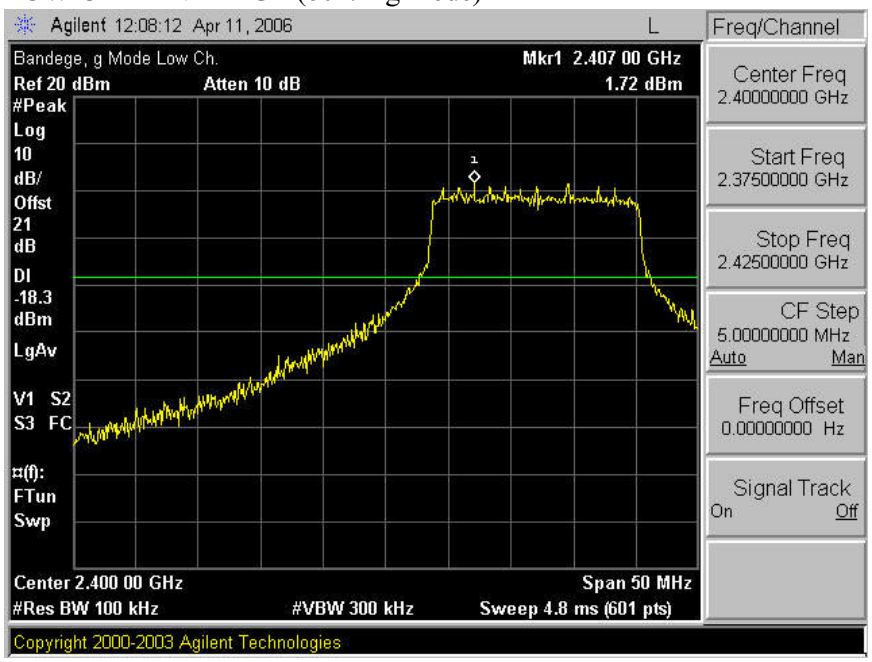
**SPURIOUS EMISSIONS, LOW CHANNEL (802.11g MODE)**

LOW CH BANDEDGE (802.11g mode)







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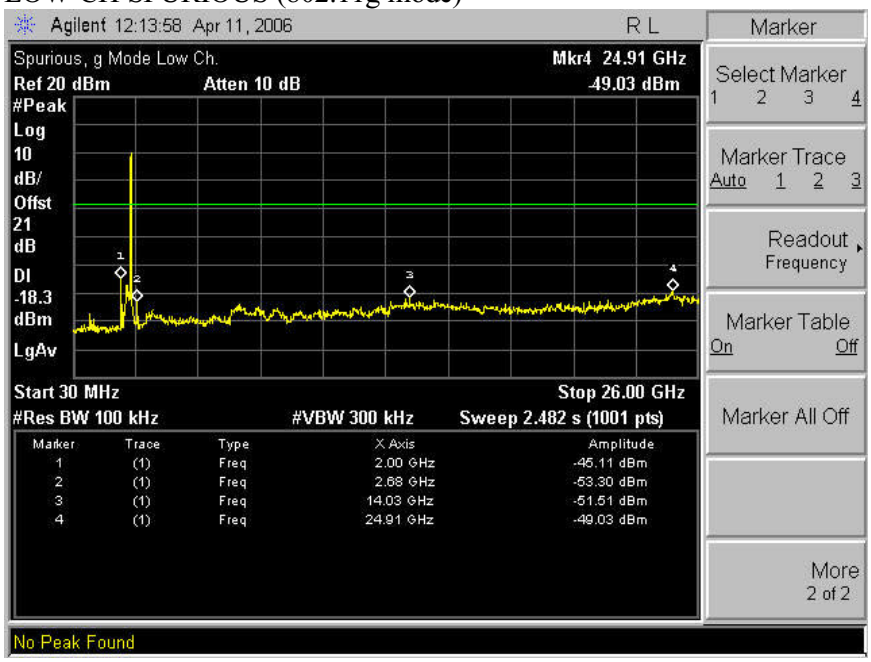
LOW CH SPURIOUS (802.11g mode)







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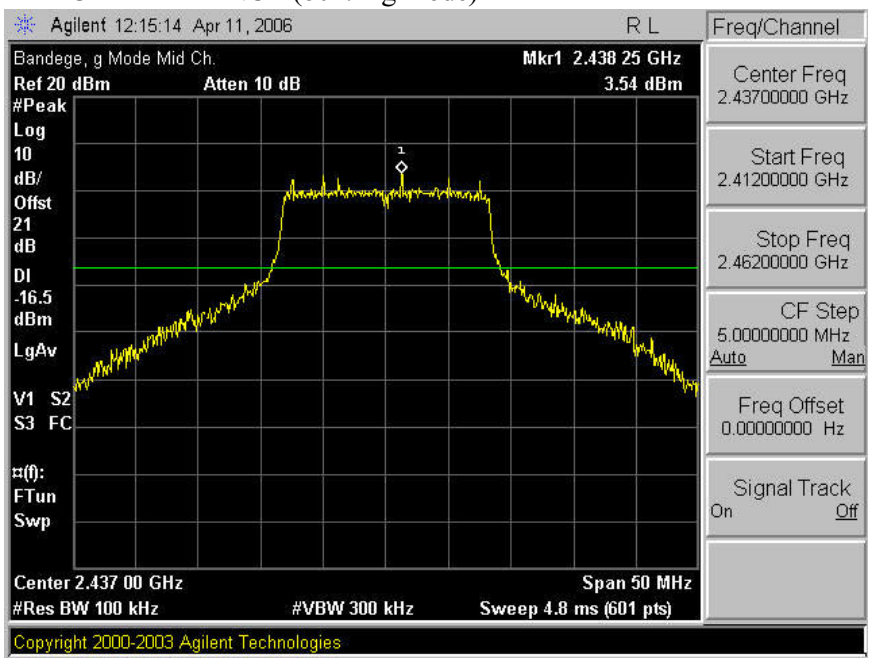
**SPURIOUS EMISSIONS, MID CHANNEL (802.11g MODE)**

MID CH REFERENCE (802.11g mode)







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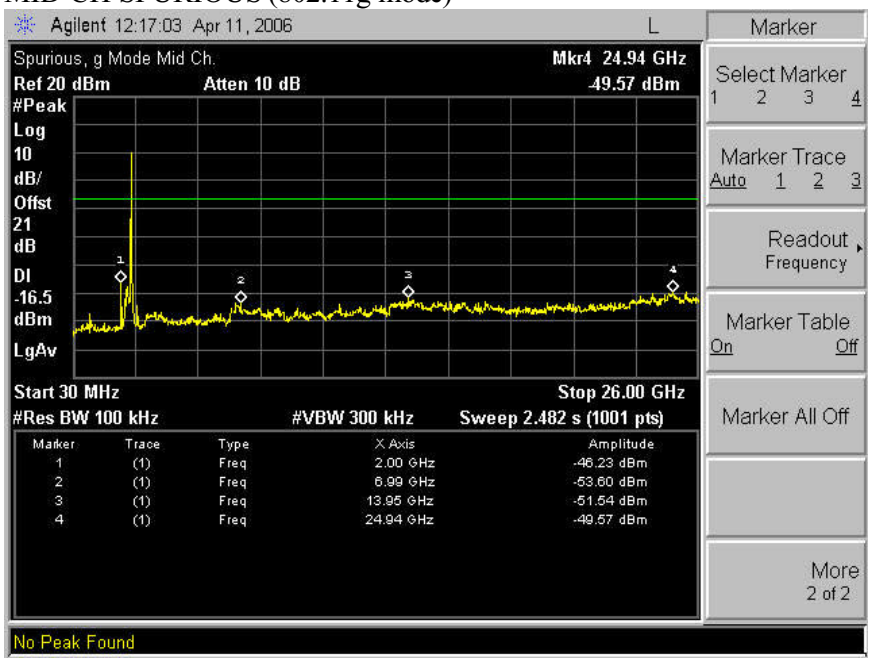
MID CH SPURIOUS (802.11g mode)







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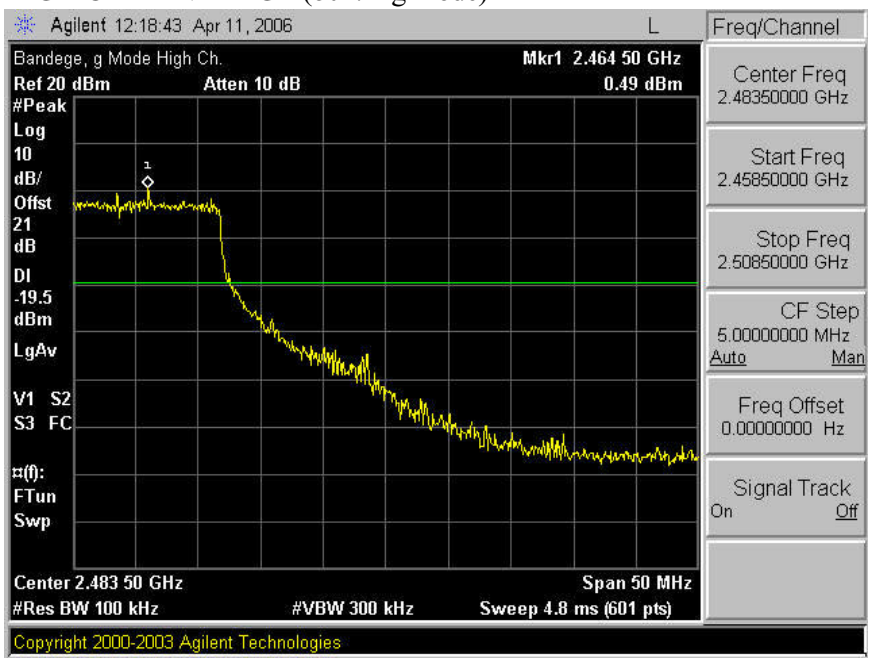
**SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g MODE)**

HIGH CH BANDEDGE (802.11g mode)







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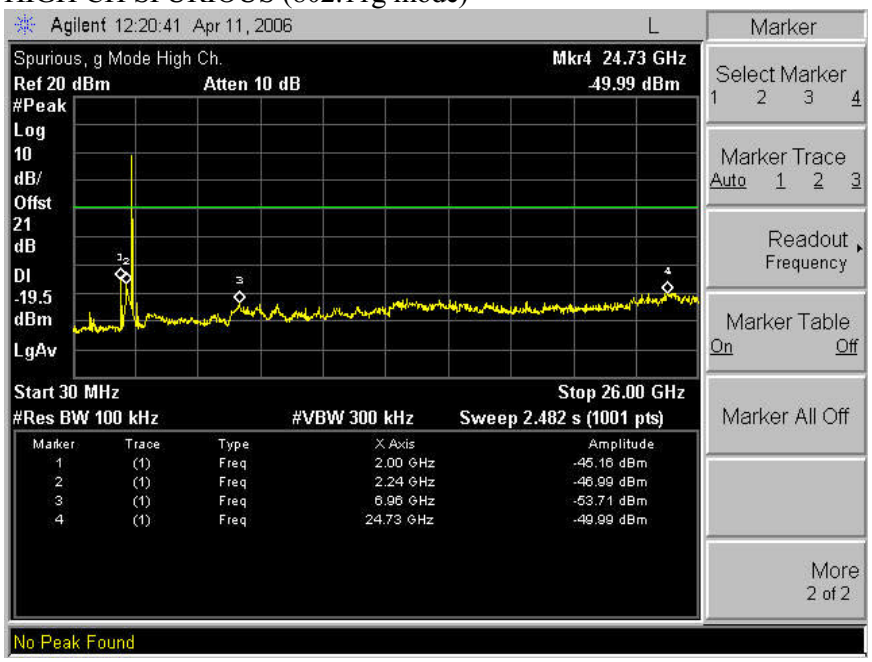
HIGH CH SPURIOUS (802.11g mode)







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## 7.2. RADIATED EMISSIONS

### 7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

**LIMITS**

§15.205 (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 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | ([2]) |
| 13.36 - 13.41 | | | |

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

§15.205 (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.




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§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 30 - 88 | 100 ** | 3 |
| 88 - 216 | 150 ** | 3 |
| 216 - 960 | 200 ** | 3 |
| Above 960 | 500 | 3 |

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

## TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.




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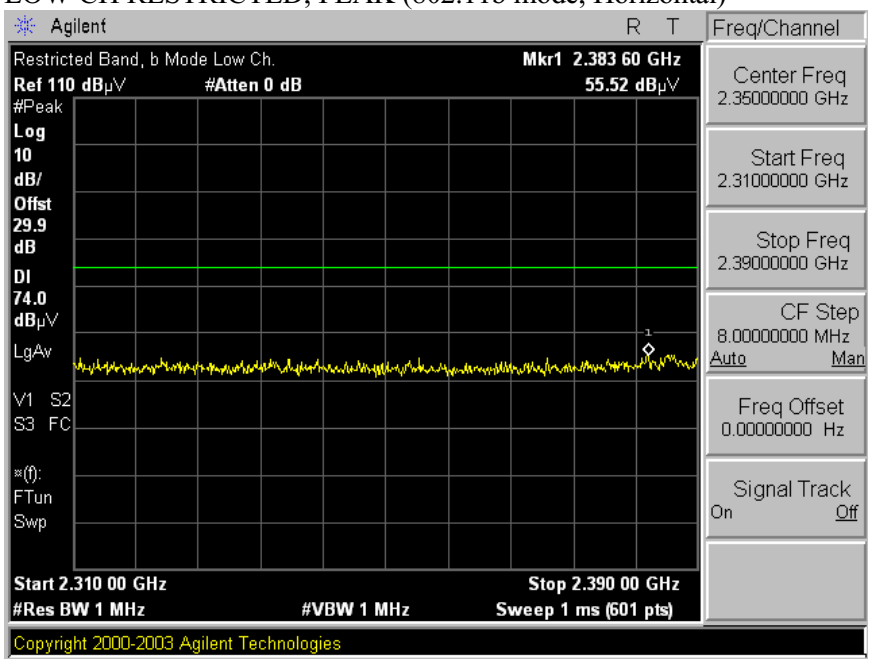
## 7.2.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BANDWIDTH INTERNAL ANTENNA

**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)**

LOW CH RESTRICTED, PEAK (802.11b mode, Horizontal)







