

# TEST REPORT

## CERTIFICATE OF CONFORMITY

**Standards:** 47 CFR FCC Part 15, Subpart B, Class B  
ANSI C63.4:2014

**Report No.:** FCBEMI-WTW-P21070045

**FCC ID:** NOIKBN778

**Model No.:** N778

**Received Date:** 2021/7/1

**Test Date:** 2021/8/9 ~ 2021/8/12

**Issued Date:** 2021/9/30

**Applicant :** NETRONIX, INC.

**Address:** No 945, Boai St, Jubei City, Hsinchu, 30265 Taiwan


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

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan

**Test Location (1):** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan.

**FCC Registration / Designation Number:** 810758 / TW1085 for Test Location (1)  
960022 / TW1058 for Test Location (2)

**Approved by :**  , **Date:** 2021/9/30  
Ken Lu / Manager

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**Prepared by :** Cherry Chuo / Specialist

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### Release Control Record

| Issue No.            | Description       | Date Issued |
|----------------------|-------------------|-------------|
| FCBEMI-WTW-P21070045 | Original release. | 2021/9/30   |

## 1 Certification

**Product:** Electronic Display Device

**Brand:** Rakuten kobo

**Test Model:** N778

**Sample Status:** Engineering sample

**Applicant:** NETRONIX, INC.

**Test Date:** 2021/8/9 ~ 2021/8/12

**Standards:** 47 CFR FCC Part 15, Subpart B, Class B

ANSI C63.4:2014

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

## 2 Summary of Test Results

The test items that the EUT needs to perform according to its interfaces and functions evaluation are as follows:

| FCC Part 15 Clause | Test Item                            | Result/Remarks  | Verdict |
|--------------------|--------------------------------------|---|---------|
| 15.107             | Conducted Emissions from Power Ports | Minimum passing Class B margin is -11.99 dB at 0.18641 MHz  | Pass    |
| 15.109             | Radiated Emissions up to 1 GHz       | Minimum passing Class B margin is -7.72 dB at 464.97 MHz    | Pass    |
|                    | Radiated Emissions above 1 GHz       | Minimum passing Class B margin is -12.22 dB at 11506.85 MHz | Pass    |

Note: 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:

| Measurement                          | Frequency      | Expanded Uncertainty (k=2) ( $\pm$ ) |
|--------------------------------------|----------------|--------------------------------------|
| Conducted Emissions from Power Ports | 150kHz ~ 30MHz | 1.8 dB                               |
| Radiated Emissions up to 1 GHz       | 30MHz ~ 1GHz   | 5.5 dB                               |
| Radiated Emissions above 1 GHz       | 1GHz ~ 6GHz    | 5.0 dB                               |
|                                      | 6 GHz ~ 18 GHz | 4.1 dB                               |

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

### 2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

### 3 General Information

#### 3.1 Description of EUT

|                     |   |
|---------------------|---|
| Product             | Electronic Display Device                           |
| Brand               | Rakuten kobo  |
| Test Model          | N778  |
| Sample Status       | Engineering sample                                  |
| Operating Software  | NA  |
| Power Supply Rating | 3.7 Vdc from battery or<br>5 Vdc from USB interface |
| Accessory Device    | Refer to Note                                       |
| Cable Supplied      | USB Cable x1 (Shielded, 1.0m)                       |

Note:

1. The accessory device are as the following table:

| <b>eMMC 1 (=ROM 1)</b> |                   |                           |
|------------------------|-------------------|---------------------------|
| Brand Name             | Model No.         | Spec.                     |
| KINGSTON               | EMMC32G-TX29-GA8A | 32G Byte, 1st source Emmc |
| <b>eMMC 2 (=ROM 2)</b> |                   |                           |
| Brand Name             | Model No.         | Spec.                     |
| MK FOUNDER             | MKEMF032GZ1E-C    | 32G Byte, 2nd source Emmc |

#### 3.2 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 5850 MHz, provided by NETRONIX, INC., for detailed internal source, please refer to the manufacturer's specifications.

#### 3.3 Features of EUT

The tests reported herein were performed according to the method specified by NETRONIX, INC., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

### 3.4 Operating Modes of EUT and Determination of Worst Case Operating Mode

For Radiated emission test, EUT has been pre-tested under following test modes, test mode A was the worst case for final test.

| Test Condition |  |              |      |                      |                  |
|----------------|--|--------------|------|----------------------|------------------|
| Mode           | Input                                    | eMM          | Mode | Arrangement          | Remark           |
| A              | DC 5V From Host with Leather sheath      | Kingston     | USB  | Horizontal Placement | Normal Operation |
| B              | DC 3.7V From Battery with Leather sheath | Kingston     | BT   | Horizontal Placement | Normal Operation |
| C              | DC 3.7V From Battery with Leather sheath | KingstonWiFi | WiFi | Horizontal Placement | Normal Operation |
| D              | DC 3.7V From Battery with Leather sheath | Kingston     | WiFi | Vertical Placement   | Normal Operation |
| E              | DC 3.7V From Battery with Leather sheath | Kingston     | WiFi | Side Placement       | Normal Operation |
| F              | DC 5V From Host with Leather sheath      | MK FOUNDER   | USB  | Horizontal Placement | Normal Operation |

NOTE: The test configurations are defined by the applicant requirement.

