

TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: FCBEMI-WTW-P21080520

FCC ID: NOIKBN778K

Model No.: N778K

Received Date: 2021/8/11

Test Date: 2021/9/30 ~ 2021/12/7

Issued Date: 2021/12/7

Applicant: NETRONIX, INC.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / 960022 / TW1058

Designation Number:

Approved by:  _____, **Date:** 2021/12/7
Ken Lu / Manager

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Prepared by : Evy Chen / Specialist

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Release Control Record

| Issue No. | Description | Date Issued |
|----------------------|-------------------|-------------|
| FCBEMI-WTW-P21080520 | Original release. | 2021/12/7 |

1 Certificate

Product: Electronic Display Device

Brand: Rakuten kobo

Test Model: N778K

Sample Status: Engineering sample

Applicant: NETRONIX, INC.

Test Date: 2021/9/30 ~ 2021/12/7

Standard: 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 need to perform in accordance with its interfaces, evaluated functions, are as follows:

| Standard / Clause | Test Item | Result | Remark |
|-------------------|--------------------------------------|--------|---|
| FCC Part 15.107 | Conducted Emissions from Power Ports | Pass | Minimum passing Class B margin is -9.78 dB at 0.45859 MHz |
| FCC Part 15.109 | Radiated Emissions up to 1 GHz | Pass | Minimum passing Class B margin is -6.05 dB at 121.52 MHz |
| FCC Part 15.109 | Radiated Emissions above 1 GHz | Pass | Minimum passing Class B margin is -13.50 dB at 29248.44 MHz |

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 as specified in CISPR 16-4-2:

| Measurement | Specification | Expanded Uncertainty (k=2) (\pm) | Maximum allowable uncertainty (\pm) |
|--------------------------------------|-----------------|---|--|
| Conducted Emissions from Power Ports | 9 kHz ~ 30 MHz | 1.8 dB | 3.4 dB (U_{cispr}) |
| Radiated Emissions up to 1 GHz | 30 MHz ~ 1 GHz | 5.8 dB | 6.3 dB (U_{cispr}) |
| Radiated Emissions above 1 GHz | 1 GHz ~ 6 GHz | 4.85 dB | 5.2 dB (U_{cispr}) |
| | 6 GHz ~ 18 GHz | 4.66 dB | - |
| | 18 GHz ~ 40 GHz | 5.07 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 | N778K |
| Sample Status | Engineering sample |
| Operating Software | NA |
| Power Supply Rating | 3.7 Vdc from battery or 5 Vdc from USB interface |
| Modulation Type | WLAN: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode BT-EDR: GFSK, π/4-DQPSK, 8DPSK BT-LE: GFSK |
| Modulation Technology | WLAN: DSSS, OFDM BT-EDR: FHSS BT-LE: DTS |
| Accessory Device | Refer to Note |
| Data Cable Supplied | USB Cable x1 (Shielded, 1.0m) |

Note:

1. Two eMMC provided to the EUT, please refer to the following table:

| No. | Model | Remark |
|-----|-------------------|-----------------------------|
| 1 | EMMC32G-TX29-GA8A | 1 st source eMMC |
| 2 | MKEMF032GZ1E-C | 2 nd source eMMC |

Note: From the above eMMCs, the worst case was found in No. 1. Therefore only the test data of the mode was recorded in this report.

2. Simultaneously transmission condition.

| Condition | Technology | |
|-----------|---------------|-----------|
| 1 | WLAN (2.4GHz) | Bluetooth |
| 2 | WLAN (5GHz) | Bluetooth |

3. The antenna provided to the EUT, please refer to the following table:

| Brand | Model | Antenna Net Gain (dBi) | Frequency Range (GHz) | Antenna Type | Connector Type |
|-------|-------------------|------------------------|-----------------------|--------------|----------------|
| INPAQ | ACM3-3216-P1-CC-S | 0.6 | 2.4~2.4835 | Chip Antenna | None |
| | | 2 | 5.15~5.85 | | |

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 from CPU clock frequency, 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

The EUT has been pre-tested under following test modes.

| Test Condition | |
|----------------|---|
| Mode | Radiated Emissions up to 1 GHz |
| 1 | Input(DC 5V From Host)+eMM(Kingston)+Mode(USB with Leather sheath)+Arrangement(Horizontal Placement) |
| 2 | Input(DC 5V From Host)+eMM(Kingston)+Mode(USB)+Arrangement(Horizontal Placement) |
| 3 | Input(DC 3.7V From Battery)+eMM(Kingston)+Mode(BT)+Arrangement(Horizontal Placement) |
| 4 | Input(DC 3.7V From Battery)+eMM(Kingston)+Mode(WiFi)+Arrangement(Horizontal Placement) |
| 5 | Input(DC 3.7V From Battery)+eMM(Kingston)+Mode(WiFi)+Arrangement(Vertical Placement) |
| 6 | Input(DC 3.7V From Battery)+eMM(Kingston)+Mode(WiFi)+Arrangement(Side Placement) |
| 7 | Input(DC 5V From Host)+eMM(MK FOUNDER)+Mode(USB with Leather sheath)+Arrangement(Horizontal Placement) |

Note: The worst case is shown up with bold words.

