

## FCC Test Report

**Report No.:** RF180125C14-1

**FCC ID:** B94-8265D2WEE

**Test Model:** HSN-Q10C

**Received Date:** Feb. 05, 2018

**Test Date:** Mar. 30, 2018 ~ Apr. 04, 2018

**Issued Date:** Apr. 25, 2018

**Applicant:** HP Inc.

**Address:** 3390 East Harmony Road, Fort Collins, Colorado 80528, United States

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan  
( R.O.C )

**Test Location (1):** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan  
Hsien 333, Taiwan, R.O.C.

**Test Location (2):** No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan,  
R.O.C

**FCC Registration /  
Designation Number:** 427177 / TW0011



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### Release Control Record

| Issue No.     | Description      | Date Issued   |
|---------------|------------------|---------------|
| RF180125C14-1 | Original Release | Apr. 25, 2018 |

## 1 Certificate of Conformity

**Product:** Notebook Computer

**Brand:** HP

**Test Model:** HSN-Q10C

**Sample Status:** Production Unit

**Applicant:** HP Inc.

**Test Date:** Mar. 30, 2018 ~ Apr. 04, 2018

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.247)  
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 RF characteristics under the conditions specified in this report.

**Prepared by :** Evonne Liu, **Date:** Apr. 25, 2018  
Evonne Liu / Specialist

**Approved by :** Dylan Chiou, **Date:** Apr. 25, 2018  
Dylan Chiou / Project Engineer

## 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    | N/A    | Refer to Note                                                                        |
| 15.205 & 209                                   | Radiated Emissions             | Pass   | Meet the requirement of limit.<br>Minimum passing margin is -12.12 dB at 2483.6 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    | Refer to Note                                                                        |

Note: This report is a partial report, only test item of Output Power and Radiated Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: 160321-02.TR05 for module (Brand: Intel, Model: 8265D2W).

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

| Measurement                    | Frequency         | Expanded Uncertainty (k=2) (±) |
|--------------------------------|-------------------|--------------------------------|
| Radiated Emissions up to 1 GHz | 30 MHz ~ 200 MHz  | 2.0153 dB                      |
|                                | 200 MHz ~1000 MHz | 2.0224 dB                      |
| Radiated Emissions above 1 GHz | 1 GHz ~ 18 GHz    | 1.0121 dB                      |
|                                | 18 GHz ~ 40 GHz   | 1.1508 dB                      |

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

|                            |                                        |
|----------------------------|----------------------------------------|
| <b>Product</b>             | Notebook Computer                      |
| <b>Brand</b>               | HP                                     |
| <b>Test Model</b>          | HSN-Q10C                               |
| <b>Status of EUT</b>       | Production Unit                        |
| <b>Power Supply Rating</b> | 20 or 15 or 12 or 9 or 5 Vdc (Adapter) |
| <b>Modulation Type</b>     | GFSK                                   |
| <b>Transfer Rate</b>       | 1 Mbps                                 |
| <b>Operating Frequency</b> | 2402 ~ 2480 MHz                        |
| <b>Number of Channel</b>   | 40                                     |
| <b>Antenna Type</b>        | Refer to Note as below                 |
| <b>Antenna Connector</b>   | N/A                                    |
| <b>Accessory Device</b>    | Refer to Note as below                 |
| <b>Data Cable Supplied</b> | Refer to Note as below                 |

Note:

1. The WLAN/BT module (Brand: Intel, Model: 8265D2W) was installed in the EUT.
2. The antenna information is listed as below.

| Antenna Type | Vendor | Part Number                                                                                                 | Antenna Gain (dBi) |             |             |             |
|--------------|--------|-------------------------------------------------------------------------------------------------------------|--------------------|-------------|-------------|-------------|
|              |        |                                                                                                             | Laptop PC Mode     |             |             |             |
|              |        |                                                                                                             | WLAN 2.4GHz        | WLAN 5.2GHz | WLAN 5.5GHz | WLAN 5.8GHz |
| PIFA         | INPAQ  | WLAN Main Antenna:<br>DQ6LB020509 (WA-P-LBLB-02-059)<br>WLAN Aux Antenna:<br>DQ6LB020509 (WA-P-LBLB-02-059) | 1.66               | 0.54        | 0.56        | -0.21       |
|              |        |                                                                                                             | Tablet PC Mode     |             |             |             |
|              |        |                                                                                                             | WLAN 2.4GHz        | WLAN 5.2GHz | WLAN 5.5GHz | WLAN 5.8GHz |
|              |        |                                                                                                             | -0.36              | 3.36        | 2.21        | 3.08        |

