



# FCC RADIO TEST REPORT

Applicant : Partner Tech Corp.

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Address : 10FL, 233-2, Baoqiao Road, Xindian,  
New Taipei City, Taiwan

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Equipment : PAT RF Module

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Model No. : PAT-WB1

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Trade Name : Partner

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FCC ID : NDPPAT-WB1

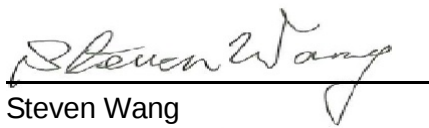
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## I HEREBY CERTIFY THAT :

The sample was received on Sep. 10, 2015 and the testing was carried out on Sep. 11, 2015 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Tested by:

  
Steven Wang  
Manager

  
Spree Yei  
Engineer

## Laboratory Accreditation:

☒ Cerpass Technology Corporation Test Laboratory



☐ Cerpass Technology(SuZhou) Co., Ltd.





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## History of this test report

☒ ORIGINAL.

☐ Additional attachment as following record:

| Attachment No. | Issue Date | Description |
|----------------|------------|-------------|
|                |            |             |
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## 1. Summary of Test Procedure and Test Results

### 1.1 Applicable Standards

ANSI C63.4: 2009

FCC Rules and Regulations Part 15 Subpart C §15.247

KDB558074

KDB662911

| FCC Rule         | Description of Test                | Result |
|------------------|------------------------------------|--------|
| 15.203           | . Antenna Requirement              | Pass   |
| 15.207           | . AC Power Line Conducted Emission | Pass   |
| 15.209<br>15.205 | . Spurious Emission(Radiated)      | Pass   |
| 15.247(d)        | . Spurious Emission(Conducted)     | Pass   |
| 15.247(a)(2)     | . 6dB Bandwidth                    | Pass   |
| 15.247(b)        | . Maximum Peak Output Power        | Pass   |
| 15.247(e)        | . Power Spectral Density           | Pass   |

This EUT has been also tested and compiled with the requirement of FCC Part 15, Subpart B, recorded in a separate test report.



## 2. Test Configuration of Equipment under Test

### 2.1 Feature of Equipment under Test

|                  |                                                                                                                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band   | 802.11 b/g/n: 2412 ~ 2462GHz<br>Bluetooth: 2402 ~ 2480GHz                                                                                                                                                                                                                                                        |
| WIFI/Bluetooth   | 802.11 b/g/n<br>Roaming function<br>The WM-BAN-BM-07_S module is designed based on Broadcom 4334 chipset solution. It supports generic GSPI, SDIOv2.0, HSIC interface to connect the WLAN to the host processor. High speed UART is available to connect the Bluetooth 4.0+HS/FM Receiver to the host processor. |
| Antenna Gain     | 6.55dBi                                                                                                                                                                                                                                                                                                          |
| Output Power     | 802.11 b/g/n: 21.45dBm<br>Bluetooth: 2.54dBm                                                                                                                                                                                                                                                                     |
| Host Information | Trade Name: PARTNER<br>Model No.: PAT-215                                                                                                                                                                                                                                                                        |

### 2.2 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT 20 (2412MHz~2462MHz)

| Channel    | Frequency(MHz) | Channel    | Frequency(MHz) |
|------------|----------------|------------|----------------|
| <b>*01</b> | <b>2412</b>    | 07         | 2442           |
| 02         | 2417           | 08         | 2447           |
| 03         | 2422           | 09         | 2452           |
| 04         | 2427           | 10         | 2457           |
| 05         | 2432           | <b>*11</b> | <b>2462</b>    |
| <b>*06</b> | <b>2437</b>    | ---        | ---            |

Note: Channels remarked \* are selected to perform test.



## 2.3 Test Mode and Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- The complete test system included Notebook and EUT for RF test.
- An executive program, "usibcm tool" under Android was executed to transmit and receive data via WLAN.
- Pre-Scanned RF Power:

| 802.11b mode            |       |       |       |       |     |     |     |     |
|-------------------------|-------|-------|-------|-------|-----|-----|-----|-----|
| Date Rate (Mbps)        | 11    | 5.5   | 2     | 1     | --- | --- | --- | --- |
| Avg. Power Output (dBm) | 14.05 | 14.29 | 14.37 | 14.44 |     |     |     |     |
| Peak Power Output (dBm) | 17.29 | 17.33 | 17.49 | 17.56 |     |     |     |     |

| 802.11g mode            |       |       |       |       |       |       |       |       |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Date Rate (Mbps)        | 54    | 48    | 36    | 24    | 18    | 12    | 9     | 6     |
| Avg. Power Output (dBm) | 12.66 | 12.82 | 13.01 | 13.26 | 13.45 | 13.53 | 13.69 | 13.77 |
| Peak Power Output (dBm) | 21.17 | 21.22 | 21.28 | 21.25 | 21.36 | 21.40 | 21.44 | 21.45 |

| 802.11n HT20 mode       |       |        |       |       |       |        |       |       |
|-------------------------|-------|--------|-------|-------|-------|--------|-------|-------|
| Date Rate (Mbps)        | 65/7  | 58.8/6 | 52/5  | 39/4  | 26/3  | 19.5/2 | 13/1  | 6.5/0 |
| Avg. Power Output (dBm) | 10.78 | 10.92  | 11.01 | 11.18 | 11.72 | 11.67  | 11.85 | 11.96 |
| Peak Power Output (dBm) | 20.18 | 20.32  | 19.98 | 20.39 | 20.48 | 20.37  | 20.51 | 20.62 |

\*The highest powers were chosen for the full test.



e. The following test mode was performed for conduction and radiation test:

Test Mode 1. 802.11b (1Mbps)

Test Mode 2. 802.11g (6Mbps)

Test Mode 3. 802.11n HT20 (6.5Mbps)

For conduction test, caused "Test Mode 2" generated the worst case, it was reported as the final data.

For radiation (30MHz-1GHz) test, caused "Test Mode 1" generated the worst case, it was reported as the final data.

For radiation (1GHz-25GHz) test, caused "Test Mode 1" generated the worst case, it was reported as the final data.

## 2.4 Description of Test System

| Device   | Manufacturer | Model No. | Description                    |
|----------|--------------|-----------|--------------------------------|
| Notebook | DELL         | VPCEB25FW | Power Cable, Unshielding, 1.8m |

Used cable

| Cable     | Quantity | Description     |
|-----------|----------|-----------------|
| Micro USB | 1        | Shielding, 1.5m |



## 2.5 General Information of Test

|                                               |                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                          |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Test Site | <b>CerpPASS Technology Corporation Test Laboratory</b><br>Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.)<br>Tel:+886-3-3226-888<br>Fax:+886-3-3226-881<br>Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C.<br>Tel: +886-2-2663-8582 |                                                                                                                                                                          |
|                                               | FCC                                                                                                                                                                                                                                                                                                             | TW1079, TW1061,390316, 228391, 641184                                                                                                                                    |
|                                               | IC                                                                                                                                                                                                                                                                                                              | 4934E-1, 4934E-2                                                                                                                                                         |
|                                               | VCCI                                                                                                                                                                                                                                                                                                            | T-2205 for Telecommunication Test<br>C-4663 for Conducted emission test<br>R-3428, R-4218 for Radiated emission test<br>G-812, G-813 for radiated disturbance above 1GHz |
| <input type="checkbox"/> Test Site            | <b>CerpPASS Technology (Suzhou) Co.,Ltd</b><br>Address: No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China<br>Tel: +86-512-6917-5888<br>Fax: +86-512-6917-5666                                                                                                                                |                                                                                                                                                                          |
|                                               | FCC                                                                                                                                                                                                                                                                                                             | 916572, 331395                                                                                                                                                           |
|                                               | IC                                                                                                                                                                                                                                                                                                              | 7290A-1, 7290A-2                                                                                                                                                         |
|                                               | VCCI                                                                                                                                                                                                                                                                                                            | T-343 for Telecommunication Test<br>C-2919 for Conducted emission test<br>R-2670 for Radiated emission test<br>G-227 for radiated disturbance above 1GHz                 |
| Frequency Range Investigated:                 | Conducted: from 150kHz to 30 MHz<br>Radiation: from 30 MHz to 25000MHz                                                                                                                                                                                                                                          |                                                                                                                                                                          |
| Test Distance:                                | The test distance of radiated emission from antenna to EUT is 3 M.                                                                                                                                                                                                                                              |                                                                                                                                                                          |



### 3. Test Equipment and Ancillaries Used for Tests

| Instrument         | Model No.   | Manufacturer | Serial No. | Calibration Date | Valid Date |
|--------------------|-------------|--------------|------------|------------------|------------|
| EMI RECEIVER       | R&S         | ESCI 3       | 101423     | 2015/04/09       | 2016/04/08 |
| LISN               | Schwarzbeck | NSLK 8127    | 8127-516   | 2015/03/09       | 2016/03/08 |
| LISN               | Schwarzbeck | NSLK 8127    | 8127-568   | 2014/09/16       | 2015/09/15 |
| PULSE LIMITER      | R&S         | ESH3-Z2      | 101934     | 2015/03/05       | 2016/03/04 |
| EMI RECEIVER       | R&S         | ESCI 3       | 100443     | 2015/03/30       | 2016/03/29 |
| BILOG ANTENNA      | Schwarzbeck | VULB 9168    | 275        | 2014/09/18       | 2015/09/17 |
| AMPLIFIER          | QuieTek     | AP/0100A     | CHM0906075 | 2014/09/17       | 2015/09/16 |
| SPECTRUM ANALYZER  | R&S         | FSP40        | 100219     | 2015/09/01       | 2016/08/31 |
| HORN ANTENNA       | EMCO        | 3115         | 31589      | 2015/03/09       | 2016/03/08 |
| PREAMPLIFIER       | AGILENT     | 8449B        | 3008A01954 | 2015/03/05       | 2016/03/04 |
| HORN ANTENNA       | EMCO        | 3116         | 31970      | 2015/03/05       | 2016/03/04 |
| HORN ANTENNA       | EMCO        | 3116         | 31974      | 2015/09/07       | 2016/09/06 |
| SPECTRUM ANALYZER  | R&S         | FSP40        | 100047     | 2015/03/07       | 2016/03/06 |
| PREAMPLIFIER       | AGILENT     | 8449B        | 3008A01954 | 2015/03/05       | 2016/03/04 |
| HIGH PASS FILTER   | HP          | 84300-80038  | 002        | N/A              | N/A        |
| SERIES POWER METER | ANRITSU     | ML2495A      | 1224005    | 2015/03/05       | 2016/03/04 |
| POWER SENSOR       | ANRITSU     | MA2411B      | 1207295    | 2015/03/05       | 2016/03/04 |
| Bluetooth Tester   | R&S         | CBT          | 101133     | 2015/03/12       | 2016/03/11 |



## 4. Antenna Requirements

### 4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.2 Antenna Construction and Directional Gain

| Antenna Type    | Antenna Gain |
|-----------------|--------------|
| Printed Antenna | 6.55dBi      |



## 5. Test of AC Power Line Conducted Emission

### 5.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2009 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

| Frequency<br>(MHz) | Quasi Peak<br>(dB $\mu$ V) | Average<br>(dB $\mu$ V) |
|--------------------|----------------------------|-------------------------|
| 0.15 – 0.5         | 66-56*                     | 56-46*                  |
| 0.5 – 5.0          | 56                         | 46                      |
| 5.0 – 30.0         | 60                         | 50                      |

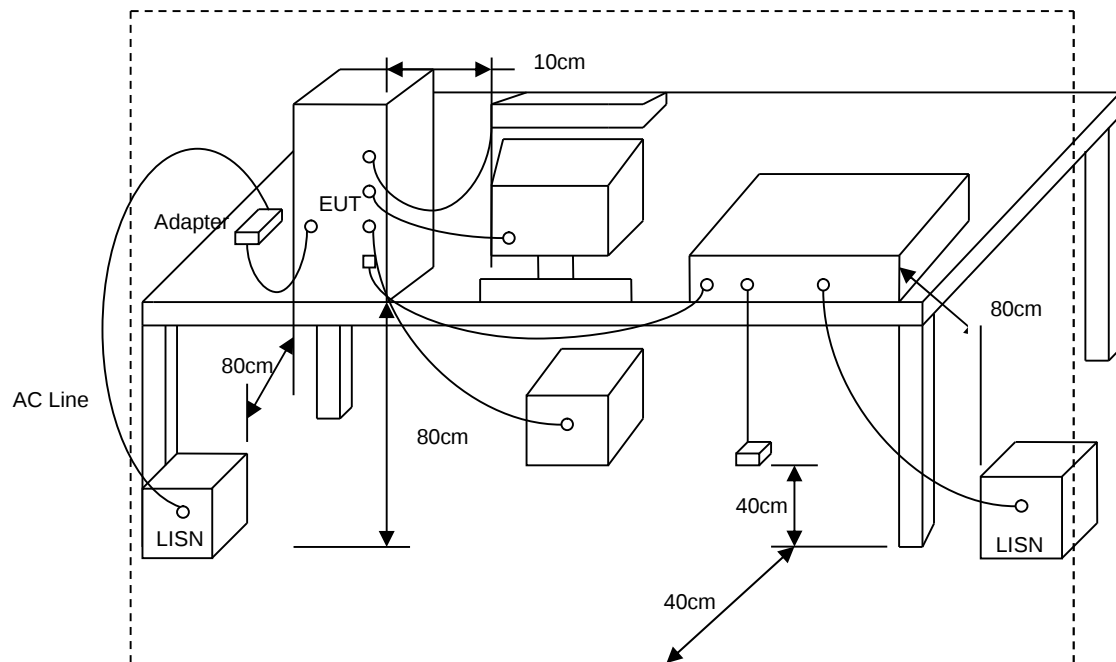
\*Decreases with the logarithm of the frequency.

