# FCC Test Report (WLAN)

| | |
|---|---|
| **Report No.:** | RF160819E01A |
| **FCC ID:** | COF-WMBNBM26A |
| **Test Model:** | WM-BN-BM-26_A |
| **Received Date:** | June 28, 2017 |
| **Test Date:** | July 11 to 13, 2017 |
| **Issued Date:** | Aug. 04, 2017 |
| **Applicant:** | UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD. |
| **Address:** | 141, Lane 351, Sec. 1, Taiping Road., Tsaotuen, Nantou 54261, Taiwan |
| **Issued By:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory |
| **Lab Address:** | E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C. |
| **Test Location (1):** | E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C. |
| **Test Location (2):** | No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C. |

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RF160819E01A | Original release. | Aug. 04, 2017 |

## 1 Certificate of Conformity

| | |
|---|---|
| **Product:** | 802.11b/g/n + BT Wireless LAN Module |
| **Brand:** | USI |
| **Test Model:** | WM-BN-BM-26_A |
| **Sample Status:** | ENGINEERING SAMPLE |
| **Applicant:** | UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD. |
| **Test Date:** | July 11 to 13, 2017 |
| **Standards:** | 47 CFR FCC Part 15, Subpart C (Section 15.247)<br>ANSI C63.10: 2013 |

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

**Prepared by :** _____ , **Date:** Aug. 04, 2017

Wendy Wu / Specialist

**Approved by :** _____ , **Date:** Aug. 04, 2017

May Chen / Manager

## 2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart C (SECTION 15.247) | | | |
|---|---|---|---|
| FCC Clause | Test Item | Result | Remarks |
| 15.205 / 15.209 / 15.247(d) | Radiated Emissions and Band Edge Measurement | PASS | Meet the requirement of limit. Minimum passing margin is -3.6dB at 745.52MHz. |
| 15.247(b) | Conducted Power | PASS | Meet the requirement of limit. |

### 2.1 Measurement Uncertainty

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

| Measurement | Frequency | Expanded Uncertainty (k=2) (±) |
|---|---|---|
| Radiated Emissions up to 1 GHz | 30MHz ~ 1GHz | 5.32 dB |
| Radiated Emissions above 1 GHz | 1GHz ~ 6GHz | 5.14 dB |
| | 6GHz ~ 18GHz | 5.04 dB |
| | 18GHz ~ 40GHz | 5.25 dB |

### 2.2 Modification Record

There were no modifications required for compliance.

## 3 General Information

### 3.1 General Description of EUT (WLAN)

| | |
|---|---|
| Product | 802.11b/g/n + BT Wireless LAN Module |
| Brand | USI |
| Test Model | WM-BN-BM-26_A |
| Status of EUT | ENGINEERING SAMPLE |
| Power Supply Rating | 3.6Vdc from host equipment |
| Modulation Type | CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM |
| Modulation Technology | DSSS,OFDM |
| Transfer Rate | 802.11b: up to 11Mbps<br>802.11g: up to 54Mbps<br>802.11n: up to 72Mbps |
| Operating Frequency | 2412 ~ 2462MHz |
| Number of Channel | 11 for 802.11b, 802.11g, 802.11n (HT20) |
| Output Power | 293.765mW |
| Antenna Type | Refer to Note |
| Antenna Connector | Refer to Note |
| Accessory Device | NA |
| Data Cable Supplied | NA |

Note:

1. This report is prepared for FCC Class II change. The difference compared with the Report No.: RF160819E01 design is as the following:
   - ◆ Changed R30, C46 componets.
2. According to above conditions only Output Power and Radiated Emissions test items need to be performed. And all data was verified to meet the requirements.
3. There are WLAN, BT technology used for the EUT.
4. The antenna provided to the EUT, please refer to the following table:

| Brand | Model | Antenna Net Gain(dBi) | Frequency range (GHz to GHz) | Antenna Type | Connecter Type |
|---|---|---|---|---|---|
| YAGEO | ANT3216LL11R2400A | 3.68 | 2.4~2.4835 | Chip | NA |

5. WLAN and BT technology cannot transmit at same time.
6. The EUT incorporates a SISO function.

| MODULATION MODE | DATA RATE (MCS) | TX & RX CONFIGURATION | |
|---|---|---|---|
| **802.11b** | 1 ~ 11Mbps | 1TX | 1RX |
| **802.11g** | 6 ~ 54Mbps | 1TX | 1RX |
| **802.11n (HT20)** | MCS 0~7 | 1TX | 1RX |

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

### 3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

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

### 3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

**APCM:** Antenna Port Conducted Measurement

**NOTE:**

1. In the original report, the EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

**Radiated Emission Test (Above 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | DSSS | DBPSK | 1 |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6 |
| 802.11n (HT20) | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.5 |

**Radiated Emission Test (Below 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|---|---|---|---|---|---|
| 802.11n (HT20) | 1 to 11 | 6, | OFDM | BPSK | 6.5 |

**Antenna Port Conducted Measurement:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | DSSS | DBPSK | 1 |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6 |
| 802.11n (HT20) | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.5 |

**Test Condition:**

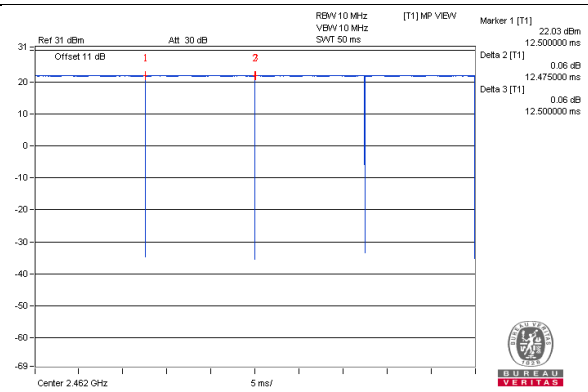
| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER (SYSTEM) | TESTED BY |
|---|---|---|---|
| **RE≥1G** | 22deg. C, 64%RH | 120Vac, 60Hz | Rey Chen |
| **RE<1G** | 25deg. C, 67%RH | 120Vac, 60Hz | Weiwei Lo |
| **APCM** | 25deg. C, 60%RH | 120Vac, 60Hz | Anderson Chen |

