

## Partial FCC Test Report

**Report No.:** RF200605C03-1

**FCC ID:** O57AX200NGW

**Test Model:** AX200NGW

**Received Date:** Jun. 05, 2020

**Test Date:** Jul. 21, 2020 ~ Jul. 30, 2020

**Issued Date:** Aug. 07, 2020

**Applicant:** Lenovo(Shanghai) Electronics Technology Co., Ltd.

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
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**FCC Registration /  
Designation Number:** 788550 / TW0003



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## Table of Contents

|   |           |
|---|-----------|
| <b>Release Control Record .....</b>                               | <b>3</b>  |
| <b>1 Certificate of Conformity .....</b>                          | <b>4</b>  |
| <b>2 Summary of Test Results.....</b>                             | <b>5</b>  |
| 2.1 Measurement Uncertainty.....                                  | 5         |
| 2.2 Modification Record .....                                     | 5         |
| <b>3 General Information .....</b>                                | <b>6</b>  |
| 3.1 General Description of EUT .....                              | 6         |
| 3.2 Description of Test Modes.....                                | 7         |
| 3.2.1 Test Mode Applicability and Tested Channel Detail.....      | 8         |
| 3.3 Description of Support Units .....                            | 10        |
| 3.3.1 Configuration of System under Test .....                    | 10        |
| 3.4 General Description of Applied Standards and References ..... | 11        |
| <b>4 Test Types and Results .....</b>                             | <b>12</b> |
| 4.1 Radiated Emission and Bandedge Measurement .....              | 12        |
| 4.1.1 Limits of Radiated Emission and Bandedge Measurement .....  | 12        |
| 4.1.2 Test Instruments .....                                      | 13        |
| 4.1.3 Test Procedures.....  | 14        |
| 4.1.4 Deviation from Test Standard .....                          | 14        |
| 4.1.5 Test Set Up .....   | 15        |
| 4.1.6 EUT Operating Conditions.....                               | 16        |
| 4.1.7 Test Results .....  | 17        |
| 4.2 Conducted Emission Measurement.....                           | 25        |
| 4.2.1 Limits of Conducted Emission Measurement .....              | 25        |
| 4.2.2 Test Instruments .....                                      | 25        |
| 4.2.3 Test Procedures.....  | 25        |
| 4.2.4 Deviation from Test Standard .....                          | 26        |
| 4.2.5 Test Setup.....   | 26        |
| 4.2.6 EUT Operating Conditions.....                               | 26        |
| 4.2.7 Test Results .....  | 27        |
| 4.3 Conducted Output Power Measurement .....                      | 29        |
| 4.3.1 Limits of Conducted Output Power Measurement.....           | 29        |
| 4.3.2 Test Setup.....   | 29        |
| 4.3.3 Test Instruments .....                                      | 29        |
| 4.3.4 Test Procedures.....  | 29        |
| 4.3.5 Deviation from Test Standard .....                          | 29        |
| 4.3.6 EUT Operating Conditions.....                               | 29        |
| 4.3.7 Test Results .....  | 30        |
| <b>5 Pictures of Test Arrangements.....</b>                       | <b>31</b> |
| <b>Annex A- Band Edge Measurement .....</b>                       | <b>32</b> |
| <b>Appendix – Information of the Testing Laboratories .....</b>   | <b>34</b> |

### Release Control Record

| Issue No.     | Description      | Date Issued   |
|---------------|------------------|---------------|
| RF200605C03-1 | Original Release | Aug. 07, 2020 |



## 2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart C (Section 15.247) |                                |        |   |
|--|--------------------------------|--------|---|
| FCC Clause                                     | Test Item                      | Result | Remarks   |
| 15.207   | AC Power Conducted Emission    | Pass   | Meet the requirement of limit.<br>Minimum passing margin is -18.34 dB at 0.38808 MHz. |
| 15.205 & 209                                   | Radiated Emissions             | Pass   | Meet the requirement of limit.<br>Minimum passing margin is -5.4 dB at 2483.50 MHz.   |
| 15.247(d)                                      | Band Edge Measurement          | N/A    | Refer to Note   |
| 15.247(d)                                      | Antenna Port Emission          | N/A    | Refer to Note   |
| 15.247(a)(2)                                   | 6 dB Bandwidth                 | N/A    | Refer to Note   |
| ---  | Occupied Bandwidth Measurement | N/A    | Refer to Note   |
| 15.247(b)                                      | Conducted Power                | Pass   | Meet the requirement of limit.  |
| 15.247(e)                                      | Power Spectral Density         | N/A    | Refer to Note   |
| 15.203   | Antenna Requirement            | N/A    | No antenna connector is used.   |

### Note:

- This report is a partial report, only test item of Conducted Emission, Radiated Emissions and Maximum Peak Output Power were performed for this report. Other testing data please refer to Intel report no.: 181210-03.TR04 for module (Brand: Intel® Wi-Fi 6 AX200 , Model: AX200NGW).
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 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) (±) |
|------------------------------------|--------------------|--------------------------------|
| Conducted Emissions at mains ports | 150 kHz ~ 30 MHz   | 2.79 dB                        |
| Radiated Emissions up to 1 GHz     | 9 kHz ~ 30 MHz     | 3.04 dB                        |
|                                    | 30 MHz ~ 200 MHz   | 2.93 dB                        |
|                                    | 200 MHz ~ 1000 MHz | 2.95 dB                        |
| Radiated Emissions above 1 GHz     | 1 GHz ~ 18 GHz     | 2.26 dB                        |
|                                    | 18 GHz ~ 40 GHz    | 1.94 dB                        |

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

|                            |  |
|----------------------------|--|
| <b>Product</b>             | WLAN and BT , 2x2 Pcle M.2 2230 adapter card |
| <b>Brand</b>               | Intel® Wi-Fi 6 AX200                         |
| <b>Test Model</b>          | AX200NGW                                     |
| <b>Status of EUT</b>       | Engineering Sample                           |
| <b>Power Supply Rating</b> | 3.3Vdc form host equipment                   |
| <b>Modulation Type</b>     | GFSK   |
| <b>Transfer Rate</b>       | LE 4.0: 1 Mbps<br>LE 5.0: 2 Mbps             |
| <b>Operating Frequency</b> | 2402 ~ 2480 MHz                              |
| <b>Number of Channel</b>   | 40   |
| <b>Output Power</b>        | LE 4.0: 5.984 mW<br>LE 5.0: 5.957 mW         |
| <b>Antenna Type</b>        | Refer to Note                                |
| <b>Antenna Connector</b>   | N/A  |
| <b>Accessory Device</b>    | N/A  |
| <b>Data Cable Supplied</b> | N/A  |

Note:

- The EUT is authorized for use in specific End-product. Please refer to below for more details.

| Product           | Brand  | Model   |
|-------------------|--------|---|
| Notebook Computer | Lenovo | ThinkBook 15 G2 ARE*****(*=0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product) |

- The following accessories were for the End-product.

