



FCC TEST REPORT (15.407)

REPORT NO.: RF110328E01-1

MODEL NO.: Pismo 315, Surf series, AP series,
Mesh Connector series, MAX series

FCC ID: U8G-P1213

RECEIVED: Mar. 28, 2011

TESTED: Apr. 12 to 20, 2011

ISSUED: May 09, 2011

APPLICANT: Pismo Labs Technology Limited

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ISSUED BY: Bureau Veritas Consumer Products Services
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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|---------------|-------------------|--------------|
| RF110328E01-1 | Original release | May 09, 2011 |

1 CERTIFICATION

PRODUCT: Pepwave Wireless Product
BRAND NAME: Pepwave
MODEL NO.: Pismo 315, Surf series, AP series, Mesh Connector series, MAX series
TEST SAMPLE: R&D SAMPLE
APPLICANT: Pismo Labs Technology Limited
TESTED: Apr. 12 to 20, 2011
STANDARDS: FCC Part 15, Subpart E (Section 15.407)
ANSI C63.4-2003
ANSI C63.10-2009

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : , **DATE:** May 09, 2011
(Claire Kuan, Specialist)

APPROVED BY : , **DATE:** May 09, 2011
(May Chen, Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For [802.11a](#)

| APPLIED STANDARD: FCC Part 15, Subpart E (Section 15.407) | | | |
|--|---|---------------|---|
| Standard Section | Test Type | Result | Remark |
| 15.407(b)(5) | AC Power Conducted Emission | PASS | Meet the requirement of limit. Minimum passing margin is -12.26dB at 4.746MHz |
| 15.407(b)(1/2/3) (b)(5) | Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz | PASS | Meet the requirement of limit. Minimum passing margin is -0.6dB at 5150.00MHz |
| 15.407(a)(1/2/3) | Peak Transmit Power | PASS | Meet the requirement of limit. |
| 15.407(a)(6) | Peak Power Excursion | PASS | Meet the requirement of limit. |
| 15.407(a)(1/2/3) | Peak Power Spectral Density | PASS | Meet the requirement of limit. |
| 15.407(g) | Frequency Stability | PASS | Meet the requirement of limit. |
| 15.203 | Antenna Requirement | PASS | No antenna connector is used. |

NOTE:

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.15~5.25GHz. For the 2400 ~ 2483.5MHz and 5.725~5.850GHz RF parameters was recorded in another test report.



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2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

| Measurement | Value |
|-----------------------------------|---------|
| Conducted emissions | 2.45 dB |
| Radiated emissions (30MHz-1GHz) | 3.30 dB |
| Radiated emissions (1GHz -18GHz) | 2.19 dB |
| Radiated emissions (18GHz -40GHz) | 2.55 dB |



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3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|------------------------------|--|
| PRODUCT | Pepwave Wireless Product |
| MODEL NO. | Pismo 315, Surf series, AP series, Mesh Connector series, MAX series |
| FCC ID | U8G-P1213 |
| POWER SUPPLY | DC 12V from power adapter |
| MODULATION TYPE | CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM |
| MODULATION TECHNOLOGY | DSSS, OFDM |
| TRANSFER RATE | 802.11a/g : 54/48/36/24/18/12/9/6Mbps 802.11b :11/5.5/2/1Mbps 802.11n (20MHz, 800ns GI): 6.5/13.0/19.5/26.0/39.0/52.0/58.5/65.0Mbps 802.11n (40MHz, 800ns GI): 13.5/27.0/40.5/54.0/81.0/108.0/121.5/135.0Mbps 802.11n (20MHz, 400ns GI): 7.2/14.4/21.7/28.9/43.3/57.8/65.0/72.2Mbps 802.11n (40MHz, 400ns GI): 15.0/30.0/45.0/60.0/90.0/120.0/135.0/150.0Mbps |
| OPERATING FREQUENCY | For 15.407 802.11a: 5.18 ~ 5.24GHz |
| | For 15.247 802.11b & 802.11g: 2.412 ~ 2.462GHz 802.11a: 5.745 ~ 5.825GHz |
| NUMBER OF CHANNEL | For 15.407 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) |
| | For 15.247(2.4GHz) 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) |
| | For 15.247(5GHz) 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) |

| | |
|-----------------------------|--|
| MAXIMUM OUTPUT POWER | For 15.247(2.4GHz) 802.11b: 144.5mW 802.11g: 281.8mW 802.11n (20MHz): 281.8mW 802.11n (40MHz): 177.8mW For 15.247(5GHz) 802.11a: 173.8mW 802.11n (20MHz): 169.8mW 802.11n (40MHz): 134.9mW For 15.407 802.11a: 28.2mW 802.11n (20MHz): 28.8mW 802.11n (40MHz): 46.8mW |
| ANTENNA TYPE | Please see note |
| DATA CABLE | RJ-45(Unshielded, 1.45m) |
| I/O PORTS | USB port x 1 RJ-45 port x 1 |
| ASSOCIATED DEVICES | Adapter x 1 |

NOTE:

- The EUT has five model names which are identical to each other in all aspects except for the following table:

| Brand | Model Name | Description |
|---------|-----------------------|---------------------------|
| Pepwave | Pismo 315 | For marketing requirement |
| | Surf series | |
| | AP series | |
| | Mesh Connector series | |
| | MAX series | |

From the above models, model: **Pismo 315** was selected as representative model for the test and its data was recorded in this report.

- There are antennas provided to this EUT, please refer to the following table:

| Antenna Type | Connector Type | Gain (dBi) | Frequency range (MHz to MHz) |
|---------------------------|----------------|------------|------------------------------|
| Omni Directional (Dipole) | RP SMA Plug | 3 | 2400~2500 |
| | | 5.5 | 5150~5350 |
| | | 6 | 5350~5875 |

3. The EUT must be supplied with a power adapter as following table:

| | |
|---------------------|---|
| BRAND | DVE |
| MODEL | DSA-12G-12 FUS 120120 |
| INPUT POWER | AC 100-240V, 50-60Hz, 0.3A |
| OUTPUT POWER | DC 12V, 1A DC Cable: 1.9m unshielded |

4. 2.4GHz and 5GHz technology cannot transmit at same time.

5. The EUT was pre-tested in chamber under the following modes:

| Test Mode | Description |
|---------------|---------------------------------|
| Mode A | Level-set (Put on tabletop) |
| Mode B | Tower-set (Wall-mounted) |

From the above modes, the radiated emission worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

6. The EUT could be applied with one 3G card, therefore emission tests are added for simultaneously transmit between wireless LAN and 3G function. The emission tests have been performed at the worst channel of both WLAN and 3G, the spurious emission of the simultaneous operation (WLAN & 3G card) has been evaluated and no non-compliance found. <only for test, not for sale>

| Brand name | Model name | FCC ID |
|------------|------------|----------|
| HUAWEI | E169u | QISE169 |
| D-Link | DWM-156 | KA2WM156 |
| D-Link | DWM-152 | KA2WM152 |

7. The EUT is 1 * 1 spatial SISO (1Tx & 1Rx) without beam forming function.

8. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 7.

9. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



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3.2 DESCRIPTION OF TEST MODES

Operated in 5150MHz ~ 5250MHz bands:

Four channels are provided for 802.11a and 802.11n (20MHz):

| CHANNEL | FREQUENCY |
|---------|-----------|
| 36 | 5180 MHz |
| 40 | 5200 MHz |
| 44 | 5220 MHz |
| 48 | 5240 MHz |

Two channels are provided for 802.11n (40MHz):

| CHANNEL | FREQUENCY |
|---------|-----------|
| 38 | 5190 MHz |
| 46 | 5230 MHz |

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

| EUT CONFIGURE MODE | APPLICABLE TO | | | | DESCRIPTION |
|--------------------|---------------|---------|---------|------|-------------|
| | PLC | RE < 1G | RE ≥ 1G | APCM | |
| - | √ | √ | √ | √ | - |

Where **PLC**: Power Line Conducted Emission **RE < 1G**: Radiated Emission below 1GHz
RE ≥ 1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted Measurement

POWER LINE CONDUCTED EMISSION TEST:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 802.11n (20MHz) | 36 to 48 | 48 | OFDM | BPSK | 6.5 |

RADIATED EMISSION TEST (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 802.11n (20MHz) | 36 to 48 | 48 | OFDM | BPSK | 6.5 |

RADIATED EMISSION TEST (ABOVE 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 802.11a | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 6 |
| 802.11n (20MHz) | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 6.5 |
| 802.11n (40MHz) | 38 to 46 | 38, 46 | OFDM | BPSK | 13.5 |

CONDUCTED OUT-BAND EMISSION MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 802.11a | 36 to 48 | 36, 48 | OFDM | BPSK | 6 |
| 802.11n (20MHz) | 36 to 48 | 36, 48 | OFDM | BPSK | 6.5 |
| 802.11n (40MHz) | 38 to 46 | 38, 46 | OFDM | BPSK | 13.5 |

ANTENNA PORT CONDUCTED MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 802.11a | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 6 |
| 802.11n (20MHz) | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 6.5 |
| 802.11n (40MHz) | 38 to 46 | 38, 46 | OFDM | BPSK | 13.5 |

TEST CONDITION:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|--------------------|---------------------------|--------------|-----------|
| RE ³ 1G | 14deg. C, 66%RH, 1025 hPa | 120Vac, 60Hz | Frank Liu |
| RE<1G | 17deg. C, 66%RH, 1025 hPa | 120Vac, 60Hz | Frank Liu |
| PLC | 15deg. C, 67%RH, 1025 hPa | 120Vac, 60Hz | Frank Liu |
| APCM | 20deg. C, 60%RH, 1025 hPa | 120Vac, 60Hz | Rex Huang |



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)

ANSI C63.4-2003

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



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3.4 DESCRIPTION OF SUPPORT UNITS

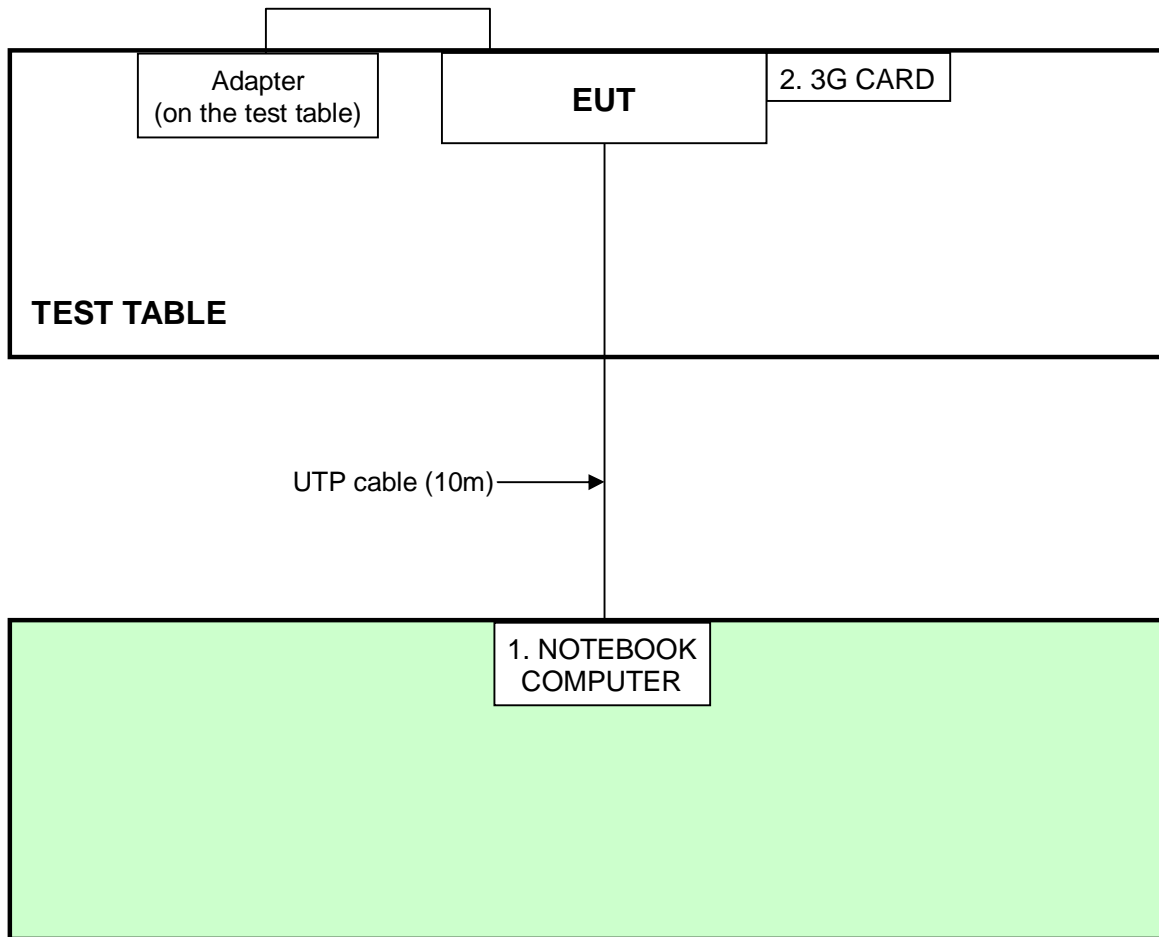
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| No. | Product | Brand | Model No. | Serial No. | FCC ID |
|-----|----------------------|--------|-----------|------------|---------|
| 1 | NOTEBOOK COMPUTER | DELL | PP32LA | FSLB32S | FCC DoC |
| 2 | 3G CARD | HUAWEI | E169u | NA | QISE169 |

| No. | Signal cable description |
|-----|--------------------------|
| 1 | UTP Cable (10m) |
| 2 | NA |

Note: The power cords of the above support units were unshielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB μ V) | |
|-----------------------------|------------------------------|----------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|-----------------------|------------|-----------------|------------------|
| Test Receiver | ESCS 30 | 100375 | Mar. 09, 2011 | Mar. 08, 2012 |
| Line-Impedance Stabilization Network (for EUT) | NSLK 8127 | 8127-522 | Sep. 08, 2010 | Sep. 07, 2011 |
| Line-Impedance Stabilization Network (for Peripheral) | ESH3-Z5 | 848773/004 | Nov. 03, 2010 | Nov. 02, 2011 |
| RF Cable (JYEBAO) | 5DFB | COCCAB-002 | Aug. 30, 2010 | Aug. 29, 2011 |
| 50 ohms Terminator | 50 | 3 | Nov. 03, 2010 | Nov. 02, 2011 |
| Software | BV ADT_Cond_V7.3.7 | NA | NA | NA |

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.

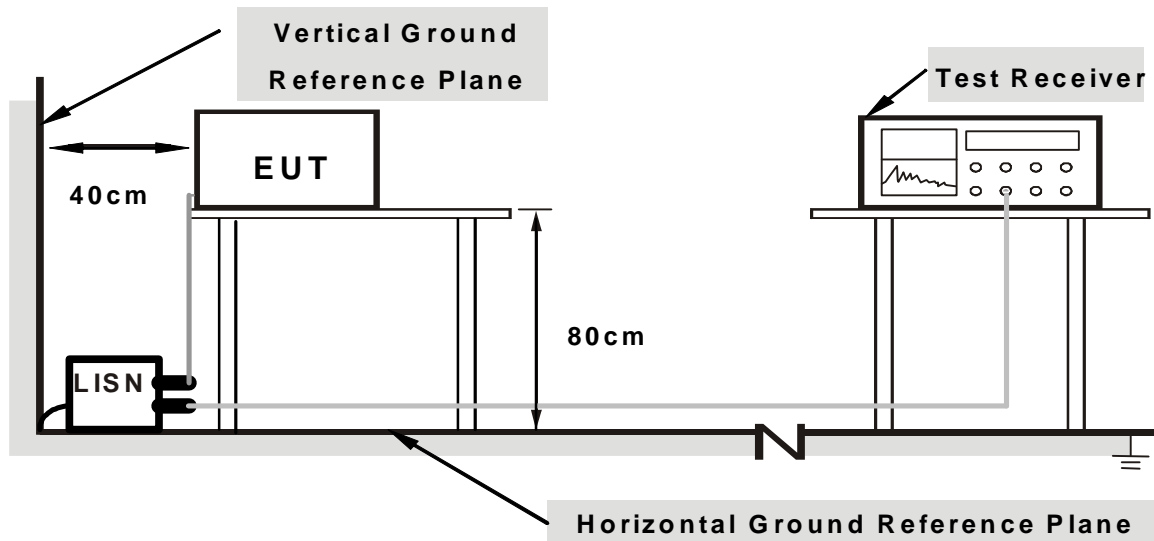
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs
- b. provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- d. The frequency range from 150kHz to 30MHz was searched. Emission level under (Limit – 20dB) was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

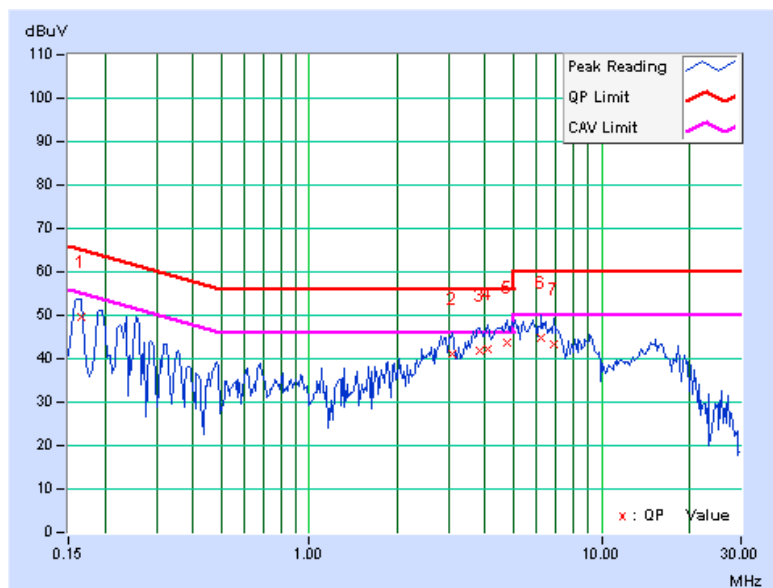
1. Placed the EUT on testing table.
2. Prepared other computer system (support unit 1) to act as communication partner and placed them outside of testing area.
3. The communication partners ran test program “art 0.9b21” to enable EUT under transmission/receiving condition continuously via one UTP cable.