### 3.3 Duty Cycle of Test Signal

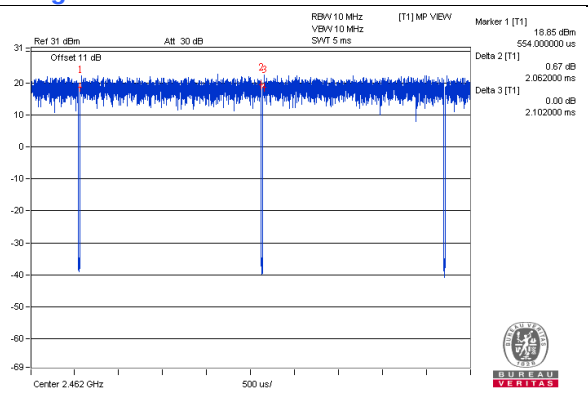
If duty cycle of test signal is ≥ 98 %, duty factor is not required.

**802.11b:** Duty cycle = 12.475/12.5 = 0.998
**802.11g:** Duty cycle = 2.062/2.102 = 0.981
**802.11n (HT20):** Duty cycle = 2.063/2.103 = 0.981

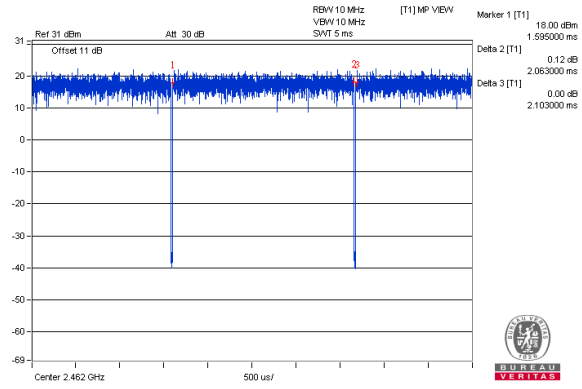
**802.11b**




**802.11g**




**802.11n (HT20)**



## 3.4 Description of Support Units

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

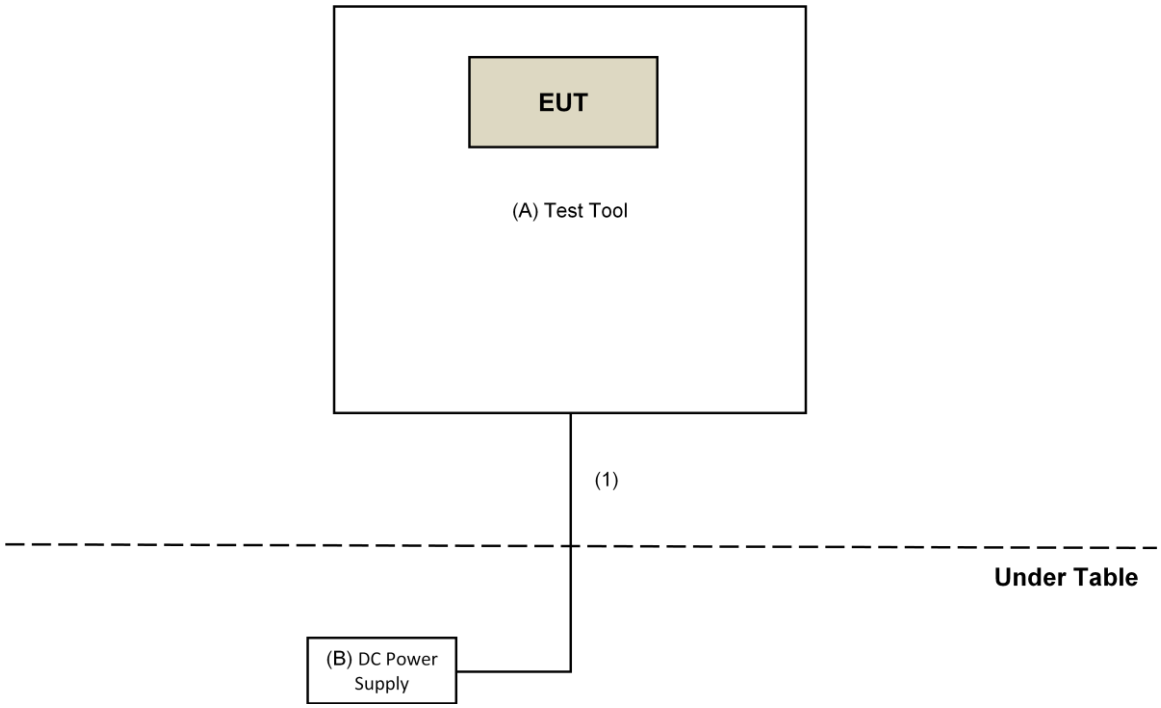
| ID | Product | Brand | Model No. | Serial No. | FCC ID | Remarks |
|---|---|---|---|---|---|---|
| A. | Test Tool | WM-BN-BM-26_A_EVB TDK V1.1 | NA | NA | NA | Supplied by client |
| B. | DC Power Supply | GOOD WILL INSTRUMENT CO., LTD. | GPC-3030D | 7700087 | NA | Provided by Lab |

Note:

1. All power cords of the above support units are non-shielded (1.8m).

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|---|---|---|---|---|---|---|
| 1. | DC Cable | 1 | 3 | No | 0 | Provided by Lab |