| Product | Brand  | Model       | Description  |
|---------|--------|-------------|--|
| Adapter | Lenovo | ADLX65YCC3A | I/P: 100-240 Vac, 50-60 Hz, 1.8 A<br>O/P: 20 Vdc, 3.25 A |
| Battery | Lenovo | L19C3PDA    | 11.52 Vdc, 3907 mAh, 45 Wh                               |

- The antenna information is listed as below. Only the antenna which has the maximum gain was chosen as a representative for the final test.

| WLAN Antenna |  |              |                                    |                       |                          |                           |                           |       |
|--------------|--|--------------|------------------------------------|-----------------------|--------------------------|---------------------------|---------------------------|-------|
| Ant. Type    | Manufacturer                                 | Parts Number |                                    | Antenna Gain (dBi)    |                          |                           |                           |       |
|              |  |              |                                    | BT/WLAN<br>2.4<br>GHz | WLAN<br>5.15~5.35<br>GHz | WLAN<br>5.47~5.725<br>GHz | WLAN<br>5.725~5.85<br>GHz |       |
| PIFA         | High-Tek<br>Electronics Co.,<br>Ltd          | Main         | 0ACCN020001N / DC33002G300         |                       | -2.47                    | 1.75                      | -2.57                     | -4.41 |
|              |  | Aux.         | 0ACCN020002N / DC33002G310         |                       | -2.19                    | -4.51                     | -2.84                     | -2.86 |
| PIFA         | MAG.LAYERS<br>Scientific-technics<br>co, LTD | Main         | PCA-3010-25GC7-A1 /<br>DC33002G600 |                       | -0.02                    | 2.02                      | 1.04                      | 1.99  |
|              |  | Aux.         | PCA-5010-25GC7-A1 /<br>DC33002G610 |                       | 1.12                     | -1.44                     | -2.19                     | -2.19 |

- The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
- The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or User's Manual.

### 3.2 Description of Test Modes

40 channels are provided to this EUT:

| Channel | Freq. (MHz) |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 0       | 2402        | 10      | 2422        | 20      | 2442        | 30      | 2462        |
| 1       | 2404        | 11      | 2424        | 21      | 2444        | 31      | 2464        |
| 2       | 2406        | 12      | 2426        | 22      | 2446        | 32      | 2466        |
| 3       | 2408        | 13      | 2428        | 23      | 2448        | 33      | 2468        |
| 4       | 2410        | 14      | 2430        | 24      | 2450        | 34      | 2470        |
| 5       | 2412        | 15      | 2432        | 25      | 2452        | 35      | 2472        |
| 6       | 2414        | 16      | 2434        | 26      | 2454        | 36      | 2474        |
| 7       | 2416        | 17      | 2436        | 27      | 2456        | 37      | 2476        |
| 8       | 2418        | 18      | 2438        | 28      | 2458        | 38      | 2478        |
| 9       | 2420        | 19      | 2440        | 29      | 2460        | 39      | 2480        |

### 3.2.1 Test Mode Applicability and Tested Channel Detail

<LE 4.0>

| EUT Configure Mode | Applicable To |       |     |       | Description |
|--------------------|---------------|-------|-----|-------|-------------|
|                    | RE≥1G         | RE<1G | PLC | Power |             |
| -                  | √             | √     | √   | √     | -           |

Where **RE≥1G**: Radiated Emission above 1 GHz      **RE<1G**: Radiated Emission below 1 GHz  
**PLC**: Power Line Conducted Emission      **Power**: Maximum Output Power Measurement

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

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

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 0, 19, 39      | GFSK            | 1                |

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

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

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 39             | GFSK            | 1                |

#### **Power Line Conducted Emission Test:**

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

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 39             | GFSK            | 1                |

#### **Maximum Output Power Measurement:**

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

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 0, 19, 39      | GFSK            | 1                |

<LE 5.0>

| EUT Configure Mode | Applicable To |       |     |       | Description |
|--------------------|---------------|-------|-----|-------|-------------|
|                    | RE $\geq$ 1G  | RE<1G | PLC | Power |             |
| -                  | √             | -     | -   | √     | -           |

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz      **RE<1G**: Radiated Emission below 1 GHz  
**PLC**: Power Line Conducted Emission      **Power**: Maximum Output Power Measurement

**Note:** "-" means no effect.

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

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

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 0, 19, 39      | GFSK            | 2                |

**Maximum Output Power Measurement:**

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

| EUT Configure Mode | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 39           | 0, 19, 39      | GFSK            | 2                |

**Test Condition:**

| Applicable To | Environmental Conditions | Input Power    | Tested by  |
|---------------|--------------------------|----------------|------------|
| RE $\geq$ 1G  | 23 deg. C, 66 % RH       | 120 Vac, 60 Hz | Titan Hsu  |
| RE<1G         | 23 deg. C, 66 % RH       | 120 Vac, 60 Hz | Titan Hsu  |
| PLC           | 23 deg. C, 67 % RH       | 120 Vac, 60 Hz | Adair Peng |
| Power         | 25 deg. C, 65 % RH       | 120 Vac, 60 Hz | Titan Hsu  |

### 3.3 Description of Support Units

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

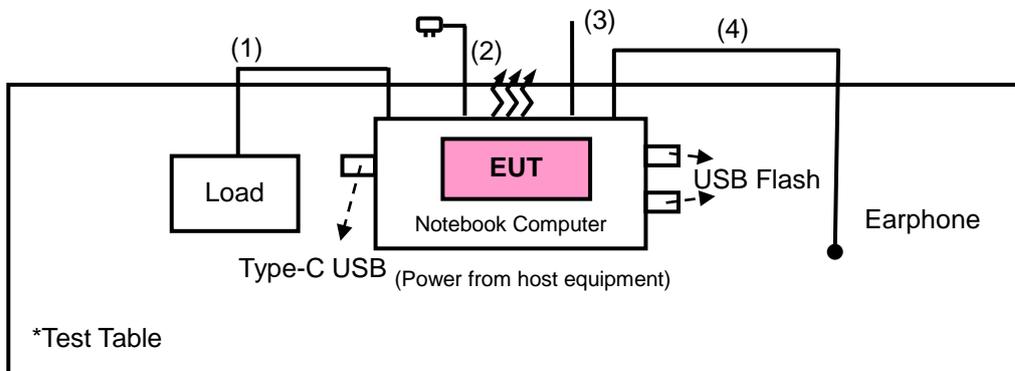
| No. | Product    | Brand   | Model No.   | Serial No. | FCC ID |
|-----|------------|---------|---|------------|--------|
| A   | Type-C USB | SanDisk | N/A   | N/A        | N/A    |
| B   | USB Flash  | HP      | v250W   | 03         | N/A    |
| C   | USB Flash  | HP      | v250W   | 05         | N/A    |
| D   | Earphone   | Apple   | N/A   | N/A        | N/A    |
| E   | Notebook   | Lenovo  | ThinkBook 15 G2 ARE*****(*=0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product) | N/A        | N/A    |
| F   | Adapter    | Lenovo  | ADLX65YCC3A   | N/A        | N/A    |

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as communication partner to transfer data.

| ID | Cable Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks                  |
|----|--------------------|------|------------|--------------------|--------------|--------------------------|
| 1. | Load Cable         | 1    | 1.5        | N                  | 0            | --                       |
| 2. | Adapter Cable      | 1    | 2.5        | Y                  | 0            | Accessory of End-product |
| 3. | HDMI Cable         | 1    | 1.5        | Y                  | 0            | --                       |
| 4. | Earphone Cable     | 1    | 1.2        | N                  | 0            | --                       |

#### 3.3.1 Configuration of System under Test



### **3.4 General Description of Applied Standards and References**

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

#### **Test Standard:**

**FCC Part 15, Subpart C (15.247)**

ANSI C63.10-2013

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

#### **References Test Guidance:**

**KDB 558074 D01 15.247 Meas Guidance v05r02**

All test items have been performed as a reference to the above KDB test guidance.