4.1.7 TEST RESULTS

| | | | |
|--------------|----------|----------------------|-------|
| PHASE | Line (L) | 6dB BANDWIDTH | 9 kHz |
|--------------|----------|----------------------|-------|

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|----------|----------------|-------------------------|----------------------------|-------|-----------------------------|-------|--------------------|--------------|----------------|-------|
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| | | | 1 | 0.166 | 0.11 | 49.67 | - | 49.78 | - | 65.18 |
| 2 | 3.094 | 0.18 | 40.83 | - | 41.01 | - | 56.00 | 46.00 | -14.99 | - |
| 3 | 3.848 | 0.20 | 41.48 | - | 41.68 | - | 56.00 | 46.00 | -14.32 | - |
| 4 | 4.082 | 0.20 | 42.15 | - | 42.35 | - | 56.00 | 46.00 | -13.65 | - |
| 5 | 4.746 | 0.23 | 43.51 | - | 43.74 | - | 56.00 | 46.00 | -12.26 | - |
| 6 | 6.223 | 0.30 | 44.54 | - | 44.84 | - | 60.00 | 50.00 | -15.16 | - |
| 7 | 6.895 | 0.34 | 42.81 | - | 43.15 | - | 60.00 | 50.00 | -16.85 | - |

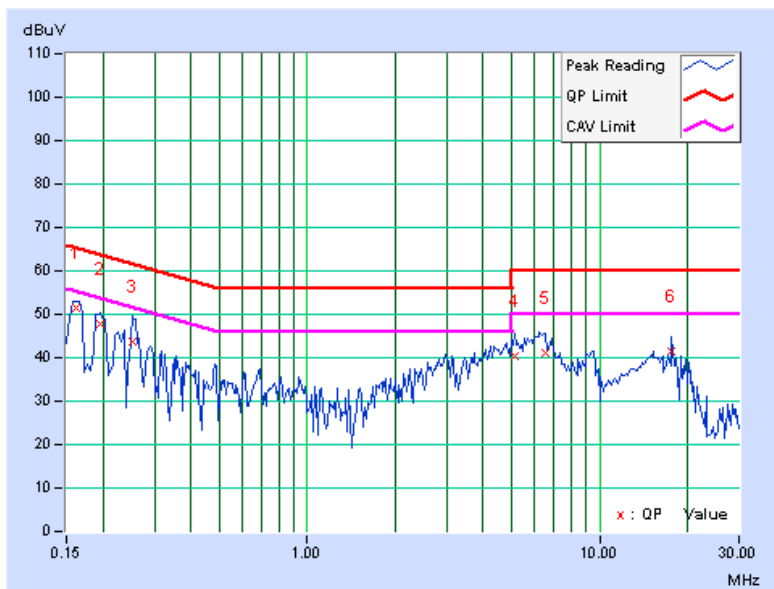
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



| | | | |
|--------------|-------------|----------------------|-------|
| PHASE | Neutral (N) | 6dB BANDWIDTH | 9 kHz |
|--------------|-------------|----------------------|-------|

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.162 | 0.12 | 51.48 | - | 51.60 | - | 65.38 | 55.38 | -13.77 | - |
| 2 | 0.197 | 0.14 | 47.60 | - | 47.74 | - | 63.74 | 53.74 | -16.00 | - |
| 3 | 0.252 | 0.14 | 43.70 | - | 43.84 | - | 61.71 | 51.71 | -17.86 | - |
| 4 | 5.117 | 0.38 | 39.85 | - | 40.23 | - | 60.00 | 50.00 | -19.77 | - |
| 5 | 6.504 | 0.51 | 40.66 | - | 41.17 | - | 60.00 | 50.00 | -18.83 | - |
| 6 | 17.695 | 1.28 | 40.09 | - | 41.37 | - | 60.00 | 50.00 | -18.63 | - |

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| Frequencies (MHz) | Field strength (microvolts/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 |

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.



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4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

| Frequencies (MHz) | EIRP Limit (dBm) | Equivalent Field Strength at 3m (dB μ V/m) *note 3 |
|-------------------|------------------|--|
| 5150~5250 | -27 | 68.3 |
| 5250~5350 | -27 | 68.3 |
| 5470~5725 | -27 | 68.3 |
| 5725~5825 | -27 *note 1 | 68.3 |
| | -17 *note 2 | 78.3 |

NOTE:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$



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4.2.3 TEST INSTRUMENTS

For below 1GHz test:

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|--------------------------------------|-----------------------------|-------------------------------------|-----------------|------------------|
| Agilent Spectrum Analyzer | E4446A | MY48250253 | Aug. 23, 2010 | Aug. 22, 2011 |
| Agilent Pre-Selector | N9039A | MY46520310 | Aug. 23, 2010 | Aug. 22, 2011 |
| Agilent Signal Generator | N5181A | MY49060347 | July 30, 2010 | July 29, 2011 |
| LIG NEX1 Test Receiver | ER-265 | L09068005 | Oct. 25, 2010 | Oct. 24, 2011 |
| Mini-Circuits Pre-Amplifier | ZFL-1000VH2B | AMP-ZFL-04 | Nov. 16, 2010 | Nov. 15, 2011 |
| Agilent Pre-Amplifier | 8449B | 3008A02465 | Feb. 28, 2011 | Feb. 27, 2012 |
| Miteq Pre-Amplifier | AFS33-1800265 0-30-8P-44 | 881786 | NA | NA |
| SCHWARZBECK Trilog Broadband Antenna | VULB 9168 | 9168-361 | Apr. 28, 2010 | Apr. 27, 2011 |
| AISI Horn_Antenna | AIH.8018 | 0000220091110 | Nov. 22, 2010 | Nov. 21, 2011 |
| SCHWARZBECK Horn_Antenna | BBHA 9170 | 9170-424 | Oct. 08, 2010 | Oct. 07, 2011 |
| RF CABLE | NA | RF104-205 RF104-207 RF104-202 | Dec. 28, 2010 | Dec. 27, 2011 |
| RF Cable | NA | CHHCAB_001 | NA | NA |
| Software | ADT_Radiated_V8.7.05 | NA | NA | NA |
| CT Antenna Tower & Turn Table | NA | NA | NA | NA |

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.



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For above 1GHz test:

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---------------------------------------|-----------------------------|-------------------------------------|------------------------|-------------------------|
| Agilent Spectrum Analyzer | E4446A | MY48250254 | July 14, 2010 | July 13, 2011 |
| Agilent Pre-Selector | N9039A | MY46520311 | July 14, 2010 | July 13, 2011 |
| Agilent Signal Generator | N5181A | MY49060517 | July 14, 2010 | July 13, 2011 |
| Mini-Circuits Pre-Amplifier | ZFL-1000VH2B | AMP-ZFL-03 | Nov. 16, 2010 | Nov. 15, 2011 |
| Agilent Pre-Amplifier | 8449B | 3008A02578 | July 05, 2010 | July 04, 2011 |
| Miteq Pre-Amplifier | AFS33-1800265 0-30-8P-44 | 881786 | NA | NA |
| SCHWARZBECK Trilog Broadband Antenna | VULB 9168 | 9168-360 | Apr. 29, 2010 | Apr. 28, 2011 |
| AISI Horn_Antenna | AIH.8018 | 0000320091110 | Nov. 12, 2010 | Nov. 11, 2011 |
| SCHWARZBECK Horn_Antenna | BBHA 9170 | 9170-424 | Oct. 08, 2010 | Oct. 07, 2011 |
| RF CABLE | NA | RF104-201 RF104-203 RF104-204 | Dec. 27, 2010 | Dec. 26, 2011 |
| RF Cable | NA | CHGCAB_001 | NA | NA |
| Software | ADT_Radiated_V8.7.05 | NA | NA | NA |
| CT Antenna Tower & Turn Table | NA | NA | NA | NA |

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. G.

4. The FCC Site Registration No. is 966073.

5. The VCCI Site Registration No. is G-137.

6. The CANADA Site Registration No. is IC 7450H-2.

4.2.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

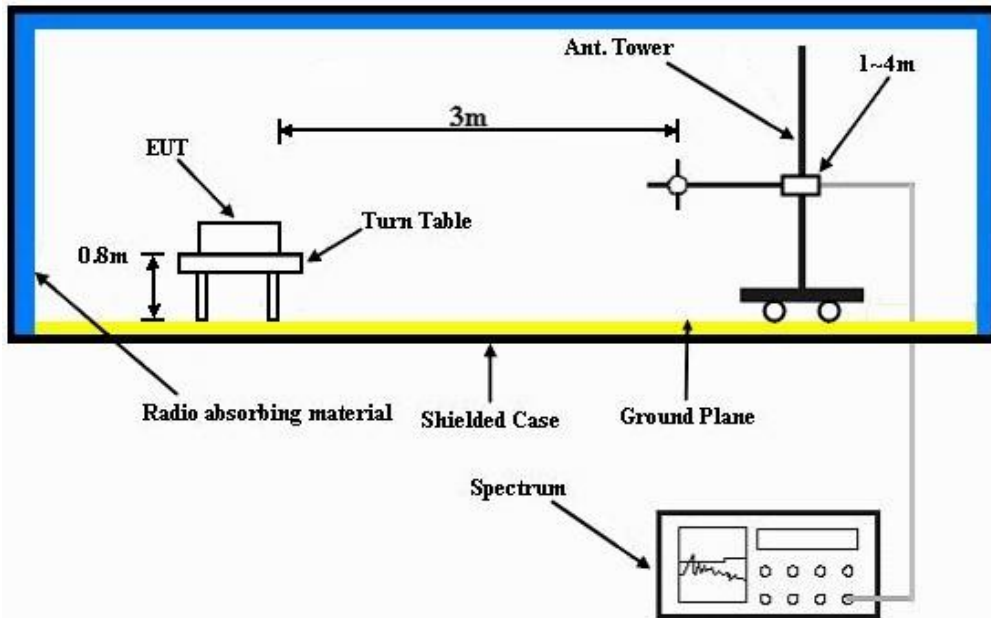
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.5 DEVIATION FROM TEST STANDARD

No deviation

4.2.6 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.7 EUT OPERATING CONDITION

Same as 4.1.6

4.2.8 TEST RESULTS

BELOW 1GHz WORST-CASE DATA : 802.11n (20MHz) OFDM MODULATION

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL | Channel 36 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 106.62 | 31.6 QP | 43.5 | -11.9 | 1.50 H | 313 | 20.76 | 10.81 |
| 2 | 234.16 | 37.4 QP | 46.0 | -8.6 | 1.00 H | 126 | 25.06 | 12.36 |
| 3 | 349.98 | 36.1 QP | 46.0 | -9.9 | 1.00 H | 257 | 19.72 | 16.40 |
| 4 | 700.15 | 40.8 QP | 46.0 | -5.2 | 1.00 H | 323 | 17.78 | 23.06 |
| 5 | 875.06 | 36.4 QP | 46.0 | -9.6 | 1.50 H | 345 | 10.25 | 26.14 |
| 6 | 1000.00 | 37.3 QP | 54.0 | -16.7 | 1.00 H | 29 | 9.72 | 27.55 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 47.76 | 36.1 QP | 40.0 | -3.9 | 1.00 V | 221 | 21.59 | 14.53 |
| 2 | 94.42 | 38.3 QP | 43.5 | -5.2 | 1.00 V | 83 | 28.63 | 9.68 |
| 3 | 231.79 | 32.3 QP | 46.0 | -13.7 | 1.50 V | 360 | 20.00 | 12.27 |
| 4 | 700.15 | 38.4 QP | 46.0 | -7.6 | 2.00 V | 344 | 15.37 | 23.06 |
| 5 | 875.06 | 32.6 QP | 46.0 | -13.4 | 1.00 V | 360 | 6.48 | 26.14 |
| 6 | 1000.00 | 35.9 QP | 54.0 | -18.1 | 1.00 V | 312 | 8.32 | 27.55 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



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ABOVE 1GHz WORST-CASE DATA

802.11a OFDM MODULATION

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL | Channel 36 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 14deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 5150.00 | 59.8 PK | 74.0 | -14.2 | 1.12 H | 11 | 19.86 | 39.94 |
| 2 | 5150.00 | 47.5 AV | 54.0 | -6.5 | 1.12 H | 11 | 7.56 | 39.94 |
| 3 | *5180.00 | 100.8 PK | | | 1.12 H | 11 | 60.78 | 40.02 |
| 4 | *5180.00 | 91.8 AV | | | 1.12 H | 11 | 51.78 | 40.02 |
| 5 | #10360.00 | 54.7 PK | 68.3 | -13.6 | 1.04 H | 32 | 8.17 | 46.53 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 5150.00 | 65.9 PK | 74.0 | -8.1 | 1.31 V | 211 | 25.96 | 39.94 |
| 2 | 5150.00 | 52.4 AV | 54.0 | -1.6 | 1.31 V | 211 | 12.46 | 39.94 |
| 3 | *5180.00 | 110.6 PK | | | 1.31 V | 211 | 70.58 | 40.02 |
| 4 | *5180.00 | 100.6 AV | | | 1.31 V | 211 | 60.58 | 40.02 |
| 5 | #10360.00 | 54.6 PK | 68.3 | -13.7 | 1.09 V | 21 | 8.07 | 46.53 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL | Channel 40 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 14deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5200.00 | 100.7 PK | | | 1.07 H | 29 | 60.63 | 40.07 |
| 2 | *5200.00 | 91.4 AV | | | 1.07 H | 29 | 51.33 | 40.07 |
| 3 | #10400.00 | 54.6 PK | 68.3 | -13.7 | 1.08 H | 89 | 8.03 | 46.57 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5200.00 | 110.9 PK | | | 1.34 V | 219 | 70.83 | 40.07 |
| 2 | *5200.00 | 100.8 AV | | | 1.34 V | 219 | 60.73 | 40.07 |
| 3 | #10400.00 | 54.1 PK | 68.3 | -14.2 | 1.04 V | 37 | 7.53 | 46.57 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “ # “: The radiated frequency is out the restricted band.



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL | Channel 48 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 14deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

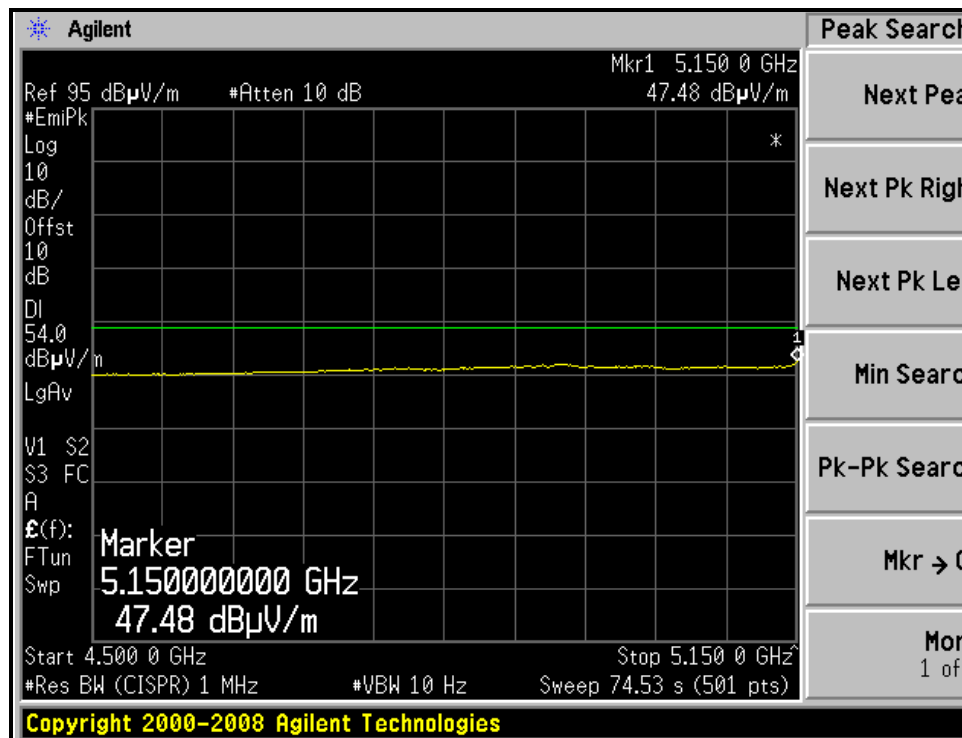
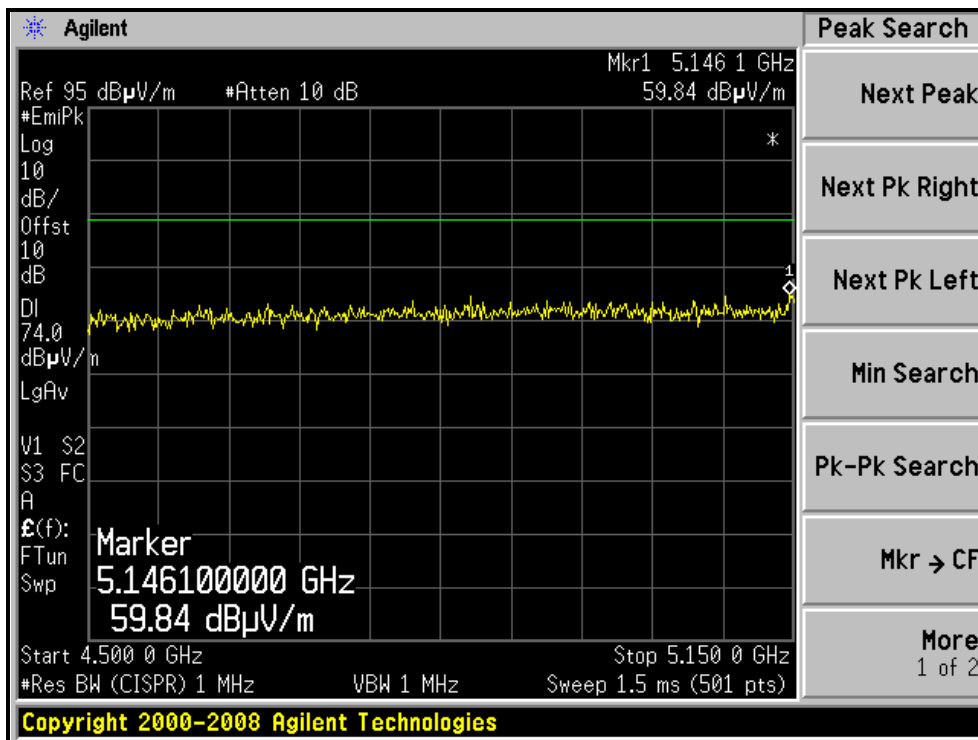
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5240.00 | 100.1 PK | | | 1.10 H | 23 | 59.93 | 40.17 |
| 2 | *5240.00 | 90.8 AV | | | 1.10 H | 23 | 50.63 | 40.17 |
| 3 | 5350.00 | 61.7 PK | 74.0 | -12.3 | 1.10 H | 29 | 21.23 | 40.47 |
| 4 | 5350.00 | 49.4 AV | 54.0 | -4.6 | 1.10 H | 29 | 8.93 | 40.47 |
| 5 | #10480.00 | 54.2 PK | 68.3 | -14.1 | 1.04 H | 76 | 7.53 | 46.67 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5240.00 | 110.7 PK | | | 1.34 V | 211 | 70.53 | 40.17 |
| 2 | *5240.00 | 100.4 AV | | | 1.34 V | 211 | 60.23 | 40.17 |
| 3 | 5350.00 | 61.1 PK | 74.0 | -12.9 | 1.34 V | 203 | 20.63 | 40.47 |
| 4 | 5350.00 | 49.4 AV | 54.0 | -4.6 | 1.34 V | 203 | 8.93 | 40.47 |
| 5 | #10480.00 | 54.4 PK | 68.3 | -13.9 | 1.05 V | 63 | 7.73 | 46.67 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