### 3.4.1 Configuration of System under Test



## 3.5 General Description of Applied Standards

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

**FCC Part 15, Subpart C (15.247)**
**KDB 558074 D01 DTS Meas Guidance v04**
**ANSI C63.10-2013**

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

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

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

**NOTE**:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| Test Receiver Agilent | N9038A | MY50010156 | Aug. 18, 2016 | Aug. 17, 2017 |
| Pre-Amplifier(*) EMCI | EMC001340 | 980142 | Jan. 20, 2016 | Jan. 19, 2018 |
| Loop Antenna(*) Electro-Metrics | EM-6879 | 264 | Dec. 16, 2016 | Dec. 15, 2018 |
| RF Cable | NA | LOOPCAB-001<br>LOOPCAB-002 | Jan. 17, 2017 | Jan. 16, 2018 |
| Pre-Amplifier Mini-Circuits | ZFL-1000VH2B | AMP-ZFL-05 | May 06, 2017 | May 05, 2018 |
| Trilog Broadband Antenna SCHWARZBECK | VULB 9168 | 9168-361 | Dec. 29, 2016 | Dec. 28, 2017 |
| RF Cable | 8D | 966-3-1<br>966-3-2<br>966-3-3 | Apr. 01, 2017 | Mar. 31, 2018 |
| Fixed attenuator Mini-Circuits | UNAT-5+ | PAD-3m-3-01 | Oct. 05, 2016 | Oct. 04, 2017 |
| Horn_Antenna SCHWARZBECK | BBHA9120-D | 9120D-406 | Dec. 28, 2016 | Dec. 27, 2017 |
| Pre-Amplifier EMCI | EMC12630SE | 980384 | Feb. 02, 2017 | Feb. 01, 2018 |
| RF Cable | EMC104-SM-SM-1200<br>EMC104-SM-SM-2000<br>EMC104-SM-SM-5000 | 160922<br>150317<br>150322 | Feb. 02, 2017<br>Mar. 29, 2017<br>Mar. 29, 2017 | Feb. 01, 2018<br>Mar. 28, 2018<br>Mar. 28, 2018 |
| Spectrum Analyzer Keysight | N9030A | MY54490520 | July 29, 2016 | July 28, 2017 |
| Pre-Amplifier EMCI | EMC184045SE | 980386 | Feb. 02, 2017 | Feb. 01, 2018 |
| Horn_Antenna SCHWARZBECK | BBHA 9170 | BBHA9170608 | Dec. 15, 2016 | Dec. 14, 2017 |
| RF Cable | SUCOFLEX 102 | 36432/2<br>36433/2 | Jan. 15, 2017 | Jan. 14, 2018 |
| Software | ADT_Radiated_V8.7.08 | NA | NA | NA |
| Antenna Tower & Turn Table Max-Full | MF-7802 | MF780208406 | NA | NA |
| Boresight Antenna Fixture | FBA-01 | FBA-SIP01 | NA | NA |
| Spectrum Analyzer R&S | FSv40 | 100964 | July 1, 2017 | June 30, 2018 |
| Power meter Anritsu | ML2495A | 1014008 | May 11, 2017 | May 10, 2018 |
| Power sensor Anritsu | MA2411B | 0917122 | May 11, 2017 | May 10, 2018 |

**NOTE:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The CANADA Site Registration No. is 20331-1.
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: July 11 to 12, 2017.

4.1.3 Test Procedures

**For Radiated emission below 30MHz**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

**For Radiated emission above 30MHz**

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

**Note:**

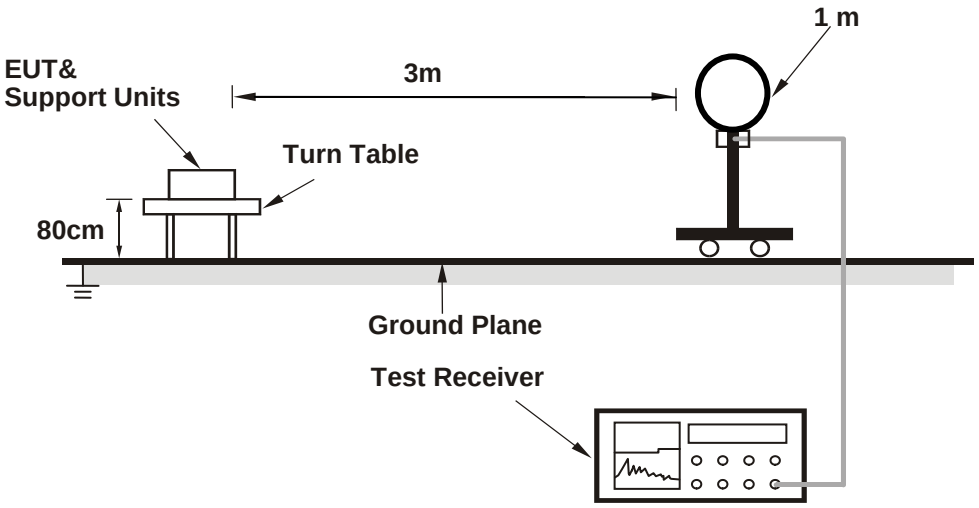
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz. If duty cycle of test signal is < 98%, the duty factor need added to measured value.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