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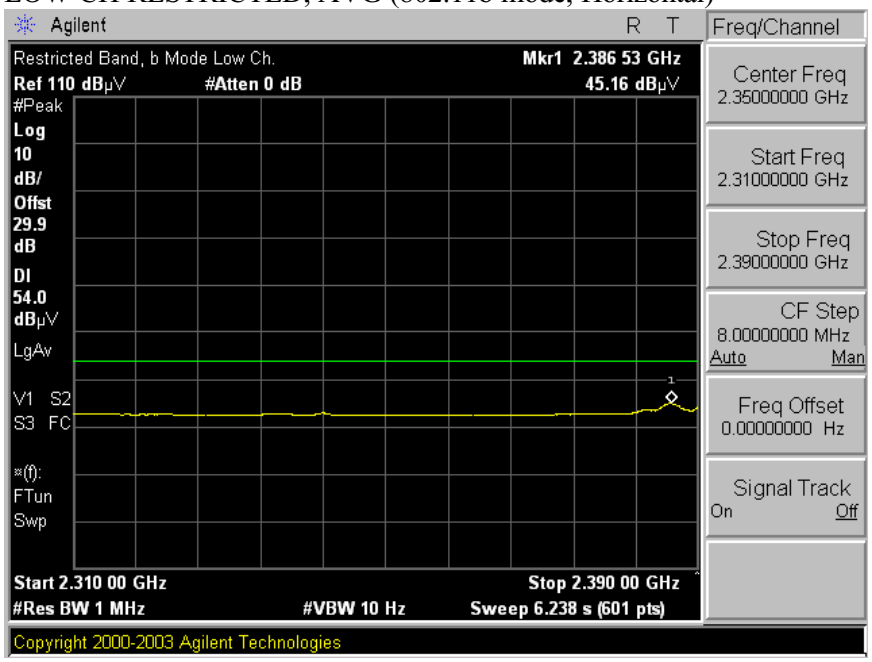
LOW CH RESTRICTED, AVG (802.11b mode, Horizontal)







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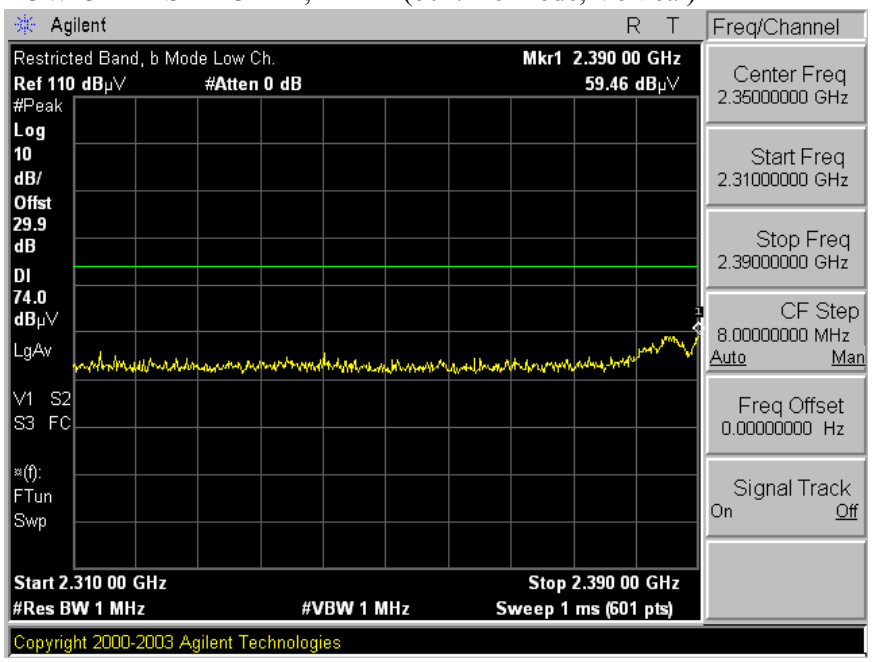
**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)**

LOW CH RESTRICTED, PEAK (802.11b mode, Vertical)







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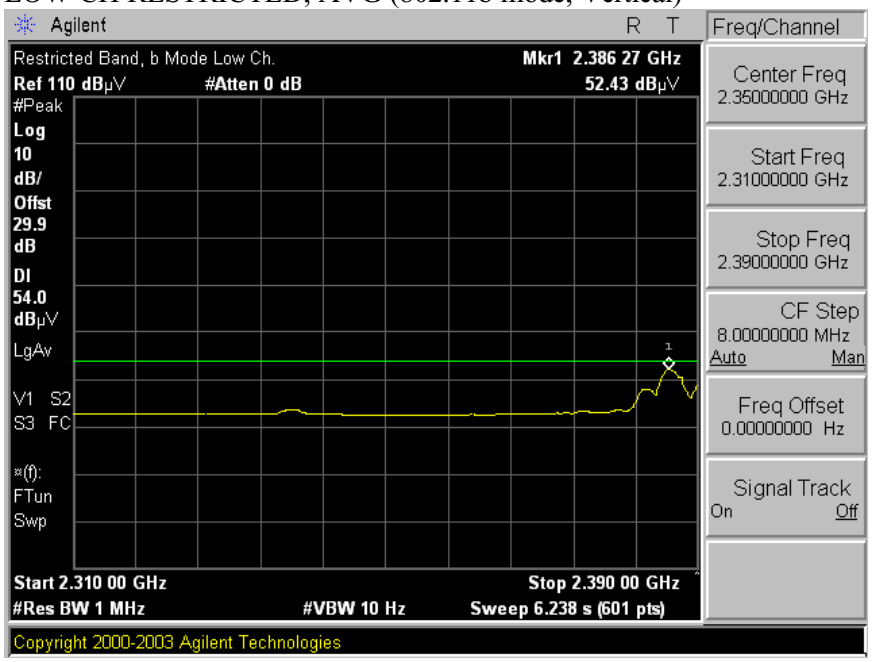
LOW CH RESTRICTED, AVG (802.11b mode, Vertical)







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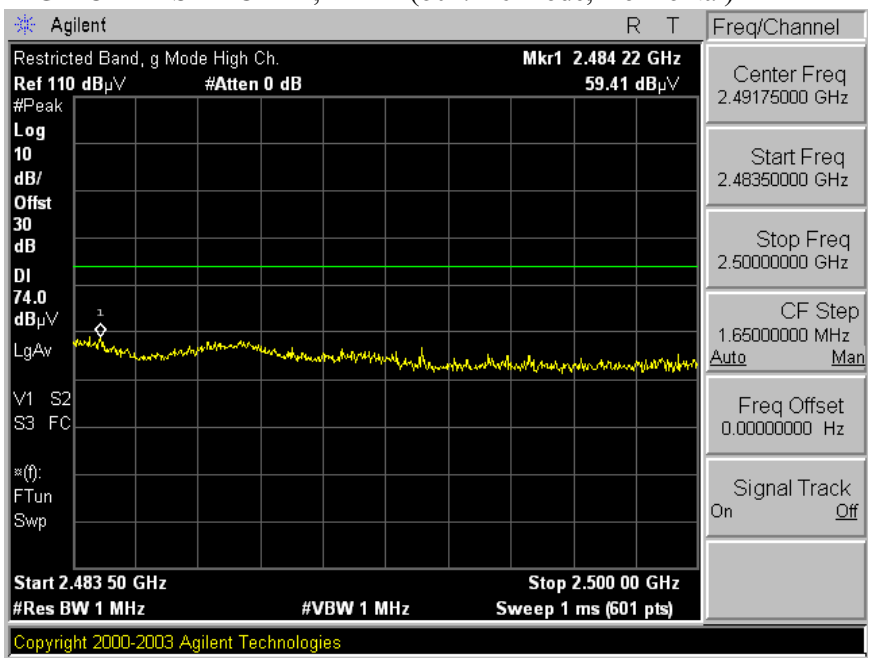
**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)**

HIGH CH RESTRICTED, PEAK (802.11b mode, Horizontal)







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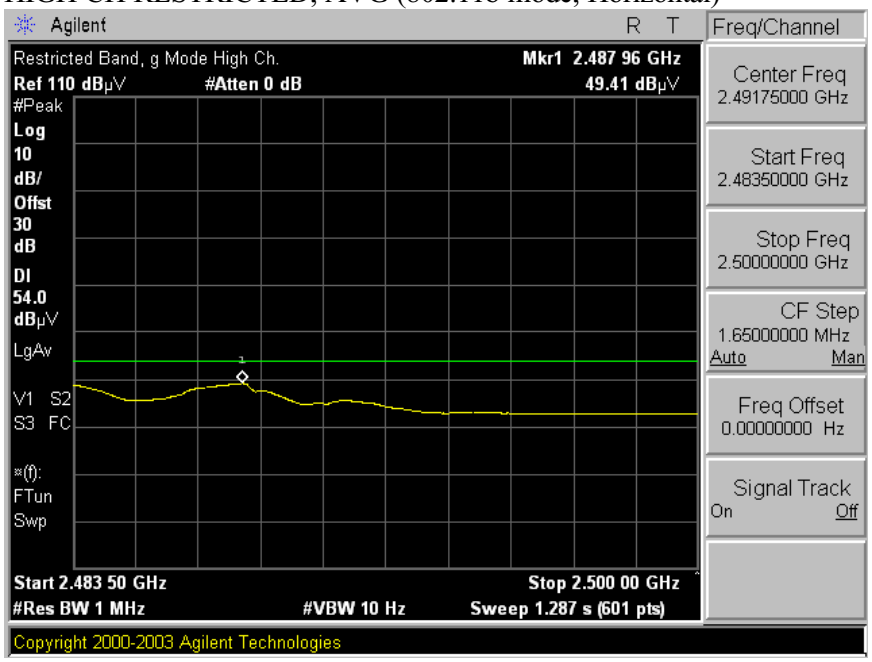
HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)







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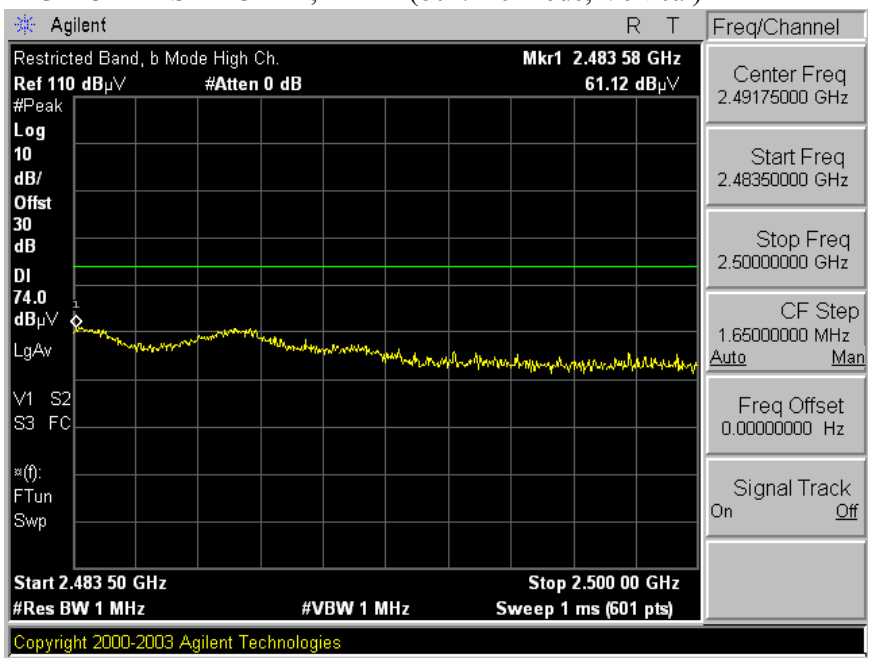
**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)**

HIGH CH RESTRICTED, PEAK (802.11b mode, Vertical)







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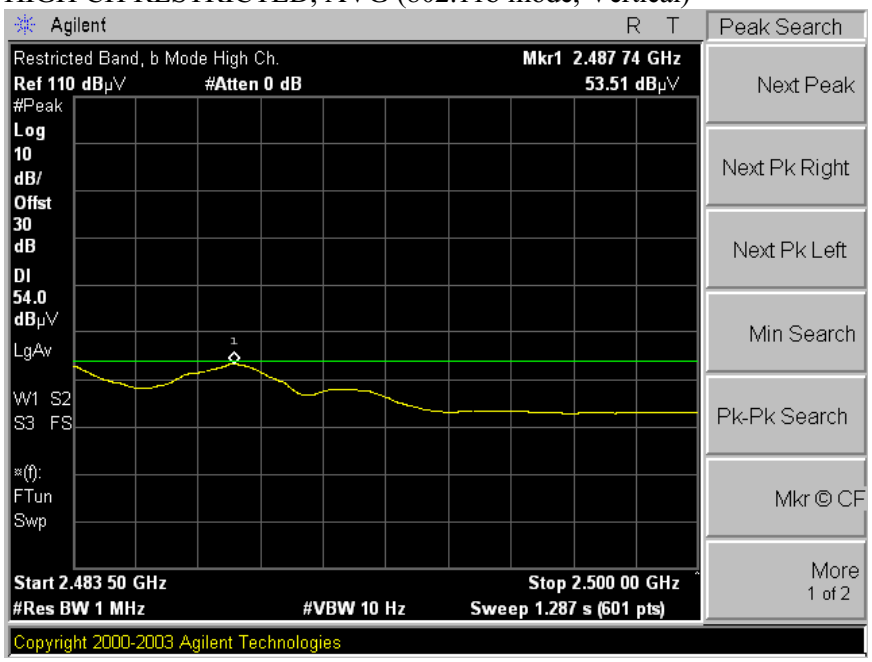
HIGH CH RESTRICTED, AVG (802.11b mode, Vertical)







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## HARMONICS AND SPURIOUS EMISSIONS (b MODE)

04/06/06 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engineer: Thanh Nguyen
Project #: 06U101762-1
Company: HONA R&D Co. LTD
EUT Description: WIRELESS ACCESS POINT
EUT M/N: 70410-QAB
Test Target: FCC Part 15.247
Mode Of Operation: Transmit B mode with Internal Antenna

Test Equipment:

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T73; S/N: 6717 @3m | T145 Agilent 3008A0056 | | | FCC 15.209 |

Hi Frequency Cables

| 2 foot cable | 3 foot cable | 12 foot cable | HPF | Reject Filter |
|---|---|---|---|---|
| Thanh 177079008 | | Thanh 208946003 | HPF_4.0GHz | |

