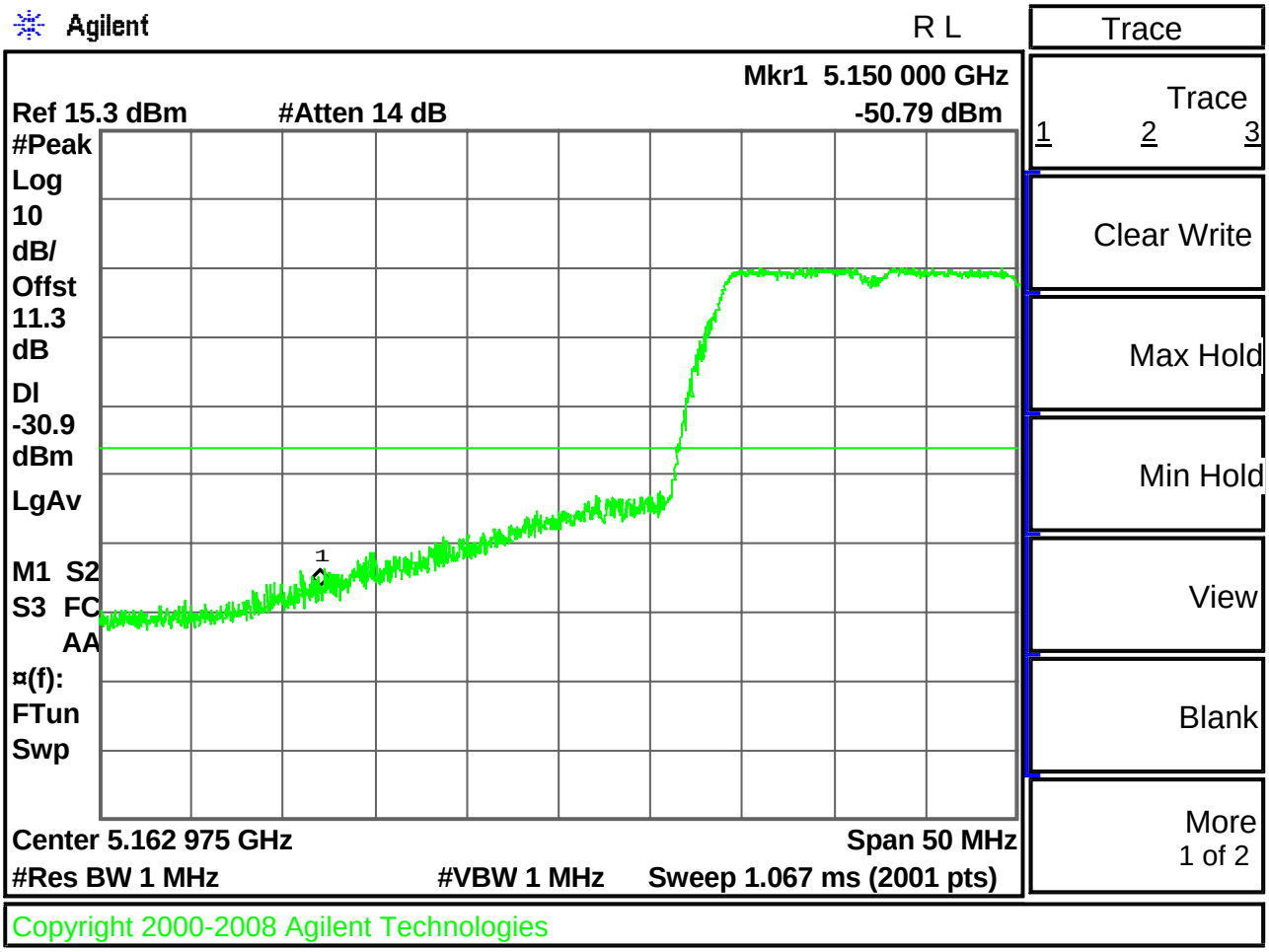
*Note: 1.Please refer to page 229 to page 230 for chart*
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

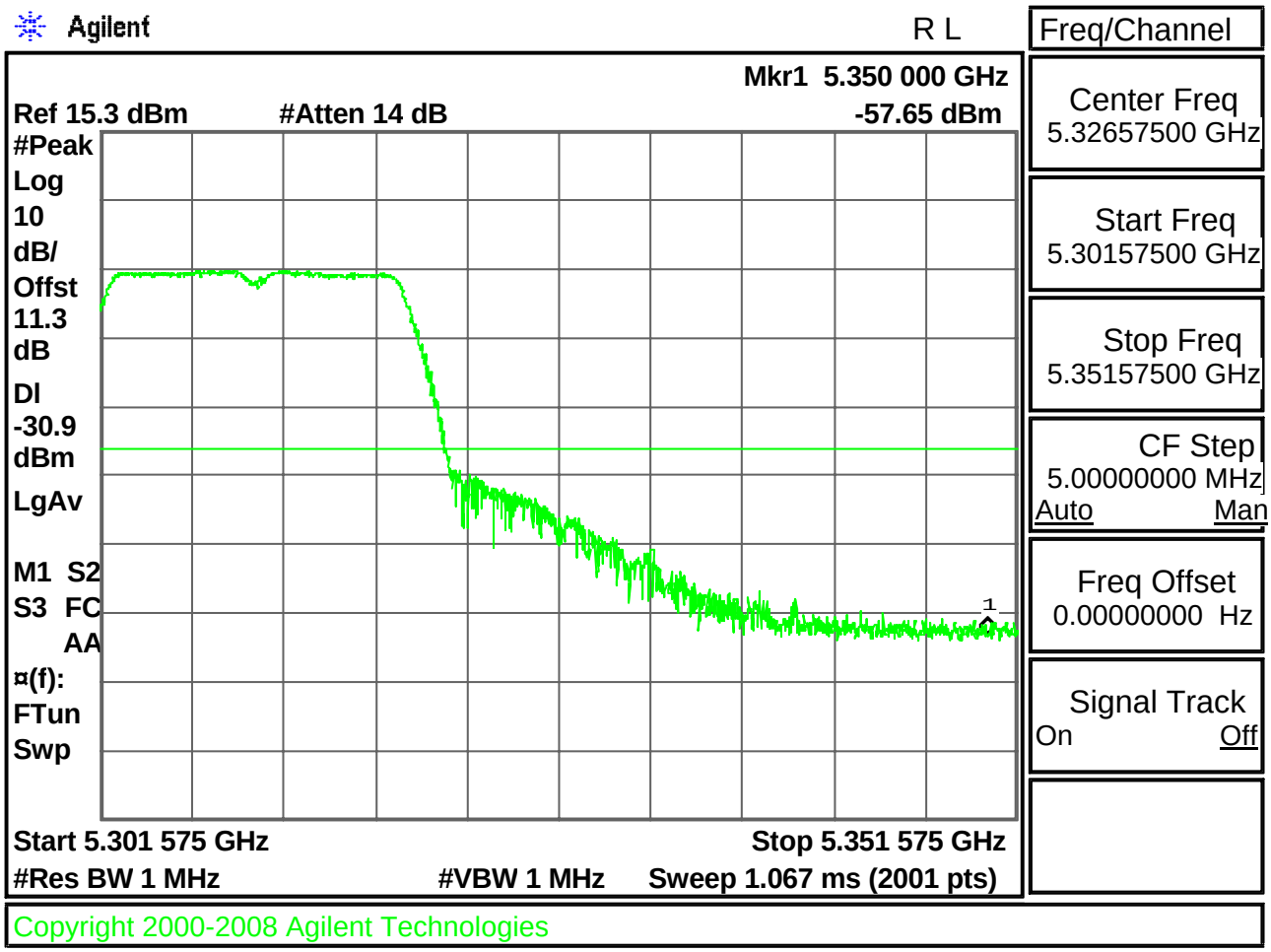

Agilent
R L
Marker ©
Mkr1 5.150 000 GHz
Ref 15.3 dBm
#Atten 14 dB
-46.10 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 5.162 975 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Mkr © CF
Mkr © CF Step
Mkr © Start
Mkr © Stop
Mkr Δ © Span
Mkr Δ © CF
Mkr © Ref Lvl
Copyright 2000-2008 Agilent Technologies