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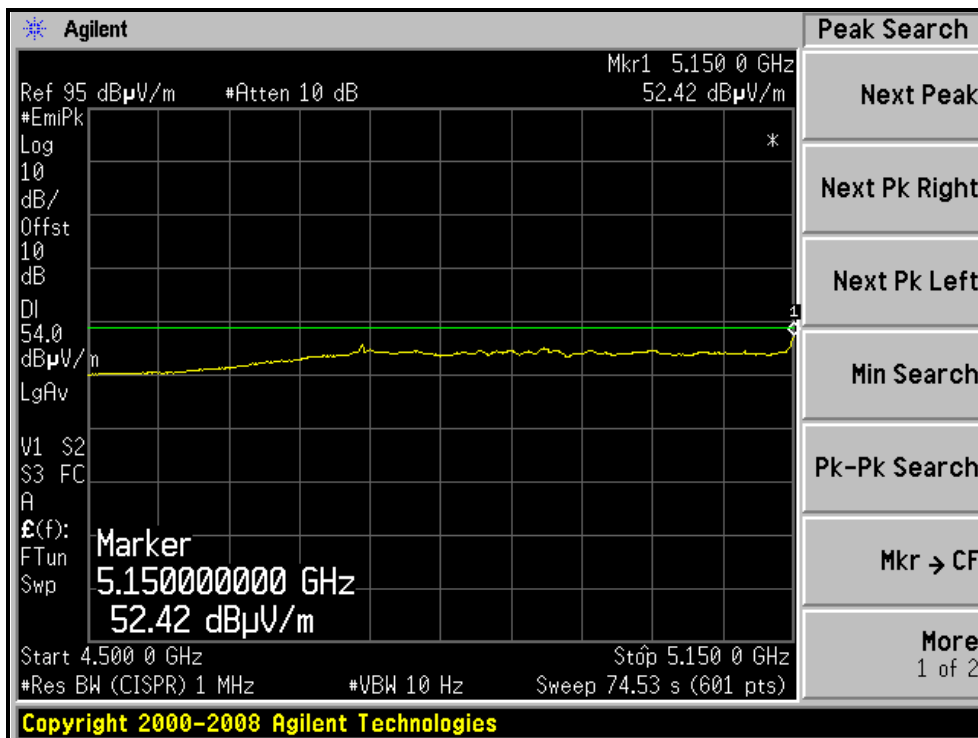
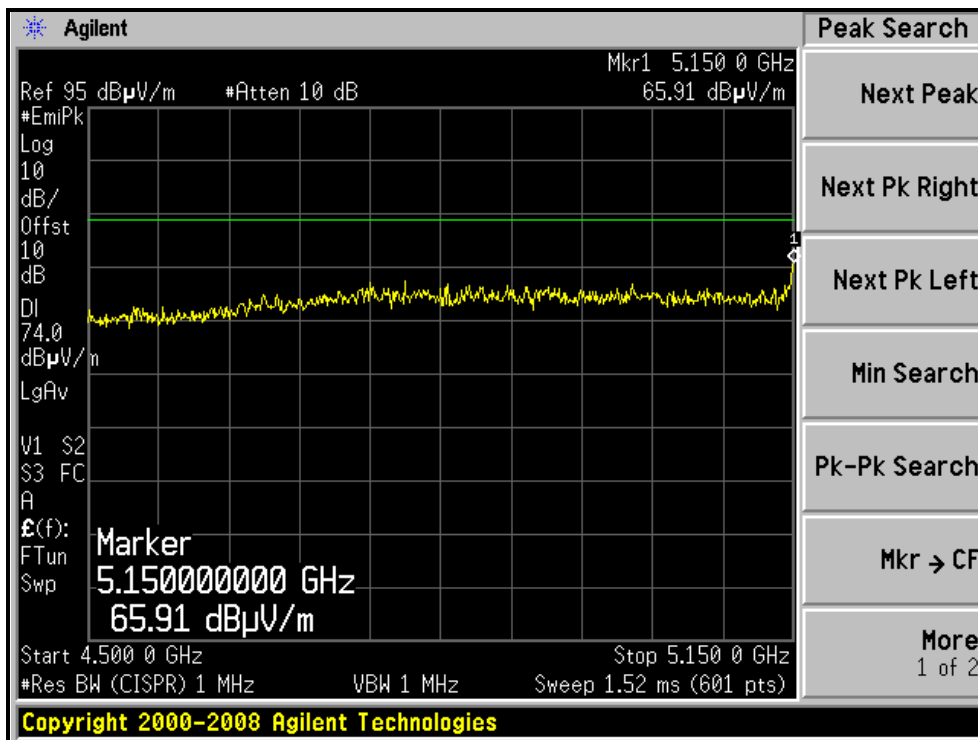
RESTRICTED BANDEDGE (802.11a MODE, CH36, HORIZONTAL)



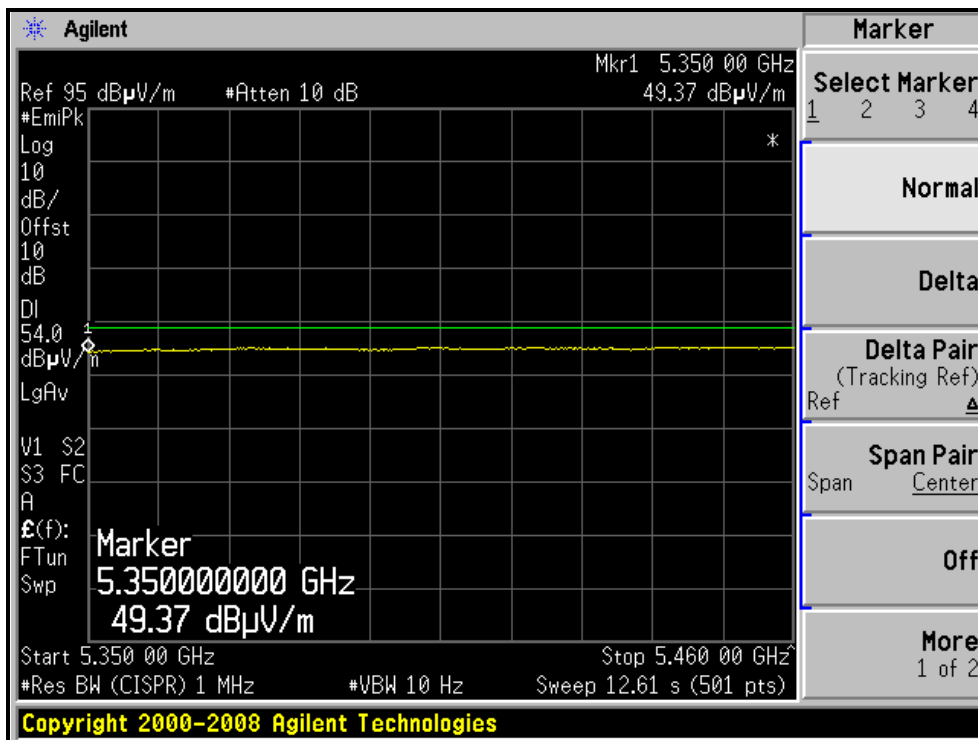
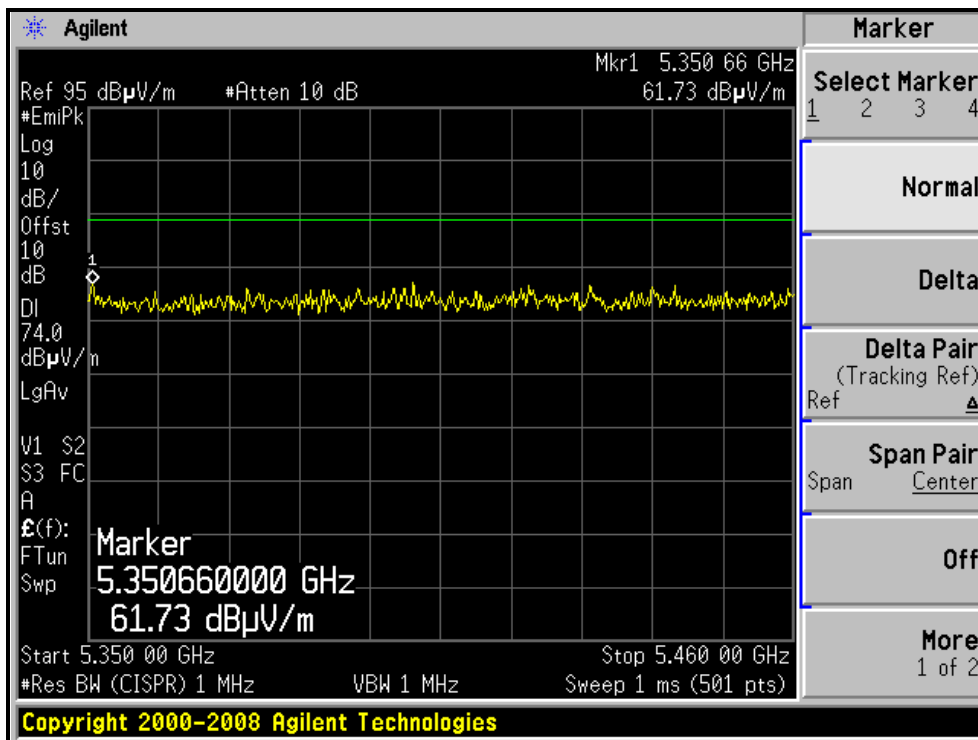


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RESTRICTED BANDEDGE (802.11a MODE, CH36, VERTICAL)



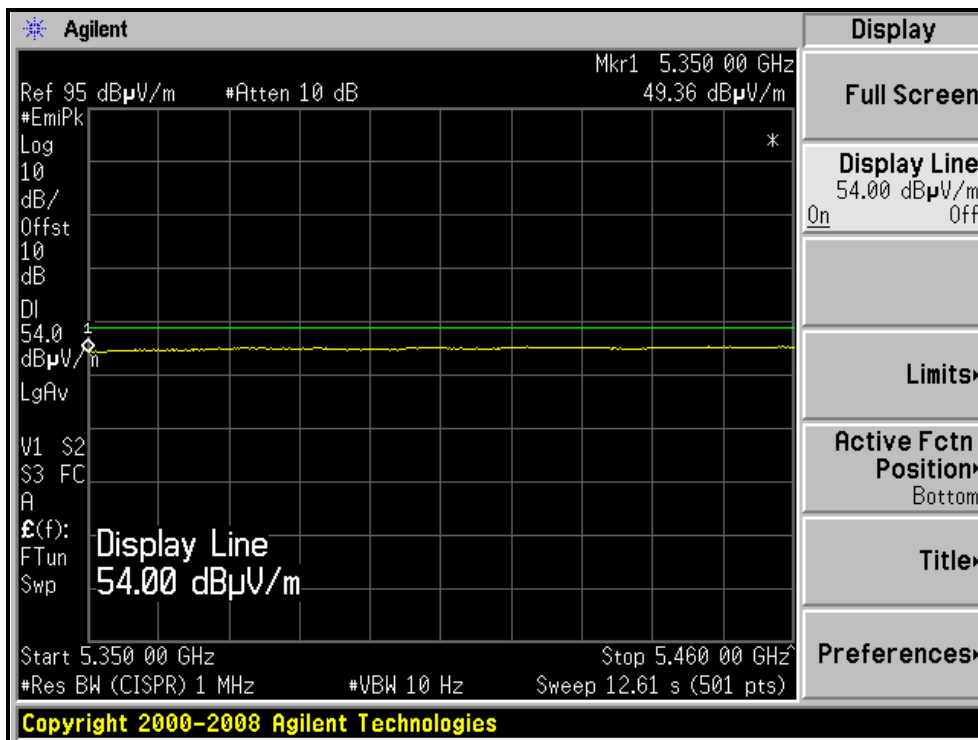
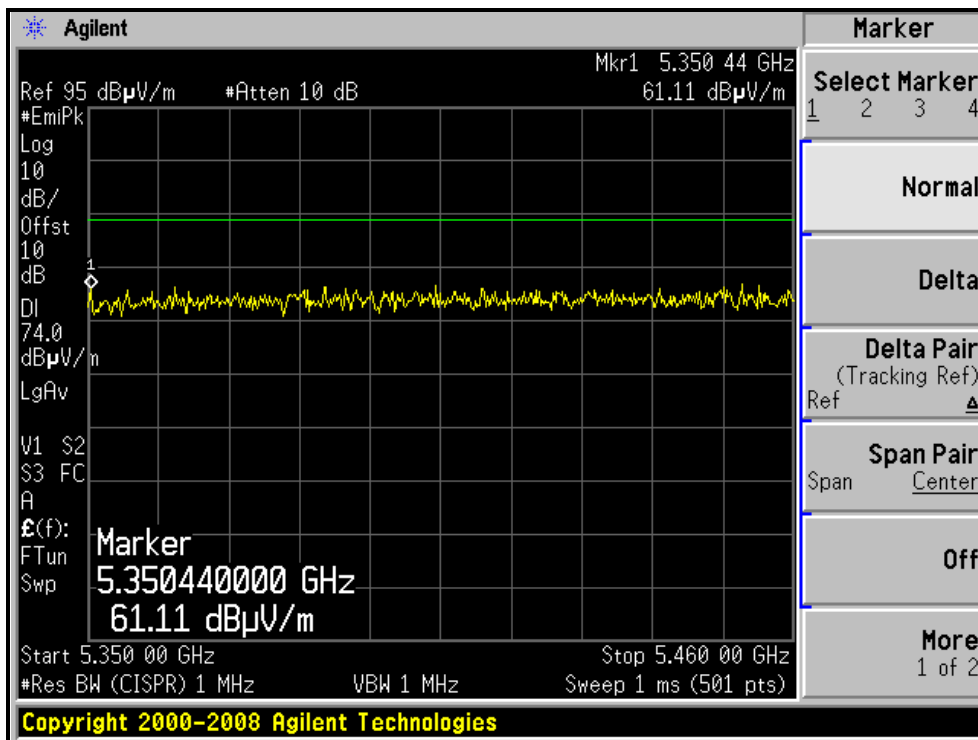
RESTRICTED BANDEDGE (802.11a MODE, CH48, HORIZONTAL)





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RESTRICTED BANDEDGE (802.11a MODE, CH48, VERTICAL)





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DRAFT 802.11n (20MHz) OFDM MODULATION

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL | Channel 36 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 14deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 5150.00 | 58.7 PK | 74.0 | -15.3 | 1.13 H | 39 | 18.76 | 39.94 |
| 2 | 5150.00 | 48.2 AV | 54.0 | -5.8 | 1.13 H | 39 | 8.26 | 39.94 |
| 3 | *5180.00 | 100.3 PK | | | 1.13 H | 31 | 60.28 | 40.02 |
| 4 | *5180.00 | 90.4 AV | | | 1.13 H | 31 | 50.38 | 40.02 |
| 5 | #10360.00 | 54.1 PK | 68.3 | -14.2 | 1.02 H | 62 | 7.57 | 46.53 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 5150.00 | 65.6 PK | 74.0 | -8.4 | 1.43 V | 42 | 25.66 | 39.94 |
| 2 | 5150.00 | 53.3 AV | 54.0 | -0.7 | 1.43 V | 42 | 13.36 | 39.94 |
| 3 | *5180.00 | 109.3 PK | | | 1.34 V | 213 | 69.28 | 40.02 |
| 4 | *5180.00 | 99.2 AV | | | 1.34 V | 213 | 59.18 | 40.02 |
| 5 | #10360.00 | 54.3 PK | 68.3 | -14.0 | 1.02 V | 43 | 7.77 | 46.53 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#“:The radiated frequency is out the restricted band.



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL | Channel 40 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 14deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5200.00 | 100.8 PK | | | 1.14 H | 38 | 60.73 | 40.07 |
| 2 | *5200.00 | 90.7 AV | | | 1.14 H | 38 | 50.63 | 40.07 |
| 3 | #10400.00 | 54.2 PK | 68.3 | -14.1 | 1.03 H | 57 | 7.63 | 46.57 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5200.00 | 110.3 PK | | | 1.31 V | 29 | 70.23 | 40.07 |
| 2 | *5200.00 | 99.8 AV | | | 1.31 V | 29 | 59.73 | 40.07 |
| 3 | #10400.00 | 54.1 PK | 68.3 | -14.2 | 1.02 V | 44 | 7.53 | 46.57 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL | Channel 48 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 14deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

