



**Spectrum Research  
& Testing Lab., Inc.**  
No.167, Ln. 780, Shan-Tong  
Rd., Ling 8, Shan-Tong Li,  
Chung-Li City, Taoyuan County  
320, Taiwan (R.O.C.)

# TEST REPORT

Reference No.: A12040901  
Report No.: FCCA12040901  
FCC ID: JY8DW09  
Page: 1 of 85  
Date: May. 18, 2012

Product Name: Wi-Reader  
Model No.: DW09  
Applicant: Apotop  
4F, No.119, Jiankang Road, Jhonghe Dist., New Taipei City  
23858, Taiwan.  
Date of Receipt: Apr. 09, 2012  
Finished date of Test: May. 14, 2012  
Applicable Standards: 47 CFR Part 15, Subpart C  
ANSI C63.4: 2003

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Jeff Lo , Date: 05/18/2012  
(Jeff Lo)

Approved By : Johnson Ho , Date: 5/18/2012  
( Johnson Ho, Director )



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## 1. DOCUMENT POLICY AND TEST STATEMENT

### 1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.

### 1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.

DC power source from external power adapter which has Input: AC 120 V, 60Hz ,  
Output: DC 5.0V , 0.45A

### 1.3 EUT MODIFICATION

- No modification in SRT Lab.



## 2. DESCRIPTION OF EUT AND TEST MODE

### 2.1 GENERAL DESCRIPTION OF EUT

|                                 |  |
|---------------------------------|--|
| <b>PRODUCT</b>                  | Wi-Reader  |
| <b>MODEL NO.</b>                | DW09   |
| <b>POWER SUPPLY</b>             | DC power source from external USB power adapter which has Input: AC 120V ,60Hz , Output: DC 5.0 V , 0.45 A       |
| <b>CABLE</b>                    | N/A  |
| <b>FREQUENCY BAND</b>           | 2400 MHz ~ 2483.5 MHz  |
| <b>CARRIER FREQUENCY</b>        | 2412 MHz ~ 2462 MHz  |
| <b>NUMBER OF CHANNEL</b>        | 11 (802.11b,g), 7 (802.11n)  |
| <b>CHANNEL SPACING</b>          | 5 MHz  |
| <b>RATED RF OUTPUT POWER</b>    | 2.4GHz<br>-11b:12.04 dBm (0.0160 W)<br>-11g:12.23 dBm (0.0167 W)<br>-11n:12.76 dBm (0.0189 W)                    |
| <b>MODULATION TYPE</b>          | IEEE802.11b DSSS(BPSK/QPSK/CCK)<br>IEEE802.11g OFDM(BPSK/16QAM/64QAM)<br>IEEE802.11n SISO-OFDM(BPSK/16QAM/64QAM) |
| <b>MODE OF OPERATION</b>        | Half duplex  |
| <b>BIT RATE OF TRANSMISSION</b> | 11b: 1, 2, 5.5, 11Mbps;<br>11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps<br>11n: MCS0~MCS7 (Max. 150Mbps)                |
| <b>ANTENNA TYPE</b>             | PIFA   |
| <b>ANTENNA GAIN</b>             | -3.22 dBi  |
| <b>CHANNEL BANDWIDTH</b>        | 20 MHz(802.11b,g) 40MHz(802.11n)   |

#### NOTE :

1. For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

### 2.2 DESCRIPTION OF EUT INTERNAL DEVICE

| DEVICE | BRAND / MAKER | MODEL # | FCC ID / DOC | REMARK |
|--------|---------------|---------|--------------|--------|
|        |               |         |              |        |



## 2.3 DESCRIPTION OF TEST MODE

11(7) channels are provided by EUT of wireless. The 3 channels of lower, medium and higher were chosen for test.

There are test modes for each test configuration as below:

| Mode | Modulation Type                 | Bandwidth | Channel | Frequency (MHz) |
|------|---------------------------------|-----------|---------|-----------------|
| 1    | IEEE 802.11b<br>(11Mbps)        | 20MHz     | CH01    | 2412            |
| 2    |                                 |           | CH07    | 2442            |
| 3    |                                 |           | CH11    | 2462            |
| 4    | IEEE 802.11g<br>(54Mbps)        | 20MHz     | CH01    | 2412            |
| 5    |                                 |           | CH07    | 2442            |
| 6    |                                 |           | CH11    | 2462            |
| 7    | IEEE 802.11n<br>(MCS7, 150Mbps) | 40MHz     | CH05    | 2422            |
| 8    |                                 |           | CH08    | 2437            |
| 9    |                                 |           | CH11    | 2452            |

### NOTE :

1. Below 1 GHz, the channel 1, 7 and 11 were pre-tested in chamber and chosen the worst case for conducted and radiated emission test.
2. Above 1 GHz, the channel 1, 7 and 11 were tested individually.



## 2.4 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

| NO | DEVICE      | BRAND     | MODEL #              | FCC ID/DOC | CABLE   |
|----|-------------|-----------|----------------------|------------|---|
| 1  | Keyboard    | MircoSoft | Wired<br>keyboard600 | DoC        | 1.5m unshielded data cable.   |
| 2  | Mouse       | Logitech  | M-UV83               | DoC        | 1.5m unshielded data cable.   |
| 3  | CRT Monitor | SAMSUNG   | PG17IS               | DoC        | 1.8m unshielded power cord<br>1.5m shielded data cable.<br>With one core. |
| 4  | Printer     | HP        | 3550                 | DoC        | 1.5m unshielded power cord<br>1.5m shielded data cable.                   |
| 5  | Notebook    | ASUS      | F81SE                | DoC        | 1.5m AC power cord<br>1.2m DC shielded power cable.                       |
| 6  | USB Cable   | CMI       | M0580                | N/A        | 0.6m shielded data cable  |

**NOTE :** For the actual test configuration, please refer to the photos of testing.



## 2.5 EUT OPERATING CONDITION

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. We will use the following programs under Windows XP system to test EUT.
  - 3.1 "EMI Test" program.

PC sent "H" pattern signal and detect following peripherals directly or via EUT:

- Color Monitor
- Keyboard
- Mouse
- Printer
- HDD

- 3.2 "Ping IP", program.

Use the ping command to link LAN port and local simulation PC through Ethernet hub.

## 3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C  
ANSI C63.4: 2003

All tests have been performed and recorded as the above standards.





### 3.1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| STANDARD SECTION | TEST TYPE AND LIMIT  | RESULTS |
|------------------|--|---------|
| 15.203           | Antenna requirement<br>Limit : max. 6dBi   | PASS    |
| 15.207           | AC Power Conducted Emission  | PASS    |
| 15.247(a)(2)     | Spectrum Bandwidth of a Direct Sequence Spread Spectrum System<br>Limit : min. 500kHz  | PASS    |
| 15.247(b)        | Maximum Peak Conducted Output Power<br>Limit: max. 30dBm                               | PASS    |
| 15.247(d)        | Transmitter Radiated Emissions<br>Limit: Table 15.209                                  | PASS    |
| 15.247(e)        | Power Spectral Density<br>Limit: max. 8dBm   | PASS    |
| 15.247(d)        | Band Edge Measurement<br>Limit: 20dB less than the peak value of fundamental frequency | PASS    |



## 4. TECHNICAL CHARACTERISTICS TEST

### 4.1 CONDUCTED EMISSION TEST

#### 4.1.1 LIMIT

| Frequency (MHz) | Class A (dB $\mu$ V) |         | Class B (dB $\mu$ V) |         |
|-----------------|----------------------|---------|----------------------|---------|
|                 | Quasi-peak           | Average | Quasi-peak           | Average |
| 0.15 - 0.5      | 79                   | 66      | 66 - 56              | 56 - 46 |
| 0.50 - 5.0      | 73                   | 60      | 56                   | 46      |
| 5.0 - 30.0      | 73                   | 60      | 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.

#### 4.1.2 TEST EQUIPMENT

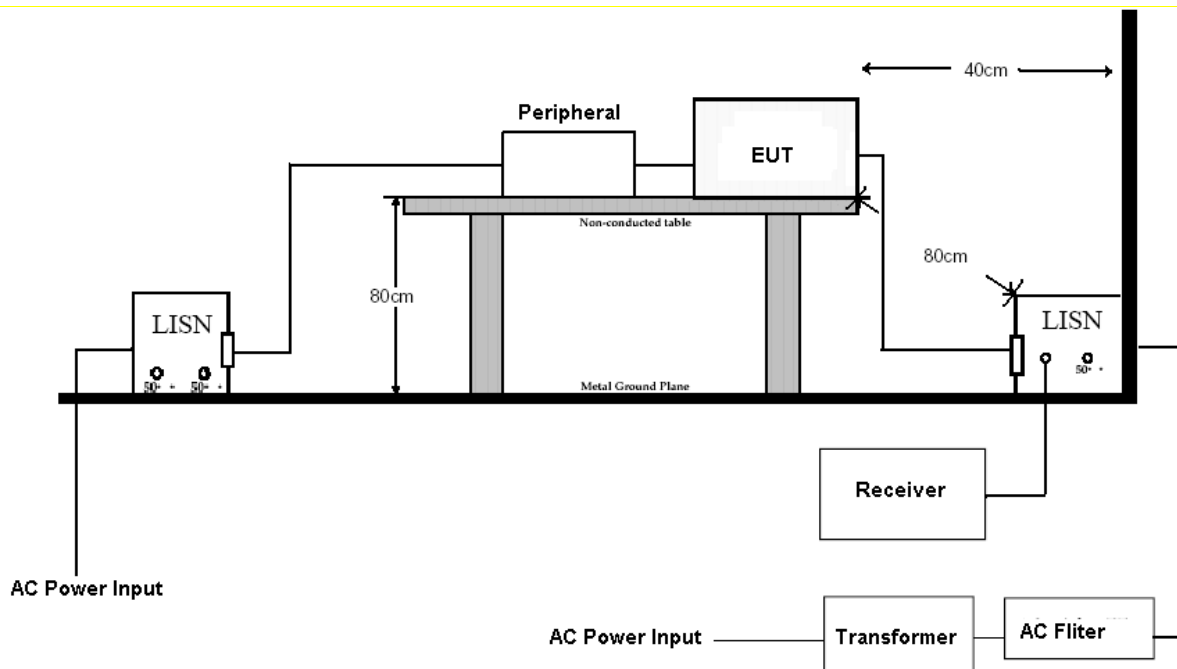
The following test equipment was used for the test:

| EQUIPMENT/<br>FACILITIES | SPECIFICATIONS       | MANUFACTURER       | MODEL#/<br>SERIAL#          | DUE DATE OF CAL.<br>& CAL. CENTER |
|--------------------------|----------------------|--------------------|-----------------------------|-----------------------------------|
| EMI TEST<br>RECEIVER     | 9kHz TO<br>2.75 GHz  | ROHDE &<br>SCHWARZ | ESCS30 /<br>100376          | Dec 2012<br>ETC                   |
| LISN                     | 50 $\mu$ H, 50 ohm   | FCC                | FCC-LISN-50-25-2 /<br>01017 | Jun 2012<br>ETC                   |
| LISN                     | 50 $\mu$ H, 50 ohm   | SOLAR              | 9252-50-R24-BNC /<br>951315 | Nov 2012<br>ETC                   |
| 50 OHM<br>TERMINATOR     | 50 ohm               | HP                 | 11593A /<br>#1              | Dec 2012<br>ETC                   |
| COAXIAL CABLE            | 5M                   | TIMES              | LMR-400 /<br>#5M(L3TCAB003) | May 2012<br>ETC                   |
| Filter                   | 2 LINE, 30A          | FIL.COIL           | FC-943 /<br>771             | NCR                               |
| GROUND PLANE             | 2M (H) x<br>3M (W)   | SRT                | N/A                         | NCR                               |
| GROUND PLANE             | 2.5M (H) x<br>3M (W) | SRT                | N/A                         | NCR                               |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



## 4.1.3 TEST SETUP



### NOTE :

1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.

## 4.1.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR22:2003. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50 $\mu$ H as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



## 4.1.5 TEST RESULT

|                    |                      |                  |                      |
|--------------------|----------------------|------------------|----------------------|
| Temperature:       | <u>24 °C</u>         | Humidity:        | <u>54 %RH</u>        |
| Frequency Range:   | <u>0.15 – 30 MHz</u> | Tested Mode:     | <u>11b_CH1</u>       |
| Receiver Detector: | <u>Q.P. and AV.</u>  | Modulation Type: | <u>QPSK</u>          |
| Tested By:         | <u>Jeff Lo</u>       | Tested Channel:  | <u>2412 MHz</u>      |
|                    |                      | Tested Date:     | <u>May. 11, 2012</u> |

Power Line Measured : Line

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.607          | -0.03                      | 31.30                         | 30.60 | 31.27                          | 30.57 | 56.00                 | 46.00 | -24.73         | -15.43 |
| 1.978          | 0.00                       | 31.90                         | 31.50 | 31.90                          | 31.50 | 56.00                 | 46.00 | -24.10         | -14.50 |
| 3.955          | 0.03                       | 36.70                         | 36.50 | 36.73                          | 36.53 | 56.00                 | 46.00 | -19.27         | -9.47  |
| 4.795          | 0.05                       | 34.50                         | 29.00 | 34.55                          | 29.05 | 56.00                 | 46.00 | -21.45         | -16.95 |
| 8.673          | 0.13                       | 35.20                         | 25.40 | 35.33                          | 25.53 | 60.00                 | 50.00 | -24.67         | -24.47 |
| 23.127         | 0.42                       | 40.30                         | 36.70 | 40.72                          | 37.12 | 60.00                 | 50.00 | -19.28         | -12.88 |

Power Line Measured : Neutral

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.380          | 0.45                       | 31.90                         | 31.00 | 32.35                          | 31.45 | 59.42                 | 49.42 | -27.07         | -17.97 |
| 0.607          | 0.40                       | 29.70                         | 29.50 | 30.10                          | 29.90 | 56.00                 | 46.00 | -25.90         | -16.10 |
| 3.943          | 0.38                       | 32.90                         | 31.50 | 33.28                          | 31.88 | 56.00                 | 46.00 | -22.72         | -14.12 |
| 4.779          | 0.40                       | 32.60                         | 30.30 | 33.00                          | 30.70 | 56.00                 | 46.00 | -23.00         | -15.30 |
| 8.045          | 0.47                       | 34.10                         | 32.20 | 34.57                          | 32.67 | 60.00                 | 50.00 | -25.43         | -17.33 |
| 23.127         | 0.83                       | 39.40                         | 36.00 | 40.23                          | 36.83 | 60.00                 | 50.00 | -19.77         | -13.17 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

|                    |               |                  |               |
|--------------------|---------------|------------------|---------------|
| Temperature:       | 24 °C         | Humidity:        | 54 %RH        |
| Frequency Range:   | 0.15 – 30 MHz | Tested Mode:     | 11b_CH7       |
| Receiver Detector: | Q.P. and AV.  | Modulation Type: | QPSK          |
| Tested By:         | Jeff Lo       | Tested Channel:  | 2442 MHz      |
|                    |               | Tested Date:     | May. 11, 2012 |

## Power Line Measured : Line

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.154          | 0.14                       | 39.20                         | 37.20 | 39.34                          | 37.34 | 65.89                 | 55.89 | -26.55         | -18.55 |
| 1.970          | 0.00                       | 30.20                         | 30.10 | 30.20                          | 30.10 | 56.00                 | 46.00 | -25.80         | -15.90 |
| 3.943          | 0.03                       | 34.50                         | 32.40 | 34.53                          | 32.43 | 56.00                 | 46.00 | -21.47         | -13.57 |
| 4.701          | 0.05                       | 33.90                         | 33.50 | 33.95                          | 33.55 | 56.00                 | 46.00 | -22.05         | -12.45 |
| 8.716          | 0.13                       | 37.60                         | 33.90 | 37.73                          | 34.03 | 60.00                 | 50.00 | -22.27         | -15.97 |
| 21.662         | 0.39                       | 38.50                         | 34.40 | 38.89                          | 34.79 | 60.00                 | 50.00 | -21.11         | -15.21 |

## Power Line Measured : Neutral

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.380          | 0.45                       | 32.70                         | 32.10 | 33.15                          | 32.55 | 59.42                 | 49.42 | -26.27         | -16.87 |
| 0.607          | 0.40                       | 31.00                         | 30.90 | 31.40                          | 31.30 | 56.00                 | 46.00 | -24.60         | -14.70 |
| 2.802          | 0.38                       | 35.20                         | 34.20 | 35.58                          | 34.58 | 56.00                 | 46.00 | -20.42         | -11.42 |
| 5.002          | 0.40                       | 33.80                         | 33.20 | 34.20                          | 33.60 | 60.00                 | 50.00 | -25.80         | -16.40 |
| 8.791          | 0.49                       | 34.90                         | 31.30 | 35.39                          | 31.79 | 60.00                 | 50.00 | -24.61         | -18.21 |
| 17.693         | 0.70                       | 39.00                         | 35.70 | 39.70                          | 36.40 | 60.00                 | 50.00 | -20.30         | -13.60 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.





# TEST REPORT

|                    |               |                  |               |
|--------------------|---------------|------------------|---------------|
| Temperature:       | 24 °C         | Humidity:        | 54 %RH        |
| Frequency Range:   | 0.15 – 30 MHz | Tested Mode:     | 11b_CH11      |
| Receiver Detector: | Q.P. and AV.  | Modulation Type: | QPSK          |
| Tested By:         | Jeff Lo       | Tested Channel:  | 2472 MHz      |
|                    |               | Tested Date:     | May. 11, 2012 |

## Power Line Measured : Line

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.150          | 0.14                       | 40.00                         | 38.10 | 40.14                          | 38.24 | 66.00                 | 56.00 | -25.86         | -17.76 |
| 0.302          | 0.02                       | 32.50                         | 32.10 | 32.52                          | 32.12 | 61.65                 | 51.65 | -29.13         | -19.53 |
| 2.802          | 0.01                       | 32.20                         | 31.10 | 32.21                          | 31.11 | 56.00                 | 46.00 | -23.79         | -14.89 |
| 4.998          | 0.05                       | 31.70                         | 29.30 | 31.75                          | 29.35 | 56.00                 | 46.00 | -24.25         | -16.65 |
| 8.033          | 0.11                       | 34.50                         | 32.60 | 34.61                          | 32.71 | 60.00                 | 50.00 | -25.39         | -17.29 |
| 23.127         | 0.42                       | 39.50                         | 34.20 | 39.92                          | 34.62 | 60.00                 | 50.00 | -20.08         | -15.38 |

## Power Line Measured : Neutral

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.228          | 0.48                       | 35.30                         | 33.80 | 35.78                          | 34.28 | 63.77                 | 53.77 | -27.99         | -19.49 |
| 0.380          | 0.45                       | 32.20                         | 31.90 | 32.65                          | 32.35 | 59.42                 | 49.42 | -26.77         | -17.07 |
| 0.607          | 0.40                       | 30.50                         | 30.40 | 30.90                          | 30.80 | 56.00                 | 46.00 | -25.10         | -15.20 |
| 2.802          | 0.38                       | 34.40                         | 33.70 | 34.78                          | 34.08 | 56.00                 | 46.00 | -21.22         | -11.92 |
| 13.357         | 0.61                       | 34.40                         | 30.50 | 35.01                          | 31.11 | 60.00                 | 50.00 | -24.99         | -18.89 |
| 23.130         | 0.83                       | 39.30                         | 36.30 | 40.13                          | 37.13 | 60.00                 | 50.00 | -19.87         | -12.87 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



**Spectrum Research & Testing Lab., Inc.**  
 No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

# TEST REPORT

Reference No.: A12040901  
 Report No.: FCCA12040901  
 FCC ID: JY8DW09  
 Page: 15 of 85  
 Date: May. 18, 2012

|                    |               |                  |               |
|--------------------|---------------|------------------|---------------|
| Temperature:       | 24 °C         | Humidity:        | 54 %RH        |
| Frequency Range:   | 0.15 – 30 MHz | Tested Mode:     | 11g_CH1       |
| Receiver Detector: | Q.P. and AV.  | Modulation Type: | OFDM          |
| Tested By:         | Jeff Lo       | Tested Channel:  | 2412 MHZ      |
|                    |               | Tested Date:     | May. 11, 2012 |

## Power Line Measured : Line

| Freq. (MHz) | Correct. Factor (dB) | Reading Value (dB $\mu$ V) |       | Emission Level (dB $\mu$ V) |       | Limit (dB $\mu$ V) |       | Margin (dB) |        |
|-------------|----------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|-------------|--------|
|             |                      | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.        | AV.    |
| 0.150       | 0.14                 | 40.70                      | 38.60 | 40.84                       | 38.74 | 66.00              | 56.00 | -25.16      | -17.26 |
| 0.603       | -0.03                | 28.30                      | 27.10 | 28.27                       | 27.07 | 56.00              | 46.00 | -27.73      | -18.93 |
| 1.970       | 0.00                 | 30.30                      | 29.20 | 30.30                       | 29.20 | 56.00              | 46.00 | -25.70      | -16.80 |
| 2.802       | 0.01                 | 35.60                      | 34.80 | 35.61                       | 34.81 | 56.00              | 46.00 | -20.39      | -11.19 |
| 4.166       | 0.03                 | 34.60                      | 34.30 | 34.63                       | 34.33 | 56.00              | 46.00 | -21.37      | -11.67 |
| 13.420      | 0.24                 | 35.80                      | 33.00 | 36.04                       | 33.24 | 60.00              | 50.00 | -23.96      | -16.76 |

## Power Line Measured : Neutral

| Freq. (MHz) | Correct. Factor (dB) | Reading Value (dB $\mu$ V) |       | Emission Level (dB $\mu$ V) |       | Limit (dB $\mu$ V) |       | Margin (dB) |        |
|-------------|----------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|-------------|--------|
|             |                      | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.        | AV.    |
| 0.353       | 0.45                 | 44.30                      | 40.10 | 44.75                       | 40.55 | 60.20              | 50.20 | -15.45      | -9.65  |
| 0.607       | 0.40                 | 36.50                      | 31.40 | 36.90                       | 31.80 | 56.00              | 46.00 | -19.10      | -14.20 |
| 1.666       | 0.38                 | 28.50                      | 25.60 | 28.88                       | 25.98 | 56.00              | 46.00 | -27.12      | -20.02 |
| 2.802       | 0.38                 | 35.80                      | 35.20 | 36.18                       | 35.58 | 56.00              | 46.00 | -19.82      | -10.42 |
| 4.923       | 0.40                 | 42.60                      | 39.10 | 43.00                       | 39.50 | 56.00              | 46.00 | -13.00      | -6.50  |
| 16.228      | 0.67                 | 40.20                      | 36.40 | 40.87                       | 37.07 | 60.00              | 50.00 | -19.13      | -12.93 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

|                    |               |                  |               |
|--------------------|---------------|------------------|---------------|
| Temperature:       | 24 °C         | Humidity:        | 54 %RH        |
| Frequency Range:   | 0.15 – 30 MHz | Tested Mode:     | 11g_CH7       |
| Receiver Detector: | Q.P. and AV.  | Modulation Type: | OFDM          |
| Tested By:         | Jeff Lo       | Tested Channel:  | 2442 MHZ      |
|                    |               | Tested Date:     | May. 11, 2012 |

## Power Line Measured : Line

| Freq. (MHz) | Correct. Factor (dB) | Reading Value (dB $\mu$ V) |       | Emission Level (dB $\mu$ V) |       | Limit (dB $\mu$ V) |       | Margin (dB) |        |
|-------------|----------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|-------------|--------|
|             |                      | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.        | AV.    |
| 0.150       | 0.14                 | 41.00                      | 38.60 | 41.14                       | 38.74 | 66.00              | 56.00 | -24.86      | -17.26 |
| 1.971       | 0.00                 | 30.10                      | 29.20 | 30.10                       | 29.20 | 56.00              | 46.00 | -25.90      | -16.80 |
| 2.802       | 0.01                 | 34.50                      | 31.30 | 34.51                       | 31.31 | 56.00              | 46.00 | -21.49      | -14.69 |
| 4.998       | 0.05                 | 33.60                      | 30.40 | 33.65                       | 30.45 | 56.00              | 46.00 | -22.35      | -15.55 |
| 8.709       | 0.13                 | 35.60                      | 31.90 | 35.73                       | 32.03 | 60.00              | 50.00 | -24.27      | -17.97 |
| 23.130      | 0.42                 | 39.70                      | 35.50 | 40.12                       | 35.92 | 60.00              | 50.00 | -19.88      | -14.08 |

## Power Line Measured : Neutral

| Freq. (MHz) | Correct. Factor (dB) | Reading Value (dB $\mu$ V) |       | Emission Level (dB $\mu$ V) |       | Limit (dB $\mu$ V) |       | Margin (dB) |        |
|-------------|----------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|-------------|--------|
|             |                      | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.        | AV.    |
| 0.228       | 0.48                 | 42.90                      | 34.30 | 43.38                       | 34.78 | 63.77              | 53.77 | -20.39      | -18.99 |
| 0.302       | 0.45                 | 51.60                      | 44.10 | 52.05                       | 44.55 | 61.65              | 51.65 | -9.60       | -7.10  |
| 0.908       | 0.39                 | 37.30                      | 32.20 | 37.69                       | 32.59 | 56.00              | 46.00 | -18.31      | -13.41 |
| 3.861       | 0.38                 | 34.50                      | 31.00 | 34.88                       | 31.38 | 56.00              | 46.00 | -21.12      | -14.62 |
| 4.166       | 0.38                 | 34.50                      | 33.90 | 34.88                       | 34.28 | 56.00              | 46.00 | -21.12      | -11.72 |
| 19.709      | 0.74                 | 39.20                      | 36.00 | 39.94                       | 36.74 | 60.00              | 50.00 | -20.06      | -13.26 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

|                    |               |                  |               |
|--------------------|---------------|------------------|---------------|
| Temperature:       | 24 °C         | Humidity:        | 54 %RH        |
| Frequency Range:   | 0.15 – 30 MHz | Tested Mode:     | 11g_CH11      |
| Receiver Detector: | Q.P. and AV.  | Modulation Type: | OFDM          |
| Tested By:         | Jeff Lo       | Tested Channel:  | 2472 MHZ      |
|                    |               | Tested Date:     | May. 11, 2012 |