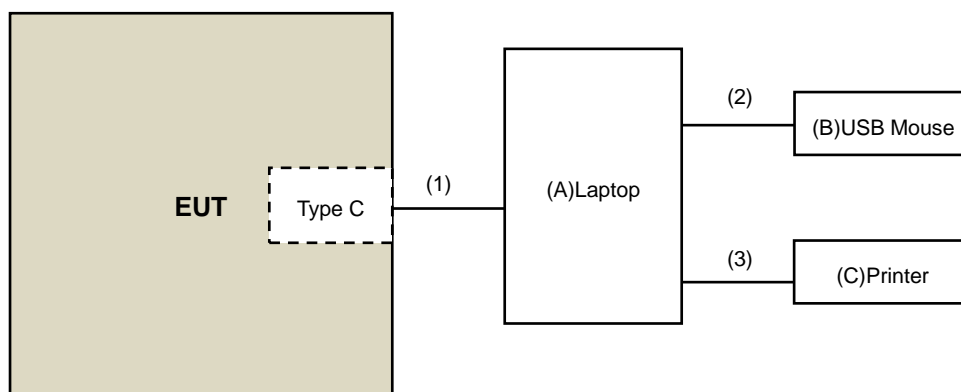
Test mode is presented in the report as below.

| Test Condition |                                     |          |      |                      |                  |
|----------------|-------------------------------------|----------|------|----------------------|------------------|
| Mode           | Input                               | eMM      | Mode | Arrangement          | Remark           |
| 1              | DC 5V From Host with Leather sheath | Kingston | USB  | Horizontal Placement | Normal Operation |

### 3.5 Test Program Used and Operation Descriptions

1. Turn on the power of all equipment.
2. Support unit A (Laptop) runs a test program "EMC.bat" to enable EUT under "R/W mode" continually via one USB cable.
3. Support unit A (Laptop) runs "EMC test.exe" then sends "H" messages to itself.

### 3.6 Connection Diagram of EUT and Peripheral Devices



### 3.7 Configuration of Peripheral Devices and Cable Connections

| ID | Product   | Brand    | Model No. | Serial No.      | FCC ID | Remarks         |
|----|-----------|----------|-----------|-----------------|--------|-----------------|
| A  | Laptop    | ASUS     | X413F     | L3N0CX14V85713A | NA     | Provided by Lab |
| B  | USB Mouse | Logitech | M-U0026   | 810-002182_005  | NA     | Provided by Lab |
| C  | Printer   | EPSON    | LQ-300+II | G88Y074085      | NA     | Provided by Lab |

Note:

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

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks               |
|----|--------------|------|------------|--------------------|--------------|-----------------------|
| 1  | USB Cable    | 1    | 1          | Yes                | 0            | Supplied by applicant |
| 2  | USB Cable    | 1    | 1.8        | Yes                | 0            | Provided by Lab       |
| 3  | USB Cable    | 1    | 1.8        | Yes                | 0            | Provided by Lab       |



## 4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.1 Conducted Emissions from Power Ports

| DESCRIPTION & MANUFACTURER        | MODEL NO.               | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------|-------------------------|------------|-----------------|------------------|
| 50 ohm terminal resistance<br>N/A | N/A                     | EMC-02     | 2020/9/16       | 2021/9/15        |
| 50 ohm terminal resistance<br>N/A | N/A                     | EMC-03     | 2020/9/30       | 2021/9/29        |
| TEST RECEIVER<br>R&S              | ESCS30                  | 100375     | 2021/5/11       | 2022/5/10        |
| LISN<br>SCHWARZBECK               | NSLK 8127               | 8127-522   | 2020/9/8        | 2021/9/7         |
| Lisn<br>R&S                       | ENV216                  | 100072     | 2021/6/16       | 2022/6/15        |
| RF Coaxial Cable<br>JYEBO         | 5D-FB                   | COACAB-001 | 2021/3/12       | 2022/3/11        |
| Fixed attenuator<br>STI           | STI02-2200-10           | 006        | 2020/8/28       | 2021/8/27        |
| Software<br>BVADT                 | BVADT_Cond_<br>V7.3.7.4 | NA         | NA              | NA               |
| DC LISN<br>TESEQ                  | HV-AN 150               | 45176      | 2021/4/23       | 2022/4/22        |
| DC LISN<br>TESEQ                  | HV-AN 150               | 45177      | 2021/4/23       | 2022/4/22        |
| LISN<br>SCHWARZBECK               | NNLK 8121               | 0809       | 2021/2/24       | 2022/2/23        |

**Note:**

1. The test was performed in HC - Conduction 3
2. The VCCI Shielded room C Registration No. is C-13611
3. Tested Date: 2021/8/12

#### 4.2 Radiated Emissions up to 1 GHz

| DESCRIPTION & MANUFACTURER              | MODEL NO.            | SERIAL NO.   | CALIBRATED DATE | CALIBRATED UNTIL |
|---|----------------------|--------------|-----------------|------------------|
| Test Receiver<br>Agilent                | N9038A               | MY51210105   | 2021/6/17       | 2022/6/16        |
| Software<br>BVADT                       | ADT_Radiated_V8.7.08 | NA           | NA              | NA               |
| Antenna Tower & Turn<br>Table<br>CT     | NA                   | NA           | NA              | NA               |
| Pre_Amplifier<br>Mini-Circuits          | ZFL-1000VH2B         | AMP-ZFL-03   | 2020/10/20      | 2021/10/19       |
| Trilog Broadband Antenna<br>SCHWARZBECK | VULB 9168            | 9168-360     | 2020/11/4       | 2021/11/3        |
| Fixed attenuator<br>Mini-Circuits       | UNAT-5+              | PAD-ATT5-04  | 2021/1/11       | 2022/1/10        |
| RF Coaxial Cable<br>COMMATE/PEWC        | 8D                   | CHGCAB-005   | 2020/12/18      | 2021/12/17       |
| RF Coaxial Cable<br>COMMATE/PEWC        | 8D-FB                | CHGCAB-001-2 | 2020/9/24       | 2021/9/23        |
| RF Coaxial Cable<br>N/A                 | RF-141               | CHGCAB-004   | 2020/9/24       | 2021/9/23        |

