# FCC 47 CFR PART 15 SUBPART E

# TEST REPORT

## For

## WLAN 802.11a MiniPCI Card

## Model: WMP-A13

## Trade Name: Alpha

*Issued to*

**Alpha Networks Inc.**
**No.8, Li Hsing Rd. Vii, Science-Based, Industrial Park,**
**Hsinchu, Taiwan, R.O.C.**

*Issued by*

**Compliance Certification Services Inc.**
**No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,**
**Taoyuan Hsien, (338) Taiwan, R.O.C.**
**TEL: 886-3-324-0332**
**FAX: 886-3-324-5235**

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# 1. TEST RESULT CERTIFICATION

**Applicant:** Alpha Networks Inc.
No.8, Li Hsing Rd. Vii, Science-Based, Industrial Park,
Hsinchu, Taiwan, R.O.C.

**Equipment Under Test:** WLAN 802.11a MiniPCI Card

**Trade Name:** Alpha

**Model:** WMP-A13

**Date of Test:** October 1 ~ December 28, 2004

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULT** |
| FCC Part 15 Subpart E | No non-compliance noted |

## We hereby certify that:

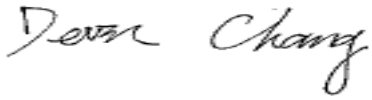
Compliance Certification Services Inc. tested the above equipment. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407.

The test results of this report relate only to the tested sample identified in this report.

*Approved by:*

Harris W. Lai
Executive Vice President
Compliance Certification Services Inc.

*Reviewed by:*



Devin Chang
Section Manager
Compliance Certification Services Inc.

# 2. EUT DESCRIPTION

| | |
|---|---|
| **Product** | WLAN 802.11a MiniPCI Card |
| **Trade Name** | Alpha |
| **Model Number** | WMP-A13 |
| **Model Discrepancy** | 1. The EUT have two types, three different gain's antennas for sales: one is Dual-Band Omni-Directional antenna and other one is Panel Directional Antenna, the detail descriptions please refer antenna specification and user manual.<br>2. The EUT may be sale combination with 802.11g Outdoor Access Point (FCC ID: KA22002090027-1) with the possible configurations below, so co-location tests have also been performed and recorded in this report.<br>1) WMP-A13/ 5dBi dual band antenna, AP/4.5dBi dual band antenna.<br>2) WMP-A13/14dBi panel directional antenna, AP/16dBi panel directional antenna.<br>3) WMP-A13/18dBi panel directional antenna, AP/16dBi panel directional antenna. |
| **Power Supply** | DC 3.3V from host device |
| **Frequency Range** | IEEE 802.11a: Base mode: 5.150 ~ 5.350 GHz<br>Turbo mode: 5.210 GHz / 5.250 GHz / 5.290 GHz<br>Base mode: 5.725 ~ 5.850 GHz<br>Turbo mode: 5.760 GHz / 5.800 GHz |
| **Transmit Power** | IEEE 802.11a: 5.150 ~ 5.350 GHz:<br>Dual-Band Omni-Directional antenna: 13.88dBm<br>Panel Directional antenna / 14dBi: 14.14dBm<br>IEEE 802.11a: 5.725 ~ 5.850 GHz:<br>Dual-Band Omni-Directional antenna / 5dBi: 15.70dBm<br>Panel Directional antenna / 18dBi: 15.36dBm |
| **Modulation Technique** | IEEE 802.11a: 5.150 ~ 5.350 GHz: OFDM<br>5.725 ~ 5.850 GHz: DSSS |
| **Transmit Data Rate** | IEEE802.11a: 6, 9, 12, 18, 24, 36, 48, 54, 108Mbps |
| **Number of Channels** | IEEE802.11a: 5.150 ~ 5.350 GHz: 8 Channels<br>5.725 ~ 5.850 GHz: 5 Channels |
| **Antenna Specification/ Applicable Frequency** | Dual-Band Omni-Directional Antenna Gain: 5dBi (5.150~5.350 / 5.725~5.850GHz)<br>Panel Directional Antenna Gain:<br>18dBi (5.725 ~ 5.850 GHz)<br>14dBi (5.250 ~ 5.350 GHz) |

***Note:*** *This submittal(s) (test report) is intended for FCC ID: RRK2004090192-1 filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.*

# 3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 Radiated testing was performed at an antenna to EUT distance 3 meters.

## 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

## 3.2 EUT EXERCISE

The EUT is operated in the engineering mode to fix the Tx frequency for the purposes of measurement.

According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

## 3.3 GENERAL TEST PROCEDURES

**Conducted Emissions**

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4, the conducted emission from the EUT is measured in the frequency range between 0.15 MHz and 30MHz, using the CISPR Quasi-Peak detector mode.

**Radiated Emissions**

The EUT is placed on the turntable, which is 0.8 m above the ground plane. The turntable is then rotated for 360 degrees to determine the proper orientation for the maximum emission level. The EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission level. And, each emission is to be maximized by changing the horizontal and vertical polarization of the receiving antenna. In order to find out the maximum emission level, the relative positions of the EUT was rotated in each of the three orthogonal axes, according to the requirements in Section 13.1.4.1 of ANSI C63.4.

## 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, 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 - 5.15 |
| [1]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 - | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.52525 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 156.7 - 156.9 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 162.0125 - 167.17 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 167.72 - 173.2 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 240 - 285 | 3600 - 4400 | ([2]) |
| 13.36 - 13.41 | 322 - 335.4 | | |

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

## 3.5 DESCRIPTION OF TEST MODES

The EUT has been set in continuous transmitting/ receiving with following test modes/ configurations:

1. Stand-alone test:

   The EUT is 802.11a mini PCI radio. It was connected to a laptop via a cardbus-to-mini PCI adapter / extension board with the configurations below for testing.

   i. EUT with 5dBi Dual-Band Omni-Directional Antenna/ test frequency range: 5.150-5.350GHz.

   ii. EUT with 14dBi Panel Directional Antenna/ test frequency range: 5.250-5.350 GHz.

2. Co-location test:

   The EUT was set at the approved 802.11g AP and selected one channel of the worst case from the mode /configuration 1) to test with L/M/H channels of 802.11g AP with the configurations indicated in section 2 of test report for testing.

# 4. INSTRUMENT CALIBRATION

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

# 5. FACILITIES AND ACCREDITATIONS

## 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☒ No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang, Taoyuan Hsien, Taiwan, R.O.C.

☐ No. 199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 5.2 EQUIPMENT

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

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

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

## 5.3 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200600-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (Registration no: 93105 and 90471).

## 5.4 TABLE OF ACCREDITATIONS AND LISTINGS

| Country | Agency | Scope of Accreditation | Logo |
|---|---|---|---|
| USA | NVLAP* | EN 55011, EN 55014-1, AS/NZS 1044, CNS 13783-1, EN 55022, CNS 13438, EN 61000-3-2, EN 61000-3-3, ANSI C63.4, FCC OST/MP-5, AS/NZS CISPR 22, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 | NVLAP® 200600-0 |
| USA | FCC | 3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements | FC 93105, 90471 |
| Japan | VCCI | 4 3/10 meter Open Area Test Sites to perform conducted/radiated measurements | VCCI R-393/1066/725/879 C-402/747/912 |
| Norway | NEMKO | EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328-2, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2 | N ELA 124a ELA 124b ELA 124c |
| Taiwan | CNLA | EN 300 328-1/2, EN 300 220-1/2/3, EN 300 440-1/2, EN 61000-3-2, EN 61000-3-3, 47 CFR FCC Part 15 Subpart C/D/E, EN 55013, CNS 13439, EN 55014-1, CNS 13783-1, EN 55022, CNS 13438, CISPR 22, AS/NZS 3548, EN 61000-4-2/3/4/5/6/8/11, ENV 50204, IEEE Std 1528, FCC OET Bulletin, 65+Supplement C, EN50360, EN50361, EN50371, RSS102 | CNLA 0363 ILAC MRA |
| Taiwan | BSMI | CNS 13438, CNS 13783-1, CNS 13439, CNS 14115 | 商檢 SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014 |
| Canada | Industry Canada | RSS212, Issue 1 | Canada IC 3991-3 IC 3991-4 |

** No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.*

# 6. SETUP OF EQUIPMENT UNDER TEST

## 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

## 6.2 SUPPORT EQUIPMENT

| No. | Device Type | Brand | Model | Series No. | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|---|
| 1. | Notebook PC | IBM | 2656 | AK-VF0HT | FCC DoC | N/A | AC I/P Cable: Unshielded, 1.8m DC O/P Cable Unshielded, 1.8m |
| 2. | USB Mouse | HP | MO19UCA | 020440964 | FCC DoC | Shielded, 1.8m | N/A |
| 3. | 802.11g Outdoor Access Point | D-Link | DWL-2600AP | N/A | KA22002090027-1 | N/A | AC I/P Cable: Unshielded, 1.8m DC O/P Cable Unshielded, 1.8m |

***Notes:***

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

# 7. FCC PART 15.407 REQUIREMENTS

## 7.1 26 dB EMISSION BANDWITH

### LIMIT

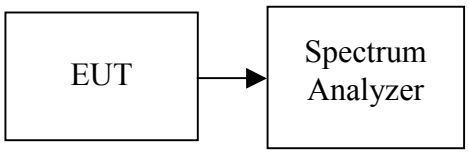
For purposes of this subpart, the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

### MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 01/10/2005 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

**Test Configuration**




### TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW > 1%EBW, VBW > RBW, Span >26dB bandwidth (Base Mode) / >26dB bandwidth (Turbo Mode), and Sweep = auto.
4. Mark the peak frequency and –26dB (upper and lower) frequency.
5. Repeat until all the rest channels were investigated.

# TEST RESULTS

*No non-compliance noted*

## Test Data

### Dual-Band Omni-Directional Antenna

| Frequency (MHz) | | | Antenna Gain (dBi) | Bandwidth (B) (MHz) |
|---|---|---|---|---|
| Base mode | Channel 1 | 5180 | 5 | 28.42 |
| | Channel 5 | 5260 | | 30.75 |
| | Channel 8 | 5320 | | 25.92 |
| Turbo mode | | 5210 | | 68.20 |
| | | 5250 | | 59.80 |
| | | 5290 | | 61.70 |

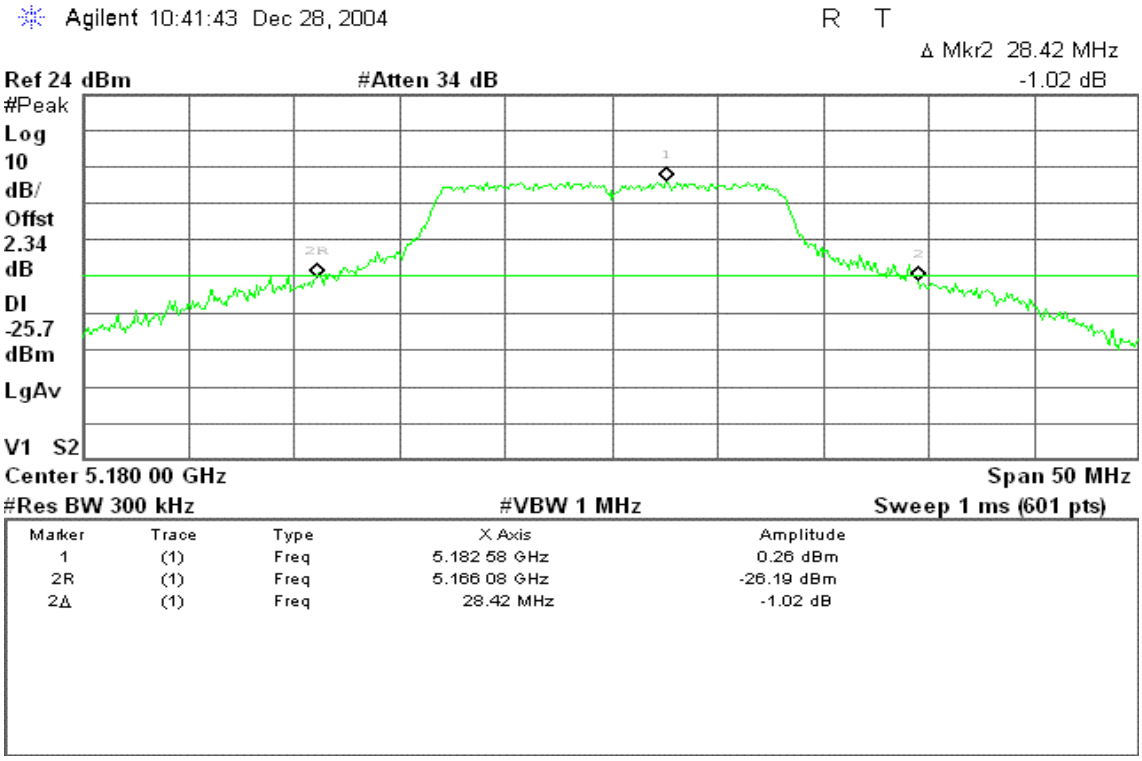
### Panel Directional Antenna

| Frequency (MHz) | | | Antenna Gain (dBi) | Bandwidth (B) (MHz) |
|---|---|---|---|---|
| Base mode | Channel 6 | 5280 | 14 | 22.33 |
| | Channel 7 | 5300 | | 21.07 |
| | Channel 8 | 5320 | | 19.73 |
| Turbo mode | | 5290 | | 73.80 |

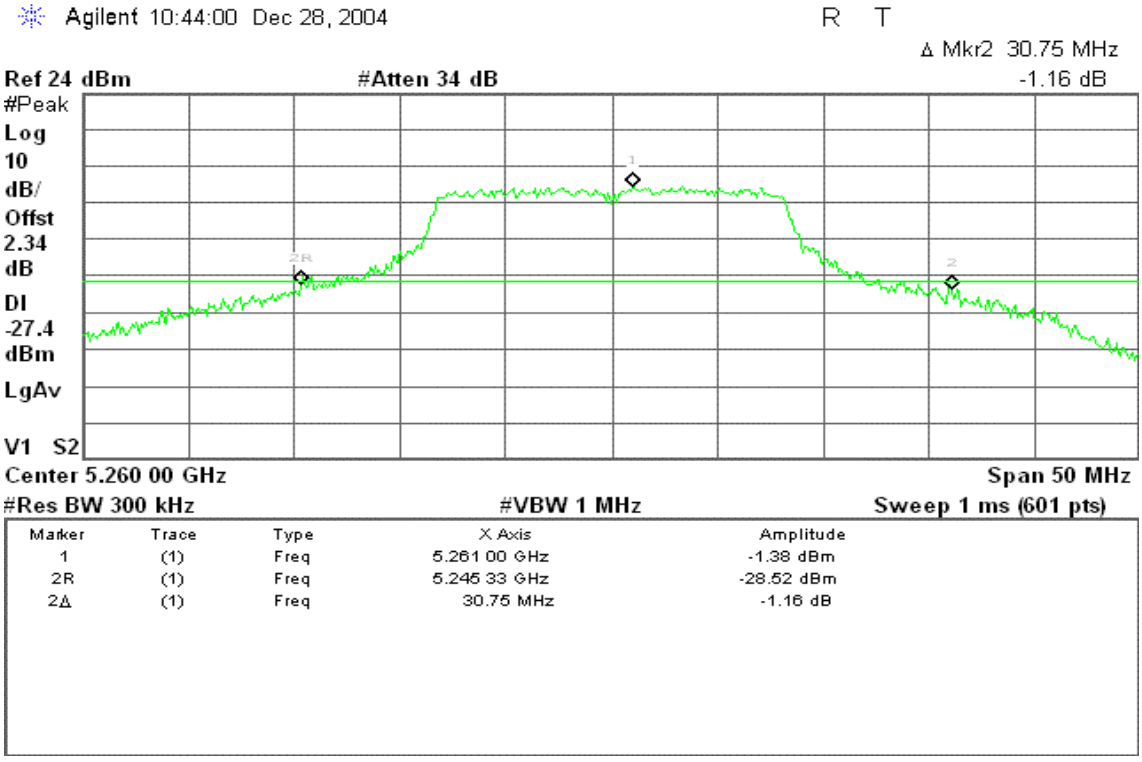
## Test Plot / Dual-Band Omni-Directional Antenna

## IEEE 802.11a Base mode

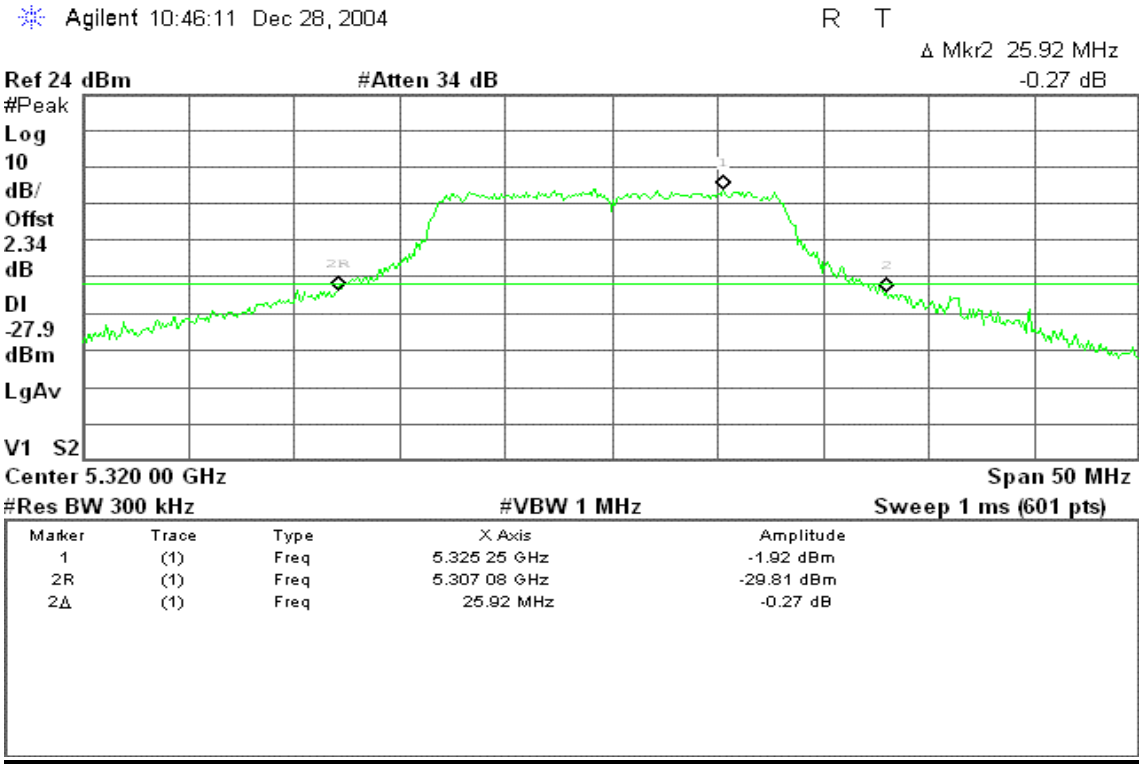
### CH 5180 / 5dBi




### CH 5260 / 5dBi

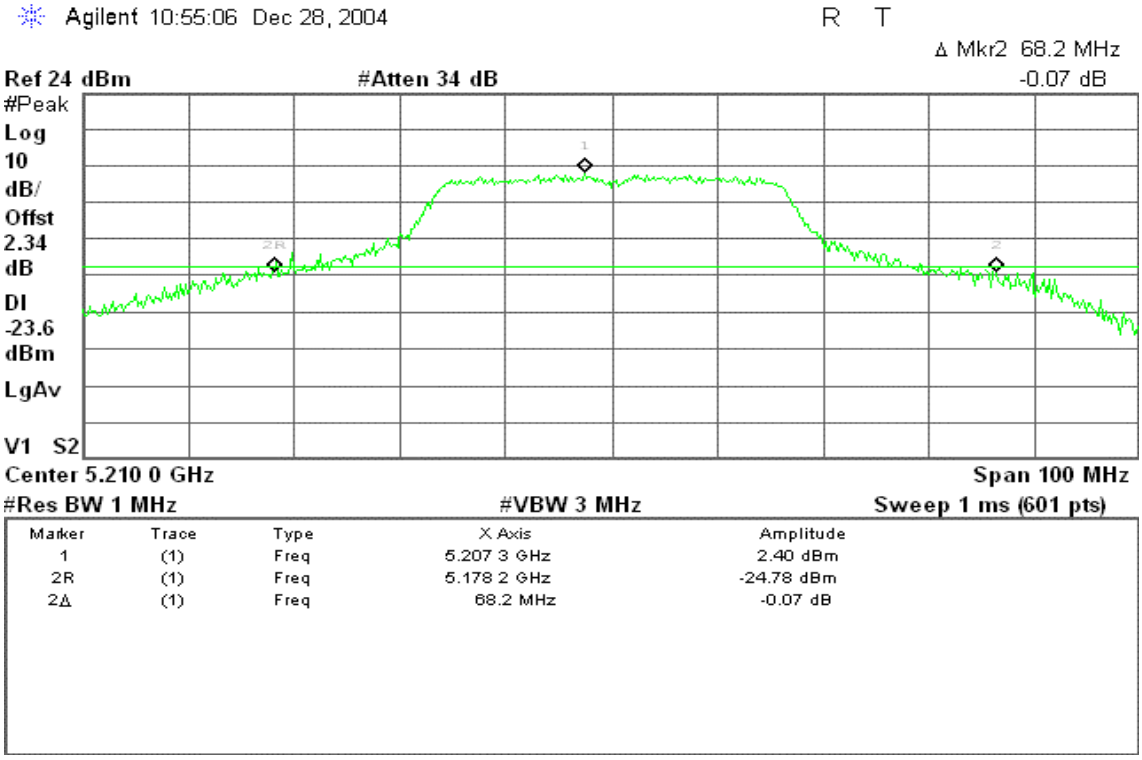


## CH 5320 / 5dBi

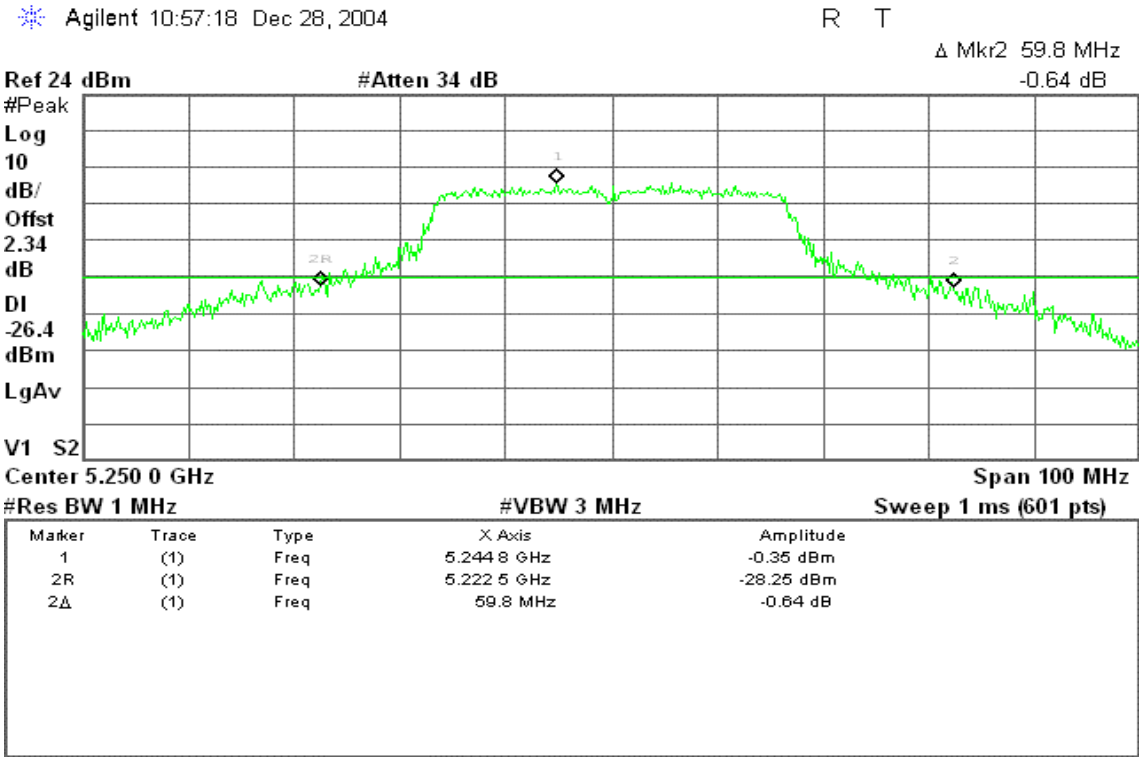

Agilent 10:46:11 Dec 28, 2004
R T
Δ Mkr2 25.92 MHz
-0.27 dB
Ref 24 dBm
#Atten 34 dB
#Peak
Log
10
dB/
Offst
2.34
dB
Dl
-27.9
dBm
LgAv
V1 S2
Center 5.320 00 GHz
Span 50 MHz
#Res BW 300 kHz
#VBW 1 MHz
Sweep 1 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 5.325 25 GHz -1.92 dBm
2R (1) Freq 5.307 08 GHz -29.81 dBm
2Δ (1) Freq 25.92 MHz -0.27 dB

## IEEE 802.11a Turbo mode

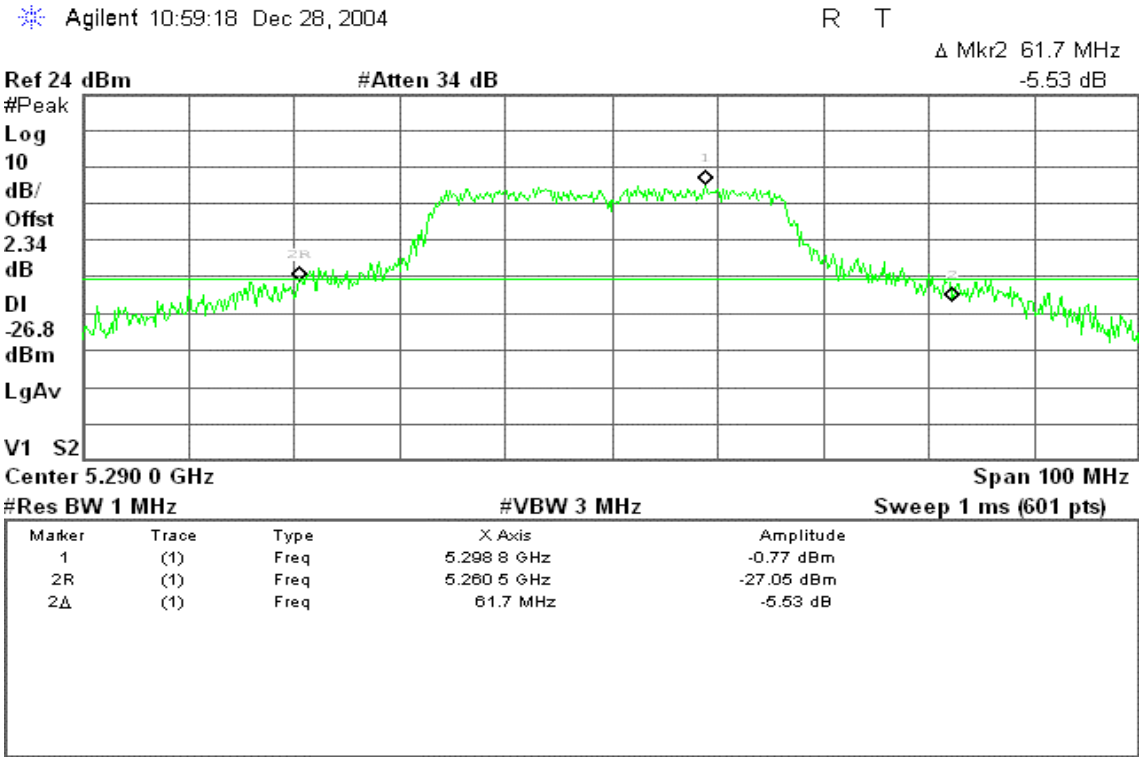
### CH 5210 / 5dBi




### CH 5250 / 5dBi



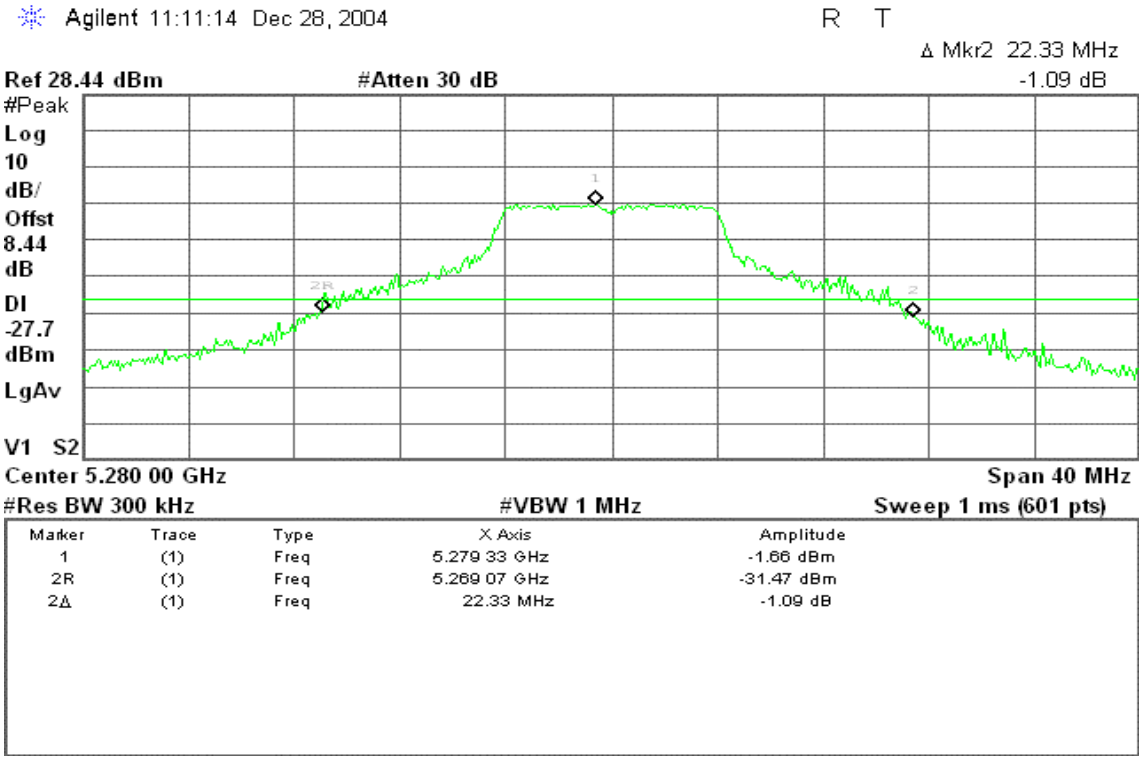
## CH 5290 / 5dBi


Agilent 10:59:18 Dec 28, 2004
R T
Δ Mkr2 61.7 MHz
-5.53 dB
Ref 24 dBm
#Atten 34 dB
#Peak
Log
10
dB/
Offst
2.34
dB
Dl
-26.8
dBm
LgAv
V1 S2
Center 5.290 0 GHz
Span 100 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 5.298 8 GHz -0.77 dBm
2R (1) Freq 5.260 5 GHz -27.05 dBm
2Δ (1) Freq 61.7 MHz -5.53 dB

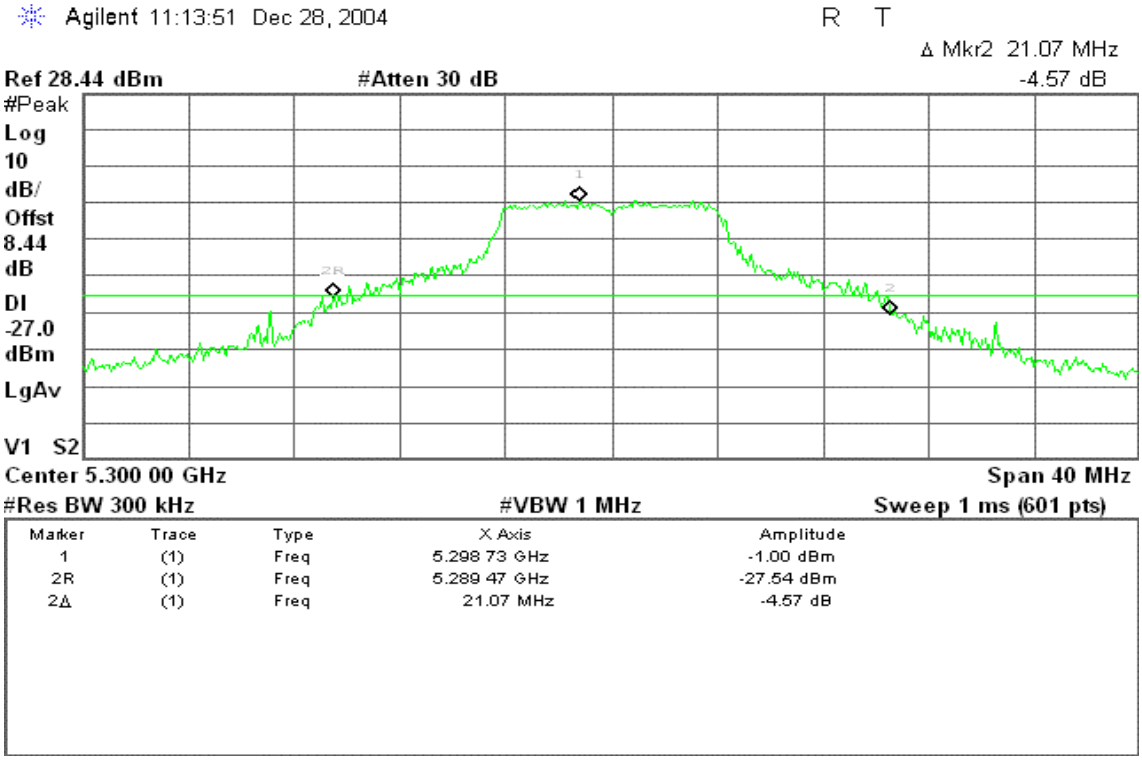
## Test Plot / Panel Directional Antenna

## IEEE 802.11a Base mode

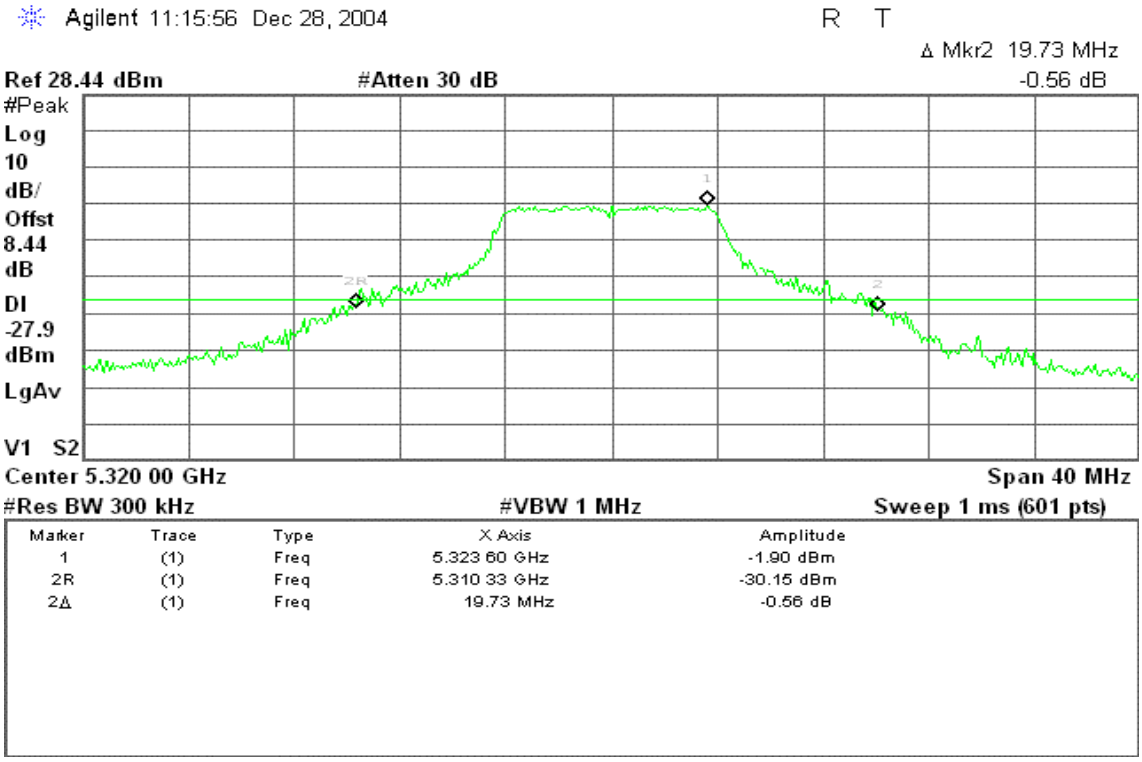
### CH 5280 / 14dBi




### CH 5300 / 14dBi

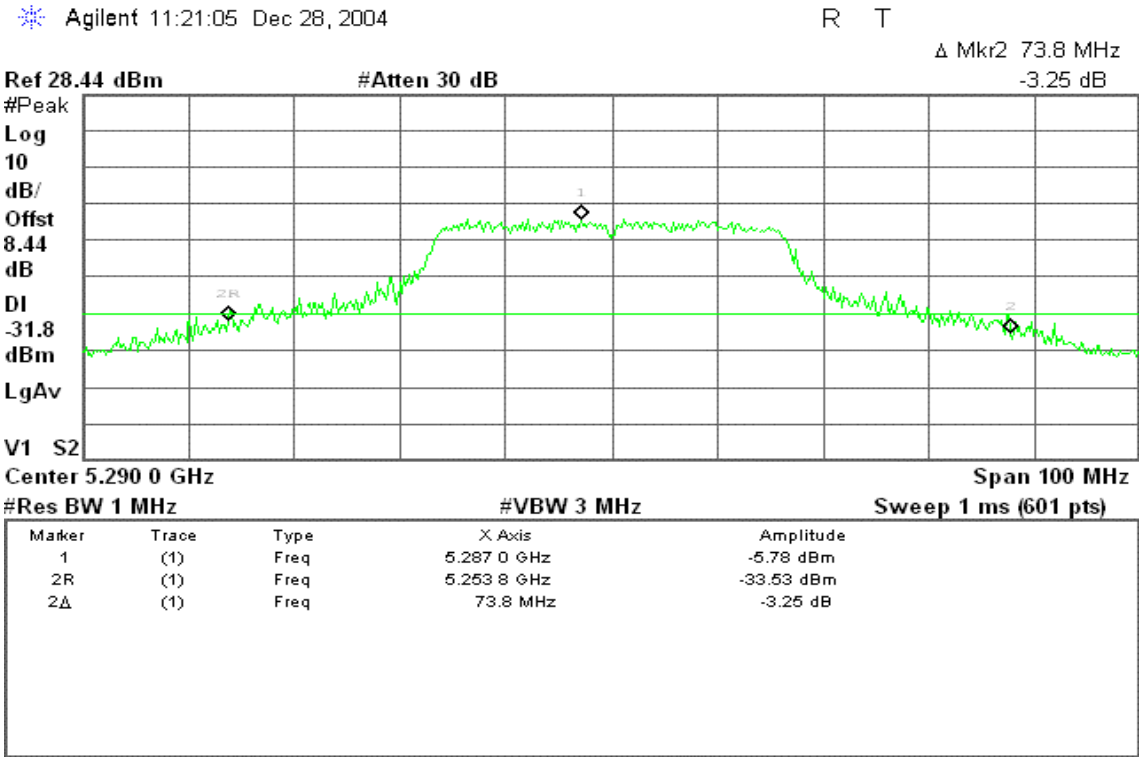


### CH 5320 / 14dBi




## IEEE 802.11a Turbo mode

### CH 5290 / 14dBi



## 7.2 PEAK POWER

## LIMIT

- For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50mW (17dBm) or 4dBm + 10log B, where B is the 26dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4dBm in any 1 MHz band.
- For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250mW (24dBm) or 11dBm + 10logB, where B is the 26dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11dBm in any 1 MHz band.
- For the band 5.725-5.825 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1mW (30dBm) or 17dBm + 10logB, where B is the 26dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17dBm in any 1 MHz band.

*If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.* The peak power shall not exceeded the limit as follows:

**Specified Limit of the Peak Power**

**Dual-Band Omni-Directional Antenna**

| Frequency (MHz) | | | B | 10 Log B (dB) | Limit 4 + 10 Log B or 11 + 10 Log B (dBm) | Antenna Gain (dBi) | Power Limit (dBm) |
|---|---|---|---|---|---|---|---|
| Base mode | Channel 1 | 5180 | 28.42 | 14.54 | 18.54 | 5 | 17 |
| | Channel 5 | 5260 | 30.75 | 14.88 | 25.88 | | 24 |
| | Channel 8 | 5320 | 25.92 | 14.14 | 25.14 | | 24 |
| Turbo mode | | 5210 | 68.20 | 18.33 | 22.33 | | 17 |
| | | 5250 | 59.80 | 17.77 | 21.77 | | 17 |
| | | 5290 | 61.70 | 17.90 | 28.90 | | 24 |

*(**Note**: Maximum antenna gain = 5dBi, therefore there is no reduction due to antenna gain.)*

**Panel Directional Antenna**

| Frequency (MHz) | | | B | 10 Log B (dB) | Limit 4 + 10 Log B or 11 + 10 Log B (dBm) | Antenna Gain (dBi) | Power Limit (dBm) |
|---|---|---|---|---|---|---|---|
| Base mode | Channel 6 | 5280 | 22.33 | 13.49 | 17.49 | 14 | 16 |
| | Channel 7 | 5300 | 21.07 | 13.24 | 24.23 | | |
| | Channel 8 | 5320 | 19.73 | 12.95 | 23.95 | | |
| Turbo mode | | 5290 | 73.80 | 18.68 | 29.68 | | |

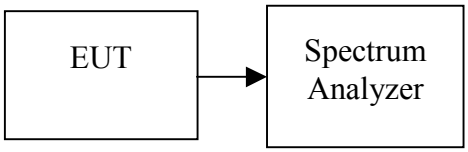
## MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 01/10/2005 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

### Test Configuration

*The EUT was connected to a spectrum analyzer through a 50Ω RF cable.*




## TEST PROCEDURE

Set span to encompass the entire emission bandwidth (EBW) of the signal.

Set RBW = 1 MHz / Set VBW = 3 MHz.

Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to "free run".·Trace average 100 traces in power averaging mode. Compute power by integrating the spectrum across the 26dB EBW of the signal. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

## TEST RESULTS

*No non-compliance noted.*

## Test Data

### Dual-Band Omni-Directional Antenna

| Frequency (MHz) | | | Reading (dBm) | Cable Loss (dB) | Output Power (dBm) | Antenna Gain (dBi) | Limit (dBm) | Result |
|---|---|---|---|---|---|---|---|---|
| Base mode | Channel 1 | 5180 | 10.86 | 2.34 | 13.20 | 5 | 17 | Pass |
| | Channel 5 | 5260 | 11.54 | 2.34 | 13.88 | | 24 | |
| | Channel 8 | 5320 | 11.10 | 2.34 | 13.44 | | 24 | |
| Turbo mode | | 5210 | 11.17 | 2.34 | 13.51 | | 17 | |
| | | 5250 | 10.16 | 2.34 | 12.50 | | 17 | |
| | | 5290 | 10.07 | 2.34 | 12.41 | | 24 | |

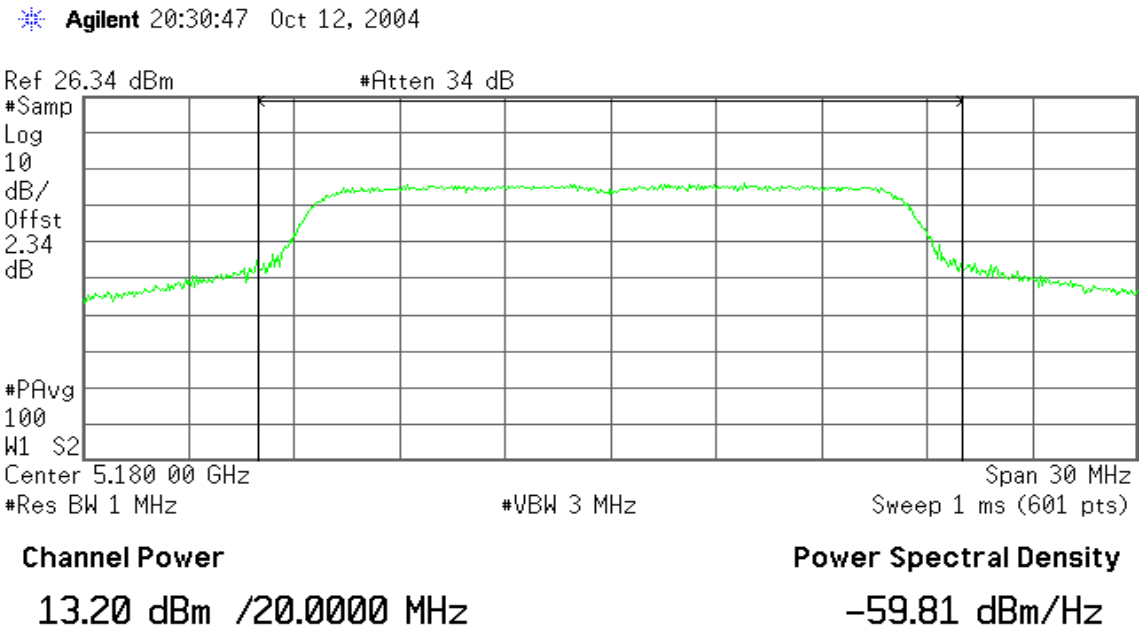
### Panel Directional Antenna

| Frequency (MHz) | | | Reading (dBm) | Cable Loss (dB) | Output Power (dBm) | Antenna Gain (dBi) | Limit (dBm) | Result |
|---|---|---|---|---|---|---|---|---|
| Base mode | Channel 6 | 5280 | 11.73 | 2.34 | 14.07 | 14 | 16 | Pass |
| | Channel 7 | 5300 | 11.68 | 2.34 | 14.02 | | | |
| | Channel 8 | 5320 | 11.80 | 2.34 | 14.14 | | | |
| Turbo mode | | 5290 | 10.19 | 2.34 | 12.53 | | | |

## Test Plot / Dual-Band Omni-Directional Antenna

## IEEE 802.11a Base mode

### CH 5180 / 5dBi



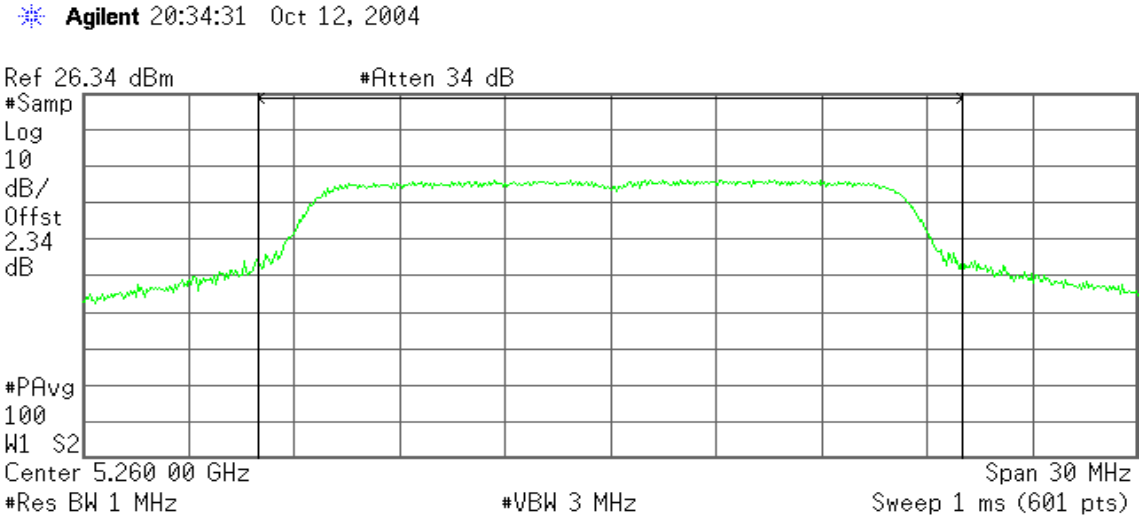

**Channel Power**

13.20 dBm /20.0000 MHz

**Power Spectral Density**

-59.81 dBm/Hz

### CH 5260 / 5dBi



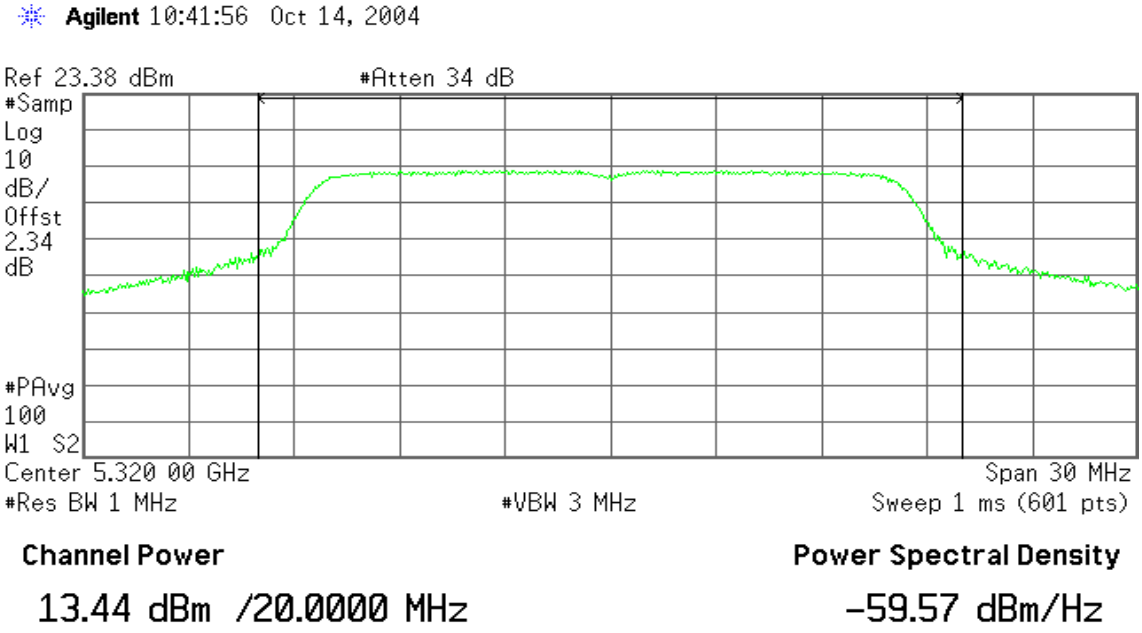

**Channel Power**

13.88 dBm /20.0000 MHz

**Power Spectral Density**

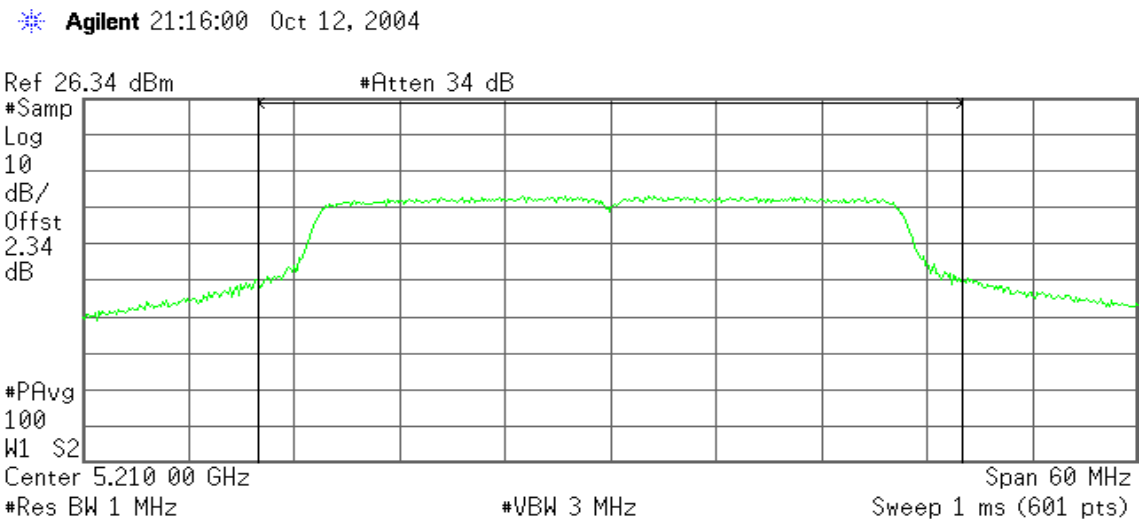
-59.13 dBm/Hz

**CH 5320 / 5dBi**

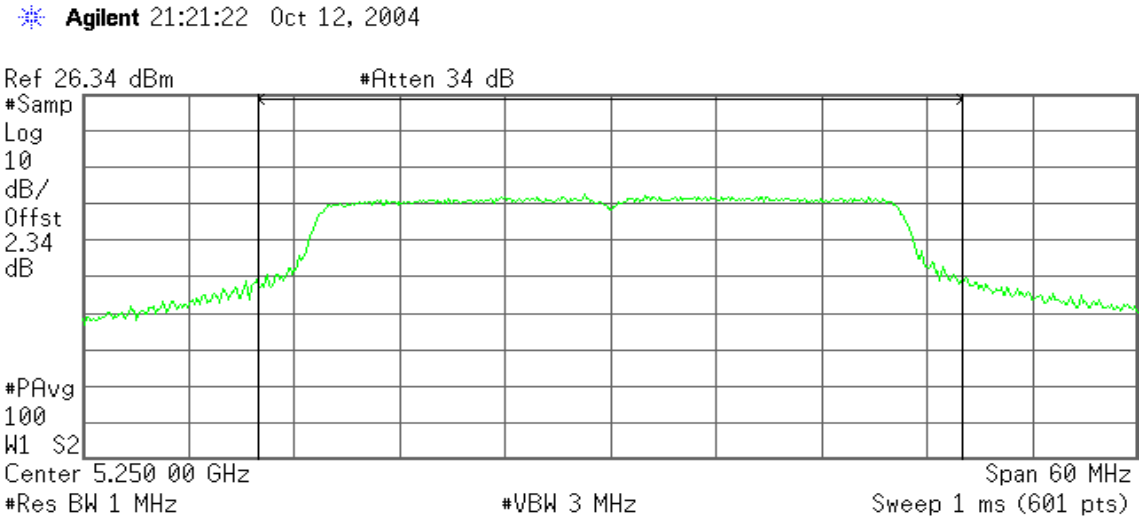

Agilent 10:41:56 Oct 14, 2004
Ref 23.38 dBm
#Atten 34 dB
#Samp
Log
10
dB/
Offst
2.34
dB
#PAvg
100
W1 S2
Center 5.320 00 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.44 dBm /20.0000 MHz
Power Spectral Density
-59.57 dBm/Hz

## IEEE 802.11a Turbo mode

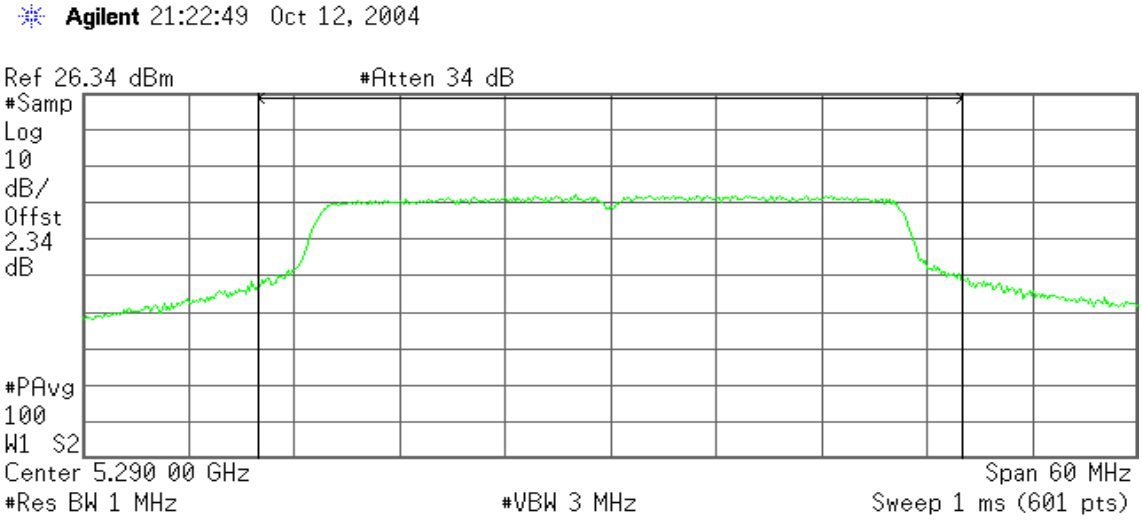
### CH 5210 / 5dBi




### CH 5250 / 5dBi



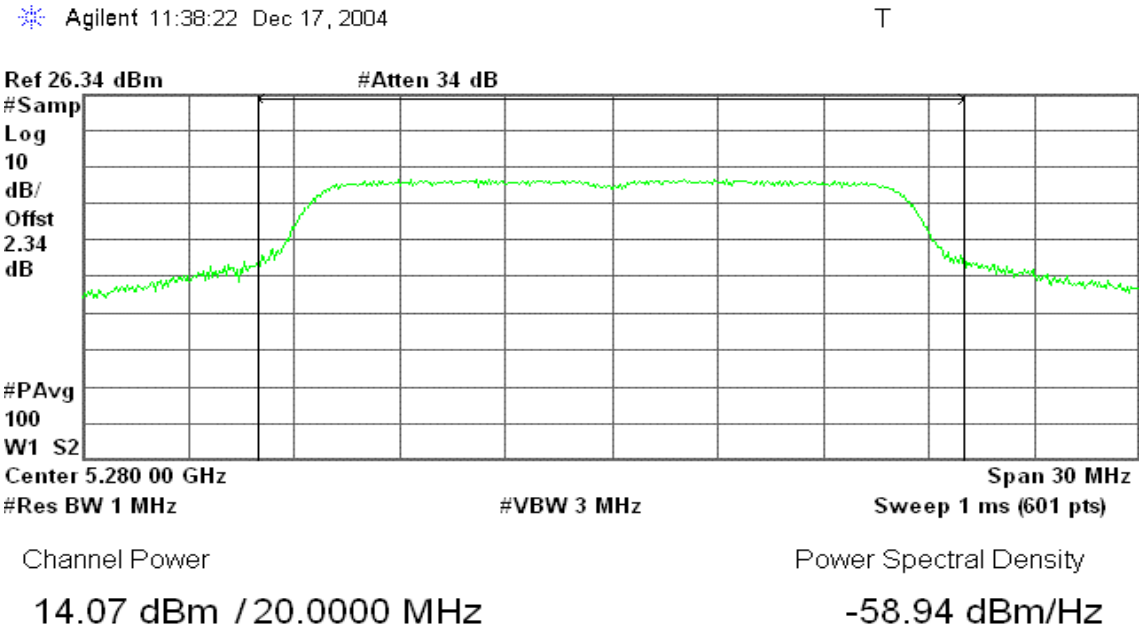
**CH 5290 / 5dBi**


Agilent 21:22:49 Oct 12, 2004
Ref 26.34 dBm
#Atten 34 dB
#Samp
Log
10
dB/
Offst
2.34
dB
#PAvg
100
W1 S2
Center 5.290 00 GHz
Span 60 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.41 dBm /40.0000 MHz
Power Spectral Density
-63.61 dBm/Hz

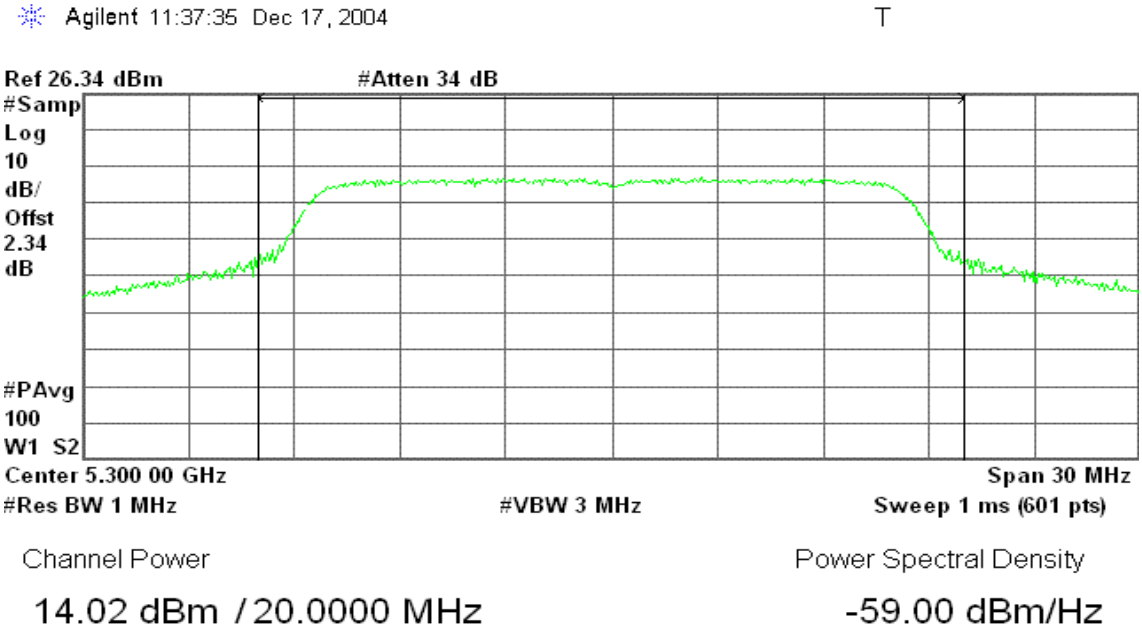
**Panel Directional Antenna**

**IEEE 802.11a Base mode**

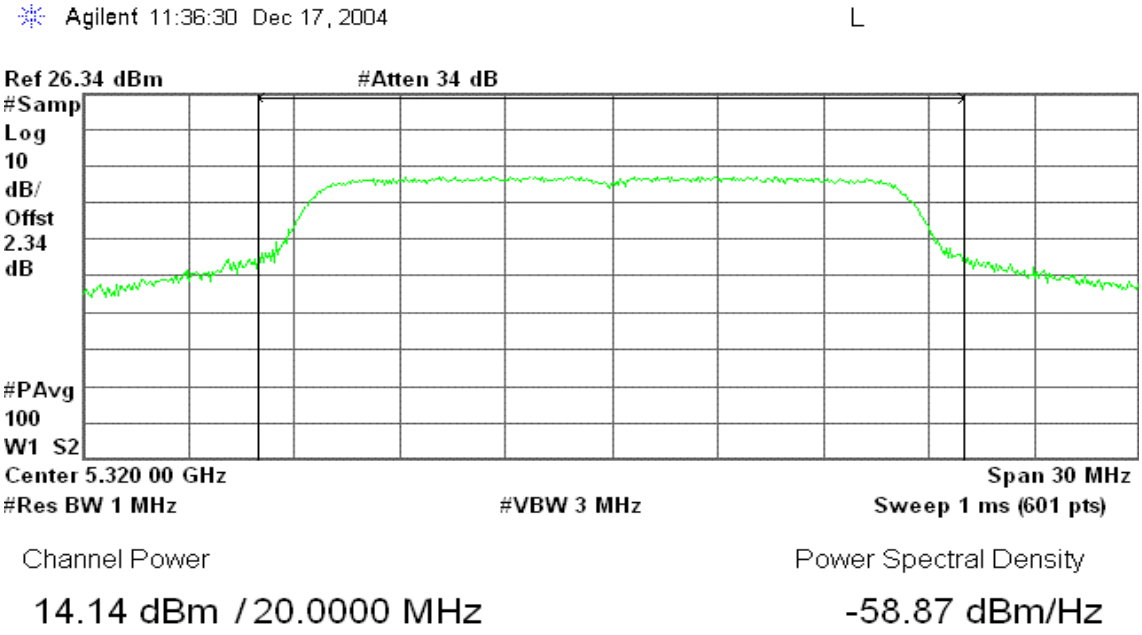
**CH 5280 / 14dBi**




**CH 5300 / 14dBi**

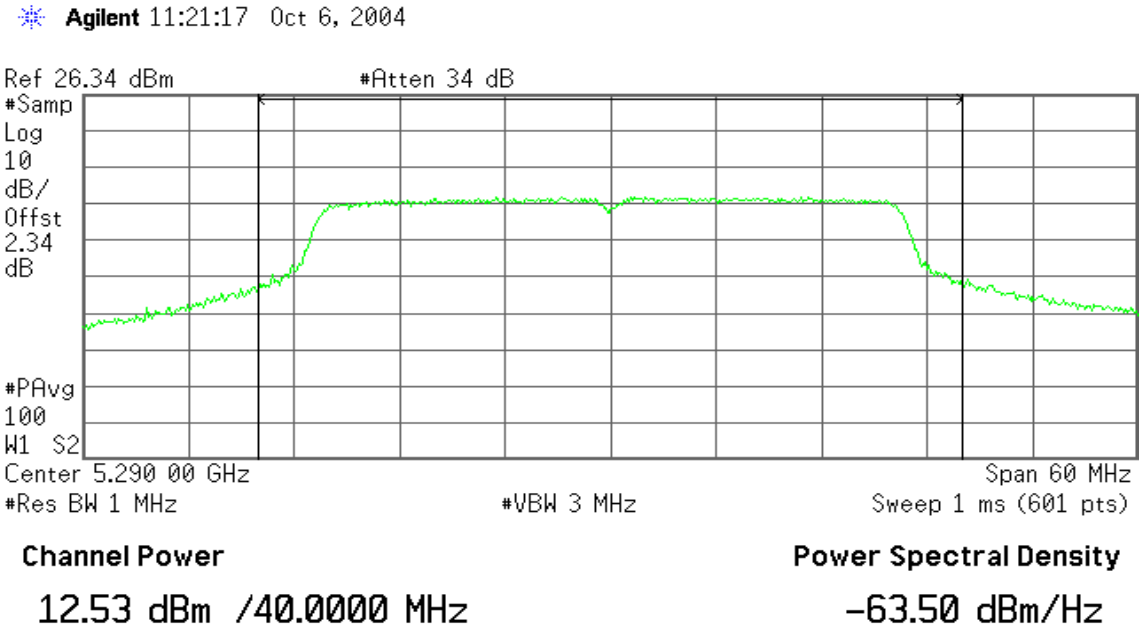


### CH 5320 / 14dBi




## IEEE 802.11a Turbo mode

### CH 5290 / 14dBi



## 7.3 BAND EDGES MEASUREMENT

## LIMIT

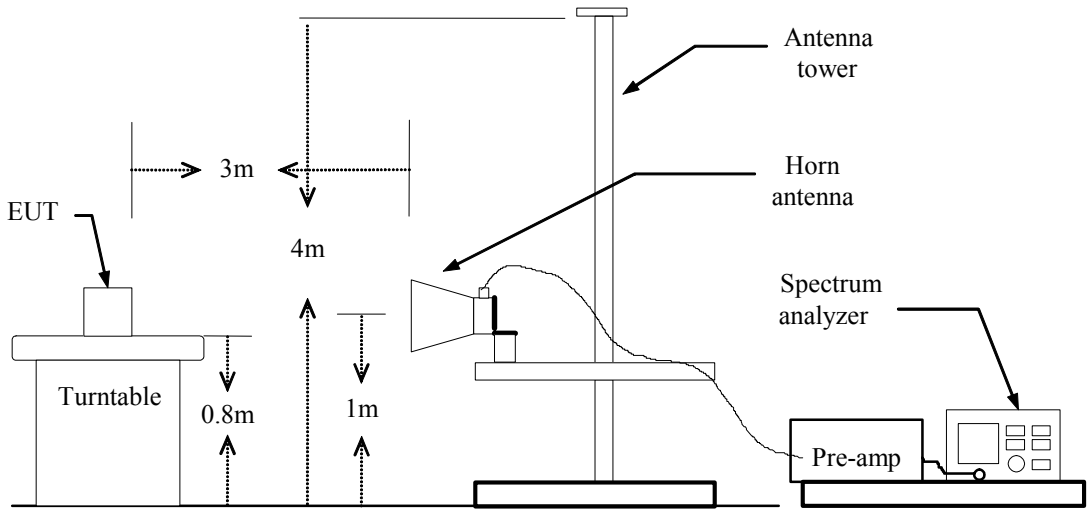
According to §15.407(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

## MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 01/10/2005 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

### Test Configuration




## TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

## TEST RESULTS

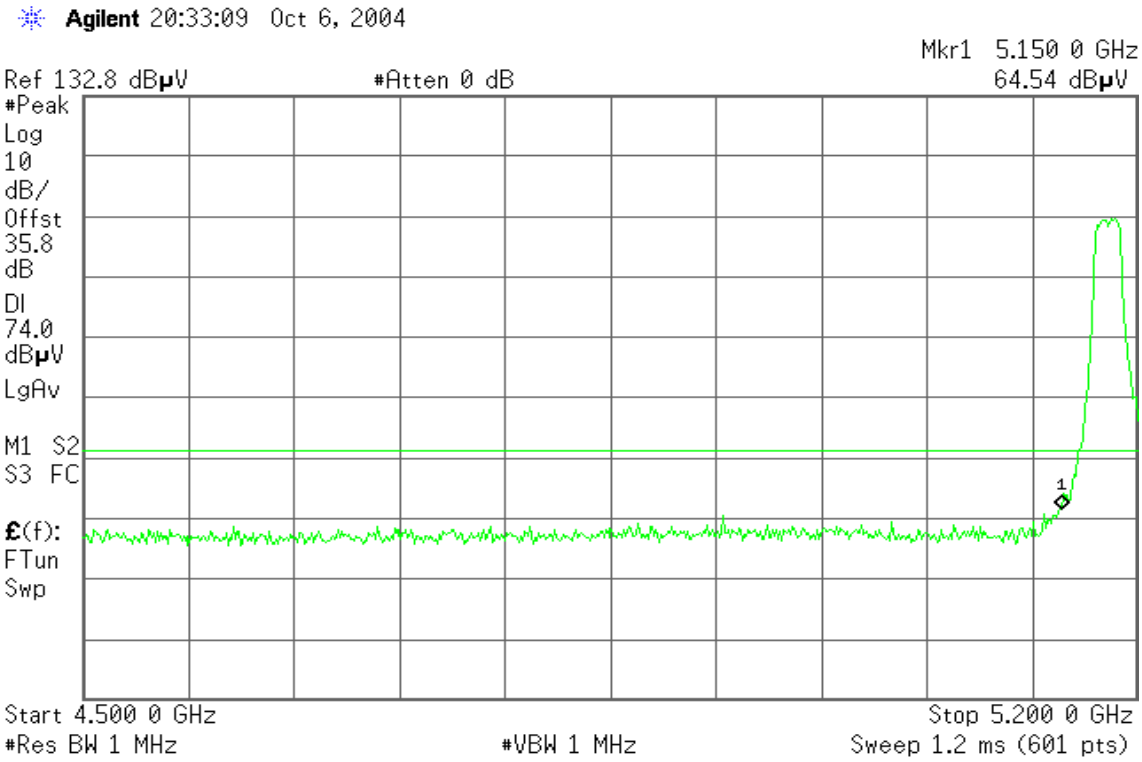
Refer to attach spectrum analyzer data chart.

## Test Plot

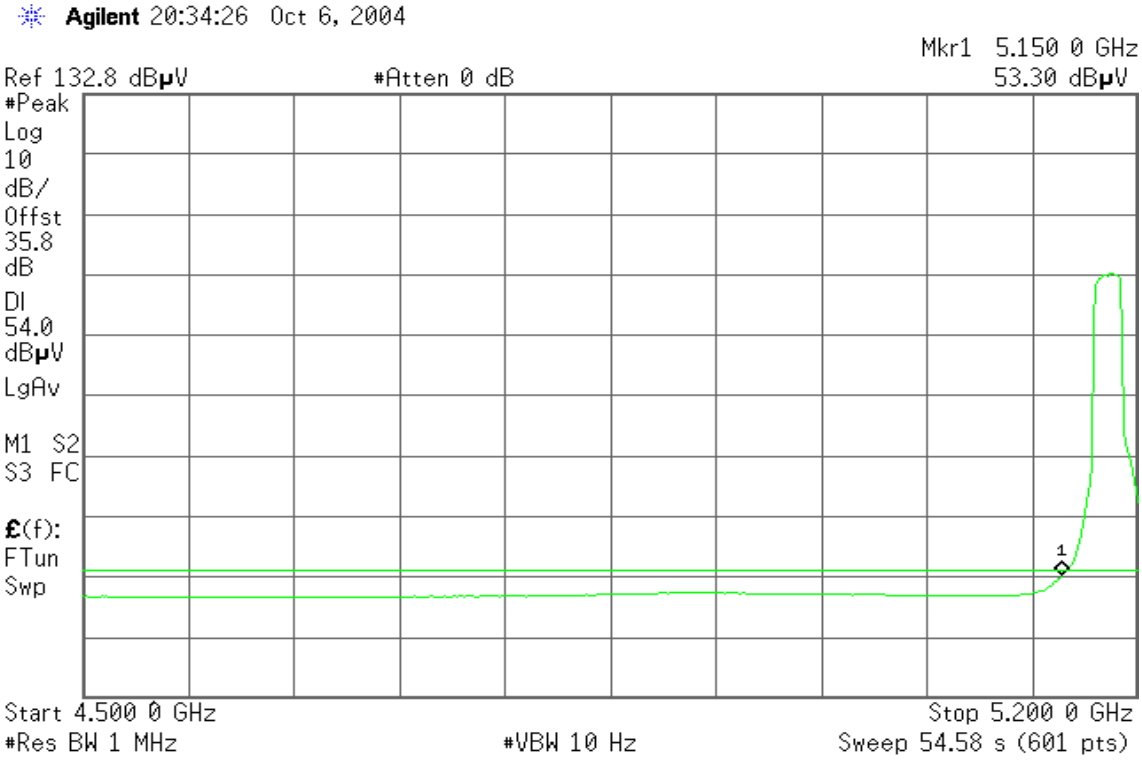
## IEEE 802.11a Base mode / Dual-Band Omni-Directional Antenna

## CH 5180 / 5dBi

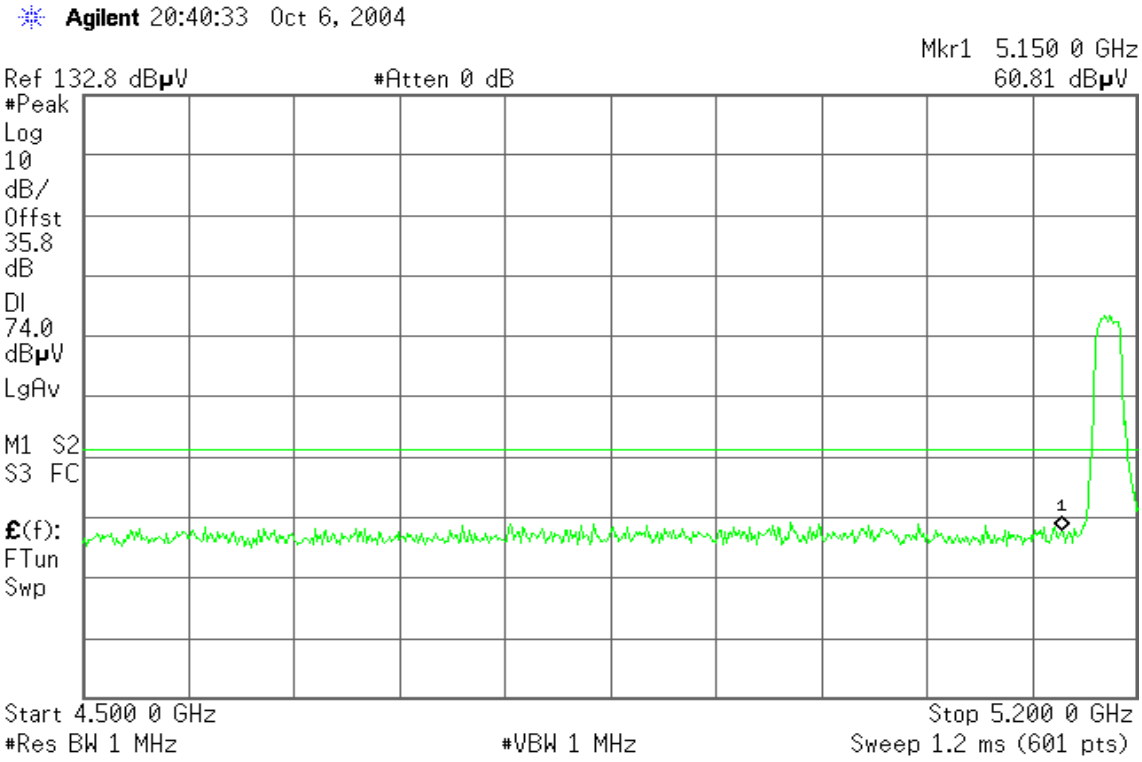
**Detector mode: Peak** **Polarity: Vertical**



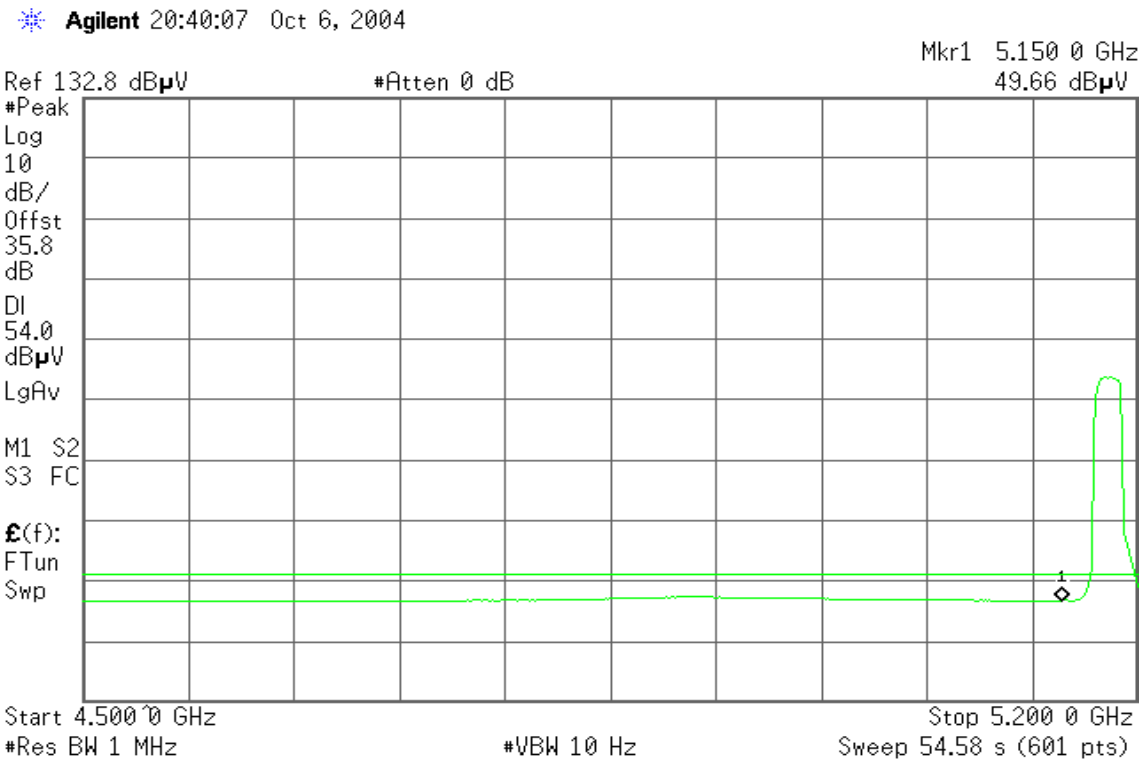

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**



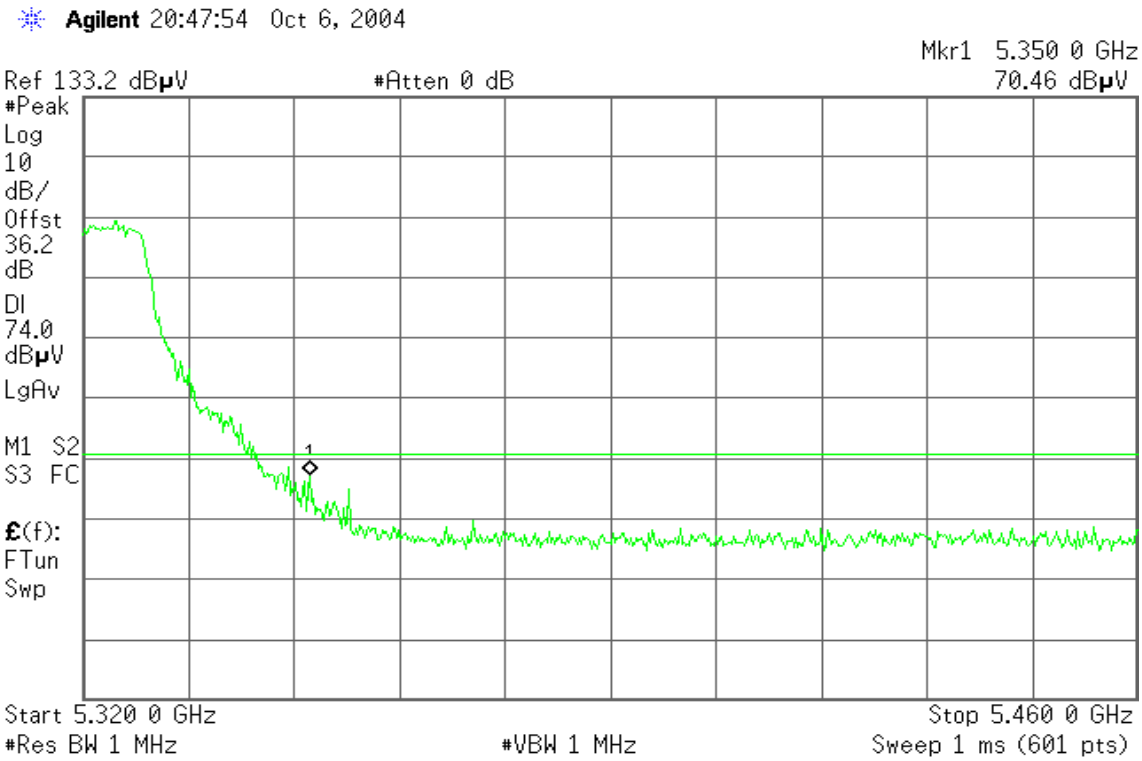

**Detector mode: Average** **Polarity: Horizontal**



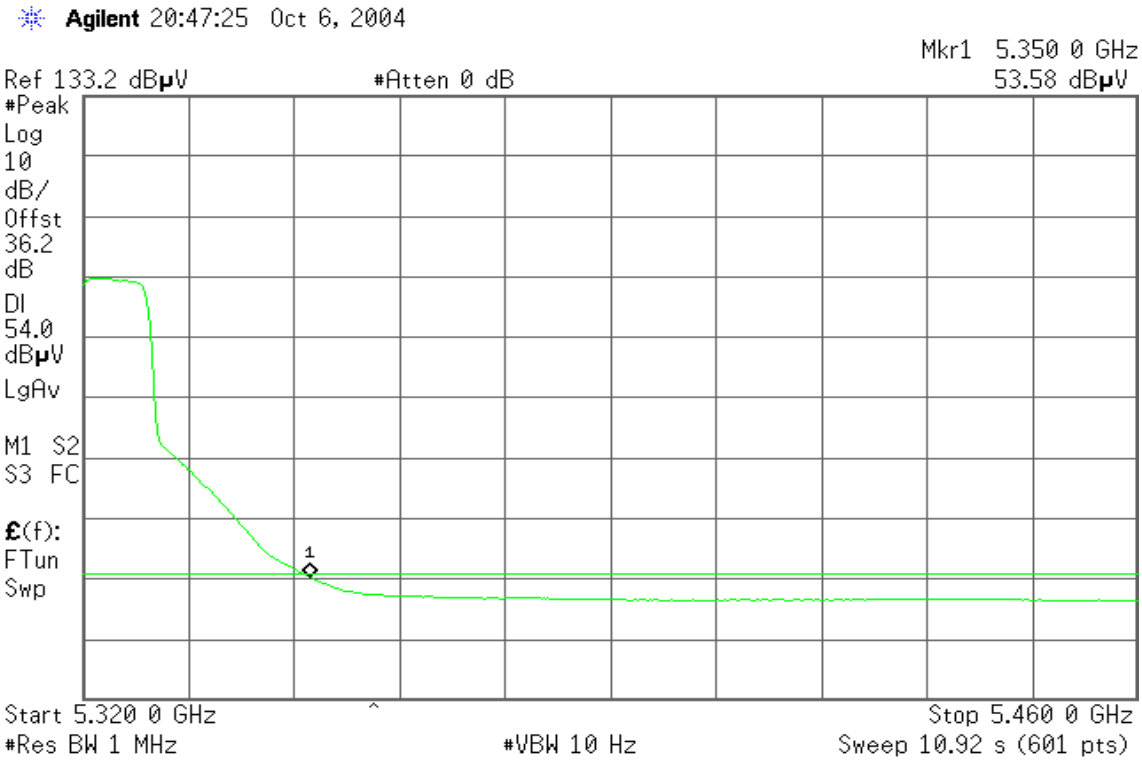
## IEEE 802.11a Base mode

## CH 5320 / 5dBi

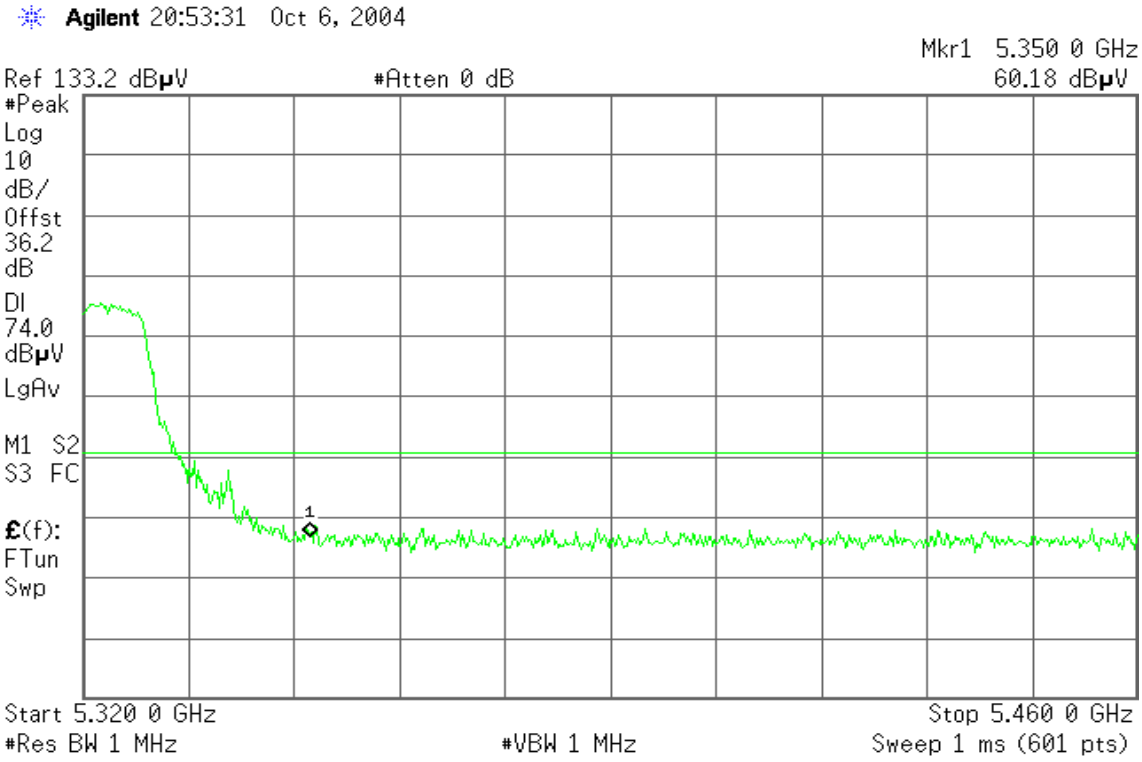
**Detector mode: Peak** **Polarity: Vertical**