3. The EUT contains following accessory devices.

| Product | Brand | Model    | Description                                                                                                   |
|---------|-------|----------|---------------------------------------------------------------------------------------------------------------|
| Adapter | hp    | TPN-LA12 | I/P: 100-240 Vac, 50-60 Hz, 1.6 A<br>O/P: 20 Vdc, 3.25 A, 15 Vdc, 4.33 A, 12 Vdc, 5 A, 9 Vdc, 3 A, 5 Vdc, 3 A |

4. 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

40 channels are provided to this EUT:

| Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) | 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

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

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz **RE<1G**: Radiated Emission below 1 GHz

**Note:** The EUT had been pre-tested on the positioned of each 4 axis. The worst case was found when positioned on **NB-plane**.

#### **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                |

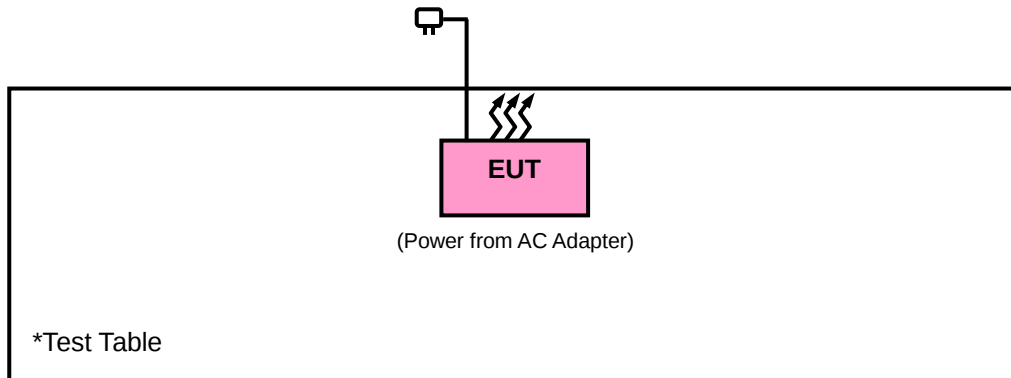
#### **Test Condition:**

| Applicable To | Environmental Conditions | Input Power    | Tested by |
|---------------|--------------------------|----------------|-----------|
| RE $\geq$ 1G  | 25 deg. C, 65 % RH       | 120 Vac, 60 Hz | Karl Lee  |
| RE<1G         | 25 deg. C, 65 % RH       | 120 Vac, 60 Hz | Karl Lee  |

