

# FCC TEST REPORT (15.247)

**REPORT NO.:** RF990709E01

**MODEL NO.:** ARS63

**FCC ID:** PPD-ARS63

**RECEIVED:** July 08, 2010

**TESTED:** July 22 to Aug. 11, 2010

**ISSUED:** Aug. 24, 2010

**APPLICANT:** Atheros Communications, Inc.

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## 1. CERTIFICATION

**PRODUCT:** Low Power 1x1 802.11 a/b/g/n (SDIO) + BT Combo Card

**BRAND NAME:** Atheros

**MODEL NO.:** ARS63

**TEST SAMPLE:** R&D SAMPLE

**TESTED:** July 22 to Aug. 11, 2010

**APPLICANT:** Atheros Communications, Inc.

**STANDARDS:** FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.4-2003  
Canada RSS-210 issue 7  
Canada RSS-Gen issue 2

The above equipment (Model: ARS63) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and was in 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** : Midoli Peng , **DATE:** Aug. 24, 2010  
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE** : Hank Chung , **DATE:** Aug. 24, 2010  
( Hank Chung, Deputy Manager )

**APPROVED BY** : May Chen , **DATE:** Aug. 24, 2010  
( May Chen, Deputy Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2412~2462MHz Band

| APPLIED STANDARD: 47 CFR Part 15, Subpart C ; RSS-210; RSS-Gen |         |                |                                                                                                           |        |                                                                                  |
|----------------------------------------------------------------|---------|----------------|-----------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------|
| Standard Section                                               |         |                | Test Type and Limit                                                                                       | Result | REMARK                                                                           |
| RSS-210                                                        | RSS-Gen | 47 CFR Part 15 |                                                                                                           |        |                                                                                  |
| -                                                              | 7.2.2   | 15.207         | AC Power Conducted Emission                                                                               | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -15.41dB at 0.150MHz |
| A8.2(a)                                                        | 4.6     | 15.247(a)(2)   | Spectrum Bandwidth of a Direct Sequence Spread Spectrum System<br>Limit: min. 500kHz                      | PASS   | Meet the requirement of limit                                                    |
| A8.4(4)                                                        | 4.8     | 15.247(b)      | Maximum Peak Output Power<br>Limit: max. 30dBm                                                            | PASS   | Meet the requirement of limit                                                    |
| A8.5                                                           | 4.9     | 15.247(c)      | Transmitter Radiated Emissions<br>FCC Limit: Table 15.209<br>RSS-210 Limit: Table 2                       | PASS   | Meet the requirement of limit<br>Minimum passing margin is -0.7dB at 2483.5MHz   |
| -                                                              | 6       | -              | Receiver Radiated Emissions<br>RSS-210 Limit: Table 2                                                     | PASS   | Meet the requirement of limit<br>Minimum passing margin is -1.5dB at 166.55MHz   |
| A8.2(b)                                                        | -       | 15.247(d)      | Power Spectral Density<br>Limit: max. 8dBm                                                                | PASS   | Meet the requirement of limit                                                    |
| A8.5                                                           | -       | 15.247(c)      | Conducted Out-Band Emission Measurement<br>Limit: 20 dB less than the peak value of fundamental frequency | PASS   | Meet the requirement of limit                                                    |
|                                                                | 7.1.4   | 15.203         | Antenna Requirement                                                                                       | PASS   | Antenna connector is IPEX not a standard connector.                              |

For 5GHz, 5725~5850MHz Band

| APPLIED STANDARD: 47 CFR Part 15, Subpart C ; RSS-210; RSS-Gen |         |                |                                                                                                           |        |                                                                                  |
|----------------------------------------------------------------|---------|----------------|-----------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------|
| Standard Section                                               |         |                | Test Type and Limit                                                                                       | Result | REMARK                                                                           |
| RSS-210                                                        | RSS-Gen | 47 CFR Part 15 |                                                                                                           |        |                                                                                  |
| -                                                              | 7.2.2   | 15.207         | AC Power Conducted Emission                                                                               | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -16.12dB at 0.240MHz |
| A8.2(a)                                                        | 4.6     | 15.247(a)(2)   | Spectrum Bandwidth of a Direct Sequence Spread Spectrum System<br>Limit: min. 500kHz                      | PASS   | Meet the requirement of limit                                                    |
| A8.4(4)                                                        | 4.8     | 15.247(b)      | Maximum Peak Output Power<br>Limit: max. 30dBm                                                            | PASS   | Meet the requirement of limit                                                    |
| A8.5                                                           | 4.9     | 15.247(c)      | Transmitter Radiated Emissions<br>FCC Limit: Table 15.209<br>RSS-210 Limit: Table 2                       | PASS   | Meet the requirement of limit<br>Minimum passing margin is -1.2dB at 11570.0MHz  |
| -                                                              | 6       | -              | Receiver Radiated Emissions<br>RSS-210 Limit: Table 2                                                     | PASS   | Meet the requirement of limit<br>Minimum passing margin is -2.6dB at 165.0MHz    |
| A8.2(b)                                                        | -       | 15.247(d)      | Power Spectral Density<br>Limit: max. 8dBm                                                                | PASS   | Meet the requirement of limit                                                    |
| A8.5                                                           | -       | 15.247(c)      | Conducted Out-Band Emission Measurement<br>Limit: 20 dB less than the peak value of fundamental frequency | PASS   | Meet the requirement of limit                                                    |
|                                                                | 7.1.4   | 15.203         | Antenna Requirement                                                                                       | PASS   | Antenna connector is IPEX not a standard connector.                              |

**NOTE:**

1. There are Bluetooth technology and WLAN technology used for the EUT. (The Bluetooth test data please refer "RF990709E01-2")
2. For WLAN: The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz and 5.725~5.850GHz. For the 5.15~5.35GHz and 5.47~5.725GHz RF parameters was recorded in another test report (RF990709E01-1).



## 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)   | 3.76 dB |
| Radiated emissions (1GHz -18GHz)  | 2.19 dB |
| Radiated emissions (18GHz -40GHz) | 2.55 dB |

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT</b>               | Low Power 1x1 802.11 a/b/g/n (SDIO) + BT Combo Card                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>MODEL NO.</b>             | ARS63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>FCC ID</b>                | PPD-ARS63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>IC ID</b>                 | 4104A-ARS63                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>POWER SUPPLY</b>          | DC 3.3V from host equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>MODULATION TYPE</b>       | CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>MODULATION TECHNOLOGY</b> | DSSS, OFDM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>TRANSFER RATE</b>         | <b>802.11b:</b> 11 / 5.5 / 2 / 1Mbps<br><b>802.11a/g:</b> 54/48/36/24/18/12/9/6Mbps<br><b>802.11n (20MHz, 800ns GI):</b> 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps<br><b>802.11n (20MHz, 400ns GI):</b> 72.2 / 65 / 57.8 / 43.3 / 28.9 / 21.7 / 14.4 / 7.2Mbps<br><b>802.11n (40MHz, 800ns GI)&lt;For 5GHz only&gt; :</b> 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps<br><b>802.11n (40MHz, 400ns GI) &lt;For 5GHz only&gt; :</b> 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15Mbps |
| <b>OPERATING FREQUENCY</b>   | <b>For 15.407</b><br>802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz                                                                                                                                                                                                                                                                                                                                                                                                               |
|                              | <b>For 15.247</b><br>802.11b & 802.11g: 2.412 ~ 2.462GHz<br>802.11a: 5.745 ~ 5.825GHz                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>NUMBER OF CHANNEL</b>     | <b>For 15.407</b><br>19 for 802.11a, 802.11n (20MHz)<br>9 for 802.11n (40MHz)                                                                                                                                                                                                                                                                                                                                                                                                              |
|                              | <b>For 15.247(2.4GHz)</b><br>11 for 802.11b, 802.11g, 802.11n (20MHz)<br><b>For 15.247(5GHz)</b><br>5 for 802.11a, 802.11n (20MHz)<br>2 for 802.11n (40MHz)                                                                                                                                                                                                                                                                                                                                |

|                             |                                                                                                                                                                                                                                                                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MAXIMUM OUTPUT POWER</b> | <b>For 15.407</b><br>802.11a: 85.1mW<br>802.11n (20MHz): 70.8mW<br>802.11n (40MHz): 81.3mW<br><b>For 15.247(2.4GHz)</b><br>802.11b: 125.9mW<br>802.11g: 239.9mW<br>802.11n (20MHz): 234.4mW<br><b>For 15.247(5GHz)</b><br>802.11a: 218.8mW<br>802.11n (20MHz): 239.9mW<br>802.11n (40MHz): 257.0mW |
| <b>ANTENNA TYPE</b>         | See item 3.2                                                                                                                                                                                                                                                                                       |
| <b>ANTENNA CONNECTOR</b>    | See item 3.2                                                                                                                                                                                                                                                                                       |
| <b>DATA CABLE</b>           | NA                                                                                                                                                                                                                                                                                                 |
| <b>I/O PORTS</b>            | NA                                                                                                                                                                                                                                                                                                 |
| <b>ASSOCIATED DEVICES</b>   | NA                                                                                                                                                                                                                                                                                                 |

**NOTE:**

- There are Bluetooth technology and WLAN technology used for the EUT. <the Bluetooth test data please refer "RF990709E01-2">
- The EUT incorporates CDD function with 802.11a, 802.11b, 802.11g and SISO function with 802.11n.
- The EUT is 1 \* 1 spatial SISO without beam forming function. The antenna configuration is one transmitter antenna and one receiver antenna, as there are 2 PIFA antennas.
- The EUT complies with 802.11n standards and backwards compatible with 802. 11a, 802.11b, 802.11g products.
- The EUT was pre-tested under the following modes:

| Test Mode     | Data rate       |
|---------------|-----------------|
| Mode A        | 400ns GI        |
| <b>Mode B</b> | <b>800ns GI</b> |

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

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

### 3.2 DESCRIPTION OF ANTENNA

There are two sets of antennas provided to this EUT, please refer to the following table:

#### Set 1:

| No. | Brand | Model        | Antenna Type | Connector | Antenna Gain (dBi)< included cable loss> |                      |                       |                       |
|-----|-------|--------------|--------------|-----------|------------------------------------------|----------------------|-----------------------|-----------------------|
|     |       |              |              |           | For 2.4GHz                               | For 5GHz (5.15~5.35) | For 5GHz (5.47~5.725) | For 5GHz (5.725~5.85) |
| 1&2 | WNC   | 81-EBJ15.005 | PIFA         | IPEX      | 3.62                                     | 3.08                 | 4.76                  | 4.76                  |

Cable Loss:

| No. | Brand | Model        | Cable Loss(dB) |                      |                       |                       | Cable Length |
|-----|-------|--------------|----------------|----------------------|-----------------------|-----------------------|--------------|
|     |       |              | For 2.4GHz     | For 5GHz (5.15~5.35) | For 5GHz (5.47~5.725) | For 5GHz (5.725~5.85) |              |
| 1&2 | WNC   | 81-EBJ15.005 | 1.15           | 1.70                 | 1.74                  | 1.79                  | 300mm        |

#### Set 2:

| No. | Brand | Model        | Antenna Type | Connector | Antenna Gain (dBi)< included cable loss> |                      |                       |                       |
|-----|-------|--------------|--------------|-----------|------------------------------------------|----------------------|-----------------------|-----------------------|
|     |       |              |              |           | For 2.4GHz                               | For 5GHz (5.15~5.35) | For 5GHz (5.47~5.725) | For 5GHz (5.725~5.85) |
| 1&2 | WNC   | 81.ED415.001 | PIFA         | IPEX      | 1.48                                     | 5.56                 | 5.34                  | 3.14                  |

Cable Loss:

| No. | Brand | Model        | Cable Loss(dB) |                      |                       |                       | Cable Length |
|-----|-------|--------------|----------------|----------------------|-----------------------|-----------------------|--------------|
|     |       |              | For 2.4GHz     | For 5GHz (5.15~5.35) | For 5GHz (5.47~5.725) | For 5GHz (5.725~5.85) |              |
| 1&2 | WNC   | 81.ED415.001 | 0.96           | 1.29                 | 1.36                  | 1.38                  | 300mm        |

All of antenna can be application for WLAN and Bluetooth.

Antenna (model: 81-EBJ15.005) was chosen for final test.

### 3.3 DESCRIPTION OF TEST MODES

#### Operated in 2400 ~ 2483.5MHz band:

Eleven channels are provided for 802.11b, 802.11g, 802.11n (20MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 1       | 2412MHz   | 7       | 2442MHz   |
| 2       | 2417MHz   | 8       | 2447MHz   |
| 3       | 2422MHz   | 9       | 2452MHz   |
| 4       | 2427MHz   | 10      | 2457MHz   |
| 5       | 2432MHz   | 11      | 2462MHz   |
| 6       | 2437MHz   |         |           |

#### Operated in 5725 ~ 5850MHz band:

Five channels are provided for 802.11a, 802.11n (20MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 149     | 5745 MHz  | 161     | 5805 MHz  |
| 153     | 5765 MHz  | 165     | 5825 MHz  |
| 157     | 5785 MHz  |         |           |

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

| CHANNEL | FREQUENCY |
|---------|-----------|
| 151     | 5755 MHz  |
| 159     | 5795 MHz  |

### 3.3.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

| EUT<br>CONFIGURE<br>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<br>CHANNEL | TESTED<br>CHANNEL | MODULATION<br>TECHNOLOGY | MODULATION<br>TYPE | DATA RATE<br>(Mbps) |
|------------------------------|----------------------|-------------------|--------------------------|--------------------|---------------------|
| 802.11b                      | 1 to 11              | 1                 | DSSS                     | DBPSK              | 1                   |
| For 5 GHz<br>802.11n (40MHz) | 151 to 159           | 159               | OFDM                     | BPSK               | 13.5                |

#### 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).
- ☒ The receiving mode had show equal or better than Tx mode during the pre-scan and hence the Tx mode data is re-used for Receiving-mode worst-case data.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| MODE                         | AVAILABLE<br>CHANNEL | TESTED<br>CHANNEL | MODULATION<br>TECHNOLOGY | MODULATIO<br>N TYPE | DATA RATE<br>(Mbps) |
|------------------------------|----------------------|-------------------|--------------------------|---------------------|---------------------|
| 802.11g                      | 1 to 11              | 6                 | OFDM                     | BPSK                | 6                   |
| For 5 GHz<br>802.11n (40MHz) | 151 to 159           | 159               | OFDM                     | BPSK                | 13.5                |

#### **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) |
|---------------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 802.11b                   | 1 to 11           | 1, 6, 11       | DSSS                  | DBPSK           | 1                |
| 802.11g                   | 1 to 11           | 1, 6, 11       | OFDM                  | BPSK            | 6                |
| 802.11n (20MHz)           | 1 to 11           | 1, 6, 11       | OFDM                  | BPSK            | 6.5              |
| For 2.4 GHz Receiver      | 1 to 11           | 1, 6, 11       | -                     | -               | -                |
| 802.11a                   | 149 to 165        | 149, 157, 165  | OFDM                  | BPSK            | 6                |
| For 5 GHz 802.11n (20MHz) | 149 to 165        | 149, 157, 165  | OFDM                  | BPSK            | 6.5              |
| For 5 GHz 802.11n (40MHz) | 151 to 159        | 151, 159       | OFDM                  | BPSK            | 13.5             |
| For 5 GHz Receiver        | 149 to 165        | 149, 157, 165  | -                     | -               | -                |

#### **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) |
|-----------------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 802.11b                     | 1 to 11           | 1, 11          | DSSS                  | DBPSK           | 1                |
| 802.11g                     | 1 to 11           | 1, 11          | OFDM                  | BPSK            | 6                |
| For 2.4 GHz 802.11n (20MHz) | 1 to 11           | 1, 11          | OFDM                  | BPSK            | 6.5              |
| 802.11a                     | 149 to 165        | 149, 165       | OFDM                  | BPSK            | 6                |
| For 5 GHz 802.11n (20MHz)   | 149 to 165        | 149, 165       | OFDM                  | BPSK            | 6.5              |
| For 5 GHz 802.11n (40MHz)   | 151 to 159        | 151, 159       | 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) |
|--------------------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 802.11b                        | 1 to 11           | 1, 6, 11       | DSSS                  | DBPSK           | 1                |
| 802.11g                        | 1 to 11           | 1, 6, 11       | OFDM                  | BPSK            | 6                |
| For 2.4 GHz<br>802.11n (20MHz) | 1 to 11           | 1, 6, 11       | OFDM                  | BPSK            | 6.5              |
| 802.11a                        | 149 to 165        | 149, 157, 165  | OFDM                  | BPSK            | 6                |
| For 5 GHz<br>802.11n (20MHz)   | 149 to 165        | 149, 157, 165  | OFDM                  | BPSK            | 6.5              |
| For 5 GHz<br>802.11n (40MHz)   | 151 to 159        | 151, 159       | OFDM                  | BPSK            | 13.5             |

### **※ TEST CONDITION:**

| APPLICABLE TO           | ENVIRONMENTAL CONDITIONS  | INPUT POWER (System) | TESTED BY            |
|-------------------------|---------------------------|----------------------|----------------------|
| <b>RE<sup>3</sup>1G</b> | 20deg. C, 70%RH, 1013 hPa | 120Vac, 60Hz         | Rex Huang / Eric Lee |
| <b>RE&lt;1G</b>         | 24deg. C, 70%RH, 1013 hPa | 120Vac, 60Hz         | Eric Lee             |
| <b>PLC</b>              | 26deg. C, 76%RH, 1013 hPa | 120Vac, 60Hz         | Frank Liu / Eric Lee |
| <b>APCM</b>             | 25deg. C, 60%RH, 1013 hPa | 120Vac, 60Hz         | Eric Lee             |



### **3.4 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 C. (15.247)**

**ANSI C63.4-2003**

**Canada RSS-210 issue 7**

**Canada RSS-Gen issue 2**

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.

### 3.5 DESCRIPTION OF SUPPORT UNITS

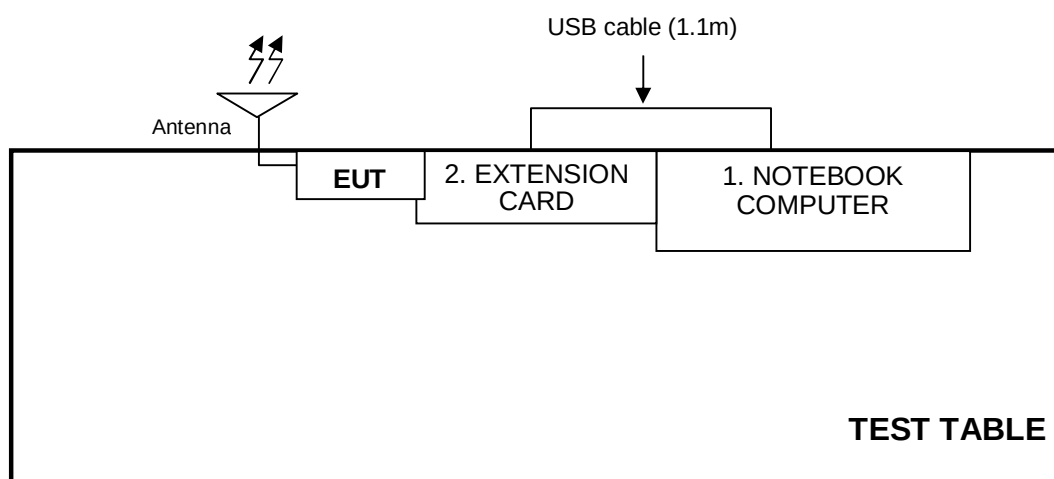
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| No. | Product           | Brand   | Model No. | Serial No. | FCC ID  |
|-----|-------------------|---------|-----------|------------|---------|
| 1   | NOTEBOOK COMPUTER | DELL    | PP32LA    | GSLB32S    | FCC DoC |
| 2   | EXTENSION CARD    | Atheros | NA        | NA         | NA      |

| No. | Signal cable description |
|-----|--------------------------|
| 1   | NA                       |
| 2   | NA                       |

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

### 3.6 CONFIGURATION OF SYSTEM UNDER TEST



## 4. TEST TYPES AND RESULTS (802.11b & g, 2400 ~ 2483.5MHz Band)

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) |          |
|-----------------------------|------------------------|----------|
| 0.15-0.5<br>0.5-5<br>5-30   | Quasi-peak             | Average  |
|                             | 66 to 56               | 56 to 46 |
|                             | 56                     | 46       |
|                             | 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, 2010   | Mar. 08, 2011    |
| Line-Impedance Stabilization Network (for EUT)        | NSLK 8127             | 8127-522   | Sep. 23, 2009   | Sep. 22, 2010    |
| Line-Impedance Stabilization Network (for Peripheral) | ESH3-Z5               | 848773/004 | Oct. 26, 2009   | Oct. 25, 2010    |
| RF Cable (JYEBAO)                                     | 5DFB                  | COBCAB-001 | Nov. 24, 2009   | Nov. 23, 2010    |
| 50 ohms Terminator                                    | 50                    | 3          | Oct. 28, 2009   | Oct. 27, 2010    |
| Software                                              | BV<br>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.

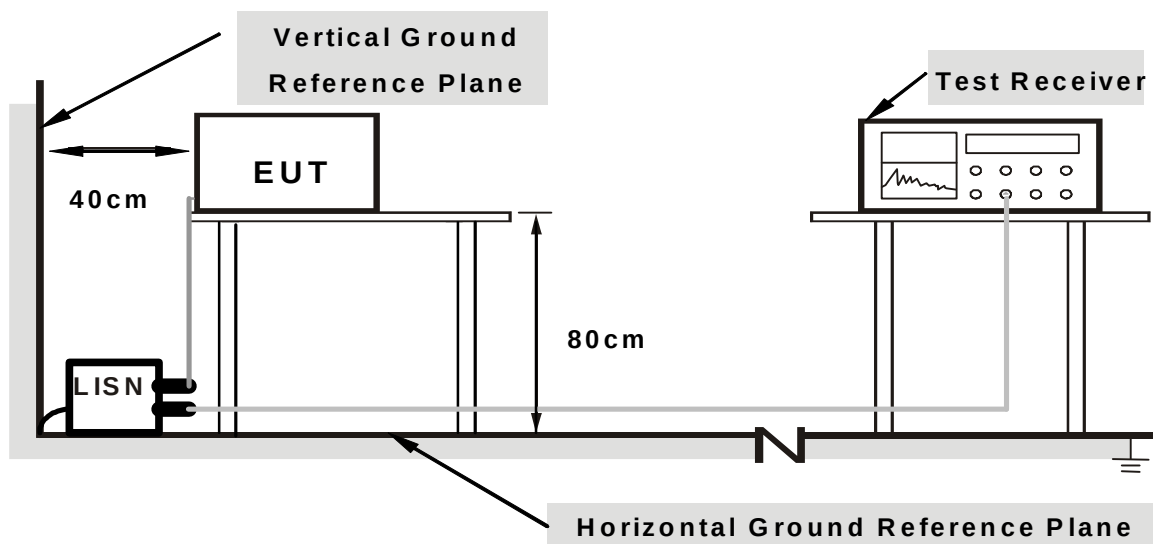
#### 4.1.3 TEST PROCEDURES

- 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 provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were 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

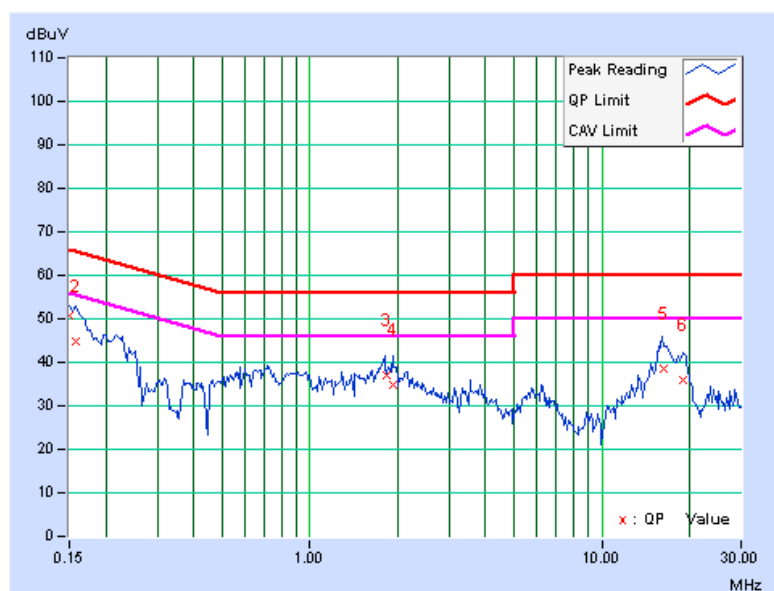
1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program  
“ART\_win\_release\_ar6003\_v\_0.2.6\_061110” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

#### 4.1.7 TEST RESULTS

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

|    | Freq.  | Corr.  | Reading Value |     | Emission Level |     | Limit     |       | Margin |     |
|----|--------|--------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| No |        | Factor | [dB (uV)]     |     | [dB (uV)]      |     | [dB (uV)] |       | (dB)   |     |
|    | [MHz]  | (dB)   | Q.P.          | AV. | Q.P.           | AV. | Q.P.      | AV.   | Q.P.   | AV. |
| 1  | 0.150  | 0.05   | 50.54         | -   | 50.59          | -   | 66.00     | 56.00 | -15.41 | -   |
| 2  | 0.158  | 0.05   | 44.76         | -   | 44.81          | -   | 65.58     | 55.58 | -20.76 | -   |
| 3  | 1.829  | 0.12   | 37.05         | -   | 37.17          | -   | 56.00     | 46.00 | -18.83 | -   |
| 4  | 1.930  | 0.13   | 34.72         | -   | 34.85          | -   | 56.00     | 46.00 | -21.15 | -   |
| 5  | 16.206 | 0.45   | 38.04         | -   | 38.49          | -   | 60.00     | 50.00 | -21.51 | -   |
| 6  | 19.086 | 0.50   | 35.51         | -   | 36.01          | -   | 60.00     | 50.00 | -23.99 | -   |

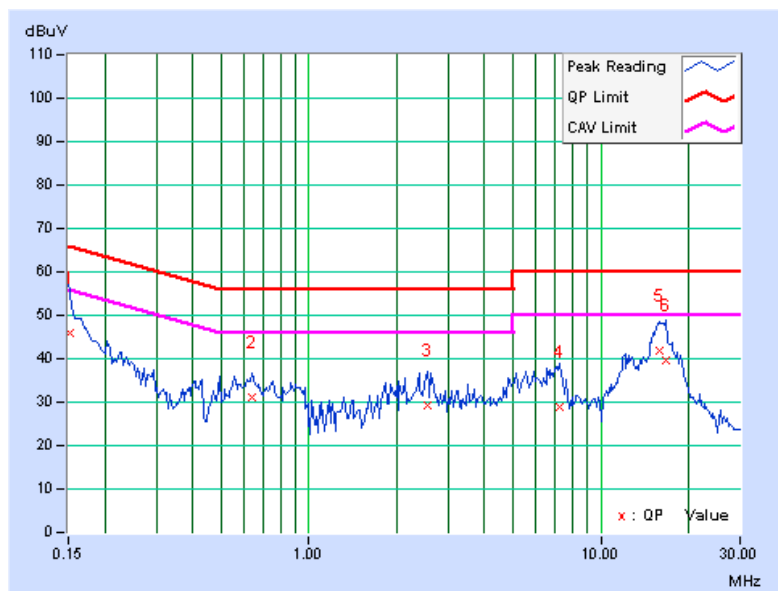
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = 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 |
|-------|-------------|---------------|-------|

|    | Freq.  | Corr.  | Reading Value |     | Emission Level |     | Limit     |       | Margin |     |
|----|--------|--------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| No |        | Factor | [dB (uV)]     |     | [dB (uV)]      |     | [dB (uV)] |       | (dB)   |     |
|    | [MHz]  | (dB)   | Q.P.          | AV. | Q.P.           | AV. | Q.P.      | AV.   | Q.P.   | AV. |
| 1  | 0.152  | 0.06   | 45.73         | -   | 45.79          | -   | 65.90     | 55.90 | -20.11 | -   |
| 2  | 0.642  | 0.08   | 31.16         | -   | 31.24          | -   | 56.00     | 46.00 | -24.76 | -   |
| 3  | 2.565  | 0.16   | 28.98         | -   | 29.14          | -   | 56.00     | 46.00 | -26.86 | -   |
| 4  | 7.206  | 0.29   | 28.54         | -   | 28.83          | -   | 60.00     | 50.00 | -31.17 | -   |
| 5  | 15.852 | 0.45   | 41.24         | -   | 41.69          | -   | 60.00     | 50.00 | -18.31 | -   |
| 6  | 16.670 | 0.47   | 39.12         | -   | 39.59          | -   | 60.00     | 50.00 | -20.41 | -   |

- 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(RSS-210 table 2&3) 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.



#### 4.2.2 TEST INSTRUMENTS

| 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                      | MY46520310                          | Aug. 18, 2009   | Aug. 17, 2010    |
| Agilent Signal Generator             | N5181A                      | MY49060347                          | July 18, 2010   | July 17, 2011    |
| LIG NEX1 Test Receiver               | ER-265                      | L09068005                           | Aug. 31, 2009   | Aug. 30, 2010    |
| Mini-Circuits Pre-Amplifier          | ZFL-1000VH2B                | AMP-ZFL-04                          | Nov. 18, 2009   | Nov. 17, 2010    |
| Agilent Pre-Amplifier                | 8449B                       | 3008A02465                          | Mar. 01, 2010   | Feb. 28, 2011    |
| Miteq Pre-Amplifier                  | AFS33-1800265<br>0-30-8P-44 | 881786                              | NA              | NA               |
| SCHWARZBECK Trilog Broadband Antenna | VULB 9168                   | 9168-361                            | Sep. 30, 2009   | Sep. 29, 2010    |
| AISI Horn Antenna                    | AIH.8018                    | 0000220091110                       | Nov. 16, 2009   | Nov. 15, 2010    |
| SCHWARZBECK Horn Antenna             | BBHA 9170                   | 9170-424                            | Sep. 30, 2009   | Sep. 29, 2010    |
| RF CABLE                             | NA                          | RF104-205<br>RF104-207<br>RF104-208 | Dec. 24, 2009   | Dec. 23, 2010    |
| 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.

### 4.2.3 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 antenna is a broadband antenna, and its height 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. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

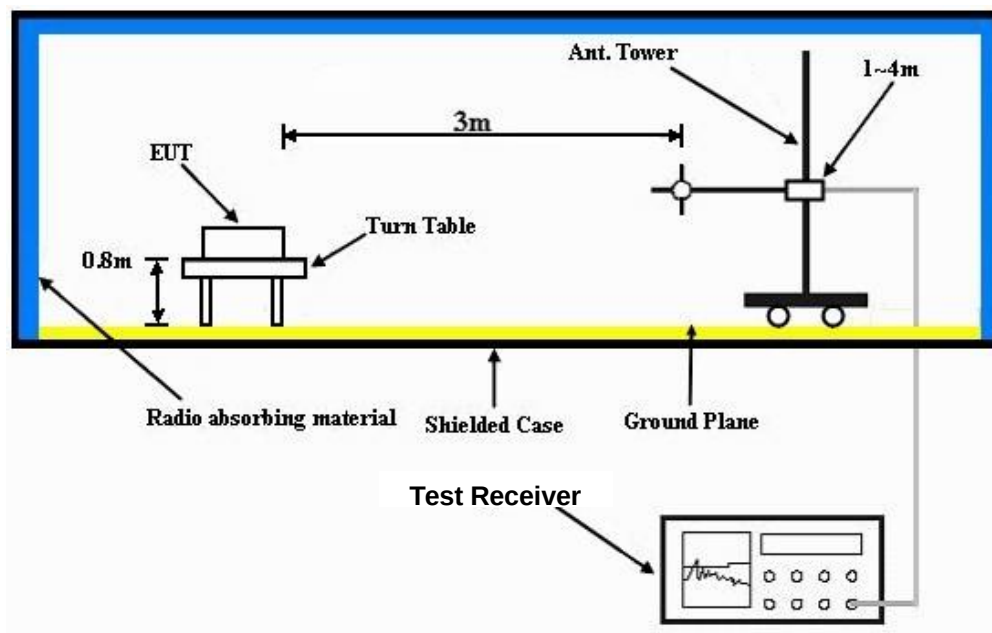
**NOTE:**

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 1MHz and video bandwidth is 3MHz for Peak detection(PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



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

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

#### 4.2.7 TEST RESULTS (FOR TRANSMITTER PART)

##### BELOW 1GHz WORST-CASE DATA : 802.11g OFDM MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 6                   | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 24deg. C, 70%RH<br>1013 hPa | TESTED BY          | Eric Lee      |

| 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                                                   | 99.65       | 33.7 QP                 | 43.5           | -9.8        | 1.75 H             | 360                  | 23.75            | 9.95                     |
| 2                                                   | 116.50      | 35.4 QP                 | 43.5           | -8.1        | 1.50 H             | 358                  | 23.11            | 12.29                    |
| 3                                                   | 133.16      | 33.9 QP                 | 43.5           | -9.6        | 2.25 H             | 0                    | 20.21            | 13.69                    |
| 4                                                   | 149.90      | 35.8 QP                 | 43.5           | -7.7        | 1.50 H             | 360                  | 21.52            | 14.30                    |
| 5                                                   | 166.55      | 42.0 QP                 | 43.5           | -1.5        | 1.75 H             | 220                  | 28.00            | 14.00                    |
| 6                                                   | 199.30      | 37.4 QP                 | 43.5           | -6.1        | 1.25 H             | 0                    | 26.14            | 11.26                    |
| 7                                                   | 248.96      | 39.8 QP                 | 46.0           | -6.2        | 1.25 H             | 281                  | 26.91            | 12.91                    |
| 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                                                   | 33.50       | 37.8 QP                 | 40.0           | -2.2        | 1.00 V             | 291                  | 24.32            | 13.46                    |
| 2                                                   | 99.80       | 26.8 QP                 | 43.5           | -16.7       | 1.00 V             | 28                   | 16.85            | 9.95                     |
| 3                                                   | 149.86      | 33.6 QP                 | 43.5           | -9.9        | 1.25 V             | 360                  | 19.30            | 14.30                    |
| 4                                                   | 166.05      | 34.4 QP                 | 43.5           | -9.1        | 2.25 V             | 312                  | 20.38            | 14.02                    |
| 5                                                   | 248.82      | 33.3 QP                 | 46.0           | -12.7       | 1.00 V             | 217                  | 20.39            | 12.91                    |
| 6                                                   | 365.25      | 31.0 QP                 | 46.0           | -15.0       | 1.75 V             | 360                  | 14.12            | 16.88                    |

- 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.