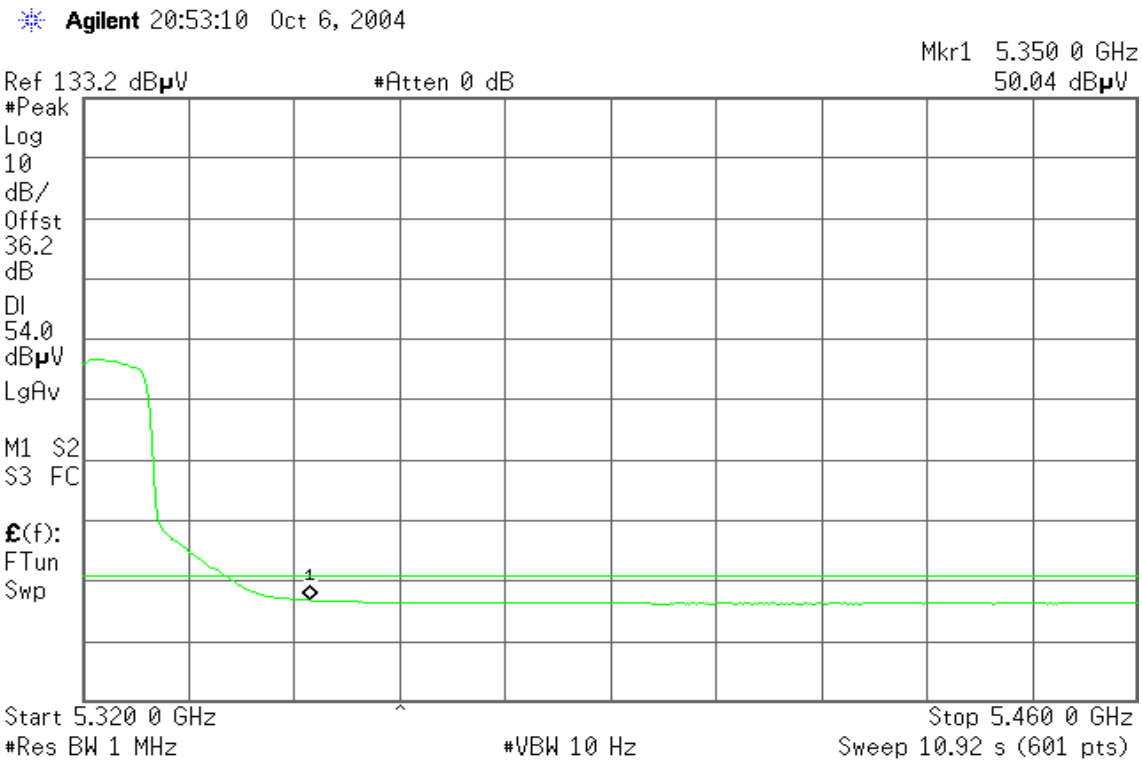

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**



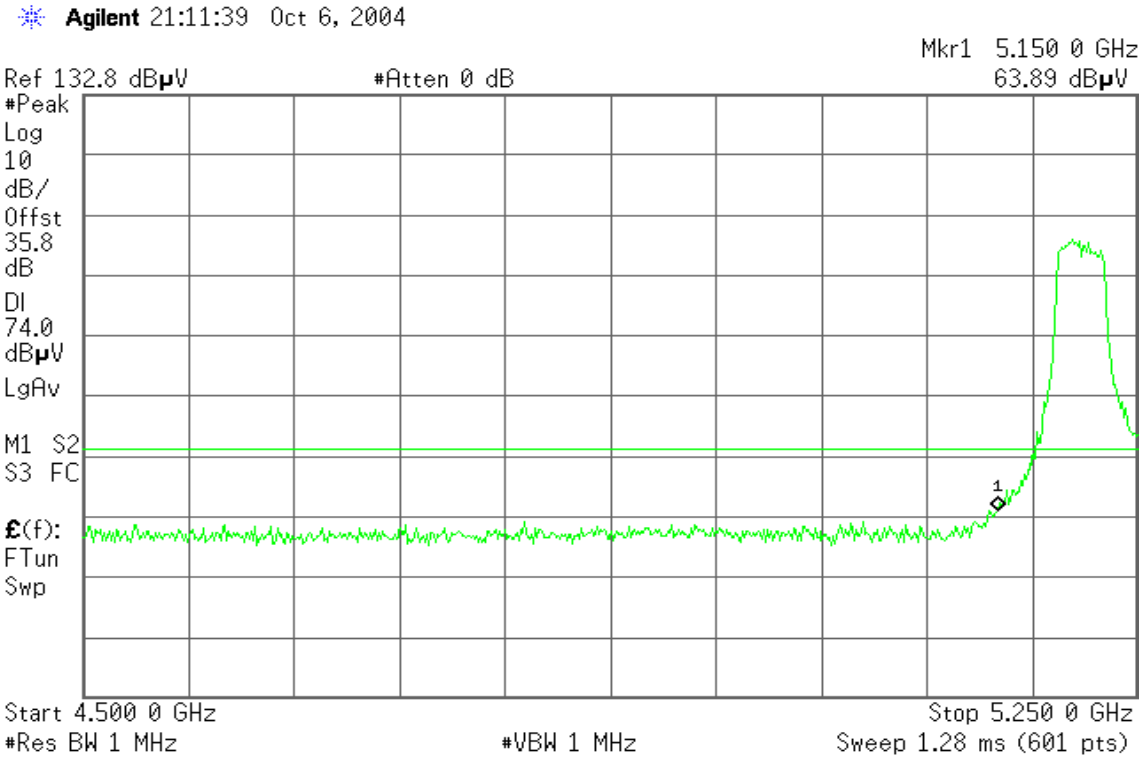

**Detector mode: Average** **Polarity: Horizontal**



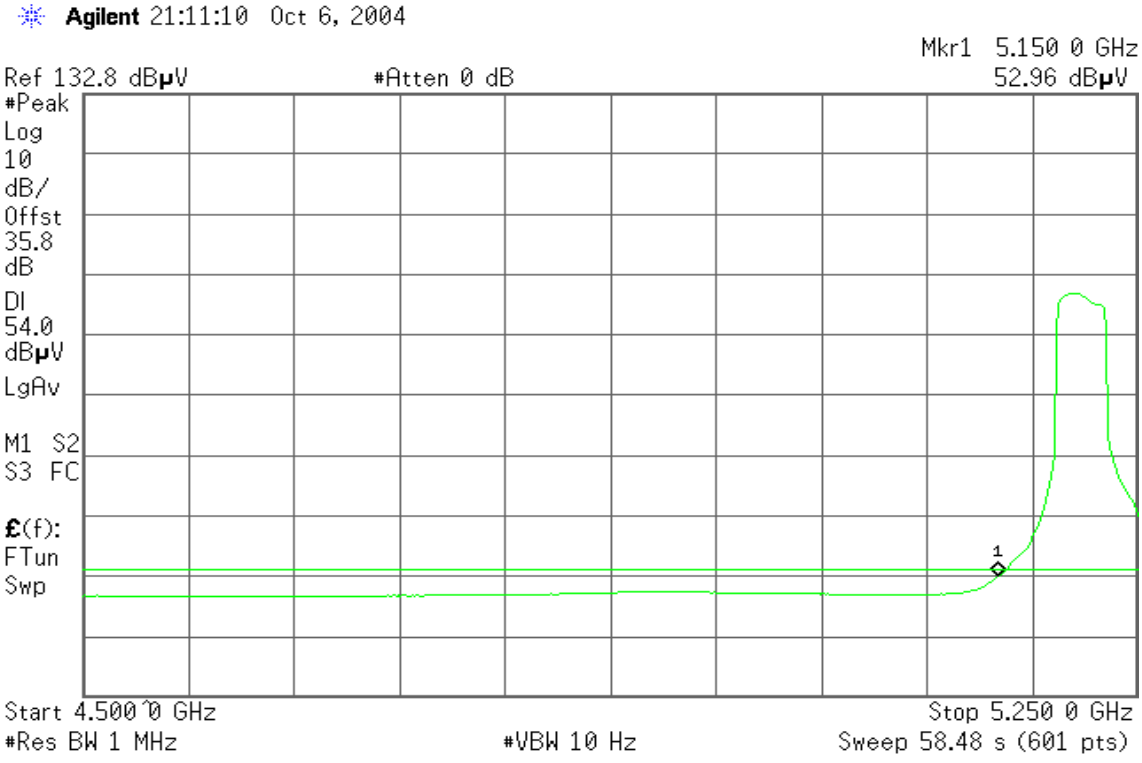
## IEEE 802.11a Turbo mode

## CH 5210 / 5dBi

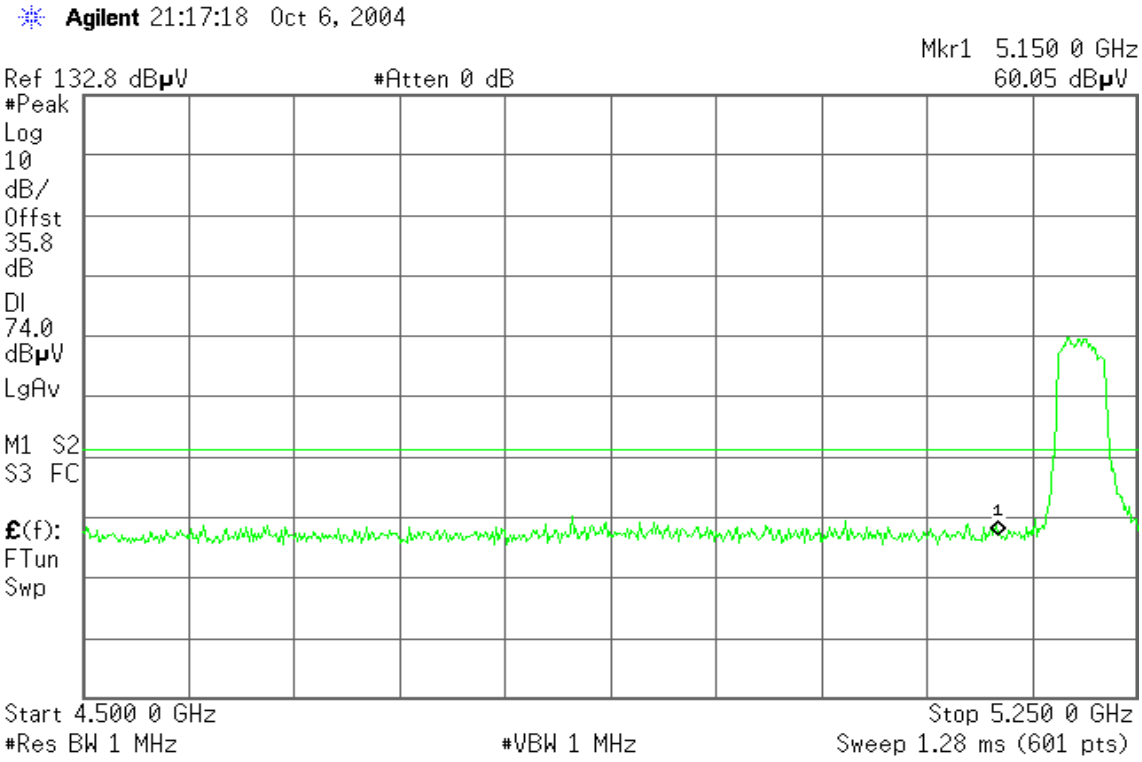
**Detector mode: Peak** **Polarity: Vertical**



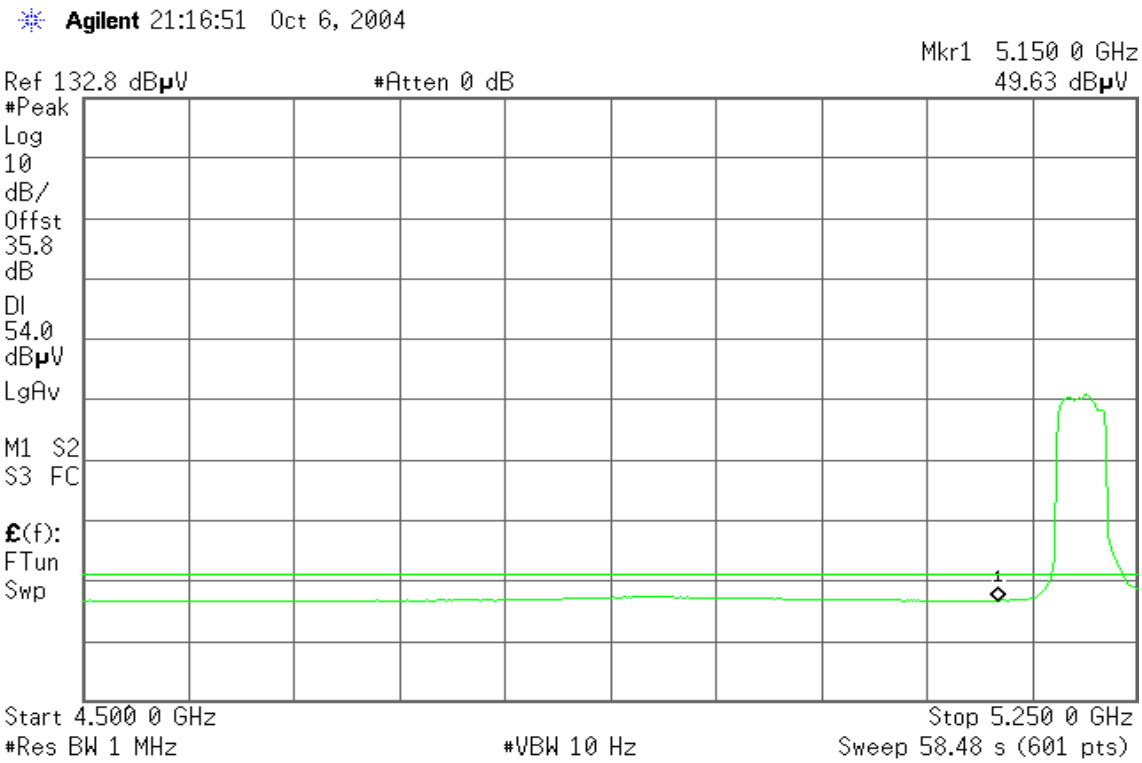

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**



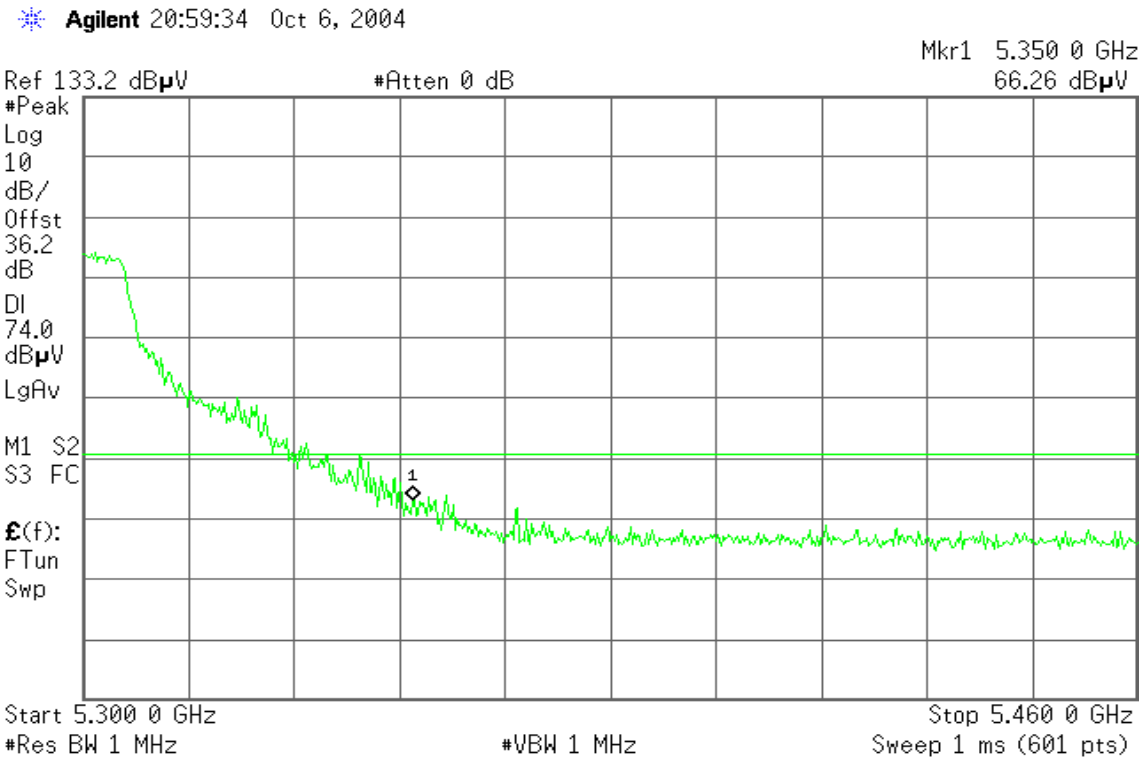

**Detector mode: Average** **Polarity: Horizontal**



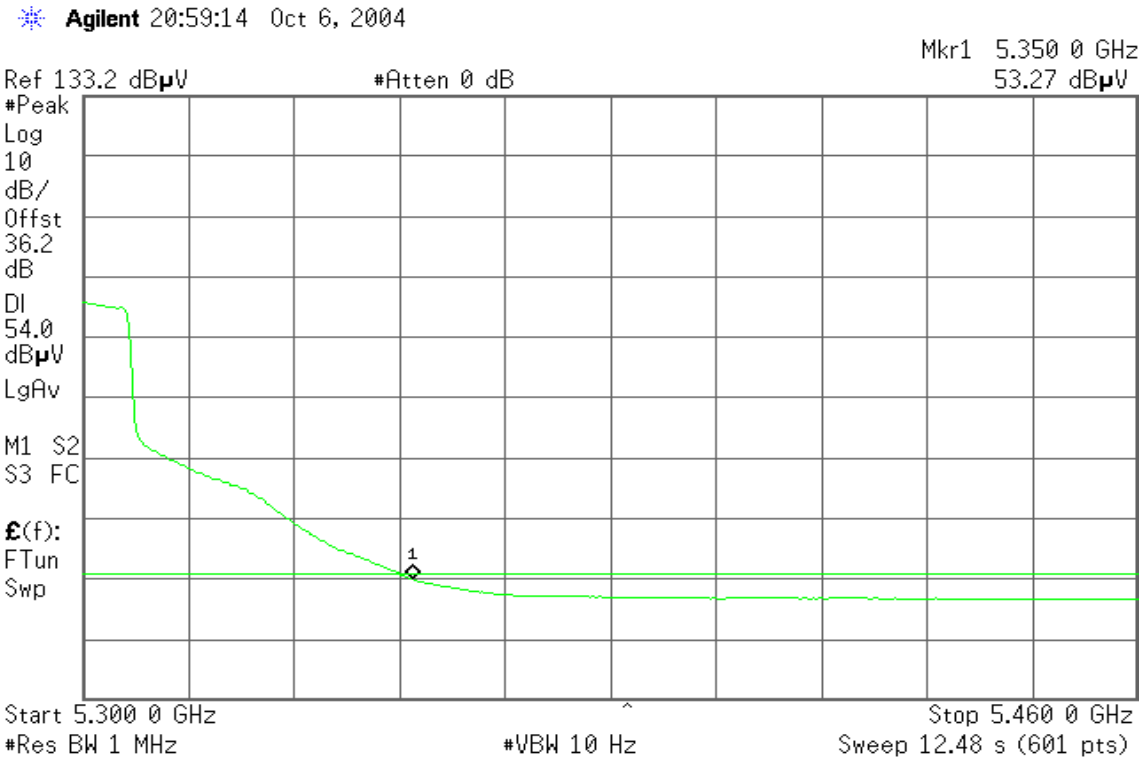
## IEEE 802.11a Turbo mode

## CH 5290 / 5dBi

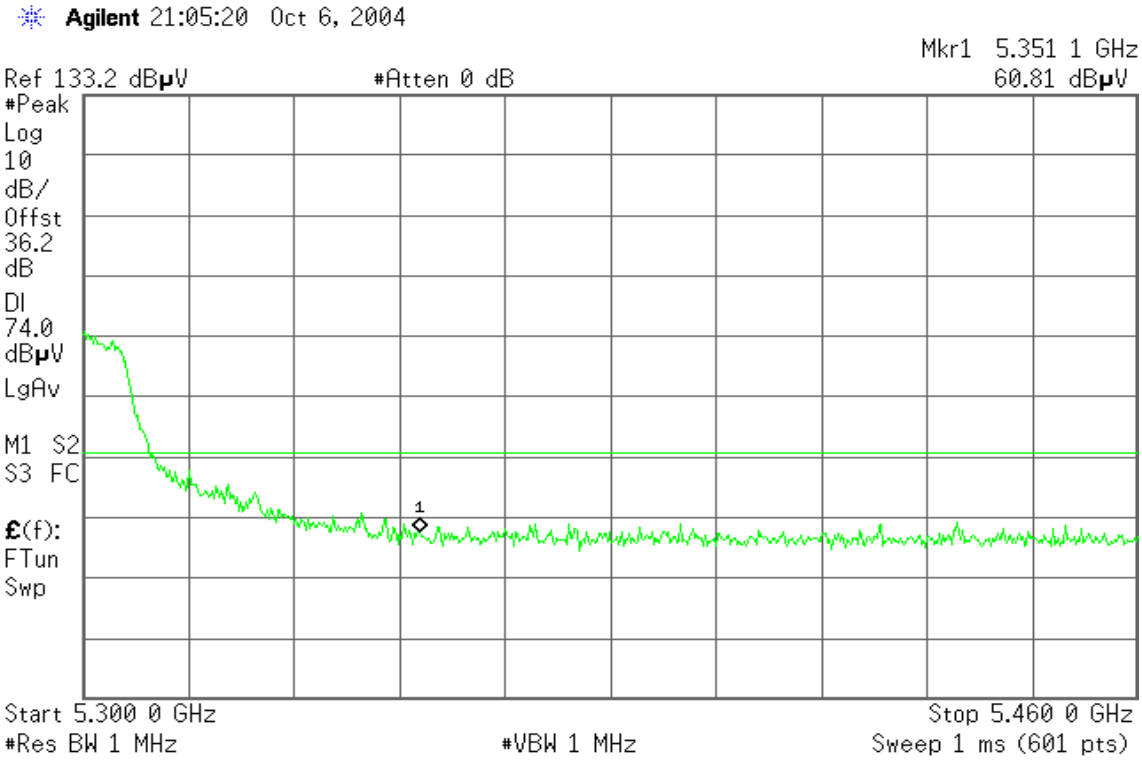
**Detector mode: Peak** **Polarity: Vertical**



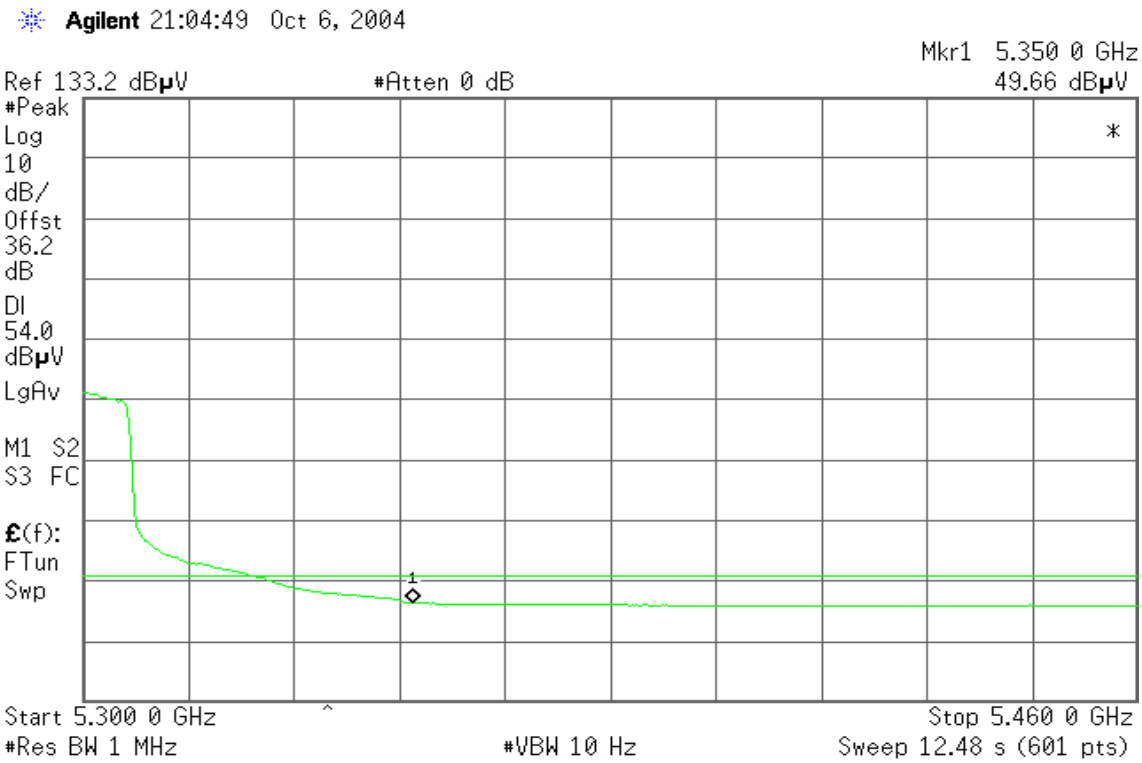

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**



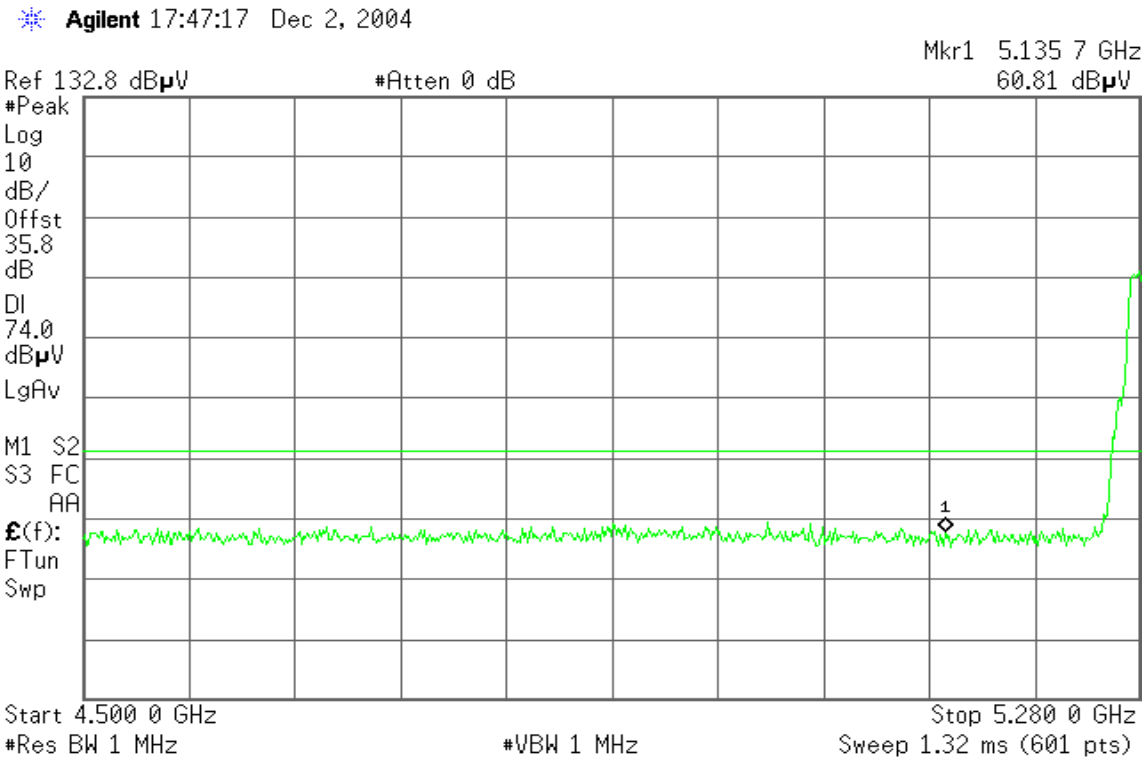

**Detector mode: Average** **Polarity: Horizontal**



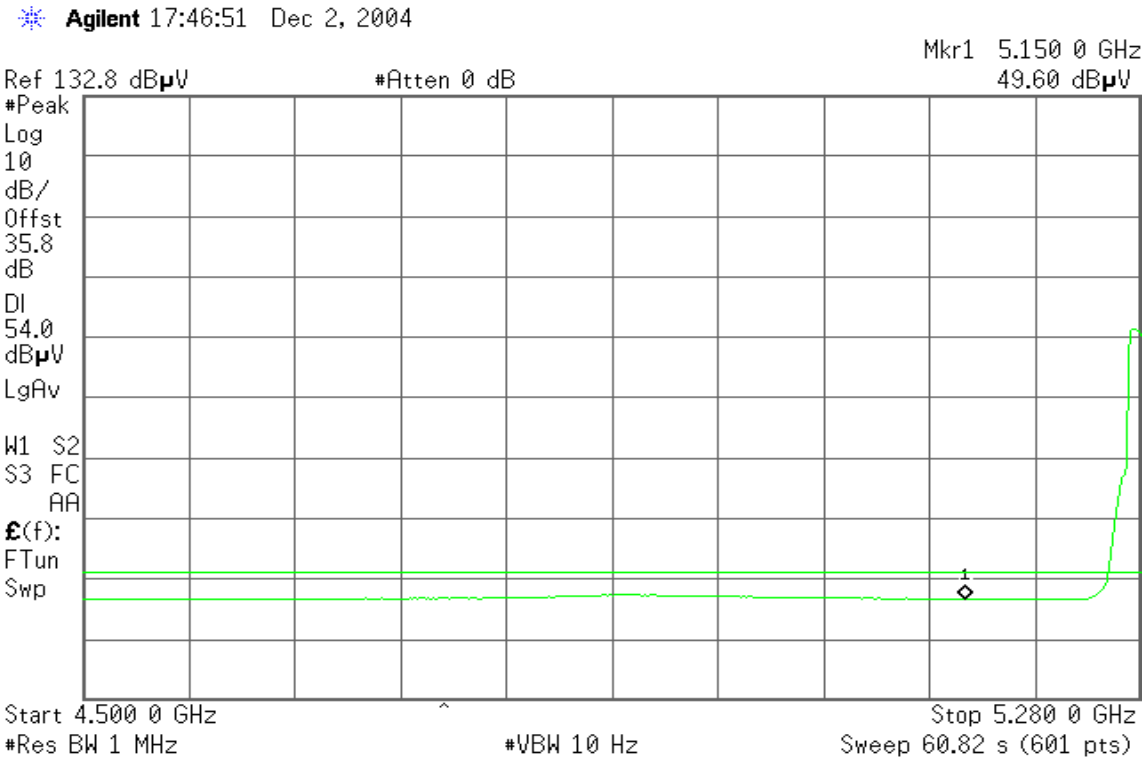
## IEEE 802.11a Base mode / Panel Directional Antenna

## CH 5280 / 14dBi

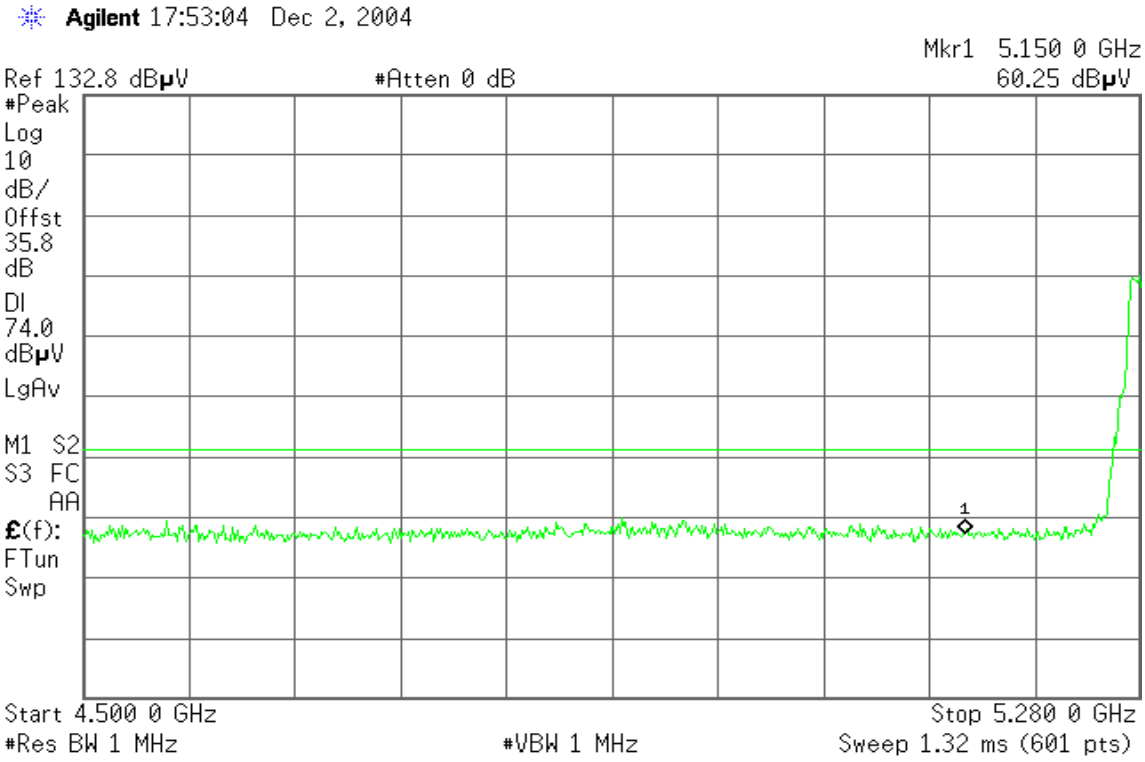
**Detector mode: Peak** **Polarity: Vertical**