### 3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

#### 3.3.1 Configuration of System under Test



### 3.4 General Description of Applied Standards

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

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

**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 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>Agilent Technologies          | N9038A          | MY52260177                                                        | Jul. 05, 2017       | Jul. 04, 2018           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ           | FSU43           | 101261                                                            | Jan. 11, 2018       | Jan. 10, 2019           |
| Double Ridge Guide Horn<br>Antenna EMCO        | 3115            | 5619                                                              | Nov. 30, 2017       | Nov. 29, 2018           |
| BILOG Antenna<br>SCHWARZBECK                   | VULB 9168       | 9168-153                                                          | Dec. 06, 2017       | Dec. 05, 2018           |
| Fixed Attenuator<br>Mini-Circuits              | BW-N10W5+       | NA                                                                | Jul. 07, 2017       | Jul. 06, 2018           |
| Loop Antenna                                   | EM-6879         | 269                                                               | Aug. 11, 2017       | Aug. 10, 2018           |
| Preamplifier<br>Agilent                        | 310N            | 187226                                                            | Jun. 23, 2017       | Jun. 22, 2018           |
| Preamplifier<br>Agilent                        | 83017A          | MY39501357                                                        | Jun. 23, 2017       | Jun. 22, 2018           |
| Power Meter<br>Anritsu                         | ML2495A         | 1232002                                                           | Dec. 07, 2017       | Dec. 06, 2018           |
| Power Sensor<br>Anritsu                        | MA2411B         | 1207325                                                           | Dec. 07, 2017       | Dec. 06, 2018           |
| RF signal cable<br>ETS-LINDGREN                | 5D-FB           | Cable-CH1-01(R<br>FC-SMS-100-SM<br>S-120+RFC-SMS<br>-100-SMS-400) | Jun. 23, 2017       | Jun. 22, 2018           |
| RF signal cable<br>ETS-LINDGREN                | 8D-FB           | Cable-CH1-02(R<br>FC-SMS-100-SM<br>S-24)                          | Jun. 23, 2017       | Jun. 22, 2018           |
| Software<br>BV ADT                             | E3<br>8.130425b | NA                                                                | NA                  | NA                      |
| Antenna Tower<br>MF                            | NA              | NA                                                                | NA                  | NA                      |
| Turn Table<br>MF                               | NA              | NA                                                                | NA                  | NA                      |
| Antenna Tower & Turn<br>Table Controller<br>MF | MF-7802         | 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 HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC7450I-1.

#### 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:**

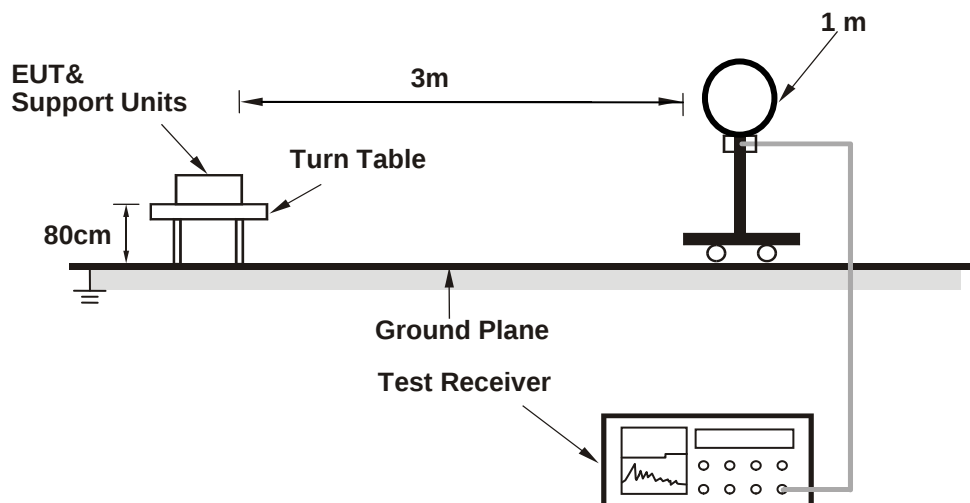
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
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.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

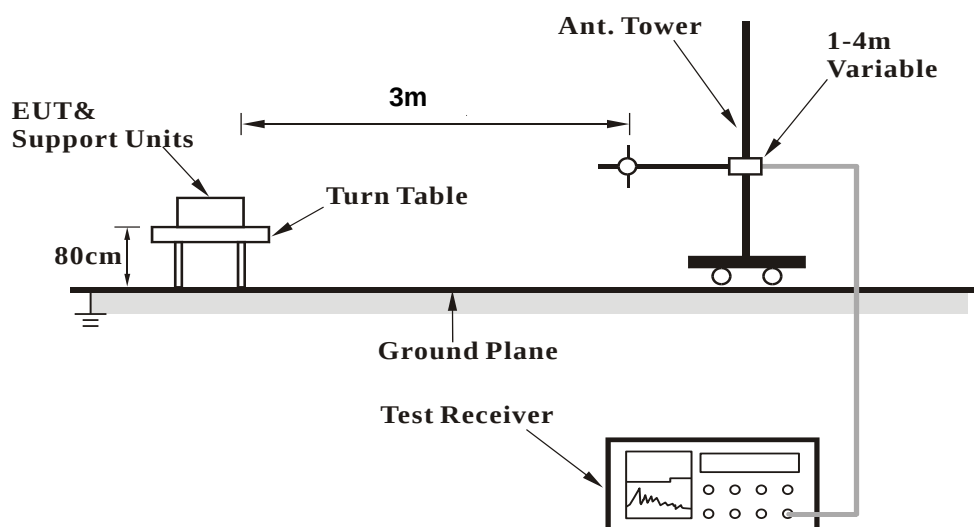
No deviation.