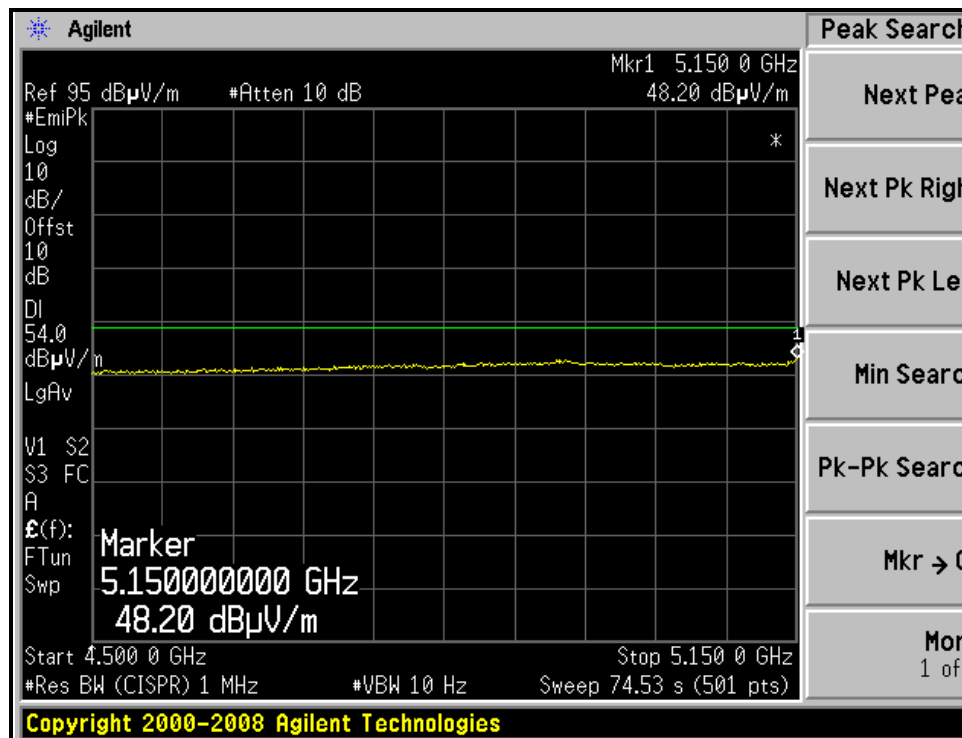
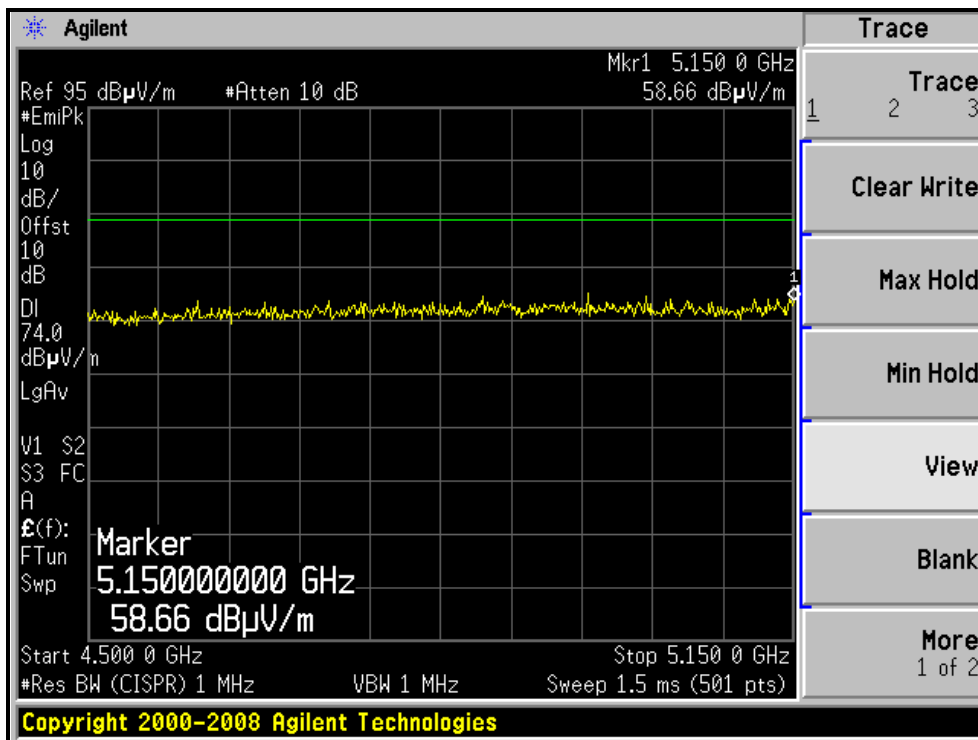
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5240.00 | 100.9 PK | | | 1.16 H | 39 | 60.73 | 40.17 |
| 2 | *5240.00 | 90.8 AV | | | 1.16 H | 39 | 50.63 | 40.17 |
| 3 | 5350.00 | 59.4 PK | 74.0 | -14.6 | 1.16 H | 39 | 18.93 | 40.47 |
| 4 | 5350.00 | 49.4 AV | 54.0 | -4.6 | 1.16 H | 39 | 8.93 | 40.47 |
| 5 | #10480.00 | 54.2 PK | 68.3 | -14.1 | 1.04 H | 69 | 7.53 | 46.67 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5240.00 | 110.7 PK | | | 1.29 V | 217 | 70.53 | 40.17 |
| 2 | *5240.00 | 100.4 AV | | | 1.29 V | 217 | 60.23 | 40.17 |
| 3 | 5350.00 | 59.4 PK | 74.0 | -14.6 | 1.44 V | 37 | 18.93 | 40.47 |
| 4 | 5350.00 | 49.5 AV | 54.0 | -4.5 | 1.44 V | 37 | 9.03 | 40.47 |
| 5 | #10480.00 | 54.4 PK | 68.3 | -13.9 | 1.02 V | 46 | 7.73 | 46.67 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.

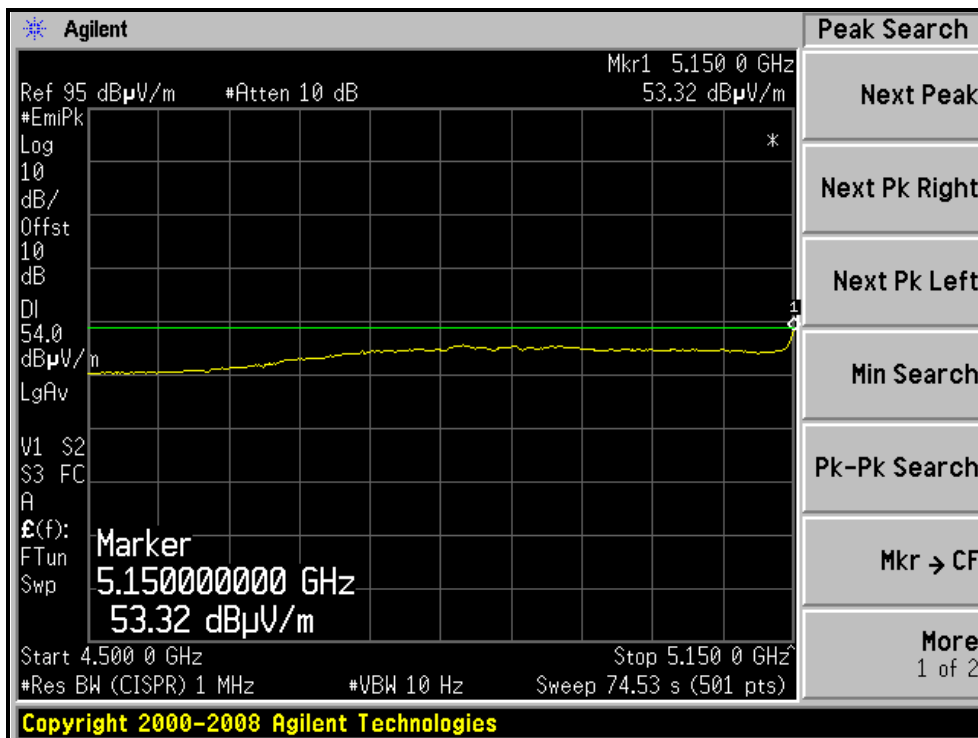
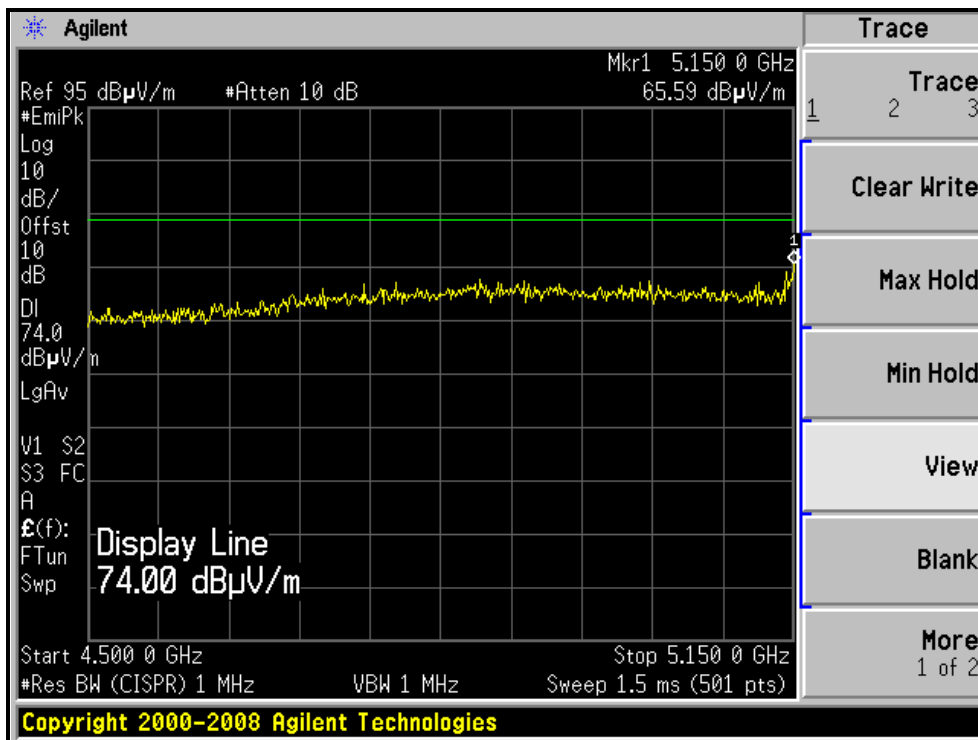


A D T

RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH36, HORIZONTAL)



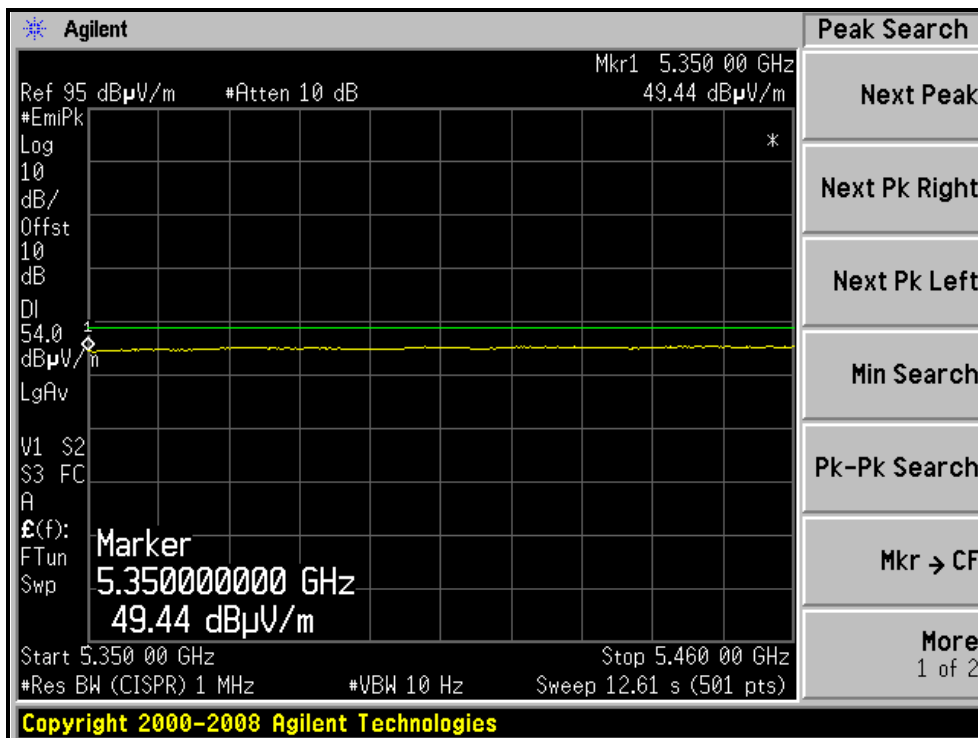
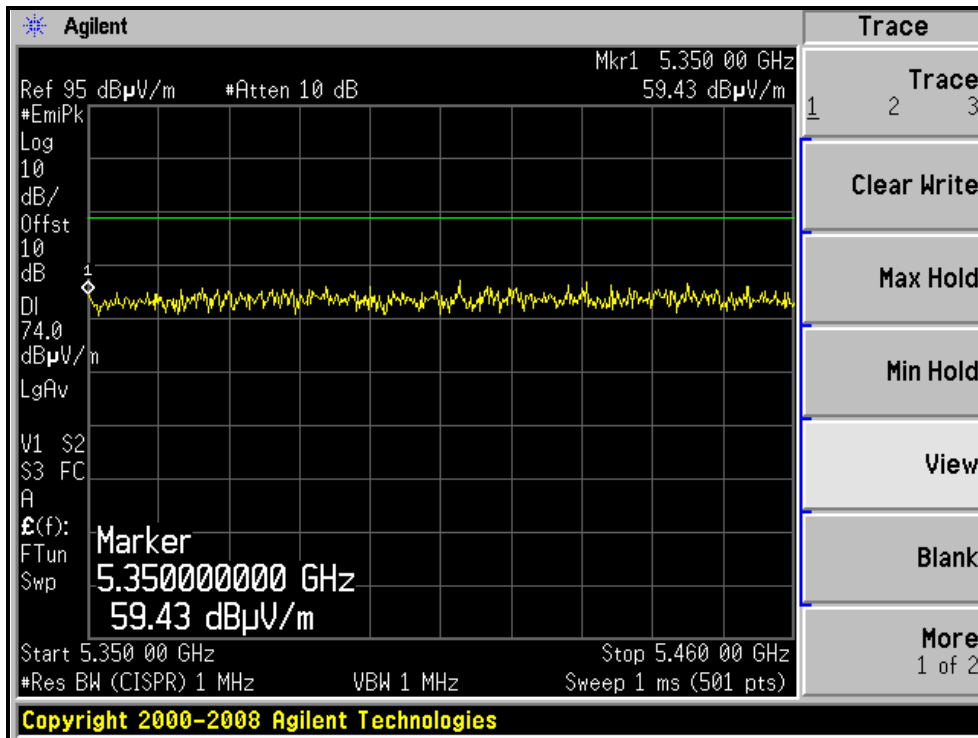
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH36, VERTICAL)



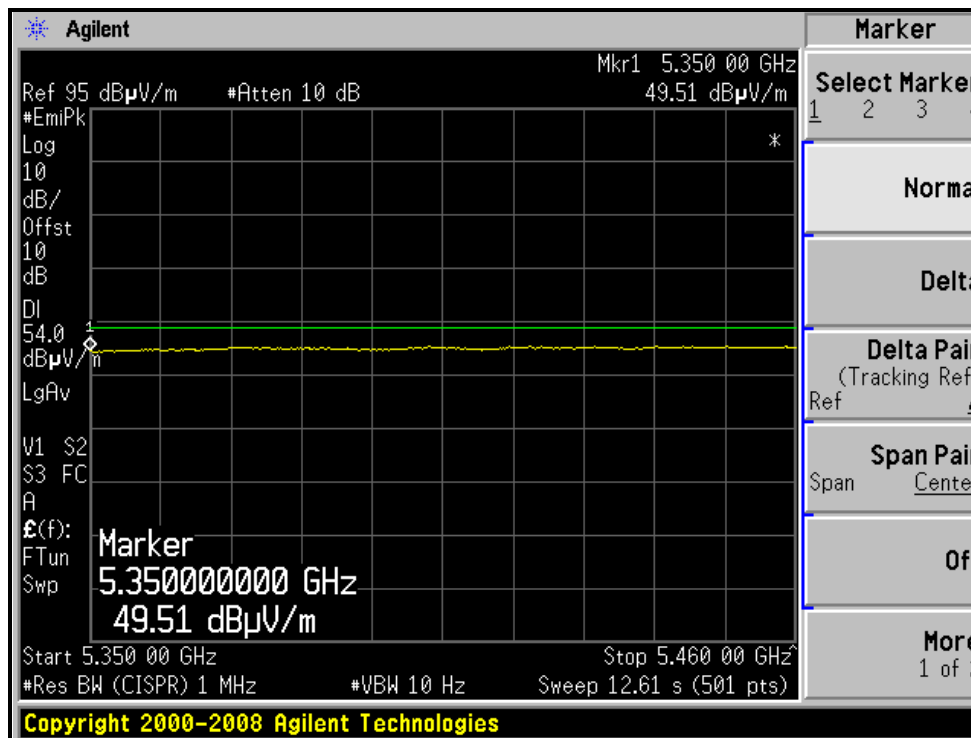
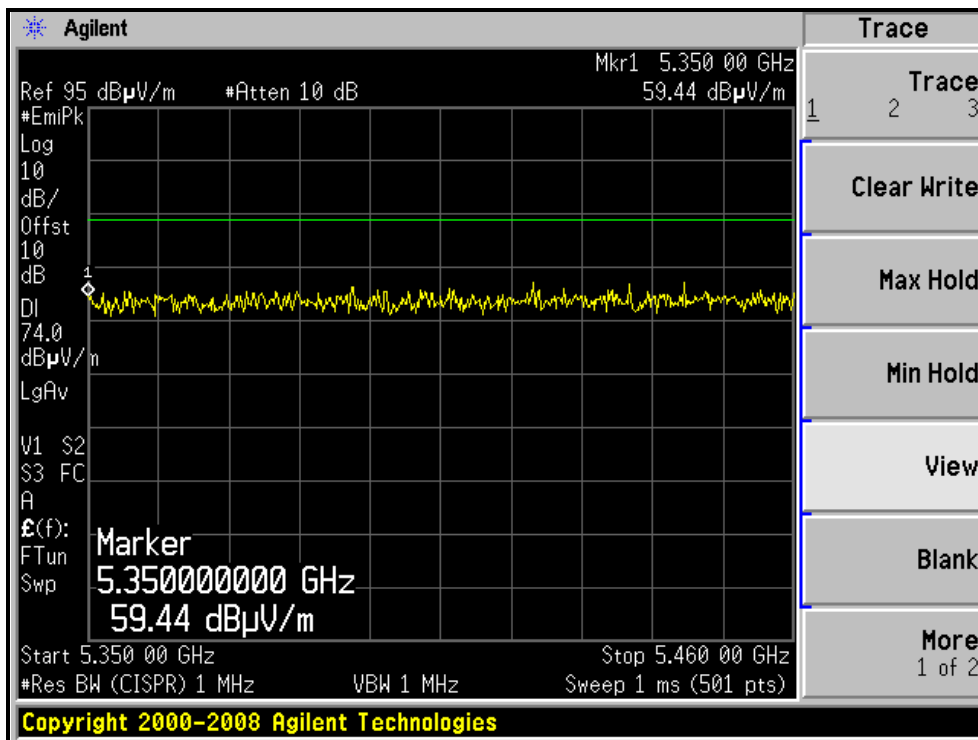


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RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH48, HORIZONTAL)



RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH48, VERTICAL)





A D T

DRAFT 802.11n (40MHz) OFDM MODULATION

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL | Channel 38 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 14deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 5150.00 | 62.8 PK | 74.0 | -11.2 | 1.44 H | 313 | 22.86 | 39.94 |
| 2 | 5150.00 | 49.7 AV | 54.0 | -4.3 | 1.44 H | 313 | 9.76 | 39.94 |
| 3 | *5190.00 | 91.4 PK | | | 1.40 H | 313 | 51.36 | 40.04 |
| 4 | *5190.00 | 81.3 AV | | | 1.40 H | 313 | 41.26 | 40.04 |
| 5 | #10380.00 | 54.1 PK | 68.3 | -14.2 | 1.07 H | 49 | 7.55 | 46.55 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 5150.00 | 64.3 PK | 74.0 | -9.7 | 1.44 V | 16 | 24.36 | 39.94 |
| 2 | 5150.00 | 53.4 AV | 54.0 | -0.6 | 1.44 V | 16 | 13.46 | 39.94 |
| 3 | *5190.00 | 104.7 PK | | | 1.41 V | 20 | 64.66 | 40.04 |
| 4 | *5190.00 | 93.3 AV | | | 1.41 V | 20 | 53.26 | 40.04 |
| 5 | #10380.00 | 54.3 PK | 68.3 | -14.0 | 1.04 V | 27 | 7.75 | 46.55 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#“: The radiated frequency is out the restricted band.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL | Channel 46 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 14deg. C, 66%RH 1025 hPa | TESTED BY | Frank Liu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5230.00 | 94.5 PK | | | 1.41 H | 319 | 54.35 | 40.15 |
| 2 | *5230.00 | 84.3 AV | | | 1.41 H | 319 | 44.15 | 40.15 |
| 3 | 5350.00 | 60.6 PK | 74.0 | -13.4 | 1.41 H | 319 | 20.13 | 40.47 |
| 4 | 5350.00 | 49.3 AV | 54.0 | -4.7 | 1.41 H | 319 | 8.83 | 40.47 |
| 5 | #10460.00 | 54.3 PK | 68.3 | -14.0 | 1.00 H | 231 | 7.65 | 46.65 |

