**SPORTON International Inc.**
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# FCC RADIO TEST REPORT

| | |
|---|---|
| Applicant's company | **Netgear Incorporated** |
| Applicant Address | 4500 Great America Parkway Santa Clara, CA 95054 U.S.A. |
| FCC ID | **PY306100037** |
| Manufacturer's company | **Gemtek Technology Co., Ltd.** |
| Manufacturer Address | No. 1 Jen Ai Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, R.O.C. 303 |

| | |
|---|---|
| Product Name | RangeMax Next Wireless Router |
| Brand Name | NETGEAR |
| Model Name | WNR854T |
| Test Rule | 47 CFR FCC Part 15 Subpart C § 15.247 |
| Test Freq. Range | 2400 ~ 2483.5MHz |
| Receive Date | Mar. 26, 2006 |
| Test Date | Apr. 06, 2006 |
| Submission Type | Original Equipment |

## Statement

**Test result included is only for the 802.11b/g part of the product.**
The test result in this report refers exclusively to the presented test model / sample.
Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.
The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Lab Code: 200079-0

# Table of Contents

# History of This Test Report

Original Issue Date: Apr. 06, 2006

Report No.: FR640311

■ No additional attachment.

☐ Additional attachment were issued as following record:

| Attachment No. | Issue Date | Description |
|---|---|---|
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# 1. CERTIFICATE OF COMPLIANCE

| | | |
|---|---|---|
| Product Name | : | RangeMax Next Wireless Router |
| Brand Name | : | NETGEAR |
| Model Name | : | WNR854T |
| Applicant | : | Netgear Incorporated |
| Test Rule Part(s) | : | 47 CFR FCC Part 15 Subpart C § 15.247 |

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Mar. 26, 2006 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

| Prepared By: | Technical Acceptance By: | Reviewed By: |
|---|---|---|
| Mandy Liang / Specialist | Steven Lu / Engineer | Wayne Hsu / Supervisor |

# 2. SUMMARY OF THE TEST RESULT

| Applied Standard: 47 CFR FCC Part 15 Subpart C | | | | |
|---|---|---|---|---|
| **Part** | **Rule Section** | **Description of Test** | **Result** | **Under Limit** |
| 4.1 | 15.207 | AC Power Line Conducted Emissions | Complies | 2.28 dB |
| 4.2 | 15.247(b)(3) | Maximum Peak Conducted Output Power | Complies | 11.90 dB |
| 4.3 | 15.247(e) | Power Spectral Density | Complies | 20.16 dB |
| 4.4 | 15.247(a)(2) | 6dB Spectrum Bandwidth | Complies | - |
| 4.5 | 15.247(d) | Radiated Emissions | Complies | 0.38 dB |
| 4.6 | 15.247(d) | Band Edge Emissions | Complies | 0.30 dB |
| 4.7 | 15.203 | Antenna Requirements | Complies | - |

| Test Items | Uncertainty | Remark |
|---|---|---|
| AC Power Line Conducted Emissions | ±2.26dB | Confidence levels of 95% |
| Maximum Peak Conducted Output Power | ±0.5dB | Confidence levels of 95% |
| Power Spectral Density | ±0.71dB | Confidence levels of 95% |
| 6dB Spectrum Bandwidth | ±6.25×10-7 | Confidence levels of 95% |
| Radiated Emissions/ Band Edge Emissions | ±3.72dB | Confidence levels of 95% |

# 3. GENERAL INFORMATION

## 3.1. Product Details

| Items | Description |
|---|---|
| Product Type | WLAN |
| Radio Type | Intentional Transceiver |
| Power Type | Power Adapter |
| Interface Type | RJ-45 |
| Modulation | DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g<br>see the below table for draft 11n |
| Data Modulation | DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM) |
| Data Rate (Mbps) | IEEE 802.11b (1/ 2/ 5.5/11)<br>IEEE 802.11g (6/9/12/18/24/36/48/54)<br>see the below table for draft 11n |
| Frequency Range | 2400 ~ 2483.5MHz |
| Channel Number | 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth |
| Channel Band Width (99%) | 11b(20MHz) : 13.04 MHz<br>Lower Channel of 11b(40MHz) : 13.36 MHz<br>Upper Channel of 11b(40MHz) : 13.44 MHz<br>11g(20MHz) : 16.56 MHz<br>11g(40MHz) : 36.32 MHz |
| Conducted Output Power | 11b(20MHz) : 18.10 dBm<br>Lower Channel of 11b(40MHz) : 17.68 dBm<br>Upper Channel of 11b(40MHz) : 17.89 dBm<br>11g(20MHz) : 14.55 dBm<br>11g(40MHz) : 17.47 dBm |
| Carrier Frequencies | 2412 ~ 2462 MHz |
| Antenna | Dipole Antenna |

**Bandwidth**

| Antenna | Single (TX) | | Two (TX) | | Three (RX Only) | |
|---|---|---|---|---|---|---|
| Band width Mode | 20 MHz | 40 MHz | 20 MHz | 40 MHz | 20 MHz | 40 MHz |
| 802.11b | V | V | X | X | V | V |
| 802.11g | V | V | V | V | V | V |
| 802.11n | V | V | V | V | V | V |

draft 11n Spec

| MCS Index | Nss | Modulation | R | NBPSC | NCBPS | | NDBPS | | Datarate(Mbps) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 800nsGI | | 400nsGI | |
| | | | | | 20MHz | 40MHz | 20MHz | 40MHz | 20MHz | 40MHz | 20MHz | 40MHz |
| 0 | 1 | BPSK | ½ | 1 | 52 | 108 | 26 | 54 | 6.5 | 13.5 | 7.200 | 15 |
| 1 | 1 | QPSK | ½ | 2 | 104 | 216 | 52 | 108 | 13.0 | 27.0 | 14.400 | 30 |
| 2 | 1 | QPSK | ¾ | 2 | 104 | 216 | 78 | 162 | 19.5 | 40.5 | 21.700 | 45 |
| 3 | 1 | 16-QAM | ½ | 4 | 208 | 432 | 104 | 216 | 26.0 | 54.0 | 28.900 | 60 |
| 4 | 1 | 16-QAM | ¾ | 4 | 208 | 432 | 156 | 324 | 39.0 | 81.0 | 43.300 | 90 |
| 5 | 1 | 64-QAM | 2/3 | 6 | 312 | 648 | 208 | 432 | 52.0 | 108.0 | 57.800 | 120 |
| 6 | 1 | 64-QAM | ¾ | 6 | 312 | 648 | 234 | 486 | 58.5 | 121.5 | 65.000 | 135 |
| 7 | 1 | 64-QAM | 5/6 | 6 | 312 | 648 | 260 | 540 | 65.0 | 135.0 | 72.200 | 150 |
| 8 | 2 | BPSK | ½ | 1 | 104 | 216 | 52 | 108 | 13.0 | 27.0 | 14.444 | 30 |
| 9 | 2 | QPSK | ½ | 2 | 208 | 432 | 104 | 216 | 26.0 | 54.0 | 28.889 | 60 |
| 10 | 2 | QPSK | ¾ | 2 | 208 | 432 | 156 | 324 | 39.0 | 81.0 | 43.333 | 90 |
| 11 | 2 | 16-QAM | ½ | 4 | 416 | 864 | 208 | 432 | 52.0 | 108.0 | 57.778 | 120 |
| 12 | 2 | 16-QAM | 3/4 | 4 | 416 | 864 | 312 | 648 | 78.0 | 162.0 | 86.667 | 180 |
| 13 | 2 | 64-QAM | 2/3 | 6 | 624 | 1296 | 416 | 864 | 104.0 | 216.0 | 115.556 | 240 |
| 14 | 2 | 64-QAM | ¾ | 6 | 624 | 1296 | 468 | 972 | 117.0 | 243.0 | 130.000 | 270 |
| 15 | 2 | 64-QAM | 5/6 | 6 | 624 | 1296 | 520 | 1080 | 130.0 | 270.0 | 144.444 | 300 |

| Symbol | Explanation |
|---|---|
| NSS | Number of spatial streams |
| R | Code rate |
| NBPSC | Number of coded bits per single carrier |
| NCBPS | Number of coded bits per symbol |
| NDBPS | Number of data bits per symbol |
| GI | guard interval |

## 3.2. Accessories

| Power | Brand | Model | Rating |
|---|---|---|---|
| Adapter 1 | NETGEAR | DSA-0151F-12 | 100-240VAC, 12VDC |
| Adapter 2 | NETGEAR | MU18-2120150-A1 | 100-240VAC, 12VDC |

## 3.3. Table for Filed Antenna

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| A | WHA YU | N/A | Dipole | U.FL | 2dBi |
| B | WHA YU | N/A | Dipole | U.FL | 2dBi |
| C | WHA YU | N/A | Dipole | U.FL | 2dBi |

## 3.4. Table for Carrier Frequencies

There are two bandwidth systems for IEEE 802.11b & 802.11g.

For 20MHz bandwidth system, use Channel 1~ Channel 11

For 40MHz bandwidth system, use Channel 3~ Channel 9

| Freqeuncy Band | Channel No. | Frequency | Channel No. | Frequency |
|---|---|---|---|---|
| 2400~2483.5MHz | 1 | 2412 MHz | 7 | 2442 MHz |
| | 2 | 2417 MHz | 8 | 2447 MHz |
| | 3 | 2422 MHz | 9 | 2452 MHz |
| | 4 | 2427 MHz | 10 | 2457 MHz |
| | 5 | 2432 MHz | 11 | 2462 MHz |
| | 6 | 2437 MHz | | |

For IEEE 802.11b, the two TX Ant. A & Ant. C couldn't transmit simultaneously.

For IEEE 802.11g, the two TX Ant. A & Ant. C could transmit simultaneously.

## 3.5. Table for Test Modes

| Test Items | Mode | Data Rate | Channel | Antenna |
|---|---|---|---|---|
| AC Power Line Conducted Emissions | Normal Link | 11 Mbps | 6 | A |
| Maximum Peak Conducted Output Power<br>Power Spectral Density<br>6dB Spectrum Bandwidth | 11b/CCK/20MHz | 1 Mbps | 1/6/11 | A |
| | Lower Channel<br>11b/CCK/40MHz | 1 Mbps | 3/6/9 | A |
| | Upper Channel<br>11b/CCK/40MHz | 1 Mbps | 3/6/9 | A |
| | 11g/BPSK/20MHz | 6 Mbps | 1/6/11 | A |
| | 11g/BPSK/40MHz | 6 Mbps | 3/6/9 | A+B |
| Radiated Emissions 9kHz~1GHz | 11g/BPSK/20MHz | 6 Mbps | 6 | A |
| Radiated Emissions 1GHz~10th Harmonic | 11b/CCK/20MHz | 1 Mbps | 1/6/11 | A |
| | Lower Channel<br>11b/CCK/40MHz | 1 Mbps | 3/6/9 | A |
| | Upper Channel<br>11b/CCK/40MHz | 1 Mbps | 3/6/9 | A |
| | 11g/BPSK/20MHz | 6 Mbps | 1/6/11 | A |
| | 11g/BPSK/40MHz | 6 Mbps | 3/6/9 | A+B |
| Band Edge Emissions | 11b/CCK/20MHz | 1 Mbps | 1/11 | A |
| | Lower Channel<br>11b/CCK/40MHz | 1 Mbps | 3/9 | A |
| | Upper Channel<br>11b/CCK/40MHz | 1 Mbps | 3/9 | A |
| | 11g/BPSK/20MHz | 6 Mbps | 1/11 | A |
| | 11g/BPSK/40MHz | 6 Mbps | 3/9 | A+B |

## 3.6. Table for Testing Locations

| Test Site No. | Site Category | Location | FCC Reg. No. | IC File No. | VCCI Reg. No |
|---|---|---|---|---|---|
| 03CH03-HY | SAC | Hwa Ya | 101377 | IC 4088 | - |
| CO04-HY | Conduction | Hwa Ya | 101377 | IC 4088 | - |
| TH01-HY | OVEN Room | Hwa Ya | - | - | - |

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

## 3.7. Table for Supporting Units

| Support Unit | Brand | Model | FCC ID |
|---|---|---|---|
| Printer | EPSON | LQ-300 | DOC |
| Modem | ACEEX | DM-1414 | IFAXDM1414 |
| Notebook *2 | DELL | PP01L | DOC |

## 3.8. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

**Power Parameters of IEEE 802.11b 20MHz Signal Antenna Transmitter**

| Test Software Version | Hyper Terminal | | |
|---|---|---|---|
| Frequency | 2412 MHz | 2437 MHz | 2462 MHz |
| IEEE 802.11b Ant. A | 58 | 57 | 55 |
| IEEE 802.11b Ant. C | 53 | 52 | 4F |

**Power Parameters of IEEE 802.11b 40MHz Signal Antenna Transmitter**

| Test Software Version | Hyper Terminal | | |
|---|---|---|---|
| Frequency | 2422 MHz | 2437 MHz | 2452 MHz |
| IEEE 802.11b Ant. A | 58 | 57 | 55 |
| IEEE 802.11b Ant. C | 53 | 52 | 4F |

**Power Parameters of IEEE 802.11g 20MHz Signal Antenna Transmitter**

| Test Software Version | Hyper Terminal | | |
|---|---|---|---|
| Frequency | 2412 MHz | 2437 MHz | 2462 MHz |
| IEEE 802.11g Ant. A | 58 | 57 | 56 |
| IEEE 802.11g Ant. C | 53 | 52 | 51 |

**Power Parameters of IEEE 802.11g 20MHz Ant. A + Ant. B Antenna Transmitter**

| Test Software Version | Hyper Terminal | | |
|---|---|---|---|
| Frequency | 2412 MHz | 2437 MHz | 2462 MHz |
| IEEE 802.11g Ant. A | 58 | 57 | 56 |
| IEEE 802.11g Ant. C | 53 | 52 | 51 |

**Power Parameters of IEEE 802.11g 40MHz Signal Antenna Transmitter**

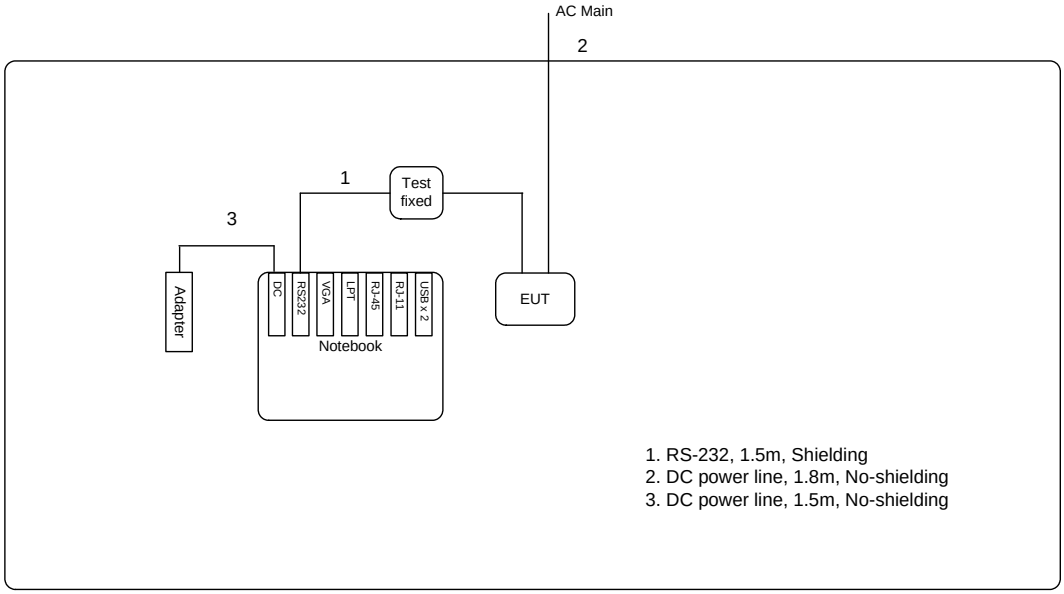
| Test Software Version | Hyper Terminal | | |
|---|---|---|---|
| Frequency | 2422 MHz | 2437 MHz | 2452 MHz |
| IEEE 802.11g Ant. A | 57 | 55 | 53 |
| IEEE 802.11g Ant. C | 52 | 51 | 4F |