# ABOVE 1GHz WORST-CASE DATA

## 802.11b DSSS MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 1                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | 2386.00     | 59.7 PK                 | 74.0           | -14.3       | 1.77 H             | 306                  | 28.50            | 31.20                    |
| 2                                                   | 2386.00     | 52.2 AV                 | 54.0           | -1.8        | 1.77 H             | 306                  | 21.00            | 31.20                    |
| 3                                                   | *2412.00    | 105.4 PK                |                |             | 1.76 H             | 304                  | 74.13            | 31.27                    |
| 4                                                   | *2412.00    | 102.9 AV                |                |             | 1.76 H             | 304                  | 71.63            | 31.27                    |
| 5                                                   | 4824.00     | 51.5 PK                 | 74.0           | -22.5       | 1.04 H             | 108                  | 12.08            | 39.42                    |
| 6                                                   | 4824.00     | 47.4 AV                 | 54.0           | -6.6        | 1.04 H             | 108                  | 7.98             | 39.42                    |
| 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                                                   | 2386.10     | 58.1 PK                 | 74.0           | -15.9       | 1.22 V             | 60                   | 26.90            | 31.20                    |
| 2                                                   | 2386.10     | 49.7 AV                 | 54.0           | -4.3        | 1.22 V             | 60                   | 18.50            | 31.20                    |
| 3                                                   | *2412.00    | 100.1 PK                |                |             | 1.22 V             | 55                   | 68.83            | 31.27                    |
| 4                                                   | *2412.00    | 97.5 AV                 |                |             | 1.22 V             | 55                   | 66.23            | 31.27                    |
| 5                                                   | 4824.00     | 54.1 PK                 | 74.0           | -19.9       | 1.04 V             | 4                    | 14.68            | 39.42                    |
| 6                                                   | 4824.00     | 51.5 AV                 | 54.0           | -2.5        | 1.04 V             | 4                    | 12.08            | 39.42                    |

**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.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 6                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | *2437.00    | 107.9 PK                |                |             | 1.72 H             | 306                  | 76.56            | 31.34                    |
| 2                                                   | *2437.00    | 105.1 AV                |                |             | 1.72 H             | 306                  | 73.76            | 31.34                    |
| 3                                                   | 4874.00     | 52.1 PK                 | 74.0           | -21.9       | 1.02 H             | 158                  | 12.48            | 39.62                    |
| 4                                                   | 4874.00     | 48.1 AV                 | 54.0           | -5.9        | 1.02 H             | 158                  | 8.48             | 39.62                    |
| 5                                                   | 7311.00     | 54.1 PK                 | 74.0           | -19.9       | 1.50 H             | 299                  | 10.00            | 44.10                    |
| 6                                                   | 7311.00     | 41.7 AV                 | 54.0           | -12.3       | 1.50 H             | 299                  | -2.40            | 44.10                    |
| 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                                                   | *2437.00    | 102.4 PK                |                |             | 1.19 V             | 65                   | 71.06            | 31.34                    |
| 2                                                   | *2437.00    | 98.4 AV                 |                |             | 1.19 V             | 65                   | 67.06            | 31.34                    |
| 3                                                   | 4874.00     | 53.4 PK                 | 74.0           | -20.6       | 1.10 V             | 216                  | 13.78            | 39.62                    |
| 4                                                   | 4874.00     | 51.3 AV                 | 54.0           | -2.7        | 1.10 V             | 216                  | 11.68            | 39.62                    |
| 5                                                   | 7311.00     | 54.7 PK                 | 74.0           | -19.3       | 1.23 V             | 57                   | 10.60            | 44.10                    |
| 6                                                   | 7311.00     | 42.8 AV                 | 54.0           | -11.2       | 1.23 V             | 57                   | -1.30            | 44.10                    |

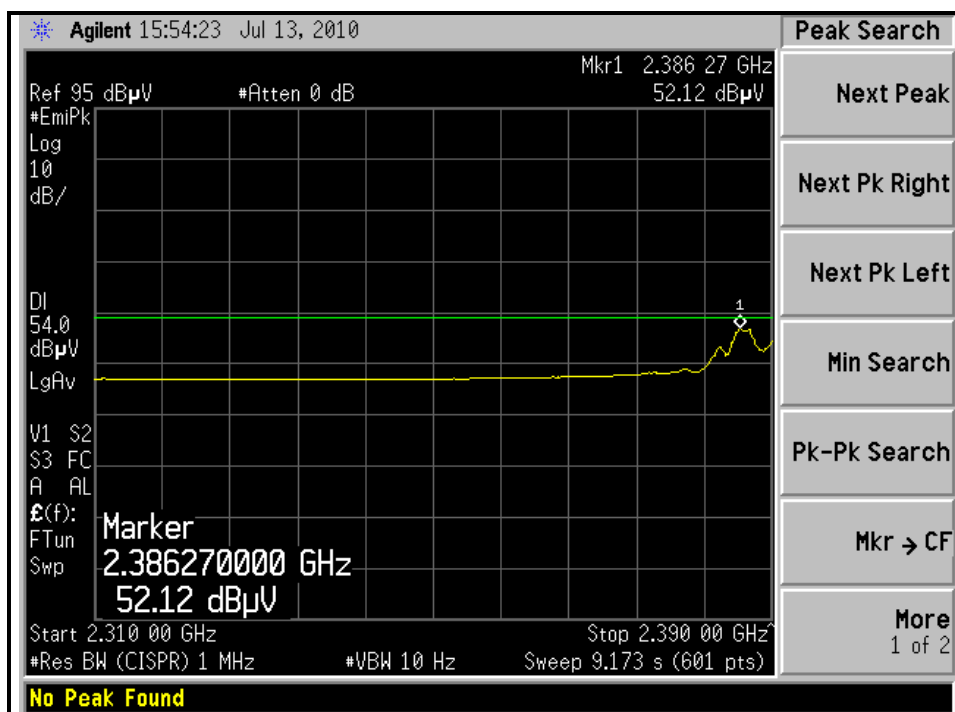
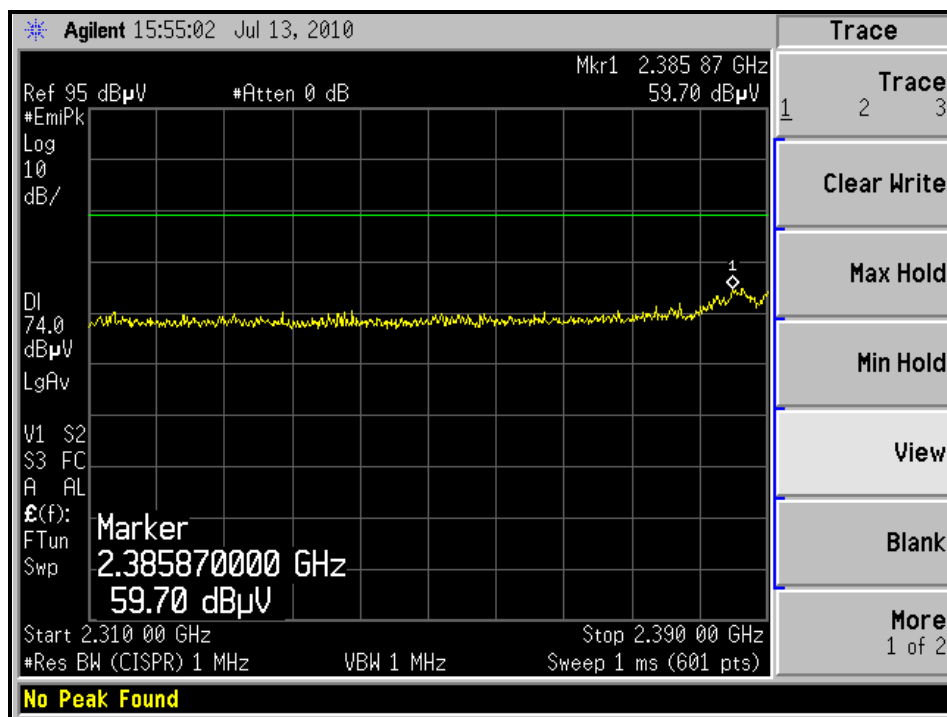
**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* ”: Fundamental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

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 11                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | *2462.00    | 105.3 PK                |                |             | 1.70 H             | 307                  | 73.90            | 31.40                    |
| 2                                                   | *2462.00    | 103.1 AV                |                |             | 1.70 H             | 307                  | 71.70            | 31.40                    |
| 3                                                   | 2488.00     | 60.0 PK                 | 74.0           | -14.0       | 1.69 H             | 311                  | 28.53            | 31.47                    |
| 4                                                   | 2488.00     | 52.4 AV                 | 54.0           | -1.6        | 1.69 H             | 311                  | 20.93            | 31.47                    |
| 5                                                   | 4924.00     | 51.1 PK                 | 74.0           | -22.9       | 1.00 H             | 112                  | 11.28            | 39.82                    |
| 6                                                   | 4924.00     | 47.4 AV                 | 54.0           | -6.6        | 1.00 H             | 112                  | 7.58             | 39.82                    |
| 7                                                   | 7386.00     | 53.1 PK                 | 74.0           | -20.9       | 1.60 H             | 300                  | 8.92             | 44.18                    |
| 8                                                   | 7386.00     | 39.9 AV                 | 54.0           | -14.1       | 1.60 H             | 300                  | -4.28            | 44.18                    |
| 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                                                   | *2462.00    | 98.1 PK                 |                |             | 1.22 V             | 63                   | 66.70            | 31.40                    |
| 2                                                   | *2462.00    | 96.1 AV                 |                |             | 1.22 V             | 63                   | 64.70            | 31.40                    |
| 3                                                   | 2487.80     | 58.6 PK                 | 74.0           | -15.4       | 1.19 V             | 59                   | 27.13            | 31.47                    |
| 4                                                   | 2487.80     | 48.0 AV                 | 54.0           | -6.0        | 1.19 V             | 59                   | 16.53            | 31.47                    |
| 5                                                   | 4924.00     | 53.7 PK                 | 74.0           | -20.3       | 1.05 V             | 94                   | 13.88            | 39.82                    |
| 6                                                   | 4924.00     | 50.7 AV                 | 54.0           | -3.3        | 1.05 V             | 94                   | 10.88            | 39.82                    |
| 7                                                   | 7386.00     | 54.8 PK                 | 74.0           | -19.2       | 1.14 V             | 106                  | 10.62            | 44.18                    |
| 8                                                   | 7386.00     | 41.4 AV                 | 54.0           | -12.6       | 1.14 V             | 106                  | -2.78            | 44.18                    |

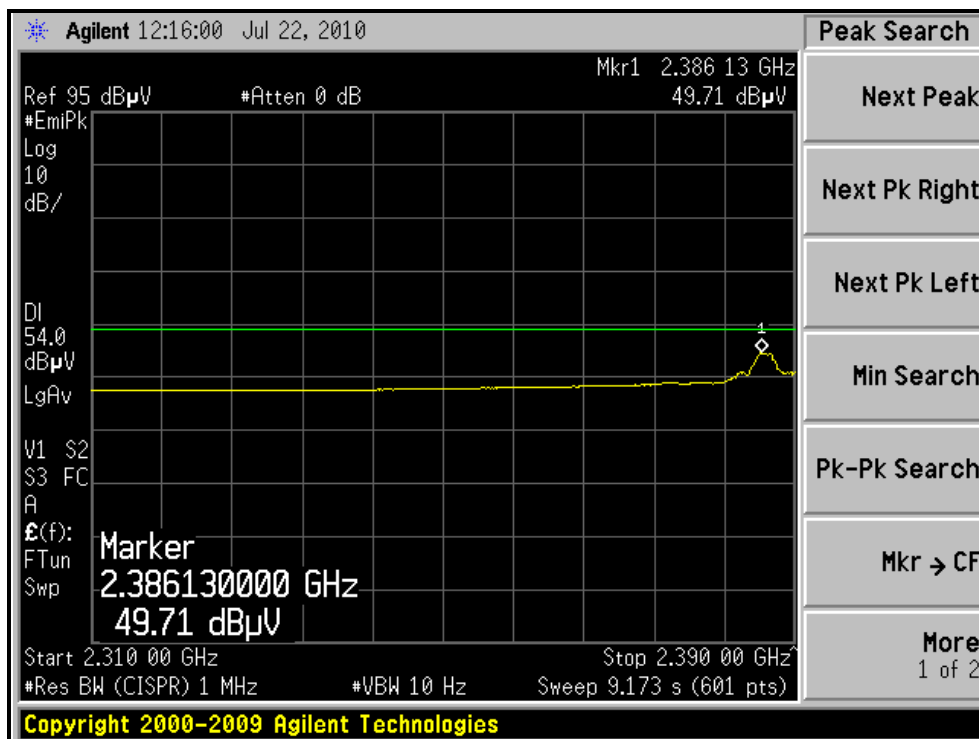
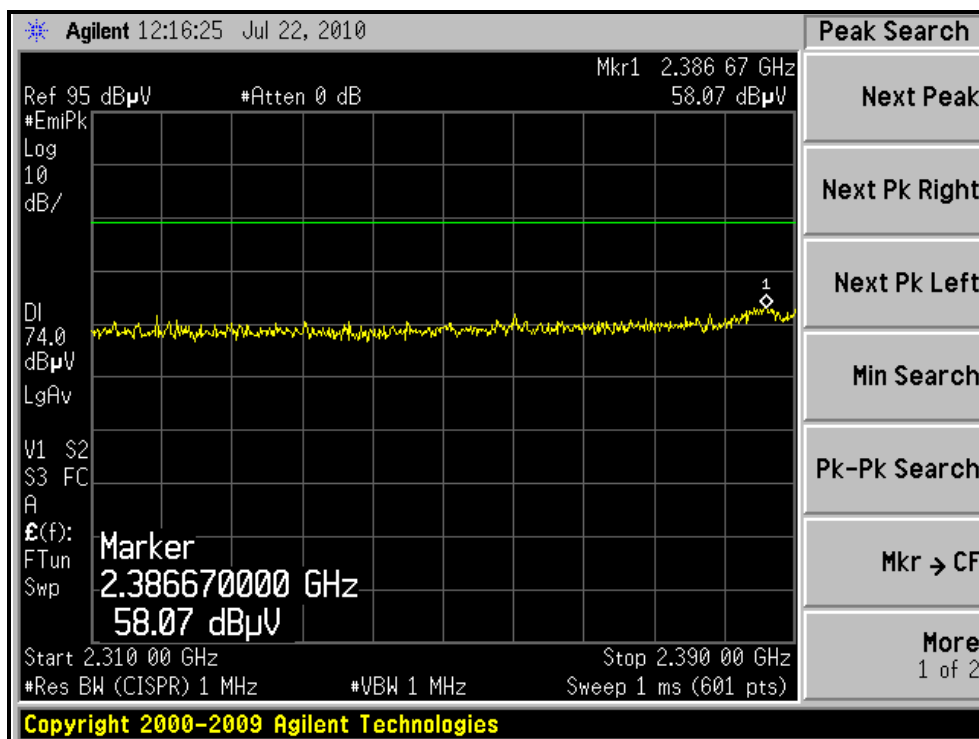
**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental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

# RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL )

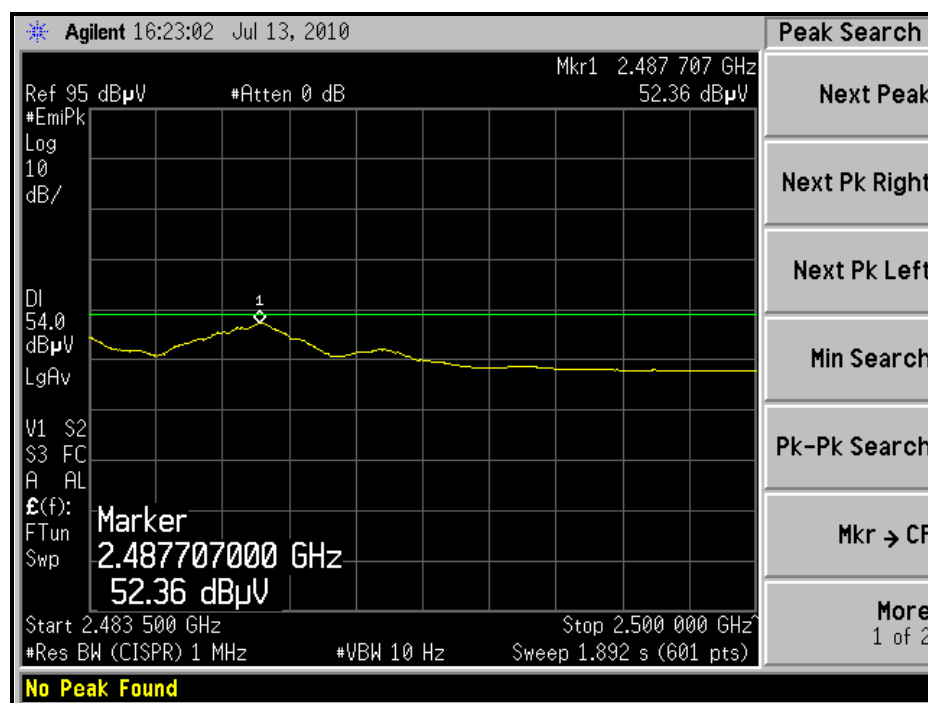
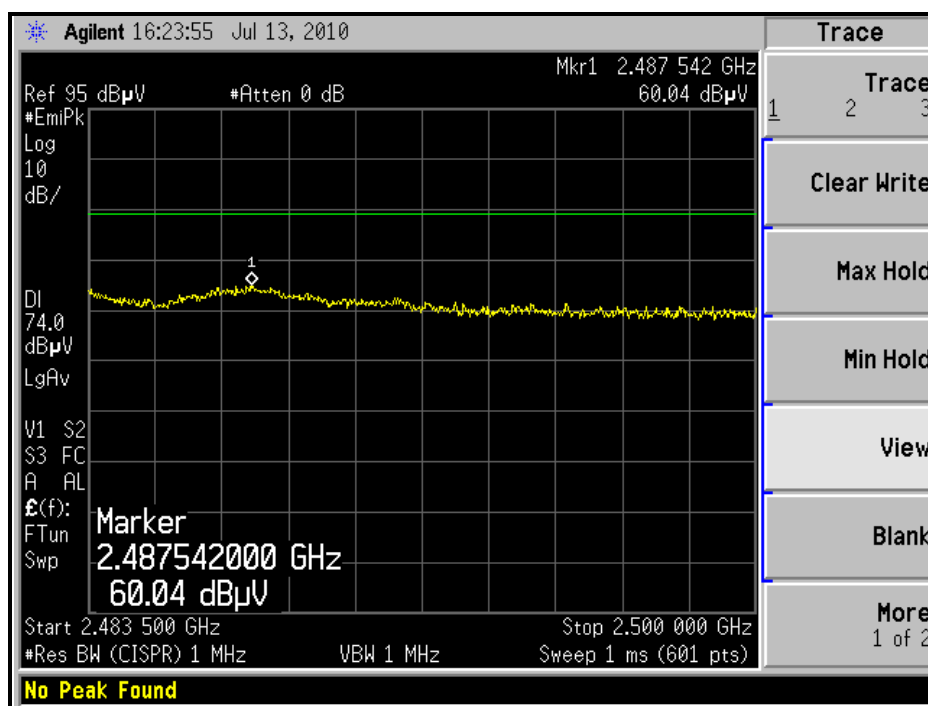




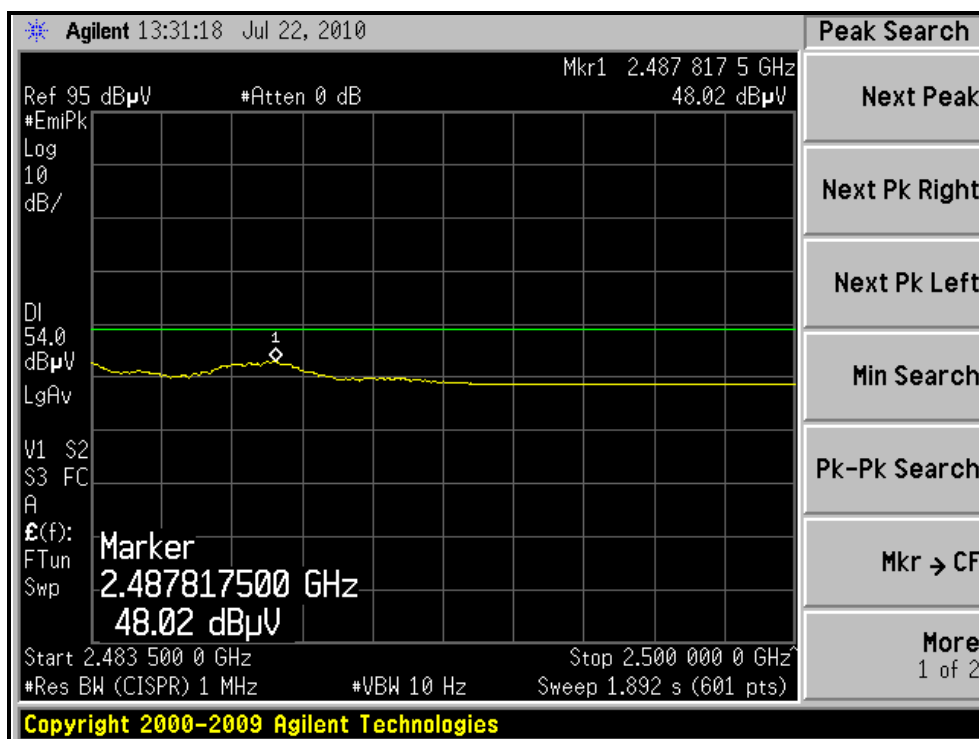
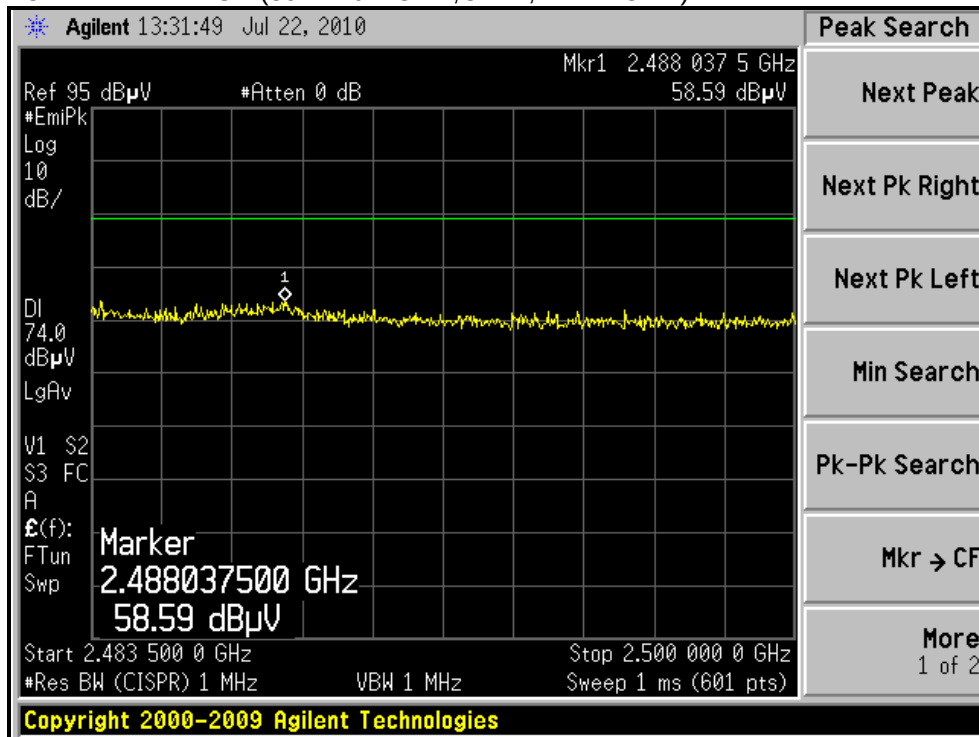
# RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL )



# RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL )



# RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL )



## 802.11g OFDM MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 1                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | 2390.00     | 69.4 PK                 | 74.0           | -4.6        | 1.78 H             | 306                  | 38.19            | 31.21                    |
| 2                                                   | 2390.00     | 53.0 AV                 | 54.0           | -1.0        | 1.78 H             | 306                  | 21.79            | 31.21                    |
| 3                                                   | *2412.00    | 106.3 PK                |                |             | 1.74 H             | 304                  | 75.03            | 31.27                    |
| 4                                                   | *2412.00    | 96.0 AV                 |                |             | 1.74 H             | 304                  | 64.73            | 31.27                    |
| 5                                                   | 4824.00     | 48.9 PK                 | 74.0           | -25.1       | 1.44 H             | 71                   | 9.48             | 39.42                    |
| 6                                                   | 4824.00     | 38.9 AV                 | 54.0           | -15.1       | 1.44 H             | 71                   | -0.52            | 39.42                    |
| 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                                                   | 2390.00     | 62.5 PK                 | 74.0           | -11.5       | 1.21 V             | 60                   | 31.29            | 31.21                    |
| 2                                                   | 2390.00     | 48.8 AV                 | 54.0           | -5.2        | 1.21 V             | 60                   | 17.59            | 31.21                    |
| 3                                                   | *2412.00    | 100.2 PK                |                |             | 1.22 V             | 55                   | 68.93            | 31.27                    |
| 4                                                   | *2412.00    | 89.3 AV                 |                |             | 1.22 V             | 55                   | 58.03            | 31.27                    |
| 5                                                   | 4824.00     | 50.2 PK                 | 74.0           | -23.8       | 1.14 V             | 83                   | 10.78            | 39.42                    |
| 6                                                   | 4824.00     | 41.9 AV                 | 54.0           | -12.1       | 1.14 V             | 83                   | 2.48             | 39.42                    |

- 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.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 6                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | *2437.00    | 112.6 PK                |                |             | 1.71 H             | 306                  | 81.26            | 31.34                    |
| 2                                                   | *2437.00    | 102.5 AV                |                |             | 1.71 H             | 306                  | 71.16            | 31.34                    |
| 3                                                   | 4874.00     | 61.1 PK                 | 74.0           | -12.9       | 1.69 H             | 248                  | 21.48            | 39.62                    |
| 4                                                   | 4874.00     | 46.9 AV                 | 54.0           | -7.1        | 1.69 H             | 248                  | 7.28             | 39.62                    |
| 5                                                   | 7311.00     | 55.6 PK                 | 74.0           | -18.4       | 1.23 H             | 50                   | 11.50            | 44.10                    |
| 6                                                   | 7311.00     | 41.5 AV                 | 54.0           | -12.5       | 1.23 H             | 50                   | -2.60            | 44.10                    |
| 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                                                   | *2437.00    | 106.5 PK                |                |             | 1.20 V             | 360                  | 75.16            | 31.34                    |
| 2                                                   | *2437.00    | 96.8 AV                 |                |             | 1.20 V             | 360                  | 65.46            | 31.34                    |
| 3                                                   | 4874.00     | 63.4 PK                 | 74.0           | -10.6       | 1.11 V             | 150                  | 23.78            | 39.62                    |
| 4                                                   | 4874.00     | 48.5 AV                 | 54.0           | -5.5        | 1.11 V             | 150                  | 8.88             | 39.62                    |
| 5                                                   | 7311.00     | 57.2 PK                 | 74.0           | -16.8       | 1.28 V             | 11                   | 13.10            | 44.10                    |
| 6                                                   | 7311.00     | 42.4 AV                 | 54.0           | -11.6       | 1.28 V             | 11                   | -1.70            | 44.10                    |

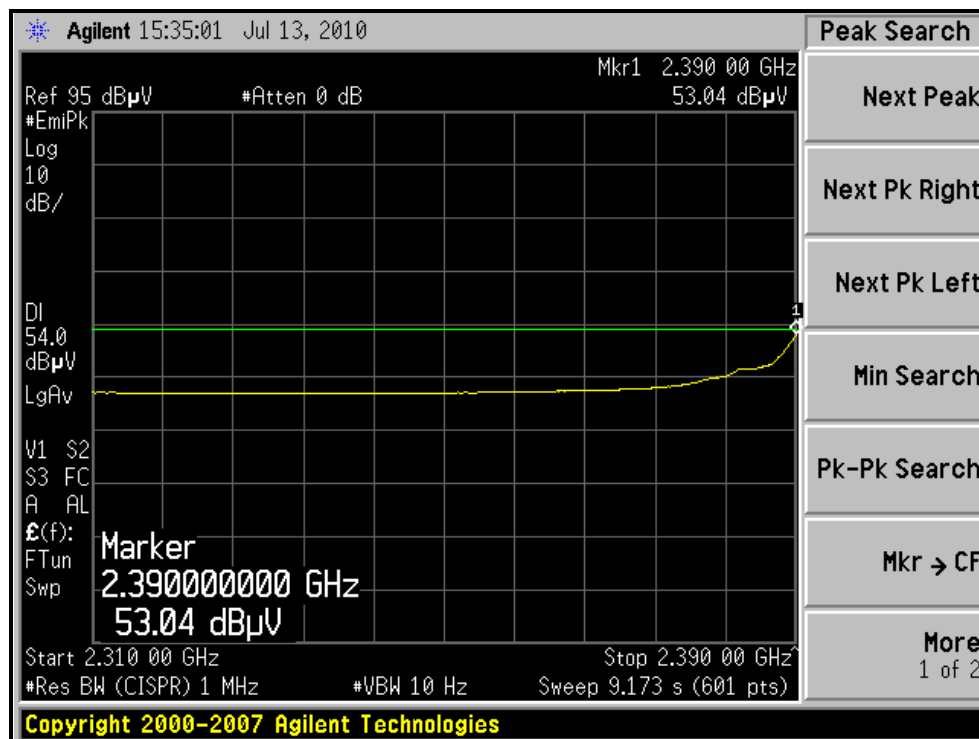
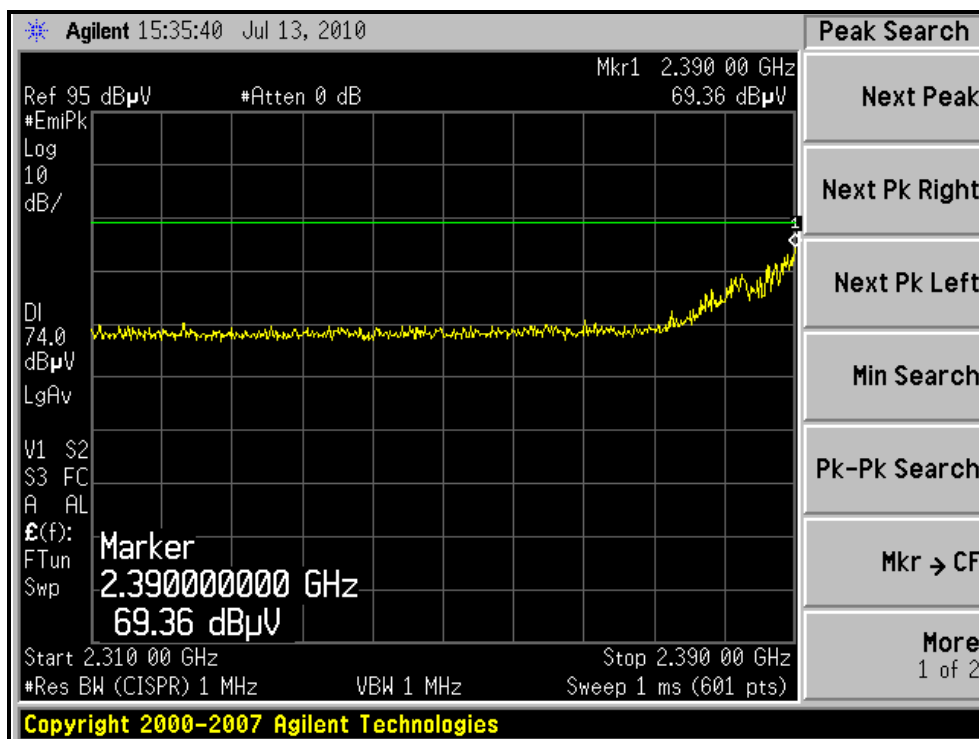
**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* ”: Fundamental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

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 11                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | *2462.00    | 106.4 PK                |                |             | 1.71 H             | 307                  | 75.00            | 31.40                    |
| 2                                                   | *2462.00    | 95.9 AV                 |                |             | 1.71 H             | 307                  | 64.50            | 31.40                    |
| 3                                                   | 2483.50     | 69.2 PK                 | 74.0           | -4.8        | 1.70 H             | 311                  | 37.74            | 31.46                    |
| 4                                                   | 2483.50     | 53.0 AV                 | 54.0           | -1.0        | 1.70 H             | 311                  | 21.54            | 31.46                    |
| 5                                                   | 4924.00     | 48.6 PK                 | 74.0           | -25.4       | 1.69 H             | 144                  | 8.78             | 39.82                    |
| 6                                                   | 4924.00     | 39.1 AV                 | 54.0           | -14.9       | 1.69 H             | 144                  | -0.72            | 39.82                    |
| 7                                                   | 7386.00     | 52.1 PK                 | 74.0           | -21.9       | 1.11 H             | 48                   | 7.92             | 44.18                    |
| 8                                                   | 7386.00     | 38.9 AV                 | 54.0           | -15.1       | 1.11 H             | 48                   | -5.28            | 44.18                    |
| 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                                                   | *2462.00    | 100.1 PK                |                |             | 1.20 V             | 48                   | 68.70            | 31.40                    |
| 2                                                   | *2462.00    | 89.2 AV                 |                |             | 1.20 V             | 48                   | 57.80            | 31.40                    |
| 3                                                   | 2483.50     | 67.9 PK                 | 74.0           | -6.1        | 1.19 V             | 53                   | 36.44            | 31.46                    |
| 4                                                   | 2483.50     | 49.9 AV                 | 54.0           | -4.1        | 1.19 V             | 53                   | 18.44            | 31.46                    |
| 5                                                   | 4924.00     | 49.9 PK                 | 74.0           | -24.1       | 1.48 V             | 26                   | 10.08            | 39.82                    |
| 6                                                   | 4924.00     | 41.5 AV                 | 54.0           | -12.5       | 1.48 V             | 26                   | 1.68             | 39.82                    |
| 7                                                   | 7386.00     | 53.6 PK                 | 74.0           | -20.4       | 1.14 V             | 278                  | 9.42             | 44.18                    |
| 8                                                   | 7386.00     | 39.2 AV                 | 54.0           | -14.8       | 1.14 V             | 278                  | -4.98            | 44.18                    |

**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.

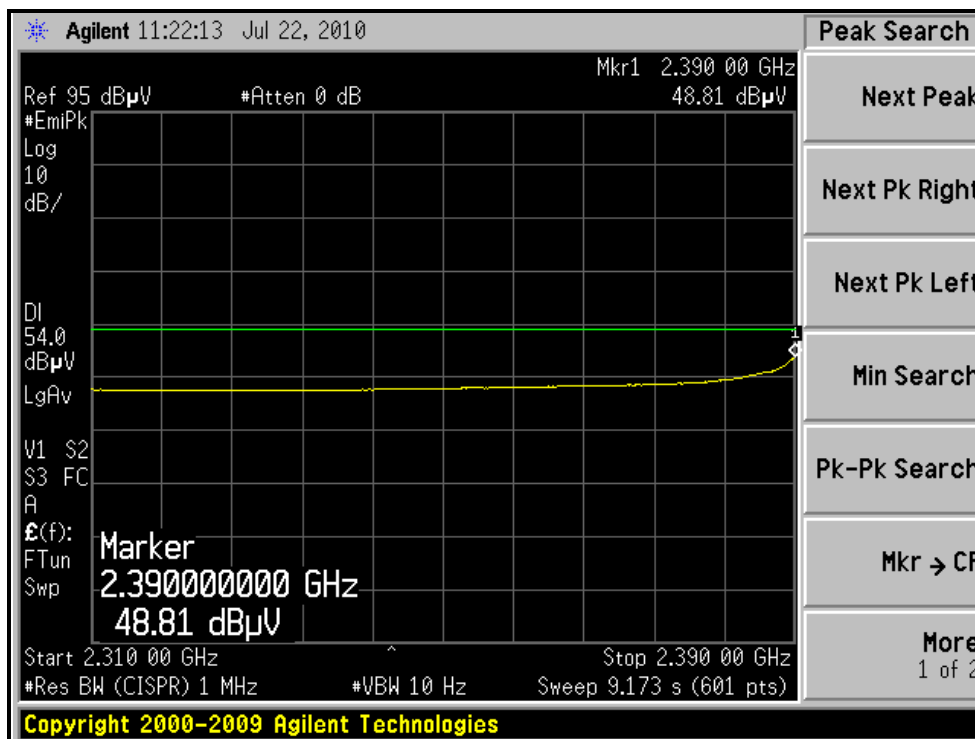
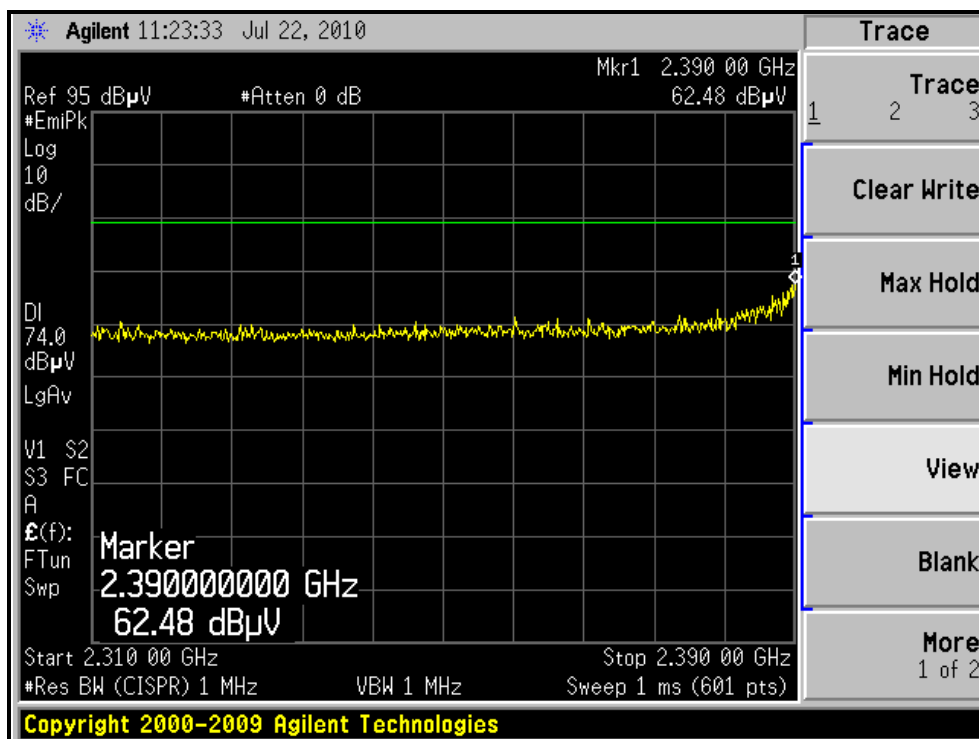
# RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL )





A D T

RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL )

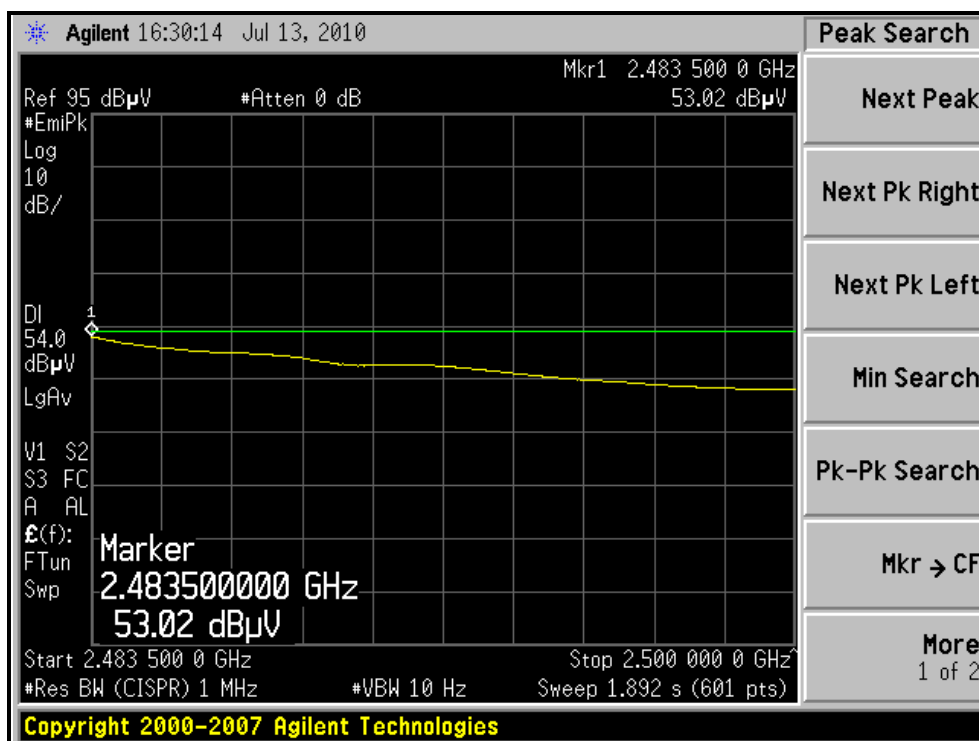
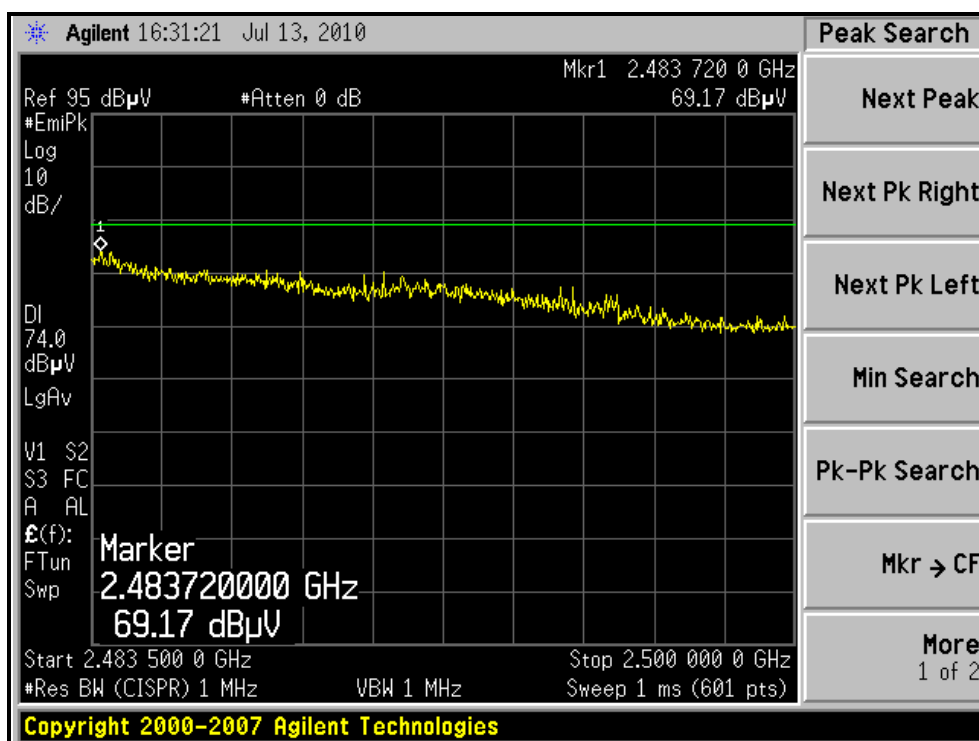




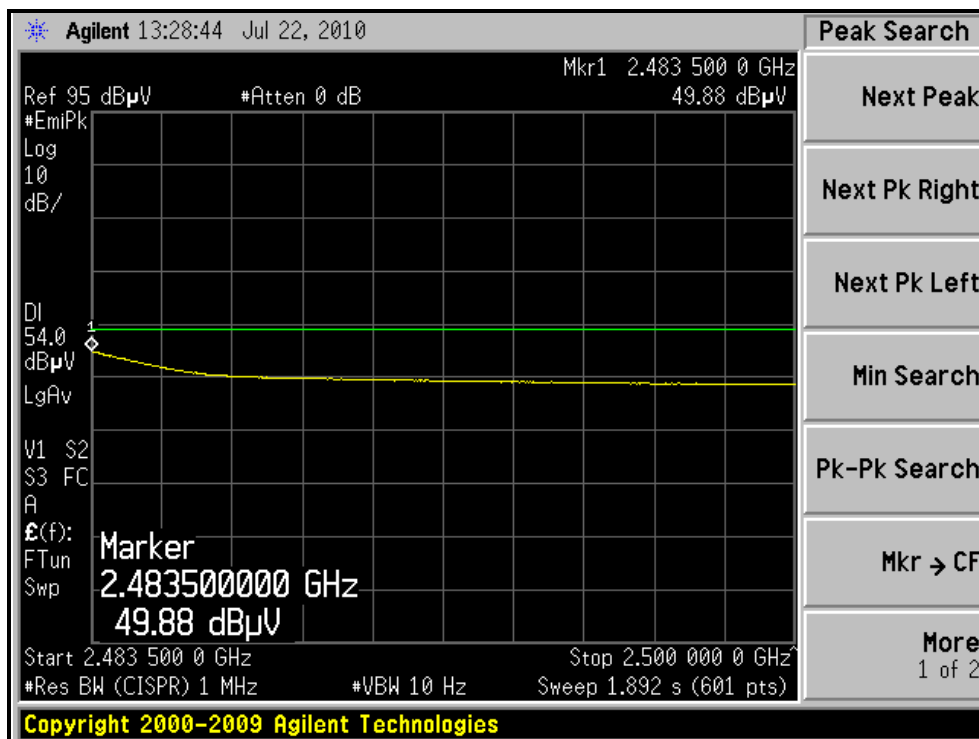
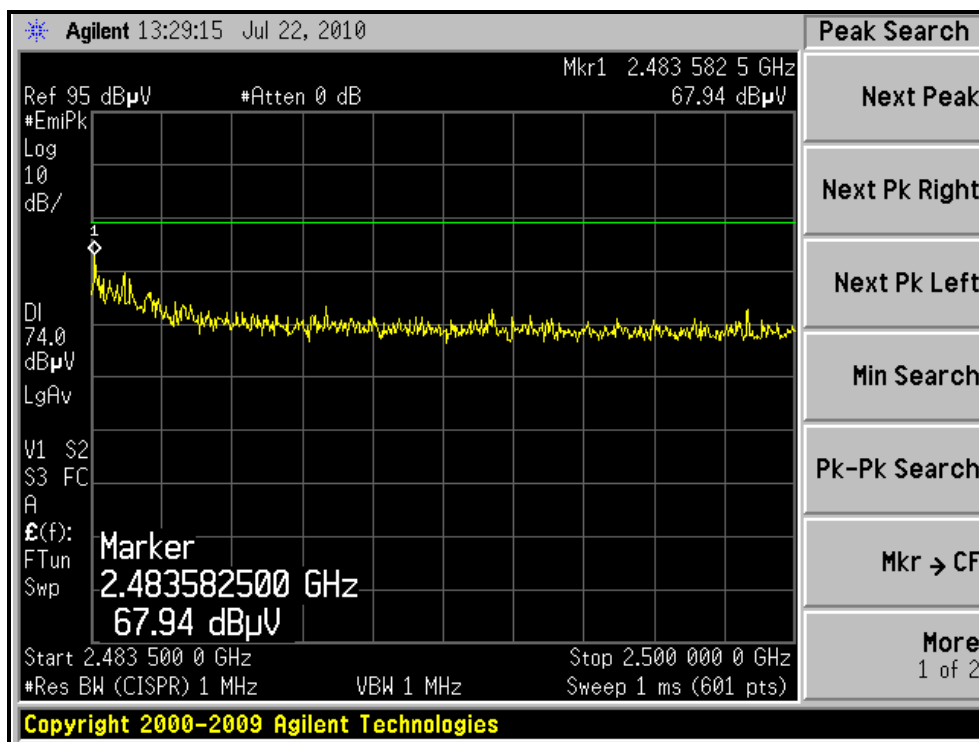


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RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL )



# RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL )



### 802.11n (20MHz) OFDM MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 1                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | 2390.00     | 70.1 PK                 | 74.0           | -3.9        | 1.77 H             | 360                  | 38.89            | 31.21                    |
| 2                                                   | 2390.00     | 52.0 AV                 | 54.0           | -2.0        | 1.77 H             | 360                  | 20.79            | 31.21                    |
| 3                                                   | *2412.00    | 104.7 PK                |                |             | 1.76 H             | 306                  | 73.43            | 31.27                    |
| 4                                                   | *2412.00    | 94.3 AV                 |                |             | 1.76 H             | 306                  | 63.03            | 31.27                    |
| 5                                                   | 4824.00     | 48.1 PK                 | 74.0           | -25.9       | 1.66 H             | 50                   | 8.68             | 39.42                    |
| 6                                                   | 4824.00     | 38.2 AV                 | 54.0           | -15.8       | 1.66 H             | 50                   | -1.22            | 39.42                    |
| 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                                                   | 2390.00     | 66.2 PK                 | 74.0           | -7.8        | 1.21 V             | 60                   | 34.99            | 31.21                    |
| 2                                                   | 2390.00     | 48.9 AV                 | 54.0           | -5.1        | 1.21 V             | 60                   | 17.69            | 31.21                    |
| 3                                                   | *2412.00    | 98.2 PK                 |                |             | 1.22 V             | 55                   | 66.93            | 31.27                    |
| 4                                                   | *2412.00    | 88.0 AV                 |                |             | 1.22 V             | 55                   | 56.73            | 31.27                    |
| 5                                                   | 4824.00     | 52.6 PK                 | 74.0           | -21.4       | 1.44 V             | 171                  | 13.18            | 39.42                    |
| 6                                                   | 4824.00     | 41.9 AV                 | 54.0           | -12.1       | 1.44 V             | 171                  | 2.48             | 39.42                    |

- 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.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 6                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | *2437.00    | 111.5 PK                |                |             | 1.71 H             | 306                  | 80.16            | 31.34                    |
| 2                                                   | *2437.00    | 101.1 AV                |                |             | 1.71 H             | 306                  | 69.76            | 31.34                    |
| 3                                                   | 4874.00     | 60.4 PK                 | 74.0           | -13.6       | 1.69 H             | 246                  | 20.78            | 39.62                    |
| 4                                                   | 4874.00     | 46.3 AV                 | 54.0           | -7.7        | 1.69 H             | 246                  | 6.68             | 39.62                    |
| 5                                                   | 7311.00     | 51.9 PK                 | 74.0           | -22.1       | 1.43 H             | 22                   | 7.80             | 44.10                    |
| 6                                                   | 7311.00     | 38.1 AV                 | 54.0           | -15.9       | 1.43 H             | 22                   | -6.00            | 44.10                    |
| 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                                                   | *2437.00    | 105.8 PK                |                |             | 1.28 V             | 60                   | 74.46            | 31.34                    |
| 2                                                   | *2437.00    | 95.4 AV                 |                |             | 1.28 V             | 60                   | 64.06            | 31.34                    |
| 3                                                   | 4874.00     | 64.6 PK                 | 74.0           | -9.4        | 1.14 V             | 68                   | 24.98            | 39.62                    |
| 4                                                   | 4874.00     | 49.1 AV                 | 54.0           | -4.9        | 1.14 V             | 68                   | 9.48             | 39.62                    |
| 5                                                   | 7311.00     | 53.4 PK                 | 74.0           | -20.6       | 1.20 V             | 158                  | 9.30             | 44.10                    |
| 6                                                   | 7311.00     | 39.9 AV                 | 54.0           | -14.1       | 1.20 V             | 158                  | -4.20            | 44.10                    |

**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.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 11                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 28deg. C, 74%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

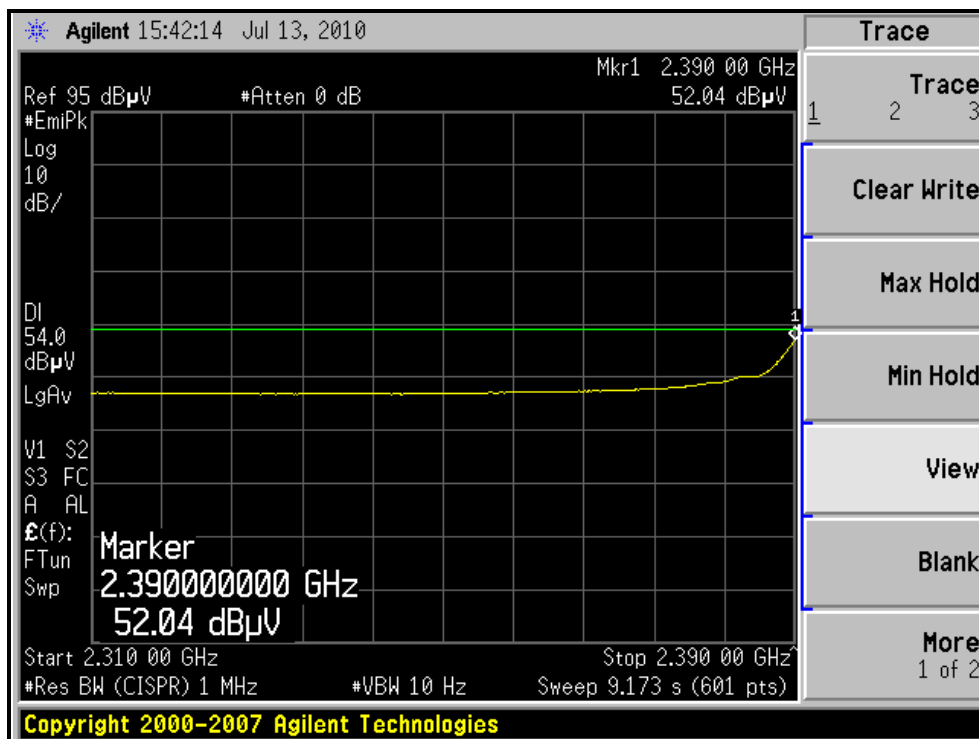
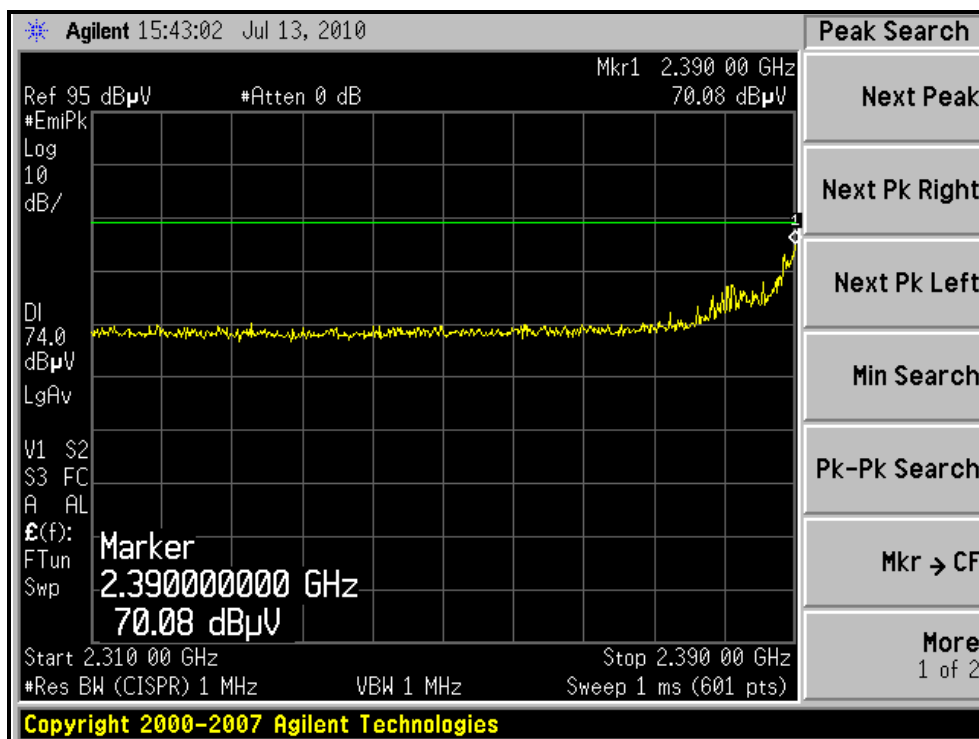
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 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                                                   | *2462.00    | 105.9 PK                |                |             | 1.71 H             | 307                  | 74.50            | 31.40                    |
| 2                                                   | *2462.00    | 95.1 AV                 |                |             | 1.71 H             | 307                  | 63.70            | 31.40                    |
| 3                                                   | 2483.50     | 71.5 PK                 | 74.0           | -2.5        | 1.70 H             | 311                  | 40.04            | 31.46                    |
| 4                                                   | 2483.50     | 53.3 AV                 | 54.0           | -0.7        | 1.70 H             | 311                  | 21.84            | 31.46                    |
| 5                                                   | 4924.00     | 49.2 PK                 | 74.0           | -24.8       | 1.29 H             | 68                   | 9.38             | 39.82                    |
| 6                                                   | 4924.00     | 38.5 AV                 | 54.0           | -15.5       | 1.29 H             | 68                   | -1.32            | 39.82                    |
| 7                                                   | 7386.00     | 51.4 PK                 | 74.0           | -22.6       | 1.40 H             | 311                  | 7.22             | 44.18                    |
| 8                                                   | 7386.00     | 38.6 AV                 | 54.0           | -15.4       | 1.40 H             | 311                  | -5.58            | 44.18                    |
| 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                                                   | *2462.00    | 98.9 PK                 |                |             | 1.19 V             | 53                   | 67.50            | 31.40                    |
| 2                                                   | *2462.00    | 89.3 AV                 |                |             | 1.19 V             | 53                   | 57.90            | 31.40                    |
| 3                                                   | 2483.50     | 69.5 PK                 | 74.0           | -4.5        | 1.20 V             | 80                   | 38.04            | 31.46                    |
| 4                                                   | 2483.50     | 49.0 AV                 | 54.0           | -5.0        | 1.20 V             | 80                   | 17.54            | 31.46                    |
| 5                                                   | 4924.00     | 53.1 PK                 | 74.0           | -20.9       | 1.50 V             | 200                  | 13.28            | 39.82                    |
| 6                                                   | 4924.00     | 42.6 AV                 | 54.0           | -11.4       | 1.50 V             | 200                  | 2.78             | 39.82                    |
| 7                                                   | 7386.00     | 54.2 PK                 | 74.0           | -19.8       | 1.40 V             | 307                  | 10.02            | 44.18                    |
| 8                                                   | 7386.00     | 39.6 AV                 | 54.0           | -14.4       | 1.40 V             | 307                  | -4.58            | 44.18                    |

**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.

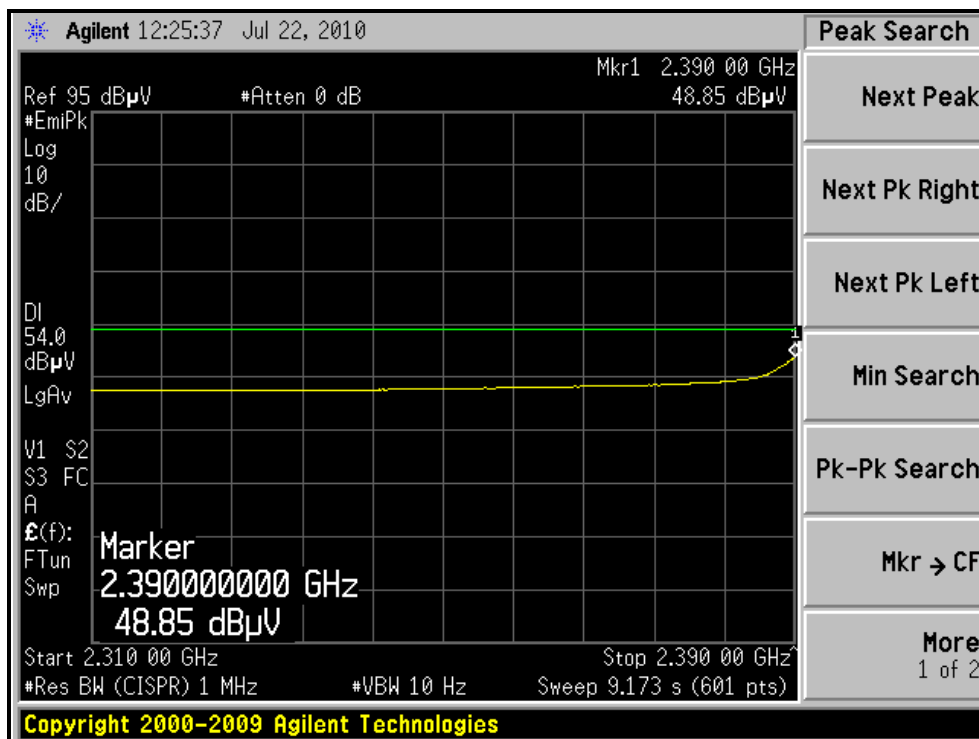
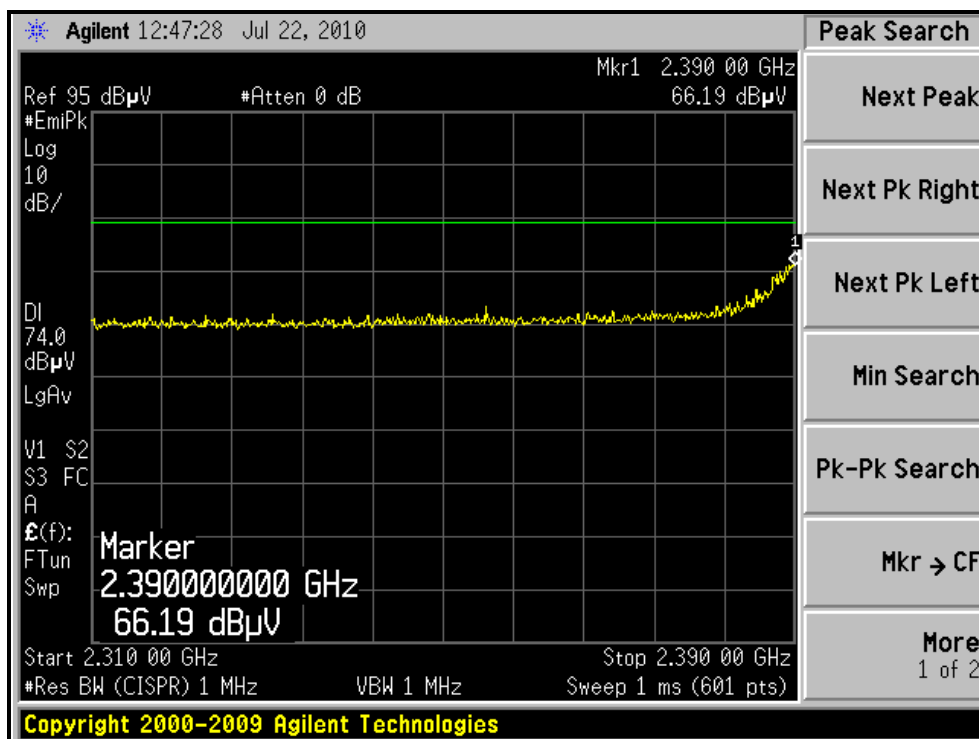


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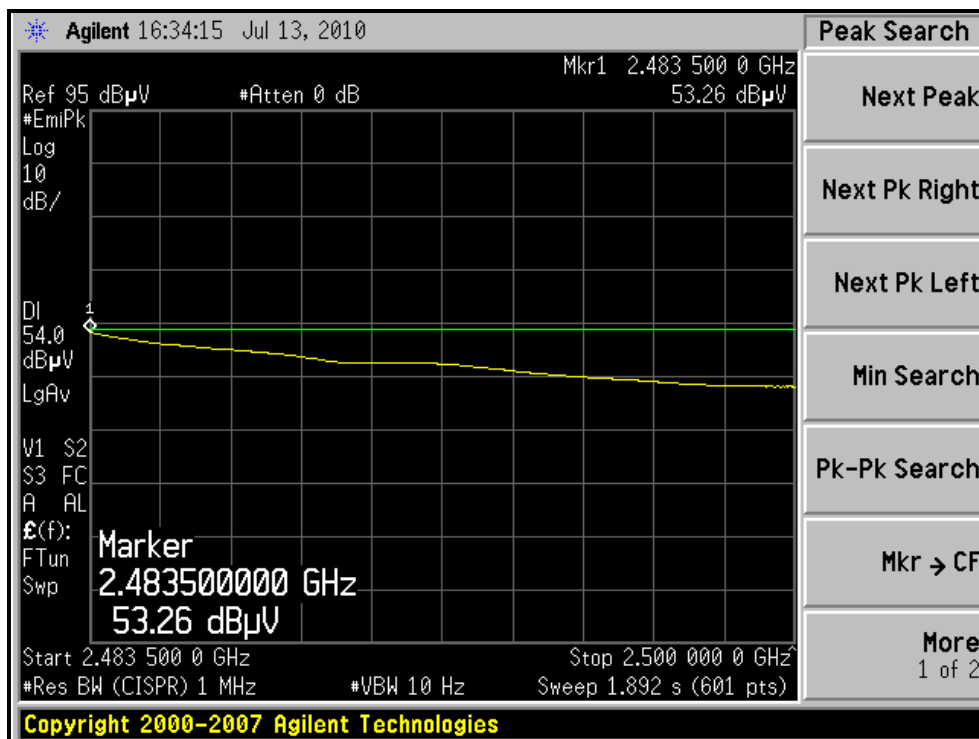
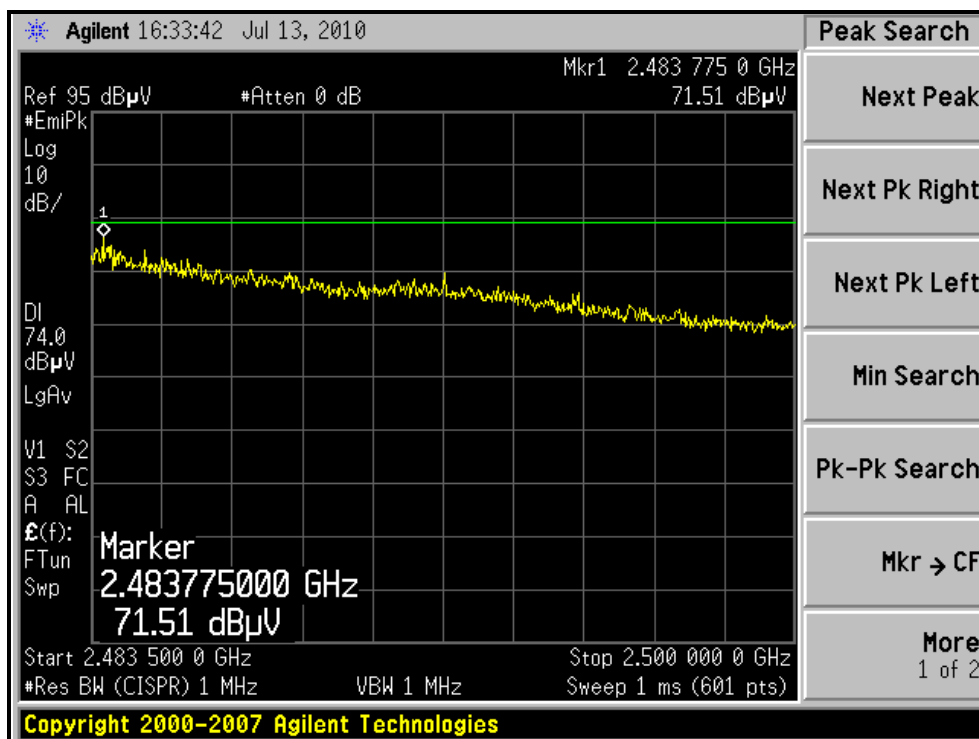
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL )



# RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL )

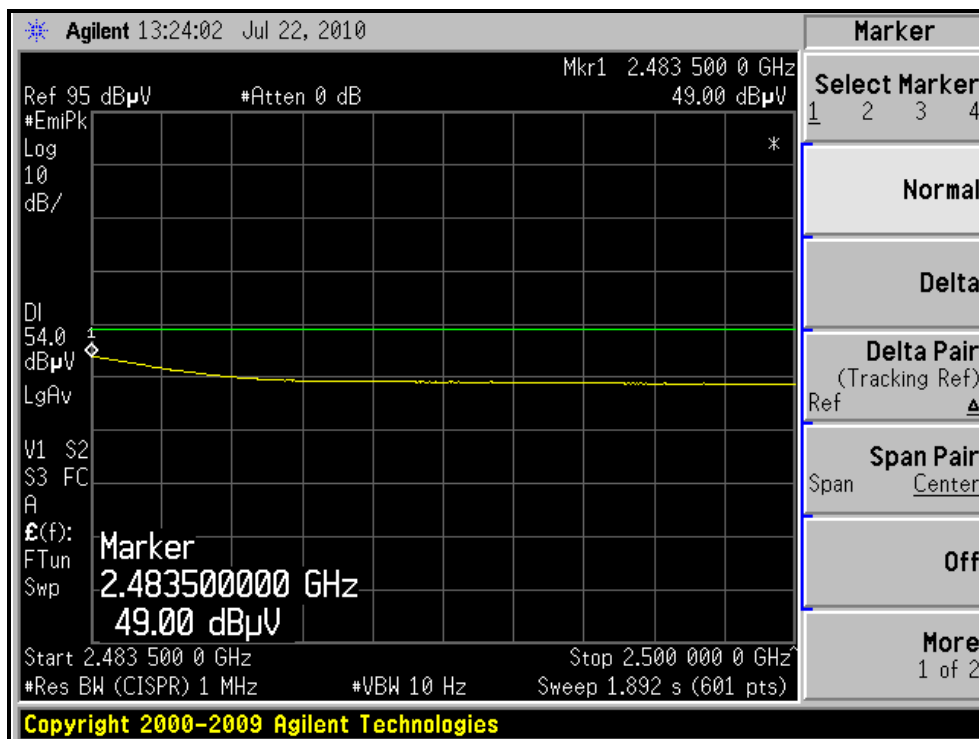
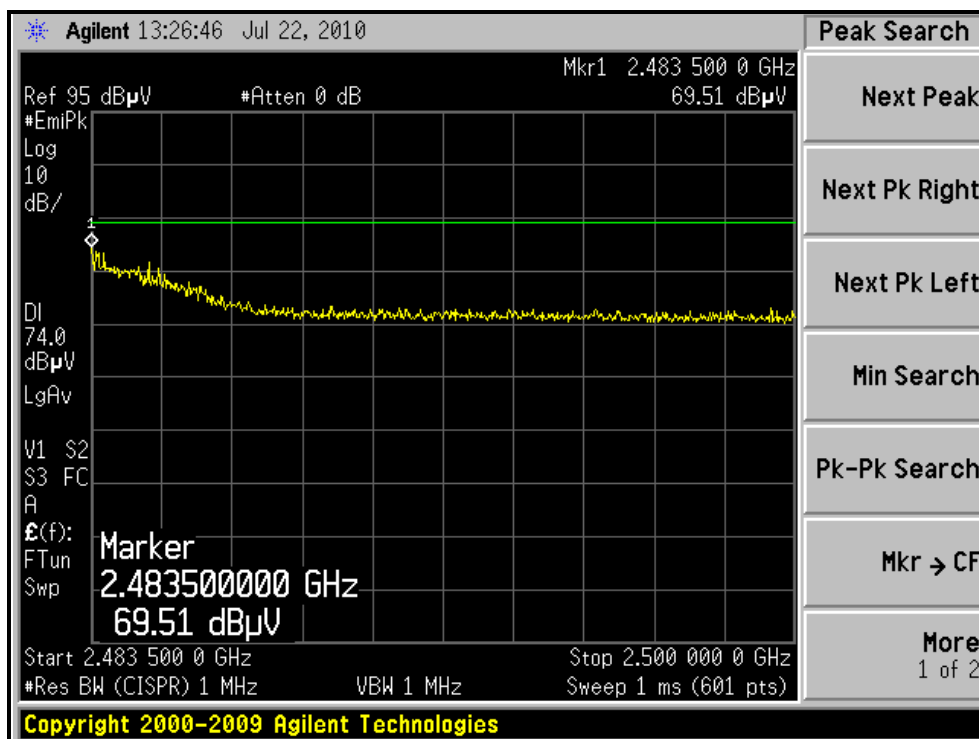


RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, HORIZONTAL )





# RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, VERTICAL )



## 4.2.8 TEST RESULTS (FOR RECEIVER PART)

### BELOW 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 6                   | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 24deg. C, 70%RH<br>1013 hPa | TESTED BY          | Eric Lee      |

| 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                                                   | 99.65       | 33.7 QP                 | 43.5           | -9.8        | 1.75 H             | 360                  | 23.75            | 9.95                     |
| 2                                                   | 116.50      | 35.4 QP                 | 43.5           | -8.1        | 1.50 H             | 358                  | 23.11            | 12.29                    |
| 3                                                   | 133.16      | 33.9 QP                 | 43.5           | -9.6        | 2.25 H             | 0                    | 20.21            | 13.69                    |
| 4                                                   | 149.90      | 35.8 QP                 | 43.5           | -7.7        | 1.50 H             | 360                  | 21.52            | 14.30                    |
| 5                                                   | 166.55      | 42.0 QP                 | 43.5           | -1.5        | 1.75 H             | 220                  | 28.00            | 14.00                    |
| 6                                                   | 199.30      | 37.4 QP                 | 43.5           | -6.1        | 1.25 H             | 0                    | 26.14            | 11.26                    |
| 7                                                   | 248.96      | 39.8 QP                 | 46.0           | -6.2        | 1.25 H             | 281                  | 26.91            | 12.91                    |
| 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                                                   | 33.50       | 37.8 QP                 | 40.0           | -2.2        | 1.00 V             | 291                  | 24.32            | 13.46                    |
| 2                                                   | 99.80       | 26.8 QP                 | 43.5           | -16.7       | 1.00 V             | 28                   | 16.85            | 9.95                     |
| 3                                                   | 149.86      | 33.6 QP                 | 43.5           | -9.9        | 1.25 V             | 360                  | 19.30            | 14.30                    |
| 4                                                   | 166.05      | 34.4 QP                 | 43.5           | -9.1        | 2.25 V             | 312                  | 20.38            | 14.02                    |
| 5                                                   | 248.82      | 33.3 QP                 | 46.0           | -12.7       | 1.00 V             | 217                  | 20.39            | 12.91                    |
| 6                                                   | 365.25      | 31.0 QP                 | 46.0           | -15.0       | 1.75 V             | 360                  | 14.12            | 16.88                    |

- 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.