## 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 20 dB 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 1000 MHz, 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 20 dB under any condition of modulation.

## 4.1.2 Test Instruments

| Description & Manufacturer                | Model No.                             | Serial No.  | Date of Calibration | Due Date of Calibration |
|---|---------------------------------------|---|---------------------|-------------------------|
| Test Receiver<br>ROHDE & SCHWARZ          | ESR3                                  | 102579  | Jul. 07, 2020       | Jul. 06, 2021           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ      | FSP40                                 | 100269  | Jun. 09, 2020       | Jun. 08, 2021           |
| BILOG Antenna<br>SCHWARZBECK              | VULB9168                              | 9168-171  | Nov. 11, 2019       | Nov. 10, 2020           |
| HORN Antenna<br>SCHWARZBECK               | 9120D                                 | 209   | Nov. 24, 2019       | Nov. 23, 2020           |
| HORN Antenna<br>SCHWARZBECK               | BBHA 9170                             | BBHA9170241   | Nov. 24, 2019       | Nov. 23, 2020           |
| Loop Antenna<br>EMCI                      | EM-6879                               | 269   | Sep. 16, 2019       | Sep. 15, 2020           |
| Preamplifier<br>Agilent<br>(Below 1GHz)   | 8447D                                 | 2944A10738  | Aug. 20, 2019       | Aug. 19, 2020           |
| Preamplifier<br>Agilent<br>(Above 1GHz)   | 8449B                                 | 3008A02465  | Mar. 23, 2020       | Mar. 22, 2021           |
| RF Coaxial Cable<br>WOKEN<br>With 5dB PAD | 8D-FB                                 | Cable-CH3-01  | Aug. 20, 2019       | Aug. 19, 2020           |
| RF signal cable<br>HUBER+SUHNER           | SUCOFLEX 104                          | Cable-CH3-03<br>(223653/4)                          | Aug. 20, 2019       | Aug. 19, 2020           |
| RF signal cable<br>HUBER+SUHNER&<br>EMCI  | SUCOFLEX<br>104&EMC104-SM-<br>SM-8000 | Cable-CH3-03<br>(309224+170907)                     | Aug. 20, 2019       | Aug. 19, 2020           |
| Software<br>BV ADT                        | ADT_Radiated_<br>V7.6.15.9.5          | NA  | NA                  | NA                      |
| Antenna Tower<br>inn-co GmbH              | MA 4000                               | 013303  | NA                  | NA                      |
| Antenna Tower Controller<br>BV ADT        | AT100                                 | AT93021702  | NA                  | NA                      |
| Turn Table<br>BV ADT                      | TT100                                 | TT93021702  | NA                  | NA                      |
| Turn Table Controller<br>BV ADT           | SC100                                 | SC93021702  | NA                  | NA                      |
| Boresight Antenna Fixture                 | FBA-01                                | FBA-SIP01   | NA                  | NA                      |
| USB Wideband Power<br>Sensor<br>KEYSIGHT  | U2021XA                               | MY55050005/MY55<br>190004/MY551900<br>07/MY55210005 | Jul. 13, 2020       | Jul. 12, 2021           |

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

2. The test was performed in HwaYa Chamber 3.

#### 4.1.3 Test Procedures

##### **For Radiated Emission below 30 MHz**

- 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. Parallel, perpendicular, and ground-parallel orientations 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 9 kHz at frequency below 30 MHz.

##### **For Radiated Emission above 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:**

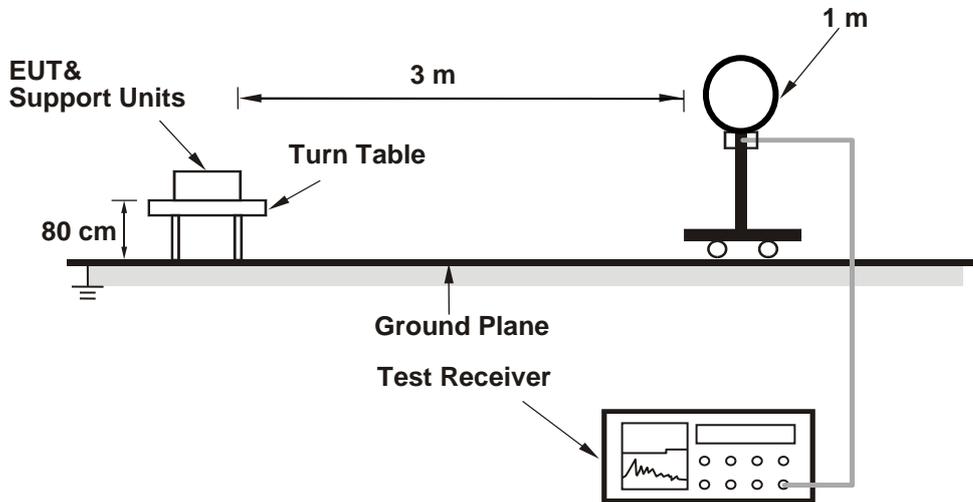
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle  $< 98\%$ ) or 10 Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1 GHz. (RBW = 1 MHz, VBW = 3 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

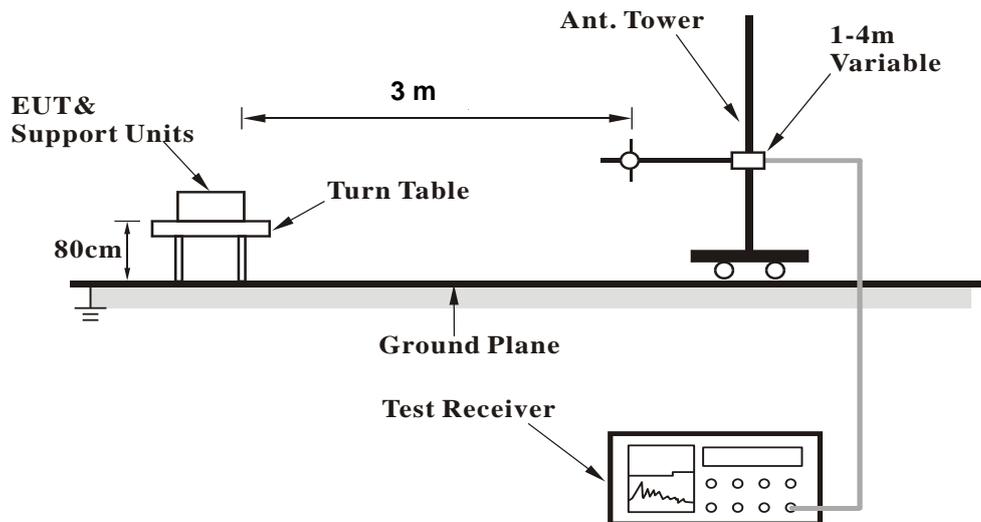
No deviation.