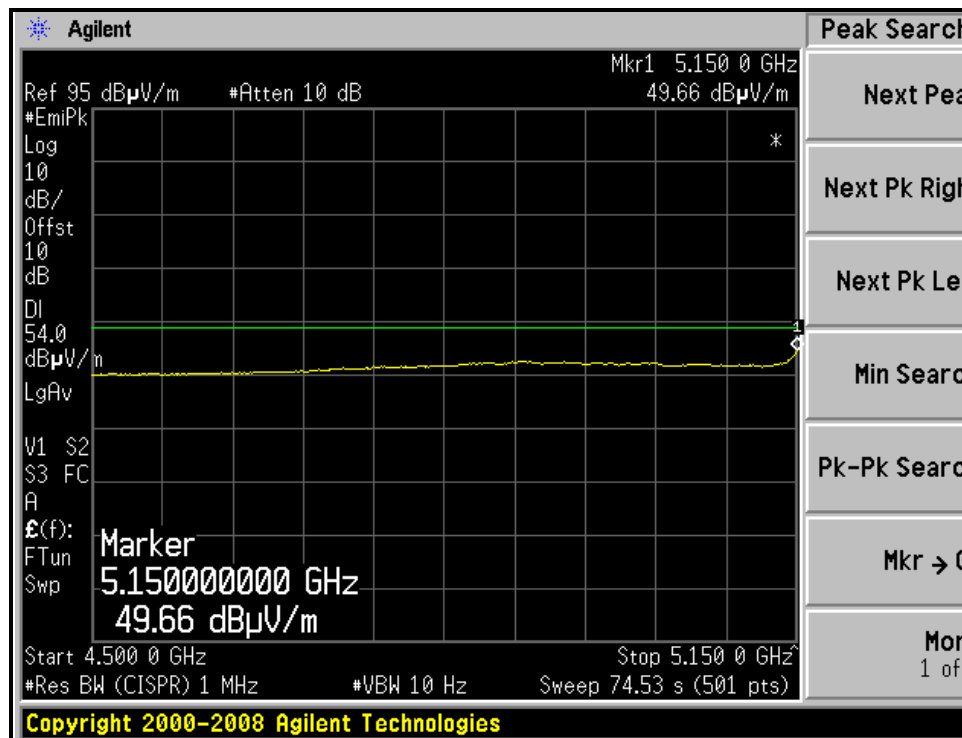
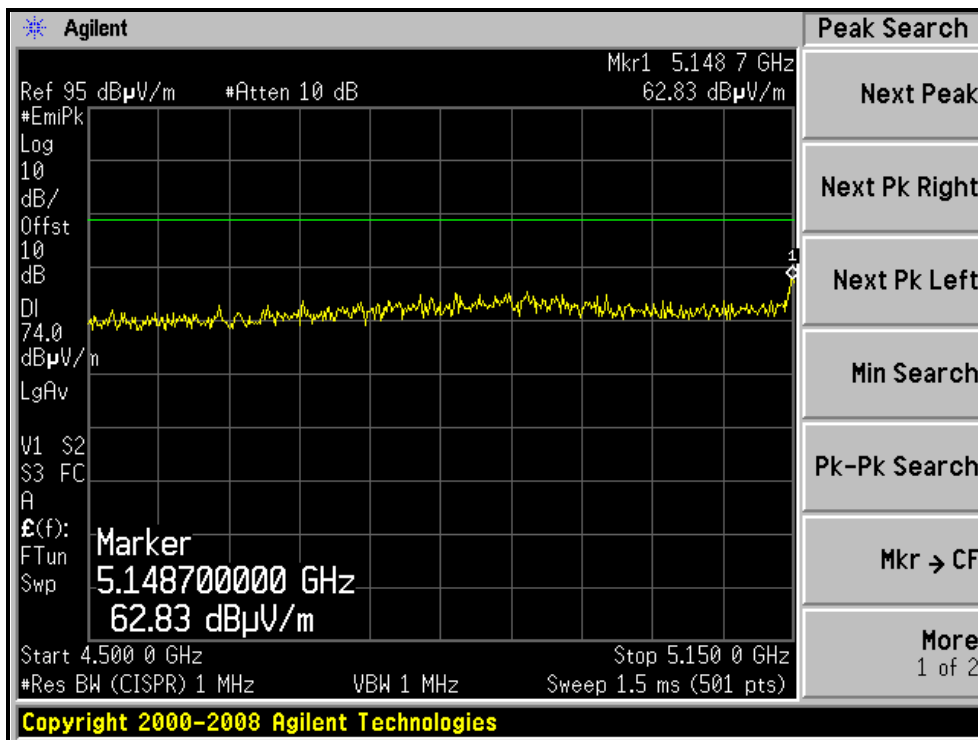
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5230.00 | 106.3 PK | | | 1.46 V | 37 | 66.15 | 40.15 |
| 2 | *5230.00 | 96.4 AV | | | 1.46 V | 37 | 56.25 | 40.15 |
| 3 | 5350.00 | 60.9 PK | 74.0 | -13.1 | 1.44 V | 106 | 20.43 | 40.47 |
| 4 | 5350.00 | 49.4 AV | 54.0 | -4.6 | 1.44 V | 106 | 8.93 | 40.47 |
| 5 | #10460.00 | 54.4 PK | 68.3 | -13.9 | 1.03 V | 45 | 7.75 | 46.65 |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



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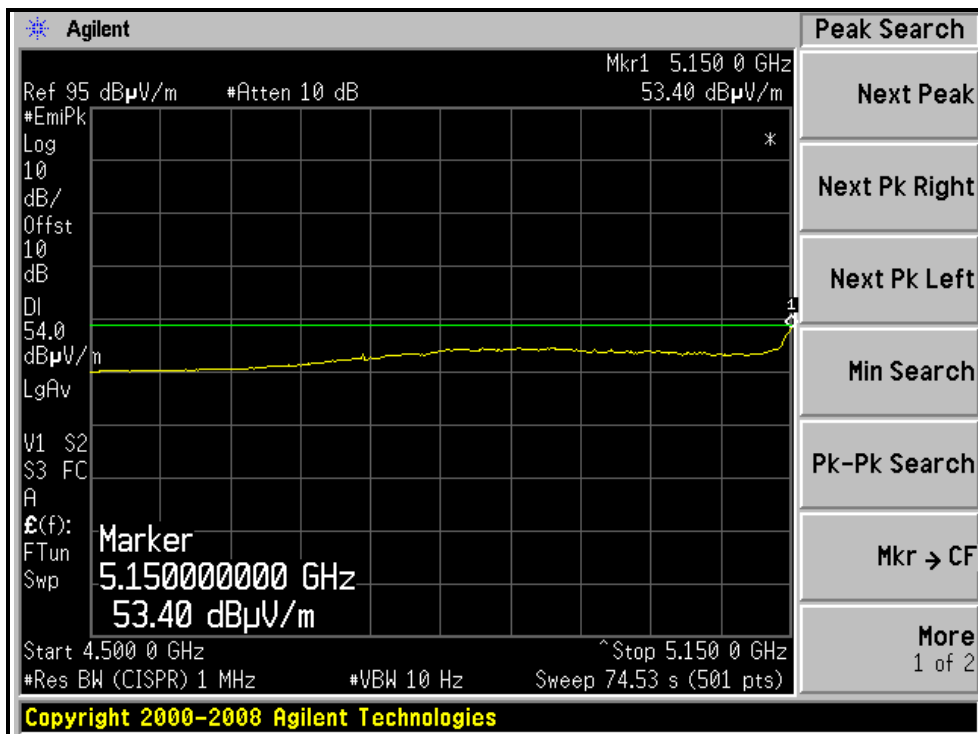
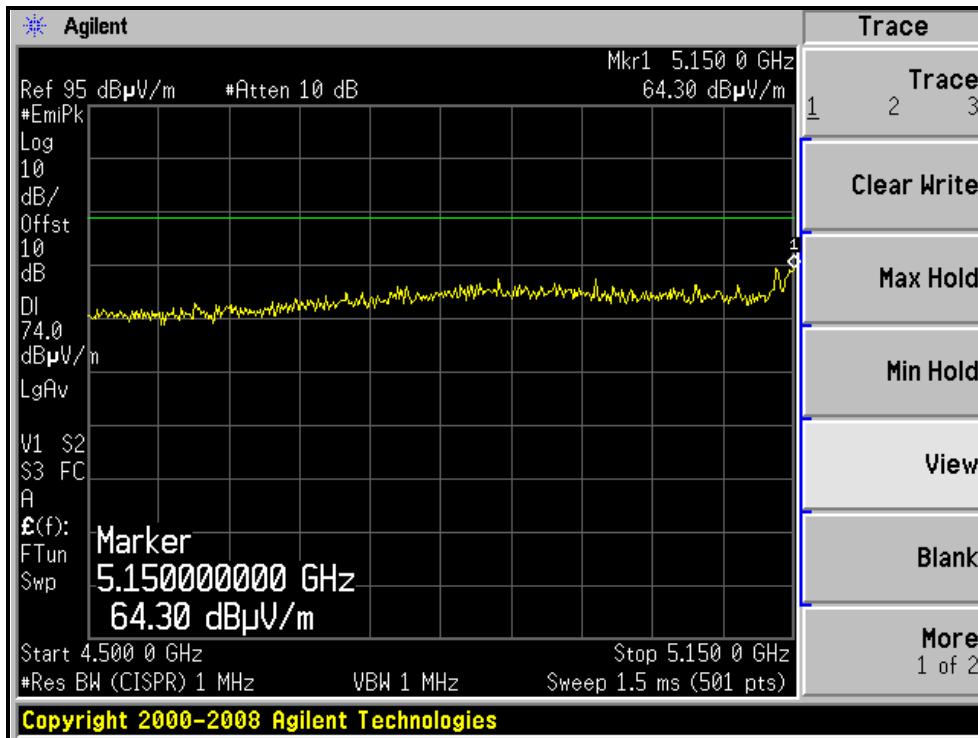
RESTRICTED BANDEDGE (802.11n (40MHz) MODE, CH38, HORIZONTAL)





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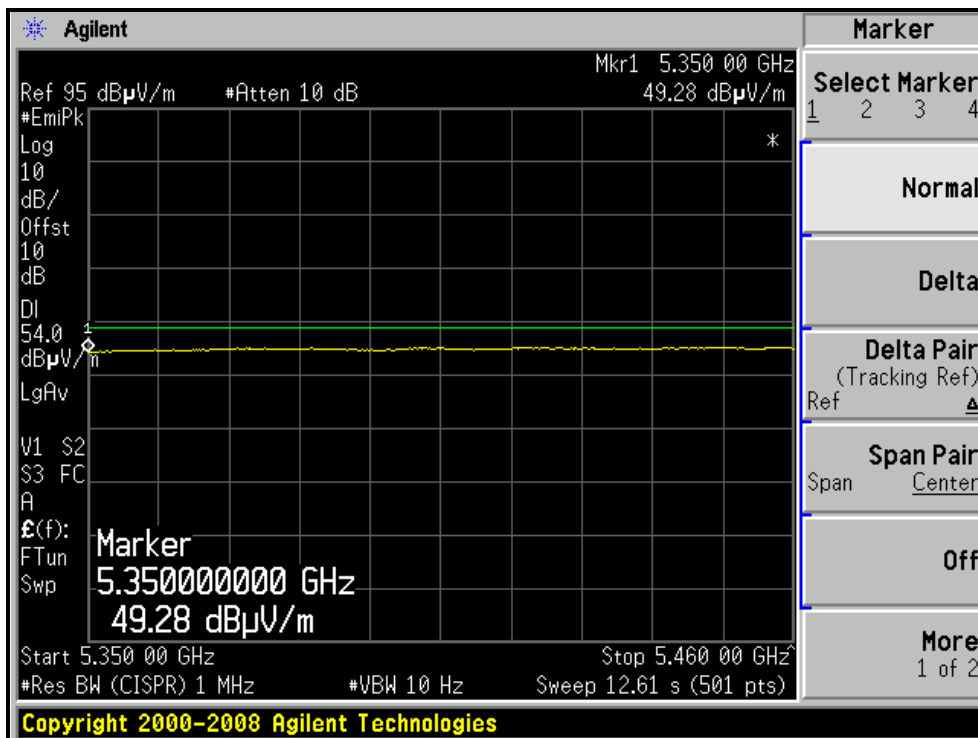
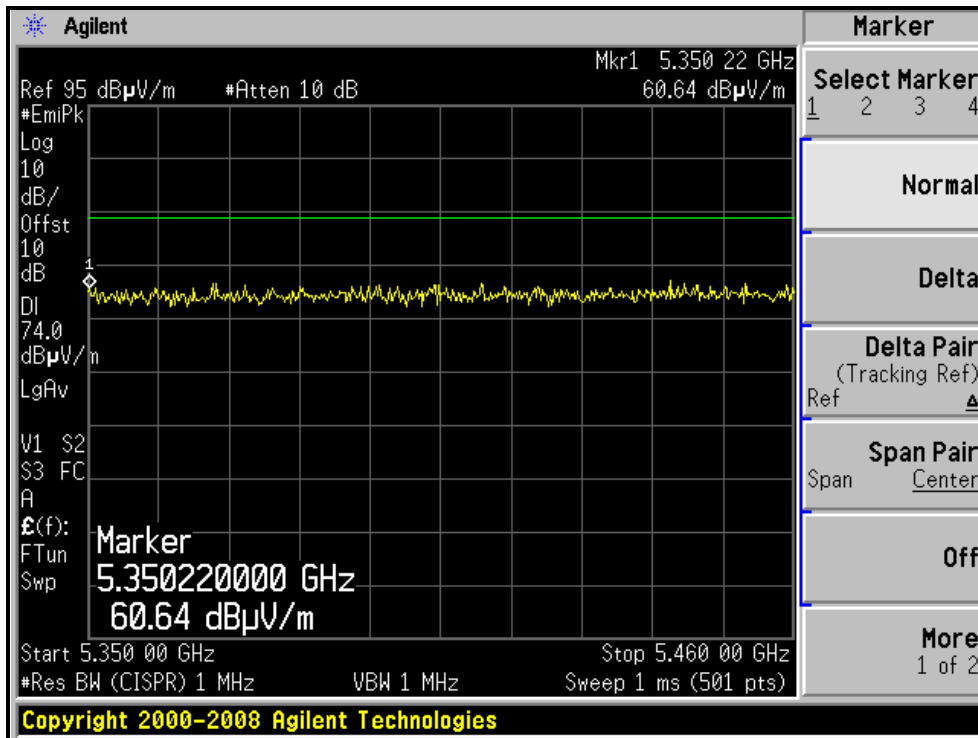
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH38, VERTICAL)





A D T

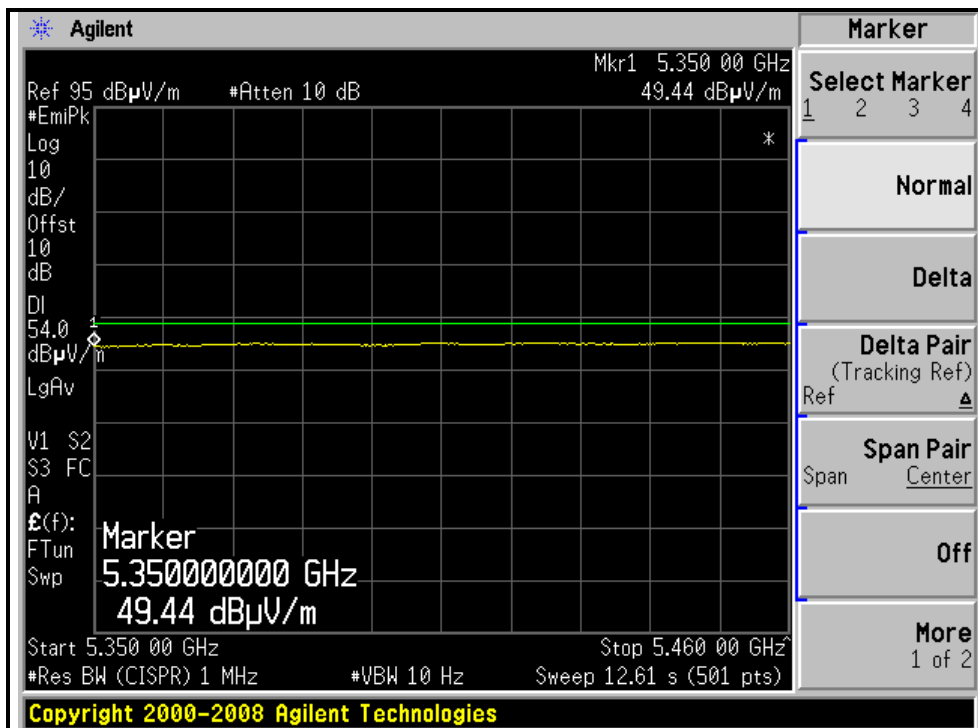
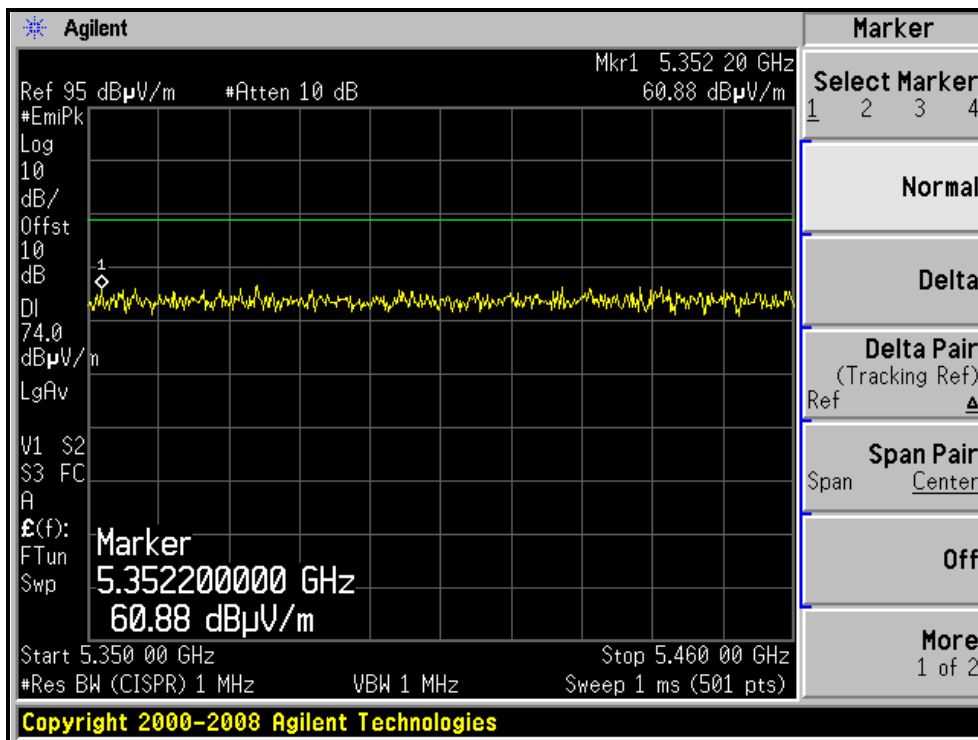
RESTRICTED BANDEDGE (802.11n (40MHz) MODE, CH46, HORIZONTAL)





A D T

RESTRICTED BANDEDGE (802.11n (40MHz) MODE, CH46, VERTICAL)



4.3 OUTPUT TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF OUTPUT TRANSMIT POWER MEASUREMENT

| Frequency Band | Limit |
|------------------|---|
| 5.15 – 5.25GHz | The lesser of 50mW (17dBm) or 4dBm + 10logB |
| 5.25 – 5.35GHz | The lesser of 250mW (24dBm) or 11dBm + 10logB |
| 5.47 – 5.725GHz | The lesser of 250mW (24dBm) or 11dBm + 10logB |
| 5.725 – 5.825GHz | The lesser of 1W (30dBm) or 17dBm + 10logB |

NOTE: Where B is the 26dB emission bandwidth in MHz.