**Note:**

1. The test was performed in HC - 966 chamber 1. The test site validated date: 2020/9/19(NSA)
2. The VCCI Site Registration No. is R-20009.
3. Tested Date: 2021/8/9

### 4.3 Radiated Emissions above 1 GHz

| DESCRIPTION & MANUFACTURER          | MODEL NO.            | SERIAL NO.    | CALIBRATED DATE | CALIBRATED UNTIL |
|-------------------------------------|----------------------|---------------|-----------------|------------------|
| Test Receiver<br>Agilent            | N9038A               | MY51210105    | 2021/6/17       | 2022/6/16        |
| Software<br>BVADT                   | ADT_Radiated_V8.7.08 | NA            | NA              | NA               |
| Antenna Tower & Turn<br>Table<br>CT | NA                   | NA            | NA              | NA               |
| Horn Antenna<br>FT-RF               | HA-07M18G-NF         | 0000320091110 | 2020/11/22      | 2021/11/21       |
| Spectrum Analyzer<br>Agilent        | E4446A               | MY48250254    | 2020/11/20      | 2021/11/19       |
| Pre_Amplifier<br>Agilent            | 8449B                | 3008A02578    | 2021/6/8        | 2022/6/7         |
| Pre_Amplifier<br>EMCI               | EMC118A45SE          | 980817        | 2021/7/16       | 2022/7/15        |
| RF Coaxial Cable<br>EMCI            | EMC104-SM-SM-2000    | 181208        | 2020/8/25       | 2021/8/24        |
| RF Coaxial Cable<br>EMCI            | EMC104-SM-SM-6000    | 181209        | 2020/8/25       | 2021/8/24        |
| RF Coaxial Cable<br>EMCI            | EMC104-SM-SM-8500    | 181211        | 2020/8/25       | 2021/8/24        |
| Fix tool for Boresight              | BAF-01               | 5             | NA              | NA               |

**Note:**

1. The test was performed in HC - 966 chamber 1. The test site validated date: 2020/9/18 (VSWR)
2. Tested Date: 2021/8/11

## 5 Limits of Test Items

### 5.1 Conducted Emissions from Power Ports

| Frequency (MHz) | Class A (dBuV) |         | Class B (dBuV) |         |
|-----------------|----------------|---------|----------------|---------|
|                 | Quasi-peak     | Average | Quasi-peak     | Average |
| 0.15 - 0.5      | 79             | 66      | 66 - 56        | 56 - 46 |
| 0.5 - 5.0       | 73             | 60      | 56             | 46      |
| 5.0 - 30.0      | 73             | 60      | 60             | 50      |

Notes: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases linearly with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 5.2 Radiated Emissions up to 1 GHz

| Radiated Emissions Limits at 10 meters (dB $\mu$ V/m) |                       |                       |                   |                   |
|---|-----------------------|-----------------------|-------------------|-------------------|
| Frequencies (MHz)                                     | FCC Part 15B, Class A | FCC Part 15B, Class B | CISPR 22, Class A | CISPR 22, Class B |
| 30-88   | 39                    | 29.5                  | 40                | 30                |
| 88-216  | 43.5                  | 33.1                  |                   |                   |
| 216-230   | 46.4                  | 35.6                  | 47                | 37                |
| 230-960   |                       |                       |                   |                   |
| 960-1000  | 49.5                  | 43.5                  |                   |                   |

| Radiated Emissions Limits at 3 meters (dB $\mu$ V/m) |                       |                       |                   |                   |
|--|-----------------------|-----------------------|-------------------|-------------------|
| Frequencies (MHz)                                    | FCC Part 15B, Class A | FCC Part 15B, Class B | CISPR 22, Class A | CISPR 22, Class B |
| 30-88  | 49.5                  | 40                    | 50.5              | 40.5              |
| 88-216   | 54                    | 43.5                  |                   |                   |
| 216-230  | 56.9                  | 46                    | 57.5              | 47.5              |
| 230-960  |                       |                       |                   |                   |
| 960-1000   | 60                    | 54                    |                   |                   |

Notes: 1. The lower limit shall apply at the transition frequencies.

### 5.3 Radiated Emissions above 1 GHz

Frequency Range (For unintentional radiators)

| Highest frequency generated or used in the device or on which the device operates or tunes (MHz) | Upper frequency of measurement range (MHz)                         |
|--|--|
| Below 1.705  | 30   |
| 1.705-108  | 1000   |
| 108-500  | 2000   |
| 500-1000   | 5000   |
| Above 1000   | 5th harmonic of the highest frequency or 40GHz, whichever is lower |

| Radiated Emissions Limits at 3 meters (dB $\mu$ V/m) |                     |                     |
|--|---------------------|---------------------|
| Frequency range                                      | Class A             | Class B             |
| Above 1GHz   | Avg: 60<br>Peak: 80 | Avg: 54<br>Peak: 74 |