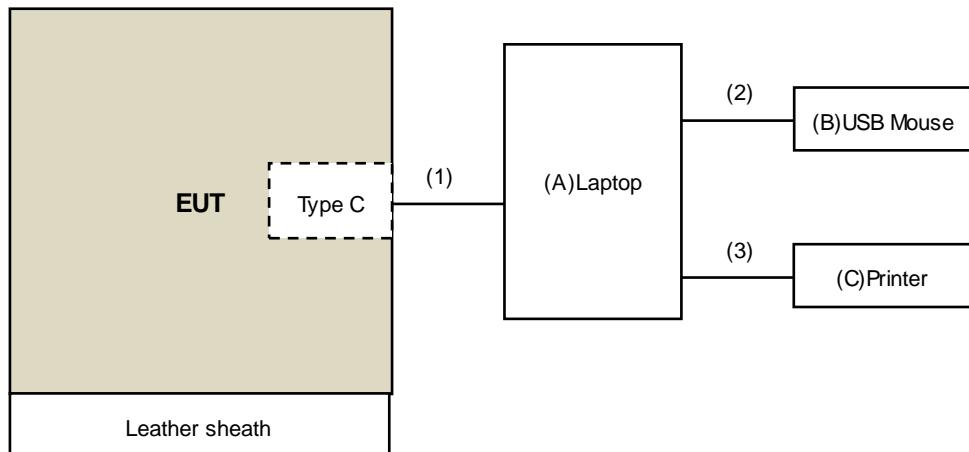
Test modes are presented in the report as below.

| Test Condition | |
|----------------|--|
| Mode | Conducted Emissions from Power Ports |
| A | Input(DC 5V From Host)+eMM(Kingston)+Mode(USB with Leather sheath)+Arrangement(Horizontal Placement) |
| Mode | Radiated Emissions up to 1 GHz |
| A | Input(DC 5V From Host)+eMM(Kingston)+Mode(USB with Leather sheath)+Arrangement(Horizontal Placement) |
| Mode | Radiated Emissions above 1 GHz |
| A | Input(DC 5V From Host)+eMM(Kingston)+Mode(USB with Leather sheath)+Arrangement(Horizontal Placement) |

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 | NA | NA | NA | NA | Provided by Lab |
| B | USB Mouse | NA | NA | NA | NA | Provided by Lab |
| C | Printer | NA | NA | NA | NA | Provided by Lab |

| ID | Cable 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 | N/A | EMC-04 | 2020/10/26 | 2021/10/25 |
| | | EMC-06 | 2020/11/19 | 2021/11/18 |
| DC LISN TESEQ | HV-AN 150 | 45176 | 2021/4/23 | 2022/4/22 |
| | | 45177 | 2021/4/23 | 2022/4/22 |
| Fixed attenuator STI | STI02-2200-10 | 006 | 2021/8/27 | 2022/8/26 |
| LISN SCHWARZBECK | NSLK 8127 | 8127-522 | 2021/9/11 | 2022/9/10 |
| LISN R&S | ENV216 | 100072 | 2021/6/16 | 2022/6/15 |
| LISN SCHWARZBECK | NNLK 8121 | 0809 | 2021/2/24 | 2022/2/23 |
| RF Coaxial Cable JYEO | 5D-FB | COACAB-001 | 2021/3/12 | 2022/3/11 |
| Software BV | BVADT_Cond_ V7.3.7.4 | NA | NA | NA |
| TEST RECEIVER R&S | ESCS30 | 100375 | 2021/5/11 | 2022/5/10 |

Notes:

1. The test was performed in HC - Conduction 3
2. Tested Date: 2021/10/2

4.2 Radiated Emissions up to 1 GHz

| Description Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|--|----------------------|----------------|-----------------|------------------|
| Antenna Tower & Turn Table CT | NA | NA | NA | NA |
| Fixed attenuator Marvelous Microwave Inc. | MVE2252-05 | MVE2252-05-001 | 2021/9/14 | 2022/9/13 |
| Pre_Amplifier Mini-Circuits | ZFL-1000VH2B | AMP-ZFL-03 | 2020/10/20 | 2021/10/19 |
| RF Coaxial Cable COMMATE/PEWC | 8D | CHGCAB-005 | 2021/9/23 | 2022/9/22 |
| RF Coaxial Cable | 8D-FB | CHGCAB-001-2 | 2021/9/23 | 2022/9/22 |
| RF Coaxial Cable | RF-141 | CHGCAB-004 | 2021/9/23 | 2022/9/22 |
| Software BV | ADT_Radiated_V8.7.08 | NA | NA | NA |
| Test Receiver Agilent | N9038A | MY51210105 | 2021/6/17 | 2022/6/16 |
| Trilog Broadband Antenna SCHWARZBECK | VULB 9168 | 9168-360 | 2020/11/4 | 2021/11/3 |

Notes:

1. The test was performed in HC - 966 chamber 1. The test site validated date: 2021/9/18(NSA)
2. Tested Date: 2021/9/30

4.3 Radiated Emissions above 1 GHz

For 1GHz ~ 18GHz

| Description Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|----------------------------------|----------------------|---------------|-----------------|------------------|
| Antenna Tower & Turn Table CT | NA | NA | NA | NA |
| Fix tool for Boresight BV | BAF-01 | 5 | NA | NA |
| Horn Antenna FT-RF | HA-07M18G-NF | 0000320091110 | 2020/11/22 | 2021/11/21 |
| Pre_Amplifier Agilent | 8449B | 3008A02578 | 2021/6/8 | 2022/6/7 |
| Pre_Amplifier EMCI | EMC118A45SE | 980817 | 2021/7/16 | 2022/7/15 |
| RF Coaxial Cable EMCI | EMC104-SM-SM-2000 | 181208 | 2021/8/24 | 2022/8/23 |
| | EMC104-SM-SM-6000 | 181209 | 2021/8/24 | 2022/8/23 |
| | EMC104-SM-SM-8500 | 181211 | 2021/8/24 | 2022/8/23 |
| Software BV | ADT_Radiated_V8.7.08 | NA | NA | NA |
| Spectrum Analyzer Agilent | E4446A | MY48250254 | 2020/11/20 | 2021/11/19 |
| Test Receiver Agilent | N9038A | MY51210105 | 2021/6/17 | 2022/6/16 |