4.3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Spectrum Analyzer | E4446A | MY48250254 | July 14, 2010 | July 13, 2011 |

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth of the signal.
3. Set RBW to 1MHz, VBW to 3MHz.
4. Using the spectrum analyzer's channel power measurement function to measure the output power.

NOTE:

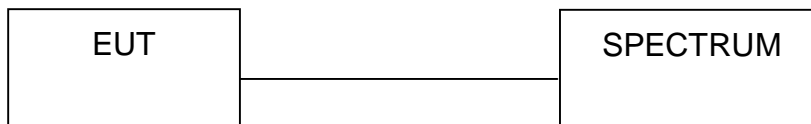
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.3.7 TEST RESULTS

802.11a OFDM MODULATION:

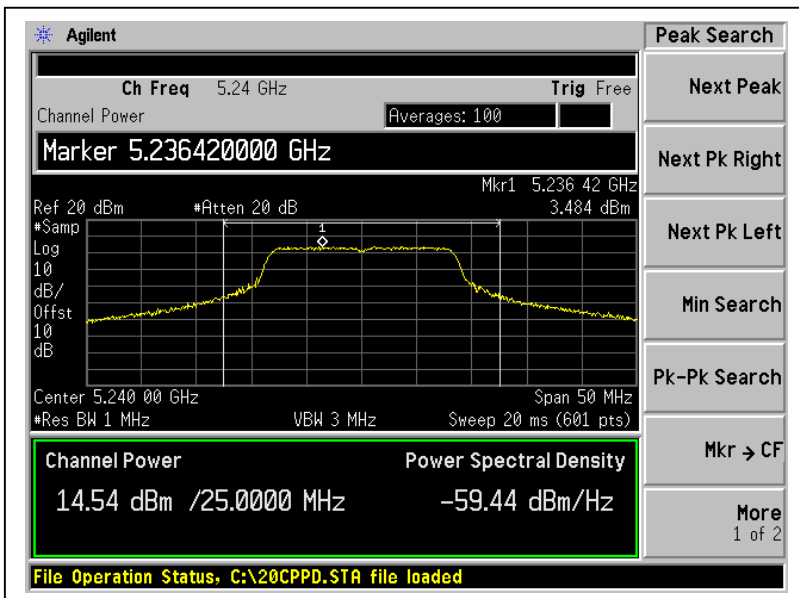
| CHANNEL | CHANNEL FREQUENCY (MHz) | OUTPUT POWER OUTPUT (mW) | OUTPUT POWER OUTPUT (dBm) | OUTPUT POWER LIMIT (dBm) | 26dBc Occupied Bandwidth (MHz) | PASS / FAIL |
|---------|-------------------------|--------------------------|---------------------------|--------------------------|--------------------------------|-------------|
| 36 | 5180 | 28.2 | 14.5 | 17 | 25.67 | PASS |
| 40 | 5200 | 28.2 | 14.5 | 17 | 26.08 | PASS |
| 48 | 5240 | 28.2 | 14.5 | 17 | 25.00 | PASS |

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

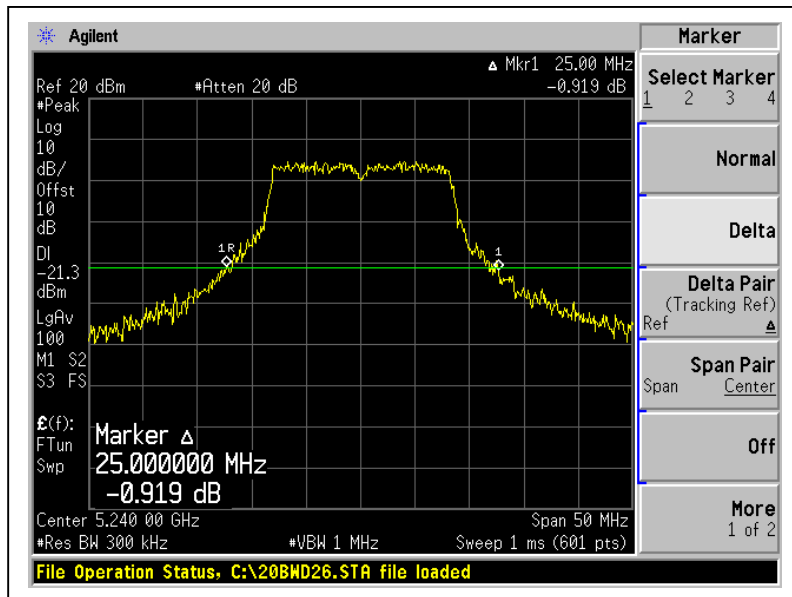


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Output Power: CH48



26dB Occupied Bandwidth: CH48





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802.11n (20MHz) OFDM MODULATION:

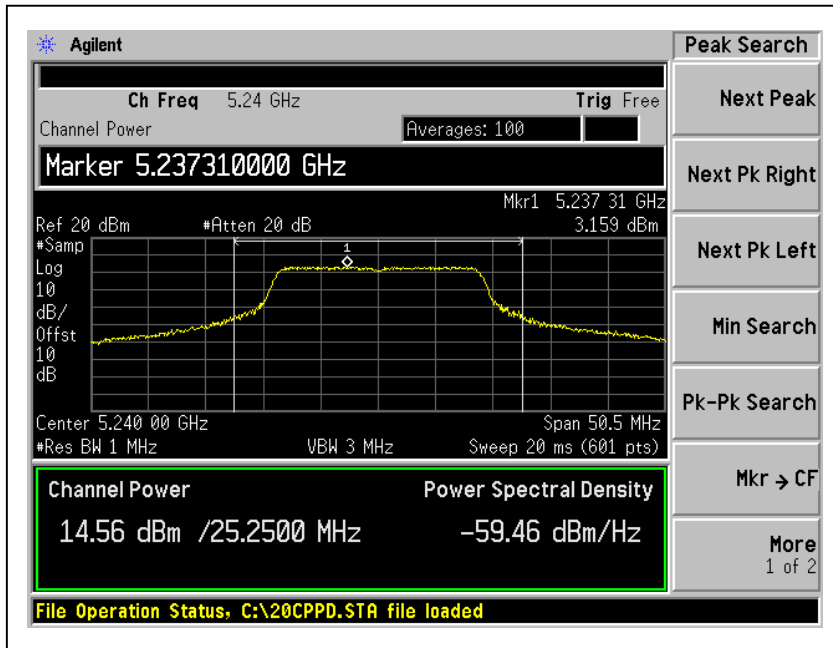
| CHANNEL | CHANNEL FREQUENCY (MHz) | OUTPUT POWER OUTPUT (mW) | OUTPUT POWER OUTPUT (dBm) | OUTPUT POWER LIMIT (dBm) | 26dBc Occupied Bandwidth (MHz) | PASS / FAIL |
|---------|-------------------------|--------------------------|---------------------------|--------------------------|--------------------------------|-------------|
| 36 | 5180 | 28.2 | 14.5 | 17 | 25.83 | PASS |
| 40 | 5200 | 28.8 | 14.6 | 17 | 25.42 | PASS |
| 48 | 5240 | 28.8 | 14.6 | 17 | 25.25 | PASS |

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

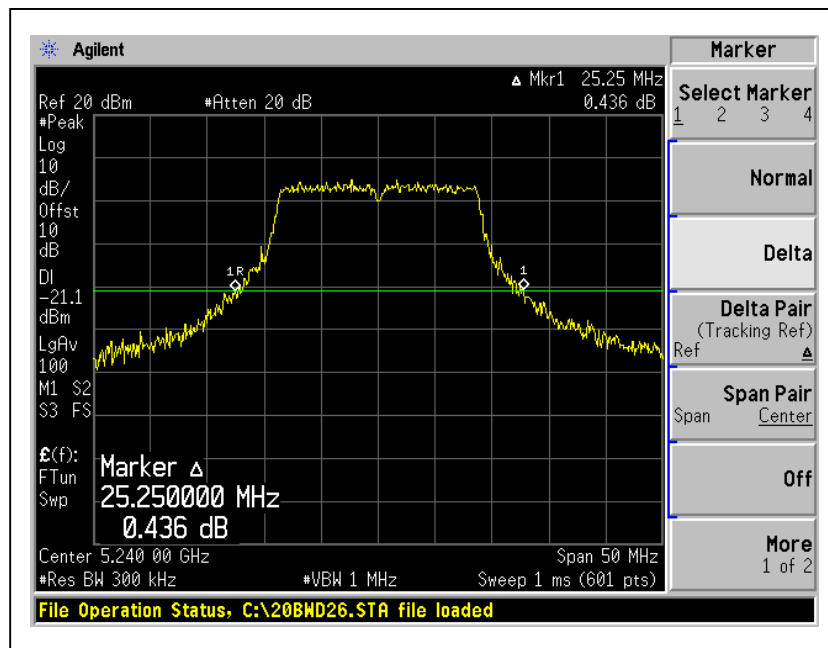


A D T

Output Power:
CH48



26dB Occupied Bandwidth:
CH48





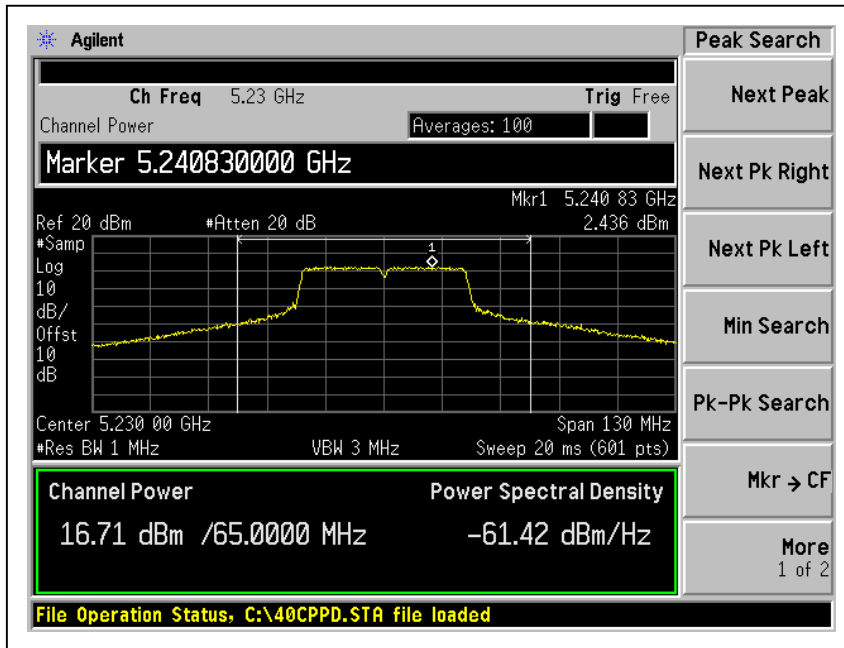
A D T

802.11n (40MHz) OFDM MODULATION:

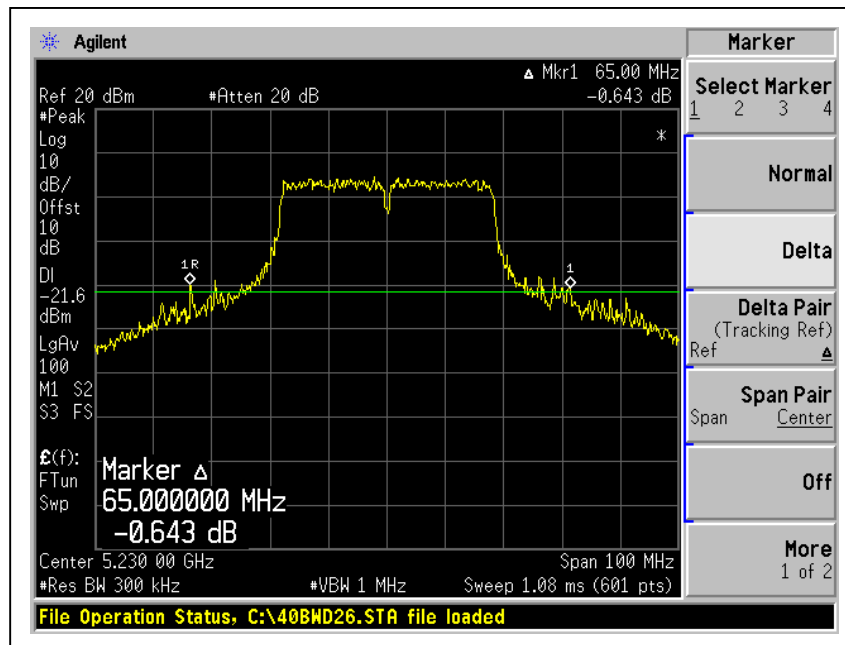
| CHANNEL | CHANNEL FREQUENCY (MHz) | OUTPUT POWER OUTPUT (mW) | OUTPUT POWER OUTPUT (dBm) | OUTPUT POWER LIMIT (dBm) | 26dBc Occupied Bandwidth (MHz) | PASS / FAIL |
|---------|-------------------------|--------------------------|---------------------------|--------------------------|--------------------------------|-------------|
| 38 | 5190 | 9.8 | 9.9 | 17 | 49.17 | PASS |
| 46 | 5230 | 46.8 | 16.7 | 17 | 65.00 | PASS |

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

Peak Power Output: CH46



26dB Occupied Bandwidth: CH46



4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

| Frequency Band | Limit |
|-------------------|-------|
| 5.15 – 5.25 GHz | 13dB |
| 5.25 – 5.35 GHz | 13dB |
| 5.47 – 5.725GHz | 13dB |
| 5.725 – 5.825 GHz | 13dB |

4.4.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Spectrum Analyzer | E4446A | MY48250254 | July 14, 2010 | July 13, 2011 |

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

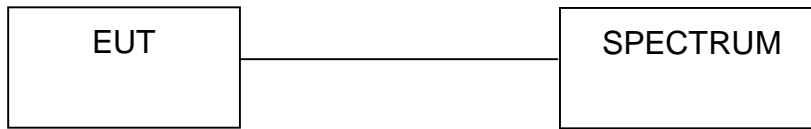
4.4.3 TEST PROCEDURE

1. Connect the cable from the spectrum analyzer to the EUT antenna port using an appropriate RF attenuator.
2. Verify the antenna port selected is the active one if the system has more than one antenna.
3. Verify the unlicensed wireless device is set to operate at 100 % duty cycle at the maximum allowed power for operation.
4. Testing shall be done on the center frequency of each U-NII band.
5. Set the spectrum analyzer span to view the entire emission bandwidth. The largest difference between the following two traces must be 13 dB for all frequencies across the emission bandwidth.
 - a. First trace: set RBW = 1 MHz, VBW = 3 MHz with peak detector and max hold settings.
 - b. Second trace: set RBW = 1 MHz, VBW = 3 MHz with sample detector and trace average across 100 traces in power averaging mode.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



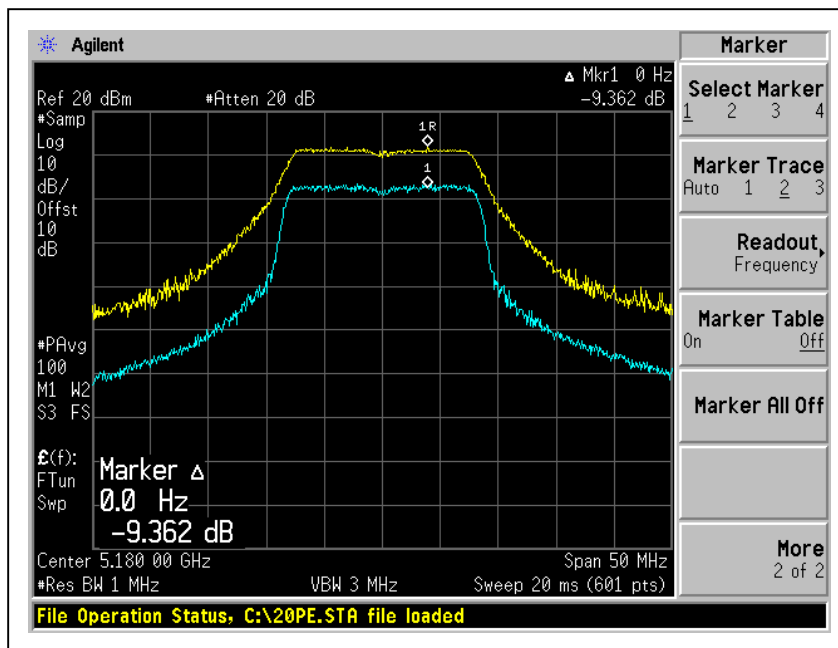
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4.4.7 TEST RESULTS

802.11a OFDM MODULATION

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER EXCURSION (dB) | PEAK to AVERAGE EXCURSION LIMIT (dB) | PASS/FAIL |
|---------|-------------------------|---------------------------|--------------------------------------|-----------|
| 36 | 5180 | 9.4 | 13 | PASS |
| 40 | 5200 | 9.2 | 13 | PASS |
| 48 | 5240 | 8.8 | 13 | PASS |