#### 4.1.5 Test Set Up

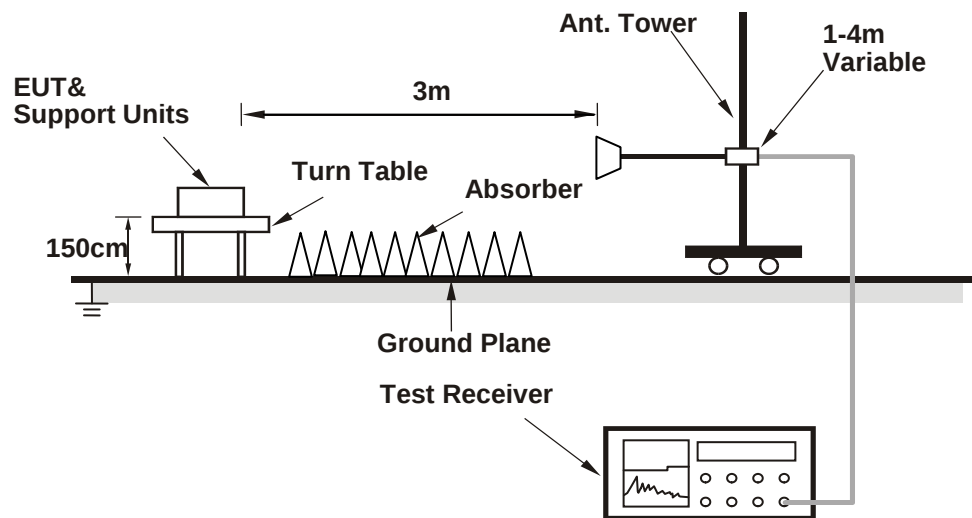
##### <Radiated Emission below 30 MHz>



##### <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

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

#### 4.1.7 Test Results

##### Above 1 GHz Data:

| EUT Test Condition       |                    | Measurement Detail |                           |
|--------------------------|--------------------|--------------------|---------------------------|
| Channel                  | Channel 0          | Frequency Range    | 1 GHz ~ 25 GHz            |
| Input Power              | 120 Vac, 60 Hz     | Detector Function  | Peak (PK)<br>Average (AV) |
| Environmental Conditions | 25 deg. C, 65 % RH | Tested By          | Karl Lee                  |

| Antennal Polarity & Test Distance: Horizontal at 3 m |                         |                   |                |             |                       |                 |                    |                     |                      |         |
|------------------------------------------------------|-------------------------|-------------------|----------------|-------------|-----------------------|-----------------|--------------------|---------------------|----------------------|---------|
| Frequency (MHz)                                      | Emission Level (dBuV/m) | Read Level (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark  |
| 2369.49                                              | 40.98                   | 39.32             | 54             | -13.02      | 31.78                 | 5.37            | 35.49              | 168                 | 116                  | Average |
| 2369.49                                              | 51.72                   | 50.06             | 74             | -22.28      | 31.78                 | 5.37            | 35.49              | 168                 | 116                  | Peak    |
| 2402                                                 | 87.08                   | 85.35             |                |             | 31.8                  | 5.4             | 35.47              | 168                 | 116                  | Average |
| 2402                                                 | 88.05                   | 86.32             |                |             | 31.8                  | 5.4             | 35.47              | 168                 | 116                  | Peak    |
| 4805                                                 | 37.99                   | 29.9              | 54             | -16.01      | 33.96                 | 8.25            | 34.12              | 150                 | 118                  | Average |
| 4805                                                 | 46.87                   | 38.78             | 74             | -27.13      | 33.96                 | 8.25            | 34.12              | 150                 | 118                  | Peak    |
| Antennal Polarity & Test Distance: Vertical at 3 m   |                         |                   |                |             |                       |                 |                    |                     |                      |         |
| Frequency (MHz)                                      | Emission Level (dBuV/m) | Read Level (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark  |
| 2385.42                                              | 40.99                   | 39.3              | 54             | -13.01      | 31.78                 | 5.4             | 35.49              | 108                 | 0                    | Average |
| 2385.42                                              | 51.66                   | 49.97             | 74             | -22.34      | 31.78                 | 5.4             | 35.49              | 108                 | 0                    | Peak    |
| 2402                                                 | 99.29                   | 97.56             |                |             | 31.8                  | 5.4             | 35.47              | 108                 | 0                    | Average |
| 2402                                                 | 100.29                  | 98.56             |                |             | 31.8                  | 5.4             | 35.47              | 108                 | 0                    | Peak    |
| 4804                                                 | 37.89                   | 29.8              | 54             | -16.11      | 33.96                 | 8.25            | 34.12              | 195                 | 105                  | Average |
| 4804                                                 | 46.54                   | 38.45             | 74             | -27.46      | 33.96                 | 8.25            | 34.12              | 195                 | 105                  | Peak    |