**Power Parameters of IEEE 802.11g 40MHz Ant. A + Ant. B Antenna Transmitter**

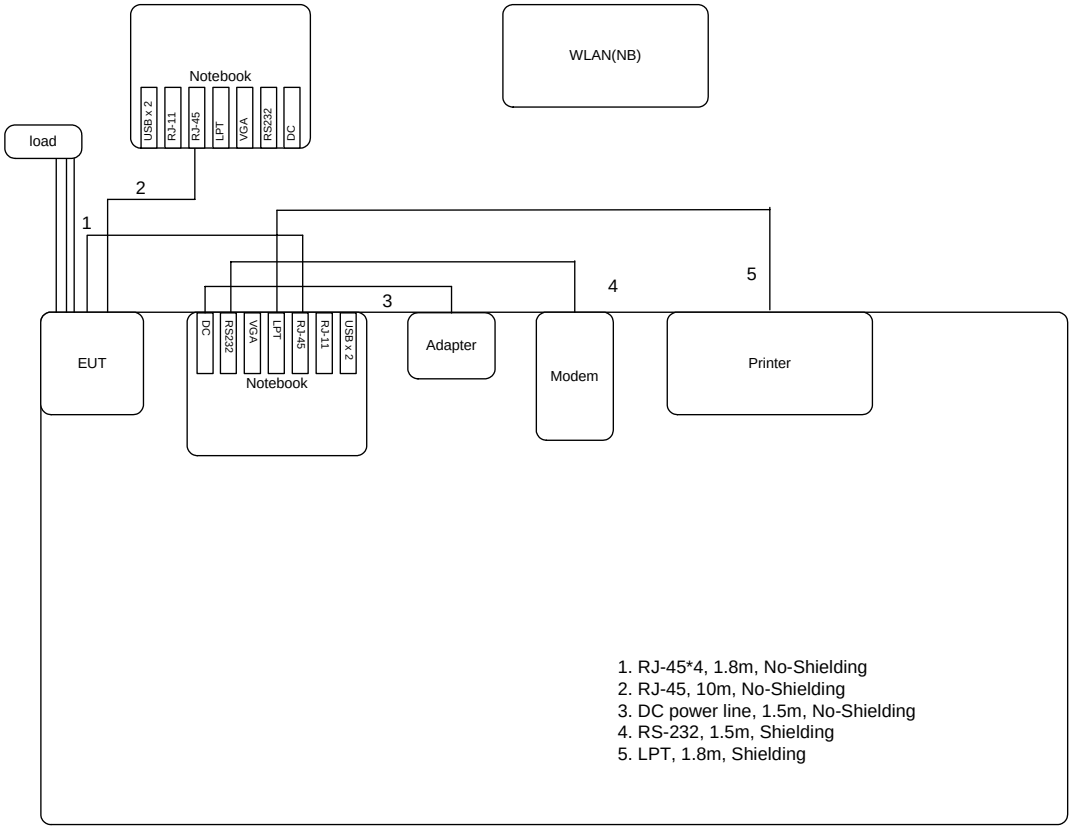
| Test Software Version | Hyper Terminal | | |
|---|---|---|---|
| Frequency | 2422 MHz | 2437 MHz | 2452 MHz |
| IEEE 802.11g Ant. A | 58 | 57 | 53 |
| IEEE 802.11g Ant. C | 53 | 52 | 4F |

## 3.9. Test Configurations

### 3.9.1. Radiation Emissions Test Configuration



## 3.9.2. AC Power Line Conduction Emissions Test Configuration



# 4. TEST RESULT

## 4.1. AC Power Line Conducted Emissions Measurement

### 4.1.1. Limit

For a Low-power Radio-frequency Device which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

| Frequency (MHz) | QP Limit (dBuV) | AV Limit (dBuV) |
|---|---|---|
| 0.15~0.5 | 66~56 | 56~46 |
| 0.5~5 | 56 | 46 |
| 5~30 | 60 | 50 |

### 4.1.2. Measuring Instruments and Setting

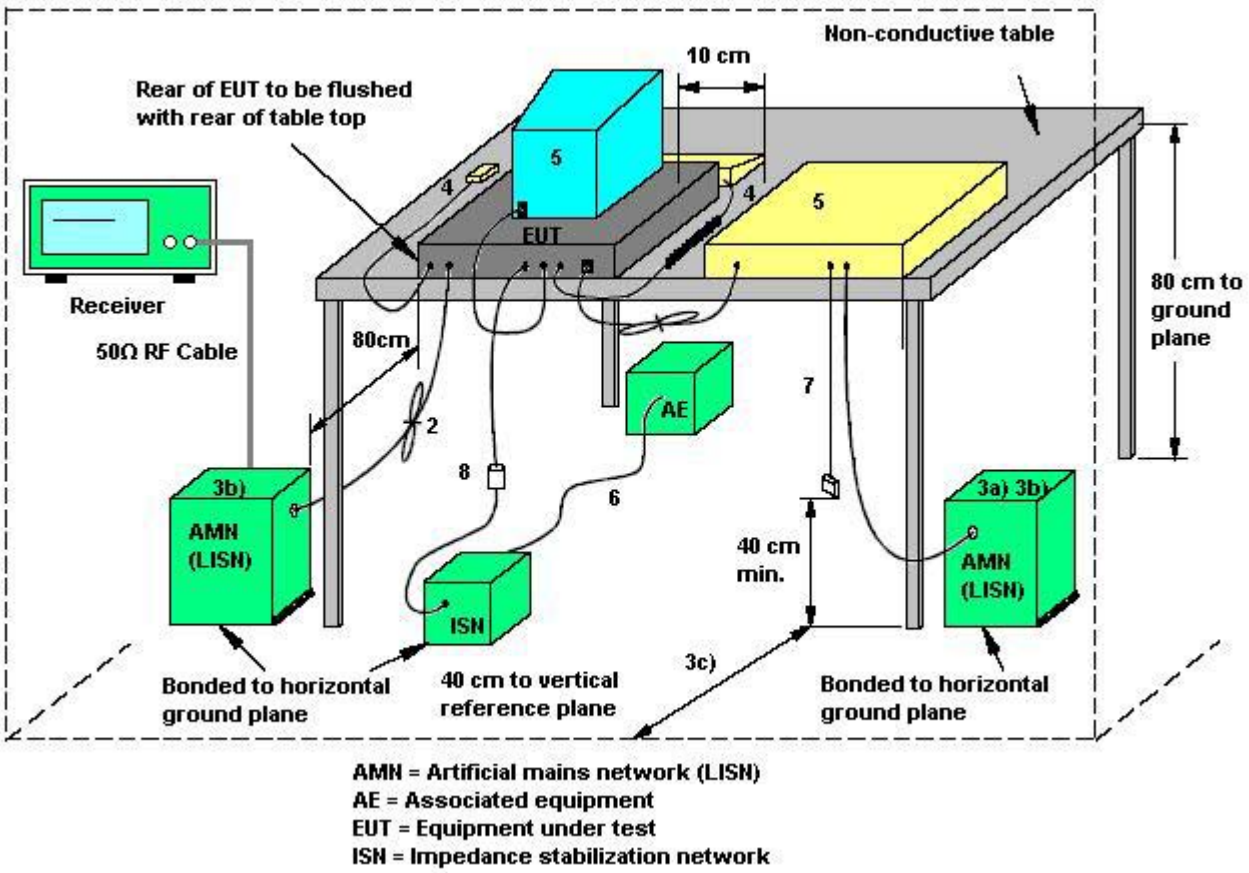
Please refer to section 5 in this report. The following table is the setting of the receiver.

| Receiver Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 KHz |

### 4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

### 4.1.4. Test Setup Layout




1. If cables, which hang closer than 40 cm to the horizontal metal groundplane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.
2. Excess mains cord shall be bundled in the centre or shortened to appropriate length.
3. EUT is connected to one artificial mains network (AMN). All AMNs and ISNs may alternatively be connected to a vertical reference plane or metal wall.
4. All other units of a system are powered from a second AMN. A multiple outlet strip can be used for multiple mains cords.
5. AMN and ISN are 80 cm from the EUT and at least 80 cm from other units and other metal planes.
6. Mains cords and signal cables shall be positioned for their entire lengths, as far as possible, at 40 cm from the vertical reference plane.
7. Cables of hand operated devices, such as keyboards, mouses, etc. shall be placed as for normal usage.
8. Peripherals shall be placed at a distance of 10 cm from each other and from the controller, except for the monitor which, if this is an acceptable installation practice, shall be placed directly on the top of the controller.
9. I/O signal cable intended for external connection.
10. The end of the I/O signal cables which are not connected to an AE may be terminated, if required, using correct terminating impedance.
11. If used, the current probe shall be placed at 0,1 m from the ISN.

### 4.1.5. Test Deviation

There is no deviation with the original standard.

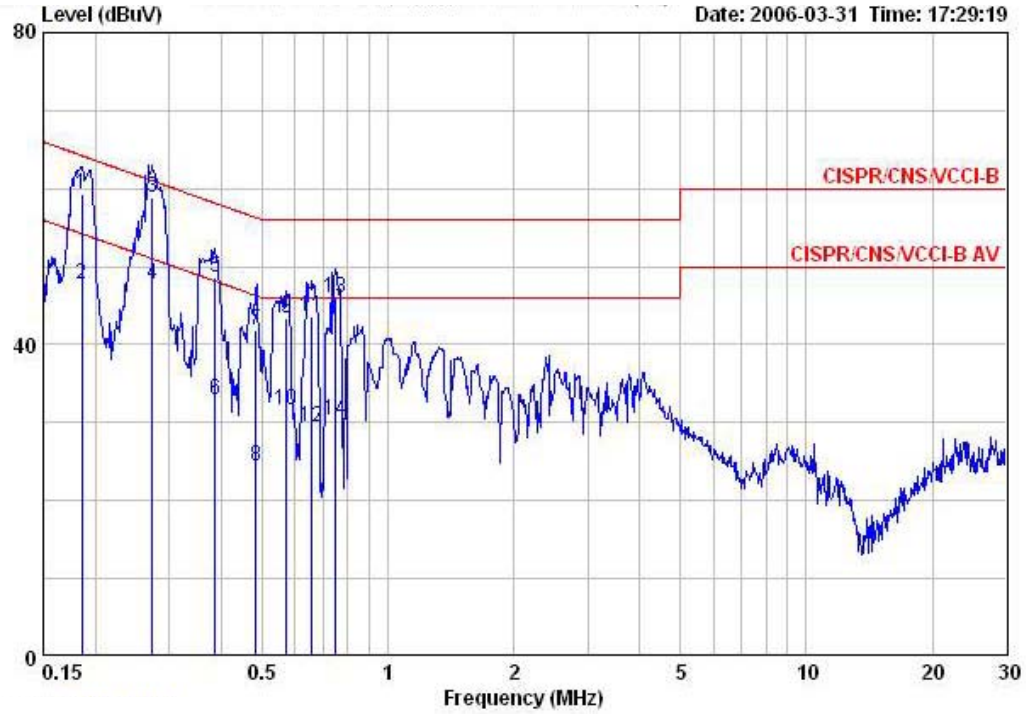
### 4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

### 4.1.7. Results of AC Power Line Conducted Emissions Measurement

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Evelyn Shih | Phase | Line |
| Configuration | Normal Link 802.11g Channel 6 | | |

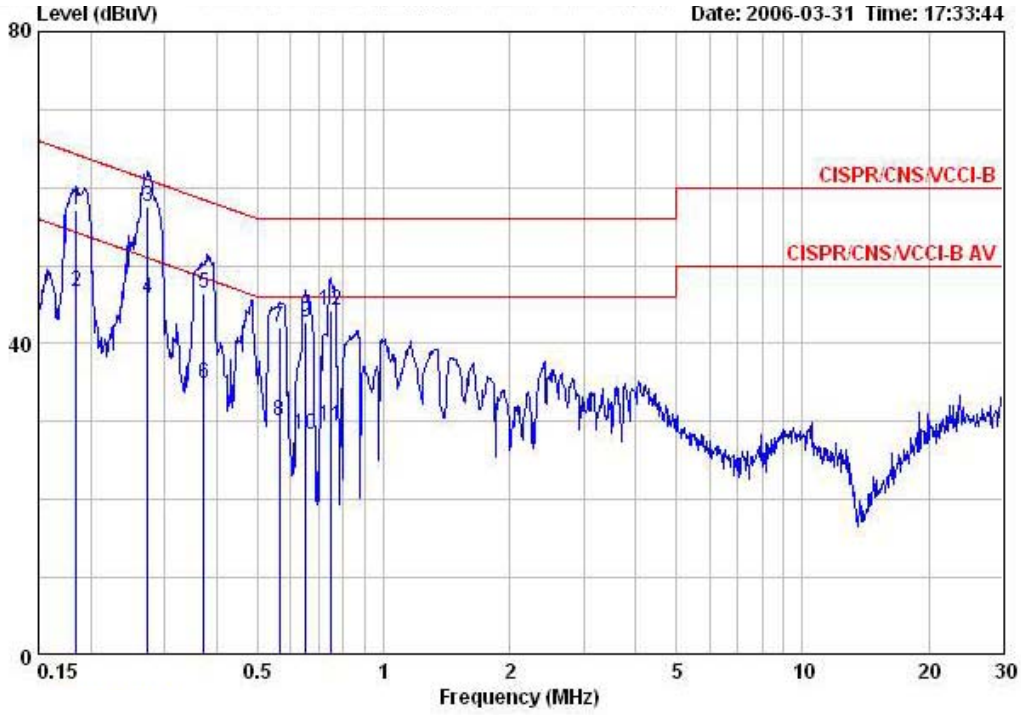
Adapter 1




| | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | 0.18541 | 59.21 | -5.03 | 64.24 | 57.64 | 1.37 | 0.20 | QP |
| 2 | 0.18541 | 47.72 | -6.52 | 54.24 | 46.15 | 1.37 | 0.20 | AVERAGE |
| 3 @ | 0.27297 | 58.75 | -2.28 | 61.03 | 57.68 | 0.87 | 0.20 | QP |
| 4 | 0.27297 | 47.64 | -3.39 | 51.03 | 46.57 | 0.87 | 0.20 | AVERAGE |
| 5 | 0.38724 | 48.59 | -9.53 | 58.12 | 47.79 | 0.60 | 0.20 | QP |
| 6 | 0.38724 | 32.90 | -15.22 | 48.12 | 32.10 | 0.60 | 0.20 | AVERAGE |
| 7 | 0.48257 | 41.93 | -14.36 | 56.29 | 41.33 | 0.50 | 0.10 | QP |
| 8 | 0.48257 | 24.41 | -21.88 | 46.29 | 23.81 | 0.50 | 0.10 | AVERAGE |
| 9 | 0.57313 | 43.33 | -12.67 | 56.00 | 42.73 | 0.40 | 0.20 | QP |
| 10 | 0.57313 | 31.64 | -14.36 | 46.00 | 31.04 | 0.40 | 0.20 | AVERAGE |
| 11 | 0.65620 | 43.53 | -12.47 | 56.00 | 42.93 | 0.40 | 0.20 | QP |
| 12 | 0.65620 | 29.44 | -16.56 | 46.00 | 28.84 | 0.40 | 0.20 | AVERAGE |
| 13 | 0.75094 | 46.01 | -9.99 | 56.00 | 45.51 | 0.30 | 0.20 | QP |
| 14 | 0.75094 | 30.27 | -15.73 | 46.00 | 29.77 | 0.30 | 0.20 | AVERAGE |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Evelyn Shih | Phase | Neutral |
| Configuration | Normal Link 802.11g Channel 6 | | |