## Power Line Measured : Line

| Freq. (MHz) | Correct. Factor (dB) | Reading Value (dB $\mu$ V) |       | Emission Level (dB $\mu$ V) |       | Limit (dB $\mu$ V) |       | Margin (dB) |        |
|-------------|----------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|-------------|--------|
|             |                      | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.        | AV.    |
| 0.154       | 0.14                 | 46.10                      | 38.80 | 46.24                       | 38.94 | 65.89              | 55.89 | -19.65      | -16.95 |
| 1.970       | 0.00                 | 31.10                      | 30.40 | 31.10                       | 30.40 | 56.00              | 46.00 | -24.90      | -15.60 |
| 2.802       | 0.01                 | 36.00                      | 31.20 | 36.01                       | 31.21 | 56.00              | 46.00 | -19.99      | -14.79 |
| 4.771       | 0.05                 | 34.50                      | 30.90 | 34.55                       | 30.95 | 56.00              | 46.00 | -21.45      | -15.05 |
| 8.713       | 0.13                 | 35.00                      | 31.30 | 35.13                       | 31.43 | 60.00              | 50.00 | -24.87      | -18.57 |
| 23.130      | 0.42                 | 40.60                      | 37.70 | 41.02                       | 38.12 | 60.00              | 50.00 | -18.98      | -11.88 |

## Power Line Measured : Neutral

| Freq. (MHz) | Correct. Factor (dB) | Reading Value (dB $\mu$ V) |       | Emission Level (dB $\mu$ V) |       | Limit (dB $\mu$ V) |       | Margin (dB) |        |
|-------------|----------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|-------------|--------|
|             |                      | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.        | AV.    |
| 0.228       | 0.48                 | 48.10                      | 40.30 | 48.58                       | 40.78 | 63.77              | 53.77 | -15.19      | -12.99 |
| 0.377       | 0.45                 | 46.10                      | 39.90 | 46.55                       | 40.35 | 59.53              | 49.53 | -12.98      | -9.18  |
| 0.603       | 0.40                 | 38.90                      | 33.40 | 39.30                       | 33.80 | 56.00              | 46.00 | -16.70      | -12.20 |
| 2.045       | 0.38                 | 30.00                      | 29.40 | 30.38                       | 29.78 | 56.00              | 46.00 | -25.62      | -16.22 |
| 5.072       | 0.40                 | 33.60                      | 30.10 | 34.00                       | 30.50 | 60.00              | 50.00 | -26.00      | -19.50 |
| 17.693      | 0.70                 | 38.90                      | 35.80 | 39.60                       | 36.50 | 60.00              | 50.00 | -20.40      | -13.50 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

|                    |               |                  |               |
|--------------------|---------------|------------------|---------------|
| Temperature:       | 24 °C         | Humidity:        | 54 %RH        |
| Frequency Range:   | 0.15 – 30 MHz | Tested Mode:     | 11n_CH5       |
| Receiver Detector: | Q.P. and AV.  | Modulation Type: | OFDM          |
| Tested By:         | Jeff Lo       | Tested Channel:  | 2422 MHZ      |
|                    |               | Tested Date:     | May. 11, 2012 |

## Power Line Measured : Line

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.150          | 0.14                       | 40.90                         | 38.90 | 41.04                          | 39.04 | 66.00                 | 56.00 | -24.96         | -16.96 |
| 1.966          | 0.00                       | 31.00                         | 29.80 | 31.00                          | 29.80 | 56.00                 | 46.00 | -25.00         | -16.20 |
| 2.802          | 0.01                       | 34.90                         | 33.70 | 34.91                          | 33.71 | 56.00                 | 46.00 | -21.09         | -12.29 |
| 4.923          | 0.05                       | 33.80                         | 30.40 | 33.85                          | 30.45 | 56.00                 | 46.00 | -22.15         | -15.55 |
| 15.435         | 0.28                       | 35.10                         | 31.10 | 35.38                          | 31.38 | 60.00                 | 50.00 | -24.62         | -18.62 |
| 16.228         | 0.29                       | 40.20                         | 35.30 | 40.49                          | 35.59 | 60.00                 | 50.00 | -19.51         | -14.41 |

## Power Line Measured : Neutral

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.322          | 0.45                       | 34.50                         | 30.70 | 34.95                          | 31.15 | 61.08                 | 51.08 | -26.13         | -19.93 |
| 0.603          | 0.40                       | 31.30                         | 30.10 | 31.70                          | 30.50 | 56.00                 | 46.00 | -24.30         | -15.50 |
| 3.935          | 0.38                       | 34.70                         | 31.40 | 35.08                          | 31.78 | 56.00                 | 46.00 | -20.92         | -14.22 |
| 4.998          | 0.40                       | 33.80                         | 29.60 | 34.20                          | 30.00 | 56.00                 | 46.00 | -21.80         | -16.00 |
| 8.783          | 0.49                       | 34.30                         | 30.30 | 34.79                          | 30.79 | 60.00                 | 50.00 | -25.21         | -19.21 |
| 16.228         | 0.67                       | 39.20                         | 34.40 | 39.87                          | 35.07 | 60.00                 | 50.00 | -20.13         | -14.93 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.





# TEST REPORT

|                    |               |                  |               |
|--------------------|---------------|------------------|---------------|
| Temperature:       | 24 °C         | Humidity:        | 54 %RH        |
| Frequency Range:   | 0.15 – 30 MHz | Tested Mode:     | 11n_CH8       |
| Receiver Detector: | Q.P. and AV.  | Modulation Type: | OFDM          |
| Tested By:         | Jeff Lo       | Tested Channel:  | 2437 MHZ      |
|                    |               | Tested Date:     | May. 11, 2012 |

## Power Line Measured : Line

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.154          | 0.14                       | 40.50                         | 38.40 | 40.64                          | 38.54 | 65.89                 | 55.89 | -25.25         | -17.35 |
| 0.908          | -0.03                      | 30.30                         | 27.30 | 30.27                          | 27.27 | 56.00                 | 46.00 | -25.73         | -18.73 |
| 1.966          | 0.00                       | 30.50                         | 30.20 | 30.50                          | 30.20 | 56.00                 | 46.00 | -25.50         | -15.80 |
| 2.802          | 0.01                       | 35.20                         | 31.80 | 35.21                          | 31.81 | 56.00                 | 46.00 | -20.79         | -14.19 |
| 4.998          | 0.05                       | 34.60                         | 32.60 | 34.65                          | 32.65 | 56.00                 | 46.00 | -21.35         | -13.35 |
| 23.127         | 0.42                       | 39.80                         | 36.30 | 40.22                          | 36.72 | 60.00                 | 50.00 | -19.78         | -13.28 |

## Power Line Measured : Neutral

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.228          | 0.48                       | 35.80                         | 34.40 | 36.28                          | 34.88 | 63.77                 | 53.77 | -27.49         | -18.89 |
| 0.302          | 0.45                       | 34.40                         | 31.90 | 34.85                          | 32.35 | 61.65                 | 51.65 | -26.80         | -19.30 |
| 0.607          | 0.40                       | 31.50                         | 30.80 | 31.90                          | 31.20 | 56.00                 | 46.00 | -24.10         | -14.80 |
| 2.045          | 0.38                       | 29.30                         | 28.70 | 29.68                          | 29.08 | 56.00                 | 46.00 | -26.32         | -16.92 |
| 4.162          | 0.38                       | 33.60                         | 30.10 | 33.98                          | 30.48 | 56.00                 | 46.00 | -22.02         | -15.52 |
| 23.127         | 0.83                       | 39.30                         | 31.90 | 40.13                          | 32.73 | 60.00                 | 50.00 | -19.87         | -17.27 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



# TEST REPORT

|                    |                      |                  |                      |
|--------------------|----------------------|------------------|----------------------|
| Temperature:       | <u>24 °C</u>         | Humidity:        | <u>54 %RH</u>        |
| Frequency Range:   | <u>0.15 – 30 MHz</u> | Tested Mode:     | <u>11n_CH11</u>      |
| Receiver Detector: | <u>Q.P. and AV.</u>  | Modulation Type: | <u>OFDM</u>          |
| Tested By:         | <u>Jeff Lo</u>       | Tested Channel:  | <u>2462 MHZ</u>      |
|                    |                      | Tested Date:     | <u>May. 11, 2012</u> |

## Power Line Measured : Line

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.150          | 0.14                       | 41.30                         | 39.20 | 41.44                          | 39.34 | 66.00                 | 56.00 | -24.56         | -16.66 |
| 0.603          | -0.03                      | 30.30                         | 27.10 | 30.27                          | 27.07 | 56.00                 | 46.00 | -25.73         | -18.93 |
| 1.666          | -0.01                      | 29.60                         | 26.60 | 29.59                          | 26.59 | 56.00                 | 46.00 | -26.41         | -19.41 |
| 2.802          | 0.01                       | 35.30                         | 33.70 | 35.31                          | 33.71 | 56.00                 | 46.00 | -20.69         | -12.29 |
| 4.162          | 0.03                       | 34.80                         | 31.10 | 34.83                          | 31.13 | 56.00                 | 46.00 | -21.17         | -14.87 |
| 21.662         | 0.39                       | 39.50                         | 34.60 | 39.89                          | 34.99 | 60.00                 | 50.00 | -20.11         | -15.01 |

## Power Line Measured : Neutral

| Freq.<br>(MHz) | Correct.<br>Factor<br>(dB) | Reading Value<br>(dB $\mu$ V) |       | Emission Level<br>(dB $\mu$ V) |       | Limit<br>(dB $\mu$ V) |       | Margin<br>(dB) |        |
|----------------|----------------------------|-------------------------------|-------|--------------------------------|-------|-----------------------|-------|----------------|--------|
|                |                            | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.                  | AV.   | Q.P.           | AV.    |
| 0.455          | 0.41                       | 30.70                         | 27.30 | 31.11                          | 27.71 | 57.29                 | 47.29 | -26.18         | -19.58 |
| 0.908          | 0.39                       | 30.30                         | 26.60 | 30.69                          | 26.99 | 56.00                 | 46.00 | -25.31         | -19.01 |
| 2.802          | 0.38                       | 34.50                         | 31.40 | 34.88                          | 31.78 | 56.00                 | 46.00 | -21.12         | -14.22 |
| 4.162          | 0.38                       | 33.90                         | 30.10 | 34.28                          | 30.48 | 56.00                 | 46.00 | -21.72         | -15.52 |
| 11.814         | 0.57                       | 41.80                         | 37.00 | 42.37                          | 37.57 | 60.00                 | 50.00 | -17.63         | -12.43 |
| 23.130         | 0.83                       | 38.30                         | 35.70 | 39.13                          | 36.53 | 60.00                 | 50.00 | -20.87         | -13.47 |

### NOTE :

1. Measurement uncertainty is  $\pm 3.61$ dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.



## 4.2 RADIATED EMISSION TEST

### 4.2.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| FREQUENCY (MHz) | DISTANCE (m) | FIELD STRENGTH (dB $\mu$ V/m) |
|-----------------|--------------|-------------------------------|
| 0.009 - 0.490   | 300          | 2400/F(KHz)                   |
| 0.490 - 1.705   | 30           | 24000/F(KHz)                  |
| 1.705 - 30      | 30           | 30                            |
| 30 - 88         | 3            | 40.0                          |
| 88 - 216        | 3            | 43.5                          |
| 216 - 960       | 3            | 46.0                          |
| Above 960       | 3            | 54.0                          |

**NOTE :**

1. In the emission tables above , the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.
- 3.

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

| FREQUENCY (MHz) | Class A (dBuV/m) (at 3m) |         | Class B (dBuV/m) (at 3m) |         |
|-----------------|--------------------------|---------|--------------------------|---------|
|                 | PEAK                     | AVERAGE | PEAK                     | AVERAGE |
| Above 1000      | 80.0                     | 60.0    | 74.0                     | 54.0    |

FCC Part 15, Section15.249 limit of radiated emission:

| FREQUENCY (MHz) | Fundamental           |                      | Harmonics            |                       |
|-----------------|-----------------------|----------------------|----------------------|-----------------------|
|                 | PEAK                  | AVERAGE              | PEAK                 | AVERAGE               |
| 2400 – 2483.5   | 114dBuV/m<br>(NOTE 2) | 50mV/m<br>(94dBuV/m) | 74dBuV/m<br>(NOTE 2) | 500uV/m<br>(54dBuV/m) |

**NOTE :**

1. Field strength limits are specified at a distance of 3 meters.
2. the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.



**Spectrum Research  
& Testing Lab., Inc.**  
No.167,Ln. 780, Shan-Tong  
Rd.,Ling 8, Shan-Tong Li,  
Chung-Li City, Taoyuan County  
320, Taiwan (R.O.C.)

# TEST REPORT

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## 4.2.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

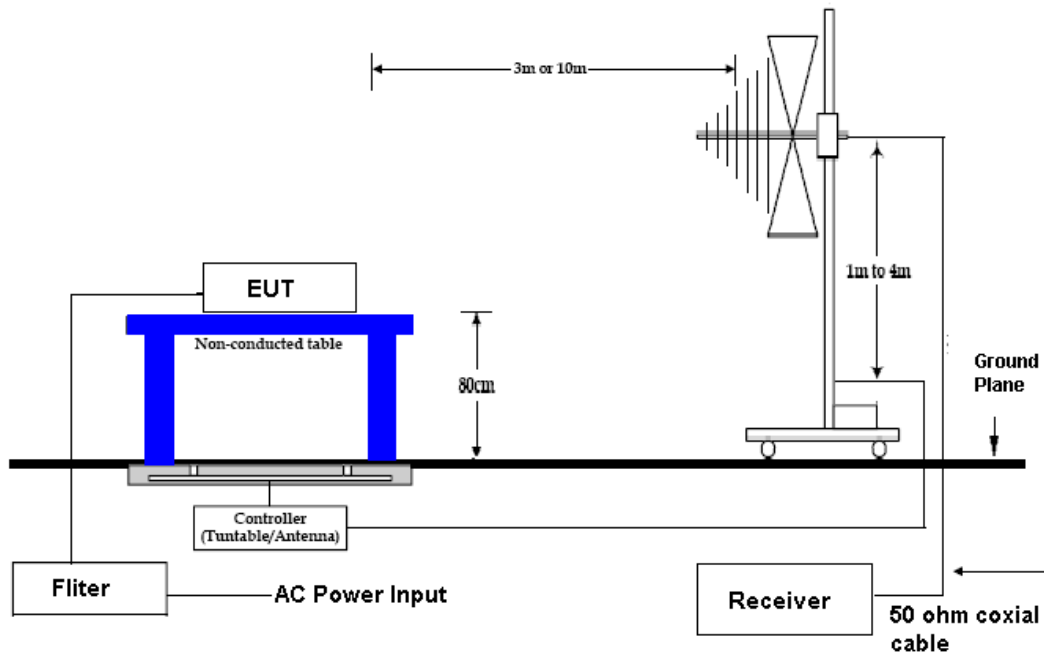
| EQUIPMENT/<br>FACILITIES | SPECIFICATIONS          | MANUFACTURER       | MODEL#/<br>SERIAL#         | DUE DATE OF CAL. &<br>CAL. CENTER |
|--------------------------|-------------------------|--------------------|----------------------------|-----------------------------------|
| EMI TEST<br>RECEIVER     | 20 MHz TO<br>1000 MHz   | ROHDE &<br>SCHWARZ | ESVS30 /<br>841977/003     | Dec. 2012<br>ETC                  |
| BI-LOG<br>ANTENNA        | 30MHz to 2GHz           | SCHFFNER           | CBL6141A /<br>4128         | May. 2012<br>ETC                  |
| COAXIAL<br>CABLE         | 30M                     | TIMES              | LMR-400 /<br>#30M          | Nov. 2012<br>SRT                  |
| FILTER                   | 2 LINE, 30A             | FIL.COIL           | FC-943 /<br>869            | May. 2012<br>ETC                  |
| OATS                     | 3 – 10 M<br>MEASUREMENT | SRT                | SRT-1                      | Jun. 2012<br>SRT                  |
| SPECTRUM<br>ANALYZER     | 9K-40GHz                | ROHDE &<br>SCHWARZ | FSP40 /<br>100093          | Dec. 2012<br>ETC                  |
| PRE-AMPLIFIER            | 1 GHz TO<br>26.5 GHz    | AGILENT            | 8449B/<br>3008A01019       | Jan. 2013<br>ETC                  |
| HORN ANTENNA             | 1 GHz TO<br>18 GHz      | EMCO               | 3115/<br>9602-4681         | Nov. 2012<br>ETC                  |
| K-TYPE CABLE             | 15M                     | HUBER SUHNER       | SF102-40/2*11 /<br>23932/2 | Feb. 2013<br>ETC                  |
| K-TYPE CABLE             | 1M                      | HUBER SUHNER       | SF102-40/2*11 /<br>28934/2 | May. 2012<br>ETC                  |

### NOTE:

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



## 4.2.3 TEST SET-UP (30MHz~1000MHz)



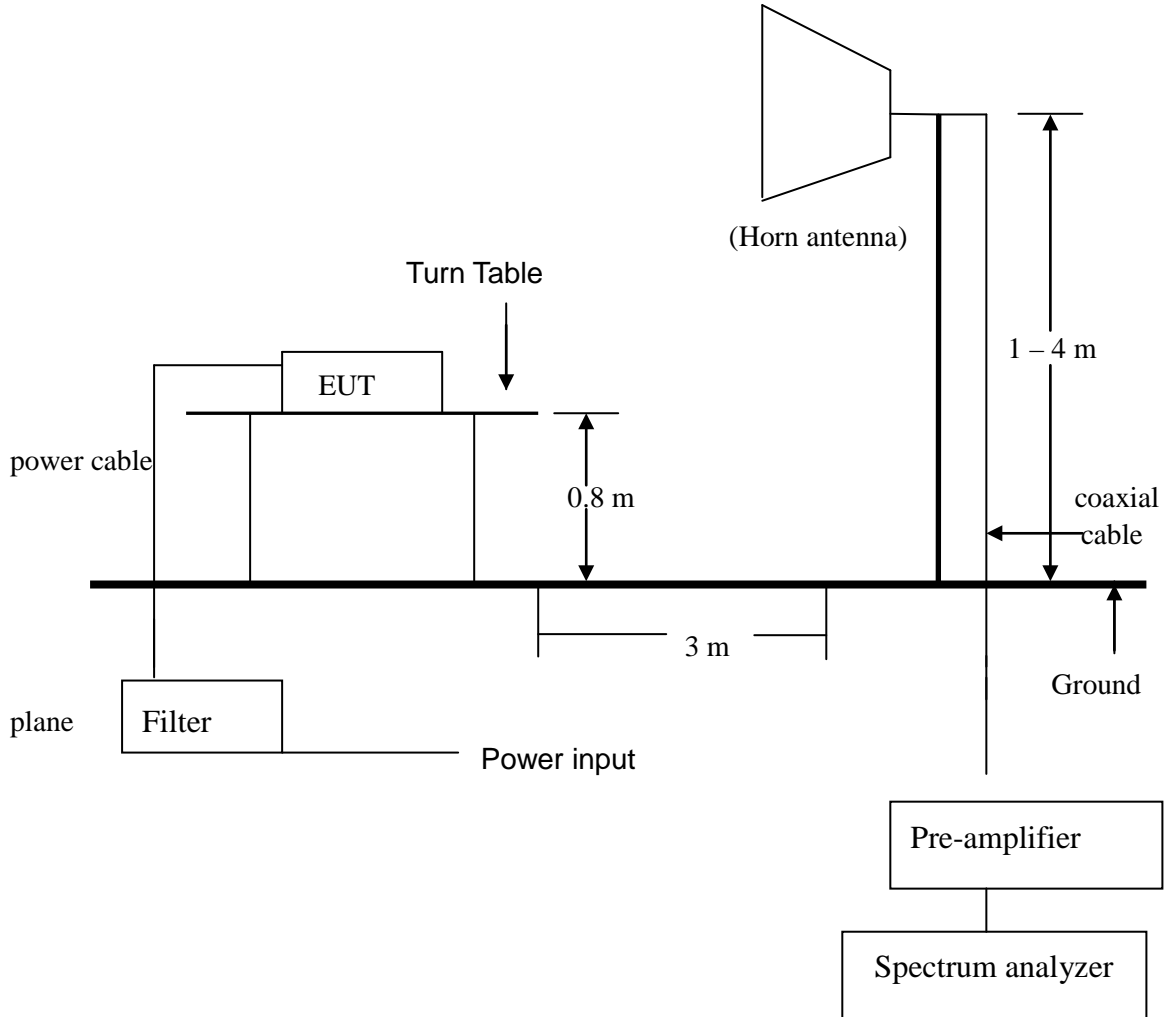
### NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.





## TEST SET- UP (1GHz - 25GHz)



### NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane. For the actual test configuration, please refer to the photos of testing.



**Spectrum Research  
& Testing Lab., Inc.**  
No.167,Ln. 780, Shan-Tong  
Rd.,Ling 8, Shan-Tong Li,  
Chung-Li City, Taoyuan County  
320, Taiwan (R.O.C.)

## TEST REPORT

Reference No.: A12040901  
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### 4.2.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2008. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



# TEST REPORT

## 4.2.5 TEST RESULT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH        |
| Frequency Range:   | 30 – 1000 MHz | Measured Distance: | 3m            |
| Receiver Detector: | Q.P.          | Tested Mode:       | 11b_CH1       |
| Tested By:         | Jeff Lo       | Tested Date:       | May. 10, 2012 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 153.1100        | 1.73            | 12.42                 | 14.5                | 28.7                    | 43.5           | -14.9       | 346   | 3.62  |
| 220.0900        | 2.00            | 13.20                 | 22.5                | 37.7                    | 46.0           | -8.3        | 36    | 3.41  |
| 281.1400        | 2.31            | 13.21                 | 23.5                | 39.0                    | 46.0           | -7.0        | 274   | 3.22  |
| 317.3800        | 2.47            | 14.31                 | 21.6                | 38.4                    | 46.0           | -7.6        | 261   | 3.11  |
| 377.6500        | 2.71            | 15.75                 | 13.2                | 31.7                    | 46.0           | -14.3       | 269   | 2.92  |
| 957.2300        | 4.61            | 24.26                 | 3.1                 | 32.0                    | 46.0           | -14.0       | 116   | 1.13  |

Antenna Polarization : Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 185.1600        | 1.85            | 10.70                 | 16.6                | 29.2                    | 43.5           | -14.4       | 63    | 1.48  |
| 265.3800        | 2.25            | 13.35                 | 18.8                | 34.4                    | 46.0           | -11.6       | 77    | 1.73  |
| 317.3500        | 2.47            | 14.31                 | 17.8                | 34.6                    | 46.0           | -11.4       | 170   | 1.89  |
| 453.8400        | 3.01            | 17.34                 | 11.7                | 32.1                    | 46.0           | -13.9       | 174   | 2.31  |
| 530.2400        | 3.32            | 18.36                 | 13.4                | 35.1                    | 46.0           | -10.9       | 182   | 2.55  |
| 957.2500        | 4.61            | 24.26                 | 4.3                 | 33.2                    | 46.0           | -12.8       | 40    | 3.87  |

### NOTE :

1. Measurement uncertainty is ±4.73dB.
2. "\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23°C          | Humidity:          | 57 %RH        |
| Frequency Range:   | 30 – 1000 MHz | Measured Distance: | 3m            |
| Receiver Detector: | Q.P.          | Tested Mode:       | 11b_CH7       |
| Tested By:         | Jeff Lo       | Tested Date:       | May. 10, 2012 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 199.3300        | 1.90            | 11.71                 | 17.1                | 30.7                    | 43.5           | -12.8       | 255   | 3.48  |
| 220.6400        | 2.00            | 13.20                 | 24.5                | 39.7                    | 46.0           | -6.3        | 133   | 3.41  |
| 288.9100        | 2.38            | 13.28                 | 19.8                | 35.5                    | 46.0           | -10.5       | 263   | 3.20  |
| 317.1200        | 2.47            | 14.31                 | 21.9                | 38.7                    | 46.0           | -7.3        | 148   | 3.11  |
| 453.8900        | 3.01            | 17.34                 | 11.5                | 31.9                    | 46.0           | -14.1       | 22    | 2.69  |
| 957.3200        | 4.61            | 24.26                 | 2.7                 | 31.6                    | 46.0           | -14.4       | 338   | 1.13  |

Antenna Polarization:Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 279.2200        | 2.30            | 13.21                 | 18.2                | 33.7                    | 46.0           | -12.3       | 159   | 1.77  |
| 317.1500        | 2.47            | 14.31                 | 18.0                | 34.8                    | 46.0           | -11.2       | 234   | 1.89  |
| 457.6800        | 3.03            | 17.40                 | 15.2                | 35.6                    | 46.0           | -10.4       | 56    | 2.32  |
| 497.5900        | 3.19            | 17.96                 | 12.3                | 33.4                    | 46.0           | -12.6       | 178   | 2.45  |
| 530.3400        | 3.32            | 18.36                 | 14.3                | 36.0                    | 46.0           | -10.0       | 183   | 2.55  |
| 957.3600        | 4.61            | 24.26                 | 5.3                 | 34.2                    | 46.0           | -11.8       | 222   | 3.87  |

**NOTE :**

1. Measurement uncertainty is ±4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH        |
| Frequency Range:   | 30 – 1000 MHz | Measured Distance: | 3m            |
| Receiver Detector: | Q.P.          | Tested Mode:       | 11b_CH11      |
| Tested By:         | Jeff Lo       | Tested Date:       | May. 10, 2012 |

## Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 219.6600        | 2.00            | 13.10                 | 24.2                | 39.3                    | 46.0           | -6.7        | 136   | 3.41  |
| 254.5900        | 2.20            | 13.28                 | 27.1                | 42.6                    | 46.0           | -3.4        | 24    | 3.31  |
| 263.8600        | 2.23            | 13.37                 | 24.2                | 39.8                    | 46.0           | -6.2        | 263   | 3.28  |
| 317.0300        | 2.47            | 14.31                 | 21.7                | 38.5                    | 46.0           | -7.5        | 111   | 3.11  |
| 355.3800        | 2.62            | 15.22                 | 18.8                | 36.6                    | 46.0           | -9.4        | 259   | 2.99  |
| 377.7100        | 2.71            | 15.75                 | 16.6                | 35.1                    | 46.0           | -10.9       | 17    | 2.92  |

## Antenna Polarization:Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 283.0800        | 2.33            | 13.23                 | 18.2                | 33.8                    | 46.0           | -12.2       | 38    | 1.78  |
| 317.0600        | 2.47            | 14.31                 | 18.2                | 35.0                    | 46.0           | -11.0       | 179   | 1.89  |
| 477.1600        | 3.11            | 17.68                 | 14.8                | 35.6                    | 46.0           | -10.4       | 248   | 2.38  |
| 497.9800        | 3.19            | 17.96                 | 13.2                | 34.3                    | 46.0           | -11.7       | 179   | 2.45  |
| 530.3400        | 3.32            | 18.36                 | 14.0                | 35.7                    | 46.0           | -10.3       | 182   | 2.55  |
| 957.2300        | 4.61            | 24.26                 | 6.3                 | 35.2                    | 46.0           | -10.8       | 41    | 3.87  |

### NOTE :

1. Measurement uncertainty is ±4.73dB.
2. "\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.





# TEST REPORT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH        |
| Frequency Range:   | 30 – 1000 MHz | Measured Distance: | 3m            |
| Receiver Detector: | Q.P.          | Tested Mode:       | 11g_CH1       |
| Tested By:         | Jeff Lo       | Tested Date:       | May. 10, 2012 |

## Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 212.7200        | 2.00            | 12.40                 | 19.4                | 33.8                    | 43.5           | -9.7        | 355   | 3.43  |
| 282.9100        | 2.32            | 13.22                 | 24.1                | 39.6                    | 46.0           | -6.4        | 238   | 3.22  |
| 301.1500        | 2.40            | 13.92                 | 21.8                | 38.1                    | 46.0           | -7.9        | 211   | 3.16  |
| 497.4600        | 3.19            | 17.96                 | 20.6                | 41.7                    | 46.0           | -4.3        | 86    | 2.55  |
| 530.3400        | 3.32            | 18.36                 | 19.4                | 41.1                    | 46.0           | -4.9        | 188   | 2.45  |
| 931.1400        | 4.56            | 23.78                 | 7.6                 | 35.9                    | 46.0           | -10.1       | 119   | 1.21  |

## Antenna Polarization: Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 264.5600        | 2.24            | 13.36                 | 18.3                | 33.9                    | 46.0           | -12.1       | 77    | 1.73  |
| 497.4800        | 3.19            | 17.96                 | 14.3                | 35.4                    | 46.0           | -10.6       | 159   | 2.45  |
| 530.3700        | 3.32            | 18.36                 | 14.2                | 35.9                    | 46.0           | -10.1       | 183   | 2.55  |
| 699.1200        | 3.80            | 20.69                 | 9.4                 | 33.9                    | 46.0           | -12.1       | 291   | 3.07  |
| 747.1700        | 3.89            | 21.83                 | 7.7                 | 33.4                    | 46.0           | -12.6       | 293   | 3.22  |
| 931.1800        | 4.56            | 23.78                 | 9.1                 | 37.4                    | 46.0           | -8.6        | 241   | 3.79  |

### NOTE :

1. Measurement uncertainty is ±4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



**Spectrum Research  
& Testing Lab., Inc.**  
No.167,Ln. 780, Shan-Tong  
Rd.,Ling 8, Shan-Tong Li,  
Chung-Li City, Taoyuan County  
320, Taiwan (R.O.C.)