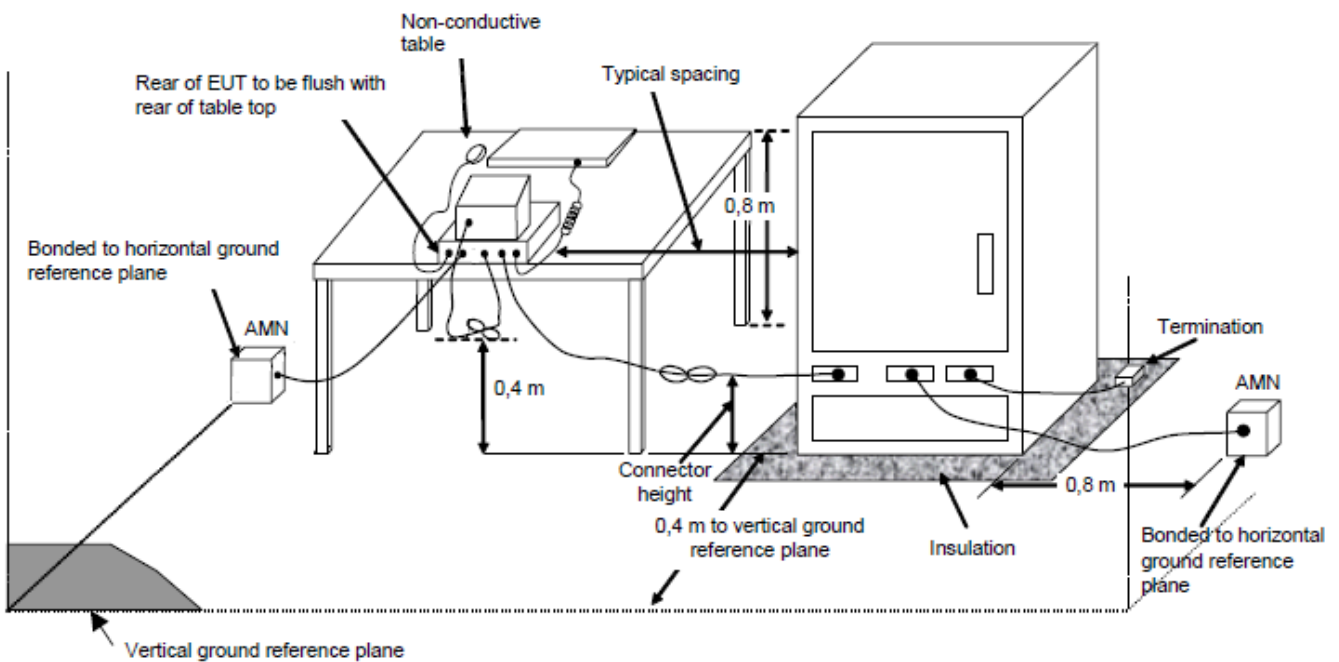
Notes: 1. These limit levels apply for a measurement distance of 3 m. If using a different measurement distance, the measured levels shall be extrapolated to the 3 m limit distance using a factor of 20 dB per decade of distance. The measurement distance shall place the measurement antenna in the far field of the ITE or digital apparatus under test.

## 6 Test Arrangements

### 6.1 Conducted Emissions from Power Ports

- a. For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the the floor standing EUT shall be insulated (by insulation of 12 mm) from the horizontal reference ground plane. The EUT is 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 are connected to the power mains through another LISN. They provide coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

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

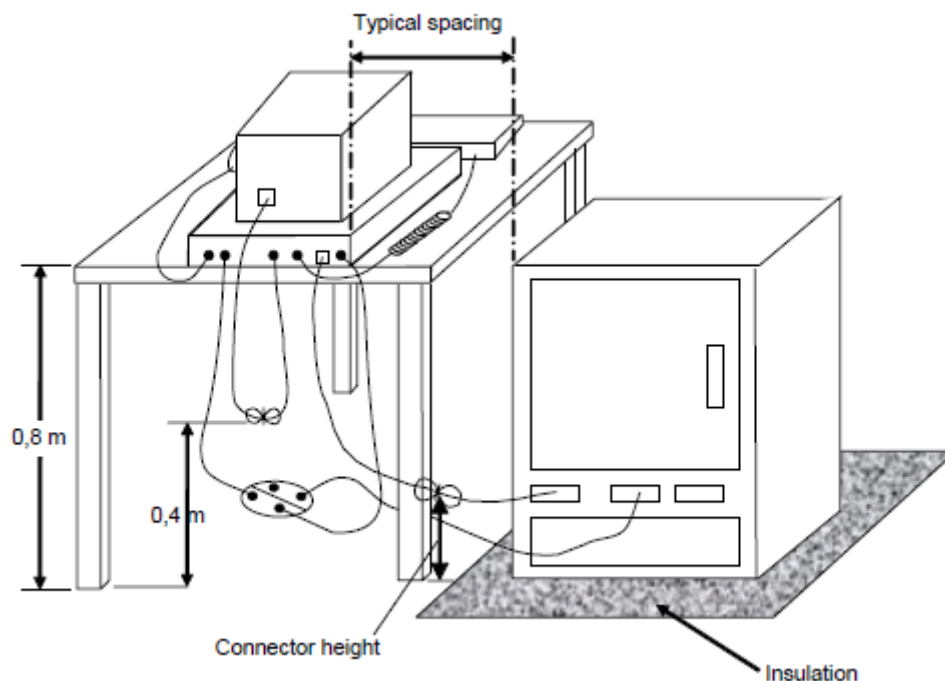


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

## 6.2 Radiated Emissions up to 1 GHz

- For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the the floor standing EUT shall be insulated (by insulation of 12 mm) from the horizontal reference ground plane. The rotating table is rotated 360 degrees to determine the position of the highest radiation. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna is a broadband antenna, and its height 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.
- 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.
- The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is up to 1 GHz.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.