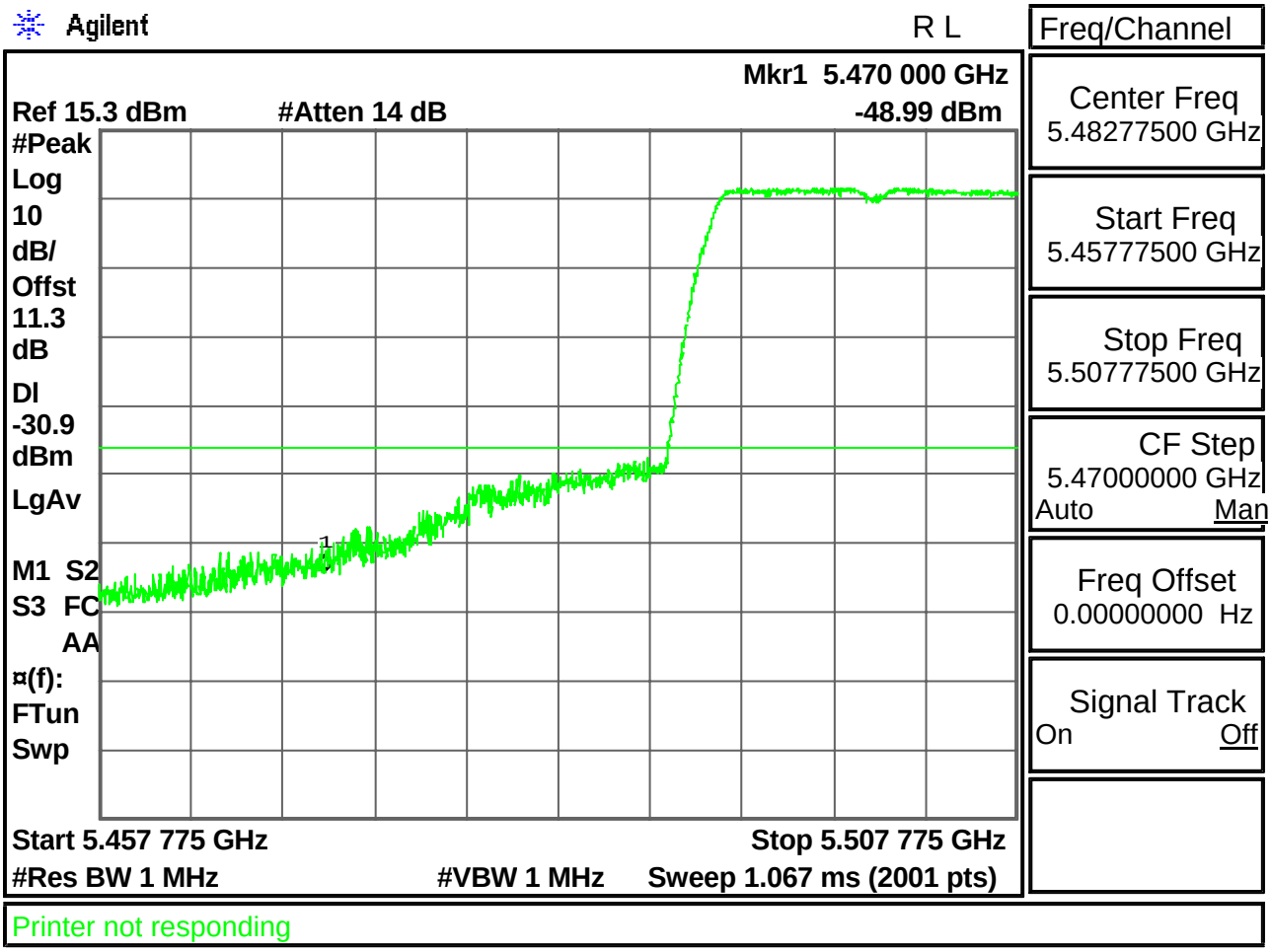

Agilent
R L
Mkr1 5.350 000 GHz
Ref 15.3 dBm
#Atten 14 dB
-56.68 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 5.328 088 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Freq/Channel
Center Freq
5.32808750 GHz
Start Freq
5.30308750 GHz
Stop Freq
5.35308750 GHz
CF Step
5.00000000 MHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

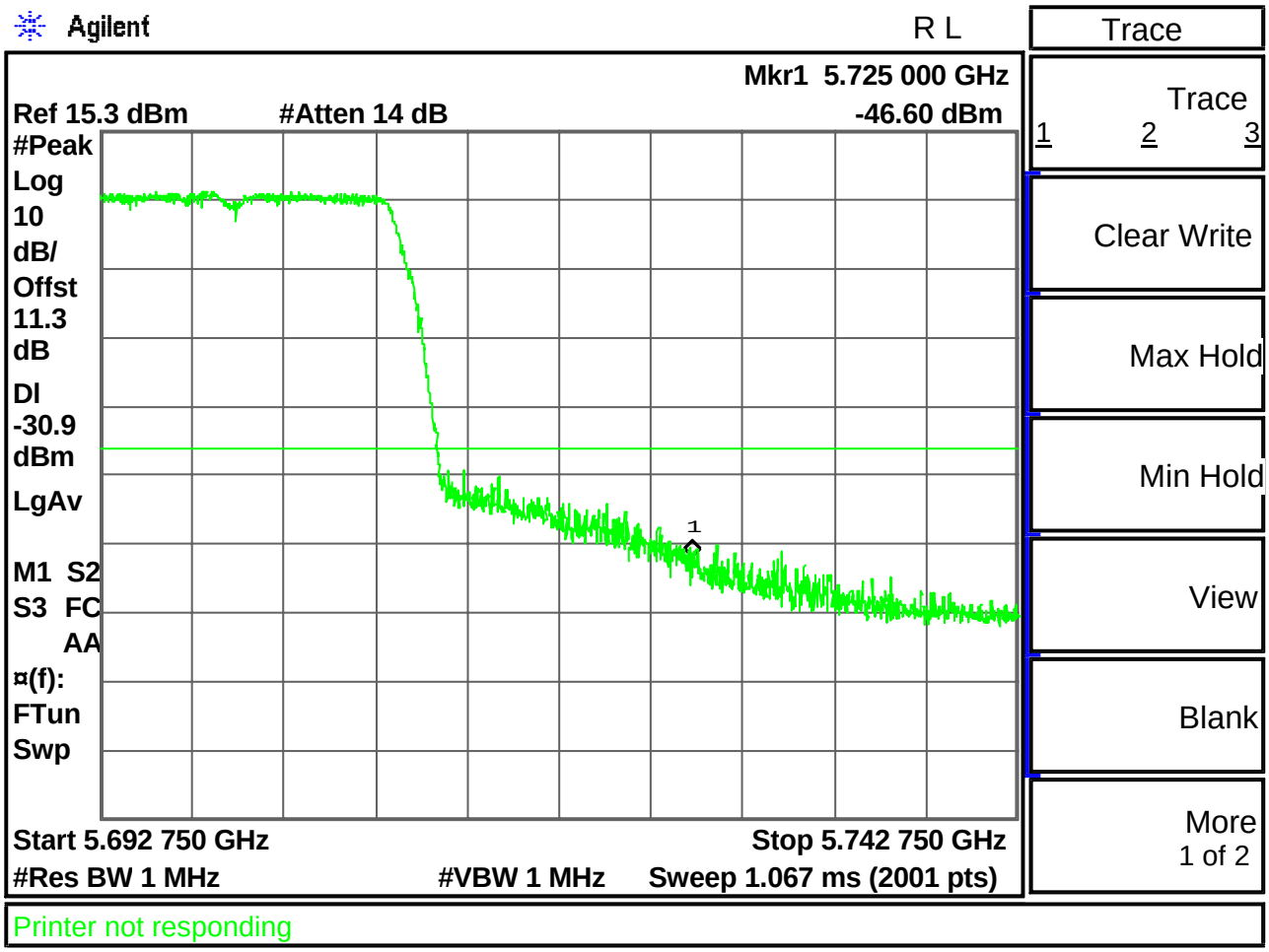

Agilent
R L
Marker ©
Mkr1 5.470 000 GHz
Ref 15.3 dBm
#Atten 14 dB
-47.73 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Mkr © CF
Mkr © CF Step
Mkr © Start
Mkr © Stop
Mkr Δ © Span
Mkr Δ © CF
Mkr © Ref Lvl
Center 5.482 450 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Printer not responding

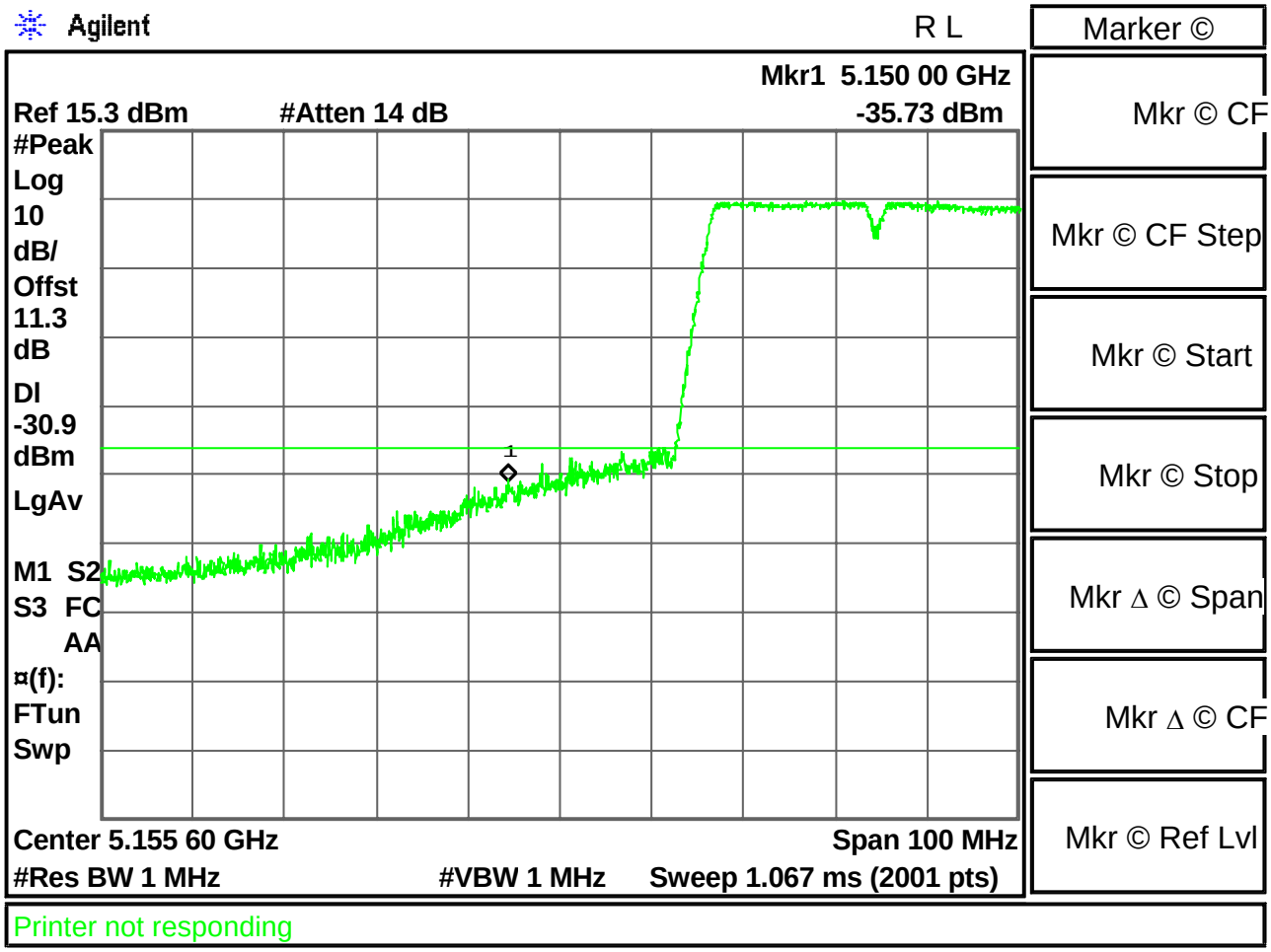

Agilent
R L
Mkr1 5.725 000 GHz
Ref 15.3 dBm
#Atten 14 dB
-49.18 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Start 5.692 750 GHz
Stop 5.742 750 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Printer not responding