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2402 MHz: Fundamental frequency.

| EUT Test Condition       |                    | Measurement Detail |                           |
|--------------------------|--------------------|--------------------|---------------------------|
| Channel                  | Channel 19         | Frequency Range    | 1 GHz ~ 25 GHz            |
| Input Power              | 120 Vac, 60 Hz     | Detector Function  | Peak (PK)<br>Average (AV) |
| Environmental Conditions | 25 deg. C, 65 % RH | Tested By          | Karl Lee                  |

| Antennal Polarity & Test Distance: Horizontal at 3 m |                         |                   |                |             |                       |                 |                    |                     |                      |         |
|------------------------------------------------------|-------------------------|-------------------|----------------|-------------|-----------------------|-----------------|--------------------|---------------------|----------------------|---------|
| Frequency (MHz)                                      | Emission Level (dBuV/m) | Read Level (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark  |
| 2385.15                                              | 41.07                   | 39.38             | 54             | -12.93      | 31.78                 | 5.4             | 35.49              | 168                 | 116                  | Average |
| 2385.15                                              | 51.22                   | 49.53             | 74             | -22.78      | 31.78                 | 5.4             | 35.49              | 168                 | 116                  | Peak    |
| 2440                                                 | 86.82                   | 84.97             |                |             | 31.85                 | 5.46            | 35.46              | 168                 | 116                  | Average |
| 2440                                                 | 87.93                   | 86.08             |                |             | 31.85                 | 5.46            | 35.46              | 168                 | 116                  | Peak    |
| 2486.92                                              | 41.43                   | 39.44             | 54             | -12.57      | 31.88                 | 5.53            | 35.42              | 168                 | 116                  | Average |
| 2486.92                                              | 52.23                   | 50.24             | 74             | -21.77      | 31.88                 | 5.53            | 35.42              | 168                 | 116                  | Peak    |
| 4880                                                 | 38.26                   | 30.07             | 54             | -15.74      | 33.98                 | 8.27            | 34.06              | 180                 | 75                   | Average |
| 4880                                                 | 47.5                    | 39.31             | 74             | -26.5       | 33.98                 | 8.27            | 34.06              | 180                 | 75                   | Peak    |
| Antennal Polarity & Test Distance: Vertical at 3 m   |                         |                   |                |             |                       |                 |                    |                     |                      |         |
| Frequency (MHz)                                      | Emission Level (dBuV/m) | Read Level (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark  |
| 2387.31                                              | 41.07                   | 39.36             | 54             | -12.93      | 31.8                  | 5.4             | 35.49              | 108                 | 0                    | Average |
| 2387.31                                              | 51.65                   | 49.94             | 74             | -22.35      | 31.8                  | 5.4             | 35.49              | 108                 | 0                    | Peak    |
| 2440                                                 | 98.97                   | 97.12             |                |             | 31.85                 | 5.46            | 35.46              | 108                 | 0                    | Average |
| 2440                                                 | 99.88                   | 98.03             |                |             | 31.85                 | 5.46            | 35.46              | 108                 | 0                    | Peak    |
| 2494.6                                               | 41.55                   | 39.53             | 54             | -12.45      | 31.9                  | 5.53            | 35.41              | 108                 | 0                    | Average |
| 2494.6                                               | 52.71                   | 50.69             | 74             | -21.29      | 31.9                  | 5.53            | 35.41              | 108                 | 0                    | Peak    |
| 4880                                                 | 38.05                   | 29.86             | 54             | -15.95      | 33.98                 | 8.27            | 34.06              | 132                 | 286                  | Average |
| 4880                                                 | 47.16                   | 38.97             | 74             | -26.84      | 33.98                 | 8.27            | 34.06              | 132                 | 286                  | Peak    |