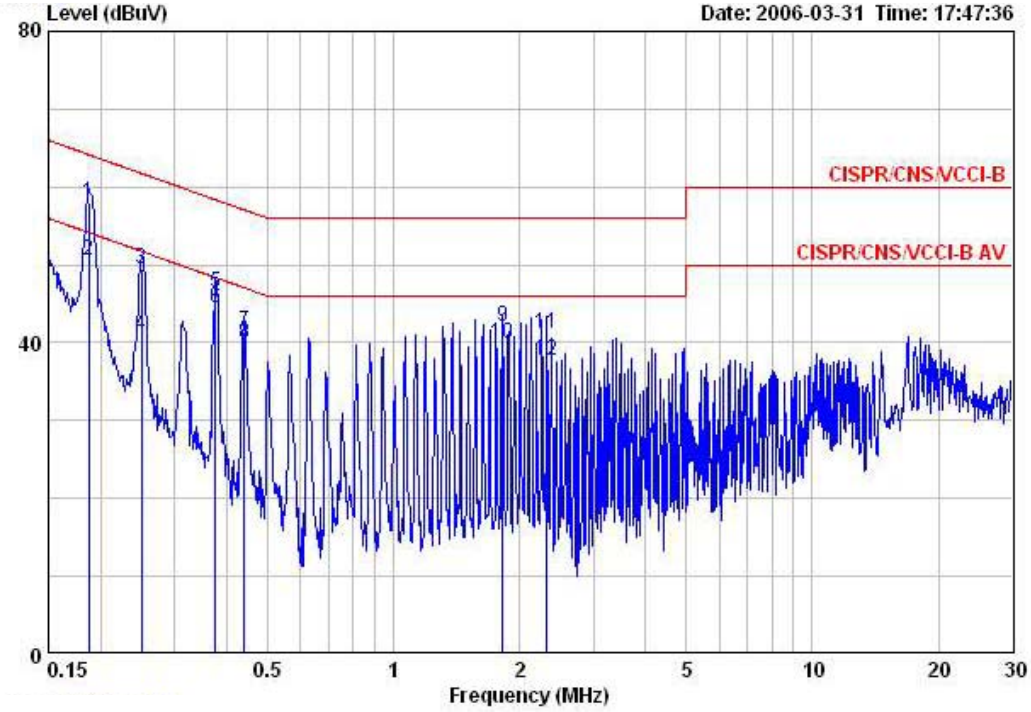
Adapter 1




| | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | 0.18443 | 57.18 | -7.10 | 64.28 | 55.71 | 1.27 | 0.20 | QP |
| 2 | 0.18443 | 46.68 | -7.60 | 54.28 | 45.21 | 1.27 | 0.20 | AVERAGE |
| 3 | 0.27297 | 57.57 | -3.46 | 61.03 | 56.67 | 0.70 | 0.20 | QP |
| 4 | 0.27297 | 45.86 | -5.17 | 51.03 | 44.96 | 0.70 | 0.20 | AVERAGE |
| 5 | 0.37174 | 46.38 | -12.08 | 58.46 | 45.68 | 0.50 | 0.20 | QP |
| 6 | 0.37174 | 34.78 | -13.68 | 48.46 | 34.08 | 0.50 | 0.20 | AVERAGE |
| 7 | 0.56409 | 42.15 | -13.85 | 56.00 | 41.65 | 0.30 | 0.20 | QP |
| 8 | 0.56409 | 30.07 | -15.93 | 46.00 | 29.57 | 0.30 | 0.20 | AVERAGE |
| 9 | 0.65084 | 42.69 | -13.31 | 56.00 | 42.19 | 0.30 | 0.20 | QP |
| 10 | 0.65084 | 28.27 | -17.73 | 46.00 | 27.77 | 0.30 | 0.20 | AVERAGE |
| 11 | 0.75094 | 29.41 | -16.59 | 46.00 | 28.91 | 0.30 | 0.20 | AVERAGE |
| 12 | 0.75094 | 44.21 | -11.79 | 56.00 | 43.71 | 0.30 | 0.20 | QP |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Evelyn Shih | Phase | Line |
| Configuration | Normal Link 802.11g Channel 6 | | |

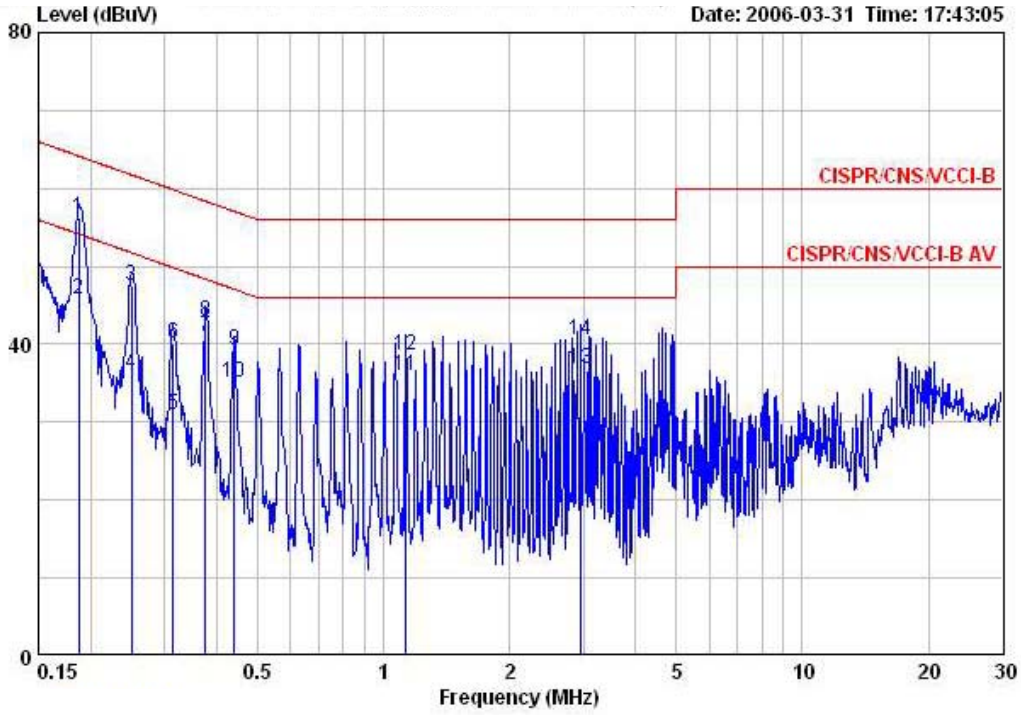
Adapter 2




| | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | 0.18739 | 57.88 | -6.27 | 64.15 | 56.42 | 1.26 | 0.20 | QP |
| 2 | 0.18739 | 50.58 | -3.57 | 54.15 | 49.12 | 1.26 | 0.20 | AVERAGE |
| 3 | 0.25078 | 49.39 | -12.34 | 61.73 | 48.29 | 0.90 | 0.20 | QP |
| 4 | 0.25078 | 41.08 | -10.65 | 51.73 | 39.98 | 0.90 | 0.20 | AVERAGE |
| 5 | 0.37499 | 46.46 | -11.93 | 58.39 | 45.66 | 0.60 | 0.20 | QP |
| 6 | 0.37499 | 44.40 | -3.99 | 48.39 | 43.60 | 0.60 | 0.20 | AVERAGE |
| 7 | 0.43974 | 41.32 | -15.75 | 57.07 | 40.62 | 0.50 | 0.20 | QP |
| 8 | 0.43974 | 39.86 | -7.21 | 47.07 | 39.16 | 0.50 | 0.20 | AVERAGE |
| 9 | 1.819 | 42.11 | -13.89 | 56.00 | 41.64 | 0.30 | 0.17 | QP |
| 10 | 1.819 | 39.91 | -6.09 | 46.00 | 39.44 | 0.30 | 0.17 | AVERAGE |
| 11 | 2.321 | 41.16 | -14.84 | 56.00 | 40.66 | 0.30 | 0.20 | QP |
| 12 | 2.321 | 37.75 | -8.25 | 46.00 | 37.25 | 0.30 | 0.20 | AVERAGE |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Evelyn Shih | Phase | Neutral |
| Configuration | Normal Link 802.11g Channel 6 | | |

Adapter 2




| | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | 0.18739 | 56.33 | -7.83 | 64.15 | 54.99 | 1.14 | 0.20 | QP |
| 2 | 0.18739 | 45.81 | -8.35 | 54.15 | 44.47 | 1.14 | 0.20 | AVERAGE |
| 3 | 0.25078 | 47.59 | -14.14 | 61.73 | 46.59 | 0.80 | 0.20 | QP |
| 4 | 0.25078 | 36.22 | -15.51 | 51.73 | 35.22 | 0.80 | 0.20 | AVERAGE |
| 5 | 0.31495 | 31.04 | -18.80 | 49.84 | 30.19 | 0.65 | 0.20 | AVERAGE |
| 6 | 0.31495 | 40.02 | -19.82 | 59.84 | 39.17 | 0.65 | 0.20 | QP |
| 7 | 0.37512 | 40.88 | -7.51 | 48.39 | 40.18 | 0.50 | 0.20 | AVERAGE |
| 8 | 0.37512 | 42.97 | -15.42 | 58.39 | 42.27 | 0.50 | 0.20 | QP |
| 9 | 0.43974 | 39.24 | -17.83 | 57.07 | 38.64 | 0.40 | 0.20 | QP |
| 10 | 0.43974 | 35.00 | -12.07 | 47.07 | 34.40 | 0.40 | 0.20 | AVERAGE |
| 11 | 1.129 | 36.06 | -9.94 | 46.00 | 35.59 | 0.30 | 0.17 | AVERAGE |
| 12 | 1.129 | 38.65 | -17.35 | 56.00 | 38.18 | 0.30 | 0.17 | QP |
| 13 | 2.946 | 36.88 | -9.12 | 46.00 | 36.38 | 0.30 | 0.20 | AVERAGE |
| 14 | 2.946 | 40.62 | -15.38 | 56.00 | 40.12 | 0.30 | 0.20 | QP |

Note:

Level = Read Level + LISN Factor + Cable Loss.

## 4.2. Maximum Peak Output Power Measurement

### 4.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

### 4.2.2. Measuring Instruments and Setting

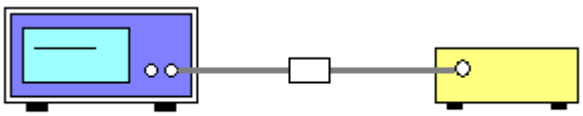
Please refer to section 5 in this report. The following table is the setting of the power meter.

| Power Meter Parameter | Setting |
|---|---|
| Filter No. | Auto |
| Measurement time | 0.135 s ~ 26 s |
| Used Peak Sensor | NRV-Z32 (model 04) |

### 4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.
4. If Ant A. & Ant C could transmit simultaneously, total output power should be added together from setp 2.

### 4.2.4. Test Setup Layout




### 4.2.5. Test Deviation

There is no deviation with the original standard.

### 4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 4.2.7. Test Result of Maximum Peak Output Power

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11b/g |

**Configuration IEEE 802.11b 20MHz Ant. A**

| Channel | Frequency | Conducted Power (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 1 | 2412 MHz | 18.10 | 30.00 | Complies |
| 6 | 2437 MHz | 17.94 | 30.00 | Complies |
| 11 | 2462 MHz | 17.90 | 30.00 | Complies |

**Lower Channel Configuration IEEE 802.11b 40MHz Ant. A**

| Channel | Frequency | Conducted Power (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 3 | 2422 MHz | 17.22 | 30.00 | Complies |
| 6 | 2437 MHz | 17.68 | 30.00 | Complies |
| 9 | 2452 MHz | 16.02 | 30.00 | Complies |

**Upper Channel Configuration IEEE 802.11b 40MHz Ant. A**

| Channel | Frequency | Conducted Power (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 3 | 2422 MHz | 16.04 | 30.00 | Complies |
| 6 | 2437 MHz | 17.89 | 30.00 | Complies |
| 9 | 2452 MHz | 15.92 | 30.00 | Complies |

**Configuration IEEE 802.11g 20MHz Ant. A**

| Channel | Frequency | Conducted Power (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 1 | 2412 MHz | 14.52 | 30.00 | Complies |
| 6 | 2437 MHz | 14.55 | 30.00 | Complies |
| 11 | 2462 MHz | 14.50 | 30.00 | Complies |

**Configuration IEEE 802.11g 40MHz Ant. A + Ant. B**

| Channel | Frequency | Conducted Power (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 3 | 2422 MHz | 17.26 | 30.00 | **Complies** |
| 6 | 2437 MHz | 17.34 | 30.00 | **Complies** |
| 9 | 2452 MHz | 17.47 | 30.00 | **Complies** |

## 4.3. Power Spectral Density Measurement

### 4.3.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 4.3.2. Measuring Instruments and Setting

Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | 1.5MHz |
| RB | 3 kHz |
| VB | 30 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | 500s |

### 4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.
5. If Ant A. & Ant C could transmit simultaneously, total power spectral density should be added together from setp 1~5.

### 4.3.4. Test Setup Layout


### 4.3.5. Test Deviation

There is no deviation with the original standard.

### 4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

## 4.3.7. Test Result of Power Spectral Density

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11b/g |

Configuration IEEE 802.11b 20MHz Ant. A

| Channel | Frequency | Power Density (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 1 | 2412 MHz | -12.84 | 8.00 | Complies |
| 6 | 2437 MHz | -12.16 | 8.00 | Complies |
| 11 | 2462 MHz | -12.50 | 8.00 | Complies |

Lower Channel Configuration IEEE 802.11b 40MHz Ant. A

| Channel | Frequency | Power Density (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 3 | 2422 MHz | -14.93 | 8.00 | Complies |
| 6 | 2437 MHz | -14.23 | 8.00 | Complies |
| 9 | 2452 MHz | -14.67 | 8.00 | Complies |

Upper Channel Configuration IEEE 802.11b 40MHz Ant. A

| Channel | Frequency | Power Density (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 3 | 2422 MHz | -14.39 | 8.00 | Complies |
| 6 | 2437 MHz | -14.65 | 8.00 | Complies |
| 9 | 2452 MHz | -14.86 | 8.00 | Complies |

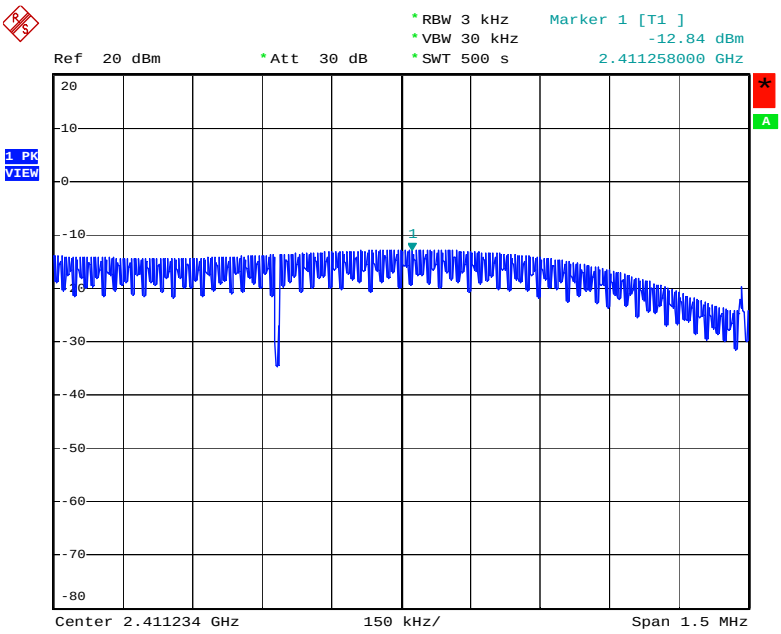
Configuration IEEE 802.11g 20MHz Ant. A

| Channel | Frequency | Power Density (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 1 | 2412 MHz | -19.77 | 8.00 | Complies |
| 6 | 2437 MHz | -18.61 | 8.00 | Complies |
| 11 | 2462 MHz | -19.39 | 8.00 | Complies |

Configuration IEEE 802.11g 40MHz Ant. A + Ant. B

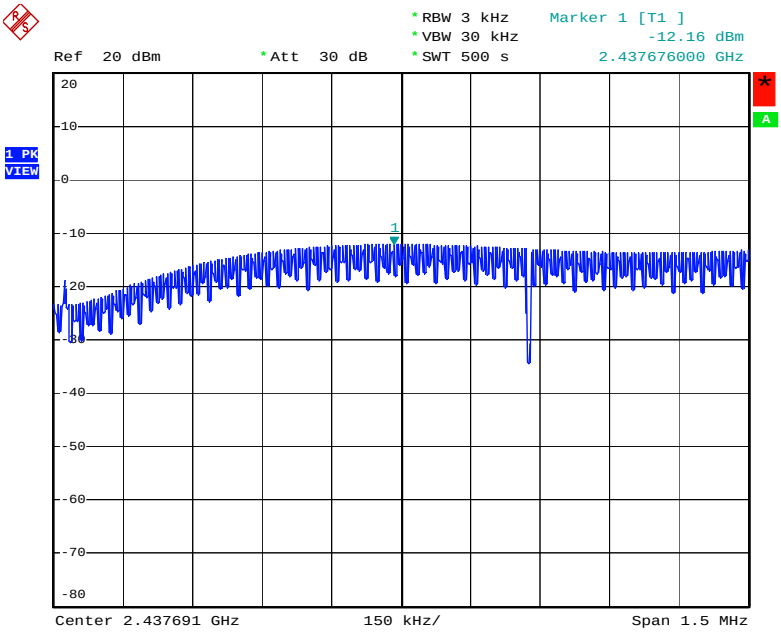
| Channel | Frequency | Power Density (dBm) | Max. Limit (dBm) | Result |
|---|---|---|---|---|
| 3 | 2422 MHz | -18.74 | 8.00 | Complies |
| 6 | 2437 MHz | -17.40 | 8.00 | Complies |
| 9 | 2452 MHz | -20.10 | 8.00 | Complies |