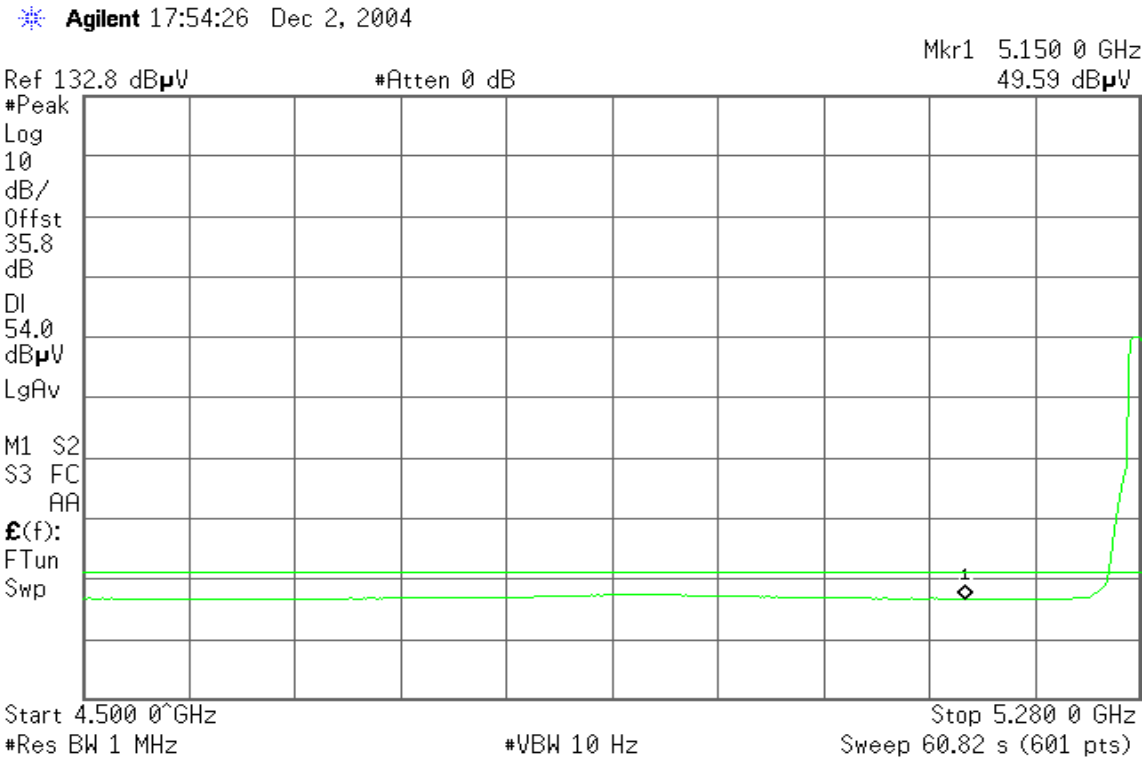

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**

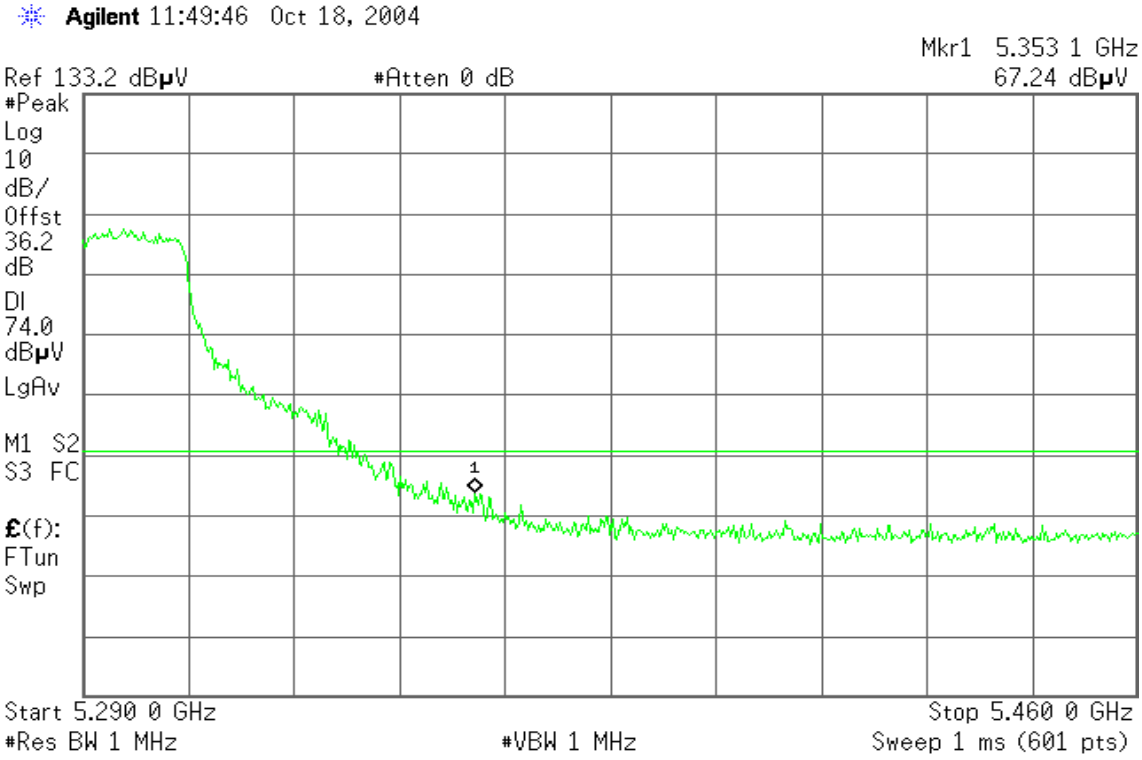



**Detector mode: Average** **Polarity: Horizontal**

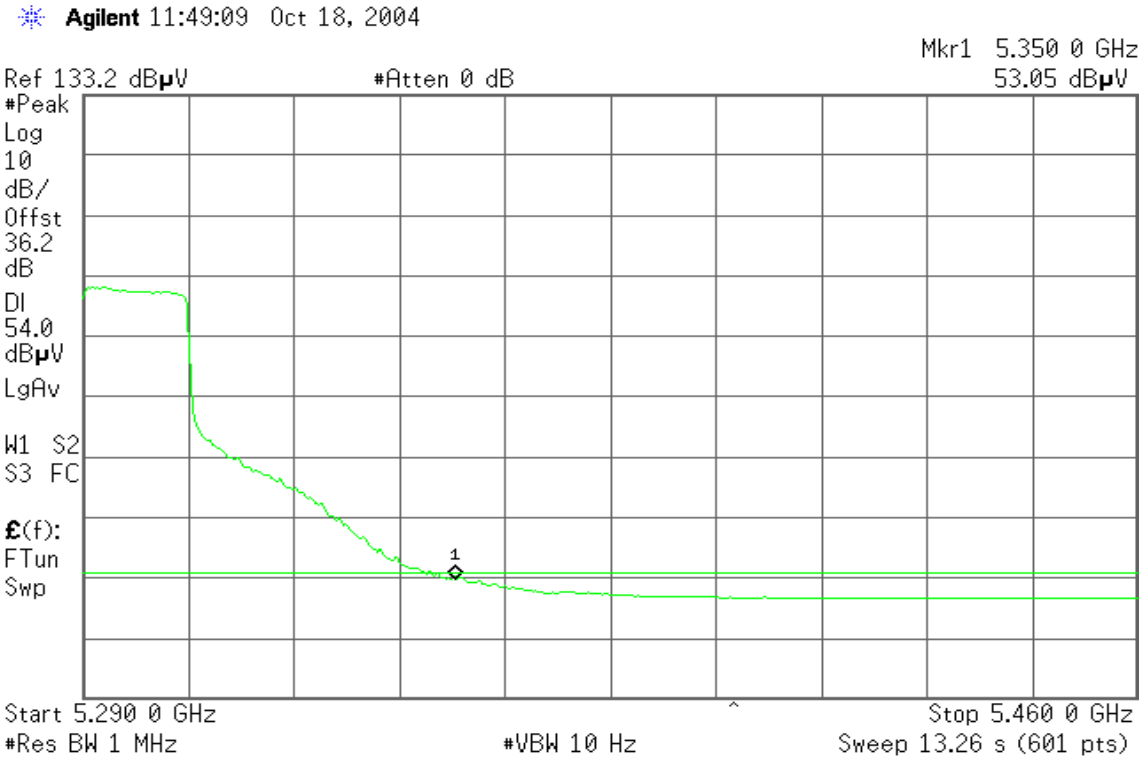


## CH 5320 / 14dBi

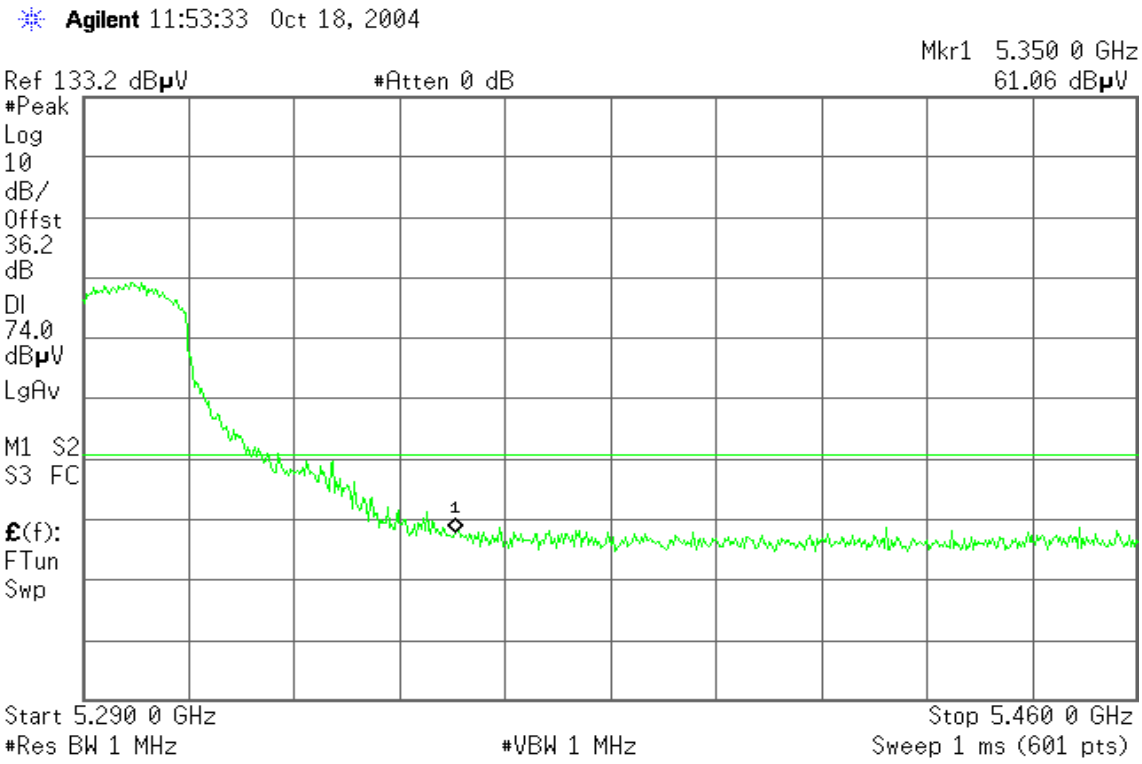
**Detector mode: Peak** **Polarity: Vertical**



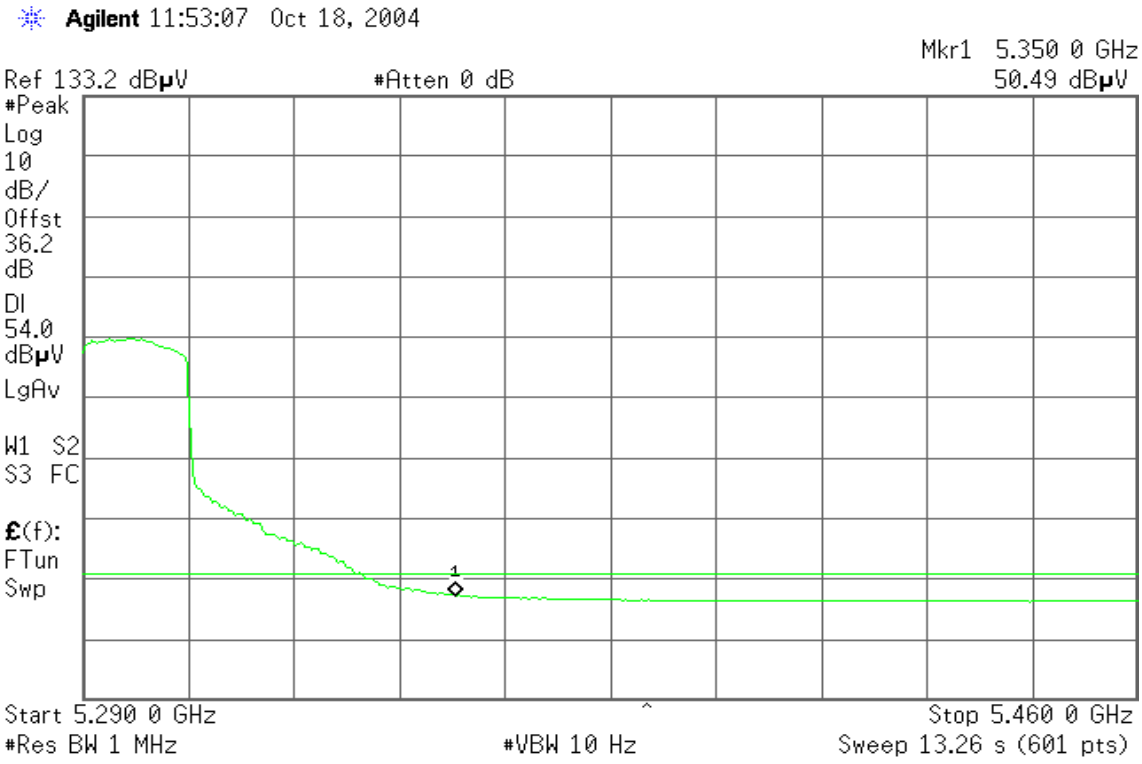

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**



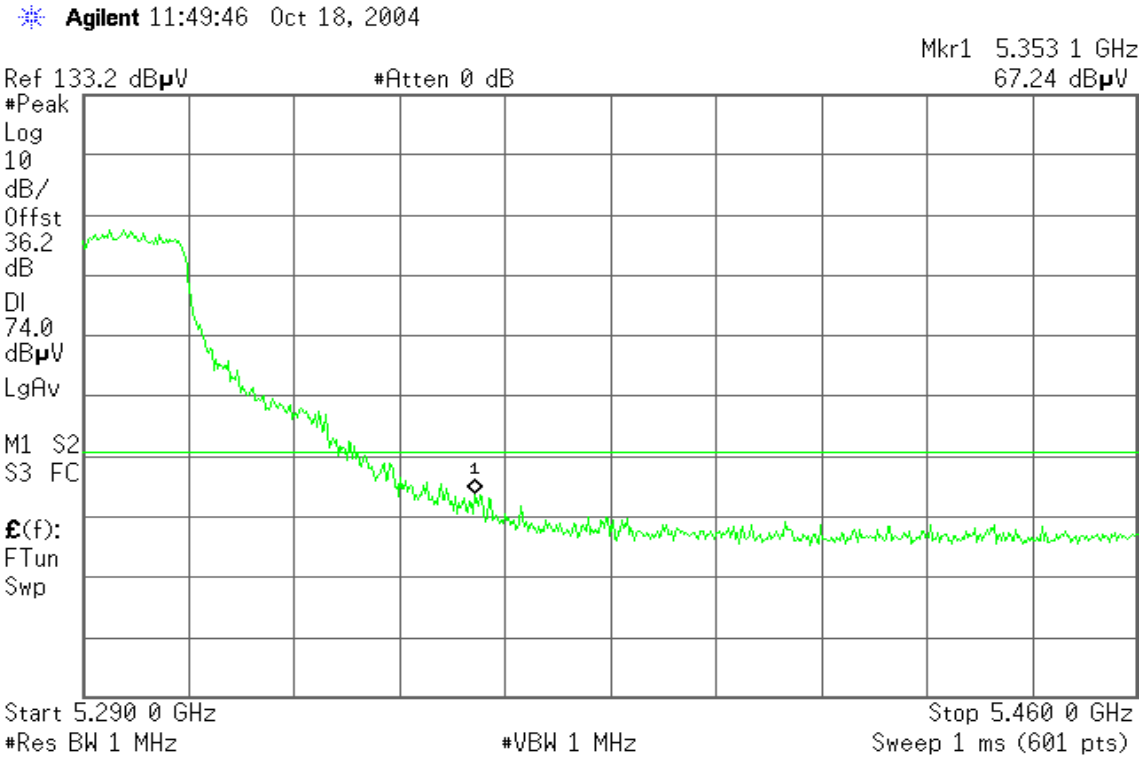

**Detector mode: Average** **Polarity: Horizontal**



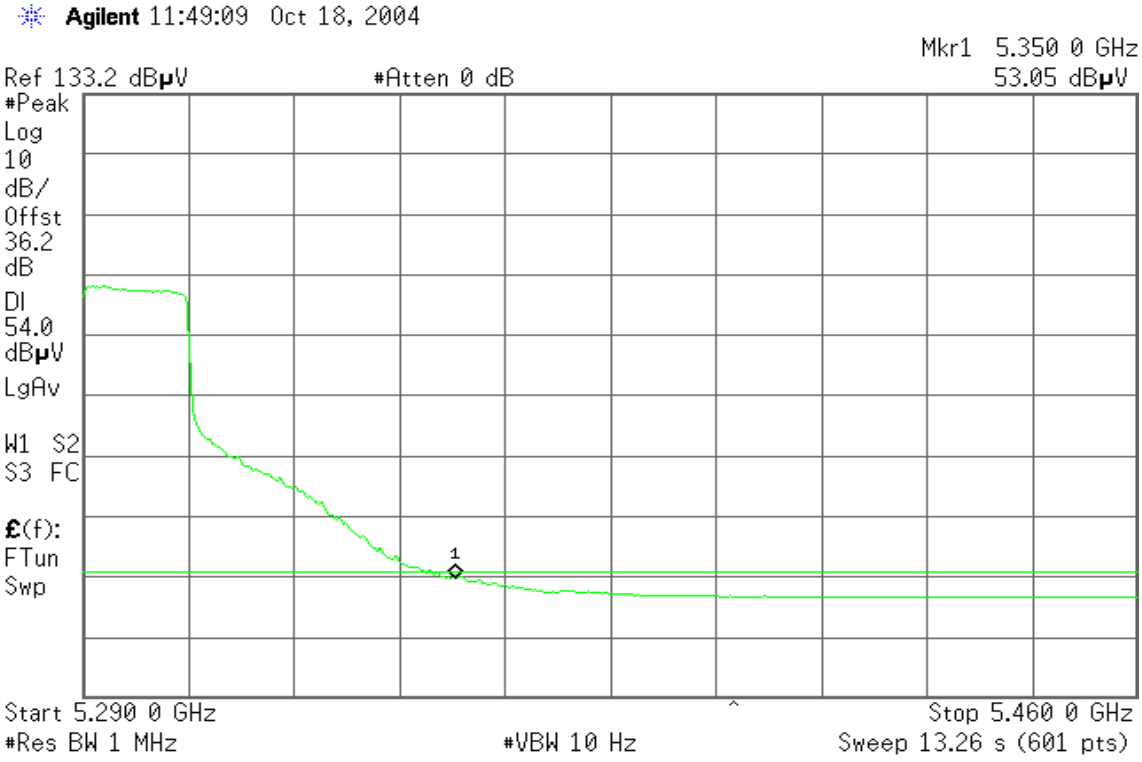
## IEEE 802.11a Turbo mode

## CH 5290 / 14dBi

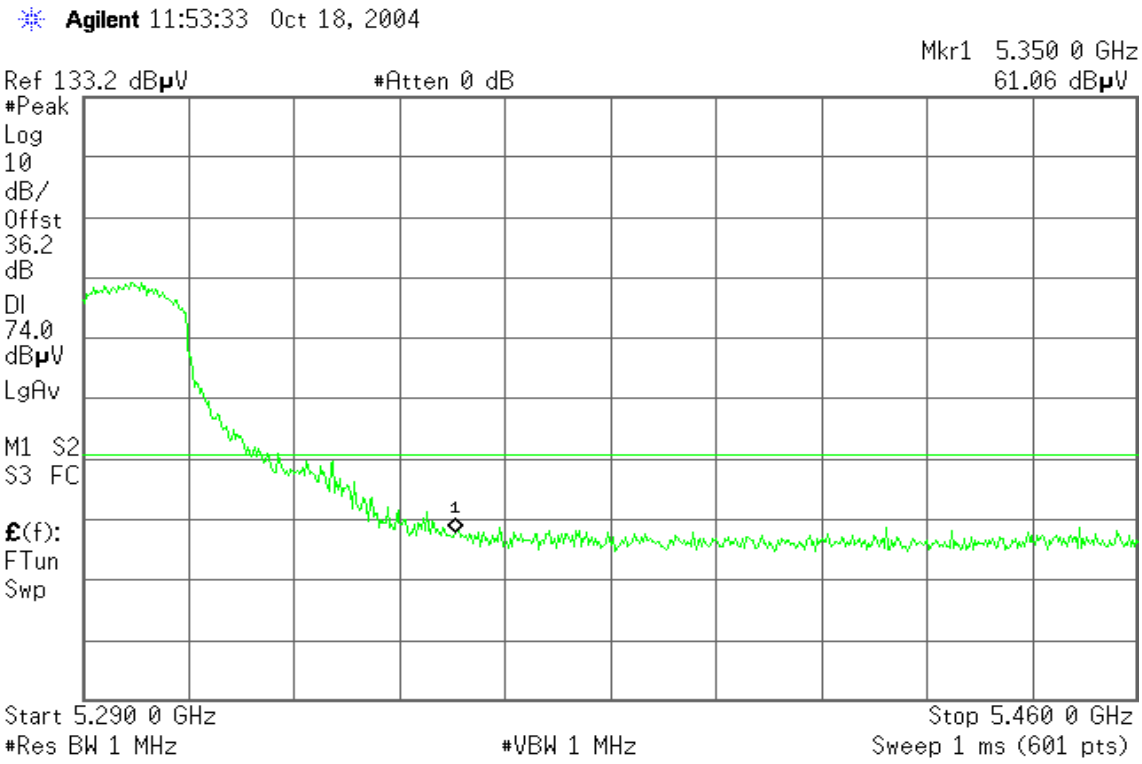
**Detector mode: Peak** **Polarity: Vertical**



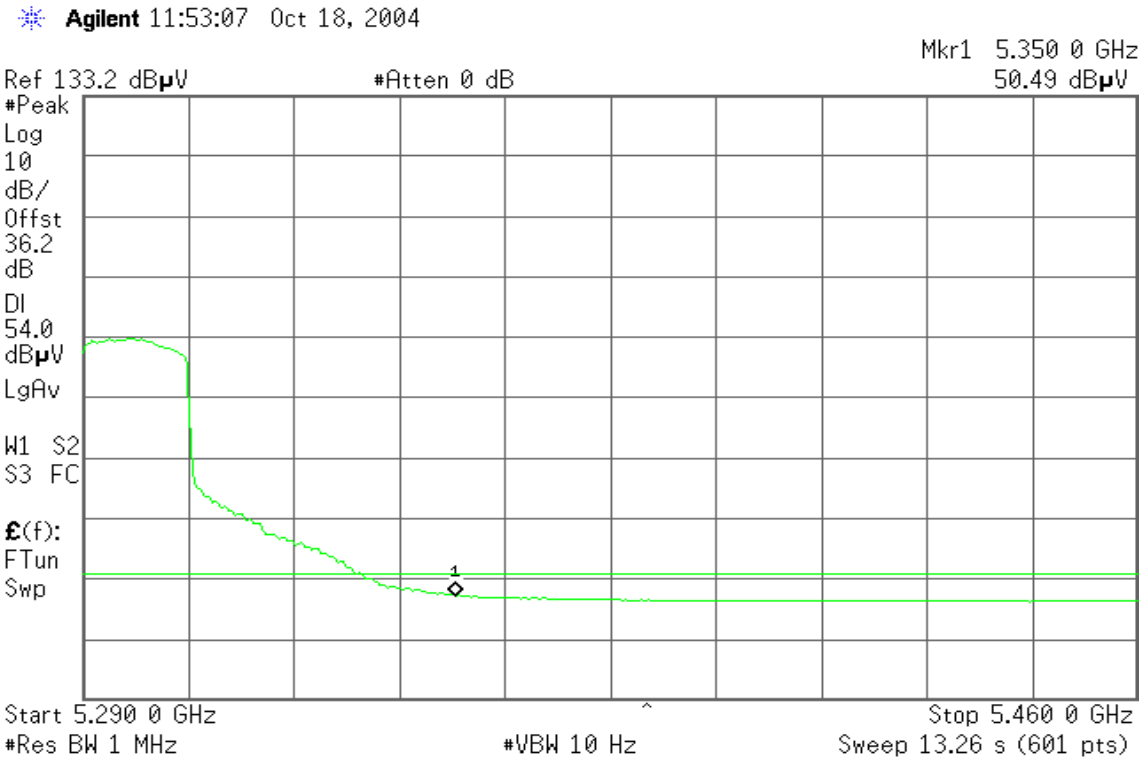

**Detector mode: Average** **Polarity: Vertical**



**Detector mode: Peak** **Polarity: Horizontal**




**Detector mode: Average** **Polarity: Horizontal**



## 7.4 PEAK POWER SPECTRAL DENSITY

## LIMIT

- For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4dBm in any 1MHz band.
- For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11dBm in any 1MHz band.

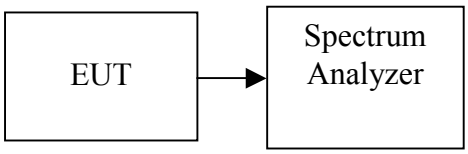
*If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.*

## MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 01/10/2005 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

**Test Configuration**




## TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = 50MHz, Sweep= Auto.
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

# TEST RESULTS

*No non-compliance noted*

**Test Data / Dual-Band Omni-Directional Antenna**

| Frequency (MHz) | | | PPSD (dBm) | Limit (dBm) | Margin (dB) | Antenna Gain (dBi) | Result |
|---|---|---|---|---|---|---|---|
| Base mode | Channel 1 | 5180 | 0.549 | 4 | -3.451 | 5 | PASS |
| | Channel 5 | 5260 | 0.302 | 11 | -10.698 | | |
| | Channel 8 | 5320 | -1.16 | 11 | -12.160 | | |
| Turbo mode | | 5210 | -2.7 | 4 | -6.700 | | |
| | | 5250 | -2.874 | 11 | -8.126 | | |
| | | 5290 | 4.864 | 11 | -6.136 | | |

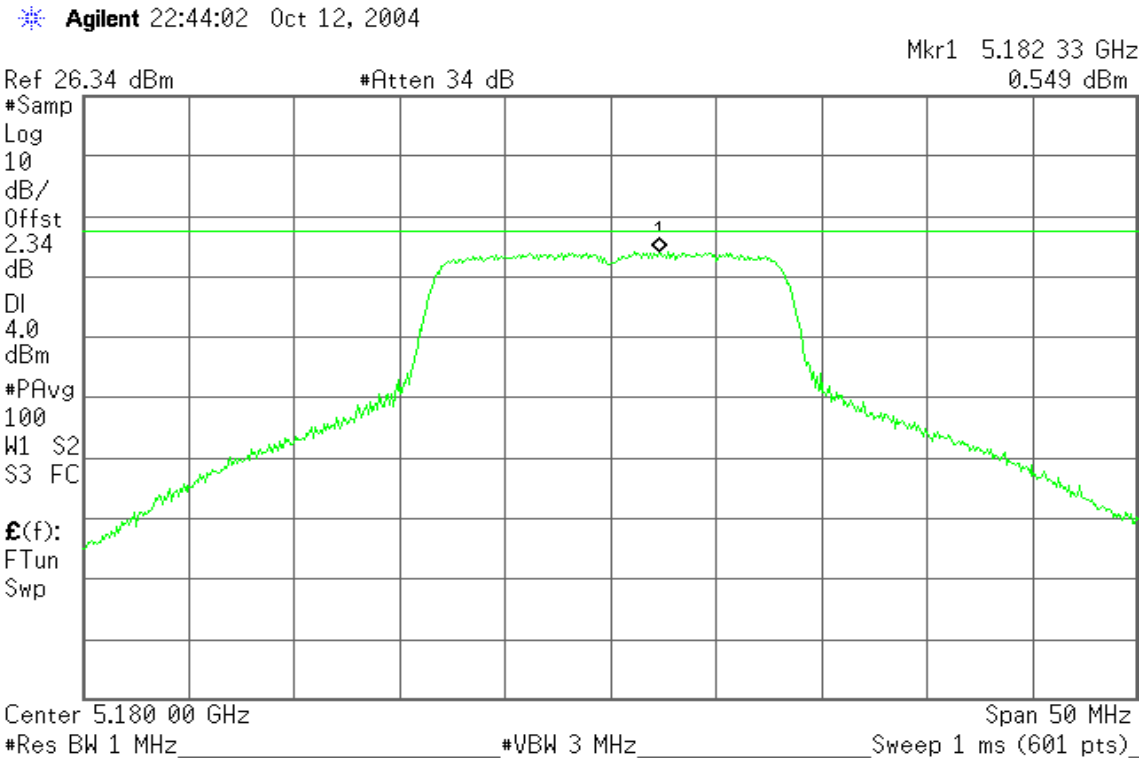
**Panel Directional Antenna**

| Frequency (MHz) | | | PPSD (dBm) | Limit (dBm) | Margin (dB) | Antenna Gain (dBi) | Result |
|---|---|---|---|---|---|---|---|
| Base mode | Channel 6 | 5280 | 2.703 | 3 | -8.297 | 14 | PASS |
| | Channel 7 | 5300 | 2.860 | | -8.14 | | |
| | Channel 8 | 5320 | 3.156 | | -7.844 | | |
| Turbo mode | | 5290 | -1.762 | | -12.762 | | |

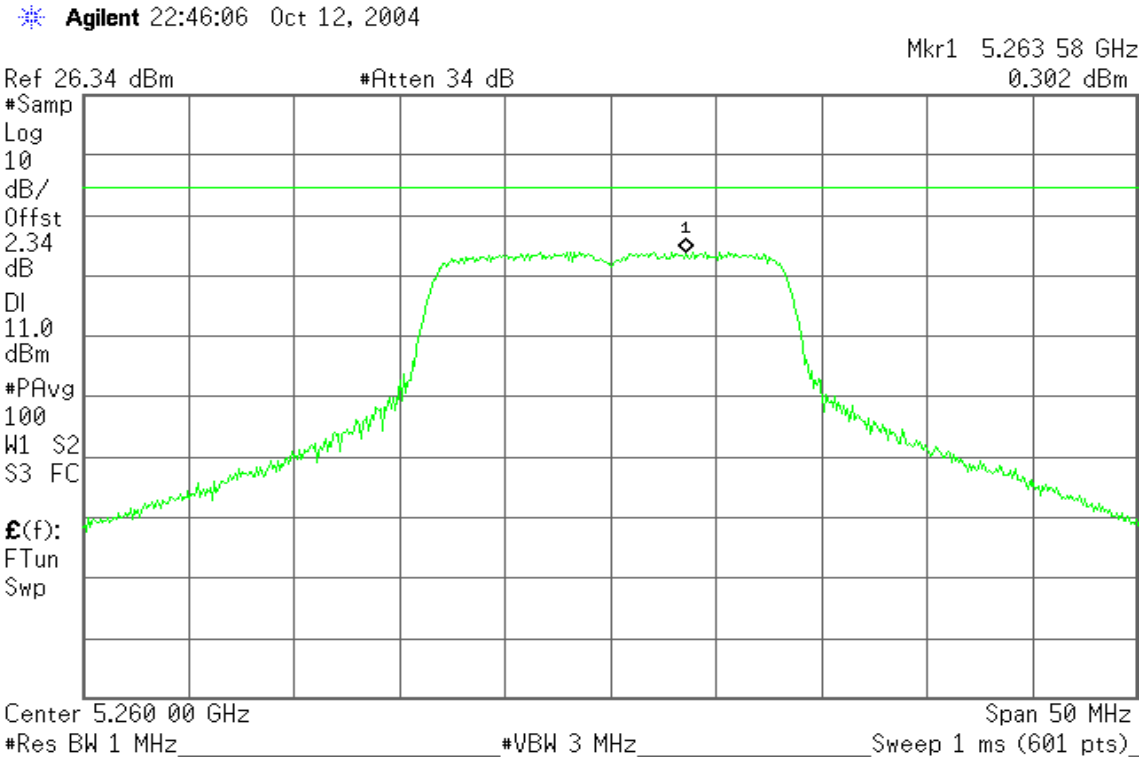
## Test Plot

## IEEE 802.11a Base mode / Dual-Band Omni-Directional Antenna

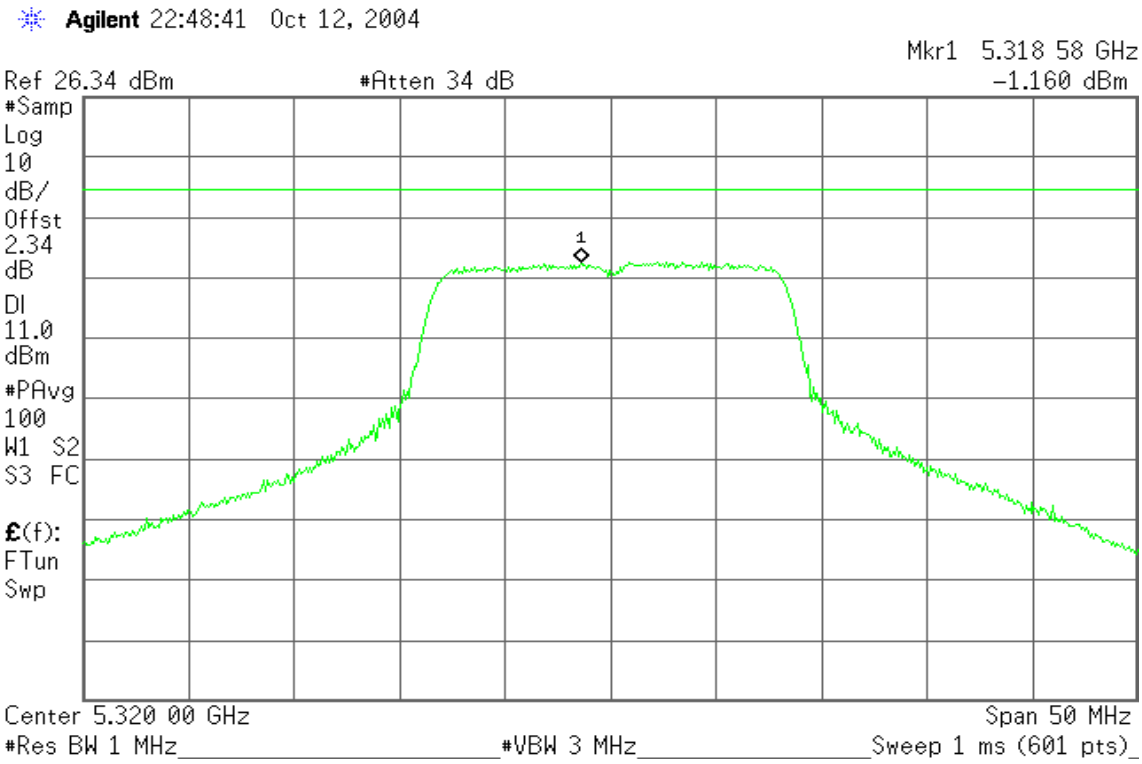
### CH 5180 / 5dBi




### CH 5260 / 5dBi

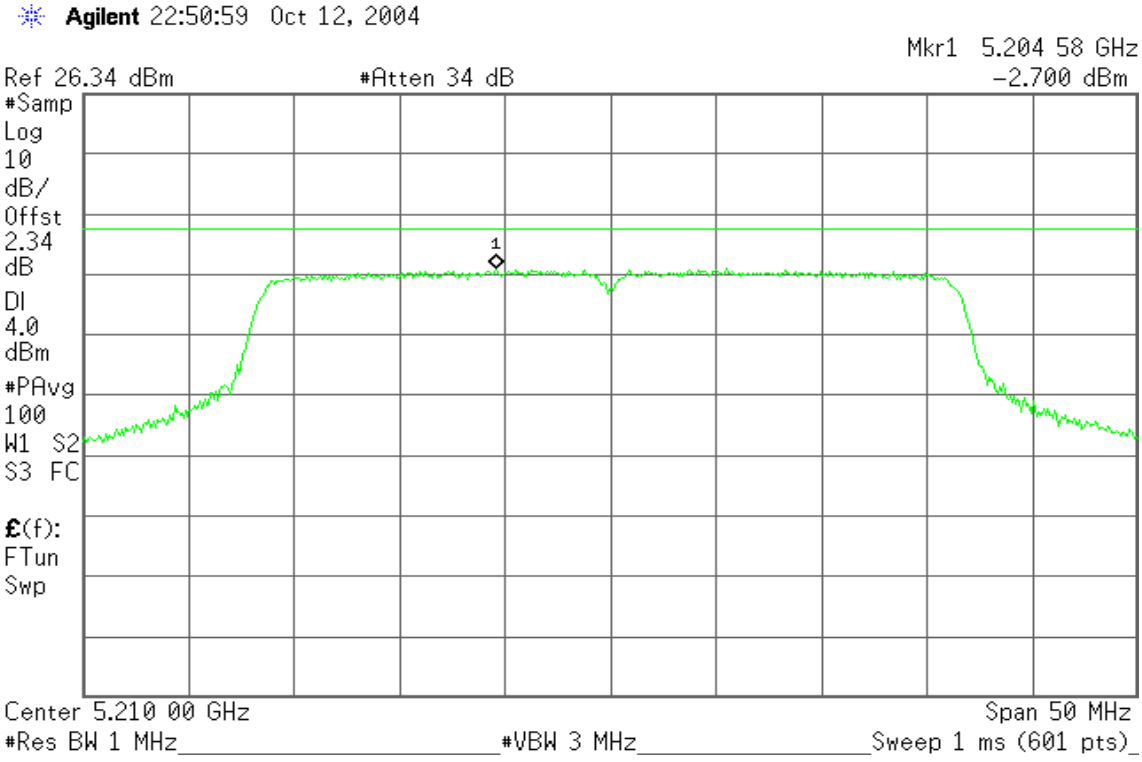


**CH 5320 / 5dBi**

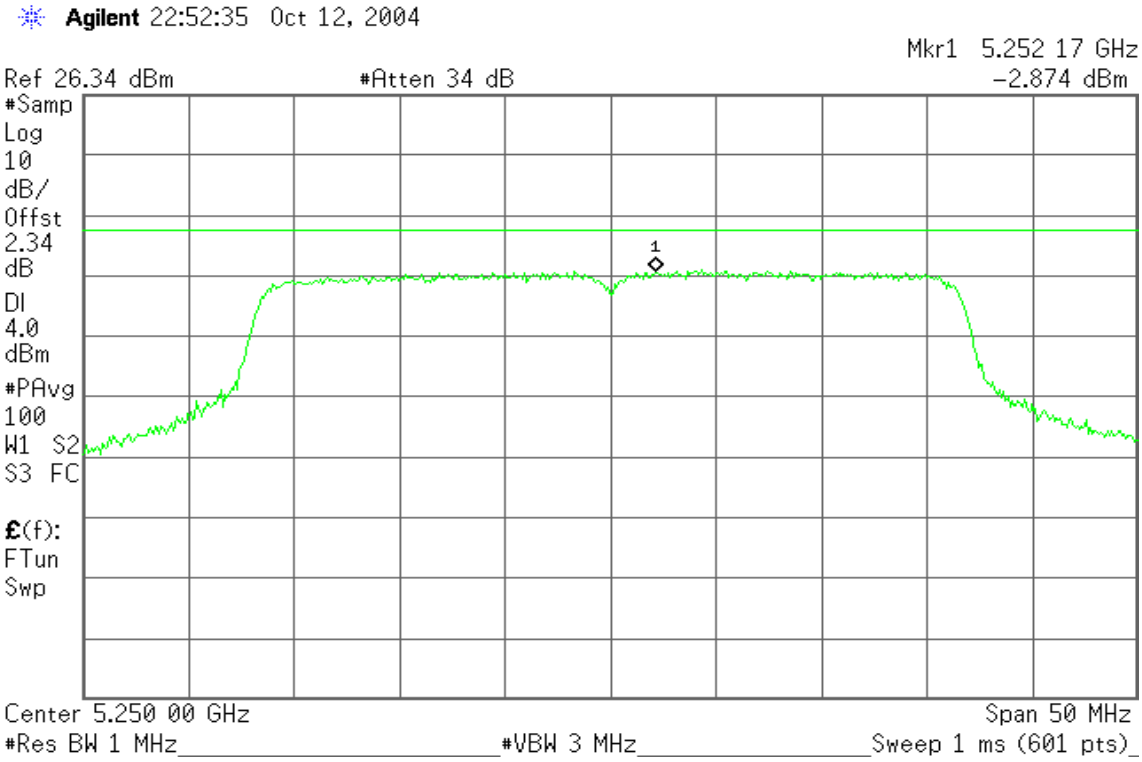

Agilent 22:48:41 Oct 12, 2004
Mkr1 5.318 58 GHz
Ref 26.34 dBm
#Atten 34 dB
-1.160 dBm
#Samp
Log
10
dB/
Offst
2.34
dB
Dl
11.0
dBm
#PAvg
100
W1 S2
S3 FC
£(f):
FTun
Swp
1
Center 5.320 00 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)

## IEEE 802.11a Turbo mode

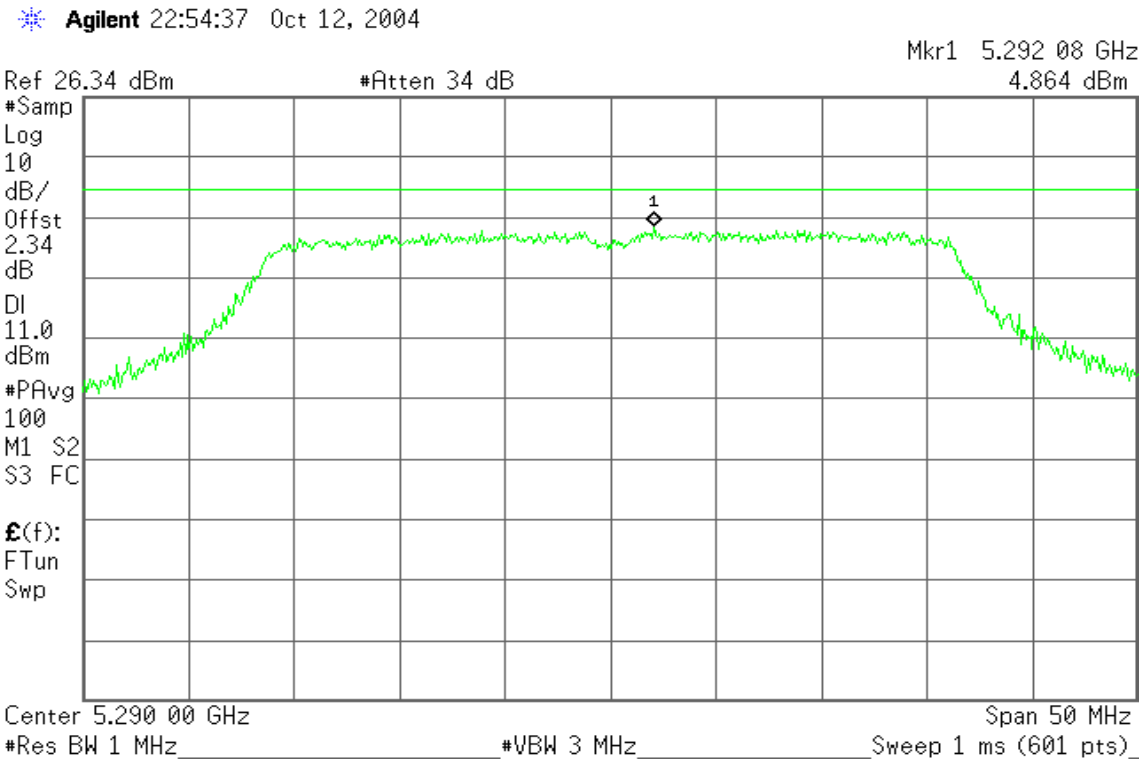
### CH 5210 / 5dBi




### CH 5250 / 5dBi

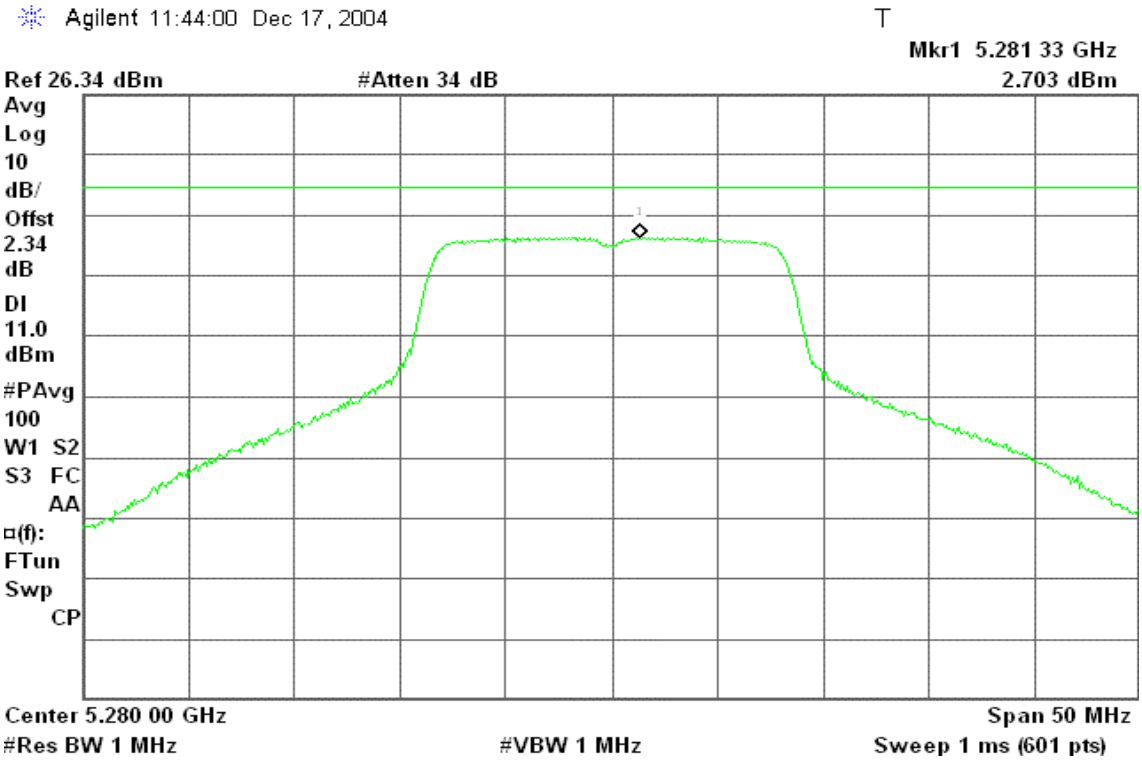


**CH 5290 / 5dBi**

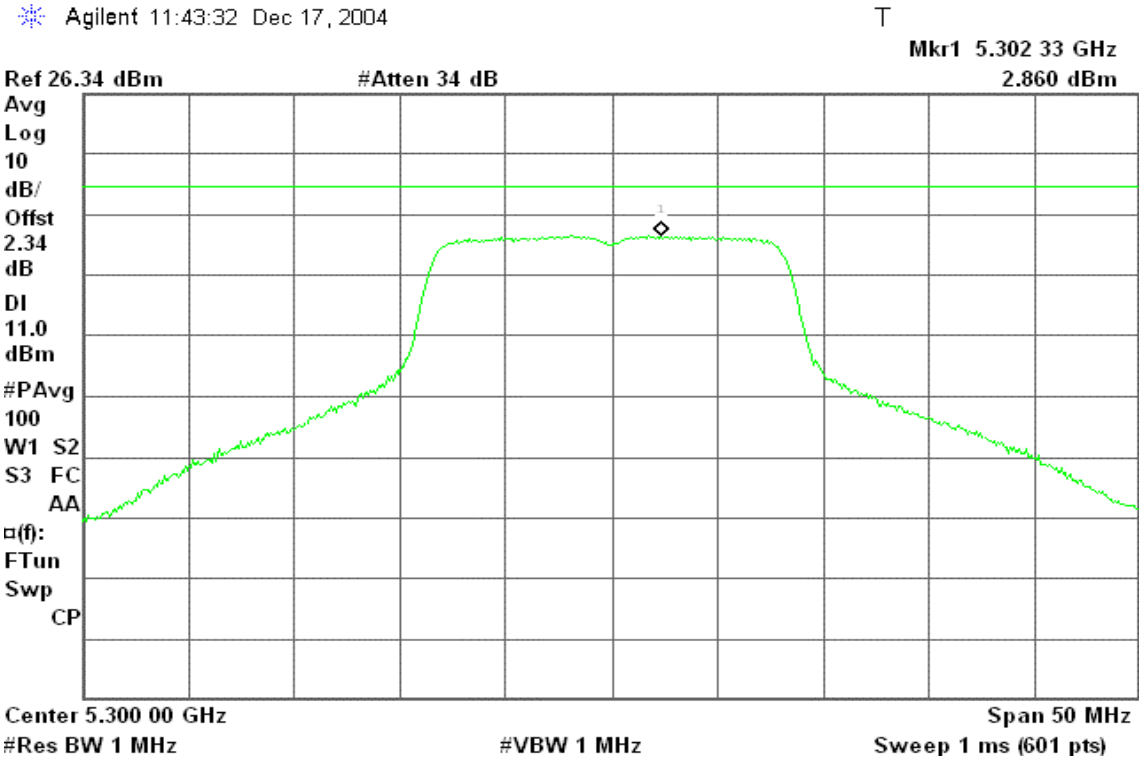

Agilent 22:54:37 Oct 12, 2004
Mkr1 5.292 08 GHz
Ref 26.34 dBm
#Atten 34 dB
4.864 dBm
#Samp
Log
10
dB/
Offst
2.34
dB
Dl
11.0
dBm
#PAvg
100
M1 S2
S3 FC
£(f):
FTun
Swp
1
Center 5.290 00 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)