### 5.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



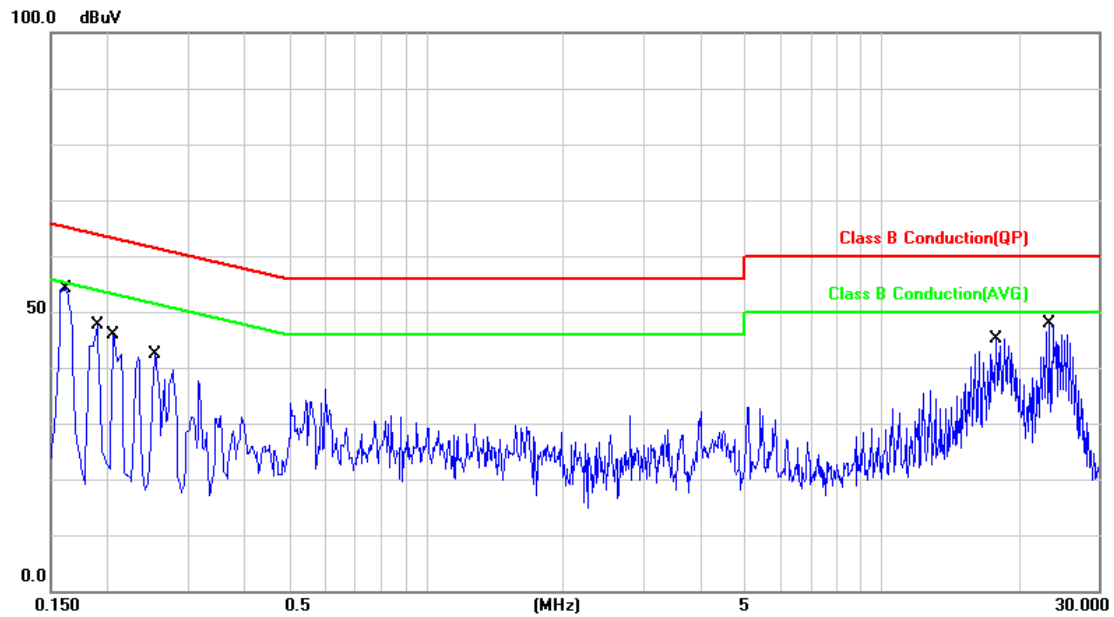
### 5.3 Typical Test Setup





## 5.4 Test Result and Data

|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : LINE     |
| Test Mode 2 | : 802.11g CH01  | Temperature          | : 26 °C    |
| Test date   | : Sep. 10, 2015 | Humidity             | : 48 %     |
| Memo        | :               | Atmospheric Pressure | : 1008 hpa |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1620          | 9.96        | 39.32          | 49.28        | 65.36        | -16.08      | QP       | P   |
| 2   | 0.1620          | 9.96        | 19.47          | 29.43        | 55.36        | -25.93      | AVG      | P   |
| 3   | 0.1900          | 9.96        | 34.71          | 44.67        | 64.03        | -19.36      | QP       | P   |
| 4   | 0.1900          | 9.96        | 17.18          | 27.14        | 54.03        | -26.89      | AVG      | P   |
| 5   | 0.2060          | 9.96        | 30.87          | 40.83        | 63.36        | -22.53      | QP       | P   |
| 6   | 0.2060          | 9.96        | 10.92          | 20.88        | 53.36        | -32.48      | AVG      | P   |
| 7   | 0.2540          | 9.96        | 23.06          | 33.02        | 61.62        | -28.60      | QP       | P   |
| 8   | 0.2540          | 9.96        | 6.08           | 16.04        | 51.62        | -35.58      | AVG      | P   |
| 9   | 17.9260         | 10.59       | 32.43          | 43.02        | 60.00        | -16.98      | QP       | P   |
| 10  | 17.9260         | 10.59       | 26.94          | 37.53        | 50.00        | -12.47      | AVG      | P   |
| 11  | 23.4140         | 10.72       | 37.36          | 48.08        | 60.00        | -11.92      | QP       | P   |
| 12  | 23.4140         | 10.72       | 30.84          | 41.56        | 50.00        | -8.44       | AVG      | P   |

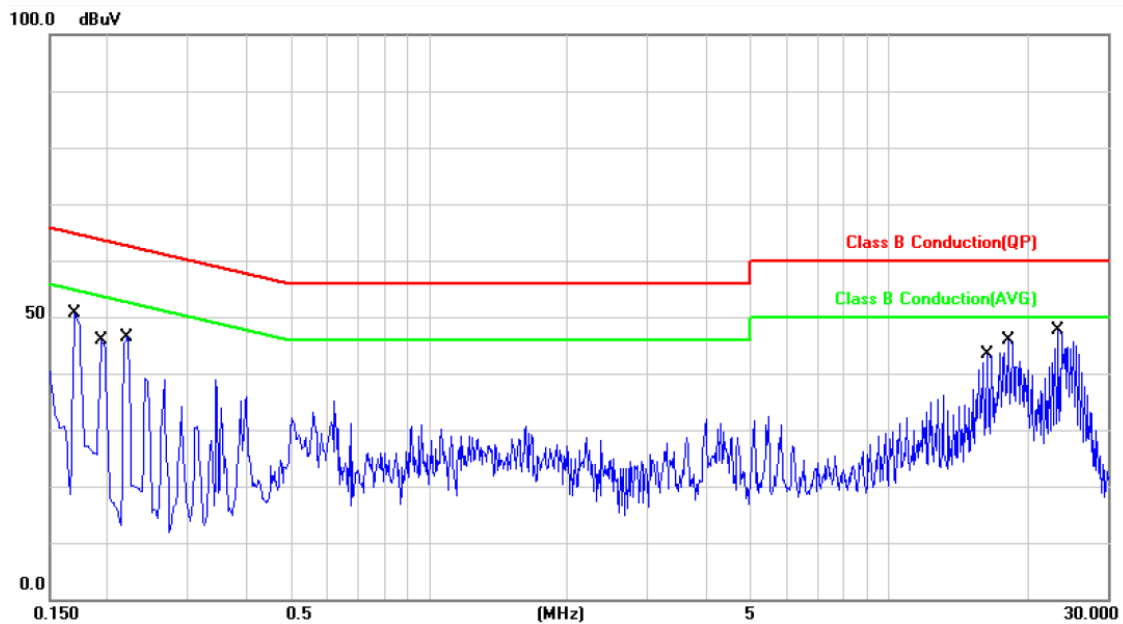
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : NEUTRAL  |
| Test Mode 2 | : 802.11g CH01  | Temperature          | : 26 °C    |
| Test date   | : Sep. 10, 2015 | Humidity             | : 48 %     |
| Memo        | :               | Atmospheric Pressure | : 1008 hpa |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1700          | 9.96        | 38.01          | 47.97        | 64.96        | -16.99      | QP       | P   |
| 2   | 0.1700          | 9.96        | 20.63          | 30.59        | 54.96        | -24.37      | AVG      | P   |
| 3   | 0.1940          | 9.95        | 34.18          | 44.13        | 63.86        | -19.73      | QP       | P   |
| 4   | 0.1940          | 9.95        | 16.78          | 26.73        | 53.86        | -27.13      | AVG      | P   |
| 5   | 0.2220          | 9.95        | 30.15          | 40.10        | 62.74        | -22.64      | QP       | P   |
| 6   | 0.2220          | 9.95        | 11.26          | 21.21        | 52.74        | -31.53      | AVG      | P   |
| 7   | 16.4660         | 10.56       | 31.69          | 42.25        | 60.00        | -17.75      | QP       | P   |
| 8   | 16.4660         | 10.56       | 25.33          | 35.89        | 50.00        | -14.11      | AVG      | P   |
| 9   | 18.2939         | 10.62       | 33.31          | 43.93        | 60.00        | -16.07      | QP       | P   |
| 10  | 18.2939         | 10.62       | 27.80          | 38.42        | 50.00        | -11.58      | AVG      | P   |
| 11  | 23.4140         | 10.76       | 36.94          | 47.70        | 60.00        | -12.30      | QP       | P   |
| 12  | 23.4140         | 10.76       | 30.42          | 41.18        | 50.00        | -8.82       | AVG      | P   |

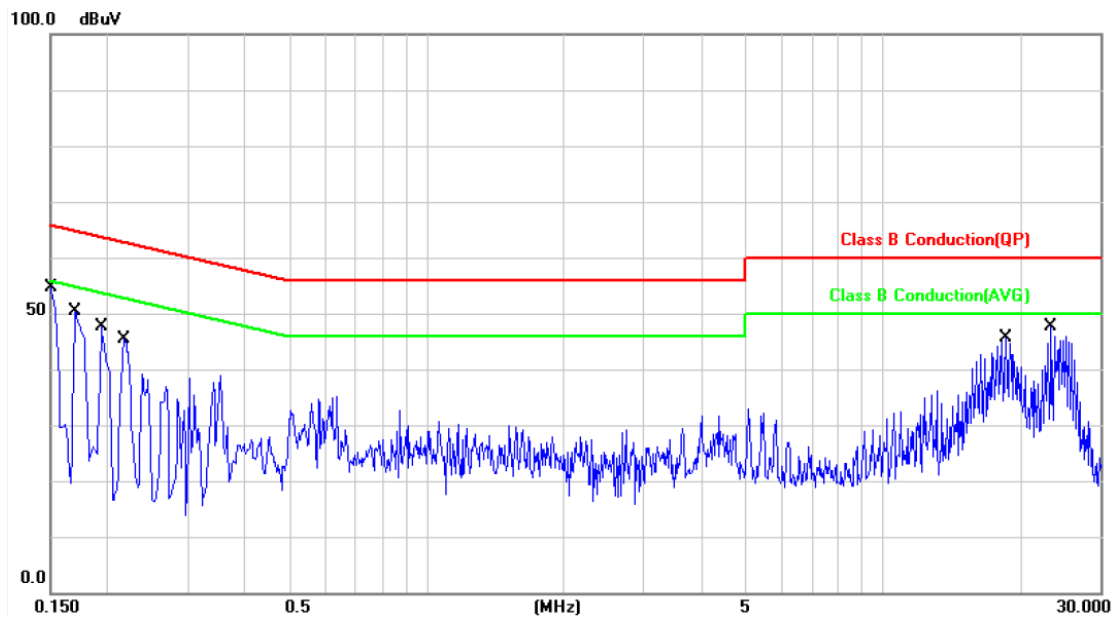
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : LINE     |
| Test Mode 2 | : 802.11g CH06  | Temperature          | : 26 °C    |
| Test date   | : Sep. 10, 2015 | Humidity             | : 48 %     |
| Memo        | :               | Atmospheric Pressure | : 1008 hpa |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1500          | 9.96        | 40.89          | 50.85        | 65.99        | -15.14      | QP       | P   |
| 2   | 0.1500          | 9.96        | 23.18          | 33.14        | 55.99        | -22.85      | AVG      | P   |
| 3   | 0.1700          | 9.96        | 37.67          | 47.63        | 64.96        | -17.33      | QP       | P   |
| 4   | 0.1700          | 9.96        | 20.24          | 30.20        | 54.96        | -24.76      | AVG      | P   |
| 5   | 0.1940          | 9.96        | 34.06          | 44.02        | 63.86        | -19.84      | QP       | P   |
| 6   | 0.1940          | 9.96        | 16.91          | 26.87        | 53.86        | -26.99      | AVG      | P   |
| 7   | 0.2180          | 9.96        | 31.14          | 41.10        | 62.89        | -21.79      | QP       | P   |
| 8   | 0.2180          | 9.96        | 13.69          | 23.65        | 52.89        | -29.24      | AVG      | P   |
| 9   | 18.6580         | 10.60       | 33.91          | 44.51        | 60.00        | -15.49      | QP       | P   |
| 10  | 18.6580         | 10.60       | 27.80          | 38.40        | 50.00        | -11.60      | AVG      | P   |
| 11  | 23.4140         | 10.72       | 37.25          | 47.97        | 60.00        | -12.03      | QP       | P   |
| 12  | 23.4140         | 10.72       | 30.73          | 41.45        | 50.00        | -8.55       | AVG      | P   |

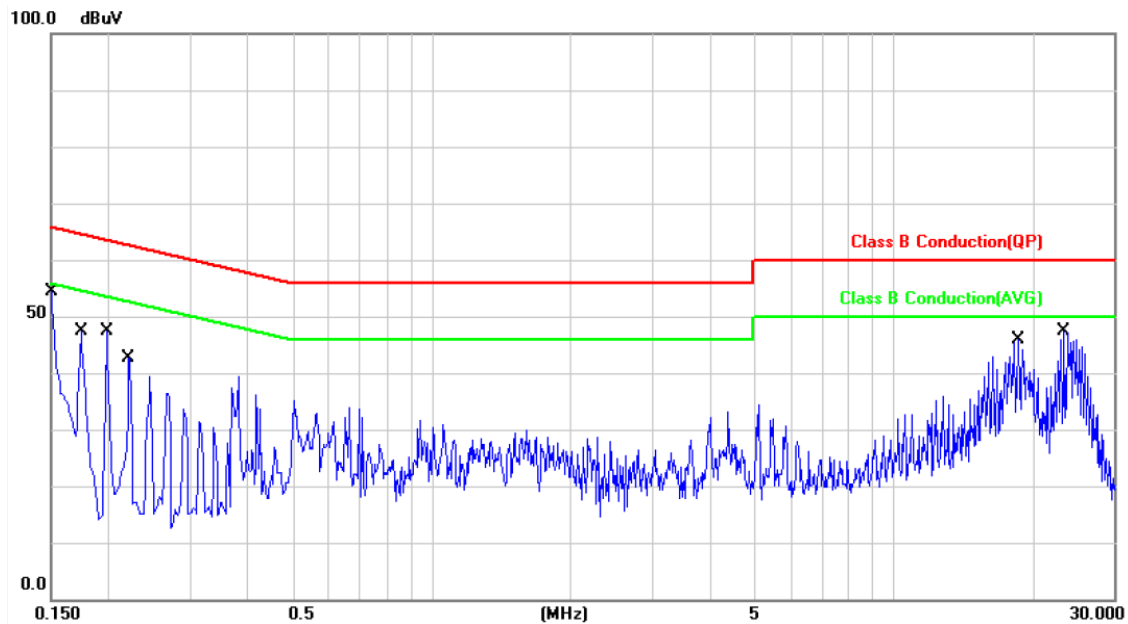
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : NEUTRAL  |
| Test Mode 2 | : 802.11g CH06  | Temperature          | : 26 °C    |
| Test date   | : Sep. 10, 2015 | Humidity             | : 48 %     |
| Memo        | :               | Atmospheric Pressure | : 1008 hpa |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1500          | 9.96        | 41.08          | 51.04        | 65.99        | -14.95      | QP       | P   |
| 2   | 0.1500          | 9.96        | 22.92          | 32.88        | 55.99        | -23.11      | AVG      | P   |
| 3   | 0.1740          | 9.96        | 34.70          | 44.66        | 64.76        | -20.10      | QP       | P   |
| 4   | 0.1740          | 9.96        | 16.23          | 26.19        | 54.76        | -28.57      | AVG      | P   |
| 5   | 0.1980          | 9.95        | 32.17          | 42.12        | 63.69        | -21.57      | QP       | P   |
| 6   | 0.1980          | 9.95        | 13.74          | 23.69        | 53.69        | -30.00      | AVG      | P   |
| 7   | 0.2220          | 9.95        | 29.95          | 39.90        | 62.74        | -22.84      | QP       | P   |
| 8   | 0.2220          | 9.95        | 11.09          | 21.04        | 52.74        | -31.70      | AVG      | P   |
| 9   | 18.6580         | 10.62       | 33.80          | 44.42        | 60.00        | -15.58      | QP       | P   |
| 10  | 18.6580         | 10.62       | 27.69          | 38.31        | 50.00        | -11.69      | AVG      | P   |
| 11  | 23.4140         | 10.76       | 36.97          | 47.73        | 60.00        | -12.27      | QP       | P   |
| 12  | 23.4140         | 10.76       | 30.43          | 41.19        | 50.00        | -8.81       | AVG      | P   |