Notes:

1. The test was performed in HC - 966 chamber 1. The test site validated date: 2021/9/17 (VSWR)
2. Tested Date: 2021/9/30



BUREAU
VERITAS

For 18GHz ~ 40GHz

| Description Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|----------------------------------|----------------------|------------|--------------------|---------------------|
| Test Receiver Agilent | N9038A | MY51210105 | 2021/6/17 | 2022/6/16 |
| Software BV | ADT_Radiated_V8.7.08 | NA | NA | NA |
| Antenna Tower & Turn Table CT | NA | NA | NA | NA |
| Pre_Amplifier EMCI | EMC184045SE | 980770 | 2021/7/16 | 2022/7/15 |
| Horn Antenna SCHWARZBECK | BBHA 9170 | 9170-424 | 2021/11/14 | 2022/11/13 |
| RF Cable(46GHz /1.5M) SUHNER | SUCOFLEX 102 | 36432/2 | 2021/1/5 | 2022/1/4 |
| RF Coaxial Cable EMEC | EM102-KMKG-450 | 21090301 | 2021/9/11 | 2022/9/10 |

Notes:

1. The test was performed in HC - 966 chamber 1. The test site validated date: 2021/9/17 (VSWR)
2. Tested Date: 2021/12/7

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 |
| 0.50 - 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

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

| Radiated Emissions Limits at 10 meters (dB μ V/m) | | | | |
|---|-----------------------------|-----------------------------|-------------------|-------------------|
| Frequencies (MHz) | FCC 15B / ICES-003, Class A | FCC 15B / ICES-003, Class B | CISPR 22, Class A | CISPR 22, Class B |
| 30-88 | 39 | 29.5 | | |
| 88-216 | 43.5 | 33.1 | 40 | 30 |
| 216-230 | | | | |
| 230-960 | 46.4 | 35.6 | | |
| 960-1000 | 49.5 | 43.5 | 47 | 37 |

| Radiated Emissions Limits at 3 meters (dB μ V/m) | | | | |
|--|-----------------------------|-----------------------------|-------------------|-------------------|
| Frequencies (MHz) | FCC 15B / ICES-003, Class A | FCC 15B / ICES-003, Class B | CISPR 22, Class A | CISPR 22, Class B |
| 30-88 | 49.5 | 40 | | |
| 88-216 | 54 | 43.5 | 50.5 | 40.5 |
| 216-230 | | | | |
| 230-960 | 56.9 | 46 | | |
| 960-1000 | 60 | 54 | 57.5 | 47.5 |

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

2. Emission level (dB μ V/m) = 20 log Emission level (uV/m).

3. QP detector shall be applied if not specified.

5.3 Radiated Emissions above 1 GHz

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

| Radiated Emissions Limits at 10 meters (dB μ V/m) | | | | |
|---|-----------------------------|-----------------------------|-------------------|-------------------|
| Frequencies (MHz) | FCC 15B / ICES-003, Class A | FCC 15B / ICES-003, Class B | CISPR 22, Class A | CISPR 22, Class B |
| 1000-3000 | Avg: 49.5 Peak: 69.5 | Avg: 43.5 Peak: 63.5 | Not defined | Not defined |
| Above 3000 | | | Not defined | Not defined |

| Radiated Emissions Limits at 3 meters (dB μ V/m) | | | | |
|--|-----------------------------|-----------------------------|---------------------|---------------------|
| Frequencies (MHz) | FCC 15B / ICES-003, Class A | FCC 15B / ICES-003, Class B | CISPR 22, Class A | CISPR 22, Class B |
| 1000-3000 | Avg: 60 Peak: 80 | Avg: 54 Peak: 74 | Avg: 56 Peak: 76 | Avg: 50 Peak: 70 |
| Above 3000 | | | Avg: 60 Peak: 80 | Avg: 54 Peak: 74 |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB μ V/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Frequency Range (For unintentional radiators)

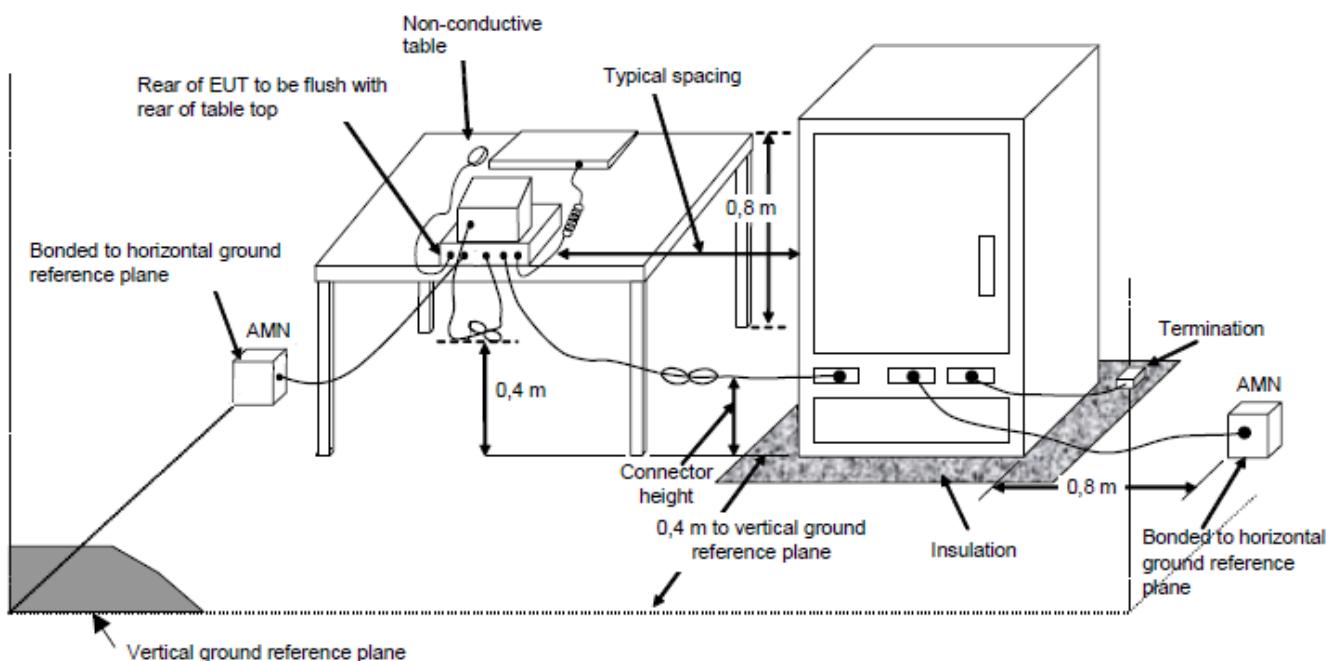
| Highest frequency generated or used in the device or on which the device operates or tunes (MHz) | Upper frequency of measurement range (MHz) |
|--|--|
| Below 1.705 | 30 |
| 1.705-108 | 1000 |
| 108-500 | 2000 |
| 500-1000 | 5000 |
| Above 1000 | 5th harmonic of the highest frequency or 40GHz, whichever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