# ABOVE 1GHz WORST-CASE DATA

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 1                   | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | 3216.00     | 57.6 PK                 | 74.0           | -16.4       | 1.00 H             | 12                   | 24.24            | 33.36                    |
| 2                                                   | 3216.00     | 50.7 AV                 | 54.0           | -3.3        | 1.00 H             | 12                   | 17.34            | 33.36                    |
| 3                                                   | 6432.00     | 55.2 PK                 | 74.0           | -18.8       | 1.03 H             | 29                   | 12.95            | 42.25                    |
| 4                                                   | 6432.00     | 45.4 AV                 | 54.0           | -8.6        | 1.03 H             | 29                   | 3.15             | 42.25                    |
| 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                                                   | 3216.00     | 51.8 PK                 | 74.0           | -22.2       | 1.06 V             | 111                  | 18.44            | 33.36                    |
| 2                                                   | 3216.00     | 47.6 AV                 | 54.0           | -6.4        | 1.06 V             | 111                  | 14.24            | 33.36                    |
| 3                                                   | 6432.00     | 55.0 PK                 | 74.0           | -19.0       | 1.11 V             | 243                  | 12.75            | 42.25                    |
| 4                                                   | 6432.00     | 45.3 AV                 | 54.0           | -8.7        | 1.11 V             | 243                  | 3.05             | 42.25                    |

**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.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 6                   | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | 3249.30     | 58.2 PK                 | 74.0           | -15.8       | 1.01 H             | 29                   | 24.74            | 33.46                    |
| 2                                                   | 3249.30     | 50.9 AV                 | 54.0           | -3.1        | 1.01 H             | 29                   | 17.44            | 33.46                    |
| 3                                                   | 6498.60     | 55.4 PK                 | 74.0           | -18.6       | 1.04 H             | 57                   | 13.06            | 42.34                    |
| 4                                                   | 6498.60     | 45.5 AV                 | 54.0           | -8.5        | 1.04 H             | 57                   | 3.16             | 42.34                    |
| 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                                                   | 3249.30     | 52.1 PK                 | 74.0           | -21.9       | 1.07 V             | 109                  | 18.64            | 33.46                    |
| 2                                                   | 3249.30     | 48.1 AV                 | 54.0           | -5.9        | 1.07 V             | 109                  | 14.64            | 33.46                    |
| 3                                                   | 6498.60     | 55.2 PK                 | 74.0           | -18.8       | 1.13 V             | 249                  | 12.86            | 42.34                    |
| 4                                                   | 6498.60     | 45.6 AV                 | 54.0           | -8.4        | 1.13 V             | 249                  | 3.26             | 42.34                    |

**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.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 11                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH<br>1013 hPa | TESTED BY          | Rex Huang                 |

| 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                                                   | 3282.60     | 58.4 PK                 | 74.0           | -15.6       | 1.04 H             | 34                   | 24.85            | 33.55                    |
| 2                                                   | 3282.60     | 51.4 AV                 | 54.0           | -2.6        | 1.04 H             | 34                   | 17.85            | 33.55                    |
| 3                                                   | 6565.30     | 55.9 PK                 | 74.0           | -18.1       | 1.07 H             | 62                   | 13.36            | 42.54                    |
| 4                                                   | 6565.30     | 45.6 AV                 | 54.0           | -8.4        | 1.07 H             | 62                   | 3.06             | 42.54                    |
| 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                                                   | 3282.60     | 52.3 PK                 | 74.0           | -21.7       | 1.09 V             | 107                  | 18.75            | 33.55                    |
| 2                                                   | 3282.60     | 48.4 AV                 | 54.0           | -5.6        | 1.09 V             | 107                  | 14.85            | 33.55                    |
| 3                                                   | 6565.30     | 55.4 PK                 | 74.0           | -18.6       | 1.14 V             | 248                  | 12.86            | 42.54                    |
| 4                                                   | 6565.30     | 45.9 AV                 | 54.0           | -8.1        | 1.14 V             | 248                  | 3.36             | 42.54                    |

**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.

### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 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

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



#### 4.3.6 EUT OPERATING CONDITIONS

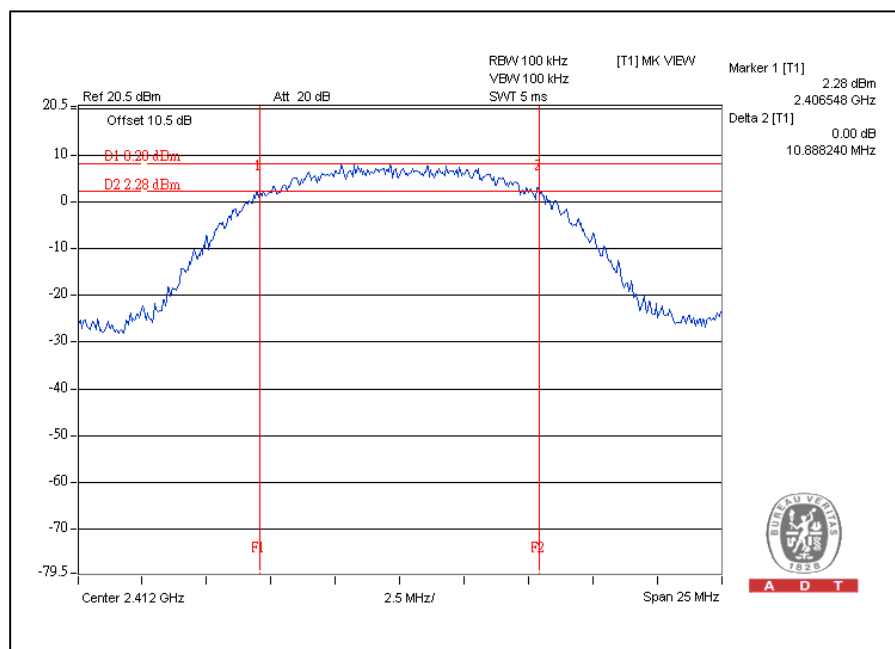
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 4.3.7 TEST RESULTS

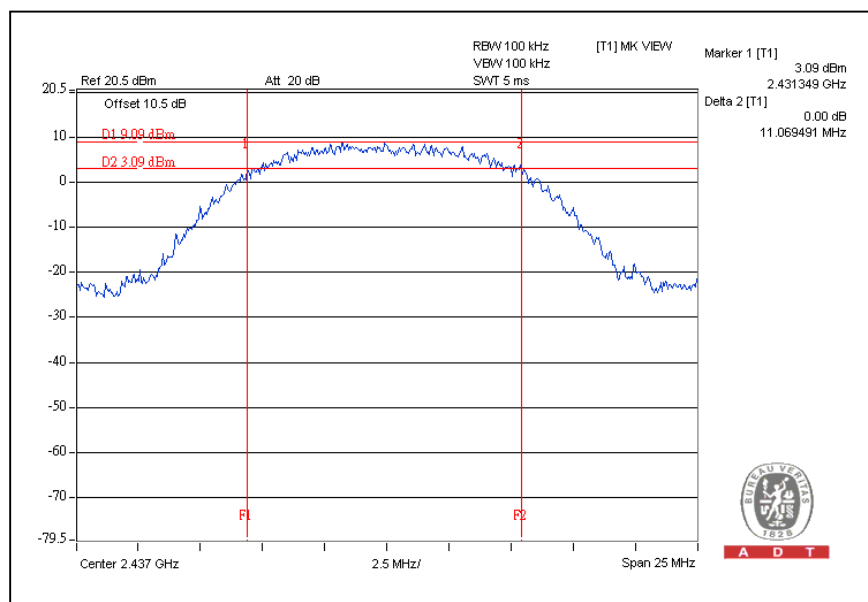
#### 802.11b DSSS MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------------------|-------------|
| 1       | 2412                    | 10.88               | 0.5                 | PASS        |
| 6       | 2437                    | 11.06               | 0.5                 | PASS        |
| 11      | 2462                    | 11.08               | 0.5                 | PASS        |

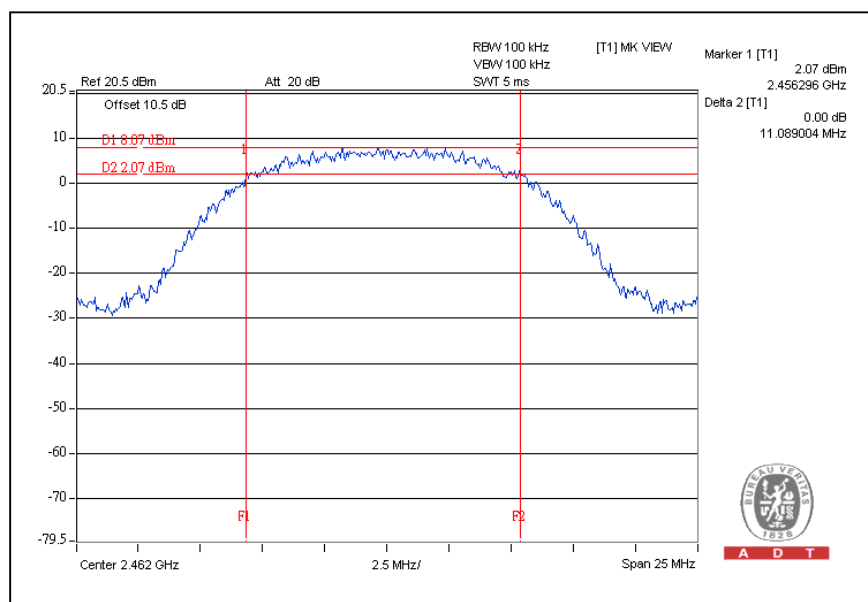
#### CH1



## CH6



## CH11

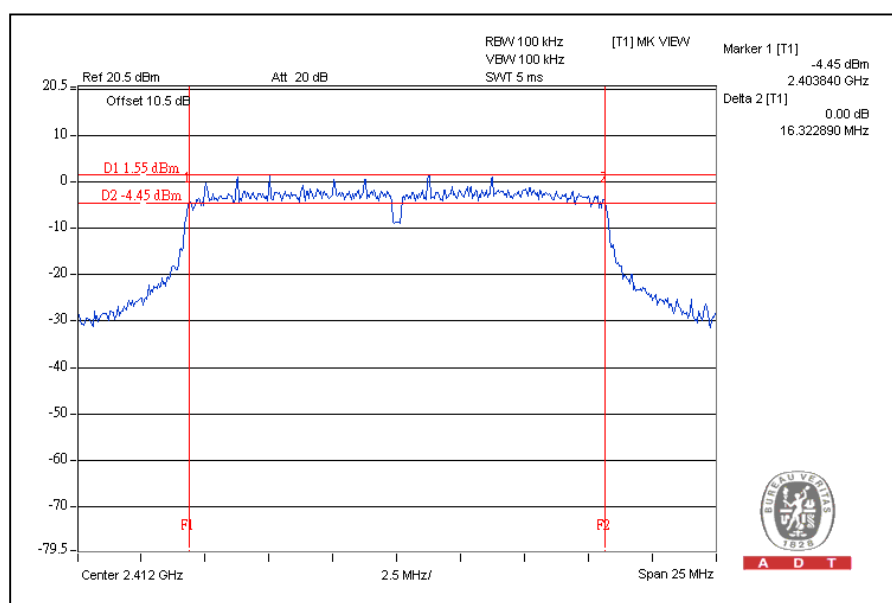




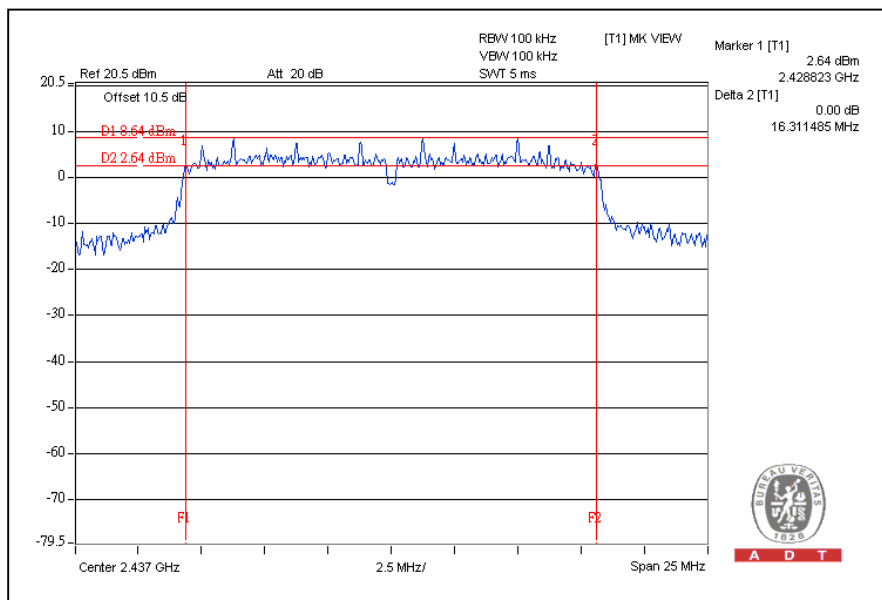
# 802.11g OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 6dB BANDWIDTH<br>(MHz) | MINIMUM LIMIT<br>(MHz) | PASS / FAIL |
|---------|-------------------------------|------------------------|------------------------|-------------|
| 1       | 2412                          | 16.32                  | 0.5                    | PASS        |
| 6       | 2437                          | 16.31                  | 0.5                    | PASS        |
| 11      | 2462                          | 16.33                  | 0.5                    | PASS        |

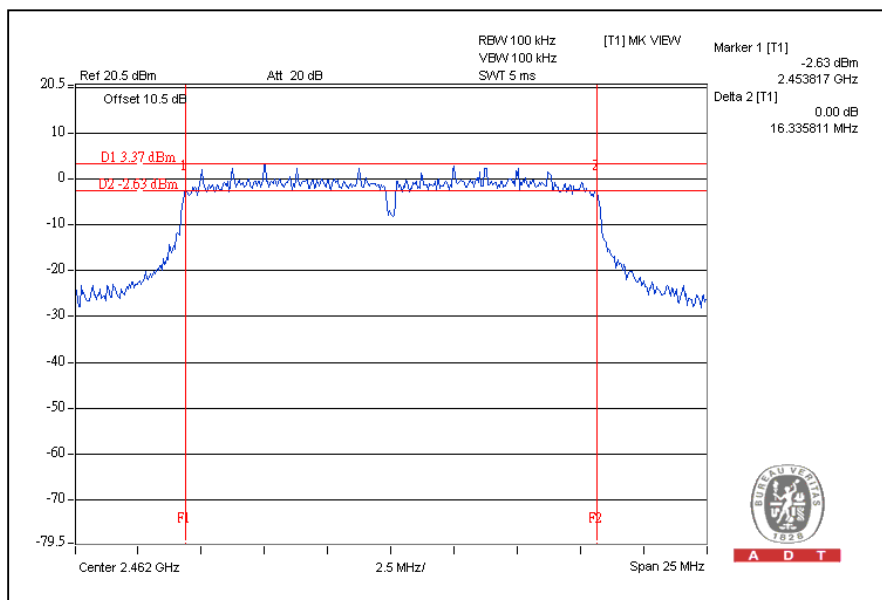
## CH1



## CH6



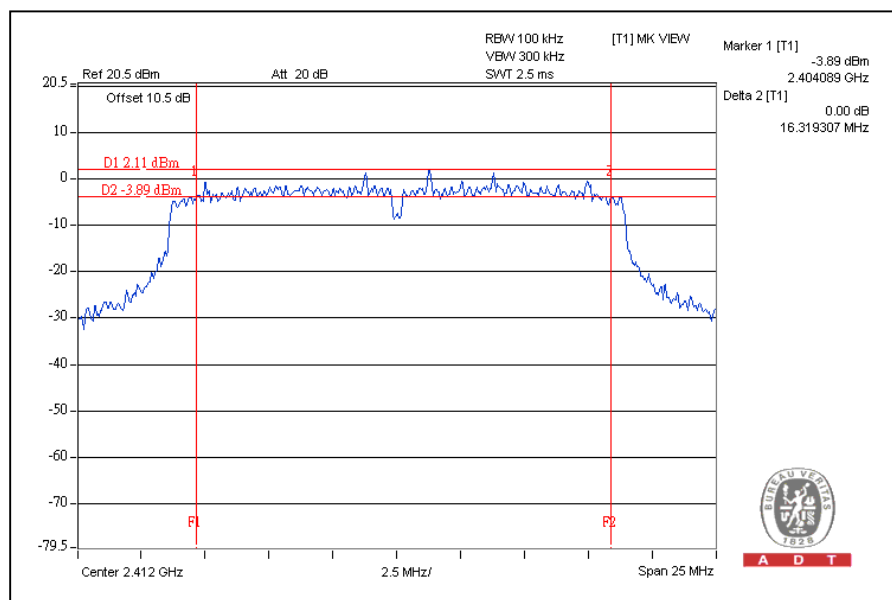
## CH11



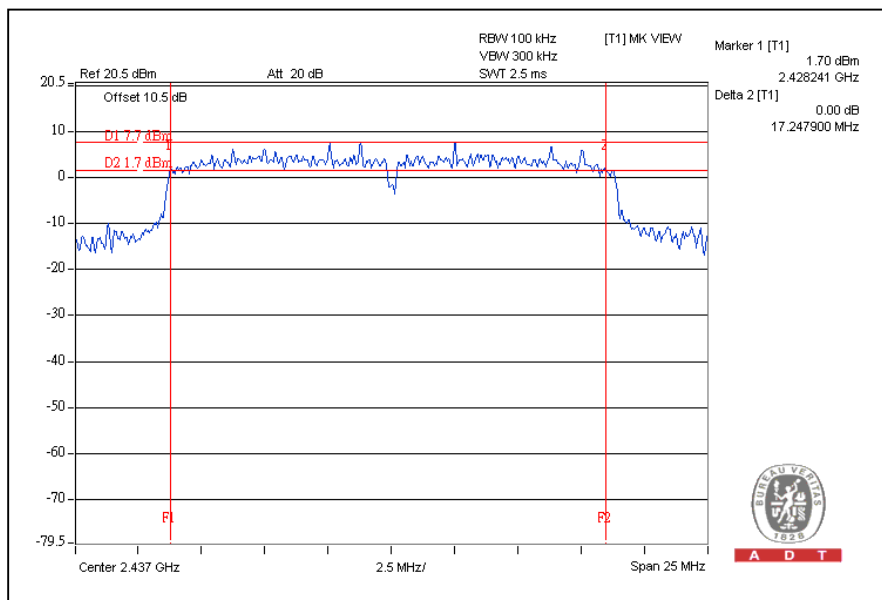
## 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------------------|-------------|
| 1       | 2412                    | 16.32               | 0.5                 | PASS        |
| 6       | 2437                    | 17.24               | 0.5                 | PASS        |
| 11      | 2462                    | 16.73               | 0.5                 | PASS        |

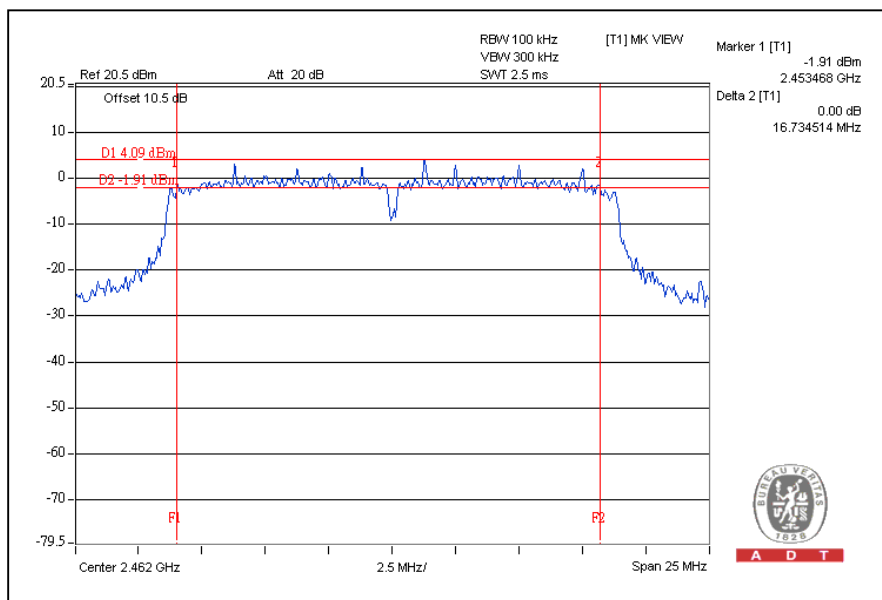
CH1



## CH6



## CH11



## 4.4 99% BANDWIDTH MEASUREMENT

### 4.4.1 TEST INSTRUMENTS

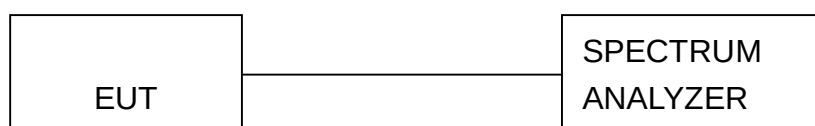
| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Spectrum Analyzer          | E4446A    | MY48250254 | July 14, 2010   | July 13, 2011    |

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

### 4.4.2 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW.

### 4.4.3 TEST SETUP



### 4.4.4 EUT OPERATING CONDITIONS

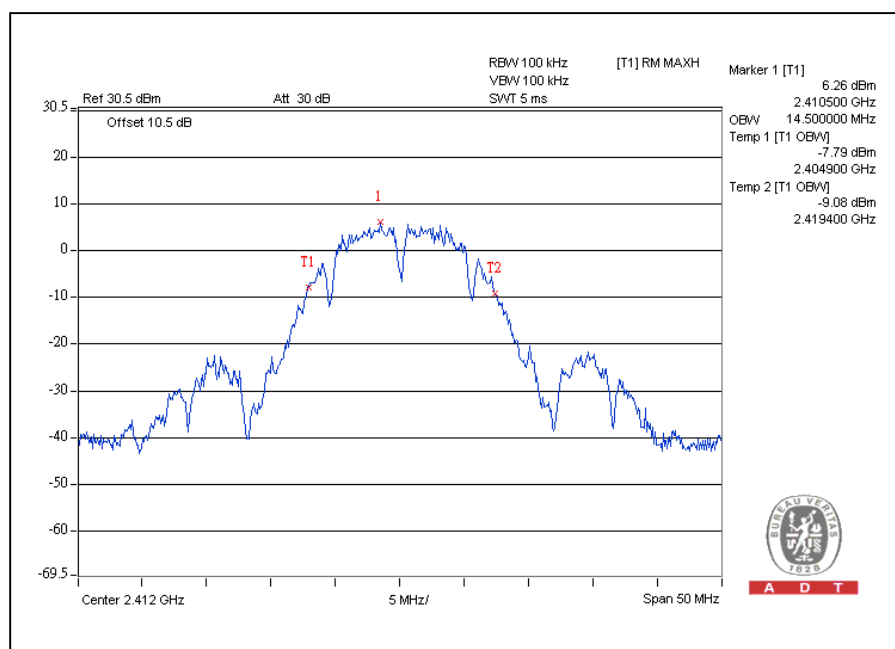
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

#### 4.4.5 TEST RESULTS

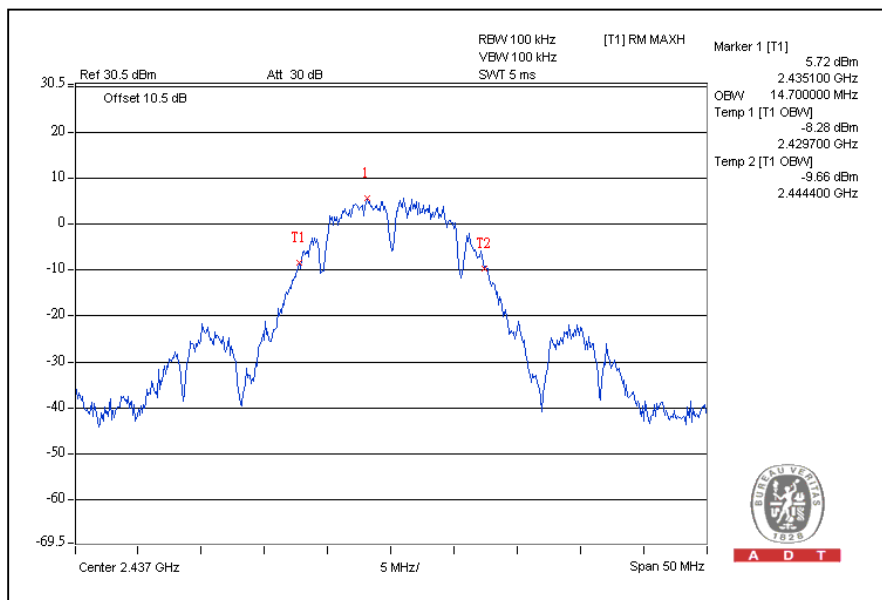
##### 802.11b DSSS MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 99% BANDWIDTH (MHz) |
|---------|-------------------------|---------------------|
| 1       | 2412                    | 14.5                |
| 6       | 2437                    | 14.7                |
| 11      | 2462                    | 14.0                |

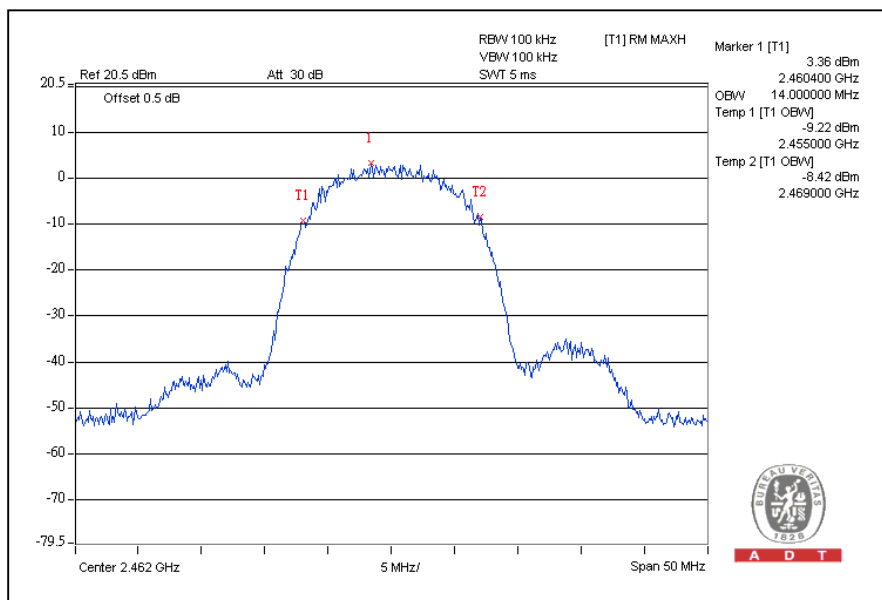
CH1



## CH6



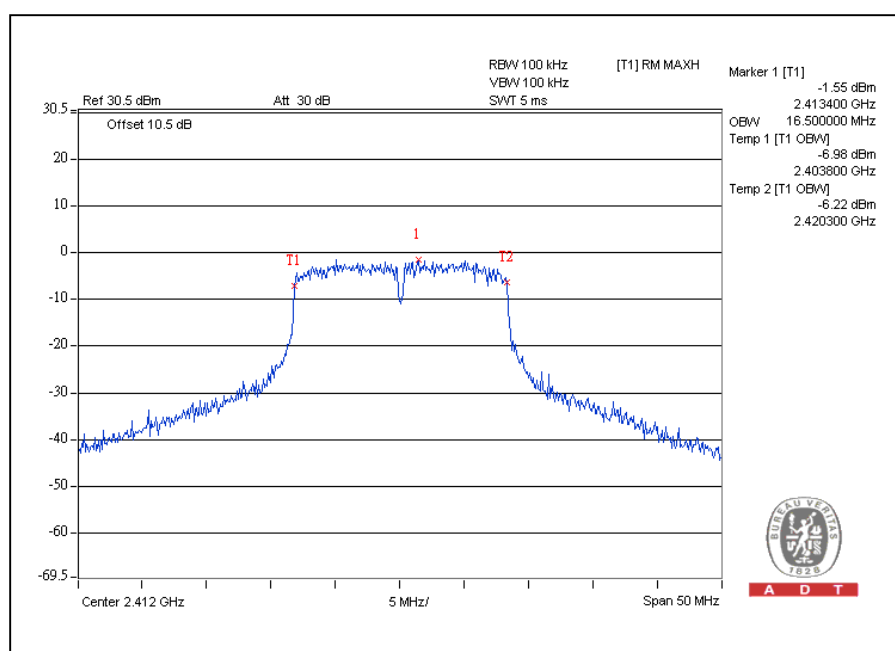
## CH11



## 802.11g OFDM MODULATION:

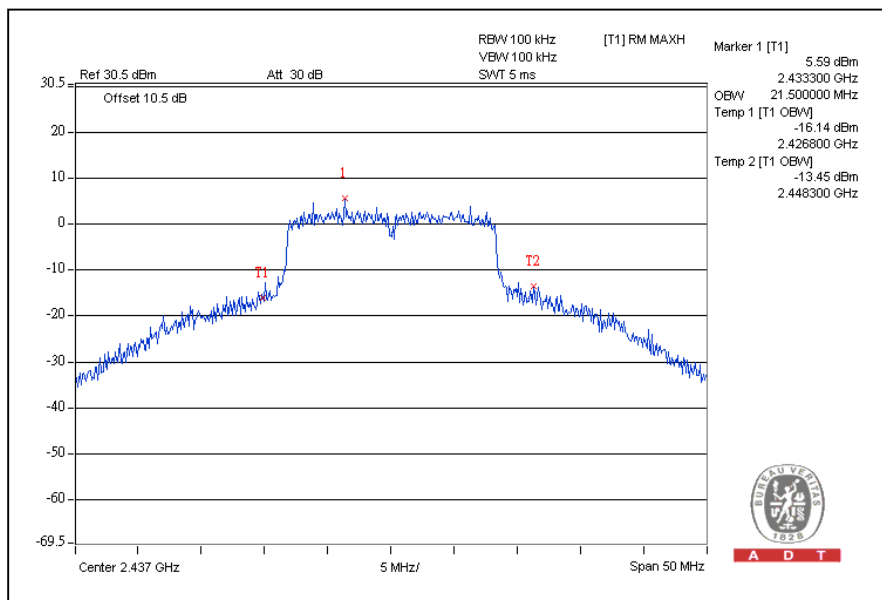
| CHANNEL | CHANNEL FREQUENCY (MHz) | 99% BANDWIDTH (MHz) |
|---------|-------------------------|---------------------|
| 1       | 2412                    | 16.5                |
| 6       | 2437                    | 21.5                |
| 11      | 2462                    | 16.5                |

### CH1

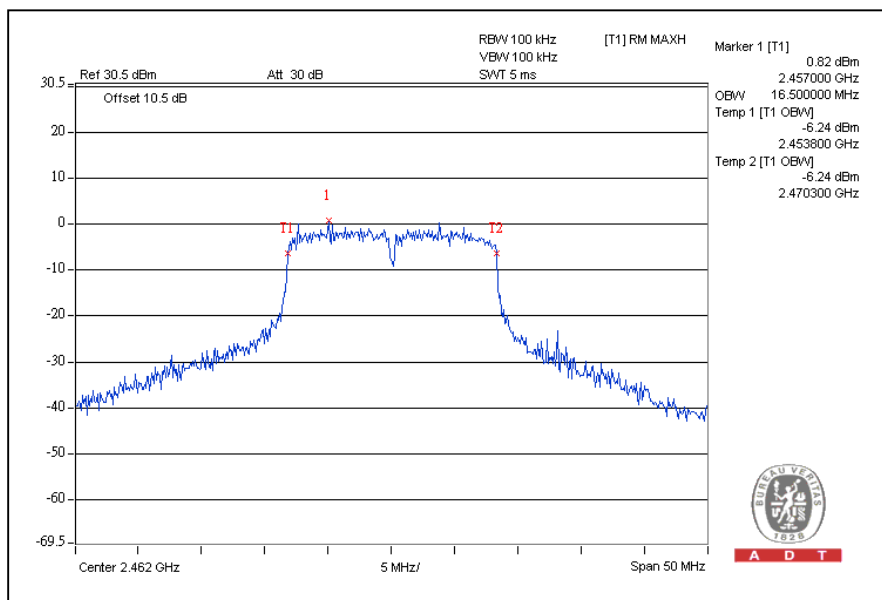




## CH6



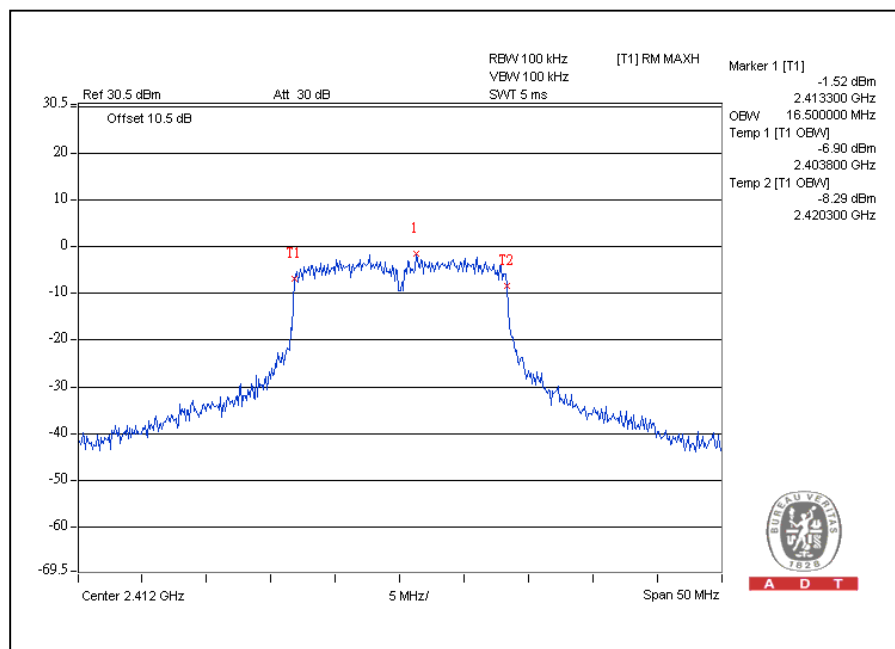
## CH11



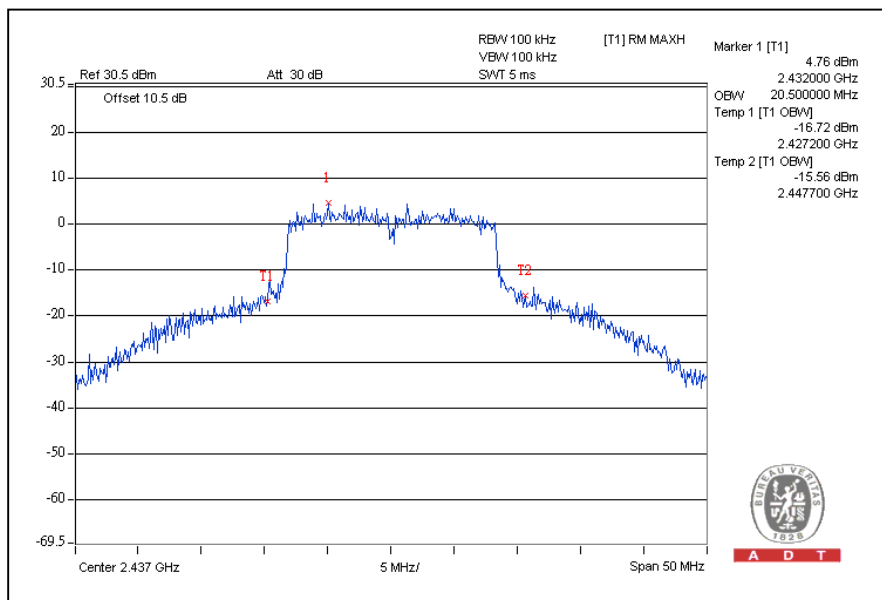
## 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 99% BANDWIDTH (MHz) |
|---------|-------------------------|---------------------|
| 1       | 2412                    | 16.5                |
| 6       | 2437                    | 20.5                |
| 11      | 2462                    | 16.5                |

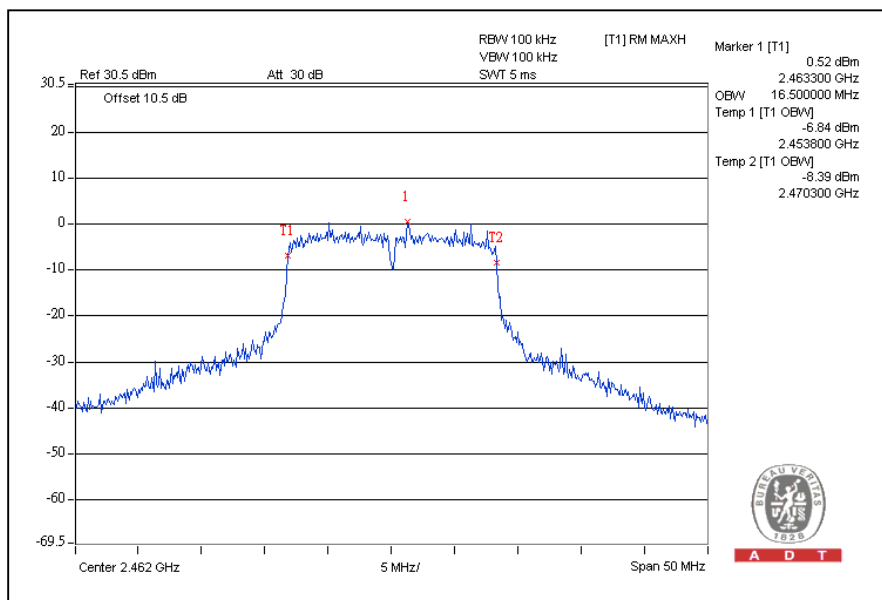
CH1



## CH6



## CH11



## 4.5 MAXIMUM PEAK OUTPUT POWER

### 4.5.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 4.5.2 INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Peak Power Meter           | ML2495A   | 0824006    | May 04, 2010    | May 03, 2011     |
| Power Sensor               | MA2411B   | 0738172    | May 04, 2010    | May 03, 2011     |

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

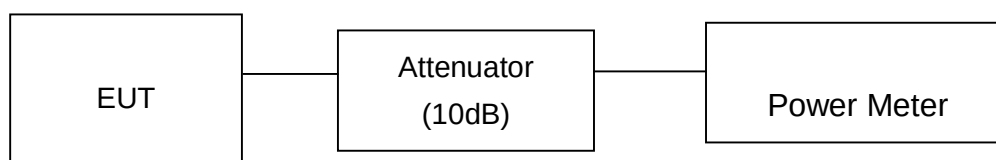
### 4.5.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the power level.

### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.5.5 TEST SETUP



### 4.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

#### 4.5.7 TEST RESULTS

##### 802.11b DSSS MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | PEAK POWER<br>OUTPUT (dBm) | PEAK POWER<br>OUTPUT (mW) | PEAK POWER<br>LIMIT (dBm) | PASS / FAIL |
|---------|-------------------------------|----------------------------|---------------------------|---------------------------|-------------|
| 1       | 2412                          | 20.9                       | 123.0                     | 30                        | PASS        |
| 6       | 2437                          | 20.8                       | 120.2                     | 30                        | PASS        |
| 11      | 2462                          | 21.0                       | 125.9                     | 30                        | PASS        |

##### 802.11g OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | PEAK POWER<br>OUTPUT (dBm) | PEAK POWER<br>OUTPUT (mW) | PEAK POWER<br>LIMIT (dBm) | PASS / FAIL |
|---------|-------------------------------|----------------------------|---------------------------|---------------------------|-------------|
| 1       | 2412                          | 22.3                       | 169.8                     | 30                        | PASS        |
| 6       | 2437                          | 23.8                       | 239.9                     | 30                        | PASS        |
| 11      | 2462                          | 23.0                       | 199.5                     | 30                        | PASS        |

##### 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | PEAK POWER<br>OUTPUT (dBm) | PEAK POWER<br>OUTPUT (mW) | PEAK POWER<br>LIMIT (dBm) | PASS / FAIL |
|---------|-------------------------------|----------------------------|---------------------------|---------------------------|-------------|
| 1       | 2412                          | 21.7                       | 147.9                     | 30                        | PASS        |
| 6       | 2437                          | 23.7                       | 234.4                     | 30                        | PASS        |
| 11      | 2462                          | 22.4                       | 173.8                     | 30                        | PASS        |

## 4.6 AVERAGE OUTPUT POWER

### 4.6.1 FOR REFERENCE.

### 4.6.2 TEST INSTRUMENTS

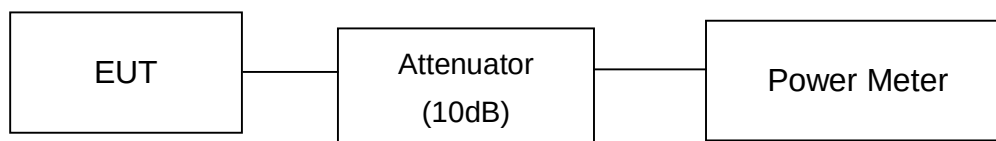
| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Peak Power Meter           | ML2495A   | 0824006    | May 04, 2010    | May 03, 2011     |
| Power Sensor               | MA2411B   | 0738172    | May 04, 2010    | May 03, 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 PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator, the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the average power level.

### 4.6.4 TEST SETUP



### 4.6.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

#### 4.6.6 TEST RESULTS

##### 802.11b DSSS MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER OUTPUT (dBm) |
|---------|-------------------------|----------------------------|
| 1       | 2412                    | 18.8                       |
| 6       | 2437                    | 19.0                       |
| 11      | 2462                    | 18.8                       |

##### 802.11g OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER OUTPUT (dBm) |
|---------|-------------------------|----------------------------|
| 1       | 2412                    | 14.0                       |
| 6       | 2437                    | 19.5                       |
| 11      | 2462                    | 15.3                       |

##### 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER OUTPUT (dBm) |
|---------|-------------------------|----------------------------|
| 1       | 2412                    | 13.3                       |
| 6       | 2437                    | 19.1                       |
| 11      | 2462                    | 14.7                       |

## 4.7 POWER SPECTRAL DENSITY MEASUREMENT

### 4.7.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.7.2 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.

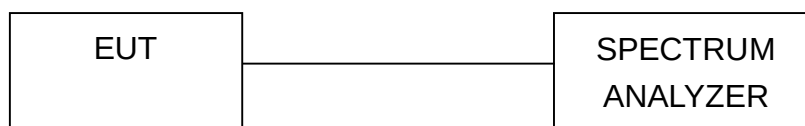
### 4.7.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

### 4.7.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.7.5 TEST SETUP



### 4.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6

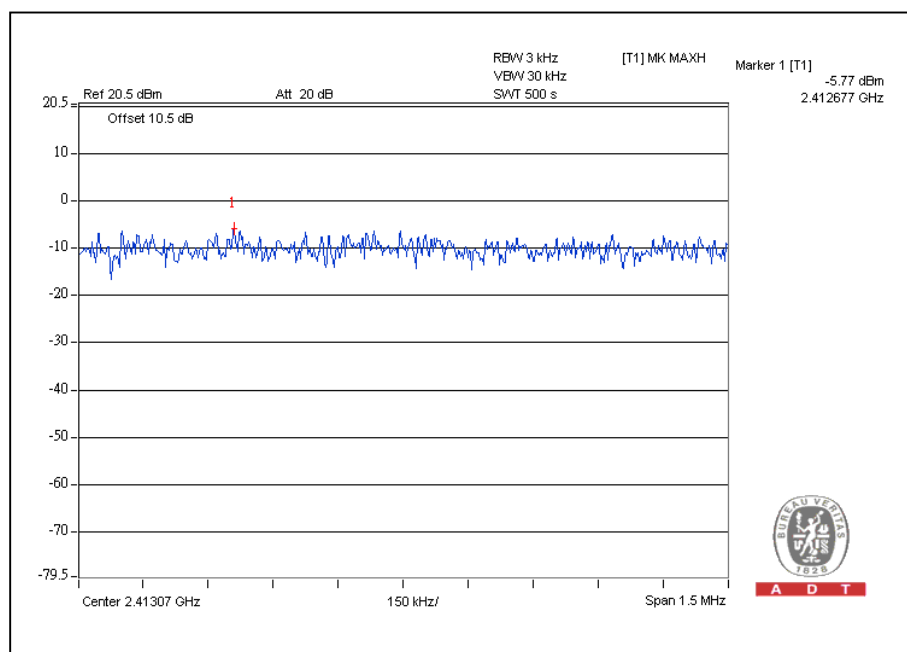


## 4.7.7 TEST RESULTS

### 802.11b DSSS MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---------|--------------------------|---------------------------------|---------------------|-------------|
| 1       | 2412                     | -5.8                            | 8                   | PASS        |
| 6       | 2437                     | -4.6                            | 8                   | PASS        |
| 11      | 2462                     | -6.5                            | 8                   | PASS        |

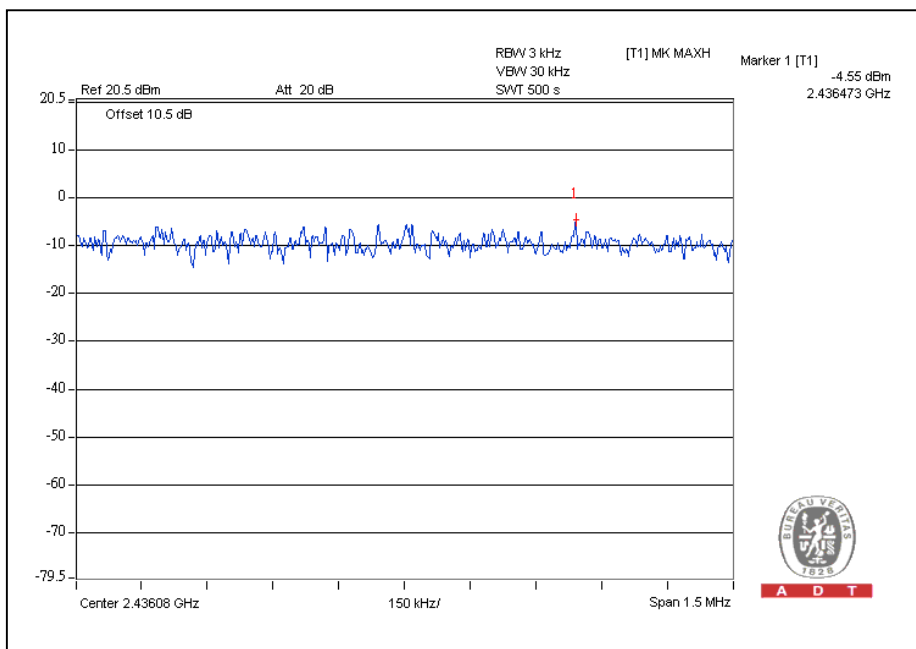
### CH1



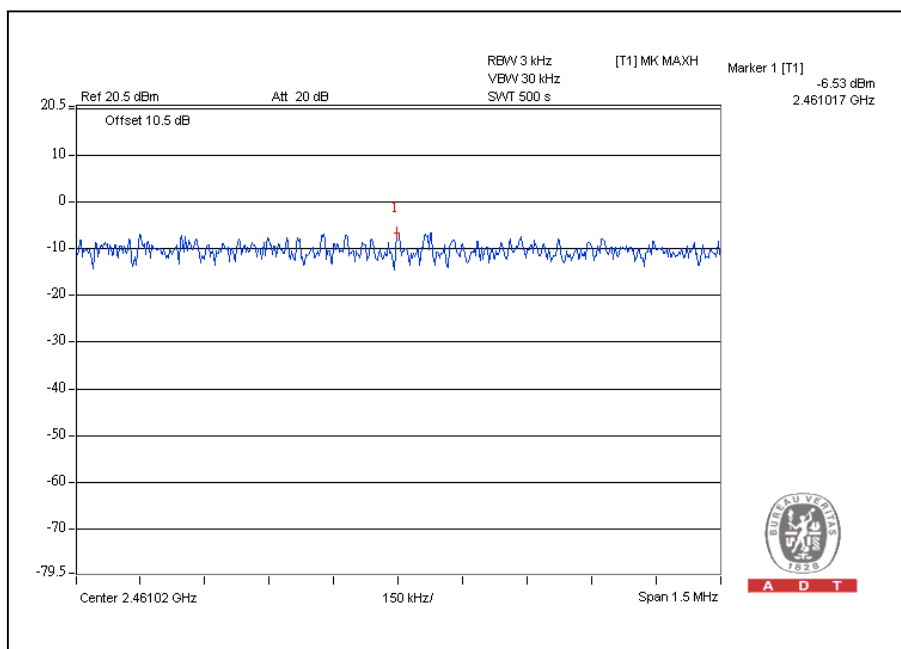


A D T

## CH6



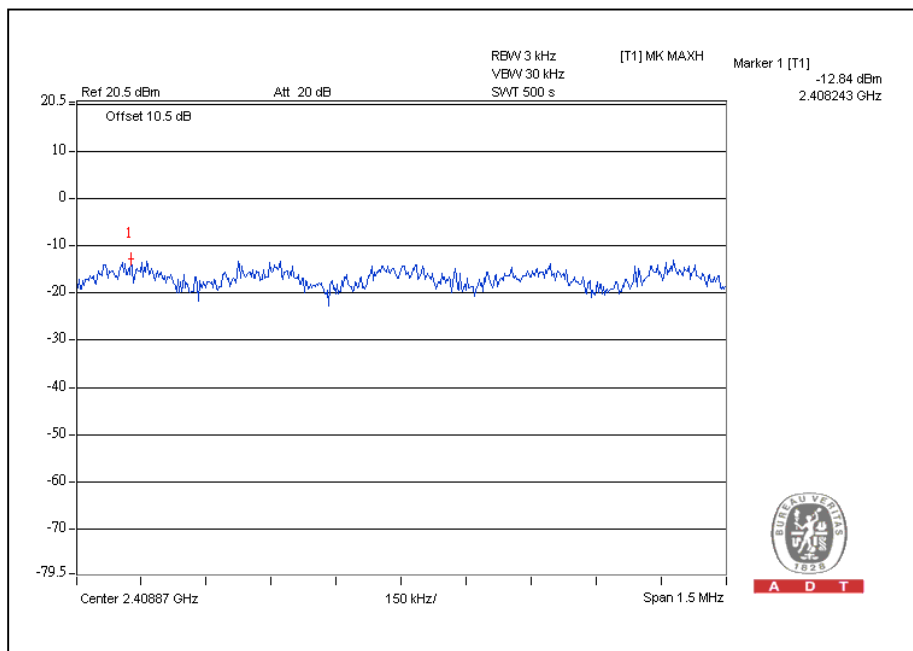
## CH11



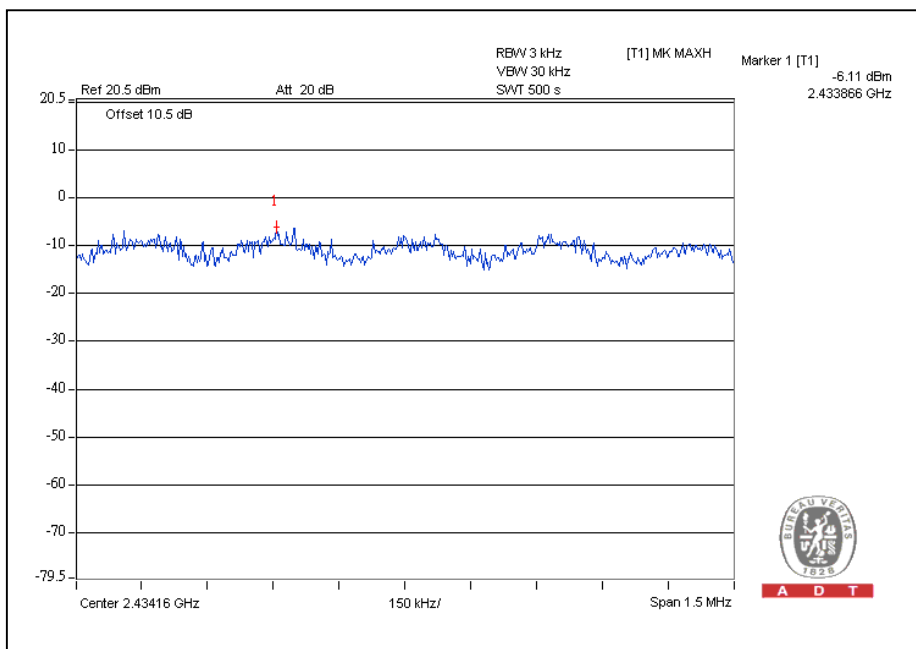
## 802.11g OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz ) | RF POWER<br>LEVEL IN 3kHz<br>BW (dBm) | MAXIMUM LIMIT<br>(dBm) | PASS / FAIL |
|---------|--------------------------------|---------------------------------------|------------------------|-------------|
| 1       | 2412                           | -12.8                                 | 8                      | PASS        |
| 6       | 2437                           | -6.1                                  | 8                      | PASS        |
| 11      | 2462                           | -9.8                                  | 8                      | PASS        |

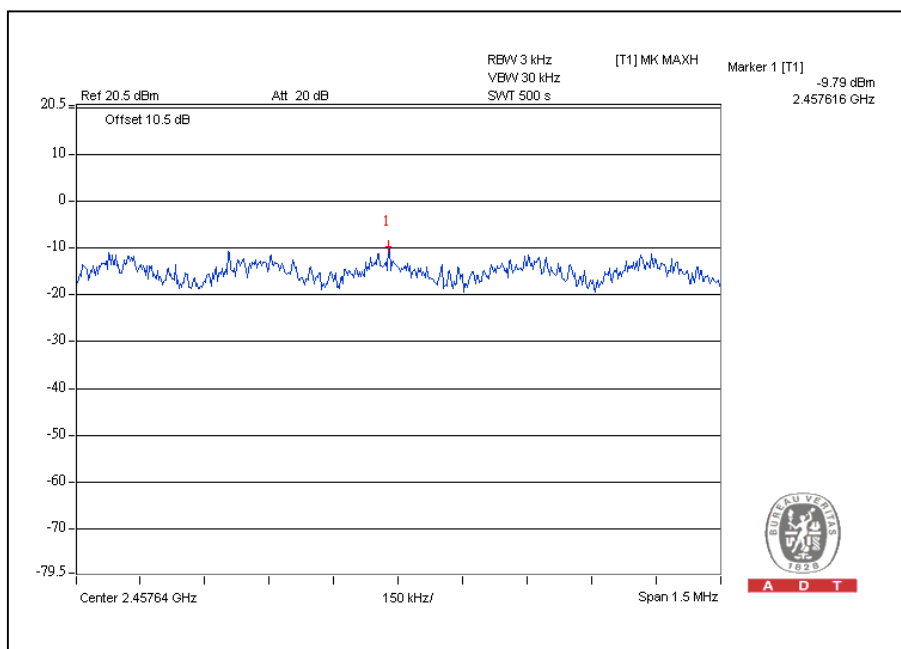
## CH1



## CH6



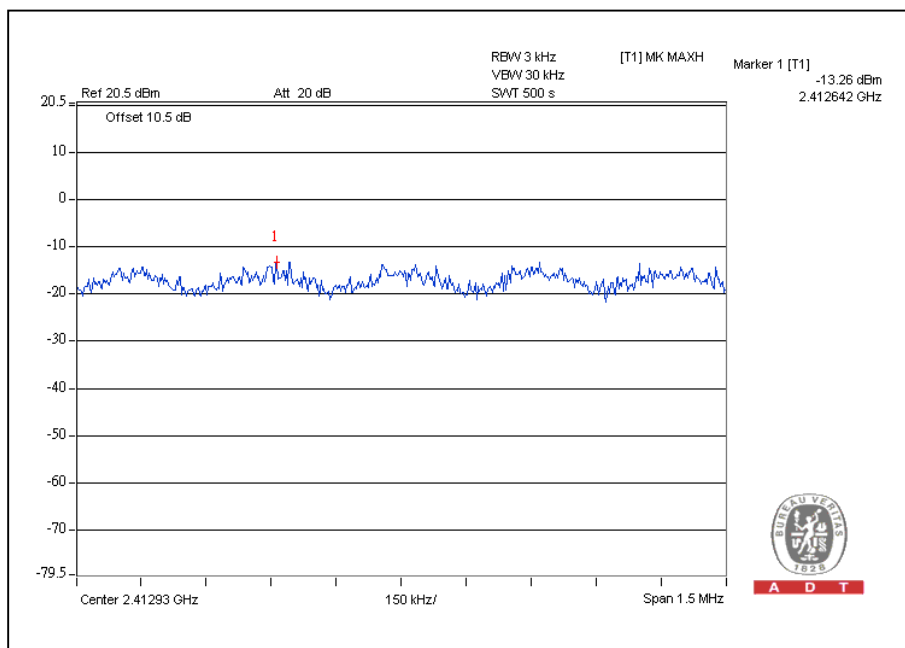
## CH11



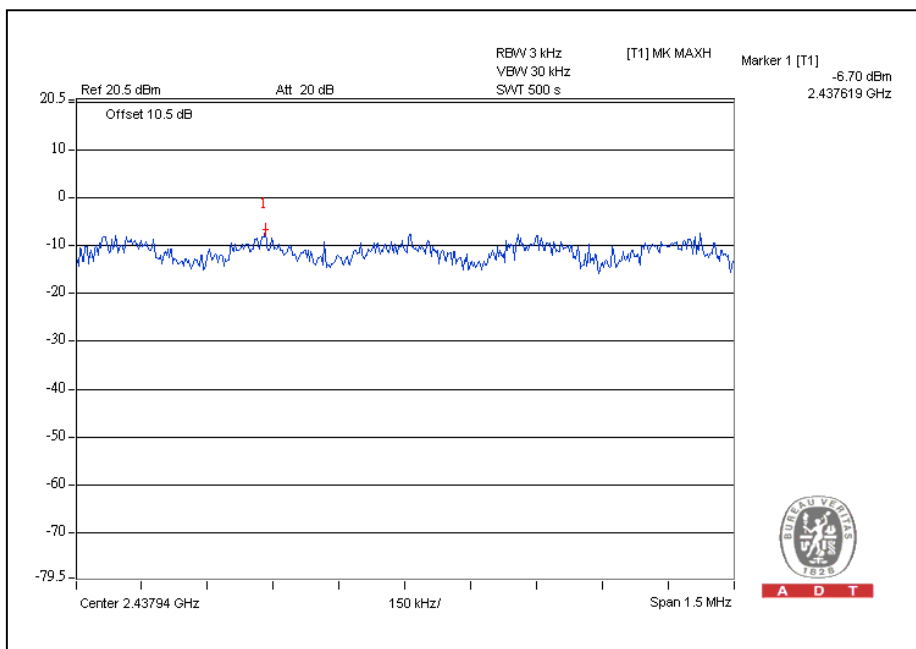
### 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---------|--------------------------|---------------------------------|---------------------|-------------|
| 1       | 2412                     | -13.3                           | 8                   | PASS        |
| 6       | 2437                     | -6.7                            | 8                   | PASS        |
| 11      | 2462                     | -11.7                           | 8                   | PASS        |

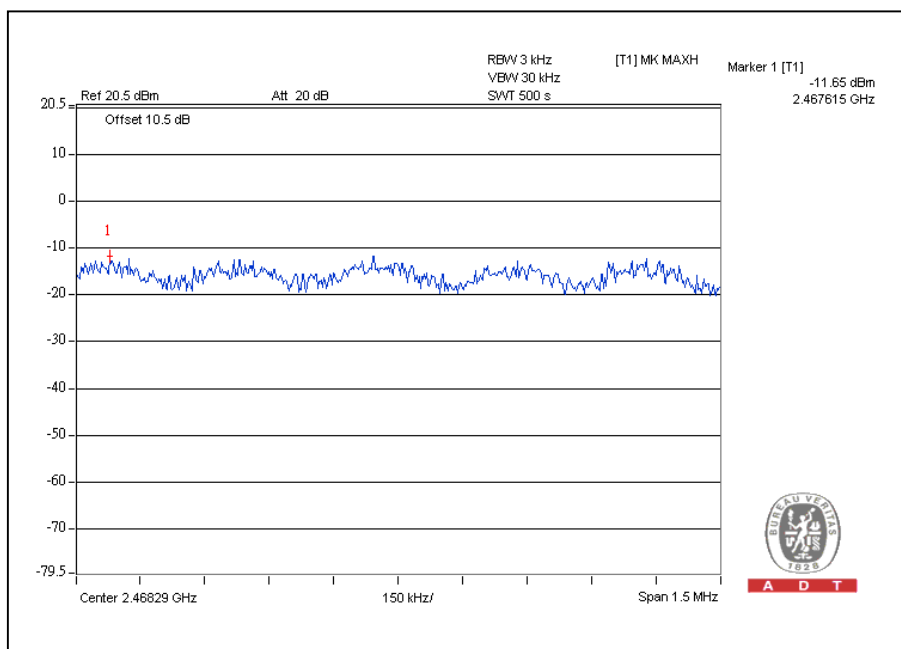
### CH1



## CH6



## CH11



## 4.8 CONDUCTED OUT-BAND EMISSION MEASUREMENT

### 4.8.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.8.2 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.

### 4.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

### 4.8.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.8.5 EUT OPERATING CONDITION

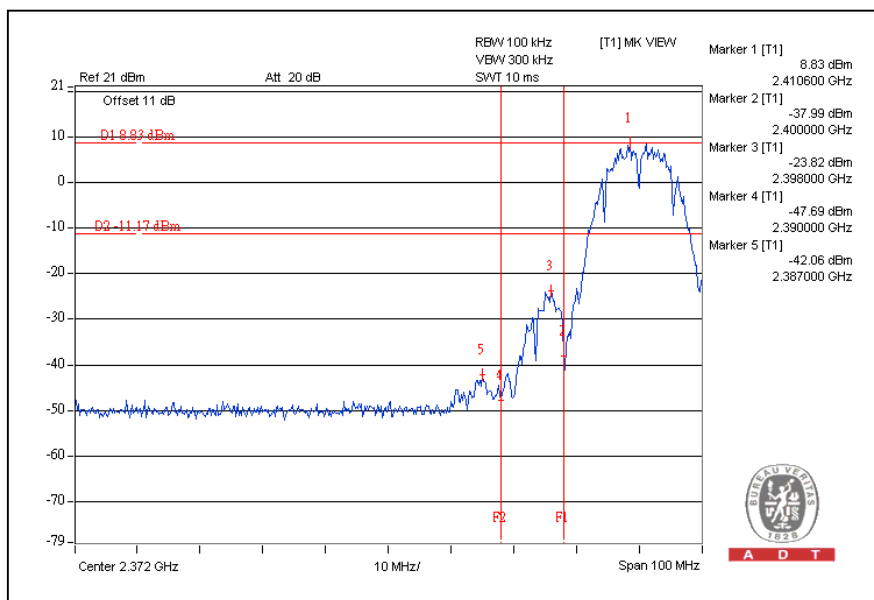
Same as Item 4.3.6

### 4.8.6 TEST RESULTS

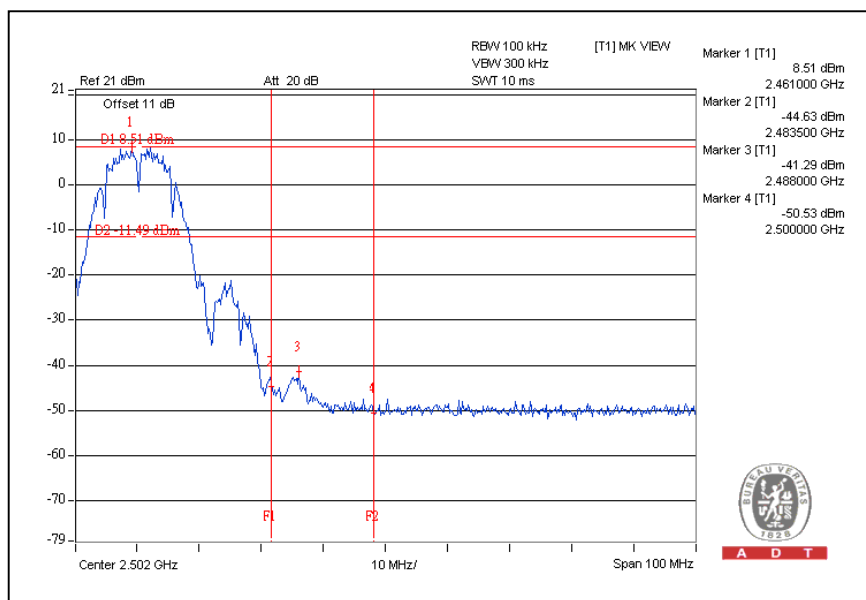
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