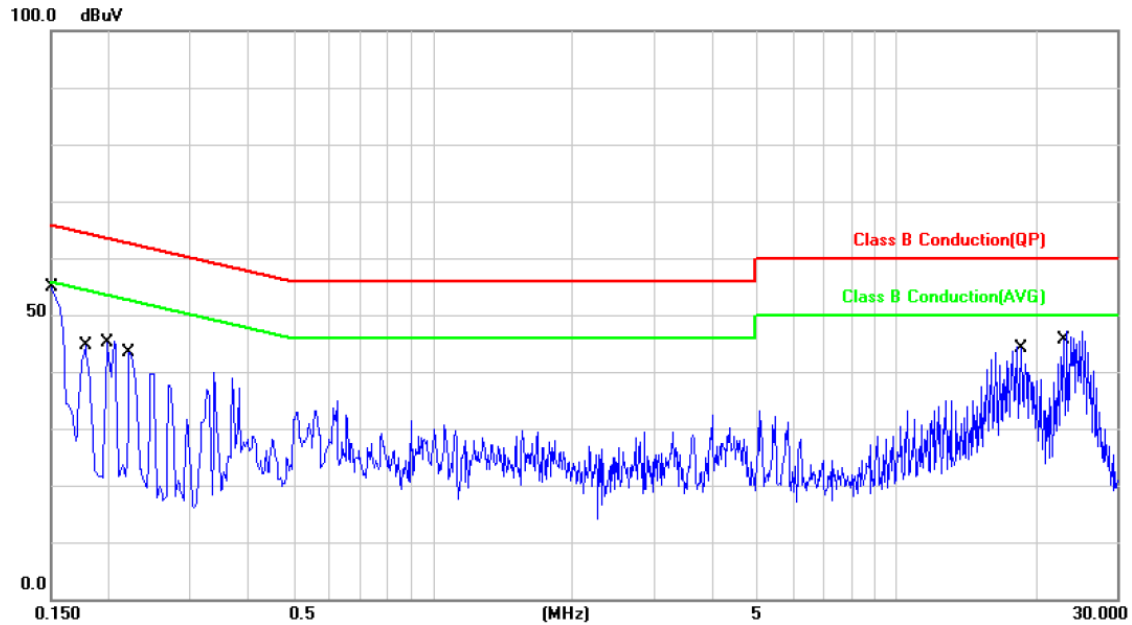
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : LINE     |
| Test Mode 2 | : 802.11g CH11  | Temperature          | : 26 °C    |
| Test date   | : Sep. 10, 2015 | Humidity             | : 48 %     |
| Memo        | :               | Atmospheric Pressure | : 1008 hpa |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1500          | 9.96        | 41.09          | 51.05        | 65.99        | -14.94      | QP       | P   |
| 2   | 0.1500          | 9.96        | 22.83          | 32.79        | 55.99        | -23.20      | AVG      | P   |
| 3   | 0.1780          | 9.96        | 32.62          | 42.58        | 64.57        | -21.99      | QP       | P   |
| 4   | 0.1780          | 9.96        | 13.07          | 23.03        | 54.57        | -31.54      | AVG      | P   |
| 5   | 0.1980          | 9.96        | 31.97          | 41.93        | 63.69        | -21.76      | QP       | P   |
| 6   | 0.1980          | 9.96        | 13.84          | 23.80        | 53.69        | -29.89      | AVG      | P   |
| 7   | 0.2220          | 9.96        | 29.77          | 39.73        | 62.74        | -23.01      | QP       | P   |
| 8   | 0.2220          | 9.96        | 11.47          | 21.43        | 52.74        | -31.31      | AVG      | P   |
| 9   | 18.6580         | 10.60       | 33.98          | 44.58        | 60.00        | -15.42      | QP       | P   |
| 10  | 18.6580         | 10.60       | 27.83          | 38.43        | 50.00        | -11.57      | AVG      | P   |
| 11  | 23.0500         | 10.71       | 35.52          | 46.23        | 60.00        | -13.77      | QP       | P   |
| 12  | 23.0500         | 10.71       | 30.11          | 40.82        | 50.00        | -9.18       | AVG      | P   |

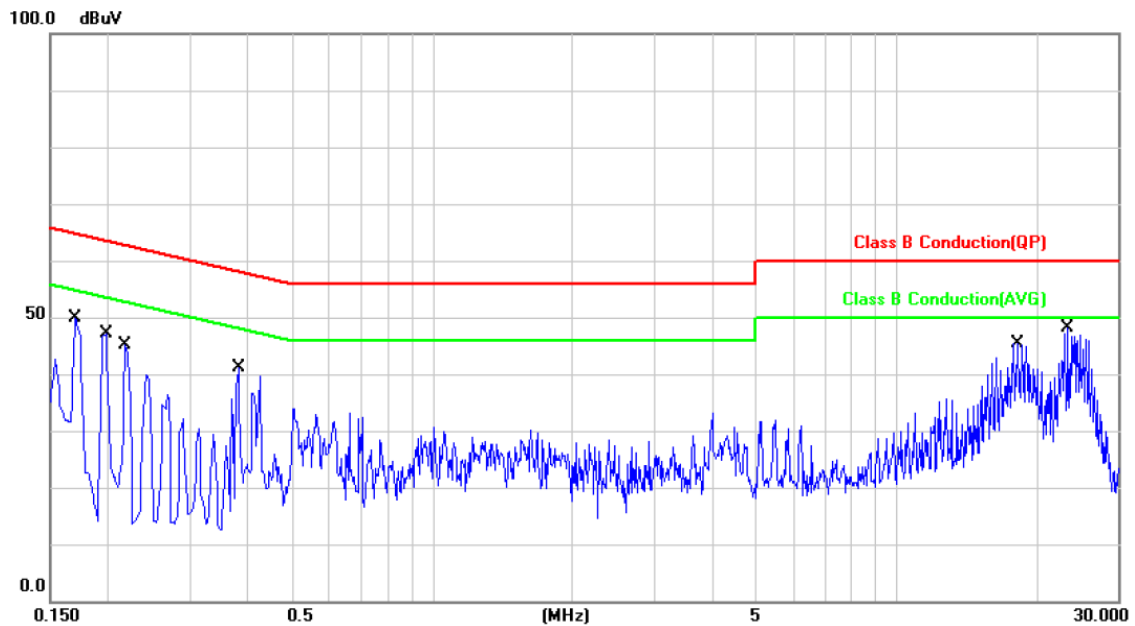
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : NEUTRAL  |
| Test Mode 2 | : 802.11g CH11  | Temperature          | : 26 °C    |
| Test date   | : Sep. 10, 2015 | Humidity             | : 48 %     |
| Memo        | :               | Atmospheric Pressure | : 1008 hpa |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1700          | 9.96        | 37.37          | 47.33        | 64.96        | -17.63      | QP       | P   |
| 2   | 0.1700          | 9.96        | 20.16          | 30.12        | 54.96        | -24.84      | AVG      | P   |
| 3   | 0.1980          | 9.95        | 32.19          | 42.14        | 63.69        | -21.55      | QP       | P   |
| 4   | 0.1980          | 9.95        | 13.75          | 23.70        | 53.69        | -29.99      | AVG      | P   |
| 5   | 0.2180          | 9.95        | 31.03          | 40.98        | 62.89        | -21.91      | QP       | P   |
| 6   | 0.2180          | 9.95        | 13.55          | 23.50        | 52.89        | -29.39      | AVG      | P   |
| 7   | 0.3820          | 9.96        | 17.56          | 27.52        | 58.23        | -30.71      | QP       | P   |
| 8   | 0.3820          | 9.96        | 3.10           | 13.06        | 48.23        | -35.17      | AVG      | P   |
| 9   | 18.2939         | 10.62       | 33.25          | 43.87        | 60.00        | -16.13      | QP       | P   |
| 10  | 18.2939         | 10.62       | 27.74          | 38.36        | 50.00        | -11.64      | AVG      | P   |
| 11  | 23.4140         | 10.76       | 36.92          | 47.68        | 60.00        | -12.32      | QP       | P   |
| 12  | 23.4140         | 10.76       | 30.35          | 41.11        | 50.00        | -8.89       | AVG      | P   |

Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss



## 6. Test of Spurious Emission (Radiated)

### 6.1 Test Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

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

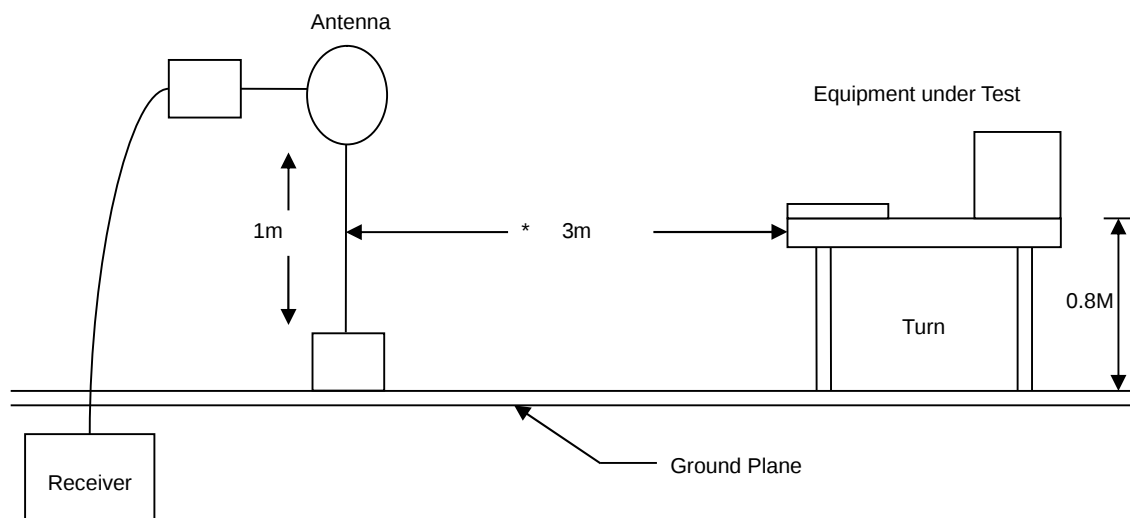
### 6.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

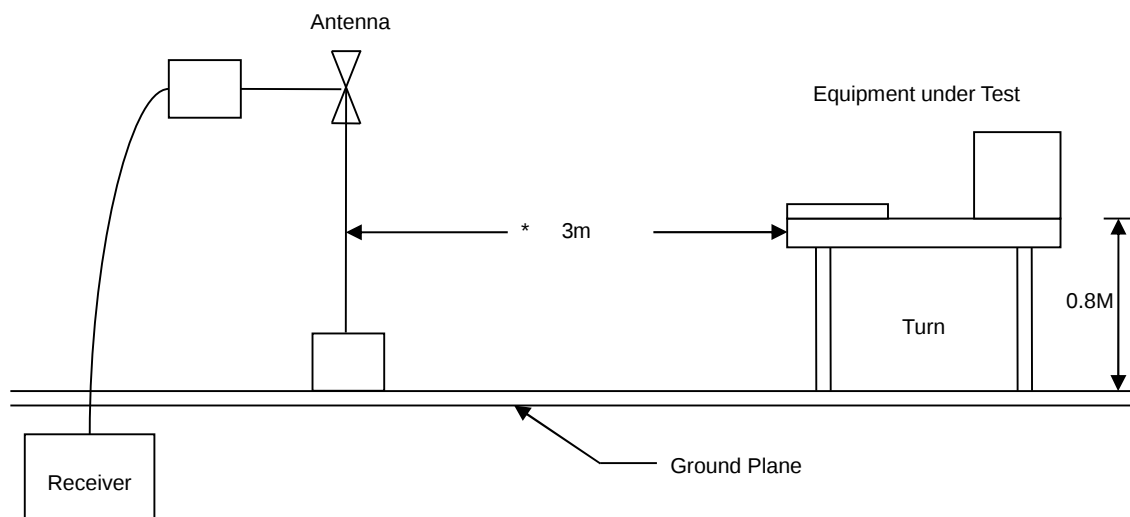


### 6.3 Typical Test Setup

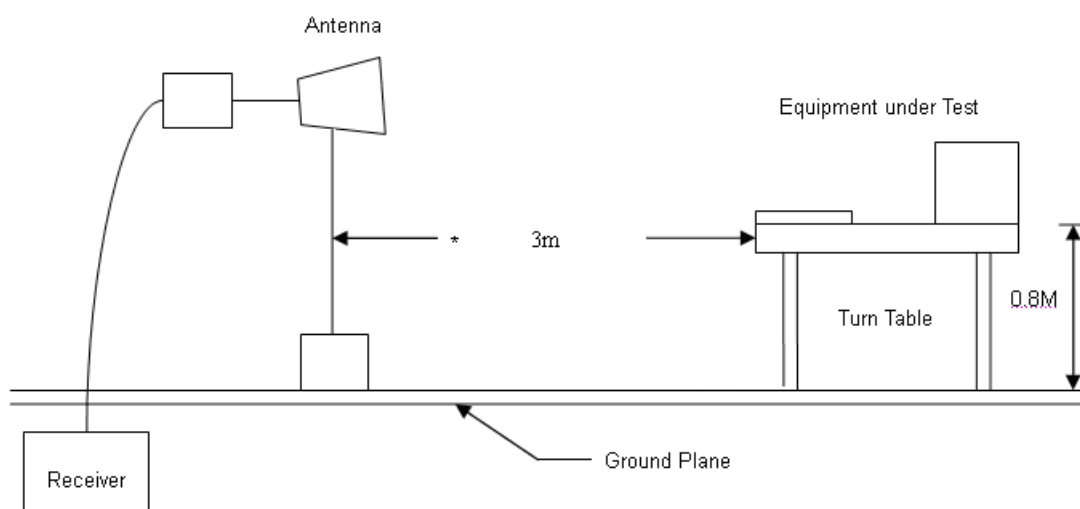
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