## IEEE 802.11a Base mode / Panel Directional Antenna

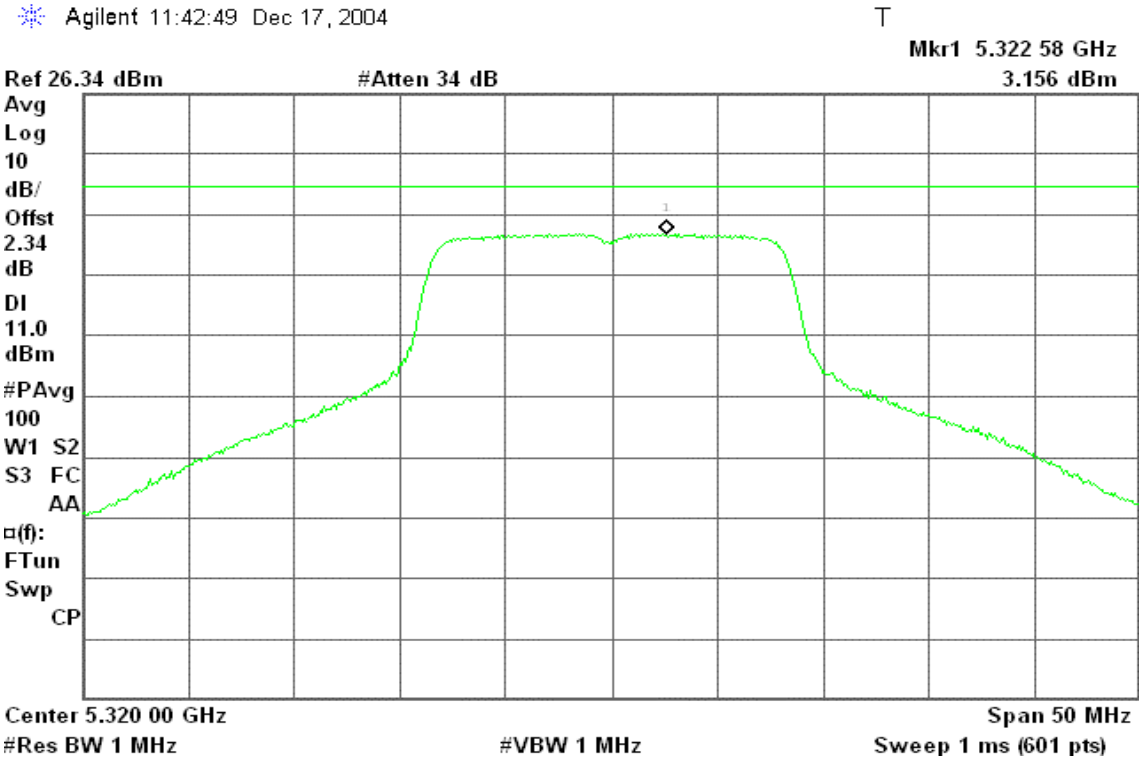
### CH 5280 / 14dBi




### CH 5300 / 14dBi

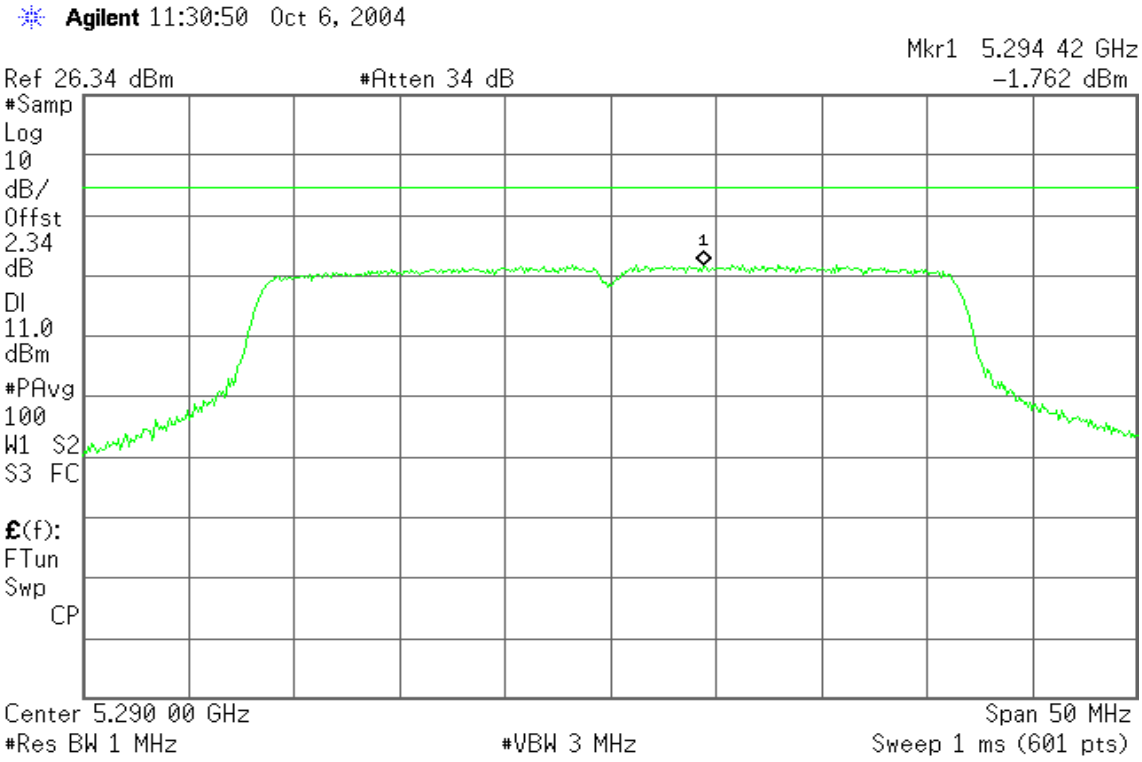


### CH 5320 / 14dBi




## IEEE 802.11a Turbo mode

### CH 5290 / 14dBi



## 7.5 PEAK EXCURSION

### LIMIT

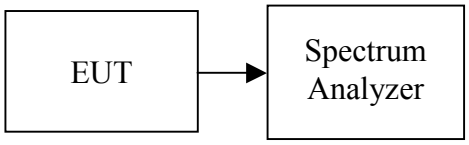
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 01/10/2005 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

**Test Configuration**




### TEST 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.

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
3. Trace A, Set RBW =1MHz, VBW = 3MHz, Span >26dB bandwidth (Base Mode) / >26dB bandwidth (Turbo Mode), Max. hold.
4. Trace B, Set RBW = 1MHz, VBW = 30kHz, Span >26dB bandwidth (Base Mode) / >26dB bandwidth (Turbo Mode), Max. hold.
5. Delta Mark trace A Maximum frequency and trace B same frequency.
6. Repeat the above procedure until measurements for all frequencies were complete.

# TEST RESULTS

*No non-compliance noted*

**Test Data / Dual-Band Omni-Directional Antenna**

| Frequency (MHz) | | | Peak Excursion (dB) | Margin (dB) | Limit (dB) | Antenna Gain (dBi) |
|---|---|---|---|---|---|---|
| Base mode | Channel 1 | 5180 | -6.16 | 6.84 | 13 | 5 |
| | Channel 5 | 5260 | -6.09 | 6.91 | | |
| | Channel 8 | 5320 | -7.03 | 5.97 | | |
| Turbo mode | | 5210 | -6.25 | 6.75 | | |
| | | 5250 | -5.83 | 7.17 | | |
| | | 5290 | -5.73 | 7.27 | | |

*(Note: Maximum antenna gain = 5dBi, therefore there is no reduction due to antenna gain.)*

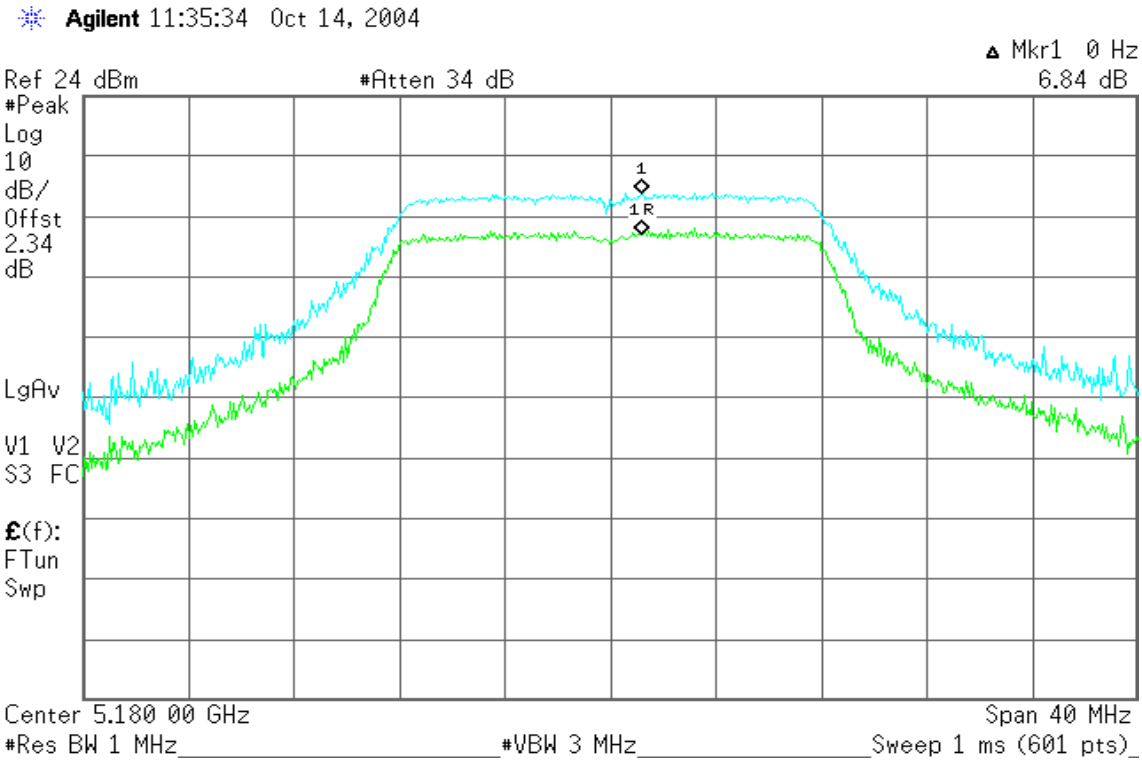
**Panel Directional Antenna**

| Frequency (MHz) | | | Peak Excursion (dB) | Margin (dB) | Limit (dB) | Antenna Gain (dBi) |
|---|---|---|---|---|---|---|
| Base mode | Channel 6 | 5280 | 7.74 | -5.26 | 13 | 14 |
| | Channel 7 | 5300 | 7.48 | -5.52 | | |
| | Channel 8 | 5320 | 8.26 | -4.74 | | |
| Turbo mode | | 5290 | 8.35 | -4.65 | | |

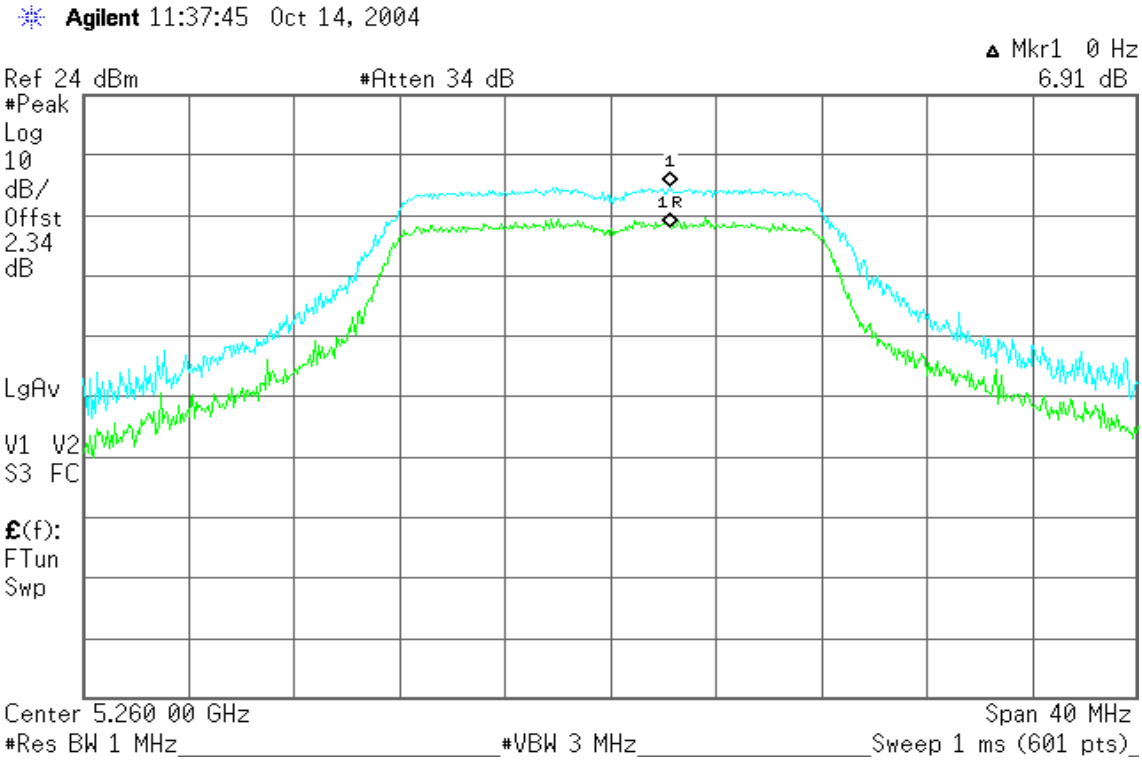
## Test Plot

## IEEE 802.11a Base mode / Dual-Band Omni-Directional Antenna

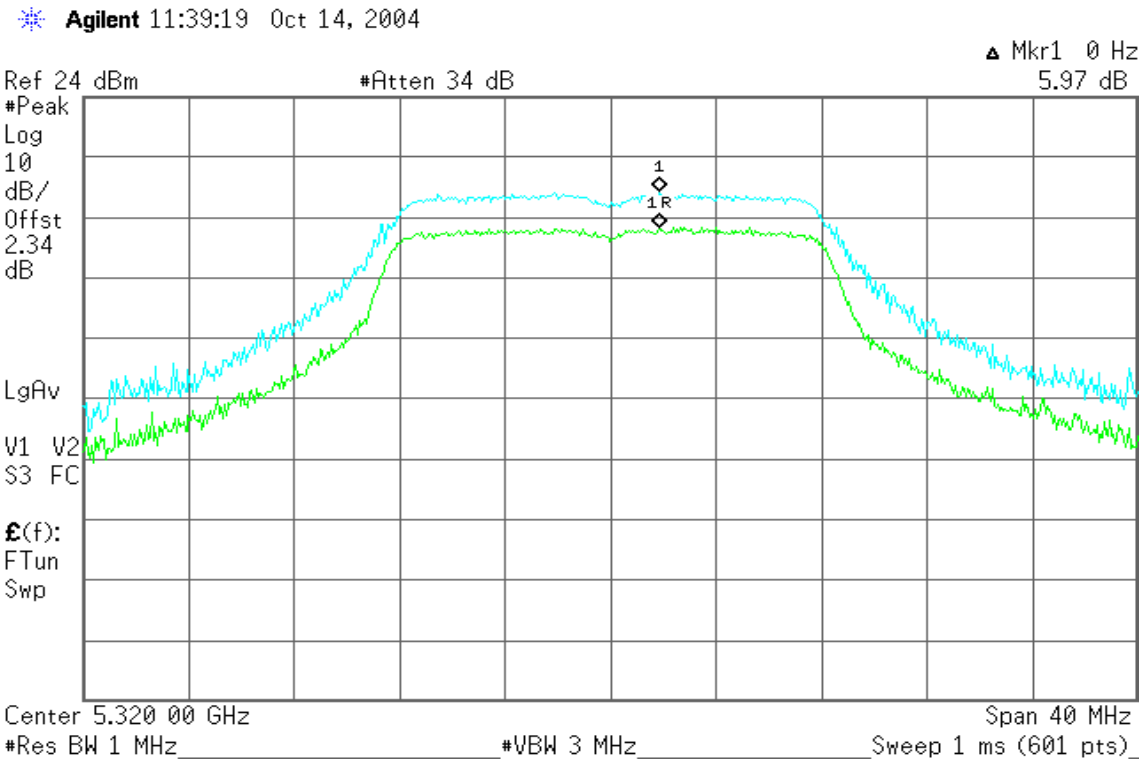
### CH 5180 / 5dBi




### CH 5260 / 5dBi

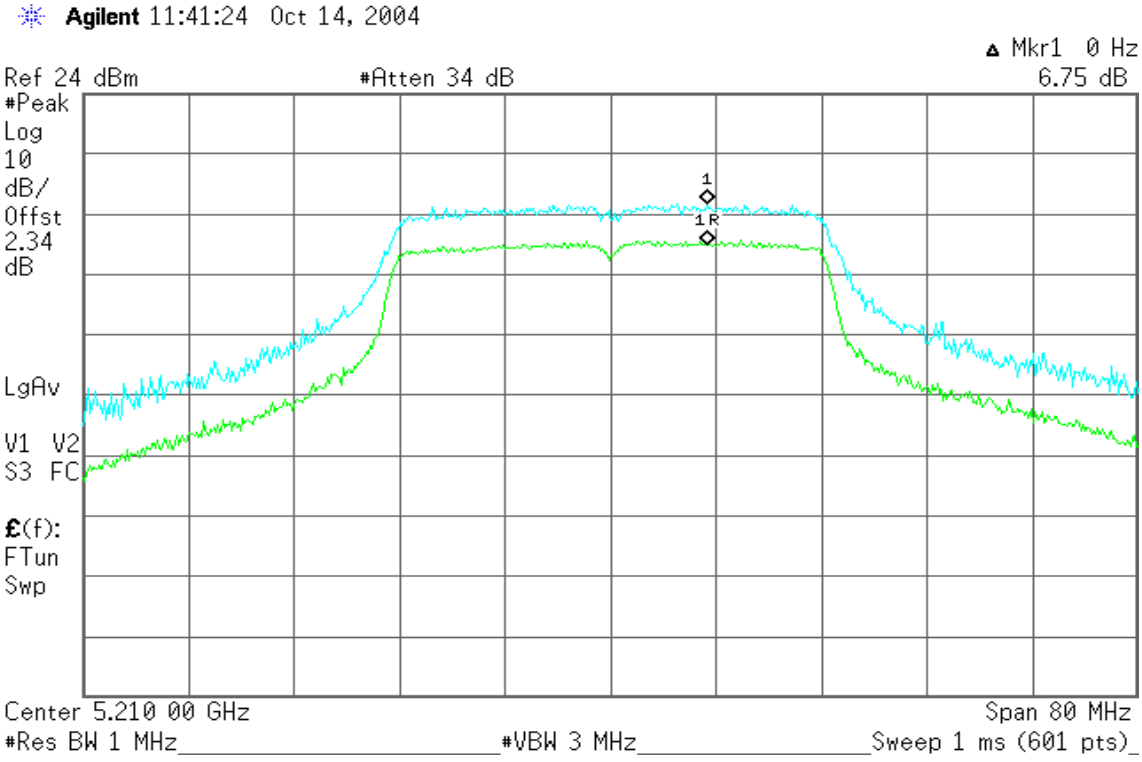


**CH 5320 / 5dBi**

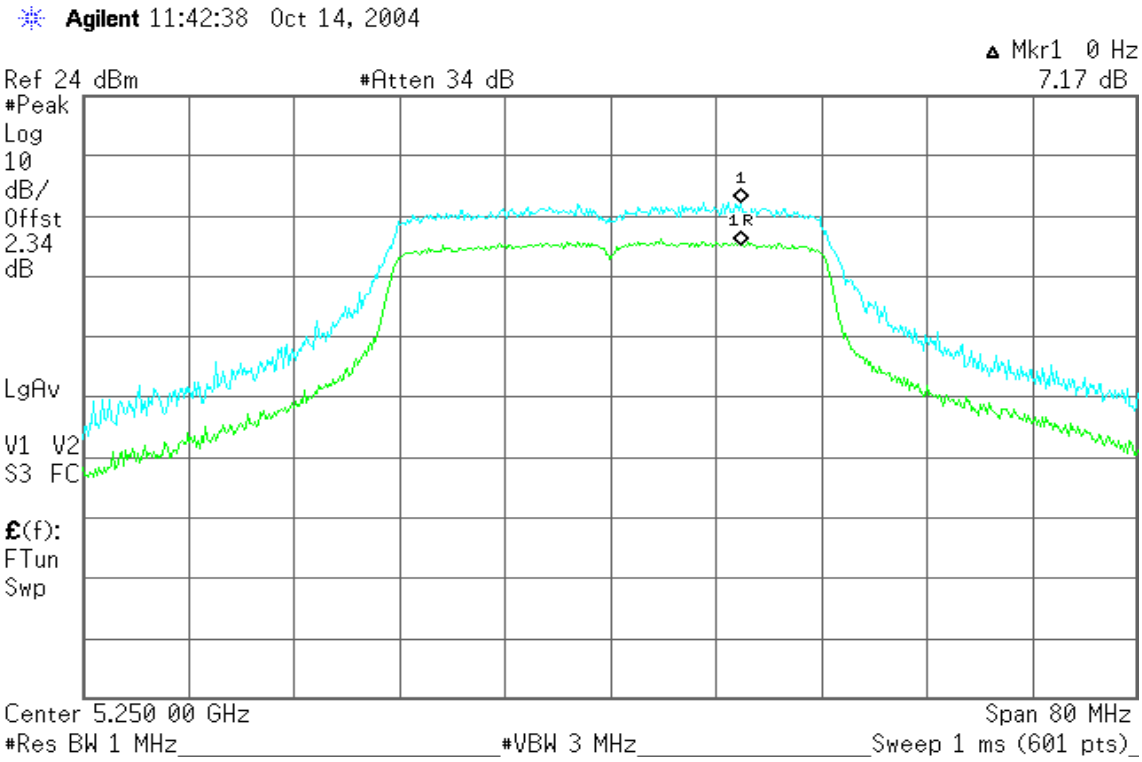

Agilent 11:39:19 Oct 14, 2004
Mkr1 0 Hz
5.97 dB
Ref 24 dBm
#Atten 34 dB
#Peak
Log
10
dB/
Offst
2.34
dB
LgAv
V1 V2
S3 FC
£(f):
FTun
Swp
Center 5.320 00 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)

## IEEE 802.11a Turbo mode

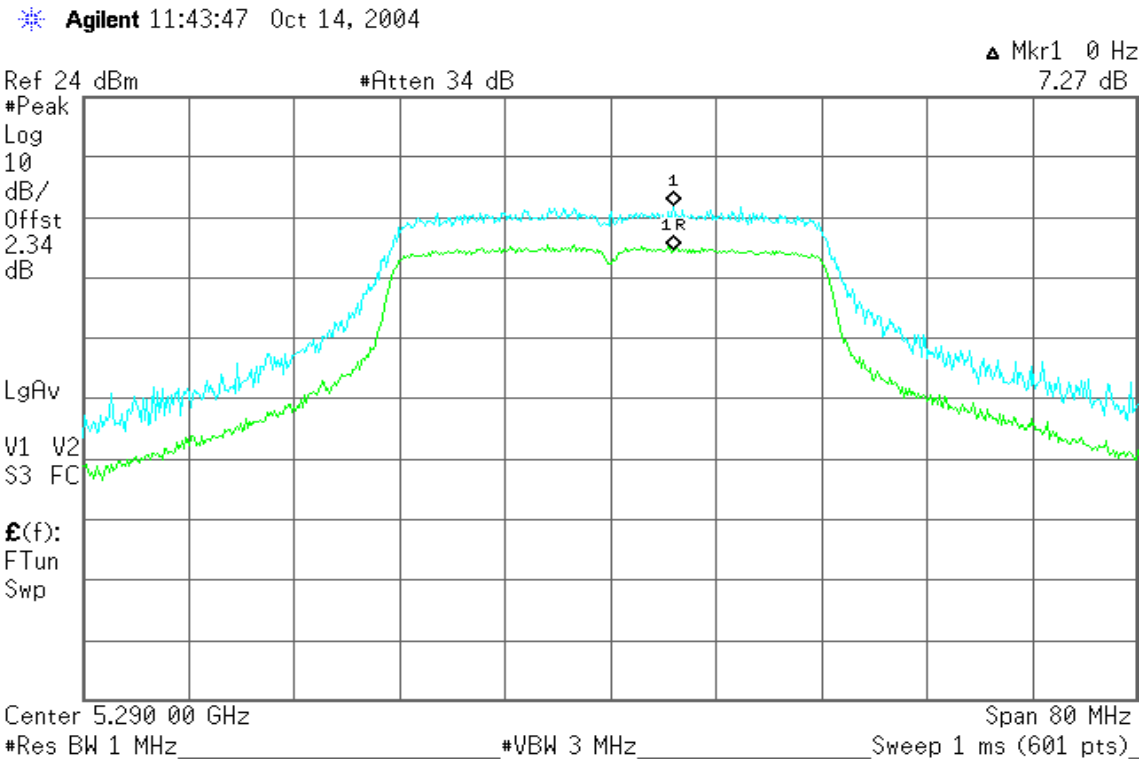
### CH 5210 / 5dBi




### CH 5250 / 5dBi

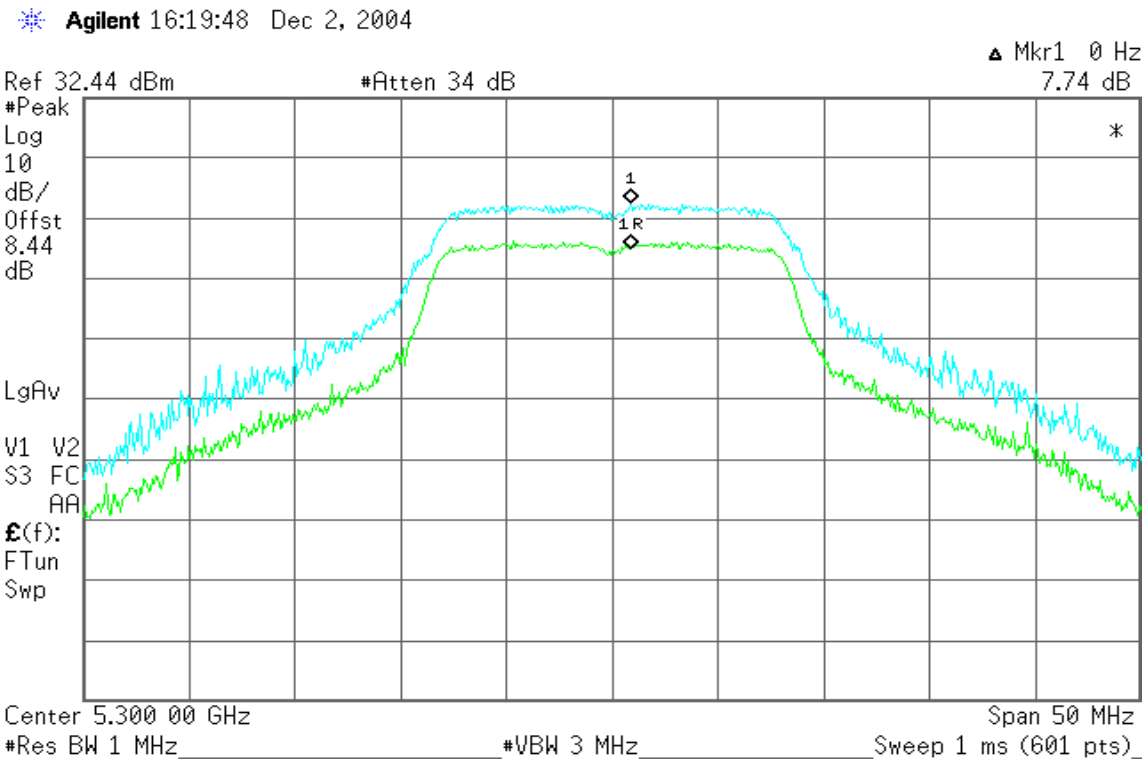


**CH 5290 / 5dBi**

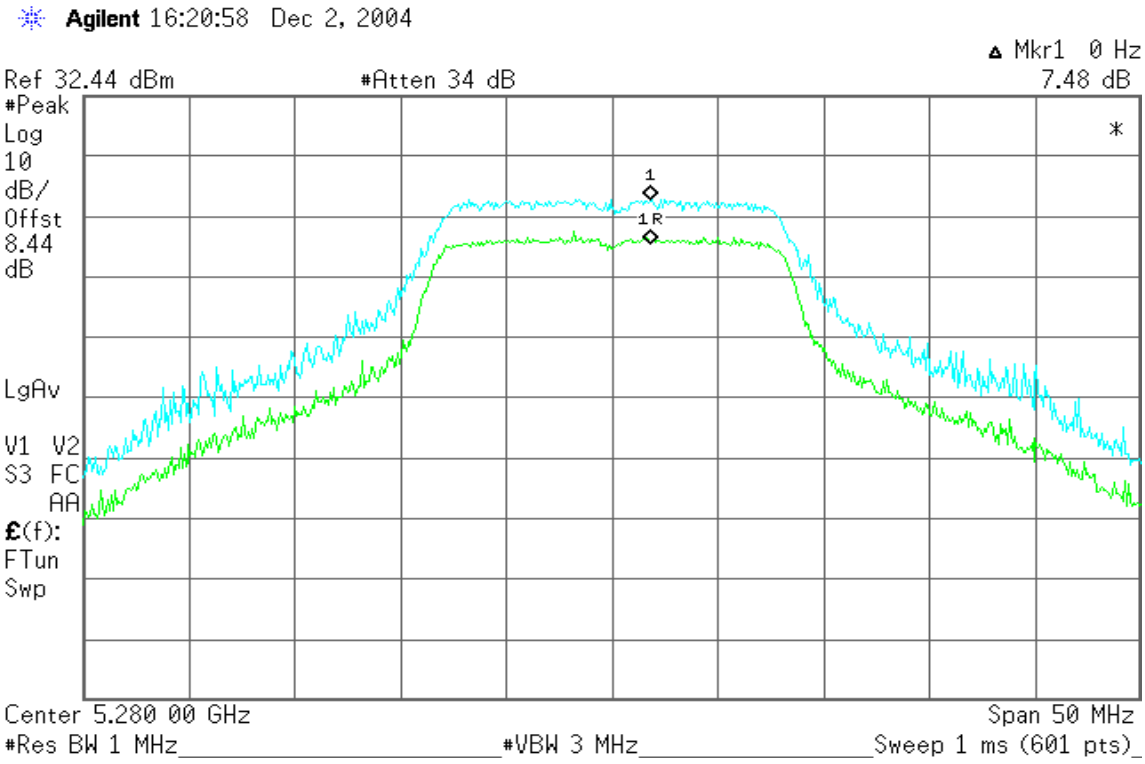

Agilent 11:43:47 Oct 14, 2004
Ref 24 dBm
#Atten 34 dB
Mkr1 0 Hz
7.27 dB
#Peak
Log
10
dB/
Offst
2.34
dB
LgAv
V1 V2
S3 FC
£(f):
FTun
Swp
1
1R
Center 5.290 00 GHz
Span 80 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)

## IEEE 802.11a Base mode / Panel Directional Antenna

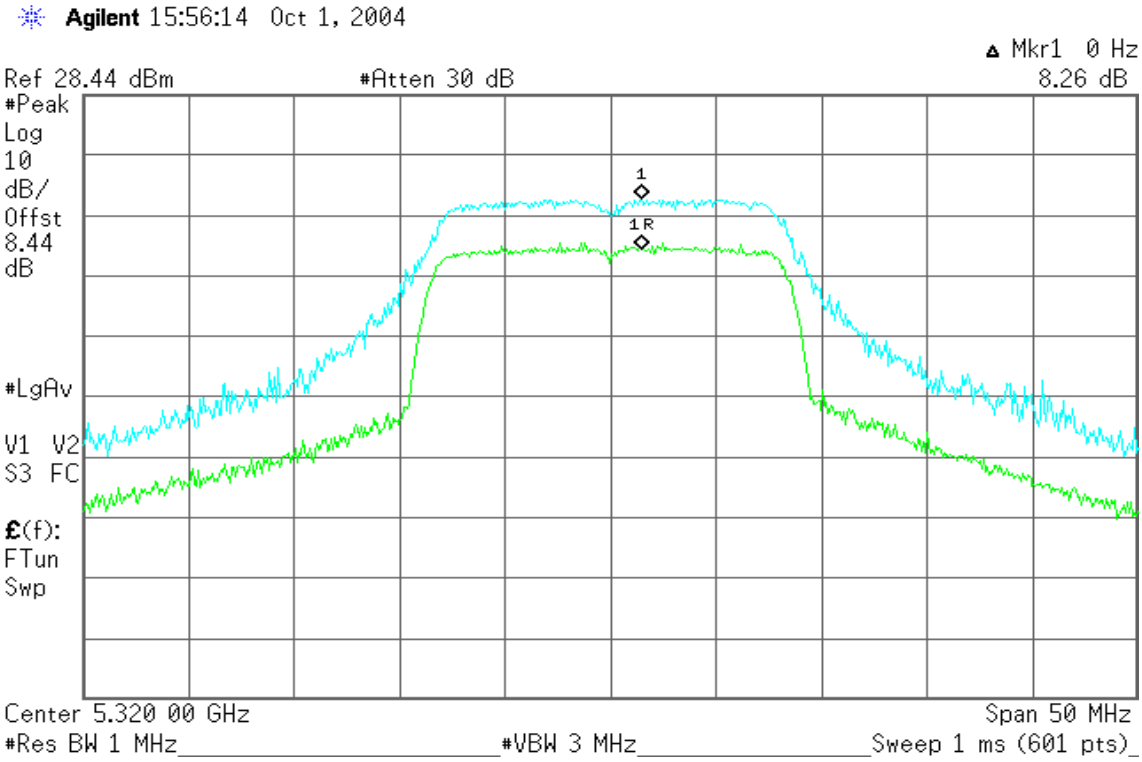
### CH 5280 / 14dBi




### CH 5300 / 14dBi

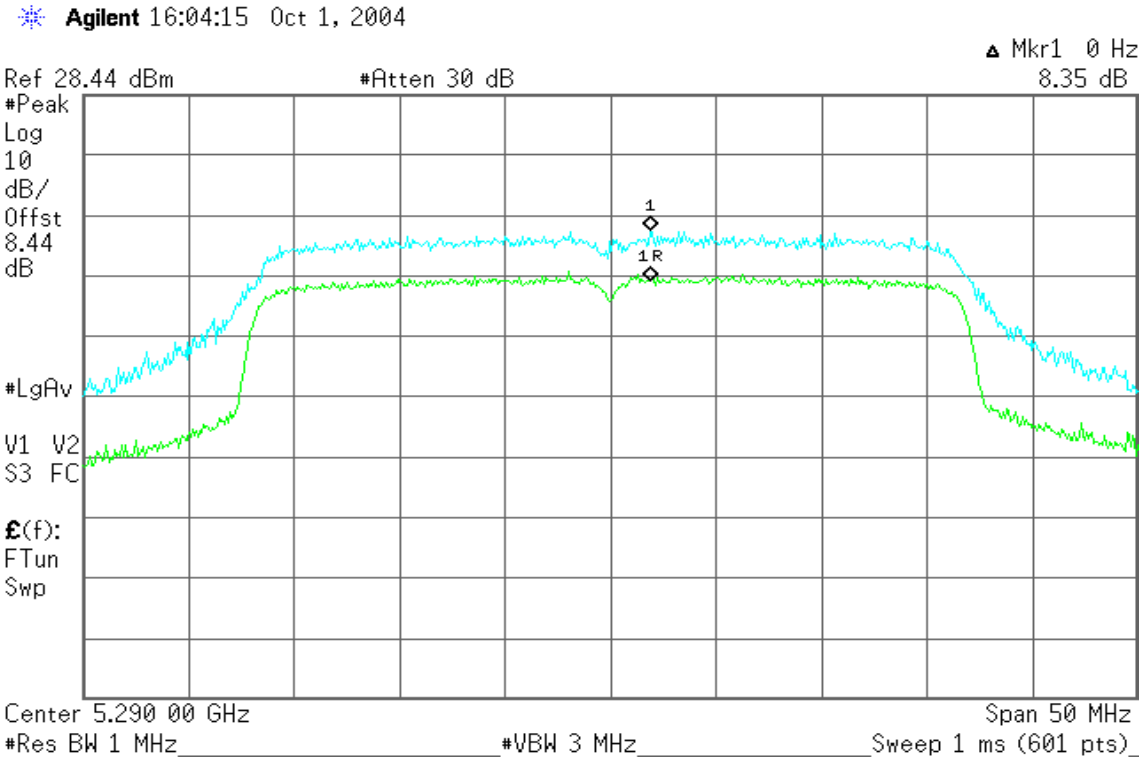


### CH 5320 / 14dBi




## IEEE 802.11a Turbo mode

### CH 5290 / 14dBi



## 7.6 RADIO FREQUENCY EXPOSURE

## LIMIT

U-NII devices are subject to the radio frequency radiation exposure requirements specified in §1.1307(b), §2.1091 and §2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

**EUT Specification**

| | |
|---|---|
| **EUT** | WLAN 802.11a MiniPCI Card |
| **Frequency band (Operating)** | ☐ WLAN: 2.412GHz ~ 2.462GHz<br>☒ WLAN: 5.150GHz ~ 5.350GHz<br>☐ WLAN: 5.725GHz ~ 5.850GHz<br>☐ Others: _____ |
| **Device category** | ☐ Portable (<20cm separation)<br>☒ Mobile (>20cm separation)<br>☐ Others _____ |
| **Exposure classification** | General Population/Uncontrolled exposure *(S=1mW/cm$^2$)* |
| **Antenna diversity** | ☐ Single antenna<br>☒ Multiple antennas<br>☐ Tx diversity<br>☐ Rx diversity<br>☒ Tx/Rx diversity |
| **Max. output power** | Dual-Band Omni-Directional Antenna / 5dBi: 13.88dBm (24.43mW)<br>Panel Directional Antenna / 14dBi: 14.14dBm (25.941mW)* |
| **Antenna gain (Max)** | Dual-Band Omni-Directional Antenna: 5dBi / Numeric gain: 3.162<br>Panel Directional Antenna: 14dBi / Numeric gain: 25.118* |
| **Evaluation applied** | ☒ MPE Evaluation*<br>☐ SAR Evaluation<br>☐ N/A |

***Note:***

1. *The maximum output power is 15.64dBm (36.64mW) at 5320Hz (with 25.118 numeric antenna gain.)*
2. *For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*

## TEST RESULTS

*No non-compliance noted.*

**Calculation**

Given $E = \sqrt{\frac{30 \times P \times G}{d}}$ & $S = \frac{E^2}{3770}$

*Where* *E = Field Strength in Volts / meter*

*P = Power in Watts*
*G=Numeric antenna gain*
*d=Distance in meters*

*S=Power Density in milliwatts / square centimeter*

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$d = \sqrt{\frac{30 \times P \times G}{3770 \times S}}$$

Changing to units of mW and cm, using:

*P (mW) = P (W) / 1000 and*

*d (cm) =100 * d (m)*

Yields

$$d = 100 \times \sqrt{\frac{30 \times (P/1000) \times G}{3770 \times S}} = 0.282 \times \sqrt{\frac{P \times G}{S}}$$

*Where* *d = distance in cm*
*P = Power in mW*
*G = Numeric antenna gain*
*S = Power Density in mW / cm^2*

Substituting the logarithmic form of power and gain using:

*P (mW) = 10 ^ (P (dBm) / 10) and*

*G (numeric) = 10 ^ (G (dBi) / 10)*

Yields

$$d = 0.282 \times \frac{10^{(P+G)/20}}{\sqrt{20}}$$ ***Equation 1***

*Where* *d = MPE safe distance in cm*
*P = Power in dBm*
*G = Antenna Gain in dBi*
*S = Power Density Limit in mW / cm^2*

**Maximum Permissible Exposure**

EUT output power = 25.941mW

Antenna Gain = 25.118 (Numeric gain)

S = 1.0 mW / cm^2 from 1.1310 Table 1

Substituting these parameters into the above Equation 1:

→ *MPE Safe Distance =7.2 cm*

*(For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.)*

## 7.7 RADIATED UNDESIRABLE EMISSION

### LIMIT

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm / MHz. Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

The provisions of §15.205 apply to intentional radiators operating under this section. The EUT is set to transmit in a continuous mode.