## 802.11b DSSS MODULATION:

### CH1

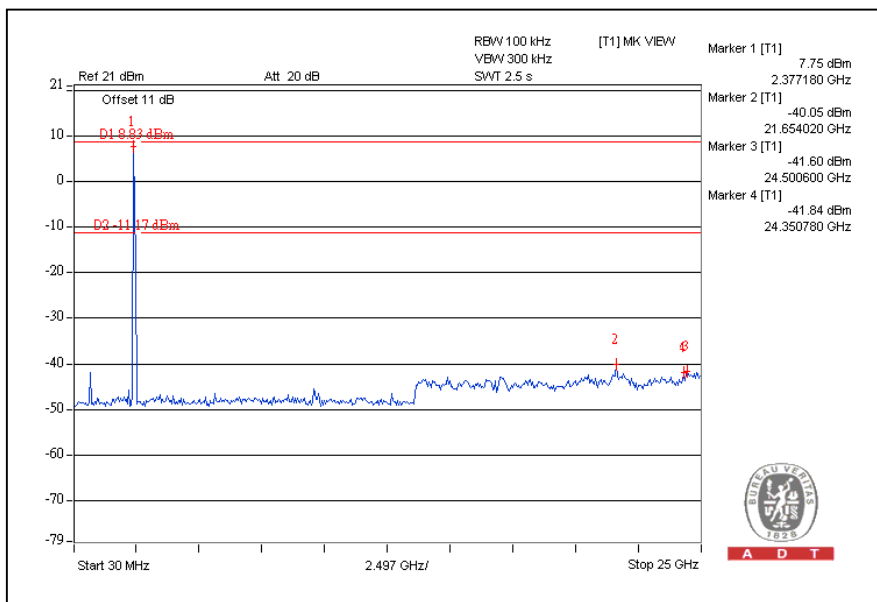


### CH11

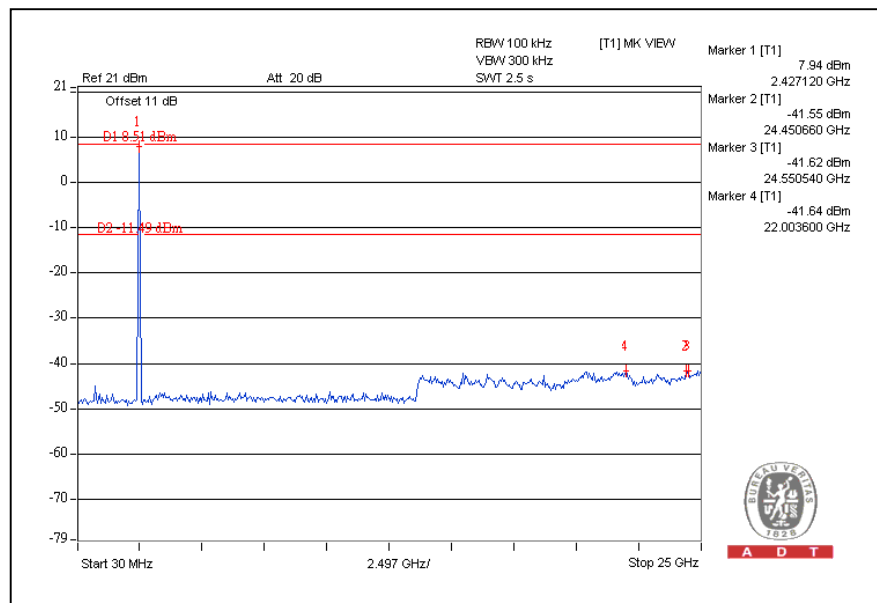




## CH1

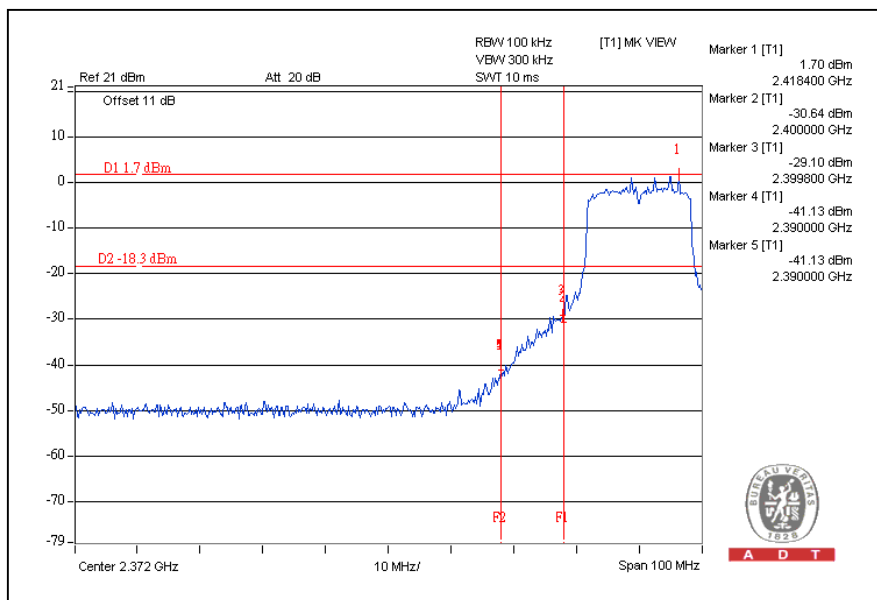


## CH11

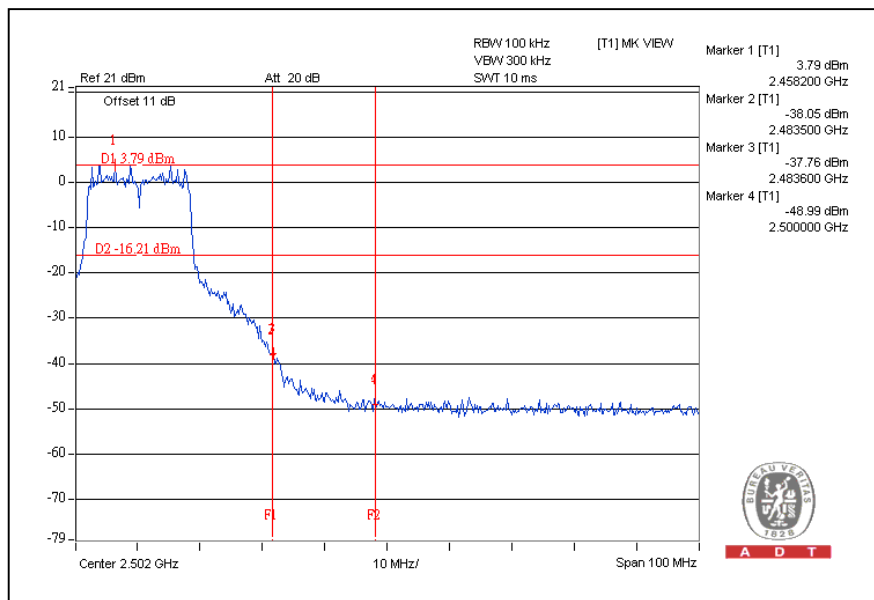


## 802.11g OFDM MODULATION:

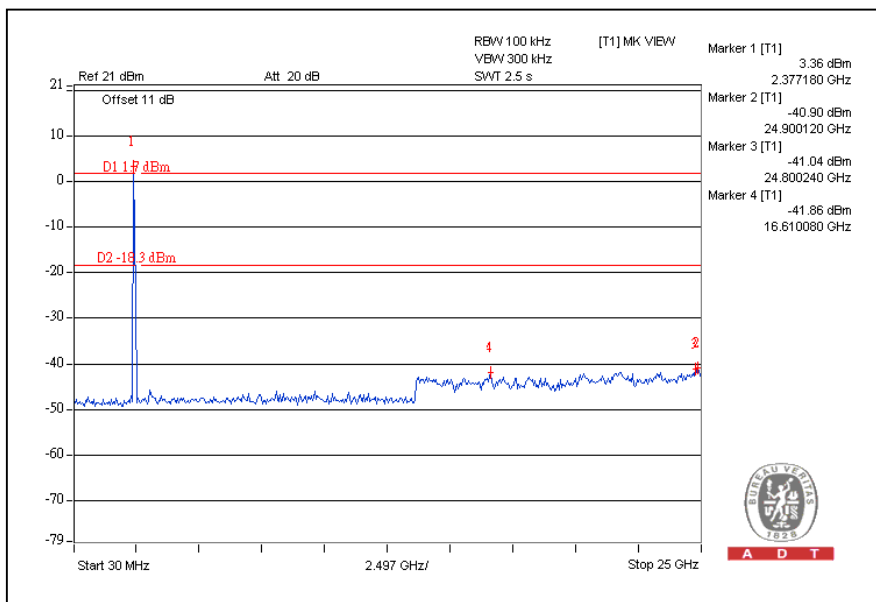
### CH1



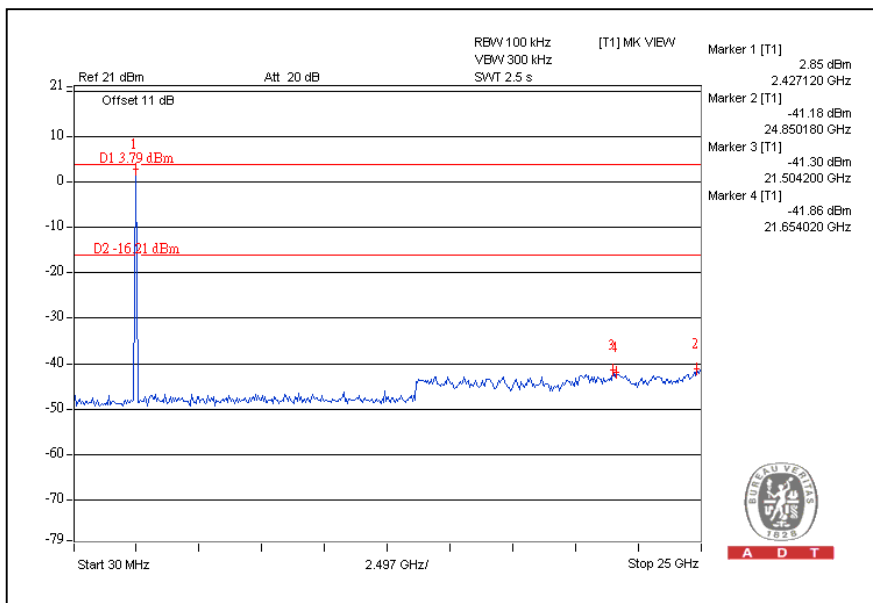
### CH11



## CH1

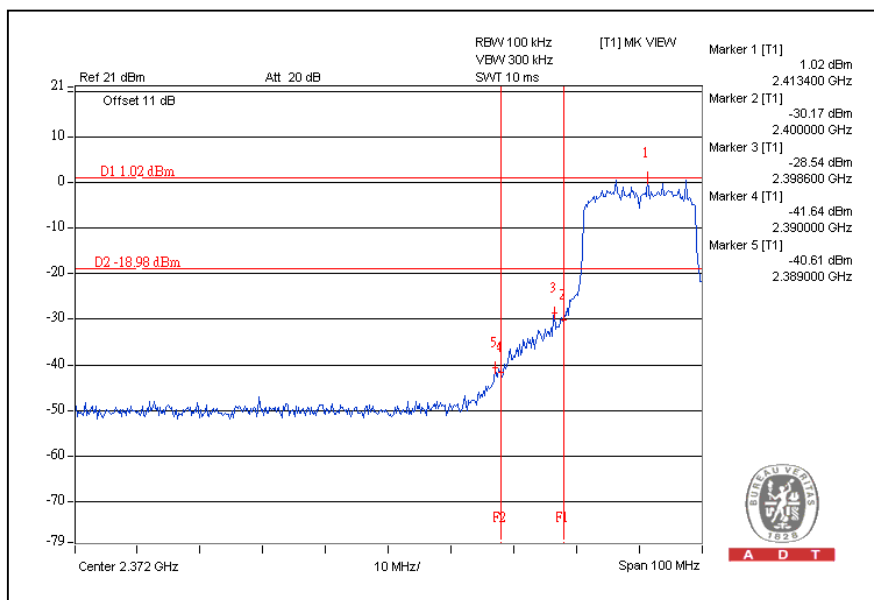


## CH11

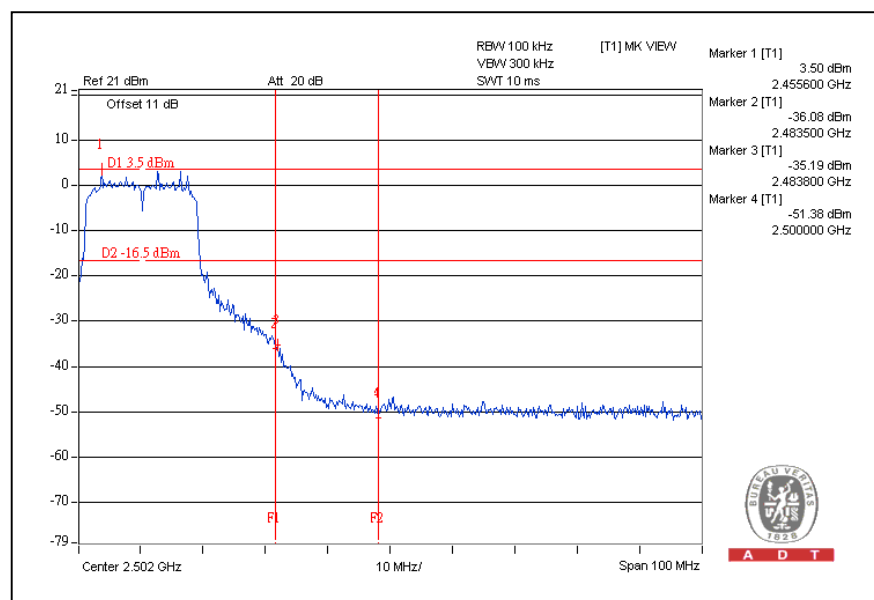


## 802.11n (20MHz) OFDM MODULATION:

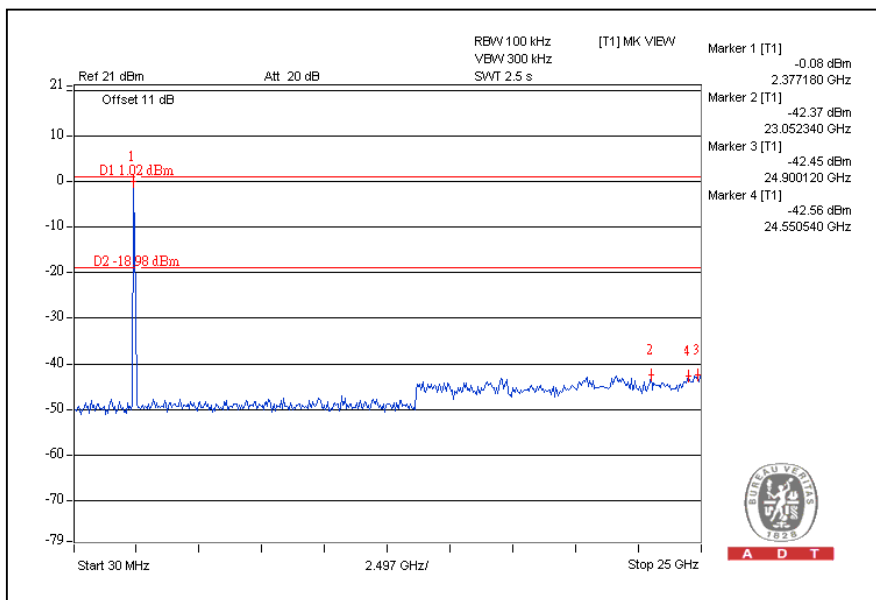
### CH1



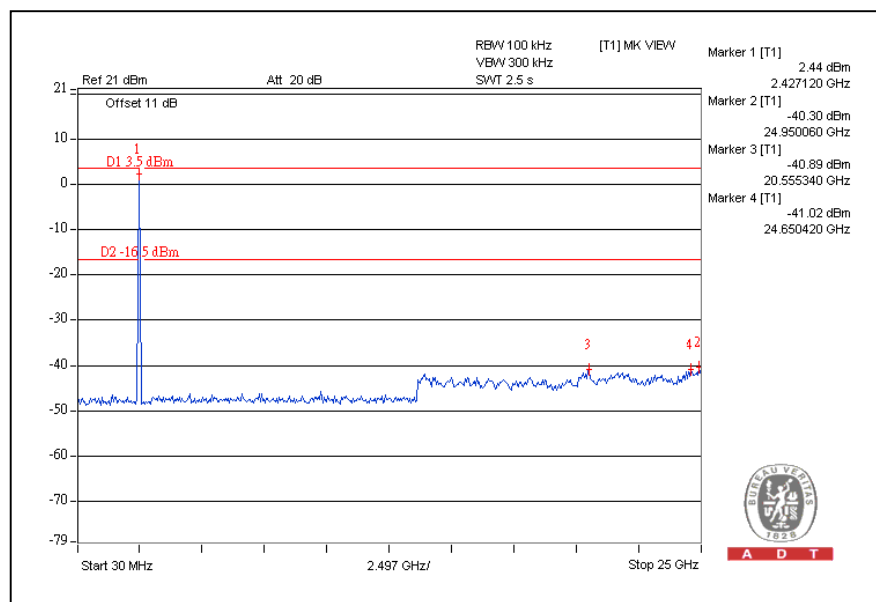
### CH11



## CH1



## CH11



## 5. TEST TYPES AND RESULTS (802.11a, 5725~5850MHz Band)

### 5.1 CONDUCTED EMISSION MEASUREMENT

#### 5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) |          |
|-----------------------------|------------------------|----------|
|                             | 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.

#### 5.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER                            | MODEL NO.             | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|-------------------------------------------------------|-----------------------|------------|-----------------|------------------|
| Test Receiver                                         | ESCS 30               | 100375     | Mar. 09, 2010   | Mar. 08, 2011    |
| Line-Impedance Stabilization Network (for EUT)        | NSLK 8127             | 8127-522   | Sep. 23, 2009   | Sep. 22, 2010    |
| Line-Impedance Stabilization Network (for Peripheral) | ESH3-Z5               | 848773/004 | Oct. 26, 2009   | Oct. 25, 2010    |
| RF Cable (JYEBAO)                                     | 5DFB                  | COBCAB-001 | Nov. 24, 2009   | Nov. 23, 2010    |
| 50 ohms Terminator                                    | 50                    | 3          | Oct. 28, 2009   | Oct. 27, 2010    |
| Software                                              | BV<br>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.

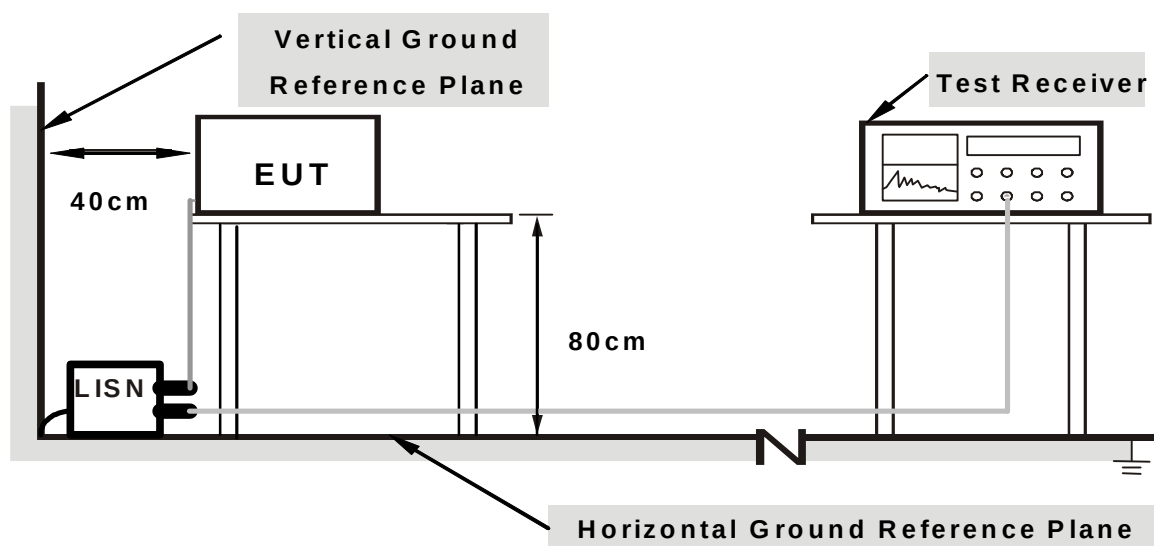
### 5.1.3 TEST PROCEDURES

- 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 provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

### 5.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.1.5 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.

### 5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

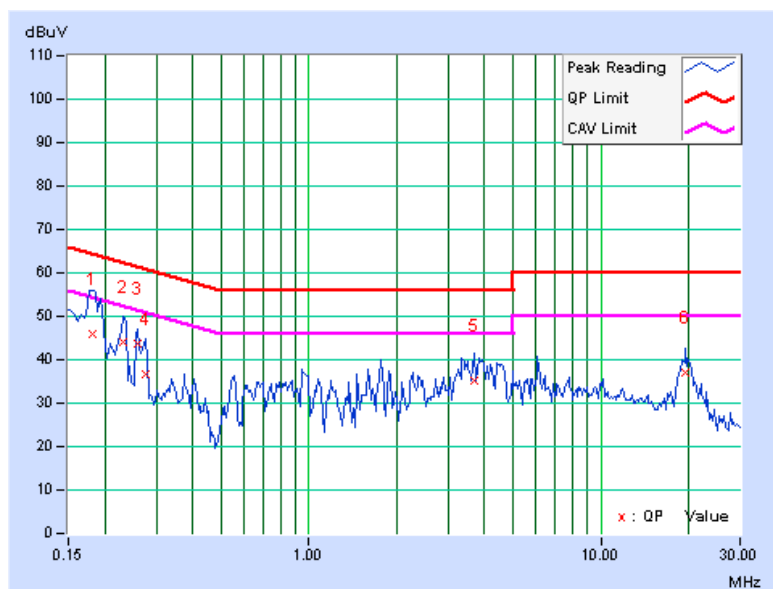


## 5.1.7 TEST RESULTS

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

|    | Freq.  | Corr.  | Reading Value |     | Emission Level |     | Limit     |       | Margin |     |
|----|--------|--------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| No |        | Factor | [dB (uV)]     |     | [dB (uV)]      |     | [dB (uV)] |       | (dB)   |     |
|    | [MHz]  | (dB)   | Q.P.          | AV. | Q.P.           | AV. | Q.P.      | AV.   | Q.P.   | AV. |
| 1  | 0.181  | 0.05   | 46.05         | -   | 46.10          | -   | 64.43     | 54.43 | -18.33 | -   |
| 2  | 0.232  | 0.05   | 43.97         | -   | 44.02          | -   | 62.38     | 52.38 | -18.36 | -   |
| 3  | 0.259  | 0.05   | 43.76         | -   | 43.81          | -   | 61.45     | 51.45 | -17.64 | -   |
| 4  | 0.275  | 0.05   | 36.50         | -   | 36.55          | -   | 60.97     | 50.97 | -24.41 | -   |
| 5  | 3.664  | 0.18   | 35.14         | -   | 35.32          | -   | 56.00     | 46.00 | -20.68 | -   |
| 6  | 19.543 | 0.50   | 36.50         | -   | 37.00          | -   | 60.00     | 50.00 | -23.00 | -   |

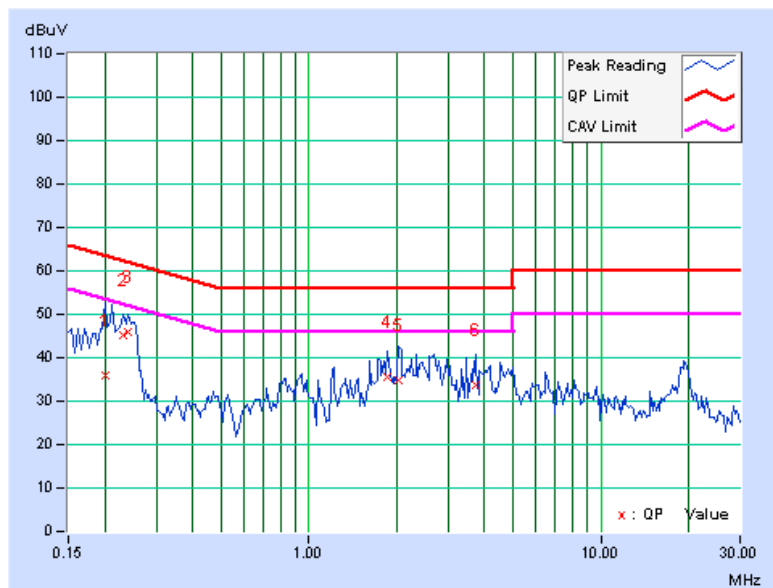
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = 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 |
|-------|-------------|---------------|-------|

|    | Freq. | Corr.  | Reading Value |     | Emission Level |     | Limit     |       | Margin |     |
|----|-------|--------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| No |       | Factor | [dB (uV)]     |     | [dB (uV)]      |     | [dB (uV)] |       | (dB)   |     |
|    | [MHz] | (dB)   | Q.P.          | AV. | Q.P.           | AV. | Q.P.      | AV.   | Q.P.   | AV. |
| 1  | 0.201 | 0.06   | 35.70         | -   | 35.76          | -   | 63.58     | 53.58 | -27.82 | -   |
| 2  | 0.232 | 0.06   | 45.18         | -   | 45.24          | -   | 62.38     | 52.38 | -17.14 | -   |
| 3  | 0.240 | 0.06   | 45.92         | -   | 45.98          | -   | 62.10     | 52.10 | -16.12 | -   |
| 4  | 1.867 | 0.13   | 35.56         | -   | 35.69          | -   | 56.00     | 46.00 | -20.31 | -   |
| 5  | 2.031 | 0.14   | 34.65         | -   | 34.79          | -   | 56.00     | 46.00 | -21.21 | -   |
| 6  | 3.738 | 0.19   | 33.60         | -   | 33.79          | -   | 56.00     | 46.00 | -22.21 | -   |

- 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.



## 5.2 RADIATED EMISSION MEASUREMENT

### 5.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209(RSS-210 table 2&3) 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.

## 5.2.2 TEST INSTRUMENTS

| 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                      | MY46520310                          | Aug. 18, 2009   | Aug. 17, 2010    |
| Agilent Signal Generator             | N5181A                      | MY49060347                          | July 18, 2010   | July 17, 2011    |
| LIG NEX1 Test Receiver               | ER-265                      | L09068005                           | Aug. 31, 2009   | Aug. 30, 2010    |
| Mini-Circuits Pre-Amplifier          | ZFL-1000VH2B                | AMP-ZFL-04                          | Nov. 18, 2009   | Nov. 17, 2010    |
| Agilent Pre-Amplifier                | 8449B                       | 3008A02465                          | Mar. 01, 2010   | Feb. 28, 2011    |
| Miteq Pre-Amplifier                  | AFS33-1800265<br>0-30-8P-44 | 881786                              | NA              | NA               |
| SCHWARZBECK Trilog Broadband Antenna | VULB 9168                   | 9168-361                            | Sep. 30, 2009   | Sep. 29, 2010    |
| AISI Horn Antenna                    | AIH.8018                    | 0000220091110                       | Nov. 16, 2009   | Nov. 15, 2010    |
| SCHWARZBECK Horn Antenna             | BBHA 9170                   | 9170-424                            | Sep. 30, 2009   | Sep. 29, 2010    |
| RF CABLE                             | NA                          | RF104-205<br>RF104-207<br>RF104-208 | Dec. 24, 2009   | Dec. 23, 2010    |
| 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.

### 5.2.3 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

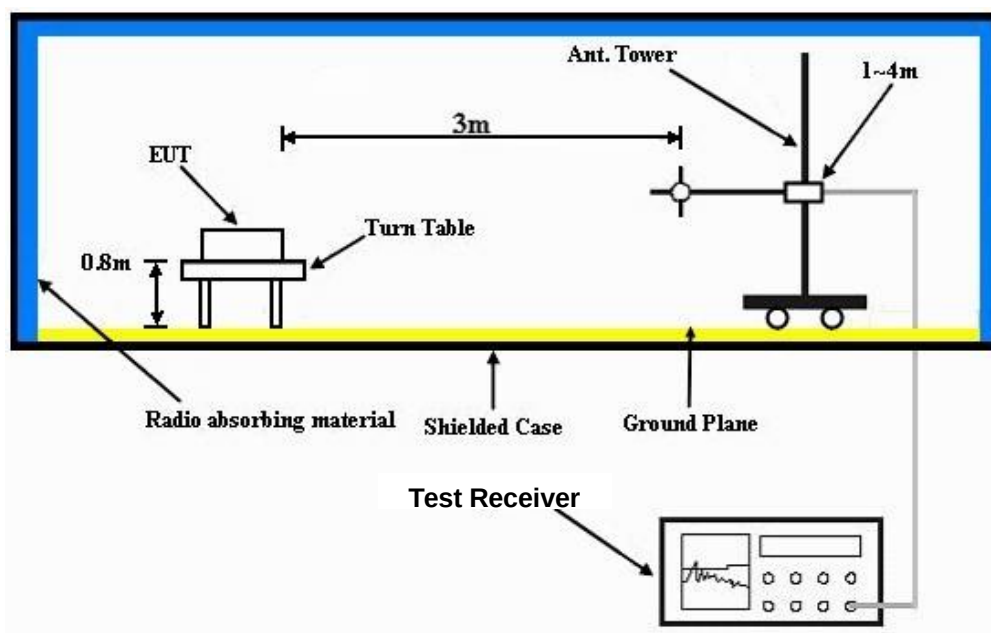
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and 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.

### 5.2.4 DEVIATION FROM TEST STANDARD

No deviation

## 5.2.5 TEST SETUP



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

## 5.2.6 EUT OPERATING CONDITIONS

Same as the 4.2.6

## 5.2.7 TEST RESULTS (FOR TRANSMITTER PART)

### BELOW 1GHz WORST-CASE DATA : 802.11n (40MHz) OFDM MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 159                 | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 24deg. C, 70%RH<br>1011 hPa | TESTED BY          | Eric Lee      |

| 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                                                   | 99.20       | 33.6 QP                 | 43.5           | -9.9        | 1.72 H             | 356                  | 23.67            | 9.93                     |
| 2                                                   | 115.00      | 33.6 QP                 | 43.5           | -9.9        | 1.55 H             | 352                  | 21.53            | 12.07                    |
| 3                                                   | 133.20      | 32.0 QP                 | 43.5           | -11.5       | 2.20 H             | 10                   | 18.30            | 13.70                    |
| 4                                                   | 150.00      | 35.0 QP                 | 43.5           | -8.5        | 1.52 H             | 360                  | 20.70            | 14.30                    |
| 5                                                   | 165.00      | 40.9 QP                 | 43.5           | -2.6        | 1.72 H             | 200                  | 26.84            | 14.06                    |
| 6                                                   | 200.00      | 38.1 QP                 | 43.5           | -5.4        | 1.50 H             | 15                   | 26.89            | 11.21                    |
| 7                                                   | 250.00      | 41.0 QP                 | 46.0           | -5.0        | 1.50 H             | 285                  | 28.05            | 12.95                    |
| 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                                                   | 33.55       | 36.9 QP                 | 40.0           | -3.1        | 1.00 V             | 300                  | 23.43            | 13.47                    |
| 2                                                   | 100.05      | 27.6 QP                 | 43.5           | -15.9       | 1.00 V             | 320                  | 17.63            | 9.97                     |
| 3                                                   | 150.62      | 35.6 QP                 | 43.5           | -7.9        | 1.20 V             | 350                  | 21.30            | 14.30                    |
| 4                                                   | 168.30      | 32.6 QP                 | 43.5           | -10.9       | 2.00 V             | 306                  | 18.67            | 13.93                    |
| 5                                                   | 250.30      | 30.6 QP                 | 46.0           | -15.4       | 1.06 V             | 243                  | 17.64            | 12.96                    |
| 6                                                   | 370.00      | 30.0 QP                 | 46.0           | -16.0       | 1.60 V             | 360                  | 12.97            | 17.03                    |

- 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.

## ABOVE 1GHz DATA

### 802.11a OFDM MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 149                 | FREQUENCY RANGE    | 1 ~ 40GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 80%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | *5745.00    | 110.4 PK                |                |             | 1.32 H             | 315                  | 68.85            | 41.55                    |
| 2                                                   | *5745.00    | 100.6 AV                |                |             | 1.32 H             | 315                  | 59.05            | 41.55                    |
| 3                                                   | 11490.00    | 65.1 PK                 | 74.0           | -8.9        | 1.48 H             | 229                  | 17.39            | 47.71                    |
| 4                                                   | 11490.00    | 49.6 AV                 | 54.0           | -4.4        | 1.48 H             | 229                  | 1.89             | 47.71                    |
| 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                                                   | *5745.00    | 105.6 PK                |                |             | 1.33 V             | 306                  | 64.05            | 41.55                    |
| 2                                                   | *5745.00    | 94.9 AV                 |                |             | 1.33 V             | 306                  | 53.35            | 41.55                    |
| 3                                                   | 11490.00    | 66.0 PK                 | 74.0           | -8.0        | 1.15 V             | 290                  | 18.29            | 47.71                    |
| 4                                                   | 11490.00    | 52.6 AV                 | 54.0           | -1.4        | 1.15 V             | 290                  | 4.89             | 47.71                    |

- 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 limit value is defined as per 15.247.



| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 157                 | FREQUENCY RANGE    | 1 ~ 40GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 80%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | *5785.00    | 110.1 PK                |                |             | 1.29 H             | 322                  | 68.42            | 41.68                    |
| 2                                                   | *5785.00    | 100.1 AV                |                |             | 1.29 H             | 322                  | 58.42            | 41.68                    |
| 3                                                   | 11570.00    | 65.2 PK                 | 74.0           | -8.8        | 1.50 H             | 230                  | 17.45            | 47.75                    |
| 4                                                   | 11570.00    | 49.8 AV                 | 54.0           | -4.2        | 1.50 H             | 230                  | 2.05             | 47.75                    |
| 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                                                   | *5785.00    | 105.9 PK                |                |             | 1.36 V             | 311                  | 64.22            | 41.68                    |
| 2                                                   | *5785.00    | 95.1 AV                 |                |             | 1.36 V             | 311                  | 53.42            | 41.68                    |
| 3                                                   | 11570.00    | 65.9 PK                 | 74.0           | -8.1        | 1.16 V             | 290                  | 18.15            | 47.75                    |
| 4                                                   | 11570.00    | 52.8 AV                 | 54.0           | -1.2        | 1.16 V             | 290                  | 5.05             | 47.75                    |

**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 limit value is defined as per 15.247.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 165                 | FREQUENCY RANGE    | 1 ~ 40GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 80%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | *5825.00    | 111.4 PK                |                |             | 1.31 H             | 323                  | 69.62            | 41.78                    |
| 2                                                   | *5825.00    | 101.4 AV                |                |             | 1.31 H             | 323                  | 59.62            | 41.78                    |
| 3                                                   | 11650.00    | 65.8 PK                 | 74.0           | -8.2        | 1.49 H             | 223                  | 17.97            | 47.83                    |
| 4                                                   | 11650.00    | 50.0 AV                 | 54.0           | -4.0        | 1.49 H             | 223                  | 2.17             | 47.83                    |
| 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                                                   | *5825.00    | 106.1 PK                |                |             | 1.41 V             | 322                  | 64.33            | 41.78                    |
| 2                                                   | *5825.00    | 95.4 AV                 |                |             | 1.41 V             | 322                  | 53.62            | 41.78                    |
| 3                                                   | 11650.00    | 67.9 PK                 | 74.0           | -6.1        | 1.27 V             | 246                  | 20.07            | 47.83                    |
| 4                                                   | 11650.00    | 52.1 AV                 | 54.0           | -1.9        | 1.27 V             | 246                  | 4.27             | 47.83                    |

**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 limit value is defined as per 15.247.

### 802.11n (20MHz) OFDM MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 149                 | FREQUENCY RANGE    | 1 ~ 40GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 80%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | *5745.00    | 112.4 PK                |                |             | 1.29 H             | 323                  | 70.85            | 41.55                    |
| 2                                                   | *5745.00    | 102.1 AV                |                |             | 1.29 H             | 323                  | 60.55            | 41.55                    |
| 3                                                   | 11490.00    | 66.9 PK                 | 74.0           | -7.1        | 1.51 H             | 222                  | 19.19            | 47.71                    |
| 4                                                   | 11490.00    | 48.9 AV                 | 54.0           | -5.1        | 1.51 H             | 222                  | 1.19             | 47.71                    |
| 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                                                   | *5745.00    | 106.9 PK                |                |             | 1.20 V             | 329                  | 65.35            | 41.55                    |
| 2                                                   | *5745.00    | 96.6 AV                 |                |             | 1.20 V             | 329                  | 55.05            | 41.55                    |
| 3                                                   | 11490.00    | 68.2 PK                 | 74.0           | -5.8        | 1.16 V             | 291                  | 20.49            | 47.71                    |
| 4                                                   | 11490.00    | 51.6 AV                 | 54.0           | -2.4        | 1.16 V             | 291                  | 3.89             | 47.71                    |

- 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 limit value is defined as per 15.247.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 157                 | FREQUENCY RANGE    | 1 ~ 40GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 80%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | *5785.00    | 111.8 PK                |                |             | 1.30 H             | 343                  | 70.12            | 41.68                    |
| 2                                                   | *5785.00    | 101.9 AV                |                |             | 1.30 H             | 343                  | 60.22            | 41.68                    |
| 3                                                   | 11570.00    | 67.2 PK                 | 74.0           | -6.8        | 1.47 H             | 234                  | 19.45            | 47.75                    |
| 4                                                   | 11570.00    | 49.8 AV                 | 54.0           | -4.2        | 1.47 H             | 234                  | 2.05             | 47.75                    |
| 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                                                   | *5785.00    | 106.5 PK                |                |             | 1.40 V             | 340                  | 64.82            | 41.68                    |
| 2                                                   | *5785.00    | 97.1 AV                 |                |             | 1.40 V             | 340                  | 55.42            | 41.68                    |
| 3                                                   | 11570.00    | 68.9 PK                 | 74.0           | -5.1        | 1.14 V             | 299                  | 21.15            | 47.75                    |
| 4                                                   | 11570.00    | 51.8 AV                 | 54.0           | -2.2        | 1.14 V             | 299                  | 4.05             | 47.75                    |

**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 limit value is defined as per 15.247.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 165                 | FREQUENCY RANGE    | 1 ~ 40GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 80%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | *5825.00    | 112.8 PK                |                |             | 1.29 H             | 359                  | 71.02            | 41.78                    |
| 2                                                   | *5825.00    | 101.8 AV                |                |             | 1.29 H             | 359                  | 60.02            | 41.78                    |
| 3                                                   | 11650.00    | 66.5 PK                 | 74.0           | -7.5        | 1.48 H             | 230                  | 18.67            | 47.83                    |
| 4                                                   | 11650.00    | 49.9 AV                 | 54.0           | -4.1        | 1.48 H             | 230                  | 2.07             | 47.83                    |
| 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                                                   | *5825.00    | 107.3 PK                |                |             | 1.39 V             | 359                  | 65.52            | 41.78                    |
| 2                                                   | *5825.00    | 97.2 AV                 |                |             | 1.39 V             | 359                  | 55.42            | 41.78                    |
| 3                                                   | 11650.00    | 68.2 PK                 | 74.0           | -5.8        | 1.23 V             | 301                  | 20.37            | 47.83                    |
| 4                                                   | 11650.00    | 51.9 AV                 | 54.0           | -2.1        | 1.23 V             | 301                  | 4.07             | 47.83                    |

**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 limit value is defined as per 15.247.

# 802.11n (40MHz) OFDM MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 151                 | FREQUENCY RANGE    | 1 ~ 40GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 80%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | *5755.00    | 108.5 PK                |                |             | 1.29 H             | 319                  | 66.91            | 41.59                    |
| 2                                                   | *5755.00    | 97.4 AV                 |                |             | 1.29 H             | 319                  | 55.81            | 41.59                    |
| 3                                                   | 11510.00    | 64.9 PK                 | 74.0           | -9.1        | 1.44 H             | 244                  | 17.18            | 47.72                    |
| 4                                                   | 11510.00    | 48.2 AV                 | 54.0           | -5.8        | 1.44 H             | 244                  | 0.48             | 47.72                    |
| 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                                                   | *5755.00    | 103.5 PK                |                |             | 1.34 V             | 308                  | 61.91            | 41.59                    |
| 2                                                   | *5755.00    | 96.6 AV                 |                |             | 1.34 V             | 308                  | 55.01            | 41.59                    |
| 3                                                   | 11510.00    | 66.1 PK                 | 74.0           | -7.9        | 1.25 V             | 300                  | 18.38            | 47.72                    |
| 4                                                   | 11510.00    | 49.4 AV                 | 54.0           | -4.6        | 1.25 V             | 300                  | 1.68             | 47.72                    |

- 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 limit value is defined as per 15.247.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 159                 | FREQUENCY RANGE    | 1 ~ 40GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 80%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | *5795.00    | 109.2 PK                |                |             | 1.32 H             | 322                  | 67.50            | 41.70                    |
| 2                                                   | *5795.00    | 98.0 AV                 |                |             | 1.32 H             | 322                  | 56.30            | 41.70                    |
| 3                                                   | 11590.00    | 64.7 PK                 | 74.0           | -9.3        | 1.47 H             | 250                  | 16.94            | 47.76                    |
| 4                                                   | 11590.00    | 47.9 AV                 | 54.0           | -6.1        | 1.47 H             | 250                  | 0.14             | 47.76                    |
| 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                                                   | *5795.00    | 104.1 PK                |                |             | 1.29 V             | 311                  | 62.40            | 41.70                    |
| 2                                                   | *5795.00    | 93.0 AV                 |                |             | 1.29 V             | 311                  | 51.30            | 41.70                    |
| 3                                                   | 11590.00    | 66.5 PK                 | 74.0           | -7.5        | 1.14 V             | 268                  | 18.74            | 47.76                    |
| 4                                                   | 11590.00    | 49.3 AV                 | 54.0           | -4.7        | 1.14 V             | 268                  | 1.54             | 47.76                    |

**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 limit value is defined as per 15.247.

## 5.2.8 TEST RESULTS (FOR RECEIVER PART)

### BELOW 1GHz DATA

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 159                 | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 24deg. C, 70%RH<br>1011 hPa | TESTED BY          | Eric Lee      |

| 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                                                   | 99.20       | 33.6 QP                 | 43.5           | -9.9        | 1.72 H             | 356                  | 23.67            | 9.93                     |
| 2                                                   | 115.00      | 33.6 QP                 | 43.5           | -9.9        | 1.55 H             | 352                  | 21.53            | 12.07                    |
| 3                                                   | 133.20      | 32.0 QP                 | 43.5           | -11.5       | 2.20 H             | 10                   | 18.30            | 13.70                    |
| 4                                                   | 150.00      | 35.0 QP                 | 43.5           | -8.5        | 1.52 H             | 360                  | 20.70            | 14.30                    |
| 5                                                   | 165.00      | 40.9 QP                 | 43.5           | -2.6        | 1.72 H             | 200                  | 26.84            | 14.06                    |
| 6                                                   | 200.00      | 38.1 QP                 | 43.5           | -5.4        | 1.50 H             | 15                   | 26.89            | 11.21                    |
| 7                                                   | 250.00      | 41.0 QP                 | 46.0           | -5.0        | 1.50 H             | 285                  | 28.05            | 12.95                    |
| 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                                                   | 33.55       | 36.9 QP                 | 40.0           | -3.1        | 1.00 V             | 300                  | 23.43            | 13.47                    |
| 2                                                   | 100.05      | 27.6 QP                 | 43.5           | -15.9       | 1.00 V             | 320                  | 17.63            | 9.97                     |
| 3                                                   | 150.62      | 35.6 QP                 | 43.5           | -7.9        | 1.20 V             | 350                  | 21.30            | 14.30                    |
| 4                                                   | 168.30      | 32.6 QP                 | 43.5           | -10.9       | 2.00 V             | 306                  | 18.67            | 13.93                    |
| 5                                                   | 250.30      | 30.6 QP                 | 46.0           | -15.4       | 1.06 V             | 243                  | 17.64            | 12.96                    |
| 6                                                   | 370.00      | 30.0 QP                 | 46.0           | -16.0       | 1.60 V             | 360                  | 12.97            | 17.03                    |

- 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.