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Ch 2412 MHz | | | | | | | | | | | | | | | V |
| 4.824 | 3.0 | 53.2 | 50.5 | 33.7 | 2.8 | -34.8 | 0.0 | 0.6 | 55.4 | 52.7 | 74 | 54 | -18.6 | -1.3 | V |
| 7.236 | 3.0 | 47.8 | 40.4 | 35.4 | 3.3 | -34.7 | 0.0 | 0.6 | 52.5 | 45.1 | 74 | 54 | -21.5 | -8.9 | V |
| 9.648 | 3.0 | 44.5 | 35.2 | 37.5 | 3.7 | -35.0 | 0.0 | 0.8 | 51.4 | 42.2 | 74 | 54 | -22.6 | -11.8 | V |
| 12.060 | 3.0 | 42.1 | 30.2 | 38.5 | 4.3 | -32.4 | 0.0 | 0.9 | 53.4 | 41.6 | 74 | 54 | -20.6 | -12.4 | Noise floor |
| 4.824 | 3.0 | 47.3 | 41.8 | 33.7 | 2.8 | -34.8 | 0.0 | 0.6 | 49.6 | 44.1 | 74 | 54 | -24.4 | -9.9 | H |
| 7.236 | 3.0 | 43.7 | 33.3 | 35.4 | 3.3 | -34.7 | 0.0 | 0.6 | 48.4 | 38.0 | 74 | 54 | -25.6 | -16.0 | H |
| 9.648 | 3.0 | 44.4 | 32.6 | 37.5 | 3.7 | -35.0 | 0.0 | 0.8 | 51.3 | 39.6 | 74 | 54 | -22.7 | -14.4 | Noise floor |
| Mid Ch 2437MHz | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 57.8 | 49.1 | 33.8 | 2.8 | -34.9 | 0.0 | 0.6 | 60.1 | 51.4 | 74 | 54 | -13.9 | -2.6 | V |
| 7.311 | 3.0 | 55.4 | 48.3 | 35.5 | 3.3 | -34.7 | 0.0 | 0.6 | 60.2 | 53.1 | 74 | 54 | -13.8 | -0.9 | V |
| 9.748 | 3.0 | 47.3 | 42.3 | 37.5 | 3.7 | -35.0 | 0.0 | 0.8 | 54.3 | 49.3 | 74 | 54 | -19.7 | -4.7 | V |
| 12.185 | 3.0 | 42.7 | 30.6 | 38.5 | 4.3 | -32.4 | 0.0 | 0.9 | 54.0 | 41.9 | 74 | 54 | -20.0 | -12.1 | Noise floor |
| 4.874 | 3.0 | 50.0 | 48.0 | 33.8 | 2.8 | -34.9 | 0.0 | 0.6 | 52.3 | 50.4 | 74 | 54 | -21.7 | -3.6 | H |
| 7.311 | 3.0 | 48.3 | 42.6 | 35.5 | 3.3 | -34.7 | 0.0 | 0.6 | 53.1 | 47.4 | 74 | 54 | -20.9 | -6.6 | H |
| 9.748 | 3.0 | 43.4 | 5.9 | 37.5 | 3.7 | -35.0 | 0.0 | 0.8 | 50.5 | 12.9 | 74 | 54 | -23.5 | -41.1 | H |
| 12.185 | 3.0 | 42.3 | 30.2 | 38.5 | 4.3 | -32.4 | 0.0 | 0.9 | 53.6 | 41.6 | 74 | 54 | -20.4 | -12.4 | Noise floor |
| High Ch 2462MHz | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 51.5 | 48.6 | 33.8 | 2.8 | -34.9 | 0.0 | 0.6 | 53.9 | 51.0 | 74 | 54 | -20.1 | -3.0 | V |
| 7.386 | 3.0 | 45.1 | 35.0 | 35.6 | 3.3 | -34.6 | 0.0 | 0.6 | 50.0 | 39.9 | 74 | 54 | -24.0 | -14.1 | V |
| 9.848 | 3.0 | 44.2 | 35.5 | 37.6 | 3.7 | -35.1 | 0.0 | 0.8 | 51.3 | 42.6 | 74 | 54 | -22.7 | -11.4 | V |
| 12.310 | 3.0 | 43.5 | 30.0 | 38.5 | 4.4 | -32.4 | 0.0 | 0.9 | 54.9 | 41.4 | 74 | 54 | -19.1 | -12.6 | Noise floor |
| 4.924 | 3.0 | 47.0 | 42.0 | 33.8 | 2.8 | -34.9 | 0.0 | 0.6 | 49.4 | 44.4 | 74 | 54 | -24.6 | -9.6 | H |
| 7.386 | 3.0 | 43.4 | 32.3 | 35.6 | 3.3 | -34.6 | 0.0 | 0.6 | 48.4 | 37.3 | 74 | 54 | -25.6 | -16.7 | H |
| 9.848 | 3.0 | 44.1 | 30.8 | 37.6 | 3.7 | -35.1 | 0.0 | 0.8 | 51.2 | 37.9 | 74 | 54 | -22.8 | -16.1 | H |
| 12.310 | 3.0 | 41.6 | 30.1 | 38.5 | 4.4 | -32.4 | 0.0 | 0.9 | 53.0 | 41.5 | 74 | 54 | -21.0 | -12.5 | Noise floor |

No other spurious emissions were detected above 5th harmonics.

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Avg Lim | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Pk Lim | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | Avg Mar | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | Pk Mar | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | | |




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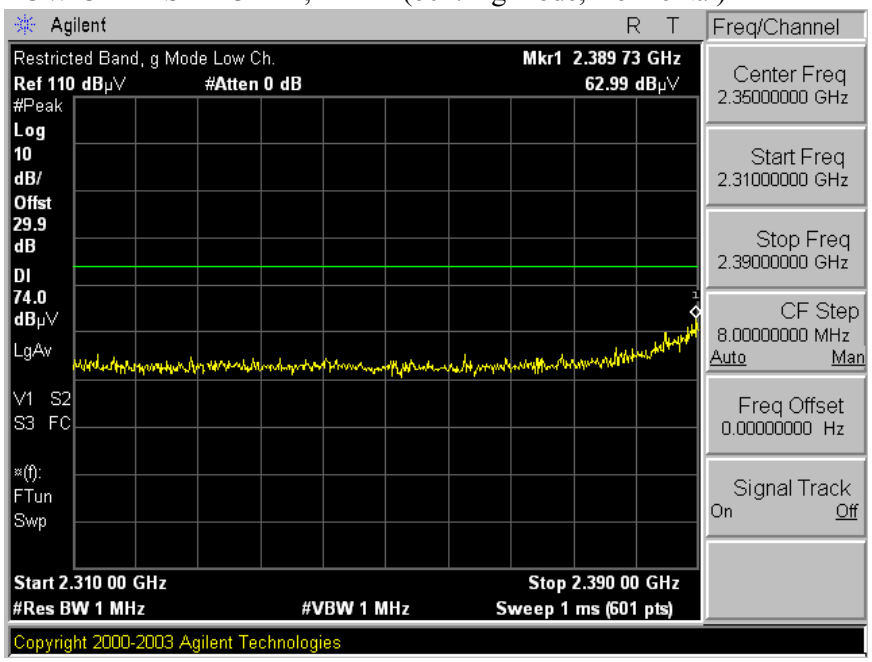
**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)**

LOW CH RESTRICTED, PEAK (802.11g mode, Horizontal)







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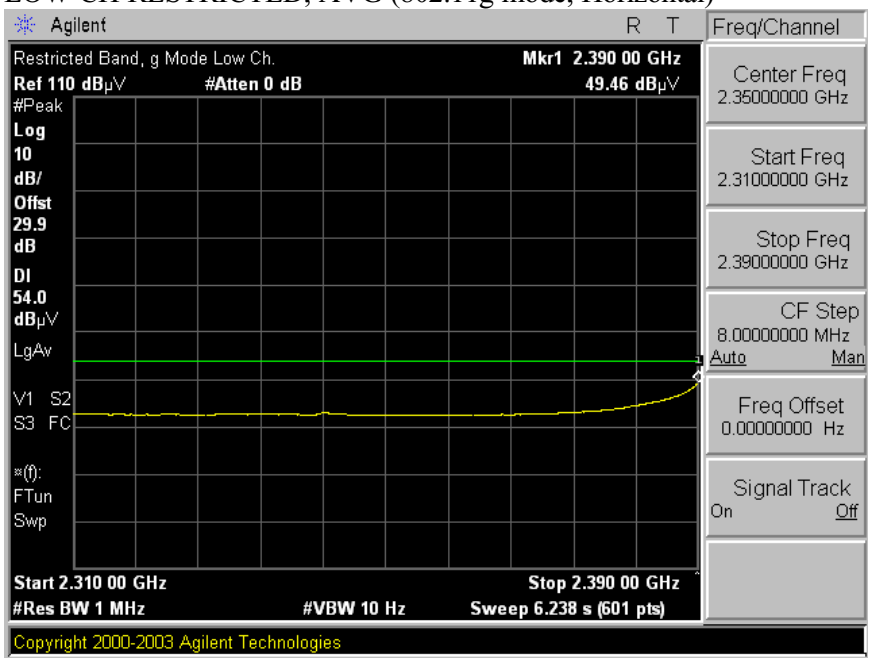
LOW CH RESTRICTED, AVG (802.11g mode, Horizontal)







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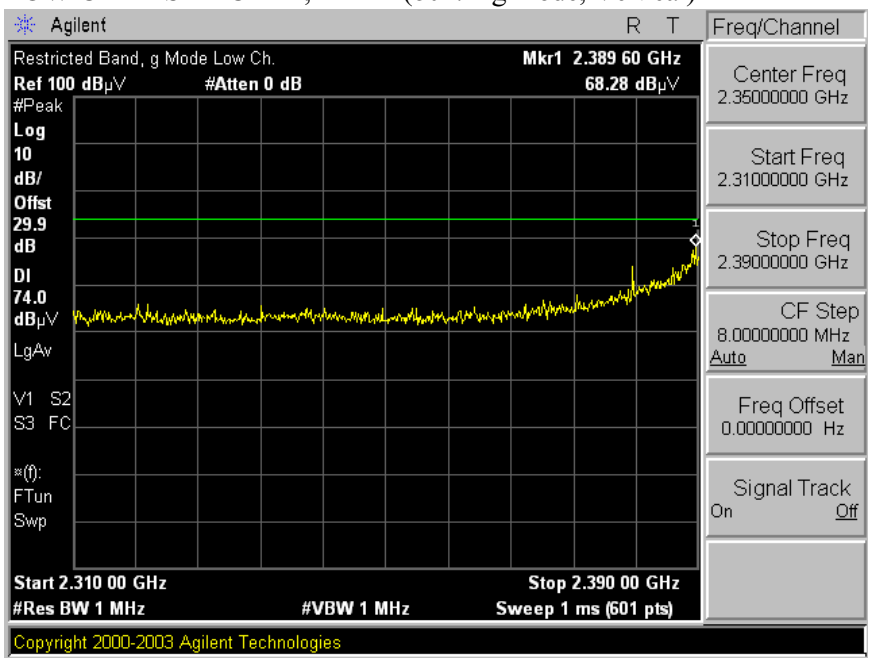
**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)**

LOW CH RESTRICTED, PEAK (802.11g mode, Vertical)







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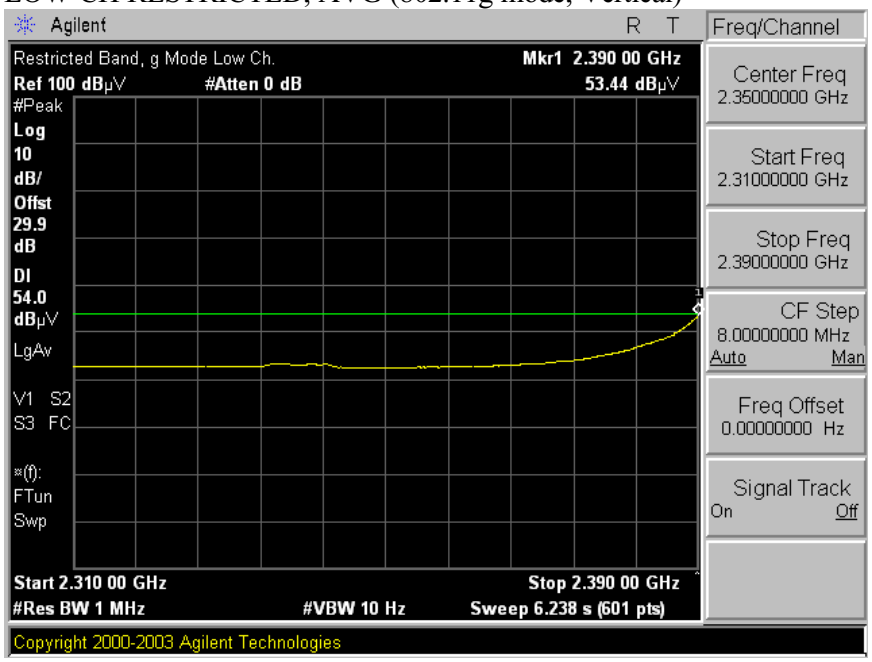
LOW CH RESTRICTED, AVG (802.11g mode, Vertical)







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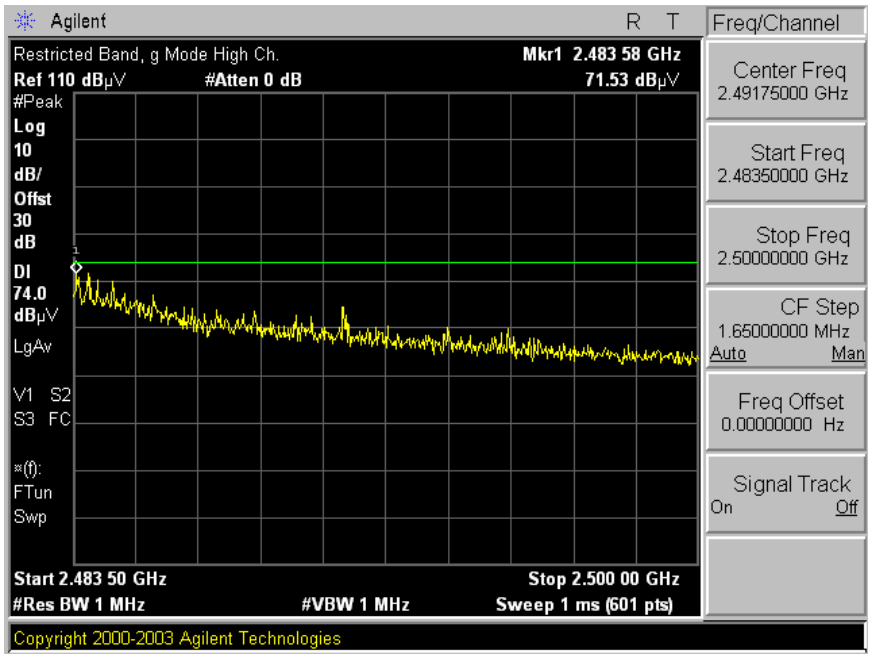
**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)**

HIGH CH RESTRICTED, PEAK (802.11g mode, Horizontal)







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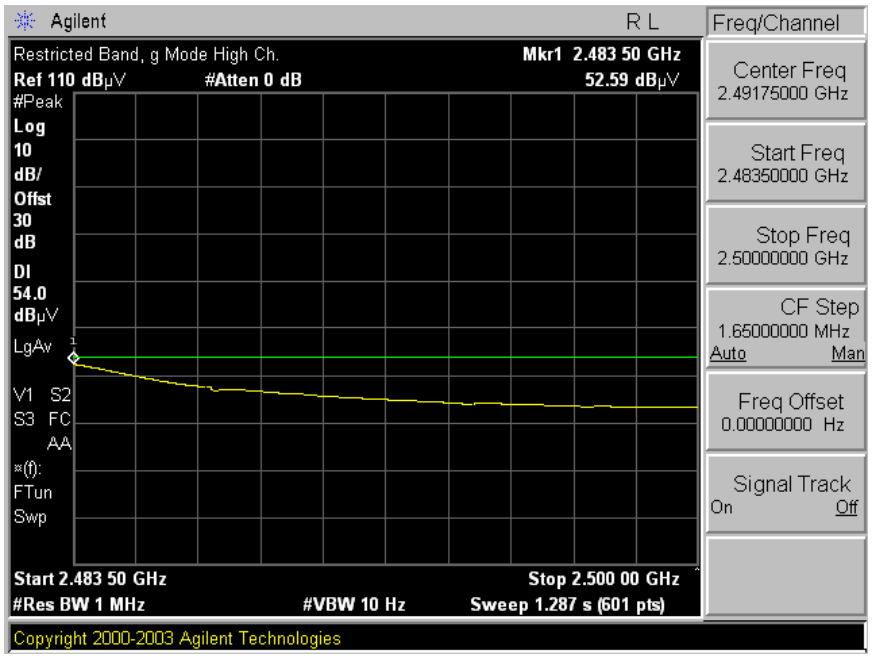
HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)