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.

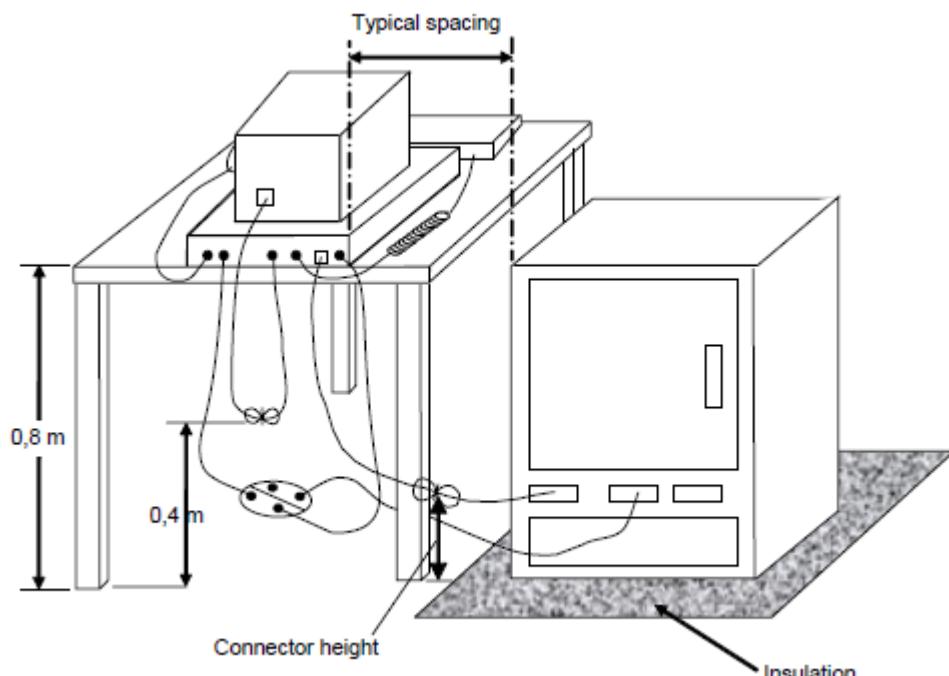


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

6.2 Radiated Emissions up to 1 GHz

- 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 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.
- 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 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.
- 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 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.