4.1.5 Test Set Up

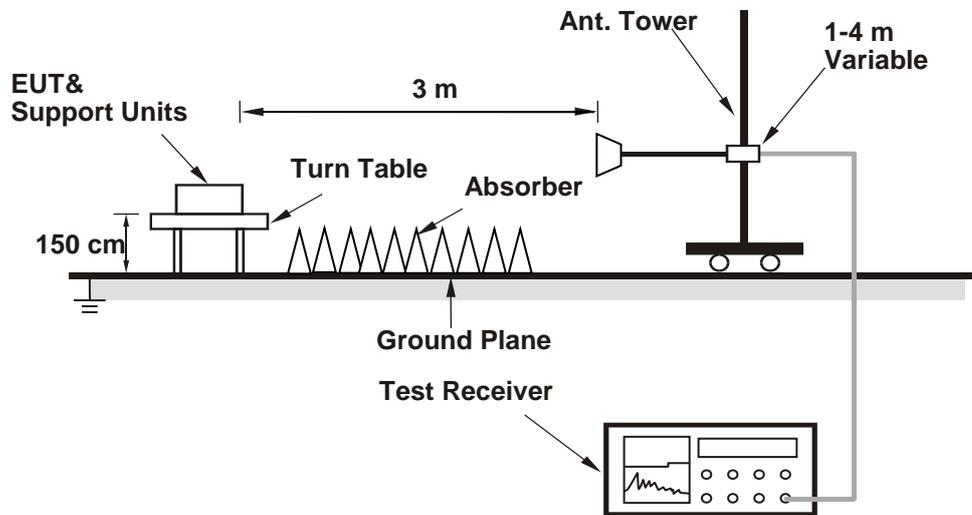
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



**<Radiated Emission above 1 GHz>**



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. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz Data:

<LE 4.0>

|                 |              |                      |              |
|-----------------|--------------|----------------------|--------------|
| CHANNEL         | TX Channel 0 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz |                      | Average (AV) |

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

| NO. | FREQ. (MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
|-----|-------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| 1   | 2390.00     | 58.7 PK                       | 74.0              | -15.3          | 2.12 H                   | 292                        | 26.4                   | 32.3                           |
| 2   | 2390.00     | 47.0 AV                       | 54.0              | -7.0           | 2.12 H                   | 292                        | 14.7                   | 32.3                           |
| 3   | *2402.00    | 97.3 PK                       |                   |                | 2.12 H                   | 292                        | 65.0                   | 32.3                           |
| 4   | *2402.00    | 95.6 AV                       |                   |                | 2.12 H                   | 292                        | 63.3                   | 32.3                           |
| 5   | 4804.00     | 45.2 PK                       | 74.0              | -28.8          | 1.79 H                   | 254                        | 42.1                   | 3.1                            |
| 6   | 4804.00     | 32.6 AV                       | 54.0              | -21.4          | 1.79 H                   | 254                        | 29.5                   | 3.1                            |

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

| NO. | FREQ. (MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
|-----|-------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| 1   | 2390.00     | 59.1 PK                       | 74.0              | -14.9          | 2.09 V                   | 251                        | 26.8                   | 32.3                           |
| 2   | 2390.00     | 47.0 AV                       | 54.0              | -7.0           | 2.09 V                   | 251                        | 14.7                   | 32.3                           |
| 3   | *2402.00    | 96.8 PK                       |                   |                | 2.09 V                   | 251                        | 64.5                   | 32.3                           |
| 4   | *2402.00    | 95.3 AV                       |                   |                | 2.09 V                   | 251                        | 63.0                   | 32.3                           |
| 5   | 4804.00     | 45.1 PK                       | 74.0              | -28.9          | 1.93 V                   | 168                        | 42.0                   | 3.1                            |
| 6   | 4804.00     | 32.4 AV                       | 54.0              | -21.6          | 1.93 V                   | 168                        | 29.3                   | 3.1                            |

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

|                 |               |                      |              |
|-----------------|---------------|----------------------|--------------|
| CHANNEL         | TX Channel 19 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz  |                      | Average (AV) |

**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   | *2440.00    | 97.1 PK                 |                |             | 2.15 H             | 297                  | 64.8             | 32.3                     |
| 2   | *2440.00    | 95.3 AV                 |                |             | 2.15 H             | 297                  | 63.0             | 32.3                     |
| 3   | 4880.00     | 45.0 PK                 | 74.0           | -29.0       | 1.85 H             | 261                  | 42.0             | 3.0                      |
| 4   | 4880.00     | 32.4 AV                 | 54.0           | -21.6       | 1.85 H             | 261                  | 29.4             | 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   | *2440.00    | 96.6 PK                 |                |             | 2.15 V             | 255                  | 64.3             | 32.3                     |
| 2   | *2440.00    | 95.2 AV                 |                |             | 2.15 V             | 255                  | 62.9             | 32.3                     |
| 3   | 4880.00     | 45.1 PK                 | 74.0           | -28.9       | 2.01 V             | 175                  | 42.1             | 3.0                      |
| 4   | 4880.00     | 32.2 AV                 | 54.0           | -21.8       | 2.01 V             | 175                  | 29.2             | 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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

|                 |               |                      |              |
|-----------------|---------------|----------------------|--------------|
| CHANNEL         | TX Channel 39 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz  |                      | Average (AV) |

**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   | *2480.00    | 100.6 PK                |                |             | 1.81 H             | 291                  | 68.2             | 32.4                     |
| 2   | *2480.00    | 98.9 AV                 |                |             | 1.81 H             | 291                  | 66.5             | 32.4                     |
| 3   | 2483.50     | 59.5 PK                 | 74.0           | -14.5       | 1.81 H             | 291                  | 27.1             | 32.4                     |
| 4   | 2483.50     | 47.6 AV                 | 54.0           | -6.4        | 1.81 H             | 291                  | 15.2             | 32.4                     |
| 5   | 4960.00     | 45.9 PK                 | 74.0           | -28.1       | 1.88 H             | 266                  | 42.6             | 3.3                      |
| 6   | 4960.00     | 33.0 AV                 | 54.0           | -21.0       | 1.88 H             | 266                  | 29.7             | 3.3                      |

**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   | *2480.00    | 101.5 PK                |                |             | 2.10 V             | 292                  | 69.1             | 32.4                     |
| 2   | *2480.00    | 99.7 AV                 |                |             | 2.10 V             | 292                  | 67.3             | 32.4                     |
| 3   | 2483.50     | 59.2 PK                 | 74.0           | -14.8       | 2.10 V             | 292                  | 26.8             | 32.4                     |
| 4   | 2483.50     | 47.6 AV                 | 54.0           | -6.4        | 2.10 V             | 292                  | 15.2             | 32.4                     |
| 5   | 4960.00     | 46.0 PK                 | 74.0           | -28.0       | 1.88 V             | 165                  | 42.7             | 3.3                      |
| 6   | 4960.00     | 33.1 AV                 | 54.0           | -20.9       | 1.88 V             | 165                  | 29.8             | 3.3                      |