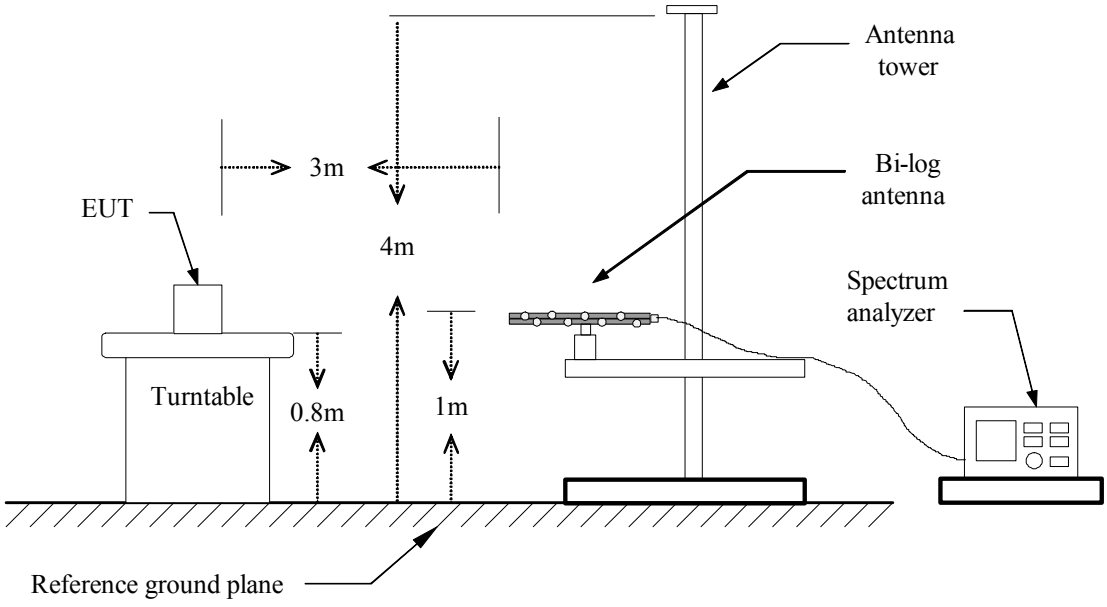
### MEASUREMENT EQUIPMENT USED

| Open Area Test Site # 3 | | | | |
|---|---|---|---|---|
| **Name of Equipment** | **Manufacturer** | **Model** | **Serial Number** | **Calibration Due** |
| Spectrum Analyzer | ADVANTEST | R3261A | N/A | 03/18/2005 |
| EMI Test Receiver | R&S | ESVS20 | 838804/004 | 01/04/2005 |
| Pre-Amplifier | HP | 8447D | 2944A09173 | 03/03/2005 |
| Bilog Antenna | SCHWAZBECK | VULB9163 | 145 | 07/05/2005 |
| Turn Table | EMCO | 2081-1.21 | 9709-1885 | N.C.R |
| Antenna Tower | EMCO | 2075-2 | 9707-2060 | N.C.R |
| Controller | EMCO | 2090 | 9709-1256 | N.C.R |
| RF Switch | ANRITSU | MP59B | M53867 | N.C.R |
| Site NSA | C&C | N/A | N/A | 09/06/2005 |
| Horn antenna | Schwarzbeck | BBHA 9120 | D210 | 02/23/2005 |
| Horn antenna | EMCO | 3116 | 2487 | 11/27/2005 |
| Loop Antenna | EMCO | 6502 | 2356 | 07/10/2005 |
| Pre-Amplifier | HP | 8449B | 3008B00965 | 10/02/2005 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

**Test Configuration**

**Below 1 GHz**




## TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

***Note:*** *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.*

# TEST RESULTS

## Below 1 GHz

### CONDITION A: EUT (Dual-Band Omni-Directional Antenna)

**Operation Mode:** TX IEEE 802.11a / CH 5180 / 5dBi **Test Date:** October 13, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 66.90 | V | Peak | 20.52 | 11.16 | 31.68 | 40.00 | -8.32 |
| 172.65 | V | Peak | 21.61 | 12.36 | 33.97 | 43.50 | -9.53 |
| 287.85 | V | Peak | 27.78 | 16.21 | 43.99 | 46.00 | -2.01 |
| 431.83 | V | Peak | 14.40 | 20.37 | 34.77 | 46.00 | -11.23 |
| 455.17 | V | Peak | 20.12 | 20.41 | 40.53 | 46.00 | -5.47 |
| 942.83 | V | Peak | 11.39 | 28.76 | 40.15 | 46.00 | -5.85 |
| 184.35 | H | Peak | 26.20 | 13.36 | 39.56 | 43.50 | -3.94 |
| 196.05 | H | Peak | 27.12 | 14.53 | 41.65 | 43.50 | -1.85 |
| 217.20 | H | Peak | 22.66 | 15.20 | 37.86 | 46.00 | -8.14 |
| 287.85 | H | Peak | 21.78 | 16.21 | 37.99 | 46.00 | -8.01 |
| 301.17 | H | Peak | 17.88 | 16.71 | 34.59 | 46.00 | -11.41 |
| 863.50 | H | Peak | 6.43 | 27.51 | 33.94 | 46.00 | -12.06 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Operation Mode:** TX IEEE 802.11a / CH 5260 / 5dBi **Test Date:** October 13, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 78.60 | V | Peak | 21.51 | 9.60 | 31.11 | 40.00 | -8.89 |
| 200.55 | V | Peak | 19.87 | 14.93 | 34.80 | 43.50 | -8.70 |
| 288.30 | V | Peak | 27.28 | 16.23 | 43.51 | 46.00 | -2.49 |
| 455.17 | V | Peak | 19.12 | 20.41 | 39.53 | 46.00 | -6.47 |
| 667.50 | V | Peak | 9.82 | 25.19 | 35.01 | 46.00 | -10.99 |
| 942.83 | V | Peak | 8.72 | 28.76 | 37.48 | 46.00 | -8.52 |
| 200.10 | H | Peak | 27.19 | 14.92 | 42.11 | 43.50 | -1.39 |
| 206.40 | H | Peak | 26.01 | 15.02 | 41.03 | 43.50 | -2.47 |
| 288.30 | H | Peak | 20.78 | 16.23 | 37.01 | 46.00 | -8.99 |
| 324.50 | H | Peak | 16.29 | 17.34 | 33.63 | 46.00 | -12.37 |
| 863.50 | H | Peak | 10.93 | 27.51 | 38.44 | 46.00 | -7.56 |
| 947.50 | H | Peak | 5.10 | 28.82 | 33.92 | 46.00 | -12.08 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Operation Mode:** TX IEEE 802.11a / CH 5320 / 5dBi **Test Date:** October 13, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 188.40 | V | Peak | 20.63 | 13.77 | 34.40 | 43.50 | -9.10 |
| 200.55 | V | Peak | 27.03 | 14.93 | 41.96 | 43.50 | -1.54 |
| 287.85 | V | Peak | 21.28 | 16.21 | 37.49 | 46.00 | -8.51 |
| 399.17 | V | Peak | 13.70 | 20.68 | 34.38 | 46.00 | -11.62 |
| 431.83 | V | Peak | 12.90 | 20.37 | 33.27 | 46.00 | -12.73 |
| 942.83 | V | Peak | 6.39 | 28.76 | 35.15 | 46.00 | -10.85 |
| 160.95 | H | Peak | 25.69 | 11.45 | 37.14 | 43.50 | -6.36 |
| 196.05 | H | Peak | 25.78 | 14.53 | 40.31 | 43.50 | -3.19 |
| 288.30 | H | Peak | 18.28 | 16.23 | 34.51 | 46.00 | -11.49 |
| 431.83 | H | Peak | 7.90 | 20.37 | 28.27 | 46.00 | -17.73 |
| 662.83 | H | Peak | 6.05 | 25.11 | 31.16 | 46.00 | -14.84 |
| 946.33 | H | Peak | 5.09 | 28.81 | 33.90 | 46.00 | -12.10 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Operation Mode:** TX IEEE 802.11a / Turbo CH 5210 / 5dBi **Test Date:** October 13, 2004
**Temperature:** 28°C **Tested by:** Max Yao
**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 196.50 | V | Peak | 18.92 | 14.57 | 33.49 | 43.50 | -10.01 |
| 217.65 | V | Peak | 15.50 | 15.20 | 30.70 | 46.00 | -15.30 |
| 287.85 | V | Peak | 22.45 | 16.21 | 38.66 | 46.00 | -7.34 |
| 431.83 | V | Peak | 13.23 | 20.37 | 33.60 | 46.00 | -12.40 |
| 668.67 | V | Peak | 8.30 | 25.21 | 33.51 | 46.00 | -12.49 |
| 953.33 | V | Peak | 7.38 | 28.92 | 36.30 | 46.00 | -9.70 |
| 172.65 | H | Peak | 25.45 | 12.36 | 37.81 | 43.50 | -5.69 |
| 200.10 | H | Peak | 26.69 | 14.92 | 41.61 | 43.50 | -1.89 |
| 288.30 | H | Peak | 19.45 | 16.23 | 35.68 | 46.00 | -10.32 |
| 431.83 | H | Peak | 8.73 | 20.37 | 29.10 | 46.00 | -16.90 |
| 664.00 | H | Peak | 4.19 | 25.13 | 29.32 | 46.00 | -16.68 |
| 947.50 | H | Peak | 3.60 | 28.82 | 32.42 | 46.00 | -13.58 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Operation Mode:** TX IEEE 802.11a / Turbo CH 5250 / 5dBi **Test Date:** October 13, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 60.60 | V | Peak | 16.15 | 13.26 | 29.41 | 40.00 | -10.59 |
| 200.10 | V | Peak | 20.69 | 14.92 | 35.61 | 43.50 | -7.89 |
| 287.85 | V | Peak | 23.12 | 16.21 | 39.33 | 46.00 | -6.67 |
| 431.83 | V | Peak | 14.40 | 20.37 | 34.77 | 46.00 | -11.23 |
| 500.67 | V | Peak | 10.62 | 22.53 | 33.15 | 46.00 | -12.85 |
| 941.67 | V | Peak | 7.88 | 28.74 | 36.62 | 46.00 | -9.38 |
| 172.65 | H | Peak | 26.11 | 12.36 | 38.47 | 43.50 | -5.03 |
| 194.25 | H | Peak | 27.74 | 14.35 | 42.09 | 43.50 | -1.41 |
| 233.40 | H | Peak | 19.70 | 15.65 | 35.35 | 46.00 | -10.65 |
| 287.85 | H | Peak | 20.78 | 16.21 | 36.99 | 46.00 | -9.01 |
| 863.50 | H | Peak | 9.76 | 27.51 | 37.27 | 46.00 | -8.73 |
| 946.33 | H | Peak | 6.09 | 28.81 | 34.90 | 46.00 | -11.10 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Operation Mode:** TX IEEE 802.11a / Turbo CH 5290 / 5dBi **Test Date:** October 13, 2004
**Temperature:** 28°C **Tested by:** Max Yao
**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 66.90 | V | Peak | 21.19 | 11.16 | 32.35 | 40.00 | -7.65 |
| 200.55 | V | Peak | 19.53 | 14.93 | 34.46 | 43.50 | -9.04 |
| 288.30 | V | Peak | 23.62 | 16.23 | 39.85 | 46.00 | -6.15 |
| 431.83 | V | Peak | 13.90 | 20.37 | 34.27 | 46.00 | -11.73 |
| 500.67 | V | Peak | 9.45 | 22.53 | 31.98 | 46.00 | -14.02 |
| 942.83 | V | Peak | 7.06 | 28.76 | 35.82 | 46.00 | -10.18 |
| 187.95 | H | Peak | 23.79 | 13.72 | 37.51 | 43.50 | -5.99 |
| 200.55 | H | Peak | 25.53 | 14.93 | 40.46 | 43.50 | -3.04 |
| 287.85 | H | Peak | 19.12 | 16.21 | 35.33 | 46.00 | -10.67 |
| 399.17 | H | Peak | 6.70 | 20.68 | 27.38 | 46.00 | -18.62 |
| 575.33 | H | Peak | 5.12 | 24.83 | 29.95 | 46.00 | -16.05 |
| 946.33 | H | Peak | 6.25 | 28.81 | 35.06 | 46.00 | -10.94 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**CONDITION B: EUT (Panel Directional Antenna)**

**Operation Mode:** TX IEEE 802.11a / CH 5280 / 14dBi **Test Date:** December 2, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 66.45 | V | Peak | 25.71 | 11.31 | 37.02 | 40.00 | -2.98 |
| 200.55 | V | Peak | 18.70 | 14.93 | 33.63 | 43.50 | -9.87 |
| 287.85 | V | Peak | 17.78 | 16.21 | 33.99 | 46.00 | -12.01 |
| 300.00 | V | Peak | 13.74 | 16.68 | 30.42 | 46.00 | -15.58 |
| 500.67 | V | Peak | 4.45 | 22.53 | 26.98 | 46.00 | -19.02 |
| 952.17 | V | Peak | 3.73 | 28.90 | 32.63 | 46.00 | -13.37 |
| | | | | | | | |
| 69.15 | H | Peak | 25.08 | 10.41 | 35.49 | 40.00 | -4.51 |
| 154.65 | H | Peak | 29.00 | 11.24 | 40.24 | 43.50 | -3.26 |
| 288.30 | H | Peak | 22.28 | 16.23 | 38.51 | 46.00 | -7.49 |
| 365.33 | H | Peak | 14.42 | 18.85 | 33.27 | 46.00 | -12.73 |
| 431.83 | H | Peak | 16.06 | 20.37 | 36.43 | 46.00 | -9.57 |
| 764.33 | H | Peak | 5.50 | 25.95 | 31.45 | 46.00 | -14.55 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Operation Mode:** TX IEEE 802.11a / CH 5300 / 14dBi **Test Date:** December 2, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 70.05 | V | Peak | 23.22 | 10.13 | 33.35 | 40.00 | -6.65 |
| 201.00 | V | Peak | 18.54 | 14.94 | 33.48 | 43.50 | -10.02 |
| 288.30 | V | Peak | 17.45 | 16.23 | 33.68 | 46.00 | -12.32 |
| 669.83 | V | Peak | 3.96 | 25.23 | 29.19 | 46.00 | -16.81 |
| 942.83 | V | Peak | 3.22 | 28.76 | 31.98 | 46.00 | -14.02 |
| 953.33 | V | Peak | 3.55 | 28.92 | 32.47 | 46.00 | -13.53 |
| 69.15 | H | Peak | 26.75 | 10.41 | 37.16 | 40.00 | -2.84 |
| 78.60 | H | Peak | 26.45 | 9.60 | 36.05 | 40.00 | -3.95 |
| 156.90 | H | Peak | 23.17 | 11.30 | 34.47 | 43.50 | -9.03 |
| 288.30 | H | Peak | 19.62 | 16.23 | 35.85 | 46.00 | -10.15 |
| 366.50 | H | Peak | 12.19 | 18.92 | 31.11 | 46.00 | -14.89 |
| 431.83 | H | Peak | 13.56 | 20.37 | 33.93 | 46.00 | -12.07 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Operation Mode:** TX IEEE 802.11a / CH 5320 / 14dBi **Test Date:** December 2, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 66.45 | V | Peak | 25.54 | 11.31 | 36.85 | 40.00 | -3.15 |
| 70.05 | V | Peak | 25.89 | 10.13 | 36.02 | 40.00 | -3.98 |
| 155.10 | V | Peak | 19.86 | 11.26 | 31.12 | 43.50 | -12.38 |
| 288.30 | V | Peak | 16.45 | 16.23 | 32.68 | 46.00 | -13.32 |
| 499.50 | V | Peak | 8.49 | 22.49 | 30.98 | 46.00 | -15.02 |
| 941.67 | V | Peak | 9.38 | 28.74 | 38.12 | 46.00 | -7.88 |
| 68.70 | H | Peak | 25.09 | 10.56 | 35.65 | 40.00 | -4.35 |
| 70.50 | H | Peak | 26.13 | 10.10 | 36.23 | 40.00 | -3.77 |
| 288.30 | H | Peak | 16.78 | 16.23 | 33.01 | 46.00 | -12.99 |
| 305.83 | H | Peak | 21.28 | 16.84 | 38.12 | 46.00 | -7.88 |
| 367.67 | H | Peak | 18.80 | 18.98 | 37.78 | 46.00 | -8.22 |
| 431.83 | H | Peak | 17.73 | 20.37 | 38.10 | 46.00 | -7.90 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Operation Mode:** TX IEEE 802.11a / Turbo CH 5290 / 14dBi **Test Date:** December 2, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 66.90 | V | Peak | 24.69 | 11.16 | 35.85 | 40.00 | -4.15 |
| 70.50 | V | Peak | 22.66 | 10.10 | 32.76 | 40.00 | -7.24 |
| 200.10 | V | Peak | 19.69 | 14.92 | 34.61 | 43.50 | -8.89 |
| 287.85 | V | Peak | 16.62 | 16.21 | 32.83 | 46.00 | -13.17 |
| 942.83 | V | Peak | 10.22 | 28.76 | 38.98 | 46.00 | -7.02 |
| 954.50 | V | Peak | 6.68 | 28.94 | 35.62 | 46.00 | -10.38 |
| 71.40 | H | Peak | 22.94 | 10.04 | 32.98 | 40.00 | -7.02 |
| 163.20 | H | Peak | 20.85 | 11.63 | 32.48 | 43.50 | -11.02 |
| 288.30 | H | Peak | 16.78 | 16.23 | 33.01 | 46.00 | -12.99 |
| 365.33 | H | Peak | 17.75 | 18.85 | 36.60 | 46.00 | -9.40 |
| 431.83 | H | Peak | 18.40 | 20.37 | 38.77 | 46.00 | -7.23 |
| 942.83 | H | Peak | 5.89 | 28.76 | 34.65 | 46.00 | -11.35 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

# Co-Location:

**CONDITION C: EUT (Dual-Band Omni-Directional Antenna) + AP (Dual-Band Omni-Directional Antenna)**

**Operation Mode:** TX IEEE 802.11a / CH 5180 / 5dBi + TX IEEE 802.11b / CH 2412 / 4.5dBi
**Test Date:** November 2, 2004
**Temperature:** 28°C
**Tested by:** Max Yao
**Humidity:** 60% RH
**Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 63.30 | V | Peak | 22.20 | 12.36 | 34.56 | 40.00 | -5.44 |
| 68.25 | V | Peak | 25.29 | 10.71 | 36.00 | 40.00 | -4.00 |
| 287.85 | V | Peak | 21.28 | 16.21 | 37.49 | 46.00 | -8.51 |
| 500.67 | V | Peak | 12.62 | 22.53 | 35.15 | 46.00 | -10.85 |
| 658.17 | V | Peak | 9.77 | 25.03 | 34.80 | 46.00 | -11.20 |
| 942.83 | V | Peak | 6.22 | 28.76 | 34.98 | 46.00 | -11.02 |
| 193.80 | H | Peak | 23.60 | 14.30 | 37.90 | 43.50 | -5.60 |
| 215.40 | H | Peak | 20.80 | 15.17 | 35.97 | 43.50 | -7.53 |
| 245.10 | H | Peak | 19.12 | 16.12 | 35.24 | 46.00 | -10.76 |
| 288.30 | H | Peak | 17.95 | 16.23 | 34.18 | 46.00 | -11.82 |
| 500.67 | H | Peak | 11.12 | 22.53 | 33.65 | 46.00 | -12.35 |
| 658.17 | H | Peak | 9.11 | 25.03 | 34.14 | 46.00 | -11.86 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5180 / 5dBi + TX IEEE 802.11b / CH 2437 / 4.5dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 68.25 | V | Peak | 25.13 | 10.71 | 35.84 | 40.00 | -4.16 |
| 200.55 | V | Peak | 21.53 | 14.93 | 36.46 | 43.50 | -7.04 |
| 288.30 | V | Peak | 21.62 | 16.23 | 37.85 | 46.00 | -8.15 |
| 499.50 | V | Peak | 11.99 | 22.49 | 34.48 | 46.00 | -11.52 |
| 658.17 | V | Peak | 9.61 | 25.03 | 34.64 | 46.00 | -11.36 |
| 942.83 | V | Peak | 6.56 | 28.76 | 35.32 | 46.00 | -10.68 |
| 166.80 | H | Peak | 26.76 | 11.91 | 38.67 | 43.50 | -4.83 |
| 194.25 | H | Peak | 22.90 | 14.35 | 37.25 | 43.50 | -6.25 |
| 254.55 | H | Peak | 20.56 | 16.20 | 36.76 | 46.00 | -9.24 |
| 266.70 | H | Peak | 18.99 | 15.91 | 34.90 | 46.00 | -11.10 |
| 500.67 | H | Peak | 11.78 | 22.53 | 34.31 | 46.00 | -11.69 |
| 658.17 | H | Peak | 10.44 | 25.03 | 35.47 | 46.00 | -10.53 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5180 / 5dBi + TX IEEE 802.11b / CH 2462 / 4.5dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 68.25 | V | Peak | 25.13 | 10.71 | 35.84 | 40.00 | -4.16 |
| 200.56 | V | Peak | 23.53 | 14.93 | 38.46 | 43.50 | -5.04 |
| 287.85 | V | Peak | 23.12 | 16.21 | 39.33 | 46.00 | -6.67 |
| 499.50 | V | Peak | 13.99 | 22.49 | 36.48 | 46.00 | -9.52 |
| 658.17 | V | Peak | 8.61 | 25.03 | 33.64 | 46.00 | -12.36 |
| 942.83 | V | Peak | 6.22 | 28.76 | 34.98 | 46.00 | -11.02 |
| 154.65 | H | Peak | 27.50 | 11.24 | 38.74 | 43.50 | -4.76 |
| 169.95 | H | Peak | 24.36 | 12.15 | 36.51 | 43.50 | -6.99 |
| 200.55 | H | Peak | 25.87 | 14.93 | 40.80 | 43.50 | -2.70 |
| 288.30 | H | Peak | 18.78 | 16.23 | 35.01 | 46.00 | -10.99 |
| 500.67 | H | Peak | 13.45 | 22.53 | 35.98 | 46.00 | -10.02 |
| 942.83 | H | Peak | 5.22 | 28.76 | 33.98 | 46.00 | -12.02 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5180 / 5dBi + TX IEEE 802.11g / CH 2412 / 4.5dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 64.65 | V | Peak | 21.89 | 11.91 | 33.80 | 40.00 | -6.20 |
| 200.55 | V | Peak | 16.87 | 14.93 | 31.80 | 43.50 | -11.70 |
| 288.30 | V | Peak | 22.45 | 16.23 | 38.68 | 46.00 | -7.32 |
| 500.67 | V | Peak | 12.95 | 22.53 | 35.48 | 46.00 | -10.52 |
| 659.33 | V | Peak | 9.75 | 25.05 | 34.80 | 46.00 | -11.20 |
| 942.83 | V | Peak | 6.06 | 28.76 | 34.82 | 46.00 | -11.18 |
| 154.65 | H | Peak | 24.34 | 11.24 | 35.58 | 43.50 | -7.92 |
| 200.55 | H | Peak | 21.70 | 14.93 | 36.63 | 43.50 | -6.87 |
| 287.85 | H | Peak | 18.28 | 16.21 | 34.49 | 46.00 | -11.51 |
| 499.50 | H | Peak | 12.49 | 22.49 | 34.98 | 46.00 | -11.02 |
| 659.33 | H | Peak | 9.92 | 25.05 | 34.97 | 46.00 | -11.03 |
| 942.83 | H | Peak | 4.89 | 28.76 | 33.65 | 46.00 | -12.35 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5180 / 5dBi + TX IEEE 802.11g / CH 2437 / 4.5dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 64.20 | V | Peak | 21.99 | 12.06 | 34.05 | 40.00 | -5.95 |
| 250.05 | V | Peak | 16.52 | 16.31 | 32.83 | 46.00 | -13.17 |
| 288.30 | V | Peak | 21.12 | 16.23 | 37.35 | 46.00 | -8.65 |
| 500.67 | V | Peak | 11.95 | 22.53 | 34.48 | 46.00 | -11.52 |
| 659.33 | V | Peak | 9.25 | 25.05 | 34.30 | 46.00 | -11.70 |
| 944.00 | V | Peak | 6.23 | 28.77 | 35.00 | 46.00 | -11.00 |
| 140.25 | H | Peak | 26.79 | 10.88 | 37.67 | 43.50 | -5.83 |
| 154.65 | H | Peak | 27.67 | 11.24 | 38.91 | 43.50 | -4.59 |
| 174.00 | H | Peak | 23.75 | 12.46 | 36.21 | 43.50 | -7.29 |
| 236.55 | H | Peak | 18.04 | 15.78 | 33.82 | 46.00 | -12.18 |
| 500.67 | H | Peak | 11.95 | 22.53 | 34.48 | 46.00 | -11.52 |
| 659.33 | H | Peak | 9.25 | 25.05 | 34.30 | 46.00 | -11.70 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5180 / 5dBi + TX IEEE 802.11g / CH 2462 / 4.5dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 67.80 | V | Peak | 24.65 | 10.86 | 35.51 | 40.00 | -4.49 |
| 250.05 | V | Peak | 16.52 | 16.31 | 32.83 | 46.00 | -13.17 |
| 288.30 | V | Peak | 20.28 | 16.23 | 36.51 | 46.00 | -9.49 |
| 500.67 | V | Peak | 12.12 | 22.53 | 34.65 | 46.00 | -11.35 |
| 666.33 | V | Peak | 12.66 | 25.17 | 37.83 | 46.00 | -8.17 |
| 942.83 | V | Peak | 6.06 | 28.76 | 34.82 | 46.00 | -11.18 |
| 167.25 | H | Peak | 24.89 | 11.94 | 36.83 | 43.50 | -6.67 |
| 200.55 | H | Peak | 20.70 | 14.93 | 35.63 | 43.50 | -7.87 |
| 244.65 | H | Peak | 17.27 | 16.10 | 33.37 | 46.00 | -12.63 |
| 500.67 | H | Peak | 11.62 | 22.53 | 34.15 | 46.00 | -11.85 |
| 658.17 | H | Peak | 9.77 | 25.03 | 34.80 | 46.00 | -11.20 |
| 942.83 | H | Peak | 5.56 | 28.76 | 34.32 | 46.00 | -11.68 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5180 / 5dBi + TX IEEE 802.11g / Turbo CH 2437 / 4.5dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 64.20 | V | Peak | 22.49 | 12.06 | 34.55 | 40.00 | -5.45 |
| 250.05 | V | Peak | 16.85 | 16.31 | 33.16 | 46.00 | -12.84 |
| 288.30 | V | Peak | 21.78 | 16.23 | 38.01 | 46.00 | -7.99 |
| 499.50 | V | Peak | 11.99 | 22.49 | 34.48 | 46.00 | -11.52 |
| 658.17 | V | Peak | 9.11 | 25.03 | 34.14 | 46.00 | -11.86 |
| 942.83 | V | Peak | 5.89 | 28.76 | 34.65 | 46.00 | -11.35 |
| 154.65 | H | Peak | 24.67 | 11.24 | 35.91 | 43.50 | -7.59 |
| 170.85 | H | Peak | 24.66 | 12.22 | 36.88 | 43.50 | -6.62 |
| 193.80 | H | Peak | 21.77 | 14.30 | 36.07 | 43.50 | -7.43 |
| 288.30 | H | Peak | 18.62 | 16.23 | 34.85 | 46.00 | -11.15 |
| 499.50 | H | Peak | 11.82 | 22.49 | 34.31 | 46.00 | -11.69 |
| 942.83 | H | Peak | 5.22 | 28.76 | 33.98 | 46.00 | -12.02 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**CONDITION D: EUT (Panel Directional Antenna) + AP (Panel Directional Antenna)**

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5320 / 14dBi + TX IEEE 802.11b / CH 2412 / 16dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 57.00 | V | Peak | 22.54 | 14.06 | 36.60 | 40.00 | -3.40 |
| 287.85 | V | Peak | 18.12 | 16.21 | 34.33 | 46.00 | -11.67 |
| 350.17 | V | Peak | 16.65 | 18.04 | 34.69 | 46.00 | -11.31 |
| 499.50 | V | Peak | 16.16 | 22.49 | 38.65 | 46.00 | -7.35 |
| 658.17 | V | Peak | 13.94 | 25.03 | 38.97 | 46.00 | -7.03 |
| 952.17 | V | Peak | 11.40 | 28.90 | 40.30 | 46.00 | -5.70 |
| | | | | | | | |
| 68.25 | H | Peak | 25.43 | 10.71 | 36.14 | 40.00 | -3.86 |
| 250.05 | H | Peak | 20.69 | 16.31 | 37.00 | 46.00 | -9.00 |
| 288.30 | H | Peak | 21.12 | 16.23 | 37.35 | 46.00 | -8.65 |
| 350.17 | H | Peak | 18.65 | 18.04 | 36.69 | 46.00 | -9.31 |
| 500.67 | H | Peak | 14.45 | 22.53 | 36.98 | 46.00 | -9.02 |
| 942.83 | H | Peak | 7.89 | 28.76 | 36.65 | 46.00 | -9.35 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5320 / 14dBi + TX IEEE 802.11b / CH 2437 / 16dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 56.55 | V | Peak | 22.70 | 14.15 | 36.85 | 40.00 | -3.15 |
| 287.85 | V | Peak | 18.12 | 16.21 | 34.33 | 46.00 | -11.67 |
| 350.17 | V | Peak | 16.82 | 18.04 | 34.86 | 46.00 | -11.14 |
| 499.50 | V | Peak | 15.99 | 22.49 | 38.48 | 46.00 | -7.52 |
| 658.17 | V | Peak | 12.11 | 25.03 | 37.14 | 46.00 | -8.86 |
| 942.83 | V | Peak | 10.06 | 28.76 | 38.82 | 46.00 | -7.18 |
| 65.10 | H | Peak | 23.30 | 11.76 | 35.06 | 40.00 | -4.94 |
| 250.05 | H | Peak | 20.52 | 16.31 | 36.83 | 46.00 | -9.17 |
| 288.30 | H | Peak | 20.95 | 16.23 | 37.18 | 46.00 | -8.82 |
| 350.17 | H | Peak | 18.65 | 18.04 | 36.69 | 46.00 | -9.31 |
| 658.17 | H | Peak | 12.27 | 25.03 | 37.30 | 46.00 | -8.70 |
| 942.83 | H | Peak | 8.22 | 28.76 | 36.98 | 46.00 | -9.02 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5320 / 14dBi + TX IEEE 802.11b / CH 2462 / 16dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 56.55 | V | Peak | 22.53 | 14.15 | 36.68 | 40.00 | -3.32 |
| 287.85 | V | Peak | 18.95 | 16.21 | 35.16 | 46.00 | -10.84 |
| 350.17 | V | Peak | 16.82 | 18.04 | 34.86 | 46.00 | -11.14 |
| 500.67 | V | Peak | 16.95 | 22.53 | 39.48 | 46.00 | -6.52 |
| 659.33 | V | Peak | 14.09 | 25.05 | 39.14 | 46.00 | -6.86 |
| 942.83 | V | Peak | 9.06 | 28.76 | 37.82 | 46.00 | -8.18 |
| 68.25 | H | Peak | 24.26 | 10.71 | 34.97 | 40.00 | -5.03 |
| 200.55 | H | Peak | 20.37 | 14.93 | 35.30 | 43.50 | -8.20 |
| 288.30 | H | Peak | 21.45 | 16.23 | 37.68 | 46.00 | -8.32 |
| 350.17 | H | Peak | 19.15 | 18.04 | 37.19 | 46.00 | -8.81 |
| 499.50 | H | Peak | 14.49 | 22.49 | 36.98 | 46.00 | -9.02 |
| 658.17 | H | Peak | 13.11 | 25.03 | 38.14 | 46.00 | -7.86 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5320 / 14dBi + TX IEEE 802.11g / CH 2412 / 16dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 56.55 | V | Peak | 23.20 | 14.15 | 37.35 | 40.00 | -2.65 |
| 287.85 | V | Peak | 18.95 | 16.21 | 35.16 | 46.00 | -10.84 |
| 304.67 | V | Peak | 20.65 | 16.81 | 37.46 | 46.00 | -8.54 |
| 500.67 | V | Peak | 16.45 | 22.53 | 38.98 | 46.00 | -7.02 |
| 659.33 | V | Peak | 14.09 | 25.05 | 39.14 | 46.00 | -6.86 |
| 944.00 | V | Peak | 9.07 | 28.77 | 37.84 | 46.00 | -8.16 |
| 67.80 | H | Peak | 24.44 | 10.86 | 35.30 | 40.00 | -4.70 |
| 250.05 | H | Peak | 20.35 | 16.31 | 36.66 | 46.00 | -9.34 |
| 287.85 | H | Peak | 21.95 | 16.21 | 38.16 | 46.00 | -7.84 |
| 350.17 | H | Peak | 19.32 | 18.04 | 37.36 | 46.00 | -8.64 |
| 500.67 | H | Peak | 14.62 | 22.53 | 37.15 | 46.00 | -8.85 |
| 659.33 | H | Peak | 12.09 | 25.05 | 37.14 | 46.00 | -8.86 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5320 / 14dBi + TX IEEE 802.11g / CH 2437 / 16dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 56.10 | V | Peak | 22.86 | 14.24 | 37.10 | 40.00 | -2.90 |
| 287.85 | V | Peak | 18.62 | 16.21 | 34.83 | 46.00 | -11.17 |
| 500.67 | V | Peak | 16.62 | 22.53 | 39.15 | 46.00 | -6.85 |
| 659.33 | V | Peak | 13.75 | 25.05 | 38.80 | 46.00 | -7.20 |
| 675.67 | V | Peak | 11.05 | 25.34 | 36.39 | 46.00 | -9.61 |
| 942.83 | V | Peak | 9.22 | 28.76 | 37.98 | 46.00 | -8.02 |
| 68.25 | H | Peak | 25.26 | 10.71 | 35.97 | 40.00 | -4.03 |
| 200.55 | H | Peak | 20.87 | 14.93 | 35.80 | 43.50 | -7.70 |
| 288.30 | H | Peak | 20.95 | 16.23 | 37.18 | 46.00 | -8.82 |
| 350.17 | H | Peak | 19.48 | 18.04 | 37.52 | 46.00 | -8.48 |
| 500.67 | H | Peak | 15.28 | 22.53 | 37.81 | 46.00 | -8.19 |
| 659.33 | H | Peak | 13.09 | 25.05 | 38.14 | 46.00 | -7.86 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5320 / 14dBi + TX IEEE 802.11g / CH 2462 /16dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 58.80 | V | Peak | 19.72 | 13.70 | 33.42 | 40.00 | -6.58 |
| 288.30 | V | Peak | 17.12 | 16.23 | 33.35 | 46.00 | -12.65 |
| 400.33 | V | Peak | 12.51 | 20.72 | 33.23 | 46.00 | -12.77 |
| 500.67 | V | Peak | 16.28 | 22.53 | 38.81 | 46.00 | -7.19 |
| 659.33 | V | Peak | 12.42 | 25.05 | 37.47 | 46.00 | -8.53 |
| 946.33 | V | Peak | 11.42 | 28.81 | 40.23 | 46.00 | -5.77 |
| 68.25 | H | Peak | 24.76 | 10.71 | 35.47 | 40.00 | -4.53 |
| 250.05 | H | Peak | 20.52 | 16.31 | 36.83 | 46.00 | -9.17 |
| 288.30 | H | Peak | 21.28 | 16.23 | 37.51 | 46.00 | -8.49 |
| 350.17 | H | Peak | 18.32 | 18.04 | 36.36 | 46.00 | -9.64 |
| 500.67 | H | Peak | 14.95 | 25.03 | 39.98 | 46.00 | -6.02 |
| 658.17 | H | Peak | 13.27 | 25.03 | 38.30 | 46.00 | -7.70 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX IEEE 802.11a / CH 5320 / 14dBi + TX IEEE 802.11g / Turbo CH 2437 / 16dBi | **Test Date:** | November 2, 2004 |
| **Temperature:** | 28°C | **Tested by:** | Max Yao |
| **Humidity:** | 60% RH | **Polarity:** | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|---|---|---|---|---|---|---|---|
| 59.25 | V | Peak | 24.23 | 13.61 | 37.84 | 40.00 | -2.16 |
| 288.30 | V | Peak | 21.28 | 16.23 | 37.51 | 46.00 | -8.49 |
| 350.17 | V | Peak | 17.15 | 18.04 | 35.19 | 46.00 | -10.81 |
| 499.50 | V | Peak | 17.49 | 22.49 | 39.98 | 46.00 | -6.02 |
| 659.33 | V | Peak | 15.75 | 25.05 | 40.80 | 46.00 | -5.20 |
| 942.83 | V | Peak | 9.72 | 28.76 | 38.48 | 46.00 | -7.52 |
| 68.25 | H | Peak | 26.09 | 10.71 | 36.80 | 40.00 | -3.20 |
| 141.60 | H | Peak | 24.45 | 10.91 | 35.36 | 43.50 | -8.14 |
| 250.05 | H | Peak | 21.19 | 16.31 | 37.50 | 46.00 | -8.50 |
| 288.30 | H | Peak | 20.62 | 16.23 | 36.85 | 46.00 | -9.15 |
| 499.50 | H | Peak | 14.49 | 22.49 | 36.98 | 46.00 | -9.02 |
| 658.17 | H | Peak | 11.61 | 25.03 | 36.64 | 46.00 | -9.36 |

***Notes:***

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPN between 30MHz to 1GHz was 100kHz.*