## Power Density Plot on Configuration IEEE 802.11b 20MHz Ant. A / 2412 MHz



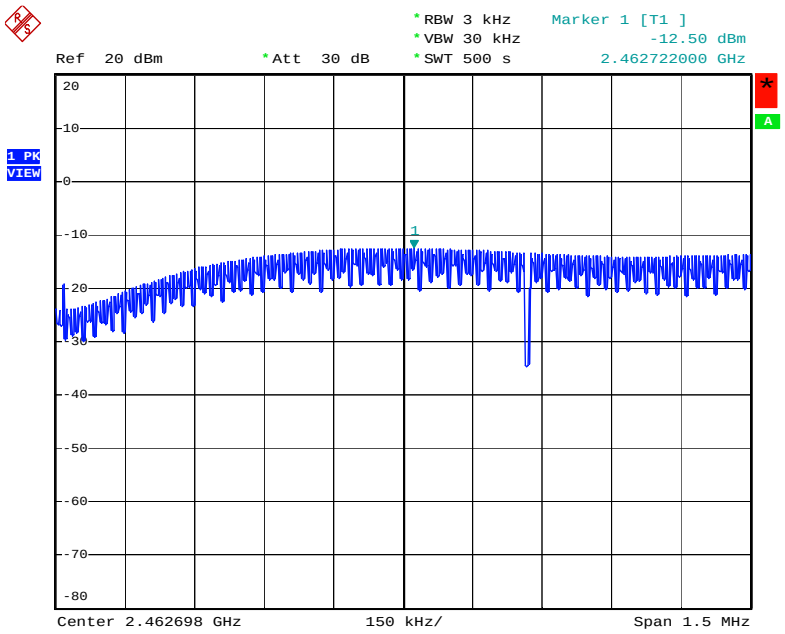

Date: 31.MAR.2006 04:21:50

## Power Density Plot on Configuration IEEE 802.11b 20MHz Ant. A / 2437 MHz



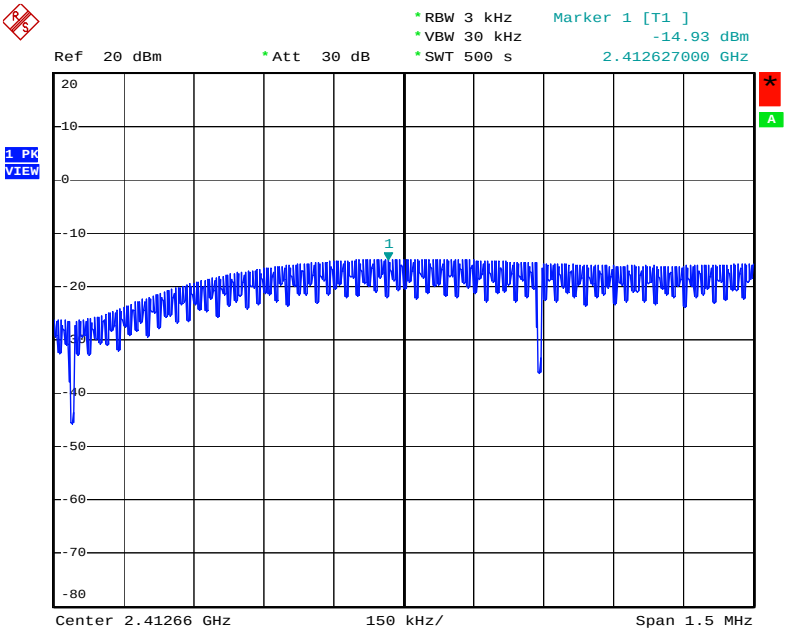

Date: 31.MAR.2006 04:22:50

## Power Density Plot on Configuration IEEE 802.11b 20MHz Ant. A / 2462 MHz



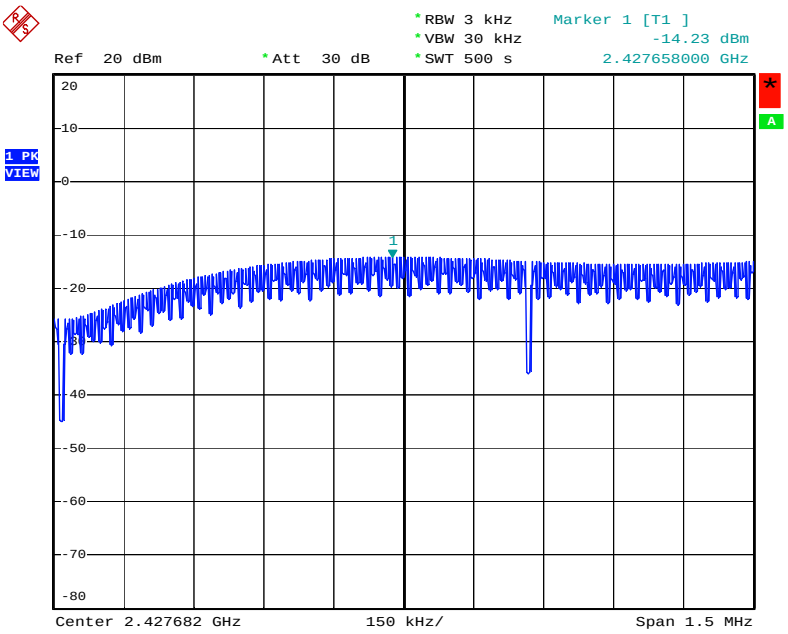

Date: 31.MAR.2006 04:23:36

## Lower Channel Power Density Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2422 MHz



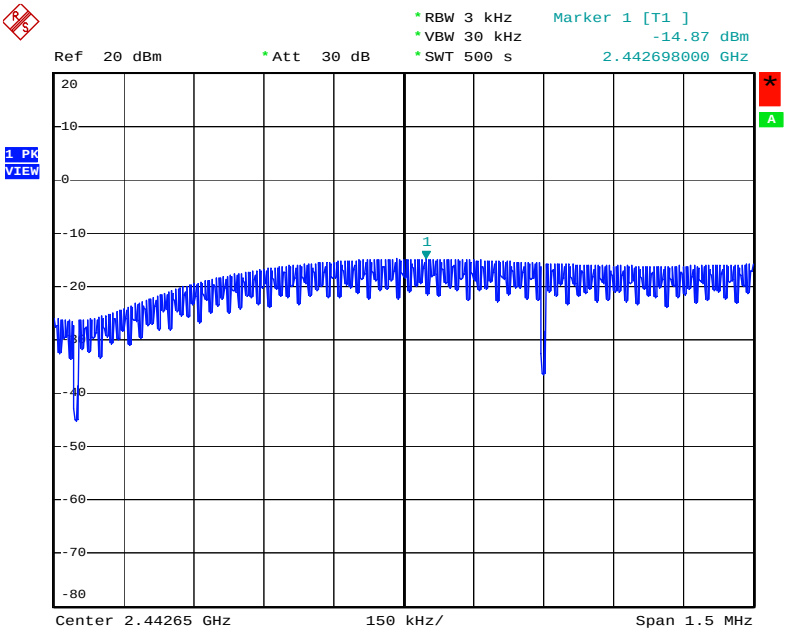

Date: 6.APR.2006 09:50:38

## Lower Channel Power Density Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2437 MHz



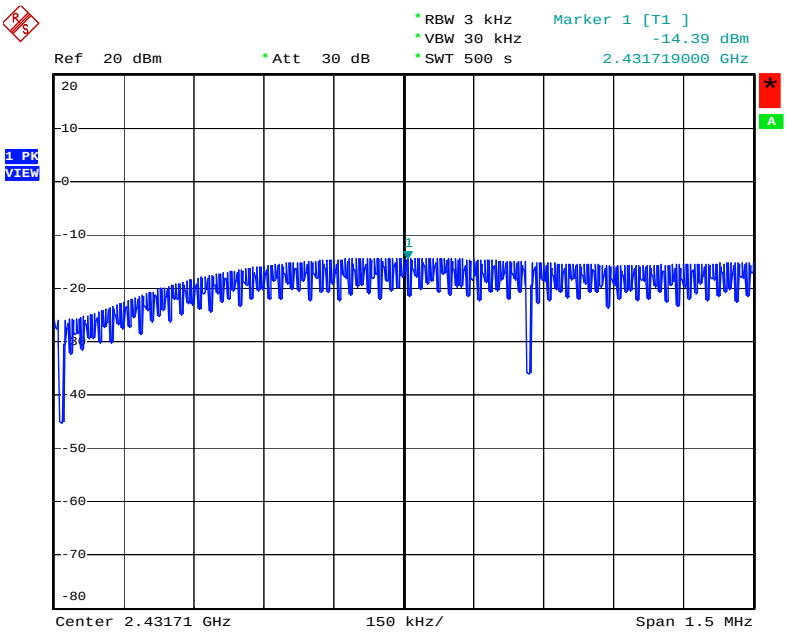

Date: 6.APR.2006 09:56:57

## Lower Channel Power Density Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2452 MHz



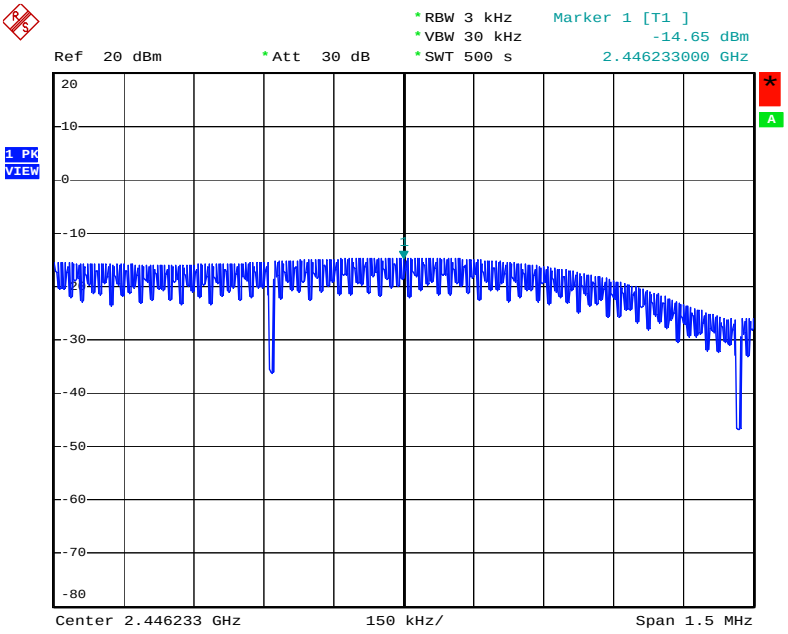

Date: 6.APR.2006 09:55:21

## Upper Channel Power Density Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2422 MHz



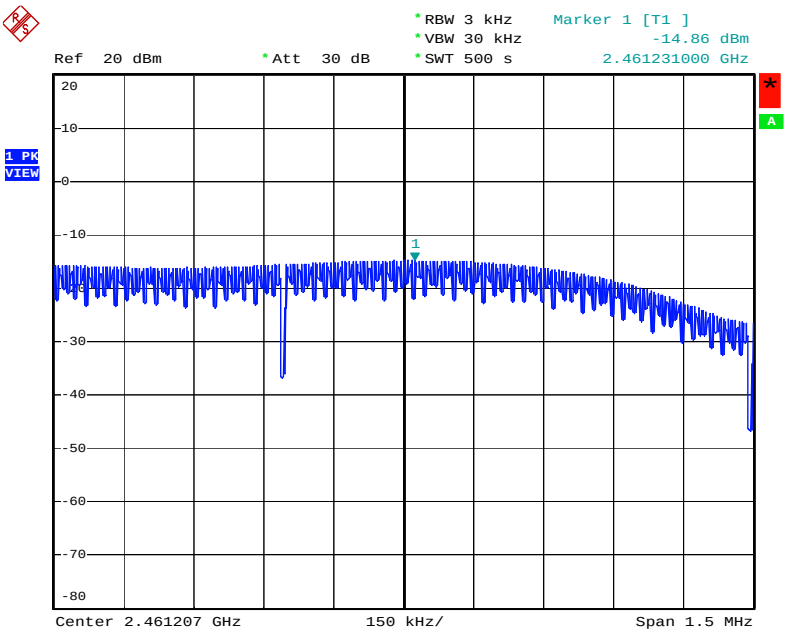

Date: 6.APR.2006 10:06:24

## Upper Channel Power Density Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2437 MHz



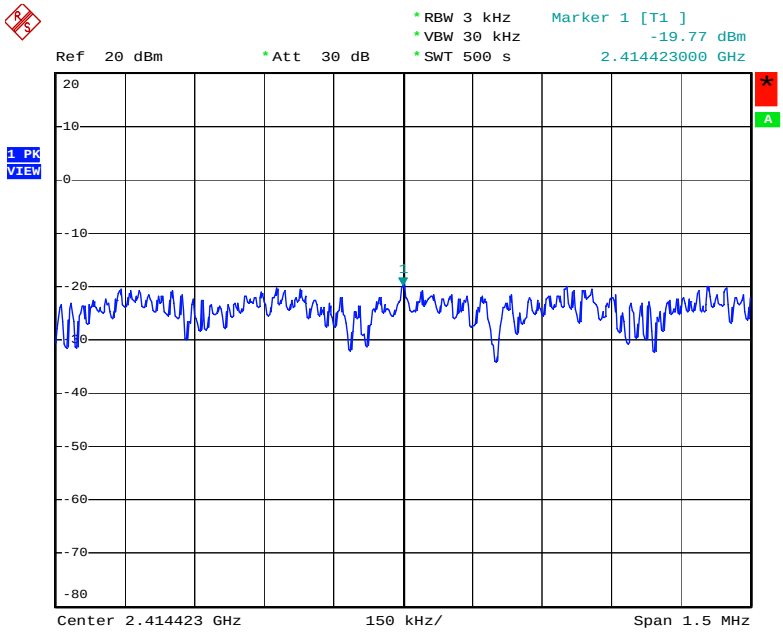

Date: 6.APR.2006 09:44:59

## Upper Channel Power Density Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2452 MHz



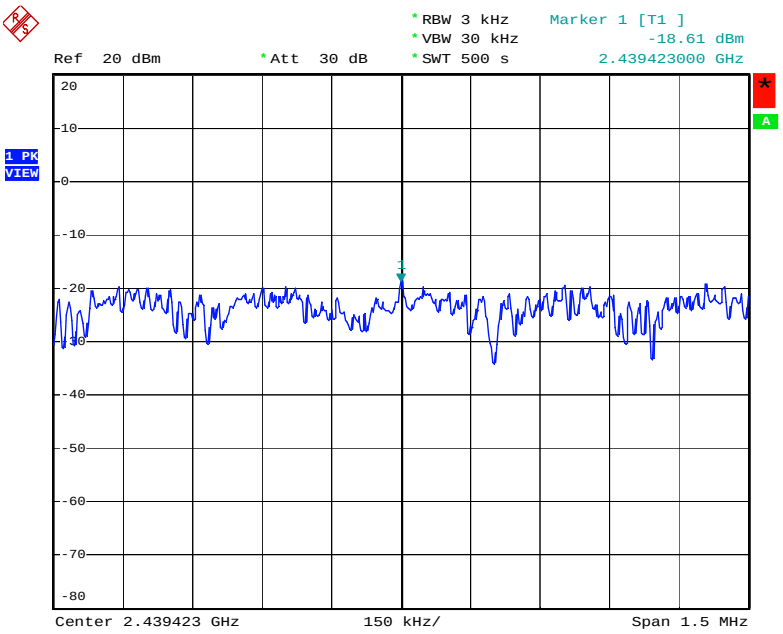

Date: 6.APR.2006 09:46:12

## Power Density Plot on Configuration IEEE 802.11g 20MHz Ant. A / 2412 MHz



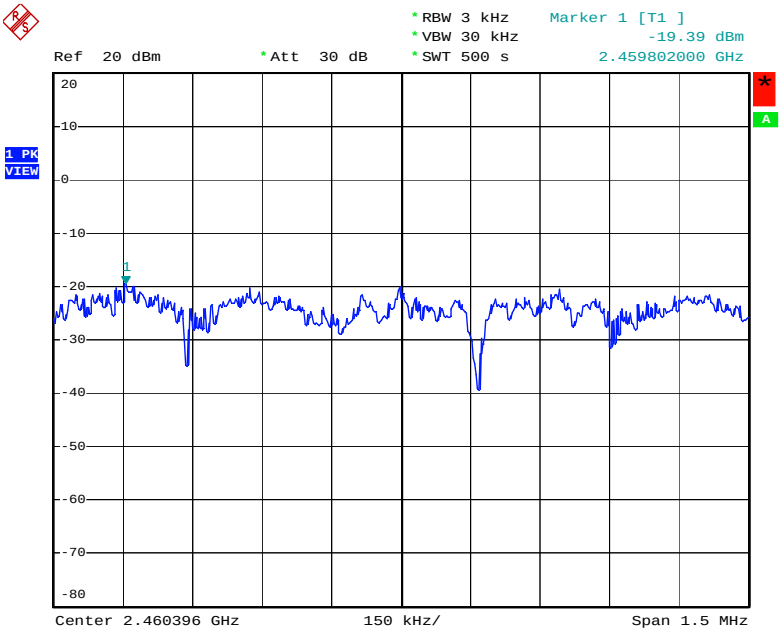

Date: 31.MAR.2006 03:51:46

## Power Density Plot on Configuration IEEE 802.11g 20MHz Ant. A / 2437 MHz



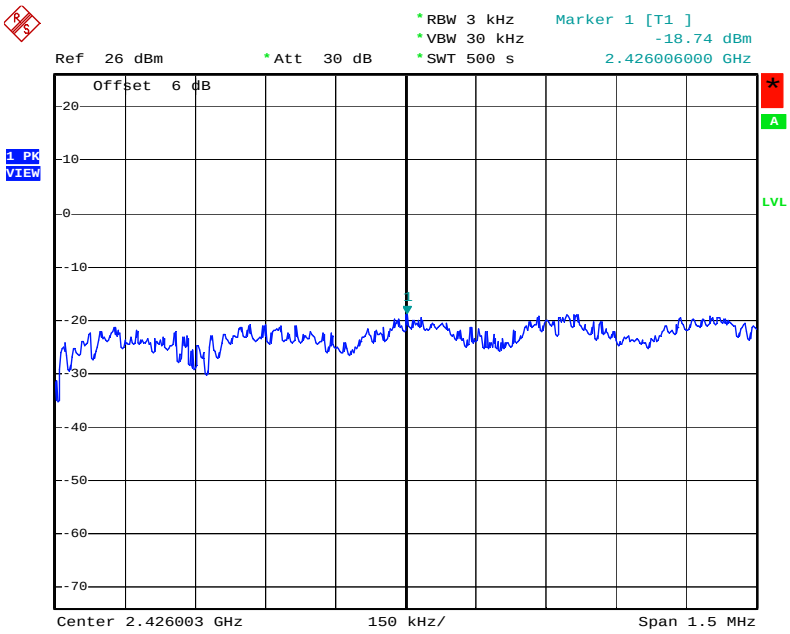

Date: 31.MAR.2006 03:52:44

## Power Density Plot on Configuration IEEE 802.11g 20MHz Ant. A / 2462 MHz



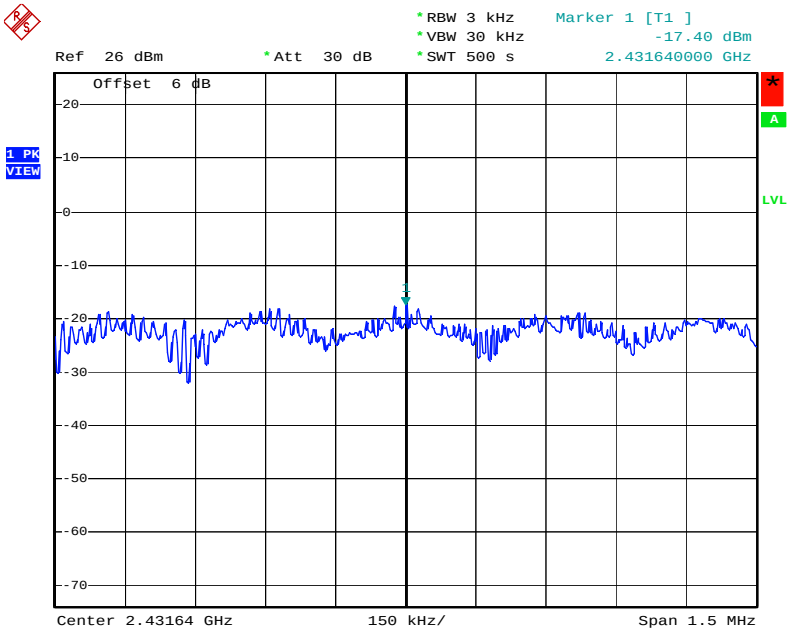

Date: 31.MAR.2006 03:53:39

## Power Density Plot on Configuration IEEE 802.11g 40MHz Ant. A + Ant. B / 2422 MHz



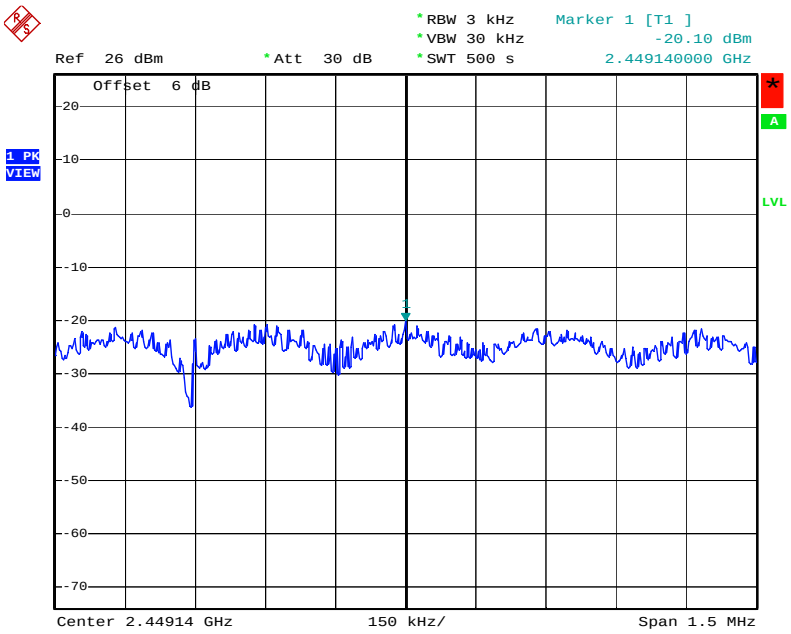

Date: 3.APR.2006 20:26:37

## Power Density Plot on Configuration IEEE 802.11g 40MHz Ant. A + Ant. B / 2437 MHz




Date: 3.APR.2006 20:29:40

## Power Density Plot on Configuration IEEE 802.11g 40MHz Ant. A + Ant. B / 2452 MHz




Date: 3.APR.2006 20:37:00