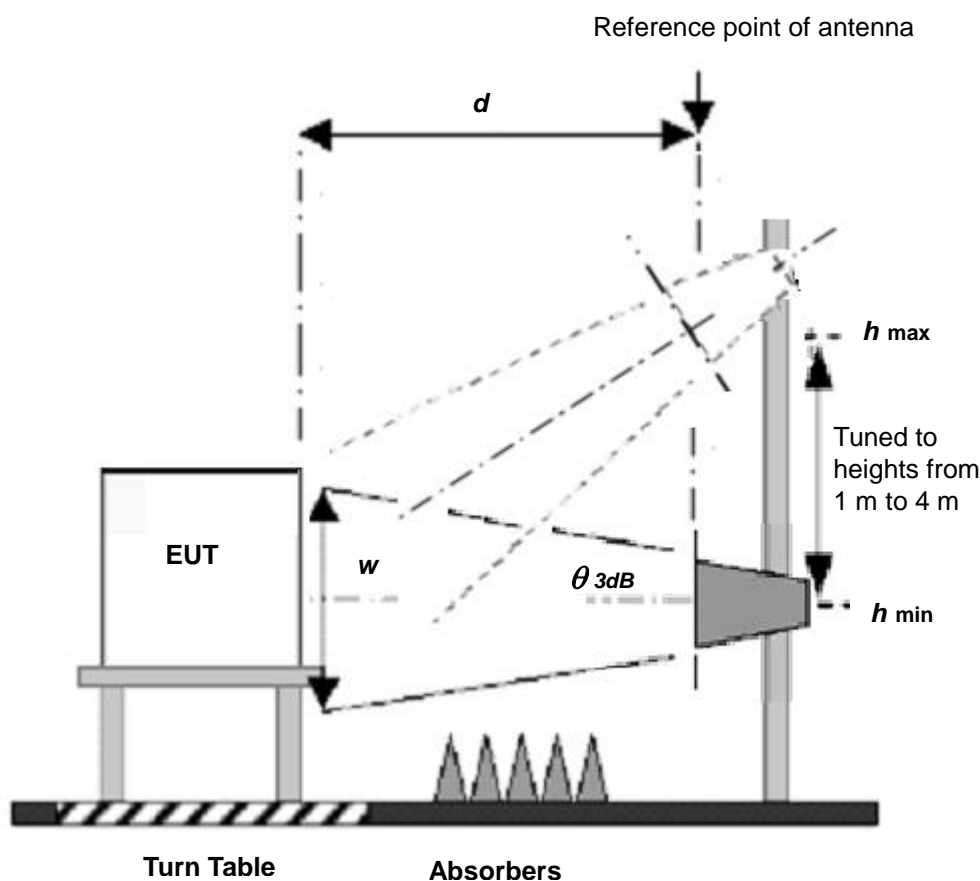


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

### 6.3 Radiated Emissions above 1 GHz

- For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the the floor standing EUT shall be insulated (by insulation of 12 mm) from the horizontal reference ground plane. The rotating table is rotated 360 degrees to determine the position of the highest radiation. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- The EUT was set  $d = 3$  meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The spectrum analyzer system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

Note: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 7 Test Results

### 7.1 Conducted Emissions from Power Ports

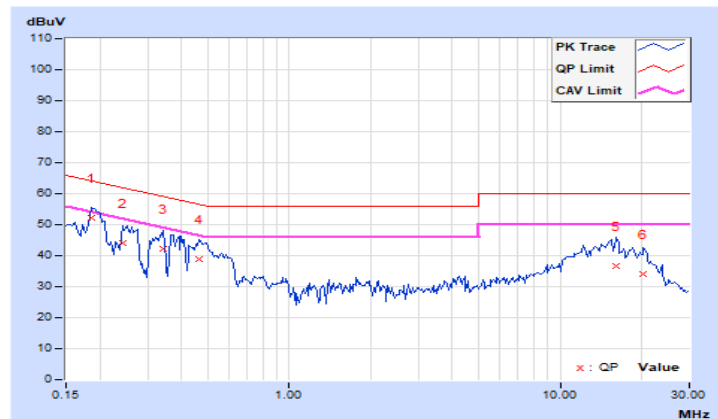
#### Mode A

|                        |                |   |                                      |
|------------------------|----------------|---|--------------------------------------|
| <b>Frequency Range</b> | 150kHz ~ 30MHz | <b>Detector Function &amp; Resolution Bandwidth</b> | Quasi-Peak (QP) / Average (AV), 9kHz |
| <b>Input Power</b>     | 120Vac, 60Hz   | <b>Environmental Conditions</b>                     | 25 °C, 67% RH                        |
| <b>Tested by</b>       | Abner Chang    |   |                                      |

| 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                         | 0.18641         | 10.00                  | 42.21                | 28.25 | 52.21                 | 38.25 | 64.20        | 54.20 | -11.99      | -15.95 |
| 2                         | 0.24375         | 10.00                  | 33.90                | 18.58 | 43.90                 | 28.58 | 61.97        | 51.97 | -18.07      | -23.39 |
| 3                         | 0.34141         | 10.01                  | 32.23                | 16.46 | 42.24                 | 26.47 | 59.17        | 49.17 | -16.93      | -22.70 |
| 4                         | 0.46250         | 10.02                  | 28.73                | 15.29 | 38.75                 | 25.31 | 56.65        | 46.65 | -17.90      | -21.34 |
| 5                         | 16.10547        | 10.78                  | 25.76                | 20.78 | 36.54                 | 31.56 | 60.00        | 50.00 | -23.46      | -18.44 |
| 6                         | 20.16406        | 10.94                  | 23.16                | 17.55 | 34.10                 | 28.49 | 60.00        | 50.00 | -25.90      | -21.51 |