# TEST REPORT

Reference No.: A12040901  
Report No.: FCCA12040901  
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Date: May. 18, 2012

|                    |                      |                    |                      |
|--------------------|----------------------|--------------------|----------------------|
| Temperature:       | <u>23 °C</u>         | Humidity:          | <u>57 %RH</u>        |
| Frequency Range:   | <u>30 – 1000 MHz</u> | Measured Distance: | <u>3m</u>            |
| Receiver Detector: | <u>Q.P.</u>          | Tested Mode:       | <u>11g_CH7</u>       |
| Tested By:         | <u>Jeff Lo</u>       | Tested Date:       | <u>May. 10, 2012</u> |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 203.4500        | 1.93            | 11.92                 | 22.8                | 36.7                    | 43.5           | -6.9        | 155   | 3.46  |
| 275.3200        | 2.30            | 13.25                 | 21.4                | 37.0                    | 46.0           | -9.1        | 244   | 3.24  |
| 301.1500        | 2.40            | 13.92                 | 21.7                | 38.0                    | 46.0           | -8.0        | 159   | 3.16  |
| 497.2300        | 3.19            | 17.96                 | 17.9                | 39.0                    | 46.0           | -7.0        | 38    | 2.55  |
| 530.4400        | 3.32            | 18.36                 | 16.5                | 38.2                    | 46.0           | -7.8        | 111   | 2.45  |
| 699.1200        | 3.80            | 20.69                 | 10.9                | 35.4                    | 46.0           | -10.6       | 222   | 1.93  |

Antenna Polarization:Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 263.4800        | 2.23            | 13.37                 | 22.0                | 37.6                    | 46.0           | -8.4        | 242   | 1.72  |
| 497.2500        | 3.19            | 17.96                 | 14.2                | 35.3                    | 46.0           | -10.7       | 321   | 2.45  |
| 530.4700        | 3.32            | 18.36                 | 14.3                | 36.0                    | 46.0           | -10.0       | 25    | 2.55  |
| 699.1500        | 3.80            | 20.69                 | 10.9                | 35.4                    | 46.0           | -10.6       | 74    | 3.07  |
| 747.1700        | 3.89            | 21.83                 | 9.7                 | 35.4                    | 46.0           | -10.6       | 36    | 3.22  |
| 931.4400        | 4.56            | 23.78                 | 8.9                 | 37.2                    | 46.0           | -8.8        | 198   | 3.79  |

**NOTE :**

1. Measurement uncertainty is ±4.73dB.
2. "\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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& Testing Lab., Inc.**  
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Rd.,Ling 8, Shan-Tong Li,  
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# TEST REPORT

Reference No.: A12040901  
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|                    |                      |                    |                      |
|--------------------|----------------------|--------------------|----------------------|
| Temperature:       | <u>23 °C</u>         | Humidity:          | <u>57 %RH</u>        |
| Frequency Range:   | <u>30 – 1000 MHz</u> | Measured Distance: | <u>3m</u>            |
| Receiver Detector: | <u>Q.P.</u>          | Tested Mode:       | <u>11g_CH11</u>      |
| Tested By:         | <u>Jeff Lo</u>       | Tested Date:       | <u>May. 10, 2012</u> |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 72.4400         | 1.22            | 8.04                  | 20.3                | 29.6                    | 40.0           | -10.4       | 124   | 3.87  |
| 269.5500        | 2.29            | 13.31                 | 21.8                | 37.4                    | 46.0           | -8.6        | 133   | 3.26  |
| 279.6400        | 2.30            | 13.21                 | 23.0                | 38.5                    | 46.0           | -7.5        | 255   | 3.23  |
| 289.7800        | 2.39            | 13.29                 | 23.9                | 39.6                    | 46.0           | -6.4        | 165   | 3.20  |
| 497.2300        | 3.19            | 17.96                 | 18.1                | 39.2                    | 46.0           | -6.8        | 23    | 2.55  |
| 530.2400        | 3.32            | 18.36                 | 18.4                | 40.1                    | 46.0           | -5.9        | 14    | 2.45  |

Antenna Polarization:Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 497.2500        | 3.19            | 17.96                 | 14.6                | 35.7                    | 46.0           | -10.3       | 188   | 2.45  |
| 530.2600        | 3.32            | 18.36                 | 13.4                | 35.1                    | 46.0           | -10.9       | 147   | 2.55  |
| 664.2900        | 3.73            | 20.41                 | 9.1                 | 33.2                    | 46.0           | -12.8       | 36    | 2.96  |
| 699.8700        | 3.80            | 20.69                 | 11.0                | 35.5                    | 46.0           | -10.5       | 325   | 3.07  |
| 747.7700        | 3.89            | 21.83                 | 8.3                 | 34.0                    | 46.0           | -12.0       | 31    | 3.22  |
| 931.1400        | 4.56            | 23.78                 | 9.1                 | 37.4                    | 46.0           | -8.6        | 220   | 3.79  |

**NOTE :**

1. Measurement uncertainty is ±4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH        |
| Frequency Range:   | 30 – 1000 MHz | Measured Distance: | 3m            |
| Receiver Detector: | Q.P.          | Tested Mode:       | 11n_CH5       |
| Tested By:         | Jeff Lo       | Tested Date:       | May. 10, 2012 |

## Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 72.9500         | 1.22            | 8.04                  | 21.5                | 30.8                    | 40.0           | -9.2        | 350   | 3.87  |
| 274.5300        | 2.30            | 13.26                 | 24.2                | 39.8                    | 46.0           | -6.2        | 274   | 3.24  |
| 497.3800        | 3.19            | 17.96                 | 20.4                | 41.5                    | 46.0           | -4.5        | 186   | 2.55  |
| 530.3400        | 3.32            | 18.36                 | 20.6                | 42.3                    | 46.0           | -3.7        | 189   | 2.45  |
| 786.1500        | 4.04            | 22.04                 | 9.2                 | 35.3                    | 46.0           | -10.7       | 108   | 1.66  |
| 931.9300        | 4.56            | 23.78                 | 8.9                 | 37.2                    | 46.0           | -8.8        | 121   | 1.21  |

## Antenna Polarization:Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 31.5800         | 0.91            | 23.50                 | 9.7                 | 34.1                    | 40.0           | -5.9        | 30    | 1.00  |
| 44.6400         | 1.04            | 16.96                 | 16.2                | 34.2                    | 40.0           | -5.8        | 43    | 1.05  |
| 73.6500         | 1.23            | 8.06                  | 24.3                | 33.6                    | 40.0           | -6.4        | 63    | 1.14  |
| 409.1200        | 2.84            | 16.48                 | 17.3                | 36.6                    | 46.0           | -9.4        | 175   | 2.17  |
| 699.4800        | 3.80            | 20.69                 | 11.7                | 36.2                    | 46.0           | -9.8        | 293   | 3.07  |
| 931.9100        | 4.56            | 23.78                 | 7.8                 | 36.1                    | 46.0           | -9.9        | 141   | 3.79  |

### NOTE :

1. Measurement uncertainty is ±4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH        |
| Frequency Range:   | 30 – 1000 MHz | Measured Distance: | 3m            |
| Receiver Detector: | Q.P.          | Tested Mode:       | 11n_CH8       |
| Tested By:         | Jeff Lo       | Tested Date:       | May. 10, 2012 |

## Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 212.7200        | 2.00            | 12.40                 | 19.5                | 33.9                    | 43.5           | -9.6        | 159   | 3.43  |
| 274.5300        | 2.30            | 13.26                 | 24.4                | 40.0                    | 46.0           | -6.0        | 133   | 3.24  |
| 497.5900        | 3.19            | 17.96                 | 19.2                | 40.3                    | 46.0           | -5.7        | 249   | 2.55  |
| 530.3800        | 3.32            | 18.36                 | 19.1                | 40.8                    | 46.0           | -5.2        | 15    | 2.45  |
| 552.4700        | 3.40            | 18.64                 | 14.1                | 36.1                    | 46.0           | -9.9        | 244   | 2.38  |
| 931.6900        | 4.56            | 23.78                 | 9.8                 | 38.1                    | 46.0           | -7.9        | 122   | 1.21  |

## Antenna Polarization: Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 44.4600         | 1.04            | 16.96                 | 15.6                | 33.6                    | 40.0           | -6.4        | 43    | 1.04  |
| 77.4400         | 1.27            | 8.14                  | 22.4                | 31.8                    | 40.0           | -8.2        | 61    | 1.15  |
| 477.0800        | 3.11            | 17.68                 | 15.1                | 35.9                    | 46.0           | -10.1       | 179   | 2.38  |
| 699.1200        | 3.80            | 20.69                 | 10.2                | 34.7                    | 46.0           | -11.3       | 292   | 3.07  |
| 747.1700        | 3.89            | 21.83                 | 10.3                | 36.0                    | 46.0           | -10.0       | 295   | 3.22  |
| 931.3400        | 4.56            | 23.78                 | 8.0                 | 36.3                    | 46.0           | -9.7        | 247   | 3.79  |

### NOTE :

1. Measurement uncertainty is  $\pm 4.73$ dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



**Spectrum Research  
& Testing Lab., Inc.**  
No.167,Ln. 780, Shan-Tong  
Rd.,Ling 8, Shan-Tong Li,  
Chung-Li City, Taoyuan County  
320, Taiwan (R.O.C.)

# TEST REPORT

Reference No.: A12040901  
Report No.: FCCA12040901  
FCC ID: JY8DW09  
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Date: May. 18, 2012

|                    |                      |                    |                      |
|--------------------|----------------------|--------------------|----------------------|
| Temperature:       | <u>23 °C</u>         | Humidity:          | <u>57 %RH</u>        |
| Frequency Range:   | <u>30 – 1000 MHz</u> | Measured Distance: | <u>3m</u>            |
| Receiver Detector: | <u>Q.P.</u>          | Tested Mode:       | <u>11n_CH11</u>      |
| Tested By:         | <u>Jeff Lo</u>       | Tested Date:       | <u>May. 10, 2012</u> |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 116.2400        | 1.50            | 11.54                 | 20.6                | 33.6                    | 43.5           | -9.9        | 349   | 3.73  |
| 277.2600        | 2.30            | 13.23                 | 24.6                | 40.1                    | 46.0           | -5.9        | 111   | 3.24  |
| 301.1500        | 2.40            | 13.92                 | 22.1                | 38.4                    | 46.0           | -7.6        | 274   | 3.16  |
| 497.7400        | 3.19            | 17.96                 | 20.6                | 41.7                    | 46.0           | -4.3        | 186   | 2.55  |
| 530.4900        | 3.32            | 18.36                 | 20.0                | 41.7                    | 46.0           | -4.3        | 188   | 2.45  |
| 931.4700        | 4.56            | 23.78                 | 8.3                 | 36.6                    | 46.0           | -9.4        | 120   | 1.21  |

Antenna Polarization:Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 44.4600         | 1.04            | 16.96                 | 15.5                | 33.5                    | 40.0           | -6.5        | 43    | 1.04  |
| 78.4900         | 1.28            | 8.16                  | 21.4                | 30.8                    | 40.0           | -9.2        | 60    | 1.15  |
| 497.7600        | 3.19            | 17.96                 | 14.3                | 35.4                    | 46.0           | -10.6       | 180   | 2.45  |
| 529.1300        | 3.32            | 18.35                 | 13.7                | 35.4                    | 46.0           | -10.6       | 181   | 2.54  |
| 551.7700        | 3.40            | 18.62                 | 19.8                | 41.8                    | 46.0           | -4.2        | 290   | 2.61  |
| 995.4400        | 4.69            | 24.56                 | 11.1                | 40.4                    | 54.0           | -13.7       | 248   | 3.99  |

**NOTE :**

1. Measurement uncertainty is ±4.73dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

|                    |               |                    |          |
|--------------------|---------------|--------------------|----------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH   |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m       |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11b      |
| Tested By:         | Jeff Lo       | Tested Channel:    | 2412 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | QPSK     |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBμV) |      | Emission Level (dBμV/m) |      | Limit (dBμV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2412.00         | -33.88              | 28.11              | 91.4                | 80.1 | 85.6                    | 74.3 | 114            | 94.0 | -28.4       | -19.7 | 159    | 2.13   |
| 2595.77         | -33.84              | 28.64              | 47.9                | 37.4 | 42.7                    | 32.2 | 74.0           | 54.0 | -31.3       | -21.8 | 295    | 2.02   |
| 3955.43         | -33.18              | 32.28              | 44.1                | 33.8 | 43.2                    | 32.9 | 74.0           | 54.0 | -30.8       | -21.1 | 176    | 1.83   |
| 4997.62         | -32.79              | 33.39              | 40.8                | 30.2 | 41.4                    | 30.8 | 74.0           | 54.0 | -32.6       | -23.2 | 70     | 1.79   |
| 7236.00         | -32.70              | 35.81              | 32.4                | 21.7 | 35.5                    | 24.8 | 74.0           | 54.0 | -38.5       | -29.2 | 35     | 1.67   |
| 9648.00         | -33.19              | 38.09              | 33.7                | 22.4 | 38.6                    | 27.3 | 74.0           | 54.0 | -35.4       | -26.7 | 9      | 1.55   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBμV) |      | Emission Level (dBμV/m) |      | Limit (dBμV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2412.00         | -33.88              | 28.11              | 94.5                | 83.4 | 88.7                    | 77.6 | 114            | 94.0 | -25.3       | -16.4 | 251    | 1.33   |
| 1200.38         | -35.26              | 24.68              | 56.7                | 45.9 | 46.1                    | 35.3 | 74.0           | 54.0 | -27.9       | -18.7 | 133    | 1.06   |
| 1400.59         | -34.79              | 25.16              | 58.3                | 47.3 | 48.6                    | 37.7 | 74.0           | 54.0 | -25.4       | -16.3 | 131    | 1.12   |
| 1795.88         | -34.22              | 26.46              | 58.5                | 46.5 | 50.7                    | 38.7 | 74.0           | 54.0 | -23.3       | -15.3 | 126    | 1.24   |
| 7236.00         | -32.70              | 35.81              | 32.4                | 22.7 | 35.5                    | 25.8 | 74.0           | 54.0 | -38.5       | -28.2 | 325    | 2.87   |
| 9648.00         | -33.19              | 38.09              | 33.7                | 20.9 | 38.6                    | 25.8 | 74.0           | 54.0 | -35.4       | -28.2 | 299    | 3.59   |

**NOTE :**

1. Measurement uncertainty is ±3.7dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

|                    |               |                    |                |
|--------------------|---------------|--------------------|----------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH         |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m             |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11b            |
| Tested By:         | Jeff Lo       | Tested Channel:    | CH7 : 2442 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | QPSK           |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2442.00         | -33.87              | 28.17              | 93.9                | 82.7 | 88.2                    | 77.0 | 114            | 94.0 | -25.8       | -17.0 | 315    | 2.37   |
| 4315.44         | -33.00              | 32.46              | 42.8                | 31.3 | 42.2                    | 30.8 | 74.0           | 54.0 | -31.8       | -23.2 | 244    | 2.14   |
| 5435.69         | -32.64              | 33.75              | 41.4                | 30.4 | 42.5                    | 31.5 | 74.0           | 54.0 | -31.5       | -22.5 | 313    | 2.03   |
| 5715.86         | -32.63              | 33.89              | 41.3                | 29.9 | 42.5                    | 31.2 | 74.0           | 54.0 | -31.5       | -22.8 | 25     | 1.98   |
| 7326.00         | -32.72              | 36.05              | 32.9                | 21.3 | 36.3                    | 24.6 | 74.0           | 54.0 | -37.7       | -29.4 | 94     | 1.77   |
| 9768.00         | -33.19              | 38.16              | 33.9                | 22.7 | 38.8                    | 27.7 | 74.0           | 54.0 | -35.2       | -26.3 | 259    | 1.64   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2442.00         | -33.87              | 28.17              | 86.1                | 75.1 | 80.4                    | 69.4 | 114            | 94.0 | -33.6       | -24.6 | 144    | 1.56   |
| 1203.69         | -35.25              | 24.69              | 58.5                | 48.8 | 47.9                    | 38.2 | 74.0           | 54.0 | -26.1       | -15.8 | 21     | 1.33   |
| 1402.31         | -34.79              | 25.16              | 57.1                | 46.4 | 47.5                    | 36.8 | 74.0           | 54.0 | -26.5       | -17.2 | 148    | 1.37   |
| 1795.44         | -34.22              | 26.46              | 57.5                | 45.7 | 49.7                    | 37.9 | 74.0           | 54.0 | -24.3       | -16.1 | 351    | 1.56   |
| 7326.00         | -32.72              | 36.05              | 32.9                | 20.6 | 36.3                    | 23.9 | 74.0           | 54.0 | -37.7       | -30.1 | 222    | 2.43   |
| 9768.00         | -33.19              | 38.16              | 33.9                | 21.4 | 38.8                    | 26.4 | 74.0           | 54.0 | -35.2       | -27.6 | 33     | 2.73   |

**NOTE :**

1. Measurement uncertainty is ±3.7dB.
2. "F": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.





# TEST REPORT

|                    |               |                    |                 |
|--------------------|---------------|--------------------|-----------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH          |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m              |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11b             |
| Tested By:         | Jeff Lo       | Tested Channel:    | CH11 : 2462 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | QPSK            |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2462.00         | -33.87              | 28.22              | 94.6                | 83.2 | 89.0                    | 77.5 | 114            | 94.0 | -25.0       | -16.5 | 314    | 2.34   |
| 4910.37         | -32.81              | 33.24              | 42.6                | 30.3 | 43.0                    | 30.7 | 74.0           | 54.0 | -31.0       | -23.3 | 222    | 2.21   |
| 4997.64         | -32.79              | 33.39              | 41.5                | 30.9 | 42.1                    | 31.5 | 74.0           | 54.0 | -31.9       | -22.5 | 147    | 2.13   |
| 5445.11         | -32.64              | 33.76              | 41.8                | 31.3 | 42.9                    | 32.4 | 74.0           | 54.0 | -31.1       | -21.6 | 159    | 2.09   |
| 7386.00         | -32.74              | 36.20              | 33.2                | 22.2 | 36.7                    | 25.7 | 74.0           | 54.0 | -37.3       | -28.3 | 21     | 1.89   |
| 9848.00         | -33.19              | 38.21              | 34.2                | 23.4 | 39.2                    | 28.4 | 74.0           | 54.0 | -34.8       | -25.6 | 13     | 1.71   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2462.00         | -33.87              | 28.22              | 97.7                | 85.5 | 92.0                    | 79.8 | 114            | 94.0 | -22.0       | -14.2 | 258    | 1.66   |
| 1110.27         | -35.46              | 24.46              | 57.0                | 46.3 | 46.0                    | 35.3 | 74.0           | 54.0 | -28.0       | -18.7 | 149    | 1.14   |
| 1402.41         | -34.79              | 25.16              | 57.8                | 45.1 | 48.2                    | 35.5 | 74.0           | 54.0 | -25.8       | -18.5 | 25     | 1.29   |
| 1795.22         | -34.22              | 26.46              | 57.8                | 44.9 | 50.0                    | 37.1 | 74.0           | 54.0 | -24.0       | -16.9 | 36     | 1.37   |
| 7386.00         | -32.74              | 36.20              | 33.2                | 23.4 | 36.7                    | 26.9 | 74.0           | 54.0 | -37.3       | -27.1 | 351    | 1.59   |
| 9848.00         | -33.19              | 38.21              | 34.2                | 22.8 | 39.2                    | 27.8 | 74.0           | 54.0 | -34.8       | -26.2 | 265    | 1.88   |

### NOTE :

1. Measurement uncertainty is  $\pm 3.7$ dB.
2. "\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

|                    |               |                    |              |
|--------------------|---------------|--------------------|--------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH       |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m           |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11g          |
| Tested By:         | Jeff Lo       | Tested Channel:    | CH1:2412 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | OFDM         |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2412.00         | -33.88              | 28.11              | 98.3                | 86.5 | 92.5                    | 80.7 | 114            | 94.0 | -21.5       | -13.3 | 104    | 2.33   |
| 1195.48         | -35.27              | 24.67              | 53.7                | 44.3 | 43.1                    | 33.7 | 74.0           | 54.0 | -30.9       | -20.3 | 11     | 2.45   |
| 1750.99         | -34.27              | 26.30              | 51.1                | 40.1 | 43.1                    | 32.1 | 74.0           | 54.0 | -30.9       | -21.9 | 231    | 2.29   |
| 5585.24         | -32.62              | 33.83              | 43.0                | 33.9 | 44.2                    | 35.1 | 74.0           | 54.0 | -29.8       | -18.9 | 45     | 2.16   |
| 7236.00         | -32.70              | 35.81              | 32.4                | 20.4 | 35.5                    | 23.5 | 74.0           | 54.0 | -38.5       | -30.5 | 351    | 2.04   |
| 9648.00         | -33.19              | 38.09              | 33.7                | 23.5 | 38.6                    | 28.4 | 74.0           | 54.0 | -35.4       | -25.6 | 63     | 1.91   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2412.00         | -33.88              | 28.11              | 94.7                | 83.7 | 88.9                    | 77.9 | 114            | 94.0 | -25.1       | -16.1 | 244    | 1.59   |
| 1400.11         | -34.79              | 25.16              | 57.3                | 46.9 | 47.6                    | 37.3 | 74.0           | 54.0 | -26.4       | -16.7 | 157    | 1.34   |
| 1795.56         | -34.22              | 26.46              | 57.4                | 46.1 | 49.7                    | 38.3 | 74.0           | 54.0 | -24.3       | -15.7 | 263    | 1.43   |
| 5385.97         | -32.66              | 33.71              | 42.4                | 32.2 | 43.4                    | 33.2 | 74.0           | 54.0 | -30.6       | -20.8 | 355    | 1.78   |
| 7236.00         | -32.70              | 35.81              | 32.4                | 21.0 | 35.5                    | 24.1 | 74.0           | 54.0 | -38.5       | -29.9 | 109    | 1.84   |
| 9648.00         | -33.19              | 38.09              | 33.7                | 23.4 | 38.6                    | 28.3 | 74.0           | 54.0 | -35.4       | -25.7 | 14     | 1.91   |

**NOTE :**

1. Measurement uncertainty is  $\pm 3.7$ dB.
2. "\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH        |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m            |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11g           |
| Tested By:         | Jeff Lo       | Tested Channel:    | CH7: 2442 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | OFDM          |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2442.00         | -33.87              | 28.17              | 98.4                | 87.4 | 92.7                    | 81.7 | 114            | 94.0 | -21.3       | -12.3 | 128    | 2.31   |
| 1920.37         | -34.07              | 26.91              | 60.2                | 49.9 | 53.0                    | 42.7 | 74.0           | 54.0 | -21.0       | -11.3 | 154    | 2.36   |
| 3580.88         | -33.31              | 31.31              | 45.2                | 35.8 | 43.2                    | 33.8 | 74.0           | 54.0 | -30.8       | -20.2 | 255    | 2.23   |
| 5455.31         | -32.64              | 33.76              | 42.1                | 32.2 | 43.3                    | 33.3 | 74.0           | 54.0 | -30.7       | -20.7 | 36     | 2.19   |
| 7326.00         | -32.72              | 36.05              | 32.9                | 23.1 | 36.3                    | 26.4 | 74.0           | 54.0 | -37.7       | -27.6 | 97     | 2.04   |
| 9768.00         | -33.19              | 38.16              | 33.9                | 22.2 | 38.8                    | 27.2 | 74.0           | 54.0 | -35.2       | -26.8 | 74     | 1.92   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2442.00         | -33.87              | 28.17              | 94.4                | 83.1 | 88.7                    | 77.4 | 114            | 94.0 | -25.3       | -16.6 | 222    | 1.43   |
| 1395.48         | -34.80              | 25.15              | 60.4                | 50.9 | 50.7                    | 41.2 | 74.0           | 54.0 | -23.3       | -12.8 | 149    | 1.36   |
| 4895.63         | -32.82              | 33.21              | 48.3                | 38.4 | 48.7                    | 38.8 | 74.0           | 54.0 | -25.3       | -15.2 | 254    | 1.54   |
| 5320.95         | -32.68              | 33.66              | 43.0                | 32.2 | 44.0                    | 33.2 | 74.0           | 54.0 | -30.0       | -20.8 | 305    | 1.67   |
| 7326.00         | -32.72              | 36.05              | 32.9                | 23.1 | 36.3                    | 26.4 | 74.0           | 54.0 | -37.7       | -27.6 | 106    | 1.81   |
| 9768.00         | -33.19              | 38.16              | 33.9                | 22.7 | 38.8                    | 27.7 | 74.0           | 54.0 | -35.2       | -26.3 | 35     | 1.97   |