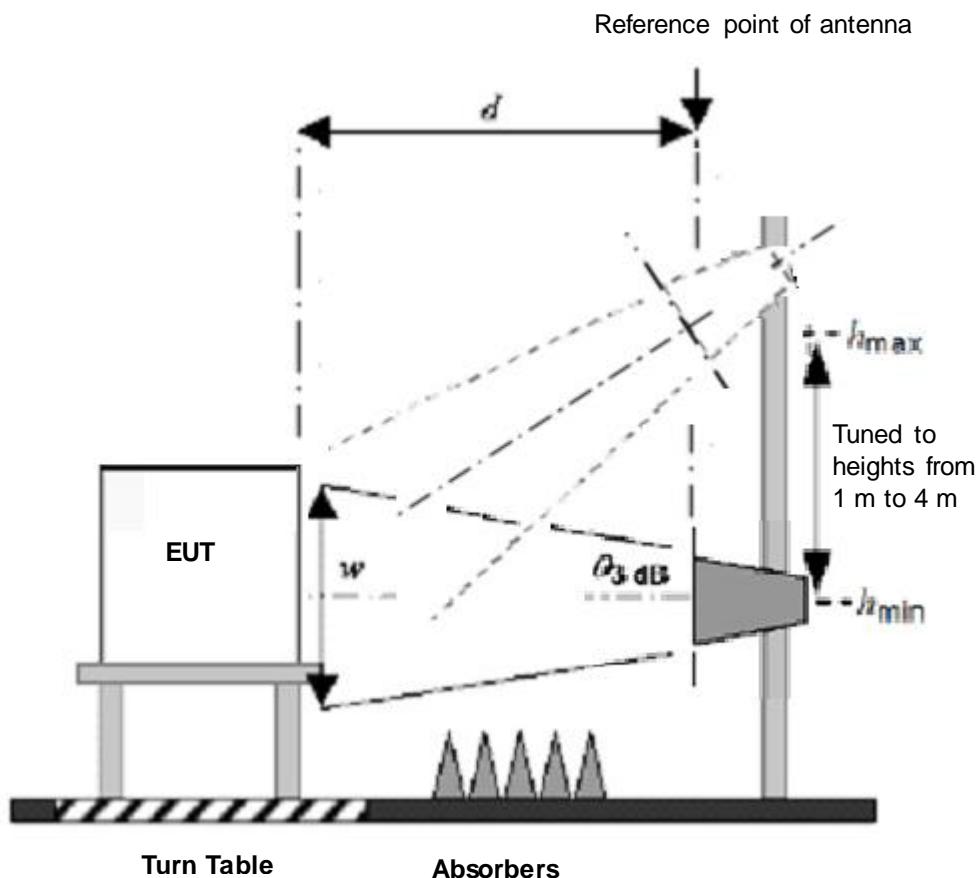


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

6.3 Radiated Emissions above 1 GHz

- 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 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.
- b. The EUT was set $d = 3$ meters for 1GHz to 29.25GHz away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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.
- e. 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 of Test Item

7.1 Conducted Emissions from Power Ports

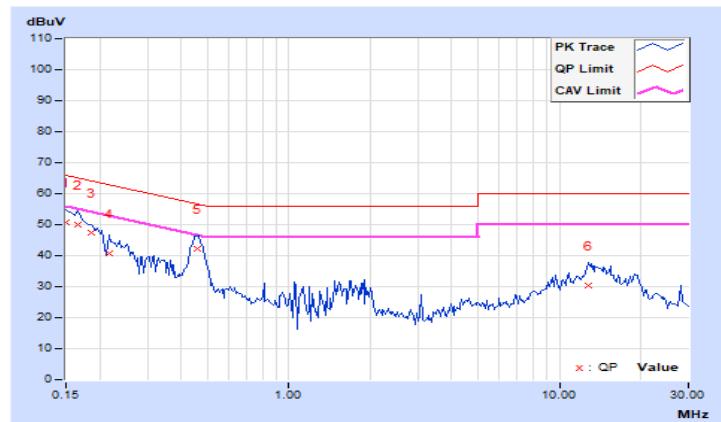
Mode A

| | | | |
|----------------------|----------------|--|--------------------------------------|
| Frequency Range | 150kHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9kHz |
| Input Power (System) | 120Vac, 60Hz | Environmental Conditions | 26 °C, 75% RH |
| Tested by | Eagle Chen | | |

| 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 | 10.04 | 40.63 | 26.79 | 50.67 | 36.83 | 65.99 | 55.99 | -15.32 | -19.16 |
| 2 | 0.16562 | 10.04 | 39.92 | 27.25 | 49.96 | 37.29 | 65.18 | 55.18 | -15.22 | -17.89 |
| 3 | 0.18516 | 10.03 | 37.37 | 18.79 | 47.40 | 28.82 | 64.25 | 54.25 | -16.85 | -25.43 |
| 4 | 0.21641 | 10.03 | 30.71 | 16.47 | 40.74 | 26.50 | 62.96 | 52.96 | -22.22 | -26.46 |
| 5 | 0.45859 | 10.04 | 32.22 | 26.90 | 42.26 | 36.94 | 56.72 | 46.72 | -14.46 | -9.78 |
| 6 | 12.85547 | 10.37 | 19.83 | 15.21 | 30.20 | 25.58 | 60.00 | 50.00 | -29.80 | -24.42 |

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

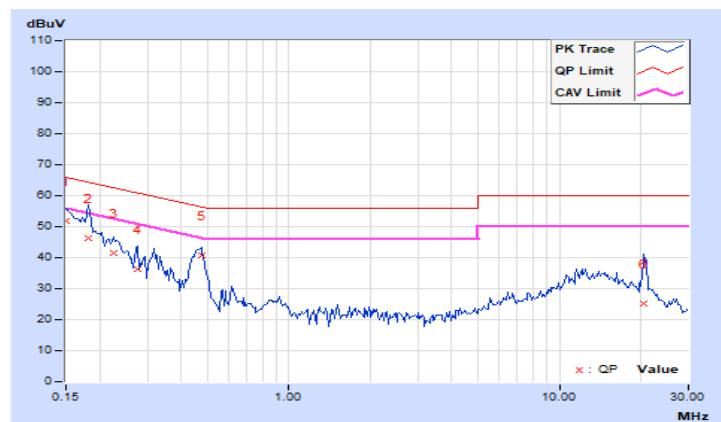


| | | | |
|-----------------------------|----------------|---|--------------------------------------|
| Frequency Range | 150kHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9kHz |
| Input Power (System) | 120Vac, 60Hz | Environmental Conditions | 26 °C, 75% RH |
| Tested by | Eagle Chen | | |

| 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 | 0.15023 | 10.03 | 41.77 | 25.93 | 51.80 | 35.96 | 65.99 | 55.99 | -14.19 | -20.03 |
| 2 | 0.18125 | 10.02 | 36.28 | 20.65 | 46.30 | 30.67 | 64.43 | 54.43 | -18.13 | -23.76 |
| 3 | 0.22422 | 10.02 | 31.62 | 19.09 | 41.64 | 29.11 | 62.66 | 52.66 | -21.02 | -23.55 |
| 4 | 0.27500 | 10.03 | 26.15 | 14.32 | 36.18 | 24.35 | 60.97 | 50.97 | -24.79 | -26.62 |
| 5 | 0.47422 | 10.04 | 30.76 | 25.92 | 40.80 | 35.96 | 56.44 | 46.44 | -15.64 | -10.48 |
| 6 | 20.44531 | 10.53 | 14.83 | 9.76 | 25.36 | 20.29 | 60.00 | 50.00 | -34.64 | -29.71 |