#### 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



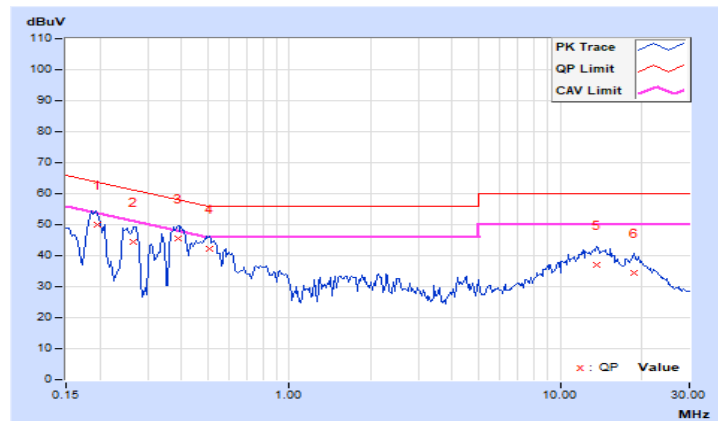


|                        |                |   |                                      |
|------------------------|----------------|---|--------------------------------------|
| <b>Frequency Range</b> | 150kHz ~ 30MHz | <b>Detector Function &amp; Resolution Bandwidth</b> | Quasi-Peak (QP) / Average (AV), 9kHz |
| <b>Input Power</b>     | 120Vac, 60Hz   | <b>Environmental Conditions</b>                     | 25 °C, 67% RH                        |
| <b>Tested by</b>       | Abner Chang    |   |                                      |

| 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                            | 0.19687         | 10.03                  | 40.08                | 28.23 | 50.11                 | 38.26 | 63.74        | 53.74 | -13.63      | -15.48 |
| 2                            | 0.26709         | 10.03                  | 34.54                | 21.37 | 44.57                 | 31.40 | 61.21        | 51.21 | -16.64      | -19.81 |
| 3                            | 0.38828         | 10.04                  | 35.59                | 23.00 | 45.63                 | 33.04 | 58.10        | 48.10 | -12.47      | -15.06 |
| 4                            | 0.50547         | 10.05                  | 32.26                | 18.62 | 42.31                 | 28.67 | 56.00        | 46.00 | -13.69      | -17.33 |
| 5                            | 13.56641        | 10.72                  | 26.35                | 20.65 | 37.07                 | 31.37 | 60.00        | 50.00 | -22.93      | -18.63 |
| 6                            | 18.64453        | 10.93                  | 23.68                | 18.94 | 34.61                 | 29.87 | 60.00        | 50.00 | -25.39      | -20.13 |

**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



## 7.2 Radiated Emissions up to 1 GHz

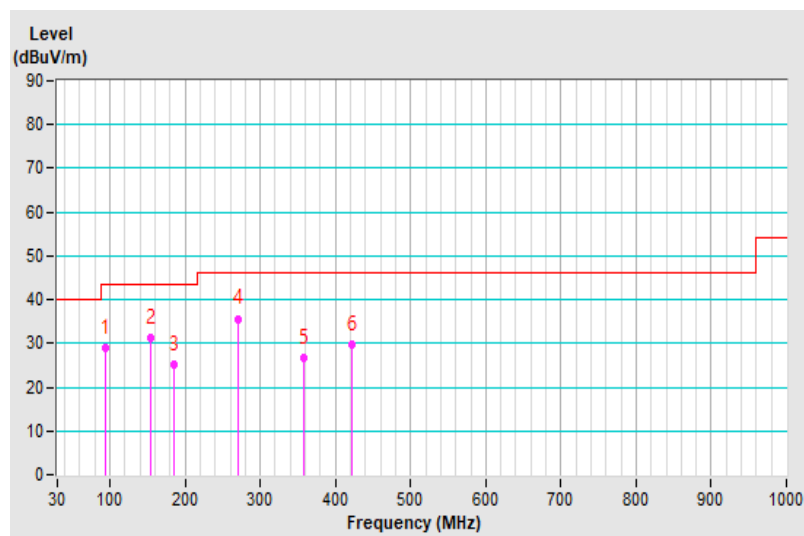
### Mode 1

|                        |                 |   |                         |
|------------------------|-----------------|---|-------------------------|
| <b>Frequency Range</b> | 30MHz ~ 1GHz    | <b>Detector Function &amp; Resolution Bandwidth</b> | Quasi-Peak (QP), 120kHz |
| <b>Input Power</b>     | DC 5V From Host | <b>Environmental Conditions</b>                     | 26 °C, 70% RH           |
| <b>Tested By</b>       | Gillian Peng    |   |                         |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1  | 93.63           | 28.89 QP                | 43.50          | -14.61      | 4.00 H             | 360                  | 42.88            | -13.99                   |
| 2  | 153.82          | 31.38 QP                | 43.50          | -12.12      | 3.00 H             | 258                  | 39.60            | -8.22                    |
| 3  | 185.37          | 25.09 QP                | 43.50          | -18.41      | 2.00 H             | 252                  | 35.72            | -10.63                   |
| 4  | 270.05          | 35.62 QP                | 46.00          | -10.38      | 1.02 H             | 352                  | 44.50            | -8.88                    |
| 5  | 356.91          | 26.76 QP                | 46.00          | -19.24      | 1.00 H             | 142                  | 33.25            | -6.49                    |
| 6  | 421.30          | 29.88 QP                | 46.00          | -16.12      | 2.00 H             | 316                  | 34.59            | -4.71                    |