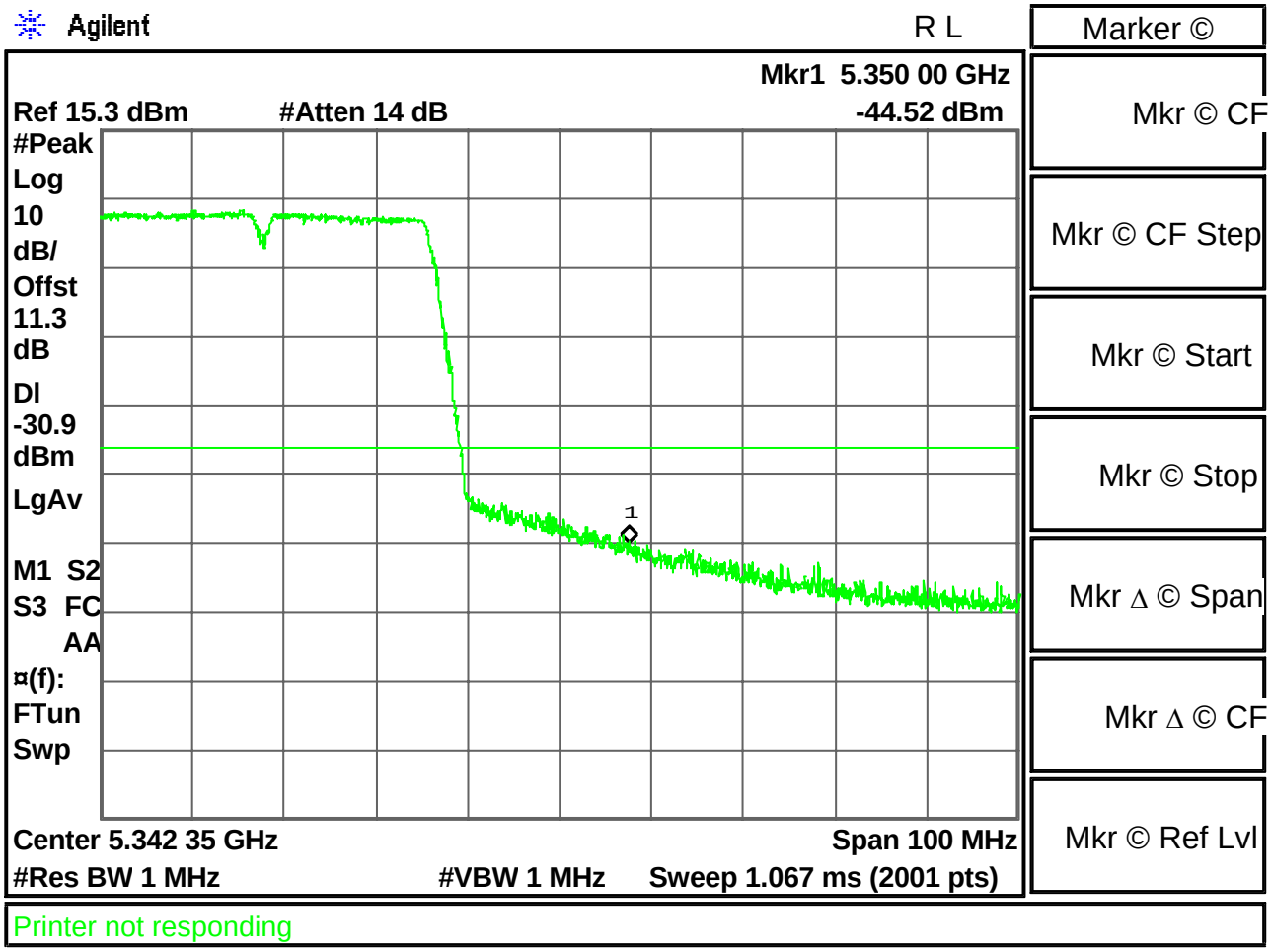

Agilent
R L
Trace
Mkr1 5.150 000 GHz
Ref 15.3 dBm
#Atten 14 dB
-50.79 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Center 5.162 975 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Copyright 2000-2008 Agilent Technologies

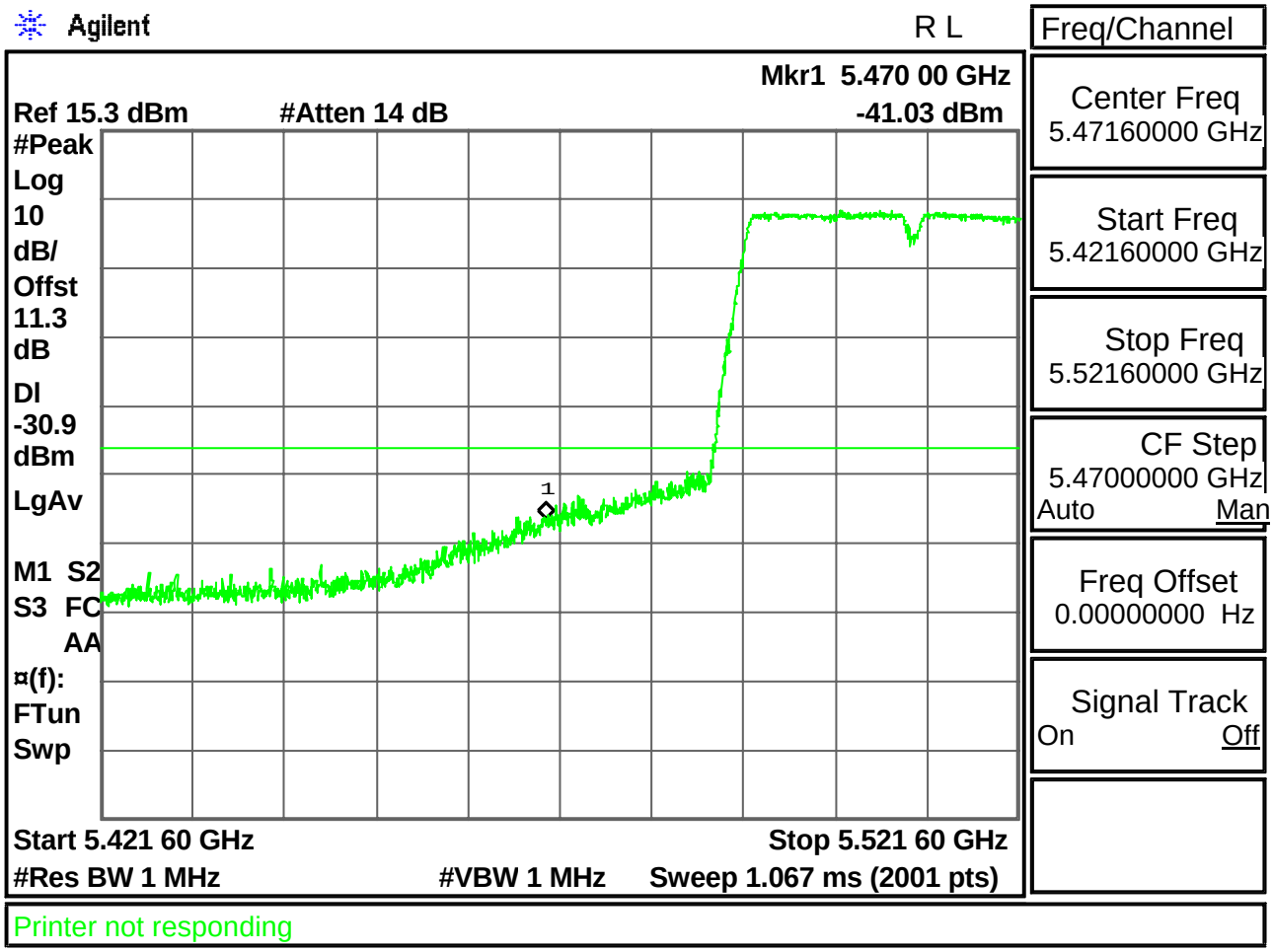

Agilent
R L
Mkr1 5.350 000 GHz
Ref 15.3 dBm
#Atten 14 dB
-57.65 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Start 5.301 575 GHz
Stop 5.351 575 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Freq/Channel
Center Freq
5.32657500 GHz
Start Freq
5.30157500 GHz
Stop Freq
5.35157500 GHz
CF Step
5.00000000 MHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Copyright 2000-2008 Agilent Technologies

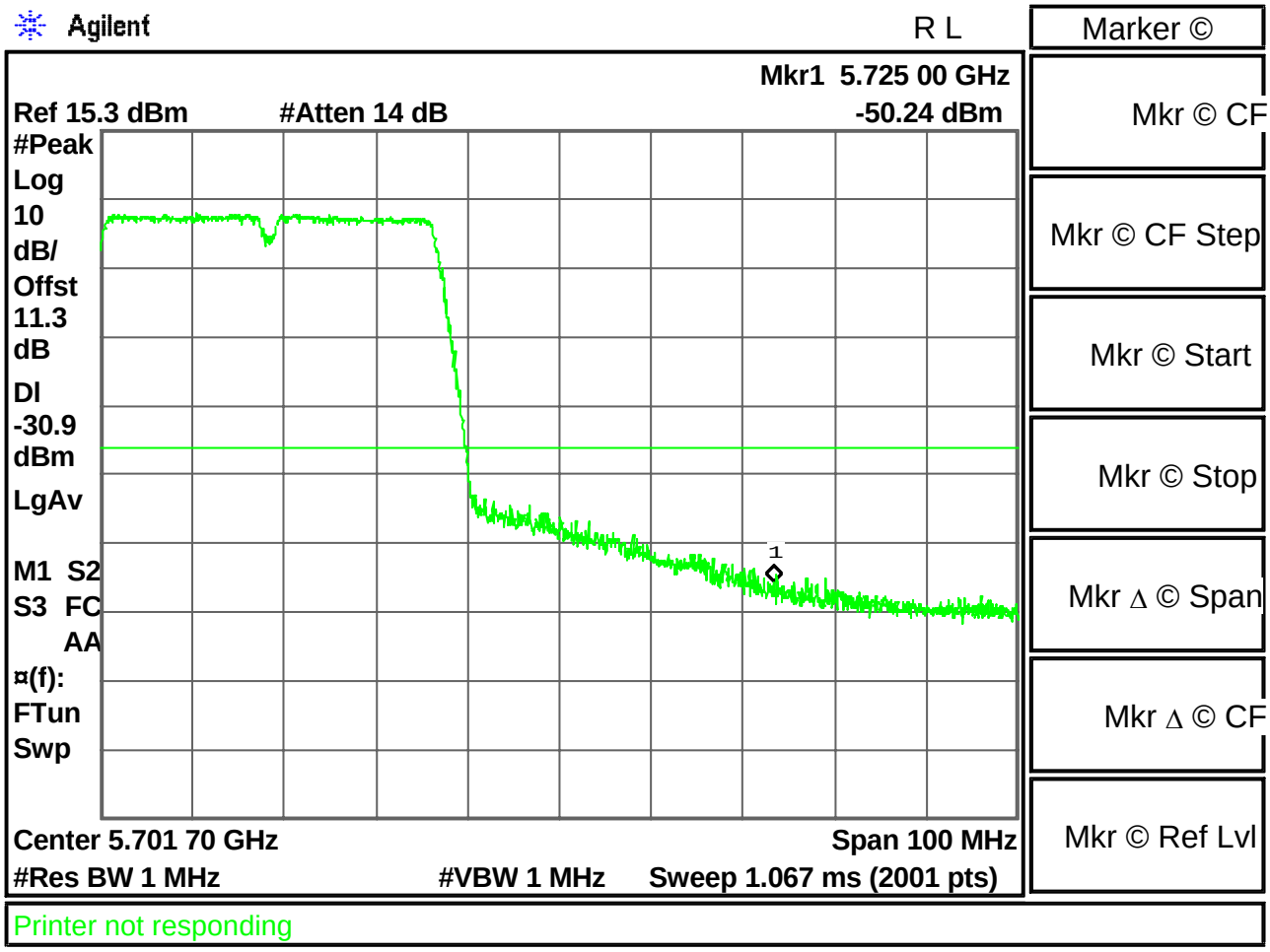

Agilent
R L
Mkr1 5.470 000 GHz
Ref 15.3 dBm
#Atten 14 dB
-48.99 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Start 5.457 775 GHz
Stop 5.507 775 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Freq/Channel
Center Freq
5.48277500 GHz
Start Freq
5.45777500 GHz
Stop Freq
5.50777500 GHz
CF Step
5.47000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Printer not responding