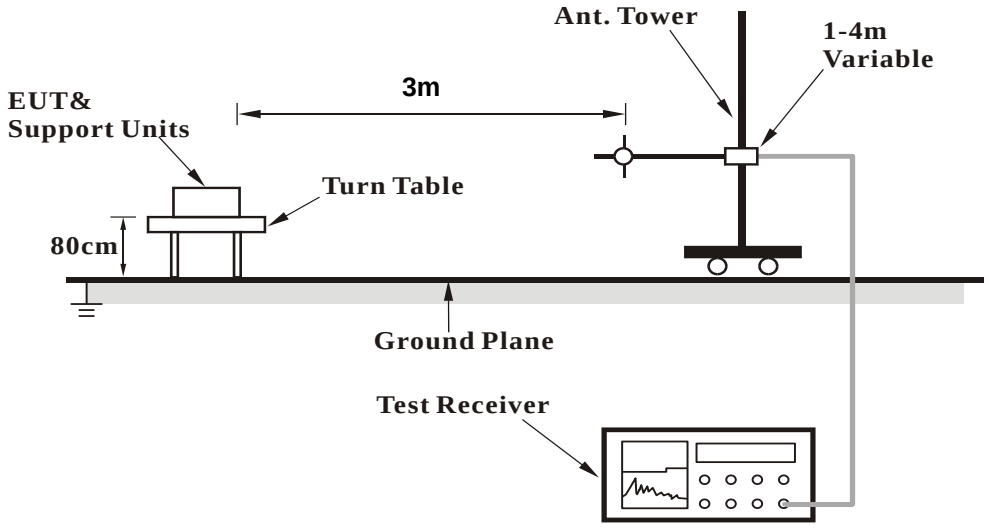
No deviation.

4.1.5 Test Setup

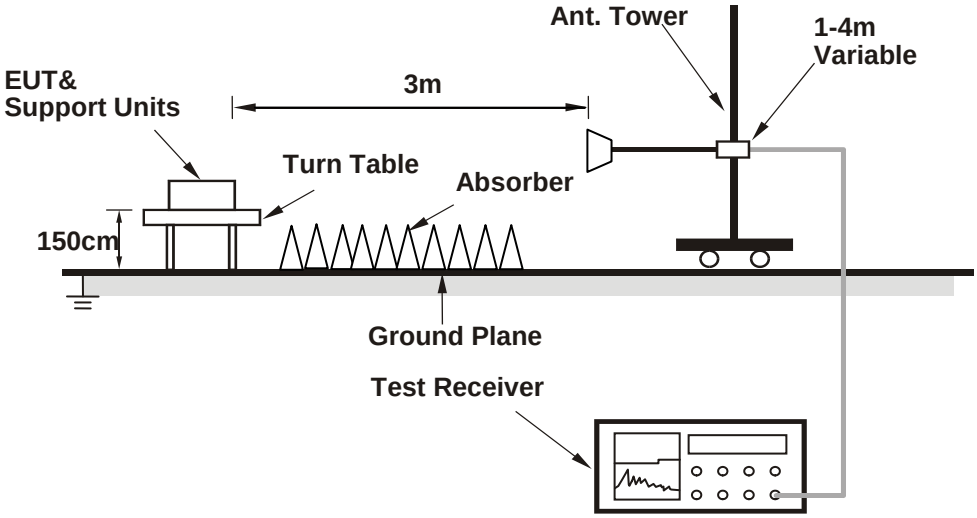
**For Radiated emission below 30MHz**




**For Radiated emission 30MHz to 1GHz**



**For Radiated emission above 1GHz**




For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 4.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. Contorlling software (USI Broadcom Wireless Labtool 2.0) has been activated to set the EUT on specific status.

4.1.7 Test Results

**Above 1GHz Data：**

**802.11b**

| CHANNEL | TX Channel 1 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 55.2 PK | 74.0 | -18.8 | 1.88 H | 260 | 56.8 | -1.6 |
| 2 | 2390.00 | 46.2 AV | 54.0 | -7.8 | 1.88 H | 260 | 47.8 | -1.6 |
| 3 | *2412.00 | 104.8 PK | | | 1.88 H | 260 | 106.3 | -1.5 |
| 4 | *2412.00 | 102.8 AV | | | 1.88 H | 260 | 104.3 | -1.5 |
| 5 | 4824.00 | 38.8 PK | 74.0 | -35.2 | 1.65 H | 211 | 35.8 | 3.0 |
| 6 | 4824.00 | 28.8 AV | 54.0 | -25.2 | 1.65 H | 211 | 25.8 | 3.0 |
| 7 | 2390.00 | 55.2 PK | 74.0 | -18.8 | 1.88 H | 260 | 56.8 | -1.6 |
| 8 | 2390.00 | 46.2 AV | 54.0 | -7.8 | 1.88 H | 260 | 47.8 | -1.6 |
| **ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M** | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 54.9 PK | 74.0 | -19.1 | 2.63 V | 201 | 56.5 | -1.6 |
| 2 | 2390.00 | 44.9 AV | 54.0 | -9.1 | 2.63 V | 201 | 46.5 | -1.6 |
| 3 | *2412.00 | 98.5 PK | | | 2.63 V | 201 | 100.0 | -1.5 |
| 4 | *2412.00 | 95.8 AV | | | 2.63 V | 201 | 97.3 | -1.5 |
| 5 | 4824.00 | 38.4 PK | 74.0 | -35.6 | 1.50 V | 122 | 35.4 | 3.0 |
| 6 | 4824.00 | 27.5 AV | 54.0 | -26.5 | 1.50 V | 122 | 24.5 | 3.0 |
| 7 | 2390.00 | 54.9 PK | 74.0 | -19.1 | 2.63 V | 201 | 56.5 | -1.6 |
| 8 | 2390.00 | 44.9 AV | 54.0 | -9.1 | 2.63 V | 201 | 46.5 | -1.6 |