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

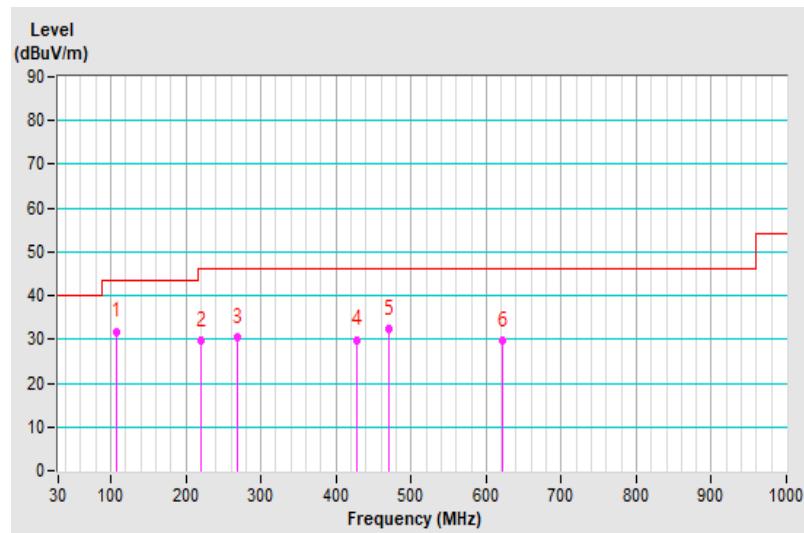
Mode A

| | | | |
|-----------------|--------------|--|-------------------------|
| Frequency Range | 30MHz ~ 1GHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP), 120kHz |
| Input Power | DC 5V | Environmental Conditions | 26 °C, 60% RH |
| Tested By | 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 | 108.33 | 31.82 QP | 43.50 | -11.68 | 2.73 H | 255 | 43.23 | -11.41 |
| 2 | 219.61 | 29.85 QP | 46.00 | -16.15 | 1.00 H | 195 | 41.15 | -11.30 |
| 3 | 269.32 | 30.58 QP | 46.00 | -15.42 | 4.00 H | 146 | 39.30 | -8.72 |
| 4 | 428.14 | 29.92 QP | 46.00 | -16.08 | 3.00 H | 191 | 34.13 | -4.21 |
| 5 | 471.06 | 32.50 QP | 46.00 | -13.50 | 4.00 H | 62 | 35.73 | -3.23 |
| 6 | 620.75 | 29.87 QP | 46.00 | -16.13 | 3.00 H | 234 | 29.84 | 0.03 |

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

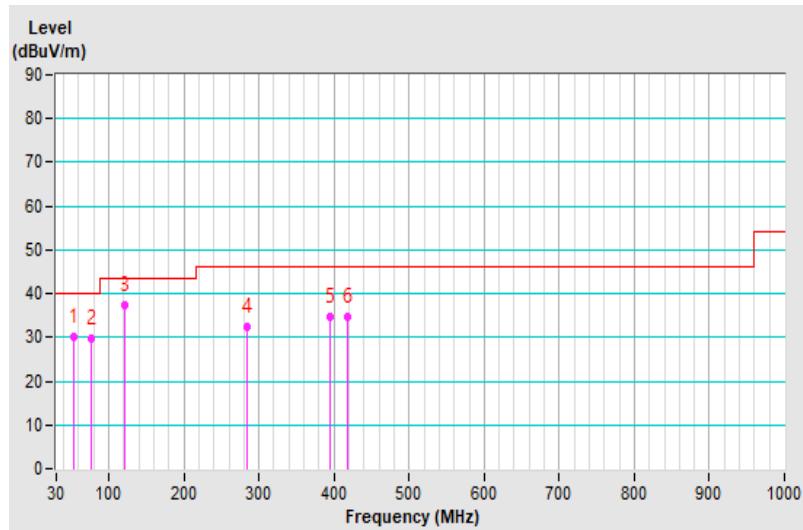


| | | | |
|------------------------|--------------|---|-------------------------|
| Frequency Range | 30MHz ~ 1GHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP), 120kHz |
| Input Power | DC 5V | Environmental Conditions | 26 °C, 60% RH |
| Tested By | Gillian Peng | | |

| 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 | 53.04 | 30.02 QP | 40.00 | -9.98 | 1.00 V | 194 | 38.48 | -8.46 |
| 2 | 76.51 | 29.80 QP | 40.00 | -10.20 | 2.00 V | 166 | 42.15 | -12.35 |
| 3 | 121.52 | 37.45 QP | 43.50 | -6.05 | 2.81 V | 27 | 47.61 | -10.16 |
| 4 | 284.38 | 32.35 QP | 46.00 | -13.65 | 2.00 V | 360 | 40.50 | -8.15 |
| 5 | 394.67 | 34.51 QP | 46.00 | -11.49 | 1.00 V | 103 | 39.82 | -5.31 |
| 6 | 417.44 | 34.52 QP | 46.00 | -11.48 | 2.00 V | 319 | 39.17 | -4.65 |