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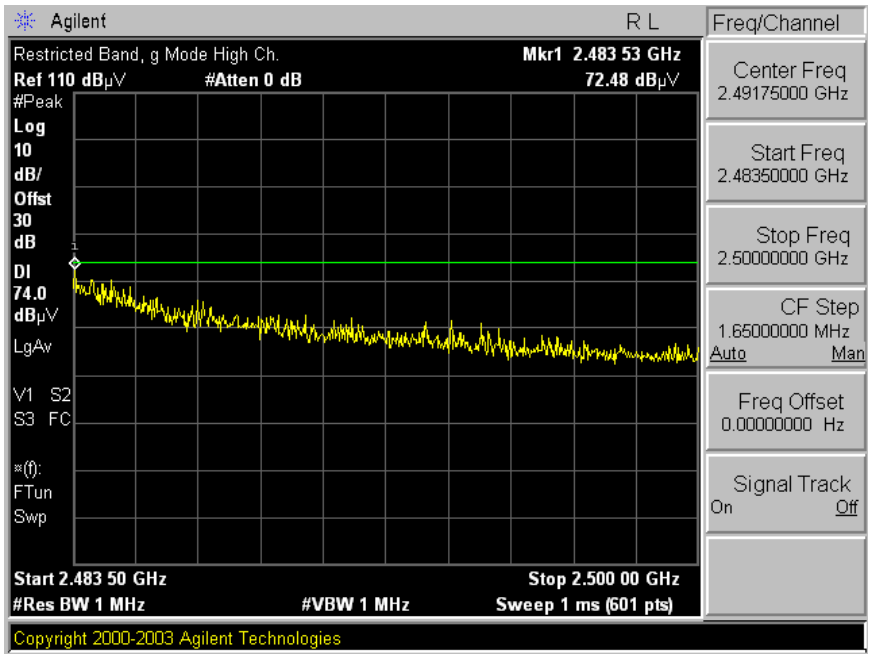
**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)**

HIGH CH RESTRICTED, PEAK (802.11g mode, Vertical)







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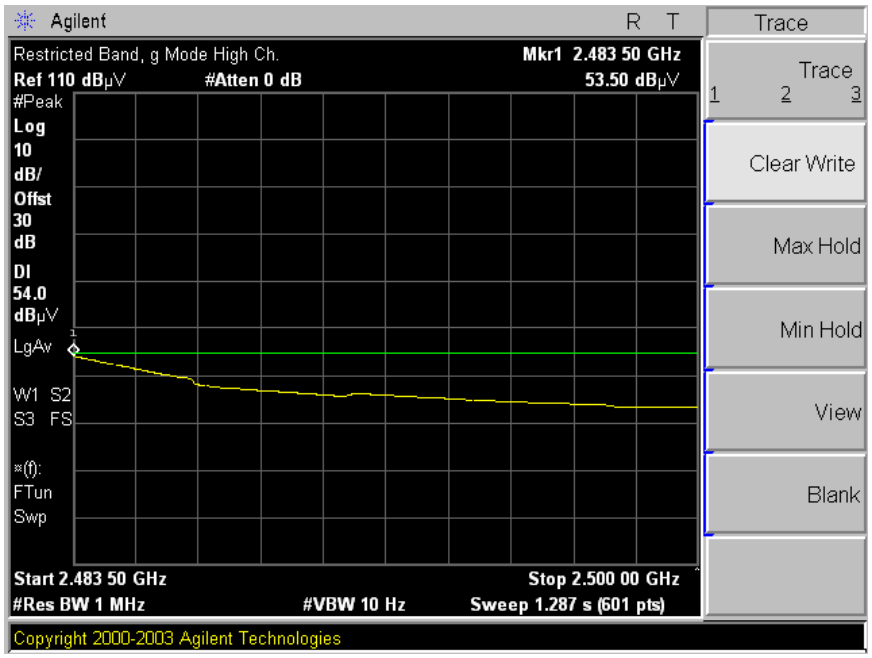
HIGH CH RESTRICTED, AVG (802.11g mode, Vertical)







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## HARMONICS AND SPURIOUS EMISSIONS (g MODE)

04/06/06 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engineer: Thanh Nguyen
Project #: 06U10176-2
Company: HONA R&D Co. LTD
EUT Description: WIRELESS ACCESS POINT
EUT M/N: 70410-QAB
Test Target: FCC Part 15.247
Mode Of Operation: Transmit g mode with Internal Antenna.

Test Equipment:

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T73; S/N: 6717 @3m | T145 Agilent 3008A0056 | | | FCC 15.209 |

Hi Frequency Cables

| 2 foot cable | 3 foot cable | 12 foot cable | HPF | Reject Filter |
|---|---|---|---|---|
| Thanh 177079008 | | Thanh 208946003 | HPF_4.0GHz | |

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Harmonics Spurious | | | | | | | | | | | | | | | |
| Low Ch 2412 MHz | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 50.9 | 37.5 | 33.7 | 2.8 | -34.8 | 0.0 | 0.6 | 53.1 | 39.7 | 74 | 54 | -20.9 | -14.3 | V |
| 7.236 | 3.0 | 52.0 | 39.2 | 35.4 | 3.3 | -34.7 | 0.0 | 0.6 | 56.7 | 43.9 | 74 | 54 | -17.3 | -10.1 | V |
| 9.648 | 3.0 | 44.0 | 31.8 | 37.5 | 3.7 | -35.0 | 0.0 | 0.8 | 50.9 | 38.8 | 74 | 54 | -23.1 | -15.2 | Noise floor |
| 4.824 | 3.0 | 45.2 | 32.9 | 33.7 | 2.8 | -34.8 | 0.0 | 0.6 | 47.4 | 35.2 | 74 | 54 | -26.6 | -18.8 | H |
| 7.236 | 3.0 | 50.0 | 37.3 | 35.4 | 3.3 | -34.7 | 0.0 | 0.6 | 54.7 | 42.0 | 74 | 54 | -19.3 | -12.0 | H |
| 9.648 | 3.0 | 43.8 | 31.9 | 37.5 | 3.7 | -35.0 | 0.0 | 0.8 | 50.8 | 38.8 | 74 | 54 | -23.2 | -15.2 | Noise floor |
| Mid Ch 2437MHz | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 50.0 | 37.9 | 33.8 | 2.8 | -34.9 | 0.0 | 0.6 | 52.3 | 40.2 | 74 | 54 | -21.7 | -13.8 | V |
| 7.311 | 3.0 | 48.6 | 36.0 | 35.5 | 3.3 | -34.7 | 0.0 | 0.6 | 53.4 | 40.8 | 74 | 54 | -20.6 | -13.2 | V |
| 9.748 | 3.0 | 43.0 | 31.2 | 37.5 | 3.7 | -35.0 | 0.0 | 0.8 | 50.1 | 38.2 | 74 | 54 | -23.9 | -15.8 | Noise floor |
| 4.874 | 3.0 | 43.0 | 30.2 | 33.8 | 2.8 | -34.9 | 0.0 | 0.6 | 45.3 | 32.5 | 74 | 54 | -28.7 | -21.5 | H |
| 7.311 | 3.0 | 45.5 | 32.1 | 35.5 | 3.3 | -34.7 | 0.0 | 0.6 | 50.3 | 36.9 | 74 | 54 | -23.7 | -17.1 | H |
| 9.748 | 3.0 | 42.7 | 31.2 | 37.5 | 3.7 | -35.0 | 0.0 | 0.8 | 49.7 | 38.3 | 74 | 54 | -24.3 | -15.7 | Noise floor |
| High Ch 2462MHz | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 50.4 | 38.4 | 33.8 | 2.8 | -34.9 | 0.0 | 0.6 | 52.8 | 40.8 | 74 | 54 | -21.2 | -13.2 | V |
| 7.386 | 3.0 | 46.6 | 33.6 | 35.6 | 3.3 | -34.6 | 0.0 | 0.6 | 51.6 | 38.6 | 74 | 54 | -22.4 | -15.4 | V |
| 9.848 | 3.0 | 42.9 | 31.5 | 37.6 | 3.7 | -35.1 | 0.0 | 0.8 | 50.0 | 38.6 | 74 | 54 | -24.0 | -15.4 | Noise floor |
| 4.924 | 3.0 | 45.3 | 31.3 | 33.8 | 2.8 | -34.9 | 0.0 | 0.6 | 47.7 | 33.7 | 74 | 54 | -26.3 | -20.3 | H |
| 7.386 | 3.0 | 44.4 | 32.7 | 35.6 | 3.3 | -34.6 | 0.0 | 0.6 | 49.3 | 37.6 | 74 | 54 | -24.7 | -16.4 | H |
| 9.848 | 3.0 | 42.3 | 30.7 | 37.6 | 3.7 | -35.1 | 0.0 | 0.8 | 49.4 | 37.8 | 74 | 54 | -24.6 | -16.2 | Noise floor |
| Spurious Emissions | | | | | | | | | | | | | | | |
| 1.000 | 3.0 | 56.06 | 49.58 | 23.8 | 1.3 | -36.2 | 0.0 | 0.0 | 45.0 | 38.5 | 74 | 54 | -29.0 | -15.5 | V |
| 1.103 | 3.0 | 62.13 | 59.47 | 24.2 | 1.3 | -36.1 | 0.0 | 0.0 | 51.6 | 48.9 | 74 | 54 | -22.4 | -5.1 | V |
| 2.241 | 3.0 | 57.51 | 45.62 | 27.9 | 2.0 | -35.2 | 0.0 | 0.0 | 52.1 | 40.2 | 74 | 54 | -21.9 | -13.8 | V |
| 1.200 | 3.0 | 54.28 | 46.69 | 24.5 | 1.4 | -36.0 | 0.0 | 0.0 | 44.2 | 36.6 | 74 | 54 | -29.8 | -17.4 | V |
| 1.099 | 3.0 | 57.42 | 48.08 | 24.2 | 1.3 | -36.1 | 0.0 | 0.0 | 46.8 | 37.5 | 74 | 54 | -27.2 | -16.5 | H |
| No other spurious emissions were detected above 3rd harmonics. | | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Avg Lim | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Pk Lim | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | Avg Mar | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | Pk Mar | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | | |




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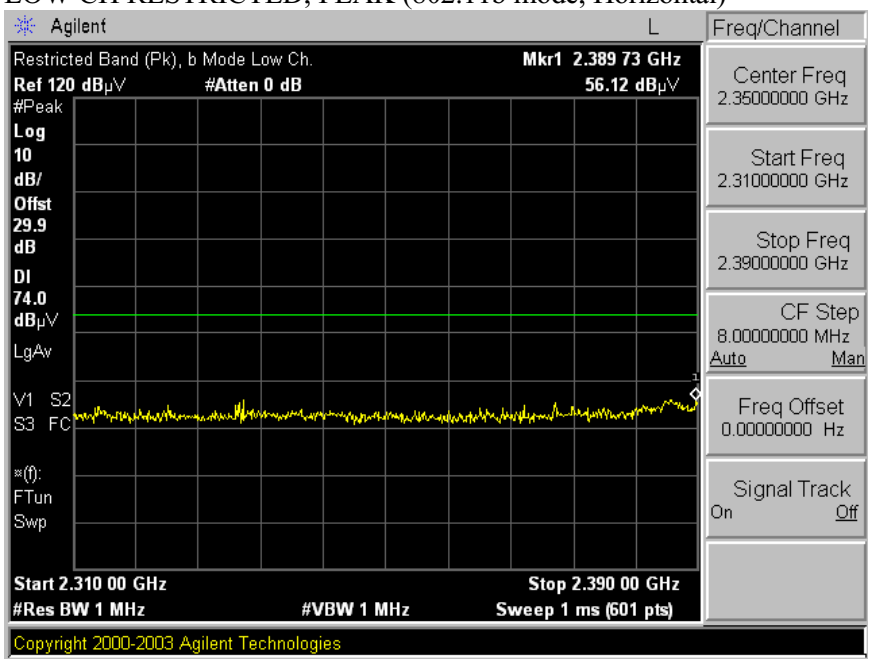
### 7.2.3. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND WITH EXTERNAL ANTENNA

**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)**

LOW CH RESTRICTED, PEAK (802.11b mode, Horizontal)







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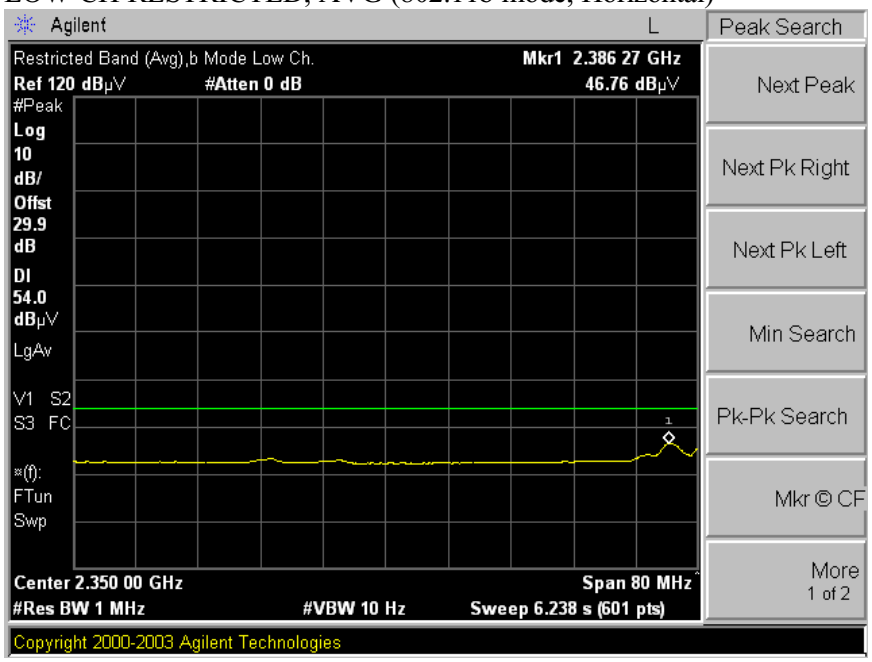
LOW CH RESTRICTED, AVG (802.11b mode, Horizontal)