**REMARKS:**

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

| CHANNEL | TX Channel 6 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 54.8 PK | 74.0 | -19.2 | 1.84 H | 260 | 56.4 | -1.6 |
| 2 | 2390.00 | 43.1 AV | 54.0 | -10.9 | 1.84 H | 260 | 44.7 | -1.6 |
| 3 | *2437.00 | 106.9 PK | | | 1.84 H | 260 | 108.4 | -1.5 |
| 4 | *2437.00 | 104.9 AV | | | 1.84 H | 260 | 106.4 | -1.5 |
| 5 | 2483.50 | 55.6 PK | 74.0 | -18.4 | 1.84 H | 260 | 57.0 | -1.4 |
| 6 | 2483.50 | 43.8 AV | 54.0 | -10.2 | 1.84 H | 260 | 45.2 | -1.4 |
| 7 | 4874.00 | 39.3 PK | 74.0 | -34.7 | 1.67 H | 197 | 36.1 | 3.2 |
| 8 | 4874.00 | 29.0 AV | 54.0 | -25.0 | 1.67 H | 197 | 25.8 | 3.2 |
| 9 | 7311.00 | 47.5 PK | 74.0 | -26.5 | 1.66 H | 122 | 38.6 | 8.9 |
| 10 | 7311.00 | 36.3 AV | 54.0 | -17.7 | 1.66 H | 122 | 27.4 | 8.9 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 54.4 PK | 74.0 | -19.6 | 2.68 V | 216 | 56.0 | -1.6 |
| 2 | 2390.00 | 41.7 AV | 54.0 | -12.3 | 2.68 V | 216 | 43.3 | -1.6 |
| 3 | *2437.00 | 100.6 PK | | | 2.68 V | 216 | 102.1 | -1.5 |
| 4 | *2437.00 | 98.0 AV | | | 2.68 V | 216 | 99.5 | -1.5 |
| 5 | 2483.50 | 55.3 PK | 74.0 | -18.7 | 2.68 V | 216 | 56.7 | -1.4 |
| 6 | 2483.50 | 42.6 AV | 54.0 | -11.4 | 2.68 V | 216 | 44.0 | -1.4 |
| 7 | 4874.00 | 38.9 PK | 74.0 | -35.1 | 1.45 V | 107 | 35.7 | 3.2 |
| 8 | 4874.00 | 27.6 AV | 54.0 | -26.4 | 1.45 V | 107 | 24.4 | 3.2 |
| 9 | 7311.00 | 46.2 PK | 74.0 | -27.8 | 1.55 V | 265 | 37.3 | 8.9 |
| 10 | 7311.00 | 36.1 AV | 54.0 | -17.9 | 1.55 V | 265 | 27.2 | 8.9 |

**REMARKS:**

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

| CHANNEL | TX Channel 11 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2462.00 | 104.5 PK | | | 1.79 H | 259 | 105.9 | -1.4 |
| 2 | *2462.00 | 102.4 AV | | | 1.79 H | 259 | 103.8 | -1.4 |
| 3 | 2483.50 | 57.9 PK | 74.0 | -16.1 | 1.79 H | 259 | 59.3 | -1.4 |
| 4 | 2483.50 | 45.3 AV | 54.0 | -8.7 | 1.79 H | 259 | 46.7 | -1.4 |
| 5 | 4924.00 | 39.3 PK | 74.0 | -34.7 | 1.72 H | 189 | 36.0 | 3.3 |
| 6 | 4924.00 | 28.7 AV | 54.0 | -25.3 | 1.72 H | 189 | 25.4 | 3.3 |
| 7 | 7386.00 | 47.3 PK | 74.0 | -26.7 | 1.66 H | 112 | 38.2 | 9.1 |
| 8 | 7386.00 | 36.1 AV | 54.0 | -17.9 | 1.66 H | 112 | 27.0 | 9.1 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2462.00 | 98.3 PK | | | 2.59 V | 185 | 99.7 | -1.4 |
| 2 | *2462.00 | 95.5 AV | | | 2.59 V | 185 | 96.9 | -1.4 |
| 3 | 2483.50 | 57.6 PK | 74.0 | -16.4 | 2.59 V | 185 | 59.0 | -1.4 |
| 4 | 2483.50 | 44.1 AV | 54.0 | -9.9 | 2.59 V | 185 | 45.5 | -1.4 |
| 5 | 4924.00 | 38.6 PK | 74.0 | -35.4 | 1.40 V | 95 | 35.3 | 3.3 |
| 6 | 4924.00 | 27.4 AV | 54.0 | -26.6 | 1.40 V | 95 | 24.1 | 3.3 |
| 7 | 7386.00 | 46.3 PK | 74.0 | -27.7 | 1.55 V | 262 | 37.2 | 9.1 |
| 8 | 7386.00 | 36.4 AV | 54.0 | -17.6 | 1.55 V | 262 | 27.3 | 9.1 |

**REMARKS:**

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

## 802.11g

| CHANNEL | TX Channel 1 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 57.9 PK | 74.0 | -16.1 | 1.88 H | 258 | 59.5 | -1.6 |
| 2 | 2390.00 | 48.0 AV | 54.0 | -6.0 | 1.88 H | 258 | 49.6 | -1.6 |
| 3 | *2412.00 | 106.4 PK | | | 1.88 H | 258 | 107.9 | -1.5 |
| 4 | *2412.00 | 98.1 AV | | | 1.88 H | 258 | 99.6 | -1.5 |
| 5 | 4824.00 | 38.8 PK | 74.0 | -35.2 | 1.66 H | 205 | 35.8 | 3.0 |
| 6 | 4824.00 | 28.6 AV | 54.0 | -25.4 | 1.66 H | 205 | 25.6 | 3.0 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 57.5 PK | 74.0 | -16.5 | 2.64 V | 212 | 59.1 | -1.6 |
| 2 | 2390.00 | 46.7 AV | 54.0 | -7.3 | 2.64 V | 212 | 48.3 | -1.6 |
| 3 | *2412.00 | 100.1 PK | | | 2.64 V | 212 | 101.6 | -1.5 |
| 4 | *2412.00 | 91.2 AV | | | 2.64 V | 212 | 92.7 | -1.5 |
| 5 | 4824.00 | 38.0 PK | 74.0 | -36.0 | 1.48 V | 113 | 35.0 | 3.0 |
| 6 | 4824.00 | 27.7 AV | 54.0 | -26.3 | 1.48 V | 113 | 24.7 | 3.0 |