**Above 1 GHz**

**CONDITION A: EUT (Dual-Band Omni-Directional Antenna)**

**Operation Mode:** TX IEEE 802.11a / CH 5180 / 5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1593.33 | V | 48.00 | --- | -6.84 | 41.16 | --- | 74.00 | 54.00 | -12.84 | Peak |
| 1840.00 | V | 53.67 | --- | -5.47 | 48.20 | --- | 74.00 | 54.00 | -5.80 | Peak |
| 2733.33 | V | 45.00 | --- | -2.15 | 42.85 | --- | 74.00 | 54.00 | -11.15 | Peak |
| 3691.67 | V | 44.17 | --- | 1.26 | 45.43 | --- | 74.00 | 54.00 | -8.57 | Peak |
| 10360.00 | V | 58.77 | 43.36 | 10.43 | 69.20 | 53.79 | 74.00 | 54.00 | -0.21 | Average |
| 15540.00 | V | 54.20 | 42.86 | 7.96 | 62.16 | 50.82 | 74.00 | 54.00 | -3.18 | Average |
| | | | | | | | | | | |
| 1040.00 | H | 46.67 | --- | -10.17 | 36.50 | --- | 74.00 | 54.00 | -17.50 | Peak |
| 1190.00 | H | 48.67 | --- | -9.08 | 39.59 | --- | 74.00 | 54.00 | -14.41 | Peak |
| 3675.00 | H | 44.50 | --- | 1.18 | 45.68 | --- | 74.00 | 54.00 | -8.32 | Peak |
| 10360.00 | H | 58.02 | 43.22 | 10.43 | 68.45 | 53.65 | 74.00 | 54.00 | -0.35 | Average |
| 15540.00 | H | 53.92 | 41.72 | 7.96 | 61.88 | 49.68 | 74.00 | 54.00 | -4.32 | Average |
| N/A | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a / CH 5260 / 5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1676.67 | V | 48.50 | --- | -6.38 | 42.12 | --- | 74.00 | 54.00 | -11.88 | Peak |
| 1836.67 | V | 52.50 | --- | -5.49 | 47.01 | --- | 74.00 | 54.00 | -6.99 | Peak |
| 2733.33 | V | 45.17 | --- | -2.15 | 43.02 | --- | 74.00 | 54.00 | -10.98 | Peak |
| 3516.67 | V | 45.34 | --- | 0.46 | 45.80 | --- | 74.00 | 54.00 | -8.20 | Peak |
| 10520.00 | V | 59.19 | 42.86 | 10.56 | 69.75 | 53.42 | 74.00 | 54.00 | -0.58 | Average |
| 15780.00 | V | 53.25 | 42.16 | 7.49 | 60.74 | 49.65 | 74.00 | 54.00 | -4.35 | Average |
| | | | | | | | | | | |
| 1190.00 | H | 47.34 | --- | -9.08 | 38.26 | --- | 74.00 | 54.00 | -15.74 | Peak |
| 1553.33 | H | 44.00 | --- | -7.17 | 36.83 | --- | 74.00 | 54.00 | -17.17 | Peak |
| 3691.67 | H | 45.00 | --- | 1.25 | 46.25 | --- | 74.00 | 54.00 | -7.75 | Peak |
| 11520.00 | H | 53.04 | 40.96 | 10.56 | 63.60 | 51.52 | 74.00 | 54.00 | -2.48 | Average |
| 15780.00 | H | 46.92 | 35.20 | 7.49 | 54.41 | 42.69 | 74.00 | 54.00 | -11.31 | Average |
| N/A | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a / CH 5320 / 5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1596.67 | V | 46.34 | --- | -6.82 | 39.52 | --- | 74.00 | 54.00 | -14.48 | Peak |
| 1836.67 | V | 54.50 | --- | -5.49 | 49.01 | --- | 74.00 | 54.00 | -4.99 | Peak |
| 1953.33 | V | 44.17 | --- | -4.71 | 39.46 | --- | 74.00 | 54.00 | -14.54 | Peak |
| 2733.33 | V | 46.00 | --- | -2.15 | 43.85 | --- | 74.00 | 54.00 | -10.15 | Peak |
| 10640.00 | V | 59.58 | 42.56 | 10.65 | 70.23 | 53.21 | 74.00 | 54.00 | -0.79 | Average |
| 15960.00 | V | 55.96 | 41.91 | 7.14 | 63.10 | 49.05 | 74.00 | 54.00 | -4.95 | Average |
| | | | | | | | | | | |
| 1043.33 | H | 46.34 | --- | -10.14 | 36.20 | --- | 74.00 | 54.00 | -17.80 | Peak |
| 1190.00 | H | 47.67 | --- | -9.08 | 38.59 | --- | 74.00 | 54.00 | -15.41 | Peak |
| 10640.00 | H | 50.71 | 41.07 | 10.65 | 61.36 | 51.72 | 74.00 | 54.00 | -2.28 | Average |
| 15960.00 | H | 48.79 | 34.52 | 7.14 | 55.93 | 41.66 | 74.00 | 54.00 | -12.34 | Average |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a / Turbo CH 5210 / 5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1646.67 | V | 48.67 | --- | -6.54 | 42.13 | --- | 74.00 | 54.00 | -11.87 | Peak |
| 1836.67 | V | 52.34 | --- | -5.49 | 46.85 | --- | 74.00 | 54.00 | -7.15 | Peak |
| 2733.33 | V | 47.50 | --- | -2.15 | 45.35 | --- | 74.00 | 54.00 | -8.65 | Peak |
| 3675.00 | V | 44.50 | --- | 1.18 | 45.68 | --- | 74.00 | 54.00 | -8.32 | Peak |
| 10420.00 | V | 54.89 | 42.37 | 10.48 | 65.37 | 52.85 | 74.00 | 54.00 | -1.15 | Average |
| 15630.00 | V | 51.78 | 42.04 | 7.79 | 59.56 | 49.82 | 74.00 | 54.00 | -4.18 | Average |
| | | | | | | | | | | |
| 1060.00 | H | 45.50 | --- | -10.01 | 35.49 | --- | 74.00 | 54.00 | -18.51 | Peak |
| 1190.00 | H | 47.84 | --- | -9.08 | 38.76 | --- | 74.00 | 54.00 | -15.24 | Peak |
| 1550.00 | H | 44.84 | --- | -7.20 | 37.64 | --- | 74.00 | 54.00 | -16.36 | Peak |
| 3666.67 | H | 46.00 | --- | 1.14 | 47.14 | --- | 74.00 | 54.00 | -6.86 | Peak |
| 10420.00 | H | 51.87 | 38.39 | 10.48 | 62.35 | 48.87 | 74.00 | 54.00 | -5.13 | Average |
| 15630.00 | H | 45.77 | 37.03 | 7.79 | 53.56 | 44.82 | 74.00 | 54.00 | -9.18 | Average |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a / Turbo CH 5250 / 5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1366.67 | V | 46.67 | --- | -8.39 | 38.28 | --- | 74.00 | 54.00 | -15.72 | Peak |
| 1546.67 | V | 47.34 | --- | -7.22 | 40.12 | --- | 74.00 | 54.00 | -13.88 | Peak |
| 1836.67 | V | 52.17 | --- | -5.49 | 46.68 | --- | 74.00 | 54.00 | -7.32 | Peak |
| 2733.33 | V | 48.00 | --- | -2.15 | 45.85 | --- | 74.00 | 54.00 | -8.15 | Peak |
| 10500.00 | V | 55.65 | 42.91 | 10.55 | 66.20 | 53.46 | 74.00 | 54.00 | -0.54 | Average |
| 15750.00 | V | 49.14 | 36.07 | 7.55 | 56.69 | 43.62 | 74.00 | 54.00 | -10.38 | Average |
| | | | | | | | | | | |
| 1200.00 | H | 50.34 | --- | -9.01 | 41.33 | --- | 74.00 | 54.00 | -12.67 | Peak |
| 1366.67 | H | 48.84 | --- | -8.39 | 40.45 | --- | 74.00 | 54.00 | -13.55 | Peak |
| 1590.00 | H | 43.34 | --- | -6.87 | 36.47 | --- | 74.00 | 54.00 | -17.53 | Peak |
| 10500.00 | H | 53.66 | 42.66 | 10.55 | 64.21 | 53.21 | 74.00 | 54.00 | -0.79 | Average |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a / Turbo CH 5290 / 5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1840.00 | V | 52.50 | --- | -5.47 | 47.03 | --- | 74.00 | 54.00 | -6.97 | Peak |
| 2733.33 | V | 47.84 | --- | -2.15 | 45.69 | --- | 74.00 | 54.00 | -8.31 | Peak |
| 10580.00 | V | 58.11 | 43.05 | 10.61 | 68.72 | 53.66 | 74.00 | 54.00 | -0.34 | Average |
| 15870.00 | V | 51.47 | 39.14 | 7.32 | 58.78 | 46.45 | 74.00 | 54.00 | -7.55 | Average |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1200.00 | H | 50.34 | --- | -9.01 | 41.33 | --- | 74.00 | 54.00 | -12.67 | Peak |
| 1366.67 | H | 49.00 | --- | -8.39 | 40.61 | --- | 74.00 | 54.00 | -13.39 | Peak |
| 2733.33 | H | 42.50 | --- | -2.15 | 40.35 | --- | 74.00 | 54.00 | -13.65 | Peak |
| 10580.00 | H | 51.12 | 40.08 | 10.61 | 61.73 | 50.69 | 74.00 | 54.00 | -3.31 | Average |
| 15870.00 | H | 48.72 | 36.63 | 7.32 | 56.04 | 43.95 | 74.00 | 54.00 | -10.05 | Average |
| N/A | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**CONDITION B: EUT (Panel Directional Antenna)**

**Operation Mode:** TX IEEE 802.11a / CH 5280 / 14dBi **Test Date:** December 2, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1200.00 | V | 47.00 | --- | -9.01 | 37.99 | --- | 74.00 | 54.00 | -16.01 | Peak |
| 1750.00 | V | 51.00 | --- | -5.99 | 45.01 | --- | 74.00 | 54.00 | -8.99 | Peak |
| 1840.00 | V | 51.67 | --- | -5.47 | 46.20 | --- | 74.00 | 54.00 | -7.80 | Peak |
| 10560.00 | V | 50.37 | 38.17 | 10.43 | 60.80 | 48.60 | 74.00 | 54.00 | -5.40 | Average |
| 15840.00 | V | 47.08 | 35.18 | 7.96 | 55.04 | 43.14 | 74.00 | 54.00 | -10.86 | Average |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| 1196.67 | H | 49.50 | --- | -9.03 | 40.47 | --- | 74.00 | 54.00 | -13.53 | Peak |
| 1366.67 | H | 46.50 | --- | -8.39 | 38.11 | --- | 74.00 | 54.00 | -15.89 | Peak |
| 10560.00 | H | 51.70 | 37.69 | 10.43 | 62.13 | 48.12 | 74.00 | 54.00 | -5.88 | Average |
| 15840.00 | H | 47.42 | 34.96 | 7.96 | 55.38 | 42.92 | 74.00 | 54.00 | -11.08 | Average |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a / CH 5300 / 14dBi **Test Date:** December 2, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1673.33 | V | 49.84 | --- | -6.39 | 43.45 | --- | 74.00 | 54.00 | -10.55 | Peak |
| 1836.67 | V | 52.84 | --- | -5.49 | 47.35 | --- | 74.00 | 54.00 | -6.65 | Peak |
| 3658.33 | V | 49.67 | --- | 1.10 | 50.77 | --- | 74.00 | 54.00 | -3.23 | Peak |
| 10600.00 | V | 56.33 | 43.01 | 10.56 | 66.89 | 53.57 | 74.00 | 54.00 | -0.43 | Average |
| 15900.00 | V | 51.66 | 40.31 | 7.49 | 59.15 | 47.80 | 74.00 | 54.00 | -6.20 | Average |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| 1193.33 | H | 51.34 | --- | -9.06 | 42.28 | --- | 74.00 | 54.00 | -11.72 | Peak |
| 10600.00 | H | 49.33 | 40.86 | 10.56 | 59.89 | 51.42 | 74.00 | 54.00 | -2.58 | Average |
| 10600.00 | H | 49.62 | 38.57 | 7.49 | 57.11 | 46.06 | 74.00 | 54.00 | -7.94 | Average |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a / CH 5320 / 14dBi **Test Date:** December 2, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1836.67 | V | 51.67 | --- | -5.49 | 46.18 | --- | 74.00 | 54.00 | -7.82 | Peak |
| 2733.33 | V | 46.84 | --- | -2.15 | 44.69 | --- | 74.00 | 54.00 | -9.31 | Peak |
| 3550.00 | V | 56.61 | 52.45 | 0.61 | 57.22 | 53.06 | 74.00 | 54.00 | -0.94 | Average |
| 7091.67 | V | 45.17 | --- | 6.80 | 51.97 | --- | 74.00 | 54.00 | -2.03 | Peak |
| 10640.00 | V | 56.90 | 42.97 | 10.65 | 67.55 | 53.62 | 74.00 | 54.00 | -0.38 | Average |
| 15960.00 | V | 49.99 | 40.20 | 7.14 | 57.13 | 47.34 | 74.00 | 54.00 | -6.66 | Average |
| | | | | | | | | | | |
| 1646.67 | H | 52.17 | --- | -6.54 | 45.63 | --- | 74.00 | 54.00 | -8.37 | Peak |
| 1766.67 | H | 52.67 | --- | -5.90 | 46.77 | --- | 74.00 | 54.00 | -7.23 | Peak |
| 3541.67 | H | 54.67 | 50.32 | 0.57 | 55.24 | 50.89 | 74.00 | 54.00 | -3.11 | Average |
| 7100.00 | H | 44.50 | --- | 6.82 | 51.32 | --- | 74.00 | 54.00 | -2.68 | Peak |
| 10640.00 | H | 57.24 | 43.07 | 10.65 | 67.89 | 53.72 | 74.00 | 54.00 | -0.28 | Average |
| 15960.00 | H | 49.50 | 38.16 | 7.14 | 56.64 | 45.30 | 74.00 | 54.00 | -8.70 | Average |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a / Turbo CH 5290 / 14dBi **Test Date:** December 2, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 1196.67 | V | 46.67 | --- | -9.03 | 37.64 | --- | 74.00 | 54.00 | -16.36 | Peak |
| 1836.67 | V | 52.17 | --- | -5.49 | 46.68 | --- | 74.00 | 54.00 | -7.32 | Peak |
| 2733.33 | V | 45.67 | --- | -2.15 | 43.52 | --- | 74.00 | 54.00 | -10.48 | Peak |
| 3525.00 | V | 44.34 | --- | 0.49 | 44.83 | --- | 74.00 | 54.00 | -9.17 | Peak |
| 10580.00 | V | 57.44 | 42.86 | 10.61 | 68.05 | 53.47 | 74.00 | 54.00 | -0.53 | Average |
| 15870.00 | V | 49.88 | 39.39 | 7.32 | 57.19 | 46.70 | 74.00 | 54.00 | -7.30 | Average |
| | | | | | | | | | | |
| 1190.00 | H | 50.17 | --- | -9.08 | 41.09 | --- | 74.00 | 54.00 | -12.91 | Peak |
| 1823.33 | H | 44.00 | --- | -5.58 | 38.42 | --- | 74.00 | 54.00 | -15.58 | Peak |
| 3525.00 | H | 46.50 | --- | 0.49 | 46.99 | --- | 74.00 | 54.00 | -7.01 | Peak |
| 10580.00 | H | 52.36 | 40.31 | 10.61 | 62.97 | 50.92 | 74.00 | 54.00 | -3.08 | Average |
| 15870.00 | H | 50.88 | 38.98 | 7.32 | 58.20 | 46.30 | 74.00 | 54.00 | -7.70 | Average |
| N/A | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

# Co-Location:

**CONDITION C: EUT (Dual-Band Omni-Directional Antenna) + AP (Dual-Band Omni-Directional Antenna)**

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5180 / 5dBi + TX IEEE 802.11b / CH 2412 / 4.5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 54.67 | --- | -3.81 | 50.86 | --- | 74.00 | 54.00 | -3.14 | Peak |
| 2206.67 | V | 53.50 | --- | -3.70 | 49.80 | --- | 74.00 | 54.00 | -4.20 | Peak |
| 3158.33 | V | 49.00 | --- | -0.90 | 48.10 | --- | 74.00 | 54.00 | -5.90 | Peak |
| 4816.67 | V | 46.34 | --- | 3.28 | 49.62 | --- | 74.00 | 54.00 | -4.38 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 2173.33 | H | 46.34 | --- | -3.81 | 42.53 | --- | 74.00 | 54.00 | -11.47 | Peak |
| 2206.67 | H | 47.50 | --- | -3.70 | 43.80 | --- | 74.00 | 54.00 | -10.20 | Peak |
| 4816.00 | H | 44.84 | --- | 3.28 | 48.12 | --- | 74.00 | 54.00 | -5.88 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5180 / 5dBi + TX IEEE 802.11b / CH 2437 / 4.5dBi
**Test Date:** October 31, 2004

**Temperature:** 28°C
**Tested by:** Max Yao

**Humidity:** 60% RH
**Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 49.84 | --- | -3.81 | 46.03 | --- | 74.00 | 54.00 | -7.97 | Peak |
| 2206.67 | V | 52.17 | --- | -3.70 | 48.47 | --- | 74.00 | 54.00 | -5.53 | Peak |
| 3166.67 | V | 50.17 | --- | -0.91 | 49.26 | --- | 74.00 | 54.00 | -4.74 | Peak |
| 4866.00 | V | 49.67 | 44.37 | 3.38 | 53.05 | 47.75 | 74.00 | 54.00 | -6.25 | Average |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 2173.33 | H | 46.00 | --- | -3.81 | 42.19 | --- | 74.00 | 54.00 | -11.81 | Peak |
| 2206.67 | H | 48.00 | --- | -3.70 | 44.30 | --- | 74.00 | 54.00 | -9.70 | Peak |
| 4866.67 | H | 45.34 | --- | 3.38 | 48.72 | --- | 74.00 | 54.00 | -5.28 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX 802. IEEE 11a Base mode / CH 5180 / 5dBi + TX 802. IEEE 11b / CH 2462 / 4.5dBi
**Test Date:** October 31, 2004

**Temperature:** 28°C
**Tested by:** Max Yao

**Humidity:** 60% RH
**Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 50.17 | --- | -3.81 | 46.36 | --- | 74.00 | 54.00 | -7.64 | Peak |
| 2206.67 | V | 52.67 | --- | -3.70 | 48.97 | --- | 74.00 | 54.00 | -5.03 | Peak |
| 3158.33 | V | 48.84 | --- | -0.95 | 47.89 | --- | 74.00 | 54.00 | -6.11 | Peak |
| 4916.67 | V | 47.00 | --- | 3.49 | 50.49 | --- | 74.00 | 54.00 | -3.51 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 2173.33 | H | 46.17 | --- | -3.81 | 42.36 | --- | 74.00 | 54.00 | -11.64 | Peak |
| 2206.67 | H | 47.84 | --- | -3.70 | 44.14 | --- | 74.00 | 54.00 | -9.86 | Peak |
| 4916.67 | H | 43.84 | --- | 3.49 | 47.33 | --- | 74.00 | 54.00 | -6.67 | Peak |
| N/A | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX 802. IEEE 11a Base mode / CH 5180 / 5dBi + TX 802. IEEE 11g Base mode / CH 2412 / 4.5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 48.34 | --- | -3.81 | 44.53 | --- | 74.00 | 54.00 | -9.47 | Peak |
| 2206.67 | V | 48.67 | --- | -3.70 | 44.97 | --- | 74.00 | 54.00 | -9.03 | Peak |
| 3166.67 | V | 48.00 | --- | -0.91 | 47.09 | --- | 74.00 | 54.00 | -6.91 | Peak |
| 5166.67 | V | 43.00 | --- | 4.02 | 47.02 | --- | 74.00 | 54.00 | -6.98 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1440.00 | H | 45.84 | --- | -8.00 | 37.84 | --- | 74.00 | 54.00 | -16.16 | Peak |
| 2206.67 | H | 47.50 | --- | -3.70 | 43.80 | --- | 74.00 | 54.00 | -10.20 | Peak |
| 4966.67 | H | 40.84 | --- | 3.60 | 44.44 | --- | 74.00 | 54.00 | -9.56 | Peak |
| N/A | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX 802. IEEE 11a Base mode / CH 5180 / 5dBi + TX 802. IEEE 11g Base mode / CH 2437 / 4.5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2206.67 | V | 52.17 | --- | -3.70 | 48.47 | --- | 74.00 | 54.00 | -5.53 | Peak |
| 3158.33 | V | 49.17 | --- | -0.95 | 48.22 | --- | 74.00 | 54.00 | -5.78 | Peak |
| 3408.33 | V | 46.84 | --- | 0.02 | 46.86 | --- | 74.00 | 54.00 | -7.14 | Peak |
| 4866.67 | V | 43.00 | --- | 3.38 | 46.38 | --- | 74.00 | 54.00 | -7.62 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 2173.33 | H | 45.00 | --- | -3.81 | 41.19 | --- | 74.00 | 54.00 | -12.81 | Peak |
| 2206.67 | H | 46.50 | --- | -3.70 | 42.80 | --- | 74.00 | 54.00 | -11.20 | Peak |
| N/A | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5180 / 5dBi + TX IEEE 802.11g Base mode / CH 2462 / 4.5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2206.67 | V | 51.84 | --- | -3.70 | 48.14 | --- | 74.00 | 54.00 | -5.86 | Peak |
| 3166.67 | V | 47.84 | --- | -0.91 | 46.93 | --- | 74.00 | 54.00 | -7.07 | Peak |
| 3400.00 | V | 46.17 | --- | -0.01 | 46.16 | --- | 74.00 | 54.00 | -7.84 | Peak |
| 4858.33 | V | 43.34 | --- | 3.37 | 46.71 | --- | 74.00 | 54.00 | -7.29 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1593.33 | H | 44.00 | --- | -6.84 | 37.16 | --- | 74.00 | 54.00 | -16.84 | Peak |
| 2206.67 | H | 48.34 | --- | -3.70 | 44.64 | --- | 74.00 | 54.00 | -9.36 | Peak |
| 4841.67 | H | 41.67 | --- | 3.33 | 45.00 | --- | 74.00 | 54.00 | -9.00 | Peak |
| N/A | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5180 / 5dBi + TX IEEE 802.11g Turbo mode / CH 2437 / 4.5dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 48.50 | --- | -3.81 | 44.69 | --- | 74.00 | 54.00 | -9.31 | Peak |
| 2206.67 | V | 54.17 | --- | -3.70 | 50.47 | --- | 74.00 | 54.00 | -3.53 | Peak |
| 3158.33 | V | 49.67 | --- | -0.95 | 48.72 | --- | 74.00 | 54.00 | -5.28 | Peak |
| 4866.67 | V | 44.34 | --- | 3.38 | 47.72 | --- | 74.00 | 54.00 | -6.28 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1596.67 | H | 45.67 | --- | -6.82 | 38.85 | --- | 74.00 | 54.00 | -15.15 | Peak |
| 2206.67 | H | 50.17 | --- | -3.70 | 46.47 | --- | 74.00 | 54.00 | -7.53 | Peak |
| 4791.67 | H | 42.50 | --- | 3.22 | 45.72 | --- | 74.00 | 54.00 | -8.28 | Peak |
| N/A | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5320 / 14dBi + TX IEEE 802.11b / CH 2412 / 16dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 3558.33 | V | 51.17 | --- | 0.65 | 51.82 | --- | 74.00 | 54.00 | -2.18 | Peak |
| 4816.67 | V | 46.84 | --- | 3.28 | 50.12 | --- | 74.00 | 54.00 | -3.88 | Peak |
| 5591.67 | V | 45.67 | --- | 4.81 | 50.48 | --- | 74.00 | 54.00 | -3.52 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1440.00 | H | 45.50 | --- | -8.00 | 37.50 | --- | 74.00 | 54.00 | -16.50 | Peak |
| 1670.00 | H | 46.67 | --- | -6.41 | 40.26 | --- | 74.00 | 54.00 | -13.74 | Peak |
| 4816.67 | H | 41.50 | --- | 3.28 | 44.78 | --- | 74.00 | 54.00 | -9.22 | Peak |
| N/A | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5320 / 14dBi + TX IEEE 802.11b / CH 2437 / 16dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 50.50 | --- | -3.81 | 46.69 | --- | 74.00 | 54.00 | -7.31 | Peak |
| 2206.67 | V | 49.17 | --- | -3.70 | 45.47 | --- | 74.00 | 54.00 | -8.53 | Peak |
| 4866.67 | V | 42.67 | --- | 3.38 | 46.05 | --- | 74.00 | 54.00 | -7.95 | Peak |
| 5541.67 | V | 45.50 | --- | 4.76 | 50.26 | --- | 74.00 | 54.00 | -3.74 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1663.33 | H | 47.50 | --- | -6.45 | 41.05 | --- | 74.00 | 54.00 | -12.95 | Peak |
| 1780.00 | H | 47.17 | --- | -5.83 | 41.34 | --- | 74.00 | 54.00 | -12.66 | Peak |
| 4866.67 | H | 41.50 | --- | 3.38 | 44.88 | --- | 74.00 | 54.00 | -9.12 | Peak |
| N/A | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5320 / 14dBi + TX IEEE 802.11b / CH 2462 / 16dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 50.67 | --- | -3.81 | 46.86 | --- | 74.00 | 54.00 | -7.14 | Peak |
| 2206.67 | V | 49.84 | --- | -3.70 | 46.14 | --- | 74.00 | 54.00 | -7.86 | Peak |
| 3666.67 | V | 44.67 | --- | 1.14 | 45.81 | --- | 74.00 | 54.00 | -8.19 | Peak |
| 4916.67 | V | 47.84 | --- | 3.49 | 51.33 | --- | 74.00 | 54.00 | -2.67 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1676.67 | H | 47.00 | --- | -6.38 | 40.62 | --- | 74.00 | 54.00 | -13.38 | Peak |
| 1780.00 | H | 45.50 | --- | -5.83 | 39.67 | --- | 74.00 | 54.00 | -14.33 | Peak |
| 4916.67 | H | 48.50 | --- | 3.49 | 51.99 | --- | 74.00 | 54.00 | -2.01 | Peak |
| N/A | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5320 / 14dBi + TX IEEE 802.11g Base mode / CH 2412 / 16dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 49.67 | --- | -3.81 | 45.86 | --- | 74.00 | 54.00 | -8.14 | Peak |
| 2206.67 | V | 47.67 | --- | -3.70 | 43.97 | --- | 74.00 | 54.00 | -10.03 | Peak |
| 3666.67 | V | 44.34 | --- | 1.14 | 45.48 | --- | 74.00 | 54.00 | -8.52 | Peak |
| 4816.67 | V | 41.67 | --- | 3.28 | 44.95 | --- | 74.00 | 54.00 | -9.05 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1593.33 | H | 44.34 | --- | -6.84 | 37.50 | --- | 74.00 | 54.00 | -16.50 | Peak |
| 2036.67 | H | 43.67 | --- | -4.27 | 39.40 | --- | 74.00 | 54.00 | -14.60 | Peak |
| 4808.33 | H | 41.34 | --- | 3.26 | 44.60 | --- | 74.00 | 54.00 | -9.40 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5320 / 14dBi + TX IEEE 802.11g Base mode / CH 2437 / 16dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 47.50 | --- | -3.81 | 43.69 | --- | 74.00 | 54.00 | -10.31 | Peak |
| 2206.67 | V | 48.50 | --- | -3.70 | 44.80 | --- | 74.00 | 54.00 | -9.20 | Peak |
| 3575.00 | V | 49.00 | --- | 0.72 | 49.72 | --- | 74.00 | 54.00 | -4.28 | Peak |
| 3616.67 | V | 46.34 | --- | 0.91 | 47.25 | --- | 74.00 | 54.00 | -6.75 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1693.33 | H | 44.67 | --- | -6.29 | 38.38 | --- | 74.00 | 54.00 | -15.62 | Peak |
| 4891.67 | H | 42.34 | --- | 3.44 | 45.78 | --- | 74.00 | 54.00 | -8.22 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
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***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5320 / 14dBi + TX IEEE 802.11g Base mode / CH 2462 / 16dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 48.34 | --- | -3.81 | 44.53 | --- | 74.00 | 54.00 | -9.47 | Peak |
| 3616.67 | V | 46.00 | --- | 0.91 | 46.91 | --- | 74.00 | 54.00 | -7.09 | Peak |
| 3666.67 | V | 45.50 | --- | 1.14 | 46.64 | --- | 74.00 | 54.00 | -7.36 | Peak |
| 4916.67 | V | 44.00 | --- | 3.49 | 47.49 | --- | 74.00 | 54.00 | -6.51 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1680.00 | H | 45.34 | --- | -6.36 | 38.98 | --- | 74.00 | 54.00 | -15.02 | Peak |
| 1760.00 | H | 46.84 | --- | -5.94 | 40.90 | --- | 74.00 | 54.00 | -13.10 | Peak |
| 3550.00 | H | 45.67 | --- | 0.61 | 46.28 | --- | 74.00 | 54.00 | -7.72 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

**Operation Mode:** TX IEEE 802.11a Base mode / CH 5320 / 14dBi + TX IEEE 802.11g Turbo mode / CH 2437 / 16dBi **Test Date:** October 31, 2004

**Temperature:** 28°C **Tested by:** Max Yao

**Humidity:** 60% RH **Polarity:** Ver. / Hor.

| Freq. (MHz) | Ant. Pol H/V | Peak Reading (dBuV) | AV Reading (dBuV) | Ant. / CL CF (dB) | Actual Fs | | Peak Limit (dBuV/m) | AV Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak (dBuV/m) | AV (dBuV/m) | | | | |
| 2173.33 | V | 49.00 | --- | -3.81 | 45.19 | --- | 74.00 | 54.00 | -8.81 | Peak |
| 2206.67 | V | 50.34 | --- | -3.70 | 46.64 | --- | 74.00 | 54.00 | -7.36 | Peak |
| 3550.00 | V | 45.34 | --- | 0.61 | 45.95 | --- | 74.00 | 54.00 | -8.05 | Peak |
| 3658.33 | V | 46.34 | --- | 1.10 | 47.44 | --- | 74.00 | 54.00 | -6.56 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1066.67 | H | 47.84 | --- | -9.96 | 37.88 | --- | 74.00 | 54.00 | -16.12 | Peak |
| 1760.00 | H | 46.00 | --- | -5.94 | 40.06 | --- | 74.00 | 54.00 | -13.94 | Peak |
| 3583.33 | H | 44.84 | --- | 0.76 | 45.60 | --- | 74.00 | 54.00 | -8.40 | Peak |
| N/A | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

***Notes:***

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.*
   b. *AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.*

# 7.8 CONDUCTED UNDESIRABLE EMISSION

## LIMIT

Transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm / MHz. Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

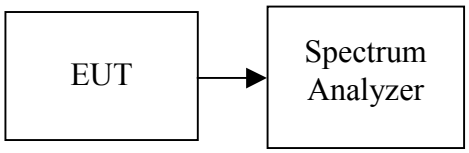
The provisions of §15.205 apply to intentional radiators operating under this section.

## MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 01/10/2005 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

**Test Configuration**




## TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

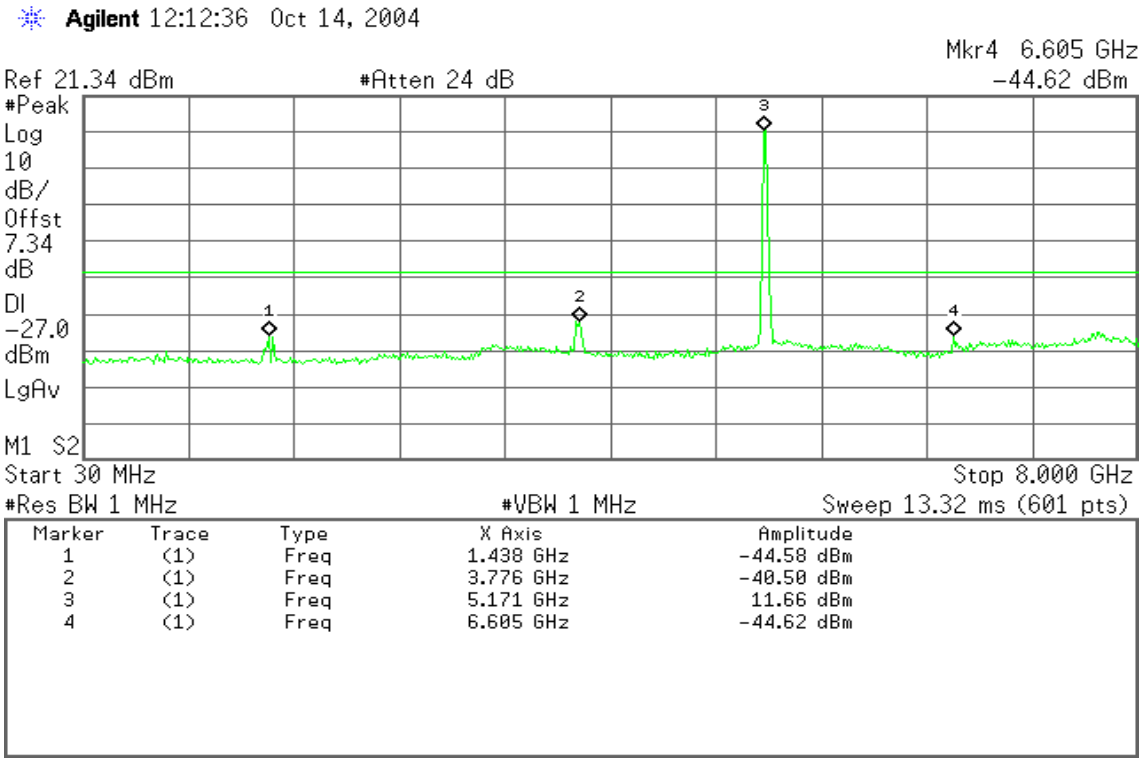
## TEST RESULTS

*No non-compliance noted.*

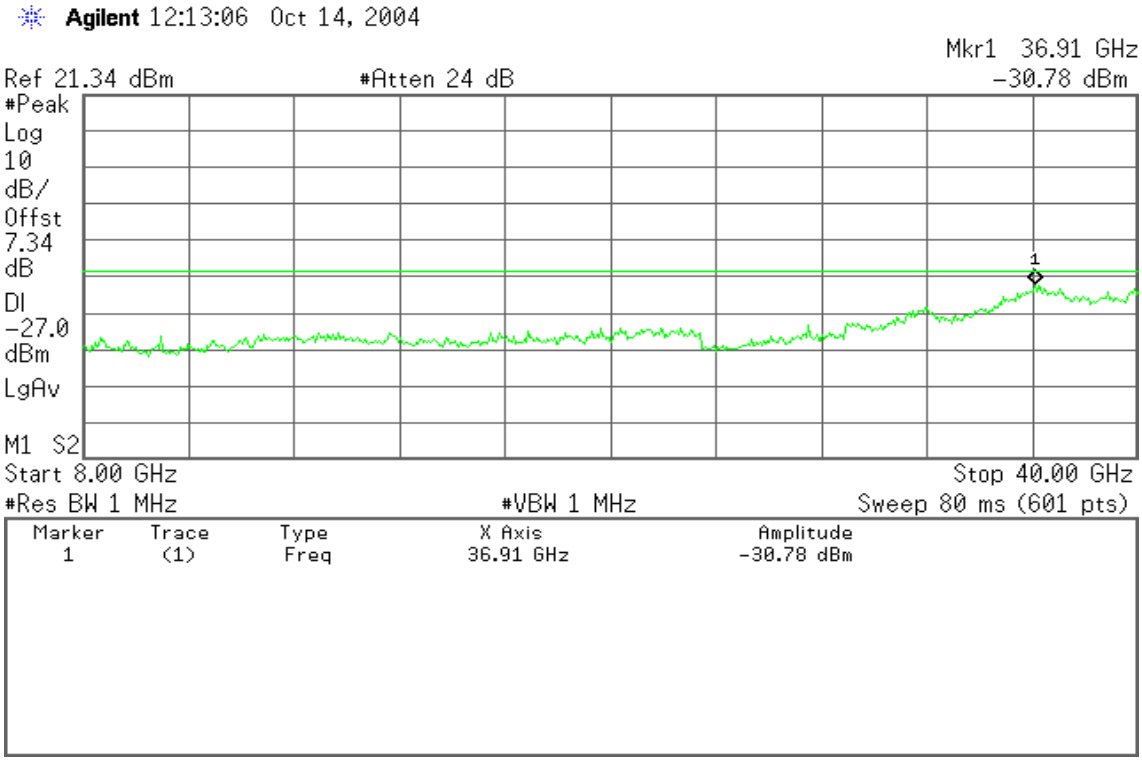
## Test Plot / Dual-Band Omni-Directional Antenna