**NOTE :**

1. Measurement uncertainty is  $\pm 3.7$ dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

|                    |               |                    |                |
|--------------------|---------------|--------------------|----------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH         |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m             |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11g            |
| Tested By:         | Jeff Lo       | Tested Channel:    | CH11: 2462 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | OFDM           |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2462.00         | -33.87              | 28.22              | 92.3                | 82.1 | 86.7                    | 76.5 | 114            | 94.0 | -27.3       | -17.5 | 12     | 2.33   |
| 4255.63         | -33.03              | 32.45              | 42.7                | 33.3 | 42.1                    | 32.7 | 74.0           | 54.0 | -31.9       | -21.3 | 338    | 2.11   |
| 4997.59         | -32.79              | 33.39              | 41.1                | 30.4 | 41.7                    | 31.0 | 74.0           | 54.0 | -32.3       | -23.0 | 159    | 2.09   |
| 5453.89         | -32.64              | 33.76              | 41.4                | 32.8 | 42.5                    | 33.9 | 74.0           | 54.0 | -31.5       | -20.1 | 148    | 2.03   |
| 7386.00         | -32.74              | 36.20              | 33.2                | 20.9 | 36.7                    | 24.4 | 74.0           | 54.0 | -37.3       | -29.6 | 256    | 1.97   |
| 9848.00         | -33.19              | 38.21              | 34.2                | 23.1 | 39.2                    | 28.1 | 74.0           | 54.0 | -34.8       | -25.9 | 36     | 1.81   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2462.00         | -33.87              | 28.22              | 99.3                | 87.4 | 93.6                    | 81.8 | 114            | 94.0 | -20.4       | -12.2 | 111    | 1.62   |
| 1195.48         | -35.27              | 24.67              | 58.3                | 48.2 | 47.7                    | 37.6 | 74.0           | 54.0 | -26.3       | -16.4 | 145    | 1.33   |
| 1401.30         | -34.79              | 25.16              | 57.8                | 45.5 | 48.1                    | 35.9 | 74.0           | 54.0 | -25.9       | -18.1 | 179    | 1.46   |
| 1795.11         | -34.22              | 26.46              | 56.8                | 46.3 | 49.0                    | 38.5 | 74.0           | 54.0 | -25.0       | -15.5 | 197    | 1.55   |
| 7386.00         | -32.74              | 36.20              | 33.2                | 23.2 | 36.7                    | 26.7 | 74.0           | 54.0 | -37.3       | -27.3 | 165    | 1.74   |
| 9848.00         | -33.19              | 38.21              | 34.2                | 24.8 | 39.2                    | 29.8 | 74.0           | 54.0 | -34.8       | -24.2 | 252    | 1.83   |

**NOTE :**

1. Measurement uncertainty is ±3.7dB.
2. "\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH        |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m            |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11n           |
| Tested By:         | Jeff Lo       | Tested Channel:    | CH5: 2422 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | OFDM          |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2422.00         | -33.88              | 28.13              | 95.2                | 84.3 | 89.5                    | 78.5 | 114            | 94.0 | -24.5       | -15.5 | 99     | 2.35   |
| 1755.38         | -34.26              | 26.32              | 53.5                | 42.4 | 45.6                    | 34.5 | 74.0           | 54.0 | -28.4       | -19.5 | 205    | 2.42   |
| 3505.49         | -33.34              | 31.11              | 44.9                | 33.8 | 42.7                    | 31.6 | 74.0           | 54.0 | -31.3       | -22.4 | 138    | 2.29   |
| 5550.58         | -32.62              | 33.82              | 41.6                | 30.9 | 42.8                    | 32.1 | 74.0           | 54.0 | -31.2       | -21.9 | 207    | 2.11   |
| 7266.00         | -32.70              | 35.89              | 34.5                | 23.3 | 37.6                    | 26.5 | 74.0           | 54.0 | -36.4       | -27.5 | 111    | 2.03   |
| 9688.00         | -33.19              | 38.11              | 34.7                | 25.7 | 39.6                    | 30.6 | 74.0           | 54.0 | -34.4       | -23.4 | 35     | 1.96   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2422.00         | -33.88              | 28.13              | 89.7                | 78.1 | 83.9                    | 72.3 | 114            | 94.0 | -30.1       | -21.7 | 269    | 1.56   |
| 1201.44         | -35.25              | 24.68              | 57.6                | 46.3 | 47.0                    | 35.7 | 74.0           | 54.0 | -27.0       | -18.3 | 236    | 1.35   |
| 1401.83         | -34.79              | 25.16              | 60.5                | 50.9 | 50.9                    | 41.3 | 74.0           | 54.0 | -23.1       | -12.7 | 215    | 1.41   |
| 1795.24         | -34.22              | 26.46              | 57.7                | 46.2 | 50.0                    | 38.4 | 74.0           | 54.0 | -24.0       | -15.6 | 317    | 1.44   |
| 7266.00         | -32.70              | 35.89              | 34.5                | 23.8 | 37.6                    | 27.0 | 74.0           | 54.0 | -36.4       | -27.0 | 18     | 1.78   |
| 9688.00         | -33.19              | 38.11              | 34.7                | 22.1 | 39.6                    | 27.0 | 74.0           | 54.0 | -34.4       | -27.0 | 97     | 1.85   |

**NOTE :**

1. Measurement uncertainty is  $\pm 3.7$ dB.
2. "F": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

|                    |               |                    |               |
|--------------------|---------------|--------------------|---------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH        |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m            |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11n           |
| Tested By:         | Jeff Lo       | Tested Channel:    | CH8: 2437 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | OFDM          |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2437.00         | -33.88              | 28.16              | 91.2                | 80.3 | 85.5                    | 74.6 | 114            | 94.0 | -28.5       | -19.4 | 313    | 2.29   |
| 4355.81         | -32.98              | 32.47              | 43.3                | 30.9 | 42.8                    | 30.4 | 74.0           | 54.0 | -31.2       | -23.6 | 244    | 2.24   |
| 4997.63         | -32.79              | 33.39              | 41.0                | 32.4 | 41.6                    | 33.0 | 74.0           | 54.0 | -32.4       | -21.0 | 56     | 2.13   |
| 5505.12         | -32.62              | 33.80              | 41.5                | 30.4 | 42.7                    | 31.6 | 74.0           | 54.0 | -31.3       | -22.4 | 259    | 2.04   |
| 7311.00         | -32.72              | 36.01              | 34.0                | 23.8 | 37.3                    | 27.1 | 74.0           | 54.0 | -36.7       | -26.9 | 138    | 1.99   |
| 9748.00         | -33.19              | 38.15              | 35.5                | 25.6 | 40.5                    | 30.6 | 74.0           | 54.0 | -33.5       | -23.4 | 214    | 1.86   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBµV) |      | Emission Level (dBµV/m) |      | Limit (dBµV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2437.00         | -33.88              | 28.16              | 91.5                | 79.6 | 85.8                    | 73.9 | 114            | 94.0 | -28.2       | -20.1 | 18     | 1.59   |
| 1195.48         | -35.27              | 24.67              | 58.9                | 48.8 | 48.3                    | 38.2 | 74.0           | 54.0 | -25.7       | -15.8 | 249    | 1.23   |
| 1401.73         | -34.79              | 25.16              | 57.9                | 46.2 | 48.3                    | 36.6 | 74.0           | 54.0 | -25.7       | -17.4 | 114    | 1.36   |
| 1795.61         | -34.22              | 26.46              | 57.3                | 46.8 | 49.6                    | 39.0 | 74.0           | 54.0 | -24.4       | -15.0 | 351    | 1.44   |
| 7311.00         | -32.72              | 36.01              | 34.0                | 23.3 | 37.3                    | 26.6 | 74.0           | 54.0 | -36.7       | -27.4 | 259    | 1.63   |
| 9748.00         | -33.19              | 38.15              | 35.5                | 24.7 | 40.5                    | 29.7 | 74.0           | 54.0 | -33.5       | -24.3 | 311    | 1.78   |

**NOTE :**

1. Measurement uncertainty is  $\pm 3.7$ dB.
2. "\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

|                    |               |                    |                |
|--------------------|---------------|--------------------|----------------|
| Temperature:       | 23 °C         | Humidity:          | 57 %RH         |
| Frequency Range:   | 1 – 25 GHz    | Measured Distance: | 3m             |
| Receiver Detector: | PK. or AV.    | Tested Mode:       | 11n            |
| Tested By:         | Jeff Lo       | Tested Channel:    | CH11: 2452 MHz |
| Tested Date:       | May. 10, 2012 | Modulation Type:   | OFDM           |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBμV) |      | Emission Level (dBμV/m) |      | Limit (dBμV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2452.00         | -33.87              | 28.19              | 88.0                | 76.4 | 82.3                    | 70.7 | 114            | 94.0 | -31.7       | -23.3 | 3      | 2.34   |
| 1401.38         | -34.79              | 25.16              | 53.5                | 42.1 | 43.9                    | 32.5 | 74.0           | 54.0 | -30.1       | -21.5 | 258    | 2.42   |
| 4255.74         | -33.03              | 32.45              | 41.9                | 30.3 | 41.3                    | 29.7 | 74.0           | 54.0 | -32.7       | -24.3 | 159    | 2.27   |
| 4997.83         | -32.79              | 33.39              | 41.2                | 31.4 | 41.8                    | 32.0 | 74.0           | 54.0 | -32.2       | -22.0 | 233    | 2.21   |
| 7356.00         | -32.73              | 36.13              | 34.2                | 23.3 | 37.6                    | 26.7 | 74.0           | 54.0 | -36.4       | -27.3 | 24     | 2.03   |
| 9808.00         | -33.19              | 38.18              | 33.5                | 22.7 | 38.5                    | 27.7 | 74.0           | 54.0 | -35.5       | -26.3 | 109    | 1.96   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dBμV) |      | Emission Level (dBμV/m) |      | Limit (dBμV/m) |      | Margin (dB) |       | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------|------|-------------------------|------|----------------|------|-------------|-------|--------|--------|
|                 |                     |                    | PK.                 | AV.  | PK.                     | AV.  | PK.            | AV.  | PK.         | AV.   |        |        |
| 2452.00         | -33.87              | 28.19              | 91.8                | 80.3 | 86.1                    | 74.6 | 114            | 94.0 | -27.9       | -19.4 | 188    | 1.66   |
| 1201.97         | -35.25              | 24.68              | 59.5                | 48.7 | 49.0                    | 38.1 | 74.0           | 54.0 | -25.0       | -15.9 | 234    | 1.31   |
| 1795.66         | -34.22              | 26.46              | 57.0                | 46.5 | 49.2                    | 38.7 | 74.0           | 54.0 | -24.8       | -15.3 | 125    | 1.39   |
| 2490.11         | -33.86              | 28.28              | 53.8                | 43.8 | 48.2                    | 38.2 | 74.0           | 54.0 | -25.8       | -15.8 | 266    | 1.59   |
| 7356.00         | -32.73              | 36.13              | 34.2                | 23.4 | 37.6                    | 26.8 | 74.0           | 54.0 | -36.4       | -27.2 | 147    | 1.77   |
| 9808.00         | -33.19              | 38.18              | 33.5                | 22.7 | 38.5                    | 27.7 | 74.0           | 54.0 | -35.5       | -26.3 | 22     | 1.85   |

**NOTE :**

1. Measurement uncertainty is ±3.7dB.
2. "\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



## 4.3 BANDWIDTH TEST

### 4.3.1 LIMIT

FCC Part15, Subpart C Section 15.247 (a)(2). The minimum 6dB bandwidth shall be at least 500 kHz.

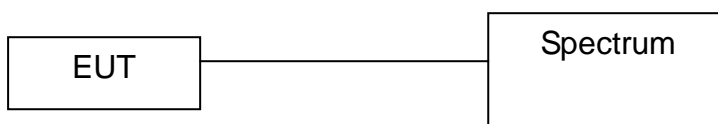
### 4.3.2 TEST EQUIPMENT

The following test equipment was used during the test:

| EQUIPMENT/FACILITIES | SPECIFICATIONS | MANUFACTURER    | MODEL#/SERIAL# | DUE DATE OF CAL. & CAL. CENTER |
|----------------------|----------------|-----------------|----------------|--------------------------------|
| SPECTRUM             | 9kHz-40GHz     | ROHDE & SCHWARZ | FSP40/100093   | Dec. 2012<br>ETC               |
| EMI Test Receiver    | 9kHz-6GHz      | ROHDE & SCHWARZ | ESL/100176     | Mar. 2012<br>R&S               |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.3.3 TEST SET-UP



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

### 4.3.4 TEST PROCEDURE

The EUT was operated in continuous transmission mode on any specific channel. Printed out the test result from the spectrum by hard copy function.

### 4.3.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.





**Spectrum Research & Testing Lab., Inc.**  
 No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

# TEST REPORT

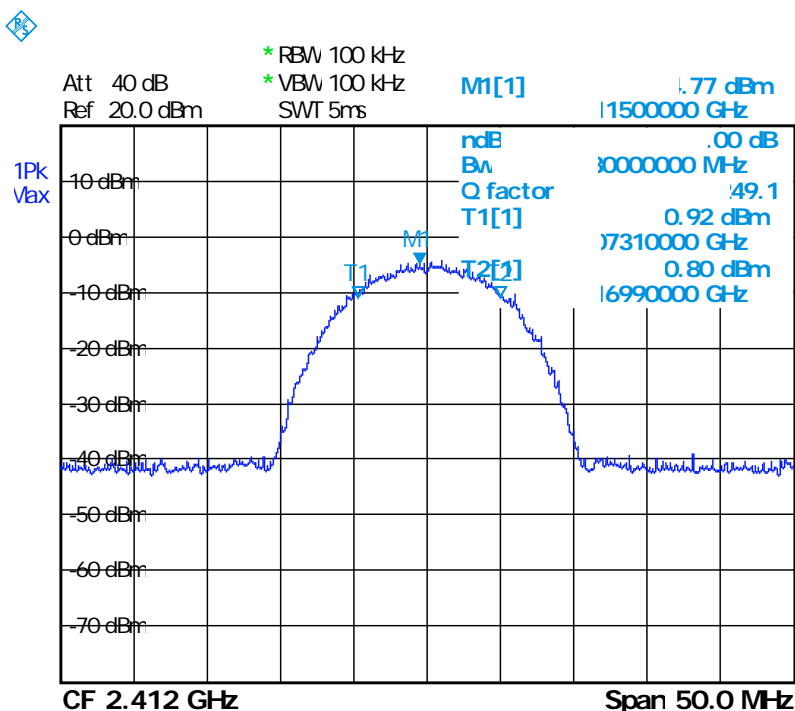
Reference No.: A12040901  
 Report No.: FCCA12040901  
 FCC ID: JY8DW09  
 Page: 45 of 85  
 Date: May. 18, 2012

## 4.3.6 TEST RESULT

|                    |               |                  |         |
|--------------------|---------------|------------------|---------|
| Temperature:       | 22°C          | Humidity:        | 51%RH   |
| Spectrum Detector: | PK.           | Tested Mode:     | 802.11b |
| Tested By:         | Jeff Lo       | Modulation Type: | QPSK    |
| Tested Date:       | May. 14, 2012 |                  |         |

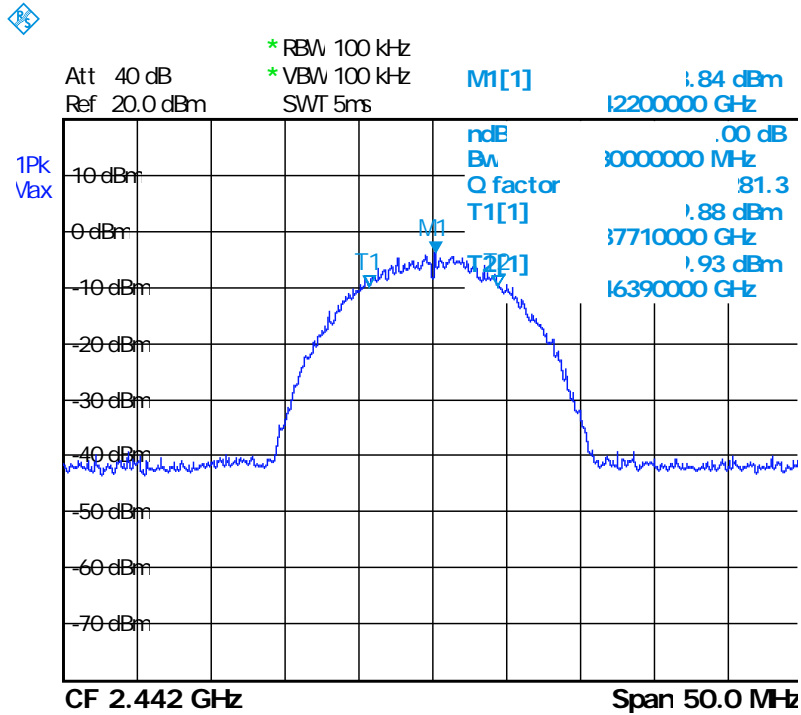
| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz) | 6dB DOWN BW (MHz) | Minimum Limit (MHz) |
|----------------|-------------------------|-------------------|---------------------|
| 1              | 2412                    | 9.68              | 0.5                 |
| 7              | 2442                    | 8.68              | 0.5                 |
| 11             | 2462                    | 10.48             | 0.5                 |

CH1:

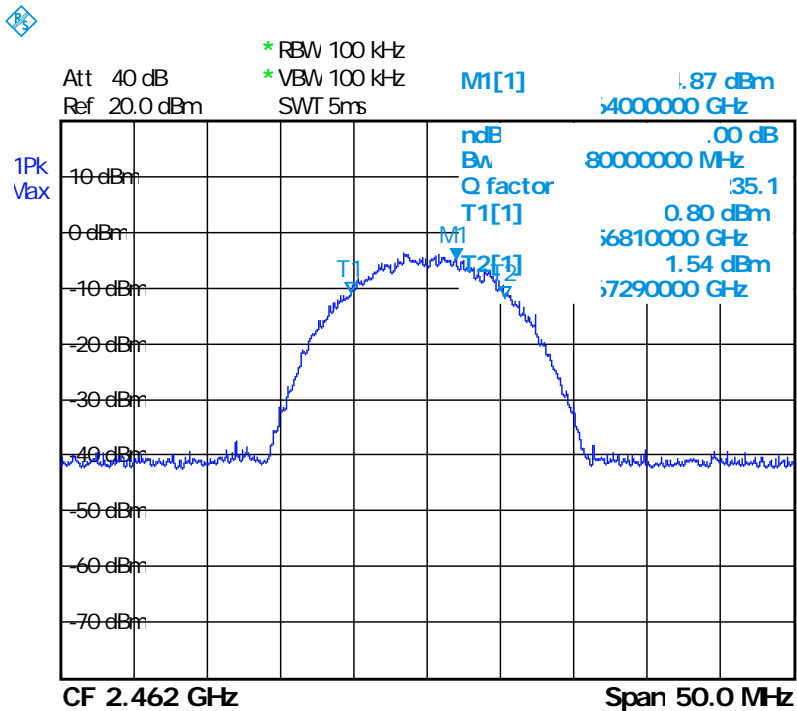




CH 7:



CH 11:





**Spectrum Research & Testing Lab., Inc.**  
 No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

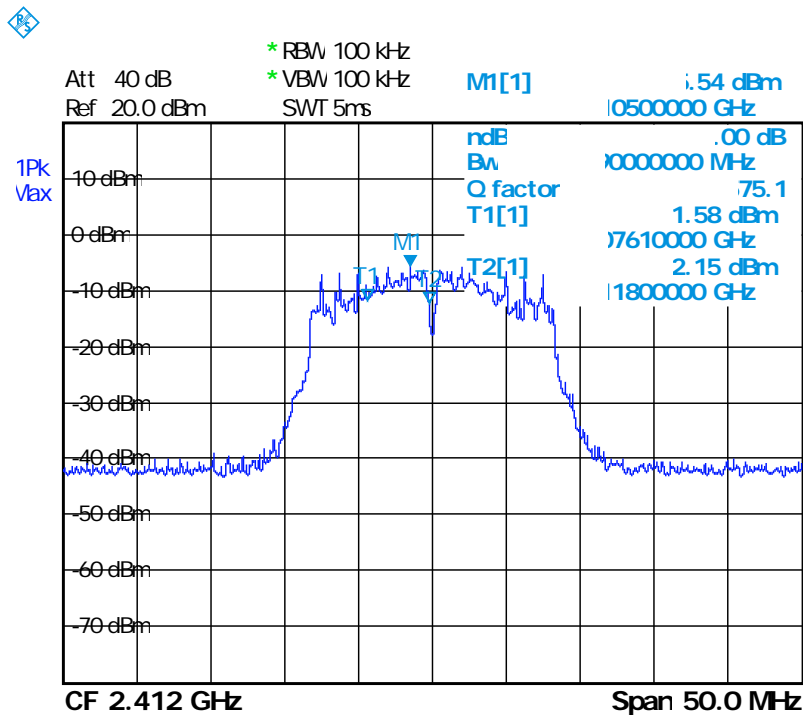
# TEST REPORT

Reference No.: A12040901  
 Report No.: FCCA12040901  
 FCC ID: JY8DW09  
 Page: 47 of 85  
 Date: May. 18, 2012

|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK.</u>           | Tested Mode:     | <u>802.11g</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>64QAM</u>   |
| Tested Date:       | <u>Apr. 03, 2012</u> |                  |                |

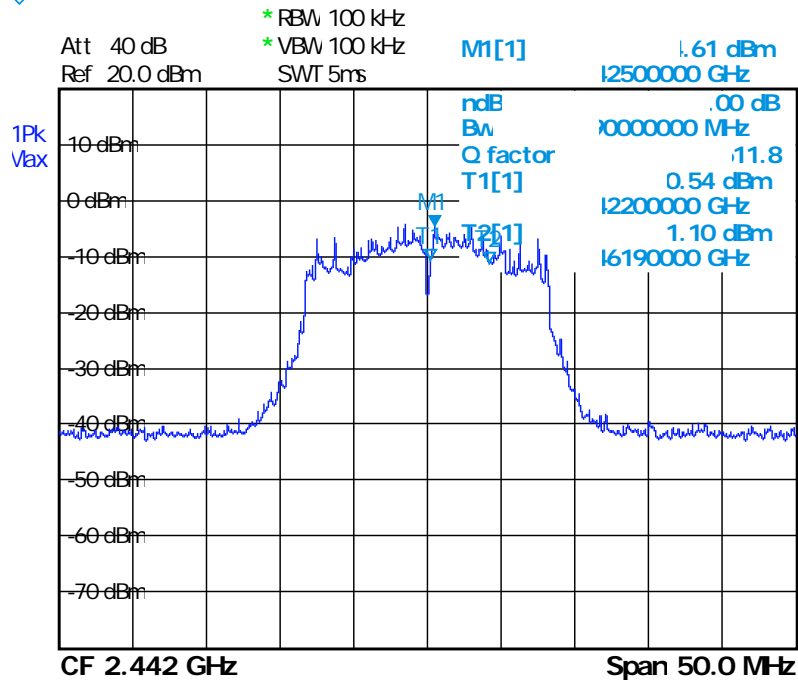
| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz) | 6dB DOWN BW (MHz) | Minimum Limit (MHz) |
|----------------|-------------------------|-------------------|---------------------|
| 1              | 2412                    | 4.19              | 0.5                 |
| 7              | 2442                    | 3.99              | 0.5                 |
| 11             | 2462                    | 2.99              | 0.5                 |

CH1:

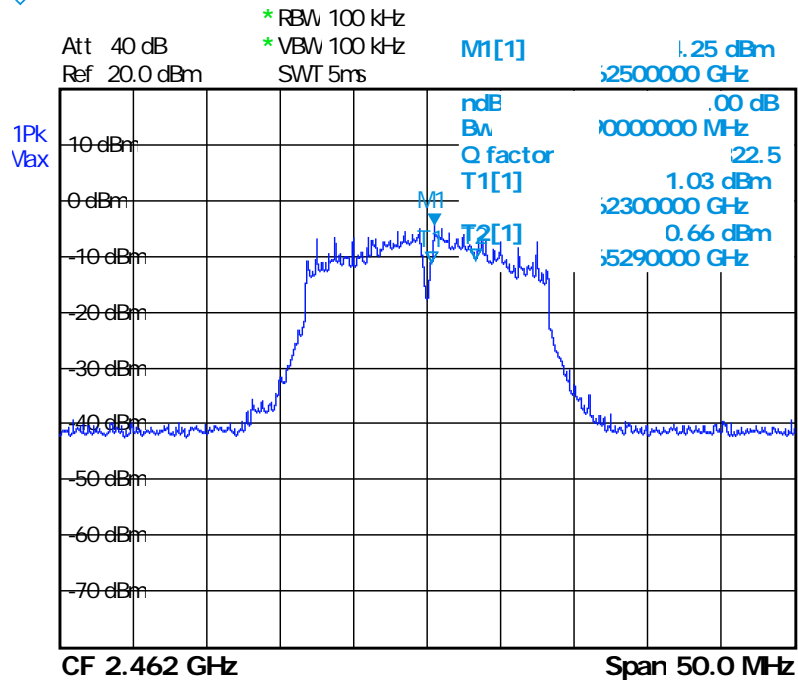




CH 7:



CH 11:





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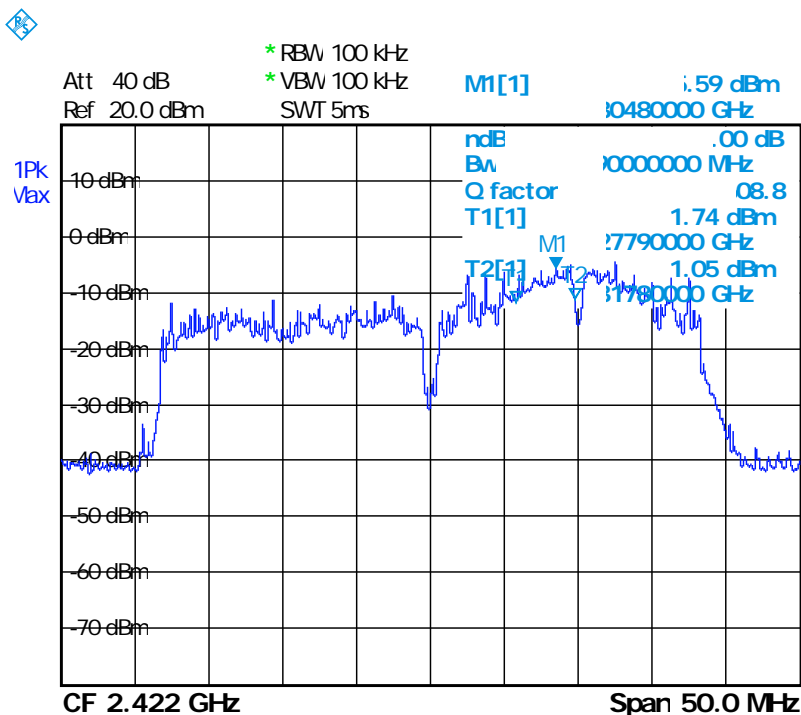
# TEST REPORT

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|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK.</u>           | Tested Mode:     | <u>802.11n</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>64QAM</u>   |
| Tested Date:       | <u>Apr. 03, 2012</u> |                  |                |

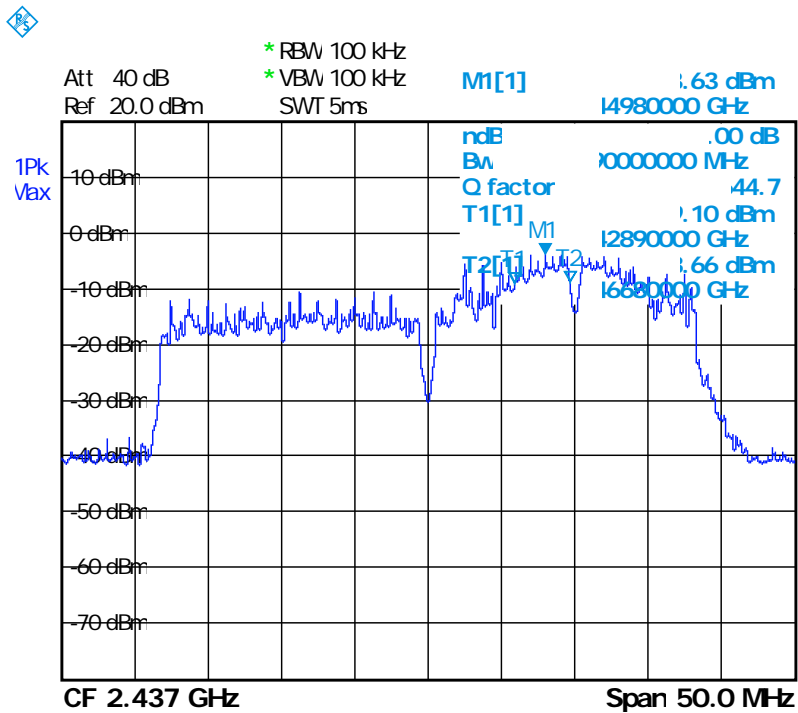
| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz) | 6dB DOWN BW (MHz) | Minimum Limit (MHz) |
|----------------|-------------------------|-------------------|---------------------|
| 5              | 2422                    | 3.99              | 0.5                 |
| 8              | 2437                    | 3.79              | 0.5                 |
| 11             | 2452                    | 2.89              | 0.5                 |

CH5:

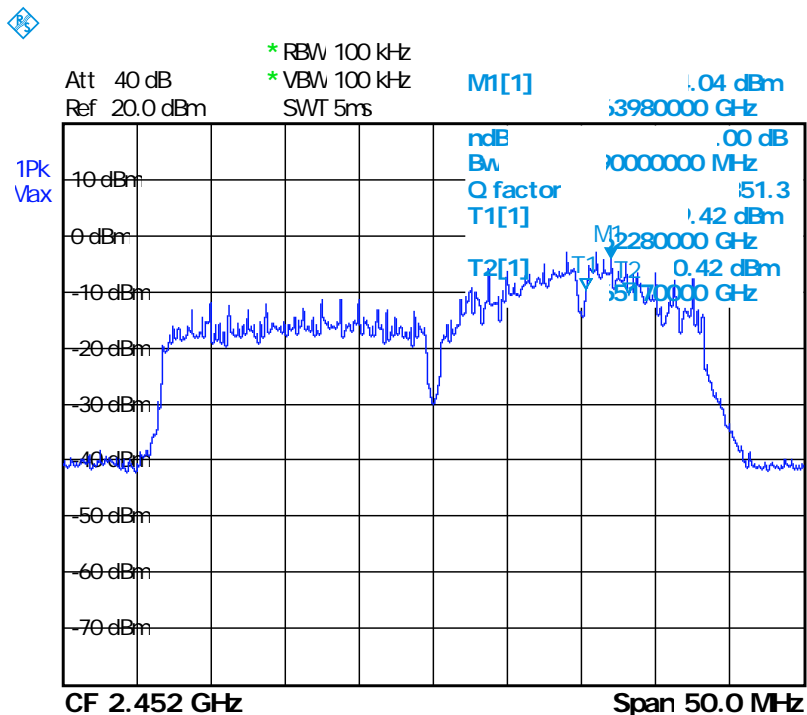




CH8:



CH11:





## 4.4 PEAK POWER TEST

### 4.4.1 LIMIT

FCC Part15, Subpart C Section 15.247(b).

| Frequency Range (MHz) | The maximum (peak) conducted output power Limit(w) |          |              |              |          |
|-----------------------|--|----------|--------------|--------------|----------|
|                       | Quantity of Hopping Channel                        | 50       | 25           | 15           | 75       |
| 902-928               |  | 1(30dBm) | 0.125(21dBm) | NA           | NA       |
| 2400-2483.5           |  | NA       | NA           | 0.125(21dBm) | 1(30dBm) |
| 5725-5850             |  | NA       | NA           | NA           | 1(30dBm) |

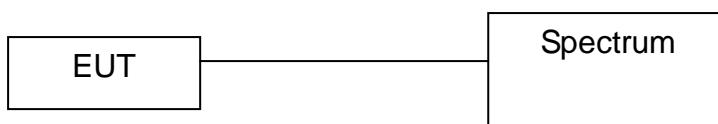
### 4.4.2 TEST EQUIPMENT

The following test equipment was used during the test:

| EQUIPMENT/ FACILITIES | SPECIFICATIONS | MANUFACTURER    | MODEL#/ SERIAL# | DUE DATE OF CAL. & CAL. CENTER |
|-----------------------|----------------|-----------------|-----------------|--------------------------------|
| SPECTRUM              | 9kHz-40GHz     | ROHDE & SCHWARZ | FSP40/ 100093   | Dec. 2012<br>ETC               |
| EMI Test Receiver     | 9kHz-6GHz      | ROHDE & SCHWARZ | ESL/ 100176     | Mar. 2012<br>R&S               |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.4.3 TEST SET-UP



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

### 4.4.4 TEST PROCEDURE

The EUT was operating in continuous transmission mode or could control its channel. Printed out the test result from the spectrum by hard copy function.

### 4.4.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

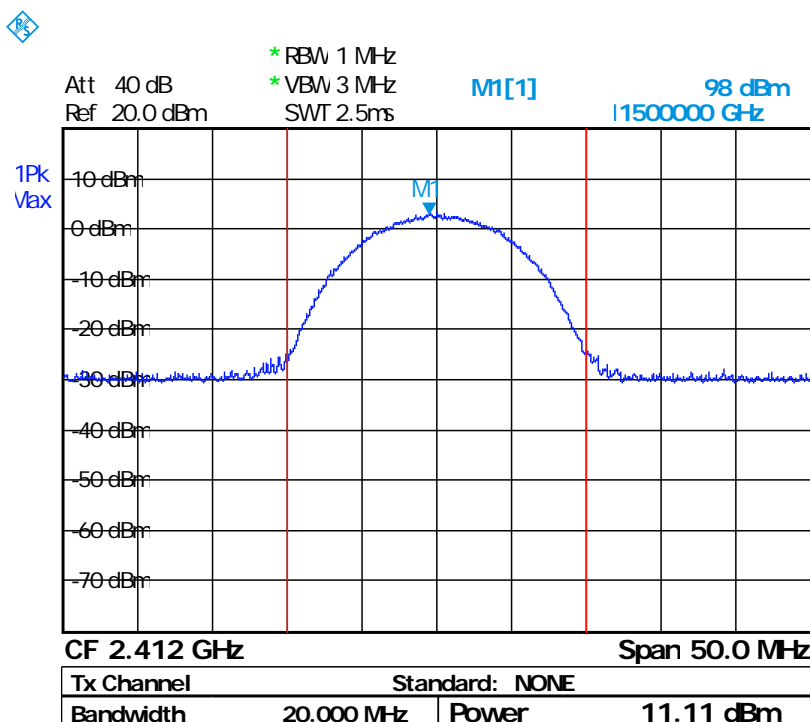


## 4.4.6 TEST RESULT

|                    |               |                  |         |
|--------------------|---------------|------------------|---------|
| Temperature:       | 22°C          | Humidity:        | 51%RH   |
| Spectrum Detector: | PK.           | Tested Mode:     | 802.11b |
| Tested By:         | Jeff Lo       | Modulation Type: | QPSK    |
| Tested Date:       | May. 14, 2012 |                  |         |

| Channel Number | Channel Frequency (MHz) | Peak Conducted Power (dBm) | Output Power (dBm) | Power Limit (dBm) |
|----------------|-------------------------|----------------------------|--------------------|-------------------|
| 1              | 2412                    | 2.98                       | 11.11              | 30                |
| 7              | 2442                    | 3.60                       | 12.04              | 30                |
| 11             | 2462                    | 2.31                       | 10.13              | 30                |

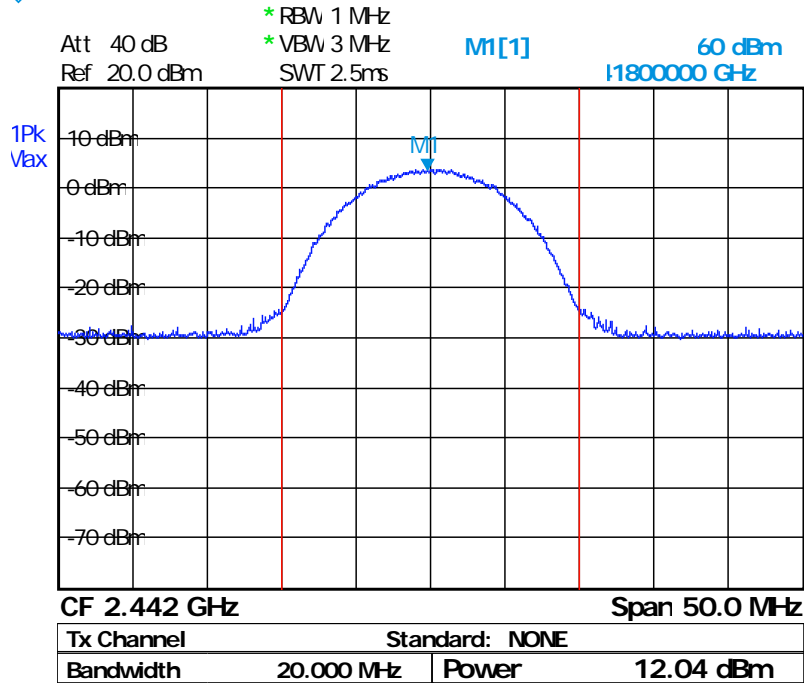
CH1 :



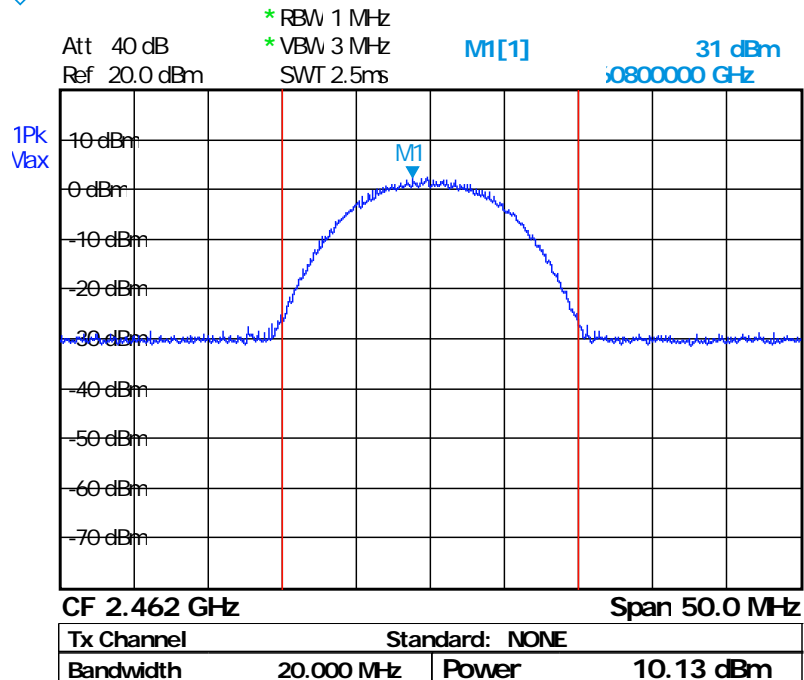




CH7 :



CH11 :





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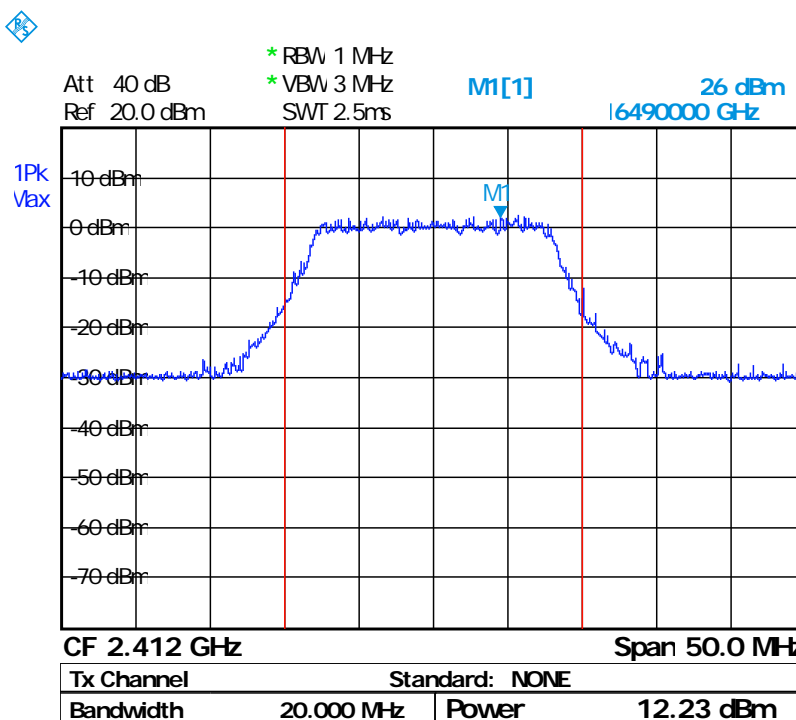
# TEST REPORT

Reference No.: A12040901  
 Report No.: FCCA12040901  
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|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK.</u>           | Tested Mode:     | <u>802.11g</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>64QAM</u>   |
| Tested Date:       | <u>May. 14, 2012</u> |                  |                |

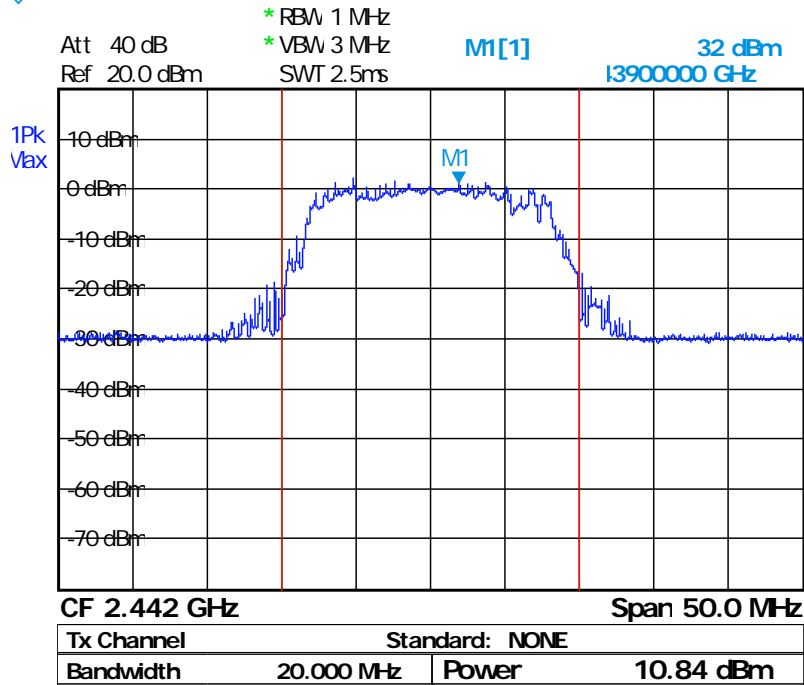
| Channel Number | Channel Frequency (MHz) | Peak Conducted Power (dBm) | Output Power (dBm) | Power Limit (dBm) |
|----------------|-------------------------|----------------------------|--------------------|-------------------|
| 1              | 2412                    | 2.26                       | 12.23              | 30                |
| 7              | 2442                    | 1.32                       | 10.84              | 30                |
| 11             | 2462                    | 0.43                       | 10.40              | 30                |

CH1 :

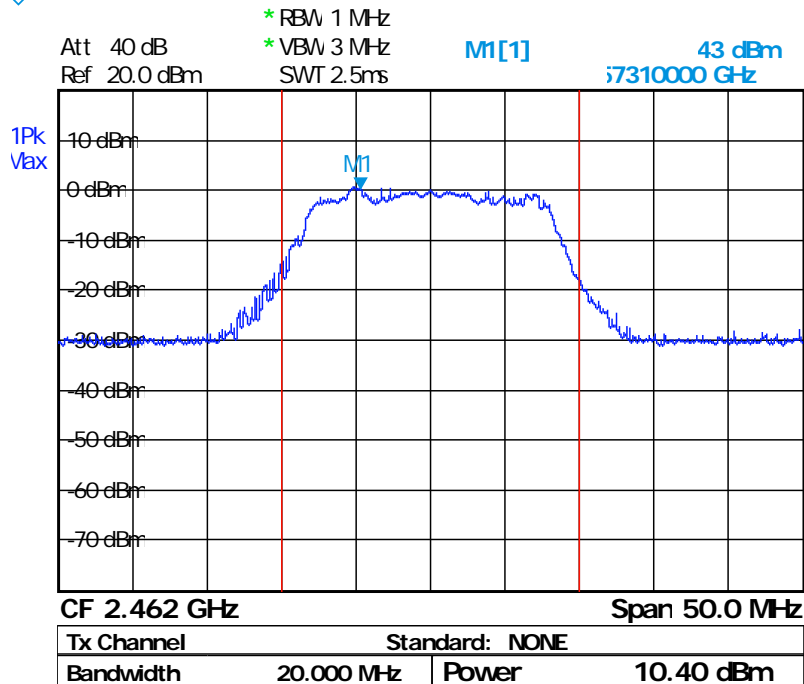




CH7 :



CH11 :





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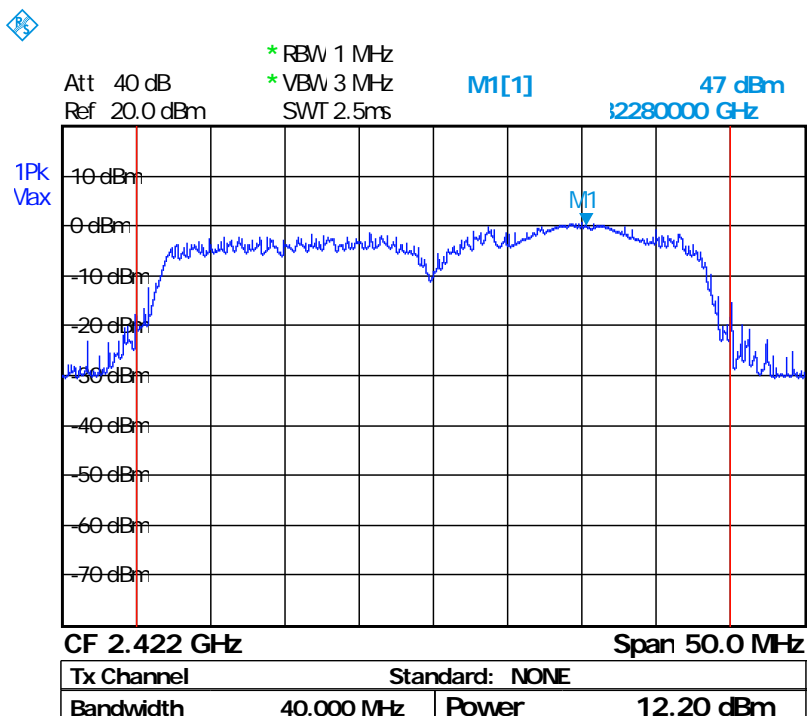
# TEST REPORT

Reference No.: A12040901  
 Report No.: FCCA12040901  
 FCC ID: JY8DW09  
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|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK.</u>           | Tested Mode:     | <u>802.11n</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>64QAM</u>   |
| Tested Date:       | <u>May. 14, 2012</u> |                  |                |

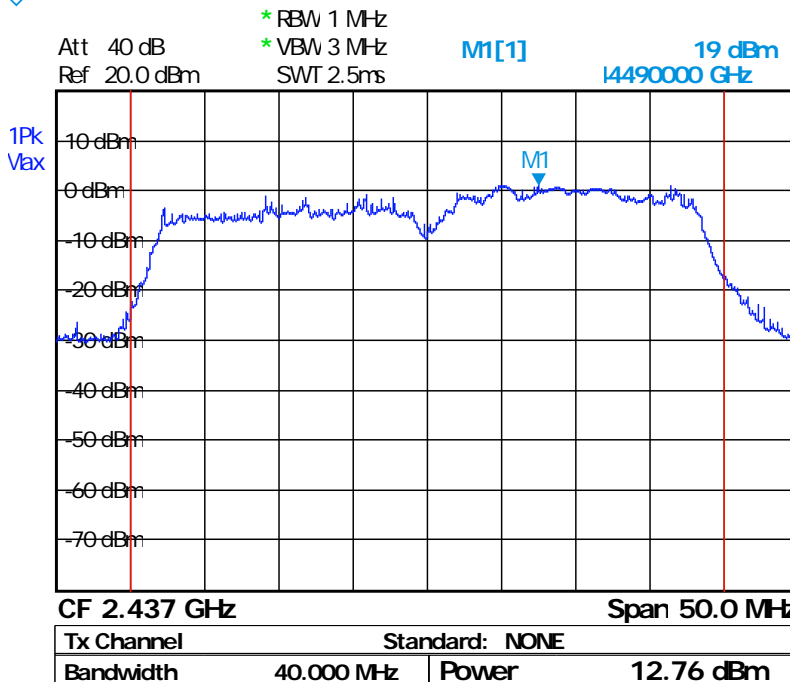
| Channel Number | Channel Frequency (MHz) | Peak Conducted Power (dBm) | Output Power (dBm) | Power Limit (dBm) |
|----------------|-------------------------|----------------------------|--------------------|-------------------|
| 5              | 2422                    | 0.47                       | 12.20              | 30                |
| 8              | 2437                    | 1.19                       | 12.76              | 30                |
| 11             | 2452                    | 0.62                       | 12.30              | 30                |

CH5 :

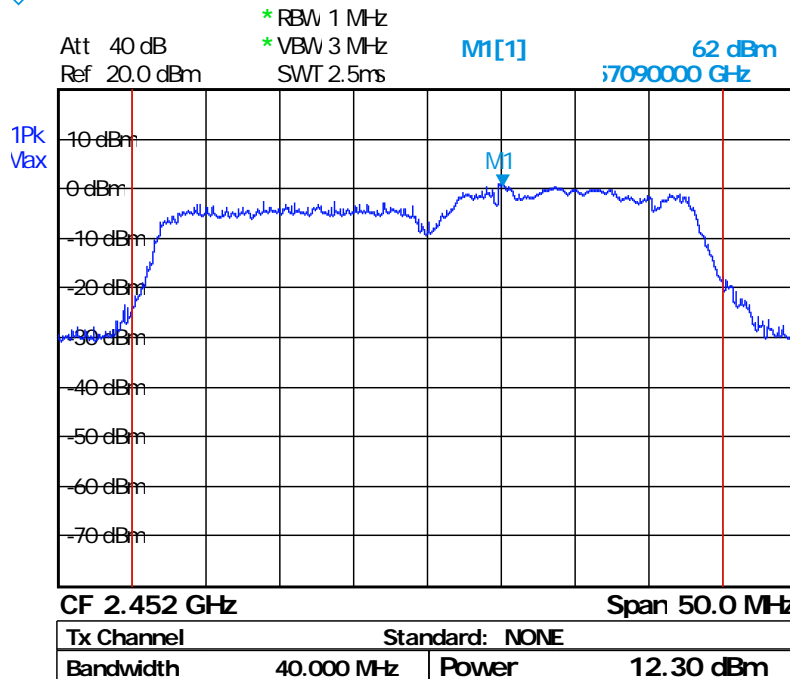




CH8 :



CH11 :