**REMARKS:**

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

| CHANNEL | TX Channel 6 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 55.4 PK | 74.0 | -18.6 | 1.84 H | 258 | 57.0 | -1.6 |
| 2 | 2390.00 | 43.7 AV | 54.0 | -10.3 | 1.84 H | 258 | 45.3 | -1.6 |
| 3 | *2437.00 | 110.7 PK | | | 1.84 H | 258 | 112.2 | -1.5 |
| 4 | *2437.00 | 102.3 AV | | | 1.84 H | 258 | 103.8 | -1.5 |
| 5 | 2483.50 | 55.7 PK | 74.0 | -18.3 | 1.84 H | 258 | 57.1 | -1.4 |
| 6 | 2483.50 | 44.5 AV | 54.0 | -9.5 | 1.84 H | 258 | 45.9 | -1.4 |
| 7 | 4874.00 | 39.0 PK | 74.0 | -35.0 | 1.43 H | 360 | 35.8 | 3.2 |
| 8 | 4874.00 | 28.8 AV | 54.0 | -25.2 | 1.43 H | 360 | 25.6 | 3.2 |
| 9 | 7311.00 | 47.3 PK | 74.0 | -26.7 | 1.56 H | 4 | 38.4 | 8.9 |
| 10 | 7311.00 | 36.0 AV | 54.0 | -18.0 | 1.56 H | 4 | 27.1 | 8.9 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 55.1 PK | 74.0 | -18.9 | 2.68 V | 212 | 56.7 | -1.6 |
| 2 | 2390.00 | 42.4 AV | 54.0 | -11.6 | 2.68 V | 212 | 44.0 | -1.6 |
| 3 | *2437.00 | 104.5 PK | | | 2.68 V | 212 | 106.0 | -1.5 |
| 4 | *2437.00 | 95.3 AV | | | 2.68 V | 212 | 96.8 | -1.5 |
| 5 | 2483.50 | 55.3 PK | 74.0 | -18.7 | 2.68 V | 212 | 56.7 | -1.4 |
| 6 | 2483.50 | 43.3 AV | 54.0 | -10.7 | 2.68 V | 212 | 44.7 | -1.4 |
| 7 | 4874.00 | 38.2 PK | 74.0 | -35.8 | 1.43 V | 109 | 35.0 | 3.2 |
| 8 | 4874.00 | 27.9 AV | 54.0 | -26.1 | 1.43 V | 109 | 24.7 | 3.2 |
| 9 | 7311.00 | 46.2 PK | 74.0 | -27.8 | 1.45 V | 132 | 37.3 | 8.9 |
| 10 | 7311.00 | 35.9 AV | 54.0 | -18.1 | 1.45 V | 132 | 27.0 | 8.9 |

**REMARKS:**

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

| CHANNEL | TX Channel 11 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2462.00 | 106.2 PK | | | 1.80 H | 258 | 107.6 | -1.4 |
| 2 | *2462.00 | 97.2 AV | | | 1.80 H | 258 | 98.6 | -1.4 |
| 3 | 2483.50 | 66.2 PK | 74.0 | -7.8 | 1.80 H | 258 | 67.6 | -1.4 |
| 4 | 2483.50 | 48.2 AV | 54.0 | -5.8 | 1.80 H | 258 | 49.6 | -1.4 |
| 5 | 4924.00 | 38.5 PK | 74.0 | -35.5 | 1.43 H | 360 | 35.2 | 3.3 |
| 6 | 4924.00 | 28.3 AV | 54.0 | -25.7 | 1.43 H | 360 | 25.0 | 3.3 |
| 7 | 7386.00 | 46.8 PK | 74.0 | -27.2 | 1.62 H | 10 | 37.7 | 9.1 |
| 8 | 7386.00 | 35.5 AV | 54.0 | -18.5 | 1.62 H | 10 | 26.4 | 9.1 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2462.00 | 100.0 PK | | | 2.64 V | 201 | 101.4 | -1.4 |
| 2 | *2462.00 | 90.3 AV | | | 2.64 V | 201 | 91.7 | -1.4 |
| 3 | 2483.50 | 65.9 PK | 74.0 | -8.1 | 2.64 V | 201 | 67.3 | -1.4 |
| 4 | 2483.50 | 47.0 AV | 54.0 | -7.0 | 2.64 V | 201 | 48.4 | -1.4 |
| 5 | 4924.00 | 37.7 PK | 74.0 | -36.3 | 1.48 V | 94 | 34.4 | 3.3 |
| 6 | 4924.00 | 27.4 AV | 54.0 | -26.6 | 1.48 V | 94 | 24.1 | 3.3 |
| 7 | 7386.00 | 45.7 PK | 74.0 | -28.3 | 1.45 V | 137 | 36.6 | 9.1 |
| 8 | 7386.00 | 35.4 AV | 54.0 | -18.6 | 1.45 V | 137 | 26.3 | 9.1 |