CH36



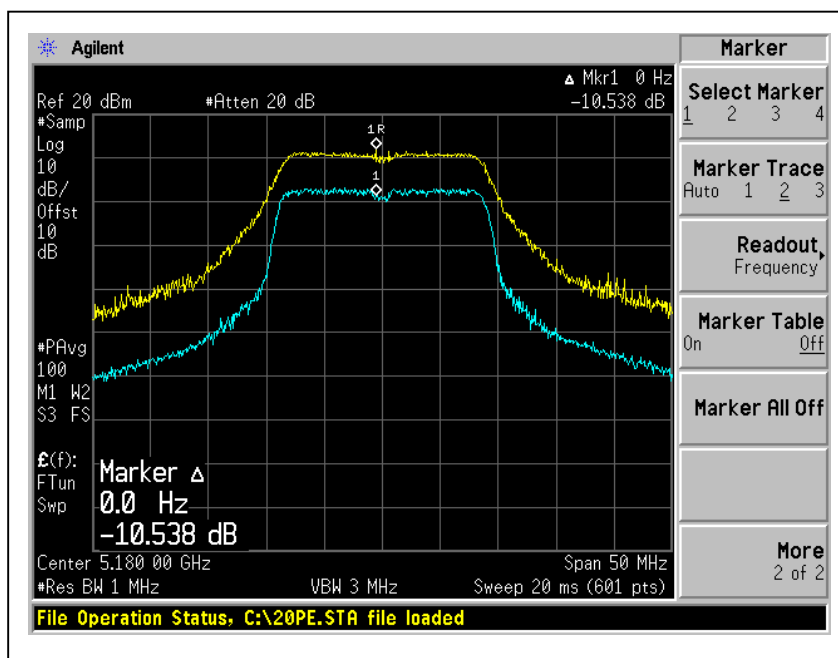


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802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER EXCURSION (dB) | PEAK to AVERAGE EXCURSION LIMIT (dB) | PASS/FAIL |
|---------|-------------------------|---------------------------|--------------------------------------|-----------|
| 36 | 5180 | 10.5 | 13 | PASS |
| 40 | 5200 | 9.3 | 13 | PASS |
| 48 | 5240 | 9.5 | 13 | PASS |

CH36



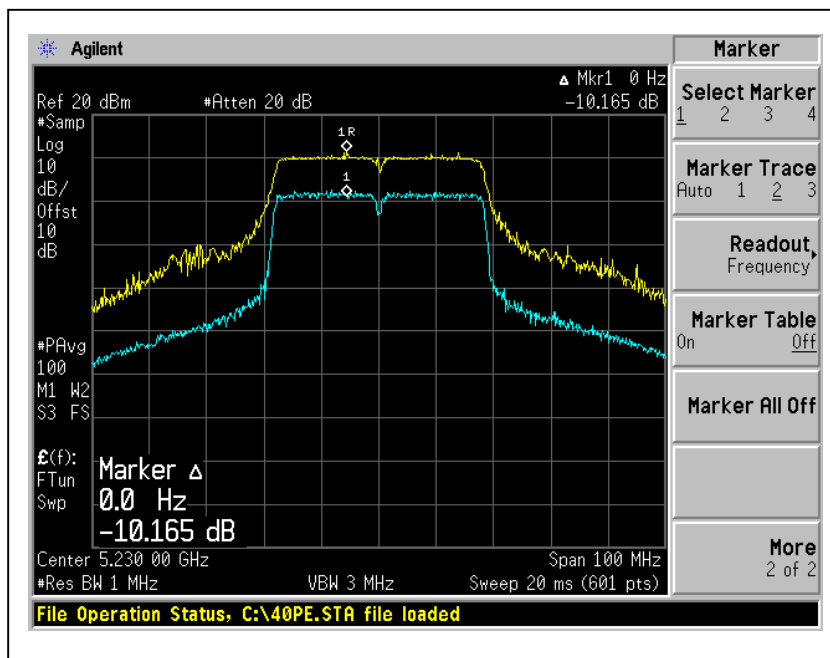


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802.11n (40MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER EXCURSION (dB) | PEAK to AVERAGE EXCURSION LIMIT (dB) | PASS/FAIL |
|---------|-------------------------|---------------------------|--------------------------------------|-----------|
| 38 | 5190 | 9.0 | 13 | PASS |
| 46 | 5230 | 10.2 | 13 | PASS |

CH46



4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

| Frequency Band | Limit |
|------------------|-------|
| 5.15 ~ 5.25GHz | 4dBm |
| 5.25 ~ 5.35GHz | 11dBm |
| 5.47 – 5.725GHz | 11dBm |
| 5.725 ~ 5.825GHz | 17dBm |

4.5.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Spectrum Analyzer | E4446A | MY48250254 | July 14, 2010 | July 13, 2011 |

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURES

1. The transmitter output was connected to the spectrum analyzer.
2. Set RBW=1MHz, VBW=3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

Same as 4.3.6



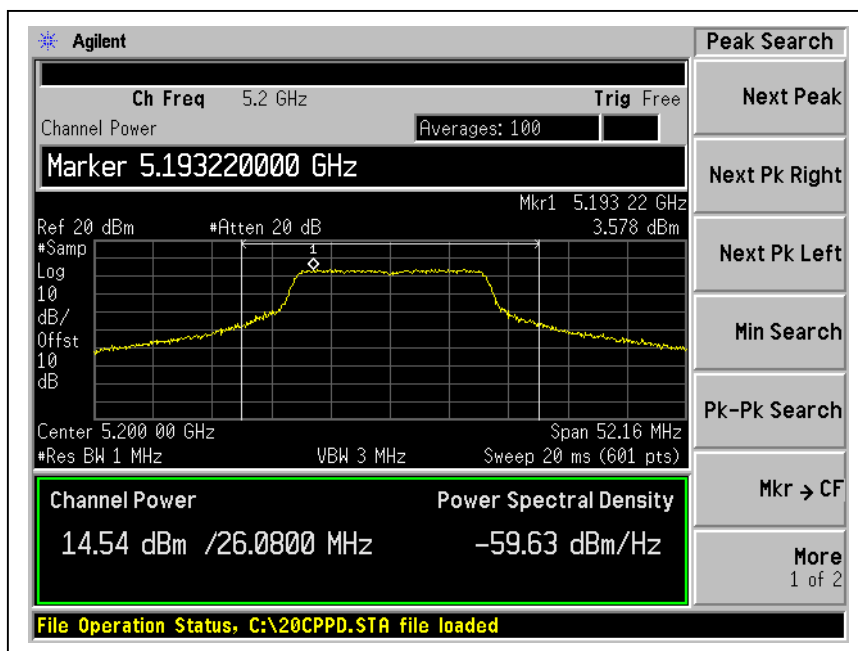
A D T

4.5.7 TEST RESULTS

802.11a OFDM MODULATION

| CHANNEL | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---------|--------------------------|---------------------------------|---------------------|-------------|
| 36 | 5180 | 3.5 | 4 | PASS |
| 40 | 5200 | 3.6 | 4 | PASS |
| 48 | 5240 | 3.5 | 4 | PASS |

CH40



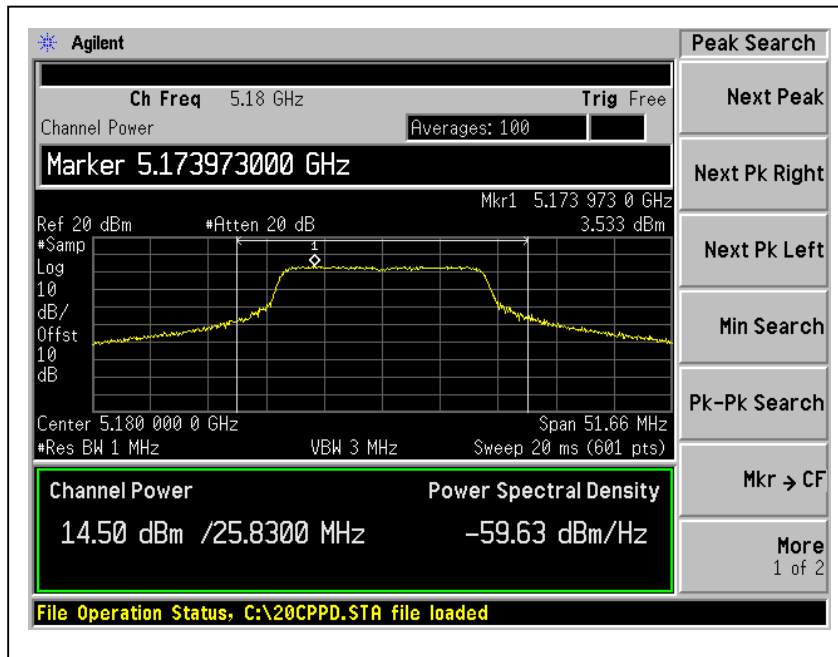


A D T

802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---------|--------------------------|---------------------------------|---------------------|-------------|
| 36 | 5180 | 3.5 | 4 | PASS |
| 40 | 5200 | 3.3 | 4 | PASS |
| 48 | 5240 | 3.2 | 4 | PASS |

CH40



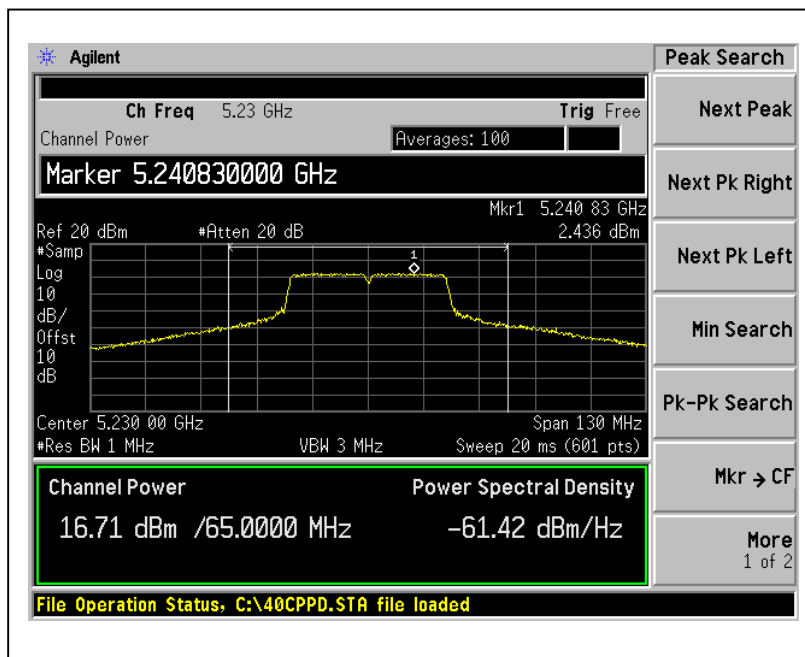


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802.11n (40MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---------|-------------------------|---------------------------------|---------------------|-------------|
| 38 | 5190 | -4.4 | 4 | PASS |
| 46 | 5230 | 2.4 | 4 | PASS |

CH46



4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within the band of the operating frequency over a temperature variation of –30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.6.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Spectrum Analyzer | FSP 40 | 100060 | May 17, 2010 | May 16, 2011 |

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

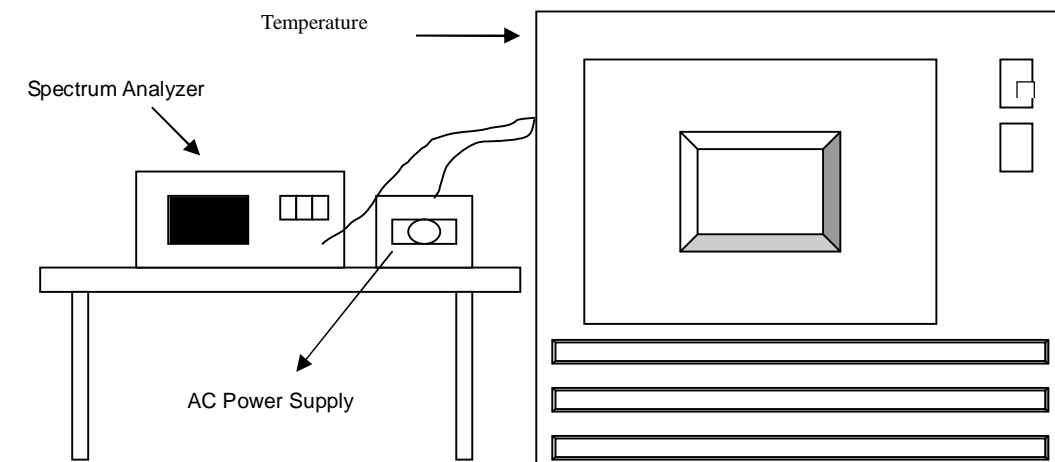
4.6.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



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4.6.7 TEST RESULTS

| Operating frequency: 5240MHz | | | | | | | | | |
|------------------------------|--------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| Temp. (°C) | Power supply (VAC) | 0 minute | | 2 minute | | 5 minute | | 10 minute | |
| | | (MHz) | (%) | (MHz) | (%) | (MHz) | (%) | (MHz) | (%) |
| 50 | 138 | 5240.0109 | 2.0802 | 5240.0049 | 0.9351 | 5240.0056 | 1.0687 | 5240.0076 | 1.4504 |
| | 120 | 5240.0092 | 1.7557 | 5240.0048 | 0.9160 | 5240.0045 | 0.8588 | 5240.0085 | 1.6221 |
| | 102 | 5240.0107 | 2.0420 | 5240.0056 | 1.0687 | 5240.0051 | 0.9733 | 5240.0073 | 1.3931 |
| 40 | 138 | 5239.976 | -4.5802 | 5239.982 | -3.4351 | 5239.9764 | -4.5038 | 5239.9775 | -4.2939 |
| | 120 | 5239.9764 | -4.5038 | 5239.9809 | -3.6450 | 5239.9759 | -4.5992 | 5239.9765 | -4.4847 |
| | 102 | 5239.9768 | -4.4275 | 5239.9811 | -3.6069 | 5239.9771 | -4.3702 | 5239.977 | -4.3893 |
| 30 | 138 | 5240.0116 | 2.2137 | 5240.0139 | 2.6527 | 5240.0164 | 3.1298 | 5240.0157 | 2.9962 |
| | 120 | 5240.0105 | 2.0038 | 5240.0147 | 2.8053 | 5240.017 | 3.2443 | 5240.0175 | 3.3397 |
| | 102 | 5240.0119 | 2.2710 | 5240.015 | 2.8626 | 5240.0161 | 3.0725 | 5240.0172 | 3.2824 |
| 20 | 138 | 5239.9799 | -3.8359 | 5239.9801 | -3.7977 | 5239.9825 | -3.3397 | 5239.9825 | -3.3397 |
| | 120 | 5239.9793 | -3.9504 | 5239.9816 | -3.5115 | 5239.9827 | -3.3015 | 5239.9821 | -3.4160 |
| | 102 | 5239.9801 | -3.7977 | 5239.9802 | -3.7786 | 5239.9812 | -3.5878 | 5239.9818 | -3.4733 |
| 10 | 138 | 5239.9968 | -0.6107 | 5240.0005 | 0.0954 | 5239.998 | -0.3817 | 5239.9982 | -0.3435 |
| | 120 | 5239.996 | -0.7634 | 5239.9998 | -0.0382 | 5239.999 | -0.1908 | 5239.9974 | -0.4962 |
| | 102 | 5239.9957 | -0.8206 | 5239.999 | -0.1908 | 5239.9989 | -0.2099 | 5239.9978 | -0.4198 |
| 0 | 138 | 5240.0202 | 3.8550 | 5240.0229 | 4.3702 | 5240.0247 | 4.7137 | 5240.0259 | 4.9427 |
| | 120 | 5240.0199 | 3.7977 | 5240.023 | 4.3893 | 5240.0245 | 4.6756 | 5240.0244 | 4.6565 |
| | 102 | 5240.02 | 3.8168 | 5240.0222 | 4.2366 | 5240.0237 | 4.5229 | 5240.0251 | 4.7901 |
| -10 | 138 | 5239.9985 | -0.2863 | 5240.0002 | 0.0382 | 5240.0038 | 0.7252 | 5240 | 0.0000 |
| | 120 | 5239.9982 | -0.3435 | 5239.9993 | -0.1336 | 5240.0035 | 0.6679 | 5239.9993 | -0.1336 |
| | 102 | 5239.999 | -0.1908 | 5240.0001 | 0.0191 | 5240.004 | 0.7634 | 5239.9991 | -0.1718 |
| -20 | 138 | 5239.985 | -2.8626 | 5239.9891 | -2.0802 | 5239.988 | -2.2901 | 5239.9884 | -2.2137 |
| | 120 | 5239.9849 | -2.8817 | 5239.989 | -2.0992 | 5239.988 | -2.2901 | 5239.9898 | -1.9466 |
| | 102 | 5239.9841 | -3.0344 | 5239.9899 | -1.9275 | 5239.9897 | -1.9656 | 5239.9893 | -2.0420 |
| -30 | 138 | 5239.9898 | -1.9466 | 5239.9936 | -1.2214 | 5239.9945 | -1.0496 | 5239.9939 | -1.1641 |
| | 120 | 5239.9892 | -2.0611 | 5239.9947 | -1.0115 | 5239.995 | -0.9542 | 5239.9925 | -1.4313 |
| | 102 | 5239.9902 | -1.8702 | 5239.9939 | -1.1641 | 5239.9946 | -1.0305 | 5239.9929 | -1.3550 |

4.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.7.1 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Spectrum Analyzer | FSP 40 | 100060 | May 17, 2010 | May 16, 2011 |

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.7.2 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 1MHz with suitable frequency span including 100MHz or 200MHz bandwidth from band edge. The band edges was measured and recorded.

4.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.7.4 TEST RESULTS

For 5.15 to 5.25GHz band:

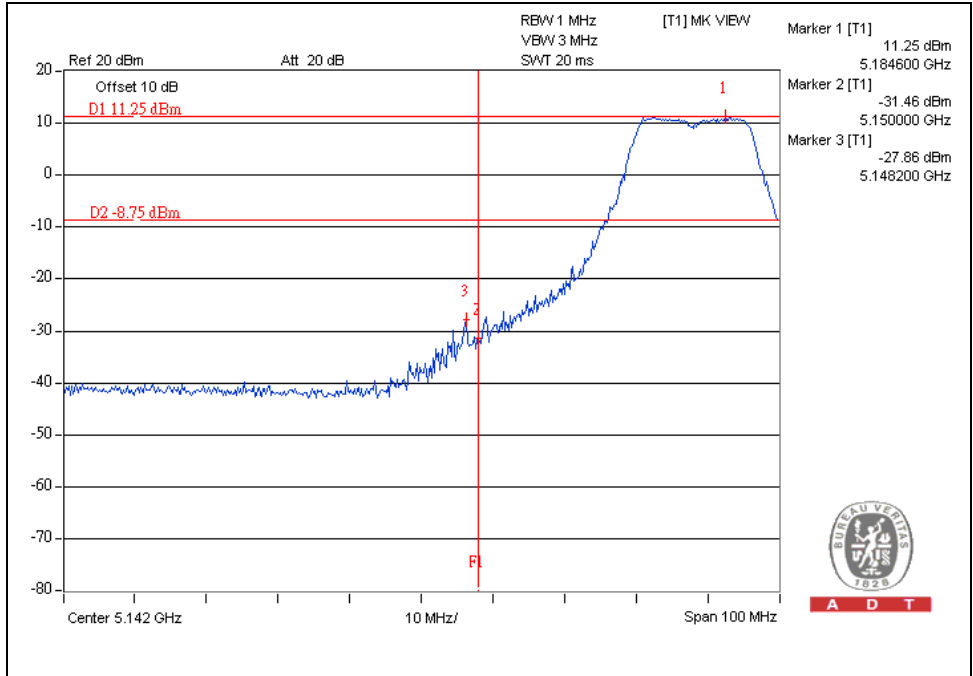
The spectrum plots (Peak RBW=1MHz, VBW=3MHz) are attached on the following pages.