Agilent
R L
Trace
Mkr1 5.725 000 GHz
Ref 15.3 dBm
#Atten 14 dB
-46.60 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Start 5.692 750 GHz
Stop 5.742 750 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Printer not responding


Agilent
R L
Marker ©
Mkr1 5.150 00 GHz
Ref 15.3 dBm
#Atten 14 dB
-35.73 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Mkr © CF
Mkr © CF Step
Mkr © Start
Mkr © Stop
Mkr Δ © Span
Mkr Δ © CF
Mkr © Ref Lvl
Center 5.155 60 GHz
Span 100 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Printer not responding


Agilent
R L
Marker ©
Mkr1 5.350 00 GHz
Ref 15.3 dBm
#Atten 14 dB
-44.52 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Center 5.342 35 GHz
Span 100 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Mkr © CF
Mkr © CF Step
Mkr © Start
Mkr © Stop
Mkr Δ © Span
Mkr Δ © CF
Mkr © Ref Lvl
Printer not responding


Agilent
R L
Mkr1 5.470 00 GHz
Ref 15.3 dBm
#Atten 14 dB
-41.03 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Start 5.421 60 GHz
Stop 5.521 60 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Freq/Channel
Center Freq
5.47160000 GHz
Start Freq
5.42160000 GHz
Stop Freq
5.52160000 GHz
CF Step
5.47000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Printer not responding


Agilent
R L
Marker ©
Mkr1 5.725 00 GHz
Ref 15.3 dBm
#Atten 14 dB
-50.24 dBm
#Peak
Log
10
dB/
Offst
11.3
dB
Dl
-30.9
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
1
Mkr © CF
Mkr © CF Step
Mkr © Start
Mkr © Stop
Mkr Δ © Span
Mkr Δ © CF
Mkr © Ref Lvl
Center 5.701 70 GHz
Span 100 MHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 1.067 ms (2001 pts)
Printer not responding

# 11 RADIATED EMISSION MEASUREMENT

## 11.1 Standard Applicable

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

According to §15.407 (b), the provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

## 11.2 Measurement rocedure

**A.Preliminary Measurement For Portable Devices.**

For portable devices, the following procedure was performed to determine the maximum emission axis of EUT (X, Y and Z axis):

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antennna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. The axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.
4. The position in which the maximum noise occurred was “X axis”. (Please see the test setup photos)

**B. Final Measurement**

1. Setup the configuration per figure 3 and 4 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, it is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions. For emission frequencies measured above 1 GHz, a pre-scan be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 120 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
   Note : A filter was used to avoid pre-amplifier saturated when measure TX operation mode.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the datarate, placement of ANT. cables associated with EUT to obtain the worse case and record the result.

Figure 3 : Frequencies measured below 1 GHz configuration

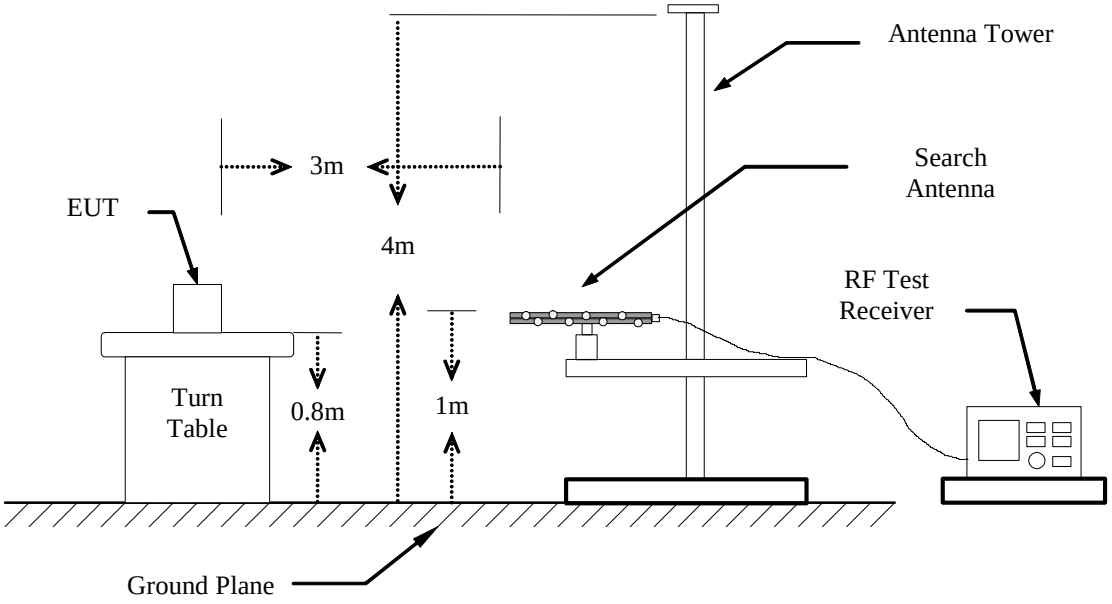
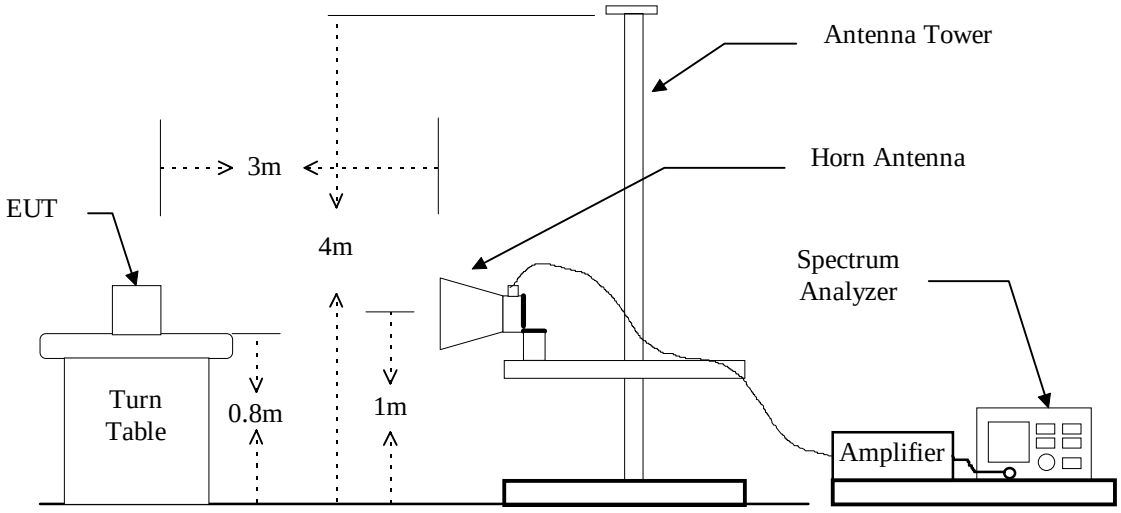



Figure 4 : Frequencies measured above 1 GHz configuration



## 11.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| EMI Test Receiver | R&S | ESIB7 | 07/25/2012 |
| Spectrum Analyzer | Rohde & Schwarz | FSU46 | 11/25/2011 |
| Horn Antenna | EMCO | 3115 | 07/21/2012 |
| BiLog Antenna | Schaffner | CBL 6112B | 09/02/2011 |
| Horn Antenna | EMCO | 3116 | 07/21/2012 |
| Preamplifier | Hewlett-Packard | 8449B | 10/10/2011 |
| Preamplifier | TRC | IJ07 | 09/27/2011 |

Measuring instrument setup in measured frequency band when specified detector function is used :

| Frequency Band (MHz) | Instrument | Function | Resolution Bandwidth | Video Bandwidth |
|---|---|---|---|---|
| 30 to 1000 | RF Test Receiver | Quasi-Peak | 120 kHz | 300 kHz |
| | Spectrum Analyzer | Peak | 120 kHz | 300 kHz |
| Above 1000 | Spectrum Analyzer | Peak | 1 MHz | 1 MHz |
| | Spectrum Analyzer | Average | 1 MHz | 10 Hz |

## 11.4 Radiated Emission Data

### 11.4.1 Harmonic

10.4.1.1 Operation Mode: TX

11.4.1.1.1 IEEE 802.11a
Operation Mode: 5.2GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5180 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10360.000 | 52.2 | 42.7 | 58.5 | 46.3 | 3.07 | 61.6 | 49.4 | 74.0 | 54.0 |
| 15540.000 | 59.4 | 45.1 | 61.2 | 47.0 | 3.56 | 64.8 | 50.6 | 74.0 | 54.0 |
| 20720.000 | --- | --- | --- | --- | 11.93 | --- | --- | 74.0 | 54.0 |

b) Channel Mid
Fundamental Frequency: 5200 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10400.000 | 52.5 | 41.4 | 53.8 | 42.4 | 3.14 | 56.9 | 45.5 | 74.0 | 54.0 |
| 15600.000 | 57.3 | 42.6 | 57.8 | 43.1 | 3.50 | 61.3 | 46.6 | 74.0 | 54.0 |
| 31200.000 | --- | --- | --- | --- | 14.54 | --- | --- | 74.0 | 54.0 |

c) Channel High
Fundamental Frequency: 5240 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10480.000 | 50.6 | 40.3 | 53.4 | 42.6 | 3.27 | 56.7 | 45.9 | 74.0 | 54.0 |
| 15720.000 | 53.6 | 40.5 | 60.9 | 44.0 | 3.38 | 64.3 | 47.4 | 74.0 | 54.0 |
| 31440.000 | --- | --- | --- | --- | 14.83 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