**REMARKS:**

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

## 802.11n (HT20)

| CHANNEL | TX Channel 1 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 57.6 PK | 74.0 | -16.4 | 1.75 H | 258 | 59.2 | -1.6 |
| 2 | 2390.00 | 48.0 AV | 54.0 | -6.0 | 1.75 H | 258 | 49.6 | -1.6 |
| 3 | *2412.00 | 106.3 PK | | | 1.75 H | 258 | 107.8 | -1.5 |
| 4 | *2412.00 | 97.2 AV | | | 1.75 H | 258 | 98.7 | -1.5 |
| 5 | 4824.00 | 38.6 PK | 74.0 | -35.4 | 1.41 H | 360 | 35.6 | 3.0 |
| 6 | 4824.00 | 28.5 AV | 54.0 | -25.5 | 1.41 H | 360 | 25.5 | 3.0 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 57.3 PK | 74.0 | -16.7 | 2.67 V | 214 | 58.9 | -1.6 |
| 2 | 2390.00 | 46.7 AV | 54.0 | -7.3 | 2.67 V | 214 | 48.3 | -1.6 |
| 3 | *2412.00 | 100.1 PK | | | 2.67 V | 214 | 101.6 | -1.5 |
| 4 | *2412.00 | 90.2 AV | | | 2.67 V | 214 | 91.7 | -1.5 |
| 5 | 4824.00 | 38.5 PK | 74.0 | -35.5 | 1.49 V | 111 | 35.5 | 3.0 |
| 6 | 4824.00 | 28.2 AV | 54.0 | -25.8 | 1.49 V | 111 | 25.2 | 3.0 |

**REMARKS:**

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

| CHANNEL | TX Channel 6 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 55.5 PK | 74.0 | -18.5 | 1.85 H | 252 | 57.1 | -1.6 |
| 2 | 2390.00 | 44.0 AV | 54.0 | -10.0 | 1.85 H | 252 | 45.6 | -1.6 |
| 3 | *2437.00 | 110.3 PK | | | 1.84 H | 263 | 111.8 | -1.5 |
| 4 | *2437.00 | 101.9 AV | | | 1.84 H | 263 | 103.4 | -1.5 |
| 5 | 2483.50 | 56.2 PK | 74.0 | -17.8 | 1.82 H | 270 | 57.6 | -1.4 |
| 6 | 2483.50 | 45.0 AV | 54.0 | -9.0 | 1.82 H | 270 | 46.4 | -1.4 |
| 7 | 4874.00 | 38.7 PK | 74.0 | -35.3 | 1.44 H | 360 | 35.5 | 3.2 |
| 8 | 4874.00 | 28.7 AV | 54.0 | -25.3 | 1.44 H | 360 | 25.5 | 3.2 |
| 9 | 7311.00 | 46.8 PK | 74.0 | -27.2 | 1.57 H | 5 | 37.9 | 8.9 |
| 10 | 7311.00 | 35.7 AV | 54.0 | -18.3 | 1.57 H | 5 | 26.8 | 8.9 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 55.2 PK | 74.0 | -18.8 | 2.72 V | 215 | 56.8 | -1.6 |
| 2 | 2390.00 | 42.7 AV | 54.0 | -11.3 | 2.72 V | 215 | 44.3 | -1.6 |
| 3 | *2437.00 | 104.0 PK | | | 2.72 V | 215 | 105.5 | -1.5 |
| 4 | *2437.00 | 95.0 AV | | | 2.72 V | 215 | 96.5 | -1.5 |
| 5 | 2483.50 | 55.9 PK | 74.0 | -18.1 | 2.72 V | 215 | 57.3 | -1.4 |
| 6 | 2483.50 | 43.8 AV | 54.0 | -10.2 | 2.72 V | 215 | 45.2 | -1.4 |
| 7 | 4874.00 | 38.7 PK | 74.0 | -35.3 | 1.46 V | 111 | 35.5 | 3.2 |
| 8 | 4874.00 | 28.4 AV | 54.0 | -25.6 | 1.46 V | 111 | 25.2 | 3.2 |
| 9 | 7311.00 | 46.2 PK | 74.0 | -27.8 | 1.46 V | 135 | 37.3 | 8.9 |
| 10 | 7311.00 | 36.1 AV | 54.0 | -17.9 | 1.46 V | 135 | 27.2 | 8.9 |

**REMARKS:**

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

| CHANNEL | TX Channel 11 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 25GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2462.00 | 105.4 PK | | | 1.83 H | 273 | 106.8 | -1.4 |
| 2 | *2462.00 | 96.2 AV | | | 1.83 H | 273 | 97.6 | -1.4 |
| 3 | 2483.50 | 65.3 PK | 74.0 | -8.7 | 1.75 H | 271 | 66.7 | -1.4 |
| 4 | 2483.50 | 47.3 AV | 54.0 | -6.7 | 1.75 H | 271 | 48.7 | -1.4 |
| 5 | 4924.00 | 38.5 PK | 74.0 | -35.5 | 1.42 H | 349 | 35.2 | 3.3 |
| 6 | 4924.00 | 28.4 AV | 54.0 | -25.6 | 1.42 H | 349 | 25.1 | 3.3 |
| 7 | 7386.00 | 46.4 PK | 74.0 | -27.6 | 1.56 H | 15 | 37.3 | 9.1 |
| 8 | 7386.00 | 35.3 AV | 54.0 | -18.7 | 1.56 H | 15 | 26.2 | 9.1 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2462.00 | 99.1 PK | | | 2.62 V | 216 | 100.5 | -1.4 |
| 2 | *2462.00 | 89.4 AV | | | 2.62 V | 216 | 90.8 | -1.4 |
| 3 | 2483.50 | 64.9 PK | 74.0 | -9.1 | 2.62 V | 216 | 66.3 | -1.4 |
| 4 | 2483.50 | 46.1 AV | 54.0 | -7.9 | 2.62 V | 216 | 47.5 | -1.4 |
| 5 | 4924.00 | 38.3 PK | 74.0 | -35.7 | 1.47 V | 110 | 35.0 | 3.3 |
| 6 | 4924.00 | 28.0 AV | 54.0 | -26.0 | 1.47 V | 110 | 24.7 | 3.3 |
| 7 | 7386.00 | 45.8 PK | 74.0 | -28.2 | 1.47 V | 133 | 36.7 | 9.1 |
| 8 | 7386.00 | 35.7 AV | 54.0 | -18.3 | 1.47 V | 133 | 26.6 | 9.1 |