### CH 5180 / 5dBi

### 30MHz ~ 8GHz

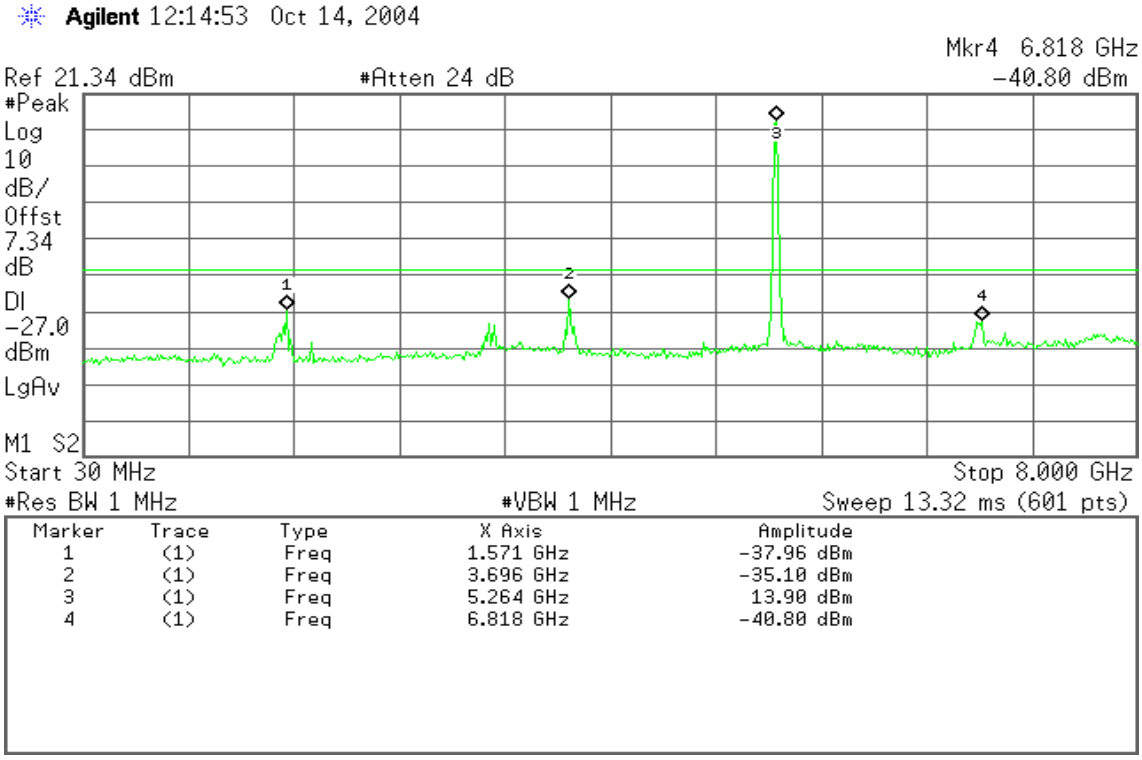



### 8GHz ~ 40GHz

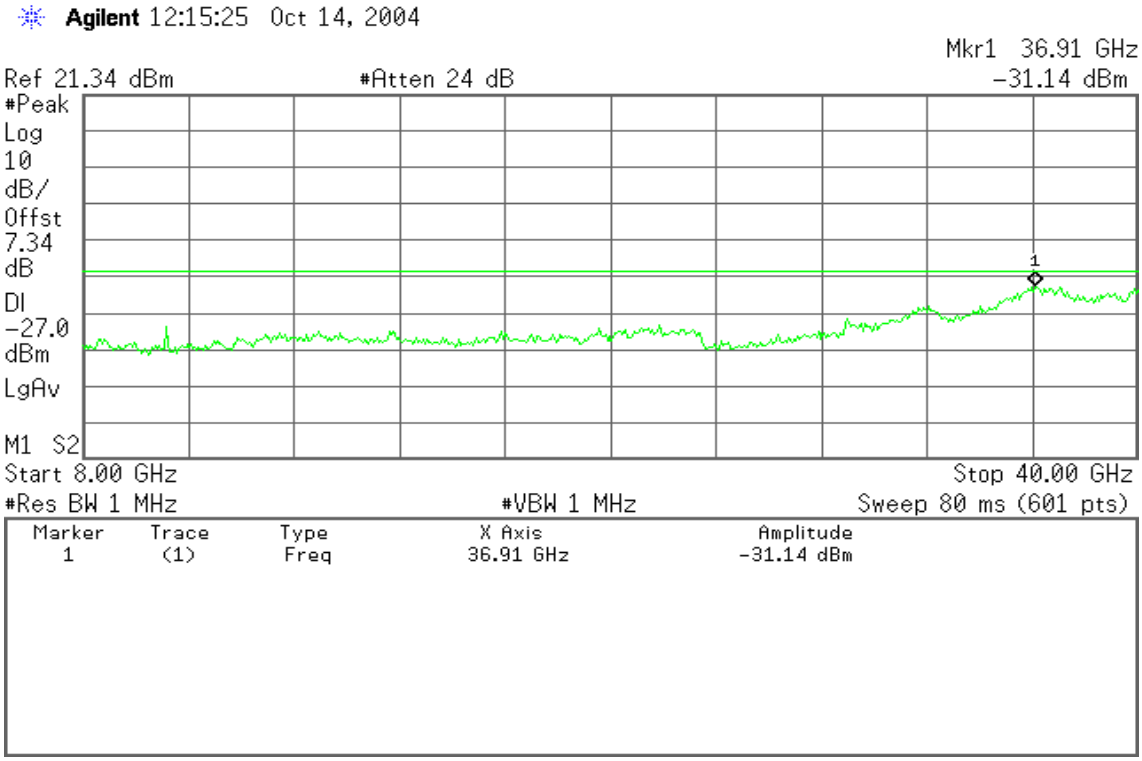


## CH 5260 / 5dBi

### 30MHz ~ 8GHz

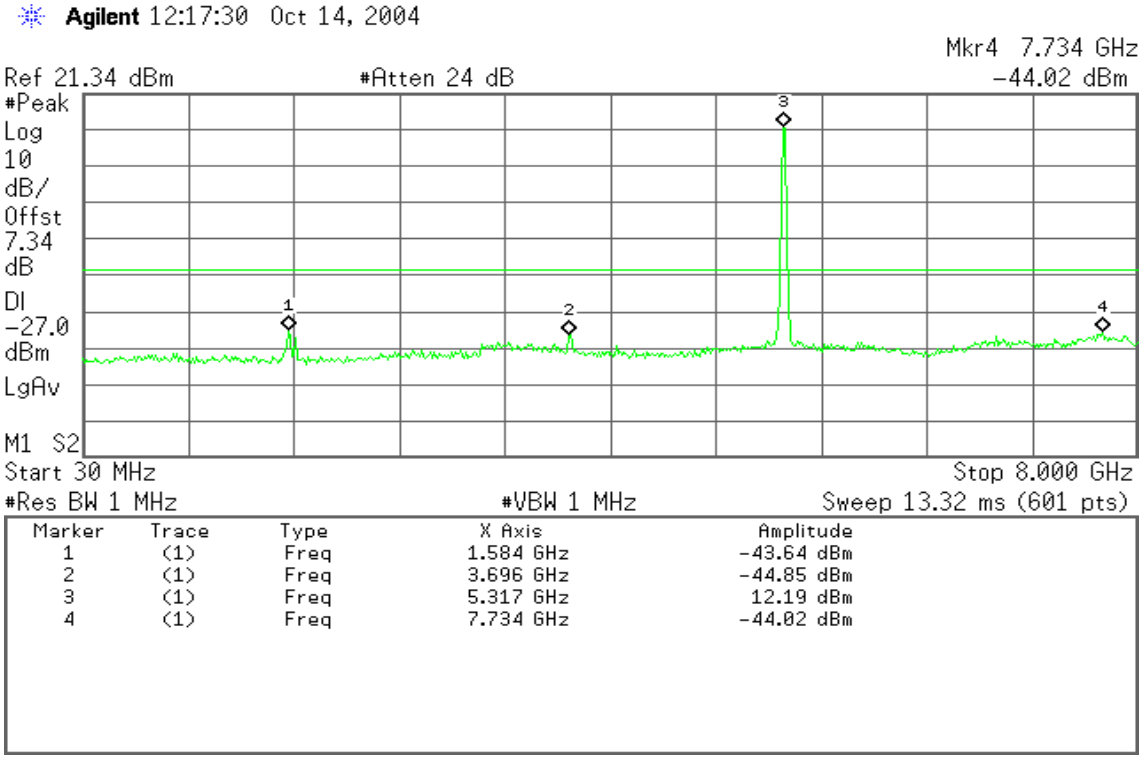



### 8GHz ~ 40GHz

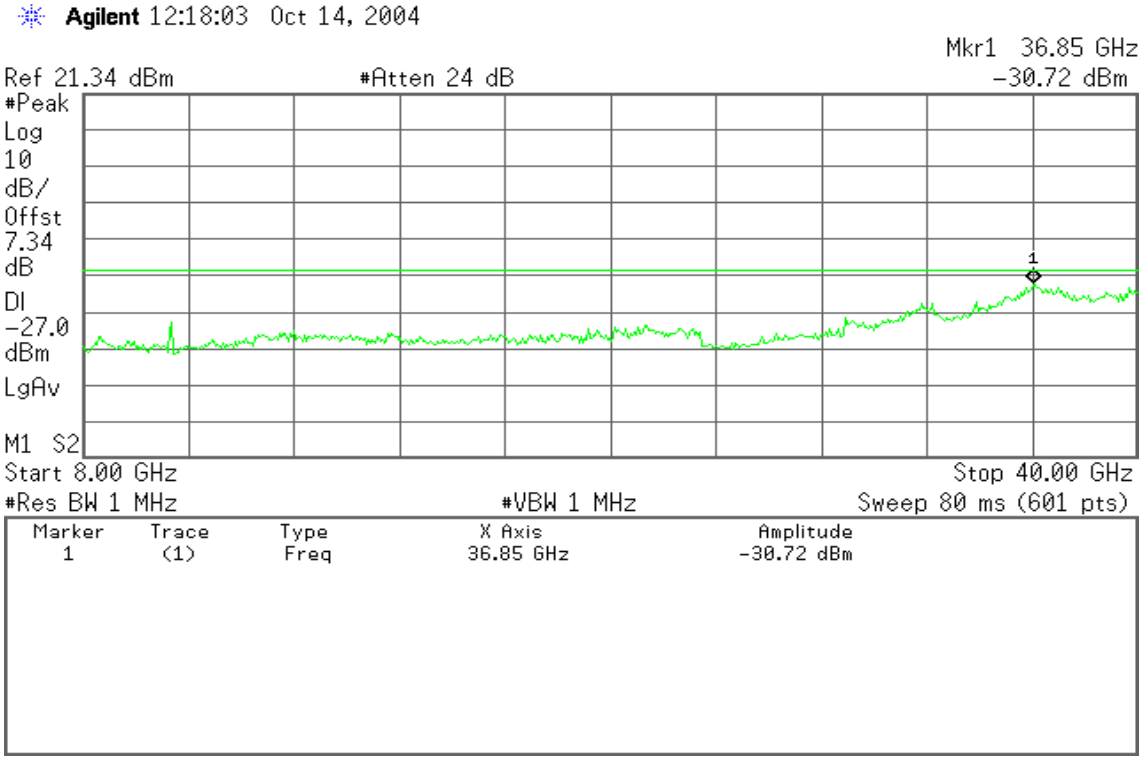


## CH 5320 / 5dBi

### 30MHz ~ 8GHz



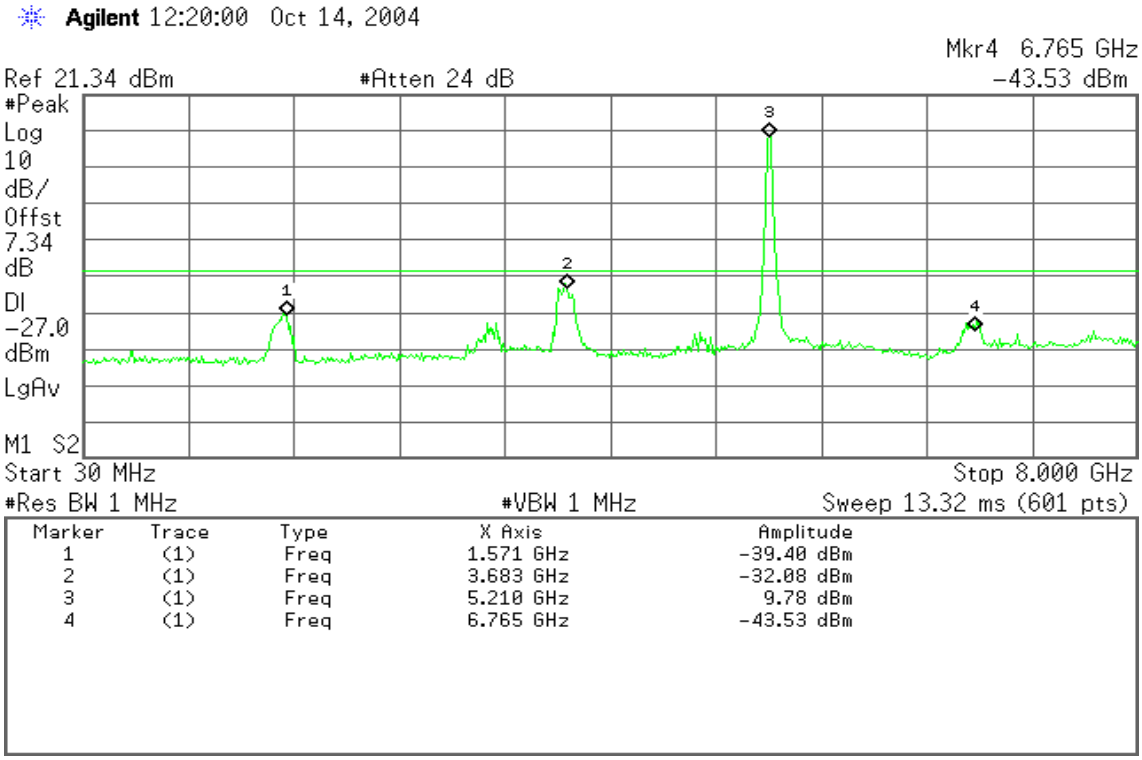

### 8GHz ~ 40GHz



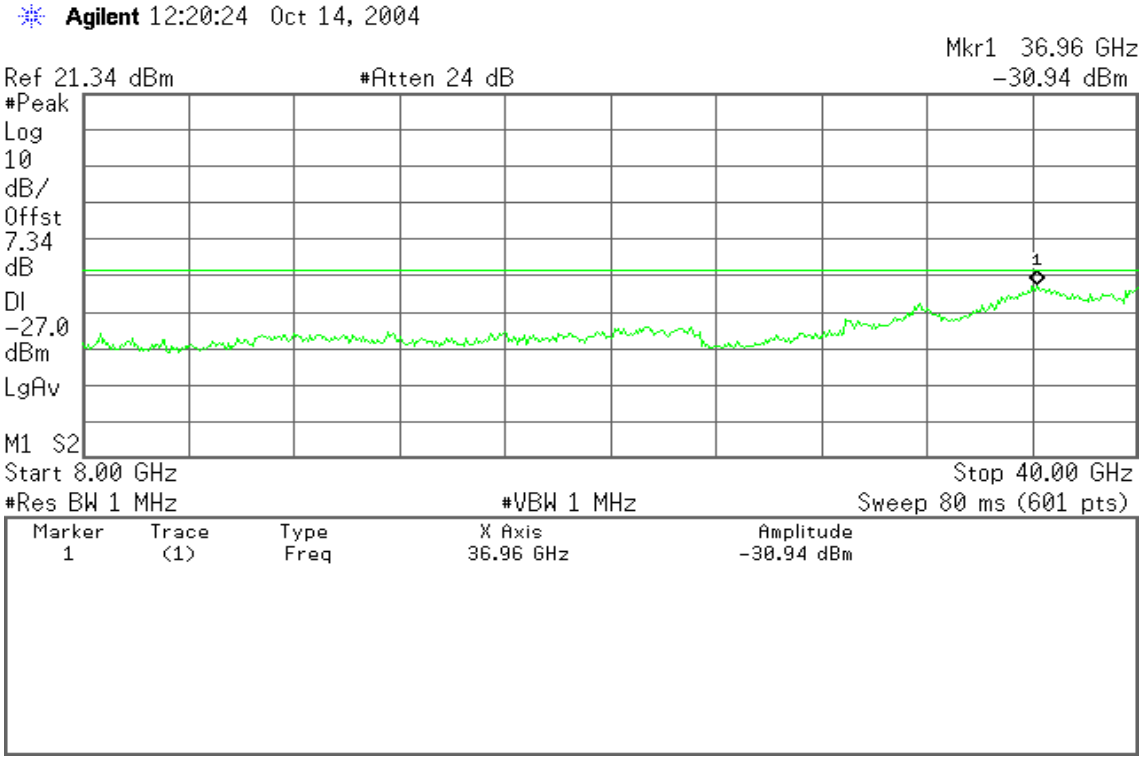
## IEEE 802.11a Turbo mode

### CH 5210 / 5dBi

### 30MHz ~ 8GHz

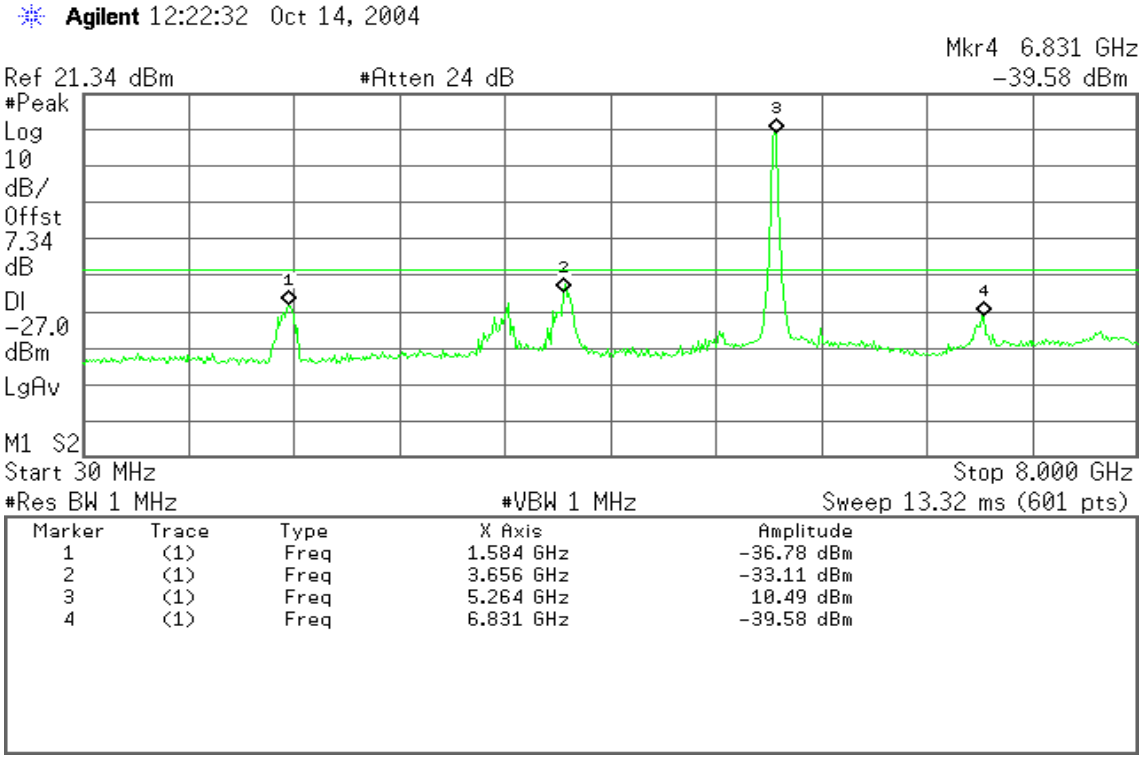



### 8GHz ~ 40GHz

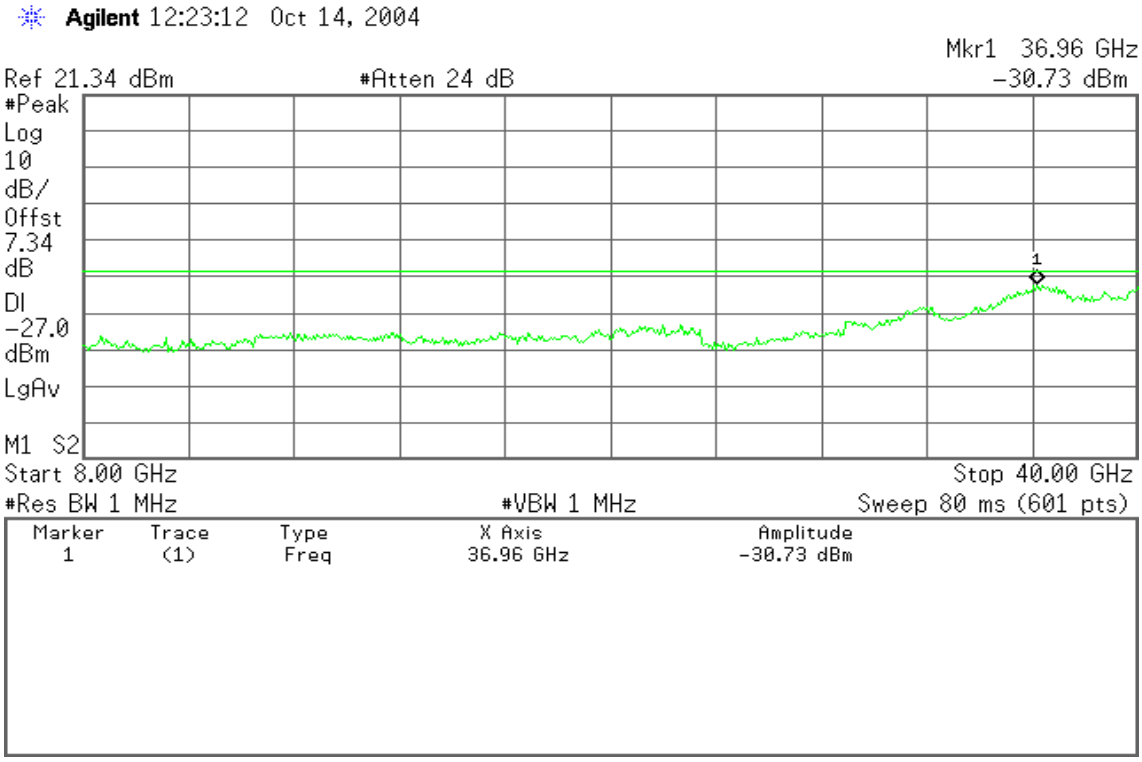


## CH 5250 / 5dBi

### 30MHz ~ 8GHz

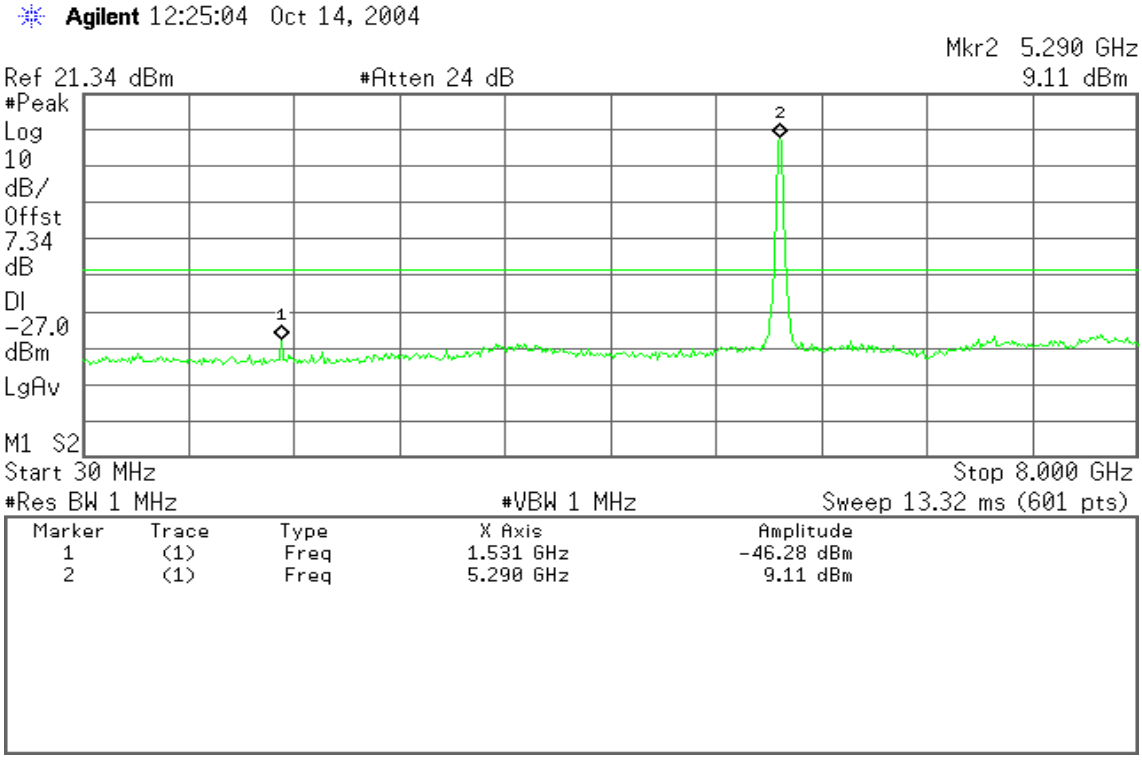



### 8GHz ~ 40GHz

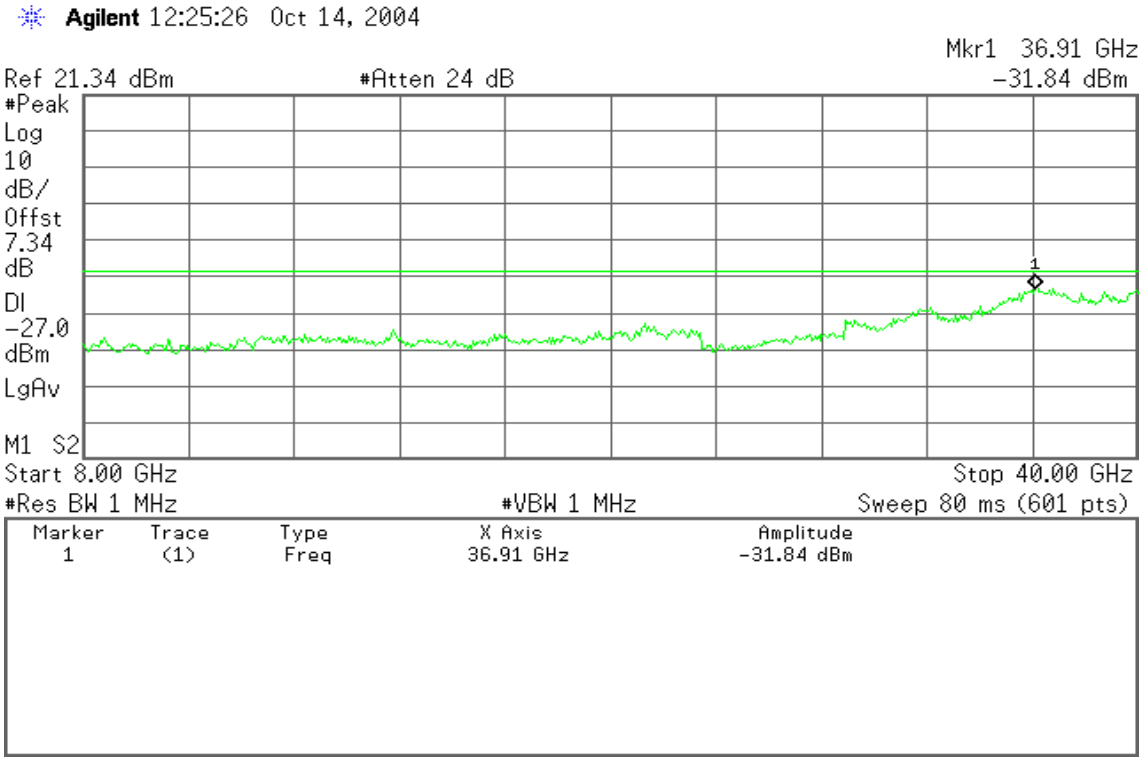


## CH 5290 / 5dBi

### 30MHz ~ 8GHz



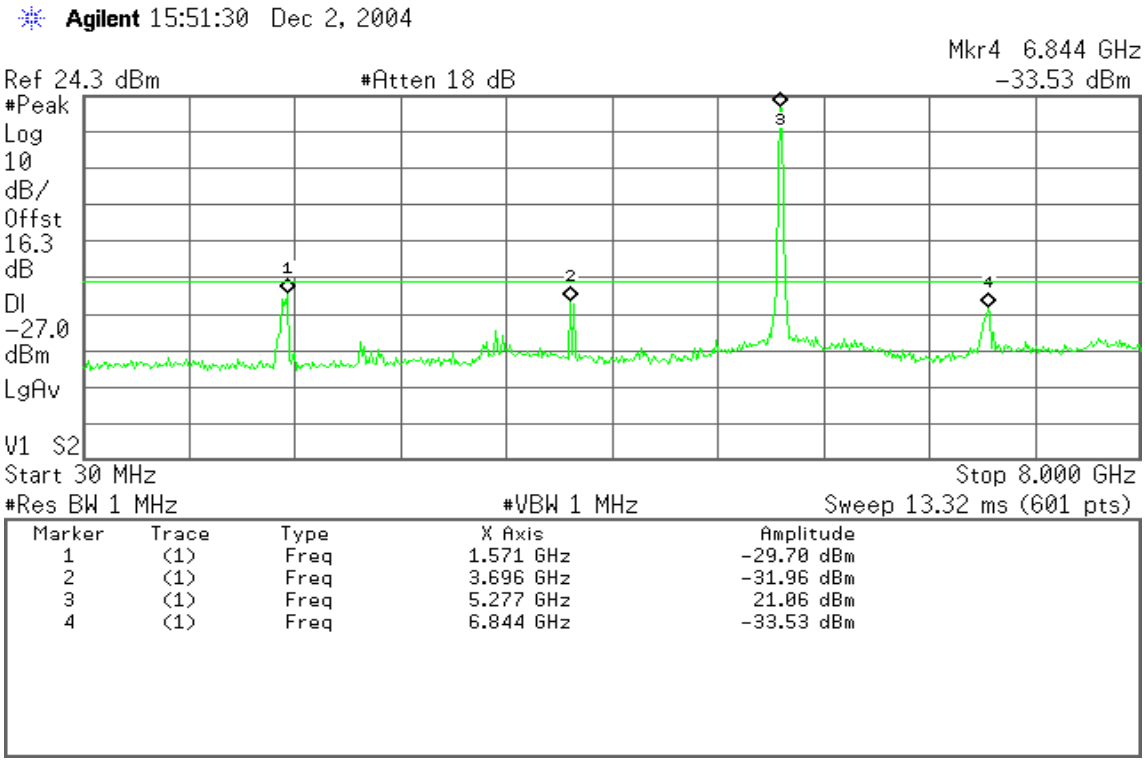

### 8GHz ~ 40GHz



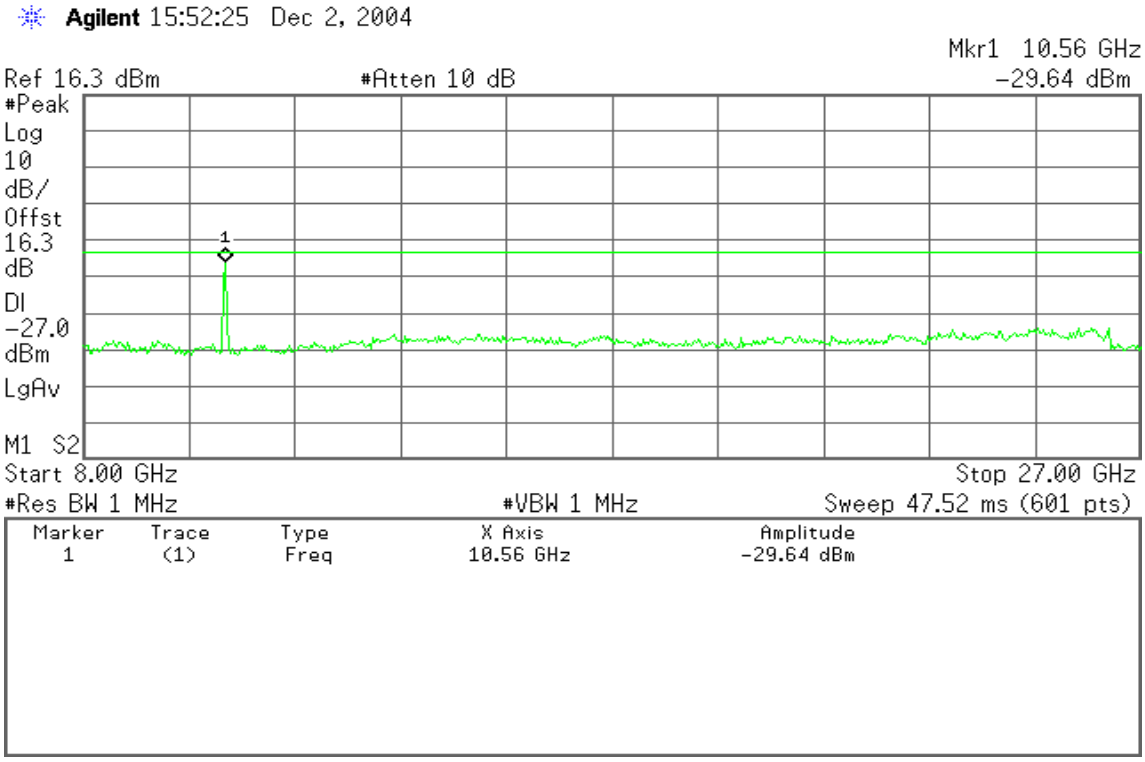
## Test Plot / Panel Directional Antenna

### CH 5280 / 14dBi

### 30MHz ~ 8GHz

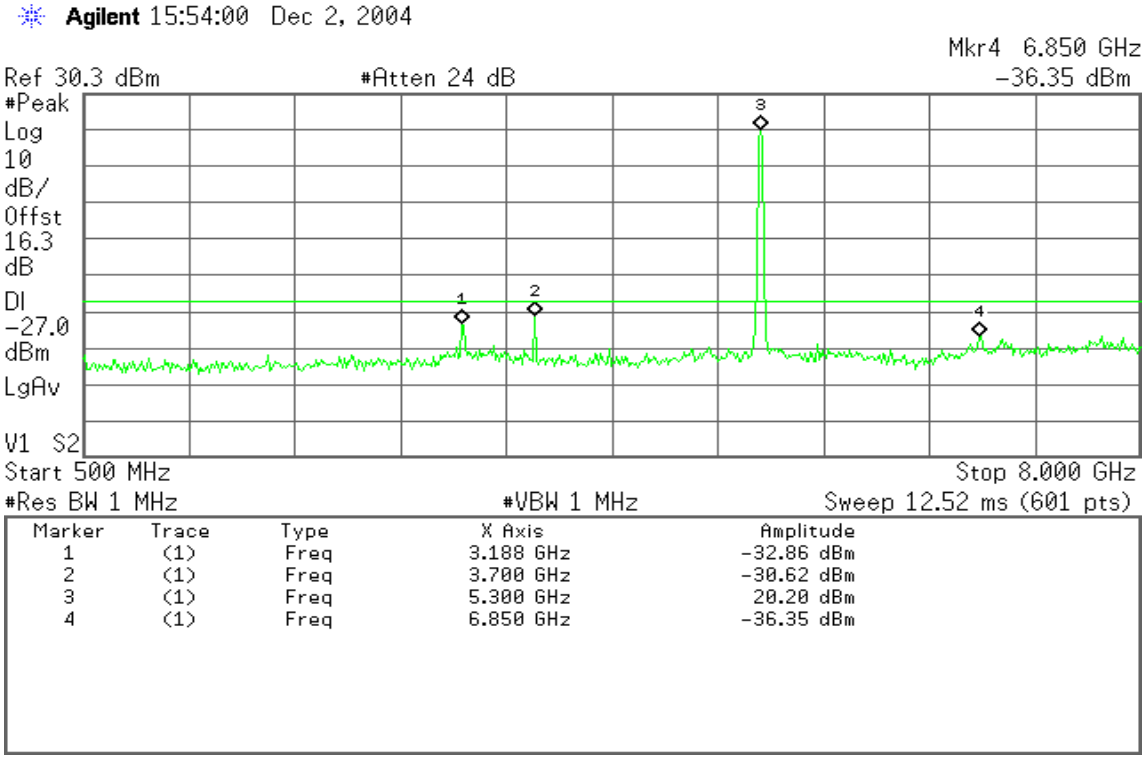



### 8GHz ~ 40GHz

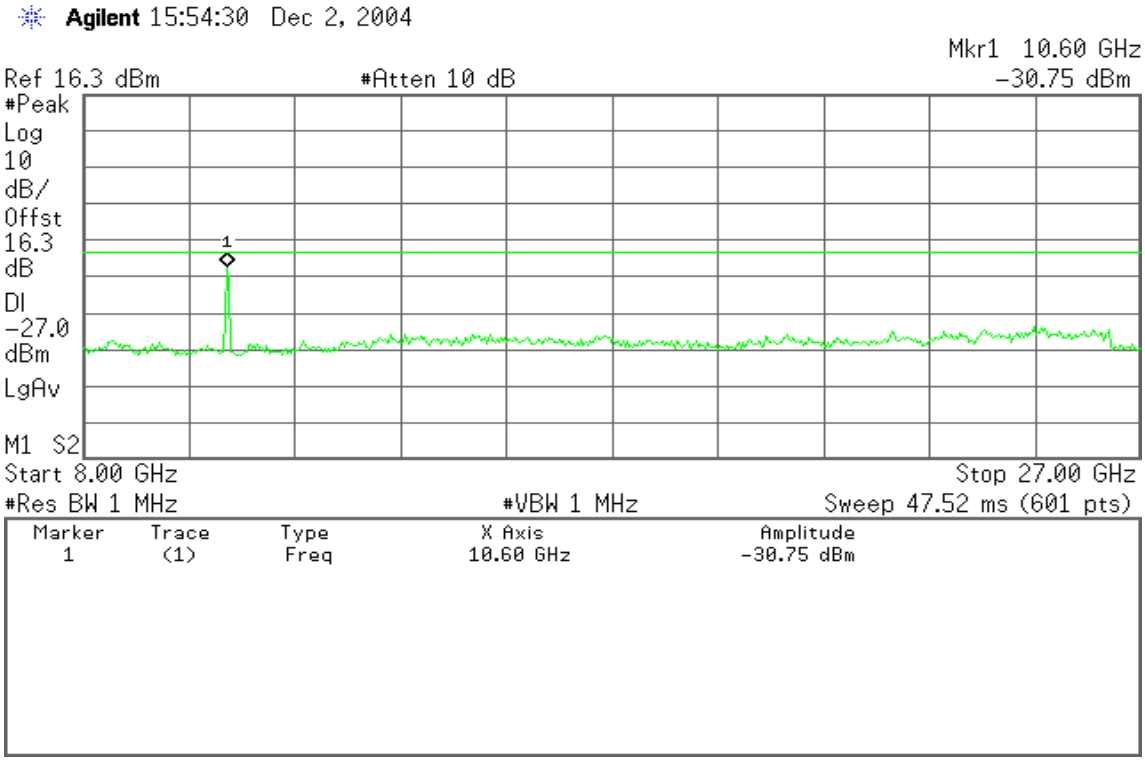


## CH 5300 / 14dBi

### 30MHz ~ 8GHz

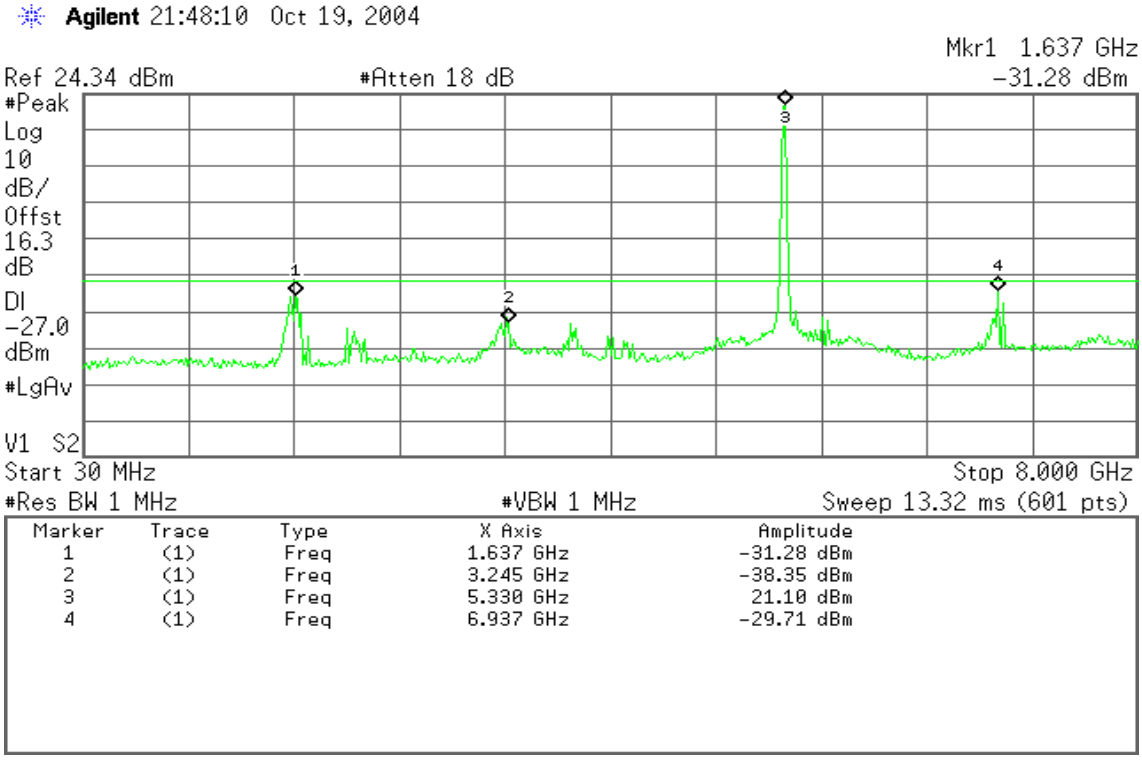



### 8GHz ~ 40GHz



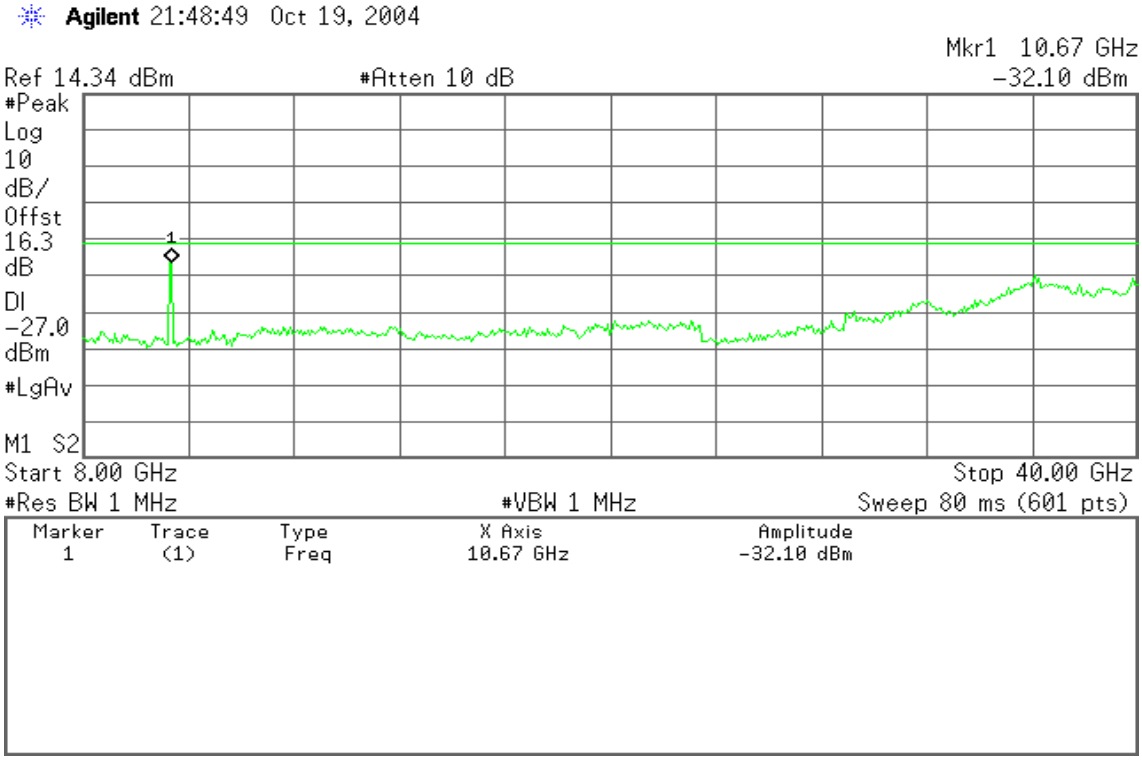
## CH 5320 / 14dBi

### 30MHz ~ 8GHz




| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 1.637 GHz | -31.28 dBm |
| 2 | (1) | Freq | 3.245 GHz | -38.35 dBm |
| 3 | (1) | Freq | 5.330 GHz | 21.10 dBm |
| 4 | (1) | Freq | 6.937 GHz | -29.71 dBm |

### 8GHz ~ 40GHz

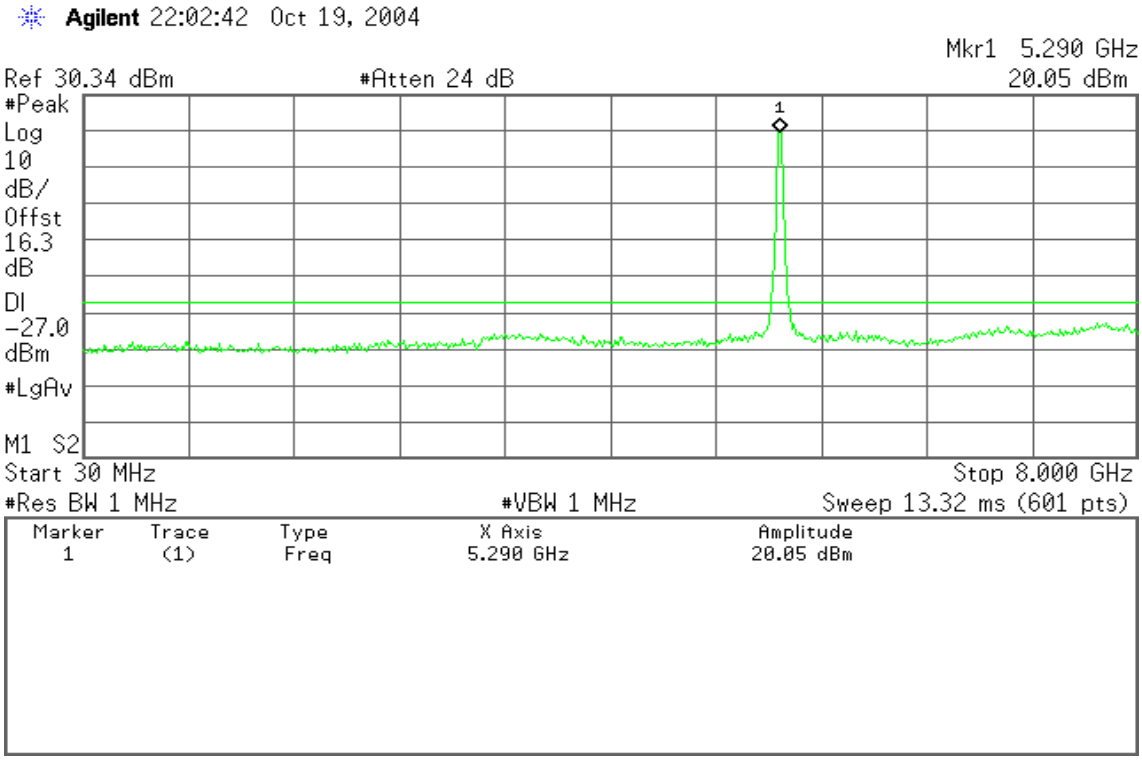



| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 10.67 GHz | -32.10 dBm |

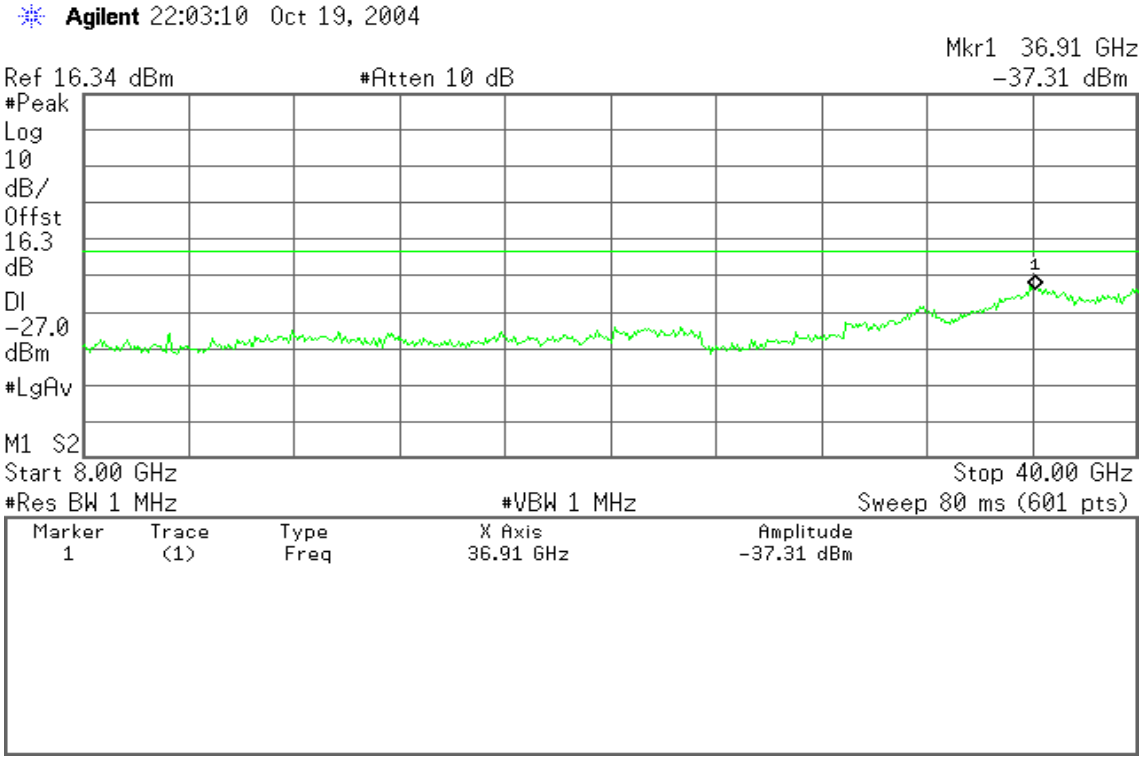
## IEEE 802.11a Turbo mode

### CH 5290 / 14dBi

### 30MHz ~ 8GHz




### 8GHz ~ 40GHz



## 7.9 TRANSMISSION IN ABSENCE OF DATA

### LIMIT

The device shall automatically discontinue transmission in case of either absence of information to transmit or operation failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

### TEST RESULTS

Please refer to the operational description for details.

***Note:*** *For the details, refer to the theory of the operation.*

## 7.10 FREQUENCY STABILITY

### LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

### TEST RESULTS

*Please refer to the operational description for details.*

***Note:*** *An examination of the band-edge plots shows that the emission will stay within the authorized band over the entire temperature range.*

## 7.11 ANTENNA REQUIREMENT

### LIMIT

According to FCC Part 15.407(d), any U-NII device that operates in the 5.15-5.25 GHz band shall use a transmitting antenna that is an integral part of the device.

### TEST RESULTS

*No non-compliance noted*

The antenna connector is designed with a unique connector and replacement of it by the user is not considered. For details, refer to the EUT photos.