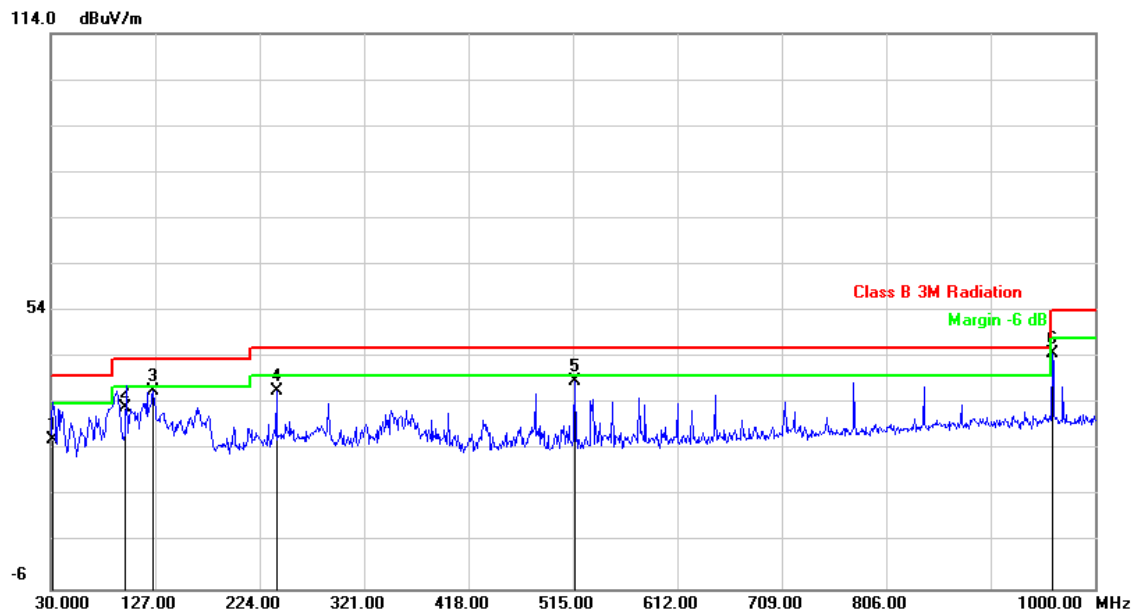


#### 6.4 Test Result and Data (9KHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

#### 6.5 Test Result and Data (30MHz ~ 1GHz)

|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : VERTICAL |
| Test Mode 1 | : 802.11b CH01  | Temperature          | : 23 °C    |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 52 %     |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 31.9400         | -7.97         | 34.27          | 26.30          | 40.00          | -13.70      | QP       | 104         | 185         | P   |
| 2   | 99.8399         | -12.49        | 45.79          | 33.30          | 43.50          | -10.20      | QP       | 104         | 185         | P   |
| 3   | 125.0600        | -8.98         | 45.84          | 36.86          | 43.50          | -6.64       | peak     | 104         | 185         | P   |
| 4   | 239.5200        | -8.73         | 45.52          | 36.79          | 46.00          | -9.21       | peak     | 104         | 185         | P   |
| 5   | 516.9400        | -1.06         | 40.06          | 39.00          | 46.00          | -7.00       | peak     | 104         | 185         | P   |
| 6   | 960.2300        | 5.83          | 38.97          | 44.80          | 54.00          | -9.20       | peak     | 104         | 185         | P   |

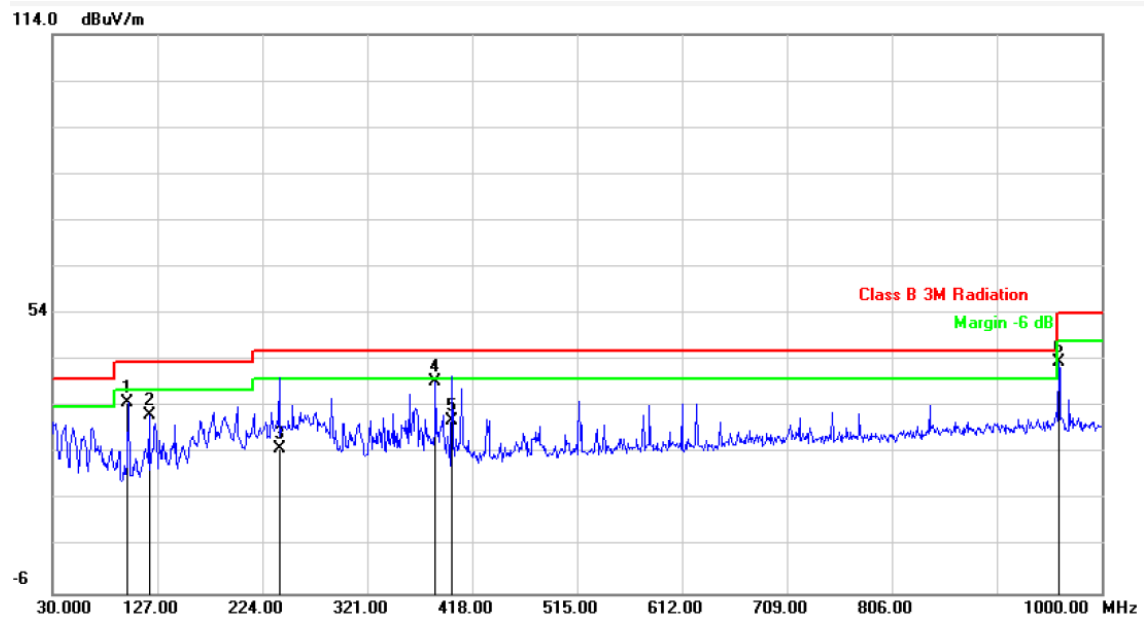
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Power       | : AC 120V       | Pol/Phase            | : HORIZONTAL |
| Test Mode 1 | : 802.11b CH01  | Temperature          | : 23 °C      |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 52 %       |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa   |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 99.8399         | -12.49        | 47.33          | 34.84          | 43.50          | -8.66       | peak     | 104         | 185         | P   |
| 2   | 119.2400        | -9.54         | 41.93          | 32.39          | 43.50          | -11.11      | peak     | 104         | 185         | P   |
| 3   | 239.5200        | -8.73         | 33.93          | 25.20          | 46.00          | -20.80      | QP       | 104         | 185         | P   |
| 4   | 384.0500        | -4.16         | 43.67          | 39.51          | 46.00          | -6.49       | peak     | 104         | 185         | P   |
| 5   | 399.5700        | -3.73         | 34.93          | 31.20          | 46.00          | -14.80      | QP       | 104         | 185         | P   |
| 6   | 960.2300        | 5.83          | 37.90          | 43.73          | 54.00          | -10.27      | peak     | 104         | 185         | P   |

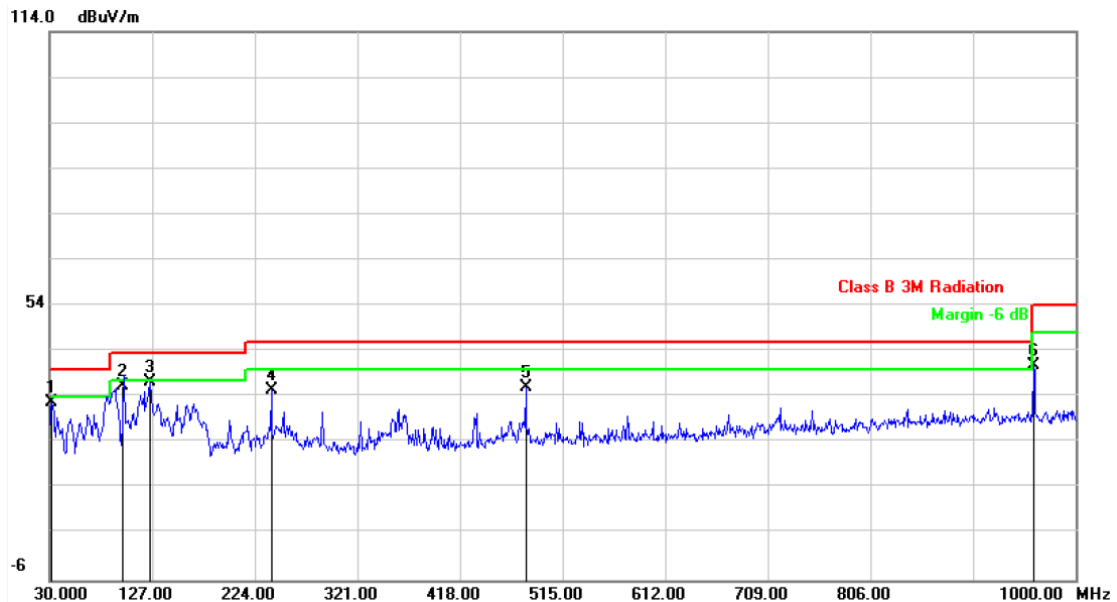
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : VERTICAL |
| Test Mode 1 | : 802.11b CH06  | Temperature          | : 23 °C    |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 52 %     |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 31.9400         | -7.97         | 40.96          | 32.99          | 40.00          | -7.01       | peak     | 102         | 188         | P   |
| 2   | 99.8399         | -12.49        | 48.99          | 36.50          | 43.50          | -7.00       | QP       | 102         | 188         | P   |
| 3   | 125.0600        | -8.98         | 46.44          | 37.46          | 43.50          | -6.04       | peak     | 102         | 188         | P   |
| 4   | 239.5200        | -8.73         | 44.39          | 35.66          | 46.00          | -10.34      | peak     | 102         | 188         | P   |
| 5   | 480.0800        | -1.79         | 37.98          | 36.19          | 46.00          | -9.81       | peak     | 102         | 188         | P   |
| 6   | 960.2300        | 5.83          | 35.19          | 41.02          | 54.00          | -12.98      | peak     | 102         | 188         | P   |

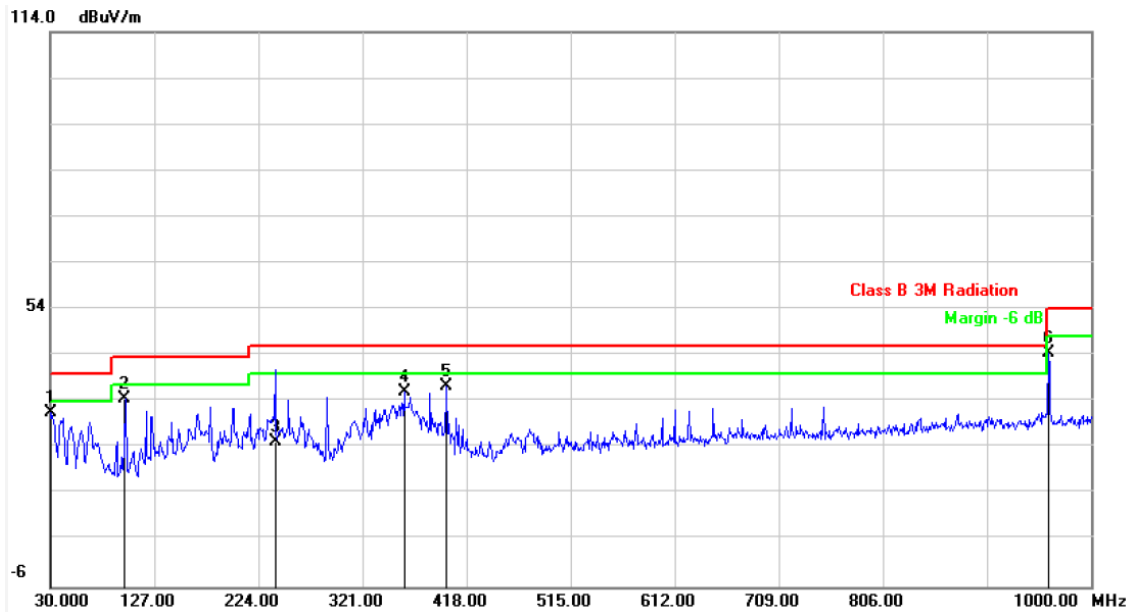
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Power       | : AC 120V       | Pol/Phase            | : HORIZONTAL |
| Test Mode 1 | : 802.11b CH06  | Temperature          | : 23 °C      |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 52 %       |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa   |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 30.9700         | -8.01         | 39.61          | 31.60          | 40.00          | -8.40       | peak     | 102         | 188         | P   |
| 2   | 99.8399         | -12.49        | 47.22          | 34.73          | 43.50          | -8.77       | peak     | 102         | 188         | P   |
| 3   | 239.5200        | -8.73         | 34.23          | 25.50          | 46.00          | -20.50      | QP       | 102         | 188         | P   |
| 4   | 359.8000        | -4.81         | 40.88          | 36.07          | 46.00          | -9.93       | peak     | 102         | 188         | P   |
| 5   | 399.5700        | -3.73         | 41.07          | 37.34          | 46.00          | -8.66       | peak     | 102         | 188         | P   |
| 6   | 960.2300        | 5.83          | 38.80          | 44.63          | 54.00          | -9.37       | peak     | 102         | 188         | P   |

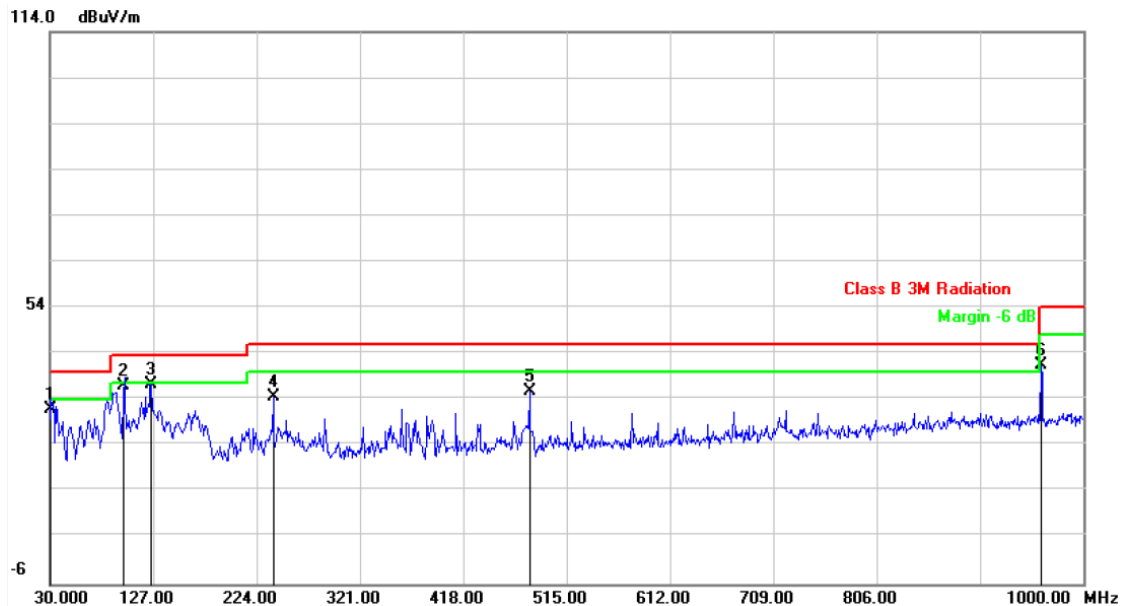
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : VERTICAL |
| Test Mode 1 | : 802.11b CH11  | Temperature          | : 23 °C    |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 52 %     |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 30.9700         | -8.01         | 40.01          | 32.00          | 40.00          | -8.00       | QP       | 101         | 183         | P   |
| 2   | 99.8399         | -12.49        | 49.59          | 37.10          | 43.50          | -6.40       | QP       | 101         | 183         | P   |
| 3   | 125.0600        | -8.98         | 46.29          | 37.31          | 43.50          | -6.19       | peak     | 101         | 183         | P   |
| 4   | 239.5200        | -8.73         | 43.42          | 34.69          | 46.00          | -11.31      | peak     | 101         | 183         | P   |
| 5   | 480.0800        | -1.79         | 37.70          | 35.91          | 46.00          | -10.09      | peak     | 101         | 183         | P   |
| 6   | 960.2300        | 5.83          | 35.68          | 41.51          | 54.00          | -12.49      | peak     | 101         | 183         | P   |