## 4.4. 6dB Spectrum Bandwidth Measurement

### 4.4.1. Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

### 4.4.2. Measuring Instruments and Setting

Please refer to section 5 in this report. The following table is the setting of the Spectrum Analyzer.

| Spectrum Parameters | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > 6dB Bandwidth |
| RB | 100 kHz |
| VB | 100 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.

### 4.4.4. Test Setup Layout

### 4.4.5. Test Deviation

There is no deviation with the original standard.

### 4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 4.4.7. Test Result of 6dB Spectrum Bandwidth

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11b/g |

**Configuration IEEE 802.11b 20MHz Ant. A**

| Channel | Frequency | 6dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Min. Limit (kHz) | Test Result |
|---|---|---|---|---|---|
| 1 | 2412 MHz | 9.40 | 13.04 | 500 | Complies |
| 6 | 2437 MHz | 9.40 | 12.96 | 500 | Complies |
| 11 | 2462 MHz | 9.40 | 13.00 | 500 | Complies |

**Lower Channel Configuration IEEE 802.11b 40MHz Ant. A**

| Channel | Frequency | 6dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Min. Limit (kHz) | Test Result |
|---|---|---|---|---|---|
| 3 | 2422 MHz | 9.60 | 13.36 | 500 | Complies |
| 6 | 2437 MHz | 9.60 | 13.28 | 500 | Complies |
| 9 | 2452 MHz | 9.60 | 13.36 | 500 | Complies |

**Upper Channel Configuration IEEE 802.11b 40MHz Ant. A**

| Channel | Frequency | 6dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Min. Limit (kHz) | Test Result |
|---|---|---|---|---|---|
| 3 | 2422 MHz | 9.60 | 13.44 | 500 | Complies |
| 6 | 2437 MHz | 9.60 | 13.28 | 500 | Complies |
| 9 | 2452 MHz | 9.60 | 13.28 | 500 | Complies |

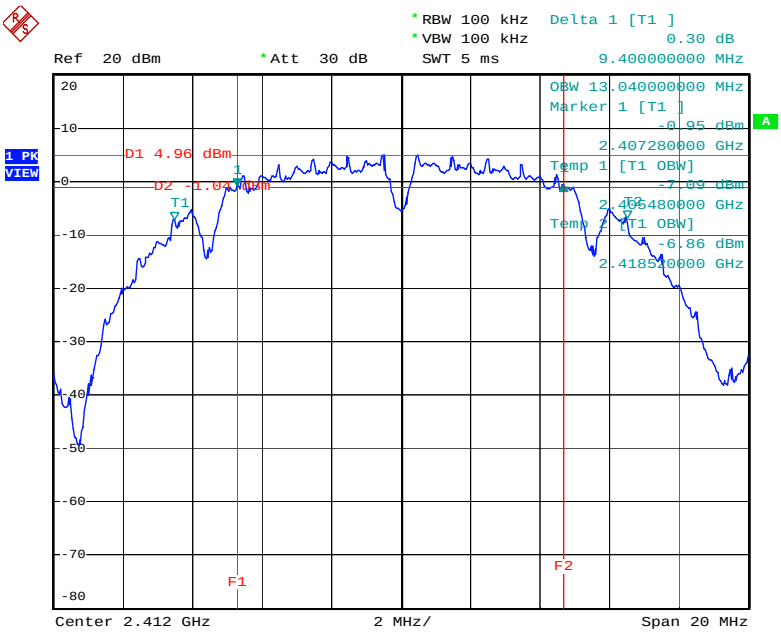
Configuration IEEE 802.11g 20MHz Ant. A

| Channel | Frequency | 6dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Min. Limit (kHz) | Test Result |
|---|---|---|---|---|---|
| 1 | 2412 MHz | 16.56 | 16.52 | 500 | Complies |
| 6 | 2437 MHz | 16.56 | 16.52 | 500 | Complies |
| 11 | 2462 MHz | 16.52 | 16.56 | 500 | Complies |

Configuration IEEE 802.11g 40MHz Ant. A + Ant. B

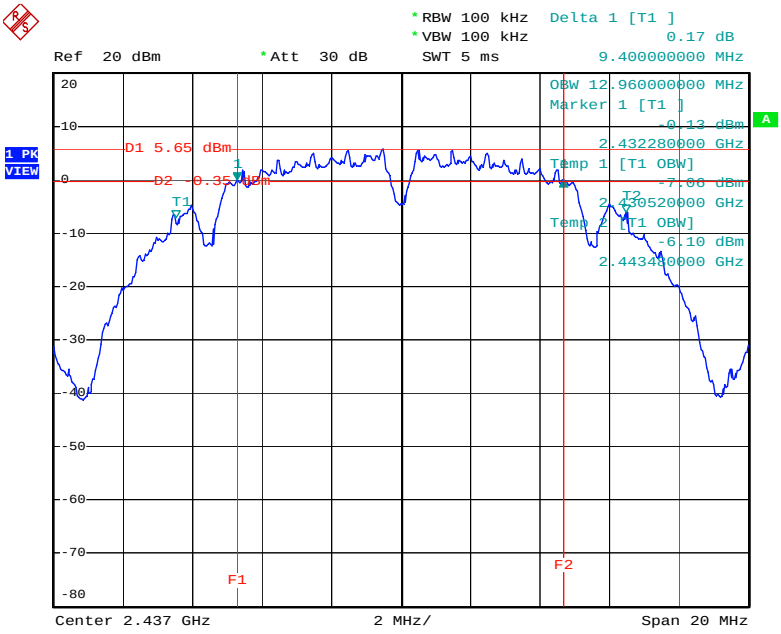
| Channel | Frequency | 6dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Min. Limit (kHz) | Test Result |
|---|---|---|---|---|---|
| 3 | 2422 MHz | 27.12 | 34.88 | 500 | Complies |
| 6 | 2437 MHz | 32.00 | 34.64 | 500 | Complies |
| 9 | 2452 MHz | 35.52 | 36.32 | 500 | Complies |