**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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

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|                 |              |                      |              |
|-----------------|--------------|----------------------|--------------|
| CHANNEL         | TX Channel 0 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz |                      | Average (AV) |

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     | 58.3 PK                 | 74.0           | -15.7       | 1.90 H             | 291                  | 26.0             | 32.3                     |
| 2   | 2390.00     | 47.5 AV                 | 54.0           | -6.5        | 1.90 H             | 291                  | 15.2             | 32.3                     |
| 3   | *2402.00    | 98.3 PK                 |                |             | 1.90 H             | 291                  | 66.0             | 32.3                     |
| 4   | *2402.00    | 94.8 AV                 |                |             | 1.90 H             | 291                  | 62.5             | 32.3                     |
| 5   | 4804.00     | 45.3 PK                 | 74.0           | -28.7       | 1.57 H             | 269                  | 42.2             | 3.1                      |
| 6   | 4804.00     | 33.1 AV                 | 54.0           | -20.9       | 1.57 H             | 269                  | 30.0             | 3.1                      |

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   | 2390.00     | 59.0 PK                 | 74.0           | -15.0       | 3.79 V             | 308                  | 26.7             | 32.3                     |
| 2   | 2390.00     | 47.6 AV                 | 54.0           | -6.4        | 3.79 V             | 308                  | 15.3             | 32.3                     |
| 3   | *2402.00    | 99.2 PK                 |                |             | 3.79 V             | 308                  | 66.9             | 32.3                     |
| 4   | *2402.00    | 95.6 AV                 |                |             | 3.79 V             | 308                  | 63.3             | 32.3                     |
| 5   | 4804.00     | 45.6 PK                 | 74.0           | -28.4       | 1.97 V             | 209                  | 42.5             | 3.1                      |
| 6   | 4804.00     | 33.4 AV                 | 54.0           | -20.6       | 1.97 V             | 209                  | 30.3             | 3.1                      |

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

|                 |               |                      |              |
|-----------------|---------------|----------------------|--------------|
| CHANNEL         | TX Channel 19 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz  |                      | Average (AV) |

**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   | *2440.00    | 98.7 PK                 |                |             | 1.89 H             | 291                  | 66.4             | 32.3                     |
| 2   | *2440.00    | 95.1 AV                 |                |             | 1.89 H             | 291                  | 62.8             | 32.3                     |
| 3   | 4880.00     | 45.5 PK                 | 74.0           | -28.5       | 1.61 H             | 249                  | 42.5             | 3.0                      |
| 4   | 4880.00     | 33.2 AV                 | 54.0           | -20.8       | 1.61 H             | 249                  | 30.2             | 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   | *2440.00    | 99.9 PK                 |                |             | 3.72 V             | 304                  | 67.6             | 32.3                     |
| 2   | *2440.00    | 96.3 AV                 |                |             | 3.72 V             | 304                  | 64.0             | 32.3                     |
| 3   | 4880.00     | 45.7 PK                 | 74.0           | -28.3       | 1.91 V             | 222                  | 42.7             | 3.0                      |
| 4   | 4880.00     | 33.6 AV                 | 54.0           | -20.4       | 1.91 V             | 222                  | 30.6             | 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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

|                 |               |                      |              |
|-----------------|---------------|----------------------|--------------|
| CHANNEL         | TX Channel 39 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz  |                      | Average (AV) |

**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        | *2480.00       | 100.7 PK                |                |             | 2.01 H             | 289                  | 68.3             | 32.4                     |
| 2        | *2480.00       | 97.0 AV                 |                |             | 2.01 H             | 289                  | 64.6             | 32.4                     |
| 3        | 2483.50        | 59.1 PK                 | 74.0           | -14.9       | 2.01 H             | 289                  | 26.7             | 32.4                     |
| <b>4</b> | <b>2483.50</b> | <b>48.6 AV</b>          | <b>54.0</b>    | <b>-5.4</b> | <b>2.01 H</b>      | <b>289</b>           | <b>16.2</b>      | <b>32.4</b>              |
| 5        | 4960.00        | 45.4 PK                 | 74.0           | -28.6       | 1.71 H             | 252                  | 42.1             | 3.3                      |
| 6        | 4960.00        | 33.4 AV                 | 54.0           | -20.6       | 1.71 H             | 252                  | 30.1             | 3.3                      |

**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        | *2480.00       | 102.6 PK                |                |             | 2.61 V             | 288                  | 70.2             | 32.4                     |
| 2        | *2480.00       | 98.9 AV                 |                |             | 2.61 V             | 288                  | 66.5             | 32.4                     |
| 3        | 2483.50        | 60.1 PK                 | 74.0           | -13.9       | 2.61 V             | 288                  | 27.7             | 32.4                     |
| <b>4</b> | <b>2483.50</b> | <b>48.6 AV</b>          | <b>54.0</b>    | <b>-5.4</b> | <b>2.61 V</b>      | <b>288</b>           | <b>16.2</b>      | <b>32.4</b>              |
| 5        | 4960.00        | 45.8 PK                 | 74.0           | -28.2       | 1.88 V             | 190                  | 42.5             | 3.3                      |
| 6        | 4960.00        | 33.7 AV                 | 54.0           | -20.3       | 1.88 V             | 190                  | 30.4             | 3.3                      |

**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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

**9 kHz ~ 30 MHz Data:**

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

**30 MHz ~ 1 GHz Worst-Case Data:**

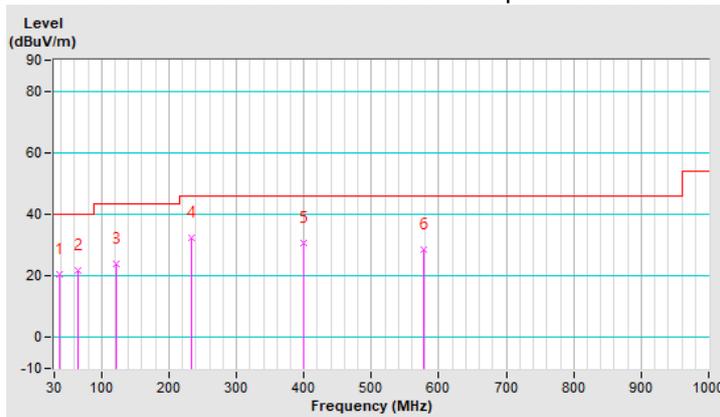
<LE 4.0>

|                 |               |                   |                 |
|-----------------|---------------|-------------------|-----------------|
| CHANNEL         | TX Channel 39 | DETECTOR FUNCTION | Quasi-Peak (QP) |
| FREQUENCY RANGE | 30MHz ~ 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   | 37.03       | 20.5 QP                 | 40.0           | -19.5       | 1.00 H             | 18                   | 30.4             | -9.9                     |
| 2   | 65.14       | 21.9 QP                 | 40.0           | -18.1       | 1.50 H             | 159                  | 31.9             | -10.0                    |
| 3   | 122.78      | 23.8 QP                 | 43.5           | -19.7       | 1.50 H             | 79                   | 34.5             | -10.7                    |
| 4   | 232.43      | 32.4 QP                 | 46.0           | -13.6       | 2.00 H             | 254                  | 43.2             | -10.8                    |
| 5   | 399.72      | 30.5 QP                 | 46.0           | -15.5       | 1.50 H             | 291                  | 35.0             | -4.5                     |
| 6   | 576.86      | 28.4 QP                 | 46.0           | -17.6       | 2.00 H             | 97                   | 28.0             | 0.4                      |