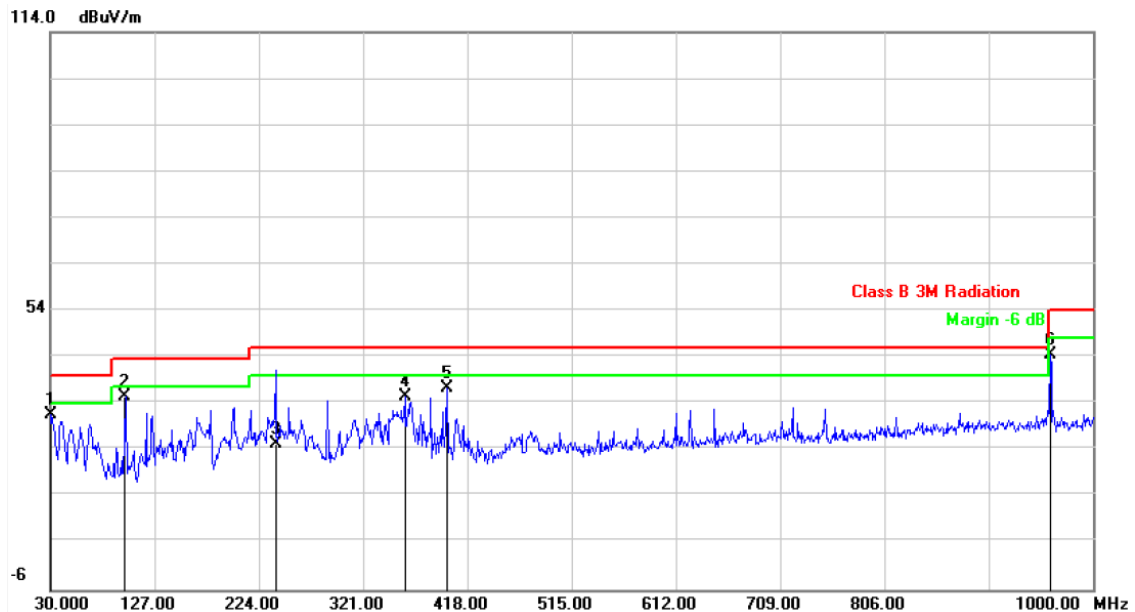
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Power       | : AC 120V       | Pol/Phase            | : HORIZONTAL |
| Test Mode 1 | : 802.11b CH11  | Temperature          | : 23 °C      |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 52 %       |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa   |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 30.9700         | -8.01         | 39.53          | 31.52          | 40.00          | -8.48       | peak     | 101         | 183         | P   |
| 2   | 99.8399         | -12.49        | 47.90          | 35.41          | 43.50          | -8.09       | peak     | 101         | 183         | P   |
| 3   | 239.5200        | -8.73         | 34.03          | 25.30          | 46.00          | -20.70      | QP       | 101         | 183         | P   |
| 4   | 359.8000        | -4.81         | 40.30          | 35.49          | 46.00          | -10.51      | peak     | 101         | 183         | P   |
| 5   | 398.6000        | -3.75         | 40.95          | 37.20          | 46.00          | -8.80       | peak     | 101         | 183         | P   |
| 6   | 960.2300        | 5.83          | 38.75          | 44.58          | 54.00          | -9.42       | peak     | 101         | 183         | P   |

Note: Level = Reading + Factor

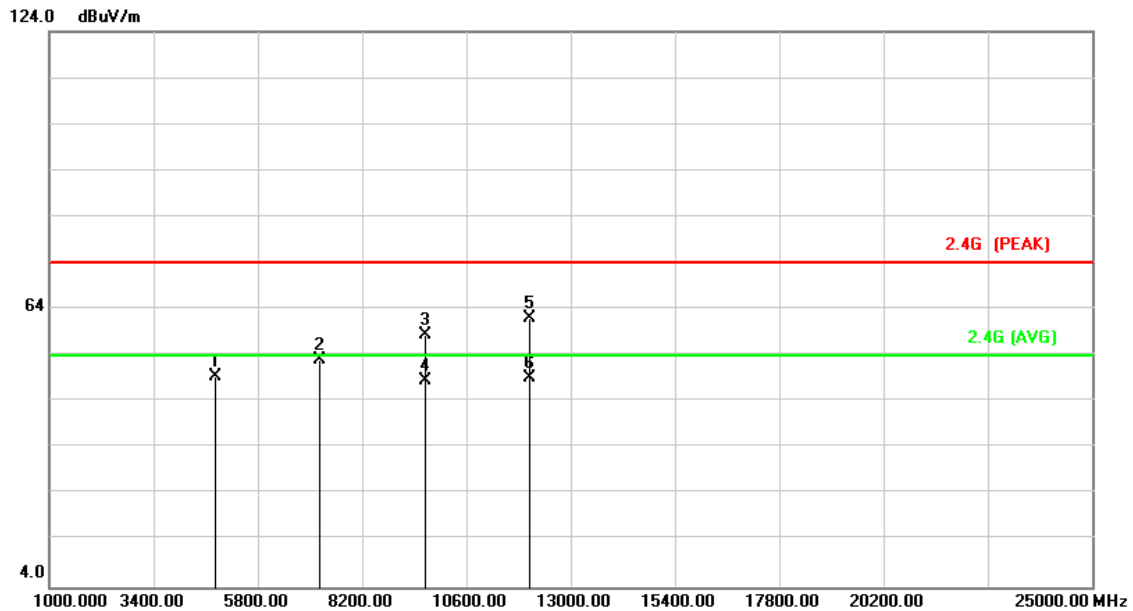
Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



## 6.6 Test Result and Data (1GHz ~ 25GHz)

|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : VERTICAL |
| Test Mode 1 | : 802.11b CH01  | Temperature          | : 23 °C    |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 53 %     |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 4824.000        | 7.91          | 41.56          | 49.47          | 74.00          | -24.53      | peak     | 102         | 188         | P   |
| 2   | 7236.000        | 13.12         | 39.83          | 52.95          | 74.00          | -21.05      | peak     | 102         | 188         | P   |
| 3   | 9648.000        | 16.44         | 42.04          | 58.48          | 74.00          | -15.52      | peak     | 102         | 188         | P   |
| 4   | 9648.000        | 16.44         | 32.07          | 48.51          | 54.00          | -5.49       | AVG      | 102         | 188         | P   |
| 5   | 12060.000       | 20.21         | 41.78          | 61.99          | 74.00          | -12.01      | peak     | 102         | 188         | P   |
| 6   | 12060.000       | 20.21         | 28.81          | 49.02          | 54.00          | -4.98       | AVG      | 102         | 188         | P   |

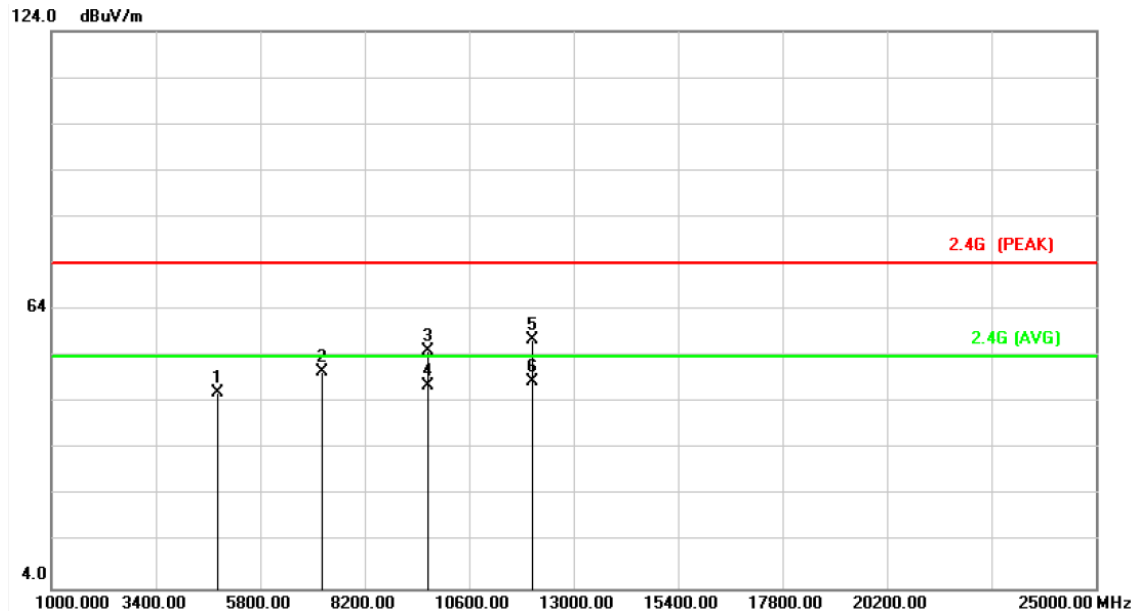
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Power       | : AC 120V       | Pol/Phase            | : HORIZONTAL |
| Test Mode 1 | : 802.11b CH01  | Temperature          | : 23 °C      |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 53 %       |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa   |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 4824.000        | 7.91          | 38.15          | 46.06          | 74.00          | -27.94      | peak     | 102         | 188         | P   |
| 2   | 7236.000        | 13.12         | 37.58          | 50.70          | 74.00          | -23.30      | peak     | 102         | 188         | P   |
| 3   | 9648.000        | 16.44         | 38.66          | 55.10          | 74.00          | -18.90      | peak     | 102         | 188         | P   |
| 4   | 9648.000        | 16.44         | 31.24          | 47.68          | 54.00          | -6.32       | AVG      | 102         | 188         | P   |
| 5   | 12060.000       | 20.21         | 37.28          | 57.49          | 74.00          | -16.51      | peak     | 102         | 188         | P   |
| 6   | 12060.000       | 20.21         | 28.42          | 48.63          | 54.00          | -5.37       | AVG      | 102         | 188         | P   |

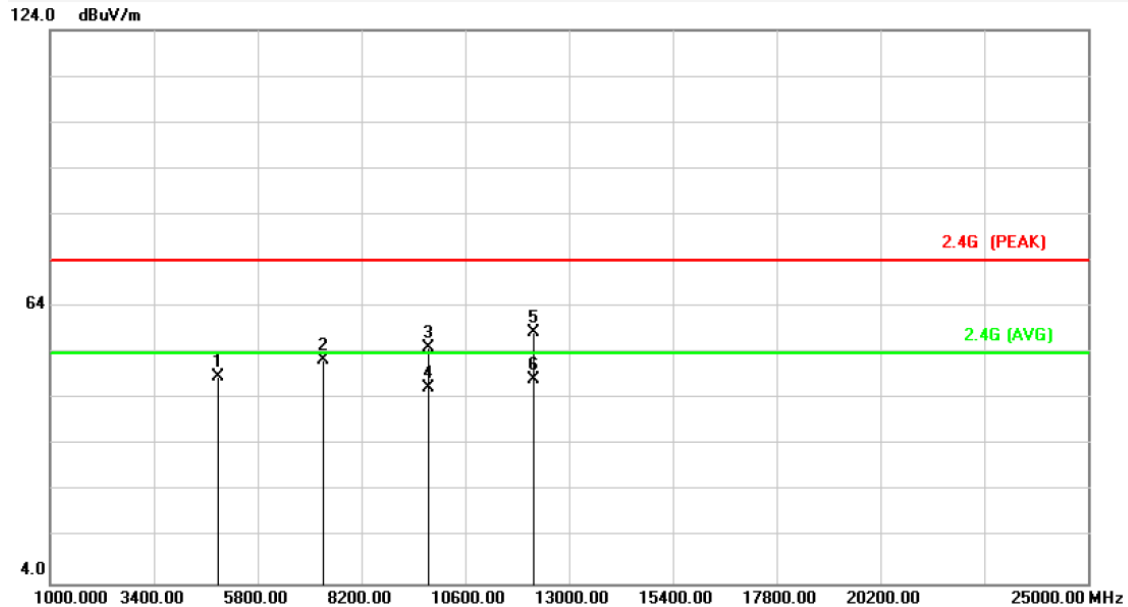
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : VERTICAL |
| Test Mode 1 | : 802.11b CH06  | Temperature          | : 23 °C    |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 53 %     |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 4874.000        | 8.07          | 40.66          | 48.73          | 74.00          | -25.27      | peak     | 104         | 184         | P   |
| 2   | 7311.000        | 13.39         | 39.21          | 52.60          | 74.00          | -21.40      | peak     | 104         | 184         | P   |
| 3   | 9748.000        | 16.59         | 38.65          | 55.24          | 74.00          | -18.76      | peak     | 104         | 184         | P   |
| 4   | 9748.000        | 16.59         | 29.96          | 46.55          | 54.00          | -7.45       | AVG      | 104         | 184         | P   |
| 5   | 12185.000       | 20.22         | 38.22          | 58.44          | 74.00          | -15.56      | peak     | 104         | 184         | P   |
| 6   | 12185.000       | 20.22         | 28.01          | 48.23          | 54.00          | -5.77       | AVG      | 104         | 184         | P   |

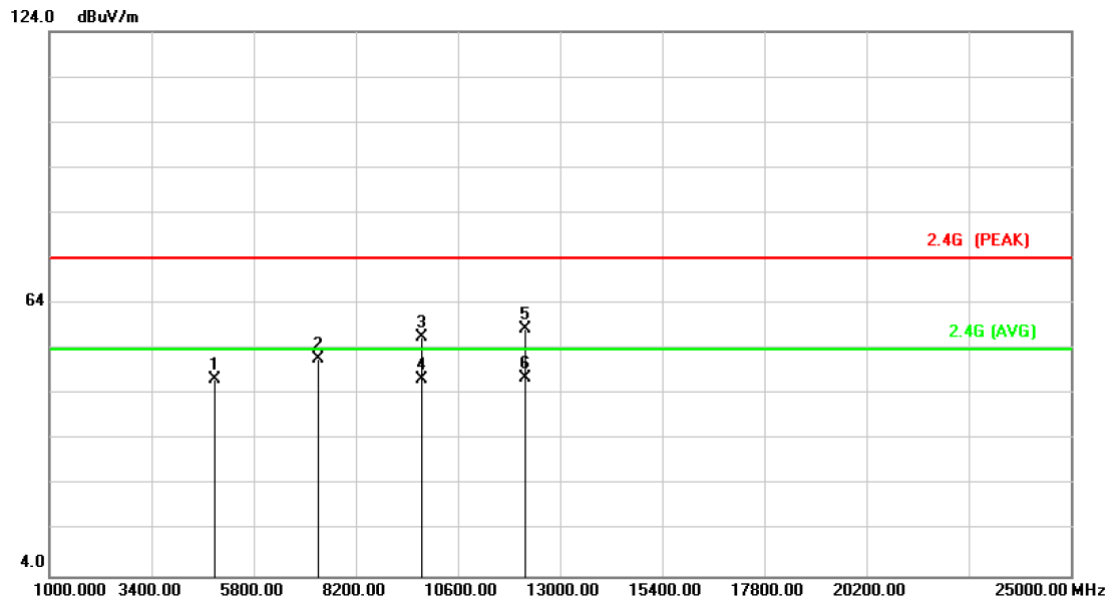
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Power       | : AC 120V       | Pol/Phase            | : HORIZONTAL |
| Test Mode 1 | : 802.11b CH06  | Temperature          | : 23 °C      |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 53 %       |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa   |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 4874.000        | 8.07          | 39.35          | 47.42          | 74.00          | -26.58      | peak     | 104         | 184         | P   |
| 2   | 7311.000        | 13.39         | 38.48          | 51.87          | 74.00          | -22.13      | peak     | 104         | 184         | P   |
| 3   | 9748.000        | 16.59         | 40.11          | 56.70          | 74.00          | -17.30      | peak     | 104         | 184         | P   |
| 4   | 9748.000        | 16.59         | 30.66          | 47.25          | 54.00          | -6.75       | AVG      | 104         | 184         | P   |
| 5   | 12185.000       | 20.22         | 38.10          | 58.32          | 74.00          | -15.68      | peak     | 104         | 184         | P   |
| 6   | 12185.000       | 20.22         | 27.34          | 47.56          | 54.00          | -6.44       | AVG      | 104         | 184         | P   |