## 6 dB Bandwidth Plot on Configuration IEEE 802.11b 20MHz Ant. A / 2412 MHz



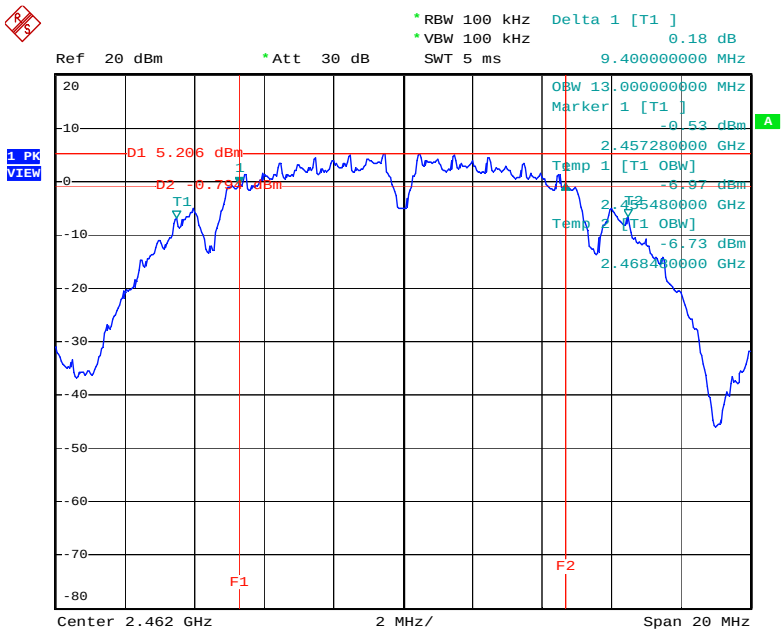

Date: 31.MAR.2006 04:21:24

## 6 dB Bandwidth Plot on Configuration IEEE 802.11b 20MHz Ant. A / 2437 MHz



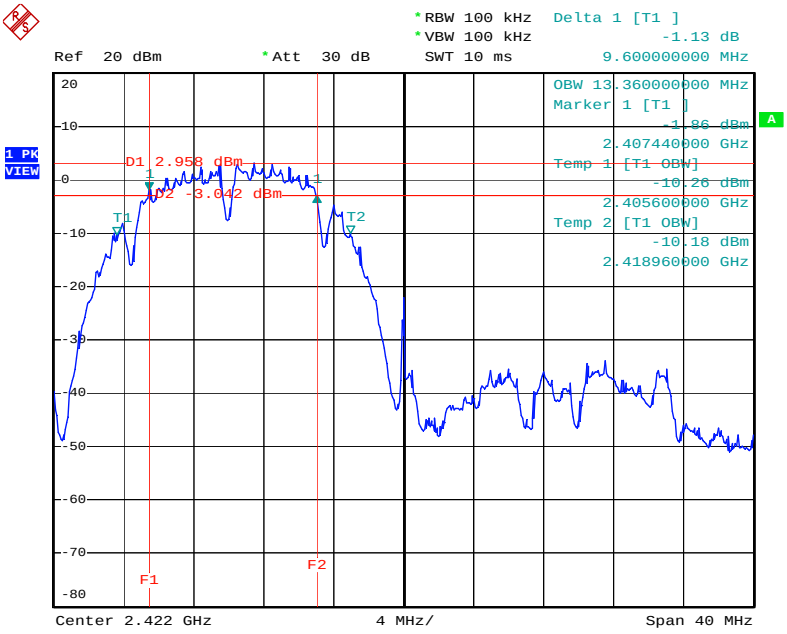

Date: 31.MAR.2006 04:22:34

## 6 dB Bandwidth Plot on Configuration IEEE 802.11b 20MHz Ant. A / 2462 MHz



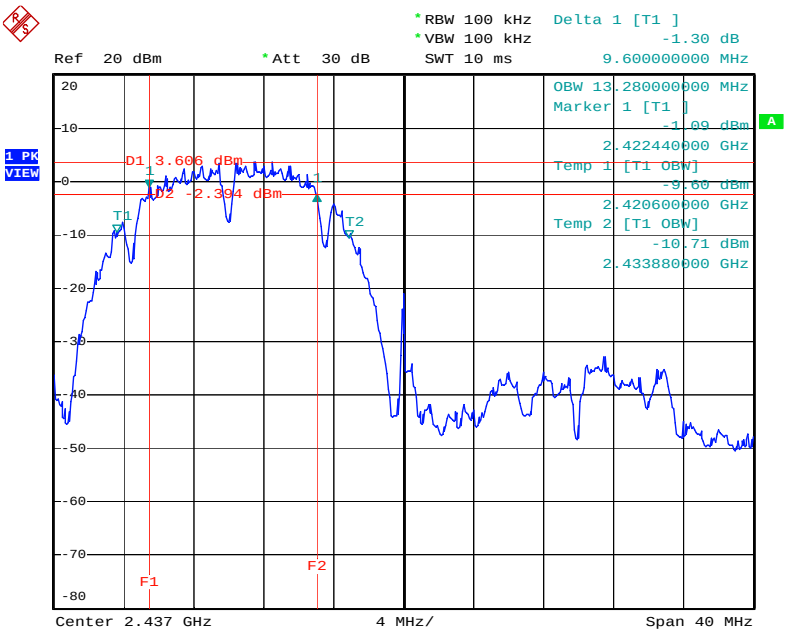

Date: 31.MAR.2006 04:23:20

## Lower Channel 6 dB Bandwidth Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2422 MHz



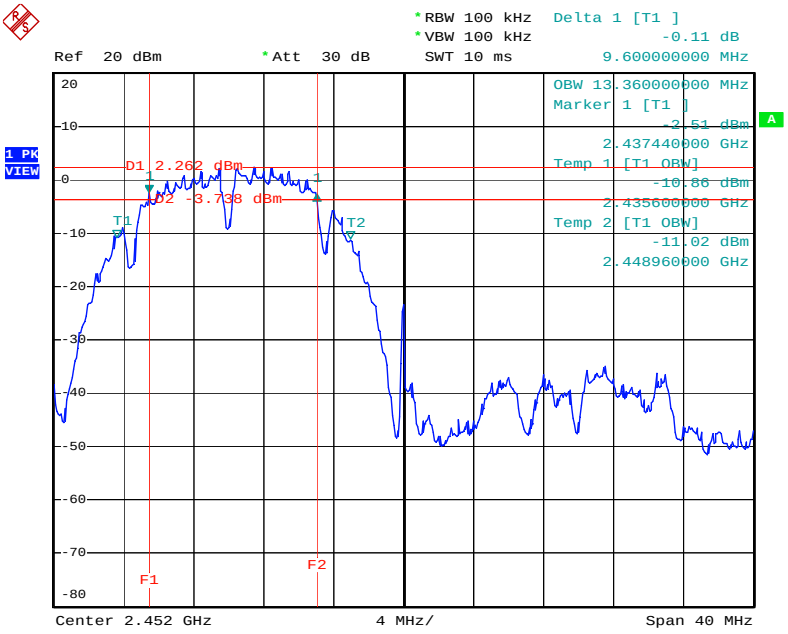

Date: 6.APR.2006 09:50:13

## Lower Channel 6 dB Bandwidth Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2437 MHz



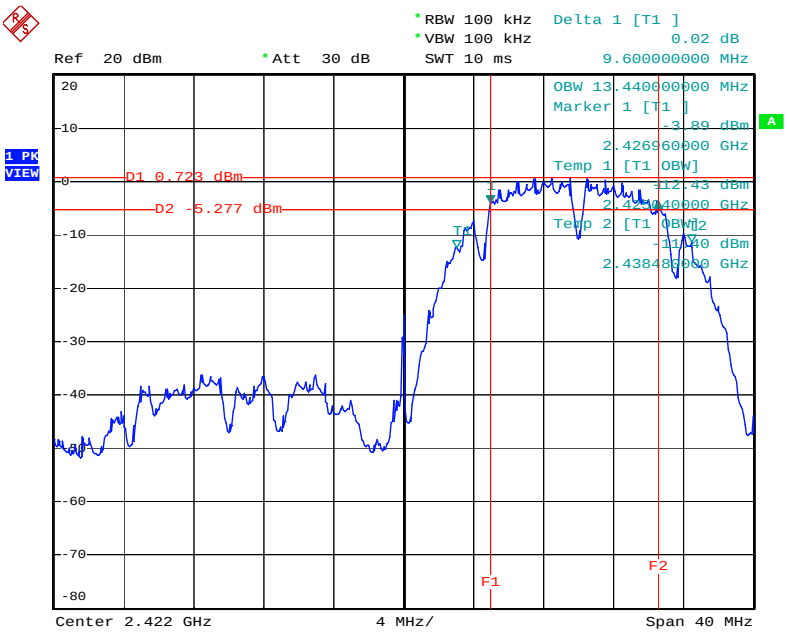

Date: 6.APR.2006 09:56:32

## Lower Channel 6 dB Bandwidth Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2452 MHz



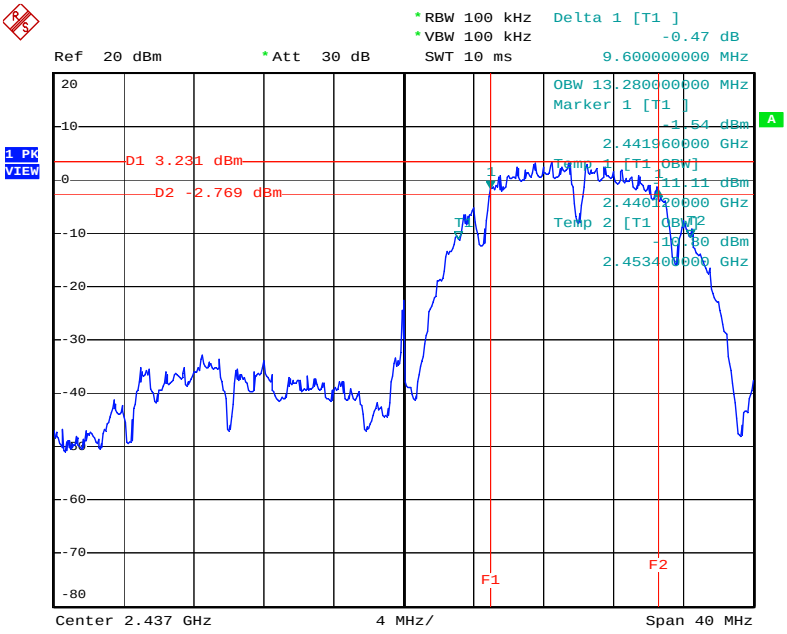

Date: 6.APR.2006 09:54:56

## Upper Channel 6 dB Bandwidth Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2422 MHz



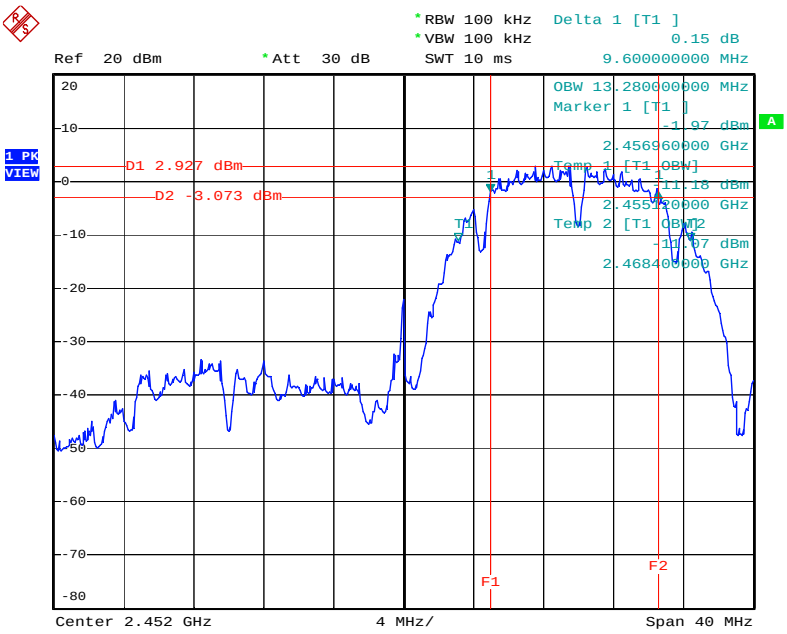

Date: 6.APR.2006 09:41:53

## Upper Channel 6 dB Bandwidth Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2437 MHz



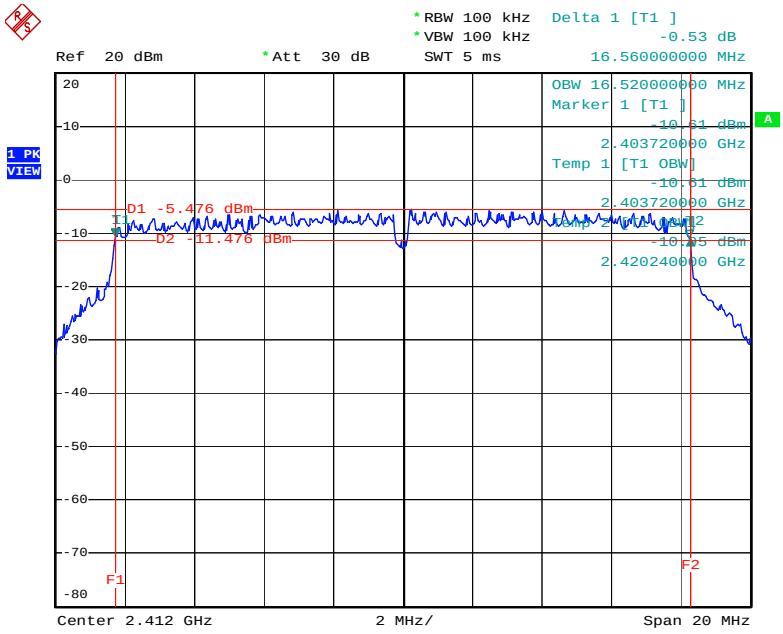

Date: 6.APR.2006 09:44:34

## Upper Channel 6 dB Bandwidth Plot on Configuration IEEE 802.11b 40MHz Ant. A / 2452 MHz



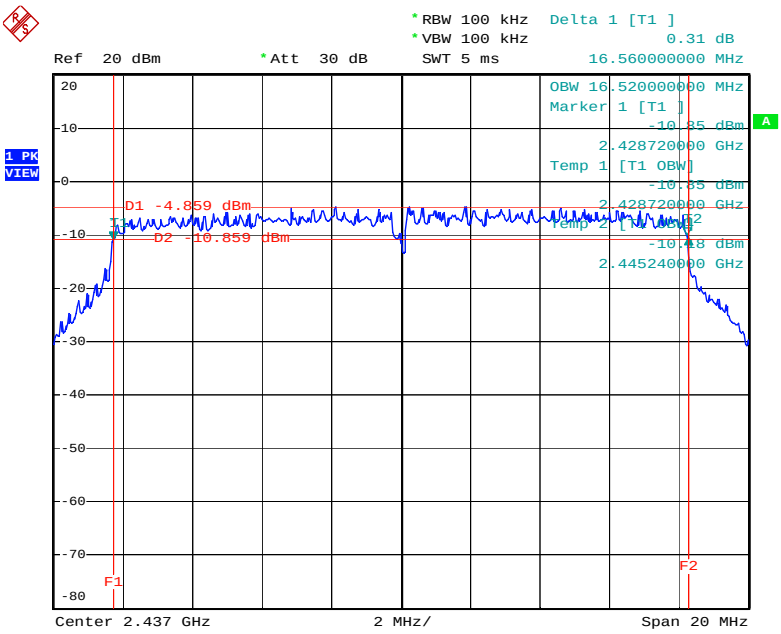

Date: 6.APR.2006 09:45:48

## 6 dB Bandwidth Plot on Configuration IEEE 802.11g 20MHz Ant. A / 2412 MHz



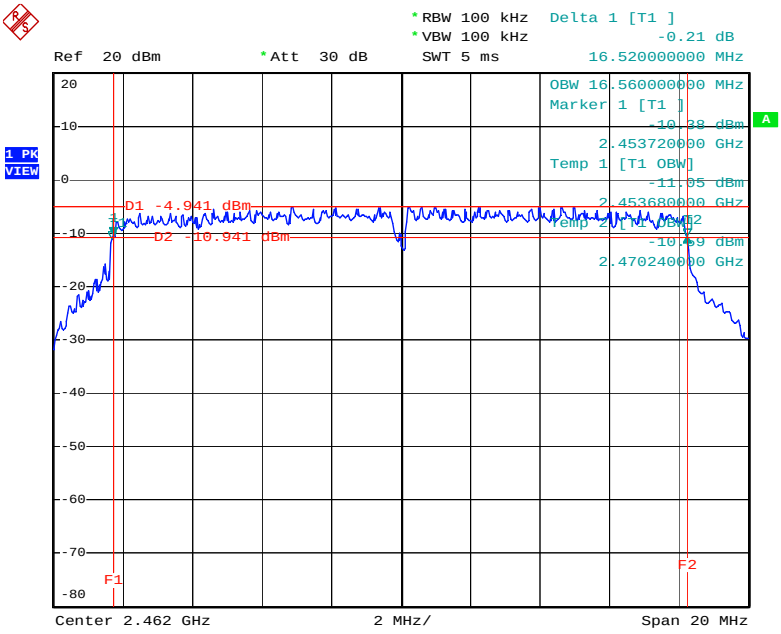

Date: 31.MAR.2006 03:51:21

## 6 dB Bandwidth Plot on Configuration IEEE 802.11g 20MHz Ant. A / 2437 MHz



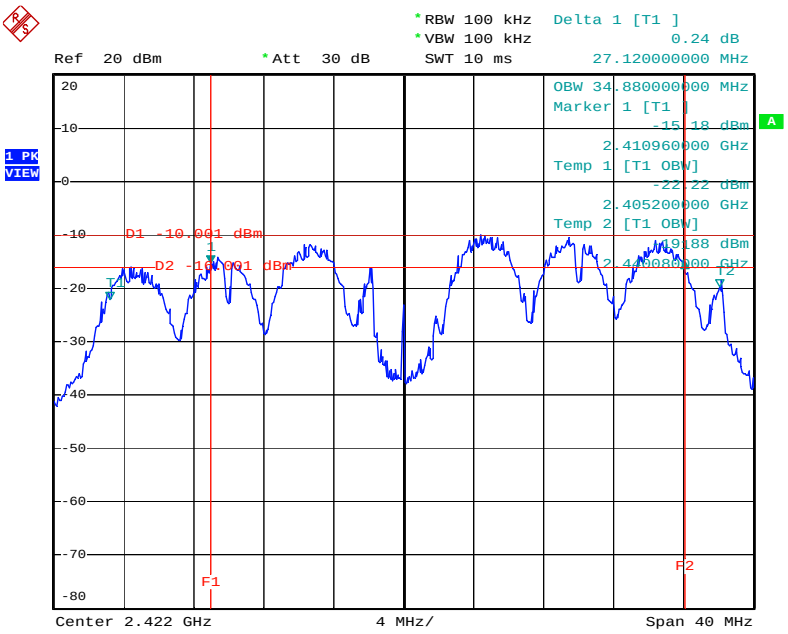

Date: 31.MAR.2006 03:52:28

## 6 dB Bandwidth Plot on Configuration IEEE 802.11g 20MHz Ant. A / 2462 MHz



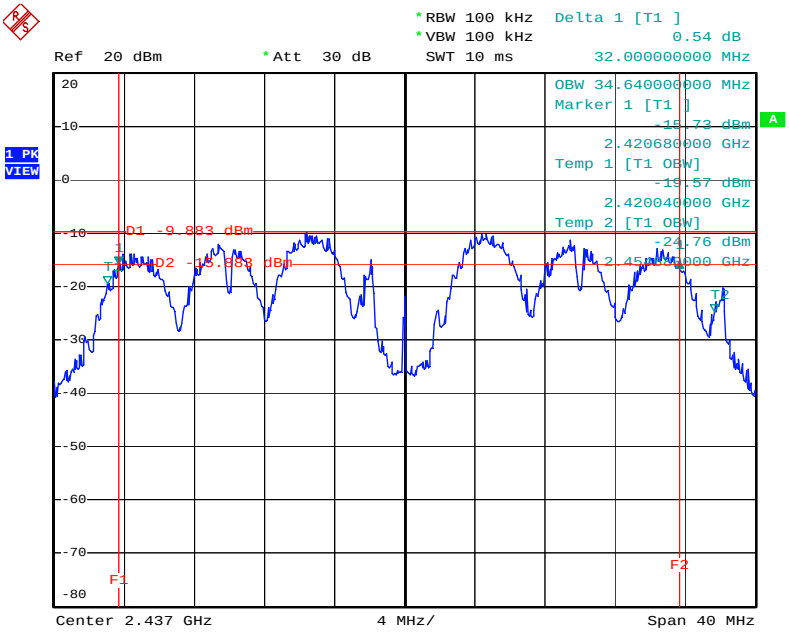

Date: 31.MAR.2006 03:53:24

## 6 dB Bandwidth Plot on Configuration IEEE 802.11g 40MHz Ant. A + Ant. B / 2422 MHz



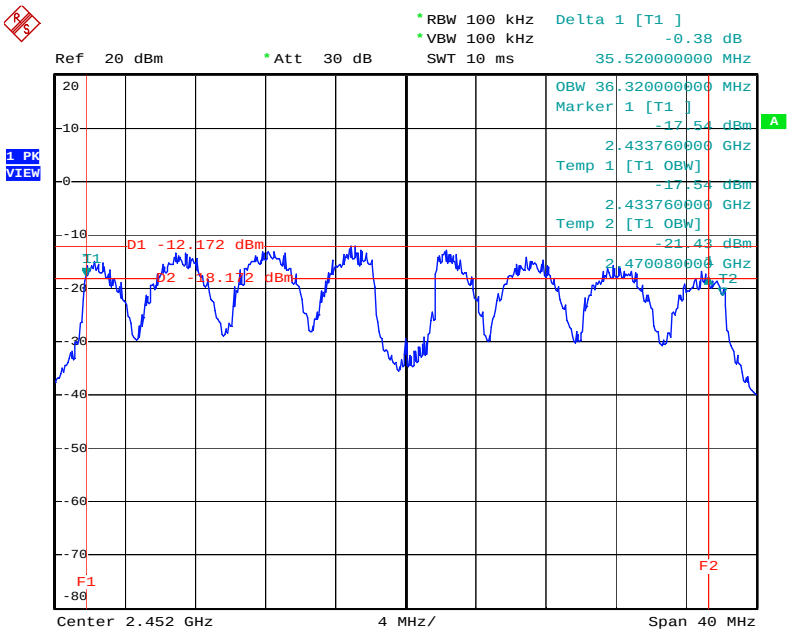

Date: 3.APR.2006 20:24:54

## 6 dB Bandwidth Plot on Configuration IEEE 802.11g 40MHz Ant. A + Ant. B / 2437 MHz




Date: 3.APR.2006 20:28:36

## 6 dB Bandwidth Plot on Configuration IEEE 802.11g 40MHz Ant. A + Ant. B / 2452 MHz




Date: 3.APR.2006 20:30:28

## 4.5. Radiated Emissions Measurement

### 4.5.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies (MHz) | Field Strength (micorvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009~0.490 | 2400/F(KHz) | 300 |
| 0.490~1.705 | 24000/F(KHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