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



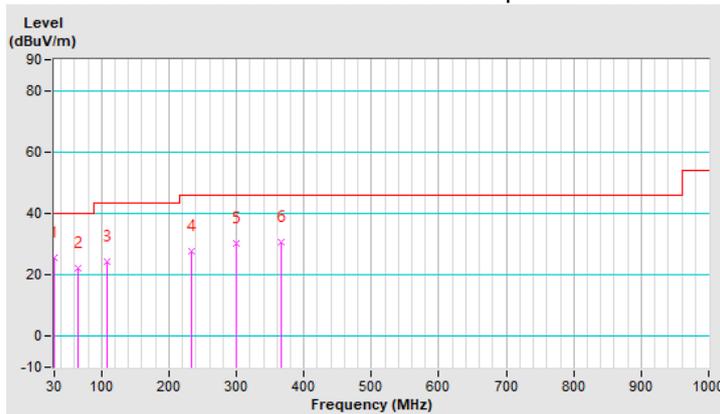
|                 |               |                      |                 |
|-----------------|---------------|----------------------|-----------------|
| CHANNEL         | TX Channel 39 | DETECTOR<br>FUNCTION | Quasi-Peak (QP) |
| FREQUENCY RANGE | 30MHz ~ 1GHz  |                      |                 |

**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   | 30.00       | 25.8 QP                 | 40.0           | -14.2       | 2.00 V             | 98                   | 36.2             | -10.4                    |
| 2   | 65.14       | 22.3 QP                 | 40.0           | -17.7       | 1.50 V             | 285                  | 32.3             | -10.0                    |
| 3   | 107.32      | 24.2 QP                 | 43.5           | -19.3       | 2.00 V             | 2                    | 36.3             | -12.1                    |
| 4   | 232.43      | 27.9 QP                 | 46.0           | -18.1       | 1.50 V             | 329                  | 38.7             | -10.8                    |
| 5   | 299.91      | 30.3 QP                 | 46.0           | -15.7       | 1.00 V             | 335                  | 37.6             | -7.3                     |
| 6   | 365.99      | 30.6 QP                 | 46.0           | -15.4       | 1.50 V             | 319                  | 36.1             | -5.5                     |

**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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



## 4.2 Conducted Emission Measurement

### 4.2.1 Limits of Conducted Emission Measurement

| Frequency (MHz) | Conducted Limit (dBUV) |         |
|-----------------|------------------------|---------|
|                 | Quasi-Peak             | Average |
| 0.15 - 0.5      | 66 - 56                | 56 - 46 |
| 0.50 - 5.0      | 56                     | 46      |
| 5.0 - 30.0      | 60                     | 50      |

- Note: 1. The lower limit shall apply at the transition frequencies.  
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 4.2.2 Test Instruments

| Description & Manufacturer                  | Model No.                | Serial No.     | Date of Calibration | Due Date of Calibration |
|---|--------------------------|----------------|---------------------|-------------------------|
| Test Receiver<br>ROHDE & SCHWARZ            | ESCI                     | 100613         | Dec. 11, 2019       | Dec. 10, 2020           |
| RF signal cable<br>Woken                    | 5D-FB                    | Cable-cond1-01 | Sep. 05, 2019       | Sep. 04, 2020           |
| LISN/AMN<br>ROHDE & SCHWARZ<br>(EUT)        | ENV216                   | 101826         | Feb. 20, 2020       | Feb. 19, 2021           |
| LISN/AMN<br>ROHDE & SCHWARZ<br>(Peripheral) | ESH3-Z5                  | 100311         | Aug. 22, 2019       | Aug. 21, 2020           |
| Software<br>ADT                             | BV ADT_Cond_<br>V7.3.7.4 | NA             | NA                  | NA                      |

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
 2. The test was performed in HwaYa Shielded Room 1 (Conduction 1).  
 3. The VCCI Site Registration No. is C-12040.

### 4.2.3 Test Procedures

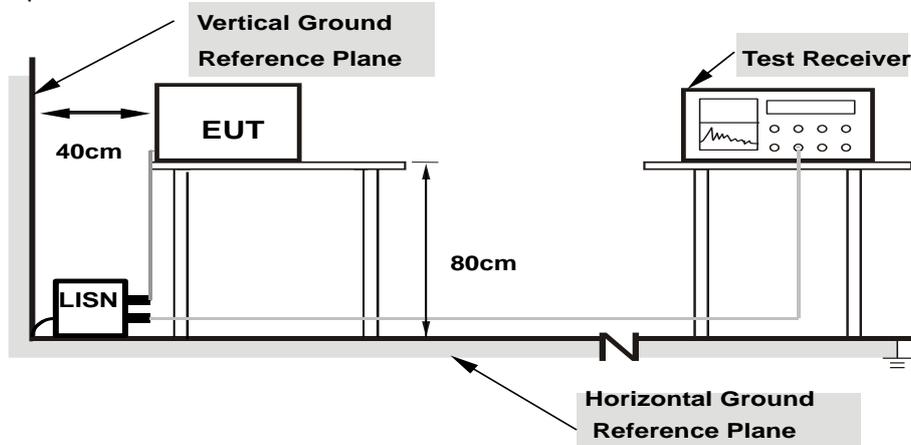
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance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

**Note:** The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz - 30 MHz.

#### 4.2.4 Deviation from Test Standard

No deviation.

#### 4.2.5 Test Setup



- Note: 1.Support units were connected to second LISN.**  
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

#### 4.2.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Set the EUT under transmission condition continuously at specific channel frequency.