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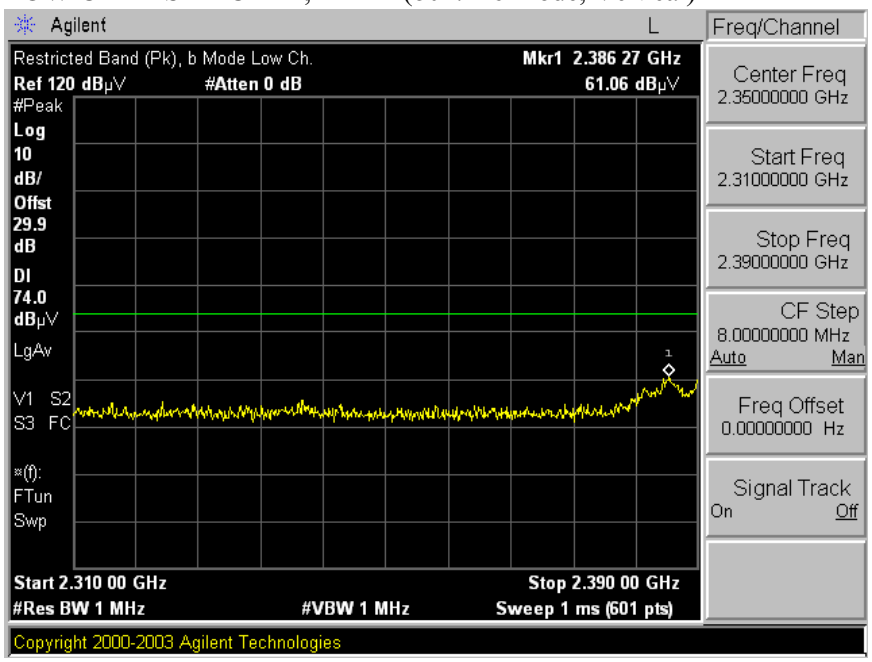
**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)**

LOW CH RESTRICTED, PEAK (802.11b mode, Vertical)







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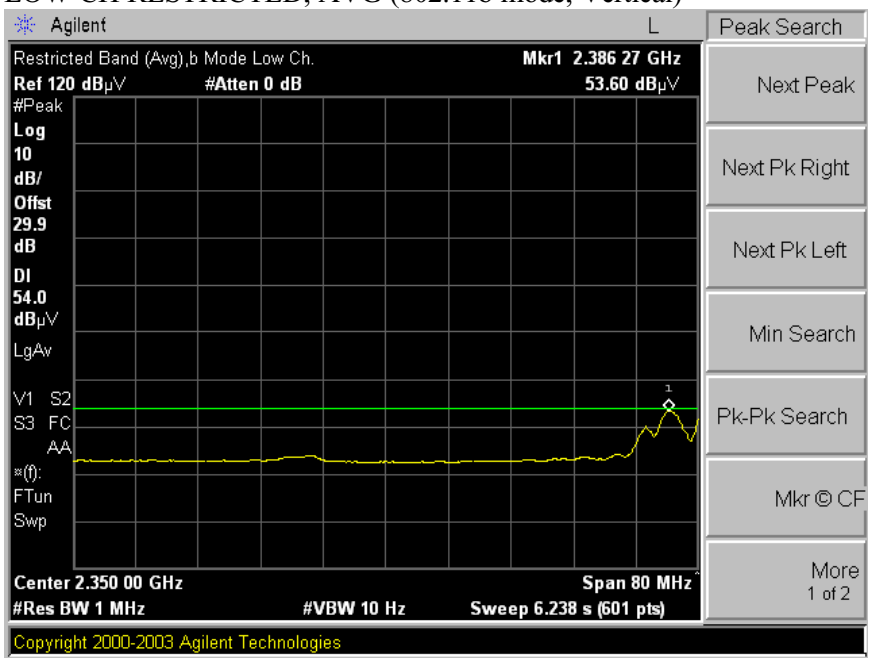
LOW CH RESTRICTED, AVG (802.11b mode, Vertical)







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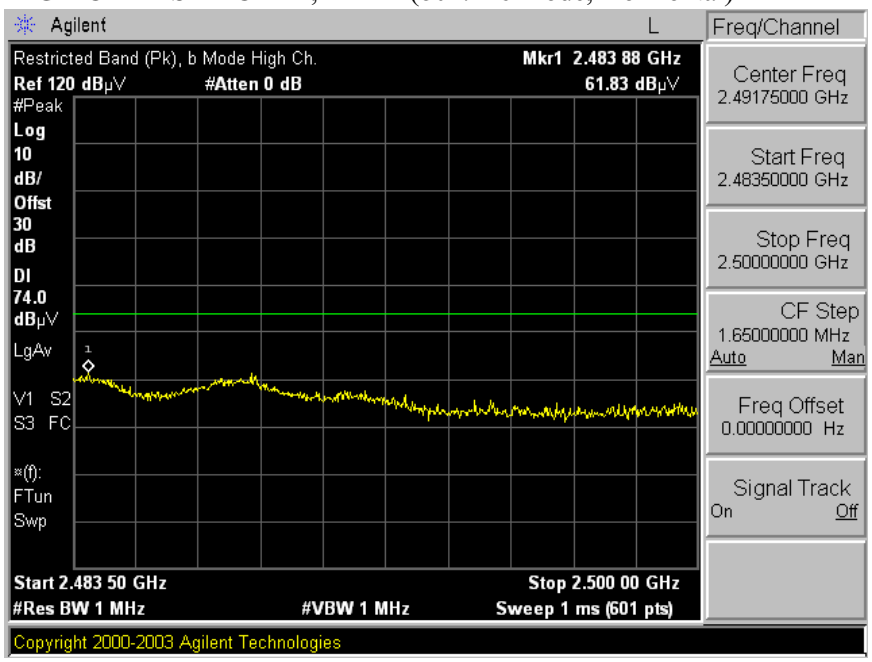
**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)**

HIGH CH RESTRICTED, PEAK (802.11b mode, Horizontal)







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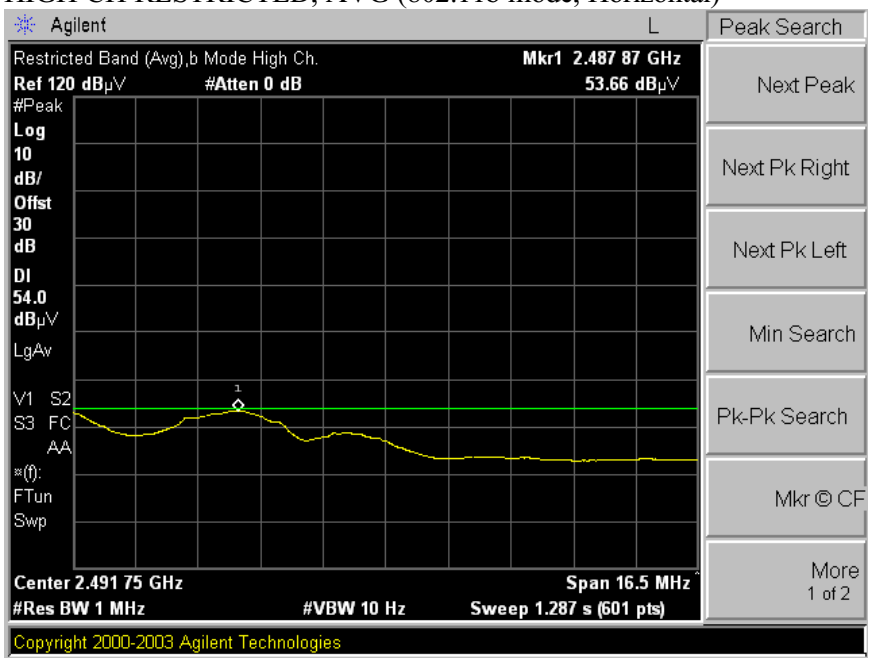
HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)







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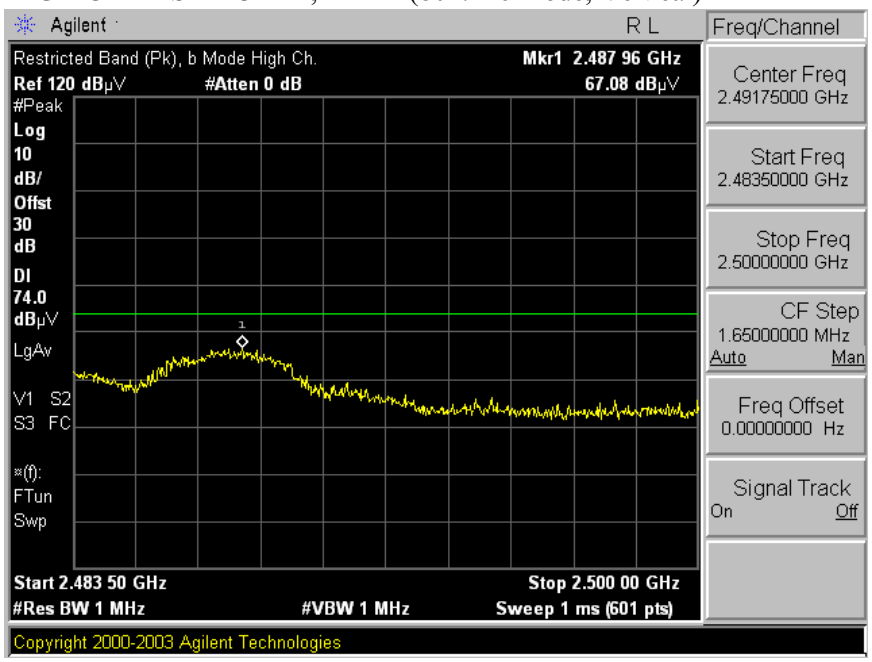
**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)**

HIGH CH RESTRICTED, PEAK (802.11b mode, Vertical)







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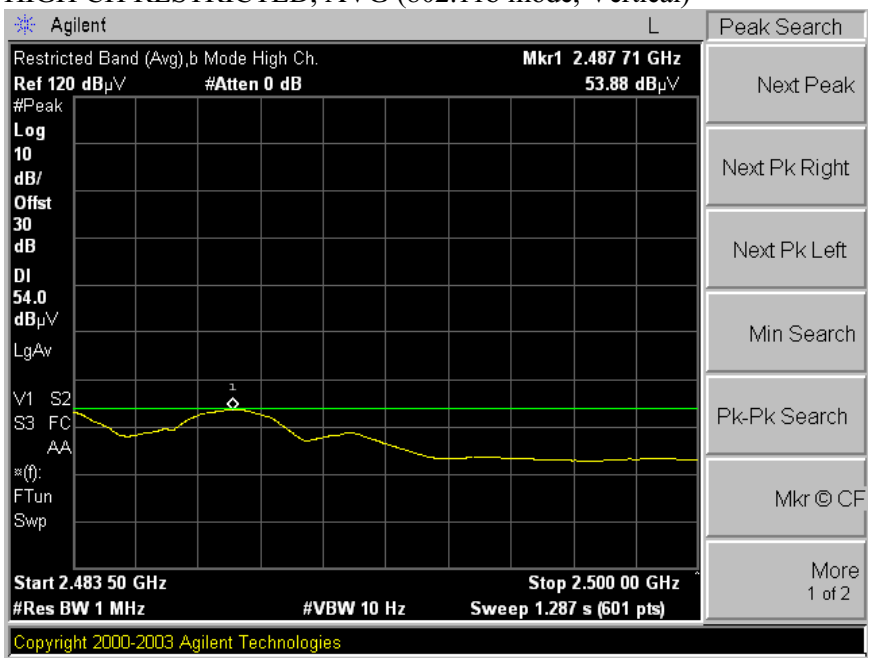
HIGH CH RESTRICTED, AVG (802.11b mode, Vertical)







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## HARMONICS AND SPURIOUS EMISSIONS (b MODE)

04/06/06 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engineer: Thanh Nguyen
Project #: 06U101762-2
Company: HONA R&D Co. LTD
EUT Description: WIRELESS ACCESS POINT
EUT M/N: 70410-QAB
Test Target: FCC Part 15.247
Mode Of Operation: Transmit b mode with Ext.Antenna

Test Equipment:

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T73; S/N: 6717 @3m | T144 Miteq 3008A00931 | | | FCC 15.209 |

Hi Frequency Cables

| 2 foot cable | 3 foot cable | 12 foot cable | HPF | Reject Filter |
|---|---|---|---|---|
| Thanh 177079008 | | Thanh 208946003 | HPF_4.0GHz | |