Operation Mode: 5.3GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5260 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10520.000 | 51.7 | 38.4 | 53.3 | 41.1 | 3.32 | 56.6 | 44.4 | 74.0 | 54.0 |
| 15780.000 | 53.4 | 40.1 | 60.6 | 44.3 | 3.32 | 63.9 | 47.6 | 74.0 | 54.0 |
| 31560.000 | --- | --- | --- | --- | 14.94 | --- | --- | 74.0 | 54.0 |

b) Channel Mid
Fundamental Frequency: 5300 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10600.000 | 50.9 | 37.9 | 53.2 | 41.2 | 3.44 | 56.6 | 44.6 | 74.0 | 54.0 |
| 15900.000 | 51.9 | 38.8 | 58.2 | 42.4 | 3.20 | 61.4 | 45.6 | 74.0 | 54.0 |
| 31800.000 | --- | --- | --- | --- | 15.08 | --- | --- | 74.0 | 54.0 |

c) Channel High
Fundamental Frequency: 5320 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10640.000 | --- | --- | 52.1 | 40.9 | 3.49 | 55.6 | 44.4 | 74.0 | 54.0 |
| 15960.000 | --- | --- | 55.1 | 40.7 | 3.14 | 58.2 | 43.8 | 74.0 | 54.0 |
| 21280.000 | --- | --- | --- | --- | 12.15 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

Operation Mode: 5.6GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5500 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11000.000 | --- | --- | 51.2 | 38.5 | 4.00 | 55.2 | 42.5 | 74.0 | 54.0 |
| 16500.000 | 53.1 | 40.2 | 58.0 | 43.2 | 4.60 | 62.6 | 47.8 | 74.0 | 54.0 |

b) Channel Mid
Fundamental Frequency: 5600 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11200.000 | --- | --- | 52.6 | 36.9 | 4.16 | 56.8 | 41.1 | 74.0 | 54.0 |
| 16800.000 | --- | --- | 52.9 | 40.2 | 6.34 | 59.2 | 46.5 | 74.0 | 54.0 |
| 22400.000 | --- | --- | --- | --- | 11.72 | --- | --- | 74.0 | 54.0 |

c) Channel High
Fundamental Frequency: 5700 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11400.000 | 51.9 | 38.5 | 56.2 | 39.9 | 4.32 | 60.5 | 44.2 | 74.0 | 54.0 |
| 22800.000 | --- | --- | --- | --- | 11.92 | --- | --- | 74.0 | 54.0 |
| 39900.000 | --- | --- | --- | --- | 16.06 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark “---” means that the emissions level is too low to be measured.

11.4.1.1.2 IEEE 802.11an, HT20
Operation Mode: 5.2GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5180 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10360.000 | 51.6 | 40.1 | 54.7 | 42.0 | 3.07 | 57.8 | 45.1 | 74.0 | 54.0 |
| 15540.000 | 60.4 | 43.7 | 57.4 | 42.8 | 3.56 | 64.0 | 47.3 | 74.0 | 54.0 |
| 20720.000 | --- | --- | --- | --- | 11.93 | --- | --- | 74.0 | 54.0 |

b) Channel Mid
Fundamental Frequency: 5200 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10400.000 | 50.9 | 39.2 | 54.1 | 42.6 | 3.14 | 57.2 | 45.7 | 74.0 | 54.0 |
| 15600.000 | 56.8 | 42.5 | 58.5 | 43.4 | 3.50 | 62.0 | 46.9 | 74.0 | 54.0 |
| 31200.000 | --- | --- | --- | --- | 14.54 | --- | --- | 74.0 | 54.0 |

c) Channel High
Fundamental Frequency: 5240 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10480.000 | 49.7 | --- | 53.9 | 41.5 | 3.27 | 57.2 | 44.8 | 74.0 | 54.0 |
| 15720.000 | 54.4 | 40.6 | 56.4 | 42.5 | 3.38 | 59.8 | 45.9 | 74.0 | 54.0 |
| 31440.000 | --- | --- | --- | --- | 14.83 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

Operation Mode: 5.3GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5260 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10520.000 | --- | --- | 54.9 | 42.5 | 3.32 | 58.2 | 45.8 | 74.0 | 54.0 |
| 15780.000 | 57.0 | 40.3 | 56.6 | 42.0 | 3.32 | 60.3 | 45.3 | 74.0 | 54.0 |
| 31560.000 | --- | --- | --- | --- | 14.94 | --- | --- | 74.0 | 54.0 |

b) Channel Mid
Fundamental Frequency: 5300 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10600.000 | --- | --- | 53.3 | 41.5 | 3.44 | 56.7 | 44.9 | 74.0 | 54.0 |
| 15900.000 | --- | --- | 52.8 | 40.5 | 3.20 | 56.0 | 43.7 | 74.0 | 54.0 |
| 31800.000 | --- | --- | --- | --- | 15.08 | --- | --- | 74.0 | 54.0 |

c) Channel High
Fundamental Frequency: 5320 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10640.000 | --- | --- | 51.8 | 39.2 | 3.49 | 55.3 | 42.7 | 74.0 | 54.0 |
| 15960.000 | 50.9 | 38.2 | 52.4 | 39.1 | 3.14 | 55.5 | 42.2 | 74.0 | 54.0 |
| 21280.000 | --- | --- | --- | --- | 12.15 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

Operation Mode: 5.6GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5500 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11000.000 | --- | --- | 50.1 | 38.2 | 4.00 | 54.1 | 42.2 | 74.0 | 54.0 |
| 16500.000 | 52.9 | 38.6 | 55.6 | 39.8 | 4.60 | 60.2 | 44.4 | 74.0 | 54.0 |

b) Channel Mid
Fundamental Frequency: 5600 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11200.000 | --- | --- | --- | --- | 4.16 | --- | --- | 74.0 | 54.0 |
| 16800.000 | --- | --- | 52.6 | 37.9 | 6.34 | 58.9 | 44.2 | 74.0 | 54.0 |
| 39200.000 | --- | --- | --- | --- | 14.38 | --- | --- | 74.0 | 54.0 |

c) Channel High
Fundamental Frequency: 5700 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11400.000 | --- | --- | 52.8 | 38.2 | 4.32 | 57.1 | 42.5 | 74.0 | 54.0 |
| 22800.000 | --- | --- | --- | --- | 11.92 | --- | --- | 74.0 | 54.0 |
| 39900.000 | --- | --- | --- | --- | 16.06 | --- | --- | 74.0 | 54.0 |

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark “---” means that the emissions level is too low to be measured.

11.4.1.1.3 IEEE 802.11an, HT40
Operation Mode: 5.2GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5190 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10380.000 | --- | --- | 51.7 | 36.6 | 3.11 | 54.8 | 39.7 | 74.0 | 54.0 |
| 15570.000 | 53.4 | 41.4 | 53.4 | 41.2 | 3.53 | 56.9 | 44.9 | 74.0 | 54.0 |
| 20760.000 | --- | --- | --- | --- | 11.96 | --- | --- | 74.0 | 54.0 |

b) Channel High
Fundamental Frequency: 5230 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11460.000 | --- | --- | 51.0 | 40.1 | 3.23 | 54.2 | 43.3 | 74.0 | 54.0 |
| 15690.000 | 53.2 | 39.9 | 54.6 | 40.6 | 3.41 | 58.0 | 44.0 | 74.0 | 54.0 |
| 31380.000 | --- | --- | --- | --- | 14.76 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

Operation Mode: 5.3GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5270 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10540.000 | --- | --- | 50.6 | 39.9 | 3.35 | 54.0 | 43.3 | 74.0 | 54.0 |
| 15810.000 | --- | --- | 52.0 | 40.8 | 3.29 | 55.3 | 44.1 | 74.0 | 54.0 |
| 31620.000 | --- | --- | --- | --- | 14.97 | --- | --- | 74.0 | 54.0 |

b) Channel High
Fundamental Frequency: 5310 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 10620.000 | 49.7 | 38.9 | 51.6 | 39.0 | 3.46 | 55.1 | 42.5 | 74.0 | 54.0 |
| 15930.000 | --- | --- | 54.2 | 40.9 | 3.17 | 57.4 | 44.1 | 74.0 | 54.0 |
| 21240.000 | --- | --- | --- | --- | 12.15 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

Operation Mode: 5.6GHz
Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

a) Channel Low
Fundamental Frequency: 5510 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11020.000 | --- | --- | --- | --- | 3.8 | --- | --- | 74.0 | 54.0 |
| 22040.000 | --- | --- | --- | --- | -4.5 | --- | --- | 74.0 | 54.0 |

b) Channel Mid
Fundamental Frequency: 5590 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11180.000 | --- | --- | --- | --- | 3.8 | --- | --- | 74.0 | 54.0 |
| 22360.000 | --- | --- | --- | --- | -4.7 | --- | --- | 74.0 | 54.0 |
| 39130.000 | --- | --- | --- | --- | -2.8 | --- | --- | 74.0 | 54.0 |

c) Channel High
Fundamental Frequency: 5670 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 11340.000 | --- | --- | --- | --- | 4.3 | --- | --- | 74.0 | 54.0 |
| 22680.000 | --- | --- | --- | --- | -4.7 | --- | --- | 74.0 | 54.0 |
| 39690.000 | --- | --- | --- | --- | 0.9 | --- | --- | 74.0 | 54.0 |