#### Remarks:

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

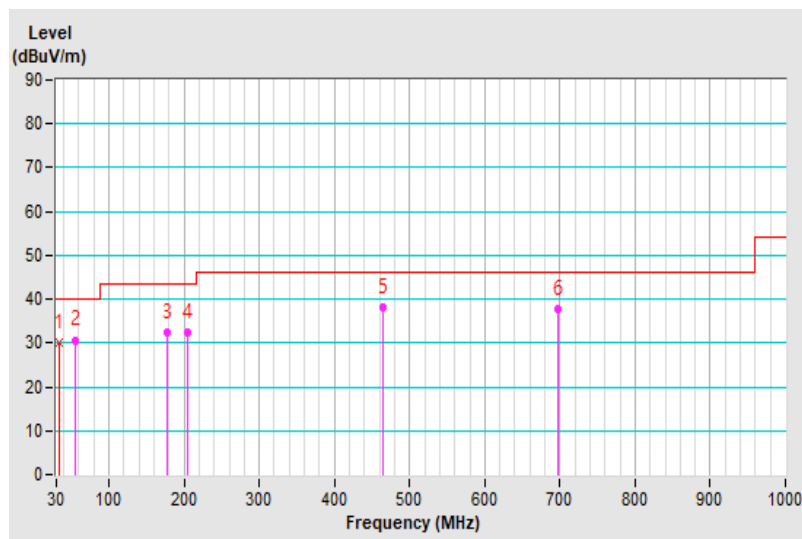


|                        |                 |   |                         |
|------------------------|-----------------|---|-------------------------|
| <b>Frequency Range</b> | 30MHz ~ 1GHz    | <b>Detector Function &amp; Resolution Bandwidth</b> | Quasi-Peak (QP), 120kHz |
| <b>Input Power</b>     | DC 5V From Host | <b>Environmental Conditions</b>                     | 26 °C, 70% RH           |
| <b>Tested By</b>       | Gillian Peng    |   |                         |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |              |                    |                      |                  |                          |
|--|-----------------|-------------------------|----------------|--------------|--------------------|----------------------|------------------|--------------------------|
| No   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB)  | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1  | 34.00           | 30.05 QP                | 40.00          | -9.95        | 2.00 V             | 360                  | 39.56            | -9.51                    |
| 2  | 55.95           | 30.66 QP                | 40.00          | -9.34        | 1.00 V             | 263                  | 39.50            | -8.84                    |
| 3  | 176.98          | 32.35 QP                | 43.50          | -11.15       | 1.00 V             | 254                  | 42.01            | -9.66                    |
| 4  | 205.01          | 32.44 QP                | 43.50          | -11.06       | 1.00 V             | 103                  | 44.20            | -11.76                   |
| <b>5</b>   | <b>464.97</b>   | <b>38.28 QP</b>         | <b>46.00</b>   | <b>-7.72</b> | <b>1.94 V</b>      | <b>340</b>           | <b>41.91</b>     | <b>-3.63</b>             |
| 6  | 697.00          | 37.63 QP                | 46.00          | -8.37        | 1.00 V             | 103                  | 36.86            | 0.77                     |