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Ch 2412 MHz | | | | | | | | | | | | | | | V |
| 4.824 | 3.0 | 53.9 | 52.2 | 33.7 | 2.8 | -36.5 | 0.0 | 0.6 | 54.5 | 52.9 | 74 | 54 | -19.5 | -1.1 | V |
| 7.236 | 3.0 | 46.7 | 36.7 | 35.4 | 3.3 | -36.2 | 0.0 | 0.6 | 49.8 | 39.8 | 74 | 54 | -24.2 | -14.2 | V |
| 9.648 | 3.0 | 45.8 | 37.3 | 37.5 | 3.7 | -37.0 | 0.0 | 0.8 | 50.8 | 42.3 | 74 | 54 | -23.2 | -11.7 | V |
| 12.060 | 3.0 | 44.2 | 31.8 | 38.5 | 4.3 | -35.4 | 0.0 | 0.9 | 52.5 | 40.1 | 74 | 54 | -21.5 | -13.9 | Noise floor |
| 4.824 | 3.0 | 54.9 | 52.5 | 33.7 | 2.8 | -36.5 | 0.0 | 0.6 | 55.5 | 53.1 | 74 | 54 | -18.5 | -0.9 | H |
| 7.236 | 3.0 | 46.6 | 37.1 | 35.4 | 3.3 | -36.2 | 0.0 | 0.6 | 49.7 | 40.2 | 74 | 54 | -24.3 | -13.8 | H |
| 9.648 | 3.0 | 44.2 | 32.5 | 37.5 | 3.7 | -37.0 | 0.0 | 0.8 | 49.2 | 37.5 | 74 | 54 | -24.8 | -16.5 | Noise floor |
| 12.060 | 3.0 | 44.8 | 32.9 | 38.5 | 4.3 | -35.4 | 0.0 | 0.9 | 53.1 | 41.2 | 74 | 54 | -20.9 | -12.8 | Noise floor |
| Mid Cha 2437MHz | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 54.2 | 51.7 | 33.8 | 2.8 | -36.5 | 0.0 | 0.6 | 55.0 | 52.5 | 74 | 54 | -19.0 | -1.5 | H |
| 7.311 | 3.0 | 46.9 | 33.9 | 35.5 | 3.3 | -36.2 | 0.0 | 0.6 | 50.1 | 37.1 | 74 | 54 | -23.9 | -16.9 | H |
| 9.748 | 3.0 | 45.8 | 37.4 | 37.5 | 3.7 | -37.0 | 0.0 | 0.8 | 50.8 | 42.5 | 74 | 54 | -23.2 | -11.5 | H |
| 12.185 | 3.0 | 45.2 | 34.6 | 38.5 | 4.3 | -35.4 | 0.0 | 0.9 | 53.5 | 43.0 | 74 | 54 | -20.5 | -11.0 | Noise floor |
| 14.622 | 3.0 | 45.8 | 35.2 | 40.2 | 4.6 | -35.3 | 0.0 | 0.9 | 56.1 | 45.6 | 74 | 54 | -17.9 | -8.4 | Noise floor |
| 4.874 | 3.0 | 51.9 | 48.6 | 33.8 | 2.8 | -36.5 | 0.0 | 0.6 | 52.6 | 49.3 | 74 | 54 | -21.4 | -4.7 | V |
| 7.311 | 3.0 | 45.8 | 33.1 | 35.5 | 3.3 | -36.2 | 0.0 | 0.6 | 49.1 | 36.3 | 74 | 54 | -24.9 | -17.7 | V |
| 9.748 | 3.0 | 45.8 | 36.2 | 37.5 | 3.7 | -37.0 | 0.0 | 0.8 | 50.9 | 41.3 | 74 | 54 | -23.1 | -12.7 | V |
| 12.185 | 3.0 | 44.1 | 31.7 | 38.5 | 4.3 | -35.4 | 0.0 | 0.9 | 52.5 | 40.0 | 74 | 54 | -21.5 | -14.0 | Noise floor |
| 14.622 | 3.0 | 45.6 | 31.5 | 40.2 | 4.6 | -35.3 | 0.0 | 0.9 | 56.0 | 41.9 | 74 | 54 | -18.0 | -12.1 | Noise floor |
| High Ch 2462MHz | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 53.6 | 51.3 | 33.8 | 2.8 | -36.5 | 0.0 | 0.6 | 54.4 | 52.1 | 74 | 54 | -19.6 | -1.9 | V |
| 7.386 | 3.0 | 51.3 | 41.6 | 35.6 | 3.3 | -36.2 | 0.0 | 0.6 | 54.7 | 45.0 | 74 | 54 | -19.3 | -9.0 | V |
| 9.848 | 3.0 | 46.8 | 39.9 | 37.6 | 3.7 | -37.0 | 0.0 | 0.8 | 52.0 | 45.0 | 74 | 54 | -22.0 | -9.0 | V |
| 12.310 | 3.0 | 43.7 | 31.9 | 38.5 | 4.4 | -35.4 | 0.0 | 0.9 | 52.0 | 40.2 | 74 | 54 | -22.0 | -13.8 | Noise floor |
| 4.924 | 3.0 | 55.1 | 53.1 | 33.8 | 2.8 | -36.5 | 0.0 | 0.6 | 55.9 | 53.9 | 74 | 54 | -18.1 | -0.1 | H |
| 7.386 | 3.0 | 42.4 | 30.4 | 35.6 | 3.3 | -36.2 | 0.0 | 0.6 | 45.7 | 33.8 | 74 | 54 | -28.3 | -20.2 | Noise floor |

No other spurious emissions were detected above 5th harmonics.

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Avg Lim | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Pk Lim | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | Avg Mar | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | Pk Mar | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | | |




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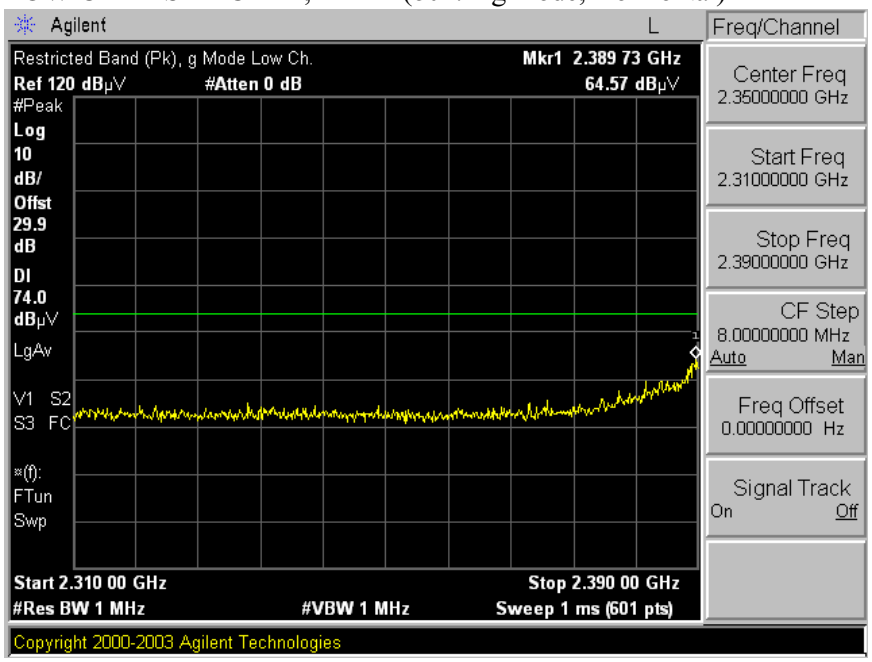
**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)**

LOW CH RESTRICTED, PEAK (802.11g mode, Horizontal)







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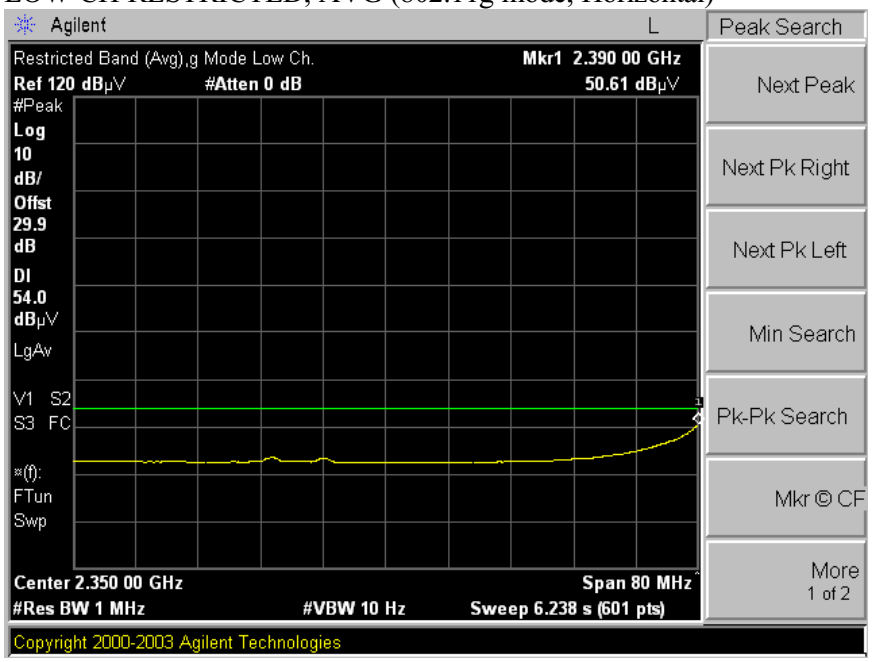
LOW CH RESTRICTED, AVG (802.11g mode, Horizontal)







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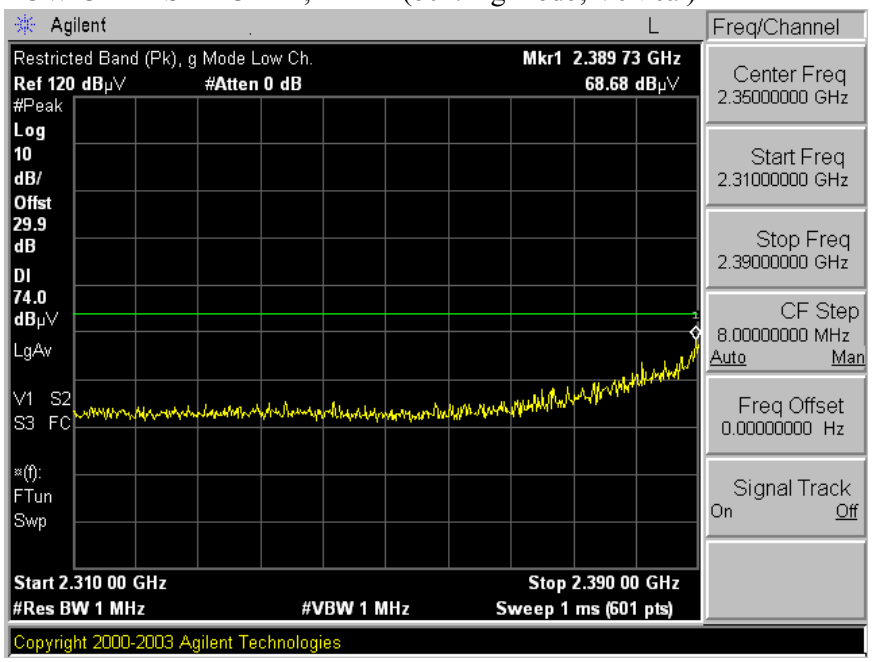
**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)**

LOW CH RESTRICTED, PEAK (802.11g mode, Vertical)







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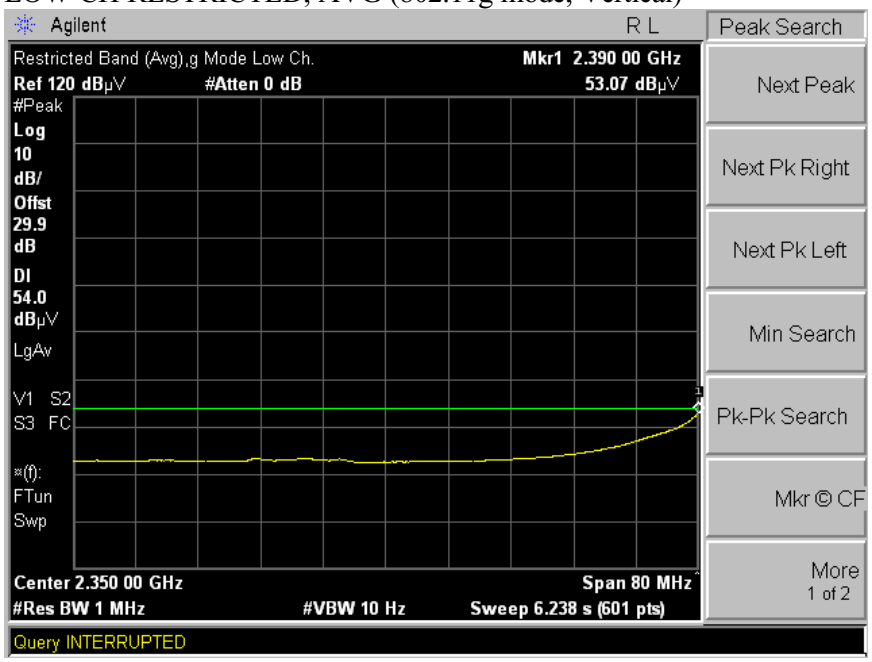
LOW CH RESTRICTED, AVG (802.11g mode, Vertical)







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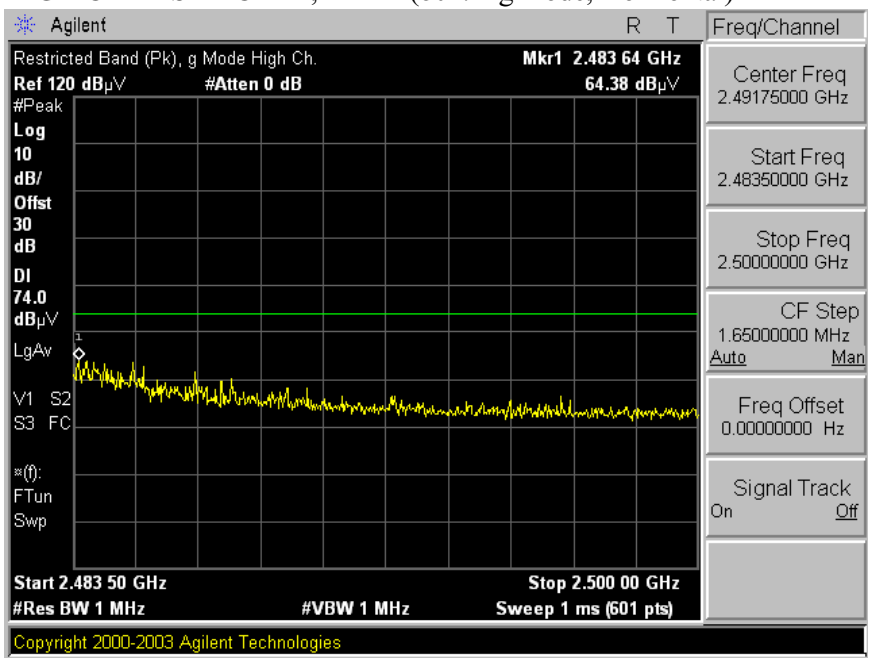
**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)**

HIGH CH RESTRICTED, PEAK (802.11g mode, Horizontal)







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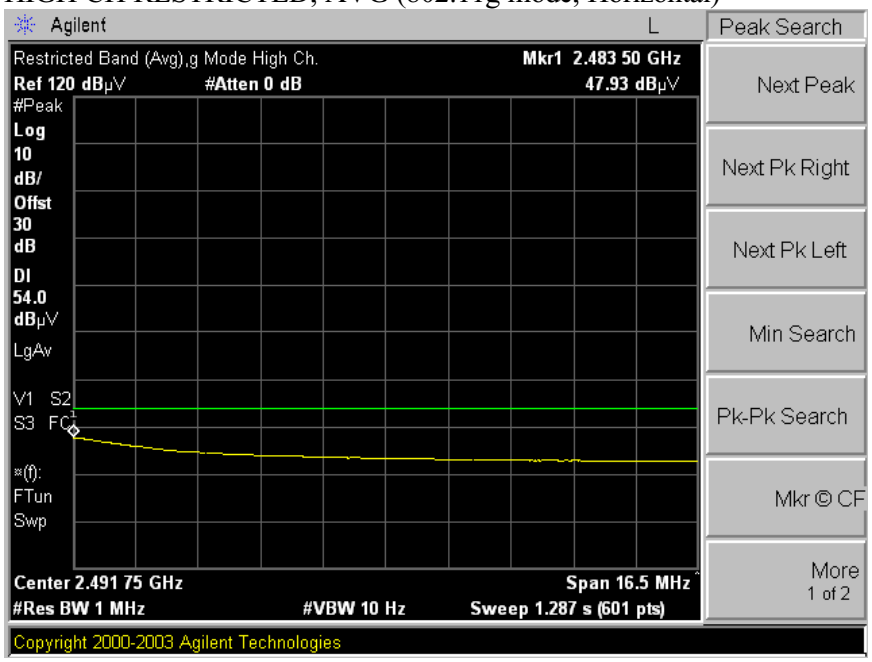
HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)