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

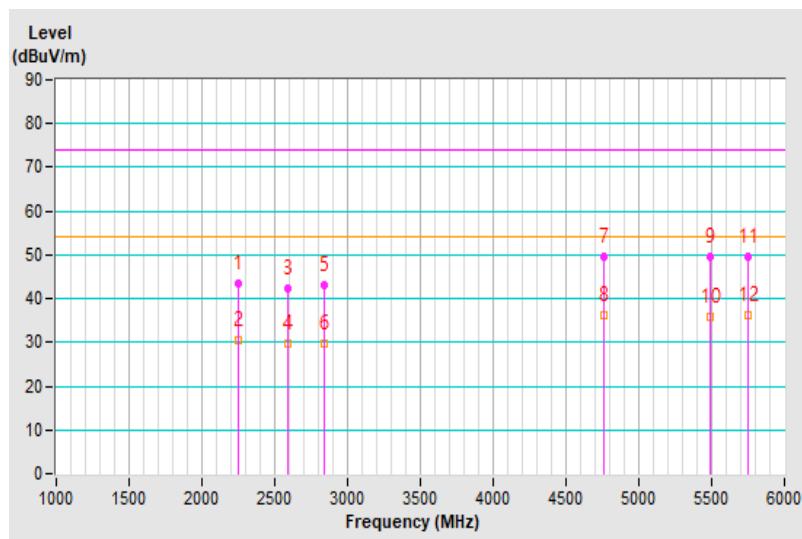
Mode A

| | | | |
|-----------------|--------------|--|--------------------------------|
| Frequency Range | 1GHz ~ 18GHz | Detector Function & Resolution Bandwidth | Peak (PK) / Average (AV), 1MHz |
| Input Power | DC 5V | Environmental Conditions | 26 °C, 60 % RH |
| Tested By | 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 | 2247.75 | 43.58 PK | 74.00 | -30.42 | 1.50 H | 57 | 40.56 | 3.02 |
| 2 | 2247.75 | 30.55 AV | 54.00 | -23.45 | 1.50 H | 0 | 27.53 | 3.02 |
| 3 | 2592.25 | 42.34 PK | 74.00 | -31.66 | 1.00 H | 202 | 40.53 | 1.81 |
| 4 | 2592.25 | 29.70 AV | 54.00 | -24.30 | 1.00 H | 235 | 27.89 | 1.81 |
| 5 | 2839.25 | 43.13 PK | 74.00 | -30.87 | 2.00 H | 279 | 39.77 | 3.36 |
| 6 | 2839.25 | 29.75 AV | 54.00 | -24.25 | 2.00 H | 218 | 26.39 | 3.36 |
| 7 | 4764.25 | 49.51 PK | 74.00 | -24.49 | 1.50 H | 199 | 37.18 | 12.33 |
| 8 | 4764.25 | 36.27 AV | 54.00 | -17.73 | 1.32 H | 360 | 23.94 | 12.33 |
| 9 | 5486.25 | 49.49 PK | 74.00 | -24.51 | 1.00 H | 327 | 37.50 | 11.99 |
| 10 | 5486.25 | 35.74 AV | 54.00 | -18.26 | 1.00 H | 287 | 23.75 | 11.99 |
| 11 | 5751.00 | 49.41 PK | 74.00 | -24.59 | 1.00 H | 360 | 37.20 | 12.21 |
| 12 | 5751.00 | 36.21 AV | 54.00 | -17.79 | 1.00 H | 342 | 24.00 | 12.21 |

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

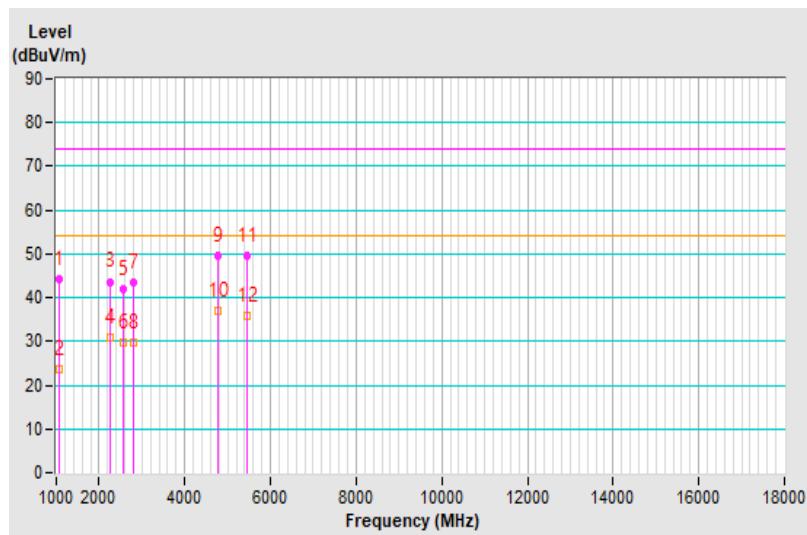


| | | | |
|------------------------|--------------|---|--------------------------------|
| Frequency Range | 1GHz ~ 18GHz | Detector Function & Resolution Bandwidth | Peak (PK) / Average (AV), 1MHz |
| Input Power | DC 5V | Environmental Conditions | 26 °C, 60 % RH |
| Tested By | Gillian Peng | | |

| 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 | 1059.25 | 44.21 PK | 74.00 | -29.79 | 1.00 V | 336 | 50.81 | -6.60 |
| 2 | 1059.25 | 23.64 AV | 54.00 | -30.36 | 1.00 V | 360 | 30.24 | -6.60 |
| 3 | 2264.25 | 43.63 PK | 74.00 | -30.37 | 2.00 V | 352 | 40.37 | 3.26 |
| 4 | 2264.25 | 30.76 AV | 54.00 | -23.24 | 2.00 V | 91 | 27.50 | 3.26 |
| 5 | 2579.50 | 42.00 PK | 74.00 | -32.00 | 2.00 V | 327 | 40.27 | 1.73 |
| 6 | 2579.50 | 29.56 AV | 54.00 | -24.44 | 2.00 V | 282 | 27.83 | 1.73 |
| 7 | 2795.25 | 43.29 PK | 74.00 | -30.71 | 2.00 V | 0 | 40.48 | 2.81 |
| 8 | 2795.25 | 29.56 AV | 54.00 | -24.44 | 2.00 V | 6 | 26.75 | 2.81 |
| 9 | 4786.25 | 49.45 PK | 74.00 | -24.55 | 1.00 V | 349 | 36.41 | 13.04 |
| 10 | 4786.25 | 36.90 AV | 54.00 | -17.10 | 1.01 V | 305 | 23.86 | 13.04 |
| 11 | 5443.00 | 49.65 PK | 74.00 | -24.35 | 1.50 V | 30 | 37.91 | 11.74 |
| 12 | 5443.00 | 35.82 AV | 54.00 | -18.18 | 1.50 V | 76 | 24.08 | 11.74 |