#### 4.2.7 Test Results

#### CONDUCTED WORST-CASE DATA

<LE 4.0>

|                 |                |  |                                      |
|-----------------|----------------|--|--------------------------------------|
| Frequency Range | 150kHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9kHz |
| Input Power     | 120Vac, 60Hz   | Environmental Conditions                 | 23°C, 67%RH                          |
| Tested by       | Adair Peng     | Test Date                                | 2020/7/21                            |

| Phase Of Power : Line (L) |                 |                        |                      |              |                       |              |              |              |               |               |
|---------------------------|-----------------|------------------------|----------------------|--------------|-----------------------|--------------|--------------|--------------|---------------|---------------|
| No                        | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) |              | Emission Level (dBuV) |              | Limit (dBuV) |              | Margin (dB)   |               |
|                           |                 |                        | Q.P.                 | AV.          | Q.P.                  | AV.          | Q.P.         | AV.          | Q.P.          | AV.           |
| 1                         | 0.16955         | 9.63                   | 33.66                | 18.97        | 43.29                 | 28.60        | 64.98        | 54.98        | -21.69        | -26.38        |
| 2                         | 0.28685         | 9.63                   | 19.65                | 8.95         | 29.28                 | 18.58        | 60.62        | 50.62        | -31.34        | -32.04        |
| <b>3</b>                  | <b>0.38808</b>  | <b>9.65</b>            | <b>26.43</b>         | <b>20.11</b> | <b>36.08</b>          | <b>29.76</b> | <b>58.10</b> | <b>48.10</b> | <b>-22.02</b> | <b>-18.34</b> |
| 4                         | 0.42334         | 9.65                   | 24.78                | 16.00        | 34.43                 | 25.65        | 57.38        | 47.38        | -22.95        | -21.73        |
| 5                         | 11.43426        | 9.88                   | 14.81                | 9.64         | 24.69                 | 19.52        | 60.00        | 50.00        | -35.31        | -30.48        |
| 6                         | 19.38329        | 9.91                   | 17.19                | 12.19        | 27.10                 | 22.10        | 60.00        | 50.00        | -32.90        | -27.90        |

#### Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

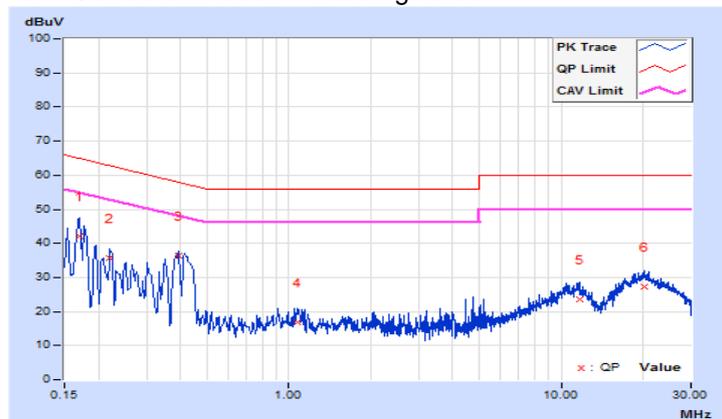


|                 |                |  |                                      |
|-----------------|----------------|--|--------------------------------------|
| Frequency Range | 150kHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9kHz |
| Input Power     | 120Vac, 60Hz   | Environmental Conditions                 | 23°C, 67%RH                          |
| Tested by       | Adair Peng     | Test Date                                | 2020/7/21                            |

| Phase Of Power : Neutral (N) |                 |                        |                      |       |                       |       |              |       |             |        |
|------------------------------|-----------------|------------------------|----------------------|-------|-----------------------|-------|--------------|-------|-------------|--------|
| No                           | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) |       | Emission Level (dBuV) |       | Limit (dBuV) |       | Margin (dB) |        |
|                              |                 |                        | Q.P.                 | AV.   | Q.P.                  | AV.   | Q.P.         | AV.   | Q.P.        | AV.    |
| 1                            | 0.16955         | 9.65                   | 32.37                | 17.96 | 42.02                 | 27.61 | 64.98        | 54.98 | -22.96      | -27.37 |
| 2                            | 0.22038         | 9.64                   | 26.16                | 12.44 | 35.80                 | 22.08 | 62.80        | 52.80 | -27.00      | -30.72 |
| 3                            | 0.39242         | 9.67                   | 26.74                | 19.31 | 36.41                 | 28.98 | 58.01        | 48.01 | -21.60      | -19.03 |
| 4                            | 1.07276         | 9.70                   | 7.19                 | 2.11  | 16.89                 | 11.81 | 56.00        | 46.00 | -39.11      | -34.19 |
| 5                            | 11.68059        | 9.93                   | 13.63                | 8.57  | 23.56                 | 18.50 | 60.00        | 50.00 | -36.44      | -31.50 |
| 6                            | 20.27477        | 10.03                  | 17.20                | 12.52 | 27.23                 | 22.55 | 60.00        | 50.00 | -32.77      | -27.45 |

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

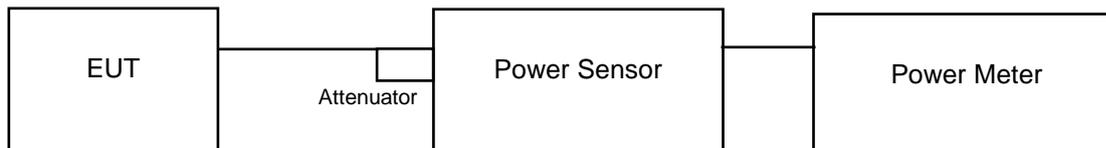


### 4.3 Conducted Output Power Measurement

#### 4.3.1 Limits of Conducted Output Power Measurement

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

#### 4.3.2 Test Setup



#### 4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

#### 4.3.4 Test Procedures

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

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

#### 4.3.5 Deviation from Test Standard

No deviation.

#### 4.3.6 EUT Operating Conditions

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

4.3.7 Test Results

<LE 4.0>

| Channel | Freq. (MHz) | Peak Power |       | Average Power |       | Power Limit (mW) | Pass / Fail |
|---------|-------------|------------|-------|---------------|-------|------------------|-------------|
|         |             | (mW)       | (dBm) | (mW)          | (dBm) |                  |             |
| 0       | 2402        | 5.741      | 7.59  | 5.649         | 7.52  | 1000             | Pass        |
| 19      | 2440        | 5.610      | 7.49  | 5.546         | 7.44  | 1000             | Pass        |
| 39      | 2480        | 5.984      | 7.77  | 5.888         | 7.70  | 1000             | Pass        |