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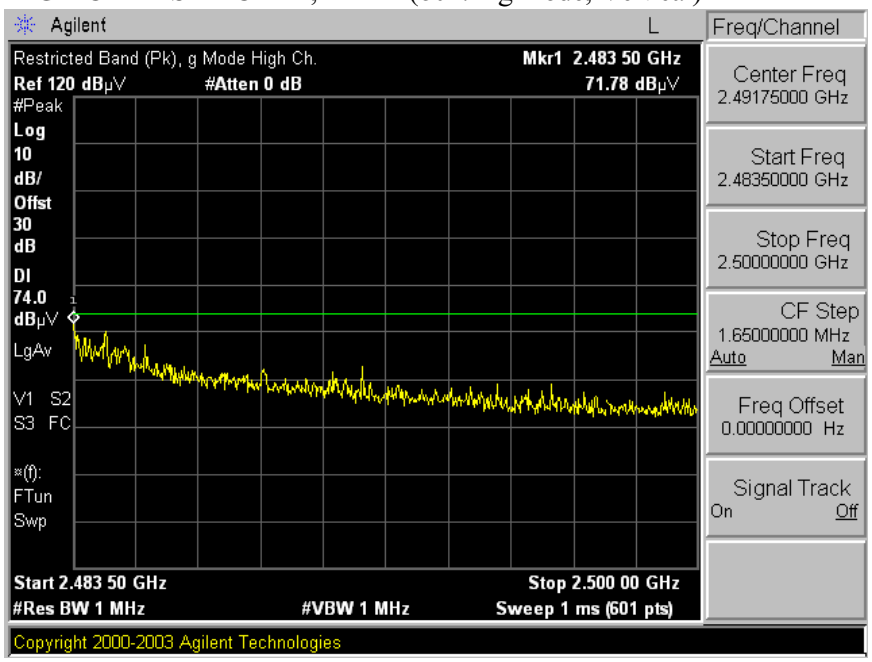
**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)**

HIGH CH RESTRICTED, PEAK (802.11g mode, Vertical)







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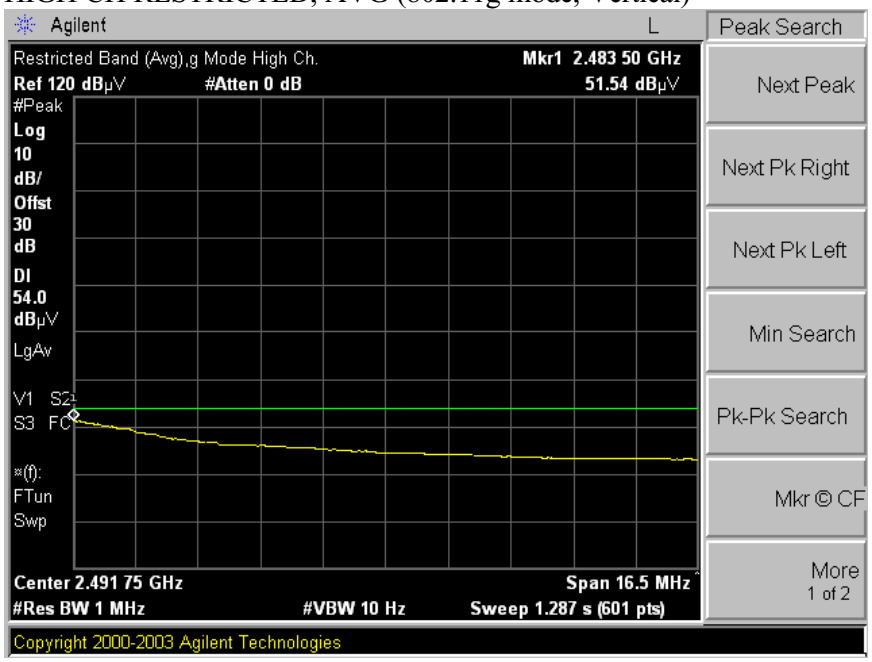
HIGH CH RESTRICTED, AVG (802.11g mode, Vertical)







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## HARMONICS AND SPURIOUS EMISSIONS (g MODE)

04/06/06 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engineer: Thanh Nguyen
Project #: 06U101762-2
Company: HONA R&D Co. LTD
EUT Description: WIRELESS ACCESS POINT
EUT M/N: 70410-QAB
Test Target: FCC Part 15.247
Mode Of Operation: Transmit g mode with External Antenna

Test Equipment:

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T73; S/N: 6717 @3m | T144 Miteq 3008A00931 | | | FCC 15.209 |

Hi Frequency Cables

| 2 foot cable | 3 foot cable | 12 foot cable | HPF | Reject Filter |
|---|---|---|---|---|
| Thanh 177079008 | | Thanh 208946003 | HPF_4.0GHz | |

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Ch 2412 MHz | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 49.9 | 36.7 | 33.7 | 2.8 | -36.5 | 0.0 | 0.6 | 50.5 | 37.3 | 74 | 54 | -23.5 | -16.7 | V |
| 7.236 | 3.0 | 53.8 | 39.1 | 35.4 | 3.3 | -36.2 | 0.0 | 0.6 | 56.9 | 42.3 | 74 | 54 | -17.1 | -11.7 | V |
| 9.648 | 3.0 | 45.1 | 33.6 | 37.5 | 3.7 | -37.0 | 0.0 | 0.8 | 50.1 | 38.7 | 74 | 54 | -23.9 | -15.3 | Noise floor |
| 4.824 | 3.0 | 46.0 | 33.8 | 33.7 | 2.8 | -36.5 | 0.0 | 0.6 | 46.6 | 34.4 | 74 | 54 | -27.4 | -19.6 | H |
| 7.236 | 3.0 | 46.8 | 34.5 | 35.4 | 3.3 | -36.2 | 0.0 | 0.6 | 49.9 | 37.6 | 74 | 54 | -24.1 | -16.4 | H |
| 9.648 | 3.0 | 45.2 | 33.3 | 37.5 | 3.7 | -37.0 | 0.0 | 0.8 | 50.2 | 38.3 | 74 | 54 | -23.8 | -15.7 | Noise floor |
| Mid Ch 2437MHz | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 48.3 | 35.4 | 33.8 | 2.8 | -36.5 | 0.0 | 0.6 | 49.0 | 36.1 | 74 | 54 | -25.0 | -17.9 | V |
| 7.311 | 3.0 | 50.9 | 35.6 | 35.5 | 3.3 | -36.2 | 0.0 | 0.6 | 54.1 | 38.8 | 74 | 54 | -19.9 | -15.2 | V |
| 9.748 | 3.0 | 47.0 | 33.8 | 37.5 | 3.7 | -37.0 | 0.0 | 0.8 | 52.1 | 38.9 | 74 | 54 | -21.9 | -15.1 | Noise floor |
| 4.874 | 3.0 | 46.7 | 33.6 | 33.8 | 2.8 | -36.5 | 0.0 | 0.6 | 47.4 | 34.3 | 74 | 54 | -26.6 | -19.7 | H |
| 7.311 | 3.0 | 46.3 | 33.5 | 35.5 | 3.3 | -36.2 | 0.0 | 0.6 | 49.5 | 36.8 | 74 | 54 | -24.5 | -17.2 | H |
| 9.748 | 3.0 | 48.9 | 35.7 | 37.5 | 3.7 | -37.0 | 0.0 | 0.8 | 53.9 | 40.7 | 74 | 54 | -20.1 | -13.3 | Noise floor |
| High Ch 2462MHz | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 49.0 | 36.8 | 33.8 | 2.8 | -36.5 | 0.0 | 0.6 | 49.8 | 37.6 | 74 | 54 | -24.2 | -16.4 | V |
| 7.386 | 3.0 | 50.3 | 34.4 | 35.6 | 3.3 | -36.2 | 0.0 | 0.6 | 53.7 | 37.8 | 74 | 54 | -20.3 | -16.2 | V |
| 9.848 | 3.0 | 44.5 | 32.2 | 37.6 | 3.7 | -37.0 | 0.0 | 0.8 | 49.6 | 37.3 | 74 | 54 | -24.4 | -16.7 | Noise floor |
| 4.924 | 3.0 | 44.5 | 33.8 | 33.8 | 2.8 | -36.5 | 0.0 | 0.6 | 45.3 | 34.6 | 74 | 54 | -28.7 | -19.4 | H |
| 7.386 | 3.0 | 44.9 | 30.6 | 35.6 | 3.3 | -36.2 | 0.0 | 0.6 | 48.2 | 33.9 | 74 | 54 | -25.8 | -20.1 | H |
| 9.848 | 3.0 | 43.5 | 32.2 | 37.6 | 3.7 | -37.0 | 0.0 | 0.8 | 48.7 | 37.3 | 74 | 54 | -25.3 | -16.7 | Noise floor |
| No other spurious emissions were detected above 3rd harmonics. | | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Avg Lim | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Pk Lim | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | Avg Mar | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | Pk Mar | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | | |




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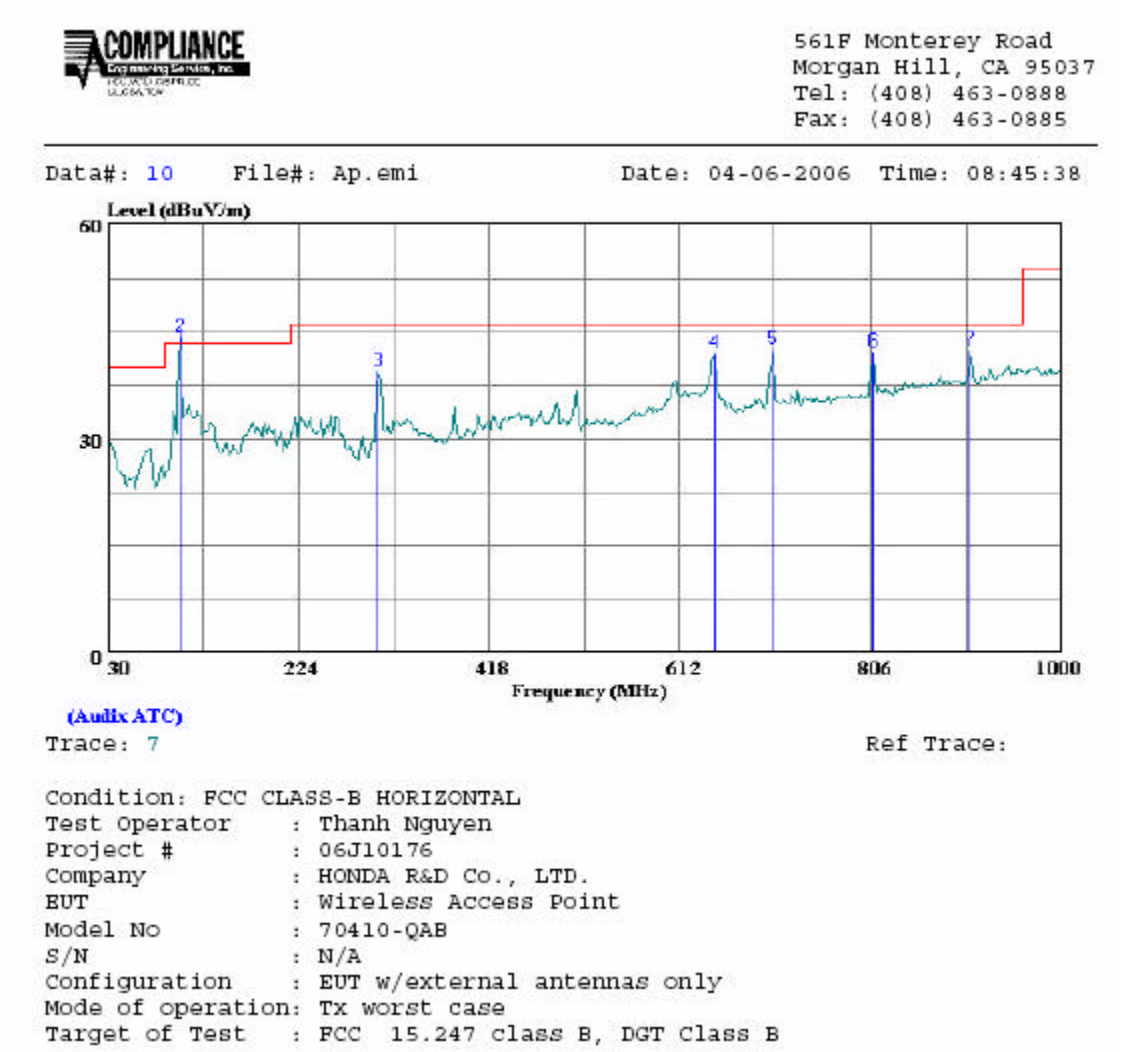
## 7.2.4. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT





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HORIZONTAL DATA

| | | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | |
| 1 | | 104.690 | 30.40 | 12.38 | 42.78 | 43.50 | -0.72 | QP |
| 2 | * | 104.690 | 31.94 | 12.38 | 44.32 | 43.50 | 0.82 | Peak |
| 3 | | 305.480 | 23.70 | 15.80 | 39.50 | 46.00 | -6.50 | Peak |
| 4 | | 647.890 | 19.56 | 22.29 | 41.85 | 46.00 | -4.15 | Peak |
| 5 | | 708.030 | 19.41 | 23.23 | 42.64 | 46.00 | -3.36 | Peak |
| 6 | | 807.940 | 17.39 | 24.69 | 42.08 | 46.00 | -3.92 | Peak |
| 7 | | 906.880 | 16.41 | 26.01 | 42.42 | 46.00 | -3.58 | Peak |