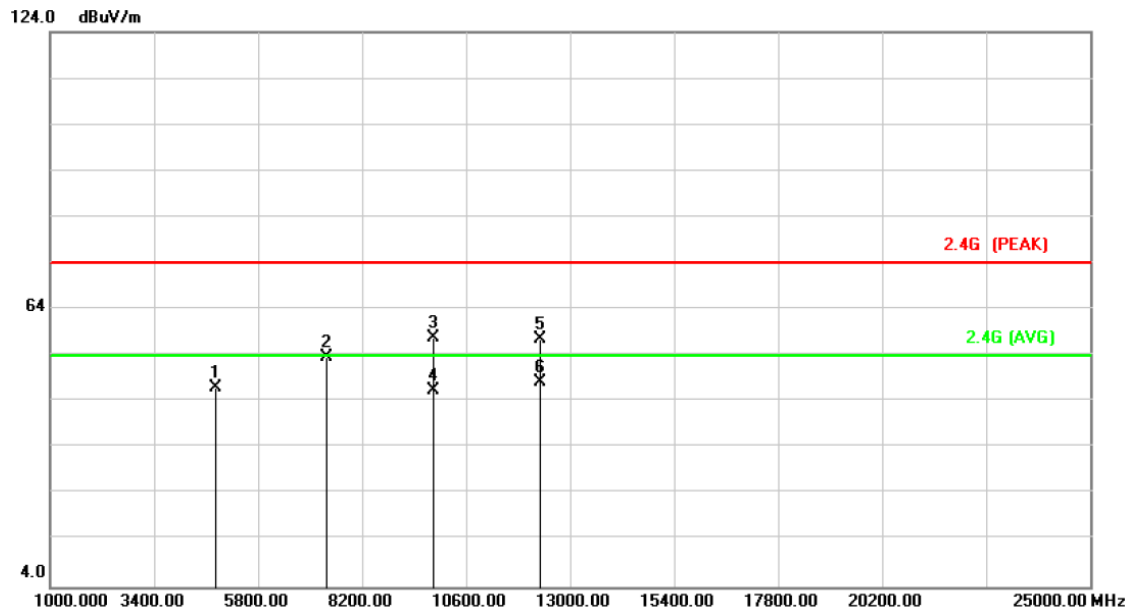
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |            |
|-------------|-----------------|----------------------|------------|
| Power       | : AC 120V       | Pol/Phase            | : VERTICAL |
| Test Mode 1 | : 802.11b CH11  | Temperature          | : 23 °C    |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 53 %     |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 4824.000        | 7.91          | 39.02          | 46.93          | 74.00          | -27.07      | peak     | 103         | 186         | P   |
| 2   | 7386.000        | 13.65         | 40.02          | 53.67          | 74.00          | -20.33      | peak     | 103         | 186         | P   |
| 3   | 9848.000        | 16.73         | 41.05          | 57.78          | 74.00          | -16.22      | peak     | 103         | 186         | P   |
| 4   | 9848.000        | 16.73         | 29.60          | 46.33          | 54.00          | -7.67       | AVG      | 103         | 186         | P   |
| 5   | 12310.000       | 20.23         | 37.27          | 57.50          | 74.00          | -16.50      | peak     | 103         | 186         | P   |
| 6   | 12310.000       | 20.23         | 27.89          | 48.12          | 54.00          | -5.88       | AVG      | 103         | 186         | P   |

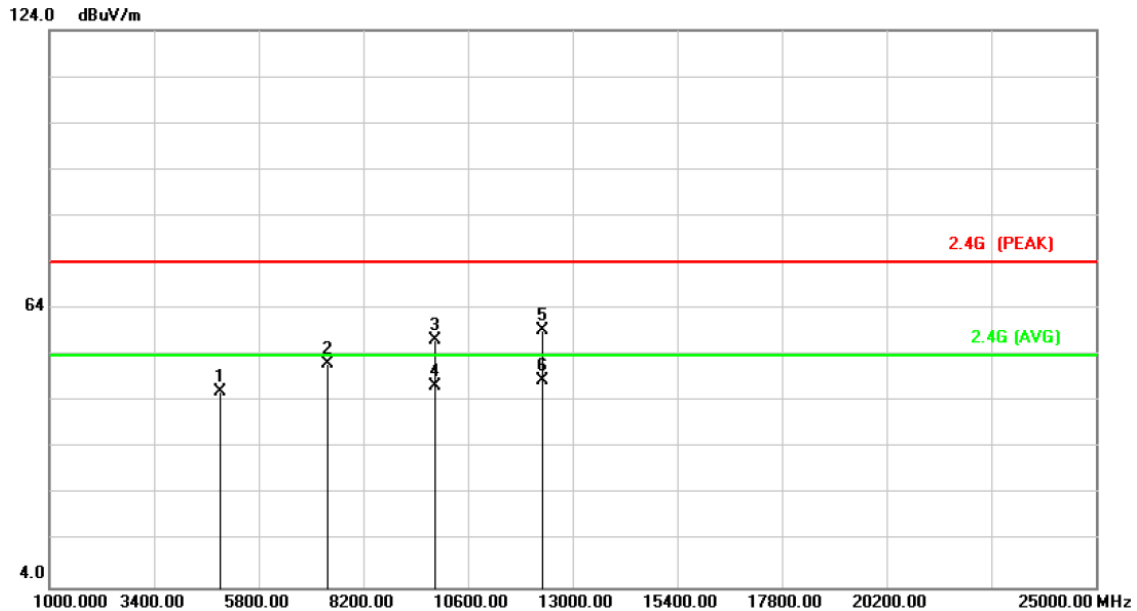
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Power       | : AC 120V       | Pol/Phase            | : HORIZONTAL |
| Test Mode 1 | : 802.11b CH11  | Temperature          | : 23 °C      |
| Test Date   | : Sep. 11, 2015 | Humidity             | : 53 %       |
| Memo        | :               | Atmospheric Pressure | : 1036 hpa   |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (°) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|-------------|-----|
| 1   | 4924.000        | 8.23          | 38.00          | 46.23          | 74.00          | -27.77      | peak     | 103         | 183         | P   |
| 2   | 7386.000        | 13.65         | 38.59          | 52.24          | 74.00          | -21.76      | peak     | 103         | 183         | P   |
| 3   | 9848.000        | 16.73         | 40.54          | 57.27          | 74.00          | -16.73      | peak     | 103         | 183         | P   |
| 4   | 9848.000        | 16.73         | 30.52          | 47.25          | 54.00          | -6.75       | AVG      | 103         | 183         | P   |
| 5   | 12310.000       | 20.23         | 39.03          | 59.26          | 74.00          | -14.74      | peak     | 103         | 183         | P   |
| 6   | 12310.000       | 20.23         | 28.39          | 48.62          | 54.00          | -5.38       | AVG      | 103         | 183         | P   |

Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



## 6.7 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                 | MHz                   | MHz             | GHz             |
|---------------------|-----------------------|-----------------|-----------------|
| 0.09000 – 0.11000   | 16.42000 – 16.42300   | 399.9 – 410.0   | 4.500 – 5.250   |
| 0.49500 – 0.505**   | 16.69475 – 16.69525   | 608.0 – 614.0   | 5.350 – 5.460   |
| 2.17350 – 2.19050   | 16.80425 – 16.80475   | 960.0 – 1240.0  | 7.250 – 7.750   |
| 4.12500 – 4.12800   | 25.50000 – 25.67000   | 1300.0 – 1427.0 | 8.025 – 8.500   |
| 4.17725 – 4.17775   | 37.50000 – 38.25000   | 1435.0 – 1626.5 | 9.000 – 9.200   |
| 4.20725 – 4.20775   | 73.00000 – 74.60000   | 1645.5 – 1646.5 | 9.300 – 9.500   |
| 6.21500 – 6.21800   | 74.80000 – 75.20000   | 1660.0 – 1710.0 | 10.600 – 12.700 |
| 6.26775 – 6.26825   | 108.00000 – 121.94000 | 1718.8 – 1722.2 | 13.250 – 13.400 |
| 6.31175 – 6.31225   | 123.00000 – 138.00000 | 2200.0 – 2300.0 | 14.470 – 14.500 |
| 8.29100 – 8.29400   | 149.90000 – 150.05000 | 2310.0 – 2390.0 | 15.350 – 16.200 |
| 8.36200 – 8.36600   | 156.52475 – 156.52525 | 2483.5 – 2500.0 | 17.700 – 21.400 |
| 8.37625 – 8.38675   | 156.70000 – 156.90000 | 2655.0 – 2900.0 | 22.010 – 23.120 |
| 8.41425 – 8.41475   | 162.01250 – 167.17000 | 3260.0 – 3267.0 | 23.600 – 24.000 |
| 12.29000 – 12.29300 | 167.72000 – 173.20000 | 3332.0 – 3339.0 | 31.200 – 31.800 |
| 12.51975 – 12.52025 | 240.00000 – 285.00000 | 3345.8 – 3358.0 | 36.430 – 36.500 |
| 12.57675 – 12.57725 | 322.00000 – 335.40000 | 3600.0 – 4400.0 | Above 38.6      |
| 13.36000 – 13.41000 |                       |                 |                 |

\*\* : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz



## 6.8 Restrict Band Emission Measurement Data

Test Date: Sep. 11, 2015

Temperature: 23 °C

Atmospheric pressure: 1036 hPa

Humidity: 53 %

Modulation Standard: IEEE 802.11b

| Channel 1       |             |                      |                       |                 |        | Fundamental Frequency: 2412 MHz |     |             |            |              |
|-----------------|-------------|----------------------|-----------------------|-----------------|--------|---------------------------------|-----|-------------|------------|--------------|
| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result (dBuV/m) | Remark | Limit (dBuV/m)                  |     | Margin (dB) | Table Deg. | Ant High (m) |
|                 |             |                      |                       |                 |        | Peak                            | Ave |             |            |              |
| 2387.32         | V           | 55.91                | -0.99                 | 54.92           | Peak   | 74                              | 54  | -19.08      | 186        | 1.02         |
| 2387.32         | V           | 42.67                | -0.99                 | 41.68           | Ave    | 74                              | 54  | -12.32      | 186        | 1.02         |
| 2387.83         | H           | 51.57                | -0.99                 | 50.58           | Peak   | 74                              | 54  | -23.42      | 186        | 1.02         |
| ---             | H           | ---                  | ---                   | ---             | Ave    | 74                              | 54  | ---         | ---        | ---          |
| Channel 11      |             |                      |                       |                 |        | Fundamental Frequency: 2462 MHz |     |             |            |              |
| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result (dBuV/m) | Remark | Limit (dBuV/m)                  |     | Margin (dB) | Table Deg. | Ant High (m) |
|                 |             |                      |                       |                 |        | Peak                            | Ave |             |            |              |
| 2483.50         | V           | 56.27                | -0.61                 | 55.66           | Peak   | 74                              | 54  | -18.34      | 185        | 1.04         |
| 2483.50         | V           | 43.79                | -0.61                 | 43.18           | Ave    | 74                              | 54  | -10.82      | 185        | 1.04         |
| 2486.288        | H           | 49.02                | -0.61                 | 48.41           | Peak   | 74                              | 54  | -25.59      | 185        | 1.04         |
| ---             | H           | ---                  | ---                   | ---             | Ave    | 74                              | 54  | ---         | ---        | ---          |

Modulation Standard: IEEE 802.11g

| Channel 1       |             |                      |                       |                 |        | Fundamental Frequency: 2412 MHz |     |             |            |              |
|-----------------|-------------|----------------------|-----------------------|-----------------|--------|---------------------------------|-----|-------------|------------|--------------|
| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result (dBuV/m) | Remark | Limit (dBuV/m)                  |     | Margin (dB) | Table Deg. | Ant High (m) |
|                 |             |                      |                       |                 |        | Peak                            | Ave |             |            |              |
| 2388.13         | V           | 60.46                | -0.99                 | 59.47           | Peak   | 74                              | 54  | -14.53      | 182        | 1.03         |
| 2388.13         | V           | 33.21                | -0.99                 | 32.22           | Ave    | 74                              | 54  | -21.78      | 182        | 1.03         |
| 2389.56         | H           | 63.18                | -0.98                 | 62.20           | Peak   | 74                              | 54  | -11.80      | 182        | 1.03         |
| 2389.56         | H           | 43.71                | -0.98                 | 42.73           | Ave    | 74                              | 54  | -11.27      | 182        | 1.03         |
| Channel 11      |             |                      |                       |                 |        | Fundamental Frequency: 2462 MHz |     |             |            |              |
| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result (dBuV/m) | Remark | Limit (dBuV/m)                  |     | Margin (dB) | Table Deg. | Ant High (m) |
|                 |             |                      |                       |                 |        | Peak                            | Ave |             |            |              |
| 2484.91         | V           | 63.20                | -0.61                 | 62.59           | Peak   | 74                              | 54  | -11.41      | 186        | 1.05         |
| 2484.91         | V           | 42.14                | -0.61                 | 41.53           | Ave    | 74                              | 54  | -12.47      | 186        | 1.05         |
| 2484.49         | H           | 67.11                | -0.61                 | 66.50           | Ave    | 74                              | 54  | -7.50       | 186        | 1.05         |
| 2484.49         | H           | 39.38                | -0.61                 | 38.74           | Peak   | 74                              | 54  | -15.26      | 186        | 1.05         |



Modulation Standard: IEEE 802.11n HT20

| Channel 1       |             |                      |                       |                 |        | Fundamental Frequency: 2412 MHz |     |             |            |              |
|-----------------|-------------|----------------------|-----------------------|-----------------|--------|---------------------------------|-----|-------------|------------|--------------|
| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result (dBuV/m) | Remark | Limit (dBuV/m)                  |     | Margin (dB) | Table Deg. | Ant High (m) |
|                 |             |                      |                       |                 |        | Peak                            | Ave |             |            |              |
| 2389.76         | V           | 62.55                | -0.98                 | 61.57           | Peak   | 74                              | 54  | -12.43      | 188        | 1.01         |
| 2389.76         | V           | 38.62                | -0.98                 | 37.64           | Ave    | 74                              | 54  | -16.36      | 188        | 1.01         |
| 2389.36         | H           | 64.67                | -0.98                 | 63.69           | Peak   | 74                              | 54  | -10.31      | 188        | 1.01         |
| 2389.36         | H           | 38.66                | -0.98                 | 37.68           | Ave    | 74                              | 54  | -16.32      | 188        | 1.01         |
| Channel 11      |             |                      |                       |                 |        | Fundamental Frequency: 2462 MHz |     |             |            |              |
| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result (dBuV/m) | Remark | Limit (dBuV/m)                  |     | Margin (dB) | Table Deg. | Ant High (m) |
|                 |             |                      |                       |                 |        | Peak                            | Ave |             |            |              |
| 2484.63         | V           | 66.33                | -0.61                 | 65.72           | Peak   | 74                              | 54  | -8.28       | 183        | 1.03         |
| 2484.63         | V           | 49.42                | -0.61                 | 48.81           | Ave    | 74                              | 54  | -5.19       | 183        | 1.03         |
| 2383.80         | H           | 64.02                | -0.61                 | 63.41           | Peak   | 74                              | 54  | -10.59      | 183        | 1.03         |
| 2383.80         | H           | 34.88                | -0.61                 | 34.27           | Ave    | 74                              | 54  | -19.73      | 183        | 1.03         |

## Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3 MHz (detector peak mode) for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3 MHz (detector sample mode) for Average detection at frequency above 1GHz.