<LE 5.0>

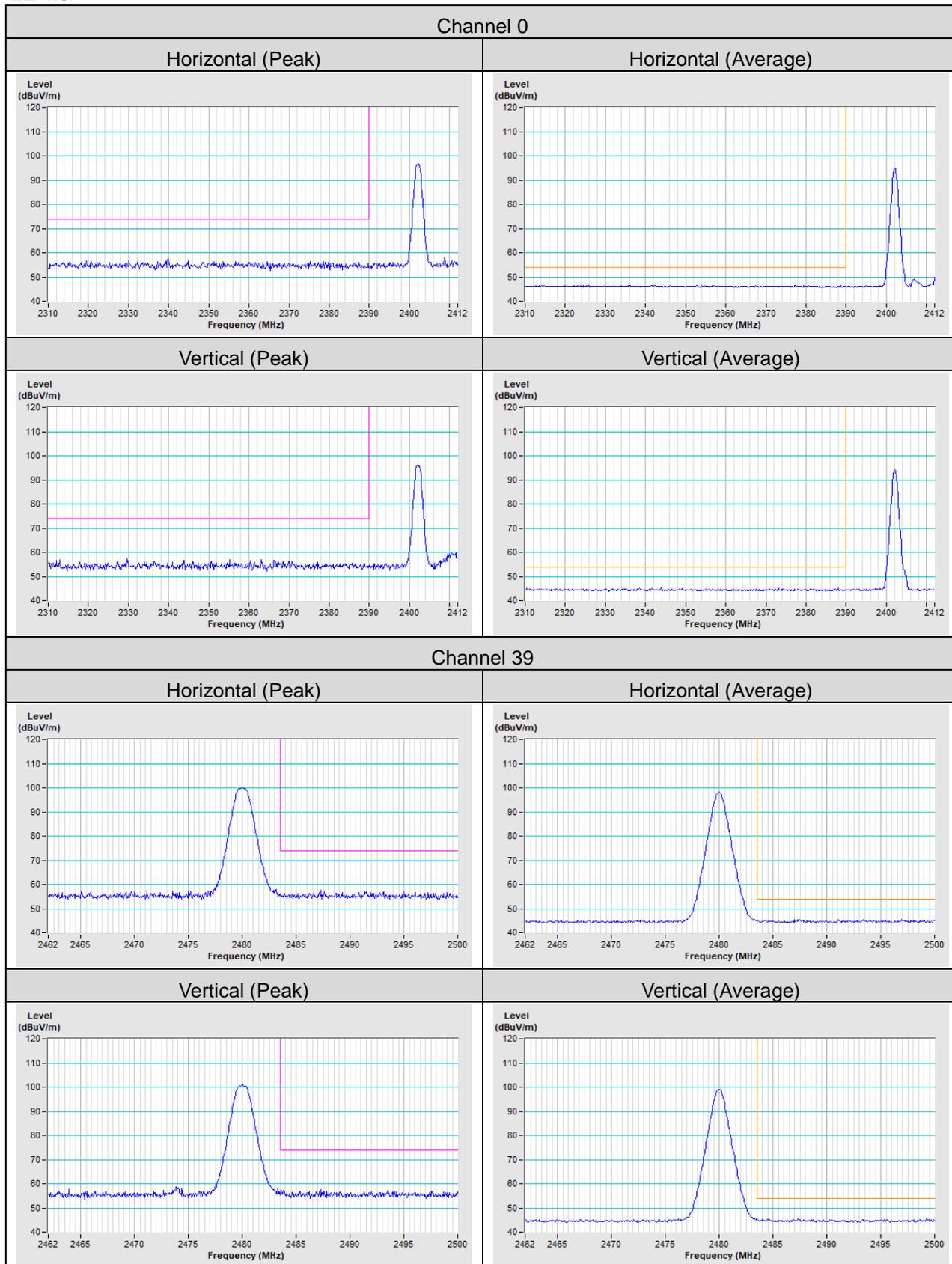
| Channel | Freq. (MHz) | Peak Power |       | Average Power |       | Power Limit (mW) | Pass / Fail |
|---------|-------------|------------|-------|---------------|-------|------------------|-------------|
|         |             | (mW)       | (dBm) | (mW)          | (dBm) |                  |             |
| 0       | 2402        | 5.715      | 7.57  | 5.623         | 7.50  | 1000             | Pass        |
| 19      | 2440        | 5.585      | 7.47  | 5.521         | 7.42  | 1000             | Pass        |
| 39      | 2480        | 5.957      | 7.75  | 5.861         | 7.68  | 1000             | Pass        |

## 5 Pictures of Test Arrangements

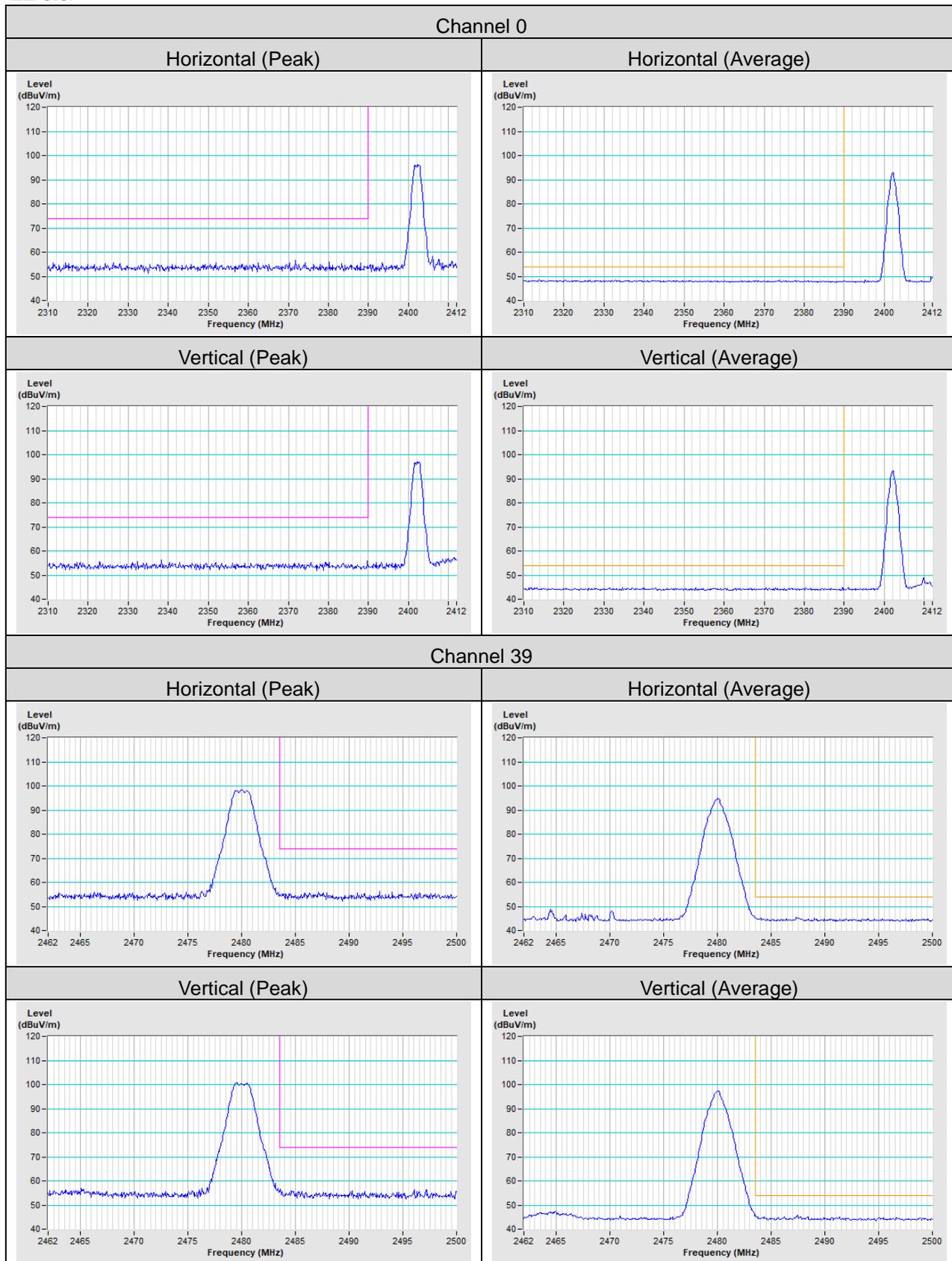
Please refer to the attached file (Test Setup Photo).

# Annex A- Band Edge Measurement

<LE 4.0>



<LE 5.0>



## Appendix – Information of 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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

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