**REMARKS:**

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

**Below 1GHz Data:**

**802.11n (HT20)**

| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 6 | **DETECTOR FUNCTION** | Quasi-Peak (QP) |
| **FREQUENCY RANGE** | 9kHz~1GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 95.96 | 35.7 QP | 43.5 | -7.8 | 1.50 H | 211 | 48.8 | -13.1 |
| 2 | 328.76 | 38.6 QP | 46.0 | -7.4 | 3.00 H | 211 | 45.1 | -6.5 |
| 3 | 472.32 | 39.9 QP | 46.0 | -6.1 | 2.00 H | 221 | 43.5 | -3.6 |
| 4 | 567.38 | 38.7 QP | 46.0 | -7.3 | 1.50 H | 145 | 40.4 | -1.7 |
| 5 | 615.88 | 35.5 QP | 46.0 | -10.5 | 1.50 H | 123 | 36.2 | -0.7 |
| 6 | 753.62 | 34.1 QP | 46.0 | -11.9 | 1.00 H | 100 | 32.4 | 1.7 |
| **ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M** | | | | | | | | |
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 96.01 | 33.7 QP | 43.5 | -9.8 | 1.50 V | 224 | 46.8 | -13.1 |
| 2 | 303.01 | 42.1 QP | 46.0 | -3.9 | 2.00 V | 84 | 49.5 | -7.4 |
| 3 | 336.01 | 40.2 QP | 46.0 | -5.8 | 2.50 V | 64 | 46.7 | -6.5 |
| 4 | 399.01 | 41.9 QP | 46.0 | -4.1 | 1.00 V | 336 | 47.2 | -5.3 |
| 5 | 494.99 | 41.0 QP | 46.0 | -5.0 | 2.00 V | 193 | 44.1 | -3.1 |
| **6** | **745.52** | **42.4 QP** | **46.0** | **-3.6** | **1.50 V** | **296** | **40.9** | **1.5** |

**REMARKS:**

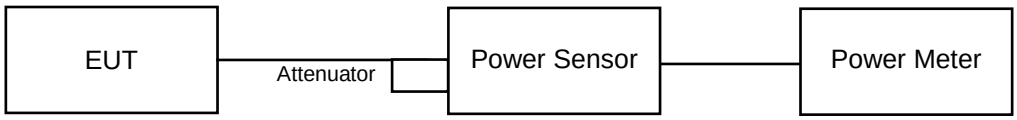
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

## 4.2 Conducted Output Power Measurement

### 4.2.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

### 4.2.2 Test Setup




### 4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.2.4 Test Procedures

A peak / average power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. Record the power level.

### 4.2.5 Deviation from Test Standard

No deviation.

### 4.2.6 EUT Operating Conditions

Same as Item 4.1.6.

4.2.7 Test Results

**FOR PEAK POWER**

**802.11b**

| Channel | Frequency (MHz) | Peak Power (mW) | Peak Power (dBm) | Limit (dBm) | Pass/Fail |
|---|---|---|---|---|---|
| 1 | 2412 | 114.288 | 20.58 | 30.00 | Pass |
| 6 | 2437 | 164.059 | 22.15 | 30.00 | Pass |
| 11 | 2462 | 121.06 | 20.83 | 30.00 | Pass |

**802.11g**

| Channel | Frequency (MHz) | Peak Power (mW) | Peak Power (dBm) | Limit (dBm) | Pass/Fail |
|---|---|---|---|---|---|
| 1 | 2412 | 180.717 | 22.57 | 30.00 | Pass |
| 6 | 2437 | 289.068 | 24.61 | 30.00 | Pass |
| 11 | 2462 | 169.824 | 22.30 | 30.00 | Pass |

**802.11n (HT20)**

| Channel | Frequency (MHz) | Peak Power (mW) | Peak Power (dBm) | Limit (dBm) | Pass/Fail |
|---|---|---|---|---|---|
| 1 | 2412 | 159.221 | 22.02 | 30.00 | Pass |
| 6 | 2437 | 293.765 | 24.68 | 30.00 | Pass |
| 11 | 2462 | 157.761 | 21.98 | 30.00 | Pass |

## FOR AVERAGE POWER

### 802.11b

| Channel | Frequency (MHz) | Average Power (mW) | Average Power (dBm) |
|---|---|---|---|
| 1 | 2412 | 69.502 | 18.42 |
| 6 | 2437 | 103.514 | 20.15 |
| 11 | 2462 | 73.282 | 18.65 |

### 802.11g

| Channel | Frequency (MHz) | Average Power (mW) | Average Power (dBm) |
|---|---|---|---|
| 1 | 2412 | 44.978 | 16.53 |
| 6 | 2437 | 87.096 | 19.40 |
| 11 | 2462 | 39.537 | 15.97 |

### 802.11n (HT20)

| Channel | Frequency (MHz) | Average Power (mW) | Average Power (dBm) |
|---|---|---|---|
| 1 | 2412 | 32.885 | 15.17 |
| 6 | 2437 | 83.368 | 19.21 |
| 11 | 2462 | 30.13 | 14.79 |

## 4.3 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

**Appendix – Information on the Testing Laboratories**

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

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


**Linko EMC/RF Lab**
Tel: 886-2-26052180
Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**
Tel: 886-3-6668565
Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety Lab**
Tel: 886-3-3183232
Fax: 886-3-3270892

**Email:** service.adt@tw.bureauveritas.com
**Web Site:** www.bureauveritas-adt.com


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

**--- END ---**