## 7. Test of Spurious Emission (Conducted)

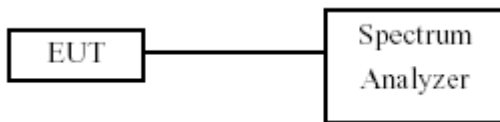
### 7.1 Test Limit

Below -20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

### 7.2 Test Procedure

- The transmitter output was connected to the spectrum analyzer via a low lose cable.
- Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
- The band edges was measured and recorded.

### 7.3 Test Setup Layout



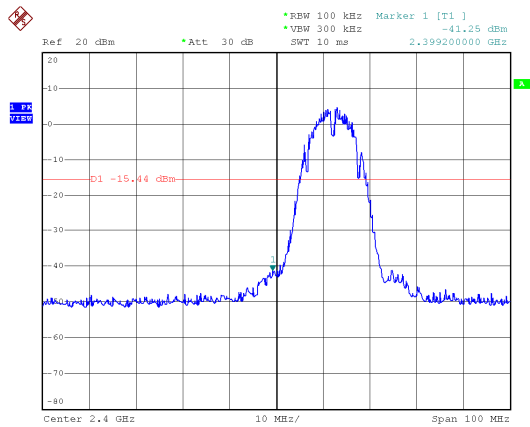
### 7.4 Test Result and Data

|                      |                 |             |        |
|----------------------|-----------------|-------------|--------|
| Test Date            | : Sep. 11, 2015 | Temperature | : 23°C |
| Atmospheric pressure | : 1055 hPa      | Humidity    | : 53%  |
| Test Result          | : PASS          |             |        |

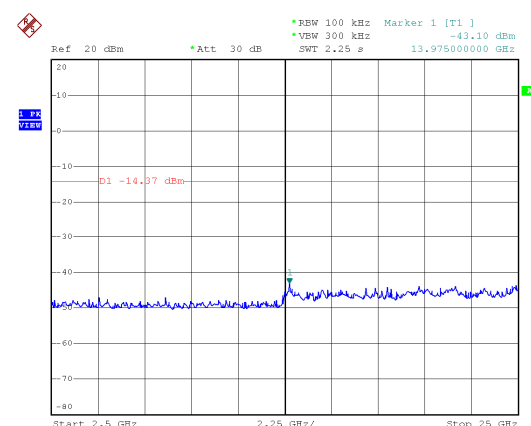
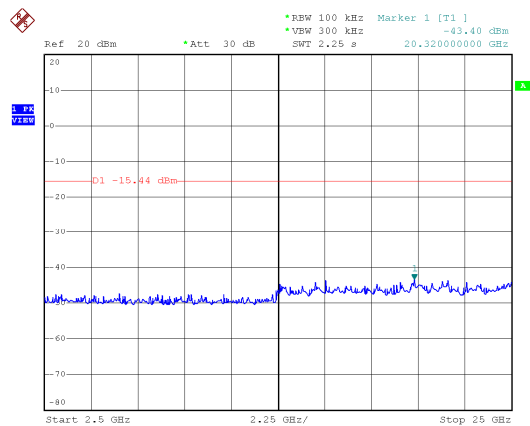
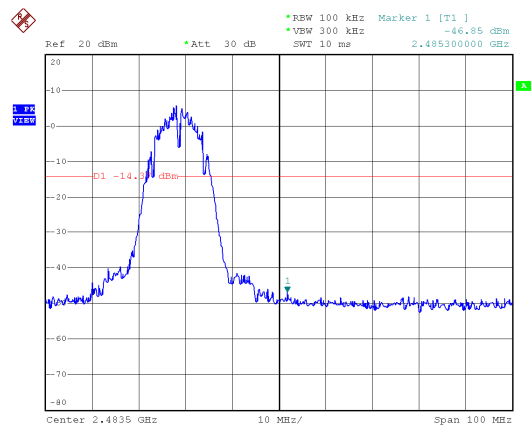
Note: Test plots refers to the following pages.



Modulation Type: 802.11b  
CH01



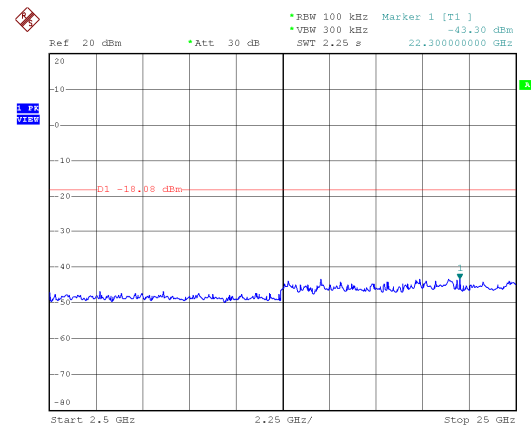
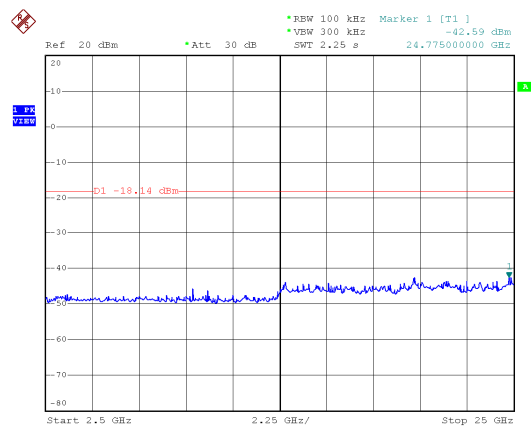
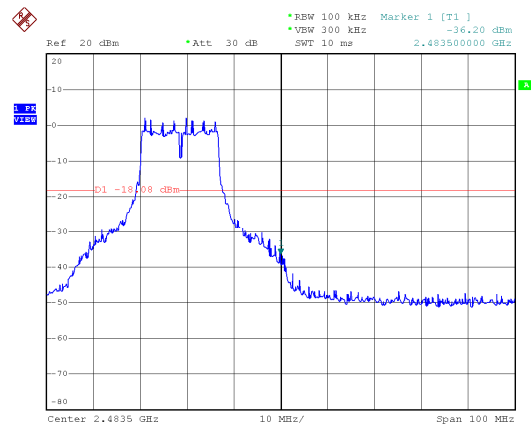
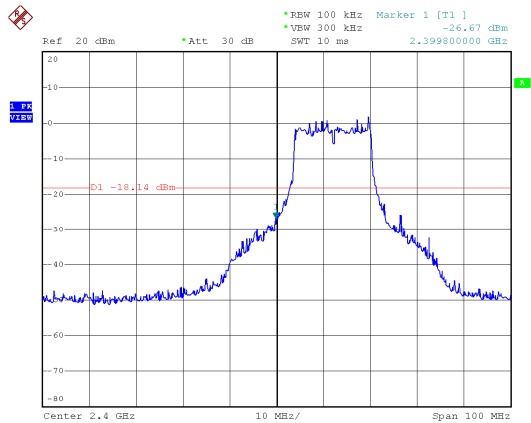
CH11





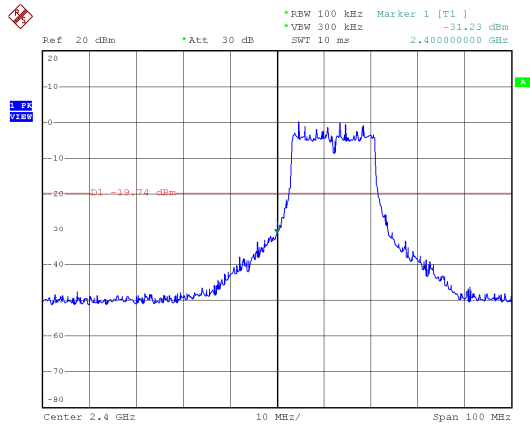
Modulation Type: 802.11g  
CH01

CH11

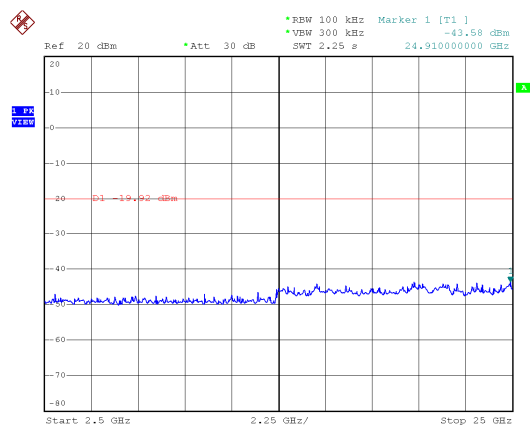
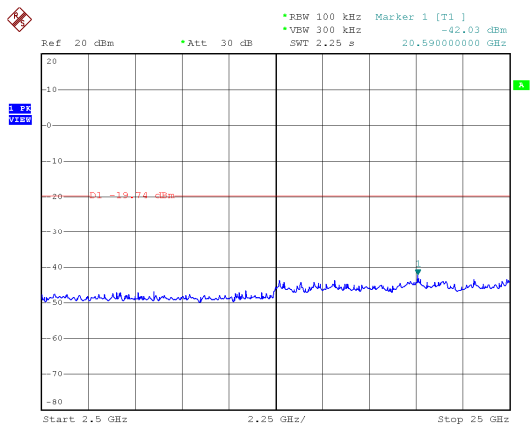
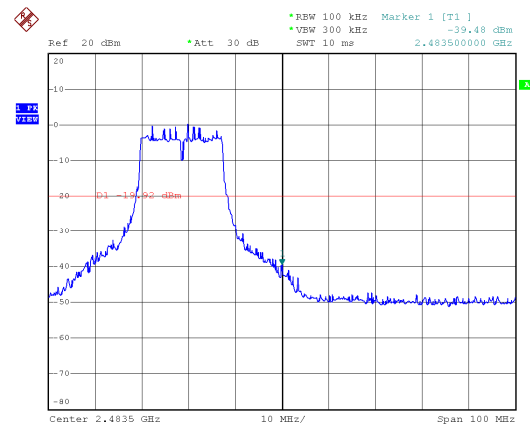




Modulation Type: 802.11n HT20  
CH01



CH11





## 8. 6dB Bandwidth Measurement Data

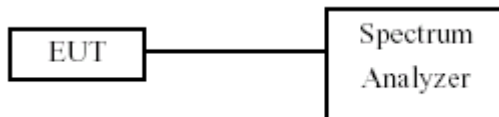
### 8.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

### 8.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 1~5% of the emission bandwidth and VBW  $\geq 3 \times$  RBW.
- The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.
- The 6dB Bandwidth was measured and recorded.

### 8.3 Test Setup Layout



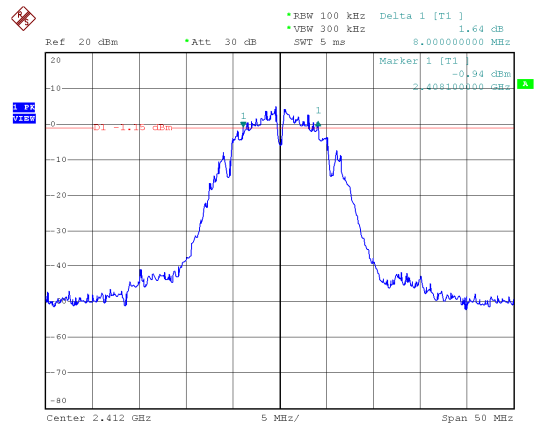
### 8.4 Test Result and Data

Test Date : Sep. 11, 2015      Temperature : 23°C  
Atmospheric pressure : 1055 hPa      Humidity : 53%

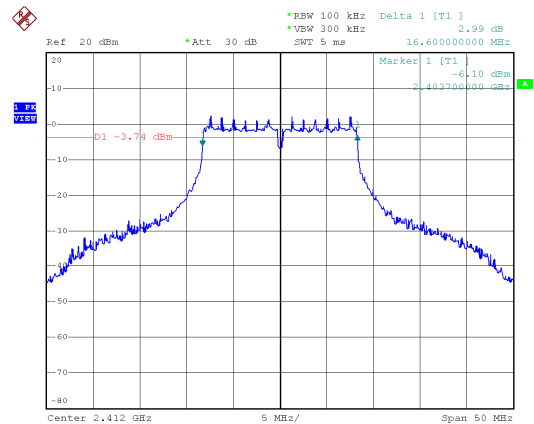
| Modulation Type             | Channel | Frequency (MHz) | 6dB Bandwidth (MHz) |
|-----------------------------|---------|-----------------|---------------------|
| IEEE 802.11b (1Mbps)        | 01      | 2412            | 8.00                |
|                             | 06      | 2437            | 7.90                |
|                             | 11      | 2462            | 8.60                |
| IEEE 802.11g (6Mbps)        | 01      | 2412            | 16.60               |
|                             | 06      | 2437            | 16.50               |
|                             | 11      | 2462            | 16.60               |
| IEEE 802.11n HT20 (6.5Mbps) | 01      | 2412            | 17.80               |
|                             | 06      | 2437            | 17.70               |
|                             | 11      | 2462            | 17.70               |