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2440 MHz: Fundamental frequency.

| EUT Test Condition       |                    | Measurement Detail |                           |
|--------------------------|--------------------|--------------------|---------------------------|
| Channel                  | Channel 39         | Frequency Range    | 1 GHz ~ 25 GHz            |
| Input Power              | 120 Vac, 60 Hz     | Detector Function  | Peak (PK)<br>Average (AV) |
| Environmental Conditions | 25 deg. C, 65 % RH | Tested By          | Karl Lee                  |

| Antennal Polarity & Test Distance: Horizontal at 3 m |                         |                   |                |             |                       |                 |                    |                     |                      |         |
|------------------------------------------------------|-------------------------|-------------------|----------------|-------------|-----------------------|-----------------|--------------------|---------------------|----------------------|---------|
| Frequency (MHz)                                      | Emission Level (dBuV/m) | Read Level (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark  |
| 2480                                                 | 86.41                   | 84.45             |                |             | 31.88                 | 5.5             | 35.42              | 168                 | 116                  | Average |
| 2480                                                 | 87.52                   | 85.56             |                |             | 31.88                 | 5.5             | 35.42              | 168                 | 116                  | Peak    |
| 2487.72                                              | 41.54                   | 39.53             | 54             | -12.46      | 31.9                  | 5.53            | 35.42              | 168                 | 116                  | Average |
| 2487.72                                              | 52.18                   | 50.17             | 74             | -21.82      | 31.9                  | 5.53            | 35.42              | 168                 | 116                  | Peak    |
| 4960                                                 | 38.59                   | 30.32             | 54             | -15.41      | 33.99                 | 8.29            | 34.01              | 121                 | 167                  | Average |
| 4960                                                 | 47.81                   | 39.54             | 74             | -26.19      | 33.99                 | 8.29            | 34.01              | 121                 | 167                  | Peak    |
| Antennal Polarity & Test Distance: Vertical at 3 m   |                         |                   |                |             |                       |                 |                    |                     |                      |         |
| Frequency (MHz)                                      | Emission Level (dBuV/m) | Read Level (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark  |
| 2480                                                 | 98.07                   | 96.11             |                |             | 31.88                 | 5.5             | 35.42              | 108                 | 0                    | Average |
| 2480                                                 | 99.02                   | 97.06             |                |             | 31.88                 | 5.5             | 35.42              | 108                 | 0                    | Peak    |
| 2483.6                                               | 41.88                   | 39.92             | 54             | -12.12      | 31.88                 | 5.5             | 35.42              | 108                 | 0                    | Average |
| 2483.6                                               | 52.94                   | 50.98             | 74             | -21.06      | 31.88                 | 5.5             | 35.42              | 108                 | 0                    | Peak    |
| 4960                                                 | 38.65                   | 30.38             | 54             | -15.35      | 33.99                 | 8.29            | 34.01              | 153                 | 228                  | Average |
| 4960                                                 | 47.68                   | 39.41             | 74             | -26.32      | 33.99                 | 8.29            | 34.01              | 153                 | 228                  | Peak    |