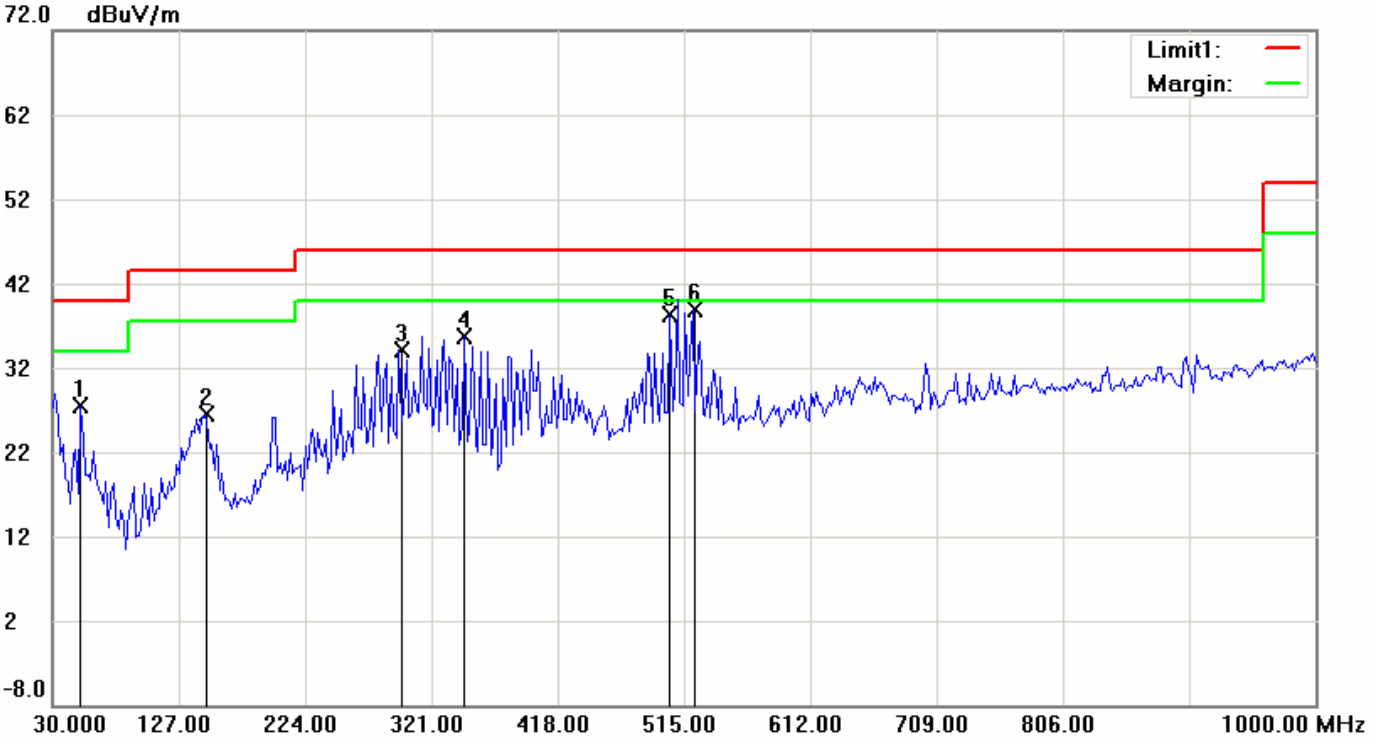
Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

### 11.4.2 Spurious Emission

Operation Mode: Tx
a) Emission frequencies below 1 GHz

**File:** 11-06-MAS-176(5G) **Data:** #139 **Date:** 2011/8/11 **Temperature:** 28 ℃

**Time:** AM 11:56:35 **Humidity:** 55 %




**Condition:** FCC Part15 RE-Class B_30-1000MHz **Polarization:** Horizontal

**EUT:** **Distance:** 3m

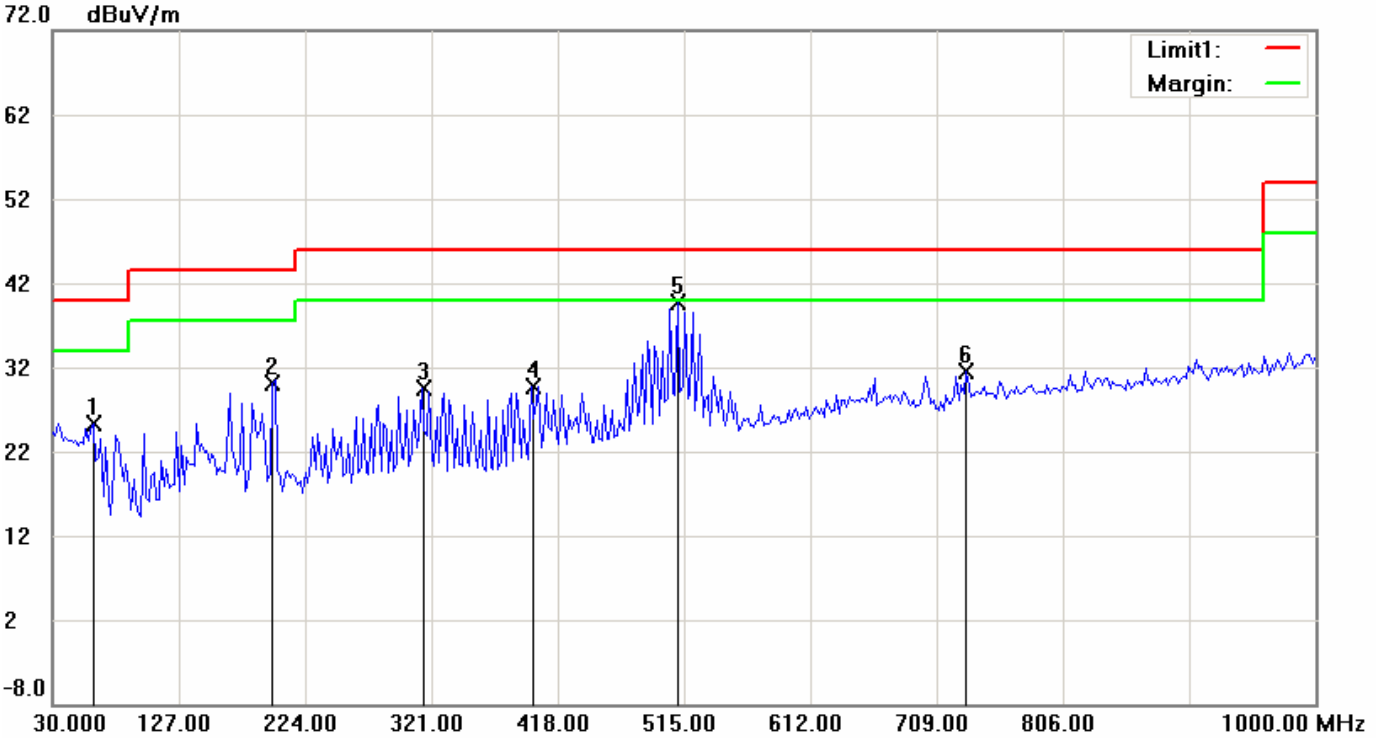
**Model:**

**Test Mode:**

| No. | Frequency | Reading | Detector | Corrected | Result | Limit | Margin |
|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV/m) | | dB/m | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | 51.3828 | 17.62 | peak | 9.79 | 27.41 | 40.00 | -12.59 |
| 2 | 146.6333 | 13.12 | peak | 13.30 | 26.42 | 43.50 | -17.08 |
| 3 | 296.3126 | 16.58 | peak | 17.45 | 34.03 | 46.00 | -11.97 |
| 4 | 346.8536 | 17.57 | peak | 18.16 | 35.73 | 46.00 | -10.27 |
| 5 | 504.3086 | 14.21 | peak | 24.09 | 38.30 | 46.00 | -7.70 |
| 6 | 521.8036 | 15.03 | peak | 23.82 | 38.85 | 46.00 | -7.15 |

**File:** **11-06-MAS-176(5G)** **Data:** **#140** **Date:** **2011/8/11** **Temperature:** **28 ℃**

**Time:** **PM 12:00:39** **Humidity:** **55 %**




**Condition:** **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Vertical**

**EUT:** **Distance:** **3m**

**Model:**

**Test Mode:**

| No. | Frequency | Reading | Detector | Corrected | Result | Limit | Margin |
|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV/m) | | dB/m | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | 61.1022 | 17.00 | peak | 8.35 | 25.35 | 40.00 | -14.65 |
| 2 | 199.1182 | 14.38 | peak | 15.64 | 30.02 | 43.50 | -13.48 |
| 3 | 313.8076 | 11.82 | peak | 17.73 | 29.55 | 46.00 | -16.45 |
| 4 | 397.3948 | 10.17 | peak | 19.58 | 29.75 | 46.00 | -16.25 |
| 5 | 510.1403 | 15.70 | peak | 24.01 | 39.71 | 46.00 | -6.29 |
| 6 | 731.7435 | 4.80 | peak | 26.68 | 31.48 | 46.00 | -14.52 |

b) Emission frequencies above 1 GHz

| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result @3m (dBuV/m) | Limit @3m (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| Radiated emission frequencies above 1 GHz to 40 GHz were too low to be measured. | | | | | | |

Note:

1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f<1000MHz).
   ±2.9dB (1GHz≦f<18GHz).
   ±3.5dB (18GHz≦f≦40GHz).

11.4.3 Radiated Measurement at Bandedge with Fundamental Frequencies and co-location

Test Date: Aug. 11, 2011 Temperature: 28℃ Humidity: 55%

11.4.3.1 Operation Mode: 5.3GHz

11.4.3.1.1 IEEE 802.11a, ch 36

| Test Frequency | Reading (dBuV) | | | | Factor | Result @3m (dBuV/m) | | Limit @3m (dBuV/m) | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | | | | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 5150.000 | 29.02 | 15.68 | 29.38 | 15.77 | 30.3 | 59.68 | 46.07 | 74 | 54 |
| 5350.000 | 29.17 | 15.54 | 29.42 | 15.69 | 30.3 | 59.72 | 45.99 | 74 | 54 |

11.4.3.1.2 IEEE 802.11an, HT20, ch 36

| Test Frequency | Reading (dBuV) | | | | Factor | Result @3m (dBuV/m) | | Limit @3m (dBuV/m) | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | | | | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 5150.000 | 29.22 | 15.99 | 29.58 | 15.97 | 30.3 | 59.88 | 46.29 | 74 | 54 |
| 5350.000 | 29.36 | 15.97 | 29.58 | 15.97 | 30.3 | 59.88 | 46.27 | 74 | 54 |

11.4.3.1.3 IEEE 802.11an, HT40, ch 38

| Test Frequency | Reading (dBuV) | | | | Factor | Result @3m (dBuV/m) | | Limit @3m (dBuV/m) | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | | | | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 5150.000 | 29.10 | 15.44 | 29.43 | 15.88 | 30.3 | 59.73 | 46.18 | 74 | 54 |
| 5350.000 | 29.15 | 15.47 | 29.34 | 15.85 | 30.3 | 59.64 | 46.15 | 74 | 54 |

Note :

1. Remark "---" means that the emissions level is too low to be measured.
2. The result is the highest value of radiated emission from restrict band of 4500 ~ 5150 MHz and 5350 ~ 5460 MHz.

11.4.3.2 Operation Mode: 5.5GHz

11.4.3.2.1 IEEE 802.11a, ch 64

| Test Frequency | Reading (dBuV) | | | | Factor | Result @3m (dBuV/m) | | Limit @3m (dBuV/m) | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | | | | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 5460.000 | 29.22 | 15.61 | 29.31 | 15.84 | 30.3 | 59.61 | 46.14 | 74 | 54 |

11.4.3.2.2 IEEE 802.11an, HT20, ch 64

| Test Frequency | Reading (dBuV) | | | | Factor | Result @3m (dBuV/m) | | Limit @3m (dBuV/m) | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | | | | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 5460.000 | 29.31 | 15.91 | 29.47 | 16.05 | 30.3 | 59.77 | 46.35 | 74 | 54 |

11.4.3.2.3 IEEE 802.11an, HT40, ch 62

| Test Frequency | Reading (dBuV) | | | | Factor | Result @3m (dBuV/m) | | Limit @3m (dBuV/m) | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | | | | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 5460.000 | 28.68 | 15.68 | 19.36 | 15.78 | 30.3 | 58.98 | 46.08 | 74 | 54 |

Note :

1. Remark "---" means that the emissions level is too low to be measured.
2. The result is the highest value of radiated emission from restrict band of 4500 ~ 5150 MHz and 5350 ~ 5460 MHz.