## ABOVE 1GHz DATA

### 802.11a OFDM MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 149                 | FREQUENCY RANGE    | 1 ~ 17.55GHz              |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | 3830.00     | 47.1 PK                 | 74.0           | -26.9       | 1.65 H             | 95                   | 11.65            | 35.45                    |
| 2                                                   | 3830.00     | 40.6 AV                 | 54.0           | -13.4       | 1.65 H             | 95                   | 5.15             | 35.45                    |
| 3                                                   | 7660.00     | 56.2 PK                 | 74.0           | -17.8       | 1.10 H             | 142                  | 11.64            | 44.56                    |
| 4                                                   | 7660.00     | 45.6 AV                 | 54.0           | -8.4        | 1.10 H             | 142                  | 1.04             | 44.56                    |
| 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                                                   | 3830.00     | 48.3 PK                 | 74.0           | -25.7       | 1.24 V             | 51                   | 12.85            | 35.45                    |
| 2                                                   | 3830.00     | 41.6 AV                 | 54.0           | -12.4       | 1.24 V             | 51                   | 6.15             | 35.45                    |
| 3                                                   | 7660.00     | 56.4 PK                 | 74.0           | -17.6       | 1.54 V             | 88                   | 11.84            | 44.56                    |
| 4                                                   | 7660.00     | 45.6 AV                 | 54.0           | -8.4        | 1.54 V             | 88                   | 1.04             | 44.56                    |

**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.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 157                 | FREQUENCY RANGE    | 1 ~ 17.55GHz              |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | 3856.66     | 47.2 PK                 | 74.0           | -26.8       | 1.52 H             | 215                  | 11.65            | 35.55                    |
| 2                                                   | 3856.66     | 40.6 AV                 | 54.0           | -13.4       | 1.52 H             | 215                  | 5.05             | 35.55                    |
| 3                                                   | 7713.33     | 56.2 PK                 | 74.0           | -17.8       | 1.00 H             | 213                  | 11.57            | 44.63                    |
| 4                                                   | 7713.33     | 45.7 AV                 | 54.0           | -8.3        | 1.00 H             | 213                  | 1.07             | 44.63                    |
| 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                                                   | 3856.66     | 48.2 PK                 | 74.0           | -25.8       | 1.02 V             | 178                  | 12.65            | 35.55                    |
| 2                                                   | 3856.66     | 42.1 AV                 | 54.0           | -11.9       | 1.02 V             | 178                  | 6.55             | 35.55                    |
| 3                                                   | 7713.33     | 56.3 PK                 | 74.0           | -17.7       | 1.00 V             | 102                  | 11.67            | 44.63                    |
| 4                                                   | 7713.33     | 45.1 AV                 | 54.0           | -8.9        | 1.00 V             | 102                  | 0.47             | 44.63                    |

**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.

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 165                 | FREQUENCY RANGE    | 1 ~ 17.55GHz              |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| 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                                                   | 3883.33     | 47.2 PK                 | 74.0           | -26.8       | 1.24 H             | 51                   | 11.55            | 35.65                    |
| 2                                                   | 3883.33     | 40.8 AV                 | 54.0           | -13.2       | 1.24 H             | 51                   | 5.15             | 35.65                    |
| 3                                                   | 7766.66     | 46.1 PK                 | 74.0           | -27.9       | 1.84 H             | 250                  | 1.38             | 44.72                    |
| 4                                                   | 7766.66     | 45.6 AV                 | 54.0           | -8.4        | 1.84 H             | 250                  | 0.88             | 44.72                    |
| 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                                                   | 3883.33     | 48.2 PK                 | 74.0           | -25.8       | 1.00 V             | 3                    | 12.55            | 35.65                    |
| 2                                                   | 3883.33     | 41.7 AV                 | 54.0           | -12.3       | 1.00 V             | 3                    | 6.05             | 35.65                    |
| 3                                                   | 7766.66     | 56.3 PK                 | 74.0           | -17.7       | 1.50 V             | 254                  | 11.58            | 44.72                    |
| 4                                                   | 7766.66     | 45.3 AV                 | 54.0           | -8.7        | 1.50 V             | 254                  | 0.58             | 44.72                    |

**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.

### 5.3 6dB BANDWIDTH MEASUREMENT

#### 5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 5.3.2 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.

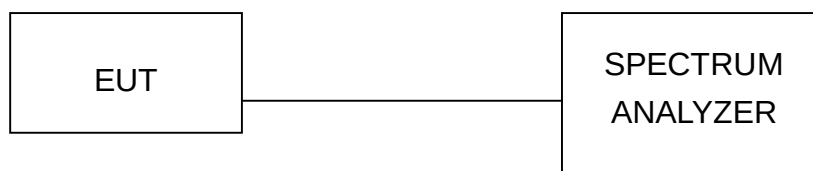
#### 5.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 5.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 5.3.5 TEST SETUP



#### 5.3.6 EUT OPERATING CONDITIONS

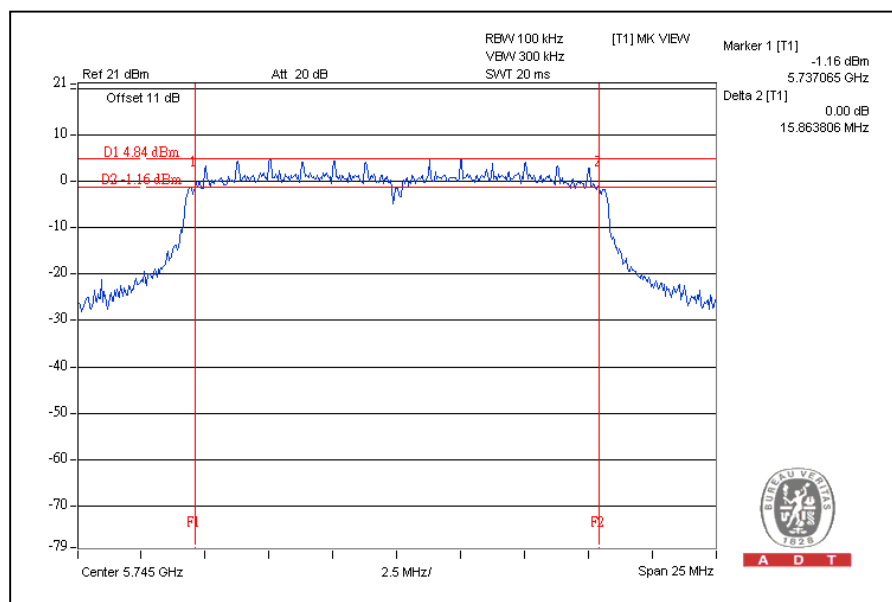
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 5.3.7 TEST RESULTS

#### 802.11a OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------------------|-------------|
| 149     | 5745                    | 15.86               | 0.5                 | PASS        |
| 157     | 5785                    | 16.05               | 0.5                 | PASS        |
| 165     | 5825                    | 15.81               | 0.5                 | PASS        |

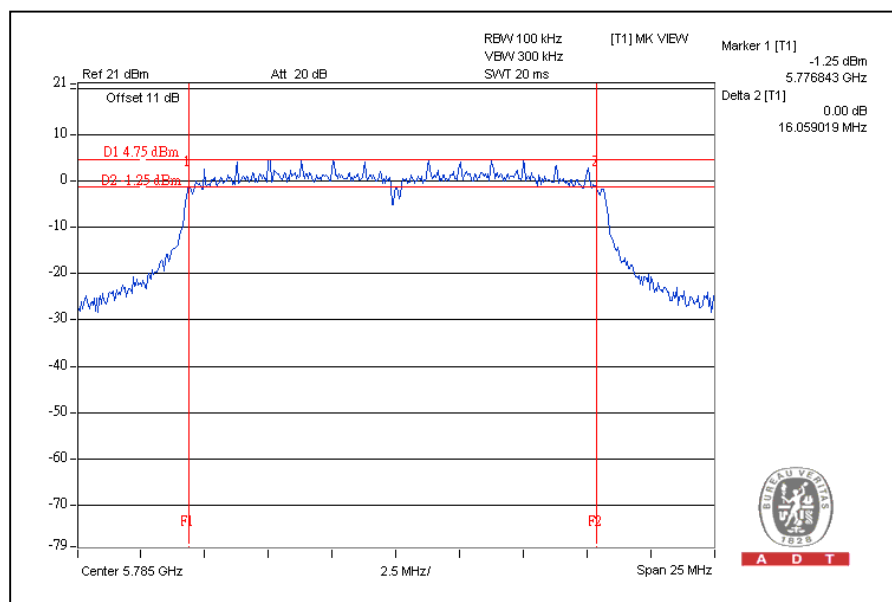
#### CH149



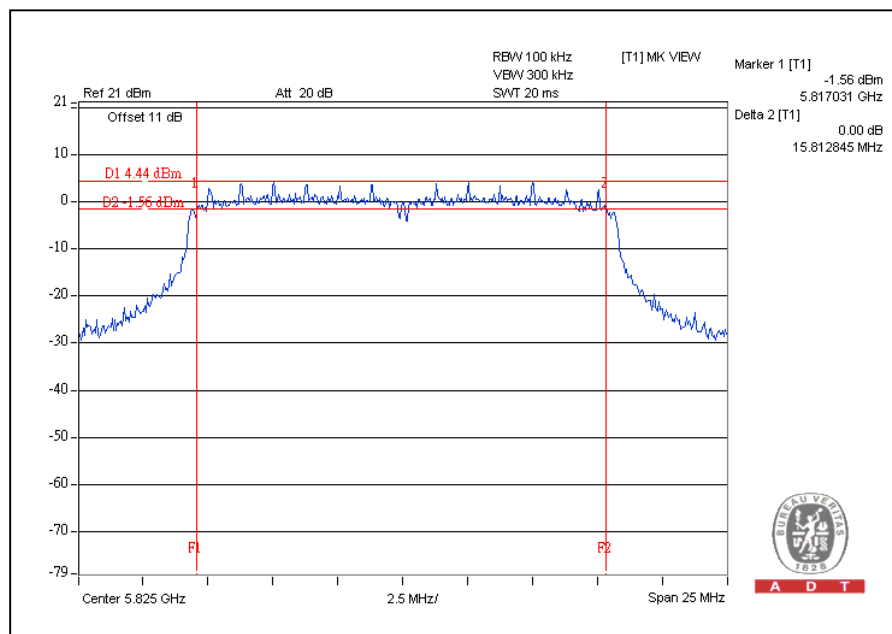


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## CH157



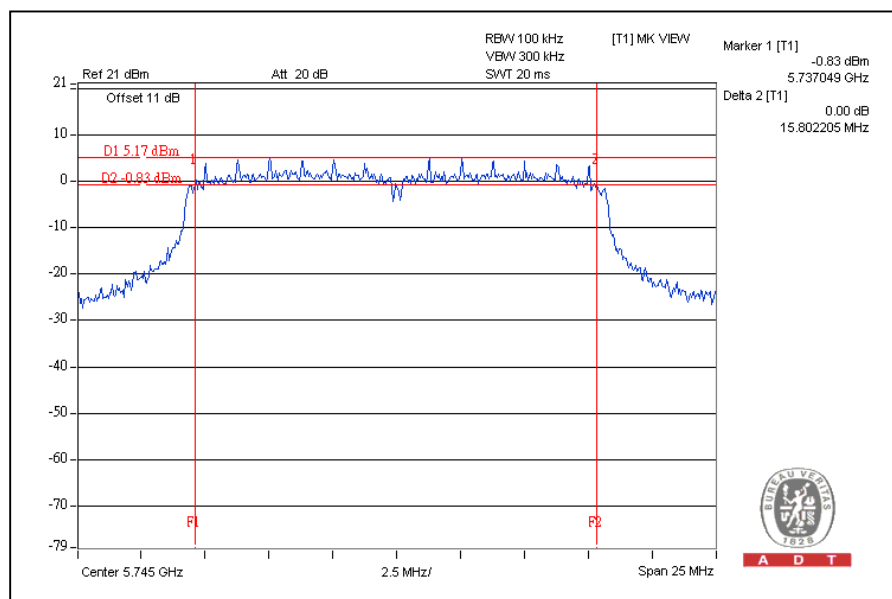
## CH165



## 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------------------|-------------|
| 149     | 5745                    | 15.80               | 0.5                 | PASS        |
| 157     | 5785                    | 15.98               | 0.5                 | PASS        |
| 165     | 5825                    | 16.07               | 0.5                 | PASS        |

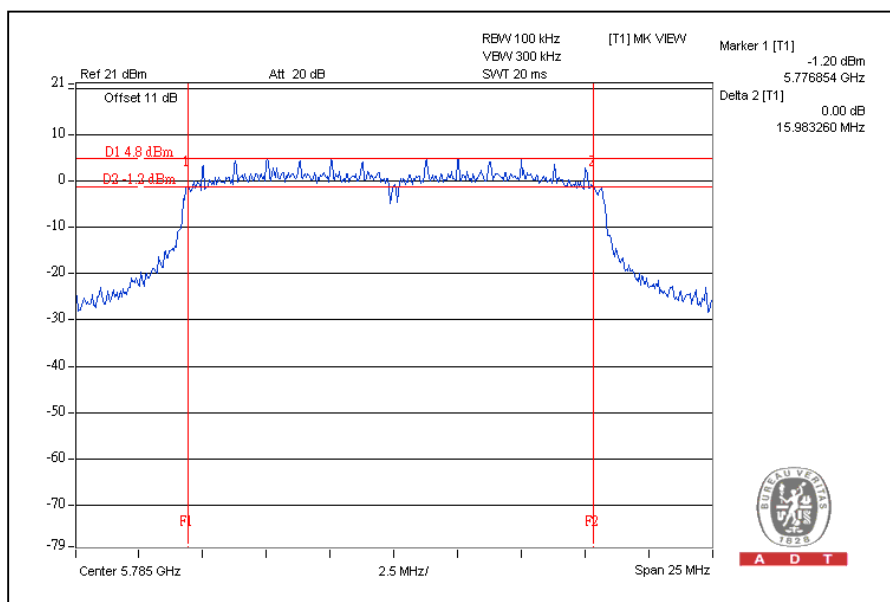
### CH149



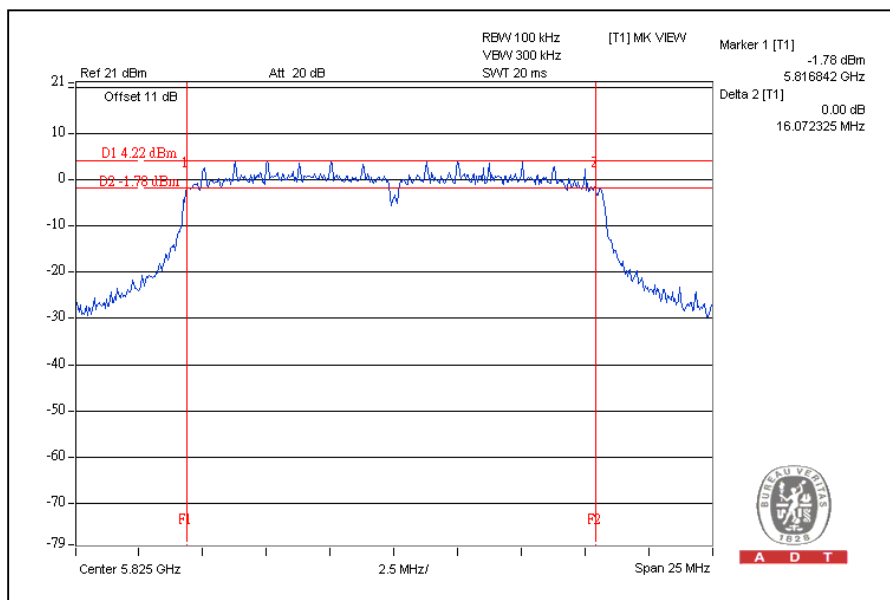


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## CH157



## CH165

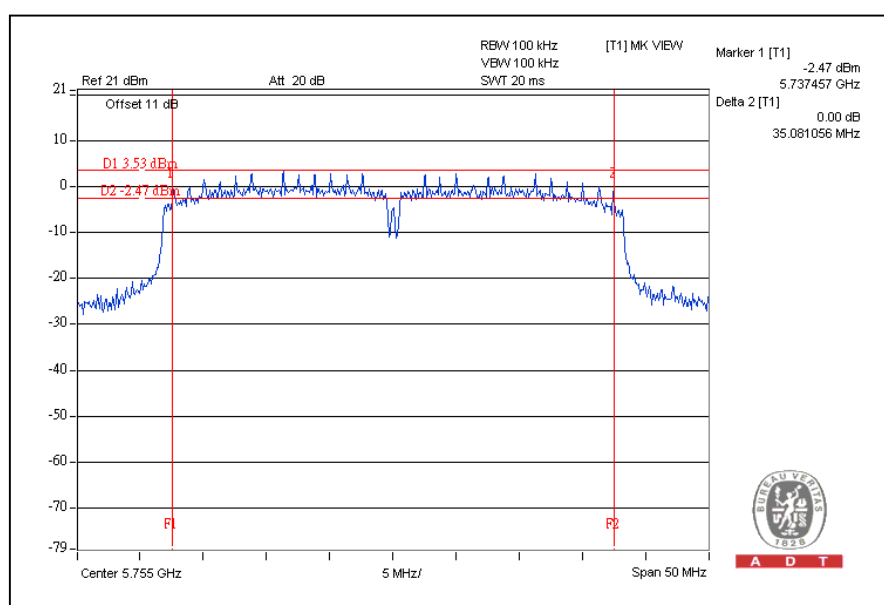




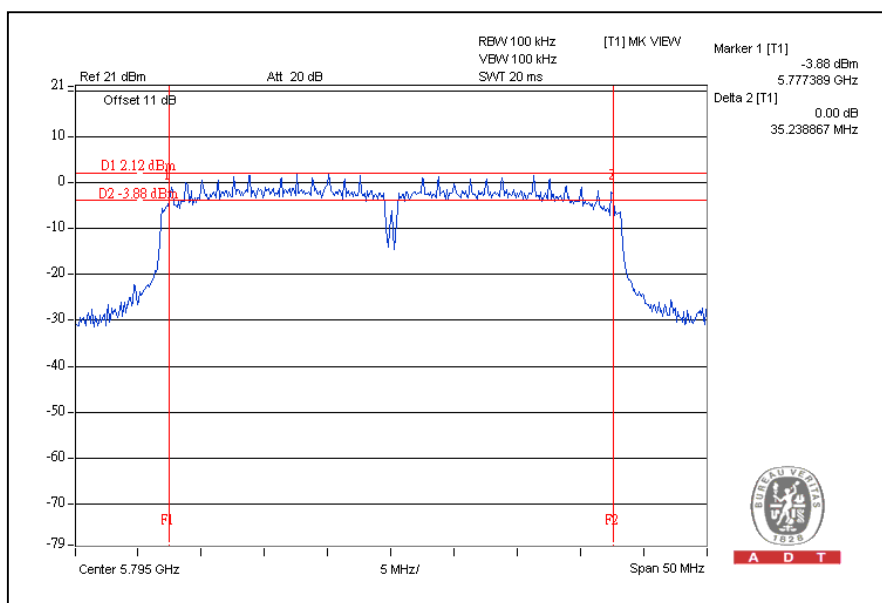
## 802.11n (40MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------------------|-------------|
| 151     | 5755                    | 35.08               | 0.5                 | PASS        |
| 159     | 5795                    | 35.23               | 0.5                 | PASS        |

### CH151



CH159



## 5.4 99% BANDWIDTH MEASUREMENT

### 5.4.1 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.

### 5.4.2 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW.

### 5.4.3 TEST SETUP



### 5.4.4 EUT OPERATING CONDITIONS

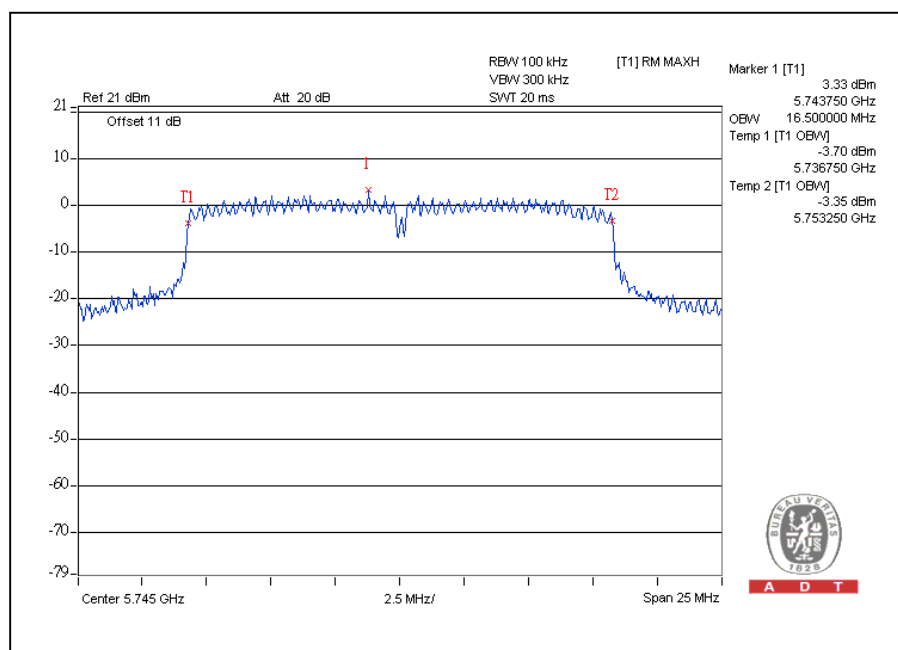
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

## 5.4.5 TEST RESULTS

### 802.11a OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 99% BANDWIDTH (MHz) |
|---------|-------------------------|---------------------|
| 149     | 5745                    | 16.5                |
| 157     | 5785                    | 16.5                |
| 165     | 5825                    | 16.45               |

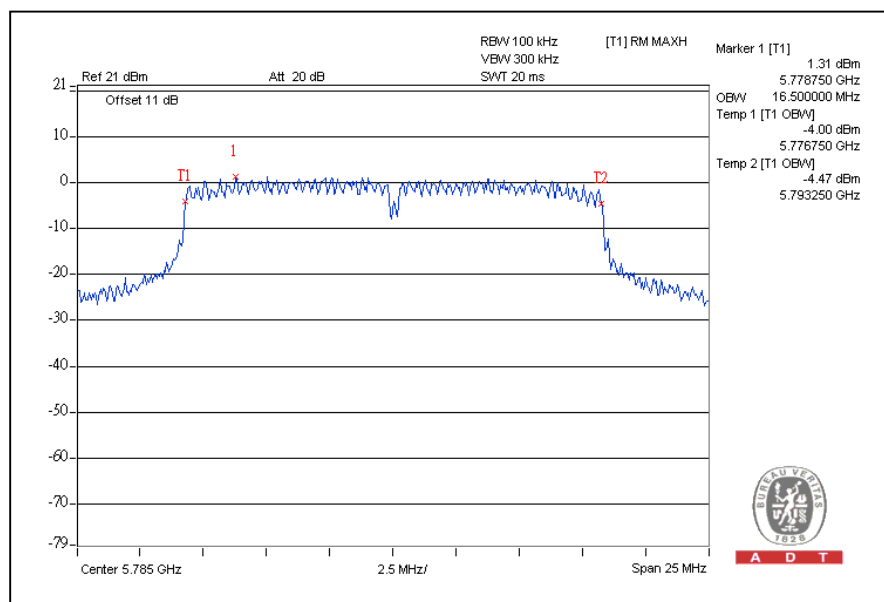
### CH149





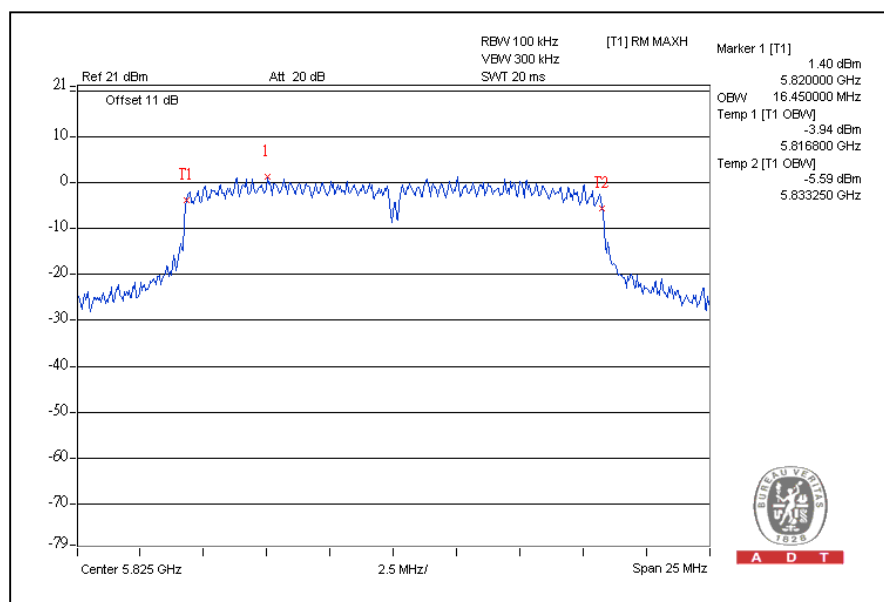
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## CH157



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## CH165

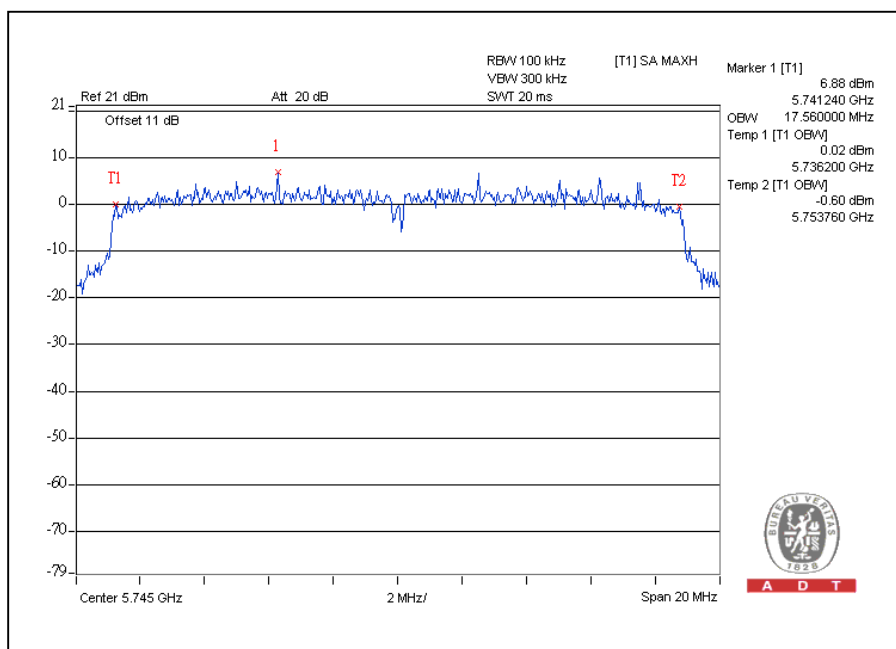


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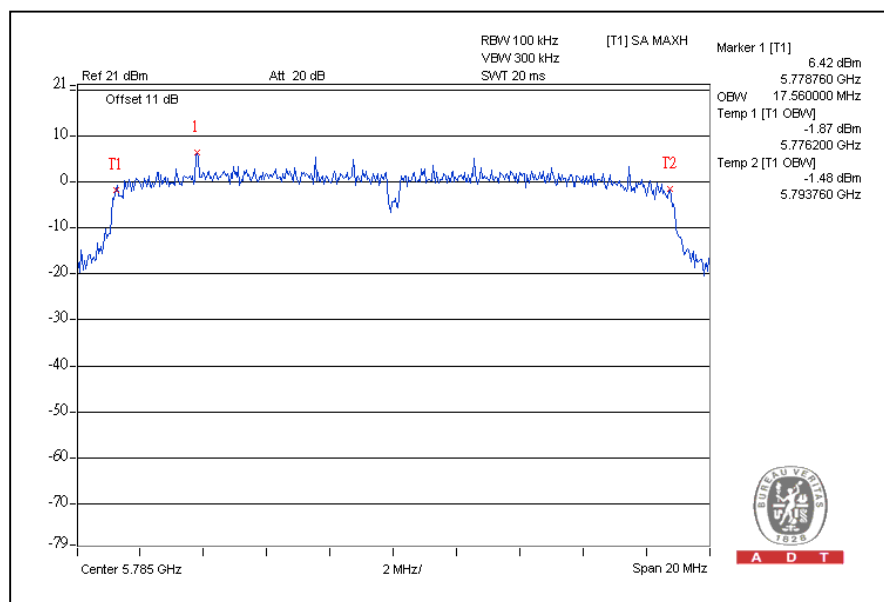
## 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 99% BANDWIDTH (MHz) |
|---------|-------------------------|---------------------|
| 149     | 5745                    | 17.56               |
| 157     | 5785                    | 17.56               |
| 165     | 5825                    | 17.56               |

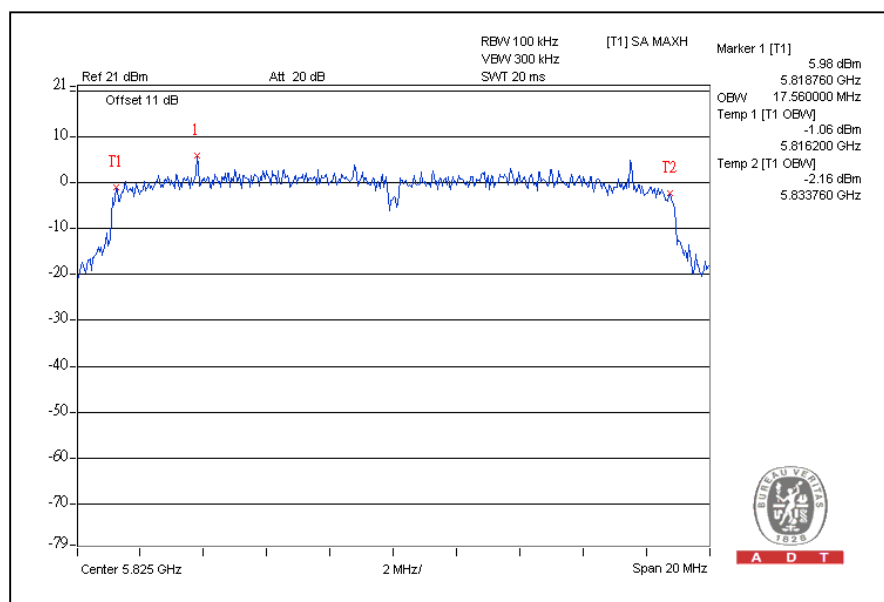
### CH149



## CH157



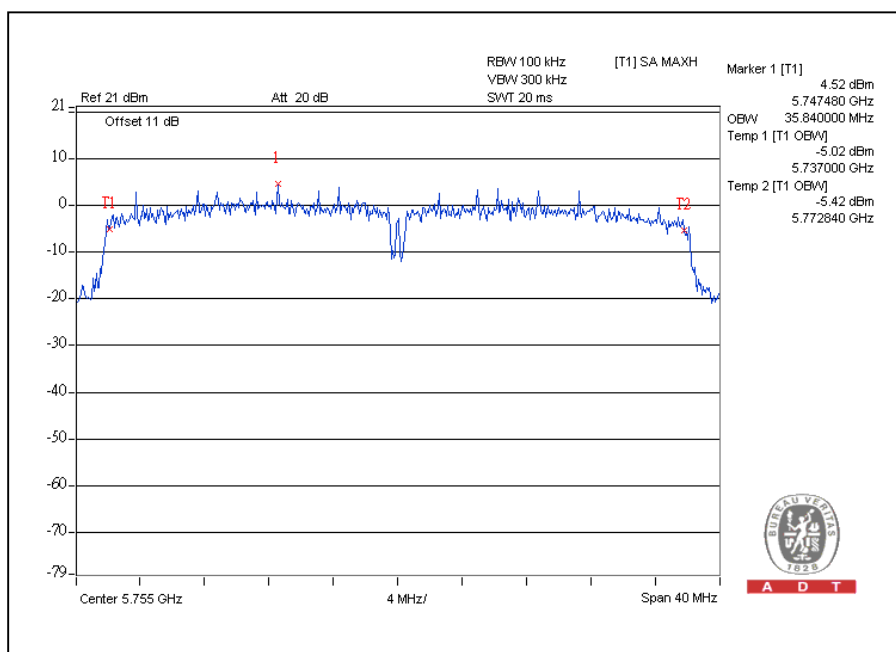
## CH165



## 802.11n (40MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 99% BANDWIDTH (MHz) |
|---------|-------------------------|---------------------|
| 151     | 5755                    | 35.84               |
| 159     | 5795                    | 36                  |

### CH151

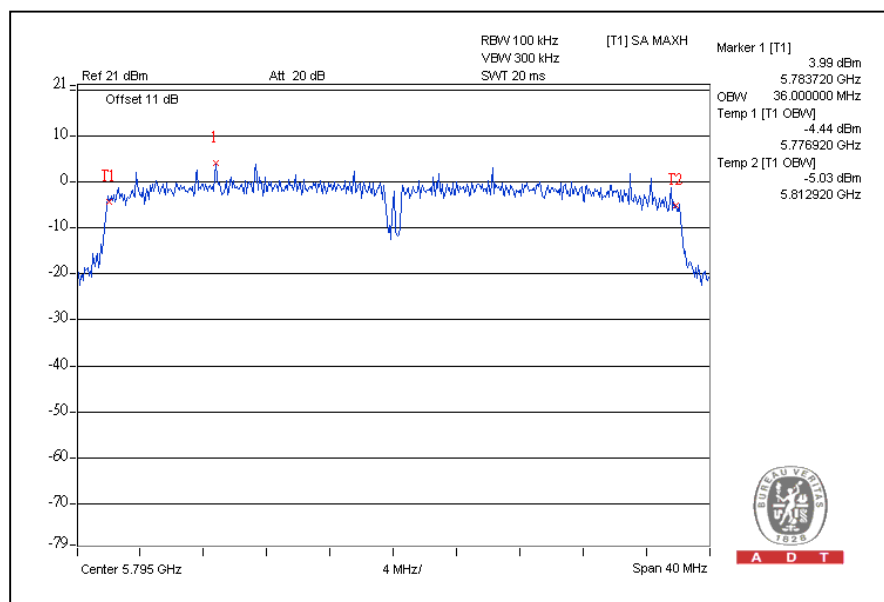






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## CH159



## 5.5 MAXIMUM PEAK OUTPUT POWER

### 5.5.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 5.5.2 INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Peak Power Meter           | ML2495A   | 0824006    | May 04, 2010    | May 03, 2011     |
| Power Sensor               | MA2411B   | 0738172    | May 04, 2010    | May 03, 2011     |

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

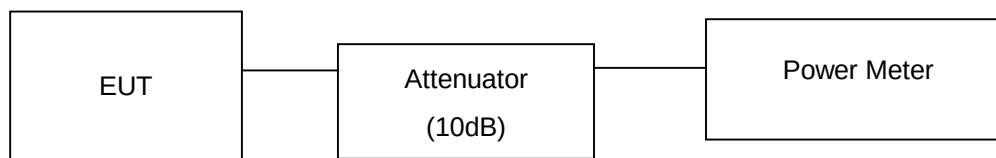
### 5.5.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the power level.

### 5.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.5.5 TEST SETUP



### 5.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

## 5.5.7 TEST RESULTS

### 802.11a OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY (MHz) | PEAK POWER<br>OUTPUT (dBm) | PEAK POWER (mW) | PEAK POWER LIMIT<br>(dBm) | PASS / FAIL |
|---------|----------------------------|----------------------------|-----------------|---------------------------|-------------|
| 149     | 5745                       | 23.4                       | 218.8           | 30                        | PASS        |
| 157     | 5785                       | 23.4                       | 218.8           | 30                        | PASS        |
| 165     | 5825                       | 23.3                       | 213.8           | 30                        | PASS        |

### 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY (MHz) | PEAK POWER<br>OUTPUT (dBm) | PEAK POWER (mW) | PEAK POWER LIMIT<br>(dBm) | PASS / FAIL |
|---------|----------------------------|----------------------------|-----------------|---------------------------|-------------|
| 149     | 5745                       | 23.8                       | 239.9           | 30                        | PASS        |
| 157     | 5785                       | 23.7                       | 234.4           | 30                        | PASS        |
| 165     | 5825                       | 23.5                       | 223.9           | 30                        | PASS        |

### 802.11n (40MHz) OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY (MHz) | PEAK POWER<br>OUTPUT (dBm) | PEAK POWER (mW) | PEAK POWER LIMIT<br>(dBm) | PASS / FAIL |
|---------|----------------------------|----------------------------|-----------------|---------------------------|-------------|
| 151     | 5755                       | 24.1                       | 257.0           | 30                        | PASS        |
| 159     | 5795                       | 24.1                       | 257.0           | 30                        | PASS        |

## 5.6 AVERAGE OUTPUT POWER

5.6.1 For reference.

### 5.6.2 TEST INSTRUMENTS

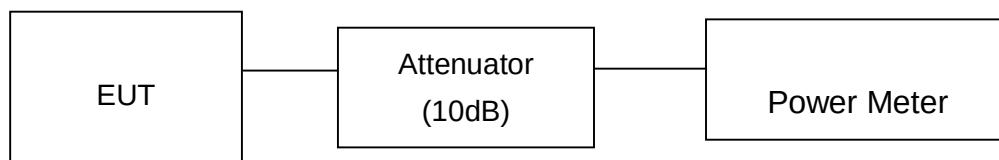
| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Peak Power Meter           | ML2495A   | 0824006    | May 04, 2010    | May 03, 2011     |
| Power Sensor               | MA2411B   | 0738172    | May 04, 2010    | May 03, 2011     |

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

### 5.6.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator, the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the average power level.

### 5.6.4 TEST SETUP



### 5.6.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

## 5.6.6 TEST RESULTS

### 802.11a OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY (MHz) | AVERAGE POWER<br>OUTPUT (dBm) |
|---------|----------------------------|-------------------------------|
| 149     | 5745                       | 16.6                          |
| 157     | 5785                       | 16.5                          |
| 165     | 5825                       | 16.3                          |

### 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY (MHz) | AVERAGE POWER<br>OUTPUT (dBm) |
|---------|----------------------------|-------------------------------|
| 149     | 5745                       | 17.5                          |
| 157     | 5785                       | 17.4                          |
| 165     | 5825                       | 17.1                          |

### 802.11n (40MHz) OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY (MHz) | AVERAGE POWER<br>OUTPUT (dBm) |
|---------|----------------------------|-------------------------------|
| 151     | 5755                       | 18.5                          |
| 159     | 5795                       | 18.6                          |

## 5.7 POWER SPECTRAL DENSITY MEASUREMENT

### 5.7.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 5.7.2 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.