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

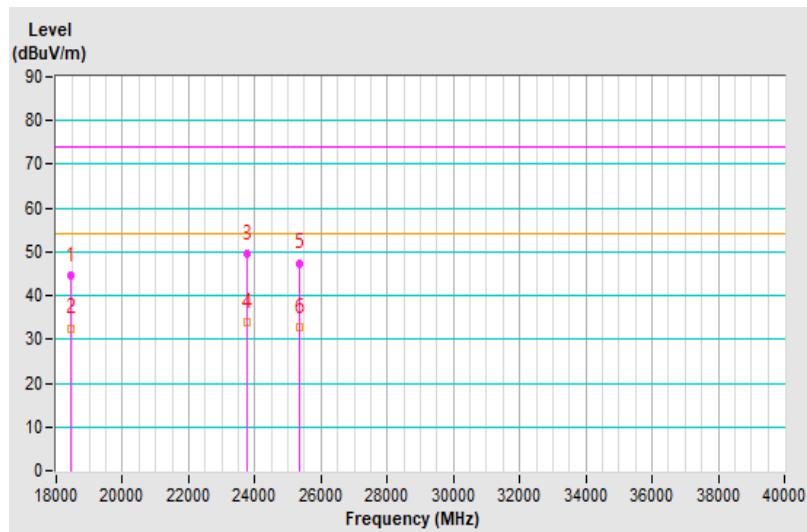


| | | | |
|------------------------|------------------|---|--------------------------------|
| Frequency Range | 18GHz ~ 29.25GHz | Detector Function & Resolution Bandwidth | Peak (PK) / Average (AV), 1MHz |
| Input Power | DC 5V | Environmental Conditions | 25 °C, 73 % RH |
| Tested By | Gillian Peng | | |

| 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 | 18459.28 | 44.76 PK | 74.00 | -29.24 | 1.50 H | 360 | 54.51 | -9.75 |
| 2 | 18459.28 | 32.60 AV | 54.00 | -21.40 | 1.50 H | 21 | 42.35 | -9.75 |
| 3 | 23760.71 | 49.48 PK | 74.00 | -24.52 | 1.00 H | 0 | 53.77 | -4.29 |
| 4 | 23760.71 | 34.04 AV | 54.00 | -19.96 | 1.11 H | 340 | 38.33 | -4.29 |
| 5 | 25343.18 | 47.48 PK | 74.00 | -26.52 | 1.00 H | 238 | 51.22 | -3.74 |
| 6 | 25343.18 | 32.74 AV | 54.00 | -21.26 | 1.00 H | 0 | 36.48 | -3.74 |

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

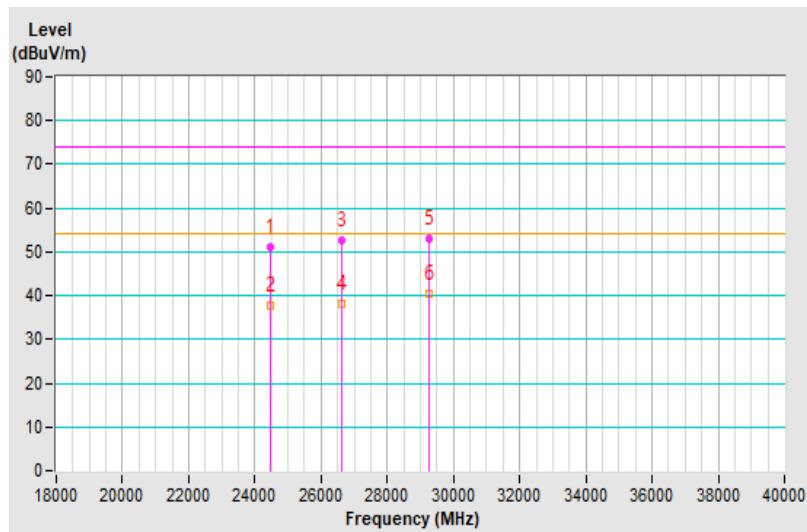


| | | | |
|------------------------|------------------|---|--------------------------------|
| Frequency Range | 18GHz ~ 29.25GHz | Detector Function & Resolution Bandwidth | Peak (PK) / Average (AV), 1MHz |
| Input Power | DC 5V | Environmental Conditions | 21 °C, 64 % RH |
| Tested By | Gillian Peng | | |

| 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 | 24481.02 | 51.03 PK | 74.00 | -22.97 | 1.00 V | 89 | 54.10 | -3.07 |
| 2 | 24481.02 | 37.67 AV | 54.00 | -16.33 | 1.00 V | 360 | 40.74 | -3.07 |
| 3 | 26643.14 | 52.75 PK | 74.00 | -21.25 | 1.50 V | 152 | 54.96 | -2.21 |
| 4 | 26643.14 | 38.09 AV | 54.00 | -15.91 | 1.50 V | 338 | 40.30 | -2.21 |
| 5 | 29248.44 | 53.15 PK | 74.00 | -20.85 | 1.00 V | 303 | 55.04 | -1.89 |
| 6 | 29248.44 | 40.50 AV | 54.00 | -13.50 | 1.07 V | 360 | 42.39 | -1.89 |

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 FCC recognized accredited test firms and accredited 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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