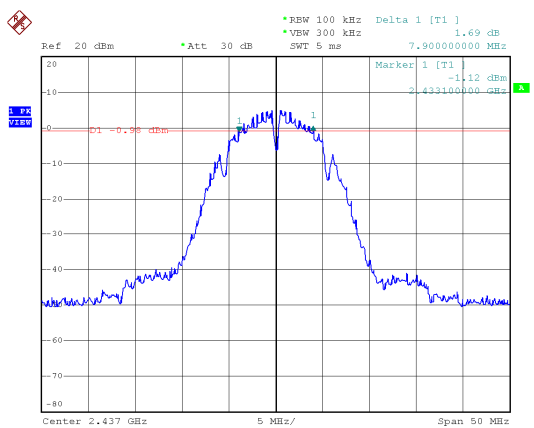
Modulation Type: 802.11b  
CH01



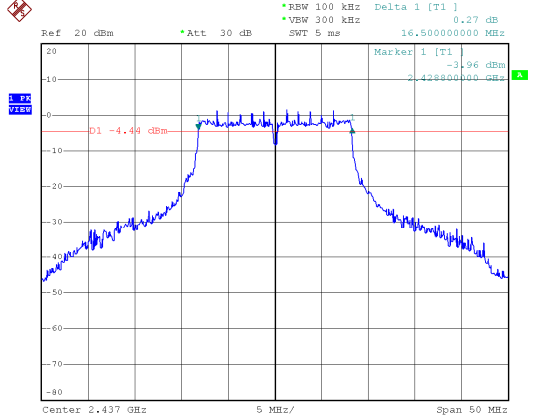
Modulation Type: 802.11g  
CH01



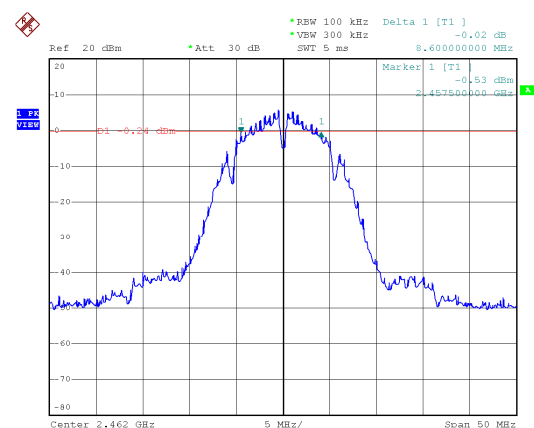
CH06



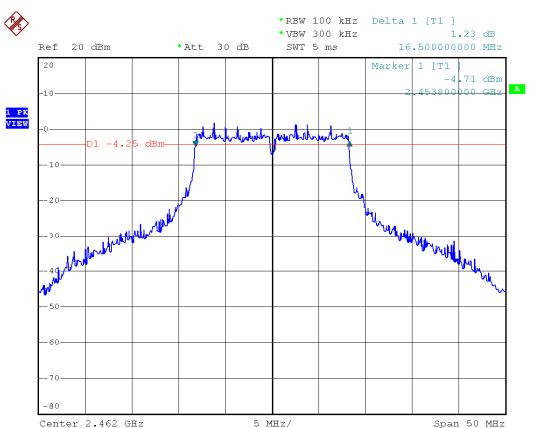
CH06



CH11

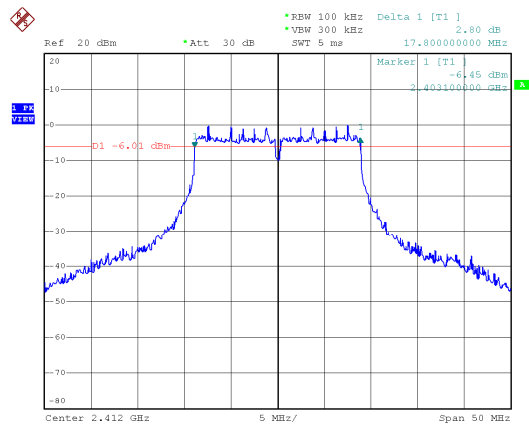


CH11

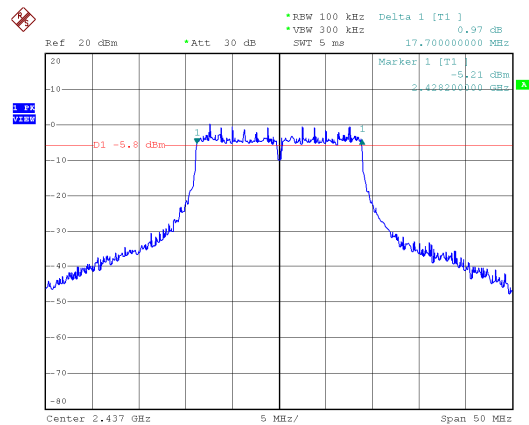




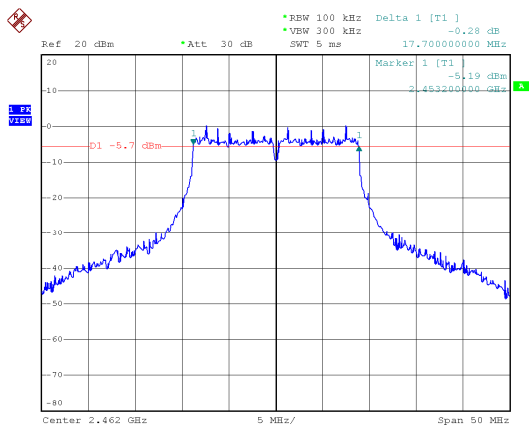
Modulation Type: 802.11n HT20  
CH01



CH06



CH11





## 9. Maximum Peak and Average Output Power

### 9.1 Test Limit

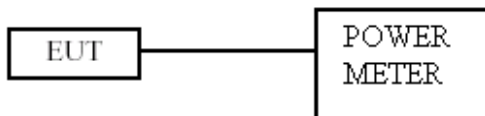
The Maximum Peak Output Power Measurement is 30dBm.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

### 9.2 Test Procedures

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

### 9.3 Test Setup Layout





#### 9.4 Test Result and Data

Test Date : Sep. 11, 2015      Temperature : 23°C  
Atmospheric pressure : 1055 hPa      Humidity : 53%

| Modulation Standard    | Channel | Frequency (MHz) | Peak Power Output (dBm) | Peak Power Output(mW) |
|------------------------|---------|-----------------|-------------------------|-----------------------|
| 802.11b (1Mbps)        | 01      | 2412            | 17.56                   | 57.02                 |
|                        | 06      | 2437            | 17.43                   | 55.34                 |
|                        | 11      | 2462            | 17.52                   | 56.49                 |
| 802.11g (6Mbps)        | 01      | 2412            | 21.45                   | 139.74                |
|                        | 06      | 2437            | 21.23                   | 132.74                |
|                        | 11      | 2462            | 21.28                   | 134.28                |
| 802.11n HT20 (6.5Mbps) | 01      | 2412            | 20.62                   | 115.35                |
|                        | 06      | 2437            | 20.35                   | 108.39                |
|                        | 11      | 2462            | 20.64                   | 115.88                |

| Modulation Standard    | Channel | Frequency (MHz) | Avg. Power Output (dBm) | Avg. Power Output (mW) |
|------------------------|---------|-----------------|-------------------------|------------------------|
| 802.11b (1Mbps)        | 01      | 2412            | 14.44                   | 27.80                  |
|                        | 06      | 2437            | 14.42                   | 27.67                  |
|                        | 11      | 2462            | 14.38                   | 27.42                  |
| 802.11g (6Mbps)        | 01      | 2412            | 13.77                   | 23.82                  |
|                        | 06      | 2437            | 13.88                   | 24.43                  |
|                        | 11      | 2462            | 13.75                   | 23.71                  |
| 802.11n HT20 (6.5Mbps) | 01      | 2412            | 11.96                   | 15.70                  |
|                        | 06      | 2437            | 12.12                   | 16.29                  |
|                        | 11      | 2462            | 12.08                   | 16.14                  |



## 10. Power Spectral Density

### 10.1 Test Limit

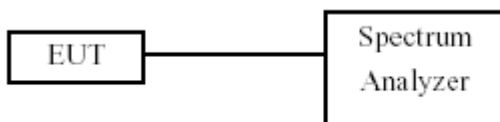
The Maximum of Power Spectral Density Measurement is 8dBm.

If transmitting antennas of directional gain greater than 6 dBi are used, the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

### 10.2 Test Procedures

- The transmitter output was connected to spectrum analyzer.
- The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
- The power spectral density was measured and recorded.

### 10.3 Test Setup Layout

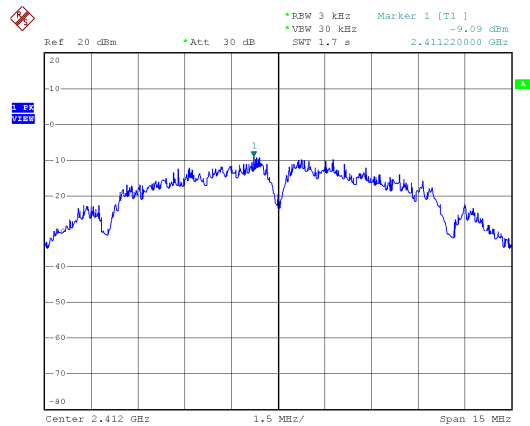
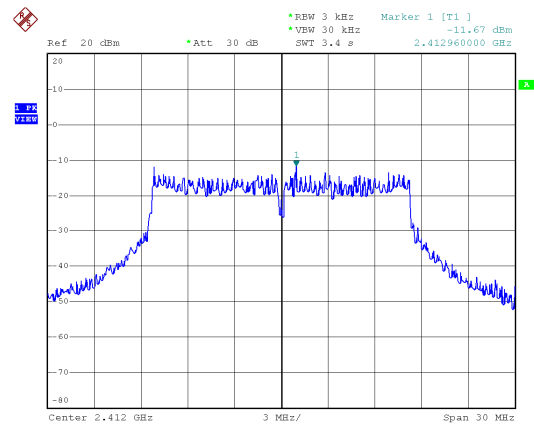


### 10.4 Test Result and Data

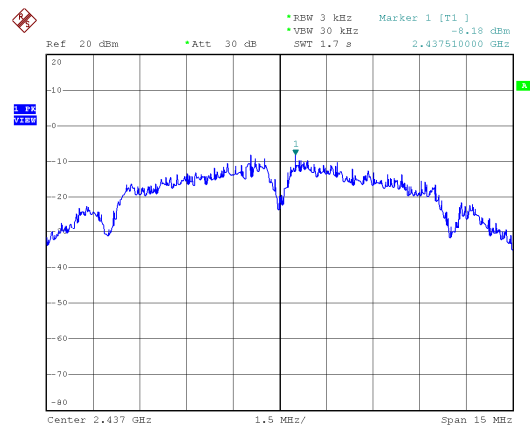
Test Date : Sep. 11, 2015      Temperature : 23°C  
Atmospheric pressure : 1055 hPa      Humidity : 53%

| Modulation Standard    | Channel | Frequency (MHz) | Maximum Power Density of 3 kHz Bandwidth (dBm) |
|------------------------|---------|-----------------|------------------------------------------------|
| 802.11b (1Mbps)        | 01      | 2412            | -9.09                                          |
|                        | 06      | 2437            | -8.18                                          |
|                        | 11      | 2462            | -7.37                                          |
| 802.11g (6Mbps)        | 01      | 2412            | -11.67                                         |
|                        | 06      | 2437            | -12.95                                         |
|                        | 11      | 2462            | -12.99                                         |
| 802.11n HT20 (6.5Mbps) | 01      | 2412            | -13.55                                         |
|                        | 06      | 2437            | -15.08                                         |
|                        | 11      | 2462            | -14.72                                         |

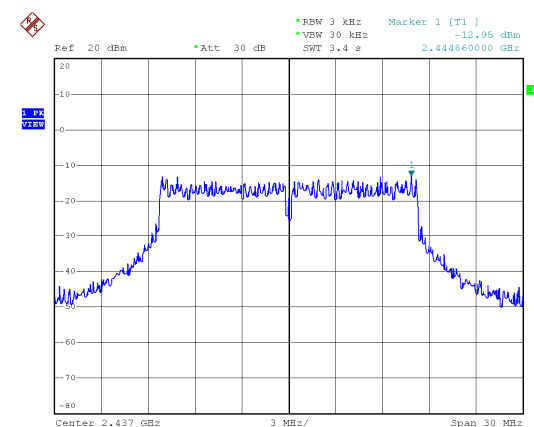
Limit: The maximum Power Spectral Density is 7.45dBm.

Modulation Type: 802.11b  
CH01Modulation Type: 802.11g  
CH01

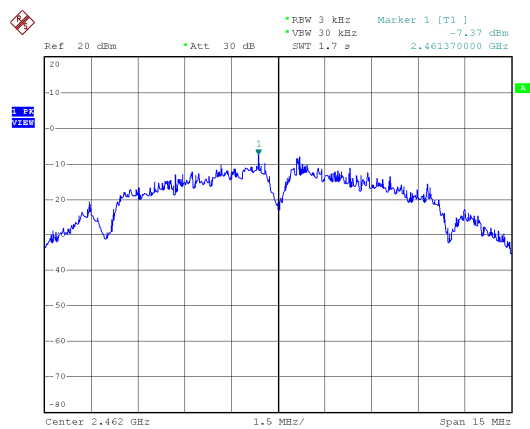
## CH06



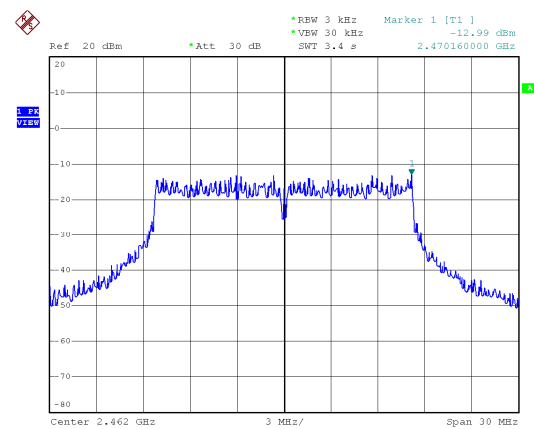
## CH06



## CH11

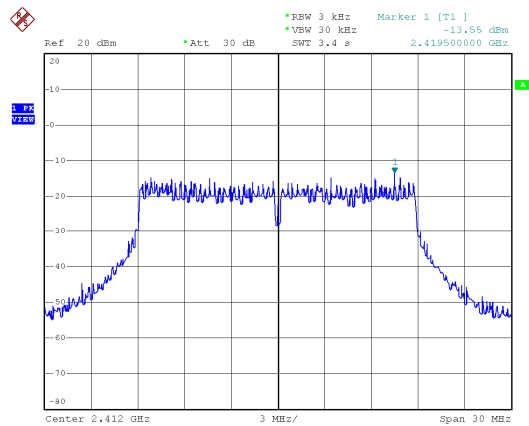


## CH11

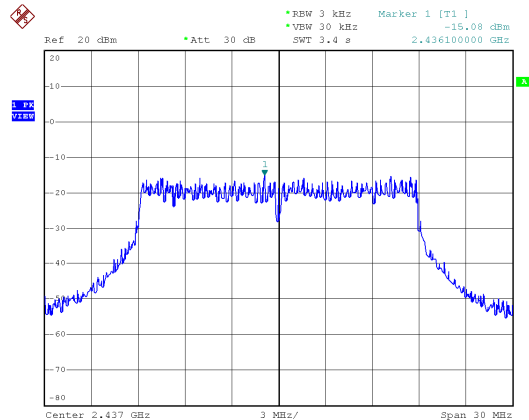




Modulation Type: 802.11n HT20  
CH01



CH06



CH11