### 4.5.2. Measuring Instruments and Setting

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average |
| RB / VB (other emission) | 100KHz / 100KHz for peak |

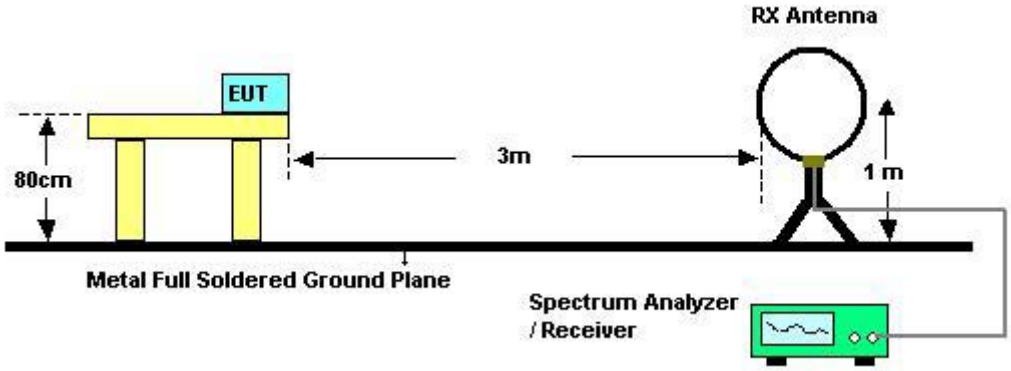
| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

### 4.5.3. Test Procedures

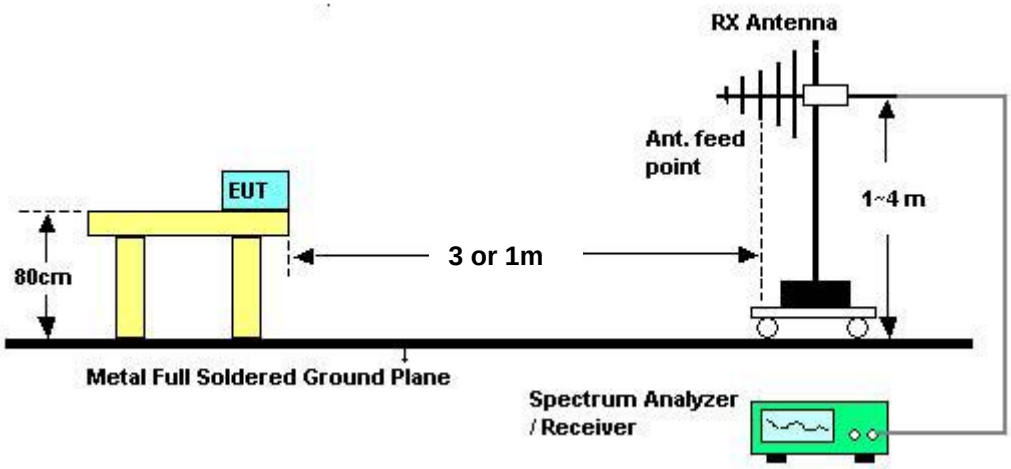
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

### 4.5.4. Test Setup Layout

**For radiated emissions below 30MHz**




**For radiated emissions above 30MHz**




Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

### 4.5.5. Test Deviation

There is no deviation with the original standard.

### 4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

## 4.5.7. Results of Radiated Emissions (9kHz~30MHz)

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11g 20MHz Channel 6 |

| Freq. (MHz) | Level (dBuV) | Over Limit (dB) | Limit Line (dBuV) | Remark |
|---|---|---|---|---|
| - | - | - | - | See Note |

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

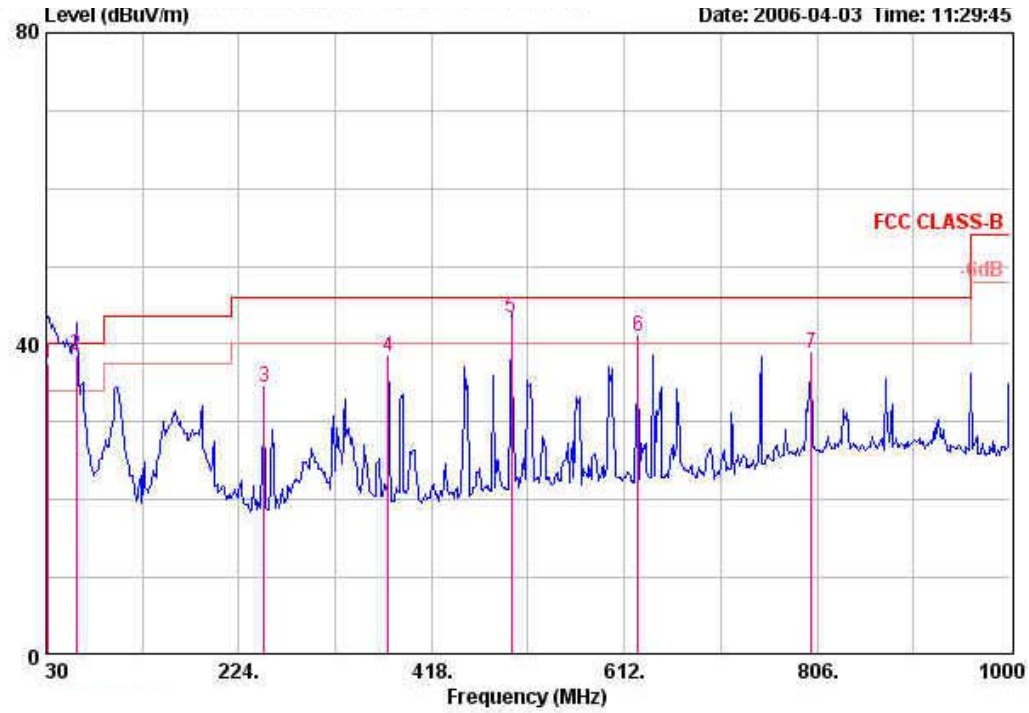
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

## 4.5.8. Results of Radiated Emissions (30MHz~1GHz)

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11g Channel 6 Ant. A<br>Adapter 1 |

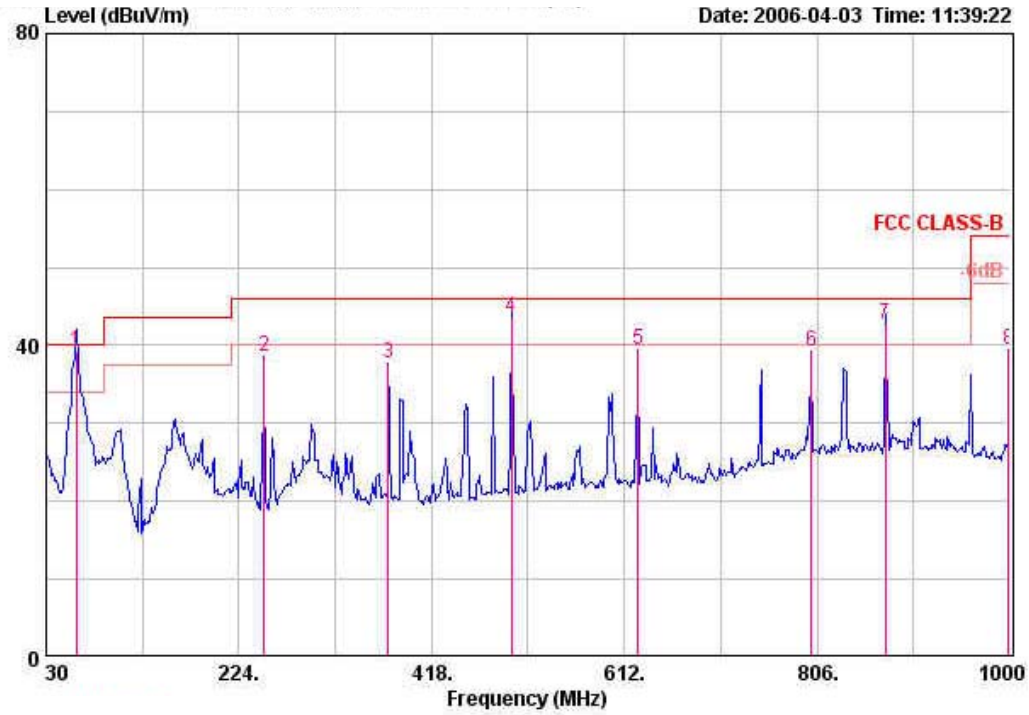
Vertical




| | Freq | Level | Over Limit | Limit Line | Read Level | Preamp Factor | Cable Loss | Antenna Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | dB/m | | cm | deg |
| 1 @ | 31.940 | 37.54 | -2.46 | 40.00 | 47.80 | 28.60 | 1.12 | 17.22 | QP | 100 | 172 |
| 2 @ | 60.070 | 38.52 | -1.48 | 40.00 | 58.00 | 28.50 | 1.90 | 7.12 | QP | 100 | 180 |
| 3 | 249.220 | 34.48 | -11.52 | 46.00 | 46.37 | 27.80 | 3.59 | 12.32 | Peak | --- | --- |
| 4 | 374.350 | 38.42 | -7.58 | 46.00 | 46.75 | 28.15 | 4.30 | 15.52 | Peak | --- | --- |
| 5 @ | 498.510 | 43.35 | -2.65 | 46.00 | 49.80 | 28.79 | 4.98 | 17.35 | QP | 100 | 270 |
| 6 @ | 625.580 | 40.88 | -5.12 | 46.00 | 46.13 | 28.80 | 5.90 | 17.64 | Peak | --- | --- |
| 7 | 800.180 | 38.89 | -7.11 | 46.00 | 39.07 | 27.70 | 6.40 | 21.12 | Peak | --- | --- |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11g Channel 6 Ant. A<br>Adapter 1 |

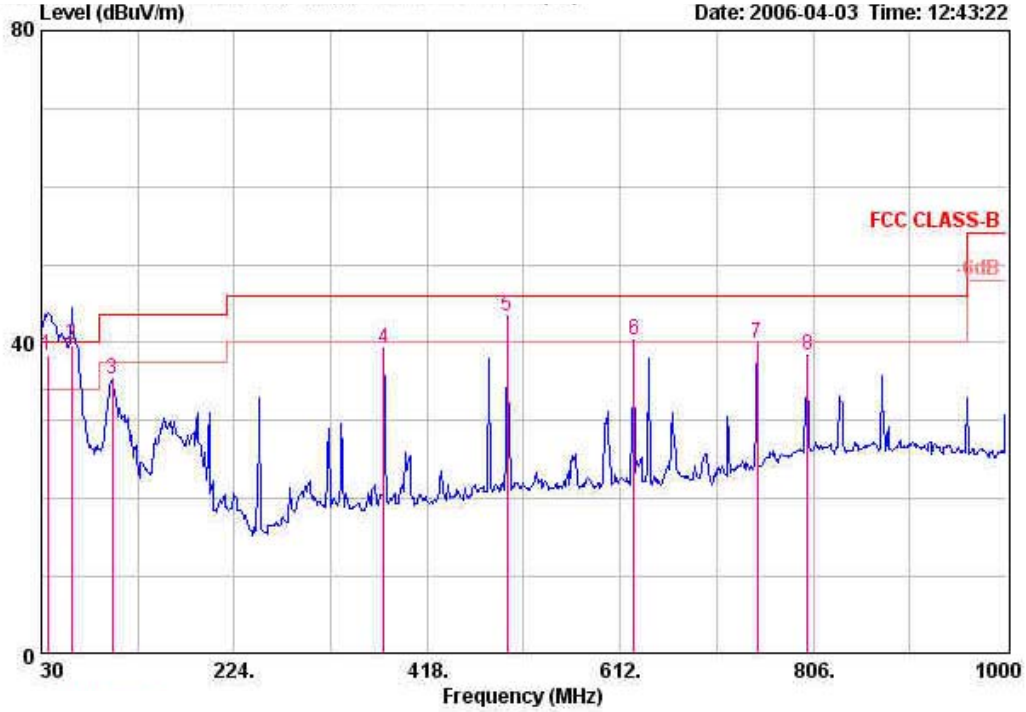
Horizontal




| | Freq | Level | Over Limit | Limit Line | Read Level | Preamp Factor | Cable Loss | Antenna Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | dB/m | | cm | deg |
| 1 @ | 60.070 | 39.32 | -0.68 | 40.00 | 58.80 | 28.50 | 1.90 | 7.12 | QP | 400 | 180 |
| 2 | 249.220 | 38.55 | -7.45 | 46.00 | 50.44 | 27.80 | 3.59 | 12.32 | Peak | --- | --- |
| 3 | 374.350 | 37.68 | -8.32 | 46.00 | 46.01 | 28.15 | 4.30 | 15.52 | Peak | --- | --- |
| 4 @ | 498.510 | 43.65 | -2.35 | 46.00 | 50.10 | 28.79 | 4.98 | 17.35 | QP | 137 | 262 |
| 5 | 625.580 | 39.49 | -6.51 | 46.00 | 44.75 | 28.80 | 5.90 | 17.64 | Peak | --- | --- |
| 6 | 800.180 | 39.15 | -6.85 | 46.00 | 39.33 | 27.70 | 6.40 | 21.12 | Peak | --- | --- |
| 7 @ | 874.870 | 42.71 | -3.29 | 46.00 | 42.77 | 27.65 | 6.65 | 20.94 | QP | 118 | 316 |
| 8 | 999.030 | 39.55 | -14.45 | 54.00 | 40.40 | 27.50 | 7.00 | 19.65 | Peak | --- | --- |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11g Channel 6 Ant. A Adapter 2 |

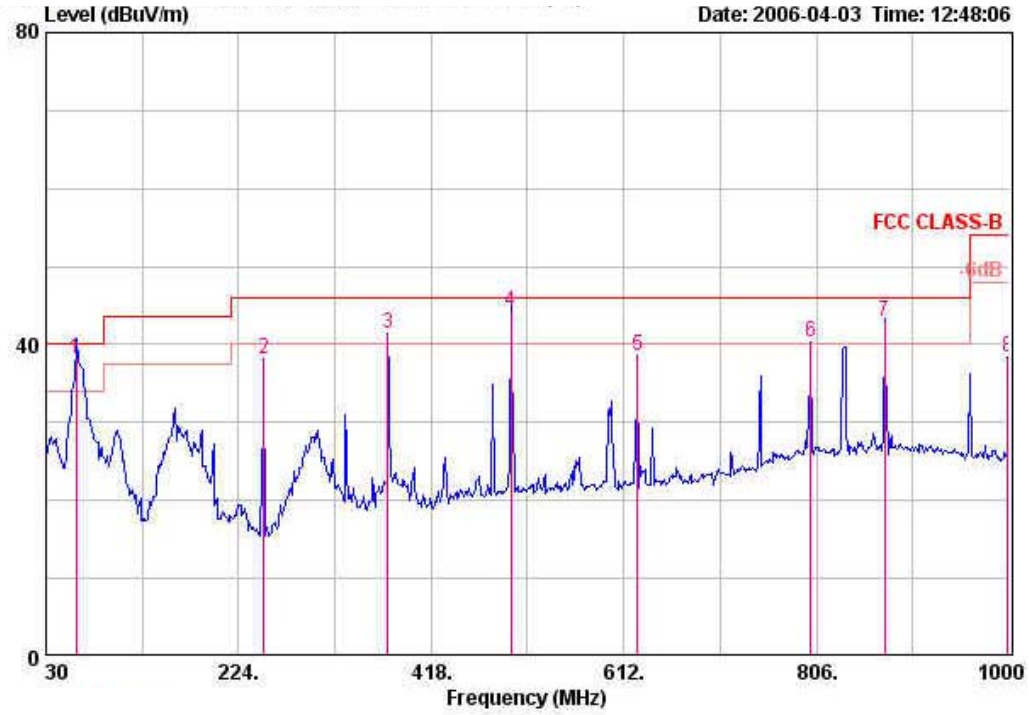
Vertical




| | Freq | Level | Over Limit | Limit Line | Read Level | Preamp Factor | Cable Loss | Antenna Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | dB/m | | cm | deg |
| 1 @ | 36.790 | 38.45 | -1.55 | 40.00 | 50.50 | 28.60 | 1.34 | 15.21 | QP | 100 | 0 |
| 2 @ | 60.070 | 39.62 | -0.38 | 40.00 | 59.10 | 28.50 | 1.90 | 7.12 | QP | 100 | 90 |
| 3 | 101.780 | 35.30 | -8.20 | 43.50 | 50.36 | 28.39 | 2.32 | 11.01 | Peak | --- | --- |
| 4 | 374.350 | 39.17 | -6.83 | 46.00 | 47.51 | 28.15 | 4.30 | 15.52 | Peak | --- | --- |
| 5 @ | 498.510 | 43.32 | -2.68 | 46.00 | 49.77 | 28.79 | 4.98 | 17.35 | QP | 100 | 200 |
| 6 @ | 625.580 | 40.33 | -5.67 | 46.00 | 45.58 | 28.80 | 5.90 | 17.64 | Peak | --- | --- |
| 7 | 749.740 | 39.99 | -6.01 | 46.00 | 42.27 | 28.00 | 6.10 | 19.62 | Peak | --- | --- |
| 8 | 800.180 | 38.28 | -7.72 | 46.00 | 38.46 | 27.70 | 6.40 | 21.12 | Peak | --- | --- |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11g Channel 6 Ant. A Adapter 2 |