### 5.7.3 TEST PROCEDURE

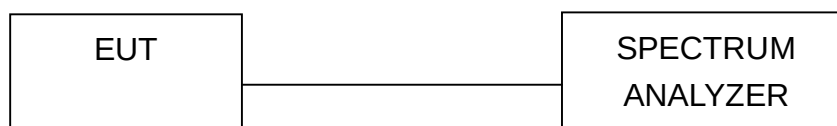
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

### 5.7.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.7.5 TEST SETUP



### 5.7.6 EUT OPERATING CONDITION

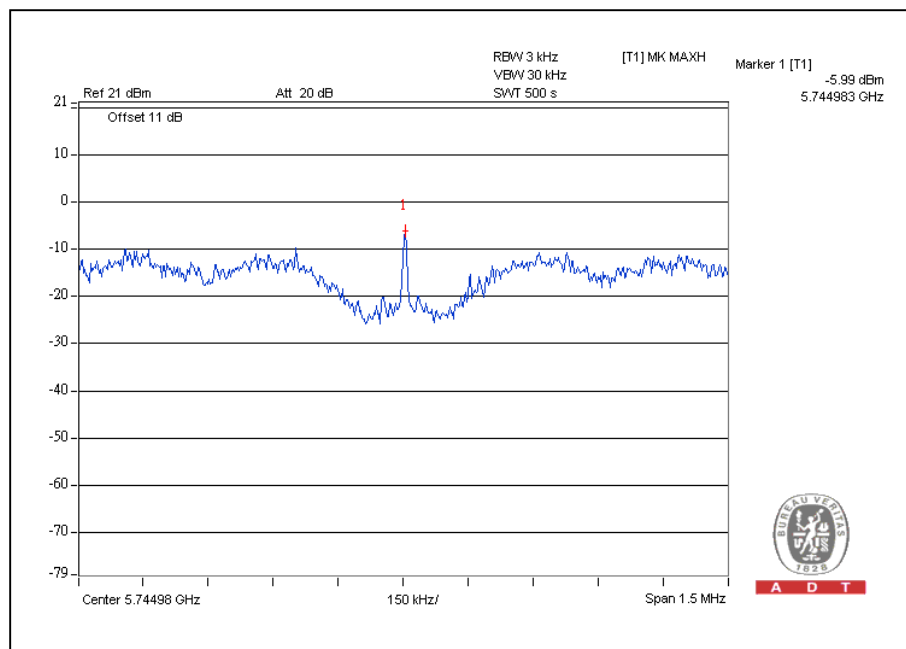
Same as Item 4.3.6

## 5.7.7 TEST RESULTS

### 802.11a OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---------|--------------------------|---------------------------------|---------------------|-------------|
| 149     | 5745                     | -6.0                            | 8                   | PASS        |
| 157     | 5785                     | -6.6                            | 8                   | PASS        |
| 165     | 5825                     | -3.7                            | 8                   | PASS        |

### CH149

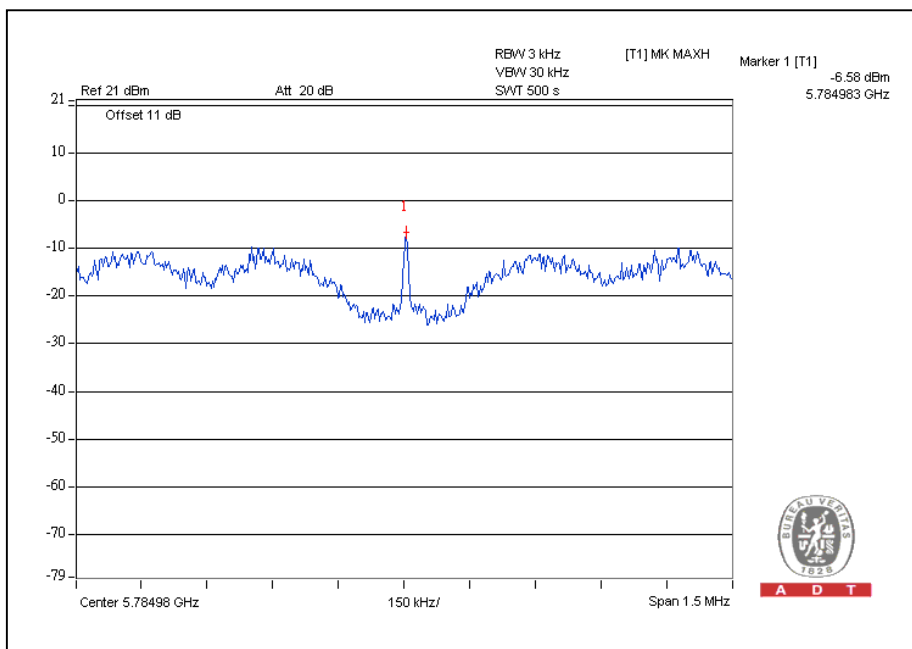




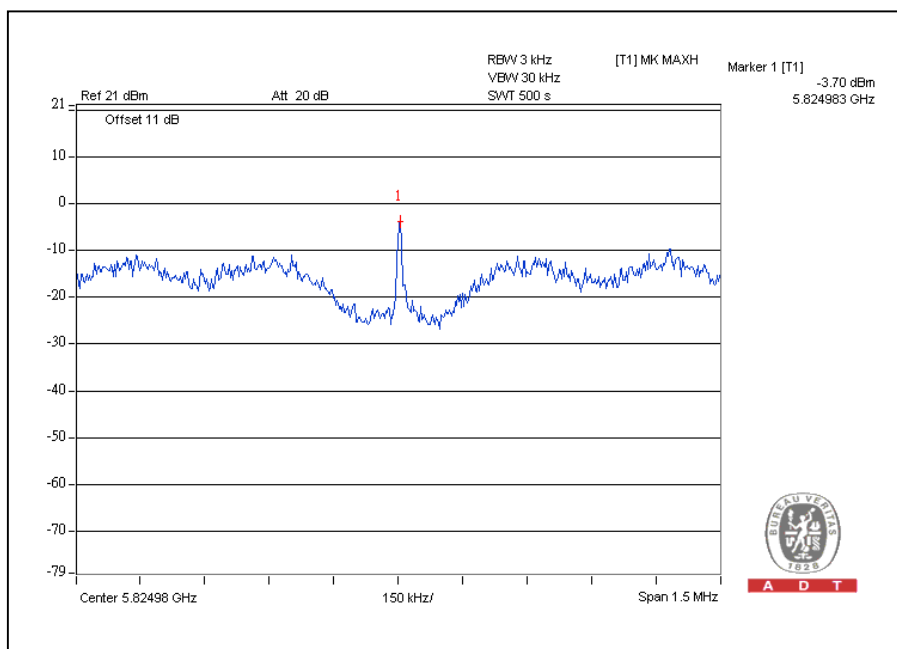


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## CH157



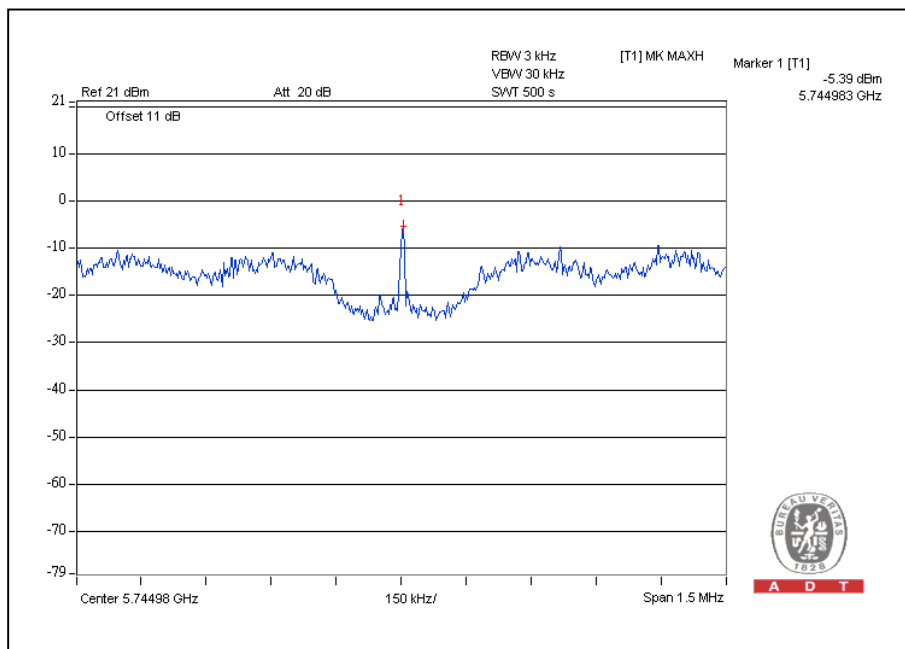
## CH165



### 802.11n (20MHz) OFDM MODULATION:

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz ) | RF POWER<br>LEVEL IN 3kHz<br>BW (dBm) | MAXIMUM LIMIT<br>(dBm) | PASS / FAIL |
|---------|--------------------------------|---------------------------------------|------------------------|-------------|
| 149     | 5745                           | -5.4                                  | 8                      | PASS        |
| 157     | 5785                           | -5.1                                  | 8                      | PASS        |
| 165     | 5825                           | -10.0                                 | 8                      | PASS        |

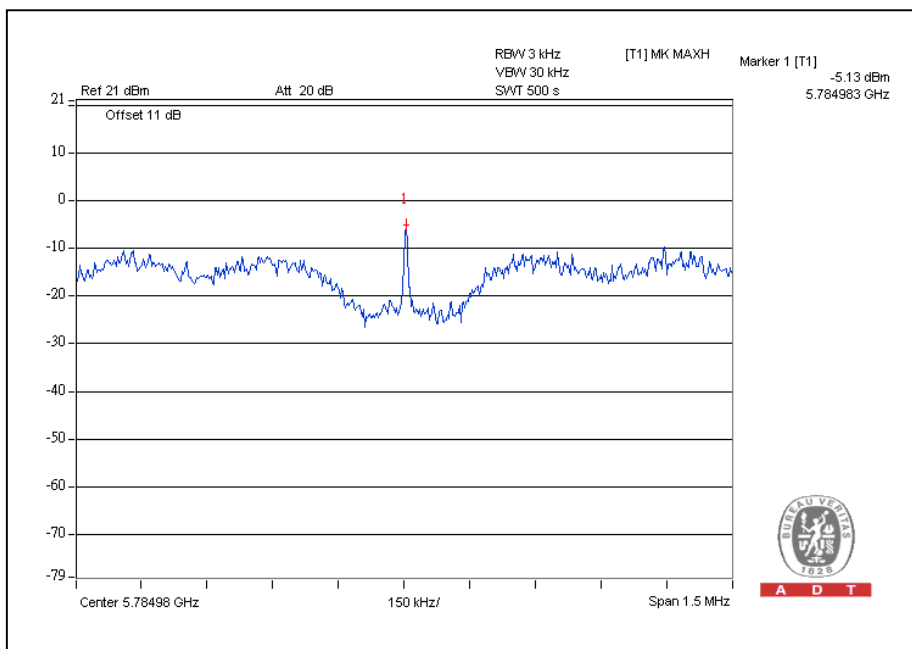
### CH149



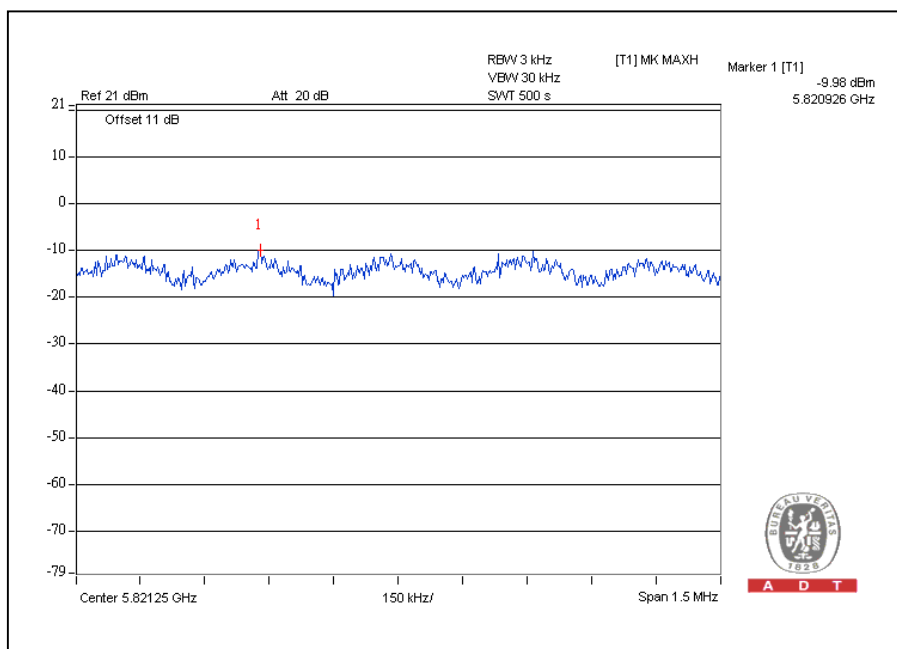


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## CH157



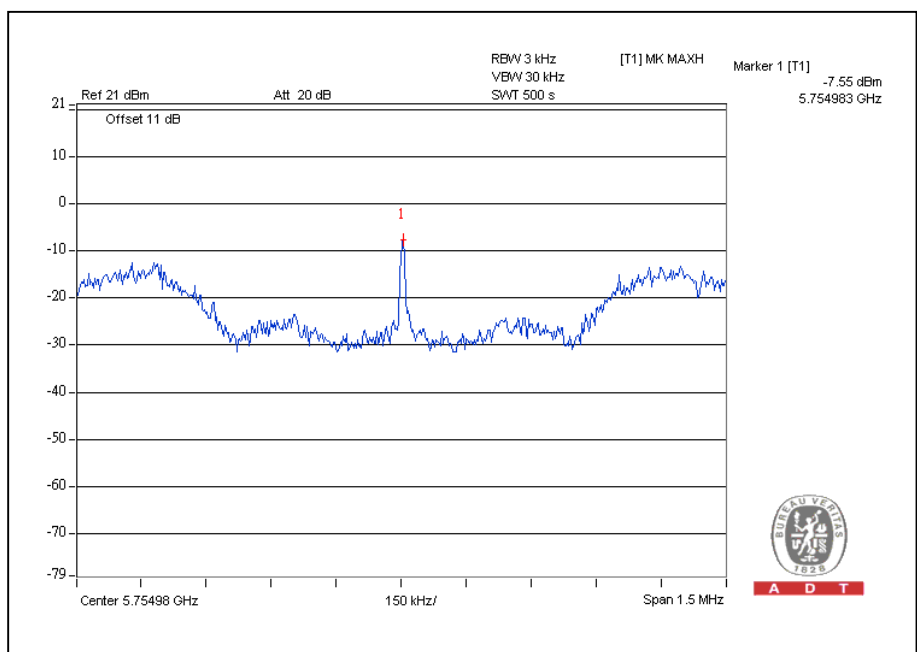
## CH165



### 802.11n (40MHz) OFDM MODULATION:

| CHANNEL | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---------|--------------------------|---------------------------------|---------------------|-------------|
| 151     | 5755                     | -7.6                            | 8                   | PASS        |
| 159     | 5795                     | -9.6                            | 8                   | PASS        |

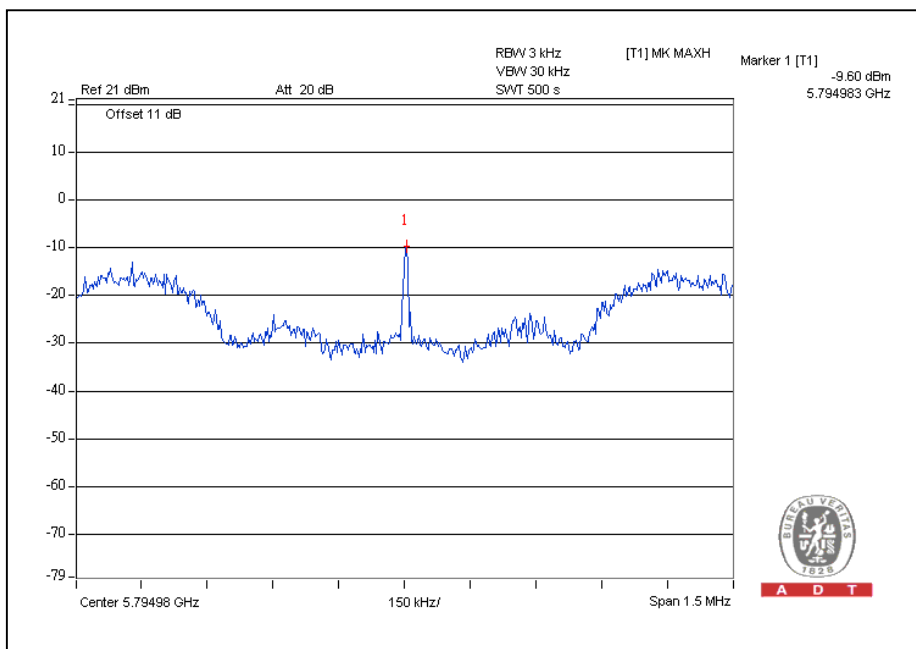
### CH151





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## 5.8 CONDUCTED OUT-BAND EMISSION MEASUREMENT

### 5.8.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 5.8.2 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.

### 5.8.3 TEST PROCEDURE

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

### 5.8.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.8.5 EUT OPERATING CONDITION

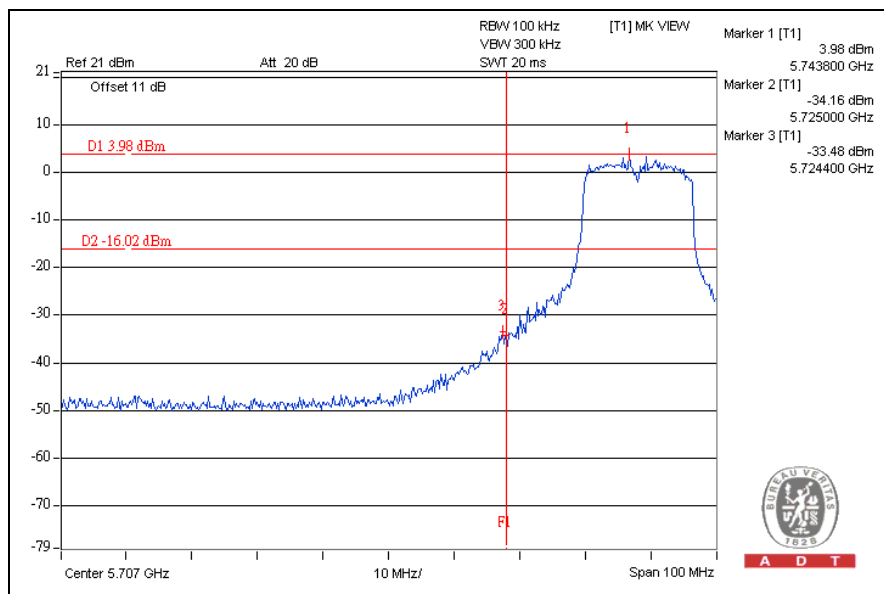
Same as Item 4.3.6

### 5.8.6 TEST RESULTS

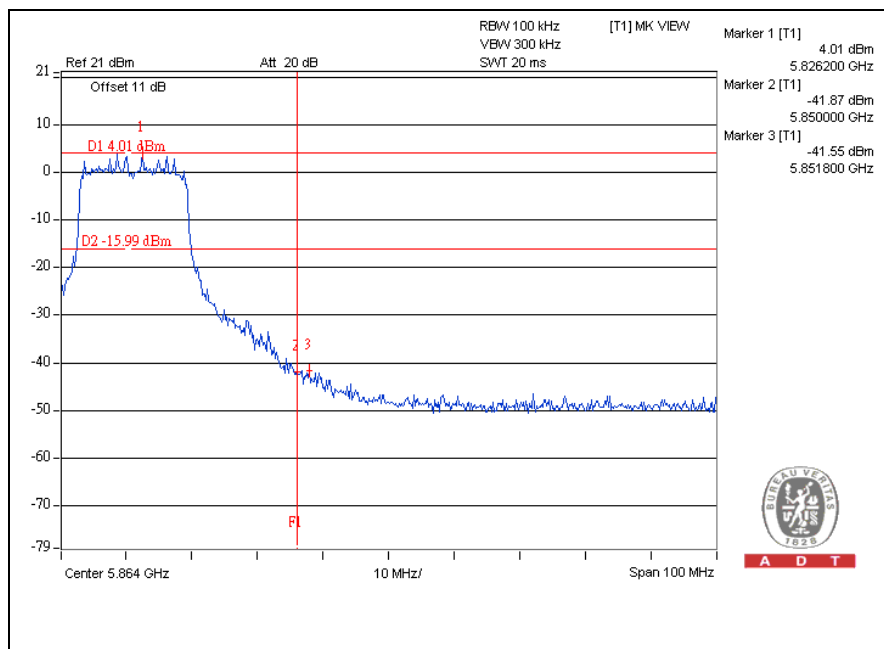
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

## 802.11a OFDM modulation

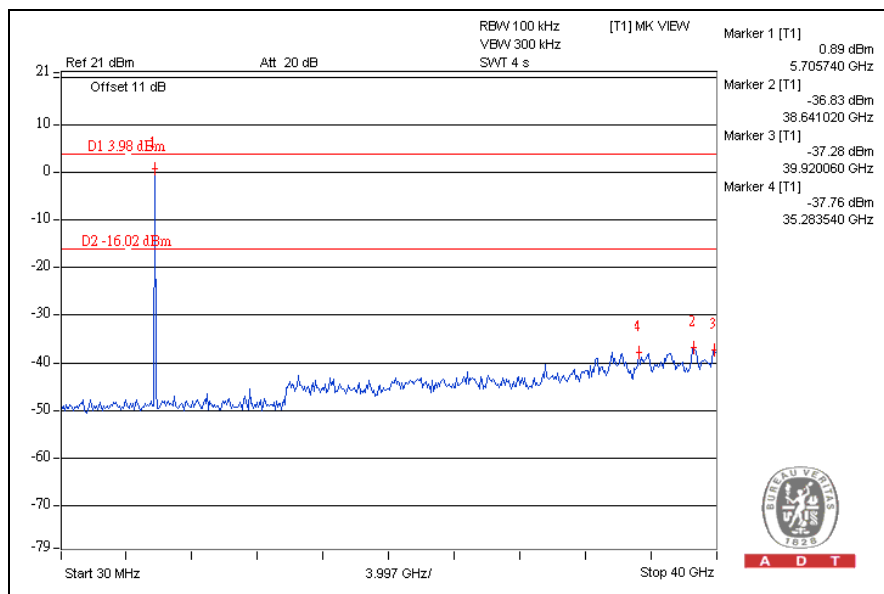
### CH149



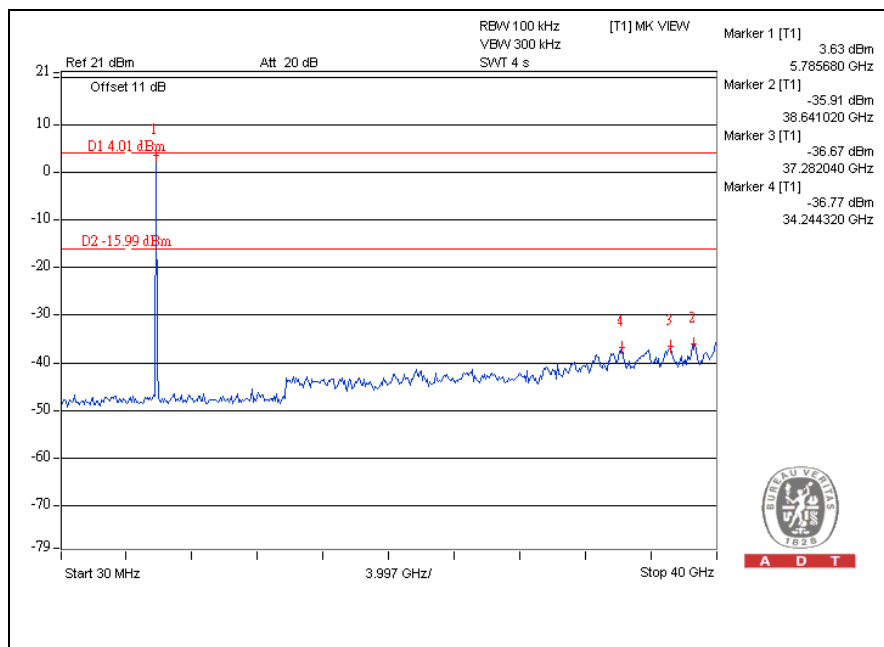
### CH165



## CH149



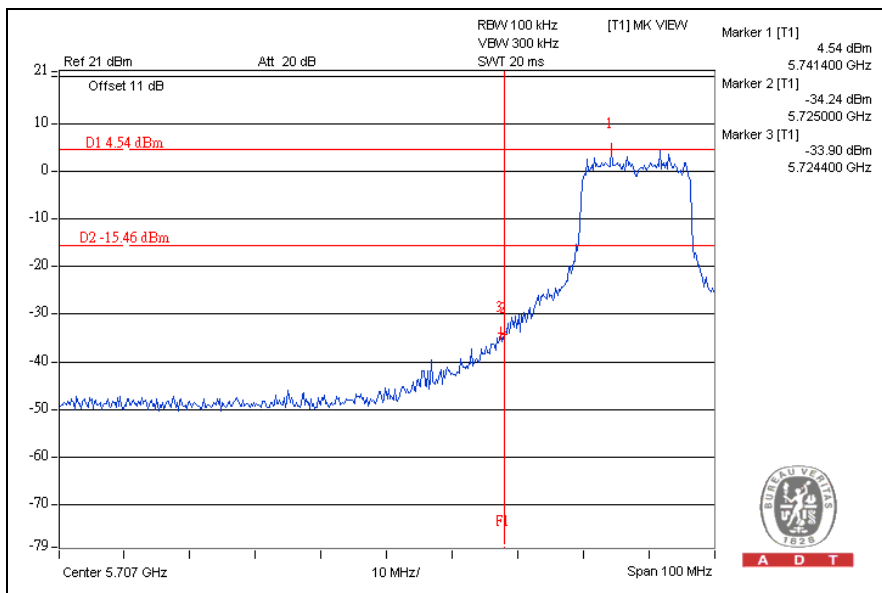
## CH165



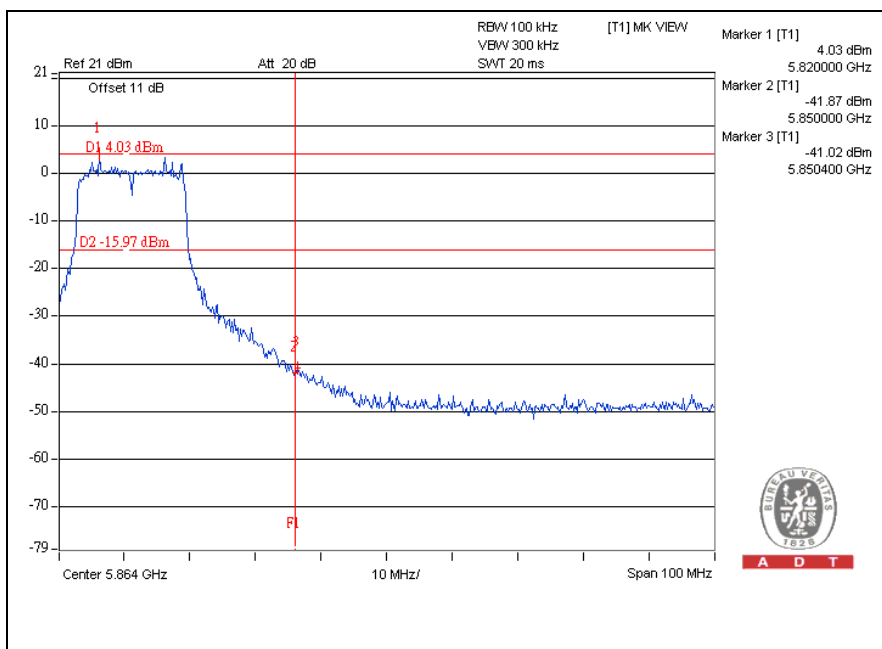


## 802.11n (20MHz) OFDM MODULATION:

### CH149



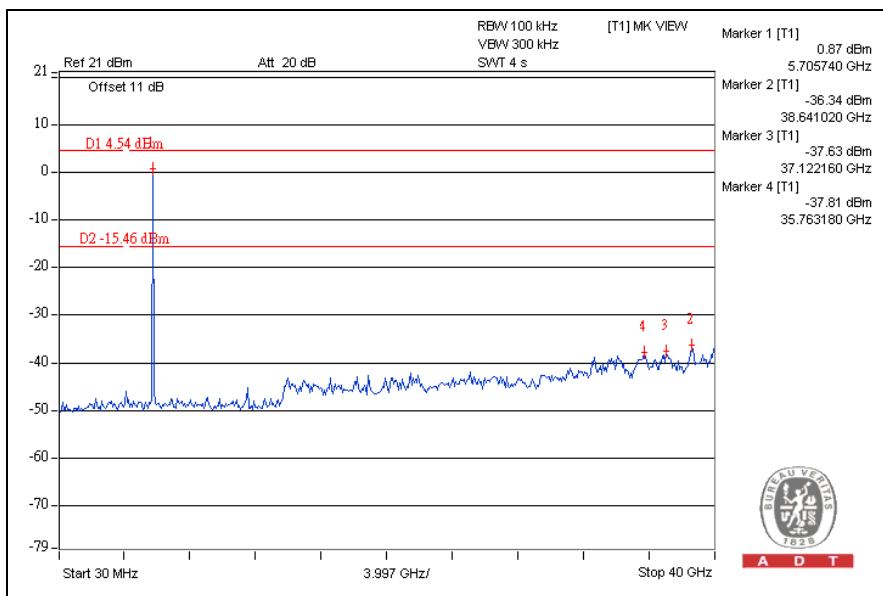
### CH165



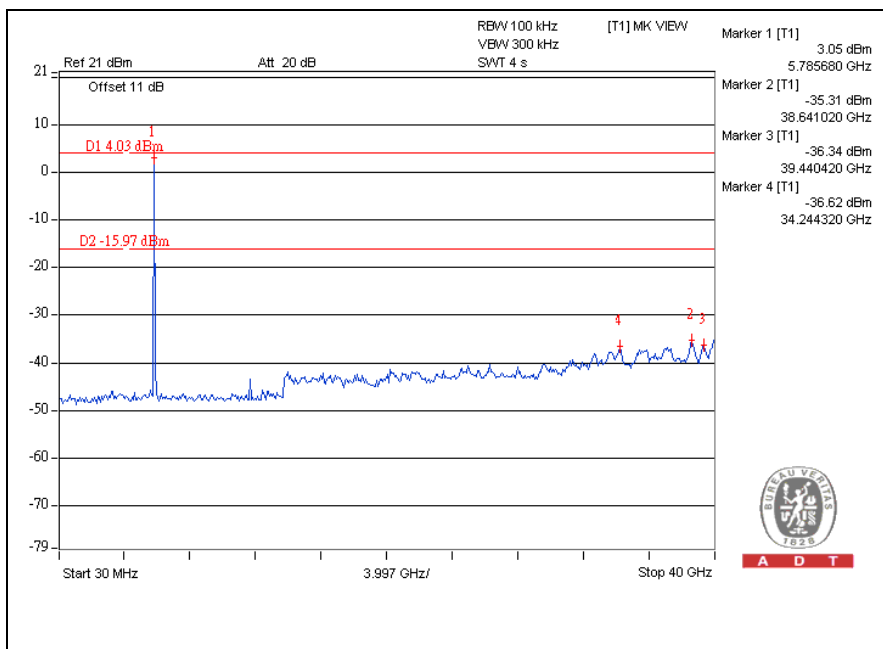


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## CH149

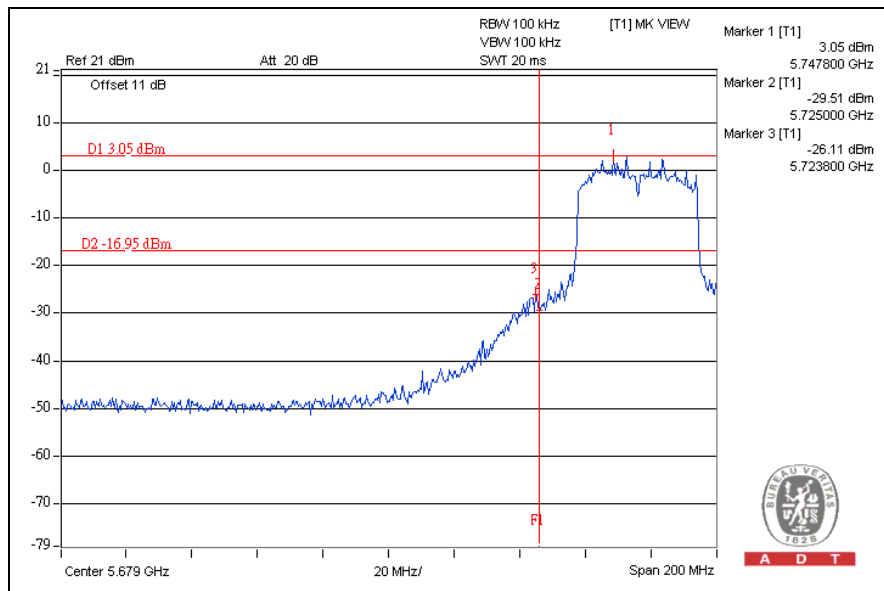


## CH165

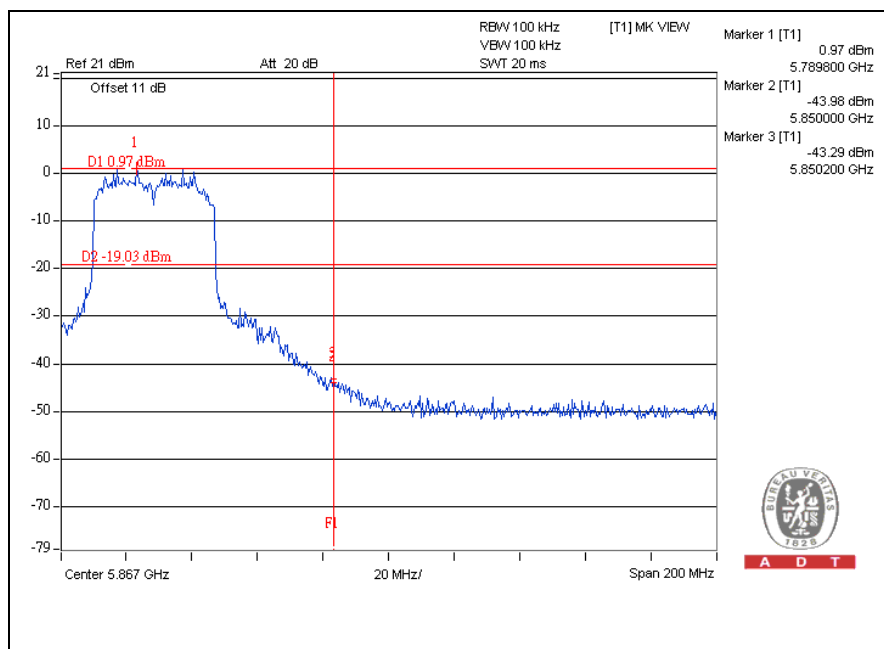


## 802.11n (40MHz) OFDM MODULATION:

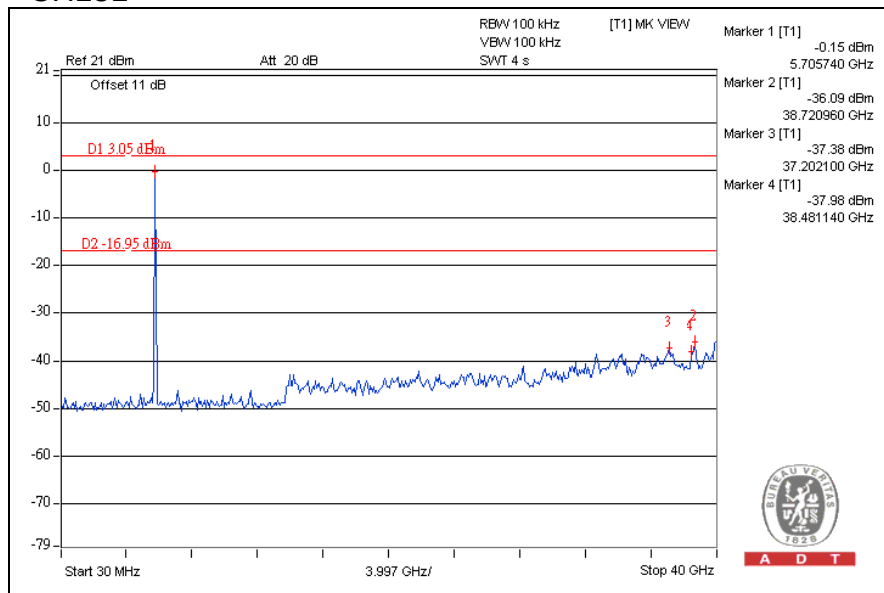
### CH151



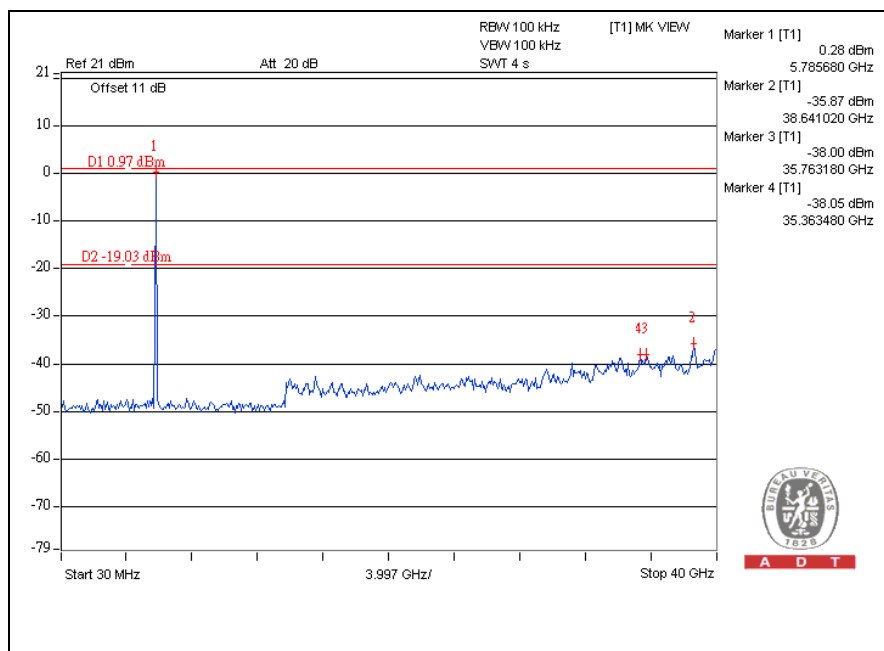
### CH159



## CH151



## CH159



## 6. 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](http://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

**Web Site:** [www.adt.com.tw](http://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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## **7.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 ---