## 4.5 BAND EDGE TEST

### 4.5.1 LIMIT

FCC Part15, Subpart C Section 15.247. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

| OPERATING<br>FREQUENCY RANGE<br>(MHz) | SPURIOUS EMISSION<br>FREQUENCY<br>(MHz) | LIMIT                                 |                        |
|---------------------------------------|---|---------------------------------------|------------------------|
|                                       |   | Peak power ration to<br>emission(dBc) | Emission level(dBuV/m) |
| 902 - 928                             | <902                                    | >20                                   | NA                     |
|                                       | >928                                    | >20                                   | NA                     |
|                                       | 960-1240                                | NA                                    | 54                     |
| 2400 - 2483.5                         | <2400                                   | >20                                   | NA                     |
|                                       | >2483.5-2500                            | NA                                    | 54                     |
| 5725 - 5850                           | <5350-5460                              | NA                                    | 54                     |
|                                       | <5725                                   | >20                                   | NA                     |
|                                       | >5850                                   | >20                                   | NA                     |



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## TEST REPORT

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### 4.5.2 TEST EQUIPMENT

The following test equipment was used during the test:

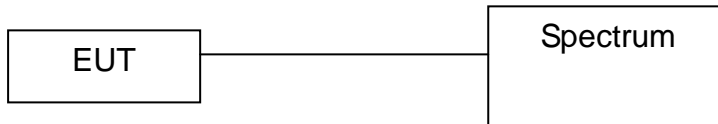
| EQUIPMENT/<br>FACILITIES | SPECIFICATIONS            | MANUFACTURER       | MODEL#/<br>SERIAL#                        | DUE DATE OF CAL. &<br>CAL. CENTER |
|--------------------------|---------------------------|--------------------|---|-----------------------------------|
| SPECTRUM                 | 9kHz-40GHz                | ROHDE &<br>SCHWARZ | FSP40/<br>100093                          | Dec. 2012<br>ETC                  |
| EMI Test Receiver        | 9kHz-6GHz                 | ROHDE &<br>SCHWARZ | ESL/<br>100176                            | Mar. 2013<br>R&S                  |
| SPECTRUM                 | 9KHz-26.5GHz              | HP                 | 8953E/<br>3710A03220                      | Nov. 2012<br>ETC                  |
| PRE-AMPLIFIER            | 1GHz-26.5GHz<br>Gain:30dB | HP                 | 8449B/<br>3008A01019                      | Nov. 2012<br>ETC                  |
| HORN ANTENNA             | 1GHz to 18GHz             | EMCO               | 3115/<br>6881                             | Nov. 2012<br>ETC                  |
| K-TYPE CABLE             | 1M                        | HUBER SUHNER       | SF102-40/2*11 /<br>28934/2                | May. 2012<br>ETC                  |
| RF CABLE                 | 1.5M                      | JYEBAO             | A30A30-L 142 /<br>EQF-0035                | Dec. 2012<br>ETC                  |
| RF CABLE                 | 3.5M                      | JYEBAO             | A30A30-L 142<br>(G3.5M)/<br>EQF-0036(002) | Dec. 2012<br>ETC                  |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



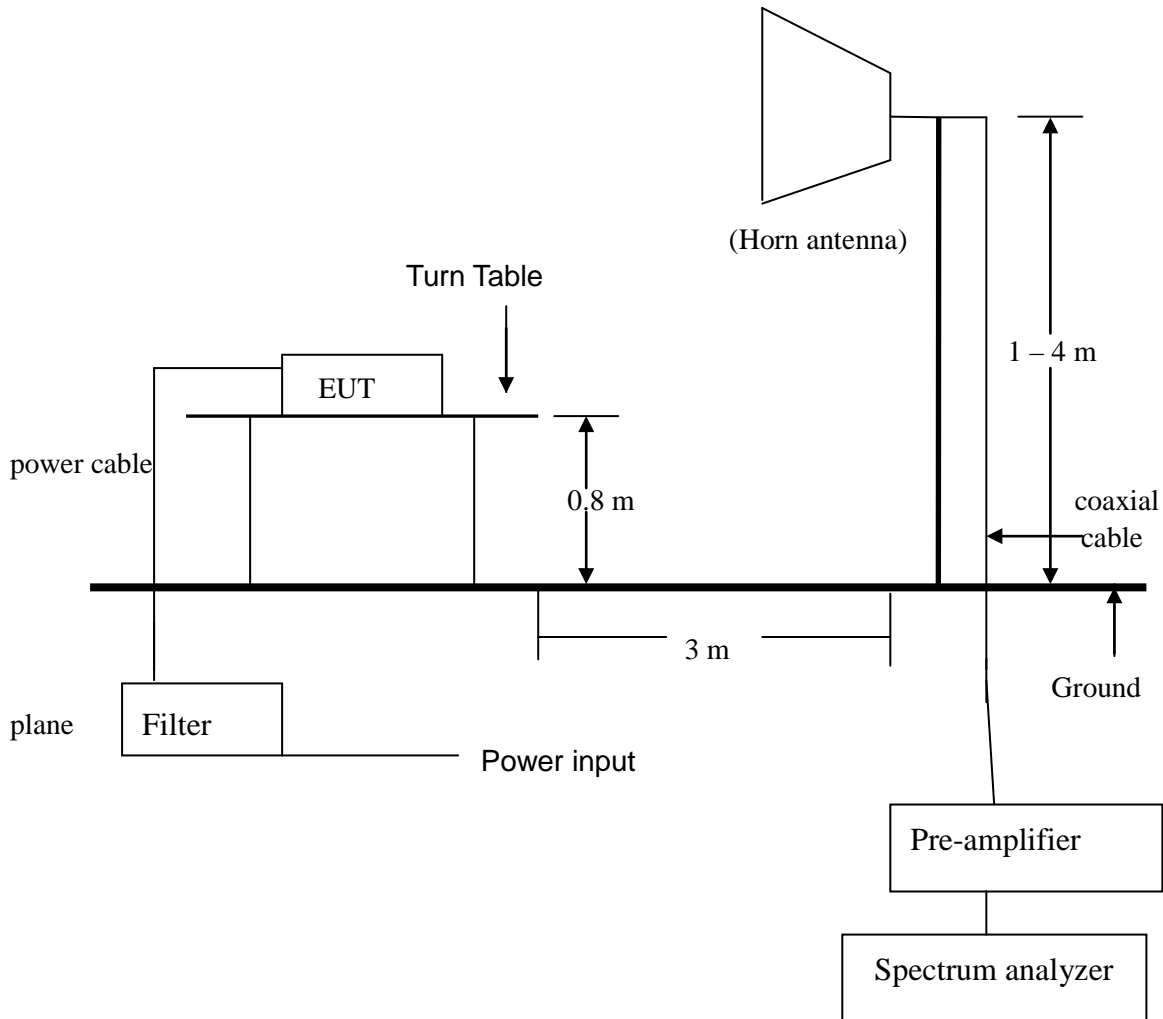
### 4.5.3 TEST SET-UP

#### FOR RF CONDUCTED TEST (dBc)



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

#### FOR RADIATED EMISSION TEST



**NOTE :**

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.





#### 4.5.4 TEST PROCEDURE

1. The EUT was operating in continuous transmission mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.
2. The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

#### 4.5.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



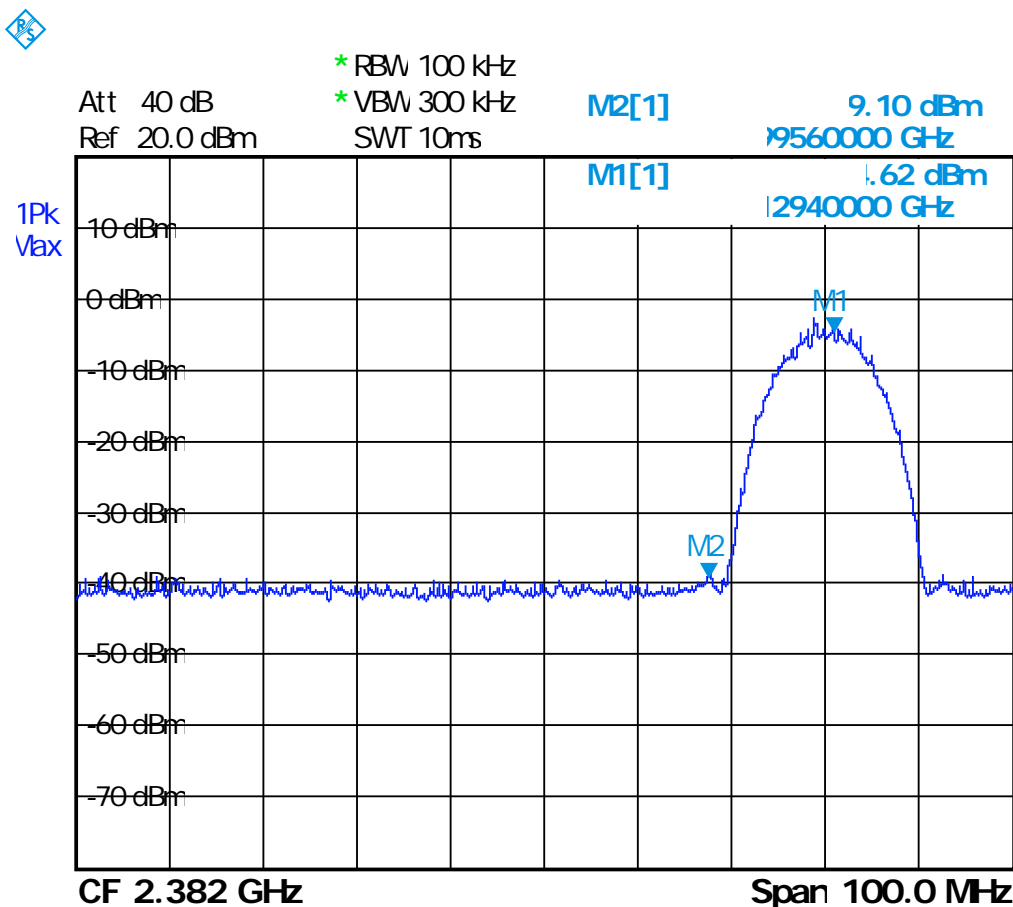
## 4.5.6 TEST RESULT

|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK. or AV.</u>    | Tested Mode:     | <u>802.11b</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>QPSK</u>    |
| Tested Date:       | <u>May. 14, 2012</u> |                  |                |

1. Conducted test

| Frequency (MHz) | PEAK POWER OUTPUT (dBm) | Emission read Value(dBm) | Result of Band edge (dBc) | Band edge LIMIT (dBc) |
|-----------------|-------------------------|--------------------------|---------------------------|-----------------------|
| <2400           | -4.62                   | -39.10                   | 34.48                     | >20dBc                |
| >2483.5         | -3.82                   | -41.23                   | 37.41                     | >20dBc                |

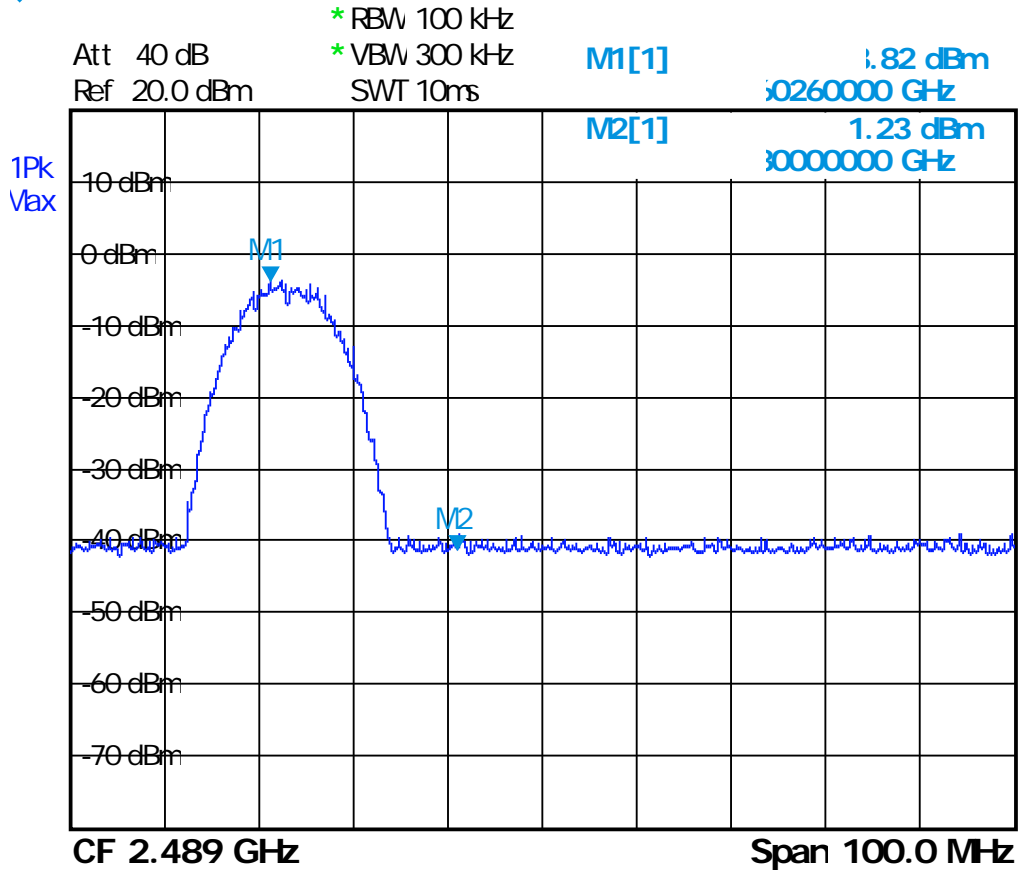
Below 2400MHz (CH1):





# TEST REPORT

Above 2483.5 MHz (CH11):



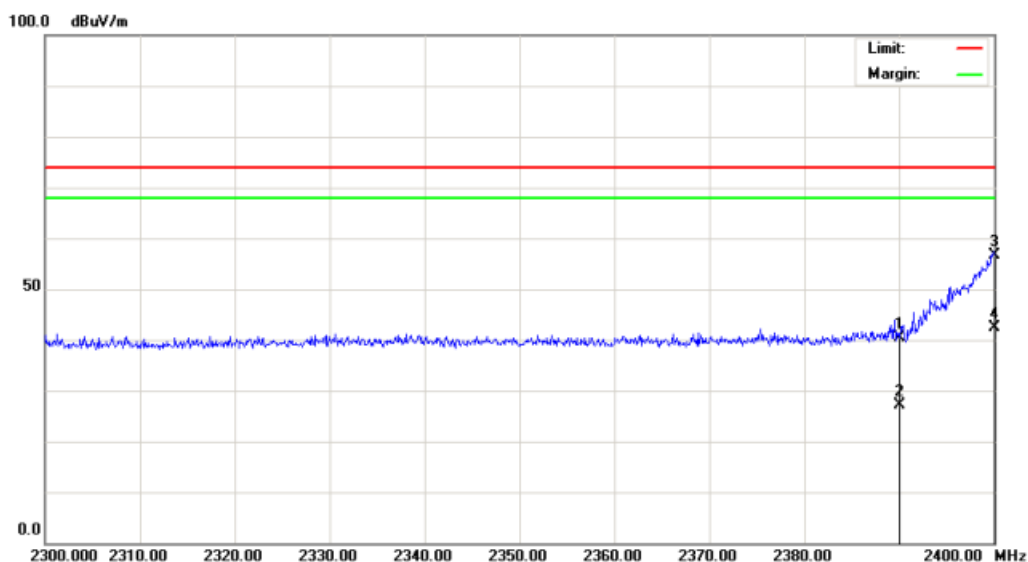


# TEST REPORT

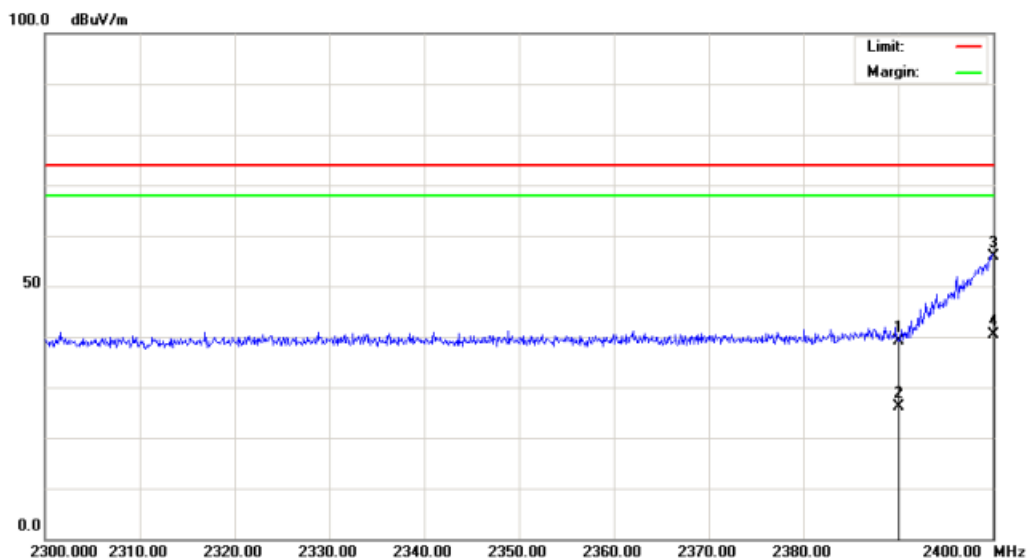
2. Radiated emission test:  
 Below 2400MHz (CH1)

| Frequency (MHz) | Correct Factor (dB) | Ant. Fac. (dB) | Ant. Pol. (H/V) | Reading (dBuV) |      | Emission (dBuV/m) |      | Limit Line (dBuV/m) |      | Over Limit (dBuV/m) |       |
|-----------------|---------------------|----------------|-----------------|----------------|------|-------------------|------|---------------------|------|---------------------|-------|
|                 |                     |                |                 | PK             | AV   | PK                | AV   | PK                  | AV   | PK                  | AV    |
| 2412.00         | -33.88              | 28.11          | H               | 91.4           | 80.1 | 85.6              | 74.3 | 114.0               | 94.0 | -28.4               | -19.7 |
| 2412.00         | -33.88              | 28.11          | V               | 94.5           | 83.4 | 88.7              | 77.6 | 114.0               | 94.0 | -25.3               | -16.4 |
| 2400.00         | -33.88              | 28.08          | H               | 59.6           | 45.3 | 53.8              | 39.5 | 74.0                | 54.0 | -20.2               | -14.5 |
| 2400.00         | -33.88              | 28.08          | V               | 58.9           | 43.4 | 53.1              | 37.6 | 74.0                | 54.0 | -20.9               | -16.4 |
| 2390.40         | -33.89              | 28.06          | H               | 43.5           | 30.1 | 37.6              | 24.3 | 74.0                | 54.0 | -36.4               | -29.7 |
| 2390.00         | -33.89              | 28.06          | V               | 42.2           | 29.1 | 36.4              | 23.3 | 74.0                | 54.0 | -37.6               | -30.7 |

Horizontal:



Vertical:



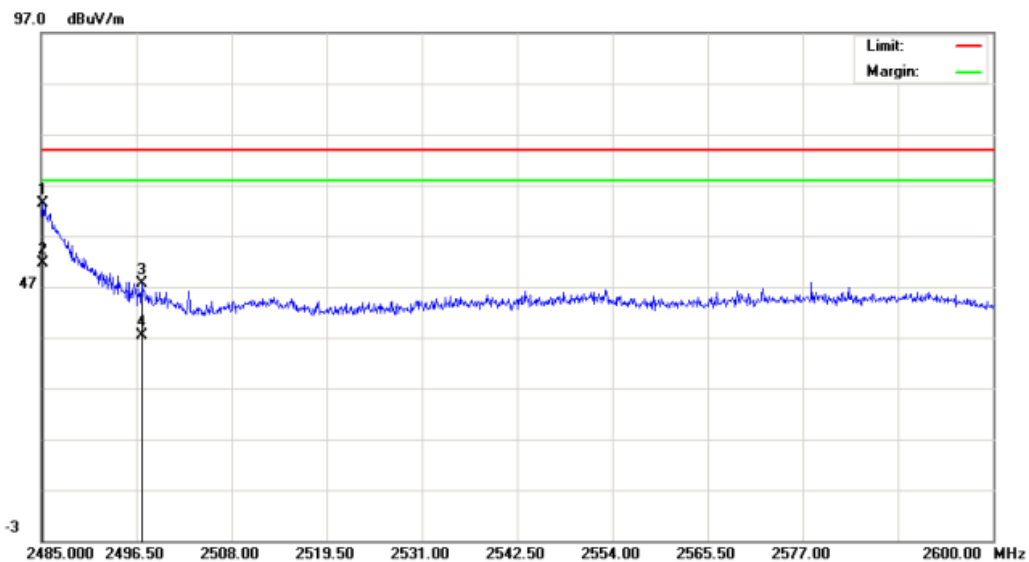


# TEST REPORT

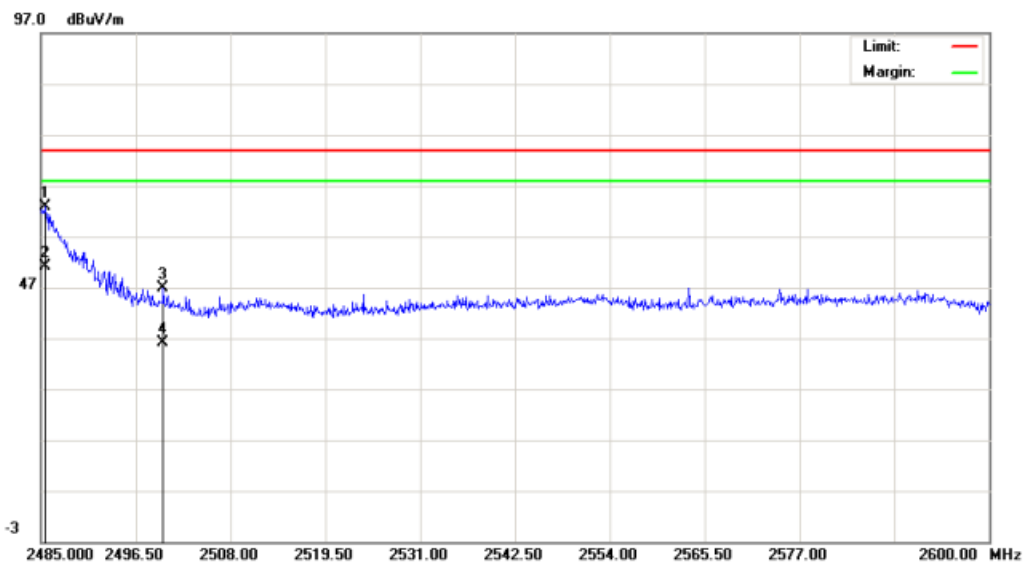
Above 2483.5 MHz (CH11)

| Frequency (MHz) | Correct Factor (dB) | Ant. Fac. (dB) | Ant. Pol. (H/V) | Reading (dBuV) |      | Emission (dBuV/m) |      | Limit Line (dBuV/m) |      | Over Limit (dBuV/m) |       |
|-----------------|---------------------|----------------|-----------------|----------------|------|-------------------|------|---------------------|------|---------------------|-------|
|                 |                     |                |                 | PK             | AV   | PK                | AV   | PK                  | AV   | PK                  | AV    |
| 2462.00         | -33.87              | 28.22          | H               | 94.6           | 83.2 | 89.0              | 77.5 | 114.0               | 94.0 | -25.0               | -16.5 |
| 2462.00         | -33.87              | 28.22          | V               | 97.7           | 85.5 | 92.0              | 79.8 | 114.0               | 94.0 | -22.0               | -14.2 |
| 2485.23         | -33.86              | 28.27          | H               | 66.0           | 54.3 | 60.4              | 48.7 | 74.0                | 54.0 | -13.6               | -5.3  |
| 2485.46         | -33.86              | 28.27          | V               | 65.5           | 53.9 | 59.9              | 48.3 | 74.0                | 54.0 | -14.1               | -5.7  |
| 2497.19         | -33.86              | 28.29          | H               | 50.3           | 39.9 | 44.8              | 34.4 | 74.0                | 54.0 | -29.2               | -19.6 |
| 2499.84         | -33.86              | 28.30          | V               | 49.5           | 38.7 | 43.9              | 33.2 | 74.0                | 54.0 | -30.1               | -20.8 |

Horizontal:



Vertical:





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# TEST REPORT

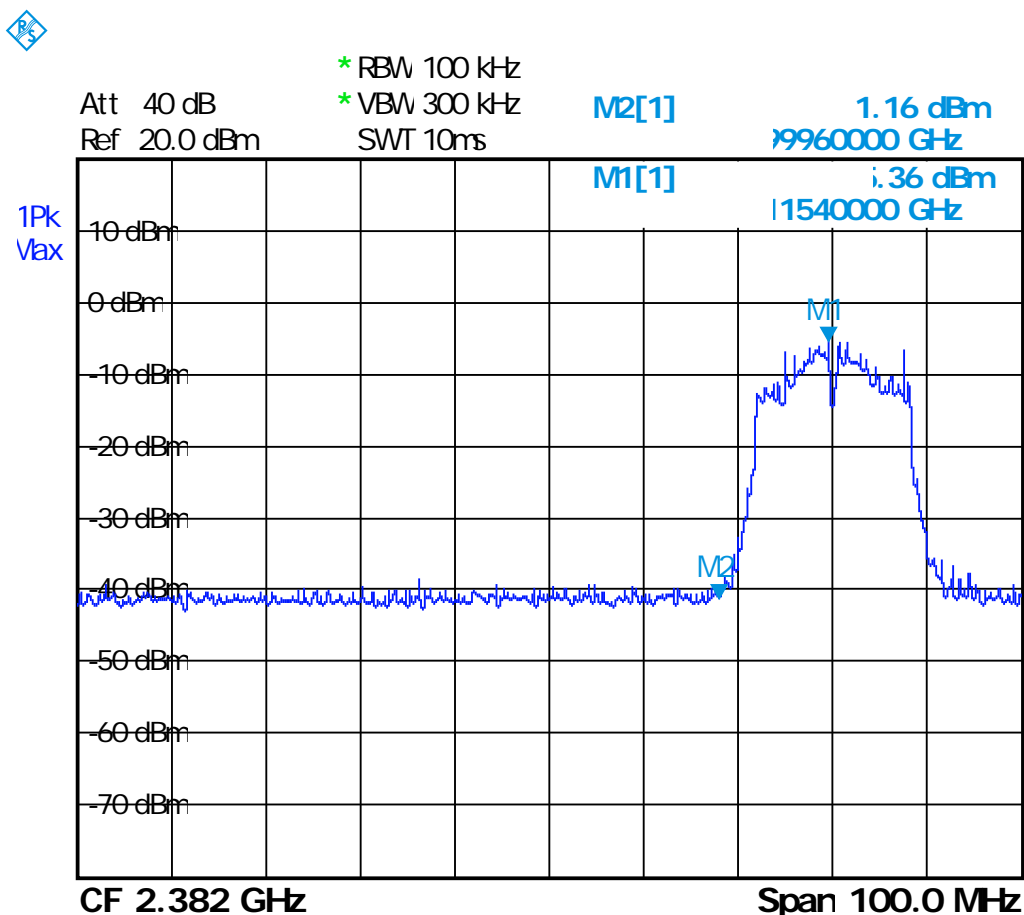
Reference No.: A12040901  
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|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK. or AV.</u>    | Tested Mode:     | <u>802.11g</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>64QAM</u>   |
| Tested Date:       | <u>May. 14, 2012</u> |                  |                |