## 11.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

***Result = Reading + Corrected Factor***

where

Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Amplifier Gain

# 12 Transmit Power Control (TPC)

## 12.1 Standard Applicable

According to 15.407 (h) (1), Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

## 12.2 Measurement Procedure

1. The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E,

   August 2002.

2. Position the EUT as shown in figure 2

## 12.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | 09/18/2012 |

## 12.4 Applicability

| Highest Power Level in DFS Band (EIRP) | | 14.92 dBm + 1.8 dBi = 16.72 dBm =46.99mW |
|---|---|---|
| ☒ | EIRP < 500 mW | Not Applicable |
| ☐ | EIRP ≧500 mW | Applicable |

# 13 Dynamic Frequency Selection (DFS)

## 13.1 Requirement

**Table 1: Applicability of DFS Requirements Prior to Use of a Channel**

| Requirement | Operational Mode | | |
|---|---|---|---|
| | Master | Client Without Radar Detection | Client With Radar Detection |
| *Non-Occupancy Period* | Yes | Not required | Yes |
| *DFS Detection Threshold* | Yes | Not required | Yes |
| *Channel Availability Check Time* | Yes | Not required | Not required |
| *Uniform Spreading* | Yes | Not required | Not required |
| *U-NII Detection Bandwidth* | Yes | Not required | Yes |

**Table 2: Applicability of DFS requirements during normal operation**

| Requirement | Operational Mode | | |
|---|---|---|---|
| | Master | Client Without Radar Detection | Client With Radar Detection |
| *DFS Detection Threshold* | Yes | Not required | Yes |
| *Channel Closing Transmission Time* | Yes | Yes | Yes |
| *Channel Move Time* | Yes | Yes | Yes |
| *U-NII Detection Bandwidth* | Yes | Not required | Yes |

## 13.2 Limits

**Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection**

| Maximum Transmit Power | Value (See Notes 1 and 2) |
|---|---|
| ≥ 200 milliwatt | -64 dBm |
| < 200 milliwatt | -62 dBm |
| Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.<br>Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. | |

**Table 4: DFS Response Requirement Values**

| Parameter | Value |
|---|---|
| *Non-occupancy period* | Minimum 30 minutes |
| *Channel Availability Check Time* | 60 seconds |
| *Channel Move Time* | 10 seconds<br>See Note 1. |
| *Channel Closing Transmission Time* | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.<br>See Notes 1 and 2. |
| *U-NII Detection Bandwidth* | Minimum 80% of the U-NII 99% transmission power bandwidth. See Note 3. |

**Note 1:** The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short Pulse Radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the *Radar Waveform*.

**Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

**Note 3:** During the *U-NII Detection Bandwidth* detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

**Table 5 – Short Pulse Radar Test Waveforms**

| Radar Type | Pulse Width (µsec) | PRI (µsec) | Number of Pulses | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|---|---|---|---|---|---|
| 1 | 1 | 1428 | 18 | 60% | 30 |
| 2 | 1-5 | 150-230 | 23-29 | 60% | 30 |
| 3 | 6-10 | 200-500 | 16-18 | 60% | 30 |
| 4 | 11-20 | 200-500 | 12-16 | 60% | 30 |
| Aggregate (Radar Types 1-4) | | | | 80% | 120 |

**Table 6 – Long Pulse Radar Test Waveform**

| Radar Type | Pulse Width (µsec) | Chirp Width (MHz) | PRI (µsec) | Number of Pulses per *Burst* | Number of *Bursts* | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|---|---|---|---|---|---|---|---|
| 5 | 50-100 | 5-20 | 1000-2000 | 1-3 | 8-20 | 80% | 30 |

**Table 7 – Frequency Hopping Radar Test Waveform**

| Radar Type | Pulse Width (µsec) | PRI (µsec) | Pulses per Hop | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|---|---|---|---|---|---|---|---|
| 6 | 1 | 333 | 9 | 0.333 | 300 | 70% | 30 |

## 13.3 Description of EUT

### 13.3.1 EUT

| | |
|---|---|
| DFS Band | ☒ 5250MHz~5350 MHz ☒ 5470MHz~5725 MHz |
| Operation Mode | ☐ Master |
| | ☒ Client without In-Service Monitoring |
| | ☐ Client with In-Service Monitoring |
| Channel Loading Method | ☒IP Based System |
| | ☐Frame Based System |
| | ☐Other System _____ |

### 13.3.2 Master Device

| | | |
|---|---|---|
| Device | | Cisco Access Point, AIR-AP1252AG-A-K9 |
| DFS software Revision | | 12.4 (10b) JDA3(fc1) |
| Minimum Antenna Gain | | 3.5dBi |
| Highest Power Level in DFS band (Pm) | | 26dBm |
| ☒ Pm≧23dBm | Conducted Threshold = -64dBm + 3.5dBi + 1dB = -59.5 dBm | |
| ☐ Pm<23dBm | Conducted Threshold = n/a | |
| Calibarated conducted DFS Detection Threshold | | -60 dBm |

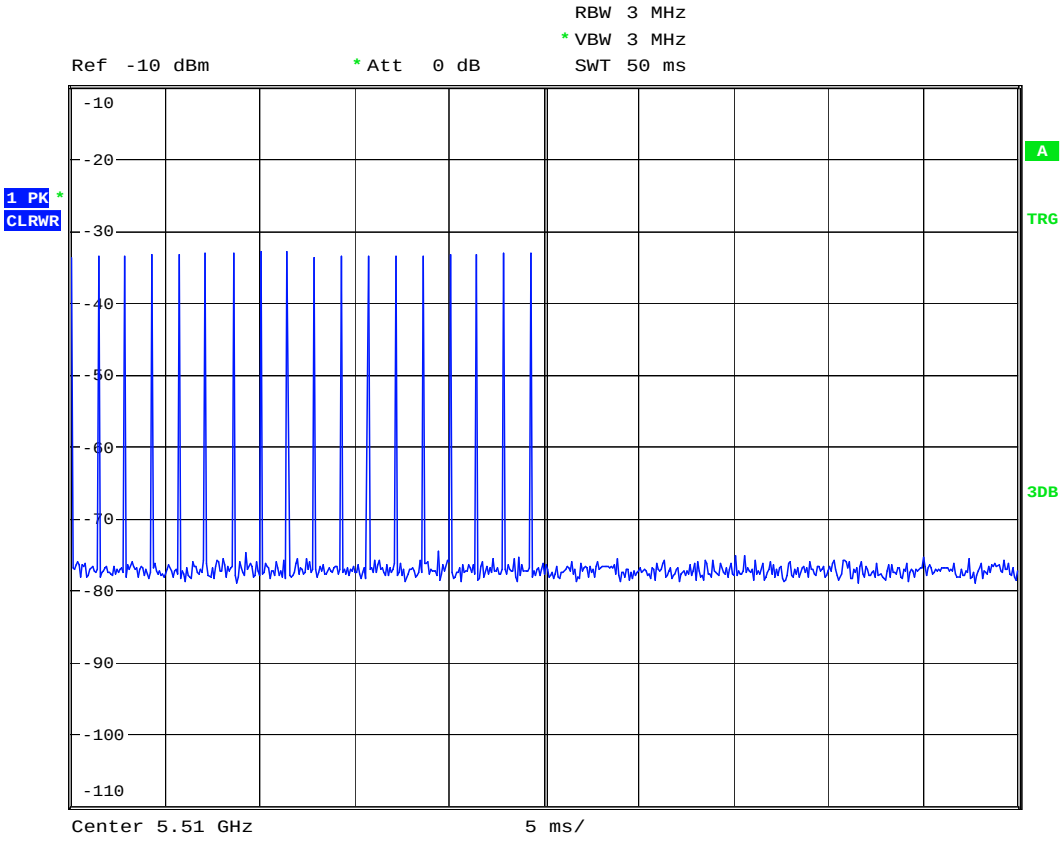
Note: The tested level is lower than the required level hence it provides margin to the limit.

# 13.4 DFS Test System

## 13.4.1 System Description

### 13.4.1.1 Radar Test Signals

Type 1

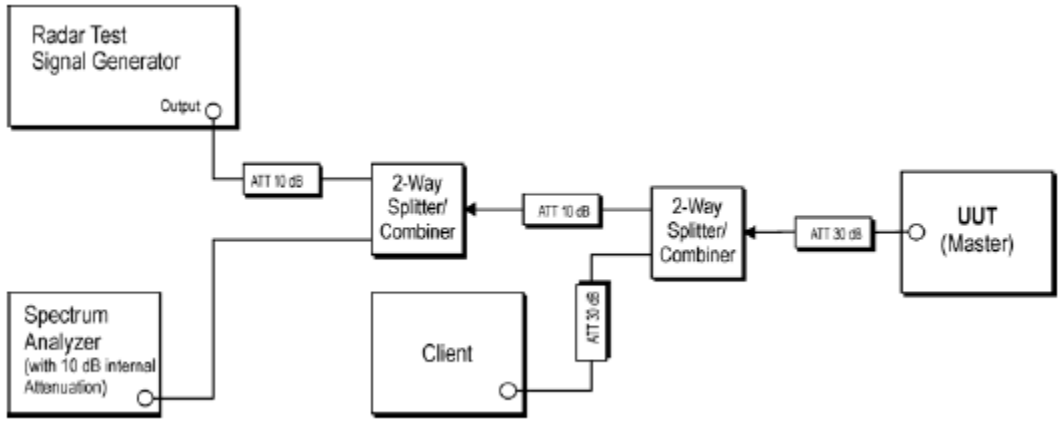



### 13.4.1.2 Traffic Signal

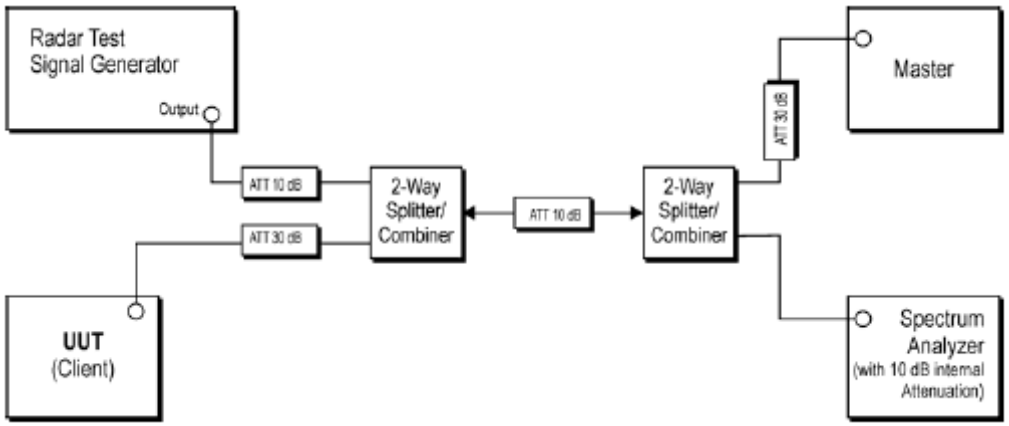
Transmission Direction is from the Master device to the Client device. The client device is seted to play the MPEG file ($6\frac{1}{2}$ Magic Hours) from the Master device, the MPEG test file and instructions are located at website: http://ntiacsd.ntia.doc.gov/dfs/.