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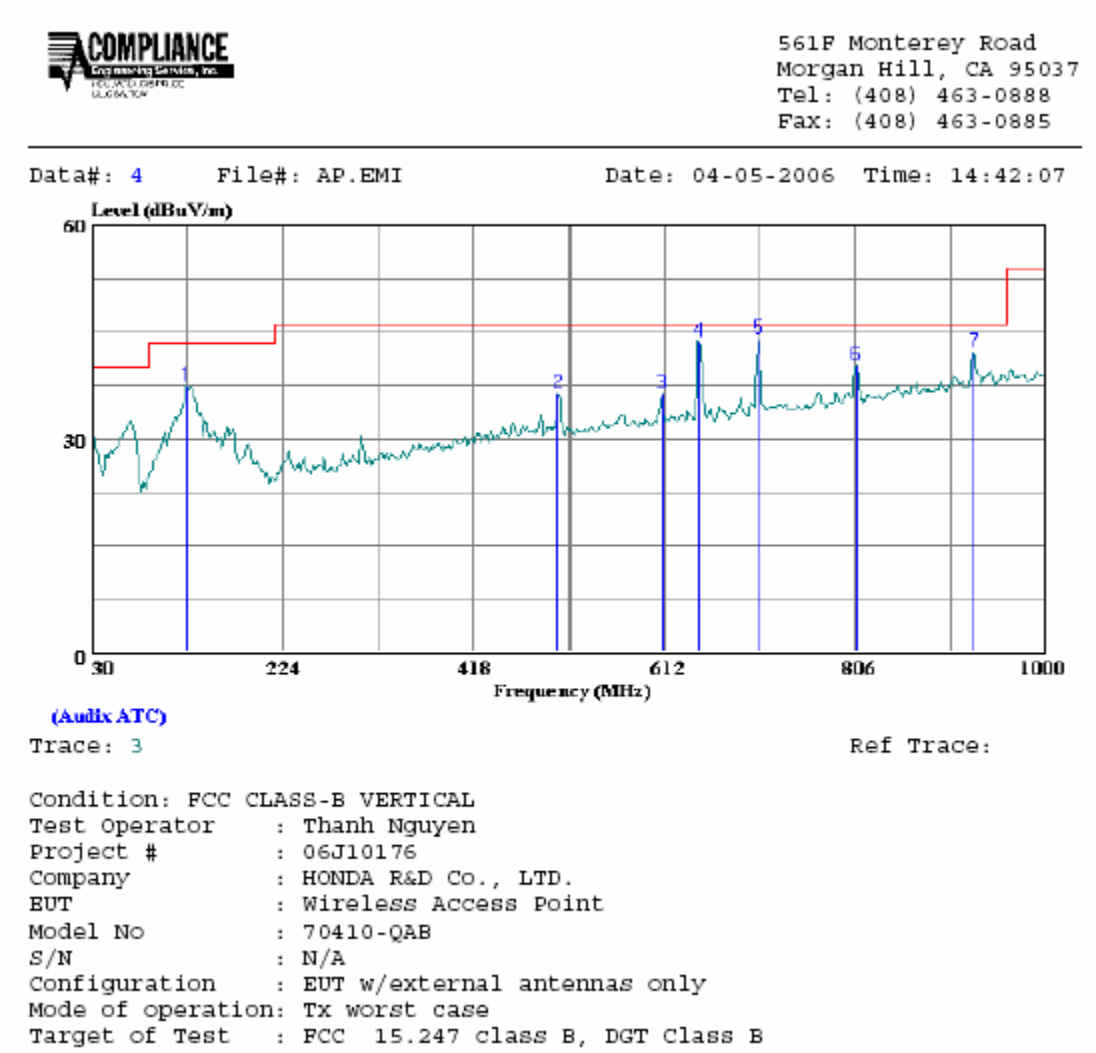
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**

VERTICAL PLOT





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VERTICAL DATA

| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | |
| 1 | 127.000 | 22.11 | 15.22 | 37.34 | 43.50 | -6.16 | Peak |
| 2 | 504.330 | 16.17 | 20.26 | 36.43 | 46.00 | -9.57 | Peak |
| 3 | 609.090 | 14.62 | 21.66 | 36.28 | 46.00 | -9.72 | Peak |
| 4 | 645.950 | 21.28 | 22.25 | 43.53 | 46.00 | -2.47 | Peak |
| 5 | 708.030 | 20.80 | 23.23 | 44.03 | 46.00 | -1.97 | Peak |
| 6 | 806.970 | 15.67 | 24.66 | 40.33 | 46.00 | -5.67 | Peak |
| 7 | 926.280 | 15.99 | 26.23 | 42.22 | 46.00 | -3.78 | Peak |




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## 7.3. POWERLINE CONDUCTED EMISSIONS

**LIMIT**

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (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 the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency.

**TEST PROCEDURE**

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

**RESULTS**

No non-compliance noted:




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## 6 WORST EMISSIONS

| CONDUCTED EMISSIONS DATA (115VAC 60Hz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq. | Reading | | | Closs | Limit | EN_B | Margin | | Remark |
| (MHz) | PK (dBuV) | QP (dBuV) | AV (dBuV) | (dB) | QP | AV | QP (dB) | AV (dB) | L1 / L2 |
| 0.21 | 50.72 | -- | -- | 0.00 | 63.41 | 53.41 | -12.69 | -2.69 | L1 |
| 2.69 | 37.16 | -- | -- | 0.00 | 56.00 | 46.00 | -18.84 | -8.84 | L1 |
| 12.12 | 41.00 | -- | -- | 0.00 | 60.00 | 50.00 | -19.00 | -9.00 | L1 |
| 0.20 | 52.76 | -- | -- | 0.00 | 63.45 | 53.45 | -10.69 | -0.69 | L2 |
| 2.46 | 38.36 | -- | -- | 0.00 | 56.00 | 46.00 | -17.64 | -7.64 | L2 |
| 12.38 | 41.26 | -- | -- | 0.00 | 60.00 | 50.00 | -18.74 | -8.74 | L2 |
| 6 Worst Data | | | | | | | | | |




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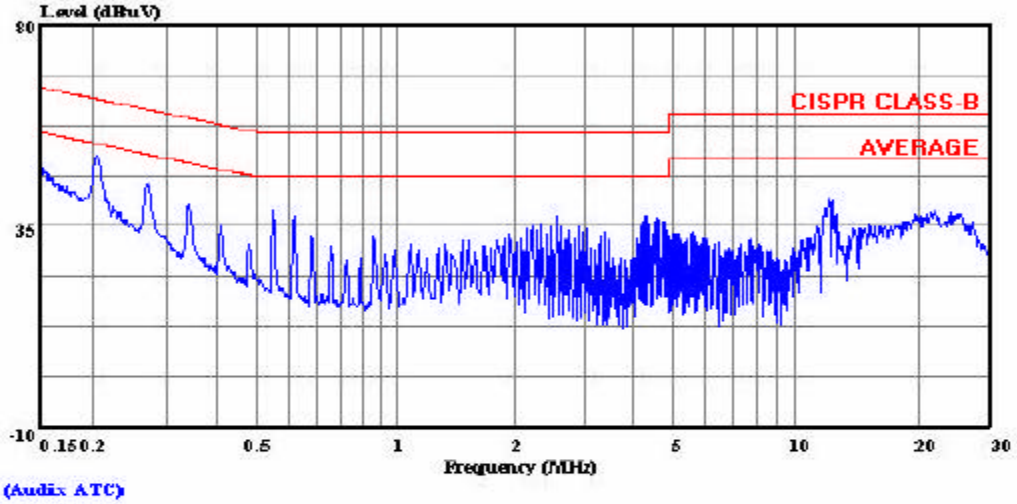
**LINE 1 RESULTS**

Compliance Certification Services
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 32 File#: 176 fcc.emi Date: 04-15-2006 Time: 10:38:26




Trace: Ref Trace:

Condition: CISPR CLASS-B
Test Operator : Thanh Nguyen
Project # : 06U10176-1
Company : HONDA R&D
EUT Description : Wireless Access Point
Model : 70410-QAB
EUT Config : EUT connect to remote support Laptop
Mode Of Operation: TX worst case
Target : FCC CLASS B
Power Source : 115VAC, 60 Hz
: Line 1: Peak(Blue)

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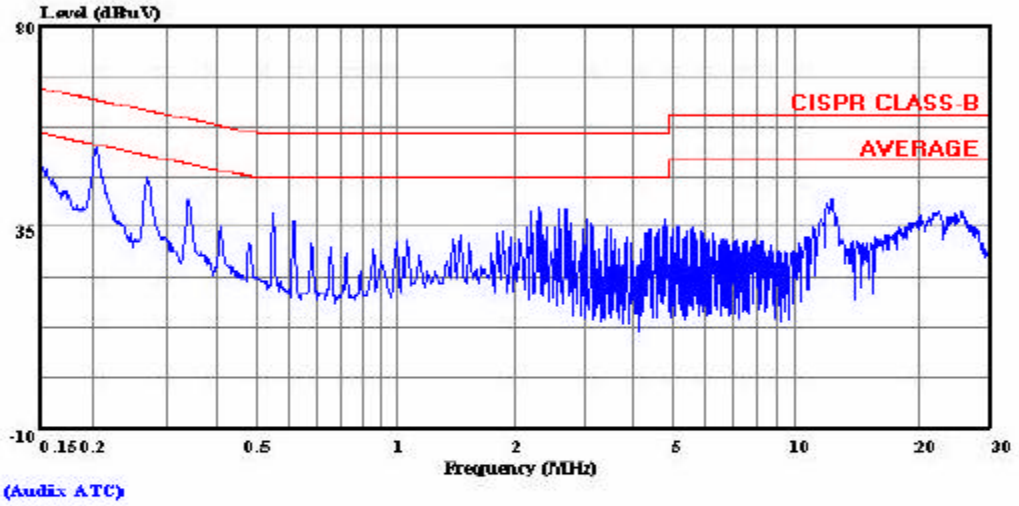
**LINE 2 RESULTS**

Compliance Certification Services
561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 17 File#: 176 fcc.emi Date: 04-15-2006 Time: 10:00:33




Trace: Ref Trace:

Condition: CISPR CLASS-B
Test Operator : Thanh Nguyen
Project # : 06U10176-1
Company : HONDA R&D
EUT Description : Wireless Access Point
Model : 70410-QAB
EUT Config : EUT connect to remote support Laptop
Mode Of Operation: TX worst case
Target : FCC CLASS B
Power Source : 115VAC, 60 Hz
: Line 2: Peak(Blue)

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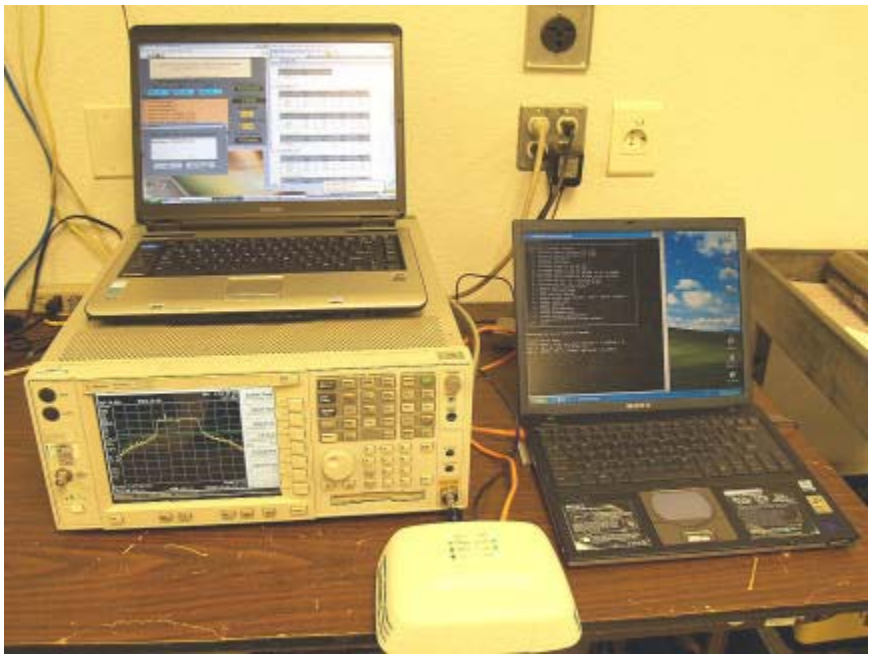
# 8. SETUP PHOTOS

**ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP**

ANTENNA PORT CONDUCTED PHOTO



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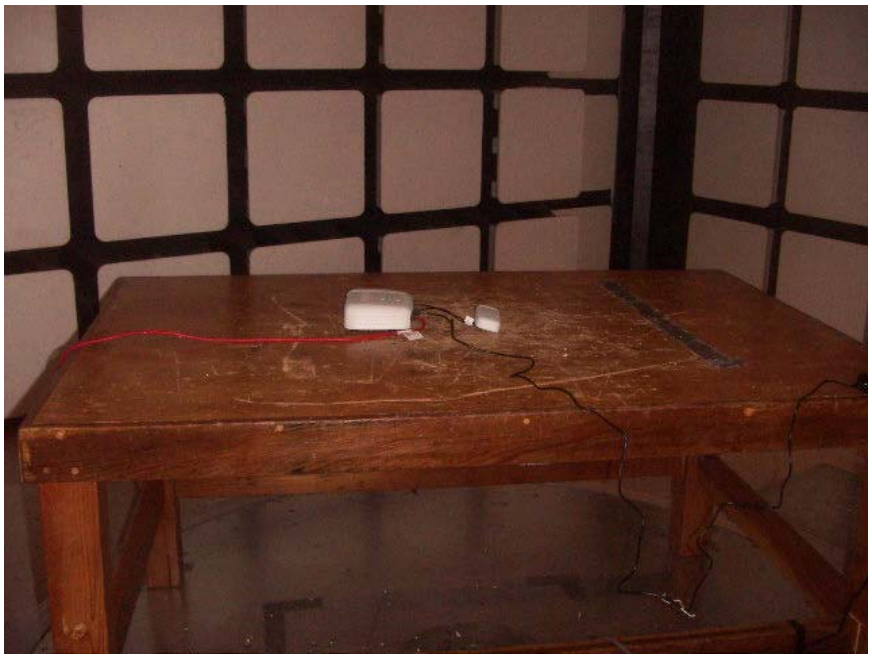
**RADIATED RF MEASUREMENT SETUP**

RADIATED FRONT PHOTO



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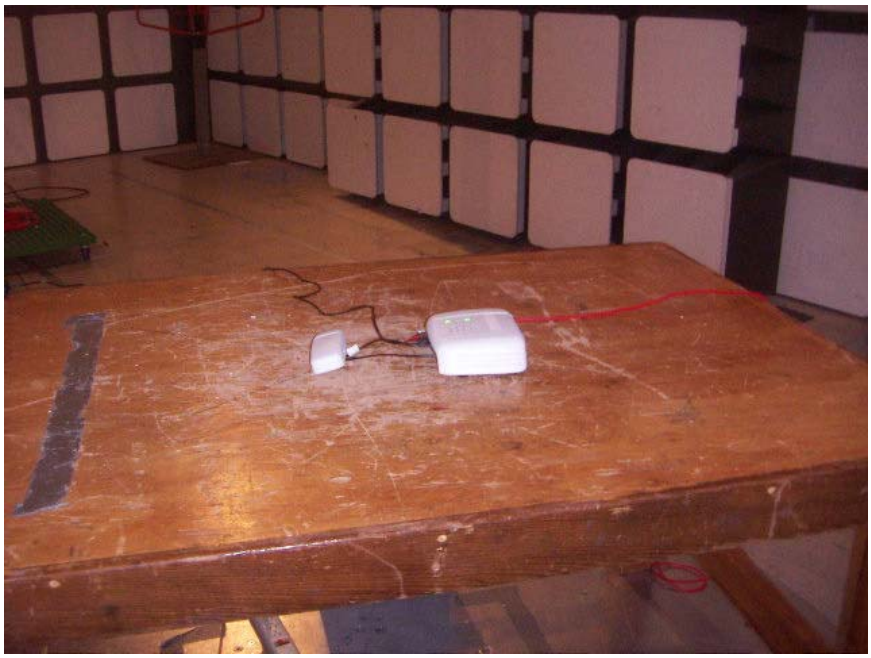
RADIATED BACK PHOTO



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**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP**

LINE CONDUCTED FRONT PHOTO

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LINE CONDUCTED BACK PHOTO

# END OF REPORT




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