## 1. Conducted test

| Frequency (MHz) | PEAK POWER OUTPUT (dBm) | Emission read Value(dBm) | Result of Band edge (dBc) | Band edge LIMIT (dBc) |
|-----------------|-------------------------|--------------------------|---------------------------|-----------------------|
| <2400           | -5.36                   | -41.16                   | 35.80                     | >20dBc                |
| >2483.5         | -4.87                   | -37.93                   | 33.06                     | >20dBc                |

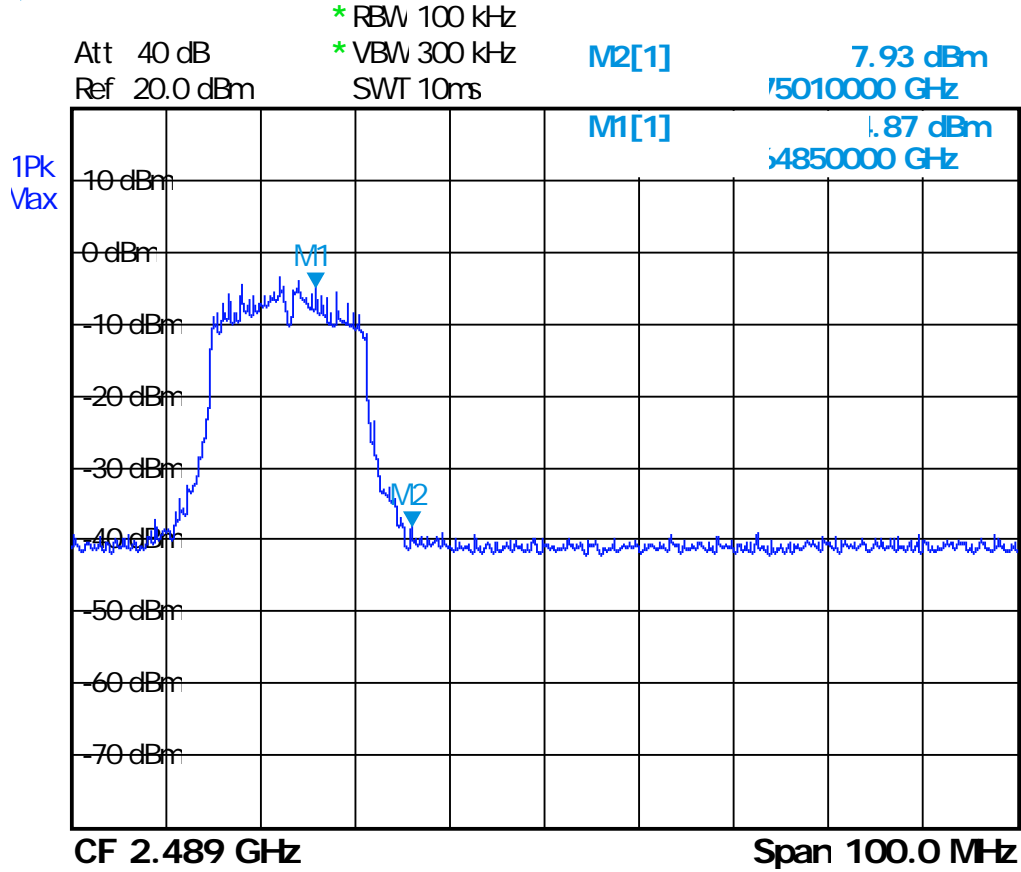
Below 2400MHz (CH1):





# TEST REPORT

Above 2483.5 MHz (CH11):



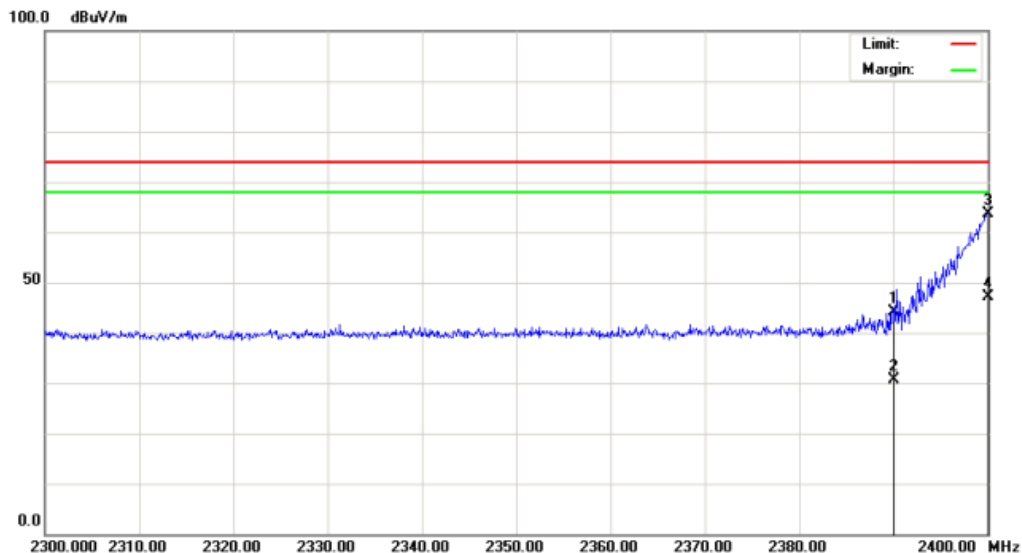


# TEST REPORT

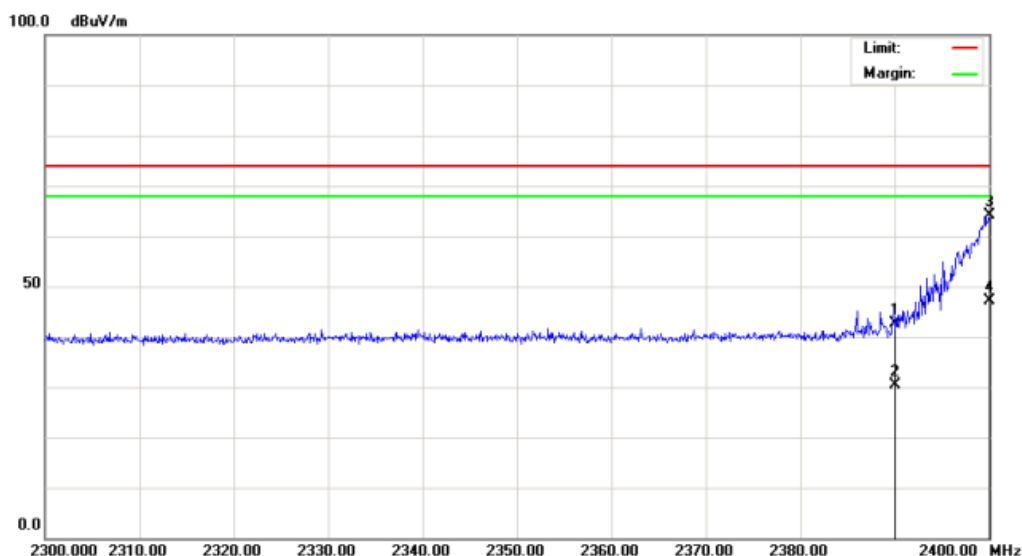
## 2. Radiated emission test Below 2400MHz (CH1)

| Frequency (MHz) | Correct Factor (dB) | Ant. Fac. (dB) | Ant. Pol. (H/V) | Reading (dBuV) |      | Emission (dBuV/m) |      | Limit Line (dBuV/m) |      | Over Limit (dBuV/m) |       |
|-----------------|---------------------|----------------|-----------------|----------------|------|-------------------|------|---------------------|------|---------------------|-------|
|                 |                     |                |                 | PK             | AV   | PK                | AV   | PK                  | AV   | PK                  | AV    |
| 2412.00         | -33.88              | 28.11          | H               | 98.3           | 86.5 | 92.5              | 80.7 | 114.0               | 94.0 | -21.5               | -13.3 |
| 2412.00         | -33.88              | 28.11          | V               | 94.7           | 83.7 | 88.9              | 77.9 | 114.0               | 94.0 | -25.1               | -16.1 |
| 2400.00         | -33.88              | 28.08          | H               | 66.6           | 50.1 | 60.8              | 44.3 | 74.0                | 54.0 | -13.2               | -9.7  |
| 2400.00         | -33.88              | 28.08          | V               | 67.2           | 50.2 | 61.4              | 44.4 | 74.0                | 54.0 | -12.6               | -9.6  |
| 2390.00         | -33.89              | 28.06          | H               | 47.2           | 33.5 | 41.4              | 27.7 | 74.0                | 54.0 | -32.6               | -26.3 |
| 2390.00         | -33.89              | 28.06          | V               | 45.5           | 33.3 | 39.7              | 27.5 | 74.0                | 54.0 | -34.3               | -26.5 |

Horizontal:



Vertical:





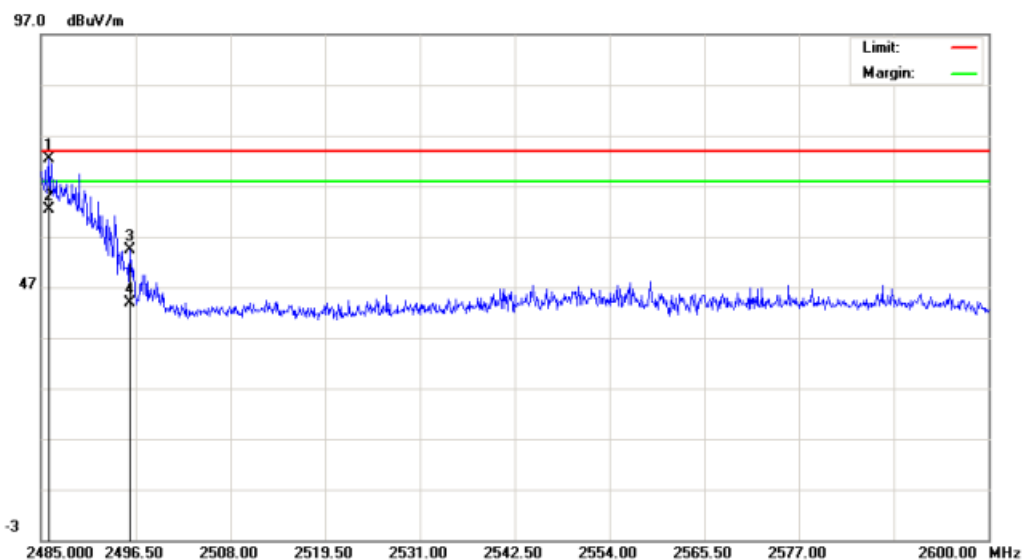


# TEST REPORT

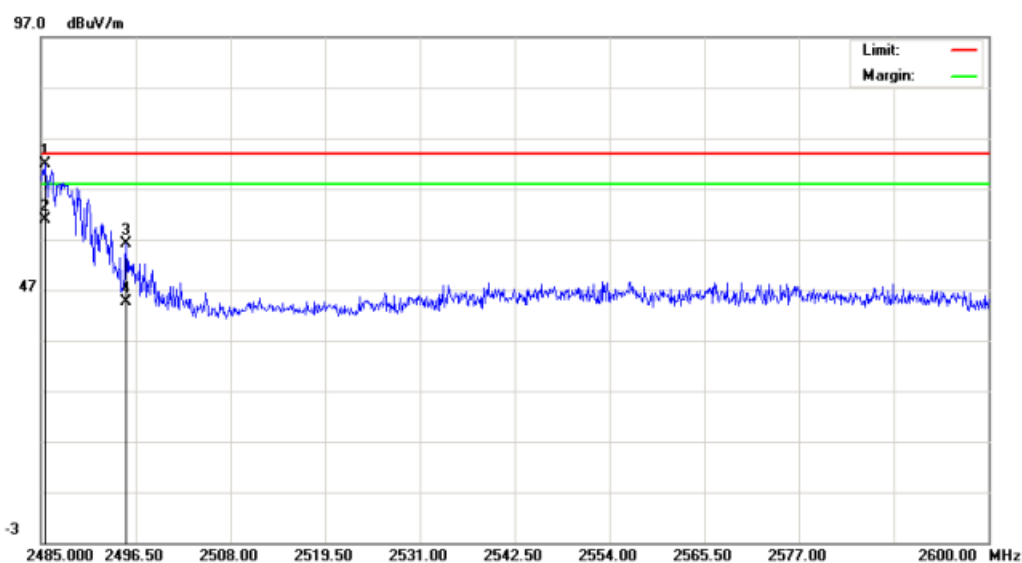
Above 2483.5 MHz (CH11)

| Frequency (MHz) | Correct Factor (dB) | Ant. Fac. (dB) | Ant. Pol. (H/V) | Reading (dBuV) |      | Emission (dBuV/m) |      | Limit Line (dBuV/m) |      | Over Limit (dBuV/m) |       |
|-----------------|---------------------|----------------|-----------------|----------------|------|-------------------|------|---------------------|------|---------------------|-------|
|                 |                     |                |                 | PK             | AV   | PK                | AV   | PK                  | AV   | PK                  | AV    |
| 2462.00         | -33.87              | 28.22          | H               | 92.3           | 82.1 | 86.7              | 76.5 | 114.0               | 94.0 | -27.3               | -17.5 |
| 2462.00         | -33.87              | 28.22          | V               | 99.3           | 87.4 | 93.6              | 81.8 | 114.0               | 94.0 | -20.4               | -12.2 |
| 2485.92         | -33.86              | 28.27          | H               | 75.1           | 56.5 | 69.5              | 50.9 | 74.0                | 54.0 | -4.5                | -3.1  |
| 2485.46         | -33.86              | 28.27          | V               | 74.7           | 55.5 | 69.1              | 49.9 | 74.0                | 54.0 | -4.9                | -4.1  |
| 2495.81         | -33.86              | 28.29          | H               | 57.0           | 46.4 | 51.4              | 40.9 | 74.0                | 54.0 | -22.6               | -13.1 |
| 2495.35         | -33.86              | 28.29          | V               | 58.7           | 47.3 | 53.1              | 41.7 | 74.0                | 54.0 | -20.9               | -12.3 |

Horizontal:



Vertical:





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# TEST REPORT

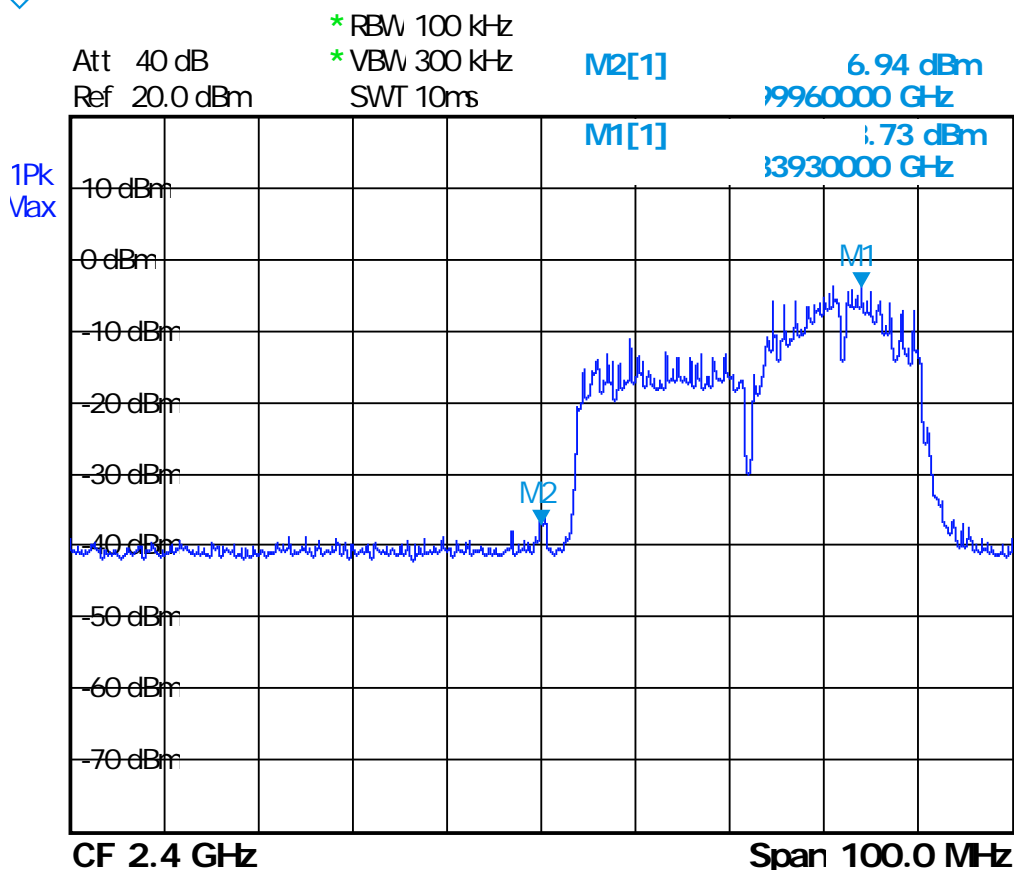
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|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK. or AV.</u>    | Tested Mode:     | <u>802.11n</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>64QAM</u>   |
| Tested Date:       | <u>May. 14, 2012</u> |                  |                |

## 1. Conducted test

| Frequency (MHz) | PEAK POWER OUTPUT (dBm) | Emission read Value(dBm) | Result of Band edge (dBc) | Band edge LIMIT (dBc) |
|-----------------|-------------------------|--------------------------|---------------------------|-----------------------|
| <2400           | -3.76                   | -36.94                   | 33.21                     | >20dBc                |
| >2483.5         | -4.95                   | -36.63                   | 31.68                     | >20dBc                |

Below 2400MHz (CH5):



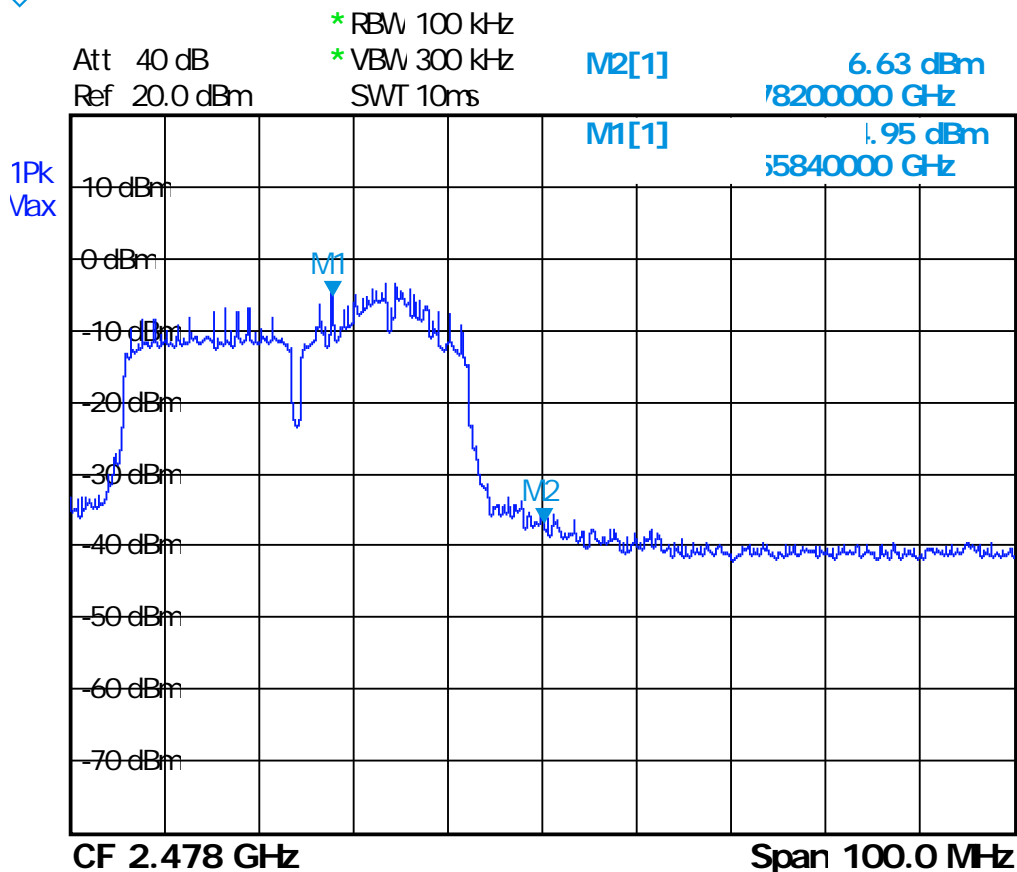


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Above 2483.5 MHz (CH11):



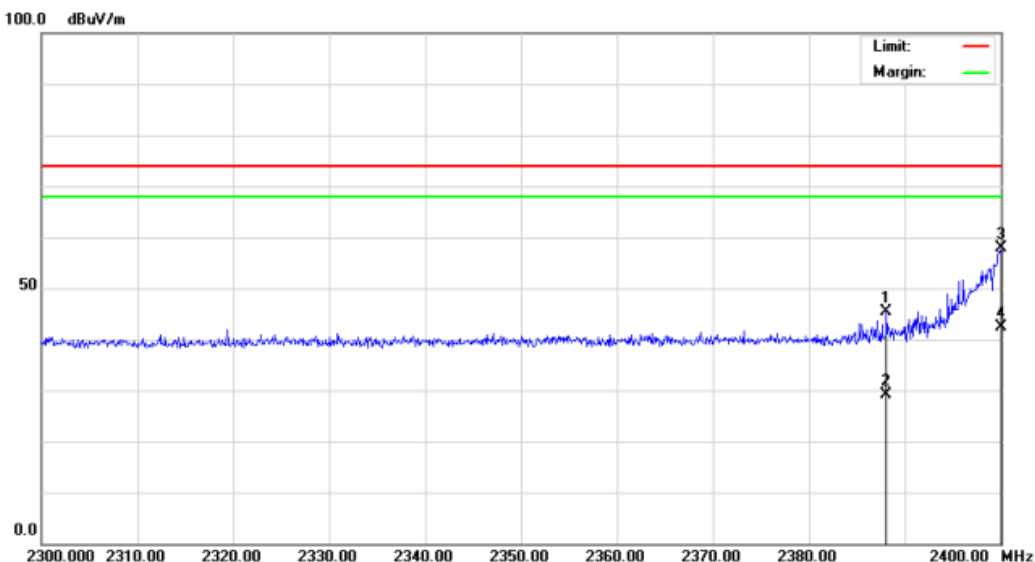


# TEST REPORT

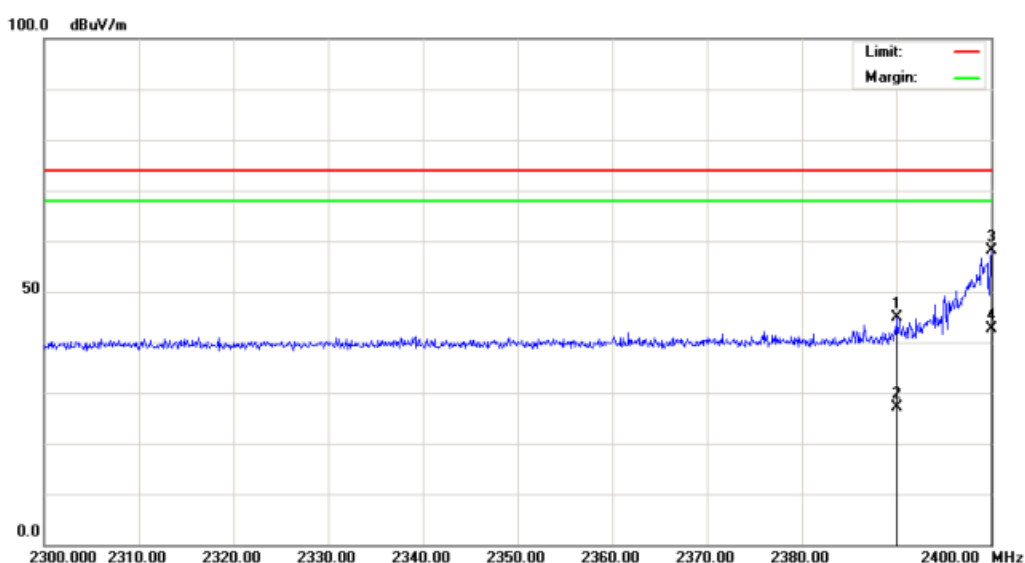
## 2. Radiated emission test Below 2400MHz (CH5)

| Frequency (MHz) | Correct Factor (dB) | Ant. Fac. (dB) | Ant. Pol. (H/V) | Reading (dBuV) |      | Emission (dBuV/m) |      | Limit Line (dBuV/m) |      | Over Limit (dBuV/m) |       |
|-----------------|---------------------|----------------|-----------------|----------------|------|-------------------|------|---------------------|------|---------------------|-------|
|                 |                     |                |                 | PK             | AV   | PK                | AV   | PK                  | AV   | PK                  | AV    |
| 2422.00         | -33.88              | 28.13          | H               | 95.2           | 84.3 | 89.5              | 78.5 | 114.0               | 94.0 | -24.5               | -15.5 |
| 2422.00         | -33.88              | 28.13          | V               | 89.7           | 78.1 | 83.9              | 72.3 | 114.0               | 94.0 | -30.1               | -21.7 |
| 2400.00         | -33.88              | 28.08          | H               | 61.0           | 45.4 | 55.1              | 39.6 | 74.0                | 54.0 | -18.9               | -14.4 |
| 2400.00         | -33.88              | 28.08          | V               | 61.2           | 45.5 | 55.4              | 39.7 | 74.0                | 54.0 | -18.6               | -14.3 |
| 2388.10         | -33.89              | 28.05          | H               | 48.3           | 31.1 | 42.4              | 25.3 | 74.0                | 54.0 | -31.6               | -28.7 |
| 2390.00         | -33.89              | 28.06          | V               | 47.8           | 30.1 | 42.0              | 24.3 | 74.0                | 54.0 | -32.0               | -29.7 |