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2480 MHz: 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:

| EUT Test Condition       |                    | Measurement Detail |                              |
|--------------------------|--------------------|--------------------|------------------------------|
| Channel                  | Channel 39         | Frequency Range    | 30 MHz ~ 1 GHz               |
| Input Power              | 120 Vac, 60 Hz     | Detector Function  | Peak (PK)<br>Quasi-peak (QP) |
| Environmental Conditions | 25 deg. C, 65 % RH | Tested By          | Karl Lee                     |

| Antennal Polarity & Test Distance: Horizontal at 3 m |                         |                   |                |             |                       |                 |                    |                     |                      |        |
|------------------------------------------------------|-------------------------|-------------------|----------------|-------------|-----------------------|-----------------|--------------------|---------------------|----------------------|--------|
| Frequency (MHz)                                      | Emission Level (dBuV/m) | Read Level (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark |
| 110.46                                               | 15.47                   | 34.53             | 43.5           | -28.03      | 11.91                 | 1.28            | 32.25              | 110                 | 13                   | Peak   |
| 244.11                                               | 17.93                   | 36.01             | 46             | -28.07      | 12.19                 | 1.85            | 32.12              | 121                 | 187                  | Peak   |
| 281.91                                               | 19.73                   | 37.06             | 46             | -26.27      | 12.76                 | 2.03            | 32.12              | 195                 | 253                  | Peak   |
| 414.8                                                | 15.74                   | 30.36             | 46             | -30.26      | 15.17                 | 2.41            | 32.2               | 198                 | 141                  | Peak   |
| 644.4                                                | 18.36                   | 29.17             | 46             | -27.64      | 18.35                 | 2.99            | 32.15              | 187                 | 176                  | Peak   |
| 726.3                                                | 20.03                   | 29.41             | 46             | -25.97      | 19.58                 | 3.16            | 32.12              | 105                 | 104                  | Peak   |
| Antennal Polarity & Test Distance: Vertical at 3 m   |                         |                   |                |             |                       |                 |                    |                     |                      |        |
| Frequency (MHz)                                      | Emission Level (dBuV/m) | Read Level (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark |
| 48.09                                                | 21                      | 37.76             | 40             | -19         | 14.56                 | 0.9             | 32.22              | 124                 | 210                  | Peak   |
| 112.62                                               | 9.85                    | 29.16             | 43.5           | -33.65      | 11.66                 | 1.28            | 32.25              | 134                 | 255                  | Peak   |
| 249.51                                               | 11.97                   | 29.92             | 46             | -34.03      | 12.3                  | 1.85            | 32.1               | 124                 | 181                  | Peak   |
| 456.8                                                | 18.12                   | 32.1              | 46             | -27.88      | 15.67                 | 2.49            | 32.14              | 138                 | 188                  | Peak   |
| 680.8                                                | 20.55                   | 30.67             | 46             | -25.45      | 18.94                 | 3.05            | 32.11              | 124                 | 204                  | Peak   |
| 798.4                                                | 20.04                   | 28.47             | 46             | -25.96      | 20.31                 | 3.32            | 32.06              | 187                 | 198                  | Peak   |

Remarks:

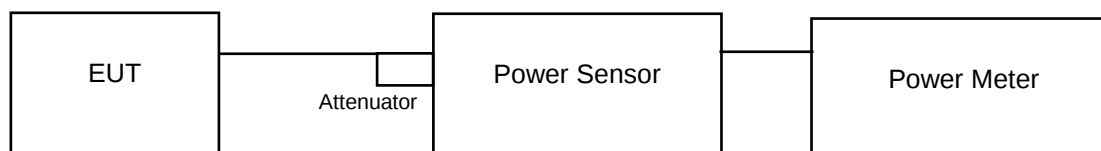
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value

## 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 (30 dBm)

### 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 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.

### 4.2.5 Deviation from Test Standard

No deviation.

### 4.2.6 EUT Operating Conditions

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

### 4.2.7 Test Results

| Channel | Frequency (MHz) | Peak Power (dBm) | Limit (dBm) | Pass / Fail |
|---------|-----------------|------------------|-------------|-------------|
| 0       | 2402            | 7.11             | 30          | Pass        |
| 19      | 2440            | 7.02             | 30          | Pass        |
| 39      | 2480            | 6.98             | 30          | Pass        |

## 5 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 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:

**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**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**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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