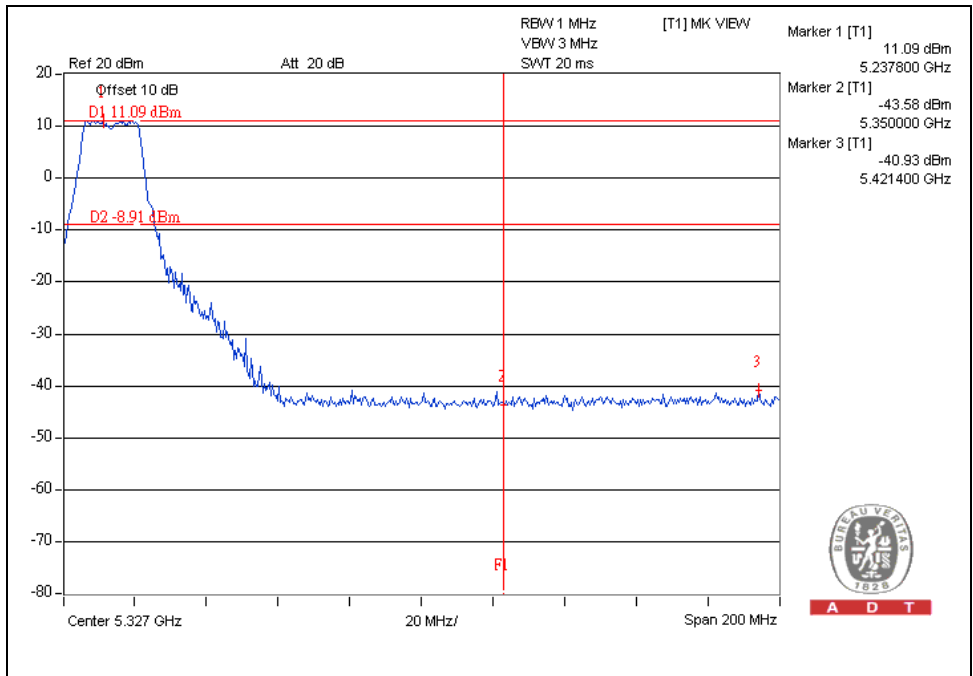
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802.11a OFDM modulation

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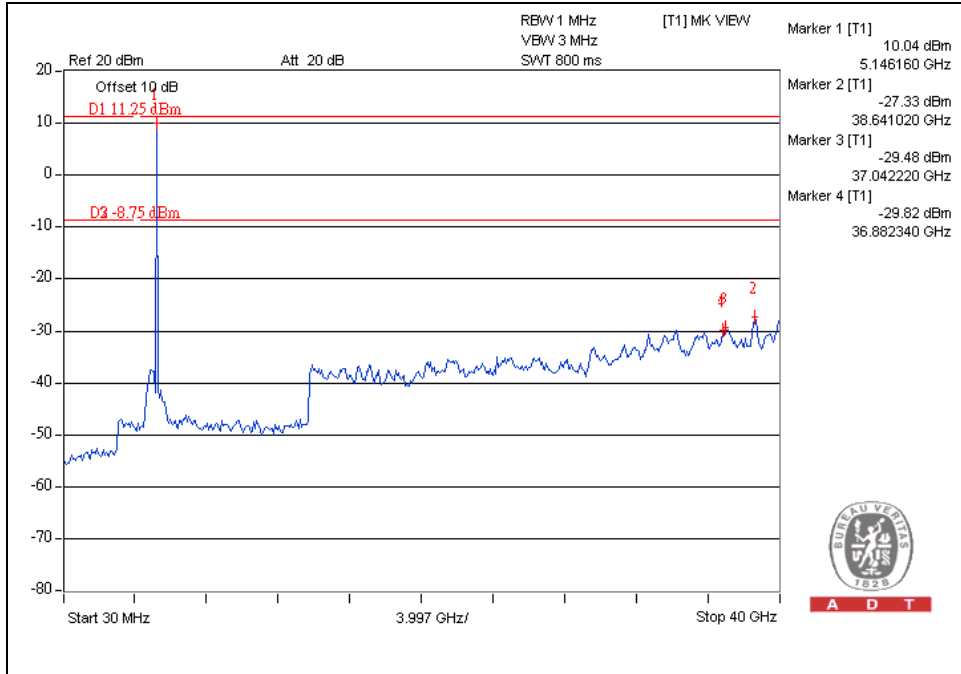
CH 48





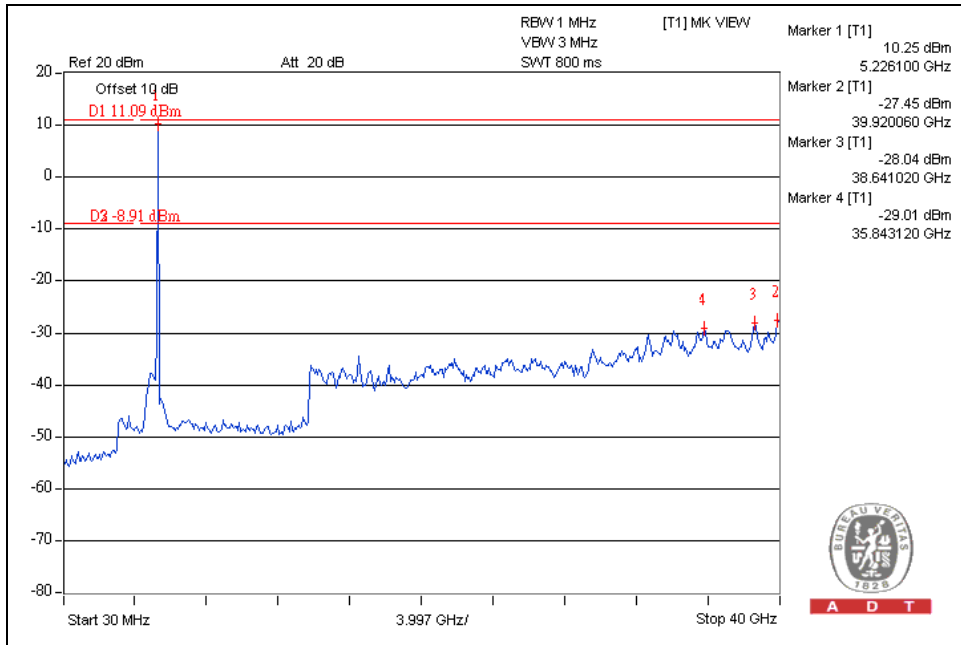
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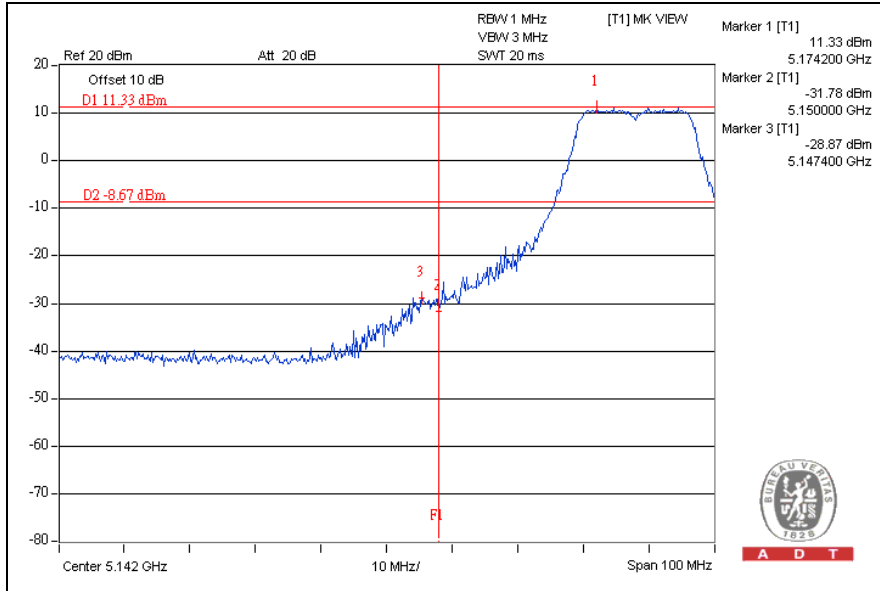
A D T



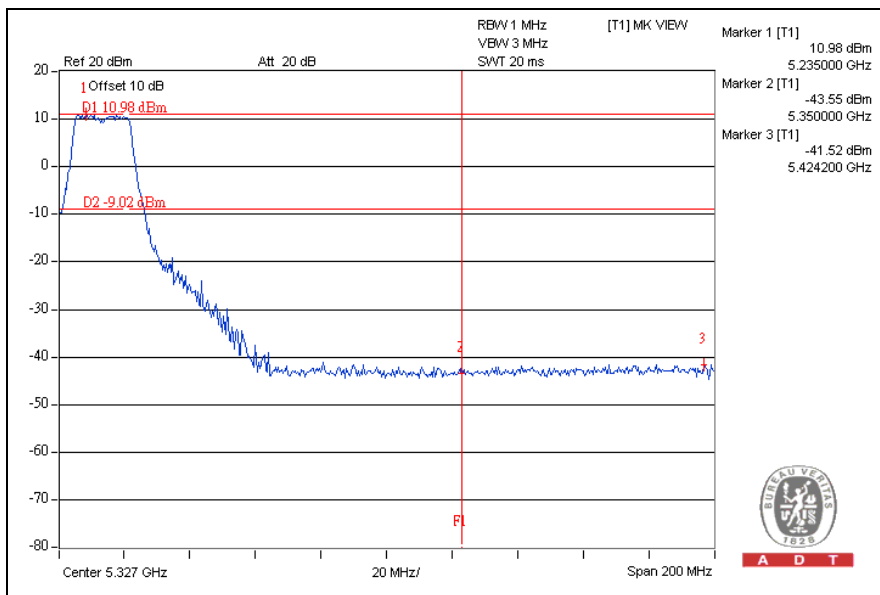
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802.11n (20MHz) OFDM MODULATION:

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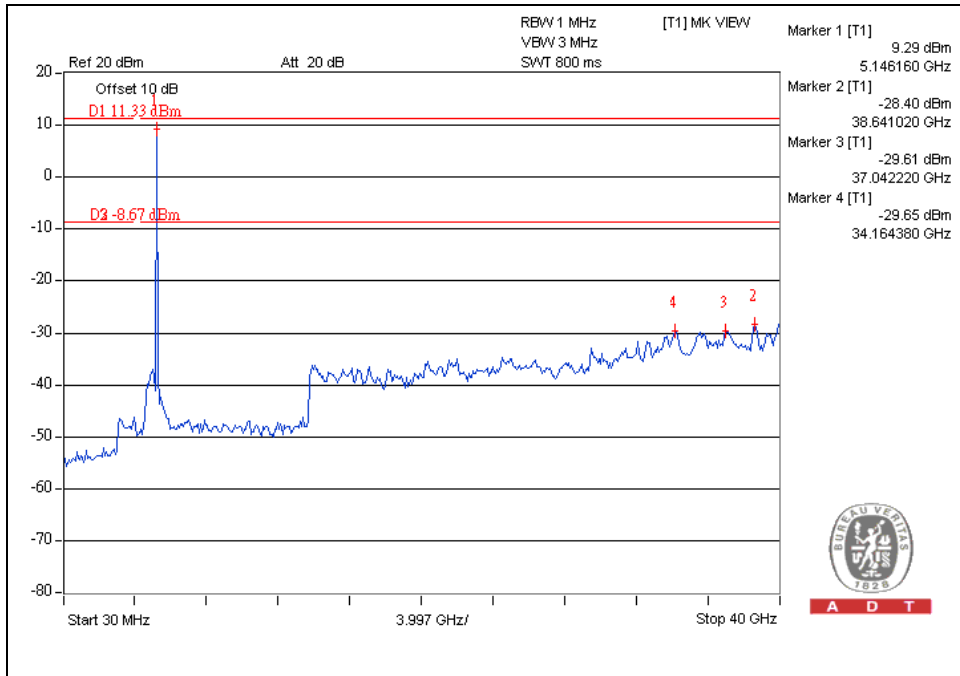
CH48



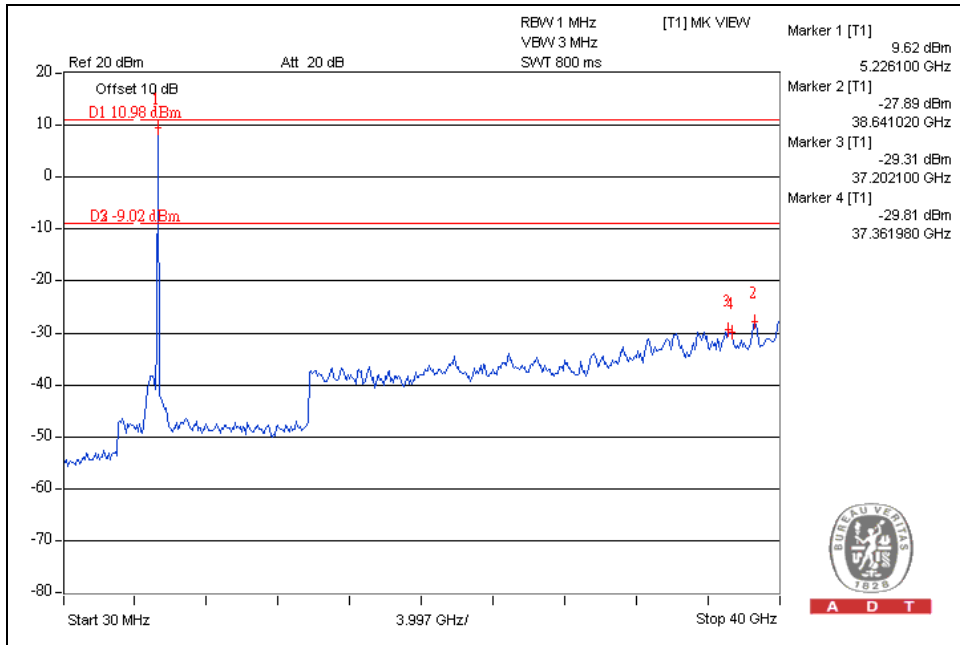


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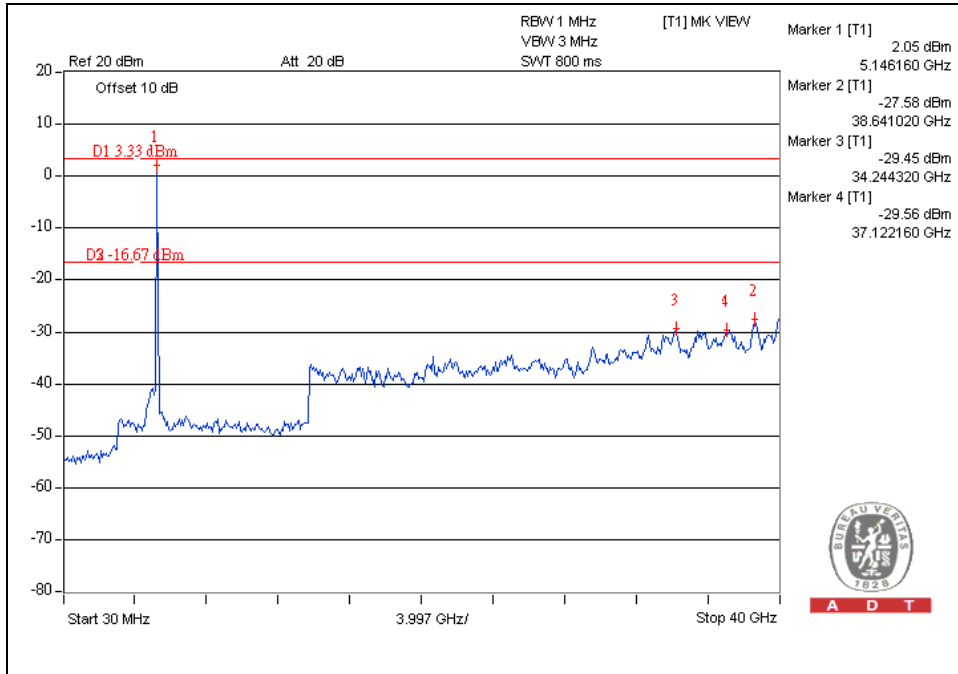
CH48



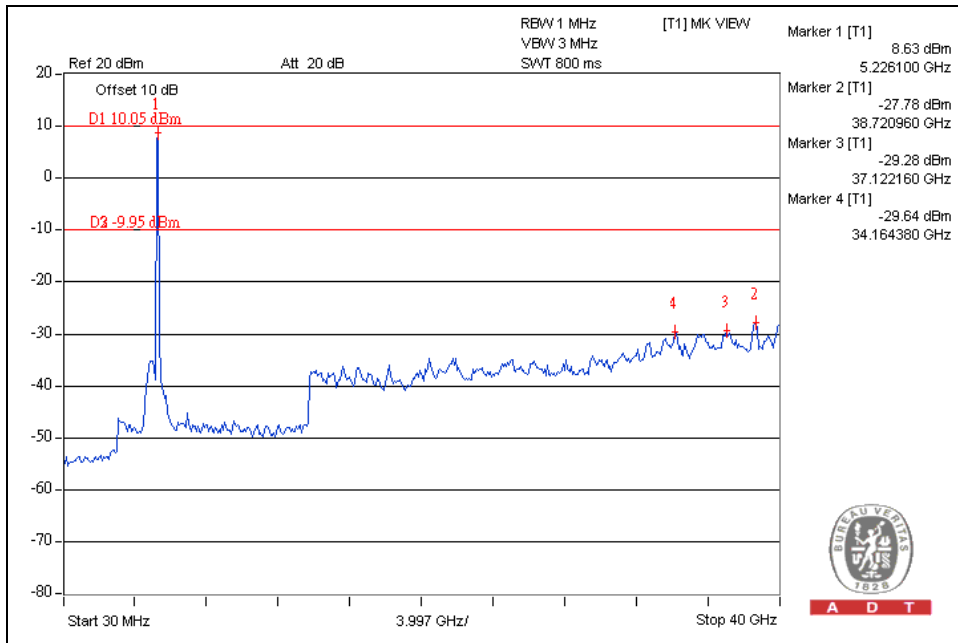


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5. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service@adt.com.tw

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.



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6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---