Horizontal




| | Freq | Level | Over Limit | Limit Line | Read Level | Preamp Factor | Cable Loss | Antenna Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | dB/m | | cm | deg |
| 1 @ | 60.070 | 38.12 | -1.88 | 40.00 | 57.60 | 28.50 | 1.90 | 7.12 | QP | 400 | 180 |
| 2 | 249.220 | 38.04 | -7.96 | 46.00 | 49.93 | 27.80 | 3.59 | 12.32 | Peak | --- | --- |
| 3 @ | 374.350 | 41.40 | -4.60 | 46.00 | 49.73 | 28.15 | 4.30 | 15.52 | Peak | --- | --- |
| 4 @ | 498.510 | 44.25 | -1.75 | 46.00 | 50.70 | 28.79 | 4.98 | 17.35 | QP | 178 | 285 |
| 5 | 625.580 | 38.68 | -7.32 | 46.00 | 43.94 | 28.80 | 5.90 | 17.64 | Peak | --- | --- |
| 6 @ | 800.180 | 40.27 | -5.73 | 46.00 | 40.45 | 27.70 | 6.40 | 21.12 | Peak | --- | --- |
| 7 @ | 874.870 | 43.04 | -2.96 | 46.00 | 43.10 | 27.65 | 6.65 | 20.94 | QP | 120 | 290 |
| 8 | 999.030 | 38.46 | -15.54 | 54.00 | 39.31 | 27.50 | 7.00 | 19.65 | Peak | --- | --- |

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

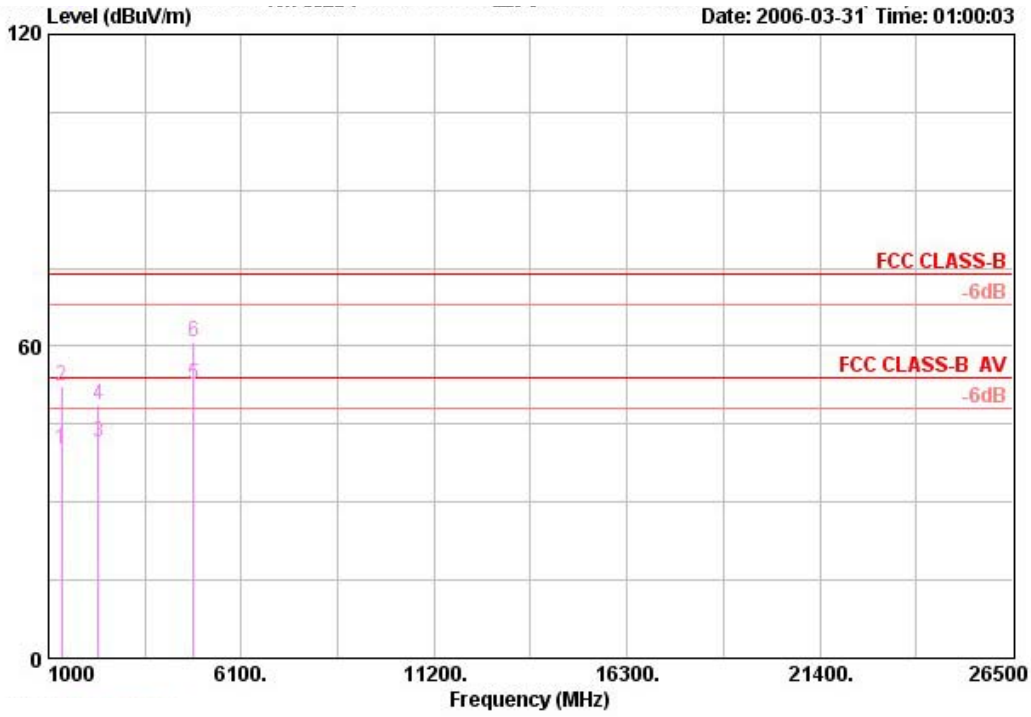
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

## 4.5.9. Results for Radiated Emissions (1GHz~10th Harmonic)

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11b 20MHz Channel 1<br>Ant. A |

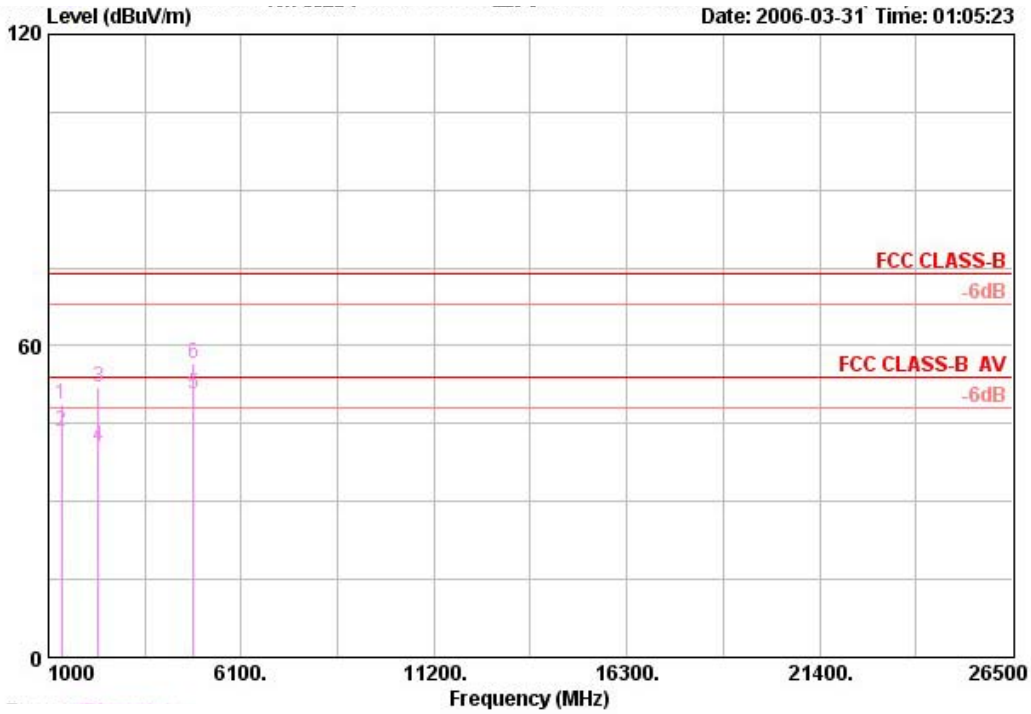
**Vertical**




| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 1342.380 | 40.21 | -13.79 | 54.00 | 44.61 | 24.87 | 5.29 | 34.55 | AVERAGE | --- | --- |
| 2 | 1342.380 | 52.28 | -21.72 | 74.00 | 56.68 | 24.87 | 5.29 | 34.55 | PEAK | --- | --- |
| 3 | 2325.000 | 41.40 | -12.60 | 54.00 | 40.51 | 28.79 | 7.16 | 35.07 | AVERAGE | --- | --- |
| 4 | 2325.000 | 48.76 | -25.24 | 74.00 | 47.87 | 28.79 | 7.16 | 35.07 | PEAK | --- | --- |
| 5 * | 4823.950 | 52.80 | -1.20 | 54.00 | 43.31 | 32.83 | 11.82 | 35.16 | AVERAGE | --- | --- |
| 6 | 4824.020 | 60.96 | -13.04 | 74.00 | 51.48 | 32.83 | 11.82 | 35.16 | PEAK | --- | --- |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11b 20MHz Channel 1<br>Ant. A |

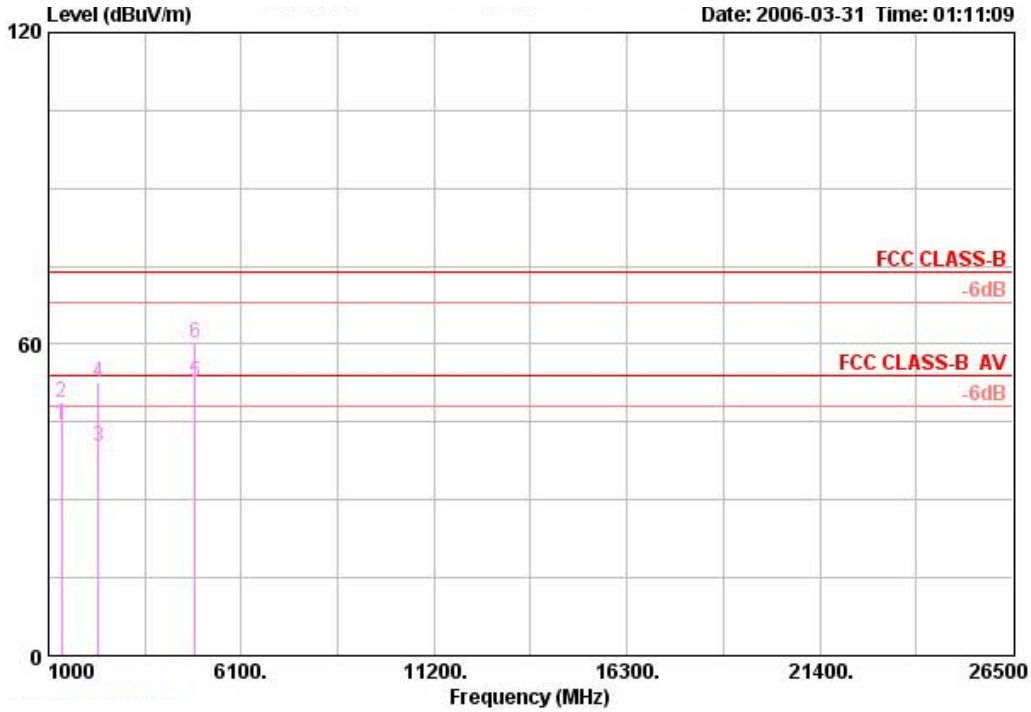
**Horizontal**




| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 1346.948 | 48.64 | -25.36 | 74.00 | 53.05 | 24.87 | 5.29 | 34.57 | PEAK | --- | --- |
| 2 | 1346.948 | 43.40 | -10.60 | 54.00 | 47.82 | 24.87 | 5.29 | 34.57 | AVERAGE | --- | --- |
| 3 | 2319.464 | 51.96 | -22.04 | 74.00 | 51.08 | 28.79 | 7.16 | 35.07 | PEAK | --- | --- |
| 4 | 2319.464 | 40.39 | -13.61 | 54.00 | 39.51 | 28.79 | 7.16 | 35.07 | AVERAGE | --- | --- |
| 5 * | 4823.952 | 50.68 | -3.32 | 54.00 | 41.20 | 32.83 | 11.82 | 35.16 | AVERAGE | --- | --- |
| 6 | 4824.004 | 56.44 | -17.56 | 74.00 | 46.95 | 32.83 | 11.82 | 35.16 | PEAK | --- | --- |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11b 20MHz Channel 6<br>Ant. A |

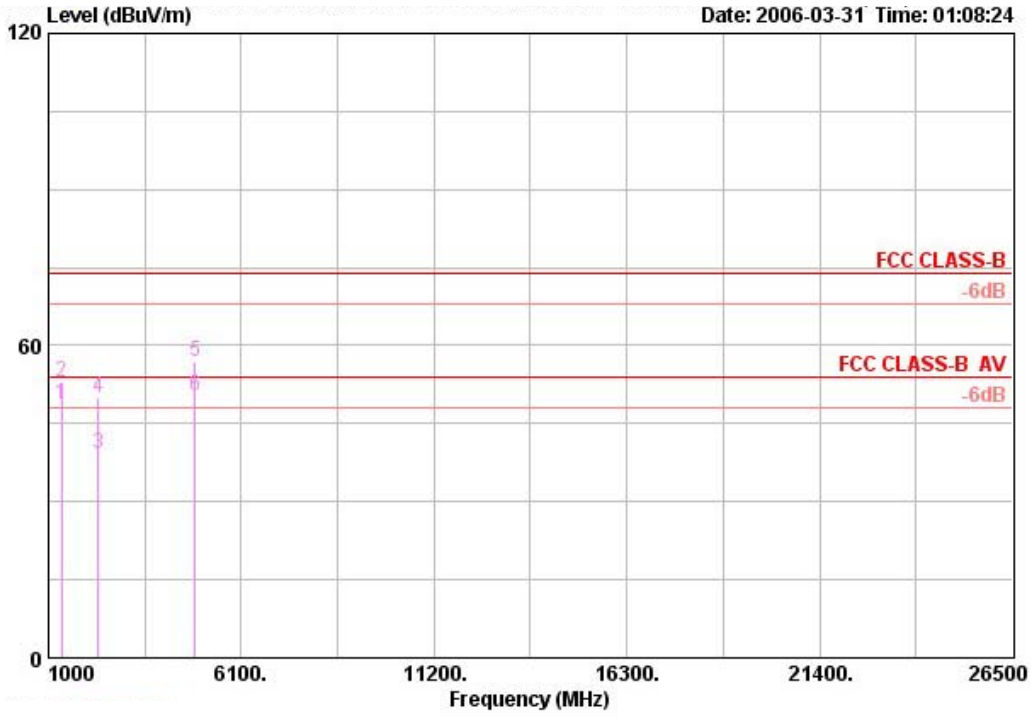
Vertical




| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 1347.544 | 44.40 | -9.60 | 54.00 | 48.81 | 24.87 | 5.29 | 34.57 | AVERAGE | --- | --- |
| 2 | 1347.544 | 48.69 | -25.31 | 74.00 | 53.11 | 24.87 | 5.29 | 34.57 | PEAK | --- | --- |
| 3 | 2319.400 | 40.07 | -13.93 | 54.00 | 39.18 | 28.79 | 7.16 | 35.07 | AVERAGE | --- | --- |
| 4 | 2319.400 | 52.57 | -21.43 | 74.00 | 51.68 | 28.79 | 7.16 | 35.07 | PEAK | --- | --- |
| 5 * | 4873.912 | 52.77 | -1.23 | 54.00 | 43.18 | 32.88 | 11.87 | 35.15 | AVERAGE | --- | --- |
| 6 | 4873.912 | 60.24 | -13.76 | 74.00 | 50.64 | 32.88 | 11.87 | 35.15 | PEAK | --- | --- |

| Temperature | 20℃ | Humidity | 70% |
|---|---|---|---|
| Test Engineer | Leo Hung | Configurations | 802.11b 20MHz Channel 6<br>Ant. A |

**Horizontal**




| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 * | 1347.560 | 48.78 | -5.22 | 54.00 | 53.20 | 24.87 | 5.29 | 34.57 | AVERAGE | --- | --- |
| 2 | 1347.560 | 52.91 | -21.09 | 74.00 | 57.33 | 24.87 | 5.29 | 34.57 | PEAK | --- | --- |
| 3 | 2321.000 | 39.29 | -14.71 | 54.00 | 38.41 | 28.79 | 7.16 | 35.07 | AVERAGE | --- | --- |
| 4 | 2321.000 | 49.96 | -24.04 | 74.00 | 49.07 | 28.79 | 7.16 | 35.07 | PEAK | --- | --- |
| 5 | 4873.784 | 56.74 | -17.26 | 74.00 | 47.14 | 32.88 | 11.87 | 35.15 | PEAK | --- | --- |
| 6 * | 4873.928 | 50.29 | -3.71 | 54.00 | 40.69 | 32.88 | 11.87 | 35.15 | AVERAGE | --- | --- |