**Remarks:**

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



### 7.3 Radiated Emissions above 1 GHz

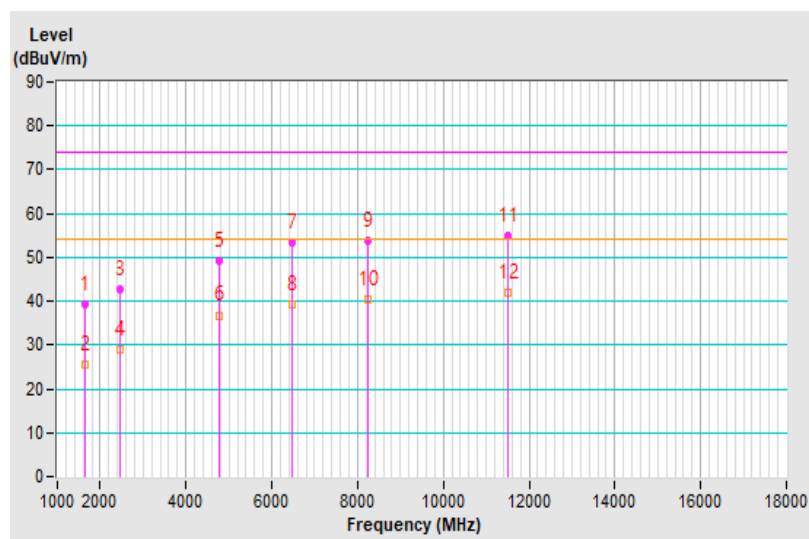
#### Mode 1

|                        |                 |   |                                |
|------------------------|-----------------|---|--------------------------------|
| <b>Frequency Range</b> | 1GHz ~ 18GHz    | <b>Detector Function &amp; Resolution Bandwidth</b> | Peak (PK) / Average (AV), 1MHz |
| <b>Input Power</b>     | DC 5V From Host | <b>Environmental Conditions</b>                     | 26 °C, 68% RH                  |
| <b>Tested By</b>       | Gillian Peng    |   |                                |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1  | 1649.40         | 39.40 PK                | 74.00          | -34.60      | 1.00 H             | 233                  | 42.35            | -2.95                    |
| 2  | 1649.40         | 25.50 AV                | 54.00          | -28.50      | 1.00 H             | 229                  | 28.45            | -2.95                    |
| 3  | 2454.35         | 42.75 PK                | 74.00          | -31.25      | 2.00 H             | 277                  | 42.26            | 0.49                     |
| 4  | 2454.35         | 28.94 AV                | 54.00          | -25.06      | 2.00 H             | 215                  | 28.45            | 0.49                     |
| 5  | 4757.00         | 49.01 PK                | 74.00          | -24.99      | 2.00 H             | 23                   | 37.20            | 11.81                    |
| 6  | 4757.00         | 36.80 AV                | 54.00          | -17.20      | 2.00 H             | 260                  | 24.99            | 11.81                    |
| 7  | 6482.50         | 53.25 PK                | 74.00          | -20.75      | 1.00 H             | 60                   | 37.00            | 16.25                    |
| 8  | 6482.50         | 39.31 AV                | 54.00          | -14.69      | 1.00 H             | 360                  | 23.06            | 16.25                    |
| 9  | 8242.85         | 53.84 PK                | 74.00          | -20.16      | 1.50 H             | 216                  | 36.46            | 17.38                    |
| 10   | 8242.85         | 40.26 AV                | 54.00          | -13.74      | 1.50 H             | 324                  | 22.88            | 17.38                    |
| 11   | 11506.85        | 55.00 PK                | 74.00          | -19.00      | 1.00 H             | 281                  | 34.90            | 20.10                    |
| 12   | 11506.85        | 41.78 AV                | 54.00          | -12.22      | 1.05 H             | 360                  | 21.68            | 20.10                    |

#### Remarks:

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

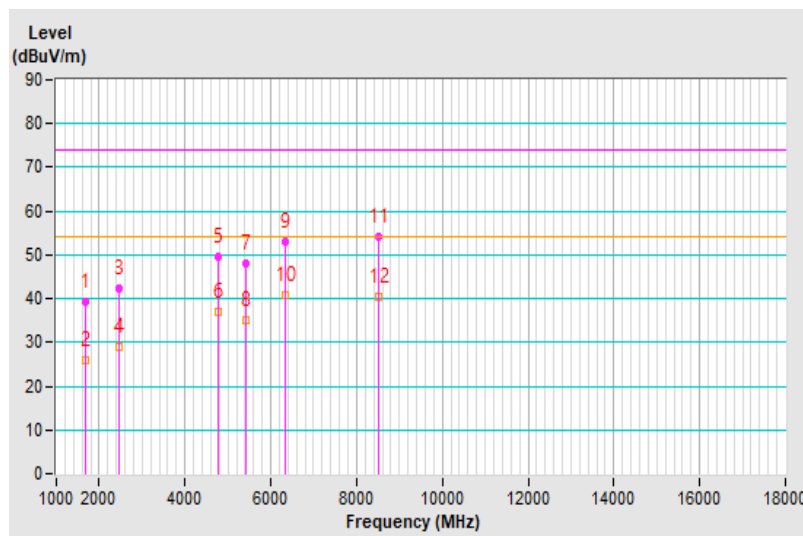


|                        |                 |   |                                |
|------------------------|-----------------|---|--------------------------------|
| <b>Frequency Range</b> | 1GHz ~ 18GHz    | <b>Detector Function &amp; Resolution Bandwidth</b> | Peak (PK) / Average (AV), 1MHz |
| <b>Input Power</b>     | DC 5V From Host | <b>Environmental Conditions</b>                     | 26 °C, 68% RH                  |
| <b>Tested By</b>       | Gillian Peng    |   |                                |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1  | 1678.30         | 39.14 PK                | 74.00          | -34.86      | 1.00 V             | 350                  | 41.83            | -2.69                    |
| 2  | 1678.30         | 25.76 AV                | 54.00          | -28.24      | 1.00 V             | 350                  | 28.45            | -2.69                    |
| 3  | 2466.25         | 42.17 PK                | 74.00          | -31.83      | 2.00 V             | 360                  | 41.62            | 0.55                     |
| 4  | 2466.25         | 29.11 AV                | 54.00          | -24.89      | 2.00 V             | 210                  | 28.56            | 0.55                     |
| 5  | 4778.25         | 49.57 PK                | 74.00          | -24.43      | 2.00 V             | 164                  | 37.08            | 12.49                    |
| 6  | 4778.25         | 37.03 AV                | 54.00          | -16.97      | 2.00 V             | 296                  | 24.54            | 12.49                    |
| 7  | 5410.65         | 48.07 PK                | 74.00          | -25.93      | 2.00 V             | 112                  | 37.00            | 11.07                    |
| 8  | 5410.65         | 35.08 AV                | 54.00          | -18.92      | 2.00 V             | 1                    | 24.01            | 11.07                    |
| 9  | 6324.40         | 52.89 PK                | 74.00          | -21.11      | 1.00 V             | 194                  | 35.30            | 17.59                    |
| 10   | 6324.40         | 40.70 AV                | 54.00          | -13.30      | 1.11 V             | 226                  | 23.11            | 17.59                    |
| 11   | 8497.00         | 54.24 PK                | 74.00          | -19.76      | 1.00 V             | 357                  | 36.86            | 17.38                    |
| 12   | 8497.00         | 40.41 AV                | 54.00          | -13.59      | 1.00 V             | 2                    | 23.03            | 17.38                    |

**Remarks:**

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



## 8 Pictures of Test Arrangements

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

## 9 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 accredited and approved according to ISO/IEC 17025.

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

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