### 13.4.2 Setup Configuration

13.4.2.1 Setup for Master with injection at the Master

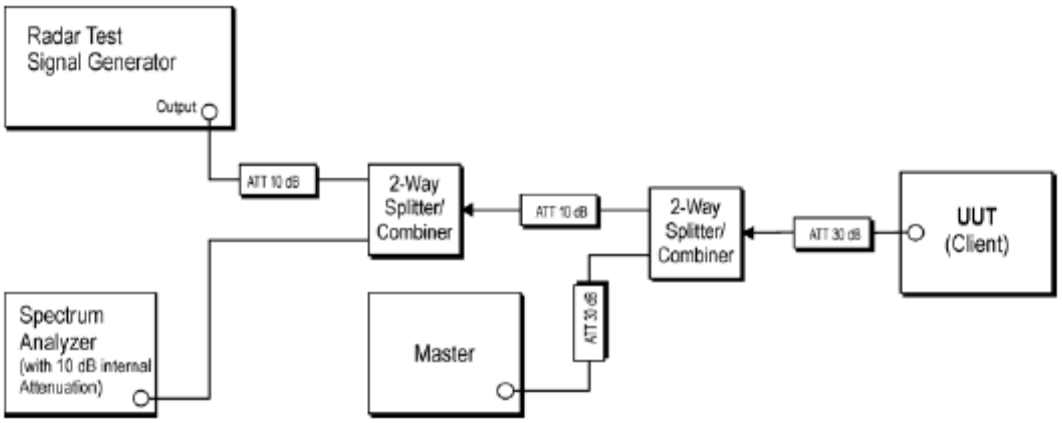



13.4.2.2 Setup for Client with injection at the Master




Client without In-Service Monitoring

13.4.2.3 Setup for Client with injection at the Client




Client with In-Service Monitoring

### 13.4.3 System Description

| Equipment | Manufacturer | Model No. | Calibrated until |
|---|---|---|---|
| Spectrum Analyzer | R&S | FSU46 | 11/17/2011 |
| Vector Signal Generator | R&S | SMU200A | 12/12/2011 |

### 13.4.4 Devices for Tested System

| Device | Manufacturer | Model No. | Cable Description |
|---|---|---|---|
| Notebook | Dell | Inspiron 1420 | Unshielded Power Line 3.3m*1 / Adaptor<br>Unshielded Signal Cable 1.0m*1/RJ45 |
| Notebook | HP | nx6320 | Unshielded Power Line 3.3m*1 / Adaptor<br>Unshielded Signal Cable 1.0m*1/RJ45 |
| Personal Computer | Lemel | PD-820 | Unshielded Power Line 1.8m*1<br>Unshielded Signal Cable 1.0m*1/RJ45 |
| Monitor | Lemel | LE510 | Unshielded Power Line 1.8m*1<br>Unshielded Signal Cable 1.0m*1/VGA |
| WLAN card | Cisco | CB21AG | ---- |
| Access Point | Cisco | AIR-AP1252AG-A-K9 | Unshielded Power Line 1.8m*1 / Adaptor<br>Unshielded Signal Cable 1.0m*1/RJ45 |

## 13.5 Test Result

### 13.5.1 Test Summary

| Clause | Test Parameter | Remarks | Pass / Fail |
|---|---|---|---|
| 15.407 | DFS Detection Threshold | Not Applicable | N/A |
| 15.407 | Channel Availability Check Time | Not Applicable | N/A |
| 15.407 | Channel Move Time | Applicable | Pass |
| 15.407 | Channel Closing Transmission Time | Applicable | Pass |
| 15.407 | Non-Occupancy Period(Associated Test) | Applicable | Pass |
| 15.407 | Uniform Spreading | Not Applicable | N/A |
| 15.407 | U-NII Detection Bandwidth | Not Applicable | N/A |

### 13.5.2 Channel Move Time

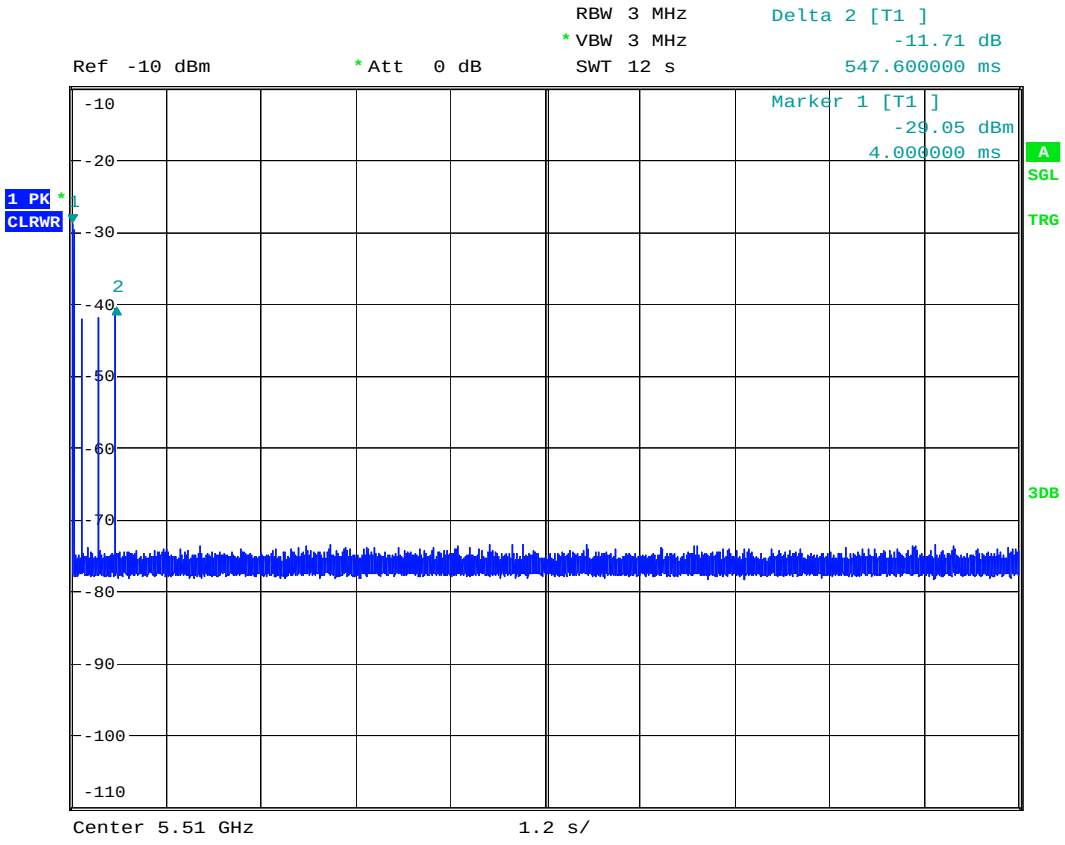
**LIMIT:**

The Channel Move Time shall not exceed the limit defined in table 4.

The Channel Closing Transmission Time shall not exceed the limit defined in table 4.

Result:

| Modulation | Operation Frequency (MHz) | Channel Move Time (CMT) (s) | Limit (s) |
|---|---|---|---|
| IEEE 802.11an HT40 | 5510 | 0.548 | 10 |



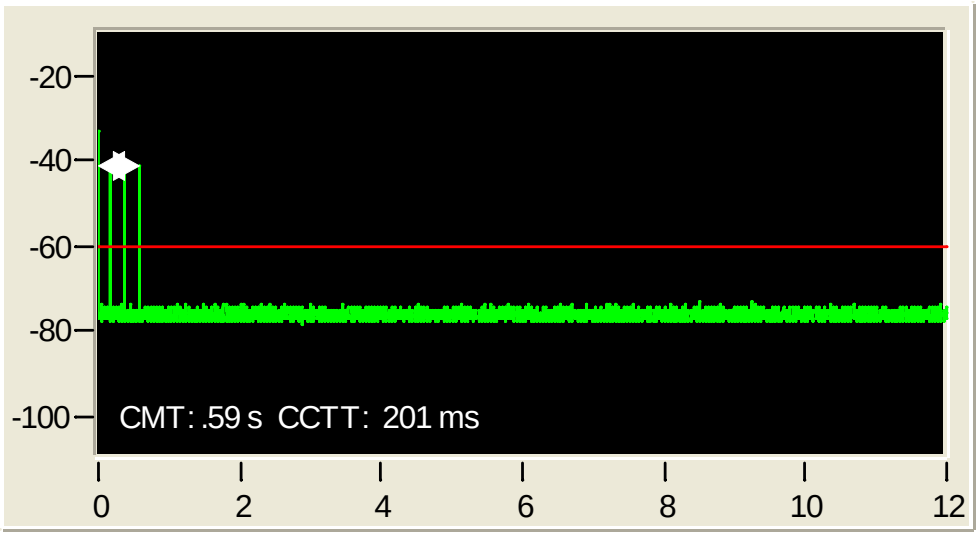
### 13.5.3 Channel Closing Transmission Time

**LIMIT:**

The Channel Closing Transmission Time shall not exceed the limit defined in table 4.

Result:

| Modulation | Operation Frequency (MHz) | Channel Closing Transmission Time (CCTT) (ms) | Limit (ms) |
|---|---|---|---|
| IEEE 802.11an HT40 | 5510 | 201 | 260 |



### 13.5.4 Non-occupancy Period (Associated Test)

**LIMIT:**

The Non-Occupancy Period shall not be less than the value defined in table 4.

Result: No EUT Transmissions is observed on the previously active channel during 30 minutes observation time.