Horizontal:



Vertical:



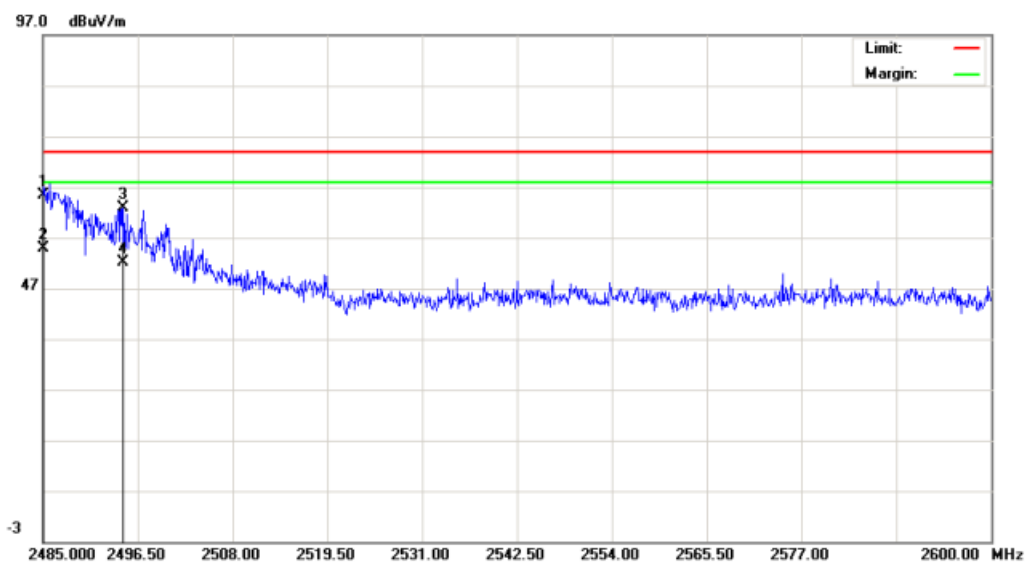


# TEST REPORT

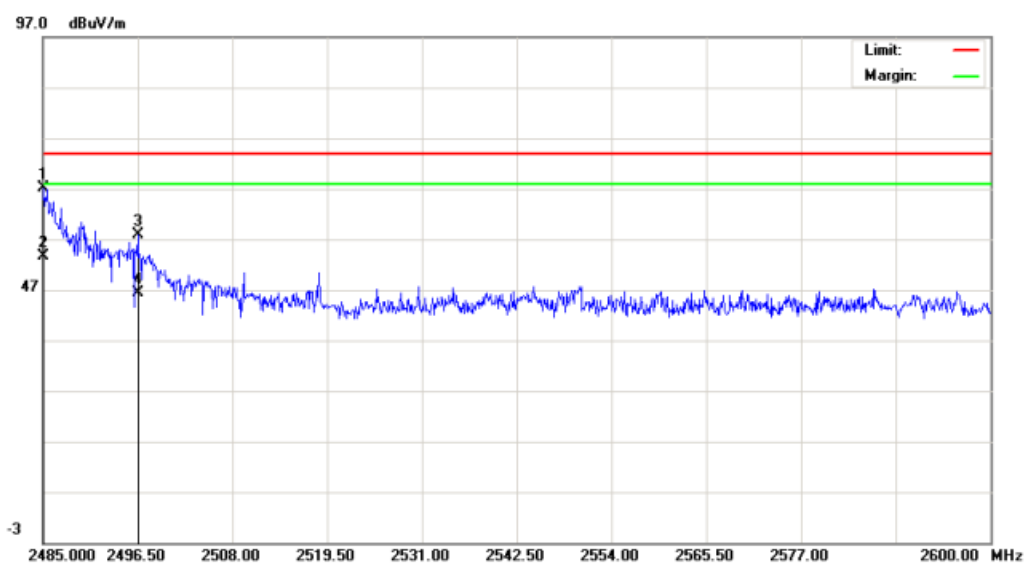
Above 2483.5 MHz (CH11)

| Frequency (MHz) | Correct Factor (dB) | Ant. Fac. (dB) | Ant. Pol. (H/V) | Reading (dBuV) |      | Emission (dBuV/m) |      | Limit Line (dBuV/m) |      | Over Limit (dBuV/m) |       |
|-----------------|---------------------|----------------|-----------------|----------------|------|-------------------|------|---------------------|------|---------------------|-------|
|                 |                     |                |                 | PK             | AV   | PK                | AV   | PK                  | AV   | PK                  | AV    |
| 2452.00         | -33.87              | 28.19          | H               | 88.0           | 76.4 | 82.3              | 70.7 | 114.0               | 94.0 | -31.7               | -23.3 |
| 2452.00         | -33.87              | 28.19          | V               | 91.8           | 80.3 | 86.1              | 74.6 | 114.0               | 94.0 | -27.9               | -19.4 |
| 2485.00         | -33.86              | 28.27          | H               | 68.1           | 56.4 | 62.5              | 50.8 | 74.0                | 54.0 | -11.5               | -3.2  |
| 2485.12         | -33.86              | 28.27          | V               | 69.9           | 56.4 | 64.3              | 50.8 | 74.0                | 54.0 | -9.7                | -3.2  |
| 2494.78         | -33.86              | 28.29          | H               | 65.6           | 54.7 | 60.0              | 49.1 | 74.0                | 54.0 | -14.0               | -4.9  |
| 2496.50         | -33.86              | 28.29          | V               | 60.5           | 49.1 | 54.9              | 43.5 | 74.0                | 54.0 | -19.1               | -10.5 |

Horizontal:



Vertical:





## 4.6 POWER DENSITY TEST

### 4.6.1 LIMIT

FCC Part15, Subpart C Section 15.247

| FREQUENCY RANGE (MHz) | Limit(dBm/kHz) |
|-----------------------|----------------|
| 902-928               | 8dBm/3kHz      |
| 2400-2483.5           |                |
| 5725-5850             |                |

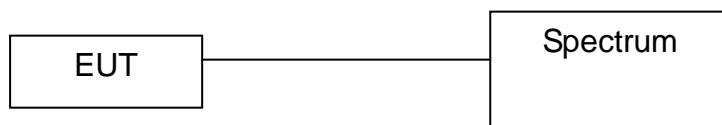
### 4.6.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

| EQUIPMENT/ FACILITIES | SPECIFICATIONS | MANUFACTURER    | MODEL#/ SERIAL# | DUE DATE OF CAL. & CAL. CENTER |
|-----------------------|----------------|-----------------|-----------------|--------------------------------|
| SPECTRUM              | 9kHz-40GHz     | ROHDE & SCHWARZ | FSP40/ 100093   | Dec. 2012<br>ETC               |
| EMI Test Receiver     | 9kHz-6GHz      | ROHDE & SCHWARZ | ESL/ 100176     | Mar. 2012<br>R&S               |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 TEST SET-UP



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

### 4.6.4 TEST PROCEDURE

The EUT was operating in transmitter mode and could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

### 4.6.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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# TEST REPORT

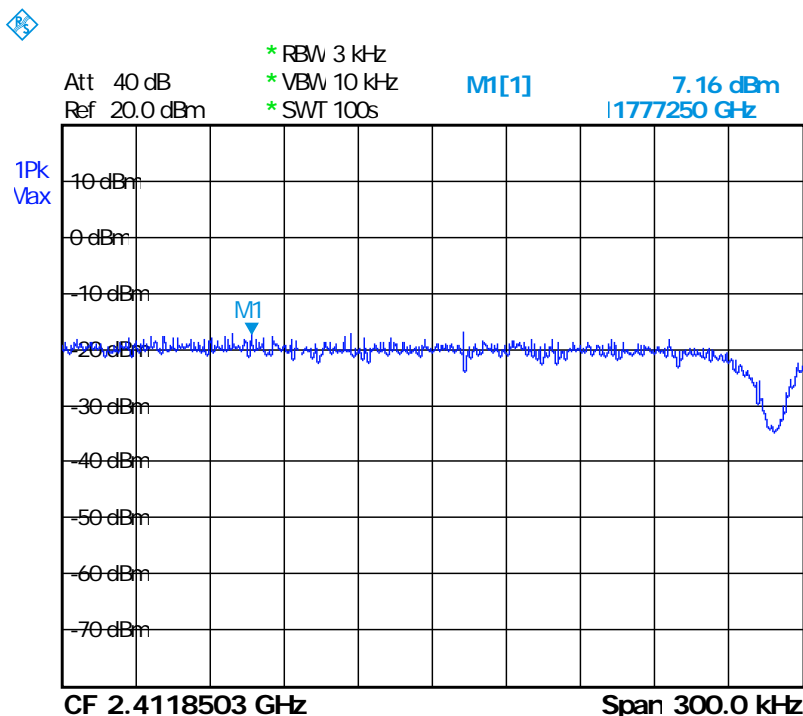
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## 4.6.6 TEST RESULT

|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK.</u>           | Tested Mode:     | <u>802.11b</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>QPSK</u>    |
| Tested Date:       | <u>May. 14, 2012</u> |                  |                |

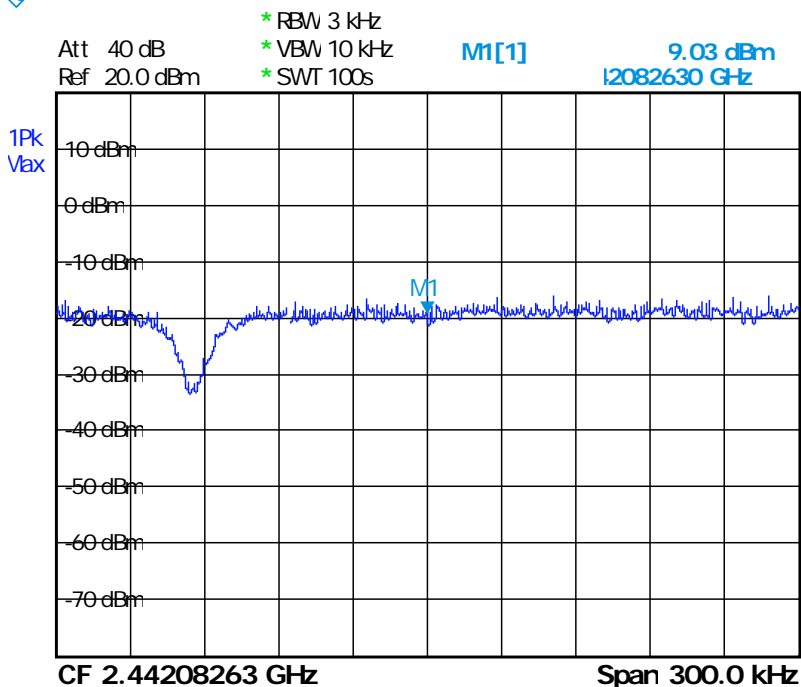
| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 3kHz BW (dBm/3kHz) | MAXIMUM LIMIT (dBm/3kHz) |
|----------------|-------------------------|--------------------------------------|--------------------------|
| 1              | 2412                    | -17.16                               | 8                        |
| 7              | 2442                    | -19.03                               | 8                        |
| 11             | 2462                    | -15.39                               | 8                        |

CH 1:

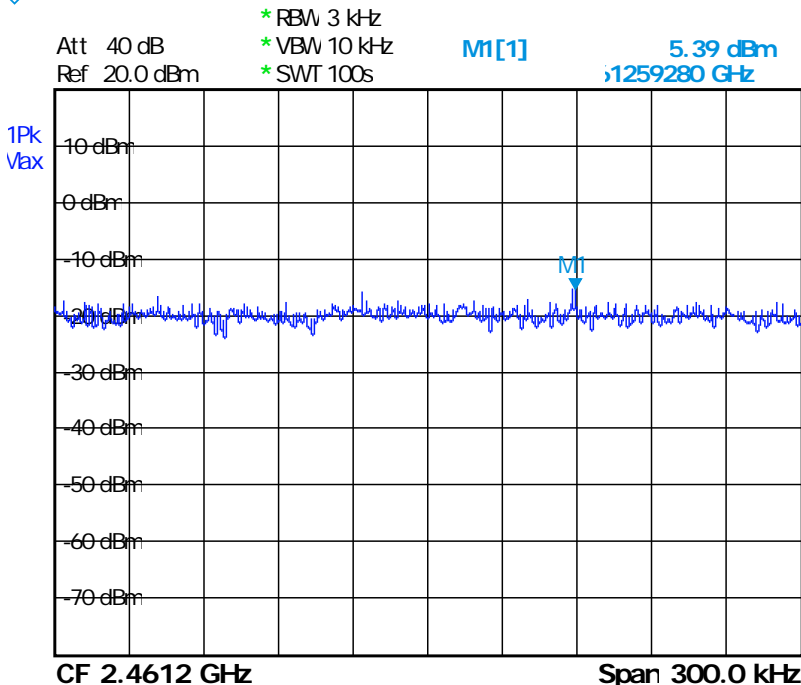




CH 7:



CH 11:







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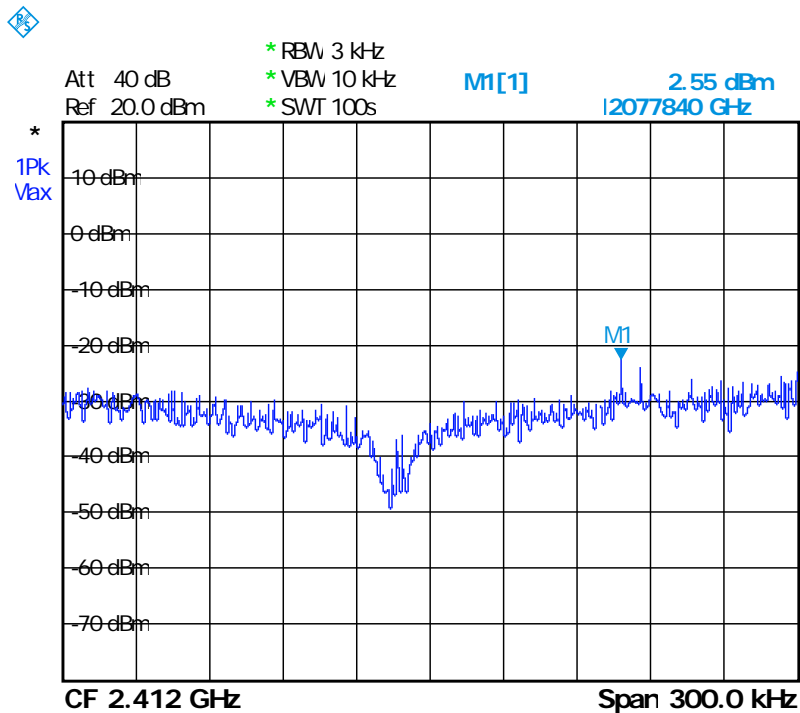
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|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK.</u>           | Tested Mode:     | <u>802.11g</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>64QAM</u>   |
| Tested Date:       | <u>May. 14, 2012</u> |                  |                |

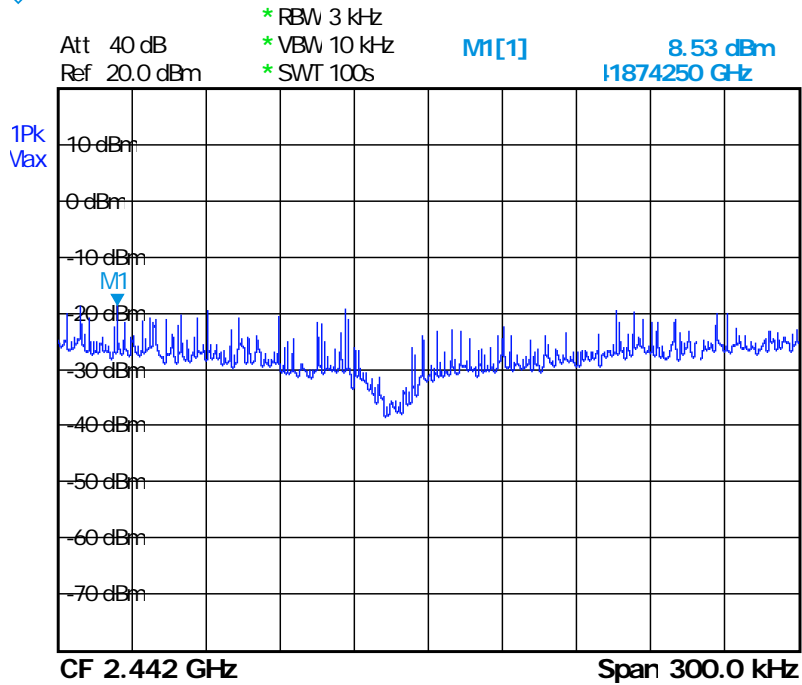
| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 3kHz BW (dBm/3kHz) | MAXIMUM LIMIT (dBm/3kHz) |
|----------------|-------------------------|--------------------------------------|--------------------------|
| 1              | 2412                    | -22.55                               | 8                        |
| 7              | 2442                    | -18.53                               | 8                        |
| 11             | 2462                    | -22.67                               | 8                        |

CH 1:

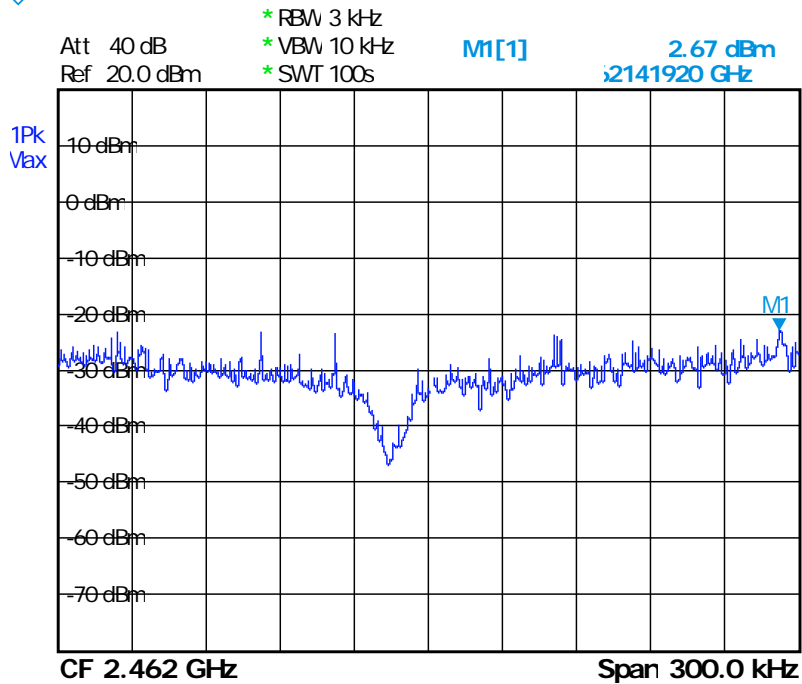




CH 7:



CH 11:





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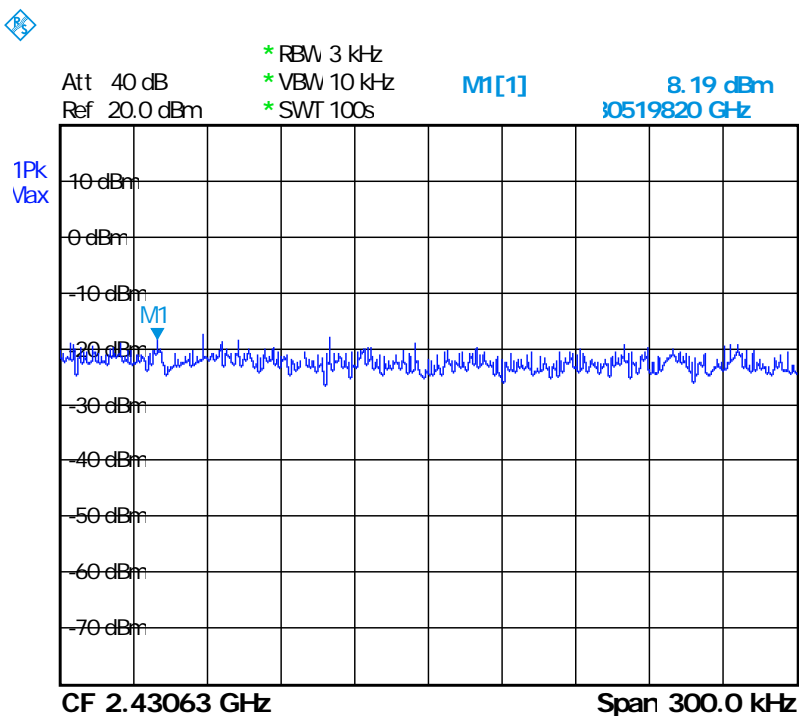
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|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Temperature:       | <u>22°C</u>          | Humidity:        | <u>51%RH</u>   |
| Spectrum Detector: | <u>PK.</u>           | Tested Mode:     | <u>802.11n</u> |
| Tested By:         | <u>Jeff Lo</u>       | Modulation Type: | <u>OFDM</u>    |
| Tested Date:       | <u>May. 14, 2012</u> |                  |                |

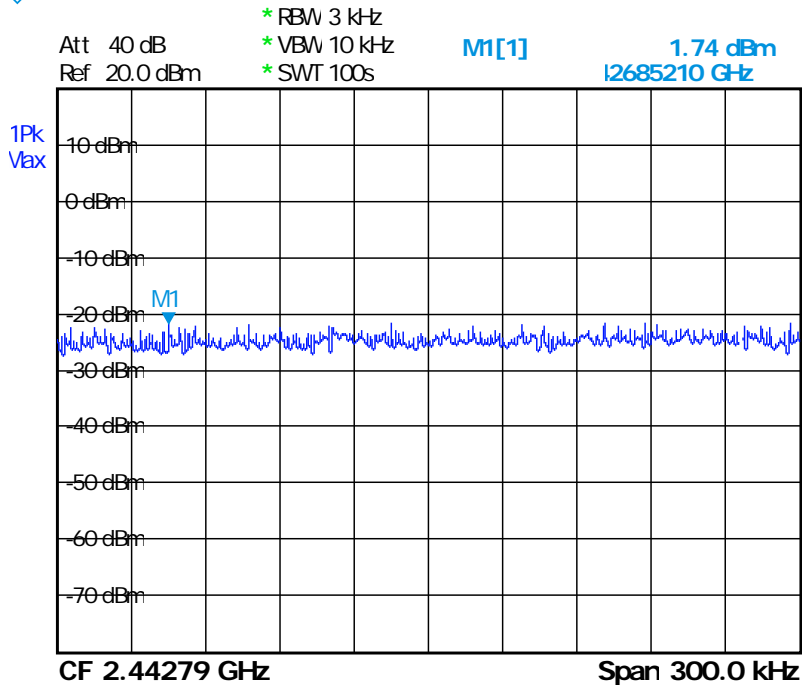
| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 3kHz BW (dBm/3kHz) | MAXIMUM LIMIT (dBm/3kHz) |
|----------------|-------------------------|--------------------------------------|--------------------------|
| 5              | 2422                    | - 18.19                              | 8                        |
| 8              | 2437                    | - 21.74                              | 8                        |
| 11             | 2452                    | - 16.98                              | 8                        |

CH 5:

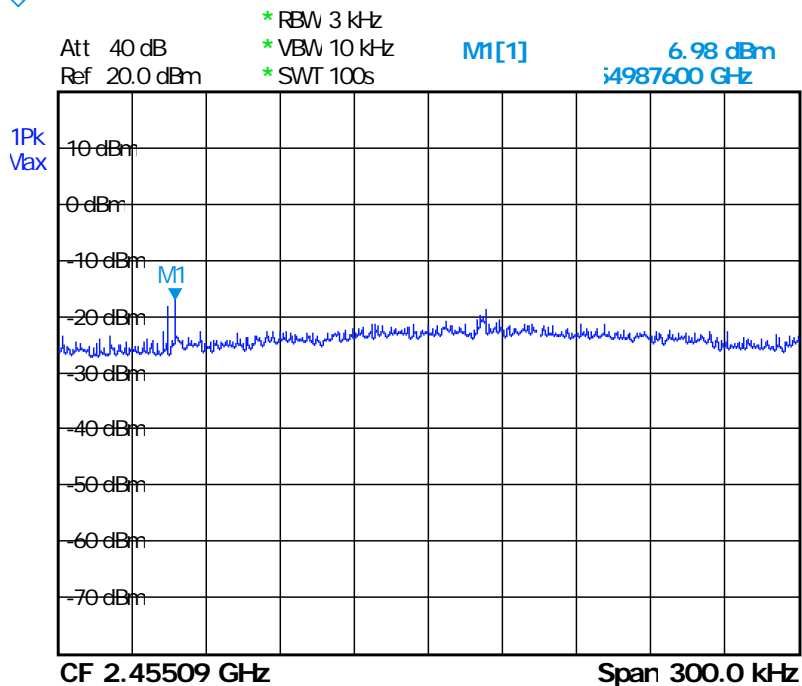




CH 8:



CH 11:





## 5 Antenna application

### 5.1 Antenna requirement

The EUT's antenna is met the requirement of FCC part15C section15.203 and 15.204.

FCC part15C section15.247 requirement:

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

### 5.2 Result

The EUT antenna used a PIFA . Gain of antenna types is -3.22 dBi that meet the requirement.



## 6. PHOTOS OF TESTING

- Conducted test (TX+RX, normal used)





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- Radiated test (below 1G , TX+RX , normal used)







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- Radiated test (above 1G , TX+RX , normal used)







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### 7. TERMS OF ABBREVIATION

|          |  |
|----------|--|
| AV.      | Average detection                            |
| AZ(°)    | Turn table azimuth                           |
| Correct. | Correction                                   |
| EL(m)    | Antenna height (meter)                       |
| EUT      | Equipment Under Test                         |
| Horiz.   | Horizontal direction                         |
| LISN     | Line Impedance Stabilization Network         |
| NSA      | Normalized Site Attenuation                  |
| Q.P.     | Quasi-peak detection                         |
| SRT Lab  | Spectrum Research & Testing Laboratory, Inc. |
| Vert.    | Vertical direction                           |